

COMPRESSIVE CONNECTOR

"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* Compressive SMD Board to Board connector. The connector is designed to make a connection between a contact surface and a Printed Wire Board (PWB). The connector is soldered to the PWB and can connect to a flex foil or PWB.

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 Electronics Documents.

501-19140 Test report of "1 Piece Board to Board Connector"

2.2 Tyco Electronics Drawings.

C-1551120 Customer drawing of "1 Piece Board to Board Connector"
 C-2173906 Customer drawing of "1 Piece Board to Board Connector"

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2.3 Other Documents.

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

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. | Contact material: | - Stainless steel. |
| | Plating Mating side: | - Post-plated with nickel and selective gold. |
| | Plating solder tabs: | - Post-plated with nickel and selective gold. |
| B. | Housing material: | - Glass filled Liquid Crystal Polymer (LCP). |

3.3 Ratings:

- | | | |
|----|------------------------|---------------------|
| A. | Voltage: | 50 V max. |
| B. | Current: | 1,75 A max./contact |
| C. | Operating temperature: | -25°C to 70°C |
| | Storage temperature: | -40°C to 85°C |
| D. | Durability: | 5 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 par. 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			
Par.	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	Max. open voltage 20mV. Max. current 100 mA DC. All contacts to be measured. <u>Requirement:</u> Initial: 40 mΩ max. ΔR: 20 mΩ max.	In acc. with IEC 60512-2-1 Measuring points shall be as indicated in figure 1, Ref. par. 3.5.1.

M E C H A N I C A L			
Par.	Test Title	Performance / Severity Requirements	Procedure
3.4.3	Contact normal force (Per contact)	Normal force shall be measured: 1. at contact position nominal +0,30mm (upper working range) (min. deflection) <u>requirement:</u> 0,2 N min. 2. at contact position nominal -0,30 mm (lower working range) (max. deflection) 0,8 N max. See also figure 3 in Par. 3.5.3 For nominal contact heights see C-drw table on sheet 3.	Normal force test equipment (force / deflection curve)

ENVIRONMENTAL			
Par.	Test Title	Performance / Severity Requirements	Procedure
3.4.4	Rapid change of temperature	Connector to be mounted in test-frame, contact position at nominal deflection. -40°/85°C, 1 hrs / 1 hrs, Transition time: <30 sec. Number of cycles: 100 Recovery time: 1 hour <u>Requirement</u> : termination resistance as per par. 3.4.2	In acc. with IEC 60512-11-4
3.4.5	Dry heat	Contact position at nominal deflection. Temperature: 85°C Duration: 1000 hrs. Recovery time: 1 hour <u>Requirement</u> : termination resistance as per par. 3.4.2 / forces as per par. 3.4.3	In acc. with IEC 60512-11-9
3.4.6	Cold	Temperature -40°C Duration 16 hrs. Recovery time: 1 hours <u>Requirement</u> : termination resistance as per par. 3.4.2	In acc. with IEC 60512-11-10
3.4.7	Damp/heat cyclic	Contacts loaded contact position at nominal deflection. 25/55°C 12 hrs / 12 hrs (= 1 cycle) RH 95% Number of cycles: 5 <u>Requirement</u> : termination resistance as per par. 3.4.2	In acc. with IEC 60512-11-12
3.4.8	Storage (Alternating Temperature)	Contacts not loaded -40/85°C Temperature change 1°C/min. 8 hrs. per cycle - Number of cycles: 10 <u>Requirement</u> : forces as per par. 3.4.3	DIN IEC 60068-2-14 Nb
3.4.9	Resistance to soldering heat (Hot-Air)	3 cycles of Hot-Air heat-curve as specified in figure 4. (unmated) <u>Requirements</u> : No cracks, chips or melting.	In acc. With IPC/JEDEC J-STD-020B with increased T peak Ref. Par. 3.5.4
3.4.10	Mixed Gas	SO ₂ : 200 ppb NO ₂ : 200 ppb H ₂ S: 10 ppb Cl ₂ : 10 ppb 25 °C; 75 % Rel. Humidity; 10 days Contact position 0,90 mm (nominal) Connection on massive Au contact surface <u>Requirement</u> : Termination resistance as per par. 3.4.2	In acc. With IEC 60068-2-60 Method 4
3.4.11	HNO ³ Testing	2 hours <u>Requirements</u> : No pores on contact dimple.	ISO 14647:2000

3.5 Additional testing details.

3.5.1 Termination resistance.

Termination resistance shall be measured as indicated in figure 2.

Bulk-resistance of circuits outside the connector, PWB tracks 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).

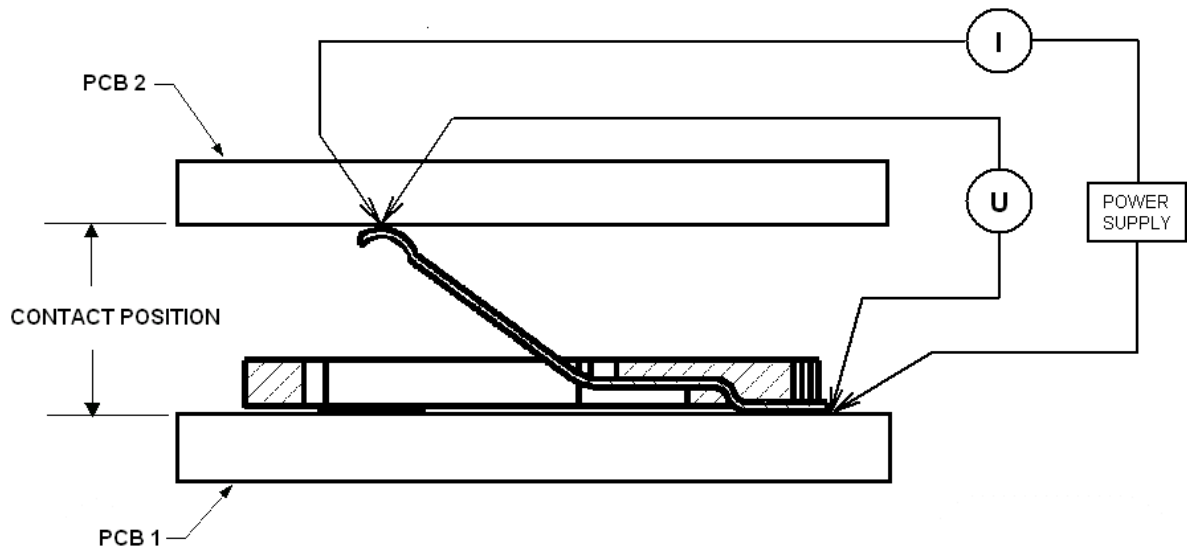


Figure 2

3.5.2 Normal Force.

Normal force shall be measured at contact position as indicated in figure 3.

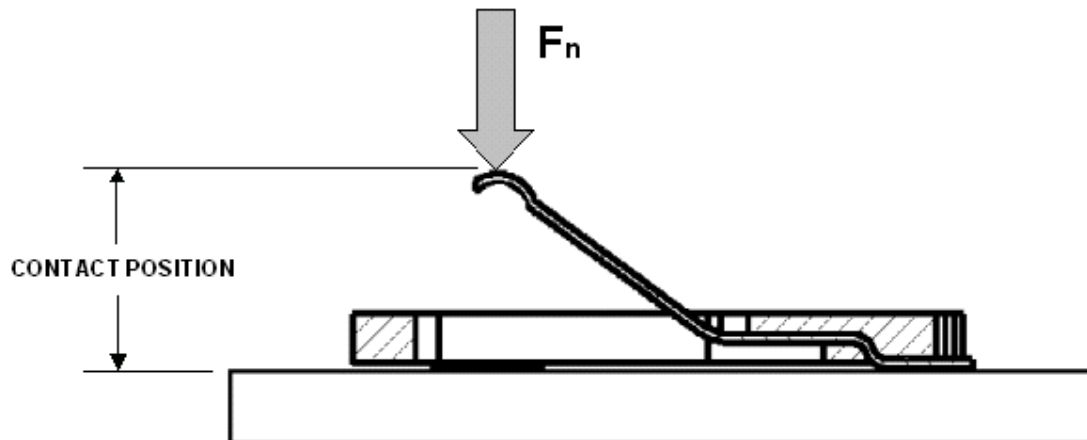


Figure 3

3.5.3 Resistance to soldering-heat.

Resistance to soldering-heat test shall cover the Hot-Air heat-curve as indicated in figure 4
Ref. IPC/JEDEC J-STD-020B with increased T peak.

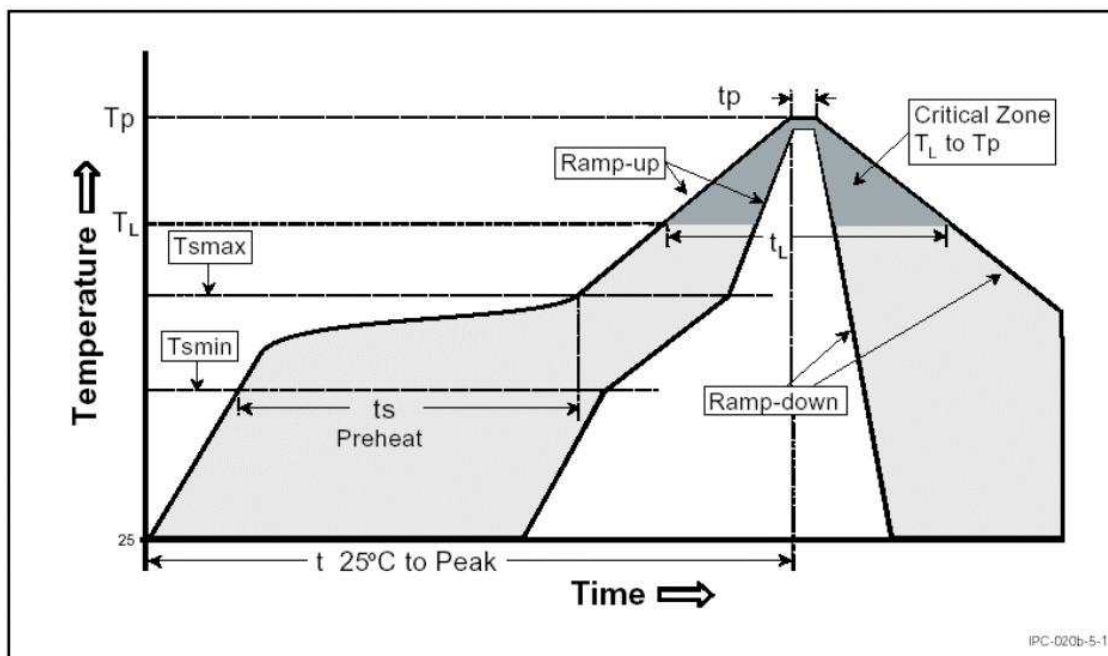


Figure 4

Method of heat transfer	a) Forced hot air convection (reflow) b) Vapour Phase soldering
Average temperature gradient in preheating	3.0 K/s
Temperature gradient in reflow	3.0 K/s
Preheating condition	max.200°C/ max. 180s
Time above 200°C	not defined
Time above 217°C	60 – 150s
Time above 230°C	not defined
Peak temperature	max 260°C
Temperature gradient in cooling	max. 6 K/s
Total reflow profile duration ¹⁾	480 s max

1) time measured from T = 40°C in preheating up to T = 100°C in cooling

3.6 Product Qualification and Requalification Test Sequence.

Test or examination	TEST - GROUP (a)				
	1	2	3	4	5
	TEST - SEQUENCE (b)				
Examination of product	1, 3, 8	1, 12	1,6	1,6	1
Termination resistance	4, 7	3, 6, 9, 11		3,5	
Contact normal force	5	4, 7	3,5		
Rapid change of temperature	6				
Dry heat		5			
Cold		8			
Damp / heat cyclic		10			
Storage (alternating temp)			4		
Soldering heat	2	2	2	2	2
Mixed Gas				4	
HNO ³					

(a) See par. 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
Compressive Connector	5	5	5	5	5

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.

Samples shall be soldered on PWB.

B. Test sequence

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

4.2 Requalification 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 par. 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 Electronics 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.