QUALIFICATION TEST REPORT

CONNECTOR, POWER,
DRAWER

501-284 Rev. O

Product Specification:	108-01317 Rev. O
CTL No.:	CTL5018-026-009
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Classification:	Unrestricted
Prepared By:	Terrance M. Shingara

Corporate Test Laboratory Harrisburg, Pennsylvania

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(R5018ts)

AMP

AMP INCORPORATED

HARRISBURG, PENNSYLVANIA 17105 PHONE: 717-564-0100 TWX: 510-657-4110

CORPORATE TEST LABORATORY

Qualification Test Report

1. Introduction

1.1 Purpose

Testing was performed on the AMP* Power Drawer Connector to determine its conformance to the requirements of AMP Product Specification 108-1317 Rev. O.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the Power Drawer Connectors manufactured by the Interconnection Components & Assemblies Product Division of the Capital Goods Business Unit. The testing was performed between June 9, 1994 and November 28, 1994.

1.3 Conclusion

The Power Drawer Connectors meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1317 Rev. O.

* Trademark

1.4 Product Description

The AMP Metrimate Drawer Connectors are true metric specification connectors designed for rack and panel mounting with radial float. The connector provides "blind" mating with up to 2.3 [.090] misalignment in any direction. The plug and receptacle can be front- or rear-panel mounted. The contacts are size 8 power contacts.

1.5 Test Samples

The test samples were randomly selected from normal current production lots, and the following part numbers were used for test:

Test Group	Quantity	Part Nbr	Description
1,2	11	213426-1	15 Pos Plug Housing
1,2	11	213427-1	15 Pos Receptacle Housing
1,2	12	213499-1	8 Pos Plug Housing
1,2	12	213500-1	8 Pos Receptacle Housing
1,2	48	213552-2	Size 8 Pin AWG 8
1,2	48	211161-1	Size 8 Socket AWG 8
1,2	81	213567-1	Size 8 Pin AWG 18
1,2	81	212014-1	Size 8 Socket AWG 18
1	60	66597-2	Size 16 Pin AWG 14
1	60	66598-2	Size 16 Socket AWG 14
2	72	66597-2	Size 16 Pin AWG 18
2	72	66598-2	Size 16 Socket AWG 18

1.6 Qualification Test Sequence

	Test Groups		
Test or Examination	1	2	3
Examination of Product	1,9	1,9	1,8
Termination Resistance, Dry Circuit	3,7	2,7	
Dielectric Withstanding Voltage			3,7
Insulation Resistance			2,6
Temperature Rise vs Current		3,8	
Vibration	5	6	
Physical Shock	6		
Mating Force	2		
Unmating Force	8		
Durability	4		
Thermal Shock			4
Humidity-Temperature Cycling			5
Mixed Flowing Gas		4	
Temperature Life		5	

The numbers indicate sequence in which tests were performed.

2. Summary of Testing

2.1 Examination of Product - All Groups

All samples submitted for testing were selected from normal current production lots. They were inspected and accepted by the Product Assurance Department of the Capital Goods Business Unit.

2.2 Termination Resistance, Dry Circuit - Groups 1,2

All termination resistance measurements, taken at 100 milliamperes DC and 50 millivolts open circuit voltage were less than 2.0 milliohms for samples crimped on AWG 8 wire, 5.0 milliohms for samples crimped on AWG 14 wire, 10.0 milliohms for samples crimped on AWG 18 wire.

Test Group	Nbr of Samples	Condition	Min	Max	Mean
1	15	Initial (AWG 8)	0.68	0.73	0.707
		After Mechanical	0.69	0.79	0.735
	60	Initial (AWG 14)	3.01	3.63	3.217
		After Mechanical	3.07	3.79	3.319
	40	Initial (AWG 18)	3.54	3.69	3.613
		After Mechanical	3.53	3.96	3.649
2	15	Initial (AWG 8)	0.65	0.75	0.710
		After Current Verif.	0.70	0.74	0.721
	100	Initial (AWG 18)	3.57	5.09	4.394
		After Current Verif.	3.66	5.07	4.401

All values in milliohms

2.3 Dielectric Withstanding Voltage - Group 3

No dielectric breakdown or flashover occurred when a test voltage was applied between adjacent contacts.

2.4 Insulation Resistance - Group 3

All insulation resistance measurements were greater than 5,000 megohms.

2.5 Temperature Rise vs Current - Group 2

All samples had a temperature rise of less than 30°C above ambient when energized with rated current.

2.6 Vibration - Groups 1,2

No discontinuities of the contacts were detected during vibration (group 1 only). Following vibration, no cracks, breaks, or loose parts on the connector assemblies were visible.

2.7 Physical Shock - Group 1

No discontinuities of the contacts were detected during physical shock. Following physical shock testing, no cracks, breaks, or loose parts on the connector assemblies were visible.

2.8 Mating Force - Group 1

All mating force measurements were less than 80 pounds for 8 position (8 power) connectors and less than 60 pounds for 15 position (3 power/ 12 signal) connectors.

2.9 Unmating Force - Group 1

All unmating force measurements were greater than 3 pounds for 8 position connectors and greater than 1 pound for 15 position connectors.

2.10 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connectors 250 times.

2.11 Thermal Shock - Group 3

No evidence of physical damage to either the contacts or the connector was visible as a result of thermal shock.

2.12 Humidity-Temperature Cycling - Group 3

No evidence of physical damage to either the contacts or the connector was visible as a result of exposure to humidity-temperature cycling.

2.13 Mixed Flowing Gas - Group 2

No evidence of physical damage to either the contacts or the connector was visible as a result of exposure to the pollutants of mixed flowing gas.

2.14 Temperature Life - Group 2

No evidence of physical damage to either the contacts or the connector was visible as a result of exposure to an elevated temperature.

3. Test Methods

3.1 Examination of Product

Product drawings and inspection plans were used to examine the samples. They were examined visually and functionally.

3.2 Termination Resistance, Low Level

Termination resistance measurements at low level current were made using a four terminal measuring technique (Figure 1). The test current was maintained at 100 milliamperes DC with an open circuit voltage of 50 millivolts DC.

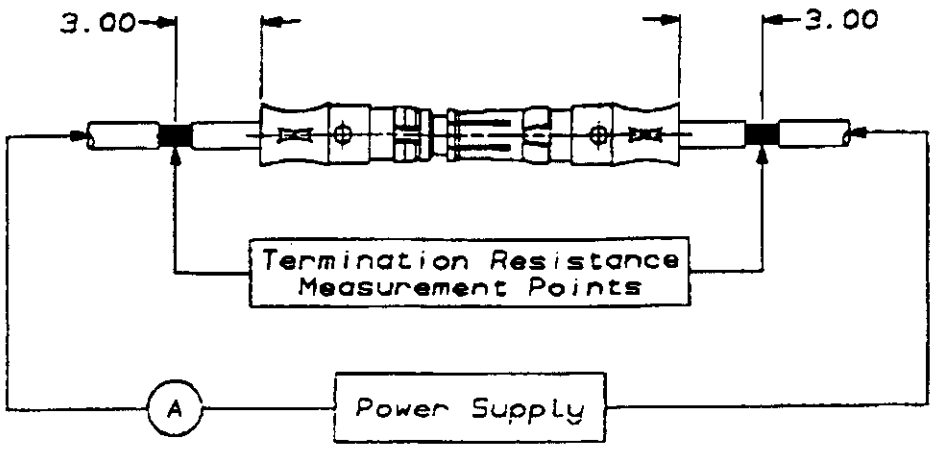

Figure 1
Typical Termination Resistance Measurement Points
housing not shown

3.3 Dielectric Withstanding Voltage

A test potential of 2,000 vac was applied between the adjacent contacts. This potential was applied for one minute and then returned to zero.

3.4 Insulation Resistance

Insulation resistance was measured between adjacent contacts, using a test voltage of 500 volts DC. This voltage was applied for two minutes before the resistance was measured.

3.5 Temperature Rise vs Specified Current

Connector temperature was measured, while energized at the specified current. Thermocouples were attached to the connectors to measure their temperatures. This temperature was then subtracted from the ambient temperature to find the temperature rise. When three readings at five minute intervals were the same, the readings were recorded.

3.6 Vibration, Random

Mated connectors were subjected to a random vibration test, specified by a random vibration spectrum, with excitation frequency bounds of 50 and 2000 hertz. The power spectral density at 50 hz is 0.005 G^2/Hz. The spectrum slopes up at 6 dB per octave to a PSD of 0.02 G^2/Hz at 100 Hz. The spectrum is flat at 1.0 G^2/Hz from 100 to 2000 Hz. The root-mean square amplitude of the excitation was 6.21 GRMS. Connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit (group 1 only). Connectors were energized with enough current to produce 18°C temperature rise above ambient(group 2 only).

3.7 Physical Shock

Mated connectors were subjected to a physical shock test, having a half-sine waveform of 50 gravity units (g peak) and a duration of 11 milliseconds. Three shocks in each direction were applied along the three mutually perpendicular planes, for a total of 18 shocks. The connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.8 Mating Force

The force required to mate individual connectors was measured, using a free floating fixture with the rate of travel at 0.5 inch/minute.

3.9 Unmating Force

The force required to unmate individual connectors was measured using a free floating fixture with the rate of travel at 0.5 inch/minute.

3.10 Durability

Connectors were mated and unmated 250 times at a rate not exceeding 300 cycles per hour.

3.11 Thermal Shock

Mated connectors were subjected to 10 cycles of temperature extremes with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -55°C and 130°C. The transition between temperatures was less than one minute.

3.12 Humidity-Temperature Cycling

Mated connectors were exposed to 10 cycles of humidity-temperature cycling. Each cycle lasted 24 hours and consisted of cycling the temperature between 25°C and 65°C twice while the relative humidity was held at 95%. During five of the first nine cycles, the connectors were exposed to a cold shock at -10°C for 3 hours.

3.13 Mixed Flowing Gas, Class II

Mated connectors were exposed for 10 days to a mixed flowing gas Class II exposure. Class II exposure is defined as a temperature of 30°C and a relative humidity of 70% with the pollutants of $C1_2$ at 10 ppb, NO_2 at 200 ppb, and H_2S at 10 ppb.

3.14 Temperature Life

Mated samples were exposed to a temperature of 130°C for 1000 hours.

4. Validation

Prepared by:

11/28/94

William Scharff
Engineering Assistant
Product Qualification Team
Corporate Test Laboratory

Reviewed by:

11/29/94

Robert S. Druckenmiller
Supervisor
Product Testing
Corporate Test Laboratory

Approved by:

12/7/94

Edward Gill
Manager
Engineering & Design Assurance
Capital Goods Business Unit