

# Product Specification

## 108-60038

### CHAMP .050(I) Board-to-Board Connector

#### Lead Free Version

1. Scope:
- 1.1 Contents:

This specification covers the requirements for product performance, test methods and quality assurance provisions of CHAMP .050 (I) Board-to-Board Connector.

The applicable product description and part numbers are as shown in Fig. 1:

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 this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements this specification and referenced documents, this specification shall take precedence.

- 2.1 AMP Specifications:

- A. 109-5000: Test Specification, General Requirements for Test Methods
- B. 501-60009: Test Report (Dip Type)

- 2.2 Military Standard and Specifications:

MIL-STD-202 Test Methods for Electronic and Electrical Component Parts

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					PAGE 1 of 7	TITLE CHAMP .050 (I) Board-to-Board connector				
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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: Phosphor Bronze  
1. 3  $\mu\text{m}$  minimum thick nickel underplate  
0.2  $\mu\text{m}$ , 0.5  $\mu\text{m}$  and 0.76  $\mu\text{m}$  minimum thick gold-plated on contact area only.  
1.0  $\mu\text{m}$  minimum thick solder-plated on tine area only.

B. Housing and Tine Plate: Molded Thermoplastic

C. Accessories and Hardware:

- Retention Leg: Brass  
1  $\mu\text{m}$  minimum thick nickel underplate  
2  $\mu\text{m}$  minimum thick solder-plated

3.3 Ratings:

- A. Voltage Rating: 250 VAC  
B. Current Rating: 1 A  
C. Temperature Rating: -55°C~85°C

3.4 Performance and Test Descriptions:

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig. 1. All tests shall be performed in the room temperature unless otherwise specified.

### 3.5 Test Requirements and Procedures Summary

Pare.	Test Items	Requirements	Procedures
3.5.1	Confirmation of Product	Product shall be conforming to the requirements of a applicable product drawing,	Visually, dimensionally and functionally inspected per applicable inspections plan.
<b>Electrical Requirements</b>			
3.5.2	Termination Resistance (Low Level)	35 mΩ max.(Initial) ΔR=20 mΩ max.(Final)	Subject mated contacts assembled in housing to closed circuit of 50 mA max. at open circuit voltage of 50 mV max. Fig.3.  AMP Spec. 109-5306
3.5.3	Insulation Resistance	1,000 MΩ MIN. (Initial) 100 MΩ Min. (Final)	Measure by applying test potential between the adjacent contacts, and between the contacts and ground in the mated connector.  MIL-STD-202, Method 302,Condition B
3.5.4	Dielectric Strength	Connector must withstand test potential of 0.5 KVAC for 1 minute. Current leakage must be 0.5mA max.	Measure by applying test potential between the adjacent contacts, and between the contacts and ground in the mated connectors.  MIL-STD-202, Method 301
3.5.5	Temperature Rising vs. Curent	30°C max. under loaded specified current.	Measure temperature rising by energized current.  Fig.3.  AMP Spec.109-5310

Para.	Test Items	Requirements	Procedures
Physical Requirements			
3.5.6	Vibration Sinusoidal Low Frequency	No electrical discontinuity greater than 1 microsecond (s) shall occur.	Subject mated connectors to 10-55-10 Hz traversed in 1 minute at 1.52 mm amplitude 2 hours each of 3 mutually perpendicular planes. MIL-STD-202, Method 201
3.5.7	Physical Shock	No electrical discontinuity greater than 1 microsecond (s) shall occur.	Subject mated connectors to 50 G's halfsine shock pulses of 11 millisecond duration:3 shocks in each direction applied along the 3 mutually perpendicular planes totally 18shocks;MIL-STD-202,Method 213,Condition A
3.5.8	Connector Mating Force	90 g max. per contact	Using autograph, measure the force required to mate connector using locking latch by operating at 100 mm a minute. Calculate the value for a contact. AMP Spec. 109-5206
3.5.9	Connector Unmating Force	15 g min. per contact	Using autograph, measure the force required to unmate connector without locking latch set in effect, by operating at 100 mm a minute. Calculate value for a contact. AMP Spec. 109-5206
3.5.10	Durability (Repeated Mate/Unmating)	The requirements per Para.3.5.2 shall be met.	Mate and unmate connectors for 500 cycles at a maximum rate of 40 cycles minute. AMP Spec. 109-27
3.5.11	Solderability	Solderable area shall have a solder coverage of 95% minimum.	With the connector mounted on PCB. immerse in melted soldering tub so that the lower surface of PCB get wetted in the temperature of 230°C±5°C PCB for 5 seconds.

Fig.1 (To be continued)

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Para.	Test items	Requirements	Procedures
3.5.12	Resistance to Soldering Heat  (Dip Type)	No physical damage shall occur.	Subject connector mounted on printed circuit boards to solder bath at $260\pm 5^{\circ}\text{C}$ for 5 seconds.  MIL-STD-202, Method 210 except as indicated above
3.5.13	Thermal Shock	The requirements per Para. 3.5.2 shall be met.	Subject mated connectors to 5 cycles between $-55 +0/-3^{\circ}\text{C}$ and $+85 +3/-0^{\circ}\text{C}$ . MIL-STD-202, Method 107, Condition A
3.5.14	Humidity-Temperature Cycling	The requirements per Paras. 3.5.2, 3.5.3, and 3.5.4 shall be met.	Subject mated connectors to 10 cycles of humidity-temperature changes between $25^{\circ}\text{C}$ and $65^{\circ}\text{C}$ at 95% R.H.
3.5.15	Salt Spay	The requirements per Para. 3.5.2 shall be met.	Subject mated connectors to 5% salt concentration for 48 hours;  MIL-STD-202, Method 101  Condition B.
3.5.16	Temperature Life	The requirements per Para. 3.5.2 shall be met.	Subject mated connectors to temperature life; $85^{\circ}\text{C}\pm 2^{\circ}\text{C}$ , 250 hours  MIL-STD-202, Method 108  Condition B.
3.5.17	Sulfurous acid gas	The requirements per Para. 3.5.2 shall be met.	Subject mated connectors to sulfurous acid gas of $10\pm 3\text{ppm}$ concentration in the room temperature with 90% min. R.H. for 48 hours.

Fig.1 (End)

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3.6 Product Qualification and Requalification Tests.

Test of Examination	Test Groups (a)											
	1	2	3	4	5	6	7	8	9	10	11	
	Test Sequence (b)											
Examination of Product	1,7	1,5	1,5	1,5	1,5	1,5	1,6	1	1	1	1	
Termination Resistance, Dry Circuit	2,6	2,4	2,4	2,4	2,4	2,4	2,5					
Dielectric Withstanding Voltage								2,5	3	3	3	
Insulation Resistance								3,6				
Temperature Rise vs Current									2			
Vibration							3					
Physical Shock							4					
Mating Force	3											
Unmating Force	4											
Durability	5											
Solderability								4			2	
Resistance to Soldering Heat										2		
Thermal Shock			3									
Humidity-Temperature Cycling		3										
Corrosin, Salt Spray						3						
Temperature Life				3								
Sulfurous acid gas					3							
Number of Samples	5	3	3	3	3	3	3	3	3	3	10	

(a) Numbers indicate sequence in which tests are performed.

Fig.2

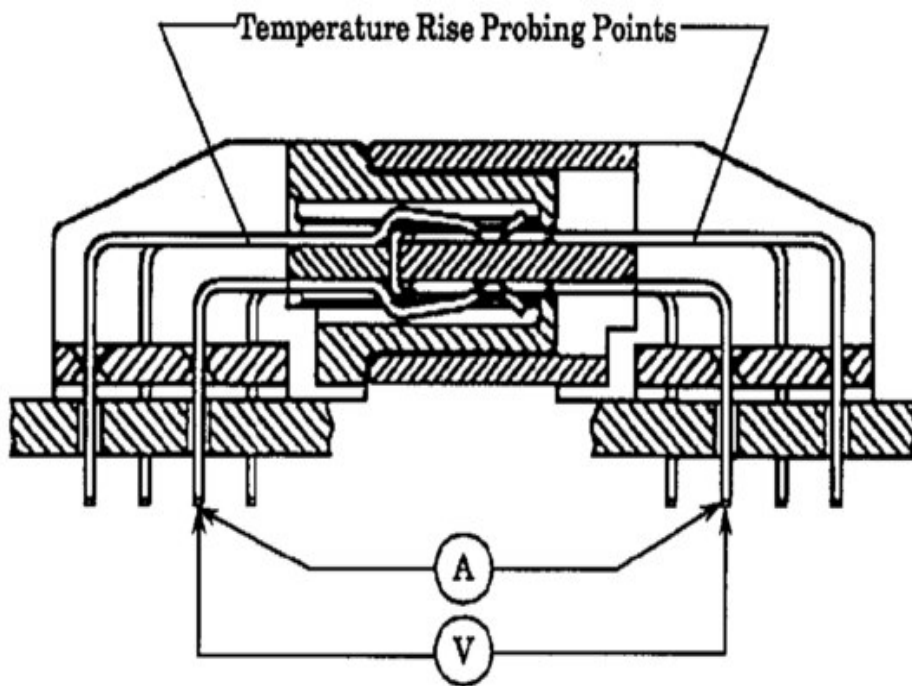


Fig. 4

Product Part No.	Description
X-5175610-X	Plug Connector, Horizontal Type, W/O Retention Leg.
X-5175472-X	Plug Connector, Horizontal Type, with Retention Leg.
X-5175611-X	Plug Connector, Vertical Type, W/O Retention Leg.
X-5175473-X	Plug Connector, Vertical Type, with Retention Leg.
X-5175612-X	Receptacle Connector, Horizontal Type, W/O Retention Leg.
X-5175474-X	Receptacle Connector, Horizontal Type, with Retention Leg.
X-5175613-X	Receptacle Connector, Vertical Type, W/O Retention Leg.
X-5175475-X	Receptacle Connector, Vertical Type, with Retention Leg.

NOTE: Prefix and suffix numbers vary depending on the variations of the number of contacts and plating designation.

Appendix 1