

## **Free Height 0.8 mm Pitch Board-to-Board Connector (SMT)**

### **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. 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

- A. MIL-STD-202 : Military Specification on Test Methods for Electronic & Electric Parts
- B. EIA 364 : Electrical Connector/Socket Test Procedures Including Environmental Classifications

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### 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 under-plate 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

Sn	Test Items	Requirements	Procedures
3.5.1	Confirmation of product	Product shall be conforming to the requirements of applicable product drawing and Application Specification.	Visually, dimensionally and functionally inspected per applicable quality inspection plan.
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 Figure 1.  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	<p>Operation Speed: 100 mm/min. Measure the force required to mate connectors.</p> <p>Spec. 109-5206.</p>
3.5.8	Connector Unmating Force	0.1 N (10 gf) min. per contact	<p>Operation Speed: 100 mm/min. Measure the force required to mate connectors.</p> <p>Spec. 109-5206</p>
3.5.9	Durability (Repeated Mating / Un-mating)	$\Delta TR = 20 \text{ m}\Omega$ max. (Final)	<p>Operation Speed: 100 mm/min No. of cycles: 100 cycles</p> <p>Spec. 109-5213</p>
3.5.10	Solderability	Wet Solder Coverage: 95 % min.	<p>For leaded: Solder Temp: <math>230 \pm 2^{\circ}\text{C}</math> Immersion Duration: <math>3+/-0.5</math> secs Flux : Alpha 100</p> <p>For lead-free : Solder Temp.: <math>250 \pm 2^{\circ}\text{C}</math> Immersion Duration: <math>3+/-0.5</math> secs Flux: Sparkle ES-1020</p> <p>Spec. 109-5203</p>
Environmental Requirements			
3.5.11	Resistance to Reflow Soldering Heat (SMT Type)	Housing shall be free from deformation and fusion.	<p>Test Connector on PC Board.</p> <p>For leaded: Pre-Heat: <math>100\sim 150^{\circ}\text{C}</math>; 60 sec min. Heat: <math>210^{\circ}\text{C}</math> MIN; 30 sec max Peak Temperature: <math>240^{\circ}\text{C}</math> max</p> <p>For lead-free: Pre-Heat: <math>150\sim 200^{\circ}\text{C}</math>; 60 sec min. Heat: <math>217^{\circ}\text{C}</math> MIN; 60 sec min. Peak Temperature: <math>260^{\circ}\text{C}</math> max.</p> <p>Spec. TEC-109-201, Cond. B.</p>

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 M $\Omega$ 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 MIL-STD-202, Method 101.
3.5.15	Industrial Gas (SO <sub>2</sub> )	$\Delta TR = 20 \text{ m}\Omega \text{ max. (Final)}$	SO <sub>2</sub> 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

Test Items	Test Group										
	1	2	3	4	5	6	7	8	9	10	11
	Test Sequence (a)										
Confirmation of product	1,9	1,9	1,5	1,5	1,5	1,5	1,5	1,5	1,3	1,3	1,3
Termination Resistance (Low Level)	2,6	2,8	2,4	2,4	2,4	2,4	2,4	2,4			
Dielectric Strength	4,8										
Insulation Resistance	3,7										
Vibration (Frequency)			3								
Physical Shock				3							
Connector Mating Force		3,6									
Connector Un-mating Force		4,7									
Durability (Repeated Mate/Unmated)		5									
Reflow Soldering Heat (SMT Type; leaded)									2		
Thermal Shock					3						
Humidity-temperature cycling	5										
Salt Spray						3					
Industrial Gas (SO <sub>2</sub> )							3				
Temperature Life (Heat Aging)								3			
Solderability										2	
Reflow Soldering Heat (SMT Type; Lead-Free)											2

Notes:

(a) Discontinuities shall not take place in this test group, during tests.

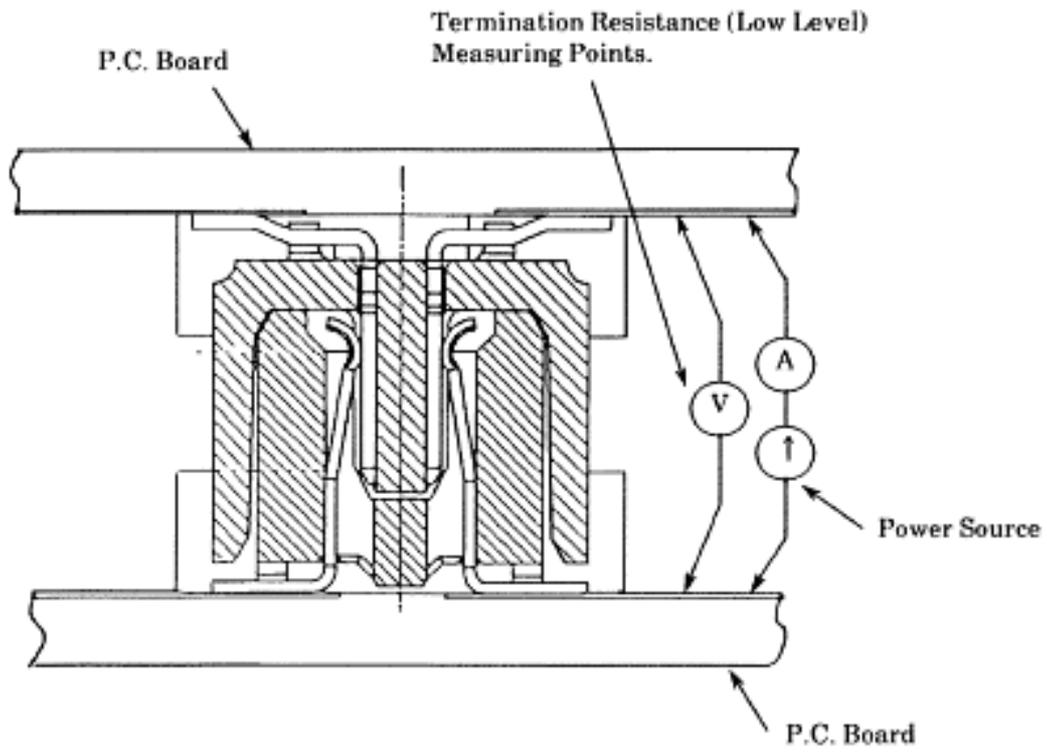


Figure 1