AMP

QUALIFICATION TEST REPORT

ADAPTER, BNC, COMMERCIAL, COAXIAL,
FEED THRU AND BULKHEAD FEED THRU

501-181 Rev. A

Product Specification:	108-12096 Rev. 0
CTL No.:	CTL3347-104-037
Date:	July 1, 1992
Classification:	Unrestricted
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Per EC:	0990-0062-94

Corporate Test Laboratory Harrisburg, Pennsylvania

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(R3347TS)

AMP

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CORPORATE TEST LABORATORY

Qualification Test Report
BNC Adapters, Feed Thru and
Bulkhead Feed Thru

1. Introduction

1.1 Purpose

Testing was performed on AMP* BNC Adapters to determine its conformance to the requirements of AMP Product Specification 108-12096 Rev.0.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the BNC Adapters manufactured by the Signal Transmission Products Division of the Capital Goods Business Group. The testing was performed between February 5, 1992 and June 26, 1992.

1.3 Conclusion

The BNC Adapters meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-12096 Rev. 0.

* Trademark

1.4 Product Description

The BNC 50 Ohm Bulkhead Jack Adapters are designed to mate two BNC Jacks thru a panel and is designed to maintain a 50 ohmimpedance. The bodies are available in both Nickel and Silver plating. The center contacts are available in both Gold and Silver.

The BNC 50 Ohm Jack Adapters are designed to mate two BNC Jacks, and maintain a 50 ohm impedance. The body is Nickel plated. The center contacts are available in both Gold and Silver.

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	30	221551-1	Bulkhead Jack Adapter (Ag)
1,2,3,4,5,6	30	221551-3	Bulkhead Jack Adapter (Au)
1,2,3,4,5,6	30	228226-1	Feed-thru Adapter (Au)
1,2,3,4,5,6	30	228226-2	Feed-thru Adapter

1.6 Qualification Test Sequence

	Test Groups					
Test or Examination	1	2	3	4	5	6
Examination of Product	1,11	1,5	1,5	1,8	1,5	1,4
Termination Resistance	4,8	2,4	2,4			
Dielectric Withstanding Voltage				3,7		
Insulation Resistance				2,6		
RF High Potential						3
RF Insertion Loss					2	
RF Leakage					3	
Voltage Standing Wave Ratio					4	
Corona						2
Vibration	6					
Physical Shock	7					
Mating Force/Torque	2,10					
Unmating Force/Torque	3,9					
Durability	5					
Thermal Shock				4		
Humidity-Temperature Cycling				5		
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, Dry Circuit - Groups 1,2,3

All termination resistance measurements, taken at 100 milliamperes dc. and 50 millivolts open circuit voltage, were less than the 1.5 milliohms maximum change (ΔR) for each center contact interface and 3.0 milliohms maximum change (ΔR) for each outer contact interface.

Test Group	No. of Samples		Min.	Max.	Mean
1	*20	Inner Contacts	-2.81	+2.53	+0.226
	40	Outer Contact	-2.85	+0.94	-0.761
2	*20	Inner Contacts	-0.06	+0.25	+0.054
	40	Outer Contact	-0.52	+2.56	+0.592
3	*20	Inner Contacts	-1.29	+1.69	+0.189
	40	Outer Contact	-1.26	+1.91	+0.289

All values in milliohms
* two contact per measurement

2.3 Dielectric Withstanding Voltage - Group 4

No dielectric breakdown or flashover occurred when a test voltage was applied between the outer and inner contacts.

2.4 Insulation Resistance - Group 4

All insulation resistance measurements were greater than 5000 megohms.

2.5 RF Hi Pot - Group 6

No breakdown or flashover occurred when a test voltage between the center and outer contacts.

2.6 RF Insertion Loss - Group 5

All insertion loss results were less than 0.05dB(f)GHz.

2.7 RF Leakage - Group 5

All RF Leakage was less than -55 dB when a 0 dBm signal was applied.

2.8 Voltage Standing Wave Ratio - Group 5

All voltage standing wave ratio measurements were less than 1.25.

2.9 Corona/Altitude - Group 6

There was no corona discharge greater than 5.0 picocoulombs.

2.10 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.

2.11 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.

2.12 Mating Force - Group 1

All mating force measurements were less than 3.0 lbs axial force and 2.5 in-lbs rotational torque.

2.13 Unmating Force - Group 1

All unmating force measurements were less than 3.0 lbs axial force and 2.5 in-lbs rotational torque.

2.14 Durability - Group 1

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

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 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 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, 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.

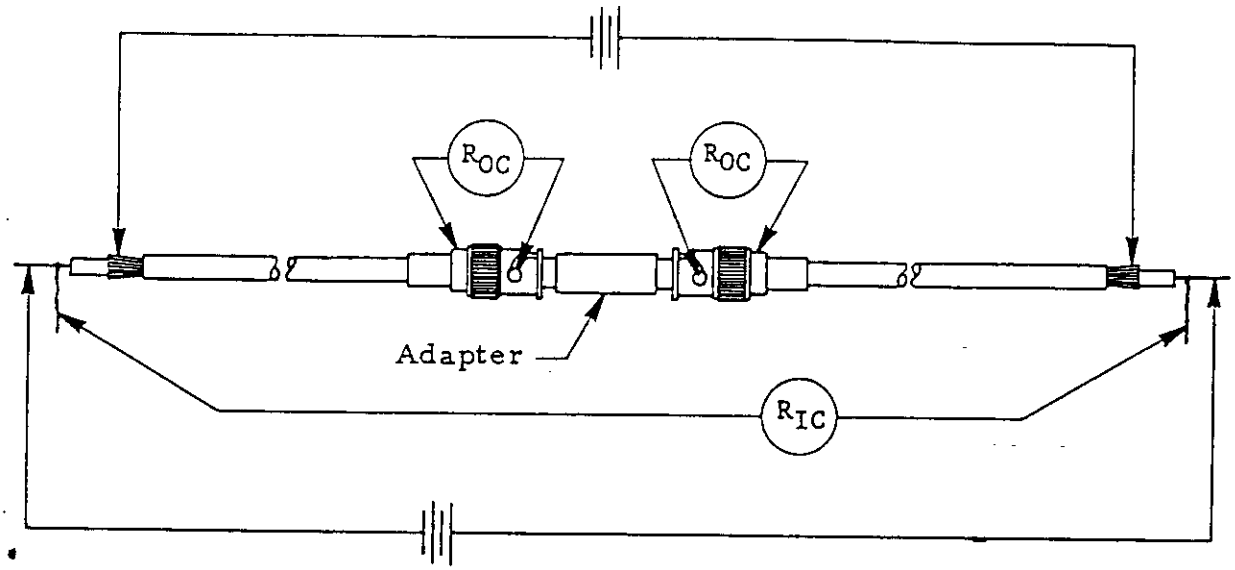

Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 1500 vac was applied between the outer and inner 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 inner contacts, using a test voltage of 500 volts dc. This voltage was applied for two minutes before the resistance was measured.

3.5 RF High Potential

An RF test potential of 1500 volts (rms) 5 Megahertz was applied between center contact and outer contact of the mated connectors. This potential was applied for one minute and then returned to zero.

3.6 Insertion Loss

A full Two-Port Calibration was performed on a network analyzer and the insertion loss, S_{21}, of the sample was measured.

3.7 RF Leakage

RF Leakage was measured on mated connectors using the Triaxial Cavity method. A 0 dBm signal at 4 GHz was applied to the connectors with a signal generator. RF Leakage was monitored with a spectrum analyzer.

3.8 Voltage Standing Wave Ratio

VSWR was measured on mated samples using an HP8510B network analyzer. The sweep range was 0.5 to 4.0 GHz.

3.9 Corona/Altitude

A test voltage of 375 v(rms) at a 5 picocoulombs maximum discharge was applied between the center contact and outer contact of the mated connectors. This test voltage was applied with a simulated altitude of 70,000 feet.

3.10 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.

3.11 Physical Shock

Mated connectors were subjected to a physical shock test, having a saw-tooth 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.

3.12 Mating Force

The force required to initiate mating of the coupling nut of the plug was measured. The torque required to fully couple the connectors was measured. A free floating fixture with the rate of travel at 0.5 inch/minute.

3.13 Unmating Force

The force required to unmate the coupling nut of the plug from the receptacle was measured. The torque required to fully uncouple the connectors was measured. A free floating fixture with the rate of travel at 0.5 inch/minute

3.14 Durability

Connectors were mated and unmated 500 times at a rate not exceeding 12 per minute.

3.15 Thermal Shock

Mated connectors 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 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%.

3.17 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.

3.18 Temperature Life

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

4. Validation

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7/1/92

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