AMP*

QUALIFICATION TEST REPORT

Connector, Low Profile Shunt

501-141 Rev. 0

Product Specification:	108-9057 Rev. 0
CTL No.:	CTL5239-014-014
Date:	March 8, 1991
Classification:	Unrestricted
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(R5239TS)

AMP

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CORPORATE TEST LABORATORY

Qualification Test Report
Connector, Low Profile Shunt

1. Introduction

1.1 Purpose

Testing was performed on AMP's Low Profile Shunt Connector to determine its conformance to the requirements of AMP Product Specification 108-9057 Rev. 0.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the Low Profile Shunt Connector manufactured by the Integrated Circuit Connector Products Division of the Capital Goods Business Sector. The testing was performed between October 1, 1990 and March 8, 1991.

1.3 Conclusion

The Low Profile Shunt Connector meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-9057 Rev. 0.

1.4 Product Description

The Low Profile shunt features one piece construction and high normal force. The Low Profile Shunt stands .250 above the printed circuit board. The housings are glass-filled polyester, 94V-0 rated. The contacts are Beryllium copper with a .000050 nickel finish . The shunt is available with gold platting in the contact area or tin plated overall.

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
1,3,4	10 ea.	531220-1	Sn plated 100 centers
1,2,3	10 ea.	531220-2	Au plated 100 centers
1,3,4	10 ea.	531230-1	Sn plated 200 centers
1,2,3	10 ea.	531230-2	Au plated 200 centers

1.6 Qualification Test Sequence

	Test Groups			
Test or Examination	1	2	3	4
Examination of Product	1,9	1,11	1,8	1,11
Termination Resistance, Specified Current		3,10		3,10
Termination Resistance, Dry Circuit	3,7	2,8		2,8
Dielectric Withstanding Voltage			3,7	
Insulation Resistance			2,6	
T-Rise vs. Current		4,9		4,9
Vibration	5	7		7
Physical Shock	6			
Contact Engaging Force	2			
Contact Separating Force	8			
Durability	4			
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 current production lots. They were inspected and accepted by the Product Assurance Department of the Capital Goods Business Sector.

2.2 Termination Resistance, Specified Current - Groups 2,4

All termination resistance measurements taken at the specified current of 3 amperes dc. were less than 10 milliohms initially and 20 milliohms final gold and 30 milliohms final tin.

Test Group	No. of Samples	Condition	Test Current	Min.	Max.	Mean
2	20	Initial	3.0	6.65	8.84	7.67
	20	Final	3.0	6.73	8.04	7.67
4	20	Initial	3.0	5.70	7.00	6.25
	20	Final	3.0	5.60	10.80	6.55

All values in milliohms

2.3 Termination Resistance, Dry Circuit - Groups 1,2,4

All termination resistance measurements, taken at 100 milliamperes dc. and 20 millivolts open circuit voltage, were less than 10 milliohms initially and 20 milliohms final gold and 30 milliohms final tin.

Test Group	No. of Samples	Condition	Min.	Max.	Mean
1	40 (Sn+Au)	Initial	5.40	8.50	6.65
	20 (Sn)	Final	5.50	6.80	6.20
	20 (Au)	Final	6.20	7.50	6.95
2	20 (Au)	Initial	6.32	8.14	7.18
	20 (Au)	Final	6.50	8.41	7.46
4	20 (Sn)	Initial	5.70	6.80	6.20
	20 (Sn)	Final	5.70	8.30	6.45

All values in milliohms

2.4 Dielectric Withstanding Voltage - Group 3

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

2.5 Insulation Resistance - Group 3

All insulation resistance measurements were greater than 1000 megohms.

2.6 Temperature Rise vs. Current - Groups 2,4

Initial temperature vs current plots were made to stability of the test samples.
All samples had a final temperature rise of less than 30°C above ambient when a specified current of 3.0 amperes dc was applied.

P/N	Plating/Centers	Test Current	Temperature Rise Above Ambient (Max)
531220-1	Sn/.100	3.0	15.0°
531220-2	Au/.100	3.0	17.2°
531230-1	Sn/.200	3.0	21.2°
531230-2	Au/.200	3.0	21.0°

All Temperatures in Degrees Celsius

2.7 Vibration - Groups 1,2,4

No discontinuities of the contacts were detected during vibration of group I samples. Following vibration, no cracks, breaks, or loose parts on the connector assemblies were visible (all groups).

2.8 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.

2.9 Contact Engaging Force - Group 1

All contact engaging forces were less than 43 ounces for gold contact and 55 ounces for tin contacts.

2.10 Contact Separating Force - Group 1

All contact separating forces were greater than 5.4 ounces per contact.

2.11 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connector 25 times, for gold and 5 times, for tin.

2.12 Thermal Shock - Group 3

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 - Groups 3,4

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 Industrial Mixed Flowing Gas - Group 2

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.

2.15 Temperature Life - Groups 2,4

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, Specified Current

Termination resistance measurements taken at the specified current of 3 amperes dc were made, using a four terminal measuring technique (Figure 1).

3.3 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.

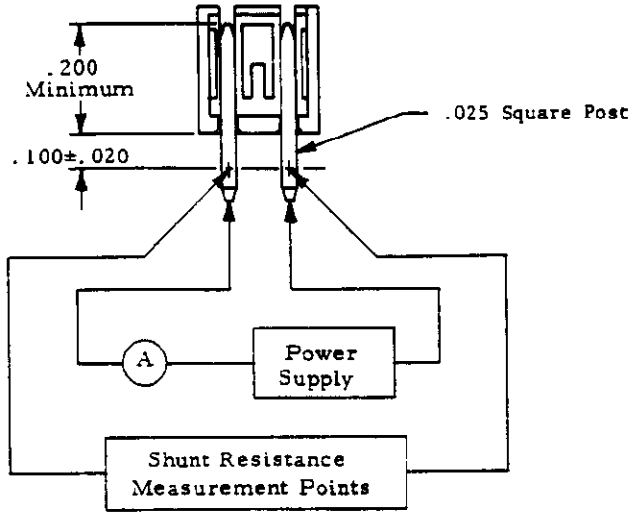

Figure 1
Typical Termination Resistance Measurement Points

3.4 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.

3.5 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.

3.6 Temperature Rise vs Specified Current

Connector temperature was measured, while energized at the specified current of 3 amperes ac. Thermocouples were attached to the connectors 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.

3.7 Vibration, Sine

Connectors, mounted on posts, were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 0.06 inch, double amplitude. The vibration frequency was varied logarithmically between the limits of 10 and 2000 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, in group I, were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.8 Physical Shock

Connectors, mounted on posts, were subjected to a physical shock test, having a sawtooth waveform of 100 gravity units (g peak) and a duration of 6 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.

3.9 Contact Engaging Force

Engaging forces were acquired by inserting a 0.026 inch gage into the socket.

3.10 Contact Separating Force

Separating forces were acquired by withdrawing a 0.024 inch gage from the socket.

3.11 Durability

Connectors and posts were mated and unmated 25/10 times at a rate not exceeding 3600 per hour.

3.12 Thermal Shock

Connectors, mounted on posts, were subjected to five cycles of temperature extremes, with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -40°C and 105°C for gold and -40°C and 85°C for tin. The transition between temperatures was less than one minute.

3.13 Humidity-Temperature Cycling

Connectors, mounted on posts, 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%.

3.14 Industrial Mixed Flowing Gas, Class III

Connectors, mounted on posts, 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.

3.15 Temperature Life

Connectors, mounted on posts, were exposed to a temperature of 85° C for 96 hours.

4. Validation

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