AMP

QUALIFICATION TEST REPORT

Reusable Component Receptacle

501-180 Rev. A

Product Specification:	108-1079 Rev. 0
CTL No.:	1336-008-002
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Corporate Test Laboratory Harrisburg, Pennsylvania

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(R1336JD1)

AMP

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CORPORATE TEST LABORATORY

Qualification Test Report
Reusable Component Receptacle

1. Introduction

1.1 Purpose

Testing was performed on AMP* Reusable Component Receptacle to determine its conformance to the requirements of AMP Product Specification 108-1079 Rev.0.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the Reusable Component Receptacle manufactured by the Integrated Circuit Connector Products Division of the Capital Goods Business Group. The testing was performed between February 19, 1992 and May 7, 1992.

1.3 Conclusion

The Reusable Component Receptacle meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1079 Rev. 0.

* Trademark

1.4 Product Description

The Reusable Receptacles are used for testing and mounting pc board components. The standard receptacles are available in a gold-plated or tin-plated open and closed bottom types. Standard receptacles have gold plated cups, but the economy version is tin-lead plated. The spring member in all receptacles is beryllium copper with tin or gold-over-nickel plating. A hole diameter of 0.089 inch is required for mounting the receptacle to the pc board. Once installed these receptacles accept component leads from a diameter of 0.018 to 0.054 inch.

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	60	380598-3	Reusable Component Recept., Tin Spring
	60	380635-2	Reusable Component Recept., Gold Spring
	60	1-380758-0	Reusable Component Recept., Tin Spring
	60	1-380758-1	Reusable Component Recept., Gold Spring
2,4	30	380598-3	Reusable Component Recept., Tin Spring
	30	380635-2	Reusable Component Recept., Gold Spring
	30	1-380758-0	Reusable Component Recept., Tin Spring
	30	1-380758-1	Reusable Component Recept., Gold Spring
3	30	380635-2	Reusable Component Recept., Gold Spring
	30	1-380758-1	Reusable Component Recept., Gold Spring
5,6	5	380598-3	Reusable Component Recept., Tin Spring
	5	380635-2	Reusable Component Recept., Gold Spring
	5	1-380758-0	Reusable Component Recept., Tin Spring
	5	1-380758-1	Reusable Component Recept., Gold Spring

Note: All receptacles were mounted on a test printed circuit board, and each pair of receptacles was engaged with one inch of the specified solid tin-plated wire for test measurements. See figure 1 for details.

1.6 Qualification Test Sequence

	Test Groups					
Test or Examination	1	2	3	4	5	6
Examination of Product	1,10	1,6	1,6	1,5	1,3	1,3
Termination Resistance, Specified Cur.		5	5			
Termination Resistance, Dry Circuit	3,8	2,4	2,4	2,4		
T-Rise vs. Current					2	
Vibration	6					
Physical Shock	7					
Contact Engaging Force	2					
Contact Separating Force	9					
Durability	4					
Solderability						2
Thermal Shock	5					
Humidity-Temperature Cycling		3				
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, Specified Current - Groups 2 & 3

All termination resistance measurements taken at the specified current of 3 and 4 amperes dc. were less than 30 milliohms.

Test Group	Number Measured	Condition	Test Current	Min.	Max.	Mean
2	60	After Humidity	4.0	0.72	4.20	2.17
	60	After Humidity	3.0	0.88	2.33	1.55
3	30	After MFG	4.0	0.62	2.75	1.43
	30	After MFG	3.0	0.87	4.21	2.18

All values in milliohms

2.3 Termination Resistance, Dry Circuit - Groups 1,2,3 & 4

All termination resistance measurements, taken at 100 milliamperes dc. and 50 millivolts open circuit voltage, were less than 15 milliohms initially and less than 30 milliohms after testing.

Test Group	Number Measured	Condition	Min.	Max.	Mean
1	120	Initial	0.41	5.30	1.98
	120	After Shock	0.91	17.64	4.63
2	60	Initial	0.49	2.10	1.14
	60	After Humidity	0.75	4.74	1.77
3	30	Initial	0.55	2.41	1.35
	30	After MFG	0.49	4.73	1.70
4	60	Initial	0.49	2.84	1.56
	60	After Temp. Life	0.72	5.40	2.39

All values in milliohms

2.4 Temperature Rise vs. Current - Group 5

All samples had a temperature rise of less than 30°C above ambient when a specified current of 4.0 and 3.0 amperes dc were applied.

P/N	Wire Size AWG	Test Current	Temperature Rise Above Ambient (Max)
1-380758-0	16	4.0	14.0°C
1-380758-1	16	4.0	14.4°C
380598-3	18	3.0	10.1°C
380635-2	18	3.0	10.0°C

All Temperatures in Degrees Celsius

2.5 Vibration - Group 1

No discontinuities of the samples were detected during vibration. Following vibration, no cracks, breaks, or loose parts on the receptacles were visible.

2.6 Physical Shock - Group 1

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

2.7 Engaging Force - Group 1

All engaging forces were less than the maximum requirements.

P/N	Gage Pin Size (inch)	Engaging Force Measured(Maximum)	Engaging Force Max. Requirement
1-380758-0	0.054	61.1	65.0
1-380758-1	0.054	61.2	65.0
1-380758-0	0.040	42.8	48.0
1-380758-1	0.040	31.3	48.0
380598-3	0.040	43.3	48.0
380635-2	0.040	41.3	48.0
380598-3	0.020	17.4	18.0
380635-2	0.020	8.1	18.0

All values in ounces

2.8 Separating Force - Group 1

All separating forces were greater than the minimum requirements.

P/N	Gage Pin Size (inch)	Separating Force Measured Min.	Separating Force Min. Requirement
1-380758-0	0.050	0.96	0.50
1-380758-1	0.050	1.00	0.50
1-380758-0	0.036	0.51	0.50
1-380758-1	0.036	0.75	0.50
380598-3	0.035	0.88	0.50
380635-2	0.035	0.90	0.50
380598-3	0.020	1.27	0.50
380635-2	0.020	1.02	0.50

All values are in ounces

2.9 Durability - Group 1

No physical damage occurred to the receptacles as a result of inserting and withdrawing the specified gage pins from the receptacles 50 times.

2.10 Solderability - Group 6

The receptacle cups met the requirement of 95% minimum solder coverage.

2.11 Thermal Shock - Group 1

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

2.12 Humidity-Temperature Cycling - Group 2

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

2.13 Mixed Flowing Gas - Group 3

No evidence of physical damage to the receptacles was visible as a result of exposure to the pollutants of mixed flowing gas.

2.14 Temperature Life - Group 4

No evidence of physical damage to the receptacles 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 and 4 amperes dc were made, using a four terminal measuring technique (Figure 1).

3.3 Termination Resistance, Dry Circuit

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.

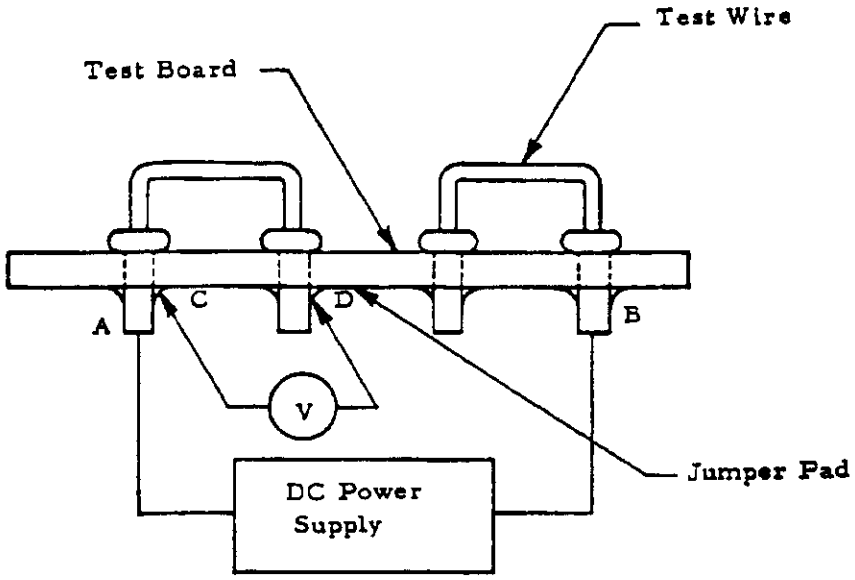

Figure 1
Typical Termination Resistance Measurement Points

3.4 Temperature Rise vs Specified Current

The receptacles temperature was measured, while energized at the specified current of 3 and 4 amperes ac. Thermocouples were attached as close as possible to the receptacle/wire interface to measure their temperatures. The ambient temperature was then subtracted from the measured temperature to find the temperature rise. When three readings at five minute intervals were the same, the readings were recorded.

3.5 Vibration, Sine

Receptacles engaged with wire 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. The receptacles were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.6 Physical Shock

Receptacles engaged with wire 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 receptacles were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.7 Contact Engaging Force

Engaging forces were acquired by inserting a 0.054, 0.040, and 0.020 inch gages into the receptacles.

3.8 Contact Separating Force

Separating forces were acquired by withdrawing a 0.050, 0.036, 0.035, and 0.018 inch gages from the receptacles.

3.9 Durability

The specified gage pins were inserted and withdrawing from the receptacles 50 times at a rate not exceeding 500 per hour.

3.10 Solderability

With the samples mounted on a printed circuit board, the receptacle cups were subjected to a solderability test by immersing them in a 109-11-2 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 then 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.

3.11 Thermal Shock

Receptacles engaged with wire 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 for tin plated receptacle, and -55°C and 125°C for gold plated receptacles. The transition between temperatures was less than one minute.

3.12 Humidity-Temperature Cycling

Receptacles engaged with wire 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%.

3.13 Mixed Flowing Gas, Class II

Receptacles engaged with wire were exposed for 20 days to an 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.

3.14 Temperature Life

Receptacles were exposed to a temperature of 85°C for 96 hours.

4. Validation

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