

**.050 Series Shielded AMPLIMITE\* Connector**

Product Specification: 108-1228 Rev B.  
 CTL Nos.: CTL4613-013-002  
 CTL0996-016-003  
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## Qualification Test Report

### 1. Introduction

#### 1.1 Purpose

Testing was performed on AMP\* AMPLIMITE\* .050 Series Right-Angle Connector to determine its conformance to the requirements of AMP Product Specification 108-1228 Rev. B.

#### 1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the AMPLIMITE .050 Series Right-Angle Connector manufactured by the Interconnection Components & Assemblies Product Division of the Capital Goods Business Unit. The testing was performed between August 4, 1992 and June 16, 1995.

#### 1.3 Conclusion

The AMPLIMITE .050 Series Right-Angle Connector meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1228 Rev. B.

1.4 Product Description

Shielded AMPLIMITE .050 series Right-Angle Connectors utilize the standard .050 series receptacle interface. These are cable or panel mounted receptacles with vertical or right-angle printed circuit board headers. The cable and panel connectors use insulation displacement contacts for round to flat laminated and ribbon cable applied plug and receptacle connectors. The plating in the mating surface area is 30 microinches gold.

1.5 Test Samples

The test samples were randomly selected from normal current production lots, and the following part numbers were used for test:

<u>Test Group</u>	<u>Quantity</u>	<u>Part Nbr</u>	<u>Description</u>
1	5	750752-1	68 Pos Shielded Backshell Kit
1 & 4	10	787170-7	68 Pos Rt.Angle Connector
	10	749621-7	68 Pos Shielded Cable Plug
2	5	750821-1	26 Pos Shielded Receptacle
	5	749621-2	26 Pos Shielded Cable Plug
3	5	786200-1	50 Pos Shielded Receptacle
	5	750833-1	50 Pos Shielded Cable Plug

1.6 Qualification Test Sequence

Test or Examination	Test Groups			
	1	2	3	4(b)
	Test Sequence (a)			
Examination of Product	1,9	1,5	1,5	1,9
Termination Resistance, Dry Circuit	3,7	2,4	2,4	
Insulation Resistance				3,7
Dielectric Withstanding Voltage				4,8
Capacitance				2
Vibration	5			
Physical Shock	6			
Durability	4			
Mating Force	2			
Unmating Force	8			
Housing Lock Strength				10
Thermal Shock				5
Humidity-Temperature Cycling				6
Temperature Life		3		
Mixed Flowing Gas			3(c)	

- (a) The numbers indicate sequence in which tests were performed.
- (b) No wires or printed circuit boards were used with test sequence 4.
- (c) Samples preconditioned with 10 cycles of durability

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 Unit.

2.2 Termination Resistance, Dry Circuit - Groups 1,2 and 3

All termination resistance measurements, taken at 100 milliamperes DC and 50 millivolts open circuit voltage, were less than 25 milliohms.

Test Group	Nbr of Data points	Condition	Milliohms		
			Min	Max	Mean
1	30	Initial	4.59	14.82	10.037
		After Mechanical	6.01	15.48	10.787
2	260	Initial	3.16	16.63	9.14
		After Temp Life	3.56	17.84	9.73
3	30	Initial	4.37	10.69	6.96
		After Mixed Gas	4.55	11.24	7.47

2.3 Insulation Resistance - Group 4

All insulation resistance measurements were greater than 1000 megohms.

2.4 Dielectric Withstanding Voltage - Group 4

No dielectric breakdown or flashover occurred when a test voltage of 500 vac was applied between adjacent contacts.

2.5 Capacitance - Group 4

All capacitance measurements were less than 3.0 picofarads.

2.6 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.

2.7 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.

## 2.8 Durability - Group 1

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

## 2.9 Mating Force - Group 1

All mating force measurements were less than 30 pounds.

## 2.10 Unmating Force - Group 1

All unmating force measurements were greater than 3.0 pounds.

## 2.11 Thermal Shock - Group 4

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

## 2.12 Humidity-Temperature Cycling - Group 4

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

## 2.13 Temperature Life - Group 2

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

## 2.14 Mixed Flowing Gas - Group 3

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

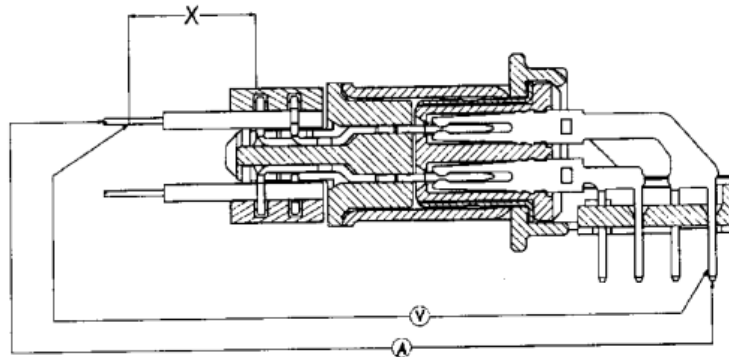
## 3. Test Methods

### 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.



VOLTAGE DROP DUE TO "X" OF WIRE IS  
REMOVED FROM ALL READINGS

Figure 1  
Typical Termination Resistance Measurement Points

### 3.3 Insulation Resistance

Insulation resistance was measured between adjacent contacts, using a test voltage of 500 volts DC. This voltage was applied for two minutes before the resistance was measured.

### 3.4 Dielectric Withstanding Voltage

A test potential of 500 vac was applied between the adjacent contacts. This potential was applied for one minute and then returned to zero.

### 3.5 Capacitance

Capacitance was measured between the adjacent contacts of mated connectors, using a test frequency of 1.0 MHz.

### 3.6 Vibration, Random

Mated connectors were subjected to a random vibration test, specified by a random vibration spectrum, with excitation frequency bounds of 50 and 2000 hertz. The power spectral density at 50 hz is 0.01 G<sup>2</sup>/Hz. The spectrum slopes up at 6 dB per octave to a PSD of 0.04 G<sup>2</sup>/Hz at 100 Hz. The spectrum is flat at 0.04 G<sup>2</sup>/Hz from 100 to 1000 Hz. The spectrum slopes down at 6 dB per octave to the upper bound frequency of 2000 Hz, at which the PSD is 0.01 G<sup>2</sup>/Hz. The root-mean square amplitude of the excitation was 7.3 GRMS. The samples were subjected to this test for 20 minutes in each of the three mutually perpendicular axes, for a total test time of 60 minutes per sample. The connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

### 3.7 Physical Shock

Mated connectors were subjected to a physical shock test, having a half-sine waveform of 30 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 connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

### 3.8 Durability

Connectors were mated and unmated 500 times at a rate not exceeding 800 per hour.

### 3.9 Mating Force

The force required to mate individual connectors was measured using a tensile/compression device and a free floating fixture. The crosshead speed was 0.5 inch/minute.

### 3.10 Unmating Force

The force required to unmate individual connectors was measured using a tensile/compression device and a free floating fixture. The crosshead speed was 0.5 inch/minute.

### 3.11 Thermal Shock

Mated connectors were subjected to 25 cycles of temperature extremes with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -55°C and 105°C. The transition between temperatures was less than one minute.

### 3.12 Humidity-Temperature Cycling

Unmated 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.) See Figure 2.

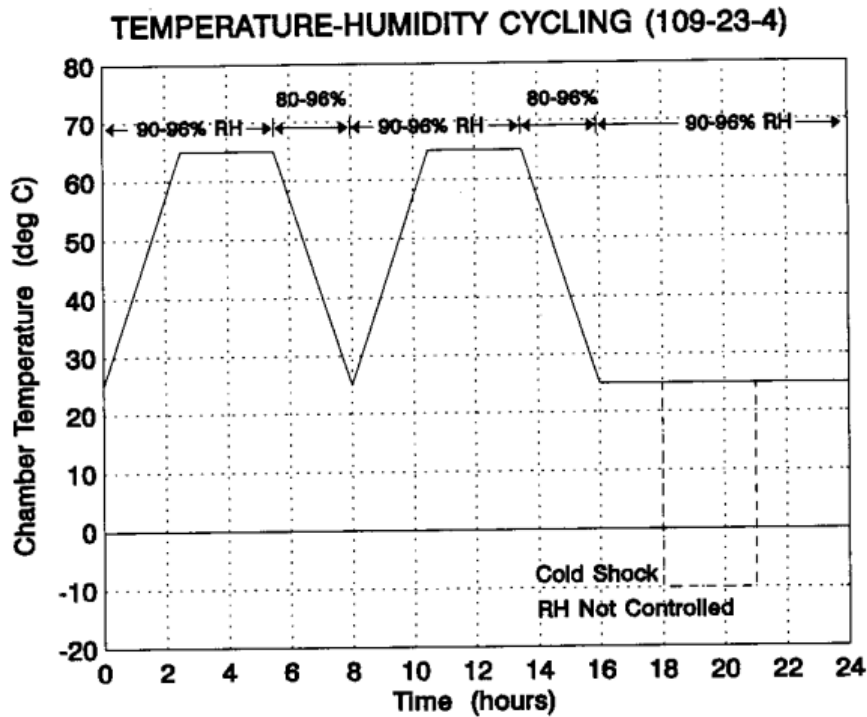


Figure 2

### 3.13 Temperature Life

Mated samples were exposed to a temperature of 105°C for 500 hours.

### 3.14 Mixed Flowing Gas, Class III

Mated connectors were exposed for 20 days to a 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<sub>2</sub> at 20 ppb, NO<sub>2</sub> at 200 ppb, and H<sub>2</sub>S at 100 ppb. Samples were preconditioned with 10 cycles of durability.



4. Validation

Prepared by:

 6/19/95

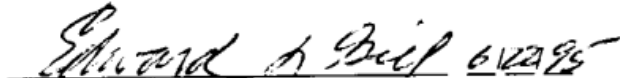
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