
Connector, Coaxial, 3.5mm Blind Mate

1. SCOPE**1.1. Content**

This specification covers performance, tests and quality requirements for AMP* Blind Mate 3.5mm coaxial connectors. These connectors are designed for use on RG 402/U and RG 405/U semi-rigid cables and include full float panel and bulkhead plugs, right angle full float panel and bulkhead plugs, and bulkhead mounted jacks.

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. 501-271: Test Report

2.2. Military Standard

MIL-C-17: Cable, Coaxial, Radio Frequency

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. Jacks:
- (1) Contact:
 - (a) Center: Beryllium copper, gold plating
 - (b) Outer: Stainless steel, gold plating
 - (2) Dielectric: PTFE
 - (3) Grip ring: Brass, nickel plating
 - (4) O-ring: Silicone rubber
 - (5) Shell: Stainless steel, passivated
- B. Plugs:
- (1) Contact:
 - (a) Center: Beryllium copper, gold over nickel plating
 - (b) Outer: Beryllium copper, gold over nickel plating
 - (2) Body: Stainless steel, passivated
 - (3) Dielectric: PTFE
 - (4) Grip ring: Brass, nickel plating
 - (5) Retention clip: Beryllium copper, tin-lead plating
 - (6) Shell: Stainless steel, passivated
 - (7) Spring: Music wire

3.3. Ratings

- A. Voltage:
- (1) Sea level:
 - (a) 500 volts rms with RG 402/U cable
 - (b) 335 volts rms with RG 405/U cable
 - (2) 70000 feet
 - (a) 125 volts rms with RG 402/U cable
 - (b) 85 volts rms with RG 405/U cable
- B. Temperature: -65 to 105°C
- C. Nominal Impedance: 50 ohms
- D. Frequency Range: 0 to 26.5 GHz

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.	ΔR 1.5 milliohms maximum for center contact. ΔR 3 milliohms maximum for shield.	AMP 109-6-1. Subject samples to 50 mv maximum open circuit at 100 ma maximum. See Figure 3.

Figure 1 (cont)

AMP

Test Description	Requirement	Procedure
Voltage standing wave ratio.	1.02 \pm .007F (GHz) for RG 402/U cable. 1.05 \pm .007F (GHz) for RG 405/U cable.	AMP Spec 109-9-2. Measure VSWR between 0.1 and 26.8 GHz.
Insulation resistance.	5000 megohms minimum.	AMP Spec 109-28-4. Test between center contact and outer shield of unmated samples.
Dielectric withstanding voltage.	1500 vac at sea level for RG 402/U cable. 1000 vac at sea level for RG 405/U cable.	AMP Spec 109-29-1. Test between center contact and outer shield of unmated samples.
RF high potential.	1000 volts rms for RG 402/U cable. 670 volts rms for RG 405/U cable.	AMP Spec 109-29-4, except 5 MHz ac. Test between center contact and outer shield of unmated samples.
Corona.	250 vdc minimum at 5 picoulombs maximum discharge for RG 405/U cable. 375 vdc minimum at 5 picoulombs maximum discharge for RG 402/U cable.	AMP Spec 109-40. Test corona at 70000 feet simulated altitude.
RF insertion loss.	.07 dB maximum.	AMP Spec 109-174-1. Measure RF insertion loss at 6 GHz.
RF leakage.	75dB maximum cable to cable.	AMP Spec 109-182. Measure RF leakage at 2.5 GHz.
MECHANICAL		
Vibration, sinusoidal.	No discontinuities of 1 microsecond or longer duration. See Note (a).	AMP Spec 109-21-4. Subject mated samples to 20 G's between 10-2000-10 Hz traversed in 20 minutes. 4 hours in each of 3 mutually perpendicular planes.
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. 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 500 cycles at maximum rate of 500 cycles per hour.

Figure 1 (cont)

Test Description	Requirement	Procedure
Mating force.	6 pounds maximum.	AMP Spec 109-42, Conditions A and B. Measure force necessary to mate samples.
Unmating force.	6 pounds maximum.	AMP Spec 109-42, Conditions A and B. Measure force necessary to unmate samples.
Cable retention.	60 pounds retention and 55 inch ounces torque for RG 402/U cable. 30 pounds retention and 16 inch ounces torque for RG 405/U cable. See Note (a).	AMP Spec 109-46. Apply retention force between connector and cable and hold for 30 seconds, then check for electrical continuity. Apply torque in both directions at a point 1 cable diameter from connector, then check for electrical continuity.
ENVIRONMENTAL		
Thermal shock.	See Note (a).	AMP Spec 109-22. Subject mated samples to 5 cycles between -65 and 105°C.
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.
Temperature life.	See Note (a).	AMP Spec 109-43. Subject mated samples to temperature life at 105°C for 1000 hours.
Mixed flowing gas.	See Note (a).	AMP Spec 109-85-2. Subject mated samples to environmental class II for 14 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	6
	Test Sequence (b)					
Examination of product	1,12	1,5	1,5	1,8	1,5	1,4
Termination resistance	4,8	2,4	2,4			
Voltage standing wave ratio					4	
Insulation resistance				2,6		
Dielectric withstanding voltage				3,7		
RF high potential						3
Corona						2
RF insertion loss					2	
RF leakage					3	
Vibration	6					
Physical shock	7					
Durability	5					
Mating force	2,9					
Unmating force	3,10					
Cable retention	11					
Thermal shock				4		
Humidity-temperature cycling				5		
Temperature life		3				
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. Test group 1 shall consist of 3 unmated and uncabled connector pairs. Test groups 2, 4 and 5 shall each consist of 3 connector pairs which shall be cabled during RF testing. Test groups 3 and 6 shall each consist of 3 connector pairs crimped to a 12 inch length of cable. Cable used for testing shall be RG 402/U and RG 405/U conforming 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.

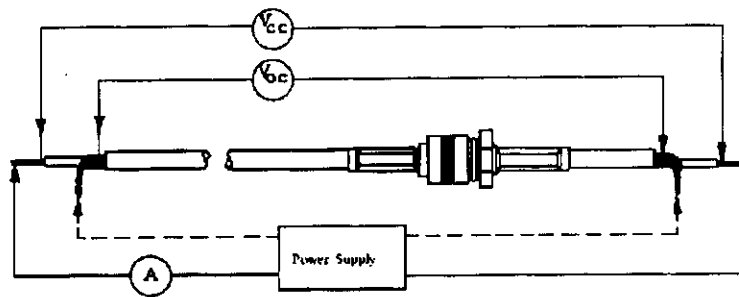


Figure 3
Termination Resistance Measurement Points