Interconnection System, High Pressure, AMPMODU™ Mod I, with Gold Contacts

1. Introduction

1.1 Purpose

Testing was performed on the High Pressure AMPMODU™ Mod I Interconnection System with Gold Contacts to determine its conformance to the requirements of AMP Product Specification 108-25025 Rev. O.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the High Pressure AMPMODU Mod I Interconnection System with Gold Contacts manufactured by the Capital Goods Business Unit. The testing was performed between December 14, 1994 and August 18, 1995.

1.3 Conclusion

The High Pressure AMPMODU Mod I Interconnection System with Gold Contacts, listed in paragraph 1.5, meet the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-25025 Rev O.

1.4 Product Description

The High Pressure, AMPMODU Mod I Interconnection system with gold contacts is a two piece configuration of which the receptacle may be mounted directly on a printed circuit board or snapped into a flame retardant housing. The receptacles are gold plated phosphor bronze. The posts are gold plated brass. The housings are Nylon 6/6, UL94V-0.

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	211	102104-1	Crimp/snap contact with AWG 18 wire
1,2	7	5-87025-0	25 Position Housing
3	12	2-87025-3	5 Position Housing
1	3	2-87025-5	2 Position Housing
1	3	87633-2	2 Position Header
1,2	7	87633-5	5 Position Header
1,2	7	2-87633-0	20 Position Header

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(a)	
Temperature Life		5	

The numbers indicate sequence in which tests were performed.

(a) Precondition with 10 cycles of Durability

2. Summary of Testing

2.1 Examination of Product - All Groups

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 - Groups 1,2

All termination resistance measurements, taken at 100 milliamperes DC and 20 millivolts open circuit voltage were less than 12 milliohms.

2.3 Dielectric Withstanding Voltage - Group 3

No dielectric breakdown or flashover occurred.

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 single circuit samples had a temperature rise of less than 30°C above ambient when a specified current of 10 amperes was applied.

2.6 Vibration - Group 1,2

No discontinuities 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 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 30 ounces maximum average per contact.

2.9 Unmating Force - Group 1

All unmating force measurements were greater than 3 ounces minimum average per contact.

2.10 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connector 50 times.

2.11 Thermal Shock - Group 3

No evidence of physical damage was visible as a result of exposure to thermal shock.

2.12 Humidity-Temperature Cycling - Group 3

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

2.13 Mixed Flowing Gas - Group 2

No evidence of physical damage 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 was visible as a result of exposure to an 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 four terminal measuring technique (Figure 1). The test current was maintained at 100 milliamperes DC with a 20 millivolt open circuit voltage.

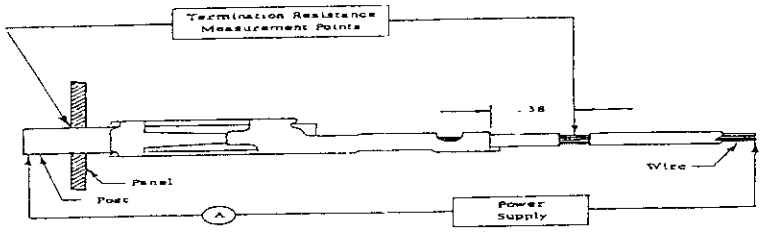


Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 1200 volts AC 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 Current

Contact temperature was measured using thermocouples attached to each individual contact. The ambient temperature was then subtracted from this temperature to find the temperature rise. When three readings at five minute intervals were the same, the readings were recorded.

3.6 Vibration, Sine

Mated samples were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 0.06 inch, double amplitude or 10 gravity units (G's) whichever is less. The vibration frequency was varied logarithmically between the limits of 10 and 500 Hz and returned to 10 Hz in 15 minutes. This cycle was performed 12 times in each of three mutually perpendicular planes for a total vibration time of 9 hours. Connectors were monitored for discontinuities of one microsecond or greater, using a current of 100 milliamperes DC in the monitoring circuit (group 1). Samples were energized with 6.5 amperes DC (group 2).

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. Connectors were monitored for discontinuities of one microsecond or greater, using a current of 100 milliamperes DC.

3.8 Mating Force

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

3.9 Unmating Force

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

3.10 Durability

Connectors were mated and unmated 50 times at a rate of 500 per hour.

3.11 Thermal Shock

Mated connectors were subjected to 5 cycles of temperature extremes with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -65 and 105°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%. (Figure 2)

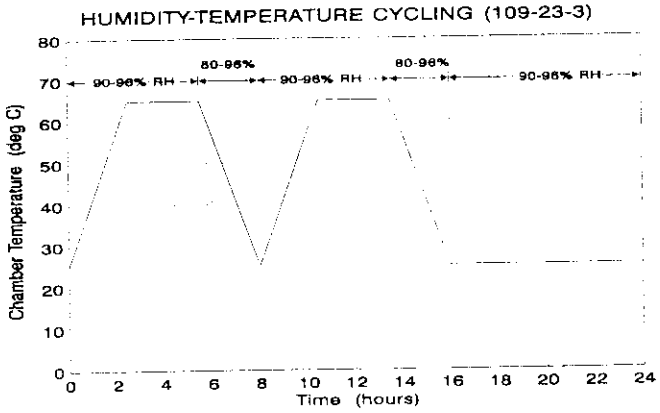


Figure 2
Typical Humidity-Temperature Cycling Profile

3.13 Mixed Flowing Gas, Class III

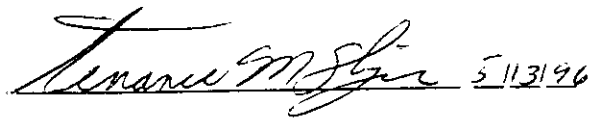
Mated connectors were exposed for 20 days to a mixed flowing gas Class III exposure. Class III exposure is defined as a temperature of 30°C and a relative humidity of 75% with the pollutants of $C1_2$ at 20 ppb, NO_2 at 200 ppb, and H_2S at 100 ppb.

3.14 Temperature Life

Mated samples were exposed to a temperature of 105°C for 500 hours.

4. Validation

Prepared by:



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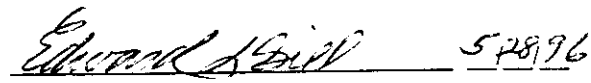

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