Connector, Mini-Box Contact With Compliant Printed Wiring Board Termination

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the AMP* Mini-Box contact assembly. These receptacle connectors provide a connection method on .050 inch centerline and a solderless compliant pin termination to the printed wiring board.

1.2. Qualification

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

1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed on 13Jun97. The test file number for this testing is CTL 5327-000-021. This documentation is on file at and available from the Americas Regional Laboratory.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. AMP Documents

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. Corporate Bulletin 401-76: Cross-reference between AMP Test Specifications and Military or Commercial Documents

D. 501-385: Qualification Test Report

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

* Trademark
I Indicates change

3.3. Ratings

A. Voltage: 200 vac
B. Current: Signal application only, 1.5 amperes maximum per contact
C. Temperature: -65 to 125°C

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per AMP Specification 109-1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing.	Visual, dimensional and functional per applicable quality inspection plan.
	ELECTRICAL	
Termination resistance.	25 milliohms maximum initial. 30 milliohms maximum final.	AMP Spec 109-6-1. Subject mated contacts assembled in housing to 50 mv maximum open circuit at 100 ma maximum. See Figure 3.
Insulation resistance.	1000 megohms minimum.	AMP Spec 109-28-4. Test between adjacent contacts and between contacts and mounting hardware of mated samples.
Dielectric withstanding voltage.	600 vac at sea level. 1 minute hold with no breakdown or flashover.	AMP Spec 109-29-1. Test between adjacent contacts and between contacts and mounting hardware of mated samples.
	MECHANICAL	
Vibration, sinusoidal.	No discontinuities of 1 microsecond or longer duration. See Note.	AMP Spec 109-21-3. Subject mated samples to 10-2000-10 Hz traversed in 20 minutes with .06 inch maximum excursion. 4 hours in each of 3 mutually perpendicular planes.
Physical shock.	No discontinuities of 1 microsecond or linger duration. See Note.	AMP Spec 109-26-9. Subject mated samples to 100 G's sawtooth shock pulses of 6 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.

Figure 1 (cont)

Test Description	Requirement	Procedure
Durability.	See Note.	AMP Spec 109-27. Mate and unmate samples for 500 cycles at a maximum rate of 600 cycles per hour.
Contact engaging force.	6 ounces maximum per contact.	AMP Spec 109-35. Size 3 times using .019 inch diameter post simulator. Then measure force required to engage .019 inch diameter post simulator to a depth of .147 inch. See Figure 4.
Contact separating force.	.10 ounce minimum per contact.	AMP Spec 109-35. Size 3 times using .019 inch diameter post simulator. Then measure force required to separate .017 inch diameter post simulator from a depth of .147 inch. See Figure 4.
Insertion force, compliant pin.	6 pounds maximum per pin.	AMP Spec 109-42. Measure force necessary to fully insert pin into printed wiring board hole.
Mating force.	.30 pound maximum per contact.	AMP Spec 109-42, Condition A. After 3 unmonitored cycles, measure force necessary to mate samples at a maximum rate of .5 inch per minute.
Unmating force.	.03 pound minimum per contact.	AMP Spec 109-42, Condition A. Measure force necessary to unmate samples at a maximum rate of .5 inch per minute.
ENVIRONMENTAL		
Thermal shock.	See Note.	AMP Spec 109-22. Subject mated samples to 5 cycles between -65 and 125°C.
Humidity-temperature cycling.	See Note.	AMP Spec 109-23-3, Condition B. Subject mated samples to 10 cycles between 25 and 65°C at 95% RH.
Salt spray corrosion.	See Note.	AMP Spec 109-24. Subject mated samples to 5% salt solution for 48 hours.

Figure 1 (cont)

Test Description	Requirement	Procedure
Temperature life.	See Note.	AMP Spec 109-43. Subject mated samples to temperature life at 125 ± 2°C for 1000 hours.

NOTE

Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in Test Sequence in Figure 2.

Figure 1 (end)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)					
	1	2	3	4	5	6
	Test Sequence (b)					
Examination of product	1,9	1,5	1,5	1,8	1,5	1,5
Termination resistance	3,7	2,4	2,4			2,4
Insulation resistance				2,7		
Dielectric withstanding voltage				3,6		
Vibration	5					
Physical shock	6					
Durability	4					
Contact engaging force					3	
Contact separating force					4	
Insertion force, compliant pin					2	
Mating force	2					
Unmating force	8					
Thermal shock				4		
Humidity-temperature cycling			3	5		
Salt spray corrosion						3
Temperature life		3				

NOTE

(a) See Para 4.1.A.
(b) Numbers indicate sequence in which tests are performed.

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Samples shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test groups 1, 2, 3, 4 and 6 shall each consist of 3, 128 position pin headers and 3, 128 position receptacles. Test group 5 shall consist of 5 receptacle contacts with compliant pins.

B. Test Sequence

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

4.2. Requalification Testing

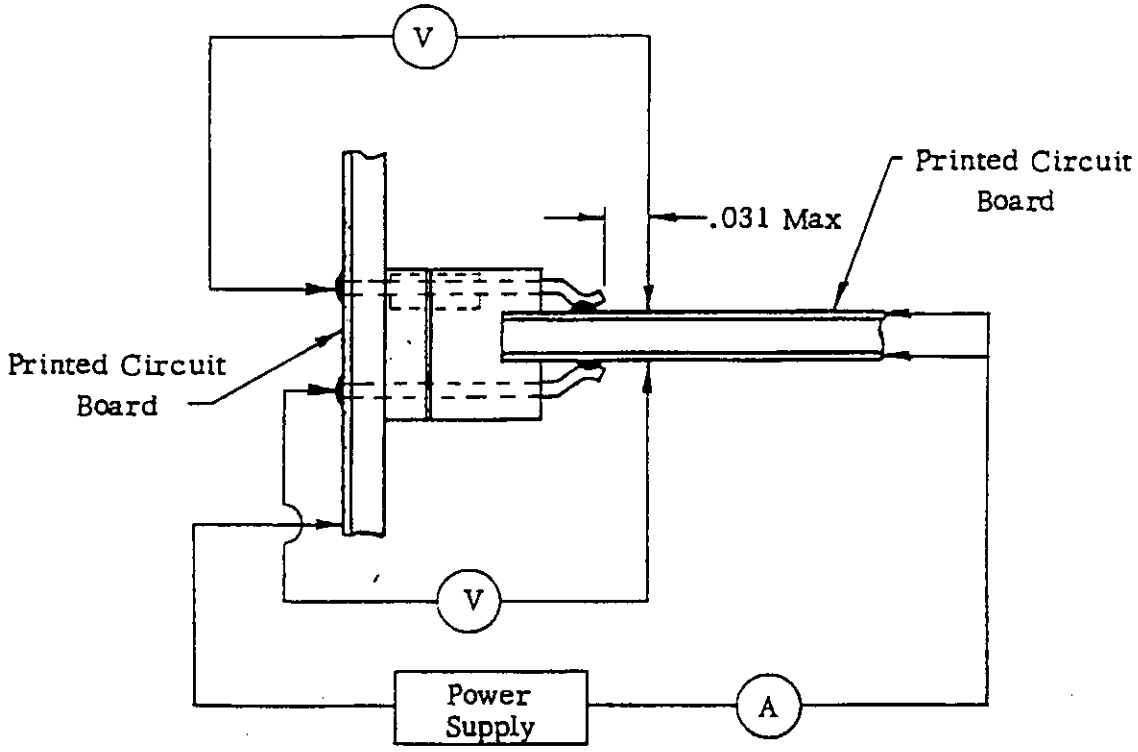
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

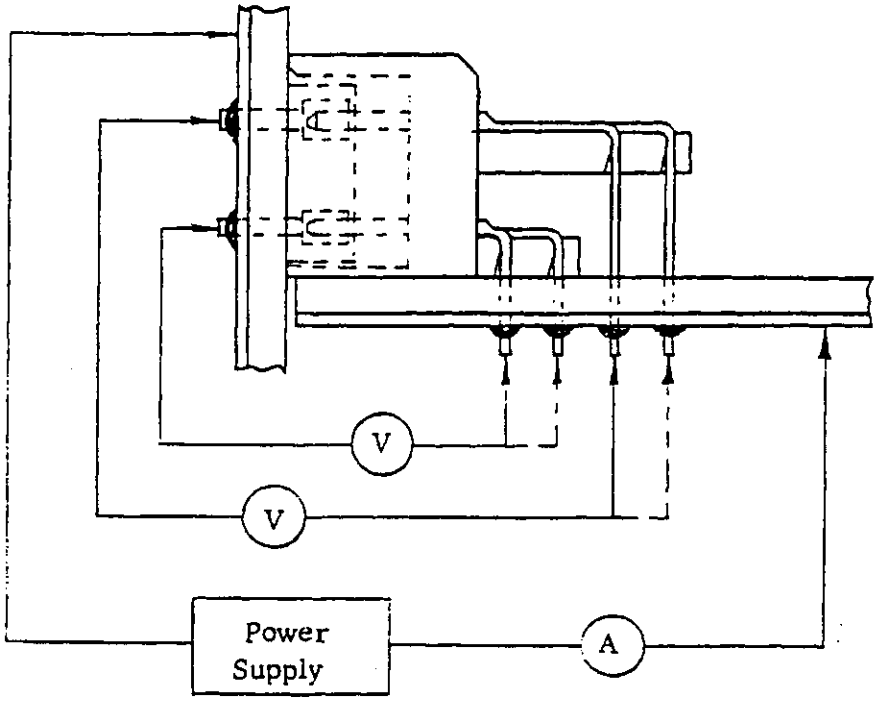
Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

Applicable AMP quality 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.

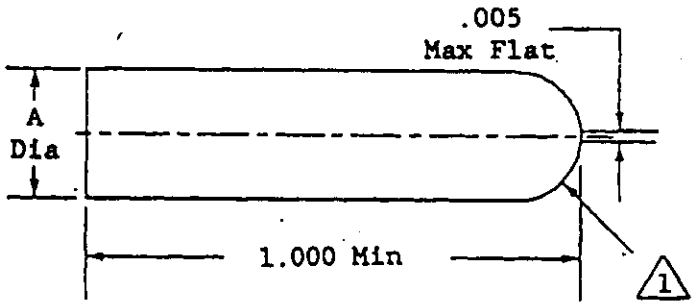


Standard Connector



Right Angle Connector

Figure 3
Termination Resistance Measurement Points



Gage Type	"A" Diameter
Engaging (Maximum)	.0190 +.0001/-.0000
Separating (Minimum)	.0170 +.0001/-.0000

NOTE

(a) Spherical radius shall be ½ pin diameter and smoothly blended without a break into the pin diameter.
(b) Material: Steel
(c) Heat treat: RC58 minimum
(d) Finish: 6 to 10 microinches rms

Figure 4
Post Simulator