CONTACT, POWER VIII, Board mounted form AMPLIMITE™ Connectors

1. Introduction

1.1 Purpose

Testing was performed on AMP® Power VIII Contacts to determine its conformance to the requirements of AMP Product Specification 108-10045-1 Rev. O.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the Power VIII Contacts manufactured by the Aerospace & Government Systems Sector. The testing was performed between July 7, 1995 and April 12, 1996.

1.3 Conclusion

The Power VIII Contacts, listed in paragraph 1.5, meet the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-10045-1 Rev O.

1.4 Product Description

The Size VIII Power pin contact is made of Brass with gold over nickel plating. The Size VIII Power socket contact is made of Beryllium copper with gold over nickel plating. Both contact solder post diameters are equivalent to an AWG 8 solid wire and are designed to be soldered to an equivalent current handling capability printed circuit board. The contacts are designed to fit into a size 8 cavity of a hybrid AMPLIMITE housings .

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
1,2,3	53	445548-1	Socket Contact
1,2,3	53	213062-1	Pin Contact
1,2	6	446405-1	Pin Housing
1,2	6	445730-1	Socket Housing

1.6 Qualification Test Sequence

	Test Groups	
Test or Examination	1	2
Examination of Product	1,9	1,9
Termination Resistance, Dry Circuit	3,7	2,7
Temperature Rise vs Current		3,8
Vibration	5	6
Physical Shock	6	
Durability	4	
Mating Force	2	
Unmating Force	8	
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 Aerospace & Government System Sector.

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 milliohms.

Test Group	Nbr of Data points	Condition	Min	Max	Mean
1	48	Initial	0.35	0.94	0.458
		After Mechanical	0.34	0.61	0.469
2	48	Initial	0.34	0.60	0.541
		After Current Verif.	0.40	1.09	0.491

All values in milliohms

2.3 Temperature Rise vs Current - Group 2

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

2.4 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.

2.5 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.

2.6 Mating Force - Group 1

All mating force measurements were less than 80 ounces per contact.

2.7 Unmating Force - Group 1

All unmating force measurements were greater than 5 ounces per contact.

2.8 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connector 500 times.

2.9 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.

2.10 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.

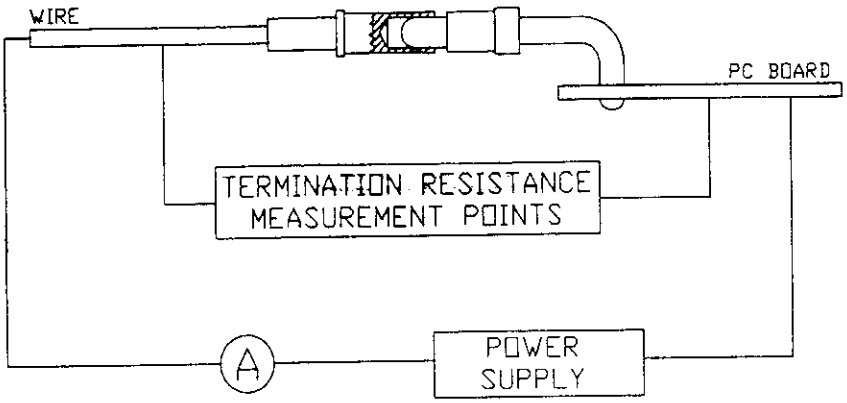

Figure 1
Typical Termination Resistance Measurement Points

3.3 Temperature Rise vs Specified Current

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

3.4 Vibration, Random

Mated connectors were subjected to a random vibration test, specified by a random vibration spectrum, with excitation frequency bounds of 5 and 500 hertz. The power spectral density at 5 Hz was 0.0003125 G^2/Hz. The spectrum sloped up at 24 dB per octave to a PSD of 0.02 G^2/Hz at 14 Hz. The spectrum was flat at 0.02 G^2/Hz from 14 to 500 Hz. The root-mean square amplitude of the excitation was 3.14 GRMS. Connectors were monitored for discontinuities equal to or greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit (Test Group 1 only). Samples mounted on 1.0 oz boards were energized with 2.6 Amperes and samples on 2 oz. boards were energized with 3.5 Amperes.(Test Group 2 only)

3.5 Physical Shock

Mated connectors were subjected to a physical shock test, having a half-sine waveform of 30 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.

3.6 Mating Force

The force required to mate individual connectors was measured using a tensile/compression device with a crosshead rate of travel at 0.5 inch/minute. The force per contact was calculated.

3.7 Unmating Force

The force required to unmate individual connectors was measured using a tensile/compression device with a crosshead rate of travel at 0.5 inch/minute. The force per contact was calculated.

3.8 Durability

Connectors were mated and unmated 500 times at a rate not exceeding 600 per hour.

3.9 Mixed Flowing Gas, Class II

Mated connectors 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 $C1_2$ at 10 ppb, NO_2 at 200 ppb, and H_2S at 10 ppb. Samples were preconditioned with 10 cycles of durability.

3.10 Temperature Life

Mated samples were exposed to a temperature of 125°C for 1000 hours.

4. Validation

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