AMP*

QUALIFICATION TEST REPORT

Straight and Right Angle
PCB Mounted, Decoupled
BNC Jack Connector

501-126 Rev. 0

Product Specification:	108-1269, Rev. 0
CTL No.:	CTL4166-011-002
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AMP

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CORPORATE TEST LABORATORY

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BNC Jack Connector

1. Introduction

1.1 Purpose

Testing was performed on AMP's BNC Jack Connector to determine its conformance to the requirements of AMP Product Specification 108-1269, Rev. 0.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the BNC Jack Connector, manufactured by the Business Development Division of the Capital Goods Business Sector. The testing was performed between May 10, 1990 and August 1, 1990.

1.3 Conclusion

The BNC Jack Connector meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1269, Rev. 0.

1.4 Product Description

The BNC Connectors are designed for PCB and panel mount application. These connectors are designed for right angle or vertical mounting. The cup contact is phosphor bronze with tin lead plating. The center contact is phosphor bronze, tin lead, silver or gold over nickel plating. The housing material is polyester PBT.

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	5 ea.	413515-2	RT Angle Jack
4	5 ea.	413515-1	RT Angle Jack
1,2,3,4,5	5 ea.	225395-1	*Plug

*for test purpose only

1.6 Qualification Test Sequence

	Test Groups				
Test or Examination	1	2	3	4	5
Examination of Product	1,9	1,5	1,6	1,10	1
Termination Resistance	3,7	2,4	2,5		
Dielectric Withstanding Voltage				4,9	
Insulation Resistance				3,8	
Capacitance				2	
Permeability			3		
RF High Potential				5	
Vibration	5				
Physical Shock	6				
Contact Engaging Force	2				
Contact Separating Force	8				
Durability	4				
Connector to Board Retention					2
Solderability					3
Thermal Shock				6	
Humidity-Temperature Cycling				7	
Industrial Mixed Flowing Gas			4		
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 Sector.

2.2 Termination Resistance - Groups 1, 2, 3

All termination resistance measurements were less than 12 milliohms for the center contact and 4 milliohms for the outer contact.

Test Group	No. of Samples	Condition	Test Current	Max.	Mean
1	5	Initial - Center	1.0	10.3	10.62
	5	Initial - Outer	1.0	2.7	2.48
	5	After Mechanical - Center	1.0	10.9	10.10
	5	After Mechanical - Outer	1.0	2.6	2.55
2	5	Initial - Center	1.0	10.0	9.88
	5	Initial - Outer	1.0	3.0	2.90
	5	After Temperature - Center	1.0	10.1	9.86
	5	After Temperature - Outer	1.0	3.0	2.74
3	5	Initial - Center	0.1	9.9	9.31
	5	Initial - Outer	0.1	3.5	3.18
	5	After Mixed Gas - Center	0.1	9.7	9.28
	5	After Mixed Gas - Outer	0.1	3.9	3.69

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 5000 megohms.

2.5 Capacitance - Group 4

All capacitance measurements were 9400 $\pm$10% picofarad.

2.6 Permeability - Group 4

All permeability measurements were less than 2.0 mu.

2.7 RF High Potential - Group 4

No flashovers occurred when the test voltage was applied.

2.8 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.

2.9 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.

2.10 Contact Engaging Force - Group 1

All contact engaging forces were less than 32 ounces per contact.

2.11 Contact Separating Force - Group 1

All contact separating forces were greater than 2 ounces per contact.

2.12 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connector 500 times.

2.13 Connector to Board Retention - Group 5

Jacks did not dislodge from test panels, and no discontinuities were observed.

2.14 Solderability - Group 5

The contact leads had a minimum of 95% solder coverage.

2.15 Thermal Shock - Group 4

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

2.16 Humidity-Temperature Cycling - Group 4

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

2.17 Industrial Mixed Flowing Gas - Group 3

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

2.18 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

Termination resistance measurements were made, using a four terminal measuring technique (Figure 1).

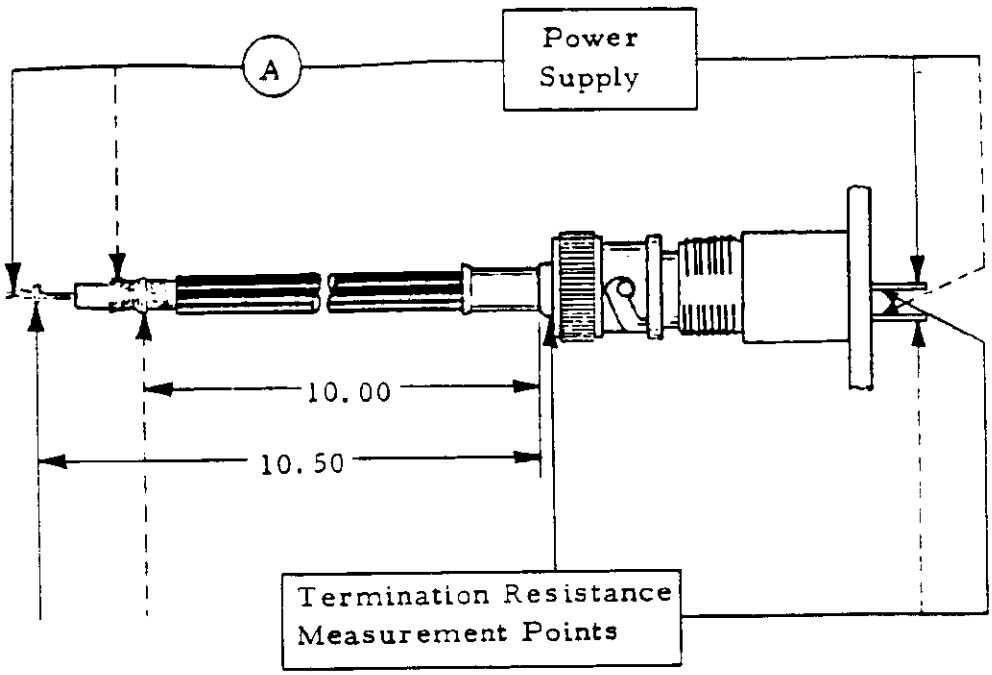

Figure 1
Typical Termination Resistance Measurement Points

3 Dielectric Withstanding Voltage

A test potential of 1500 vac was applied between the outer and center contacts. This potential was applied for one minute and then returned to zero.

3.4 Insulation Resistance

Insulation resistance was measured between the outer and center contacts, using a test voltage of 500 vdc. This voltage was applied for two minutes before the resistance was measured.

3.5 Capacitance

Capacitance was measured between the center contact and the spring clip of unmated connectors, using a test frequency of 100 hertz.

3.6 Permeability

Magnetic permeability was checked, using a 2.0 micro mu magnet.

3.7 RF High Potential

A test voltage of 1000 vac was applied between the center contact and the body of the connector. This potential has a frequency of 5.0 mHz and was maintained for one minute.

3.8 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 uniformly between the limits of 10 and 55 Hz and returned to 10 Hz in one minute. This cycle was performed in each of three mutually perpendicular planes, for a total vibration time of six hours. Connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.9 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.

3.10 Contact Engaging Force

Engaging forces were acquired by inserting a .054 inch gage into the socket.

3.11 Contact Separating Force

Separating forces were acquired by withdrawing a .052 inch gage from the socket.

3.12 Durability

Connectors were mated and unmated 500 times at a rate not exceeding 720 per hour.

3.13 Connector to Board Retention

An axial load of 50 pounds was applied to the jack, in a direction away from the test board. This weight was applied for 30 seconds. Continuity was monitored with a low voltage lamp circuit.

3.14 Solderability

Connector assembly contact solder tails were subjected to a solderability test, by immersing them in a mildly active 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.

3.15 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 -55°C and 85°C. The transition between temperatures was less than one minute.

3.16 Humidity-Temperature Cycling

Mated connectors 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.

3.17 Industrial Mixed Flowing Gas, Class III

Mated connectors were exposed for 20 days to an industrial mixed flowing gas Class III exposure. Class III exposure is defined as a temperature of 30°C and a relative humidity of 75% with the pollutants of Cl_2 at 20 ppb, NO_2 at 200 ppb, and H_2S at 100 ppb.

3.18 Temperature Life

Mated samples were exposed to a temperature of 55°C for 96 hours.

4. Validation

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