Connector, Coaxial, Consumer Series BNC, Crimp Type

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for AMP* consumer series BNC crimp type coaxial connectors.

1.2. Definitions

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

A. Connector assembly: Consists of mated plug and jack terminated to their respective cable.
B. Connector: May be either plug or jack as described below.
C. Plug: Contains male inner contact and a rotating collar for locking purposes.
D. Jack: Contains female inner contact and may be either cable, panel or bulkhead mounted types.
E. Feed thru adapter: Contains female inner contact either end.

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. 501-273: Test Report

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

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

3.2. Materials

A. Body: Brass, zinc or copper alloy, nickel plating
B. Contact: Beryllium copper, phosphor bronze or brass, gold over nickel plating
C. Dielectric: Polypropylene, polyethylene or polymethylpentene
D. Ferrule: Copper, tin-lead plating

3.3. Ratings

A. Voltage: 500 volts (rms) at sea level
B. Temperature: -25 to 85°C
C. Nominal impedance: 50 ohms
D. Frequency range: 0 to 2 GHz

3.4. Performance and Test Description

Product is designed to meet electrical, mechanical and environmental performance requirements specified in Figure 1. All tests are performed at ambient environmental conditions per AMP Specification 109-1 unless otherwise specified.

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, dry circuit.	Center contact: ΔR 3 milliohms maximum. Outer contact: ΔR 5 milliohms maximum.	Subject mated connectors to 50 mv open circuit at 100 ma. See Figure 3. AMP Spec 109-6-1.
Insulation resistance.	5000 megohms minimum.	Test between center and outer contacts of unmated connector assemblies. AMP Spec 109-28-4.
Dielectric withstanding voltage.	1500 vac at sea level.	Test between center and outer contacts of unmated connector assemblies. AMP Spec 109-29-1.
RF high potential.	1000 vac at 5 MHz.	Test between center and outer contacts of mated connector assemblies. AMP Spec 109-29-1, except at 5 MHz.

Figure 1 (cont)

Test Description	Requirement	Procedure
Corona.	300 volts (rms) minimum at 5 picocoulombs maximum discharge.	Test corona at 70000 feet simulated altitude. AMP Spec 109-40.
Shielding effectiveness.	40 dB minimum up to 1500 MHz. 35 dB minimum up to 2000 MHz.	Measure shielding effectiveness of mated pairs between 50 and 2000 MHz. AMP Spec 109-90.
RF insertion loss.	0.5 dB maximum.	Measure RF insertion loss at 2 GHz. AMP Spec 109-174-2.
Voltage standing wave ratio (VSWR).	1.30 maximum.	Measure VSWR of mated pairs between 0.1 and 2.0 GHz. AMP Spec 109-181.
MECHANICAL		
Vibration, sinusoidal.	No discontinuities of 10 microseconds or longer. See Note (a).	Subject mated connectors to 15 G's between 10-55-10 Hz. 2 hours in each of 3 mutually perpendicular planes. AMP Spec 109-21-1.
Physical shock.	No discontinuities of 10 microseconds or longer duration. See Note (a).	Subject mated connectors 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. AMP Spec 109-26-1.
Durability.	See Note (a).	Mate and unmate connector assemblies for 100 cycles at maximum rate of 12 cycles per minute. AMP Spec 109-27.
Mating/unmating force.	6 pounds maximum longitudinal. 6 inch pounds maximum torque.	Measure longitudinal and rotational forces necessary to mate and unmate connectors. Connectors are fully mated when bayonet lugs pass detents in coupling mechanism. AMP Spec 109-42, Conditions A and B.
Cable retention.	40 pounds minimum. No loss of electrical continuity. See Note (a).	Apply tensile load between cable and connector at rate of 1 inch per minute. Hold for 30 seconds and check electrical continuity using low voltage test light.

Figure 1 (cont)

Test Description	Requirement	Procedure
Coupling nut retention, rotational.	20 pounds minimum. Coupling nut shall not loosen or dislodge from plug body. See Note (a).	Apply tensile load between coupling nut and plug body at rate of 1 inch per minute. Hold for 1 minute. During hold, rotate coupling nut 2 revolutions in each direction.
ENVIRONMENTAL		
Thermal shock.	See Note (a).	Subject mated connectors to 5 cycles between -25 and 85°C. AMP Spec 109-22.
Humidity-temperature cycling.	Measure insulation resistance within 5 minutes of removal from chamber. See Note (a).	Subject mated connectors to 10 humidity-temperature cycles between 25 and 65°C at 95% RH. AMP Spec 109-23-4, Condition B.
Temperature life.	See Note (a).	Subject mated connectors to temperature life at 85°C for 1000 hours. AMP Spec 109-43.
Mixed flowing gas.	See Note (a).	Subject mated connectors to environmental class II for 14 days. AMP Spec 109-85-2.

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.

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	1,13	1,5	1,5	1,8	1,5	1,4
Termination resistance, dry circuit	4,8	2,4	2,4			
Insulation resistance				2,6		
Dielectric withstanding voltage				3,7		
RF high potential						3
Corona						2
Shielding effectiveness					3	
RF insertion loss					2	
Voltage standing wave ratio					4	
Vibration	6					
Physical shock	7					
Durability	5					
Mating force	2,9					
Unmating force	3,10					
Cable retention	11					
Coupling nut retention, rotational	12					
Thermal shock				4		
Humidity-temperature cycling				5		
Temperature life		3				
Mixed flowing gas			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

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. All test groups shall consist of 3 connector pairs with each connector crimped to a 12 inch length of RG58C/U cable. Cable used for testing shall conform to MIL-C-17.

B. Test Sequence

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

4.2. Requalification Testing

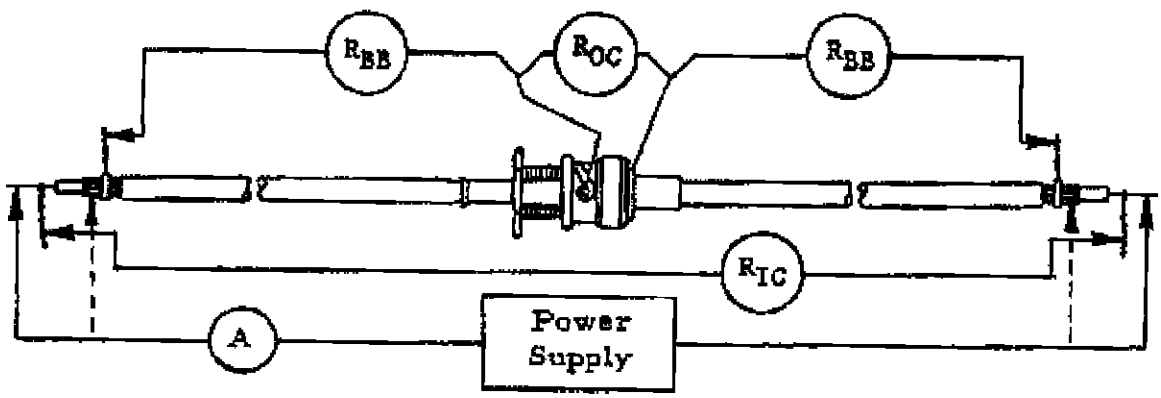
If changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of original testing sequence as determined by development/product, quality and reliability engineering.

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 (1) R_{OC} is outer contact measurement.
R_{IC} is inner contact measurement.
R_{BB} is braid to body measurement.
(2) Establish base resistance measurements. Measure ΔR after test sequence.

Figure 3
Resistance Measurement Points