AMP*

QUALIFICATION TEST REPORT

High Current, High Voltage
Commercial LGH* Connector

501-114 Rev. 0

Product Specification:	108-36027, Rev. 0
CTL No.:	CTL4085-001-001
Date:	May 8, 1990
Classification:	Unrestricted
Prepared By:	Terrance M. Shingara

*Trademark of AMP Incorporated

Table of Contents

AMP

AMP INCORPORATED

HARRISBURG, PENNSYLVANIA 17105 PHONE: 717-564-0100 TWX: 510-657-4110

CORPORATE TEST LABORATORY

Qualification Test Report
High Current, High Voltage
Commercial LGH Connector

1. Introduction

1.1 Purpose

Testing was performed on AMP's Commercial LGH Connector to determine if it meets the requirements of AMP Product Specification 108-36027, Rev. 0.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the Commercial LGH Connector, manufactured by the Aerospace and Government System Sector. The testing was performed between October 23, 1989 and January 1, 1990.

1.3 Conclusion

The Commercial LGH Connector meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-36027, Rev. 0.

1.4 Product Description

AMP *LGH* High Voltage High Current Connector system is designed for flash tube connections in copy machine application. The connector housing and strain relief are a molding of Nylon 6/6, having a 94 V-0 rating.

The connector incorporates two commercial High Current, Phosphor bronze, pre-tined electroplated contacts for the high voltage line. The drain contacts consist of a tin-plated TYPE III+ pin and socket.

1.5 Test Samples

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

Test Group	Quantity	Part Number	Description
1,2,3,4	20	867027-1	Plug Housing
1,2,3,4	20	867026-1	Receptacle Housing
1,2,3	15	66591-1	Type VI Pin
4	5	66103-2	Type III+ Pin
1,2,3,4	20	66105-2	Type III+ Socket
1,2,3,4	20	350651-1	High Current Commercial Contact AWG 16
1,2,3,4	20	350650-1	High Current Commercial Contact AWG 10

1.6 Qualification Test Sequence

	Test Groups			
Test or Examination	1	2	3	4
Examination of Product	1,10	1,10	1,9	1,5
Termination Resistance, Specified Current	3,7	2,9	2,6	
Dielectric Withstanding Voltage	9	4,8	3,7	
Insulation Resistance		3,7	4,8	
High Voltage Soak			5	
Vibration, Discontinuity	5			
Physical Shock	6			
Mating Force	2			
Unmating Force	8			
Contact Retention				3
Durability	4			
Housing Panel Retention				2
Housing Lock Strength				4
Thermal Shock		5		
Humidity-Temperature Cycling		6		

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 production lots. They were inspected and accepted by the Product Assurance Department of the Aerospace and Government System Sector.

2.2 Termination Resistance, Specified Current - Groups 1, 2, 3

All termination resistance measurements taken at specified current were less than the specification requirements.

Test Group	No. of Samples	Condition	Wire Gage	Test Current	Spec. Max.	Max.
1	10	Initial	22	5.0	10.0	2.62
			16	8.0	2.0	0.64
			10	20.0	2.0	0.50
		Final	22	5.0	10.0	6.39
			16	8.0	2.0	0.74
			10	20.0	2.0	0.55
2	10	Initial	22	5.0	10.0	2.73
			16	8.0	2.0	0.65
			10	20.0	2.0	0.50
		Final	22	5.0	10.0	7.25
			16	8.0	2.0	0.64
			10	20.0	2.0	0.84
3	10	Initial	22	5.0	10.0	2.45
			16	8.0	2.0	0.66
			10	20.0	2.0	0.58
		Final	22	5.0	10.0	2.93
			16	8.0	2.0	0.64
			10	20.0	2.0	0.71

All values in milliohms

2.3 Dielectric Withstanding Voltage - Groups 1, 2, 3

There was no dielectric breakdown or flashover between adjacent contacts, when a test voltage of 8000 Vdc was applied for one minute. This was performed at sea level and 10000 feet above sea level.

2.4 Insulation Resistance - Groups 2, 3

All insulation resistance measurements were greater than the specification requirement of 5000 megohms for the initial measurement, and 1000 megohms for measurement taken after test.

2.5 High Voltage Soak - Group 3

After the high voltage soak, there was no evidence of physical damage.

2.6 Vibration, Discontinuity - Group 1

There were no discontinuities of the contacts greater than ten microsecond during vibration. Following vibration, there were no cracks, breaks, or loose parts on the connector assemblies.

2.7 Physical Shock - Group 1

There were no discontinuities of the contacts greater than ten microsecond during physical shock. Following physical shock testing, there were no cracks, breaks, or loose parts on the connector assemblies.

2.8 Mating Force - Group 1

All mating force measurements were less than the specification requirement of 31 pounds per contact.

2.9 Unmating Force - Group 1

All unmating force measurements were greater than the specification requirement of 5.0 pounds per contact.

2.10 Contact Retention - Group 4

There was no physical damage to either the contacts or the housing, and no contacts dislodged from the housings, as a result of applying 40 pound axial load to the main contacts and 15 pound axial load to the drain contacts.

2.11 Durability - Group 1

There was no physical damage to the samples, as a result of mating and unmating the connector 50 times.

2.12 Housing Panel Retention - Group 4

The housings tested did not dislodge from the test panel. There was no damage to the locking mechanism after testing.

2.13 Housing Lock Strength - Group 4

Mated connectors did not unmate with a 17 pound axial load applied.

2.14 Thermal Shock - Group 2

There was no evidence of physical damage to either the contacts or the connector, as a result of thermal shock.

2.15 Humidity-Temperature Cycling - Group 2

There was no evidence of physical damage to either the contacts or the connector, as a result of exposure to humidity temperature cycling.

3. Test Methods

3.1 Examination of Product

The 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 at specified current were made, using a four terminal measuring technique (Figure 1).

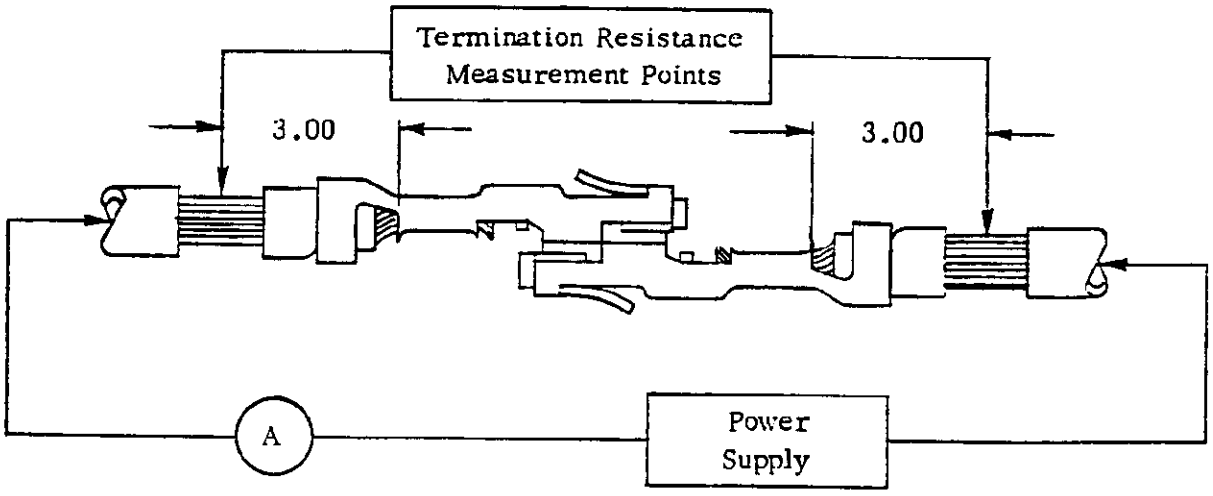

Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 8000 Vdc was applied between the adjacent contacts. This potential was applied for one minute and then returned to zero. This test was performed at sea level and 10,000 feet above sea level.

3.4 Insulation Resistance

Insulation resistance was measured between adjacent contacts, using a test voltage of 500 volts dc. This voltage was applied for one minute before the resistance was measured.

3.5 High Voltage Soak

Samples were energized with 2500 Vac RMS and maintained for 250 hours.

3.6 Vibration, Discontinuity, 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 120 times in each of three mutually perpendicular planes, for a total vibration time of six hours. Connectors were monitored for discontinuities greater than ten microseconds, 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 sawtooth waveform of 50 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 ten microseconds, using a current of 100 milliamperes in the monitoring circuit.

3.8 Mating Force

The force required to mate connector halves was measured, using a free floating fixture with the rate of travel at 0.5 inch/minute. Force per contact was calculated.

3.9 Unmating Force

The force required to unmate connector halves was measured, using a free floating fixture with the rate of travel at 0.5 inch/minute. Force per contact was calculated.

3.10 Contact Retention

An axial load of 40 pounds was applied to each main contact, and 15 pounds was applied to each drain contact. The force was held for 60 seconds. The force was applied in a direction so as to cause removal of the contacts from the housing.

3.11 Durability

Connectors were mated and unmated 50 times by hand.

3.12 Housing Panel Retention

Connectors were mounted rigidly into a test panels. An axial load of 17 pounds was applied to the end of the connector and maintained for one minute.

3.13 Housing Lock Strength

An axial load of 40 pounds was applied to mated connector assemblies. The force was applied in a direction normal to the plane of the connector.

3.14 Thermal Shock

Mated connectors were subjected to twenty-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.

3.15 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.

4. Validation

Prepared by:

Terrance M. Shingara 4/2/90
Terrance M. Shingara
Test Engineer
Design Assurance Testing
Corporate Test Laboratory

Reviewed by:

Richard A. Groft 4/2/90
Richard A. Groft
Supervisor
Design Assurance Testing
Corporate Test Laboratory

Approved by:

Gerald M. Lankard 4/18/90
Gerald M. Lankard
Manager
Reliability
Aerospace and Government System Sector