AMP*

QUALIFICATION TEST REPORT

Test Probe Receptacle

501-116 Rev. 0

Product Specification:	108-1082, Rev. B
CTL No.:	CTL1335-010-005
Date:	June 25, 1990
Classification:	Unrestricted
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CORPORATE TEST LABORATORY

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Test Probe Receptacle

1. Introduction

1.1 Purpose

Testing was performed on AMP's Test Probe Receptacle to determine if it meets the requirements of AMP Product Specification 108-1082, Rev. B.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the Test Probe Receptacle, manufactured by the Integrated Circuit Connector Product Division of the Capital Goods Business Sector. The testing was performed between January 22, 1990 and May 18, 1990.

1.3 Conclusion

The Test Probe Receptacle meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1082, Rev. B.

1.4 Product Description

The AMP line of Test Probe Receptacles is designed to provide low-cost test probe capability of circuits on printed circuit boards, without interruption of operating currents.

Receptacles are available with either two or three mounting legs. Two legs of the tri-leg mount are not part of the live testing circuit. Receptacles are also available either in the standard or high profile. The tri-leg mount gives maximum stability. The two-leg mount yields maximum density.

The contact is brass with gold, silver, or tin-lead plating. The housing is Nylon 6/6 with a UL94V-2 rating. The receptacle is designed to accept a .080 probe.

1.5 Test Samples

The test samples were randomly selected from current production, and the following part numbers were used for test:

Test Group	Total Quantity	Part Number	Description
2,3,4,5,6	25	350180-9	30 Au Standard TRI
1,3,4,5,6	25	1-582118-4	150 Sn Standard BI
2,3,4,5	20	2-582118-1	150 Ag Standard BI
2,3,4	15	3-582118-2	30 Au Standard BI
2,3,4	15	3-582119-7	30 Au Standard TRI
2,3,4,5	20	3-582120-5	30 Au High TRI
1,3,4,5,6	25	1-582340-4	150 Sn High BI
2,3,4,5,6	25	2-582340-0	200 Ag High BI
2,3,4	15	3-582340-6	30 Au High BI

1.6 Qualification Test Sequence

Test or Examination	Test Groups 1	2	3	4	5	6
Examination of Product	1,9	1,9	1,9	1,10	1,4	1,3
Termination Resistance, Dry Circuit	2,7	2,7	3,7	3,7		
Dielectric Withstanding Voltage				8		
Insulation Resistance				2,6		
T-Rise vs. Current	3,8	3,8				
Capacitance					2	
Corona				9		
Vibration	4	4	5			
Physical Shock			6			
Contact Engaging Force			2			
Contact Separating Force			8			
Durability			4			
Solderability					3	
Resistance to Soldering Heat						2
Thermal Shock				4		
Humidity-Temperature Cycling	5			5		
Industrial Mixed Flowing Gas		5				
Temperature Life	6	6				

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 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, 4

All termination resistance measurements, taken at 100 milliamperes dc. and 20 millivolts open circuit voltage, were less than 7.0 milliohms initially and 20.0 milliohms after testing.

Test Group	No. of Samples	Condition	Min.	Max.	Mean
1	10	Initial	0.022	0.059	0.040
		After Humidity	0.105	0.207	0.156
2	35	Initial	0.055	1.533	0.307
		After Industrial Gas	0.286	7.961	1.758
3	45	Initial	0.023	1.003	0.368
		After Mechanical	0.038	1.811	0.667
4	45	Initial	0.024	0.896	0.315
		After Thermal Shock	0.018	1.070	0.346

All values in milliohms

2.3 Dielectric Withstanding Voltage - Group 4

There was no dielectric breakdown or flashover between adjacent receptacles, when a test voltage of 1800 V ac was applied for one minute.

2.4 Insulation Resistance - Group 4

All insulation resistance measurements were greater than 10000 megohms.

2.5 Temperature Rise vs. Current - Groups 1,2

All samples had a temperature rise of less than 30°C above ambient, when a specified current of 4.75 amperes dc was applied.

Temperature Rise Above Ambient (Max.)

Part Number	Initial	Final
1-582118-4	18.0	17.8
1-582340-4	19.5	18.1
3-582118-2	17.8	17.9
2-582118-1	17.3	16.6
2-582340-0	17.4	18.6
3-582340-6	19.2	18.6

All Temperatures in Degrees Celsius

2.6 Capacitance - Group 5

All capacitance measurements were less than 1.0 picofarad.

2.7 Corona - Group 4

There was no corona discharge greater than 5.0 picocoulombs at or below a potential of 1000 V ac.

2.8 Vibration - Groups 1, 2, 3

There were no cracks, breaks, or loose parts on the connector assemblies following vibration.

2.9 Physical Shock - Group 3

There were no cracks, breaks, or loose parts on the connector assemblies following physical shock.

2.10 Contact Engaging Force - Group 3

All contact engaging forces were less than 100 ounces.

2.11 Contact Separating Force - Group 3

All contact separating forces were greater than 3.0 ounces.

2.12 Durability - Group 3

There was no physical damage to the receptacles, as a result of mating and unmating the receptacles and a test probe 100 times for gold contacts and 25 times for silver and tin contacts.

2.13 Solderability - Group 5

The contact leads met the requirement of 95% minimum solder coverage.

2.14 Resistance to Soldering Heat - Group 6

There was no evidence of physical damage to the receptacles, as a result of soldering heat.

2.15 Thermal Shock - Group 4

There was no evidence of physical damage to the receptacles, as a result of thermal shock.

2.16 Humidity-Temperature Cycling - Group 1

There was no evidence of physical damage to the receptacles, as a result of exposure to humidity-temperature cycling.

2.17 Industrial Mixed Flowing Gas - Group 2

There was no evidence of physical damage to the receptacles, as a result of exposure to the pollutants of industrial mixed flowing gas.

2.18 Temperature Life - Groups 1,2

There was no evidence of physical damage to the receptacles, as a result of exposure to a temperature of 85°C for 96 hours.

3. Test Methods

3.1 Examination of Product

The 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 20 millivolts dc.

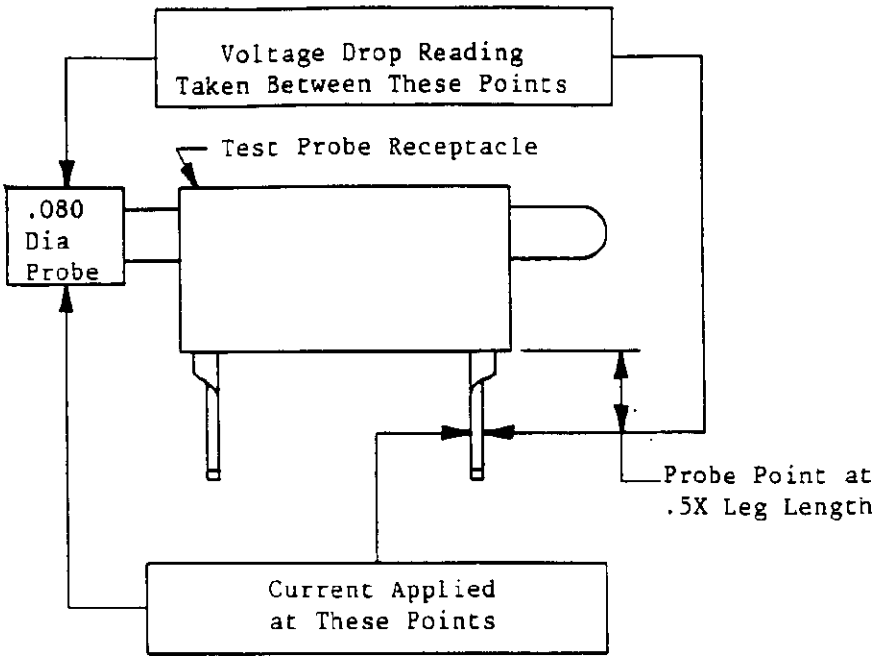

Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 1800 V ac was applied between the adjacent receptacles. This potential was applied for one minute and then returned to zero.

3.4 Insulation Resistance

Insulation Resistance was measured between adjacent receptacles using a test voltage of 500 V dc. This voltage was applied for two minutes before the the resistance was measured.

3.5 Temperature Rise vs. Specified Current

The connector temperature was measured, while energized at the specified current of 4.75 amperes ac. Thermocouples were attached to the contact to measure their temperatures. This temperature was then subtracted from the ambient temperature to find the temperature rise. When three readings at five minute intervals were the same, the readings were recorded.

3.6 Capacitance

The capacitance was measured between the center contact and housing. A test frequency of 1.0 megahertz was used.

3.7 Corona

With a test voltage of 1000 V ac rms applied, the maximum corona observed was less than 5 picocoulombs. The corona was observed, using an oscilloscope.

3.8 Vibration, Energized, Sine

Receptacles 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 minute. This cycle was performed 120 times in each of three mutually perpendicular planes, for a total vibration time of 6 hours. Connectors in Test Groups 1 and 2 were energized with 4.75 amps dc, and total circuit voltage drop was monitored.

3.9 Physical Shock

Receptacles were subjected to a physical shock test, having a sawtooth 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.

3.10 Contact Engaging Force

Engaging forces were acquired by inserting a 0.081 inch gage into the socket.

3.11 Contact Separating Force

Separating forces were acquired by withdrawing a 0.079 inch gage from the socket.

3.12 Durability

Receptacles and test probes were mated and unmated at a rate not exceeding 600 per hour.

3.13 Solderability

The receptacle solder tails were subjected to a solderability test. The solder tails were immersed in a non-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 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.

3.14 Resistance to Soldering Heat

Samples were mounted on a printed circuit board and immersed, so that the bottom of the test board rested on the molten solder. The temperature of the solder was 280°, and the duration of immersion was 30 seconds.

3.15 Thermal Shock

Receptacles were subjected to five 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.

3.16 Humidity-Temperature Cycling

Receptacles 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. Following each cold shock, samples were subjected to 15 minutes of low frequency vibration.

3.17 Industrial Mixed Flowing Gas, Class II

Receptacles were exposed for 20 days in the industrial mixed flowing gas chamber. Class II exposure is defined as a temperature of 30°C, and a relative humidity of 70%. Pollutants are Cl_2 at 10 ppb, NO_2 at 200 ppb, and H_2S at 10 ppb.

3.18 Temperature Life

Receptacles were subjected to 96 hours at an elevated temperature of 85°C.

4. Validation

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