



QUALIFICATION TEST REPORT

CONNECTOR, AMPMODU*,
50/50 GRID CABLE

501-288

Rev. 0

Product Specification: 108-1443 Rev. 0
CTL No.: CTL7745-005-005
Date: January 11, 1995
Classification: Unrestricted
Prepared By: Terrance M. Shingara

* Trademark

CONTROLLED DOCUMENT
This report is a controlled document
per AMP Specification 102-21. It is subject to
change and Corporate Standards should
be contacted for the latest revision.

COPYRIGHT 1981, 1994
BY AMP INCORPORATED
ALL RIGHTS RESERVED.

Corporate Test Laboratory Harrisburg, Pennsylvania

Table of Contents

	<u>Page</u>
1. Introduction	1
1.1 Purpose	1
1.2 Scope	1
1.3 Conclusion	1
1.4 Product Description	2
1.5 Test Samples	2
1.6 Qualification Test Sequence	2
2. Summary of Testing	3
2.1 Examination of Product	3
2.2 Termination Resistance, Dry Circuit	3
2.3 Dielectric Withstanding Voltage	3
2.4 Insulation Resistance	3
2.5 Vibration	3
2.6 Physical Shock	3
2.7 Mating Force	3
2.8 Unmating Force	3
2.9 Durability	4
2.10 Thermal Shock	4
2.11 Humidity-Temperature Life	4
2.12 Mixed Flowing Gas	4
2.13 Temperature Life	4
3. Test Methods	4
3.1 Examination of Product	4
3.2 Termination Resistance, Dry Circuit	4
3.3 Dielectric Withstanding Voltage	5
3.4 Insulation Resistance	5
3.5 Vibration	5
3.6 Physical Shock	6
3.7 Mating Force	6
3.8 Unmating Force	6
3.9 Durability	6
3.10 Thermal Shock	6
3.11 Humidity-Temperature Life	6
3.12 Mixed Flowing Gas	6
3.13 Temperature Life	6
4. Validation	7
(R7745ts)	



AMP INCORPORATED

HARRISBURG, PENNSYLVANIA 17105 PHONE: 717-231-3222 FAX: 717-231-3283
CORPORATE TEST LABORATORY

Qualification Test Report

1. Introduction

1.1 Purpose

Testing was performed on AMP^{*} AMPMODU, 50/50 Grid Cable Connector to determine its conformance to the requirements of AMP Product Specification 108-1443 Rev. O.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the AMPMODU, 50/50 Grid Cable Connector manufactured by the Printed Circuit Board Products Group of the Capital Goods Business Unit. The testing was performed between September 19, 1994 and January 6, 1995.

1.3 Conclusion

The AMPMODU, 50/50 Grid Cable Connector meets the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1443 Rev. O.

* Trademark

1.4 Product Description

The AMPMODU 50/50 Grid Connector system consists of surface-mount, vertical and right angle .050 by .050 grid headers and mating cable receptacles. The system includes double row, vertical shrouded headers and receptacles in sizes ranging from 10 through 100 position.

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 ea.	104895-1	10 Pos Rt. Angle Latched Header
1	5 ea.	104892-1	10 Pos Latched Recpt.
1,2,3,4	5 ea.	1-104656-0	100 Pos Vert. Unlatched Header
1,2,3,4	5 ea.	1-104893-0	100 Pos Unlatched Recpt.
4	5 ea.	1-104894-0	100 Pos Rt Angle Unlatched Recpt.

1.6 Qualification Test Sequence

Test or Examination	Test Groups			
	1	2	3	4
Examination of Product	1,9	1,5	1,5	1,8
Termination Resistance, Dry Circuit	3,7	2,4	2,4	
Dielectric Withstanding Voltage				3,7
Insulation Resistance				2,6
Vibration	5			
Physical Shock	6			
Mating Force	2			
Unmating Force	8			
Durability	4			
Thermal Shock				4
Humidity-Temperature Cycling				5
Mixed Flowing Gas			3	
Temperature Life		3		

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 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 1,2,3

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	Min	Max	Mean
1	60	Initial	10.45	13.84	11.905
		After Mechanical	9.40	13.07	11.648
2	30	Initial	11.16	14.25	12.001
		After Temp Life	10.54	15.50	13.155
3	30	Initial	15.87	13.78	12.038
		After Mixed Gas	11.78	14.89	13.159

All values in milliohms

2.4 Dielectric Withstanding Voltage - Group 4

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

2.5 Insulation Resistance - Group 4

All insulation resistance measurements were greater than 5,000 megohms.

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 Mating Force - Group 1

All mating force measurements were less than 0.4 pounds per contact.

2.9 Unmating Force - Group 1

All unmating force measurements were greater than 0.03 pounds per contact.

2.10 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connector 200 times.

2.11 Thermal Shock - Group 4

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

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 exposure to humidity-temperature cycling.

2.13 Mixed Flowing Gas - Group 3

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

2.14 Temperature Life - Group 2

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

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.

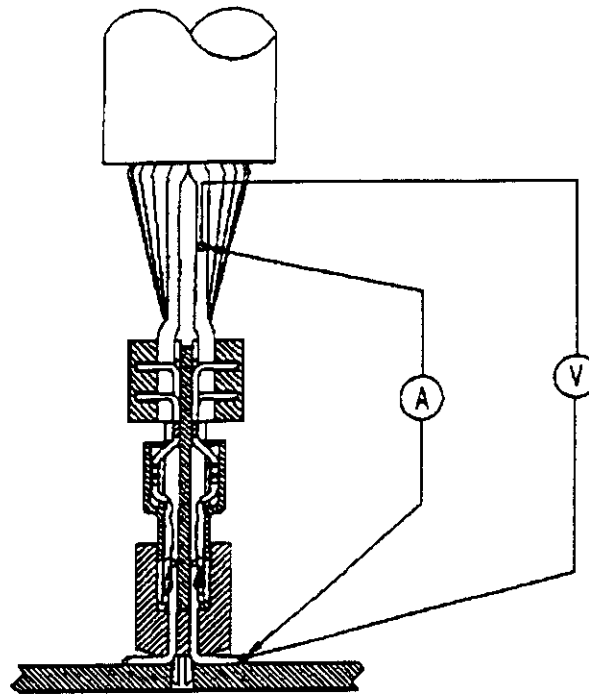


Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 300 vac was applied between the adjacent contacts. This potential was applied for one minute and then returned to zero.

3.4 Insulation Resistance

Insulation resistance was measured between adjacent contacts, using a test voltage of 100 volts DC. This voltage was applied for two minutes before the resistance was measured.

3.5 Vibration, Random

Mated connectors were subjected to a random vibration test, specified by a random vibration spectrum, with excitation frequency bounds of 5 and 500 hertz. The power spectral density at 5 hz is $0.000312 \text{ G}^2/\text{Hz}$. The spectrum slopes up at 12 dB per octave to a PSD of $0.02 \text{ G}^2/\text{Hz}$ at 14 Hz. The spectrum is flat at $0.02 \text{ G}^2/\text{Hz}$ from 14 to 500 Hz. The root-mean square amplitude of the excitation was 3.13 GRMS. Connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

3.6 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.

3.7 Mating Force

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

3.8 Unmating Force

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

3.9 Durability

Connectors were mated and unmated 200 times at a rate not exceeding 150 per hour.

3.10 Thermal Shock

Mated connectors were subjected to 10 cycles of temperature extremes with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -65°C and 105°C. The transition between temperatures was less than one minute.

3.11 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%.

3.12 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 C1₂ at 20 ppb, NO₂ at 200 ppb, and H₂S at 100 ppb. Samples were preconditioned with 10 cycles of durability.

3.13 Temperature Life

Mated samples were exposed to a temperature of 105°C for 500 hours. Samples were preconditioned with 10 cycles of durability.

4. Validation

Prepared by:

Terrance M. Shingara 1/11/95

Terrance M. Shingara
Test Engineer
Product Qualification Team
Corporate Test Laboratory

Reviewed by:

Robert S. Druckenmiller 1/11/95

Robert S. Druckenmiller
Supervisor
Product Testing
Corporate Test Laboratory

Approved by:

Edward Gill 1/11/95

Edward Gill
Manager
Engineering & Design Assurance
Capital Goods Business Unit