AMP

QUALIFICATION TEST REPORT

Miniature Spring Sockets

501-127 Rev. A

Product Specification:	108-14008, Rev. E
CTL No.:	CTL3076-017-037
Date:	September 18, 1990
Classification:	Unrestricted
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Per EC:	0990-0062-094

Corporate Test Laboratory Harrisburg, Pennsylvania

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AMP

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CORPORATE TEST LABORATORY

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Miniature Spring Socket

1. Introduction

1.1 Purpose

Testing was performed on AMP* Miniature Spring Sockets to determine its conformance to the requirements of AMP Product Specification 108-14008, Rev. E.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the Miniature Spring Sockets, manufactured by the Integrated Circuit Connector Products Division of the Capital Goods Business Sector. The testing was performed between March 5, 1990 and April 24, 1990.

1.3 Conclusion

The Miniature Spring Sockets meet the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-14008, Rev. E.

* Trademark

1.4 Product Description

The Miniature Spring Socket is designed to provide an electrical and mechanical connection with solid wire leads typically encountered on electrical and electronic components. Various sizes of sockets accommodate wire diameters ranging from .010 to .065 inch.

The contact is a copper alloy with either gold or tin plating. The eyelet is copper or copper alloy with gold or tin plating.

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	32 ea.	2-330808-7	Sn .013/.020 Socket
	32 ea.	6-330808-5	Au .013/.020 Socket
	32 ea.	2-331272-5	Sn .022/.025 Socket
	32 ea.	2-331272-6	Au .022/.025 Socket
	32 ea.	1-331677-3	Sn .030/.033 Socket
	32 ea.	1-331677-4	Au .030/.033 Socket
	32 ea.	1-332070-1	Au .034/.037 Socket
	32 ea.	2-332070-2	Sn .034/.037 Socket
	32 ea.	1-50871-7	Sn .050/.057 Socket
	32 ea.	1-50871-3	Au .050/.057 Socket

1.6 Qualification Test Sequence

Test or Examination	Test Groups 1	2	3	4
Examination of Product	1,10	1,7	1.7	1
Termination Resistance, Specified Current		3,6	3,6	
Termination Resistance, Dry Circuit	4,9	2,5	2,5	
T-Rise vs. Current				2
Vibration	7			
Physical Shock	8			
Contact Engaging Force	2			
Contact Separating Force	3			
Durability	5			
Thermal Shock	6			
Corrosion, Salt Spray			4	
Mixed Flowing Gas		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 Sector.

2.2 Termination Resistance, Specified Current - Groups 2, 3

All termination resistance measurements taken at the specified current of one amperes dc. were less than 15.0 milliohms initially and 30 milliohms after testing.

Test Group	No. of Samples	Condition	Min.	Max.	Mean
2	80	Initial	0.71	6.73	2.39
	80	After Salt Corrosion	0.95	10.63	3.13
3	80	Initial	1.03	6.09	2.00
	80	After Mixed Gas	1.06	8.75	2.91

All values in milliohms

2.3 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 15.0 milliohms initially and 30 milliohms after testing.

Test Group	No. of Samples	Condition	Min.	Max.	Mean
1	160	Initial	0.62	6.63	2.22
	160	After Mechanical	1.00	7.29	3.33
2	80	Initial	0.71	6.65	2.38
	80	After Salt Corrosion	0.91	9.78	3.08
3	80	Initial	1.17	5.48	2.25
	80	After Mixed Gas	1.06	6.94	3.07

All values in milliohms

2.4 Temperature Rise vs. Current - Group 4

All sockets had a temperature rise of less than 30°C above ambient when a specified current of 6.0 amperes dc was applied.

P/N	Wire Size AWG	Test Current	Temperature Rise Above Ambient (Max)
1-50871-7	16	6.0	18.57°
1-50871-3	16	6.0	22.85°

All Temperatures in Degrees Celsius

2.5 Vibration - Group 1

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

2.7 Contact Engaging Force - Group 1

All contact engaging forces were less than 24 ounces per socket for Series I and 56 ounces per contact for Series II thru V.

2.8 Contact Separating Force - Group 1

All contact separating forces were greater than 0.5 ounces per socket.

2.9 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the appropriate gage with each socket 50 times.

2.10 Thermal Shock - Group 1

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

2.11 Corrosion, Salt Spray - Group 2

No evidence of physical damage to the sockets was visible as a result of exposure to a salt spray atmosphere.

2.12 Industrial Mixed Flowing Gas - Group 3

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

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 1.0 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.

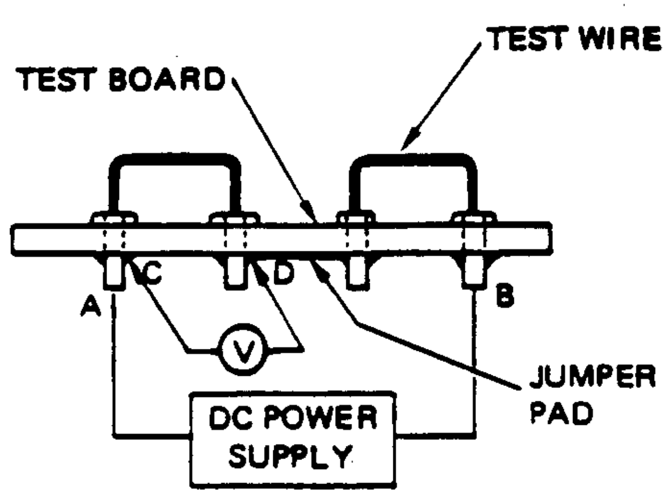

Figure 1
Typical Termination Resistance Measurement Points

3.4 Temperature Rise vs. Specified Current

Connector temperature was measured while energized at the specified current of 6.0 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.

3.5 Vibration, Sine

Mated connectors 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.

3.6 Physical Shock

Mated connectors 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 Contact Engaging Force

Engaging forces were acquired by inserting the appropriate gage into the socket. (Figure 2)

3.8 Contact Separating Force

Separating forces were acquired by withdrawing the gage from the socket. (Figure 2)

3.9 Durability

Sockets were mated and unmated 50 times with the appropriate gage. (Figure 2)

Socket Series Number	Gage Pin Diameter Engaging/Durability	Separating
I	.017	.014
II	.025	.022
III	.033	.030
IV	.040	.037
V	.057	.055

Figure 2
Engaging/Durability and Separating Gages

3.10 Thermal Shock

Mated connectors were subjected to five cycles of temperature extremes, with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -65°C and 125°C. The transition between temperatures was less than one minute.

3.11 Corrosion, Salt Spray

Mated connectors were subjected to a 5% salt spray environment for 48 hours. The temperature of the box was maintained at 95 +2/-3°C, and the pH of the salt solution was between 6.5 and 7.2.

3.12 Mixed Flowing Gas, Class II

Mated connectors 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.

4. Validation

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