



The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore, TE Connectivity (TE) makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, TE may change these requirements based on the results of additional testing and evaluation. Contact TE Engineering for further details.

AMPMODU 2mm RECEPTACLE, Wire to Board, CRIMP type

1. SCOPE

1.1. Contents

This specification covers the performance, test and quality requirements for the AMPMODU, 2mm WIRE TO BOARD CRIMP Type Receptacles

1.2. Qualification

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

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. Qualification Test Results

- [502-139227](#): Qualification Test Report

2.2. Application Specification

- [114-32173](#): Application Specification, AMPMODU 2mm Receptacle, Wire to Board, Crimp

2.3. Customer Drawing Numbers:

2mm Receptacle housing	2mm Receptacle terminal
2316102 – Single Row, Crimp, Plain	2316113 - Crimp Contact, AWG 24-28
2316103 – Single Row, Crimp, Locking Ramp	2316114 - Crimp Contact, AWG 28-30
2316104 – Single Row, Crimp, Center Latch	
2316108 – Dual Row, Crimp, Plain	
2316109 – Dual Row, Crimp, Locking Ramp	
2316110 – Dual Row, Crimp, Center Latch	

2.4. IEC Specification

- IEC 60512 Connectors for Electronic Equipment — Tests and Measurements
- IEC 60068-1 Environmental Testing — Part 1: General and Guidance

2.5. Reference Document

- [109-197](#) Test Specification (TE Test Specification vs EIA and IEC Test Methods)
- [109-1](#) General Requirements for Testing (TE Internal Document)
- [108-64040](#) Product Specification, AMPMODU 2mm, Header and Board to Board Receptacle

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing. In case of a conflict between this document and the production drawing, Production drawing shall be considered.

- Housing: High Temperature plastic, UL 94 V0, BLACK.
- Contact: Phosphor Bronze
- Plating: 0.1µm Gold Flash; 0.38µm gold; 0.76µm gold or Tin 1.27-2.54µm Over Nickel

3.3. Ratings

Table 1

VOLTAGE	CURRENT	OPERATING TEMPERATURE
125V DC or 125 V AC RMS	2A Maximum	-40°C to 105°C for Tin Plated Contact -40°C to 125°C for Au Plated Contact

Table 2

WIRE SIZE	CURRENT	RETENTION FORCE (N) Min
AWG #24	2.0	28
AWG #26	1.5	15
AWG #28	1.0	11
AWG #30	0.5	6

Insulation O.D. 1.0mm max.

4. TEST REQUIREMENTS AND PROCEDURES SUMMARY

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 per TE specification 109-1

Table 3

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
Examination of product	Meets requirements of product drawing and Application Specification. No physical damage.	Visually inspected per applicable quality inspection plan or IEC 60512-1-1 (Visual inspection)

ELECTRICAL

Temperature rise	42°C maximum (30°C max @1.6A)	Stabilize at a single current level for 1 hour after 3 consecutive readings at 5-minute intervals are within 1°C. Current-carrying capacity tests IEC 60512-5-1
Voltage proof (Dielectric withstand voltage)	Dielectric strength - Connector must withstand potential of 650VAC for 1min, No breakdown or flashover. Current leakage limit to 5mA max.	Measured by applying voltage potential to adjacent contacts, and between the ground in the mated connector assembly IEC 60512-4-1 (Voltage proof)
Insulation resistance	Min 1000M Ω (Initial) Min 500M Ω (Final)	The insulation resistance shall be measured between two adjacent terminations having a minimum spacing using 500 VDC IEC 60512-3-1 (Insulation resistance test) Method C
Total Connection Resistance	Initial: Max 15m Ω Final: Max 30m Ω	Subject mated contacts assembled in housing to closed circuit current of 100mA max at open circuit voltage of 20mV max. IEC 60512-2-1 (Contact resistance – millivolt level method) Total connection resistance consists of bulk wire + bulk connectors and contact resistance. Exclude bulk wire in calculation.

MECHANICAL

Connector Mating/ Unmating force	Mating: 2.2N max. Unmating: 0.2N min.	Subject terminated contact and posts to mate and un-mate, to measure the force required to insert and extract by operating at a rate of 25.4 mm/min per contact IEC 60512-13-1 (Engaging and separating forces)										
Contact retention in housing	10N min	Apply axial pull-off load to crimped contact inserted in housing and measure the force required to dislodge contact from housing. IEC-60512-15-1 Test 15a										
Connector Durability	Total Connection Resistance $R \leq 30m\Omega$ final	IEC60512-9-1 (Durability). <table border="1"> <thead> <tr> <th>No. of cycles</th> <th>Plating thickness (min)</th> </tr> </thead> <tbody> <tr> <td>250</td> <td>0.76μm Gold</td> </tr> <tr> <td>100</td> <td>0.38μm Gold</td> </tr> <tr> <td>50</td> <td>0.1μm Gold</td> </tr> <tr> <td>25</td> <td>1.27μm Tin</td> </tr> </tbody> </table>	No. of cycles	Plating thickness (min)	250	0.76 μ m Gold	100	0.38 μ m Gold	50	0.1 μ m Gold	25	1.27 μ m Tin
No. of cycles	Plating thickness (min)											
250	0.76 μ m Gold											
100	0.38 μ m Gold											
50	0.1 μ m Gold											
25	1.27 μ m Tin											
Crimp strength	Per table 2, in Sec 3.3	Crimp strength on each specified wire size shall meet the requirements in Table 2. When the crimped wire is pulled along axial direction at the speed of 25.4 mm/min. IEC 60512-16-4 Mechanical tests on contacts and terminations – Test 16d: Tensile strength (crimped connections)										
Center Latch engage (without contacts)	6N Maximum	Mate housings without loading contacts along axial direction at the speed of 25.4 mm/min. IEC 60512-13-1										
Latch durability	Shall meet Latch retention force	Mate and Unmate unloaded housings 25 times at 25.4mm/min IEC 60512-9-1 Endurance tests - Test 9a: Mechanical operation										
Center Latch disengage (without contacts)	20N Minimum	Unmate housings without contacts loaded into housing along axial direction at the speed of 25.4 mm/min. IEC 60512-13-1										

Vibration	No electrical discontinuity greater than 1 microsecond.	10-55-10 Hz traversed in 1 minute at 1.52mm amplitude 2 Hours each of 3 mutually perpendicular planes IEC60512-6-4.
Physical shock	No electrical discontinuity greater than 1 microsecond.	Subject mated connector, acceleration 50g, half sine wave pulses of 11msec, duration: 3 shocks, in each direction, 18 shocks in total IEC60512-6-3.

Environmental

Mixed flow gas	Total Connection resistance shall be met.	Subject mated samples to environmental class III for 21 days. IEC 60068-2-60 (method 3).
Humidity, Steady State	Insulation Resistance (Final) 500MΩ min. Total Connection resistance shall be met.	Subject mated connectors to steady state humidity at 40°C±2°C and 90-95% R.H for 96 hrs. IEC 60512-11-12 (Damp)
Dry heat/ Temperature Life (Heat Aging)	Total Connection resistance shall be met.	Temperature: 105°C Duration: 500 hours IEC 60512-11-9 (Dry heat)
Thermal Shock	Total Connection resistance shall be met.	Subject mated connector assemblies on 5 cycles –40 °C and +105°C for Tin Plated Contact (+125°C for Gold Plated Contact) for 30 minutes each duration at temperature extremes. IEC 60512-11-4 (Rapid change in Temp/thermal shock)

4.1. Product Qualification and Requalification Test Sequence

Table 4

Test or Examination	Test Group					
	1	2	3	4	5	6
	Test Sequence(a)					
Initial examination of product	1	1	1	1	1	1
Total Connection resistance	3, 7	2, 5, 7,9				2, 5
Temperature Rise		3, 10				
Voltage Proof			3,7			
Insulation resistance			2,6			
Connector Mating Force	2					
Connector Un-mating force	8					
Contact retention in housing			8			
Connector Durability	4					3
Crimp strength					2	
Center Latch engage (without contacts)				2		
Durability of latch (without contacts)				3		
Center Latch disengage (without contacts)				4		
Vibration	5	8				
Physical shock	6					
Mixed flowing gas †		4				4
Humidity, stead state †		4	5			4
Dry Heat / Temperature life		6				
Thermal shock			4			
Final examination of product	9	11	9	5		6



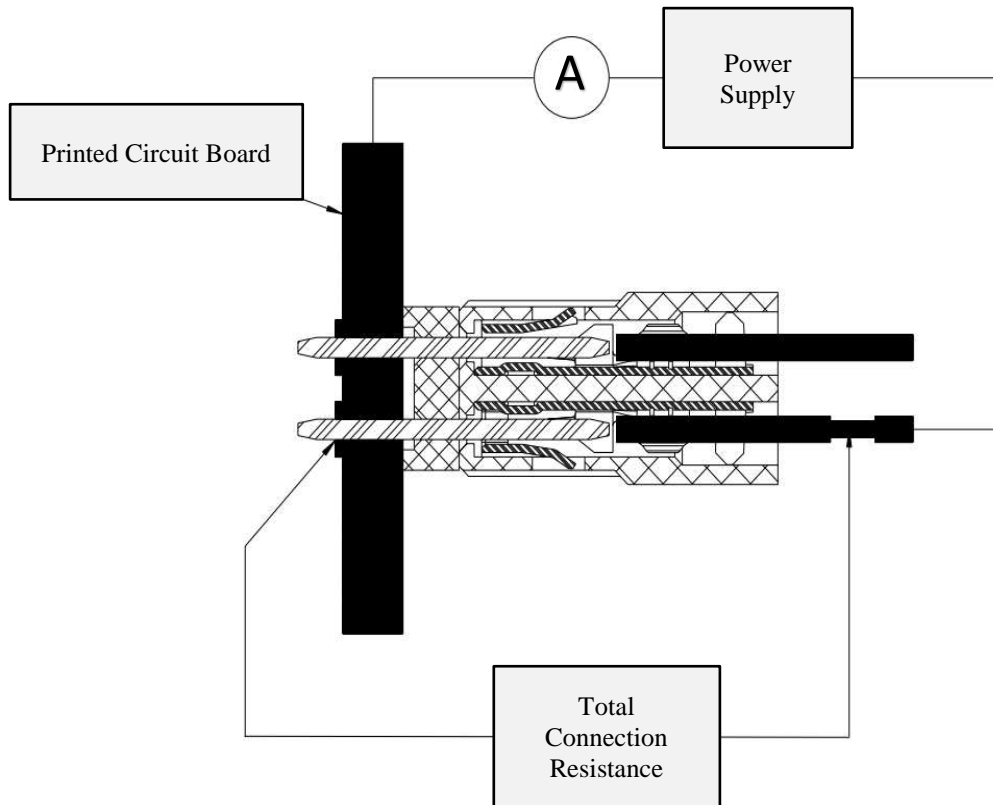
NOTE:

- “a” - Numbers indicate sequence in which tests are performed.
- “†” - Humidity, Steady state is for non-noble plating, Mixed flowing gas is for noble plating.

5. QUALIFICATION TEST

- 5.1. Qualification test shall be performed according to the test methods and requirements specified in Table 3 according to sequence specified by Table 4

Figure 1 – Total Connection Resistance Measurement Set up



6. QUALITY ASSURANCE PROVISIONS

6.1. SAMPLE SELECTION

The test specimens to be used for the performance evaluation testing, shall be prepared in accordance with TE Application Specification 114-32259 and 114-32173. They shall be selected at random from production. At least 5 connectors of the 6 positions or at least 30 contacts shall be used for each test group.

6.2. RE-QUALIFICATION TESTING

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

6.3. ACCEPTANCE

Acceptance is based on verification that product meets requirements defined in section 4. Failures attributed to equipment; test setup or operator deficiencies shall not disqualify product. When product failure occurs, corrective action shall be taken, and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmitting.

6.4. QUALITY CONFORMANCE INSPECTION

Applicable TE quality inspection plan will specify sampling acceptable quality level to be used. Dimensions and functional requirements shall be in accordance with applicable product drawing and this specification.