



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™ Senior Power Connector

1. SCOPE

1.1. Content

This specification covers performance, test and quality requirements for TE Connectivity (TE) Crown Clip™ Senior Power Connector series (CCS Power).

Version I: Crown Clip™ Senior Power Connector with Gold plating version

Version II: Crown Clip™ Senior Power Connector with Silver plating version

Mating Bus Bar Board Material: High Conductivity Copper Alloy C10100/C10200/C11000.

Mating Bus Bar Board Plating Specification:

Version I: Gold Plating over 1.27~7.6um Matte Nickel under-plating on copper board.

Version II: Semi-Bright Silver Plating over 1.27~7.6um Matte Nickel base-plating on copper board.

Remark: Product contact plating interface shall be compatible between connector and mating bus bar 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

- 114-128068: Application Specification of Crown Clip™ Senior Power Connector
- 501-128067: Qualification Test Report of Crown Clip™ Senior Power Connector

2.2. Industry Documents

- EIA-364 Electrical Connector/Socket Test Procedures Including Environmental Classifications
- 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, Flammability UL94 V-0.

Contact: High Conductivity Copper Alloy

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

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

3.3. Ratings

- Voltage: 12V AC/DC (General application); 600V AC/DC Max.
1000V AC/DC Max. for 1643903-* and 2204700-*
- Current: CCS Connector 220A (General Application), 300A Max. per Connector
CC4200 Connector 420A (General Application), 450A Max. per Connector
- Operating temperature: -65°C to 125°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.

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

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	Refer to figure 1. maximum spec. (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	Refer to figure 2. maximum spec.	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 contacts of specimens.
Temperature rise vs current.	Refer to Current vs Temperature-Rise Curve at specified current, as figure 3/4/5/6	EIA-364-70, Method II. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1°C.

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	100 cycles for Gold plating version 50 cycles for Silver plating version	EIA-364-09. Mate and unmate specimens with a bus bar board for the specific cycles at a maximum rate of 500 cycles per hour.
Mating force	Refer to figure 1 product spec table	EIA-364-13. Measure force to mate specimens at a maximum rate of 25.4 mm [1.0 in] per minute.
Unmating force	Refer to figure 1 product spec table	EIA-364-13. Measure force to unmate specimens at a maximum rate of 25.4 mm [1.0 in] per minute.
Floating Contact with $\pm 6^\circ$ (Except for 1926671-* Dual Crown Clip Senior connector)	See Note, and product contact resistance meet spec.	Manually mate/unmating samples with $\pm 6^\circ$ for 20 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°C and 105°C.
Humidity-temperature cycling.	See Note.	EIA-364-31, Method III, Condition B. Subject mated specimens to 10 cycles (10 days) between 25°C and 65°C.
Temperature life	See Note.	EIA-364-17, Method A, Condition 4. Subject mated specimens to 125°C for 504 hours.
Salt Spray Test	See Note.	EIA-364-26, Condition B. Subject specimens tested for 48 hours, with 5% solution salt spray.

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)
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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.

Figure 1. Crown Clip™ Senior Power Connector Specification Table.

TE P/N	Description	LLCR, initial state (mΩ)	LLCR, final state (mΩ)	Mating Force Max.	Unmating Force Min.
1643906-1	CCS Single Pole, Gold	0.5mΩ	1mΩ	60N max.	8N min.
1926671-1	Dual-CCS Gold Plating	0.5mΩ	1mΩ	60N max.	8N min.
1926671-2	Dual-CCS Silver Plating (Obsoleted)	0.5mΩ	1mΩ	150N max.	15N min.
1643903-1	CCS II General Version, Gold	0.20mΩ	0.50mΩ	100N max.	8N min.
1643903-2	CCS II 3000, Gold Plating	0.20mΩ	0.50mΩ	60N max.	8N min.
1643903-3	CCS II Silver Plating	0.20mΩ	0.50mΩ	150N max.	15N min.
2204700-1	CC 4200, Gold Plating	0.10mΩ	0.10mΩ	60N max.	8N min.

TE P/N	Description	Rated Current (A)
1643906-1	CCS Single Pole, Gold	220A General, 300A Max.
1926671-1	Dual-CCS Gold Plating	220A General, 300A Max.
1926671-2	Dual-CCS Silver Plating (Obsoleted)	220A General, 300A Max.
1643903-1	CCS II General Version, Gold	220A General, 300A Max.
1643903-2	CCS II 3000, Gold Plating	220A General, 300A Max.
1643903-3	CCS II Silver Plating	220A General, 300A Max.
2204700-1	CC 4200, Gold Plating	420A General, 450A Max.

Figure 2. Crown Clip™ Senior Power Connector Contact Resistance Specification Table.

TE P/N	Description	Contact Resistance (mΩ)
1643906-1	CCS Single Pole, Gold	0.5mΩ
1926671-1	Dual-CCS Gold Plating	0.5mΩ
1926671-2	Dual-CCS Silver Plating (Obsoleted)	0.5mΩ
1643903-1	CCS II General Version, Gold	0.20mΩ
1643903-2	CCS II 3000, Gold Plating	0.20mΩ
1643903-3	CCS II Silver Plating	0.20mΩ
2204700-1	CC 4200, Gold Plating	0.10mΩ

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			
Low level contact resistance	2,5,7	4,7,9,13	3,5,7,9	2,7(a),11	2,4	2,4			
Contact resistance at rated current				5,9					
Insulation resistance		2,10							
Withstanding voltage		3,11							
Temperature rise vs. Current				4,8					
Vibration			8						
Mechanical shock			6						
Durability	3(b)	5	4(b)	3(b)					
Mating force			2						
Unmating force			10						
Salt Spray test					3				
Thermal shock		6							
Humidity-temperature cycling		8							
Temperature life	4								
Mixed flowing gas				6(c)					
Floating Contact with $\pm 6^\circ$						3			
Reseating	6	12		10					
Final examination of product	8	14	11	12	5	5			

NOTE

- (a) LLCR shall be measured according to MFG test sequence.
- (b) Durability (preconditioning) 5 cycles
- (c) Temperature life (preconditioning)
- (d) MFG-Class IIA. $\frac{1}{2}$ samples mated 14days; $\frac{1}{2}$ samples unmated 7days, and then mated for final 7days.
- (e) Reseating: Manually mate/unmating samples for three cycles.

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 5 connectors and 10 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.

Product Current & Temperature-rise Curve

Figure 3. Current & Temperature-rise Curve of Single Crown Clip Senior Power Connector 1643906

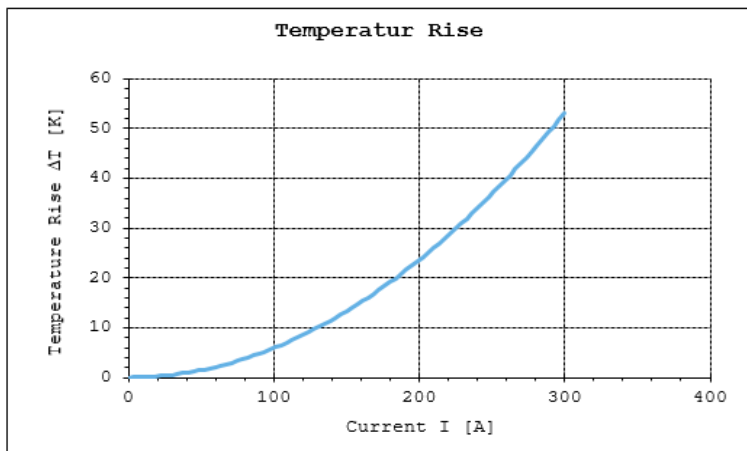


Figure 4. Current & Temperature-rise Curve of Dual-Crown Clip Senior Power Connector 1926671

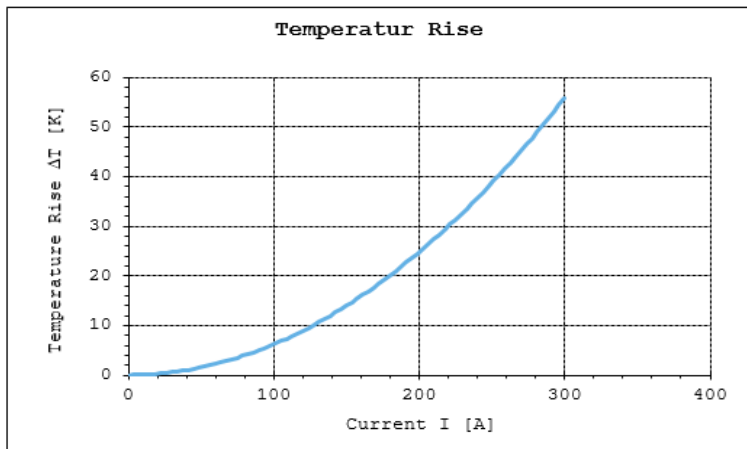


Figure 5. Current & Temperature-rise Curve of Crown Clip Senior II Power Connector 1643903

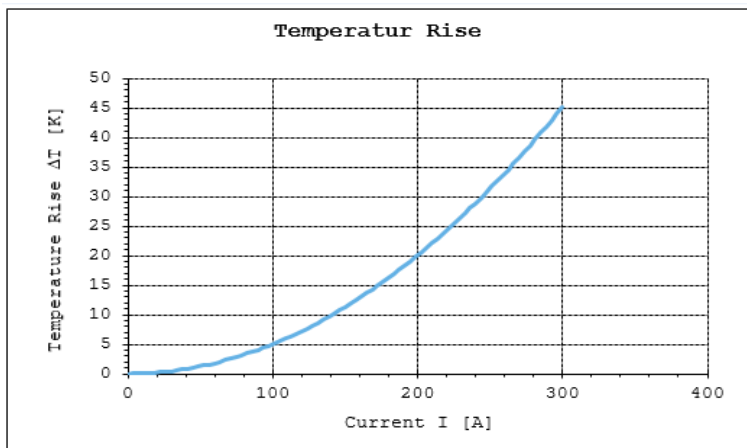


Figure 6. Current & Temperature-rise Curve of Crown Clip 4200 Power Connector 2204700

