

2Pin&3Pin Miniature waterproof Connector**1. Purpose:**

This is qualification test. The purpose of this test is to evaluate the performance of 3 Pin latched Wire to Wire poke in Connector.

Testing was performed on below products to determine it compliance with the requirements of product specification 108-137093.

2. Scope:

This is test report for 2Pin&3Pin miniature waterproof Connector. Testing was performed at TE Connectivity Shanghai Electrical Components Test Laboratory between Apr, 2016 to Jul, 2016.

3. Conclusion:

The product met the electrical, mechanical, and environmental performance requirements of TE product specification 108-137093.

4. Test samples:

Samples were taken randomly from current production. The following part numbers were used for test:

Description	Product Part No.
Plug assembly for miniature waterproof Connector	*-2834074-*
Receptacle assembly for miniature waterproof Connector	*-2834075-*
Socket contact for miniature waterproof Connector	*-2834067-*
Pin contact for miniature waterproof Connector	*-2834068-*

5. Test Method**5.1 Examination of Product**

Visual inspection per product drawing.

Requirements: Meets visual requirements.

Test Method: In accordance with EIA-364-18

5.2 Contact Resistance

Subject the specimen to maximum allowed rating current and measure the contact resistance.

Requirements: 20mΩ Max.

Test Method: EIA-364-06

5.3 Insulation resistance

Unmated connector with 500V DC between adjacent contacts for 1 min.

Requirements: 1000 MΩMin.initial, 100 MΩMin. Final.

Test Method: EIA-364-21

5.4 Withstanding voltage

Mated connector with 1800 V AC between adjacent contacts for 1 min.

Requirements: No breakdown.

Test Method: EIA-364-20

5.5 Current rating

Mated connector measured at max rated current with series all contacts.

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

Requirement: Temperature rise should be 30°C Max.

Test method: EIA-364-70

5.6 Crimp tensile

Determine crimp tensile at a maximum rate of 25 ± 6 mm [$.98 \pm .24$ in] per minute.

Requirements:

Wire Size (AWG)	Crimp Tensile (N Min.)
18	89
20	36
22	36

Test Method: EIA-364-8.

5.7 Random Vibration

Subject mated specimens to 3.10G's rms between 20~500HZ. Fifteen minutes in each of 3 mutually perpendicular planes.

Requirements: No discontinuities of 1 microsecond or longer duration.

Test method: EIA-364-28, Test Condition VII, Condition D

5.8 Mechanical shock

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.

Requirements: No discontinuities of 1 microsecond or longer duration.

Test method: EIA-364-27, Condition A

5.9 Durability

Mating and unmating specimens for 30 cycles at a max rate of 500 cycles per hour.

Requirement: No mechanical damage; No change to performance; Contact resistance: 20mΩ Max;

Test method: EIA-364-09

5.10 Contact insertion force

Measure force necessary to insert crimped contacts into housing.

Requirements: 20N Max..

Test method: EIA-364-5.

5.11 Contact retention force

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.

Requirements: Contact shall not dislodge.

Test method: EIA-364-13

5.12 Housing lock strength

Determine housing lock strength at a maximum rate of 12.7 mm [.5 in] per minute.

Requirements: 30N Min.

Test method: EIA-364-98.

5.13 Mating force

Measure force necessary to mate specimens at a max rate of 12.7mm per minute.

Requirements: 40 Max.

Test method: EIA-364-13

5.14 Unmating force(Without latch)

Measure force necessary to unmate specimens at a max rate of 12.7mm per minute.

Requirements: 10N Max.

Test method: EIA-364-13

5.15 Thermal Shock

Subject specimens to 25 cycles between -40 and 125 °C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures.

Requirements: No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence

Test method: EIA-364-32, Test Condition VIII

5.16 Humidity (cycling Temperature)

Subject specimens to 10 cycles (10 days) between 25 and 65 °C at 80 to 100% RH.

Requirements: No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence

Test method: EIA-364-31, Method III

5.17 Temperature life

Subject mated specimens to 125 °C for 250 hours.

Requirements: No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence

Test method: EIA-364-17, Method B, Test Condition 4.

5.18 Ingress protection.

Waterproof IPX7 Test.

Requirements: No physical damage, and meet requirements of additional tests specified in Product Qualification

Test Sequence

Test method: IEC 60529, IPX7.

5.19 Use aging.

Subject specimens to 113 ± 5°C for 168 hours.

Requirements: No physical damage, and meet requirements of additional tests specified in Product Qualification

Test Sequence

Test method: UL 486D, Sections 9.4.1.1(a).

6. Unless otherwise stated, the following environmental conditions prevailed during testing:

Temperature: 15°C to 35°C Relative Humidity: 25% to 75%

7. 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

8. Test Result

Group	Test Item	N	Condition	Test Result			Requirement	Judgment
				Max	Min	Ave		
A	Examination of Product	5	Initial	Meets visual requirements.			No abnormalities	Pass
	Contact resistance	5	Initial	3.88	3.85	4.22	<20mΩ	Pass
	Durability	5	Final	No mechanical damage			No abnormalities	Pass
	Random Vibration	5	Final	No discontinuities of 1 microsecond or longer duration occurred			No abnormalities	Pass
	Mechanical Shock	5	Final	No discontinuities of 1 microsecond or longer duration occurred			No abnormalities	Pass
	Contact resistance	5	Final	12.19	13.03	17.10	<20mΩ	Pass
	Examination of Product	5	Final	Meets visual requirements.			No abnormalities	Pass
B	Examination of Product	5	Initial	Meets visual requirements.			No abnormalities	Pass
	Contact resistance	5	Initial (18AWG)	3.91	3.35	3.73	<20mΩ	Pass
		5	Initial (22AWG)	3.38	3.63	3.88	<20mΩ	Pass
	Current rating	5	Initial (18AWG)	9.7°C	13.3°C	12.20°C	<30°C	Pass
		5	Initial (22AWG)	15.45°C	13.20°C	14.36°C	<30°C	Pass
	Humidity (Temperature cycling)	5	Final	No physical damage occurred			No abnormalities	Pass
	Temperature life	5	Final	No physical damage occurred			No abnormalities	Pass
	Contact resistance	5	Final (18AWG)	4.40	4.85	8.75	<20mΩ	Pass
		5	Final (22AWG)	5.72	4.60	6.65	<20mΩ	Pass
	Current rating	5	Final (18AWG)	14.45°C	17.30°C	17.65°C	<30°C	Pass
5		Final (22AWG)	17.50°C	19.95°C	20.45°C	<30°C	Pass	
Examination of Product	5	Final	Meets visual requirements.			No abnormalities	Pass	
C	Examination of Product	5	Initial	No physical damage occurred			No abnormalities	Pass
	Insulation resistance	5	Initial	7.21E+11	5.55E+11	3.81E+11	>1000MΩ	Pass
	Withstanding Voltage	5	Initial	No breakdown			No abnormalities	Pass
	Thermal shock	5	Final	No physical damage occurred			No abnormalities	Pass
	Humidity (Temperature cycling)	5	Final	No physical damage occurred			No abnormalities	Pass

	Insulation resistance	5	Final	1.62E+11	0.54E+11	0.28E+11	>100MΩ	Pass
	Withstanding Voltage	5	Final	No breakdown			No abnormalities	Pass
	Housing lock strength	5	Final	93.66	120.09	119.41	>30N	Pass
	Contact retention force	5	Final	Contacts no dislodge.			No abnormalities	Pass
	Examination of Product	5	Final	No physical damage occurred			No abnormalities	Pass
D	Examination of Product	5	Initial	Meets visual requirements.			No abnormalities	Pass
	Crimp tensile 18AWG	5	Pin Contact	123.22	113.09	132.88	>89N	Pass
		5	Socket Contact	107.38	101.69	120.25	>89N	Pass
	Crimp tensile 20AWG	5	Pin Contact	91.95	101.08	89.89	>36N	Pass
		5	Socket Contact	57.08	80.45	56.69	>36N	Pass
	Crimp tensile 22AWG	5	Pin Contact	74.83	82.47	80.38	>36N	Pass
5		Socket Contact	83.19	83.98	82.25	>36N	Pass	
E	Examination of Product	5	Initial	Meets visual requirements.			No abnormalities	Pass
	Ingress protection	5	Final	No water ingress			No abnormalities	Pass
	Use aging	5	Final	No physical damage occurred			No abnormalities	Pass
	Ingress protection	5	Final	No water ingress			No abnormalities	Pass
	Insulation resistance	5	Final	0.73E+12	3.03E+12	3.63E+12	>100MΩ	Pass
	Examination of Product	5	Final	No physical damage occurred			No abnormalities	Pass
F	Examination of Product	5	Initial	Meets visual requirements.			No abnormalities	Pass
	Contact insertion force	5	Final	3.76	3.81	3.77	<20N	Pass
	Mating force	5	Final	11.69	14.03	15.85	<40N	Pass
	Durability	5	Final	No physical damage occurred			No abnormalities	Pass
	Unmating force(Without latch)	5	Final	3.69	3.13	3.50	<10N	Pass
	Examination of Product	5	Final	No physical damage occurred			No abnormalities	Pass

END