



LP6.2 Connector Product Specification

1. SCOPE

1.1. Content

This specification covers performance, tests, and quality requirements for LP6.2 connector.

The LP6.2 connector product is a wire-to-board and mass terminated using crimp termination technology on 6.2mm centerlines. It is available in 3 positions and designed to be terminated to 14 AWG to 18 AWG wire. For the header assembly, it provides vertical type with through hole mounted.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 2 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 501-161444.

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

- 114-160996 Application Specification
- 501-161444 Qualification Test Report

2.2. Commercial Standards and Specifications

- IEC 60695 International Standard – Fire Hazard Testing
- 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.

3.3. Ratings

- A. Voltage Rating: 600V AC/DC
- B. Current Rating: 14A Max.

Refer to Figure 1 for maximum allowable current to be applied.

No. of circuit	Maximum Allowable Current (A)		
	14AWG	16AWG	18AWG
3	14	9	8

Figure 1



NOTE

These currents are expected to produce an initial 30°C temperature rise (maximum) at the contacts. The temperature rise at the end of consecutive sequential testing (i.e. humidity-temperature cycling, temperature life, and vibration) may be higher.

- C. Temperature Rating: -40°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
Initial Examination of Product	Meets requirements of product drawing and Application Specification 114-160996.	EIA-364-18. Visual and dimensional inspection per product drawing.
Final Examination of Product	Meets visual requirements.	EIA-364-18. Visual examination.
Electrical		
Low Level Contact Resistance (LLCR)	7 milliohms maximum initial. 10 milliohms maximum final.	EIA-364-23. Subject specimens to 10 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 4.
Insulation Resistance	1000 megaohm minimum initial. 500 megaohm minimum final.	EIA-364-21 500 volts DC for one minute hold. Test between the outer surface of the housing and the contact and also between adjacent contacts.
Withstanding Voltage	One minute hold with no breakdown or flashover. 5.0 milliamperes maximum leakage current.	EIA-364-20, Condition I. Initial: 2000 VAC Final: 2000 VAC Test between the outer surface of the housing and the contact and also between adjacent contacts.

Test Description	Requirement	Procedure	
Temperature Rise vs. Current	30°C maximum temperature rise.	EIA-364-70, Method 1. Test current specific in Figure 1 apply to mate specimens. Stabilize until 3 readings at 5 minutes intervals are within 1°C.	
Mechanical			
Vibration	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition I. Subject mated specimens to 10 to 55 to 10Hz traversed in 1 minute with 1.5 mm maximum total excursion. Two hours in each of 3 mutually perpendicular planes. The test current of 100mA shall be applied.	
Durability	See Note.	EIA-364-9. Mate and un-mate specimens for 50 cycles at a maximum rate of 500 cycles per hour.	
Connector Mating Force	29.4N Max.	EIA-364-13, Method A. Measure force necessary to mate specimens fully from point of initial contact at a maximum rate of 25.4 mm/min with latch disengaged.	
Connector Un-mating Force	6.0N Min. at Initial	EIA-364-13, Method A. Measure force necessary to un-mate specimens at a maximum rate of 25.4 mm/min with latch disengaged.	
Connector Un-mating Force 10 th	4.5N Min. at 10 th	EIA-364-13, Method A. Measure force necessary to un-mate specimens at a maximum rate of 25.4 mm/min with latch disengaged.	
Crimp Tensile Strength	Wire Size (AWG)	EIA-364-8 Operation Speed: 25.4 mm/min Pulling load shall be applied between the correctly crimped contact and a wire. The load required to pull the wire out of the contact or break the wire shall be measure.	
	18		78.4
	16		98.0
	14		147
Contact Insertion Force	11.8N Max.	EIA-364-5 Operation Speed: 25.4 mm/min. The load required to insert the crimped contact into the housing shall be measured.	
Contact Retention Force	53.9N Min.	EIA-364-29, Method C Operation Speed: 25.4 mm/min. The load required to pull the contact out of the housing shall be measured.	

Test Description	Requirement	Procedure
Housing Locking Strength	50N Min.	EIA-364-98. Measure the mate connector locking retention strength at a rate of 12.7 mm/min without receptacle terminals.
Pin Contact Retention Force	20N Min.	EIA-364-29, Method C Measure the pin contact retention at a maximum rate of 25.4 mm per minute.
Resistance to Soldering Heat	See Note.	The specimens shall be mounted on a PCB and subjected to a resistance to soldering heat test of the following conditions. Solder: Sn-3.0Ag-0.5Cu Flux: Activation flux Solder Temperature: 260±5°C Immersion Period: 5±0.5 seconds
Solderability	Wet Solder Coverage 95% Min.	TEC-109-11 Method A The fluxed soldering section of the specimen shall be dipped in solder of the following conditions. Solder: Sn-3.0Ag-0.5Cu Flux: Activation flux Solder Temperature: 245±3°C Immersion Period: 3±0.5 seconds

Environmental

Humidity	See Note.	EIA-364-31, Method II. The Specimen shall be placed in humidity chamber of the following conditions. Temperature: 40±2°C Relative humidity: 90 to 95% Period: 96h
Heat Aging	See Note.	EIA-364-17, Method A, Test Condition 5, Test Time Condition A. Subject mated specimens to 125±3°C for 96 hours.
Thermal Shock	See Note.	EIA-364-32, Method A Test Condition VII. Subject mated specimens to 25 cycles between -55±3°C and 85±3°C with 30 minutes dwells at temperature extremes and 5 minutes transition between temperatures.
Hydrogen Sulfide Gas	See Note.	Subject mated specimens to a hydrogen sulfide gas test of the following conditions. Concentration: 3±1 ppm Temperature: 40±2°C Relative humidity: 80±5% Period: 96h

Test Description	Requirement	Procedure
Salt Spray	Meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence.	EIA-364-26. Subject mated specimens to a salt spray test of the following conditions. Temperature: 35±2°C Concentration: 5 ± 0.1% Period: 48h
Ammonia Gas	There shall be no stress corrosion cracking. See Note.	Subject mated specimens in atmosphere that rated 25 mL/L of 3% NH3 for 7 hours.
Needle Flame Test	After applying a 30 second needle flame test to the test sample, one of the following conditions should be met: a) The test sample has no flames or scorching heat, and the specified base layer or packaging paper has not ignited. b) After removing the needle flame, the flame or heat of the test sample and surrounding components will extinguish within 30 seconds, i.e. $t_b < 30$ seconds, and the surrounding components were not completely burned, and the specified base layer or packaging paper did not ignite.	IEC 60695-11-5
Glow Wire Test 750°C and 850°C	Test at 750°C. No flame or $T_e - T_i < 2s$. Test at 850°C. No ignition or the flame extinguishes within 30 seconds and the specified layer placed underneath the test specimen does not ignite.	IEC 60695-2-11

Figure 2 (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 3.

3.6. Product Qualification and Requalification Test Sequence

TEST OR EXAMINATION	TEST GROUP (a)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	TEST SEQUENCE (b)															
Initial Examination of Product	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LLCR	3,6									2,7	2,6	2,4	2,4	2,4		
Insulation Resistance										3,8	3,7					
Withstanding Voltage										4,9	4,8					
Temperature Rise vs. Current			2													
Vibration	5															
Durability	4															
Connector Mating Force	2	2														
Connector Un-mating Force		3														
Connector Un-mating Force 10 th		4														
Crimp Tensile Strength				2												
Contact Insertion Force					2											
Contact Retention Force					3											
Housing Locking Strength						2										
Pin Contact Retention Force							2									
Resistance to Soldering Heat								2								
Solderability									2							
Humidity										6						
Heat Aging											5					
Thermal Shock										5						
Hydrogen Sulfide Gas												3				
Salt Spray													3			
Ammonia Gas														3		
Needle Flame Test															2	
Glow Wire Test 750°C and 850°C																2
Final Examination of Product	7	5	3	3	4	3	3	3	3	10	9	5	5	5	3	3

Figure 3



NOTE

(a) See paragraph 4.2.

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

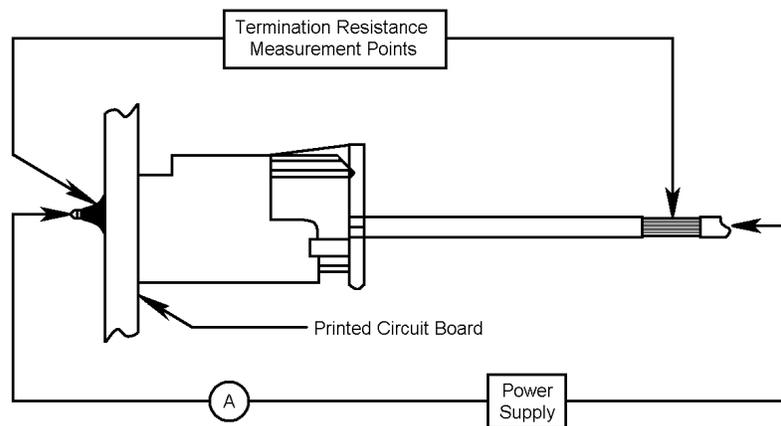


Figure 4: LLCR Measurement Points (Subtract Wire Bulk)

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 5.

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

Figure 5

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 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 Figure 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.