

PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers the performance, tests, and quality requirements for AMP* HN Series Coaxial plugs.

1.2. Definitions

For the purpose of this specification, the following definitions shall apply.

- A. Connector Assembly: A connector assembly consists of a mated plug and jack, terminated to their respective cable.
- B. Connector: A connector may be either a plug or a jack as described below.
 - (1) Plug: (Male) - contains the male inner contact and a rotating, threaded collar for locking purposes.
 - (2) Jack: (Female) - contains the female inner contact and may be either cable or panel mount type.

1.3. 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 constitute a part of this specification to the extent specified herein. 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 the requirements of this specification and the referenced documents, this specification shall take precedence.

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

2.2. Military Specifications

- A. MIL-C-17: Cable, Coaxial, Radio Frequency
- B. MIL-C-39012: Connectors, Coaxial, RF, General Specification For

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

The materials used in the construction of this product and the finish or plating shall be as specified on the AMP Product Drawing.

3.3. Ratings

- A. Nominal Impedance: 50 ohms
- B. Frequency Range: 0 - 4 GHz
- C. Operating Temperature: -65 to 85°C
- D. Operating Voltage @ Sea Level: 1500 volts (rms)

3.4. Performance and Test Description

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

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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 inspection plan.																		
ELECTRICAL																				
Termination Resistance, Specified Current (b)	<table border="0"> <tr> <td>Type</td> <td colspan="2">Resistance, milliohms</td> </tr> <tr> <td><u>Contact</u></td> <td><u>Initial</u></td> <td><u>Final</u></td> </tr> <tr> <td>Inner</td> <td>1.0</td> <td>1.5</td> </tr> <tr> <td>Right Angle</td> <td>2.5</td> <td>3.0</td> </tr> <tr> <td>Outer</td> <td colspan="2">0.3</td> </tr> <tr> <td>Braid to Body</td> <td colspan="2">0.5</td> </tr> </table>	Type	Resistance, milliohms		<u>Contact</u>	<u>Initial</u>	<u>Final</u>	Inner	1.0	1.5	Right Angle	2.5	3.0	Outer	0.3		Braid to Body	0.5		Measure potential drop of mated contacts at 1 ampere DC, see Figure 3; AMP Spec 109-25, calculate resistance.
Type	Resistance, milliohms																			
<u>Contact</u>	<u>Initial</u>	<u>Final</u>																		
Inner	1.0	1.5																		
Right Angle	2.5	3.0																		
Outer	0.3																			
Braid to Body	0.5																			
Dielectric Withstanding Voltage	5000 vac rms 60 Hz dielectric withstanding voltage, one minute hold. No breakdown or flashover.	Test between center and outer contacts of unmated connector assemblies; AMP Spec 109-29-1.																		
Insulation Resistance	10,000 megohms minimum initial.	Test between center and outer contact of unmated connector assembly, AMP Spec 109-28-4.																		
Permeability	2 Mu maximum.	Measure magnetic permeability; AMP Spec 109-88.																		
Voltage Standing Wave Radio	1.30 maximum 1.35 maximum for Right Angle	Measure VSWR between 0.5 and 4 GHz, except discrete frequency network analyzer may be used; AMP Spec 109-9.																		
Altitude/Corona	500 volts rms minimum at 5 picocoulombs maximum discharge.	Test corona at 70,000 feet simulated altitude in accordance with AMP Spec 109-40.																		
R.F. High Potential	3000 volts peak 5 MHz for 1 minute. No dielectric breakdown or flashover.	Test between center and outer contacts of mated connectors; AMP Spec 109-29-1, except at 5 MHz and AC.																		

Figure 1 (cont)

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Test Description	Requirement	Procedure		
R.F. Leakage	Connector leakage cable to cable shall not exceed -90 dB.	Measure RF leakage in accordance with MIL-C-39012 between 2 and 3 GHz.		
R.F. Insertion Loss	.15 dB maximum at 10 GHz.	Measure RF Insertion Loss in accordance with MIL-C-39012 at 4 GHz.		
MECHANICAL				
Vibration (a)	No discontinuities greater than 1 micro-second.	Subject mated connectors to 15 G's, 10-2000 Hz with 100 ma current applied; AMP Spec 109-21-3.		
Physical Shock (a)	No discontinuities greater than 1 micro-second.	Subject mated connector to 100 G's sawtooth in 6 milli-seconds; 3 shocks in each direction applied along the 3 mutually perpendicular planes total 18 shocks; see Figure 4; AMP Spec 109-26-9.		
Mating and Unmating	6 inch pounds maximum.	Connectors shall be fully mated and unmated with a standard part while measuring the force. Connectors are fully mated when referenced planes coincide.		
Engaging and Separating Force	Mating of .570" ID ring 5 pounds maximum. Mating of .558" ID ring 1 pound minimum. .324" ID ring shall contact all slotted members within .031" of their tip ends.	Plugs Only: Measure force to insert into a .570" maximum ID test ring and a .558" maximum ID test ring to .093" depth then measure depth from tip ends of spring members to contact a .560" ID minimum test ring.		
Figure 1 (cont)				
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Test Description	Requirement	Procedure		
Cable Retention (a)	No loss of electrical continuity or evidence of physical damage.	Apply a tensile load of 90 pounds between connector and cable for 30 seconds and check for electrical discontinuity. Then bend cable 90°, then reverse 180° at 10 cable diameters from the connector for 4 cycles, then recheck continuity.		
Durability (a)	No physical damage.	Mate and unmate connector assemblies for 500 cycles; AMP Spec 109-27.		
Coupling Nut Retention	Coupling nut shall not loosen or dislodge from plug body.	Apply a tensile load of 100 pounds between coupling nut and plug body for 1 minute.		
ENVIRONMENTAL.				
Thermal Shock (a)	No physical damage.	Subject unmated connectors to 5 cycles between -65° and +85°C; AMP Spec 109-22.		
Humidity-Temperature Cycling (a)	No physical damage. 200 megohms minimum within 5 minutes after removal from chamber.	Subject mated connectors to 10 humidity-temperature cycles between 25° and 65°C at 95% RH; AMP Spec 109-23, Method III, Cond B, with cold shock at -10°C less step 7b.		
Corrosion, Salt Spray	No base metal exposure on any mating or interface surface of the connectors.	Subject unmated uncabled connectors to 5% salt concentration for 48 hours; AMP Spec 109-24, Cond B.		
<p>(a) Shall show no evidence of damage, cracking, or chipping.</p> <p>(b) Requirements based on silver plated plug mated with nickel plated jack.</p> <p style="text-align: center;">Figure 1 (end)</p>				
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3.6. Connector Tests and Sequences

Test or Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Examination of Product	1	1	1	1
Termination Resistance, Specified Current(c)			6-9-11-14	
Dielectric Withstanding Voltage			7-13-17	
Insulation Resistance (d)	5	5	5-16	5
Permeability	4	4	4	4
Voltage Standing Wave Ratio		6		
Altitude Corona			18	
R.F. High Potential			19	
R.F. Leakage		8		
R.F. Insertion Loss		7		
Vibration			8	
Physical Shock			10	
Mating and Unmating	2-7	2	2-22	2-7
Engaging and Separating Force	3	3	3	3-8
Cable Retention			20	
Durability				6
Coupling Nut Retention			21	
Thermal Shock			12	
Humidity-Temperature Cycling			15	
Corrosion, Salt Spray	6			

- (a) See Para 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Test Group 3 Sequence 6 measure inner contact, outer contact, and braid to body. Test Group 3 Sequences 9, 11 and 14 measure inner contact resistance only.
- (d) Test Group 3 Sequence 16 measures Insulation Resistance with 5 minutes after Humidity-Temperature Cycling.

Figure 2

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4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Connectors shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production. Test Group 1 shall consist of 3 unmated, uncabled connector pairs. Test Group 2 shall consist of 3 connector pairs, which shall be cabled during R.F. testing. Test Groups 3 and 4 shall consist of 3 connector pairs with each connector crimped to a 12 inch length of cable. Cable used for testing shall be RG-214/U which shall conform to MIL-C-17.

B. Test Sequence

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

C. Acceptance

- (1) All samples tested in accordance with this specification shall meet the stated requirement.
- (2) Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken.

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.

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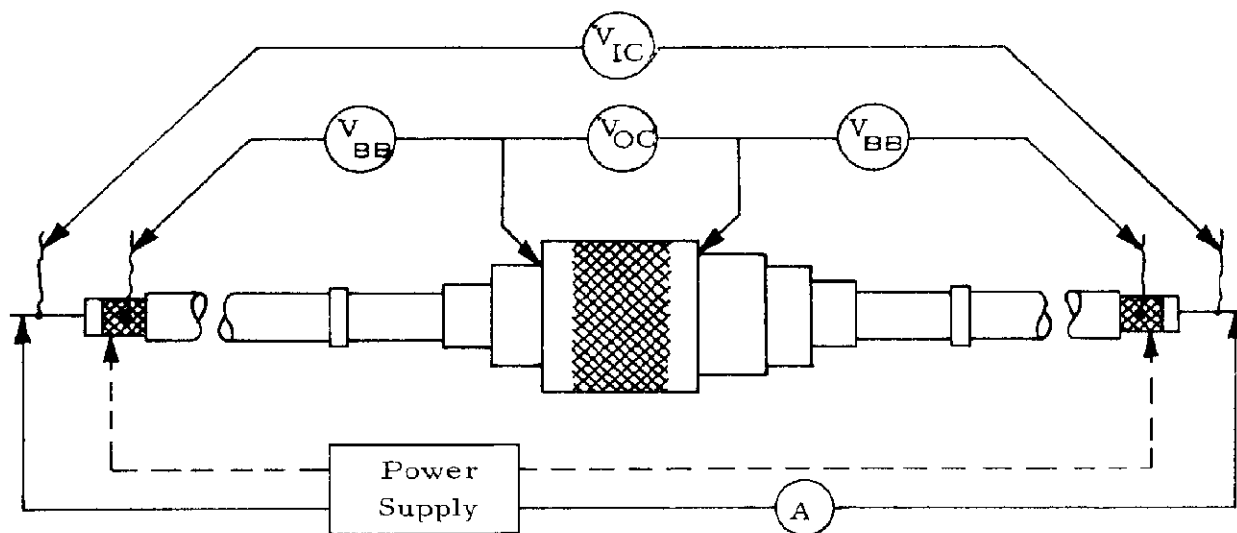
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- NOTE:
- (a) V_{OC} is outer contact measurement.
 V_{IC} is inner contact measurement.
 V_{BB} is braid to body measurement.
 - (b) Measure at 1 ampere DC.
 - (c) Also measure 3 feet of wire, calculate milliohms per inch. Measure distance between probes on specimens and subtract an equal distance of wire resistance to obtain actual contact resistance.

Figure 3

Resistance Measurement Points

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