AMP*

QUALIFICATION TEST REPORT

Retention of Qualification
AMP* MTA 100, Closed End Housing Connector

501-25-1 Rev. 0

Product Specification:	AMP* Product Specification 108-1050, Rev. E
CTL No.:	CTL1537-501-001
Date:	2/22/89
Classification:	Unrestricted

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Corporate Test Laboratory Harrisburg, Pennsylvania

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(R1537RG1)

AMP

AMP INCORPORATED

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

CORPORATE TEST LABORATORY

Retention of Qualification Test Report on AMP MTA 100 Closed End Housing Connector AMP P/N 640440-6

1. Introduction

1.1 Purpose

The AMP MTA 100 closed end housing connector was tested to determine its ability to continue to meet the performance requirements of AMP Product Specification 108-1050, Rev. E.

1.2 Scope

This report covers the electrical and mechanical performance of the MTA 100 six circuit closed end housing connector manufactured by the Automotive Consumer Business Group. Testing was performed between May 6, 1986 and January 5, 1987.

1.3 Conclusions

The AMP MTA 100 six circuit connector, tested on 22 AWG wire, meets the performance requirements of AMP Product Specification 108-1050, Rev. E.

1.4 Product Description

The MTA 100 closed end housing connector is a complete printed circuit board interconnection system. Assemblies are available in 2 to 28 circuits, and are designed to mate with all available 0.100 inch post headers.

1.5 Test Samples

Thirteen samples, terminated on UL style 1007, 7 strand, 22 AWG wire, were submitted for Groups 2, 3, 7, and 8. Groups 2 and 3 consisted of two connector assemblies each. Group 7 consisted of five connector assemblies, and Group 8 consisted of 4 connector assemblies. All wires were applied in accordance with AMP Specification 114-1019.

Part Number	Quantity	Description
640440-6	13	6 Position, 0.100 C/L Plug
640452-6	13	6 Position Post Header

1.6 Qualification Test Sequence

Test or Examination	Test Group 2	3	7	8
	Test Sequence (A)			
Examination of Product	1	1	1	1
Termination Resistance, Dry Circuit	3,5	3,5		
Dielectric Withstanding Voltage	7			
Insulation Resistance	2,6			
Mating Force		2		
Unmating Force		6		
Tensile Straight & Perpendicular (B)				2
Durability		4		
Contact Retention			2	
Humidity-Temperature Cycling	4			

(A) Numbers indicate sequence in which tests were performed.

(B) One-half of the samples were subjected to straight tensile testing and the other to perpendicular tensile testing.

2. Testing Summary

2.1 Examination of Product - Groups 2,3,7, and 8

All connectors submitted for testing were selected from production lots that were subjected to inspection and found to be acceptable by the Product Assurance Department of the Automotive Consumer Business Group.

2.2 Termination Resistance, Dry Circuit - Groups 2 & 3

Connector assemblies were mounted on printed circuit boards to allow automated reading of resistance. A test current of 100ma maximum at 50mv open circuit was applied to the mated connector assemblies. The millivolt drops were read and converted to milliohms. The actual connector assembly resistance was calculated by subtracting the bulk resistance of 2.5 inches of 22 AWG wire. (See Figure 1 for current application and millivolt drop measurement points.)

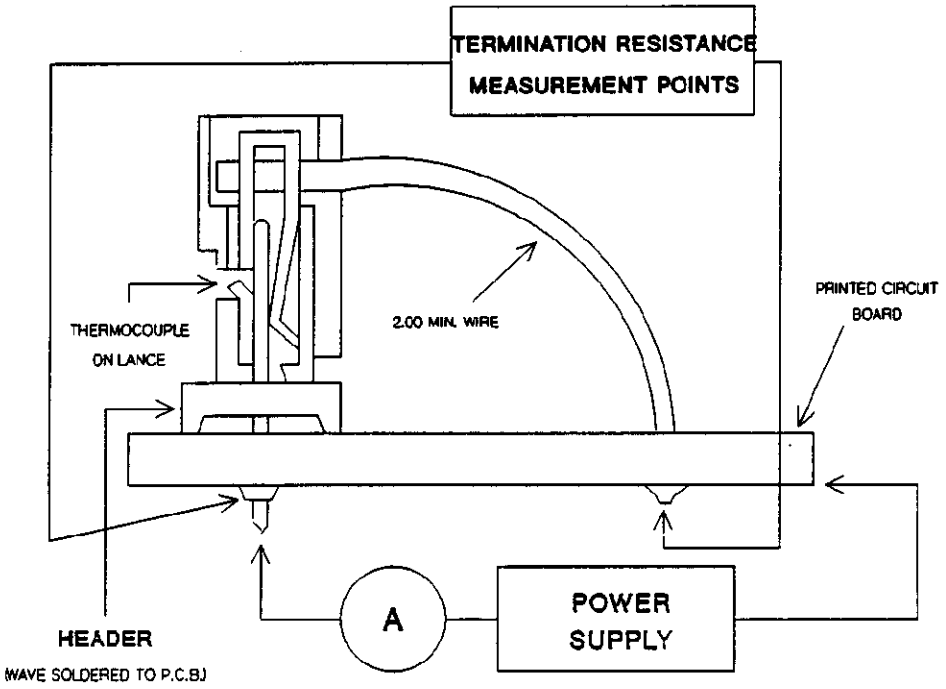

FIGURE 1

Test Results

All samples tested passed with values below the 5.0 milliohms maximum initial allowance, the 2.0 milliohms maximum change in resistance allowed after durability (Group 3), and the 4.0 milliohms maximum change in resistance allowed after humidity-temperature cycling (Group 2).

Group	Environment	Min	Max	Mean	Spec Limit
2	Initial	2.94	4.67	3.49	5.0 Max
	After Humidity	-0.39	3.14	1.59	4.0 Max Δ
3	Initial	3.09	3.93	3.52	5.0 Max
	After Durability	0.16	1.99	0.95	2.0 Max Δ

2.3 Dielectric Withstanding Voltage - Group 2

Following humidity/temperature cycling and final insulation resistance testing, the unmated connector assemblies of Group 2 were subjected to dielectric withstanding voltage testing. A 750v ac voltage was applied between all adjacent contact pairs at a rate of 500 volts per second. When the specified voltage level was reached, it was held for one minute.

Test Results

All samples passed with no breakdown, flashover, or arcing occurring on any of the samples tested.

2.4 Insulation Resistance - Group 2

Unmated connector assemblies were subjected to insulation resistance testing. Samples were placed in a Faraday cage. Five hundred volts dc test voltage was applied between all adjacent contacts. Samples were energized for two minutes, after which the insulation resistance was measured.

Test Results

All samples tested passed the 5,000 megohms minimum initial allowance and the 1,000 megohms minimum final allowance after humidity temperature cycling.

Initial Resistance - In Megohms

Sample Number	Minimum Initial	Minimum Initial Requirement
301	2.4×10^7	5.0×10^3
302	4.5×10^7	5.0×10^3

Final Resistance - In Megohms

Sample Number	Minimum Initial	Minimum Initial Requirement
301	5.0×10^6	1.0×10^3
302	7.5×10^6	1.0×10^3

2.5 Mating Force - Group 3

Connector assemblies and their counterpart post headers were mounted in an appropriate compression machine. The force necessary to mate the connector assemblies a distance of 0.20 inch from the point of initial contact at a rate of 0.5 inch per minute was then measured and recorded. Force per contact was calculated by dividing the total force by the number of circuits per connector assembly.

Test Results

Both samples passed testing with force per contact below the 2.0 pounds maximum initial allowed. See data which follows:

Sample 401		Sample 402	
Total Force	Calculated Force Per Contact	Total Force	Calculated Force Per Contact
1.95 lbs.	0.33 lbs.	2.95 lbs.	0.49 lbs.

2.6 Unmating Force - Group 3

After durability testing, connector assemblies and printed circuit boards were mounted in an appropriate tensile machine. The force to unmate the mated connector assemblies from the printed circuit boards was measured. From these measured values, the force per contact was calculated by dividing the total force by the number circuits per connector assembly.

Test Results

Both connector assemblies passed with force per contact values above the 0.1 pound minimum allowed.

Sample 401		Sample 402	
Total Force	Calculated Force Per Contact	Total Force	Calculated Force Per Contact
2.90 lbs.	0.48 lbs.	1.65 lbs.	0.28 lbs.

2.7 Tensile, Straight & Perpendicular - Group 8

Two connector assemblies were subjected to straight tensile testing, and two were subjected to perpendicular tensile testing. Connectors were mounted on a tensile testing machine, and a force was applied, at a rate of one inch/minute, parallel to the axis of the wire for straight tensile testing. Likewise, a force was applied perpendicular to the axis of the wire, at the same rate, for perpendicular tensile testing. Slot tensile values were measured.

Test Results

All samples passed testing, with tensile values above the 12.0 pounds minimum allowed for straight tensile testing and 3.5 pounds minimum allowed for perpendicular tensile testing.

Straight Tensile - Force in Pounds

Sample 901	Max.	Min.	Avg.
	16.4	12.0	14.93
Sample 902	Max.	Min.	Avg.
	17.8	14.8	15.93

Perpendicular Tensile - Force in Pounds

Sample 903	Max.	Min.	Avg.
	8.7	6.9	8.05
Sample 904	Max.	Min.	Avg.
	8.4	6.6	7.80

2.8 Durability - Group 3

Appropriate headers were mounted on circuit boards, and connectors were manually mated and unmated with them a total of twenty-five cycles each.

Test Results

Effects of this testing were determined by the results of unmating force and termination resistance, dry circuit testing. See individual tests for results.

2.9 Contact Retention - Group 7

Unwired connector assemblies were subjected to contact retention testing. Pull wires were soldered to the crimp slot of the individual contacts in special cut away housings. An axial load of 5.0 pounds was applied to each contact at a rate of one pound per second and then held for a minimum of five seconds.

Test Results

All samples passed testing with no contact pull out occurring at the required 5.0 pounds minimum pull force.

2.10 Humidity-Temperature Cycling - Group 2

Matted connectors of Group 2 were subjected to 10 cycles (10 days) of humidity-temperature cycling between 25° and 65°C at 95% RH with low frequency vibration and cold shock at -10°C. Samples were monitored during vibration for discontinuities.

Test Results

No discontinuities occurred during the low frequency vibration. Following humidity-temperature cycling, samples were examined and had remained mated with no evidence of cracking or chipping. Insulation resistance, dielectric withstanding voltage, and termination resistance testing was performed on the connectors after humidity-temperature testing. See individual tests for results.

3. Validation

Report prepared by,

James D'Angelo 3/1/89
James D'Angelo
Engineering Assistant
Product Testing Section
Corporate Test Laboratory

Reviewed by,

Richard A. Groft 3/2/89
Richard A. Groft
Supervisor
Design Assurance Testing
Corporate Test Laboratory

Approved by,

Barry K. McGee 3/10/89
Richard Houseknecht
Manager
Quality Assurance
Automotive Consumer Business Group

Barry K. McGee
Supervisor and Reliability Engineer
Product Assurance
Automotive/Consumer Business Group