



## SPECIFICATION

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SPEC. NO.: PS-51470-XXXXX-XXX

REVISION: C

PRODUCT NAME: 2.0 mm PITCH WTB CONNECTOR.T/H D/R TYPE

PRODUCT NO: 51470,51471 SERIES

PREPARED:  <b>GAOLI</b>  DATE: <b>2022.07.20</b>	CHECKED:  <b>XUZHUYONG</b>  DATE: <b>2022.07.20</b>	APPROVED:  <b>XUZHUYONG</b>  DATE: <b>2022.07.20</b>
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Aces P/N: 51470 ,51471 series

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RELEASE DATE: 2022/07/20

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ECN No: ECN-007122

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## 2 SCOPE

This specification covers performance, tests and quality requirements for **2.0 mm pitch WTB connector.T/H D/R S/T Type**.

## 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: [Refer to the drawing.](#)

### 4.3 Ratings

- 4.3.1 Working voltage less than 36 volts (per pin)
- 4.3.2 Voltage: [250 Volts AC \(per pin\)](#)
- 4.3.3 Current:  
[AWG#22: 4.0 Amperes \(per pin\)](#)  
[AWG#24: 3.4 Amperes \(per pin\)](#)  
[AWG#26: 2.5 Amperes \(per pin\)](#)
- 4.3.4 Operating Temperature : [-40°C to +105°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.
<b>ELECTRICAL</b>		
Item	Requirement	Standard
Low Level Contact Resistance	30 m $\Omega$ Max.	Mate connectors, measure by dry circuit, 20mV Max., 10mA Max. (EIA-364-23)
Insulation Resistance	1000 M $\Omega$ 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.	1000V 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)
<b>MECHANICAL</b>		
Item	Requirement	Standard
Durability	50 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)	1.00Kgf Min.	Operation Speed : 25.4 $\pm$ 3 mm/minute.. Measure the contact retention force with tester.
Crimping Terminal / Housing Retention Force (Cable Side)	1 Kgf MIN.	Apply axial pull out force at the speed rate of 25.4 $\pm$ 3 mm/minute. On the terminal assembled in the housing.

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Crimping Pull Out Force	AWG# 24: 2.0Kgf Min. AWG# 26: 1.5Kgf Min. AWG# 28: 1.0Kgf Min.	Operation Speed : 25.4 ± 3 mm/minute. Fix the crimped terminal, apply axial pull out force on the wire.
Vibration	1 μs 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 μs 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 <b>Wave</b> Soldering Heat (Board Side)	See Product Qualification and Test Sequence Group 10 (Lead Free)	Solder Temp. : 265±5°C, 10±0.5sec.
Resistance to <b>Reflow</b> Soldering Heat (Board Side)	See Product Qualification and Test Sequence Group 10 (Lead Free)	Pre Heat : 150°C~180°C, 60~120sec. Heat : 217°C Min.90sec 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 °C, 30 minutes +85 +3/-0 °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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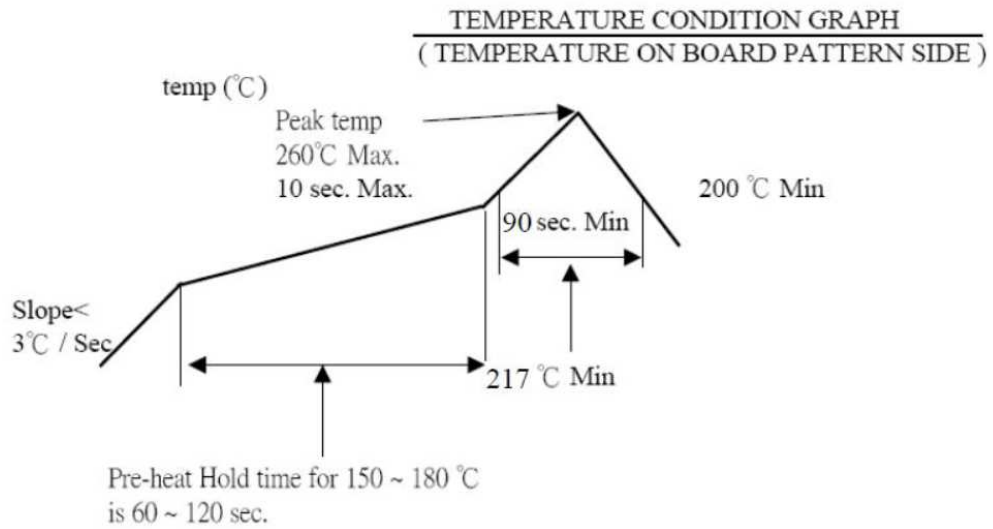
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Temperature Life	See Product Qualification and Test Sequence Group <b>5</b>	Subject mated connectors to temperature life at <b>85°C</b> for <b>96 hours</b> . (EIA-364-17, Test condition A)
Salt Spray (Only For Gold Plating)	See Product Qualification and Test Sequence Group <b>6</b>	Subject mated/unmated connectors to 5% salt-solution concentration, <b>35°C</b> <b>(I) Gold flash for 8 hours</b> <b>(II) Gold plating 3 u" for 48 hours</b> <b>(III) Gold plating 5 u" for 96 hours.</b> (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 <b>245 ±5°C</b> , for <b>4-5</b> sec. (EIA-364-52)
Hand Soldering Temperature Resistance (Board Side)	Appearance: No damage	$T \geq 350^{\circ}\text{C}$ , 3sec at least.

**Note.** Flowing Mixed Gas shall be conduct by customer request.

## 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、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)									3		
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)									1		
Resistance to Soldering Heat (Board Side)										2	
Hand Soldering Temperature Resistance (Board Side)											2
<b>Sample Size</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>

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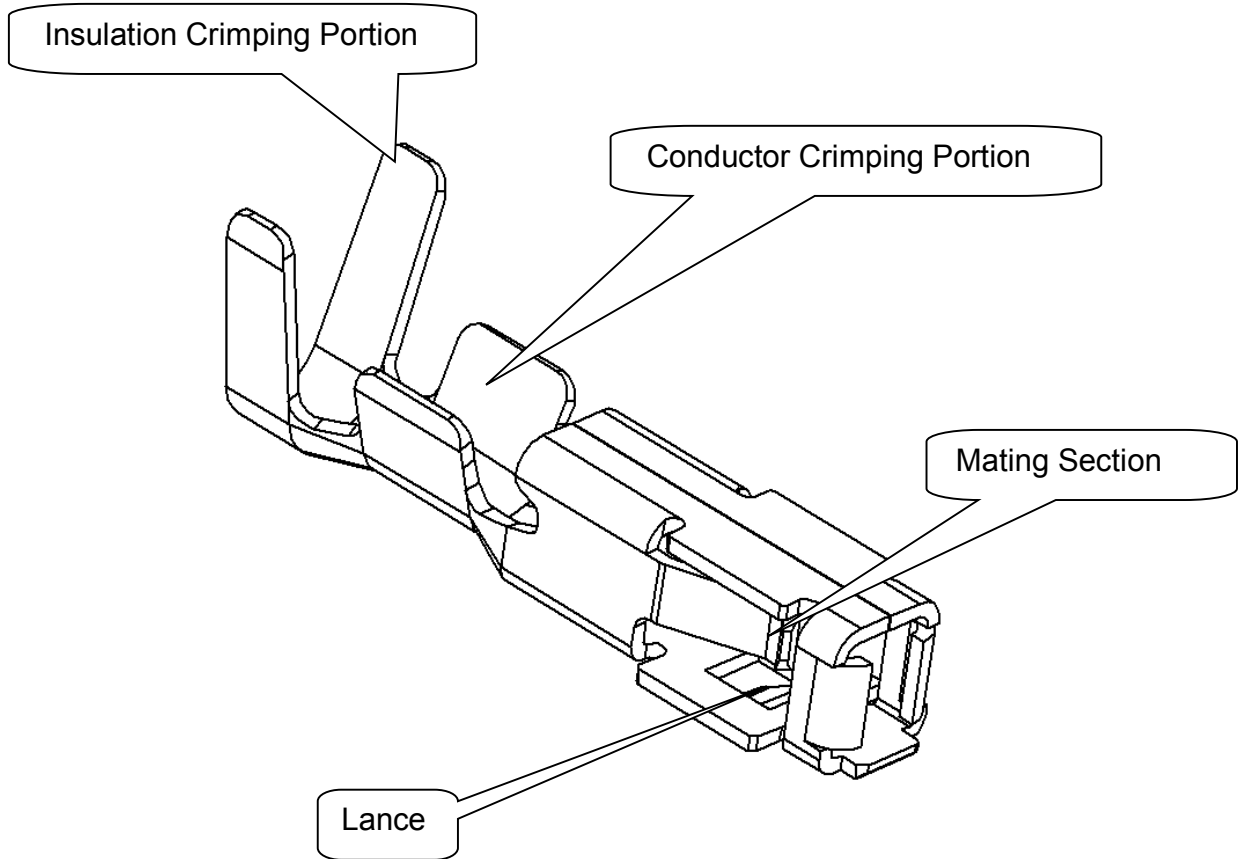
## 8 MATING / UNMATING FORCE

( Kgf )

No.of circuits	At initial		At 50th
	Mating Force (Max.)	Unmating Force (Min.)	Unmating Force (Min.)
12	7.20Kg	0.6Kg	0.6Kg
<b>28</b>	<b>10.0Kg</b>	<b>0.8Kg</b>	<b>0.8Kg</b>

Test method : A Housing crimped contact (s) and a header shall be mated and unmated on the same axis. Initial insertion and withdrawal circuit and multi – circuits. For the measurement of single circuit,the housing lock shall be removed.

## 9 ANATOMY OF CRIMPING TERMINAL



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### 10 APPLICABLE WIRES: UL1007 ETFE WIRE

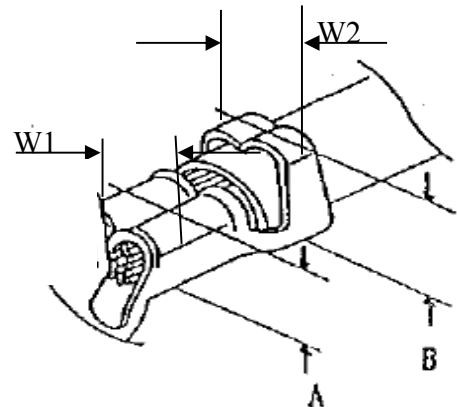
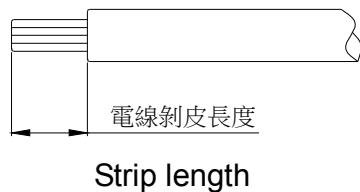
AWG Size:AWG#28~24#

Insulation OD:  $\Phi$ 1.2mm~1.4mm

### 11 CRIMPING CONDITION

#### 鉚線條件表 CRIMPING CONDITION

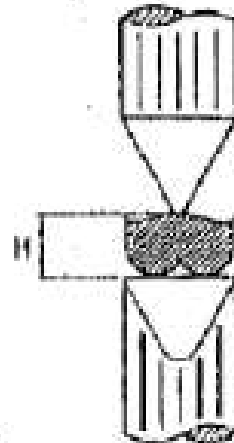
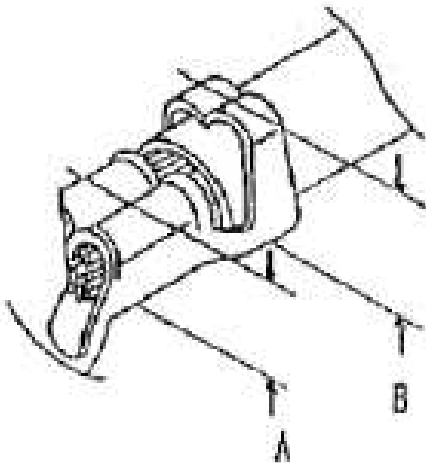
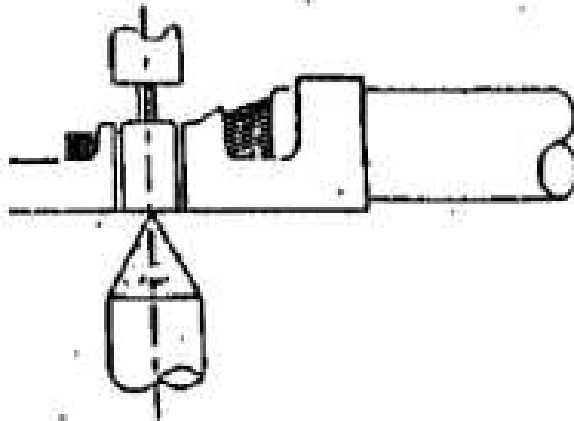
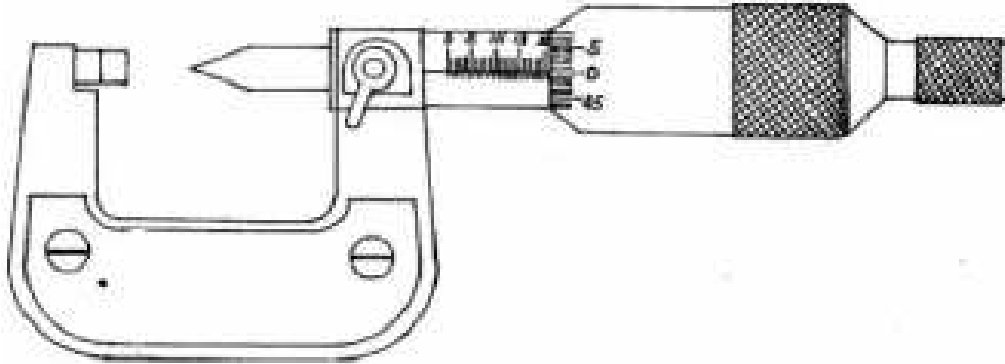
Part Number	Wire Specification			Crimp Height (mm)		Crimp Width (mm)	
	UL Style (REF.)	AWG Size	Insulation OD(mm)	Conductor A	Insulation B	Conductor W1	Insulation W2
51471-txxx-xxx	UL1007	28	1.20	0.55~0.62	1.1~1.35	1.3 Max.	1.5 Max.
	UL1007	26	1.30	0.60~0.67	1.4~1.65	1.3 Max.	1.5 Max.
	UL1007	24	1.40	0.65~0.72	1.7~1.95	1.3 Max.	1.5 Max.



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)：1.5~1.9mm(參考值)

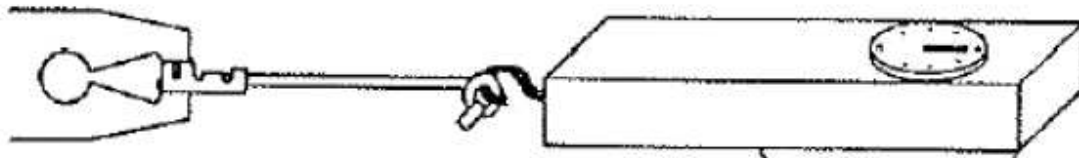
## 12 CRIMPING HEIGHT MEASUREMENT



### 13 PULL FORCE OF CRIMPING SECTION MEASUREMENT

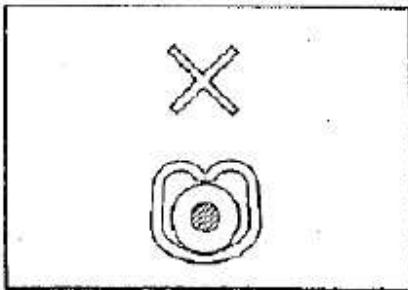


Before test samples, please measure crimp height and do not crimp insulation.

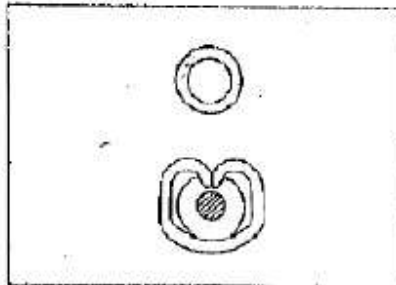


Pull Force of Crimp Section Measurement

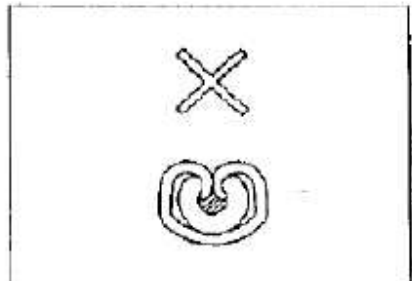
### 14 STANDARD INSULATION CRIMPING



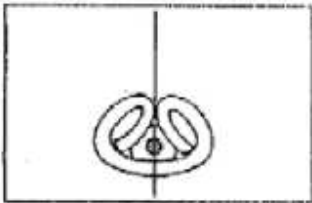
Not enough crimp



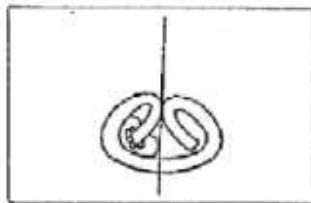
Good



Crimp too much

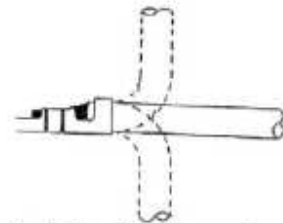


Good



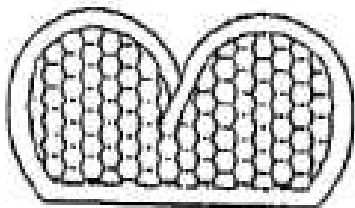
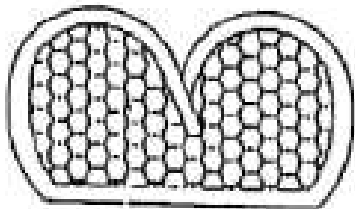
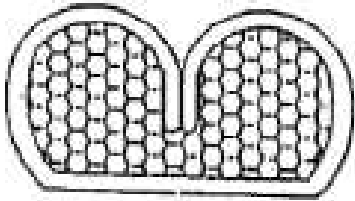
NG

Insulation Crimp Condition

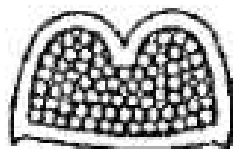


As following figure shown. It is no problem if wire bent up down 90 degrees 1 cycle and insulation position still in ideal position.

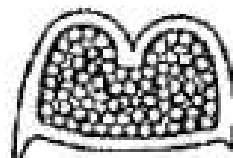
**15 CONDUCTORS CRIMPING CONDITION**



Lower conduct  
retension force



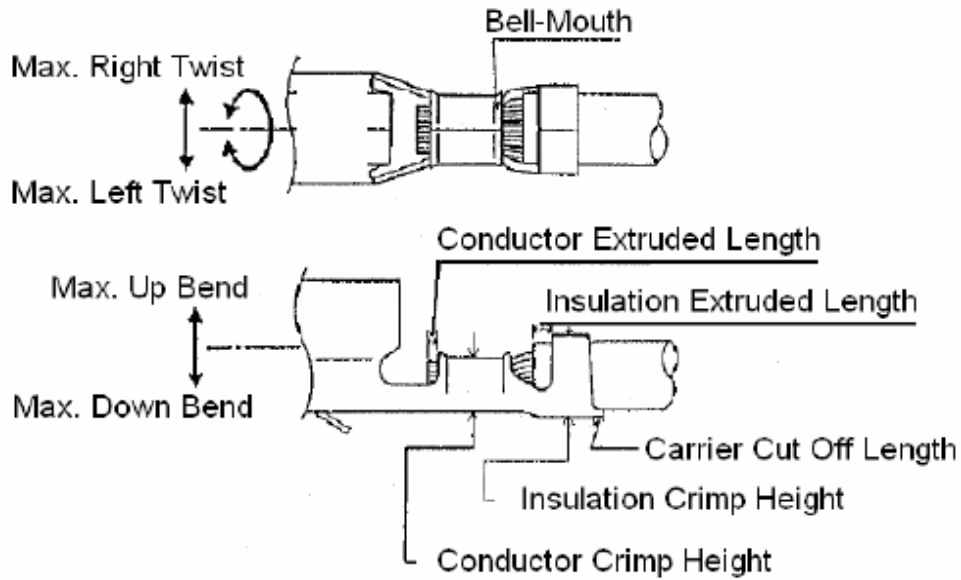
Good



Large burr

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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