Patch Panel, Modular Jack To RJ21 CHAMP* Connector

1. INTRODUCTION

1.1. Purpose

Testing was performed on the AMP* Modular Jack to RJ21 CHAMP* Connector Patch Panel to determine its conformance to the requirements of AMP Product Specification 108-1576-1 Rev. O.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the Modular Jack to RJ21 CHAMP Connector Patch Panel manufactured by the Building Cabling Products Division of the Communication Business Unit. The testing was performed between April 15, 1996 and December 6, 1996.

1.3. Conclusion

The Modular Jack to RJ21 CHAMP Connector Patch Panel, listed in paragraph 1.5., meet the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1576-1 Rev O and also complies with TIA/EIA-568-A, ANNEX A, October 6, 1995 Specification.

1.4. Product Description

The 24 Port Patch Panel, Modular Jack to RJ21 CHAMP Connector contains 24, 8 position Modular Jacks and 4, 50 position RJ21 CHAMP connectors that are terminated with 24 AWG solid copper wire. FR-4 PC boards are used to connect between the Modular Jacks and the RJ21 CHAMP Connector.

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 Number	Description
1,2,3,4	1 ea.	556186-1	24 Port Patch Panel
1,2,3,4	4 ea.	554758-1	50 Position CHAMP Plug
1,2,3,4	24 ea.	555799-1	8 Position Mod Jack

1.6. Qualification Test Sequence

Test or Examination	Test Groups			
	1	2	3	4
	Test Sequence (a)			
Examination of Product	1,6	1,5	1,8	1,6
Termination Resistance, Dry Circuit	2,5	2,4	2,7	
Insulation Resistance				2,5
Vibration	3			
Physical Shock	4			
Durability			3,6(b)(c)	
Thermal Shock			4	3
Humidity-Temperature Cycling			5	4
Temperature Life		3		

NOTE

(a) The numbers indicate sequence in which tests were performed.
(b) Performed 100 cycles before Thermal Shock, 33 after 50 cycles of Thermal Shock, 33 cycles after 7 days of Temperature Humidity Cycling, and 34 cycles after 21 days.
(c) Durability cycling was performed on the Modular Jack Plug and CHAMP Plug assembly.

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 Building Cabling Products Group.

2.2. Termination Resistance, Dry Circuit - Groups 1, 2 and 3

All termination resistance measurements, taken at 100 milliamperes DC and 20 millivolts open circuit voltage had a maximum increase in resistance (ΔR) of 20 milliohms or less.

Test Group	Data Points	Delta Max.
1	48	.88
2	40	3.52
3	40	7.87

All values in milliohms

2.3. Insulation Resistance - Group 4

All insulation resistance measurements were greater than 100 megohms.

2.4. Vibration - Group 1

No discontinuities of the contacts were detected during vibration. 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. Durability - Group 3

No physical damage occurred to the samples as a result of mating and unmating the connector 200 times.

2.7. Thermal Shock - Groups 3 and 4

No evidence of physical damage to either the contacts or the connector was visible as a result of thermal shock.

2.8. Humidity-Temperature Cycling - Groups 3 and 4

No evidence of physical damage to either the contacts or the connector was visible as a result of exposure to humidity-temperature cycling.

2.9. 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 by using a four terminal measuring technique (Figure 1). The test current was maintained at 100 milliamperes DC with an open circuit voltage of 20 millivolts DC.

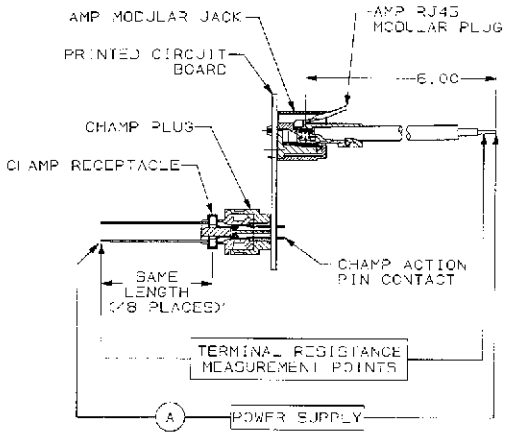

Figure 1
Typical Termination Resistance Measurement Points

3.3. Insulation Resistance

Insulation resistance was measured between adjacent contacts, using a test voltage of 500 volts DC. This voltage was applied for no longer than 2 minutes before the resistance was measured.

3.4. Vibration, Sine

Fully assembled Patch Panel was subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 0.06 inch. The vibration frequency was varied uniformly between the limits of 10 and 55 Hz and returned to 10 Hz in 5 minutes. This cycle was performed in each of 3 mutually perpendicular planes, for a total vibration time of 1 hour and 45 minutes. Connectors were monitored for discontinuities greater than 1 microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.5. Physical Shock

Fully assembled Patch Panel was 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 3 mutually perpendicular planes, for a total of 18 shocks. The Patch Panel assembly was monitored for discontinuities greater than 1 microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.6. Durability

Both the Modular Jack and the CHAMP plug assemblies were mated and unmated 200 times at a rate not exceeding 10 cycles per minute. See Qualification Test Sequence Para 1.6. for sequence.

3.7. Thermal Shock

Fully assembled Patch Panel was subjected to 100 cycles of temperature extremes with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -40 and 70°C. The transition between temperatures was less than one minute.

3.8. Humidity-Temperature Cycling

Fully assembled Patch Panel was 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 the relative humidity was held at 95%. During 5 of the first 9 cycles, the connectors were exposed to a cold shock at -10°C for 3 hours.

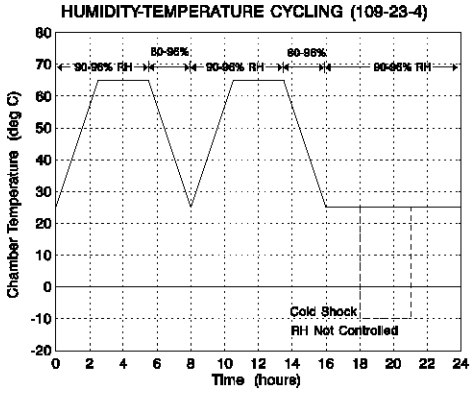

Figure 2
Typical Humidity-Temperature Cycling Profile

3.9. Temperature Life

Fully assembled Patch Panel was exposed to a temperature of 70 °C for 500 hours.

4. VALIDATION

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