Connector, Metrimate, Power

1. INTRODUCTION

1.1. Purpose

Testing was performed on the AMP* Metrimate Power Connector to determine its conformance to the requirements of AMP Product Specification 108-10033-1 Revision O.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the Metrimate Power Connector. Testing was performed at the Americas Regional Laboratory between 09Jan95 and 08Apr96. The test file number for this testing is CTL 5019-037-015. This documentation is on file at and available from the Americas Regional Laboratory.

1.3. Conclusion

The Metrimate Power Connector listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-10033-1 Revision O.

1.4. Product Description

The Metrimate Power Connector is a true metric specification connector designed for panel, free-hanging or printed circuit board application. Housings are made from UL rated 94V-0 thermoplastic and are designed to accept AMP precision formed, size 16 one-piece Type VI or two-piece Type III+ contacts, as well as screw machined Type II contacts. In addition, these Multimate housings will accept AMP subminiature coaxial contacts and fiber optic ferrules. Connectors are available in 4, 6, 9, 12, 18, 24, 36 and 62 position panel mount and 1, 3, 6, 10 and 16 position free-hanging and printed circuit board mount.

1.5. Test Samples

Test samples were representative of normal production lots. Samples identified with the following part numbers were used for test:

Test Group	Quantity	Part Number	Description
1	12	207019-1	36 position plug connector
1	6	207020-1	36 position receptacle connector
1	3	207534-1	36 position tin plated header
1	3	207534-3	36 position gold plated header
1	324	66597-1	Tin plated pin contact
1	108	66598-1	Tin plated socket contact
1	324	66597-2	Gold plated pin contact
1	108	66598-2	Gold plated socket contact

Figure 1

1.6. Qualification Test Sequence

Test or Examination	Test Group (a)
	1
	Test Sequence (b)
Examination of product	1,8
Termination resistance, dry circuit	2,6
Temperature rise vs current	7
Vibration	5
Humidity-temperature cycling	3(c)
Temperature life	4
Mixed flowing gas	3(d)

NOTE

(a) See Para 1.5.
(b) Numbers indicate sequence in which tests are performed.
(c) Tin plated samples only, precondition with 50 cycles durability.
(d) Gold plated samples only, precondition with 500 cycles durability.

Figure 2

2. SUMMARY OF TESTING

2.1. Examination of Product

All samples submitted for testing were randomly selected from current production lots. A Certificate of Conformance was issued by the Product Assurance Department of the Capital Goods Business Unit. Where specified, samples were visually examined and no evidence of physical damage detrimental to product performance was observed.

2.2. Termination Resistance, Dry Circuit

All termination resistance measurements, taken at 100 milliamperes DC and 50 millivolts open circuit voltage were less than 10.0 milliohms initially and 10.0 finally.

Test Group	Number of Data Points	Condition	Termination Resistance		
			Min	Max	Mean
1	72	Initial	2.57	3.13	2.798
		Final	2.50	4.74	3.327

NOTE *All values in milliohms.*

Figure 3

2.3. Temperature Rise vs Current

All samples had a temperature rise of less than 30°C above ambient when tested using a baseline rated current of14.77 amperes for gold plated contacts and 10.73 amperes for tin plated contacts and the correct derating factor value based on the samples wiring configuration.

2.4. Vibration

Following vibration, no cracks, breaks, or loose parts on the samples were visible.

2.5. Humidity-temperature Cycling

No evidence of physical damage was visible as a result of exposure to humidity-temperature cycling.

2.6. Mixed Flowing Gas

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

2.7. Temperature Life

No evidence of physical damage was visible as a result of exposure to elevated temperature.

3. TEST METHODS

3.1. Examination of Product

Where specified, samples were visually examined for evidence of physical damage detrimental to product performance.

3.2. Termination Resistance, Low Level

Termination resistance measurements at low level current were made using a 4 terminal measuring technique (Figure 4). The test current was maintained at 100 milliamperes DC with a 50 millivolt open circuit voltage.

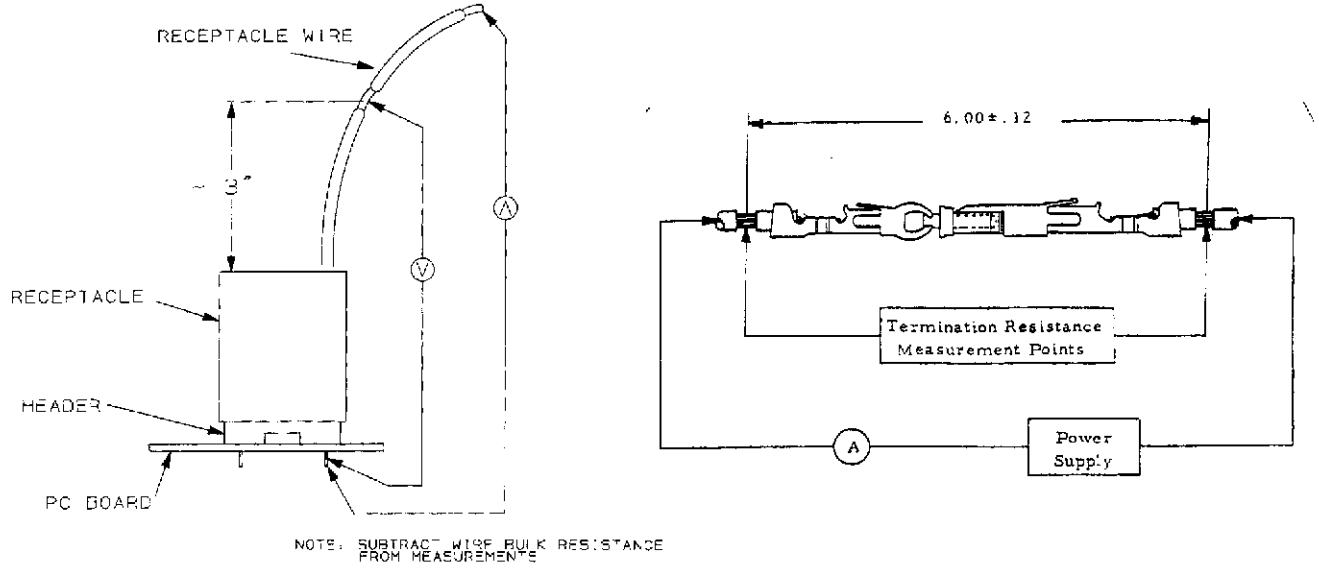

Figure 4
Typical Termination Resistance Measurement Points

3.3. Temperature Rise vs Current

Temperature rise curves were produced by measuring individual contact temperatures at 5 different current levels. These measurements were plotted to produce a temperature rise vs current curve. Thermocouples were attached to the contacts to measure their temperatures. The ambient temperature was then subtracted from this measured temperature to find the temperature rise. When the temperature rise of 3 consecutive readings taken at 5 minute intervals did not differ by more than 1°C, the temperature measurement was recorded.

3.4. Vibration, Random

Mated samples were subjected to a random vibration test, specified by a random vibration spectrum, with excitation frequency bounds of 10 and 500 Hz. The power spectral density at 10 Hz was 0.000312 G^2/Hz. The spectrum sloped up at 6 dB per octave to a PSD of 0.2 G^2/Hz at 25 Hz. The spectrum was flat at 0.2 G^2/Hz from 25 to 500 Hz. The root-mean square amplitude of the excitation was 9.79 GRMS. This was performed for 20 minutes in each of 3 mutually perpendicular planes for a total vibration time of 60 minutes. Samples were energized with a current of 6.2 amperes AC to achieve a temperature rise of 18°C.

3.5. Humidity-temperature Cycling

Mated samples with tin plated contacts 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 maintaining high humidity (Figure 5). The samples were preconditioned with 50 cycles of durability.

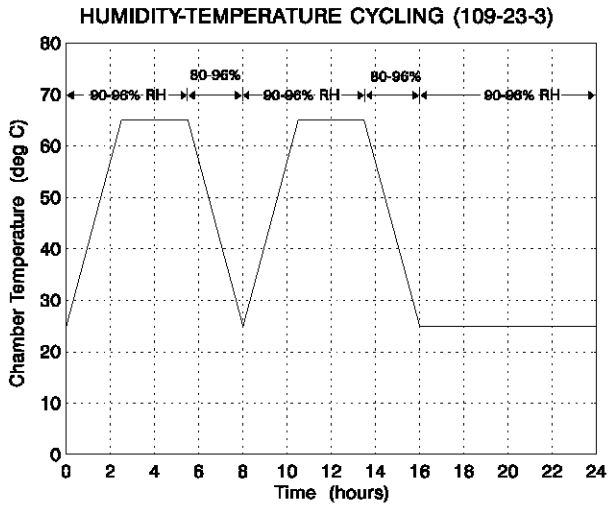

Figure 5
Typical Humidity-Temperature Cycling Profile

3.6. Mixed Flowing Gas, Class II

Mated samples with gold plated contacts were exposed for 14 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 Cl_2 at 10 ppb, NO_2 at 200 ppb, and H_2S at 10 ppb. Samples were preconditioned with 500 cycles of durability.

3.7. Temperature Life

Mated samples with gold plated contacts were exposed to a temperature of 130°C for 240 hours. The samples with tin plated contacts were exposed to a temperature of 90°C for 240 hours.

4. VALIDATION

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