



SPECIFICATION

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SPEC. NO.: PS-50469-XXXXX-XXX

REVISION: E

PRODUCT NAME: 2.0 mm PITCH WTB CONNECTOR

PRODUCT NO: 50469 、 50470 SERIES

PREPARED: ZHOUQUAN DATE: 2018/08/14	CHECKED: BRAVE DATE: 2018/08/14	APPROVED: BRAVE DATE: 2018/08/14
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Aces P/N: **50469** series

TITLE: **2.0 mm PITCH WTB CONNECTOR**

RELEASE DATE: 2018.08.14

REVISION: E

ECN No: ECN-1808348

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1 REVISION HISTORY

Rev.	ECN #	Revision Description	Prepared	Date
O	ECN-1110135	UPDATED CURRENT RATING FOR ADW1109077	BRUCE	2011/10/13
A	ECN-1210167	ADD AWG #26 & #30 IN SPEC FOR DWR1210037	BRUCE	2012/10/17
B	ECN-1401240	ADD WORKING VOLTAGE	XUFEI	2014/01/14
C	ECN-1503364	ADD CURRENT TEMPERATURE RISE CURVE	JUGG	2015/03/27
D	ECN-1807287	ADD ACES APPLICATION SOP	SHI,YANAN	2018/07/13
E	ECN-1808348	Change Salt Spray times	ZHOUQUAN	2015.01.08

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2 SCOPE

This specification covers performance, tests and quality requirements for **2.0 mm pitch WTB connector**.

3 APPLICABLE DOCUMENTS

EIA-364: ELECTRONICS INDUSTRIES ASSOCIATION

4 REQUIREMENTS

4.1 Design and Construction

- 4.1.1 Product shall be of design, construction and physical dimensions specified on applicable product drawing.
- 4.1.2 All materials conform to R.o.H.S. and the standard depends on TQ-WI-140101.

4.2 Materials and Finish

- 4.2.1 Contact: High performance copper alloy.
 - Finish: (a) Contact Area: [Refer to the drawing.](#)
 - (b) Under plate: [Refer to the drawing.](#)
 - (c) Solder area: [Refer to the drawing.](#)
- 4.2.2 Housing: Thermoplastic or Thermoplastic High Temp., UL94V-0
- 4.2.3 Fitting Nail: Copper Alloy
 - Finish: (a) Under plate: [Refer to the drawing.](#)

4.3 Ratings

- 4.3.1 [Working voltage less than 36 volts \(per pin\)](#)
- 4.3.2 Voltage: [50 Volts AC \(per pin\)](#)
- 4.3.3 Current: [AWG#26 / #28 / #30: 3.0 Amperes \(per pin\)](#)
- 4.3.4 Operating Temperature : [-40°C to +85°C](#)

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5 Performance

5.1. Test Requirements and Procedures Summary

Item	Requirement	Standard
Examination of Product	Product shall meet requirements of applicable product drawing and specification.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Item	Requirement	Standard
Low Level Contact Resistance	20 m Ω Max.(initial)per contact ΔR 20 m Ω Max.	Mate connectors, measure by dry circuit, 20mV Max., 100mA Max. (EIA-364-23)
Insulation Resistance	500 M Ω Min.	Unmated connectors, apply 500 V DC between adjacent terminals. (EIA-364-21)
Dielectric Withstanding Voltage	No discharge, flashover or breakdown. Current leakage: 1 mA max.	300V AC Min. at sea level for 1 minute. Test between adjacent contacts of unmated connectors. (EIA-364-20)
Temperature Rise	30°C Max. Change allowed	Mate connector: measure the temperature rise at rated current until temperature stable. The ambient condition is still air at 25°C (EIA-364-70,METHOD1,CONDITION1)
MECHANICAL		
Item	Requirement	Standard
Durability	30 cycles.	The sample should be mounted in the tester and fully mated and unmated the number of cycles specified at the rate of 25.4 $\pm$ 3mm/min.
Mating / Unmating Forces	Please see Item 8	Operation Speed : 25.4 $\pm$ 3 mm/minute.. Measure the force required to mate/unmate connector. (EIA-364-13)
Contact Retention Force (Board Side)	0.20 Kgf Min.	Operation Speed : 25.4 $\pm$ 3 mm/minute.. Measure the contact retention force with tester.
Fitting Nail Retention Force (Board Side)	0.25 Kgf Min.	Apply axial pull out force at the speed rate of 25.4 $\pm$ 3 mm/minute. On the fitting nail assembled in the housing.

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Crimping Terminal / Housing Retention Force (Cable Side)	0.8 Kgf Min.	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the terminal assembled in the housing.
Crimping Pull Out Force (Cable Side)	AWG #26: 1.5Kgf Min. AWG #28: 1.0Kgf Min. AWG #30: 1.0Kgf Min.	Operation Speed : 25.4 ± 3 mm/minute. Fix the crimped terminal, apply axial pull out force on the wire.
Vibration	1 μ s Max.	The electrical load condition shall be 100 mA maximum for all contacts. Subject to a simple harmonic motion having amplitude of 0.76mm (1.52mm maximum total excursion) in frequency between the limits of 10 and 55 Hz. The entire frequency range, from 10 to 55 Hz and return to 10 Hz, shall be traversed in approximately 1 minute. This motion shall be applied for 2 hours in each of three mutually perpendicular directions. (EIA-364-28 Condition I)
Shock (Mechanical)	1 μ s Max.	Subject mated connectors to 50 G's (peak value) half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks). The electrical load condition shall be 100mA maximum for all contacts. (EIA-364-27, test condition A)

ENVIRONMENTAL

Item	Requirement	Standard
Resistance to Reflow Soldering Heat (Board Side)	See Product Qualification and Test Sequence Group 10 (Lead Free)	Pre Heat : $150^{\circ}\text{C} \sim 180^{\circ}\text{C}$, 60~120sec. Heat : 230°C Min., 40sec Min. Peak Temp. : 260°C Max, 10sec Max.
Thermal Shock	See Product Qualification and Test Sequence Group 4	Mate module and subject to follow condition for 5 cycles. 1 cycles: $-55 +0/-3^{\circ}\text{C}$, 30 minutes $+85 +3/-0^{\circ}\text{C}$, 30 minutes (EIA-364-32, test condition I)
Humidity	See Product Qualification and Test Sequence Group 4	Mated Connector 40°C , 90~95% RH, 96 hours. (EIA-364-31, Condition A, Method II)

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Temperature Life	See Product Qualification and Test Sequence Group 5	Subject mated connectors to temperature life at 85°C for 96 hours. (EIA-364-17, Test condition A)
Salt Spray (Only For Gold Plating)	See Product Qualification and Test Sequence Group 6	Subject mated/unmated connectors to 5% salt-solution concentration, 35°C (I) Gold flash for 8 hours (II) Gold plating 3 u" for 48 hours (III) Gold plating 5 u" for 96 hours. (EIA-364-26)
Solder ability (Board Side)	Tin plating: Solder able area shall have minimum of 95% solder coverage. Gold plating: Solder able area shall have minimum of 75% solder coverage	And then into solder bath, Temperature at 245 ±5°C, for 4-5 sec. (EIA-364-52)
Hand Soldering Temperature Resistance (Board Side)	Appearance: No damage	T ≥ 350°C, 3sec at least.

Note. Flowing Mixed Gas shall be conducted by customer request.

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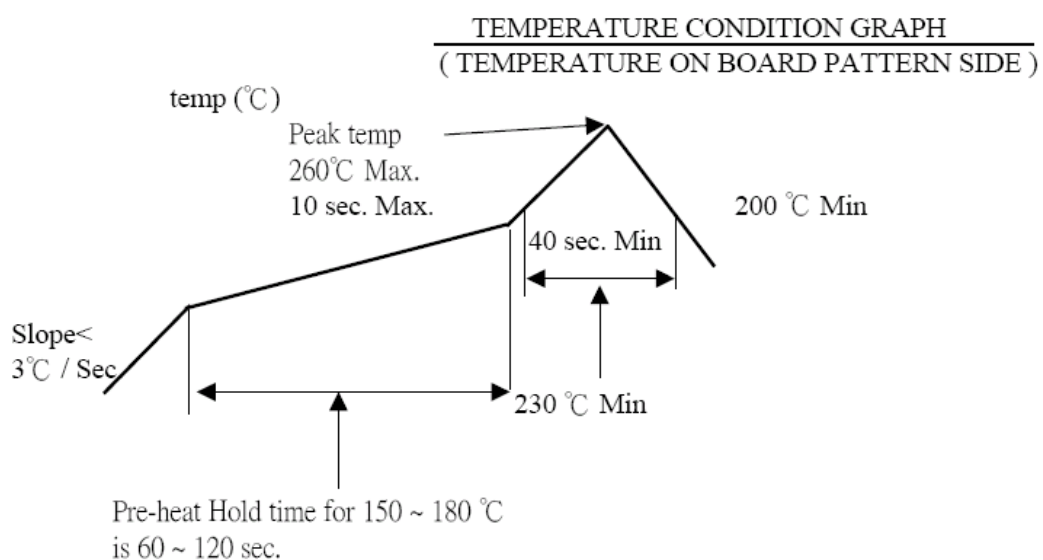
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6 INFRARED REFLOW CONDITION



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7 PRODUCT QUALIFICATION AND TEST SEQUENCE

Test or Examination	Test Group										
	1	2	3	4	5	6	7	8	9	10	11
	Test Sequence										
Examination of Product		1、5	1、5	1、7	1、6	1、4				1、4	1
Low Level Contact Resistance		2、7	2、6	2、10	2、9	2、5				2、5	
Insulation Resistance				3、9	3、8						
Dielectric Withstanding Voltage				4、8	4、7						
Temperature Rise	1										
Mating / Unmating Force		3、6									
Durability		4									
Contact Retention Force (Board Side)									3		
Vibration			3								
Shock (Mechanical)			4								
Thermal Shock				5							
Humidity				6							
Temperature Life					5						
Salt Spray (Only For Gold Plating)						3					
Solder ability (Board Side)							1				
Crimping Pull Out Force(Cable Side)								1			
Crimping Terminal / Housing Retention Force (Cable Side)									1		
Fitting Nail & Contact Retention Force (Board Side)									2		
Resistance to Soldering Heat (Board Side)										3	
Hand Soldering Temperature Resistance (Board Side)											2
Sample Size	2	4	4	4	4	4	2	4	4	4	4

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8 MATING / UNMATING FORCE

Number of circuits	Mating Force. kgf. (Max.)		Unmating Force kgf. (Min.)	
	1th	30th	1th	30th
4~8	3.5	3.5	0.25	0.25

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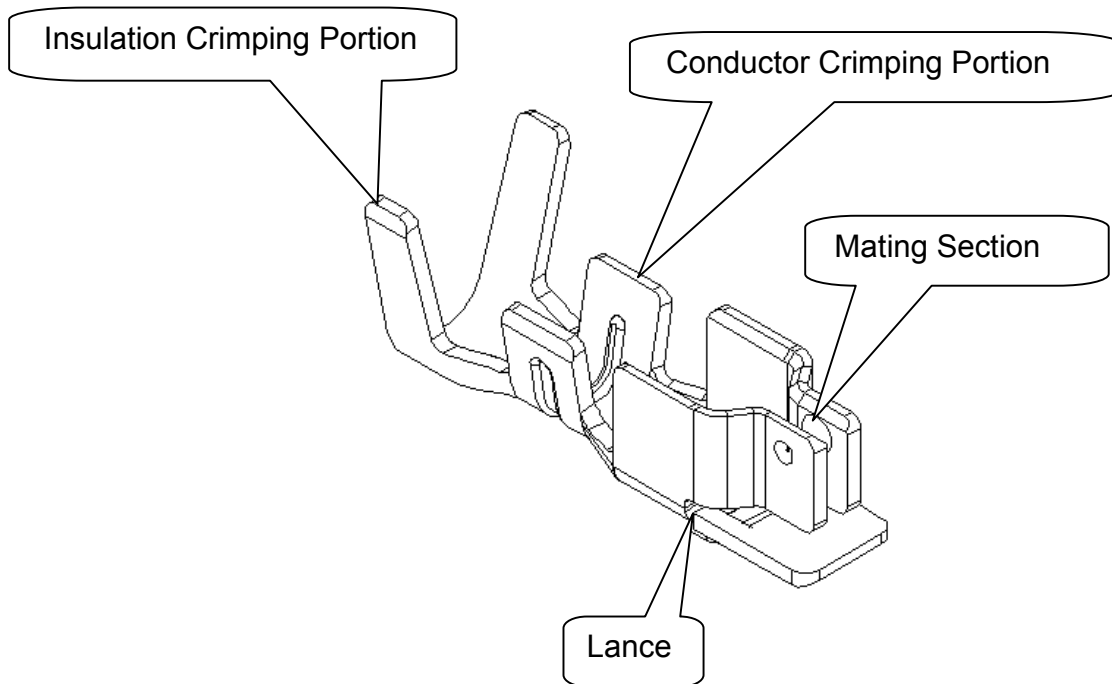
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9 ANATOMY OF CRIMPING TERMINAL



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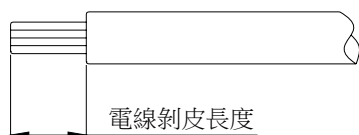
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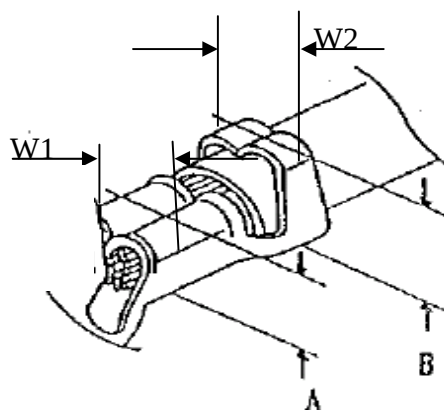
10 CRIMPING CONDITION

鉚線條件表 CRIMPING CONDITION

Part Number	Wire Specification			Crimp Height (mm)		Crimp Width (mm)	
	UL Style (REF.)	AWG Size	Insulation OD(mm)	Conductor A	Insulation B	Conductor W1	Insulation W2
50470-TXXX	UL10368	26	1.00	0.55~0.65	1.25~1.35	0.8~0.9	1.40 Max.
		28	0.90	0.50~0.60	1.25~1.35	0.8~0.9	1.40 Max.
		30	0.80	0.45~0.55	1.25~1.35	0.8~0.9	1.40 Max.



Strip length



Note:

- 1、W1為芯線導體鉚壓後之寬度(Conductor Crimping Width)：W1值如上表(參考值)
- 2、W2為電線外被部分鉚壓後之寬度(Insulation Crimping Width)：W2值如上表(參考值)
- 3、A為芯線導體鉚壓後之高度(Conductor Crimping height)：A值如上表(參考值)
- 4、B為電線外被鉚壓後之高度(Insulation Crimping height)：B值如上表(參考值)
- 5、電線剝皮長度(Strip length)：1.2~1.7mm(參考值)

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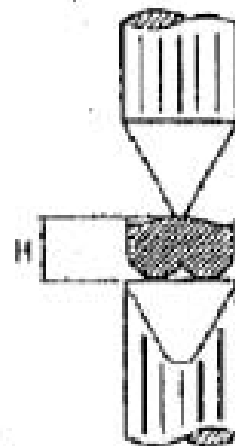
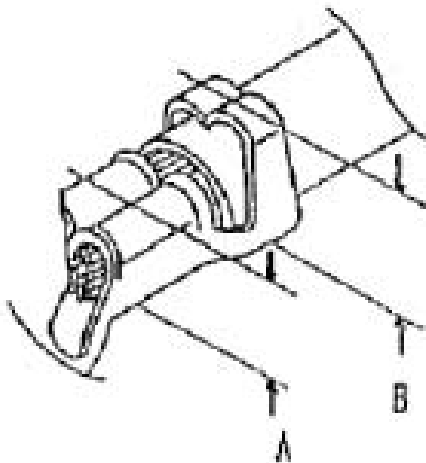
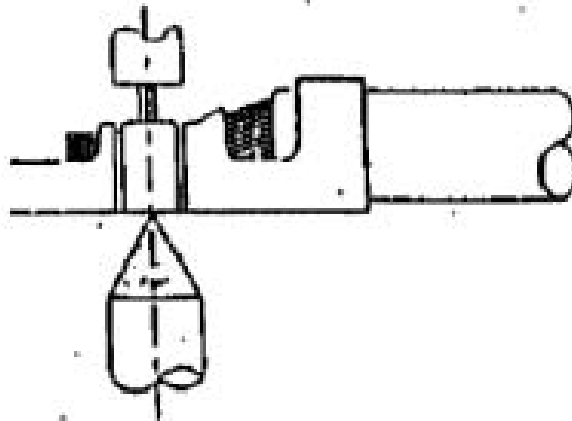
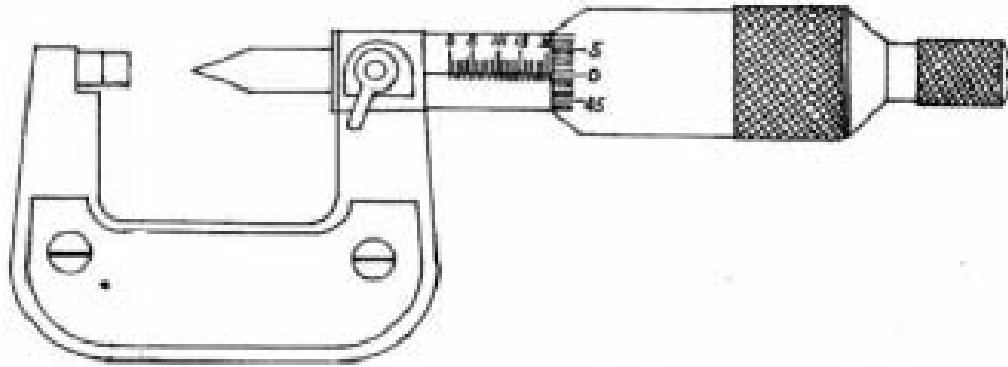
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11 CRIMPING HEIGHT MEASUREMENT



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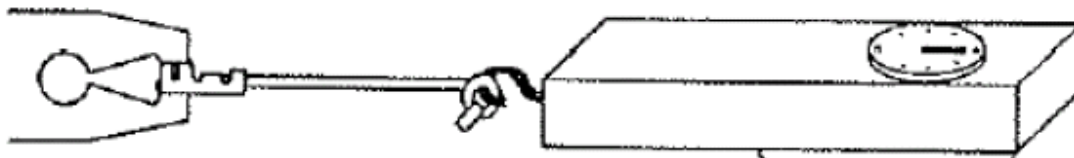
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12 PULL FORCE OF CRIMPING SECTION MEASUREMENT

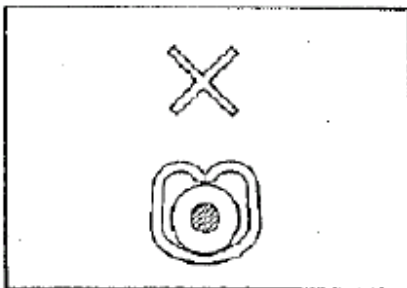


Before test samples, please measure crimp height and do not crimp insulation.

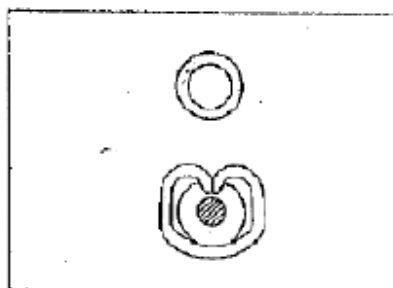


Pull Force of Crimp Section Measurement

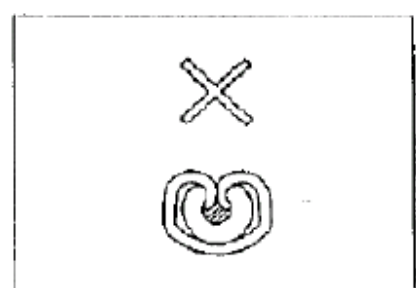
13 STANDARD INSULATION CRIMPING



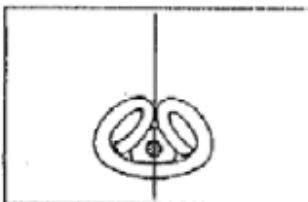
Not enough crimp



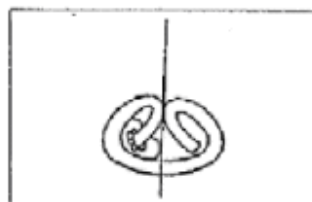
Good



Crimp too much

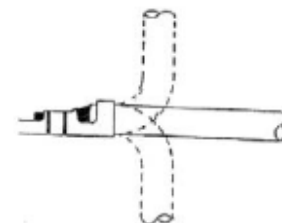


Good



NG

Insulation Crimp Condition



As following figure shown.
It is no problem if wire bent
up down 90 degrees 1 cycle
and insulation position still
in ideal position.

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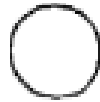
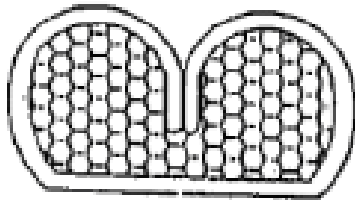
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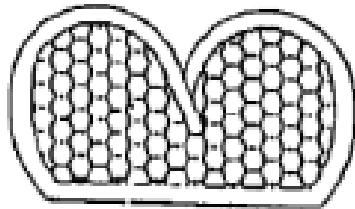
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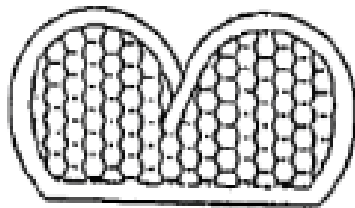
14 CONDUCTORS CRIMPING CONDITION



Good

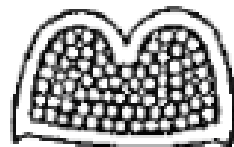


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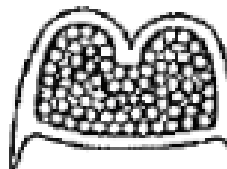


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Lower conduct
retension force



Good



Large burr

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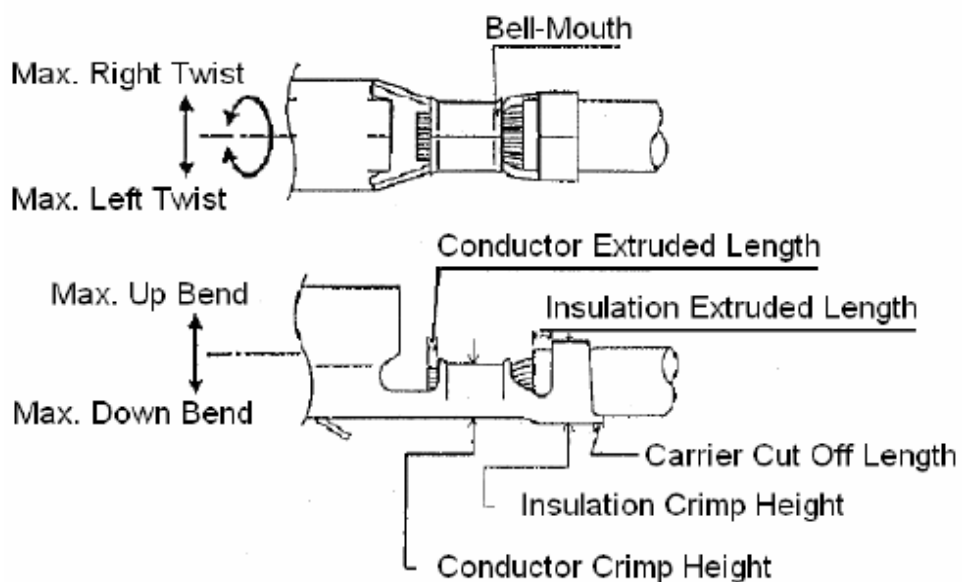
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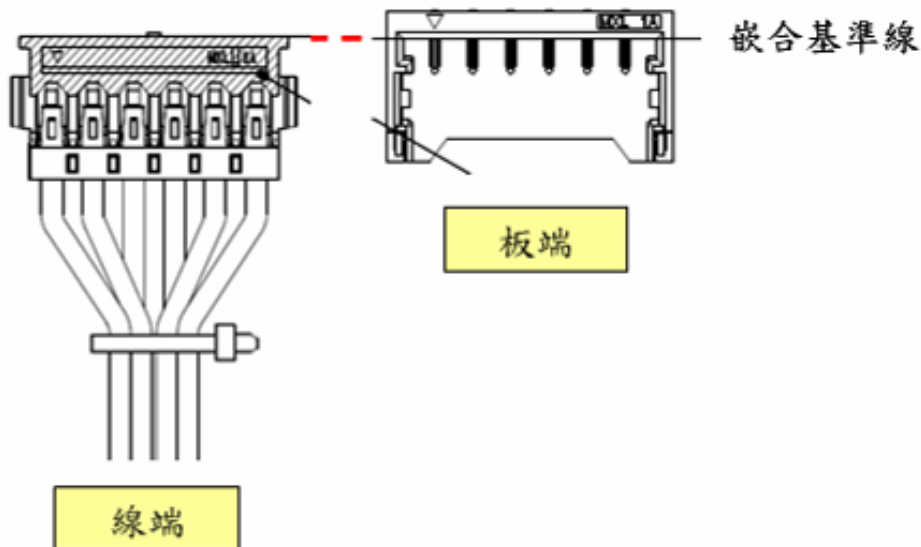
15 CRIMPING REQUIREMENT



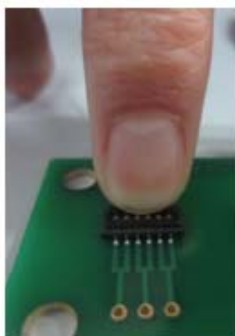
Item	Range(Ref.)
Max. Up Bend	6°
Max. Down Bend	6°
Max. Left Twist	5°
Max. Right Twist	5°
Bell-Mouth Length	0.1~0.3mm
Carrier Cut Off Length	0~0.2mm
Conductor Extruded Length	0.05~0.2mm

16 ACES APPLICATION SOP

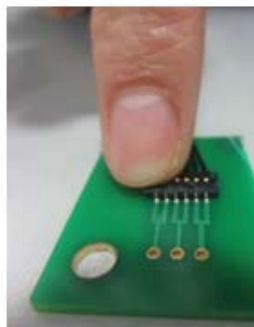
1. 當一個完整的 connector 對配時，首先觀察其線端與板端的嵌合基準位置。



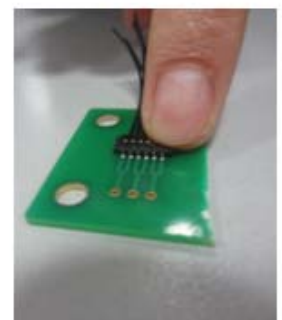
2. 對配時使用拇指將線端對準板端卡槽垂直按壓進板端,為確保板線端完全對配到位，再用拇指分別按壓板線端膠體兩側卡扣確保卡扣完全嵌合。



拇指向下按壓



拇指按壓左側卡扣



拇指按壓右側卡扣

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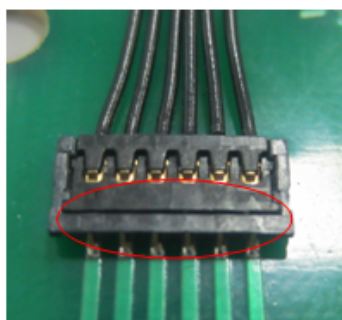
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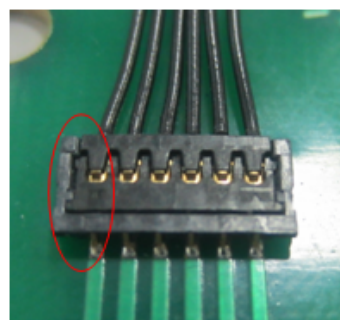
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注意事項

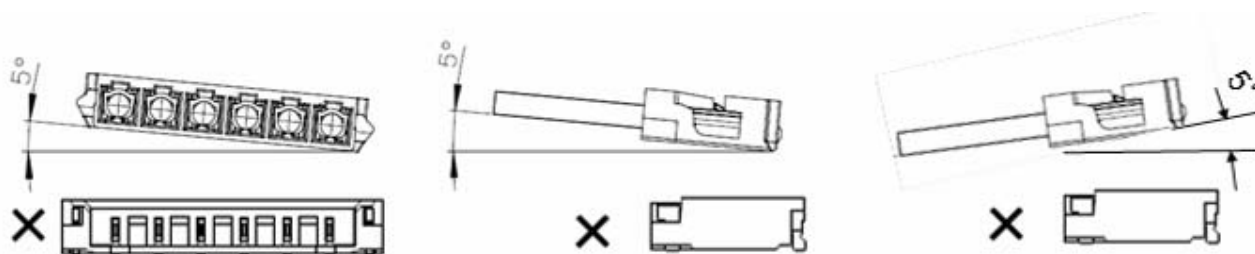


嵌合位置OK



LOCK位置完全扣合

3. 當線端與板端壓合時，請避免超過 5° ，如下圖所示:



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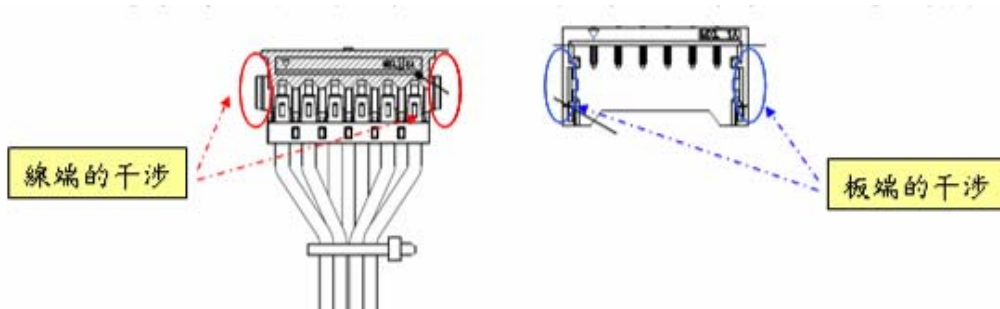
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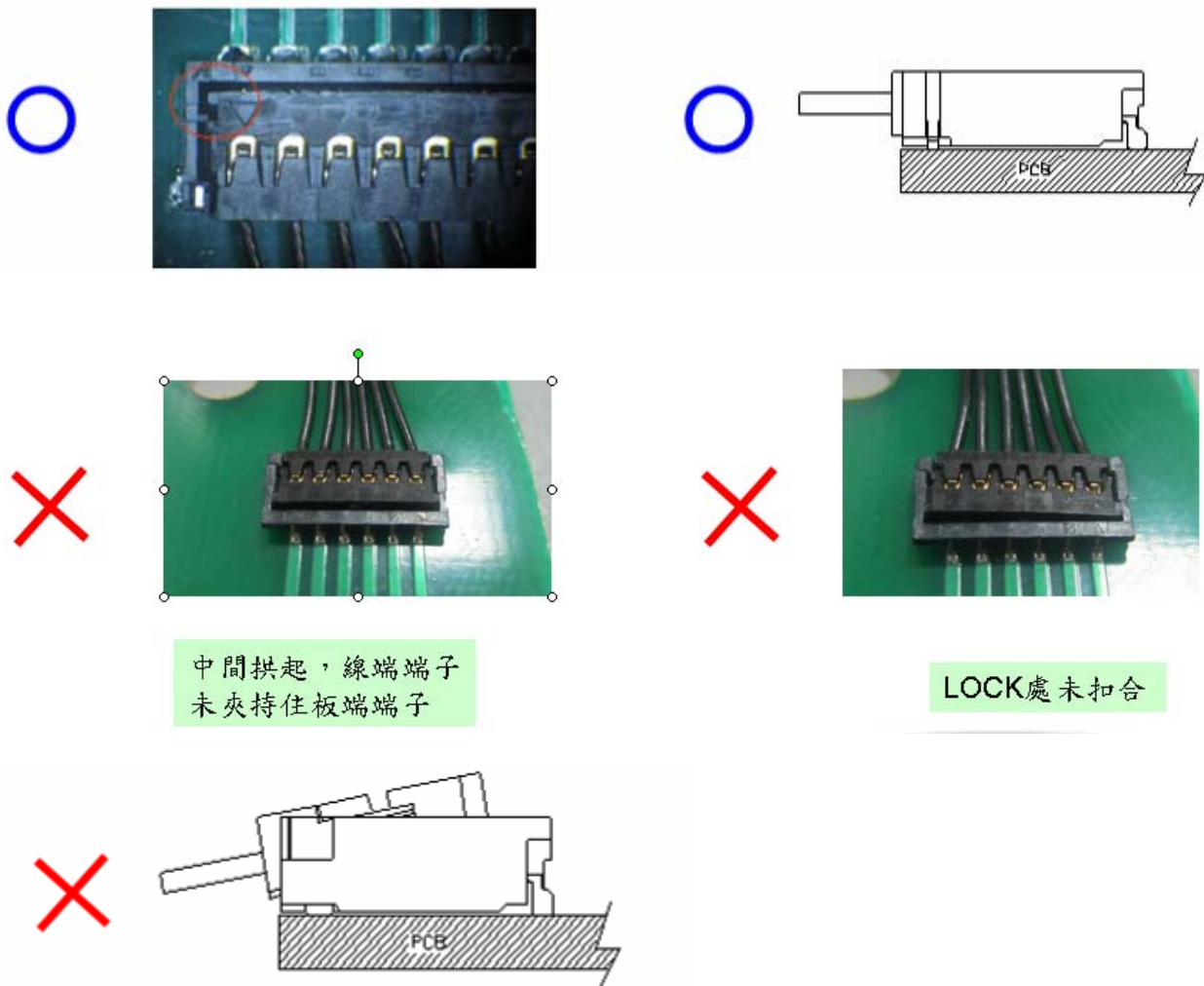
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4. 對配壓合完畢時，確認其對配狀況，其線端的干涉必須完整與板端結合。



線端與板端對配后狀況如下圖：



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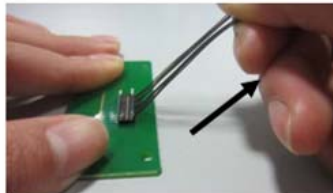
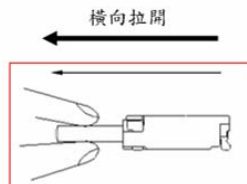
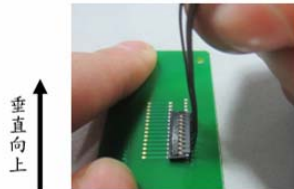
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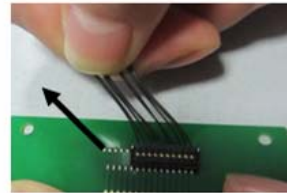
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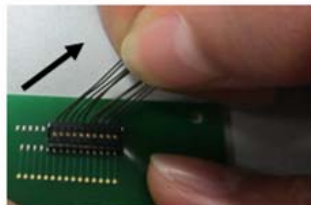
5. 當未對配正確時，應該拉住線端，垂直並保持直線的方式向上拉開，切勿橫向或斜向式拉開線端。



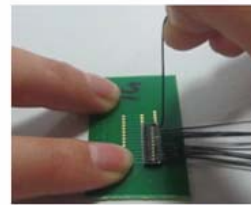
斜向拉開



斜向拉開



斜向拉開



單線拉開

TITLE: **2.0 mm PITCH WTB CONNECTOR**

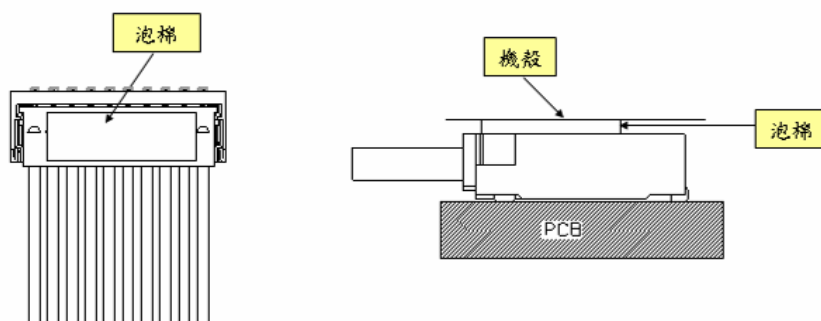
RELEASE DATE: 2018.08.14

REVISION: E

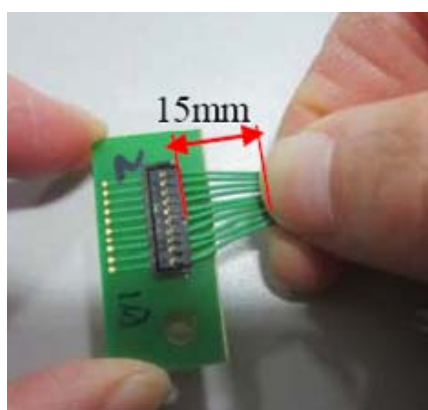
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- 6.當產品與機殼之間間隙大于 0.15mm 時，需增加泡棉填充(材質為 SRS-24P，壓縮量為 44~47%)，或者以其他機構設計來壓住連機器，或是以其他機構設計來使得間隙小于 0.15mm.

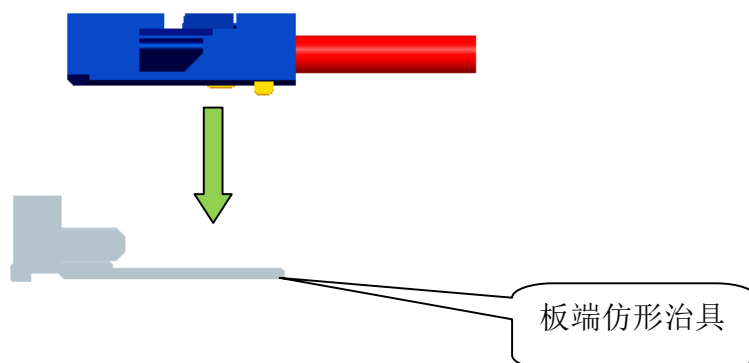


7. 做插拔測試時，握線距離以 15mm 為準，進行拔出力測試.



8. Cable 線束若需要點膠固定,必須將穿線后的線端膠體插入板端仿形治具后,在進行點膠處理(避免線端端子在膠體內歪斜時被 UV 膠固定,導致 OP 組裝作業時,難以將線端插入板端)

(1)Cable 膠體垂直準備插入板端仿形治具



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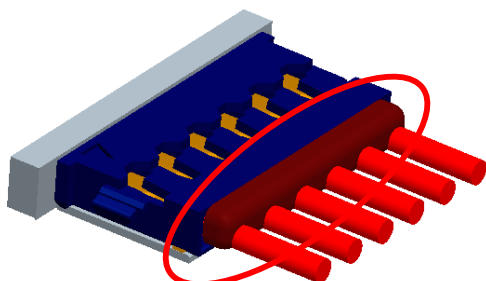
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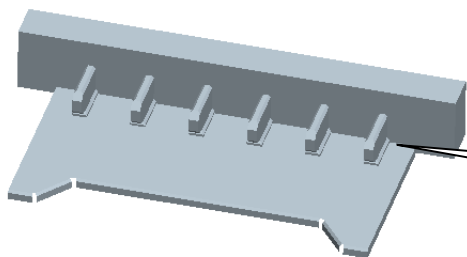
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(2)點膠處理



PS:板端仿形治具端子排布同板端完全相同,去除兩側 LOCK.也可用板端連接器焊板后去除兩側 LOCK 使用.



板端仿形治具