AMP

QUALIFICATION TEST REPORT

SOCKET, SIP COMPLIANT PIN

501-205 Rev. 0

Product Specification:	108-1251 Rev. 0
CTL No.:	CTL1419-004-005
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Table of Contents

(R1419TS)

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Qualification Test Report
Socket, SIP Compliant Pin

1. Introduction

1.1 Purpose

Testing was performed on AMP*'s SIP Compliant Pin Socket to determine its conformance to the requirements of AMP Product Specification 108-1251 Rev.0.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the SIP Compliant Pin Socket manufactured by the Integrated Circuit Connector Products Division of the Capital Goods Business Group. The testing was performed between October 15, 1992 and November 23, 1992.

1.3 Conclusion

The SIP Compliant Pin Socket meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1251 Rev. 0.

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1.4 Product Description

The compliant pin SIP (single inline package) socket allows the application of SIP components to a backplane or printed circuit board without soldering. The single-leaf ACTION PIN* contacts require a standard plated-through hole tolerance of .040 ±.003.

The contact is phosphor bronze with tin plating. The housing is polyester, glass filled, UL 94V-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:

Test Group	Quantity	Part Number	Description
1,2,3,4,5	2	382444-2	8 Position Socket

1.6 Qualification Test Sequence

Test or Examination	Test Groups 1	2	3	4	5
Examination of Product	1,12	1,7	1,6	1,9	1,3
Termination Resistance, Dry Circuit	4,9	2,5	2,5		
Dielectric Withstanding Voltage				3,6	
Insulation Resistance				2,5	
Capacitance				7	
T-Rise vs. Current					2
Vibration	7				
Physical Shock	8				
Mating Force	2				
Unmating Force	3,10	3,6			
Contact Retention				8	
Durability	6		3		
Compliant Pin Retention	11		7		
Thermal Shock	5				
Humidity-Temperature Cycling			4	4	
Temperature Life		4			

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 20 millivolts open circuit voltage, had an initial resistance of less than 15 milliohms and had a final change in resistance (ΔR) of less than 10 milliohms

Test Group	No. of Samples	Condition	Min.	Max.	Mean
1	16	Initial	5.9	6.1	6.03
	16	After Mechanical (ΔR)	-0.2	+0.7	+0.11
	32	Initial	4.2	4.7	4.50
2	32	After Temperature Life (ΔR)	-0.3	+0.2	-0.05
	32	Initial	4.3	4.7	4.50
3	32	After Humidity (ΔR)	-0.1	+0.4	+0.15

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 10,000 megohms.

2.5 Temperature Rise vs. Current - Group 5

All samples had a temperature rise of less than 10°C above ambient when a specified current of 1.0 amperes dc was applied.

2.6 Capacitance - Group 4

All capacitance measurements were less than 1.0 picofarads.

2.7 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.

2.8 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 Mating Force - Group 1

All mating force measurements were less than 250 grams maximum average per contact.

2.10 Unmating Force - Group 1

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

2.11 Contact Retention - Group 8

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 340 grams to the contacts.

2.12 Durability - Groups 1,3

No physical damage occurred to the samples as a result of mating and unmating a dummy IC module 10 times.

2.13 Compliant Pin Retention - Groups 1,3

The force required to push out all pins inserted into the test board was greater than 2.5 pounds per contact.

2.14 Thermal Shock - Group 1

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

2.15 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.

2.16 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 20 millivolts dc.

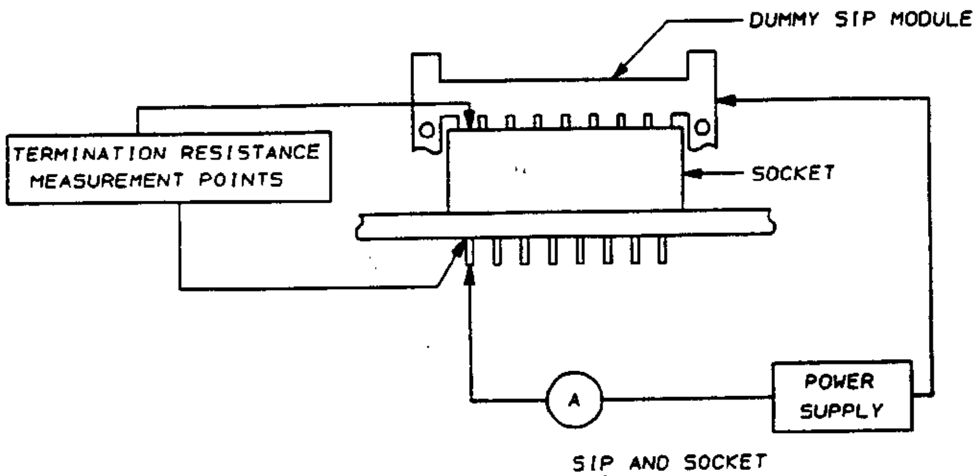

Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 1000 vac was applied between the adjacent 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 Temperature Rise vs Specified Current

Connector temperature was measured, while energized at the specified current of 1.0 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.

3.6 Capacitance

Capacitance was measured between the adjacent contacts of unmated connectors, using a test frequency of 1.0 MHz.

3.7 Vibration, Sine

Connectors, mated with dummy IC's, 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 were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.8 Physical Shock

Connectors, mated with dummy IC's, were subjected to a physical shock test, having a half-sine 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 Mating Force

The force required to mate dummy IC's with the SIP package was measured, using a free floating fixture with the rate of travel at 0.5 inch/minute.

3.10 Unmating Force

The force required to unmate dummy IC's from the SIP package was measured, using a free floating fixture with the rate of travel at 0.5 inch/minute.

3.11 Contact Retention

An axial load of 340 grams 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.

3.12 Durability

Dummy IC's and connectors were mated and unmated 10_ times at a rate not exceeding 500 per hour.

3.13 Compliant Pin Retention

An axial force was applied to all pins simultaneously. This force was applied in a direction opposite of that of insertion.

3.14 Thermal Shock

Connectors, mated with dummy IC's, 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.

3.15 Humidity-Temperature Cycling

Connectors, mated with dummy IC's, 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.

3.16 Temperature Life

Connectors, mated with dummy IC's, were exposed to a temperature of 118°C for 300 hours.

4. Validation

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