



AMPMODU* 1.0 Small Centerline Board to Board

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the AMPMODU* Small centerline interconnection system incorporating standard pressure receptacles housed in flame retardant housings. The mating male header assemblies utilize 0.3 mm square posts housed in flame retardant insulating housings. Receptacles and Headers mate on 1.0mm centerlines and mount on printed circuit boards.

1.2. Qualification

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

1.3. Qualification Test Results

Successful qualification testing on the subject product line has not been completed. The Qualification Test Report number will be issued upon successful qualification testing.

2. APPLICABLE DOCUMENTS AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- 114-32210: Application Specification (AMPMODU* 1.0mm Small Centerline Printed Circuit Board Connectors)
- 114-32329: Application Specification (AMPMODU* 1.0mm Small Centerline Printed Circuit Board Connectors)
- 501-134122: Qualification Test Report (AMPMODU* 1.0mm Small Centerline Interconnection System)

2.2. Industry Documents

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- IEC 60512: Connectors for Electronic Equipment Tests and Measurements
- IEC 60068: Environmental Testing General Procedure

2.3. Reference Document

- 109-197: Test Specification (TE Test Specification vs EIA and IEC Test Methods)
- 109-1: General Requirements for Testing

3. REQUIREMENTS

3.1. Design and Construction

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



3.2. Ratings

Voltage	Current	Temperature
30 VAC	1 amp max per contact UL 0.9 amp max per contact CSA 4.0 amps max single circuit (See Derating Curves Figure 4)	-55° C to +125° C (Gold plated)

3.3. Test Requirements and Procedures

Product is designed to meet the electrical, mechanical and environmental performance requirements specified below:

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
Examination of product	Meets requirements of product drawing and application specification. No physical damage.	EIA-364-18 or IEC-60512-1-1 Visually inspected per applicable quality inspection plan or applicable standards.

ELECTRICAL

Low Level Contact Resistance (LLCR).	Initial 16 milliohms maximum. Final 30 milliohms maximum	EIA-364-23 or IEC-60512-2-1 Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Insulation Resistance.	1000 Megaohms minimum initial. 500 Megaohms minimum final	EIA-364-21 or IEC-60512-3-1 500 volts DC, 2-minute hold. Test between adjacent contacts of mated specimens.
Dielectric Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I or IEC-60512-4-1 Test voltage (rms) – 300VAC at Sea level. Test between adjacent contacts of mated specimens.
Temperature rise vs current.	30°C maximum temperature rise at specified current.	EIA-364-70, Method 1 or IEC-60512-5-1 Stabilize at a single current level until 3 readings at 5-minute intervals are within 1°C. See Figure 4

Figure 1



NOTE

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.

MECHANICAL

Test Description	Requirement	Procedure
Random vibration.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition V. Letter B. Subject mated specimens 50 to 2000 Hz. Two hours in each of 3 mutually perpendicular planes. 100ma, See Figure 5.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Condition G. Or IEC 60512-6-3 Subject mated specimens to 100 G's sawtooth shock pulses of 6 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Durability.	Termination resistance (low level) shall be met.	EIA-364-9 or IEC 60512-9-1 Mate and unmate gold flash plated specimens for 25 cycles; 30µ gold for 100 cycles; at a maximum rate of 500 cycles per hour.
Contact Retention in Housing	Minimum of 1N retention force	EIA-364-29. Or IEC 60512-15-1 Apply load 100 g to header pin per contact mating direction. No dislodging
Mating force.	65 N Maximum per 100 pos connector	EIA-364-13 or IEC 60512-13-1 Measure force necessary to mate specimens after from point of initial contact at a maximum rate of 12.7mm per minute.

Figure 1(cont.)



Unmating force.	8.0 N min per 100 pos connector.	EIA-364-13. Or IEC 60512-13-1 Measure force necessary to unmate specimens at a maximum rate of 12.7mm per minute.
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NOTE

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.

ENVIRONMENTAL

Thermal shock.	See Note. Contact resistance shall be met	EIA-364-32. Method A, Test Condition 1 Or IEC 60512-11-4 Subject mated specimens to 5 cycles between -55 and 85°C with 30-minute dwells at temperature extremes and 1 minute transition between temperatures.
Humidity/temperature cycling.	See Note. Contact resistance shall be met	EIA-364-31, Method IV. (Omit 7a,7b) or IEC 60512-11-12 Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 90 to 98% RH
Temperature life.	See Note. Contact resistance shall be met	EIA-364-17, Method A, Test or IEC 60512-11-9 Condition 5, Test Time Condition C. Subject mated specimens to 125°C for 500 hours.
Mixed flowing gas.	See Note.	EIA-364-65, Class IIA (4 gas). Subject unmated specimens to 7 days first then mated the second 7 days.
Solderability	The contact solder tails should be covered by a continuous new solder coating for 95% Minimum of affected area. No Physical damage shall occur	J-STD-002TEST S1,

Figure 1(cont.)



Resistance to soldering Heat	No physical damage shall occur. 3 cycles of 260°C peak reflow soldering simulation curve.	TEC 109-201, Condition B (reflow curve 3.3, test method B)
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Figure 1(end)



NOTE

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.

3.4. Product Qualification and Requalification Test Sequence

TEST OR EXAMINATION					
	1	2	3	4	5
	TEST SEQUENCE (b)				
Initial examination of product	1	1	1	1	1
LLCR	3, 7	2, 4			2, 5, 7, 9
Insulation Resistance			2, 6		
Withstanding Voltage			3, 7		
Temperature Rise vs. Current					3, 10
Solderability, Dip Test				2	
Random Vibration	5				8 (c)
Mechanical Shock	6				
Durability	4				
Mating Force	2				
Unmating Force	8				
Thermal Shock			4		
Humidity/Temperature Cycling		3	5		
Temperature Life					6
Mixed Flowing Gas					4(d)
Final examination of product	9	5	8	3	11

Figure 2



NOTE

- (a) See Paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Vibration testing is performed at the 18°C temperature rise current level
- (d) Precondition by mating Au Flash with 5 cycles, 30 Au with 10 cycles.



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 at random from current production from 30µm and flash gold assemblies. If specimens are soldered, apply after soldering and cleaning per Application Specifications 114-32329, 114-32210 or Instruction Sheet 408-7411. All test groups 100 position assemblies. Test groups 1, 2 shall each consist of a minimum of 3 mounted connector assemblies with a minimum of 36 post/receptacle pairs, series wired. Test group 3 shall consist of 3 mated, unmounted, and unwired connector assemblies with a minimum of 36 post/receptacle pairs. Test group 4 shall consist of a minimum of 5 header and receptacle of either plating variation (same tail plating). Test group 5 shall consist of 6, 100 position header/receptacle assemblies.

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 the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If 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 shall 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.



NOTE

Header Post Plating shall be identical to receptacle plating.

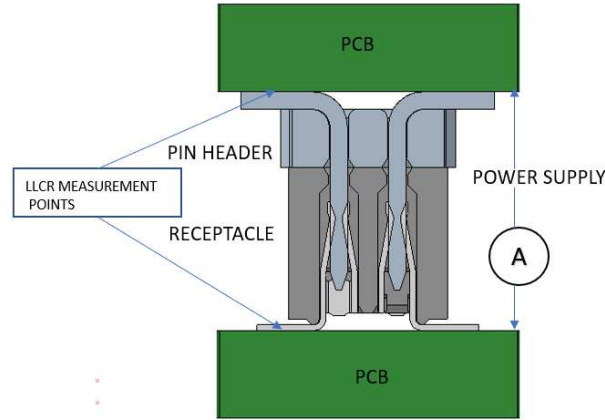


Figure 3
LLCR Measurement Points

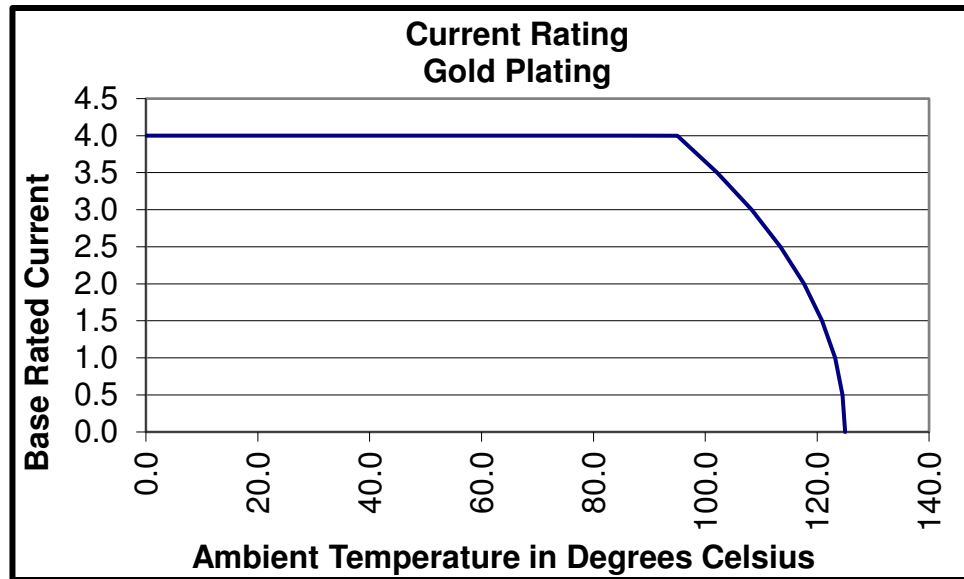


Figure 4
Current Carrying Capability

Connector Loading	F - Factor	Current Rating (A)
Single Circuit	1	4.061
50%	0.355	1.442
100%	0.223	0.906



NOTE

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

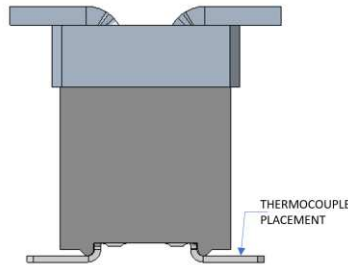


Figure 4
Thermocouple Placement

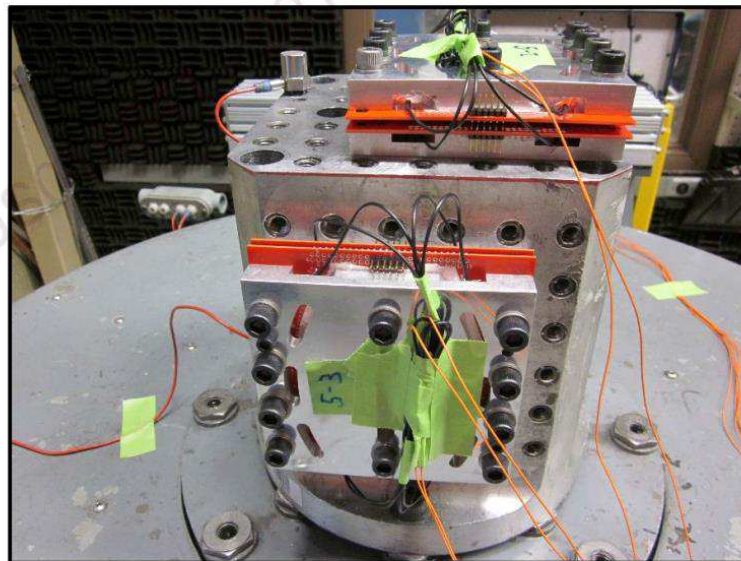


Figure 5 – Vibration Test Setup