QUALIFICATION TEST REPORT

CONNECTOR, AMPMODU*, MTE

501-316 Rev. O

Product Specification:	108-25034 Rev. O
CTL No.:	CTL5465-014-001
Date:	August 24, 1995
Classification:	Unrestricted
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* Trademark

Corporate Test Laboratory Harrisburg, Pennsylvania

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AMP

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CORPORATE TEST LABORATORY

Qualification Test Report

1. Introduction

1.1 Purpose

Testing was performed on AMP* AMPMODU, MTE Connector to determine its conformance to the requirements of AMP Product Specification 108-25034 Rev. O.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the AMPMODU, MTE Connector manufactured by the Printed Circuit Board Products Division of the Capital Goods Business Unit. The testing was performed between August 18, 1994 and August 24, 1995.

1.3 Conclusion

The AMPMODU, MTE Connectors listed in paragraph 1.5 meet the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-25034 Rev. O.

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1.4 Product Description

The AMPMODU MTE interconnection system consists of single-row housings with contacts preloaded on .100 centers.

1.5 Test Samples

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

Test Group	Quantity	Part Nbr	Description
1	15	103960-1	MTE Receptacle (Au)
1	15	103670-1	MTE Header (Au)
1,4	5 ea	103645-9	MTE Receptacle (Sn)
1,4	5 ea	103639-9	MTE Header (Sn)
2	5	103734-9	MTE Receptacle (Au)
2	5	103735-9	MTE Header (Au)
3,5	5 ea	103644-9	MTE Receptacle (Au)
3,5	5 ea	103638-9	MTE Header (Au)

1.6 Qualification Test Sequence

	Test Groups				
Test or Examination	1	2	3	4	5
Examination of Product	1,9	1,5	1,5	1,5	1,8
Termination Resistance, Dry Circuit	3,7	2,4	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				3	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 1,2,3,4

All termination resistance measurements, taken at 100 milliamperes DC and 50 millivolts open circuit voltage were less than 15 milliohms initially and had a change in resistance (ΔR) after testing of less than 5.0 milliohms.

Test Group	Nbr of Data points	Condition	Min	Max	Mean
1	80	Initial	4.11	11.07	7.448
		After Mechanical(ΔR)	-0.15	+2.19	+0.492
2	50	Initial	5.53	6.99	6.414
		After Temp Life (ΔR)	-0.30	+1.69	+0.661
3	50	Initial	5.62	7.29	6.466
		After Mixed Gas (ΔR)	+0.36	+2.71	+1.229
4	50	Initial	5.35	6.81	5.843
		After Humidity (ΔR)	+0.21	+3.39	+1.095

All values in milliohms

2.3 Dielectric Withstanding Voltage - Group 5

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

2.4 Insulation Resistance - Group 5

All insulation resistance measurements were greater than 5,000 megohms initially and 400 megohms after humidity exposure.

2.5 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.

2.6 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.

2.7 Mating Force - Group 1

All mating force measurements were less than 9 ounces per contact for gold plated contacts and 14 ounces per contact for tin plated contacts.

2.8 Unmating Force - Group 1

All unmating force measurements were greater than 1 ounce per contact.

2.9 Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating Tin plated contacts 30 times and 75 times for 15 microinch gold plated contacts

2.10 Thermal Shock - Group 5

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

2.11 Humidity-Temperature Cycling - Groups 4,5

No evidence of physical damage to either the contacts or the connector was visible as a result of exposure to humidity-temperature cycling.

2.12 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.

2.13 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.

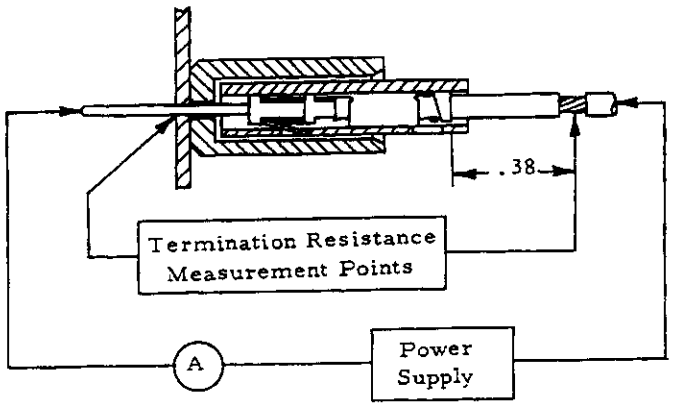

Figure 1
Typical Termination Resistance Measurement Points

3.3 Dielectric Withstanding Voltage

A test potential of 600 volts AC 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 500 volts DC. This voltage was applied for two minutes before the resistance was measured.

3.5 Vibration, Sine

Mated connectors, with gold contacts, were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 0.06 inch, double amplitude or 15 G's (whichever is less). The vibration frequency was varied logarithmically between the limits of 10 and 2,000 Hz and returned to 10 Hz in 20 minutes. This cycle was performed 12 times in each of three mutually perpendicular planes, for a total vibration time of 12 hours. Connectors were monitored for discontinuities greater than one microsecond, using a current of 100 milliamperes in the monitoring circuit.

Mated connectors, with tin contacts, were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 0.06 inch, double amplitude or 10 G's (whichever is less). The vibration frequency was varied logarithmically between the limits of 10 and 500 Hz and returned to 10 Hz in 15 minutes. This cycle was performed 12 times in each of three mutually perpendicular planes, for a total vibration time of 9 hours. 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 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 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.

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.

3.9 Durability

Connectors were mated and unmated at a rate not exceeding 10 cycles per minute.

3.10 Thermal Shock

Mated connectors were subjected to 5 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

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.

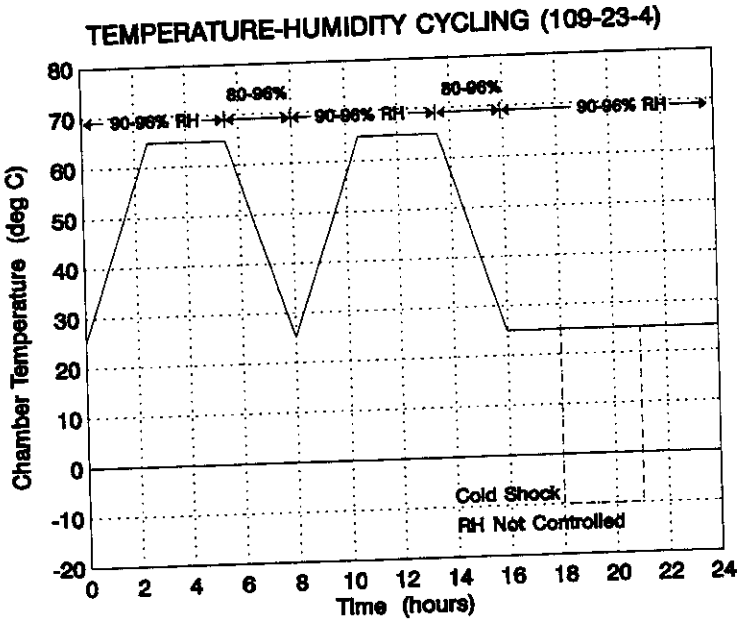

Figure 2
Typical Temperature Cycling with High Humidity Profile

3.12 Mixed Flowing Gas, Class II

Mated connectors were exposed for 14 days to a mixed flowing gas Class II exposure. Class II exposure is defined as a temperature of 30°C and a relative humidity of 70% with the pollutants of $C1_2$ at 10 ppb, NO_2 at 200 ppb, and H_2S at 10 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

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