Jack, Modular, 8 Position Right Angle Inverted Multiple Port With & Without LED

1. INTRODUCTION

1.1. Purpose

Testing was performed on the AMP* 8 position inverted modular jack (IMJ) to determine its conformance to the requirements of AMP Product Specification 108-1163-4 Revision A.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the 8 position inverted modular jack. Testing was performed at the Americas Regional Laboratory between 29Sep97 and 09Jun98. The test file number for this testing is CTL 8215-003-002. This documentation is on file at and available from the Americas Regional Laboratory.

1.3. Conclusion

The 8 position inverted modular jacks listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1163-4 Revision A.

1.4. Product Description

The 8 position inverted modular jacks with integrated LEDs are designed for network and communication applications were the LEDs would indicate various states of transmission activity. The jack is available as shielded or unshielded. The contacts are phosphor bronze, nickel plated with selective gold plating in the contact area and tin-lead plating on the solder tails. The housing material is high temperature nylon UL94V-O.

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
1,4	10	406549-1	Inverted modular jack with LED, shielded
1,2,3	15	406533-1	Inverted modular jack with LED, unshielded

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%

* Trademark
| Indicates change

1.7. Qualification Test Sequence

Test or Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Examination of product	1,9	1,5	1,7	1,8
Termination resistance	3,7	2,4	2,6	
Insulation resistance				2,6
Dielectric withstanding voltage				3,7
Vibration	5			
Mechanical shock	6			
Durability	4		5(c)	
Mating force	2			
Unmating force	8			
Thermal shock			3	4
Humidity-temperature cycling			4	5
Temperature life		3(d)		

NOTE

(a) See Para 1.5.
(b) Numbers indicate sequence in which tests are performed.
(c) Special environmental sequence, see Para 3.10. and 3.11.
(d) Precondition samples with 10 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 the Product Assurance Department of Americas Business Development. Where specified, samples were visually examined and no evidence of physical damage detrimental to product performance was observed. Samples containing LED's were energized, with 2.1 volts DC and 20 milliamperes maximum current, to verify their operation.

2.2. Termination Resistance - Test Groups 1, 2 and 3

All termination resistance measurements, taken at 100 milliamperes maximum and 20 millivolts maximum open circuit voltage had a change in resistance (ΔR) of less than 10 milliohms after testing.

Test Group	Number of Data Points	Condition	Termination Resistance, ΔR		
			Min	Max	Mean
1	80	After mechanical	-0.54	+0.85	-0.037
2	80	After temperature life	+1.05	+4.01	+2.004
3	40	After humidity	-0.47	+0.33	-0.052

NOTE *All values in milliohms*

Figure 3

2.3. Insulation Resistance - Test Group 4

All insulation resistance measurements were greater than 500 megohms.

2.4. Dielectric Withstanding Voltage - Test Group 4

No dielectric breakdown or flashover occurred.

2.5. Vibration - Test Group 1

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

2.6. Mechanical Shock - Test Group 1

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

2.7. Mating Force - Test Group 1

All mating force measurements were less than 4.5 pounds.

2.8. Unmating Force - Test Group 1

All unmating force measurements were less than 4.5 pounds.

2.9. Durability - Test Groups 1 and 3

No physical damage occurred to the samples as a result of mating and unmating the samples 750 times.

2.10. Thermal Shock - Test Groups 3 and 4

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

2.11. Humidity-temperature Cycling - Test Groups 3 and 4

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

2.12. 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. Samples containing LED's were energized, with 2.1 volts DC and 20 milliamperes maximum current, to verify their operation.

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.

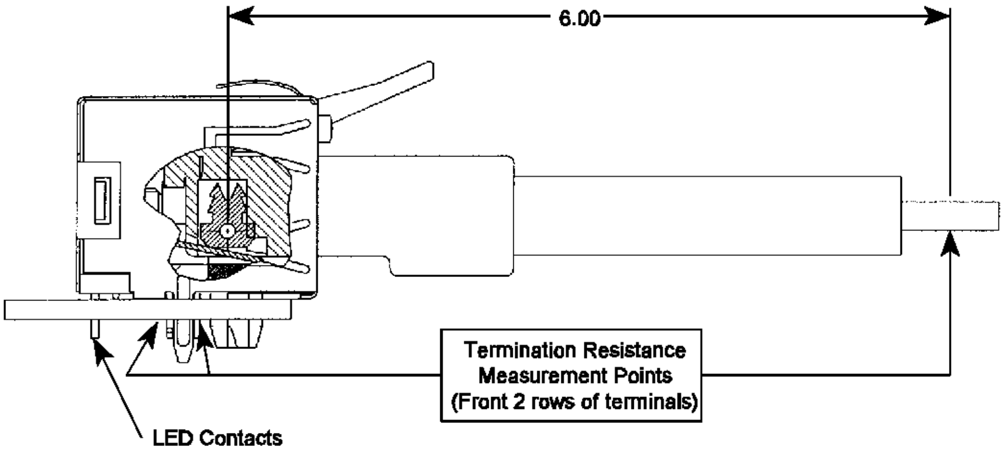

Figure 4
Typical Termination Resistance Measurement Points

3.3. Insulation Resistance

Insulation resistance was measured between adjacent contacts of unmated samples. A test voltage of 500 volts DC was applied for 1 minute before the resistance was measured.

3.4. Dielectric Withstanding Voltage

A test potential of 1000 volts AC was applied between the adjacent contacts of unmated samples. This potential was applied for 1 minute and then returned to zero. A test potential of 1500 volts AC was applied between all contacts and the shield of unmated samples. This potential was applied for 1 minute and then returned to zero.

3.5. Vibration, Sinusoidal

Mated samples were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 0.06 inch, double amplitude. The vibration frequency was varied uniformly between the limits of 10 and 55 Hz and returned to 10 Hz in 1 minute. This cycle was performed 120 times in each of 3 mutually perpendicular planes for a total vibration time of 6 hours. Samples were monitored for discontinuities of 1 microsecond or greater using a current of 100 milliamperes DC.

3.6. Mechanical Shock, Half-sine

Mated samples were subjected to a mechanical 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 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.

3.7. Mating Force

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

3.8. Unmating Force

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

3.9. Durability

Samples were mated and unmated 750 times at a maximum rate of 600 cycles per hour.

3.10. Thermal Shock

A. Unmated samples were subjected to 100 cycles of thermal shock with each cycle consisting of 30 minute dwells at -40 and 85°C. The transition between temperatures was less than 1 minute (Test Group 4).

B. Mated samples were subjected to 100 cycles of thermal shock with each cycle consisting of 30 minute dwells at -40 and 85°C. The transition between temperatures was less than 1 minute. Samples were subjected to 100 cycles of durability prior to thermal shock and 33 cycles of durability after 50 cycles of thermal shock (Test Group 3).

3.11. Humidity-temperature Cycling

A. Unmated samples were exposed to 21 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. During 5 of the first 9 cycles, the samples were exposed to a cold shock at -10°C for 3 hours (Test Group 4, Figure 5).

B. Mated samples were exposed to 21 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. During 5 of the first 9 cycles, the samples were exposed to a cold shock at -10°C for 3 hours. Samples were subjected to 33 cycles of durability after the first 7 days of humidity-temperature cycling and 34 cycles of durability after 21 days of humidity-temperature cycling (Test Group 3, Figure 5).

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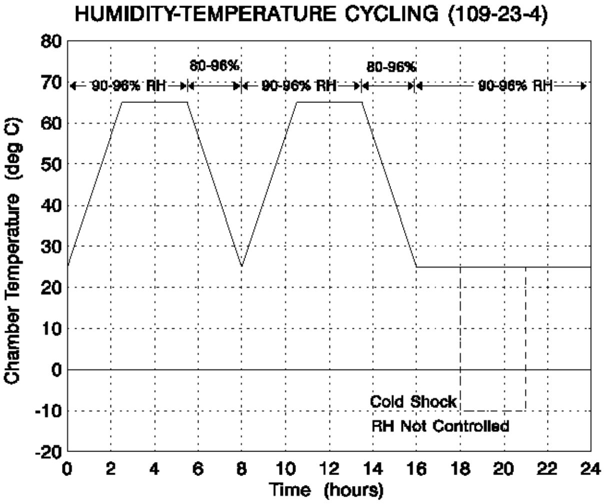

Figure 5
Typical Humidity-Temperature Cycling Profile

3.12. Temperature Life

Mated samples were exposed to a temperature of 85°C for 500 hours. Samples were preconditioned with 10 cycles of durability.