



1MM Dual Row External Locking HPI

1. SCOPE

1.1. Content

This specification covers performance, tests, and quality requirements for 1MM Dual Row External Locking HPI connectors.

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 was completed. The Qualification Test Report number for this testing is 501-162489.

1.4. Revision Summary

Revisions to this specification include:

- Initial release of specification.

2. APPLICABLE DOCUMENTS AND FORMS

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. TE Connectivity Specifications

114-161919	Application Specification
501-162489	Qualification Test Report

2.2. Commercial Standards and Specifications

IEC 61984	International Standard – Safety Requirements and Tests
IEC 60335	International Standard – Safety of Household and Similar Appliance
IEC 60512	International Standard – Connectors for Electronic Equipment – Tests and Measurements
IEC 60695	International Standard – Fire Hazard Testing
UL 1977	Safety Standards – Component Connectors for Use in Data, Signal, Control, and Power Applications
EIA-364	Electrical Connector/Socket Test Procedures Including Environmental Classifications

2.3. Reference Documents

109-1	General Requirements for Testing
102-950	Qualification of Separable Interface Connectors

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. Materials

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

- A. Housing: Nylon 66, UL94V-0
- B. Contacts: Phosphor Bronze, Matte Tin-plated:100u"Min or Gold-flash or Au 15u" or Au 30u" over Nickel plating

3.3. Ratings

- A. Voltage Rating: 50VAC
- B. Current Rating: 1A AC/DC (AWG #28)
- C. Temperature Rating: -25°C to +85°C

3.4. Performance Requirements and Test Description

The product should meet the electrical, mechanical and environmental performance requirements specified in Figure 1. All tests shall be performed at ambient environmental conditions otherwise specified.

3.5. Test Requirements and Procedure Summary

Test Description	Requirement	Procedure			
Examination of Product	Product shall be conforming to the requirements of applicable product drawing and applicable Specification	Condition/Method: Visual inspection Standard: No breaks, crack, and deform should be found.			
Electrical					
Contact Resistance	Initial: 20 mΩ (max.) After environmental test: 30 mΩ (max.)	Mate connectors: apply a maximum voltage of Initial: 10 mΩ (max.)20 mV and a current of 100 mA. According to EIA-364-23.			
Dielectric Withstanding Voltage	There shall be no breakdown nor flashover.	Test method: Initially AC 500V (rms) and after humidity and thermal shock tests AC 250V (rms) shall be applied between outer surface of housing and terminal and between adjacent terminals for one minute. According to EIA-364-20.			
Insulation Resistance	Initial: 100 MΩ (min.) After humidity test: 50 MΩ (min.) After thermal shock test: 50 MΩ (min.)	Test method: DC500V shall be applied between outer surface of housing and terminal and between adjacent terminals to measure insulation resistance. According to EIA-364-21.			
Mechanical					
Insertion & withdrawal force	Pos	Initial		At 30th	The product is clamped on a plugging force machine and inserted and unplugged 30 times at a rate of 25.4mm/min
		Mating Force Max.	Unmating Force Min.	Unmating Force Min.	
	2X4				
	2X5	4kgf	0.40kgf	0.35kgf	
	2X6	5kgf	0.50kgf	0.40kgf	
	2X8	5kgf	0.70kgf	0.60kgf	
	2X9	5kgf	0.70kgf	0.70kgf	
	2X10	5kgf	0.80kgf	0.80kgf	
	2X12	6.5kgf	0.80kgf	0.80kgf	

	<table><tr><td>2X15</td><td>8kgf</td><td>1.20kgf</td><td>1.20kgf</td></tr><tr><td>2X25</td><td>12.0kgf</td><td>1.50kgf</td><td>1.50kgf</td></tr></table>	2X15	8kgf	1.20kgf	1.20kgf	2X25	12.0kgf	1.50kgf	1.50kgf	
2X15	8kgf	1.20kgf	1.20kgf							
2X25	12.0kgf	1.50kgf	1.50kgf							
Contact retention force	0.7 kgf (min.)	Crimped terminal shall be mounted in a housing and pulled in an alignment. The load to pull the terminal out of the housing shall be measured.								
Post retention force	0.3 kgf (min.)	The end of a post shall be pushed in a perpendicular to wafer. The load to make the post start moving shall be measured.								
Vibration	Contact resistance shall be 30 milliohms (max.) after the test. There shall be no current discontinuity longer than 1 microsecond during the test.	Mated connectors should be mounted on a PCB and subjected to a vibration test of the following conditions. During the test, current continuity shall be checked. After the test, contact resistance shall be measured. (MIL-STD-202, test method 201) Frequency: 10~55~10 Hz/min. Amplitude: 1.5 mm Direction: 1. Axis of up and down 2. Axis of right and left 3. Axis of front and back								

Environmental

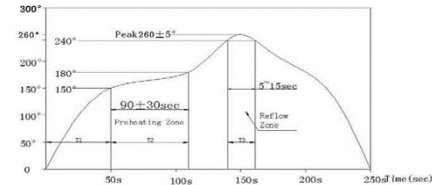
Thermal shock	Contact resistance shall be 30 milliohms (max.) after the test. Insulation resistance shall be 50 megohms (min.) after the test. There shall be no breakdown nor flashover on dielectric withstanding voltage test.	1 cycle consists of: -55 °C for 30 minutes +85 °C for 30 minutes Times of cycles: 25 cycles
Humidity		Temperature: 40±2 °C Humidity: 90% ~ 95% (RH) Period: 240 hours continuously
Salt Spray	Contact resistance shall be 30 milliohms (max.) after the test.	After the test, specimen shall be washed with running water and dried naturally before the measurement of contact resistance. Temperature: 40±2 °C Humidity: 90% ~ 95% (RH) Brine concentration: 5±1% Period: 24 hours
Solderability	Minimum 95% of solder dipping section shall be covered with solder No adhering tin, blackening and other abnormal load,	Fluxed soldering section of shrouded header shall be dipped in solder of the following conditions. Solder temperature: 245±5 °C Immersion period: 3-5 seconds
Resistance to soldering heat	There shall be no deformation nor damage which may affect the performance. Reflow soldering temperature profile : 	Specimen shall be mounted on a PCB and subjected to resistance to soldering heat test of the following conditions. Solder temperature: 260±5 °C Immersion period: 3-5 seconds

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.

3.6. Product Qualification and Requalification Test Sequence

TEST OR EXAMINATION	TEST GROUP (a)								
	A	B	C	D	E	F	G	H	I
	TEST SEQUENCE (b)								
Examination of Product	1,3	1,3	1,3	1,5	1,9	1,9	1,5	1,3	1,3
Contact resistance				2,4	2,6	2,6	2,4		
Insulation resistance					3,7	3,7			
Dielectric withstanding voltage					4,8	4,8			
Insertion force & withdrawal force	2								
Contact retention force		2							
Post retention force			2						
Vibration				3					
Thermal shock					5				
Humidity						5			
Salt spray							3		
Solderability								2	
Resistance to soldering heat									2

Figure 2

**NOTE**

(a) See paragraph 4.2.

(b) Numbers indicate sequence in which tests are performed.

4. QUALITY ASSURANCE PROVISIONS

4.1. Test Conditions

Unless otherwise specified, all the tests shall be performed in any combination of the following test conditions shown in Figure 3.

Temperature	15°C – 35°C
Relative Humidity	45% – 75%
Atmospheric Pressure	86.6 – 106.6 kPa

Figure 3

4.2. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production.

B. Test Sequence

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

4.3. 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.

4.4. Acceptance

Acceptance is based on verification that the product meets the requirements in 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.

4.5. Quality Conformance Inspection

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