AMP*

QUALIFICATION TEST REPORT

CONNECTOR, CHAMP*
PRINTED CIRCUIT BOARD

501-146 Rev. 0

Product Specification:	108-6078 Rev. 0
CTL No.:	CTL1252-005-001
Date:	May 15, 1991
Classification:	Unrestricted
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(R1252TS)

AMP

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CORPORATE TEST LABORATORY

Qualification Test Report
Printed Circuit Board CHAMP Connector

1. Introduction

1.1 Purpose

Testing was performed on AMP's Printed Circuit Board CHAMP Connector to determine its conformance to the requirements of AMP Product Specification 108-6078 Rev. 0.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the Printed Circuit Board CHAMP Connector manufactured by the Communication Products Division of the Capital Goods Business Sector. The testing was performed between February 26,1991 and May 17,1991.

1.3 Conclusion

The Printed Circuit Board CHAMP Connector meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-6078 Rev. 0.

1.4 Product Description

The Printed Circuit Board CHAMP Connector is available in Right Angle, Vertical, and Edge Mount configuration, with 24, 36, 50, and 60 contact positions. The housing material is black thermoplastic, 94V-0 rated. The terminals are selectively plated gold over nickel plated high strength copper alloy, with tin plated tails.

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
1,2,3,4,5	1 ea	552725-1	50 pos Rt Angle Recpt.
1,2,3,4	1 ea	552116-1	50 pos Vertical Plug
1,2,3,4,5	2 ea	556014-1	36 pos Rt Angle Recpt.
1,2,3,4	2 ea	552274-1	36 pos Vertical Plug

1.6 Qualification Test Sequence

	Test Groups				
Test or Examination	1	2	3	4	5
Examination of Product	1	1,5	1,5	1,8	1
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				
Solderability					2
Thermal Shock				4	
Humidity-Temperature Cycling				5	
Industrial Mixed Flowing Gas			3		
Temperature Life		3			

The numbers indicate sequence in which tests were performed.

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 Capital Goods Business Sector.

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, were less than 30 milliohms.

Test Group	No. of Samples	Condition	Min.	Max.	Mean
1	122	Initial	15.2	23.0	19.38
		After Mechanical	15.6	25.3	19.93
2	122	Initial	14.6	23.9	18.83
		After Temp Life	14.9	25.0	19.60
3	122	Initial	15.0	23.8	19.28
		After Industrial Gas	15.1	25.4	19.79

All values in milliohms

2.3 Dielectric Withstanding Voltage - Group 4

No dielectric breakdown or flashover occurred when a test voltage was applied between adjacent contacts.

2.4 Insulation Resistance - Group 4

All insulation resistance measurements were greater than 2.0×10^{4} megohms.

2.5 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.

2.6 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.

2.7 Mating Force - Group 1

All mating force measurements were less than 0.7 pounds per contact.

2.8 Unmating Force - Group 1

All unmating force measurements were greater than 0.08 pounds per contact.

2.9 Durability - Group 1

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

2.10 Solderability - Group 5

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

2.11 Thermal Shock - Group 4

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

2.12 Humidity-Temperature Cycling - Group 4

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

2.13 Industrial Mixed Flowing Gas - Group 3

No evidence of physical damage to either the contacts or the connector was visible as a result of exposure to the pollutants of industrial mixed flowing gas.

2.14 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, using a four terminal measuring technique (Figure 1). The test current was maintained at 100 milliamperes dc, with an open circuit voltage of 50 millivolts dc.

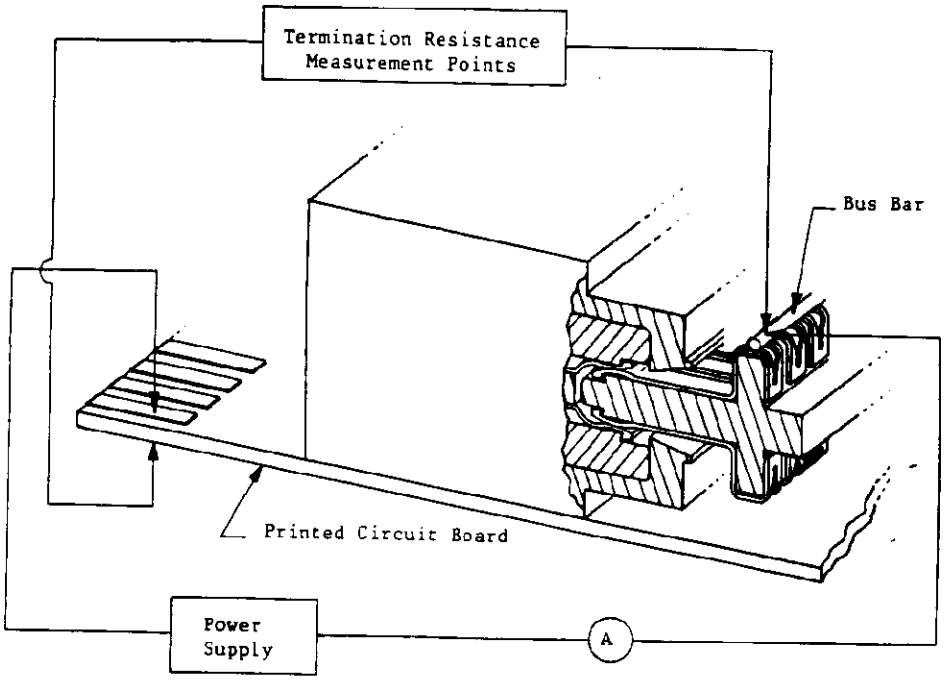

Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 1000 vac 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 Vibration, Sine

Mated connectors 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 one minutes. This cycle was performed 120 times in each of three mutually perpendicular planes, for a total vibration time of six hours. Connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.6 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. The connectors were monitored for discontinuities greater than one microsecond, 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 free floating fixture with the rate of travel at 0.5 inch/minute.

3.8 Unmating Force

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

3.9 Durability

Connectors were mated and unmated 200 times at a rate not exceeding 500 per hour.

3.10 Solderability

Connector assembly contact solder tails were subjected to a solderability test by immersing them in a mildly active 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.

3.11 Thermal Shock

Unmated connectors were subjected to 1024 cycles of temperature extremes, with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -40°C and 60°C. The transition between temperatures was less than one minute.

3.12 Humidity-Temperature Cycling

Unmated 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%. During five of the first nine cycles, the connectors were exposed to a cold shock at -10°C for 3 hours.

3.13 Industrial Mixed Flowing Gas, Class III

Mated connectors were exposed for 20 days to an industrial 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 Cl_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 70°C for 1000 hours.

4. Validation

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