2 Through 6 Position Inverted Through-Board SMT Connectors

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

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the Tyco Electronics 2 Through 6 Position Inverted Through-Board Surface Mount (SMT) Connectors.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 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. Tyco Electronics Documents

- 114-13245: Application Specification (Inverted Printed Circuit Board (PCB) SMT Connector Assembly)
- 501-TBD: Qualification Test Report (2 Through 6 Position Inverted Through-Board SMT Connectors)

2.2. Industry Document

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

2.3. Reference Document

109-197: Test Specification (Tyco Electronics Test Specifications vs EIA and IEC Test Methods)

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.

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3.3. Ratings

- Voltage: 50 volts AC/DC
- Current: 3 amperes maximum with 24 AWG wire; 2.5 amperes maximum with 26 AWG wire; and 1.5 amperes maximum with 28 AWG wire
- Temperature: -30 to 105˚C

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing.	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 (LLCR).	10 milliohms maximum initial. 20 milliohms maximum final.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Insulation resistance.	500 megohms minimum initial. 100 megohms minimum final.	EIA-364-21. 500 volts DC, 2 minute hold. Test between adjacent contacts.
Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 500 volts AC at sea level. Test between adjacent contacts.
Temperature rise vs current.	30˚C maximum temperature rise at specified current.	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1˚C. See Figure 4.
MECHANICAL		
Sinusoidal vibration.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition I. Subject mated specimens to 10 to 55 to 10 Hz traversed in 1 minute with 1.5 mm maximum total excursion. Two hours in each of 3 mutually perpendicular planes. See Figure 5.

Figure 1 (continued)

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Test Description	Requirement	Procedure
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 applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 5.
Durability.	See Note.	EIA-364-9. Mate and unmate specimens for 30 cycles at a maximum rate of 500 cycles per hour.
Mating force.	See Figure 6.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm per minute.
Unmating force.	See Figure 6.	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm per minute.
Contact retention.	1.0 kgf minimum.	EIA-364-29, Method A. Apply specified load at a maximum rate of 25.4 mm per minute and hold for 6 ± 1 seconds.
Resistance to soldering heat.	See Note.	TEC 109-201, Condition B.
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32, Test Condition I. Subject specimens to10 cycles between -55 and 105˚C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures.
Humidity/temperature cycling.	See Note.	EIA-364-31, Method IV. Subject specimens to 10 cycles (10 days) between 25 and 65˚C at 80 to 100% RH with -10˚C cold shock.
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 4, Test Time Condition B. Subject specimens to 105˚C for 250 hours.

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 Figure 2.*

Figure 1 (end)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)				
	1	2	3	4	5
	Test Sequence (b)				
Initial examination of product	1	1	1	1	1
LLCR	3,8,10	2,7			
Insulation resistance			2,6		
Withstanding voltage			3,7		
Temperature rise vs current	9	4,8			
Solderability, dip test					
Sinusoidal vibration	6	6			
Mechanical shock	7				
Durability	4	3			
Mating force	2				
Unmating force	11				
Contact retention					2
Resistance to soldering heat				2	
Thermal shock			4		
Humidity/temperature cycling		5	5		
Temperature life	5				
Final examination of product	12	9	8	3	

NOTE *(a) See paragraph 4.1.A.*
(b) Numbers indicate sequence in which tests are performed.

Figure 2

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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 a minimum of 5 specimens.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 2.

4.2. Requalification Testing

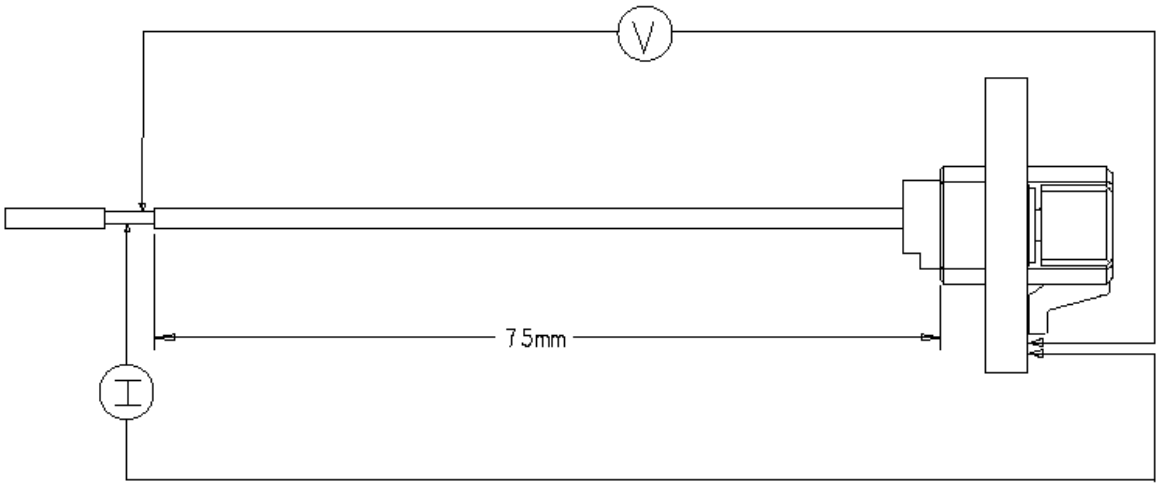
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 1. 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.



LLCR = Total resistance - wire resistance

Figure 3
LLCR Measurement Points

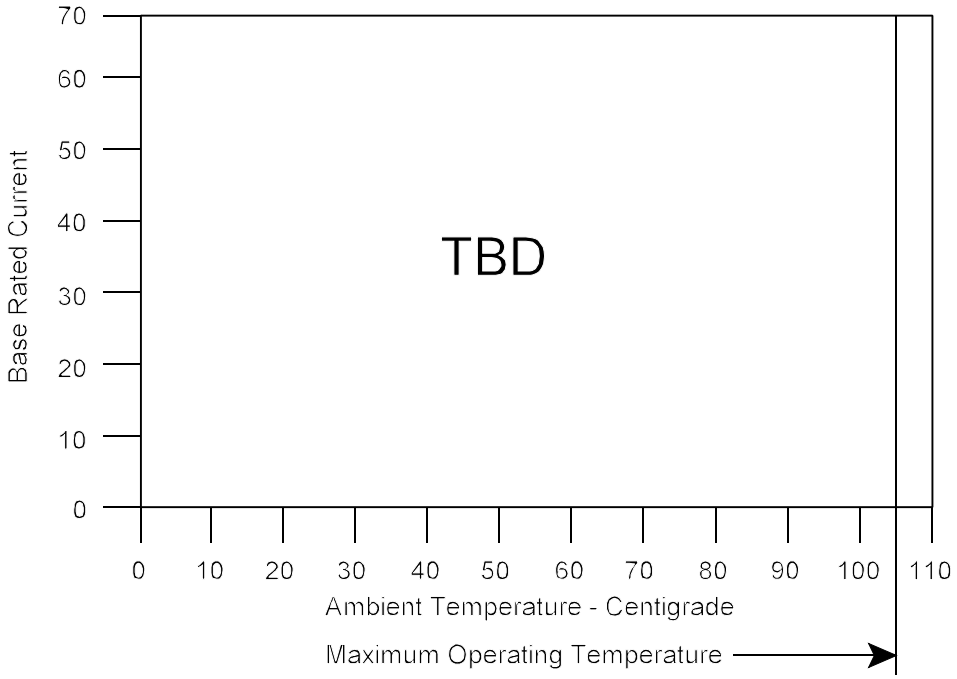


Figure 4A
Current Carrying Capability

Percent Connector Loading	Wire Size AWG		
	28	26	24
Single Contact	TBD		
50			
100			

NOTE *To determine acceptable current carrying capacity for percentage connector loading and wire gage indicated, use the Multiplication Factor (F) from the above chart and multiply it times the Base rated Current for a single circuit at the maximum ambient operating temperature shown in Figure 4A.*

Figure 4B
Current Rating

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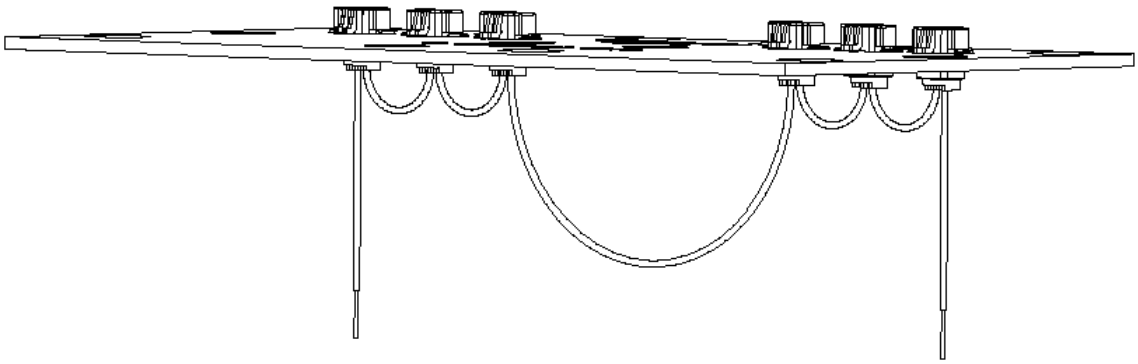

Figure 5
Vibration & Mechanical Shock Mounting Fixture

Number of Positions	Mating Force (kgf Maximum)	Unmating Force (kgf Minimum)
2	2.99	0.46
3	3.26	0.53
4	3.53	0.6
5	3.8	0.67
6	4.07	0.74

Figure 6
Mating/Unmating Requirements

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