# Connector, Coaxial, SMA Series Hex Crimp For Flexible Cable

## 1. SCOPE

### 1.1. Content

This specification covers performance, tests and quality requirements for AMP* SMA series hex crimp connectors for flexible 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 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. 501-296: Test Report

## 3. REQUIREMENTS

### 3.1. Design and Construction

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

### 3.2. Materials

Materials used in construction shall be as specified on applicable product drawing.

### 3.3. Ratings

A. Voltage:
   (1) 335 volts rms at sea level
   (2) 85 volts rms at 70000 feet
B. Current: Signal application only
C. Temperature:
   (1) -65 to 165°C when used with cable having teflon dielectric
   (2) -55 to 85°C when used with cable having polyethylene dielectric
D. Nominal Impedance: 50 ohms
E. Frequency Range: 0 to 12.4 GHz




| Indicates change

### 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. | 10 milliohms maximum for center contact.<br>4 milliohms maximum for braid.<br>ΔR 2 milliohms maximum. | AMP 109-6-1.<br>Subject mated contacts assembled in housing to 50 mv maximum open circuit at 100 ma maximum.<br>See Figure 3. |
| Voltage standing wave ratio. | 1.15 + .02F (GHz) maximum. | AMP Spec 109-9-2.<br>Measure VSWR between .5 and 12.4 GHz. |
| Insulation resistance. | 5000 megohms minimum. | AMP Spec 109-28-4.<br>Test between center contact and outer braid of unmated samples. |
| Dielectric withstanding voltage. | 1000 vac at sea level. | AMP Spec 109-29-1.<br>Test between center contact and outer braid of unmated samples. |
| RF high potential. | 670 volts rms at 5 MHz. | AMP Spec 109-29-3.<br>Test between center contact and outer braid of unmated samples. |
| Corona. | Less than 5 picoloumbs at 250 volts rms minimum. | AMP Spec 109-40.<br>Test corona at 70000 feet simulated altitude. |
| Shielding effectiveness | Minimum of 40 dB to 1500 MHz.<br>Minimum of 20 dB to 2000 MHz. | AMP Spec 109-90.<br>Measure shielding effectiveness between 50 and 2000 MHz. |
| RF insertion loss. | .06 √F(GHz) dB maximum at 6 GHz for standard plug and jack.<br>.15 √F(GHz) dB maximum at 6 GHz for right angle plug. | AMP Spec 109-174-2.<br>Measure RF insertion loss at 6 GHz. |
| MECHANICAL | | |
| Vibration, sinusoidal. | No discontinuities of 1 microsecond or longer duration. See Note (a). | AMP Spec 109-21-4.<br>Subject mated samples to 20 G's between 10-2000-10 Hz traversed in 20 minutes in each of 3 mutually perpendicular planes.<br>See Figure 4. |

Figure 1 (cont)

| Test Description | Requirement | Procedure |
|---|---|---|
| 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. See Figure 4. |
| Durability. | See Note (a). | AMP Spec 109-27. Mate and unmate samples for 500 cycles at maximum rate of 600 cycles per hour. |
| Mating torque. | See Note (a). | AMP Spec 109-42, Condition B. Torque samples to 8 inch pounds. |
| Unmating torque. | 6 inch ounces minimum. | AMP Spec 109-42, Condition B. Measure torque necessary to unmate samples. |
| ENVIRONMENTAL | | |
| Thermal shock. | See Note (a). | AMP Spec 109-22. Subject mated samples to 5 cycles between -55 and 85°C. |
| Humidity-temperature cycling. | See Note (a). | AMP Spec 109-23-3, 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 85°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 | 1,9 | 1,5 | 1,5 | 1,8 | 1,5 | 1,4 |
| Termination resistance | 3,7 | 2,4 | 2,4 | | | |
| Voltage standing wave ratio | | | | | 4 | |
| Insulation resistance | | | | 2,6 | | |
| Dielectric withstanding voltage | | | | 3,7 | | |
| RF high potential | | | | | | 3 |
| Corona | | | | | | 2 |
| Shielding effectiveness | | | | | 3 | |
| RF insertion loss | | | | | 2 | |
| Vibration | 5 | | | | | |
| Physical shock | 6 | | | | | |
| Durability | 4 | | | | | |
| Mating force | 2 | | | | | |
| Unmating force | 8 | | | | | |
| Thermal shock | | | | 4 | | |
| Humidity-temperature cycling | | | | 5 | | |
| Temperature life | | 3(c) | | | | |
| 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. All test groups shall each consist of a minimum of 5 connectors.

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.

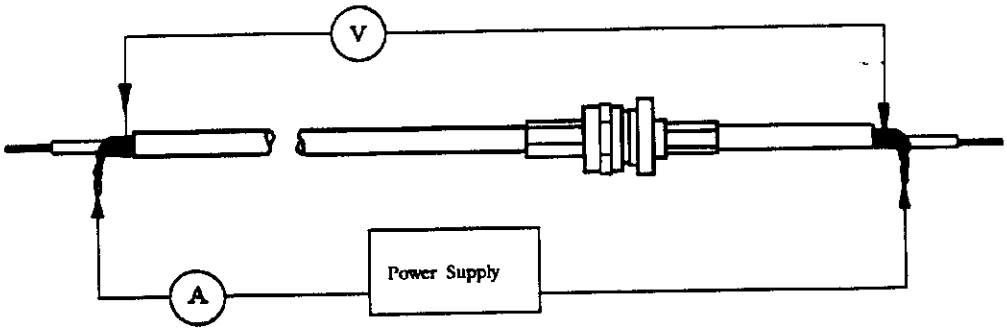


Figure 3
Termination Resistance Measurement Points

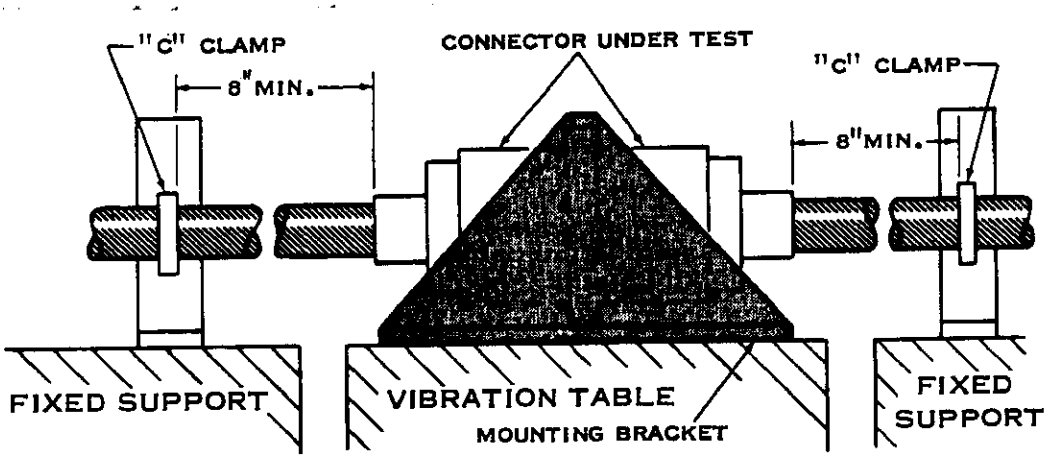


Figure 4
Vibration & Physical Shock Mounting Fixture