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**AMPMODU\* 50/50 Grid Connector System**

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**1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for AMPMODU\* 50/50 Grid Connector System. This miniature board to board system consists of printed circuit board mounted receptacles and headers on a .050 by .050 inch centerline. Both the receptacles and headers are designed to be soldered to the surface of printed wiring boards having pads with preapplied solder paste. Conventional processes shall be used in placing and reflowing the solder paste as defined in applicable documents. This specification applies when receptacles and/or headers are mounted to G-10 or FR-4 epoxy printed wiring boards.

## 1.2. Qualification

When tests are performed on subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using applicable inspection plan and product drawing.

## 1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed on 25Sep95. Additional testing was completed on 27Sep02. The Qualification Test Report number for this testing is 501-317. This documentation is on file at and available from Engineering Practices and Standards (EPS).

**2. APPLICABLE DOCUMENTS**

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. 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. Tyco Electronics Documents

- 102-950: Quality Specification (Qualification of Separable Interface Connectors)
- 114-7010: Application Specification (AMPMODU 50/50 Grid Connectors for SMT PC Board and IDC Ribbon Cable Applications)
- 501-317: Qualification Test Report (AMPMODU\* 50/50 Grid Connector System)

## | 2.2. Industry Document

| EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications

## | 2.3. Reference Document

| 109-197: Test Specification (Tyco Electronics Test Specifications vs EIA and IEC Test Methods)

**3. REQUIREMENTS**

## 3.1. Design and Construction

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

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.3. Ratings

- Voltage: 30 volts AC
- Current: See Figure 4 for applicable current carrying capability
- Temperature: -65 to 105°C

3.4. Performance and Test Description

Product is designed to meet electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure								
Examination of product.	Meets requirements of product drawing and Application Specification 114-7010.	Visual, dimensional and functional per applicable quality inspection plan.								
ELECTRICAL										
Termination resistance.	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">Header Stack Height</td> <td style="text-align: center;">Milliohms Maximum Initial</td> </tr> <tr> <td style="text-align: center;">.250 inch</td> <td style="text-align: center;">12</td> </tr> <tr> <td style="text-align: center;">.320 inch</td> <td style="text-align: center;">14</td> </tr> <tr> <td style="text-align: center;">.390 inch</td> <td style="text-align: center;">16</td> </tr> </table> $\Delta R$ 8 milliohms maximum.	Header Stack Height	Milliohms Maximum Initial	.250 inch	12	.320 inch	14	.390 inch	16	EIA-364-23. Subject mated contacts assembled in housing to 50 mv maximum open circuit at 100 ma maximum. See Figure 3.
Header Stack Height	Milliohms Maximum Initial									
.250 inch	12									
.320 inch	14									
.390 inch	16									
Insulation resistance.	5000 megohms minimum.	EIA-364-21. Test between adjacent contacts of mated specimens.								
Dielectric withstanding voltage.	300 volts AC at sea level for 1 minute.	EIA-364-20, Condition I. Test between adjacent contacts of mated specimens.								
Temperature rise vs current.	30°C maximum temperature rise at 3.9 amperes AC.	EIA-364-70, Method 1. Measure temperature rise vs current. See Figure 4.								
MECHANICAL										
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition V. Subject mated specimens to 16.91 G's rms. 20 minutes in each of 3 mutually perpendicular planes. See Figure 5.								

Figure 1 (continued)

Test Description	Requirement	Procedure
Physical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Method G. Subject mated specimens to 100 G's sawtooth shock pulses of 6 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 5.
Durability.	See Note.	EIA-364-9. Mate and unmate specimens for 200 cycles at maximum rate of 150 cycles per hour.
Contact retention.	Contacts shall not dislodge from circuit cavity.	EIA-364-29. Apply axial load of .25 pound to header and .40 pound to receptacle in mating direction to solder tails of header and receptacle.
Mating force.	6.4 ounces maximum per contact.	EIA-364-9. Measure force necessary to mate specimens a distance of .060 inch from point of initial contact at maximum rate of .5 inch per minute.
Unmating force.	1 ounce minimum per contact.	EIA-364-9. Measure force necessary to unmate specimens at maximum rate of .5 inch per minute.
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32, Test Condition II. Subject mated specimens to 10 cycles between -65 and 105°C.
Humidity-temperature cycling.	See Note.	EIA-364-31, Method III. Subject specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH.
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 4, Time Condition C. Subject mated specimens to 105°C for 500 hours.

Figure 1 (continued)

Test Description	Requirement	Procedure
Mixed flowing gas.	See Note.	EIA-364-65, Class III (3 gas). Subject mated beryllium copper specimens to environmental class III for 20 days.
Mixed flowing gas.	See Note.	EIA-364-65, Class IIIA (4 gas). Subject mated copper alloy specimens to environmental Class IIIA for 20 days.

**NOTE** *Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in Test Sequence in Figure 2.*

Figure 1 (end)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Examination of product	1,9	1,9	1,8	1,3
Termination resistance	3,7	2,7		
Insulation resistance			2,6	
Dielectric withstanding voltage			3,7	
Temperature rise vs current		3,8		
Vibration	5	6(c)		
Physical shock	6			
Durability	4			
Contact retention				2
Mating force	2			
Unmating force	8			
Thermal shock			4	
Humidity-temperature cycling			5	
Temperature life		5		
Mixed flowing gas, Class III		4(d)		
Mixed flowing gas, Class IIIA		4(d)		

**NOTE** (a) *See paragraph 4.1.A.*  
 (b) *Numbers indicate sequence in which tests are performed.*  
 (c) *Discontinuities shall not be measured. Energize at 18 °C level for 100% loadings per Quality Specification 102-950.*  
 (d) *Precondition specimens with 10 cycles durability.*

Figure 2

**4. QUALITY ASSURANCE PROVISIONS**

4.1. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected from current production. Test groups shall consist of a minimum of 5 vertical receptacles and shrouded headers containing at least 30 contacts total. Test group 1 shall consist of the smallest and largest position sizes available. Test groups 2, 3 and 4 shall each consist of the largest position size available.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 2.

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or 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 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 specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable 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.

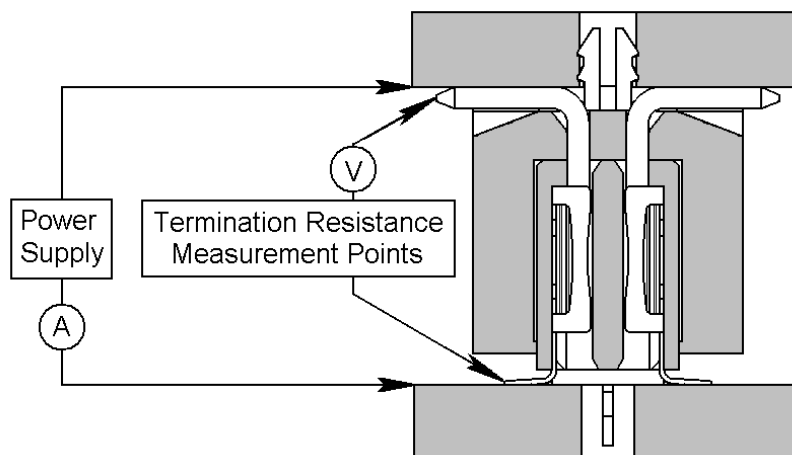


Figure 3  
Termination Resistance Measurement Points

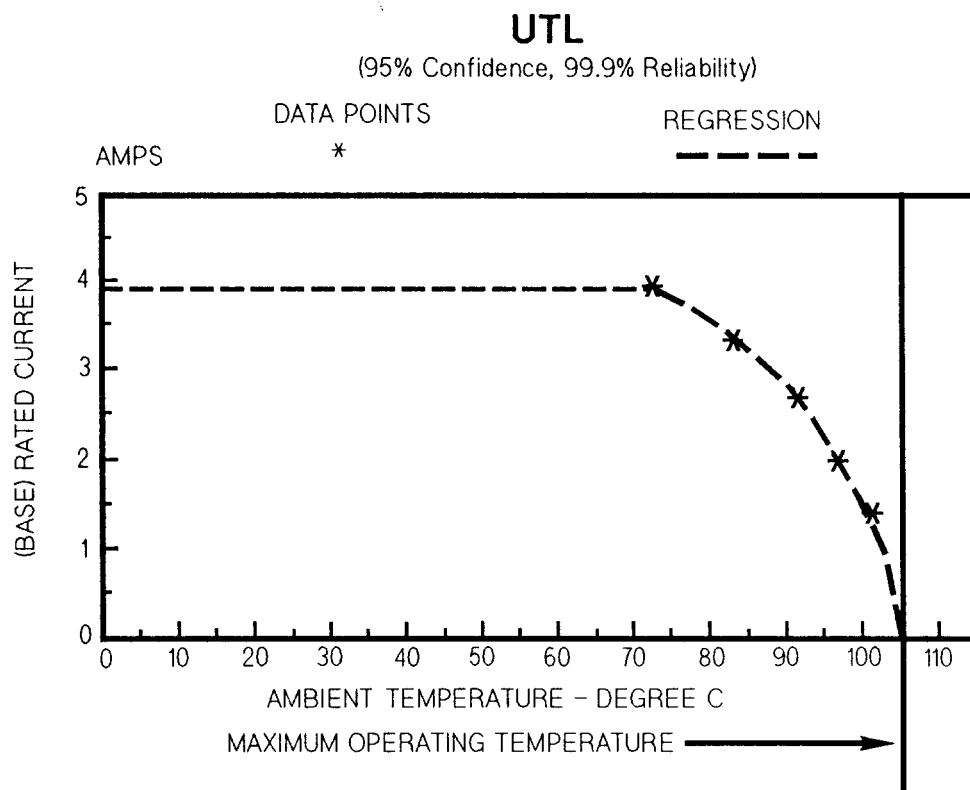


Figure 4A  
Current Carrying Capability

Percent Connector Loading	F-Factor
Single Contact	1
50	.42
100	.29

**NOTE**

To determine the acceptable current carrying capacity for the percentage connector loading indicated, use the Multiplication Factor (F) from the above chart and multiply it times the Base rated Current for a single circuit at maximum ambient operating temperature as shown in Figure 4A.

Figure 4B  
Current Rating

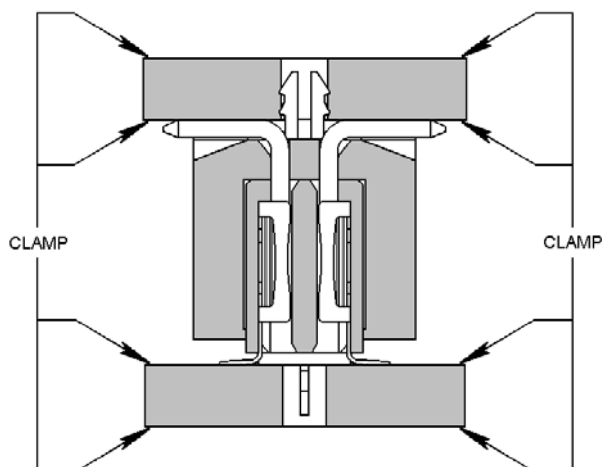


Figure 5  
Vibration & Physical Shock Mounting Fixture

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