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### Introduction

#### Product Facts

- High density packaging features
- Minimum mass
- MIL spec or Commercial-Off-The-Shelf (COTS) options
- Durable performance, rugged
- Outstanding electrical performance; low contact resistance
- Withstands shock and vibration
- Expanded temperature range
- Reliable mass crimp terminations
- Crimp any material, shape, finish
- Extensive design options
- Other options:
  - EMI/RFI filter
  - SMT or thru-hole
  - Harness assemblies
  - Mounting brackets
  - Custom modifications
  - Backshells
  - Lo-profile
  - Headers
  - Flex circuit attached
  - Mixed signal technology



NANONICS Nanominiature Connectors and associated cable systems are designed for size and weight reduction while maintaining a high level of reliability and ruggedness. The contact system is used throughout the product family to enhance long-term performance and quality of the system in difficult applications. Connector manufacturing utilizes only materials that are selected to pass Space and Military Specifications. Fabrication of the connectors includes machine controlled crimping of the leads or wires directly to the pin or socket contacts prior to final connector assembly. These high-end Nanominiature connectors are designed into numerous configurations that range from wired nano-strips to complex flex circuit interconnect systems and cover the circuit spectrum from dc. to rf. applications. Customized versions of each design type can be requested. Application Engineering and custom harness designs are available to help resolve fitting previously large interconnection systems into smaller and smaller spaces.

#### General Specifications

**Military** — meets \*DSCC specs. 94031 through 94046

#### Goldbore Contacts

**Material** — Beryllium copper

**Plating** — Nickel over gold

**Contact Current** — 4 Amps continuous

**Resistance** — .003-.008 ohms

**Engage Force** — 1.0 oz. average/contact

**Wire size/Current** — 30 AWG & smaller/1 Amp

**Contact Pitch** — .025 [.635], .0125 [.317] for 2 row

**Insulators** — Polyphenylene sulfide or liquid crystal polymer

**Metal Shells** — 6061 Aluminum with electroless nickel plate; 303 stainless steel; other metals & plating available

**Dielectric WV** — Sea level 70,000 ft. [21,336 m]

|         |        |        |
|---------|--------|--------|
| Plastic | 500VDC | 250VDC |
| Metal   | 400VDC | 200VDC |

**Insulation Resistance** — 1000 Megohms

**Vibration & Shock** — \*DSCC 94031 - 94046 & MIL-C-83513

**Environment** — \*DSCC 94031 - 94046 & MIL-C-83513 (Tested over 4000 engagements)

**Polarization** — DUALLOBE, pins, keys

**Temperature Range** — -328°F to +437°F [-200°C to +225°C]

**Layouts** — 2-65 positions

**Coupling** — Jackscrews; friction

**Outgassing** — Meets Sp-R-0022

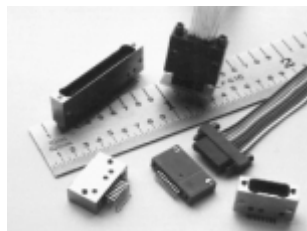
\*DSCC-Defense Supply Center, Columbus. Formerly, DESC, Dayton, Ohio

**Introduction** (Continued)



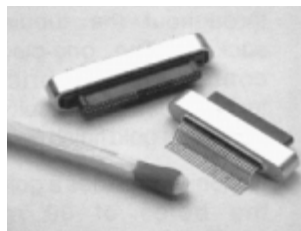
**Strip**

- Smallest of connectors
- Friction coupling
- Guide pin polarization
- SMT, or thru-hole
- Wire, flex and ribbon options



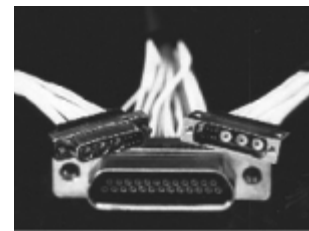
**DUALOBE Connector**

- Polarized scoop-proof mating
- Blindmating with ease
- Coupling with jackscrews
- Panel mount, SMT, thru-hole
- MIL Specs or COTS



**Hermetic "H" Series**

- Hermetic per MIL-STD-202
- MIL-STD-883; 1X10-8 CC/sec leak rate
- 5-60 positions, larger sizes as assemblies
- Mate with NANONICS standard DUALOBE receptacles



**Nano-Coaxial Connectors**

- More than 1/3 smaller than Micro-Ds
- Custom mixed signal systems
- Uses 32 AWG coax
- Maintains low cross talk
- Improved analog signal control



**Environmentally Sealed Circulars**

- Quick Disconnect or Thread Coupling Plugs
- Panel Mount and Flush Mount Receptacles
- Sizes include: 7, 19 and 44 position
- Nano-Sized Shells and .025 [0.635] pitch connections

**The Contact System**

The contact system features burnished gold bores and surfaces throughout the tubular pins and sockets. The one-piece seamless contacts are fabricated using techniques that result in superior, gold finish contacts.

Tyco Electronics provides a typical gold thickness of 30 micro-inches (.000030 [0.00076]). In addition, seamless contact bores further contribute to crimps of outstanding quality and durability (i.e., gas tight and intrusion proof). Innovative receptacle design effectively doubles the electrical "creep" distance between sockets permitting higher voltage limits. The contact system also minimizes bias to resonate, thus, vibration and shock induced "opens" are virtually eliminated.

Excellent physical and electrical mating characteristics are obtained via a low engaging force that maintains an effective contact wiping action during mating. Problems associated with special mating tools or jigs and zero force engaging techniques (i.e., ZIF) are eliminated.

**Socket Contact**

The socket is the active element. It incorporates the necessary spring action to promote low contact resistance and long life endurance. The socket is a seamless one piece tubular part without slots or other traditional means to provide the spring action. Precision manufacturing techniques produce a highly reliable and simple contact. A unique burnished Goldbore finish is common to the crimp barrels of both contacts and the socket engaging bore. The gold finish provides contact integrity for superior reliability and environmental performance.

**Pin Contact**

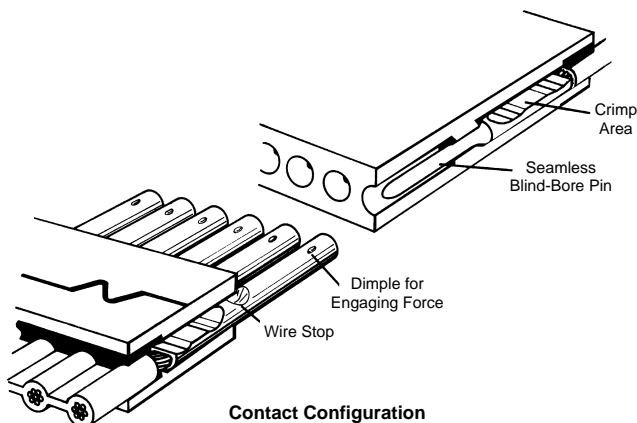
The pin contact is fabricated employing ultra precision methods producing a blind-bore seamless pin

with a burnished gold finish on ID and OD surfaces. The pin, being approximately .0125 [0.32] in diameter, is not as strong as the socket. Consequently, the pin has been recessed within the insulator, thereby permitting the stronger member (the socket) to be exposed.

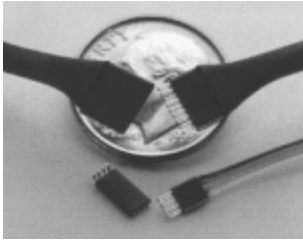
**Termination**

Connectors are normally terminated at the factory per specifications. Thus, no special techniques or termination tools are required by the customer. Tyco Electronics can also provide factory terminated harness assemblies (including flex circuits) to your specifications. All terminated connectors and harness assemblies are tested and certified prior to shipment. Both contacts embody closed crimp bores that provide the optimum shape for a variety of conductor shapes and materials, including 30 AWG thru 40 and smaller.

Crimp termination accommodates solid and stranded conductors as well as flat conductors and ribbon cable. Crimps are gas-tight and intrusion proof.



**Contact Configuration**

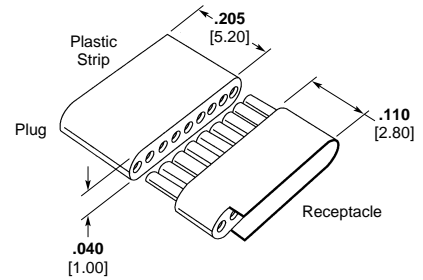
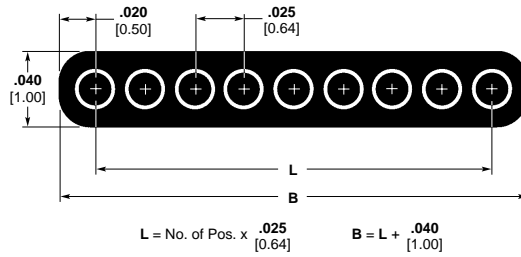


NANONICS Strip Connectors provide dramatic reduction in size and weight, and enable reduction in board space requirements while retaining DUALLOBE Connector series performance.

Strips are useful in applications such as hearing aids, hand-held communication devices, flex terminations, and high density electronics where packaging space is at a premium.

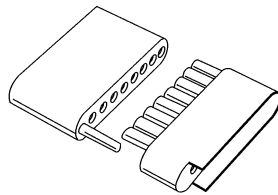
Strips are available for PCB surface mount and thru-hole applications and may be terminated with ribbon cable, flex circuits and a variety of insulated wire, 30 AWG thru 42 AWG and smaller. Contact Tyco Electronics for details.

Strip Connectors

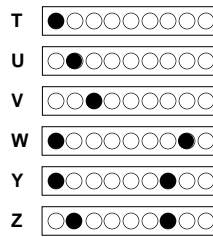


Polarization

Polarization of the strips is accomplished with the use of polarizing guide posts.



"T" Shown



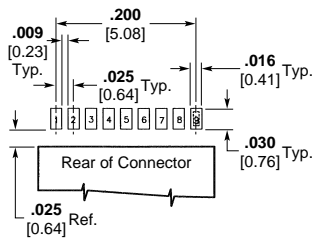
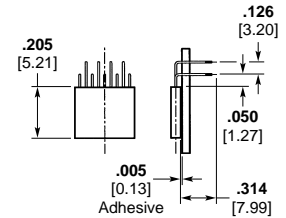
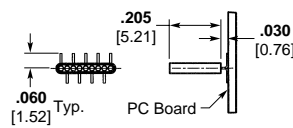
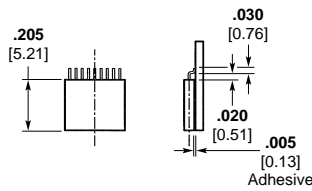
Polarizing Guide Post (PGP) Positions

Stocked Sizes

| No. of Positions | Dimensions |       |
|------------------|------------|-------|
|                  | L          | B     |
| 4                | .115       | .155  |
|                  | 2.92       | 3.92  |
| 9                | .240       | .280  |
|                  | 6.10       | 7.10  |
| 15               | .390       | .430  |
|                  | 9.91       | 10.91 |

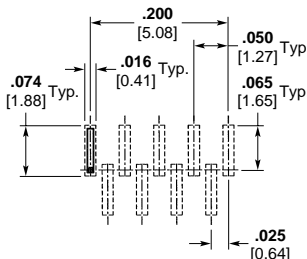
Other sizes available. Contact Tyco Electronics for more information.

9-Position, Single Row, Strip Connector and Plug



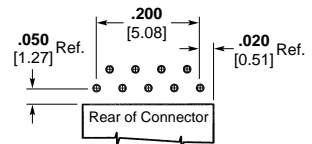
Recommended PC Board Layout

Surface Mount Option



Recommended PC Board Layout

Vertical Surface Mount Option





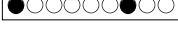
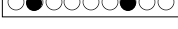


Recommended PC Board Layout

Thru Hole Option

**Strip Connectors - Wire Terminations**

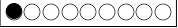



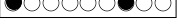
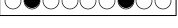
|                                |                          |     |                 |   |    |     |   |
|--------------------------------|--------------------------|-----|-----------------|---|----|-----|---|
| <b>Class/Row/Type</b>          | XXX                      | XXX | XX              | X | XX | XXX | X |
| USS                            | Unshrouded, 1 Row, Strip |     |                 |   |    |     |   |
| <b>Positions</b>               |                          |     |                 |   |    |     |   |
| 004                            | 4 Position               |     |                 |   |    |     |   |
| 009                            | 9 Position               |     |                 |   |    |     |   |
| 015                            | 15 Position              |     |                 |   |    |     |   |
| <b>Configuration</b>           |                          |     |                 |   |    |     |   |
| PC                             | Plug                     |     |                 |   |    |     |   |
| SC                             | Receptacle               |     |                 |   |    |     |   |
| <b>Conductor Sizes/Strands</b> |                          |     |                 |   |    |     |   |
| 0                              | 28 AWG Solid             | 3   | 32 AWG 7 Strand |   |    |     |   |
| 1                              | 30 AWG Solid             | 4   | 34 AWG 7 Strand |   |    |     |   |
| 2                              | 30 AWG 7 Strand          |     |                 |   |    |     |   |

|   |   |
|---|---|
| <b>Polarization</b>   | <b>Polarization: (Strip Type Only)</b>  |
| Plug contains guide post<br>Receptacle accepts guide post                                 | T = One Pin  |
|   | U = One Pin  |
|   | V = One Pin  |
|   | W = Two Pin  |
|   | Y = Two Pin  |
|   | Z = Two Pin  |
| <b>Conductor Length</b>   |   |
| XXX Three numbers only, length is in inches ( i.e. 012 = twelve inches)                   |   |
| CXX A "C" followed by two numbers, length is in centimeters ( i.e. C06 = six centimeters) |   |
| MXX An "M" followed by two numbers, length is in meters ( i.e. M02 = two meters)          |   |
| <b>Conductor Type</b>   |   |
| DX White TEFLON   | DM Color Coded TEFLON per MIL-STD-681   |
| DY White PTFE M16878/6  | DT White TEFZEL M22759/33   |
| DC Color Coded TEFLON   |   |

Note: See Page 5031 for standard part numbers.

**Strip Connectors - Surface Mount and Thru Hole Terminations**

|                       |   |     |    |   |
|-----------------------|---|-----|----|---|
| <b>Class/Row/Type</b> | XXX                                     | XXX | XX | X |
| USS                   | Unshrouded, 1 Row, Strip                |     |    |   |
| <b>Positions</b>      |   |     |    |   |
| 004                   | 4 Position                              |     |    |   |
| 009                   | 9 Position                              |     |    |   |
| 015                   | 15 Position                             |     |    |   |
| <b>Configuration</b>  |   |     |    |   |
| B2                    | Plug, Horizontal SMT                    |     |    |   |
| L2                    | Receptacle, Horizontal SMT              |     |    |   |
| C6                    | Plug, Horizontal Mount, Thru Hole       |     |    |   |
| M6                    | Receptacle, Horizontal Mount, Thru Hole |     |    |   |

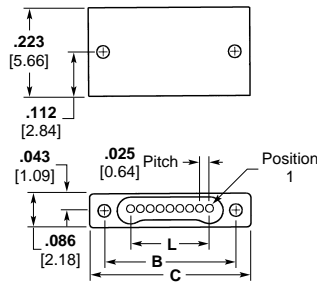
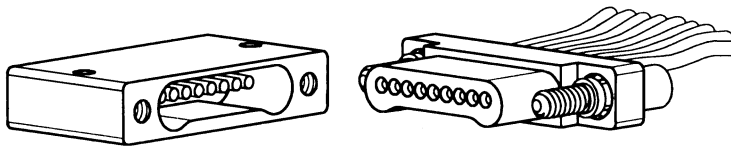
|   |   |
|---|---|
| <b>Polarization</b>                                       | <b>Polarization: (Strip Type Only)</b>  |
| Plug contains guide post<br>Receptacle accepts guide post | T = One Pin  |
|   | U = One Pin  |
|   | V = One Pin  |
|   | W = Two Pin  |
|   | Y = Two Pin  |
|   | Z = Two Pin  |

Note: See Page 5031 for standard part numbers.

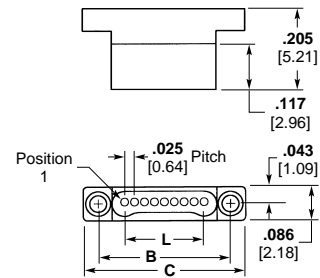
#### DUALLOBE Single Row Connectors

#### Options

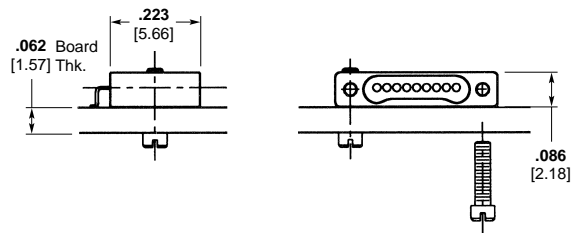
- Plastic or Metal
- Standard Sizes: 5, 9, 15, 25, 37, and 51
- Factory wired to your specifications, or PC board termination shown in examples
- Contact Tyco Electronics for design specifications



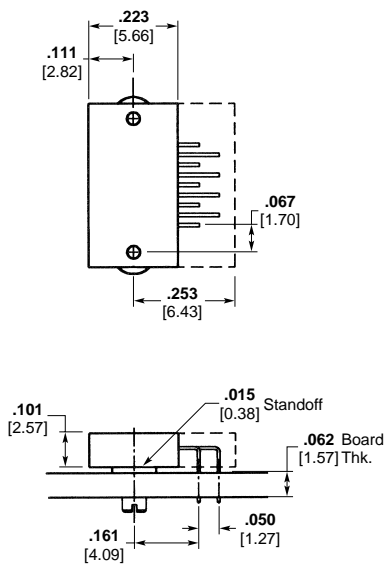
Receptacle



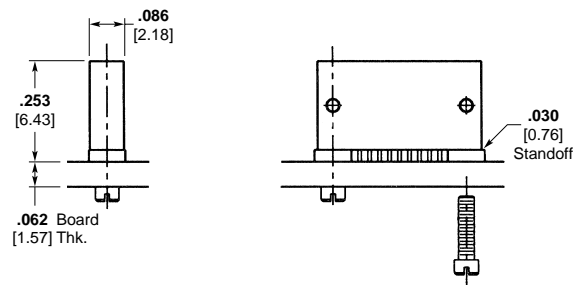
Plug



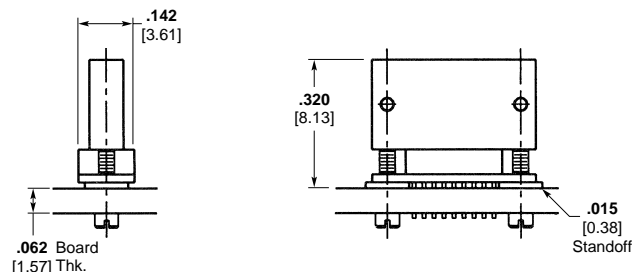
Horizontal Surface Mount



Horizontal Thru Hole



Vertical Surface Mount



Vertical Thru Hole

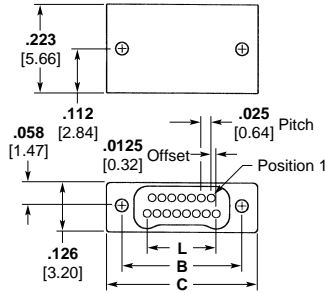
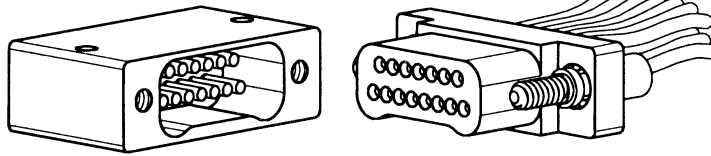
| Size | Dimensions         |                    |                    |
|------|--------------------|--------------------|--------------------|
|      | L<br>±.005 [±0.13] | B<br>±.005 [±0.13] | C<br>±.005 [±0.13] |
| 5    | .100<br>2.51       | .233<br>5.87       | .308<br>7.76       |
| 9    | .200<br>5.08       | .333<br>8.46       | .405<br>10.29      |
| 15   | .350<br>8.89       | .483<br>12.27      | .555<br>14.10      |
| 25   | .600<br>15.24      | .733<br>18.62      | .805<br>20.45      |
| 37   | .900<br>22.86      | 1.033<br>26.24     | 1.105<br>28.07     |
| 51   | 1.250<br>31.75     | 1.383<br>35.13     | 1.455<br>36.96     |



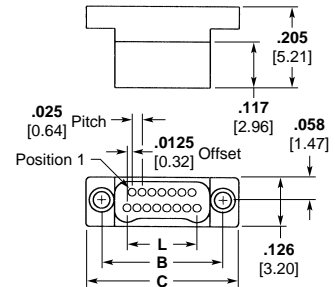
DUALLOBE Two Row Connectors

Options

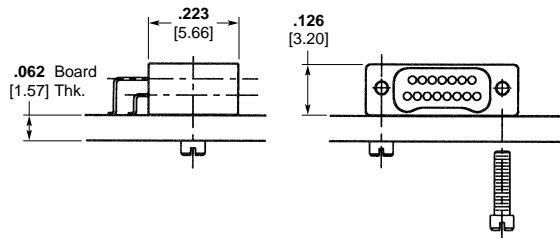
- Plastic or Metal
- Standard Sizes: 9, 15, 25, 37, 51 and 65
- Factory wired to your specifications, or PC board termination shown in examples
- Contact Tyco Electronics for design specifications



Receptacle

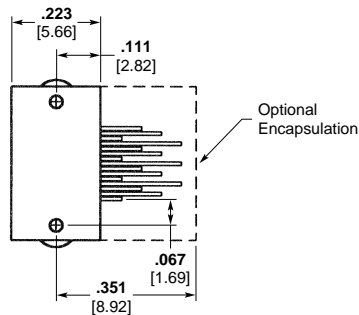


Plug

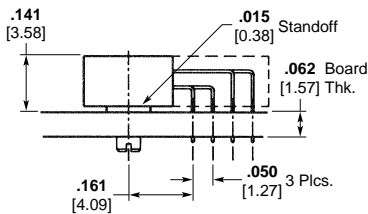


Horizontal Surface Mount

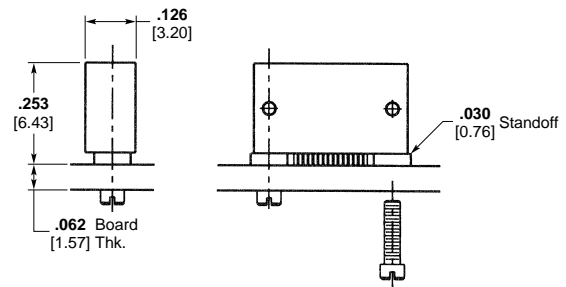
| Size | Dimensions         |                    |                    |
|------|--------------------|--------------------|--------------------|
|      | L<br>±.005 [±0.13] | B<br>±.005 [±0.13] | C<br>±.005 [±0.13] |
| 9    | .100<br>2.54       | .229<br>5.82       | .305<br>7.75       |
| 15   | .175<br>4.45       | .304<br>7.72       | .385<br>9.78       |
| 25   | .300<br>7.62       | .429<br>10.90      | .510<br>12.95      |
| 37   | .450<br>11.43      | .579<br>14.71      | .660<br>16.76      |
| 51   | .625<br>15.88      | .754<br>19.15      | .835<br>21.21      |
| 65   | .800<br>20.32      | .929<br>23.60      | 1.010<br>25.65     |



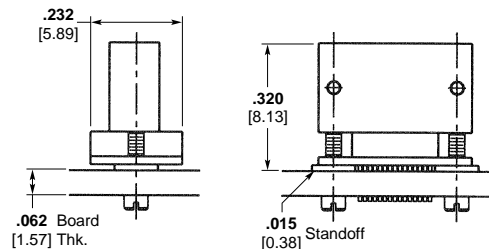
Vertical Surface Mount



Horizontal Thru Hole



Vertical Thru Hole



**DUALOBE Connectors - Jumper Terminations\***

|                                  |                                     |   |   |     |    |   |    |     |   |
|----------------------------------|-------------------------------------|---|---|-----|----|---|----|-----|---|
| <b>Class</b>                     | X                                   | X | X | XXX | XX | X | XX | XXX | X |
| J Jumper                         |                                     |   |   |     |    |   |    |     |   |
| <b>Rows</b>                      |                                     |   |   |     |    |   |    |     |   |
| S 1 Row                          |                                     |   |   |     |    |   |    |     |   |
| T 2 Row                          |                                     |   |   |     |    |   |    |     |   |
| <b>Type</b>                      |                                     |   |   |     |    |   |    |     |   |
| L LCP (Plastic)                  |                                     |   |   |     |    |   |    |     |   |
| M Metal (Al; Ni Plate)           |                                     |   |   |     |    |   |    |     |   |
| <b>Positions</b>                 |                                     |   |   |     |    |   |    |     |   |
| 005 5 Position (single row only) | 037 37 Position                     |   |   |     |    |   |    |     |   |
| 009 9 Position                   | 051 51 Position                     |   |   |     |    |   |    |     |   |
| 015 15 Position                  | 065 65 Position (two row only)      |   |   |     |    |   |    |     |   |
| 025 25 Position                  |                                     |   |   |     |    |   |    |     |   |
| <b>Configurations</b>            |                                     |   |   |     |    |   |    |     |   |
| PP Plug to Plug, 1 to 1          | PD Plug to Plug, low to high in row |   |   |     |    |   |    |     |   |
| PR Plug to Receptacle, 1 to 1    | RR Receptacle to Receptacle, 1 to 1 |   |   |     |    |   |    |     |   |

\*Made to Order

**Threads/Jackscrew**

|                                   |                                |
|-----------------------------------|--------------------------------|
| <b>Threads (Receptacles Only)</b> | <b>Jackscrews (Plugs Only)</b> |
| N Thread for 1.0 mm Jackscrews    | M 1.0 mm Non Captive Jackscrew |
| Q Thread for 1.2 mm Jackscrews    | N 1.0 mm Captive Jackscrew     |
|                                   | Q 1.2 mm Captive Jackscrew     |

**Conductor Length**

|   |
|---|
| XXX Three numbers only, length is in inches ( i.e. 012 = twelve inches)                   |
| CXX A "C" followed by two numbers, length is in centimeters ( i.e. C06 = six centimeters) |
| MXX An "M" followed by two numbers, length is in meters ( i.e. M02 = two meters)          |

**Conductor Type**

|                        |                                       |
|------------------------|---------------------------------------|
| DX White TEFLON        | DM Color Coded TEFLON per MIL-STD-681 |
| DY White PTFE M16878/6 | DT White TEFZEL M22759/33             |
| DC Color Coded TEFLON  | GX TEFLON Ribbon Cable FEP            |

**Conductor Size/Strands**

|                   |                   |
|-------------------|-------------------|
| 0 28 AWG Solid    | 3 32 AWG 7 Strand |
| 1 30 AWG Solid    | 4 34 AWG 7 Strand |
| 2 30 AWG 7 Strand |                   |

Note: See Page 5024 for standard part numbers.

**DUALOBE Connectors - Surface Mount and Thru Hole Terminations**

|                                  |                                |   |   |     |    |   |   |
|----------------------------------|--------------------------------|---|---|-----|----|---|---|
| <b>Class</b>                     | X                              | X | X | XXX | XX | X | X |
| S DUALOBE                        |                                |   |   |     |    |   |   |
| <b>Rows</b>                      |                                |   |   |     |    |   |   |
| S 1 Row                          |                                |   |   |     |    |   |   |
| T 2 Row                          |                                |   |   |     |    |   |   |
| <b>Type</b>                      |                                |   |   |     |    |   |   |
| L LCP (Plastic)                  |                                |   |   |     |    |   |   |
| M Metal (Al; Ni Plate)           |                                |   |   |     |    |   |   |
| <b>Positions</b>                 |                                |   |   |     |    |   |   |
| 005 5 Position (single row only) | 037 37 Position                |   |   |     |    |   |   |
| 009 9 Position                   | 051 51 Position                |   |   |     |    |   |   |
| 015 15 Position                  | 065 65 Position (two row only) |   |   |     |    |   |   |
| 025 25 Position                  |                                |   |   |     |    |   |   |

**Threads/Jackscrew**

|                                   |                                |
|-----------------------------------|--------------------------------|
| <b>Threads (Receptacles Only)</b> | <b>Jackscrews (Plugs Only)</b> |
| N Thread for 1.0 mm Jackscrews    | M 1.0 mm Non Captive Jackscrew |
| Q Thread for 1.2 mm Jackscrews    | N 1.0 mm Captive Jackscrew     |
|                                   | Q 1.2 mm Captive Jackscrew     |

**Mounting Hardware(Receptacles Only)**

|                                 |                                 |
|---------------------------------|---------------------------------|
| A 1.2 mm x .160"                | K 1.0 mm x .200" w/ 4 Standoffs |
| C 1.0 mm x .200" w/ 2 Standoffs | L 1.2 mm x .200" w/ 2 Standoffs |
| D 1.2 mm x .160" w/ 2 Standoffs | P 1.2 mm x .200" w/ 4 Standoffs |
| H 1.0 mm x .160"                | S 1.0 mm x .160" w/ 2 Standoffs |
| I 1.2 mm x .200"                |                                 |

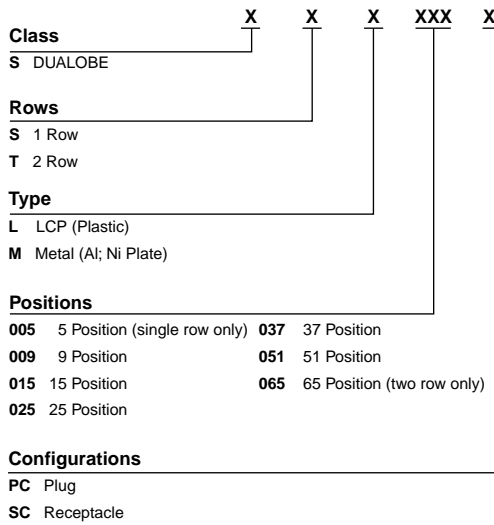
**Configuration**

|   |
|---|
| B2 Plug, Horizontal SMT   |
| B4 Plug, Vertical SMT   |
| B42 Plug, Vertical SMT, .020" Extended Leads  |
| B44 Plug, Vertical SMT, .040" Extended Leads  |
| L2 Receptacle, Horizontal SMT   |
| L4 Receptacle, Vertical SMT   |
| L42 Receptacle, Vertical SMT, .020" Extended Leads  |
| L44 Receptacle, Vertical SMT, .040" Extended Leads  |
| L8 Receptacle, Vertical SMT w/ integrated standoffs (metal shell only)                        |
| L82 Receptacle, Vertical SMT w/ integrated standoffs, .020" Extended Leads (metal shell only) |
| L84 Receptacle, Vertical SMT w/ integrated standoffs, .040" Extended Leads (metal shell only) |
| C5 Plug, Vertical Mount, Thru Hole  |
| C6 Plug, Horizontal Mount, Thru Hole  |
| M5 Receptacle, Vertical Mount, Thru Hole  |
| M6 Receptacle, Horizontal Mount, Thru Hole  |

Note: See Pages 5024-5026 for standard part numbers.

**DUALOBE Connectors - Wire Terminations**

Note: See Page(s) 5027-5030 for standard part numbers.



**Threads/Jackscrew**

| Threads (Receptacles Only) |                              | Jackscrews (Plugs Only) |                              |
|----------------------------|------------------------------|-------------------------|------------------------------|
| N                          | Thread for 1.0 mm Jackscrews | M                       | 1.0 mm Non Captive Jackscrew |
| Q                          | Thread for 1.2 mm Jackscrews | N                       | 1.0 mm Captive Jackscrew     |
|                            |                              | Q                       | 1.2 mm Captive Jackscrew     |

**Conductor Length**

XXX Three numbers only, length is in inches ( i.e. 012 = twelve inches)  
 CXX A "C" followed by two numbers, length is in centimeters ( i.e. C06 = six centimeters)  
 MXX An "M" followed by two numbers, length is in meters ( i.e. M02 = two meters)

**Conductor Type**

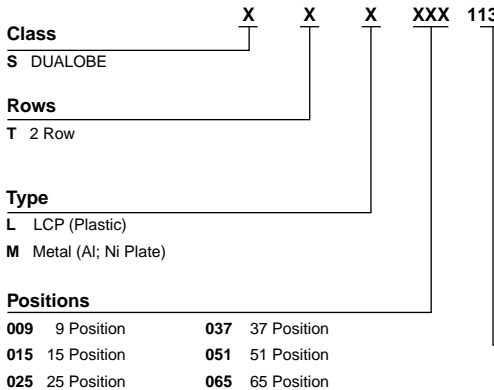
|    |                     |    |                                    |
|----|---------------------|----|------------------------------------|
| DX | White TEFLON        | DM | Color Coded TEFLON per MIL-STD-681 |
| DY | White PTFE M16878/6 | DT | White TEFZEL M22759/33             |
| DC | Color Coded TEFLON  | GX | TEFLON Ribbon Cable FEP            |

**Conductor Size/Strands**

|   |                 |   |                 |
|---|-----------------|---|-----------------|
| 0 | 28 AWG Solid    | 3 | 32 AWG 7 Strand |
| 1 | 30 AWG Solid    | 4 | 34 AWG 7 Strand |
| 2 | 30 AWG 7 Strand |   |                 |

**DUALOBE Connectors - "Duckbill" Termination**

Note: See Page(s) 5026 & 5027 for standard part numbers.



**Threads/Jackscrew**

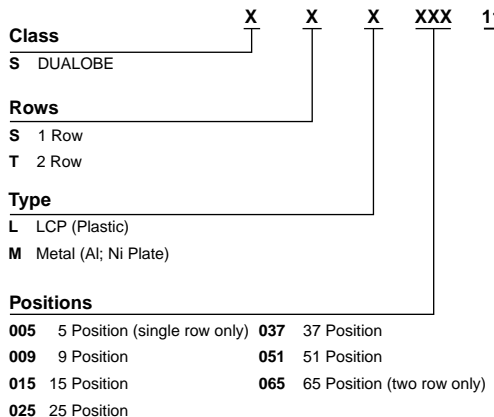
| Threads (Receptacles Only) |                              | Jackscrews (Plugs Only) |                              |
|----------------------------|------------------------------|-------------------------|------------------------------|
| N                          | Thread for 1.0 mm Jackscrews | M                       | 1.0 mm Non Captive Jackscrew |
| Q                          | Thread for 1.2 mm Jackscrews | N                       | 1.0 mm Captive Jackscrew     |
|                            |                              | Q                       | 1.2 mm Captive Jackscrew     |

**Configuration**  
PC Plug  
SC Receptacle

**Special**  
11378 Duckbill Termination

**DUALOBE Connectors - Solder Cup Termination**

Note: See Page(s) 5030 & 5031 for standard part numbers.



**Threads/Jackscrew**

| Threads (Receptacles Only) |                              | Jackscrews (Plugs Only) |                              |
|----------------------------|------------------------------|-------------------------|------------------------------|
| N                          | Thread for 1.0 mm Jackscrews | M                       | 1.0 mm Non Captive Jackscrew |
| Q                          | Thread for 1.2 mm Jackscrews | N                       | 1.0 mm Captive Jackscrew     |
|                            |                              | Q                       | 1.2 mm Captive Jackscrew     |

**Configuration**  
PC Plug  
SC Receptacle

**Special**  
11500 Solder Cup Termination

N-Series Circular Connectors

**Circular Nanominiature Connectors .025 [0.64] Pitch**

NANONICS N-Series circulars are one of the industry's smallest, reliable, circular nanominiature connectors.

Design and manufacturing focus is aimed directly at:

- High Density
- Reduced Weight
- Reduced Diameter
- High Reliability

This family of in-line circulars is available in pin counts of 7, 19 and 44 positions. Outside diameters range from .300 [7.62] OD. to .530 [13.46] OD.

The connector contact system features burnished gold bores and surfaces through the tubular pins and sockets.

One-piece seamless contacts are used to increase contact area and current carrying capability while reducing effects from vibration, shock and thermal excursions.

NANONICS circular connectors are offered with a wide variety of wire and cable terminations. Leads can be left pigtailed for convenient attachment into pc boards, systems and sensors. Connectors of any type available can be included in the harness design and manufacturing process at Tyco Electronics. Additional panel mounting configurations can be made available.

**Specifications**

**Metal Shell** — Aluminum 6061

**Plating** — Nickel/Gold

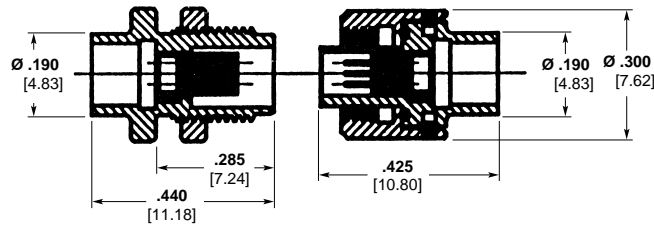
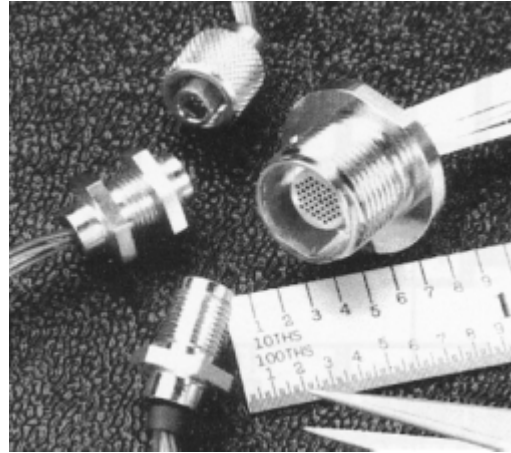
**Insulator** — Liquid crystal polymer

**Contacts** — Beryllium copper, Nickel over gold plated

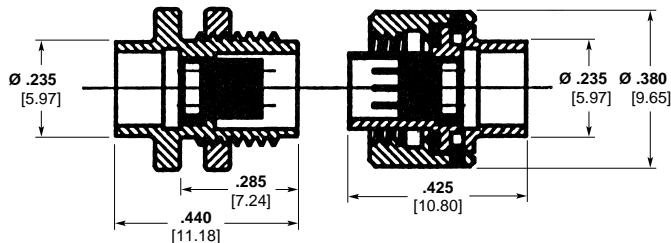
**Resistance** — .003-.008 Ohm

**Threaded Coupling Nut Action**

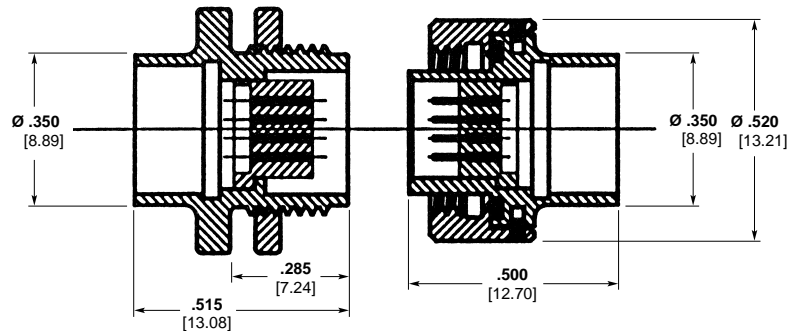
**Temperature Rated** — 482°F [250°C]



**NCG007 — 7 Position Circular**



**NCG019 — 19 Position Circular**



**NCG044 — 44 Position Circular**

Environmentally Sealed Quick Disconnect Circular Connectors

Nanominiature  
.025 [0.64] Contact Pitch

19 Position Quick Disconnect  
Flush Mount Receptacle  
and Plug

- Environmental seal
- EMI/RFI seal
- Contact system exceeds MIL-C-83513
- Also available in 7 and 44 positions
- "O" rings for environmental seal

**Specifications**

**Connector Body** — 6061-T6 Aluminum

**Plating** — Nickel per MIL-C-26074

**Insulator** — Liquid crystal polymer

**Contact Current** — 4 amps continuous

**Contact Resistance** — .003-.008 Ohm

**Contact Mating Force** — 1.0 oz. avg./contact

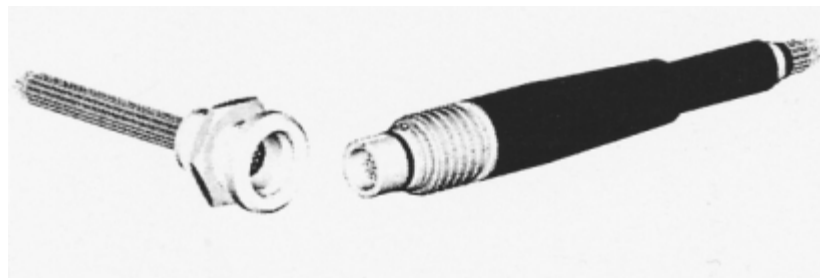
**Wire Size** — 30 AWG stranded or smaller

**Wire Current** — 1 amp max. (30 AWG)

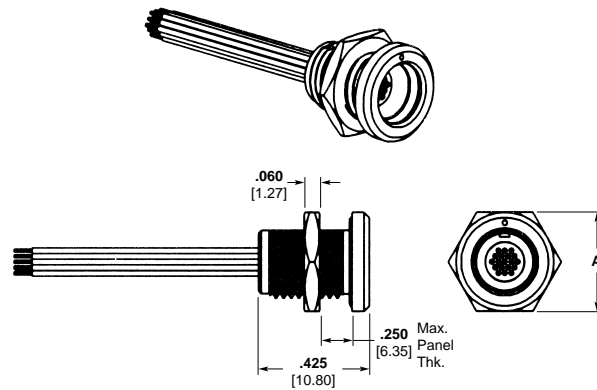
**Coupling** — Push-pull quick disconnect

**Mated Length** —  
.705 [17.91] (without strain relief)  
1.71 [43.43] (with strain relief sizes 7, 19)  
2.21 [56.13] (with strain relief size 44)

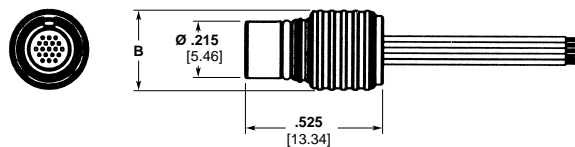
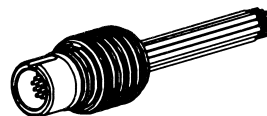
| No. of Positions | Receptacle A Dim. | Plug B Dim.   |
|------------------|-------------------|---------------|
| 7                | .312<br>7.92      | .250<br>6.35  |
| 19               | .375<br>9.53      | .300<br>7.62  |
| 44               | .500<br>12.70     | .395<br>10.03 |



(Shown with Optional Strain Relief)



19 Position Flush Mount Receptacle (Shown)



19 Position Plug (Without Strain Relief) (Shown)

5 Pin and Socket Connectors

#### Environmentally Sealed Threaded Coupling Circular Connectors

Nanominiature  
.025 [0.64] Contact Pitch

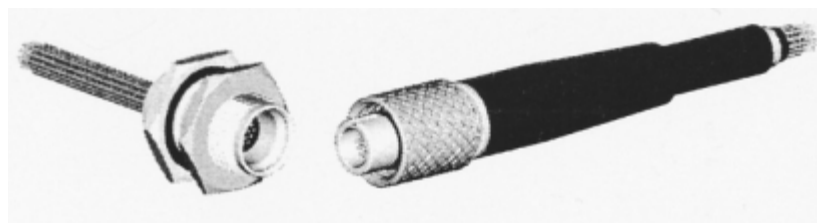
19 Position Threaded  
Coupling Panel Mount  
Receptacle and Plug

- Environmental seal
- EMI/RFI seal
- Contact system exceeds MIL-C-83513
- Also available in 7 and 44 positions
- The panel mount receptacle will also mate with the quick disconnect plug

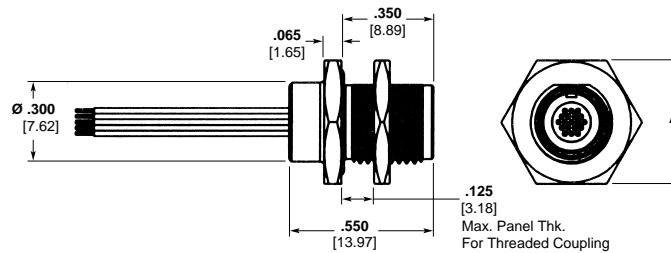
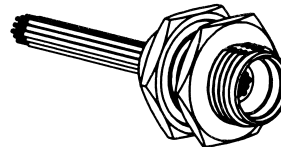
#### Specifications

**Connector Body** — 6061-T6 Aluminum  
**Plating** — Nickel per MIL-C-26074  
**Insulator** — Liquid crystal polymer  
**Contact Current** — 4 amps continuous  
**Contact Resistance** — .003-.008 Ohm  
**Contact Mating Force** — 1.0 oz. avg./contact  
**Wire Size** — 30 AWG stranded or smaller  
**Wire Current** — 1 amp max. (30 AWG)  
**Coupling** — Threaded coupling nut  
**Mated Length** —  
 .830 [21.08] (without strain relief)  
 1.83 [46.48] (with strain relief sizes 7, 19)  
 2.33 [59.18] (with strain relief size 44)

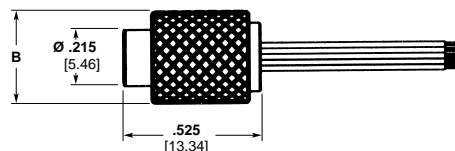
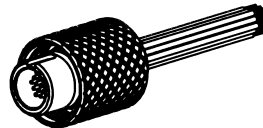
| No. of Positions | Receptacle    |               |
|------------------|---------------|---------------|
|                  | Flange A Dim. | Plug B Dim.   |
| 7                | .406<br>10.31 | .315<br>8.00  |
| 19               | .469<br>11.91 | .355<br>9.02  |
| 44               | .563<br>14.30 | .475<br>12.07 |



(Shown with Optional Strain Relief)



19 Position Panel Mount Receptacle (Shown)



19 Position Plug (Without Strain Relief) (Shown)

#### Circular Connectors - Wire Terminations

| <p><b>Class/Type</b></p> <p>XXX NANONICS, Circular, Gold</p> <p>QCM Quick Disconnect, Circular, Metal</p> <p>TCM Threaded Coupling, Circular, Metal<br/>(plug only; mates to panel mount receptacle only)</p> <p><b>Positions</b></p> <p>007 7 Position</p> <p>019 19 Position</p> <p>044 44 Position</p> <p><b>Configurations</b></p> <p>PC Plug</p> <p>SC Receptacle</p> <p><b>Conductor Size/Strands</b></p> <p>0 28 AWG Solid      3 32 AWG 7 Strand</p> <p>1 30 AWG Solid      4 34 AWG 7 Strand</p> <p>2 30 AWG 7 Strand</p> | <p><b>Circular Mounting/Features (Does Not Apply to NCG Series)</b></p> <table border="0"> <tr> <th colspan="2">Mounting (Receptacles Only)</th> <th>Features</th> </tr> <tr> <td>P</td> <td>Panel Mount</td> <td>B Backshell</td> </tr> <tr> <td>F</td> <td>Flush Mount</td> <td></td> </tr> </table> <p><b>Conductor Length</b></p> <p>XXX Three numbers only, length is in inches ( i.e. 012 = twelve inches)</p> <p>CXX A "C" followed by two numbers, length is in centimeters ( i.e. C06 = six centimeters)</p> <p>MXX An "M" followed by two numbers, length is in meters ( i.e. M02 = two meters)</p> <p><b>Conductor Type</b></p> <table border="0"> <tr> <td>DX</td> <td>White TEFLON</td> <td>DM</td> <td>Color Coded TEFLON per MIL-STD-681</td> </tr> <tr> <td>DY</td> <td>White PTFE M16878/6</td> <td>DT</td> <td>White TEFZEL M22759/33</td> </tr> <tr> <td>DC</td> <td>Color Coded TEFLON</td> <td></td> <td></td> </tr> </table> | Mounting (Receptacles Only) |                                    | Features | P | Panel Mount | B Backshell | F | Flush Mount |  | DX | White TEFLON | DM | Color Coded TEFLON per MIL-STD-681 | DY | White PTFE M16878/6 | DT | White TEFZEL M22759/33 | DC | Color Coded TEFLON |  |  |
|--|--|-----------------------------|------------------------------------|----------|---|-------------|-------------|---|-------------|--|----|--------------|----|------------------------------------|----|---------------------|----|------------------------|----|--------------------|--|--|
| Mounting (Receptacles Only)  |  | Features                    |                                    |          |   |             |             |   |             |  |    |              |    |                                    |    |                     |    |                        |    |                    |  |  |
| P  | Panel Mount  | B Backshell                 |                                    |          |   |             |             |   |             |  |    |              |    |                                    |    |                     |    |                        |    |                    |  |  |
| F  | Flush Mount  |                             |                                    |          |   |             |             |   |             |  |    |              |    |                                    |    |                     |    |                        |    |                    |  |  |
| DX   | White TEFLON   | DM                          | Color Coded TEFLON per MIL-STD-681 |          |   |             |             |   |             |  |    |              |    |                                    |    |                     |    |                        |    |                    |  |  |
| DY   | White PTFE M16878/6  | DT                          | White TEFZEL M22759/33             |          |   |             |             |   |             |  |    |              |    |                                    |    |                     |    |                        |    |                    |  |  |
| DC   | Color Coded TEFLON   |                             |                                    |          |   |             |             |   |             |  |    |              |    |                                    |    |                     |    |                        |    |                    |  |  |

Note: See Page(s) 5023 & 5024 for standard part numbers.

50 Ohm Coaxial Connector System

Options

- Mixed signal option; five signal leads and shell with coax
- Up to 9 coax connections per shell
- Horizontal surface mount receptacle also available

Mechanical Specifications

Receptacle Contact Outside Diameter — .075 [1.91]

Mated Contact Pair Length — .322 [8.19]

Mated Shells Height — .166 [4.22]

Mated Shells Width — .535 [13.59]

Mated Shells Length With Back Potting — .511 [12.98]

Product Specifications

**Main Connector** — 6061 Aluminum nickel plated, liquid crystal polymer insulator

**Outer Contact** — Beryllium copper, gold/nickel plated

**Inner Coax Contact** — Beryllium copper, gold/nickel plated

**Coax Insulator** — TEFLON

**Back Potting** — Space quality epoxy

**Wire Size** — 30 AWG to 38 AWG

**Environmental Rating** — Meets MIL-C-83513

**Operating Temperature** — -67°F to 311°F [-55°C to 155°C]

Electrical Specifications

**Impedance** — 50 Ohm

**Frequency Range** — 0 -20 GHz

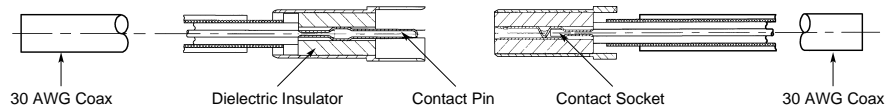
**Working Voltage** — 100 v

**Dielectric Withstanding** — 300 Vrms @ Sea Level

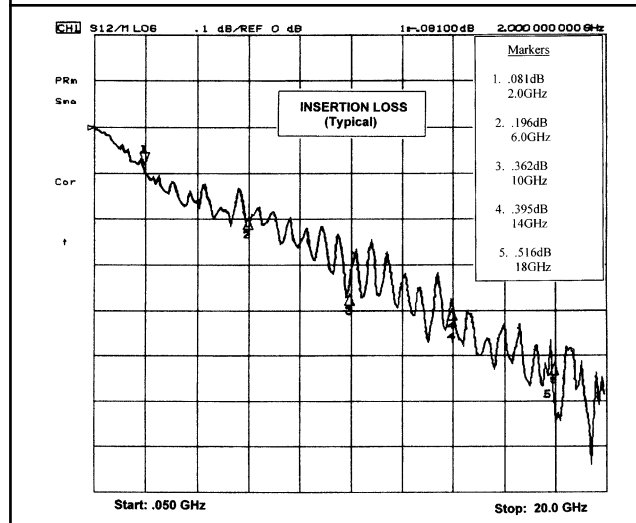
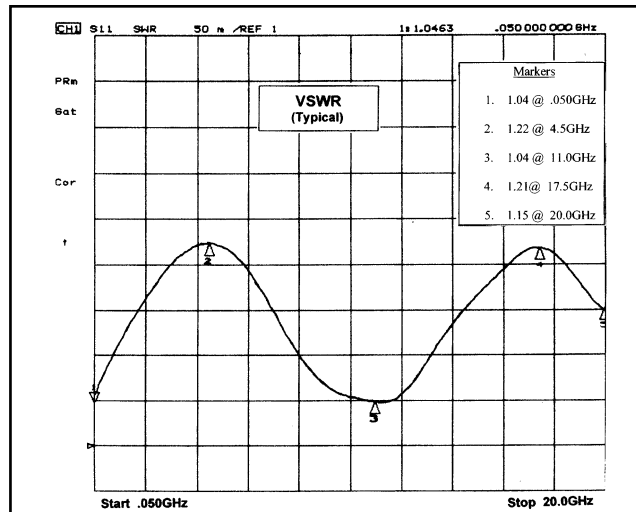
**Note:** Insertion Loss of 30 AWG Coax Cable @ (50 Ohm) is approximately 1.0db/ft. @ 3 GHz. The connector system with 6" of coax on each side, is better than 1.5db @ 3 GHz.



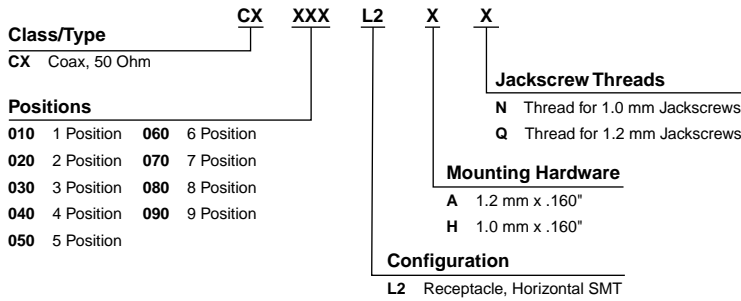
Size Comparison: Above; Nano, Below; Micro-D



Coax Pin & Socket Contact Set

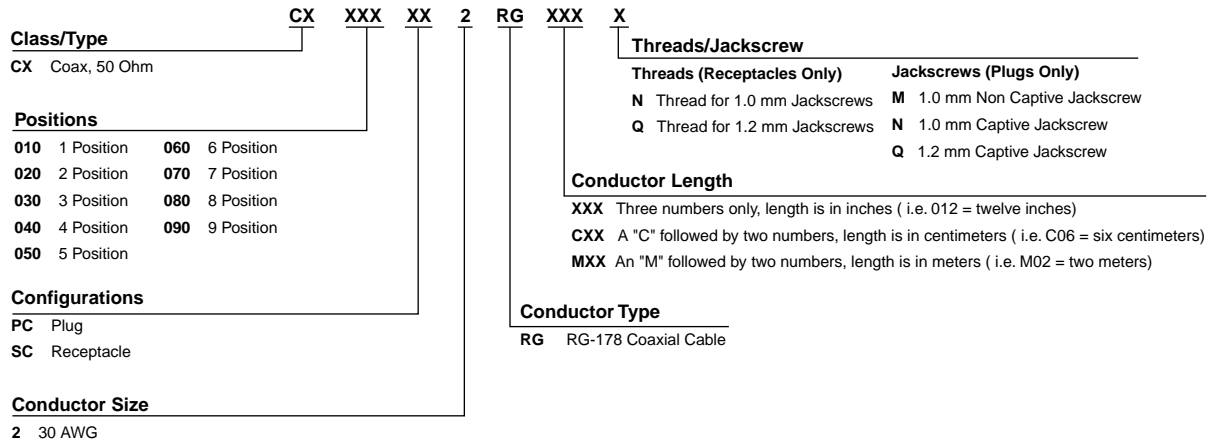


**Coax - Horizontal Surface Mount - Surface Mount Termination**



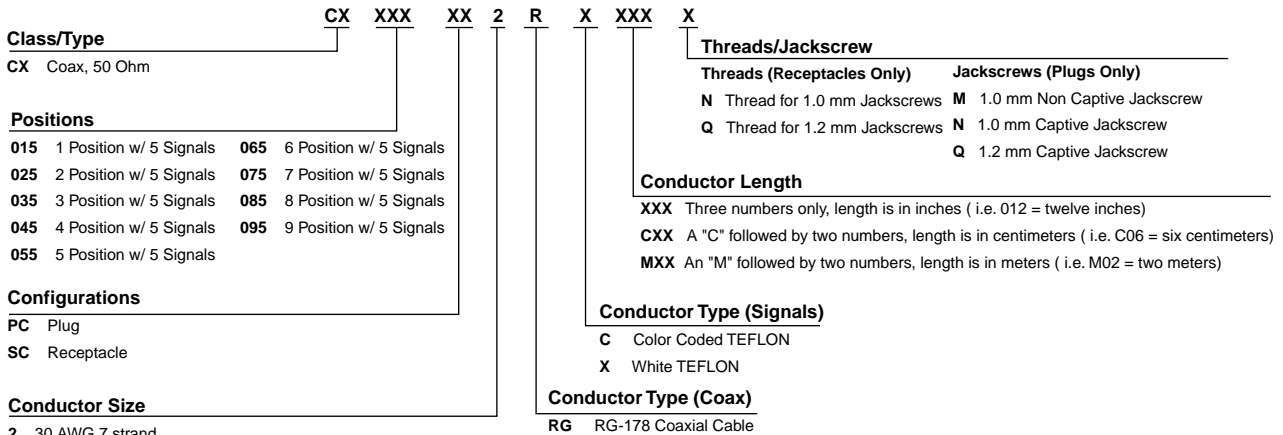
Note: See Page 5023 for standard part numbers.

**Coax Only - Wire Terminations**



Note: See Page 5023 for standard part numbers.

**Coax with Mixed Signals - Wire Terminations**



Note: See Page 5023 for standard part numbers.



**.025 [0.64] Contact Pitch**

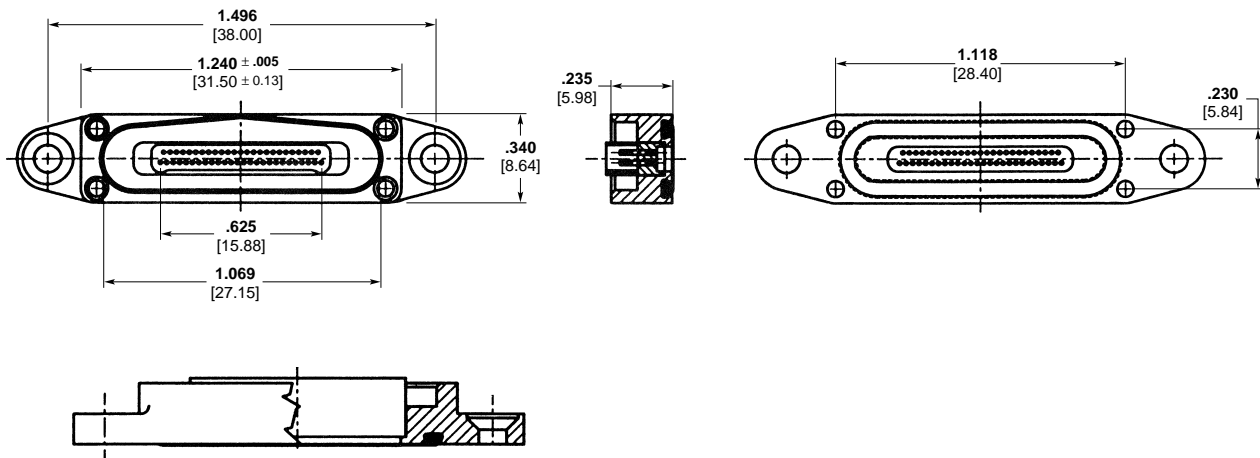
- Environmentally sealed
- 3000 PSI performance
- RFI/EMI protected
- Vibration and Shock DSCC 94031-94046 MIL-C-83513
- Terminate with wire, flex circuit, and ribbon cable
- Interface with NANONICS standard DUALLOBE connectors

NANONICS nanominiature environmental connectors provide reliability and high density packaging solutions in harsh environmental conditions.

These connectors offer a variety of terminations including one or two rows, plastic or metal shrouds, vertical, horizontal, or panel mount.



**Typical**



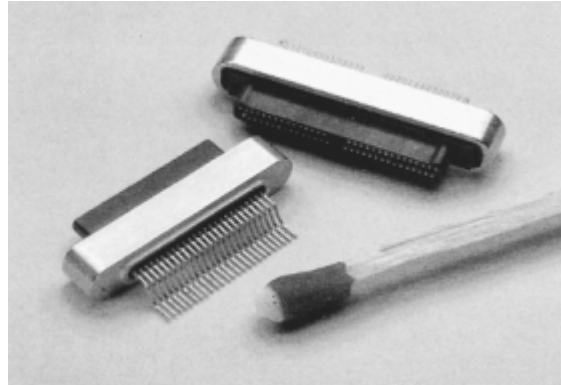
**Size 51, 2 Row, DUALLOBE Connectors  
Environmental Series,  
Receptacle Assembly**

**For ordering information contact  
Tyco Electronics**

Hermetic Connectors

"H Series" Nanominiature  
(.025 [0.64] pitch)

- Hermetic per MIL-STD-202
- Meets MIL-STD 833, 1-10-8CC He/s max. leak rate
- Solder/Braze KOVAR bodies
- Laser weldable 4047 aluminum flange
- Seamless spring socket
- One or two contact rows
- Low engaging forces (1.0 oz) minimize stress
- High performance contact system
- Contact Tyco Electronics for detailed information



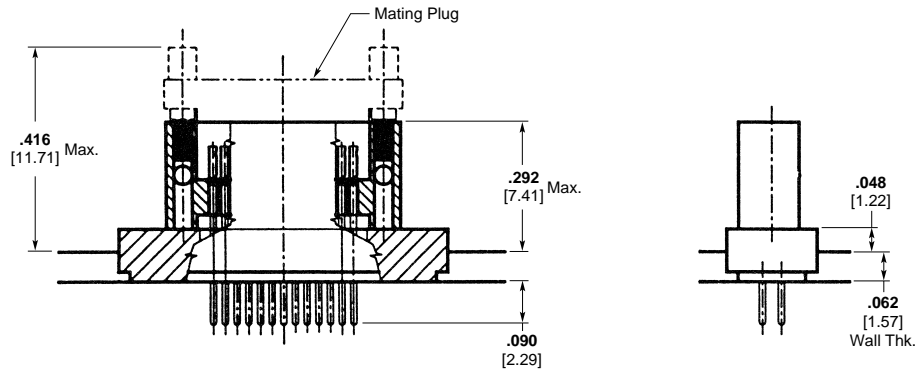
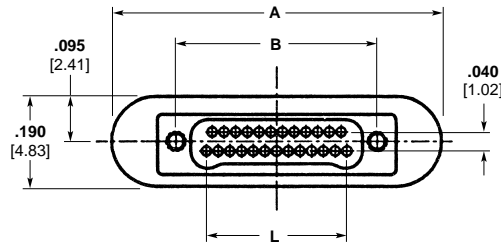
Single Row, 25 Pin

The "H Series" Hermetics bring together established hermetic manufacturing capabilities and our Nanominiature contact and connector design.

The NANONICS "H Series" connectors offer a hermetically glass sealed receptacle per MIL-STD-202 in all sizes. They can be laser welded (aluminum, stainless steel) or soldered/brazed (KOVAR). The hermetic receptacles intermate with NANONICS standard line of DUALOBE plugs.

The connectors are designed for MIL class reliability in harsh environments and for dense packaging and reduced size and weight.

Mating DUALOBE plugs offer a variety of terminations and feature one or two rows, plastic or metal shrouds, vertical, horizontal, or panel mount. The contact system features one-piece, seamless, spring socket and gold plated KOVAR pins.



Two Row, Glass Seal, Receptacle

| Size | Dimensions     |               |               |
|------|----------------|---------------|---------------|
|      | A              | B             | L             |
| 9    | .500<br>12.70  | .229<br>5.82  | .100<br>2.54  |
| 15   | .575<br>14.61  | .304<br>7.72  | .175<br>4.45  |
| 25   | .700<br>17.78  | .429<br>10.90 | .300<br>7.62  |
| 37   | .850<br>21.59  | .579<br>14.71 | .450<br>11.43 |
| 51*  | 1.025<br>26.04 | .754<br>19.15 | .625<br>15.88 |
| 65** | 1.200<br>30.48 | .929<br>23.60 | .800<br>20.32 |

\* 46 Contacts, Pos. 12, 13, 14, 38 & 39 are omitted.

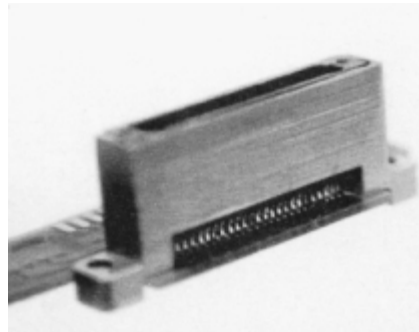
\*\* 60 Contacts, Pos. 16, 17, 48, 49 & 50 are omitted.

For ordering information contact  
Tyco Electronics

Filtered Connectors

10 MHz - 6+ GHz  
 Size 30 Contacts — .025  
 [0.64]/.0125 [0.32] Pitch

- EMI/RFI filter options for nanominiature connectors
- 30 microinches of pore-free Goldbore burnished gold on all internal and external contact and crimp surfaces;
  - Low resistance of .003-.008 ohms
  - 4000+ engagement cycles
  - High performance contact system
- Gas-tight mass crimp;
  - termination reliability
  - enables ribbon, flex circuits
- Reliable, seamless contacts
- Temperature, -67°F to 257°F [-55°C to +125°C]
- Increased voltage limits
- Low engaging forces (1.0 oz)
- MIL-C-83513 performance
- Stocked sizes 9, 15, 25, 37, 51 and 65
- Standard sizes available, 5 thru 65 contacts in increments of 1 (1 row) or 2 (2 row)



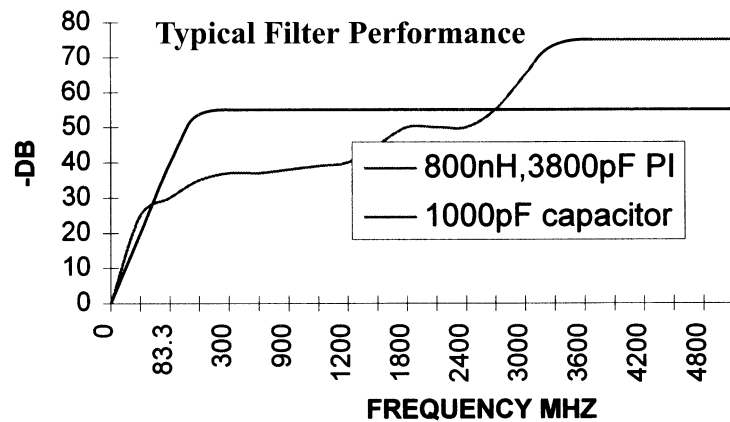
PCB Mount, 51 Position With Filters

Filtered connectors are designed for MIL class, high reliability in harsh environments, and for dense packaging requirements. Small size and weight (0.5 gr avg.) are featured benefits of filtered connectors making them highly suitable for high-density circuit designs. The filter options are available in PI, L, or C configurations and have a range from 10MHz to over 6.0GHz.

PCB connectors with filters (SM or thru-hole) are configured within shrouded DUALOBE connectors versions. Filters are housed within the connector body. The DUALOBE connectors series features one or two rows, with plastic or metal shrouds, vertical, horizontal, or panel mount. Filters may be specified for either plugs or receptacles.

All configurations incorporate an innovative high performance rated contact system on .025 [0.64] centers.

The contact/filter system features a one-piece, seamless, spring socket design that improves connector reliability and performance in harsh environments.

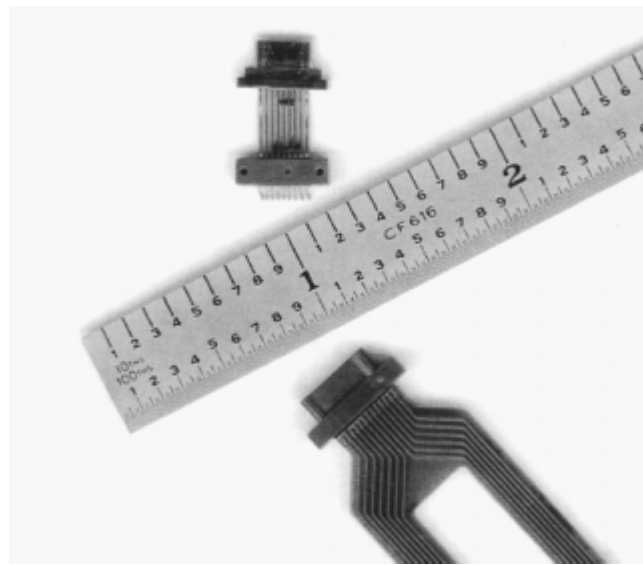


For ordering information contact Tyco Electronics

**Flex Circuit, Ribbon Cable Terminations**

Proprietary crimp technology helps eliminate solder terminations and related problems

- Mass Crimps exceed requirements of MIL-C-39029 and terminate any material, any shape, any finish, 28 AWG or larger
- Connectors meet DSCC\* specifications 94031-94046 for Nanominiature connectors, and the performance requirements of MIL-C-83513
- The contact system features a one-piece, seamless, spring socket and pin design enhancing environmental performance
- New thresholds of performance have been established via the Goldbore contact and proprietary crimp terminations, i.e.:
  - Low resistance of .003-.008 ohms
  - High performance contact system
  - MIL spec quality mass crimp
  - Seamless contacts
  - MIL spec performance
  - DSCC\* spec qualified
  - Increased voltage limits via insulator design
  - Low engaging forces
- Stocked sizes: 9, 15, 25, 37, 51 and 65
- Standard sizes: 5-65 positions



Tyco Electronics offers a wide range of nanominiature connectors for flex circuit and ribbon cable.

Designed for mass crimp termination to .025 [0.64] and .0125 [0.42] pitch flat/ribbon cable and flex circuits, connectors feature

MIL class reliability in harsh environments, and dense packaging capability (1/4 of microminiature size) and reduced weight — 0.5 grams avg.). The 2-row DUALLOBE connector provides an effective termination pitch of .0125 [0.42].

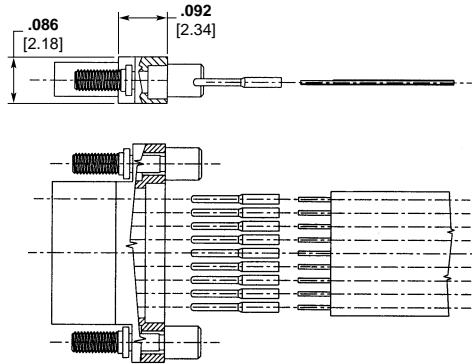
Available as strips or shrouded DUALLOBE connectors feature one or two rows, vertical, horizontal, surface mount, thru-hole, and panel mount options.

\*DSCC-Defense Supply Center, Columbus. Formerly, DESC, Dayton, Ohio

**For ordering information contact Tyco Electronics**

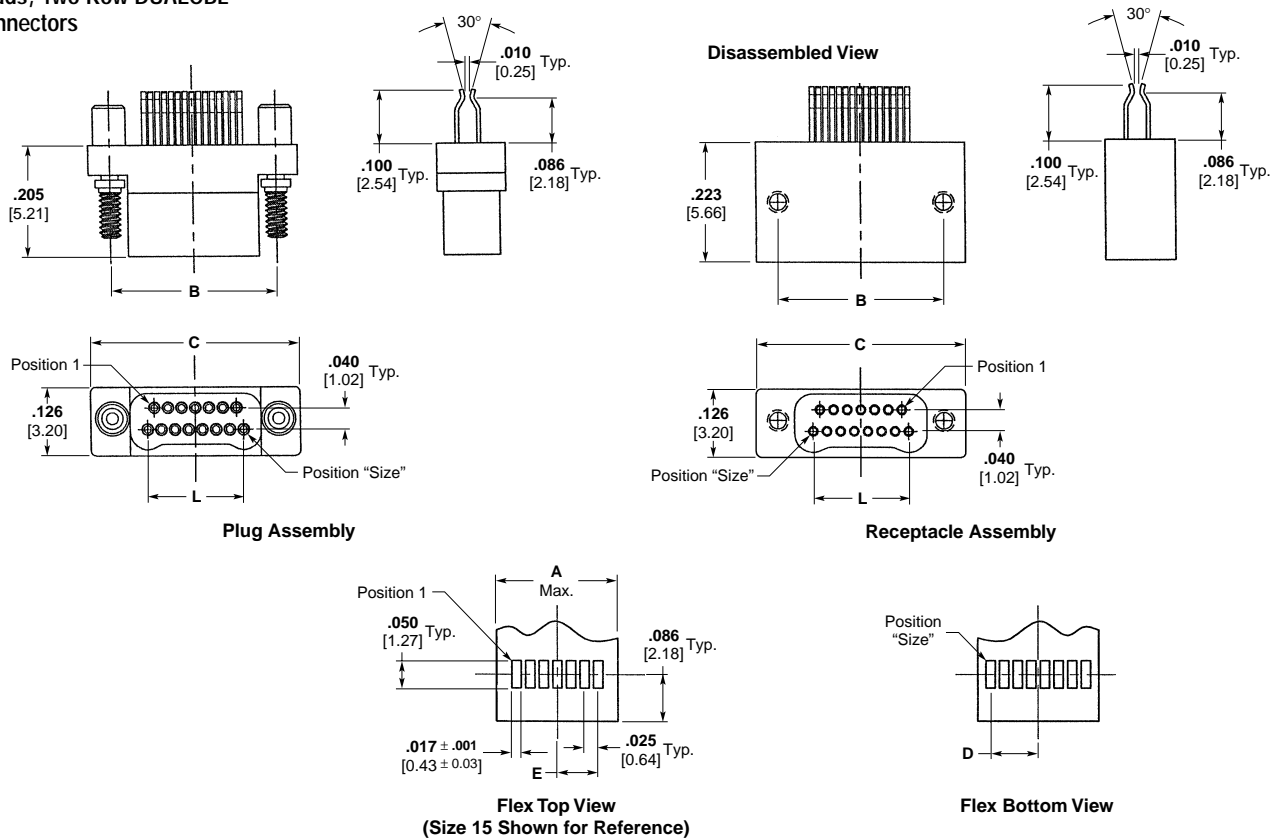
Flex Circuit, Ribbon Cable Terminations (Continued)

Crimp to Sculptured Flex Version



Soldered to Flex

Metal or Plastic, Duckbill Leads, Two Row DUALOBE Connectors



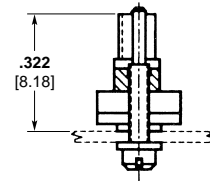
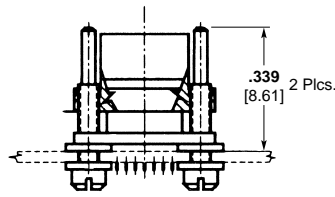
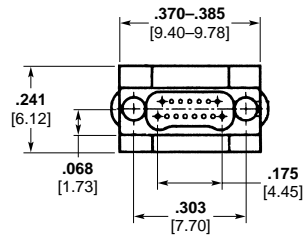
| Size | Dimensions    |               |                 |                |               |               |
|------|---------------|---------------|-----------------|----------------|---------------|---------------|
|      | A Max.        | B             | C ±.0050 [0.13] | D              | E             | L             |
| 09   | .150<br>3.81  | .229<br>5.82  | .3085<br>7.84   | .0500<br>1.27  | .0375<br>0.95 | .100<br>2.54  |
| 15   | .225<br>5.72  | .304<br>7.72  | .3835<br>9.74   | .0875<br>2.22  | .0750<br>1.91 | .175<br>4.45  |
| 25   | .350<br>8.89  | .429<br>10.90 | .5085<br>12.92  | .1500<br>3.81  | .1375<br>3.49 | .300<br>7.62  |
| 37   | .500<br>12.70 | .579<br>14.71 | .6585<br>16.73  | .2250<br>5.72  | .2125<br>5.40 | .450<br>11.43 |
| 51   | .675<br>17.15 | .754<br>19.15 | .8335<br>21.17  | .3125<br>7.94  | .3000<br>7.62 | .625<br>15.88 |
| 65   | .850<br>21.59 | .929<br>23.60 | 1.0085<br>25.62 | .4000<br>10.16 | .3875<br>9.84 | .800<br>20.32 |

For ordering information contact Tyco Electronics

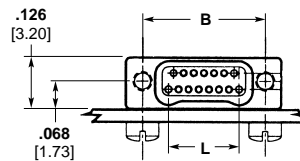
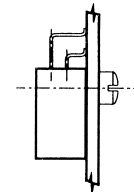
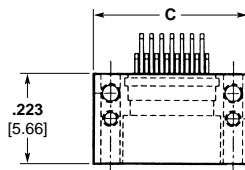
**Blindmating Board to Board, or Flex Circuit to Board with Metal DUALOBE Connectors**

- Mounted vertically or horizontally
- Surface Mount or Thru-Hole
- Guide pin assisted alignment
- MIL spec quality connectors
- Miniaturization of modules

Formats include horizontal board to horizontal board, and horizontal board to vertical board. Board clamping promotes contact retention, and the connectors act as standoffs to protect the spacing for components between boards.



**Metal Shell, 2 Row, DUALOBE, 15 Position Plug**



**Metal, 2 Row, DUALOBE, Horizontal Surface Mount, Receptacle**

| Size | Dimensions    |               |                                    |
|------|---------------|---------------|------------------------------------|
|      | L             | B             | C<br>+.010/- .005<br>[+.025/-0.13] |
| 9    | .100<br>2.54  | .229<br>5.82  | .310<br>7.87                       |
| 15   | .175<br>4.45  | .304<br>7.72  | .385<br>9.78                       |
| 25   | .300<br>7.62  | .429<br>10.90 | .510<br>12.95                      |
| 37   | .450<br>11.43 | .579<br>14.71 | .660<br>16.76                      |
| 51   | 6.25<br>15.88 | .754<br>19.15 | .835<br>21.21                      |
| 61   | .750<br>19.05 | .879<br>22.33 | .960<br>24.38                      |
| 65   | .800<br>20.32 | .929<br>23.60 | 1.010<br>25.65                     |

For ordering information contact Tyco Electronics

| NANONICS Part Number                      | Tyco Part Number |
|---|------------------|
| <b>Coax Only</b>                          |                  |
| CX010PC2RG006N                            | 0-1589070-1      |
| CX010PC2RG018N                            | 0-1589070-2      |
| CX010PC2RG072N                            | 0-1589070-3      |
| CX020PC2RG018N                            | 0-1589070-4      |
| CX030PC2RG006N                            | 0-1589070-5      |
| CX030PC2RG012                             | 0-1589070-6      |
| CX030PC2RG012N                            | 0-1589070-7      |
| CX030PC2RG018N                            | 0-1589070-8      |
| CX030PC2RG020Q                            | 0-1589070-9      |
| CX030SC2RG006N                            | 0-1589071-3      |
| CX030SC2RG012                             | 0-1589071-4      |
| CX040PC2RG012N                            | 1-1589070-0      |
| CX040PC2RG030N                            | 1-1589070-1      |
| CX040SC2RG012                             | 0-1589071-5      |
| <b>Coaxial - Horizontal Surface Mount</b> |                  |
| CX010L2HN                                 | 0-1589072-1      |
| CX030L2HN                                 | 0-1589072-3      |
| CX030L23N                                 | 0-1589072-2      |
| CX03511822L2HN                            | 0-1589075-1      |
| CX04511822L2HN                            | 0-1589075-2      |
| <b>Coax with Mixed Signals</b>            |                  |
| CX015PC2RC012                             | 0-1589068-1      |
| CX015SC2RC012N                            | 0-1589069-1      |
| CX035PC2RC006N                            | 0-1589068-2      |
| CX035PC2RC018N                            | 0-1589068-3      |
| CX035SC2RC006N                            | 0-1589069-2      |
| CX035SC2RC018N                            | 0-1589069-3      |
| CX045PC2RC006N                            | 0-1589068-4      |
| CX045SC2RC006N                            | 0-1589069-4      |
| <b>Circular Connectors</b>                |                  |
| NCG007PC2DC003                            | 0-1589425-1      |
| NCG007PC2DC006                            | 0-1589425-2      |
| NCG007PC2DC008                            | 0-1589425-3      |
| NCG007PC2DC012                            | 0-1589425-4      |
| NCG007PC2DC018                            | 0-1589425-5      |
| NCG007PC2DC040                            | 0-1589425-6      |
| NCG007PC2DCC60                            | 0-1589425-7      |
| NCG007PC2DM024                            | 0-1589425-8      |
| NCG007SC2DC003                            | 0-1589426-1      |
| NCG007SC2DC004                            | 0-1589426-2      |
| NCG007SC2DC006                            | 0-1589426-3      |
| NCG007SC2DC008                            | 0-1589426-4      |
| NCG007SC2DC012                            | 0-1589426-5      |
| NCG007SC2DC018                            | 0-1589426-6      |
| NCG007SC2DC024                            | 0-1589426-7      |
| NCG007SC2DC036                            | 0-1589426-8      |
| NCG007SC2DC048                            | 0-1589426-9      |
| NCG007SC2DC060                            | 1-1589426-0      |
| NCG007SC2DM024                            | 1-1589426-1      |
| NCG019PC2DC003                            | 0-1589427-1      |
| NCG019PC2DC006                            | 0-1589427-2      |
| NCG019PC2DC018                            | 0-1589427-3      |
| NCG019PC2DC036                            | 0-1589427-4      |
| NCG019PC2DC072                            | 0-1589427-5      |
| NCG019PC3DC036                            | 0-1589427-6      |
| NCG019SC2DC003                            | 0-1589428-1      |
| NCG019SC2DC006                            | 0-1589428-2      |
| NCG019SC2DC018                            | 0-1589428-3      |
| NCG019SC2DC024                            | 0-1589428-4      |
| NCG019SC2DC036                            | 0-1589428-5      |

| NANONICS Part Number | Tyco Part Number |
|----------------------|------------------|
| NCG019SC2DC072       | 0-1589428-6      |
| NCG019SC3DC036       | 0-1589428-7      |
| NCG044PC2DC003       | 0-1589429-1      |
| NCG044PC2DC006       | 0-1589429-2      |
| NCG044PC2DC012       | 0-1589429-3      |
| NCG044PC2DC015       | 0-1589429-4      |
| NCG044PC2DC033       | 0-1589429-5      |
| NCG044PC2DC036       | 0-1589429-6      |
| NCG044PC2DC042       | 0-1589429-7      |
| NCG044PC2DC060       | 0-1589429-8      |
| NCG044PC2DCC30       | 0-1589429-9      |
| NCG044SC2DC003       | 0-1589430-1      |
| NCG044SC2DC006       | 0-1589430-2      |
| NCG044SC2DC012       | 0-1589430-3      |
| NCG044SC2DC015       | 0-1589430-4      |
| NCG044SC2DC018       | 0-1589430-5      |
| NCG044SC2DC024       | 0-1589430-6      |
| NCG044SC2DC036       | 0-1589430-7      |
| NCG044SC2DC060       | 0-1589430-8      |
| NCG044SC2DCC30       | 0-1589430-9      |
| QCM007PC2DC003       | 0-1589055-1      |
| QCM007PC2DC006       | 0-1589055-2      |
| QCM007PC2DC012       | 0-1589055-3      |
| QCM007PC2DC012B      | 0-1589055-4      |
| QCM007PC2DC018B      | 0-1589055-5      |
| QCM007PC2DC020       | 0-1589055-6      |
| QCM007PC2DC036B      | 0-1589055-7      |
| QCM007PC2DC040       | 0-1589055-8      |
| QCM007PC2DC072       | 0-1589055-9      |
| QCM007PC2DCC30       | 1-1589055-0      |
| QCM007PC2DMC46       | 1-1589055-1      |
| QCM007PC2DX006B      | 1-1589055-2      |
| QCM007SC2DC003P      | 0-1589060-1      |
| QCM007SC2DC004P      | 0-1589060-2      |
| QCM007SC2DC006F      | 0-1589056-1      |
| QCM007SC2DC006P      | 0-1589060-3      |
| QCM007SC2DC012P      | 0-1589060-4      |
| QCM007SC2DC012PB     | 0-1589060-5      |
| QCM007SC2DC018PB     | 0-1589060-6      |
| QCM007SC2DC020F      | 0-1589056-2      |
| QCM007SC2DC036P      | 0-1589060-7      |
| QCM007SC2DC036PB     | 0-1589060-8      |
| QCM007SC2DCC30F      | 0-1589056-3      |
| QCM007SC2DCC30P      | 0-1589060-9      |
| QCM007SC2DM003P      | 1-1589060-0      |
| QCM007SC2DMC16F      | 0-1589056-4      |
| QCM007SC2DMC46F      | 0-1589056-5      |
| QCM007SC2DX006F      | 0-1589056-6      |
| QCM019PC0DC012       | 0-1589057-1      |
| QCM019PC0DM072B      | 0-1589057-2      |
| QCM019PC2DC003       | 0-1589057-3      |
| QCM019PC2DC006       | 0-1589057-4      |
| QCM019PC2DC012       | 0-1589057-5      |
| QCM019PC2DC020       | 0-1589057-6      |
| QCM019PC2DC120B      | 0-1589057-7      |
| QCM019PC2DMC46       | 0-1589057-8      |
| QCM019PC2DXC30       | 0-1589057-9      |
| QCM019SC0DC012F      | 0-1589058-1      |
| QCM019SC0DCC15P      | 0-1589061-1      |
| QCM019SC0DM072F      | 0-1589058-2      |
| QCM019SC0DXC15P      | 0-1589061-2      |

| NANONICS Part Number | Tyco Part Number |
|----------------------|------------------|
| QCM019SC2DC003P      | 0-1589061-3      |
| QCM019SC2DC006F      | 0-1589058-3      |
| QCM019SC2DC006P      | 0-1589061-4      |
| QCM019SC2DC012P      | 0-1589061-5      |
| QCM019SC2DC018F      | 0-1589058-4      |
| QCM019SC2DC020F      | 0-1589058-5      |
| QCM019SC2DC020P      | 0-1589061-6      |
| QCM019SC2DC036P      | 0-1589061-7      |
| QCM019SC2DCC30P      | 0-1589061-8      |
| QCM019SC2DMC16F      | 0-1589058-6      |
| QCM019SC2DMC46F      | 0-1589058-7      |
| QCM019SC2DXC30F      | 0-1589058-8      |
| QCM019SC2DXC30P      | 0-1589061-9      |
| QCM044PC2DC003       | 0-1589059-1      |
| QCM044PC2DC006       | 0-1589059-2      |
| QCM044PC2DC006B      | 0-1589059-3      |
| QCM044PC2DC012       | 0-1589059-4      |
| QCM044PC2DC012B      | 0-1589059-5      |
| QCM044PC2DC020       | 0-1589059-6      |
| QCM044PC2DC030       | 0-1589059-7      |
| QCM044PC2DC060B      | 0-1589059-8      |
| QCM044PC2DC120B      | 0-1589059-9      |
| QCM044SC2DC003P      | 0-1589062-1      |
| QCM044SC2DC006F      | 0-1589058-9      |
| QCM044SC2DC006P      | 0-1589062-2      |
| QCM044SC2DC012F      | 1-1589058-0      |
| QCM044SC2DC012P      | 0-1589062-3      |
| QCM044SC2DC018F      | 1-1589058-1      |
| QCM044SC2DC019PB     | 0-1589062-4      |
| QCM044SC2DC020F      | 1-1589058-2      |
| QCM044SC2DC036P      | 0-1589062-5      |
| QCM044SC2DC060F      | 1-1589058-3      |
| QCM044SC2DMC16P      | 0-1589062-6      |
| QCM044SC2DMC46P      | 0-1589062-7      |
| TCM007PC2DC003       | 0-1589063-1      |
| TCM007PC2DC006       | 0-1589063-2      |
| TCM007PC2DC006B      | 0-1589063-3      |
| TCM007PC2DC012       | 0-1589063-4      |
| TCM007PC2DC012B      | 0-1589063-5      |
| TCM007PC2DC018B      | 0-1589063-6      |
| TCM007PC2DC036       | 0-1589063-7      |
| TCM007PC2DM003       | 0-1589063-8      |
| TCM019PC0DCC10       | 0-1589064-1      |
| TCM019PC0DXC10       | 0-1589064-2      |
| TCM019PC2DC003       | 0-1589064-3      |
| TCM019PC2DC006       | 0-1589064-4      |
| TCM019PC2DC006B      | 0-1589064-5      |
| TCM019PC2DC012       | 0-1589064-6      |
| TCM019PC2DC012B      | 0-1589064-7      |
| TCM019PC2DC024       | 0-1589064-8      |
| TCM019PC2DC036       | 0-1589064-9      |
| TCM019PC2DC060B      | 1-1589064-0      |
| TCM019PC2DC066       | 1-1589064-1      |
| TCM019PC2DCC30       | 1-1589064-2      |
| TCM044PC2DC003       | 0-1589065-1      |
| TCM044PC2DC006       | 0-1589065-2      |
| TCM044PC2DC006B      | 0-1589065-3      |
| TCM044PC2DC012       | 0-1589065-4      |
| TCM044PC2DC012B      | 0-1589065-5      |
| TCM044PC2DC018B      | 0-1589065-6      |
| TCM044PC2DC019B      | 0-1589065-7      |

5 Pin and Socket Connectors

| NANONICS Part Number   | Tyco Part Number | NANONICS Part Number | Tyco Part Number | NANONICS Part Number                           | Tyco Part Number |
|------------------------|------------------|----------------------|------------------|--|------------------|
| TCM044PC2DC036         | 0-1589065-8      | JSM051PP2GXC50N      | 5-1589672-8      | JTM025PR2DT240N                                | 3-1589674-9      |
| TCM044PC2DC036B        | 0-1589065-9      | JSM051PP2GXC75N      | 5-1589672-9      | JTM025PR2DX0.5N                                | 4-1589674-0      |
| TCM044PC2DMC46         | 1-1589065-0      | JSM051PP2GXC80N      | 6-1589672-0      | JTM025PR2DX006Q                                | 4-1589674-1      |
| <b>DUALOBE Jumpers</b> |                  |                      |                  |  |                  |
| JSL009PP2DX003N        | 7-1589671-1      | JSM051PR2GX002N      | 6-1589672-1      | JTM025PR2DX012N                                | 4-1589674-2      |
| JSL009PR2DC012N        | 7-1589671-2      | JTL015PP2DX008M      | 9-1589672-5      | JTM025PR2DX020                                 | 4-1589674-3      |
| JSL009RR2DX0.5N        | 7-1589671-3      | JTL015PR2DX008       | 9-1589672-6      | JTM037PD2DC002N                                | 8-1589674-8      |
| JSL015PP2DX006N        | 7-1589671-4      | JTL025PP2DC036N      | 9-1589672-8      | JTM037PD2DC004N                                | 8-1589674-9      |
| JSL037PD2GXC02N        | 7-1589671-5      | JTL025PP2DCC07N      | 9-1589672-9      | JTM037PD2GX012N                                | 9-1589674-0      |
| JSL037PR2DX002N        | 7-1589671-6      | JTL025PP2DX002N      | 0-1589673-1      | JTM037PD2GX024N                                | 9-1589674-1      |
| JSL051PD2GXC10N        | 7-1589671-7      | JTL025PP2DX003N      | 0-1589673-2      | JTM037PP0DM006                                 | 9-1589674-2      |
| JSL051PD2GXC17N        | 7-1589671-8      | JTL025PP2DX010N      | 0-1589673-3      | JTM037PP2DX001N                                | 9-1589674-4      |
| JSL051PD2GXC22N        | 7-1589671-9      | JTL025PR2DCM31N      | 0-1589673-4      | JTM037PP2DX002N                                | 9-1589674-5      |
| JSL051PD2GXC30N        | 8-1589671-0      | JTL037PP2DC07.5N     | 0-1589673-5      | JTM037PP2DX004N                                | 9-1589674-6      |
| JSL051PD2GXC75N        | 8-1589671-1      | JTL037PP2DC08.5N     | 0-1589673-6      | JTM037PP2DX006Q                                | 9-1589674-7      |
| JSL051PD2GXC80N        | 8-1589671-2      | JTL037PP2DC09.5N     | 0-1589673-7      | JTM037PP2DX009Q                                | 9-1589674-8      |
| JSL051PP2DC004N        | 8-1589671-3      | JTL037PP2DX002N      | 0-1589673-8      | JTM037PP2DX016                                 | 9-1589674-9      |
| JSL051PP2GXC10N        | 8-1589671-4      | JTL037PP2DX003N      | 0-1589673-9      | JTM037PP2DX024N                                | 0-1589675-1      |
| JSL051PP2GXC15N        | 8-1589671-5      | JTL037PP2DX012       | 1-1589673-0      | JTM037PP2GX024N                                | 0-1589675-2      |
| JSL051PP2GXC17N        | 8-1589671-6      | JTL037PR2DT024N      | 1-1589673-1      | JTM037PR0DC036M                                | 0-1589675-3      |
| JSL051PP2GXC22N        | 8-1589671-7      | JTL051PP2DX002N      | 1-1589673-4      | JTM037PR2DT001N                                | 0-1589675-4      |
| JSL051PP2GXC75N        | 8-1589671-8      | JTL051PP2DX006N      | 1-1589673-5      | JTM037PR2DX001N                                | 0-1589675-5      |
| JSL051PP2GXC80N        | 8-1589671-9      | JTL051PP2DX010N      | 1-1589673-6      | JTM037PR2GX002                                 | 0-1589675-6      |
| JSM005PP2DC002N        | 9-1589671-0      | JTL051PP2DX024N      | 1-1589673-7      | JTM037PR2GX003N                                | 0-1589675-7      |
| JSM005PP2DT150N        | 9-1589671-1      | JTL051PR2DC048       | 1-1589673-8      | JTM051PD2DT004N                                | 6-1589675-1      |
| JSM009PP2DC002N        | 9-1589671-5      | JTL065PP2DC012N      | 2-1589673-3      | JTM051PD2DXC10N                                | 6-1589675-2      |
| JSM009PP2DC003N        | 9-1589671-6      | JTL065PP2DCC05N      | 2-1589673-4      | JTM051PP2DC004N                                | 6-1589675-3      |
| JSM009PP2DC024N        | 9-1589671-7      | JTM009PD2DX003N      | 3-1589673-1      | JTM051PP2DX001N                                | 6-1589675-4      |
| JSM009PR2DC002N        | 9-1589671-8      | JTM009PD2DX006N      | 3-1589673-2      | JTM051PP2DX004N                                | 6-1589675-5      |
| JSM009PR2DC006N        | 9-1589671-9      | JTM009PP2DC02.5N     | 3-1589673-3      | JTM051PP2DX012N                                | 6-1589675-6      |
| JSM015PD2DCC02N        | 0-1589672-6      | JTM009PP2DT002N      | 3-1589673-4      | JTM051PP2DX2.5N                                | 6-1589675-7      |
| JSM015PP2GX014N        | 0-1589672-7      | JTM009PP2DT004N      | 3-1589673-5      | JTM051PP2DX4.5N                                | 6-1589675-8      |
| JSM015PP2GX018N        | 0-1589672-8      | JTM009PP2DX006N      | 3-1589673-6      | JTM051PR2DC002N                                | 6-1589675-9      |
| JSM015PR2DC001N        | 0-1589672-9      | JTM009PR2DCC50N      | 3-1589673-7      | JTM051PR2DC005                                 | 7-1589675-0      |
| JSM015PR2DC002N        | 1-1589672-0      | JTM015PD2GX012N      | 6-1589673-8      | JTM051PR2DT001N                                | 7-1589675-1      |
| JSM015PR2DC003N        | 1-1589672-1      | JTM015PP2DC006M      | 6-1589673-5      | JTM051PR2DX002N                                | 7-1589675-2      |
| JSM015PR2DC006N        | 1-1589672-2      | JTM015PP2DC012M      | 6-1589673-6      | JTM051PR2GX002                                 | 7-1589675-3      |
| JSM025PP2DX004N        | 2-1589672-0      | JTM015PP2DC02.5N     | 6-1589673-7      | JTM051PR2GX006Q                                | 7-1589675-4      |
| JSM025PP2DX008N        | 2-1589672-1      | JTM015PP2DT004N      | 6-1589673-8      | JTM051RR2DC003                                 | 7-1589675-5      |
| JSM025PP2DXC17N        | 2-1589672-2      | JTM015PP2DX001N      | 6-1589673-9      | JTM065PP2DX002N                                | 0-1589676-1      |
| JSM025PP2GX003N        | 2-1589672-3      | JTM015PP2DX006N      | 7-1589673-0      | JTM065PP2DX004N                                | 0-1589676-2      |
| JSM025PP2GX024N        | 2-1589672-4      | JTM015PP2DX009N      | 7-1589673-1      | JTM065PP2DX006N                                | 0-1589676-3      |
| JSM025PP4DXC20N        | 2-1589672-5      | JTM015PP2DX024N      | 7-1589673-2      | JTM065PP2DX007N                                | 0-1589676-4      |
| JSM025PR2DC006N        | 2-1589672-6      | JTM015PP2GX003       | 7-1589673-3      | JTM065PR2DC001N                                | 0-1589676-5      |
| JSM025PR2GX002N        | 2-1589672-7      | JTM015PP2GX006       | 7-1589673-4      | JTM065PR2DC003                                 | 0-1589676-6      |
| JSM037PD2GXC10N        | 3-1589672-3      | JTM015PP2GX012       | 7-1589673-5      | JTM065PR2DC003N                                | 0-1589676-7      |
| JSM037PP2DCC06Q        | 3-1589672-4      | JTM015PP2GX012N      | 7-1589673-6      | JTM065PR2DX004N                                | 0-1589676-8      |
| JSM037PP2DCC08Q        | 3-1589672-5      | JTM015PP2GX024       | 7-1589673-7      | JTM065PR2GX001N                                | 0-1589676-9      |
| JSM037PP2DX018N        | 3-1589672-6      | JTM015PR2DC002N      | 7-1589673-8      | JTM065RR2DC003                                 | 1-1589676-0      |
| JSM037PP2GX072N        | 3-1589672-7      | JTM015PR2DC012M      | 7-1589673-9      | <b>DUALOBE - Surface Mount &amp; Thru Hole</b> |                  |
| JSM051PD2GXC10N        | 4-1589672-7      | JTM015PR2DT001N      | 8-1589673-0      | SSL005L2AN                                     | 0-1589462-5      |
| JSM051PD2GXC12         | 4-1589672-8      | JTM025PP2DX001N      | 2-1589674-8      | SSL005L2HN                                     | 0-1589462-6      |
| JSM051PD2GXC12N        | 4-1589672-9      | JTM025PP2DX012N      | 2-1589674-9      | SSL005M6SN                                     | 0-1589469-6      |
| JSM051PD2GXC15N        | 5-1589672-0      | JTM025PP2DX018N      | 3-1589674-0      | SSL009L2AN                                     | 0-1589462-7      |
| JSM051PD2GXC17N        | 5-1589672-1      | JTM025PP2DX022N      | 3-1589674-1      | SSL009L2AQ                                     | 0-1589462-8      |
| JSM051PD2GXC50N        | 5-1589672-2      | JTM025PP2DX03.8M     | 3-1589674-2      | SSL009L2HN                                     | 0-1589462-9      |
| JSM051PP2DCC12Q        | 5-1589672-3      | JTM025PP2DX03.8N     | 3-1589674-3      | SSL009L42HN                                    | 0-1589463-1      |
| JSM051PP2GXC12         | 5-1589672-4      | JTM025PP2DY006N      | 3-1589674-4      | SSL009L43KN                                    | 0-1589464-1      |
| JSM051PP2GXC12N        | 5-1589672-5      | JTM025PP2DY020N      | 3-1589674-5      | SSL009L4CN                                     | 0-1589463-2      |
| JSM051PP2GXC17N        | 5-1589672-6      | JTM025PR0DXC20N      | 3-1589674-6      | SSL009L4KN                                     | 0-1589463-3      |
| JSM051PP2GXC22N        | 5-1589672-7      | JTM025PR0DXC30N      | 3-1589674-7      | SSL009M6D                                      | 0-1589469-7      |
|                        |                  | JTM025PR2DT001N      | 3-1589674-8      | SSL009M6H                                      | 0-1589469-8      |



| NANONICS Part Number | Tyco Part Number | NANONICS Part Number | Tyco Part Number | NANONICS Part Number | Tyco Part Number |
|----------------------|------------------|----------------------|------------------|----------------------|------------------|
| SSL009M6SN           | 0-1589469-9      | SSM025M5CN           | 1-1589470-0      | STL025C6N            | 0-1589481-1      |
| SSL015L2AN           | 1-1589462-0      | SSM025M5HN           | 1-1589470-1      | STL025L2AN           | 1-1589483-5      |
| SSL015L2AQ           | 1-1589462-1      | SSM025M5LQ           | 1-1589470-2      | STL025L2AQ           | 1-1589483-6      |
| SSL015L2CN           | 1-1589462-2      | SSM025M6DQ           | 2-1589469-7      | STL025L2HN           | 1-1589483-7      |
| SSL015L2H            | 1-1589462-3      | SSM025M6HN           | 2-1589469-8      | STL025L42KN          | 1-1589484-1      |
| SSL015L2HNN          | 1-1589462-4      | SSM025M6SN           | 3-1589469-0      | STL025L44N           | 1-1589484-2      |
| SSL015L4N            | 0-1589463-4      | SSM031L2AN           | 7-1589679-2      | STL025L4HN           | 1-1589484-3      |
| SSL015M5KN           | 0-1589470-2      | SSM031L2HN           | 7-1589679-3      | STL025L4KN           | 1-1589484-4      |
| SSL015M6D            | 1-1589469-0      | SSM037B2             | 0-1589460-9      | STL025M5             | 1-1589488-0      |
| SSL015M6N            | 1-1589469-1      | SSM037B2N            | 1-1589460-2      | STL025M5CN           | 1-1589488-1      |
| SSL025B2             | 0-1589460-1      | SSM037L2AQ           | 3-1589462-9      | STL025M6             | 0-1589487-9      |
| SSL025L2AN           | 1-1589462-6      | SSM037L2HN           | 4-1589462-1      | STL025M6DQ           | 1-1589487-0      |
| SSL025L2HN           | 1-1589462-7      | SSM037L42KN          | 1-1589463-9      | STL025M6N            | 1-1589487-1      |
| SSL025L42            | 0-1589463-5      | SSM037L4KN           | 2-1589463-0      | STL025M6SN           | 1-1589487-2      |
| SSL025M5CN           | 0-1589470-3      | SSM037L84KN          | 0-1589467-1      | STL037B42            | 0-1589485-2      |
| SSL025M6D            | 1-1589469-2      | SSM037M6HN           | 3-1589469-2      | STL037L2AN           | 2-1589483-0      |
| SSL025M6DQ           | 1-1589469-3      | SSM037M6SN           | 3-1589469-3      | STL037L2AQ           | 2-1589483-1      |
| SSL025M6H            | 1-1589469-4      | SSM051C5N            | 0-1589461-3      | STL037L2HN           | 2-1589483-2      |
| SSL025M6HN           | 1-1589469-5      | SSM051L2AQ           | 4-1589462-3      | STL037L44KN          | 1-1589484-5      |
| SSL025M6SQ           | 1-1589469-6      | SSM051L2HN           | 4-1589462-4      | STL037L4HN           | 1-1589484-6      |
| SSL037B2N            | 0-1589460-4      | SSM051L2IQ           | 4-1589462-5      | STL037M5LQ           | 1-1589488-3      |
| SSL037L2HN           | 1-1589462-8      | SSM051L42KN          | 2-1589463-1      | STL037M5Q            | 1-1589488-4      |
| SSL037M5N            | 0-1589470-4      | SSM051L44KN          | 2-1589463-2      | STL037M6SN           | 1-1589487-5      |
| SSL051B2             | 0-1589460-5      | SSM051L4KN           | 2-1589463-3      | STL051L2AQ           | 2-1589483-4      |
| SSL051L2CN           | 1-1589462-9      | SSM051M5CN           | 1-1589470-3      | STL051L2CN           | 2-1589483-5      |
| SSL051L2HN           | 2-1589462-0      | SSM051M6SN           | 3-1589469-4      | STL051L2HN           | 2-1589483-6      |
| SSM005L2HN           | 2-1589462-1      | STL009L2H            | 0-1589483-8      | STL051L42KN          | 1-1589484-7      |
| SSM005M6SN           | 1-1589469-7      | STL009L2HN           | 0-1589483-9      | STL051L4HN           | 1-1589484-8      |
| SSM009B2N            | 0-1589460-7      | STL009L42KN          | 0-1589484-2      | STL051L4KN           | 1-1589484-9      |
| SSM009C5Q            | 0-1589461-1      | STL009L4KN           | 0-1589484-3      | STL051M5CN           | 1-1589488-5      |
| SSM009C6Q            | 0-1589471-1      | STL009M5L            | 0-1589488-7      | STL051M6A            | 1-1589487-6      |
| SSM009L2             | 2-1589462-2      | STL015B2N            | 0-1589490-1      | STL051M6SN           | 1-1589487-7      |
| SSM009L2AN           | 2-1589462-3      | STL015B44N           | 0-1589485-1      | STL065L2HN           | 2-1589483-7      |
| SSM009L2AQ           | 2-1589462-4      | STL015L2AN           | 1-1589483-1      | STL065L2N            | 2-1589483-8      |
| SSM009L2HN           | 2-1589462-5      | STL015L2AQ           | 1-1589483-2      | STL065L42KN          | 2-1589484-0      |
| SSM009L2N            | 2-1589462-6      | STL015L2CN           | 1-1589483-3      | STL065L44N           | 2-1589484-1      |
| SSM009L2SN           | 2-1589462-7      | STL015L2HN           | 1-1589483-4      | STL065L4CQ           | 2-1589484-2      |
| SSM009L42KN          | 0-1589463-6      | STL015L42KN          | 0-1589484-5      | STL065L4KN           | 2-1589484-3      |
| SSM009L44KN          | 0-1589463-7      | STL015L44KN          | 0-1589484-6      | STL065M6SN           | 1-1589487-8      |
| SSM009L44N           | 0-1589463-8      | STL015L44N           | 0-1589484-7      | STM009B42N           | 0-1589485-3      |
| SSM009L4KN           | 0-1589463-9      | STL015L4CQ           | 0-1589484-8      | STM009C6N            | 0-1589481-2      |
| SSM009M5CN           | 0-1589470-5      | STL015L4HN           | 0-1589484-9      | STM009L2HN           | 3-1589483-0      |
| SSM009M5HN           | 0-1589470-6      | STL015L4KN           | 1-1589484-0      | STM009L2N            | 3-1589483-1      |
| SSM009M5LQ           | 0-1589470-7      | STL015M5CN           | 0-1589488-8      | STM009L2SN           | 3-1589483-2      |
| SSM009M6AQ           | 1-1589469-8      | STL015M6CN           | 0-1589487-6      | STM009L42HN          | 2-1589484-4      |
| SSM009M6CN           | 1-1589469-9      | STL015M6SN           | 0-1589487-7      | STM009L42KN          | 2-1589484-5      |
| SSM009M6DQ           | 2-1589469-0      | SSM015C5N            | 0-1589461-2      | STM009L44HN          | 2-1589484-6      |
| SSM009M6HN           | 2-1589469-2      | SSM015L2AN           | 2-1589462-8      | STM009L44PQ          | 2-1589484-7      |
| SSM009M6SN           | 2-1589469-4      | SSM015L2AQ           | 2-1589462-9      | STM009L44Q           | 2-1589484-8      |
| SSM025B44N           | 0-1589465-1      | SSM015L2CN           | 3-1589462-0      | STM009L4AQ           | 2-1589484-9      |
| SSM025C6Q            | 0-1589471-2      | SSM015L2HN           | 3-1589462-1      | STM009L4KN           | 3-1589484-0      |
| SSM025L2AN           | 3-1589462-4      | SSM015L2SN           | 3-1589462-2      | STM009L4PQ           | 3-1589484-1      |
| SSM025L2AQ           | 3-1589462-5      | SSM015L44KN          | 1-1589463-0      | STM009M5CN           | 1-1589488-6      |
| SSM025L2HN           | 3-1589462-6      | SSM015L4KN           | 1-1589463-1      | STM009M5DQ           | 1-1589488-7      |
| SSM025L2SN           | 3-1589462-8      | SSM015L4PQ           | 1-1589463-2      | STM009M5HN           | 1-1589488-8      |
| SSM025L44HN          | 1-1589463-3      | SSM015M5CN           | 0-1589470-8      | STM009M5LQ           | 1-1589488-9      |
| SSM025L44KN          | 1-1589463-4      | SSM015M5LQ           | 0-1589470-9      | STM009M5Q            | 2-1589488-0      |
| SSM025L4HN           | 1-1589463-5      | SSM015M6HN           | 2-1589469-5      | STM009M6AN           | 1-1589487-9      |
| SSM025L4KN           | 1-1589463-6      | SSM015M6SN           | 2-1589469-6      | STM009M6DQ           | 2-1589487-0      |
| SSM025L4PQ           | 1-1589463-7      | STL025B2             | 0-1589490-2      | STM009M6HN           | 2-1589487-1      |
| SSM025L4SN           | 1-1589463-8      | STL025C5N            | 0-1589482-1      | STM009M6SN           | 2-1589487-2      |

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|----------------------|------------------|----------------------|------------------|--|------------------|
| STM015B2N            | 0-1589490-3      | STM025M5SN           | 3-1589488-2      | STM051M5AQ                                   | 3-1589488-9      |
| STM015B42N           | 0-1589485-4      | STM025M6AN           | 2-1589487-9      | STM051M5CN                                   | 4-1589488-0      |
| STM015C6N            | 0-1589481-3      | STM025M6CN           | 3-1589487-0      | STM051M5DQ                                   | 4-1589488-1      |
| STM015L2AQ           | 3-1589483-5      | STM025M6DQ           | 3-1589487-1      | STM051M5LQ                                   | 4-1589488-2      |
| STM015L2HN           | 3-1589483-6      | STM025M6HN           | 3-1589487-2      | STM051M5PQ                                   | 4-1589488-3      |
| STM015L2HQ           | 3-1589483-7      | STM025M6N            | 3-1589487-3      | STM051M6CN                                   | 4-1589487-3      |
| STM015L2LQ           | 3-1589483-8      | STM025M6Q            | 3-1589487-4      | STM051M6DQ                                   | 4-1589487-4      |
| STM015L2N            | 3-1589483-9      | STM025M6SN           | 3-1589487-5      | STM051M6HN                                   | 4-1589487-5      |
| STM015L2SN           | 4-1589483-0      | STM037B2N            | 0-1589490-5      | STM051M6PQ                                   | 4-1589487-6      |
| STM015L42KN          | 3-1589484-2      | STM037B42N           | 0-1589485-8      | STM051M6SN                                   | 4-1589487-7      |
| STM015L44AQ          | 3-1589484-3      | STM037B4N            | 0-1589485-9      | STM051M6SQ                                   | 4-1589487-8      |
| STM015L44HN          | 3-1589484-4      | STM037C6N            | 0-1589481-5      | STM065B2Q                                    | 0-1589490-9      |
| STM015L44KN          | 3-1589484-5      | STM037L2AN           | 5-1589483-3      | STM065B42N                                   | 1-1589485-1      |
| STM015L44Q           | 3-1589484-6      | STM037L2AQ           | 5-1589483-4      | STM065B44                                    | 1-1589485-2      |
| STM015L4HN           | 3-1589484-7      | STM037L2HN           | 5-1589483-5      | STM065B44Q                                   | 1-1589485-3      |
| STM015L4KN           | 3-1589484-8      | STM037L2SN           | 5-1589483-7      | STM065B4Q                                    | 1-1589485-4      |
| STM015L4PQ           | 3-1589484-9      | STM037L42HN          | 5-1589484-2      | STM065C5Q                                    | 0-1589482-5      |
| STM015L82HN          | 0-1589486-1      | STM037L42K           | 5-1589484-3      | STM065C6                                     | 0-1589481-7      |
| STM015L84KN          | 0-1589486-2      | STM037L42KN          | 5-1589484-4      | STM065L2AQ                                   | 7-1589483-1      |
| STM015M5AN           | 2-1589488-1      | STM037L44KN          | 5-1589484-5      | STM065L2CN                                   | 7-1589483-2      |
| STM015M5CN           | 2-1589488-2      | STM037L44PQ          | 5-1589484-6      | STM065L2HN                                   | 7-1589483-3      |
| STM015M5HN           | 2-1589488-3      | STM037L44Q           | 5-1589484-7      | STM065L2KN                                   | 7-1589483-5      |
| STM015M5KN           | 2-1589488-4      | STM037L44SN          | 5-1589484-8      | STM065L42HN                                  | 7-1589484-2      |
| STM015M5LN           | 2-1589488-5      | STM037L4HN           | 5-1589484-9      | STM065L42KN                                  | 7-1589484-3      |
| STM015M5LQ           | 2-1589488-6      | STM037L4KN           | 6-1589484-0      | STM065L42N                                   | 7-1589484-4      |
| STM015M5PQ           | 2-1589488-7      | STM037L4PQ           | 6-1589484-1      | STM065L4KN                                   | 7-1589484-5      |
| STM015M6AN           | 2-1589487-3      | STM037L82AQ          | 0-1589486-5      | STM065L82AQ                                  | 0-1589486-6      |
| STM015M6DQ           | 2-1589487-4      | STM037M5AN           | 3-1589488-3      | STM065L82HN                                  | 0-1589486-7      |
| STM015M6HN           | 2-1589487-5      | STM037M5CN           | 3-1589488-4      | STM065L84IQ                                  | 0-1589486-8      |
| STM015M6N            | 2-1589487-6      | STM037M5HN           | 3-1589488-5      | STM065M5CN                                   | 4-1589488-4      |
| STM015M6S            | 2-1589487-7      | STM037M5N            | 3-1589488-6      | STM065M5LQ                                   | 4-1589488-6      |
| STM015M6SN           | 2-1589487-8      | STM037M5PQ           | 3-1589488-7      | STM065M5N                                    | 4-1589488-7      |
| STM025B2N            | 0-1589490-4      | STM037M5SN           | 3-1589488-8      | STM065M6                                     | 5-1589487-0      |
| STM025B42N           | 0-1589485-5      | STM037M6AN           | 3-1589487-6      | STM065M6CN                                   | 5-1589487-1      |
| STM025B44            | 0-1589485-6      | STM037M6AQ           | 3-1589487-7      | STM065M6HN                                   | 5-1589487-3      |
| STM025C5N            | 0-1589482-2      | STM037M6DN           | 3-1589487-8      | STM065M6SN                                   | 5-1589487-4      |
| STM025C6N            | 0-1589481-4      | STM037M6DQ           | 3-1589487-9      | <b>DUALOBE - Soldered to Flex (Duckbill)</b> |                  |
| STM025L2AN           | 4-1589483-2      | STM037M6HN           | 4-1589487-0      | STL00911378PC                                | 0-1589066-3      |
| STM025L2AQ           | 4-1589483-3      | STM037M6SN           | 4-1589487-1      | STL00911378PCN                               | 0-1589066-4      |
| STM025L2CN           | 4-1589483-4      | STM037M6SQ           | 4-1589487-2      | STL00911378SCN                               | 0-1589067-1      |
| STM025L2HN           | 4-1589483-5      | STM051B2N            | 0-1589490-6      | STL01511378PCN                               | 0-1589066-5      |
| STM025L2HQ           | 4-1589483-6      | STM051B2Q            | 0-1589490-8      | STL02511378PCN                               | 0-1589066-6      |
| STM025L2IQ           | 4-1589483-7      | STM051B42N           | 1-1589485-0      | STL02511378SCN                               | 0-1589067-2      |
| STM025L2N            | 4-1589483-9      | STM051C5N            | 0-1589482-3      | STL03711378PCN                               | 0-1589066-7      |
| STM025L42KN          | 4-1589484-0      | STM051C5Q            | 0-1589482-4      | STL05111378PCN                               | 0-1589066-8      |
| STM025L44HN          | 4-1589484-2      | STM051C6N            | 0-1589481-6      | STL05111378SCHN                              | 0-1589067-3      |
| STM025L44KN          | 4-1589484-3      | STM051L2AQ           | 6-1589483-0      | STL06511378PC                                | 0-1589066-9      |
| STM025L44N           | 4-1589484-4      | STM051L2CN           | 6-1589483-2      | STL06511378PCN                               | 1-1589066-0      |
| STM025L44PQ          | 4-1589484-5      | STM051L2HN           | 6-1589483-3      | STL06511378SCN                               | 0-1589067-4      |
| STM025L44Q           | 4-1589484-6      | STM051L2HQ           | 6-1589483-4      | STM00911378PCN                               | 1-1589066-1      |
| STM025L4KN           | 4-1589484-7      | STM051L2Q            | 6-1589483-6      | STM00911378SCN                               | 0-1589067-6      |
| STM025L4LQ           | 4-1589484-8      | STM051L2SN           | 6-1589483-8      | STM01511378SCN                               | 0-1589067-7      |
| STM025L4PN           | 4-1589484-9      | STM051L42HN          | 6-1589484-3      | STM02511378PC                                | 1-1589066-2      |
| STM025L4PQ           | 5-1589484-0      | STM051L42KN          | 6-1589484-4      | STM02511378PCN                               | 1-1589066-3      |
| STM025L4SN           | 5-1589484-1      | STM051L42N           | 6-1589484-5      | STM02511378SCN                               | 0-1589067-8      |
| STM025L82HN          | 0-1589486-3      | STM051L44HN          | 6-1589484-6      | STM03711378PCN                               | 1-1589066-4      |
| STM025L84KN          | 0-1589486-4      | STM051L44KN          | 6-1589484-7      | STM03711378PCQ                               | 1-1589066-5      |
| STM025M5CN           | 2-1589488-8      | STM051L44PQ          | 6-1589484-8      | STM05111378PC                                | 1-1589066-6      |
| STM025M5HN           | 2-1589488-9      | STM051L44Q           | 6-1589484-9      | STM05111378PCM                               | 1-1589066-7      |
| STM025M5LQ           | 3-1589488-0      | STM051L4KN           | 7-1589484-0      | STM05111378PCN                               | 1-1589066-8      |
| STM025M5PQ           | 3-1589488-1      | STM051L4PQ           | 7-1589484-1      | STM05111378PCQ                               | 1-1589066-9      |

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| STM05111378SCN                      | 0-1589067-9      |
| STM06511378PCN                      | 2-1589066-0      |
| STM06511378PCQ                      | 2-1589066-1      |
| STM06511378SCN                      | 1-1589067-0      |
| <b>DUALLOBE - Wire Terminations</b> |                  |
| SSL005PC0DC006N                     | 0-1589455-2      |
| SSL005PC0DC012N                     | 0-1589455-3      |
| SSL005PC2DC004                      | 0-1589455-4      |
| SSL005PC2DC006                      | 0-1589455-5      |
| SSL005PC2DC006N                     | 0-1589455-6      |
| SSL005PC2DX006N                     | 0-1589455-7      |
| SSL005SC0DC006N                     | 0-1589457-1      |
| SSL005SC2DC006N                     | 0-1589457-2      |
| SSL005SC3DM024N                     | 0-1589457-3      |
| SSL009PC0DC006N                     | 0-1589455-8      |
| SSL009PC0DMM03N                     | 0-1589455-9      |
| SSL009PC2DC001N                     | 1-1589455-0      |
| SSL009PC2DC003                      | 1-1589455-1      |
| SSL009PC2DC006N                     | 1-1589455-2      |
| SSL009PC2DC009N                     | 1-1589455-3      |
| SSL009PC2DC012                      | 1-1589455-4      |
| SSL009PC2DC012M                     | 1-1589455-5      |
| SSL009PC2DC012N                     | 1-1589455-6      |
| SSL009PC2DC018N                     | 1-1589455-7      |
| SSL009PC2DCC03N                     | 1-1589455-8      |
| SSL009PC2DCC10N                     | 1-1589455-9      |
| SSL009PC2DM010N                     | 2-1589455-0      |
| SSL009PC2DM018M                     | 2-1589455-1      |
| SSL009PC2DMC60Q                     | 2-1589455-2      |
| SSL009SC0DMM03N                     | 0-1589457-4      |
| SSL009SC2DC003                      | 0-1589457-5      |
| SSL009SC2DC006N                     | 0-1589457-6      |
| SSL009SC2DC012                      | 0-1589457-7      |
| SSL009SC2DM006N                     | 0-1589457-8      |
| SSL009SC2GX006                      | 1-1589457-0      |
| SSL015PC0DMM03N                     | 2-1589455-3      |
| SSL015PC2DC006N                     | 2-1589455-4      |
| SSL015PC2DC008N                     | 2-1589455-5      |
| SSL015PC2DC012                      | 2-1589455-6      |
| SSL015PC2DC012N                     | 2-1589455-7      |
| SSL015PC2DC018                      | 2-1589455-8      |
| SSL015PC2DC024                      | 2-1589455-9      |
| SSL015PC2DM018M                     | 3-1589455-0      |
| SSL015SC0DMM03N                     | 1-1589457-1      |
| SSL015SC2DC006N                     | 1-1589457-2      |
| SSL015SC2DC012N                     | 1-1589457-3      |
| SSL015SC2DC024N                     | 1-1589457-4      |
| SSL025PC2DC006                      | 3-1589455-1      |
| SSL025PC2DC006N                     | 3-1589455-2      |
| SSL025PC2DC012                      | 3-1589455-3      |
| SSL025PC2DC020N                     | 3-1589455-4      |
| SSL025PC2DM018M                     | 3-1589455-5      |
| SSL025PC2DX012Q                     | 3-1589455-6      |
| SSL025PC2GX006N                     | 3-1589455-7      |
| SSL025SC2DC006                      | 1-1589457-5      |
| SSL025SC2DC006N                     | 1-1589457-6      |
| SSL025SC2DC012N                     | 1-1589457-7      |
| SSL037PC2DC012N                     | 3-1589455-8      |
| SSL037PC2DC024N                     | 3-1589455-9      |
| SSL037PC2DC096N                     | 4-1589455-0      |
| SSL037SC2DC012N                     | 1-1589457-8      |

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| SSM005PC2DC006       | 4-1589455-2      |
| SSM005PC2DC006N      | 4-1589455-3      |
| SSM005PC2DC012N      | 4-1589455-4      |
| SSM005PC2DC018N      | 4-1589455-5      |
| SSM005PC2DC036N      | 4-1589455-6      |
| SSM005PC2DC040N      | 4-1589455-7      |
| SSM005PC2DX012N      | 4-1589455-8      |
| SSM005PC2DX018N      | 4-1589455-9      |
| SSM005PC2DX024N      | 5-1589455-0      |
| SSM005PC4DX012N      | 5-1589455-1      |
| SSM005PC4DXM01       | 5-1589455-2      |
| SSM005SC2DC006N      | 1-1589457-9      |
| SSM005SC2DC012N      | 2-1589457-0      |
| SSM005SC2DC018N      | 2-1589457-1      |
| SSM005SC2DC040N      | 2-1589457-2      |
| SSM005SC2DX024HN     | 2-1589457-3      |
| SSM005SC4DX012N      | 2-1589457-4      |
| SSM009PC0DC024N      | 5-1589455-3      |
| SSM009PC0DM024N      | 5-1589455-4      |
| SSM009PC0DX012N      | 5-1589455-5      |
| SSM009PC2DC003       | 5-1589455-6      |
| SSM009PC2DC003N      | 5-1589455-7      |
| SSM009PC2DC006       | 5-1589455-8      |
| SSM009PC2DC006N      | 5-1589455-9      |
| SSM009PC2DC010N      | 6-1589455-0      |
| SSM009PC2DC012       | 6-1589455-1      |
| SSM009PC2DC012M      | 6-1589455-2      |
| SSM009PC2DC012N      | 6-1589455-3      |
| SSM009PC2DC018       | 6-1589455-4      |
| SSM009PC2DC018N      | 6-1589455-5      |
| SSM009PC2DC024       | 6-1589455-6      |
| SSM009PC2DC024N      | 6-1589455-7      |
| SSM009PC2DC036N      | 6-1589455-8      |
| SSM009PC2DC060N      | 6-1589455-9      |
| SSM009PC2DCC10N      | 7-1589455-0      |
| SSM009PC2DCM01N      | 7-1589455-1      |
| SSM009PC2DM010N      | 7-1589455-2      |
| SSM009PC2DM018N      | 7-1589455-3      |
| SSM009PC2DM024       | 7-1589455-4      |
| SSM009PC2DX005N      | 7-1589455-5      |
| SSM009PC2DX006N      | 7-1589455-6      |
| SSM009PC2DX010N      | 7-1589455-7      |
| SSM009PC2DX012N      | 7-1589455-8      |
| SSM009PC2DX018N      | 7-1589455-9      |
| SSM009PC2DX024N      | 8-1589455-0      |
| SSM009PC2DY006N      | 8-1589455-1      |
| SSM009PC3DC018N      | 8-1589455-2      |
| SSM009SC1DC002       | 2-1589457-5      |
| SSM009SC2DC006HN     | 2-1589457-6      |
| SSM009SC2DC006N      | 2-1589457-7      |
| SSM009SC2DC012N      | 2-1589457-9      |
| SSM009SC2DC018N      | 3-1589457-0      |
| SSM009SC2DC024N      | 3-1589457-1      |
| SSM009SC2DC036N      | 3-1589457-2      |
| SSM009SC2DM006N      | 3-1589457-4      |
| SSM009SC2DM012       | 3-1589457-5      |
| SSM009SC2DX012N      | 3-1589457-6      |
| SSM009SC2DX018N      | 3-1589457-7      |
| SSM009SC2DX024HN     | 3-1589457-8      |
| SSM009SC2DX036HN     | 3-1589457-9      |

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| SSM015PC0DC018N      | 8-1589455-4      |
| SSM015PC0DMM02N      | 8-1589455-5      |
| SSM015PC2DC003N      | 8-1589455-6      |
| SSM015PC2DC006       | 8-1589455-7      |
| SSM015PC2DC006N      | 8-1589455-8      |
| SSM015PC2DC008N      | 8-1589455-9      |
| SSM015PC2DC012       | 9-1589455-0      |
| SSM015PC2DC012N      | 9-1589455-1      |
| SSM015PC2DC018       | 9-1589455-2      |
| SSM015PC2DC018N      | 9-1589455-3      |
| SSM015PC2DC024N      | 9-1589455-4      |
| SSM015PC2DC036N      | 9-1589455-5      |
| SSM015PC2DC048N      | 9-1589455-6      |
| SSM015PC2DC060N      | 9-1589455-7      |
| SSM015PC2DM024N      | 9-1589455-8      |
| SSM015PC2DMC20N      | 9-1589455-9      |
| SSM015PC2DMM02N      | 0-1589456-1      |
| SSM015PC2DT012N      | 0-1589456-2      |
| SSM015PC2DX006N      | 0-1589456-3      |
| SSM015PC2DX006Q      | 0-1589456-4      |
| SSM015PC2DX008       | 0-1589456-5      |
| SSM015PC2DX012N      | 0-1589456-6      |
| SSM015PC2DX024N      | 0-1589456-7      |
| SSM015PC2DY003N      | 0-1589456-8      |
| SSM015PC2DY006N      | 0-1589456-9      |
| SSM015PC2DY012N      | 1-1589456-0      |
| SSM015PC2GX018N      | 1-1589456-1      |
| SSM015PC4DX030N      | 1-1589456-2      |
| SSM015SC0DC012N      | 4-1589457-0      |
| SSM015SC2DC003N      | 4-1589457-1      |
| SSM015SC2DC006N      | 4-1589457-2      |
| SSM015SC2DC012N      | 4-1589457-3      |
| SSM015SC2DC018       | 4-1589457-4      |
| SSM015SC2DC036N      | 4-1589457-5      |
| SSM015SC2DX006N      | 4-1589457-8      |
| SSM015SC2DX012HN     | 4-1589457-9      |
| SSM015SC2DX018N      | 5-1589457-0      |
| SSM015SC2DX024HN     | 5-1589457-2      |
| SSM015SC2DY012N      | 5-1589457-3      |
| SSM015SC2DY018N      | 5-1589457-4      |
| SSM015SC4DX005N      | 5-1589457-5      |
| SSM025PC2DC003N      | 1-1589456-4      |
| SSM025PC2DC006Q      | 1-1589456-5      |
| SSM025PC2DC010N      | 1-1589456-6      |
| SSM025PC2DC012       | 1-1589456-7      |
| SSM025PC2DC012N      | 1-1589456-8      |
| SSM025PC2DC018       | 1-1589456-9      |
| SSM025PC2DC018N      | 2-1589456-0      |
| SSM025PC2DC025N      | 2-1589456-1      |
| SSM025PC2DC030N      | 2-1589456-2      |
| SSM025PC2DC036N      | 2-1589456-3      |
| SSM025PC2DCC30N      | 2-1589456-4      |
| SSM025PC2DX006N      | 2-1589456-5      |
| SSM025PC2DX012N      | 2-1589456-6      |
| SSM025PC2DX018N      | 2-1589456-7      |
| SSM025PC2DX024N      | 2-1589456-8      |
| SSM025PC2GX006       | 2-1589456-9      |
| SSM025PC2GX018N      | 3-1589456-0      |
| SSM025PC3DY006N      | 3-1589456-1      |
| SSM025SC2DC012N      | 5-1589457-6      |

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| SSM025SC2DC018       | 5-1589457-7      | STL015PC2DC010N      | 2-1589472-8      | STL051PC2DC012       | 7-1589472-0      |
| SSM025SC2DC024N      | 5-1589457-9      | STL015PC2DC012       | 2-1589472-9      | STL051PC2DC012N      | 7-1589472-1      |
| SSM025SC2DX006N      | 6-1589457-0      | STL015PC2DC012N      | 3-1589472-0      | STL051PC2DC018       | 7-1589472-2      |
| SSM025SC2DX018N      | 6-1589457-1      | STL015PC2DC015N      | 3-1589472-1      | STL051PC2DC024N      | 7-1589472-3      |
| SSM025SC2DX024HN     | 6-1589457-3      | STL015PC2DC018M      | 3-1589472-2      | STL051PC2DC036N      | 7-1589472-4      |
| SSM025SC3DY006N      | 6-1589457-4      | STL015PC2DC030N      | 3-1589472-3      | STL051PC2DC040N      | 7-1589472-5      |
| SSM037PC2DC006       | 3-1589456-2      | STL015PC2DC036N      | 3-1589472-4      | STL051PC2DCC35N      | 7-1589472-6      |
| SSM037PC2DC006N      | 3-1589456-3      | STL015PC2DCC10N      | 3-1589472-5      | STL051SC2DC003N      | 3-1589476-0      |
| SSM037PC2DC012       | 3-1589456-4      | STL015PC2DM010N      | 3-1589472-6      | STL051SC2DC012N      | 3-1589476-1      |
| SSM037PC2DX012N      | 3-1589456-5      | STL015PC2DX010N      | 3-1589472-8      | STL051SC2DC018N      | 3-1589476-2      |
| SSM037PC2DC015N      | 3-1589456-6      | STL015PC2DX036N      | 3-1589472-9      | STL051SC2DC024N      | 3-1589476-3      |
| SSM037PC2DC018       | 3-1589456-7      | STL015PC2GX040N      | 4-1589472-0      | STL051SC2DC048       | 3-1589476-4      |
| SSM037PC2DC018N      | 3-1589456-8      | STL015SC0DMM03N      | 1-1589476-0      | STL065PC0DC036N      | 7-1589472-8      |
| SSM037PC2DC024N      | 3-1589456-9      | STL015SC2DC008       | 1-1589476-1      | STL065PC2DC006       | 7-1589472-9      |
| SSM037PC2DCM01N      | 4-1589456-0      | STL015SC2DC008N      | 1-1589476-2      | STL065PC2DC006N      | 8-1589472-0      |
| SSM037PC2DX012Q      | 4-1589456-2      | STL015SC2DC012N      | 1-1589476-3      | STL065PC2DC012N      | 8-1589472-1      |
| SSM037PC2DX018N      | 4-1589456-3      | STL015SC2DC018N      | 1-1589476-4      | STL065PC2DC018       | 8-1589472-2      |
| SSM037PC2GXC30N      | 4-1589456-4      | STL015SC2DC030N      | 1-1589476-5      | STL065PC2DC018N      | 8-1589472-3      |
| SSM037SC2DC018       | 6-1589457-5      | STL015SC2DC036N      | 1-1589476-6      | STL065PC2DC024N      | 8-1589472-4      |
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| STM051PC2DX012Q      | 9-1589474-4      |
| STM051PC2DX015N      | 9-1589474-5      |
| STM051PC2DX018       | 9-1589474-6      |
| STM051PC2DX018N      | 9-1589474-7      |
| STM051PC2DY015N      | 9-1589474-8      |
| STM051PC2GXM01N      | 9-1589474-9      |
| STM051SC0DXC10N      | 4-1589477-5      |
| STM051SC1DXC20       | 4-1589477-6      |
| STM051SC2DC003N      | 4-1589477-7      |
| STM051SC2DC006       | 4-1589477-8      |
| STM051SC2DC006N      | 4-1589477-9      |
| STM051SC2DC012N      | 5-1589477-0      |
| STM051SC2DC015HN     | 5-1589477-1      |
| STM051SC2DC015N      | 5-1589477-2      |
| STM051SC2DC016N      | 5-1589477-3      |
| STM051SC2DC018HN     | 5-1589477-4      |
| STM051SC2DC018N      | 5-1589477-5      |
| STM051SC2DC018Q      | 5-1589477-6      |
| STM051SC2DC036N      | 5-1589477-7      |
| STM051SC2DC060N      | 5-1589477-8      |
| STM051SC2DC060Q      | 5-1589477-9      |
| STM051SC2DM012N      | 6-1589477-0      |
| STM051SC2DMM01N      | 6-1589477-1      |
| STM051SC2DT030N      | 6-1589477-3      |
| STM051SC2DX012N      | 6-1589477-4      |
| STM051SC2DX015N      | 6-1589477-5      |
| STM065PC2DC003N      | 0-1589475-1      |
| STM065PC2DC006       | 0-1589475-2      |
| STM065PC2DC006N      | 0-1589475-3      |
| STM065PC2DC008Q      | 0-1589475-4      |
| STM065PC2DC012N      | 0-1589475-5      |
| STM065PC2DC012Q      | 0-1589475-6      |
| STM065PC2DC016M      | 0-1589475-7      |
| STM065PC2DC016N      | 0-1589475-8      |
| STM065PC2DC018M      | 0-1589475-9      |
| STM065PC2DC018N      | 1-1589475-0      |
| STM065PC2DC018Q      | 1-1589475-1      |
| STM065PC2DC024N      | 1-1589475-2      |
| STM065PC2DC024Q      | 1-1589475-3      |
| STM065PC2DC030N      | 1-1589475-4      |
| STM065PC2DC036N      | 1-1589475-5      |
| STM065PC2DC072N      | 1-1589475-6      |
| STM065PC2DM018N      | 1-1589475-7      |
| STM065PC2DT018N      | 1-1589475-8      |
| STM065PC2DT030N      | 1-1589475-9      |
| STM065PC2DX006N      | 2-1589475-0      |
| STM065PC2DX018N      | 2-1589475-1      |

| NANONICS Part Number                    | Tyco Part Number |
|---|------------------|
| STM065PC2DX036N                         | 2-1589475-2      |
| STM065PC2DY012N                         | 2-1589475-3      |
| STM065PC2DY024N                         | 2-1589475-4      |
| STM065PC2GXM01N                         | 2-1589475-5      |
| STM065PC3DM006N                         | 2-1589475-6      |
| STM065PC3DX024N                         | 2-1589475-7      |
| STM065SC2DC003N                         | 6-1589477-6      |
| STM065SC2DC006                          | 6-1589477-7      |
| STM065SC2DC006N                         | 6-1589477-8      |
| STM065SC2DC012N                         | 6-1589477-9      |
| STM065SC2DC012Q                         | 7-1589477-0      |
| STM065SC2DC015N                         | 7-1589477-1      |
| STM065SC2DC018                          | 7-1589477-2      |
| STM065SC2DC018N                         | 7-1589477-3      |
| STM065SC2DC018Q                         | 7-1589477-4      |
| STM065SC2DC024N                         | 7-1589477-5      |
| STM065SC2DC024Q                         | 7-1589477-6      |
| STM065SC2DC036HN                        | 7-1589477-7      |
| STM065SC2DC036N                         | 7-1589477-8      |
| STM065SC2DT030N                         | 7-1589477-9      |
| <b>DUALOBE - Solder Cup Termination</b> |                  |
| SSL00511500PCN                          | 0-1589051-1      |
| SSL00511500SCN                          | 0-1589052-1      |
| SSL00911500PC                           | 0-1589051-2      |
| SSL00911500PCN                          | 0-1589051-3      |
| SSL00911500SCN                          | 0-1589052-2      |
| SSL01511500PCM                          | 0-1589051-4      |
| SSL01511500PCN                          | 0-1589051-5      |
| SSL01511500SCN                          | 0-1589052-3      |
| SSM00511500PC                           | 1-1589051-4      |
| SSM00511500PCN                          | 0-1589051-7      |
| SSM00511500SCN                          | 0-1589052-4      |
| SSM00911500PC                           | 0-1589051-8      |
| SSM00911500PCN                          | 0-1589051-9      |
| SSM01511500PCN                          | 1-1589051-0      |
| SSM01511500SC                           | 0-1589052-5      |
| SSM02511500SCQ                          | 0-1589052-7      |
| SSM03711500PC                           | 1-1589051-1      |
| SSM03711500PCN                          | 1-1589051-2      |
| SSM05111500PCN                          | 1-1589051-3      |
| SSM05111500SCN                          | 0-1589052-8      |
| STL00911500PCN                          | 0-1589053-1      |
| STL00911500SCN                          | 0-1589054-1      |
| STL01511500PCN                          | 0-1589053-2      |
| STL01511500SCN                          | 0-1589054-2      |
| STL02511500PC                           | 0-1589053-3      |
| STL02511500PCN                          | 0-1589053-4      |
| STL02511500SC                           | 0-1589054-3      |
| STL03711500PCN                          | 0-1589053-5      |
| STL03711500SCN                          | 0-1589054-4      |
| STL05111500PCN                          | 0-1589053-6      |
| STL06511500PCN                          | 1-1589053-8      |
| STM00911500PCN                          | 0-1589053-7      |
| STM00911500SCN                          | 0-1589054-5      |
| STM01511500PCN                          | 0-1589053-8      |
| STM01511500PCQ                          | 0-1589053-9      |
| STM01511500SCHN                         | 0-1589054-6      |
| STM01511500SCN                          | 0-1589054-7      |
| STM02511500PC                           | 1-1589053-0      |
| STM02511500PCN                          | 1-1589053-1      |
| STM02511500SC                           | 0-1589054-8      |

| NANONICS Part Number                         | Tyco Part Number | NANONICS Part Number | Tyco Part Number | NANONICS Part Number | Tyco Part Number |
|--|------------------|----------------------|------------------|----------------------|------------------|
| STM02511500SCN                               | 0-1589054-9      | USS004PC2DCC30       | 0-1589448-9      | USS009SC2DC012Z      | 2-1589449-7      |
| STM03711500PCN                               | 1-1589053-2      | USS004PC2DX006       | 1-1589448-1      | USS009SC2DC018       | 2-1589449-8      |
| STM03711500PCQ                               | 1-1589053-3      | USS004PC2DX012       | 1-1589448-2      | USS009SC2DC018T      | 2-1589449-9      |
| STM03711500SCN                               | 1-1589054-0      | USS004PC2GX006       | 1-1589448-3      | USS009SC2DC024       | 3-1589449-0      |
| STM05111500PCN                               | 1-1589053-4      | USS004PC2GX024       | 1-1589448-4      | USS009SC2DC025T      | 3-1589449-1      |
| STM05111500PCQ                               | 1-1589053-5      | USS004PC3DC018       | 1-1589448-5      | USS009SC2DC036T      | 3-1589449-2      |
| STM05111500SCN                               | 1-1589054-1      | USS004SC2DC002       | 0-1589449-1      | USS009SC2DC036U      | 3-1589449-3      |
| STM06511500PC                                | 1-1589053-6      | USS004SC2DC003       | 0-1589449-2      | USS009SC2DC036V      | 3-1589449-4      |
| STM06511500PCN                               | 1-1589053-7      | USS004SC2DC003T      | 0-1589449-3      | USS009SC2DC036W      | 3-1589449-5      |
| STM06511500SCN                               | 1-1589054-2      | USS004SC2DC004       | 0-1589449-4      | USS009SC2DC060T      | 3-1589449-6      |
| <b>Strip - Surface Mount &amp; Thru Hole</b> |                  |                      |                  |                      |                  |
| USS004B2                                     | 0-1589451-1      | USS004SC2DC006       | 0-1589449-5      | USS009SC2DCC05T      | 3-1589449-7      |
| USS004B2T                                    | 0-1589451-2      | USS004SC2DC012       | 0-1589449-6      | USS009SC2DCM01T      | 3-1589449-8      |
| USS004C6                                     | 0-1589453-1      | USS004SC2DC012T      | 0-1589449-7      | USS009SC2DX004T      | 3-1589449-9      |
| USS004L2                                     | 0-1589452-1      | USS004SC2DC012U      | 0-1589449-8      | USS009SC2DX006T      | 4-1589449-0      |
| USS004L2T                                    | 0-1589452-2      | USS004SC2DC024       | 0-1589449-9      | USS009SC2DX012       | 4-1589449-1      |
| USS004M6                                     | 0-1589454-1      | USS004SC2DC036       | 1-1589449-0      | USS009SC2GX006       | 4-1589449-2      |
| USS009B2                                     | 0-1589451-3      | USS004SC2DC048       | 1-1589449-1      | USS009SC2GX012       | 4-1589449-3      |
| USS009B2T                                    | 0-1589451-5      | USS004SC2DCC30       | 1-1589449-2      | USS009SC3DX004T      | 4-1589449-4      |
| USS009B2Z                                    | 0-1589451-6      | USS004SC2DX006       | 1-1589449-4      | USS010SC2DC006       | 4-1589449-5      |
| USS009C6                                     | 0-1589453-2      | USS004SC2DX012T      | 1-1589449-5      | USS015PC2DC006       | 3-1589448-5      |
| USS009C6T                                    | 0-1589453-3      | USS004SC2GX006       | 1-1589449-6      | USS015PC2DC012       | 3-1589448-6      |
| USS009C6V                                    | 0-1589453-4      | USS004SC2GX024       | 1-1589449-7      | USS015PC2DC012T      | 3-1589448-7      |
| USS009L2                                     | 0-1589452-3      | USS004SC3DC018       | 1-1589449-8      | USS015PC2DC012V      | 3-1589448-8      |
| USS009L2T                                    | 0-1589452-4      | USS004SC3DX004T      | 1-1589449-9      | USS015PC2DC018       | 3-1589448-9      |
| USS009L2U                                    | 0-1589452-5      | USS009PC0DC006T      | 1-1589448-6      | USS015PC2DMC60T      | 4-1589448-0      |
| USS009L2V                                    | 0-1589452-6      | USS009PC2DC006       | 1-1589448-7      | USS015PC2DX004T      | 4-1589448-1      |
| USS009M6                                     | 0-1589454-2      | USS009PC2DC006W      | 1-1589448-8      | USS015PC2DX012       | 4-1589448-2      |
| USS015B2                                     | 0-1589451-8      | USS009PC2DC012       | 1-1589448-9      | USS015PC2DX024T      | 4-1589448-3      |
| USS015B2T                                    | 0-1589451-9      | USS009PC2DC012T      | 2-1589448-0      | USS015SC2DC006       | 4-1589449-6      |
| USS015C6                                     | 0-1589453-5      | USS009PC2DC012V      | 2-1589448-1      | USS015SC2DC012       | 4-1589449-7      |
| USS015L2                                     | 0-1589452-7      | USS009PC2DC018V      | 2-1589448-2      | USS015SC2DC012T      | 4-1589449-8      |
| USS015L2T                                    | 0-1589452-8      | USS009PC2DC024       | 2-1589448-3      | USS015SC2DC036T      | 4-1589449-9      |
| USS015L2V                                    | 0-1589452-9      | USS009PC2DC036       | 2-1589448-4      | USS015SC2DMC60T      | 5-1589449-0      |
| USS025B2                                     | 1-1589451-0      | USS009PC2DC036T      | 2-1589448-5      | USS015SC2DX004T      | 5-1589449-1      |
| USS025L2                                     | 1-1589452-0      | USS009PC2DC036U      | 2-1589448-6      | USS015SC2DX018T      | 5-1589449-2      |
| USS037B2                                     | 1-1589451-1      | USS009PC2DC036V      | 2-1589448-7      | USS015SC3DX004T      | 5-1589449-3      |
| USS037L2                                     | 1-1589452-1      | USS009PC2DCC05T      | 2-1589448-8      | USS025PC2DC006       | 4-1589448-4      |
| USS037L2T                                    | 1-1589452-2      | USS009PC2DX001       | 2-1589448-9      | USS025PC2DX018T      | 4-1589448-5      |
| USS051B2                                     | 1-1589451-3      | USS009PC2DX004T      | 3-1589448-0      | USS025SC2DC006       | 5-1589449-4      |
| USS051L2                                     | 1-1589452-3      | USS009PC2DX006T      | 3-1589448-1      | USS037PC1DXC20       | 4-1589448-6      |
| <b>Strip - Wire Terminations</b>             |                  |                      |                  |                      |                  |
| USS004PC2DC003                               | 0-1589448-1      | USS009PC2DX012       | 3-1589448-2      | USS037PC2DC006       | 4-1589448-7      |
| USS004PC2DC006                               | 0-1589448-2      | USS009PC2GX006       | 3-1589448-3      | USS037PC2DC020T      | 4-1589448-8      |
| USS004PC2DC012                               | 0-1589448-3      | USS009PC2GX012       | 3-1589448-4      | USS037SC1DXC20       | 5-1589449-5      |
| USS004PC2DC012T                              | 0-1589448-4      | USS009SC2DC004       | 2-1589449-0      | USS037SC2DC006       | 5-1589449-6      |
| USS004PC2DC012U                              | 0-1589448-5      | USS009SC2DC006       | 2-1589449-1      | USS037SC2DX006T      | 5-1589449-7      |
| USS004PC2DC024                               | 0-1589448-6      | USS009SC2DC006W      | 2-1589449-2      | USS051PC2DC012       | 5-1589448-0      |
| USS004PC2DC036                               | 0-1589448-7      | USS009SC2DC006Z      | 2-1589449-3      | USS051PC2DX012       | 5-1589448-1      |
| USS004PC2DC036T                              | 0-1589448-8      | USS009SC2DC008       | 2-1589449-4      | USS051SC2DC012       | 5-1589449-8      |
|  |                  | USS009SC2DC012       | 2-1589449-5      |                      |                  |
|  |                  | USS009SC2DC012T      | 2-1589449-6      |                      |                  |

5 Pin and Socket Connectors

Introduction

Product Facts

- Designed for both military and commercial applications
- Low engaging force is achieved by the manner in which Twist Pin Contacts are designed
- The metal shell and plastic shell are available with solder cup and solid or stranded wire terminations
- Mating force maximum is 10 oz. [2.78N] times the number of contacts
- Durability — No known mechanical or electrical issues detrimental to the function of the connectors after 500 cycles of mating and unmating
- Current Rating — 3 amps max per contact



MICRODOT Connectors MCK and MCD High Density Microminiature "D" Connectors described in this catalog comprise a complete connector system, which is adaptable to a numerous variety of form factors. Low engaging force is achieved by the manner in which the twist pin contacts are designed. By constructing the male contact as a breathing helical spring, electrical contact is achieved at many points around the periphery of the pin bundle rather than at a few discrete points, as in conventional pin designs. Normal twist

pin engagement force is 6 oz. [1.67N] typically and 8 oz. [2.22N] maximum. The low force twist pins exhibit an engaging force of 4 oz. [1.11N] typically and 5 oz. [1.39N] maximum. Low force twist pins are standard in MIL-PRF-83513 configurations of MCK and MCD connectors and may be supplied as an option in all other configurations.

The MCK and MCD Series of connectors featured in this catalog are designed to meet the applicable requirements of MIL-PRF-83513, for intermateability, interchangeability, and

performance. Designed for both military and commercial applications, the MCK's and MCD's are especially well suited for use in miniaturized airborne and space electronics, computers, and test equipment. The metal shell MCK's and plastic shell MCD's are available with solder cup, and solid or stranded wire terminations. MCK transition blocks are standard for printed circuit board mounting. Custom termination configurations for both MCK and MCD can be accommodated. Micro D's are also supplied in wired harness assemblies.



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MCK/MCD/MCDM Series Metal and Plastic Shell Connectors

**Technical and Performance Data**

(Applicable to MCK, MCD and MCDM unless otherwise noted)

**Electrical**

**Contacts** — Pin 24 AWG twist pin, Socket 24 AWG precision machined barrel, Wire Range 24 AWG to 30 AWG solid and stranded.

**Contact Resistance** — (voltage drop) 25 millivolts max. at 3 amps, 77°± 7.4°F [25°± 3° C].

**Current Rating** — 3 amps max. per contact.

**Dielectric Withstanding Voltage** — Volts RMS 60 Hz at room ambient.

At sea level 600V solder pots, 800V wire terminations & transition blocks. At 70,000 ft. [21,336 m] 150V solder pots, 200V wire terminations & transition blocks.

**Insulation Resistance** — 5,000 megohms min. (@ 500 VDC) at ambient room temperature.

**Magnetic Permeability** — 2 mu max.

**Mechanical**

**Contact Spacing** — .050 [1.27mm] centers.

**Contact Engagement & Separation** — Standard contact engaging force is 6.0 oz. [1.67N] (8.0 oz. [2.22N] max.). Separation force is 0.5 [1.4N] oz. min.

**Mating Force Maximum** — Calculated as 10 oz. times the number of contacts.

**Environmental**

**Temperature Range** — -67°F to 257°F [-55° C to +125°C] for MCK/MCD, -67°F to 302°F [-55°C to +150°C] for MCDM.

**Vibration** — No discontinuity in excess of 1 µ sec. when tested in accordance with MIL-STD-1344, Method 2005, test Condition IV.

**Solderability** — Connectors shall pass the test requirements of MIL-STD-202, Method 208

**Shock** — No discontinuity in excess of 1 µ sec. when tested in accordance with MIL-STD-1344, Method 2004, test Condition E.

**Durability** — No mechanical or electrical defects detrimental to the function of the connectors after 500 cycles of mating and unmating.

**Humidity** — After exposure to humidity as specified by MIL-STD-1344, Method 1002, Type II, IR shall be 1 megohm min. following step 7a of Method 1002 and 1000 megohms min. after 24 hours of conditioning per Method 1002.

**Salt Spray** — Connectors shall meet the performance requirements of contact resistance, mating and unmating forces, and contact retention after being subjected to the 48-hour 5% solution salt spray test per MIL-STD-1344, Method 1001, Condition B.

**Fluid Immersion** — Unmated connectors after being fully immersed in one of the following fluids, for the prescribed time, will mate at a force of 10 oz. [2.78N] times the number of contacts or less: Perchloroethylene, 2 hours; Lubricating oil per MIL-L-23699, 20 hours.

**Insert Retention** — Inserts will withstand a 50 lb. [34N/cm<sup>2</sup>] per square inch load in either direction.

**Crimp Termination Tensile Strength** — (Unassembled contacts with crimped stranded wire terminations) Wires will not pull out of contacts when the following axial loads are applied: 24 AWG, 5 lbs. [22.24N]; 26 AWG, 4 lbs. [17.79N]; 28 AWG, 3 lbs. [13.34N]

**Outgassing** — When tested in accordance with SP-R-0022, Total Mass Loss (TML) shall be less than 1.0% and Volatile Condensable Material (VCM) shall be less than 0.1% of the original specimen.

**Materials and Finishes**

**Contacts** — Copper alloy plated with .000050 [.00127] gold over copper flash per MIL-G-45204 Type II.

**Hardware** — see pages 5041 and 5042.

**MCK-Metal Shell** —

Insulator — RYTON R4, Polyphenylene Sulfide per MIL-M-24519  
 Interfacial Seal — Fluorosilicone Rubber per MIL-R-25988 (socket side only)  
 Body Shell — Aluminum alloy—high grade plated  
 Cadmium per QQ-P-416  
 Nickel, electroless per AMS 2404

**Transition Block Shell** — RYTON R4, Polyphenylene Sulfide per MIL-M-24519  
 Potting Material — Epoxy, Black

**MCD-Plastic Shell** — Insulator/Body — Polyester, glass filled per MIL-M-24519, Polyphenylene Sulfide per MIL-M-24519

**Wire Terminations** — Solid copper per QQ-W-343 gold plated per MIL-G-45204  
 Stranded TEFLON insulated per MIL-W-16878  
 Stranded TEFLON insulated per MIL-W-22759/11, /33  
 Solid copper per QQ-W-343, solder dipped (Transition block)

**MCDM-Metal Shell** — Insulator — Diallyl Phthalate per MIL-M-14, Type SDG-F  
 Body Shell — Aluminum alloy—high grade, nickel plated

**Twist Pin, Pin and Socket Contacts**

The contact spring member normally found in socket contacts has been eliminated by creating a breathing helical spring principle on the pin contact — smaller, more durable contacts can be manufactured economically.



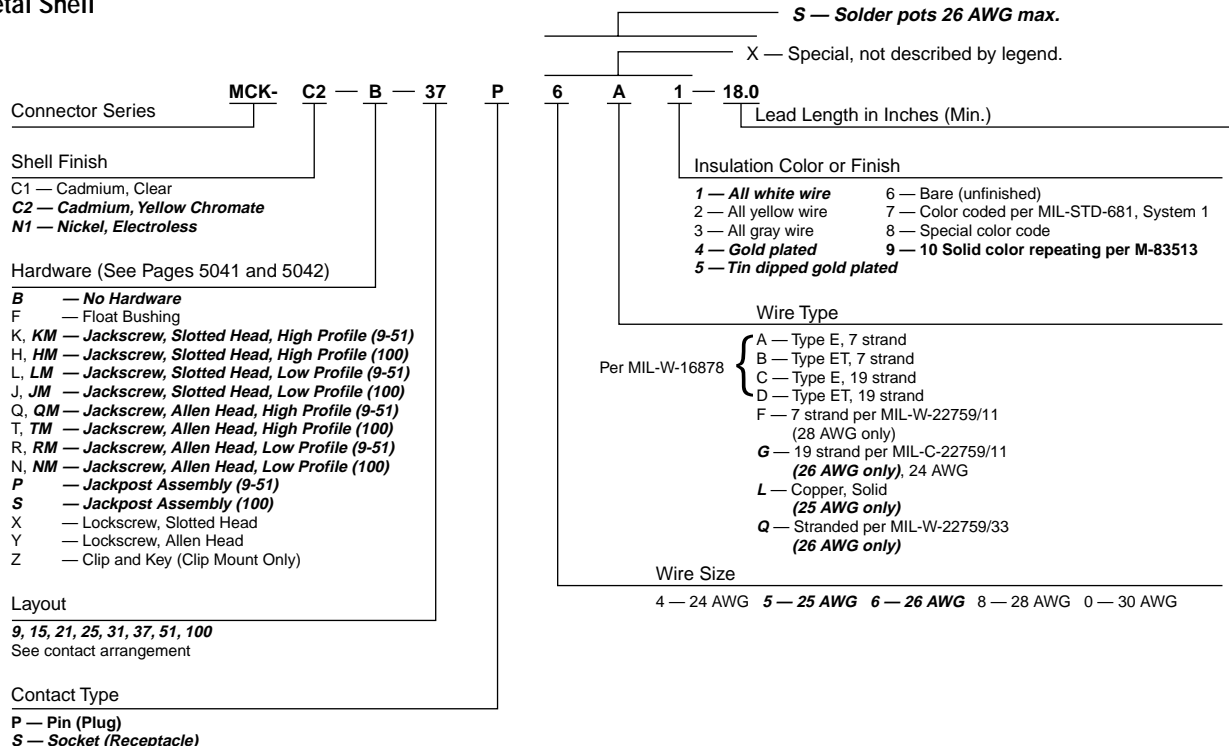
Wire range 24-36 AWG solid & stranded.

MIL-PRF-83513 — Only the descriptive legend in bold italic is applicable to current MIL-PRF-83513 configurations; MIL-PRF-83513/1 through /4 — MCK metal shell; MIL-PRF-83513/6 through /9 — MCD plastic shell.

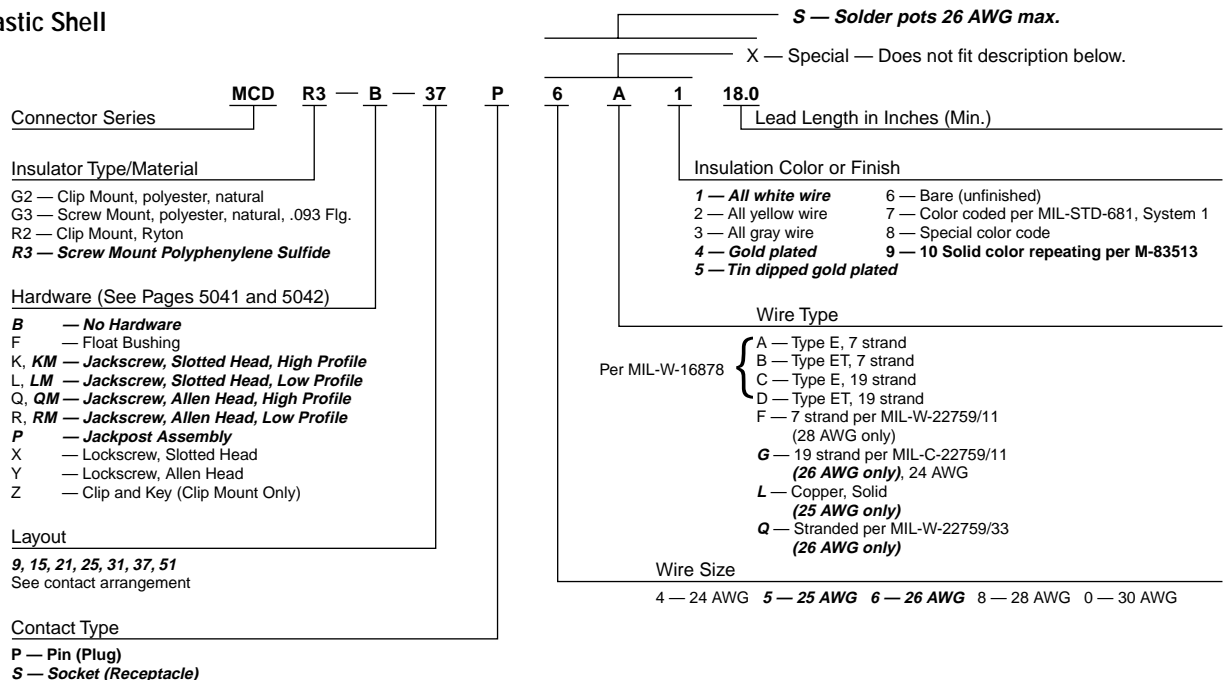
In addition, MIL-PRF-83513 solid copper wire termination is specified 25 AWG, 0.5; and 1.0 [25.4] lengths only and stranded insulated wire termination is specified 26 AWG, 18.0 [457.2] and 36.0 [914.4] lead lengths only. Hardware for MIL-PRF-83513 configurations is specified separately by the M83513/5-XX designation. M83513/1 through /4 and /6 through /9 specify no hardware (B). Mounting/mating hardware is shown on pages 5041 and 5042 with the applicable military nomenclature. The MICRODOT catalog part number for a MIL-PRF-83513 configuration may be constructed to include the desired hardware.

See pages 5058-5062 for M83513/ cross reference.

**Metal Shell**

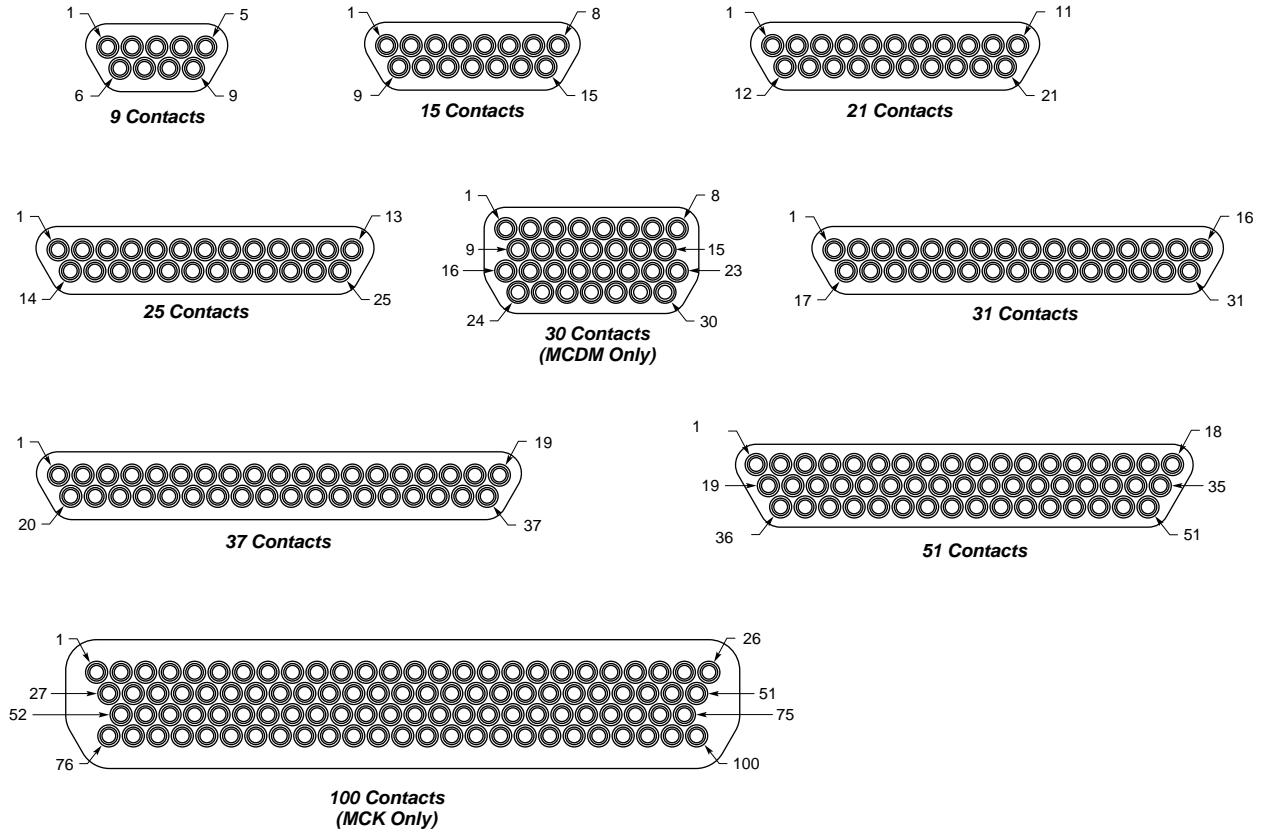


**Plastic Shell**



**Note: Items in bold italic are qualified to MIL-PRF-83513.**

Face View of Pin Insert  
(Socket Side is Mirror Image)



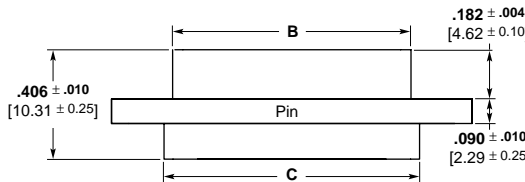
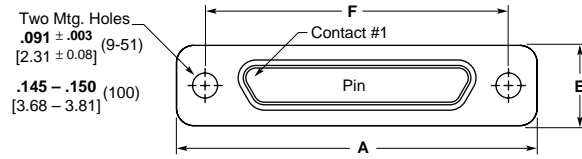
**Note:** MCK metal shells are not designed to intermate or interchange with MCD plastic shells. If metal/plastic intermating is desired, use MCDM Series Metal Shell on pages 5052 and 5053 with MCD Series Plastic Shell on page 5038.

MCK Series Metal Shell Connectors

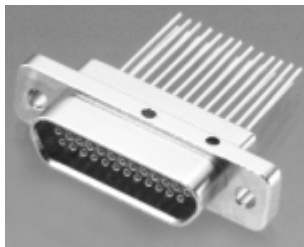
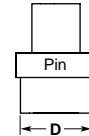
Dimensions per MIL-PRF-83513



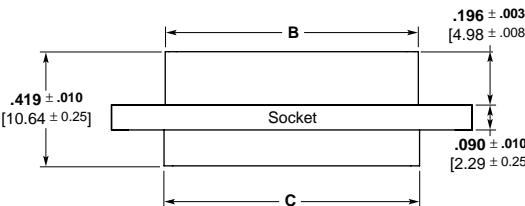
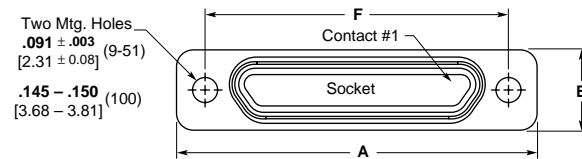
Plug  
(Pin side)



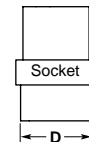
Crimp or Solder



Receptacle  
(Socket side)



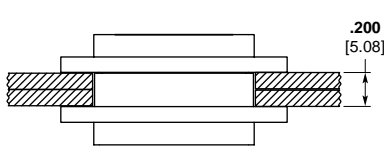
Crimp or Solder



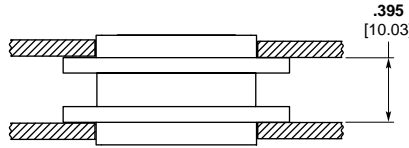
| Part Number    | A<br>± .010 [.254] | B Max.         | C<br>+.010 [.254]<br>-.018 [.457] | D Max        | E<br>±.010 [.254] | F<br>± .005 [.127] |
|----------------|--------------------|----------------|-----------------------------------|--------------|-------------------|--------------------|
| MCK**- 9P***   | .775<br>19.68      | .333<br>8.46   | .390<br>9.91                      | .270<br>6.86 | .298<br>7.57      | .565<br>14.35      |
| MCK**- 9S***   | .775<br>19.68      | .402<br>10.22  | .390<br>9.91                      | .270<br>6.86 | .298<br>7.57      | .565<br>14.35      |
| MCK**- 15P***  | .925<br>23.50      | .483<br>12.27  | .540<br>13.72                     | .270<br>6.86 | .298<br>7.57      | .715<br>18.16      |
| MCK**- 15S***  | .925<br>23.50      | .552<br>14.03  | .540<br>13.72                     | .270<br>6.86 | .298<br>7.57      | .715<br>18.16      |
| MCK**- 21P***  | 1.075<br>27.30     | .633<br>16.08  | .690<br>17.53                     | .270<br>6.86 | .298<br>7.57      | .865<br>21.97      |
| MCK**- 21S***  | 1.075<br>27.30     | .702<br>17.84  | .690<br>17.53                     | .270<br>6.86 | .298<br>7.57      | .865<br>21.97      |
| MCK**- 25P***  | 1.175<br>29.84     | .733<br>18.62  | .790<br>20.07                     | .270<br>6.86 | .298<br>7.57      | .965<br>24.51      |
| MCK**- 25S***  | 1.175<br>29.84     | .802<br>20.38  | .790<br>20.07                     | .270<br>6.86 | .298<br>7.57      | .965<br>24.51      |
| MCK**- 31P***  | 1.325<br>33.66     | .883<br>22.43  | .940<br>23.88                     | .270<br>6.86 | .298<br>7.57      | 1.115<br>28.32     |
| MCK**- 31S***  | 1.325<br>33.66     | .952<br>24.19  | .940<br>23.88                     | .270<br>6.86 | .298<br>7.57      | 1.115<br>28.32     |
| MCK**- 37P***  | 1.475<br>37.46     | 1.033<br>26.24 | 1.090<br>27.69                    | .270<br>6.86 | .298<br>7.57      | 1.265<br>32.13     |
| MCK**- 37S***  | 1.475<br>37.46     | 1.102<br>28.00 | 1.090<br>27.69                    | .270<br>6.86 | .298<br>7.57      | 1.265<br>32.13     |
| MCK**- 51P***  | 1.425<br>36.20     | .983<br>24.97  | 1.040<br>26.42                    | .310<br>7.87 | .341<br>8.66      | 1.215<br>30.86     |
| MCK**- 51S***  | 1.425<br>36.20     | 1.052<br>26.73 | 1.040<br>26.42                    | .310<br>7.87 | .341<br>8.66      | 1.215<br>30.86     |
| MCK**- 100P*** | 2.160<br>54.86     | 1.383<br>35.13 | 1.432<br>36.37                    | .360<br>9.15 | .384<br>9.75      | 1.800<br>45.71     |
| MCK**- 100S*** | 2.160<br>54.86     | 1.508<br>38.31 | 1.432<br>36.37                    | .360<br>9.15 | .384<br>9.75      | 1.800<br>45.71     |

P = Pin, S = Socket

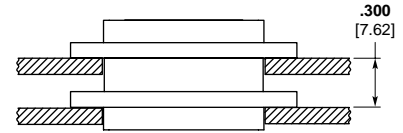
Panel Mounting Dimensions — MCK



Plug and Receptacle Rear Mounted



Plug and Receptacle Front Mounted



Plug Front Mounted Receptacle Rear Mounted

Panel Cutout Dimensions — MCK

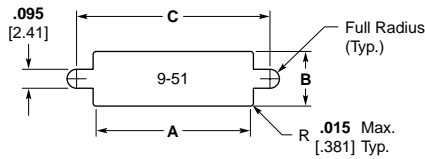


Figure 1 Front Mounting

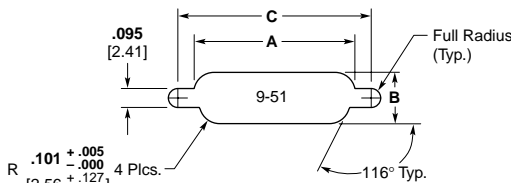
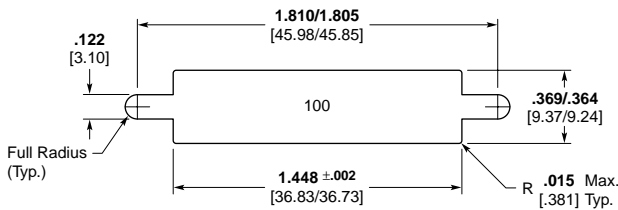
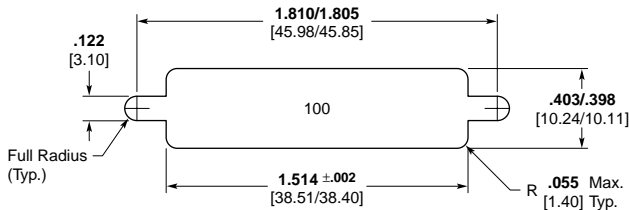


Figure 2 Rear Mounting



Front Mounting

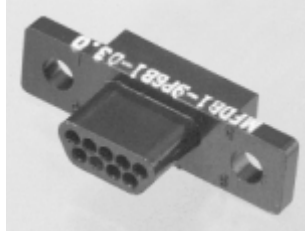


Rear Mounting

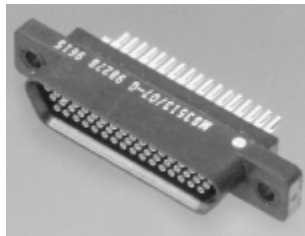
| Number of Contacts | Fig. | A<br>+ .004 [.102]<br>- .000 [.000] | B<br>+ .004 [.102]<br>- .000 [.000] | C<br>+ .005 [.127]<br>- .000 [.000] |
|--------------------|------|-------------------------------------|-------------------------------------|-------------------------------------|
| 9                  | 1    | .404<br>10.26                       | .274<br>6.96                        | .570<br>14.48                       |
|                    | 2    | .406<br>10.31                       | .257<br>6.53                        | .570<br>14.48                       |
| 15                 | 1    | .554<br>14.07                       | .274<br>6.96                        | .720<br>18.29                       |
|                    | 2    | .556<br>14.12                       | .257<br>6.53                        | .720<br>18.29                       |
| 21                 | 1    | .704<br>17.88                       | .274<br>6.96                        | .870<br>22.10                       |
|                    | 2    | .706<br>17.93                       | .257<br>6.53                        | .870<br>22.10                       |
| 25                 | 1    | .804<br>20.42                       | .274<br>6.96                        | .970<br>24.64                       |
|                    | 2    | .806<br>20.47                       | .257<br>6.53                        | .970<br>24.64                       |
| 31                 | 1    | .954<br>24.23                       | .274<br>6.96                        | 1.120<br>28.45                      |
|                    | 2    | .956<br>24.28                       | .257<br>6.53                        | 1.120<br>28.45                      |
| 37                 | 1    | 1.104<br>28.04                      | .274<br>6.96                        | 1.270<br>32.26                      |
|                    | 2    | 1.106<br>28.09                      | .257<br>6.53                        | 1.270<br>32.26                      |
| 51                 | 1    | 1.054<br>26.77                      | .314<br>7.98                        | 1.220<br>30.99                      |
|                    | 2    | 1.056<br>26.82                      | .300<br>7.62                        | 1.220<br>30.99                      |

MCD Series Plastic Shell Connectors

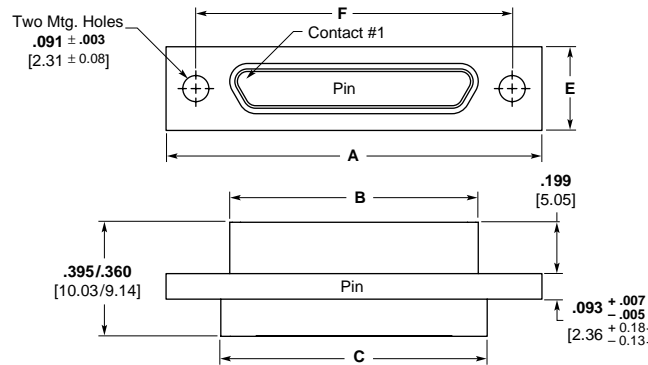
Screw Mount Dimensions Per MIL-PRF-83513



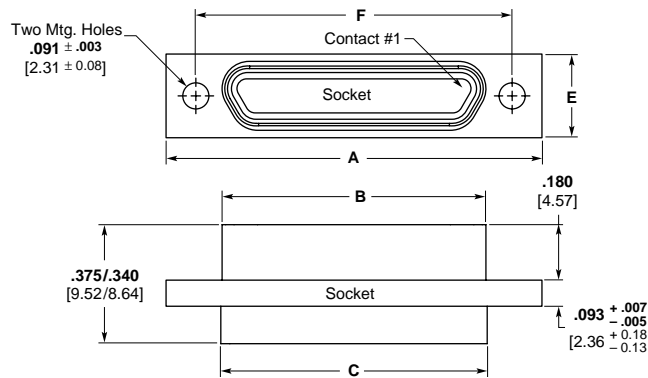
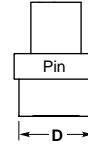
Plug (Pin side)



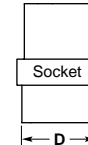
Receptacle (Socket side)



Crimp or Solder



Crimp or Solder



Polyphenylene Sulfide (RYTON) — MCDR3\* per MIL-PRF-83513

Note: MCD Plastic Screw Mount Series is interchangeable with MCDM Metal Series Connectors (Pages 5052 and 5053).

| Part Number   | A ± .010 [.254] | B Max.           | C +.010 [-.254] -0.018 [-.457] | D Max        | E ±.010 [-.254] | F ± .005 [-.127] | Avg. Weight lbs. ± 5% [grams] |
|---------------|-----------------|------------------|--------------------------------|--------------|-----------------|------------------|-------------------------------|
| MCD**- 9P***  | .788<br>20.02   | .2918<br>7.412   | .398<br>10.11                  | .173<br>4.39 | .208<br>5.28    | .565<br>14.35    | .0017<br>0.77                 |
| MCD**- 9S***  | .788<br>20.02   | .3798<br>9.647   | .398<br>10.11                  | .173<br>4.39 | .208<br>5.28    | .565<br>14.35    | .0016<br>0.72                 |
| MCD**- 15P*** | .938<br>23.83   | .4418<br>11.222  | .548<br>13.92                  | .173<br>4.39 | .208<br>5.28    | .715<br>18.16    | .0024<br>1.08                 |
| MCD**- 15S*** | .938<br>23.83   | .5298<br>13.457  | .548<br>13.92                  | .173<br>4.39 | .208<br>5.28    | .715<br>18.16    | .0023<br>1.04                 |
| MCD**- 21P*** | 1.088<br>27.64  | .5918<br>15.032  | .698<br>17.73                  | .173<br>4.39 | .208<br>5.28    | .865<br>21.97    | .0035<br>1.59                 |
| MCD**- 21S*** | 1.088<br>27.64  | .6798<br>17.267  | .698<br>17.73                  | .173<br>4.39 | .208<br>5.28    | .865<br>21.97    | .0034<br>1.54                 |
| MCD**- 25P*** | 1.188<br>30.18  | .6918<br>17.572  | .798<br>20.27                  | .173<br>4.39 | .208<br>5.28    | .965<br>24.51    | .0042<br>1.90                 |
| MCD**- 25S*** | 1.188<br>30.18  | .7798<br>19.807  | .798<br>20.27                  | .173<br>4.39 | .208<br>5.28    | .965<br>24.51    | .0037<br>1.67                 |
| MCD**- 31P*** | 1.338<br>33.99  | .8418<br>21.382  | .948<br>24.08                  | .173<br>4.39 | .208<br>5.28    | 1.115<br>28.32   | .0053<br>2.40                 |
| MCD**- 31S*** | 1.338<br>33.99  | .9298<br>23.617  | .948<br>24.08                  | .173<br>4.39 | .208<br>5.28    | 1.115<br>28.32   | .0048<br>2.17                 |
| MCD**- 37P*** | 1.488<br>37.80  | .9918<br>25.192  | 1.098<br>27.89                 | .173<br>4.39 | .208<br>5.28    | 1.265<br>32.13   | .0057<br>2.58                 |
| MCD**- 37S*** | 1.488<br>37.80  | 1.0798<br>27.427 | 1.098<br>27.89                 | .173<br>4.39 | .208<br>5.28    | 1.265<br>32.13   | .0051<br>2.31                 |
| MCD**- 51P*** | 1.438<br>36.53  | .9418<br>23.922  | 1.048<br>26.62                 | .220<br>5.59 | .250<br>6.35    | 1.215<br>30.86   | .0072<br>3.26                 |
| MCD**- 51S*** | 1.438<br>36.53  | 1.0298<br>26.157 | 1.048<br>26.62                 | .220<br>5.59 | .250<br>6.35    | 1.215<br>30.86   | .0063<br>2.85                 |

P = Pin, S = Socket

Note: Weight given is with .500 [12.7] uninsulated, solid, 24 AWG gold plated copper pigtailed.

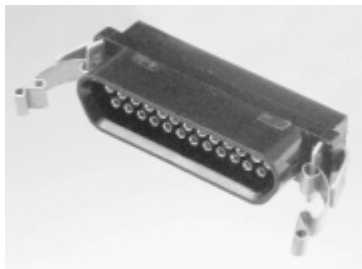
\*See "How to Specify" for description, on page 5034.

MCD Series Plastic Shell Connectors (Continued)

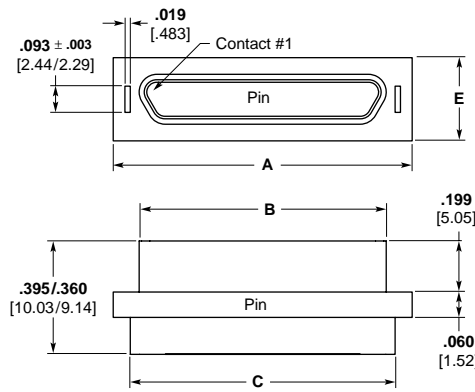
Clip Mount — MCD



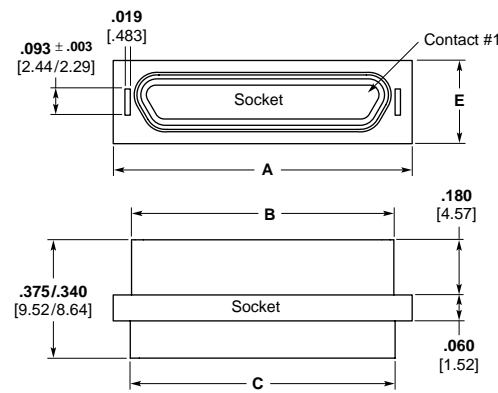
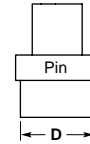
Plug  
(Pin side)



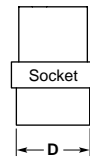
Receptacle  
(Socket side)



Crimp or Solder



Crimp or Solder



Note: Clip Mount not covered by current issue of MIL-PRF-83513.

| Part Number   | A<br>±.005 [.127] | B Max.           | C<br>+.010 [.254] | D<br>±.010 (.254) | E<br>±.005 [.127] | Avg. Weight<br>lbs. ± 5%<br>[grams] |
|---------------|-------------------|------------------|-------------------|-------------------|-------------------|-------------------------------------|
| MCD**- 9P***  | .506<br>12.85     | .2918<br>74.12   | .398<br>10.11     | .165<br>4.19      | .208<br>5.28      | .0017<br>0.77                       |
| MCD**- 9S***  | .506<br>12.85     | .3798<br>96.47   | .398<br>10.11     | .165<br>4.19      | .208<br>5.28      | .0016<br>0.72                       |
| MCD**- 15P*** | .656<br>16.66     | .4418<br>112.22  | .548<br>13.92     | .165<br>4.19      | .208<br>5.28      | .0024<br>1.08                       |
| MCD**- 15S*** | .656<br>16.66     | .5298<br>134.57  | .548<br>13.92     | .165<br>4.19      | .208<br>5.28      | .0023<br>1.04                       |
| MCD**- 21P*** | .806<br>20.47     | .5918<br>150.32  | .698<br>17.73     | .165<br>4.19      | .208<br>5.28      | .0035<br>1.59                       |
| MCD**- 21S*** | .806<br>20.47     | .6798<br>172.67  | .698<br>17.73     | .165<br>4.19      | .208<br>5.28      | .0034<br>1.54                       |
| MCD**- 25P*** | .906<br>23.01     | .6918<br>175.72  | .798<br>20.27     | .165<br>4.19      | .208<br>5.28      | .0042<br>1.90                       |
| MCD**- 25S*** | .906<br>23.01     | .7798<br>198.07  | .798<br>20.27     | .165<br>4.19      | .208<br>5.28      | .0037<br>1.67                       |
| MCD**- 31P*** | 1.056<br>26.82    | .8418<br>213.82  | .948<br>24.08     | .165<br>4.19      | .208<br>5.28      | .0053<br>2.40                       |
| MCD**- 31S*** | 1.056<br>26.82    | .9298<br>236.17  | .948<br>24.08     | .165<br>4.19      | .208<br>5.28      | .0048<br>2.17                       |
| MCD**- 37P*** | 1.206<br>30.63    | .9918<br>251.92  | 1.098<br>27.89    | .165<br>4.19      | .208<br>5.28      | .0057<br>2.58                       |
| MCD**- 37S*** | 1.206<br>30.63    | 1.0798<br>274.27 | 1.098<br>27.89    | .165<br>4.19      | .208<br>5.28      | .0051<br>2.31                       |
| MCD**- 51P*** | 1.156<br>29.36    | .9418<br>239.22  | 1.048<br>26.62    | .208<br>5.28      | .250<br>6.35      | .0072<br>3.26                       |
| MCD**- 51S*** | 1.156<br>29.36    | 1.0298<br>261.57 | 1.048<br>26.62    | .208<br>5.28      | .250<br>6.35      | .0063<br>2.85                       |

P = Pin, S = Socket

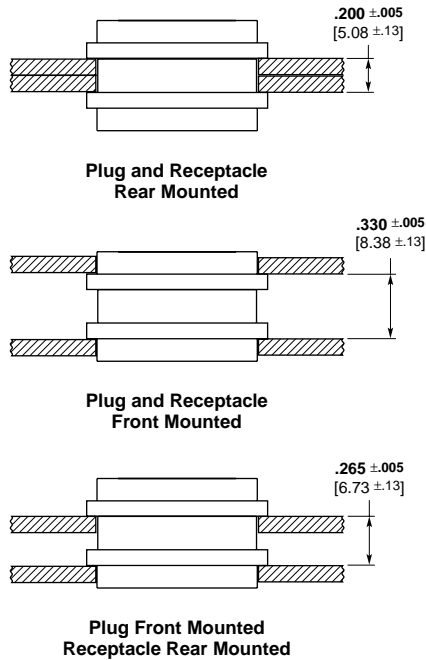
Note: Weight given is with .500 [12.7] uninsulated, solid, 24 AWG gold plated copper pigtails.

\*See "How to Specify" for description, on page 5034.

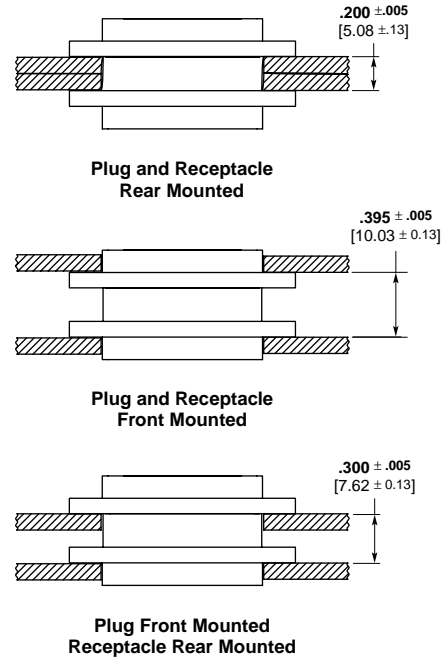


Panel Mounting Dimensions — MCD

Clip Mount



Screw Mount



Panel Cutout Dimensions — MCD

Clip Mounting

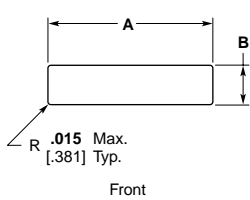


Figure 1

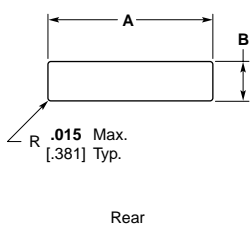


Figure 3

Screw Mounting

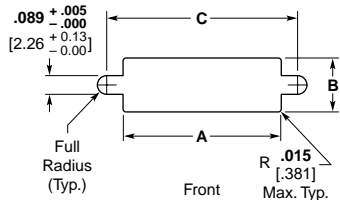


Figure 2

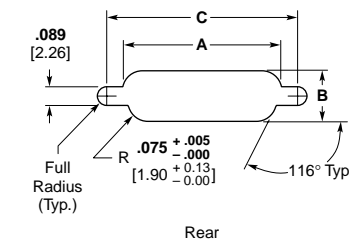


Figure 4

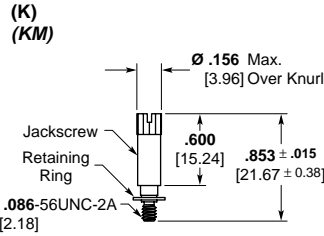
Notes: Front mounting preferred.

Items in bold italic are qualified to MIL-PRF-83513.

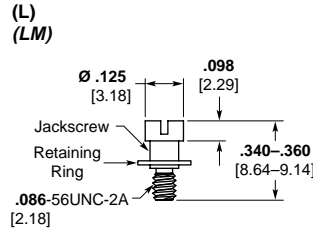
| Number of Contacts | Fig. | A             |              | B             |              | C             |              |
|--------------------|------|---------------|--------------|---------------|--------------|---------------|--------------|
|                    |      | + .004 [.102] | -.000 [.000] | + .004 [.102] | -.000 [.000] | + .005 [.127] | -.000 [.000] |
| 9                  | 1    | .438          | [11.13]      | .177          | [4.50]       | —             | —            |
|                    | 2    | .412          | [10.46]      | .177          | [4.50]       | .570          | [14.48]      |
|                    | 3    | .438          | [11.13]      | .222          | [5.64]       | —             | —            |
|                    | 4    | .384          | [9.75]       | .222          | [5.64]       | .570          | [14.48]      |
| 15                 | 1    | .588          | [14.93]      | .177          | [4.50]       | —             | —            |
|                    | 2    | .562          | [14.27]      | .177          | [4.50]       | .720          | [18.29]      |
|                    | 3    | .588          | [14.93]      | .222          | [5.64]       | —             | —            |
|                    | 4    | .534          | [13.56]      | .222          | [5.64]       | .720          | [18.29]      |
| 21                 | 1    | .738          | [18.75]      | .177          | [4.50]       | —             | —            |
|                    | 2    | .712          | [18.08]      | .177          | [4.50]       | .870          | [22.10]      |
|                    | 3    | .738          | [18.75]      | .222          | [5.64]       | —             | —            |
|                    | 4    | .684          | [17.37]      | .222          | [5.64]       | .870          | [22.10]      |
| 25                 | 1    | .838          | [21.29]      | .177          | [4.50]       | —             | —            |
|                    | 2    | .812          | [20.62]      | .177          | [4.50]       | .970          | [24.64]      |
|                    | 3    | .838          | [21.29]      | .222          | [5.64]       | —             | —            |
|                    | 4    | .784          | [19.91]      | .222          | [5.64]       | .970          | [24.64]      |
| 31                 | 1    | .988          | [25.10]      | .177          | [4.50]       | —             | —            |
|                    | 2    | .962          | [24.43]      | .177          | [4.50]       | 1.120         | [28.45]      |
|                    | 3    | .988          | [25.10]      | .222          | [5.64]       | —             | —            |
|                    | 4    | .934          | [23.72]      | .222          | [5.64]       | 1.120         | [28.45]      |
| 37                 | 1    | 1.138         | [28.91]      | .177          | [4.50]       | —             | —            |
|                    | 2    | 1.112         | [28.24]      | .177          | [4.50]       | 1.270         | [32.26]      |
|                    | 3    | 1.138         | [28.91]      | .222          | [5.64]       | —             | —            |
|                    | 4    | 1.084         | [27.53]      | .222          | [5.64]       | 1.270         | [32.26]      |
| 51                 | 1    | 1.088         | [27.64]      | .224          | [5.69]       | —             | —            |
|                    | 2    | 1.062         | [26.97]      | .224          | [5.69]       | 1.220         | [30.99]      |
|                    | 3    | 1.088         | [27.64]      | .264          | [6.71]       | —             | —            |
|                    | 4    | 1.034         | [26.26]      | .264          | [6.71]       | 1.220         | [30.99]      |

For Screw Mount MCK,  
MCD and MCDM

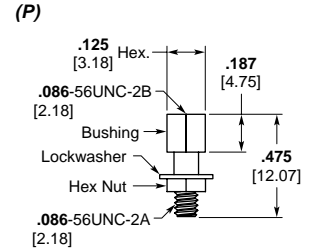
9-51 Contacts  
Slot Head



**Part Number 5-1532137-8**  
**Jackscrew Assembly**  
**High Profile**  
(K) 096-0002-0010  
**M83513/5-06**  
(KM) S96-0002-0084



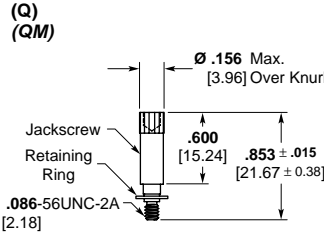
**Part Number 5-1532137-7**  
**Jackscrew Assembly**  
**Low Profile**  
(L) 096-0002-0011  
**M83513/5-05**  
(LM) S96-0002-0085



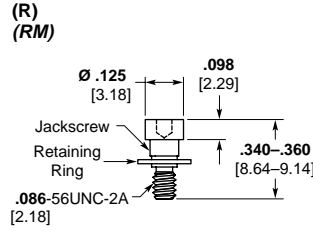
**Part Number 5-1532137-9**  
**Jackpost Assembly**  
(P) S96-0002-0009  
**M83513/5-07**

P mates with K,KM, L,LM, Q,QM and R,RM Jackscrew Assemblies.

9-51 Contacts  
1/16" Allen Head



**Part Number 5-1532137-6**  
**Jackscrew Assembly**  
**High Profile**  
(Q) 096-0002-0014  
**M83513/5-03**  
(QM) S96-0002-0086

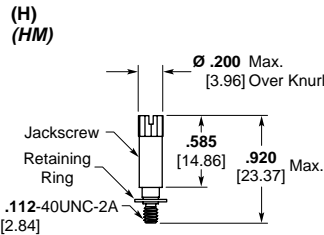


**Part Number 5-1532137-5**  
**Jackscrew Assembly**  
**Low Profile**  
(R) 096-0002-0015  
**M83513/5-02**  
(RM) S96-0002-0087

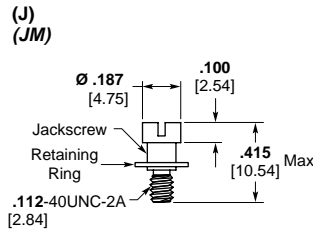
**Notes:**

- Jackpost Assemblies will accommodate .094 [2.39] max. thickness panel.
- Letter(s) in parentheses is to assist in ordering hardware with the connector (See "How To Specify" page 5034).
- Single letters (e.g. K) designate hardware kits (2 pcs. per kit) that meets M83513/05 requirements except the material is 303 stainless steel, passivated.
- Add M suffix (e.g. KM) to designate hardware that meets all M83513/05 requirements. Material is corrosion resistant steel, non-magnetic, 125,000 PSI tensile strength minimum (Applies to jackscrews only).
- Non-MIL hardware ordered separately should be ordered in pairs; i.e. 2 pcs. P/N 096-0002-0009 per connector half.
- Items in bold italic are qualified to MIL-PRF-83513.**

100 Contacts  
Slot Head

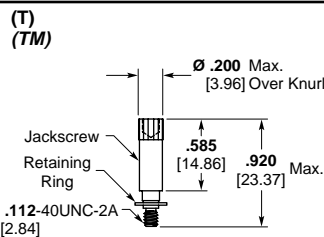


**Part Number 6-1532137-3**  
**Jackscrew Assembly**  
**High Profile**  
(H) 096-0002-0061  
**M83513/5-16**  
(HM) S96-0002-0088

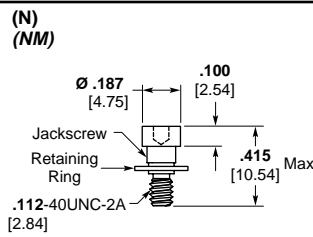


**Part Number 6-1532137-2**  
**Jackscrew Assembly**  
**Low Profile**  
(J) 096-0002-0062  
**M83513/5-15**  
(JM) S96-0002-0089

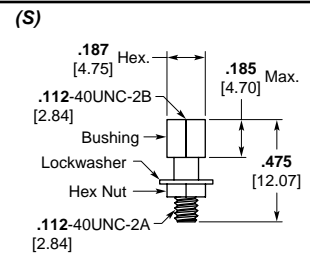
100 Contacts  
1/16" Allen Head



**Part Number 6-1532137-1**  
**Jackscrew Assembly**  
**High Profile**  
(T) 096-0002-0064  
**M83513/5-13**  
(TM) S96-0002-0090



**Part Number 6-1532137-0**  
**Jackscrew Assembly**  
**Low Profile**  
(N) 096-0002-0065  
**M83513/5-12**  
(NM) S96-0002-0091



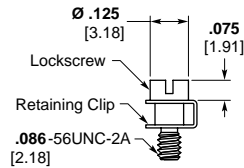
**Part Number 6-1532137-4**  
**Jackpost Assembly**  
(S) S96-0002-0060  
**M83513/5-17**

S mates with H,HM, J,JM, T,TM and N,NM Jackscrew Assemblies.

Mounting and Coupling Hardware (Continued)

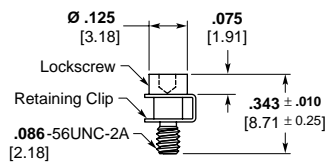
For Screw Mount MCK,  
MCD and MCDM (Continued)

Slot Head  
(X)



**Part Number 4-1532137-3**  
**Lockscrew Assembly**  
**096-0002-0008**

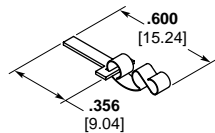
1/16" Allen Head  
(Y)



**Part Number 1495164-1**  
**Lockscrew Assembly**  
**096-0002-0013**

For Clip Mount — MCD

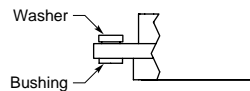
(Z)



**Part Number 1466018-1**  
**Mounting Key and Clip**  
**P/N 096-0001-0000**  
**(2 Required)**

For Float Mount — MCK,  
MCD and MCDM

(F)



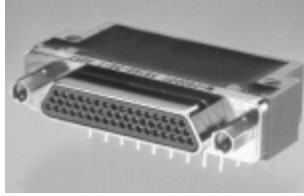
**Float Mount Bushing**  
**(Factory Installed)**

**Notes:**

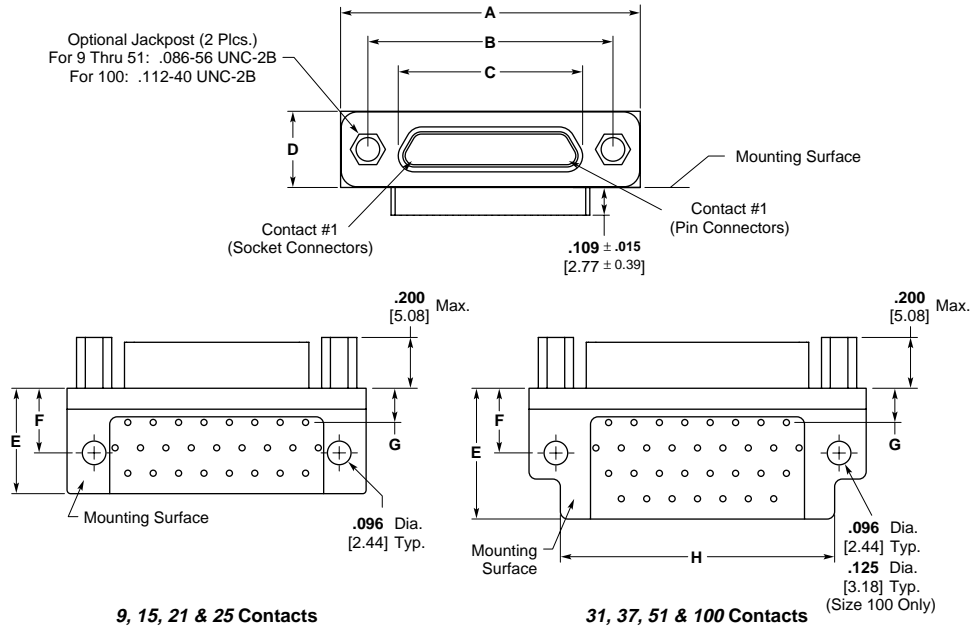
1. Jackpost Assemblies will accommodate .094 [2.39] max. thickness panel.
2. Letter(s) in parentheses is to assist in ordering hardware with the connector (See "How To Specify" page 5034).
3. Hardware ordered separately should be ordered in pairs; i.e. 2 pcs. P/N 096-0002-0013 per connector half.

MCK Transition Blocks

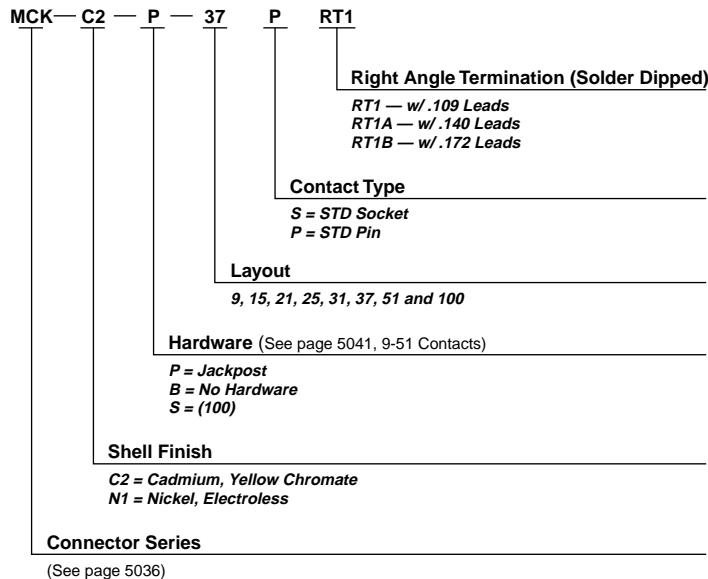
RT1 — Right-Angle Termination Configuration



MIL-PRF-83513/10 through /21 configurations. 90° — Lo Profile termination configurations.  
See pages 5061 & 5062 for M83513/cross references.



How To Specify



Notes:

1. For terminal identification see page 5045.
2. Grid pattern for all configurations is .100 x .100 [2.54 x 2.54].
3. Wire lengths shown are for RT1.
4. **Items in bold italic are qualified to MIL-PRF-83513.**

RT1 — Right-Angle Termination Configuration

(Continued)

| Part Number              | A<br>Max.             | B<br>± 005 [.127]     | C<br>Max.             | D<br>Max.            | E<br>Max.             | F<br>+.010 [.254]    | G<br>+.010 [.254]   | H<br>Max.             |
|--------------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|----------------------|---------------------|-----------------------|
| <i>MCK-**-*- 9PRTI</i>   | <b>.785</b><br>19.94  | <b>.565</b><br>14.35  | <b>.333</b><br>8.46   | <b>.308</b><br>7.83  | <b>.420</b><br>10.67  | <b>.250</b><br>6.35  | <b>.230</b><br>5.84 | —                     |
| <i>MCK-**-*- 9SRTI</i>   | <b>.785</b><br>19.94  | <b>.565</b><br>14.35  | <b>.402</b><br>10.22  | <b>.308</b><br>7.83  | <b>.420</b><br>10.67  | <b>.250</b><br>6.35  | <b>.230</b><br>5.84 | —                     |
| <i>MCK-**-*- 15PRTI</i>  | <b>.935</b><br>23.75  | <b>.715</b><br>18.16  | <b>.483</b><br>12.27  | <b>.308</b><br>7.83  | <b>.420</b><br>10.67  | <b>.250</b><br>6.35  | <b>.130</b><br>3.30 | —                     |
| <i>MCK-**-*- 15SRTI</i>  | <b>.935</b><br>23.75  | <b>.715</b><br>18.16  | <b>.552</b><br>14.03  | <b>.308</b><br>7.83  | <b>.420</b><br>10.67  | <b>.250</b><br>6.35  | <b>.130</b><br>3.30 | —                     |
| <i>MCK-**-*- 21PRTI</i>  | <b>1.085</b><br>27.56 | <b>.865</b><br>21.97  | <b>.633</b><br>16.08  | <b>.308</b><br>7.83  | <b>.420</b><br>10.67  | <b>.250</b><br>6.35  | <b>.130</b><br>3.30 | —                     |
| <i>MCK-**-*- 21SRTI</i>  | <b>1.085</b><br>27.56 | <b>.865</b><br>21.97  | <b>.702</b><br>17.84  | <b>.308</b><br>7.83  | <b>.420</b><br>10.67  | <b>.250</b><br>6.35  | <b>.130</b><br>3.30 | —                     |
| <i>MCK-**-*- 25PRTI</i>  | <b>1.185</b><br>30.10 | <b>.965</b><br>24.51  | <b>.733</b><br>18.62  | <b>.308</b><br>7.83  | <b>.420</b><br>10.67  | <b>.250</b><br>6.35  | <b>.130</b><br>3.30 | —                     |
| <i>MCK-**-*- 25SRTI</i>  | <b>1.185</b><br>30.10 | <b>.965</b><br>24.51  | <b>.802</b><br>20.38  | <b>.308</b><br>7.83  | <b>.420</b><br>10.67  | <b>.250</b><br>6.35  | <b>.130</b><br>3.30 | —                     |
| <i>MCK-**-*- 31PRTI</i>  | <b>1.335</b><br>33.91 | <b>1.115</b><br>28.32 | <b>.883</b><br>22.43  | <b>.308</b><br>7.83  | <b>.520</b><br>13.21  | <b>.250</b><br>6.35  | <b>.130</b><br>3.30 | <b>1.085</b><br>27.56 |
| <i>MCK-**-*- 31SRTI</i>  | <b>1.335</b><br>33.91 | <b>1.115</b><br>28.32 | <b>.952</b><br>24.19  | <b>.308</b><br>7.83  | <b>.520</b><br>13.21  | <b>.250</b><br>6.35  | <b>.130</b><br>3.30 | <b>1.085</b><br>27.56 |
| <i>MCK-**-*- 37PRTI</i>  | <b>1.485</b><br>37.72 | <b>1.265</b><br>32.13 | <b>1.033</b><br>26.24 | <b>.308</b><br>7.83  | <b>.520</b><br>13.21  | <b>.250</b><br>6.35  | <b>.130</b><br>3.30 | <b>1.185</b><br>30.10 |
| <i>MCK-**-*- 37SRTI</i>  | <b>1.485</b><br>37.72 | <b>1.265</b><br>32.13 | <b>1.102</b><br>28.00 | <b>.308</b><br>7.83  | <b>.520</b><br>13.21  | <b>.250</b><br>6.35  | <b>.130</b><br>3.30 | <b>1.185</b><br>30.10 |
| <i>MCK-**-*- 51PRTI</i>  | <b>1.435</b><br>36.45 | <b>1.215</b><br>30.86 | <b>.983</b><br>24.97  | <b>.351</b><br>8.92  | <b>.650</b><br>16.51  | <b>.300</b><br>7.62  | <b>.150</b><br>3.81 | <b>1.225</b><br>31.88 |
| <i>MCK-**-*- 51SRTI</i>  | <b>1.435</b><br>36.45 | <b>1.215</b><br>30.86 | <b>1.052</b><br>26.73 | <b>.351</b><br>8.92  | <b>.650</b><br>16.51  | <b>.300</b><br>7.62  | <b>.150</b><br>3.81 | <b>1.225</b><br>31.88 |
| <i>MCK-**-*- 100PRTI</i> | <b>2.170</b><br>55.12 | <b>1.800</b><br>45.72 | <b>1.383</b><br>35.13 | <b>.394</b><br>10.01 | <b>1.000</b><br>25.40 | <b>.400</b><br>10.16 | <b>.200</b><br>5.08 | <b>1.815</b><br>46.11 |
| <i>MCK-**-*- 100SRTI</i> | <b>2.170</b><br>55.12 | <b>1.800</b><br>45.72 | <b>1.508</b><br>38.31 | <b>.394</b><br>10.01 | <b>1.000</b><br>25.40 | <b>.400</b><br>10.16 | <b>.200</b><br>5.08 | <b>1.815</b><br>46.11 |

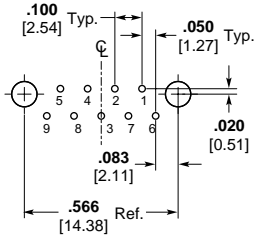
P = Pin, S = Socket

Note: Items in bold italic are qualified to MIL-PRF-83513.

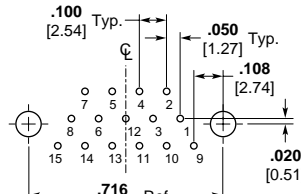
**RT1 — Right-Angle Termination Configuration**

(Continued)

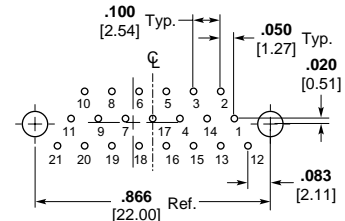
View is from mounting surface of connector. Plug configuration shown. For receptacle, use mirror image. (Except 100 contacts)



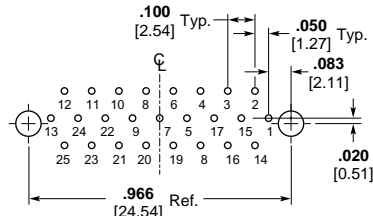
**9 Contacts**



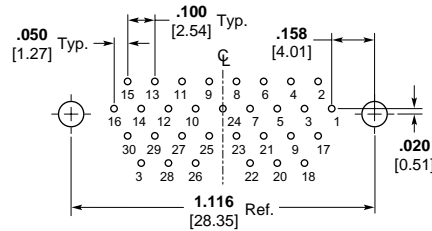
**15 Contacts**



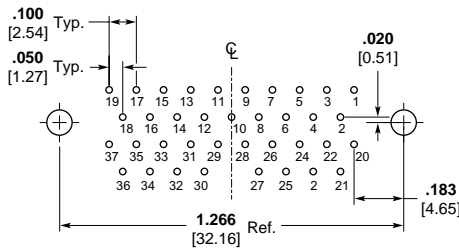
**21 Contacts**



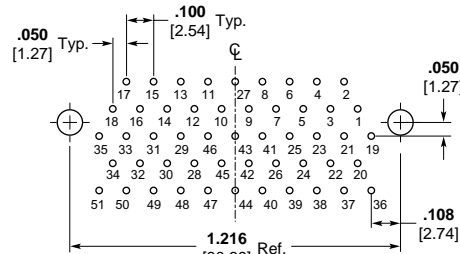
**25 Contacts**



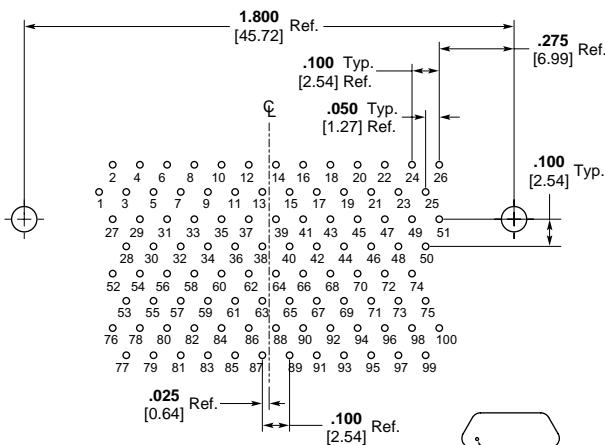
**31 Contacts**



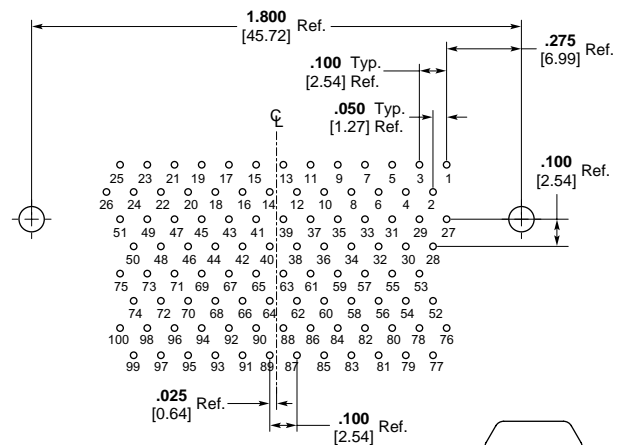
**37 Contacts**



**51 Contacts**



**100 Contacts (Socket Connector)**

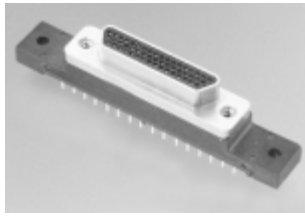


**100 Contacts (Pin Connector)**

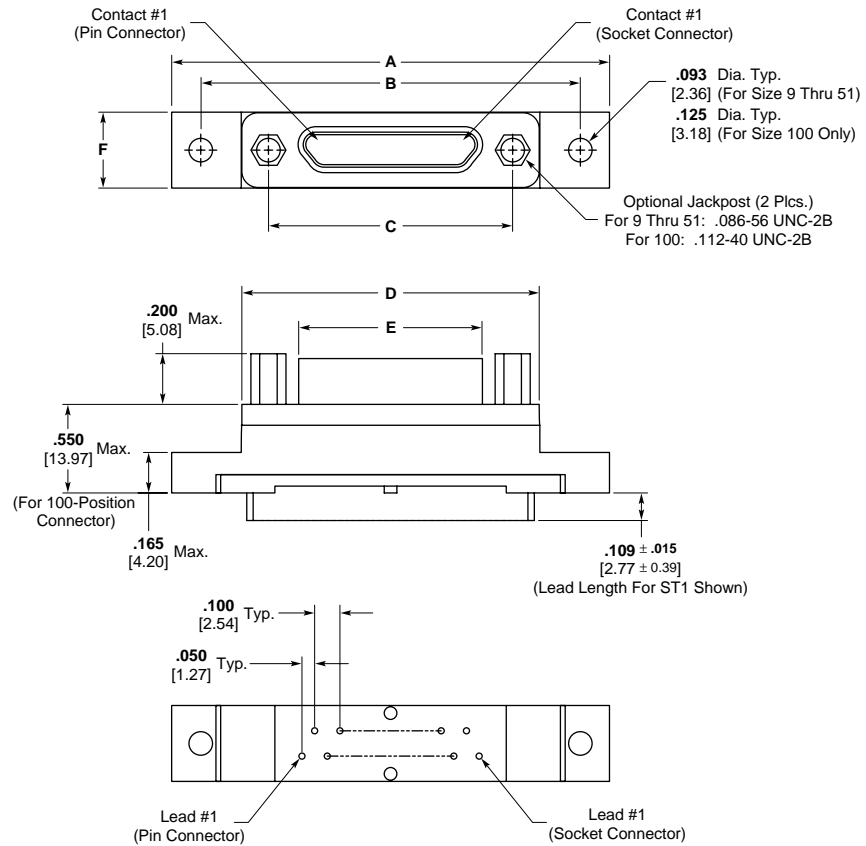


MCK Transition Blocks (Continued)

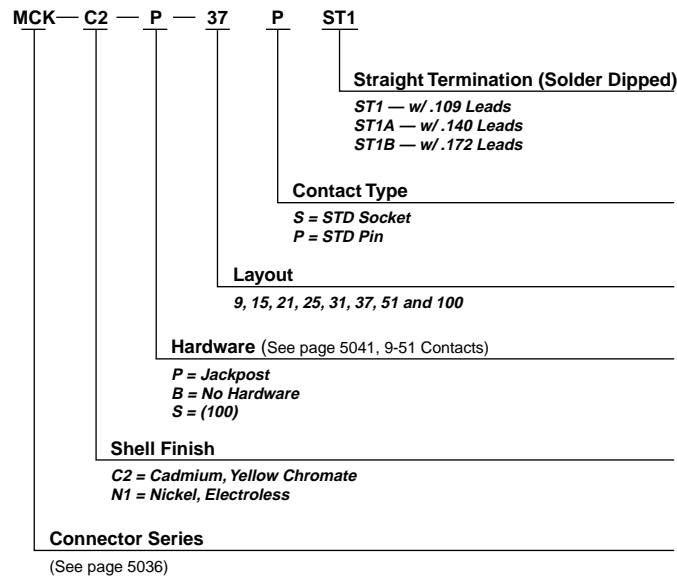
ST1 — Straight Termination Configuration



MIL-PRF-83513/22 through /27 configurations. 180° — Lo Profile termination configurations. See page 5062 for M83513/cross references.



How To Specify



Notes:

1. For terminal identification see page 5048.
2. Grid pattern for all configurations is .100 x .100 [2.54 x 2.54].
3. Wire lengths shown are for ST1.
4. **Items in bold italic are qualified to MIL-PRF-83513.**

MCK Transition Blocks (Continued)

ST1 — Straight Termination Configuration (Continued)

| Part Number              | A<br>Max.             | B<br>± .005 [.127]    | C<br>± .005 [.127]    | D<br>Max.             | E<br>Max.             | F<br>Max.            |
|--------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|
| <i>MCK-**-*- 9PSTI</i>   | <b>1.390</b><br>35.31 | <b>1.150</b><br>29.21 | <b>.565</b><br>14.35  | <b>.785</b><br>19.94  | <b>.333</b><br>8.46   | <b>.308</b><br>7.83  |
| <i>MCK-**-*- 9SSTI</i>   | <b>1.390</b><br>35.31 | <b>1.150</b><br>29.21 | <b>.565</b><br>14.35  | <b>.785</b><br>19.94  | <b>.402</b><br>10.22  | <b>.308</b><br>7.83  |
| <i>MCK-**-*- 15PSTI</i>  | <b>1.390</b><br>35.31 | <b>1.150</b><br>29.21 | <b>.715</b><br>18.16  | <b>.935</b><br>23.75  | <b>.483</b><br>12.27  | <b>.308</b><br>7.83  |
| <i>MCK-**-*- 15SSTI</i>  | <b>1.390</b><br>35.31 | <b>1.150</b><br>29.21 | <b>.715</b><br>18.16  | <b>.935</b><br>23.75  | <b>.552</b><br>14.03  | <b>.308</b><br>7.83  |
| <i>MCK-**-*- 21PSTI</i>  | <b>1.690</b><br>42.93 | <b>1.450</b><br>36.83 | <b>.865</b><br>21.97  | <b>1.085</b><br>27.56 | <b>.633</b><br>16.08  | <b>.308</b><br>7.83  |
| <i>MCK-**-*- 21SSTI</i>  | <b>1.690</b><br>42.93 | <b>1.450</b><br>36.83 | <b>.865</b><br>21.97  | <b>1.085</b><br>27.56 | <b>.702</b><br>17.84  | <b>.308</b><br>7.83  |
| <i>MCK-**-*- 25PSTI</i>  | <b>1.740</b><br>44.20 | <b>1.500</b><br>38.10 | <b>.965</b><br>24.51  | <b>1.185</b><br>30.10 | <b>.733</b><br>18.62  | <b>.308</b><br>7.83  |
| <i>MCK-**-*- 25SSTI</i>  | <b>1.740</b><br>44.20 | <b>1.500</b><br>38.10 | <b>.965</b><br>24.51  | <b>1.185</b><br>30.10 | <b>.802</b><br>20.38  | <b>.308</b><br>7.83  |
| <i>MCK-**-*- 31PSTI</i>  | <b>2.040</b><br>51.82 | <b>1.800</b><br>45.72 | <b>1.115</b><br>28.32 | <b>1.335</b><br>33.91 | <b>.883</b><br>22.43  | <b>.308</b><br>7.83  |
| <i>MCK-**-*- 31SSTI</i>  | <b>2.040</b><br>51.82 | <b>1.800</b><br>45.72 | <b>1.115</b><br>28.32 | <b>1.335</b><br>33.91 | <b>.952</b><br>24.19  | <b>.308</b><br>7.83  |
| <i>MCK-**-*- 37PSTI</i>  | <b>2.340</b><br>59.44 | <b>2.100</b><br>53.34 | <b>1.265</b><br>32.13 | <b>1.485</b><br>37.72 | <b>1.033</b><br>26.24 | <b>.308</b><br>7.83  |
| <i>MCK-**-*- 37SSTI</i>  | <b>2.340</b><br>59.44 | <b>2.100</b><br>53.34 | <b>1.265</b><br>32.13 | <b>1.485</b><br>37.72 | <b>1.102</b><br>28.00 | <b>.308</b><br>7.83  |
| <i>MCK-**-*- 51PSTI</i>  | <b>2.270</b><br>57.66 | <b>2.000</b><br>50.80 | <b>1.215</b><br>30.86 | <b>1.435</b><br>36.45 | <b>.983</b><br>24.97  | <b>.351</b><br>8.92  |
| <i>MCK-**-*- 51SSTI</i>  | <b>2.270</b><br>57.66 | <b>2.000</b><br>50.80 | <b>1.215</b><br>30.86 | <b>1.435</b><br>36.45 | <b>1.052</b><br>26.73 | <b>.351</b><br>8.92  |
| <i>MCK-**-*- 100PSTI</i> | <b>3.070</b><br>77.98 | <b>2.800</b><br>71.12 | <b>1.800</b><br>45.72 | <b>2.170</b><br>55.12 | <b>1.383</b><br>35.13 | <b>.394</b><br>10.01 |
| <i>MCK-**-*- 100SSTI</i> | <b>3.070</b><br>77.98 | <b>2.800</b><br>71.12 | <b>1.800</b><br>45.72 | <b>2.170</b><br>55.12 | <b>1.508</b><br>38.31 | <b>.394</b><br>10.01 |

P = Pin, S = Socket

5  
Pin and Socket Connectors

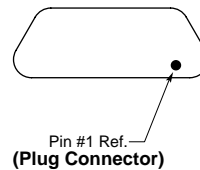
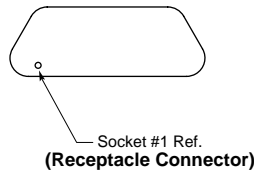
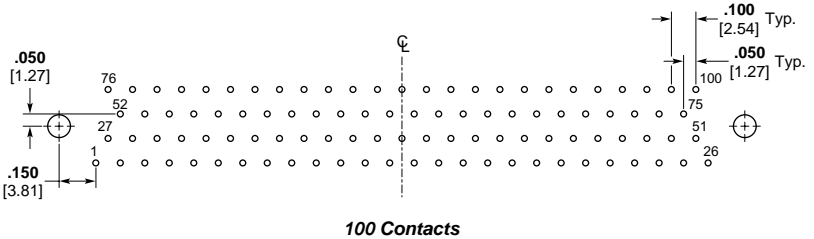
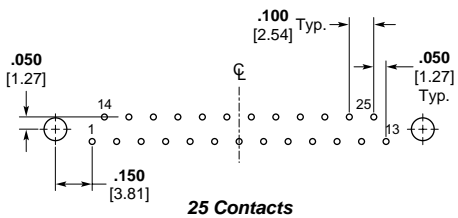
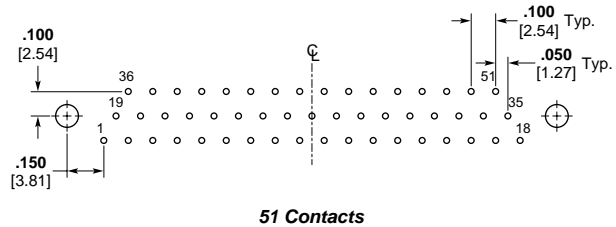
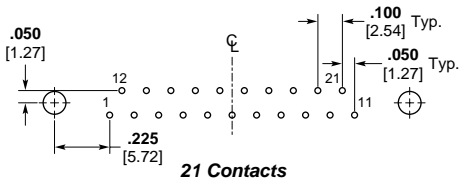
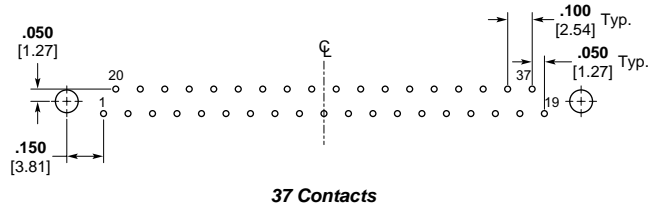
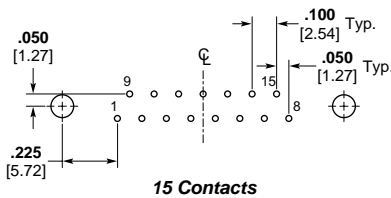
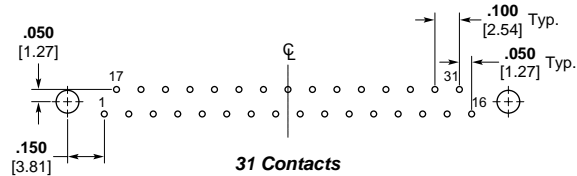
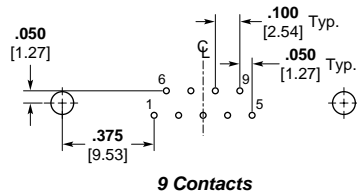
Note: Items in bold italic are qualified to MIL-PRF-83513.



MCK Transition Blocks (Continued)

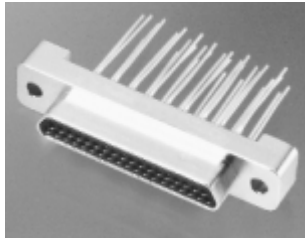
**ST1 — Straight Termination Configuration** (Continued)

View is from mounting surface of connector. Plug configuration shown. For receptacle, use mirror image.

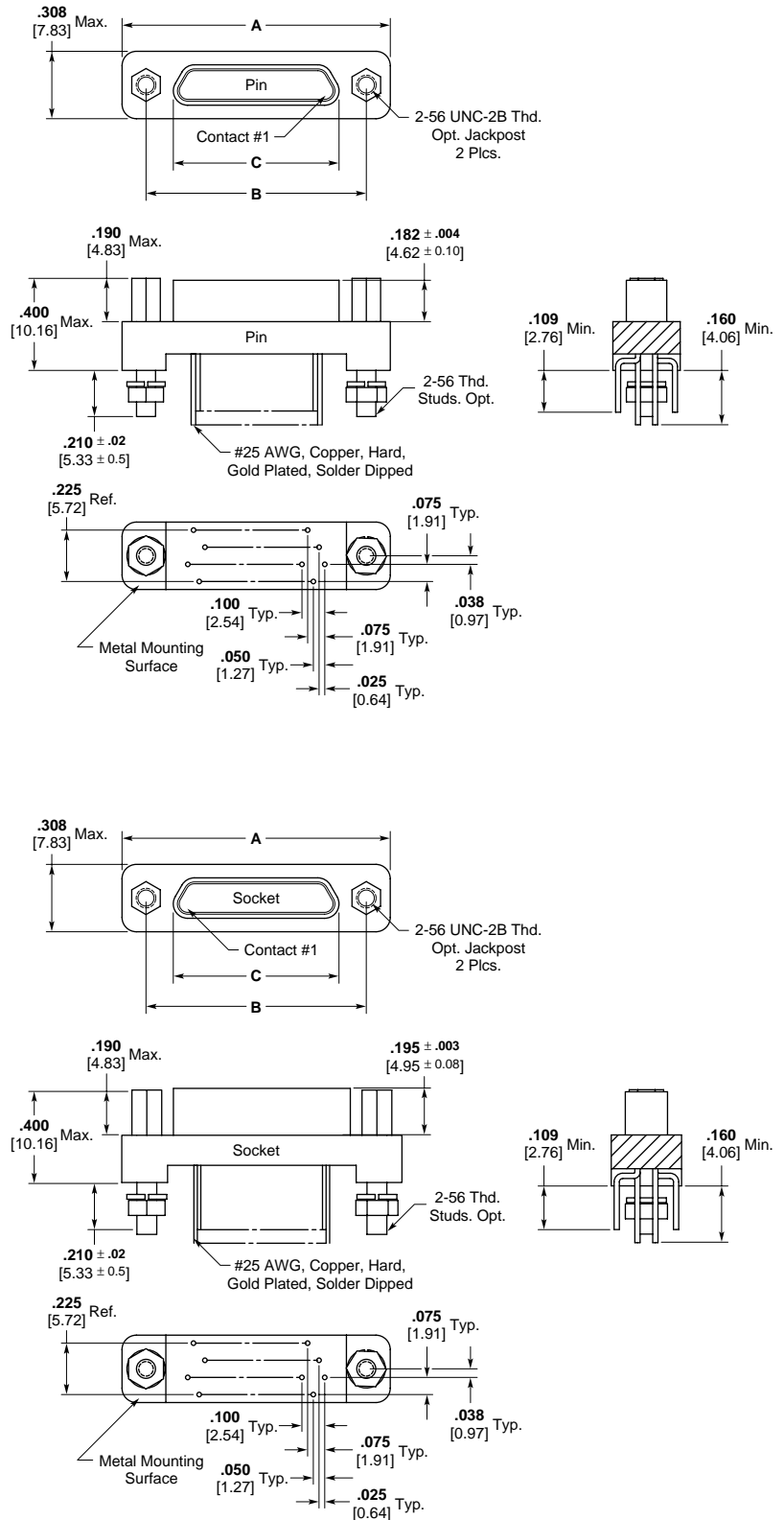


MCK ST2 Series Straight Mount PCB Connectors

MCK with Cactus Bend Termination



- Meets MIL-PRF-83513 Performance
- Single metal shell with no Transition Block
- Low profile and light weight
- .100 [2.54] x .075 [1.91] grid pattern
- Design allows lower cost construction

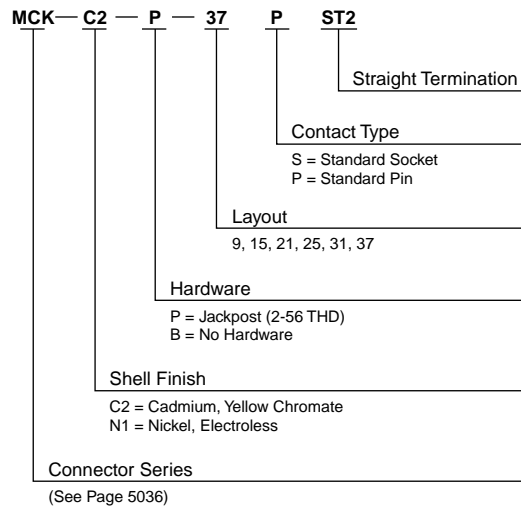


5 Pin and Socket Connectors

MCK ST2 Series Straight Mount PCB Connectors (Continued)

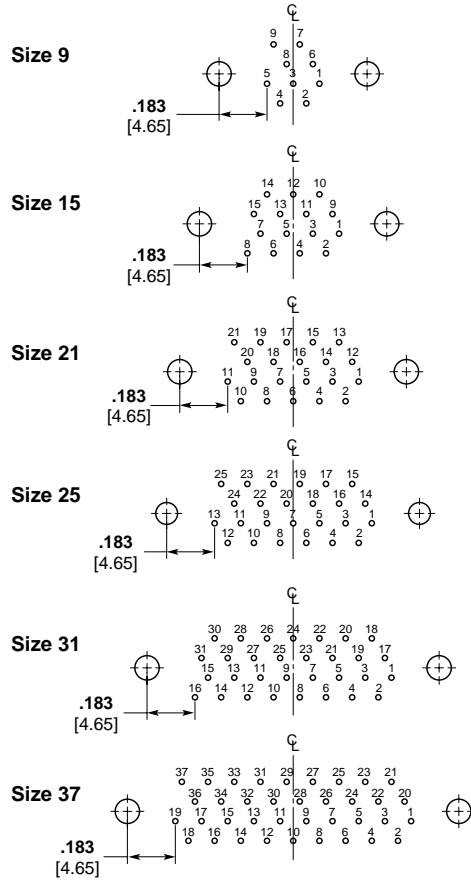
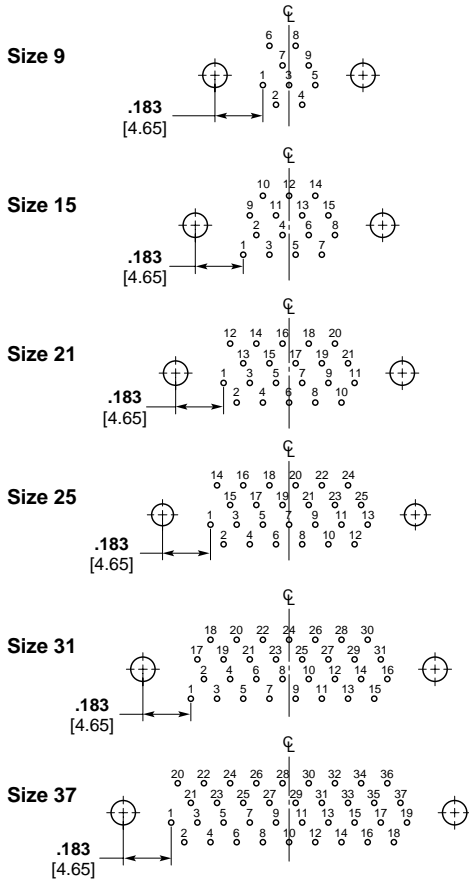
| Part Number       | A<br>Max.      | B ± .005       | C<br>Max.      |
|-------------------|----------------|----------------|----------------|
| MCK-**-*- 9 PST2  | .785<br>19.94  | .565<br>14.35  | .333<br>8.46   |
| MCK-**-*- 9 SST2  | .785<br>19.94  | .565<br>14.35  | .402<br>10.21  |
| MCK-**-*- 15 PST2 | .935<br>23.75  | .715<br>18.16  | .483<br>12.27  |
| MCK-**-*- 15 SST2 | .935<br>23.75  | .715<br>18.16  | .552<br>14.02  |
| MCK-**-*- 21 PST2 | 1.085<br>27.56 | .865<br>21.97  | .633<br>16.08  |
| MCK-**-*- 21 SST2 | 1.085<br>27.56 | .865<br>21.97  | .702<br>17.83  |
| MCK-**-*- 25 PST2 | 1.185<br>30.10 | .965<br>24.51  | .733<br>18.62  |
| MCK-**-*- 25 SST2 | 1.185<br>30.10 | .965<br>24.51  | .802<br>20.37  |
| MCK-**-*- 31 PST2 | 1.335<br>33.91 | 1.115<br>28.32 | .883<br>22.43  |
| MCK-**-*- 31 SST2 | 1.335<br>33.91 | 1.115<br>28.32 | .952<br>24.18  |
| MCK-**-*- 37 PST2 | 1.485<br>37.72 | 1.265<br>32.13 | 1.033<br>26.24 |
| MCK-**-*- 37 SST2 | 1.485<br>37.72 | 1.265<br>32.13 | 1.102<br>27.99 |

How To Specify

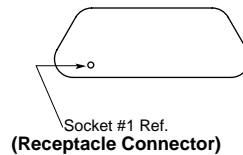
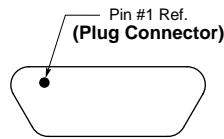


View is of mounting surface of pin connector

View is of mounting surface of socket connector



5  
Pin and Socket Connectors



**Technical & Performance Data**

**Performance**

**Contact Resistance** — The average mated contact resistance is 4 milliohms, with a maximum value of 8 milliohms, using standard #24 solid copper leads when measured directly behind the crimp joints of the mated pin and socket contacts. The average resistance value at 100 microvolts is 4.8 milliohms.

**Dielectric Withstanding Voltage (60 Hz rms room temperature)** — 750 VAC at sea level; 200 VAC at 70,000 feet [21,336 m].

**Vibration (Per MIL-STD-202C, Method 204-A, Condition D)** — No discontinuity in excess of 1 microsecond during twelve 20 minute sweeps from 10 to 2,000 CPS at .06 double amplitude or 20 G forces, whichever is less.

**Corrosion Resistance (Per MIL-STD-202C, Method 101B, Condition B)** — Both mated and unmated samples do not exceed the

maximum allowable contact resistance (8 milliohms) when subjected to the 48 hour salt spray test.

**Durability** — The contact resistance after 500 mating cycles is less than the maximum allowable, 8 milliohms.

**Insulation Resistance** — Greater than 5,000 megohms at room temperature for the materials listed under "Materials".

**Maximum Current Carrying Capacity** — No. 24 contact, 3 amperes. It must be recognized, however, that all the wires to a connector will not carry their maximum current under all environmental conditions due to wire temperature.

**Contact Engaging and Separation Forces** — 6 oz. [1.67N] maximum (eng.); 0.5 oz. [.14N] minimum (sep.).

**Temperature Range (Operating)** — Diallyl phthalate -67°F to 257°F [-55°C to +125°C].

**Materials**

**Insulator** — Diallyl phthalate per MIL-M-14, Type SDG-F.

**Contacts** — Pin Contact: Copper alloy and beryllium copper alloy make up the complete construction. Socket Contact: Copper alloy.

**Body Shell** — High grade aluminum alloy.

**Finishes**

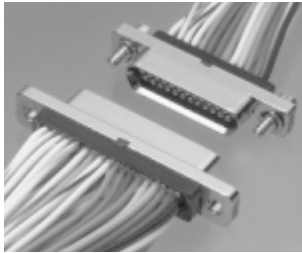
**Contacts** — Standard finish is 0.000050 [0.00127] gold over copper flash per MIL-G-45204, Type II.

**Body Shell** — Electroless nickel per AMS 2404.

**Note:**

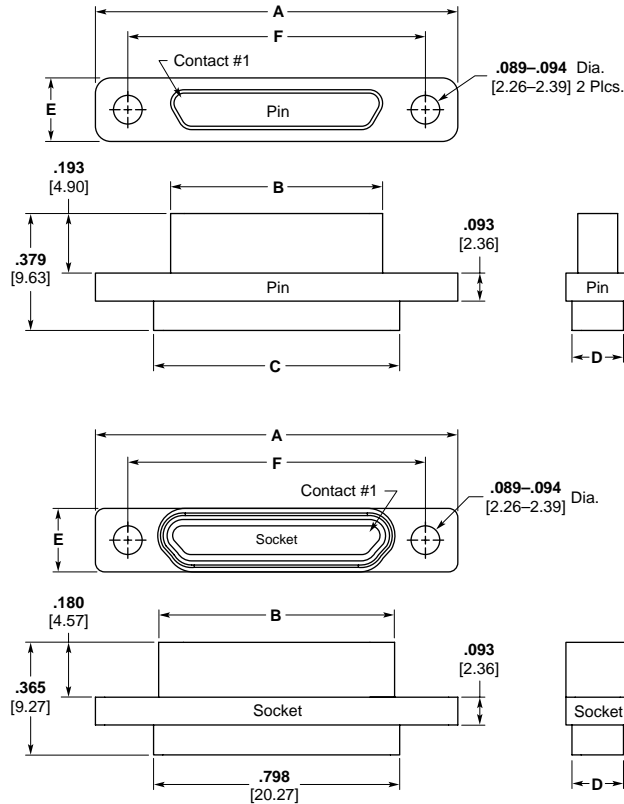
Insulators are molded into their metal shells — No bonded joint is used.

**Screw Mount**



The only metal shell connector that mates with all existing plastic types. This line is ideal for external use and other applications requiring frequent disconnect and remating. When durability and reliability are paramount the metal shell connector is unsurpassed — it eliminates the need for retrofitting where new metal shell varieties must mate with older plastic types.

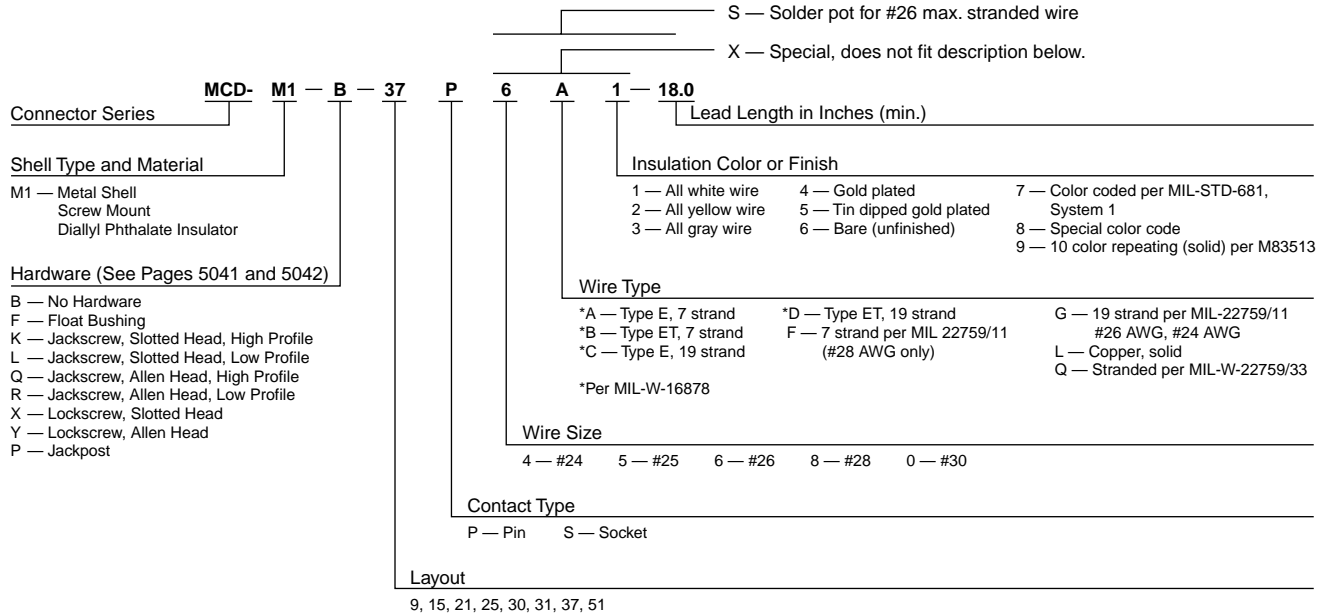
Originally designed for military applications, they are currently used for commercial requirements, including computers.



MCDM Series Metal Shell Connectors (Continued)

Screw Mount (Continued)

How To Specify



5 Pin and Socket Connectors

| Part Number  | A<br>± .005<br>[±.127] | B<br>± .005<br>[±.127] | C<br>± .010<br>[±.254] | D<br>± .010<br>[±.254] | E<br>± .005<br>[±.127] | F<br>± .005<br>[±.127] | Avg. Weight<br>lbs. ± 5%<br>[grams] |
|--------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------------------|
| MCDM1-9P***  | .780<br>19.81          | .290<br>7.36           | .398<br>10.11          | .165<br>4.19           | .208<br>5.28           | .565<br>14.35          | .003<br>1.36                        |
| MCDM1-9S***  | .780<br>19.81          | .365<br>9.27           | .398<br>10.11          | .165<br>4.19           | .208<br>5.28           | .565<br>14.35          | .003<br>1.36                        |
| MCDM1-15P*** | .930<br>23.62          | .440<br>11.18          | .548<br>13.92          | .165<br>4.19           | .208<br>5.28           | .715<br>18.16          | .004<br>1.81                        |
| MCDM1-15S*** | .930<br>23.62          | .515<br>13.08          | .548<br>13.92          | .165<br>4.19           | .208<br>5.28           | .715<br>18.16          | .004<br>1.81                        |
| MCDM1-21P*** | 1.080<br>27.43         | .590<br>14.99          | .698<br>17.73          | .165<br>4.19           | .208<br>5.28           | .865<br>21.97          | .005<br>2.26                        |
| MCDM1-21S*** | 1.080<br>27.43         | .665<br>16.89          | .698<br>17.73          | .165<br>4.19           | .208<br>5.28           | .865<br>21.97          | .005<br>2.26                        |
| MCDM1-25P*** | 1.180<br>29.97         | .690<br>17.53          | .798<br>20.27          | .165<br>4.19           | .208<br>5.28           | .965<br>24.51          | .006<br>2.72                        |
| MCDM1-25S*** | 1.180<br>29.97         | .765<br>19.43          | .798<br>20.27          | .165<br>4.19           | .208<br>5.28           | .965<br>24.51          | .005<br>2.26                        |
| MCDM1-30P*** | .930<br>23.62          | .435<br>11.05          | .548<br>13.92          | .252<br>6.40           | .295<br>7.49           | .715<br>18.16          | .007<br>3.17                        |
| MCDM1-30S*** | .930<br>23.62          | .515<br>13.08          | .548<br>13.92          | .252<br>6.40           | .295<br>7.49           | .715<br>18.16          | .007<br>3.17                        |
| MCDM1-31P*** | 1.330<br>33.78         | .840<br>21.34          | .948<br>16.46          | .165<br>4.19           | .208<br>5.28           | 1.115<br>28.32         | .007<br>3.17                        |
| MCDM1-31S*** | 1.330<br>33.78         | .915<br>23.24          | .948<br>16.46          | .165<br>4.19           | .208<br>5.28           | 1.115<br>28.32         | .006<br>2.72                        |
| MCDM1-37P*** | 1.480<br>37.59         | .990<br>25.15          | 1.098<br>27.89         | .165<br>4.19           | .208<br>5.28           | 1.270<br>32.26         | .007<br>3.17                        |
| MCDM1-37S*** | 1.480<br>37.59         | 1.065<br>27.05         | 1.098<br>27.89         | .165<br>4.19           | .208<br>5.28           | 1.270<br>32.26         | .007<br>3.17                        |
| MCDM1-51P*** | 1.430<br>36.32         | .940<br>23.88          | 1.048<br>26.62         | .208<br>5.28           | .250<br>6.35           | 1.215<br>30.86         | .009<br>4.08                        |
| MCDM1-51S*** | 1.430<br>36.32         | 1.015<br>25.78         | 1.048<br>26.62         | .208<br>5.28           | .250<br>6.35           | 1.215<br>30.86         | .008<br>3.62                        |

**Note:** Weight given is with .500 [12.7] uninsulated, solid, 24 AWG gold plated copper pigtailed.

MCDM Series Metal Shell RF COMBOMATE Connectors

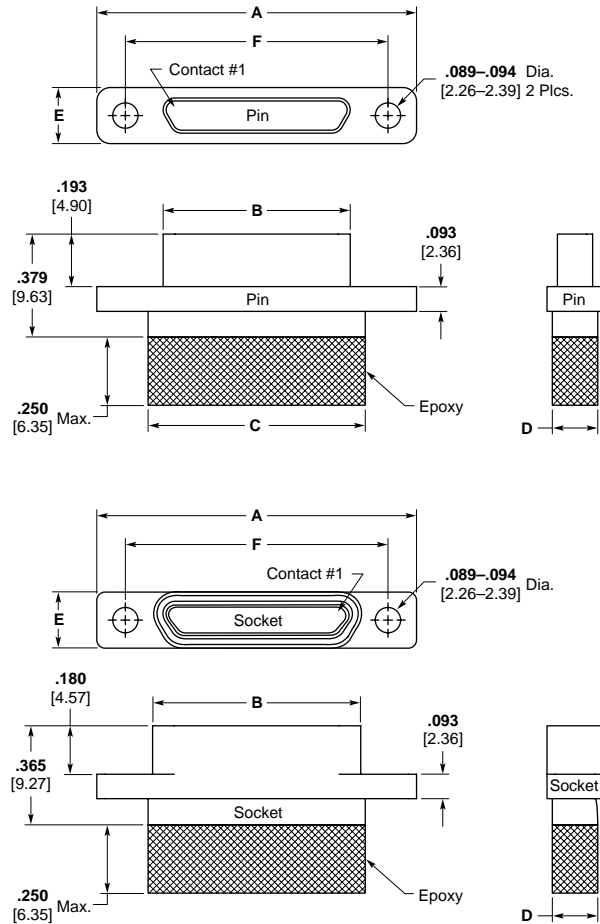
**Screw Mount Coaxial Terminations**

Available *now* — RF Performance in standard subminiature rectangular connectors, with VSWR values of 1.01 to 1.10 in frequencies ranging in DC to 2.3 GHz. This is the COMBOMATE Connector.

This series of connectors incorporates the same metal shells and twist pin contacts used in the widely accepted, high reliability, MCDM Series.

The RF COMBOMATE Connector Series will accommodate RG 196 A/U or RG 178 B/U coaxial cable terminated in a unique, already tooled insert layouts. This feature results in savings in cost, time and space.

The RF COMBOMATE Connector Series will accommodate a maximum of 17 RG 196 A/U or RG 178 B/U cables in an area of less than .225 sq. inches [14.51 mm<sup>2</sup>]. Mixed layouts with coaxial terminations and standard AWG 24, 26 and 28 are also immediately available in 7 different shell sizes. The overall envelope and mounting dimensions of equivalent size of COMBOMATE Connectors are exactly the same as the standard MCDM Series.



**Performance Data — Coaxial Terminations**

**Impedance** — 49.0 to 51.0 Ohms.

**Voltage Standing Wave Ratio (VSWR)** — 1.01:1 to 1.10:1 at frequency ranging in DC to 2.3 GHz.

**Dielectric Withstanding Voltage (60 Hz rms room temperature)** — 750 VAC at sea level; 200 VAC at 70,000 feet [21,336 m].

|          | <b>(Actual Test Data) Crosstalk (Between Adjacent Lines)</b> |               |               |               |
|----------|--|---------------|---------------|---------------|
|          | <b>1 to 2</b>  | <b>2 to 3</b> | <b>3 to 4</b> | <b>4 to 5</b> |
| 30 MHz   | 60.0 db  | 59.8 db       | 60.7 db       | 60.0 db       |
| 100 MHz  | 49.1 db  | 48.3 db       | 51.7 db       | 50.6 db       |
| 175 MHz  | 42.6 db  | 41.4 db       | 47.2 db       | 47.0 db       |
| 500 MHz  | 38.0 db  | 38.8 db       | 39.5 db       | 40.0 db       |
| 1000 MHz | 31.6 db  | 32.0 db       | 30.0 db       | 32.5 db       |
| 2000 MHz | 22.4 db  | 22.5 db       | 22.3 db       | 20.8 db       |
| 3000 MHz | 21.5 db  | 23.9 db       | 21.4 db       | 24.2 db       |

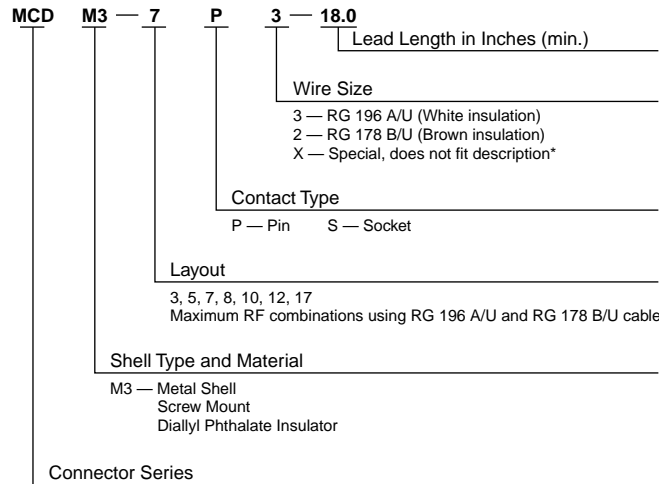
| <b>Sample</b> | <b>Insertion Loss</b> |           |           |           |           |
|---------------|-----------------------|-----------|-----------|-----------|-----------|
|               | <b>#1</b>             | <b>#2</b> | <b>#3</b> | <b>#4</b> | <b>#5</b> |
| 30 MHz        | .08 db                | .08 db    | .08 db    | .08 db    | .08 db    |
| 100 MHz       | .24 db                | .24 db    | .25 db    | .25 db    | .25 db    |
| 175 MHz       | .35 db                | .36 db    | .36 db    | .34 db    | .32 db    |
| 500 MHz       | .58 db                | .50 db    | .60 db    | .58 db    | .48 db    |
| 1000 MHz      | 1.25 db               | 1.33 db   | 1.36 db   | 1.35 db   | 1.24 db   |
| 2000 MHz      | 1.48 db               | 1.71 db   | 1.42 db   | 1.40 db   | 1.45 db   |
| 3000 MHz      | 2.66 db               | 2.45 db   | 2.74 db   | 2.86 db   | 2.84 db   |

**Note:** Verification of all test data is on file at Tyco Electronics and is available upon request. All test runs using RG 196 A/U.

MCDM Series Metal Shell RF COMBOMATE Connectors (Continued)

Screw Mount Coaxial Terminations (Continued)

How To Specify



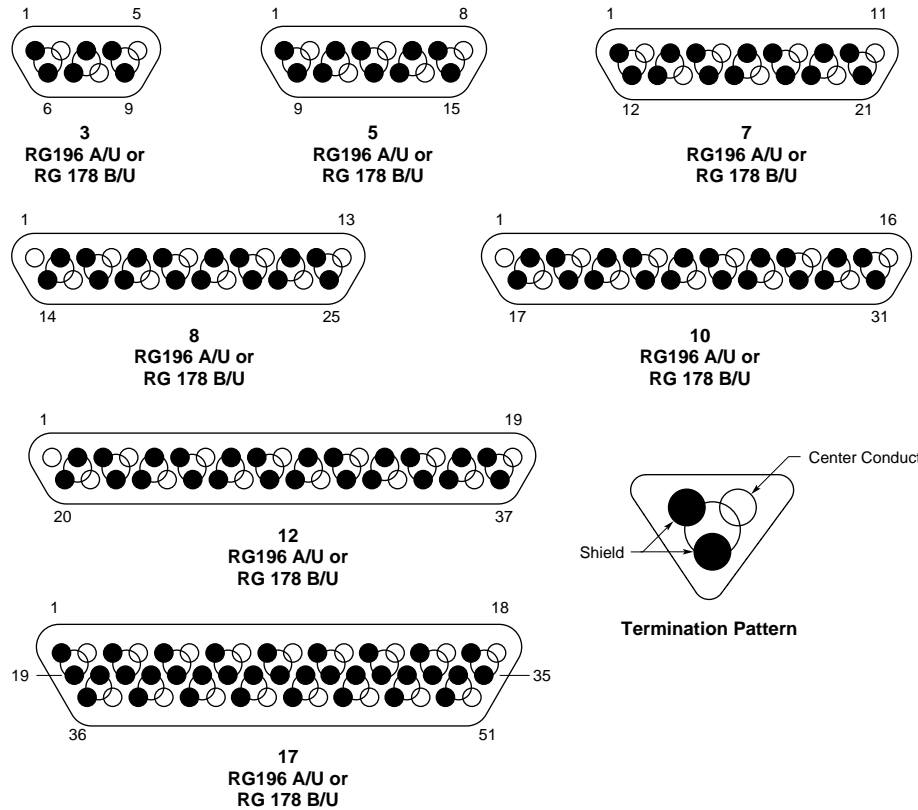
\*Ordering Criteria: A wide variety of contact combinations, coaxial and power mixed, are available. Contact Tyco Electronics for additional arrangement numbers.

| Part Number | A<br>± .005<br>[± .127] | B<br>± .005<br>[± .127] | C<br>Max.      | D<br>Max.    | E<br>± .005<br>[± .127] | F<br>± .005<br>[± .127] |
|-------------|-------------------------|-------------------------|----------------|--------------|-------------------------|-------------------------|
| MCDM3-3P**  | .780<br>19.81           | .290<br>7.36            | .408<br>10.36  | .200<br>5.08 | .208<br>5.28            | .565<br>14.35           |
| MCDM3-3S**  | .780<br>19.81           | .365<br>9.27            | .408<br>10.36  | .200<br>5.08 | .208<br>5.28            | .565<br>14.35           |
| MCDM3-5P**  | .930<br>23.62           | .440<br>11.18           | .558<br>14.17  | .200<br>5.08 | .208<br>5.28            | .715<br>18.16           |
| MCDM3-5S**  | .930<br>23.62           | .515<br>13.08           | .558<br>14.17  | .200<br>5.08 | .208<br>5.28            | .715<br>18.16           |
| MCDM3-7P**  | 1.080<br>27.43          | .590<br>14.99           | .708<br>17.98  | .200<br>5.08 | .208<br>5.28            | .865<br>21.97           |
| MCDM3-7S**  | 1.080<br>27.43          | .665<br>16.89           | .708<br>17.98  | .200<br>5.08 | .208<br>5.28            | .865<br>21.97           |
| MCDM3-8P**  | 1.180<br>29.97          | .690<br>17.53           | .808<br>20.52  | .200<br>5.08 | .208<br>5.28            | .965<br>24.51           |
| MCDM3-8S**  | 1.180<br>29.97          | .765<br>19.43           | .808<br>20.52  | .200<br>5.08 | .208<br>5.28            | .965<br>24.51           |
| MCDM3-10P** | 1.330<br>33.78          | .840<br>21.34           | .958<br>24.33  | .200<br>5.08 | .208<br>5.28            | 1.115<br>28.32          |
| MCDM3-10S** | 1.330<br>33.78          | .915<br>23.24           | .958<br>24.33  | .200<br>5.08 | .208<br>5.28            | 1.115<br>28.32          |
| MCDM3-12P** | 1.480<br>37.59          | .990<br>25.15           | 1.108<br>27.89 | .200<br>5.08 | .208<br>5.28            | 1.270<br>32.26          |
| MCDM3-12S** | 1.480<br>37.59          | 1.065<br>27.05          | 1.108<br>27.89 | .200<br>5.08 | .208<br>5.28            | 1.270<br>32.26          |
| MCDM3-17P** | 1.430<br>36.32          | .940<br>23.88           | 1.058<br>26.87 | .245<br>6.22 | .250<br>6.35            | 1.215<br>30.86          |
| MCDM3-17S** | 1.430<br>36.32          | 1.015<br>25.78          | 1.058<br>26.87 | .245<br>6.22 | .250<br>6.35            | 1.215<br>30.86          |



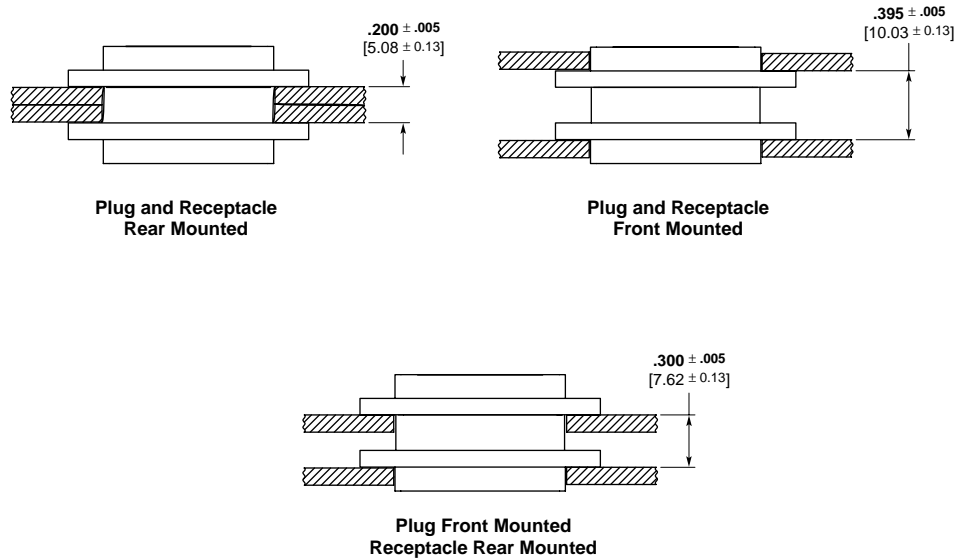
MCDM Series Metal Shell RF COMBOMATE Connectors (Continued)

Contact Arrangement as Viewed from the Engaging Face of the Pin Side



**Note:** The above contact arrangements are the maximum densities that can be obtained in each shell size when using RG 196 A/U or RG 178 B/U cable.

Panel Mounting Dimensions — MCDM



Panel Cutout Dimensions

Screw Mounting

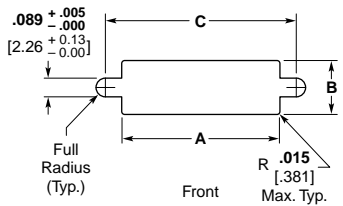


Figure 1

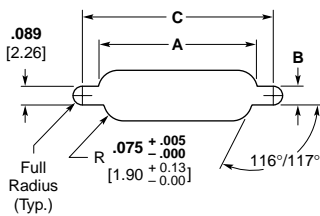


Figure 2

Note: Front mounting preferred.

| Number of Contacts | Fig. | A               |                 | B               |                 | C               |                 |
|--------------------|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                    |      | + .004 [+ .102] | - .000 [- .000] | + .004 [+ .102] | - .000 [- .000] | + .005 [+ .127] | - .000 [- .000] |
| 9                  | 1    | .412            | [10.46]         | .177            | [4.50]          | .570            | [14.48]         |
|                    | 2    | .384            | [9.75]          | .222            | [5.64]          | .570            | [14.48]         |
| 15                 | 1    | .562            | [14.27]         | .177            | [4.50]          | .720            | [18.29]         |
|                    | 2    | .534            | [13.56]         | .222            | [5.64]          | .720            | [18.29]         |
| 21                 | 1    | .712            | [18.08]         | .177            | [4.50]          | .870            | [22.10]         |
|                    | 2    | .684            | [17.37]         | .222            | [5.64]          | .870            | [22.10]         |
| 25                 | 1    | .812            | [20.62]         | .177            | [4.50]          | .970            | [24.64]         |
|                    | 2    | .784            | [19.91]         | .222            | [5.64]          | .970            | [24.64]         |
| 31                 | 1    | .962            | [24.43]         | .177            | [4.50]          | 1.120           | [28.45]         |
|                    | 2    | .934            | [23.72]         | .222            | [5.64]          | 1.120           | [28.45]         |
| 37                 | 1    | 1.112           | [28.24]         | .177            | [4.50]          | 1.270           | [32.26]         |
|                    | 2    | 1.084           | [27.53]         | .222            | [5.64]          | 1.270           | [32.26]         |
| 51                 | 1    | 1.062           | [26.97]         | .224            | [5.69]          | 1.220           | [30.99]         |
|                    | 2    | 1.034           | [26.26]         | .264            | [6.71]          | 1.220           | [30.99]         |

MCK (Metal Shell)

| Military Part No. | MICRODOT Part No.   |
|-------------------|---------------------|
| M83513/01-A*      | MCK--B- 9PS         |
| M83513/01-B*      | MCK--B- 15PS        |
| M83513/01-C*      | MCK--B- 21PS        |
| M83513/01-D*      | MCK--B- 25PS        |
| M83513/01-E*      | MCK--B- 31PS        |
| M83513/01-F*      | MCK--B- 37PS        |
| M83513/01-G*      | MCK--B- 51PS        |
| M83513/01-H*      | MCK--B-100PS        |
| M83513/02-A*      | MCK--B- 9SS         |
| M83513/02-B*      | MCK--B- 15SS        |
| M83513/02-C*      | MCK--B- 21SS        |
| M83513/02-D*      | MCK--B- 25SS        |
| M83513/02-E*      | MCK--B- 31SS        |
| M83513/02-F*      | MCK--B- 37SS        |
| M83513/02-G*      | MCK--B- 51SS        |
| M83513/02-H*      | MCK--B-100SS        |
| M83513/03-A01*    | MCK--B- 9P6G1-18.0  |
| M83513/03-B01*    | MCK--B- 15P6G1-18.0 |
| M83513/03-C01*    | MCK--B- 21P6G1-18.0 |
| M83513/03-D01*    | MCK--B- 25P6G1-18.0 |
| M83513/03-E01*    | MCK--B- 31P6G1-18.0 |
| M83513/03-F01*    | MCK--B- 37P6G1-18.0 |
| M83513/03-G01*    | MCK--B- 51P6G1-18.0 |
| M83513/03-H01*    | MCK--B-100P6G1-18.0 |
| M83513/03-A02*    | MCK--B- 9P6G1-36.0  |
| M83513/03-B02*    | MCK--B- 15P6G1-36.0 |
| M83513/03-C02*    | MCK--B- 21P6G1-36.0 |
| M83513/03-D02*    | MCK--B- 25P6G1-36.0 |
| M83513/03-E02*    | MCK--B- 31P6G1-36.0 |
| M83513/03-F02*    | MCK--B- 37P6G1-36.0 |
| M83513/03-G02*    | MCK--B- 51P6G1-36.0 |
| M83513/03-H02*    | MCK--B-100P6G1-36.0 |
| M83513/03-A03*    | MCK--B- 9P6G9-18.0  |
| M83513/03-B03*    | MCK--B- 15P6G9-18.0 |
| M83513/03-C03*    | MCK--B- 21P6G9-18.0 |
| M83513/03-D03*    | MCK--B- 25P6G9-18.0 |
| M83513/03-E03*    | MCK--B- 31P6G9-18.0 |
| M83513/03-F03*    | MCK--B- 37P6G9-18.0 |
| M83513/03-G03*    | MCK--B- 51P6G9-18.0 |
| M83513/03-H03*    | MCK--B-100P6G9-18.0 |
| M83513/03-A04*    | MCK--B- 9P6G9-36.0  |
| M83513/03-B04*    | MCK--B- 15P6G9-36.0 |
| M83513/03-C04*    | MCK--B- 21P6G9-36.0 |
| M83513/03-D04*    | MCK--B- 25P6G9-36.0 |
| M83513/03-E04*    | MCK--B- 31P6G9-36.0 |
| M83513/03-F04*    | MCK--B- 37P6G9-36.0 |
| M83513/03-G04*    | MCK--B- 51P6G9-36.0 |
| M83513/03-H04*    | MCK--B-100P6G9-36.0 |
| M83513/03-A05*    | MCK--B- 9P5L4-0.5   |
| M83513/03-B05*    | MCK--B- 15P5L4-0.5  |
| M83513/03-C05*    | MCK--B- 21P5L4-0.5  |
| M83513/03-D05*    | MCK--B- 25P5L4-0.5  |
| M83513/03-E05*    | MCK--B- 31P5L4-0.5  |
| M83513/03-F05*    | MCK--B- 37P5L4-0.5  |
| M83513/03-G05*    | MCK--B- 51P5L4-0.5  |
| M83513/03-H05*    | MCK--B-100P5L4-0.5  |
| M83513/03-A06*    | MCK--B- 9P5L4-1.0   |
| M83513/03-B06*    | MCK--B- 15P5L4-1.0  |
| M83513/03-C06*    | MCK--B- 21P5L4-1.0  |
| M83513/03-D06*    | MCK--B- 25P5L4-1.0  |

| Military Part No. | MICRODOT Part No.   |
|-------------------|---------------------|
| M83513/03-E06*    | MCK--B- 31P5L4-1.0  |
| M83513/03-F06*    | MCK--B- 37P5L4-1.0  |
| M83513/03-G06*    | MCK--B- 51P5L4-1.0  |
| M83513/03-H06*    | MCK--B-100P5L4-1.0  |
| M83513/03-A07*    | MCK--B- 9P5L5-0.5   |
| M83513/03-B07*    | MCK--B- 15P5L5-0.5  |
| M83513/03-C07*    | MCK--B- 21P5L5-0.5  |
| M83513/03-D07*    | MCK--B- 25P5L5-0.5  |
| M83513/03-E07*    | MCK--B- 31P5L5-0.5  |
| M83513/03-F07*    | MCK--B- 37P5L5-0.5  |
| M83513/03-G07*    | MCK--B- 51P5L5-0.5  |
| M83513/03-H07*    | MCK--B-100P5L5-0.5  |
| M83513/03-A08*    | MCK--B- 9P5L5-1.0   |
| M83513/03-B08*    | MCK--B- 15P5L5-1.0  |
| M83513/03-C08*    | MCK--B- 21P5L5-1.0  |
| M83513/03-D08*    | MCK--B- 25P5L5-1.0  |
| M83513/03-E08*    | MCK--B- 31P5L5-1.0  |
| M83513/03-F08*    | MCK--B- 37P5L5-1.0  |
| M83513/03-G08*    | MCK--B- 51P5L5-1.0  |
| M83513/03-H08*    | MCK--B-100P5L5-1.0  |
| M83513/03-A09*    | MCK--B- 9P6Q1-18.0  |
| M83513/03-B09*    | MCK--B- 15P6Q1-18.0 |
| M83513/03-C09*    | MCK--B- 21P6Q1-18.0 |
| M83513/03-D09*    | MCK--B- 25P6Q1-18.0 |
| M83513/03-E09*    | MCK--B- 31P6Q1-18.0 |
| M83513/03-F09*    | MCK--B- 37P6Q1-18.0 |
| M83513/03-G09*    | MCK--B- 51P6Q1-18.0 |
| M83513/03-H09*    | MCK--B-100P6Q1-18.0 |
| M83513/03-A10*    | MCK--B- 9P6Q1-36.0  |
| M83513/03-B10*    | MCK--B- 15P6Q1-36.0 |
| M83513/03-C10*    | MCK--B- 21P6Q1-36.0 |
| M83513/03-D10*    | MCK--B- 25P6Q1-36.0 |
| M83513/03-E10*    | MCK--B- 31P6Q1-36.0 |
| M83513/03-F10*    | MCK--B- 37P6Q1-36.0 |
| M83513/03-G10*    | MCK--B- 51P6Q1-36.0 |
| M83513/03-H10*    | MCK--B-100P6Q1-36.0 |
| M83513/03-A11*    | MCK--B- 9P6Q9-18.0  |
| M83513/03-B11*    | MCK--B- 15P6Q9-18.0 |
| M83513/03-C11*    | MCK--B- 21P6Q9-18.0 |
| M83513/03-D11*    | MCK--B- 25P6Q9-18.0 |
| M83513/03-E11*    | MCK--B- 31P6Q9-18.0 |
| M83513/03-F11*    | MCK--B- 37P6Q9-18.0 |
| M83513/03-G11*    | MCK--B- 51P6Q9-18.0 |
| M83513/03-H11*    | MCK--B-100P6Q9-18.0 |
| M83513/03-A12*    | MCK--B- 9P6Q9-36.0  |
| M83513/03-B12*    | MCK--B- 15P6Q9-36.0 |
| M83513/03-C12*    | MCK--B- 21P6Q9-36.0 |
| M83513/03-D12*    | MCK--B- 25P6Q9-36.0 |
| M83513/03-E12*    | MCK--B- 31P6Q9-36.0 |
| M83513/03-F12*    | MCK--B- 37P6Q9-36.0 |
| M83513/03-G12*    | MCK--B- 51P6Q9-36.0 |
| M83513/03-H12*    | MCK--B-100P6Q9-36.0 |
| M83513/03-A13*    | MCK--B- 9P6G1-72.0  |
| M83513/03-B13*    | MCK--B- 15P6G1-72.0 |
| M83513/03-C13*    | MCK--B- 21P6G1-72.0 |
| M83513/03-D13*    | MCK--B- 25P6G1-72.0 |
| M83513/03-E13*    | MCK--B- 31P6G1-72.0 |
| M83513/03-F13*    | MCK--B- 37P6G1-72.0 |
| M83513/03-G13*    | MCK--B- 51P6G1-72.0 |
| M83513/03-H13*    | MCK--B-100P6G1-72.0 |

| Military Part No. | MICRODOT Part No.   |
|-------------------|---------------------|
| M83513/03-A14*    | MCK--B- 9P6G9-72.0  |
| M83513/03-B14*    | MCK--B- 15P6G9-72.0 |
| M83513/03-C14*    | MCK--B- 21P6G9-72.0 |
| M83513/03-D14*    | MCK--B- 25P6G9-72.0 |
| M83513/03-E14*    | MCK--B- 31P6G9-72.0 |
| M83513/03-F14*    | MCK--B- 37P6G9-72.0 |
| M83513/03-G14*    | MCK--B- 51P6G9-72.0 |
| M83513/03-H14*    | MCK--B-100P6G9-72.0 |
| M83513/03-A15*    | MCK--B- 9P6Q1-72.0  |
| M83513/03-B15*    | MCK--B- 15P6Q1-72.0 |
| M83513/03-C15*    | MCK--B- 21P6Q1-72.0 |
| M83513/03-D15*    | MCK--B- 25P6Q1-72.0 |
| M83513/03-E15*    | MCK--B- 31P6Q1-72.0 |
| M83513/03-F15*    | MCK--B- 37P6Q1-72.0 |
| M83513/03-G15*    | MCK--B- 51P6Q1-72.0 |
| M83513/03-H15*    | MCK--B-100P6Q1-72.0 |
| M83513/03-A16*    | MCK--B- 9P6Q9-72.0  |
| M83513/03-B16*    | MCK--B- 15P6Q9-72.0 |
| M83513/03-C16*    | MCK--B- 21P6Q9-72.0 |
| M83513/03-D16*    | MCK--B- 25P6Q9-72.0 |
| M83513/03-E16*    | MCK--B- 31P6Q9-72.0 |
| M83513/03-F16*    | MCK--B- 37P6Q9-72.0 |
| M83513/03-G16*    | MCK--B- 51P6Q9-72.0 |
| M83513/03-H16*    | MCK--B-100P6Q9-72.0 |
| M83513/04-A01*    | MCK--B- 9S6G1-18.0  |
| M83513/04-B01*    | MCK--B- 15S6G1-18.0 |
| M83513/04-C01*    | MCK--B- 21S6G1-18.0 |
| M83513/04-D01*    | MCK--B- 25S6G1-18.0 |
| M83513/04-E01*    | MCK--B- 31S6G1-18.0 |
| M83513/04-F01*    | MCK--B- 37S6G1-18.0 |
| M83513/04-G01*    | MCK--B- 51S6G1-18.0 |
| M83513/04-H01*    | MCK--B-100S6G1-18.0 |
| M83513/04-A02*    | MCK--B- 9S6G1-36.0  |
| M83513/04-B02*    | MCK--B- 15S6G1-36.0 |
| M83513/04-C02*    | MCK--B- 21S6G1-36.0 |
| M83513/04-D02*    | MCK--B- 25S6G1-36.0 |
| M83513/04-E02*    | MCK--B- 31S6G1-36.0 |
| M83513/04-F02*    | MCK--B- 37S6G1-36.0 |
| M83513/04-G02*    | MCK--B- 51S6G1-36.0 |
| M83513/04-H02*    | MCK--B-100S6G1-36.0 |
| M83513/04-A03*    | MCK--B- 9S6G9-18.0  |
| M83513/04-B03*    | MCK--B- 15S6G9-18.0 |
| M83513/04-C03*    | MCK--B- 21S6G9-18.0 |
| M83513/04-D03*    | MCK--B- 25S6G9-18.0 |
| M83513/04-E03*    | MCK--B- 31S6G9-18.0 |
| M83513/04-F03*    | MCK--B- 37S6G9-18.0 |
| M83513/04-G03*    | MCK--B- 51S6G9-18.0 |
| M83513/04-H03*    | MCK--B-100S6G9-18.0 |
| M83513/04-A04*    | MCK--B- 9S6G9-36.0  |
| M83513/04-B04*    | MCK--B- 15S6G9-36.0 |
| M83513/04-C04*    | MCK--B- 21S6G9-36.0 |
| M83513/04-D04*    | MCK--B- 25S6G9-36.0 |
| M83513/04-E04*    | MCK--B- 31S6G9-36.0 |
| M83513/04-F04*    | MCK--B- 37S6G9-36.0 |
| M83513/04-G04*    | MCK--B- 51S6G9-36.0 |
| M83513/04-H04*    | MCK--B-100S6G9-36.0 |
| M83513/04-A05*    | MCK--B- 9S5L4-0.5   |
| M83513/04-B05*    | MCK--B- 15S5L4-0.5  |
| M83513/04-C05*    | MCK--B- 21S5L4-0.5  |
| M83513/04-D05*    | MCK--B- 25S5L4-0.5  |

**MCK (Metal Shell)** (Continued)

| Military Part No. | MICRODOT Part No.     |
|-------------------|-----------------------|
| M83513/04-E05*    | MCK-**-B- 31S5L4-0.5  |
| M83513/04-F05*    | MCK-**-B- 37S5L4-0.5  |
| M83513/04-G05*    | MCK-**-B- 51S5L4-0.5  |
| M83513/04-H05*    | MCK-**-B-100S5L4-0.5  |
| M83513/04-A06*    | MCK-**-B- 9S5L4-1.0   |
| M83513/04-B06*    | MCK-**-B- 15S5L4-1.0  |
| M83513/04-C06*    | MCK-**-B- 21S5L4-1.0  |
| M83513/04-D06*    | MCK-**-B- 25S5L4-1.0  |
| M83513/04-E06*    | MCK-**-B- 31S5L4-1.0  |
| M83513/04-F06*    | MCK-**-B- 37S5L4-1.0  |
| M83513/04-G06*    | MCK-**-B- 51S5L4-1.0  |
| M83513/04-H06*    | MCK-**-B-100S5L4-1.0  |
| M83513/04-A07*    | MCK-**-B- 9S5L5-0.5   |
| M83513/04-B07*    | MCK-**-B- 15S5L5-0.5  |
| M83513/04-C07*    | MCK-**-B- 21S5L5-0.5  |
| M83513/04-D07*    | MCK-**-B- 25S5L5-0.5  |
| M83513/04-E07*    | MCK-**-B- 31S5L5-0.5  |
| M83513/04-F07*    | MCK-**-B- 37S5L5-0.5  |
| M83513/04-G07*    | MCK-**-B- 51S5L5-0.5  |
| M83513/04-H07*    | MCK-**-B-100S5L5-0.5  |
| M83513/04-A08*    | MCK-**-B- 9S5L5-1.0   |
| M83513/04-B08*    | MCK-**-B- 15S5L5-1.0  |
| M83513/04-C08*    | MCK-**-B- 21S5L5-1.0  |
| M83513/04-D08*    | MCK-**-B- 25S5L5-1.0  |
| M83513/04-E08*    | MCK-**-B- 31S5L5-1.0  |
| M83513/04-F08*    | MCK-**-B- 37S5L5-1.0  |
| M83513/04-G08*    | MCK-**-B- 51S5L5-1.0  |
| M83513/04-H08*    | MCK-**-B-100S5L5-1.0  |
| M83513/04-A09*    | MCK-**-B- 9S6Q1-18.0  |
| M83513/04-B09*    | MCK-**-B- 15S6Q1-18.0 |
| M83513/04-C09*    | MCK-**-B- 21S6Q1-18.0 |

| Military Part No. | MICRODOT Part No.     |
|-------------------|-----------------------|
| M83513/04-D09*    | MCK-**-B- 25S6Q1-18.0 |
| M83513/04-E09*    | MCK-**-B- 31S6Q1-18.0 |
| M83513/04-F09*    | MCK-**-B- 37S6Q1-18.0 |
| M83513/04-G09*    | MCK-**-B- 51S6Q1-18.0 |
| M83513/04-H09*    | MCK-**-B-100S6Q1-18.0 |
| M83513/04-A10*    | MCK-**-B- 9S6Q1-36.0  |
| M83513/04-B10*    | MCK-**-B- 15S6Q1-36.0 |
| M83513/04-C10*    | MCK-**-B- 21S6Q1-36.0 |
| M83513/04-D10*    | MCK-**-B- 25S6Q1-36.0 |
| M83513/04-E10*    | MCK-**-B- 31S6Q1-36.0 |
| M83513/04-F10*    | MCK-**-B- 37S6Q1-36.0 |
| M83513/04-G10*    | MCK-**-B- 51S6Q1-36.0 |
| M83513/04-H10*    | MCK-**-B-100S6Q1-36.0 |
| M83513/04-A11*    | MCK-**-B- 9S6Q9-18.0  |
| M83513/04-B11*    | MCK-**-B- 15S6Q9-18.0 |
| M83513/04-C11*    | MCK-**-B- 21S6Q9-18.0 |
| M83513/04-D11*    | MCK-**-B- 25S6Q9-18.0 |
| M83513/04-E11*    | MCK-**-B- 31S6Q9-18.0 |
| M83513/04-F11*    | MCK-**-B- 37S6Q9-18.0 |
| M83513/04-G11*    | MCK-**-B- 51S6Q9-18.0 |
| M83513/04-H11*    | MCK-**-B-100S6Q9-18.0 |
| M83513/04-A12*    | MCK-**-B- 9S6Q9-36.0  |
| M83513/04-B12*    | MCK-**-B- 15S6Q9-36.0 |
| M83513/04-C12*    | MCK-**-B- 21S6Q9-36.0 |
| M83513/04-D12*    | MCK-**-B- 25S6Q9-36.0 |
| M83513/04-E12*    | MCK-**-B- 31S6Q9-36.0 |
| M83513/04-F12*    | MCK-**-B- 37S6Q9-36.0 |
| M83513/04-G12*    | MCK-**-B- 51S6Q9-36.0 |
| M83513/04-H12*    | MCK-**-B-100S6Q9-36.0 |
| M83513/04-A13*    | MCK-**-B- 9S6G1-72.0  |
| M83513/04-B13*    | MCK-**-B- 15S6G1-72.0 |

| Military Part No. | MICRODOT Part No.     |
|-------------------|-----------------------|
| M83513/04-C13*    | MCK-**-B- 21S6G1-72.0 |
| M83513/04-D13*    | MCK-**-B- 25S6G1-72.0 |
| M83513/04-E13*    | MCK-**-B- 31S6G1-72.0 |
| M83513/04-F13*    | MCK-**-B- 37S6G1-72.0 |
| M83513/04-G13*    | MCK-**-B- 51S6G1-72.0 |
| M83513/04-H13*    | MCK-**-B-100S6G1-72.0 |
| M83513/04-A14*    | MCK-**-B- 9S6G9-72.0  |
| M83513/04-B14*    | MCK-**-B- 15S6G9-72.0 |
| M83513/04-C14*    | MCK-**-B- 21S6G9-72.0 |
| M83513/04-D14*    | MCK-**-B- 25S6G9-72.0 |
| M83513/04-E14*    | MCK-**-B- 31S6G9-72.0 |
| M83513/04-F14*    | MCK-**-B- 37S6G9-72.0 |
| M83513/04-G14*    | MCK-**-B- 51S6G9-72.0 |
| M83513/04-H14*    | MCK-**-B-100S6G9-72.0 |
| M83513/04-A15*    | MCK-**-B- 9S6Q1-72.0  |
| M83513/04-B15*    | MCK-**-B- 15S6Q1-72.0 |
| M83513/04-C15*    | MCK-**-B- 21S6Q1-72.0 |
| M83513/04-D15*    | MCK-**-B- 25S6Q1-72.0 |
| M83513/04-E15*    | MCK-**-B- 31S6Q1-72.0 |
| M83513/04-F15*    | MCK-**-B- 37S6Q1-72.0 |
| M83513/04-G15*    | MCK-**-B- 51S6Q1-72.0 |
| M83513/04-H15*    | MCK-**-B-100S6Q1-72.0 |
| M83513/04-A16*    | MCK-**-B- 9S6Q9-72.0  |
| M83513/04-B16*    | MCK-**-B- 15S6Q9-72.0 |
| M83513/04-C16*    | MCK-**-B- 21S6Q9-72.0 |
| M83513/04-D16*    | MCK-**-B- 25S6Q9-72.0 |
| M83513/04-E16*    | MCK-**-B- 31S6Q9-72.0 |
| M83513/04-F16*    | MCK-**-B- 37S6Q9-72.0 |
| M83513/04-G16*    | MCK-**-B- 51S6Q9-72.0 |
| M83513/04-H16*    | MCK-**-B-100S6Q9-72.0 |

\*C = Cadmium or N = Nickel (space applications only)  
 \*\*C2 = Cadmium or N1 = Nickel (space applications only)

**Hardware**

| Military Part No. | MICRODOT Part No.     |
|-------------------|-----------------------|
| M83513/05-02      | "A. HD, J/S, L.F. #2" |
| M83513/05-12      | "A. HD, J/S, L.F. #4" |
| M83513/05-03      | "A. HD, J/S,H.F. #2"  |
| M83513/05-13      | "A. HD, J/S, H.F. #4" |

| Military Part No. | MICRODOT Part No.     |
|-------------------|-----------------------|
| M83513/05-05      | "S. HD, J/S, L.F. #2" |
| M83513/05-15      | "S. HD, J/S, L.F. #4" |
| M83513/05-06      | "S. HD, J/S, H.F. #2" |
| M83513/05-16      | "S. HD, J/S, H.F. #4" |

| Military Part No. | MICRODOT Part No.   |
|-------------------|---------------------|
| M83513/05-07      | "JACKPOST ASSY #2"  |
| M83513/05-17      | "JACKPOST ASSY, #4" |

**MCDR (Plastic Shell)**

| Military Part No. | MICRODOT Part No. |
|-------------------|-------------------|
| M83513/06-A       | MCDR3-B- 9PS      |
| M83513/06-B       | MCDR3-B-15PS      |
| M83513/06-C       | MCDR3-B-21PS      |
| M83513/06-D       | MCDR3-B-25PS      |
| M83513/06-E       | MCDR3-B-31PS      |
| M83513/06-F       | MCDR3-B-37PS      |
| M83513/06-G       | MCDR3-B-51PS      |
| M83513/07-A       | MCDR3-B- 9SS      |
| M83513/07-B       | MCDR3-B-15SS      |
| M83513/07-C       | MCDR3-B-21SS      |
| M83513/07-D       | MCDR3-B-25SS      |
| M83513/07-E       | MCDR3-B-31SS      |
| M83513/07-F       | MCDR3-B-37SS      |

| Military Part No. | MICRODOT Part No.   |
|-------------------|---------------------|
| M83513/07-G       | MCDR3-B-51SS        |
| M83513/08-A01     | MCDR3-B- 9P6G1-18.0 |
| M83513/08-B01     | MCDR3-B-15P6G1-18.0 |
| M83513/08-C01     | MCDR3-B-21P6G1-18.0 |
| M83513/08-D01     | MCDR3-B-25P6G1-18.0 |
| M83513/08-E01     | MCDR3-B-31P6G1-18.0 |
| M83513/08-F01     | MCDR3-B-37P6G1-18.0 |
| M83513/08-G01     | MCDR3-B-51P6G1-18.0 |
| M83513/08-A02     | MCDR3-B- 9P6G1-36.0 |
| M83513/08-B02     | MCDR3-B-15P6G1-36.0 |
| M83513/08-C02     | MCDR3-B-21P6G1-36.0 |
| M83513/08-D02     | MCDR3-B-25P6G1-36.0 |
| M83513/08-E02     | MCDR3-B-31P6G1-36.0 |

| Military Part No. | MICRODOT Part No.   |
|-------------------|---------------------|
| M83513/08-F02     | MCDR3-B-37P6G1-36.0 |
| M83513/08-G02     | MCDR3-B-51P6G1-36.0 |
| M83513/08-A03     | MCDR3-B- 9P6G9-18.0 |
| M83513/08-B03     | MCDR3-B-15P6G9-18.0 |
| M83513/08-C03     | MCDR3-B-21P6G9-18.0 |
| M83513/08-D03     | MCDR3-B-25P6G9-18.0 |
| M83513/08-E03     | MCDR3-B-31P6G9-18.0 |
| M83513/08-F03     | MCDR3-B-37P6G9-18.0 |
| M83513/08-G03     | MCDR3-B-51P6G9-18.0 |
| M83513/08-A04     | MCDR3-B- 9P6G9-36.0 |
| M83513/08-B04     | MCDR3-B-15P6G9-36.0 |
| M83513/08-C04     | MCDR3-B-21P6G9-36.0 |
| M83513/08-D04     | MCDR3-B-25P6G9-36.0 |

MCDR (Plastic Shell) (Continued)

| Military Part No. | MICRODOT Part No.   |
|-------------------|---------------------|
| M83513/08-E04     | MCDR3-B-31P6G9-36.0 |
| M83513/08-F04     | MCDR3-B-37P6G9-36.0 |
| M83513/08-G04     | MCDR3-B-51P6G9-36.0 |
| M83513/08-A05     | MCDR3-B- 9P5L4-0.5  |
| M83513/08-B05     | MCDR3-B-15P5L4-0.5  |
| M83513/08-C05     | MCDR3-B-21P5L4-0.5  |
| M83513/08-D05     | MCDR3-B-25P5L4-0.5  |
| M83513/08-E05     | MCDR3-B-31P5L4-0.5  |
| M83513/08-F05     | MCDR3-B-37P5L4-0.5  |
| M83513/08-G05     | MCDR3-B-51P5L4-0.5  |
| M83513/08-A06     | MCDR3-B- 9P5L4-1.0  |
| M83513/08-B06     | MCDR3-B-15P5L4-1.0  |
| M83513/08-C06     | MCDR3-B-21P5L4-1.0  |
| M83513/08-D06     | MCDR3-B-25P5L4-1.0  |
| M83513/08-E06     | MCDR3-B-31P5L4-1.0  |
| M83513/08-F06     | MCDR3-B-37P5L4-1.0  |
| M83513/08-G06     | MCDR3-B-51P5L4-1.0  |
| M83513/08-A07     | MCDR3-B- 9P5L5-0.5  |
| M83513/08-B07     | MCDR3-B-15P5L5-0.5  |
| M83513/08-C07     | MCDR3-B-21P5L5-0.5  |
| M83513/08-D07     | MCDR3-B-25P5L5-0.5  |
| M83513/08-E07     | MCDR3-B-31P5L5-0.5  |
| M83513/08-F07     | MCDR3-B-37P5L5-0.5  |
| M83513/08-G07     | MCDR3-B-51P5L5-0.5  |
| M83513/08-A08     | MCDR3-B- 9P5L5-1.0  |
| M83513/08-B08     | MCDR3-B-15P5L5-1.0  |
| M83513/08-C08     | MCDR3-B-21P5L5-1.0  |
| M83513/08-D08     | MCDR3-B-25P5L5-1.0  |
| M83513/08-E08     | MCDR3-B-31P5L5-1.0  |
| M83513/08-F08     | MCDR3-B-37P5L5-1.0  |
| M83513/08-G08     | MCDR3-B-51P5L5-1.0  |
| M83513/08-A09     | MCDR3-B- 9P6Q1-18.0 |
| M83513/08-B09     | MCDR3-B-15P6Q1-18.0 |
| M83513/08-C09     | MCDR3-B-21P6Q1-18.0 |
| M83513/08-D09     | MCDR3-B-25P6Q1-18.0 |
| M83513/08-E09     | MCDR3-B-31P6Q1-18.0 |
| M83513/08-F09     | MCDR3-B-37P6Q1-18.0 |
| M83513/08-G09     | MCDR3-B-51P6Q1-18.0 |
| M83513/08-A10     | MCDR3-B- 9P6Q1-36.0 |
| M83513/08-B10     | MCDR3-B-15P6Q1-36.0 |
| M83513/08-C10     | MCDR3-B-21P6Q1-36.0 |
| M83513/08-D10     | MCDR3-B-25P6Q1-36.0 |
| M83513/08-E10     | MCDR3-B-31P6Q1-36.0 |
| M83513/08-F10     | MCDR3-B-37P6Q1-36.0 |
| M83513/08-G10     | MCDR3-B-51P6Q1-36.0 |
| M83513/08-A11     | MCDR3-B- 9P6Q9-18.0 |
| M83513/08-B11     | MCDR3-B-15P6Q9-18.0 |
| M83513/08-C11     | MCDR3-B-21P6Q9-18.0 |
| M83513/08-D11     | MCDR3-B-25P6Q9-18.0 |
| M83513/08-E11     | MCDR3-B-31P6Q9-18.0 |
| M83513/08-F11     | MCDR3-B-37P6Q9-18.0 |
| M83513/08-G11     | MCDR3-B-51P6Q9-18.0 |
| M83513/08-A12     | MCDR3-B- 9P6Q9-36.0 |
| M83513/08-B12     | MCDR3-B-15P6Q9-36.0 |
| M83513/08-C12     | MCDR3-B-21P6Q9-36.0 |
| M83513/08-D12     | MCDR3-B-25P6Q9-36.0 |
| M83513/08-E12     | MCDR3-B-31P6Q9-36.0 |
| M83513/08-F12     | MCDR3-B-37P6Q9-36.0 |
| M83513/08-G12     | MCDR3-B-51P6Q9-36.0 |
| M83513/08-A13     | MCDR3-B- 9P6G1-72.0 |

| Military Part No. | MICRODOT Part No.    |
|-------------------|----------------------|
| M83513/08-B13     | MCDR3-B-15P6G1-72.0  |
| M83513/08-C13     | MCDR3-B-21P6G1-72.0  |
| M83513/08-D13     | MCDR3-B-25P6G1-72.0  |
| M83513/08-E13     | MCDR3-B-31P6G1-72.0  |
| M83513/08-F13     | MCDR3-B-37P6G1-72.0  |
| M83513/08-G13     | MCDR3-B-51P6G1-72.0  |
| M83513/08-A14     | MCDR3-B- 9P6G9-72.0  |
| M83513/08-B14     | MCDR3-B-15P6G9-72.0  |
| M83513/08-C14     | MCDR3-B-21P6G9-72.0  |
| M83513/08-D14     | MCDR3-B-25P6G9-72.0  |
| M83513/08-E14     | MCDR3-B-31P6G9-72.0  |
| M83513/08-F14     | MCDR3-B-37P6G9-72.0  |
| M83513/08-G14     | MCDR3-B-51P6G9-72.0  |
| M83513/08-A15     | MCDR3-B- 9P6Q1-72.0  |
| M83513/08-B15     | MCDR3-B-15P6Q1-72.0  |
| M83513/08-C15     | MCDR3-B-21P6Q1-72.0  |
| M83513/08-D15     | MCDR3-B-25P6Q1-72.0  |
| M83513/08-E15     | MCDR3-B-31P6Q1-72.0  |
| M83513/08-F15     | MCDR3-B-37P6Q1-72.0  |
| M83513/08-G15     | MCDR3-B-51P6Q1-72.0  |
| M83513/08-A16     | MCDR3-B- 9P6Q9-72.0  |
| M83513/08-B16     | MCDR3-B-15P6Q9-72.0  |
| M83513/08-C16     | MCDR3-B-21P6Q9-72.0  |
| M83513/08-D16     | MCDR3-B-25P6Q9-72.0  |
| M83513/08-E16     | MCDR3-B-31P6Q9-72.0  |
| M83513/08-F16     | MCDR3-B-37P6Q9-72.0  |
| M83513/08-G16     | MCDR3-B-51P6Q9-72.0  |
| M83513/09-A01     | MCDR3-B- 9S6G1-18.0  |
| M83513/09-B01     | MCDR3-B-15S6G1-18.0  |
| M83513/09-C01     | MCDR3-B-21S6G1-18.0  |
| M83513/09-D01     | MCDR3-B-25S6G1-18.0  |
| M83513/09-E01     | MCDR3-B-31S6G1-18.0  |
| M83513/09-F01     | MCDR3-B-37S6G1-18.0  |
| M83513/09-G01     | MCDR3-B-51S6G1-18.0  |
| M83513/09-A02     | MCDR3-B- 9S6G1-36.0  |
| M83513/09-B02     | MCDR3-B-15S6G1-36.0  |
| M83513/09-C02     | MCDR3-B-21S6G1-36.0  |
| M83513/09-D02     | MCDR3-B-25S6G1-36.0  |
| M83513/09-E02     | MCDR3-B-31S6G1-36.0  |
| M83513/09-F02     | MCDR3-B-37S6G1-36.0  |
| M83513/09-G02     | MCDR3-B-51S6G1-36.0  |
| M83513/09-A03     | MCDR3-B- 9S6G9-18.0  |
| M83513/09-B03     | MCDR3-B-15S6G9-18.0  |
| M83513/09-C03     | MCDR3-B- 21S6G9-18.0 |
| M83513/09-D03     | MCDR3-B-25S6G9-18.0  |
| M83513/09-E03     | MCDR3-B-31S6G9-18.0  |
| M83513/09-F03     | MCDR3-B-37S6G9-18.0  |
| M83513/09-G03     | MCDR3-B-51S6G9-18.0  |
| M83513/09-A04     | MCDR3-B- 9S6G9-36.0  |
| M83513/09-B04     | MCDR3-B-15S6G9-36.0  |
| M83513/09-C04     | MCDR3-B-21S6G9-36.0  |
| M83513/09-D04     | MCDR3-B-25S6G9-36.0  |
| M83513/09-E04     | MCDR3-B-31S6G9-36.0  |
| M83513/09-F04     | MCDR3-B-37S6G9-36.0  |
| M83513/09-G04     | MCDR3-B-51S6G9-36.0  |
| M83513/09-A05     | MCDR3-B- 9S5L4-0.5   |
| M83513/09-B05     | MCDR3-B-15S5L4-0.5   |
| M83513/09-C05     | MCDR3-B-21S5L4-0.5   |
| M83513/09-D05     | MCDR3-B-25S5L4-0.5   |
| M83513/09-E05     | MCDR3-B-31S5L4-0.5   |

| Military Part No. | MICRODOT Part No.   |
|-------------------|---------------------|
| M83513/09-F05     | MCDR3-B-37S5L4-0.5  |
| M83513/09-G05     | MCDR3-B-51S5L4-0.5  |
| M83513/09-A06     | MCDR3-B- 9S5L4-1.0  |
| M83513/09-B06     | MCDR3-B-15S5L4-1.0  |
| M83513/09-C06     | MCDR3-B-21S5L4-1.0  |
| M83513/09-D06     | MCDR3-B-25S5L4-1.0  |
| M83513/09-E06     | MCDR3-B-31S5L4-1.0  |
| M83513/09-F06     | MCDR3-B-37S5L4-1.0  |
| M83513/09-G06     | MCDR3-B-51S5L4-1.0  |
| M83513/09-A07     | MCDR3-B- 9S5L5-0.5  |
| M83513/09-B07     | MCDR3-B-15S5L5-0.5  |
| M83513/09-C07     | MCDR3-B-21S5L5-0.5  |
| M83513/09-D07     | MCDR3-B-25S5L5-0.5  |
| M83513/09-E07     | MCDR3-B-31S5L5-0.5  |
| M83513/09-F07     | MCDR3-B-37S5L5-0.5  |
| M83513/09-G07     | MCDR3-B-51S5L5-0.5  |
| M83513/09-A08     | MCDR3-B- 9S5L5-1.0  |
| M83513/09-B08     | MCDR3-B-15S5L5-1.0  |
| M83513/09-C08     | MCDR3-B-21S5L5-1.0  |
| M83513/09-D08     | MCDR3-B-25S5L5-1.0  |
| M83513/09-E08     | MCDR3-B-31S5L5-1.0  |
| M83513/09-F08     | MCDR3-B-37S5L5-1.0  |
| M83513/09-G08     | MCDR3-B-51S5L5-1.0  |
| M83513/09-A09     | MCDR3-B- 9S6Q1-18.0 |
| M83513/09-B09     | MCDR3-B-15S6Q1-18.0 |
| M83513/09-C09     | MCDR3-B-21S6Q1-18.0 |
| M83513/09-D09     | MCDR3-B-25S6Q1-18.0 |
| M83513/09-E09     | MCDR3-B-31S6Q1-18.0 |
| M83513/09-F09     | MCDR3-B-37S6Q1-18.0 |
| M83513/09-G09     | MCDR3-B-51S6Q1-18.0 |
| M83513/09-A10     | MCDR3-B- 9S6Q1-36.0 |
| M83513/09-B10     | MCDR3-B-15S6Q1-36.0 |
| M83513/09-C10     | MCDR3-B-21S6Q1-36.0 |
| M83513/09-D10     | MCDR3-B-25S6Q1-36.0 |
| M83513/09-E10     | MCDR3-B-31S6Q1-36.0 |
| M83513/09-F10     | MCDR3-B-37S6Q1-36.0 |
| M83513/09-G10     | MCDR3-B-51S6Q1-36.0 |
| M83513/09-A11     | MCDR3-B- 9S6Q9-18.0 |
| M83513/09-B11     | MCDR3-B-15S6Q9-18.0 |
| M83513/09-C11     | MCDR3-B-21S6Q9-18.0 |
| M83513/09-D11     | MCDR3-B-25S6Q9-18.0 |
| M83513/09-E11     | MCDR3-B-31S6Q9-18.0 |
| M83513/09-F11     | MCDR3-B-37S6Q9-18.0 |
| M83513/09-G11     | MCDR3-B-51S6Q9-18.0 |
| M83513/09-A12     | MCDR3-B- 9S6Q9-36.0 |
| M83513/09-B12     | MCDR3-B-15S6Q9-36.0 |
| M83513/09-C12     | MCDR3-B-21S6Q9-36.0 |
| M83513/09-D12     | MCDR3-B-25S6Q9-36.0 |
| M83513/09-E12     | MCDR3-B-31S6Q9-36.0 |
| M83513/09-F12     | MCDR3-B-37S6Q9-36.0 |
| M83513/09-G12     | MCDR3-B-51S6Q9-36.0 |
| M83513/09-A13     | MCDR3-B- 9S6G1-72.0 |
| M83513/09-B13     | MCDR3-B-15S6G1-72.0 |
| M83513/09-C13     | MCDR3-B-21S6G1-72.0 |
| M83513/09-D13     | MCDR3-B-25S6G1-72.0 |
| M83513/09-E13     | MCDR3-B-31S6G1-72.0 |
| M83513/09-F13     | MCDR3-B-37S6G1-72.0 |
| M83513/09-G13     | MCDR3-B-51S6G1-72.0 |
| M83513/09-A14     | MCDR3-B- 9S6G9-72.0 |
| M83513/09-B14     | MCDR3-B-15S6G9-72.0 |

MIL-PRF-83513 Cross Reference (Continued)

MCDR (Plastic Shell) (Continued)

| Military Part No. | MICRODOT Part No.   |
|-------------------|---------------------|
| M83513/09-C14     | MCDR3-B-21S6G9-72.0 |
| M83513/09-D14     | MCDR3-B-25S6G9-72.0 |
| M83513/09-E14     | MCDR3-B-31S6G9-72.0 |
| M83513/09-F14     | MCDR3-B-37S6G9-72.0 |
| M83513/09-G14     | MCDR3-B-51S6G9-72.0 |
| M83513/09-A15     | MCDR3-B- 9S6Q1-72.0 |
| M83513/09-B15     | MCDR3-B-15S6Q1-72.0 |

| Military Part No. | MICRODOT Part No.   |
|-------------------|---------------------|
| M83513/09-C15     | MCDR3-B-21S6Q1-72.0 |
| M83513/09-D15     | MCDR3-B-25S6Q1-72.0 |
| M83513/09-E15     | MCDR3-B-31S6Q1-72.0 |
| M83513/09-F15     | MCDR3-B-37S6Q1-72.0 |
| M83513/09-G15     | MCDR3-B-51S6Q1-72.0 |
| M83513/09-A16     | MCDR3-B- 9S6Q9-72.0 |
| M83513/09-B16     | MCDR3-B-15S6Q9-72.0 |

| Military Part No. | MICRODOT Part No.   |
|-------------------|---------------------|
| M83513/09-C16     | MCDR3-B-21S6Q9-72.0 |
| M83513/09-D16     | MCDR3-B-25S6Q9-72.0 |
| M83513/09-E16     | MCDR3-B-31S6Q9-72.0 |
| M83513/09-F16     | MCDR3-B-37S6Q9-72.0 |
| M83513/09-G16     | MCDR3-B-51S6Q9-72.0 |

MCK (Metal Shell)

| Military Part No. | MICRODOT Part No. |
|-------------------|-------------------|
| M83513/10-A01*N   | MCK--B- 9PRT1     |
| M83513/10-B01*N   | MCK--B- 15PRT1    |
| M83513/10-C01*N   | MCK--B- 21PRT1    |
| M83513/10-D01*N   | MCK--B- 25PRT1    |
| M83513/10-E01*N   | MCK--B- 31PRT1    |
| M83513/10-F01*N   | MCK--B- 37PRT1    |
| M83513/10-A01*P   | MCK--P- 9PRT1     |
| M83513/10-B01*P   | MCK--P- 15PRT1    |
| M83513/10-C01*P   | MCK--P- 21PRT1    |
| M83513/10-D01*P   | MCK--P- 25PRT1    |
| M83513/10-E01*P   | MCK--P- 31PRT1    |
| M83513/10-F01*P   | MCK--P- 37PRT1    |
| M83513/10-A02*N   | MCK--B- 9PRT1A    |
| M83513/10-B02*N   | MCK--B- 15PRT1A   |
| M83513/10-C02*N   | MCK--B- 21PRT1A   |
| M83513/10-D02*N   | MCK--B- 25PRT1A   |
| M83513/10-E02*N   | MCK--B- 31PRT1A   |
| M83513/10-F02*N   | MCK--B- 37PRT1A   |
| M83513/10-A02*P   | MCK--P- 9PRT1A    |
| M83513/10-B02*P   | MCK--P- 15PRT1A   |
| M83513/10-C02*P   | MCK--P- 21PRT1A   |
| M83513/10-D02*P   | MCK--P- 25PRT1A   |
| M83513/10-E02*P   | MCK--P- 31PRT1A   |
| M83513/10-F02*P   | MCK--P- 37PRT1A   |
| M83513/10-A03*N   | MCK--B- 9PRT1B    |
| M83513/10-B03*N   | MCK--B- 15PRT1B   |
| M83513/10-C03*N   | MCK--B- 21PRT1B   |
| M83513/10-D03*N   | MCK--B- 25PRT1B   |
| M83513/10-E03*N   | MCK--B- 31PRT1B   |
| M83513/10-F03*N   | MCK--B- 37PRT1B   |
| M83513/10-A03*P   | MCK--P- 9PRT1B    |
| M83513/10-B03*P   | MCK--P- 15PRT1B   |
| M83513/10-C03*P   | MCK--P- 21PRT1B   |
| M83513/10-D03*P   | MCK--P- 25PRT1B   |
| M83513/10-E03*P   | MCK--P- 31PRT1B   |
| M83513/10-F03*P   | MCK--P- 37PRT1B   |
| M83513/11-G01*N   | MCK--B- 51PRT1    |
| M83513/11-G01*P   | MCK--P- 51PRT1    |
| M83513/11-G02*N   | MCK--B- 51PRT1A   |
| M83513/11-G02*P   | MCK--P- 51PRT1A   |
| M83513/11-G03*N   | MCK--B- 51PRT1B   |
| M83513/11-G03*P   | MCK--P- 51PRT1B   |
| M83513/12-H01*N   | MCK--B-100PRT1    |
| M83513/12-H01*P   | MCK--P-100PRT1    |
| M83513/12-H02*N   | MCK--B-100PRT1A   |
| M83513/12-H02*P   | MCK--P-100PRT1A   |
| M83513/12-H03*N   | MCK--B-100PRT1B   |

| Military Part No. | MICRODOT Part No. |
|-------------------|-------------------|
| M83513/12-H03*P   | MCK--P-100PRT1B   |
| M83513/13-A01*N   | MCK--B- 9SRT1     |
| M83513/13-B01*N   | MCK--B- 15SRT1    |
| M83513/13-C01*N   | MCK--B- 21SRT1    |
| M83513/13-D01*N   | MCK--B- 25SRT1    |
| M83513/13-E01*N   | MCK--B- 31SRT1    |
| M83513/13-F01*N   | MCK--B- 37SRT1    |
| M83513/13-A01*P   | MCK--P- 9SRT1     |
| M83513/13-B01*P   | MCK--P- 15SRT1    |
| M83513/13-C01*P   | MCK--P- 21SRT1    |
| M83513/13-D01*P   | MCK--P- 25SRT1    |
| M83513/13-E01*P   | MCK--P- 31SRT1    |
| M83513/13-F01*P   | MCK--P- 37SRT1    |
| M83513/13-A02*N   | MCK--B- 9SRT1A    |
| M83513/13-B02*N   | MCK--B- 15SRT1A   |
| M83513/13-C02*N   | MCK--B- 21SRT1A   |
| M83513/13-D02*N   | MCK--B- 25SRT1A   |
| M83513/13-E02*N   | MCK--B- 31SRT1A   |
| M83513/13-F02*N   | MCK--B- 37SRT1A   |
| M83513/13-A02*P   | MCK--P- 9SRT1A    |
| M83513/13-B02*P   | MCK--P- 15SRT1A   |
| M83513/13-C02*P   | MCK--P- 21SRT1A   |
| M83513/13-D02*P   | MCK--P- 25SRT1A   |
| M83513/13-E02*P   | MCK--P- 31SRT1A   |
| M83513/13-F02*P   | MCK--P- 37SRT1A   |
| M83513/13-A03*N   | MCK--B- 9SRT1B    |
| M83513/13-B03*N   | MCK--B- 15SRT1B   |
| M83513/13-C03*N   | MCK--B- 21SRT1B   |
| M83513/13-D03*N   | MCK--B- 25SRT1B   |
| M83513/13-E03*N   | MCK--B- 31SRT1B   |
| M83513/13-F03*N   | MCK--B- 37SRT1B   |
| M83513/13-A03*P   | MCK--P- 9SRT1B    |
| M83513/13-B03*P   | MCK--P- 15SRT1B   |
| M83513/13-C03*P   | MCK--P- 21SRT1B   |
| M83513/13-D03*P   | MCK--P- 25SRT1B   |
| M83513/13-E03*P   | MCK--P- 31SRT1B   |
| M83513/13-F03*P   | MCK--P- 37SRT1B   |
| M83513/14-G01*N   | MCK--B- 51SRT1    |
| M83513/14-G01*P   | MCK--P- 51SRT1    |
| M83513/14-G02*N   | MCK--B- 51SRT1A   |
| M83513/14-G02*P   | MCK--P- 51SRT1A   |
| M83513/14-G03*N   | MCK--B- 51SRT1B   |
| M83513/14-G03*P   | MCK--P- 51SRT1B   |
| M83513/15-H01*N   | MCK--B-100SRT1    |
| M83513/15-H01*P   | MCK--P-100SRT1    |
| M83513/15-H02*N   | MCK--B-100SRT1A   |
| M83513/15-H02*P   | MCK--P-100SRT1A   |

| Military Part No. | MICRODOT Part No. |
|-------------------|-------------------|
| M83513/15-H03*N   | MCK--B-100SRT1B   |
| M83513/15-H03*P   | MCK--P-100SRT1B   |
| M83513/16-A01*N   | MCK--B- 9PRT3     |
| M83513/16-B01*N   | MCK--B- 15PRT3    |
| M83513/16-C01*N   | MCK--B- 21PRT3    |
| M83513/16-D01*N   | MCK--B- 25PRT3    |
| M83513/16-E01*N   | MCK--B- 31PRT3    |
| M83513/16-F01*N   | MCK--B- 37PRT3    |
| M83513/16-A01*P   | MCK--P- 9PRT3     |
| M83513/16-B01*P   | MCK--P- 15PRT3    |
| M83513/16-C01*P   | MCK--P- 21PRT3    |
| M83513/16-D01*P   | MCK--P- 25PRT3    |
| M83513/16-E01*P   | MCK--P- 31PRT3    |
| M83513/16-F01*P   | MCK--P- 37PRT3    |
| M83513/16-A02*N   | MCK--B- 9PRT3A    |
| M83513/16-B02*N   | MCK--B- 15PRT3A   |
| M83513/16-C02*N   | MCK--B- 21PRT3A   |
| M83513/16-D02*N   | MCK--B- 25PRT3A   |
| M83513/16-E02*N   | MCK--B- 31PRT3A   |
| M83513/16-F02*N   | MCK--B- 37PRT3A   |
| M83513/16-A02*P   | MCK--P- 9PRT3A    |
| M83513/16-B02*P   | MCK--P- 15PRT3A   |
| M83513/16-C02*P   | MCK--P- 21PRT3A   |
| M83513/16-D02*P   | MCK--P- 25PRT3A   |
| M83513/16-E02*P   | MCK--P- 31PRT3A   |
| M83513/16-F02*P   | MCK--P- 37PRT3A   |
| M83513/16-A03*N   | MCK--B- 9PRT3B    |
| M83513/16-B03*N   | MCK--B- 15PRT3B   |
| M83513/16-C03*N   | MCK--B- 21PRT3B   |
| M83513/16-D03*N   | MCK--B- 25PRT3B   |
| M83513/16-E03*N   | MCK--B- 31PRT3B   |
| M83513/16-F03*N   | MCK--B- 37PRT3B   |
| M83513/16-A03*P   | MCK--P- 9PRT3B    |
| M83513/16-B03*P   | MCK--P- 15PRT3B   |
| M83513/16-C03*P   | MCK--P- 21PRT3B   |
| M83513/16-D03*P   | MCK--P- 25PRT3B   |
| M83513/16-E03*P   | MCK--P- 31PRT3B   |
| M83513/16-F03*P   | MCK--P- 37PRT3B   |
| M83513/17-G01*N   | MCK--B- 51PRT3    |
| M83513/17-G01*P   | MCK--P- 51PRT3    |
| M83513/17-G02*N   | MCK--B- 51PRT3A   |
| M83513/17-G02*P   | MCK--P- 51PRT3A   |
| M83513/17-G03*N   | MCK--B- 51PRT3B   |
| M83513/17-G03*P   | MCK--P- 51PRT3B   |
| M83513/18-H01*N   | MCK--B-100PRT3    |
| M83513/18-H01*P   | MCK--P-100PRT3    |
| M83513/18-H02*N   | MCK--B-100PRT3A   |

5 Pin and Socket Connectors

MCK (Metal Shell) (Continued)

| Military Part No. | MICRODOT Part No. | Military Part No. | MICRODOT Part No. | Military Part No. | MICRODOT Part No. |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| M83515/18-H02*P   | MCK-**-P-100PRT3A | M83513/21-H03*N   | MCK-**-B-100SRT3B | M83513/24-H03*P   | MCK-**-P-100PST1B |
| M83513/18-H03*N   | MCK-**-B-100PRT3B | M83513/21-H03*P   | MCK-**-P-100SRT3B | M83513/25-A01*N   | MCK-**-B- 9SST1   |
| M83513/18-H03*P   | MCK-**-P-100PRT3B | M83513/22-A01*N   | MCK-**-B- 9PST1   | M83513/25-B01*N   | MCK-**-B- 15SST1  |
| M83513/19-A01*N   | MCK-**-B- 9SRT3   | M83513/22-B01*N   | MCK-**-B- 15PST1  | M83513/25-C01*N   | MCK-**-B- 21SST1  |
| M83513/19-B01*N   | MCK-**-B- 15SRT3  | M83513/22-C01*N   | MCK-**-B- 21PST1  | M83513/25-D01*N   | MCK-**-B- 25SST1  |
| M83513/19-C01*N   | MCK-**-B- 21SRT3  | M83513/22-D01*N   | MCK-**-B- 25PST1  | M83513/25-E01*N   | MCK-**-B- 31SST1  |
| M83513/19-D01*N   | MCK-**-B- 25SRT3  | M83513/22-E01*N   | MCK-**-B- 31PST1  | M83513/25-F01*N   | MCK-**-B- 37SST1  |
| M83513/19-E01*N   | MCK-**-B- 31SRT3  | M83513/22-F01*N   | MCK-**-B- 37PST1  | M83513/25-A01*P   | MCK-**-P- 9SST1   |
| M83513/19-F01*N   | MCK-**-B- 37SRT3  | M83513/22-A01*P   | MCK-**-P- 9PST1   | M83513/25-B01*P   | MCK-**-P- 15SST1  |
| M83513/19-A01*P   | MCK-**-P- 9SRT3   | M83513/22-B01*P   | MCK-**-P- 15PST1  | M83513/25-C01*P   | MCK-**-P- 21SST1  |
| M83513/19-B01*P   | MCK-**-P- 15SRT3  | M83513/22-C01*P   | MCK-**-P- 21PST1  | M83513/25-D01*P   | MCK-**-P- 25SST1  |
| M83513/19-C01*P   | MCK-**-P- 21SRT3  | M83513/22-D01*P   | MCK-**-P- 25PST1  | M83513/25-E01*P   | MCK-**-P- 31SST1  |
| M83513/19-D01*P   | MCK-**-P- 25SRT3  | M83513/22-E01*P   | MCK-**-P- 31PST1  | M83513/25-F01*P   | MCK-**-P- 37SST1  |
| M83513/19-E01*P   | MCK-**-P- 31SRT3  | M83513/22-F01*P   | MCK-**-P- 37PST1  | M83513/25-A02*N   | MCK-**-B- 9SST1A  |
| M83513/19-F01*P   | MCK-**-P- 37SRT3  | M83513/22-A02*N   | MCK-**-B- 9PST1A  | M83513/25-B02*N   | MCK-**-B- 15SST1A |
| M83513/19-A02*N   | MCK-**-B- 9SRT3A  | M83513/22-B02*N   | MCK-**-B- 15PST1A | M83513/25-C02*N   | MCK-**-B- 21SST1A |
| M83513/19-B02*N   | MCK-**-B- 15SRT3A | M83513/22-C02*N   | MCK-**-B- 21PST1A | M83513/25-D02*N   | MCK-**-B- 25SST1A |
| M83513/19-C02*N   | MCK-**-B- 21SRT3A | M83513/22-D02*N   | MCK-**-B- 25PST1A | M83513/25-E02*N   | MCK-**-B- 31SST1A |
| M83513/19-D02*N   | MCK-**-B- 25SRT3A | M83513/22-E02*N   | MCK-**-B- 31PST1A | M83513/25-F02*N   | MCK-**-B- 37SST1A |
| M83513/19-E02*N   | MCK-**-B- 31SRT3A | M83513/22-F02*N   | MCK-**-B- 37PST1A | M83513/25-A02*P   | MCK-**-P- 9SST1A  |
| M83513/19-F02*N   | MCK-**-B- 37SRT3A | M83513/22-A02*P   | MCK-**-P- 9PST1A  | M83513/25-B02*P   | MCK-**-P- 15SST1A |
| M83513/19-A02*P   | MCK-**-P- 9SRT3A  | M83513/22-B02*P   | MCK-**-P- 15PST1A | M83513/25-C02*P   | MCK-**-P- 21SST1A |
| M83513/19-B02*P   | MCK-**-P- 15SRT3A | M83513/22-C02*P   | MCK-**-P- 21PST1A | M83513/25-D02*P   | MCK-**-P- 25SST1A |
| M83513/19-C02*P   | MCK-**-P- 21SRT3A | M83513/22-D02*P   | MCK-**-P- 25PST1A | M83513/25-E02*P   | MCK-**-P- 31SST1A |
| M83513/19-D02*P   | MCK-**-P- 25SRT3A | M83513/22-E02*P   | MCK-**-P- 31PST1A | M83513/25-F02*P   | MCK-**-P- 37SST1A |
| M83513/19-E02*P   | MCK-**-P- 31SRT3A | M83513/22-F02*P   | MCK-**-P- 37PST1A | M83513/25-A03*N   | MCK-**-B- 9SST1B  |
| M83513/19-F02*P   | MCK-**-P- 37SRT3A | M83513/22-A03*N   | MCK-**-B- 9PST1B  | M83513/25-B03*N   | MCK-**-B- 15SST1B |
| M83513/19-A03*N   | MCK-**-B- 9SRT3B  | M83513/22-B03*N   | MCK-**-B- 15PST1B | M83513/25-C03*N   | MCK-**-B- 21SST1B |
| M83513/19-B03*N   | MCK-**-B- 15SRT3B | M83513/22-C03*N   | MCK-**-B- 21PST1B | M83513/25-D03*N   | MCK-**-B- 25SST1B |
| M83513/19-C03*N   | MCK-**-B- 21SRT3B | M83513/22-D03*N   | MCK-**-B- 25PST1B | M83513/25-E03*N   | MCK-**-B- 31SST1B |
| M83513/19-D03*N   | MCK-**-B- 25SRT3B | M83513/22-E03*N   | MCK-**-B- 31PST1B | M83513/25-F03*N   | MCK-**-B- 37SST1B |
| M83513/19-E03*N   | MCK-**-B- 31SRT3B | M83513/22-F03*N   | MCK-**-B- 37PST1B | M83513/25-A03*P   | MCK-**-P- 9SST1B  |
| M83513/19-F03*N   | MCK-**-B- 37SRT3B | M83513/22-A03*P   | MCK-**-P- 9PST1B  | M83513/25-B03*P   | MCK-**-P- 15SST1B |
| M83513/19-A03*P   | MCK-**-P- 9SRT3B  | M83513/22-B03*P   | MCK-**-P- 15PST1B | M83513/25-C03*P   | MCK-**-P- 21SST1B |
| M83513/19-B03*P   | MCK-**-P- 15SRT3B | M83513/22-C03*P   | MCK-**-P- 21PST1B | M83513/25-D03*P   | MCK-**-P- 25SST1B |
| M83513/19-C03*P   | MCK-**-P- 21SRT3B | M83513/22-D03*P   | MCK-**-P- 25PST1B | M83513/25-E03*P   | MCK-**-P- 31SST1B |
| M83513/19-D03*P   | MCK-**-P- 25SRT3B | M83513/22-E03*P   | MCK-**-P- 31PST1B | M83513/25-F03*P   | MCK-**-P- 37SST1B |
| M83513/19-E03*P   | MCK-**-P- 31SRT3B | M83513/22-F03*P   | MCK-**-P- 37PST1B | M83513/26-G01*N   | MCK-**-B- 51SST1  |
| M83513/19-F03*P   | MCK-**-P- 37SRT3B | M83513/23-G01*N   | MCK-**-B- 51PST1  | M83513/26-G01*P   | MCK-**-P- 51SST1  |
| M83513/20-G01*N   | MCK-**-B- 51SRT3  | M83513/23-G01*P   | MCK-**-P- 51PST1  | M83513/26-G02*N   | MCK-**-B- 51SST1A |
| M83513/20-G01*P   | MCK-**-P- 51SRT3  | M83513/23-G02*N   | MCK-**-B- 51PST1A | M83513/26-G02*P   | MCK-**-P- 51SST1A |
| M83513/20-G02*N   | MCK-**-B- 51SRT3A | M83513/23-G02*P   | MCK-**-P- 51PST1A | M83513/26-G03*N   | MCK-**-B- 51SST1B |
| M83513/20-G02*P   | MCK-**-P- 51SRT3A | M83513/23-G03*N   | MCK-**-B- 51PST1B | M83513/26-G03*P   | MCK-**-P- 51SST1B |
| M83513/20-G03*N   | MCK-**-B- 51SRT3B | M83513/23-G03*P   | MCK-**-P- 51PST1B | M83513/27-H01*N   | MCK-**-B-100SST1  |
| M83513/20-G03*P   | MCK-**-P- 51SRT3B | M83513/24-H01*N   | MCK-**-B-100PST1  | M83513/27-H01*P   | MCK-**-P-100SST1  |
| M83513/21-H01*N   | MCK-**-B-100SRT3  | M83513/24-H01*P   | MCK-**-P-100PST1  | M83513/27-H02*N   | MCK-**-B-100SST1A |
| M83513/21-H01*P   | MCK-**-P-100SRT3  | M83513/24-H02*N   | MCK-**-B-100PST1A | M83515/27-H02*P   | MCK-**-P-100SST1A |
| M83513/21-H02*N   | MCK-**-B-100SRT3A | M83515/24-H02*P   | MCK-**-P-100PST1A | M83513/27-H03*N   | MCK-**-B-100SST1B |
| M83515/21-H02*P   | MCK-**-P-100SRT3A | M83513/24-H03*N   | MCK-**-B-100PST1B | M83513/27-H03*P   | MCK-**-P-100SST1B |

\*C = Cadmium or N = Nickel (space applications only)  
 \*\*C2 = Cadmium or N1 = Nickel (space applications only)

Introduction

High Density Circular Connectors

Product Facts

- High density, light-weight Multi-Pin Circular Connectors feature a crimp contact retention method, requiring no insertion or removal tools
- Reverse gender available
- Ideal for harsh environment
- Sealed — Silicon rubber grommet/o-ring
- Unsealed — No grommet/o-ring
- Meets MIL Standards (high quality) but is not QPL qualified
- Ideally suited to applications where many conductors must be accommodated in a minimum of space with minimum weight
- MARC Series Connectors are non-magnetic



Our high density, light-weight Multi-Pin Circular Connectors are the industry's most advanced and are ideally suited to applications where many conductors must be accommodated in a minimum of space with minimum weight.

All series of connectors feature a crimp contact retention method, requiring no insertion or removal tools.

The MARC 43 Series Connectors conform to applicable performance requirements of MIL-C-26482 and has seen extensive service on many leading aerospace and ground support equipment programs.

The MARC 53 Series Connectors, designed to conform to the USAF high reliability specification MIL-C-38300, as offers high density connector performance. The positive lock coupling mechanism, combined with our exclusive floating interfacial seal, offers outstanding performance under rigorous service conditions.

The MARC 63 Series Connectors, our Bayonet Coupling Series, accommodates all insert patterns and layouts available in the MARC 43 Series Connectors, MARC 53 Series Connectors, and RMD Series Connectors. All insert assemblies are

completely interchangeable. Lighter in weight and smaller in size than any comparable connector on the market, it requires up to 50% less engagement/separation force. Conversion to bayonet coupling shell from MARC 43 Series Connectors or MARC 53 Series Connectors is done without tools by merely transferring the contacts and insert assemblies into the MARC 63 Series Connectors shell.

The newest addition to the Multi-Pin product line is the MARC 73 Series Connectors. The twist pin Circular Connector combines the lightweight, bayonet



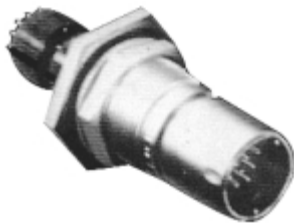
**Introduction** (Continued)

coupling feature of the MARC 63 Series Connectors with the twist pin high density, center-to-center contact spacing of 0.065 [1.65] inch. The utilization of 22 AWG twist pin and socket contacts provide for 50% greater contact densities

than presently offered in the MARC 43 Series Connectors, MARC 53 Series Connectors, or MARC 63 Series Connectors.

The MQR Series is a line of circular quick disconnect connectors for rugged environmental use.

Consult Tyco Electronics for detailed information.



**SHM Receptacle  
MARC 43 Series Connectors &  
MARC 53 Series Connectors**



**Mated MARC 53  
Series Connectors**



**SHM Receptacle  
MARC 43 Series Connectors &  
MARC 53 Series Connectors**



**Mated MARC 63 Series Connectors**



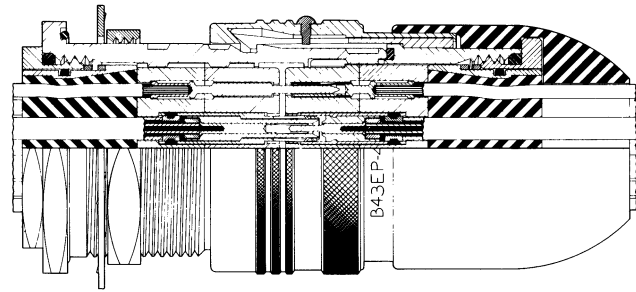
**Mated MARC 43 Series  
Connectors**

**MARC 43 Series Connectors**

**General Information**

A high density (.080 [2.03] contact centers), lightweight, subminiature, cylindrical connector series featuring crimp contacts and fingertip, push-pull, quick disconnect coupling. This series conforms to the applicable performance requirements of MIL-C-26482 and is available in unsealed, environmentally sealed, and hermetic types.

A large assortment in insert arrangements — accommodating AWG 12 through 32 gauge wire and miniature coaxial cables — is available for the design engineer's choice. The contacts are



retained by shoulder entrapment and can be crimped with the standard M22520 tools, using appropriate locators. This proven series of connectors has a long history of outstanding performance

on many military and aerospace programs. MARC 43 Series Connectors are ideal for applications where high performance must be achieved at low cost.

**Materials and Finishes**

MARC 43 Series Connector housings and quick disconnect couplings are machined from bar stock aluminum to combine maximum strength with minimum weight. Threaded couplings are machined from non-magnetic, stainless steel bar stock for durability of the coupling threads. Contacts are manufactured from high conductivity copper alloys which have been selected for low contact resistance over the operat-

ing range of the connectors. Inserts are molded from flame-resistant, glass-filled diallyl phthalate, meeting MIL-M-14 requirements. All resilient parts are made of high temperature, silicone rubbers. Fuel resistant compounds are used where swelling affects the performance of the connector. All materials are carefully selected for their non-magnetic properties.

connector housings and quick disconnect couplings. For threaded coupling applications, aluminum components are hard, black anodized, and stainless steel plug coupling is passivated with black oxide finish. Conductive finish modifications include gold, cadmium, and iridium finishes. Contacts are gold plated per MIL-G-45204 requirements. See page 5071 for modification information.

The standard finish is clear, non-conductive anodize on

**Service and Performance Data**

**I. Electrical — Electrical Ratings**

| Contact Size | Current Rating                    |  | Dielectric Withstanding Voltage (RMS) | Working Voltage |                            |
|--------------|-----------------------------------|--|---------------------------------------|-----------------|----------------------------|
|              | Amperes, Max., +27°C <sup>1</sup> |  |                                       | Sea Level       | 70,000 ft. [21,336 m] Alt. |
| 22 AWG       | 5 amps                            |  | 1000                                  | 750             | 300                        |
| 16 AWG       | 20 amps                           |  | 1000                                  | 750             | 300                        |
| 12 AWG       | 50 amps                           |  | 1000                                  | 750             | 300                        |
| 50 ohm       | 3 amps                            |  | 1000                                  | 750             | 300                        |
| 75 ohm       | 3 amps                            |  | 1250                                  | 1000            | 300                        |
| 95 ohm       | 3 amps                            |  | 1500                                  | 1250            | 300                        |

<sup>1</sup> Consult nomograph.

**II. Mechanical — Durability: 500 Cycles Mate/Unmate. Coupling/Uncoupling Forces and Tightening Torques:**

| Shell Size | Coupling/ Uncoupling Force (In-Lbs.) Max. | Tightening Torque (In-Lbs.) |                           |
|------------|---|-----------------------------|---------------------------|
|            |   | Retaining Nut               | Mounting Nut              |
| A          | 13 [57.8 N]                               | 20, Max. [2.26 Nm]          | 30-45 [3.39 Nm – 5.08 Nm] |
| B          | 17 [75.6 N]                               | 20, Max. [2.26 Nm]          | 40-55 [4.52 Nm – 6.21 Nm] |
| C          | 21 [93.4 N]                               | 20, Max. [2.26 Nm]          | 55-70 [6.21 Nm – 7.91 Nm] |

Operating Temperature: -85°F to 257°F [-65°C to +125°C].

| Contact Size    | Wire Size  | Conductor Dia. (Stranded) <sup>1</sup> | Dielectric Dia. (Teflon) | Shield Dia.            | Jacket Dia. <sup>2</sup> |
|-----------------|------------|--|--------------------------|------------------------|--------------------------|
| 22              | 22, 24, 26 | .019-.032<br>.482-.813                 | —                        | —                      | .039-.054<br>.990-1.37   |
| 16 <sup>3</sup> | 16, 18, 20 | .038-.061<br>.965-1.55                 | —                        | —                      | .065-.081<br>1.65-2.06   |
| 12              | 12 AWG     | .071-.093<br>1.80-2.36                 | —                        | —                      | .096-.120<br>2.44-3.05   |
| 50 ohm          | 50 ohm     | .013<br>.330 Max.                      | .032-.036<br>.813-.914   | .048-.054<br>1.22-1.37 | .065-.087<br>1.65-2.21   |
| 75 ohm          | 75 ohm     | .013<br>.330 Max.                      | .060-.066<br>1.52-1.68   | .078-.084<br>1.98-2.13 | .096-.109<br>2.44-2.77   |
| 95 ohm          | 95 ohm     | .013<br>.330 Max.                      | .100-.104<br>2.54-2.64   | .115-.123<br>2.92-3.12 | .137-.154<br>3.48-3.91   |

<sup>1</sup> Tolerance of conductor diameters required for a reliable crimp. Smaller sizes readily accommodated — consult Tyco Electronics.

<sup>2</sup> Smaller jacketed cable can be accommodated but environmental seal may be impaired. Smooth extruded jacket should be used for consistent wire sealing.

<sup>3</sup> Size 16 AWG Contact for size 20 AWG Wire — Use Tool 010-0080-0000.

**Test Data**

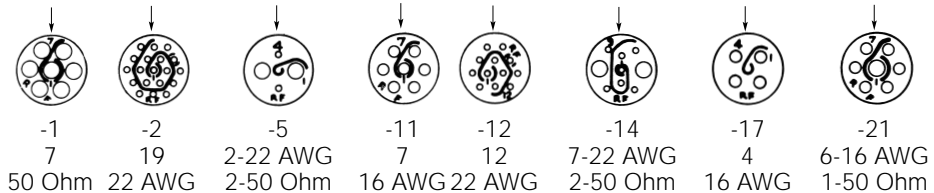
MARC 43 Series Connectors meet the applicable performance requirements of specification MIL-C 26482 (Navy) to include the following selected test parameters listed below:

| DESCRIPTION<br>MIL-C-26482 Test Para                              | TEST REQUIREMENTS  |
|---|--|
| <b>Insulation Resistance, Room and High Temp.,</b><br>Para. 4.7.3 | Insulation resistance of unmated connectors shall be 5000 megohms, minimum at room temperature and 2000 megohms, minimum, at 257°F [+125°C] when measured per MIL-STD-202, Method 302, Test Condition B.   |
| <b>Dielectric Withstanding Voltage,</b><br>Para. 4.7.4            | No evidence of dielectric breakdown or flashover when mated and unmated plugs are subjected to 1000 volts, rms, per MIL-STD-202, Method 301.   |
| <b>Durability,</b><br>Para. 4.7.9                                 | Plugs and receptacles designed to withstand up to 500 cycles of engagement and separation without detrimental electrical or mechanical damage to the connectors.   |
| <b>Corrosion,</b><br>Para. 4.7.10                                 | Unmated plugs and receptacles shall show no exposure of basis metal due to corrosion which would affect electrical or mechanical performance of the connectors after subjection to 24 hours exposure to salt spray atmosphere per MIL-STD 202, Method 101.   |
| <b>Sweep Vibration,</b><br>Mated, Para. 4.7.11                    | Mated connectors shall show no circuit interruptions greater than 10 microseconds during 12 hours vibration to include six sweeps in two axes at -67°F [-55°C], room temperature, and 257°F [+125°C] per MIL-STD-202, Method 204, Test Condition B. Post inspection shall show no detrimental cracking, breaking, or loosening of parts. |
| <b>Moisture Resistance,</b><br>Para. 4.7.13 and 4.7.13.1          | The insulation resistance of mated connectors shall exceed 100 megohms after subjection to moisture resistance testing per MIL-STD-202, Method 106.  |
| <b>Contact Retention,</b><br>Para. 4.7.16                         | Contacts shall withstand 15 lbs [66.7 N] axial load without axial displacement in excess of 0.012 [0.305] or damage to contacts or inserts when the axial load is applied to the mating end of the contacts in unmated plugs and receptacles at a rate of approximately 1 lb/sec.  |

**Contact Arrangements<sup>1</sup>**

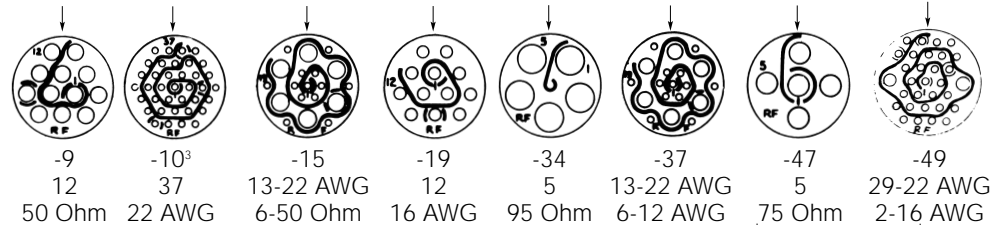
**"A Size" Insert Layouts  
(A = ) Shell Size 9**

Insert Arrangement<sup>2</sup>  
Number of Contacts  
Contact Size



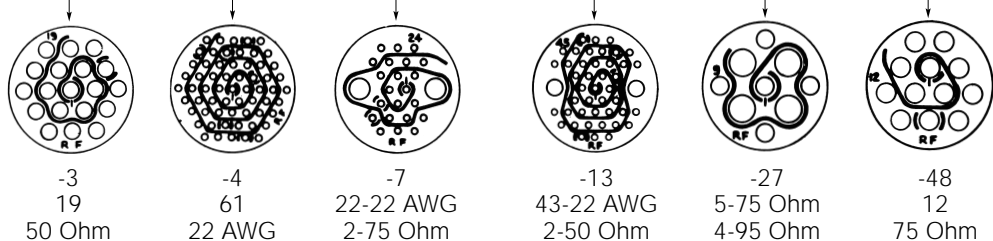
**"B Size" Insert Layouts  
(B = ) Shell Size 12**

Insert Arrangement<sup>2</sup>  
Number of Contacts  
Contact Size



**"C Size" Insert Layouts  
(C = ) Shell Size 15**

Insert Arrangement<sup>2</sup>  
Number of Contacts  
Contact Size



**Notes:** <sup>1</sup> Views shown are front face view of receptacles. Front face view of plugs is mirror image of that shown.  
<sup>2</sup> Arrow (↑) indicates insert top or vertical position in relation to top or vertical position of connector housings.  
<sup>3</sup> Arrangement also available in hermetic seal receptacles.

**Part Number and Ordering Information**

**MARC 43 Series Connectors (Continued)**

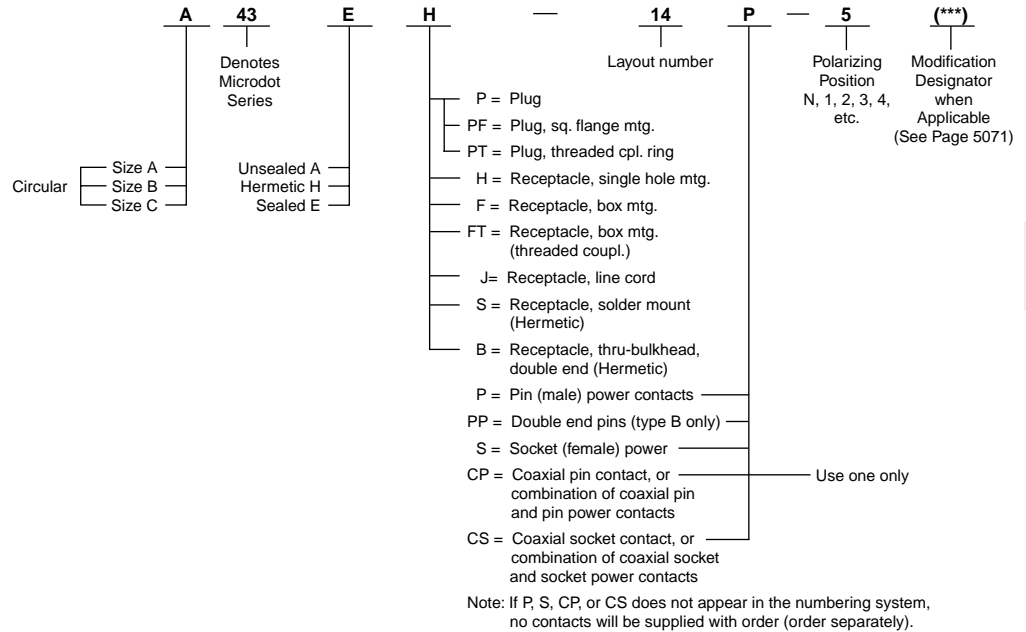
MARC 43 Series Connector part numbers indicate size, shape, insert layout, type of seal, style of contact and polarization. **Note:** Pin or socket (power or coaxial) contacts may be used in either plugs or receptacles. However, it is recommended that pins be placed in the receptacle when possi-

ble to take advantage of our "scuff-proof" design. (The style—pin or socket—of a coaxial contact refers to the outer contact body.)

**Alternate Keying.** Standard alternate polarizing key positions are shown below. Additional polarizing keyways are available upon request.

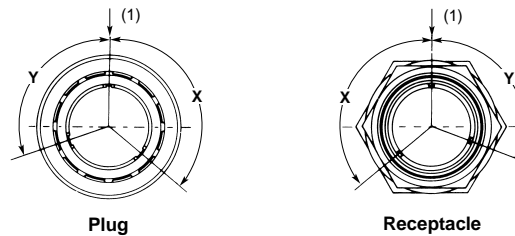
**Supplemental Accessory Hardware.** We also manufacture supplemental accessory hardware (protective covers, cable clamps, etc.) to adapt these connectors to almost any application. For modifications to fit your requirements, contact Tyco Electronics.

**Typical Part Number**



**Polarizing Key Positions**

All MARC 43 Series Connector multi-pin plugs and receptacles are available in alternate polarizing positions as listed below:



<sup>(1)</sup> Arrow (↓) indicates top or vertical position (master key-keyway) and coincides with top or vertical position of insert. This relationship remains constant with alternate polarizing key positions.

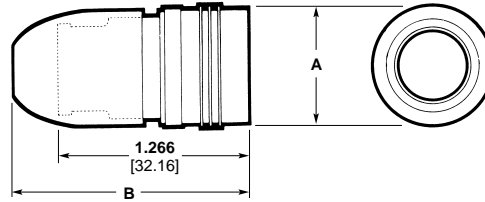
N—for Normal

| Size A    |     |     | Size B     |     |     | Size C     |     |     |
|-----------|-----|-----|------------|-----|-----|------------|-----|-----|
| Part No.  | X°  | Y°  | Part No.   | X°  | Y°  | Part No.   | X°  | Y°  |
| A43****N  | 130 | 110 | B43****N   | 130 | 110 | C43****N   | 130 | 110 |
| A43****-1 | 130 | 150 | B43****-1  | 130 | 90  | C43****-1  | 130 | 90  |
| A43****-2 | 90  | 110 | B43****-2  | 130 | 145 | C43****-2  | 130 | 150 |
| A43****-3 | 210 | 110 | B43****-3  | 105 | 110 | C43****-3  | 130 | 170 |
| A43****-4 | 130 | 35  | B43****-4  | 155 | 110 | C43****-4  | 190 | 110 |
| A43****-5 | 90  | 230 | B43****-5  | 80  | 110 | C43****-5  | 150 | 110 |
|           |     |     | B43****-6  | 190 | 110 | C43****-6  | 90  | 110 |
|           |     |     | B43****-7  | 130 | 170 | C43****-7  | 70  | 110 |
|           |     |     | B43****-8  | 215 | 110 | C43****-8  | 70  | 230 |
|           |     |     | B43****-9  | 80  | 230 | C43****-9  | 90  | 230 |
|           |     |     | B43****-10 | 130 | 30  | C43****-10 | 210 | 110 |
|           |     |     |            |     |     | C43****-11 | 30  | 110 |
|           |     |     |            |     |     | C43****-12 | 250 | 30  |
|           |     |     |            |     |     | C43****-13 | 130 | 30  |
|           |     |     |            |     |     | C43****-14 | 30  | 230 |

**Configurations**

**Type P**

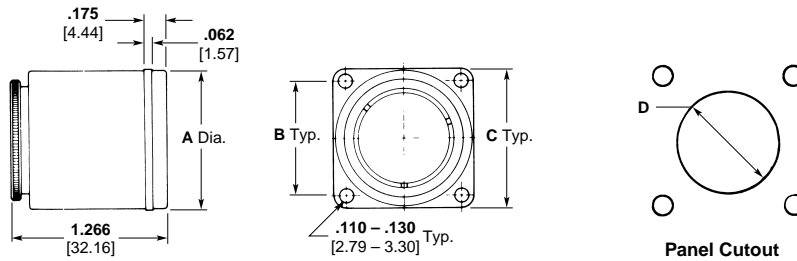
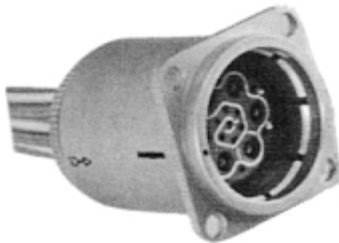
Straight Plug, Push-Pull Coupling, Sealed or Unsealed (Mates with Receptacles, All Types)



| Shell Size | Dimensions     |                |
|------------|----------------|----------------|
|            | A              | B              |
| A          | .766<br>19.46  | 1.578<br>40.08 |
| B          | .953<br>24.21  | 1.656<br>42.06 |
| C          | 1.141<br>28.98 | 1.75<br>44.45  |

**Type PF**

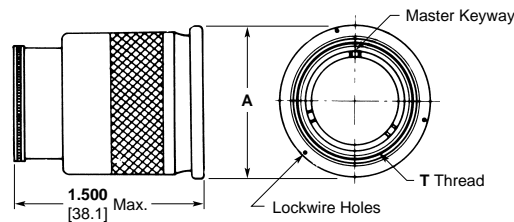
Straight Plug, Square Flange Mounting, Push-Pull Coupling, Sealed or Unsealed (Mates with Receptacles, all Types.)



| Shell Size | Dimensions     |               |                |                |
|------------|----------------|---------------|----------------|----------------|
|            | A              | B             | C              | D              |
| A          | .730<br>18.54  | .664<br>16.86 | .875<br>22.23  | .750<br>19.05  |
| B          | .920<br>23.37  | .786<br>19.96 | 1.000<br>25.40 | .940<br>23.88  |
| C          | 1.110<br>28.19 | .924<br>23.47 | 1.125<br>28.58 | 1.130<br>28.70 |

**Type PT**

Straight Plug, Threaded Coupling, Sealed or Unsealed (Mates with Receptacles, Types H, HH, and FT)



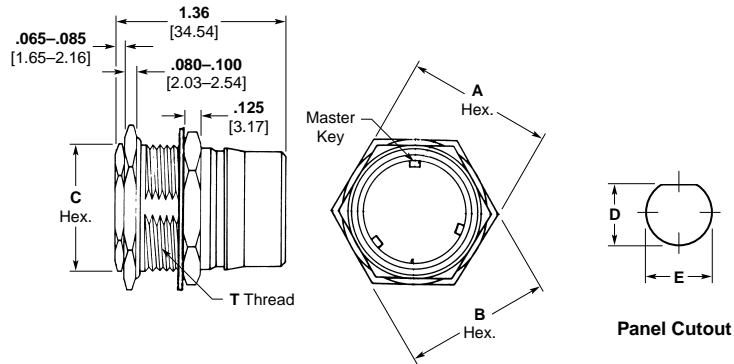
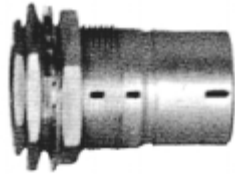
| Shell Size | Dimensions     |              |
|------------|----------------|--------------|
|            | A              | T (Class 2B) |
| A          | .813<br>20.65  | 5/8-32 UN    |
| B          | 1.000<br>25.40 | 13/16-28 UN  |
| C          | 1.19<br>30.23  | 1-28 UN      |

#### MARC 43 Series Connectors (Continued)

#### Configurations (Continued)

##### Type H

Receptacle, Single Hole Mounting  
Sealed or Unsealed  
(Mates with Plugs, Types P, PF and PT)

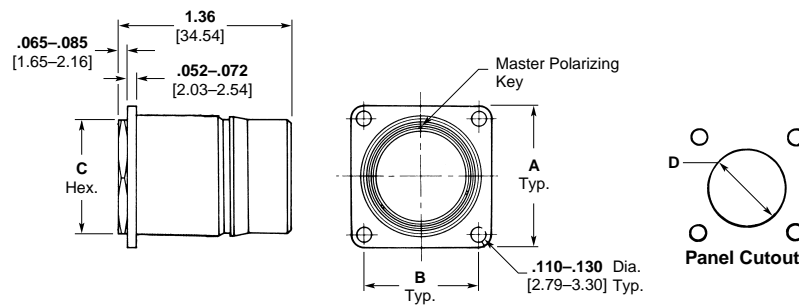
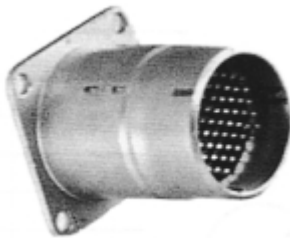


| Shell Size | Dimensions     |                |               |                          |                           | T (Class 2A) |
|------------|----------------|----------------|---------------|--------------------------|---------------------------|--------------|
|            | A              | B              | C             | D                        | E                         |              |
| A          | .75<br>19.05   | .687<br>17.45  | .562<br>14.27 | .607-.611<br>15.42-15.52 | .625-.629<br>15.8-15.97   | 5/8-32 UN    |
| B          | .937<br>23.80  | .875<br>22.23  | .75<br>19.05  | .794-.798<br>20.17-20.27 | .812-.816<br>20.62-20.72  | 13/16-28 UN  |
| C          | 1.125<br>28.58 | 1.062<br>26.97 | .875<br>22.23 | .975-.979<br>24.77-24.87 | .999-1.003<br>25.37-25.47 | 1-28 UN      |

F: .313 [7.95] max. panel for P & PF; PT: .109 [2.77] max. panel.

##### Type 43F

Receptacle, Box Mounting,  
Sealed or Unsealed (Mates with Plugs, Types P and PF)



| Shell Size | Dimensions     |               |               |               |
|------------|----------------|---------------|---------------|---------------|
|            | A              | B             | C             | D             |
| A          | .875<br>22.23  | .594<br>15.08 | .562<br>14.27 | .595<br>15.11 |
| B          | 1.000<br>25.40 | .786<br>19.96 | .75<br>19.05  | .783<br>19.89 |
| C          | 1.125<br>28.58 | .906<br>23.01 | .875<br>22.23 | .960<br>24.38 |

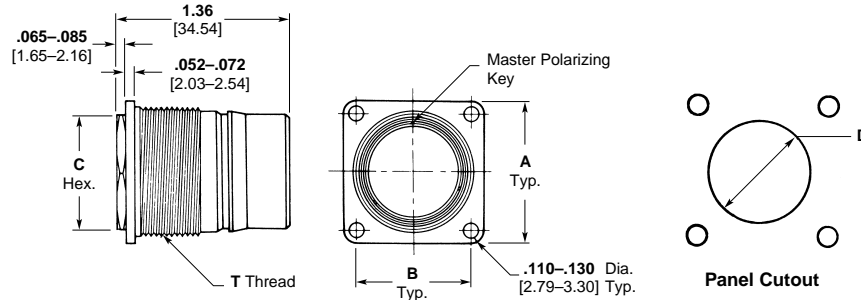
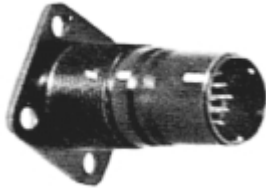
**Note:** Unless otherwise shown, tolerances are: Decimals  $\pm 0.015$  [ $\pm 381$ ], fractions  $\pm 1/32$ .

#### MARC 43 Series Connectors (Continued)

#### Configurations (Continued)

##### Type FT

Receptacle, Box Mounting, Threaded Coupling, Sealed or Unsealed (Mates with Plugs, Types PT, P and PF)

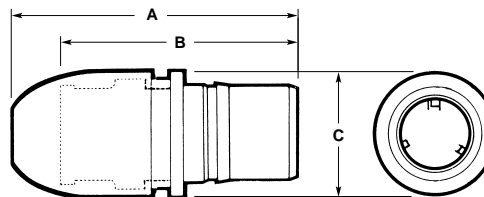


| Shell Size | Dimensions     |               |               |                      |
|------------|----------------|---------------|---------------|----------------------|
|            | A              | B             | C             | T (Class 2A)         |
| A          | .875<br>22.23  | .594<br>15.08 | .562<br>14.27 | 5/8-32 UN<br>16.38   |
| B          | 1.000<br>25.40 | .786<br>19.96 | .75<br>19.05  | 13/16-28 UN<br>21.13 |
| C          | 1.125<br>28.58 | .906<br>23.01 | .875<br>22.23 | 1-28 UN<br>25.90     |

Max. panel thickness is .125 [3.18].

##### Type J

Receptacle, Line Cord, Sealed or Unsealed (Mates with Plugs, Types P and PF)

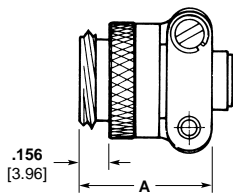


| Shell Size | Dimensions     |               |                |
|------------|----------------|---------------|----------------|
|            | A              | B             | C              |
| A          | 1.703<br>43.26 | 1.36<br>34.54 | .766<br>19.46  |
| B          | 1.781<br>45.24 | 1.36<br>34.54 | .953<br>24.21  |
| C          | 1.875<br>47.63 | 1.36<br>34.54 | 1.141<br>28.98 |

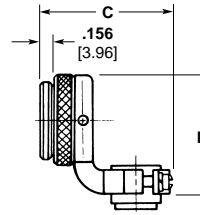
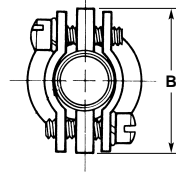
**Note:** Unless otherwise shown, tolerances are: Decimals  $\pm 0.015$  [ $\pm 381$ ], fractions  $\pm 1/32$ .

Accessories

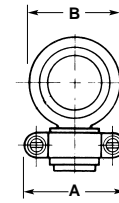
Cable Clamps



Straight



Right-Angle



| Shell Size | Part No.      | A (Max.)      | B (Max.)       |
|------------|---------------|---------------|----------------|
| A          | 086-0099-00X1 | .704<br>17.88 | .750<br>19.05  |
| B          | 086-0100-00X1 | .773<br>19.63 | .932<br>23.67  |
| C          | 086-0101-00X1 | .829<br>21.05 | 1.078<br>27.38 |

| Shell Size | Part No.      | A (Max.)       | B (Max.)      | C (Max.)       | D (Max.)       |
|------------|---------------|----------------|---------------|----------------|----------------|
| A          | 086-0103-00X1 | .737<br>18.72  | .600<br>15.24 | 1.100<br>27.94 | .879<br>22.33  |
| B          | 086-0104-00X1 | .913<br>23.19  | .770<br>19.55 | 1.250<br>31.75 | 1.067<br>27.10 |
| C          | 086-0105-00X1 | 1.048<br>26.62 | .962<br>24.43 | 1.469<br>37.31 | 1.233<br>31.32 |

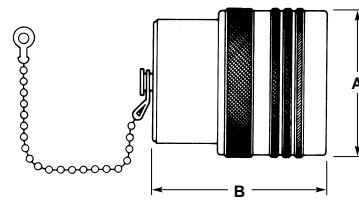
Contacts (see pages 5086 and 5087)

| Contact Size                 | Pin Part No.  | Socket Part No. |
|------------------------------|---------------|-----------------|
| 22 AWG                       | 083-0009-00R4 | 082-0464-00Y9   |
| 16 AWG                       | 083-0158-00R4 | 082-0113-00T1   |
| 12 AWG                       | 083-0173-00R4 | 082-0132-00T1   |
| 50 ohm Coaxial (Solder Type) | 084-0024-00T2 | 084-0027-00T2   |
| 50 ohm Coaxial (Crimp Type)  | 141-1500-0001 | 142-1500-0001   |
| 75 ohm Coaxial               | 084-0025-00T2 | 084-0028-00T2   |
| 95 ohm Coaxial               | 084-0026-00T2 | 084-0029-00T2   |

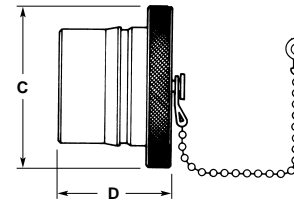
Contact Cavity Sealing Plugs (see page 5088)

| Contact Size   | Sealed Connector Part No. | Unsealed Connector Part No. |
|----------------|---------------------------|-----------------------------|
| 22 AWG         | 086-0055-0000             | 086-0001-0000               |
| 16 AWG         | 086-0056-0000             | 086-0014-0000               |
| 12 AWG         | 086-0057-0000             | 086-0015-0000               |
| 50 ohm Coaxial | 086-0058-0000             | 086-0061-0000               |
| 75 ohm Coaxial | 086-0059-0000             | 086-0062-0000               |
| 95 ohm Coaxial | 086-0060-0000             | 086-0063-0000               |

Protective Covers



Receptacle Cover



Plug Cover

| Shell Size | Receptacle Cover Part No. <sup>1</sup> |               | Plug Cover Part No. <sup>1</sup> |               | Dimensions (Max.) |               |                |               |
|------------|--|---------------|----------------------------------|---------------|-------------------|---------------|----------------|---------------|
|            | With Chain                             | Without Chain | With Chain                       | Without Chain | A                 | B             | C              | D             |
| A          | 086-0049-00J2                          | 086-0073-00P1 | 086-0052-00J2                    | 086-0076-00P1 | .766<br>19.46     | .950<br>24.13 | .969<br>24.62  | .913<br>23.19 |
| B          | 086-0050-00J2                          | 086-0074-00P1 | 086-0053-00J2                    | 086-0077-00P1 | .953<br>24.21     | .950<br>24.13 | 1.156<br>29.36 | .913<br>23.19 |
| C          | 086-0051-00J2                          | 086-0075-00P1 | 086-0054-00J2                    | 086-0078-00P1 | 1.141<br>28.98    | .950<br>24.13 | 1.344<br>34.14 | .913<br>23.19 |

<sup>1</sup> For threaded plug (PT) and receptacle (FT) covers, consult Tyco Electronics. Wire rope/lanyard attachments and plastic protective caps also available, consult Tyco Electronics.

Modifications

The MARC 43 Series Connector modification identification system provides alteration of standard MARC 43 Series Connectors to include special finishes, accessories, MARC 53 Series Connector housings, and custom quality assurance provisions — processing, testing, serialization, traceability. Consult your sales representative or Tyco Electronics for additional modification information.

Standard modifications include:

- (009): MARC 43 Series Connector, anodized finish — black.
- (048): MARC 43 Series Connector, iridite finish — gold.
- (056): MARC 43 Series Connector, cadmium plated — clear.
- (057): MARC 43 Series Connector including cable clamp, straight type.
- (078): MARC 43 Series Connector insert arrangement plus MARC 53 Series Connector positive lock coupling.
- (094): MARC 43 Series Connector coaxial insert arrangement to include all-crimp coaxial contacts plus MARC 53 Series Connector positive lock coupling.
- (098): MARC 43 Series Connector connector including cable clamp, right-angle type.



**MARC 53 Series Connectors**

**General Information**

The MARC 53 Series Connector family represents a major advancement in the design of high density (.080 [2.03] contact centers), sub-miniature, power and coaxial contact connectors. The MARC 53 Series Connectors consists of two connector styles — the Military approved MD53 featuring shoulder entrapped contacts, and the new RMD53 utilizing rear insertable/removable contacts. MARC 53 Series Connectors combine positive lock — the rugged, push-pull, lock-coupling mechanism — with the unique positive seal multiple sealing system.

Positive lock is our new finger-tip, push-pull coupling with the safety lock feature, and is the only connector made with positive "blind mating" indication. When the plug is fully engaged, the coupling ring can be rotated 45° to the safety lock position; if the plug is not

completely engaged, the coupling ring cannot be turned to the safety lock position. Consequently, under "blindmating" conditions, it is always possible to determine if the plug is properly engaged without visual reference, damage, or accidental disengagement.

The environmental integrity is guaranteed by multiple seal construction using silicone rubber "O" rings and a floating, voidless insert construction. The floating insert design allows the inserts to move within the connector housing to control interfacial sealing pressure in spite of tolerance accumulation, and a compression interfacial seal with minimum engaging force. Both the primary "O" ring system and the continuous dielectric construction withstand the MIL-C-38300A altitude breathing test. The sealing system meets the air leakage requirements of not more than 1 cubic inch

of air per hour at a 30 P.S.I. pressure differential. This redundant sealing method is indicative of the inherent reliability built into our connectors.

MARC 53 Series Connector power contacts are manufactured from high grade copper alloys, and are designed to be crimped with standard M22520 tooling using subminiature contact locators.

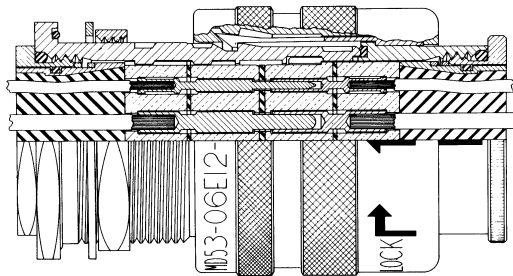
MARC 53 Series Connectors incorporate hard insulators in both the plug and receptacle inserts for exceptional contact stability. Shoulder entrapment positively retains the front insertable MD53 contacts between the front and rear insulators. The new RMD53 contacts are rear insertable and removable and are retained within the connector insulators by clips which can be visually inspected. No insertion or extraction tools are

required for either the MD53 or RMD53 contacts using nominal size wire.

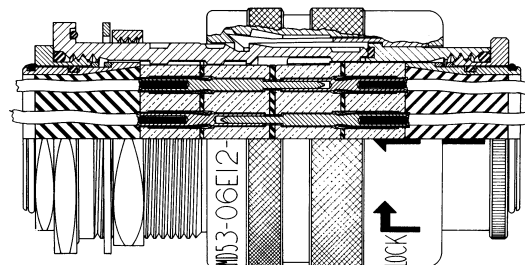
MARC 53 Series Connectors are truly field serviceable... no special tools are required for maintainability. In addition, connector subcomponents damaged through handling or misuse can be procured separately generally without the need to scrap entire connector units.

Weight reductions as high as 67% are achieved without loss of performance.

MARC 53 Series Connectors are available in both environmental and hermetic styles. In addition to the positive lock plug, a threaded coupling plug is also available. Part numbers for configurations offering various finishes and accessories plus other design variations to satisfy special requirements are also available.



**MD53**  
shoulder entrapped contacts



**RMD53**  
rear insertable contacts

**Materials and Finishes**

Housings and quick disconnect couplings are machined from bar stock aluminum to combine maximum strength with minimum weight. Threaded couplings are machined from non-magnetic, stainless steel bar stock for durability of the coupling threads. Contacts are manufactured from high conductivity copper alloys

which have been selected for low contact resistance over the operating range of the connectors. Inserts are molded from flame-resistant, glass-filled diallyl phthalate, meeting MIL-M-14 requirements. All resilient parts are made of high-temperature, silicone elastomers. Fuel resistant compounds are used where swelling affects

the performance of the connector. All materials are selected for their non-magnetic properties.

The standard finish is hard black, non-conductive, anodized finish on connector housings and quick disconnect couplings; stainless steel threaded coupling is passivated with black oxide finish. Conductive finish

modifications include gold finish and electroless nickel finish. Multi-finish modifications for connector plugs include black anodized disconnect coupling with conductive finish on shell grounding members. Contacts are gold plated per MIL-G-45204 requirements. See Page 5081 for modification information.

MARC 53 Series Connectors (Continued)

I. Electrical — Electrical Ratings

| Contact Size | Current Rating (Amperes, Max., 81°F [+27°C]) | Dielectric Withstanding Voltage (RMS) | Working Voltage |                               | Contact Resistance (Millivolts, Max.) |
|--------------|--|---------------------------------------|-----------------|-------------------------------|---------------------------------------|
|              |  |                                       | Sea Level       | 110,000 <sup>1</sup> Ft. Alt. |                                       |
| 22 AWG       | 5  | 1000                                  | 750             | 300                           | 15                                    |
| 16 AWG       | 20   | 1000                                  | 750             | 300                           | 20                                    |

<sup>1</sup> 10,000 ft equals 33,528 m altitude.

Wire Sizes Accommodated

| Contact Size | Cond. Dia. (Stranded) <sup>1</sup> | Jacket Size <sup>2</sup> |
|--------------|------------------------------------|--------------------------|
| 22 AWG       | .019-.032<br>.483-.813             | .039-.054<br>.991-1.37   |
| 16 AWG       | .038-.061<br>.965-1.55             | .065-.081<br>1.65-2.05   |

<sup>1</sup> Tolerance of conductor diameters required for a reliable crimp. Smaller sizes readily accommodated — consult Tyco Electronics.

<sup>2</sup> Smaller jacketed cable can be accommodated but environmental seal may be impaired. Smooth extruded jacket should be used for consistent wire sealing.

Insulation Resistance: 5000 megohms, minimum, at room ambient conditions.

II. Mechanical — Durability: 500 Cycles Mate/Unmate.

Coupling/Uncoupling Forces and Tightening Torques:

| Shell Size | Coupling/ Uncoupling Force (In-Lbs.) Max. | Tightening Torque (In-Lbs.) |                        |
|------------|---|-----------------------------|------------------------|
|            |   | Retaining Nut               | Mounting Nut           |
| 9          | 18 [80.07 N]                              | 20 [2.26 Nm], Max.          | 30-45 [3.39 – 5.08 Nm] |
| 12         | 22 [97.86 N]                              | 20 [2.26 Nm], Max.          | 40-55 [4.52 – 6.21 Nm] |
| 15         | 27 [120.10 N]                             | 20 [2.26 Nm], Max.          | 55-70 [6.21 – 7.91 Nm] |
| 18         | 32 [142.34 N]                             | 20 [2.26 Nm], Max.          | 70-85 [7.91 – 9.60 Nm] |

Operating Temperature: -67°F to 257°F [-55°C to +125°C]  
 Connector Mated Length: MD Plug (06) mated to MD Receptacles (00) (01) (02) (12): 2.031 [51.58], max. RMD Plug (06) mated to RMD Receptacles: 2.217 [56.31], max.

**Test Data**

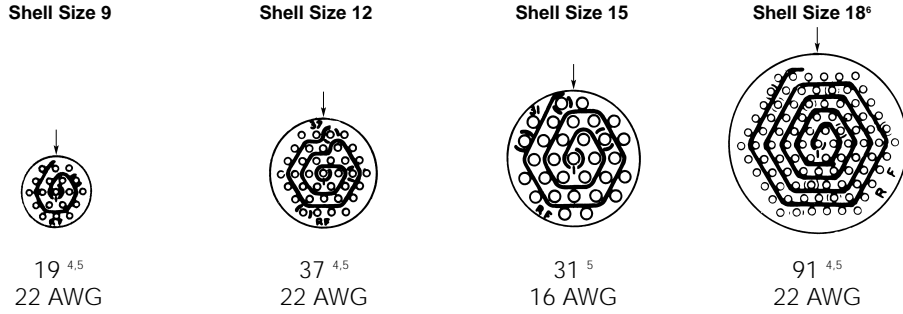
MARC 53 Series Connectors exceed the requirements of specification MIL-C-38300A (USAF) as detailed in the applicable M38300A (USAF) military specification sheets.

MARC 53 Series Connectors meet the following selected test parameters as specified below:

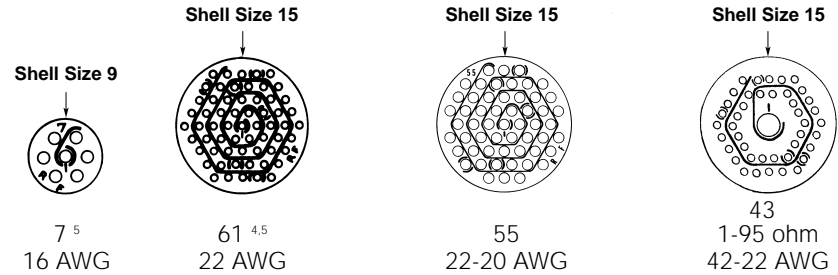
| <b>DESCRIPTION<br/>MIL-C-38300 Test Para</b>                                     | <b>TEST REQUIREMENTS</b>   |
|--|--|
| <b>Contact Retention</b><br>Para. 4.10.3   | MD Contacts shall withstand 15 lbs [66.72 N] axial load and RMD contacts 10 lbs [44.48 N] axial load without axial displacement in excess of 0.012 [.305] or damage to contacts or inserts when the axial load is applied to the mating end of the contacts in unmated plugs and receptacles at a rate of approximately 1 lb/sec. [4.45 N].    |
| <b>Contact Resistance</b><br>Para. 4.10.8  | The potential drop across normally mated contacts shall not exceed 25 mv under room ambient and high temperature service conditions when measured as specified in MIL-C-26636, Fig. 2, with maximum rated current.   |
| <b>Dielectric Withstanding Voltage, Altitude and Sea Level</b><br>Para. 4.10.10  | No evidence of dielectric breakdown or flashover when mated and unmated plugs are subjected to 645 and 180 volts RMS, respectively, at altitudes up to 110,000 feet [33,528 m] and 1000 volts RMS at sea level.  |
| <b>Insulation Resistance, Room and High Temp.</b><br>Para. 4.10.13 and 4.10.13.1 | Insulation resistance of mated plugs and receptacles shall be 5000 megohms, minimum, at room temperature and 1000 megohms, minimum, at 257°F [+125°C] when measured per MIL-STD-202, Method 302, Test Condition B.   |
| <b>Coupling and Uncoupling</b><br>Para. 4.11.3                                   | Plugs and receptacles shall withstand up to 500 cycles of engagement and separation (locking mechanism actuated with each cycle) without detrimental damage to plugs or receptacles or not satisfying subsequent tests of MIL-C-38300.   |
| <b>Fluid Immersion</b><br>Para. 4.11.5   | Mating and unmating forces shall not exceed 27 lbs, [120.10 N] maximum, (15 shell size) after fully wired plugs and receptacles are immersed for 20 hours, each, in hydraulic fluid (MIL-H-5606) and high temperature lubricating oil (MIL-L-9236) followed by a one-hour dry.   |
| <b>Sweep Vibration, Mated</b><br>Para. 4.11.6                                    | Mated connectors shall show no circuit interruptions greater than one microsecond during 12 hours vibration to include six sweeps in each axis at extreme temperatures of -85°F [-65°C] and 257°F [+125°C] per MIL-STD-202, Method 204, Test Condition D. Post inspection shall show no detrimental cracking, breaking, or loosening of parts. |
| <b>Moisture Resistance</b><br>Para. 4.11.8                                       | The insulation resistance of mated connectors shall exceed 1000 megohms after subjection to moisture resistance testing per MIL-STD-202, Method 106, as amended by MIL-C-38300.  |
| <b>Altitude Breathing</b><br>Para. 4.11.12                                       | The insulation resistance of wired and mated connectors shall be 5000 megohms, minimum, and there shall be no flashover or breakdown at a test voltage of 1000 volts RMS after the third cycle and while immersed in 5% salt water solution at 68°F [20°C] and room ambient pressure pressure at 68°F [20°C].                                  |
| <b>Salt Spray</b><br>Para. 4.11.13   | Unmated plugs and receptacles shall show no excessive corrosion which would detrimentally affect the electrical and mechanical performance of the connectors after subjection to 24 hours exposure to salt spray atmosphere per MIL-STD-202, Method 101.   |

MARC 53 Series Connectors (Continued)

Contact Arrangements <sup>1,2</sup>



Insert Arrangement <sup>3</sup>  
Number of Contacts  
Contact Size



Insert Arrangement <sup>3</sup>  
Number of Contacts  
Contact Size

<sup>1</sup> Views shown are front face view of receptacles. Front face view of plugs is mirror image of that shown.  
<sup>2</sup> In addition to those inserts shown, MARC 43 Series Connector inserts may be utilized in MARC 53 Series Connector housings. See page 5071, MARC 43 Series Connector modifications.  
<sup>3</sup> Arrow (↑) indicates insert top or vertical position in relation to top or vertical position of connector housings.  
<sup>4</sup> Arrangement also available in RMD style.  
<sup>5</sup> Arrangement also available in hermetic seal receptacles.  
<sup>6</sup> Arrangement available in 06, 00, 01.

Part Number and Ordering Information

MARC 53 Series Connector part numbers indicate size, shape, insert layout, type of seal, style of contact and polarization.

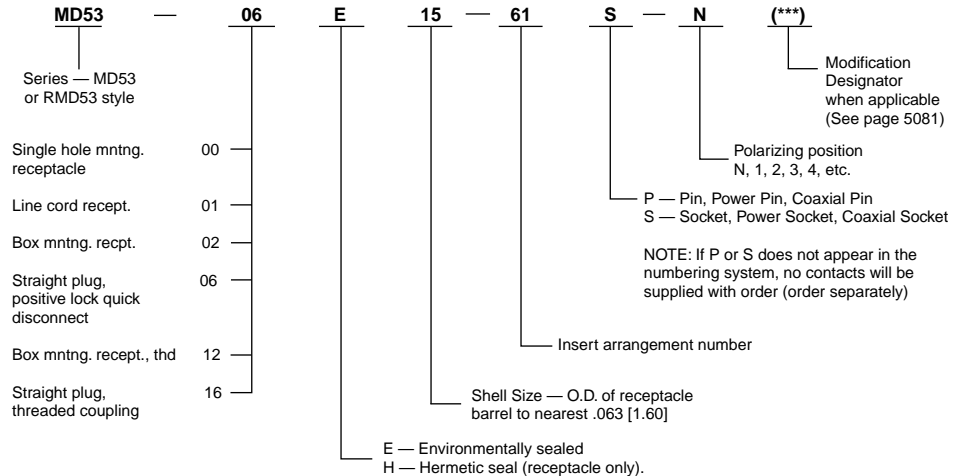
**Note:** Pin or socket (power or coaxial) contacts may be used in either plugs or receptacles. However, it is recommended that pins be placed in the receptacles when possible to take advantage of our "scuff-proof" design.

**Alternate Keying** — Standard alternate polarizing key positions are shown below. Additional polarizing keyways are available upon request.

**Supplemental Accessory Hardware** — We also manu-

facture supplemental accessory hardware (protective covers, shield adapters, etc.) to adapt these connectors to almost any application. For modifications to fit your requirements, contact Tyco Electronics.

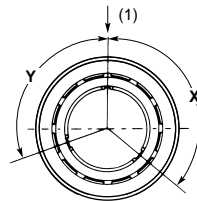
Typical Part Number



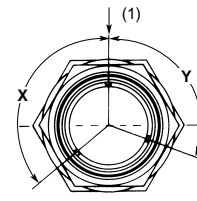
MARC 53 Series Connectors (Continued)

**Polarizing Key Positions**

All of our multi-pin plugs and receptacles are available in alternate polarizing positions as listed below:



**Plug**  
(Shell sizes 9, 12, 15 only)

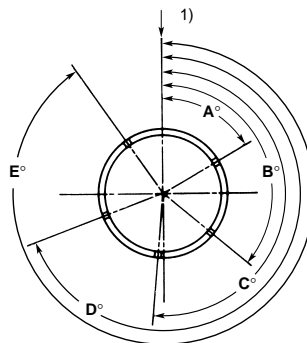


**Receptacle**  
(Shell sizes 9, 12, 15 only)

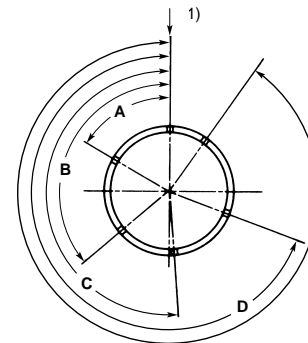
| Shell Size 9        |     |     |
|---------------------|-----|-----|
| Part No.            | X°  | Y°  |
| (R) MD53-***9-***-N | 130 | 110 |
| (R) MD53-***9-***-1 | 130 | 150 |
| (R) MD53-***9-***-2 | 90  | 110 |
| (R) MD53-***9-***-3 | 210 | 110 |
| (R) MD53-***9-***-4 | 130 | 35  |
| (R) MD53-***9-***-5 | 90  | 230 |

| Shell Size 12         |     |     |
|-----------------------|-----|-----|
| Part No.              | X°  | Y°  |
| (R) MD53-***12-***-N  | 130 | 110 |
| (R) MD53-***12-***-1  | 130 | 90  |
| (R) MD53-***12-***-2  | 130 | 145 |
| (R) MD53-***12-***-3  | 105 | 110 |
| (R) MD53-***12-***-4  | 155 | 110 |
| (R) MD53-***12-***-5  | 80  | 110 |
| (R) MD53-***12-***-6  | 190 | 110 |
| (R) MD53-***12-***-7  | 130 | 170 |
| (R) MD53-***12-***-8  | 215 | 110 |
| (R) MD53-***12-***-9  | 80  | 230 |
| (R) MD53-***12-***-10 | 130 | 30  |

| Shell Size 15         |     |     |
|-----------------------|-----|-----|
| Part No.              | X°  | Y°  |
| (R) MD53-***15-***-N  | 130 | 110 |
| (R) MD53-***15-***-1  | 130 | 90  |
| (R) MD53-***15-***-2  | 130 | 150 |
| (R) MD53-***15-***-3  | 130 | 170 |
| (R) MD53-***15-***-4  | 190 | 110 |
| (R) MD53-***15-***-5  | 150 | 110 |
| (R) MD53-***15-***-6  | 90  | 110 |
| (R) MD53-***15-***-7  | 70  | 110 |
| (R) MD53-***15-***-8  | 70  | 230 |
| (R) MD53-***15-***-9  | 90  | 230 |
| (R) MD53-***15-***-10 | 210 | 110 |
| (R) MD53-***15-***-11 | 30  | 110 |
| (R) MD53-***15-***-12 | 250 | 30  |
| (R) MD53-***15-***-13 | 130 | 30  |
| (R) MD53-***15-***-14 | 30  | 230 |



**Plug**  
(Shell size 18 only)



**Receptacle**  
(Shell size 18 only)

| Shell Size 18         |    |     |     |     |     |
|-----------------------|----|-----|-----|-----|-----|
| Part No.              | A° | B°  | C°  | D°  | E°  |
| (R) MD53-***18-***-N  | 60 | 130 | 185 | 250 | 325 |
| (R) MD53-***18-***-1  | 70 | 130 | 205 | 270 | 320 |
| (R) MD53-***18-***-2  | 55 | 130 | 210 | 250 | 310 |
| (R) MD53-***18-***-3  | 50 | 130 | 190 | 235 | 305 |
| (R) MD53-***18-***-4  | 75 | 125 | 190 | 250 | 320 |
| (R) MD53-***18-***-5  | 80 | 150 | 205 | 250 | 300 |
| (R) MD53-***18-***-6  | 50 | 90  | 175 | 250 | 315 |
| (R) MD53-***18-***-7  | 70 | 120 | 175 | 250 | 295 |
| (R) MD53-***18-***-8  | 70 | 130 | 205 | 260 | 325 |
| (R) MD53-***18-***-9  | 35 | 90  | 130 | 215 | 285 |
| (R) MD53-***18-***-10 | 75 | 140 | 210 | 250 | 310 |

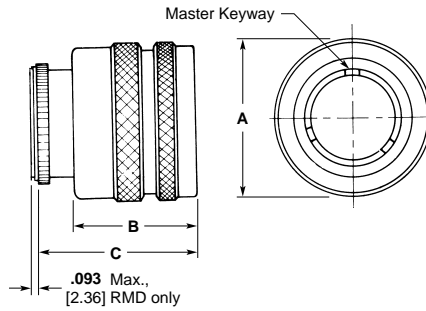
<sup>(1)</sup> Arrow (↑) indicates top or vertical position (master key/keyway) and coincides with top or vertical position of insert shown on page 5067. This relationship remains constant with alternate polarizing key positions.  
(R) Rear insertable and removable.

MARC 53 Series Connectors (Continued)

Configurations

**MD53-06E/RMD53-06E**

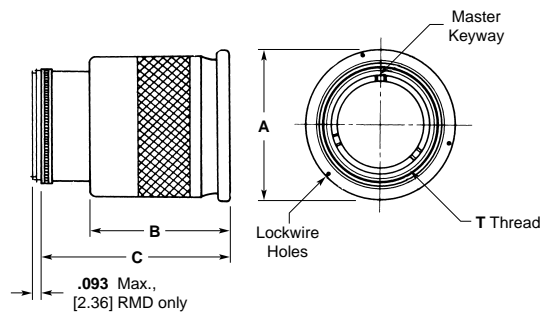
Straight Plug, positive lock  
Coupling, Environmental  
(Mates with Receptacles,  
All Types)



| Shell Size | Dimensions     |               |                |
|------------|----------------|---------------|----------------|
|            | A              | B (Max.)      | C (Max.)       |
| 9          | .890<br>22.60  | 1.000<br>25.4 | 1.281<br>32.54 |
| 12         | 1.078<br>27.38 | 1.000<br>25.4 | 1.281<br>32.54 |
| 15         | 1.262<br>32.05 | 1.000<br>25.4 | 1.281<br>32.54 |
| 18         | 1.577<br>40.06 | 1.000<br>25.4 | 1.281<br>32.54 |

**MD53-16E/RMD53-16E**

Straight Plug, Threaded  
Coupling, Environmental  
(Mates with Receptacles,  
Types 00 and 12; Not avail-  
able in 18 Shell Size)



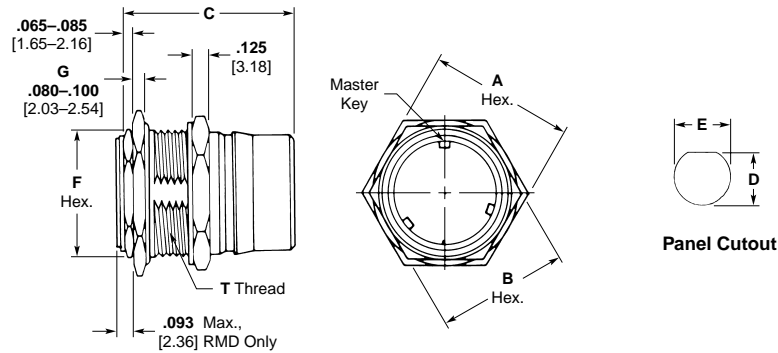
| Shell Size | Dimensions     |                |                |              |
|------------|----------------|----------------|----------------|--------------|
|            | A              | B (Max.)       | C (Max.)       | T (Class 2B) |
| 9          | .812<br>20.62  | 1.125<br>28.57 | 1.500<br>38.1  | 1/8-32UN     |
| 12         | 1.000<br>25.4  | 1.125<br>28.57 | 1.500<br>38.1  | 13/16-28UN   |
| 15         | 1.187<br>30.15 | 1.125<br>28.57 | 1.500<br>38.1  | 1-28UN       |
| 18         | 1.437<br>36.50 | 1.125<br>28.57 | 1.437<br>36.50 | 1-1/4-28UN   |

**MARC 53 Series Connectors (Continued)**

**Configurations (Continued)**

**MD53-00E/RMD53-00E**

Receptacle, Single Hole Mounting, Environmental (Mates with Plugs, Type 06 and 16)

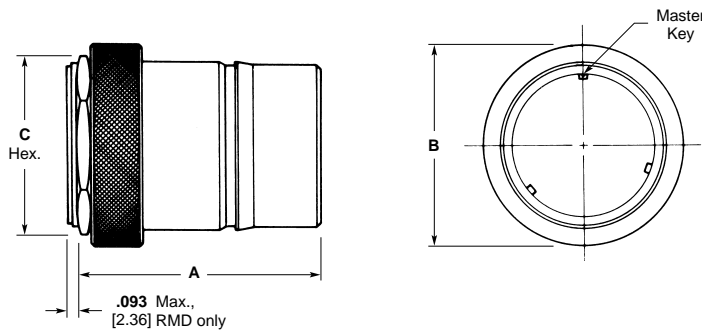


| Shell Size | Dimensions     |                |                |                            |                            |                |              | T (Class 2A) |
|------------|----------------|----------------|----------------|----------------------------|----------------------------|----------------|--------------|--------------|
|            | A              | B              | C              | D                          | E                          | F              | G            |              |
| 9          | .75<br>19.05   | .687<br>17.45  | 1.360<br>34.54 | .607-.611<br>15.42-15.52   | .625-.629<br>15.87-15.97   | .563<br>14.30  | .090<br>2.29 | 5/8-32NS     |
| 12         | .937<br>23.80  | .875<br>22.23  | 1.360<br>34.54 | .794-.798<br>20.17-20.27   | .812-.816<br>20.62-20.73   | .75<br>19.05   | .090<br>2.29 | 13/16-28NS   |
| 15         | 1.125<br>28.58 | 1.062<br>26.97 | 1.360<br>34.54 | .975-.979<br>24.76-24.86   | .999-1.003<br>25.37-25.48  | .875<br>22.23  | .090<br>2.29 | 1-28UNS      |
| 18         | 1.625<br>41.28 | 1.375<br>34.93 | 1.360<br>34.54 | 1.214-1.218<br>30.83-30.94 | 1.251-1.255<br>31.77-31.87 | 1.125<br>28.58 | .125<br>3.18 | 1-1/4-28UN   |

**Note:** .313 [7.95] Maximum Panel Thickness when mated with a positive lock 06 Plug.  
.109 [2.77] Maximum Panel Thickness when mated with threaded 16 Plug.

**MD53-01E/RMD53-01E**

Receptacle, Line Cord, Environmental (Mates with Plug, Type 06)



| Shell Size | Dimensions     |                |                |
|------------|----------------|----------------|----------------|
|            | A (Max.)       | B (Max.)       | C              |
| 9          | 1.360<br>34.54 | .766<br>19.46  | .562<br>14.27  |
| 12         | 1.360<br>34.54 | .953<br>24.21  | .75<br>19.05   |
| 15         | 1.360<br>34.54 | 1.141<br>28.98 | .875<br>22.23  |
| 18         | 1.360<br>34.54 | 1.578<br>40.08 | 1.125<br>28.58 |

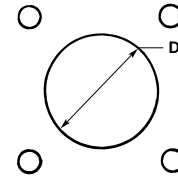
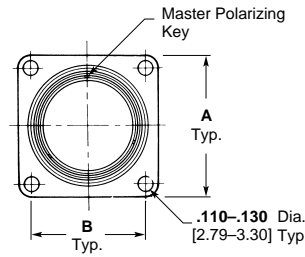
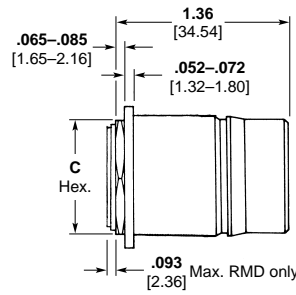
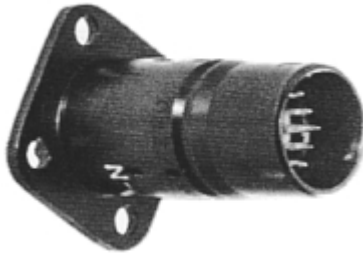
**Note:** Unless otherwise shown, tolerances are: decimals ± .015 [±.381]; fractions ± 1/32.

MARC 53 Series Connectors (Continued)

Configurations (Continued)

**MD53-02E/RMD53-02E**

Receptacle, Box Mounting, Environmental (Mates with Plug, Type 06)



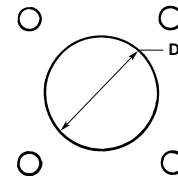
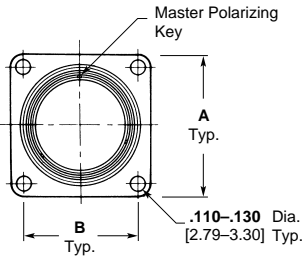
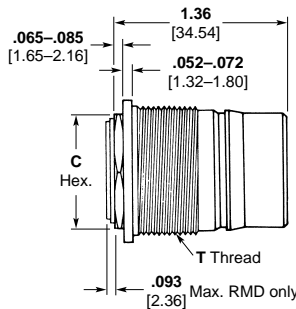
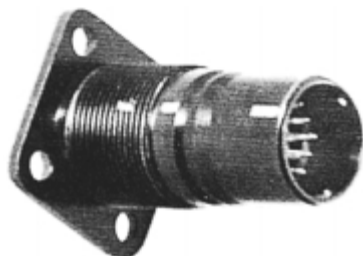
Panel Cutout

.375 [9.53] Max. Panel Thickness for rear-mount applications.

| Shell Size | Dimensions     |                |                |                |
|------------|----------------|----------------|----------------|----------------|
|            | A              | B              | C              | D              |
| 9          | .875<br>22.23  | .594<br>15.09  | .563<br>14.30  | .595<br>15.11  |
| 12         | 1.000<br>25.40 | .786<br>19.96  | .75<br>19.05   | .783<br>19.89  |
| 15         | 1.125<br>28.58 | .906<br>23.01  | .875<br>22.23  | .960<br>24.38  |
| 18         | 1.344<br>34.14 | 1.062<br>26.97 | 1.125<br>28.58 | 1.212<br>30.78 |

**MD53-12E/RMD53-12E**  
Threaded Coupling

Receptacle, Box Mounting, Environmental (Mates with Plugs, Type 06 and 16; not available in 18 Shell Size)



Panel Cutout

.125 [3.18] Max. Panel Thickness when mated with threaded 16 Plug for rear mount applications.

| Shell Size | Dimensions     |               |               |              |                |
|------------|----------------|---------------|---------------|--------------|----------------|
|            | A              | B             | C             | T (Class 2A) | D              |
| 9          | .875<br>22.23  | .594<br>15.09 | .563<br>14.30 | 5/8-32UN     | .645<br>16.38  |
| 12         | 1.000<br>25.40 | .786<br>19.96 | .75<br>19.05  | 13/16-28UN   | .832<br>21.13  |
| 15         | 1.125<br>28.58 | .906<br>23.01 | .875<br>22.23 | 1-28UN       | 1.020<br>25.91 |

Note: Unless otherwise shown, tolerances are: decimals ± .015 [±.381]; fractions ± 1/32.



#### MARC 53 Series Connectors (Continued)

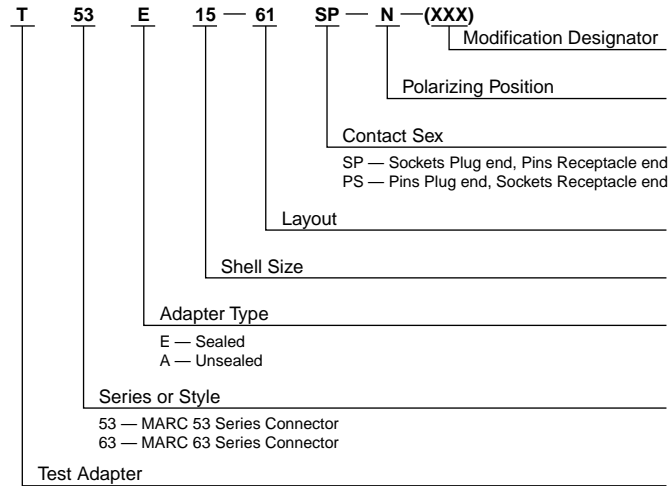
#### Accessories

##### Test Adapter

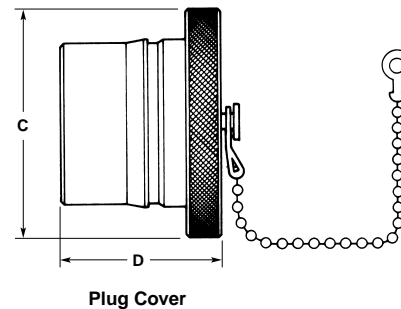
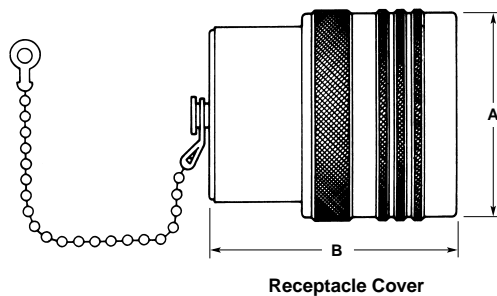
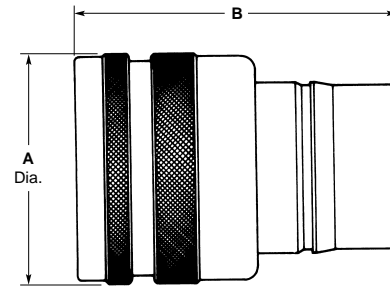
The test adapter accessory is utilized primarily as a connector simulator to preserve the end-use connector where this connector would be subjected to extensive testing, matings, or probings. The test adapter, when mated, provides the exact mating interface as that of the end-use connector and is completely field serviceable.

#### Test Adapter Product Part Number System

##### How to Specify



| Shell Size | Dimension      |                |
|------------|----------------|----------------|
|            | A (Max.)       | B (Max.)       |
| 9          | .906<br>23.01  | 2.670<br>67.82 |
| 12         | 1.094<br>27.79 | 2.670<br>67.82 |
| 15         | 1.281<br>32.54 | 2.670<br>67.82 |
| 18         | 1.594<br>40.49 | 2.670<br>67.82 |



#### Protective Covers

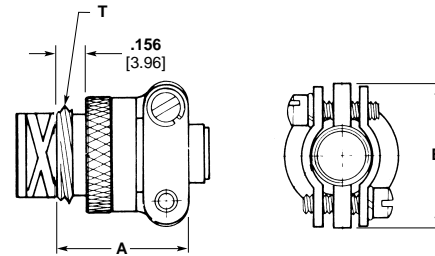
| Shell Size | Receptacle Cover Part No. <sup>1</sup> |               | Plug Cover Part No. <sup>1</sup> |               | Dimensions (Max.) |               |                |               |
|------------|--|---------------|----------------------------------|---------------|-------------------|---------------|----------------|---------------|
|            | With Chain                             | Without Chain | With Chain                       | Without Chain | A                 | B             | C              | D             |
| 9          | 086-0049-00AL                          | 086-0073-00W3 | 086-0052-00L6                    | 086-0076-00P2 | .766<br>19.46     | .950<br>24.13 | .969<br>24.61  | .913<br>23.19 |
| 12         | 086-0050-00AL                          | 086-0074-00W3 | 086-0053-00L6                    | 086-0077-00P2 | .953<br>24.21     | .950<br>24.13 | 1.156<br>29.36 | .913<br>23.19 |
| 15         | 086-0051-00AL                          | 086-0075-00W3 | 086-0054-00L6                    | 086-0078-00P2 | 1.141<br>28.98    | .950<br>24.13 | 1.344<br>34.14 | .913<br>23.19 |
| 18         | 086-0146-00AL                          | 086-0139-00W3 | 086-0147-00L6                    | 086-0140-00P2 | 1.578<br>40.08    | 1.000<br>25.4 | 1.781<br>45.24 | .913<br>23.19 |

<sup>1</sup> For threaded plug (PT) cover, consult Tyco Electronics. Wire rope/lanyard attachments and plastic protective caps also available, consult Tyco Electronics.

Accessories (Continued)

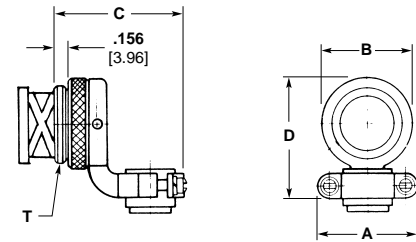
Cable Clamps

| Shell Size | Clamp Part No. |               | A             | B              | T<br>Thd. 2A  |
|------------|----------------|---------------|---------------|----------------|---------------|
|            | MD             | RMD           |               |                |               |
| 9          | 086-0099-00F5  | 086-0175-00F3 | .704<br>17.88 | .750<br>19.05  | 1/2-20 UNF    |
| 12         | 086-0100-00F5  | 086-0176-00F3 | .773<br>19.63 | .932<br>23.67  | 11/16-24 UNEF |
| 15         | 086-0101-00F5  | 086-0177-00F3 | .829<br>21.06 | 1.078<br>27.38 | 13/16-24 UNEF |
| 18         | 086-0142-00F5  | 086-0178-00F3 | .890<br>22.61 | 1.250<br>31.75 | 1-28 UN       |



Straight

| Shell Size | Clamp Part No. |               | A              | B (Max.)       | C (Max.)       | D              | T<br>Thd. 2A  |
|------------|----------------|---------------|----------------|----------------|----------------|----------------|---------------|
|            | MD             | RMD           |                |                |                |                |               |
| 9          | 086-0103-00F5  | 086-0179-00F3 | .737<br>18.72  | .600<br>15.24  | 1.100<br>27.94 | .879<br>22.32  | 1/2-20 UNF    |
| 12         | 086-0104-00F5  | 086-0180-00F3 | .913<br>23.19  | .775<br>19.68  | 1.250<br>31.75 | 1.067<br>27.10 | 11/16-24 UNEF |
| 15         | 086-0105-00F5  | 086-0181-00F3 | 1.048<br>26.62 | .962<br>24.43  | 1.469<br>37.31 | 1.233<br>31.32 | 13/16-20 UNEF |
| 18         | 086-0143-00F5  | 086-0182-00F3 | 1.225<br>31.12 | 1.185<br>30.01 | 1.550<br>39.37 | 1.550<br>39.37 | 1-28 UN       |



Right-Angle

Contacts (see pages 5086 and 5087)

| Contact Size | Pin Part No.  |               | Socket Part No. |               |
|--------------|---------------|---------------|-----------------|---------------|
|              | MD            | RMD           | MD              | RMD           |
| 22 AWG       | 083-0009-00R4 | 083-1200-00R4 | 082-0464-00Y9   | 082-0462-00Y9 |
| 16 AWG       | 083-0158-00R4 | —             | 082-0113-00T1   | —             |

Note: Standard packaging includes same quantity of contacts as contact cavities in insert.

Contact Cavity Sealing Plugs (see page 5088)

| Contact Size | Standard Length Part No. |               | Short Length Part No. |               |
|--------------|--------------------------|---------------|-----------------------|---------------|
|              | MD                       | RMD           | MD                    | RMD           |
| 22 AWG       | 086-0055-0000            | 086-0148-0000 | 082-0009-0000         | 086-0009-0000 |
| 16 AWG       | 086-0056-0000            | —             | 082-0010-0000         | —             |

Note: Standard length plug occupies contact cavity and wire sealing grommet. Short length plug occupies wire sealing grommet only (to be used behind non-wired contacts and in plugs which mate to hermetic receptacles).

Modifications

We offer a unique modification identification system which provides alteration of standard MARC 53 Series Connectors to include special finishes, accessories, MARC 43 Series Connector contact arrangements, and custom quality assurance provisions — processing, testing, serialization, traceability. Consult Tyco Electronics for additional modification information.

Standard modifications include:

- (503): MARC 53 Series Connector including cable clamp, straight type
- (504): MARC 53 Series Connector including cable clamp, right-angle type
- (506): MARC 53 Series Connector, gold finish

- (507): MARC 53 Series Connector, electroless nickel finish
- (508): MARC 53 Series Connector, black anodized coupling ring, gold over electroless nickel housings, retaining nuts and hardware.

**MARC 63 Series Connectors RMD63 Performance Data**

MARC 63 Series Connectors, RMD63 Series meet or exceed the performance requirements of specification MIL-C-38300A (USAF) as detailed in the M38300A (USAF) military specification sheets covering the MARC 63 Series Connectors. Tyco Electronics can supply detailed, cross reference information. MARC 63 Series Connectors, RMD63 Series meet the following selected test parameters as specified below:

| DESCRIPTION  | TEST REQUIREMENTS  |
|--|--|
| <b>Contact Retention</b>                                       | Contacts are to withstand 15 lbs. [66.72 N] axial load and RMD contacts 10 lbs. [44.48 N] axial load without axial displacement in excess of 0.012 [.305] or damage to contacts or inserts when the axial load is applied to the mating end of the contacts in unmated plugs and receptacles at a rate of approximately 1 lb/sec. [4.45 N].    |
| <b>Contact Resistance</b>                                      | The potential drop across normally mated contacts shall not exceed 25 mv under room ambient and high temperature service conditions when measured as specified in MIL-C-26636, Fig. 2, with maximum rated current.   |
| <b>Dielectric Withstanding Voltage, Altitude and Sea Level</b> | No evidence of dielectric breakdown or flashover when mated and unmated plugs are subjected to 645 and 180 volts RMS, respectively, at altitudes up to 110,000 [33,528 m] feet and 1000 volts RMS at sea level.  |
| <b>Insulation Resistance, Room and High Temp.</b>              | Insulation resistance of mated plugs and receptacles shall be 5000 megohms, minimum, at room temperature and 1000 megohms, minimum, at 257°F [+125°C] when measured per MIL-STD-202, Method 302, Test Condition B.   |
| <b>Coupling and Uncoupling</b>                                 | Plugs and receptacles shall withstand up to 500 cycles of engagement and separation without detrimental damage to plugs or receptacles or not satisfying subsequent tests of MIL-C-38300.  |
| <b>Fluid Immersion</b>   | Mating and unmating forces shall not exceed 27 lbs. [120.10 N], maximum, (15 shell size) after fully wired plugs and receptacles are immersed for 20 hours, each, in hydraulic fluid (MIL-H-5606) and high temperature lubricating oil (MIL-L-9236) followed by a one-hour dry.  |
| <b>Sweep Vibration, Mated</b>                                  | Mated connectors shall show no circuit interruptions greater than one microsecond during 12 hours vibration to include six sweeps in each axis at extreme temperatures of -85°F [-65°C] and 257°F [+125°C] per MIL-STD-202, Method 204, Test Condition D. Post inspection shall show no detrimental cracking, breaking, or loosening of parts. |
| <b>Moisture Resistance</b>                                     | The insulation resistance of mated connectors shall exceed 1000 megohms after subjection to moisture resistance testing per MIL-STD-202, Method 106, as amended by MIL-C-38300.  |
| <b>Altitude Breathing</b>                                      | The insulation resistance of wired and mated connectors shall be 5000 megohms, minimum, and there shall be no flashover or breakdown at test voltage of 1000 volts RMS after the third cycle and while immersed in 5% salt water solution at 68°F [20°C] and room ambient pressure at 68°F [20°C].   |
| <b>Salt Spray</b>  | Unmated plugs and receptacles shall show no excessive corrosion which would detrimentally affect the electrical and mechanical performance of the connectors after subjection to 24 hours exposure to salt spray atmosphere per MIL-STD-202, Method 101.   |

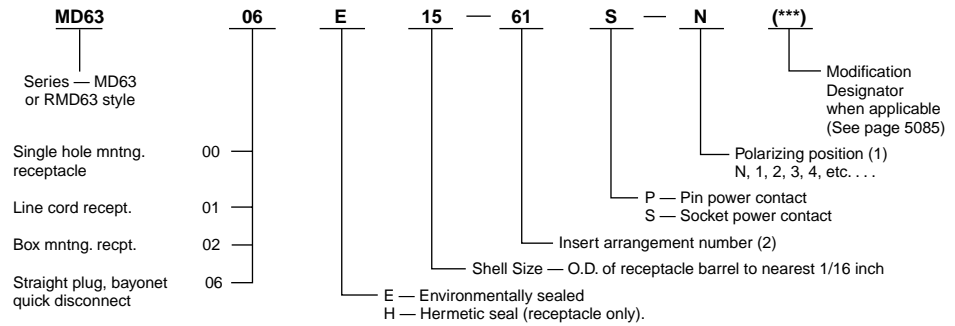
**MARC 63 Series Connectors** (Continued)

**Part Number and Ordering Information**

Connector part numbers indicate size, shape, insert layout, type of seal, style of contact and polarization.

**Note:** Pin or socket (power or coaxial) contacts may be used in either plugs or receptacles. However, it is recommended that pins be placed in the receptacle when possible to take advantage of our "scuff-proof" design.

**Typical Part Number**

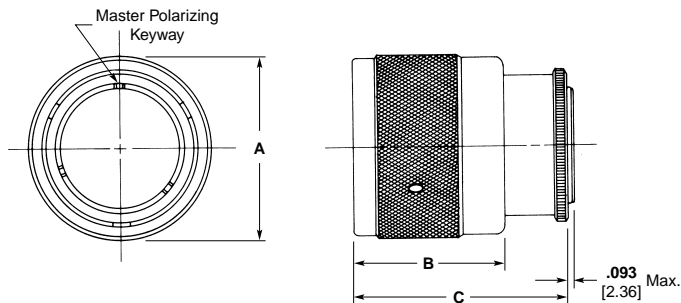


(1) For polarizing key positions see MARC 53 Series Connectors.  
 (2) For contact arrangements see MARC 53 Series Connectors.  
**Note:** If P or S does not appear in the numbering system, no contacts will be supplied with order (order separately).

**Configurations**

**MD63-06E/RMD63-06E**

Straight Plug, Bayonet Coupling, Environmental and Non-Environmental (Mates with Receptacles 02, 00 and 01)



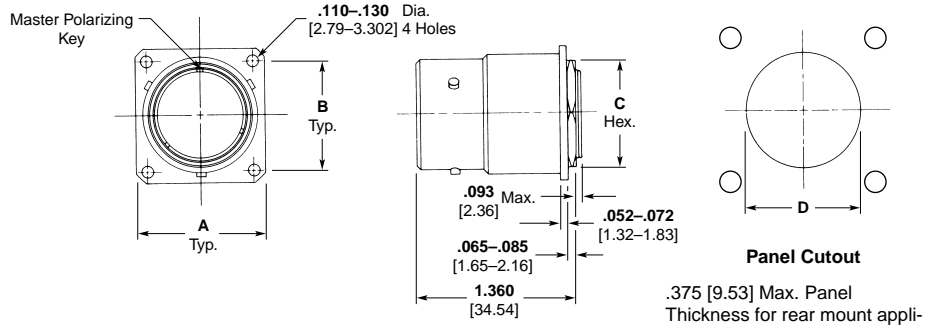
| Shell Size | Dimensions     |               |                |
|------------|----------------|---------------|----------------|
|            | A              | B (Max.)      | C (Max.)       |
| 9          | .813<br>20.65  | 1.000<br>25.4 | 1.288<br>32.72 |
| 12         | 1.000<br>25.40 | 1.000<br>25.4 | 1.288<br>32.72 |
| 15         | 1.125<br>28.58 | 1.000<br>25.4 | 1.288<br>32.72 |
| 18         | 1.594<br>40.49 | 1.000<br>25.4 | 1.288<br>32.72 |

**MARC 63 Series Connectors (Continued)**

**Configurations (Continued)**

**MD63-02E/RMD63-02E**

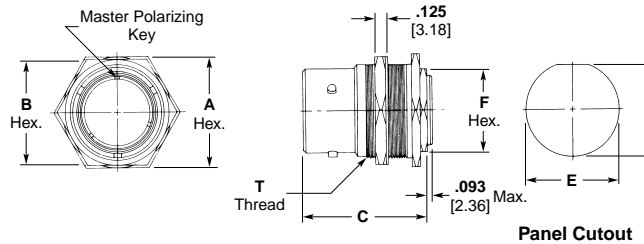
Receptacle, Box Mounting, Environmental and Non-Environmental (Mates with Plug, Type 06)



| Shell Size | Dimensions     |                |                |                            |
|------------|----------------|----------------|----------------|----------------------------|
|            | A              | B              | C              | D                          |
| 9          | .875<br>22.23  | .662<br>16.81  | .562<br>14.27  | .693-.697<br>17.60-17.70   |
| 12         | 1.000<br>25.40 | .786<br>19.96  | .75<br>19.05   | .881-.885<br>22.38-22.48   |
| 15         | 1.125<br>28.58 | .906<br>23.01  | .875<br>22.23  | 1.006-1.011<br>25.55-25.68 |
| 18         | 1.344<br>34.14 | 1.062<br>26.97 | 1.125<br>28.58 | 1.250-1.260<br>30.48-32.00 |

**MD63-00E/RMD63-00E**

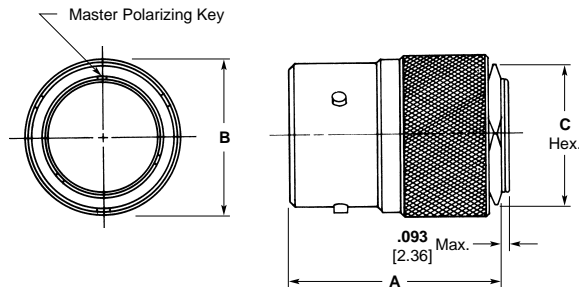
Receptacle, Single Hole Mounting, Environmental and Non-Environmental (Mates with Plug, Type 06)



| Shell Size | Dimensions     |                |                |                            |                            |                |              |
|------------|----------------|----------------|----------------|----------------------------|----------------------------|----------------|--------------|
|            | A              | B              | C              | D                          | E                          | F              | T (Class 2A) |
| 9          | .813<br>20.65  | .75<br>19.05   | 1.360<br>34.54 | .669-.673<br>16.99-17.09   | .693-.697<br>17.60-17.70   | .562<br>14.27  | 11/16-32UN   |
| 12         | 1.000<br>25.40 | .937<br>23.80  | 1.360<br>34.54 | .850-.856<br>21.59-21.74   | .881-.885<br>22.38-22.48   | .75<br>19.05   | 7/8-28UN     |
| 15         | 1.125<br>28.58 | 1.062<br>26.97 | 1.360<br>34.54 | .975-.979<br>24.76-24.87   | 1.006-1.010<br>25.55-25.65 | .875<br>22.23  | 1-28UN       |
| 18         | 1.625<br>41.28 | 1.375<br>34.93 | 1.360<br>34.54 | 1.212-1.216<br>30.78-30.88 | 1.251-1.255<br>31.78-31.88 | 1.125<br>28.58 | 1-1/4-28UN   |

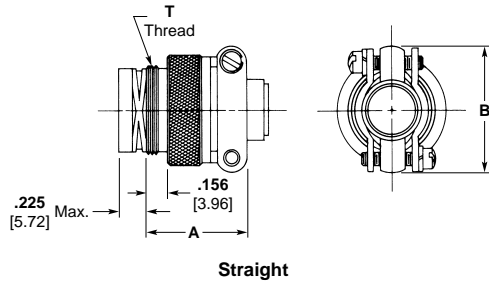
**MD63-01E/RMD63-01E**

Receptacle, Line Cord, Environmental (Mates with Plug, Type 06)



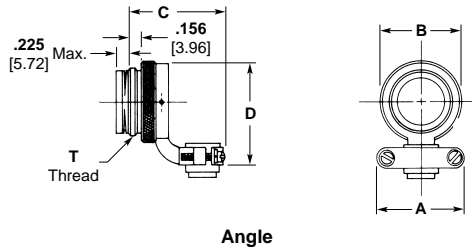
| Shell Size | Dimensions     |                |                |
|------------|----------------|----------------|----------------|
|            | A              | B (Max.)       | C              |
| 9          | 1.360<br>34.54 | .703<br>17.86  | .562<br>14.27  |
| 12         | 1.360<br>34.54 | .891<br>22.63  | .75<br>19.05   |
| 15         | 1.360<br>34.54 | 1.016<br>25.81 | .875<br>22.23  |
| 18         | 1.360<br>34.54 | 1.203<br>30.56 | 1.125<br>28.58 |

Accessories  
Cable Clamps



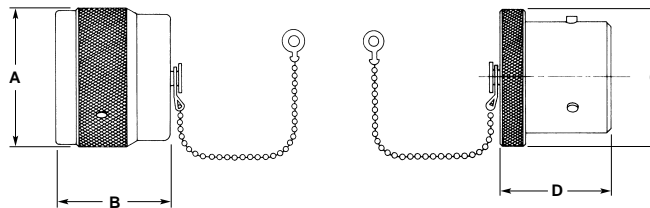
| Shell Size | Part No.      | A             | B              | T Thread        |
|------------|---------------|---------------|----------------|-----------------|
| 9          | 086-0175-00N1 | .704<br>17.88 | .750<br>19.05  | 1/2-20UNF-2A    |
| 12         | 086-0176-00N1 | .773<br>19.63 | .932<br>23.67  | 11/16-24UNEF-2A |
| 15         | 086-0177-00N1 | .829<br>21.06 | 1.078<br>27.38 | 13/16-20UNEF-2A |
| 18         | 086-0178-00N1 | .890<br>22.61 | 1.250<br>31.75 | 1-28UN-2A       |

Straight



Angle

| Shell Size | Part No.      | A              | B (Max.)       | C (Max.)       | D              | T Thread        |
|------------|---------------|----------------|----------------|----------------|----------------|-----------------|
| 9          | 086-0179-00N1 | .737<br>18.72  | .600<br>15.24  | 1.100<br>27.94 | .879<br>22.32  | 1/2-20UNF-2A    |
| 12         | 086-0180-00N1 | .913<br>23.19  | .785<br>19.94  | 1.250<br>31.75 | 1.067<br>27.10 | 11/16-24UNEF-2A |
| 15         | 086-0181-00N1 | 1.048<br>26.62 | .962<br>24.43  | 1.469<br>37.31 | 1.233<br>31.21 | 13/16-20UNEF-2A |
| 18         | 086-0182-00N1 | 1.225<br>31.12 | 1.185<br>30.10 | 1.550<br>39.37 | 1.550<br>39.37 | 1-28UN-2A       |



Protective Covers

| Shell Size | Receptacle Part No. |               | Plug Part No. |               | Dimensions     |               |                |               |
|------------|---------------------|---------------|---------------|---------------|----------------|---------------|----------------|---------------|
|            | Without Chain       | With Chain    | Without Chain | With Chain    | A              | B             | C              | D             |
| 9          | 086-0253-00P2       | 086-0257-00L6 | 086-0261-00F5 | 086-0265-00L6 | .813<br>20.65  | .950<br>24.13 | .813<br>20.65  | .913<br>23.19 |
| 12         | 086-0254-00P2       | 086-0258-00L6 | 086-0262-00F5 | 086-0266-00L6 | 1.000<br>25.40 | .950<br>24.13 | 1.000<br>25.40 | .913<br>23.19 |
| 15         | 086-0255-00P2       | 086-0259-00L6 | 086-0263-00F5 | 086-0267-00L6 | 1.125<br>28.58 | .950<br>24.13 | 1.125<br>28.58 | .913<br>23.19 |
| 18         | 086-0256-00P2       | 086-0260-00L6 | 086-0264-00F5 | 086-0268-00L6 | 1.594<br>40.49 | .950<br>24.13 | 1.594<br>40.49 | .913<br>23.19 |

Plastic Protective Covers also available; consult Tyco Electronics.

Modifications

We offer a unique modification system which provides alteration of standard MARC 63 Series Connectors to include special finishes, accessories, and custom

quality assurance provisions — processing, testing, serialization, traceability. Consult your sales representative or Tyco Electronics for additional modification information.

Standard modifications include:

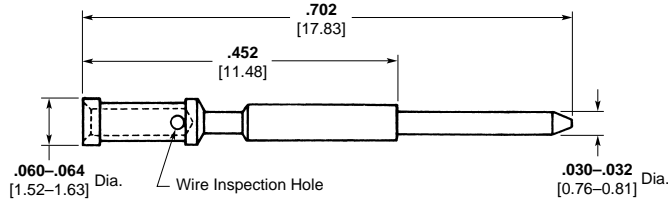
(801): MARC 63 Series Connector, electroless nickel finish

(803): MARC 63 Series Connector including cable clamp, straight type

(804): MARC 63 Series Connector including cable clamp, right-angle type

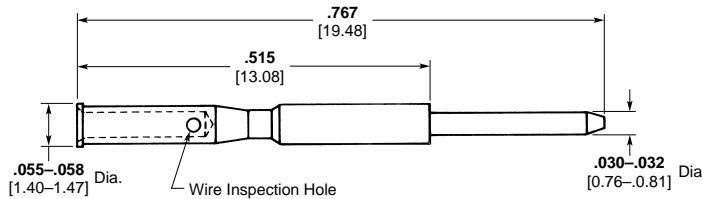
Contacts for MARC 43, MARC 53 and MARC 63 Connectors

MARC 43, MD53, MD63 Series

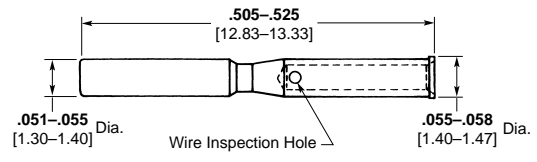


**Part Number 083-0009-00R4**  
**22 AWG Pin**

MARC RMD53, RMD63 Series

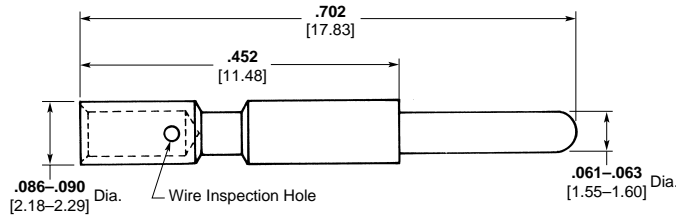


**Part Number 083-1200-00R4**  
**22 AWG Pin**

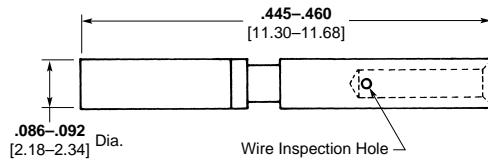


**Part Number 082-0461-00Y9**  
**22 AWG Socket**

MARC 43, MD53, MD63 Series

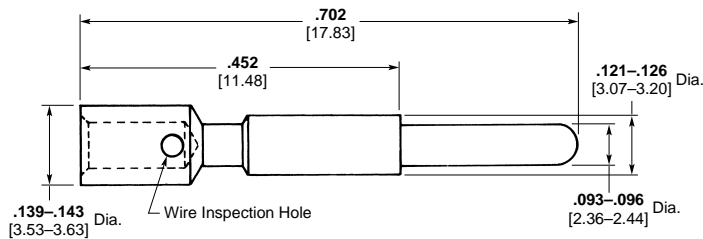


**Part Number 083-0158-00R4**  
**16 AWG Pin**

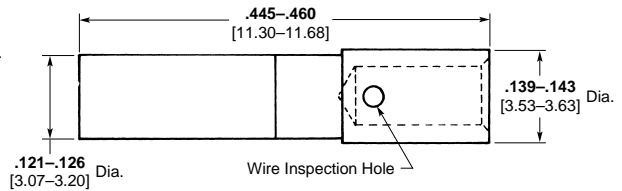


**Part Number 082-0113-00T1**  
**16 AWG Socket**

MARC 43 Series

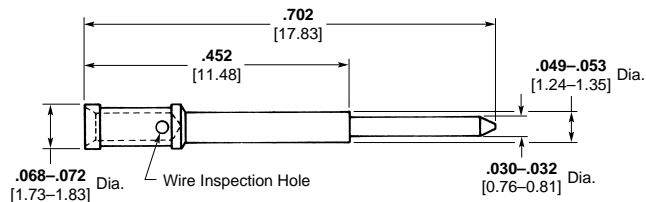


**Part Number 083-0173-00R4**  
**12 AWG Pin**



**Part Number 082-0132-00T1**  
**12 AWG Socket**

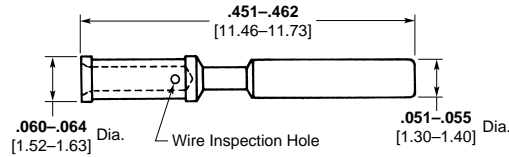
MARC MD53, MD63 Series



**Part Number 083-1435-00R4**  
**22-20 AWG Pin**

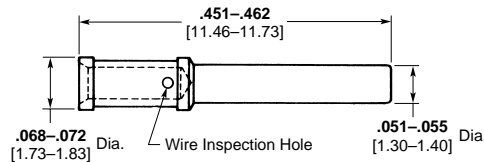
Contacts for MARC 43, MARC 53 and MARC 63 Connectors (Continued)

MARC 43, MD53, MD63 Series



Part Number 082-0464-00Y9  
22 AWG Socket

MARC MD53, MD63 Series

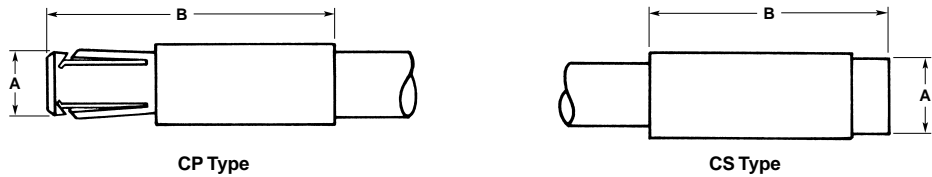


Part Number 082-0466-00Y9  
22-20 AWG Socket

Coaxial Contacts

MARC 43, MD53, MD63 Series

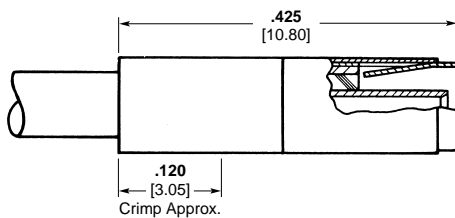
Solder Type Coaxial Contacts



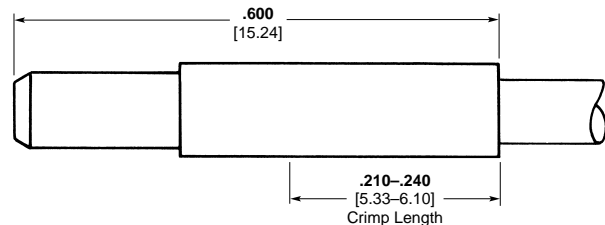
| Contact | Part No.      | Type | A Dia.       | B             |
|---------|---------------|------|--------------|---------------|
| 50 Ω    | 084-0027-00T2 | CS   | .109<br>2.77 | .452<br>11.48 |
|         | 084-0024-00T2 | CP   | .093<br>2.36 | .600<br>15.24 |
| 75 Ω    | 084-0028-00T2 | CS   | .123<br>3.12 | .452<br>11.48 |
|         | 084-0025-00T2 | CP   | .106<br>2.69 | .600<br>15.24 |
| 95 Ω    | 084-0029-00T2 | CS   | .168<br>4.27 | .452<br>11.48 |
|         | 084-0026-00T2 | CP   | .149<br>3.78 | .600<br>15.24 |

MARC 43 Series

LEPRA/CON Crimp Type,  
50 Ohm Coaxial Contacts



Part Number 142-1500-0001  
CS Socket



Part Number 141-1500-0001  
CP Pin



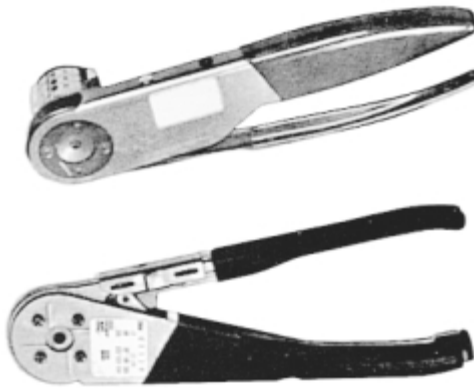
| Size      | Part No.      | Application                                    | Description |
|-----------|---------------|--|-------------|
|           | 086-0001-0000 | Unsealed 43 Series                             |             |
| 22 AWG    | 086-0009-0000 | Sealed 43 Series<br>MD53, RMD53<br>MD63, RMD63 |             |
|           | 086-0148-0000 | RMD53, RMD63                                   |             |
|           | 086-0056-0000 | Sealed 43 Series<br>MD53, MD63                 |             |
| 16 AWG    | 086-0010-0000 | Sealed 43 Series<br>MD53, MD63                 |             |
|           | 086-0014-0000 | Unsealed 43 Series                             |             |
|           | 086-0057-0000 | Sealed 43 Series                               |             |
| 12 AWG    | 086-0015-0000 | Unsealed 43 Series                             |             |
| 22/20 AWG | 086-0251-0000 | MD53, MD63                                     |             |

| Size | Part No.      | Application        | A Dia.                 | B Dia.                 | Description |
|------|---------------|--------------------|------------------------|------------------------|-------------|
| 5052 | 086-0061-0000 | Unsealed 43 Series | .112-.120<br>2.84-3.05 | —                      |             |
| 7552 | 086-0062-0000 |                    | .135-.143<br>3.43-3.63 | —                      |             |
| 9552 | 086-0063-0000 |                    | .178-.186<br>4.52-4.72 | —                      |             |
| 5052 | 086-0058-0000 | Sealed 43 Series   | .081-.089<br>2.06-2.26 | .112-.120<br>2.84-3.05 |             |
| 7552 | 086-0059-0000 |                    | .106-.114<br>2.69-2.90 | .135-.143<br>3.43-3.63 |             |
| 9552 | 086-0060-0000 |                    | .151-.159<br>3.84-4.04 | .178-.186<br>4.52-4.72 |             |

Assembly Tools

**MARC 43, 53 and 63 Series Connectors**

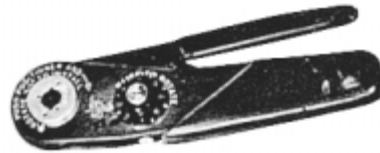
**Removal Tool** — None required.  
**Crimp Tools** — Turret style tool (M22520/1-01 and TH88) MICRODOT Part Number 010-0080-0000 — Crimps all power contacts.  
**Locator Style Tool** — MICRODOT Part Number 010-0070-0000 with locators.



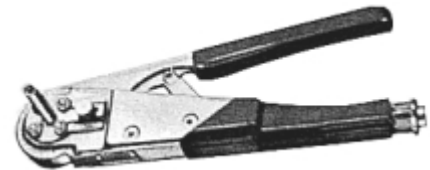
| Contact Size | Wire Size | Locator       |
|--------------|-----------|---------------|
| 22           | 22, 24    | 010-0072-0000 |
| 22           | 26        | 010-0087-0000 |
| 16           | 16, 18    | 010-0075-0000 |

For MARC 43 Series Connector Crimp Coax Contacts Use 010-0132-0000 & 010-0169-0000.

**MARC 73 Series Connectors**



| Description           | Part No.                     |
|-----------------------|------------------------------|
| Crimp Tool w/ Locator | 010-3008-0000                |
| Crimp Tool Only       | 010-3009-0000<br>M22520/2-01 |
| Locator Only          | 010-3010-0000                |



| Description           | Part No.      |
|-----------------------|---------------|
| Crimp Tool w/ Locator | 010-3002-0000 |
| Crimp Tool Only       | 010-0190-0000 |
| Locator Only          | 010-3007-0000 |

**Service and Performance Data**

MARC 73 Series Connectors meet or exceed the performance requirements of specification MIL-C-38999. Your sales representative or field engineer can supply detailed, cross-reference information. MARC 73 Series Connectors meet the following selected test parameters as specified below:

| DESCRIPTION  | TEST REQUIREMENTS  |
|--|--|
| <b>Contact Retention</b>                                       | Contacts are to withstand 10 lbs [44.48 N] axial load without axial displacement in excess of 0.012 [0.30] or damage to contacts or inserts when the axial load is applied to the mating end of the contacts in unmated plugs and receptacles at a rate of approximately 1 lb/sec. [4.45 N].   |
| <b>Contact Resistance</b>                                      | The potential drop across normally mated contacts shall not exceed 25 mv under room ambient and high temperature service conditions when measured as specified in MIL C-39029 with maximum rated current.  |
| <b>Dielectric Withstanding Voltage, Altitude and Sea Level</b> | No evidence of dielectric breakdown or flashover when mated and unmated plugs are subjected to 645 and 180 volts RMS, respectively, at altitudes up to 70,000 feet [21,336 m] and 1000 volts RMS at sea level.   |
| <b>Insulation Resistance, Room and High Temp.</b>              | Insulation resistance of mated plugs and receptacles shall be 5000 megohms, minimum, at room temperature and 1000 megohms, minimum, at 257°F [+125°C] when measured per MIL-STD 202, Method 302, Test Condition B.   |
| <b>Coupling and Uncoupling</b>                                 | Plugs and receptacles shall withstand up to 500 cycles of engagement and separation without detrimental damage to plugs or receptacles or not satisfying subsequent tests.   |
| <b>Fluid Immersion</b>   | Mating and unmating forces shall not exceed 27 lbs [120.10 N] maximum, (15 shell size) after fully wired plugs and receptacles are immersed for 20 hours, each, in hydraulic fluid (MIL-H-5606) and high temperature lubricating oil (MIL-L-9236) followed by a one-hour dry.  |
| <b>Sweep Vibration, Mated</b>                                  | Mated connectors shall show no circuit interruptions greater than one microsecond during 12 hours vibration to include six sweeps in each axis at extreme temperatures of -85°F [-65°C] and 257°F [+125°C] per MIL-STD-202, Method 204, Test Condition D. Post inspection shall show no detrimental cracking, breaking, or loosening of parts. |
| <b>Moisture Resistance</b>                                     | The insulation resistance of mated connectors shall exceed 1000 megohms after subjection to moisture resistance testing per MIL-STD-202, Method 106.   |
| <b>Altitude Breathing</b>                                      | The insulation resistance of wired and mated connectors shall be 5000 megohms, minimum, and there shall be no flashover or breakdown at test voltage of 1000 volts RMS after the third cycle and while immersed in 5% salt water solution at 68°F [20°C] and room ambient pressure at 68°F [20°C].   |
| <b>Salt Spray</b>  | Unmated plugs and receptacles shall show no excessive corrosion which would detrimentally affect the electrical and mechanical performance of the connectors after subjection to 24 hours exposure to salt spray atmosphere per MIL-STD-202, Method 101.   |

Service and Performance Data

I. Electrical — Electrical Ratings

| Contact Size | Current Rating (Amperes, Max., 81°F [+27°C]) | Dielectric Withstanding Voltage (RMS) | Working Voltage |                               | Contact Resistance (Millivolts, Max.) |
|--------------|--|---------------------------------------|-----------------|-------------------------------|---------------------------------------|
|              |  |                                       | Sea Level       | 110,000 Ft. Alt. <sup>1</sup> |                                       |
| 22 AWG       | 5  | 1000                                  | 750             | 300                           | 8                                     |

<sup>1</sup> 110,000 ft = 33,528 m

Wire Range Accommodations

| Wire Barrel Size | Wire Size | O.D. of Finished Wire Range | Nominal           | Wire Spec. MIL-W-16878 |
|------------------|-----------|-----------------------------|-------------------|------------------------|
| 22 AWG           | 26        | .029 Min.<br>0.74           | .031 Nom.<br>0.79 | Type "E" or "ET"       |
|                  | 24        | —                           | .036 Nom.<br>0.91 | Type "ET"              |
|                  | 22        | .044 Max.<br>1.12           | .042 Nom.<br>1.07 | Type "ET"              |

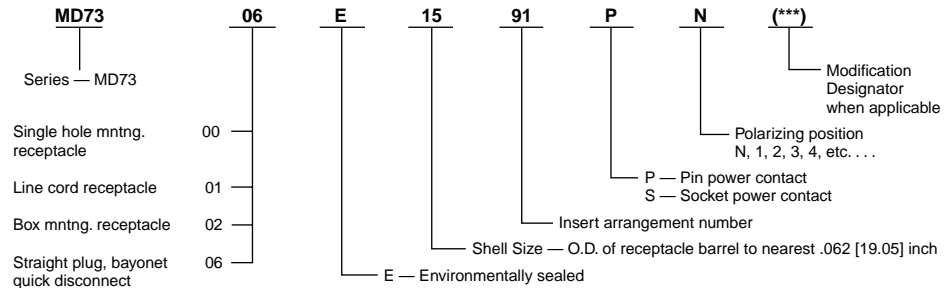
II. Mechanical — Durability: 500 Cycles Mate/Unmate. Coupling/Uncoupling Forces and Tightening Torques:

| Shell Size | Coupling/Uncoupling Force (In-Lbs.) Max. | Tightening Torque (In-Lbs.) |                           |
|------------|--|-----------------------------|---------------------------|
|            |  | Retaining Nut               | Mounting Nut              |
| 9          | 10 [44.48]                               | 20 [2.26 N] Max.            | 30-45 [3.39 Nm – 5.08 Nm] |
| 12         | 15 [66.72]                               | 20 [2.26 N] Max.            | 40-55 [4.52 Nm – 6.21 Nm] |
| 15         | 22 [97.86]                               | 20 [2.26 N] Max.            | 55-70 [6.21 Nm – 7.91 Nm] |
| 18         | 28 [124.55]                              | 20 [2.26 N] Max.            | 70-85 [7.91 Nm – 9.60 Nm] |

Operating Temperature: -67°F to 257°F [-55°C to +125°C]. Connector Mated Length: 2.217 [56.31] Max.

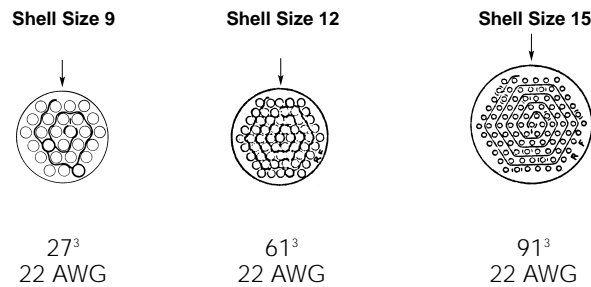
Part Number and Ordering Information

MARC 73 Series Connector part numbers indicate size, shape, insert layout, type of seal, style of contact and polarization.



**Notes:** Pin contacts in plug; socket contacts in receptacle. If P or S does not appear in the numbering system, no contacts will be supplied with order (order separately).

Contact Arrangements<sup>1</sup>



Insert Arrangement<sup>2</sup>  
 Number of Contacts  
 Contact Size

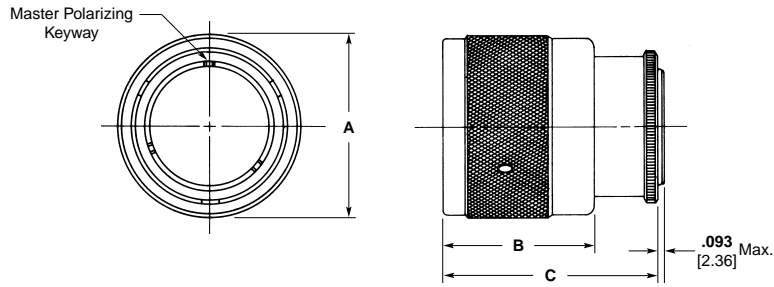
<sup>1</sup> Views shown are front face views of receptacles. Front face view of plug is mirror image of that shown.  
<sup>2</sup> Arrow (↓) indicates insert top or vertical position in relation to top or vertical position of housing.  
<sup>3</sup> The 22 AWG contact arrangements will accommodate MIL-W-16878 Type ET, 22, 24, 26 AWG wire. Contact spacing is on 0.065 [1.65] centers.

#### MARC 73 Series Connectors (Continued)

#### Configurations

##### MD73-06E

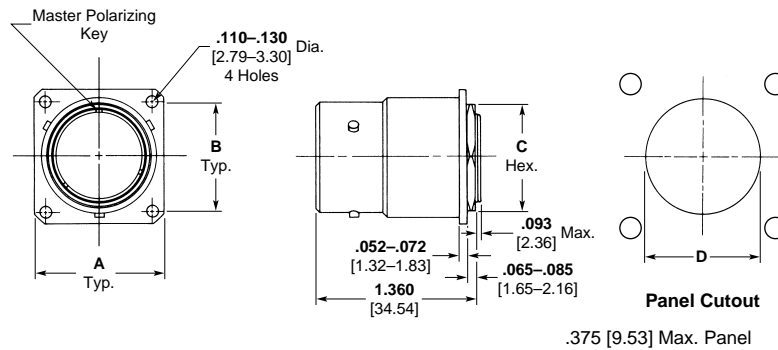
Straight Plug, Bayonet Coupling, Environmental and Non-Environmental (Mates with Receptacles 02, 00 and 01)



| Shell Size | Dimensions     |                |                |
|------------|----------------|----------------|----------------|
|            | A              | B (Max.)       | C (Max.)       |
| 9          | .813<br>20.65  | 1.000<br>25.40 | 1.288<br>32.72 |
| 12         | 1.000<br>25.40 | 1.000<br>25.40 | 1.288<br>32.72 |
| 15         | 1.125<br>28.58 | 1.000<br>25.40 | 1.288<br>32.72 |
| 18         | 1.594<br>40.49 | 1.000<br>25.40 | 1.288<br>32.72 |

##### MD73-02E

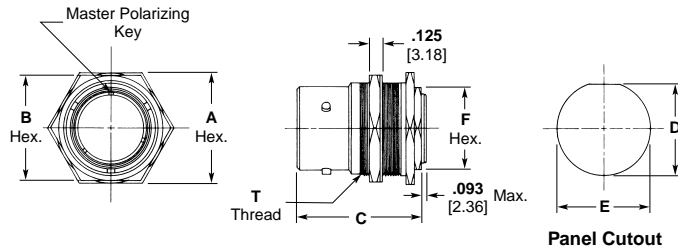
Receptacle, Box Mounting, Environmental and Non-Environmental (Mates with Plug, Type 06)



| Shell Size | Dimensions     |                |                |                            |
|------------|----------------|----------------|----------------|----------------------------|
|            | A              | B              | C              | D                          |
| 9          | .875<br>22.23  | .662<br>16.81  | .562<br>14.27  | .693-.697<br>17.60-17.70   |
| 12         | 1.000<br>25.40 | .786<br>19.96  | .75<br>19.05   | .881-.885<br>22.38-22.48   |
| 15         | 1.125<br>28.58 | .906<br>23.01  | .875<br>22.23  | 1.006-1.011<br>25.55-25.68 |
| 18         | 1.344<br>34.14 | 1.062<br>26.97 | 1.125<br>28.58 | 1.250-1.260<br>31.75-32.00 |

##### MD73-00E

Receptacle, Single Hole Mounting, Environmental and Non-Environmental (Mates with Plug, Type 06)



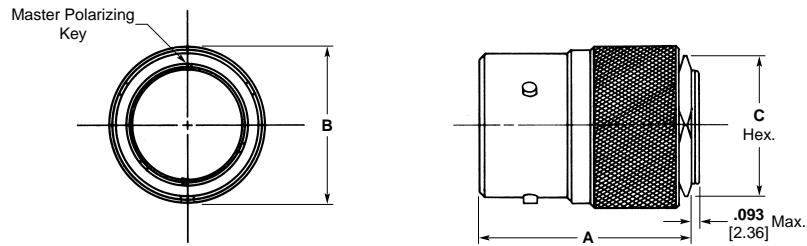
| Shell Size | Dimensions     |                |                |                            |                            |                |              |
|------------|----------------|----------------|----------------|----------------------------|----------------------------|----------------|--------------|
|            | A              | B              | C              | D                          | E                          | F              | T (Class 2A) |
| 9          | .813<br>20.65  | .75<br>19.05   | 1.360<br>34.54 | .669-.673<br>16.99-17.09   | .693-.697<br>17.60-17.70   | .562<br>14.27  | 11/16-32UN   |
| 12         | 1.000<br>25.40 | .937<br>23.80  | 1.360<br>34.54 | .850-.856<br>21.59-21.74   | .881-.885<br>22.38-22.48   | .75<br>19.05   | 7/8-28UN     |
| 15         | 1.125<br>28.58 | 1.062<br>26.97 | 1.360<br>34.54 | .975-.979<br>24.77-24.87   | 1.006-1.010<br>25.55-25.65 | .875<br>22.23  | 1-28UN       |
| 18         | 1.625<br>41.28 | 1.375<br>34.93 | 1.360<br>34.54 | 1.212-1.216<br>30.78-30.89 | 1.251-1.255<br>31.78-31.88 | 1.125<br>28.58 | 1-1/4-28UN   |

**MARC 73 Series Connectors (Continued)**

**Configurations (Continued)**

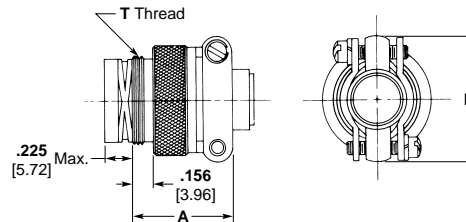
**MD73-01E**

Receptacle, Line Cord,  
Environmental (Mates with  
Plug, Type 06)

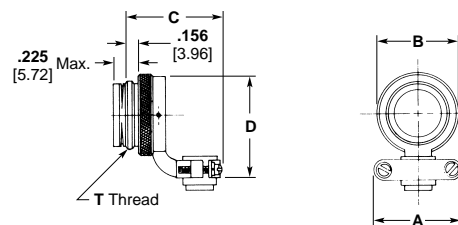


| Shell Size | Dimensions |          |       |
|------------|------------|----------|-------|
|            | A          | B (Max.) | C     |
| 9          | 1.360      | .703     | .562  |
|            | 34.54      | 17.86    | 14.27 |
| 12         | 1.360      | .891     | .75   |
|            | 34.54      | 20.57    | 19.05 |
| 15         | 1.360      | 1.016    | .875  |
|            | 34.54      | 25.81    | 22.23 |
| 18         | 1.360      | 1.203    | 1.125 |
|            | 34.54      | 30.56    | 28.58 |

**Accessories**  
**Cable Clamps**



| Shell Size | Clamp Part No. | A             | B              | T Thd. 2A     |
|------------|----------------|---------------|----------------|---------------|
| 9          | 086-0341-00N1  | .704<br>17.88 | .750<br>19.05  | 1/2-20 UNF    |
| 12         | 086-0342-00N1  | .773<br>19.63 | .932<br>23.67  | 11/16-24 UNEF |
| 15         | 086-0343-00N1  | .829<br>21.06 | 1.078<br>27.38 | 13/16-20 UNEF |
| 18         | 086-0344-00N1  | .890<br>22.61 | 1.250<br>31.75 | 1-28 UN       |



| Shell Size | Clamp Part No. | A              | B (Max.)       | C (Max.)       | D              | T Thd. 2A     |
|------------|----------------|----------------|----------------|----------------|----------------|---------------|
| 9          | 086-0337-00N1  | .737<br>18.72  | .600<br>15.24  | 1.100<br>27.94 | .879<br>22.33  | 1/2-20 UNF    |
| 12         | 086-0338-00N1  | .913<br>23.19  | .785<br>19.94  | 1.250<br>31.75 | 1.067<br>27.10 | 11/16-24 UNEF |
| 15         | 086-0339-00N1  | 1.048<br>26.62 | .962<br>24.43  | 1.469<br>37.31 | 1.233<br>31.32 | 13/16-20 UNEF |
| 18         | 086-0340-00N1  | 1.225<br>31.12 | 1.185<br>30.10 | 1.550<br>39.37 | 1.550<br>39.37 | 1-28 UN       |

**Accessories (Continued)**

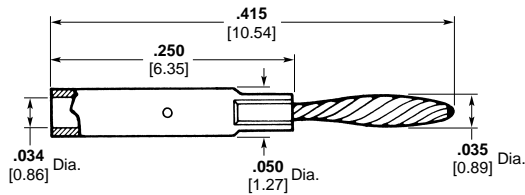
**Contacts**

**Twist pin — 22 Pins and Sockets**

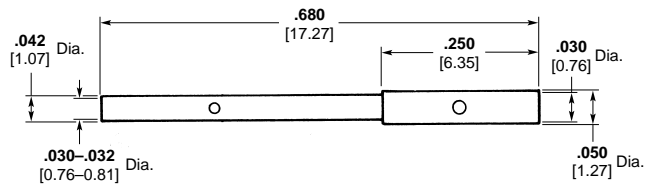
Copper alloy plated .000050 [0.00127]  
gold over copper flash per MIL-G-45204,  
Type II

**Rating** — 5 amps

**Contact Resistance** — .008 ohms  
max.



**Part Number 096-0526-0000**

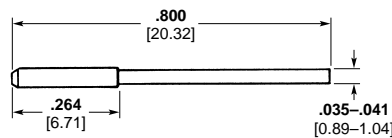


**Part Number 096-0626-0001**

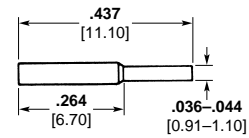
**Engineering/Separation Forces** —  
6 oz. [1.67 N] max. / .502 [1.139 N] min.

**Durability** — 2000 cycles

**Contact Cavity Sealing Plugs**



**Part Number 086-0331-0000**

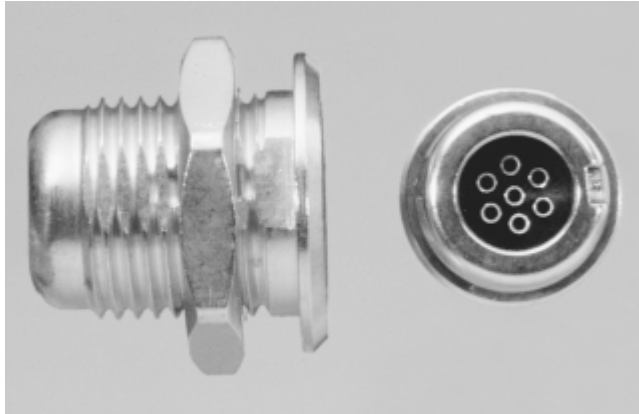


**Part Number 086-0330-0000**

| Contact Size | Sealing Plug  | Filler Plug   |
|--------------|---------------|---------------|
| 22 AWG       | 086-0331-0000 | 086-0330-0000 |

**Note:** Sealing plug occupies insert and grommet cavities.  
Filler plug occupies insert cavity only.

**MQR Series — Microminiature Circular Connectors**



MQR stands for MICRODOT Quick Release. This line of circular quick disconnect connectors has metal shells with push-pull couplings which provide a positive connection for rugged environmental use. The MQR series is specified for cable-to-cable and cable-to-panel applications.

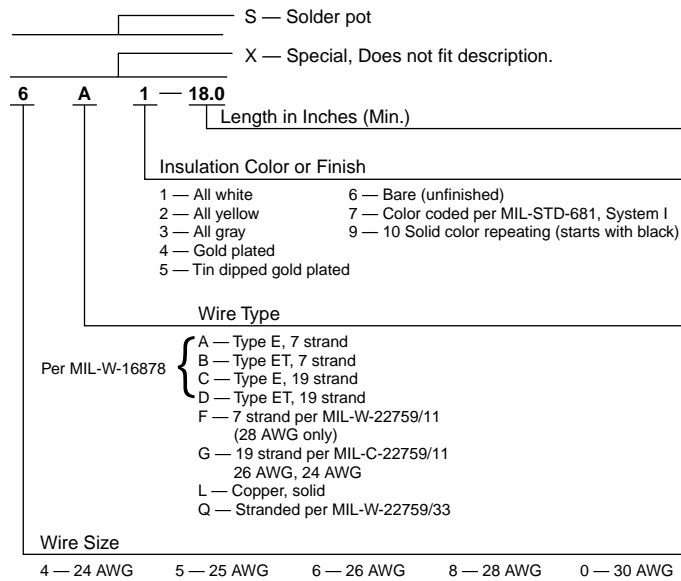
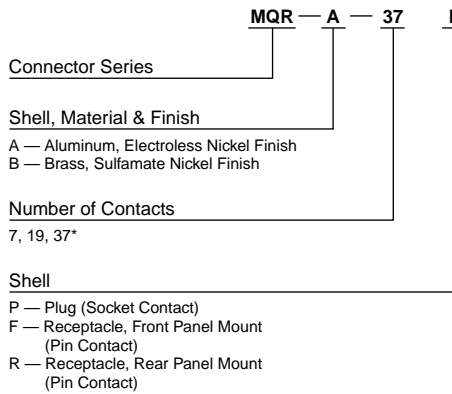
The plug connector side contains socket contacts. The receptacle connector side contains pin contacts. Because the pin contact is

“active” or “live”, the pins require the physical protection that the receptacle side offers. (Similar to a “protected” or “shrouded” header.)

While there is no optional hardware for the MQR series, the receptacles incorporate a standard jam nut to tighten the connector down to the board or panel.

MQR connectors are manufactured to the performance specifications of MIL-PRF-83513.

**How to Specify/ Ordering Code**



\* uses twist pin contact

**MQR Plug**

| Size | Dimensions    |               |
|------|---------------|---------------|
|      | Ø A           | Ø B           |
| 7    | .375<br>9.53  | .300<br>7.62  |
| 19   | .475<br>12.07 | .400<br>10.16 |
| 37   | .750<br>19.05 | .630<br>16.00 |

**Front Panel Mount (MQR Receptacle)**

| Size | Dimensions    |               |               |                |
|------|---------------|---------------|---------------|----------------|
|      | A (Hex)       | B (Min.)      | Ø C (Min.)    | D Thd.         |
| 7    | .500<br>12.7  | .361<br>9.17  | .376<br>9.55  | 3/8-32 UNEF-2A |
| 19   | .625<br>15.88 | .477<br>12.16 | .501<br>12.73 | 1/2-28 UNEF-2A |
| 37   | .812<br>20.62 | .722<br>18.39 | .751<br>19.07 | 3/4-20 UNEF-2A |

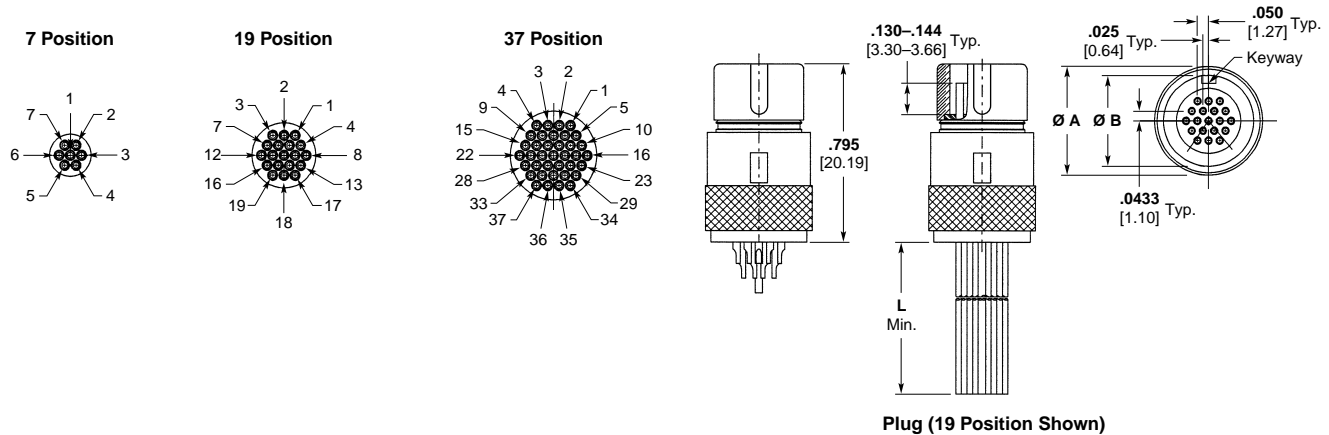


#### MQR Series — Microminiature Circular Connectors (Continued)

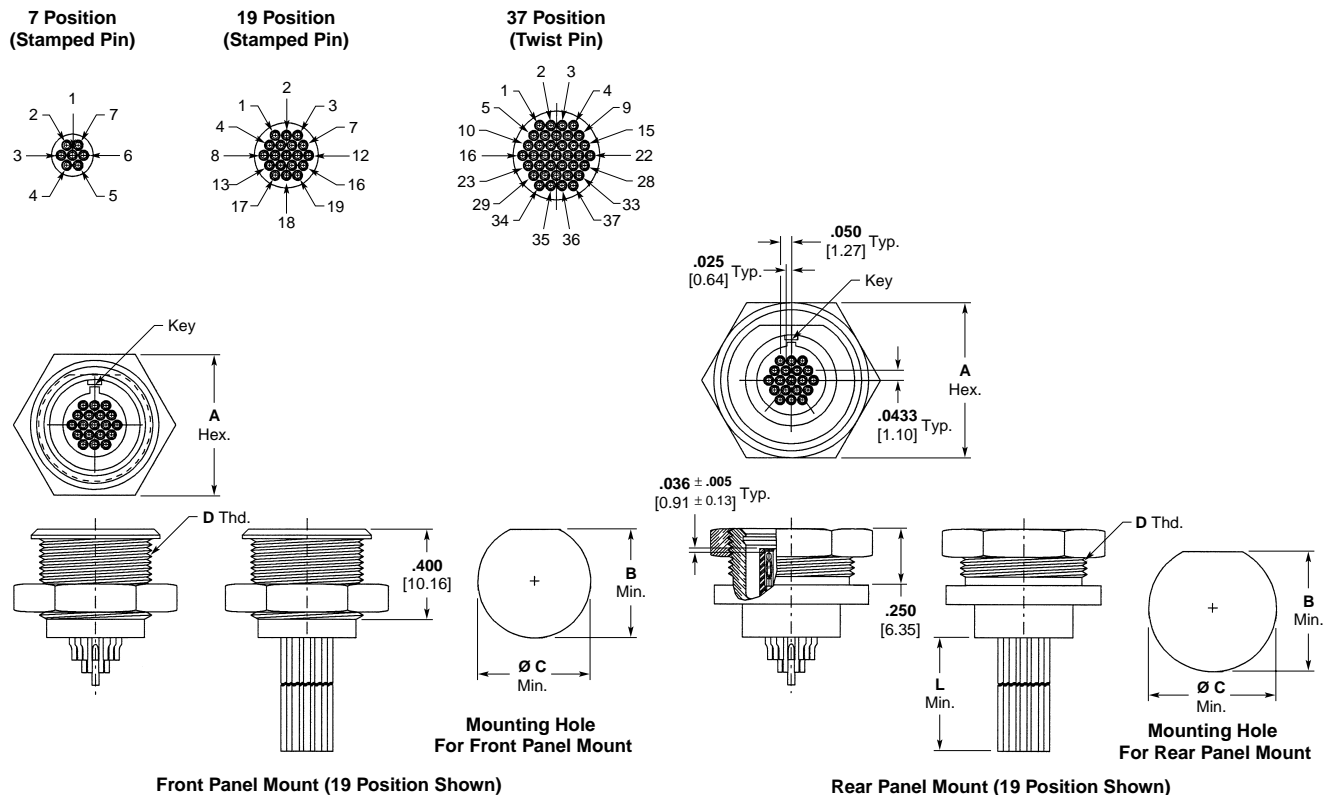
##### Rear Panel Mount (MQR Receptacle)

| Size | Dimensions    |               |               |                 |
|------|---------------|---------------|---------------|-----------------|
|      | A (Hex)       | B (Min.)      | Ø C (Min.)    | D Thd.          |
| 7    | .500<br>12.7  | .422<br>10.72 | .440<br>11.18 | 7/16-28 UNEF-2A |
| 19   | .687<br>17.45 | .531<br>13.49 | .564<br>14.33 | 9/16-24 UNEF-2A |
| 37   | .812<br>20.62 | .722<br>18.39 | .751<br>19.07 | 3/4-20 UNEF-2A  |

##### Circular MQR Series Quick Release Plug

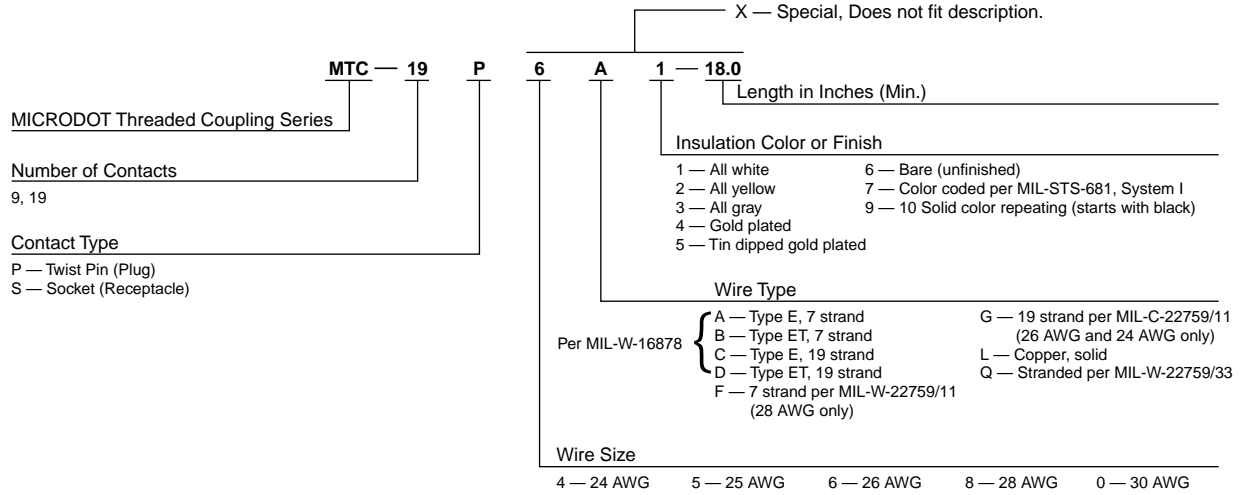


##### Circular MQR Series Quick Release Receptacle



MTC Series — Microminiature Circular Connectors

How to Specify/  
Ordering Code

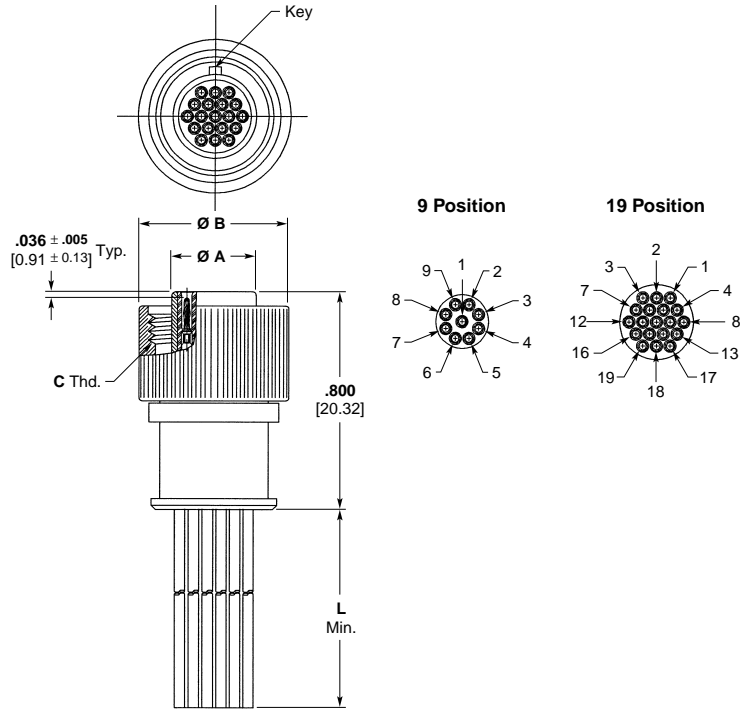


Material and Finish

Shell — Aluminum, nickel plated  
Contact — Copper alloy, gold plated  
Insulator — RYTON

MTC Series Plug

| Size | Dimensions |       |            |
|------|------------|-------|------------|
|      | Ø A        | Ø B   | C Thd.     |
| 9    | .227       | .456  | M10 x 0.75 |
|      | 5.77       | 11.58 | 19.05      |
| 19   | .308       | .545  | M12 x 1    |
|      | 7.82       | 13.84 | 25.40      |

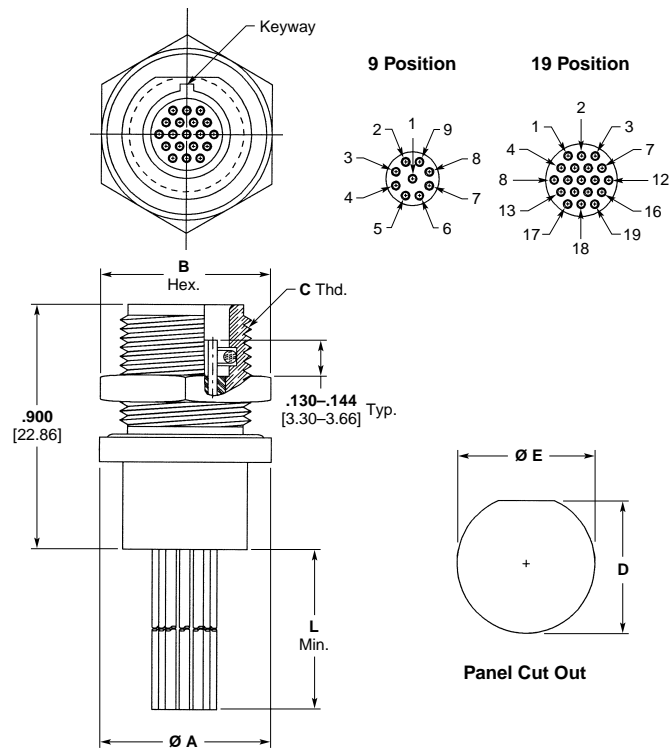


MTC Series Plug (19 Position Shown)

MTC Series — Microminiature Circular Connectors (Continued)

MTC Series Receptacle

| Size | Dimensions    |               |                     |               |               |
|------|---------------|---------------|---------------------|---------------|---------------|
|      | Ø A           | B Hex.        | C Thd.              | D Min.        | Ø E Min.      |
| 9    | .562<br>14.27 | .500<br>12.70 | M10 x 0.75<br>19.05 | .370<br>9.40  | .394<br>10.01 |
| 19   | .625<br>15.88 | .625<br>15.88 | M12 x 1<br>25.40    | .445<br>11.30 | .474<br>12.04 |



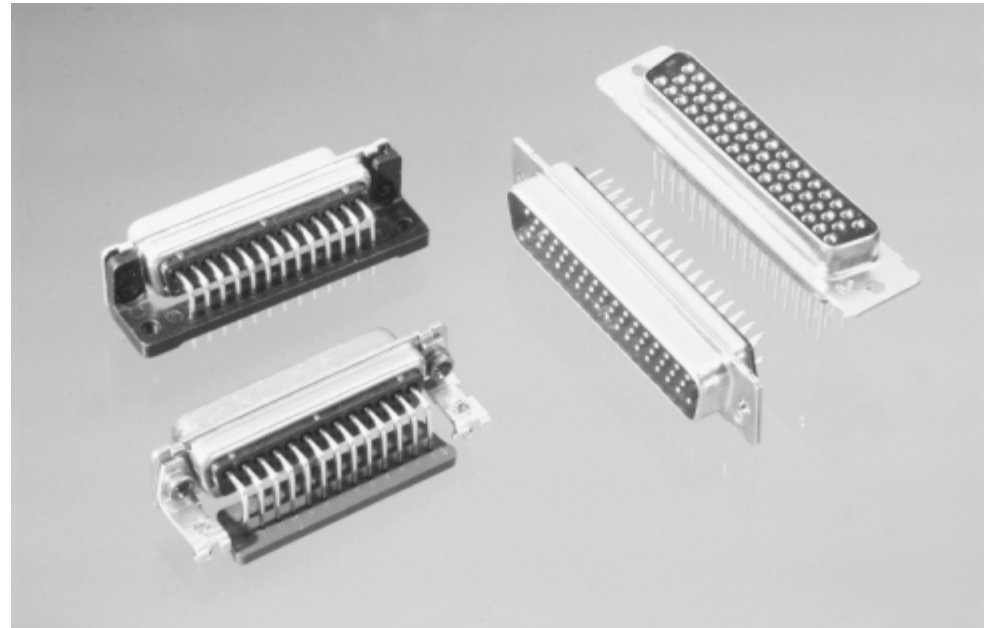
MTC Series Receptacle (19 Position Shown)

### Introduction

#### Product Facts

- Military qualified connectors conform to the latest amendments of MIL-DTL-24308
- Industrial versions available that use the same manufacturing process of MIL-C-24308 connectors
- Non-magnetic versions available per NASA spec, or with rubber grommet on rear of NASA-type connector
- ULTRA-LITE AMPLIMITE non-magnetic connectors save weight and improve EMI shielding vs. brass shell NASA-style connectors
- MIL-C-39029 contacts offer reliability and economies of high speed termination by automatic machine
- Connector savers (feed-through) preserve permanently mounted connectors in high use applications
- Choice of sizes — Size 1 through 5 for Series 109, standard density with 9, 15, 25, 37 and 50 contacts; Size 1 through 6 for Series 90, high density with 15, 26, 44, 62, 78 and 104 contacts
- Series 109 standard density connectors are available with cavities for power or coaxial contacts mixed with size 20 signal contacts
- Right-angle and straight PC board connectors in Series 109, standard density
- Preloaded, straight-posted connectors available in Series 90, high density
- Preloaded, solder cup connectors available in Series 109, standard density
- Produced under a Quality Management System certified to ISO 9001

A copy of the certificate is available upon request



AMPLIMITE Military Subminiature D Connectors are compact pin and socket connectors especially designed for high density packages. They are ideally suited for applications such as military equipment, ground support devices, computer peripheral equipment, modems and industrial instrumentation.

In addition to the complete selection of standard military subminiature D-type connectors, Tyco Electronics offers special application versions such as connectors which mix power/coax cavities with size 20 signal contacts; feed-through connectors which provide a disposable interface for high use applications; and special non-magnetic connectors with a rubber grommet on the rear, for strain relief.

Series 109 and Series 90 military connectors conform

to the latest amendments of the MIL-DTL-24308 specification and thus are intermateable with similar connectors in the same sizes from other manufacturers. A broad range of this catalog, complemented by a variety of commercial cable clamps and mating hardware, which can be found in catalog 1307612.

Each AMPLIMITE crimp connector has metal clips which retain the pins and sockets after they are loaded into the inserts from the rear.

Series 109 connectors accept size 20 contacts, while Series 90 connectors accept size 22 contacts. Cavity spacing conforms to military specifications.

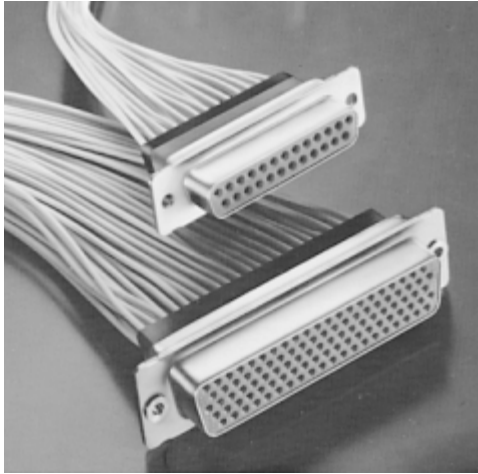
Size 20 and size 22 pins and sockets are designed for an 8-indent crimp. They are supplied loose-piece for

crimping in a standard M22520/2 hand operated tool or tape-mounted for high speed application by an AMP-TAPEMATIC Stripper/Crimper Machine.

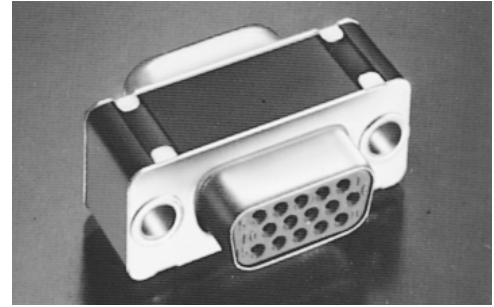
Series 90 and Series 109 connectors preloaded with contacts are available for printed circuit board mounting.

Special Series 109 connectors with power/coax cavities accept power contacts for 18 through 8 AWG [0.8-8 mm<sup>2</sup>] wire or coaxial contacts for RG/U 174, 188A and 316 cable, in combination with standard size 20 signal contacts.

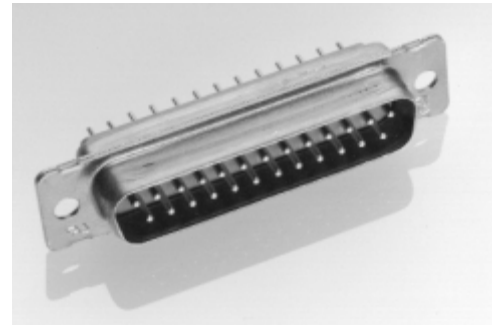
A complete range of non-military AMPLIMITE subminiature D connectors, contacts and accessories are shown in catalog 1307612, available on request from Tyco Electronics.



Connectors for crimp, snap-in contacts are available in both series, standard shells and non-magnetic, plus non-magnetic with rear rubber grommet.



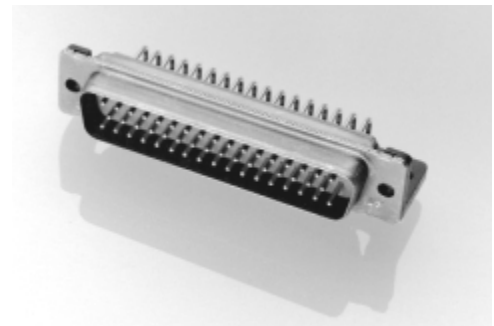
Connector savers extend life in high-use applications.



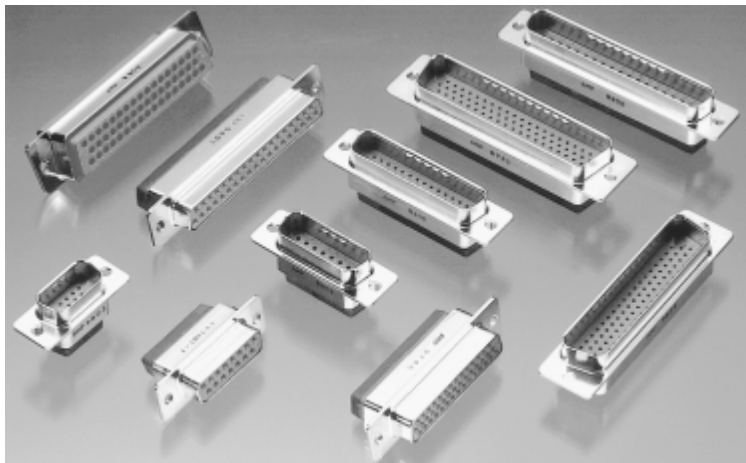
Straight posted versions available in both (Series 109) standard density and (Series 90) high density connectors.



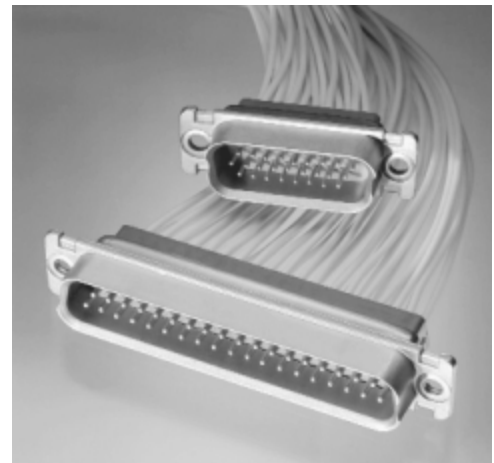
Coax or power contacts can be mixed with signal contacts.



Right-angle board mount connectors for Series 109, standard density connections.



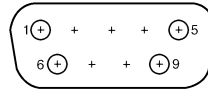
ULTRA-LITE AMPLIMITE Connectors for state-of-the-art weight savings and EMI performance.



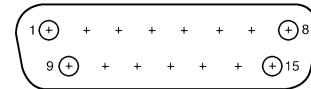
The Series 109 and 90 Blindmate Plug connectors are designed to prevent butting of contacts during mating.

Series 109 Connectors (Standard Density)

Insert Arrangements



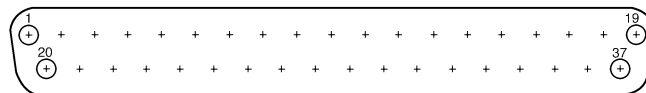
**9 Position  
(Shell Size 1)  
MS 18273-1**



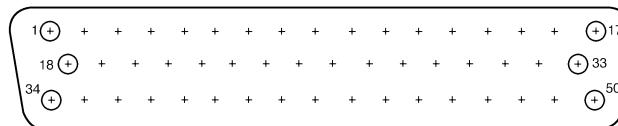
**15 Position  
(Shell Size 2)  
MS 18274-1**



**25 Position  
(Shell Size 3)  
MS 18275-1**



**37 Position  
(Shell Size 4)  
MS 18276-1**



**50 Position  
(Shell Size 5)  
MS 18277-1**

**Note:** Mating face of plug shown; receptacle is mirror image.

Performance Specifications

All Series 109 AMPLIMITE military connectors conform to the latest amendments of military specification MIL-DTL-24308. For more detailed information refer to MIL-DTL-24308.

All Series 109 Connectors are designed for a -67°F to 257°F [-55°C to +125°C] temperature range.

Series 109 contact current rating for Crimp Snap Connectors for MIL-C-39029 7.5 amps in free air.

Series 109 contact current rating for PCB Mount Connectors 5.0 amps per 108-1770.

Technical Documents List

The following technical documents cover the application and performance of AMPLIMITE Series 109 Connectors, contacts, tooling and accessories.

**Military Specifications**

MIL-DTL-24308 Connectors, Electric, Rectangular, Miniature Polarized Shell, Rack and Panel, General Specifications for

MIL-C-39029 Contacts, Electrical Connector, General Specification for

**NASA Specification**

GSFC-S-311-P-4 Non-Magnetic Connectors, General Specification for

**AMP Instruction Sheets**

- 408-7516 AMP Application Tooling for MIL-C-39029 Contacts
- 408-7634 Application and Maintenance for AMP Hand Crimping Tool 90302-1
- 408-7694-1 Application and Maintenance for AMP Hand Crimping Tool 90312-1
- 408-7954 Application and Maintenance for AMP Hand Crimping Tool 90374-1
- 408-7508 AMP Insertion/Extraction Tools 91067-1, 91067-2 and 91067-3
- 408-7837 AMP Female Screwlock Kit 205817-1 and AMP Male Screw/Retainer Kit 211883-5

Size 20 Crimp Contacts for Series 109 Connectors (MIL-C-39029)

Size 20 Crimp, Snap-In Contacts .040 [1.02] Pin Diameter

Material and Finish:

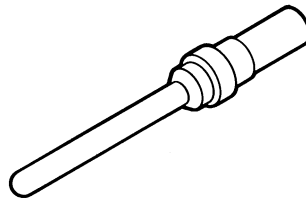
Pin and Socket Body —

<sup>a</sup>Contact Body & Mating Area — Copper alloy, plated gold .000050–.000100 [0.00127–0.00254] thick over .000050–.000100 [0.00127–0.00254] thick nickel underplate.

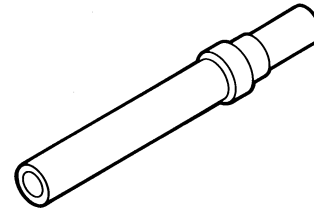
<sup>b</sup>Contact Body — Copper alloy, gold flash .000005 [0.00013] min thick over .000050–.000100 [0.00127–0.00254] thick nickel underplate.

<sup>c</sup>Mating Area — Copper alloy, plated gold .000050 min thick over .000050–.000100 [0.00127–0.00254] thick nickel underplate.

Socket Hood — Passivated stainless steel.



**Pin**  
M39029/64-369  
(Supersedes M24308/11-1)



**Socket**  
M39029/63-368  
(Supersedes M24308/10-1)

| Wire Size Range<br>AWG [mm <sup>2</sup> ] | Ins. Dia. (Max.) | Contact Configuration | Tape Mounted Contacts Part No. | Loose Piece Contacts        |                        | Hand Tool          |                          | Contact Color Band  |
|---|------------------|-----------------------|--------------------------------|-----------------------------|------------------------|--------------------|--------------------------|---------------------|
|   |                  |                       |                                | Military Part No. (M39029/) | AMP Part No.           | Tool No. (M22520/) | Positioner No. (M22520/) |                     |
| 20-24<br>0.6-0.2                          | .072<br>1.83     | Pin                   | 205089-2 <sup>a</sup>          | 64-369                      | 205089-1 <sup>a</sup>  | 02-01              | 02-08                    | orange, blue, white |
|   |                  | Socket                | 205090-2 <sup>a</sup>          | 63-368                      | 205090-1 <sup>a</sup>  | 02-01              | 02-08                    | orange, blue, gray  |
| 20-24<br>0.6-0.2                          | .072<br>1.83     | Pin                   | 1218371-2 <sup>b</sup>         | 64-369                      | 1218371-1 <sup>b</sup> | 02-01              | 02-08                    | orange, blue, white |
|   |                  | Socket                | 1218372-2 <sup>b</sup>         | 63-368                      | 1218372-1 <sup>b</sup> | 02-01              | 02-08                    | orange, blue, gray  |

Tape mounted contacts are used in the AMP-TAPEMATIC Stripper/Crimper Machine Part Number 599406-7 (page 5142).

- Notes:** 1. These contacts are used in Series 109 military connectors.  
 2. Insertion/Extraction Tool Part Number 91067-2 (Military Part Number M81969/1-02) is used to install and remove pin and socket contacts.  
 3. See AMP Instruction Sheet 408-7516 for wire length, tool and selector settings.  
 4. Color bands are read in the direction of terminal (wire barrel) end to mating end.

Size 20 Crimp Contacts for Series 109 Connectors (Industrial Grade)

Size 20 Crimp, Snap-In Contacts .040 [1.02] Pin Diameter

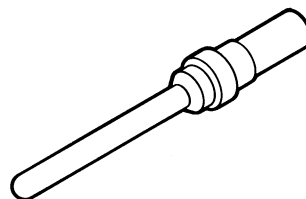
Material and Finish:

Pin and Socket Body —

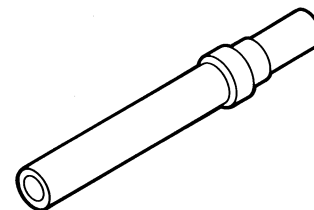
**Pin Body** — Brass, plated gold .000030 [0.00076] min thick over .000050–.000150 [0.00127–0.00381] thick nickel underplate.

**Socket Body** — Brass, plated gold .000010 [0.00025] min thick over .000050–.000150 [0.00127–0.00381] thick nickel underplate.

**Socket Clip** — Copper alloy, plated gold .000050 [0.00013] min thick over .000050–.000150 [0.00127–0.00381] thick nickel underplate.



**Pin**



**Socket**

| Wire Size Range<br>AWG [mm <sup>2</sup> ] | Ins. Dia. (Max.) | Contact Configuration | Tape Mounted Contacts Part No. | Loose Piece Contacts Part No. | Hand Tool          |                          |
|---|------------------|-----------------------|--------------------------------|-------------------------------|--------------------|--------------------------|
|   |                  |                       |                                |                               | Tool No. (M22520/) | Positioner No. (M22520/) |
| 20-24<br>0.6-0.2                          | .072<br>1.83     | Pin                   | 1218266-4                      | 1218266-3                     | 02-01              | 02-08                    |
|   |                  | Socket                | 1218267-4                      | 1218267-3                     | 02-01              | 02-08                    |
| 18<br>0.8                                 | .083<br>2.11     | Pin                   | 1218266-2                      | 1218266-1                     | 02-01              | 02-08                    |
|   |                  | Socket                | 1218267-2                      | 1218267-1                     | 02-01              | 02-08                    |

Tape mounted contacts are used in the AMP-TAPEMATIC Stripper/Crimper Machine Part Number 599406-7 (page 5142).

- Notes:** 1. These contacts are used in Series 109 connectors.  
 2. Insertion/Extraction Tool Part Number 91067-2 (Military Part Number M81969/1-02) is used to install and remove pin and socket contacts.  
 3. See AMP Instruction Sheet 408-7516 for wire length, tool and selector settings.

Size 20 Posted Contacts for Series 109 Connectors

Size 20 Posted Contacts

Material and Finish:

**Pin and Socket Body** —  
Leaded nickel copper or beryllium copper, plated per chart below

**Socket Hood** —  
See chart below

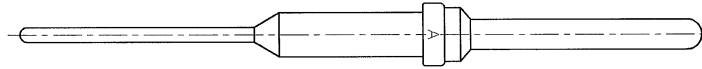


**Pin and Socket  
Insertion/Extraction Tool**

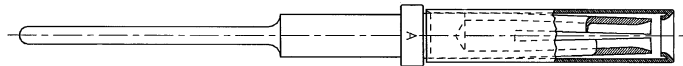
AMP Part Number 91067-2 or  
MIL Number M81969/1-02  
Insertion tip, for replacement  
Part Number 126195-3  
Extraction tip, for replacement  
Part Number 126195-4

**Notes:**

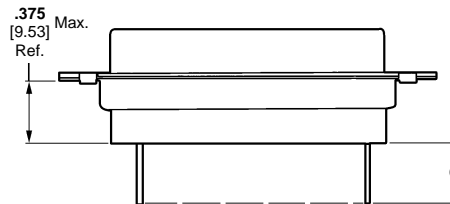
1. Contacts on this page can be used with connectors on pages 5105-5109, 5122, 5123 and 5139.
2. Mating End of pin and socket complies with MIL-C-39029.
3. See page 5144 for PCB layouts.



**Pin**  
(See Drawing No. 212565 for latest configuration)



**Socket**  
(See Drawing No. 208778 for latest configuration)



**Post extension when used in a standard connector**

| Post Diameter<br>± .002 [± .050] | Post Extension<br>C ± .025 [± 0.63] | Part Nos.  |            | Contact Plating   | Socket Hood Material and Finish |
|----------------------------------|-------------------------------------|------------|------------|---|---------------------------------|
|                                  |                                     | Pin        | Socket     |   |                                 |
| .018<br>0.46                     | .325<br>8.25                        | 1-212565-0 | 1-208778-0 | Gold .000050-.000100 [0.00127-0.00254] thick over .000150-.000250 [0.00381-0.00635] thick copper underplate | Passivated Stainless Steel      |
| .018<br>0.46                     | .325<br>8.25                        | —          | 1-208778-1 | Gold .000050-.000100 [0.00127-0.00254] thick over .000050-.000150 [0.00127-0.00381] thick nickel underplate | Passivated Stainless Steel      |
| .018<br>0.46                     | .240<br>6.10                        | —          | 1-208778-2 | Gold .000050-.000100 [0.00127-0.00254] thick over .000150-.000250 [0.00381-0.00635] thick copper underplate | Passivated Stainless Steel      |



Size 20 Posted Contacts for Series 109 Connectors (High Current Upgrade Program)

The High Current Size 20 contact has been designed to fit into the Series 109 AMPLIMITE Connectors per MIL-C-24308.

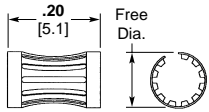
**Material**

**Body** — Copper Alloy  
**Louvertac Band** — Beryllium Copper

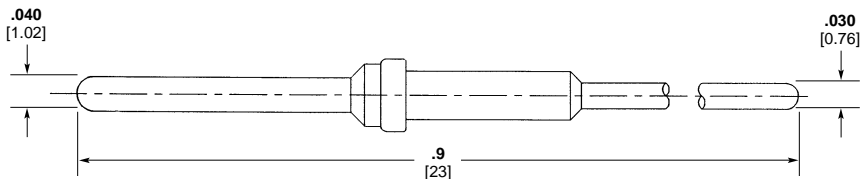
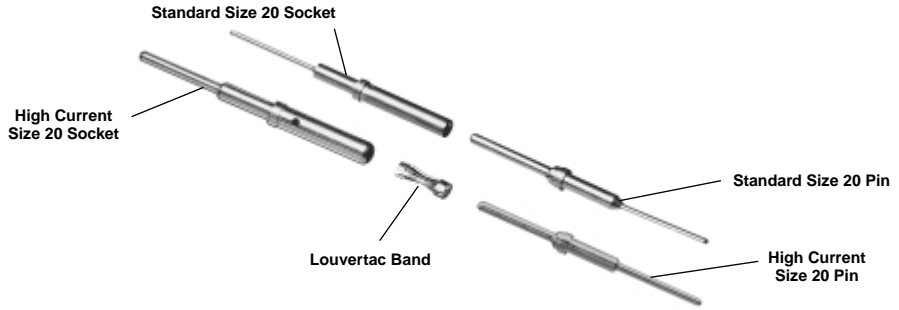
**Finish**

**Body** — Gold  
**Louvertac Band** — Gold

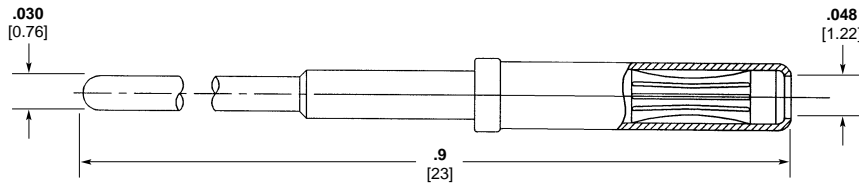
**Current-Carrying Capacity.** The High Current Size 20 contact with a 20 gage wire attached to the .030 [0.762] diameter solder tail acquired an initial 86°F [30°C] T-Rise of 11.85 amps in free air.



Multiple contact point due to hyperbolic shape.



Pin Part Number 194081-1



Socket Part Number 194083-1

The contacts can be sold loose piece or installed into any of the MIL Standard connectors.

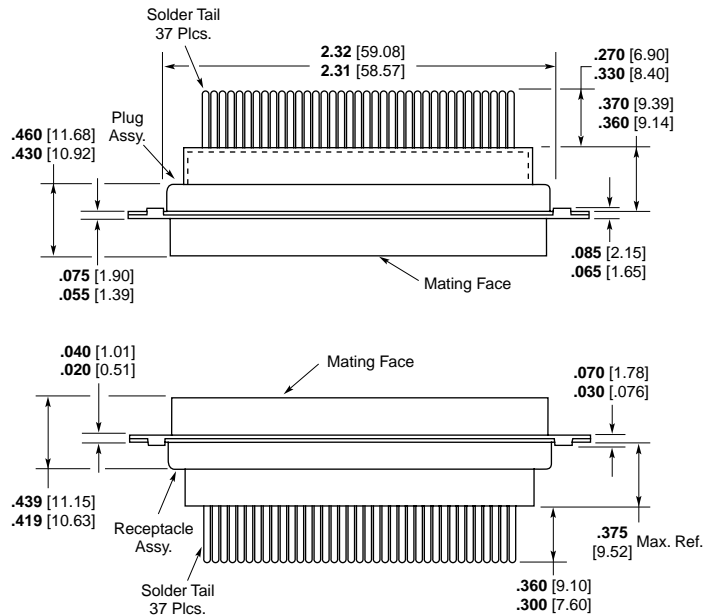


**Pin and Socket Insertion/Extraction Tool**

Part Number 91067-2 or MIL number M81969/1-02

Insertion tip, for replacement Part Number 126195-3

Extraction tip, for replacement Part Number 126195-4



**Typical Fully-Loaded 37 Position Plug and Receptacle**

**Notes: 1. High Current contacts with Louvertac bands are NOT intermateable with any other contact.**

**Material and Finish:**

Shell — Steel, cadmium plated

Insert — Approved material per MIL-DTL-24308

Retention Clips — Stainless steel

**Related Product Data:**

Cavity Identification — page 5101

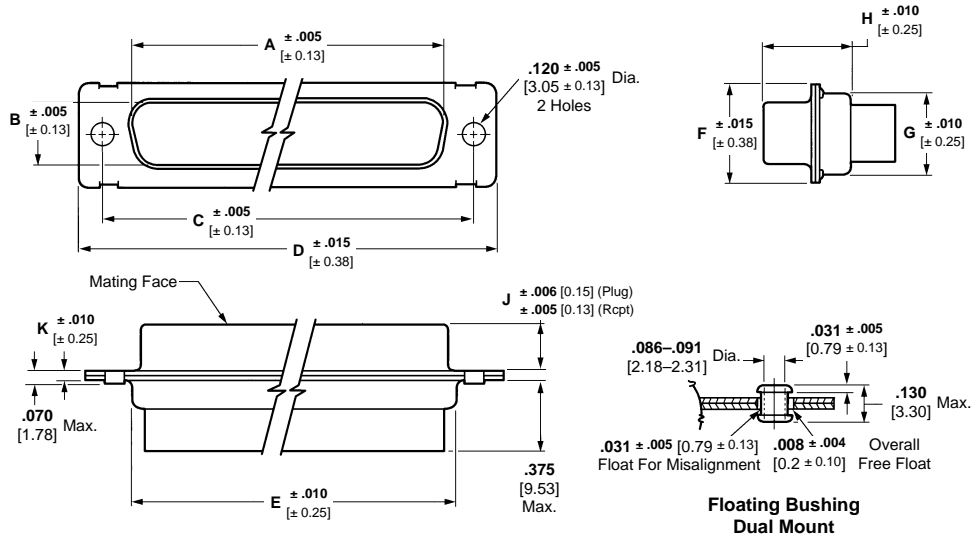
Contacts — pages 5102-5104

Mounting, Mating Specifications — page 5143

Accessories — pages 5148-5150

**Attention: Connector marking**

Connector marking may differ from package marking. All connectors marked per MIL-DTL-24308.



**Series 109 Plugs per MIL-DTL-24308**

| No. of Contact Pos. (Shell Size) | Dimensions     |              |                |                |                |               |               |               |              |              | Standard Mount            |                      | Floating Bushing Mount    |                      | Description                 |
|----------------------------------|----------------|--------------|----------------|----------------|----------------|---------------|---------------|---------------|--------------|--------------|---------------------------|----------------------|---------------------------|----------------------|-----------------------------|
|                                  | A (Inside)     | B (Inside)   | C              | D              | E              | F             | G             | H             | J            | K            | Military Part No. M24308/ | AMP Part No.         | Military Part No. M24308/ | AMP Part No.         |                             |
| 9 (1)                            | .666<br>16.92  | .329<br>8.36 | .984<br>24.99  | 1.213<br>30.81 | .759<br>19.28  | .494<br>12.55 | .422<br>10.72 | .422<br>10.72 | .235<br>5.97 | .030<br>0.76 | 4-259F<br>4-1F            | 205162-1<br>205556-2 | 4-324F<br>4-302F          | 205412-1<br>205486-2 | Plug only<br>Plug with pins |
| 15 (2)                           | .994<br>25.25  | .329<br>8.36 | 1.312<br>33.32 | 1.541<br>39.14 | 1.083<br>27.51 | .494<br>12.55 | .422<br>10.72 | .422<br>10.72 | .235<br>5.97 | .030<br>0.76 | 4-260F<br>4-2F            | 205164-1<br>205558-2 | 4-325F<br>4-303F          | 205408-1<br>205409-2 | Plug only<br>Plug with pins |
| 25 (3)                           | 1.534<br>38.96 | .329<br>8.36 | 1.852<br>47.04 | 2.088<br>53.04 | 1.625<br>41.3  | .494<br>12.55 | .422<br>10.72 | .426<br>10.82 | .230<br>5.84 | .039<br>0.99 | 4-261F<br>4-3F            | 205166-1<br>205560-2 | 4-326F<br>4-304F          | 205413-1<br>205487-2 | Plug only<br>Plug with pins |
| 37 (4)                           | 2.182<br>55.42 | .329<br>8.36 | 2.500<br>63.5  | 2.729<br>69.32 | 2.272<br>57.71 | .494<br>12.55 | .422<br>10.72 | .426<br>10.82 | .230<br>5.84 | .039<br>0.99 | 4-262F<br>4-4F            | 205168-1<br>205562-2 | 4-327F<br>4-305F          | 205414-1<br>205488-2 | Plug only<br>Plug with pins |
| 50 (5)                           | 2.079<br>52.81 | .441<br>11.2 | 2.406<br>61.11 | 2.635<br>66.93 | 2.178<br>55.32 | .605<br>15.37 | .534<br>13.56 | .426<br>10.82 | .230<br>5.84 | .039<br>0.99 | 4-263F<br>4-5F            | 205170-1<br>205564-2 | 4-328F<br>4-306F          | 205415-1<br>205431-2 | Plug only<br>Plug with pins |

**Series 109 Receptacles per MIL-DTL-24308**

| No. of Contact Pos. (Shell Size) | Dimensions     |               |                |                |                |               |               |              |              |              | Standard Mount            |                      | Floating Bushing Mount    |                      | Description                          |
|----------------------------------|----------------|---------------|----------------|----------------|----------------|---------------|---------------|--------------|--------------|--------------|---------------------------|----------------------|---------------------------|----------------------|--------------------------------------|
|                                  | A (Outside)    | B (Outside)   | C              | D              | E              | F             | G             | H            | J            | K            | Military Part No. M24308/ | AMP Part No.         | Military Part No. M24308/ | AMP Part No.         |                                      |
| 9 (1)                            | .643<br>16.33  | .311<br>7.9   | .984<br>24.99  | 1.213<br>30.81 | .759<br>19.28  | .494<br>12.55 | .422<br>10.72 | .429<br>10.9 | .243<br>6.17 | .030<br>0.76 | 2-281F<br>2-1F            | 205161-1<br>205555-2 | 2-292F<br>2-23F           | 205416-1<br>205483-2 | Recept. only<br>Recept. with sockets |
| 15 (2)                           | .971<br>24.66  | .311<br>7.9   | 1.312<br>33.32 | 1.541<br>39.14 | 1.083<br>27.51 | .494<br>12.55 | .422<br>10.72 | .429<br>10.9 | .243<br>6.17 | .030<br>0.76 | 2-282F<br>2-2F            | 205163-1<br>205557-2 | 2-293F<br>2-24F           | 205417-1<br>205433-2 | Recept. only<br>Recept. with sockets |
| 25 (3)                           | 1.511<br>38.38 | .311<br>7.9   | 1.852<br>47.04 | 2.088<br>53.04 | 1.625<br>41.3  | .494<br>12.55 | .422<br>10.72 | .429<br>10.9 | .243<br>6.17 | .039<br>0.99 | 2-283F<br>2-3F            | 205165-1<br>205559-2 | 2-294F<br>2-25F           | 205418-1<br>205484-2 | Recept. only<br>Recept. with sockets |
| 37 (4)                           | 2.159<br>54.84 | .311<br>7.9   | 2.500<br>63.5  | 2.729<br>69.32 | 2.272<br>57.71 | .494<br>12.55 | .422<br>10.72 | .429<br>10.9 | .243<br>6.17 | .039<br>0.99 | 2-284F<br>2-4F            | 205167-1<br>205561-2 | 2-295F<br>2-26F           | 205419-1<br>205485-2 | Recept. only<br>Recept. with sockets |
| 50 (5)                           | 2.064<br>52.43 | .423<br>10.74 | 2.406<br>61.11 | 2.635<br>66.93 | 2.178<br>55.32 | .605<br>15.37 | .534<br>13.56 | .429<br>10.9 | .243<br>6.17 | .039<br>0.99 | 2-285F<br>2-5F            | 205169-1<br>205563-2 | 2-296F<br>2-27F           | 205420-1<br>205432-2 | Recept. only<br>Recept. with sockets |

- Notes:**
- Size 20 contacts supplied with connectors are loose piece.
  - "F" is stamped on connectors following M24308 Part Number as required. "F" designates cadmium shell plating.
  - See pages 5151 through 5155 (Military to AMP Part Number cross reference) for additional part numbers.)

Crimp, Series 109, Standard Density Connectors (Industrial Grade)

**Material and Finish:**

Shell — Steel, zinc plated

Insert — Approved material per MIL-DTL-24308

Retention Clips — Stainless steel

**Related Product Data:**

Cavity Identification — page 5101

Contacts — pages 5102-5104

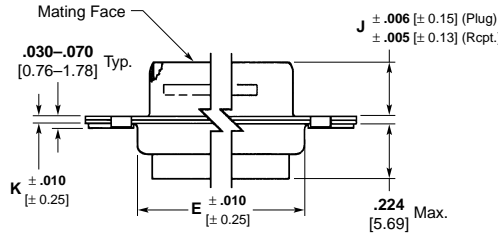
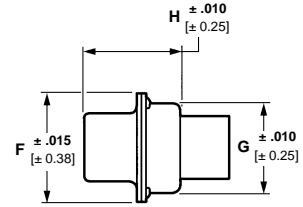
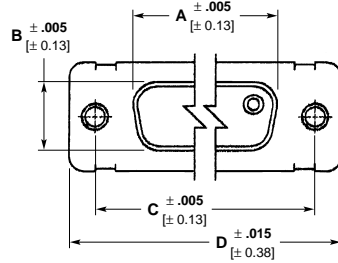
Mounting, Mating Specifications — page 5143

Accessories — pages 5148-5150

**Attention: Connector marking**

Connector marking may differ from package marking.

**Note:** Meets requirements of MIL-DTL-24308



Clinch Nut Mount

**Series 109 Plugs**

| No. of Contact Pos. (Shell Size) | Dimensions     |              |                |                |                |               |               |               |               |              | Standard Mount Part No. | Description |            |
|----------------------------------|----------------|--------------|----------------|----------------|----------------|---------------|---------------|---------------|---------------|--------------|-------------------------|-------------|------------|
|                                  | A (Inside)     | B (Inside)   | C              | D              | E              | F             | G             | H             | J             | K            |                         |             |            |
| 9 (1)                            | .666<br>16.92  | .329<br>8.36 | .984<br>24.99  | 1.213<br>30.81 | .759<br>19.28  | .494<br>12.55 | .422<br>10.72 | .422<br>10.72 | .422<br>10.72 | .235<br>5.97 | .030<br>0.76            | 1218748-1   | Plug only  |
| 15 (2)                           | .994<br>25.25  | .329<br>8.36 | 1.312<br>33.32 | 1.541<br>39.14 | 1.083<br>27.51 | .494<br>12.55 | .422<br>10.72 | .422<br>10.72 | .422<br>10.72 | .235<br>5.97 | .030<br>0.76            | 1218748-2   | Plug only  |
| 25 (3)                           | 1.534<br>38.96 | .329<br>8.36 | 1.852<br>47.04 | 2.088<br>53.04 | 1.625<br>41.3  | .494<br>12.55 | .422<br>10.72 | .426<br>10.82 | .230<br>5.84  | .039<br>0.99 |                         | 1218748-3   | Plug only  |
| 37 (4)                           | 2.182<br>55.42 | .329<br>8.36 | 2.500<br>63.5  | 2.729<br>69.32 | 2.272<br>57.71 | .494<br>12.55 | .422<br>10.72 | .426<br>10.82 | .230<br>5.84  | .039<br>0.99 |                         | 1218748-4   | Plug only  |
| 50 (5)                           | 2.079<br>52.81 | .441<br>11.2 | 2.406<br>61.11 | 2.635<br>66.93 | 2.178<br>55.32 | .605<br>15.37 | .534<br>13.56 | .426<br>10.82 | .230<br>5.84  | .039<br>0.99 |                         | 1218748-5   | Plug. only |

Clinch Nut Mount available, contact Tyco Electronics.

**Series 109 Receptacles**

| No. of Contact Pos. (Shell Size) | Dimensions     |               |                |                |                |               |               |              |              |              | Clinch Nut Mount Part No. | Description  |              |
|----------------------------------|----------------|---------------|----------------|----------------|----------------|---------------|---------------|--------------|--------------|--------------|---------------------------|--------------|--------------|
|                                  | A (Inside)     | B (Inside)    | C              | D              | E              | F             | G             | H            | J            | K            |                           |              |              |
| 9 (1)                            | .643<br>16.33  | .311<br>7.9   | .984<br>24.99  | 1.213<br>30.81 | .759<br>19.28  | .494<br>12.55 | .422<br>10.72 | .429<br>10.9 | .243<br>6.17 | .030<br>0.76 | 1218749-1                 | Recept. only |              |
| 15 (2)                           | .971<br>24.66  | .311<br>7.9   | 1.312<br>33.32 | 1.541<br>39.14 | 1.083<br>27.51 | .494<br>12.55 | .422<br>10.72 | .429<br>10.9 | .243<br>6.17 | .030<br>0.76 | 1218749-2                 | Recept. only |              |
| 25 (3)                           | 1.511<br>38.38 | .311<br>7.9   | 1.852<br>47.04 | 2.088<br>53.04 | 1.625<br>41.3  | .494<br>12.55 | .422<br>10.72 | .429<br>10.9 | .243<br>6.17 | .039<br>0.99 |                           | 1218749-3    | Recept. only |
| 37 (4)                           | 2.159<br>54.84 | .311<br>7.9   | 2.500<br>63.5  | 2.729<br>69.32 | 2.272<br>57.71 | .494<br>12.55 | .422<br>10.72 | .429<br>10.9 | .243<br>6.17 | .039<br>0.99 |                           | 1218749-4    | Recept. only |
| 50 (5)                           | 2.064<br>52.43 | .423<br>10.74 | 2.406<br>61.11 | 2.635<br>66.93 | 2.178<br>55.32 | .605<br>15.37 | .534<br>13.56 | .429<br>10.9 | .243<br>6.17 | .039<br>0.99 |                           | 1218749-5    | Recept. only |

Standard Mount available, contact Tyco Electronics.

Non-Magnetic Crimp Plugs, Series 109, Standard Density Connectors (NASA Qualified)

Connector Material and Finish:

Shell — Brass, gold plated

Insert — Approved material per MIL-DTL-24308

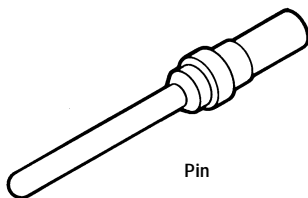
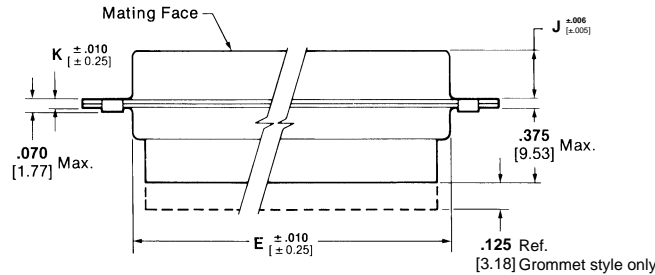
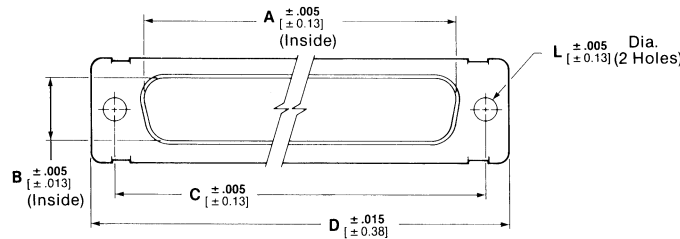
Retention Clips — Copper alloy

Related Product Data:

Cavity Identification — page 5101

Mounting, Mating Specifications — page 5143

Accessories — pages 5148-5150



Pin

Pin Contact

| Wire Size Range    | AMP Part No. / NASA No. |
|--------------------|-------------------------|
| 26-28<br>0.15-0.08 | 206794-2                |
| 20-24<br>0.6-0.2   | 205089-4<br>G-10-P1     |

Strip length .140 [3.56]  
Max. insulation diameter .072 [1.83]  
Hand tool M22520/2-01 or AMP Part Number 601966-1  
Positioner M22520/2-08 or AMP Part Number 601966-5

Contact Material and Finish:

Copper alloy plated gold  
.00050-.000100 [0.00127-0.00254]  
thick over .000100-.000150  
[0.00254-0.00381] copper underplate

Non-Magnetic Plugs per NASA Specification

| No. of Contact Pos. (Shell Size) | Dimensions |       |       |       |       |       |       |       |      |      |      | NASA No.        | AMP Part No. |
|----------------------------------|------------|-------|-------|-------|-------|-------|-------|-------|------|------|------|-----------------|--------------|
|                                  | A          | B     | C     | D     | E     | F     | G     | H     | J    | K    | L    |                 |              |
| 9<br>(1)                         | .666       | .329  | .984  | 1.213 | .759  | .494  | .422  | .422  | .235 | .030 | .154 | 311P409-1P-B-15 | 207252-1     |
|                                  | 16.92      | 8.36  | 24.99 | 30.81 | 19.28 | 12.55 | 10.72 | 10.72 | 5.97 | 0.76 | 3.91 |                 |              |
| 15<br>(2)                        | .994       | .329  | 1.312 | 1.541 | 1.083 | .494  | .422  | .422  | .235 | .030 | .154 | 311P409-2P-B-15 | 206798-1     |
|                                  | 25.25      | 8.36  | 33.32 | 39.14 | 27.51 | 12.55 | 10.72 | 10.72 | 5.97 | 0.76 | 3.91 |                 |              |
| 25<br>(3)                        | 1.534      | .329  | 1.852 | 2.088 | 1.625 | .494  | .422  | .426  | .230 | .039 | .154 | 311P409-3P-B-15 | 206800-1     |
|                                  | 38.96      | 8.36  | 47.04 | 53.04 | 41.3  | 12.55 | 10.72 | 10.82 | 5.84 | 0.99 | 3.91 |                 |              |
| 37<br>(4)                        | 2.182      | .329  | 2.500 | 2.729 | 2.272 | .494  | .422  | .426  | .230 | .039 | .154 | 311P409-4P-B-15 | 206802-1     |
|                                  | 55.42      | 8.36  | 63.5  | 69.32 | 57.71 | 12.55 | 10.72 | 10.82 | 5.84 | 0.99 | 3.91 |                 |              |
| 50<br>(5)                        | 2.079      | .441  | 2.406 | 2.635 | 2.178 | .605  | .534  | .426  | .230 | .039 | .154 | 311P409-5P-B-15 | 206804-1     |
|                                  | 52.81      | 11.20 | 61.11 | 66.93 | 55.32 | 15.37 | 13.56 | 10.82 | 5.84 | 0.99 | 3.91 |                 |              |
|                                  |            |       |       |       |       |       |       |       |      |      | .120 |                 |              |
|                                  |            |       |       |       |       |       |       |       |      |      | 3.05 |                 |              |

Non-Magnetic Plugs With Silicone Rubber Rear Grommet<sup>1</sup>

| No. of Contact Pos. (Shell Size) | Dimensions |       |       |       |       |       |       |       |      |      |      | AMP Part No. |
|----------------------------------|------------|-------|-------|-------|-------|-------|-------|-------|------|------|------|--------------|
|                                  | A          | B     | C     | D     | E     | F     | G     | H     | J    | K    | L    |              |
| 9<br>(1)                         | .666       | .329  | .984  | 1.213 | .759  | .494  | .422  | .422  | .235 | .030 | .120 | 211638-4     |
|                                  | 16.92      | 8.36  | 24.99 | 30.81 | 19.28 | 12.55 | 10.72 | 10.72 | 5.97 | 0.76 | 3.05 |              |
| 15<br>(2)                        | .994       | .329  | 1.312 | 1.541 | 1.083 | .494  | .422  | .422  | .235 | .030 | .120 | 211639-4     |
|                                  | 25.25      | 8.36  | 33.32 | 39.14 | 27.51 | 12.55 | 10.72 | 10.72 | 5.97 | 0.76 | 3.05 |              |
| 25<br>(3)                        | 1.534      | .329  | 1.852 | 2.088 | 1.625 | .494  | .422  | .426  | .230 | .039 | .120 | 211640-4     |
|                                  | 38.96      | 8.36  | 47.04 | 53.04 | 41.3  | 12.55 | 10.72 | 10.82 | 5.84 | 0.99 | 3.05 |              |
| 37<br>(4)                        | 2.182      | .329  | 2.500 | 2.729 | 2.272 | .494  | .422  | .426  | .230 | .039 | .120 | 211641-4     |
|                                  | 55.42      | 8.36  | 63.5  | 69.32 | 57.71 | 12.55 | 10.72 | 10.82 | 5.84 | 0.99 | 3.05 |              |
| 50<br>(5)                        | 2.079      | .441  | 2.406 | 2.635 | 2.178 | .605  | .534  | .426  | .230 | .039 | .120 | 211642-4     |
|                                  | 52.81      | 11.20 | 61.11 | 66.93 | 55.32 | 15.37 | 13.56 | 10.82 | 5.84 | 0.99 | 3.05 |              |

<sup>1</sup> Grommet provided for cable strain relief.



Pin and Socket Insertion/Extraction Tool

AMP Part Number 91067-2 or MIL Number M81969/1-02  
Insertion tip, for replacement Part Number 126195-3  
Extraction tip, for replacement Part Number 126195-4

Non-Magnetic Crimp Receptacles, Series 109, Standard Density Connectors (NASA Qualified)

**Connector Material and Finish:**

**Shell** — Brass, gold plated

**Insert** — Approved material per MIL-DTL-24308

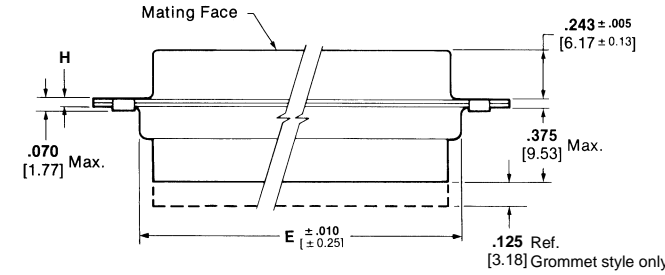
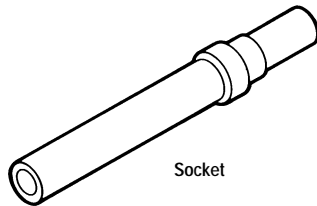
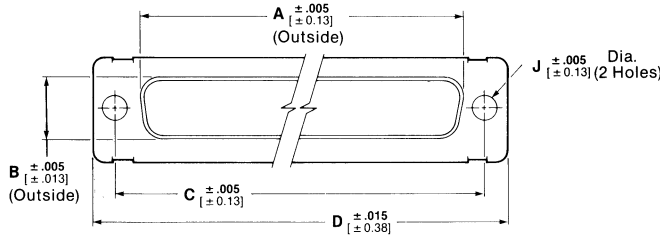
**Retention Clips** — Copper alloy

**Related Product Data:**

**Cavity Identification** — page 5101

**Mounting, Mating Specifications** — page 5143

**Accessories** — pages 5148-5150



**Socket Contact**

| Wire Size Range    | AMP Part No. / NASA No. |
|--------------------|-------------------------|
| 26-28<br>0.15-0.08 | 206795-1<br>—           |
| 20-24<br>0.6-0.2   | 206793-1<br>G-10-S1     |

Strip length .140 [3.56]  
Max. insulation diameter .072 [1.83]  
Hand tool M22520/2-01 or AMP Part Number 601966-1  
Positioner M22520/2-08 or AMP Part Number 601966-5

**Contact Material and Finish:**

Copper alloy plated gold  
.000050-.000100 [0.00127-.00254]  
thick over .000100-.000150  
[0.00254-.00381] copper underplate

Non-Magnetic Receptacles per NASA Specification

| No. of Contact Pos. (Shell Size) | Dimensions |       |       |       |       |       |       |      |      |      | NASA No.        | AMP Part No. |
|----------------------------------|------------|-------|-------|-------|-------|-------|-------|------|------|------|-----------------|--------------|
|                                  | A          | B     | C     | D     | E     | F     | G     | H    | J    |      |                 |              |
| 9<br>(1)                         | .643       | .311  | .984  | 1.213 | .759  | .494  | .422  | .030 | .154 | 3.91 | 311P409-1S-B-15 | 207253-1     |
|                                  | 16.33      | 7.9   | 24.99 | 30.81 | 19.28 | 12.55 | 10.72 | 0.76 | 3.91 | 3.05 |                 |              |
| 15<br>(2)                        | .971       | .311  | 1.312 | 1.541 | 1.083 | .494  | .422  | .030 | .154 | 3.91 | 311P409-2S-B-15 | 206799-1     |
|                                  | 24.66      | 7.9   | 33.32 | 39.14 | 27.51 | 12.55 | 10.72 | 0.76 | 3.91 | 3.05 |                 |              |
| 25<br>(3)                        | 1.511      | .311  | 1.852 | 2.088 | 1.625 | .494  | .422  | .039 | .154 | 3.91 | 311P409-3S-B-15 | 206801-1     |
|                                  | 38.38      | 7.9   | 47.04 | 53.04 | 41.3  | 12.55 | 10.72 | 0.99 | 3.91 | 3.05 |                 |              |
| 37<br>(4)                        | 2.159      | .311  | 2.500 | 2.729 | 2.272 | .494  | .422  | .039 | .154 | 3.91 | 311P409-4S-B-15 | 206803-1     |
|                                  | 55.42      | 7.9   | 63.5  | 69.32 | 57.71 | 12.55 | 10.72 | 0.99 | 3.91 | 3.05 |                 |              |
| 50<br>(5)                        | 2.064      | .423  | 2.406 | 2.635 | 2.178 | .605  | .534  | .039 | .154 | 3.91 | 311P409-5S-B-15 | 206805-1     |
|                                  | 52.43      | 10.74 | 61.11 | 66.93 | 55.32 | 15.37 | 13.56 | 0.99 | 3.91 | 3.05 |                 |              |

Non-Magnetic Receptacles With Silicone Rubber Rear Grommet<sup>1</sup>

| No. of Contact Pos. (Shell Size) | Dimensions |       |       |       |       |       |       |      |      |      | AMP Part No. |
|----------------------------------|------------|-------|-------|-------|-------|-------|-------|------|------|------|--------------|
|                                  | A          | B     | C     | D     | E     | F     | G     | H    | J    |      |              |
| 9<br>(1)                         | .643       | .311  | .984  | 1.213 | .759  | .494  | .422  | .030 | .120 | 3.05 | 211633-4     |
|                                  | 16.33      | 7.9   | 24.99 | 30.81 | 19.28 | 12.55 | 10.72 | 0.76 | 3.05 | 3.05 |              |
| 15<br>(2)                        | .971       | .311  | 1.312 | 1.541 | 1.083 | .494  | .422  | .030 | .120 | 3.05 | 211634-4     |
|                                  | 24.66      | 7.9   | 33.32 | 39.14 | 27.51 | 12.55 | 10.72 | 0.76 | 3.05 | 3.05 |              |
| 25<br>(3)                        | 1.511      | .311  | 1.852 | 2.088 | 1.625 | .494  | .422  | .039 | .120 | 3.05 | 211635-4     |
|                                  | 38.38      | 7.9   | 47.04 | 53.04 | 41.3  | 12.55 | 10.72 | 0.99 | 3.05 | 3.05 |              |
| 37<br>(4)                        | 2.159      | .311  | 2.500 | 2.729 | 2.272 | .494  | .422  | .039 | .120 | 3.05 | 211636-4     |
|                                  | 54.84      | 7.9   | 63.5  | 69.32 | 57.71 | 12.55 | 10.72 | 0.99 | 3.05 | 3.05 |              |
| 50<br>(5)                        | 2.064      | .423  | 2.406 | 2.635 | 2.178 | .605  | .534  | .039 | .120 | 3.05 | 211637-4     |
|                                  | 52.43      | 10.74 | 61.11 | 66.93 | 55.32 | 15.37 | 13.56 | 0.99 | 3.05 | 3.05 |              |

<sup>1</sup> Grommet provided for cable strain relief.



AMP Part Number 91067-2 or MIL Number M81969/1-02  
Insertion tip, for replacement Part Number 126195-3  
Extraction tip, for replacement Part Number 126195-4

Crimp, Blindmate Plugs, Series 109, Standard Density Connectors

**Materials and Finish:**

**Shell, Front** — Aluminum alloy, cadmium plated with yellow chromate

**Shell, Rear** — Steel, cadmium plated with yellow chromate

**Insert Assembly** — Approved material per MIL-DTL-24308

**Retention Clips** — Stainless steel

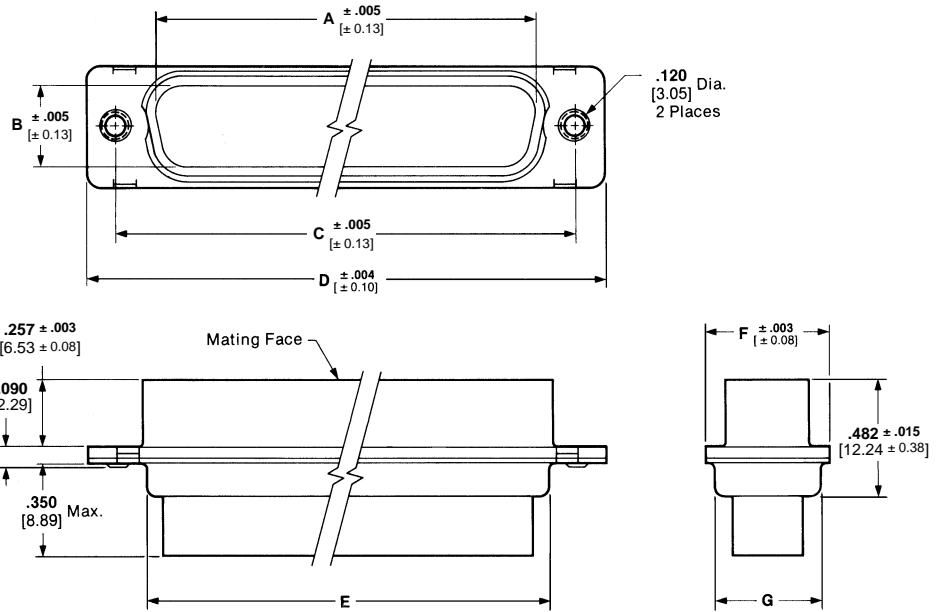
**Related Product Data:**

**Cavity Identification** — page 5101

**Contacts** — pages 5102-5104

**Mounting Specifications** — page 5143

Mating information contained on page 5143 does not pertain to Blindmate design. Flange to flange spacing can be a max. of .270 [6.86].



| No. of Contact Pos. (Shell Size) | Dimensions     |               |                |                |                            |               |                          | AMP Part No. |
|----------------------------------|----------------|---------------|----------------|----------------|----------------------------|---------------|--------------------------|--------------|
|                                  | A              | B             | C              | D              | E                          | F             | G                        |              |
| 9 (1)                            | .656<br>16.66  | .324<br>8.23  | .984<br>24.99  | 1.224<br>31.09 | .769/1.750<br>19.53/19.05  | .506<br>12.85 | .432/.413<br>10.97/10.49 | 445005-1     |
| 15 (2)                           | .984<br>25.0   | .324<br>8.23  | 1.312<br>33.32 | 1.552<br>39.42 | 1.093/1.074<br>27.76/27.28 | .506<br>12.85 | .432/.413<br>10.97/10.49 | 445006-1     |
| 25 (3)                           | 1.524<br>38.71 | .324<br>8.23  | 1.852<br>47.04 | 2.099<br>53.31 | 1.635/1.616<br>41.53/41.05 | .506<br>12.85 | .432/.413<br>10.97/10.49 | 445007-1     |
| 37 (4)                           | 2.172<br>55.17 | .324<br>8.23  | 2.500<br>63.5  | 2.740<br>69.60 | 2.282/2.263<br>57.96/57.48 | .506<br>12.85 | .432/.413<br>10.97/10.49 | 445008-1     |
| 50 (5)                           | 2.082<br>52.88 | .444<br>11.28 | 2.406<br>61.11 | 2.646<br>67.21 | 2.188/2.167<br>55.58/55.04 | .617<br>15.67 | .544/.525<br>13.82/13.34 | 445009-1     |

**Note:** See page 5122 for Blindmate coax/signal combinations.

Straight PCB, Series 109, Standard Density Connectors (MIL Qualified)

**Material and Finish:**

- Shell** — Steel, cadmium plated
- Insert** — Approved material per MIL-DTL-24308
- Contact** — Copper alloy plated gold over nickel underplate\*
- Spacer** — Aluminum alloy, Iridite finish

**Related Product Data:**

- Cavity Identification** — page 5101
- Mounting, Mating Specifications** — page 5143

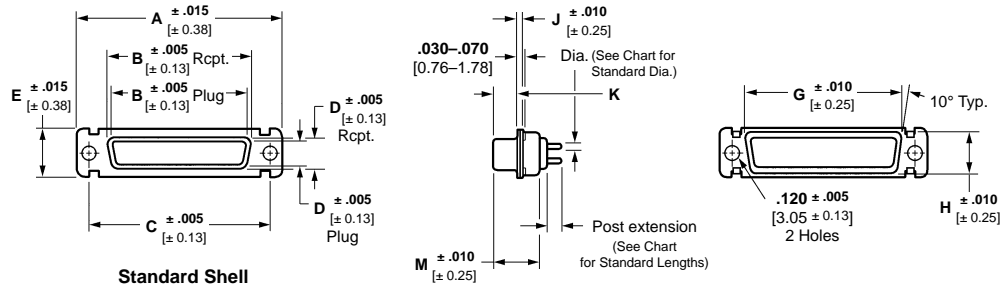
**Accessories** — pages 5148-5150

**PCB Layouts** — See page 5144 or AMP customer drawing.

\***Socket Body** — .000050 [0.00127] min. gold over .000050 [0.00127] min. nickel

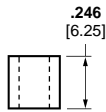
**Mating Area** — .000050 [0.00127] min. gold over .000050 [0.00127] min. nickel

**Plug Body** — .000050 [0.00127] min. gold over .000050 [0.00127] min. nickel



**Standard Shell**

| MS Shell Size | Connector Style | Dimensions     |                |                |               |               |                |               |              |                        |               |
|---------------|-----------------|----------------|----------------|----------------|---------------|---------------|----------------|---------------|--------------|------------------------|---------------|
|               |                 | A              | B              | C              | D             | E             | G              | H             | J            | K                      | M             |
| 1             | Plug            | 1.213<br>30.81 | .666<br>16.92  | .984<br>24.99  | .329<br>8.36  | .494<br>12.55 | .759<br>19.28  | .422<br>10.72 | .030<br>0.76 | .238/.229<br>6.04/5.81 | .422<br>10.72 |
|               | Receptacle      | 1.213<br>30.81 | .643<br>16.33  | .984<br>24.99  | .311<br>7.90  | .494<br>12.55 | .759<br>19.28  | .422<br>10.72 | .030<br>0.76 | .248/.238<br>6.29/6.04 | .429<br>10.90 |
| 2             | Plug            | 1.541<br>39.14 | .994<br>25.25  | 1.312<br>33.32 | .329<br>8.36  | .494<br>12.55 | 1.083<br>27.51 | .422<br>10.72 | .030<br>0.76 | .238/.229<br>6.04/5.81 | .422<br>10.72 |
|               | Receptacle      | 1.541<br>39.14 | .971<br>24.66  | 1.312<br>33.32 | .311<br>7.90  | .494<br>12.55 | 1.083<br>27.51 | .422<br>10.72 | .030<br>0.76 | .248/.238<br>6.29/6.04 | .429<br>10.90 |
| 3             | Plug            | 2.088<br>53.04 | 1.534<br>38.96 | 1.852<br>47.04 | .329<br>8.36  | .494<br>12.55 | 1.625<br>41.28 | .422<br>10.72 | .039<br>0.99 | .236/.224<br>5.99/5.68 | .426<br>10.82 |
|               | Receptacle      | 2.088<br>53.04 | 1.511<br>38.38 | 1.852<br>47.04 | .311<br>7.90  | .494<br>12.55 | 1.625<br>41.28 | .422<br>10.72 | .030<br>0.76 | .248/.238<br>6.29/6.04 | .429<br>10.90 |
| 4             | Plug            | 2.729<br>69.32 | 2.182<br>55.42 | 2.500<br>63.5  | .329<br>8.36  | .494<br>12.55 | 2.272<br>57.71 | .422<br>10.72 | .039<br>0.99 | .236/.224<br>5.99/5.68 | .426<br>10.82 |
|               | Receptacle      | 2.729<br>69.32 | 2.159<br>54.84 | 2.500<br>63.5  | .311<br>7.90  | .494<br>12.55 | 2.272<br>57.71 | .422<br>10.72 | .030<br>0.76 | .248/.238<br>6.29/6.04 | .429<br>10.90 |
| 5             | Plug            | 2.635<br>66.93 | 2.079<br>52.81 | 2.406<br>61.11 | .441<br>11.20 | .605<br>15.37 | 2.178<br>55.32 | .534<br>13.56 | .039<br>0.99 | .236/.224<br>5.99/5.68 | .426<br>10.82 |
|               | Receptacle      | 2.635<br>66.93 | 2.064<br>52.43 | 2.406<br>61.11 | .423<br>10.74 | .605<br>15.37 | 2.178<br>55.32 | .534<br>13.55 | .030<br>0.76 | .248/.238<br>6.29/6.04 | .429<br>10.90 |



**Spacer**

**Receptacle Assemblies**

| Shell Size | No. Pos. | Post Dia.    | Post Ext. ± .020 [± 0.51] | Military Part No. M24308/ | AMP Part No. |
|------------|----------|--------------|---------------------------|---------------------------|--------------|
| 1          | 9        | .030<br>0.76 | .156<br>3.96              | 23-1F                     | 443975-1     |
| 2          | 15       | .030<br>0.76 | .156<br>3.96              | 23-2F                     | 443975-2     |
| 3          | 25       | .030<br>0.76 | .156<br>3.96              | 23-3F                     | 443975-3     |
| 4          | 37       | .030<br>0.76 | .156<br>3.96              | 23-4F                     | 443975-4     |
| 5          | 50       | .030<br>0.76 | .156<br>3.96              | 23-5F                     | 443975-5     |
| 1          | 9        | .030<br>0.76 | .188<br>4.78              | 23-7F                     | 443976-1     |
| 2          | 15       | .030<br>0.76 | .188<br>4.78              | 23-8F                     | 443976-2     |
| 3          | 25       | .030<br>0.76 | .188<br>4.78              | 23-9F                     | 443976-3     |
| 4          | 37       | .030<br>0.76 | .188<br>4.78              | 23-10F                    | 443976-4     |
| 5          | 50       | .030<br>0.76 | .188<br>4.78              | 23-11F                    | 443976-5     |
| 1          | 9        | .040<br>1.02 | .156<br>3.96              | 23-13F                    | 443977-1     |
| 2          | 15       | .040<br>1.02 | .156<br>3.96              | 23-14F                    | 443977-2     |
| 3          | 25       | .040<br>1.02 | .156<br>3.96              | 23-15F                    | 443977-3     |
| 4          | 37       | .040<br>1.02 | .156<br>3.96              | 23-16F                    | 443977-4     |
| 5          | 50       | .040<br>1.02 | .156<br>3.96              | 23-17F                    | 443977-5     |
| 1          | 9        | .040<br>1.02 | .188<br>4.78              | 23-19F                    | 443978-1     |
| 2          | 15       | .040<br>1.02 | .188<br>4.78              | 23-20F                    | 443978-2     |
| 3          | 25       | .040<br>1.02 | .188<br>4.78              | 23-21F                    | 443978-3     |
| 4          | 37       | .040<br>1.02 | .188<br>4.78              | 23-22F                    | 443978-4     |
| 5          | 50       | .040<br>1.02 | .188<br>4.78              | 23-23F                    | 443978-5     |

**Plug Assemblies**

| Shell Size | No. Pos. | Post Dia.    | Post Ext. ± .020 [± 0.51] | Military Part No. M24308/ | AMP Part No. |
|------------|----------|--------------|---------------------------|---------------------------|--------------|
| 1          | 9        | .030<br>0.76 | .156<br>3.96              | 24-1F                     | 1218124-1    |
| 2          | 15       | .030<br>0.76 | .156<br>3.96              | 24-2F                     | 1218124-2    |
| 3          | 25       | .030<br>0.76 | .156<br>3.96              | 24-3F                     | 1218124-3    |
| 4          | 37       | .030<br>0.76 | .156<br>3.96              | 24-4F                     | 1218124-4    |
| 5          | 50       | .030<br>0.76 | .156<br>3.96              | 24-5F                     | 1218124-5    |
| 1          | 9        | .030<br>0.76 | .188<br>4.78              | 24-7F                     | 1218125-1    |
| 2          | 15       | .030<br>0.76 | .188<br>4.78              | 24-8F                     | 1218125-2    |
| 3          | 25       | .030<br>0.76 | .188<br>4.78              | 24-9F                     | 1218125-3    |
| 4          | 37       | .030<br>0.76 | .188<br>4.78              | 24-10F                    | 1218125-4    |
| 5          | 50       | .030<br>0.76 | .188<br>4.78              | 24-11F                    | 1218125-5    |
| 1          | 9        | .040<br>1.02 | .156<br>3.96              | 24-13F                    | 1218126-1    |
| 2          | 15       | .040<br>1.02 | .156<br>3.96              | 24-14F                    | 1218126-2    |
| 3          | 25       | .040<br>1.02 | .156<br>3.96              | 24-15F                    | 1218126-3    |
| 4          | 37       | .040<br>1.02 | .156<br>3.96              | 24-16F                    | 1218126-4    |
| 5          | 50       | .040<br>1.02 | .156<br>3.96              | 24-17F                    | 1218126-5    |
| 1          | 9        | .040<br>1.02 | .188<br>4.78              | 24-19F                    | 1218127-1    |
| 2          | 15       | .040<br>1.02 | .188<br>4.78              | 24-20F                    | 1218127-2    |
| 3          | 25       | .040<br>1.02 | .188<br>4.78              | 24-21F                    | 1218127-3    |
| 4          | 37       | .040<br>1.02 | .188<br>4.78              | 24-22F                    | 1218127-4    |
| 5          | 50       | .040<br>1.02 | .188<br>4.78              | 24-23F                    | 1218127-5    |

**Straight PCB, Series 109, Standard Density Connectors  
(Industrial Grade)**

**Material and Finish:**

- Shell** — Steel, see below
- Insert** — Approved material per MIL-DTL-24308
- Contact** — Copper alloy plated gold over nickel underplate\*
- Spacer** — Aluminum alloy, Iridite finish

**Related Product Data:**

- Cavity Identification** — page 5101
- Mounting, Mating Specifications** — page 5143
- Accessories** — pages 5148-5150
- PCB Layouts** — See page 5144 or AMP customer drawing.

**\*aSocket Body and Mating Area** —

- .000050 [0.00127] min. gold over
- .000050 [0.00127] min. nickel

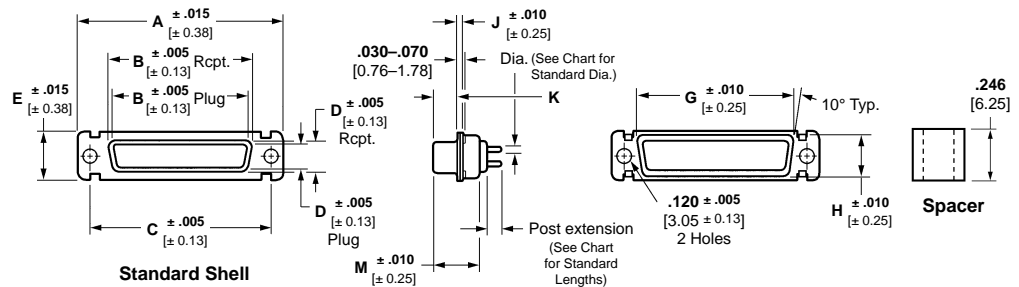
**Plug Body and Mating Area** —

- .000050 [0.00127] min. gold over
- .000050 [0.00127] min. nickel

**bMating Area** — Copper alloy with

- .000030 [0.00076] min. gold plate over .000050 [0.00127] min. nickel underplate

**Product Specification** — 108-1770



| MS Shell Size | Connector Style | Dimensions     |                |                |               |               |                |               |              |                        |               |
|---------------|-----------------|----------------|----------------|----------------|---------------|---------------|----------------|---------------|--------------|------------------------|---------------|
|               |                 | A              | B              | C              | D             | E             | G              | H             | J            | K                      | M             |
| 1             | Plug            | 1.213<br>30.81 | .666<br>16.92  | .984<br>24.99  | .329<br>8.36  | .494<br>12.55 | .759<br>19.28  | .422<br>10.72 | .030<br>0.76 | .238/.229<br>6.04/5.81 | .422<br>10.72 |
|               | Receptacle      | 1.213<br>30.81 | .643<br>16.33  | .984<br>24.99  | .311<br>7.90  | .494<br>12.55 | .759<br>19.28  | .422<br>10.72 | .030<br>0.76 | .248/.238<br>6.29/6.04 | .429<br>10.90 |
| 2             | Plug            | 1.541<br>39.14 | .994<br>25.25  | 1.312<br>33.32 | .329<br>8.36  | .494<br>12.55 | 1.083<br>27.51 | .422<br>10.72 | .030<br>0.76 | .238/.229<br>6.04/5.81 | .422<br>10.72 |
|               | Receptacle      | 1.541<br>39.14 | .971<br>24.66  | 1.312<br>33.32 | .311<br>7.90  | .494<br>12.55 | 1.083<br>27.51 | .422<br>10.72 | .030<br>0.76 | .248/.238<br>6.29/6.04 | .429<br>10.90 |
| 3             | Plug            | 2.088<br>53.04 | 1.534<br>38.96 | 1.852<br>47.04 | .329<br>8.36  | .494<br>12.55 | 1.625<br>41.28 | .422<br>10.72 | .039<br>0.99 | .236/.224<br>5.99/5.68 | .426<br>10.82 |
|               | Receptacle      | 2.088<br>53.04 | 1.511<br>38.38 | 1.852<br>47.04 | .311<br>7.90  | .494<br>12.55 | 1.625<br>41.28 | .422<br>10.72 | .030<br>0.76 | .248/.238<br>6.29/6.04 | .429<br>10.90 |
| 4             | Plug            | 2.729<br>69.32 | 2.182<br>55.42 | 2.500<br>63.5  | .329<br>8.36  | .494<br>12.55 | 2.272<br>57.71 | .422<br>10.72 | .039<br>0.99 | .236/.224<br>5.99/5.68 | .426<br>10.82 |
|               | Receptacle      | 2.729<br>69.32 | 2.159<br>54.84 | 2.500<br>63.5  | .311<br>7.90  | .494<br>12.55 | 2.272<br>57.71 | .422<br>10.72 | .030<br>0.76 | .248/.238<br>6.29/6.04 | .429<br>10.90 |
| 5             | Plug            | 2.635<br>66.93 | 2.079<br>52.81 | 2.406<br>61.11 | .441<br>11.20 | .605<br>15.37 | 2.178<br>55.32 | .534<br>13.56 | .039<br>0.99 | .236/.224<br>5.99/5.68 | .426<br>10.82 |
|               | Receptacle      | 2.635<br>66.93 | 2.064<br>52.43 | 2.406<br>61.11 | .423<br>10.74 | .605<br>15.37 | 2.178<br>55.32 | .534<br>13.55 | .030<br>0.76 | .248/.238<br>6.29/6.04 | .429<br>10.90 |

| Shell Size | No. Pos. | Post Dia.    | Post Ext. ±.020 [± 0.51] | Receptacle Part No.            |                                |                                 |
|------------|----------|--------------|--------------------------|--------------------------------|--------------------------------|---------------------------------|
|            |          |              |                          | Tin Plated Shells <sup>a</sup> | Tin Plated Shells <sup>b</sup> | Zinc Plated Shells <sup>a</sup> |
| 1          | 9        | .030<br>0.76 | .156<br>3.96             | 1218826-1                      | 1218293-1                      | 1218289-1                       |
| 2          | 15       | .030<br>0.76 | .156<br>3.96             | 1218826-2                      | 1218293-2                      | 1218289-2                       |
| 3          | 25       | .030<br>0.76 | .156<br>3.96             | 1218826-3                      | 1218293-3                      | 1218289-3                       |
| 4          | 37       | .030<br>0.76 | .156<br>3.96             | 1218826-4                      | 1218293-4                      | 1218289-4                       |
| 5          | 50       | .030<br>0.76 | .156<br>3.96             | 1218826-5                      | 1218293-5                      | 1218289-5                       |
| 1          | 9        | .030<br>0.76 | .188<br>4.78             | 1218827-1                      | 1218294-1                      | 1218290-1                       |
| 2          | 15       | .030<br>0.76 | .188<br>4.78             | 1218827-2                      | 1218294-2                      | 1218290-2                       |
| 3          | 25       | .030<br>0.76 | .188<br>4.78             | 1218827-3                      | 1218294-3                      | 1218290-3                       |
| 4          | 37       | .030<br>0.76 | .188<br>4.78             | 1218827-4                      | 1218294-4                      | 1218290-4                       |
| 5          | 50       | .030<br>0.76 | .188<br>4.78             | 1218827-5                      | 1218294-5                      | 1218290-5                       |
| 1          | 9        | .040<br>1.02 | .156<br>3.96             | 1218828-1                      | 1218295-1                      | 1218291-1                       |
| 2          | 15       | .040<br>1.02 | .156<br>3.96             | 1218828-2                      | 1218295-2                      | 1218291-2                       |
| 3          | 25       | .040<br>1.02 | .156<br>3.96             | 1218828-3                      | 1218295-3                      | 1218291-3                       |
| 4          | 37       | .040<br>1.02 | .156<br>3.96             | 1218828-4                      | 1218295-4                      | 1218291-4                       |
| 5          | 50       | .040<br>1.02 | .156<br>3.96             | 1218828-5                      | 1218295-5                      | 1218291-5                       |
| 1          | 9        | .040<br>1.02 | .188<br>4.78             | 1218829-1                      | 1218296-1                      | 1218292-1                       |
| 2          | 15       | .040<br>1.02 | .188<br>4.78             | 1218829-2                      | 1218296-2                      | 1218292-2                       |
| 3          | 25       | .040<br>1.02 | .188<br>4.78             | 1218829-3                      | 1218296-3                      | 1218292-3                       |
| 4          | 37       | .040<br>1.02 | .188<br>4.78             | 1218829-4                      | 1218296-4                      | 1218292-4                       |
| 5          | 50       | .040<br>1.02 | .188<br>4.78             | 1218829-5                      | 1218296-5                      | 1218292-5                       |

| Shell Size | No. Pos. | Post Dia.    | Post Ext. ±.020 [± 0.51] | Plug Part No.                  |                                 |
|------------|----------|--------------|--------------------------|--------------------------------|---------------------------------|
|            |          |              |                          | Tin Plated Shells <sup>a</sup> | Zinc Plated Shells <sup>a</sup> |
| 1          | 9        | .030<br>0.76 | .156<br>3.96             | 1218374-1                      | 1218378-1                       |
| 2          | 15       | .030<br>0.76 | .156<br>3.96             | 1218374-2                      | 1218378-2                       |
| 3          | 25       | .030<br>0.76 | .156<br>3.96             | 1218374-3                      | 1218378-3                       |
| 4          | 37       | .030<br>0.76 | .156<br>3.96             | 1218374-4                      | 1218378-4                       |
| 5          | 50       | .030<br>0.76 | .156<br>3.96             | 1218374-5                      | 1218378-5                       |
| 1          | 9        | .030<br>0.76 | .188<br>4.78             | 1218375-1                      | 1218379-1                       |
| 2          | 15       | .030<br>0.76 | .188<br>4.78             | 1218375-2                      | 1218379-2                       |
| 3          | 25       | .030<br>0.76 | .188<br>4.78             | 1218375-3                      | 1218379-3                       |
| 4          | 37       | .030<br>0.76 | .188<br>4.78             | 1218375-4                      | 1218379-4                       |
| 5          | 50       | .030<br>0.76 | .188<br>4.78             | 1218375-5                      | 1218379-5                       |
| 1          | 9        | .040<br>1.02 | .156<br>3.96             | 1218376-1                      | 1218380-1                       |
| 2          | 15       | .040<br>1.02 | .156<br>3.96             | 1218376-2                      | 1218380-2                       |
| 3          | 25       | .040<br>1.02 | .156<br>3.96             | 1218376-3                      | 1218380-3                       |
| 4          | 37       | .040<br>1.02 | .156<br>3.96             | 1218376-4                      | 1218380-4                       |
| 5          | 50       | .040<br>1.02 | .156<br>3.96             | 1218376-5                      | 1218380-5                       |
| 1          | 9        | .040<br>1.02 | .188<br>4.78             | 1218377-1                      | 1218381-1                       |
| 2          | 15       | .040<br>1.02 | .188<br>4.78             | 1218377-2                      | 1218381-2                       |
| 3          | 25       | .040<br>1.02 | .188<br>4.78             | 1218377-3                      | 1218381-3                       |
| 4          | 37       | .040<br>1.02 | .188<br>4.78             | 1218377-4                      | 1218381-4                       |
| 5          | 50       | .040<br>1.02 | .188<br>4.78             | 1218377-5                      | 1218381-5                       |



Straight PCB, Series 109, "Make First Break Last" Sub-D Connectors (Industrial Grade)

**Material and Finish:**

**Shell** — Steel, cadmium or tin plated

**Insert** — Polyester per MIL-M-24519

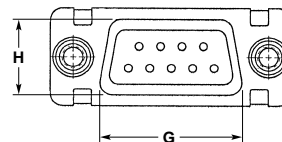
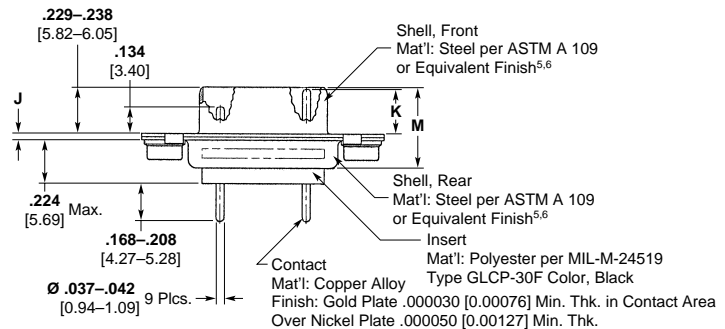
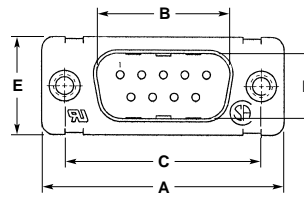
**Contact** — Copper alloy with .000030 [0.00076] min. gold plate over .000050 [0.00127] min. nickel underplate

**Regular Length Contact Location:** 1, 6, and 9

**Short Length Contact Location:** 2 thru 5, 7, and 8

**Finish** — Cadmium per QQ-P-416

**Finish** — Tin plated per MIL-T-10727



| MS Shell Size | Connector Style | Dimensions     |                |                |              |               |                |               |                        |              |                          |
|---------------|-----------------|----------------|----------------|----------------|--------------|---------------|----------------|---------------|------------------------|--------------|--------------------------|
|               |                 | A              | B              | C              | D            | E             | G              | H             | J                      | K            | M                        |
| 1             | Plug            | 1.213<br>30.81 | .666<br>16.92  | .984<br>24.99  | .329<br>8.36 | .494<br>12.55 | .759<br>19.28  | .422<br>10.72 | .020/.040<br>0.51/1.02 | .223<br>5.66 | .412/.432<br>10.46/10.97 |
|               | Receptacle      | 1.213<br>30.81 | .643<br>16.33  | .984<br>24.99  | .311<br>7.90 | .494<br>12.55 | .759<br>19.28  | .422<br>10.72 | .238/.248<br>6.05/6.30 | .178<br>4.52 | .419/.439<br>10.64/11.15 |
| 2             | Receptacle      | 1.541<br>39.14 | .971<br>24.66  | 1.312<br>33.32 | .311<br>7.90 | .494<br>12.55 | 1.083<br>27.51 | .422<br>10.72 | .238/.248<br>6.05/6.30 | .178<br>4.52 | .419/.439<br>10.64/11.15 |
| 3             | Plug            | 2.088<br>53.04 | 1.534<br>38.96 | 1.852<br>47.04 | .329<br>8.36 | .494<br>12.55 | 1.625<br>41.28 | .422<br>10.72 | .029/.049<br>0.74/1.24 | .217<br>5.51 | .416/.435<br>10.57/11.07 |

**Plug Assemblies**

| Shell Size | No. Pos. | Post Dia.              | Plug Part No.     |                       |
|------------|----------|------------------------|-------------------|-----------------------|
|            |          |                        | Tin Plated Shells | Cadmium Plated Shells |
| 1          | 9        | .037/.043<br>0.94/1.09 | 443638-2          | 443638-1              |
| 3          | 25       | .037/.043<br>0.94/1.09 | 443631-2          | 443631-1              |

**Receptacle Assemblies**

| Shell Size | No. Pos. | Post Dia.              | Plug Part No.     |                       |
|------------|----------|------------------------|-------------------|-----------------------|
|            |          |                        | Tin Plated Shells | Cadmium Plated Shells |
| 1          | 9        | .037/.043<br>0.94/1.09 | 443637-2          | 443637-1              |
| 2          | 15       | .037/.043<br>0.94/1.09 | 443646-2          | 443646-1              |

Right-Angle, PCB Plugs, Series 109, Standard Density Connectors (MIL Qualified)

Material and Finish:

Shell — Steel, cadmium plated

Insert and Post Spacer — Approved material per MIL-DTL-24308

Contact — Copper alloy with .000050 [0.00127] min. gold plate over .000050 [0.00127] min. nickel underplate

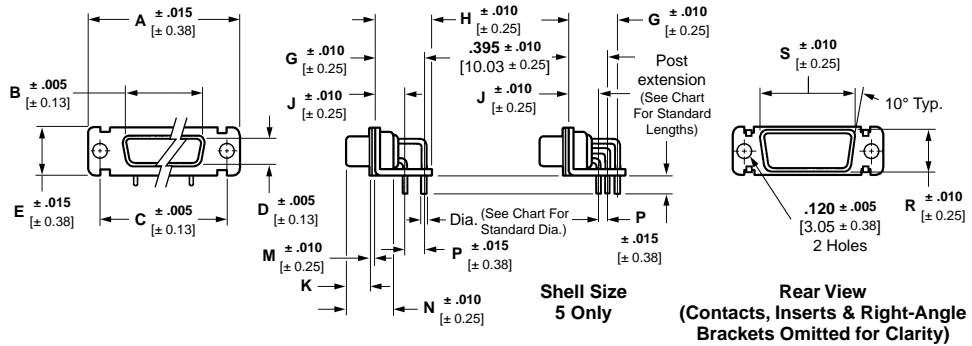
Related Product Data:

Cavity Identification — page 5101

Mounting, Mating Specifications — page 5143

Accessories — pages 5148-5150

PCB Layouts — See page 5144 or AMP customer drawing.



| MS Shell Size | Connector Style | Dimensions |       |       |       |       |       |       |      |           |      |       |      |       |       |
|---------------|-----------------|------------|-------|-------|-------|-------|-------|-------|------|-----------|------|-------|------|-------|-------|
|               |                 | A          | B     | C     | D     | E     | G     | H     | J    | K         | M    | N     | P    | R     | S     |
| 1             | Plug            | 1.213      | .666  | .984  | .329  | .494  | .395  | .484  | .283 | .238/.229 | .030 | .422  | .112 | .422  | .759  |
|               |                 | 30.81      | 16.92 | 24.99 | 8.36  | 12.55 | 10.03 | 12.29 | 7.19 | 6.04/5.81 | 0.76 | 10.72 | 2.84 | 10.72 | 19.28 |
| 2             | Plug            | 1.541      | .994  | 1.312 | .329  | .494  | .395  | .484  | .283 | .238/.229 | .030 | .422  | .112 | .422  | 1.083 |
|               |                 | 39.14      | 25.25 | 33.33 | 8.36  | 12.55 | 10.03 | 12.29 | 7.19 | 6.04/5.81 | 0.76 | 10.72 | 2.84 | 10.72 | 27.51 |
| 3             | Plug            | 2.088      | 1.534 | 1.852 | .329  | .494  | .395  | .484  | .283 | .236/.224 | .039 | .426  | .112 | .422  | 1.625 |
|               |                 | 53.04      | 38.96 | 47.04 | 8.36  | 12.55 | 10.03 | 12.29 | 7.19 | 5.99/5.68 | 0.99 | 10.82 | 2.84 | 10.72 | 29.59 |
| 4             | Plug            | 2.729      | 2.182 | 2.500 | .329  | .494  | .395  | .484  | .283 | .236/.224 | .039 | .426  | .112 | .422  | 2.272 |
|               |                 | 69.32      | 55.42 | 63.5  | 8.36  | 12.55 | 10.03 | 12.29 | 7.19 | 5.99/5.68 | 0.99 | 10.82 | 2.84 | 10.72 | 57.71 |
| 5             | Plug            | 2.635      | 2.079 | 2.406 | .441  | .605  | .507  | .594  | .283 | .236/.224 | .039 | .426  | .112 | .534  | 2.178 |
|               |                 | 66.93      | 52.81 | 61.11 | 10.44 | 15.37 | 12.88 | 15.09 | 7.19 | 5.99/5.68 | 0.99 | 10.82 | 2.84 | 13.56 | 55.32 |

Plug Assemblies — .030 [0.76] Post Dia.

| Shell Size | No. Pos. | Post Ext. ±.020 [±0.51] | Military Part No. M24308/ | AMP Part No. |
|------------|----------|-------------------------|---------------------------|--------------|
| 1          | 9        | .125<br>3.18            | 24-25F                    | 1218440-1    |
| 2          | 15       | .125<br>3.18            | 24-26F                    | 1218440-2    |
| 3          | 25       | .125<br>3.18            | 24-27F                    | 1218440-3    |
| 4          | 37       | .125<br>3.18            | 24-28F                    | 1218440-4    |
| 5          | 50       | .125<br>3.18            | 24-29F                    | 1218440-5    |
| 1          | 9        | .156<br>3.96            | 24-31F                    | 1218441-1    |
| 2          | 15       | .156<br>3.96            | 24-32F                    | 1218441-2    |
| 3          | 25       | .156<br>3.96            | 24-33F                    | 1218441-3    |
| 4          | 37       | .156<br>3.96            | 24-34F                    | 1218441-4    |
| 5          | 50       | .156<br>3.96            | 24-35F                    | 1218441-5    |
| 1          | 9        | .188<br>4.78            | 24-49F                    | 1218444-1    |
| 2          | 15       | .188<br>4.78            | 24-50F                    | 1218444-2    |
| 3          | 25       | .188<br>4.78            | 24-51F                    | 1218444-3    |
| 4          | 37       | .188<br>4.78            | 24-52F                    | 1218444-4    |
| 5          | 50       | .188<br>4.78            | 24-53F                    | 1218444-5    |

Plug Assemblies — .040 [1.02] Post Dia.

| Shell Size | No. Pos. | Post Ext. ±.020 [±0.51] | Military Part No. M24308/ | AMP Part No. |
|------------|----------|-------------------------|---------------------------|--------------|
| 1          | 9        | .125<br>3.18            | 24-37F                    | 1218442-1    |
| 2          | 15       | .125<br>3.18            | 24-38F                    | 1218442-2    |
| 3          | 25       | .125<br>3.18            | 24-39F                    | 1218442-3    |
| 4          | 37       | .125<br>3.18            | 24-40F                    | 1218442-4    |
| 5          | 50       | .125<br>3.18            | 24-41F                    | 1218442-5    |
| 1          | 9        | .156<br>3.96            | 24-43F                    | 1218443-1    |
| 2          | 15       | .156<br>3.96            | 24-44F                    | 1218443-2    |
| 3          | 25       | .156<br>3.96            | 24-45F                    | 1218443-3    |
| 4          | 37       | .156<br>3.96            | 24-46F                    | 1218443-4    |
| 5          | 50       | .156<br>3.96            | 24-47F                    | 1218443-5    |
| 1          | 9        | .188<br>4.78            | 24-55F                    | 1218445-1    |
| 2          | 15       | .188<br>4.78            | 24-56F                    | 1218445-2    |
| 3          | 25       | .188<br>4.78            | 24-57F                    | 1218445-3    |
| 4          | 37       | .188<br>4.78            | 24-58F                    | 1218445-4    |
| 5          | 50       | .188<br>4.78            | 24-59F                    | 1218445-5    |

Note: The suffix "F" on M24308 part numbers designates cadmium shell plating.

Right-Angle, PCB Receptacles, Series 109, Standard Density Connectors (MIL Qualified)

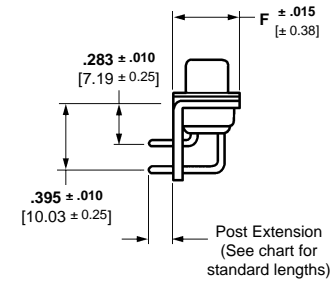
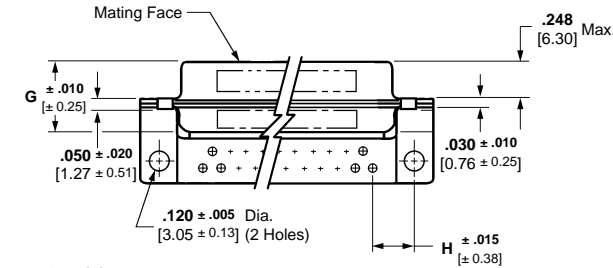
Material and Finish:

- Shell — Steel, cadmium plated
- Insert and Post Spacer — Approved material per MIL-DTL-24308
- Contacts —
- Socket Body — Copper alloy with .000050 [0.00127] min. gold plate over .000050 [0.00127] min. nickel underplate
- Mating Area — Copper alloy with .000050 [0.00127] min. gold plate over .000050 [0.00127] min. nickel underplate

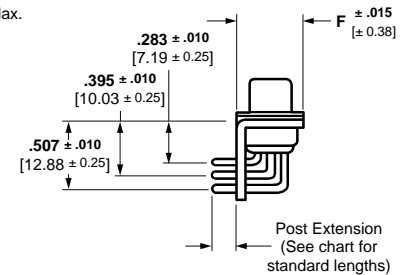
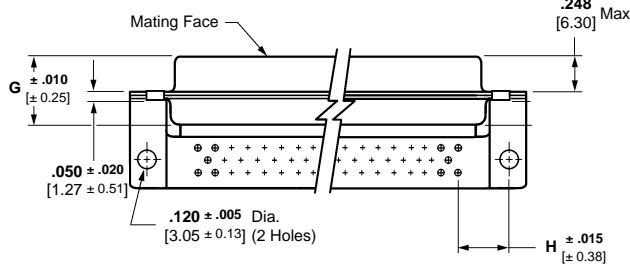
Related Product Data:

- Cavity Identification — page 5101
- Mounting, Mating Specifications — page 5143
- Accessories — pages 5148-5150
- PCB Layouts — See page 5144 or AMP customer drawing.

9, 15, 25 and 37 Positions

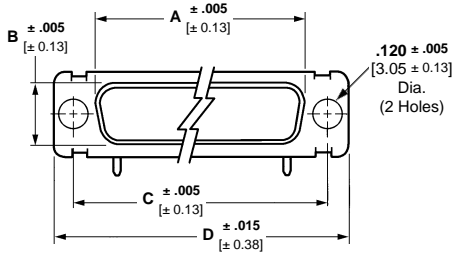


50 Positions



Receptacle Assemblies

| No. of Contact Pos. (Shell Size) | Dimensions     |               |                |                |               |               |              |
|----------------------------------|----------------|---------------|----------------|----------------|---------------|---------------|--------------|
|                                  | A (Outside)    | B (Outside)   | C              | D              | F             | G             | H            |
| 9 (1)                            | .643<br>16.33  | .311<br>7.9   | .984<br>24.99  | 1.213<br>30.81 | .494<br>12.55 | .429<br>10.97 | .276<br>7.01 |
| 15 (2)                           | .971<br>24.66  | .311<br>7.9   | 1.312<br>33.32 | 1.541<br>39.14 | .494<br>12.55 | .429<br>10.97 | .278<br>7.06 |
| 25 (3)                           | 1.511<br>38.38 | .311<br>7.9   | 1.852<br>47.04 | 2.088<br>53.04 | .494<br>12.55 | .429<br>10.97 | .274<br>6.96 |
| 37 (4)                           | 2.159<br>54.84 | .311<br>7.9   | 2.500<br>63.5  | 2.729<br>69.32 | .494<br>12.55 | .429<br>10.97 | .272<br>6.91 |
| 50 (5)                           | 2.064<br>52.43 | .423<br>10.74 | 2.406<br>61.11 | 2.635<br>66.93 | .605<br>15.37 | .429<br>10.97 | .333<br>8.46 |



Receptacle Assemblies — .030 [0.76] Post Dia.

| Shell Size | No. Pos. | Post Ext. ± .020 [± 0.51] | Military Part No. M24308/ | AMP Part No. |
|------------|----------|---------------------------|---------------------------|--------------|
| 1          | 9        | .125<br>3.18              | 23-25F                    | 1218434-1    |
| 2          | 15       | .125<br>3.18              | 23-26F                    | 1218434-2    |
| 3          | 25       | .125<br>3.18              | 23-27F                    | 1218434-3    |
| 4          | 37       | .125<br>3.18              | 23-28F                    | 1218434-4    |
| 5          | 50       | .125<br>3.18              | 23-29F                    | 1218434-5    |
| 1          | 9        | .156<br>3.96              | 23-31F                    | 1218408-1    |
| 2          | 15       | .156<br>3.96              | 23-32F                    | 1218408-2    |
| 3          | 25       | .156<br>3.96              | 23-33F                    | 1218408-3    |
| 4          | 37       | .156<br>3.96              | 23-34F                    | 1218408-4    |
| 5          | 50       | .156<br>3.96              | 23-35F                    | 1218408-5    |
| 1          | 9        | .188<br>4.78              | 23-49F                    | 1218437-1    |
| 2          | 15       | .188<br>4.78              | 23-50F                    | 1218437-2    |
| 3          | 25       | .188<br>4.78              | 23-51F                    | 1218437-3    |
| 4          | 37       | .188<br>4.78              | 23-52F                    | 1218437-4    |
| 5          | 50       | .188<br>4.78              | 23-53F                    | 1218437-5    |

Receptacle Assemblies — .040 [1.02] Post Dia.

| Shell Size | No. Pos. | Post Ext. ± .020 [± 0.51] | Military Part No. M24308/ | AMP Part No. |
|------------|----------|---------------------------|---------------------------|--------------|
| 1          | 9        | .125<br>3.18              | 23-37F                    | 1218435-1    |
| 2          | 15       | .125<br>3.18              | 23-38F                    | 1218435-2    |
| 3          | 25       | .125<br>3.18              | 23-39F                    | 1218435-3    |
| 4          | 37       | .125<br>3.18              | 23-40F                    | 1218435-4    |
| 5          | 50       | .125<br>3.18              | 23-41F                    | 1218435-5    |
| 1          | 9        | .156<br>3.96              | 23-43F                    | 1218436-1    |
| 2          | 15       | .156<br>3.96              | 23-44F                    | 1218436-2    |
| 3          | 25       | .156<br>3.96              | 23-45F                    | 1218436-3    |
| 4          | 37       | .156<br>3.96              | 23-46F                    | 1218436-4    |
| 5          | 50       | .156<br>3.96              | 23-47F                    | 1218436-5    |
| 1          | 9        | .188<br>4.78              | 23-55F                    | 1218438-1    |
| 2          | 15       | .188<br>4.78              | 23-56F                    | 1218438-2    |
| 3          | 25       | .188<br>4.78              | 23-57F                    | 1218438-3    |
| 4          | 37       | .188<br>4.78              | 23-58F                    | 1218438-4    |
| 5          | 50       | .188<br>4.78              | 23-59F                    | 1218438-5    |

Note: The suffix "F" on M24308 part numbers designates cadmium shell plating.

Right-Angle, PCB Plugs, Series 109, Standard Density Connectors (Industrial Grade)

Material and Finish:

Shell — Steel, see below

Insert and Post Spacer — Approved material per MIL-DTL-24308

Contact — Copper alloy with .000050 [0.00127] min. gold plate over .000050 [0.00127] min. nickel underplate

Related Product Data:

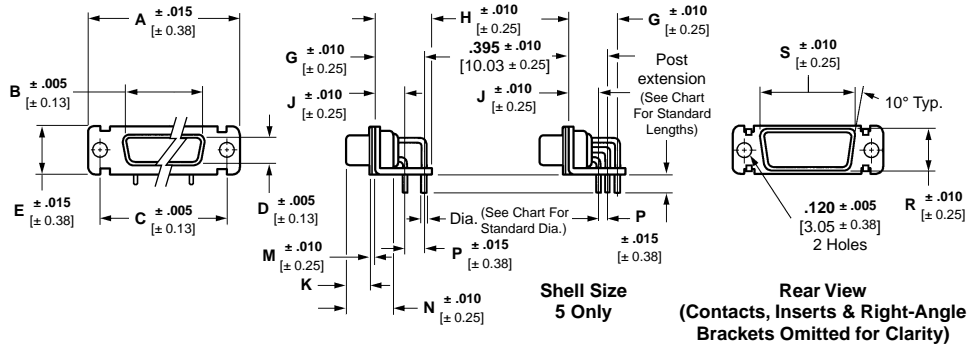
Cavity Identification — page 5101

Mounting, Mating Specifications — page 5143

Accessories — pages 5148-5150

PCB Layouts — See page 5144 or AMP customer drawing.

Product Specification — 108-1770



| MS Shell Size | Connector Style | Dimensions     |                |                |               |               |               |               |              |                        |              |               |              |               |                |
|---------------|-----------------|----------------|----------------|----------------|---------------|---------------|---------------|---------------|--------------|------------------------|--------------|---------------|--------------|---------------|----------------|
|               |                 | A              | B              | C              | D             | E             | G             | H             | J            | K                      | M            | N             | P            | R             | S              |
| 1             | Plug            | 1.213<br>30.81 | .666<br>16.92  | .984<br>24.99  | .329<br>8.36  | .494<br>12.55 | .395<br>10.03 | .484<br>12.29 | .283<br>7.19 | .238/.229<br>6.04/5.81 | .030<br>0.76 | .422<br>10.72 | .112<br>2.84 | .422<br>10.72 | .759<br>19.28  |
| 2             | Plug            | 1.541<br>39.14 | .994<br>25.25  | 1.312<br>33.33 | .329<br>8.36  | .494<br>12.55 | .395<br>10.03 | .484<br>12.29 | .283<br>7.19 | .238/.229<br>6.04/5.81 | .030<br>0.76 | .422<br>10.72 | .112<br>2.84 | .422<br>10.72 | 1.083<br>27.51 |
| 3             | Plug            | 2.088<br>53.04 | 1.534<br>38.96 | 1.852<br>47.04 | .329<br>8.36  | .494<br>12.55 | .395<br>10.03 | .484<br>12.29 | .283<br>7.19 | .236/.224<br>5.99/5.68 | .039<br>0.99 | .426<br>10.82 | .112<br>2.84 | .422<br>10.72 | 1.625<br>29.59 |
| 4             | Plug            | 2.729<br>69.32 | 2.182<br>55.42 | 2.500<br>63.5  | .329<br>8.36  | .494<br>12.55 | .395<br>10.03 | .484<br>12.29 | .283<br>7.19 | .236/.224<br>5.99/5.68 | .039<br>0.99 | .426<br>10.82 | .112<br>2.84 | .422<br>10.72 | 2.272<br>57.71 |
| 5             | Plug            | 2.635<br>66.93 | 2.079<br>52.81 | 2.406<br>61.11 | .441<br>10.44 | .605<br>15.37 | .507<br>12.88 | .594<br>15.09 | .283<br>7.19 | .236/.224<br>5.99/5.68 | .039<br>0.99 | .426<br>10.82 | .112<br>2.84 | .534<br>13.56 | 2.178<br>55.32 |

Plug Assemblies — .030 [0.76] Post Dia.

| Shell Size | No. Pos. | Post Ext.<br>±.020 [± 0.51] | Part No.          |                    |
|------------|----------|-----------------------------|-------------------|--------------------|
|            |          |                             | Tin Plated Shells | Zinc Plated Shells |
| 1          | 9        | .125<br>3.18                | 1218830-1         | 1218831-1          |
| 2          | 15       | .125<br>3.18                | 1218830-2         | 1218831-2          |
| 3          | 25       | .125<br>3.18                | 1218830-3         | 1218831-3          |
| 4          | 37       | .125<br>3.18                | 1218830-4         | 1218831-4          |
| 5          | 50       | .125<br>3.18                | 1218830-5         | 1218831-5          |
| 1          | 9        | .156<br>3.96                | 1218832-1         | 1218833-1          |
| 2          | 15       | .156<br>3.96                | 1218832-2         | 1218833-2          |
| 3          | 25       | .156<br>3.96                | 1218832-3         | 1218833-3          |
| 4          | 37       | .156<br>3.96                | 1218832-4         | 1218833-4          |
| 5          | 50       | .156<br>3.96                | 1218832-5         | 1218833-5          |
| 1          | 9        | .188<br>4.78                | 1218838-1         | 1218839-1          |
| 2          | 15       | .188<br>4.78                | 1218838-2         | 1218839-2          |
| 3          | 25       | .188<br>4.78                | 1218838-3         | 1218839-3          |
| 4          | 37       | .188<br>4.78                | 1218838-4         | 1218839-4          |
| 5          | 50       | .188<br>4.78                | 1218838-5         | 1218839-5          |

Plug Assemblies — .040 [1.02] Post Dia.

| Shell Size | No. Pos. | Post Ext.<br>±.020 [± 0.51] | Part No.          |                    |
|------------|----------|-----------------------------|-------------------|--------------------|
|            |          |                             | Tin Plated Shells | Zinc Plated Shells |
| 1          | 9        | .125<br>3.18                | 1218834-1         | 1218835-1          |
| 2          | 15       | .125<br>3.18                | 1218834-2         | 1218835-2          |
| 3          | 25       | .125<br>3.18                | 1218834-3         | 1218835-3          |
| 4          | 37       | .125<br>3.18                | 1218834-4         | 1218835-4          |
| 5          | 50       | .125<br>3.18                | 1218834-5         | 1218835-5          |
| 1          | 9        | .156<br>3.96                | 1218836-1         | 1218837-1          |
| 2          | 15       | .156<br>3.96                | 1218836-2         | 1218837-2          |
| 3          | 25       | .156<br>3.96                | 1218836-3         | 1218837-3          |
| 4          | 37       | .156<br>3.96                | 1218836-4         | 1218837-4          |
| 5          | 50       | .156<br>3.96                | 1218836-5         | 1218837-5          |
| 1          | 9        | .188<br>4.78                | 1218840-1         | 1218841-1          |
| 2          | 15       | .188<br>4.78                | 1218840-2         | 1218841-2          |
| 3          | 25       | .188<br>4.78                | 1218840-3         | 1218841-3          |
| 4          | 37       | .188<br>4.78                | 1218840-4         | 1218841-4          |
| 5          | 50       | .188<br>4.78                | 1218840-5         | 1218841-5          |

Right-Angle, PCB Receptacles, Series 109, Standard Density Connectors (Industrial Grade)

**Material and Finish:**

**Shell** — Steel, see following page for finish options

**Insert and Post Spacer** — Approved material per MIL-DTL-24308

**Contacts** —

**Socket Body** — Copper alloy with .000050 [0.00127] min. gold plate over .000050 [0.00127] min. nickel underplate

**Mating Area** — Copper alloy with .000050 [0.00127] min. gold plate over .000050 [0.00127] min. nickel underplate

**Mating Area** — Copper alloy with .000030 [0.00076] min. gold plate over .000050 [0.00127] min. nickel underplate

**Related Product Data:**

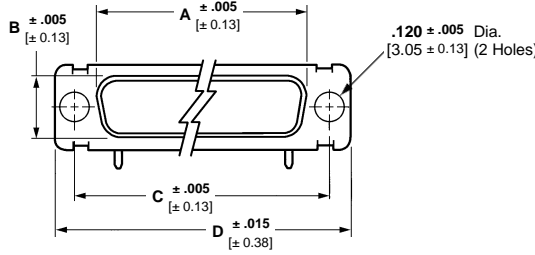
**Cavity Identification** — page 5101

**Mounting, Mating Specifications** — page 5143

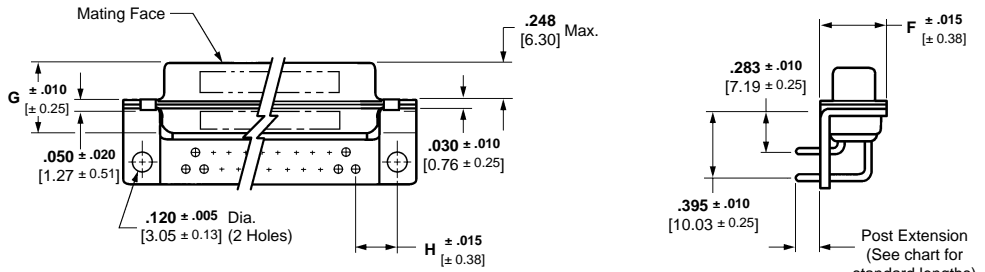
**Accessories** — pages 5148-5150

**PCB Layouts** — See page 5144 or AMP customer drawing.

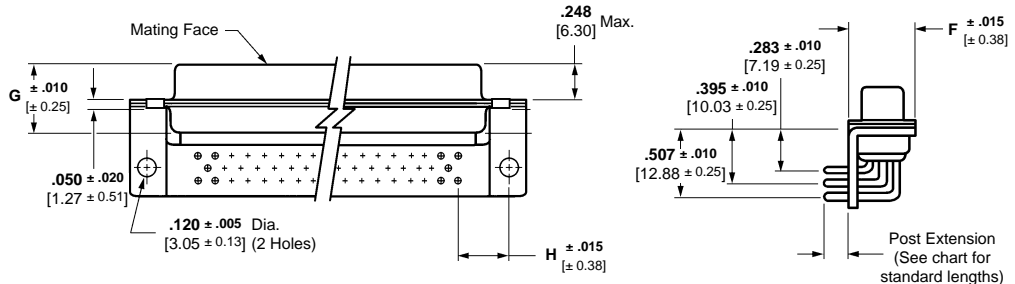
**Product Specification** — 108-1770



**9, 15, 25 and 37 Positions**



**50 Positions**



**Receptacle Assemblies**

| No. of Contact Pos. (Shell Size) | Dimensions     |               |                |                |               |               |              |
|----------------------------------|----------------|---------------|----------------|----------------|---------------|---------------|--------------|
|                                  | A (Outside)    | B (Outside)   | C              | D              | F             | G             | H            |
| 9<br>(1)                         | .643<br>16.33  | .311<br>7.9   | .984<br>24.99  | 1.213<br>30.81 | .494<br>12.55 | .429<br>10.97 | .276<br>7.01 |
| 15<br>(2)                        | .971<br>24.66  | .311<br>7.9   | 1.312<br>33.32 | 1.541<br>39.14 | .494<br>12.55 | .429<br>10.97 | .278<br>7.06 |
| 25<br>(3)                        | 1.511<br>38.38 | .311<br>7.9   | 1.852<br>47.04 | 2.088<br>53.04 | .494<br>12.55 | .429<br>10.97 | .274<br>6.96 |
| 37<br>(4)                        | 2.159<br>54.84 | .311<br>7.9   | 2.500<br>63.5  | 2.729<br>69.32 | .494<br>12.55 | .429<br>10.97 | .272<br>6.91 |
| 50<br>(5)                        | 2.064<br>52.43 | .423<br>10.74 | 2.406<br>61.11 | 2.635<br>66.93 | .605<br>15.37 | .429<br>10.97 | .333<br>8.46 |

Right-Angle, PCB Receptacles, Series 109, Standard Density Connectors  
(Industrial Grade) (Continued)

Material and Finish:

Shell — Steel  
Insert and Post Spacer — Approved material per MIL-DTL-24308

Contacts —  
Socket Body — Copper alloy with .000050 [0.00127] min. gold plate over .000050 [0.00127] min. nickel underplate

<sup>a</sup>Mating Area — Copper alloy with .000050 [0.00127] min. gold plate over .000050 [0.00127] min. nickel underplate

<sup>b</sup>Mating Area — Copper alloy with .000030 [0.00076] min. gold plate over .000050 [0.00127] min. nickel underplate

Related Product Data:

Cavity Identification — page 5101  
Mounting, Mating Specifications — page 5143  
Accessories — pages 5148-5150  
PCB Layouts — See page 5144 or AMP customer drawing.  
Product Specification — 108-1770

Receptacle Assemblies — .030 [0.76] Post Dia.

| Shell Size | No. Pos. | Post Ext.<br>± .020 [± 0.51] | Part No.                       |                                |                                 |
|------------|----------|------------------------------|--------------------------------|--------------------------------|---------------------------------|
|            |          |                              | Tin Plated Shells <sup>a</sup> | Tin Plated Shells <sup>a</sup> | Zinc Plated Shells <sup>a</sup> |
| 1          | 9        | .125<br>3.18                 | 1218842-1                      | 1218844-1                      | 1218843-1                       |
| 2          | 15       | .125<br>3.18                 | 1218842-2                      | 1218844-2                      | 1218843-2                       |
| 3          | 25       | .125<br>3.18                 | 1218842-3                      | 1218844-3                      | 1218843-3                       |
| 4          | 37       | .125<br>3.18                 | 1218842-4                      | 1218844-4                      | 1218843-4                       |
| 5          | 50       | .125<br>3.18                 | 1218842-5                      | 1218844-5                      | 1218843-5                       |
| 1          | 9        | .156<br>3.96                 | 1218845-1                      | 1218847-1                      | 1218846-1                       |
| 2          | 15       | .156<br>3.96                 | 1218845-2                      | 1218847-2                      | 1218846-2                       |
| 3          | 25       | .156<br>3.96                 | 1218845-3                      | 1218847-3                      | 1218846-3                       |
| 4          | 37       | .156<br>3.96                 | 1218845-4                      | 1218847-4                      | 1218846-4                       |
| 5          | 50       | .156<br>3.96                 | 1218845-5                      | 1218847-5                      | 1218846-5                       |
| 1          | 9        | .188<br>4.78                 | 1218854-1                      | 1218856-1                      | 1218855-1                       |
| 2          | 15       | .188<br>4.78                 | 1218854-2                      | 1218856-2                      | 1218855-2                       |
| 3          | 25       | .188<br>4.78                 | 1218854-3                      | 1218856-3                      | 1218855-3                       |
| 4          | 37       | .188<br>4.78                 | 1218854-4                      | 1218856-4                      | 1218855-4                       |
| 5          | 50       | .188<br>4.78                 | 1218854-5                      | 1218856-5                      | 1218855-5                       |

Receptacle Assemblies — .040 [1.02] Post Dia.

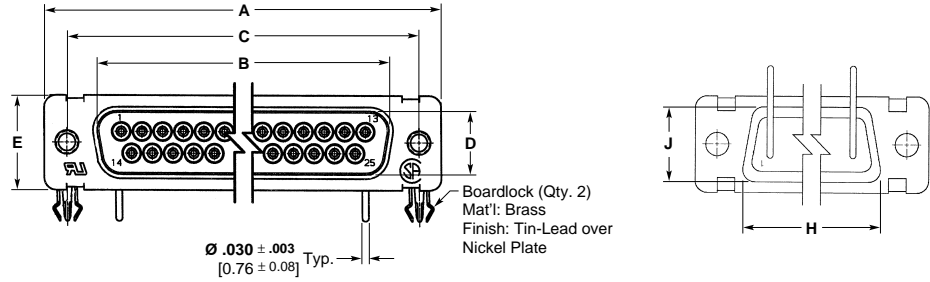
| Shell Size | No. Pos. | Post Ext.<br>± .020 [± 0.51] | Part No.                       |                                |                                 |
|------------|----------|------------------------------|--------------------------------|--------------------------------|---------------------------------|
|            |          |                              | Tin Plated Shells <sup>a</sup> | Tin Plated Shells <sup>a</sup> | Zinc Plated Shells <sup>a</sup> |
| 1          | 9        | .125<br>3.18                 | 1218848-1                      | 1218850-1                      | 1218849-1                       |
| 2          | 15       | .125<br>3.18                 | 1218848-2                      | 1218850-2                      | 1218849-2                       |
| 3          | 25       | .125<br>3.18                 | 1218848-3                      | 1218850-3                      | 1218849-3                       |
| 4          | 37       | .125<br>3.18                 | 1218848-4                      | 1218850-4                      | 1218849-4                       |
| 5          | 50       | .125<br>3.18                 | 1218848-5                      | 1218850-5                      | 1218849-5                       |
| 1          | 9        | .156<br>3.96                 | 1218851-1                      | 1218853-1                      | 1218852-1                       |
| 2          | 15       | .156<br>3.96                 | 1218851-2                      | 1218853-2                      | 1218852-2                       |
| 3          | 25       | .156<br>3.96                 | 1218851-3                      | 1218853-3                      | 1218852-3                       |
| 4          | 37       | .156<br>3.96                 | 1218851-4                      | 1218853-4                      | 1218852-4                       |
| 5          | 50       | .156<br>3.96                 | 1218851-5                      | 1218853-5                      | 1218852-5                       |
| 1          | 9        | .188<br>4.78                 | 1218857-1                      | 1218859-1                      | 1218858-1                       |
| 2          | 15       | .188<br>4.78                 | 1218857-2                      | 1218859-2                      | 1218858-2                       |
| 3          | 25       | .188<br>4.78                 | 1218857-3                      | 1218859-3                      | 1218858-3                       |
| 4          | 37       | .188<br>4.78                 | 1218857-4                      | 1218859-4                      | 1218858-4                       |
| 5          | 50       | .188<br>4.78                 | 1218857-5                      | 1218859-5                      | 1218858-5                       |

5  
Pin and Socket Connectors

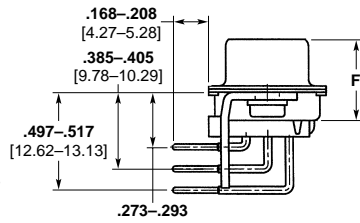
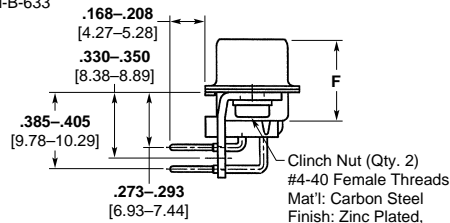
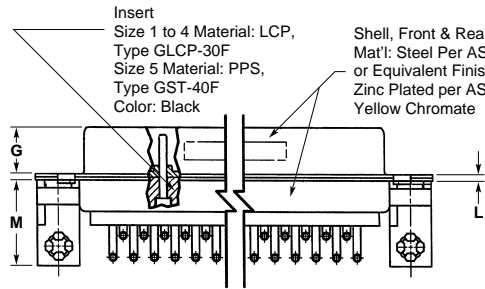
Right-Angle, PCB Plugs, Series 109, with One Piece Insert  
(Industrial Grade)

**Material and Finish:**

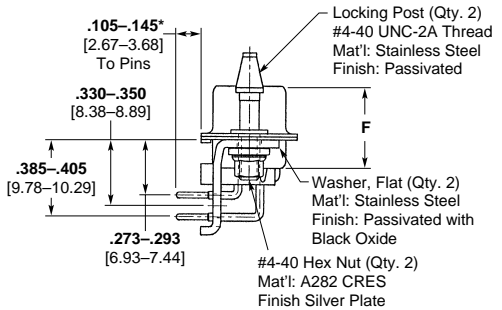
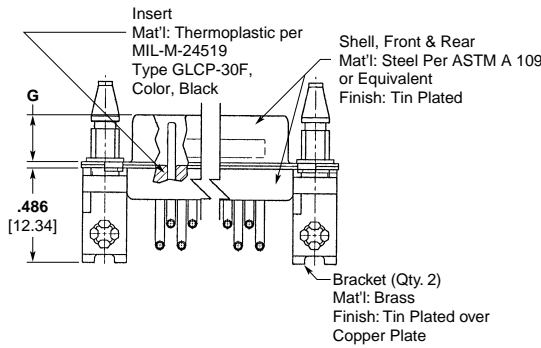
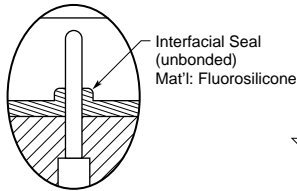
- Shell — Steel, see below
- Insert — Thermoplastic
- Contact Material — Brass or Beryllium copper
- Contact Finish — Gold with .000010 [0.00025] min. gold plate over .000050 [0.00127] min. nickel underplate
- Interfacial Seal — Fluorosilicone



3 and 5 Positions (with interfacial seal)



9 Position (with Locking Post)



\*Signal Contacts are solder dipped with SnPb 63/37 to meet the requirements of MIL-DTL-24308, method 208.

| MS Shell Size | Connector Style | Dimensions                 |                            |                            |                           |                           |                           |                         |                            |                           |                         |                           |
|---------------|-----------------|----------------------------|----------------------------|----------------------------|---------------------------|---------------------------|---------------------------|-------------------------|----------------------------|---------------------------|-------------------------|---------------------------|
|               |                 | A                          | B                          | C                          | D                         | E                         | F                         | G                       | H                          | J                         | L                       | M                         |
| 1             | Plug            | 1.198/1.228<br>30.43/31.19 | .661/1.671<br>16.21/16.46  | .979/1.989<br>24.87/25.12  | .324/1.334<br>8.23/8.48   | .479/1.509<br>12.17/12.93 | .412/1.432<br>10.46/10.97 | .229/1.238<br>5.82/6.05 | .749/1.769<br>19.02/19.53  | .412/1.432<br>10.46/10.97 | .020/0.040<br>0.51/1.02 | —                         |
| 3             | Plug            | 2.073/2.103<br>52.65/53.42 | 1.529/1.539<br>38.25/38.51 | 1.847/1.857<br>46.91/47.17 | .324/1.334<br>8.23/8.48   | .479/1.509<br>12.17/12.93 | .416/1.436<br>10.57/11.07 | .224/1.236<br>5.69/5.99 | 1.615/1.635<br>41.02/41.53 | .412/1.432<br>10.46/10.97 | .029/0.049<br>0.74/1.24 | .435/1.443<br>11.05/11.25 |
| 5             | Plug            | 2.620/2.650<br>66.55/67.31 | 2.074/2.084<br>52.30/52.55 | 2.401/2.411<br>60.99/61.24 | .436/1.446<br>11.07/11.33 | .590/1.620<br>14.99/15.75 | .416/1.436<br>10.57/11.07 | .224/1.236<br>5.69/5.99 | 2.168/2.188<br>55.07/55.58 | .524/1.544<br>13.31/13.82 | .029/0.049<br>0.74/1.24 | .490/1.498<br>12.45/12.65 |

Plug Assemblies — .030 [0.76] Post Dia.

| Shell Size | No. Pos. | With Interfacial Seal | Part No.          |                    |
|------------|----------|-----------------------|-------------------|--------------------|
|            |          |                       | Tin Plated Shells | Zinc Plated Shells |
| 1          | 9        | No                    | 1218606-6         | —                  |
| 3          | 25       | Yes                   | —                 | 1218538-3          |
| 5          | 50       | Yes                   | —                 | 1218538-5          |

Right-Angle, PCB Receptacles, Series 109, with One Piece Insert  
(Industrial Grade)

**Material and Finish:**

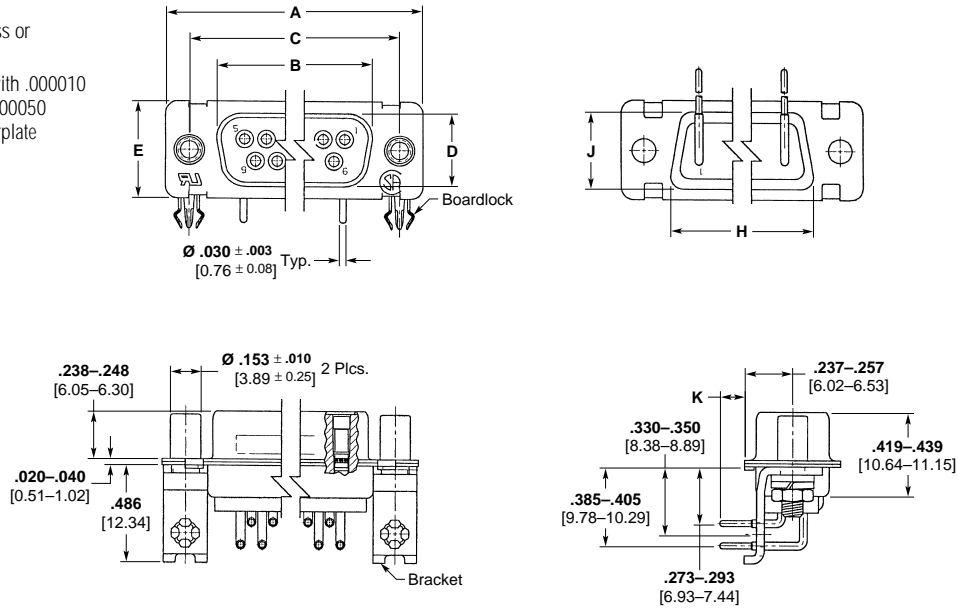
**Shell** — Steel, tin plated

**Insert** — Thermoplastic

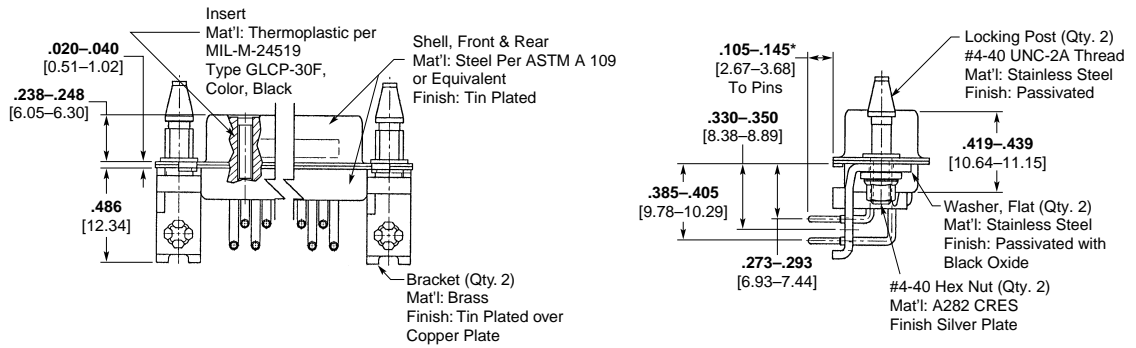
**Contact Material** — Brass or Beryllium copper

**Contact Finish** — Gold with .000010 [0.00025] min. gold over .000050 [0.00127] min. nickel underplate

9 Position



9 Position (with Locking Post)



\*Signal Contacts are solder dipped with SnPb 63/37 to meet the requirements of MIL-DTL-24308, method 208.

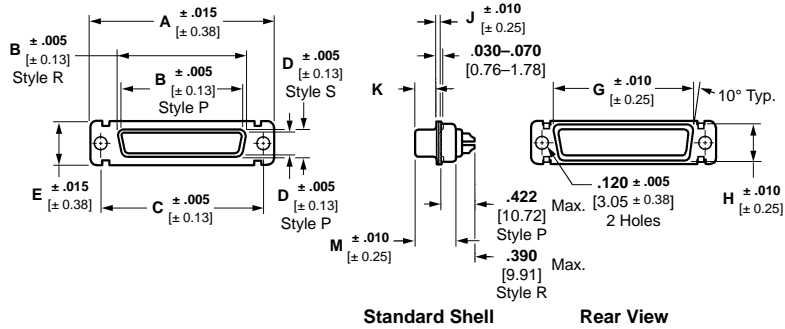
| MS Shell Size | Connector Style | Dimensions         |                  |                  |                  |                  | H                | J                | K                             | Part Number |
|---------------|-----------------|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------------------|-------------|
|               |                 | A                  | B                | C                | D                | E                |                  |                  |                               |             |
| 1             | Receptacle      | <b>1.198/1.228</b> | <b>.638/.648</b> | <b>.979/.989</b> | <b>.306/.316</b> | <b>.479/.509</b> | <b>.749/.769</b> | <b>.412/.432</b> | <b>.105/.145</b><br>2.67/3.68 | 1218665-1   |
|               |                 | 30.43/31.19        | 16.21/16.46      | 24.87/25.12      | 7.77/8.03        | 12.17/12.93      | 19.02/19.53      | 10.46/10.97      | <b>.136/.176</b><br>3.45/4.47 | 1218665-6   |
|               |                 |                    |                  |                  |                  |                  | <b>.749/.769</b> | <b>.412/.432</b> | —                             | 1218607-6   |



Solder Cup, Series 109, Standard Density Connectors

**Material and Finish:**  
**Shell** — Steel or brass, cadmium plated  
**Insert** — Approved material per MIL-DTL-24308  
**Contact** — Copper alloy, plated gold over copper underplate

**Related Product Data:**  
**Cavity Identification** — page 5101  
**Mounting, Mating Specifications** — page 5143  
**Accessories** — pages 5148-5150



| MS Shell Size | Connector Style | Dimensions     |                |                |               |               |                |               |              |                        |               |
|---------------|-----------------|----------------|----------------|----------------|---------------|---------------|----------------|---------------|--------------|------------------------|---------------|
|               |                 | A              | B              | C              | D             | E             | G              | H             | J            | K                      | M             |
| 1             | Plug            | 1.213<br>30.81 | .666<br>16.92  | .984<br>24.99  | .329<br>8.36  | .494<br>12.55 | .759<br>19.28  | .422<br>10.72 | .030<br>0.76 | .238/.229<br>6.09/5.81 | .422<br>10.72 |
|               | Receptacle      | 1.213<br>30.81 | .643<br>16.33  | .984<br>24.99  | .311<br>7.90  | .494<br>12.55 | .759<br>19.28  | .422<br>10.72 | .030<br>0.76 | .248/.238<br>6.29/6.09 | .429<br>10.90 |
| 2             | Plug            | 1.541<br>39.14 | .994<br>25.25  | 1.312<br>33.32 | .329<br>8.36  | .494<br>12.55 | 1.083<br>27.51 | .422<br>10.72 | .030<br>0.76 | .238/.229<br>5.99/5.68 | .422<br>10.72 |
|               | Receptacle      | 1.541<br>39.14 | .971<br>24.66  | 1.312<br>33.32 | .311<br>7.90  | .494<br>12.55 | 1.083<br>27.51 | .422<br>10.72 | .030<br>0.76 | .248/.238<br>6.29/6.09 | .429<br>10.90 |
| 3             | Plug            | 2.088<br>53.04 | 1.534<br>38.96 | 1.852<br>47.04 | .329<br>8.36  | .494<br>12.55 | 1.625<br>41.28 | .422<br>10.72 | .039<br>0.99 | .236/.224<br>5.99/5.68 | .426<br>10.82 |
|               | Receptacle      | 2.088<br>53.04 | 1.511<br>38.38 | 1.852<br>47.04 | .311<br>7.90  | .494<br>12.55 | 1.625<br>41.28 | .422<br>10.72 | .030<br>0.76 | .248/.238<br>6.29/6.09 | .429<br>10.90 |
| 4             | Plug            | 2.729<br>69.32 | 2.182<br>55.42 | 2.500<br>63.5  | .329<br>8.36  | .494<br>12.55 | 2.272<br>57.71 | .422<br>10.72 | .039<br>0.99 | .236/.224<br>5.99/5.68 | .426<br>10.82 |
|               | Receptacle      | 2.729<br>69.32 | 2.159<br>54.84 | 2.500<br>63.5  | .311<br>7.90  | .494<br>12.55 | 2.272<br>57.71 | .422<br>10.72 | .030<br>0.76 | .248/.238<br>6.29/6.09 | .429<br>10.90 |
| 5             | Plug            | 2.635<br>66.93 | 2.079<br>52.81 | 2.406<br>61.11 | .441<br>11.20 | .605<br>15.37 | 2.178<br>55.32 | .534<br>13.56 | .039<br>0.99 | .236/.224<br>5.99/5.68 | .426<br>10.82 |
|               | Receptacle      | 2.635<br>66.93 | 2.064<br>52.43 | 2.406<br>61.11 | .423<br>10.74 | .605<br>15.37 | 2.178<br>55.32 | .534<br>13.56 | .030<br>0.76 | .248/.238<br>6.29/6.09 | .429<br>10.90 |

Solder Cup Assemblies

Steel Shells

| Contact Style | Shell Size | No. Pos. | Mount | Military Part No. M24308/ | AMP Part No. |
|---------------|------------|----------|-------|---------------------------|--------------|
| Receptacle    | 1          | 9        | Std.  | 1-1F                      | 593007-1     |
|               | 2          | 15       | Std.  | 1-2F                      | 593007-2     |
|               | 3          | 25       | Std.  | 1-3F                      | 593007-3     |
|               | 4          | 37       | Std.  | 1-4F                      | 593007-4     |
|               | 5          | 50       | Std.  | 1-5F                      | 593007-5     |
| Receptacle    | 1          | 9        | F/F   | 1-12F                     | 593008-1     |
|               | 2          | 15       | F/F   | 1-13F                     | 593008-2     |
|               | 3          | 25       | F/F   | 1-14F                     | 593008-3     |
|               | 4          | 37       | F/F   | 1-15F                     | 593008-4     |
|               | 5          | 50       | F/F   | 1-16F                     | 593008-5     |
| Receptacle    | 1          | 9        | D/F   | 1-23F                     | 593009-1     |
|               | 2          | 15       | D/F   | 1-24F                     | 593009-2     |
|               | 3          | 25       | D/F   | 1-25F                     | 593009-3     |
|               | 4          | 37       | D/F   | 1-26F                     | 593009-4     |
|               | 5          | 50       | D/F   | 1-27F                     | 593009-5     |
| Plug          | 1          | 9        | Std.  | 3-1F                      | 593002-1     |
|               | 2          | 15       | Std.  | 3-2F                      | 593002-2     |
|               | 3          | 25       | Std.  | 3-3F                      | 593002-3     |
|               | 4          | 37       | Std.  | 3-4F                      | 593002-4     |
|               | 5          | 50       | Std.  | 3-5F                      | 593002-5     |
| Plug          | 1          | 9        | F/F   | 3-12F                     | 593004-1     |
|               | 2          | 15       | F/F   | 3-13F                     | 593004-2     |
|               | 3          | 25       | F/F   | 3-14F                     | 593004-3     |
|               | 4          | 37       | F/F   | 3-15F                     | 593004-4     |
|               | 5          | 50       | F/F   | 3-16F                     | 593004-5     |

Brass Shells (Non-Magnetic)

| Contact Style | Shell Size | No. Pos. | Mount | Military Part No. M24308/ | AMP Part No. |
|---------------|------------|----------|-------|---------------------------|--------------|
| Receptacle    | 1          | 9        | Std.  | 5-1F                      | 593036-1     |
|               | 2          | 15       | Std.  | 5-2F                      | 593036-2     |
|               | 3          | 25       | Std.  | 5-3F                      | 593036-3     |
|               | 4          | 37       | Std.  | 5-4F                      | 593036-4     |
|               | 5          | 50       | Std.  | 5-5F                      | 593036-5     |
| Receptacle    | 1          | 9        | F/F   | 5-12F                     | 593037-1     |
|               | 2          | 15       | F/F   | 5-13F                     | 593037-2     |
|               | 3          | 25       | F/F   | 5-14F                     | 593037-3     |
|               | 4          | 37       | F/F   | 5-15F                     | 593037-4     |
|               | 5          | 50       | F/F   | 5-16F                     | 593037-5     |
| Receptacle    | 1          | 9        | D/F   | 5-23F                     | 593038-1     |
|               | 2          | 15       | D/F   | 5-24F                     | 593038-2     |
|               | 3          | 25       | D/F   | 5-25F                     | 593038-3     |
|               | 4          | 37       | D/F   | 5-26F                     | 593038-4     |
|               | 5          | 50       | D/F   | 5-27F                     | 593038-5     |
| Plug          | 1          | 9        | Std.  | 7-1F                      | 593057-1     |
|               | 2          | 15       | Std.  | 7-2F                      | 593057-2     |
|               | 3          | 25       | Std.  | 7-3F                      | 593057-3     |
|               | 4          | 37       | Std.  | 7-4F                      | 593057-4     |
|               | 5          | 50       | Std.  | 7-5F                      | 593057-5     |
| Plug          | 1          | 9        | F/F   | 7-12F                     | 593058-1     |
|               | 2          | 15       | F/F   | 7-13F                     | 593058-2     |
|               | 3          | 25       | F/F   | 7-14F                     | 593058-3     |
|               | 4          | 37       | F/F   | 7-15F                     | 593058-4     |
|               | 5          | 50       | F/F   | 7-16F                     | 593058-5     |

Mounting Abbreviations: Std. = Standard, F/F = Front Float, D/F - Dual Float  
**Note:** The suffix "F" on M24308 part numbers designates cadmium shell plating.

Connector Savers, Series 109, Standard Density

Connector savers prolong the life of permanently installed connectors which would otherwise be subjected to repeated cycles of mating and unmating, in applications such as test interfaces or on testing devices.

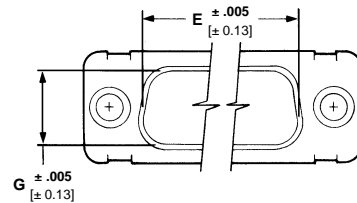
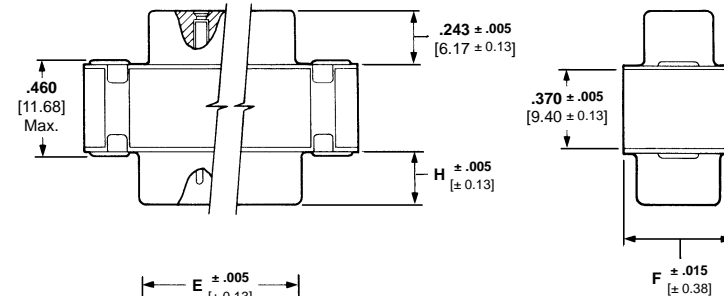
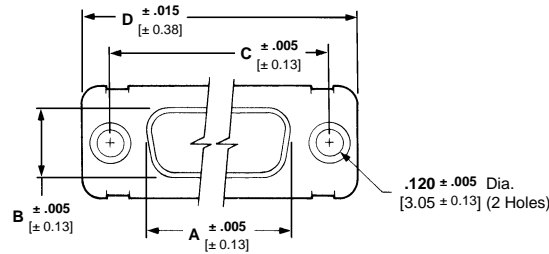
**Material and Finish:**

**Standard —**

- Shell** — Steel, cadmium plated
- Contact Body** — Beryllium copper with .000050 [0.00127] min. gold plate over .000050 [0.00127] min. nickel underplate
- Socket Hood** — Passivated stainless steel
- Insert** — Glass filled polyester
- Spacer** — Black nylon

**Non Magnetic —**

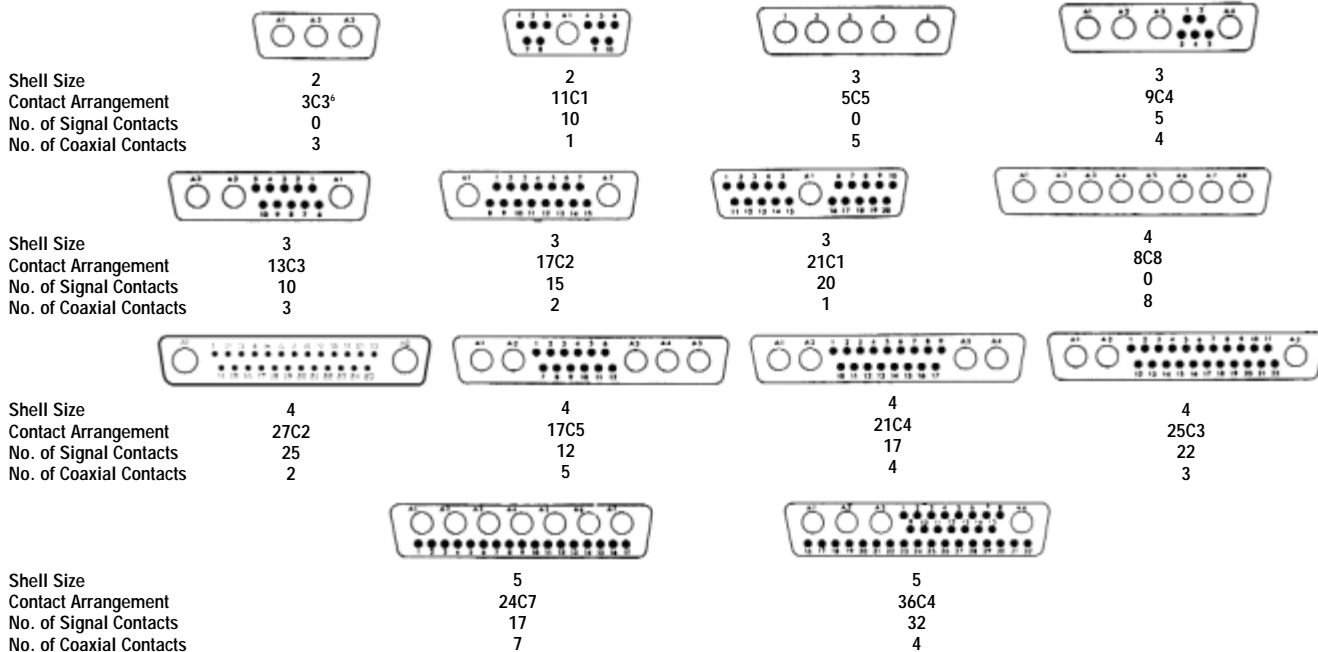
- Shell** — Brass, gold plated
- Contact Body** — Beryllium copper with .000050 [0.00127] min. gold plate over .000100 [0.00254] min. copper underplate
- Socket Hood** — Brass with .000050 [0.00127] min. gold over .000100 [0.00254] min. copper underplate
- Insert** — Glass filled polyester
- Spacer** — Black nylon



| No. of Contact Pos. (Shell Size) | Dimensions     |               |                |                |                |               |               |              |
|----------------------------------|----------------|---------------|----------------|----------------|----------------|---------------|---------------|--------------|
|                                  | A (outside)    | B (outside)   | C              | D              | E (inside)     | F             | G (inside)    | H            |
| 9 (1)                            | .643<br>16.33  | .311<br>7.9   | .984<br>24.99  | 1.213<br>30.81 | .666<br>16.92  | .494<br>12.55 | .329<br>8.36  | .235<br>5.97 |
| 15 (2)                           | .971<br>24.66  | .311<br>7.9   | 1.312<br>33.32 | 1.541<br>39.14 | .994<br>25.25  | .494<br>12.55 | .329<br>8.36  | .235<br>5.97 |
| 25 (3)                           | 1.511<br>38.38 | .311<br>7.9   | 1.852<br>47.04 | 2.088<br>53.04 | 1.534<br>38.96 | .494<br>12.55 | .329<br>8.36  | .230<br>5.84 |
| 37 (4)                           | 2.159<br>54.84 | .311<br>7.9   | 2.500<br>63.5  | 2.729<br>69.32 | 2.182<br>55.42 | .494<br>12.55 | .329<br>8.36  | .230<br>5.84 |
| 50 (5)                           | 2.064<br>52.43 | .423<br>10.74 | 2.406<br>61.11 | 2.635<br>66.93 | 2.079<br>52.81 | .605<br>15.37 | .441<br>11.20 | .230<br>5.84 |

| No. of Contact Pos. (Shell Size) | Standard (Cadmium Plated Steel Shell) | Non-Magnetic (Gold Plated Brass Shell) |
|----------------------------------|---------------------------------------|--|
| 9 (1)                            | 212559-1                              | 212559-2                               |
| 15 (2)                           | 212560-1                              | 212560-2                               |
| 25 (3)                           | 212561-1                              | 212561-2                               |
| 37 (4)                           | 212562-1                              | 212562-2                               |
| 50 (5)                           | 212563-1                              | 212563-2                               |

Crimp, Power/Coax/Signal Combination Standard Density, Series 109 Connectors



**Material and Finish:**

- Shell** — Steel or copper alloy
- Plating** — Cadmium, tin or gold
- Insert** — Approved material per MIL-DTL-24308
- Retention Clips** — Stainless steel or copper alloy

**Contact Selection:**

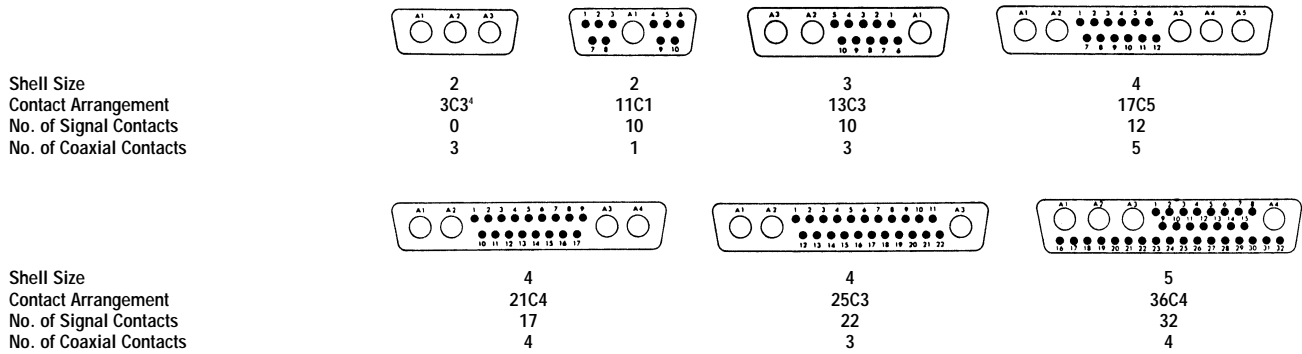
- Standard:**
  - Size 8 coax: Table I, page 5125
  - Size 8 power: page 5124
  - Size 20 signal: pages 5102-5104, 5107 and 5108
- Blindmate:**
  - Size 8 coax: Table II, page 5126
  - Size 8 power: page 5124
  - Size 20 signal: pages 5102-5104, 5107 and 5108

| Insert Arrangement | Standard                                    |                     |   |                     |   |                     |   |                     | Blindmate                                   |                     |
|--------------------|---|---------------------|---|---------------------|---|---------------------|---|---------------------|---|---------------------|
|                    | Cad Plated Steel Shell (.120 Mounting Hole) |                     | Tin Plated Steel Shell (.120 Mounting Hole) |                     | NASA Gold Plated Brass (.120 Mounting Hole) |                     | NASA Gold Plated Brass (.154 Mounting Hole) |                     | Cad Plated Steel Shell (.120 Mounting Hole) |                     |
|                    | Plug (Pin)                                  | Receptacle (Socket) | Plug (Pin)                                  | Receptacle (Socket) | Plug (Pin)                                  | Receptacle (Socket) | Plug (Pin)                                  | Receptacle (Socket) | Plug (Pin)                                  | Receptacle (Socket) |
| 3C3                | 448153-1                                    | 445705-4            | 448153-4                                    | 445705-1            | 448153-2                                    | 445705-2            | 448153-3                                    | 445705-3            | 447717-1                                    | 447718-1            |
| 11C1               | 211111-1                                    | 211112-1            | 211111-4                                    | 211112-4            | 211111-2                                    | 211112-2            | 211111-3                                    | 211112-3            | 447721-1                                    | 447722-1            |
| 5C5                | 212491-1                                    | 212059-1            | 212491-3                                    | 212059-3            | 212491-6                                    | 212059-2            | 212491-7                                    | 212059-6            | 446630-1                                    | 212049-3            |
| 9C4                | 212498-1                                    | 212502-1            | 212498-4                                    | 212502-5            | 212498-2                                    | 212502-2            | 212498-3                                    | 212502-3            | 445701-1                                    | 212051-2            |
| 13C3               | 208810-1                                    | 208811-1            | 208810-2                                    | 208811-2            | 208810-3                                    | 208811-3            | 208810-4                                    | 208811-4            | 447723-1                                    | 212057-2            |
| 17C2               | 212506-1                                    | 212510-1            | 212506-5                                    | 212510-4            | 212506-2                                    | 212510-2            | 212506-4                                    | 212510-3            | 447724-1                                    | 212053-3            |
| 21C1               | 212522-1                                    | 212526-1            | 212522-2                                    | 212526-2            | 212522-3                                    | 212526-3            | 212522-4                                    | 212526-4            | 447727-1                                    | 212055-2            |
| 8C8                | 446405-1                                    | 445730-1            | 446405-4                                    | 445730-5            | 446405-2                                    | 445730-3            | 446405-3                                    | 445730-4            | 447719-1                                    | 447720-1            |
| 27C2               | 212538-1                                    | 212542-1            | 212538-4                                    | 212542-4            | 212538-2                                    | 212542-2            | 212538-3                                    | 212542-3            | 447732-1                                    | 447733-1            |
| 17C5               | 212514-1                                    | 212518-1            | 212514-5                                    | 212518-5            | 212514-3                                    | 212518-3            | 212514-4                                    | 212518-4            | 447725-1                                    | 447726-1            |
| 21C4               | 212530-1                                    | 212534-1            | 212530-4                                    | 212534-4            | 212530-2                                    | 212534-2            | 212530-3                                    | 212534-3            | 447728-1                                    | 445726-1            |
| 25C3               | 208742-1                                    | 208551-1            | 208742-4                                    | 208551-4            | 208742-2                                    | 208551-2            | 208742-3                                    | 208551-3            | 447730-1                                    | 447731-1            |
| 24C7               | 208743-1                                    | 208552-1            | 208743-4                                    | 208552-4            | 208743-2                                    | 208552-2            | 208743-6                                    | 208552-5            | 446631-1                                    | 445000-2            |
| 36C4               | 208744-1                                    | 208550-1            | 208744-5                                    | 208550-4            | 208744-3                                    | 208550-2            | 208744-4                                    | 208550-3            | 446710-1                                    | 446711-1            |

**Notes:**

- NASA connectors listed above are qualified to NASA specification 311-P-405. See pages 5156 and 5157 for NASA cross reference.
- Plug insert arrangements shown. Receptacle arrangement is mirror image.
- Cable clamp/strain relief hardware cannot be used with these arrangements.
- See pages 5146 and 5147 for PCB layouts.
- Blindmate plugs feature a chamfered lead-in on the front shell, which is constructed of aluminum alloy. See page 5109 for shell dimensions. Blindmate receptacles feature float bushings installed in the mounting holes. See pages 5105 and 5106 for shell dimensions.
- The 3C3 arrangement can be mated 180°. Contact Tyco Electronics or call Technical Support for keyed Part Numbers.
- All connector plugs with grounding indents except the cadmium plated.

Boardmount Power/Coax/Signal/Combination Standard Density,  
Series 109 Connectors



**Material and Finish:**

Shell — Steel or copper alloy

Plating — Cadmium or tin

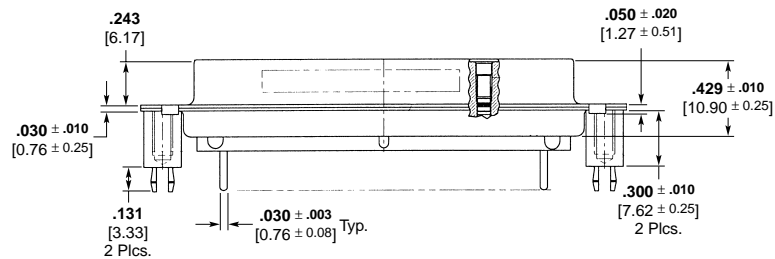
Insert — Approved material per MIL-DTL-24308

**Contact Selection:**

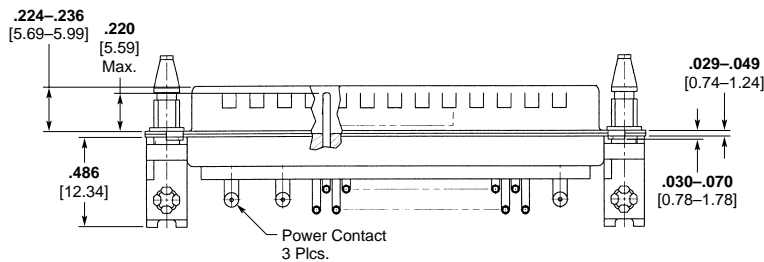
Standard (If not shown with connector):

Size 8 coax: Table I, page 5125

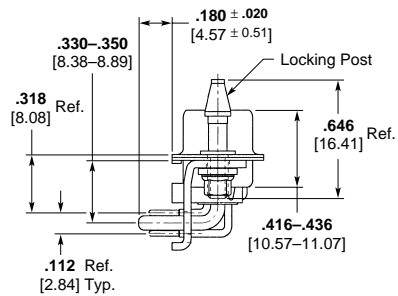
Size 8 power: page 5124



Typical Vertical Receptacle



Typical Right-Angle Plug



| Contact Config. | Shell Plating | Style            | Hardware Options |            | 4-40 Standoff |               |               | Contacts |      | Spacers | Part No.  |
|-----------------|---------------|------------------|------------------|------------|---------------|---------------|---------------|----------|------|---------|-----------|
|                 |               |                  | Screwlocks       | Boardlocks | Clinchnuts    | w/ Boardlocks | Locking Posts | Power    | Coax |         |           |
| 3C3             | Tin           | Vertical Recept. | No               | No         | No            | Yes           | No            | No       | No   | No      | 1218896-1 |
| 11C1            | Cad.          | Vertical Plug    | No               | No         | No            | No            | No            | No       | Yes  | Yes     | 1218128-1 |
| 11C1            | Cad.          | Vertical Recept. | No               | No         | No            | No            | No            | No       | Yes  | Yes     | 1218129-1 |
| 13C3            | Tin           | Vertical Plug    | No               | No         | No            | Yes           | No            | No       | No   | No      | 1218816-1 |
| 17C5            | Tin           | Right-Angle Plug | Yes              | Yes        | No            | No            | No            | Yes      | No   | No      | 1218939-1 |
| 21C4            | Tin           | Vertical Recept. | No               | No         | No            | Yes           | No            | No       | No   | No      | 1218887-1 |
| 25C3            | Tin           | Right-Angle Plug | No               | Yes        | No            | No            | Yes           | Yes      | No   | No      | 1218611-1 |
| 36C4            | Tin           | Vertical Recept. | No               | Yes        | No            | Yes           | No            | No       | No   | No      | 1218807-1 |

**Notes:**

1. Plug insert arrangements shown. Receptacle arrangement is mirror image.
2. See AMP customer drawing for PCB layouts.
3. The 3C3 arrangement can be mated 180°. Contact your Tyco Electronics Sales Engineer or call Technical Support for keyed Part Numbers.

Size 8 Contacts (Power) for Standard Density,  
Series 109 Power/Coax/Signal Connectors

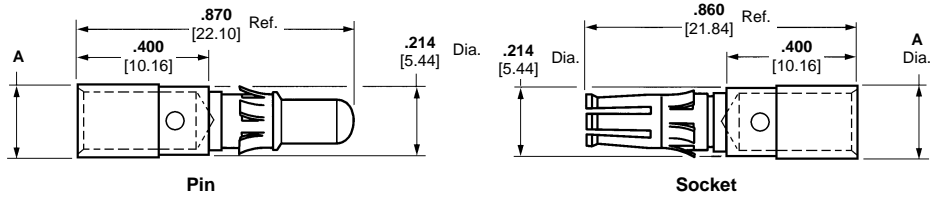
**Crimp Contacts**

**Material and Finish:**

Copper alloy, plated gold over nickel underplate

**Retention Clips** — Stainless steel or phosphor bronze

**Note:** clip may differ from view shown



**Product Specification:**

**For Crimp Contacts — 108-10045**  
(current rating and wire size)

**For PCB Contacts — 108-10045-1**

**Hand Crimp Tool** — AMP 608651-1  
with positioner AMP 608651-2

**Extraction Tool** — 318813-1

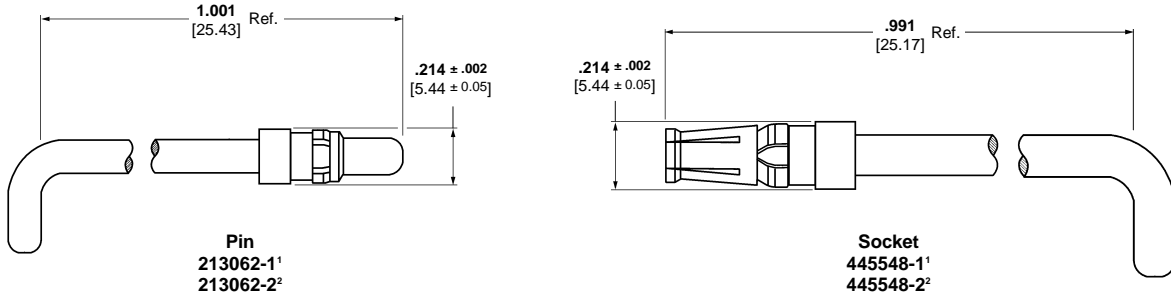
| Wire Size Range |                 | Dim. A       | Part Numbers              |                           |                       |                       |                        |                        |
|-----------------|-----------------|--------------|---------------------------|---------------------------|-----------------------|-----------------------|------------------------|------------------------|
| AWG             | mm <sup>2</sup> |              | 50 Gold Pins <sup>3</sup> | 30 Gold Pins <sup>3</sup> | 50 Gold Sockets       | 30 Gold Sockets       | Blindmate 50 Gold Pins | 30 Blindmate Gold Pins |
| 8 <sup>2</sup>  | 8               | .230<br>5.84 | 211159-1                  | 211159-3                  | 211161-1              | 211161-3              | 1218385-1              | —                      |
| 10 <sup>2</sup> | 5               | .185<br>4.69 | 211159-2                  | 211159-4                  | 211161-2              | 211161-4              | —                      | —                      |
| 12-14           | 2-3             | .150<br>3.81 | 212007-1                  | 212007-2                  | 212008-1              | 212008-2              | 1218483-1              | 1218483-2              |
| 16-18           | 0.8-1.4         | .102<br>2.59 | 212013-1 <sup>1</sup>     | 212013-2 <sup>1</sup>     | 212014-1 <sup>1</sup> | 212014-2 <sup>1</sup> | —                      | —                      |

- Notes:** 1. 16-18 size use 608668-1 with Positioner 608668-2.  
2. Retention clip shown is for 12-14, 16-18 Awg. See AMP customer drawing for 8, 10 AWG Retention Clip.  
3. Use these contacts only with the **Standard** connectors on pages 5122 and 5123. Do not use with **Blindmate** connectors.

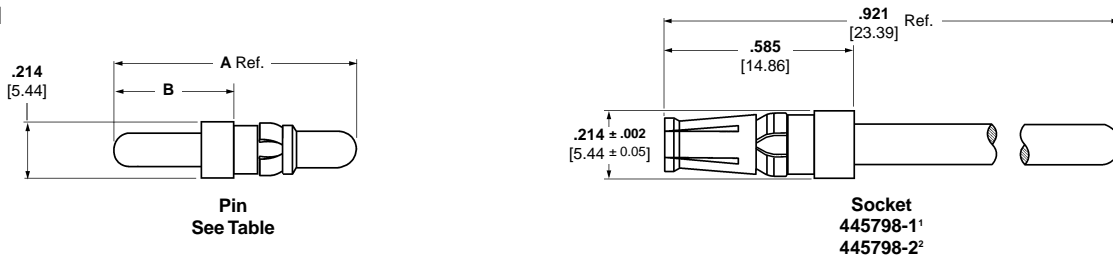
**Printed Circuit Board Contacts**

(Use these contacts only with the **Standard** connectors on page 5123. Do not use with **Blindmate** connectors.)

**Right-Angle**



**Vertical**



| Part Number             | Dim A           | Dim B           |
|-------------------------|-----------------|-----------------|
| 449379-1 <sup>1</sup>   | .931<br>[23.65] | .461<br>[11.71] |
| 449379-2 <sup>1</sup>   | .845<br>[21.46] | .375<br>[9.52]  |
| 1-449379-0 <sup>2</sup> | .931<br>[23.65] | .461<br>[11.71] |
| 1-449379-1 <sup>2</sup> | .845<br>[21.46] | .375<br>[9.52]  |

- Note:** 1. Standard connector, .000050 [0.00127] gold plating.  
2. Standard connector, .000030 [0.00076] gold plating.

#### RF Contacts for Standard Density, Series 109 Power/Coax/Signal Connectors

#### Performance Characteristics

**Frequency Range** — 0 to 500 MHz  
**Operating Voltage, Max.** — 275 vac rms @ sea level  
**Termination Resistance, Max.** — Center Contact — 6.0 milliohms  
 Outer Contact — 3.0 milliohms  
**Insulation Resistance, Min.** — 5,000 megohms @ 500 vdc  
**Dielectric Withstanding Voltage** — Sea Level — 800 Volts rms  
 30,000 ft [9,144 m] — 525 volts rms  
 70,000 ft [21,336m] — 275 volts rms  
**VSWR to 500MHz, Max.**

| Pin/Socket              | VSWR |
|-------------------------|------|
| Straight/Straight       | 1.30 |
| Right-Angle/Straight    | 1.35 |
| Right-Angle/Right-Angle | 1.40 |

**Extraction Tool** — 318813-1  
**Hand Crimp Tool** — 69710-2  
**Pneu. Crimp Tool** — 69365-8  
**Dies for Crimp Tools** — See table  
**Instruction Sheet** — 408-06755 Size 8 Coaxial RF 50-Ohm and Non-Impedance Matched Pin and Socket Contact Kits

**RF Crosstalk** — 90dB @ 5-500 MHz  
**Mating Force, Max.** — 4.0 lb [17.8 N]  
**Unmating Force, Min.** — 2.0 oz [0.556 N]  
**Contact Retention** — 20 lb [89 N]  
**Contact Durability** — 500 cycles

| Cable RG/U                     | Force |       |
|--------------------------------|-------|-------|
|                                | lb    | [N]   |
| 316, 188, 174, 179, 179A, 179B | 20    | 89    |
| 188-type Double-Braid          | 35    | 155.8 |
| 142, 142A, 142B                | 50    | 222.5 |

**Operating Temperature** — 131°F to 257°F [55°C to +125°C]  
**Thermal Shock** — 131°F to 257°F [55°C to +125°C] per MIL-STD-1344, Method 1003, Cond. A  
**Physical Shock** — 50 G's per MIL-STD-1344, Method 2004, Cond. A  
**Vibration** — MIL-STD-1344, Method 2005, Cond. II

**Moisture Resistance** — 240 hours per MIL-STD-1344, Method 1002, Cond. II  
**Salt Fog** — 48 hours per MIL-STD-1344, Method 1001, Cond. B  
**Extraction Tool Numbers**  
**Subminiature D Housings** — 58095-1 AMPLIMITE Connector  
**AMP-HDI Connector Housings** — 58095-2

**Material**  
**Brass** — per QQ-B-626 and MIL-C-50  
**Phosphor Bronze** — per QQ-B-750  
**Beryllium Copper** — per QQ-C-530  
**TEFLON** — per MIL-P-19468  
**Nylon** — per MIL-M-20693  
**Finish**  
**Bright Tin-Lead Plating** — per ASTM-B-571  
**Copper Plating** — per MIL-C-14550  
**Gold Plating** — per MIL-G-45204  
**Nickel Plating** — per QQ-N-290

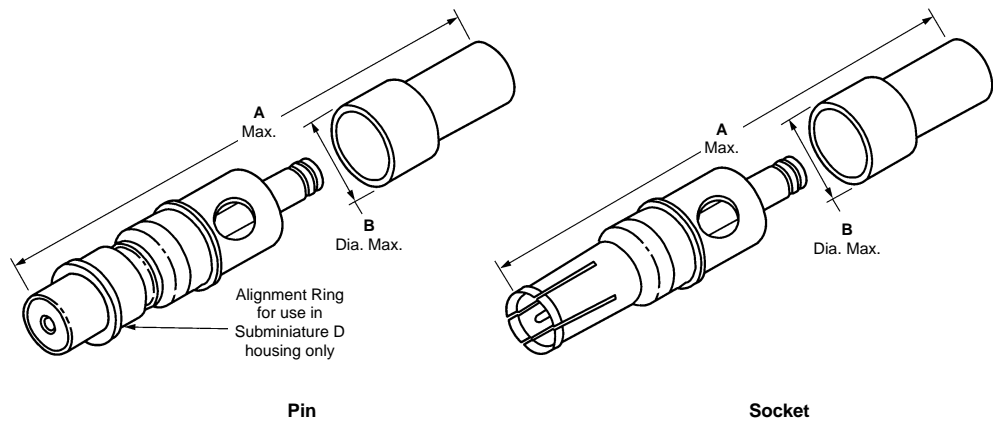


Table I - Standard

| RG/U Cable                                       | Dimensions<br>A B |              | Contact Part Numbers  |          |          |          | Die Insert for Tools |
|--|-------------------|--------------|-----------------------|----------|----------|----------|----------------------|
|  |                   |              | Non-Impedance Matched |          | 50 Ohm   |          |                      |
|  |                   |              | Pin                   | Socket   | Pin      | Socket   |                      |
| 178, 178A, 178B<br>196, 196A                     | .950<br>24.13     | .235<br>5.94 | 228618-5              | 228596-5 | —        | —        | 59993-1              |
| 174, 316<br>188, 188A                            | .956<br>24.28     | .234<br>5.94 | 228618-1              | 228596-1 | 221980-1 | 221981-1 | 59993-1              |
| 179, 179A, 179B<br>187, 187A, 161<br>Belden 9221 | .956<br>24.28     | .234<br>5.94 | 228618-2              | 228596-2 | 221980-3 | 221981-3 | 59993-1              |
| 188-Type<br>Double Braid                         | .956<br>24.28     | .234<br>5.94 | 228618-3              | 228596-3 | —        | —        | 59993-1              |
| 142, 142A, 142B<br>400, Belden 9246              | 1.080<br>27.43    | .255<br>6.48 | 228618-4              | 228596-4 | 221980-2 | 221981-2 | 58212-1              |

**Notes:**  
 1. Non Impedance Matched contacts and 50 ohm contacts are not intermateable.  
 2. Use these contacts only with the **Standard** connectors on pages 5122 and 5123.

5 Pin and Socket Connectors

RF Contacts for Standard Density,  
Series 109 Power/Coax/Signal Connectors (Continued)

**Materials**

**Center Contacts** — Beryllium Copper or Brass per QQ-B-626, per QQ-C-530, gold plated

**Outer Contacts** — Beryllium copper per QQ-C-530, gold plated

**Plugs** — Beryllium copper per QQ-C-530, gold plated

**Jack** — Stainless steel per ASTM-A-582, gold plated

**Shells** — Stainless steel per ASTM-A-582, passivated

**Panel Shells** — Brass per QQ-B-626, nickel plated

**Dielectrics** — TEFLON per ASTM-D-1457

**Grip Rings** — Brass per MIL-C-50 or Beryllium Copper per QQ-C-530, nickel plated

**Springs** — Steel wire per QQ-W-470

**Bushings** — Stainless steel per ASTM-A-582, passivated

**Retention Springs** — Beryllium Copper per QQ-C-530, Tin-Lead Plated

**Finishes**

Passivate per QQ-P-35

Gold per MIL-G-45204

Nickel per QQ-N-290

Tin-Lead per ASTM-B-545

**Performance Characteristics:**

**Electrical Characteristics**

**Nominal Impedance** — 50 ohms

**Frequency Range** —

2.8 mm: 0 to 26.5 GHz

2.8 mm for size 8 cavities: 0 to 40 GHz

**Operating Voltage** —

RG-402/U Cable (3.58 [1.141] O.D.)

500 volts rms at 60 Hz (sea level)

125 volts rms at 60 Hz

(21 336 m [70,000 ft])

RG-405/U Cable (2.18 [.086] O.D.)

335 volts rms at 60 Hz (sea level)

85 volts rms at 60 Hz

70,000 ft [21,336 m]

**Mechanical Characteristics**

**Cable Retention** —

RG-402/U Cable (3.58 [1.141] O.D.)—

60 lb [266.9 N], min.

RG-405/U Cable (2.18 [.086] O.D.)—

30 lb [133.4 N], min.

**Connector Mating Force** —

2.8 mm: 3 lbs Max.

**Environmental Characteristics**

**Temperature Range** —

-85°F to +221°F [-65°C to +105°C]

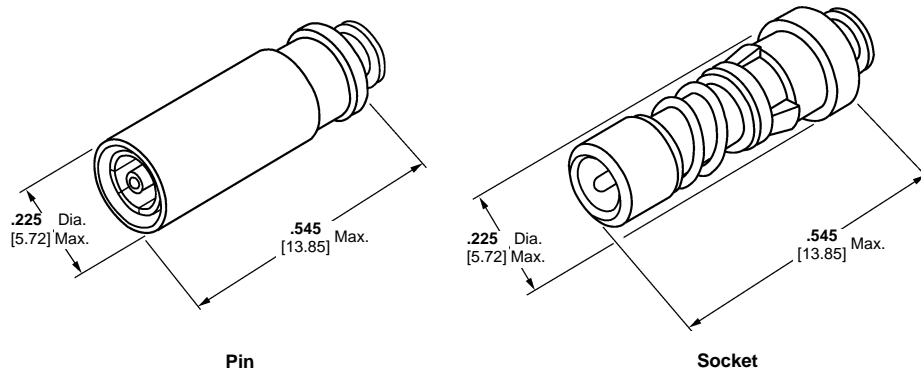


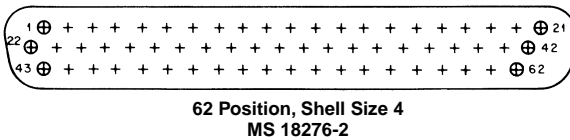
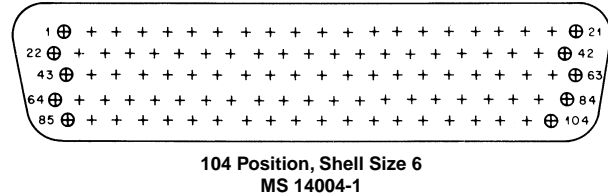
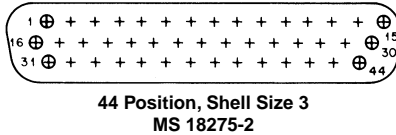
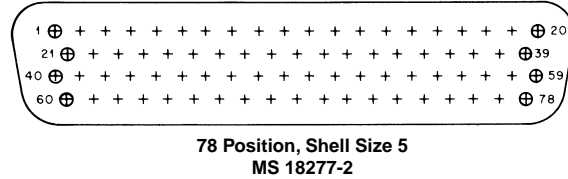
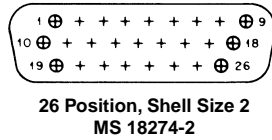
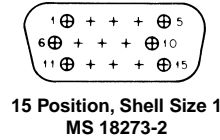
Table II - 2.8 mm Blindmate

| RG/U Cable                    | Contact Type  | Part Number | Crimp Tool | Die Set  | Locator  | Insertion Tool | Extraction Tool |
|-------------------------------|---------------|-------------|------------|----------|----------|----------------|-----------------|
| 405 Semi-Rigid<br>.086 [2.18] | Pin (Plug)    | 413242-1    | 59980-1    | 312253-2 | 852113-1 | 852115-1       | 2-305183-0      |
|                               | Socket (Jack) | 413249-1    | 59980-1    | 312253-2 | 852114-1 | —              | 318813-1        |

**Note:**

1. Use these contacts only with the **Blindmate** connectors on page 5122.

Insert Arrangements



Note: Mating face of plug shown: receptacle is mirror image.

Performance Specifications

All Series 90 AMPLIMITE military connectors conform to the latest amendments of military specification MIL-DTL-24308. For more detailed information, refer to MIL-DTL-24308.

All Series 90 connectors are designed for a -67°F to 257°F [-55°C to +125°C] temperature range.

Technical Documents List

The following is a list of technical documents that cover the application and performance of AMPLIMITE Series 90 military connectors, contacts, tooling and accessories.

**Military Specifications**

- MIL-DTL-24308 Connectors, Electric, Rectangular, Miniature Polarized Shell, Rack and Panel, General Specifications for
- MIL-C-39029 Contacts, Electrical Connector, General Specification for

**NASA Specification**

- GSFC-S-311-P-4 Non-Magnetic Connectors, General Specification for

**AMP Instruction Sheets**

- 408-7516 AMP Application Tooling for MIL-C-39029 Contacts
- 408-7610 Application and Maintenance for AMP Hand Crimping Tool 90294-1
- 408-7508 AMP Insertion/Extraction Tools 91067-1, 91067-2 and 91067-3
- 408-7837 AMP Female Screwlock Kit 205817-8 and AMP Male Screw/Retainer Kit 211883-5



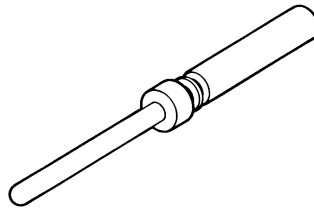
Electronics

Size 22 Crimp Contacts for Series 90 Connectors (MIL-C-39029)

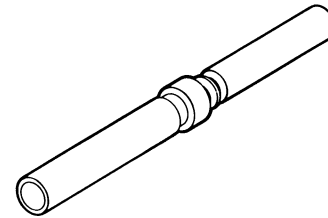
Size 22 Crimp, Snap-In  
Contacts .030 [0.76]  
Pin Diameter

Material and Finish

**Pin, Socket Body** — Copper alloy,  
plated gold over nickel underplate  
**Socket Hood** — Passivated stainless  
steel



**Pin**  
**M39029/58-360**  
(Supersedes M24308/13-1)



**Socket**  
**M39029/57-354**  
(Supersedes M24308/12-1)

| Wire Size Range |                    | Ins. Dia. (Max.) | Contact Configuration | Tape Mounted Contacts <sup>1</sup> |                             | Loose Piece Contacts |                    | Hand Tool                |                       | Contact Color Bands |
|-----------------|--------------------|------------------|-----------------------|------------------------------------|-----------------------------|----------------------|--------------------|--------------------------|-----------------------|---------------------|
| AWG             | [mm <sup>2</sup> ] |                  |                       | AMP Part No.                       | Military Part No. (M39029/) | AMP Part No.         | Tool No. (M22520/) | Positioner No. (M22520/) |                       |                     |
| 22-28           | 0.4-0.8            | .054<br>1.38     | Pin                   | 204370-5                           | 58-360                      | 204370-2             | 02-01              | 02-09                    | orange, blue, black   |                     |
|                 |                    |                  | Socket                | 204351-2                           | 57-354                      | 204351-1             | 02-01              | 02-06                    | orange, green, yellow |                     |

<sup>1</sup>Tape mounted contacts are used in the AMP-TAPEMATIC Stripper/Crimper Machine Part Number **599406-7** (page 5142).

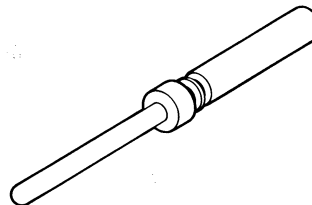
- Notes:**
1. These contacts are used in Series 90 military connectors.
  2. Insertion/Extraction Tool Part Number **91067-1** (Military Part Number **M81969/1-04**) is used to install and remove pin and socket contacts.
  3. See AMP Instruction Sheet 408-7516 for wire length, tool and selector settings.
  4. Color bands are read in the direction of terminal (wire barrel) end to mating end.

Size 22 Crimp Contacts for Series 90 Connectors (Industrial Grade)

Size 22 Crimp, Snap-In  
Contacts .030 [0.76]  
Pin Diameter

Material and Finish

**Pin Body** — Copper alloy with  
.000050-.000100 [0.00127-0.00254]  
gold plate over .000050-.000150  
[0.00127-0.00381] nickel underplate



**Pin**

| Wire Size Range |                    | Ins. Dia. (Max.) | Contact Configuration | Tape Mounted Contacts <sup>1</sup> Part No. | Loose Piece Contacts Part No. | Hand Tool          |                          |
|-----------------|--------------------|------------------|-----------------------|---|-------------------------------|--------------------|--------------------------|
| AWG             | [mm <sup>2</sup> ] |                  |                       |   |                               | Tool No. (M22520/) | Positioner No. (M22520/) |
| 22-28           | 0.4-0.8            | .054<br>1.38     | Pin                   | 1218699-2                                   | 1218699-1                     | 02-01              | 02-09                    |
|                 |                    |                  | Socket                | —   | —                             | —                  | —                        |

<sup>1</sup>Tape mounted contacts are used in the AMP-TAPEMATIC Stripper/Crimper Machine Part Number **599406-7** (page 5142).

- Notes:**
1. These contacts are used in Series 90 connectors.
  2. Insertion/Extraction Tool Part Number **91067-1** (Military Part Number **M81969/1-04**) is used to install and remove pin and socket contacts.
  3. See AMP Instruction Sheet 408-7516 for wire length, tool and selector settings.

Size 22 Posted Contacts for Series 90 Connectors

Size 22 Posted Contacts

Material and Finish

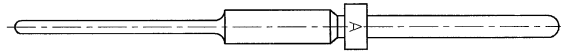
**Pin and Socket Body** — Leaded nickel copper or beryllium copper

**Socket Hood** — See chart below

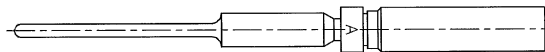


**Pin and Socket Insertion/Extraction Tool**

AMP Part Number 91067-1 or MIL Part Number M81969/1-04  
 Insertion tip, for replacement Part Number 126237-1  
 Extraction tip, for replacement Part Number 126195-2



**Pin**  
(See drawing No. 207683 for latest configurations)

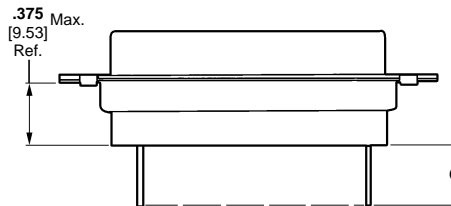


**Socket**  
(See drawing No. 207684 for latest configurations)

**Notes:**

1. Contacts on this page can be used with connectors on pages 5130-5134, 5140. See page 5145 for PCB layouts.
2. Mating End of pin and socket complies with MIL-C-39029.

| Post Diameter<br>± .002 [± .050] | Post Extension<br>C ± .025 [± 0.63] | Part Nos.  |          | Contact Plating  | Socket Hood Material and Finish                                      |  |
|----------------------------------|-------------------------------------|------------|----------|--|--|--|
|                                  |                                     | Pin        | Socket   |  |  |  |
| .018<br>0.46                     | .175<br>4.45                        | 207683-6   | 207684-3 | Pin<br>.000050-.000100 [0.00127-0.00254]<br>thick gold plate over  | Socket<br>.000050-.000100 [0.00127-0.00254]<br>thick gold plate over | Brass or Beryllium copper with<br>.000050-.000100 [0.00127-0.00254]<br>thick gold plate over<br>.000100-.000250 [0.00254-0.00635]<br>thick copper underplate |
|                                  | .275<br>6.99                        | 207683-2   | 207684-1 | .000100-.000150 [0.00254-0.00381]<br>thick copper underplate   | .000100-.000250 [0.00254-0.00635]<br>thick copper underplate         |  |
|                                  | .525<br>13.34                       | 207683-4   | 207684-2 |  |  |  |
| .025<br>0.64                     | .275<br>6.99                        | 207683-8   | 207684-4 | .000050-.000100 [0.00127-0.00254]<br>thick gold plate over<br>.000050-.000150 [0.00127-0.00381]<br>thick nickel underplate |  | Passivated Stainless Steel   |
|                                  | .275<br>6.99                        | —          | 207684-5 | .000050-.000100 [0.00127-0.00254]<br>thick gold plate over   |  |  |
| .018<br>0.46                     | .525<br>13.34                       | 207683-9   | —        | .000050-.000150 [0.00127-0.00381]<br>thick nickel underplate   |  | Passivated Stainless Steel   |
|                                  | .175<br>4.45                        | 1-207683-1 | —        | .000050-.000100 [0.00127-0.00254]<br>thick gold plate over<br>.000200-.000250 [0.00508-0.00635]<br>thick nickel underplate |  |  |



Post extension when used in a standard connector

**(MIL Qualified)**

**Material and Finish**

Shell — Steel, cadmium plated

Insert — Approved material per MIL-DTL-24308

Retention Clips — Stainless steel or copper alloy

**(Industrial Grade)**

**Material and Finish**

Shell — Steel, zinc plated

Insert — Polyphenylene Sulfide (PPS)

Retention Clips — Stainless steel or copper alloy

**Related Product Data**

Cavity Identification — page 5127

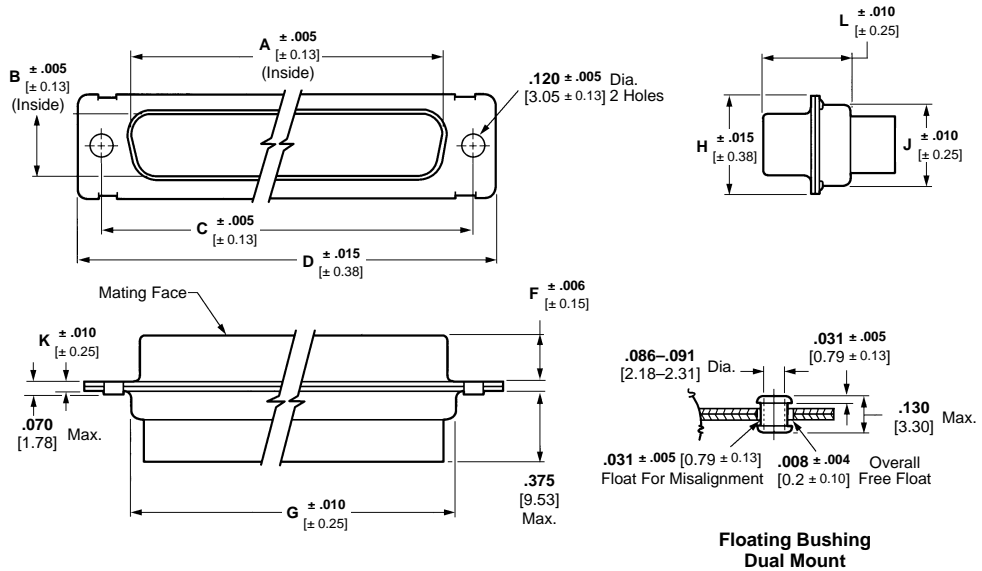
Contacts — pages 5128, 5129

Mounting, Mating Dimensions — page 5143

Accessories — pages 5148-5150

**Attention: MIL Qualified Connector marking**

Connector marking may differ from package marking. All connectors marked per MIL-DTL-24308.



| No. of Contact Pos. (Shell Size) | Dimensions                             |              |                           |              |      |       |       |       |      |       |                | MIL Qualified |                        |          |                             | Description | Industrial Grade <sup>3</sup> Standard Mount Part No. |
|----------------------------------|--|--------------|---------------------------|--------------|------|-------|-------|-------|------|-------|----------------|---------------|------------------------|----------|-----------------------------|-------------|---|
|                                  | A                                      | B            | C                         | D            | F    | G     | H     | J     | K    | L     | Standard Mount |               | Floating Bushing Mount |          |                             |             |   |
|                                  | Military Part No. <sup>2</sup> M24308/ | AMP Part No. | Military Part No. M24308/ | AMP Part No. |      |       |       |       |      |       |                |               |                        |          |                             |             |   |
| 15 (1)                           | .666                                   | .329         | .984                      | 1.213        | .235 | .759  | .494  | .422  | .030 | .422  | 4-264F         | 204501-1      | 4-329F                 | 204525-1 | Plug only                   | 1218746-1   |   |
|                                  | 16.92                                  | 8.36         | 24.99                     | 30.81        | 5.97 | 19.28 | 12.55 | 10.72 | 0.76 | 10.72 | 4-11F          | 204513-2      | 4-307F                 | 204537-2 | Plug with pins <sup>1</sup> | —           |   |
| 26 (2)                           | .994                                   | .329         | 1.312                     | 1.541        | .235 | 1.083 | .494  | .422  | .030 | .422  | 4-265F         | 204503-1      | 4-330F                 | 204527-1 | Plug only                   | 1218746-2   |   |
|                                  | 25.25                                  | 8.36         | 33.32                     | 39.14        | 5.97 | 27.51 | 12.55 | 10.72 | 0.76 | 10.72 | 4-12F          | 204515-2      | 4-308F                 | 204539-2 | Plug with pins <sup>1</sup> | —           |   |
| 44 (3)                           | 1.534                                  | .329         | 1.852                     | 2.088        | .230 | 1.625 | .494  | .422  | .039 | .426  | 4-266F         | 204505-1      | 4-331F                 | 204529-1 | Plug only                   | 1218746-3   |   |
|                                  | 38.96                                  | 8.36         | 47.04                     | 53.04        | 5.84 | 4.13  | 12.55 | 10.72 | 0.99 | 10.82 | 4-13F          | 204517-2      | 4-309F                 | 204541-2 | Plug with pins <sup>1</sup> | —           |   |
| 62 (4)                           | 2.182                                  | .329         | 2.500                     | 2.729        | .230 | 2.272 | .494  | .422  | .039 | .426  | 4-267F         | 204507-1      | 4-332F                 | 204531-1 | Plug only                   | 1218746-4   |   |
|                                  | 55.42                                  | 8.36         | 63.5                      | 69.32        | 5.84 | 57.7  | 12.55 | 10.72 | 0.99 | 10.82 | 4-14F          | 204519-2      | 4-310F                 | 204543-2 | Plug with pins <sup>1</sup> | —           |   |
| 78 (5)                           | 2.079                                  | .441         | 2.406                     | 2.635        | .230 | 2.178 | .605  | .534  | .039 | .426  | 4-268F         | 204509-1      | 4-333F                 | 204533-1 | Plug only                   | 1218746-5   |   |
|                                  | 52.81                                  | 11.2         | 61.11                     | 66.93        | 5.84 | 55.32 | 15.37 | 13.56 | 0.99 | 10.82 | 4-15F          | 204521-2      | 4-311F                 | 204545-2 | Plug with pins <sup>1</sup> | —           |   |
| 104 (6)                          | 2.212                                  | .503         | 2.500                     | 2.729        | .230 | 2.302 | .668  | .596  | .039 | .426  | 4-269F         | 204511-1      | 4-334F                 | 204535-1 | Plug only                   | 1218746-6   |   |
|                                  | 56.18                                  | 12.78        | 63.5                      | 69.32        | 5.84 | 58.47 | 16.97 | 15.14 | 0.99 | 10.82 | 4-16F          | 204523-2      | 4-312F                 | 204547-2 | Plug with pins <sup>1</sup> | —           |   |

Notes: See pages 5151 through 5155 (military to AMP Part Number cross reference) for additional part numbers.

<sup>1</sup> Size 22 sockets supplied with receptacles are loose piece.

<sup>2</sup> "F" is stamped on connectors following M24308 part number as required. "F" designates cadmium shell plating.

<sup>3</sup> Meets requirements of MIL-DTL-24308.

Crimp Receptacles, Series 90, High Density Connectors

**(MIL Qualified)**

**Material and Finish**

Shell — Steel, cadmium plated

Insert — Approved material per MIL-DTL-24308

Retention Clips — Stainless steel or copper alloy

**(Industrial Grade)**

**Material and Finish**

Shell — Steel, zinc plated

Insert — Polyphenylene Sulfide (PPS)

Retention Clips — Stainless steel or copper alloy

**Related Product Data**

Cavity Identification — page 5127

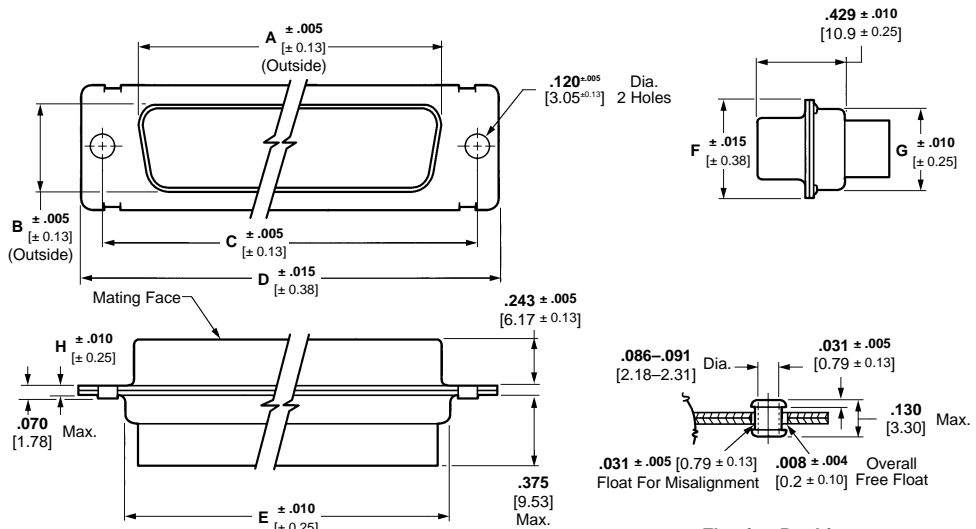
Contacts — pages 5128, 5129

Mounting, Mating Dimensions — page 5143

Accessories — pages 5148-5150

**Attention: Connector marking**

Connector marking may differ from package marking. All connectors marked per MIL-DTL-24308.



**Floating Bushing Dual Mount**



**Clinch Nut Mount**

| No. of Contact Pos. (Shell Size) | Dimensions                             |                 |  |                  |  |                 |  |                | MIL Qualified                          |              |  |              | Description                       | Industrial Grade <sup>3</sup> Clinch Nut Mount Part No. |
|----------------------------------|--|-----------------|--|------------------|--|-----------------|--|----------------|--|--------------|--|--------------|-----------------------------------|---|
|                                  | A                                      | B               | C                                      | D                | E                                      | F               | G                                      | H              | Standard Mount                         |              | Floating Bushing Mount                 |              |                                   |   |
|                                  | Military Part No. <sup>2</sup> M24308/ | AMP Part No.    | Military Part No. <sup>2</sup> M24308/ | AMP Part No.     | Military Part No. <sup>2</sup> M24308/ | AMP Part No.    | Military Part No. <sup>2</sup> M24308/ | AMP Part No.   | Military Part No. <sup>2</sup> M24308/ | AMP Part No. | Military Part No. <sup>2</sup> M24308/ | AMP Part No. |                                   |   |
| 15 (1)                           | .643<br>[16.33]                        | .311<br>[7.9]   | .984<br>[24.99]                        | 1.213<br>[30.81] | .759<br>[19.28]                        | .494<br>[12.55] | .422<br>[10.72]                        | .030<br>[0.76] | 2-286F                                 | 204500-1     | 2-297F                                 | 204524-1     | Recept. only                      | 1218747-1   |
| 26 (2)                           | .971<br>[24.66]                        | .311<br>[7.9]   | 1.312<br>[33.32]                       | 1.541<br>[39.14] | 1.083<br>[27.51]                       | .494<br>[12.55] | .422<br>[10.72]                        | .030<br>[0.76] | 2-287F                                 | 204502-1     | 2-298F                                 | 204526-1     | Recept. only                      | 1218747-2   |
|                                  |  |                 |  |                  |  |                 |  |                | 2-12F                                  | 204514-2     | 2-29F                                  | 204538-2     | Recept. with sockets <sup>1</sup> | —   |
| 44 (3)                           | 1.511<br>[38.38]                       | .311<br>[7.9]   | 1.852<br>[47.04]                       | 2.088<br>[53.04] | 1.625<br>[41.3]                        | .494<br>[12.55] | .422<br>[10.72]                        | .039<br>[0.99] | 2-288F                                 | 204504-1     | 2-299F                                 | 204528-1     | Recept. only                      | 1218747-3   |
|                                  |  |                 |  |                  |  |                 |  |                | 2-13F                                  | 204516-2     | 2-30F                                  | 204540-2     | Recept. with sockets <sup>1</sup> | —   |
| 62 (4)                           | 2.159<br>[54.84]                       | .311<br>[7.9]   | 2.500<br>[63.5]                        | 2.729<br>[69.32] | 2.272<br>[57.7]                        | .494<br>[12.55] | .422<br>[10.72]                        | .039<br>[0.99] | 2-289F                                 | 204506-1     | 2-300F                                 | 204530-1     | Recept. only                      | 1218747-4   |
|                                  |  |                 |  |                  |  |                 |  |                | 2-14F                                  | 204518-2     | 2-31F                                  | 204542-2     | Recept. with sockets <sup>1</sup> | —   |
| 78 (5)                           | 2.064<br>[52.43]                       | .423<br>[10.74] | 2.406<br>[61.11]                       | 2.635<br>[66.93] | 2.178<br>[55.32]                       | .605<br>[15.37] | .534<br>[13.56]                        | .039<br>[0.99] | 2-290F                                 | 204508-1     | 2-301F                                 | 204532-1     | Recept. only                      | 1218747-5   |
|                                  |  |                 |  |                  |  |                 |  |                | 2-15F                                  | 204520-2     | 2-32F                                  | 204544-2     | Recept. with sockets <sup>1</sup> | —   |
| 104 (6)                          | 2.189<br>[55.6]                        | .485<br>[12.32] | 2.500<br>[63.5]                        | 2.729<br>[69.32] | 2.302<br>[58.47]                       | .668<br>[16.97] | .596<br>[15.14]                        | .039<br>[0.99] | 2-291F                                 | 204510-1     | 2-302F                                 | 204534-1     | Recept. only                      | 1218747-6   |
|                                  |  |                 |  |                  |  |                 |  |                | 2-16F                                  | 204522-2     | 2-33F                                  | 204546-2     | Recept. with sockets <sup>1</sup> | —   |

Notes: See pages 5151 through 5155 (military to AMP Part Number cross reference) for additional part numbers.

<sup>1</sup> Size 22 sockets supplied with receptacles are loose piece.

<sup>2</sup> "F" is stamped on connectors following M24308 part number as required. "F" designates cadmium shell plating.

<sup>3</sup> Meets requirements of MIL-DTL-24308.

Non-Magnetic Crimp Plugs, Series 90, High Density Connectors  
(NASA Qualified)

**Connector Material and Finish**

Shell — Brass, gold plated

Insert — Approved material per MIL-DTL-24308

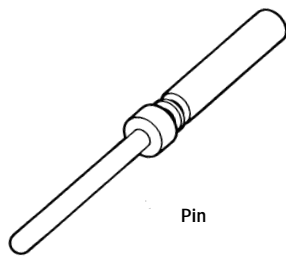
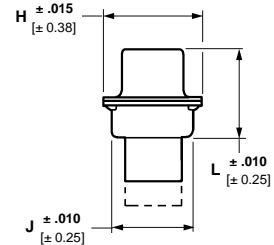
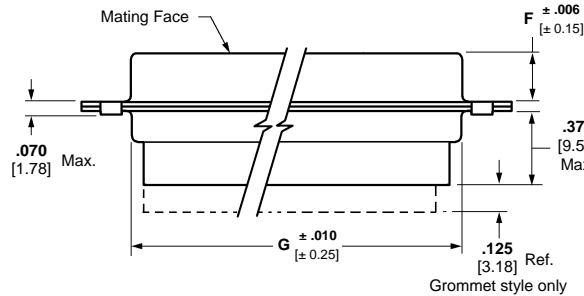
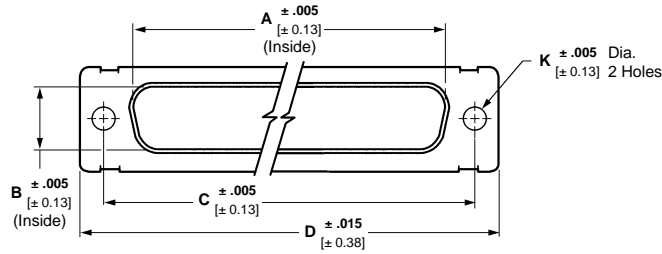
Retention Clips — Copper alloy

**Related Product Data**

Cavity Identification — page 5127

Mounting, Mating Specifications — page 5143

Accessories — pages 5148-5150



Pin

Non-Magnetic Plugs per NASA Specification

| Wire Size Range    | AMP Part No. / NASA No. |
|--------------------|-------------------------|
| 22-28<br>0.4-0.08  | 204370-8<br>G-08-P1     |
| 26-28<br>0.15-0.08 | 206495-3<br>—           |

Max. insulation diameter .054 [1.38]  
Hand tool AMP Part Number 601966-1 or MIL Part Number M22520/2-01  
Positioner AMP Part Number 601966-6 or MIL Part Number M22520/2-09

**Contact Material and Finish**

Copper alloy, .000050–.000100 [0.00127–0.0254] thick gold plate over .000100–.000150 [0.0254–0.00381] thick copper underplate

| No. of Contact Pos. (Shell Size) | Dimensions     |               |                |                |              |                |               |               |               |              | NASA No.        | AMP Part No. |
|----------------------------------|----------------|---------------|----------------|----------------|--------------|----------------|---------------|---------------|---------------|--------------|-----------------|--------------|
|                                  | A              | B             | C              | D              | F            | G              | H             | J             | L             | K            |                 |              |
| 15 (1)                           | .666<br>16.92  | .329<br>8.36  | .984<br>24.99  | 1.213<br>30.81 | .235<br>5.97 | .759<br>19.28  | .494<br>12.55 | .422<br>10.72 | .422<br>10.72 | .154<br>3.91 | 311P407-1P-B-15 | 206498-1     |
|                                  |                |               |                |                |              |                |               |               |               | .120<br>3.05 | 311P407-1P-B-12 | 206498-4     |
| 26 (2)                           | .994<br>25.25  | .329<br>8.36  | 1.312<br>33.32 | 1.541<br>39.14 | .235<br>5.97 | 1.083<br>27.51 | .494<br>12.55 | .422<br>10.72 | .422<br>10.72 | .154<br>3.91 | 311P407-2P-B-15 | 206500-1     |
|                                  |                |               |                |                |              |                |               |               |               | .120<br>3.05 | 311P407-2P-B-12 | 206500-4     |
| 44 (3)                           | 1.534<br>38.96 | .329<br>8.36  | 1.852<br>47.04 | 2.088<br>53.04 | .230<br>5.84 | 1.625<br>41.3  | .494<br>12.55 | .422<br>10.72 | .426<br>10.82 | .154<br>3.91 | 311P407-3P-B-15 | 206063-2     |
|                                  |                |               |                |                |              |                |               |               |               | .120<br>3.05 | 311P407-3P-B-12 | 206063-4     |
| 62 (4)                           | 2.182<br>55.42 | .329<br>8.36  | 2.500<br>63.5  | 2.729<br>69.32 | .230<br>5.84 | 2.272<br>57.7  | .494<br>12.55 | .422<br>10.72 | .426<br>10.82 | .154<br>3.91 | 311P407-4P-B-15 | 206502-1     |
|                                  |                |               |                |                |              |                |               |               |               | .120<br>3.05 | 311P407-4P-B-12 | 206502-4     |
| 78 (5)                           | 2.079<br>52.81 | .441<br>11.20 | 2.406<br>61.11 | 2.635<br>66.93 | .230<br>5.84 | 2.178<br>57.7  | .605<br>15.37 | .534<br>13.56 | .426<br>10.82 | .154<br>3.91 | 311P407-5P-B-15 | 206504-1     |
|                                  |                |               |                |                |              |                |               |               |               | .120<br>3.05 | 311P407-5P-B-12 | 206504-4     |
| 104 (6)                          | 2.212<br>56.18 | .503<br>12.78 | 2.500<br>63.5  | 2.729<br>69.32 | .230<br>5.84 | 2.302<br>58.47 | .668<br>16.97 | .596<br>15.14 | .426<br>10.82 | .154<br>3.91 | 311P407-6P-B-15 | 206066-2     |
|                                  |                |               |                |                |              |                |               |               |               | .120<br>3.05 | 311P407-6P-B-12 | 206066-4     |



Pin and Socket Insertion/Extraction Tool

AMP Part Number 91067-1 or MIL Part Number M81969/1-04  
Insertion tip, for replacement Part Number 126237-1

Extraction tip, for replacement Part Number 126195-2

Non-Magnetic Plugs With Silicone Rubber Rear Grommet<sup>1</sup>

| No. of Contact Pos. (Shell Size) | Dimensions     |               |                |                |              |                |               |               |               |              | AMP Part No.  |          |
|----------------------------------|----------------|---------------|----------------|----------------|--------------|----------------|---------------|---------------|---------------|--------------|---------------|----------|
|                                  | A              | B             | C              | D              | F            | G              | H             | J             | K             | L            |               |          |
| 15 (1)                           | .666<br>16.92  | .329<br>8.36  | .984<br>24.99  | 1.213<br>30.81 | .235<br>5.97 | .759<br>19.28  | .494<br>12.55 | .422<br>10.72 | .422<br>10.72 | .120<br>3.05 | .422<br>10.72 | 211673-4 |
| 26 (2)                           | .994<br>25.25  | .329<br>8.36  | 1.312<br>33.32 | 1.541<br>39.14 | .235<br>5.97 | 1.083<br>27.51 | .494<br>12.55 | .422<br>10.72 | .422<br>10.72 | .120<br>3.05 | .422<br>10.72 | 211674-4 |
| 44 (3)                           | 1.534<br>38.96 | .329<br>8.36  | 1.852<br>47.04 | 2.088<br>53.04 | .230<br>5.84 | 1.625<br>41.3  | .494<br>12.55 | .422<br>10.72 | .426<br>10.82 | .120<br>3.05 | .426<br>10.82 | 211675-4 |
| 62 (4)                           | 2.182<br>55.42 | .329<br>8.36  | 2.500<br>63.5  | 2.729<br>69.32 | .230<br>5.84 | 2.272<br>57.7  | .494<br>12.55 | .422<br>10.72 | .426<br>10.82 | .120<br>3.05 | .426<br>10.82 | 211676-4 |
| 78 (5)                           | 2.079<br>52.81 | .441<br>11.20 | 2.406<br>61.11 | 2.635<br>66.93 | .230<br>5.84 | 2.178<br>55.32 | .605<br>15.37 | .534<br>13.56 | .426<br>10.82 | .120<br>3.05 | .426<br>10.82 | 211677-4 |
| 104 (6)                          | 2.212<br>56.18 | .503<br>12.78 | 2.500<br>63.5  | 2.729<br>69.32 | .230<br>5.84 | 2.302<br>58.47 | .668<br>16.97 | .596<br>15.14 | .426<br>10.82 | .120<br>3.05 | .426<br>10.82 | 211678-4 |

<sup>1</sup> Grommet provided for cable strain relief.

**Non-Magnetic Crimp Receptacles, Series 90, High Density Connectors (NASA Qualified)**

**Connector Material and Finish**

**Shell** — Brass, gold plated

**Insert** — Approved material per MIL-DTL-24308

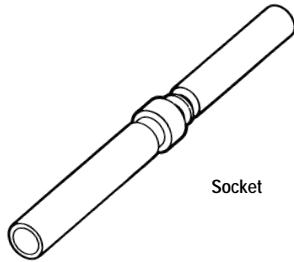
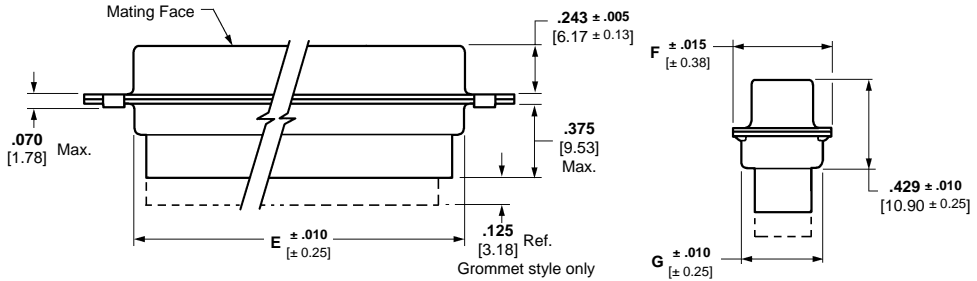
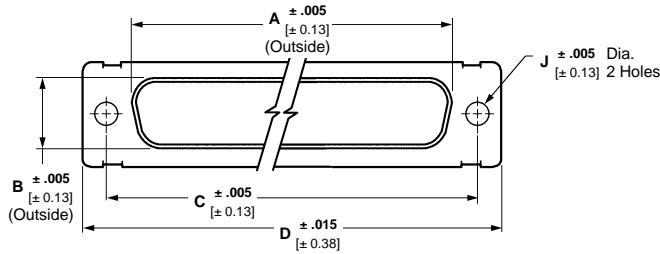
**Retention Clips** — Copper alloy

**Related Product Data**

**Cavity Identification** — page 5127

**Mounting, Mating Specifications** — page 5143

**Accessories** — pages 5148-5150



Socket

**Non-Magnetic Receptacles per NASA Specification**

| Wire Size Range    | AMP Part No. / NASA No. |
|--------------------|-------------------------|
| 22-28<br>0.4-0.08  | 206071-1<br>G-08-S1     |
| 26-28<br>0.15-0.08 | 206496-1<br>—           |

Max. insulation diameter .054 [1.38]  
Hand tool AMP Part Number 601966-1 or MIL Part Number M22520/2-01  
Positioner AMP Part Number 601966-4 or MIL Part Number M22520/2-06

**Contact and Hood Material and Finish**

Copper alloy, .000050-.000100 [0.00127-0.0254] thick gold plate over .000100-.000150 [0.0254-0.00381] thick copper underplate

| No. of Contact Pos. (Shell Size) | Dimensions |       |       |       |       |       |       |      |      | NASA No.        | AMP Part No. |
|----------------------------------|------------|-------|-------|-------|-------|-------|-------|------|------|-----------------|--------------|
|                                  | A          | B     | C     | D     | E     | F     | G     | J    |      |                 |              |
| 15<br>(1)                        | .643       | .311  | .984  | 1.213 | .759  | .494  | .422  | .154 | 3.91 | 311P407-1S-B-15 | 206499-1     |
|                                  | 16.33      | 7.9   | 24.99 | 30.81 | 19.28 | 12.55 | 10.72 | .120 | 3.05 |                 |              |
| 26<br>(2)                        | .971       | .311  | 1.312 | 1.541 | 1.083 | .494  | .422  | .154 | 3.91 | 311P407-2S-B-15 | 206501-1     |
|                                  | 24.66      | 7.9   | 33.32 | 39.14 | 27.51 | 12.55 | 10.72 | .120 | 3.05 |                 |              |
| 44<br>(3)                        | 1.511      | .311  | 1.852 | 2.088 | 1.625 | .494  | .422  | .154 | 3.91 | 311P407-3S-B-15 | 206064-2     |
|                                  | 38.38      | 7.9   | 47.04 | 53.04 | 41.3  | 12.55 | 10.72 | .120 | 3.05 |                 |              |
| 62<br>(4)                        | 2.159      | .311  | 2.500 | 2.729 | 2.272 | .494  | .422  | .154 | 3.91 | 311P407-4S-B-15 | 206503-1     |
|                                  | 54.84      | 7.9   | 63.5  | 69.32 | 57.7  | 12.55 | 10.72 | .120 | 3.05 |                 |              |
| 78<br>(5)                        | 2.064      | .423  | 2.406 | 2.635 | 2.178 | .605  | .534  | .154 | 3.91 | 311P407-5S-B-15 | 206505-1     |
|                                  | 52.43      | 10.74 | 61.11 | 66.93 | 55.32 | 15.37 | 13.56 | .120 | 3.05 |                 |              |
| 104<br>(6)                       | 2.189      | .485  | 2.500 | 2.729 | 2.302 | .668  | .596  | .154 | 3.91 | 311P407-6S-B-15 | 206065-2     |
|                                  | 55.6       | 12.32 | 63.5  | 69.32 | 58.47 | 16.97 | 15.14 | .120 | 3.05 |                 |              |

**Non-Magnetic Receptacles With Silicone Rubber Rear Grommet<sup>1</sup>**



Pin and Socket Insertion/Extraction Tool

AMP Part Number 91067-1 or MIL Part Number M81969/1-04  
Insertion tip, for replacement Part Number 126237-1  
Extraction tip, for replacement Part Number 126195-2

| No. of Contact Pos. (Shell Size) | Dimensions |       |       |       |       |       |       |      |      | AMP Part No. |
|----------------------------------|------------|-------|-------|-------|-------|-------|-------|------|------|--------------|
|                                  | A          | B     | C     | D     | E     | F     | G     | J    |      |              |
| 15<br>(1)                        | .643       | .311  | .984  | 1.213 | .759  | .494  | .422  | .120 | 3.05 | 211667-4     |
|                                  | 16.33      | 7.9   | 24.99 | 30.81 | 19.28 | 12.55 | 10.72 | .120 | 3.05 |              |
| 26<br>(2)                        | .971       | .311  | 1.312 | 1.541 | 1.083 | .494  | .422  | .120 | 3.05 | 211668-4     |
|                                  | 24.66      | 7.9   | 33.32 | 39.14 | 27.51 | 12.55 | 10.72 | .120 | 3.05 |              |
| 44<br>(3)                        | 1.511      | .311  | 1.852 | 2.088 | 1.625 | .494  | .422  | .120 | 3.05 | 211669-4     |
|                                  | 38.38      | 7.9   | 47.04 | 53.04 | 41.3  | 12.55 | 10.72 | .120 | 3.05 |              |
| 62<br>(4)                        | 2.159      | .311  | 2.500 | 2.729 | 2.272 | .494  | .422  | .120 | 3.05 | 211670-4     |
|                                  | 54.84      | 7.9   | 63.5  | 69.32 | 57.7  | 12.55 | 10.72 | .120 | 3.05 |              |
| 78<br>(5)                        | 2.064      | .423  | 2.406 | 2.635 | 2.178 | .605  | .534  | .120 | 3.05 | 211671-4     |
|                                  | 52.43      | 10.74 | 61.11 | 66.93 | 55.32 | 15.37 | 13.56 | .120 | 3.05 |              |
| 104<br>(6)                       | 2.189      | .485  | 2.500 | 2.729 | 2.302 | .668  | .596  | .120 | 3.05 | 211672-4     |
|                                  | 55.6       | 12.32 | 63.5  | 69.32 | 58.47 | 16.97 | 15.14 | .120 | 3.05 |              |

<sup>1</sup> Grommet provided for cable strain relief.

Crimp Blindmate Plugs, Series 90, High Density Connectors

**Material and Finish**

**Shell, Front** — Aluminum alloy, cadmium plated with yellow chromate

**Shell, Rear** — Steel, cadmium plated with yellow chromate

**Insert Assembly** — Approved material per MIL-DTL-24308

**Retention Clips** — Stainless steel

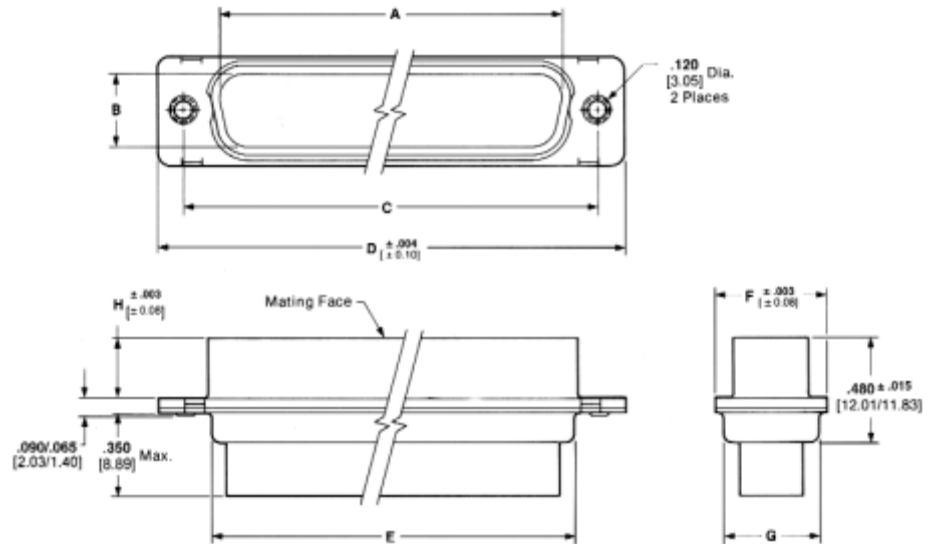
**Related Product Data**

**Cavity Identification** — page 5127

**Contacts** — pages 5128, 5129

**Mounting Specifications** — page 5143

Flange to flange spacing can be a max. of .270 [6.86] for Blindmate connectors.



| No. of Contact Pos. (Shell Size) | Dimensions     |               |                |                |                            |               |                          |              | AMP Part No. |
|----------------------------------|----------------|---------------|----------------|----------------|----------------------------|---------------|--------------------------|--------------|--------------|
|                                  | A              | B             | C              | D              | E                          | F             | G                        | H            |              |
| 15 (1)                           | .656<br>16.66  | .324<br>8.23  | .984<br>24.99  | 1.224<br>31.09 | .769/.750<br>19.53/19.05   | .506<br>12.85 | .432/.413<br>10.97/10.49 | .257<br>6.53 | 213153-1     |
| 26 (2)                           | .984<br>25.0   | .324<br>8.23  | 1.312<br>33.32 | 1.552<br>39.42 | 1.093/1.074<br>27.76/27.28 | .506<br>12.85 | .432/.413<br>10.97/10.49 | .257<br>6.53 | 445010-1     |
| 44 (3)                           | 1.524<br>38.71 | .324<br>8.23  | 1.852<br>47.04 | 2.099<br>53.31 | 1.635/1.616<br>41.53/41.05 | .506<br>12.85 | .432/.413<br>10.97/10.49 | .257<br>6.53 | 445011-1     |
| 62 (4)                           | 2.172<br>55.17 | .324<br>8.23  | 2.500<br>63.5  | 2.740<br>69.6  | 2.282/2.263<br>57.96/57.48 | .506<br>12.85 | .432/.413<br>10.97/10.49 | .257<br>6.53 | 213118-1     |
| 78 (5)                           | 2.082<br>52.88 | .444<br>11.28 | 2.406<br>61.11 | 2.646<br>67.21 | 2.188/2.167<br>55.58/55.04 | .617<br>15.67 | .544/.525<br>13.82/13.34 | .257<br>6.53 | 445012-1     |
| 104 (6)                          | 2.212<br>56.18 | .503<br>12.78 | 2.500<br>63.5  | 2.740<br>69.6  | 2.302<br>58.47             | .680<br>17.27 | .606/.587<br>15.39/14.91 | .267<br>6.78 | 212933-3     |

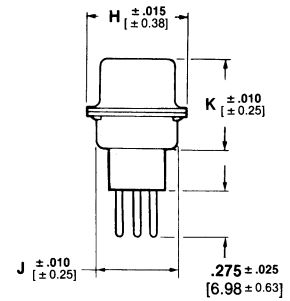
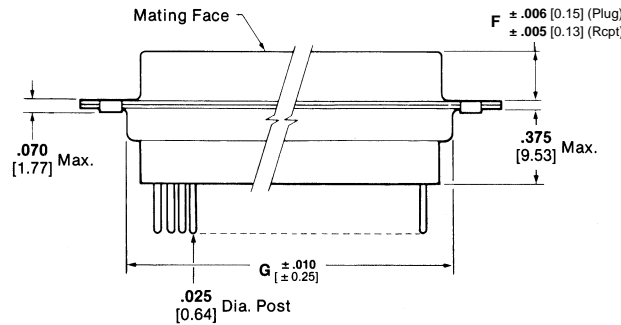
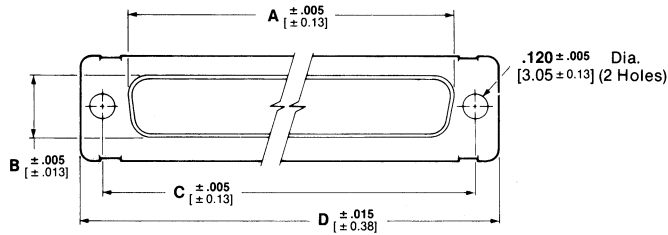
Straight PCB, Series 90, High Density Connectors (Industrial Grade)

**Material and Finish**

- Shell — Steel, cadmium plated
- Insert — Polyphenylene Sulfide (PPS)
- Retention Clips — Stainless steel

**Related Product Data**

- Cavity Identification — page 5127
- Contacts — page 5129
- Mounting, Mating Dimensions — page 5143
- Accessories — pages 5148-5150
- PCB Layouts — See page 5145 or AMP customer drawing



Replacement Pin Contact  
Part Number 207683-8

**Plugs**

| No. of Contact Pos. (Shell Size) | Dimensions     |               |                |                |              |                |               |               |               |          | AMP Part No. |
|----------------------------------|----------------|---------------|----------------|----------------|--------------|----------------|---------------|---------------|---------------|----------|--------------|
|                                  | A (Inside)     | B (Inside)    | C              | D              | F            | G              | H             | J             | K             |          |              |
| 15 (1)                           | .666<br>16.92  | .329<br>8.36  | .984<br>24.99  | 1.213<br>30.81 | .235<br>5.97 | .759<br>19.28  | .494<br>12.55 | .422<br>10.72 | .422<br>10.72 | 208866-1 |              |
| 26 (2)                           | .994<br>25.25  | .329<br>8.36  | 1.312<br>33.32 | 1.541<br>39.14 | .235<br>5.97 | 1.083<br>27.51 | .494<br>12.55 | .422<br>10.72 | .422<br>10.72 | 208867-1 |              |
| 44 (3)                           | 1.534<br>38.96 | .329<br>8.36  | 1.852<br>47.04 | 2.088<br>53.04 | .230<br>5.84 | 1.625<br>41.3  | .494<br>12.55 | .422<br>10.72 | .426<br>10.82 | 208868-1 |              |
| 62 (4)                           | 2.182<br>55.42 | .329<br>8.36  | 2.500<br>63.5  | 2.729<br>69.32 | .230<br>5.84 | 2.272<br>57.7  | .494<br>12.55 | .422<br>10.72 | .426<br>10.82 | 208869-1 |              |
| 78 (5)                           | 2.079<br>52.81 | .441<br>11.20 | 2.406<br>61.11 | 2.635<br>66.93 | .230<br>5.84 | 2.178<br>55.32 | .605<br>15.37 | .534<br>13.56 | .426<br>10.82 | 208870-1 |              |
| 104 (6)                          | 2.212<br>56.18 | .503<br>12.78 | 2.500<br>63.5  | 2.729<br>69.32 | .230<br>5.84 | 2.302<br>58.47 | .668<br>16.97 | .596<br>15.14 | .426<br>10.82 | 208871-1 |              |

Replacement Socket Contact  
Part Number 207684-4

**Receptacles**

| No. of Contact Pos. (Shell Size) | Dimensions     |               |                |                |              |                |               |               |              |          | AMP Part No. |
|----------------------------------|----------------|---------------|----------------|----------------|--------------|----------------|---------------|---------------|--------------|----------|--------------|
|                                  | A (Outside)    | B (Outside)   | C              | D              | F            | G              | H             | J             | K            |          |              |
| 15 (1)                           | .643<br>16.33  | .311<br>7.9   | .984<br>24.99  | 1.213<br>30.81 | .243<br>6.17 | .759<br>19.28  | .494<br>12.55 | .422<br>10.72 | .429<br>10.9 | 208872-1 |              |
| 26 (2)                           | .971<br>24.66  | .311<br>7.9   | 1.312<br>33.32 | 1.541<br>39.14 | .243<br>6.17 | 1.083<br>27.51 | .494<br>12.55 | .422<br>10.72 | .429<br>10.9 | 208873-1 |              |
| 44 (3)                           | 1.511<br>38.38 | .311<br>7.9   | 1.852<br>47.04 | 2.088<br>53.04 | .243<br>6.17 | 1.625<br>41.3  | .494<br>12.55 | .422<br>10.72 | .429<br>10.9 | 208874-1 |              |
| 62 (4)                           | 2.159<br>54.84 | .311<br>7.9   | 2.500<br>63.5  | 2.729<br>69.32 | .243<br>6.17 | 2.272<br>57.7  | .494<br>12.55 | .422<br>10.72 | .429<br>10.9 | 208875-1 |              |
| 78 (5)                           | 2.064<br>52.43 | .423<br>10.74 | 2.406<br>61.11 | 2.635<br>66.93 | .243<br>6.17 | 2.178<br>55.32 | .605<br>15.37 | .534<br>13.56 | .429<br>10.9 | 208876-1 |              |
| 104 (6)                          | 2.189<br>55.6  | .485<br>12.32 | 2.500<br>63.5  | 2.729<br>69.32 | .243<br>6.17 | 2.302<br>58.47 | .668<br>16.97 | .596<br>15.14 | .429<br>10.9 | 208877-1 |              |

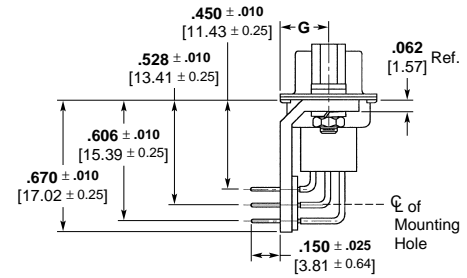
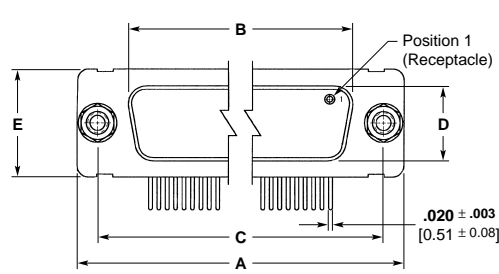


Right-Angle PCB, Series 90, with Female Screwlocks

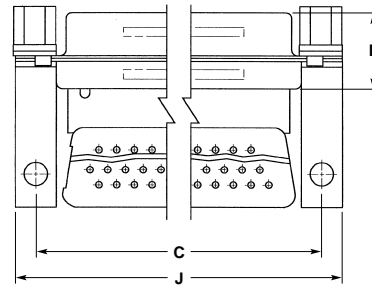
Material and Finish

Shell — Brass, gold over copper plated

Insert — Diallyl phthalate or polyester or Polyphenylene Sulfide (PPS)



Shell Size 1 thru 4



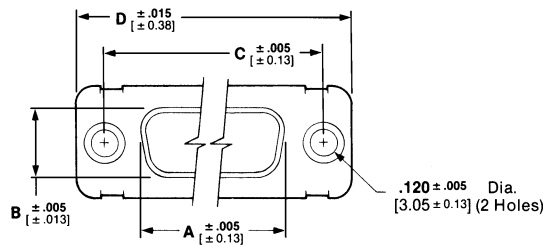
Plugs

| No. of Contact Pos. (Shell Size) | Dimensions     |                |                |               |               |               |                            |                |  | AMP Part No. |
|----------------------------------|----------------|----------------|----------------|---------------|---------------|---------------|----------------------------|----------------|--|--------------|
|                                  | A              | B              | C              | D             | E             | F             | G                          | J              |  |              |
| 15 (1)                           | 1.213<br>30.81 | .666<br>16.92  | .984<br>24.99  | .329<br>8.36  | .494<br>12.55 | .422<br>10.72 | .246 ± .010<br>6.25 ± 0.25 | 1.204<br>30.58 |  | 1-593326-7   |
| 26 (2)                           | 1.541<br>39.14 | .994<br>25.25  | 1.312<br>33.32 | .329<br>8.36  | .494<br>12.55 | .422<br>10.72 | .246 ± .010<br>6.25 ± 0.25 | 1.532<br>38.91 |  | 1-593326-8   |
| 44 (3)                           | 2.088<br>53.04 | 1.534<br>38.96 | 1.852<br>47.04 | .329<br>8.36  | .494<br>12.55 | .426<br>10.82 | .246 ± .010<br>6.25 ± 0.25 | 2.077<br>52.76 |  | 1-593326-9   |
| 62 (4)                           | 2.729<br>69.32 | 2.182<br>55.42 | 2.500<br>63.50 | .329<br>8.36  | .494<br>12.55 | .426<br>10.82 | .246 ± .010<br>6.25 ± 0.25 | 2.720<br>69.09 |  | 2-593326-0   |
| 78 (5)                           | 2.635<br>66.93 | 2.079<br>52.81 | 2.406<br>61.11 | .441<br>11.20 | .605<br>15.37 | .426<br>10.82 | .246 ± .010<br>6.25 ± 0.25 | 2.626<br>66.70 |  | 2-593326-1   |
| 104 (6)                          | 2.729<br>69.32 | 2.213<br>56.21 | 2.500<br>63.50 | .503<br>12.78 | .668<br>16.97 | .426<br>10.82 | .246 ± .010<br>6.25 ± 0.25 | 2.720<br>69.09 |  | 2-593326-2   |

Receptacles

| No. of Contact Pos. (Shell Size) | Dimensions     |                |                |               |               |               |                            |                |  | AMP Part No. |
|----------------------------------|----------------|----------------|----------------|---------------|---------------|---------------|----------------------------|----------------|--|--------------|
|                                  | A              | B              | C              | D             | E             | F             | G                          | J              |  |              |
| 15 (1)                           | 1.213<br>30.81 | .643<br>16.33  | .984<br>24.99  | .311<br>7.90  | .494<br>12.55 | .422<br>10.72 | .248 ± .010<br>6.30 ± 0.25 | 1.204<br>30.58 |  | 1-593327-7   |
| 26 (2)                           | 1.541<br>39.14 | .971<br>24.66  | 1.312<br>33.32 | .311<br>7.90  | .494<br>12.55 | .422<br>10.72 | .248 ± .010<br>6.30 ± 0.25 | 1.532<br>38.91 |  | 1-593327-8   |
| 44 (3)                           | 2.088<br>53.04 | 1.511<br>38.38 | 1.852<br>47.04 | .311<br>7.90  | .494<br>12.55 | .426<br>10.82 | .248 ± .010<br>6.30 ± 0.25 | 2.077<br>52.76 |  | 1-593327-9   |
| 62 (4)                           | 2.729<br>69.32 | 2.159<br>54.84 | 2.500<br>63.50 | .311<br>7.90  | .494<br>12.55 | .426<br>10.82 | .248 ± .010<br>6.30 ± 0.25 | 2.720<br>69.09 |  | 2-593327-0   |
| 78 (5)                           | 2.635<br>66.93 | 2.064<br>52.43 | 2.406<br>61.11 | .423<br>10.74 | .605<br>15.37 | .426<br>10.82 | .248 ± .010<br>6.30 ± 0.25 | 2.626<br>66.70 |  | 2-593327-1   |
| 104 (6)                          | 2.729<br>69.32 | 2.188<br>55.58 | 2.500<br>63.50 | .485<br>12.32 | .668<br>16.97 | .426<br>10.82 | .248 ± .010<br>6.30 ± 0.25 | 2.726<br>69.24 |  | 2-593327-2   |

Connector savers prolong the life of permanently installed connectors which would otherwise be subjected to repeated cycles of mating and unmating, in applications such as test interfaces or on testing devices.



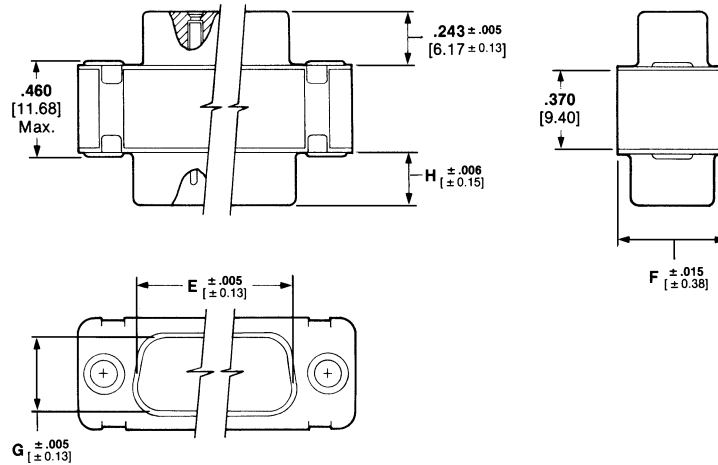
**Material and Finish**

**Standard**

- Shell** — Steel, cadmium plated
- Contact Body** — Beryllium copper, .000050 [0.00127] min. gold plate over .000050 [0.00127] min. nickel underplate
- Socket Hood** — Passivated stainless steel
- Insert** — Polyphenylene Sulfide (PPS)
- Spacer** — Black nylon

**Non Magnetic**

- Shell** — Brass, gold plated
- Contact Body** — Beryllium copper, .000050 [0.00127] min. gold plate over .000050 [0.00127] min. copper underplate
- Socket Hood** — Brass, .000050 [0.00127] min. gold plate over .000100 [0.00254] min. copper underplate
- Insert** — Polyphenylene Sulfide (PPS)
- Spacer** — Black nylon



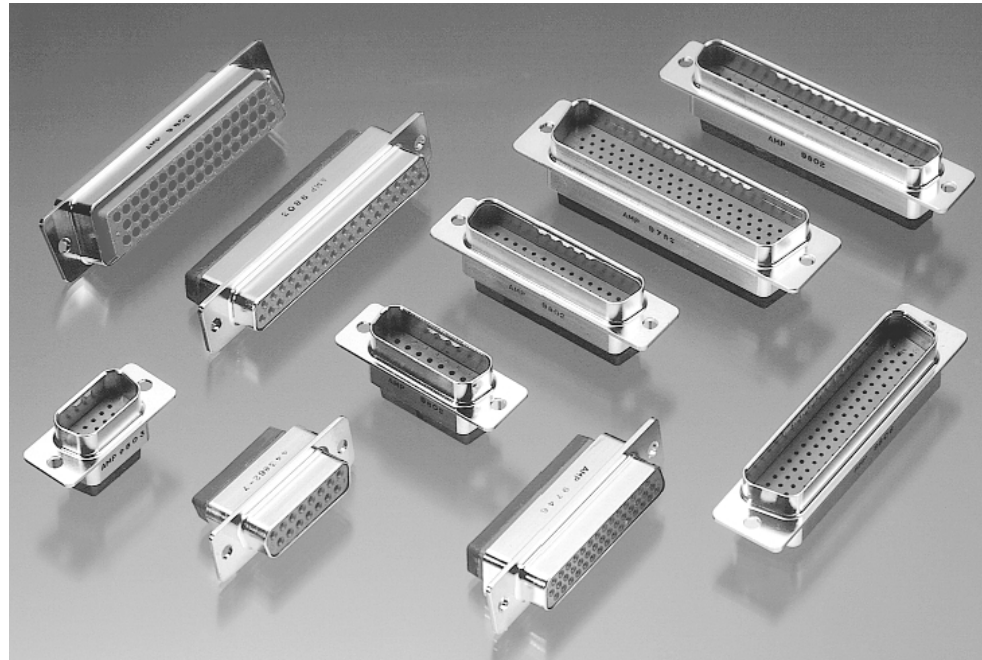
| Dimensions     |               |                |                |                |               |               |              |
|----------------|---------------|----------------|----------------|----------------|---------------|---------------|--------------|
| A (Outside)    | B (Outside)   | C              | D              | E (Inside)     | F             | G (Inside)    | H            |
| .643<br>16.33  | .311<br>7.9   | .984<br>24.99  | 1.213<br>30.81 | .666<br>16.92  | .494<br>12.55 | .329<br>8.36  | .235<br>5.97 |
| .971<br>24.66  | .311<br>7.9   | 1.312<br>33.32 | 1.541<br>39.14 | .994<br>25.25  | .494<br>12.55 | .329<br>8.36  | .235<br>5.97 |
| 1.511<br>38.38 | .311<br>7.9   | 1.852<br>47.04 | 2.088<br>53.04 | 1.534<br>38.96 | .494<br>12.55 | .329<br>8.36  | .230<br>5.84 |
| 2.159<br>54.84 | .311<br>7.9   | 2.500<br>63.5  | 2.729<br>69.32 | 2.182<br>55.42 | .494<br>12.55 | .329<br>8.36  | .230<br>5.84 |
| 2.064<br>52.43 | .423<br>10.74 | 2.406<br>61.11 | 2.635<br>66.93 | 2.079<br>52.81 | .605<br>15.37 | .441<br>11.20 | .230<br>5.84 |
| 2.189<br>55.60 | .485<br>12.32 | 2.500<br>63.5  | 2.729<br>69.32 | 2.212<br>56.18 | .668<br>16.97 | .503<br>12.78 | .230<br>5.84 |

| No. of Contact Pos. (Shell Size) | Standard (Cadmium Over Steel) | Non-Magnetic (Gold Over Brass) |
|----------------------------------|-------------------------------|--------------------------------|
| 15 (1)                           | 211010-1                      | 211010-4                       |
| 26 (2)                           | 211011-1                      | 211011-4                       |
| 44 (3)                           | 211012-1                      | 211012-4                       |
| 62 (4)                           | 211013-1                      | 211013-4                       |
| 78 (5)                           | 211014-1                      | 211014-4                       |
| 104 (6)                          | 211015-1                      | 211015-4                       |

Introduction

Product Facts

- One-piece aluminum shells for light-weight and enhanced EMI performance
- Connectors are typically 15–20% lighter than brass counterparts
- Interates/interchanges with existing designs
- Enhanced EMI performance over brass shells by 10–20 dB
- Series 109 Plugs & Receptacles shell size 1 through 5 (9-50 positions)
- Series 90 Plugs & Receptacles in shell size 1 through 6 (15-104 positions)
- Can be provided with or without grommet
- Plug shells include grounding indents
- Designed to meet NASA 311P
- Designed to meet MIL-DTL-24308D specification
- DSCC Drawings 99012 through 99015



Material and Finish

**Housing Material** — Polyphenylene Sulfide (PPS)

**Shell Finish** — .000050 [0.00127] min. gold plate over .00100–.00125 [0.0254–0.0318] nickel underplate

**Shell Material** — Aluminum alloy

**Temperature Range** — -67°F to 257°F [-55°C to 125°C]

**Voltage Rating** — 300 V

**Current Rating** — Contact current rating per MIL-C-39029  
 Size 20 — 7.5 amps in free air  
 Size 22 — 5.0 amps in free air (refer to MIL Spec. for cable specifications)

**Low Level Termination Resistance** — 11 Ohm max. 109 Series, 17 milliohms only for 90 Series per MIL-C-39029

Performance Characteristics

**Dielectric Withstanding Voltage** — 1000 VAC between adjacent pos.

**Insulation Resistance** — Min. 1000 milliohm between adjacent pos.

**Voltage Rating** — 300 V

**Durability** — Up to 500 matings/cycle  
**Vibration** — 3.13 G's RMS between 5–500 Hz 15 minutes per plane

**Physical Shock** — 18 drops, half-sine 30 G's at 11 millisecond

**Temperature Range** — -67°F to 257°F [-55°C to 125°C]

**Thermal Shock** — -67°F to 257°F [-55°C to 125°C]

**Temperature-Humidity** — 77°F to 149°F [+25°C to +65°C] at 95% relative humidity

**Corrosion** — Mixed flowing gas, class II

**Product Specifications** — 108-1834 (Design objectives)

Weight Comparisons for the AMPLIMITE Connector Series 90 (1) PC AL vs the (2) PC Brass NASA Grade Connector Assemblies

Receptacles

| Shell Size | Connector Position | Aluminum Shell Assy. Without Grommet | Brass Shell Assy. Without Grommet | Brass to Aluminum % Difference Without Grommet |
|------------|--------------------|--------------------------------------|-----------------------------------|--|
| 1          | 15                 | 4                                    | 5.2                               | 23.1%  |
| 2          | 26                 | 6.2                                  | 7.5                               | 17.3%  |
| 3          | 44                 | 9                                    | 10.9                              | 17.4%  |
| 4          | 62                 | 12.4                                 | 15.3                              | 19.0%  |
| 5          | 78                 | 15.3                                 | 17.9                              | 14.5%  |
| 6          | 104                | 17.2                                 | 20                                | 14.0%  |

Note: All weight values are in grams.

Plugs

| Shell Size | Connector Position | Aluminum Shell Assy. Without Grommet | Brass Shell Assy. Without Grommet | Brass to Aluminum % Difference Without Grommet |
|------------|--------------------|--------------------------------------|-----------------------------------|--|
| 1          | 15                 | 3.6                                  | 4.6                               | 21.7%  |
| 2          | 26                 | 5.3                                  | 6.2                               | 14.5%  |
| 3          | 44                 | 7.8                                  | 10.3                              | 24.3%  |
| 4          | 62                 | 10.9                                 | 14.1                              | 22.7%  |
| 5          | 78                 | 12.7                                 | 15.9                              | 20.1%  |
| 6          | 104                | 14.3                                 | 17.5                              | 18.3%  |

Note: All weight values are in grams.

ULTRA-LITE Connector Plugs and Receptacles, Series 109

**Connector Material and Finish**

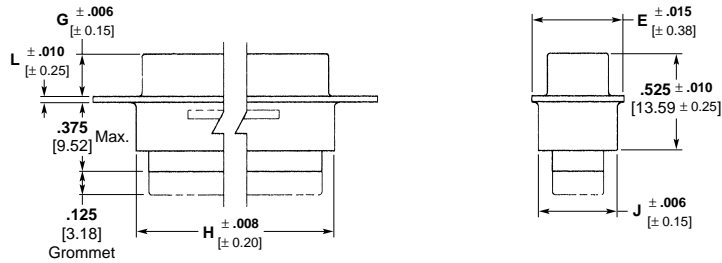
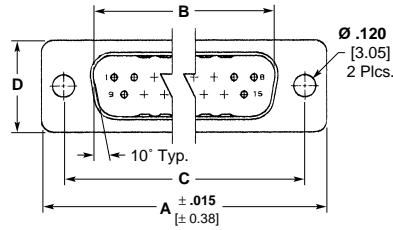
**Shell** — Aluminum alloy, gold plated per MIL-G-45204 over nickel per MIL-C-26074.

**Insert** — Blue diallyl phthalate per MIL-M-14 or black Polyphenylene Sulfide (PPS) per MIL-M-24519 or blue thermoplastic per MIL-M-24519

**Retention Clips** — Beryllium copper

**Grommet** — Silicon rubber per ZZ-R-765, color: red

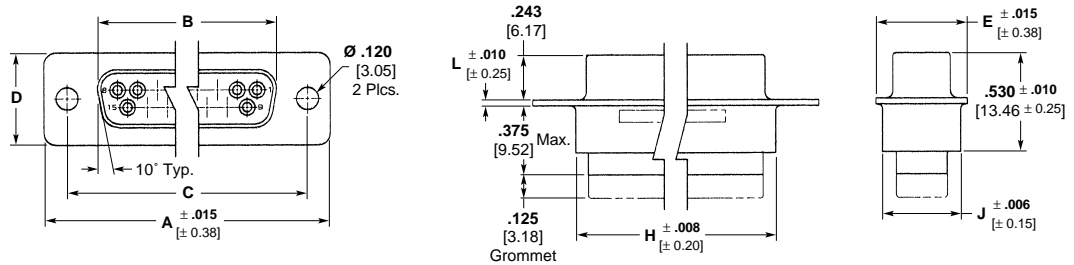
**Contacts** — Uses size 20 crimp or posted contacts, ref. pages 5102-5104.



**Plugs**

| No. of Contact Pos. (Shell Size) | Dimensions       |                  |                  |                 |                 |                |                  |                 |                | AMP Part No.              |
|----------------------------------|------------------|------------------|------------------|-----------------|-----------------|----------------|------------------|-----------------|----------------|---------------------------|
|                                  | A                | B                | C                | D               | E               | G              | H                | J               | L              |                           |
| 9<br>(1)                         | 1.213<br>[30.81] | .666<br>[16.92]  | .984<br>[24.99]  | .329<br>[8.36]  | .494<br>[12.55] | .235<br>[5.97] | .770<br>[19.56]  | .438<br>[11.13] | .030<br>[0.76] | 1218234-1<br>1218234-6*   |
| 15<br>(2)                        | 1.541<br>[39.14] | .994<br>[25.25]  | 1.312<br>[33.32] | .329<br>[8.36]  | .494<br>[12.55] | .235<br>[5.97] | 1.094<br>[27.79] | .438<br>[11.13] | .030<br>[0.76] | 1218234-2<br>1218234-7*   |
| 25<br>(3)                        | 2.088<br>[53.04] | 1.534<br>[38.96] | 1.852<br>[47.04] | .329<br>[8.36]  | .494<br>[12.55] | .230<br>[5.84] | 1.636<br>[41.55] | .438<br>[11.13] | .039<br>[0.99] | 1218234-3<br>1218234-8*   |
| 37<br>(4)                        | 2.729<br>[69.32] | 2.182<br>[55.42] | 2.500<br>[63.50] | .329<br>[8.36]  | .494<br>[12.55] | .230<br>[5.84] | 2.284<br>[58.01] | .438<br>[11.13] | .039<br>[0.99] | 1218234-4<br>1218234-9*   |
| 50<br>(5)                        | 2.635<br>[66.93] | 2.079<br>[52.81] | 2.406<br>[61.11] | .441<br>[11.20] | .605<br>[15.38] | .230<br>[5.84] | 2.189<br>[55.60] | .550<br>[13.97] | .039<br>[0.99] | 1218234-5<br>1-1218234-0* |

\*Rubber Grommet



**Receptacles**

| No. of Contact Pos. (Shell Size) | Dimensions       |                  |                  |                 |                 |                  |                 |                |                           | AMP Part No. |
|----------------------------------|------------------|------------------|------------------|-----------------|-----------------|------------------|-----------------|----------------|---------------------------|--------------|
|                                  | A                | B                | C                | D               | E               | H                | J               | L              |                           |              |
| 9<br>(1)                         | 1.213<br>[30.81] | .643<br>[16.33]  | .984<br>[24.99]  | .311<br>[7.90]  | .494<br>[12.55] | .770<br>[19.56]  | .438<br>[11.13] | .030<br>[0.76] | 1218235-1<br>1218235-6*   |              |
| 15<br>(2)                        | 1.541<br>[39.14] | .971<br>[24.66]  | 1.312<br>[33.32] | .311<br>[7.90]  | .494<br>[12.55] | 1.094<br>[27.79] | .438<br>[11.13] | .030<br>[0.76] | 1218235-2<br>1218235-7*   |              |
| 25<br>(3)                        | 2.088<br>[53.04] | 1.511<br>[38.38] | 1.852<br>[47.04] | .311<br>[7.90]  | .494<br>[12.55] | 1.636<br>[41.55] | .438<br>[11.13] | .039<br>[0.99] | 1218235-3<br>1218235-8*   |              |
| 37<br>(4)                        | 2.729<br>[69.32] | 2.159<br>[54.84] | 2.500<br>[63.50] | .311<br>[7.90]  | .494<br>[12.55] | 2.284<br>[58.01] | .438<br>[11.13] | .039<br>[0.99] | 1218235-4<br>1218235-9*   |              |
| 50<br>(5)                        | 2.635<br>[66.93] | 2.064<br>[52.43] | 2.406<br>[61.11] | .423<br>[10.74] | .605<br>[15.38] | 2.189<br>[55.60] | .550<br>[13.97] | .039<br>[0.99] | 1218235-5<br>1-1218235-0* |              |

\*Rubber Grommet

ULTRA-LITE Connector Plugs and Receptacles, Series 90

**Connector Material and Finish**

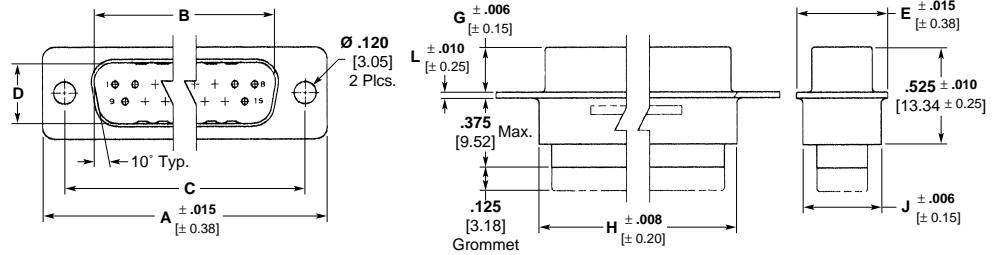
**Shell** — Aluminum alloy, gold plated per MIL-G-45204 over nickel per MIL-C-26074.

**Insert** — Blue diallyl phtalate per MIL-M-14 or black Polyphenylene Sulfide (PPS) per MIL-M-24519 or blue thermoplastic per MIL-M-24519

**Retention Clips** — Beryllium copper

**Grommet** — Silicon rubber per ZZ-R-765, color: red

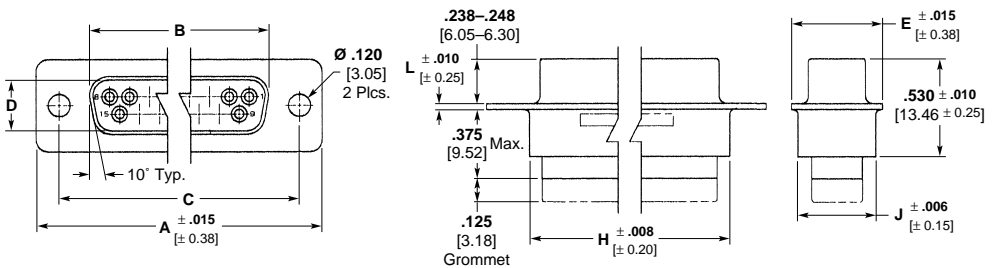
**Contacts** — Uses size 22 crimp and posted contacts, ref. pages 5128 and 5129.



**Plugs**

| No. of Contact Pos. (Shell Size) | Dimensions     |                |                |               |               |              |                |               |              | AMP Part No.              |
|----------------------------------|----------------|----------------|----------------|---------------|---------------|--------------|----------------|---------------|--------------|---------------------------|
|                                  | A              | B              | C              | D             | E             | G            | H              | J             | L            |                           |
| 15 (1)                           | 1.213<br>30.81 | .666<br>16.92  | .984<br>24.99  | .329<br>8.36  | .494<br>12.55 | .235<br>5.97 | .770<br>19.56  | .438<br>11.13 | .030<br>0.76 | 1218232-1<br>1218232-7*   |
| 26 (2)                           | 1.541<br>39.14 | .994<br>25.25  | 1.312<br>33.32 | .329<br>8.36  | .494<br>12.55 | .235<br>5.97 | 1.094<br>27.79 | .438<br>11.13 | .030<br>0.76 | 1218232-2<br>1218232-8*   |
| 44 (3)                           | 2.088<br>53.04 | 1.534<br>38.96 | 1.852<br>47.04 | .329<br>8.36  | .494<br>12.55 | .230<br>5.84 | 1.636<br>41.55 | .438<br>11.13 | .039<br>0.99 | 1218232-3<br>1218232-9*   |
| 62 (4)                           | 2.729<br>69.32 | 2.182<br>55.42 | 2.500<br>63.50 | .329<br>8.36  | .494<br>12.55 | .230<br>5.84 | 2.284<br>58.01 | .438<br>11.13 | .039<br>0.99 | 1218232-4<br>1-1218232-0* |
| 78 (5)                           | 2.635<br>66.93 | 2.079<br>52.81 | 2.406<br>61.11 | .441<br>11.20 | .605<br>15.38 | .230<br>5.84 | 2.189<br>55.60 | .550<br>13.97 | .039<br>0.99 | 1218232-5<br>1-1218232-1* |
| 104 (6)                          | 2.729<br>69.32 | 2.212<br>56.18 | 2.500<br>63.50 | .503<br>12.78 | .668<br>16.97 | .230<br>5.84 | 2.313<br>58.75 | .608<br>15.44 | .039<br>0.99 | 1218232-6<br>1-1218232-2* |

\*Rubber Grommet



**Receptacles**

| No. of Contact Pos. (Shell Size) | Dimensions     |                |                |               |               |                |               |              | AMP Part No.              |
|----------------------------------|----------------|----------------|----------------|---------------|---------------|----------------|---------------|--------------|---------------------------|
|                                  | A              | B              | C              | D             | E             | H              | J             | L            |                           |
| 15 (1)                           | 1.213<br>30.81 | .644<br>16.36  | .984<br>24.99  | .311<br>7.90  | .494<br>12.55 | .770<br>19.56  | .438<br>11.13 | .030<br>0.76 | 1218233-1<br>1218233-7*   |
| 26 (2)                           | 1.541<br>39.14 | .972<br>24.69  | 1.312<br>33.32 | .311<br>7.90  | .494<br>12.55 | 1.094<br>27.79 | .438<br>11.13 | .030<br>0.76 | 1218233-2<br>1218233-8*   |
| 44 (3)                           | 2.088<br>53.04 | 1.512<br>38.40 | 1.852<br>47.04 | .311<br>7.90  | .494<br>12.55 | 1.636<br>41.55 | .438<br>11.13 | .039<br>0.99 | 1218233-3<br>1218233-9*   |
| 62 (4)                           | 2.729<br>69.32 | 2.160<br>54.86 | 2.500<br>63.50 | .311<br>7.90  | .494<br>12.55 | 2.284<br>58.01 | .438<br>11.13 | .039<br>0.99 | 1218233-4<br>1-1218233-0* |
| 78 (5)                           | 2.635<br>66.93 | 2.065<br>52.45 | 2.406<br>61.11 | .423<br>10.74 | .605<br>15.38 | 2.189<br>55.60 | .550<br>13.97 | .039<br>0.99 | 1218233-5<br>1-1218233-1* |
| 104 (6)                          | 2.729<br>69.32 | 2.190<br>55.63 | 2.500<br>63.50 | .485<br>12.32 | .668<br>16.97 | 2.313<br>58.75 | .608<br>15.44 | .039<br>0.99 | 1218233-6<br>1-1218233-2* |

\*Rubber Grommet

ULTRA-LITE AMPLIMITE Connector Part Numbers vs. NASA's 311P Part Numbers and DSCC Part Numbers

AMPLIMITE Connector Series 90 (High Density Sub "D"'s)

| DSCC Part No. w/Grommet | DSCC Part No. w/out Grommet | NASA Part No. w/out Grommet | Plug / Receptacle | Shell Size | Position | ULTRA-LITE Connectors  |                       |
|-------------------------|-----------------------------|-----------------------------|-------------------|------------|----------|------------------------|-----------------------|
|                         |                             |                             |                   |            |          | Part No. w/out Grommet | Part No. with Grommet |
| 99012SAFPRA-1           | 99012NAFPR-1                | 311P407-1P-B-12             | Plug              | 1          | 15       | 1218232-1              | 1218232-7             |
| 99012SAFPRA-2           | 99012NAFPR-2                | 311P407-1P-B-12             | Plug              | 2          | 26       | 1218232-2              | 1218232-8             |
| 99012SAFPRA-3           | 99012NAFPR-3                | 311P407-1P-B-12             | Plug              | 3          | 44       | 1218232-3              | 1218232-9             |
| 99012SAFPRA-4           | 99012NAFPR-4                | 311P407-1P-B-12             | Plug              | 4          | 62       | 1218232-4              | 1-1218232-0           |
| 99012SAFPRA-5           | 99012NAFPR-5                | 311P407-1P-B-12             | Plug              | 5          | 78       | 1218232-5              | 1-1218232-1           |
| 99012SAFPRA-6           | 99012NAFPR-6                | 311P407-1P-B-12             | Plug              | 6          | 104      | 1218232-6              | 1-1218232-2           |
| 99014SAESR-1            | 99014NAESR-1                | 311P407-1S-B-12             | Receptacle        | 1          | 15       | 1218233-1              | 1218233-7             |
| 99014SAESR-2            | 99014NAESR-2                | 311P407-1S-B-12             | Receptacle        | 2          | 26       | 1218233-2              | 1218233-8             |
| 99014SAESR-3            | 99014NAESR-3                | 311P407-1S-B-12             | Receptacle        | 3          | 44       | 1218233-3              | 1218233-9             |
| 99014SAESR-4            | 99014NAESR-4                | 311P407-1S-B-12             | Receptacle        | 4          | 62       | 1218233-4              | 1-1218233-0           |
| 99014SAESR-5            | 99014NAESR-5                | 311P407-1S-B-12             | Receptacle        | 5          | 78       | 1218233-5              | 1-1218233-1           |
| 99014SAESR-6            | 99014NAESR-6                | 311P407-1S-B-12             | Receptacle        | 6          | 104      | 1218233-6              | 1-1218233-2           |

AMPLIMITE Connector Series 109 (Standard Density Sub "D"'s)

| DSCC Part No. w/Grommet | DSCC Part No. w/out Grommet | NASA Part No. w/out Grommet | Plug / Receptacle | Shell Size | Position | ULTRA-LITE Connectors  |                       |
|-------------------------|-----------------------------|-----------------------------|-------------------|------------|----------|------------------------|-----------------------|
|                         |                             |                             |                   |            |          | Part No. w/out Grommet | Part No. with Grommet |
| 99013SAEPR-1            | 99013NAEPR-1                | 311P409-1P-B-12             | Plug              | 1          | 9        | 1218234-1              | 1218234-7             |
| 99013SAEPR-2            | 99013NAEPR-2                | 311P409-2P-B-12             | Plug              | 2          | 15       | 1218234-2              | 1218234-8             |
| 99013SAEPR-3            | 99013NAEPR-3                | 311P409-3P-B-12             | Plug              | 3          | 25       | 1218234-3              | 1218234-9             |
| 99013SAEPR-4            | 99013NAEPR-4                | 311P409-4P-B-12             | Plug              | 4          | 37       | 1218234-4              | 1-1218234-0           |
| 99013SAEPR-5            | 99013NAEPR-5                | 311P409-5P-B-12             | Plug              | 5          | 50       | 1218234-5              | 1-1218234-1           |
| 99015SAESR-1            | 99015NAESR-1                | 311P409-1S-B-12             | Receptacle        | 1          | 9        | 1218235-1              | 1218235-7             |
| 99015SAESR-2            | 99015NAESR-2                | 311P409-2S-B-12             | Receptacle        | 2          | 15       | 1218235-2              | 1218235-8             |
| 99015SAESR-3            | 99015NAESR-3                | 311P409-3S-B-12             | Receptacle        | 3          | 25       | 1218235-3              | 1218235-9             |
| 99015SAESR-4            | 99015NAESR-4                | 311P409-4S-B-12             | Receptacle        | 4          | 37       | 1218235-4              | 1-1218235-0           |
| 99015SAESR-5            | 99015NAESR-5                | 311P409-5S-B-12             | Receptacle        | 5          | 50       | 1218235-5              | 1-1218235-1           |

Note: AMP Part Nos. are not NASA approved parts, but will conform to NASA's performance requirements.

Application Tools for Series 109 (Size 20) Crimp Contacts



**Pin and Socket  
Insertion/Extraction Tool**

AMP Part Number 91067-2 or  
MIL Part Number M81969/1-02  
Insertion tip, for replacement  
Part Number 126195-3  
Extraction tip, for replacement  
Part Number 126195-4



**AMP-TAPEMATIC Stripper/  
Crimper Machine Part Number  
599406-7**

**Funnel Part Number 125905-1 for  
Size 20 Contacts**

The AMP-TAPEMATIC Stripper/Crimper Machine strips wire and applies an 8-indent crimp termination per MIL-C-22520. The machine terminates pin and socket contacts which are tape mounted and reel fed. It offers production rates of up to 1200 finished leads per hour, provides overall lower applied costs and maintains a high degree of termination reliability.



**Hand Crimping Tool  
AMP Part Number 601966-1 or  
MIL Part Number M22520/2-01**

**Positioner  
AMP Part Number 601966-5 or  
MIL Part Number M22520/2-08**

This standard military-type hand tool terminates pins and sockets to wire with an 8-indent, M22520/2 crimp. It is ideally suited for prototype, field maintenance and other applications where volume production is not a factor.

Application Tools for Series 90 (Size 22) Crimp Contacts



**Pin and Socket  
Insertion/Extraction Tool**

AMP Part Number 91067-1 or  
MIL Part Number M81969/1-04  
Insertion tip, for replacement  
Part Number 126237-1  
Extraction tip, for replacement  
Part Number 126195-2



**AMP-TAPEMATIC Stripper/  
Crimper Machine Part Number  
599406-7**

**Funnel Part Number 125905-2 for  
Size 22 Contacts**

The AMP-TAPEMATIC Stripper/Crimper Machine strips wire and applies an 8-indent crimp termination per MIL-C-22520. The machine terminates pin and socket contacts which are tape mounted and reel fed. It offers production rates of up to 1200 finished leads per hour, provides overall lower applied costs and maintains a high degree of termination reliability.



**Hand Crimping Tool  
AMP Part Number 601966-1 or  
MIL Part Number M22520/2-01**

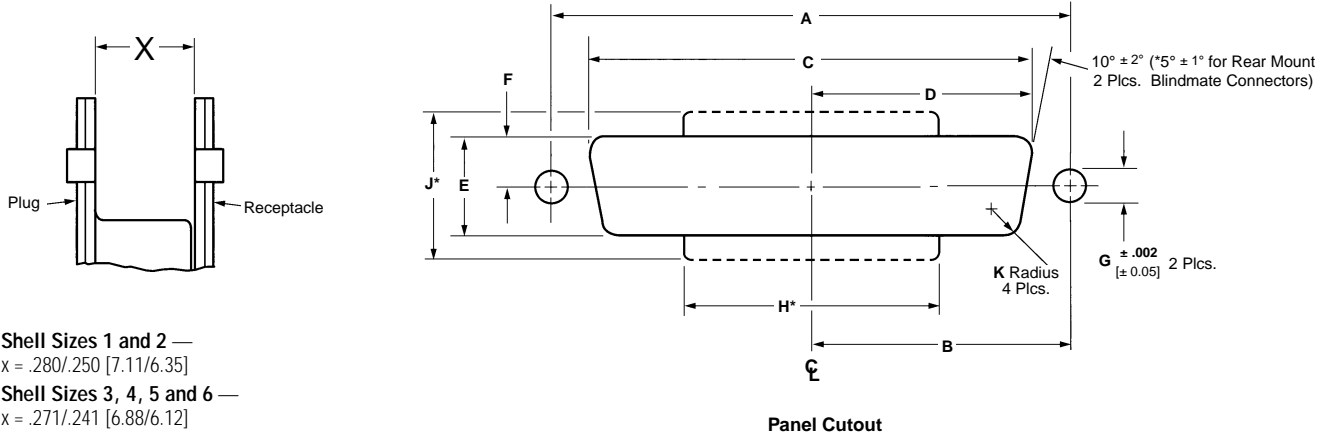
**Positioner (Pin)  
AMP Part Number 601966-6 or  
MIL Part Number M22520/2-09**

**Positioner (Socket)  
AMP Part Number 601966-4 or  
MIL Part Number M22520/2-06**

This standard military-type hand tool terminates pins and sockets to wire with an 8-indent, M22520/2 crimp. It is ideally suited for prototype, field maintenance and other applications where volume production is not a factor.

Mating and Mounting Specifications for Series 109 and Series 90 Connectors

Plug Receptacle Mating



Shell Sizes 1 and 2 —  
x = .280/.250 [7.11/6.35]  
Shell Sizes 3, 4, 5 and 6 —  
x = .271/.241 [6.88/6.12]  
Blindmate Connectors (all sizes) —  
x = .270 [6.86] min.

The X dimension is necessary for full mating of connector halves. This dimension must be taken into consideration when determining the method of mounting, panel thickness, etc.



AMPLIMITE Plug, Front-Panel Mounted



AMPLIMITE Receptacle, Rear-Panel Mounted

Attention: Front-Panel Mount

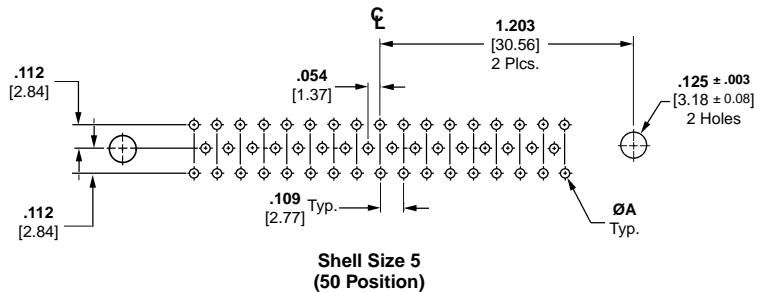
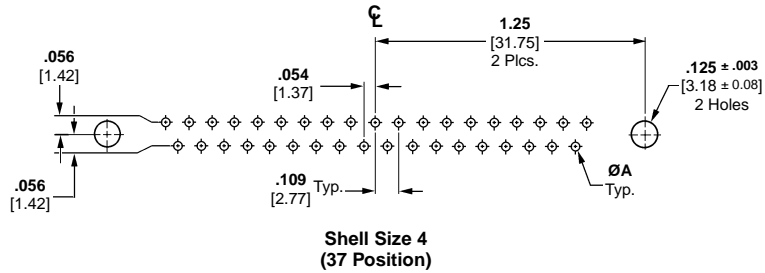
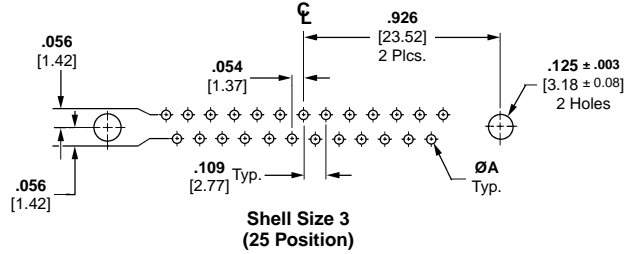
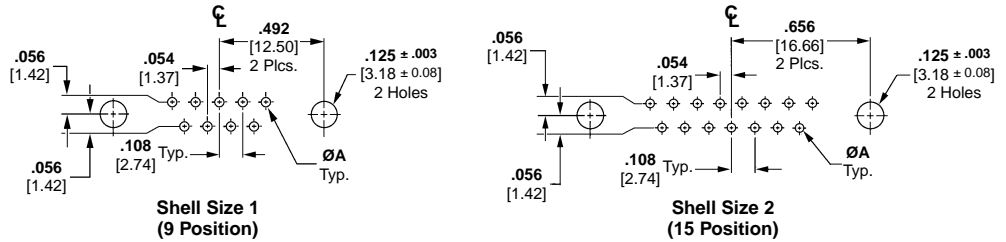
When front mounting a MIL-DTL-24308 connector utilizing the tab method of securing shell halves, it is recommended to utilize a .032 [0.81] thick washer (not supplied) to prevent deformation of connector flange.

| Shell Size (No. of Contact Pos.) |                      | Mounting Method  |                               | Dimensions     |                |               |              |              |                |               |    |    |              |              |
|----------------------------------|----------------------|------------------|-------------------------------|----------------|----------------|---------------|--------------|--------------|----------------|---------------|----|----|--------------|--------------|
| Series 109 Connectors            | Series 90 Connectors | Front/Rear Panel | With/Without Flouting Bushing | A              | B              | C             | D            | E            | F              | G             | H* | J* | K            |              |
| 1<br>(9 Pos.)                    | 1<br>(15 Pos.)       | Front            | With                          | .906<br>23.01  | .453<br>11.51  | .545<br>13.84 | .273<br>6.93 | .088<br>2.24 | —              | —             | —  | —  | .083<br>2.11 |              |
|                                  |                      |                  | Without                       | .874<br>22.2   | .437<br>11.1   | .513<br>13.03 | .257<br>6.53 | .120<br>3.05 | —              | —             | —  | —  | —            | .083<br>2.11 |
|                                  |                      | Rear             | With                          | .838<br>21.29  | .419<br>10.64  | .481<br>12.22 | .241<br>6.12 | .088<br>2.24 | .332<br>8.43   | .662<br>16.81 | —  | —  | —            | .132<br>3.35 |
|                                  |                      |                  | Without                       | .806<br>20.47  | .403<br>10.24  | .449<br>11.4  | .225<br>5.72 | .120<br>3.05 | .300<br>7.62   | .630<br>16    | —  | —  | —            | .132<br>3.35 |
| 2<br>(15 Pos.)                   | 2<br>(26 Pos.)       | Front            | With                          | 1.234<br>31.34 | .617<br>15.67  | .545<br>13.84 | .273<br>6.93 | .088<br>2.24 | —              | —             | —  | —  | .083<br>2.11 |              |
|                                  |                      |                  | Without                       | 1.202<br>30.53 | .601<br>15.27  | .513<br>13.03 | .257<br>6.53 | .120<br>3.05 | —              | —             | —  | —  | .083<br>2.11 |              |
|                                  |                      | Rear             | With                          | 1.166<br>29.62 | .583<br>14.81  | .481<br>12.22 | .241<br>6.12 | .088<br>2.24 | .665<br>16.81  | .662<br>16.81 | —  | —  | —            | .132<br>3.35 |
|                                  |                      |                  | Without                       | 1.134<br>28.8  | .567<br>14.4   | .449<br>11.4  | .225<br>5.72 | .120<br>3.05 | .623<br>15.82  | .630<br>16    | —  | —  | —            | .132<br>3.35 |
| 3<br>(25 Pos.)                   | 3<br>(44 Pos.)       | Front            | With                          | 1.775<br>45.09 | .888<br>22.55  | .545<br>13.84 | .273<br>6.93 | .088<br>2.24 | —              | —             | —  | —  | .083<br>2.11 |              |
|                                  |                      |                  | Without                       | 1.743<br>44.27 | .872<br>22.15  | .513<br>13.03 | .257<br>6.53 | .120<br>3.05 | —              | —             | —  | —  | .083<br>2.11 |              |
|                                  |                      | Rear             | With                          | 1.706<br>43.33 | .853<br>21.67  | .481<br>12.22 | .241<br>6.12 | .088<br>2.24 | 1.197<br>30.4  | .662<br>16.81 | —  | —  | —            | .132<br>3.35 |
|                                  |                      |                  | Without                       | 1.674<br>42.52 | .837<br>21.26  | .449<br>11.4  | .225<br>5.72 | .120<br>3.05 | 1.165<br>29.59 | .630<br>16    | —  | —  | —            | .132<br>3.35 |
| 4<br>(37 Pos.)                   | 4<br>(62 Pos.)       | Front            | With                          | 2.423<br>61.17 | 1.212<br>30.78 | .545<br>13.84 | .273<br>6.93 | .088<br>2.24 | —              | —             | —  | —  | .083<br>2.11 |              |
|                                  |                      |                  | Without                       | 2.391<br>60.73 | 1.196<br>30.38 | .513<br>13.03 | .257<br>6.53 | .120<br>3.05 | —              | —             | —  | —  | .083<br>2.11 |              |
|                                  |                      | Rear             | With                          | 2.354<br>59.79 | 1.777<br>29.9  | .481<br>12.22 | .241<br>6.12 | .088<br>2.24 | 1.845<br>46.86 | .662<br>16.81 | —  | —  | —            | .132<br>3.35 |
|                                  |                      |                  | Without                       | 2.326<br>59.08 | 1.163<br>29.54 | .449<br>11.4  | .225<br>5.72 | .120<br>3.05 | 1.813<br>46.05 | .630<br>16    | —  | —  | —            | .132<br>3.35 |
| 5<br>(50 Pos.)                   | 5<br>(78 Pos.)       | Front            | With                          | 2.329<br>59.16 | 1.165<br>29.59 | .655<br>16.64 | .328<br>8.33 | .088<br>2.24 | —              | —             | —  | —  | .083<br>2.11 |              |
|                                  |                      |                  | Without                       | 2.297<br>58.34 | 1.149<br>29.18 | .623<br>15.82 | .312<br>7.92 | .120<br>3.05 | —              | —             | —  | —  | .083<br>2.11 |              |
|                                  |                      | Rear             | With                          | 2.250<br>57.15 | 1.125<br>28.58 | .587<br>14.91 | .294<br>7.47 | .088<br>2.24 | 1.740<br>44.2  | .772<br>19.61 | —  | —  | —            | .132<br>3.35 |
|                                  |                      |                  | Without                       | 2.218<br>56.34 | 1.109<br>28.17 | .555<br>14.1  | .278<br>7.06 | .120<br>3.05 | 1.708<br>43.38 | .740<br>18.8  | —  | —  | —            | .132<br>3.35 |
| —                                | 6<br>(104 Pos.)      | Front            | With                          | 2.453<br>62.31 | 1.227<br>31.17 | .717<br>18.21 | .359<br>9.12 | .088<br>2.24 | —              | —             | —  | —  | .083<br>2.11 |              |
|                                  |                      |                  | Without                       | 2.421<br>61.49 | 1.211<br>30.76 | .685<br>17.4  | .343<br>8.71 | .120<br>3.05 | —              | —             | —  | —  | .083<br>2.11 |              |
|                                  |                      | Rear             | With                          | 2.388<br>60.66 | 1.194<br>30.33 | .654<br>16.61 | .327<br>8.31 | .088<br>2.24 | 1.875<br>47.64 | .835<br>21.21 | —  | —  | —            | .132<br>3.35 |
|                                  |                      |                  | Without                       | 2.356<br>59.84 | 1.179<br>29.92 | .622<br>5.8   | .311<br>7.9  | .120<br>3.05 | 1.843<br>46.81 | .803<br>20.4  | —  | —  | —            | .132<br>3.35 |

\*Panel cutout configuration with these dimensions provides clearance for mounting connectors with cable clamp assemblies.



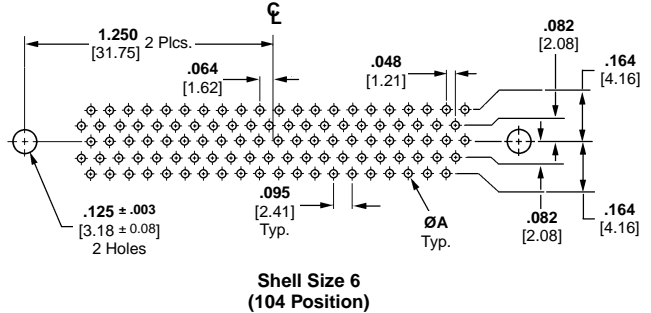
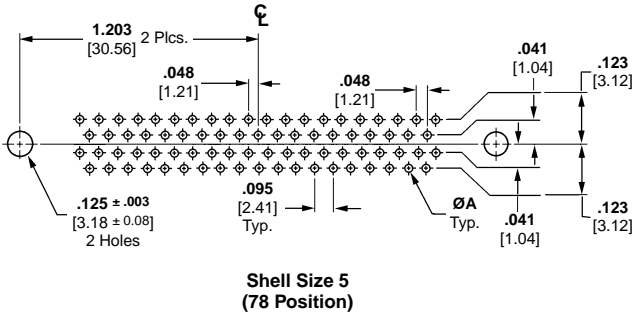
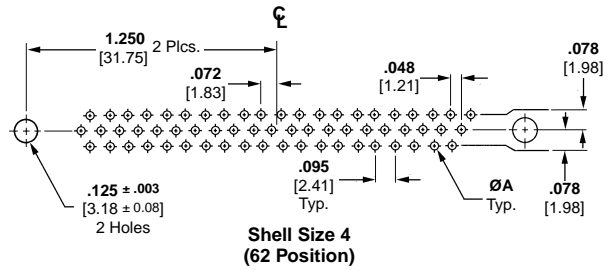
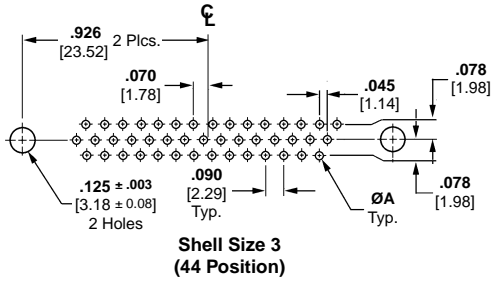
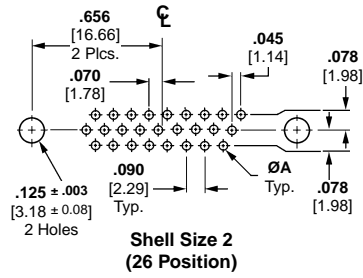
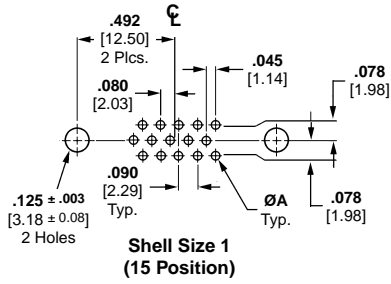
PCB Layouts—Series 109 (Standard Density)



| Post Diameter | ØA                        |
|---------------|---------------------------|
| .018 [0.46]   | .028 [0.71] — .038 [0.96] |
| .025 [0.64]   | .035 [0.89] — .045 [1.14] |
| .030 [0.76]   | .040 [1.02] — .050 [1.27] |
| .040 [1.02]   | .050 [1.27] — .060 [1.52] |

- Notes:**
- Mating face of plug is shown, receptacle is mirror image.
  - PCB mounting hole diameters are provided for connectors with .120 [3.05] diameter mounting holes. For connectors with .154 [3.91] mounting holes, use PCB mounting hole diameter .160 ± .003 [4.06 ± 0.08].
  - PC layouts illustrated above serve as a guide only; they are not to be used for actual design or construction of customer equipment. Consult AMP customer print for detailed PC board layout requirements.

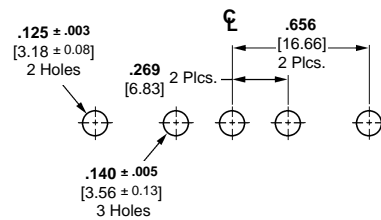
PCB Layouts—Series 90 (High Density)



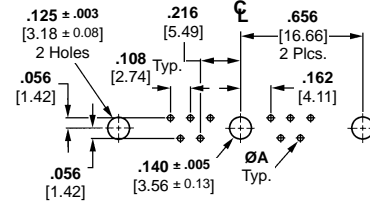
| Post Diameter | ØA                        |
|---------------|---------------------------|
| .018 [0.46]   | .028 [0.71] — .038 [0.96] |
| .025 [0.64]   | .035 [0.89] — .045 [1.14] |
| .030 [0.76]   | .040 [1.02] — .050 [1.27] |
| .040 [1.02]   | .050 [1.27] — .060 [1.52] |

- Notes:**
1. Mating face of plug is shown, receptacle is mirror image.
  2. PCB mounting hole diameters are provided for connectors with .120 [3.05] diameter mounting holes. For connectors with .154 [3.91] mounting holes, use PCB mounting hole diameter .160 ± .003 [4.06 ± 0.08].
  3. PC layouts illustrated above serve as a guide only; they are not to be used for actual design or construction of customer equipment. Consult AMP customer print for detailed PC board layout requirements.

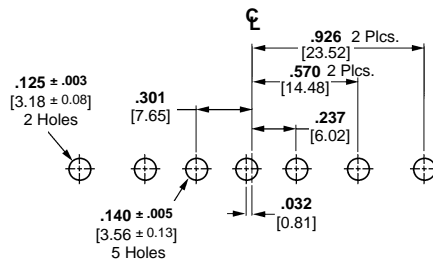
### PCB Layouts (Power/Coax/Signal)



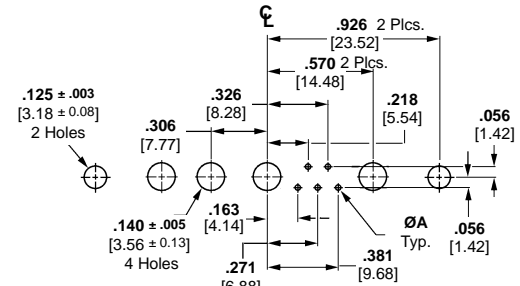
3C3



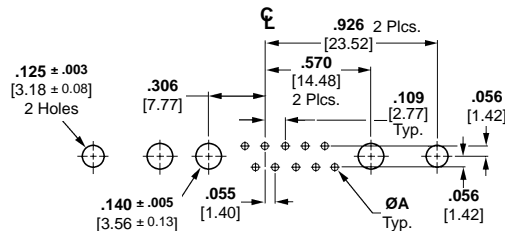
11C1



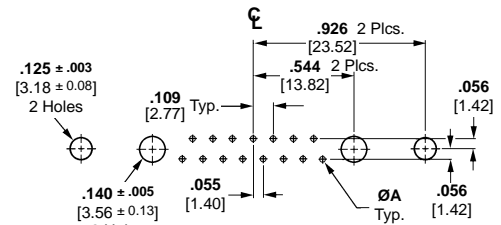
5C5



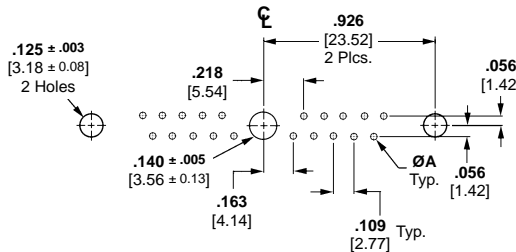
9C4



13C3



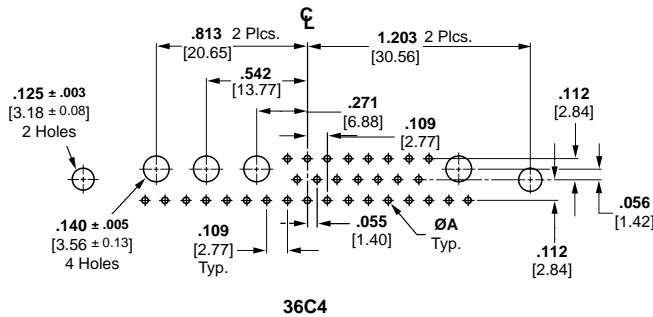
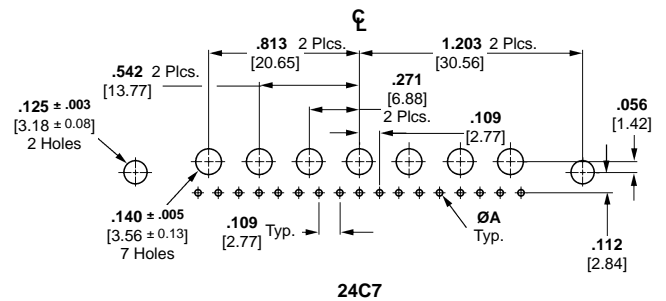
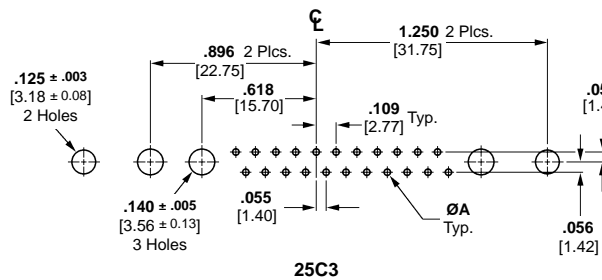
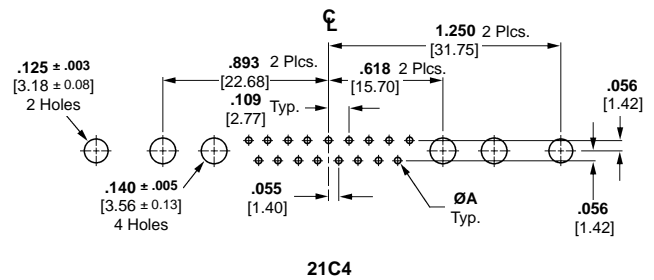
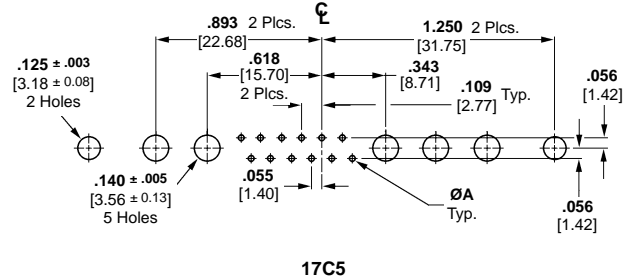
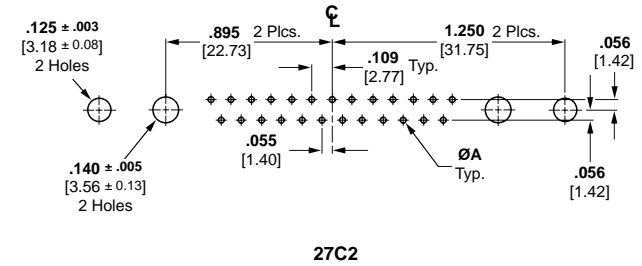
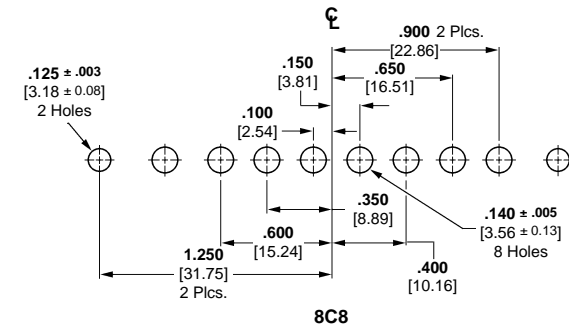
17C2



21C1

| Post Diameter | ØA                        |
|---------------|---------------------------|
| .018 [0.46]   | .028 [0.71] — .038 [0.96] |
| .025 [0.64]   | .035 [0.89] — .045 [1.14] |
| .030 [0.76]   | .040 [1.02] — .050 [1.27] |
| .040 [1.02]   | .050 [1.27] — .060 [1.52] |

- Notes:**
- Mating face of plug is shown, receptacle is mirror image.
  - PCB mounting hole diameters are provided for connectors with .120 [3.05] diameter mounting holes. For connectors with .154 [3.91] mounting holes, use PCB mounting hole diameter .160 ± .003 [4.06 ± 0.08].
  - PC layouts illustrated above serve as a guide only; they are not to be used for actual design or construction of customer equipment. Consult AMP customer print for detailed PC board layout requirements.



| Post Diameter | ØA                        |
|---------------|---------------------------|
| .018 [0.46]   | .028 [0.71] – .038 [0.96] |
| .025 [0.64]   | .035 [0.89] – .045 [1.14] |
| .030 [0.76]   | .040 [1.02] – .050 [1.27] |
| .040 [1.02]   | .050 [1.27] – .060 [1.52] |

- Notes:**
1. Mating face of plug is shown, receptacle is mirror image.
  2. PCB mounting hole diameters are provided for connectors with .120 [3.05] diameter mounting holes. For connectors with .154 [3.91] mounting holes, use PCB mounting hole diameter .160 ± .003 [4.06 ± 0.08].
  3. PC layouts illustrated above serve as a guide only; they are not to be used for actual design or construction of customer equipment. Consult AMP customer print for detailed PC board layout requirements.

Accessories

Female Screwlocks for Metal-Shell Connectors

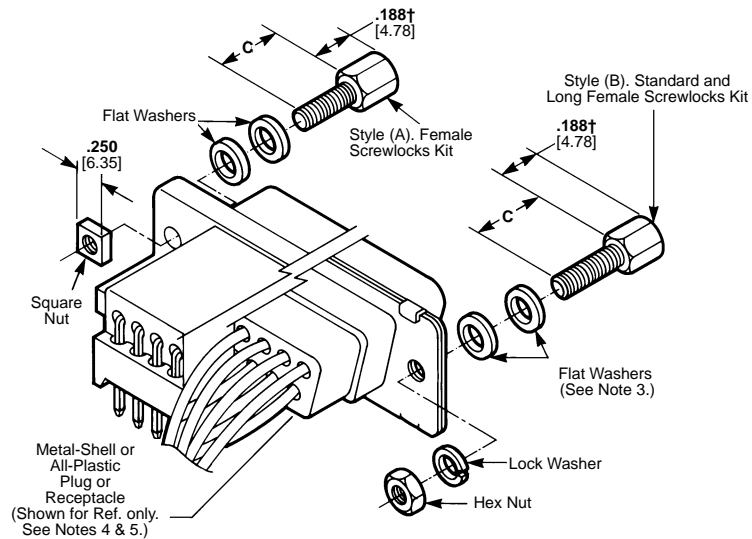
Material and Finish

**Standard Steel Parts** — Cold rolled steel per ASTM A108, zinc plated per ASTM B633, Type II, Class SCI

**Stainless Steel** — Passivated stainless steel

Technical Documents

Instruction Sheet — 408-7837



**Nut Driver, Part Number 811262-1**  
(Used for assembling female screwlocks to connector flange)

| Connector Used with | Style | Dim. C       | Thread Size | Finish          | Steel Kit Number |                          | Stainless Steel |              |
|---------------------|-------|--------------|-------------|-----------------|------------------|--------------------------|-----------------|--------------|
|                     |       |              |             |                 | Individual       | Bulk Packed <sup>a</sup> | Standard Kit    | Long Special |
| 6                   | (B)   | .312<br>7.93 | 4-40        | Yellow Chromate | 205817-1         | 205817-2                 | —               | —            |
|                     |       |              |             | Clear Chromate  | 748271-1†        | —                        | —               | —            |
|                     |       |              | M3 (Metric) | Yellow Chromate | 207872-1         | —                        | —               | —            |
|                     |       |              |             | Clear Chromate  | 207872-3         | —                        | —               | —            |
|                     |       |              | 4-40††      | Yellow Chromate | 206897-1         | —                        | —               | —            |
| .090 Thick Panels†  | (B)   | .312<br>7.93 | 4-40        | Yellow Chromate | 748271-3         | —                        | —               | —            |
| 6                   | (B)   | .312<br>7.93 | 4-40        | Yellow Chromate | —                | —                        | 212447-1        | —            |
| 6                   | (B)   | .500<br>12.7 | 4-40        | Yellow Chromate | —                | —                        | —               | 212452-1     |

Individual Screwlocks

(Washers and Nuts not included)

| Connector Used with | Style | Dimension C  | Thread Size     | Finish          | Screwlocks             |                          |
|---------------------|-------|--------------|-----------------|-----------------|------------------------|--------------------------|
|                     |       |              |                 |                 | Individual             | Bulk Packed <sup>a</sup> |
| 6                   | (B)   | .312<br>7.93 | 4-40            | Yellow Chromate | 205818-2               | —                        |
|                     |       |              |                 | Clear Chromate  | 205818-3               | —                        |
|                     |       |              |                 | Clear Chromate  | 748558-3 <sup>ΔΔ</sup> | 748558-4 <sup>ΔΔ</sup>   |
|                     |       |              | M2.6** (Metric) | Clear Chromate  | 749765-3               | —                        |
|                     |       |              | 4-40            | Yellow Chromate | 748270-2†              | —                        |
|                     |       |              | M3*** (Metric)  | Clear Chromate  | 747404-3               | —                        |
|                     |       |              | (Special)       | .185<br>4.70    | 4-40                   | Clear Chromate           |

<sup>a</sup>Each part is individually bulk packed for multiple kit orders.

<sup>ΔΔ</sup>With captivated star washer. No additional hardware included.

†Part Number 748270-2 and 748271-1 Dimension .158 [4.01]

††206897-1 kit contains 2-screwlocks, 2-hex nuts and 2-retainers.

\*\*M2.6 is the female thread size. The male thread size is 4-40.

\*\*\*M3 is the female thread size. The male thread size is 4-40.

- Notes:**
1. All parts are packaged unassembled.
  2. Each female screwlock kit is comprised of two assemblies as illustrated above.
  3. One or two flat washers may be required for panel thicknesses less than .060 [1.52]. Female screwlocks are not recommended for panel thicknesses greater than .060 [1.52].
  4. Female screwlocks with 2-56 thread size are to be used with cable clamps with mounting flanges. Female screwlocks with 4-40 and M3 (Metric) thread sizes can be used with all other cable clamps.
  5. Female screwlocks mate with male screw retainers (page 5149).
  6. Series 90 and 109 Connectors without eyelets or floating bushings.

Accessories (Continued)

Male Screw Retainers for Metal-Shell Connectors

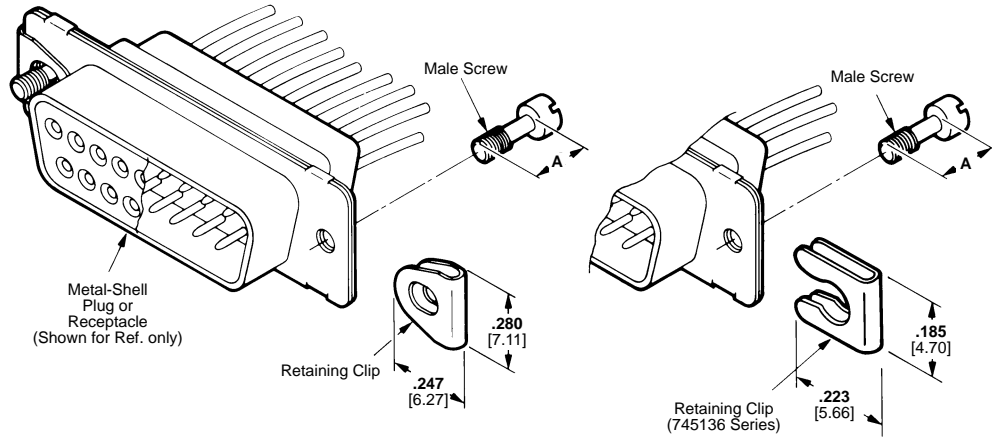
Material and Finish

**Male Screw** — Steel, zinc plated clear or yellow chromate

**Retaining Clip** — .012 [0.31] stainless steel

Technical Documents

Instruction Sheet — 408-7837



| Male Screw Finish | Thread Size   | Dimension A  | Male Screw Retainer Kit No. |              |
|-------------------|---------------|--------------|-----------------------------|--------------|
|                   |               |              | Individual                  | Bulk Packed* |
| Yellow Chromate   | 4-40          | .220<br>5.59 | 205980-1                    | 205980-3     |
|                   |               | .200<br>5.08 | 745136-1                    | 745136-2     |
|                   | M3 (Metric)   | .225<br>5.72 | 207871-1                    | —            |
|                   | M2.6 (Metric) | .225<br>5.72 | 750035-1                    | —            |
| Clear Chromate    | 4-40          | .220<br>5.59 | 205980-4                    | 205980-5     |
|                   |               | .200<br>5.08 | 745136-3                    | 745136-4     |

\*Each part is individually bulk packed for multiple kit orders.

**Notes:** 1. All parts are packaged unassembled.

2. Each kit is comprised of two male screws and two retaining clips. Male screw retainers are also furnished as part of cable clamp kits (pages 5148 and 5149).

3. Male screw retainers mate with female screwlocks (page 5148) and with metal-shell board mount connectors featuring 4-40 threaded inserts or female screwlocks.

4. Retaining clip must be assembled onto connector flanges with threaded hole toward wire side of connector.

Stainless Steel Kit

Materials

**All Parts** — Stainless steel, passivated per QQ-P-35B.

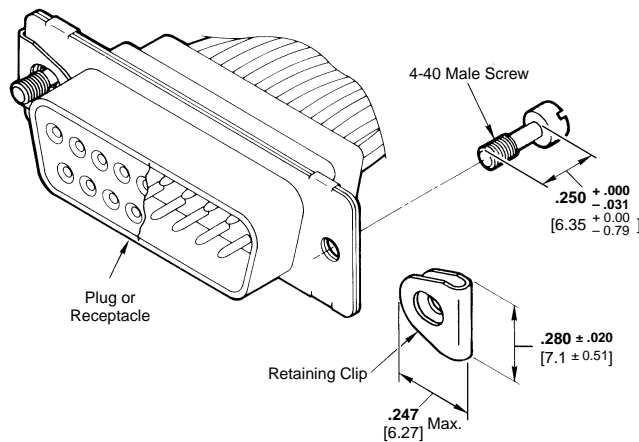
AMP Part Number 211883-5 or MIL Part Number M24308/25-6P

Notes:

1. Each kit includes two screws and two retainers.

2. Retainer is assembled onto connector flange with threaded hole toward the wire side of the connector.

Male Screw Retainer Kits



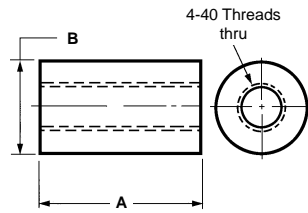
### Accessories (Continued)

#### Standard Bushings (for Connectors with Straight Posted Contacts, PC Board Mounted)

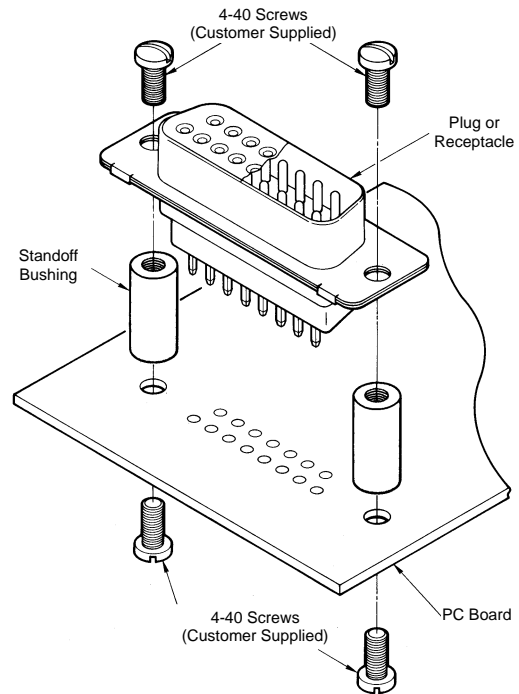
**Material**  
Aluminum

#### Kit Numbers

\*Parts are individually bulk packed for multiple kit orders.



**Note:** Standoff Bushings are used with a plug or receptacle of PC board mounted connectors.



| Part No. | Dim. A        | Dim. B       | Packaged     |
|----------|---------------|--------------|--------------|
| 205933-3 | .435<br>11.05 | .250<br>6.35 | 2 Per Bag    |
| 205933-4 | .435<br>11.05 | .250<br>6.35 | *Bulked Pack |
| 443279-2 | .246<br>6.25  | .190<br>4.83 | 2 Per Bag    |
| 443279-3 | .246<br>6.25  | .190<br>4.83 | *Bulk Pack   |

#### Dust Covers

Dust covers for subminiature D connectors are not manufactured by Tyco Electronics. They may be purchased from:\*

**Caplugs**  
2150 Elmwood Avenue  
Buffalo, NY 14207  
Phone: (716) 876-9855  
Fax: (716) 874-1680

See Catalog 1307612 for additional hardware such as cable clamps, strain reliefs, etc.

#### Notes:

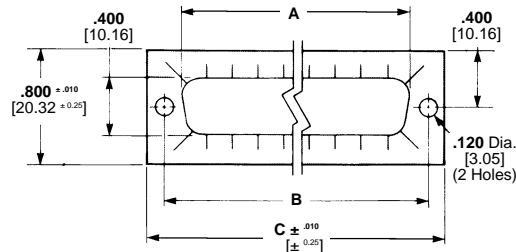
1. There are no cable clamp/strain relief hardware available for size 6 connectors.

2. Cable clamp/strain relief hardware cannot be used with the Power/Coax/Combination Product shown on pages 5122 and 5123 of this catalog.

\* Caplugs is not an affiliate of Tyco Electronics.

#### EMI/RFI Gaskets

**Material and Finish**  
Brass, .006 [0.15] thick;  
bright tin plated



9, 15, 25 and 37 Positions

| Shell Size<br>(No. of<br>Contact Pos.) | Dimensions     |                |                | Gasket<br>Part No. |
|--|----------------|----------------|----------------|--------------------|
|  | A              | B              | C              |                    |
| 1<br>(9)                               | .746<br>18.95  | .984<br>24.99  | 1.220<br>30.99 | 747024-3           |
| 2<br>(15)                              | 1.074<br>27.28 | 1.312<br>33.32 | 1.555<br>39.50 | 747025-3           |
| 3<br>(25)                              | 1.614<br>41.00 | 1.852<br>47.04 | 2.100<br>53.34 | 745776-3           |
| 4<br>(37)                              | 2.266<br>57.56 | 2.500<br>63.50 | 2.730<br>69.34 | 745777-3           |

MIL-DTL-24308 vs. AMP AMPLIMITE Connectors

This list is provided for reference only. In the event that a discrepancy exists between this catalog and the respective military QPL, then the QPL shall take precedence.

| MILITARY PART NUMBER FOR ORDERING | MILITARY PART NUMBER ON CONNECTOR | AMP PART NUMBER FOR ORDERING | AMP PART NUMBER ON CONNECTOR | REMARKS<br>(All connectors provided with contacts unless otherwise specified) |               |
|-----------------------------------|-----------------------------------|------------------------------|------------------------------|---|---------------|
| /1                                | M24308/1-1F                       | M24308/1-1F                  | 593007-1                     | 593007-1  |               |
|                                   | M24308/1-2F                       | M24308/1-2F                  | 593007-2                     | 593007-2  |               |
|                                   | M24308/1-3F                       | M24308/1-3F                  | 593007-3                     | 593007-3  |               |
|                                   | M24308/1-4F                       | M24308/1-4F                  | 593007-4                     | 593007-4  |               |
|                                   | M24308/1-5F                       | M24308/1-5F                  | 593007-5                     | 593007-5  |               |
|                                   | M24308/1-12F                      | M24308/1-12F                 | 593008-1                     | 593008-1  |               |
|                                   | M24308/1-13F                      | M24308/1-13F                 | 593008-2                     | 593008-2  |               |
|                                   | M24308/1-14F                      | M24308/1-14F                 | 593008-3                     | 593008-3  |               |
|                                   | M24308/1-15F                      | M24308/1-15F                 | 593008-4                     | 593008-4  |               |
|                                   | M24308/1-16F                      | M24308/1-16F                 | 593008-5                     | 593008-5  |               |
|                                   | M24308/1-23F                      | M24308/1-23F                 | 593009-1                     | 593009-1  |               |
|                                   | M24308/1-24F                      | M24308/1-24F                 | 593009-2                     | 593009-2  |               |
|                                   | M24308/1-25F                      | M24308/1-25F                 | 593009-3                     | 593009-3  |               |
|                                   | M24308/1-26F                      | M24308/1-26F                 | 593009-4                     | 593009-4  |               |
|                                   | M24308/1-27F                      | M24308/1-27F                 | 593009-5                     | 593009-5  |               |
| /2                                | M24308/2-1F                       | M24308/2-1F                  | 205555-2                     | 205555-2  |               |
|                                   | M24308/2-2F                       | M24308/2-2F                  | 205557-2                     | 205557-2  |               |
|                                   | M24308/2-3F                       | M24308/2-3F                  | 205559-2                     | 205559-2  |               |
|                                   | M24308/2-4F                       | M24308/2-4F                  | 205561-2                     | 205561-2  |               |
|                                   | M24308/2-5F                       | M24308/2-5F                  | 205563-2                     | 205563-2  |               |
|                                   | M24308/2-6F                       | M24308/2-1F                  | 205555-3                     | 205555-2  | WITH TOOL     |
|                                   | M24308/2-7F                       | M24308/2-2F                  | 205557-3                     | 205557-2  | WITH TOOL     |
|                                   | M24308/2-8F                       | M24308/2-3F                  | 205559-3                     | 205559-2  | WITH TOOL     |
|                                   | M24308/2-9F                       | M24308/2-4F                  | 205561-3                     | 205561-2  | WITH TOOL     |
|                                   | M24308/2-10F                      | M24308/2-5F                  | 205563-3                     | 205563-2  | WITH TOOL     |
|                                   | M24308/2-11F                      | M24308/2-11F                 | 204512-2                     | 204512-2  |               |
|                                   | M24308/2-12F                      | M24308/2-12F                 | 204514-2                     | 204514-2  |               |
|                                   | M24308/2-13F                      | M24308/2-13F                 | 204516-2                     | 204516-2  |               |
|                                   | M24308/2-14F                      | M24308/2-14F                 | 204518-2                     | 204518-2  |               |
|                                   | M24308/2-15F                      | M24308/2-15F                 | 204520-2                     | 204520-2  |               |
|                                   | M24308/2-16F                      | M24308/2-16F                 | 204522-2                     | 204522-2  |               |
|                                   | M24308/2-17F                      | M24308/2-11F                 | 204512-3                     | 204512-2  | WITH TOOL     |
|                                   | M24308/2-18F                      | M24308/2-12F                 | 204514-3                     | 204514-2  | WITH TOOL     |
|                                   | M24308/2-19F                      | M24308/2-13F                 | 204516-3                     | 204516-2  | WITH TOOL     |
|                                   | M24308/2-20F                      | M24308/2-14F                 | 204518-3                     | 204518-2  | WITH TOOL     |
|                                   | M24308/2-21F                      | M24308/2-15F                 | 204520-3                     | 204520-2  | WITH TOOL     |
|                                   | M24308/2-22F                      | M24308/2-16F                 | 204522-3                     | 204522-2  | WITH TOOL     |
|                                   | M24308/2-23F                      | M24308/2-23F                 | 205483-2                     | 205483-2  |               |
|                                   | M24308/2-24F                      | M24308/2-24F                 | 205433-2                     | 205433-2  |               |
|                                   | M24308/2-25F                      | M24308/2-25F                 | 205484-2                     | 205484-2  |               |
|                                   | M24308/2-26F                      | M24308/2-26F                 | 205485-2                     | 205485-2  |               |
|                                   | M24308/2-27F                      | M24308/2-27F                 | 205432-2                     | 205432-2  |               |
|                                   | M24308/2-28F                      | M24308/2-28F                 | 204536-2                     | 204536-2  |               |
|                                   | M24308/2-29F                      | M24308/2-29F                 | 204538-2                     | 204538-2  |               |
|                                   | M24308/2-30F                      | M24308/2-30F                 | 204540-2                     | 204540-2  |               |
|                                   | M24308/2-31F                      | M24308/2-31F                 | 204542-2                     | 204542-2  |               |
|                                   | M24308/2-32F                      | M24308/2-32F                 | 204544-2                     | 204544-2  |               |
|                                   | M24308/2-33F                      | M24308/2-33F                 | 204546-2                     | 204546-2  |               |
|                                   | M24308/2-281F                     | M24308/2-1F                  | 205161-1                     | 205555-2  | LESS CONTACTS |
|                                   | M24308/2-282F                     | M24308/2-2F                  | 205163-1                     | 205557-2  | LESS CONTACTS |
|                                   | M24308/2-283F                     | M24308/2-3F                  | 205165-1                     | 205559-2  | LESS CONTACTS |
|                                   | M24308/2-284F                     | M24308/2-4F                  | 205167-1                     | 205561-2  | LESS CONTACTS |
|                                   | M24308/2-285F                     | M24308/2-5F                  | 205169-1                     | 205563-2  | LESS CONTACTS |
|                                   | M24308/2-286F                     | M24308/2-11F                 | 204500-1                     | 204512-2  | LESS CONTACTS |
|                                   | M24308/2-287F                     | M24308/2-12F                 | 204502-1                     | 204514-2  | LESS CONTACTS |
|                                   | M24308/2-288F                     | M24308/2-13F                 | 204504-1                     | 204516-2  | LESS CONTACTS |
|                                   | M24308/2-289F                     | M24308/2-14F                 | 204506-1                     | 204518-2  | LESS CONTACTS |
|                                   | M24308/2-290F                     | M24308/2-15F                 | 204508-1                     | 204520-2  | LESS CONTACTS |
|                                   | M24308/2-291F                     | M24308/2-16F                 | 204510-1                     | 204522-2  | LESS CONTACTS |

Note: The suffix "F" on M24308 part numbers designates cadmium shell plating.



**MIL-DTL-24308 vs. AMP AMPLIMITE Connectors (Continued)**

| MILITARY PART NUMBER FOR ORDERING | MILITARY PART NUMBER ON CONNECTOR | AMP PART NUMBER FOR ORDERING | AMP PART NUMBER ON CONNECTOR | REMARKS<br>(All connectors provided with contacts unless otherwise specified) |               |  |
|-----------------------------------|-----------------------------------|------------------------------|------------------------------|---|---------------|--|
| <b>/2</b>                         | M24308/2-292F                     | M24308/2-23F                 | 205416-1                     | 205483-2  | LESS CONTACTS |  |
|                                   | M24308/2-293F                     | M24308/2-24F                 | 205417-1                     | 205433-2  | LESS CONTACTS |  |
|                                   | M24308/2-294F                     | M24308/2-25F                 | 205418-1                     | 205484-2  | LESS CONTACTS |  |
|                                   | M24308/2-295F                     | M24308/2-26F                 | 205419-1                     | 205485-2  | LESS CONTACTS |  |
|                                   | M24308/2-296F                     | M24308/2-27F                 | 205420-1                     | 205432-2  | LESS CONTACTS |  |
|                                   | M24308/2-297F                     | M24308/2-28F                 | 204524-1                     | 204536-2  | LESS CONTACTS |  |
|                                   | M24308/2-298F                     | M24308/2-29F                 | 204526-1                     | 204538-2  | LESS CONTACTS |  |
|                                   | M24308/2-299F                     | M24308/2-30F                 | 204528-1                     | 204540-2  | LESS CONTACTS |  |
|                                   | M24308/2-300F                     | M24308/2-31F                 | 204530-1                     | 204542-2  | LESS CONTACTS |  |
|                                   | M24308/2-301F                     | M24308/2-32F                 | 204532-1                     | 204544-2  | LESS CONTACTS |  |
|                                   | M24308/2-302F                     | M24308/2-33F                 | 204534-1                     | 204546-2  | LESS CONTACTS |  |
|                                   | M24308/2-342F                     | M24308/2-342F                | 211525-2                     | 211525-2  |               |  |
|                                   | M24308/2-343F                     | M24308/2-343F                | 211526-2                     | 211526-2  |               |  |
|                                   | M24308/2-344F                     | M24308/2-344F                | 211527-2                     | 211527-2  |               |  |
|                                   | M24308/2-345F                     | M24308/2-345F                | 211528-2                     | 211528-2  |               |  |
|                                   | M24308/2-346F                     | M24308/2-346F                | 211529-2                     | 211529-2  |               |  |
|                                   | M24308/2-347F                     | M24308/2-347F                | 211536-2                     | 211536-2  |               |  |
|                                   | M24308/2-348F                     | M24308/2-348F                | 211537-2                     | 211537-2  |               |  |
|                                   | M24308/2-349F                     | M24308/2-349F                | 211538-2                     | 211538-2  |               |  |
|                                   | M24308/2-350F                     | M24308/2-350F                | 211539-2                     | 211539-2  |               |  |
|                                   | M24308/2-351F                     | M24308/2-351F                | 211540-2                     | 211540-2  |               |  |
|                                   | M24308/2-352F                     | M24308/2-352F                | 211541-2                     | 211541-2  |               |  |
|                                   | M24308/2-482F                     | M24308/2-342F                | 211525-1                     | 211525-2  | LESS CONTACTS |  |
|                                   | M24308/2-483F                     | M24308/2-343F                | 211526-1                     | 211526-2  | LESS CONTACTS |  |
|                                   | M24308/2-484F                     | M24308/2-344F                | 211527-1                     | 211527-2  | LESS CONTACTS |  |
|                                   | M24308/2-485F                     | M24308/2-345F                | 211528-1                     | 211528-2  | LESS CONTACTS |  |
|                                   | M24308/2-486F                     | M24308/2-346F                | 211529-1                     | 211529-2  | LESS CONTACTS |  |
| M24308/2-487F                     | M24308/2-347F                     | 211536-1                     | 211536-2                     | LESS CONTACTS   |               |  |
| M24308/2-488F                     | M24308/2-348F                     | 211537-1                     | 211537-2                     | LESS CONTACTS   |               |  |
| M24308/2-489F                     | M24308/2-349F                     | 211538-1                     | 211538-2                     | LESS CONTACTS   |               |  |
| M24308/2-490F                     | M24308/2-350F                     | 211539-1                     | 211539-2                     | LESS CONTACTS   |               |  |
| M24308/2-491F                     | M24308/2-351F                     | 211540-1                     | 211540-2                     | LESS CONTACTS   |               |  |
| M24308/2-492F                     | M24308/2-352F                     | 211541-1                     | 211541-2                     | LESS CONTACTS   |               |  |
| <b>/3</b>                         | M24308/3-1F                       | M24308/3-1F                  | 593002-1                     | 593002-1  |               |  |
|                                   | M24308/3-2F                       | M24308/3-2F                  | 593002-2                     | 593002-2  |               |  |
|                                   | M24308/3-3F                       | M24308/3-3F                  | 593002-3                     | 593002-3  |               |  |
|                                   | M24308/3-4F                       | M24308/3-4F                  | 593002-4                     | 593002-4  |               |  |
|                                   | M24308/3-5F                       | M24308/3-5F                  | 593002-5                     | 593002-5  |               |  |
|                                   | M24308/3-12F                      | M24308/3-12F                 | 593004-1                     | 593004-1  |               |  |
|                                   | M24308/3-13F                      | M24308/3-13F                 | 593004-2                     | 593004-2  |               |  |
|                                   | M24308/3-14F                      | M24308/3-14F                 | 593004-3                     | 593004-3  |               |  |
|                                   | M24308/3-15F                      | M24308/3-15F                 | 593004-4                     | 593004-4  |               |  |
|                                   | M24308/3-16F                      | M24308/3-16F                 | 593004-5                     | 593004-5  |               |  |
|                                   | <b>/4</b>                         | M24308/4-1F                  | M24308/4-1F                  | 205556-2  | 205556-2      |  |
|                                   |                                   | M24308/4-2F                  | M24308/4-2F                  | 205558-2  | 205558-2      |  |
| M24308/4-3F                       |                                   | M24308/4-3F                  | 205560-2                     | 205560-2  |               |  |
| M24308/4-4F                       |                                   | M24308/4-4F                  | 205562-2                     | 205562-2  |               |  |
| M24308/4-5F                       |                                   | M24308/4-5F                  | 205564-2                     | 205564-2  |               |  |
| M24308/4-6F                       |                                   | M24308/4-1F                  | 205556-3                     | 205556-2  | WITH TOOL     |  |
| M24308/4-7F                       |                                   | M24308/4-2F                  | 205558-3                     | 205558-2  | WITH TOOL     |  |
| M24308/4-8F                       |                                   | M24308/4-3F                  | 205560-3                     | 205560-2  | WITH TOOL     |  |
| M24308/4-9F                       |                                   | M24308/4-4F                  | 205562-3                     | 205562-2  | WITH TOOL     |  |
| M24308/4-10F                      |                                   | M24308/4-5F                  | 205564-3                     | 205564-2  | WITH TOOL     |  |
| M24308/4-11F                      |                                   | M24308/4-11F                 | 204513-2                     | 204513-2  |               |  |
| M24308/4-12F                      |                                   | M24308/4-12F                 | 204515-2                     | 204515-2  |               |  |
| M24308/4-13F                      |                                   | M24308/4-13F                 | 204517-2                     | 204517-2  |               |  |
| M24308/4-14F                      |                                   | M24308/4-14F                 | 204519-2                     | 204519-2  |               |  |
| M24308/4-15F                      |                                   | M24308/4-15F                 | 204521-2                     | 204521-2  |               |  |
| M24308/4-16F                      |                                   | M24308/4-16F                 | 204523-2                     | 204523-2  |               |  |

**Note:** The suffix "F" on M24308 part numbers designates cadmium shell plating.

MIL-DTL-24308 vs. AMP AMPLIMITE Connectors (Continued)

| MILITARY PART NUMBER FOR ORDERING | MILITARY PART NUMBER ON CONNECTOR | AMP PART NUMBER FOR ORDERING | AMP PART NUMBER ON CONNECTOR | REMARKS<br>(All connectors provided with contacts unless otherwise specified) |               |
|-----------------------------------|-----------------------------------|------------------------------|------------------------------|---|---------------|
| /4                                | M24308/4-17F                      | M24308/4-11F                 | 204513-3                     | 204513-2  | WITH TOOL     |
|                                   | M24308/4-18F                      | M24308/4-12F                 | 204515-3                     | 204515-2  | WITH TOOL     |
|                                   | M24308/4-19F                      | M24308/4-13F                 | 204517-3                     | 204517-2  | WITH TOOL     |
|                                   | M24308/4-20F                      | M24308/4-14F                 | 204519-3                     | 204519-2  | WITH TOOL     |
|                                   | M24308/4-21F                      | M24308/4-15F                 | 204521-3                     | 204521-2  | WITH TOOL     |
|                                   | M24308/4-22F                      | M24308/4-16F                 | 204523-3                     | 204523-2  | WITH TOOL     |
|                                   | M24308/4-259F                     | M24308/4-1F                  | 205162-1                     | 205556-2  | LESS CONTACTS |
|                                   | M24308/4-260F                     | M24308/4-2F                  | 205164-1                     | 205558-2  | LESS CONTACTS |
|                                   | M24308/4-261F                     | M24308/4-3F                  | 205166-1                     | 205560-2  | LESS CONTACTS |
|                                   | M24308/4-262F                     | M24308/4-4F                  | 205168-1                     | 205562-2  | LESS CONTACTS |
|                                   | M24308/4-263F                     | M24308/4-5F                  | 205170-1                     | 205564-2  | LESS CONTACTS |
|                                   | M24308/4-264F                     | M24308/4-11F                 | 204501-1                     | 204513-2  | LESS CONTACTS |
|                                   | M24308/4-265F                     | M24308/4-12F                 | 204503-1                     | 204515-2  | LESS CONTACTS |
|                                   | M24308/4-266F                     | M24308/4-13F                 | 204505-1                     | 204517-2  | LESS CONTACTS |
|                                   | M24308/4-267F                     | M24308/4-14F                 | 204507-1                     | 204519-2  | LESS CONTACTS |
|                                   | M24308/4-268F                     | M24308/4-15F                 | 204509-1                     | 204521-2  | LESS CONTACTS |
|                                   | M24308/4-269F                     | M24308/4-16F                 | 204511-1                     | 204523-2  | LESS CONTACTS |
|                                   | M24308/4-302F                     | M24308/4-302F                | 205486-2                     | 205486-2  |               |
|                                   | M24308/4-303F                     | M24308/4-303F                | 205409-2                     | 205409-2  |               |
|                                   | M24308/4-304F                     | M24308/4-304F                | 205487-2                     | 205487-2  |               |
|                                   | M24308/4-305F                     | M24308/4-305F                | 205488-2                     | 205488-2  |               |
|                                   | M24308/4-306F                     | M24308/4-306F                | 205431-2                     | 205431-2  |               |
|                                   | M24308/4-307F                     | M24308/4-307F                | 204537-2                     | 204537-2  |               |
|                                   | M24308/4-308F                     | M24308/4-308F                | 204539-2                     | 204539-2  |               |
|                                   | M24308/4-309F                     | M24308/4-309F                | 204541-2                     | 204541-2  |               |
|                                   | M24308/4-310F                     | M24308/4-310F                | 204543-2                     | 204543-2  |               |
|                                   | M24308/4-311F                     | M24308/4-311F                | 204545-2                     | 204545-2  |               |
|                                   | M24308/4-312F                     | M24308/4-312F                | 204547-2                     | 204547-2  |               |
|                                   | M24308/4-324F                     | M24308/4-302F                | 205412-1                     | 205486-2  | LESS CONTACTS |
|                                   | M24308/4-325F                     | M24308/4-303F                | 205408-1                     | 205409-2  | LESS CONTACTS |
|                                   | M24308/4-326F                     | M24308/4-304F                | 205413-1                     | 205487-2  | LESS CONTACTS |
|                                   | M24308/4-327F                     | M24308/4-305F                | 205414-1                     | 205488-2  | LESS CONTACTS |
|                                   | M24308/4-328F                     | M24308/4-306F                | 205415-1                     | 205431-2  | LESS CONTACTS |
|                                   | M24308/4-329F                     | M24308/4-307F                | 204525-1                     | 204537-2  | LESS CONTACTS |
| M24308/4-330F                     | M24308/4-308F                     | 204527-1                     | 204539-2                     | LESS CONTACTS   |               |
| M24308/4-331F                     | M24308/4-309F                     | 204529-1                     | 204541-2                     | LESS CONTACTS   |               |
| M24308/4-332F                     | M24308/4-310F                     | 204531-1                     | 204543-2                     | LESS CONTACTS   |               |
| M24308/4-333F                     | M24308/4-311F                     | 204533-1                     | 204545-2                     | LESS CONTACTS   |               |
| M24308/4-334F                     | M24308/4-312F                     | 204535-1                     | 204547-2                     | LESS CONTACTS   |               |
| /5                                | M24308/5-1F                       | M24308/5-1F                  | 593036-1                     | 593036-1  |               |
|                                   | M24308/5-2F                       | M24308/5-2F                  | 593036-2                     | 593036-2  |               |
|                                   | M24308/5-3F                       | M24308/5-3F                  | 593036-3                     | 593036-3  |               |
|                                   | M24308/5-4F                       | M24308/5-4F                  | 593036-4                     | 593036-4  |               |
|                                   | M24308/5-5F                       | M24308/5-5F                  | 593036-5                     | 593036-5  |               |
|                                   | M24308/5-12F                      | M24308/5-12F                 | 593037-1                     | 593037-1  |               |
|                                   | M24308/5-13F                      | M24308/5-13F                 | 593037-2                     | 593037-2  |               |
|                                   | M24308/5-14F                      | M24308/5-14F                 | 593037-3                     | 593037-3  |               |
|                                   | M24308/5-15F                      | M24308/5-15F                 | 593037-4                     | 593037-4  |               |
|                                   | M24308/5-16F                      | M24308/5-16F                 | 593037-5                     | 593037-5  |               |
|                                   | M24308/5-23F                      | M24308/5-23F                 | 593038-1                     | 593038-1  |               |
|                                   | M24308/5-24F                      | M24308/5-24F                 | 593038-2                     | 593038-2  |               |
|                                   | M24308/5-25F                      | M24308/5-25F                 | 593038-3                     | 593038-3  |               |
|                                   | M24308/5-26F                      | M24308/5-26F                 | 593038-4                     | 593038-4  |               |
| M24308/5-27F                      | M24308/5-27F                      | 593038-5                     | 593038-5                     |   |               |
| /23                               | M24308/23-1F                      | M24308/23-1F                 | 443975-1                     | 443975-1  |               |
|                                   | M24308/23-2F                      | M24308/23-2F                 | 443975-2                     | 443975-2  |               |
|                                   | M24308/23-3F                      | M24308/23-3F                 | 443975-3                     | 443975-3  |               |
|                                   | M24308/23-4F                      | M24308/23-4F                 | 443975-4                     | 443975-4  |               |
|                                   | M24308/23-5F                      | M24308/23-5F                 | 443975-5                     | 443975-5  |               |

Note: The suffix "F" on M24308 part numbers designates cadmium shell plating.

MIL-DTL-24308 vs. AMP AMPLIMITE Connectors (Continued)

| MILITARY PART NUMBER FOR ORDERING | MILITARY PART NUMBER ON CONNECTOR | AMP PART NUMBER FOR ORDERING | AMP PART NUMBER ON CONNECTOR | REMARKS<br>(All connectors provided with contacts unless otherwise specified) |
|-----------------------------------|-----------------------------------|------------------------------|------------------------------|---|
| /23                               | M24308/23-7F                      | M24308/23-7F                 | 443976-1                     | 443976-1  |
|                                   | M24308/23-8F                      | M24308/23-8F                 | 443976-2                     | 443976-2  |
|                                   | M24308/23-9F                      | M24308/23-9F                 | 443976-3                     | 443976-3  |
|                                   | M24308/23-10F                     | M24308/23-10F                | 443976-4                     | 443976-4  |
|                                   | M24308/23-11F                     | M24308/23-11F                | 443976-5                     | 443976-5  |
|                                   | M24308/23-13F                     | M24308/23-13F                | 443977-1                     | 443977-1  |
|                                   | M24308/23-14F                     | M24308/23-14F                | 443977-2                     | 443977-2  |
|                                   | M24308/23-15F                     | M24308/23-15F                | 443977-3                     | 443977-3  |
|                                   | M24308/23-16F                     | M24308/23-16F                | 443977-4                     | 443977-4  |
|                                   | M24308/23-17F                     | M24308/23-17F                | 443977-5                     | 443977-5  |
|                                   | M24308/23-19F                     | M24308/23-19F                | 443978-1                     | 443978-1  |
|                                   | M24308/23-20F                     | M24308/23-20F                | 443978-2                     | 443978-2  |
|                                   | M24308/23-21F                     | M24308/23-21F                | 443978-3                     | 443978-3  |
|                                   | M24308/23-22F                     | M24308/23-22F                | 443978-4                     | 443978-4  |
|                                   | M24308/23-23F                     | M24308/23-23F                | 443978-5                     | 443978-5  |
|                                   | M24308/23-31F                     | M24308/23-31F                | 1218408-1                    | 1218408-1   |
|                                   | M24308/23-32F                     | M24308/23-32F                | 1218408-2                    | 1218408-2   |
|                                   | M24308/23-33F                     | M24308/23-33F                | 1218408-3                    | 1218408-3   |
|                                   | M24308/23-34F                     | M24308/23-34F                | 1218408-4                    | 1218408-4   |
|                                   | M24308/23-35F                     | M24308/23-35F                | 1218408-5                    | 1218408-5   |
| /24                               | M24308/24-1F                      | M24308/24-1F                 | 1218124-1                    | 1218124-1   |
|                                   | M24308/24-2F                      | M24308/24-2F                 | 1218124-2                    | 1218124-2   |
|                                   | M24308/24-3F                      | M24308/24-3F                 | 1218124-3                    | 1218124-3   |
|                                   | M24308/24-4F                      | M24308/24-4F                 | 1218124-4                    | 1218124-4   |
|                                   | M24308/24-5F                      | M24308/24-5F                 | 1218124-5                    | 1218124-5   |
|                                   | M24308/24-7F                      | M24308/24-7F                 | 1218125-1                    | 1218125-1   |
|                                   | M24308/24-8F                      | M24308/24-8F                 | 1218125-2                    | 1218125-2   |
|                                   | M24308/24-9F                      | M24308/24-9F                 | 1218125-3                    | 1218125-3   |
|                                   | M24308/24-10F                     | M24308/24-10F                | 1218125-4                    | 1218125-4   |
|                                   | M24308/24-11F                     | M24308/24-11F                | 1218125-5                    | 1218125-5   |
|                                   | M24308/24-13F                     | M24308/24-13F                | 1218126-1                    | 1218126-1   |
|                                   | M24308/24-14F                     | M24308/24-14F                | 1218126-2                    | 1218126-2   |
|                                   | M24308/24-15F                     | M24308/24-15F                | 1218126-3                    | 1218126-3   |
|                                   | M24308/24-16F                     | M24308/24-16F                | 1218126-4                    | 1218126-4   |
|                                   | M24308/24-17F                     | M24308/24-17F                | 1218126-5                    | 1218126-5   |
|                                   | M24308/24-19F                     | M24308/24-19F                | 1218127-1                    | 1218127-1   |
|                                   | M24308/24-20F                     | M24308/24-20F                | 1218127-2                    | 1218127-2   |
|                                   | M24308/24-21F                     | M24308/24-21F                | 1218127-3                    | 1218127-3   |
|                                   | M24308/24-22F                     | M24308/24-22F                | 1218127-4                    | 1218127-4   |
|                                   | M24308/24-23F                     | M24308/24-23F                | 1218127-5                    | 1218127-5   |
|                                   | M24308/24-25F                     | M24308/24-25F                | 1218440-1                    | 1218440-1   |
|                                   | M24308/24-26F                     | M24308/24-26F                | 1218440-2                    | 1218440-2   |
|                                   | M24308/24-27F                     | M24308/24-27F                | 1218440-3                    | 1218440-3   |
|                                   | M24308/24-28F                     | M24308/24-28F                | 1218440-4                    | 1218440-4   |
|                                   | M24308/24-29F                     | M24308/24-29F                | 1218440-5                    | 1218440-5   |
|                                   | M24308/24-31F                     | M24308/24-31F                | 1218441-1                    | 1218441-1   |
|                                   | M24308/24-32F                     | M24308/24-32F                | 1218441-2                    | 1218441-2   |
|                                   | M24308/24-33F                     | M24308/24-33F                | 1218441-3                    | 1218441-3   |
|                                   | M24308/24-34F                     | M24308/24-34F                | 1218441-4                    | 1218441-4   |
|                                   | M24308/24-35F                     | M24308/24-35F                | 1218441-5                    | 1218441-5   |
|                                   | M24308/24-37F                     | M24308/24-37F                | 1218442-1                    | 1218442-1   |
|                                   | M24308/24-38F                     | M24308/24-38F                | 1218442-2                    | 1218442-2   |
|                                   | M24308/24-39F                     | M24308/24-39F                | 1218442-3                    | 1218442-3   |
|                                   | M24308/24-40F                     | M24308/24-40F                | 1218442-4                    | 1218442-4   |
|                                   | M24308/24-41F                     | M24308/24-41F                | 1218442-5                    | 1218442-5   |
|                                   | M24308/24-43F                     | M24308/24-43F                | 1218443-1                    | 1218443-1   |
|                                   | M24308/24-44F                     | M24308/24-44F                | 1218443-2                    | 1218443-2   |
|                                   | M24308/24-45F                     | M24308/24-45F                | 1218443-3                    | 1218443-3   |
|                                   | M24308/24-46F                     | M24308/24-46F                | 1218443-4                    | 1218443-4   |
|                                   | M24308/24-47F                     | M24308/24-47F                | 1218443-5                    | 1218443-5   |

Note: The suffix "F" on M24308 part numbers designates cadmium shell plating.

MIL-DTL-24308 vs. AMP AMPLIMITE Connectors (Continued)

| MILITARY PART NUMBER FOR ORDERING | MILITARY PART NUMBER ON CONNECTOR | AMP PART NUMBER FOR ORDERING | AMP PART NUMBER ON CONNECTOR | REMARKS<br>(All connectors provided with contacts unless otherwise specified) |                         |
|-----------------------------------|-----------------------------------|------------------------------|------------------------------|---|-------------------------|
| /24                               | M24308/24-49F                     | M24308/24-49F                | 1218444-1                    | 1218444-1   |                         |
|                                   | M24308/24-50F                     | M24308/24-50F                | 1218444-2                    | 1218444-2   |                         |
|                                   | M24308/24-51F                     | M24308/24-51F                | 1218444-3                    | 1218444-3   |                         |
|                                   | M24308/24-52F                     | M24308/24-52F                | 1218444-4                    | 1218444-4   |                         |
|                                   | M24308/24-53F                     | M24308/24-53F                | 1218444-5                    | 1218444-5   |                         |
|                                   | M24308/24-55F                     | M24308/24-55F                | 1218445-1                    | 1218445-1   |                         |
|                                   | M24308/24-56F                     | M24308/24-56F                | 1218445-2                    | 1218445-2   |                         |
|                                   | M24308/24-57F                     | M24308/24-57F                | 1218445-3                    | 1218445-3   |                         |
|                                   | M24308/24-58F                     | M24308/24-58F                | 1218445-4                    | 1218445-4   |                         |
|                                   | M24308/24-59F                     | M24308/24-59F                | 1218445-5                    | 1218445-5   |                         |
|                                   | M24308/23-25F                     | M24308/23-25F                | 1218434-1                    | 1218434-1   |                         |
|                                   | M24308/23-26F                     | M24308/23-26F                | 1218434-2                    | 1218434-2   |                         |
|                                   | M24308/23-27F                     | M24308/23-27F                | 1218434-3                    | 1218434-3   |                         |
|                                   | M24308/23-28F                     | M24308/23-28F                | 1218434-4                    | 1218434-4   |                         |
|                                   | M24308/23-29F                     | M24308/23-29F                | 1218434-5                    | 1218434-5   |                         |
|                                   | M24308/23-37F                     | M24308/23-37F                | 1218435-1                    | 1218435-1   |                         |
|                                   | M24308/23-38F                     | M24308/23-38F                | 1218435-2                    | 1218435-2   |                         |
|                                   | M24308/23-39F                     | M24308/23-39F                | 1218435-3                    | 1218435-3   |                         |
|                                   | M24308/23-40F                     | M24308/23-40F                | 1218435-4                    | 1218435-4   |                         |
|                                   | M24308/23-41F                     | M24308/23-41F                | 1218435-5                    | 1218435-5   |                         |
|                                   | M24308/23-43F                     | M24308/23-43F                | 1218436-1                    | 1218436-1   |                         |
|                                   | M24308/23-44F                     | M24308/23-44F                | 1218436-2                    | 1218436-2   |                         |
|                                   | M24308/23-45F                     | M24308/23-45F                | 1218436-3                    | 1218436-3   |                         |
|                                   | M24308/23-46F                     | M24308/23-46F                | 1218436-4                    | 1218436-4   |                         |
|                                   | M24308/23-47F                     | M24308/23-47F                | 1218436-5                    | 1218436-5   |                         |
|                                   | M24308/23-49F                     | M24308/23-49F                | 1218437-1                    | 1218437-1   |                         |
|                                   | M24308/23-50F                     | M24308/23-50F                | 1218437-2                    | 1218437-2   |                         |
|                                   | M24308/23-51F                     | M24308/23-51F                | 1218437-3                    | 1218437-3   |                         |
|                                   | M24308/23-52F                     | M24308/23-52F                | 1218437-4                    | 1218437-4   |                         |
|                                   | M24308/23-53F                     | M24308/23-53F                | 1218437-5                    | 1218437-5   |                         |
|                                   | M24308/23-55F                     | M24308/23-55F                | 1218438-1                    | 1218438-1   |                         |
|                                   | M24308/23-56F                     | M24308/23-56F                | 1218438-2                    | 1218438-2   |                         |
|                                   | M24308/23-57F                     | M24308/23-57F                | 1218438-3                    | 1218438-3   |                         |
|                                   | M24308/23-58F                     | M24308/23-58F                | 1218438-4                    | 1218438-4   |                         |
|                                   | M24308/23-59F                     | M24308/23-59F                | 1218438-5                    | 1218438-5   |                         |
| /25                               | M24308/25-6P                      | —                            | 211883-5                     | —   | Male screw retainer kit |
| /26                               | M24308/26-1P                      | —                            | 212447-1                     | —   | Female screwlock kit    |
|                                   | M24308/26-1                       | —                            | 205817-8                     | —   | Female screwlock kit    |

**Note:** The suffix "F" on M24308 part numbers designates cadmium shell plating.  
The suffix "P" designates passivated stainless steel.

5 Pin and Socket Connectors

M39029, M22520 and M81969 vs. AMP AMPLIMITE Connectors

| MILITARY PART NUMBER FOR ORDERING | AMP PART NUMBER FOR ORDERING | REMARKS<br>(All connectors provided with contacts unless otherwise specified) |
|-----------------------------------|------------------------------|---|
| M39029/57-354                     | 204351-1                     | Size 22 Socket  |
| M39029/58-360                     | 204370-2                     | Size 22 Pin   |
| M39029/63-368                     | 205090-1                     | Size 20 Socket  |
| M39029/64-369                     | 205089-1                     | Size 20 Pin   |
| M22520/2-01                       | 601966-1                     | Crimp Tool  |
| M22520/2-06                       | 601966-4                     | Size 22 Socket Positioner   |
| M22520/2-08                       | 601966-5                     | Size 20 Positioner  |
| M22520/2-09                       | 601966-6                     | Size 22 Pin Positioner  |
| M81969/1-02                       | 91067-2                      | Size 20 Ins/Ext Tool  |
| M81969/1-04                       | 91067-1                      | Size 22 Ins/Ext Tool  |

NASA Power/Coax/Signal Combination vs. AMP AMPLIMITE Connectors

| AMP PART NUMBER | ASSEMBLY NASA P/N 311-P-4/ | DESCRIPTION                      |
|-----------------|----------------------------|----------------------------------|
| 448153-2        | 05-7P-B-12                 | PLUG,3C3,NON-MAG.,120 MTG HOLE   |
| 448153-3        | 05-7P-B-15                 | PLUG,3C3,NON-MAG.,154 MTG HOLE   |
| 448154-2        | 05-8P-B-12                 | PLUG,7C2,NON-MAG.,120 MTG HOLE   |
| 448154-3        | 05-8P-B-15                 | PLUG,7C2,NON-MAG.,154 MTG HOLE   |
| 211111-2        | 05-9P-B-12                 | PLUG,11C1,NON-MAG.,120 MTG HOLE  |
| 211111-3        | 05-9P-B-15                 | PLUG,11C1,NON-MAG.,154 MTG HOLE  |
| 212491-6        | 05-10P-B-12                | PLUG,5C5,NON-MAG.,120 MTG HOLE   |
| 212491-7        | 05-10P-B-15                | PLUG,5C5,NON-MAG.,154 MTG HOLE   |
| 212498-2        | 05-11P-B-12                | PLUG,9C4,NON-MAG.,120 MTG HOLE   |
| 212498-3        | 05-11P-B-15                | PLUG,9C4,NON-MAG.,154 MTG HOLE   |
| 208810-3        | 05-12P-B-12                | PLUG,13C3,NON-MAG.,120 MTG HOLE  |
| 208810-4        | 05-12P-B-15                | PLUG,13C3,NON-MAG.,154 MTG HOLE  |
| 212506-2        | 05-13P-B-12                | PLUG,17C2,NON-MAG.,120 MTG HOLE  |
| 212506-4        | 05-13P-B-15                | PLUG,17C2,NON-MAG.,154 MTG HOLE  |
| 212522-3        | 05-14P-B-12                | PLUG,21C1,NON-MAG.,120 MTG HOLE  |
| 212522-4        | 05-14P-B-15                | PLUG,21C1,NON-MAG.,154 MTG HOLE  |
| 446405-2        | 05-15P-B-12                | PLUG,8C8,NON-MAG.,120 MTG HOLE   |
| 446405-3        | 05-15P-B-15                | PLUG,8C8,NON-MAG.,154 MTG HOLE   |
| 212514-3        | 05-17P-B-12                | PLUG,17C5,NON-MAG.,120 MTG HOLE  |
| 212514-4        | 05-17P-B-15                | PLUG,17C5,NON-MAG.,154 MTG HOLE  |
| 212530-2        | 05-18P-B-12                | PLUG,21C4,NON-MAG.,120 MTG HOLE  |
| 212530-3        | 05-18P-B-15                | PLUG,21C4,NON-MAG.,154 MTG HOLE  |
| 208742-2        | 05-20P-B-12                | PLUG,25C3,NON-MAG.,120 MTG HOLE  |
| 208742-3        | 05-20P-B-15                | PLUG,25C3,NON-MAG.,154 MTG HOLE  |
| 212538-2        | 05-21P-B-12                | PLUG,27C2,NON-MAG.,120 MTG HOLE  |
| 212538-3        | 05-21P-B-15                | PLUG,27C2,NON-MAG.,154 MTG HOLE  |
| 208743-2        | 05-22P-B-12                | PLUG,24C7,NON-MAG.,120 MTG HOLE  |
| 208743-6        | 05-22P-B-15                | PLUG,24C7,NON-MAG.,154 MTG HOLE  |
| 208744-3        | 05-23P-B-12                | PLUG,36C4,NON-MAG.,120 MTG HOLE  |
| 208744-4        | 05-23P-B-15                | PLUG,36C4,NON-MAG.,154 MTG HOLE  |
| 445705-2        | 05-7S-B-12                 | RECPT,3C3,NON-MAG.,120 MTG HOLE  |
| 445705-3        | 05-7S-B-15                 | RECPT,3C3,NON-MAG.,154 MTG HOLE  |
| 211112-2        | 05-9S-B-12                 | RECPT,11C1,NON-MAG.,120 MTG HOLE |
| 211112-3        | 05-9S-B-15                 | RECPT,11C1,NON-MAG.,154 MTG HOLE |
| 212059-2        | 05-10S-B-12                | RECPT,5C5,NON-MAG.,120 MTG HOLE  |
| 212059-6        | 05-10S-B-15                | RECPT,5C5,NON-MAG.,154 MTG HOLE  |
| 212502-2        | 05-11S-B-12                | RECPT,9C4,NON-MAG.,120 MTG HOLE  |
| 212502-3        | 05-11S-B-15                | RECPT,9C4,NON-MAG.,154 MTG HOLE  |
| 208811-3        | 05-12S-B-12                | RECPT,13C3,NON-MAG.,120 MTG HOLE |
| 208811-4        | 05-12S-B-15                | RECPT,13C3,NON-MAG.,154 MTG HOLE |
| 212510-2        | 05-13S-B-12                | RECPT,17C2,NON-MAG.,120 MTG HOLE |
| 212510-3        | 05-13S-B-15                | RECPT,17C2,NON-MAG.,154 MTG HOLE |
| 212526-3        | 05-14S-B-12                | RECPT,21C1,NON-MAG.,120 MTG HOLE |
| 212526-4        | 05-14S-B-15                | RECPT,21C1,NON-MAG.,154 MTG HOLE |
| 445730-3        | 05-15S-B-12                | RECPT,8C8,NON-MAG.,120 MTG HOLE  |
| 445730-4        | 05-15S-B-15                | RECPT,8C8,NON-MAG.,154 MTG HOLE  |
| 212518-3        | 05-17S-B-12                | RECPT,17C5,NON-MAG.,120 MTG HOLE |
| 212518-4        | 05-17S-B-15                | RECPT,17C5,NON-MAG.,154 MTG HOLE |
| 212534-2        | 05-18S-B-12                | RECPT,21C4,NON-MAG.,120 MTG HOLE |
| 212534-3        | 05-18S-B-15                | RECPT,21C4,NON-MAG.,154 MTG HOLE |
| 208551-2        | 05-20S-B-12                | RECPT,25C3,NON-MAG.,120 MTG HOLE |
| 208551-3        | 05-20S-B-15                | RECPT,25C3,NON-MAG.,154 MTG HOLE |
| 212542-2        | 05-21S-B-12                | RECPT,27C2,NON-MAG.,120 MTG HOLE |
| 212542-3        | 05-21S-B-15                | RECPT,27C2,NON-MAG.,154 MTG HOLE |
| 208552-2        | 05-22S-B-12                | RECPT,24C7,NON-MAG.,120 MTG HOLE |
| 208552-5        | 05-22S-B-15                | RECPT,24C7,NON-MAG.,154 MTG HOLE |
| 208550-2        | 05-23S-B-12                | RECPT,36C4,NON-MAG.,120 MTG HOLE |
| 208550-3        | 05-23S-B-15                | RECPT,36C4,NON-MAG.,154 MTG HOLE |

**NASA Series 109 and 90 vs. AMP AMPLIMITE Connectors**

| NASA PART NUMBER FOR ORDERING | NASA PART NUMBER ON CONNECTOR | AMP PART NUMBER FOR ORDERING | AMP PART NUMBER ON CONNECTOR | REMARKS<br>(All connectors provided with contacts unless otherwise specified) |
|-------------------------------|-------------------------------|------------------------------|------------------------------|---|
| 311P407-1P-B-15               | 311P407-1P-B-15               | 206498-1                     | 206498-1                     | LESS CONTACTS   |
| 311P407-1P-B-12               | 311P407-1P-B-12               | 206498-4                     | 206498-4                     | LESS CONTACTS   |
| 311P407-2P-B-15               | 311P407-2P-B-15               | 206500-1                     | 206500-1                     | LESS CONTACTS   |
| 311P407-2P-B-12               | 311P407-2P-B-12               | 206500-4                     | 206500-4                     | LESS CONTACTS   |
| 311P407-3P-B-15               | 311P407-3P-B-15               | 206063-2                     | 206063-2                     | LESS CONTACTS   |
| 311P407-3P-B-12               | 311P407-3P-B-12               | 206063-4                     | 206063-4                     | LESS CONTACTS   |
| 311P407-4P-B-15               | 311P407-4P-B-15               | 206502-1                     | 206502-1                     | LESS CONTACTS   |
| 311P407-4P-B-12               | 311P407-4P-B-12               | 206502-4                     | 206502-4                     | LESS CONTACTS   |
| 311P407-5P-B-15               | 311P407-5P-B-15               | 206504-1                     | 206504-1                     | LESS CONTACTS   |
| 311P407-5P-B-12               | 311P407-5P-B-12               | 206504-4                     | 206504-4                     | LESS CONTACTS   |
| 311P407-6P-B-15               | 311P407-6P-B-15               | 206066-2                     | 206066-2                     | LESS CONTACTS   |
| 311P407-6P-B-12               | 311P407-6P-B-12               | 206066-4                     | 206066-4                     | LESS CONTACTS   |
| 311P407-1S-B-15               | 311P407-1S-B-15               | 206499-1                     | 206499-1                     | LESS CONTACTS   |
| 311P407-1S-B-12               | 311P407-1S-B-12               | 206499-4                     | 206499-4                     | LESS CONTACTS   |
| 311P407-2S-B-15               | 311P407-2S-B-15               | 206501-1                     | 206501-1                     | LESS CONTACTS   |
| 311P407-2S-B-12               | 311P407-2S-B-12               | 206501-4                     | 206501-4                     | LESS CONTACTS   |
| 311P407-3S-B-15               | 311P407-3S-B-15               | 206064-2                     | 206064-2                     | LESS CONTACTS   |
| 311P407-3S-B-12               | 311P407-3S-B-12               | 206064-4                     | 206064-4                     | LESS CONTACTS   |
| 311P407-4S-B-15               | 311P407-4S-B-15               | 206503-1                     | 206503-1                     | LESS CONTACTS   |
| 311P407-4S-B-12               | 311P407-4S-B-12               | 206503-4                     | 206503-4                     | LESS CONTACTS   |
| 311P407-5S-B-15               | 311P407-5S-B-15               | 206505-1                     | 206505-1                     | LESS CONTACTS   |
| 311P407-5S-B-12               | 311P407-5S-B-12               | 206505-4                     | 206505-4                     | LESS CONTACTS   |
| 311P407-6S-B-15               | 311P407-6S-B-15               | 206065-2                     | 206065-2                     | LESS CONTACTS   |
| 311P407-6S-B-12               | 311P407-6S-B-12               | 206065-4                     | 206065-4                     | LESS CONTACTS   |
| 311P409-1P-B-15               | 311P409-1P-B-15               | 207252-1                     | 207252-1                     | LESS CONTACTS   |
| 311P409-1P-B-12               | 311P409-1P-B-12               | 207252-2                     | 207252-2                     | LESS CONTACTS   |
| 311P409-2P-B-15               | 311P409-2P-B-15               | 206798-1                     | 206798-1                     | LESS CONTACTS   |
| 311P409-2P-B-12               | 311P409-2P-B-12               | 206798-2                     | 206798-2                     | LESS CONTACTS   |
| 311P409-3P-B-15               | 311P409-3P-B-15               | 206800-1                     | 206800-1                     | LESS CONTACTS   |
| 311P409-3P-B-12               | 311P409-3P-B-12               | 206800-2                     | 206800-2                     | LESS CONTACTS   |
| 311P409-4P-B-15               | 311P409-4P-B-15               | 206802-1                     | 206802-1                     | LESS CONTACTS   |
| 311P409-4P-B-12               | 311P409-4P-B-12               | 206802-2                     | 206802-2                     | LESS CONTACTS   |
| 311P409-5P-B-15               | 311P409-5P-B-15               | 206804-1                     | 206804-1                     | LESS CONTACTS   |
| 311P409-5P-B-12               | 311P409-5P-B-12               | 206804-2                     | 206804-2                     | LESS CONTACTS   |
| 311P409-1S-B-15               | 311P409-1S-B-15               | 207253-1                     | 207253-1                     | LESS CONTACTS   |
| 311P409-1S-B-12               | 311P409-1S-B-12               | 207253-2                     | 207253-2                     | LESS CONTACTS   |
| 311P409-2S-B-15               | 311P409-2S-B-15               | 206799-1                     | 206799-1                     | LESS CONTACTS   |
| 311P409-2S-B-12               | 311P409-2S-B-12               | 206799-2                     | 206799-2                     | LESS CONTACTS   |
| 311P409-3S-B-15               | 311P409-3S-B-15               | 206801-1                     | 206801-1                     | LESS CONTACTS   |
| 311P409-3S-B-12               | 311P409-3S-B-12               | 206801-2                     | 206801-2                     | LESS CONTACTS   |
| 311P409-4S-B-15               | 311P409-4S-B-15               | 206803-1                     | 206803-1                     | LESS CONTACTS   |
| 311P409-4S-B-12               | 311P409-4S-B-12               | 206803-2                     | 206803-2                     | LESS CONTACTS   |
| 311P409-5S-B-15               | 311P409-5S-B-15               | 206805-1                     | 206805-1                     | LESS CONTACTS   |
| 311P409-5S-B-12               | 311P409-5S-B-12               | 206805-2                     | 206805-2                     | LESS CONTACTS   |
| G-08-P1                       |                               | 204370-8                     |                              | SIZE 22 PIN   |
| G-08-S1                       |                               | 206071-1                     |                              | SIZE 22 SOCKET  |
| G-10-P1                       |                               | 205089-4                     |                              | SIZE 20 PIN   |
| G-10-S1                       |                               | 206793-1                     |                              | SIZE 20 SOCKET  |

5 Pin and Socket Connectors

### Introduction

#### Product Facts

- **Modular versatility with Multimate contact capabilities permit multiple combinations of power, signal, coaxial and fiber optic circuits in one basic connector configuration**
- **Choice of shell sizes for housing one, two or three contact modules**
- **Modules available accommodating various circuit arrangements**
- **Polarized shells, with and without floating bushings**
- **Machine-applied terminations provide high production rates at low applied cost**
- **Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476**
- **Certified by Canadian Standards Association, File No. LR 7189**



AMP G Series connectors provide a practical means of mixing various types of electrical circuits in one basic connector configuration. They offer modular versatility as well as Multimate contact capabilities which permit use of multiple combinations of power, signal, coaxial and fiber optic circuits in the same connectors.

The "G" Series connector line provides a choice of shell sizes for housing either one, two, or three

contact modules. The modules, in turn, are available in a variety of circuit densities to accommodate Type XII power contacts; Size 12 Type I and miniature COAXICON contacts (interchangeable in the same contact cavity); and Size 16 Type II, III+, VI, X, subminiature COAXICON contacts.

Each shell includes a retainer plate for easy drop-in assembly of the contact modules. Both shell and retainer are made of cast

aluminum. Shells also are available with and without floating bushings and are polarized with keyways in the receptacles and matching keys in the plugs. The modules are made of either diallyl phthalate or general purpose phenolic.

Complementing the "G" Series modular connectors are latching hardware, cable clamps and strain relief which ensure the integrity of all mated connections.

#### Technical Documents

The following is a list of technical documents covering the application, performance and maintenance of "G" Series Connectors.

**Product Specifications** describe technical performance characteristics and verification tests. They are intended for the Design, Component and Quality Engineer.

**108-10002** — AMP G Series Connectors

**108-10037** — Type XII Contacts

**Instruction Sheets** provide instructions for assembling or applying the product. They are intended for the Manufacturing Assembler or Operator.

#### Product —

Connectors, Contacts and Accessories — 408-7171, 408-7184, 408-7189, 408-7190, 408-7230

Locking Latch — 408-7268

Locking Spring — 408-7187

Cable Clamps — 408-7185

Strain Relief — 408-7186, 408-7263

#### Tooling —

Crimping Dies:

Type I Contacts 1 — 408-7225

Type II Contacts — 408-7420, 408-7453

Type XII Contacts — 408-7175

Miniature COAXICON Contacts — 408-1770

Hand Crimping:

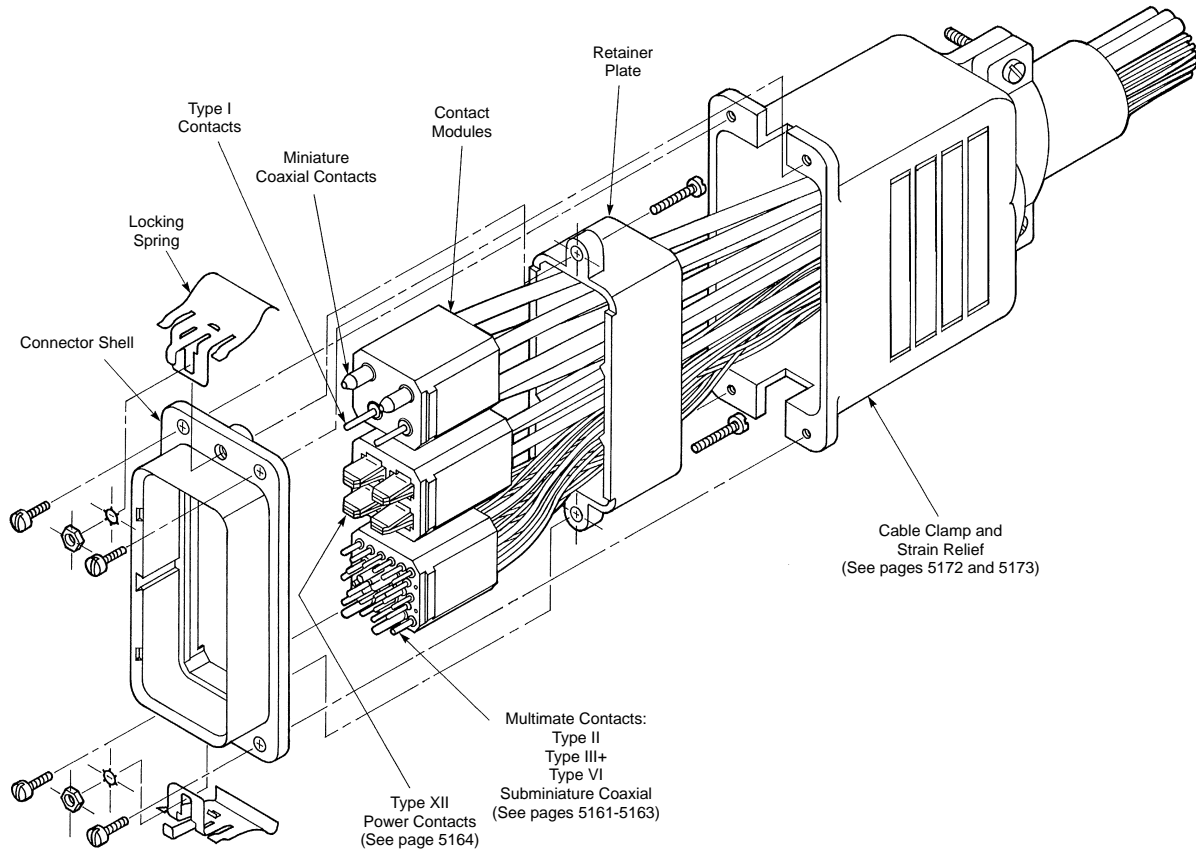
Type I Contacts — 408-7192

Type II Contacts — 408-6810, 408-1786, 408-7267

Type III+ Contacts — 408-7414, 408-9819

Type VI Contacts — 408-9819, 408-7680, 408-7716

Type XII Contacts — 408-2095



**Contact Current Carrying Capability**

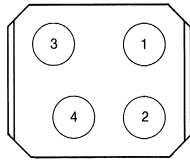
The total current capacity of each contact is dependent upon the heat rise resulting from the combination of electrical loads on all the contacts in the connector arrangement and the maximum ambient temperature in which the connector will be operating. Caution must be taken to assure that these combinations of conditions do not cause the internal temperature of the connector to exceed the maximum operating temperature of the housing material. There are several variables which must be considered when determining the maximum current capability of your application.

These variables are:

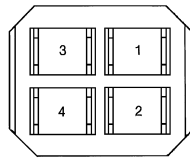
- a) Wire Size — Larger wire will carry more current since it has less internal resistance to current flow and generates less heat. The wire also conducts heat away from the connector.
- b) Connector Size — In general, the more circuits in a connector, the less current per contact can be carried.
- c) Ambient Temperature — The higher the ambient temperature, the less current can be carried.



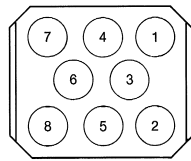
Contact Modules



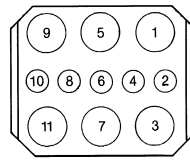
4 Position  
(Type I and/or Miniature  
COAXICON Contacts)



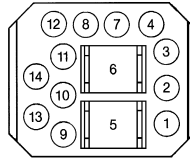
4 Position  
(Type XII Power Contacts)



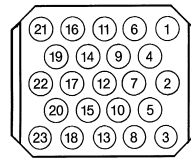
8 Position  
(Type I and/or Miniature  
COAXICON Contacts)



11 Position  
(Type I and/or Miniature  
COAXICON Contacts  
and Multimate Contacts)



14 Position  
(Type XII and Multimate  
Contacts)



23 Position  
(Multimate Contacts)

**Note:** Mating face of Pin Module shown. Socket Module is mirror image.

| No. of Positions | Module Will Accommodate These Contact Variations†  | Part Numbers |               |                       |                       |
|------------------|--|--------------|---------------|-----------------------|-----------------------|
|                  |  | Phenolic     |               | Diallyl Phthalate     |                       |
|                  |  | Pin Module   | Socket Module | Pin Module            | Socket Module         |
| 4                | 4 Type XII Contacts  | 202624-2     | 202625-2      | —                     | —                     |
| 4                | 4 Miniature COAXICON Contacts or Type I (Size 12) Contacts   | —            | —             | 213092-2              | 213093-2              |
| 8                | 8 Any combination of Miniature COAXICON Contacts and Type I (Size 12) Contacts   | —            | —             | 213090-4*<br>213090-2 | 213091-4*<br>213091-2 |
| 11               | 6 Miniature COAXICON Contacts or Type I (Size 12) Contacts and 5 Type II (Size 16), Type III+ (Size 16), Type VI (Size 16) or Subminiature COAXICON Contacts | 202648-4     | 202649-4      | 202648-2              | 202649-2              |
| 14               | 2 Type XII Contacts and 12 Type II (Size 16), Type III+ (Size 16), Type VI (Size 16), or Subminiature COAXICON Contacts                                      | 202759-2     | 202760-2      | 202759-4              | 202760-4              |
| 23               | 23 Type II (Size 16), Type III+ (Size 16), Type VI (Size 16) or Subminiature COAXICON Contacts   | 202650-4     | 202651-4      | 202650-2              | 202651-2              |

\*Type I contacts cannot be used in cavities 1, 2, 7 and 8.  
†Order contacts separately, see below and pages 5163-5166.

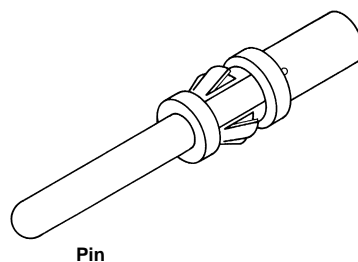
Multimate Contacts

Type I Contacts

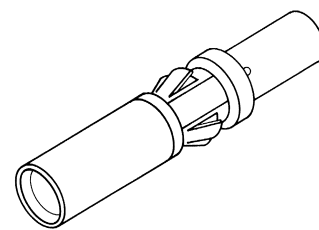
Contact size — 12  
Pin diameter — .094 [2.39]  
Test current — 23 amperes\*

Materials:

Contact Body — Copper alloy  
Spring — Stainless steel  
Finish — .000030 [0.00076] gold over .000030 [0.00076] nickel



Pin



Socket

\*Note: Current carrying capability depends on wire size, connector size and ambient temperature.

| Wire Size Range<br>AWG | Wire Strip Length<br>[mm <sup>2</sup> ] | Wire Strip Length | Ins. Dia. Range | Loose Piece Contact Part No. |          | Tooling Part Number |                               |
|------------------------|---|-------------------|-----------------|------------------------------|----------|---------------------|-------------------------------|
|                        |   |                   |                 | Pin                          | Socket   | Hand Tool           | Dies for Pneumatic Tool 69365 |
|                        |   |                   |                 |                              |          |                     |                               |
| 18-16                  | 0.8-1.4                                 | .234<br>5.95      | No Ins. Support | 202421-1                     | 202418-1 | 90121               | 90122                         |
| 14-12                  | 2-3                                     | .234<br>5.95      | No Ins. Support | 202422-1                     | 202417-1 |                     |                               |

Extraction Tool Part Number 305183-8.

Signal Contacts

Type II, Screw Machined, Crimp

Material

Contact Body — Brass

Retention Spring — Stainless steel

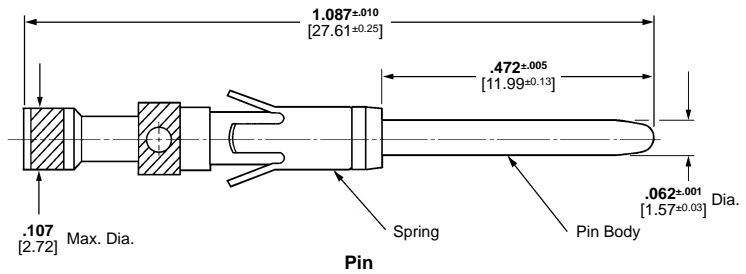
Finish

Contact Body — 000030 [0.00076] gold over .000050 [0.00127] nickel. Gold thickness controlled on socket O.D.

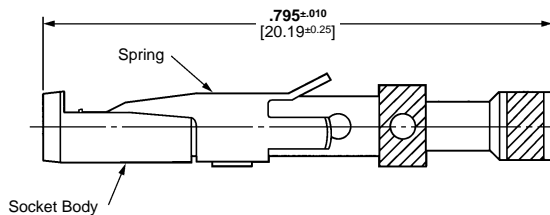
Retention Spring — Stainless steel



Pin



Socket



Socket

Contact Size 16—Pin Diameter .062 [1.57] (Test Current, 13 Ampere)‡

| Wire Size Range | Ins. Dia. Range <sup>1</sup> | Tape Mounted Contact No. <sup>2</sup> |                       | Loose Piece Contact No. |                         | Contact Color Code    | Tooling Part No.                                   |   |                      |  |
|-----------------|------------------------------|---------------------------------------|-----------------------|-------------------------|-------------------------|-----------------------|--|---|----------------------|--|
|                 |                              | Pin                                   | Socket                | Pin                     | Socket                  |                       | Tape Mounted Dies for AMP-TAPETRONIC Machine 69875 | Loose Piece Die Set for 626 Pneumatic Tool System | Hand Tool            |  |
| 28-24           | 0.08-0.20                    | .035-.055<br>0.89-1.40                | 201611-4              | —                       | 201611-1 <sup>4</sup>   | 201613-1 <sup>5</sup> | Red/Red  | 90249-2   | 90230-1 <sup>7</sup> | 91538-1<br>or 601967-1                         |
|                 |                              |                                       | —                     | —                       | 201334-1 <sup>4</sup>   | 201332-1 <sup>5</sup> |  |   |                      | Red/Red  |
|                 |                              |                                       | —                     | —                       | 202410-1 <sup>4</sup>   | 202411-1 <sup>5</sup> | Green  | —   | —                    | 601967-1                                       |
| 24-20           | 0.2-0.6                      | .040-.062<br>1.02-1.57                | 201578-4              | —                       | 201578-1 <sup>4</sup>   | 201580-1 <sup>5</sup> | Yellow/Red   | 90249-2   | 90230-1 <sup>7</sup> | 91538-1<br>or 58541-1 <sup>*</sup>             |
|                 |                              |                                       | 201330-6              | 201328-9                | 201330-1 <sup>4</sup>   | 201328-1 <sup>5</sup> | Yellow/Red   |   |                      | —  |
| 18<br>(Two)     | 0.9-0.9<br>(Two)             | No. Ins. Support                      | —                     | —                       | 202725-1 <sup>4</sup>   | 202726-1 <sup>4</sup> | Blue   | —   | 90231-2 <sup>7</sup> | 91539-1<br>or 601967-1                         |
| 18-16           | 0.8-1.4                      | .080-.105<br>2.03-2.67                | —                     | —                       | 202507-1 <sup>4</sup>   | 202508-1 <sup>5</sup> | —  | —   | —                    | 90136-1<br>or 601967-1                         |
|                 |                              |                                       | 200336-6              | 200333-8                | 200336-1 <sup>4</sup>   | 200333-1 <sup>4</sup> | Blue/Blue  | 90250-1   | 90231-2 <sup>7</sup> | 91539-1  |
|                 |                              |                                       | —                     | —                       | 204219-1 <sup>5,6</sup> | —                     | Blue/Blue  | —   | —                    | 58541-1 <sup>*</sup><br>or 601967-1            |
| 14              | 2                            | No Ins. Support                       | 212618-2 <sup>3</sup> | 201568-3                | 201570-1 <sup>4</sup>   | 201568-1 <sup>5</sup> | Violet/Blue  | 90250-1   | 90231-2 <sup>7</sup> | 91539-1<br>58541-1 <sup>*</sup><br>or 601967-1 |

<sup>1</sup>Overall insulation crimp diameter, including crimp barrel, must not exceed .125 [3.18].

<sup>2</sup>For AMP-TAPETRONIC Machine Part Number 69875, order contacts by Tape Mounted Contact No., plus packaging code "IM REEL" (5000 parts per reel).

<sup>3</sup>Grounding pin is used to provide a make-first/break-last condition when mating and unmating connector halves.

<sup>4</sup>Use turret TH502 (1-601967-6) with hand tool 601967-1.

<sup>5</sup>Use turret TH501 (1-601967-5) with hand tool 601967-1.

<sup>6</sup>Pin length is .630±.005 [16.002±.0127] on these two pins.

<sup>7</sup>Die Set requires "C" Head Adapter Part Number 318161-1; Adapter Holder Part Number 356304-1 (with ratchet) or 189928-1 (without); and Power Unit Part Number 189721-2 (hand actuated) or 189722-2 (foot actuated).

<sup>\*</sup>Commercial PRO-CRIMPER II Hand Tool for field repair use only. Note: Die Set can be adapted for use with the 626 Pneumatic Tool System.

<sup>†</sup>Does not use Hand Tool 91539-1 or 601967-1.

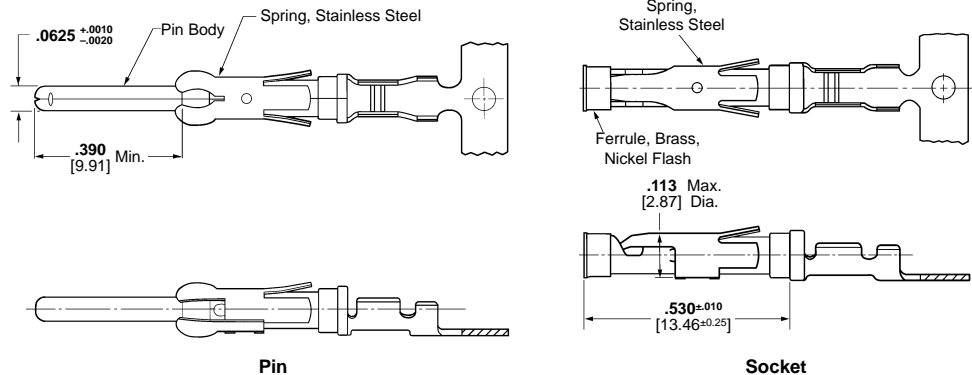
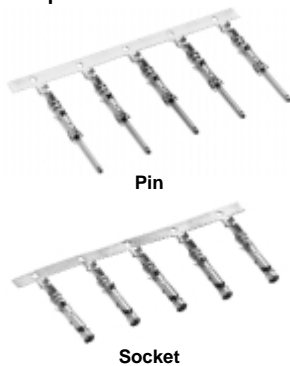
<sup>‡</sup>Single contact, free-air test current is not to be construed as contact rating current.

Insertion Tool Part Number 200893-2 (for insulation diameters .070 [1.78] or less).

Extraction Tool Part Number 305183.

Signal Contacts (Continued)

Type III+ Precision Formed, Crimp



Material and Finish

Contact Body — Brass  
Retention Spring — Stainless steel

Contact Size 16—Pin Diameter .062 [1.57] (Test Current, 13 Ampere)‡

| Wire Size Range |                 | Ins. Dia. Range                     | Contact Finish                | Strip Form Contact No. |           | Loose Piece Contact No. |         | Tooling Part No.   |   |
|-----------------|-----------------|-------------------------------------|-------------------------------|------------------------|-----------|-------------------------|---------|--|---|
| AWG             | mm <sup>2</sup> |                                     |                               | Pin                    | Socket    | Pin                     | Socket  | Loose Piece Hand Tool  | Strip Form Applicators                          |
| 30-26           | 0.05-0.15       | .040-.060 <sup>1</sup><br>1.02-1.52 | Bright Tin-Lead               | 66425-6                | 66424-6   | —                       | —       | 91515-1 <sup>5</sup>   | 466598-□***                                     |
|                 |                 |                                     | Gold/Nickel <sup>2</sup>      | 66425-7                | 66424-7   | 66429-3                 | 66428-3 |  |   |
|                 |                 |                                     | Sel. Gold/Nickel <sup>3</sup> | 66425-8                | 66424-8   | 66429-4                 | 66428-4 |  |   |
|                 |                 | .014-.030 <sup>1</sup><br>0.36-0.76 | Gold/Nickel <sup>2</sup>      | 66393-7                | 66394-7   | —                       | —       | 90225-2 <sup>5</sup>   | 466585-3***                                     |
|                 |                 |                                     | Sel. Gold/Nickel <sup>3</sup> | 66393-8                | 66394-8   | 66406-4                 | 66405-4 |  |   |
|                 |                 |                                     |                               |                        |           |                         |         |  |   |
| 26-24           | 0.12-0.2        | .035-.055 <sup>1</sup><br>0.89-1.40 | Bright Tin-Lead               | 66106-6                | 66108-6   | 66107-2                 | 66109-2 | 91515-1 <sup>5</sup><br>or<br>58495-1*                         | 466321-□***<br>or<br>466908-2***                |
|                 |                 |                                     | Gold/Nickel <sup>2</sup>      | 66106-7                | 66108-7   | 66107-3                 | 66109-3 |  |   |
|                 |                 |                                     | Sel. Gold/Nickel <sup>3</sup> | 66106-8                | 66108-8   | 66107-4                 | 66109-4 |  |   |
|                 |                 | .040-.080 <sup>1</sup><br>1.02-2.03 | Bright Tin-Lead               | 66102-7                | 66104-7   | 66103-2                 | 66105-2 | 91515-1 <sup>5</sup><br>or<br>58495-1*                         | 466323-□***<br>or<br>466907-2***                |
|                 |                 |                                     | Gold/Nickel <sup>2</sup>      | 66102-8                | 66104-8   | 66103-3                 | 66105-3 |  |   |
|                 |                 |                                     | Sel. Gold/Nickel <sup>3</sup> | 66102-9                | 66104-9   | 66103-4                 | 66105-4 |  |   |
| 24-20           | 0.2-0.6         | .060-.120 <sup>4</sup><br>1.52-3.05 | Bright Tin-Lead               | 66564-6                | 66563-6   | 66566-2                 | 66565-2 | 91542-1 <sup>5</sup>   | 466383-4***<br>or 466979-1***<br>or 567363-□*** |
|                 |                 |                                     | Sel. Gold/Nickel <sup>3</sup> | 66564-8                | 66563-8   | 66566-4                 | 66565-4 |  |   |
|                 |                 |                                     |                               |                        |           |                         |         |  |   |
|                 |                 | .080-.100 <sup>1</sup><br>2.03-2.54 | Bright Tin-Lead               | 66332-5                | 66331-5   | 66400-1                 | 66399-1 | 91523-1 <sup>5</sup><br>or<br>90225-2 <sup>5</sup>             | 466324-□***<br>or<br>466942-1***                |
|                 |                 |                                     | Gold/Nickel <sup>2</sup>      | 66332-7                | 66331-7   | 66400-3                 | 66399-3 |  |   |
|                 |                 |                                     | Sel. Gold/Nickel <sup>3</sup> | 66332-8                | 66331-8   | 66400-4                 | 66399-4 |  |   |
| 18-16           | 0.8-1.4         | .080-.100 <sup>1</sup><br>2.03-2.54 | Bright Tin-Lead               | 66098-7                | 66100-7   | 66099-2                 | 66101-2 | 91505-1 <sup>5</sup> or<br>91523-1 <sup>5</sup> or<br>58495-1* | 466325-□***<br>or<br>466906-1***                |
|                 |                 |                                     | Gold/Nickel <sup>2</sup>      | 66098-8                | 66100-8   | 66099-3                 | 66101-3 |  |   |
|                 |                 |                                     | Sel. Gold/Nickel <sup>3</sup> | 66098-9                | 66100-9   | 66099-4                 | 66101-4 |  |   |
|                 |                 | .080-.100 <sup>1</sup><br>2.03-2.54 | Bright Tin-Lead               | 66359-6                | 66358-6   | 66361-2                 | 66360-2 | 91519-1 <sup>5</sup>   | 466326-□***<br>or<br>466923-2***                |
|                 |                 |                                     | Gold/Nickel <sup>2</sup>      | 66359-9                | 66358-9   | 66361-3                 | 66360-3 |  |   |
|                 |                 |                                     | Sel. Gold/Nickel <sup>3</sup> | 1-66359-0              | 1-66358-0 | 66361-4                 | 66360-4 |  |   |
| 18-14           | 0.8-2.0         | .110-.150 <sup>4</sup><br>2.79-3.81 | Bright Tin-Lead               | 66597-1                | 66598-1   | 66602-1                 | 66601-1 | 91521-1 <sup>5</sup>   | 466958-1***<br>or<br>567364-□***                |
|                 |                 |                                     | Gold/Nickel <sup>2</sup>      | —                      | —         | —                       | —       |  |   |
|                 |                 |                                     | Sel. Gold/Nickel <sup>3</sup> | 66597-2                | 66598-2   | 66602-2                 | 66601-2 |  |   |

<sup>1</sup>Overall insulation crimp diameter, including crimp barrel, must not exceed .125 [3.18].

<sup>2</sup>.000015 [0.00038] gold in the mating area over .000030 [0.00076] min. nickel.

<sup>3</sup>.000030 [0.00076] gold in the mating area over .000030 [0.00076] min. nickel.

<sup>4</sup>Contacts can only be used in Metrimate, Series 1 (Arr. 23-24), Series 4 (Arr. 23-13M, 23-16M, 23-22M), and VDE connectors.

<sup>5</sup>To use with the 626 Pneumatic Tool System: remove the crimping head from the Straight Action Hand Tool (SAHT) Assembly, order SAHT Adapter (Contact Technical Support for Part Number), Adapter Holder Part Number 356304-1 (with ratchet) or 189928-1 (without), and Power Unit Part Number 189721-1 (hand actuated) or 189722-1 (foot actuated).

\*Commercial PRO-CRIMPER II hand tool for field repair only. Note: Die Set can be adapted for use with the 626 Pneumatic Tool System.

‡Single contact, free-air test current is not to be construed as contact rating current. Use only for testing.

Insertion Tool Part Number 91002-1 (for insulation diameters .070 [1.78] or less), Number 200893-2 (for insulation diameters .090 [2.29] max.).

Extraction Tool Part Number 305183.

\*\*\*Contact Technical Support for Automatic Machine Applicator Part Numbers.

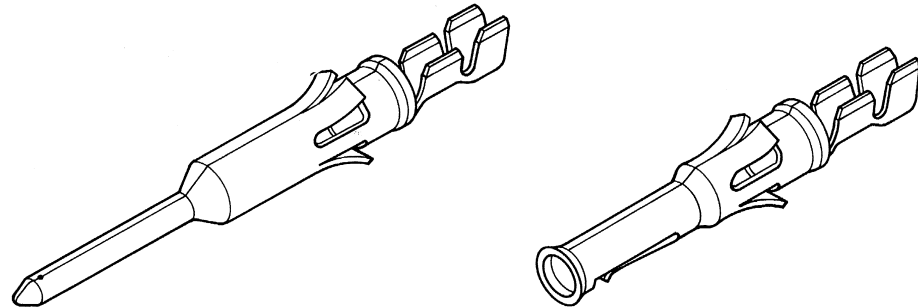
Multimate Contacts

Type VI Contacts

Contact size — 16  
 Pin diameter — .062 [1.57]  
 Test current — 13 amperes\*  
 Material — Copper alloy

Contact Finish:

A — Tin  
 B — Gold flash over .000050 [0.00127] nickel on entire contact with .000030 [0.00076] selective gold plating on contact area



Pin

Socket

\*Note: Current carrying capability depends on wire size, connector size and ambient temperature.

| Wire Size Range <sup>1</sup> |                    | Ins. Dia. Range                     | Contact Finish | Contact Part Number (reeled for AMP Standard Applicator) |         | Contact Part Numbers (reeled for AMP Quick-Change Applicator) |         | Loose Piece Contact Part No. |         | Tooling Part Numbers Hand Tool  |
|------------------------------|--------------------|-------------------------------------|----------------|--|---------|---|---------|------------------------------|---------|---------------------------------|
| AWG                          | [mm <sup>2</sup> ] |                                     |                | Pin  | Socket  | Pin   | Socket  | Pin                          | Socket  |                                 |
| 28-26                        | 0.08-0.15          | .035-.055<br>0.89-1.4               | A              | 66585-1  | —       | 66585-2   | —       | —                            | —       | 91515-1<br>58495-1 <sup>3</sup> |
|                              |                    |                                     | B              | —  | —       | 66585-4   | 66586-4 | 66595-2                      | 66596-2 | —                               |
| 24-20                        | 0.2-0.6            | .040-.080<br>1.02-2.03              | A              | 66583-1  | 66584-1 | 66583-2   | 66584-2 | 66593-1                      | 66594-1 | 91515-1<br>58495-1 <sup>3</sup> |
|                              |                    |                                     | B              | —  | —       | 66583-4   | 66584-4 | 66593-2                      | 66594-2 | —                               |
| 22-18                        | 0.3-0.9            | .055-.110<br>1.40-2.79              | A              | 66581-1  | 66582-1 | 66581-2   | 66582-2 | 66591-1                      | 66592-1 | 90327-1                         |
|                              |                    |                                     | B              | —  | —       | 66581-4   | 66582-4 | 66591-2                      | 66592-2 | —                               |
| 18-16                        | 0.8-1.4            | .080-.100<br>2.03-2.54              | A              | 66579-1  | 66580-1 | 66579-2   | 66580-2 | 66589-1                      | 66590-1 | 91515-1<br>58495-1 <sup>3</sup> |
|                              |                    |                                     | B              | —  | —       | 66579-4   | 66580-4 | 66589-2                      | 66590-2 | —                               |
| 14                           | 2                  | .080-.135 <sup>2</sup><br>2.03-3.43 | A              | 66577-1  | 66578-1 | 66577-2   | 66578-2 | 66587-1                      | —       | 91550-1                         |
|                              |                    |                                     | B              | —  | —       | 66577-4   | 66578-4 | 66587-2                      | 66588-2 | —                               |

<sup>1</sup>Wire strip length—.156 [.396] (all wire sizes).  
<sup>2</sup>Maximum insulation diameter recommended for "G" Series connectors with Multimate contact cavities is .110 [2.79].  
<sup>3</sup>Economy Hand Tool for field repair only.  
 Insertion Tool Part Number 91002-1 for insulation diameters .070 [1.78] or less.  
 Extraction Tool Part Number 305183.

Applicator Nos. for Terminating Machines

| Wire Size Range |                 | Model K  | Model T  | Model G  | Model Stripper/Crimper |
|-----------------|-----------------|--|----------|----------|------------------------|
| AWG             | mm <sup>2</sup> |  |          |          |                        |
| 28-26           | 0.08-0.15       | 466321-4                                       | 466321-3 | 466321-6 | 466908-2               |
| 24-20           | 0.2-0.6         | 466323-4                                       | 466323-3 | —        | 466907-2               |
| 22-18           | 0.3-0.9         | 466384-4                                       | 466384-3 | —        | 466914-1               |
| 18-16           | 0.8-1.4         | 466325-2                                       | 466325-1 | 466325-5 | —                      |
| 14              | 2               | 687997-2 <sup>4</sup><br>687997-4 <sup>4</sup> | —        | —        | —                      |

<sup>4</sup>Insulation Dia. Range—Part Number 687997-2, .080-.105 [2.03-2.67]; Part Number 687997-4, .105-.135 [2.67-3.43].

Multimate Contacts (Continued)

Type XII Power Contacts

Continuous Operating Current

Silver or gold — 25 amperes max.

Tin-lead — 15 amperes max.

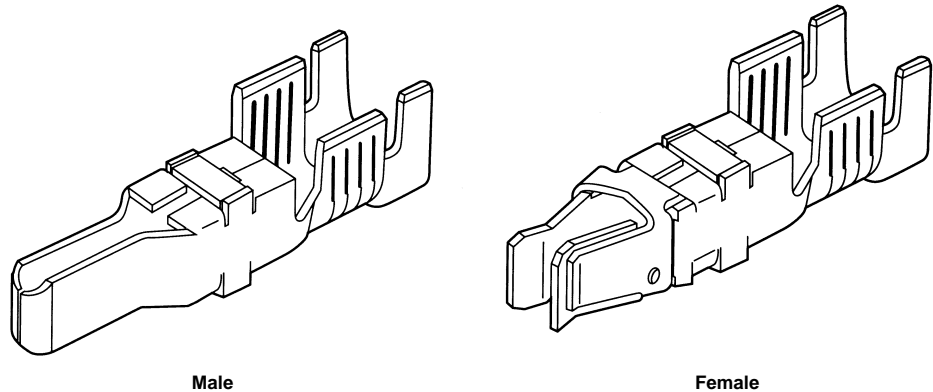
Material — Copper

Contact Finish

A — Tin-Lead

B — .000030 [0.00076] selective gold over .000030 [0.00076] nickel

C — .000100 [0.00254] silver plated contacts with lubricant added



| Wire Size Range <sup>1</sup> |                    | Ins. Dia. Range        | Contact Finish | Strip Form Contact Part Number |         |                              |           | Loose Piece Contact Part No. |         | Die Insert Number for Hand Tool 69710-1, or 626 Pneumatic Tool System** |
|------------------------------|--------------------|------------------------|----------------|--------------------------------|---------|------------------------------|-----------|------------------------------|---------|---|
| AWG                          | [mm <sup>2</sup> ] |                        |                | for Standard Applicator        |         | for Quick-Change Applicator* |           | Male                         | Female  |   |
| 16 and 14-12                 | 1.25-1.4 and 2-3   | .135-.160<br>3.43-4.06 | A              | 66255-1                        | 66740-7 | 66255-5                      | 1-66740-2 | 66261-1                      | 66740-8 | 90145-2 <sup>3</sup><br>and<br>90145-1 <sup>4</sup>                     |
|                              |                    |                        |                | 66256-1 <sup>2</sup>           | —       | 66256-5 <sup>2</sup>         | —         | 66262-1 <sup>2</sup>         | —       |   |
|                              |                    |                        | B              | 66255-2                        | 66740-5 | 66255-6                      | 1-66740-1 | 66261-2                      | 66740-6 |   |
|                              |                    |                        |                | 66256-2 <sup>2</sup>           | —       | 66256-4 <sup>2</sup>         | —         | 66262-2 <sup>2</sup>         | —       |   |
|                              |                    |                        | C5             | 66255-7                        | 66740-1 | 66255-8                      | 66740-9   | 66261-4                      | 66740-2 |   |
|                              |                    |                        |                | 66256-6 <sup>2</sup>           | —       | 66256-7 <sup>2</sup>         | —         | 66262-4 <sup>2</sup>         | —       |   |
| 10                           | 5-6                | .190-.220<br>4.83-5.59 | A              | 66253-1                        | 66741-7 | 66253-5                      | 1-66741-2 | 66259-1                      | 66741-8 | 90140-1   |
|                              |                    |                        |                | 66254-1 <sup>2</sup>           | —       | —                            | —         | 66260-1 <sup>2</sup>         | —       |   |
|                              |                    |                        | B              | 66253-2                        | 66741-5 | 66253-6                      | 1-66741-1 | 66259-2                      | 66741-6 |   |
|                              |                    |                        |                | 66254-2 <sup>2</sup>           | —       | —                            | —         | 66260-2 <sup>2</sup>         | —       |   |
|                              |                    |                        | C5             | 66253-4                        | 66741-1 | 66253-8                      | 66741-9   | 66259-4                      | 66741-2 |   |
|                              |                    |                        |                | 66254-4 <sup>2</sup>           | —       | —                            | —         | 66260-4 <sup>2</sup>         | —       |   |

<sup>1</sup>Wire strip length—.281 [7.14]

<sup>2</sup>Grounding Contact

<sup>3</sup>Die Insert Part Number 90145-2 is for crimping 16 AWG [1.25-1.4 mm<sup>2</sup>] wire

<sup>4</sup>Die Insert Part Number 90145-1 is for crimping 14-12 AWG [2-3 mm<sup>2</sup>] wire

<sup>5</sup>Recommended for high current/vibration applications where fretting corrosion is a problem.

Extraction Tool Part Number 91019-3

\*Quick-Change Applicators for—16-14-12 AWG: Model K—Part Number 567455-2, Model T—Part Number 567455-1, Model G—Part Number 567455-3  
10 AWG: Model K—Part Number 567021-2, Model T—Part Number 567021-1, Model G—Part Number 567021-4

\*\* Use 626 adapter 318161-1

Multimate Contacts (Continued)

Miniature COAXICON Contacts

Material

Outer Shell — Brass per MIL-C-50

Center Conductor — Beryllium copper

Inner Dielectric — Polypropylene

Retention Spring — Passivated stainless steel

Ferrule — Copper

Finish

Outer Shell, Center Conductor — .000030 [0.00076] gold over .000030 [0.00076] nickel

Retention Spring — Nickel per QQ-N-290

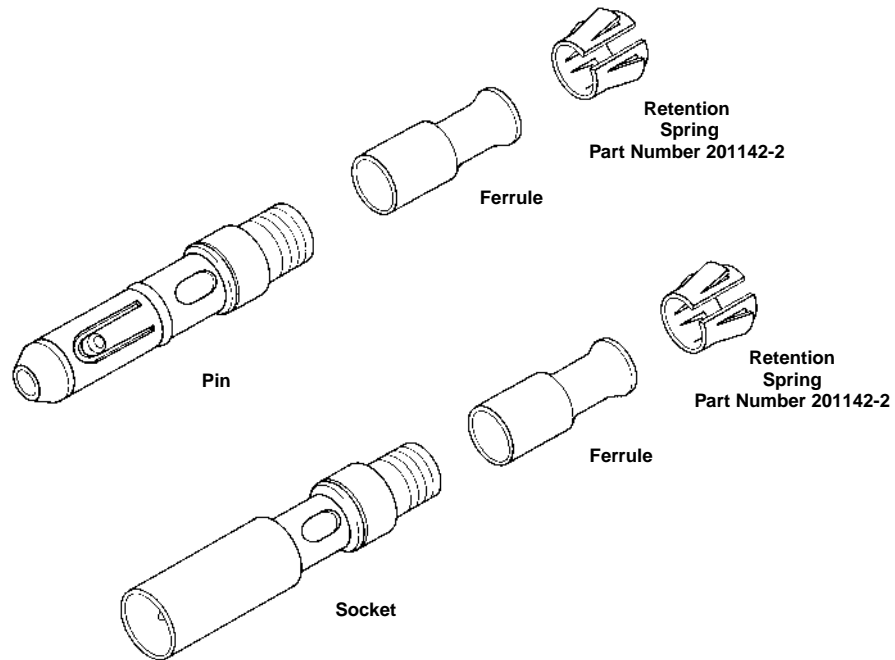
Ferrule — Bright tin-lead per MIL-T-10727

Contacts

A — .000030 [0.00076] gold

B — .000100 [0.00254] gold

Test Method for Electronic and Electrical Component Parts: MIL-STD-202



Selection Chart for Coaxial Cable

| Cable Size (RG/U)   | Contact Finish | Loose Piece Contact Part Number |            | Ferrule Part Number | Tooling Part Number  |                      | Tool Handle, Die Insert and Plastic Collar Color Code** |
|---|----------------|---------------------------------|------------|---------------------|--|----------------------|---|
|   |                | Pin                             | Socket     |                     | Die Insert for Hand Tool 69710 or 626 Pneumatic Tool System <sup>2</sup> | Hand Tool Number     |   |
| 55, 55A, 55B, 141, 142, 223                                   | A              | 201145-4                        | 201146-4   | 330478              | 69315-4  | 69248-4              | Blue & Orange   |
|   | B              | —                               | 201146-9   |                     |  |                      |   |
| 58, 58A, 58B, 58C   | A              | 201145-4                        | 201146-4   | —                   | 69220-2  | —                    | Blue  |
|   | B              | —                               | 201146-9   |                     |  |                      |   |
| 59, 59A, 59B, 62, 62A, 62B<br>124, 140, 210 (4-Position Only) | A              | 201097-1                        | 201098-1   | 329006              | 69675-1  | 91912-4 <sup>1</sup> | Yellow  |
|   | B              | —                               | 201144-6   |                     |  |                      |   |
| 179, 179A, 187, 21-598  | A              | 201143-1                        | 201144-1   | 328666              | 69227-2  | 91912-3 <sup>1</sup> | White   |
|   | B              | —                               | 201144-6   |                     |  |                      |   |
| 180, 180A, 195, 21-597  | A              | 201145-2                        | 201146-2   | 328664              | 69222-2  | —                    | Red   |
|   | B              | 1-201145-0                      | 1-201146-0 |                     |  |                      |   |
| 178, 178A, 196  | A              | 201511-1                        | —          | 328667              | 69373  | 69186-2              | Brown   |
| 174, 188, 316   | A              | 201143-5                        | 201144-5   | 328666              | 69227-2  | 91912-3 <sup>1</sup> | White   |
|   | B              | 201143-7                        | 201144-7   |                     |  |                      |   |
| 122   | A              | 201145-1                        | 201146-4   | 328664              | 69222-2  | 45639-2              | Red   |

\*Includes bench mount and foot control.

\*\*Match Plastic Collar and Tool colors for application to cable, Inner Insulator color identifies Wire Barrel of Center Contact

Note: A ferrule and retention spring (Part Number 201142-2) are required for each pin and socket.

Extraction Tool Part Number 305183-8

<sup>1</sup> SDE die used with tool frame 354940-1

<sup>2</sup> Use 626 adapter 318161-1

Selection Chart for Twisted Pair Leads

| Wire Size Range           |                    | Max. Ins. Dia. (Two Wires Combined) | Contact Finish | Loose Piece Contact Part Number |          | Ferrule Part Number | Tooling Part Number   |                      | Tool Handle, Die Insert and Plastic Collar Color Code ** |
|---------------------------|--------------------|-------------------------------------|----------------|---------------------------------|----------|---------------------|---|----------------------|--|
| AWG                       | [mm <sup>2</sup> ] |                                     |                | Pin                             | Socket   |                     | Die Inserts for Hand Tool 69710-1 or 626 Pneumatic Tool System <sup>1</sup> | Hand Tool            |  |
| 28-26 (Solid)             | 0.08-0.15          | .080<br>2.03                        | A              | 201511-1                        | —        | 328667              | 69373   | 69186-2              | Brown  |
| 24-22 (Stranded)          | 0.2-0.4            | .115<br>2.92                        | A              | 201143-5                        | 201144-5 | 328666              | 69672   | 91912-4 <sup>2</sup> | Gray and White   |
|                           |                    |                                     | B              | 201143-7                        | 201144-7 |                     |   |                      |  |
| 24-22 (Solid or Stranded) | 0.2-0.4            | .160<br>.406                        | A              | 50079-1                         | 50080-1  | 329029              | 69222-2   | 45639-2              | Red  |

Selection Chart for Shielded Wire

| Cable Size (RG/U)   | Contact Finish | Loose Piece Contact Part Number |          | Ferrule Part Number | Tooling Part Number   |                      | Tool Handle, Die Insert and Plastic Collar Color Code ** |
|---|----------------|---------------------------------|----------|---------------------|---|----------------------|--|
|   |                | Pin                             | Socket   |                     | Die Inserts for Hand Tool 69710 or 626 Pneumatic Tool System <sup>1</sup> | Hand Tool            |  |
| No. 26, NAS-702, Class A & C<br>No. 26, MIL-W-16878, Types E & EE<br>No. 24, NAS-702, Class A & C<br>No. 24, MIL-W-16878, Types E & EE<br>No. 22, NAS 702, Class C<br>No. 22, MIL-W-16878, Type E<br>No. 22, MIL-C-7078 A, Type I<br>No. 1 Dielectric, .068 [1.73] O.D. | A              | 201143-2                        | 201144-2 | 328666              | —   | 69147-2              | Gray   |
| No. 22, NAS-702, Class A<br>No. 22, MIL-C-7078 A, Type II   | A              | 201143-3                        | 201144-3 | 328666              | 69227-2   | 91912-3 <sup>2</sup> | White  |
| No. 22, MIL-C-7078 A, Types I & II<br>No. 2 Dielectric, .075 [1.91] O.D.<br>No. 3 Dielectric, .085 [2.16] O.D.  | A              | 201145-1                        | 201146-4 | —                   | 69222-2   | 45639-2              | Red  |
| No. 22, NAS-702, Class B  | A              | 201145-4                        | 201146-4 | 328663              | 69220-2   | 45740-2              | Blue   |
|   | B              | —                               | 201146-9 |                     |   |                      |  |

Selection Chart for Various Manufacturers' Cables

| Center Conductor Wire                       |                    | Dielectric O.D. (Max.) | Cable O.D. Range      | Braid  | Loose Piece Contact Part No. |          | Ferrule Part Number | Tooling Part Number   |           | Tool Handle, Die Insert and Plastic Collar Color Code** |
|---|--------------------|------------------------|-----------------------|--------|------------------------------|----------|---------------------|---|-----------|---|
| AWG/Type                                    | [mm <sup>2</sup> ] |                        |                       |        | Pin                          | Socket   |                     | Die Inserts for Hand Tool 69710-1 or 626 Pneumatic Tool System <sup>1</sup> | Hand Tool |   |
| Brand Rex T209A<br>29 AWG                   | 0.7-0.08           | .076<br>1.93           | .112-.122<br>2.84-3.1 | Single | —                            | 201146-2 | 330587              | 69440   | —         | Orange  |
| Brand Rex T5788A<br>26 AWG                  | 0.12-0.15          | .106<br>2.69           | .160<br>4.06          | Single | 201145-2                     | 201146-2 | 328664              | 69222-2   | 45639-2   | Red   |
| 32-26                                       | 0.03-0.15          | .129<br>3.28           | .122-.137<br>3.1-3.48 | Single | —                            | 201146-2 | 330587              | 69440   | —         | Orange  |
| Raychem 0030D1314<br>Army Ordnance 11207177 |                    |                        |                       |        |                              |          |                     |   |           |   |

\*Includes bench mount and foot control; requires Manual Take-Up Attachment Part Number 69689  
 \*\*Match Plastic Collar and Tool colors for application to cable. Inner Insulator color identifies Wire Barrel of Center Contact.  
 Note: A ferrule and retention spring (Part Number 201142-2) are required for each pin and socket.  
 Extraction Tool Part Number 305183-8  
<sup>1</sup> Use 626 adapter 318161-1  
<sup>2</sup> SDE die used with tool frame 354940-1

Coaxial Contacts

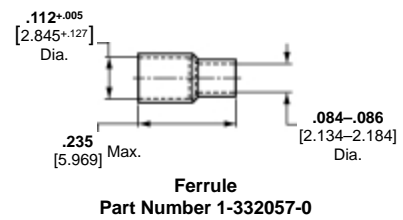
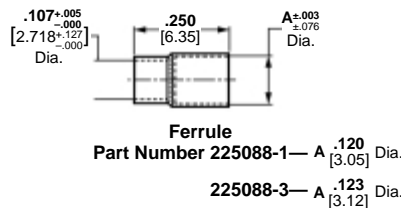
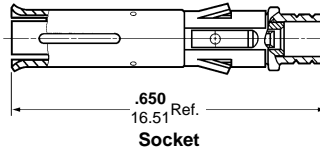
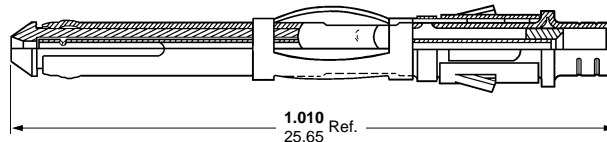
Subminiature Coax, Size 16  
Precision Formed, Crimp



Pin



Socket



Material

- Outer Shell** — Brass per MIL-C-50
- Center Conductor** — Beryllium copper per QQ-C-533 (Pin); Brass per QQ-B-626 (Socket)
- Inner Dielectric** — Polypropylene
- Retention Spring** — Stainless steel per QQ-S-766
- Ferrule** — Copper per QQ-C-576
- Finish**
- Outer Shell, Center Conductor** — See charts
- Ferrule†** — Bright tin-lead per MIL-T-10727

Selection Chart for Coaxial Cable

| Cable Size (RG/U)  | Contact Finish                       | Loose Piece Contact No. |         | Ferrule Part No. | Tooling Part No.  |           |
|--------------------|--------------------------------------|-------------------------|---------|------------------|---|-----------|
|                    |                                      | Pin                     | Socket  |                  | Die Sets for Hand Tool 69710-1 or 626 Pneumatic Tool System | Hand Tool |
| 178, 196           | Gold/Nickel Gold/Copper <sup>1</sup> | 226537-2                | 51565-2 | 1-332057-0†      | 69690-2 <sup>3</sup>  | 69656-2   |
|                    | Gold/Nickel Gold/Copper <sup>2</sup> | —                       | 51565-5 |                  |   |           |
| 196 (Double Braid) | Gold/Nickel Gold/Copper <sup>1</sup> | 226537-2                | 51565-2 | 225088-1†        | —   | 69656-9   |
|                    | Gold/Nickel Gold/Copper <sup>2</sup> | —                       | 51565-5 |                  |   |           |
| 174, 188, 316      | Gold/Nickel Gold/Copper <sup>1</sup> | 226537-1                | 51565-1 | 1-332056-0       | 69690 <sup>3</sup>  | 91911-3*  |
|                    | Gold/Nickel Gold/Copper <sup>2</sup> | 226537-4                | 51565-4 |                  |   |           |
| 174 (Double Braid) | Gold/Nickel Gold/Copper <sup>1</sup> | 226537-1                | 51565-1 | 225088-3         | —   | 69656-7   |
|                    | Gold/Nickel Gold/Copper <sup>2</sup> | 226537-4                | 51565-4 |                  |   |           |
| 179, 187           | Gold/Nickel Gold/Copper <sup>1</sup> | 226537-1                | 51565-1 | 1-332056-0       | 69690-1 <sup>3</sup>  | 91911-4*  |
|                    | Gold/Nickel Gold/Copper <sup>2</sup> | 226537-4                | 51565-4 |                  |   |           |
| 187 (Double Braid) | Gold/Nickel Gold/Copper <sup>1</sup> | 226537-1                | 51565-1 | 225088-1†        | —   | 69656-8   |
|                    | Gold/Nickel Gold/Copper <sup>2</sup> | 226537-4                | 51565-4 |                  |   |           |
| 161                | Gold/Nickel Gold/Copper <sup>1</sup> | 226537-1                | 51565-1 | 1-332056-0       | —   | —         |
|                    | Gold/Nickel Gold/Copper <sup>2</sup> | 226537-4                | 51565-4 |                  |   |           |

<sup>1</sup>.000030 [0.00076] gold over .000050 [0.00127] nickel—outer shell and socket center conductor; .000030 [0.00076] gold over .000100 [0.00254] copper—pin center conductor.  
<sup>2</sup>.000050 [0.00127] gold over .000050 [0.00127] nickel—outer shell and socket center conductor; .000050 [0.00127] gold over .000100 [0.00254] copper—pin center conductor.  
<sup>3</sup>Die Set requires "C" Head Adapter Part Number 318161-1; Adapter Holder Part Number 356304-1 (with ratchet) or 189928-1 (without); and Power Unit Part Number 189721-2 (hand actuated) or 189722-2 (foot actuated).  
 †Does not use Hand Tool 45098 or 601967-1.  
 Extraction Tool Part Number 305183  
 \* SDE die used with tool frame 354940-1



**Subminiature Coax, Size 16  
Precision Formed, Crimp**

(Continued)

**Finish**

**Ferrule<sup>1</sup>** — Bright tin-lead per MIL-T-10727

**Coaxial Contacts (Continued)**

**Selection Chart for Twisted Pair and Shielded Wire**

| Wire Size   |                 | Contact Finish                       | Loose Piece Contact No. |         | Ferrule Part No. | Tooling Part No.  |                           |
|---|-----------------|--------------------------------------|-------------------------|---------|------------------|---|---------------------------|
| AWG   | mm <sup>2</sup> |                                      | Pin                     | Socket  |                  | Die Sets for Hand Tool 69710-1 or 626 Pneumatic Tool System | Hand Tool                 |
| 30<br>(Twisted Pair, Solid)                                       | 0.05            | Gold/Nickel Gold/Copper <sup>1</sup> | 226537-3                | 51565-3 | 1-332057-0†      | 69690-2 <sup>3</sup>  | 69656-2                   |
|   |                 | Gold/Nickel Gold/Copper <sup>2</sup> | 226537-6                | 51565-6 |                  |   |                           |
| 28<br>(Twisted Pair, Solid)                                       | 0.08-0.09       | Gold/Nickel Gold/Copper <sup>1</sup> | 226537-3                | 51565-3 | 1-332057-0†      | 69690 <sup>3</sup>  | 91911-3*                  |
|   |                 | Gold/Nickel Gold/Copper <sup>2</sup> | 226537-6                | 51565-6 |                  |   |                           |
| 28<br>(Twisted Pair, Stranded 7 Str., .0050 [0.13] Dia.)          | 0.08-0.09       | Gold/Nickel Gold/Copper <sup>1</sup> | 226537-3                | 51565-3 | 1-332057-0†      | 69690-1 <sup>3</sup><br>or<br>69690-2 <sup>3</sup>          | 91911-4*<br>or<br>69656-2 |
|   |                 | Gold/Nickel Gold/Copper <sup>2</sup> | 226537-6                | 51565-6 |                  |   |                           |
| 26<br>(Twisted Pair, Solid or Stranded 7 Str., .0063 [0.16] Dia.) | 0.12-0.15       | Gold/Nickel Gold/Copper <sup>1</sup> | 226537-3                | 51565-3 | 1-332057-0†      | 69690 <sup>3</sup>  | 91911-3*                  |
|   |                 | Gold/Nickel Gold/Copper <sup>2</sup> | 226537-6                | 51565-6 |                  |   |                           |
| 26<br>(Shielded, .075 [1.91] Max. O.D.)                           | 0.12-0.15       | Gold/Nickel Gold/Copper <sup>1</sup> | 226537-1                | 51565-1 | 1-332057-0†      | 69690-3 <sup>3</sup>  | 69656-3                   |
|   |                 | Gold/Nickel Gold/Copper <sup>2</sup> | 226537-4                | 51565-4 |                  |   |                           |

<sup>1</sup>.000030 [0.00076] gold over .000050 [0.00127] nickel—outer shell and socket center conductor; .000030 [0.00076] gold over .000100 [0.00254] copper—pin center conductor.

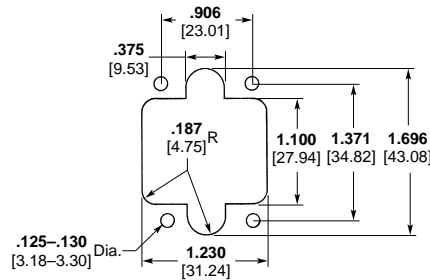
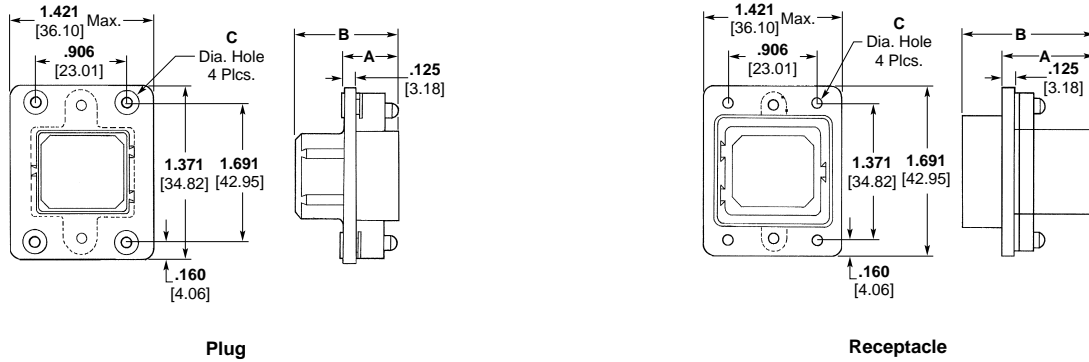
<sup>2</sup>.000050 [0.00127] gold over .000050 [0.00127] nickel—outer shell and socket center conductor; .000050 [0.00127] gold over .000100 [0.00254] copper—pin center conductor.

<sup>3</sup>Die Set requires "C" Head Adapter Part Number 318161-1; Adapter Holder Part Number 356304-1 (with ratchet) or 189928-1 (without); and Power Unit Part Number 189721-2 (hand actuated) or 189722-2 (foot actuated).

**Note:** A ferrule is required for each pin and socket. Extraction Tool Part Number 305183.

\* SDE die used with tool frame 354940-1

One-Module Shell

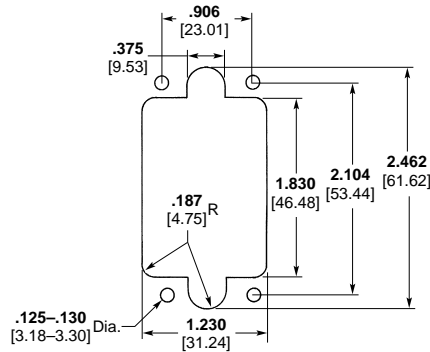
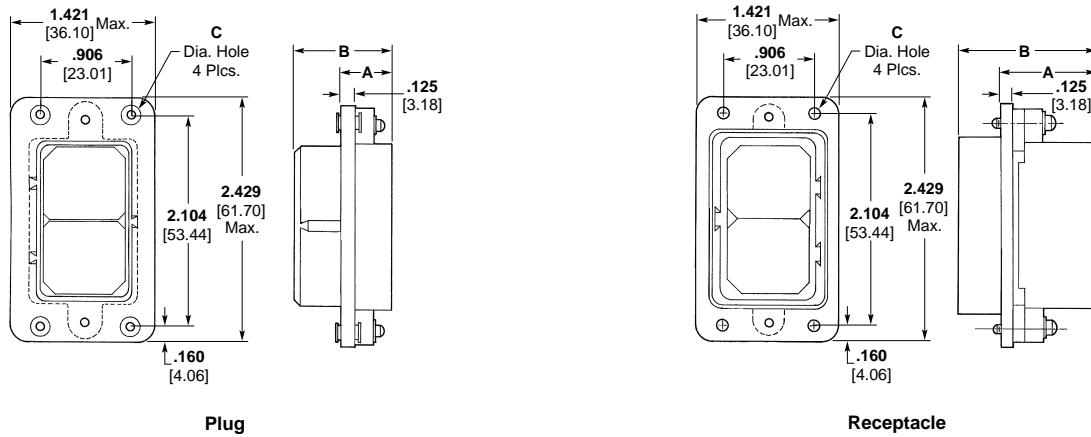


Recommended Panel Cutout

| Shell Type                       | For Pin Module |                |              |                | For Socket Module |                |              |                |
|----------------------------------|----------------|----------------|--------------|----------------|-------------------|----------------|--------------|----------------|
|                                  | Dimensions     |                |              | Shell Part No. | Dimensions        |                |              | Shell Part No. |
|                                  | A              | B              | C            |                | A                 | B              | C            |                |
| Receptacle                       | 1.001<br>25.43 | 1.509<br>38.33 | .120<br>3.05 | 202279-3       | .595<br>15.11     | 1.103<br>28.02 | .120<br>3.05 | 202279-4       |
| Plug (with Floating Bushings)    | .886<br>22.5   | 1.416<br>35.97 | .118<br>3.00 | 202275-4       | .480<br>12.19     | 1.010<br>25.65 | .118<br>3.00 | 202275-3       |
| Plug (without Floating Bushings) | .886<br>22.5   | 1.416<br>35.97 | .125<br>3.18 | 202786-2       | .480<br>12.19     | 1.010<br>25.65 | .125<br>3.18 | 202786-1       |

- Notes:**
1. Plugs for pin modules mate with receptacles for socket modules, and plug for socket modules mate with receptacles for pin modules.
  2. Completely assembled connectors are available upon request. Consult Tyco Electronics for part nos. of specific arrangements desired.
  3. Pin and socket modules for these shells are presented on page 5160.
  4. For cable clamps and latching hardware, see pages 5172 and 5173.

Two-Module Shell

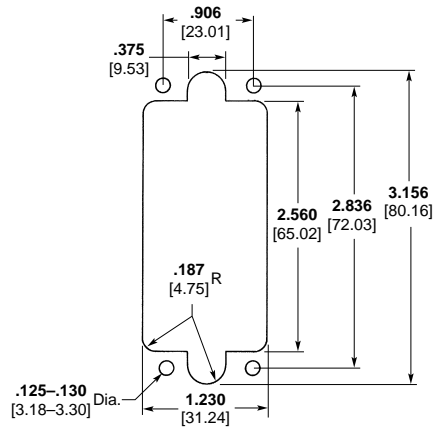
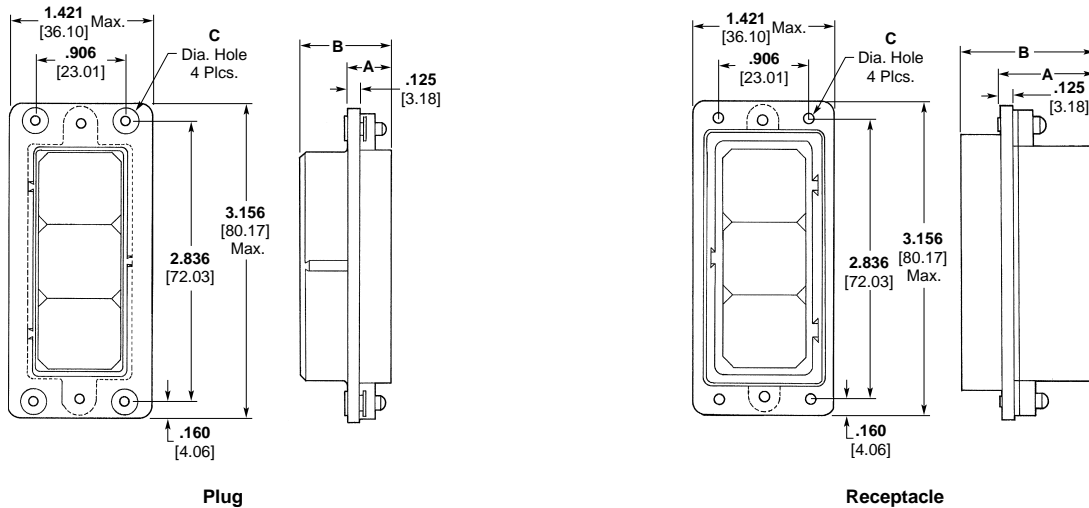


Recommended Panel Cutout

| Shell Type                       | For Pin Module |                |              |                | For Socket Module |                |              |                |
|----------------------------------|----------------|----------------|--------------|----------------|-------------------|----------------|--------------|----------------|
|                                  | Dimensions     |                |              | Shell Part No. | Dimensions        |                |              | Shell Part No. |
|                                  | A              | B              | C            |                | A                 | B              | C            |                |
| Receptacle                       | 1.001<br>25.43 | 1.509<br>38.33 | .120<br>3.05 | 202681-2       | .595<br>15.11     | 1.103<br>28.02 | .120<br>3.05 | 202681-3       |
| Plug (with Floating Bushings)    | .886<br>22.5   | 1.416<br>35.97 | .118<br>3.00 | 202680-3       | .480<br>12.19     | 1.010<br>25.65 | .118<br>3.00 | 202680-2       |
| Plug (without Floating Bushings) | .886<br>22.5   | 1.416<br>35.97 | .125<br>3.18 | 202789-2       | .480<br>12.19     | 1.010<br>25.65 | .125<br>3.18 | 202789-1       |

- Notes:**
1. Plugs for pin modules mate with receptacles for socket modules, and plug for socket modules mate with receptacles for pin modules.
  2. Completely assembled connectors are available upon request. Consult Tyco Electronics for part nos. of specific arrangements desired.
  3. Pin and socket modules for these shells are presented on page 5160.
  4. For cable clamps and latching hardware, see pages 5172 and 5173.

Three-Module Shell



Recommended Panel Cutout

| Shell Type                       | For Pin Module |                |              | Shell Part No. | For Socket Module |                |              | Shell Part No. |
|----------------------------------|----------------|----------------|--------------|----------------|-------------------|----------------|--------------|----------------|
|                                  | A              | B              | C            |                | A                 | B              | C            |                |
| Receptacle                       | 1.001<br>25.43 | 1.509<br>38.33 | .120<br>3.05 | 202287-3       | .595<br>15.11     | 1.103<br>28.02 | .120<br>3.05 | 202287-4       |
| Plug (with Floating Bushings)    | .886<br>22.5   | 1.416<br>35.97 | .118<br>3.00 | 202283-4       | .480<br>12.19     | 1.010<br>25.65 | .118<br>3.00 | 202283-3       |
| Plug (without Floating Bushings) | .886<br>22.5   | 1.416<br>35.97 | .125<br>3.18 | 202795-2       | .480<br>12.19     | 1.010<br>25.65 | .125<br>3.18 | 202795-1       |

Accessories

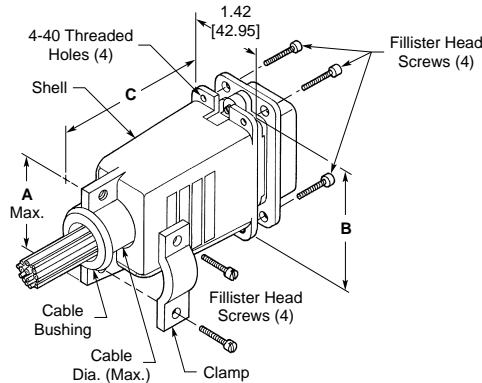
Cable Clamps, Straight Cable Exit

Material and Finish

**Clamp and Shell** — Die cast aluminum, zinc plated

**Fillister Head Screws** — Cold rolled steel, zinc plated

**Cable Bushings** — Rubber, black



| Shell Size<br>(No. of Modules) | Dimensions |       |       | Cable Dia.<br>(Max.) | Cable Bushings | Cable Part No. |
|--------------------------------|------------|-------|-------|----------------------|----------------|----------------|
|                                | A          | B     | C     |                      |                |                |
| 1                              | 1.315      | 1.416 | 2.625 | .750                 | With           | 202764-1*      |
|                                | 33.4       | 35.96 | 66.68 | 19.05                | Without        | 202764-2       |
| 2                              | 1.100      | 1.691 | 2.625 | .563                 | Without        | 202305-3       |
|                                | 27.94      | 42.95 | 66.68 | 14.3                 |                |                |
| 3                              | 1.820      | 2.424 | 3.140 | .875                 | With           | 202617-1*      |
|                                | 46.23      | 61.57 | 69.76 | 22.23                | Without        | 202617-2       |
| 3                              | 2.135      | 3.156 | 3.140 | 1.156                | With           | 1-202301-1**   |
|                                | 54.23      | 80.16 | 79.76 | 29.37                | Without        | 1-202301-0     |

\*Two Cable Bushings are included to provide .625 [15.88] and .250 [6.35] diameter cable outlets.

\*\*Four Cable Bushings are included to provide .938 [23.83], .750 [19.05], .625 [15.88] and .250 [6.35] diameter cable outlets.

**Note:** These cable clamps can be used on either a plug or receptacle shell of the appropriate size; refer to pages 5169-5171.

Cable Clamps, 90° Cable Exit (For One-Module Shell)

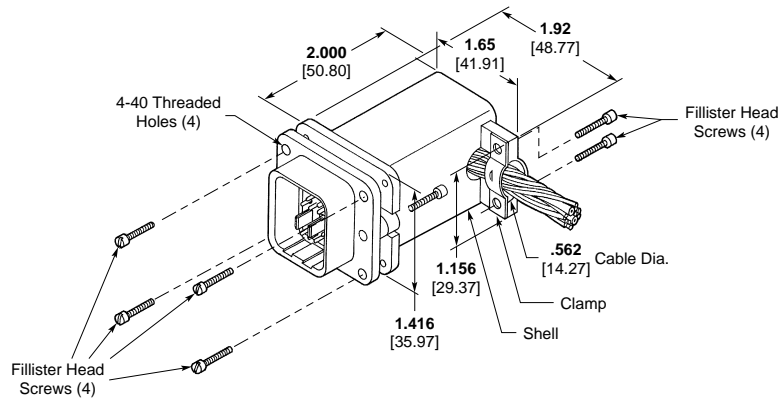
Part Number 206132-1

Material and Finish

**Clamp** — Steel, cadmium plated

**Shell** — Thermoplastic, gray

**Fillister Head Screws** — Cold rolled steel, zinc plated

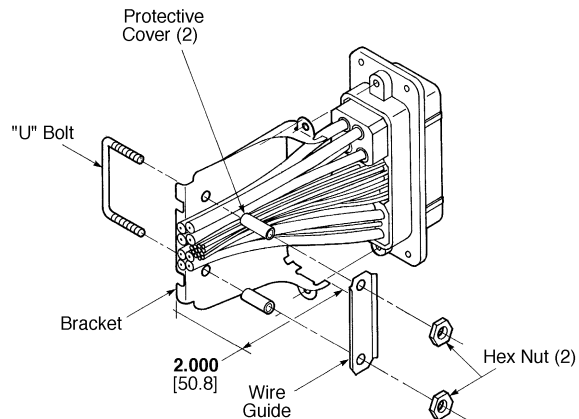


**Note:** This cable clamp can be used on either a plug or receptacle shell, one-module size only, refer to page 5169.

**Strain Relief  
(for Three-Module Shell)**

Part Number 202567-1

**Note:** This strain relief can be used on either a plug or receptacle shell, three-module size only, refer to page 5171.



**Locking Latch Assembly**

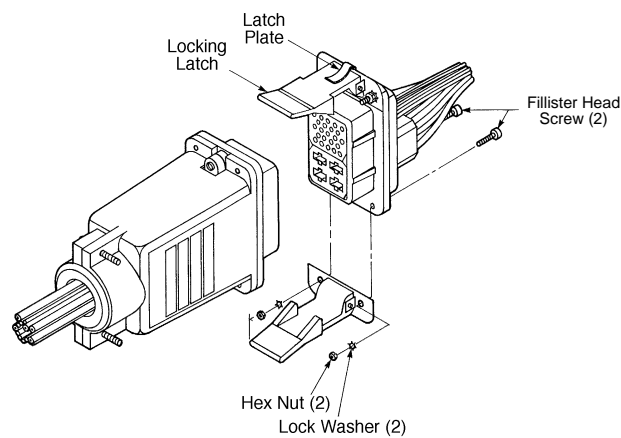
Part Number 202832-1  
(without mounting hardware)

Part Number 202832-2  
(with mounting hardware\*)

\*Mounting hardware includes four lock washers, 4-40 hex nuts and fillister head screws.

**Notes:**

1. Locking Latch Assemblies are packaged two per unit.
2. Locking Latch Assemblies can be used on either a plug or receptacle shell. They cannot be used with shells having floating bushings.
3. Locking Latch Assemblies must



**Locking Spring**

Part Number 202577-1  
(without mounting hardware)

Part Number 202577-2  
(with mounting hardware\*)

**Spring Catch**

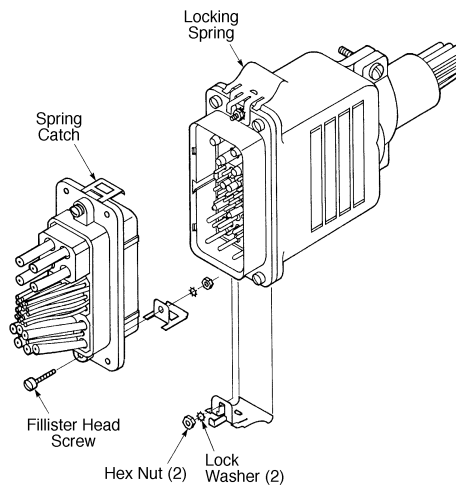
Part Number 202576-1  
(without mounting hardware)

Part Number 202576-2  
(with mounting hardware\*)

\*Mounting hardware includes two lock washers, 4-40 hex nuts and screws.

**Notes:**

1. Locking springs and spring catches are packaged two per kit.
2. Locking springs and spring catches can be used on either a plug or receptacle shell. They cannot be used with shells having floating bushings.



**Application Tooling**

**CERTI-CRIMP and CERTI-CRIMP II Hand Tools**

These tools are ideal for small production, prototype and experimental applications. They are used for terminating pin and socket contacts to wire and feature the CERTI-CRIMP ratchet device to form accurate crimps each time.



Hand Tool Part Number 69710



**CERTI-CRIMP II**  
Straight Action Hand Tool



SDE die in PRO-CRIMPER frame. Go to [www.tooling.tycoelectronics.com](http://www.tooling.tycoelectronics.com) for additional tooling options for SDE dies.

**626 Pneumatic Tool System**



Lightweight, air-operated modular tooling system. Accepts a wide variety of interchangeable heads for crimping various types of contacts, terminals and splices onto wires ranging 6-26 AWG [13-0.12 mm<sup>2</sup>], plus coaxial and fiber optic cable. Available with either hand- or foot-actuation switch. Optional ratchet control available to provide complete crimp cycle.

**Specifications**

**Outside Diameter** — 1.83 [46.5]  
**Length** — 11.6-12.9 [295-327]  
**Grip Span** — 2.19 [55.6] over button/handle  
**Weight** — 2.3-3.3 lb [1.0-1.5 kg]  
**Air** — 90-100 psi [6.21-6.89 bar], 11.14 in<sup>3</sup> [0.00018 m<sup>3</sup>]  
**Cycle Time** — 0.7-0.8 sec (16-14 AWG [1.3-2 mm<sup>2</sup>] PIDG Terminals)  
 For more information, request Catalog 124208.

**AMP-O-LECTRIC Model "K" Terminating Machine, 1-471273-3**



Semiautomatic bench machine for use with standard-style applicators. It is an electrically-powered, clutched, flywheel-energy-style machine, equipped with a mechanical strip feed mechanism. Products commonly applied with this machine include AMP splices, AMPLIVAR splices, and FASTON flag receptacles.

**Specifications**

**Width** — 21 [533]  
**Depth** — 20 [508]  
**Height** — 24 [610] without reel  
**Weight** — 230 lb [104 kg]  
**Electrical** — 120 VAC, 60 Hz, 6 A  
**Air** — 90-110 psi [6.21-7.59 bar], 6 scfm [0.00282 m<sup>3</sup>/s] when required with air-feed applicators  
**Wire Range** — 26-10 AWG [0.12-6 mm<sup>2</sup>] solid or stranded, depending on product applied  
 For more information, contact Tyco Electronics.

**AMP-O-LECTRIC Model "G" Terminating Machines, 354500-1, -9, -11**



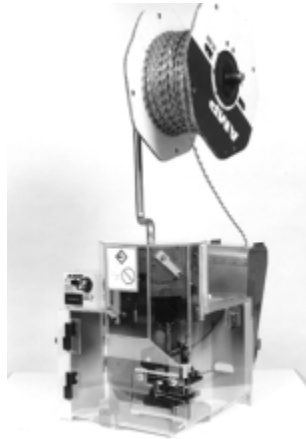
Semiautomatic bench machines for crimping reeled terminals and contacts, featuring a quiet and reliable direct motor drive, microprocessor controls for ease of setup and operation, and guarding and lighting designed for operator convenience. All models are equipped with either manual or automatic precision adjustment of crimp height. Machine-mounted sensors are available for crimp quality monitoring using conventional miniature-style applicators.

**Specifications**

**Width** — 18.7-25.3 [475-643] depending on applicator type  
**Depth** — 21.5-28.1 [546-713] depending on applicator type  
**Height** — 20 [508]  
**Weight** — 240 lb [110 kg]  
**Electrical** — 120 or 220 VAC, 50 or 60 Hz; 310 VA  
**Air** — 90-110 psi [6.21-7.59 bar], 6 scfm [0.00282 m<sup>3</sup>/s] when required with air-feed applicators  
**Wire Range** — 26-10 AWG [0.12-6 mm<sup>2</sup>] solid or stranded, depending on product applied  
 For more information, request Catalog 65828.

Application Tooling (Continued)

**Entry Level Terminator (ELT), 1338600-1, -2, -3, -4, -5, -6**



Semiautomatic Bench Terminator for side- and end-feed reeled terminals and contacts. The ELT uses a DC motor with gear box drive. The result is a small-footprint design that is fast and quiet. Cycle time is less than 0.400 seconds with an operation sound level of 76dBA. With a crimp force capacity of 3,000 pounds, the ELT is available for all but the highest crimp force applications. A wide range of optional equipment is also available to meet your specific application requirements.

**Specifications**

**Width** — 16.8 [427]  
**Depth** — 20.6 [523]  
**Height** — 20 [510] without reel support  
**Weight** — approx. 150 lb [68 kg]  
**Electrical** — 100-240 VAC, 50/60 Hz, 6A (Note: Avg <1 A at 120 VAC when used as a bench-top unit at 2,000 cycles per hour operating rate)  
**Air** — 90-100 psi [6.21-6.90 bar], 6 scfm [0.00282 m<sup>3</sup>/s] when required for use with air-feed applicators (Note: Optional Air Feed Valve Assembly Required)  
**Wire Range** — Up to 14 AWG [2.5 mm<sup>2</sup>]  
 For more information, request catalog 1308382.

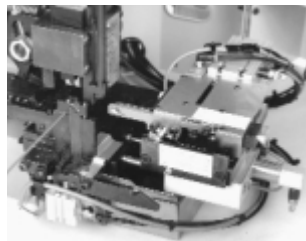
**AMP-O-MATIC Stripper-Crimper Machines, 1320895-1, -2**



Semiautomatic bench crimping machines that also strip the wire, and are therefore used for terminating jacketed cable. Feature manual precision adjustment of crimp height, keyed strip blades for faster, more accurate setups, and an efficient scrap removal system. All adjustments can be made from the front of the machines without special tools. Available with crimp quality monitoring.

**Specifications**

**Width** — 14 [355]  
**Depth** — 18 [457]  
**Height** — 33 [838] without reel  
**Weight** — 150 lb [68 kg]  
**Electrical** — 120 VAC, 50 or 60 Hz, 5 A  
**Air** — 80-100 psi [5.52-6.90 bar], 3.5 scfm [0.00165 m<sup>3</sup>/s]  
**Wire Range** — 32-14 AWG [0.03-2 mm<sup>2</sup>]  
 For more information, request Catalog 65004.



The combination of the Stripping Module with the Entry Level Terminator (ELT) or the AMP-O-LECTRIC Model G Terminator provides an economical and proficient method of stripping wire and crimping terminals on the same machine. Wires are stripped moments before crimping, meaning there is virtually no chance of damaging wire conductors during handling or storage. Once the wire is fed into the start sensor the Stripping Module does the rest, improving placement accuracy.

**Specifications**

**Wire Range Base Module** — 0.03 mm<sup>2</sup> - 2.0 mm<sup>2</sup> (32-14 AWG) (30-32 AWG may require special kit.)  
**Max. Insulation** — .200 [5.08]  
**Cable Breakout** — > 1.100 [29.00]  
**Strip Length** — .100 - .400 [2.50 - 10.16]  
**Noise** — Less than 82 dBA (Typical at operator position with standard mechanical feed applicator)  
**Weight** — 4.53 Kilograms (10 lb)  
**Height** — 5.000 [127.00]  
**Electrical** — 100-240 VAC, 50/60 Hz, single phase current, obtains power from the terminator  
**Air** — 620-760 kPa (90-100 psi), 2.83 liters/sec (6 scfm)  
**Wire Sensor** — Gold plated contacts with laser etched target  
 For more information, request Catalog 1309085.



Application Tooling (Continued)

**AMPOMATOR CLS IV+ Lead-Making Machines, 356500-1, -2**

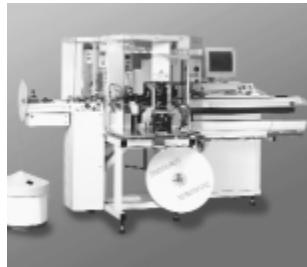


Fully-automatic machines that measure, cut, strip and terminate single leads. Microprocessor-controlled, and programmed and operated using an easy-to-follow, menu-driven touch-screen. Features include direct-drive terminating units with precision crimp height adjustment, fully programmable setups, wire runout and splice detection, and motorized pre-feed with wire straightener. Crimp quality monitoring is also available.

**Specifications**

**Width** — 159 [4 040]  
**Depth** — 68 [1 730]  
**Height** — 86 [2 185] with 24 [610] dia. reel  
**Weight** — 2 000 lb [907 kg]  
**Electrical** — 220 VAC, 50 or 60 Hz, single phase, 25 A, with neutral and ground  
**Air** — 90 psi [6.21 bar], 15 scfm [0.0071 m<sup>3</sup>/s] sustained  
**Wire Range** — 26-10 AWG [0.12-6 mm<sup>2</sup>] stranded, 26-16 AWG [0.12-1.4 mm<sup>2</sup>] solid  
**Lead Lengths** — 3-90 [76.2-2 285], 90-1 000 [2 285-25 400] with long lead conveyors  
 For more information, request Catalog 124324.

**Gamma 333 PC Lead-Making Machine, Three Stations, 1-528324-1**



With its capacity to accommodate an additional processing station on side 1, the Gamma 333 PC can perform a number of new processes. It can produce two-ended crimp leads, process double crimp connections with three different terminals or apply seals on one end of the wire. Tinning and ink jet marking are two further options. Process monitoring is integrated into the system, for accurate trimming and stripping of the wires.

**Specifications**

**Length** — 125 [3137]  
**Width** — 54.2 [1377]  
**Height** — 70.5 [1790]  
**Length Range** — 2.36 in-32.8 ft [60-10,000] (optional 30mm)  
**Cross-Section Range** — AWG 26-AWG 10 [0.125mm<sup>2</sup>-5mm<sup>2</sup>]  
**Noise Level** — <76dB (without crimping modules)  
**Electrical** — 3x208 - 480V, 50-60Hz; 6kVA  
**Compressed Air** — 5-6 bar  
**Air Consumption** — 6.5m<sup>3</sup>/h  
**Weight** — 1850 lbs [840 kg] with two crimping modules  
 For more information, request Catalog 1307901.

**Crimp Quality Monitor (CQM), 1320420-1, -2**



This unique system provides 100% on-the-fly crimp inspection. It measures the crimp height of each termination, and evaluates the quality of each crimp. If a crimp is questionable, the monitor alerts the operator with both visual and audible alarms. It also provides ports for printing and networking. When used with AMP-O-ELECTRIC Model "G" Termination Machines, the monitor is mounted to the


machine. When used with AMPOMATOR CLS IV Lead-Making Machines, it is integrated into the machine's operating system.

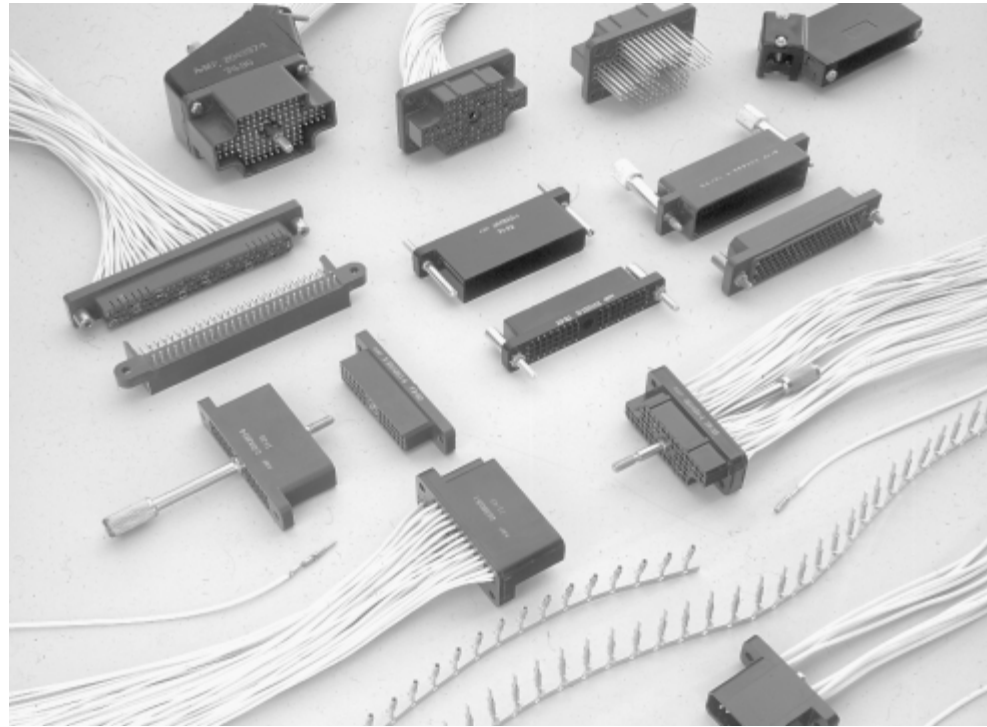
**Specifications**

**Width** — 8.8 [220]  
**Depth** — 8.1 [205]  
**Height** — 4.6 [115]  
**Weight** — 5 lb [2.3 kg]  
**Electrical** — 100-240 VAC, 50/60 Hz, 3.2 A  
 For more information, request Catalog 82275.

### Introduction

#### Product Facts

- Plug and receptacle connectors are molded plastic blocks categorized by the number of contact positions and type of material
- The pin body is fabricated from brass and conforms to MIL-C-50 or ASTM-B-36. The plating is gold per MIL-G-45204 over nickel per QQ-N-290. The retention spring sleeve is fabricated from stainless steel and conforms to QQ-S-766
- The socket body is made of brass per MIL-C-50 or ASTM-B-36. Plating is gold per MIL-G-45204 over nickel per QQ-N-290. The stainless steel retention spring sleeve conforms to QQ-S-766
- Shields and cable clamps are molded polysulfone components conforming to MIL-P-46120
- Brass keying pins and sockets conform to QQ-B-626 or ASTM-B-16, with zinc plating per QQ-Z-325 or stainless steel per QQ-S-763
- Locking rings, washers, bushings, retaining rings, nuts and screws are stainless steel conforming to QQ-S-763 or QQ-S-766
- Recognized under the Component Program of Underwriters Laboratories Inc.,  File No. E28476



High Density Rectangular (HDR) connectors are designed in response to ever-increasing demands for miniaturization. The grid spacing of .100 x .100 [2.54 x 2.54] provides density for a connector accommodating a 20 thru 30 AWG [0.6 thru 0.05 mm<sup>2</sup>] wire range.

A variety of contact configurations and platings permits great design flexibility. Machine terminated, crimp snap-in contacts are available for the entire wire range. Also available are .025 [0.64] square posts on pin and socket contacts suitable for wrap-type wiring.

This unique connector is available in 12, 24, 36, 48, 54 and 106 positions in a rectangular housing. A special 95-position connector rounds out this group of rack and panel configured connectors.

A two piece, 80-position connector has been developed for printed circuit boards.

Versatility is designed into this family of connectors. Housings are available with or without center fasteners. Housing material for most connectors is diallyl phthalate or phenolic. When

mounting connectors with jackscrews, the receptacle half should be mounted to the chassis or panel. The turnable jackscrews should be positioned on the plug half containing the cable assembly.

Tooling for terminating leads is also available to meet production requirements. For limited production or prototype applications, the CERTI-CRIMP hand tool is ideal. Automatic machines are designed to fit various in-plant production needs.

#### Technical Features

**Available Number of Positions** — 12, 24, 36, 48, 54, 106  
**Center Spacing** — .100 [2.54] x .100 [2.54]  
**Housing material** — Diallyl Phthalate or Phenolic  
**Flammability Rating** — UL 94V-0, UL File No. E28476  
**Contact Material** — Brass  
**Contact Finish** — .000030 [0.00076] Au  
**Contact Size** — 20  
**Wire Size Range** — 20–30 AWG

#### Termination Resistance —

| AWG | Gold | Tin  |
|-----|------|------|
| 20  | 8.0  | 16.5 |
| 24  | 14.5 | 27.0 |
| 26  | 22.0 | —    |
| 30  | 48.0 | —    |

**Connector Mating Per Circuit** — Gold 25 oz./Contact

#### Performance Characteristics

**Dielectric Withstanding Voltage** — 1000 VAC

**Insulation Resistance** — DAP 50,000 megohms min. (initial), Phenolic 5000 megohms min. (initial)

**Voltage Rating** — 440 VAC Sea Level @ 3 Amp max.

**Connector Mating/Unmating** — Gold 25 oz. max., Tin 50 oz. max.

**Contact Retention Force** — DAP – 5.0 lb., Phenolic – 7.5 lb.

**Durability** — 500 Matings per Cycle Gold, 250 Matings per Cycle Tin

**Temperature Range** — DAP -85°F to 257°F [-65°C to 125°C], Phenolic -131°F to 302°F [55°C to 150°C]

**Thermal Shock** — DAP -85°F to 257°F [-65°C to 125°C], Phenolic -131°F to 302°F [55°C to 125°C]

**Maximum Current** — 3 Amp max.

#### Wire Size —

| AWG | Test Current |
|-----|--------------|
| 20  | 3.0          |
| 24  | 2.25         |
| 26  | 1.75         |
| 30  | 1.00         |

#### Technical Documents

**Product Specifications** — Connectors/PC Board Headers – 108-10015

**Application Specification** — 114-10002

**Instruction Sheet** —

408-7357, 408-7472, 408-7484

### Contacts

#### Type XI Crimp Snap-In Contacts

Contact Size — 20  
Pin Diameter — .040 [1.02]

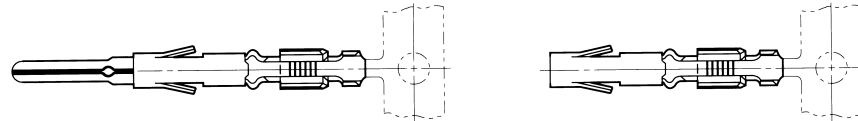
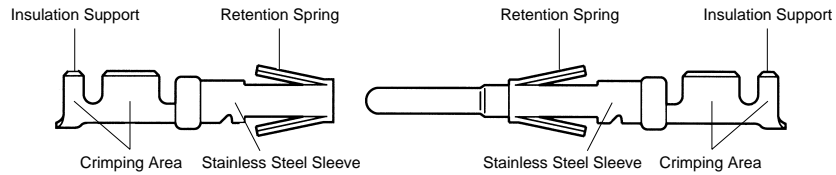
#### Plated as follows

**A** — .000030 [0.00076] gold over .000050 [0.00127] nickel  
**B** — Gold flash over .000050 [0.00127] nickel on entire contact with additional .000030 [0.00076] gold in contact area  
Contact Sleeve — Stainless Steel

#### Insertion Tool



Part Number 91042-1



Pin

Socket

| Wire Size Range<br>AWG | Ins. Dia.<br>mm <sup>2</sup> | Contact<br>Finish<br>Max. | Part Numbers |          |             |          | CERTI-CRIMP<br>Hand<br>Tool No. | Quick-Change Applicator No.          |   |
|------------------------|------------------------------|---------------------------|--------------|----------|-------------|----------|---------------------------------|--------------------------------------|---|
|                        |                              |                           | Strip Form   |          | Loose Piece |          |                                 | AMP-O-ELECTRIC<br>Machine<br>Model G | AMP-O-MATIC<br>Stripper/Crimper II<br>Machine |
|                        |                              |                           | Pin          | Socket   | Pin         | Socket   |                                 |                                      |   |
| 20-24                  | 0.6-0.2                      | .062                      | A            | 203816-1 | 203802-1    | 203816-3 | 203802-3                        | —                                    | 466904-1                                      |
|                        |                              | 1.57                      | B            | 203816-2 | 203802-2    | 203816-4 | 203802-4                        |                                      |   |
| 26-30                  | 0.15-0.05                    | .048                      | A            | 203874-1 | 203875-1    | 203874-3 | 203875-3                        | —                                    | —   |
|                        |                              | 1.22                      | B            | 203874-2 | 203875-2    | 203874-4 | 203875-4                        |                                      |   |

#### Wrap-Type Contacts with .025 x .025 [0.64 x 0.64] Posts

Contact Size — 20  
Pin Diameter — .040 [1.02]

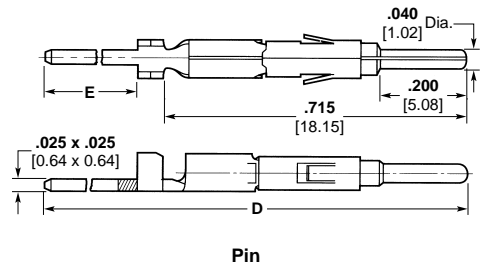
#### Plated as follows

**A** — .000030 [0.00076] gold over .000050 [0.00127] nickel  
**B** — Gold flash over .000050 [0.00127] nickel on entire contact with additional .000030 [0.00076] gold in contact area  
Contact Sleeve — Stainless Steel

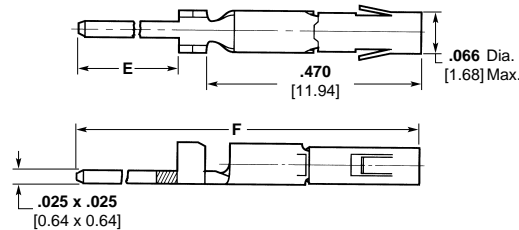
#### Extraction Tool



Part Number 91038-3



Pin



Socket

| Max. Terminations Per Post | Dimensions |       |       | Contact Finish | Contact Part Numbers* |            |
|----------------------------|------------|-------|-------|----------------|-----------------------|------------|
|                            | D          | E     | F     |                | Pin                   | Socket     |
| 1                          | 1.022      | .257  | .767  | A              | 1-205171-0            | 1-205172-0 |
|                            | 25.96      | 6.53  | 19.48 | B              | 205171-7              | 205172-7   |
| 2                          | 1.236      | .471  | .981  | A              | 1-205171-1            | 1-205172-1 |
|                            | 31.39      | 11.96 | 24.92 | B              | 205171-8              | 205172-8   |
| 3                          | 1.450      | .685  | 1.195 | A              | 1-205171-2            | 1-205172-2 |
|                            | 36.83      | 17.40 | 30.35 | B              | 205171-9              | 205172-9   |

\*Loose piece contacts for maintenance and repair only. Packaged 100 pieces per bag.

Housings

12, 24, 36, & 48 Positions

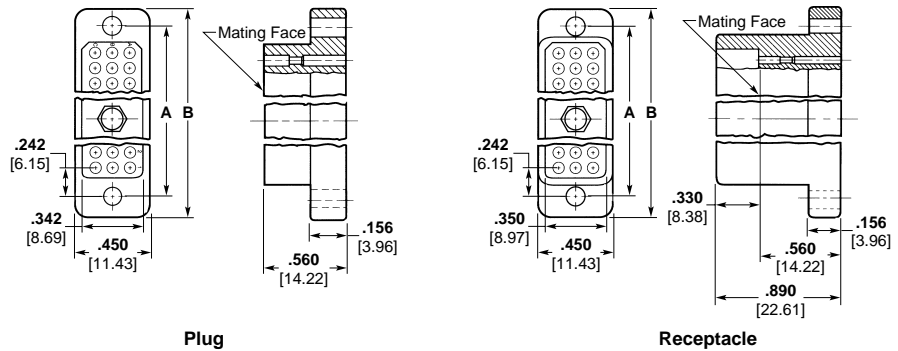
Material — See chart on page 5180

Related Product Data

Contacts — Page 5178

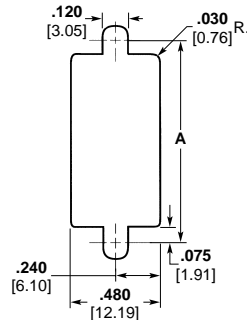
Accessories — Pages 5186 and 5187

Technical Documents — Page 5177



Plug

Receptacle



Recommended Panel Cutout

54 Position

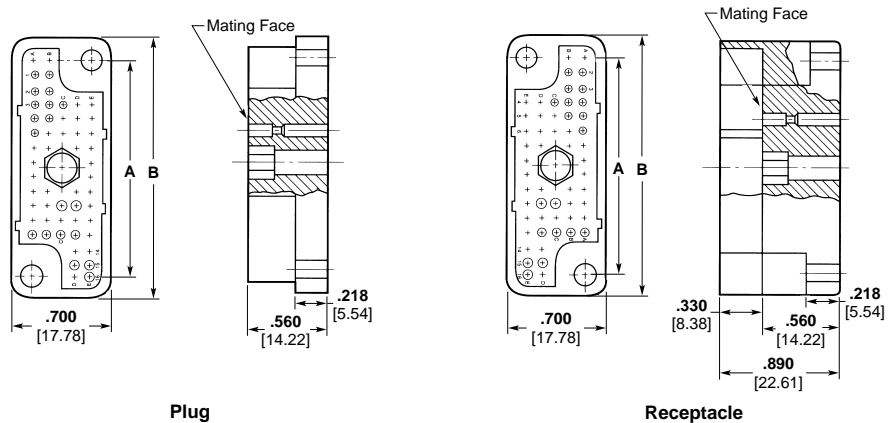
Material — See chart on page 5180

Related Product Data

Contacts — Page 5178

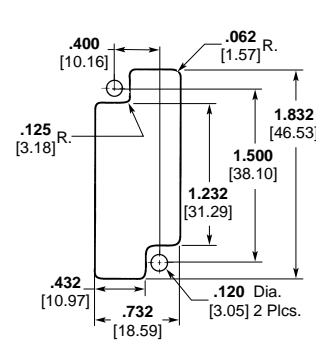
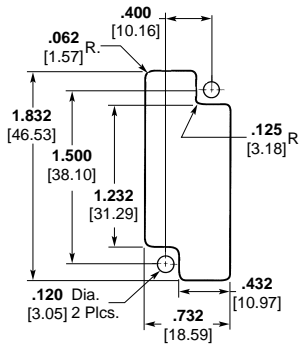
Accessories — Pages 5186 and 5187

Technical Documents — Page 5177



Plug

Receptacle



Recommended Panel Cutout

106 Position

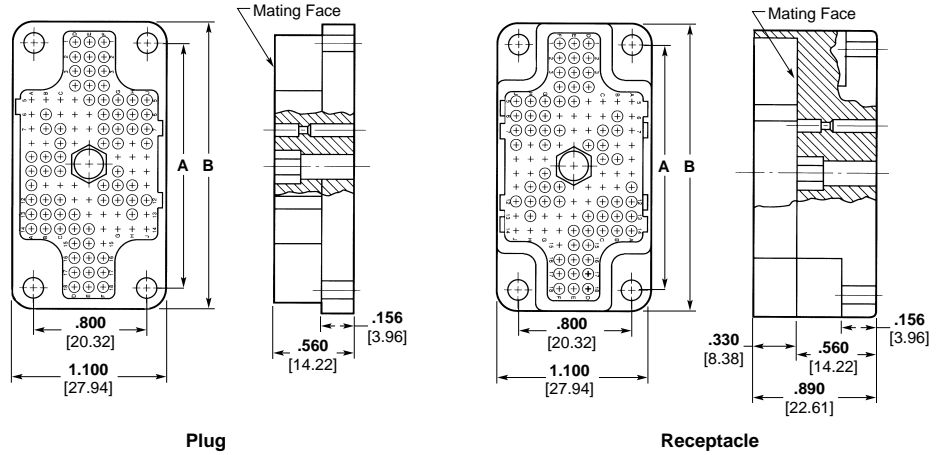
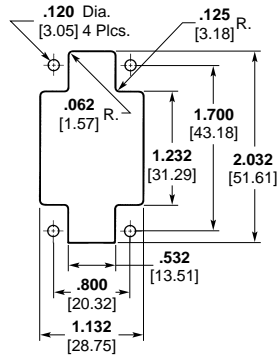
Material — see chart below

Related Product Data

Contacts — Page 5178

Accessories — Pages 5186 and 5187

Technical Documents — Page 5177



Recommended Panel Cutout

| Center Fastener         | No. of Positions | Dimensions     |                     | Center Fastener Type | Part Numbers |                   |                 |                   |
|-------------------------|------------------|----------------|---------------------|----------------------|--------------|-------------------|-----------------|-------------------|
|                         |                  | A              | B                   |                      | Plug Half    |                   | Receptacle Half |                   |
|                         |                  |                |                     |                      | Phenolic     | Diallyl Phthalate | Phenolic        | Diallyl Phthalate |
| With Center Fastener    | 12               | 1.084<br>24.43 | 1.334<br>33.88      | Fixed Female         | 204727-1     | 204727-2          | —               | 204728-2          |
|                         |                  |                |                     | Long Male Turnable   | —            | —                 | 204740-1        | 204740-2          |
|                         |                  |                |                     | Fixed Female         | 204729-1     | 204729-2          | —               | —                 |
|                         | 24               | 1.484<br>37.69 | 1.734<br>44.04      | Long Male Turnable   | —            | 204741-2          | 204742-1        | 204742-2          |
|                         |                  |                |                     | Short Male Turnable  | —            | —                 | —               | 204742-4          |
|                         |                  |                |                     | Fixed Female         | 204731-1     | 204731-2          | —               | 204732-2          |
|                         | 36               | 1.884<br>47.85 | 2.134<br>54.20      | Long Male Turnable   | 204743-1     | 204743-2          | 204744-1        | 204744-2          |
|                         |                  |                |                     | Short Male Turnable  | 204743-3     | —                 | —               | —                 |
|                         |                  |                |                     | Fixed Female         | 204733-1     | —                 | 204734-1        | 204734-2          |
|                         | 48               | 2.284<br>58.01 | 2.534<br>64.36      | Long Male Turnable   | —            | 204745-2          | 204746-1        | 204746-2          |
|                         |                  |                |                     | Short Male Turnable  | —            | 204745-4          | —               | —                 |
|                         |                  |                |                     | Fixed Female         | 204735-1     | —                 | 204736-1        | —                 |
|                         | 54               | 1.500<br>38.10 | 1.800<br>45.72      | Long Male Turnable   | 204747-1     | 204747-2          | 204748-1        | 204748-2          |
|                         |                  |                |                     | Short Male Turnable  | —            | —                 | —               | 204748-4          |
|                         |                  |                |                     | Fixed Female         | 204737-1     | 204737-2          | 204738-1        | 204738-2          |
| 106                     | 1.700<br>43.18   | 2.000<br>50.80 | Long Male Turnable  | 204749-1             | 204749-2     | 204750-1          | 204750-2        |                   |
|                         |                  |                | Short Male Turnable | —                    | 204749-4     | —                 | 204750-4        |                   |
|                         |                  |                | Fixed Female        | —                    | —            | —                 | —               |                   |
| Without Center Fastener | 12               | 1.084<br>24.43 | 1.334<br>33.88      | —*                   | 204281-2     | 2-204281-2        | 204282-2        | —                 |
|                         | 24               | 1.484<br>37.69 | 1.734<br>44.04      | —*                   | —            | 2-204281-4        | 204282-4        | 2-204282-4        |
|                         | 36               | 1.884<br>47.85 | 2.134<br>54.20      | —*                   | 204281-6     | 2-204281-6        | 204282-6        | 2-204282-6        |
|                         | 48               | 2.284<br>58.01 | 2.534<br>64.36      | —*                   | 204281-8     | 2-204281-8        | 204282-8        | —                 |
|                         | 54               | 1.500<br>38.10 | 1.800<br>45.72      | —*                   | 203804-1     | 203804-2          | 203803-1        | 203803-2          |
|                         | 106              | 1.700<br>43.18 | 2.000<br>50.80      | —*                   | 204260-1     | 204260-2          | 204259-1        | 204259-2          |

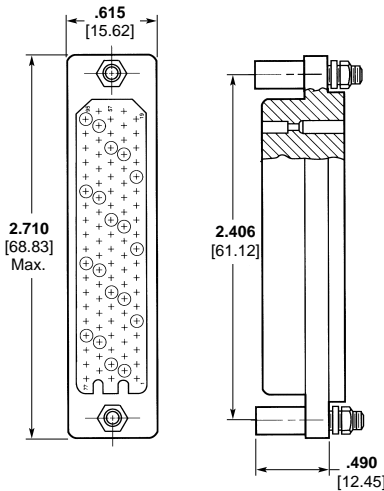
\*See page 5186 for jackscrews.

Housings (Continued)

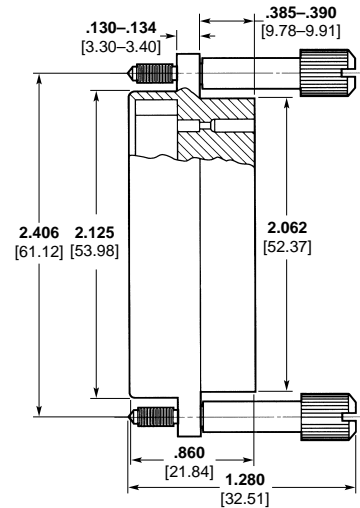
95 Position Connector with Jackscrews

**Material**  
 Housing — Diallyl Phthalate  
 Jackscrews — Stainless Steel

**Related Product Data**  
 Contacts — Page 5178  
 Technical Documents — Page 5177



**Plug**  
 Part Number 204694-1

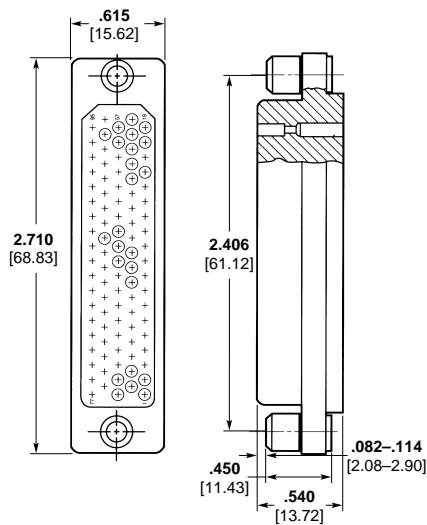


**Receptacle**  
 Part Number 204693-2

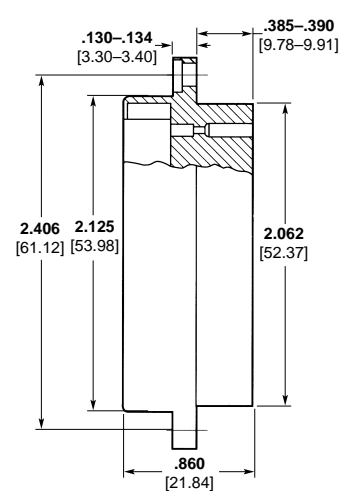
95 Position Connector with Floating Bushings

**Material**  
 Housing — Diallyl Phthalate  
 Floating Bushings — Stainless Steel

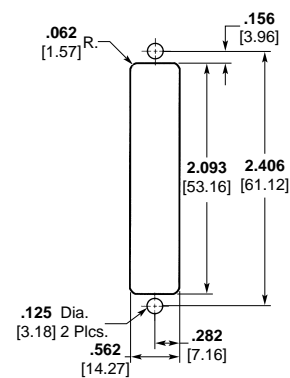
**Related Product Data**  
 Contacts — Page 5178  
 Technical Documents — Page 5177



**Plug**  
 Part Number 204030-1



**Receptacle**  
 Part Number 204027-2



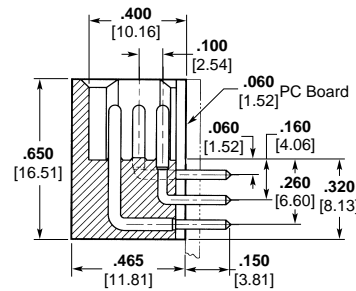
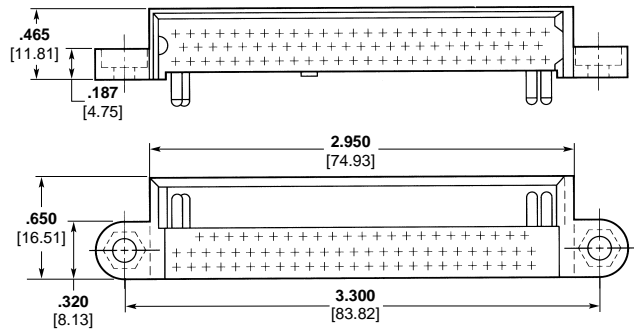
**Recommended Panel Cutout**

**Note:** Marking on receptacles are on wiring side only.

**80 Position Pin Header**

**Material and Finish**

**Housing** — Diallyl Phthalate  
**Contacts** — Brass Plated .000030  
 [0.00076] Gold over .000030 [0.00076]  
 Nickel



**Part Number 204818-4**

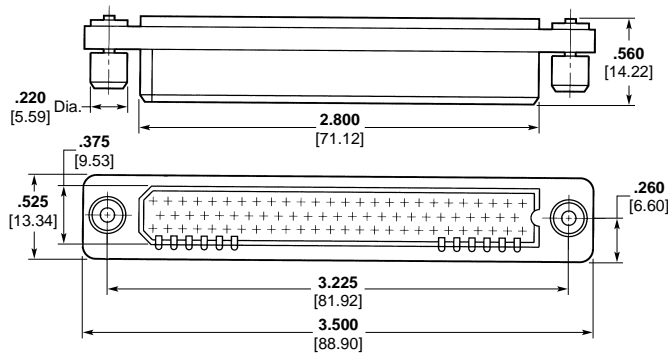
**80 Position Plug with Floating Bushings**

**Material and Finish**

**Housing** — Diallyl Phthalate  
**Floating Bushings** — Stainless Steel

**Related Product Data**

**Contacts** — Page 5178  
**Technical Documents** — Page 5177



**Part Number 204819-1**

Preloaded Housings, .025 x .025 [0.64 x 0.64] Posted Contacts for Automatic Wiring

12, 24, 36, & 48 Position

**Material and Finish**

**Housing** — See Chart

**Contact Body** —

Brass Plated as follows

**A** — .000030 [0.00076] Gold over .000050 [0.00127] Nickel

**B** — Gold Flash over .000050 [0.00127] Nickel on entire contact, with additional .000030 [0.00076] Gold in contact area

**Contact Sleeve** — Stainless Steel

**Related Product Data**

**Contact Size** — 20

**Pin Diameter** — .040 [1.02]

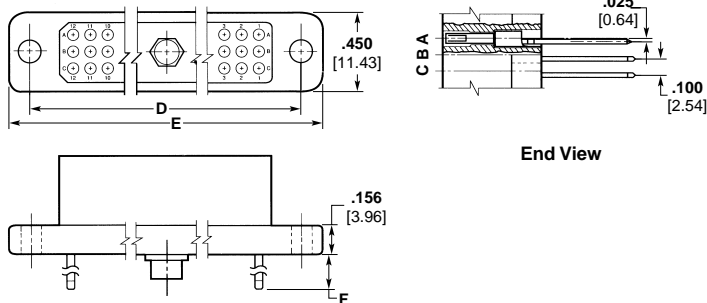
**Current Rating** — 3.0 Amperes (20 AWG [0.5–0.6 mm<sup>2</sup>] wire)

**Replacement Contacts** — Page 5178

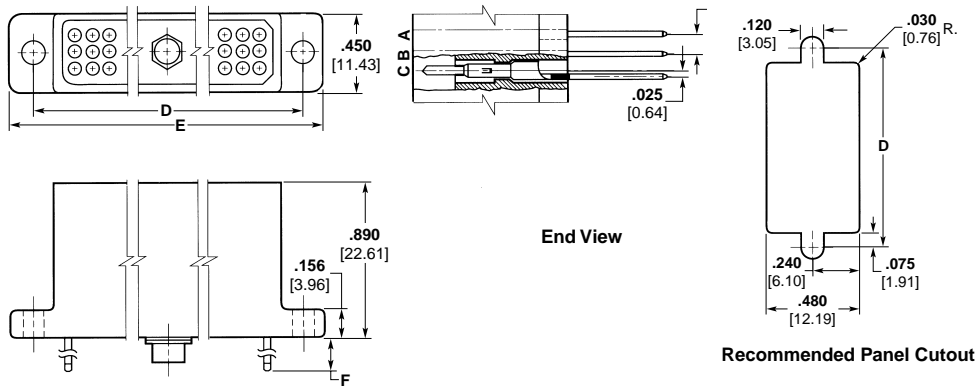
**Mateable Connectors** — Pages 5179 and 5180

**Technical Documents** — Page 5177

**Plug Assembly**



**Receptacle Assembly**



| No. of Positions | Dimensions<br>D      E |                | Contact Finish | Max. Termination Per Post | Dim. F        | Part Numbers                  |                   |                                  |                   |
|------------------|------------------------|----------------|----------------|---------------------------|---------------|-------------------------------|-------------------|----------------------------------|-------------------|
|                  |                        |                |                |                           |               | Plug Assembly Socket Contacts |                   | Receptacle Assembly Pin Contacts |                   |
|                  |                        |                |                |                           |               | Phenolic                      | Diallyl Phthalate | Phenolic                         | Diallyl Phthalate |
| 12               | 1.084<br>27.43         | 1.334<br>33.88 | A              | 1                         | .242<br>6.15  | —                             | —                 | —                                | 2-204682-8        |
|                  |                        |                |                | 3                         | .670<br>17.02 | —                             | —                 | —                                | 3-204682-0        |
| 24               | 1.484<br>37.69         | 1.734<br>44.04 | A              | 1                         | .242<br>6.15  | —                             | 6-204683-4        | 1-204684-9                       | —                 |
|                  |                        |                |                | 3                         | .670<br>17.02 | —                             | 6-204683-6        | 2-204684-1                       | 3-204684-0        |
|                  |                        |                | B              | 1                         | .242<br>6.15  | 6-204683-1                    | 7-204683-0        | —                                | —                 |
|                  |                        |                |                | 3                         | .670<br>17.02 | 6-204683-3                    | —                 | 2-204684-7                       | —                 |
| 36               | 1.884<br>48.85         | 2.134<br>54.20 | A              | 1                         | .242<br>6.15  | —                             | —                 | 1-204686-9                       | 2-204686-8        |
|                  |                        |                |                | 3                         | .670<br>17.02 | 5-204685-7                    | 6-204685-6        | —                                | 3-204686-0        |
|                  |                        |                | B              | 1                         | .242<br>6.15  | —                             | —                 | —                                | 3-204686-4        |
|                  |                        |                |                | 3                         | .670<br>17.02 | 6-204685-3                    | 7-204685-2        | —                                | 3-204686-6        |
| 48               | 2.284<br>58.01         | 2.534<br>64.36 | A              | 1                         | .242<br>6.15  | 5-204687-5                    | —                 | —                                | 2-204688-8        |
|                  |                        |                |                | 3                         | .670<br>17.02 | 5-204687-7                    | 6-204687-6        | —                                | 3-204688-0        |
|                  |                        |                | B              | 1                         | .242<br>6.15  | —                             | 7-204687-0        | —                                | —                 |
|                  |                        |                |                | 3                         | .670<br>17.02 | 6-204687-3                    | 7-204687-2        | —                                | —                 |

**Notes:** 1. Markings on receptacle assembly are on wiring side only.  
 2. In addition to combinations listed, all sizes are available with or without female jackscrews. Plugs are available with pins, and receptacles are available with sockets. Consult Tyco Electronics for details.  
 3. Fixed female jackscrews are included with these assemblies.



Preloaded Housings, .025 x .025 [0.64 x 0.64] Posted Contacts for Automatic Wiring (Continued)

54 Position

Plug Assembly

Material and Finish

Housing — See Chart

Contact Body —

Brass Plated as follows  
**A** — .000030 [0.00076] Gold over  
 .000050 [0.00127] Nickel

**B** — Gold Flash over .000050  
 [0.00127] Nickel on entire contact, with  
 additional .000030 [0.00076] Gold in  
 contact area

Contact Sleeve — Stainless Steel

Related Product Data

Contact Size — 20

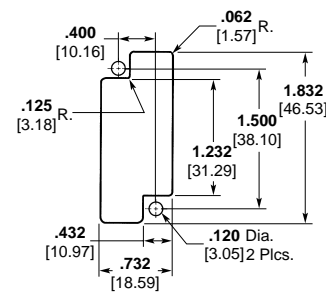
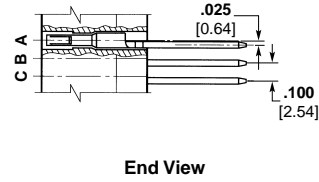
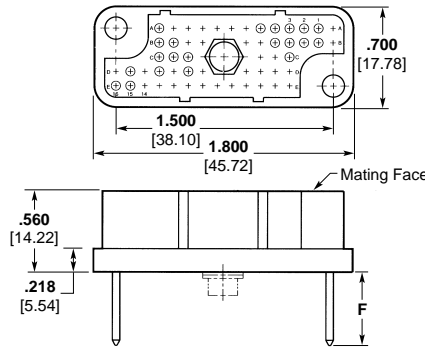
Pin Diameter — .040 [1.02]

Current Rating — 3.0 Amperes  
 (20 AWG [0.5–0.6 mm<sup>2</sup>] wire)

Replacement Contacts — Page 5178

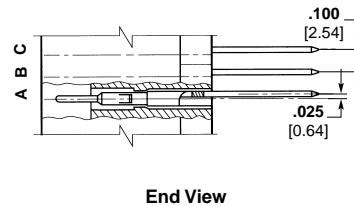
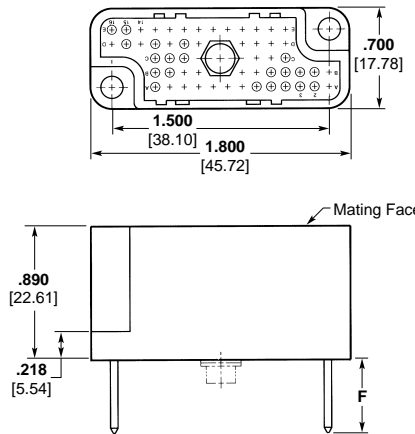
Mateable Connectors — Pages 5179  
 and 5180

Technical Documents — Page 5177



Recommended Panel Cutout for Receptacle

Receptacle Assembly



| Contact Finish | Max. Termination Per Post | Dim. F        | Part Numbers                  |                   |                                  |                   |
|----------------|---------------------------|---------------|-------------------------------|-------------------|----------------------------------|-------------------|
|                |                           |               | Plug Assembly Socket Contacts |                   | Receptacle Assembly Pin Contacts |                   |
|                |                           |               | Phenolic                      | Diallyl Phthalate | Phenolic                         | Diallyl Phthalate |
| A              | 1                         | .242<br>6.15  | 5-204689-5                    | 6-204689-4        | 1-204690-9                       | —                 |
|                | 2                         | .456<br>11.58 | 5-204689-6                    | 6-204689-5        | —                                | —                 |
|                | 3                         | .670<br>17.02 | 5-204689-7                    | 6-204689-6        | 2-204690-1                       | 3-204690-0        |
| B              | 1                         | .242<br>6.15  | 6-204689-1                    | —                 | —                                | —                 |
|                | 3                         | .670<br>17.02 | —                             | 7-204689-2        | 2-204690-7                       | —                 |

- Notes:** 1. Markings on receptacle assembly are on wiring side only.  
 2. In addition to combinations listed, all sizes are available with or without female jackscrews. Plugs are available with pins, and receptacles are available with sockets. Consult Tyco Electronics for details.  
 3. Fixed female jackscrews are included with these assemblies.

Preloaded Housings, .025 x .025 [0.64 x 0.64] Posted Contacts for Automatic Wiring (Continued)

106 Position

Material and Finish

Housing — See Chart

Contact Body —

Brass Plated as follows

**A** — .000030 [0.00076] Gold over .000050 [0.00127] Nickel

**B** — Gold Flash over .000050 [0.00127] Nickel on entire contact, with additional .000030 [0.00076] Gold in contact area

Contact Sleeve — Stainless Steel

Related Product Data

Contact Size — 20

Pin Diameter — .040 [1.02]

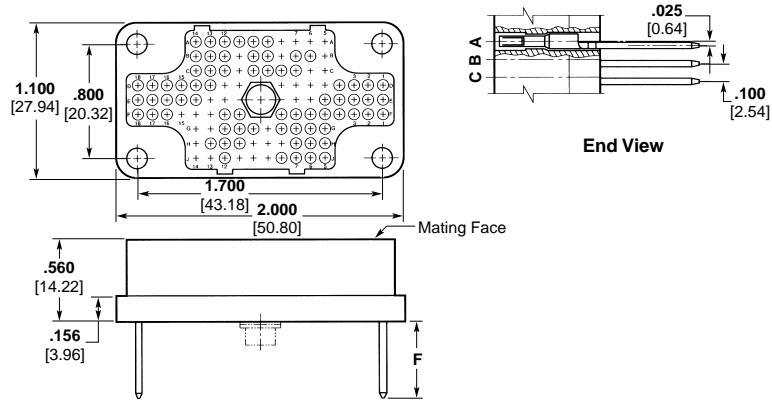
Current Rating — 3.0 Amperes (20 AWG [0.5–0.6 mm<sup>2</sup>] wire)

Replacement Contacts — Page 5178

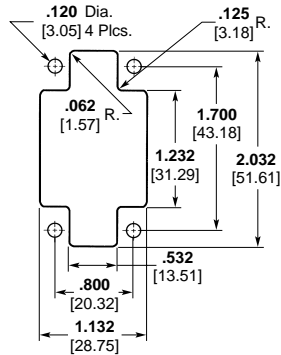
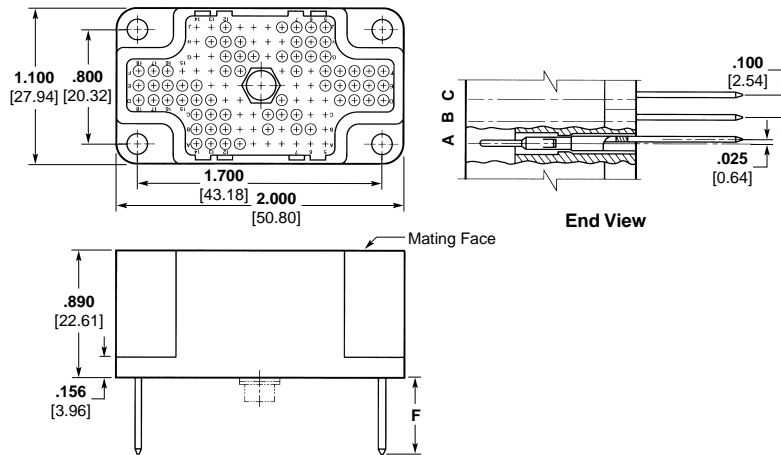
Mateable Connectors — Pages 5179 and 5180

Technical Documents — Page 5177

Plug Assembly



Receptacle Assembly



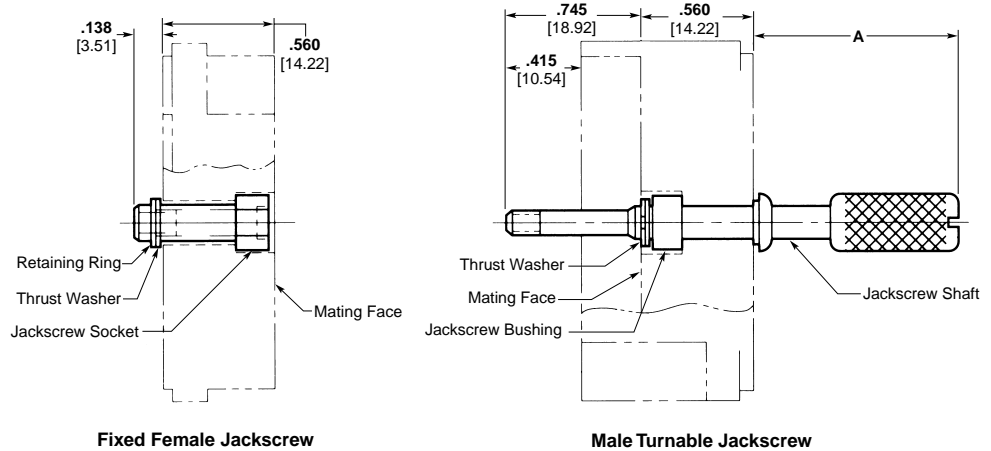
Recommended Panel Cutout

| Contact Finish | Max. Termination Per Post | Dim. F        | Part Numbers                  |                   |                                  |                   |
|----------------|---------------------------|---------------|-------------------------------|-------------------|----------------------------------|-------------------|
|                |                           |               | Plug Assembly Socket Contacts |                   | Receptacle Assembly Pin Contacts |                   |
|                |                           |               | Phenolic                      | Diallyl Phthalate | Phenolic                         | Diallyl Phthalate |
| A              | 1                         | .242<br>6.15  | 5-204691-5                    | —                 | —                                | 2-204692-8        |
|                | 3                         | .670<br>17.02 | 5-204691-7                    | 6-204691-6        | 2-204692-1                       | 3-204692-0        |
| B              | 1                         | .242<br>6.15  | 6-204691-1                    | 7-204691-0        | —                                | 3-204692-4        |
|                | 3                         | .670<br>17.02 | 6-204691-3                    | 7-204691-2        | 2-204692-7                       | 3-204692-6        |

- Notes:**
1. Markings on receptacle assembly are on wiring side only.
  2. In addition to combinations listed, all sizes are available with or without female jackscrews. Plugs are available with pins, and receptacles are available with sockets. Consult Tyco Electronics for details.
  3. Fixed female jackscrews are included with these assemblies.

Accessories

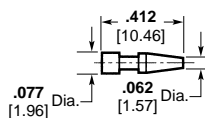
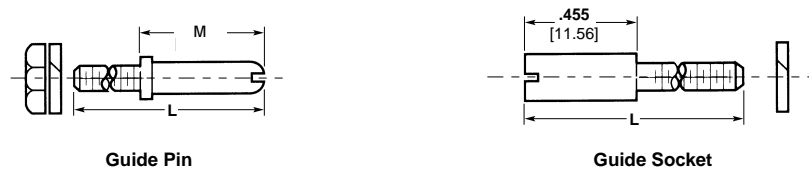
Center Fasteners



| No. of Positions | Type                | A                    | Part No. |
|------------------|---------------------|----------------------|----------|
| 12, 24<br>36, 48 | Fixed Female        | —                    | 204299-1 |
|                  | Short Male Turnable | <b>1.01</b><br>25.65 | 204298-1 |
|                  | Long Male Turnable  | <b>1.76</b><br>44.70 | 204298-2 |
| 54, 106          | Fixed Female        | —                    | 203879-1 |
|                  | Short Male Turnable | <b>1.01</b><br>25.65 | 203880-1 |
|                  | Long Male Turnable  | <b>1.76</b><br>44.70 | 203880-2 |

**Note:** Short male jackscrews cannot be used with shield and cable clamp assemblies.

Keying



| Material          | Pin                   |                      |          | Socket                |          |
|-------------------|-----------------------|----------------------|----------|-----------------------|----------|
|                   | Dim. L                | Dim. M               | Part No. | Dim. L                | Part No. |
| Zinc Plated Brass | <b>1.100</b><br>27.94 | <b>.515</b><br>13.08 | 203881-1 | <b>1.045</b><br>26.54 | 203882-1 |
| Stainless Steel   | <b>1.100</b><br>27.94 | <b>.515</b><br>13.08 | 203881-2 | <b>1.045</b><br>26.54 | 203882-2 |
| Zinc Plated Brass | <b>1.300</b><br>33.02 | <b>.725</b><br>18.42 | 205694-1 | —                     | —        |

Keying Plug

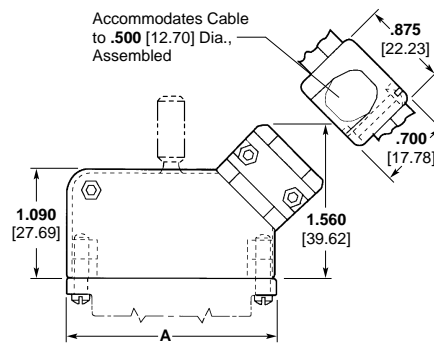
Part Number 205120-1

Accessories (Continued)

45° Shield and Cable Clamps

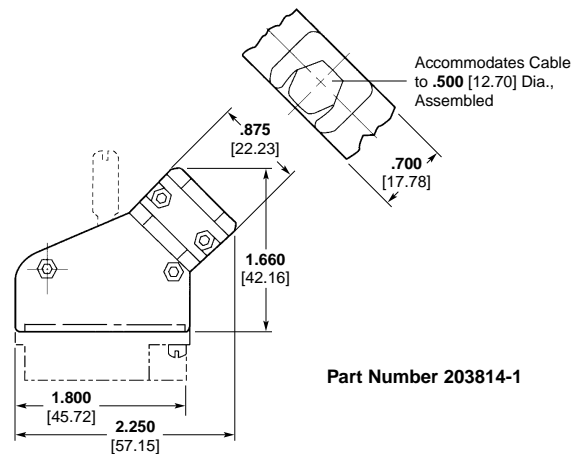
Material — Black Polysulfone

12, 24, 36 & 48 Position



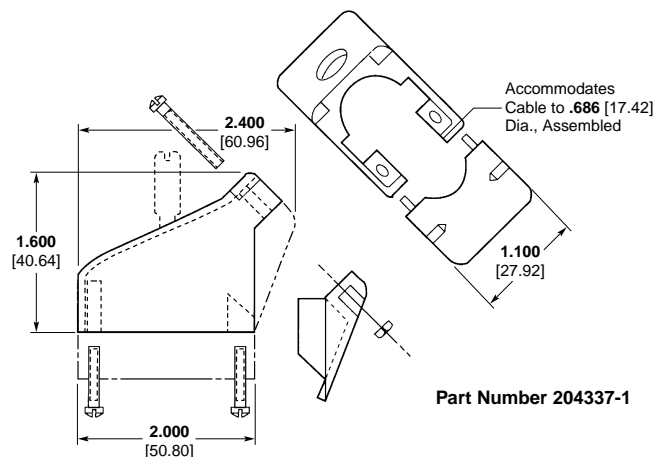
| No. of Positions | Dim. A         | Part No. |
|------------------|----------------|----------|
| 12               | 1.334<br>33.88 | 205083-1 |
| 24               | 1.734<br>44.04 | 205083-2 |
| 36               | 2.134<br>54.20 | 205083-3 |
| 48               | 2.534<br>64.36 | 205083-4 |

54 Position



Part Number 203814-1

106 Position



Part Number 204337-1

Type XI crimp/snap-in contacts may be applied with hand tools, semi-automatic bench equipment or fully-automatic lead-making machines.

### CERTI-CRIMP II Straight Action Hand Tools (SAHT)



Premium grade hand tools. Feature ratchet control to provide complete crimp cycle. Die sets close in a straight line. Include a contact locator and wire stop, plus an insulation crimp adjustment lever, when applicable. Approximate weight 1.3 lb [0.59 kg].

### Application Tooling

#### AMP-O-LECTRIC Model "K" Terminating Machine, 1-471273-3



Semiautomatic bench machine for use with standard-style applicators. It is an electrically-powered, clutched, flywheel-energy-style machine, equipped with a mechanical strip feed mechanism. Products commonly applied with this machine include AMP splices, AMPLIVAR splices, and FASTON flag receptacles.

#### Specifications

**Width** — 21 [533]

**Depth** — 20 [508]

**Height** — 24 [610] without reel

**Weight** — 230 lb [104 kg]

**Electrical** — 120 VAC, 60 Hz, 6 A

**Air** — 90-110 psi [6.21-7.59 bar], 6 scfm [0.00282 m<sup>3</sup>/s] when required with air-feed applicators

**Wire Range** — 26-10 AWG [0.12-6 mm<sup>2</sup>] solid or stranded, depending on product applied

For more information, contact Tyco Electronics.

#### AMPOMATOR CLS IV+ Lead-Making Machines, 356500-1, -2



Fully-automatic machines that measure, cut, strip and terminate single leads. Microprocessor-controlled, and programmed and operated using an easy-to-follow, menu-driven touch-screen. Features include direct-drive terminating units with precision crimp height adjustment, fully programmable setups, wire runout and splice detection, and motorized pre-feed with wire straightener. Crimp quality monitoring is also available.

#### Specifications

**Width** — 159 [4 040]

**Depth** — 68 [1 730]

**Height** — 86 [2 185] with 24 [610] dia. reel

**Weight** — 2 000 lb [907 kg]

**Electrical** — 220 VAC, 50 or 60 Hz, single phase, 25 A, with neutral and ground

**Air** — 90 psi [6.21 bar], 15 scfm [0.0071 m<sup>3</sup>/s] sustained

**Wire Range** — 26-10 AWG [0.12-6 mm<sup>2</sup>] stranded, 26-16 AWG [0.12-1.4 mm<sup>2</sup>] solid

**Lead Lengths** — 3-90

[76.2-2 285], 90-1 000 [2 285-25 400] with long lead conveyors

For more information, request Catalog 124324.

#### Crimp Quality Monitor (CQM), 1320420-1, -2



This unique system provides 100% on-the-fly crimp inspection. It measures the crimp height of each termination, and evaluates the quality of each crimp. If a crimp is questionable, the monitor alerts the operator with both visual and audible alarms. It also provides ports for printing and networking. When used with AMP-O-LECTRIC Model "G" Termination Machines, the monitor is mounted to the machine. When used with AMPOMATOR CLS IV+ Lead-Making Machines, it is integrated into the machine's operating system.

#### Specifications

**Width** — 8.8 [220]

**Depth** — 8.1 [205]

**Height** — 4.6 [115]

**Weight** — 5 lb [2.3 kg]

**Electrical** — 100-240 VAC, 50/60 Hz, 3.2 A

For more information, request Catalog 82275.

Application Tooling (Continued)

**AMP-O-LECTRIC Model "G" Terminating Machines, 354500-1, -9, -11**

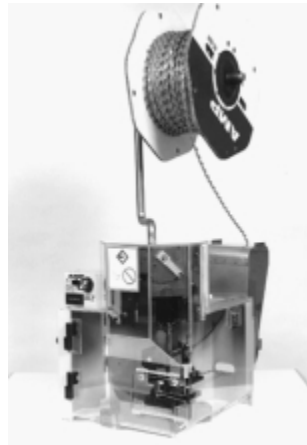


Semiautomatic bench machines for crimping reeled terminals and contacts, featuring a quiet and reliable direct motor drive, microprocessor controls for ease of setup and operation, and guarding and lighting designed for operator convenience. All models are equipped with either manual or automatic precision adjustment of crimp height. Machine-mounted sensors are available for crimp quality monitoring using conventional miniature-style applicators.

**Specifications**

**Width** — 18.7-25.3 [475-643] depending on applicator type  
**Depth** — 21.5-28.1 [546-713] depending on applicator type  
**Height** — 20 [508]  
**Weight** — 240 lb [110 kg]  
 Electrical — 120 or 220 VAC, 50 or 60 Hz; 310 VA  
**Air** — 90-110 psi [6.21-7.59 bar], 6 scfm [0.00282 m<sup>3</sup>/s] when required with air-feed applicators  
**Wire Range** — 26-10 AWG [0.12-6 mm<sup>2</sup>] solid or stranded, depending on product applied  
 For more information, request Catalog 65828.

**Entry Level Terminator (ELT), 1338600-1, -2, -3, -4, -5, -6**



Semiautomatic Bench Terminator for side- and end-feed reeled terminals and contacts. The ELT uses a DC motor with gear box drive. The result is a small-footprint design that is fast and quiet. Cycle time is less than 0.400 seconds with an operation sound level of 76dBa. With a crimp force capacity of 3,000 pounds, the ELT is available for all but the highest crimp force applications. A wide range of optional equipment is also available to meet your specific application requirements.

**Specifications**

**Width** — 16.8 [427]  
**Depth** — 20.6 [523]  
**Height** — 20 [510] without reel support  
**Weight** — approx. 150 lb [68 kg]  
**Electrical** — 100-240 VAC, 50/60 Hz, 6A (Note: Avg <1 A at 120 VAC when used as a bench-top unit at 2,000 cycles per hour operating rate)  
**Air** — 90-100 psi [6.21-6.90 bar], 6 scfm [0.00282 m<sup>3</sup>/s] when required for use with air-feed applicators (Note: Optional Air Feed Valve Assembly Required)  
**Wire Range** — Up to 14 AWG [2.5 mm<sup>2</sup>]  
 For more information, request catalog 1308382.

**AMP-O-MATIC Stripper/Crimper Machine, 1320895-1**

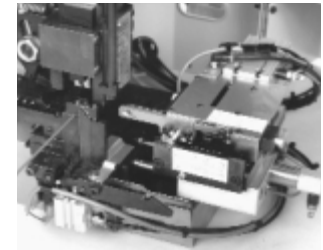


Semiautomatic bench crimping machines that also strip the wire, and are therefore used for terminating jacketed cable. Feature manual precision adjustment of crimp height, keyed strip blades for faster, more accurate setups, and an efficient scrap removal system. All adjustments can be made from the front of the machines without special tools. Available with crimp quality monitoring.

**Specifications**

**Width** — 14 [355]  
**Depth** — 18 [457]  
**Height** — 33 [838] without reel  
**Weight** — 150 lb [68 kg]  
**Electrical** — 120 VAC, 50 or 60 Hz, 5 A  
**Air** — 80-100 psi [5.52-6.90 bar], 3.5 scfm [0.00165 m<sup>3</sup>/s]  
**Wire Range** — 32-14 AWG [0.03-2 mm<sup>2</sup>]  
 For more information, request Catalog 65004.

**Stripping Module**



The combination of the Stripping Module with the Entry Level Terminator (ELT) or the AMP-O-LECTRIC Model G Terminator provides an economical and proficient method of stripping wire and crimping terminals on the same machine. Wires are stripped during handling or storage. Once the wire is fed into the start sensor the Stripping Module does the rest, improving placement accuracy.

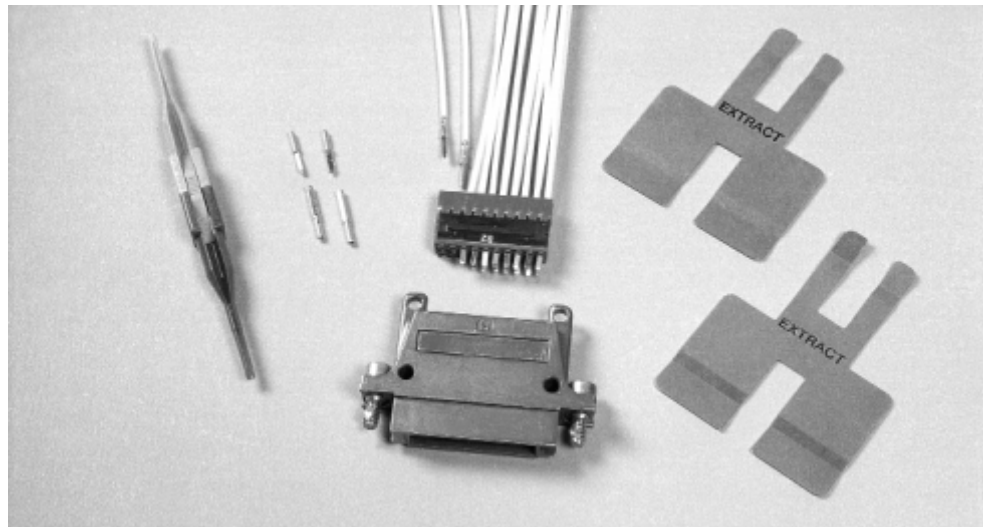
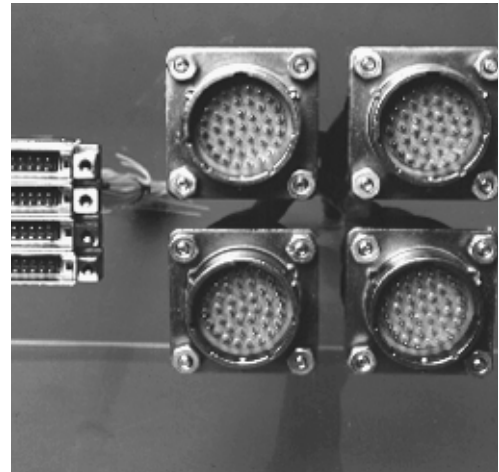
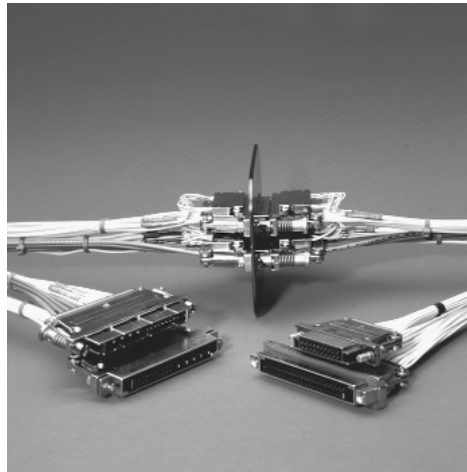
**Specifications**

**Wire Range Base Module** — 0.03 mm<sup>2</sup> - 2.0 mm<sup>2</sup> (32-14 AWG) (30-32 AWG may require special kit.)  
**Max. Insulation** — .200 [5.08]  
**Cable Breakout** — > 1.100 [29.00]  
**Strip Length** — .100 - .400 [2.50 - 10.16]  
**Noise** — Less than 82 dBA (Typical at operator position with standard mechanical feed applicator)  
**Weight** — 4.53 Kilograms (10 lb)  
**Height** — 5.000 [127.00]  
**Electrical** — 100-240 VAC, 50/60 Hz, single phase current, obtains power from the terminator  
**Air** — 620-760 kPa (90-100 psi), 2.83 liters/sec (6 scfm)  
**Wire Sensor** — Gold plated contacts with laser etched target  
 For more information, request Catalog 1309085.

**Introduction**

**Product Facts**

- Low-profile rectangular design for high packaging density
- Environmental sealing for aerospace applications
- Modular components for design versatility and logistics savings
- Lightweight materials for weight savings
- Quick-disconnect mating hardware



**METRIC**  
Dimensions in this section are millimeters over inches

**System**

The Raychem MTC product line is a complete modular connector system consisting of lightweight, environmentally sealed miniature rectangular connectors (shell housings with removable inserts) and individually removable rear-release contacts.

**Components**

MTC connectors are now available with quick-disconnect mating hardware, EME shielding accessories, and modular inserts that can accommodate a mix of signal and power crimp contacts and coaxial contacts. The need for special termination tooling has

been minimized, while the ease of manufacturing and maintenance has been improved.

**Configurations**

MTC rectangular connectors using jack screws or quick-disconnect hardware can be stacked or panel-mounted next to each other without any provision for grip space, a feature that can save significant panel area.

MTC connectors are available in 1-inch and 2-inch configurations. Modular removable inserts with size 22 and/or size 16 contact cavities can be combined into the 1-inch and 2-inch MTC housings.

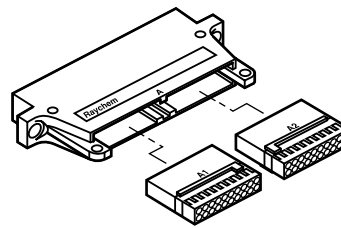
**Inserts**

MTC inserts are available in 20-cavity and 5-cavity versions. The 20-cavity insert accepts size 20-22 (24 AWG to 20 AWG wire) crimp contacts. The 5-cavity insert accepts size 16-14 crimp contacts. Insertion/extraction of the contacts is rear release.

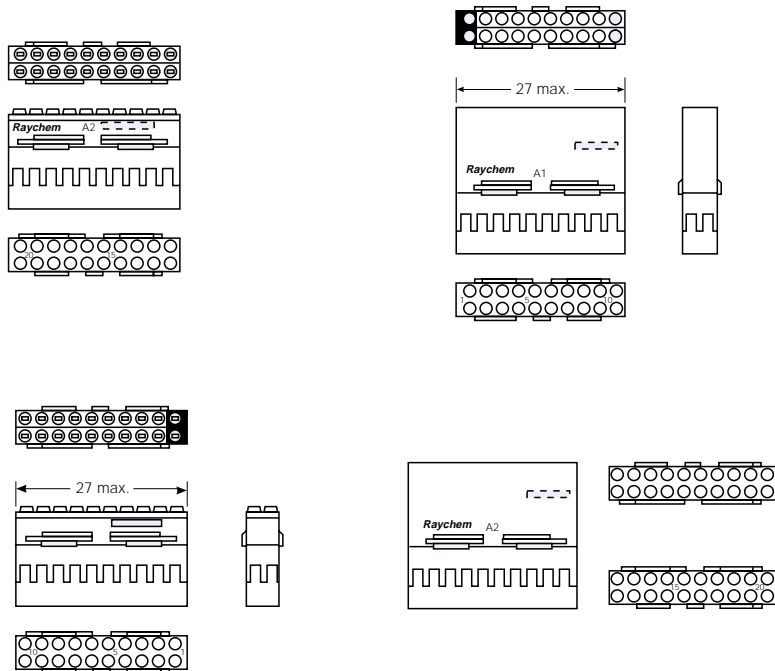
**Note:**

Other configurations are available in the MTC family (size 12 contacts; 50 mil spacing for double density; accessories). Please contact Tyco Electronics.

20-Cavity Inserts



2-inch shell with inserts



MTCP-122-20 inserts are used with MTC100 1-inch and 2-inch shells. The 1-inch shell takes:

- One MTCP-122-20P (pin contact) **or**
- One MTCP-122-20S (socket contact)

The 2-inch shell takes:

- One MTCP-122-20P1 and one MTCP-122-20P2 (pin contact) **or**
- One MTCP-122-20S1 and one MTCP-122-20S2 (socket contact)

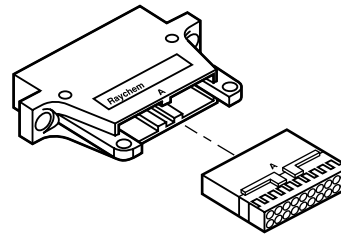
2 x 20 Cavity Inserts  
(Size 20-22)—2-Inch Shell

| Pin Insert    | Socket Insert |
|---------------|---------------|
| MTCP-122-20P1 | MTCP-122-20S1 |
| MTCP-122-20P2 | MTCP-122-20S2 |

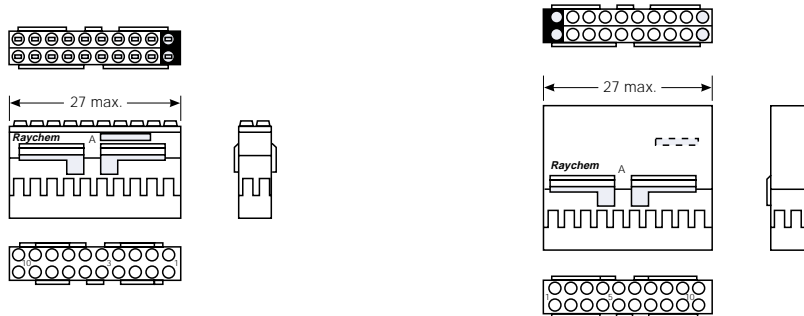


1 x 20 Cavity Inserts (Size 20-22)—1-Inch Shell

20-Cavity Inserts (Continued)



1-inch shell with insert



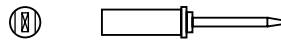
| Pin Insert   | Socket Insert |
|--------------|---------------|
| MTCP-122-20P | MTCP-122-20S  |

**Contacts for 20-Cavity Inserts**

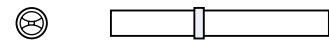
The contacts for 20-cavity inserts must be ordered separately. They are:

- CTA-0166—pin contact
- CTA-0165—socket contact

Contacts accept 24 AWG to 20 AWG wires.



**Pin Contact  
CTA-0166**

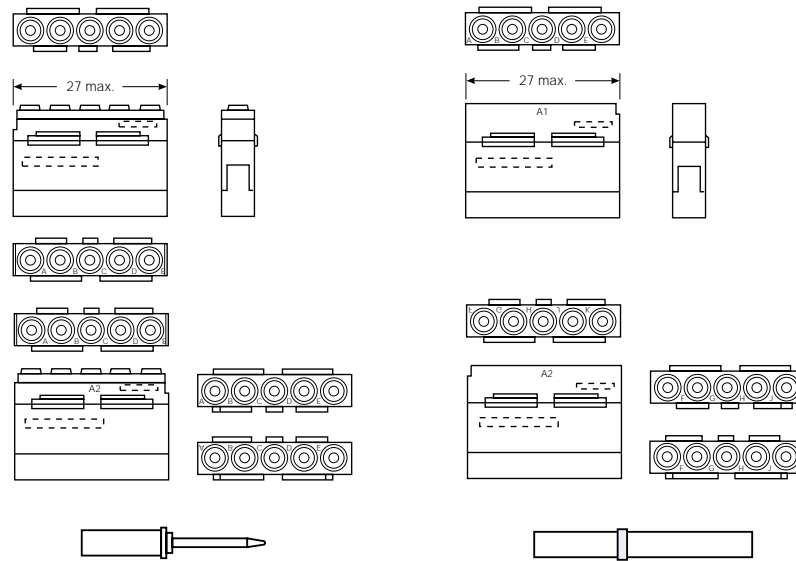


**Socket Contact  
CTA-0165**

| Tools                            |            | Tools                            |            |
|----------------------------------|------------|----------------------------------|------------|
| Positioner for pin contact       | CE-1605900 | Positioner for socket contact    | CE-1606000 |
| Installation process             | ES-61413   | Installation process             | ES-61413   |
| Contact removal tool (plastic)   | CTA-1160   | Contact removal tool (plastic)   | CTA-1160   |
| Extraction tool for MTCP inserts | CTA-0161   | Extraction tool for MTCP inserts | CTA-0161   |

5-Cavity Inserts

5-Cavity Inserts (Size 16)



MTCP-116-05 inserts are used with MTC100 1-inch and 2-inch shells. The 1-inch shell takes:

- One MTCP-116-05-P1 (pin contact) **or**
- One MTCP-116-05-S1 (socket contact)

The 2-inch shell takes:

- One MTCP-116-05P1 and one MTC-116-05P2 (pin contact) **or**
- One MTCP-116-05-S1 and one MTCP-116-05-S2 (socket contact)

**5-Cavity Inserts (Size 16)**

| Pin Insert    | Socket Insert |
|---------------|---------------|
| MTCP-116-05P1 | MTCP-116-05S1 |
| MTCP-116-05P2 | MTCP-116-05S2 |

**Contacts for 5-Cavity Inserts**

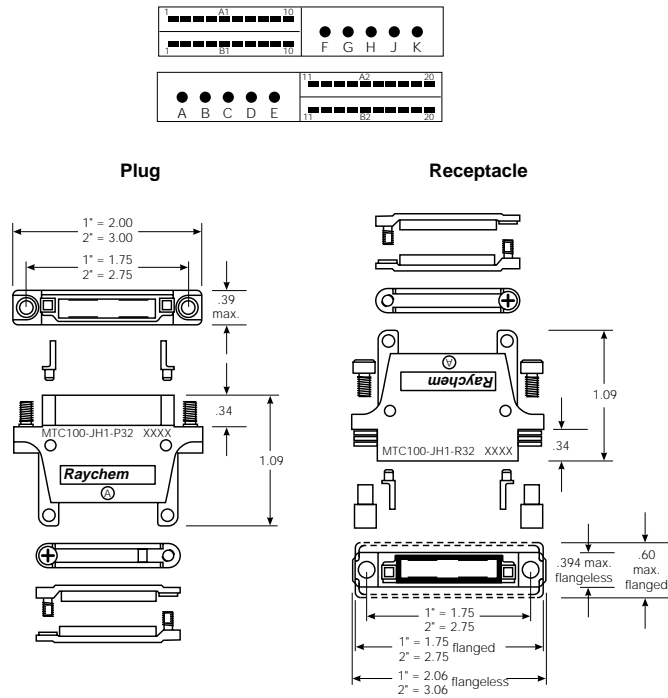
The contacts for 5-cavity inserts must be ordered separately. They include:

- CTA-0079 - pin contact (MS 27493-16) (MIL-C-39029/58 intermateable)
- CTA-0078 - socket contact (MS 27491-16) (MIL-C-39029/57 intermateable)
- D-602-0140 - coaxial pin contact (MIL-C-39029/76 intermateable)
- D-602-0171 - coaxial socket contact (MIL-C-39029/78 intermateable)

Other contacts designed for M38999 Series II connectors can be used.

| Pin Contact          | Socket Contact       |
|----------------------|----------------------|
| D-602-0140 (coaxial) | D-602-0171 (coaxial) |
| CTA-0079 (power)     | CTA-0078 (power)     |

Hybrid Inserts



Hybrids

Hybrid insert combinations of size 22 and size 16 contact cavities are also possible.

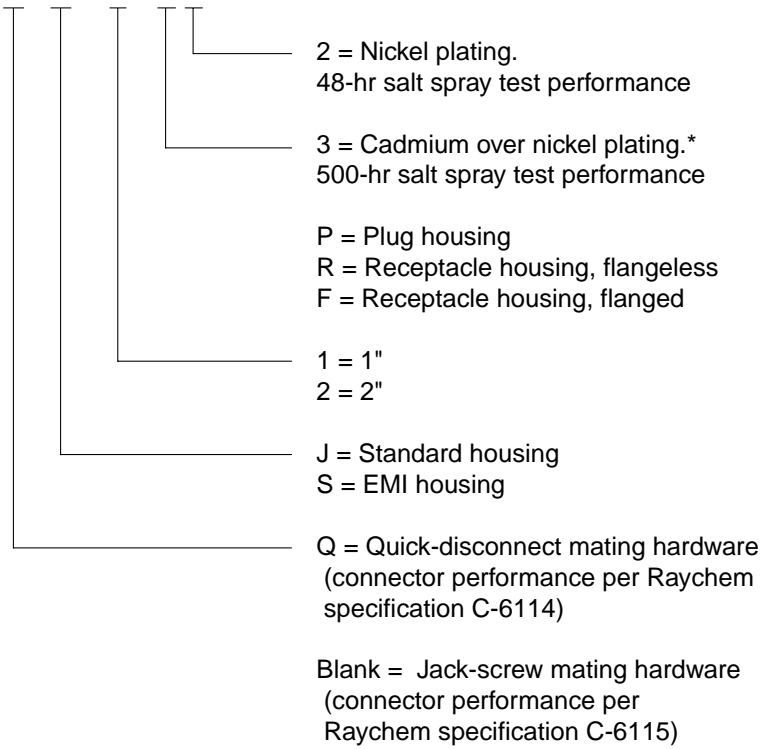
**2-Inch Shell—Hybrid Assembly**

Power and signal

**Shells**

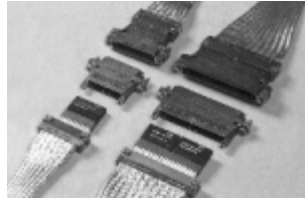
MTC connector housing shells are available with nickel plating (48-hr salt spray performance) or cadmium over nickel plating (500-hr salt spray performance).

MTC connector housings are offered with quick-disconnect or jack-screw mating hardware. Each connector shell is polarized and has 64 user-defined keying combinations. Lightweight, low-profile EME backshells are also available for increased shielding effectiveness of the connector.

**MTC Shells Ordering Information****M T C 1 0 0 X - X H X - X X 2**

\*Some combinations of shells, mating hardware and EME shielding accessories are not available.  
Contact Tyco Electronics for product information.

Accessories



**Low-Profile EME Backshells**

Lightweight rectangular EME backshells connect the overall bundle shield to the MTC connector housing. Individual cable shields can also be terminated to the backshell braid by using Raychem SolderSleeve devices.

The backshell is mounted on the MTC housing via the cable clamp screws.

MTC backshell features include a low profile, light weight, and Level II EME performance.



**EME Backshell Adapters**

CHA-0275 2-inch adapter (plug or receptacle)

CHA-0276 1-inch adapter (plug or receptacle)

MTC shield-grounding busbars Raychem MTC shield-grounding busbars allow for simple, cost-effective termination of cable shielding to MTC aluminum housings.

Two-inch shield-grounding busbars terminate up to 20 shielded twisted pairs on a 2-inch MTC connector. The individual shields are terminated to "fingers" on the busbar with Raychem SolderSleeve devices.

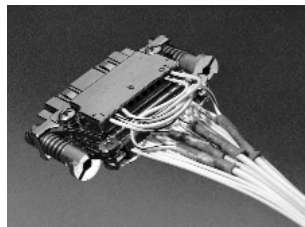
The busbar is mounted on the MTC housing via cable clamp screws.

MTC busbar features include a simple termination, cost effectiveness, light weight, and Level I EME performance.

**Shield-Grounding Busbars**

CTA-0022 1-inch busbar (with 5 SolderSleeve terminators)

CTA-0023 2-inch busbar (with 10 SolderSleeve terminators)



**EME Shielding Accessories for MTC Connectors**

**Grounding Block**

Allows for cable shield termination grounding on the MTC shell housing via crimp-removable contacts. This grounding scheme allows individual cables to be removed from the connector without cutting a ganged ground connection. Sufficient ground contacts are available to handle shielded twisted-pair cables.

CHA-0301 1-inch grounding block receptacle shell

CHA-0302 2-inch grounding block receptacle shell

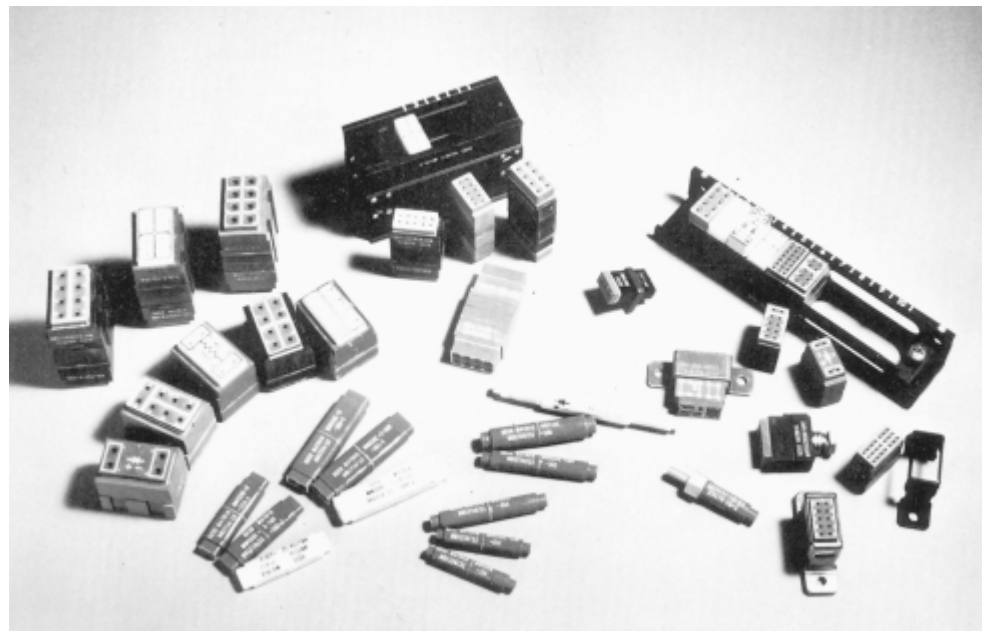
CHA-0303 1-inch grounding block plug shell

CHA-0304 2-inch grounding block plug shell

Introduction

Product Facts

- The TJS connections are inherently more reliable than conventional threaded and solder terminations.
- The user's wiring is crimped to gold plated pin contacts, conforming to MIL-C-39029/1, which are individually mated to probe-proof gold plated pre-bussed sockets contained within the module and splice.
- Modules and Splices — environment proof conforming to the requirements of MIL-T-81714. These modules can be assembled into MIL-T-81714 rails and are individually removable. Brackets are also available to mount individual or triads of modules. The splices are designed to terminate from two to four wires.
- Commercial TJS consists of module blocks (either environmental or non-environmental) designed for custom assembled installations. These can be furnished in pre-assembled arrays in rails or individually with rail kits to accommodate various rows and lengths of modules.
- TJS Connectors also qualified to German Army Standard VG 95212-31/ VG 95231-102/103/105



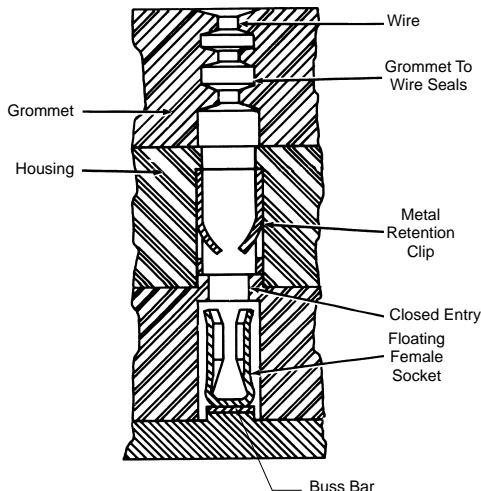
The Terminal Junction System (TJS) provides design engineers with a compact family of modules and splices for interconnecting wires. Both the modules and splices facilitate interconnecting with pre-bussed configurations to which the user's 22 thru 12 AWG wires are terminated with crimped removable pin contacts. Servicing tools required are the commonly available MIL-C-81969/14, plastic tool and MIL-C-22520 crimping tool used

for rear release connector contacts.

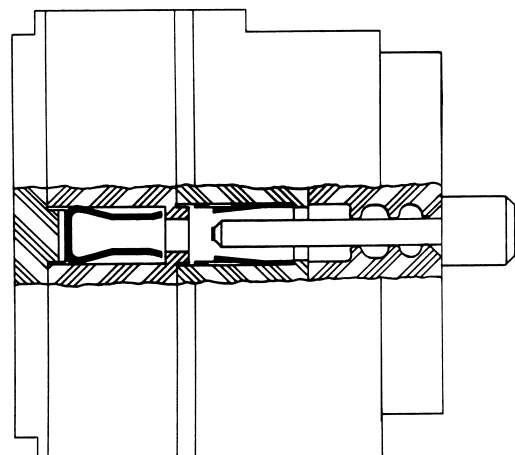
The TJS eliminates many shortcomings of the conventional lug and threaded termination. The TJS has no loose attaching hardware, such as nuts, screws and lock-washers to complete the termination. The TJS saves space and weight over threaded terminations while reducing installation cost. There is complete electrical isolation and optional environmental

sealing grommet in the TJS without user installed busses, barriers, insulating strips, potting and enclosures. The TJS module pre-bussed integral sockets are permanently connected in a variety of bussing arrangements to suit the most exacting circuit requirements. These modules can be user assembled into any required bussing arrangement and contact size permutation.

Typical Module Construction (Cross-Section)



Module With Sealing Plug Installed (Cross-Section)



**Voltage Rating —**

Sizes 22, 20, 16, 12

| Altitude      | DWV*    | Working Voltage |
|---------------|---------|-----------------|
| Sea level     | 1,500 V | 600 V           |
| 70,000 Feet** | 600 V   | 300 V           |

Size 21 (22HD)

| Altitude      | DWV*    | Working Voltage |
|---------------|---------|-----------------|
| Sea Level     | 1,000 V | 600 V           |
| 70,000 Feet** | 325 V   | 300 V           |

\* DWV = Dielectric Withstanding Voltage

\*\* [21,336m]

**Contact Voltage Drop (Max.) —**

| Contact Size | Test Current | Initial | After Conditioning |
|--------------|--------------|---------|--------------------|
| 21 (22HD)    | 5.0 A        | 55 V    | 65 V               |
| 22           | 5.0 A        | 45 V    | 50 V               |
| 20           | 7.5 A        | 45 V    | 50 V               |
| 16           | 13.0 A       | 50 V    | 55 V               |
| 12           | 23.0 A       | 40 V    | 45 V               |

The MV drop is measured across an adjacent bussed pair of wire contacts.

**Operating Temperature Range —**

| Class | Minimum       | Maximum         |
|-------|---------------|-----------------|
| D     | -65°C (-85°F) | +200°C (+392°F) |

**Altitude Immersion —**

Insulation resistance shall not fall below 5,000 megohms after being subjected to three, 70,000-foot [21,336m] altitude immersion cycles in salt water.

**Fluid Immersion —**

Class D—Extended fluid type

| Fluid       |                 |
|-------------|-----------------|
| MIL-H-5606  | Hydraulic fluid |
| MIL-L-23699 | Lubricating oil |
| MIL-T-5624  | Aviation fuel   |
| MIL-L-7808  | Lubrication oil |
| MIL-A-8243  | Anti-ice fluid  |
| MIL-C-25769 | Cleaning fluid  |
| Skydrol     | 500A & 500B     |
| Aerosafe    | 2300 & 2300W    |
| Flyjet      | III             |
| Esso Oil    | Turbo 25        |

**Moisture Resistance —**

High Humidity (95% RH) 100 megohms min.  
After Drying—24 hours 1,000 megohms min.

**Durability —**

No performance degradation after 10 cycles of contact insertion/removal.

**Vibration —**

Class D

Sine, MIL-STD-202, method 204 condition G  
Random, MIL-STD-1344, method 2005.

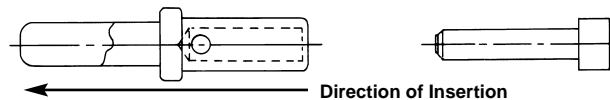
**Shock —**

Class D

MIL-STD-1344, Method 2004  
(300 G, 3 milliseconds duration, half-sine).

**Contacts, Sealing Plugs and Assembly Tools**

**Contacts and Sealing Plugs**



| Size     | Part Numbers |              |               |            |
|----------|--------------|--------------|---------------|------------|
|          | Pin Contacts |              | Sealing Plugs |            |
|          | Commercial   | Military     | Commercial    | Military   |
| 21(22HD) | 592413-1     | M39029/1-507 | 592104-4      | MS27488-22 |
| 22       | 3-592404-1   | M39029/1-100 | 592104-1      | MS27488-20 |
| 20       | 2-592404-1   | M39029/1-101 | 592104-1      | MS27488-20 |
| 16       | 1-592404-1   | M39029/1-102 | 592104-2      | MS27488-16 |
| 12       | 592404-1     | M39029/1-103 | 592104-3      | MS27488-12 |

**Insertion/Removal Tools**

| Size     | Part Numbers |              | Color*  | Wire Gage | Contact Wire Dia. Min./Max. | Finished Crimp Tool  | Turret or Positioner |
|----------|--------------|--------------|---------|-----------|-----------------------------|----------------------|----------------------|
|          | Commercial   | Military     |         |           |                             |                      |                      |
| 21(22HD) | —            | M81969/14-01 | Grn/Wh  | 28-22     | .030-.054 [.76-1.37]        | M22520/2-01          | M22520/2-32          |
| 22       | 592105-1     | M81969/14-11 | Rd/Wh   | 26-22     | .034-.066 [.86-1.68]        | M22520/2-01          | M22520/2-11          |
| 20       | 592105-1     | M81969/14-11 | Rd/Wh   | 24-20     | .038-.083 [.97-2.11]        | M22520/1-01 or /2-01 | M22520/1-02 or /2-02 |
| 16       | —            | M81969/14-03 | Blue/Wh | 20-16     | .060-.101 [1.52-2.57]       | M22520/1-01          | M22520/1-02          |
| 12       | —            | M81969/14-04 | Yel/Wh  | 14-12     | .087-.147 [2.21-3.73]       | M22520/1-01          | M22520/1-02          |

\* Colored end for contact insertion; white end for release/removal.

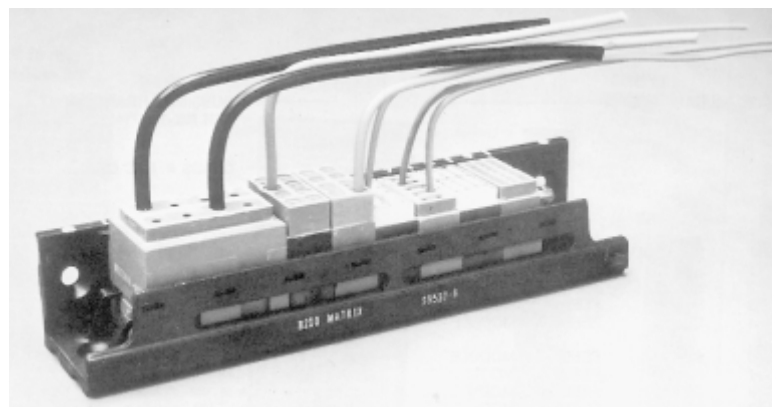
**Electronics**

**Feedback and Feedthru Terminal Junction Modules**

MIL-T-81714 Terminal Junction module blocks are available in sizes 12, 16, 20, 22 and 22HD. The size 12 and 16 feedback blocks have eight cavities each. The size 20 and 22 feed-back blocks have 10 cavities each (size 22HD has 21 cavities). The feedthru blocks have the same number of cavities situated on both sides of the block.

Military bussing arrangements are available with each size block.

These module blocks and mounting rail assemblies are qualified to MIL-T-81714. The pin contacts are qualified to MIL-C-39029/1.



**Feedthru**

| Military Part Numbers Feedthru Modules | AMP Commercial Part Numbers Feedthru Modules |
|--|--|
| <b>(Class D) Size 20</b>               |  |
| M81714/7-DA1                           | 592608-3                                     |
| M81714/7-DB1                           | 592608-1                                     |
| M81714/7-DB2                           | —  |
| M81714/7-DB3                           | —  |
| M81714/7-DC1                           | 592608-8                                     |
| M81714/7-DC2                           | —  |
| M81714/7-DD1                           | 592608-6                                     |
| M81714/7-DE1                           | 592608-5                                     |
| M81714/7-DJ1                           | —  |
| <b>(Class D) Size 16</b>               |  |
| M81714/8-DA1                           | 592604-5                                     |
| M81714/8-DB1                           | 592604-3                                     |
| M81714/8-DB2                           | 592604-7                                     |

| Military Part Numbers Feedthru Modules | AMP Commercial Part Numbers Feedthru Modules |
|--|--|
| <b>(Class D) Size 16 (Continued)</b>   |  |
| M81714/8-DC1                           | 592604-9                                     |
| M81714/8-DC2                           | —  |
| M81714/8-DD1                           | 592604-1                                     |
| M81714/8-DH1                           | —  |
| <b>(Class D) Size 12</b>               |  |
| M81714/9-DA1                           | 592600-9                                     |
| M81714/9-DB1                           | 592600-7                                     |
| M81714/9-DB2                           | 1-592600-3                                   |
| M81714/9-DC1                           | 592600-1                                     |
| M81714/9-DC2                           | 1-592600-1                                   |
| M81714/9-DD1                           | 592600-5                                     |
| M81714/9-DH1                           | 592600-3                                     |

**Notes:** Tyco Electronics has not qualified the Feedthru Modules to MIL-T-81714. The Military part number is shown for reference only.

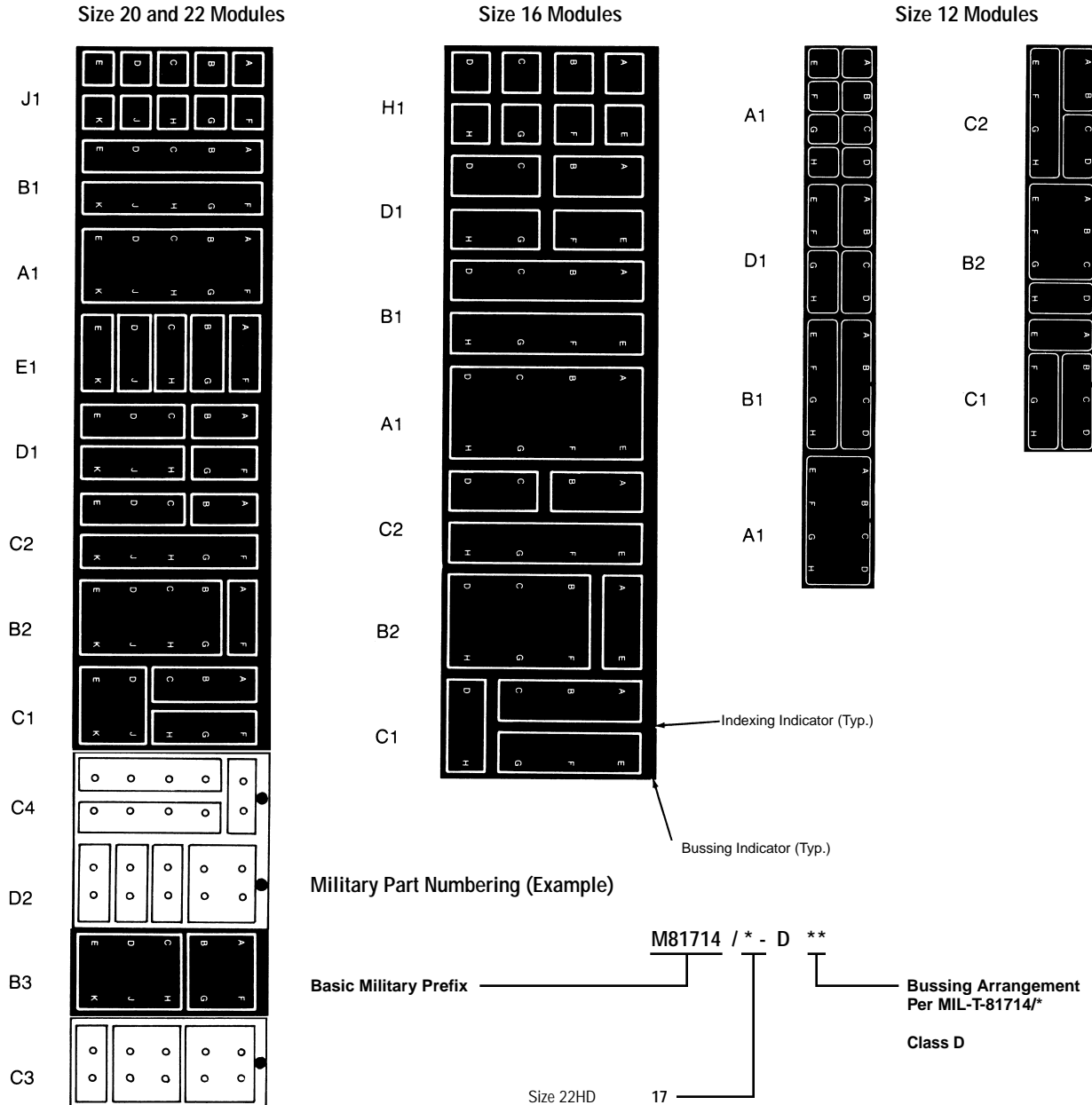
**Feedback**

| Military Part Numbers Feedback Modules | AMP MIL Qualified Part Numbers Feedback Modules | AMP Commercial Part Numbers Feedback Modules |
|--|---|--|
| <b>(Class D) Size 22</b>               |   |  |
| M81714/1-DA1                           | —   | 592633-4                                     |
| M81714/1-DB1                           | —   | 592633-2                                     |
| M81714/1-DB2                           | —   | 1-592633-2                                   |
| M81714/1-DB3                           | —   | 2-592633-0                                   |
| M81714/1-DC1                           | —   | 1-592633-4                                   |
| M81714/1-DC2                           | —   | 1-592633-0                                   |
| M81714/1-DD1                           | —   | 592633-8                                     |
| M81714/1-DE1                           | —   | 592633-6                                     |
| <b>(Class D) Size 21</b>               |   |  |
| M81714/17-D31                          | 592629-1  | 592629-2                                     |
| M81714/17-D32                          | 592629-3  | 592629-4                                     |
| M81714/17-D33                          | 592629-5  | 592629-6                                     |
| M81714/17-D34                          | 592629-7  | 592629-8                                     |
| M81714/17-D35                          | 592629-9  | 1-592629-0                                   |
| M81714/17-D36                          | 4-592629-4                                      | —  |
| M81714/17-D37                          | 1-529629-1                                      | 1-592629-2                                   |
| M81714/17-D38                          | 1-592629-3                                      | 1-592629-4                                   |
| M81714/17-D39                          | 1-592629-5                                      | 1-592629-6                                   |
| M81714/17-D40                          | 1-592629-7                                      | 1-592629-8                                   |
| M81714/17-D42                          | 4-592629-2                                      | 4-592629-0                                   |
| M81714/17-D43                          | 4-592629-3                                      | —  |
| M81714/17-D44                          | 1-592629-9                                      | 2-592629-0                                   |
| M81714/17-D45                          | 4-592629-5                                      | 2-592629-2                                   |

| Military Part Numbers Feedback Modules | AMP MIL Qualified Part Numbers Feedback Modules | AMP Commercial Part Numbers Feedback Modules |
|--|---|--|
| <b>(Class D) SIZE 20</b>               |   |  |
| M81714/2-DA1                           | 592624-3  | 592624-4                                     |
| M81714/2-DB1                           | 592624-1  | 592624-2                                     |
| M81714/2-DB2                           | 1-592624-0                                      | 1-592624-1                                   |
| M81714/2-DB3                           | 1-592624-8                                      | 1-592624-9                                   |
| M81714/2-DC1                           | 1-592624-2                                      | 1-592624-3                                   |
| M81714/2-DC2                           | 2-592624-2                                      | 592624-9                                     |
| M81714/2-DD1                           | 592624-7  | 592624-8                                     |
| M81714/2-DE1                           | 592624-5  | 592624-6                                     |
| <b>(Class D) SIZE 16</b>               |   |  |
| M81714/3-DA1                           | 592620-5  | 592620-6                                     |
| M81714/3-DB1                           | 592620-3  | 592620-4                                     |
| M81714/3-DB2                           | 592620-9  | 1-592620-0                                   |
| M81714/3-DC1                           | 1-592620-1                                      | 1-592620-2                                   |
| M81714/3-DC2                           | 592620-7  | 592620-8                                     |
| M81714/3-DD1                           | 592620-1  | 592620-2                                     |
| <b>(Class D) SIZE 12</b>               |   |  |
| M81714/4-DA1                           | —   | 592616-6                                     |
| M81714/4-DB1                           | —   | 592616-4                                     |
| M81714/4-DB2                           | —   | 1-592616-0                                   |
| M81714/4-DC1                           | —   | 1-592616-2                                   |
| M81714/4-DC2                           | —   | 592616-8                                     |
| M81714/4-DD1                           | —   | 592616-1                                     |

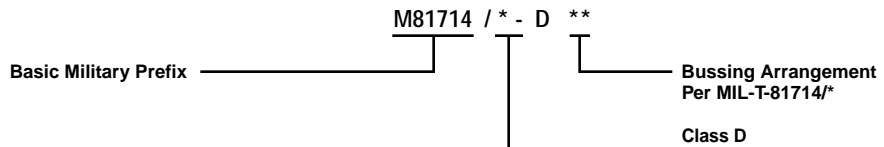


Typical Bussing Arrangements



Consult Tyco Electronics for additional bussing arrangements.

Military Part Numbering (Example)



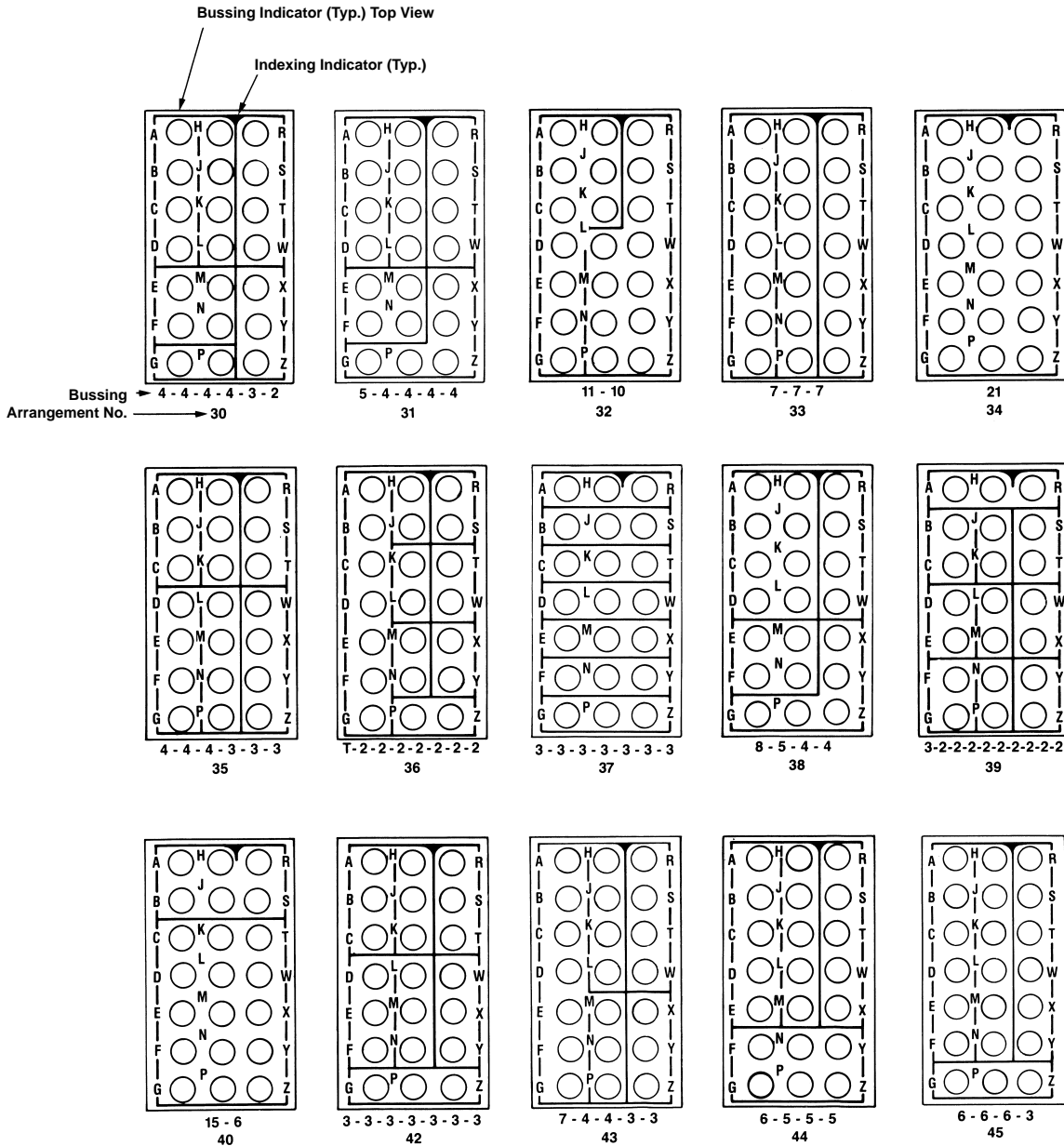
|                  |           |    |
|------------------|-----------|----|
|                  | Size 22HD | 17 |
|                  | Size 22   | 1  |
| Feedback Module  | Size 20   | 2  |
|                  | Size 16   | 3  |
|                  | Size 12   | 4  |
|                  |           |    |
| Feedthru Module* | Size 22   | 6  |
|                  | Size 20   | 7  |
|                  | Size 16   | 8  |
|                  | Size 12   | 9  |

\* For Reference Only

- Notes:** 1. When ordered to military part number, contacts and sealing plugs are included.  
 2. Mounting hardware is not included; order separately. (See pages 5202 and 5203.)  
 3. Size 16 Module Dim. (Typ.) — (Feedback) .850 [21.59] L x .390 [9.91] W x 1.000 [25.40] H  
 (Feedthru) .850 [21.59] L x .390 [9.91] W x 1.830 [46.48] H

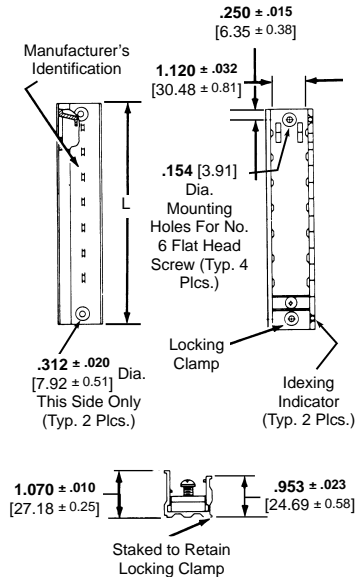
Typical Bussing Arrangements

Size 22HD Military,  
Size 21 Commercial  
Modules



### Feedback Terminal Junction Modules (Continued)

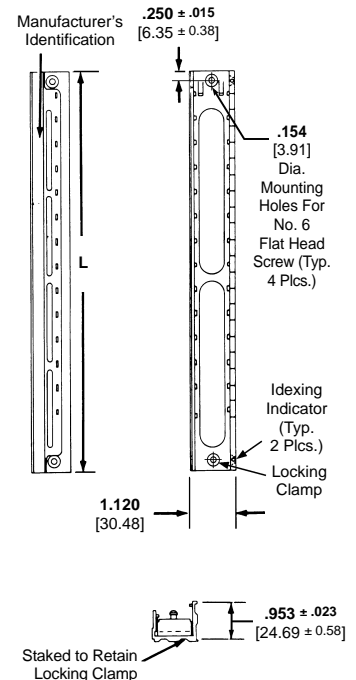
#### Mounting Hardware Standard Weight Rail Assembly Part Number 591613



#### Rail Assembly Dimensions

| Length<br>L    | 591613 and 591621 Part Numbers |          |             |           |
|----------------|--------------------------------|----------|-------------|-----------|
|                | Standard Weight                |          | Lightweight |           |
|                | 591613                         | M81714/5 | 591621      | M81714/16 |
| 1.781 [45.24]  | -1                             | —        | -1          | —         |
| 2.171 [55.14]  | -2                             | —        | -2          | —         |
| 2.561 [65.05]  | -3                             | -2       | -3          | -2        |
| 2.951 [74.96]  | -4                             | -3       | -4          | -3        |
| 3.341 [84.86]  | -5                             | -4       | -5          | -4        |
| 3.371 [85.62]  | -6                             | -5       | -6          | -5        |
| 4.121 [104.67] | -7                             | -6       | -7          | -6        |
| 4.511 [114.58] | -8                             | -7       | -8          | -7        |
| 4.901 [124.49] | -9                             | -8       | -9          | -8        |
| 5.291 [134.39] | -10                            | -1       | -10         | -1        |
| 5.681 [144.30] | -11                            | -9       | -11         | -9        |
| 6.071 [154.20] | -12                            | -10      | -12         | -10       |
| 6.461 [164.11] | -13                            | -11      | -13         | -11       |
| 6.851 [174.02] | -14                            | -12      | -14         | -12       |
| 7.241 [183.92] | -15                            | -13      | -15         | -13       |
| 7.631 [193.83] | -16                            | —        | -16         | —         |
| 8.021 [203.73] | -17                            | —        | -17         | —         |
| 8.411 [213.64] | -18                            | —        | -18         | —         |
| 8.801 [223.54] | -19                            | —        | -19         | —         |
| 9.191 [233.45] | -20                            | —        | -20         | —         |

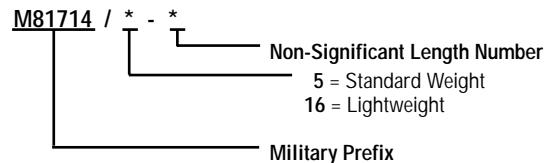
#### Lightweight Rail Assembly Part Number 591621 (weight savings of up to 40%)



Rail Assemblies are made of black anodized aluminum alloy. Locking clamp screw is corrosion resistant steel (passivated). Rails will accommodate all sizes and various quantities of feedback modules in any combination.

#### Rail Part Numbering

##### Military



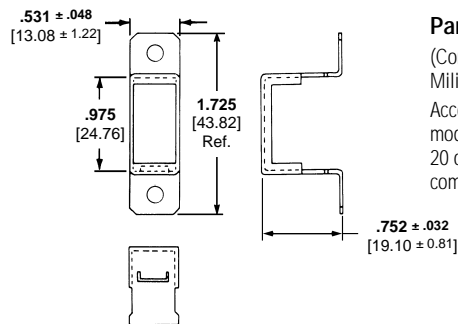
**Note:** Rail Assemblies do not contain module blocks. Order separately. (See page 5199.)

†(based on Size 22, 20, and 16 dimensions)

#### Individual Module Mounting Brackets

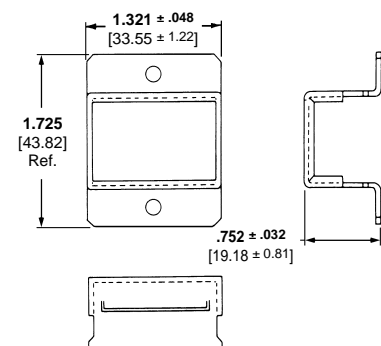
##### Part Number 591637-1

(Commercial equiv. to Military M81714/29-1)  
Accommodates one Size 21, 22, 20 or 16 module.



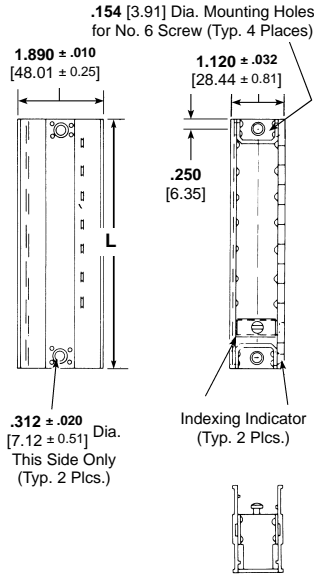
##### Part Number 591638-1

(Commercial equiv. to Military M81714/29-2)  
Accommodates one Size 12 module or three Size 21, 22, 20 or 16 modules in any combination.

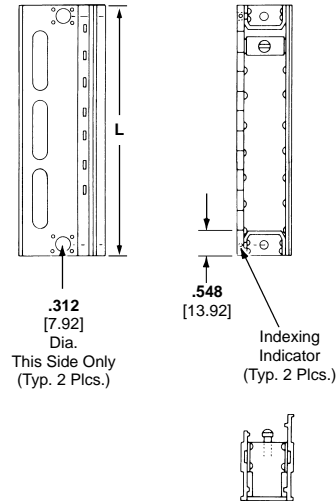


Mounting Hardware

Standard Weight  
Rail Assembly  
Part Number 591601



Lightweight Rail Assembly  
Part Number 591603



Rail Assembly Dimensions

| Length<br>L    | 591601 and 591603 Part Numbers |              |
|----------------|--------------------------------|--------------|
|                | Standard Weight                | Lightweight  |
|                | Commercial*                    | Commercial** |
|                | 591601                         | 591603       |
| 2.041 [51.84]  | -1                             | —            |
| 2.431 [61.75]  | -2                             | —            |
| 2.821 [71.65]  | -3                             | —            |
| 3.211 [81.56]  | -4                             | —            |
| 3.601 [91.46]  | -5                             | -4           |
| 3.991 [101.37] | -6                             | -5           |
| 4.381 [111.28] | -7                             | —            |
| 4.771 [121.18] | -8                             | —            |
| 5.161 [131.09] | -9                             | —            |
| 5.551 [141.00] | -10                            | —            |
| 5.941 [150.90] | -11                            | -1           |
| 6.331 [160.81] | -12                            | —            |
| 6.721 [170.71] | -13                            | —            |
| 7.111 [180.62] | -14                            | -2           |
| 7.501 [190.52] | -15                            | -3           |
| 7.891 [200.43] | -16                            | —            |
| 8.281 [210.34] | -17                            | —            |
| 8.671 [220.24] | -18                            | —            |
| 9.061 [230.15] | -19                            | —            |
| 9.451 [240.06] | -20                            | —            |

Rail Assemblies are made of black anodized aluminum alloy. Locking clamp screw is corrosion resistant steel (passivated). Rails will accommodate all sizes and various quantities of feed thru modules in any combination.

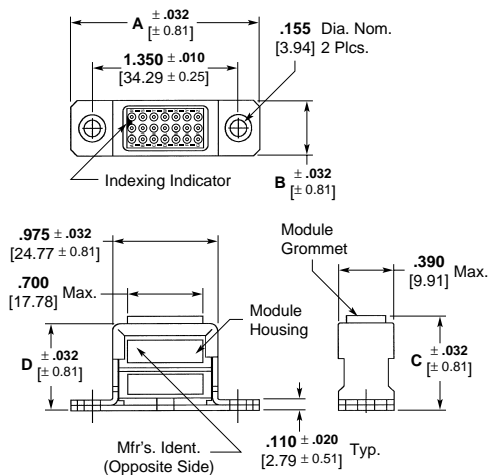
\* Commercial equivalent to M81714/10—\*

\*\* Commercial equivalent to M81714/14—\*

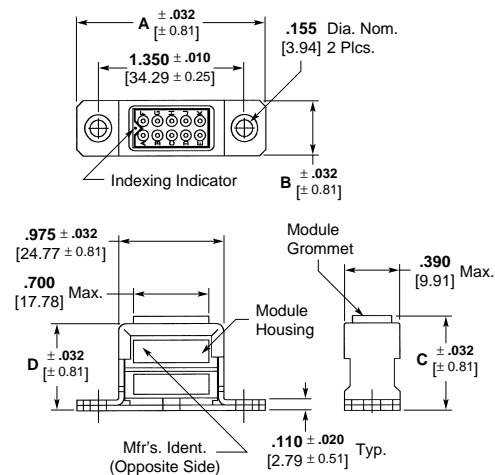
**Grounding Flange Modules**

AMP Grounding Flange Blocks are available in Sizes 22, 20, 16 and 12. All contacts are bussed together and connected to a ground plate made of nickel plated aluminum.

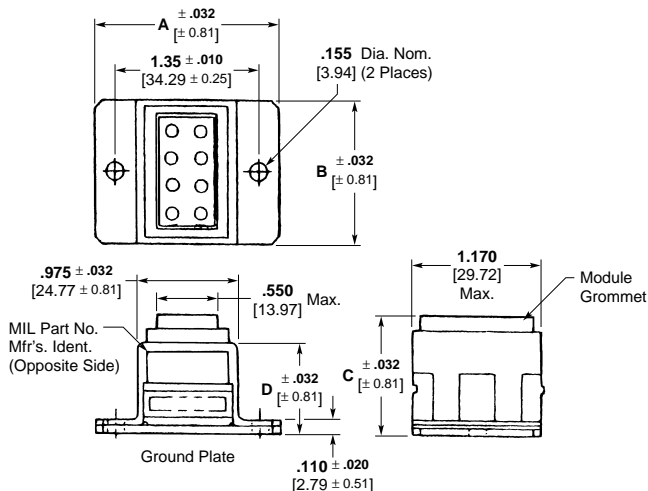
**HD22  
Part Number 592840**



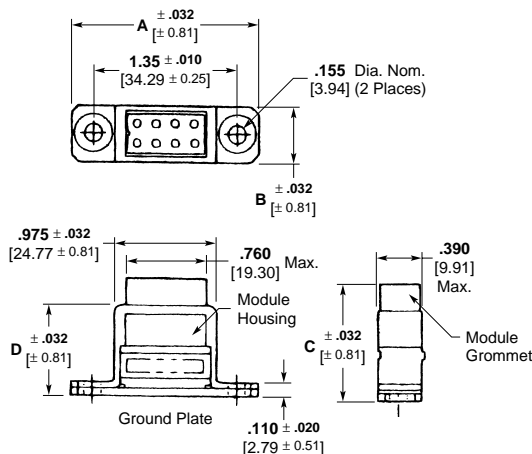
**Size 20, 22  
Part Number 592836**



**Size 12  
Part Number 592820-1**



**Size 16  
Part Number 592830-1**



**Commercial Equivalent to Military M81714/28- \* \*\***

| Contact Size | Dimensions |       |       |       | Part No. |
|--------------|------------|-------|-------|-------|----------|
|              | A          | B     | C     | D     |          |
| HD22         | 1.725      | 0.515 | 0.880 | 0.817 | 592840-2 |
|              | 43.82      | 13.08 | 22.35 | 20.75 |          |
| 22           | 1.725      | 0.515 | 0.880 | 0.817 | 592836-3 |
|              | 43.82      | 13.08 | 22.35 | 20.75 |          |
| 20           | 1.725      | 0.515 | 0.880 | 0.817 | 592836-1 |
|              | 43.82      | 13.08 | 22.35 | 20.75 |          |
| 16           | 1.725      | 0.515 | 1.060 | 0.817 | 592830-1 |
|              | 43.82      | 13.08 | 26.92 | 20.75 |          |
| 12           | 1.725      | 1.305 | 1.060 | 0.817 | 592820-1 |
|              | 43.82      | 33.15 | 26.92 | 20.75 |          |

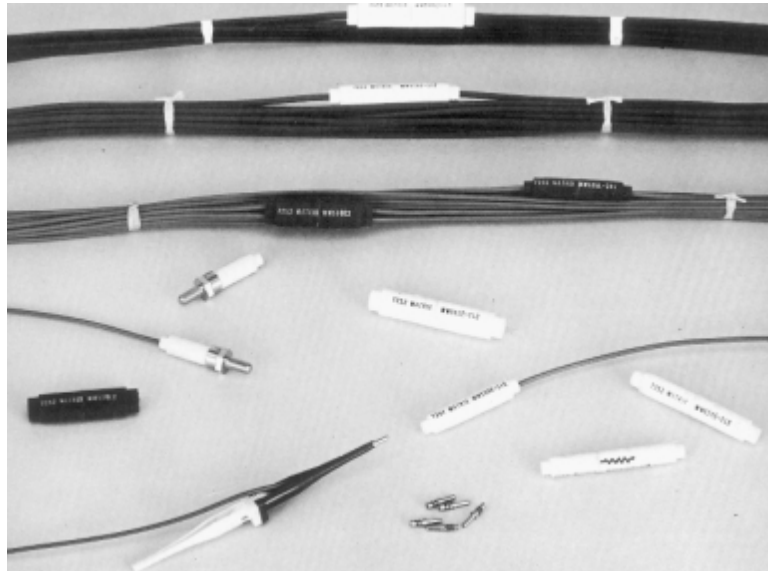
**Wire Splices**

**Single Splice**

Built and qualified to MIL-T-81714, the commercial Single Wire Splice provides an environmentally reliable, positive and maintainable in-line disconnect between single wires. Their small diameter permits placement within a wire bundle or electrical harness. The standard M39029/1 pin contact is utilized. Single wire splices are available per MIL-T-81714.

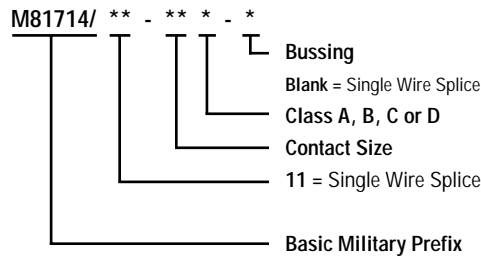
**Double Splice**

Provides an environmental in-line disconnect for joining up to four wires. Bussed or unbussed contacts are available permitting the versatility of joining wires in double, triple or quadruple combinations.



**Part Numbering**

**Military**



**Double Spliced**

| Contact Size | Bussed Part No. | Unbussed Part No. |
|--------------|-----------------|-------------------|
| 22           | 592588-6        | —                 |
| 20           | 592588-5        | 592589-1          |
| 16           | 592588-4        | —                 |

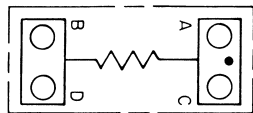
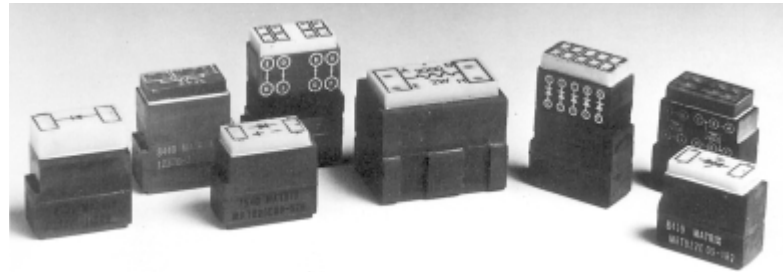
**Single Splice**

| Contact Size | Part No. | MIL Part No. M81714/11 |
|--------------|----------|------------------------|
| 20           | 592583-3 | -20D                   |
| 16           | 592583-2 | -16D                   |
| 12           | 592583-1 | -12D                   |

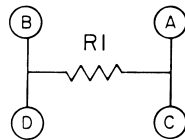
*Electronics*

**Electronic Module Blocks and Splices**

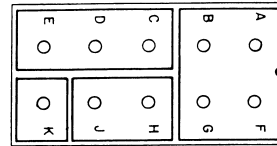
Electronic Modules, Splices and Mounting Hardware are custom engineered to suit the user's application. During design, specific part numbers will be assigned. (see page 5210.)



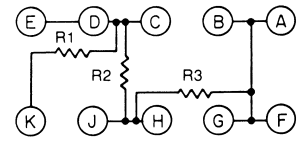
TOP MARKING (TYP)



SCHEMATIC DIAGRAM



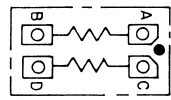
TOP MARKING



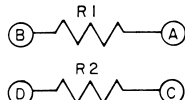
SCHEMATIC DIAGRAM

**Fig. 1A**

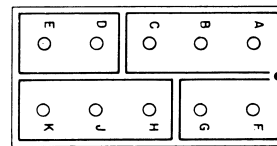
**Fig. 5A**



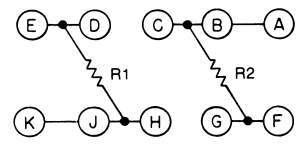
TOP MARKING (TYP)



SCHEMATIC DIAGRAM



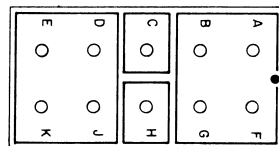
TOP MARKING



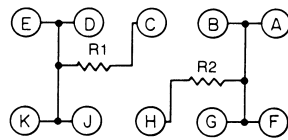
SCHEMATIC DIAGRAM

**Fig. 2A**

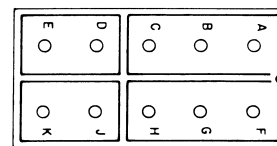
**Fig. 6A**



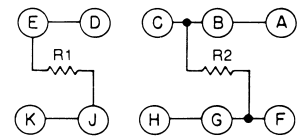
TOP MARKING



SCHEMATIC DIAGRAM



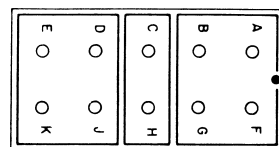
TOP MARKING



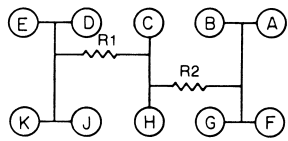
SCHEMATIC DIAGRAM

**Fig. 3A**

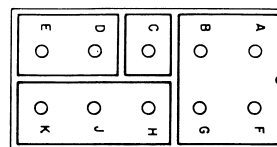
**Fig. 7A**



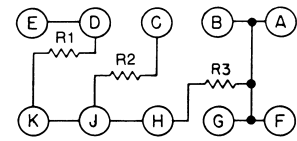
TOP MARKING



SCHEMATIC DIAGRAM



TOP MARKING



SCHEMATIC DIAGRAM

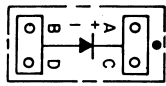
**Fig. 4A**

**Fig. 8A**

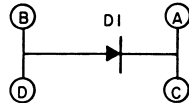
Consult Tyco Electronics for additional circuit arrangements.

Typical Diode Circuit Arrangements

(See page 5210 for Part Numbers.)

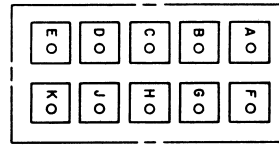


TOP MARKING

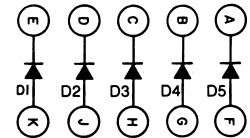


SCHEMATIC DIAGRAM

Fig. 1B

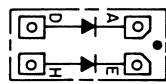


TOP MARKING (TYP)

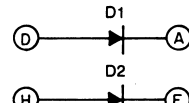


SCHEMATIC DIAGRAM

Fig. 5B



TOP MARKING

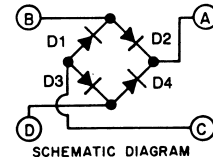


SCHEMATIC DIAGRAM

Fig. 2B

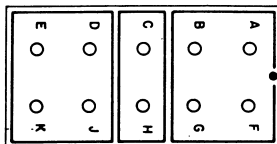


TOP MARKING

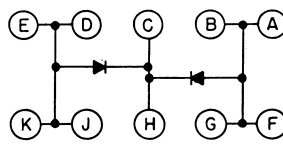


SCHEMATIC DIAGRAM

Fig. 6B

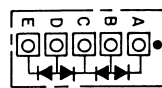


TOP MARKING

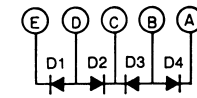


SCHEMATIC DIAGRAM

Fig. 3B

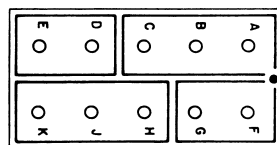


TOP MARKING (TYP)

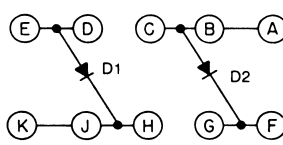


SCHEMATIC DIAGRAM

Fig. 7B

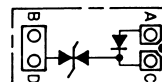


TOP MARKING

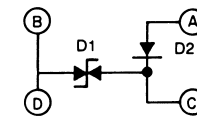


SCHEMATIC DIAGRAM

Fig. 4B



TOP MARKING (TYP)



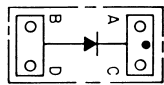
SCHEMATIC DIAGRAM

Fig. 8B

Consult Tyco Electronics for additional circuit arrangements.

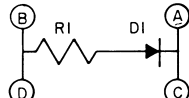


Typical Combination  
Circuit Arrangements

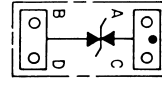


TOP MARKING

**Fig. 1C**

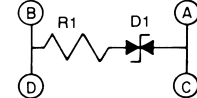


SCHEMATIC DIAGRAM

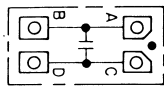


TOP MARKING

**Fig. 5C**

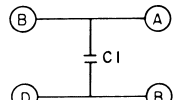


SCHEMATIC DIAGRAM

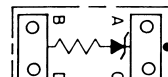


TOP MARKING (TYP)

**Fig. 2C**

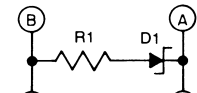


SCHEMATIC DIAGRAM

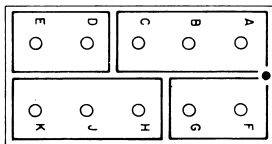


TOP MARKING (TYP)

**Fig. 6C**

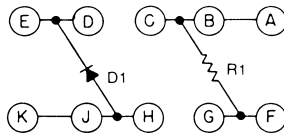


SCHEMATIC DIAGRAM

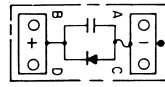


TOP MARKING

**Fig. 3C**

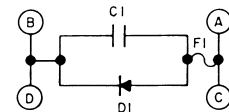


SCHEMATIC DIAGRAM

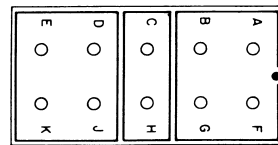


TOP MARKING

**Fig. 7C**

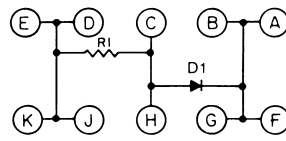


SCHEMATIC DIAGRAM

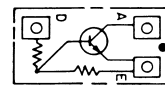


TOP MARKING

**Fig. 4C**

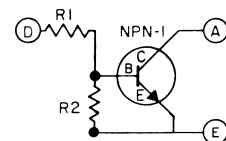


SCHEMATIC DIAGRAM



TOP MARKING

**Fig. 8C**



SCHEMATIC DIAGRAM

Consult Tyco Electronics for additional circuit arrangements.

Various Component Types

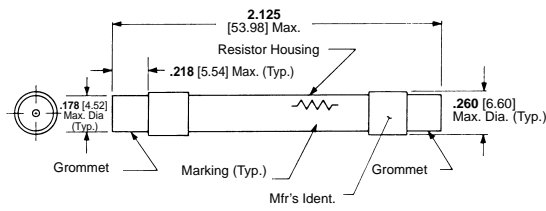


Fig. 1D

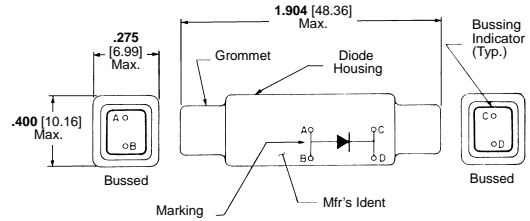


Fig. 5D

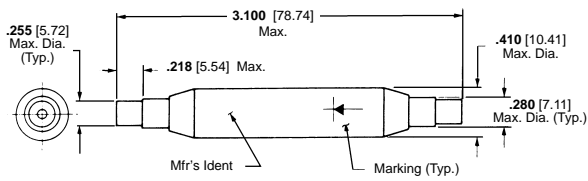


Fig. 2D

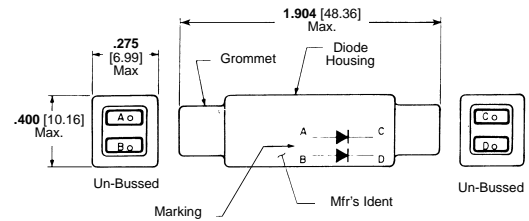


Fig. 6D

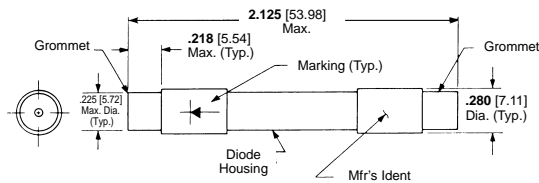


Fig. 3D

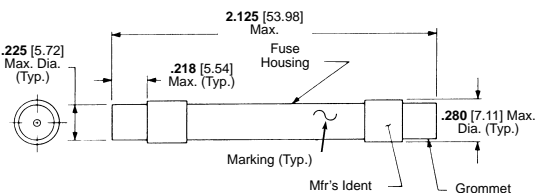


Fig. 7D

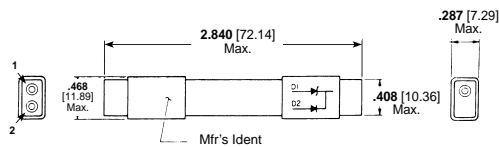


Fig. 4D

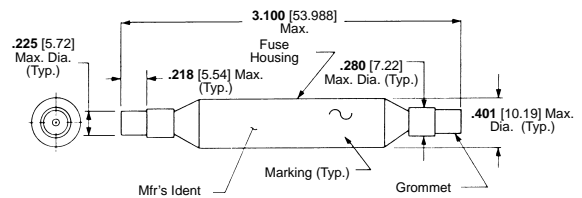


Fig. 8D

Electronic Module Blocks and Splices Part Numbering Information

| Description   | Figure                            | Part Number                      | Electrical Information                         |
|---------------|-----------------------------------|----------------------------------|--|
| Module Blocks | Fig. 1A                           | 591872-1                         | R1=1500 Ω RCR07G152JS                          |
|               |                                   | 591873-1                         | R1=9100 Ω RLR07C9101GS                         |
|               |                                   | 591877-2                         | R1=150 Ω                                       |
|               | Fig. 2A                           | 591899-1                         | R=RLR20C10R0GS 10 Ω                            |
|               |                                   | 591892-1                         | R1=R2=127 Ω RNC55H1270FS                       |
|               |                                   | 591898-1                         | R1=R2=10 Ω RLR20C10R0GS                        |
|               |                                   | 591876-1                         | R1=180 Ω RLR07C1800GS<br>R2=487 Ω RLR07C4870FS |
|               |                                   | 591871-1                         | R1=R2=2200 Ω RCR07G222JS                       |
|               |                                   | 591875-1                         | R1=180 Ω RLR07C1800GS<br>R2=348 Ω RLR07C3480FS |
|               | Fig. 4A                           | 591911-1                         | R1=34.8 kΩ R2=21.5 kΩ                          |
|               | Fig. 5B                           | 591854-1                         | D1=D2=D3=D4=D5=JAN1N5618                       |
|               |                                   | 591855-1                         | D1=D2=D3=D4=D5=JANTX1N5618                     |
|               | Fig. 7B                           | 591857-2                         | D1=D2=D3=D4=D5=JANTX1N5618                     |
|               |                                   | 592887-1                         | D1=D2=D3=D4=1N4007                             |
|               | Module Blocks<br>(Diode Circuits) | Fig. 1B                          | 591893-2                                       |
| 591894-2      |                                   |                                  | D1=JANTX1N751A                                 |
| 591896-2      |                                   |                                  | D1=JANTX1N5552                                 |
| 591893-2      |                                   |                                  | D1=JANTX1N5624                                 |
| 591894-2      |                                   |                                  | D1=JANTX1N751A                                 |
| Fig. 5B       |                                   | 591895-2                         | D1=JANTX1N5618                                 |
|               |                                   | 591864-1                         | D1=JAN1N5618                                   |
|               |                                   | 591866-1                         | D1=D2=D3=D4=D5=JANTX1N5554                     |
|               |                                   | 591863-1                         | D1=D2=D3=D4=D5=JANTX1N5552                     |
|               |                                   | 591863-4                         | D1=D2=D3=D4=D5=1N4007                          |
| Splices       | Fig. 2D                           | 591865-1                         | D1=D2=D3=D4=D5=JANTX1N5618 Class A             |
|               |                                   | 591855-1                         | D1=D2=D3=D4=D5=JANTX1N5618                     |
|               |                                   | 591917-1                         | R1=RN65C1270F 127 Ω                            |
|               |                                   | 591917-3                         | R1=RNC60J1002FS 10 Ω                           |
|               |                                   | 591917-4                         | R1=RC20GF681J 680 Ω                            |
|               |                                   | 591917-5                         | R1=RLR32C1201GM 1200 Ω                         |
|               |                                   | 591917-7                         | R1=RLR32C1000GS 100 Ω                          |
|               | Fig. 3D                           | 1-591917-2                       | R1=RLR07C1001GR 1000 Ω                         |
|               |                                   | 1-591917-3                       | R1=RLR32C1000GR 100 Ω                          |
|               |                                   | 591846-2                         | D1=1N5199                                      |
| Fig. 4D       | 591847-3                          | D1=JAN1N5618                     |  |
| Fig. 5D       | 591992-1                          | D1=JANTX1N4972<br>D2=JANTX1N5618 |  |
|               | 591841-1                          | D1=JAN1N5618                     |  |
|               | 591889-1                          | D1=1N3981                        |  |
|               | 591890-1                          | D1=1N5367B                       |  |
| Fig. 6D       | 591842-1                          | D1=D2=JAN1N5618                  |  |

**Note:** Products are also qualified to VG 95212-31/ VG 95231-102/103/105. Please contact Tyco Electronics for cross reference.

Military Cross Reference

| Military Part Numbers<br>Feedback Modules | AMP MIL Qualified Part Numbers<br>Feedback Modules | AMP Commercial Part Numbers<br>Feedback Modules |
|---|--|---|
| <b>(Class A) Size 22</b>                  |  |   |
| M81714/1-AA1                              | —  | 592634-4  |
| M81714/1-AB1                              | —  | 592634-2  |
| M81714/1-AB2                              | —  | 1-592634-2                                      |
| M81714/1-AB3                              | —  | 1-592634-7                                      |
| M81714/1-AC1                              | —  | 1-592634-4                                      |
| M81714/1-AC2                              | —  | 1-592634-0                                      |
| M81714/1-AD1                              | —  | 592634-8  |
| M81714/1-AE1                              | —  | 592634-6  |
| <b>(Class A) Size 21</b>                  |  |   |
| M81714/17-A31                             | 592630-3   | 592630-4  |
| M81714/17-A32                             | 592630-5   | 592630-6  |
| M81714/17-A33                             | 592630-7   | 592630-8  |
| M81714/17-A34                             | 592630-9   | 1-592630-0                                      |
| M81714/17-A35                             | 1-592630-1   | 1-592630-2                                      |
| M81714/17-A36                             | 1-592630-3   | 1-592630-4                                      |
| M81714/17-A37                             | 1-592630-5   | 1-592630-6                                      |
| M81714/17-A38                             | 1-592630-7   | 1-592630-8                                      |
| M81714/17-A39                             | 1-592630-9   | 2-592630-0                                      |
| M81714/17-A40                             | 2-592630-1   | 2-592630-2                                      |
| M81714/17-A42                             | 2-592630-3   | 2-592630-4                                      |
| M81714/17-A43                             | 4-592630-3   | 4-592630-4                                      |
| M81714/17-A44                             | 2-592630-5   | 2-592630-6                                      |
| M81714/17-A45                             | 2-592630-7   | 2-592630-8                                      |
| <b>(Class A) Size 20</b>                  |  |   |
| M81714/2-AA1                              | 592625-5   | 592625-6  |
| M81714/2-AB1                              | 592625-3   | 592625-4  |
| M81714/2-AB2                              | 1-592625-3   | 1-592625-4                                      |
| M81714/2-AB3                              | 2-592625-1   | 2-592625-2                                      |
| M81714/2-AC1                              | 1-592625-5   | 1-592625-6                                      |
| M81714/2-AC2                              | 1-592625-1   | 1-592625-2                                      |
| M81714/2-AD1                              | 592625-9   | 1-592625-0                                      |
| M81714/2-AE1                              | 592625-7   | 592625-8  |
| <b>(Class A) Size 16</b>                  |  |   |
| M81714/3-AA1                              | 592621-7   | 592621-8  |
| M81714/3-AB1                              | 592621-5   | 592621-6  |
| M81714/3-AB2                              | 1-592621-1   | 1-592621-2                                      |
| M81714/3-AC1                              | 1-592621-3   | 1-592621-4                                      |
| M81714/3-AC2                              | 592621-9   | 1-592621-0                                      |
| M81714/3-AD1                              | 592621-3   | 592621-4  |
| <b>(Class A) Size 12</b>                  |  |   |
| M81714/4-AA1                              | —  | 592617-8  |
| M81714/4-AB1                              | —  | 592617-6  |
| M81714/4-AB2                              | —  | 1-592617-2                                      |
| M81714/4-AC1                              | —  | 1-592617-4                                      |
| M81714/4-AC2                              | —  | 1-592617-0                                      |
| M81714/4-AD1                              | —  | 592617-4  |
| <b>(Class B) Size 22</b>                  |  |   |
| M81714/1-BA1                              | —  | 592636-4  |
| M81714/1-BB1                              | —  | 592636-2  |
| M81714/1-BB2                              | —  | 1-592636-2                                      |
| M81714/1-BB3                              | —  | 1-592636-6                                      |
| M81714/1-BC1                              | —  | 1-592636-4                                      |
| M81714/1-BC2                              | —  | 1-592636-0                                      |
| M81714/1-BD1                              | —  | 592636-8  |
| M81714/1-BE1                              | —  | 592636-6  |
| <b>(Class B) Size 21</b>                  |  |   |
| M81714/17-B31                             | 592631-3   | 592631-4  |
| M81714/17-B32                             | 592631-5   | 592631-6  |
| M81714/17-B33                             | 592631-7   | 592631-8  |

Feedback Modules (Class B) Size 21 Continued on page 5212

Military Cross Reference (Continued)

| Military Part Numbers<br>Feedback Modules | AMP MIL Qualified Part Numbers<br>Feedback Modules | AMP Commercial Part Numbers<br>Feedback Modules |
|---|--|---|
| <b>(Class B) Size 21</b> (Continued)      |  |   |
| M81714/17-B34                             | 592631-9   | 1-592631-0                                      |
| M81714/17-B35                             | 1-592631-1   | 1-592631-2                                      |
| M81714/17-B36                             | 1-592631-3   | 1-592631-4                                      |
| M81714/17-B37                             | 1-592631-5   | 1-592631-6                                      |
| M81714/17-B38                             | 4-592631-4   | —   |
| M81714/17-B39                             | 1-592631-7   | 1-592631-8                                      |
| M81714/17-B40                             | 4-592631-2   | —   |
| M81714/17-B42                             | 1-592631-9   | 2-592631-0                                      |
| M81714/17-B43                             | 2-592631-1   | 2-592631-2                                      |
| M81714/17-B44                             | 2-592631-4   | 2-592631-5                                      |
| M81714/17-B45                             | 4-592631-3   | —   |
| <b>(Class B) Size 20</b>                  |  |   |
| M81714/2-BA1                              | 592627-3   | 592627-4  |
| M81714/2-BB1                              | 592627-1   | 592627-2  |
| M81714/2-BB2                              | 1-592627-1   | 1-592627-2                                      |
| M81714/2-BB3                              | 1-592627-5   | 1-592627-6                                      |
| M81714/2-BC1                              | 1-592627-3   | 1-592627-4                                      |
| M81714/2-BC2                              | 592627-9   | 1-592627-0                                      |
| M81714/2-BD1                              | 592627-7   | 592627-8  |
| M81714/2-BE1                              | 592627-5   | 592627-6  |
| <b>(Class B) Size 16</b>                  |  |   |
| M81714/3-BA1                              | 592623-5   | 592623-6  |
| M81714/3-BB1                              | 592623-3   | 592623-4  |
| M81714/3-BB2                              | 592623-9   | 1-592623-0                                      |
| M81714/3-BC1                              | 1-592623-1   | 1-592623-2                                      |
| M81714/3-BC2                              | 592623-7   | 592623-8  |
| M81714/3-BD1                              | 592623-1   | 592623-2  |
| <b>(Class B) Size 12</b>                  |  |   |
| M81714/4-BA1                              | —  | 592619-6  |
| M81714/4-BB1                              | —  | 592619-4  |
| M81714/4-BB2                              | —  | 1-592619-0                                      |
| M81714/4-BC1                              | —  | 1-592619-2                                      |
| M81714/4-BC2                              | —  | 592619-8  |
| M81714/4-BD1                              | —  | 592619-2  |
| <b>(Class C) Size 22</b>                  |  |   |
| M81714/1-CA1                              | —  | 592635-4  |
| M81714/1-CB1                              | —  | 592635-2  |
| M81714/1-CB2                              | —  | 1-592635-2                                      |
| M81714/1-CB3                              | —  | 1-592635-6                                      |
| M81714/1-CC1                              | —  | 1-592635-4                                      |
| M81714/1-CC2                              | —  | 1-592635-0                                      |
| M81714/1-CD1                              | —  | 592635-8  |
| M81714/1-CE1                              | —  | 592635-6  |
| <b>(Class C) Size 21</b>                  |  |   |
| M81714/17-C31                             | 592632-1   | 592632-2  |
| M81714/17-C32                             | 4-592632-3   | —   |
| M81714/17-C33                             | 592632-3   | 592632-4  |
| M81714/17-C34                             | 592632-5   | —   |
| M81714/17-C35                             | 592632-6   | 592632-7  |
| M81714/17-C36                             | 592632-8   | 592632-9  |
| M81714/17-C37                             | 1-592632-1   | 1-592632-2                                      |
| M81714/17-C38                             | 1-592632-3   | —   |
| M81714/17-C39                             | 4-592632-4   | —   |
| M81714/17-C40                             | 1-592632-4   | 1-592632-5                                      |
| M81714/17-C41                             | 4-592632-1   | —   |
| M81714/17-C42                             | 4-592632-5   | —   |
| M81714/17-C43                             | 1-592632-6   | 1-592632-7                                      |
| M81714/17-C44                             | 1-592632-8   | 1-592632-9                                      |
| M81714/17-C45                             | 4-592632-6   | —   |

Military Cross Reference (Continued)

| Military Part Numbers<br>Feedback Modules | AMP MIL Qualified Part Numbers<br>Feedback Modules | AMP Commercial Part Numbers<br>Feedback Modules |
|---|--|---|
| <b>(Class C) Size 20</b>                  |  |   |
| M81714/2-CA1                              | 592626-3   | 592626-4  |
| M81714/2-CB1                              | 592626-1   | 592626-2  |
| M81714/2-CB2                              | 1-592626-1   | 1-592626-2                                      |
| M81714/2-CB3                              | 2-592626-4   | 1-592626-5                                      |
| M81714/2-CC1                              | 1-592626-3   | 1-592626-4                                      |
| M81714/2-CC2                              | 592626-9   | 1-592626-0                                      |
| M81714/2-CD1                              | 592626-7   | 592626-8  |
| M81714/2-CE1                              | 592626-5   | 592626-6  |
| <b>(Class C) Size 16</b>                  |  |   |
| M81714/3-CA1                              | 592622-5   | 592622-6  |
| M81714/3-CB1                              | 592622-3   | 592622-4  |
| M81714/3-CB2                              | 592622-9   | 1-592622-0                                      |
| M81714/3-CC1                              | 1-592622-1   | 1-592622-2                                      |
| M81714/3-CC2                              | 592622-7   | 592622-8  |
| M81714/3-CD1                              | 592622-1   | 592622-2  |
| <b>(Class C) Size 12</b>                  |  |   |
| M81714/4-CA1                              | —  | 592618-6  |
| M81714/4-CB1                              | —  | 592618-4  |
| M81714/4-CB2                              | —  | 1-592618-0                                      |
| M81714/4-CC1                              | —  | 1-592618-2                                      |
| M81714/4-CC2                              | —  | 592618-8  |
| M81714/4-CD1                              | —  | 592618-2  |
| <b>(Class D) Size 22</b>                  |  |   |
| M81714/1-DA1                              | —  | 592633-4  |
| M81714/1-DB1                              | —  | 592633-2  |
| M81714/1-DB2                              | —  | 1-592633-2                                      |
| M81714/1-DB3                              | —  | 2-592633-0                                      |
| M81714/1-DC1                              | —  | 1-592633-4                                      |
| M81714/1-DC2                              | —  | 1-592633-0                                      |
| M81714/1-DD1                              | —  | 592633-8  |
| M81714/1-DE1                              | —  | 592633-6  |
| <b>(Class D) Size 21</b>                  |  |   |
| M81714/17-D31                             | 592629-1   | 592629-2  |
| M81714/17-D32                             | 592629-3   | 592629-4  |
| M81714/17-D33                             | 592629-5   | 592629-6  |
| M81714/17-D34                             | 592629-7   | 592629-8  |
| M81714/17-D35                             | 592629-9   | 1-592629-0                                      |
| M81714/17-D36                             | 4-592629-4   | —   |
| M81714/17-D37                             | 1-592629-1   | 1-592629-2                                      |
| M81714/17-D38                             | 1-592629-3   | 1-592629-4                                      |
| M81714/17-D39                             | 1-592629-5   | 1-592629-6                                      |
| M81714/17-D40                             | 1-592629-7   | 1-592629-8                                      |
| M81714/17-D42                             | 4-592629-2   | 4-592629-0                                      |
| M81714/17-D43                             | 4-592629-3   | —   |
| M81714/17-D44                             | 1-592629-9   | 2-592629-0                                      |
| M81714/17-D45                             | 4-592629-5   | 2-592629-2                                      |
| <b>(Class D) Size 20</b>                  |  |   |
| M81714/2-DA1                              | 592624-3   | 592624-4  |
| M81714/2-DB1                              | 592624-1   | 592624-2  |
| M81714/2-DB2                              | 1-592624-0   | 1-592624-1                                      |
| M81714/2-DB3                              | 1-592624-8   | 1-592624-9                                      |
| M81714/2-DC1                              | 1-592624-2   | 1-592624-3                                      |
| M81714/2-DC2                              | 2-592624-2   | 592624-9  |
| M81714/2-DD1                              | 592624-7   | 592624-8  |
| M81714/2-DE1                              | 592624-5   | 592624-6  |

Military Cross Reference (Continued)

| Military Part Numbers<br>Feedback Modules | AMP MIL Qualified Part Numbers<br>Feedback Modules | AMP Commercial Part Numbers<br>Feedback Modules |
|---|--|---|
| <b>(Class D) Size 16</b>                  |  |   |
| M81714/3-DA1                              | 592620-5   | 592620-6  |
| M81714/3-DB1                              | 592620-3   | 592620-4  |
| M81714/3-DB2                              | 592620-9   | 1-592620-0                                      |
| M81714/3-DC1                              | 1-592620-1   | 1-592620-2                                      |
| M81714/3-DC2                              | 592620-7   | 592620-8  |
| M81714/3-DD1                              | 592620-1   | 592620-2  |
| M81714/4-DA1                              | —  | 592616-6  |
| M81714/4-DB1                              | —  | 592616-4  |
| M81714/4-DB2                              | —  | 1-592616-0                                      |
| M81714/4-DC1                              | —  | 1-592616-2                                      |
| M81714/4-DC2                              | —  | 592616-8  |
| M81714/4-DD1                              | —  | 592616-1  |

| Military Part Numbers<br>Wire Splice | AMP MIL Qualified Part Numbers<br>Wire Splice | AMP Commercial Part Numbers<br>Wire Splice |
|--------------------------------------|---|--|
| <b>(Class A) Size 22</b>             |   |  |
| M81714/11-22A                        | —   | 1-592575-9                                 |
| <b>(Class A) Size 20</b>             |   |  |
| M81714/11-20A                        | 592575-7                                      | 1-592575-8                                 |
| <b>(Class A) Size 16</b>             |   |  |
| M81714/11-16A                        | 592575-4                                      | 1-592575-4                                 |
| <b>(Class A) Size 12</b>             |   |  |
| M81714/11-12A                        | 592575-1                                      | 1-592575-3                                 |
| <b>(Class B) Size 22</b>             |   |  |
| M81714/11-22B                        | —   | 1-592575-6                                 |
| <b>(Class B) Size 20</b>             |   |  |
| M81714/11-20B                        | 592575-9                                      | 2-592575-2                                 |
| <b>(Class B) Size 16</b>             |   |  |
| M81714/11-16B                        | 592575-6                                      | 2-592575-0                                 |
| <b>(Class B) Size 12</b>             |   |  |
| M81714/11-12B                        | 592575-3                                      | —  |
| <b>(Class C) Size 22</b>             |   |  |
| M81714/11-22C                        | —   | 1-592575-5                                 |
| <b>(Class C) Size 20</b>             |   |  |
| M81714/11-20C                        | 592575-8                                      | 2-592575-1                                 |
| <b>(Class C) Size 16</b>             |   |  |
| M81714/11-16C                        | 592575-5                                      | 1-592575-9                                 |
| <b>(Class C) Size 12</b>             |   |  |
| M81714/11-12C                        | 592575-2                                      | —  |
| <b>(Class D) Size 22</b>             |   |  |
| M81714/11-22D                        | —   | 592583-7                                   |
| <b>(Class D) Size 20</b>             |   |  |
| M81714/11-20D                        | 592583-3                                      | 592583-6                                   |
| <b>(Class D) Size 16</b>             |   |  |
| M81714/11-16D                        | 592583-2                                      | 592583-5                                   |
| <b>(Class D) Size 12</b>             |   |  |
| M81714/11-12D                        | 592583-1                                      | —  |

Military Cross Reference (Continued)

| Military Part Numbers<br>Lightweight Feedback<br>Rail Assembly | AMP MIL Qualified Part Numbers<br>Lightweight Feedback<br>Rail Assembly | AMP Commercial Part Numbers<br>Lightweight Feedback<br>Rail Assembly |
|--|---|--|
| M81714/16-1  | 1-591621-0  | —  |
| M81714/16-2  | 591621-3  | —  |
| M81714/16-3  | 591621-4  | —  |
| M81714/16-4  | 591621-5  | —  |
| M81714/16-5  | 591621-6  | —  |
| M81714/16-6  | 591621-7  | —  |
| M81714/16-7  | 591621-8  | —  |
| M81714/16-8  | 591621-9  | —  |
| M81714/16-9  | 1-591621-1  | —  |
| M81714/16-10   | 1-591621-2  | —  |
| M81714/16-11   | 1-591621-3  | —  |
| M81714/16-12   | 1-591621-4  | —  |

| Military Part Numbers<br>Feedback<br>Rail Assembly | AMP MIL Qualified Part Numbers<br>Feedback<br>Rail Assembly | AMP Commercial Part Numbers<br>Feedback<br>Rail Assembly |
|--|---|--|
| M81714/5-1   | 1-591613-0  | —  |
| M81714/5-2   | 591613-3  | —  |
| M81714/5-3   | 591613-4  | —  |
| M81714/5-4   | 591613-5  | —  |
| M81714/5-5   | 591613-6  | —  |
| M81714/5-6   | 591613-7  | —  |
| M81714/5-7   | 591613-8  | —  |
| M81714/5-8   | 591613-9  | —  |
| M81714/5-9   | 1-591613-1  | —  |
| M81714/5-10  | 1-591613-2  | —  |
| M81714/5-11  | 1-591613-3  | —  |
| M81714/5-12  | 1-591613-4  | —  |
| M81714/5-13  | 1-591613-5  | —  |

| Military Part Numbers<br>Feedthru Modules | AMP MIL Qualified Part Numbers<br>Feedthru Modules | AMP Commercial Part Numbers<br>Feedthru Modules |
|---|--|---|
| <b>(Class A) Size 22</b>                  |  |   |
| M81714/6-AA1                              | —  | 592613-6  |
| M81714/6-AB1                              | —  | 592613-4  |
| M81714/6-AB2                              | —  | 1-592613-6                                      |
| M81714/6-AB3                              | —  | 2-592613-0                                      |
| M81714/6-AC1                              | —  | 1-592613-8                                      |
| M81714/6-AC2                              | —  | 1-592613-4                                      |
| M81714/6-AD1                              | —  | 1-592613-2                                      |
| M81714/6-AE1                              | —  | 592613-8  |
| M81714/6-AJ1                              | —  | 592613-2  |
| <b>(Class A) Size 20</b>                  |  |   |
| M81714/7-AA1                              | —  | 592609-6  |
| M81714/7-AB1                              | —  | 592609-4  |
| M81714/7-AB2                              | —  | 1-592609-4                                      |
| M81714/7-AB3                              | —  | 1-592609-8                                      |
| M81714/7-AC1                              | —  | 1-592609-6                                      |
| M81714/7-AC2                              | —  | 1-592609-2                                      |
| M81714/7-AD1                              | —  | 1-592609-0                                      |
| M81714/7-AE1                              | —  | 592609-8  |
| M81714/7-AJ1                              | —  | 592609-2  |



Military Cross Reference (Continued)

| Military Part Numbers<br>Feedthru Modules | AMP MIL Qualified Part Numbers<br>Feedthru Modules | AMP Commercial Part Numbers<br>Feedthru Modules |
|---|--|---|
| <b>(Class A) Size 16</b>                  |  |   |
| M81714/8-AA1                              | —  | 592605-8  |
| M81714/8-AB1                              | —  | 592605-6  |
| M81714/8-AB2                              | —  | 1-592605-2                                      |
| M81714/8-AC1                              | —  | 1-592605-4                                      |
| M81714/8-AC2                              | —  | 1-592605-0                                      |
| M81714/8-AD1                              | —  | 592605-4  |
| M81714/8-AH1                              | —  | 592605-2  |
| <b>(Class A) Size 12</b>                  |  |   |
| M81714/9-AA1                              | —  | 592601-8  |
| M81714/9-AB1                              | —  | 592601-6  |
| M81714/9-AB2                              | —  | 1-592601-2                                      |
| M81714/9-AC1                              | —  | 1-592601-4                                      |
| M81714/9-AC2                              | —  | 1-592601-0                                      |
| M81714/9-AD1                              | —  | 592601-4  |
| M81714/9-AH1                              | —  | 592601-2  |
| <b>(Class B) Size 22</b>                  |  |   |
| M81714/6-BA1                              | —  | 592615-6  |
| M81714/6-BB1                              | —  | 592615-4  |
| M81714/6-BB2                              | —  | 1-592615-4                                      |
| M81714/6-BB3                              | —  | 1-592615-8                                      |
| M81714/6-BC1                              | —  | 1-592615-6                                      |
| M81714/6-BC2                              | —  | 1-592615-2                                      |
| M81714/6-BD1                              | —  | 1-592615-0                                      |
| M81714/6-BE1                              | —  | 592615-8  |
| M81714/6-BJ1                              | —  | 592615-2  |
| <b>(Class B) Size 20</b>                  |  |   |
| M81714/7-BA1                              | —  | 592611-6  |
| M81714/7-BB1                              | —  | 592611-4  |
| M81714/7-BB2                              | —  | 1-592611-4                                      |
| M81714/7-BB3                              | —  | 1-592611-8                                      |
| M81714/7-BC1                              | —  | 1-592611-6                                      |
| M81714/7-BC2                              | —  | 1-592611-2                                      |
| M81714/7-BD1                              | —  | 1-592611-0                                      |
| M81714/7-BE1                              | —  | 592611-8  |
| M81714/7-BJ1                              | —  | 592611-2  |
| <b>(Class B) Size 16</b>                  |  |   |
| M81714/8-BA1                              | —  | 592607-8  |
| M81714/8-BB1                              | —  | 592607-6  |
| M81714/8-BB2                              | —  | 1-592607-2                                      |
| M81714/8-BC1                              | —  | 1-592607-4                                      |
| M81714/8-BC2                              | —  | 1-592607-0                                      |
| M81714/8-BD1                              | —  | 592607-4  |
| M81714/8-BH1                              | —  | 592607-2  |
| <b>(Class B) Size 12</b>                  |  |   |
| M81714/9-BA1                              | —  | 592603-8  |
| M81714/9-BB1                              | —  | 592603-6  |
| M81714/9-BB2                              | —  | 1-592603-2                                      |
| M81714/9-BC1                              | —  | 1-592603-4                                      |
| M81714/9-BC2                              | —  | 1-592603-0                                      |
| M81714/9-BD1                              | —  | 592603-4  |
| M81714/9-BH1                              | —  | 592603-2  |

Military Cross Reference (Continued)

| Military Part Numbers<br>Feedthru Modules | AMP MIL Qualified Part Numbers<br>Feedthru Modules | AMP Commercial Part Numbers<br>Feedthru Modules |
|---|--|---|
| <b>(Class C) Size 22</b>                  |  |   |
| M81714/6-CA1                              | —  | 592614-6  |
| M81714/6-CB1                              | —  | 592614-4  |
| M81714/6-CB2                              | —  | 1-592614-4                                      |
| M81714/6-CB3                              | —  | 1-592614-8                                      |
| M81714/6-CC1                              | —  | 1-592614-6                                      |
| M81714/6-CC2                              | —  | 1-592614-2                                      |
| M81714/6-CD1                              | —  | 1-592614-0                                      |
| M81714/6-CE1                              | —  | 592614-8  |
| M81714/6-CJ1                              | —  | 592614-2  |
| <b>(Class C) Size 20</b>                  |  |   |
| M81714/7-CA1                              | —  | 592610-6  |
| M81714/7-CB1                              | —  | 592610-4  |
| M81714/7-CB2                              | —  | 1-592610-5                                      |
| M81714/7-CB3                              | —  | 1-592610-9                                      |
| M81714/7-CC1                              | —  | 1-592610-7                                      |
| M81714/7-CC2                              | —  | 1-592610-3                                      |
| M81714/7-CD1                              | —  | 1-592610-1                                      |
| M81714/7-CE1                              | —  | 592610-8  |
| M81714/7-CJ1                              | —  | 592610-2  |
| <b>(Class C) Size 16</b>                  |  |   |
| M81714/8-CA1                              | —  | 592606-8  |
| M81714/8-CB1                              | —  | 592606-6  |
| M81714/8-CB2                              | —  | 1-592606-2                                      |
| M81714/8-CC1                              | —  | 1-592606-4                                      |
| M81714/8-CC2                              | —  | 1-592606-0                                      |
| M81714/8-CD1                              | —  | 592606-4  |
| M81714/8-CH1                              | —  | 592606-2  |
| <b>(Class C) Size 12</b>                  |  |   |
| M81714/9-CA1                              | —  | 592602-8  |
| M81714/9-CB1                              | —  | 592602-6  |
| M81714/9-CB2                              | —  | 1-592602-2                                      |
| M81714/9-CC1                              | —  | 1-592602-4                                      |
| M81714/9-CC2                              | —  | 1-592602-0                                      |
| M81714/9-CD1                              | —  | 592602-4  |
| M81714/9-CH1                              | —  | 592602-2  |

