1. SCOPE

1.1. Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of Free Height 0.8 mm Pitch, Board-to-Board Connector (SMT).

2. APPLICABLE DOCUMENTS

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 Electronics Documents

A. 109-5000 : AMP Test Specifications vs EIA and IEC Test Methods
B. 114-5254 : Application Specification
C. 501-5099 : Test Report
D. 411-5666-1 : Instruction Sheet

2.2. Commercial Standard

B. EIA 364 : Electrical Connector/Socket Test Procedures Including Environmental Classifications
3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

    A. Contact:
       Material: Receptacle Contact – Copper Alloy
       Plug Contact – Brass
       Finish: 0.0002 mm min, thick gold-plated on contact area only over nickel underplate all over.

    B. Housing:
       Thermo Plastic Molded Compound: LCP

3.3. Ratings

    A. Voltage: 100 VAC.
    B. Current Rating: 0.5 A allowable current to be applied.
    C. Temperature Rating: -40 °C to +125 °C.

3.4. Performance and Test Description

Product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Para 3.5. All tests shall be performed in the room temperature, unless otherwise specified.
### 3.5. Test Requirements and Procedures Summary

<table>
<thead>
<tr>
<th>Test Items</th>
<th>Requirements</th>
<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5.1 Confirmation of product</td>
<td>Product shall be conforming to the requirements of applicable product drawing and Application Specification.</td>
<td>Visually, dimensionally and functionally inspected per applicable quality inspection plan.</td>
</tr>
</tbody>
</table>

**Electrical Requirements**  
(TR = Termination Resistance)

| 3.5.2 Termination Resistance (Low Level) | 30 mΩ max. (Initial)  
ΔTR = 20 mΩ max. (Final) | Subject mated contacts assembled in housing to closed circuit current of 10mA max. at open circuit voltage of 20 mV max.. See Fig. 1a.  
Spec. 109-5311-1, Fig. 1 |
| 3.5.3 Dielectric Strength | Neither creeping discharge nor flashover shall occur.  
Current leakage: 5 mA max. | 500 VAC for 1 minute.  
Test between adjacent circuits of mated/unmated connectors.  
Spec. 109-5301 |
| 3.5.4 Insulation Resistance. | 500 MΩ (Initial)  
500 MΩ (Final) | Impressed Voltage 500 VDC.  
Test between adjacent circuits of unmated connectors.  
Spec. 109-5302 |

**Physical Requirements**

| 3.5.5 Vibration (Frequency) | No electrical discontinuity greater than 0.1 micro-sec shall occur. | Subject mated connectors to 10-55-10 Hz transverses in 1 minute at 1.52 mm amplitude with 100mA applied.  
Duration: 2 hours each for 3 mutually perpendicular planes.  
Spec. 109-5201 |
| 3.5.6 Physical Shock | No electrical discontinuity greater than 0.1 micro-sec shall occur. | Accelerated Velocity: 50G  
Waveform: Saw tooth shock pulse  
Duration: 11 m sec  
Velocity Change: 11.3 m/s  
Number of Drops: 18 Drops  
Spec. 109-5208 |
## 3.5.7 Connector Mating Force
- **0.9 N (90 gf) max. per contact**
- **Operation Speed:** 100 mm/min. Measure the force required to mate connectors.
- **Spec. 109-5206.**

## 3.5.8 Connector Unmating Force
- **0.1 N (10 gf) min. per contact**
- **Operation Speed:** 100 mm/min. Measure the force required to unmate connectors.
- **Spec. 109-5206**

## 3.5.9 Durability (Repeated Mating / Un-mating)
- **ΔTR = 20 mΩ max. (Final)**
- **Operation Speed:** 100 mm/min
- **No. of cycles:** 100 cycles
- **Spec. 109-5213**

## 3.5.10 Solderability
- **Wet Solder Coverage:** 95 % min.
- **For leaded:**
  - Solder Temp: 230 ± 2°C
  - Immersion Duration: 3 +/- 0.5 secs
  - Flux: Alpha 100
- **For lead-free :**
  - Solder Temp.: 250 ± 2°C
  - Immersion Duration: 3 +/- 0.5 secs
  - Flux: Sparkle ES-1020
- **Spec. 109-5203**

### Environmental Requirements

## 3.5.11 Resistance to Reflow Soldering Heat and Solderability (SMT Type)
- **Housing shall be free from deformation and fusion, and soldered area shall form miasmal fillets.**
- **Test Connector on PC Board.**
- **For leaded:**
  - Pre-Heat: 100~150°C; 60 sec min.
  - Heat: 210°C MIN; 30 sec max
  - Peak Temperature: 240°C max
- **For lead-free:**
  - Pre-Heat: 150~200°C; 60 sec min.
  - Heat: 217°C MIN; 60 sec min.
  - Peak Temperature: 260°C max.
- **Spec. 109-201, Cond. B.**
<table>
<thead>
<tr>
<th>Section</th>
<th>Test Type</th>
<th>Specification</th>
<th>Notes</th>
</tr>
</thead>
</table>
| 3.5.12  | Thermal Shock                 | $\Delta TR = 20 \, \text{m\Omega} \, \text{max. (Final)}$ | -40°C / 30 min.; +125°C / 30 min.  
Making this a cycle, repeat 5 cycles.  
Spec. 109-5103 |
| 3.5.13  | Humidity-temperature cycling. | Insulation Resistance = 100 MΩ min.  
$\Delta TR = 20 \, \text{m\Omega} \, \text{max. (Final)}$ | Mated connector.  
Temp: 25–65°C,  
R.H.: 90–95%  
No. of cycles: 10  
Vibration (low frequency) eliminated.  
Spec. 109-5106 |
| 3.5.14  | Salt Spray                    | $\Delta TR = 20 \, \text{m\Omega} \, \text{max. (Final)}$ | Subject mated connectors to 5% salt concentration.  
Duration: 24 hrs.  
Spec. 109-5101  
| 3.5.15  | Industrial Gas (SO₂)          | $\Delta TR = 20 \, \text{m\Omega} \, \text{max. (Final)}$ | SO₂ Gas: 10 ppm.  
R.H.: 90–95 %  
Temp: Room Temperature  
Duration: 24 hrs  
Spec. 109-5107 |
| 3.5.16  | Temperature Life (Heat Aging) | $\Delta TR = 20 \, \text{m\Omega} \, \text{max. (Final)}$ | Temp.: +125°C,  
Duration: 4 days  
Spec. 109-5104 |

Notes:  
TR = Termination Resistance
3.6. Product Qualification Test Sequence

<table>
<thead>
<tr>
<th>Test Items</th>
<th>Test Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Confirmation of product</td>
<td>1,9</td>
</tr>
<tr>
<td>Termination Resistance (Low Level)</td>
<td>2,6</td>
</tr>
<tr>
<td>Dielectric Strength</td>
<td>4,8</td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>3,7</td>
</tr>
<tr>
<td>Vibration (Frequency)</td>
<td></td>
</tr>
<tr>
<td>Physical Shock</td>
<td></td>
</tr>
<tr>
<td>Connector Mating Force</td>
<td>3,6</td>
</tr>
<tr>
<td>Connector Un-mating Force</td>
<td>4,7</td>
</tr>
<tr>
<td>Durability (Repeated Mate/Unmated)</td>
<td>5</td>
</tr>
<tr>
<td>Reflow Soldering Heat (SMT Type; leaded)</td>
<td>3</td>
</tr>
<tr>
<td>Thermal Shock</td>
<td></td>
</tr>
<tr>
<td>Humidity-temperature cycling</td>
<td>5</td>
</tr>
<tr>
<td>Salt Spray</td>
<td>3</td>
</tr>
<tr>
<td>Industrial Gas (SO₂)</td>
<td></td>
</tr>
<tr>
<td>Temperature Life (Heat Aging)</td>
<td></td>
</tr>
<tr>
<td>Solderability</td>
<td></td>
</tr>
<tr>
<td>Reflow Soldering Heat (Lead-Free)</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
(a) Discontinuities shall not take place in this test group, during tests.
Fig. 1a (V-V Type)