



HCI 6.2mm Pitch wire to wire & wire to board Connectors

1. SCOPE

1.1. Content

This specification covers the requirements for product performance, test methods and quality assurance provisions of HCI 6.2mm Pitch wire to wire & wire to board Connectors

Applicable product description and part numbers are as shown in Fig.5.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Fig 4 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 in 28APR2023. The Qualification Test Report number for this testing is 501-115205.

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

114-115045	Application Specification
501-115205	Qualification Test Report

2.2. Commercial Standards and Specifications

EIA-364	Electrical Connector/Socket Test Procedures Including Environmental Classifications
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2.3. Reference Documents

109-1	General Requirements for Testing
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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 (Plug, Receptacle, Header): Thermoplastic, UL94V-0
- B. Contacts: Copper Alloy, Tin plating over Nickel plating.

3.3. Ratings

- A. Voltage Rating: 600 VAC
- B. Current Rating

Number of Circuits	Current(A)					
	#12	#14	#16	#18	#20	#22
1 Pos.	23	18	15	11	9	4
2 Pos.	23	18	15	11	9	4
3 Pos.	22	17	14	10	8	4
4 Pos.	21	16	13	9	8	4
6 Pos.	16	12	8	7	5	3
8 Pos.	16	11	7	6	5	3
12 Pos.	15	10	7	6	4	3

Fig.1 Current Rating

#18, #20, #22 have not finished evaluate.

- C. Temperature Rating: -25°C to +90°C

3.4. Performance Requirements and Test Description

The product should meet the electrical, mechanical and environmental performance requirements specified in Figure 2. 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	Visual and Dimensional Inspection Test Procedure for Electrical Connectors. EIA-364-18
Electrical		
Contact Resistance (Low Level)	7 mΩ Max. (Initial) 10 mΩ Max. (Final)	Mate connectors: apply a maximum voltage of 20 mV and a current of 10 mA. EIA-364-06A
Dielectric Withstanding Voltage	There shall be no breakdown nor flashover.	Between two adjacent contacts apply voltage of per 1 minute. According to EIA-364-20A. Initial: AC 2000V Final: AC 1500V EIA-364-20

Insulation Resistance	1000 MΩ Min. (Initial) 500 MΩ Min. (Final)	The insulation resistance shall be measured between two adjacent terminations having a minimum spacing, using the 500±50V, test voltage applied per 60 seconds. EIA-364-21B.
Temperature Rising	30°C Max.	Mate connectors: measure the temperature rise at the rated current. EIA-364-70C

Mechanical

Connector Mating Force	1kgf(9.8N) Max./per pin	A male with crimped Contacts and a female Shall be mated and unmated on the same axis. Insertion and withdrawal forces. The force shall be applied with rate of 25 mm/minute. EIA 364-13E, Condition A
Connector Unmating Force	0.2kgf(1.96N) Min./per pin At 10th: 0.15kgf(1.47N) Min./per pin	A male with crimped Contacts and a female Shall be mated and unmated on the same axis. Insertion and withdrawal forces. The force shall be applied with rate of 25 mm/minute. EIA 364-13E, Condition A
Durability (Repeated Mate/Unmating)	Contact resistance meet spec	Mating connectors axial insert and pull out. The force shall be applied with rate of 25 mm/minute.No. of cycles: 50cycles EIA 364-9C
Tensile Strength of Wire Termination	AWG 12: 15.0kgf(147N) Min. AWG 14: 15.0kgf(147N) Min. AWG 16: 10.0kgf(98N) Min. AWG 18: 8.0kgf(78.4N) Min. AWG 20: 6.5kgf(63.7N) Min. AWG 22: 3.0kgf(29.4N) Min.	An axial force shall be applied to pull out wire. The force shall be applied with rate of 25 mm/minute. EIA-364-08
Contact Retention Force (from housing with primary lock only for Receptacle and Plug)	3.00kgf(29.4N) Min.	An axial force shall be applied to pull-out contacts. The force shall be applied with rate of 25mm/minute. EIA-364-29
Contact Insertion Force (contact into the housing for Receptacle and Plug)	2.00kgf(19.6) Max.	An axial force shall be applied to insert contacts. The force shall be applied with rate of 25mm/minute. EIA 364-13E, Condition A
Lock Retention Force	4.00kgf(39.2N) Min.	An axial force shall be applied to pull-out housing from wafer .The force shall be applied with rate of 25 mm/minute. EIA-364-29
Vibration (Low Frequency)	No electrical discontinuity greater than 1 μ sec. shall occur. Contact resistance meet spec	Amplitude: 1.52mm P-P Frequency: 10-55-10 Hz in 1 minute Duration: 2 hours in each X.Y.Z. axes EIA-364-28
Mechanical Shock	No electrical discontinuity greater than 1 μ sec. shall occur. Contact resistance meet spec	Mate connectors and shock at 490m/s ² (50G) with half sine wave (11 milliseconds) , 3 drops in each X.Y.Z.axes. EIA-364-27B
Hammering Shock ¹	Contact Resistance : 7mΩ at initial, 10mΩ at final No electrical discontinuity greater than 1μsec. shall occur.	Accelerated Velocity : 980 m/s ² (100G) Hammering Speed : 1 time/sec. Hammering Cycles : 3,000 cycles

Hammering Shock ²	No electrical discontinuity greater than 1µsec. shall occur. LLCR's variation including crimping and wire after the test shall be within 40%.	Accelerated Velocity : 980 m/s ² (100G) Acceleration direction: Mating/unmating. Hammering Frequency : 1 time/sec. Hammering Times : 100,000 times
Environmental		
Thermal Shock	Appearance: No Physical Damage. Contact Resistance : 7mΩ at initial, 10mΩ at final Insulation Resistance : Min.1000MΩ at initial, Min.500MΩ at final Dielectric Withstanding Voltage : No breakdown nor flashover	Mate connectors 1 cycle consists of: -40 ° C (30 minutes) +85 ° C (30 minutes) No. of cycles: 10 cycles EIA-364-32B.
Humidity		Mate connectors Temperature : 40±2 °C Humidity: 90% ~ 95% (RH) Period: 96 hours(Continuously) EIA-364-31A.
Salt Spray	Appearance: No Physical Damage Contact Resistance : 7mΩ at initial, 10mΩ at final	Mate connectors Temperature : 35±2 ° C Humidity : 90% ~ 95% (RH) Salt concentration : 5±1% Period : 24 hours(Continuously) EIA-364-26A.
Temperature Life (Heat Aging)		Mate connectors 125±2°C, 150 hours. EIA-364-1000.
Cold Resistance		Mate connectors -40±3°C, 96 hours. EIA-364-105
Solderability	No Physical Damage. 95% of immersed area must, show no voids, pin holes.	Solder temperature: 245±5 Immersion duration 2~3sec. Prior the test, the unit under test shall be subjected to steam aging for a period of 8 hours. TEC-109-11
H2S	Appearance: No Physical Damage Contact Resistance : 7mΩ at initial, 10mΩ at final	Temperature:40±2°C, Concentration:3ppm, Humidity: 75~80%(RH) , Period: 96hours.

Fig.2 Test Requirement and Procedure Summary



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 Fig 2.

3.6. Product Qualification and Requalification Test Sequence

Test Examination	Test Group (a)															
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	Test Sequence (b)															
Examination of Product	1	1,7	1,3	1,3	1,9	1,5	1,9	1,9	1,9	1,5	1,5	1,3	1,5	1,5	1,3	1,5
Contact insertion force	2															
Contact Retention force	3															
Lock retention force			2													
Mating force		3														
Un-mating force		4														
Durability		5														
Insulation resistance					3,7		3,7	3,7	3,7							
Withstand Voltage					4,8		4,8	4,8	4,8							
Contact resistance		2,6			2,6	2,4	2,6	2,6	2,6	2,4	2,4		2,4	2,4		2,4
Temperature Rise				2												
Humidity					5											
Salt Spray						3										
Thermal Shock							5									
Temperature Life								5								
Cold Resistance									5							
Mechanical shock										3						
Vibration											3					
Solderability												2				
H2S													3			
Hammering Shock ¹														3		
Tensile Strength of Wire Termination															2	
Hammering Shock ²																3

Fig.3 Test Sequence



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 Fig.4 .

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

Fig.4 Test Condition

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 Fig.3 .

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 Fig.2. 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 sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

APPENDIX

The applicable product descriptions and base numbers are shown in Fig.5 .

Product Part No.	Description
X-2408780-X	Plug housing of HCl 6.2mm Pitch wire to wire & wire to board Connectors
X-2408818-X	Receptacle housing of HCl 6.2mm Pitch wire to wire Connectors
2408840-X	Socket contact of HCl 6.2mm Pitch wire to wire & wire to board Connectors
2408841-X	Pin contact of HCl 6.2mm Pitch wire to wire Connectors
X-2408753-X TBD	Header of HCl 6.2mm Pitch wire to board Connectors

Fig.5 Product Part No.