Interconnection System, AMPMODU* Mod IV, Wire-To-Board, Standard Pressure Tin Contacts

1. INTRODUCTION

1.1. Purpose

Testing was performed on AMPMODU* Mod IV wire-to-board, standard pressure tin contacts to determine their conformance to the requirements of AMP Product Specification 108-25020-1 Revision A.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the AMPMODU Mod IV wire-to-board, standard pressure tin contacts. Testing was performed at the Americas Regional Laboratory between 05Jan98 and 05Mar99. The test file number for this testing is CTL 5207-000-049. This documentation is on file at and available from the Americas Regional Laboratory.

1.3. Conclusion

The AMPMODU Mod IV wire-to-board, standard pressure tin contacts listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-25020-1 Revision A.

1.4. Product Description

The AMPMODU Mod IV wire-to-board, with standard pressure tin contacts consist of standard pressure tin receptacle contacts crimped onto either solid or stranded wire and then inserted into a Mod IV housing. This system is designed to mate with AMPMODU Mod II 0.025 inch square posts or headers.

1.5. Test Samples

The 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	3	1-87456-5	20 position Mod IV housing
1	1	4-87456-7	72 position Mod IV housing
2	3	1-87456-5	20 position Mod IV housing
1	132	85969-9	Mod IV contacts with 20 AWG wire (BeCu)
2	60	85969-9	Mod IV contacts with 20 AWG wire (BeCu)
1	2	3-103328-5	72 position breakaway header
2	3	1-103328-0	20 position breakaway header

Figure 1

1.6. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

Temperature: 15 to 35°C
Relative Humidity: 20 to 80%

1.7. Qualification Test Sequence

Test or Examination	Test Group (a)	
	1	2
	Test Sequence (b)	
Examination of product	1,9	1,9
Dry circuit resistance	3,7	2,7
Temperature rise vs current		3,8
Vibration	5	6(c)
Mechanical shock	6	
Durability	4	
Mating force	2	
Unmating force	8	
Humidity-temperature cycling		4(d)
Temperature life		5

NOTE

(a) See Para 1.5.
(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 3 cycles durability.

Figure 2

2. SUMMARY OF TESTING

2.1. Examination of Product - All Test Groups

All samples submitted for testing were representative of normal production lots. A Certificate of Conformance was issued by Product Assurance. Where specified, samples were visually examined and no evidence of physical damage detrimental to product performance was observed.

2.2. Termination Resistance - Test Groups 1 and 2

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

Test Group	Number of Data Points	Condition	Termination Resistance		
			Min	Max	Mean
1	30	Initial	4.96	7.79	6.370
		After mechanical	4.70	12.60	7.861
2	30	Initial	4.69	8.13	5.461
		After current verification	6.37	18.96	11.505

NOTE *All values in milliohms.*

Figure 3

2.3. Temperature Rise vs Current - Test Group 2

All samples had a temperature rise of less than 30°C above ambient when tested using a baseline rated current of 1.6 amperes and the correct derating factor value based on the samples wiring configuration.

2.4. Vibration - Test Groups 1 and 2

No discontinuities were detected during vibration (Test group 1 only). Following vibration, no cracks, breaks, or loose parts on the samples were visible.

2.5. Mechanical Shock - Test Group 1

No discontinuities were detected during mechanical shock. Following mechanical shock, no cracks, breaks, or loose parts on the samples were visible.

2.6. Durability - Test Group 1

No physical damage occurred as a result of mating and unmating the samples 30 times.

2.7. Mating Force - Test Group 1

All mating force measurements were less than 9.0 ounces per contact maximum average.

2.8. Unmating Force - Test Group 1

All unmating force measurements were greater than 1.5 ounces per contact minimum average.

2.9. Humidity-temperature Cycling - Test Group 2

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

2.10. Temperature Life - Test Group 2

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

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

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 maximum with a 20 millivolt maximum open circuit voltage.

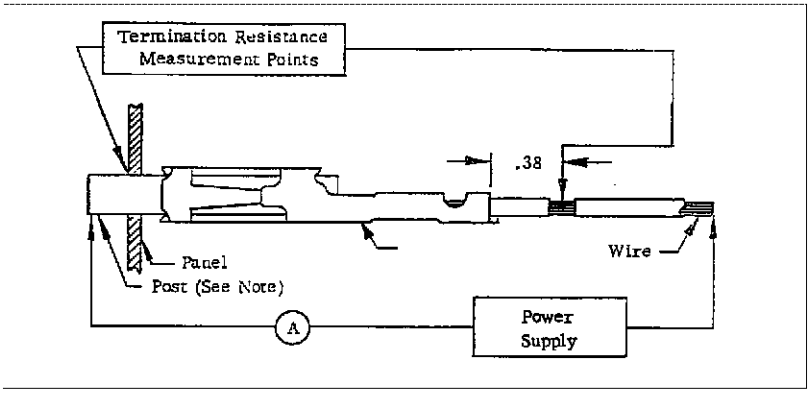

Figure 4
Typical Termination Resistance Measurement Points

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 individual 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, Sinusoidal

Mated samples were subjected to a sinusoidal vibration test. The vibration frequency was varied logarithmically between the approximate limits of 10 and 500 Hz. The entire frequency range of 10 to 500 Hz and return to 10 Hz was traversed in approximately 15 minutes. This cycling was performed for a period of 1.3 hours in each of 3 mutually perpendicular axes, so that the motion was applied for a total period of 4 hours. The parameters were a simple harmonic motion having an amplitude of either 0.06 inch double amplitude (maximum total excursion) or 10 gravity units (g's peak) whichever is less. Samples were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC (Test group 1). Samples were energized with 4.0 amperes test current which produced a 18°C temperature rise (Test group 2).

3.5. Mechanical Shock, Sawtooth

Mated samples were subjected to a mechanical shock test, having a sawtooth waveform of 100 gravity units (g peak) and a duration of 6 milliseconds. Three shocks in each direction were applied along the 3 mutually perpendicular planes, for a total of 18 shocks. Samples were monitored for discontinuities of 1 microsecond or greater, using a current of 100 milliamperes DC.

3.6. Durability

Samples were mated and unmated 30 times at a maximum rate of 600 cycles per hour.

3.7. Mating Force

The force required to mate individual samples was measured using a tensile/compression device with the rate of travel at 1.0 inch per minute and a free floating fixture. The average force per contact was calculated.

3.8. Unmating Force

The force required to unmate individual samples was measured using a tensile/compression device with the rate of travel at 1.0 inch per minute and a free floating fixture. The average force per contact was calculated.

3.9. Humidity-temperature Cycling

Mated samples were exposed to 10 cycles of humidity-temperature cycling. Each cycle lasted 24 hours and consisted of cycling the temperature between 25 and 65°C twice while maintaining high humidity (Figure 5). Samples were preconditioned with 3 cycles of durability.

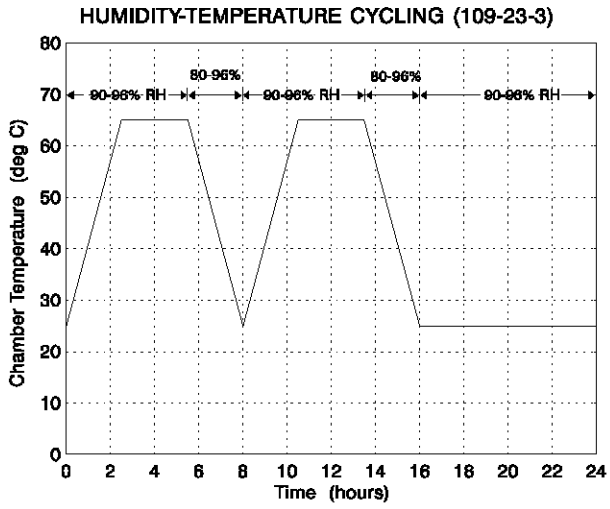

Figure 5
Typical Humidity-Temperature Cycling Profile

3.10. Temperature Life

Mated samples were exposed to a temperature of 85°C for 500 hours.