AMP

QUALIFICATION TEST REPORT

AMP* Circular Din Connector

501-15 Rev. 0

Rev B

Product Spec.: 108-10047
CTL No.: 4904-241-001
Date: April 18, 1985
Distribution: 10

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(501-15/LABREP6)

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CORPORATE TEST LABORATORY

Qualification Test Report
AMP Circular Din Connector

1. Introduction

1.1 Purpose

Testing was conducted to determine product compliance to AMP Specification 108-10047, Rev. 0.

1.2 Scope

This report covers the electrical and mechanical performance of the AMP Circular Din Connector, produced by the Connector Products Division of the Connector and Electronic Products Group. Testing was performed in the Connector and Electronic Products Group Laboratory and the Corporate Test Laboratory between September 4, 1984 and February 15, 1985.

1.3 Conclusion

The AMP Circular Din Connector conforms to the requirements of the specification.

1.4 Test Samples

Part Number	Type	Contact P/N	Wire Size	Group	Quantity
211502-6	3 Pos. Plug	66728-2	24	1,2,3	5
211502-6	3 Pos. Plug	66728-2	28	4	1
211502-6	3 Pos. Plug	66735-1	20	4	1
211503-6	4 Pos. Plug	66728-2	24	1,2,3	5
211503-6	4 Pos. Plug	66728-2	28	4	1
211503-6	4 Pos. Plug	66735-1	20	4	1
211451-6	5 Pos. Plug	66728-2	24	1,2,3	5
211451-6	5 Pos. Plug	66728-2	28	4	1
211451-6	5 Pos. Plug	66735-1	20	4	1
211504-6	6 Pos. Plug	66728-2	24	1,2,3	5
211504-6	6 Pos. Plug	66728-2	28	4	1
211504-6	6 Pos. Plug	66735-1	20	4	1
211505-6	7 Pos. Plug	66728-2	24	1,2,3	5
211505-6	7 Pos. Plug	66728-2	28	4	1
211505-6	7 Pos. Plug	66735-1	20	4	1
211451-6	5 Pos. Plug	66728-2	22	4	1
211451-6	5 Pos. Plug	66735-1	24	4	1
211451-6	5 Pos. Plug	66728-2	26	4	1
211506-6	8 Pos. Plug	66735-1	20	1,3,4	5
211506-6	8 Pos. Plug	66728-2	22	1,3	4
211506-6	8 Pos. Plug	66735-1	24	1,3	4
211506-6	8 Pos. Plug	66728-2	24	2	1
211506-6	8 Pos. Plug	66728-2	28	4	5
212438-2	3 Pos. Plug	66728-2	24	2	1
212439-2	4 Pos. Plug	66728-2	24	2	1
212440-2	5 Pos. Plug	66728-2	24	2	1
212441-2	6 Pos. Plug	66728-2	24	2	1
212442-2	7 Pos. Plug	66728-2	24	2	1
212443-2	8 Pos. Plug	66728-2	24	2	1
212443-2	8 Pos. Plug	66728-2	28	4	1
212443-2	8 Pos. Plug	66735-1	20	4	1
211507-1	3 Pos. Grd. Recept.			1,2,3,4	7
211508-1	4 Pos. Grd. Recept.			1,2,3,4	7
211450-1	5 Pos. Grd. Recept.			1,2,3,4	7
211509-1	6 Pos. Grd. Recept.			1,2,3,4	7
211510-1	7 Pos. Grd. Recept.			1,2,3,4	7
211511-1	8 Pos. Grd. Recept.			1,2,3,4	19
212042-1	3 Pos. Shield Recept.			2	1
212043-1	4 Pos. Shield Recept.			2	1
212044-1	5 Pos. Shield Recept.			2	1
212045-1	6 Pos. Shield Recept.			2	1
212046-1	7 Pos. Shield Recept.			2	1
212047-1	8 Pos. Shield Recept.			2	3

1.5 Test Sequence

Test	Test Group 1	2	3	4
Examination of Product	1,8	1,7	1,6	1
Termination Resistance, Specified Current	7		5	
Dielectric Withstanding Voltage	2	5		
Insulation Resistance	3		3	
Temperature Rise vs. Current				2
Vibration	4			
Physical Shock	5			
Mating Force		2		
Unmating Force		3		
Contact Retention		6		
Durability			4	
Thermal Shock		4		
Humidity, Steady State			2	
Corrosion, Salt Spray	6			

2. Summary of Testing

2.1 Examination of Product - All Groups

All test samples met the visual, dimensional, and functional requirements of the product drawing.

2.2 Termination Resistance, Specified Current - Groups 1 and 3

Voltage drop measurements were taken after the current stabilized. Measurements were made from the P.C. Board to a point six inches on the wire behind the connector. Resistance was calculated from the voltage drop measurements. The resistance of the six inches of wire was subtracted from the measured resistance to obtain the resistance of the pin and socket interface plus the crimp on the pin.

Test Results - All Readings are in Milliohms

Group	Wire Size	Current	No Samples	Min.	Max.	Avg.	Spec. Limit
1	20	7.5 amps	16	4.9	9.4	6.7	15.0
1	22	5.0 amps	16	4.0	13.0	6.8	20.0
1	24	3.0 amps	66	4.4	21.0	8.2	25.0
1	28	1.5 amps	16	3.8	6.6	4.2	20.0
3	20	7.5 amps	16	2.8	11.9	7.6	15.0
3	22	5.0 amps	16	2.0	16.7	6.3	20.0
3	24	3.0 amps	66	4.4	18.1	6.5	25.0
3	28	1.5 amps	16	2.5	13.7	7.1	20.0

All samples met the requirement of the specification.

2.3 Dielectric Withstanding Voltage - Groups 1 and 2

Testing was performed between adjacent contacts of mated connector assemblies. An a.c. voltage of 750 volts was applied for one minute. The samples from Group 2 were tested following Thermal Shock.

Test Results

All samples tested met the requirements of no breakdowns or flashovers.

2.4 Insulation Resistance - Groups 1 and 3

Measurements were made between adjacent contacts of the mated connector assembly. To obtain measurements, a voltage potential of 500 volts d.c. was applied for one minute. Group 3 was tested following humidity exposure.

Test Results

All samples tested met the specification requirement of 5×10^3 megohms minimum.

2.5 Vibration - Group 1

Mated connectors were subjected to a simple harmonic motion having an amplitude of .06 inch double amplitude. The frequency was varied uniformly between the approximate limits of 10 and 55 Hz. This motion was applied for 2 hours in each of three mutually perpendicular axes. Samples were monitored for discontinuities greater than one microsecond.

Test Results

There were no discontinuities during test, and no physical damage occurred to the samples.

2.6 Physical Shock - Group 1

Mated connectors were subjected to a shock test with a half-sine waveform of 50 g's and a duration of eleven milliseconds. Three shocks in each direction were applied along the three mutually perpendicular axes of the sample for a total of 18 shocks. The samples were monitored for electrical discontinuities greater than one microsecond and for physical damage.

Test Results

No discontinuities occurred during test, and there was no evidence of physical damage to the test samples.

2.7 Mating Force - Group 2

The force to mate the connector assembly was measured from the point of initial contact. The connector was mated at a rate of 0.5 inch per minute.

Test Results

All samples met the specification requirement of 3 lbs. per contact maximum.

2.8 Unmating Force - Group 2

The force to unmate the connector assembly was measured with the locking latches removed. The connector was unmated at a rate of 0.5 inch per minute.

Test Results

All samples met the specification requirement of 1 lb. per contact minimum.

2.9 Contact Retention - Group 2

An axial load of six pounds was applied to the crimped contacts.

Test Results

All samples met the specification requirement of no contact displacement from the housing.

2.10 Durability - Group 3

The connector assemblies were mated and unmated 100 times.

Test Results

There was no physical damage to the samples, and the samples still had electrical continuity after completion of the test.

2.11 Thermal Shock - Group 2

Mated connectors were subjected to 10 cycles of extreme heat and cold. The temperature extremes were -55°C and +105°C. One-half hour of exposure at the high temperature, followed by one-half hour at the low temperature, constituted one cycle. The transition time between extremes was less than 1 minute.

Test Results

There was no physical damage to the connector assemblies as a result of this test. The samples met the requirement of the specification for dielectric following the test.

2.12 Humidity - Group 3

Mated connectors were subjected to a steady state humidity environment of 90-95% relative humidity at 40°C. The duration of this exposure was 4 days.

Test Results

There was no physical damage to the connector assemblies as a result of this test. The samples met the requirements of 5×10^3 megohms minimum for insulation resistance following humidity exposure.

2.13 Salt Spray Corrosion - Group 1

Mated connectors were subjected to a 5% salt concentration for 48 hours.

Test Results

The samples met the specification requirement of no base metal exposure.

2.14 Temperature Rise vs. Current - Group 4

Connector assemblies were subjected to a temperature rise at rated current. The following are the rated current for each wire size and connector density tested.

Number of Contacts	#28 AWG	#20 AWG
3	4.0 amps	6.0 amps
4	3.5 amps	6.0 amps
5	3.0 amps	5.0 amps
6	3.0 amps	5.0 amps
7	2.5 amps	5.0 amps
8	2.5 amps	5.0 amps

Test Results

All test samples, when subjected to rated current, had a temperature rise less than 30°C above ambient.

2. Validation

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