

**Pluggable Bus Bar Connector with high current contacts
Crown Clip Junior**

The product may not perform according to the product specification if precautions have not been taken in the application to provide mechanical stability of the connector in relation to its mating parts.

1 SCOPE .

1.1 Content.

This specification covers performance, test and quality requirements for a Tyco Electronics* Pluggable Bus Bar Connector. These connectors provide a means of bringing high current levels up to 150A from Bus Bar conductors to printed circuit boards.

1.2 Qualification.

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

2 APPLICABLE DOCUMENTS.

The following documents form a part of this specification to the extend specified herein. Unless otherwise specified, latest edition of the document applies. In the event of conflict between the requirements in this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between requirements of this specification and referenced documents, this specification shall take precedence.

2.1 Tyco Documents.

501-19134	Test report
502-19856	Test report
109-1	General Requirements for Test Specifications

2.2 Tyco Drawings

C-1982530	Customer drawing
C-2042305	Customer drawing
C-2178410	Customer drawing

2.3 Other Documents.

IEC 60512	Basic testing procedures and measuring methods for electromechanical components for electronic equipment.
IEC 60068	Basic environmental testing procedures.

DR. R. Daamen

DATE: 24 Jan 08

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3 REQUIREMENTS.

3.1 Design and Construction:

Products shall be of design, construction and physical dimensions as specified on the applicable product drawing.

3.2 Material and Finish:

- | | | |
|----|--------------|---|
| A. | Contacts: | - Copper alloy. |
| | Plating: | - Post-plated with Nickel under layer all over.
- Post-plated with Tin in solder and contact area. |
| B. | Spring clip: | - Stainless steel. |
| C. | Housing: | - PBT. |

3.3 Ratings:

- | | | |
|----|------------------------|----------------------------|
| A. | Voltage: | -48 V DC. |
| B. | Current: | 170 A maximum |
| D. | Operating temperature: | -20°C to 75°C. |
| | Storage temperature | -40°C to 50°C |
| E. | Durability: | 50 mating/unmating cycles. |

3.4 Performance and Test description:

The product is designed to meet electrical, mechanical and environmental performance specified in this paragraph as tested per test sequence specified in para. 3.6.

Unless otherwise specified, all tests are performed at ambient environmental conditions per IEC specification 60068-1 clause 5.3., and are performed with connectors in mated conditions.

V I S U A L			
Para	Test Title	Performance / Severity Requirements	Procedure
3.4.1	Examination of product	Meets requirements of product-drawing and applicable instructions on customer drawing, and application specification.	Visual, dimensional and functional per applicable inspection plan. In acc. with IEC 60512-1-1 Magnification 10x

E L E C T R I C A L			
3.4.2	Termination resistance	0,2 mΩ maximum (for all pitch combinations as described in para 3.5.2.)	Subject contacts assembled in housing and mated to a bus bar conductor to 50mV maximum open circuit at 100 mA DC maximum. See figure 1 and par 3.5.2.
3.4.3	Insulation resistance	5000 MΩ min. initial (After moisture 1000 MΩ min.)	Test voltage 500 V DC, duration 1 minute. In acc. with IEC 60512-3-1
3.4.4	Voltage proof	Requirement: no break-down or flash-over.	Test voltage: 1000 V AC Duration 1 minute. In acc. with IEC 60512-4-1 Test between 2 connectors when mounted on a PCB with a pitch of 25±1mm.
3.4.5	Hot insertion/extraction	Termination resistance after test 0,2 mΩ maximum.	Min. 50 mating/unmating cycles. Mating/unmating speed between max. 750mm/s and min. 50mm/s. Current: 150A
3.4.6	Current carrying capacity	Temperature rise: 30°C maximum over ambient temperature (+75°C). 'Derating curve' to be added in paragraph 3.5.4 after test. 'Temperature-rise vs current curve' to be added in paragraph 3.5.5 after test.	In acc. with IEC 60512-5-2 test 5b

M E C H A N I C A L			
Para	Test Title	Performance / Severity Requirements	Procedure
3.4.7	Mating force	80N maximum. (2 connectors; at nominal pitch as described in paragraph 3.5.2.) 100N maximum. (2 connectors; all misaligned and angled pitch combinations as described in paragraph 3.5.2.)	Measure force necessary to mate 2 samples with 2 bus bar conductors. See figure 2
3.4.8	Un-mating force	50±25N. (2 connectors; at nominal pitch as described in para 3.5.2.) 75N±25N. (2 connectors; all misaligned and angled pitch combinations as described in paragraph 3.5.2.)	Measure force necessary to un-mate 2 samples with 2 bus bar conductors. See figure 2.
3.4.9	Durability	No damage allowed.	With connector mounted on PCB mate and unmate samples for 50 cycles with a bus bar conductor..
3.4.10	PC-board insertion force	800N max. with unplated reference PCB as shown in figure 3. PCB thickness in test application 3,2mm.	Measure force necessary to insert the connector in the PCB. See figure 3.
3.4.11	Solder ability	5% maximum de-wetting.	Solder-bath temperature 260°C, duration 3 sec.

E N V I R O N M E N T A L			
Para	Test Title	Performance / Severity Requirements	Procedure
3.4.12	Rapid change of temperature	-55°/105°C, 0,5 hrs / 0,5 hrs, Transition time: <2 sec. Number of cycles: 25 (mated) Recovery time: 1 hour.	In acc. with IEC 60512-11-4
3.4.13	Damp/heat cyclic	25/55°C 12 hrs / 12 hrs (= 1 cycle) RH 95% Number of cycles: 10 (unmated)	In acc. with IEC 60512-11-12

3.5 Additional testing details.

3.5.1 Termination resistance

Termination resistance shall be measured as indicated in figure 1, for all pitch combinations as described in par 3.5.2.

Bulk-resistance of circuits outside the connector, such as PC-Board paths and wire for series connection, are not included in the requirement and therefore shall be measured and documented separately for reference (in case of significant influence).

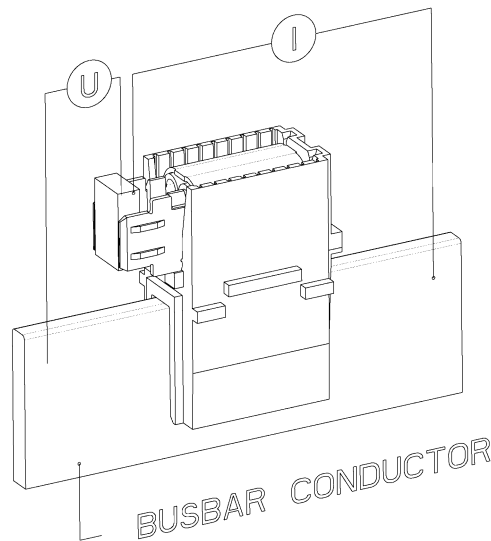


Figure 1.

3.5.2 Mating/unmating force

Mating and un-mating force shall be measured as indicated in figure 2, 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 using 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.

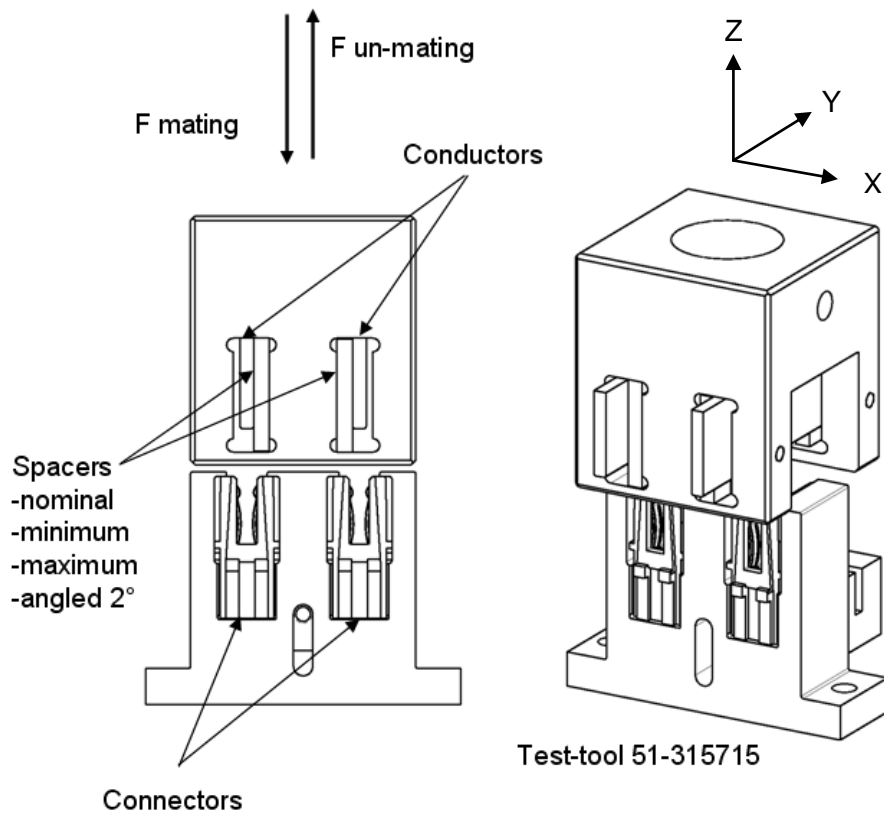


Figure 2.

3.5.3 PCB insertion force

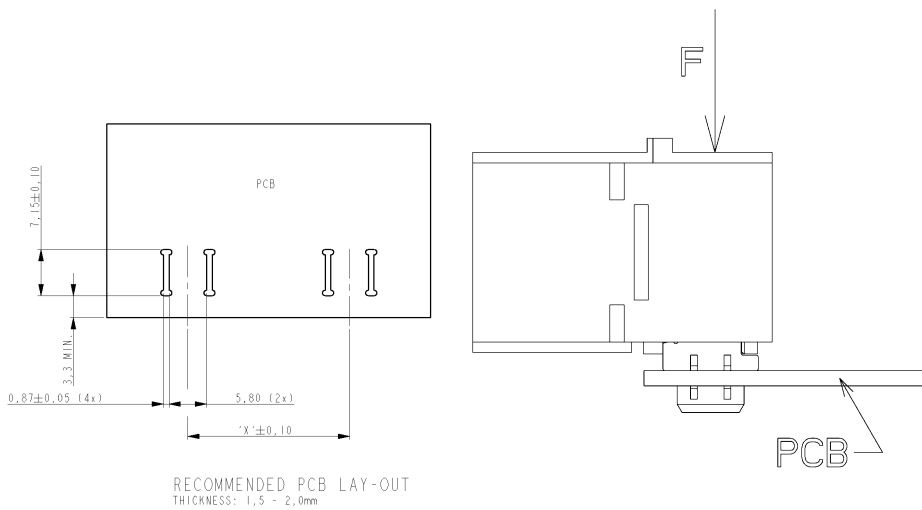
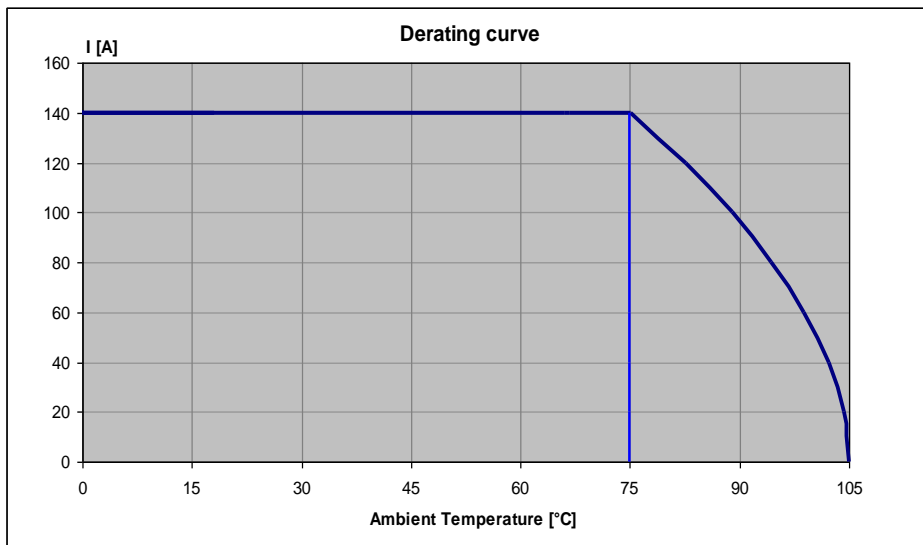
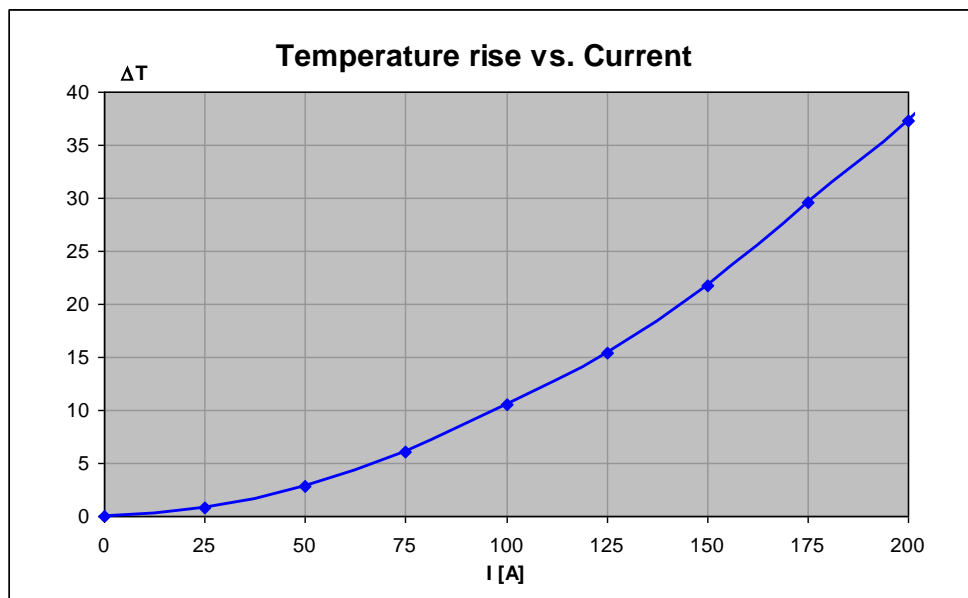


Figure 3.

3.5.4 Current temperature derating curve



3.5.5 Temperature rise vs current curve



3.6 Product Qualification and Regualification Test Sequence.

Test or examination	TEST - GROUP (a)				
	1	2	3	4	5
	TEST - SEQUENCE (b)				
Examination of product	1,9	1,3	1,8	1,4	1,5
Termination resistance	2,8				2,4
Insulation resistance			2,7		
Voltage proof			3,6		
Hot insertion/extraction					3
Current temperature derating		2			
Mating force	3,6				
Unmating force	4,7				
Durability	5				
PC-Board insertion force				2	
Solder ability				3	
Rapid change of temperature			4		
Damp / heat cyclic			5		

- (a) See para. 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.

Sample description	Number of samples in test - groups				
	1	2	3	4	5
Pluggable bus bar connector	6	6	6	6	6
Bus bar conductor (tinplated)	6	6	6	6	6
Test-board				6	

4 QUALITY ASSURANCE PROVISIONS.

4.1 Qualification testing.

A. Sample selection

Samples shall be prepared in accordance with applicable instructions and shall be selected at random from current production.

B. Test sequence

Qualification inspection shall be verified by testing samples as specified in para. 3.6.

4.2 Regualification testing.

If changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of original testing sequence as determined by product, quality and reliability engineering.

4.3 Acceptance.

Acceptance is based upon verification that product meets requirements of para. 3.4. Failures attributed to equipment, test set-up, applied customer components or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for requalification. Testing to confirm corrective action is required before resubmittal.

4.4 Quality conformance inspection.

Applicable Tyco quality inspection plan will specify sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with applicable product drawing and this specification.