AMPMODU 2.0mm PITCH EMIX Economic Metric Interconnect Series Wire-To-Board System

1. SCOPE

1.1. Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of TE Economic Metric Interconnect Series, 2.0mm Pitch, crimp Type.

The applicable product description and part number are as shown below.

Table 1:

PRODUCT PART NO	DESCRIPTION
X-1470106-X	Receptacle CRIMP Contact, applicable wire: AWG #22~#28
X-1470107-X	Receptacle CRIMP Housing, 6-32 Circuit position, even
X-1470108-X	Post Header Right-Angle, 6-32 Circuit position, even
X-1470109-X	Post Header Vertical type, 6-32 Circuit position, even

1.2. Qualification

When tests are performed on the subject product line, procedures specified in TE 109 series 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. 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. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- 501-57218: Qualification Test Report.

2.2. Reference Document

- 109-197 Test Specification (TE Test Specification vs EIA and IEC Test Methods)

3. REQUIREMENTS

3.1. Design and Construction

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

3.1.1. Materials

A. Receptacle Crimp Housing: Thermoplastic, UL94V-0, color: Natural.

B. Post Header Housing: Thermoplastic, UL94V-0, color: Ivory.

C. Receptacle Crimp Contact: Copper Alloy, Tin plated over Nickel under plated all over.

D. Post header Contact: Copper Alloy, Tin plated over Nickel under plated all over.

3.2. Ratings

Voltage Rating	Current Rating	Operating Temperature
100 VDC	3A	-25°C to +85°C

Current: AWG #22 – 3.0A
AWG #24 – 2.5A
AWG #26 – 2.0A
AWG #28 – 1.5A

3.2.1. Applicable wires

A. Wire Size: AWG #28 -- #24 (0.08mm² - 0.32mm²).

B. Insulation Diameter: Ø0.9mm – Ø1.5mm.

***NOTE 1**:* The compatibility of wires for termination must be evaluated accordingly; by the category from each manufacturer, brand, trade names and product catalog numbers.

3.2.2. Applicable Printed Circuit Board

A. Board Thickness: 1.0mm – 1.6mm.

B. Hole Diameter: Ø0.7mm – Ø0.8mm.

3.3. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions per TE specification 109-1.

Table 2:

<table>
<tr><th>TEST DESCRIPTION</th><th>REQUIREMENT</th><th>PROCEDURE</th></tr>
<tr><td>Examination of product</td><td>Meets requirements of product drawing and Application Specification</td><td>Visually inspected per applicable quality inspection plan.</td></tr>
<tr><td>Solderability</td><td>The contact solder tails should be covered by a continuous new solder coating for 95% Minimum of affected area. See note 2</td><td>Subject contacts to solderability testing, as specified solder transfer at 245±5°C for 3sec. MIL-STD-202, Method 208</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>No physical damage shall occur. See note 2</td><td>Subject product mounted on printed circuit board to solder bath at 240±5°C for 10 to 12 seconds.</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>No physical damage shall occur. See note 2</td><td>In acc. with:
TE Spec 109-201,Test Method A, Condition B
NOTE: This test is applicable only for PN X-2823646-X</td></tr>
<tr><td colspan="3">ELECTRICAL</td></tr>
<tr><td>Contact Resistance</td><td>Initial -10m ohms max.
Final - 20m ohms max.</td><td>Subject mated contacts assembled in housing to closed circuit current of 50mA max at open circuit voltage of 50mV max.</td></tr>
<tr><td>Insulation Resistance</td><td>1000M ohms min. (Initial)
500M ohms min. (Final)</td><td>Measure by applying test potential between adjacent contacts and between the contacts and ground in the mated connector assembly.
MIL-STD-202, Method 302, Condition B</td></tr>
<tr><td>Dielectric Strength</td><td>Connector must withstand test potential of 800 VAC for 1min. Current leakage limit to 5.0mA max.</td><td>Measure by applying test potential between adjacent contacts and between the contacts and ground in the mated connector assembly.
MIL-STD-202, Method 301.</td></tr>
<tr><td colspan="3">MECHANICAL</td></tr>
<tr><td rowspan="8">Connector Mating/ Unmating force</td><td colspan="2">Initial</td><td rowspan="8">Subject terminated connector and header to mate and unmate to measure the force required to engage and disengage by operating at a rate of 25mm a minute.</td></tr>
<tr><td>Circuit Pos</td><td>Insertion (kgf max)</td><td>Extraction (kgf min)</td></tr>
<tr><td>6</td><td>4.0</td><td>1.1</td></tr>
<tr><td>8</td><td>5.0</td><td>1.3</td></tr>
<tr><td>10</td><td>6.0</td><td>1.5</td></tr>
<tr><td>12</td><td>7.0</td><td>1.7</td></tr>
<tr><td>14</td><td>8.0</td><td>1.9</td></tr>
<tr><td>16</td><td>9.0</td><td>2.1</td></tr>
</table>

	18	10.0	2.3	
	20	11.0	2.5	
	22	12.0	2.7	
	24	13.0	2.9	
	26	14.0	3.1	
	28	15.0	3.1	
	30	16.0	3.5	
	32	17.0	3.7	

Individual Pin Insertion/ Extraction Force	Insertion Force	Extraction Force	Subject terminated contact and pin to mate and unmate to measure the force required to insert and extract by opening at a rate of 25mm a minute.
	0.5kgf max	0.1kgf max	
Tensile Strength of Wire termination	AWG #22 –4.0kgf min. AWG #24 –3.0kgf min. AWG #26 –2.0kgf min. AWG #28–1.0kgf min.		Apply an axial pull-off load to terminated wire of contact at a rate of 100mm a minute. The load is applied in the axial and lateral directions.
Contact Retention Force	1.5kgf min. per contact		Apply axial load to terminated contact at a rate of 100mm a minute.
Post Retention Force	1.0kgf min. per contact		Apply axial pull-off load to post contact mounted on housing and measure the force required to dislodge post from housing.
Vibration	No electrical discontinuities greater than 1 microsecond. See note 2		Subject mated connectors to 10-55-10Hz traversed in 1 min at 1.52mm amplitude for 2 hours in each of 3 mutually perpendicular planes. MIL-STD-202, Method 201, Condition A
Durability	Contact resistance (low level) shall be met. See note 2		Subject connector assembly to 30 cycles of repeated mating/Unmating at a rate of 10 cycles a minute.
ENVIRONMENTAL			
Temperature Life (Heat aging)	Contact resistance (low level) Shall be met. See note 2		Subject mated connector assemblies to temperature life at 85°C±2°C for 96 hours.
Resistance to cold	Contact resistance (low level) Shall be met. See note 2		Subject mated connector to cold testing atmosphere at -25°C±3°C, 48 hours
Humidity	Insulation resistance (Final): 500M ohms min. Contact resistance (low level) Shall be met. See note 2		Subject mated connectors to steady state humidity at 40°C and 90-95% R.H for 240hrs. MIL-STD-202, Method 103, Condition B

Thermal shock	Contact resistance (low level) shall be met. See note 2	Subject mated connector assemblies on 25 cycles-55°C and +85°C for 30 minutes each duration at temperature extremes. MIL-STD-202, Method 107, Condition A.

NOTE 2:
Shall meet visual requirements, show no physical damages.

3.4. Product Qualification and Requalification Test Sequence

TEST OR EXAMINATION	TEST GROUP				
	A	B	C	D	E
	TEST SEQUENCE (a)				
Initial examination of product/Final Examination	1,10	1	1,9	1,5	1,5
Contact resistance	6,11	2,4	4,6,8	2,4	2,4
Insulation resistance			2		
Dielectric Withstanding Voltage			3		
Mating Force	7				
Unmating Force	8				
Individual Insert-Extraction Force	5				
Tensile Strength of Wire Termination	2				
Contact Retention Force	12				
Post retention Force	13				
Vibration		3			
Temperature Life				3	
Resistance to Cold			5		
Humidity					3
Thermal Shock			7		
Solderability	3				
Resistance to Solder Heat	4				
Durability	9				

NOTE 3:
"a"- Numbers indicate sequence in which tests are performed.

4. QUALITY ASSURANCE PROVSIONS

4.1. QUALIFICATION TESTING.

A. Test Specimens

The test specimens to be used for the performance evaluation testing, shall be prepared in accordance with TE Application Specification, 114-57013, Termination AMP 2.0mm HPI Dual Row CRIMP Connector, by using samples selected from the current production at random, and conforming to the requirement of the applicable product drawings.

B. Test Condition

Unless otherwise specified, all tests shall be performed under any combination of the following test conditions:

Temperature: 15-35°C

Relative Humidity: 25-85%.

Atmospheric Pressure: 650-800 mmHg.

4.2. 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.

4.3. ACCEPTANCE

Acceptance is based on verification that product meets requirements spelled in Table 2. Data 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 resubmit.

4.4. 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

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>>TE Connectivity(泰科)