High Power Inverted Thru Board Connector

1. SCOPE

1.1. Content

This specification defines the performance, tests, and quality requirements for the TE Connectivity (TE) 2- through 4-Position High Power Inverted Through-Board Surface Mount (SMT) Connectors to be used with the TE Economy Power II plugs and crimp contacts.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Table 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

1.3. Successful qualification testing on the subject product line was completed on 28 Mar 2013. The qualification test report number for this testing is 501-134014. This documentation is on file at and available from Engineering Practices and Standards (EPS).

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

- 114-32030: Application Specification
- 501-134014: Qualification Test Report

2.2. Industry Document

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

2.3. Reference Document

109-197: Test Specification (TE 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.

3.3. Ratings

- Voltage: 600 volts AC/DC
- Current: 7 amperes maximum with 18, 20, or 22 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 Table 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

3.5. Test Requirements and Procedures Summary

Table 1

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing and Application Specification 114-32030.	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.	1000 megohms minimum initial. 500 megohms minimum final.	EIA-364-21. 500 volts DC, 2 minute hold. Test between adjacent contacts of unmated specimens.
Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 2200 volts AC at sea level. Test between adjacent contacts of unmated specimens.
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.
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 4.
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 4.

Table 1

Test Description	Requirement	Procedure
Durability.	See Note.	EIA-364-9. Mate and un-mate specimens for 50 cycles at a maximum rate of 500 cycles per hour.
Mating force.	4.0 kgf for 2 position 6.0 kgf for 3 position 8.0 kgf for 4 position	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm per minute.
Unmating force.	0.8 kgf for 2 position 1.2 kgf for 3 position 1.6 kgf for 4 position	EIA-364-13. Measure force necessary to unmate specimens at a maximum rate of 12.7 mm per minute.
Contact retention.	3.0 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.
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32, Test Condition I. Subject mated specimens to 5 cycles between -30 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 mated 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 mated 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 Table 2.*

3.6. Product Qualification and Requalification Test Sequence

Table 2

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

NOTE

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

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. Test groups 1 and 2 shall consist of a minimum of 5 (2 and 4 position) specimens. Test groups 3 and 4 shall consist of a minimum of 5 (2 through 4 position) specimens.

B. Test Sequence

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

4.2. Requalification Testing

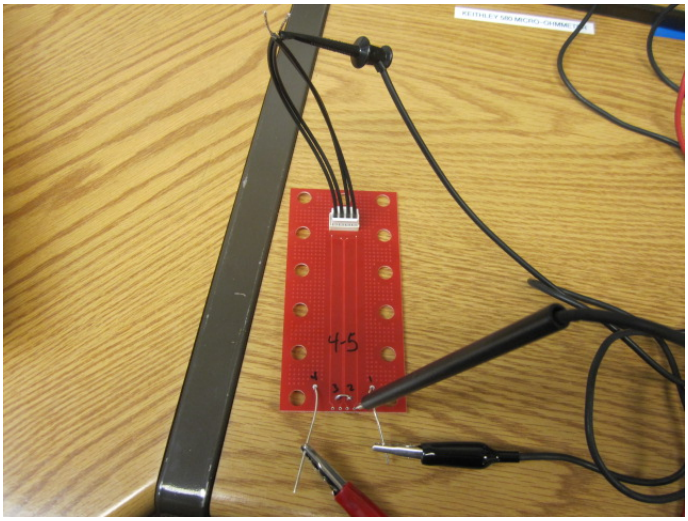
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality, and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Table 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 1
LLCR Measurement Points

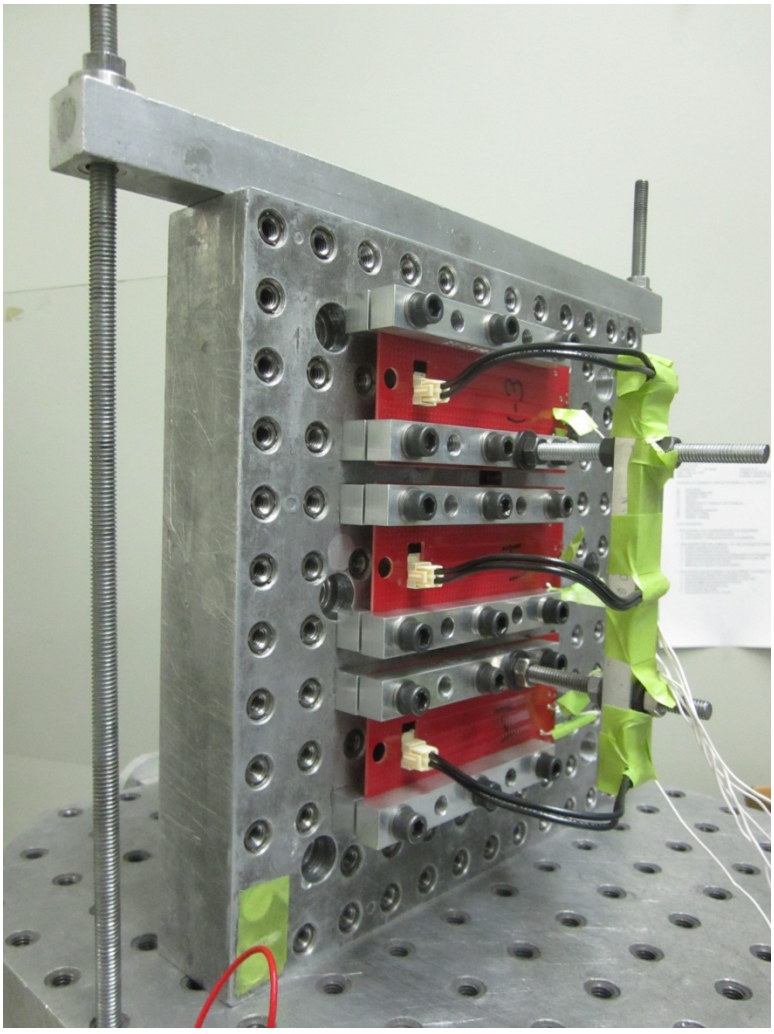


Figure 2
Vibration and Mechanical Shock Mounting Fixture