Connector, Z-PACK*, 2mm FB, Signal & Power

1. INTRODUCTION

1.1. Purpose

Testing was performed on AMP* Z-PACK*, 2mm FB Connector to determine its conformance to the requirements of AMP Product Specification 108-1441 Rev A.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the Z-PACK, 2mm FB
I Connector manufactured by the Global Personal Computer Business Group.

1.3. Conclusion

The Z-PACK, 2mm FB Connector, listed in paragraph 1.5., meet the electrical, mechanical, and environmental performance requirements of AMP Product Specification 108-1441 Rev A.

1.4. Product Description

The Z-PACK, 2mm FB, Signal & Power connector is a backplane bus system which interconnects printed circuit boards using pin and receptacle connectors. Connectors employ a four row 2mm centerline configuration. Being through hole devices, pin and receptacle contacts have either solder or press fit leads. The housings are high temperature thermoplastic, liquid crystal polymer.

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
1,2,3,4,5	5 ea	536501-4	192 position signal header
1,2,3,4,5	5 ea	536507-4	192 position signal receptacle
1,2,3,4	5 ea	536607-1	8 position power receptacle
1,2,3,4	5 ea	536600-1	8 position power header
1,3	5 ea	223513-3	96 position right angle header
1	5 ea	536511-3	96 position right angle receptacle
3	5 ea	536510-3	96 position right angle receptacle

1.6. Qualification Test Sequence

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

NOTE *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 randomly selected from current production lots. A Certificate of Conformance was issued by the Product Assurance Department of the Interconnection Components & Assemblies Product Division. Where specified, samples were visually examined and no evidence of physical damage detrimental to product performance was observed.

2.2. Termination Resistance, Dry Circuit - Group 1,2,3,5

All termination resistance measurements, taken at 100 milliamperes DC and 20 millivolts open circuit voltage, were less than 10 milliohms ΔR.

Test Group	Nbr of Data points	Condition	Min	Max	Mean
1 (Signals)	1080	After Mechanical	-7.59	+4.46	-0.51
(Power)	40	After Mechanical	-0.09	+0.24	+0.01
2 (Signals)	960	After Temp Life	-1.29	+3.67	+0.11
(Power)	40	After Temp Life	-0.02	+0.28	+0.09
3 (Signals)	1920	After Mixed Gas	-3.05	+2.45	+0.09
(Power)	40	After Mixed Gas	-0.13	+1.73	+0.21
5 (Signals)	768	After Vibration	-1.13	+2.97	+0.32

NOTE *All values in milliohms*

2.3. Dielectric Withstanding Voltage - Group 4

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

2.4. Insulation Resistance - Group 4

All insulation resistance measurements were greater than 100 megohms.

2.5. Temperature Rise vs Current - Group 5

All samples had a temperature rise of less than 30°C above ambient when a specified current of 4.77 amperes DC was applied to a single circuit (signal contacts).

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 0.70 Newtons/contact signal module and 2.40 Newtons/contact power module.

2.9. Unmating Force - Group 1

All unmating force measurements were greater than 0.12 Newton/contact signal module and 0.30 Newton/contact power module.

2.10. Durability - Group 1

No physical damage occurred to the samples as a result of mating and unmating the connector 250 times (100 times for R/A headers).

2.11. Thermal Shock - Group 4

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

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 the humidity-temperature cycling exposure.

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 the mixed flowing gas exposure.

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 the elevated temperature exposure.

3. TEST METHODS

3.1. Examination of Product

Where specified, samples were visually examined for evidence of physical damage detrimental to product performance.

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 20 millivolts DC.

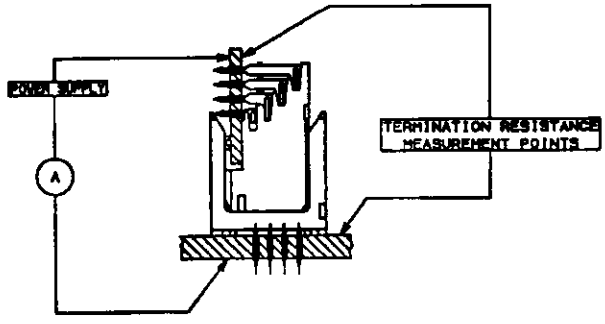


Figure 1
Typical Termination Resistance Measurement Points

3.3. Dielectric Withstanding Voltage

A test potential of 1000 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. Temperature Rise vs Specified Current

Connector temperature was measured, while energized at the specified current of 4.77 amperes DC. Thermography was used to measure connector temperatures. This temperature was then subtracted from the ambient temperature to find the temperature rise. When three readings at five minute intervals were the same, the readings were recorded.

3.6. Vibration, Sine

Mated connectors were subjected to sinusoidal vibration, having a simple harmonic motion with an amplitude of 0.06 inch, double amplitude or 20 G's (whichever is less). The vibration frequency was varied logarithmically 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, 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.

3.7. Physical Shock

Mated connectors were subjected to a physical shock test, having a half-sine 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.

3.8. Mating Force

The force required to mate individual connectors was measured using a tensile/compression device and a free floating fixture. The crosshead rate of travel was 0.5 inch/minute.

3.9. Unmating Force

The force required to unmate individual connectors was measured using a tensile/compression device and a free floating fixture. The crosshead rate of travel was 0.5 inch/minute.

3.10. Durability

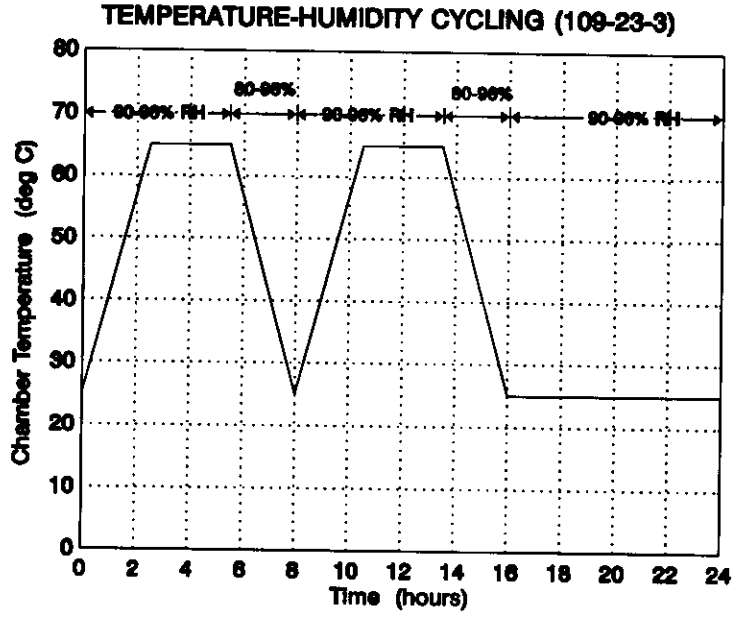
Vertical pin headers and R/A receptacles were mated and unmated 250 times at a rate not exceeding 100 cycles per hour. R/A receptacles were mated and unmated 100 times at a rate not exceeding 100 cycles per hour.

3.11. Thermal Shock

Unmated connectors were subjected to 5 cycles of temperature extremes with each cycle consisting of 30 minutes at each temperature. The temperature extremes were -55° and 125°C. The transition between temperatures was less than one minute.

3.12. 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% as illustrated in Figure 2.



3.13. 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 Cl_2 at 10 ppb, NO_2 at 200 ppb, and H_2S at 10 ppb. Samples were preconditioned with 25 cycles of durability (R/A 5 cycles).

3.14. Temperature Life

Mated samples were exposed to a temperature of 70°C for 1000 hours (Group 2 only). Mated samples were exposed to a temperature of 105°C for 500 hours (Group 5 only).

4. VALIDATION

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