
Size 16 HDSF Crimp Type Pin and Socket Contacts

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 Size 16 Heavy Duty Stamped and Formed (HDSF) Pin and Socket Contacts.

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

- 114-13045: Application Specification (HDSF Size 16 Pin and Socket Contacts)
- 501-TBD: Qualification Test Report (Size 16 HDSF Crimp Type Pin and Socket Contacts)

2.2. Industry Documents

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- USCAR-21: Performance Specification for Cable-To-Terminal Electrical Crimps

2.3. Government Document

MIL-C-39029: Contacts, Electrical Connector, General Specification for

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.

3.3. Ratings

- Voltage: Dependent on connector housing design
- Current: : See Figure 4
- Temperature: -40 to 125°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 114-13045.	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).	11 milliohms maximum.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage.										
Voltage drop.	100 millivolts maximum.	EIA-364-6. Measure voltage drop across mated terminals, crimps, and 150 mm of wire on each side.										
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												
Crimp tensile.	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Wire Size (AWG)</th> <th>Crimp Tensile (N minimum)</th> </tr> <tr> <td>20</td> <td>75</td> </tr> <tr> <td>18</td> <td>90</td> </tr> <tr> <td>16</td> <td>120</td> </tr> <tr> <td>14</td> <td>180</td> </tr> </table>	Wire Size (AWG)	Crimp Tensile (N minimum)	20	75	18	90	16	120	14	180	USCAR-21, Revision 1, Section 4.4. Determine crimp tensile at a rate of 50 to 250 mm per minute. Terminal insulation crimp, if present, shall be disabled prior to testing.
Wire Size (AWG)	Crimp Tensile (N minimum)											
20	75											
18	90											
16	120											
14	180											
Durability.	See Note.	EIA-364-9. Mate and unmate specimens for 50 cycles at a maximum rate of 300 cycles per hour.										
Socket contact engagement force.	1.02 kg maximum per contact.	MIL-C-39029, Section 3.5.5. Use a 1.61 +0.0000/-0.0025 mm diameter polished steel pin with spherical tip.										

Figure 1 (continued)

Test Description	Requirement	Procedure
Socket contact separating force.	42.5 g minimum per contact.	MIL-C-39029, Section 3.5.5. Use a 1.56 +0.0025/-0.0000 mm diameter polished steel pin with spherical tip.
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32. Subject specimens to 20 cycles between -40 and 125°C with 15 minute dwells at temperature extremes and 1 minute transition between temperatures.
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 5, Test Time Condition D. Subject specimens to 125°C for 1000 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
	Test Sequence (b)		
Initial examination of product	1	1	1
LLCR	2,7,9		
Voltage drop	3,10		
Temperature rise vs current	4,11		
Crimp tensile			2
Durability	5	4	
Socket contact engagement force		2,6	
Socket contact separating force		3,7	
Thermal shock	6		
Temperature life	8	5	
Final examination of product	12	8	3

NOTE

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

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. Each test group shall consist of a minimum of 5 specimens crimped to appropriate wire sizes between 14 and 10 AWG..

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.

TBD

Figure 3
LLCR Measurement Points

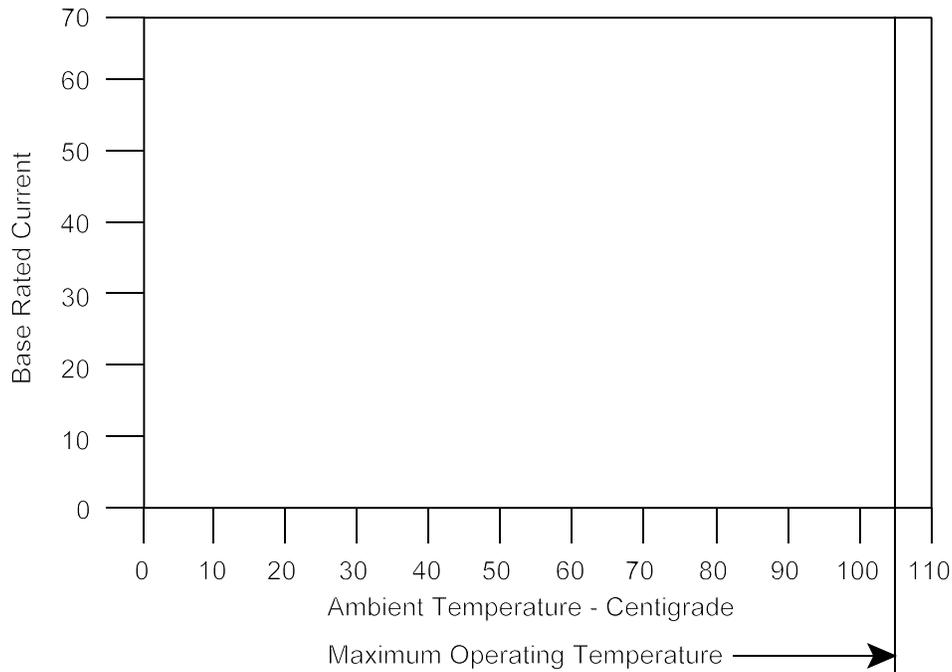


Figure 4A
Current Carrying Capability

Percent Connector Loading	Wire Size AWG			
	14	16	18	20
Single Contact				
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