



QUALIFICATION TEST REPORT

CONNECTOR, SHORT POINT,
RECEPTACLE CONTACT

501-292

Rev. A

Product Specification: 108-1472 Rev. O
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Corporate Test Laboratory Harrisburg, Pennsylvania

Table of Contents

	<u>Page</u>
1. Introduction	1
1.1 Purpose	1
1.2 Scope	1
1.3 Conclusion	1
1.4 Product Description	2
1.5 Test Samples	2
1.6 Qualification Test Sequence	2
2. Summary of Testing	3
2.1 Examination of Product	3
2.2 Termination Resistance, Dry Circuit	3
2.3 Dielectric Withstanding Voltage	3
2.4 Insulation Resistance	3
2.5 Vibration	3
2.6 Physical Shock	3
2.7 Mating Force	4
2.8 Unmating Force	4
2.9 Durability	4
2.10 Contact Retention	4
2.11 Thermal Shock	4
2.12 Humidity-Temperature Life	4
2.13 Mixed Flowing Gas	4
2.14 Temperature Life	4
3. Test Methods	4
3.1 Examination of Product	4
3.2 Termination Resistance, Dry Circuit	5
3.3 Dielectric Withstanding Voltage	5
3.4 Insulation Resistance	5
3.5 Vibration	5
3.6 Physical Shock	6
3.7 Mating Force	6
3.8 Unmating Force	6
3.9 Durability	6
3.10 Contact Retention	6
3.11 Thermal Shock	6
3.12 Humidity-Temperature Life	6
3.13 Mixed Flowing Gas	7
3.14 Temperature Life	7
4. Validation	8

(R0548ts)



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CORPORATE TEST LABORATORY

Qualification Test Report

1. Introduction

1.1 Purpose

Testing was performed on AMP™ short point receptacle contact and connector system to determine its conformance to the requirements of AMP Product Specification 108-1472 Rev. O.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the short point receptacle contact and connector system manufactured by the Printed Circuit Board Products Division of the Capital Goods Business Unit. The testing was performed between November 28, 1994 and January 31, 1995

1.3 Conclusion

The short point receptacle contact and connector system meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1472 Rev. O.

1.4 Product Description

The short point receptacle contact is a separable electrical connection device for mating to .025 inch square posts. It can be crimped to 20 to 32 AWG wire sizes and is intended to be used with a connector housing with centerline spacing of at least .100 inch.

The contacts are a copper alloy, gold over tin duplex over nickel plating and tin over nickel plating. The housing material is black Polyamide, glass filled, 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:

<u>Test Group</u>	<u>Quantity</u>	<u>Part Nbr</u>	<u>Description</u>
1	5	103328-3	6 Pos DR B/A Hdr (Sn)
1	5	103186-3	6 Pos DR B/A Hdr (Au)
1,4,5	15	1-103328-0	20 Pos DR B/A Hdr (Sn)
1,2,3	15	1-103186-0	20 Pos DR B/A Hdr (Au)
2	5	3-103328-2	64 Pos DR B/A Hdr (Sn)
1	10	104482-2	6 Pos DR SHRTPT HSG
1,2,3,4,5	30	104482-9	20 Pos DR SHRTPT HSG
2	5	104483-8	64 Pos DR SHRTPT HGS
1,4,5	330	104479-2	SHTRTPT REC CONT (Sn)
1,2,3	330	104479-3	SHTRTPT REC CONT (Au)
2	320	104480-2	SHTRTPT REC CONT (Sn)

1.6 Qualification Test Sequence

<u>Test or Examination</u>	<u>Test Groups</u>				
	1	2	3	4	5
Examination of Product	1,9	1,5	1,5	1,5	1,9
Termination Resistance, Dry Circuit	3,7	2,4	2,4	2,4	
Dielectric Withstanding Voltage					3,7
Insulation Resistance					2,6
Vibration	5				
Physical Shock	6				
Mating Force	2				
Unmating Force	8				
Contact Retention					8
Durability	4				
Thermal Shock					4
Humidity-Temperature Cycling				3	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 Unit.

2.2 Termination Resistance, Dry Circuit - Groups 1,2,3,4

All termination resistance measurements, taken at 100 milliamperes DC and 50 millivolts open circuit voltage were less than 15 milliohms initially and less than 20 milliohms after testing.

Test Group	Nbr of Data points	Condition	Min	Max	Mean
1	260	Initial	2.59	4.02	3.595
		After Mechanical	2.55	16.08	5.795
2	160	Initial	3.37	4.04	4.308
		After Temp Life	3.45	11.01	4.341
3	100	Initial	3.00	3.48	3.219
		After Mixed Gas	3.02	3.99	3.260
4	100	Initial	3.03	3.49	3.146
		After Humidity	3.06	3.97	3.292

All values in milliohms

2.3 Dielectric Withstanding Voltage - Group 5

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

2.4 Insulation Resistance - Group 5

All insulation resistance measurements were greater than 5,000 megohms initially and 1,000 megohms after humidity exposure.

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 9 ounces for gold contacts and less than 21 ounces for tin contacts

2.8 Unmating Force - Group 1

All unmating force measurements were greater than 1.5 ounces per contact.

2.9 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connector 75 times for connectors with 15 microinch gold contacts and 25 times for connectors with tin contacts.

2.10 Contact Retention - Group 5

No physical damage occurred to either the contacts or the housing, and no contacts dislodged from the housings as a result of applying an axial load of 3 pounds to the contacts.

2.11 Thermal Shock - Group 5

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 - Groups 4,5

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 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.

2.14 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.

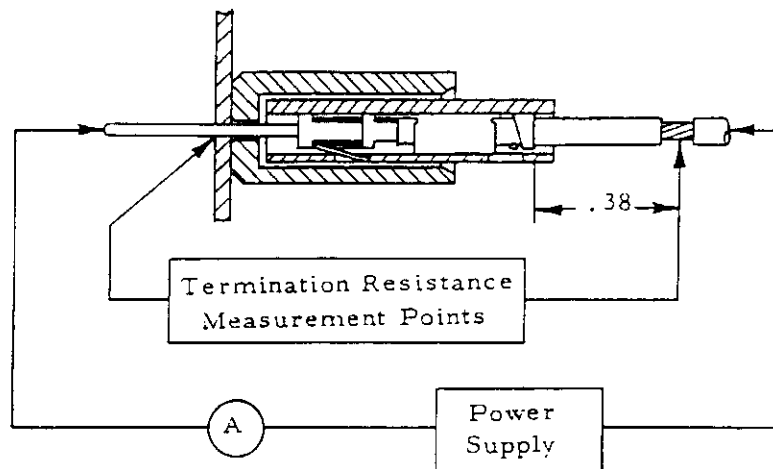


Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 750 vac at sea level, 300 vac at 50,000 feet, and 275 vac at 70,000 feet 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 or 15 G's (whichever is less). The vibration frequency was varied logarithmically between the limits of 10 and 2,000 Hz and returned to 10 Hz in 20 minutes. This cycle was performed 12 times in each of three mutually perpendicular planes, for a total vibration time of 12 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 saw-tooth 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 a maximum rate of travel at 1.0 inch/minute.

3.8 Unmating Force

The force required to unmate individual connectors was measured using a free floating fixture with a maximum rate of travel at 1.0 inch/minute.

3.9 Durability

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

3.10 Contact Retention

An axial load of 3 pounds was applied to each contact and held for 60 seconds. The force was applied in a direction to cause removal of the contacts from the housing.

3.11 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 -65°C and 105°C. The transition between temperatures was less than one minute.

3.12 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%.

3.13 Mixed Flowing Gas, Class III

Mated connectors were exposed for 20 days to a 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 Cl₂ at 20 ppb, NO₂ at 200 ppb, and H₂S at 100 ppb. Samples were preconditioned with 10 cycles of durability.

3.14 Temperature Life

Mated samples were exposed to a temperature of 105°C for 500 hours.

4. Validation

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