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**AMPMODU, 2.0mm PITCH BOARD-TO-BOARD  
CONNECTOR**

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**1. SCOPE**

**1.1. 1.1. CONTENTS**

This specification covers the performance, tests and quality requirements for the **AMPMODU, 2.0mm PITCH BOARD-TO-BOARD CONNECTOR**.

**1.2. 1.2. QUALIFICATION**

When tests are performed on the subject product line, the procedures specified in Tyco 109 series specifications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

**2. APPLICABLE DOCUMENTS AND SPECIFICATIONS**

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

**2.1. 2.1 TYCO SPECIFICATIONS**

- A. 109-1: General Requirements for Test Specifications
- B. 109 series: Test Specification as indicated in figure 2 (Comply with MIL-STD-202)
- C. Corporate Bulletin 401-76: Cross-reference between Tyco test Specifications and Military or Commercial Documents.
- D. 501-57197: Test Report.

**3. REQUIREMENTS**

**3.1. DESIGN AND CONSTRUCTION**

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

**3.2. MATERIALS**

- A. Housing : Thermoplastic or Thermoplastic High Temp., UL94V-0.
- B. Contact : Copper Alloy, Gold plating on contact area, Tin or Tin-Lead Plating on soldertail over Nickel underplating overall.

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**3.3. RATINGS**

- A. Voltage: 250 VAC rms.
- B. Current: 1 A Max
- C. Operating Temperature: -40°C to + 105°C

**3.4. PERFORMANCE AND TEST DESCRIPTION**

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in Table 2. All tests are performed at ambient environmental conditions per AMP Specification 109-1 unless otherwise specified.

**3.5. TEST REQUIREMENTS AND PROCEDURES SUMMARY**

| NO.                            | TEST ITEMS                                 | REQUIREMENTS   |                  | PROCEDURES  |
|--------------------------------|--|--|------------------|---|
| 3.5.1                          | Examination of Product                     | Meets requirements of product drawing. No physical damage.                                       |                  | Visual inspection.  |
| <b>ELECTRICAL REQUIREMENTS</b> |  |  |                  |   |
| 3.5.2.1                        | Termination Resistance                     | Initial  | 20m ohms max.    | Subject mated contacts assembled in housing to closed circuit current of 50mA max at open circuit voltage of 50mV max. (See Fig. 1)   |
|                                |  | Final  | 30m ohms max.    |   |
| 3.5.2.2                        | Insulation Resistance                      | 1000M ohms min. (Initial)<br>1000M ohms min (Final)  |                  | Measure by applying test potential between adjacent contacts, and between the contacts and ground in the mated connector assembly.<br>MIL-STD-202, Method 302, Condition B  |
| 3.5.2.3                        | Dielectric Strength                        | Connector must withstand test potential of 650VAC for 1 min. Current leakage limit to 5.0mA max. |                  | Measure by applying test potential between adjacent contacts, and between the contacts and ground in the mated connector assembly.<br>MIL-STD-202, Method 301   |
| <b>MECHANICAL REQUIREMENTS</b> |  |  |                  |   |
| 3.5.3.1                        | Individual Pin Insertion/ Extraction Force | Insertion Force  | Extraction Force | Subject terminated contact and pin to mate and unmate to measure the force required to insert and extract by operating at a rate of 100mm a minute. (See Fig. 2)  |
|                                |  | 200 gf max   | 10gf min         |   |
| 3.5.3.2                        | Receptacle Contact Retention Force         | 250 gf min. per contact  |                  | Apply axial load to terminated contact at a rate of 25mm a minute.  |
| 3.5.3.3                        | Post Retention Force                       | 0.5 kgf min. per contact   |                  | Apply axial pull-off load to post contact mounted on housing and measure the force required to dislodge post from housing.  |
| 3.5.3.4                        | Solder ability                             | The inspected area of each lead must have 95% solder coverage minimum.                           |                  | Steam Aging Preconditioning :<br>(1) Tin 、 Tin-Cu Coating:<br>93+3/-5°C 、 100% HR 、 8hrs.<br><J-STD-002 category 3 aging><br>(2) Other Coating:<br>93+3/-5°C 、 100% HR 、 1hrs.<br><J-STD-002 category 2 aging><br>Solder pot temperature: 245±5°C, 5sec |

| NO.                               | TEST ITEMS                           | REQUIREMENTS   | PROCEDURES   |
|-----------------------------------|--------------------------------------|--|--|
| <b>ENVIRONMENTAL REQUIREMENTS</b> |                                      |  |  |
| 3.5.4.1                           | Vibration                            | No electrical discontinuity greater than 1 microsecond.  | Subject mated connectors to 10-55-10 Hz traversed in 1minutes at 1.52mm amplitude 2 Hours each of 3 mutually perpendicular planes.<br>MIL-STD-202, Method201, Condition A                                      |
| 3.5.4.2                           | Temperature Life (Heat Aging)        | Termination resistance (low level) shall be met.<br>Termination resistance 40m ohms Max.         | Subject mated connector assemblies to temperature life at 85°C±2°C for 96 hours.   |
| 3.5.4.3                           | Humidity, Steady State               | Insulation Resistance (Final) 500M ohms min.<br>Termination resistance (low level) shall be met. | Subject mated connectors to steady state humidity at 40°C±2°C and 90-95% R.H for 96 hrs.   |
| 3.5.4.4                           | Thermal Shock                        | Termination resistance (low level) shall be met.   | Subject mated connector assemblies on 5 cycle -55 °C and +80°C for 30 minutes each duration at temperature extremes.<br>MIL-STD-202, Method 107, Condition A   |
| 3.5.4.5                           | Resistance to Soldering Heat         | No Physical damage   | Subject connector mounted on printed circuit boards to solder bath at 260±5°C for 5±1 seconds (Flow soldering).<br>MIL-STD-202, Method 210, Condition C.   |
| 3.5.4.6                           | Durability (Repeated Mate /Unmating) | Termination resistance (low level) shall be met.   | Subject connector assembly to 50 cycles of repeated mating /unmating at a rate of 10 cycles a minute.  |
| 3.5.4.7                           | Salt Spray                           | 30m Ω Max. (Final)   | Exposing in a heat chamber at a temperature of 35°C ±2°C for 24 hours.<br>EIA-364-26A, CONDIION A.   |
| 3.4.5.8                           | Resistance to Wave Soldering Heat    | No physical damage shall occur.  | Solder Temp. : 240±5°C, 10±0.5sec.<br>Tyco spec. 109-202, Condition A  |
|                                   | Resistance to Wave Soldering Heat    | No physical damage shall occur.  | Solder Temp. : 265±5°C, 10±0.5sec.<br>Tyco spec. 109-202, Condition B  |
|                                   | Resistance to Wave Soldering Heat    | No physical damage shall occur.  | Solder Temp. : 260±5°C, 10±0.5sec.<br>Tyco spec. 109-202, Condition C  |
|                                   | Resistance to Reflow Soldering Heat  | No physical damage shall occur.  | Pre-soak condition, 85°C/85% RH for 168 hours.<br>Pre Heat: 150~180°C, 90±30sec.<br>Heat: 230°C Min., 30±10sec.<br>Peak Temp. : 245+0/-5°C, 10~30sec.<br>Duration: 3 cycles<br>Tyco spec. 109-201, Condition A |
|                                   | Resistance to Reflow Soldering Heat  | No physical damage shall occur.  | Pre-soak condition, 85°C/85% RH for 168 hours.<br>Pre Heat: 150~180°C, 90±30sec.<br>Heat: 230°C Min., 30±10sec.<br>Peak Temp. : 260+0/-5°C, 20~40sec.<br>Duration: 3 cycles<br>Tyco spec. 109-201, Condition B |

Figure 1

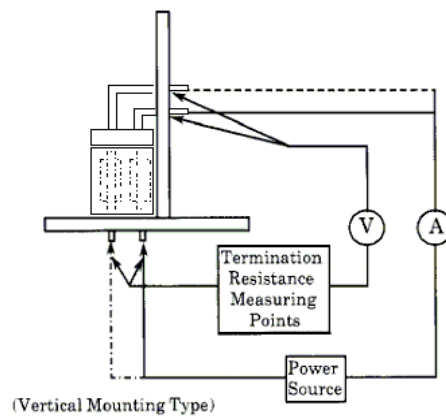
**3.6. PRODUCT QUALIFICATION AND REQUALIFICATION TEST**

| Para Ref | Test of Examination                | Test Group        |     |     |     |     |     |     |     |     |     |
|----------|------------------------------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|          |                                    | A                 | B   | C   | D   | E   | F   | G   | H   | I   | J   |
|          |                                    | Test Sequence (a) |     |     |     |     |     |     |     |     |     |
| 3.5.1    | Examination of Product             | 1,5               | 1,9 | 1,6 | 1,5 | 1,5 | 1,4 | 1,3 | 1,3 | 1,5 | 1,3 |
| 3.5.2.1  | Termination Resistance             | 2,4               | 8   |     | 2,4 | 2,4 |     |     |     | 2,4 |     |
| 3.5.2.2  | Insulation Resistance              |                   |     | 2,5 |     |     |     |     |     |     |     |
| 3.5.2.3  | Dielectric Withstanding Voltage    |                   |     | 3   |     |     |     |     |     |     |     |
| 3.5.3.1  | Individual Insert Force            |                   | 2,5 |     |     |     |     |     |     |     |     |
| 3.5.3.1  | Individual Extraction Force        |                   | 3,6 |     |     |     |     |     |     |     |     |
| 3.5.3.2  | Receptacle Contact Retention Force |                   |     |     |     |     |     | 2   |     |     |     |
| 3.5.3.3  | Post Retention Force               |                   |     |     |     |     |     |     | 2   |     |     |
| 3.5.3.4  | Solderability                      |                   |     |     |     |     | 2   |     |     |     |     |
| 3.5.4.1  | Vibration                          |                   |     |     |     |     |     |     |     | 3   |     |
| 3.5.4.2  | Temperature Life                   |                   |     |     |     | 3   |     |     |     |     |     |
| 3.5.4.3  | Humidity, Steady State             |                   |     | 4   |     |     |     |     |     |     |     |
| 3.5.4.4  | Thermal Shock                      | 3                 |     |     |     |     |     |     |     |     |     |
| 3.5.4.5  | Resistance to Soldering Heat       |                   |     |     |     |     | 3   |     |     |     |     |
| 3.5.4.6  | Durability                         |                   | 4,7 |     |     |     |     |     |     |     |     |
| 3.5.4.7  | Salt Spray                         |                   |     |     | 3   |     |     |     |     |     |     |
| 3.5.4.8  | Resistance to Soldering Heat       |                   |     |     |     |     |     |     |     |     | 2   |

**Figure 2**

- (a) Numbers indicate sequence in which tests are performed.
- (b) Discontinuities shall not be measured.

**3.7. FIGURE 3. CONTACT RESISTANCE & RESISTANCE TO FLOW SOLDER HEAT**



When the tests are performed, plating of the post contacts shall be corresponding to that of receptacle contact to be used for testing.

Fig.3-1 Termination Resistance Measuring Points.

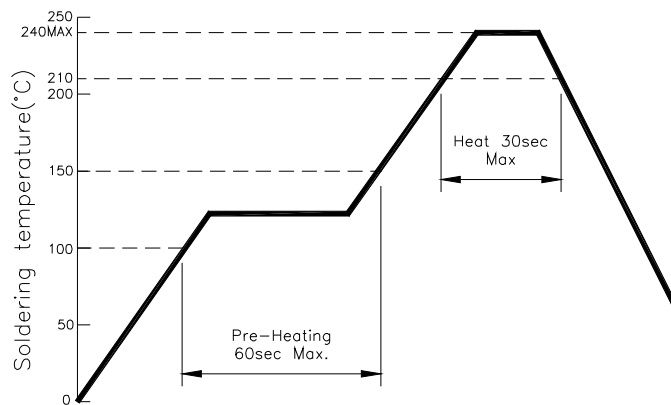


Fig.4-1 Temperature Profile of Reflow Soldering

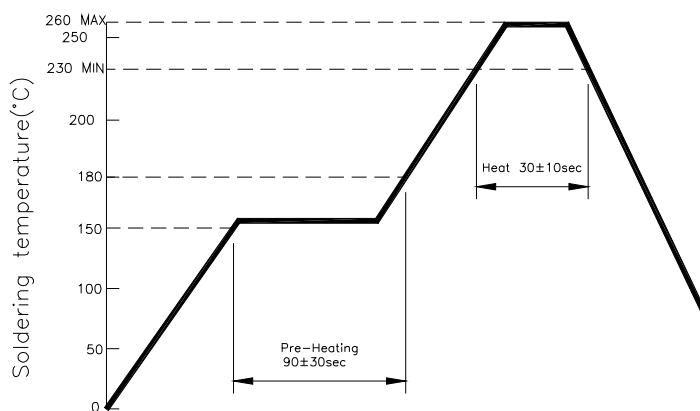


Fig.4-2 Temperature Profile of Reflow Soldering