AMP

QUALIFICATION TEST REPORT

PIN RECEPTACLE,
PRINTED CIRCUIT BOARD,
.088 TO .093 DIAMETER

501-196 Rev. O

Product Specification:	108-1411 Rev. A
CTL No.:	CTL7198-100-001
Date:	October 29, 1992
Classification:	Unrestricted
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Table of Contents

(R7198ts)

AMP

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CORPORATE TEST LABORATORY

Qualification Test Report
Pin Receptacle, PCB, .088 to .093 Diameter

1. Introduction

1.1 Purpose

Testing was performed on AMP's Pin Receptacle to determine its conformance to the requirements of AMP Product Specification 108-1411 Rev. A.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the Pin Receptacle manufactured by the Consumer Products Business Unit of the Automotive/Consumer Business Group. The testing was performed between September 11, 1992 and October 29, 1992.

1.3 Conclusion

The Pin Receptacle meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1411 Rev. A.

1.4 Product Description

The AMP Pin Receptacle contact is a phosphor bronze, tin plated contact, designed to be mounted on a 0.062 inch circuit board. The contact is designed to mate with .088 to .093 diameter posts.

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
1,2,3,4,5,6	20 ea.	63566-1	PCB Pin Receptacle
1,2,3,4,5,6	20 ea.	N/A	.093 Pin cluster (4)

1.6 Qualification Test Sequence

	Test Groups					
Test or Examination	1	2	3	4	5	6
Examination of Product	1,9	1,5	1,5	1,5	1,6	1,5
Termination Resistance, Specified Current					4	
Termination Resistance, Dry Circuit	3,7	2,4	2,4	2,4	2,5	2,4
T-Rise vs. Current					3	
Vibration	5					
Physical Shock	6					
Mating Force	2					
Unmating Force	8					
Durability	4					
Forced Motion						3
Thermal Shock			3			
Humidity-Temperature Cycling				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 Automotive/Consumer Business Group.

2.2 Termination Resistance, Specified Current - Group 5

All termination resistance measurements taken at the specified current of 3 amperes dc. were less than 10 milliohms.

Test Group	No. of Samples	Condition	Test Current	Min.	Max.	Mean
5	20	After T-rise	3.0	0.76	1.51	1.119

All values in milliohms

2.3 Termination Resistance, Dry Circuit - All Groups

All termination resistance measurements, taken at 100 milliamperes dc. and 50 millivolts open circuit voltage, were less than 10 milliohms.

Test Group	No. of Samples	Condition	Min.	Max.	Mean
1	20	Initial	0.89	1.16	1.045
		After Mechanical	1.16	3.00	1.906
2	20	Initial	0.90	1.18	1.026
		After Temp Life	0.94	1.77	1.264
3	20	Initial	0.81	1.22	1.006
		After Thermal Shock	1.13	7.80	2.948
4	20	Initial	0.90	1.31	1.056
		After Humidity	0.92	1.94	1.158
5	20	Initial	0.85	1.23	1.002
		After T-rise	0.94	1.67	1.185
6	20	Initial	0.89	1.26	1.035
		After Durability	1.06	2.60	1.863

All values in milliohms

2.4 Temperature Rise vs. Current - Group 5

All samples had a temperature rise of less than 10°C above ambient when a specified current of 3.0 amperes dc was applied.

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 9.0 pounds for a 4 pin cluster.

2.8 Unmating Force - Group 1

All unmating force measurements were greater than 2.5 pounds for a 4 pin cluster.

2.9 Durability - Group 1

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

2.10 Forced Motion - Group 6

No physical damage occurred to the samples as a result of forced motion. Forced motion has a total travel of 0.010 inch.

2.11 Thermal Shock - Group 3

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

2.12 Humidity-Temperature Cycling - Group 4

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

2.13 Temperature Life - Group 2

No evidence of physical damage to the contacts 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 50 millivolts dc.

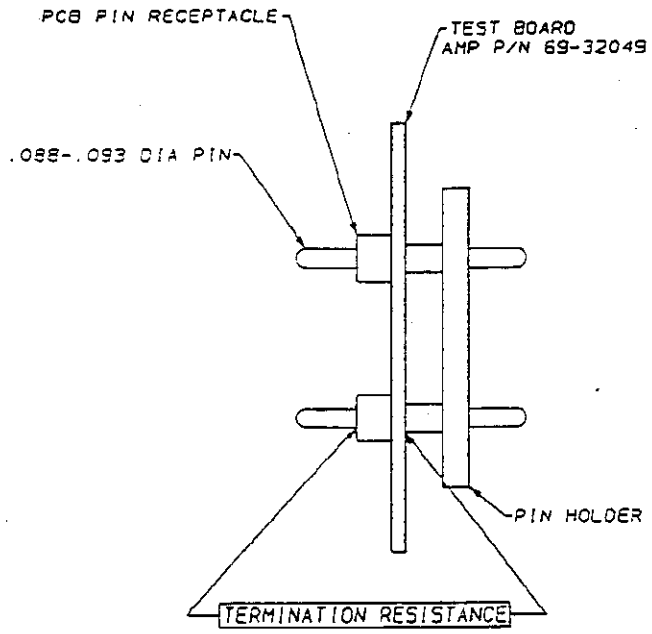

Figure 1
Typical Termination Resistance Measurement Points

3.4 Temperature Rise vs Specified Current

Contact temperature was measured, while energized at the specified current of 3 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.

3.5 Vibration, Random

Mated contacts were subjected to a random vibration test, specified by a random vibration spectrum, with excitation frequency bounds of 5 and 500 hertz. The power spectral density at 5 hz is .0006 G^2/Hz. The spectrum slopes up at 6 dB per octave to a PSD of .01 G^2/Hz at 10 Hz. The spectrum is flat at .01 G^2/Hz from 10 to 500 Hz. The root-mean square amplitude of the excitation was 2.22 GRMS. This cycle was performed for three hours in each of three mutually perpendicular planes, for a total vibration time of 9 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 contacts were subjected to a physical shock test, having a half-sine 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 contacts 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 contact assemblies 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 contact assemblies was measured, using a free floating fixture with the rate of travel at 0.5 inch/minute.

3.9 Durability

Contacts were mated and unmated 10 times at a rate not exceeding 300 per hour.

3.10 Forced Motion

Contacts were cycled 1000 times at a rate of 300 cycles per hour. The total travel of each cycle was 0.010 inches along the axes of the mating pin.

3.11 Thermal Shock

Mated contacts were subjected to 1000 cycles of temperature extremes, with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -40°C and 100°C. The transition between temperatures was less than one minute.

3.12 Humidity-Temperature Cycling

Mated contacts were exposed to 21 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 Temperature Life

Mated contacts were exposed to a temperature of 105°C for 580 hours.

4. Validation

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