

PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for AMP\* N Series coaxial connectors for RG-402 semi-rigid cable.

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 constitute a part of this specification to the extent specified herein. 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. 501-179: Test Report

3. REQUIREMENTS

3.1. Design and Construction

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

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Product Code: 3317

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|  |                          |            |               |   |  |                  |                  |
|--|--------------------------|------------|---------------|---|--|------------------|------------------|
| <p><b>CONTROLLED DOCUMENT</b><br/>This specification is a controlled document per AMP Specification 102-21. It is subject to change and Corporate Standards should be contacted for latest revision.</p> |                          |            |               | <p>DR<br/><i>Brent L Beckley 8/27/92</i></p>  | <p><b>AMP</b> AMP Incorporated<br/>Harrisburg, PA 17105-3608</p> |                  |                  |
|  |                          |            |               | <p>CHK<br/><i>Michael R. Paul 8/31/92</i></p> |  |                  |                  |
|  |                          |            |               | <p>APP<br/><i>Konan Pabel 9-8-92</i></p>      | <p>NO<br/><b>108-12093</b></p>                                   | <p>REV<br/>0</p> | <p>LOC<br/>B</p> |
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| LTR  | REVISION RECORD          | APP        | DATE          | 1 OF 7  | CONNECTOR, COAXIAL, N SERIES, SEMI-RIGID CABLE                   |                  |                  |

### 3.2. Materials

- A. Adapter assembly
  - (1) Collar: Stainless steel, passivated
  - (2) Grip ring: Brass, nickel plating
  - (3) Shell: Stainless steel, passivated
- B. Jack
  - (1) Contact, center: Beryllium copper, gold plating
  - (2) Dielectric: Polytetrafluorethylene
  - (3) Shell: Brass, bright nickel over copper plating
- C. Plug
  - (1) Contact, center: Beryllium copper, gold plating
  - (2) Contact, outer: Phosphor bronze, bright nickel over copper plating
  - (3) Coupling nut: Brass, bright nickel over copper plating
  - (4) Dielectric: Polytetrafluorethylene
  - (5) Shell: Brass, bright nickel over copper plating

### 3.3. Ratings

- A. Voltage: 1000 volts alternating current
- B. Temperature: -65 to 105°C
- C. Characteristic Impedance: 50Ω
- D. Frequency Range: 0 to 15 GHz

### 3.4. Performance and Test Description

Product is designed to meet electrical, mechanical and environmental performance requirements specified in Figure 1. All tests 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. | 1.5 milliohms maximum initial.<br>2 milliohms maximum final. | Subject mated contacts assembled in housing to 50 mv open circuit at 100 ma.<br>See Figure 3.<br>AMP Spec 109-6-1. |
| Dielectric withstanding voltage.     | 1500 vac at sea level.<br>No breakdown or flashover.         | Test between center contact and outer shell of unmated connector assemblies.<br>AMP Spec 109-29-1.                 |

Figure 1 (cont)

| Test Description                    | Requirement   | Procedure   |
|-------------------------------------|---|---|
| Insulation resistance.              | 5000 megohms minimum initial.<br>5000 megohms minimum final.    | Test between center contact and outer shell of unmated connector assemblies.<br>AMP Spec 109-28-4.  |
| RF high potential.                  | 1000 volts rms.<br>1 minute hold.                               | Test between center contact and outer shell of unmated connector assemblies.<br>AMP Spec 109-29-3.  |
| RF insertion loss.                  | .06 f(GHz) maximum at 6 GHz.                                    | Measure RF insertion loss at 6 GHz.<br>AMP Spec 109-174-2.  |
| RF leakage.                         | -60 dB minimum leakage.   | Measure RF leakage between 2 and 3 GHz.<br>AMP Spec 109-182   |
| Voltage standing wave ratio. (VSWR) | 1.35 maximum.   | Measure VSWR between .5 and 15 GHz.<br>AMP Spec 109-181.  |
| Permeability.                       | 2 Mμ maximum.   | Measure permeability using 2 Mμ pellet.<br>AMP Spec 109-88.   |
| Corona/altitude.                    | Less than 5 picocoulombs at 375 volts rms minimum.              | Measure connectors for corona at 70000 feet simulated altitude.<br>AMP Spec 109-40.   |
| <b>MECHANICAL</b>                   |   |   |
| Sinusoidal vibration.               | No discontinuities greater than 1 microsecond.<br>See Note (a). | Subject mated connectors to 20 G's between 10 to 2000 Hz traversed in 20 minutes in each of 3 mutually perpendicular planes.<br>See Figure 4.<br>AMP Spec 109-21-4.   |
| Physical shock.                     | No discontinuities greater than 1 microsecond.<br>See Note (a). | Subject mated connectors 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.<br>See Figure 4.<br>AMP Spec 109-26-9. |

Figure 1 (cont)

|            |   |      |           |     |     |
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| Test Description              | Requirement   | Procedure   |
|-------------------------------|---|---|
| Contact engaging force.       | 25 pounds maximum outer contacts, plug only.<br>2 pounds maximum inner contacts, jack only. | Measure force necessary to engage .066 $\phi$ pin to .125 depth for jacks after pre-conditioning 1 time with .073 $\phi$ pin. Measure force necessary to engage .316 ID ring to .093 minimum depth on outer plug contact.<br>AMP Spec 109-35. |
| Contact separating force.     | 2 ounces minimum.   | Measure force necessary to separate .063 $\phi$ pin from center jack contacts.<br>AMP Spec 109-35.  |
| Coupling nut retention.       | Coupling nut shall not loosen or dislodge from plug body.                                   | Apply 100 pound tensile load between coupling nut and plug body for 1 minute. During test, rotate nut 2 revolutions in each direction.<br>AMP Spec 109-50.  |
| Durability.                   | See Note (a).   | Mate and unmate connector assemblies for 500 cycles at maximum rate of 600 cycles per hour.<br>AMP Spec 109-27.   |
| ENVIRONMENTAL                 |   |   |
| Thermal shock.                | See Note (a).   | Subject mated connectors to 5 cycles between -65 and 115°C.<br>AMP Spec 109-22.   |
| Humidity-temperature cycling. | See Note (a).   | Subject mated connectors to 10 humidity-temperature cycles between 25 and 65°C at 95% RH.<br>AMP Spec 109-23-4, Condition B.  |
| Mixed flowing gas.            | See Note (a).   | Subject mated connectors to environmental class II for 20 days.<br>AMP Spec 109-85-2.   |
| Temperature life.             | See Note (a).   | Subject mated connectors to temperature life at 105°C for 1000 hours duration.<br>AMP Spec 109-43.  |

(a) Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests specified in Test Sequence in Figure 2.

Figure 1 (end)

|  |      |    |           |     |     |
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### 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              | 1,10              | 1,5 | 1,5  | 1,9 | 1,5 | 1,4 |
| Termination resistance, dry circuit | 3,7               | 2,4 | 2,4  |     |     |     |
| Dielectric withstanding voltage     |                   |     |      | 3,8 |     |     |
| Insulation resistance               |                   |     |      | 2,7 |     |     |
| RF high potential                   |                   |     |      |     |     | 3   |
| RF insertion loss                   |                   |     |      |     | 2   |     |
| RF leakage                          |                   |     |      |     | 3   |     |
| Voltage standing wave ratio         |                   |     |      |     | 4   |     |
| Permeability                        |                   |     |      | 4   |     |     |
| Corona/altitude                     |                   |     |      |     |     | 2   |
| Vibration                           | 5                 |     |      |     |     |     |
| Physical shock                      | 6                 |     |      |     |     |     |
| Contact engaging force              | 2                 |     |      |     |     |     |
| Contact separation force            | 8                 |     |      |     |     |     |
| Coupling nut retention              | 9                 |     |      |     |     |     |
| Durability                          | 4                 |     |      |     |     |     |
| Thermal shock                       |                   |     |      | 5   |     |     |
| Humidity-temperature cycling        |                   |     |      | 6   |     |     |
| Mixed flowing gas                   |                   |     | 3(c) |     |     |     |
| Temperature life                    |                   | 3   |      |     |     |     |

- (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.

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 contain minimum of 5 connectors each.

###### 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.

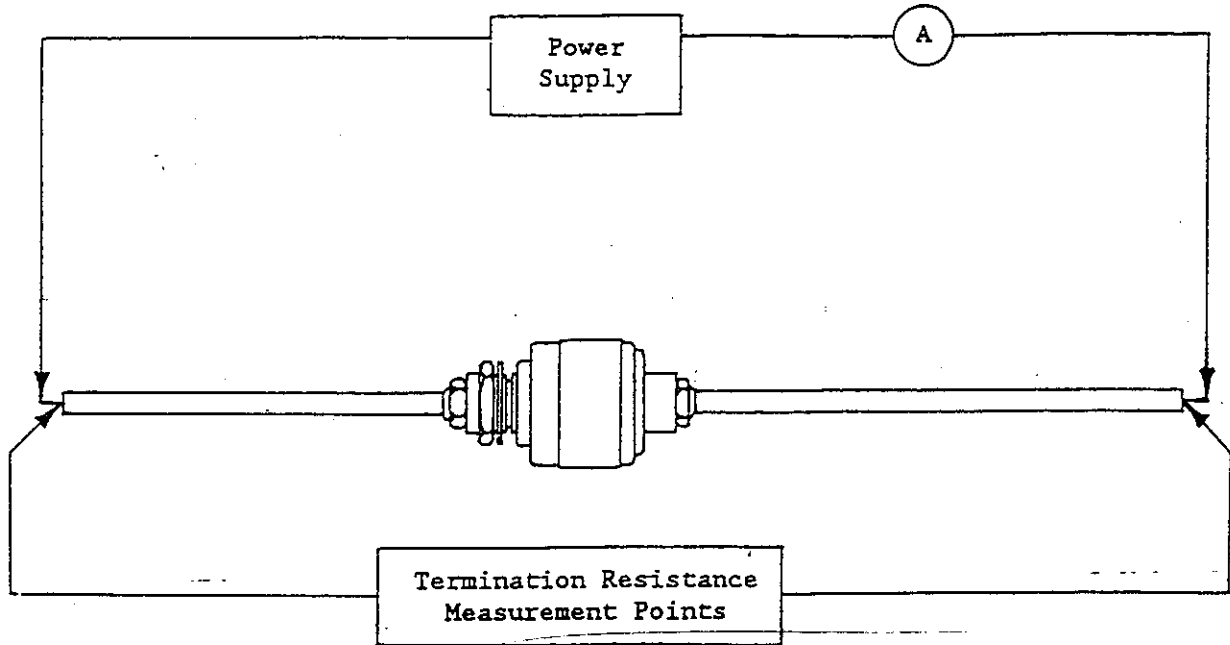
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#### 4.3. Acceptance

Acceptance is based upon 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 prior to resubmittal.

#### 4.4. Quality Conformance Inspection

Applicable AMP quality inspection plan will specify acceptable quality sampling level to be used. Dimensional and functional requirements shall be in accordance with applicable product drawing and this specification.



- Note:
- (a)  $V_{IC}$  is inner contact measurement.
  - (c) Measure 3 feet of wire and calculate milliohms per inch. Measure distance between probes on specimens and subtract an equal distance of wire resistance to obtain actual termination resistance.

Figure 3  
Termination Resistance Measurement Points

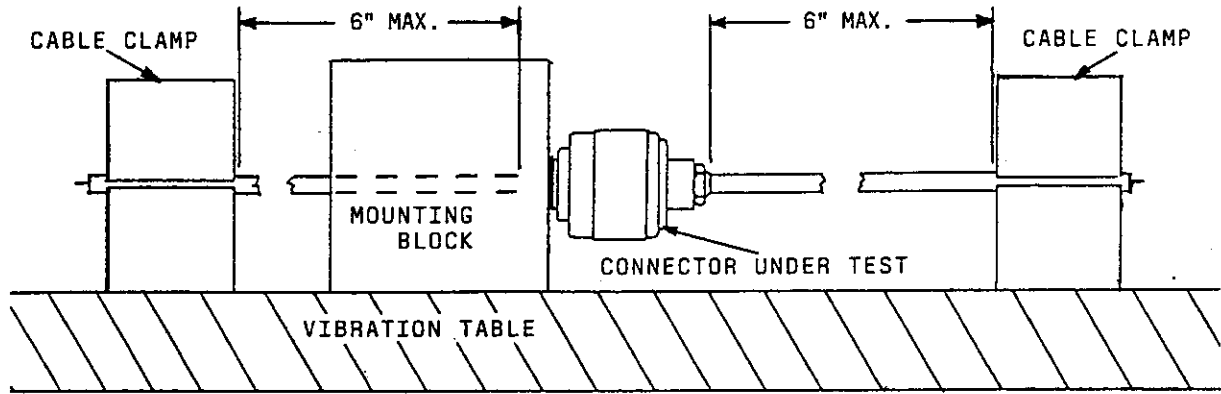


Figure 4  
 Vibration And Physical Shock Mounting Fixture