
ICCON Power Pin and Socket Connector System

1. SCOPE

1.1. Content

This product specification covers performance, tests and quality requirements for ICCON Power Pin and Socket Connector System.

1.2. Qualification

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

2. APPLICABLE DOCUMENTS

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 Documents

- 109-197: Test Specification (TE Test Specifications vs EIA and IEC Test Methods)
- 114-128112: Application Specification (ICCON Power Pin and Socket Connector System)
- 501-128123: Qualification Test Report (ICCON Power Pin and Socket Connector System)

2.2. Industry Standard

EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction 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 product drawing.

3.3. Ratings

- Voltage: 600 Volts REF for ICCON INSERT and ICCON BLOCK.
(Entire connector will take one line of current, voltage depend on the application)
100 Volts for ICCON Slim
- Current: 35A for 2.4mm Diameter pin and mating socket
80A for 3.4mm/3.5mm/3.6mm Diameter pin and mating socket
120A for 6.0mm Diameter pin and mating socket
200A for 8.0mm Diameter pin and mating socket
250A for 9.0mm/9.1mm Diameter pin and mating socket
350A for 10.3mm Diameter pin and mating socket
- Operating temperature: -40 °C to 105°C

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in paragraph 3.5. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per EIA-364.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Initial examination of product	Meets requirements of product drawing, applicable instructions on customer drawing, and application specification.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Low level contact resistance	1 milliohm maximum initial 1 milliohm maximum change	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage.
Contact resistance at rated current	1 milliohm maximum initial 1 milliohm maximum change	EIA-364-6. 30°C temperature rise result at rated current.
Insulation resistance	1000 megohms minimum	EIA-364-21. 500 volts DC, 2-minute hold. Test between adjacent contacts of mated specimens
Withstanding voltage	One-minute hold with no breakdown or flashover	EIA-364-20, Condition I. 1000 volts DC at sea level. Test between adjacent contacts of mated specimens
Temperature rise vs current.	30°C maximum temperature rises at specified current.	EIA-364-70, Method II. Stabilize at a single current level 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 V, letter C. Subject mated specimens to 9.26G's rms. Duration 120 minutes in each of three mutually perpendicular planes.
Mechanical Shock	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Condition A. Subject mated specimens to 50 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction were applied along the 3 mutually perpendicular planes for a total of 18 shocks.
Durability	See Note	EIA-364-09. Mate and un-mate specimens for 200 cycles at a maximum rate of 500 cycles per hour.

Test Description	Requirement	Procedure
Mating force	14 N Maximum for 2.4mm Diameter pin and mating socket. 21 N Maximum for 3.4mm~3.6mm Diameter pin and mating socket. 34 N Maximum for 6.0mm Diameter pin and mating socket. 45 N Maximum for 8.0mm Diameter pin and mating socket. 52 N Maximum for 9.0mm/9.1mm Diameter pin and mating socket 60 N Maximum for 10.3mm Diameter pin and mating socket.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Unmating force	3 N Minimum for 2.4mm Diameter pin and mating socket. 4 N Minimum for 3.4mm~3.6mm Diameter pin and mating socket. 7.5 N Minimum for 6.0mm Diameter pin and mating socket. 10 N Minimum for 8.0mm Diameter pin and mating socket. 11 N Minimum for 9.0mm/9.1mm Diameter pin and mating socket 12.8 N Minimum for 10.3mm Diameter pin and mating socket.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Compliant pin insertion	111.2 N [25 lbf] maximum per pin.	EIA-364-5 Measure force necessary to correctly apply a specimen to a printed circuit board at a maximum rate of 12.7mm [.5 in] per minute.
Compliant pin retention	6.7 N [1.5 lbf] minimum per pin.	EIA-364-29 Measure force necessary to correctly apply a specimen to a printed circuit board at a maximum rate of 12.7mm [.5 in] per minute.
Floating force	20N minimum, 80N maximum After mated, offset pin to the side limit of ICCON INSERT socket	EIA-364-29 Measure force necessary to correctly apply a specimen to a printed circuit board at a maximum rate of 12.7mm [.5 in] per minute.
Offset mating force	90N maximum Pin offset 1mm from center and mating into ICCON INSERT socket	EIA-364-29 Measure force necessary to correctly apply a specimen to a printed circuit board at a maximum rate of 12.7mm [.5 in] per minute.

Test Description	Requirement	Procedure
Floating durability	See Note	EIA-364-09. Mated specimens offset pin to one side limit to other side limit of ICCON INSERT socket for 200 cycles at a maximum rate of 500 cycles per hour.
Knurl insertion force	500N minimum, 2000N maximum	EIA-364-29 Measure force necessary to correctly apply a specimen to a printed circuit board at a maximum rate of 12.7mm [.5 in] per minute.
ENVIRONMENTAL		
Temperature life	See Note.	EIA-364-17, Method A, Condition 4. Subject mated specimens to 105°C for 500 hours.
Thermal Shock	See Note.	EIA-364-32, method A, condition II Mated specimens were subjected to 5 cycles of thermal shock with each cycle consisting of 30-minute dwells at -65°C and 105°C with 1-minute transition between temperatures.
Cyclic Temperature & Humidity	See Note.	EIA-364-31, method III, condition B Mated specimens were exposed to 10 humidity/temperature cycles. Each cycle lasted 24 hours and consisted of cycling the temperature between 25°C and 65°C at 80 to 100% RH.
Mixed flowing gas.	See Note.	EIA-364-65, Class IIA. ½ of samples mated for 336 hours, ½ of samples unmated for initial 168 hours, then mated for final 168 hours.
Resistance to Reflow Heat	No physical and mechanical damage allowed.	Peak Temperature: 260°C+5°C/-0°C, Reflow Time (230°C Min): 45~60 seconds.

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 paragraph 3.6.

Figure 1

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
	Test sequence (b)										
Initial examination of product	1	1	1	1	1	1	1	1	1	1	1
Low level contact resistance	2,5,7	2,5,7,9	2,5,7,9	2,5,7,9	2,4	2		3,6,8			
Contact resistance						5					
Temperature rise						4					
Insulation resistance							2,6				
Withstanding voltage							3,7				
Durability	3(c)	3(c)	3(c)	3(c)	3			7			
Vibration			6								
Mechanical Shock			8								
Mating force						3					
Unmating force						6		8			
Compliant pin insertion									2		
Compliant pin retention									3		
Floating force								4			
Offset mating force								2			
Floating durability								5			
Knurl Insertion force										2	
Temperature life	4		4(d)	4(d)							
Thermal Shock		4					4				
Cyclic Temperature Humidity		6					5				
Mixed flowing gas				6(e)							
Reseating Once	6	8		8							
Resistance to Reflow Heat											2
Final examination of product	8	10	10	10	5	7	8	9	4	3	3

NOTE

- (a) See para 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Precondition specimens with 20 durability cycles.
- (d) Precondition specimens with 72 hours at 105°C temperature life.
- (e) ½ of samples mated for 336 hours, ½ of samples unmated for initial 168 hours, then mated for final 168 hours.

Figure 2

4. QUALITY ASSURANCE PROVISIONS
4.1. 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 paragraph 3.6.

4.2. Requalification Testing

If changes significantly affecting form, fit or functions 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.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of paragraph 3.6. 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.

4.4. 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.