

PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification contains performance requirements and qualification test procedures and production testing for AMP\* SMC series coaxial connectors.

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) -- The plug contains the female inner contact and a rotating, threaded collar for coupling purposes.
  - 2. Jack: (Female) -- Contains the male inner contact.

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.

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.

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				CHK				
				APP				
				LOC B	NO 108-12030			
				TITLE				
				SHEET 1 OF 8		SMC Series Coaxial Connectors		
DIST 12	A	ECN C83-875	APP	DATE				
LTR	REVISION RECORD		APP	DATE				

2.2. Military

A. 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 the 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 - 10 GHz
- C. Operating Temperature: -65 to +85°C
- D. Operating Voltage @ Sea Level: 335 VRMS
- E. Operating Voltage @ 70,000 Feet: 85 VRMS

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.	Visual, dimensional and functional per applicable inspection plan.	
ELECTRICAL			
Termination Resistance Specified Current	MILLIOHMS MAXIMUM	Measure potential drop of mated contacts at 1 ampere DC, see Figure 3, AMP Spec 109-25, calculate resistance.	
	<u>Initial</u> <u>After Test</u>		
	Inner Con- tacts		
	Straight      6.0      8.0 (Rt. Angle) 12.0   16.0		
	Outer Contact      1.0      N/A		
Shield to Body      1.0      N/A			

Figure 1 (cont)

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Test Description	Requirement	Procedure
Dielectric Withstanding Voltage	1000 Vac rms 60 Hz dielectric withstanding voltage, one minute hold. No breakdown or flash-over.	Test between center and outer contacts of unmated connector assemblies; AMP Spec 109-29-1.
Insulation Resistance	1000 megohms minimum	Test between center and outer contact of unmated connector assembly, AMP Spec 109-28-4.
Permeability	2 Mu maximum	Measure magnetic permeability in accordance with AMP Spec 109-88.
Voltage Standing Wave Ratio	1.30 + .04 (F in GHz) max.	Measure VSWR between 0.5 and 10 GHz in accordance with MIL-C-39012, Paragraph 4.6.12, as applicable.
Altitude/Corona	250 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	700 volts rms 5 MHz for 1 minute. No dielectric breakdown or flashover.	Test between center and outer contacts of unmated connectors; AMP Spec 109-29-1, except at 5 MHz AC.
R.F. Leakage	Connector leakage cable to cable shall not exceed -60 dB minimum.	Measure RF Leakage in accordance with MIL-C-39012 between 2 and 3 GHz.
R.F. Insertion Loss	.25dB maximum at 4 GHz for straight .50 dB maximum at 4 GHz for right angles.	Measure RF Insertion Loss in accordance with MIL-C-39012 at 4 GHz.
<b>MECHANICAL</b>		
Vibration	No discontinuities greater than 1 micro-second. (a)	Subject mated connectors to 20 G's, 10-2000 Hz with 100 ma current applied, see Figure 4; AMP Spec 109-21-4.

Figure 1 (cont)

<b>AMP</b>	AMP INCORPORATED Harrisburg, Pa. 17105	LOC	SHEET	NO	REV
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Test Description	Requirement	Procedure
Physical Shock	No discontinuities greater than 1 micro-second. (a)	Subject mated connector to 100 G's half sine in 6 milliseconds; 3 shocks in each direction applied along the 3 mutually perpendicular planes total 18 shocks; see Figure 4; AMP Spec 109-26-9.
Mating/Unmating Force	16 inch ounces	Connectors shall be fully engaged and disengaged with a standard mating part while measuring the force required.
Mating Characteristics	.021 inch gage 2.5 pounds maximum insertion force.  .019 inch gage 1 ounce minimum withdrawal force.	Plugs only: Precondition by inserting a .0215 inch gage 1 time to a .050 inch minimum depth. Measure force to insert a .0210 inch gage to .050 inch depth. Insert a .0190 inch gage to .050 inch depth and measure force to withdraw.
Cable Retention	No loss of electrical continuity or evidence of physical damage.	Apply a tensile load of 20 pounds between connector and cable for 30 seconds and check for electrical discontinuity. Bend cable 90°, then reverse 180° for 4 such cycles of a point 10 cable diameters from connector and recheck continuity.
Durability	No physical damage (a)	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 30 pounds between coupling nut and plug body for 1 minute. During the minute, rotate nut 2 revolutions in each direction.
Coupling Proof Torque	Coupling mechanism shall not dislodge from body.	Connectors shall be mated and coupling nut tightened to 60 inch-ounces for 1 minute then released.

Figure 1 (cont)

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Test Description	Requirement	Procedure
<b>ENVIRONMENTAL</b>		
Thermal Shock	No physical damage (a).	Subject mated connectors to 5 cycles between -65° and +85°C; AMP Spec 109-22.
Corrosion, Salt Spray	No base metal exposure on any mating or interface surface of the connectors.	Subject mated connectors to 5% salt concentration for 48 hours; AMP Spec 109-24, Cond B.

(a) Shall show no evidence of damage, cracking, or chipping.

Figure 1 (end)

### 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)	8-11	7-10-13-15		
Dielectric Withstanding Voltage		8-14		
Insulation Resistance	7	6	7	7
Permeability	5	5	5	5
Voltage Standing Wave Ratio	6			
Altitude Corona		16		
R.F. High Potential		17		
R.F. Leakage			6	
R.F. Insertion Loss				6
Vibration		9		
Physical Shock		11		
Mating Unmating Force	4-12	4-20	4	4
Mating Characteristics	2-13	2	2	2
Cable Retention			18	
Durability	9			
Coupling Nut Retention		19		
Coupling Proof Torque	3	3	3	3
Thermal Shock			13	
Corrosion, Salt Spray	10			

(a) See Paragraph 4.1.A.

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

(c) Test Groups 1 and 2 Sequence 8 and 7 respectively measure inner contact, outer contact, and shield to body. Test Groups 1 and 2 Sequences 11 and 10, 13, 15 respectively measure inner contact resistance only.

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 Groups 1, 3, and 4 consist of 3 connector pairs each, which shall be cabled during R.F. testing. Test Group 2 shall consist of 3 connector pairs with each connector crimped to a 12 inch length of cable.

###### 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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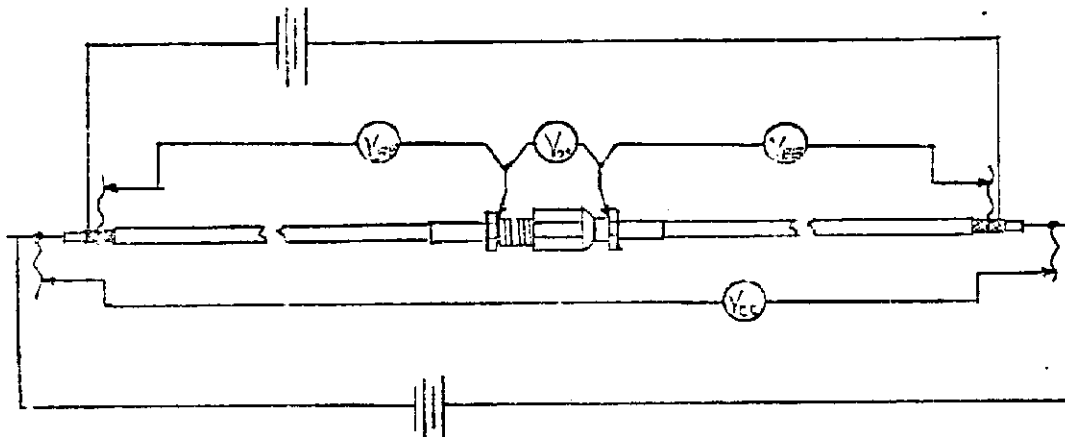
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- NOTE: (a)  $V_{sb}$  is shield to body measurement.  
 $V_{bc}$  is outer contact measurement.  
 $V_{cc}$  is center contact measurement.
- (b) Measure at 1 ampere DC.
- (c) Also measure 3 feet of wire, calculate milliohms per inch. Measure distance between probes on center contact measurement and shield to body measurement, multiply by milliohms per inch and subtract this value from measurement to obtain actual contact resistance.

Figure 3  
 Resistance Measurement Points

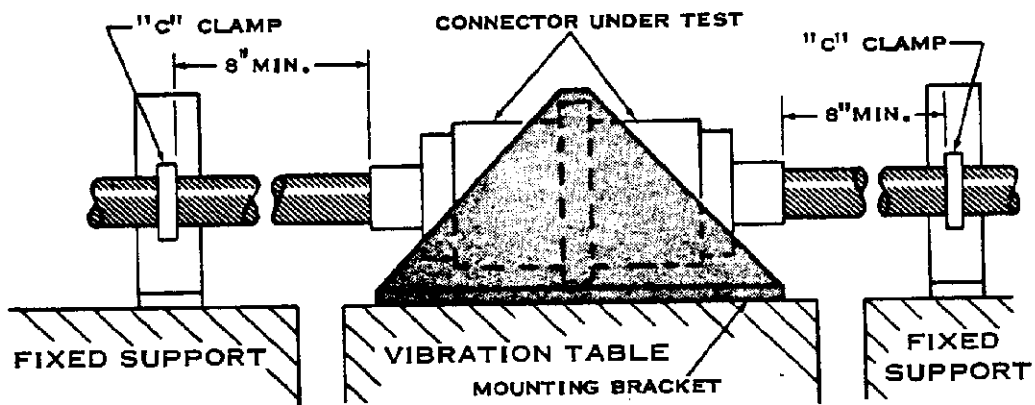


Figure 4

Vibration and Physical Shock Mounting

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