



The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore, TE Connectivity (TE) makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, TE may change these requirements based on the results of additional testing and evaluation. Contact TE Engineering for further details.

Crown Clip Junior Direct Power Connector

1. SCOPE

1.1. Content

This specification covers performance, test and quality requirement for TE Connectivity (TE) Crown Clip Junior Power Connector.

Version I: Crown Clip Junior Direct Power Connector with Tin plating version

Version II: Crown Clip Junior Direct Power Connector with Silver plating version

Bus Bar Board Plating Specification:

Version I: 3um min. Tin Plating over 1.27um min. Nickel under-plating on copper board.

Version II: 3um min. Silver Plating over 1.27um min. Nickel under-plating on copper board.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in item 3.4 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. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- 114-19128: Application Specification
- 501-19134: Qualification Test Report

2.2. Industry Documents

- EIA-364 Electrical Connector/Socket Test Procedures Including Environmental Classifications
- IEC-60512 Basic testing procedures and measuring methods for electromechanical components for electronic equipment
- IEC 60068 Basic environmental testing procedures
- EDCS-164608: Cisco Qualification of Electrical Connectors for Reliability Grades S and A
- [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.

3.2. Material

Housing: Thermoplastic.

Contact: High conductivity copper alloy

Plating Version I: Tin plating over Nickel base plated on copper contact.

Plating Version II: Sem-bright Silver plating over Nickel base plated on copper contact.

3.3. Ratings

- Voltage: 48V AC/DC (General application); 1000V AC/DC Max.
- Current: 150A (General application), 170A max.
- Operating temperature: -65°C to 105°C
- Storage temperature: -40°C to 30°C

3.4. Test Requirements and Procedures Summary

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Item 3.5. Unless otherwise specified, all tests shall be performed at ambient environmental conditions, in accordance with EIA-364, IEC 60068 clause 5.3.

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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. Document gold plating thickness at contact interfaces.
Final examination of product	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Low level contact resistance	0.2 milliohms maximum (initial and final)	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. Mated with bus bar
Contact resistance at rated current	0.2 milliohms maximum (initial and final)	EIA-364-6. Current TBD at 30°C temperature rise result at rated current.
Insulation resistance.	5000 megohms minimum	EIA-364-21. 500 volts DC, 1 minute duration. Test between adjacent contacts of specimens.
Withstanding voltage.	No breakdown or flashover.	EIA-364-20, Condition I. 2500 volts AC/DC duration 1 minute test between adjacent specimen contacts.
Temperature rise vs current.	30°C maximum temperature rise at specified current.	EIA-364-70, Method II. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1°C.
Hot Insertion/Extraction	Contact resistance 0.2mΩ max	Mating/unmating 50 cycles min. Current 150A DC, speed 50mm/s min.,750mm/s max.

Test Description	Requirement	Procedure
MECHANICAL		
Vibration	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition V, letter C. 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, Method A. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Durability (preconditioning)	See Note	EIA-364-09. Mate and unmate specimens with a bus bar conductor for 5 cycles at a maximum rate of 500 cycles per hour.
Durability	50 cycles	EIA-364-09. Mate and unmate specimens with a bus bar board for 50 cycles at a maximum rate of 500 cycles per hour.
Mating force	60 N maximum per connector	EIA-364-13. Measure force to mate specimens at a maximum rate of 12.7 mm [.5 in] per minute, see 4.5 Reference.
Unmating force	12.5 N minimum per connector	EIA-364-13. Measure force to unmate specimens at a maximum rate of 12.7 mm [.5 in] per minute, see 4.5 Reference.
Insertion force	800 N maximum	EIA-364-5. Measure force necessary to correctly apply a specimen to a printed circuit board at a maximum rate of 12.7 mm [.5 in] per minute.
Component heat resistance to soldering.	See Note.	TE Connectivity 109-202, Condition B.
Solderability dip test.	Solderable area shall be the 95% minimum solder coverage. See Note.	EIA-364-52. Solder bath temperature $260 \pm 5^{\circ}\text{C}$, duration 3 seconds.
Reseating	See Note.	Manually mate/unmating samples for three cycles.

Test Description	Requirement	Procedure
ENVIRONMENTAL		
Thermal shock	See Note.	EIA-364-32, Method A, Condition II. Subject mated specimens to 25 cycles between -65 and 105°C.
Thermal cycling	See Note.	EIA-364-110, Method A Subject mated specimens to 500 cycles between 15 and 85°C.
Thermal disturbance	See Note.	EIA-364-110, Method A Subject mated specimens to 10 cycles between 15 and 85°C.
Humidity-temperature cycling.	See Note.	EIA-364-31, Method III, Condition B. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C.
Temperature life (preconditioning)	See Note.	EIA-364-17, Method A (temperature and duration per EIA-364-1000, table 9, 60°C for 10 years) Subject mated specimens to 105°C for 72 hours.
Temperature life	See Note.	EIA-364-17, Method A, Condition 4. Subject mated specimens to 105°C for 1000 hours.
Dust	See Note.	EIA-364-91. Subject specimens shall be unmated for one hour.
Mixed flowing gas.	See Note.	EIA-364-65, Class IIA. ½ Subject specimens mated for 336 hours(14 days); ½ Subject specimens unmated for 168 hours, and then mated for final 168 hours, (7 days unmated, 7 days mated)

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 3.5.

3.5. Product Qualification Test Sequence

Test or Examination	Test Group								
	1	2	3	4	5	6	7	8	9
	Test sequence								
Initial examination of product	1	1	1	1	1	1	1	1	1
Low level contact resistance	2,5,7	4,7,9,13	3,6,8,10	2,6,8(a),12	2,6,8,12	2,5,7,9	2,5,7,9	2,4	
Contact resistance at rated current				10	10				
Insulation resistance		2,10							
Withstanding voltage		3,11							
Temperature rise vs. Current				4,9	4,9				
Hot Insertion/Extraction								3	
Vibration			9						
Mechanical shock			7						
Durability	3(b)	5	4(b)	3(b)	3(b)	3(b)	3(b)		
Mating force			2						
Unmating force			11						
insertion force									2
Dust							4		
Component heat resistance to soldering									3
Solderability test									4
Thermal shock		6			5				
Thermal cycling						6			
Thermal disturbance							6		
Humidity-temperature cycling		8			7				
Temperature life	4		5(c)	5(c)		4(c)			
Mixed flowing gas				7(d)					
Reseating	6	12		11	11	8	8		
Final examination of product	8	14	12	13	13	10	10	5	5

NOTE

- (a) LLCR shall be measured according to MFG test sequence.
- (b) Durability (preconditioning)
- (c) Temperature life (preconditioning)
- (d) MFG-Class IIA. ½ samples mated 14days; ½ samples unmated 7days, and then mated for final 7days.
- (e) Group 4 is only for Connector Version II; Group 5 is only for Connector Version I..

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. Each test group shall consist of one fully populated bus bar assembly with a minimum of 24 power and 30 signal contacts measured.

B. Test Sequence

Qualification inspection shall be verified by test specimen as specified in Item 3.4.

4.2. 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.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of item 3.4. 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.

4.5. Reference

Mating/Unmating Force

Mating and un-mating force shall be measured as indicated in the below figure, for all pitch combinations as described below

The copper conductors shall have a thickness of $3,0 \pm 0,1$ mm, post-plated with tin over nickel.

The pitch of the connectors in the test-tool is 25,0mm. The pitch of the conductors can be adjusted by spacers.

The possible pitch combinations of the conductors are:

1. Pitch 25,0mm (nominal)
2. Pitch 24,0mm (minimal)
3. Pitch 26,0mm (maximal)

4. Pitch 24,0mm with conductors angled $+2^\circ$ and -2° (in Y-direction)
5. Pitch 26,0mm with conductors angled $+2^\circ$ and -2° (in Y-direction)
6. Pitch 25,0mm with conductors angled $+2^\circ$ and -2° (in Z-direction).
7. Pitch 24,0mm with conductors angled $+2^\circ$ and -2° (in Z-direction)
8. Pitch 26,0mm with conductors angled $+2^\circ$ and -2° (in Z-direction)

The mating / un-mating force shall be measured in all combinations

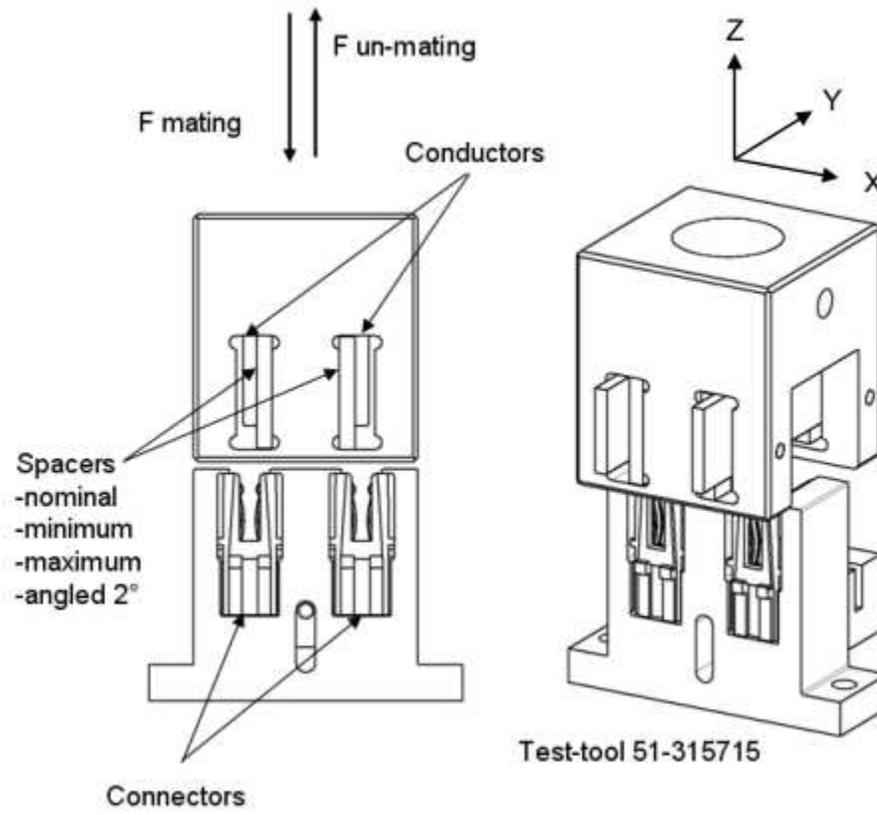


Figure. Reference test view of Mating/Unmating force test