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**Connector, Metrimate Power Drawer With Powerband Contacts**

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**1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for the AMP\* Metrimate power drawer connector equipped with Powerband contacts. Both pin and socket have wire barrels to receive solid or stranded copper wire. After placing stripped end of wire into the barrel, permanent attachment between the two is achieved via crimping with the recommended tool. Powerband contacts fitted inside the socket provide a high current carrying medium with manageable insertion and extraction force. Pin and socket are available in two sizes to receive 8/10 and 12/14 AWG wires. Connector body consists of two self-aligning halves. One half contains pins and the other contains sockets. Housing is designed for eight independent channels. The two halves are polarized to preserve circuit polarity.

## 1.2. Qualification

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

## 1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed on 08Oct98. The test file number for this testing is CTL 5018-019. This documentation is on file at and available from the Americas Regional Laboratory.

**2. APPLICABLE DOCUMENTS**

The following 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.

## 2.1. AMP Documents

- A. 109-1: General Requirements for Test Specifications
- B. 109 Series: Test Specifications as indicated in Figure 1
- C. Corporate Bulletin 401-76: Cross-reference between AMP Test Specifications and Government or Commercial Documents
- D. 114-10039: Application Specification
- E. 114-10043: Application Specification
- F. 501-450: Qualification Test Report

**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

- A. Contact: Copper alloy, gold plating
- B. Housing: Polyester, glass filled, UL94V-0
- C. Pin: Copper alloy, gold over nickel plating
- D. Powerband: Beryllium copper, gold plating
- E. Retaining ring: Beryllium copper, nickel plating
- F. Socket: Copper alloy, gold over nickel plating

3.3. Ratings

- A. Voltage: 600 vac or vdc
- B. Current: See Figure 3 for applicable current carrying capability
- C. 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 AMP Specification 109-1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure										
Examination of product.	Meets requirements of product drawing and AMP Spec 114-10039 and 114-10043.	Visual, dimensional and functional per applicable quality inspection plan.										
<b>ELECTRICAL</b>												
Termination resistance.	<table border="1" style="display: inline-table; vertical-align: top;"> <thead> <tr> <th>Wire Size AWG</th> <th>Resistance Milliohms Maximum</th> </tr> </thead> <tbody> <tr> <td>8</td> <td>2</td> </tr> <tr> <td>10</td> <td>3</td> </tr> <tr> <td>12</td> <td>4</td> </tr> <tr> <td>14</td> <td>5</td> </tr> </tbody> </table>	Wire Size AWG	Resistance Milliohms Maximum	8	2	10	3	12	4	14	5	AMP Spec 109-6-6. Subject mated contacts assembled in housing to 20 mv maximum open circuit at 100 ma maximum.
Wire Size AWG	Resistance Milliohms Maximum											
8	2											
10	3											
12	4											
14	5											
Insulation resistance.	5000 megohms minimum.	AMP Spec 109-28-4. Test between adjacent contacts of mated samples.										
Dielectric withstanding voltage.	2000 vac at sea level. 1 minute hold with no breakdown or flashover.	AMP Spec 109-29-1. Test between adjacent contacts of mated samples.										
Temperature rise vs current.	30°C maximum temperature rise at specified current.	AMP Spec 109-45-1. Measure temperature rise vs current. See Figure 3.										

Figure 1 (cont)

Test Description	Requirement	Procedure
<b>MECHANICAL</b>		
Vibration, sinusoidal.	No discontinuities of 1 microsecond or longer duration. See Note.	AMP Spec 109-21-1. Subject mated samples to 10-55-10 Hz traversed in 1 minute with .06 inch maximum excursion. 2 hours in each of 3 mutually perpendicular planes. See Figure 4.
Physical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	AMP Spec 109-26-1. Subject mated samples to 50 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 Figure 4.
Durability.	See Note.	AMP Spec 109-27. Mate and unmate samples for 100 cycles at a maximum rate of 600 cycles per hour.
Contact retention.	Contact shall not dislodge from housing.	AMP Spec 109-30-1. Apply axial load of 25 pounds to contact in unmating direction.
Mating force.	10 pounds maximum average per contact.	AMP Spec 109-42, Condition A. Measure force necessary to mate samples at a maximum rate of 0.5 inch per minute.
Unmating force.	2 pounds minimum average per contact.	AMP Spec 109-42, Condition A. Measure force necessary to unmate samples at a maximum rate of 0.5 inch per minute.
<b>ENVIRONMENTAL</b>		
Thermal shock.	See Note.	AMP Spec 109-22. Subject mated samples to 5 cycles between -55 and 105°C.
Humidity-temperature cycling.	See Note.	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.	AMP Spec 109-43. Subject mated samples to temperature life at 105°C for 500 hours.

Figure 1 (cont)

Test Description	Requirement	Procedure
Mixed flowing gas.	See Note.	AMP Spec 109-85-2. Subject mated samples to environmental class II for 14 days.

**NOTE** *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
	Test Sequence (b)		
Examination of product	1,10	1,9	1,8
Termination resistance	3,7	2,7	
Insulation resistance			2,6
Dielectric withstanding voltage			3,7
Temperature rise vs current		3,8	
Vibration	5	6(c)	
Physical shock	6		
Durability	4		
Contact retention	9		
Mating force	2		
Unmating force	8		
Thermal shock			4
Humidity-temperature cycling			5
Temperature life		5	
Mixed flowing gas		4(d)	

**NOTE**

- (a) *See Para 4.1.A.*
- (b) *Numbers indicate sequence in which tests are performed.*
- (c) *Discontinuities shall not be measured. Energize at 18°C level for 100% loadings per AMP Specification 109-151.*
- (d) *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 5 connectors of each type.

**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 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**

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.

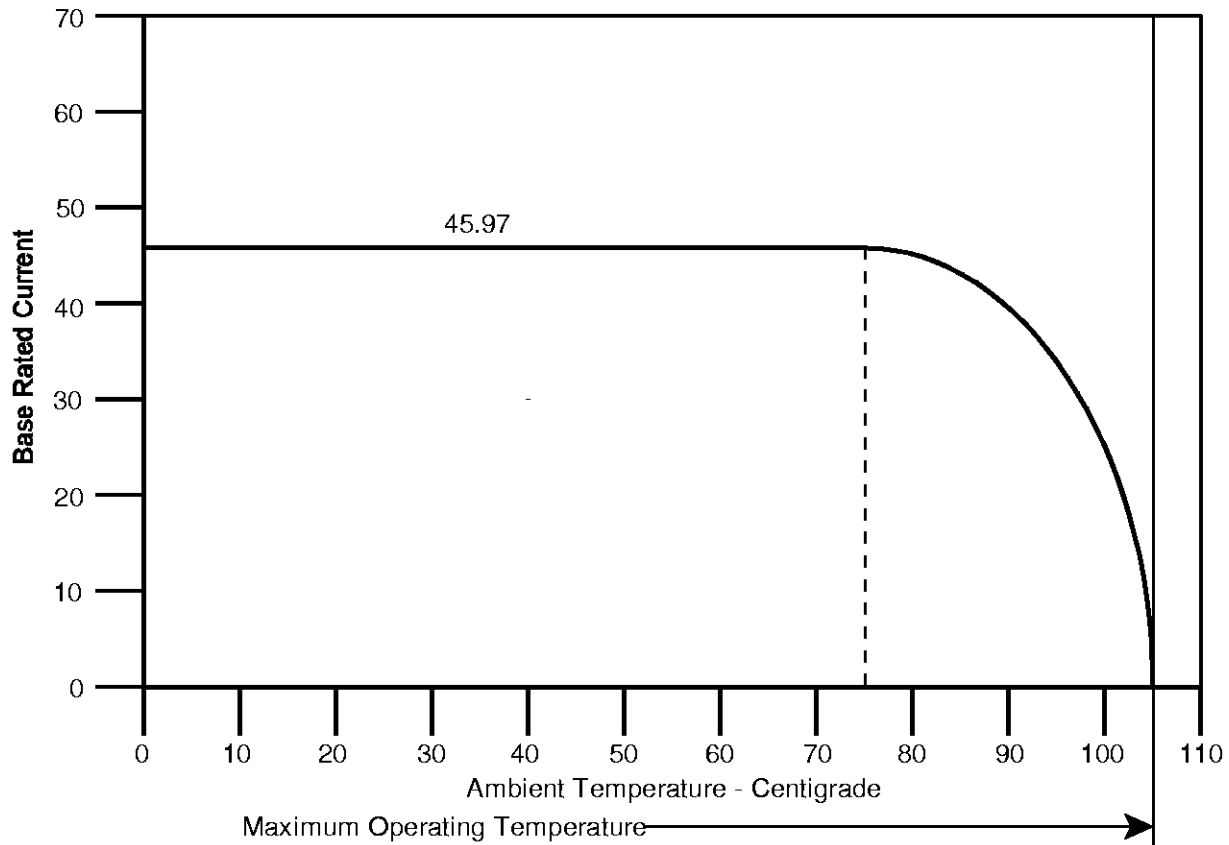


Figure 3A  
Current Carrying Capability

Percent Connector Loading	Wire Size AWG			
	8	10	12	14
Single Contact	1	.84	.67	.51
50	.82	.69	.55	.42
100	.67	.56	.45	.34

**NOTE**

To determine acceptable current carrying capacity for percentage connector loading and wire gage indicated, use the Multiplication Factor (F) from the above chart and multiply it times the Base rated Current for a single circuit at the maximum ambient operating temperature shown in Figure 3A.

Figure 3B  
Current Rating

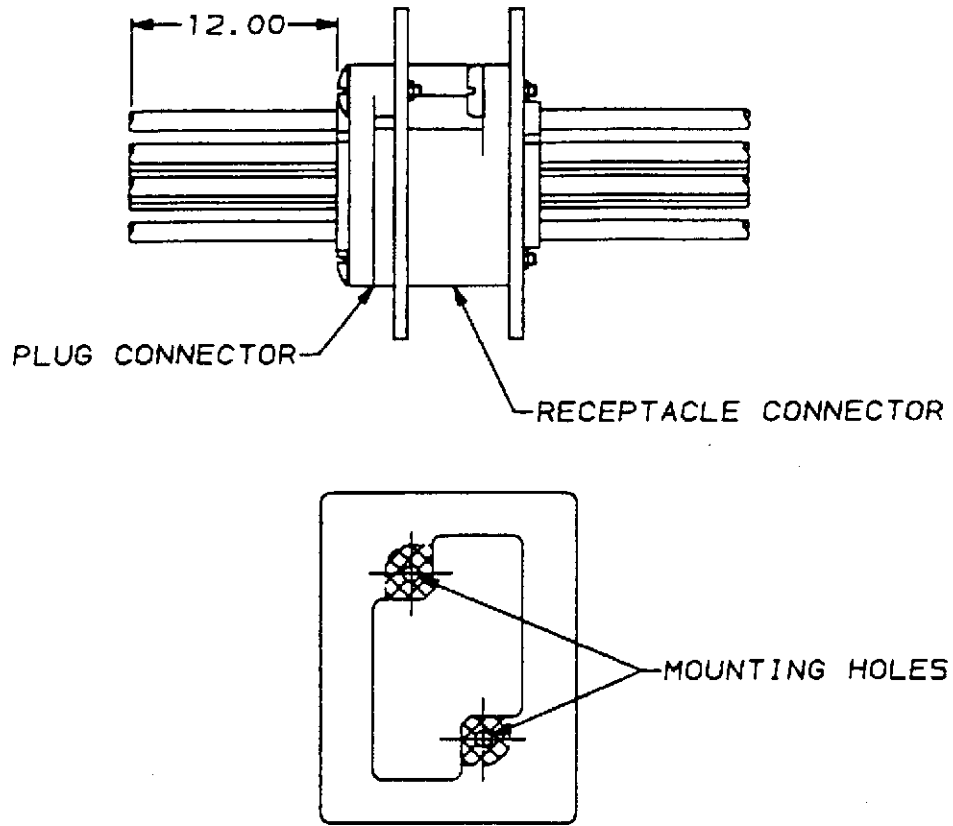


Figure 4  
Vibration & Physical Shock Mounting Fixture