

MAR 26 1990  
 MAY 09 1990  
 OCT 09 1990  
 APR 30 1991  
 MAY 06 1991

1. SCOPE

**TENTATIVE**

1.1. Content

This specification covers the performance, tests and quality requirements for the Z-PACK\* 2 mm connector system. These connectors are 2 piece devices to interconnect 2 printed circuit boards. Receptacle connector and pin connectors are through hole devices with solder tails and ACTION PIN\* contacts. Connectors are in 4 row configuration.

1.2. Qualification

When tests are performed on the subject product line, the procedures specified in AMP 109 series specifications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. AMP Documents

- A. 109-1: General Requirements for Test Specifications
- B. 109 Series: Test Specifications as indicated in Figure 1. (Comply with MIL-STD-202, MIL-STD-1344 and EIA RS-364)
- C. Corporate Bulletin 401-76: Cross-reference between AMP Test Specifications and Military or Commercial Documents
- D. 114- : Application Specification
- E. 501- : Test Report

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

\*Trademark of AMP Incorporated

Product Code: 5689

COPYRIGHT 1990, 91 BY AMP INCORPORATED. ALL INTERNATIONAL RIGHTS RESERVED.

<p style="text-align: center;"><b>TENTATIVE</b></p> <p>This specification is based on design objectives and is strictly tentative. Although preliminary test data may exist the specification is subject to change based on the results of additional testing and evaluation.</p> <p>Accordingly, AMP Incorporated makes no representation or warranty expressed or implied that the product described herein will comply with this specification.</p>				DR		<p style="text-align: center;"><b>AMP</b> AMP Incorporated Harrisburg, PA 17105-3608</p>	
				CHK			
APP				NO 108-1318		REV 0	LOC B
LTR				PAGE 1 OF 10		TITLE CONNECTOR, SYSTEM, Z-PACK, 2MM, POWER AND SIGNAL	
REVISION RECORD		APP	DATE				

### 3.2. Material

#### A. Contacts:

- (1) Signal/power pin: Phosphor bronze, gold over nickel.
- (2) Signal receptacle mini-TBC contact: Phosphor bronze, AMP-DURAGOLD\* over nickel.
- (3) Power receptacle mini-TBC contact: Beryllium copper, AMP-DURAGOLD over nickel.

B. Housing: High temperature thermoplastic, Liquid Crystal Polymer, black

### 3.3. Ratings

A. Voltage: 250 vac

#### B. Current:

- (1) Signal: 1 ampere maximum per contact.
- (2) Power: See Figure 2

C. Temperature: -65° to 125°C

### 3.4. Performance and Test Description

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. All tests are performed at ambient temperature unless otherwise specified.

### 3.5. Test Requirements and Procedures Summary

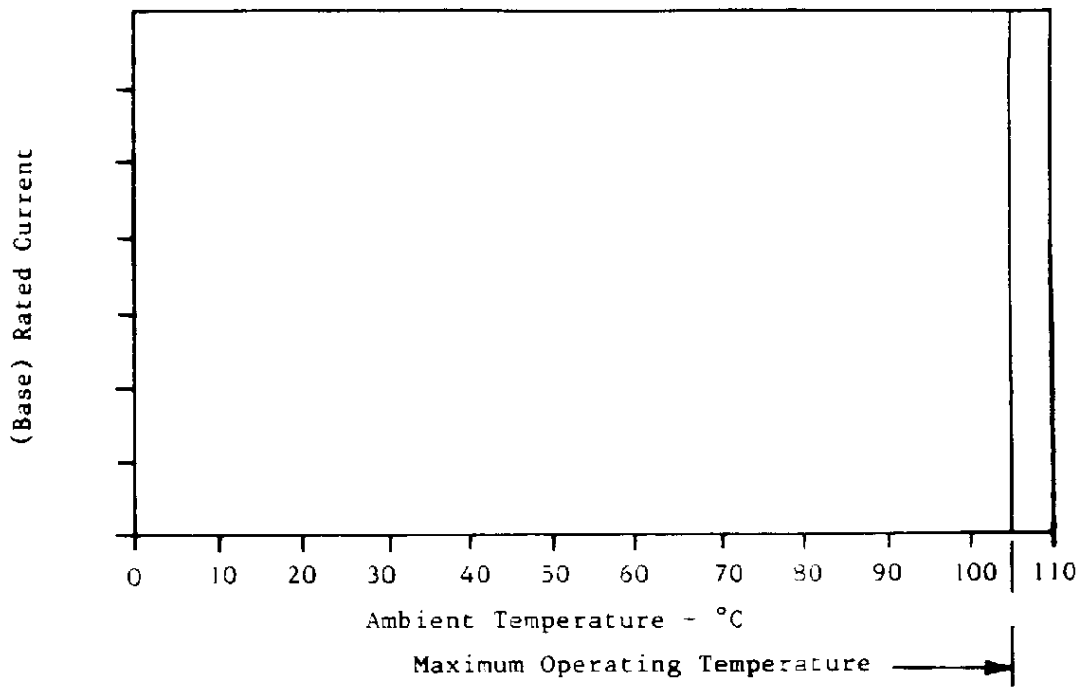
Test Description	Requirement	Procedure
Examination of Product	Meets requirements of product drawing and AMP Spec 114-_____.	Visual, dimensional and functional per applicable quality inspection plan.
<b>ELECTRICAL</b>		
Termination Resistance, Dry Circuit	<u>Power:</u> 15 milliohms maximum initial. $\Delta R$ 5 milliohms maximum. <u>Signal:</u> 20 milliohms maximum initial. $\Delta R$ 7 milliohms maximum.	Subject mated contacts assembled in housing to 50 mv open circuit at 100 ma maximum, see Figure 5; AMP Spec 109-6-1.
Dielectric Withstanding Voltage	600 vac dielectric withstanding voltage, one minute hold. No breakdown or flashover.	Test between adjacent contacts of mated connector assemblies; AMP Spec 109-29-1.
Insulation Resistance	5000 megohms minimum initial; 500 megohms minimum final.	Test between adjacent contacts of mated connector assembly; AMP Spec 109-28-1.
Temperature Rise vs Current	30°C maximum temperature rise at specified current.	Measure T-Rise vs current AMP Spec 109-45-1. See Figure 2.

Figure 1 (cont)

<b>AMP</b>	AMP Incorporated Harrisburg, PA 17105-3608	PAGE	NO	REV	LOC
		2	108-1318	O	B

Test Description	Requirement	Procedure																		
<b>MECHANICAL</b>																				
Vibration, Random	No discontinuities greater than 1 microsecond. See note (a).	Subject mated connector to 11.6 G rms, see Figure 4; AMP Spec 109-21-5, Figure 3, test level D. Duration 15 minutes.																		
Physical Shock	No discontinuities greater than 1 microsecond. See note (a).	Subject mated connector to 50 G's half-sine shock pulses of 11 millisecond duration; 3 shocks in each direction applied along the 3 mutually perpendicular planes total 18 shocks, see Figure 4; AMP Spec 109-26-1.																		
Mating Force	3.0 ounces maximum per contact.	Measure force necessary to mate connector assembly, incorporating free floating fixture; AMP Spec 109-42, cond A, calculate force per contact.																		
Unmating Force	0.4 ounces minimum per contact.	Measure force necessary to unmate connector assembly; AMP Spec 109-42, cond A.																		
Durability	See note (a).	Mate and unmate connector assemblies for number of cycles specified, at a maximum rate of 600 cycles/hour; AMP Spec 109-27. <table border="1" data-bbox="1079 1276 1495 1577"> <thead> <tr> <th data-bbox="1079 1276 1328 1310">Plating microinches</th> <th data-bbox="1328 1276 1495 1310">Cycles</th> </tr> </thead> <tbody> <tr> <td data-bbox="1079 1310 1328 1344">Receptacle-30</td> <td data-bbox="1328 1310 1495 1344"></td> </tr> <tr> <td data-bbox="1079 1344 1328 1377">AMP-DURAGOLD</td> <td data-bbox="1328 1344 1495 1377">250</td> </tr> <tr> <td data-bbox="1079 1377 1328 1411">Pin Header-30</td> <td data-bbox="1328 1377 1495 1411"></td> </tr> <tr> <td data-bbox="1079 1411 1328 1444">gold</td> <td data-bbox="1328 1411 1495 1444">250</td> </tr> <tr> <td data-bbox="1079 1444 1328 1478">Receptacle-50</td> <td data-bbox="1328 1444 1495 1478"></td> </tr> <tr> <td data-bbox="1079 1478 1328 1512">AMP-DURAGOLD</td> <td data-bbox="1328 1478 1495 1512">500</td> </tr> <tr> <td data-bbox="1079 1512 1328 1545">Pin Header-50</td> <td data-bbox="1328 1512 1495 1545"></td> </tr> <tr> <td data-bbox="1079 1545 1328 1579">gold</td> <td data-bbox="1328 1545 1495 1579">500</td> </tr> </tbody> </table>	Plating microinches	Cycles	Receptacle-30		AMP-DURAGOLD	250	Pin Header-30		gold	250	Receptacle-50		AMP-DURAGOLD	500	Pin Header-50		gold	500
Plating microinches	Cycles																			
Receptacle-30																				
AMP-DURAGOLD	250																			
Pin Header-30																				
gold	250																			
Receptacle-50																				
AMP-DURAGOLD	500																			
Pin Header-50																				
gold	500																			
Figure 1 (cont)																				
<b>AMP</b> AMP Incorporated Harrisburg, PA 17105-3608	PAGE 3	NO 108-1318	REV 0	LOC B																

Test Description	Requirement	Procedure		
<b>ENVIRONMENTAL</b>				
Thermal Shock	See note (a).	Subject mated connectors to 5 cycles between -65° and 125°C; AMP Spec 109-22		
Humidity-Temperature Cycling	See note (a)	Subject mated connectors to 10 humidity-temperature cycles between 25° and 65°C at 95% RH; AMP Spec 109-23-3, cond. B.		
Industrial Mixed Flowing Gas	See note (a).	Subject mated connectors to environmental class III for 20 days; AMP Spec 109-85-3.		
Temperature Life	See note (a)	Subject mated connectors to temperature life at 105°C for 500 hours duration; AMP Spec 109-43, test level 10.		
<p>(a) Shall meet visual requirements, show no physical damage, and shall meet requirements of additional tests as specified in the Test Sequence in Figure 3.</p> <p style="text-align: center;">Figure 1 (end)</p>				
<b>AMP</b> AMP Incorporated Harrisburg, PA 17105-3608	PAGE 4	NO 108-1318	REV 0	LOC B



Represents a typical example of a connector rated at \_\_\_\_\_ amperes with 30° temperature rise.

Current Carrying Capability  
Figure 2A

<b>AMP</b>	AMP Incorporated Harrisburg, PA 17105-3608	PAGE	NO	REV	LOC
		5	108-1318	0	B

Downloaded from [Elcodis.com](http://Elcodis.com) electronic components distributor

Wire Gage

% Connector Loading*	AWG %					
	Single Contact					
	25					
	50					
	75					
	100					

Multiplication Factor -F

\* Connector loading is uniformly distributed

Note: To determine the acceptable current carrying capacity for the percentage connector loading and wire gage indicated, use the Multiplication Factor (F) from the above chart and multiply it times the Base Rated Current for a single circuit at the maximum operating temperature as shown on Figure 2A.

Figure 2B  
Current Rating

<b>AMP</b>	AMP Incorporated Harrisburg, PA 17105-3608	PAGE	NO	REV	LOC
		6	108-1318	0	B

### 3.6. Product Qualification and Requalification Tests

Test or Examination	Test Group (a)				
	1	2	3	4(c)	5
	Test Sequence (b)				
Examination of Product	1,9	1,6	1,6	1,8	1,10
Termination Resistance, Dry Circuit	3,7	2,5	2,5		2,8
Dielectric Withstanding Voltage				3,7	
Insulation Resistance				2,6	
Temperature Rise vs Current					3,9
Vibration	5				7(d)
Physical Shock	6				
Mating Force	2				
Unmating Force	8				
Durability	4	3	3		4
Thermal Shock				4	
Humidity-Temperature Cycling				5	
Industrial Mixed Flowing Gas			4		5
Temperature Life		4			6

- (a) See Para 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Group 4 shall be unmounted
- (d) Discontinuities shall not be measured. Energize at the 18°C level for 100% loading as determined in AMP Specification 109-151

Figure 3

<b>AMP</b> AMP Incorporated Harrisburg, PA 17105-3608	PAGE	NO	REV	LOC
	7	108-1318	0	B

#### 4. QUALITY ASSURANCE REQUIREMENTS

##### 4.1. Qualification Testing

###### A. Sample Selection

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production. All test groups shall consist of 5 connectors of the largest size available for each plating configuration. For the signal version, all tests requiring individual contact measurements shall be conducted on 12 contacts from each connector. Four contacts from each end and 4 contacts from the middle of the connector shall be measured. For the power versions, all tests requiring individual contact measurements shall be conducted on a minimum of 30 randomly selected contacts distributed among the 5 connectors. Test groups 1,2,3 and 5 shall be mounted on printed circuit boards designed to accommodate vibration and physical shock fixturing. The fixture shall provide a series circuit for all contacts with access to measure termination resistance. The signal version connectors shall be subjected to test groups 1,2, 3 and 4. The power version connectors shall be subjected to test groups 1, 4 and 5.

###### B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 3.

##### 4.2. Requalification Testing

If changes significantly affecting form, fit, or function are made to the product or to the manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality, and reliability engineering.

##### 4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

##### 4.4. Quality Conformance Inspection

The applicable AMP quality inspection plan will specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

**AMP**

AMP Incorporated  
Harrisburg, PA 17105-3608

PAGE NO

8

108-1318

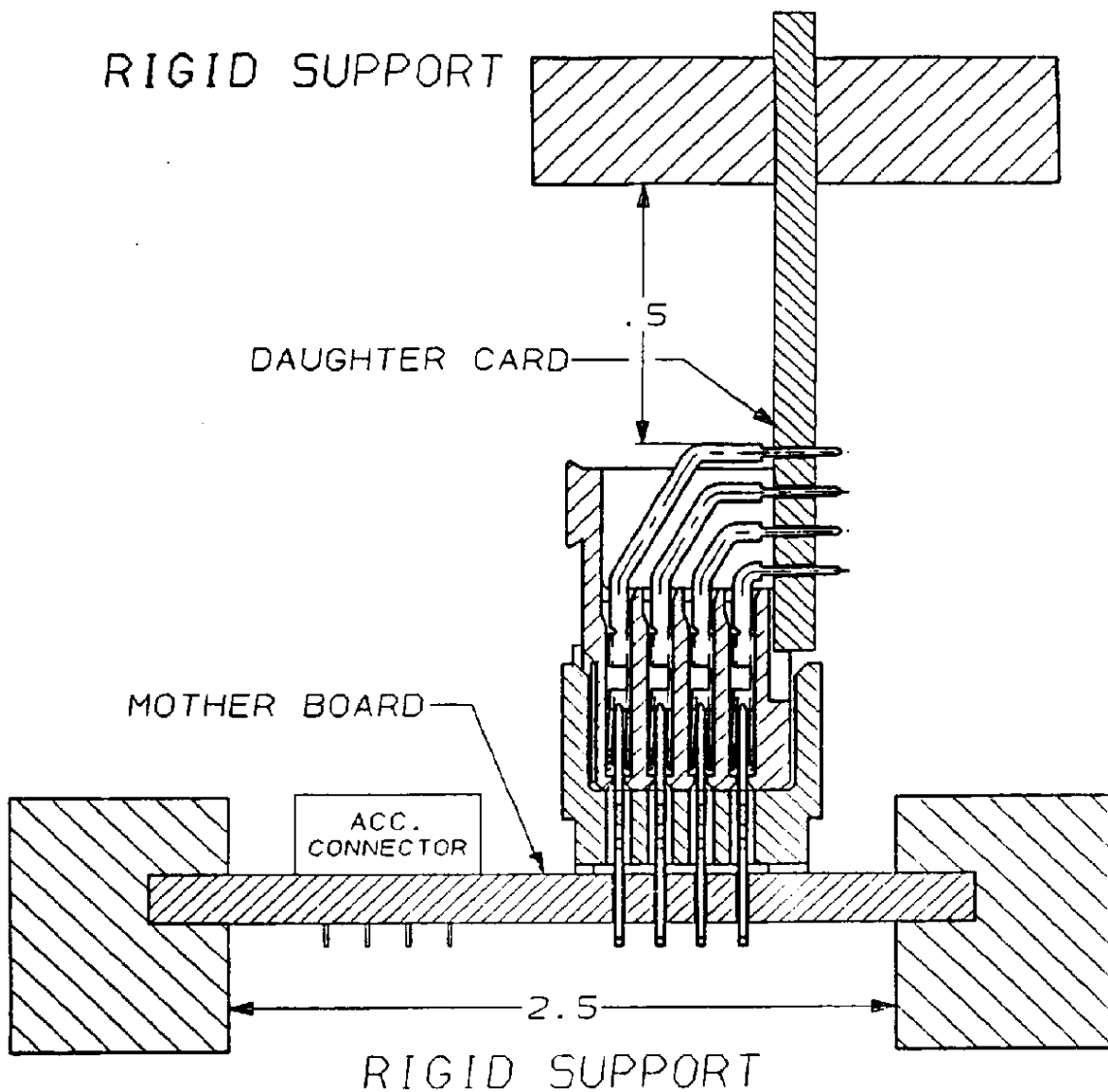
REV

0

LOC

**B**





Note: Support extends a minimum of 1 inch beyond end of connector.

Figure 4  
Vibration and Physical Shock Mounting Fixture

**AMP**

AMP Incorporated  
Harrisburg, PA 17105-3608

PAGE NO

9

108-1318

REV

0

LOC

**B**

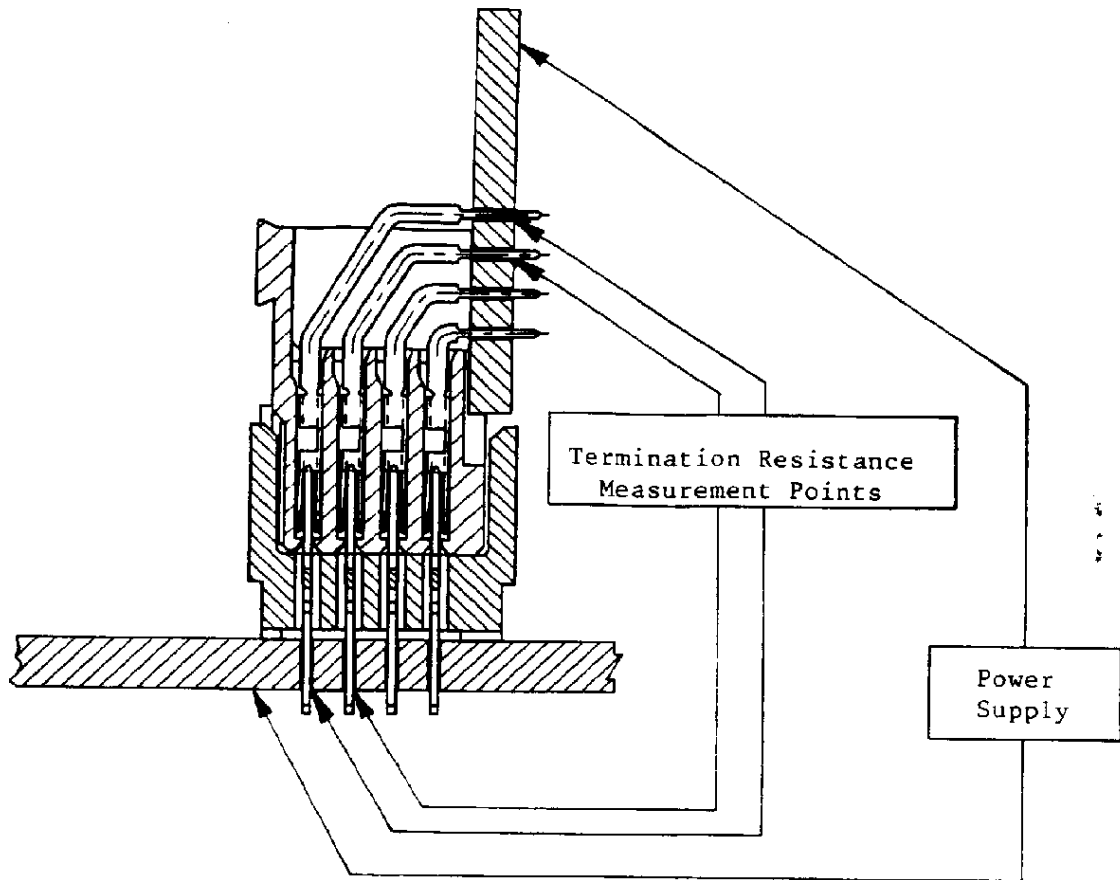


Figure 5  
Resistance and Temperature Measurement Points

**AMP**

AMP Incorporated  
Harrisburg, PA 17105-3608

PAGE NO

10

108-1318

REV

0

LOC

B