AMP

QUALIFICATION TEST REPORT

CONNECTOR, CHAMP*, 050 SERIES,
BOARD TO BOARD, VERTICAL AND
RIGHT ANGLE MOUNTING

501-173 Rev. A

Product Specification:	108-1367 Rev. 0
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	CTL0925-001-001
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CORPORATE TEST LABORATORY

Qualification Test Report
CHAMP 050 Series I and High Density

1. Introduction

1.1 Purpose

Testing was performed on AMP's CHAMP 050 Connectors to determine its conformance to the requirements of AMP Product Specification 108-1367 Rev. 0.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the CHAMP 050 Series Connectors manufactured by the Communication Products Division of the Capital Goods Business Group. The testing was performed between March 9, 1992 and April 29, 1992.

1.3 Conclusion

The CHAMP 050 Series Connectors meet the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1367 Rev. 0.

1.4 Product Description

The CHAMP 050 Series Connectors was designed as a very high-density connector with half-pitch contacts. They are available in both wire-to-board and board-to-board versions. The leaf-type contacts are phosphor bronze with a gold over nickel underplate.

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	2-557102-3	80 pos Series I Plug
1,2,3,4	1	2-557101-3	80 pos Series I Recpt
1,2,3,4	1	3-557102-4	130 pos Series I Plug
1,2,3,4	1	3-557101-4	130 pos Series I Recpt
5,6	1	2-557103-3	80 pos Series I Recpt
5,6	1	2-557100-3	80 pos Series I Plug
5,6	1	3-557103-4	130 pos Series I Recpt
5,6	1	3-557100-4	130 pos Series I Plug
1,2,3,4,5,6	1	557095-1	140 pos HD Recpt
1,2,3,4,5,6	1	557096-1	140 pos HD Plug
1,2,3,4,5,6	2	557095-3	188 pos HD Recpt
1,2,3,4,5,6	1	557096-3	188 pos HD Plug
1,2,3,4,5,6	1	557147-3	188 pos HD Plug

1.6 Qualification Test Sequence

	Test Groups					
Test or Examination	1	2	3	4	5	6
Examination of Product	1,9	1,5	1,5	1,8	1	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
Resistance to Soldering Heat					2	
Thermal Shock				4		
Humidity-Temperature Cycling				5		
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 Group.

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 change in resistance (ΔR) less than 10.0 milliohms.

Test Group	No. of Data Pts.	Condition	Min.	Max.	Mean
1	200	After Mechanical	-7.45	4.99	-0.820
2	468	After Temp. Life	-2.37	3.22	-0.184
3	468	After Mixed Flowing Gas	-2.83	3.16	0.123

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 1000 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 90 grams per contact pair.

2.8 Unmating Force - Group 1

All unmating force measurements were greater than 15 grams per contact pair.

2.9 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connector 500 times.

2.10 Solderability - Group 6

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

2.11 Resistance to Soldering Heat - Group 5

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

2.12 Thermal Shock - Group 4

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

2.13 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.

2.14 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 mixed flowing gas.

2.15 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.

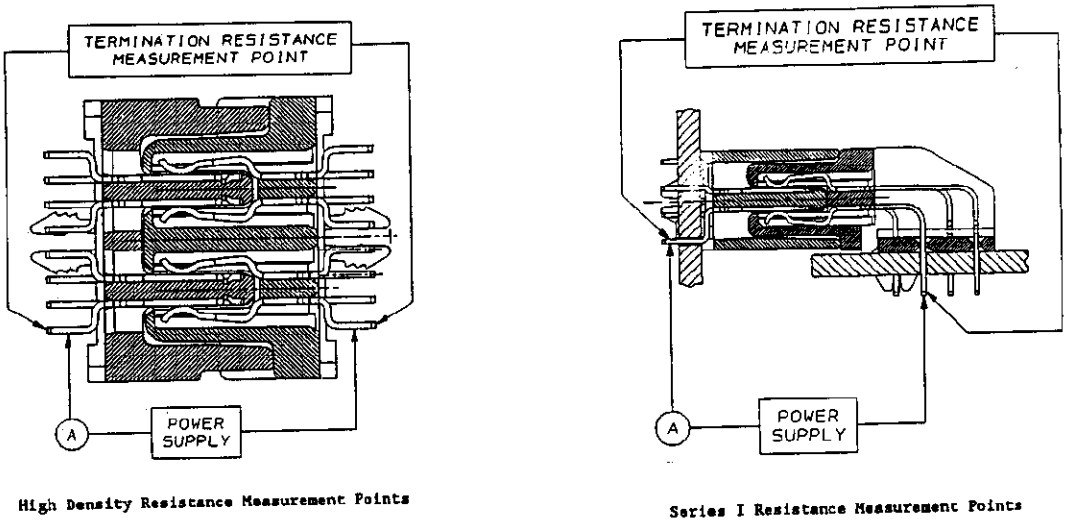

Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 750 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 1 minutes. This cycle was performed 120 times in each of three mutually perpendicular planes, for a total vibration time of 6 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. The force per contact was calculated.

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. The force per contact was calculated.

3.9 Durability

Connectors were mated and unmated 500 times at a rate not exceeding 600 per hour.

3.10 Solderability

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

3.11 Resistance to Soldering Heat

Connectors were lowered into a solder pot until the entire solder tail surface was immersed in molten solder. The temperature of the solder was 260°$\pm$5°C, and the duration of the immersion was 10$\pm$ 2 seconds.

3.12 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°C and 85°C. The transition between temperatures was less than one minute.

3.13 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%. During five of the first nine cycles, the connectors were exposed to a cold shock at -10°C for 3 hours. After the cold shock samples were subjected to a 15 minute low frequency vibration test in one random axis.

3.14 Mixed Flowing Gas, Class II

Mated connectors were exposed for 20 days to an 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 Cl_2 at 10 ppb, NO_2 at 200 ppb, and H_2S at 10 ppb.

3.15 Temperature Life

Mated samples were exposed to a temperature of 70°C for 1000 hours.

4. Validation

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