

PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for the AMP* Trio-Mate flat flexible discrete circuit, .100 centerline connector. This connector provides a connection for FFC or conductive ink circuitry. The connector can accommodate a cable thickness range between .005 inch and .015 inch in the contact area with circuitry on .100 inch centerlines. Two to 22 position connectors are available for mounting vertically on .062 inch and .093 inch boards. Another version is available for horizontal mounting on .062 inch boards.

1.2. Qualification

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

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: General Requirements for Test Specifications
- B. 109 Series: Test Specifications as indicated in Figure 1. (Comply with MIL-STD-202, MIL-STD-1344 and EIA RS-364)
- C. 114-2062: Connector, Trio-Mate, Flat Flexible Discrete Circuit, .100 Centerline, Application of

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C	Revise per ECN AZ-589	<i>PR</i>	<i>4/30/85</i>	APP Jim Pritulsky 6/21/82		LOC B	NO 108-2038	REV C
B	Revise per ECN AZ-513	<i>PR</i>	<i>4/3/85</i>	SHEET 1 OF 6		TITLE CONNECTOR, TRIO-MATE, FLAT FLEXIBLE DISCRETE CIRCUIT, .100 CENTERLINE		
LTR	REVISION RECORD	APP	DATE					

3. REQUIREMENTS

3.1. Design and Construction

Connectors shall be of the design, construction and physical dimensions specified on the applicable product drawings.

3.2. Materials

- A. Contact: Phosphor bronze, pre-tin
- B. Housing: Polyester, glass filled, 94V-0

3.3. Ratings

- A. Current/Voltage: 250 vac at 1 ampere maximum
- B. Operating Temperature:
 - (1) -55° to 105°C for tin plated circuitry.
 - (2) -55° to 85°C for conductive ink.

3.4. Performance and Test Description

Connectors shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of Product	Meets requirements of product drawing and AMP Spec 114-2062.	Visual, dimensional and functional per applicable inspection plan.
ELECTRICAL		
Termination Resistance, Dry Circuit (low level) (b)	15 milliohms maximum initial; $\Delta R = 3$ milliohms maximum for tin plated copper circuits.	Subject mated connector and test cable to 50 mv open circuit at 100 ma maximum, see Figure 3; AMP Spec 109-6-1.
Dielectric Withstanding Voltage	1.4 kvac dielectric withstanding voltage, one minute hold.	Test between adjacent contacts of unmated and un-mounted connector assembly; AMP Spec 109-29-1.

Figure 1 (cont)

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Test Description	Requirement	Procedure
Insulation Resistance	5000 megohms minimum.	Test between adjacent contacts of unmated and unmounted assembly; AMP Spec 109-28-4.
Capacitance	1.0 picofarads maximum.	Test between adjacent circuits of unmated and unmounted assembly; AMP Spec 109-47, cond C.
MECHANICAL		
Vibration (a)	No discontinuities greater than 1.0 microsecond; termination resistance, dry circuit.	Subject mated connector with test cable to 10-55-10 Hz traversed in 1 minute at .06 inches total excursion; 2 hours in each of 3 mutually perpendicular planes, 100 ma current applied; AMP Spec 109-21-1.
Physical Shock (a)	No discontinuities greater than 1.0 microseconds.	Subject mated connector with test cable to 100 G's sawtooth in 6 milliseconds; 1 shock in each direction applied along the 3 mutually perpendicular planes total 6 shocks; AMP Spec 109-26-9.
Contact Retention	250 grams minimum; no damage or loosening of contacts.	Apply axial load of 250 grams to contacts; AMP Spec 109-30.
Durability	Termination resistance, dry circuit after 1,5,10, 20 and 25 insertions.	Mate and unmate assemblies for 25 cycles by hand; AMP Spec 109-27.
Solderability	Contact tabs shall have a solder coverage of 95% minimum.	AMP Spec 109-11-1.

Figure 1 (cont)

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Test Description	Requirement	Procedure
Resistance to Soldering Heat	No physical damage.	Immerse connector mounted on glass epoxy wiring board in solder bath at $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 10 seconds at a rate of $1 \pm .25$ inches/second; AMP Spec 109-63-3.
ENVIRONMENTAL		
Thermal Shock (a)	Termination resistance, dry circuit.	Subject mated connectors with test cable to 25 cycles between -55° and 105°C for tin plated circuitry and -55° to 85°C for conductive ink circuitry; AMP Spec 109-22.
Temperature-Humidity Cycling	Termination resistance, dry circuit; insulation resistance; dielectric withstanding voltage.	Subject mated connectors with test cable and unmated connectors to 10 temperature-humidity cycles between 25° and 65°C at 95% RH; AMP Spec 109-23, method III, cond B, less step 7a.
Corrosion, Industrial Gas	Termination resistance, dry circuit.	Subject mated connector with test cable to 96 hours of 200 ppb each of nitrogen dioxide, sulfur dioxide and hydrogen sulfide.

- (a) Shall remain mated and show no evidence of damage, cracking or chipping.
(b) Due to circuit composition variables and the inclusion of some cable bulk in termination resistance measurement technique, conductive ink circuits may exceed the termination resistance values listed above. Contact AMP Engineering for information regarding conductive ink circuits.

Figure 1 (end)

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3.6. Connector Tests and Sequences

Test or Examination	Test Group (a)								
	1	2	3	4	5	6	7	8	9
	Test Sequence (b)								
Examination of Product	1	1	1	1	1	1	1	1	1
Termination Resistance, Dry Circuit (c)			2,4	2,4	2,4	2,4	2,4		
Dielectric Withstanding Voltage		4,7							
Insulation Resistance		3,6							
Capacitance		2							
Vibration			3						
Physical Shock			5						
Contact Retention	2								
Durability				3					
Solderability								2	
Resistance to Soldering Heat									2
Thermal Shock					3				
Temperature-Humidity Cycling		5				3			
Corrosion, Industrial Gas							3		

(a) See Para 4.1.A.

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

(c) Due to the offset of each contact, the bulk resistance is different for each contact in a set of 3.

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production. Test Groups 1 and 2 shall each consist of five 10-position connectors. Test Groups 3 thru 9 shall each consist of ten 10-position connectors, providing a minimum of 30 measurements for each of the 3 contact positions. All testing shall be conducted using cable consisting of .003 inch thick by .062 inch wide tin plated copper conductors on .100 inch centerlines, with polyester insulation one side and a total cable thickness of .011 inch maximum. Test cables shall be UL listed and rated 105°C, 300 volts rms.

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 2.

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C. Acceptance

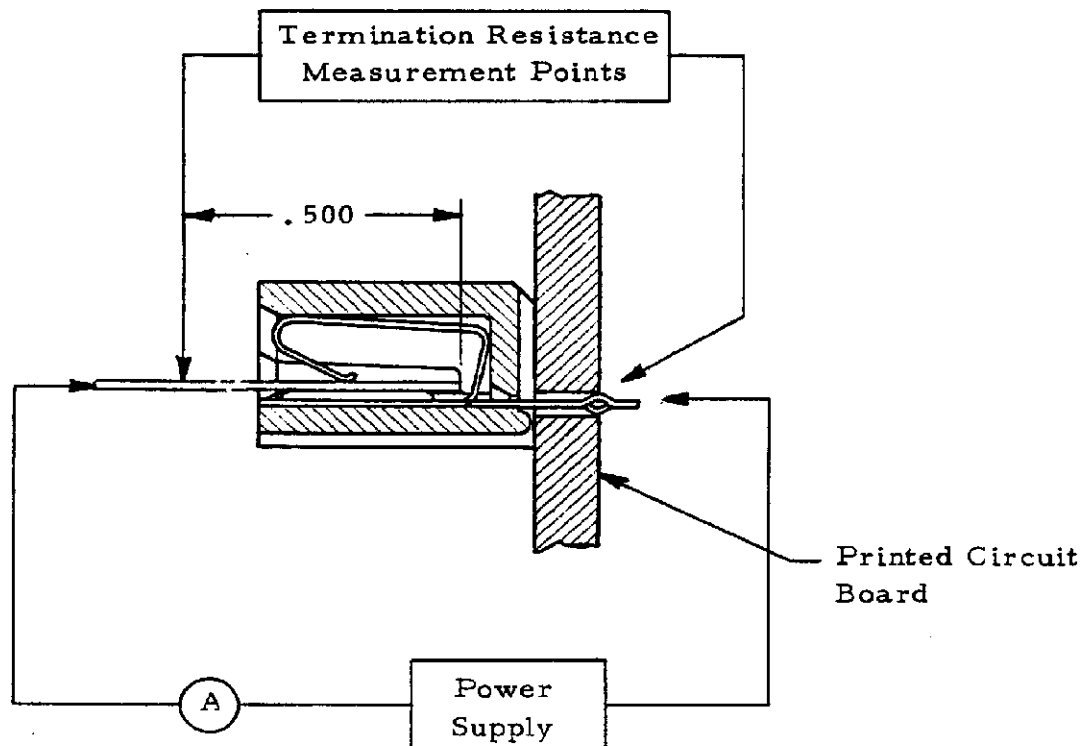
- (1) Requirements put on test samples, as indicated in the requirements portion of Figure 1, exist as either the upper or lower statistical tolerance limit (95% confidence, 99% reliability). All samples tested in accordance with this specification shall meet the stated tolerance limit.
- (2) Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification.

4.2. Quality Conformance Inspection

The applicable AMP inspection plan will specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

4.3. Certification

This product has been Recognized under Component Recognition Program of Underwriters Laboratories Inc., Electrical File Number E-28476.



Note: Test cable length shall be 2 inches minimum and 3 inches maximum.

Figure 3
Termination Resistance Measurement Points

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