

108-5407

NUMBER:

Customer Release

SECURITY CLASSIFICATION:

## Product Specification

108-5407

### AMP M64 Card Edge Connector

1. Scope :

1.1 Contents :

This specification covers the requirements for product performance, test methods and quality assurance provisions of AMP M64 Card Edge Connector, Thru-Hole Type, Gold-plated Version. The applicable product descriptions and part number are as shown in Appendix 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 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 AMP Specifications :

- A. 109-1 Test Specification, General Requirements for Test Methods.
- B. 501-5109 Test Report


2.2 Military Standard and specifications :

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

3. Requirements :

3.1 Design and Construction :

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

					DR.	28 Jun. '93	SHEET 1 OF 9	 AMP (Japan), Ltd. Kawasaki, Japan		
					I. Enomoto					
					CHK.	28 Jun. '93		LOC	LOC	NO.
	C	Revised FJ00-4397-96	J-T	J-2	18.7.94	Y. Yoshimura	J	A	108-5407	C
	B	Revised FJ00-0972-94	I.E	Y.Y	18.7.94					
	A	Revised FJ00-0068-94	I.E	Y.Y	3.2.94	APP.	28 Jun. '93	NAME		
	0	RELEASED	I.E	Y.Y	28.7.93	Y. Yoshimura	AMP M64 Card Edge Connector			
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**3.2 Materials :**

**A. Contact :**

Copper Alloy, 0.3  $\mu\text{m}$  minimum thick gold-plated on contact area only over nickel underplate all over, 1  $\mu\text{m}$  minimum thick tin-lead plated on soldering area only.

**B. Housing :**

Molded Thermoplastic Resin.

**3.3 Ratings :**

A. Voltage Rating : 100 VAC

B. Current Rating : 1 A

C. Temperature Rating :  $-55^{\circ}\text{C}$  to  $105^{\circ}\text{C}$

Temperature rising due to energized current load is inclusive.

**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 are performed at ambient temperature unless otherwise specified.

**3.5 Test Requirements and Procedures Summary :**

Para.	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 inspection plan.
3.5.2	Termination Resistance (Low Level)	30 m $\Omega$ Max. (Initial)/Pos. $\Delta R = 20 \text{ m}\Omega$ Max. (Final)/Pos.	Measure by applying closed circuit current of 50 mA Max. at open circuit voltage of 100 mV Max. to the mated contact test circuit housing. Fig. 2. AMP Spec. 109-5306

Fig. 1 (to be continued)

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SECURITY CLASSIFICATION: Customer Release NUMBER: 108-5407	Para.	Test Items	Requirements	Procedures	
	3.5.3	Dielectric Strength	Connector must withstand test potential of 1 kVAC for 1 minute.	Measure at 10 probing points, by applying test potential between the adjacent contacts in the unmated connector MIL-STD-202, Method 301	
	3.5.4	Insulation Resistance	1000 M $\Omega$ Min. (Initial)	Measure at 10 probing points by applying test potential between the adjacent contacts in the unmated connector MIL-STD-202, Method 302 Condition B	
	3.5.5	Capacitance	1 pF max.	Test between the adjacent circuits of unmated connector by probing at 10 points, by using 1 MHz. MIL-STD-202, Method 305	
	Physical Performance				
	3.5.6	Vibration Sinusoidal Low Frequency	No electrical discontinuity greater than 0.1 microsecond (s) shall occur.	Using a connector mated with weighted test PCB, subject connector assembly to 10-55-10 Hz traversed in 1 minute at 1.52 mm (.050) total excursion 2 hours in each of 3 mutually perpendicular planes. MIL-STD-202, Method 201	
	3.5.7	Physical Shock	No electrical discontinuity greater than 0.1 microsecond (s) shall occur.	Using a connector mated with weighted test PCB, subject board, connector assembly to 50G's sawtooth wave in 11 milliseconds, 3 shocks in each direction applied along the 3 mutually perpendicular planes, totally 18 shocks. MIL-STD-202, Method 213 Condition A	

Fig. 1 (to be continued)

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SECURITY CLASSIFICATION: Customer Release NUMBER: 108-5407	Para.	Test Items	Requirements	Procedures
	3.5.8	PCB Insertion Force	0.78 N (80 gf) Max. per contact, initial	Using test PCB of $1.27 \pm 0.01$ mm thickness, measure the force required to mate PCB with connector. (In this test, the force required to turn PCB before it engages on locking, is excluded.) Obtain the value per contact by calculation.
	3.5.9	Contact Retention Force	Contact shall not dislodge a distance greater than 4.9 N (500 gf)	Apply an axial load to pull off the contact upward. AMP Spec. 109-30
	3.5.10	Durability (Repeated Mate / Unmating)	Termination Resistance (Low Level) (Final) $\Delta R = 20 \text{ m}\Omega \text{ max./Pos.}$ No physical damage shall be evident.	Repeat mating and unmating of the connector for 25 cycles by using the PCB test board having thickness of $1.27 \pm 0.02$ mm without locking device set in effect.
	3.5.11	Solderability	Soldering area of the contact shall have solder coverage of 95% minimum.	Subject contacts to solderability testing, by immersing the contact tynes into melted solder at $230 \pm 5$ °C for $5 \pm 0.5$ seconds. MIL-STD-202, Method 208
	3.5.12	Resistance to Soldering Heat	No physical damage .	Subject product mounted on PCB to solder bath at $260 \text{ }^\circ\text{C} \pm 5$ °C for $10 \pm 1$ seconds or at $350 \text{ }^\circ\text{C} \pm 10$ °C for $3^{+0.5}_{-0}$ seconds. MIL-STD-202, Method 210 Conditions A and B.
3.5.13	Thermal Shock	Termination Resistance : $\Delta R = 20 \text{ m}\Omega \text{ Max. (Final)/Pos.}$	Subject connector mated with PCB test board to 10 cycles of temperature changes between $-55$ °C and $105$ °C holding for 30 minutes at each temperature extreme.	

Fig. 1 (to be continued)

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Para.	Test Items	Requirements	Procedures
3.5.14	Humidity-Temperature Cycling	Insulation Resistance (Final) 1,000 M $\Omega$ min. Termination Resistance (Low Level) (Final) $\Delta R = 20 \text{ m}\Omega \text{ max./Pos.}$	Subject connector mated with PCB test board, to 10 cycles of temperature changes between 25 °C and 65 °C with 95% R.H. followed by exposure under -10 °C for cold shock test. MIL-STD-202, Method 106
3.5.15	Salt Spray	Termination Resistance (Low Level) (Final) $\Delta R = 20 \text{ m}\Omega \text{ max./Pos.}$ Must meet visual & electrical requirements, where applicable.	Subject connector mated with PCB test board (1) to salt spray of 5% concentration for 48 hours. MIL-STD-202, Method 101 Condition B
3.5.16	Temperature Life	Termination Resistance (Low Level) (Final) $\Delta R = 20 \text{ m}\Omega \text{ max./Pos.}$	Subject connector mated with PCB test board (1) to elevated temperature at 105 °C for 160 hours.
3.5.17	Hydrogen Sulfide Gas Exposure	Termination Resistance (Low Level) (Final) $\Delta R = 20 \text{ m}\Omega \text{ max. (Final)/Pos.}$	Subject connector mated with PCB test board (1) to the test atmosphere in chamber as specified in Fig. 3 for 96 hours.

Fig. 1 (End)

## (1) PCB Test Board :

The PCB test board used for this testing shall be of G-10 type, conductors clad on both sides, having thickness of  $1.27 \pm 0.1 \text{ mm}$  with the appropriate length for testing connectors. The surfaces of the PCB conductors to make contact with the connector contacts shall be finished as follows :  $0.76 \mu\text{m}$  minimum thick gold-plated over  $1.27 \mu\text{m}$  minimum thick nickel underplate.

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## 3.6 Product Qualification and Requalification Tests.

(These Sequences shall be used for Separable Connectors)

Test or Examination	Test Group								
	1	2	3	4	5	6	7	8	9
	Test Sequence								
Examination of Product	1, 7	1, 5	1, 8	1, 3	1, 5	1, 6	1, 7	1, 3	1, 5
Termination Resistance, Dry Circuit	2, 6	2, 4				3, 5	3, 6		2, 4
Dielectric Withstanding Voltage			3, 7						
Insulation Resistance			2, 6						
Capacitance					2				
Vibration	4								
Physical Shock	5								
Contact Retention					3				
Durability	3					2	2		
PCB Insertion Force								2	
Resistance to Soldering Heat				2					
Solderability					4				
Thermal Shock (per Product Spec)			4				4		
Resistance to Hydrogen Sulfide Gas						4			
Humidity-Temperature Cycling			5				5		
Corrosion, Salt Spray									3
Temperature Life		3							
Number of Samples	3 Sets	2 Sets	2 Sets	2 Sets	2 Sets	2 Sets	2 Sets	3 Sets	2 Sets

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

Fig. 4

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4. QUALITY ASSURANCE PROVISIONS

4.1 Test Specimens :

4.1.1 The test specimens to be employed for the tests, shall be conforming to the applicable product drawing (s).

4.1.2 No sample shall be reused, unless otherwise specified.

4.2 Test Conditions :

All the tests shall be performed under and combination of the following test conditions.

Temperature : 15-35 °C

Relative Humidity : 45-75 %

Atmospheric Pressure : 650-800 mmHg

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 4.

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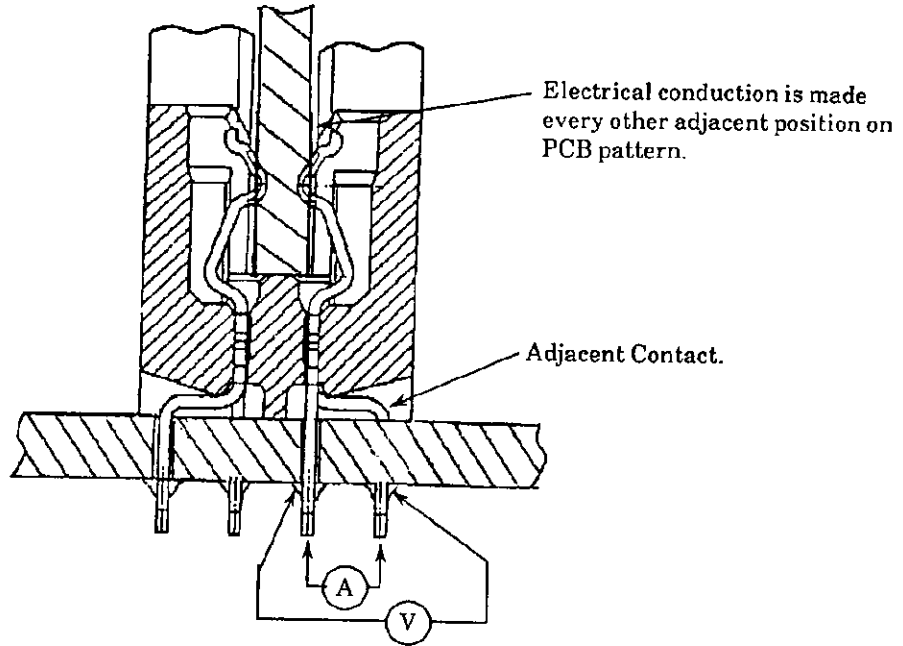
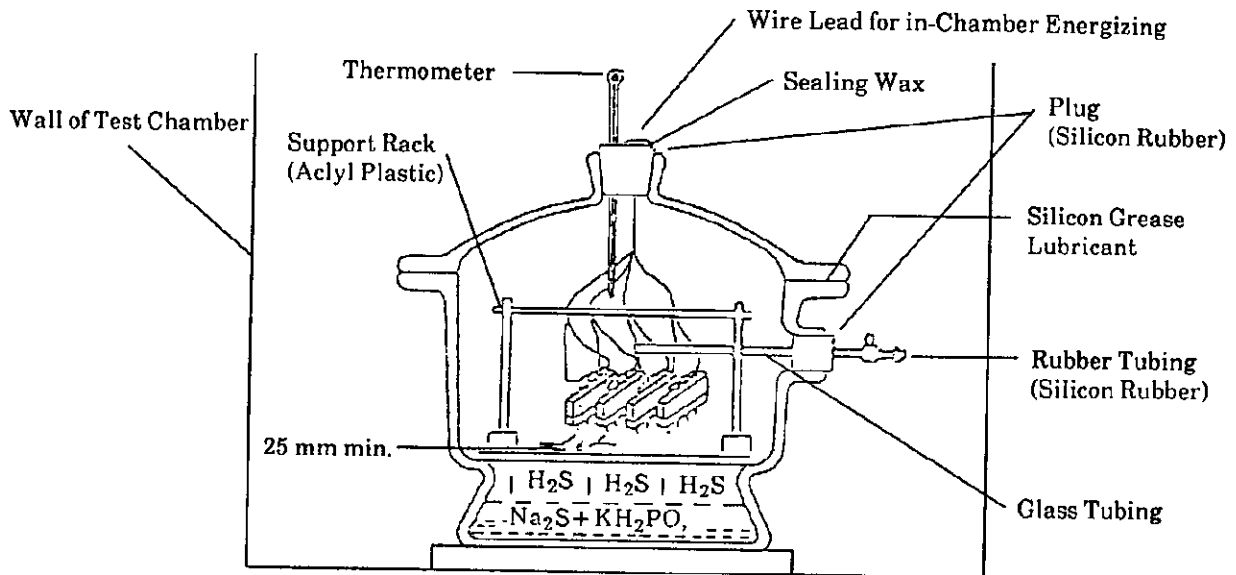


Fig. 2 Termination Resistance Measuring Circuit Diagram



Temperature :  $40 \pm 2^\circ C$   
 $H_2S$  Gas Concentration : 3 ppm  
 Relative Humidity : 90~95 %

Fig. 3 Hydrogen Sulfided Gas Test Apparatus

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The applicable product descriptions and part numbers are as shown in Appendix 1.

Product Part No.	Descriptions
X-179150-X	Vertical Type Connector, 168 Position
X-179711-X	Vertical Type with Ejector Conn. 168 Pos.
X-353006-X	Vertical Type with Double Ejector Conn. 168 Pos.
X-179508-X	Low-Profile with Ejector Conn. 168 Pos.

Appendix 1

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