SYSTEM, CONNECTOR, CHAMP™ 0.8mm

1. Introduction

1.1 Purpose

Testing was performed on AMP® CHAMP™ 0.8mm Connector to determine its conformance to the requirements of AMP Product Specification 108-1471 Rev. O.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the CHAMP™ 0.8mm Connector manufactured by the Interconnection Components & Assembly Division of the Capital Goods Business Unit. The testing was performed between January 9, 1996 and March 15, 1996.

1.3 Conclusion

The CHAMP™ 0.8mm Connectors, listed in paragraph 1.5, meet the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1471 Rev O.

1.4 Product Description

The CHAMP™ 0.8mm Connector system consists of both Cable mounted and printed circuit board (PCB) mounted plugs designed to mate with a PCB receptacle. The contacts are made from Phosphor bronze, with selected gold plating in the contact area, tin-lead plating on the crimp area, all over nickel plating. The housing material is LCP, black, 85°C, 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
1,2,3,4,5	5	787046-1	90 Pos Hybrid Plug
1,2,3,4,5	5	787175-1	90 Pos Hybrid Receptacle
1,2,3,4,5	5	787131-3	68 Pos Cable Plug
1,2,3,4	5	787254-1	68 Pos Thru-hole Receptacle

1.6 Qualification Test Sequence

	Test Groups				
Test or Examination	1	2	3	4	5
Examination of Product	1,9	1,6	1,5	1,8	1,3
Termination Resistance, Dry Circuit	3,7	2,4	2,4		
Dielectric Withstanding Voltage				3,7	
Insulation Resistance				2,6	
Vibration	5				
Physical Shock	6				
Mating Force	2				
Unmating Force	8				
Durability	4				
Housing Lock Strength		5			
Solderability					2
Thermal Shock				4	
Humidity				5	
Mixed Flowing Gas			3(a)		
Temperature Life		3(a)			

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 1,2,3

All termination resistance measurements, taken at 100 milliamperes DC and 50 millivolts open circuit voltage had a maximum increase in resistance (+ΔR) of less than 10 milliohms.

Test Group	Nbr of Data points	Condition	Min	Max	Mean
1	130	After Mechanical	-3.04	+8.19	+1.531
2	130	After Temp Life	-1.69	+4.45	+0.843
3	130	After Mixed Gas	-5.51	+3.87	-0.207

All values in milliohms

2.3 Dielectric Withstanding Voltage - Group 4

No dielectric breakdown or flashover occurred.

2.4 Insulation Resistance - Group 4

All insulation resistance measurements were greater than 500 megohms.

2.5 Vibration - Group 1

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

2.6 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.

2.7 Mating Force - Group 1

All mating force measurements were less than 50N for the 90 position connectors and 44N for the 68 position connectors.

2.8 Unmating Force - Group 1

All unmating force measurements were greater than 6.0N for the 90 position connectors and 6.2N for the 68 position connectors.

2.9 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connector 2000 times.

2.10 Housing Lock Strength - Group 2

The force required to unlatch mated connectors exceded the 125N minimum.

2.11 Solderability - Group 5

The contact leads had a minimum of 95% solder coverage.

2.12 Thermal Shock - Group 4

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

2.13 Humidity-Temperature Cycling - Group 4

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

2.14 Mixed Flowing Gas - Group 3

No evidence of physical damage was visible as a result of exposure to the pollutants of mixed flowing gas.

2.15 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 (Figures 1 & 2). The test current was maintained at 100 milliamperes DC with a 20 millivolt open circuit voltage.

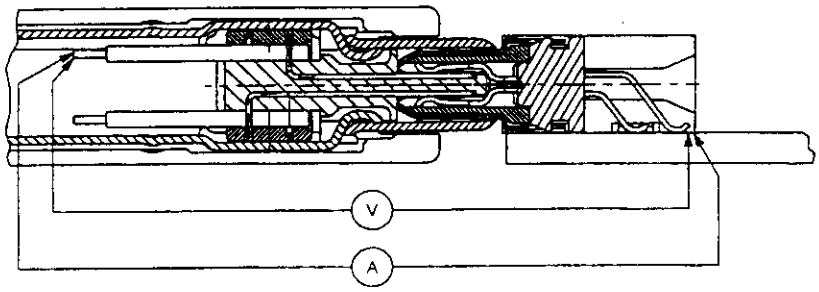

Figure 1
Typical Termination Resistance Measurement Points
Cable to Board

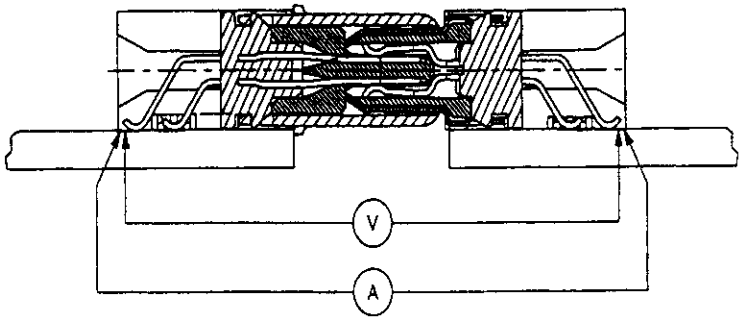

Figure 2
Typical Termination Resistance Measurement Points
Board to Board

3.3 Dielectric Withstanding Voltage

A test potential of 250 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 100 volts DC. This voltage was applied for two minutes before the resistance was measured.

3.5 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 is 0.000312 G^2/Hz. The spectrum slopes up at 6 dB per octave to a PSD of 0.04 G^2/Hz at 16 Hz. The spectrum is flat at 0.04 G^2/Hz from 16 to 500 Hz. The root-mean square amplitude of the excitation was 4.41 GRMS. This was performed for 20 minutes in each of three mutually perpendicular planes, for a total vibration time of 60 minutes. Connectors were monitored for discontinuities of one microsecond or greater, using a current of 100 milliamperes DC.

3.6 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 of one microsecond or greater, using a current of 100 milliamperes in the monitoring circuit.

3.7 Mating Force

The force required to mate individual connectors was measured, using a tensile/compression device and a free floating fixture with the rate of travel at 13 mm/minute.

3.8 Unmating Force

The force required to unmate individual connectors was measured using a tensile/compression device and a free floating fixture with the rate of travel at 13 mm/minute.

3.9 Durability

Connectors were mated and unmated 2,000 times at a rate of 500 per hour.

3.10 Housing Lock Strength

An increasing axial force was applied to mated connector halves until the connector latches release. The force was applied in a direction normal to the plane of the connector.

3.11 Solderability

Connector assembly contact solder tails were subjected to a solderability test by immersing them in a nonactivated Rosin flux for 5 to 10 seconds, allowed to drain for 10 to 60 seconds, then held over molten solder without contact for 2 seconds. The solder tails were then immersed in the molten solder at a rate of approximately one inch per second, held for 3 to 5 seconds, then withdrawn. After cleaning in isopropyl alcohol, the samples were visually examined for solder coverage. The solder used for testing was 60/40 tin lead composition and was maintained at a temperature of 245°C.

3.10 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 -55 and 85°C. The transition between temperatures was less than one minute.

3.11 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 3)

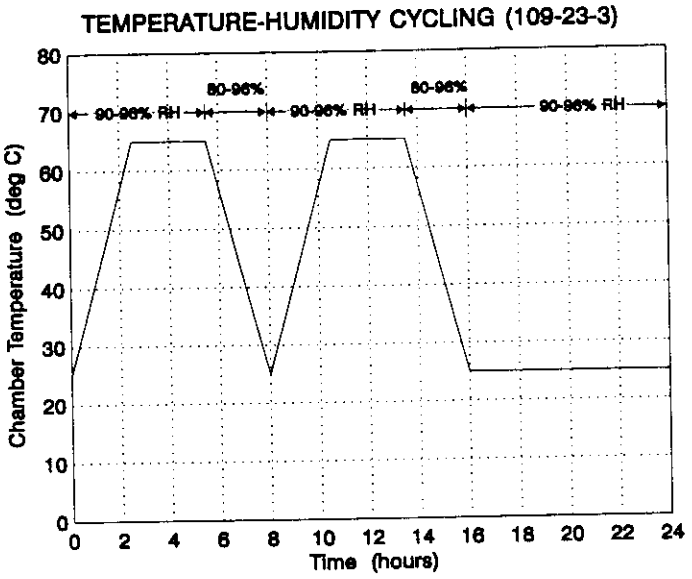

Figure 3
Typical Humidity-Temperature Clyling Profile

3.12 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.

3.13 Temperature Life

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

4. Validation

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