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## .031 X .061 Locking Clip Connector

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### 1. SCOPE

#### 1.1. Content

This specification covers the performance and test requirements and quality assurance provisions for the AMP\* locking clip contacts used to connect wire to .031 x .062 wiring post with positive retention system. It is intended to be used with the AMPMODU\* Mod I post product line. Contacts may be used individually or in multiple position housings. Contacts are crimp type, snap-in design, and are available with gold or tin plating.

### 2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the 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. 114-25008: Contact, .031 x .062 Locking Clip, Application of

### 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. Material

- A. Housing: Polyester, 94V-0
- B. Contact: Phosphor bronze, tin or gold over nickel plating
- C. Clip: Stainless steel

#### 3.3. Rating

- A. Current: 5 amperes maximum per contact
- B. Operating Temperature: -65° to 105°C

### 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 Procedure Summary

Test Description	Requirements	Procedure
Examination of Product	Meet requirements of drawing and AMP Spec 114-25008.	Dimensional and visual.
<b>ELECTRICAL</b>		
Termination Resistance, Dry Circuit (Low Level)	12 milliohms maximum.	Subject mated contacts assembled in housing to 50 mv maximum open circuit, 100 ma maximum; AMP Spec 109-6, cond A, measured as indicated in Figure 3 and 4.
Termination Resistance, Specified Current	6 milliohms maximum for gold plated contacts; 12 milliohms maximum for tin plated contacts.	Measure potential drop of mated contacts, current as indicated but not to exceed 3 amperes, see Figure 3 or 4; AMP Spec 109-25.
Insulation Resistance	5000 meoghms minimum initial.	Unmated connectors, test between adjacent contacts and contacts to mounting hardware; AMP Spec 109-28-4.
Dielectric Withstanding Voltage	Test Voltage (rms)      Altitude, <u>.156 centerline</u> <u>feet</u> 1,200      Sea Level 450      50,000 275      70,000 1 minute hold. No breakdown or flashover.	Unmated connectors, test between adjacent contacts and contacts to mounting hardware, 500 volts per second until test potential is reached; AMP Spec 109-29-1.

Figure 1 (cont)

Test Description	Requirements	Procedure																
Crimp Resistance	<p>Resistance, milliohms maximum</p> <table border="1"> <thead> <tr> <th>Wire Size, AWG</th> <th>Test Current, amp</th> <th>Initial</th> <th>Final</th> </tr> </thead> <tbody> <tr> <td>18</td> <td>5</td> <td>1.7</td> <td>2.5</td> </tr> <tr> <td>20</td> <td>5</td> <td>2.0</td> <td>3.0</td> </tr> <tr> <td>22</td> <td>5</td> <td>3.0</td> <td>5.0</td> </tr> </tbody> </table>	Wire Size, AWG	Test Current, amp	Initial	Final	18	5	1.7	2.5	20	5	2.0	3.0	22	5	3.0	5.0	Measure as indicated in Figure 3. Record measurement after temperature of wire has stabilized. Calculate crimp resistance; AMP Spec 109-25.
Wire Size, AWG	Test Current, amp	Initial	Final															
18	5	1.7	2.5															
20	5	2.0	3.0															
22	5	3.0	5.0															
Current Cycling	Crimp resistance shall not exceed "Final" value.	125% rated current for 30 minutes, 15 minutes no current, total 50 cycles; AMP Spec 109-51, cond B, method 3.																
<b>MECHANICAL</b>																		
Connector Mating Force	6.0 pounds maximum per contact 1st cycle; 4.0 pounds maximum per contact 3rd cycle.	Connector mating force divided by number of contacts; AMP Spec 109-42, cond A, measure initial force after third mating.																
Connector Unmating Force	3 pounds minimum per contact 1st cycle; 2 pounds minimum per contact 3rd cycle.	Connector unmating force divided by number of contacts; AMP Spec 109-42, cond A, mate connector and measure force to unmate.																
Durability	Termination resistance, dry circuit; connector unmating force; no mechanical damage.	<p>Mate and unmate at a rate of 150 cycles per hour for the number of cycles specified; AMP Spec 109-27.</p> <table border="1"> <thead> <tr> <th>Plating</th> <th>Cycles</th> </tr> </thead> <tbody> <tr> <td>15 microinches gold</td> <td>25</td> </tr> <tr> <td>100 microinches tin</td> <td>25</td> </tr> </tbody> </table>	Plating	Cycles	15 microinches gold	25	100 microinches tin	25										
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Vibration	No interruption of continuity greater than 1 microsecond; no physical damage.	Subject wired and mated connectors to 10 G's, 10-500 Hz, with 100 ma current applied; AMP Spec 109-21-2.																

Figure 1 (cont)

Test Description	Requirements	Procedure
Physical Shock	No interruption of continuity greater than 1 microsecond; no physical damage.	Subject rigid mount wired and mated connectors to 100 G's, 6 millisecond; sawtooth wave form; with 100 ma current applied; 3 shocks in each direction applied along the 3 mutually perpendicular planes, total 18 shocks; AMP Spec 109-26-9.
Contact Retention	Contact shall not dislodge from its normal locking position.	Apply an axial load of 6.5 pounds to each contact at a rate of 1 inch per minute; AMP Spec 109-30.
Crimp Tensile	Wire shall not separate from contact. Wire Size, Tensile, <u>AWG</u> <u>pounds minimum</u> 18            25 20            17.5 22            11	Apply an axial load as specified at a rate of 1 inch per minute; AMP Spec 109-16.
Contact Locking Spring Retention	10 pounds minimum.	Straight axial force applied at a rate of 5 inches per minute.
<b>ENVIRONMENTAL</b>		
Thermal Shock	Termination resistance, dry circuit, no physical damage.	Subject wired and mated connector to 5 cycles, -65° to 105°C; AMP Spec 109-22.

Figure 1 (end)

### 3.6. Connector Tests and Sequence

Test or Examination	Test Group (a)		
	1	2	3
	Test Sequence (b)		
Examination of Product	1	1	1
Termination Resistance, Dry Circuit	3, 9, 11, 16, 20, 23		3, 7, 9, 14, 16, 19
Termination Resistance, Specified Current	4, 21, 24		4, 17, 20
Insulation Resistance	6, 17		
Dielectric Withstanding Voltage	7, 18		
Crimp Resistance		2, 4	
Current Cycling		3	
Connector Mating Force	2		2
Connector Unmating Force	5, 12		5, 10
Durability	10		8
Vibration	13		11 (d)
Physical Shock	14		12
Contact Retention	25		
Crimp Tensile		5	
Contact Locking Spring Retention			21
Thermal Shock	8		6
Temperature-Humidity Cycling	15		13
Corrosion, Salt Spray (c) (e)	19		15
Corrosion, Industrial Gas (c) (e)	22		18

(a) See Para 4.1.A.

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

(c) This test is not applicable to tin plated parts.

(d) Housings removed prior to vibration test, and left off for remainder of tests.

(e) One half of the samples shall be subjected to salt spray the remaining half to industrial gas.

Figure 2

#### 4. PRODUCT ASSURANCE PROVISIONS

##### 4.1. Qualification Testing

###### A. Sample Selection

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets. Test group 1 shall consist of 6 connectors with a minimum of 36 contacts. Test group 2 shall consist of a minimum of 30 contacts. Test group 3 shall consist of a minimum of 36 contacts. All test measurements shall consist of 30 random readings.

###### B. Test Sequence

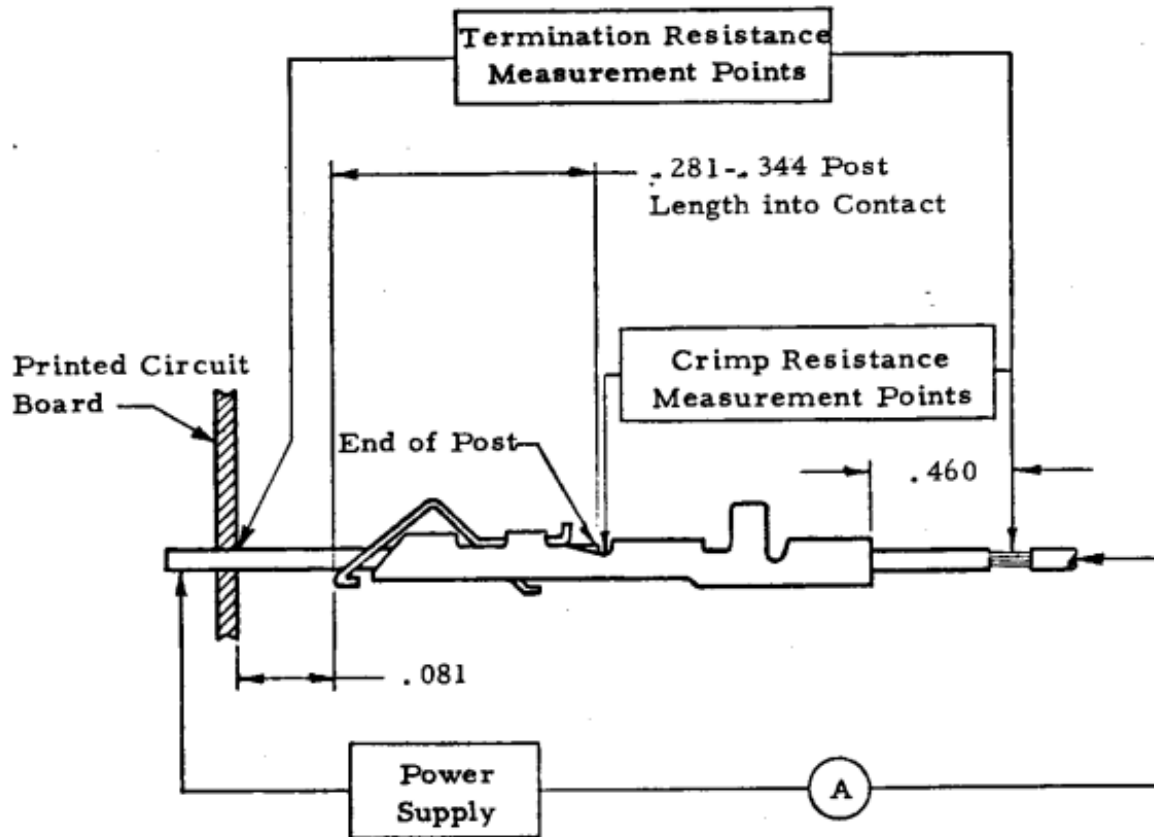
Qualification inspection shall be verified by testing samples as specified in Figure 2.

###### C. Acceptance

- (1) Requirements put on test samples, as indicated in the requirements portion of Figure 1, exist as either the upper or lower statistical tolerance limit (95% confidence, 99% reliability). All samples tested in accordance with this specification shall meet the stated tolerance limit.
- (2) Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification.

##### 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.



**Figure 3**  
**Termination and Crimp Resistance Measurement Points**  
**for Crimped Receptacles**

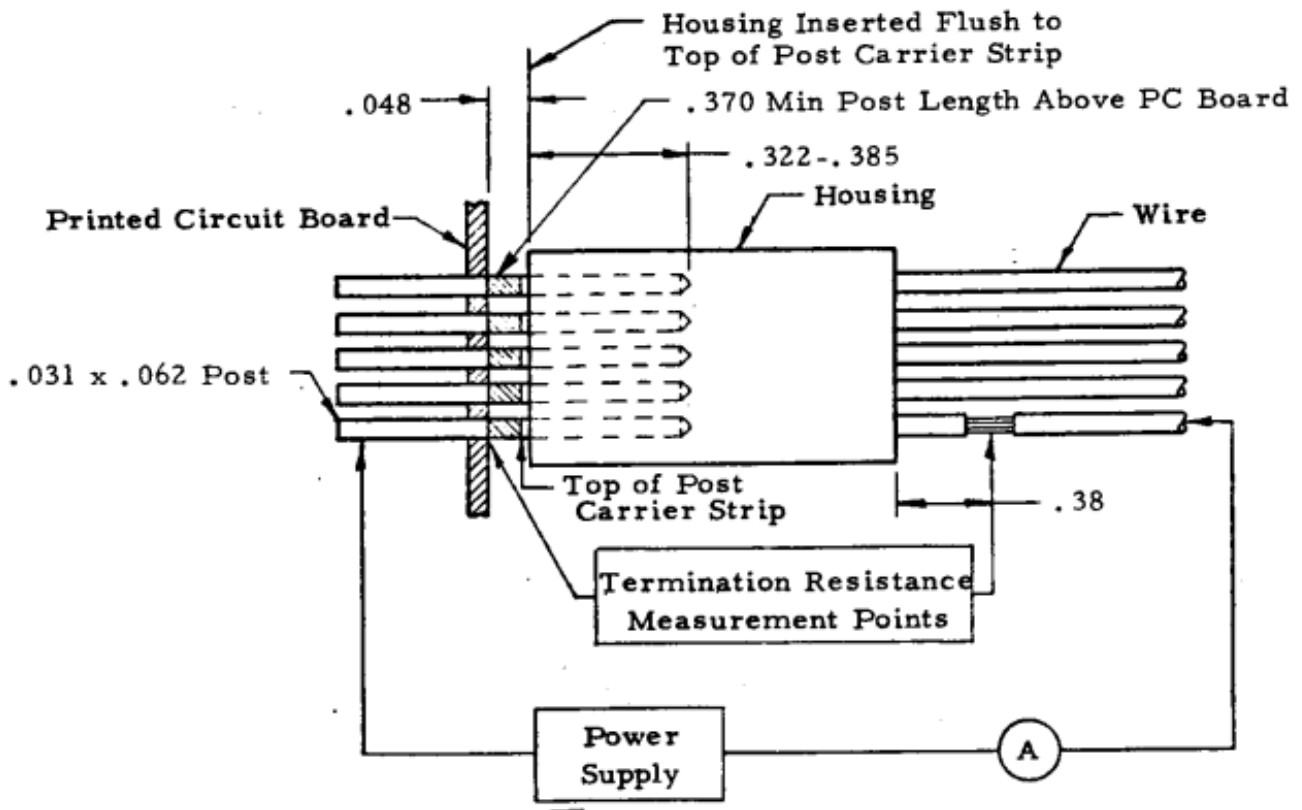


Figure 4

Termination Resistance Measurement Points for Connectors