

**Contact, Coaxial, 50 Ohm & Non-Impedance Matched, Multiple Size
8 In Series 109 Housings****1. SCOPE****1.1. Content**

This specification covers performance, tests and quality requirements for AMP* 50 ohm size 8 coaxial contacts. These contacts are for use in special cavities of panels or printed circuit board mounted multiple connectors.

1.2. 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. 501-147: 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

Materials shall be as specified on applicable product drawing.

3.3. Ratings

- A. Voltage: 275 vac rms
- B. Temperature: -55 to 125°C
- C. Frequency Range:
 - (1) 0 to 2 GHz for 50 ohm connectors
 - (2) 0 to 500 MHz for non-impedance matched connectors

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.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Termination resistance.	Center contact: ΔR 6 milliohms maximum. Outer contact: ΔR 2 milliohms maximum.	AMP 109-6-1. Subject mated contacts assembled in housing to 50 mv maximum open circuit at 100 ma maximum. See Figure 3.
Voltage standing wave ratio.	Pin and socket, non-impedance matched. Straight to straight: 1.30 maximum. Right angle to straight: 1.35 maximum. Right angle to right angle: 1.40 maximum.	AMP Spec 109-9-1. Measure VSWR between 0 and 500 MHz.
	Pin and socket, 50 ohm matched. Straight to straight: 1.20 maximum. Right angle to straight: 1.25 maximum. Right angle to right angle: 1.30 maximum.	AMP Spec 109-9-1. Measure VSWR between 0 and 2 GHz.
Insulation resistance.	5000 megohms minimum.	AMP Spec 109-28-4. Test between center and outer conductor for each contact of mated samples.
Dielectric withstanding voltage.	800 vac at sea level. 525 vac at 30000 feet. 275 vac at 70000 feet.	AMP Spec 109-29-1. Test between center and outer conductor for each contact of mated samples.
Shielding effectiveness.	40 dB minimum up to 400 MHz. 30 dB minimum up to 2000 MHz.	AMP Spec 109-90. Measure shielding effectiveness of mated pair between 50 and 2000 MHz.
RF insertion loss.	.15 dB maximum.	AMP Spec 109-174-2. Measure RF insertion loss at 4 GHz.

Figure 1 (cont)

Test Description	Requirement	Procedure																				
RF crosstalk.	80 dB maximum.	AMP Spec 109-179-1. Position contact assemblies in adjacent connector cavities and mate connector. Measure RF crosstalk using sweep signal between 5 and 500 MHz.																				
MECHANICAL																						
Cable retention.	<table><tr><td>Cable Type</td><td>Retention, Lbs Min</td></tr><tr><td>RG 174</td><td>20</td></tr><tr><td>RG 179A</td><td>20</td></tr><tr><td>RG 188B</td><td>20</td></tr><tr><td>RG 316</td><td>20</td></tr><tr><td>RD 188</td><td>35</td></tr><tr><td>Double Braid</td><td></td></tr><tr><td>RG 142</td><td>50</td></tr><tr><td>RG 142A</td><td>50</td></tr><tr><td>RG 142B</td><td>50</td></tr></table>	Cable Type	Retention, Lbs Min	RG 174	20	RG 179A	20	RG 188B	20	RG 316	20	RD 188	35	Double Braid		RG 142	50	RG 142A	50	RG 142B	50	AMP Spec 109-16. Apply force between contact and cable with even loading on both center and outer conductor. Maintain force for 1 minute and release and check for electrical continuity using low voltage test light.
Cable Type	Retention, Lbs Min																					
RG 174	20																					
RG 179A	20																					
RG 188B	20																					
RG 316	20																					
RD 188	35																					
Double Braid																						
RG 142	50																					
RG 142A	50																					
RG 142B	50																					
Vibration, sinusoidal.	No discontinuities of 1 microsecond or longer duration. See Note (a).	AMP Spec 109-21-2. Subject mated samples to 10-500-10 Hz traversed in 15 minutes. 3 hours in each of 3 mutually perpendicular planes. See Figure 4.																				
Physical shock.	No discontinuities of 1 microsecond or longer duration. See Note (a).	AMP Spec 109-26-1. Subject mated samples to 50 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 4.																				
Durability.	See Note (a).	AMP Spec 109-27. Mate and unmate samples for 500 cycles at maximum rate of 720 cycles per hour.																				
Mating force.	5 pounds maximum.	AMP Spec 109-42, Condition A. Measure force necessary to mate samples at maximum rate of .5 inch per minute.																				
Unmating force.	2 ounces minimum.	AMP Spec 109-42, Condition A. Measure force necessary to unmate samples at maximum rate of .5 inch per minute.																				
ENVIRONMENTAL																						
Thermal shock.	See Note (a).	AMP Spec 109-22. Subject unmated samples to 5 cycles between -55 and 125°C.																				

Figure 1 (cont)

Test Description	Requirement	Procedure
Humidity-temperature cycling.	See Note (a).	AMP Spec 109-23-3, Condition B. Subject mated samples to 10 cycles between 25 and 65°C at 95% RH.
Temperature life.	See Note (a).	AMP Spec 109-43. Subject mated samples to temperature life at 125°C for 1000 hours.
Mixed flowing gas.	See Note (a).	AMP Spec 109-85-3. Subject mated samples to environmental class III for 20 days.

- (a) 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
	Test Sequence (b)				
Examination of product	1,10	1,5	1,5	1,8	1,6
Termination resistance	3,7	2,4	2,4		
Voltage standing wave ratio					3
Insulation resistance				2,6	
Dielectric withstanding voltage				3,7	
Shielding effectiveness					5
RF insertion loss					2
RF crosstalk					4
Cable retention	9				
Vibration	5				
Physical shock	6				
Durability	4				
Mating force	2				
Unmating force	8				
Thermal shock				4	
Humidity-temperature cycling				5	
Temperature life		3(c)			
Mixed flowing gas			3(c)		

- (a) See Para 4.1.A.
 (b) Numbers indicate sequence in which tests are performed.
 (c) Precondition samples with 10 cycles durability.

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. All test groups shall each consist of 5 mated contact pairs with contacts mounted in their ~~respective~~ housings. All test groups shall be crimped to 12 inch lengths of appropriate cable and soldered to printed circuit boards as applicable. Cable shall be RG316 in accordance with MIL-C-17.

B. Test Sequence

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

4.2. Requalification Testing

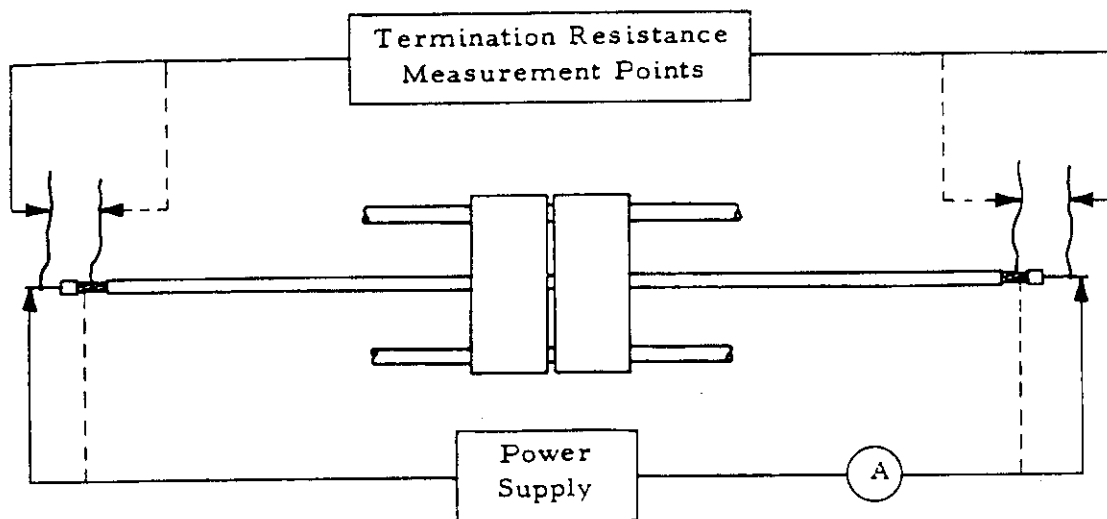
If changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of original testing sequence as determined by development/product, quality and reliability engineering.

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:
- (a) Also measure 3 foot length of cable and calculate milliohms per inch.
 - (b) Measure distance between probes and subtract an equal distance of cable to obtain actual termination resistance.

Figure 3
Termination Resistance Measurement Points

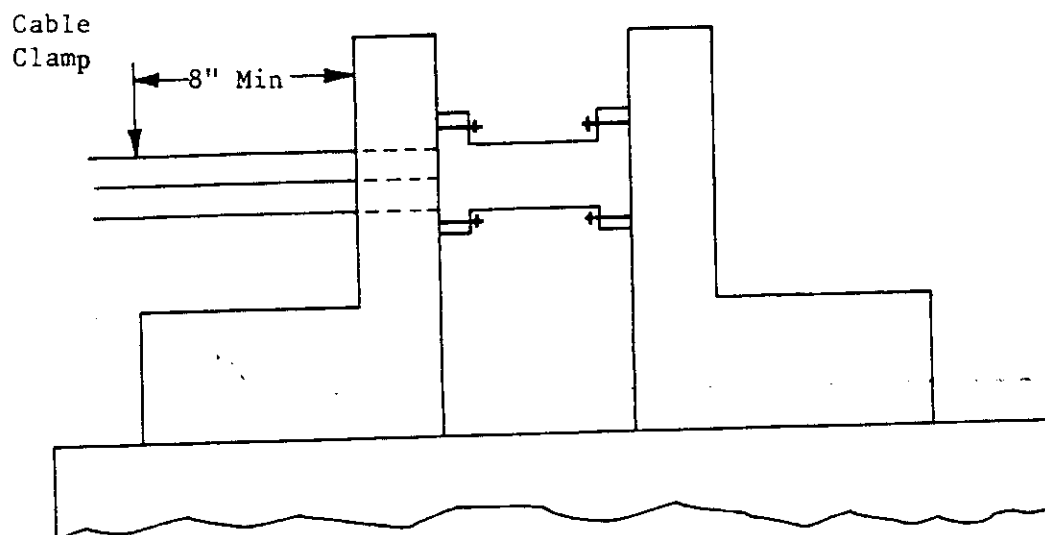


Figure 4
Vibration & Physical Shock Mounting Fixture