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

Flip-N-Lok Connector Product Specification

1. SCOPE

1.1. Content

This specification covers performance, tests, and quality requirements for the Modular High-Density Wire-to-Board Connector using the Signal Grace Inertia 2.5 terminals.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in 2 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

1.3. Qualification Test Results

Successful qualification testing on the subject product line has not been completed. The Qualification Test Report number will be issued upon successful qualification testing.

1.4. Revision Summary

Revisions to this specification include:

- Initial release of specification.

2. APPLICABLE DOCUMENTS AND FORMS

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. TE Connectivity Specifications

114-106077	Application Specification
501-TBD	Qualification Test Report
408-160088	Instruction Sheet

2.2. Commercial Standards and Specifications

UL 1977	Safety Standards – Component Connectors for Use in Data, Signal, Control, and Power Applications
EIA-364	Electrical Connector/Socket Test Procedures Including Environmental Classifications
J-STD-002	Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires

2.3. Reference Documents

109-1	General Requirements for Testing
102-950	Qualification of Separable Interface Connectors

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction, materials, 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 TE drawing.

3.3. Ratings

A. Voltage Rating: 50V AC/DC

B. Current Rating: See Appendix 1.

C. Temperature Rating: –30°C to +105°C (include temperature rising by energized current)

D. Applicable PCB: Thickness 1.6mm

3.4. Performance Requirements and Test Description

The product should meet the electrical, mechanical, and environmental performance requirements specified in Figure 1. All tests shall be performed at ambient environmental conditions otherwise specified.

3.5. Test Requirements and Procedure Summary

Test Description	Requirement	Procedure
Examination of Product	Meets requirements of product drawing and TE specification (114-106077). After testing, there shall be no corrosive influence on the performance and no physical damage.	EIA-364-18 Visual and dimensional inspection per the product drawing.
Electrical		
Terminal Resistance (Low Level Contact Resistance)	10 m Ω Max. (Initial) 20 m Ω Max. (Final)	EIA-364-23 Subject mated contact assembled in housing to 20mV Max. open circuit at 10mA. Subtract the resistance of the wire from the measurement. See Figure 4.
Insulation Resistance	1000 MΩ Min. (Initial) 500 MΩ Min. (Final)	EIA-364-21 Apply 500 VDC and hold for 2 minutes. Test between contacts in adjacent circuits and between housing and contacts in an unmated connector.
Dielectric Withstanding Voltage	1 minute hold with no creeping discharge or flashover. Current leakage: 5mA Max.	EIA-364-20, Condition I Hold at 1.1kVAC for 1 minute. Test between contacts in adjacent circuits and between housing and all contacts in an unmated connector.

Figure 1 (continued)

<table>
<tr><td>Temperature Rise Vs. Current</td><td>Initial 30ºC maximum when subjected to the specified current indicated in Appendix 1.</td><td>EIA-364-70, Method 1
Measure the temperature rise above ambient created by the energizing current. Measurement must be taken at a place where there is no influence from air convection. Contacts to be assembled in housing with all circuits connected. Stabilize at a single current level until 3 readings at 5-minute intervals are within 1ºC.</td></tr>
<tr><td colspan="3">Mechanical</td></tr>
<tr><td>Sinusoidal Vibration (Low Frequency)</td><td>No electrical discontinuity greater than 1 µs shall occur.

See Note.</td><td>EIA-364-28, Condition I
Subject mated connectors to 10-55-10 Hz frequency range traversed over 1 minute at an amplitude of 1.52mm. Apply for 2 hours in each of 3 mutually perpendicular planes. 100 mA applied electrical load.</td></tr>
<tr><td>Mechanical Shock</td><td>No electrical discontinuity greater than 1µs shall occur.

See Note.</td><td>EIA-364-27 Method A
Subject mated connector to 50G’s half-sine shock pulse of 11ms duration. 3 drops each to normal and reversed directions of X, Y and Z axis. Total of 18 drops.</td></tr>
<tr><td>Connector Mating Force with Lever</td><td>Mating Force:
40-Position = 45N Max.</td><td>EIA-364-13 Method A
Operation speed: 25.4mm/min.
Measure the force required to mate connectors without locking latches.</td></tr>
<tr><td>Connector Unmating Force with Lever</td><td>Unmating Force:
40-Position = 7.5N Min.</td><td>EIA-364-13 Method A
Operation speed: 25.4mm/min.
Measure the force required to unmate connectors.</td></tr>
<tr><td>Receptacle Contact Insertion Force</td><td>7.84N Max. per contact</td><td>EIA-364-5
Operation speed: 25.4mm/min.
Measure the force required to insert a contact into the housing.</td></tr>
<tr><td>Receptacle Contact Retention Force</td><td>14.7N Min.</td><td>EIA-364-29, Method C
Operation speed: 25.4mm/min.
Apply an axial pull force to the crimped wire while the housing is secured.</td></tr>
<tr><td>Crimp Tensile Strength</td><td><table><tr><th colspan="2">Wire Size</th><th>Crimp Tensile (Min.)</th></tr><tr><th>mm²</th><th>(AWG)</th><th>N (lbf)</th></tr><tr><td>0.08</td><td>28</td><td>8.9 (2)</td></tr><tr><td>0.13</td><td>26</td><td>17.8 (4)</td></tr><tr><td>0.20</td><td>24</td><td>26.7 (6)</td></tr><tr><td>0.32</td><td>22</td><td>36 (8)</td></tr></table></td><td>EIA-364-8
Operation speed: 25.4mm/min.
Apply an axial pull force to the crimped wire. Contact to be secured on the tester. Insulation barrel to be disabled.
*Terminal to be held in a fixture to equalize the forces applied during the test.</td></tr>
</table>

Figure 1 (continued)

Durability (Repeated Mate / Unmate)	See Note.	EIA-364-9 Manually mate and unmate specimens for 30 cycles.
Post Retention Force	19.6N Min.	EIA-364-29, Method C Operation speed: 25.4mm/min. Measure post retention force.
Environmental		
Thermal Shock	See Note.	EIA-364-32, Condition I Subject mated specimens to 25 cycles between -55 ºC and 85 ºC with 30-minute dwell time at temperature extremes and a 5-minute (max.) transition between temperatures.
Humidity-Temperature Cycling	See Note.	EIA-364-31, Method IV Subject mated specimens to 10 cycles between 25 ± 3°C and 65 ± 3°C at 80-98% R.H. Measurements to be recorded after specimens are held for 3 hours at ambient temperature and humidity. 1 cycle is 24 hours.
Temperature Life	See Note.	EIA-364-17, Method A, Test Condition 4, Test Time Condition C. Subject mated connector to 105 ± 2ºC for a duration of 500 hours.
Solderability	Wet Solder Coverage: 95% min. Continuous coating free from defects.	EIA/IPC/JEDEC J-STD-002, Test A1 Lead-Free Solder Solder temperature: 245 ± 5 °C Immersion Duration: 5 ± 0.5s
Resistance to Soldering Heat	See Note.	EIA-364-56, Procedure 3, Condition G Test connector on PCB. Solder Temperature: 265 ± 5°C Immersion Duration: 10 ± 2s

Figure 1 (end)

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.

3.6. Product Qualification and Requalification Test Sequence

TEST OR EXAMINATION	TEST GROUP (a)						
	1	2	3	4	5	6	7
	TEST SEQUENCE (b)						
Initial examination of product	1	1	1	1	1	1	1
Terminal Resistance	3, 7	2, 5(c), 7(c), 9					
Insulation Resistance			2,6				
Dielectric Withstanding Voltage			3,7				
Temperature Rise Vs. Current		3, 10					
Vibration	5	8					
Mechanical Shock	6						
Mating Force	2						
Unmating Force	8						
Receptacle Contact Insertion Force				2			
Receptacle Contact Retention Force				3			
Crimp Tensile Strength							2
Durability	4						
Post Retention Force					2		
Thermal Shock			4				
Humidity-Temperature Cycling		4	5				
Temperature Life		6					
Solderability						2	
Resistance to Solder Heat						3	
Final Examination of Product	9	11	8	4	3	4	3

Figure 1

NOTE
(a) See paragraph 4.2.
(b) Numbers indicate sequence in which tests are performed.
(c) Optional measurements used for verification/failure identification purposes.

4. QUALITY ASSURANCE PROVISIONS

4.1. Test Conditions

Unless otherwise specified, all the tests shall be performed in any combination of the following test conditions shown in Figure 3.

Temperature	15°C – 35°C
Relative Humidity	45% – 75%
Atmospheric Pressure	86.6 – 106.6 kPa

Figure 3

4.2. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production. The crimped contacts shall be prepared in accordance with the requirements of Application Specification 114-106077 and are to be selected at random from current production.

B. Applicable Wires

The wires to be used for crimping the samples for performance testing shall be conforming to the requirements specified in Application Specification 114-106077.

C. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in **Error! Reference source not found.**.

4.3. 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.

4.4. Acceptance

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

4.5. 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.

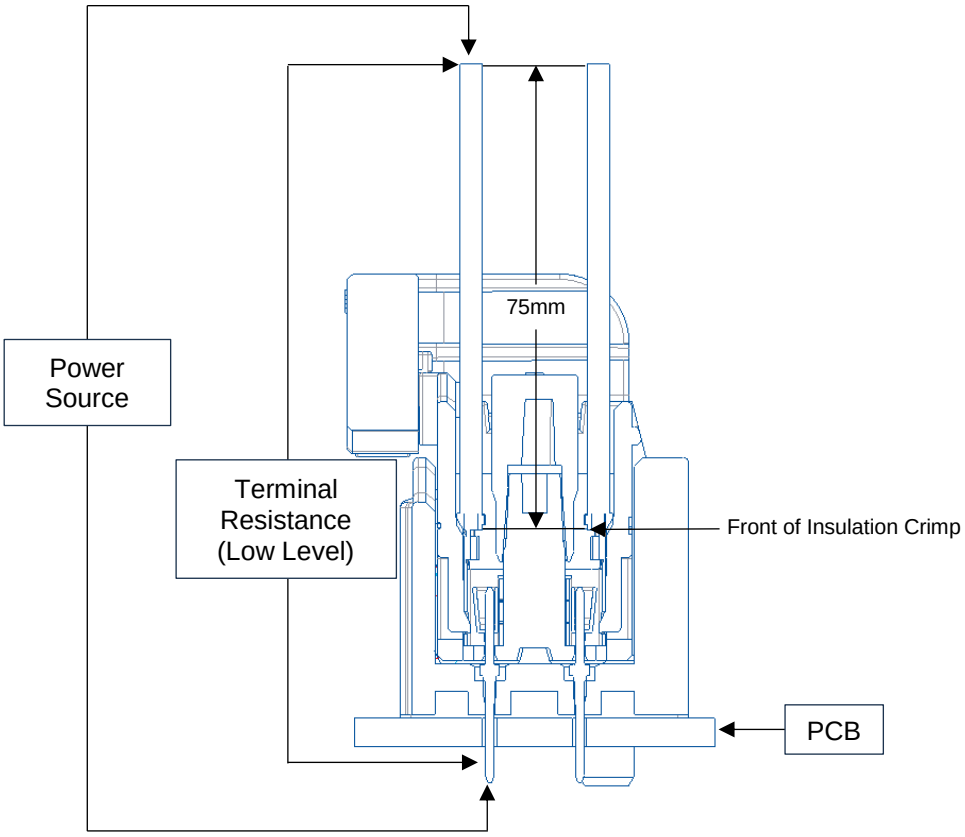
Power Source
Terminal Resistance (Low Level)
75mm
Front of Insulation Crimp
PCB

Figure 4

Appendix 1: Initial 30°C T-Rise Currents

Current Rating				
Wire Size	22 AWG	24 AWG	26 AWG	28 AWG
Current	3A	2.5A	2A	1.5A