



SPECIFICATION

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SPEC. NO.: PS-51221-XXXXX-XXX REVISION: A

PRODUCT NAME: 1.5 mm PITCH WIRE TO BOARD CONNECTOR

PRODUCT NO: 51221 SERIES , 51222 SERIES

PREPARED: ZHANGHAO DATE: 2018.08.20	CHECKED: BRAVE DATE: 2018.08.20	APPROVED: BRAVE DATE: 2018.08.20
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Aces P/N: **51221 51222 series**

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1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
O	ECN-1303316	NEW SPEC FOR 51221&51222	SKY	2013.06.17
A	ECN-1808425	Modified Salt Spray Specifications	ZHANGHAO	2018.08.20

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2 SCOPE

This specification covers performance, tests and quality requirements for **1.50 mm pitch WTB wafer**.

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: PLS see P/N LEGEND
- 4.2.2 Housing: Thermoplastic or Thermoplastic High Temp., UL94V-0

4.3 Ratings

- 4.3.1 Working voltage less than 36 volts AC (per pin)
- 4.3.2 Voltage: 50 V AC ,DC
- 4.3.3 Current Rating: AWG#24:4.0A (Per Pin)
AWG#26:3.0A (Per Pin)
AWG#28:3.0A (Per Pin)
AWG#30:3.0A (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	40 m Ω Max.(initial)per contact 20 m Ω Max. Change allowed	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..	500 VAC 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 METHOD 2)
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. (EIA-364-09)
Crimping Pull Out Force (Wire & terminal)	AWG# 24: 3.8Kgf Min. AWG# 26: 2.6Kgf Min. AWG# 28: 3.8Kgf Min. AWG# 30: 2.6Kgf Min.	Operation Speed : 25.4 \pm 3 mm/minute. Fix the crimped terminal, apply axial pull out force on the wire.
Crimping Terminal / Housing Retention Force (Cable Side)	0.5kgf MIN.	Operation Speed : 25.4 \pm 3 mm/minute. Fix the crimped terminal, apply axial pull out force on the Housing
Mating / Unmating Forces	See item 8	Operation Speed : 25.4 \pm 3 mm/minute.. Measure the force required to mate/Un-mate connector. (EIA-364-13)

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Contact Retention Force (Board Side)	0.4kgf MIN.	Operation Speed : 25.4 ± 3 mm/minute. Measure the contact retention force with Tensile strength tester
Fitting Nail / Housing Retention Force	0.25kgf Min.	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the fitting nail assembled in the housing.
Vibration	1 us 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 us 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°C~180°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: -40 +0/-3 °C, 30 minutes +85 +3/-0 °C, 30 minutes (EIA-364-32, test condition I)

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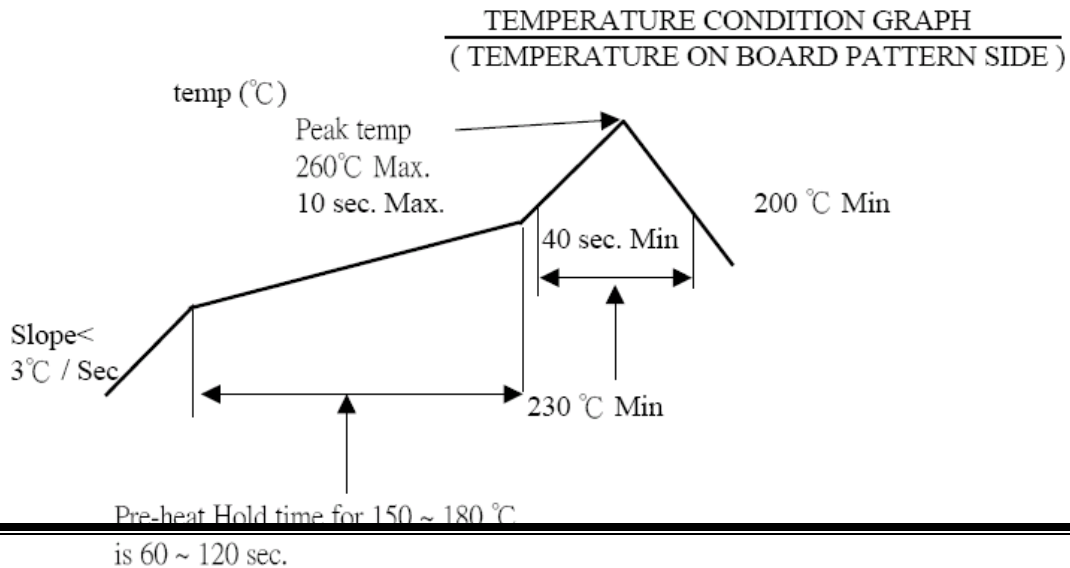
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Humidity	See Product Qualification and Test Sequence Group 4	Mated Connector 40°C, 90~95% RH, 96 hours. (EIA-364-31, Condition A, Method II)
Temperature life	See Product Qualification and Test Sequence Group 5	Subject mated connectors to temperature 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, Under the condition that the electroplating layer on the metal surface is not destroyed (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 95% solder coverage	Subject the test area of contacts into the flux for 5-10 sec. 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 conduct by customer request.

6 Infrared reflow condition

6.1. Lead-free Process



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



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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 Forces

Unit: Kgf

NO. OF Ckt.	At Initial		At 30th
	Mating(kgf max)	Unmating(kgf min)	Unmating(kgf min)
007	4.00	0.6	0.4

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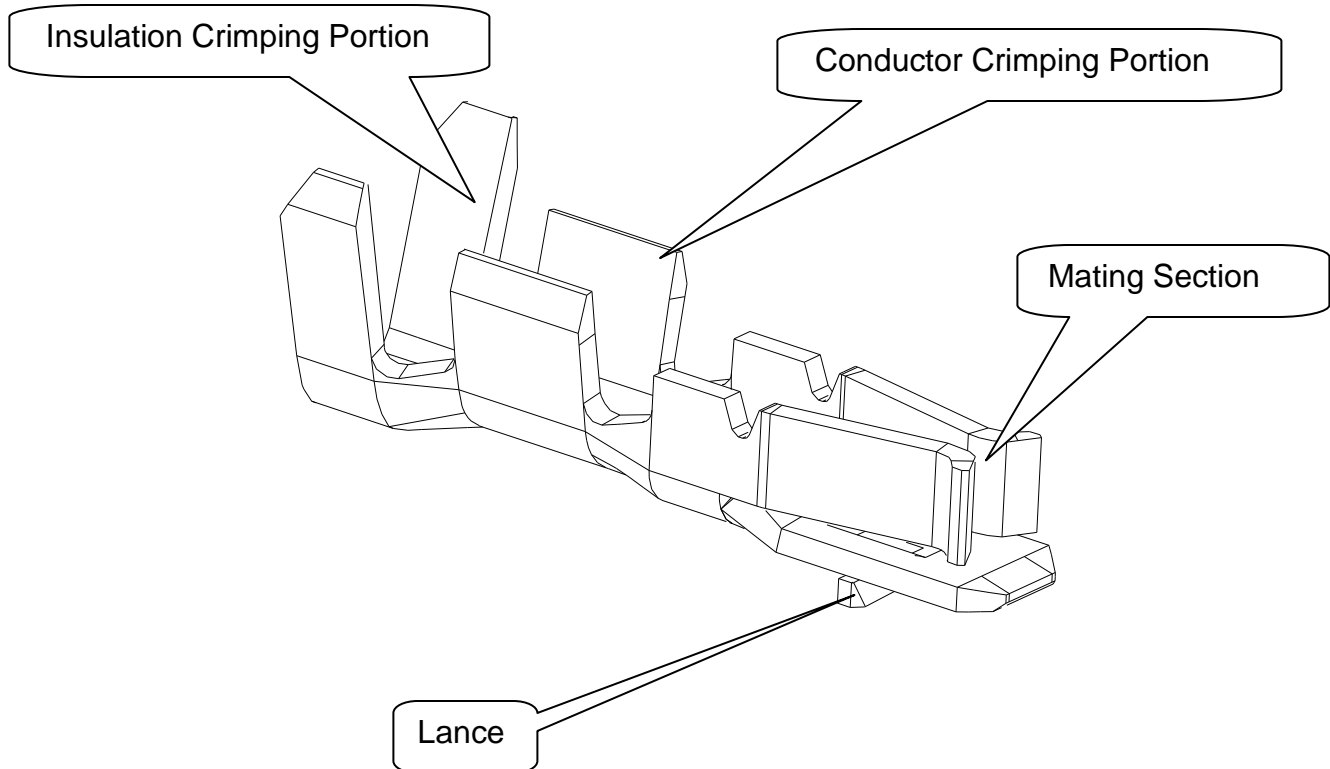
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9 ANATOMY OF CRIMPING TERMINAL



10 APPLICABLE WIRES: UL10584 ETFE WIRE

- AWG Size: AWG#24
Insulation OD: $\Phi 0.95\text{mm}$
- AWG Size: AWG#26
Insulation OD: $\Phi 0.7\text{mm}$
- AWG Size: AWG#28
Insulation OD: $\Phi 0.7\text{mm}$
- AWG Size: AWG#30
Insulation OD: $\Phi 0.7\text{mm}$

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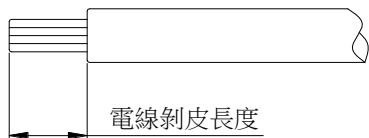
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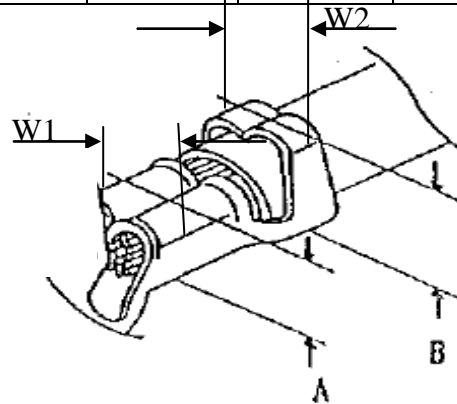
11 CRIMPING CONDITION

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
51221-Txxx	UL10064	24	0.95	0.60~0.65	1.10~1.20	0.91~1.01	0.98~1.08
	UL10064	26	0.7	0.55~0.60	1.05~1.10	0.89~0.99	1.02~1.12
	UL10064	28	0.95	0.60~0.65	1.10~1.20	0.91~1.01	0.98~1.08
	UL10064	30	0.7	0.55~0.60	1.05~1.10	0.89~0.99	1.02~1.12



Strip length



Note:

- 1、W1為芯線導體鉚壓後之寬度(Conductor Crimping Width)：W1值如上表
- 2、W2為電線外被部分鉚壓後之寬度(Insulation Crimping Width)：W2值如上表
- 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)：1.2~1.6mm(參考值)

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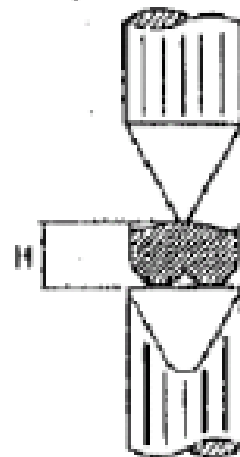
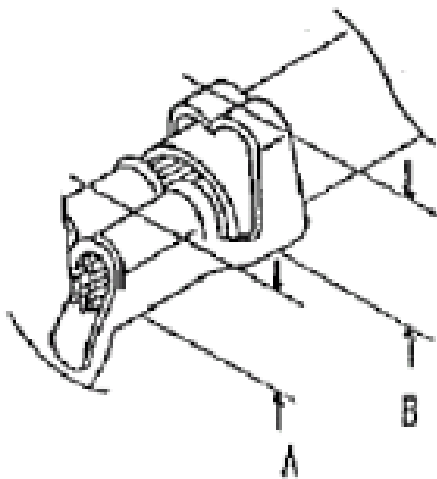
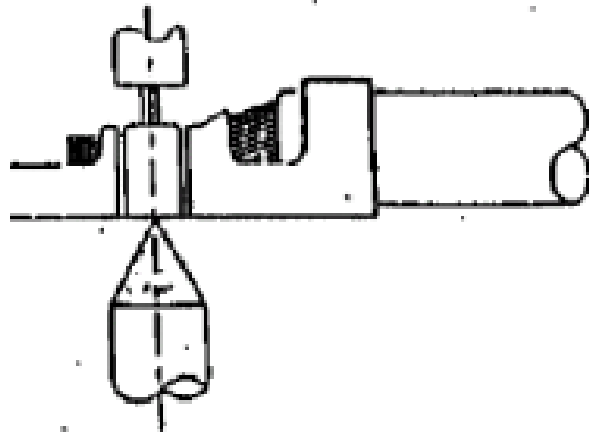
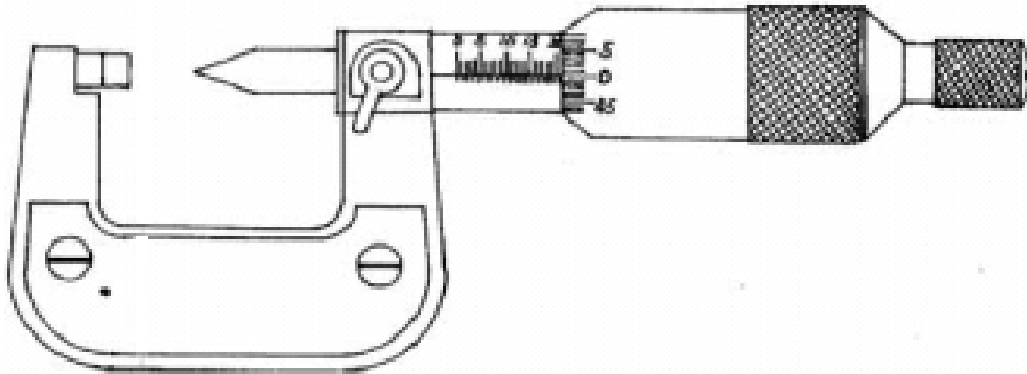
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12 CRIMPING HEIGHT MEASUREMENT



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13 PULL FORCE OF CRIMPING SECTION MEASUREMENT

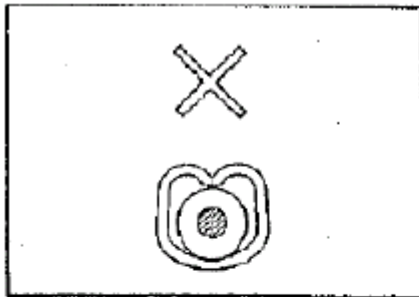


Before test samples, please measure crimp height and do not crimp insulation.

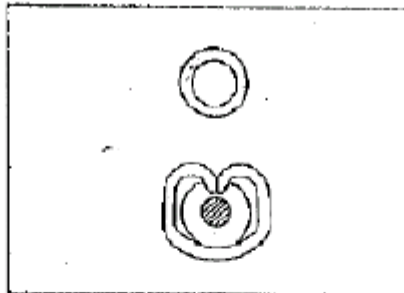


Pull Force of Crimp Section Measurement

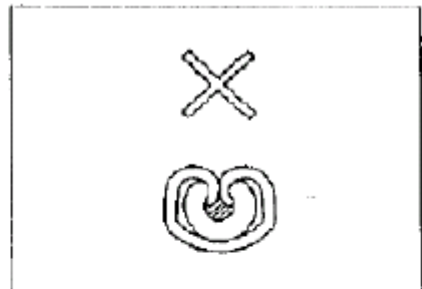
14 STANDARD INSULATION CRIMPING



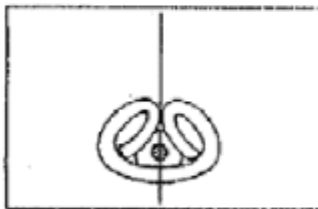
Not enough crimp



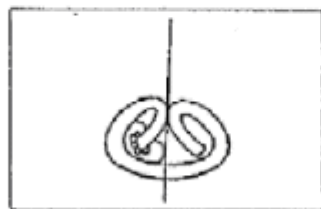
Good



Crimp too much

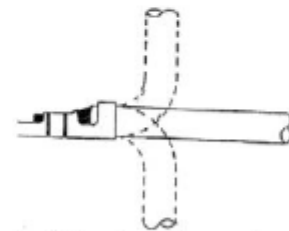


Good



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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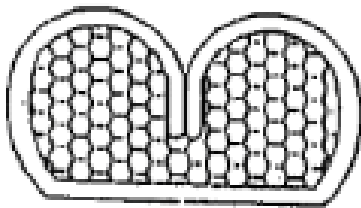
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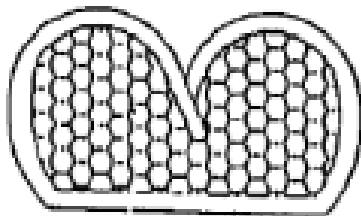
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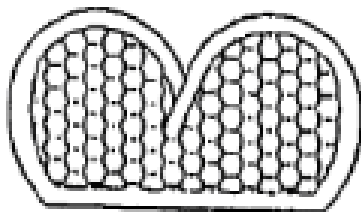
15 CONDUCTORS CRIMPING CONDITION



Good

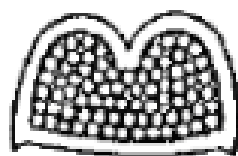


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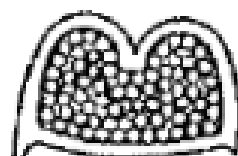


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Lower conduct retention force



Good



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Large burr

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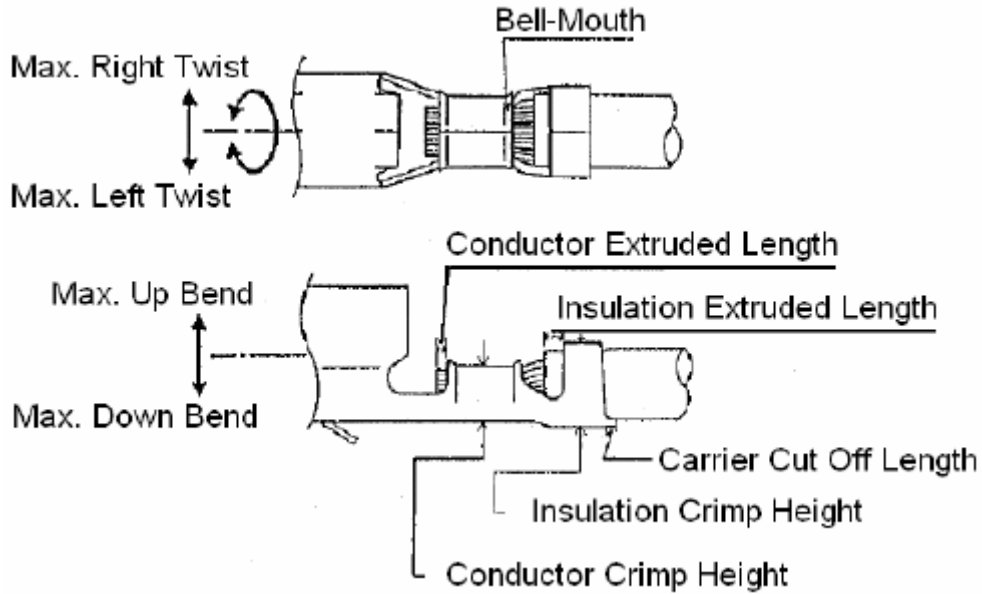
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16 CRIMPING REQUIREMENT



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