



## SPECIFICATION

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SPEC. NO.: PS-51204-XXXXX-XXX

REVISION: J

PRODUCT NAME: 1.00 mm PITCH WTB WAFER CONN

PRODUCT NO: 51204,51200,52272 series

PREPARED:  <b>YIJIAHAO</b>  DATE: <b>2023/09/25</b>	CHECKED:  <b>XUZHIYONG</b>  DATE: <b>2023/09/25</b>	APPROVED:  <b>XUZHIYONG</b>  DATE: <b>2023/09/25</b>
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## 1 REVISION HISTORY

Rev.	ECN NO.	Revision Description	Prepared	Date
1	ECN-1204566	PROPOSAL	BRAVE	2012/04/20
O	ECN-1208240	FOR APD1010088 RELEASE	BRAVE	2012/08/17
A	ECN-1401125	ADD Working voltage	YANGYANG	2014/01/10
B	ECN-1505206	ADD 4/5/6PIN Mating / Unmating Forces	XIUJIN	2015/5/18
C	ECN-1806371	ADD 8PIN Mating / Unmating Forces	ZHOUQUAN	2018/6/20
D	ECN-1808425	Modified Salt Spray Specifications	ZHANGHAO	2018/8/20
E	ECN-005578	ADD NEW PN 55272 SERIES	HUAILIN	2021/10/12
F	ECN-006179	Modified Salt Spray Specification	YANJINXIU	2021/12/20
G	ECN-007308	FOR DWR-2203171 Modify the current of line 28#	YANJINXIU	2022/03/10
H	ECN-009533	ADD 2/3PIN Mating / Unmating Forces	GAOLI	2022/11/1
J	ECN-013771	ADD 10PIN Mating / Unmating Forces	YIJIAHAO	2023/09/25

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## 2 SCOPE

This specification covers performance, tests and quality requirements for **1.0 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: **Refer to the drawing**.

### 4.3 Ratings

- 4.3.1 **Working voltage less than 36 volts AC (per pin)**
- 4.3.2 Voltage: **50 Volts AC (per pin)**
- 4.3.3 Current: **AWG#28: 1.2 Amperes (per pin)**  
**AWG#30 : 1.0 Amperes (per pin)**  
**AWG#32 : 1.0 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.
<b>ELECTRICAL</b>		
Item	Requirement	Standard
Low Level Contact Resistance	<b>20 m Ω</b> Max.(initial)per contact <b>ΔR 20 m Ω</b> Max.	Mate connectors, measure by dry circuit, <b>20mV</b> Max., <b>100mA</b> Max. (EIA-364-23)
Insulation Resistance	<b>500 M Ω</b> Min.	Unmated connectors, apply <b>500 V</b> DC between adjacent terminals. (EIA-364-21)
Dielectric Withstanding Voltage	No discharge, flashover or breakdown. Current leakage: <b>1 mA</b> max.	<b>300V</b> AC Min. at sea level for <b>1</b> minute. Test between adjacent contacts of unmated connectors. (EIA-364-20)
Temperature Rise	<b>30°C</b> 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	<b>30</b> cycles.	The sample should be mounted in the tester and fully mated and unmated the number of cycles specified at the rate of <b>25.4 ± 3mm/min</b> .
Mating / Unmating Forces	Please see Item <b>8</b>	Operation Speed : <b>25.4 ± 3</b> mm/minute.. Measure the force required to mate/unmate connector. (EIA-364-13)
Contact Retention Force (Board Side)	<b>0.40</b> Kgf Min.	Operation Speed : <b>25.4 ± 3</b> mm/minute. Measure the contact retention force with tester.
Fitting Nail /Housing Retention Force	<b>0.20</b> Kgf MIN.	Apply axial pull out force at the speed rate of <b>25.4 ± 3</b> mm/minute. On the fitting nail assembled in the housing.

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Crimping Terminal / Housing Retention Force (Cable Side)	0.5 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	AWG# 32: 0.6Kgf Min. AWG# 30: 0.8Kgf 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 <b>10 and 55 Hz</b> . The entire frequency range, from <b>10 to 55 Hz</b> and return to <b>10 Hz</b> , 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 <b>50 G's</b> (peak value) <b>half-sine</b> shock pulses of <b>11</b> 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>Reflow</b> Soldering Heat (Board Side)	See Product Qualification and Test Sequence Group <b>10 (Lead Free)</b>	Pre Heat : 150°C~180°C, 60~120sec. Heat : 230°C Min., 40sec Min. Peak Temp. : 260°CMax, 10sec Max.
Thermal Shock	See Product Qualification and Test Sequence Group <b>4</b>	Mate module and subject to follow condition for 5 cycles. 1 cycles: <b>-55</b> +0/-3 °C, 30 minutes <b>+85</b> +3/-0 °C, 30 minutes (EIA-364-32, test condition I)
Humidity	See Product Qualification and Test Sequence Group <b>4</b>	Mated Connector 40°C, 90~95% RH, 96 hours. (EIA-364-31, Condition A, Method II)

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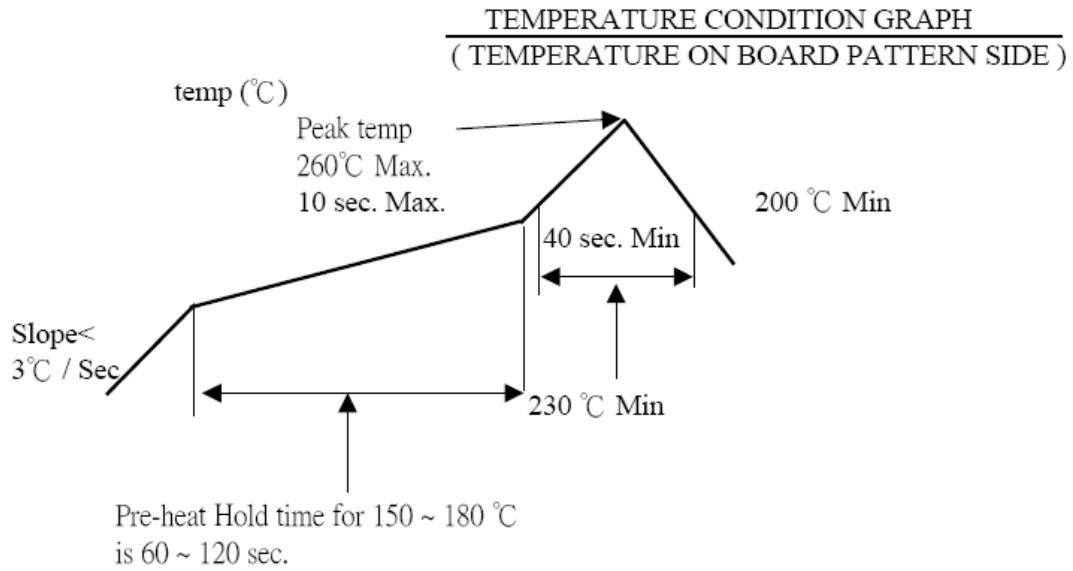
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Temperature Life	See Product Qualification and Test Sequence Group <b>5</b>	Subject mated connectors to temperature life at <b>85°C</b> for <b>96 hours</b> . (EIA-364-17, Test condition A)
Salt Spray (Only For Gold Plating)	See Product Qualification and Test Sequence Group <b>6</b>	Subject mated/unmated connectors to 5% salt-solution concentration, <b>35°C</b> , Under the condition that the electroplating layer on the metal surface is not destroyed (I) Gold flash for 8 hours (II) $1 \mu\text{m} < \text{Gold plating} \leq 3 \mu\text{m}$ for 48 hours. (III) Gold plating $\geq 5 \mu\text{m}$ 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 <b>245 ±5°C</b> , for <b>4-5 sec</b> . (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 conducted 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							1				
Crimping Pull Out Force								1			
Crimping Terminal / Housing Retention Force (Cable Side)									1		
Fitting Nail /Housing Retention Force									2		
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

Number of circuits	At initial		At 30th
	Mating Force. kgf. (Max.)	Unmating Force kgf. (Min.)	Unmating Force kgf. (Min.)
2	3.00	0.20	0.18
3	3.00	0.20	0.18
4	4.00	0.20	0.18
5	4.00	0.20	0.18
6	4.00	0.20	0.20
8	4.00	0.35	0.20
10	4.00	0.35	0.25
26	4.00	1.5	1.0
30	4.00	1.5	1.0

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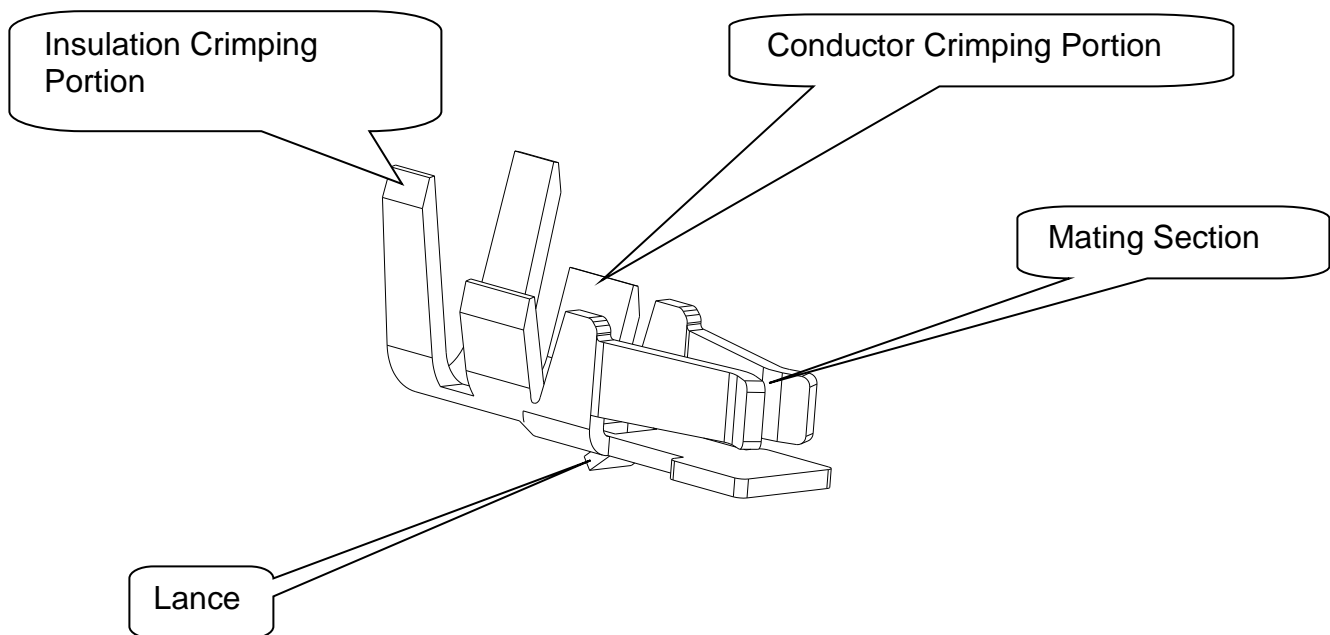
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## 9 ANATOMY OF CRIMPING TERMINAL



## 10 APPLICABLE WIRES: UL10584 ETFE WIRE

AWG Size: AWG#28~ AWG#32

Insulation OD:  $\Phi 0.4 \sim \Phi 0.8$ mm

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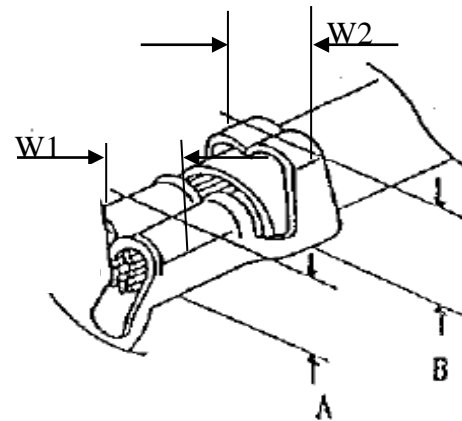
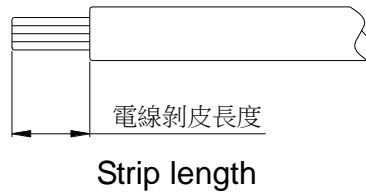
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**11 CRIMPING CONDITION**

**鉚線條件表 CRIMPING CONDITION**

Part Number	Wire Specification			Crimp Height (mm)		Crimp Width (mm)	
	UL Style	AWG Size	Insulation OD(mm)	Conductor A	Insulation B	Conductor W1	Insulation W2
51204-Txxx	UL3302	32	0.60Max.	0.35~0.45	1.00Max.	0.75 Max.	0.80 Max.
51204-Txxx	UL3302	30	0.60	0.40~0.50	1.00Max.	0.75 Max.	0.80 Max.
51204-Txxx	UL3302	28	0.80Max.	0.45~0.58	1.10Max.	0.75 Max.	0.80 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)：1.0~1.5mm(參考值)

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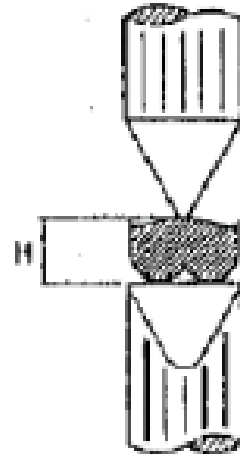
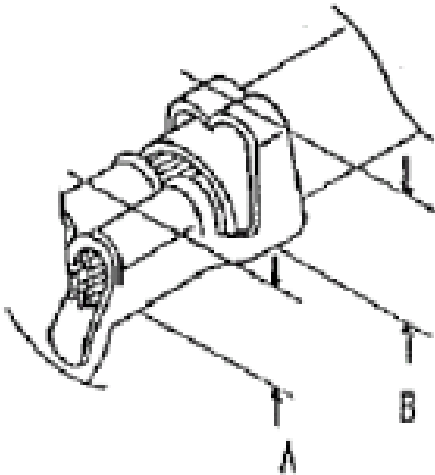
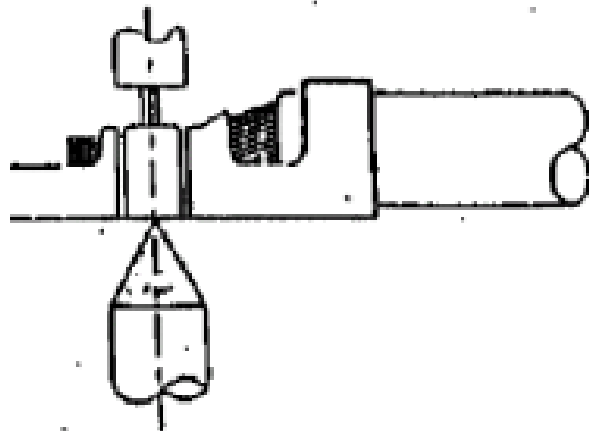
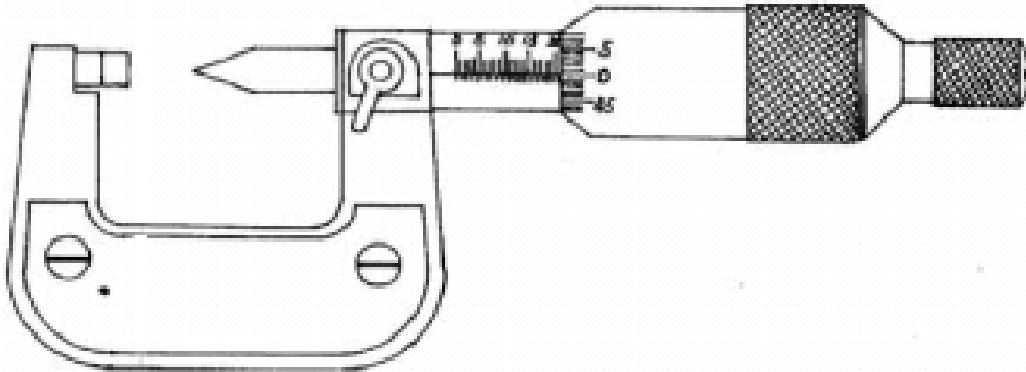
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## 12 CRIMPING HEIGHT MEASUREMENT



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



Pull Force of Crimp Section Measurement

**14 STANDARD INSULATION CRIMPING**

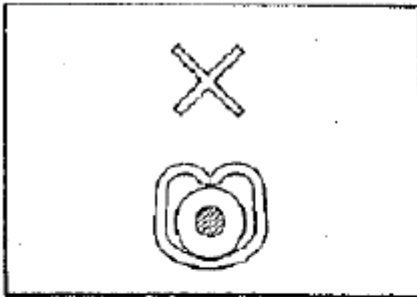
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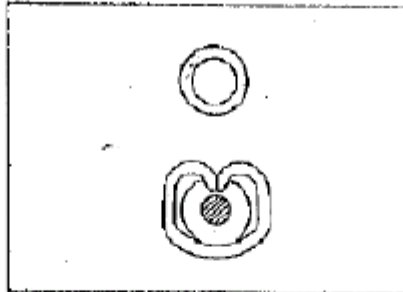
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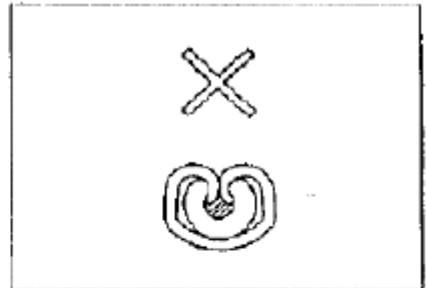
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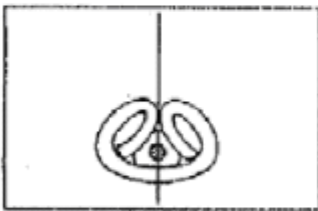
Not enough crimp



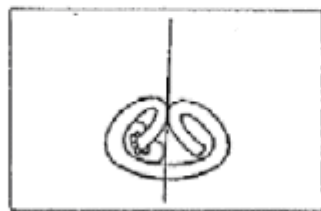
Good



Crimp too much

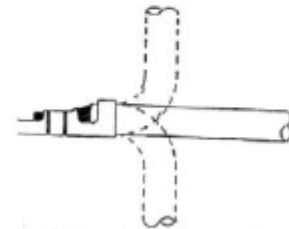


Good



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**

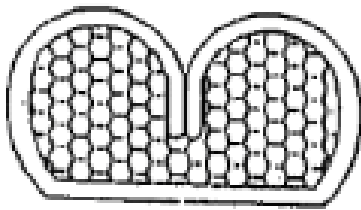
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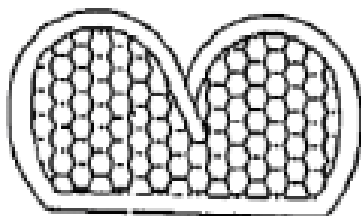
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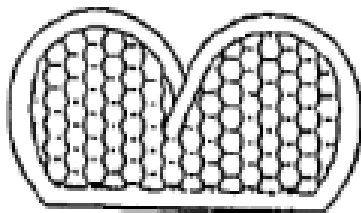
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Good

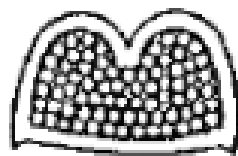


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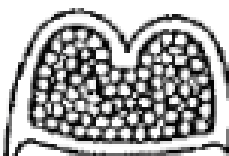


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Lower conduct  
retension force



Good



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Large burr



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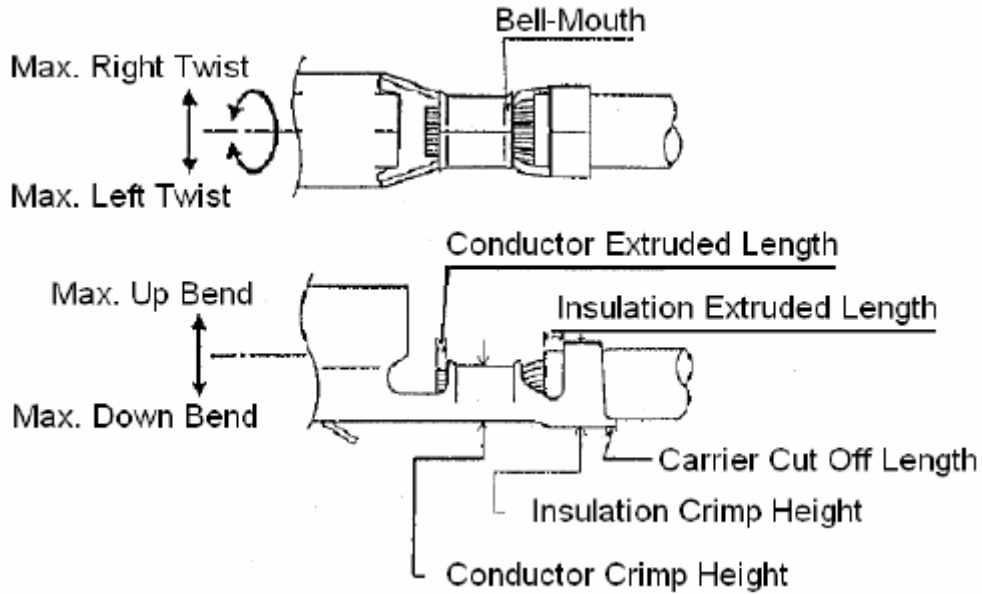
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**16 CRIMPING REQUIREMENT**



Item	Range(Ref.)
Max. Up Bend	6°
Max. Down Bend	6°
Max. Left Twist	5°
Max. Right Twist	5°
Bell-Mouth Length	0.1~0.30mm
Carrier Cut Off Length	0~0.2mm
Conductor Extruded Length	0.05~0.20mm