AMP

QUALIFICATION TEST REPORT

AMP* CHAMP* Latch Low Profile Connectors

501-59 Rev. 0

Rev A 3/16/89

Product Specification:	108-6076
CTL No.:	CTL1250-025-006
Date:	October 5, 1987
Classification:	Unrestricted
Prepared by:	J. J. Edwards

*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
AMP CHAMP Latch Low Profile Connectors
Part Numbers 553602-1 and 553603-1

1. Introduction

1.1 Purpose

Testing was conducted to measure the performance of AMP CHAMP Latch Low Profile Connectors when tested to the requirements of AMP Product Specification 108-6076, Rev. 0.

1.2 Scope

This report covers electrical and mechanical performance of AMP CHAMP Latch Low Profile Connectors made by the Communications Products Division of the Signal Transmission Products Group. They were submitted to the Components and Assemblies Group Laboratory on January 24, 1986. Testing was performed between February 13, 1986 and November 6, 1986

1.3 Conclusion

AMP CHAMP Latch Low Profile Connectors meet the electrical and mechanical performance requirements of Product Specification 108-6076, Rev. 0.

1.4 Product Description

AMP CHAMP Latch connectors provide a means of mass terminating 0.050 inch centerline ribbon cable without prestripping of wire. Housings are made of self-extinguishing thermoplastic material. Contacts are copper alloy with gold over nickel plating. The cover is secured to the connector body with two latching tabs. Connectors are made in four sizes, 14, 24, 36 and 50 positions. They can terminate ribbon cable with 26 through 30 AWG solid wire and 28 AWG stranded wire.

1.5 Test Samples

Connectors were taken randomly from current production. Test groups 1, 2 and 3 each consisted of two fifty position connector halves wired with 28 AWG cable. All fifty circuits in each connector were tested in test groups 1 and 3; twenty five circuits in each connector were tested in test group 2. Test groups 4, 5 and 6 consisted of two unmated 50 position connectors wired with 26, 28 and 30 AWG solid and 28 AWG stranded cable respectively. Two pairs of mated 50 position connectors were wired with 28 AWG solid cable. Sample identification for Test Groups 4, 5, and 6 is:
Samples 1 & 2 were wired with 26 solid and were unmated.
Samples 3 & 4 were wired with 28 solid and were unmated.
Samples 5 & 6 were wired with 30 solid and were unmated.
Samples 7 & 8 were wired with 28 stranded and were unmated.
Samples 9 & 10 were wired with 28 solid and were mated.

Samples tested were:
Part No. 553602-1 Fifty Position Plug Assembly
Part No. 553603-1 Fifty Position Receptacle Assembly

1.6 Qualification Test Sequence

Test or Examination	Test Group 1	2	3	4	5	6
	Test Sequence (a)					
Examination of Product	1	1	1	1	1	1
Termination Resistance, Dry Circuit	2,8	2,5		2,4	2,4	2,4
Dielectric Withstanding Voltage			3			
Insulation Resistance			2			
Vibration		3				
Physical Shock		4				
Mating Force	3,6					
Unmating Force	4,7					
Durability	5					
Thermal Shock					3	
Humidity-Temperature Cycling				3		
Industrial Mixed Flowing Gas						3

(a) Numbers show the sequence in which the tests are performed.

2. Summary of Testing

2.1 Examination of Product - All Groups

All connectors submitted for testing were selected from production lots. They were inspected and accepted by the Product Assurance Department of the Communications Products Division, and were delivered to the C&A Group laboratory on January 23, 1986.

2.2 Termination Resistance, Dry Circuit - Groups 1, 2, 4, 5 and 6

All samples met the requirements of the specification.

The initial termination resistance of the contacts in each test group were as follows.

		Resistance in milliohms			
Test Group	Sample Number	Min.	Max.	Mean	Specified Maximum
1	1	15.2	19.5	17.3	22.0
	2	16.6	19.9	18.2	22.0
2	1	11.5	17.1	13.5	22.0
	2	11.6	17.2	14.0	22.0
4	1	6.7	8.9	7.6	12.0
	2	6.1	8.7	7.6	12.0
	3	4.7	7.2	6.0	12.0
	4	5.1	7.5	6.3	12.0
	5	4.6	6.9	5.6	12.0
	6	4.6	6.9	5.4	12.0
	7	5.9	9.2	7.1	12.0
	8	6.3	8.4	7.3	12.0
	9	12.1	16.3	14.1	22.0
	10	11.1	14.9	13.0	22.0
5	1	5.4	7.9	6.6	12.0
	2	5.9	7.7	6.7	12.0
	3	5.2	7.9	6.7	12.0
	4	5.5	7.7	6.6	12.0
	5	2.6	5.0	3.7	12.0
	6	4.3	6.4	5.4	12.0
	7	6.0	8.6	7.0	12.0
	8	5.7	8.3	7.0	12.0
	9	11.4	15.7	13.4	22.0
	10	11.2	15.8	13.3	22.0

2.2 **Termination Resistance, Dry Circuit Cont'd.**

Test Group	Sample Number	Min.	Max.	Mean	Specified Maximum
6	1	6.1	8.6	7.3	12.0
	2	6.6	8.9	7.4	12.0
	3	4.1	6.6	5.5	12.0
	4	5.4	7.7	6.5	12.0
	5	4.1	6.3	5.2	12.0
	6	4.4	7.2	5.6	12.0
	7	5.9	9.0	7.2	12.0
	8	6.0	8.4	7.0	12.0
	9	11.7	15.6	13.3	22.0
	10	11.4	15.5	13.1	22.0

The change in resistance (ΔR) between the initial and subsequent termination resistance measurements were as follows:

Test Group	Sample Number	Min.	Max.	Mean	Specified Maximum ΔR
After Durability:					
1	1	-0.19	1.70	0.64	10.0
	2	-0.09	1.07	0.22	10.0
After Physical Shock:					
2	1	-0.24	2.18	0.29	10.0
	2	-0.39	1.44	0.34	10.0
After Humidity-Temperature Cycling:					
4	1	-0.09	-0.03	-0.06	5.0
	2	-0.09	-0.02	-0.06	5.0
	3	-0.10	-0.03	-0.07	5.0
	4	-0.10	-0.04	-0.07	5.0
	5	-0.15	-0.10	-0.13	5.0
	6	-0.20	-0.02	-0.09	5.0
	7	-0.58	2.08	0.06	15.0
	8	-0.32	1.57	0.01	15.0
	9	-1.63	1.87	0.10	10.0
	10	-1.53	1.86	0.00	10.0
After Thermal Shock:					
5	1	-0.95	0.07	-0.01	5.0
	2	-0.08	0.00	-0.03	5.0
	3	-0.50	0.84	0.08	5.0
	4	-0.05	0.08	-0.02	5.0
	5	-0.19	-0.07	-0.13	5.0
	6	-0.31	0.17	-0.24	5.0
	7	-0.14	0.38	0.05	15.0
	8	-0.22	0.35	-0.01	15.0
	9	-0.39	2.53	0.62	10.0
	10	-0.06	1.54	0.46	10.0

2.2 Termination Resistance, Dry Circuit, Cont'd

Test Group	Sample Number	Min.	Max.	Mean	Specified Maximum ΔR
After Industrial Mixed Flowing Gas:					
6	1	0.02	0.08	0.05	5.0
	2	0.02	0.09	0.03	5.0
	3	-0.08	-0.02	-0.03	5.0
	4	0.05	0.08	0.06	5.0
	5	-0.09	0.00	-0.05	5.0
	6	0.03	0.09	0.05	5.0
	7	-0.24	1.10	0.16	15.0
	8	-0.05	1.00	0.12	15.0
	9	-2.06	0.29	-0.18	10.0
	10	0.09	0.74	0.22	10.0

2.3 Mating Force - Group 1

All samples met the requirements of the specification.

All readings are in pounds.

Reading	Sample No.	Force	Specified Maximum
Initial	1	23.0	35
	2	22.5	35
Final	1	27.0	35
	2	26.5	35

2.4 Durability - Group 1

After 200 mating and unmating cycles, there was no visible wear or damage. Samples met the mating and unmating force and termination resistance requirements of the product specification.

2.5 Unmating Force - Group 1

All samples met the requirements of the specification.

All readings are in pounds.

Reading	Sample No.	Force	Specified Minimum
Initial	1	14.0	10
	2	10.0	10
Final	1	18.0	10
	2	11.5	10

2.6 Vibration - Group 2

During vibration testing there were no discontinuities greater than one microsecond. Following vibration, there were no cracks, breaks or loose parts.

2.7 Physical Shock- Group 2

During physical shock testing there were no discontinuities greater than one microsecond. Following physical shock, there were no cracks, breaks or loose parts.

2.8 Insulation Resistance - Group 3

The insulation resistance was greater than the 5000 megohms required. The minimum value was $9.9X10^{6}$ megohms.

2.9 Dielectric Withstanding Voltage - Group 3

There was no voltage breakdown or flashover when 1000 V ac was impressed on adjacent contacts.

2.10 Humidity-Temperature Cycling - Group 4

After ten days of humidity-temperature cycling there was no damage to the connectors.

2.11 Thermal Shock - Group 5

Connectors were exposed to 5 cycles of thermal shock between the temperatures of -65°C and 90°C. There was no damage to the samples.

2.12 Industrial Mixed Flowing Gas - Group 6

Connectors were exposed to a Class II environment for 20 days. There was no damage to the connectors.

3. Test Methods

3.1 Examination of Product

The product drawing and inspection plan were used to examine the samples. They were examined visually, dimensionally and functionally.

3.2 Termination Resistance, Dry Circuit

Termination resistance was measured on all contacts in each test group. A four terminal resistance measuring station was used. Current during the test was maintained at 50 milliamperes with 50 millivolts maximum open circuit voltage.

3.3 Mating Force

Connector halves were mounted in free floating fixtures. The force required to mate them for a distance of 0.095 inch from the initial point of contact was measured. The speed of mating was 0.5 inch per minute.

3.4 Durability

Connectors were mated and unmated 200 times at a rate 150 cycles per hour, maximum. The mating force fixturing was used.

3.5 Unmating Force

The force needed to unmate the connectors was measured. The mating force fixturing was used.

3.6 Vibration

Mated connectors were subjected to vibration having sinusoidal motion. The amplitude was either 0.06 inch, double amplitude or 15 gravity units peak, whichever was less. The vibration frequency was varied 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. 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 physically shocked. The parameters were a sawtooth waveform of 100 gravity units for a duration of six 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 Insulation Resistance

Insulation resistance was measured between adjacent contacts of mated connectors. A voltage of 500 V dc was applied for two minutes and the insulation resistance was measured.

3.9 Dielectric Withstanding Voltage

A test voltage of 1000 V ac was applied between adjacent contacts of mated connectors for one minute.

3.10 Humidity-Temperature Cycling

Mated and unmated connectors were exposed to a ten day humidity-temperature cycle. A 24 hour period consisted of cycling the temperature between 25°C and 65°C twice while holding the humidity at 95%. A cold shock was performed on them during five of the first nine days. The cold shock was -10°C for three hours.

3.11 Thermal Shock

Mated and unmated connectors were subjected to five cycles of thermal shock. The temperature extremes were -65°C and +85°C. Each cycle consisted of 30 minutes at each temperature. Transition between temperatures was less than five minutes.

3.12 Industrial Mixed Flowing Gas

Mated and unmated connectors were exposed to 20 days in the industrial mixed flowing gas chamber. Class II exposure is defined as a temperature of 30°C and a relative humidity of 70%. Pollutants are Cl_2 at 10 ppb, NO_2 at 200 ppb, and H_2S at 10 ppb.

4. Validation

Prepared by:

10/5/87

J. J. Edwards
Supervisor, Design Assurance Testing
Corporate Test Laboratory

Reviewed by:

10/7/87

James R. Kohout
Manager, Product Testing
Corporate Test Laboratory

Approved by:

___/___/___

Er Ralston
Manager, Product Assurance
Communications Products Division