

1.0 SCOPE

1.1. Content:

This specification covers performance, tests and quality requirements for Miniature Water Proof connectors. Applicable product descriptions and part numbers are as shown on product drawing.

1.2. Qualification:

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

2.0 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 TE Connectivity Documents:

501-137093: Test Report.

C-2834074: Customer drawing for plug

C-2834075: Customer drawing for receptacle

C-2834067: Customer drawing for socket contact

C-2834068: Customer drawing for pin contact

3.0 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.

3.4 Ratings

A. Voltage: 400 V AC Max.

B. Current: 3.5 A Max. for 22AWG; 5A Max. for 18-20AWG

C. Operating Temperature: -40 to 105°C

D. Storage Environment:

Temperature: - 40°C to 65°C Relative humidity: 15%-70%

3.5 Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements. Unless otherwise specified, all tests shall be performed in the room temperature (5~35°C), relative humidity (45~85%), air pressure (86~106kPa), and special case temperature (18~22°C), relative humidity (60~70%), unless otherwise specified.

3.6 Test Requirements and Procedures Summary

3.6.1 Examination:

Test Description	Requirement	Procedure
Examination of the product	Meets visual requirements.	Visual inspection per product drawing. Per EIA-364-18

3.6.2 ELECTRICAL

Test Description	Requirement	Procedure
Contact Resistance	20 mΩ Max	Subject the specimen to maximum allowed rating current and measure the contact resistance. Per EIA-364-06
Insulation resistance.	1000 MΩ Min. initial, 100 MΩ Min. final.	Unmated connector with 500 V DC between adjacent contacts for 1 min. Per EIA-364-21
Dielectric strength	No breakdown.	Mated connector with 1800 V AC between adjacent contacts for 1 min. Per EIA-364-20
Current rating	The temperature rise should be 30°C Max.	Mated connector measured at max rated current with series all contacts. Per EIA-364-70

3.6.3 MECHANICAL

Test Description	Requirement	Procedure								
Crimp tensile	<table border="0"> <tr> <td>Wire Size (AWG)</td> <td>Crimp Tensile (N Min.)</td> </tr> <tr> <td>18</td> <td>89</td> </tr> <tr> <td>20</td> <td>36</td> </tr> <tr> <td>22</td> <td>36</td> </tr> </table>	Wire Size (AWG)	Crimp Tensile (N Min.)	18	89	20	36	22	36	EIA-364-8. Determine crimp tensile at a maximum rate of 25 ± 6 mm [.98 ± .24 in] per minute.
Wire Size (AWG)	Crimp Tensile (N Min.)									
18	89									
20	36									
22	36									
Random Vibration	No discontinuities of 1 microsecond or longer duration.	Subject mated specimens to 3.10G's rms between 20~500HZ. Fifteen minutes in each of 3 mutually perpendicular planes. Per EIA-364-28, Test Condition VII, Condition D.								
Mechanical shock	No discontinuities of 1 microsecond or longer duration.	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. Per EIA-364-27, Condition A.								
Durability	No mechanical damage No change to performance Contact resistance: 20mΩ Max.	Mating and unmating specimens for 30 cycles (Tin plated) or 75 cycles (Gold plated) at a max rate of 500 cycles per hour. Per EIA-364-09.								

Test Description	Requirement	Procedure
Contact insertion force	20N Max.	EIA-364-5. Measure force necessary to insert crimped contacts into housing.
Contact retention force	Contact shall not dislodge.	EIA-364-29. Apply an axial load of 18N in the mating direction at a maximum rate of 25.4 mm [1.0 in] per minute. The specified force shall be maintained for 6 seconds \pm 1 second.
Housing lock strength	30N Min.	EIA-364-98. Determine housing lock strength at a maximum rate of 12.7 mm [.5 in] per minute.
Mating force	40N Max..	Measure force necessary to mate specimens at a max rate of 12.7mm per minute. Per EIA-364-13
Unmating force(Without latch force)	10N Max.	Measure force necessary to unmate specimens at a max rate of 12.7mm per minute. Per EIA-364-13

3.6.4 Environmental

Test Description	Requirement	Procedure
Thermal shock	No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence	Subject specimens to 25 cycles between -40 and 125 °C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures. Per EIA-364-32, Test Condition VIII.
Humidity (cycling Temperature)	No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence	Subject specimens to 10 cycles (10 days) between 25 and 65 °C at 80 to 100% RH. Per EIA-364-31, Method III.
Temperature life	No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence	Subject mated specimens to 125 °C for 250 hours. Per EIA-364-17, Method B, Test Condition 4.
Ingress protection.	No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence	IEC 60529, IPX7.
Use aging.	No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence	UL 486D, Sections 9.4.1.1(a). Subject specimens to 113 \pm 5°C for 168 hours.

*Remark: The text “**No mechanical damage**” means No structure is damaged/No connection becomes loose/The specimen still is fully functional in electricity after testing.*

3.6.5 Product Qualification and Requalification Test Sequence

Test group	a	b	c	d	e	f
Examination of product	1,7	1,8	1	1	1,6	1,6
Contact resistance	2,6	2,6				
Insulation resistance			2,6		5	
Withstanding Voltage			3,7			
Current rating		3,7				
Crimp tensile				2		
Random vibration	4					
Mechanical shock	5					
Durability	3					4
Mating force						3
Unmating force						5
Contact insertion force						2
Contact retention force			9			
Housing lock strength			8			
Thermal shock			4			
Humidity -temperature cycling		4	5			
Temperature life		5				
Ingress protection					2,4	
Use aging					3	
Sample size	5(a)	5(c)	5(a)	5(b)	5(b)	5(a)

NOTE

- a. 5 sets for default wire size: 20AWG.
- b. 5 sets for each wire size: 18AWG, 20AWG, 22AWG.
- c. 5 sets for 18AWG, 5 sets for 22AWG.

4.0 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.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified.

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. 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 resubmitted.

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