

**Connector, AMPLIMITE\*, Shielded, .050 Series****1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for AMPLIMITE\* .050 series product. This product consists of printed circuit board mounted and cable applied plug and receptacle connectors, excluding S-Bus, ACTION PIN\* connectors and product intended for termination to .025 inch centerline ribbon cable and surface mount product.

## 1.2. Qualification

When tests are performed on subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

**2. APPLICABLE DOCUMENTS**

The following Tyco Electronics documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. 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.

- 109-1: Test Specification (General Requirements for Test Specifications)
- 109 Series: Test Specifications as indicated in Figure 1
- 114-40029: Application Specification (AMPLIMITE\* .050 Series Insulation Displacement and Printed Circuit Board Connectors)
- 501-155: Qualification Test Report (Connector, AMPLIMITE\*, Shielded, .050)

**3. REQUIREMENTS**

## 3.1. Design and Construction

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

## 3.2. Materials

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

## 3.3. Ratings

- Voltage: 30 volts AC per UL and CSA
- Current: Signal application only, 1 ampere maximum at 50% energized, See Figure 2.
- Temperature: -55 to 105°C

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per Test Specification 109-1.

3.5. Test Requirements and Procedures Summary

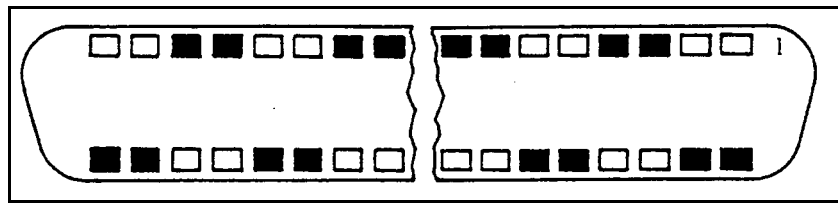
Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and Application Spec 114-40029.	Visual, dimensional and functional per applicable quality inspection plan.
<b>ELECTRICAL</b>		
Termination resistance.	25 milliohms maximum.	AMP Spec 109-6-1. Subject mated contacts assembled in housing to 50 mv maximum open circuit at 100 ma maximum. See Figure 5.
Insulation resistance.	1000 megohms minimum.	AMP Spec 109-28-4. Test between adjacent contacts of mated samples.
Dielectric withstanding voltage.	500 vac at sea level.	AMP Spec 109-29-1. Test between adjacent contacts of mated samples.
Capacitance.	3 picofarads maximum.	AMP Spec 109-47, Condition E. Test between adjacent circuits of mated samples.
<b>MECHANICAL</b>		
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See Note.	AMP Spec 109-21-5. Subject mated samples to 7.3 G's rms. 20 minutes in each of 3 mutually perpendicular planes. See Figures 6 and 7.
Physical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	AMP Spec 109-26-1, except 30 G's. Subject mated samples to 30 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figures 6 and 7.
Durability.	See Note.	AMP Spec 109-27. Mate and unmate samples without locking latches for 500 cycles at maximum rate of 800 cycles per hour.

Figure 1 (continued)

Test Description	Requirement	Procedure												
Mating force.	<table border="1"> <thead> <tr> <th>Connector Position</th> <th>Pounds Maximum</th> </tr> </thead> <tbody> <tr> <td>20 - 40</td> <td>15</td> </tr> <tr> <td>42 - 60</td> <td>20</td> </tr> <tr> <td>62 - 80</td> <td>30</td> </tr> <tr> <td>82 - 100</td> <td>40</td> </tr> <tr> <td>102 - 120</td> <td>50</td> </tr> </tbody> </table>	Connector Position	Pounds Maximum	20 - 40	15	42 - 60	20	62 - 80	30	82 - 100	40	102 - 120	50	AMP Spec 109-42, Condition A. Measure force necessary to mate samples without locking latches at maximum rate of 1 inch per minute.
Connector Position	Pounds Maximum													
20 - 40	15													
42 - 60	20													
62 - 80	30													
82 - 100	40													
102 - 120	50													
Unmating force.	<table border="1"> <thead> <tr> <th>Connector Position</th> <th>Pounds Minimum</th> </tr> </thead> <tbody> <tr> <td>20 - 40</td> <td>1.5</td> </tr> <tr> <td>42 - 60</td> <td>2.0</td> </tr> <tr> <td>62 - 80</td> <td>3.0</td> </tr> <tr> <td>82 - 100</td> <td>5.0</td> </tr> <tr> <td>102 - 120</td> <td>7.0</td> </tr> </tbody> </table>	Connector Position	Pounds Minimum	20 - 40	1.5	42 - 60	2.0	62 - 80	3.0	82 - 100	5.0	102 - 120	7.0	AMP Spec 109-42, Condition A. Measure force necessary to unmate samples without locking latches at maximum rate of 1 inch per minute.
Connector Position	Pounds Minimum													
20 - 40	1.5													
42 - 60	2.0													
62 - 80	3.0													
82 - 100	5.0													
102 - 120	7.0													
Housing lock strength.	25 pounds minimum.	AMP Spec 109-50. Determine strength of housing locking mechanism.												
<b>ENVIRONMENTAL</b>														
Thermal shock.	See Note.	AMP Spec 109-22. Subject mated samples to 25 cycles between -55 and 105°C.												
Humidity-temperature cycling.	See Note.	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.	AMP Spec 109-43. Subject mated samples to temperature life at 105°C for 500 hours.												
Mixed flowing gas.	See Note.	AMP Spec 109-85-3. Subject mated samples to environmental class III for 20 days.												

**NOTE** *Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in Test Sequence in Figure 3.*

Figure 1 (end)



RECEPTACLE

■ Denotes energized circuit

Figure 2  
Current Energizing Circuit

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)			
	1	2	3	4(c)
	Test Sequence (b)			
Examination of product	1,9	1,5	1,5	1,9
Termination resistance	3,7	2,4	2,4	
Insulation resistance				3,7
Dielectric withstanding voltage				4,8
Capacitance				2
Vibration	5			
Physical shock	6			
Durability	4			
Mating force	2			
Unmating force	8			
Housing lock strength				10
Thermal shock				5
Humidity-temperature cycling				6
Temperature life		3		
Mixed flowing gas			3(d)	

**NOTE**

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) No wires or printed circuit boards used with test sequence 4.
- (d) Precondition samples with 10 cycles durability.

Figure 3

**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 consist of number of samples specified in Figure 4. All connectors shall have gold on contact interface. Backshells where required shall be straight exit. Cable shall be 28 AWG (7/32) tin plated copper wire in accordance with AMP Specification 114-40029. 30 random contacts shall be selected and identified, contact selection shall include ends of the connector. Unless otherwise specified, these contacts shall be used for all measurements.

Test Group	Qty	Position	Male	Female	Hardware	Cable
1	5	120	Cable plug with backshell	Boardmount	Latches	Shielded round jacketed
	5	120	Cable plug with backshell	Panel mount	Latches	Shielded round jacketed/ribbon
	5	20	All plastic plug	Boardmount	None	Ribbon
2	5	50	All plastic plug	Boardmount	None	Ribbon
	5	50	Cable plug with backshell	Panel mount	Latches	Shield round jacketed/ribbon
3	5	50	All plastic plug	Boardmount	None	Ribbon
	5	50	Cable plug with backshell	Panel mount	Latches	Shielded round jacketed/ribbon
4	5	50	Cable plug with backshell	Boardmount, w/o board	Latches	None
	5	50	Cable plug with backshell	Panel mount	Latches	None

Figure 4

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 3.

4.2. Requalification Testing

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

4.3. Acceptance

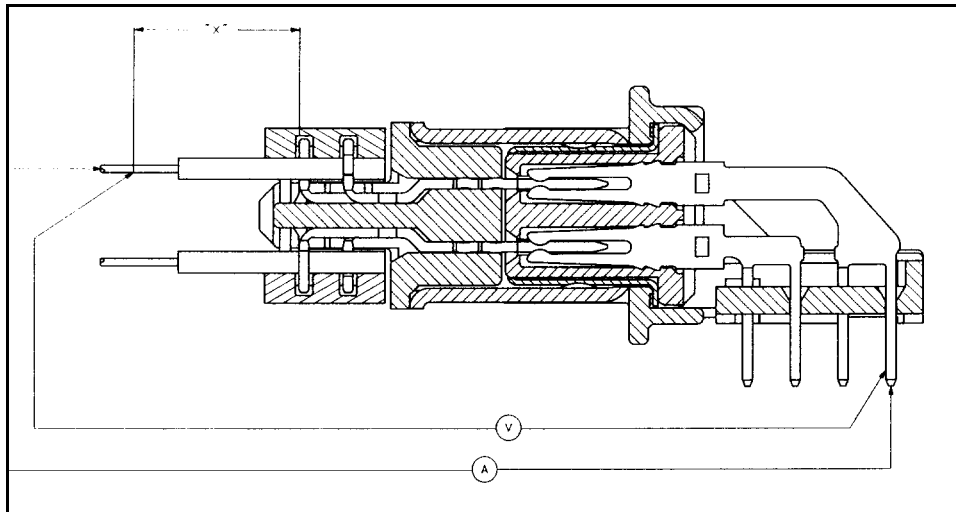
Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable AMP quality 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.

4.5. Certification

Product has been recognized under the Component Recognition Program of Underwriters' Laboratories Inc., Electrical File number E-28476, and certified by Canadian Standards, File Number LR-86179-1.



Note: Voltage drop due to "X" of wire is to be removed from all readings.  
(Backshells not illustrated)

Figure 5  
Termination Resistance Measurement Points

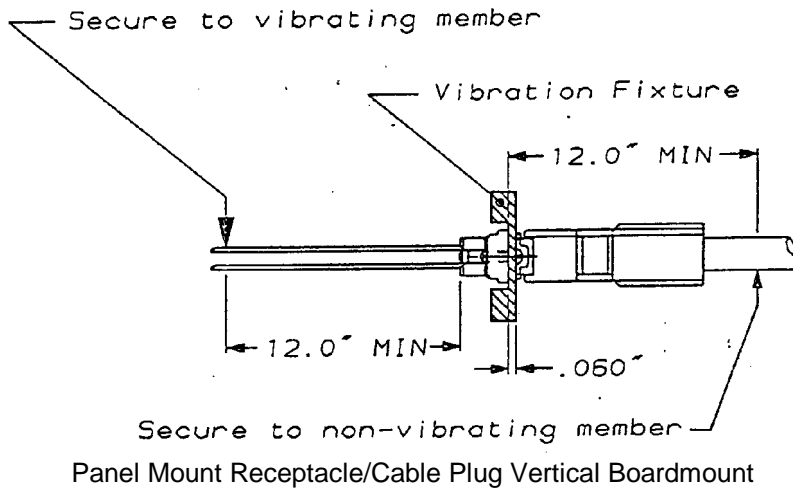
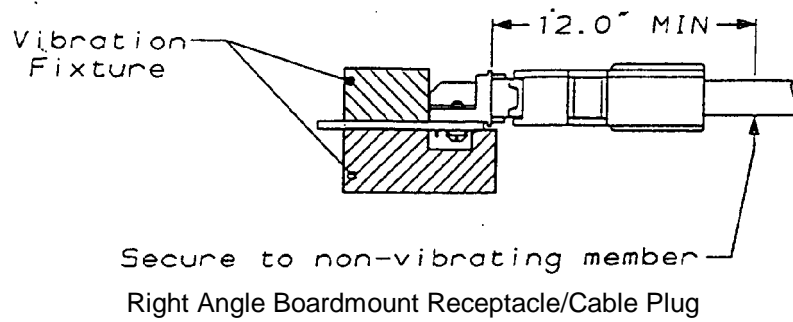


Figure 6  
Vibration & Physical Shock Mounting & Clamping Location

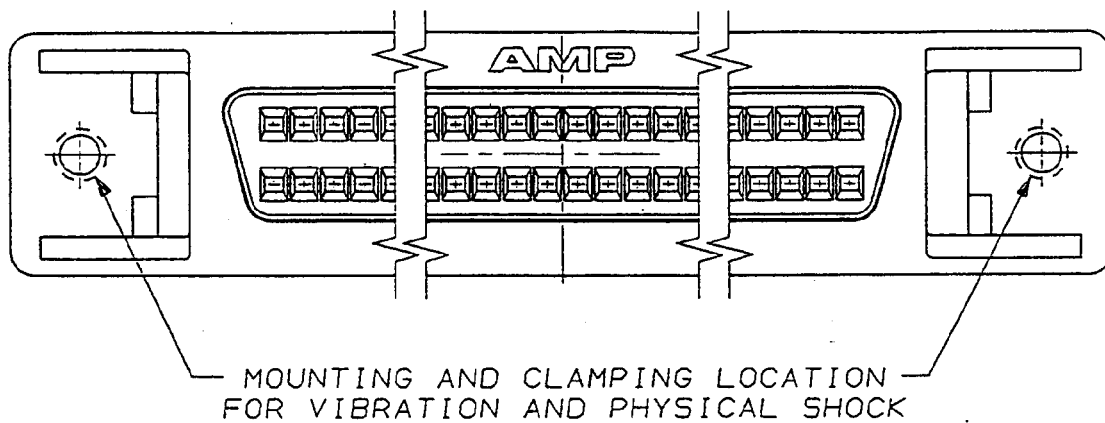


Figure 7  
Vibration & Physical Shock Mounting & Clamping Location