
**Interconnection System, AMPMODU* Mod II, Short
Point-Of-Contact Receptacle**

1. SCOPE**1.1. Content**

This specification covers performance, tests and quality requirements for AMPMODU* Mod II interconnection system incorporating the short point-of-contact receptacle. The receptacles are housed in board mounted flame retardant housings. The mating male header assemblies utilize .025 inch square or .025 inch diameter posts in flame retardant insulating headers. The header assemblies may be shrouded or unshrouded. The receptacles and posts mate on .100 or .150 inch centerlines and both mount to solderable printed circuit boards.

1.2. Connector Configuration

Vertical or horizontal

1.3. Qualification

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

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, latest edition of the document applies. In the event of conflict between requirements of this specification and product drawing, product drawing shall take precedence. In the event of conflict between requirements of this specification and 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. 114-25018: Application Specification
- E. 501-77: Test Report

3. REQUIREMENTS**3.1. Design and Construction**

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

3.2. Materials

- A. Contact: Phosphor bronze or beryllium copper
- B. Housing: Glass filled nylon, diallyl phthalate, phenolic, or polyphynelene sulfide (PPS)
UL 94V-0

3.3. Ratings

- A. Current:
 - (1) 3 amperes maximum for single contact
 - (2) 2 amperes maximum per contact for fully energized connector
- B. Operating Temperature:
 - (1) -65 to 105°C for glass filled nylon
 - (2) -65 to 125°C for diallyl phthalate (DAP)
 - (3) -55 to 125°C for phenolic
 - (4) -55 to 125°C for PPS (Ryton)
 - (5) -65 to 100°C for product tin/lead plated in contact mating area

3.4. Performance and Test Description

Product is designed to meet 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 and AMP Spec 114-25018.	Visual, dimensional and functional per applicable inspection plan.															
ELECTRICAL																	
Termination resistance.	12 milliohms maximum.	AMP 109-6-1. Subject mated contacts assembled in housing to 50 mv maximum open circuit at 100 ma maximum. See Figures 4 and 5.															
Insulation resistance.	5000 megohms minimum initial.	AMP Spec 109-28-4. Test between adjacent contacts of mated samples.															
Dielectric withstanding voltage.	<table border="0"> <tr> <td>Test Voltage (rms)</td> <td>Altitude</td> <td></td> </tr> <tr> <td>.100 .150</td> <td>(feet)</td> <td></td> </tr> <tr> <td>750 1000</td> <td>Sea level</td> <td></td> </tr> <tr> <td>300 400</td> <td>50000</td> <td></td> </tr> <tr> <td>275 275</td> <td>70000</td> <td></td> </tr> </table>	Test Voltage (rms)	Altitude		.100 .150	(feet)		750 1000	Sea level		300 400	50000		275 275	70000		AMP Spec 109-29-1. Test between adjacent contacts of mated samples.
Test Voltage (rms)	Altitude																
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750 1000	Sea level																
300 400	50000																
275 275	70000																

Figure 1 (cont)

Test Description	Requirement	Procedure
Temperature rise vs current.	30°C maximum temperature rise above ambient.	AMP Spec 109-45-1. Measure temperature rise at 3 contacts from 1 row (end, middle and contact midway between) with the sample suspended in free air, solder tines oriented down with entire sample energized at rated current. See Figure 6.
MECHANICAL		
Solderability.	Solderable area shall have minimum of 95% solder coverage.	AMP Spec 109-11-1. Subject contacts to solderability.
Vibration.	No discontinuities of 1 microsecond or longer duration. See Note (a).	AMP Spec 109-21-4. Subject mated samples to 20 G's, 10-2000 Hz with 100 ma current applied.
Physical shock.	No discontinuities of 1 microsecond or longer duration. See Note (a).	AMP Spec 109-26-9. Subject mated samples to 100 G's sawtooth shock pulses of 6 milliseconds duration with 100 ma current applied. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Durability.	See Note (a).	AMP Spec 109-27. Mate and unmate samples for 200 cycles for 30 μin gold plating, 75 cycles for 15 μin gold plating, and 75 cycles for 100 μin tin-lead plating at maximum rate of 600 cycles per hour.
Contact engaging force.	6 ounces maximum.	AMP Spec 109-35. Measure force to engage on second insertion, using gage #1, to minimum insertion depth of .206 inch. See Figure 7.
Contact separating force.	1 ounce minimum for gold and inprocess contacts. .75 ounce minimum for tin plated contacts. See Note (b).	AMP Spec 109-35. Size 2 times using gage #1. Insert gage #2 to minimum depth of .206 inch and measure force to separate. See Figure 7.

Figure 1 (cont)

Test Description	Requirement	Procedure
Mating force.	8 ounces maximum per contact.	AMP Spec 109-42, Condition A. Measure force necessary to mate samples after 1 unmonitored cycle using free floating fixtures at a rate of .5 inch per minute. Calculate force per contact.
I Unmating force.	1 ounce minimum per contact.	AMP Spec 109-42, Condition A. Measure force necessary to unmate samples during third cycle at a rate of .5 inch per minute. Calculate force per contact.

ENVIRONMENTAL

Thermal shock.	See Note (a).	AMP Spec 109-22. Subject mated samples to 5 cycles between temperatures indicated in Para 3.3.B. for each respective material.
Humidity-temperature cycling.	See Note (a).	AMP Spec 109-23-4, Condition B. Subject mated samples to 10 cycles between 25 and 65°C at 95% RH with 5 cold shocks.
Mixed flowing gas.	See Note (a).	AMP Spec 109-85-2. Subject mated samples to environmental class II for 20 days.

NOTE

- (a) *Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in Test Sequence in Figure 2.*
- (b) *Sizing will be done prior to initial separation force only.*

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	1,12	1,6	1,6	1,8	1,3	1,3
Termination resistance	5,10	2,5	2,5			
Insulation resistance				2,6		
Dielectric withstanding voltage				3,7		
Temperature rise vs current						2
Solderability					2	
Vibration	8					
Physical shock	9					
Durability	6	3	3			
Contact engaging force	2					
Contact separating force	3,7					
Mating force	4					
Unmating force	11					
Thermal shock				4		
Humidity-temperature cycling		4		5		
Mixed flowing gas			4			

NOTE

- (a) See Para 4.1.A. and Figure 3.
- (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 and 4 shall consist of a minimum of 3 mounted connector assemblies with a minimum total of 36 post/receptacle pairs. Test groups 1 and 4 shall be series wired. Test group 2 shall consist of 3 mated unmounted, unwired connector assemblies with a minimum total of 36 post/receptacle pairs. Test group 3 shall consist of a minimum of 30 receptacles and posts of each soldertail plating variation, see Figure 3. Test group 5 shall consist of a mounted, mated connector assembly with a minimum total of 36 post/receptacle pairs and shall be series wired. Test group 6 shall consist of 1 post/receptacle pair of each contact plating configuration. See Figure 3 to select proper plating and housing configuration for the respective test groups. Fretting lubrication should be applied to tin/lead product. If soldered, apply after soldering and cleaning per AMP Specification 114-25018 and IS Sheet 7411.

Test Group	Plating Configuration (a) (Thickness in μ in)		Receptacle Housing	
	Receptacle		Material (b)	Centerline Spacing (Inches)
	Contact Area	Soldertail		
1A	30 Au	Au flash	Optional	Optional
1B	15 Au	Au flash	Optional	Optional
1C	15 Au	50-100 Tin-lead	Optional	Optional
1D	100-200 Tin-lead	100-200 Tin-lead	Optional	Optional
2A	30 Au	Au flash	PPS	.100
2B	30 Au	50-100 Tin-lead	PPS	.150
2C	15 Au	Au flash	Nylon	.100
2D	15 Au	50-100 Tin-lead	Nylon	.150
2E	100-200 Tin-lead	100-200 Tin-lead	Nylon	Optional
3A	30 Au	50-100 Tin-lead	Optional	Optional
3B	30 Au	Au flash	Optional	Optional
3C	15 Au	Au flash	Optional	Optional
4A	30 Au	50-100 Tin-lead	PPS	.100
4B	30 Au	50-100 Tin-lead	PPS	.150
4C	30 Au	Au flash	Nylon	.100
4D	30 Au	Au flash	Nylon	.150
5A	30 Au	Au flash	Optional	Optional
5B	30 Au	50-100 Tin-lead	Optional	Optional
5C	100-200 Tin-lead	100-200 Tin-lead	Optional	Optional
6A	30 Au	Au flash	Optional	Optional
6B	15 Au	50-100 Tin-lead	Optional	Optional
6C	100-200 Tin-lead	100-200 Tin-lead	Optional	Optional

NOTE

- (a) Underplate for all plating configurations is 50 microinches minimum of nickel.
- (b) All header housings are glass filled nylon.

Figure 3
Test Sample Matrix

B. Test Sequence

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

4.2. Requalification Testing

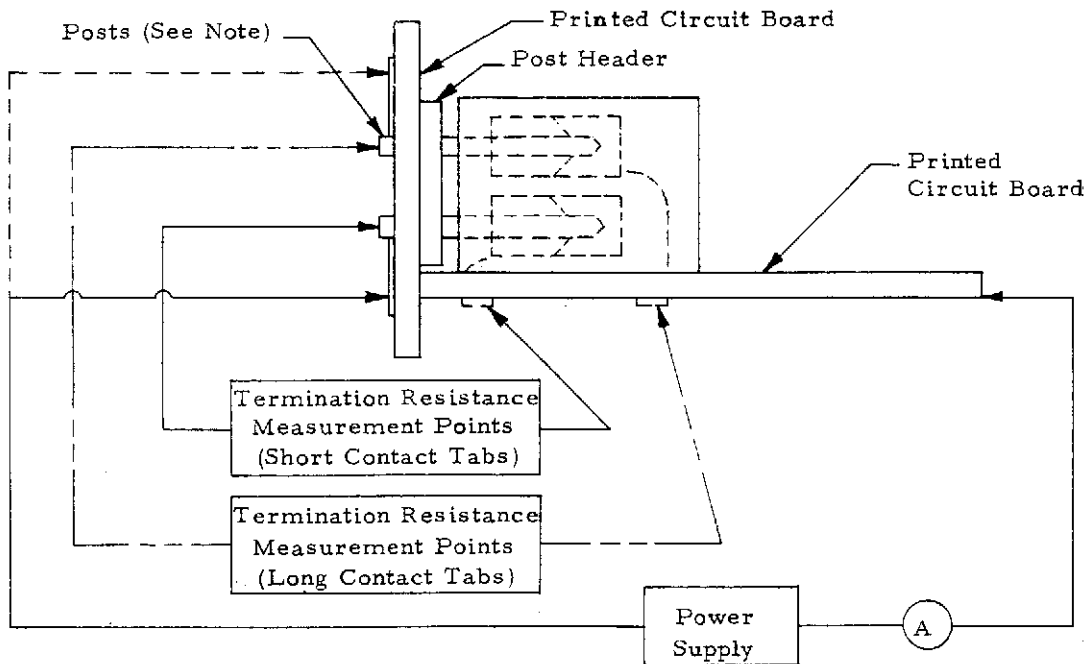
If changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

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

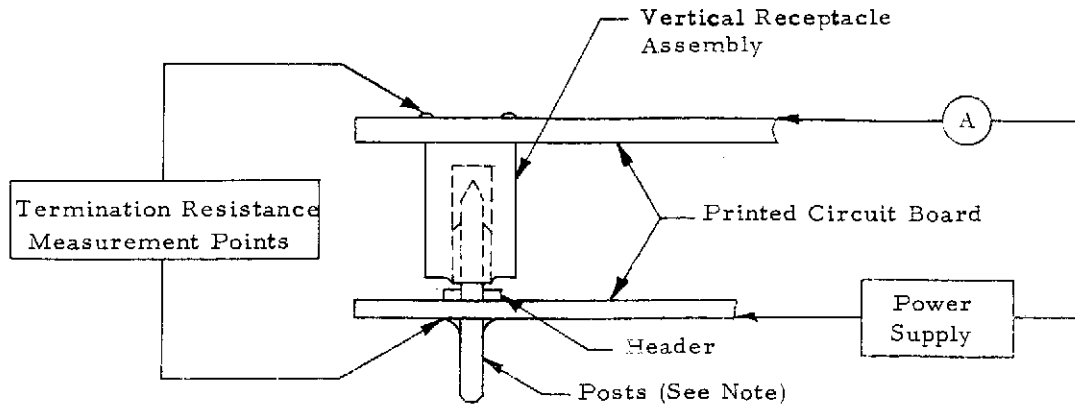
4.4. Quality Conformance Inspection

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



NOTE *Post plating shall be identical to receptacle plating when conducting tests. See Figure 3.*

Figure 4
Termination Resistance Measurement Points
Post Header Assembly & Horizontal Receptacle Assembly



NOTE

Post plating shall be identical to receptacle plating when conducting tests. See Figure 3.

Figure 5
Termination Resistance Measurement Points
Post Header Assembly & Vertical Receptacle Assembly

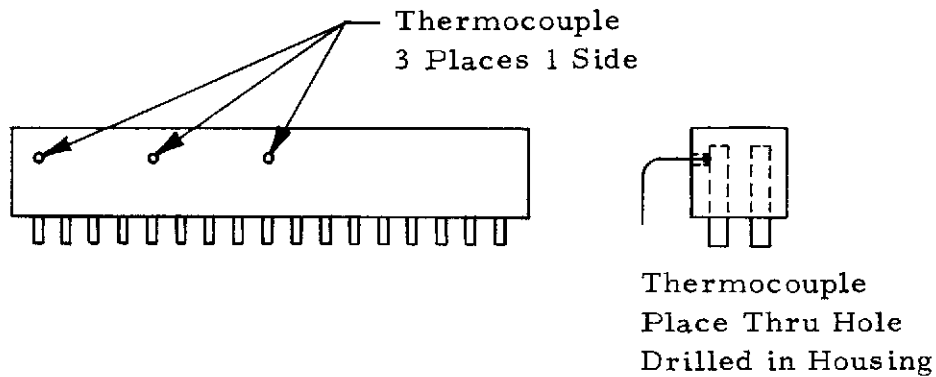
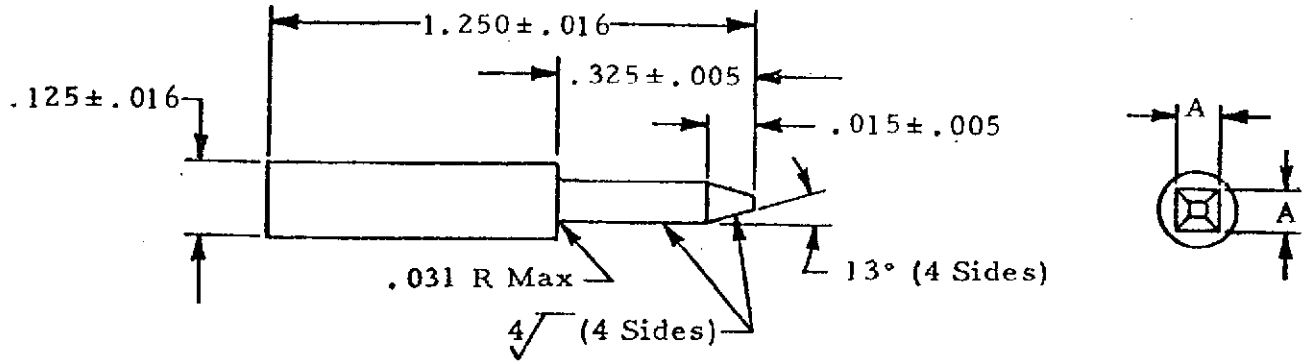


Figure 6
Temperature Rise Vs Current



NOTE

- (a) Tolerance: $\pm .005$ or $\pm 2^\circ$ as applicable, unless otherwise specified.
- (b) Material: Tool Steel, AISI type 02 per AMP Specification 100-15.
- (c) Heat Treat: Rockwell C 50-55.
- (d) Gage surface shall be clean of contaminants or lubricants.

Gage Number	"A" Dimension
1	$.0260 +.0000/- .0001$
2	$.0240 +.0001/- .0000$

Figure 7
Force Gages