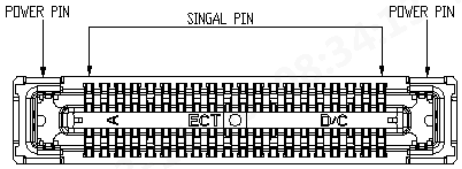
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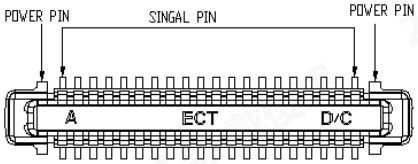
Product Specification

Rev.	Description	Written/Date	Checked/Date	Approved/Date
X1	New Release per ZPDR23070006	Sean.zhang 11/06/23’	Roc.Xu 11/06/23’	DJH 11/06/23’

1.0 Scope: This specification covers the requirements for product performance and test methods of ECT’s Board To Board High current Connectors of the part numbers specified as bellow. Product shall be of the design, construction and physical dimensions specified in the applicable product drawing.

本规格书包含了ECT 板对板 大电流 连接器(料号见列表)的性能需求
测试方法. 产品的设计, 结构, 形状和尺寸应该在适当的产品图面中进行描述.





	PLUG	RECEP
PIN	PART NO.	PART NO.
10	818051887	818051886
16	818051815	818051814
24	818051817	818051816
32	818051819	818051818
40	818044587	818044588
50	818053991	818053992
60	818053989	818053990

2.0 Rating:

2.1 Voltage Rating: 60V AC/DC

额定电压:60 V AC / DC

2.2 Rated current : For signal pin 0.3 AMPS/Pin (Max), For power pin 6 AMPS / Pin (Max)

额定电流: 信号 Pin 0.3 AMPS/Pin（Max）,电源 Pin 6 AMPS/Pin (Max)

2.3 Temperature Range: -40℃ to +85℃ storage; -40℃ to +85℃ operating

温度范围：-40℃ to +85℃ storage; -40℃ to +85℃ operating

3.0 Test Condition:(测试条件)

All tests shall be performed as bellow conditions unless otherwise specified.
所有测试依据以下规格条件执行，特别说明规格除外。

3.1 Temperature range : +15℃ to +35℃

测试温度范围：+15℃ to +35℃

3.2 Humidity range: 25% to 80%

测试湿度范围：25% to 80%

3.3 Atmospheric Pressure: 86kPa to 106 kPa (860 to 1060 m bar)

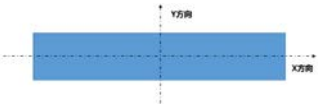
测试大气压力：86kPa to 106 kPa (860 to 1060 m bar)

4.0 Test Methods and Requirements(测试方法和要求):

4.1 Examination of product(产品外观检验)

Item 项目	Test Description 测试描述	Test Methods 测试条件	Requirement 要求
4.1.1	Examination of product (Outward Appearance Structure) 产品外观结构检验	**EIA 364-18** Shall be confirmed with eyes in accordance with each drawing. Shall be confirmed by using proper measuring instruments. 依照图面要求对产品目视检查，再用测量工具按图面要求测量尺寸	1). Shall meet visual requirement, show no physical damage. 外观没有任何的物理损坏 2). Structure shall be meet the design and dimensional requirements of drawing.外观结构应满足图纸的设计和尺寸要求
4.2 Electrical Performance（电气性能）:			
Item 项目	Test Description 测试描述	Test Methods 测试条件	Requirement 要求
4.2.1	低功率接触阻抗 LLCR	**Refer to EIA-364-23C** Refer to EIA-364-23C 100 milliamperes at 20 millivolts open circuit	信号 pin（signal）: 初始 LLCR Max. 50 mΩ Initial Max. 50 mΩ 寿命&环境后△20mΩ ▵ 20mΩ after test 电源 pin（Power）: 初始 LLCR Max . 15mΩ Initial LLCR Max. 15mΩ 寿命&环境后 Max. 15mΩ Max. 15mΩ after test
4.2.2	绝缘阻抗 Insulation resistance	**Refer to EIA-364-21D** Refer to EIA-364-21D Apply 500 VDC (Pitch≥ 0.35) /250 VDC(Pitch≤ 0.35) between conductors for 2 minutes , which should not make contact under normal condition1000 MΩ Min.	1000 MΩ Min.
4.2.3	耐电压 Dielectric with standing voltage	**EIA-364-20D 方法 A** Refer to EIA-364-20D Method A	无压降，漏电流≤0.5mA No voltage breakdown，the electrical

		500 AC(Pitch≥ 0.35)/250 AC(Pitch≤ 0.35) 60Hz for 1 min Include contact to contact and contact to shell	leakage ≤ 0.5mA No voltage breakdown
4.2.4	温升 Temperature rise	**EIA-364-70B，Method 1.** Refer to EIA-364-70B，Method 1. Measured at maximum rated current with series all contacts.	测试后，最大温升 30 ° C Max After tests maximum increase for environmental temperature, 30 °C Max. 电源 Pin PCB 铜箔 Pad 尺寸： 长*宽*厚=10*5*0.035 Dimensions of Copper Foil for Power Pin Pad: Length*width*thickness=10*5*0.035
4.3 Mechanical requirement (机械性能):			
Item 项目	Test Description 测试描述	Test Methods 测试条件	Requirement 要求
4.3.1	随机振动 Radom Vibration	**Refer to EIA-364-28F 条件 V** Refer to EIA-364-28F ,condition v test letter A 5.35Gs RMS 15 MINUTES each axis	端子瞬断时间小于 1us. Discontinuity max 1 μs all contacts in series
4.3.2	正弦振动 Sine Vibration	**Refer to EIA-364-28F 条件 I** Refer to EIA-364-28F ,condition I Amplitude 1.52 mm (0.06 in),10 Hz to 55 Hz in 1 minute,2 hours in each of three mutually perpendicular directions (total of 6 hours) under electrical load conditions.	端子瞬断时间小于 1us. Discontinuity max 1 μs all contacts in series
4.3.3	机械冲击 Mechanical Shock	**Refer to EIA-364-27C** 50G'S HALF SINE 11 ms duration three shocks each axis	端子瞬断时间小于 1us. Discontinuity max 1 μs all contacts in series
4.3.4	跌落测试 Drop test	Receptacle soldered to pwb (Pb-free). Pwb mounted to 180g jig. Plug mated to receptacle. Drop from 1.5m 18 times.6 directions each 3 times	无机械损伤 无焊脚开裂 电气性能 ok

		公母座连接器分别焊接在 PCB 板上，并配合到位，固定在 180g 重量的夹具上，从 1.5 米高处自由落体 18 次（6 个方向，每个方向各 3 次）	端子瞬断时间小于 1us. No mechanism damage No cracks on solder joints. Electric function is O.K. Discontinuity max 1 μs all contacts in series
4.3.5	X/Y 推力测试 X/Y direction HSG strength	BTB 公母头配合后，沿 X/Y 方向剪切错动，直至破坏，记录 HSG 抗破坏曲线及最大力值； BTB on PCB and mating status , make plug and Rec. shear slip by X/Y direction until HSG broken, record curves and get the Max value dates of shear strength.	HSG X 方向抗剪切破坏强度≥30N； X direction HSG strength need ≥30N HSG Y 方向抗剪切破坏强度≥35N； Y direction HSG strength need ≥35N 
4.3.6	导向能力测试 Guiding test	公母头 X/Y 方向错位 0.2mm 扣合测试（不可浮动），扣合力上限设定 60N； Make mating test by BTB Plug & Rec. offset 0.2mm in X/Y direction, set upper limit mating force ＜60N	公母无扣合破损及碎屑 No broken and scrap on Plug & Rec. side
4.3.7	寿命 Durability	**Refer to EIA-364-09C** Make the specimens that are on board mated, then fix the receptacles to the machine on horizontal or perpendicular direction. Use the machine catch the plugs and separate the specimens, then make the plugs be fully mated with receptacles at a rate of 12.5millimeters/minute on horizontal or perpendicular direction.duration:10 cycles 将焊板的 BTB 公端与母端配合好后将母端水平或垂直固定在测试仪器上，用仪器夹住公端分离，然后将公端以 12.5 millimeters/minute 的速度水平或垂直插入焊板母端直到配合到位，循环	30 次，无机械损伤，端子阻抗；产品的插入/拔出力满足规格. 30 Times，No mechanical damage, contact resistance，Connector Mating/un-mating in spec .

		30 次	
4.3.8	Connector Mating & Unmating Force 插入/拔出力	**Refer to EIA-364-13E 方法 A** The connectors shall be fully mated or coupled at a rate of 10 millimeters / minute, the peak force required for mating shall be recorded.	**Total Insertion Force(插入力)** 寿命前后 50N Max before and after durability 50N Max **Total Extraction Force(拔出力)** 10/16/24pin 寿命前（首次）： 总计 6N Min Total 6N Min 10/16/24pin pin 寿命后： 总计 4N Min Total 4N Min 32/40/50/60pin 寿命前（首次）： 总计 10N Min Total 10N Min 32/40/50/60pin 寿命后： 总计 8N Min Total 8N Min
4.3.9	手感率 Click ratio	从插拔力曲线中的插入力峰值和谷值计算手感率； After mating/un-mating test , calculate click ratio by mating force peak & Valley value.	初始手感率≥60%，前 5 次≥60%，寿命后≥40% Initial Click ratio ≥60%，First 5 times ≥60%，After test ≥40%
4.3.10	端子容差要求 Nominal Value of contact offset requirement	公母扣合后在 X 方向（pitch）错位 0.10MM，不会发生短路断路现象.	公母互配后，端子在 pitch 方向错位 0.1mm，不会发生短路断路 Contact offset 0.1mm in pitch direction, no short circuit or open circuit.
4.3.11	端子保持力 Contact retention force	夹持端子的料带，沿着组装的反方向，将端子拔出，记录拔出的力量。 The bridge with holding contacts pulls out contacts along with the direction against assembly, and record extraction force. Minimum Number of samples: 5 pcs Connector(both Rec.& Plug) contact tack out from HSG	最小 0.2N 每 Pin 0.2N Min / pin

4.4 Environmental performance（环境性能）

Item 项目	Test Description 测试描述	Test Methods 测试条件	Requirement 要求
4.4.1	温度寿命 Temperature life	**Refer to** EIA-364-17，方法 A，测试条件 3 Refer to EIA-364-17， Method A， test condition 3 ,96h for connectors Chamber temperature is 85+/-2°C(temperature rise + chamber temperature = specified test temperature)	无机械损伤，无性能变化 LLCR:Δ R =20mΩ Max. 绝缘阻抗≥1000MΩ No mechanical damage No change to performance Contact resistance: Δ R =20mΩMax. Insulation resistance ≥ 1000MΩ
4.4.2	低温 Low Temperature	**Refer to** EIA-364-59A，测试条件 3，持续时间 D Refer to EIA-364-59A test condition 3 ,duration D Temperature -40+/-3°C 96h	无机械损伤，无性能变化 LLCR:Δ R =20mΩ Max. 绝缘阻抗≥1000MΩ No mechanical damage No change to performance Contact resistance: Δ R =20mΩ Max. Insulation resistance ≥ 1000MΩ
4.4.3	湿热循环 Humidity-Temperature Cycling	**Refer to** EIA-364-31C Method IV, Test condition B Refer to EIA-364-31C Method IV, Test condition B 10 cycle (240Hr)	无机械损伤 无性能变化 LLCR:Δ R =20mΩ Max. 绝缘阻抗≥1000MΩ No mechanical damage No change to performance Contact resistance: Δ R =20mΩ Max. Insulation resistance ≥ 1000MΩ

4.4.4	**高温高湿** High-temperature and humidity	**Refer to EIA-364-31C** Refer to EIA-364-31C High-temperature 85°C , 95%RH Duration : 120h	无机械损伤 无性能变化 LLCR:Δ R =20mΩ Max. 绝缘阻抗≥1000MΩ No mechanical damage No change to performance Contact resistance: Δ R =20mΩ Max. Insulation resistance ≥ 1000MΩ
4.4.5	温冲 Thermal shock	**Refer to EIA-364-32F ,方法 A, 测试条件：, 持续时间：A-1** Refer to EIA-364-32F method A, test condition I, test duration A-1 25 cycle at Ta = - 55 °C (+0/-5℃) for 0.5 hours; then change of temp=25°C (+/-10℃) Maximum 5 min; then Tb=+85°C(+3/-0℃) for 0.5 hours; then cool to ambient. Recovery: 2 hours at ambient atmosphere.	无机械损伤 无性能变化 LLCR:ΔR =20mΩ Max. 绝缘阻抗≥1000MΩ No mechanical damage No change to performance Contact resistance: ΔR =20mΩ Max. Insulation resistance ≥ 1000MΩ
4.4.6	**盐雾** Salt spray	**Refer to EIA-364-26B，测试条件 B.** Refer to EIA-364-26B Test condition B 48 hour spray, At temp.35°±2°c R/H 95-98% Salt NaCl mist 5% After test wash parts and return to room ambient for 2 hours	无机械损伤 无性能变化 LLCR:ΔR =20mΩ Max. 绝缘阻抗≥1000MΩ No mechanical damage No change to performance Contact resistance: ΔR =20mΩ Max. Insulation resistance ≥ 1000MΩ
4.5 Solder-ability requirement(焊接性能)			
4.5.1	Surface Mount Solder-ability Test 沾锡测试	**Refer to IPC-J-STD-002C.** 参考 IPC-J-STD-002C.	At least 95% of immersed area should be adequately wetted on all samples except on cutting edge 除了端子的裁切面外，所有样品的焊脚沾锡面积至少95%

4.5.2	Resistance to Reflow Soldering Heat: 过炉测试	**Refer to IPC-J-STD-002C.** 参考IPC-J-STD-002C. 测试样品需过炉三次 参考客户炉温曲线 不带锡膏，不使用氮气 Refer to IPC-J-STD-002C The unmated DUT should withstand three immediately followed reflow processes meet Huawei IR curve. Nitrogen is not allowed for this test. Number of reflows should meet at least 3 cycles.	产品功能ok 电气性能ok 产品过炉后尺寸仍需满足规格要求 The functional and electrical requirements still fulfilled. No deformation of component after reflow on any side of the component
4.5.3	Flux resistance / penetration: 爬锡&锡渗透	**Refer to IPC-J-STD-002C.** 参考IPC-J-STD-002C 测试样品需过炉三次 参考客户炉温曲线 焊盘，钢网开口和厚度 The component should withstand three immediately followed Huawei reflow requirements.	不允许助焊剂和锡膏侵入到端子接触部位 产品功能OK 电气性能ok No flux or solder ingression into contact area. The functional and electrical requirements fulfilled
4.5.4	Co-planarity measurement during reflow cycle 炉后共面度	**Refer to IPC-J-STD-002C.** **参考** IPC-J-STD-002C. Refer to IPC-J-STD-002C The co-planarity of the soldering terminals should be measured during the whole reflow cycle which meet the maximum limits stated by IPC-J-STD-002C, latest revision.	炉前max 0.08 mm **炉中**max 0.10mm 炉后max 0.10mm Co-planarity max 0.08 mm During IR max 0.10mm After IR 0.10mm
4.5.5	Solder peel off strength 焊接强度	Minimum Number of samples: 10 pcs Connector(both Rec.& Plug) peeling strength from board Final peel off force should be noted for each direction.	Min 1N/pin

5.0 INFRARED REFLOW CONDITION (回流焊曲线条件)

过炉回流曲线要求	
参数	典型值
均温区要求 （150°C 到 200°C）	100~120 s
峰值温升速率(TL~Tp)	Max: 3°C /s
液态线（217°C）以上时间	100~150s
最低回流峰值温度	255°C
250°C 以上时间	Min: 30s
冷却阶段的斜率（Tp~TL）	Max: -6℃/s
25°C 到 Tp 时间	Max: 8min

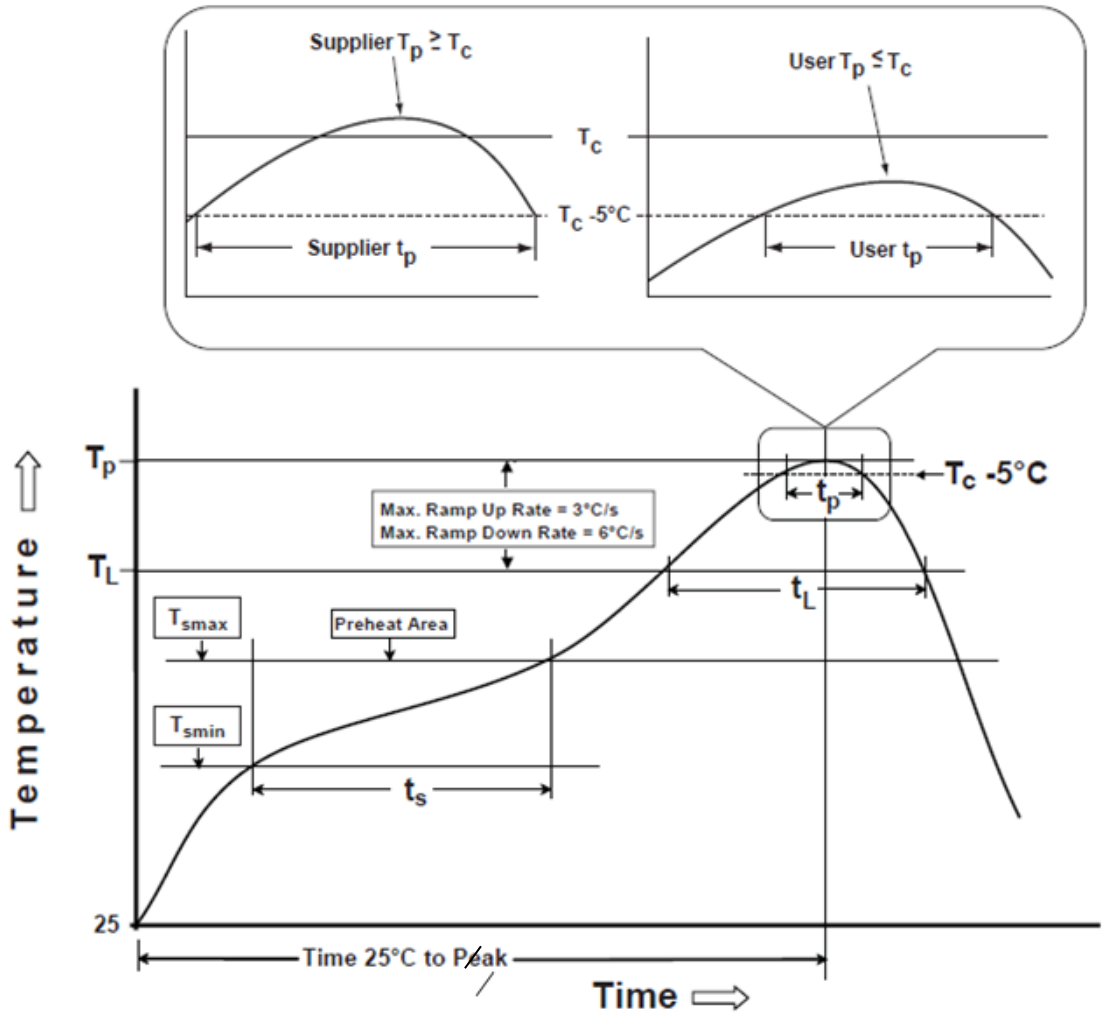


Fig1.Reflow Temperature profile

6.0 INSTRUCTION OF APPLICATION TO USAGE 产品组装的使用说明

This specification is written based on the supposition that the receptacle is mounted on PCB (Hard PCB) and the plug is mounted on FPC. In the case of the receptacle is mounted on FPC and the plug is mounted on PCB (Hard PCB) is also covered. Receptacle contains formable terminal. Please pay attention to un-mating process of connectors if you mount Receptacle on FPC

本说明书根据母座端往PCB基板（硬板）侧实际安装、公座端往FPC（软板）侧，实际安装的设想而作成，同时也适用于公座端往FPC（软板）、公座往PCB基板（硬板）上的实装。母座上的端子容易变形，实装到FPC（软板）上时，特别要注意拔出时的操作。

6.1 MATING (插入操作相关)

6.1.1 HOW TO MATE(INSERTION) 组合方法（插入方法）

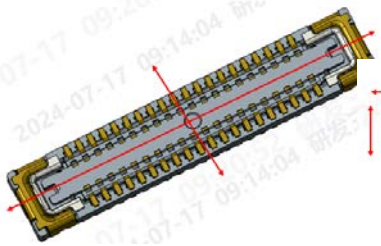
After positioning correctly for mating ,then the distance between PCB and FPC is about 1.30mm, insert the Plug to the receptacle in parallel with each other.

组合时（插入时）请对好位置再进行。位置对好时，PCB基板和FPC软板间的尺寸大概位置在1.30mm之后，请将公座侧与母座侧保持平衡后再插入

Please find correct position at inside wall of receptacle and inside wall of plug

正确的位置调合如右图，请沿母座内壁和公座内壁来进行操作

STEP 1

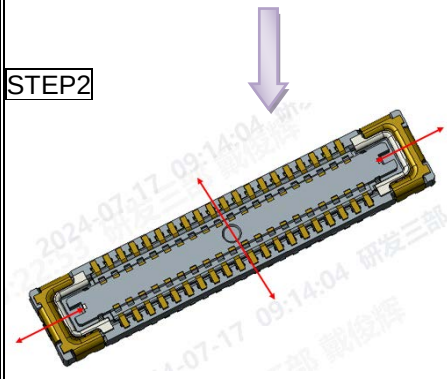


Positioning the plug correctly in parallel with the receptacle

请在公座侧与母座侧保持平衡的状态下再校对位置

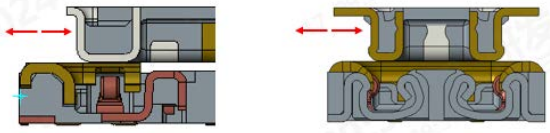


STEP2



Correct position

调整确切位置



Correct position for mating

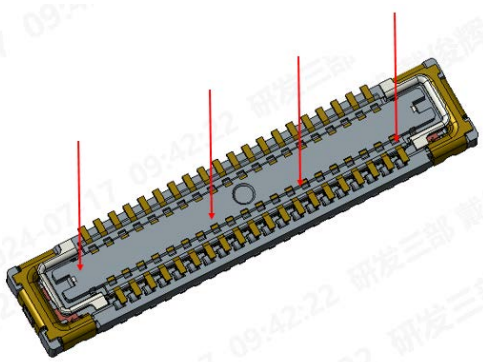
正确的嵌合调整位置

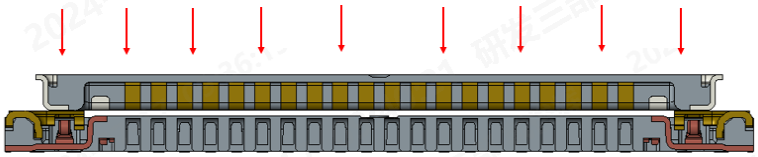


Position the plug correct by adjusting back or forth

轻轻移动公座侧来确认位置调合是否正确

STEP3

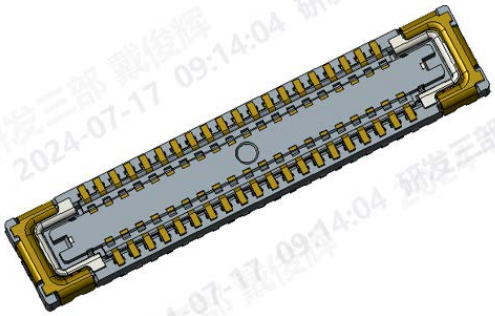




Insert the plug in parallel wich the receptacle until fully seated

请将公座侧平行压入到母座

STEP4

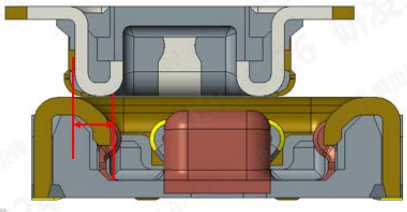


6.2 MATING POSITIONING WITH SLIGHTLY INCLINED 组合时调合位置的方法（位置平行调整困难时）

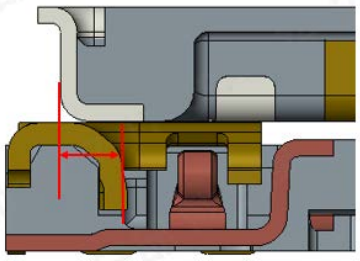
6.2.1 When operated in “a” Direction(lengthways) 长方向有自由度时

Please keep it within 0.20mm

请保持在 0.20mm 以内



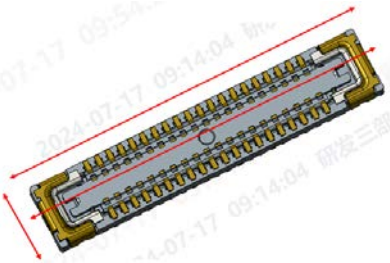
“ b” Direction 短方向



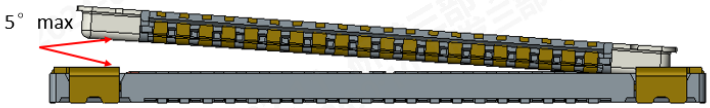
“ a” Direction 长方向

STEP1

“a” Direction



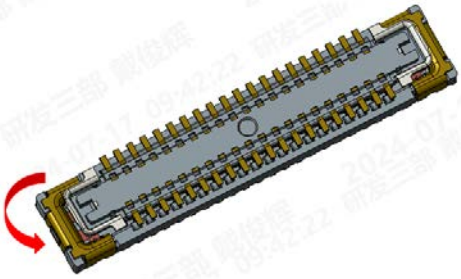
“b” Direction

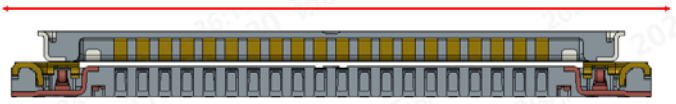


Position for mating by inclining the plug to the receptacle approximately less than 10^0

请在公座侧稍微倾斜（5 度以下）的状态下进行组合位置调整操作

STEP2



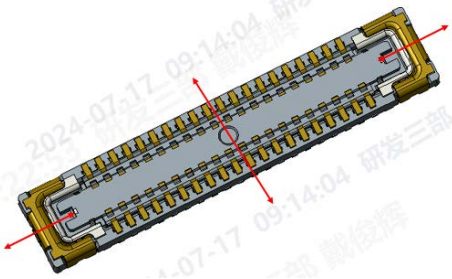


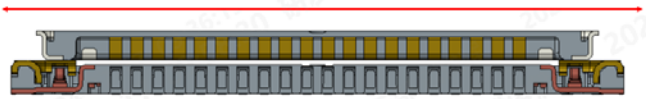
Once the plug is positioned over the receptacle

Move it to the parallel position

位置调合后，请将公座侧和母座侧保持平行

STEP3





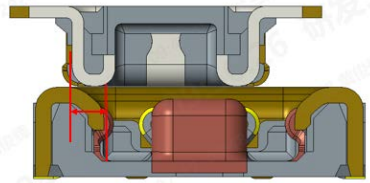
Please go to the STEP3 in 6.1.1

请参照 6.1.1 步骤 3 进行下一步操作

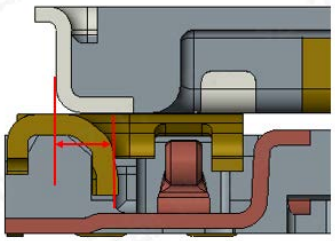
Position the plug correct by adjusting back or forth

轻轻移动公座侧来确认位置调合是否对位

6.2.2 When operated in “b” Direction 短方向有自由度时



“ b” Direction 短方向

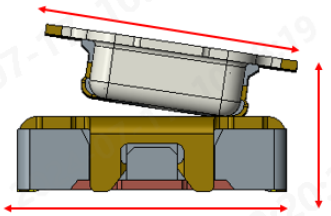


“ a” Direction（lengthways） 长方向

Please keep it within 0.20mm

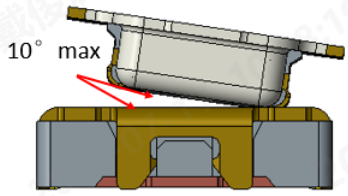
请保持在 0.20mm 以内

STEP1



“b” Direction

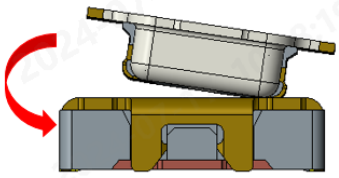
“a” Direction

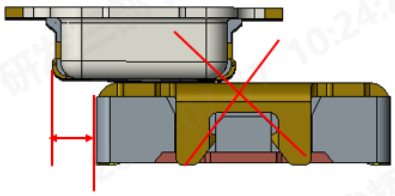


Position for mating by inclining the plug to the receptacle approximately less than 10^0

请在公座侧稍微倾斜（5 度以下）的状态下进行组合位置调整操作

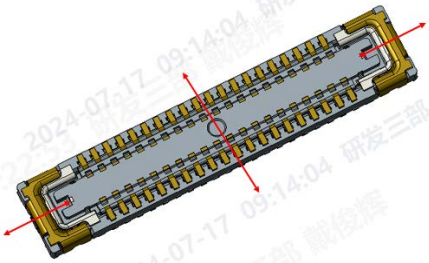
STEP2





Notes：Pay attention NOT to have the wrong position in“b” Direction 注：请注意位置调合偏差不能太大

STEP3



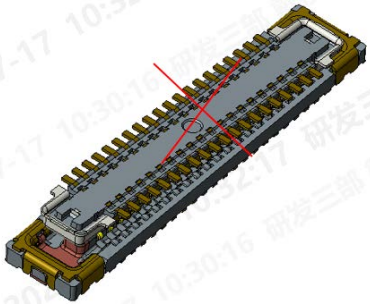
Please go to the STEP3 in 6.1.1

请参照 6.1.1 步骤 3 进行下一步操作

6.3 CONNECTOR HANDLING WHEN MATING(组合时操作注意事项)

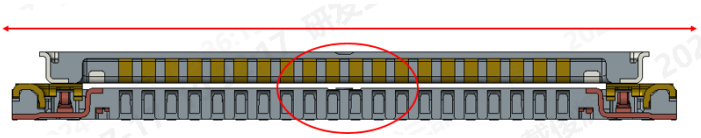
Please DO NOT apply force while mating the receptacle or plug at an angle in the “a” direction(lengthways) It may cause damage to the connector

请在连接器之间平行的状态下进行组合操作。如果在连接器之间不平行、处在倾斜的状态下组合时，连接器本体之间可能会有干涉，就会有损坏连接器的可能。



Mating with angle(Wrong Handling)

连接器倾斜组合

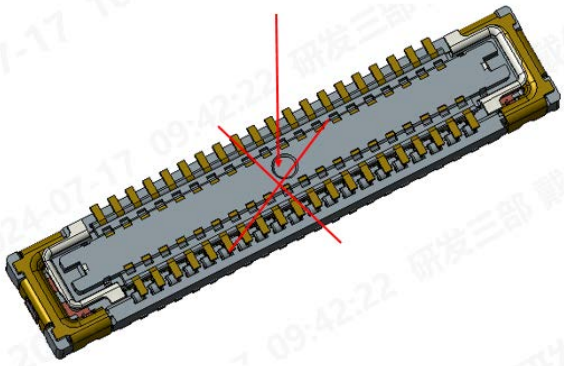


Mating with Parallel(Correct Handling)

连接器平行组合

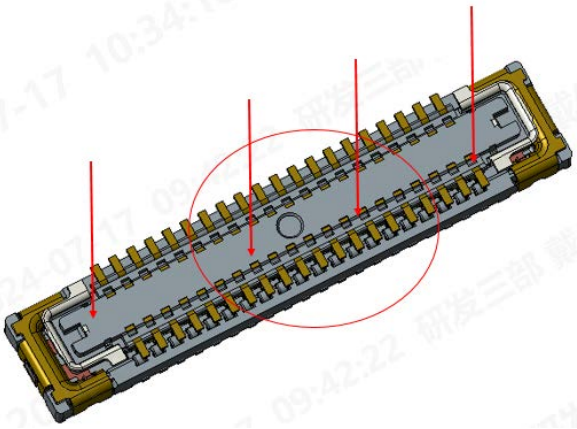
This product is downsized comparing with the current products and needs to be handled more carefully. When mating(inserting), do NOT push the only center of connector but the whole connector in parallel with The receptacle . When pushed only the center of connector , it may cause damage to the connector

本产品比现有产品还要小，连接器的强度较低。组合（插入）时，不能单单只按压连接器中间部，要平行按压整体。如果只按压连接器中间的话，连接器就会有折断的可能



Pushing only Center(Wrong Handling)

只按压连接器中间部



Pushing Whole Paralleled(Correct Handling)

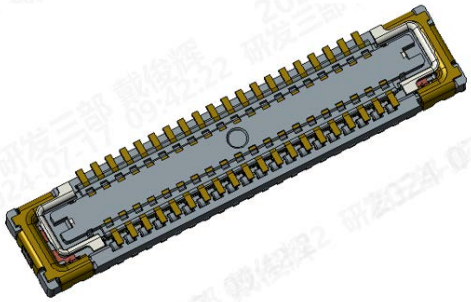
平行按压连接器整体

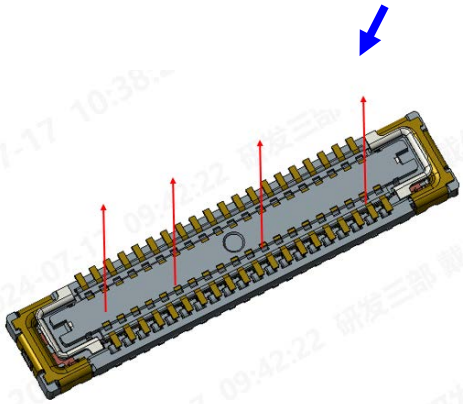
6.4 UN-MATING

6.4.1 HOW TO WITHDRAW 拔出方法

The plug shall be released from the receptacle paralleled to the mated axis or by moving the plug slowly

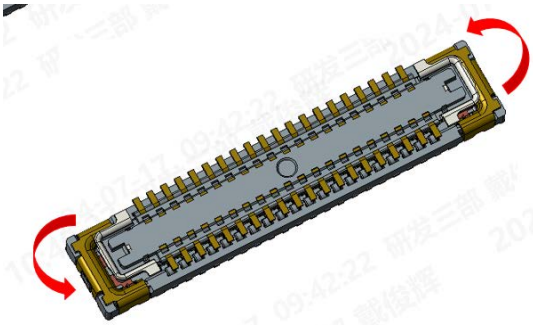
极力沿着组合轴平行拔去，或是向左右一点点边晃动边拔出。



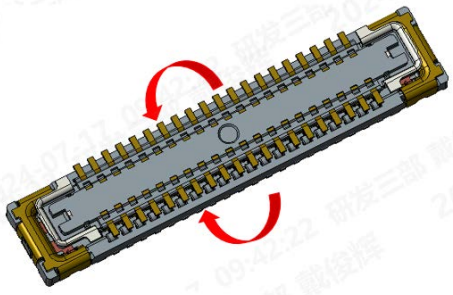


Releasing the plug paralleled to the mated axis

沿着组合轴向平行拔去



Releasing the plug by moving slowly in “a” direction (lengthways) 向左右一点点边晃动边拔去（长方向）



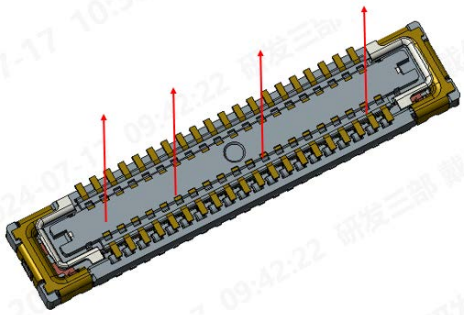
Releasing the plug by moving slowly in “b” direction

向左右一点点边晃动边拔去(短方向)

6.4.2 CONNECTOR HANDLING WHEN WITHDRAWING（拔出时操作注意事项）

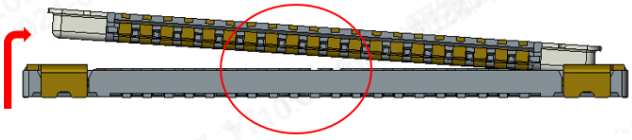
This product is downsized comparing with the current products and needs to be handled more carefully When un-mating(withdrawing), do NOT twist the plug to release . It may cause damage to connector.

本产品比现有产品还要小，连接器的单体强度较低（单体强度）。如果在过度倾斜状态下拔去的话，连接器就会有破损的可能



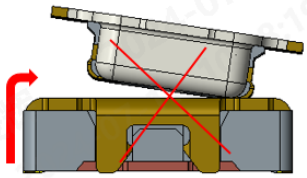
Releasing the plug paralleled to the mated axis

沿着组合轴向平行拔去



Slant releasing in “a” Direction (lengthways)

长方向的倾斜拔出



Slant releasing in “b” Direction

短方向的倾斜拔出

Merit and demerit for slant releasing are below

长方向的倾斜拔去方式与短方向的倾斜拔去方式存在以下优点及缺点

	Slant releasing in “a” Direction (lengthways) 长方向的倾斜拔出	Slant releasing in “b” Direction 短方向的倾斜拔出
Merit 优点	1.Not easily cause the damage to the terminals 不容易引起端子变形 2.Hard to be withdrawn 拔出的力度小	None 无特别优点
Demerit 缺点	1. Multiple connector can be damaged plug 多个连接器时拔出时可能会损坏公座	The continuity defect can be caused by damage to the terminals 端子变形风险，同时会存在不导通的可能

7.0 Test Group	Sample Groups

Test Item	Test Description	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q		
4.1.1	外观检查	1,9	1,7	1,5	1,3	1,3	1,3	1,5	1,3	1,7	1,7	1,7	1,9	1,9	1,7	1,3	1,5	1,3		
4.2.1	LLCR	4,10	2,6	2,4				2,4		2,5	2,5	2,5	2,6	2,6	2,5					
4.2.2	绝缘阻抗	5,11	,							3,6	3,6	3,6	3,7	3,7	3,6					
4.2.3	耐电压	6,12											4,8	4,8						
4.2.4	温升				2															
4.3.1	随机振动		3																	
4.3.2	正弦振动		4																	
4.3.3	机械冲击		5																	
4.3.4	跌落测试			3																
4.3.5	X/Y 推力测试					2														
4.3.6	导向能力测试						2													
4.3.7	耐久测试	7																		
4.3.8	插拔力测试	2,8																		
4.3.9	手感率	3,9																		
4.3.10	端子容差测试							3												
4.3.11	端子保持力								2											
4.4.1	温度寿命									4										
4.4.2	低温										4									
4.4.3	温湿循环											4								
4.4.4	高温高湿												5							
4.4.5	温冲													5						
4.4.6	盐雾														4					
4.5.1	沾锡测试															2				
4.5.2	过炉测试																2			
4.5.3	爬锡&锡渗透																3			
4.5.4	炉后共面度																	2		
4.5.5	焊接强度																4			
测试数量		15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15		