Product Specification

EX150 Power Connector Specification

Revision: B0

PROPRIETARY NOTE

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1. Scope

This specification covers the material and performance requirements for the EX150 series 150A/Per Pair High Current Power Connector.

2. Applicable documents

In the event of conflict between requirements of this specification and product drawing, product drawing shall take precedence. In the event of conflict between requirements of this specification and referenced documents, this specification take precedence.

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 Material

Must be compatible with lead-free soldering process

Housing: High Temperature Thermoplastic UL94-V0;

Contact: High Conductivity Copper Alloy,

Gold plated at mating area & Sn plated at solder tail, all over Nickel;

3.3 Ratings

Voltage Rating: 600V DC/250V AC @ Power Pin, 120V AC/DC @ Signal Pin

Current Rating: 150 A @ Power Blade, 7.5A @ Signal Pin

Operating Temperature: -40℃ ~ +125℃.

4. Test requirement and procedures summary

4.1 Examination of product

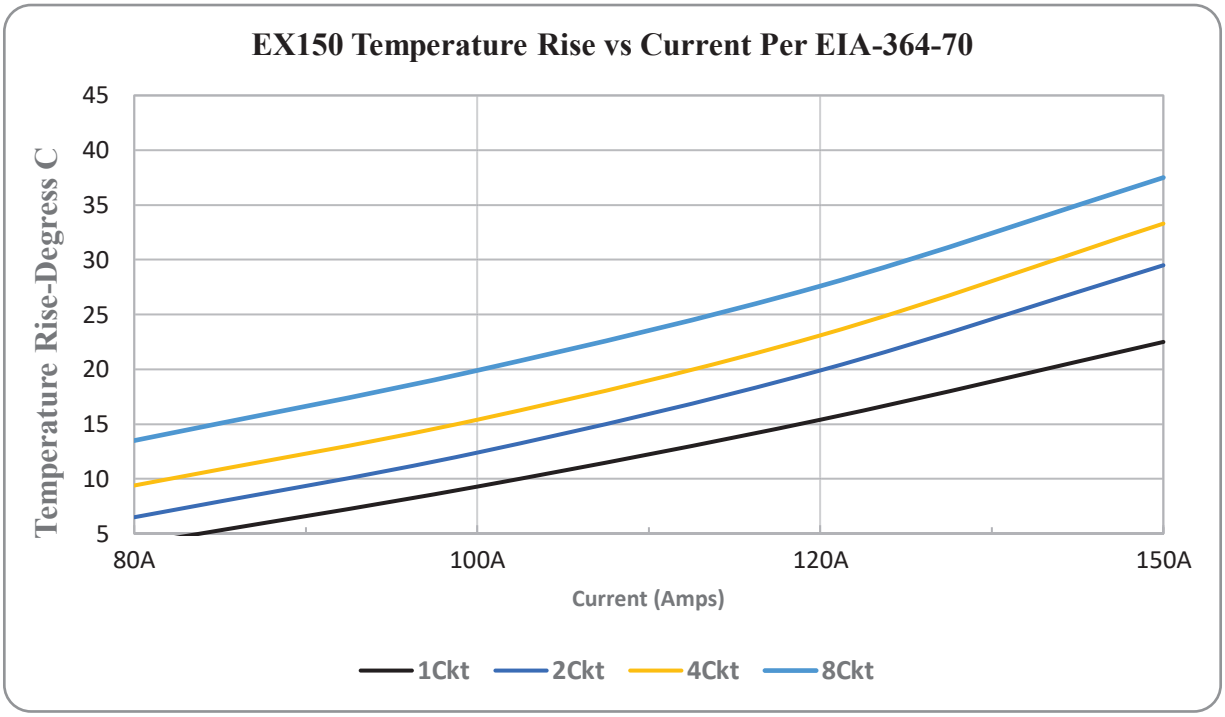
Test	Requirements	Test Procedure
Examination of product	Meets requirements of applicable product drawing and specification	Visual, dimensional and functional per applicable quality inspection plan

4.2 Electrical Performance requirements

Test	Requirements	Test Procedure
Contact Resistance (Low Level)	0.5 mΩ Max @ Power Blade (initail), 10 mΩ Max @Signal Pin (initial); 1.0 mΩ Max change @ Power Blade (final), 20 mΩ Max change @ Signal Pin (final);	Mated contacts assembled in housing; 20mV Max, 100mA max. (EIA-364-23)
Insulation Resistance	5000 MΩ Min @ Power Blade; 500 MΩ Min @ Signal Pin	Impress Voltage 500V DC. Test between adjacent circuits of unmated connectors. (EIA-364-21)

4.2 Electrical Performance requirements

Test	Requirements	Test Procedure
Dielectric withstanding Voltage	2000 VDC RMS @ Power Blade; 500V DC RMS @ Signal Pin,No discharge, flashover or breakdown.	Test between adjacent circuits of unmated connectors for 1 minutes. (EIA-364-20)
Temperature rise	Mate connectors Measure T-Rise @ Rated Current After 0.5 Hours min.	EIA-364-70



4.3 Mechanical performance requirements

Test	Requirements	Test Procedure
Mating force	24.5N Max. (2.5Kgf Max.)/Per Pair	Operation speed: 25.4mm/ minute Measure the force required to mate connector. (EIA-364-13)
Withdrawal force	4.9N.(0.5Kgf Min.) /Per Pair	Operation speed: 25.4mm/ minute Measure the force required to unmate connector (EIA-364-13)
Durability	1.Contact Resistance: 1.5 mΩ Max @ Power Blade, 30 mΩ Max @ Signal Pin 2.No evidence of physical damage	Mating/Unmating 5,000 cycles max. (Reference, confirm after the test results) at a max rate of 10 cycles per minute. (EIA-364-09)
Durability (preconditioning)	No evidence of physical damage	Mating/Unmating 50 cycles at a max rate of 10 cycles per minute (EIA-364-09)

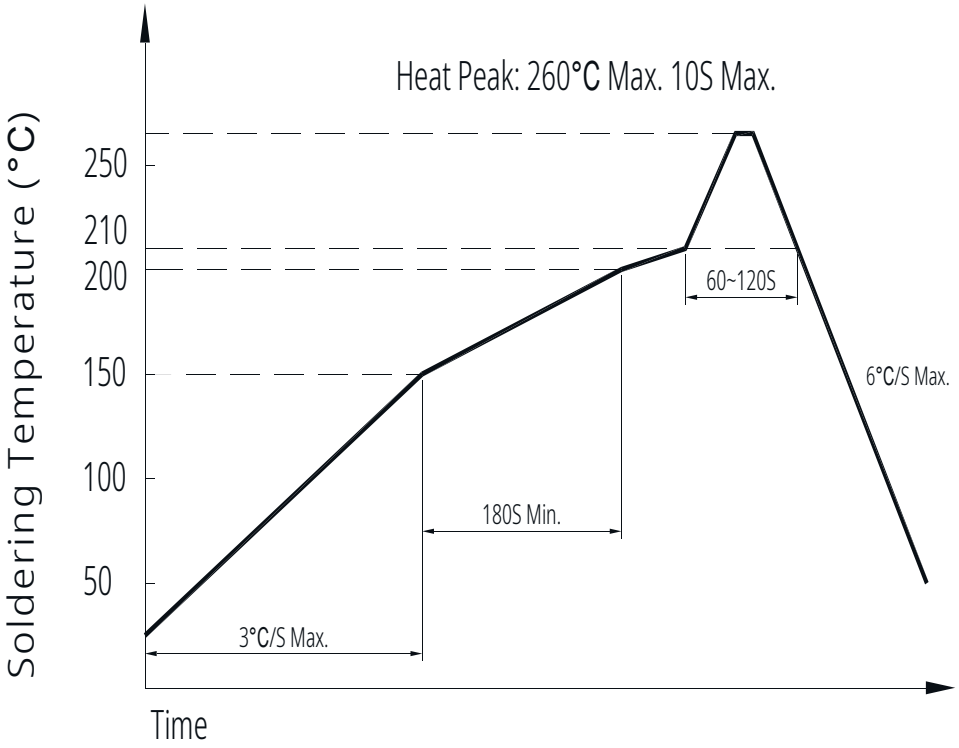
4.3 Mechanical performance requirements

Test	Requirements	Test Procedure
Reseating	1.Contact Resistance: 1.5 mΩ Max @ Power Blade, 30 mΩ Max @ Signal Pin 2.No evidence of physical damage	Manually unplug/plug the connector or socket. Perform 3 such cycles.
Contact Retention	13.0N (1.3Kgf) Min @ Plug, 7.0N (0.7 Kgf) Min @ Receptacle	Axial pullout force on the terminal in the housing at a rate of 25.4±6 mm/minute. (EIA-364-29)
Max Insertion force in to PCB	45.1N (4.6Kgf) max. @ per Pin	Insert contact at a rate of 25.4±6 mm per minute to 1.15mm (finish) PCB holes
	9.8N (1.0Kgf) min. @ per Pin	Insert contact at a rate of 25.4±6 mm per minute to 1.15mm (finish) PCB holes
Thermal Shock	1.Contact Resistance: 1.5 mΩ Max @ Power Blade, 30 mΩ Max @ Signal Pin 2.No evidence of physical damage	Mated connectors. -55℃ ~ +85℃ for 30 Minutes/cycle, repeat 10 cycles. (EIA-364-32 test condition I)
Temperature Life	1.Contact Resistance: 1.5 mΩ Max @ Power Blade, 30 mΩ Max @ Signal Pin 2.No evidence of physical damage	Mated connector. 105℃ Duration: 240H (EIA-364-17)
Temperature Life (Preconditioning)	1.Contact Resistance: 1.5 mΩ Max @ Power Blade, 30 mΩ Max @ Signal Pin 2.No evidence of physical damage	Mated connector. 105℃ Duration: 120H (EIA-364-17)
Thermal Disturbance	1.Contact Resistance: 1.5 mΩ Max @ Power Blade, 30 mΩ Max @ Signal Pin 2.No evidence of physical damage	Cycle the connector between 15℃+/-3℃ and 85℃+/-3℃, as measured on the part. Ramps should be a minimum of 2℃/Min., And dwell times should insure that the contacts reach the temperature Extremes (a minimum of 5 minutes) Humidity is not controlled. Perform 10 such cycles.

4.3 Mechanical performance requirements

Test	Requirements	Test Procedure
Temperature-Humidity Cycle test	1.Contact Resistance: 1.5 mΩ Max @ Power Blade, 30 mΩ Max @ Signal Pin 2.No evidence of physical damage	Mated Connector Initial measurement, cold shock and vibration. Except cycle the connector between 25℃ ±3℃ at 80%±3%RH and 65℃ ±3℃ at 50%±3%RH. Ramp times should be 0.5 hour and dwell times should be 1.0 hour. Dwell times start when the temperature and humidity have stabilized within the specified levels. Perform 24 such cycles. EIA-364-31, method III
Salt Spray	Contact Resistance: 1.5 mΩ Max @ Power Blade, 30 mΩ Max @ Signal Pin	Subject mated connectors to 5% salt concentration for 48 hours. (EIA-364-26)
Solderability	Wet Solder Coverage: 95%Min.	Dip Test: Solder temperature: 245±5℃, Immersion Duration: 3±0.5 seconds (EIA-364-56)
		Hand soldering, 60~100W electric ferrochrome, 370~430℃,2~4 seconds
Resistance to Reflow Soldering Heat	No physical damage shall occur	IR Reflow: Test connector on PCB Pre-Heat 150~200℃: 180sec.Min. Heat 210℃ Min.: 60~120sec. Heat Peak 260℃ Max. 10sec. Max. (EIA-364-56)
		Wave solder: Temperature(solder): 260+0℃/-5℃ Duration: 10±1 seconds. (EIA-364-56)

Figure-1 Soldering Profile / 插板焊接制程建议参数设定



IR Reflow Temperature Profile

Description	Requirement
Average Ramp Rate	3°C/sec Max
Preheat Temperature	150°C Min to 200°C Max
Preheat Time	60 to 180 sec
Ramp to Peak	3°C/sec Max
Peak Temperature	260 ±5°C
Ramp - Cool Down	6°C/sec Max

Figure-2 Typical Mating Sequence / 对配行程设定

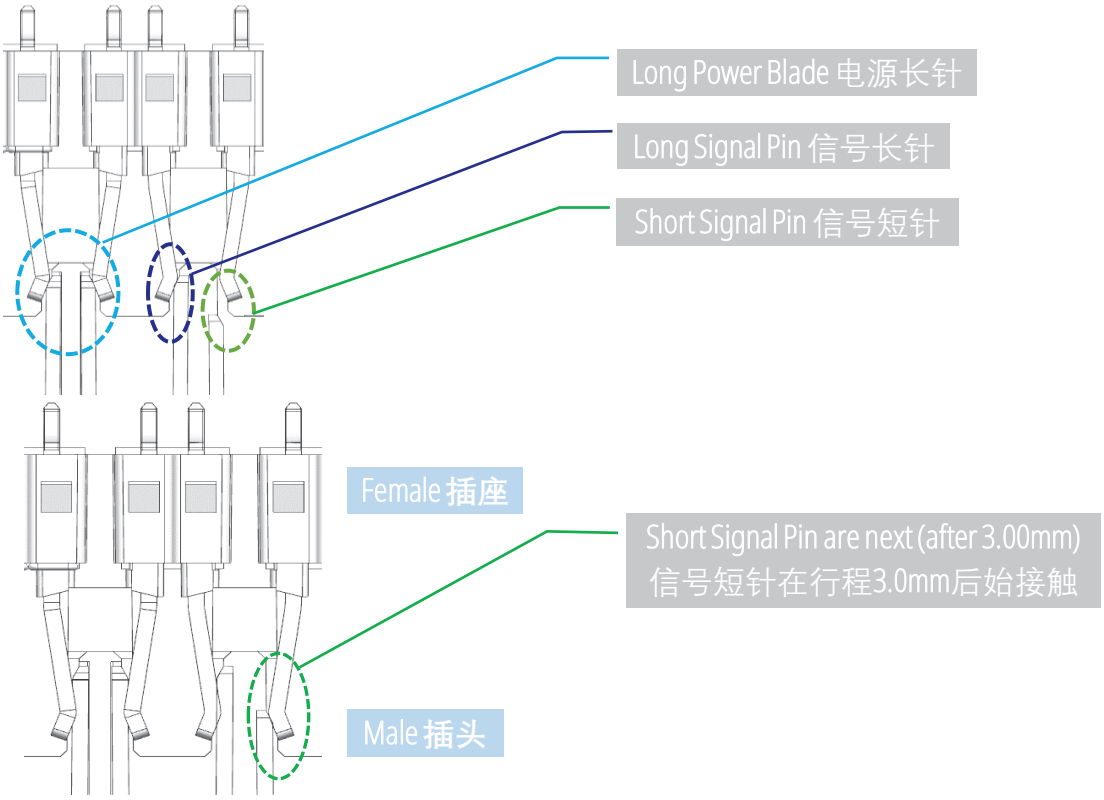
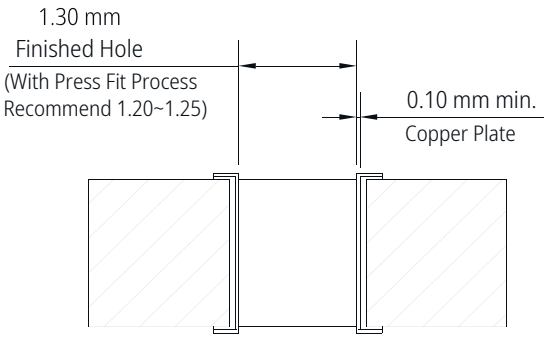
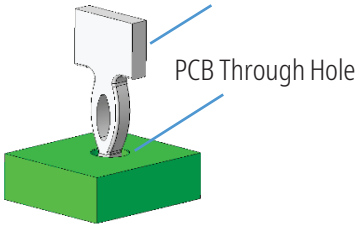


Figure-3 Recommended PCB Through Hole Spec./ 建议PCB开孔规格





（参考）插板力

Insertion force into PCB for Terminal with compliant Pins

1) Ø1.08mm 5.8 kgf max./per pin.
2) Ø1.15mm 4.6 kgf max./per pin
3) Ø1.20mm 3.3 kgf max./per pin
4) Ø1.25mm 1.4 kgf max./per pin
5) Ø1.30mm 0.3 kgf max./per pin

Figure-4 Board Insertion Procedure for Press Fit Connector/ 建议压接工艺

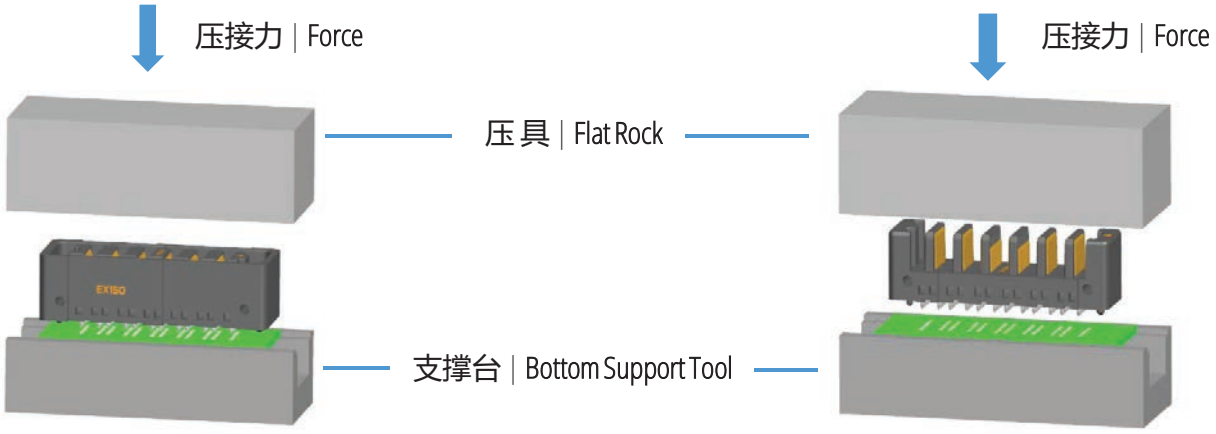


Figure-5 Diagram of the recommended assembly / 建议装配示意图

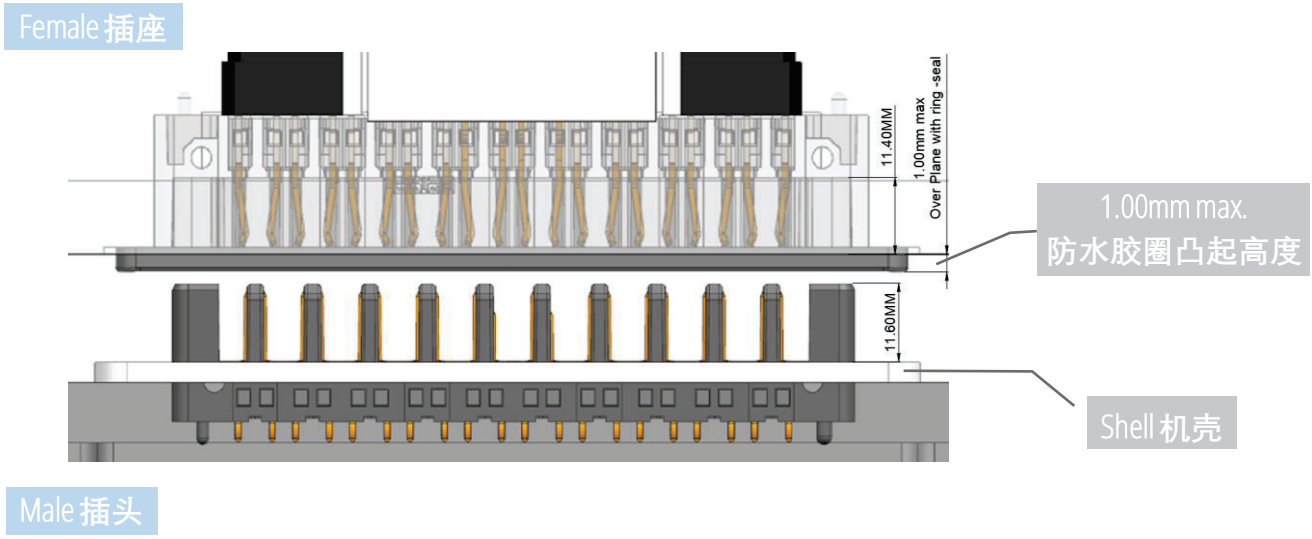


Figure-6 Diagram of the recommended waterproof application / 建议防水应用装配示意图

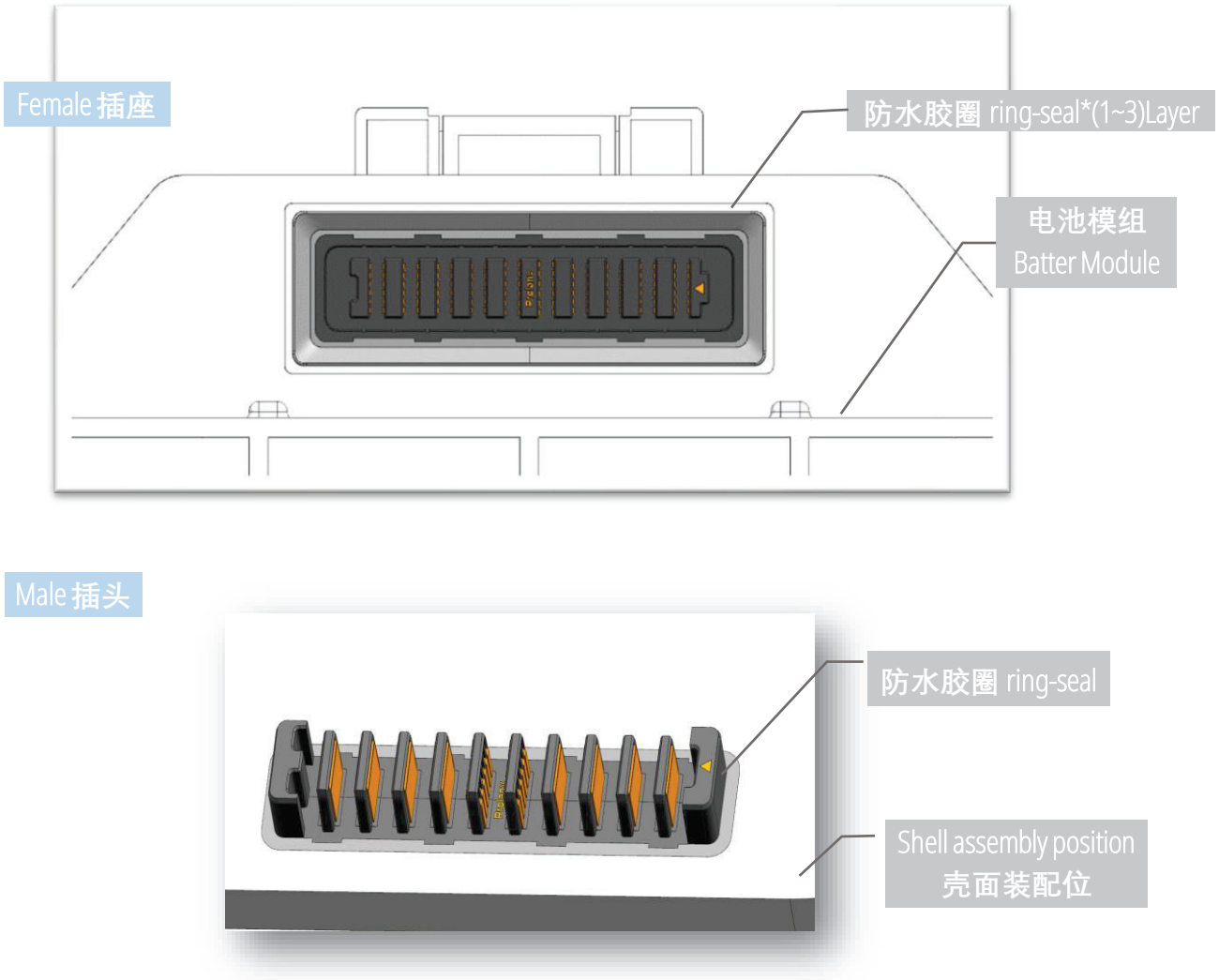


Figure-7 Recommended application methods of connecting wire / 接线示意图 （焊接或锁定结构）

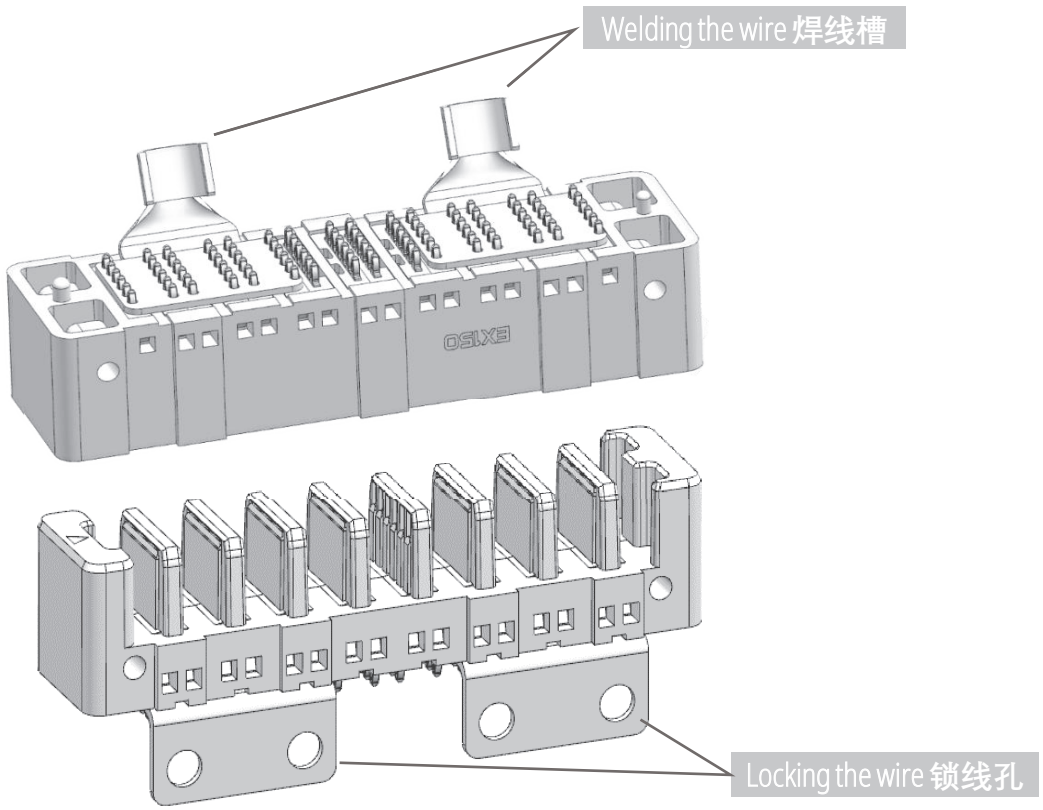
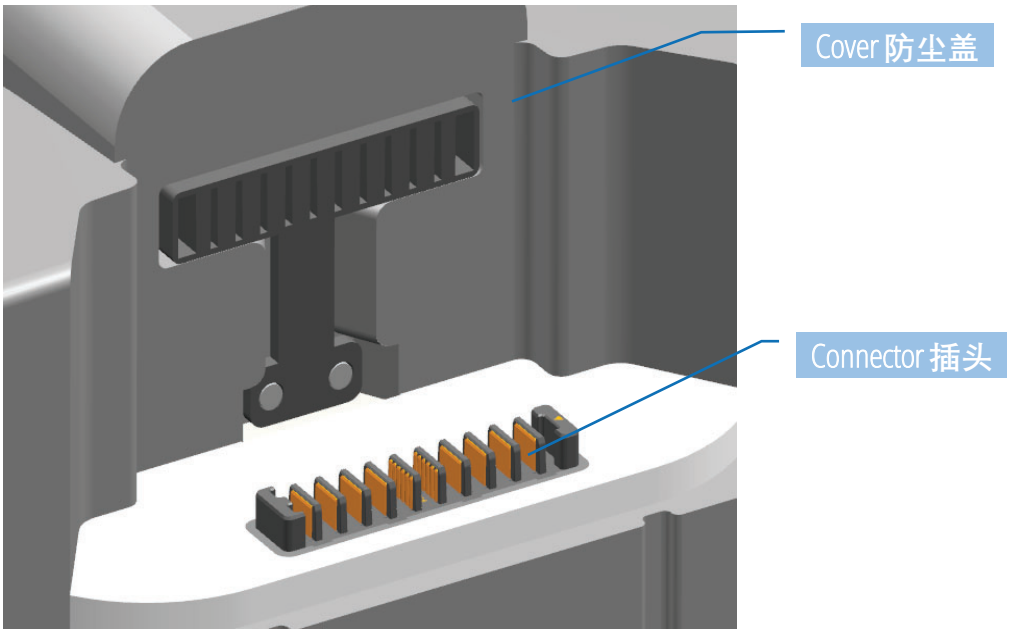


Figure-8 On standby, reommended to protect Connector with cover / 待机状态，建议使用防尘盖



4.5 Product qualification and requalification test

Test or Examination	Test Group								
	A	B	C	D	E	F	G	H	I
Examination of product	1,10, 13	1,7,11, 15,18	1,7,11, 15,18	1,7,11, 14	1,6,11	1,7	1,4	1,3	1,3,5
Contact Resistance (low level)	3,11	3,8,12, 16	3,8,12, 16	3,8,12	2,7,12	2,8			4
Insulation Resistance					3,8,13	3,9			
Dielectric withstanding Voltage					4,9,14	4, 10			
Temperature rise (Current Rating)	4,12	4,9,13, 17	4,9,13, 17	4,9,13					
Mating force	5,8								
Withdrawal force	6,9								
Durability	7								
Durability (preconditioning)		5	5	5	5	5			
Reseating		14	14	10					
Contact Retention								2	
Max Insertion force in to PCB									2
Thermal Shock			6						
Temperature Life				6	10				
Temperature Life (Preconditioning)		6							
Thermal Disturbance		10							
Temperature-Humidity Cycle test			10						
Salt Spray						6			
Solderability (Hand)	2	2	2	2					
Solderability							3		
Resistance to Reflow Soldering Heat							2		