AMP

QUALIFICATION TEST REPORT

CONNECTOR, 2MM MINI-SHUNT

501-222 REV. O

Product Specification:	108-1445 Rev. O
CTL No.:	CTL4153-002-001
Date:	June 11, 1993
Classification:	Unrestricted
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Corporate Test Laboratory Harrisburg, Pennsylvania

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(R4153TS)

AMP

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CORPORATE TEST LABORATORY

Qualification Test Report
2mm Mini-Shunt

1. Introduction

1.1 Purpose

Testing was performed on AMP* 2mm Mini-Shunt to determine its conformance to the requirements of AMP Product Specification 108-1445 Rev. O.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the 2mm Mini-Shunt manufactured by the Integrated Circuit Connector Products Division of the Capital Goods Business Group. The testing was performed between April 13 1993 and June 11, 1993.

1.3 Conclusion

The 2mm Mini-Shunt meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1445 Rev. O.

*Trademark

1.4 Product Description

This connector is a separable, electrical connection device for mating 0.5mm [.020in] square or round posts. When connector is used in normal application, the centerline spacing between mating posts shall be 2mm [.079in]. The contacts are beryllium copper, nickel plated overall with gold stripe or tin. The housings are black thermoplastic, UL94V-O.

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 Nbr	Description
1,2,3,4	30 ea.	382575-2	2mm Shunt (gold)
3	30 ea.	382575-1	2mm Shunt (tin)
1,2,3,4	150	4-176264-8	2mm Header (gold)

1.6 Qualification Test Sequence

	Test Groups			
Test or Examination	1	2	3	4
Examination of Product	1,9	1,5	1,6	1,8
Termination Resistance, Dry Circuit	3,7	2,4	2,5	
Dielectric Withstanding Voltage				3,7
Insulation Resistance				2,6
Vibration	5			
Physical Shock	6			
Mating Force	2			
Unmating Force	8			
Durability	4			
Thermal Shock				4
Humidity-Temperature Cycling			4	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 were less than 20 milliohms.

Test Group	Nbr of Samples	Condition	Min	Max	Mean
1	30	Initial	6.55	7.83	6.85
		After Mechanical	6.61	12.94	7.65
2	30	Initial	6.57	10.15	7.10
		After Temperature Life	7.25	15.99	9.13
3	30	Initial (gold)	6.58	7.26	6.83
		After Mixed Flowing Gas	6.74	14.29	7.64
	30	Initial (tin)	6.14	6.78	6.33
		After Humidity	6.22	8.65	6.58

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 shunts.

2.4 Insulation Resistance - Group 4

All insulation resistance measurements were greater than 1,000 megohms.

2.5 Vibration - Group 1

No discontinuities were detected during vibration. Following vibration, no cracks, breaks, or loose parts on the shunt assemblies were visible.

2.6 Physical Shock - Group 1

No discontinuities were detected during physical shock. Following physical shock testing, no cracks, breaks, or loose parts on the shunt assemblies were visible.

2.7 Mating Force - Group 1

All mating force measurements were less than 600 grams per shunt.

2.8 Unmating Force - Group 1

All unmating force measurements were greater than 200 grams per shunt.

2.9 Durability - Group

No physical damage occurred to the samples as a result of mating and unmating the shunt assembly 50 times.

2.10 Thermal Shock - Group 4

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

2.11 Humidity-Temperature Cycling - Groups 3,4

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

2.12 Mixed Flowing Gas - Group 3

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

2.13 Temperature Life - Group 2

No evidence of physical damage to either the contacts or the shunt 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.

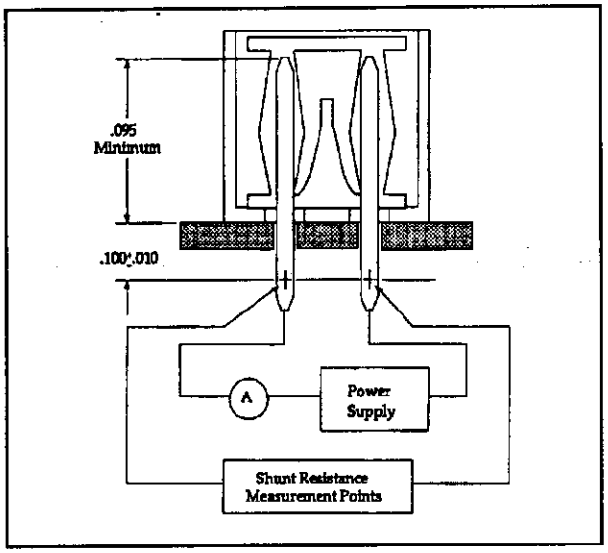

Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 1000 vac was applied between the adjacent shunts. This potential was applied for one minute and then returned to zero.

3.4 Insulation Resistance

Insulation resistance was measured between adjacent shunts, using a test voltage of 500 volts DC. This voltage was applied for two minutes before the resistance was measured.

3.5 Vibration, Sine

Shunts mated to headers 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 6 hours. Shunts were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.6 Physical Shock

Shunts mated to headers 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.

3.7 Mating Force

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

3.9 Durability

The shunt and header were mated and unmated 50 times at a rate not exceeding 600 per hour.

3.10 Thermal Shock

Mated shunts 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 105°C. The transition between temperatures was less than one minute.

3.11 Humidity-Temperature Cycling

Mated shunts 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%.

3.12 Mixed Flowing Gas, Class II

Mated shunts were exposed for 14 days to a 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. Samples were preconditioned with 5 cycles of durability.

3.13 Temperature Life

Mated shunts were exposed to a temperature of 105°C for 1000 hours. Samples were preconditioned with 5 cycles of durability.

4. Validation

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6/11/93

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