

# MPSA56/MMBTA56/PZTA56

## PNP General Purpose Amplifier

### Description

This device is designed for general purpose amplifier applications at collector currents to 300mA. Sourced from Process 73

### Absolute Maximum Ratings\*

T<sub>A</sub> = 25°C unless otherwise specified.

| Parameter  | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Collector-Emitter Voltage                        | V <sub>CES</sub>                  | -80         | V    |
| Collector-Base Voltage                           | V <sub>CBO</sub>                  | -80         | V    |
| Emitter-Base Voltage                             | V <sub>EBO</sub>                  | -4.0        | V    |
| Collector Current – Continuous                   | I <sub>C</sub>                    | -500        | mA   |
| Operating and Storage Junction Temperature Range | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

\*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

#### Notes:

1. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
3. All voltages (V) and currents (A) are negative polarity for PNP transistors.

### Thermal Characteristics

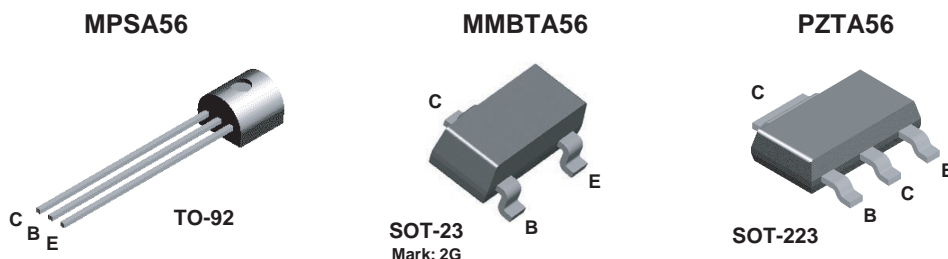
T<sub>A</sub> = 25°C unless otherwise noted.

| Characteristic                                 | Symbol           | Max        |            |              | Units       |
|--|------------------|------------|------------|--------------|-------------|
|  |                  | MPSA56     | *MMBTA56   | **PZTA56     |             |
| Total Device Dissipation,<br>Derate above 25°C | P <sub>D</sub>   | 625<br>5.0 | 350<br>2.8 | 1,000<br>8.0 | mW<br>mW/°C |
| Thermal Resistance, Junction to Case           | R <sub>θJC</sub> | 83.3       |            |              | °C/W        |
| Thermal Resistance, Junction to Ambient        | R <sub>θJA</sub> | 200        | 357        | 125          | °C/W        |

\*Device mounted on FR-4 PCB 1.6" x 1.6" x 0.06."

\*\*Device mounted on FR-4 PCB 36mm x 18mm x 1.5mm; mounting pad for the collector lead min. 6 cm<sup>2</sup>.

### Packages



## Electrical Characteristics

$T_A = 25^\circ\text{C}$  unless otherwise specified.

| Parameter                            | Symbol        | Test Condition  | Min.       | Max. | Units         |
|--------------------------------------|---------------|---|------------|------|---------------|
| <b>OFF CHARACTERISTICS</b>           |               |   |            |      |               |
| Collector-Emitter Breakdown Voltage* | $V_{(BR)CEO}$ | $I_C = -1.0\text{mA}, I_B = 0$  | -80        |      | V             |
| Collector-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C = -100\mu\text{A}, I_E = 0$  | -80        |      | V             |
| Emitter-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E = -100\mu\text{A}, I_C = 0$  | -4.0       |      | V             |
| Collector-Cutoff Current             | $I_{CEO}$     | $V_{CE} = -60\text{V}, I_B = 0$   |            | -0.1 | $\mu\text{A}$ |
| Collector-Cutoff Current             | $I_{CBO}$     | $V_{CB} = -80\text{V}, I_E = 0$   |            | -0.1 | $\mu\text{A}$ |
| <b>ON CHARACTERISTICS</b>            |               |   |            |      |               |
| DC Current Gain                      | $h_{FE}$      | $I_C = -10\text{mA}, V_{CE} = -1.0\text{V}$<br>$I_C = -100\text{mA}, V_{CE} = -1.0\text{V}$ | 100<br>100 |      |               |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = -100\text{mA}, I_B = -10\text{mA}$   |            | -0.2 | V             |
| Base-Emitter On Voltage              | $V_{BE(on)}$  | $I_C = -100\text{mA}, V_{CE} = -1.0\text{V}$  |            | -1.2 | V             |
| <b>SMALL SIGNAL CHARACTERISTICS</b>  |               |   |            |      |               |
| Current Gain – Bandwidth Product     | $f_T$         | $I_C = -100\text{mA}, V_{CE} = -1.0\text{V},$<br>$f = 100\text{MHz}$                        | 50         |      | MHz           |

\*Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

### Note:

All voltages (V) and currents (A) are negative polarity for PNP transistors.

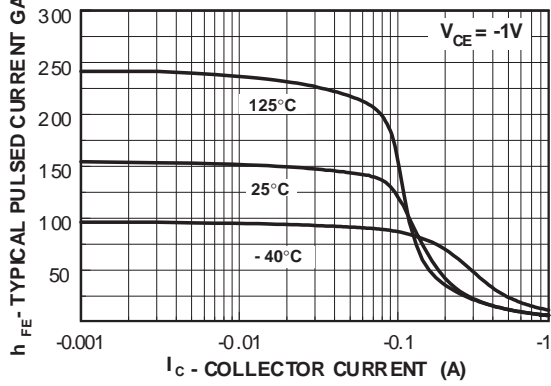
## Spice Model

PNP

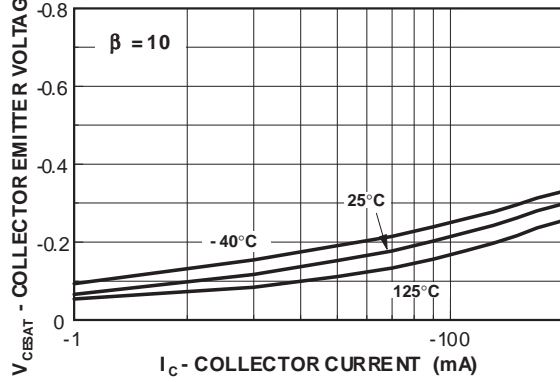
(Is=12.27p Xti=3 Eg=1.11 Vaf=100 Bf=91.63 Ne=1.531 Ise=12.27p Ikf=1.009 Xtb=1.5 Br=1.287 Nc=2 Isc=0 Ikr=0 Rc=.6 Cjc=48.28p Mjc=.5615 Vjc=.75 Fc=.5 Cje=106.7p Mje=.5168 Vje=.75 Tr=496.3n Tf=865.8p Itf=.2 Vtf=2 Xtf=.8 Rb=10)

## Typical Characteristics

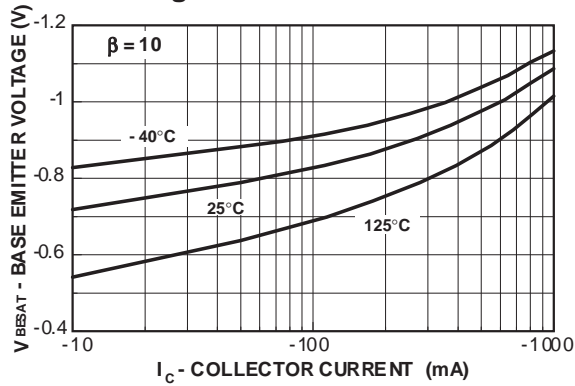
### Typical Pulsed Current Gain vs Collector Current



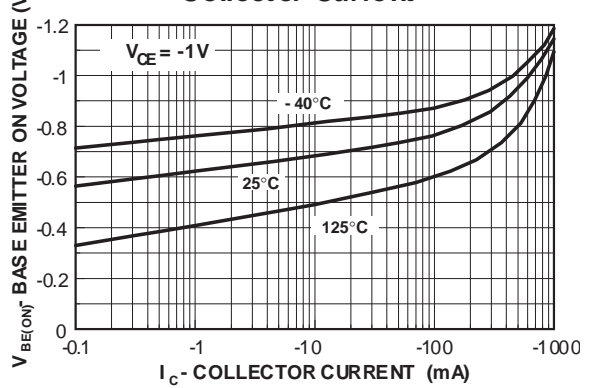
### Collector-Emitter Saturation Voltage vs Collector Current



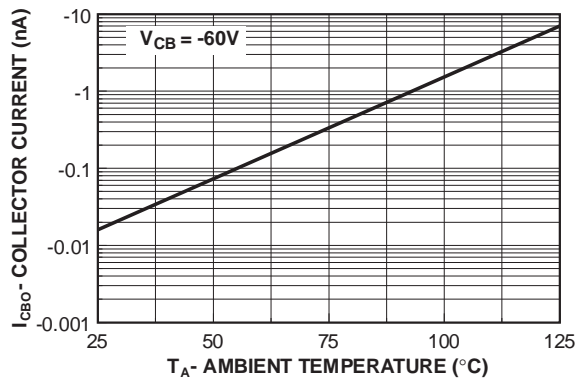
### Base-Emitter Saturation Voltage vs Collector Current



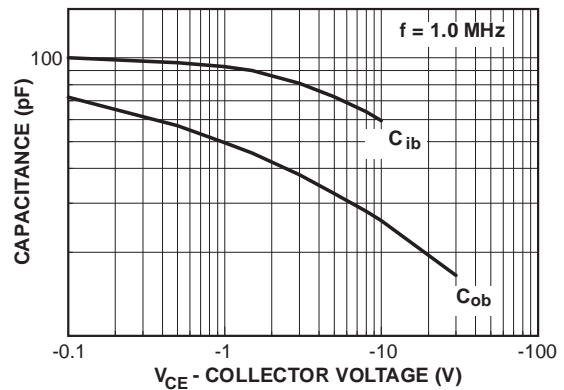
### Base Emitter ON Voltage vs Collector Current



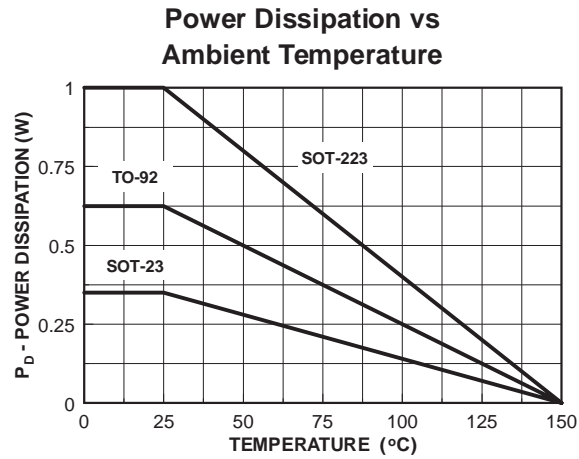
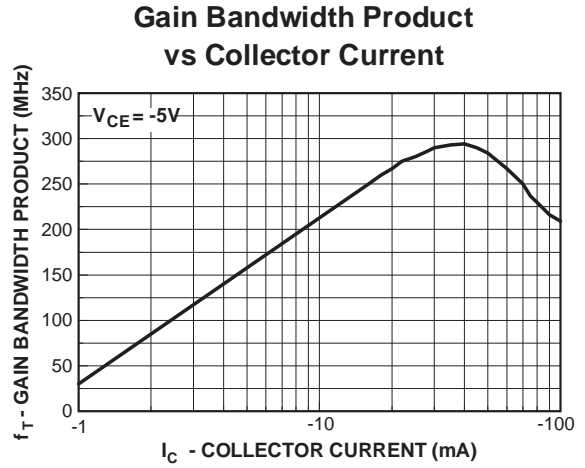
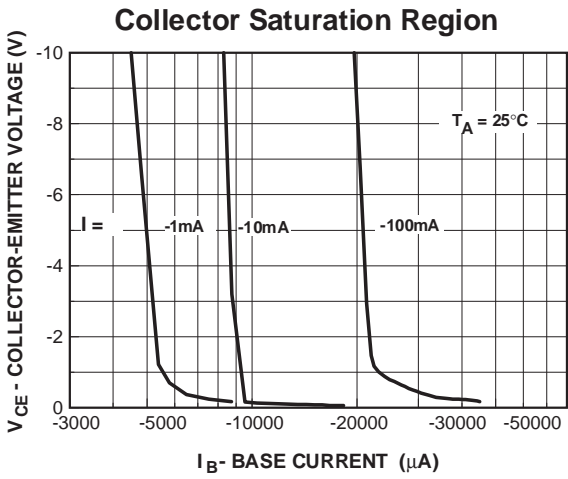
### Collector-Cutoff Current vs Ambient Temperature



### Input and Output Capacitance vs Reverse Voltage



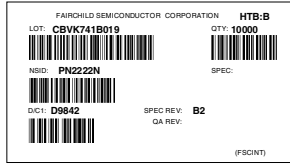
**Typical Characteristics** (Continued)



# TO-92 Tape and Reel Data

## TO-92 Packaging Configuration: Figure 1.0

FSCINT Label sample



F63TNR Label sample



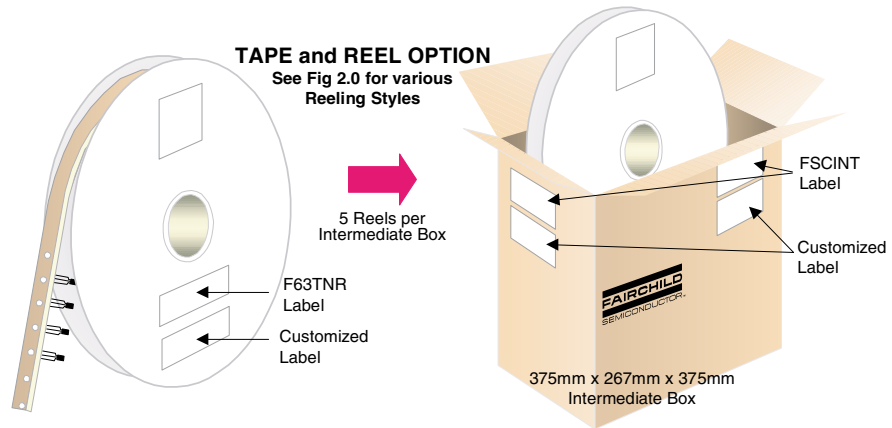
### TO-92 TNR/AMMO PACKING INFORMATION

| Packing | Style | Quantity | EOL code |
|---------|-------|----------|----------|
| Reel    | A     | 2,000    | D26Z     |
|         | E     | 2,000    | D27Z     |
| Ammo    | M     | 2,000    | D74Z     |
|         | P     | 2,000    | D75Z     |

Unit weight = 0.22 gm  
 Reel weight with components = 1.04 kg  
 Ammo weight with components = 1.02 kg  
 Max quantity per intermediate box = 10,000 units

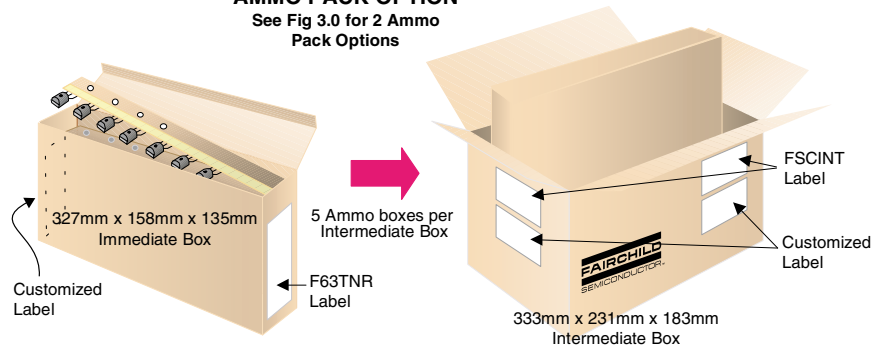
### TAPE and REEL OPTION

See Fig 2.0 for various Reeling Styles



### AMMO PACK OPTION

See Fig 3.0 for 2 Ammo Pack Options

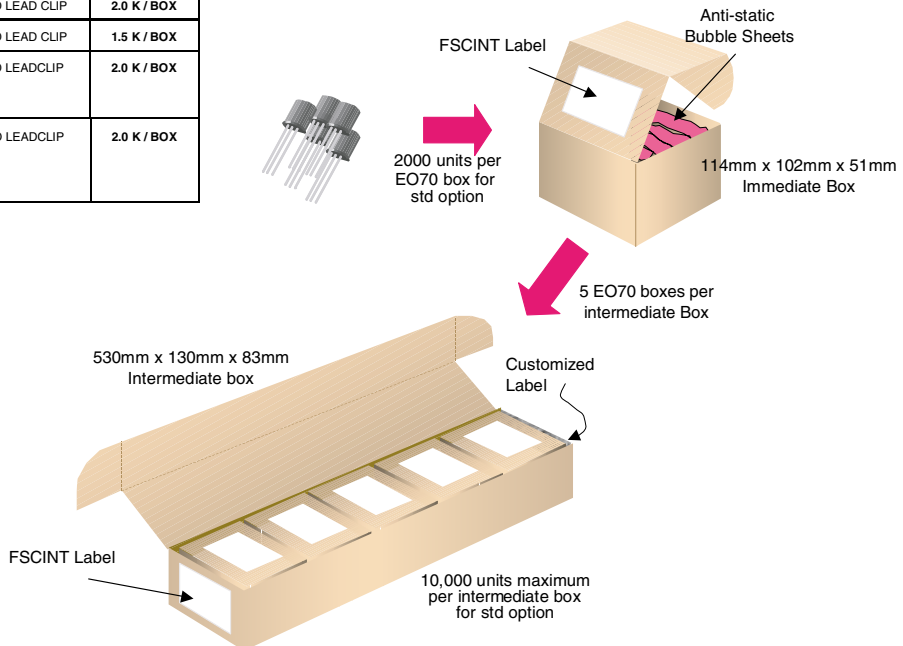


### (TO-92) BULK PACKING INFORMATION

| EOL CODE    | DESCRIPTION   | LEADCLIP DIMENSION | QUANTITY    |
|-------------|---|--------------------|-------------|
| J18Z        | TO-18 OPTION STD  | NO LEAD CLIP       | 2.0 K / BOX |
| J05Z        | TO-5 OPTION STD   | NO LEAD CLIP       | 1.5 K / BOX |
| NO EOL CODE | TO-92 STANDARD STRAIGHT FOR: PKG 92, 94 (NON PROELECTRON SERIES), 96                  | NO LEADCLIP        | 2.0 K / BOX |
| L34Z        | TO-92 STANDARD STRAIGHT FOR: PKG 94 (PROELECTRON SERIES BCXXX, BFXXX, BSRXXX), 97, 98 | NO LEADCLIP        | 2.0 K / BOX |

### BULK OPTION

See Bulk Packing Information table

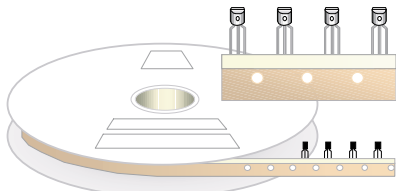


## TO-92 Tape and Reel Data (Continued)

### TO-92 Reeling Style

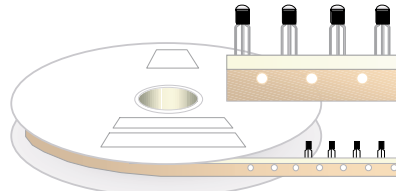
Configuration: Figure 2.0

Machine Option "A" (H)



Style "A", D26Z, D70Z (s/h)

Machine Option "E" (J)

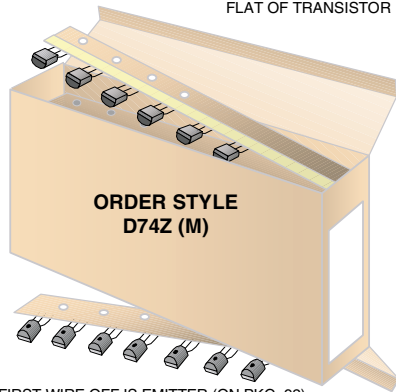


Style "E", D27Z, D71Z (s/h)

### TO-92 Radial Ammo Packaging

Configuration: Figure 3.0

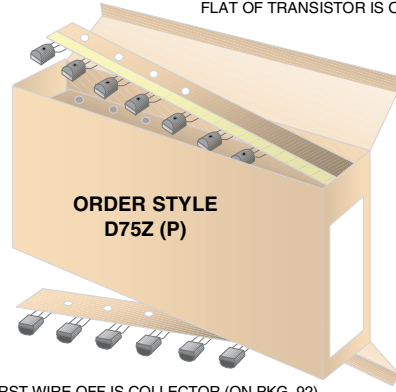
FIRST WIRE OFF IS COLLECTOR  
ADHESIVE TAPE IS ON THE TOP SIDE  
FLAT OF TRANSISTOR IS ON TOP



ORDER STYLE  
D74Z (M)

FIRST WIRE OFF IS EMITTER (ON PKG. 92)  
ADHESIVE TAPE IS ON BOTTOM SIDE  
FLAT OF TRANSISTOR IS ON BOTTOM

FIRST WIRE OFF IS EMITTER  
ADHESIVE TAPE IS ON THE TOP SIDE  
FLAT OF TRANSISTOR IS ON BOTTOM

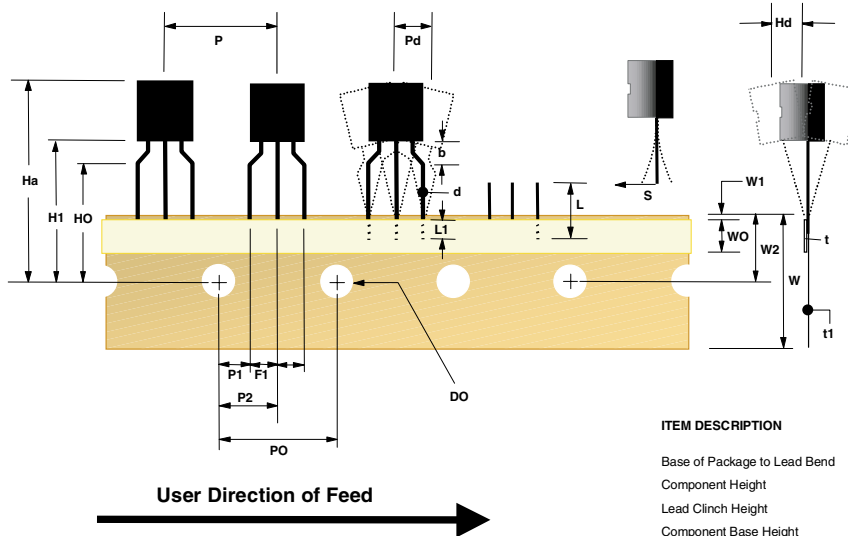


ORDER STYLE  
D75Z (P)

FIRST WIRE OFF IS COLLECTOR (ON PKG. 92)  
ADHESIVE TAPE IS ON BOTTOM SIDE  
FLAT OF TRANSISTOR IS ON TOP

## TO-92 Tape and Reel Data (Continued)

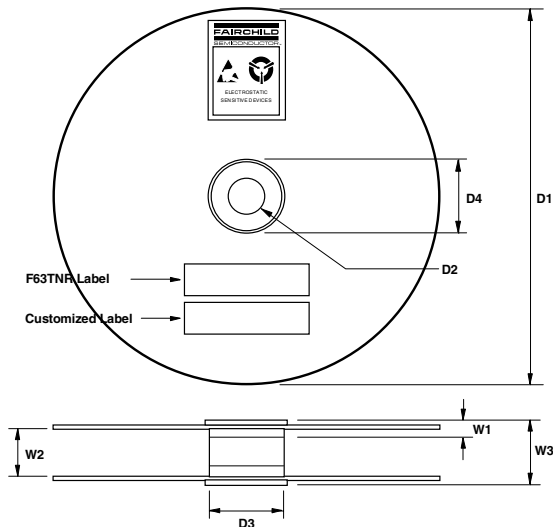
### TO-92 Tape and Reel Taping Dimension Configuration: Figure 4.0



| ITEM DESCRIPTION                   | SYMBOL | DIMENSION              |
|------------------------------------|--------|------------------------|
| Base of Package to Lead Bend       | b      | 0.098 (max)            |
| Component Height                   | Ha     | 0.928 (+/- 0.025)      |
| Lead Clinch Height                 | HO     | 0.630 (+/- 0.020)      |
| Component Base Height              | H1     | 0.748 (+/- 0.020)      |
| Component Alignment ( side/side )  | Pd     | 0.040 (max)            |
| Component Alignment ( front/back ) | Hd     | 0.031 (max)            |
| Component Pitch                    | P      | 0.500 (+/- 0.020)      |
| Feed Hole Pitch                    | PO     | 0.500 (+/- 0.008)      |
| Hole Center to First Lead          | P1     | 0.150 (+0.009, -0.010) |
| Hole Center to Component Center    | P2     | 0.247 (+/- 0.007)      |
| Lead Spread                        | F1/F2  | 0.104 (+/- 0.010)      |
| Lead Thickness                     | d      | 0.018 (+0.002, -0.003) |
| Cut Lead Length                    | L      | 0.429 (max)            |
| Taped Lead Length                  | L1     | 0.209 (+0.051, -0.052) |
| Taped Lead Thickness               | t      | 0.032 (+/- 0.006)      |
| Carrier Tape Thickness             | t1     | 0.021 (+/- 0.006)      |
| Carrier Tape Width                 | W      | 0.708 (+0.020, -0.019) |
| Hold - down Tape Width             | WO     | 0.236 (+/- 0.012)      |
| Hold - down Tape position          | W1     | 0.035 (max)            |
| Feed Hole Position                 | W2     | 0.360 (+/- 0.025)      |
| Sprocket Hole Diameter             | DO     | 0.157 (+0.008, -0.007) |
| Lead Spring Out                    | S      | 0.004 (max)            |

Note : All dimensions are in inches.

### TO-92 Reel Configuration: Figure 5.0

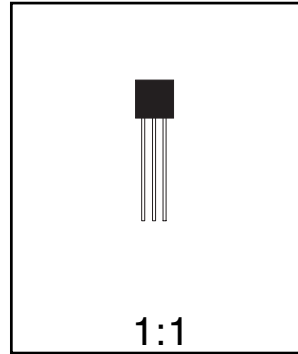
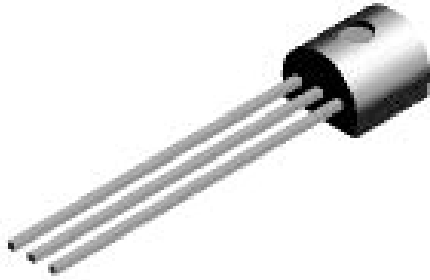


| ITEM DESCRIPTION               | SYMBOL | MINIMUM | MAXIMUM |
|--------------------------------|--------|---------|---------|
| Reel Diameter                  | D1     | 13.975  | 14.025  |
| Arbor Hole Diameter (Standard) | D2     | 1.160   | 1.200   |
| (Small Hole)                   | D2     | 0.650   | 0.700   |
| Core Diameter                  | D3     | 3.100   | 3.300   |
| Hub Recess Inner Diameter      | D4     | 2.700   | 3.100   |
| Hub Recess Depth               | W1     | 0.370   | 0.570   |
| Flange to Flange Inner Width   | W2     | 1.630   | 1.690   |
| Hub to Hub Center Width        | W3     |         | 2.090   |

Note: All dimensions are in inches

**TO-92 Package Dimensions**

**TO-92 (FS PKG Code 92, 94, 96)**



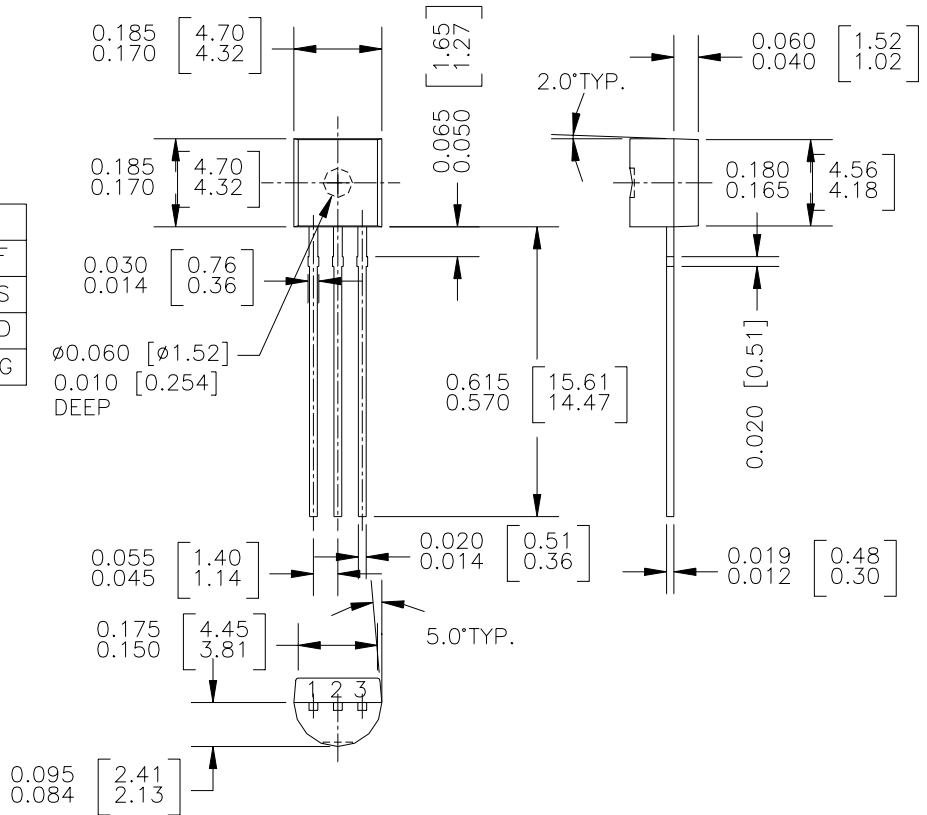
Scale 1:1 on letter size paper

Dimensions shown below are in:  
inches [millimeters]

Part Weight per unit (gram): 0.1977

TO-92 (92,94,96)

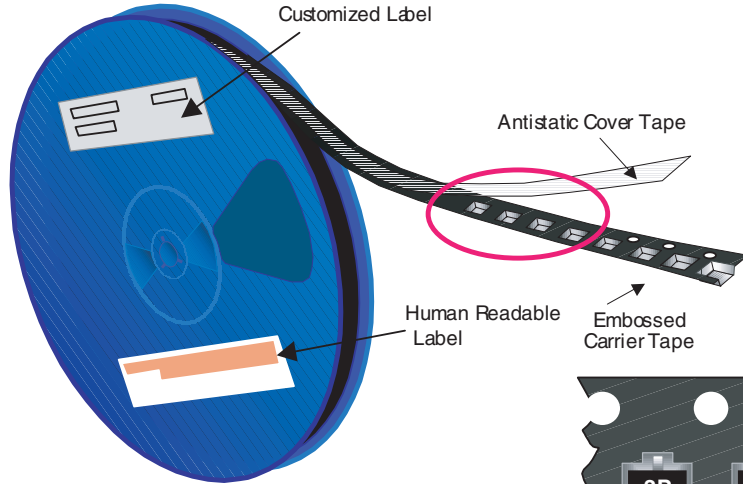
| PIN | 92 |   | 94 |   | 96 |   |
|-----|----|---|----|---|----|---|
|     | B  | F | B  | F | B  | F |
| 1   | E  | D | E  | D | B  | S |
| 2   | B  | S | C  | G | E  | D |
| 3   | C  | G | B  | S | C  | G |





## SOT-23 Tape and Reel Data

### SOT-23 Packaging Configuration: Figure 10

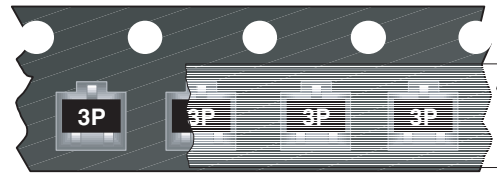


#### Packaging Description:

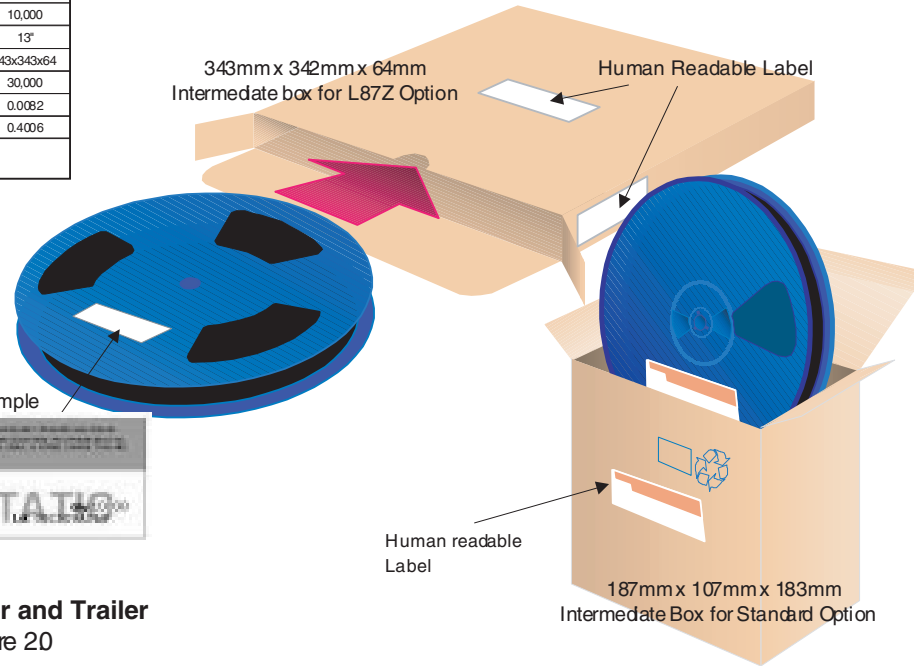
SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 177mm diameter reel. The reels are dark blue in color and is made of polystyrene plastic (anti-static coated). Other option comes in 10,000 units per 13" or 330mm diameter reel. This and some other options are described in the Packaging Information table.

These full reels are individually labeled and placed inside a standard intermediate made of recyclable corrugated brown paper with a Fairchild logo printing. One pizza box contains eight reels maximum. And these intermediate boxes are placed inside a labeled shipping box which comes in different sizes depending on the number of parts shipped.

| SOT-23 Packaging Information |                         |            |
|------------------------------|-------------------------|------------|
| Packaging Option             | Standard (no flow code) | D87Z       |
| Packaging type               | TNR                     | TNR        |
| Qty per Reel/Tube/Bag        | 3,000                   | 10,000     |
| Reel Size                    | 7" Dia                  | 13"        |
| Box Dimension (mm)           | 187x107x183             | 343x343x64 |
| Max qty per Box              | 24,000                  | 30,000     |
| Weight per unit (gm)         | 0.0082                  | 0.0082     |
| Weight per Reel (kg)         | 0.1175                  | 0.4006     |
| Note/Comments                |                         |            |



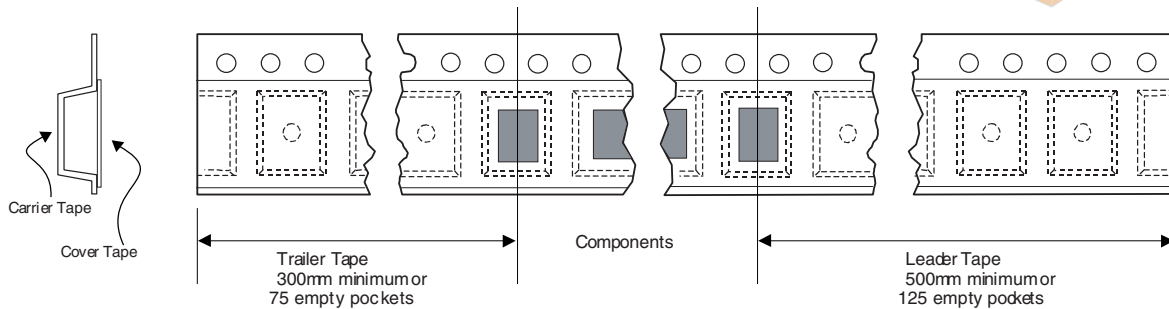
#### SOT-23 Unit Orientation



#### Human Readable Label sample

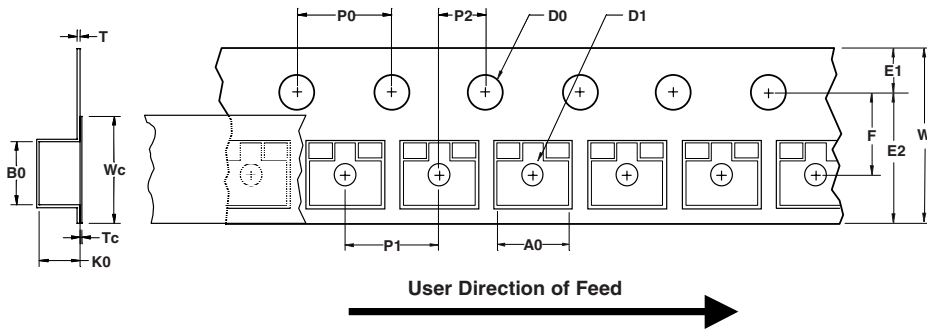


### SOT-23 Tape Leader and Trailer Configuration: Figure 20



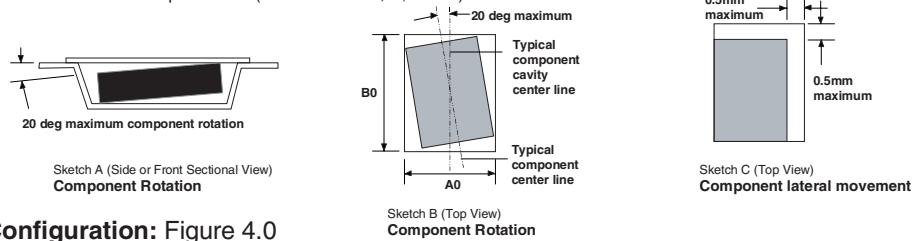
## SOT-23 Tape and Reel Data (Continued)

### SOT-23 Embossed Carrier Tape Configuration: Figure 3.0

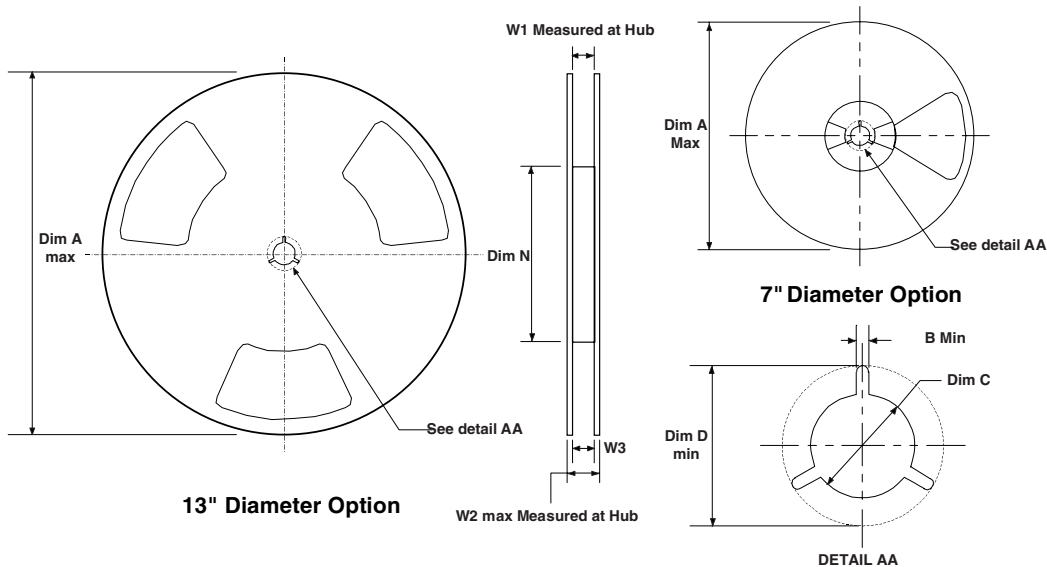


| Dimensions are in millimeter |                 |                 |               |                 |                   |                 |             |                 |               |               |                 |                   |               |                 |
|------------------------------|-----------------|-----------------|---------------|-----------------|-------------------|-----------------|-------------|-----------------|---------------|---------------|-----------------|-------------------|---------------|-----------------|
| Pkg type                     | A0              | B0              | W             | D0              | D1                | E1              | E2          | F               | P1            | P0            | K0              | T                 | Wc            | Tc              |
| SOT-23 (8mm)                 | 3.15<br>+/-0.10 | 2.77<br>+/-0.10 | 8.0<br>+/-0.3 | 1.55<br>+/-0.05 | 1.125<br>+/-0.125 | 1.75<br>+/-0.10 | 6.25<br>min | 3.50<br>+/-0.05 | 4.0<br>+/-0.1 | 4.0<br>+/-0.1 | 1.30<br>+/-0.10 | 0.228<br>+/-0.013 | 5.2<br>+/-0.3 | 0.06<br>+/-0.02 |

Notes: A0, B0, and K0 dimensions are determined with respect to the EIA/Jedec RS-481 rotational and lateral movement requirements (see sketches A, B, and C).



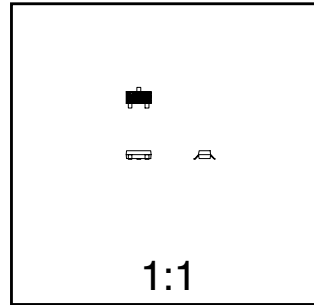
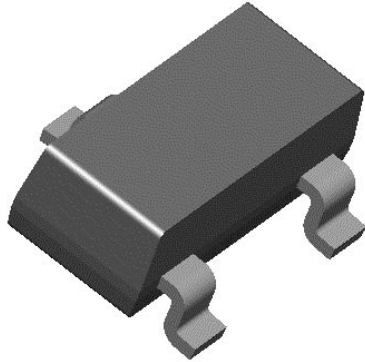
### SOT-23 Reel Configuration: Figure 4.0



| Dimensions are in inches and millimeters |             |               |              |                                   |               |             |                                   |               |                             |
|--|-------------|---------------|--------------|-----------------------------------|---------------|-------------|-----------------------------------|---------------|-----------------------------|
| Tape Size                                | Reel Option | Dim A         | Dim B        | Dim C                             | Dim D         | Dim N       | Dim W1                            | Dim W2        | Dim W3 (LSL-USL)            |
| 8mm                                      | 7" Dia      | 7.00<br>177.8 | 0.059<br>1.5 | 512 +0.020/-0.008<br>13 +0.5/-0.2 | 0.795<br>20.2 | 2.165<br>55 | 0.331 +0.059/-0.000<br>8.4 +1.5/0 | 0.567<br>14.4 | 0.311 - 0.429<br>7.9 - 10.9 |
| 8mm                                      | 13" Dia     | 13.00<br>330  | 0.059<br>1.5 | 512 +0.020/-0.008<br>13 +0.5/-0.2 | 0.795<br>20.2 | 4.00<br>100 | 0.331 +0.059/-0.000<br>8.4 +1.5/0 | 0.567<br>14.4 | 0.311 - 0.429<br>7.9 - 10.9 |

## SOT-23 Package Dimensions

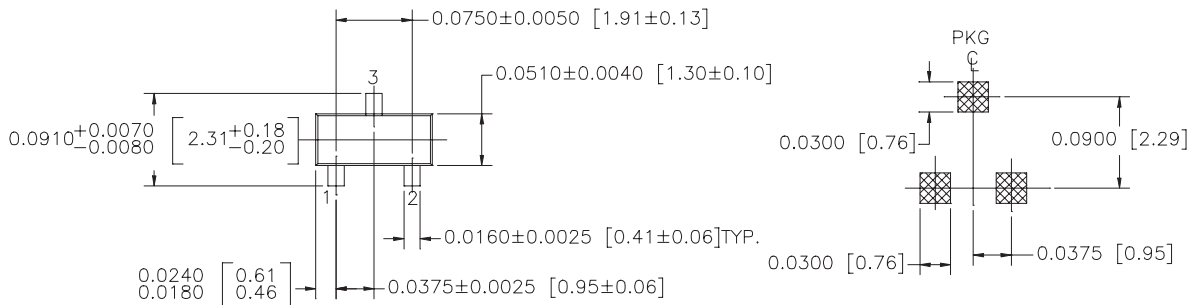
# SOT-23 (FS PKG Code 49)



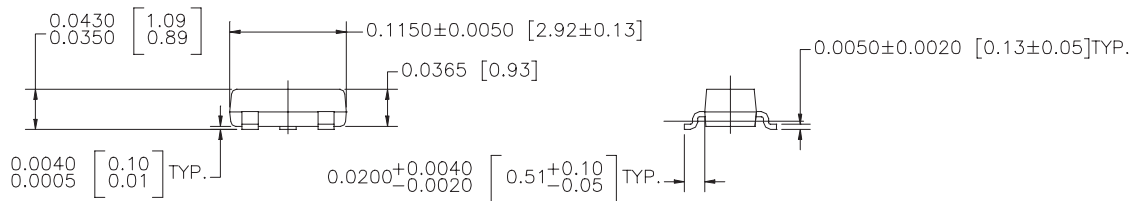
Scale 1:1 on letter size paper

Dimensions shown below are in:  
inches [millimeters]

Part Weight per unit (gram): 0.0082



### LAND PATTERN RECOMMENDATION



CONTROLLING DIMENSION IS INCH  
VALUES IN [ ] ARE MILLIMETERS

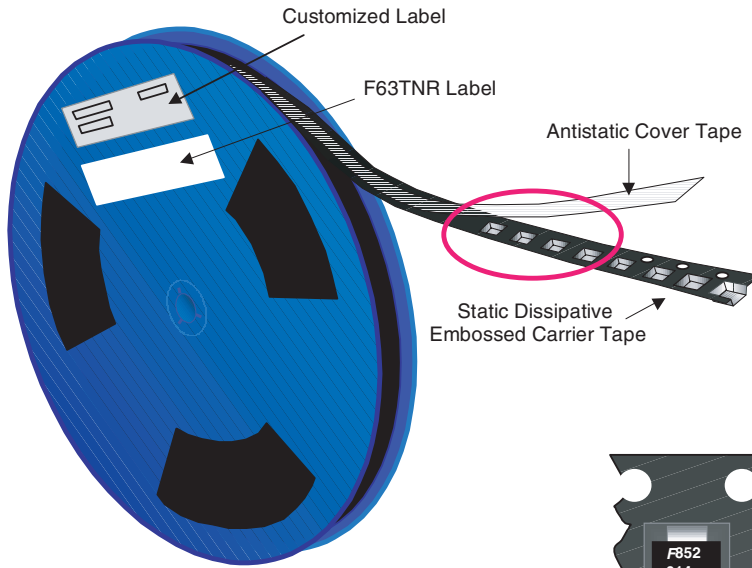
SOT 23, 3 LEADS LOW PROFILE

NOTE : UNLESS OTHERWISE SPECIFIED

- STANDARD LEAD FINISH 150 MICROINCHES / 3.81 MICROMETERS  
MINIMUM TIN / LEAD (SOLDER) ON ALLOY 42
- REFERENCE JEDEC REGISTRATION TO-236, VARIATION AB, ISSUE G, DATED JUL 1993

## SOT-223 Tape and Reel Data

### SOT-223 Packaging Configuration: Figure 1.0

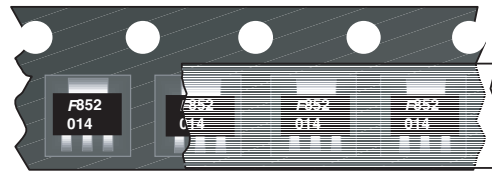


#### Packaging Description:

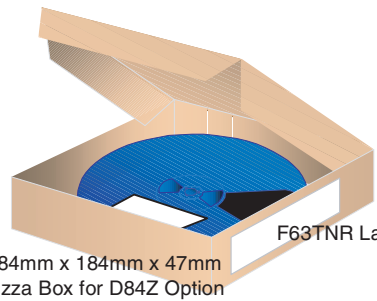
SOT-223 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 2,500 units per 13" or 330cm diameter reel. The reels are dark blue in color and is made of polystyrene plastic (anti-static coated). Other option comes in 500 units per 7" or 177cm diameter reel. This and some other options are further described in the Packaging Information table.

These full reels are individually barcode labeled and placed inside a standard intermediate box (illustrated in figure 1.0) made of recyclable corrugated brown paper. One box contains two reels maximum. And these boxes are placed inside a barcode labeled shipping box which comes in different sizes depending on the number of parts shipped.

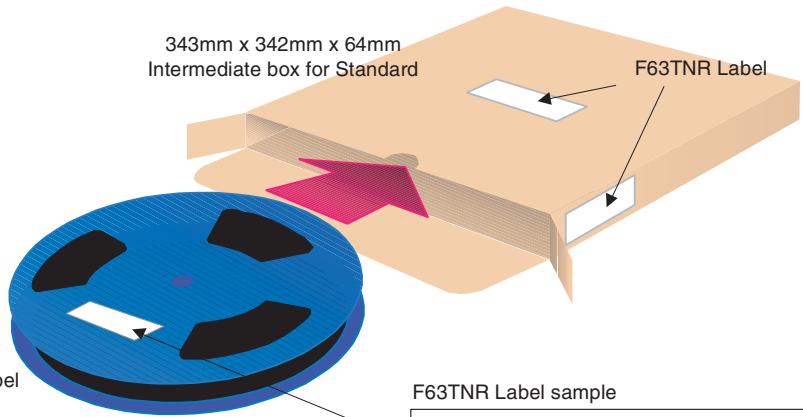
| SOT-223 Packaging Information |                         |            |
|-------------------------------|-------------------------|------------|
| Packaging Option              | Standard (no flow code) | D84Z       |
| Packaging type                | TNR                     | TNR        |
| Qty per Reel/Tube/Bag         | 2,500                   | 500        |
| Reel Size                     | 13" Dia                 | 7" Dia     |
| Box Dimension (mm)            | 343x64x343              | 184x187x47 |
| Max qty per Box               | 5,000                   | 1,000      |
| Weight per unit (gm)          | 0.1246                  | 0.1246     |
| Weight per Reel (kg)          | 0.7250                  | 0.1532     |
| Note/Comments                 |                         |            |



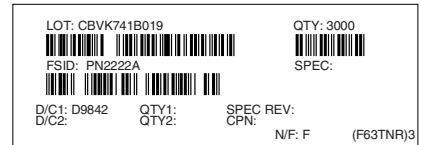
#### SOT-223 Unit Orientation



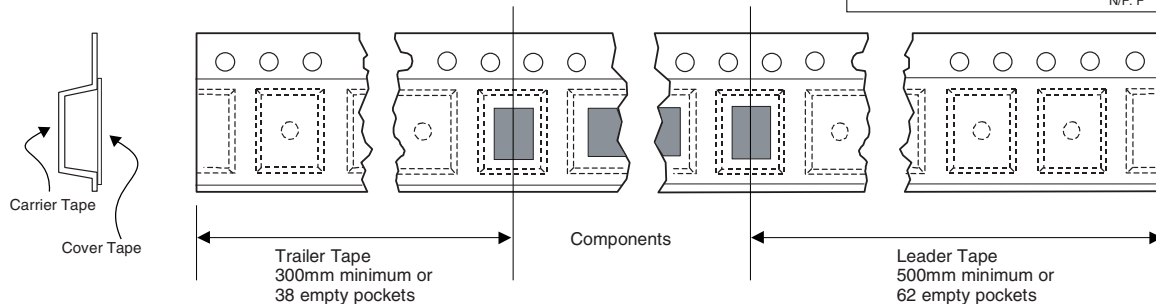
343mm x 342mm x 64mm  
Intermediate box for Standard



#### F63TNR Label sample

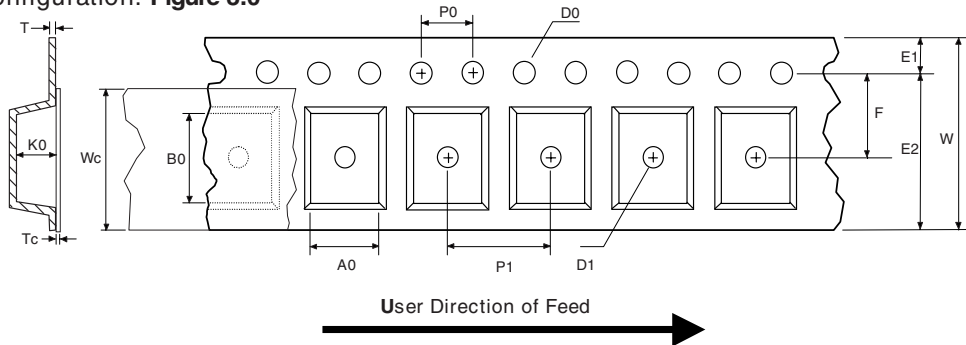


### SOT-223 Tape Leader and Trailer Configuration: Figure 2.0



## SOT-223 Tape and Reel Data (Continued)

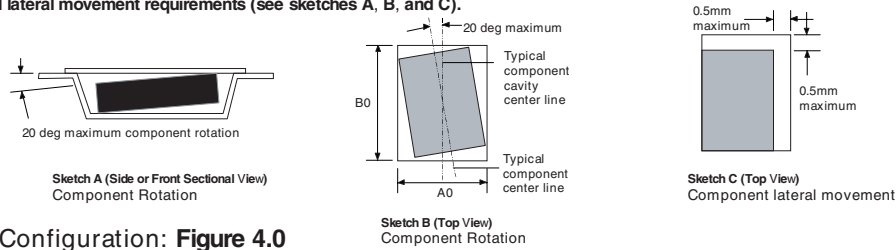
SOT-223 Embossed Carrier Tape  
Configuration: **Figure 3.0**



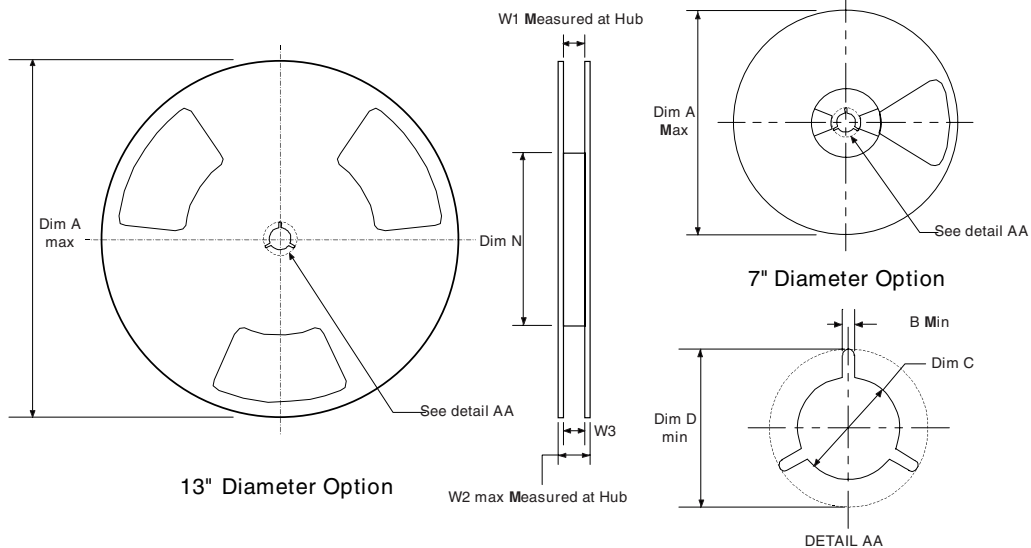
Dimensions are in millimeter

| Pkg type       | A0              | B0              | W              | D0              | D1              | E1              | E2           | F               | P1            | P0            | K0              | T                      | Wc              | Tc              |
|----------------|-----------------|-----------------|----------------|-----------------|-----------------|-----------------|--------------|-----------------|---------------|---------------|-----------------|------------------------|-----------------|-----------------|
| SOT-223 (12mm) | 6.83<br>+/-0.10 | 7.42<br>+/-0.10 | 12.0<br>+/-0.3 | 1.55<br>+/-0.05 | 1.50<br>+/-0.10 | 1.75<br>+/-0.10 | 10.25<br>min | 5.50<br>+/-0.05 | 8.0<br>+/-0.1 | 4.0<br>+/-0.1 | 1.88<br>+/-0.10 | 0.292<br>+/-<br>0.0130 | 9.5<br>+/-0.025 | 0.06<br>+/-0.02 |

Notes: A0, B0, and K0 dimensions are determined with respect to the EIA/Jedec RS-481 rotational and lateral movement requirements (see sketches A, B, and C).



## SOT-223 Reel Configuration: Figure 4.0

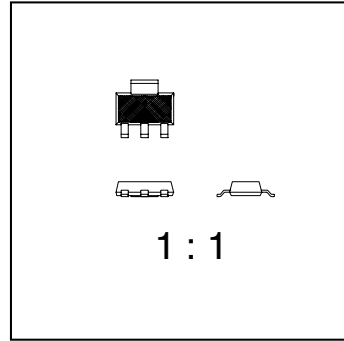
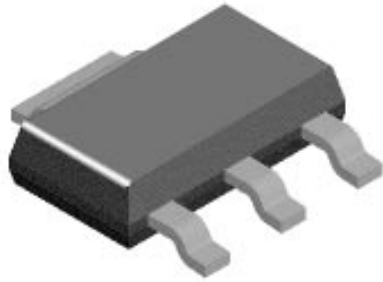


Dimensions are in inches and millimeters

| Tape Size | Reel Option | Dim A         | Dim B        | Dim C                             | Dim D         | Dim N        | Dim W1                           | Dim W2        | Dim W3 (LSL-USL)             |
|-----------|-------------|---------------|--------------|-----------------------------------|---------------|--------------|----------------------------------|---------------|------------------------------|
| 12mm      | 7" Dia      | 7.00<br>177.8 | 0.059<br>1.5 | 512 +0.020/-0.008<br>13 +0.5/-0.2 | 0.795<br>20.2 | 5.906<br>150 | 0.488 +0.078/-0.000<br>12.4 +2/0 | 0.724<br>18.4 | 0.469 - 0.606<br>11.9 - 15.4 |
| 12mm      | 13" Dia     | 13.00<br>330  | 0.059<br>1.5 | 512 +0.020/-0.008<br>13 +0.5/-0.2 | 0.795<br>20.2 | 7.00<br>178  | 0.488 +0.078/-0.000<br>12.4 +2/0 | 0.724<br>18.4 | 0.469 - 0.606<br>11.9 - 15.4 |

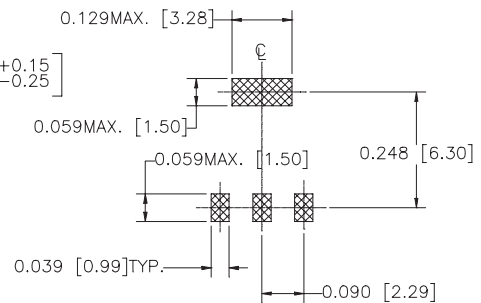
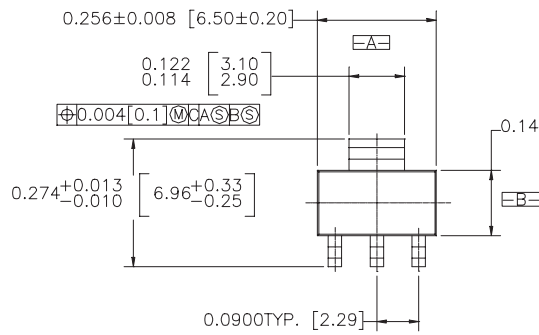
## SOT-223 Package Dimensions

# SOT-223 (FS PKG Code 47)



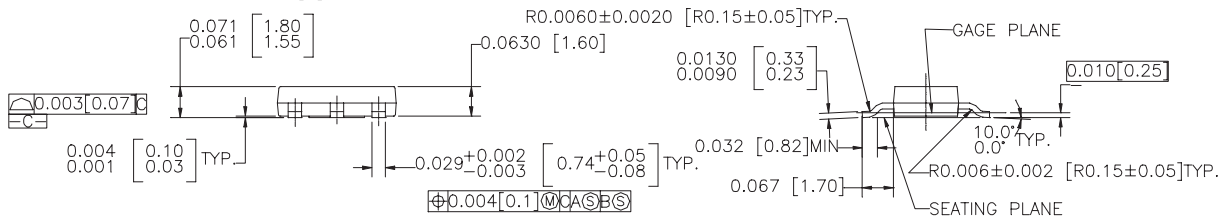
Scale 1:1 on letter size paper

Part Weight per unit (gram): 0.1246



CONTROLLING DIMENSION IS INCH  
VALUES IN [ ] ARE MILLIMETERS

LAND PATTERN RECOMMENDATION



- NOTES : UNLESS OTHERWISE SPECIFIED  
 1. STANDARD LEAD FINISH TO BE 150 MICRONS/ 3.81 MICROMETERS  
 MINIMUM TIN/LEAD (SOLDER) ON COPPER.  
 2. REFERENCE JEDEC REGISTRATION TO-261, VARIATION AA, ISSUE A, DATED JAN 1990

SOT223, 4 LEADS

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| ACEx™                                | FAST®               | ISOPLANAR™    | PowerSaver™         | SuperSOT™-6     |
| ActiveArray™                         | FASTr™              | LittleFET™    | PowerTrench®        | SuperSOT™-8     |
| Bottomless™                          | FPST™               | MICROCOUPLER™ | QFET®               | SyncFET™        |
| Build it Now™                        | FRFET™              | MicroFET™     | QS™                 | TCM™            |
| CoolFET™                             | GlobalOptoisolator™ | MicroPak™     | QT Optoelectronics™ | TinyLogic®      |
| CROSSVOLT™                           | GTO™                | MICROWIRE™    | Quiet Series™       | TINYOPTO™       |
| DOMETM                               | HiSeC™              | MSX™          | RapidConfigure™     | TruTranslation™ |
| EcoSPARK™                            | I <sup>2</sup> C™   | MSXPro™       | RapidConnect™       | UHC™            |
| E <sup>2</sup> CMOSTM                | i-Lo™               | OCX™          | μSerDes™            | UltraFET®       |
| EnSigna™                             | ImpliedDisconnect™  | OCXPro™       | ScalarPump™         | UniFET™         |
| FACT™                                | IntelliMAX™         | OPTOLOGIC®    | SILENT SWITCHER®    | VCX™            |
| FACT Quiet Series™                   |                     | OPTOPLANAR™   | SMART START™        | Wire™           |
|                                      |                     | PACMAN™       | SPM™                |                 |
| Across the board. Around the world.™ |                     | POP™          | Stealth™            |                 |
| The Power Franchise®                 |                     | Power247™     | SuperFET™           |                 |
| Programmable Active Droop™           |                     | PowerEdge™    | SuperSOT™-3         |                 |

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