
Wire To Board Connectors

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the Tyco Electronics Wire To Board Connectors designed for use with hermaphroditic blade and receptacle 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.

1.3. Successful qualification testing on the subject product line was completed on 20Apr10. The Qualification Test Report number for this testing is 501-731. 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

- 114-13252: Application Specification (Wire To Board Connector For Hermaphroditic Blade and Receptacle Connectors)
- 501-731: Qualification Test Report (Wire To Board Connectors)

2.2. Industry Document

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

2.3. Reference Document

109-197: Test Specification (AMP 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: 125 volts AC or DC
- Current: 6 amperes maximum
- Temperature: -40 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 and Application Specification 114-13252.	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).	15 milliohms maximum initial. ΔR 5 milliohms maximum.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Insulation resistance.	1 megohm minimum.	EIA-364-21. 500 volts DC, 2 minute hold. Test between adjacent contacts of mated specimens.
Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 1500 volts AC at sea level. Test between adjacent contacts of mated specimens.
Temperature rise vs current.	30°C maximum temperature rise at 6 amperes.	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1°C. 100% of the circuits energized.
MECHANICAL		
Random vibration.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition VII, Condition Letter D. Subject mated specimens to 3.10 G's rms between 20 to 500 Hz. Fifteen minutes in each of 3 mutually perpendicular planes. See Figure 4.

Figure 1 (continued)

Test Description	Requirement	Procedure								
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Condition H. Subject mated specimens to 30 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.								
Durability.	See Note.	EIA-364-9. Mate and unmate specimens for 10 cycles at a maximum rate of 500 cycles per hour.								
Mating force.	15.12 N [3.40 lbf] maximum for 2 position product. 27.13 N [6.10 lbf] maximum for 4 position product. 38.92 N [8.75 lbf] maximum for 6 position product.	EIA-364-13. Measure force necessary to mate specimens without locking latches at a maximum rate of 12.7 mm [.5 in] per minute.								
Unmating force.	7.12 N [1.60 lbf] minimum for 2 position product. 16.0 N [3.60 lbf] minimum for 4 position product. 23.13 N [5.20 lbf] minimum for 6 position product.	EIA-364-13. Measure force necessary to unmate specimens without locking latches at a maximum rate of 12.7 mm [.5 in] per minute.								
Termination tensile strength.	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Wire Size (AWG)</th> <th>N [lbf] (Minimum)</th> </tr> </thead> <tbody> <tr> <td>22</td> <td>48.9 [11.0]</td> </tr> <tr> <td>20</td> <td>62.3 [14.0]</td> </tr> <tr> <td>18</td> <td>80.1 [18.0]</td> </tr> </tbody> </table>	Wire Size (AWG)	N [lbf] (Minimum)	22	48.9 [11.0]	20	62.3 [14.0]	18	80.1 [18.0]	EIA-364-8. Determine crimp tensile at a maximum rate of 25 ± 6 mm [.98 ± .24 in] per minute.
Wire Size (AWG)	N [lbf] (Minimum)									
22	48.9 [11.0]									
20	62.3 [14.0]									
18	80.1 [18.0]									
Contact retention.	Contacts shall not dislodge. See Note.	EIA-364-29. Apply an axial load of 24.47 N [5.5 lbf] at a maximum rate of 12.7 mm [.5 in] per minute.								
Contact insertion force.	13.34 N [3 lbf] maximum.	EIA-364-5. Measure force necessary to insert a contact into the housing at a maximum rate of 12.7 mm [.5 in] per minute.								
Housing lock strength.	22.24 N [5 lbf] minimum.	EIA-364-98. Determine housing lock strength at maximum rate of 12.7 mm [.5 in] per minute.								
ENVIRONMENTAL										
Thermal shock.	See Note.	EIA-364-32, Test Condition VIII. Subject mated specimens to 25 cycles between -40 and 105°C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures.								

Figure 1 (continued)

Test Description	Requirement	Procedure
Humidity/temperature cycling.	See Note.	EIA-364-31, Method III. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH.
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 4. Subject mated specimens to 105°C for 548 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(b)	2(c)	3(b)	4(c)	5	6	7(b)	8(c)
	Test Sequence (d)							
Initial examination of product	1	1	1	1	1	1	1	1
LLCR	3,5,7,9	2,4,6	2,5,7,9	2,5,7,9				
Insulation resistance					2,6(e)			
Withstanding voltage					3,7(e)			
Temperature rise vs current			3,10	3,10				
Random vibration	6	5	8	8				
Mechanical shock	8	7						
Durability	4	3						
Mating force	2							
Unmating force	10							
Termination tensile strength							2(f)	2(f)
Contact retention						3(g)		
Contact insertion force						2(g)		
Housing lock strength	11(h)				8(h)			
Thermal shock					4			
Humidity/temperature cycling			4(i)	4(i)	5			
Temperature life			6	6				
Final examination of product	12	8	11	11	9	4	3	3

NOTE

- (a) See paragraph 4.1.A.
- (b) Specimens in these test groups shall have the contacts crimped using an applicator.
- (c) Specimens in these test groups shall have the contacts crimped using a hand tool.
- (d) Numbers indicate sequence in which tests are performed.
- (e) Each position size to be tested with sockets inserted with the lance to the right (Figure 5A) and each position to be tested with sockets inserted with the lance to the left (Figure 5B).
- (f) Each contact for every wire size to be tested.
- (g) Testing to be done on blade contacts; socket contacts with the lance to the right (Figure 5A), and socket contacts with the lance to the left (Figure 5B).
- (h) Testing to be done with the contacts inserted in the housing.
- (i) Precondition with 5 mating and unmating cycles.

Figure 2

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. Unless otherwise specified, each test group shall consist of 5 random connector assemblies. All contacts shall be crimped to appropriate test conductors per Application Specification 114-13252.

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.

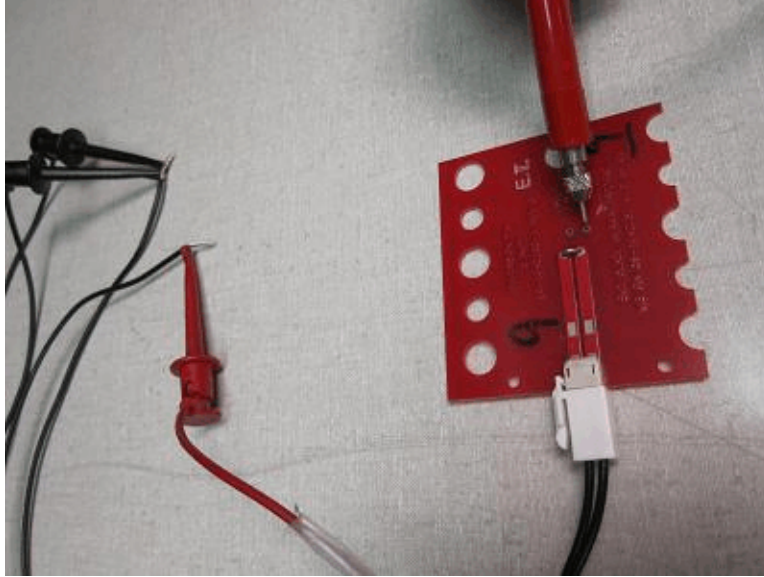


Figure 3
LLCR Measurement Points

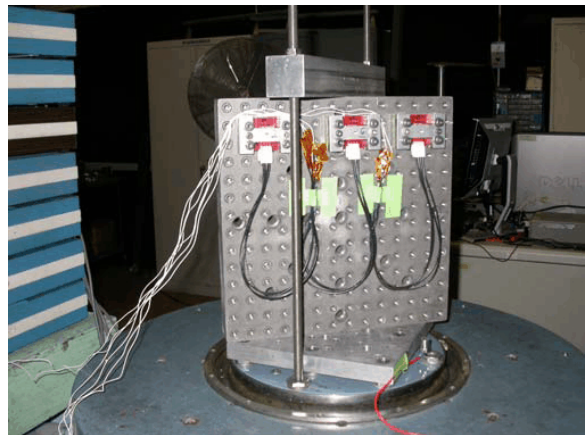
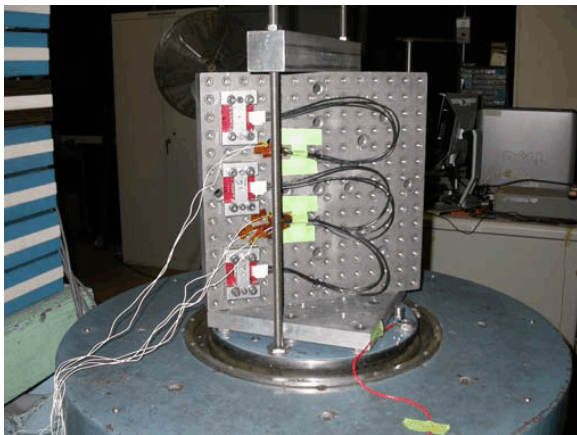
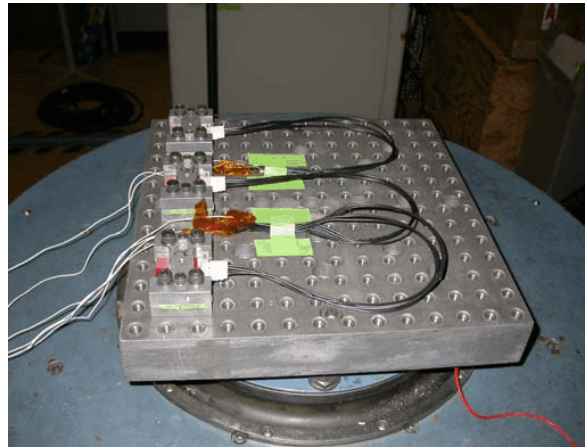
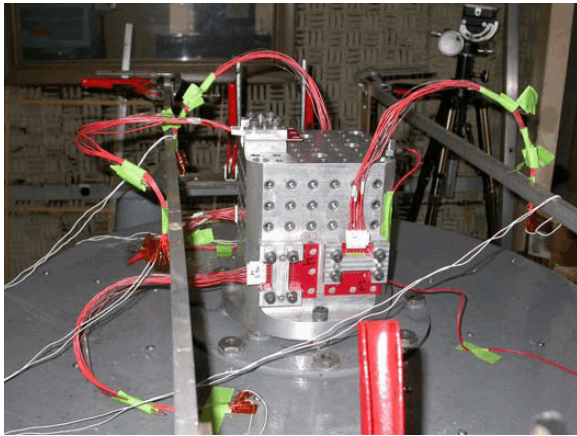


Figure 4
Vibration & Mechanical Shock

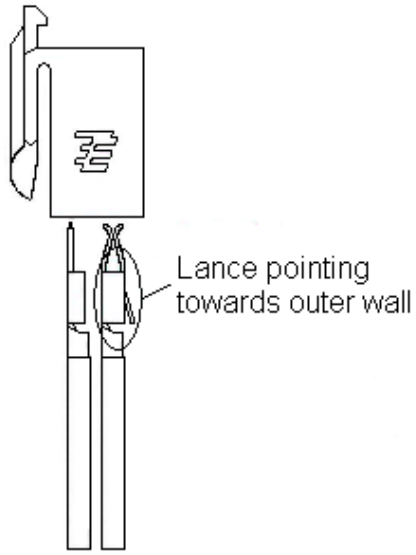


Figure 5A

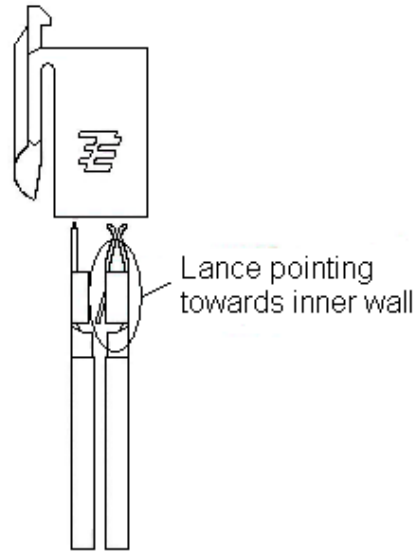


Figure 5B

Lance Orientation