# SPECIFICATION

宏 致 電 子 股 份 有 限 公 司

桃 園 縣 中 壢 市 東 園 路 13 號

No.13, Dongyuan Rd., Jhongli City,

Taoyuan County 320, Taiwan (R.O.C.)

TEL: +886-3-463-2808
FAX: +886-3-463-1800

**SPEC. NO.:** PS-50278-XXXXX-XXX **REVISION:** U

**PRODUCT NAME:** 1.25mm WIRE TO BOARD WAFER LPF-2 SMT R/A TYPE

**PRODUCT NO:** 50277 50278 50279 50461 50462 50483 50484 51483 51484 51485 51486 51280 51319 51377 52218 51301 52215 SERIES.

| PREPARED: | CHECKED: | APPROVED: |
|---|---|---|
| **Lu,TaoTao** | **Xu,ZhiYong** | **Xu,ZhiYong** |
| DATE: **2022.03.14** | DATE: **2022.03.14** | DATE: **2022.03.14** |

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# 1 REVISION HISTORY

| Rev. | ECN # | Revision Description | Prepared | Date |
|---|---|---|---|---|
| O | ECN-0812248 | NEW SPEC | JASON | 2008.12.4 |
| A | ECN-0910106 | ADW0909097 ADD Soldering Heat | JASON | 2009.10.08 |
| B | ECN-1005167 | REVISE SPEC | VIOLET | 2010/05/05 |
| C | ECN-1101021 | REVISE SPEC | GAVIN | 2011/01/25 |
| D | ECN-1107379 | ADW1106049 ADD AWG#28: 1.8 A /PER PIN | CHUNBO | 2011/07/06 |
| E | ECN-1306039 | ADD 51483 / 51484 | BRAVE | 2013/06/05 |
| F | ECN-1307276 | ADD 51485 | DAVID | 2013/07/18 |
| G | ECN-1309111 | ADD 51486 | DAVID | 2013/09/12 |
| H | ECN-1401172 | ADD WORKING VOLTAGE | XUFEI | 2014/01/09 |
| J | ECN-1410340 | ADD AWG#26: 2.5A (PER PIN UL10064) | XIUJIN | 2014/10/17 |
| K | ECN-1410419 | REVISE Mating Force | COCOYU | 2014/10/30 |
| L | ECN-1503136 | ADD 51280 | GUKEQING | 2015/03/10 |
| M | ECN-1508337 | ADD AWG#30: 1.0A (PER PIN UL3302) | WANGWEI | 2015/08/26 |
| N | ECN-1509266 | REVISE Salt Spray | WANGWEI | 2015/09/22 |
| P | ECN-1512054 | REVISE Mating / Unmating Forces | CHENYA | 2015/11/24 |
| Q | ECN-1601148 | ADD 51319 SERIES | CHENYA | 2015/12/07 |
| R | EC N-1710356 | ADD 51377 SERIES | SHIYANAN | 2017/09/09 |
| S | ECN-000276 | ADD 52218 SERIES | Huang,Shun Sen | 2020/09/07 |
| T | ECN-001024 | ADD 51301 SERIES | Shi,SongTao | 2020/10/30 |
| U | ECN-006373 | ADD 52215 SERIES | Lu,TaoTao | 2022/03/14 |

## 2 SCOPE

This specification covers performance, tests and quality requirements for 1.25mm pitch WTB connector. This Product Spec. Refer to…Aces- P/N ： 50277 50278 50279 50461 50462 50483 50484 51483 51484 51485 51486 51280 51319 51377 52218 51301 Series.

## 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 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: 200 Volts AC (per pin)

4.3.3 Current: AWG#26: 2.3 Amperes (per pin)
AWG#26: 2.5 Amperes (per pin UL10064)
AWG#28: 1.8 Amperes (per pin)
AWG#30: 1.0 Amperes (per pin)
AWG#32: 0.8 Amperes (per pin)
AWG#30: 1.0 Amperes (per pin UL3302)

4.3.4 Operating Temperature : -40℃ to +85℃

# 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 | 55 mΩ Max.(initial)per contact<br>△R 20 mΩ Max. | Mate connectors, measure by dry circuit, 20mV Max., 100mA Max.<br>(EIA-364-23) |
| Insulation Resistance | 100 MΩ Min. | Unmated connectors, apply 500 V DC between adjacent terminals.<br>(EIA-364-21) |
| Dielectric Withstanding Voltage | No discharge, flashover or breakdown.<br>Current leakage: 1 mA max. | 500V AC Min. at sea level for 1 minute. Test between adjacent contacts of unmated connectors.<br>(EIA-364-20) |
| Temperature Rise | 30℃ Max. Change allowed | Mate connector: measure the temperature rise at rated current until temperature stable. The ambient condition is still air at 25℃<br>(EIA-364-70,METHOD1,CONDITION1) |

**MECHANICAL**

| 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 ± 3mm/min. |
| Mating / Unmating Forces | Mating Force:0.4Kgf/pin MAX<br>Unmating Force:0.05Kgf/pin MIN | Operation Speed：<br>25.4 ± 3 mm/minute.<br>Measure the force required to mate/unmated connector.<br>(EIA-364-13) |
| Contact Retention Force (Board Side) | 0.30 Kgf Min. | Operation Speed：<br>25.4 ± 3 mm/minute.<br>Measure the contact retention force with tester. |

| | | |
|---|---|---|
| Fitting Nail /Housing Retention Force(Board Side) | 0.40 Kgf MIN. | Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the fitting nail assembled in the housing. |
| 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# 26: 9.8N Min.<br>AWG# 28: 9.8N Min.<br>AWG# 30: 4.9N Min.<br>AWG# 32: 3.0N Min. | Operation Speed：<br>25.4 ± 3 mm/minute.<br>Fix the crimped terminal; apply axial pull out force on the wire. |
| 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) |

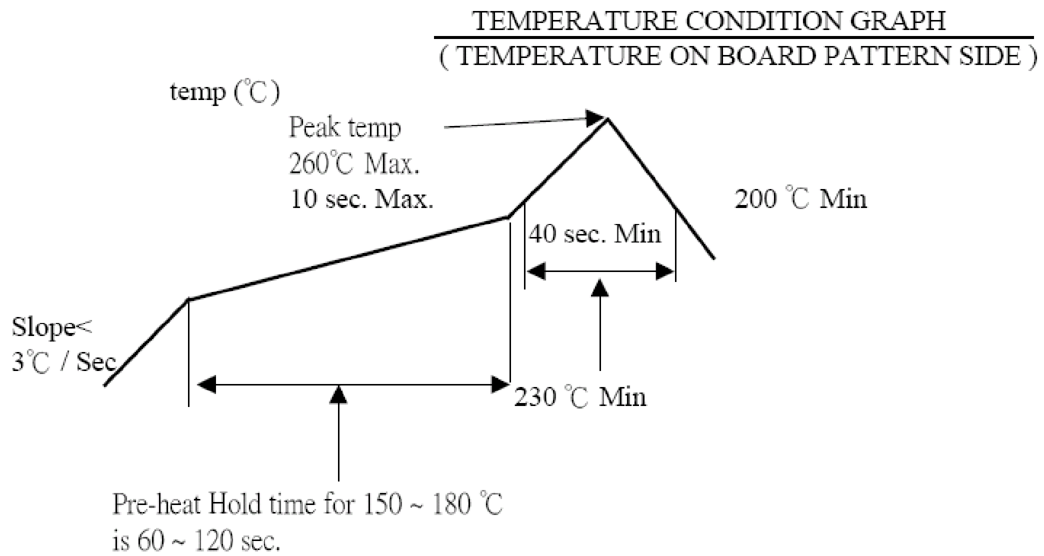
## ENVIRONMENTAL

| Item | Requirement | Standard |
|---|---|---|
| Resistance to **Wave** Soldering Heat (Board Side) | See Product Qualification and Test Sequence Group 10 **(Lead Free)** | Solder Temp.：<br>265±5℃, 10±0.5sec. |
| Resistance to **Reflow** Soldering Heat (Board Side) | See Product Qualification and Test Sequence Group 10 **(Lead Free)** | Pre Heat：150℃~180℃, 60~120sec.<br>Heat：230℃ Min., 40sec Min.<br>Peak Temp.：260℃Max, 10sec Max. |
| Thermal Shock | See Product Qualification and Test | Mate module and subject to follow |

| | | |
|---|---|---|
| | Sequence Group 4 | condition for 5 cycles.<br>1 cycles:<br>-40 +0/-3 ℃, 30 minutes<br>+85 +3/-0 ℃, 30 minutes<br>(EIA-364-32, test condition I) |
| Humidity | See Product Qualification and Test Sequence Group 4 | Mated Connector<br>40℃, 90~95% RH,<br>96 hours.<br>(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℃ for 96 hours.<br>(EIA-364-17, Test condition A) |
| Salt Spray<br>(Only For Gold Plating) | See Product Qualification and Test Sequence Group 6 | Subject mated/unmated connectors to 5% salt-solution concentration, 35℃<br>(I) Gold plating ＜3u" for 8 hours.<br>(II) 3u"≤Gold plating＜5u" for 48 hours<br>(III) Gold plating≥5u" for 96 hours.<br>(EIA-364-26) |
| Solder ability<br>(Board Side) | Tin plating:<br>Solder able area shall have minimum of 95% solder coverage.<br>Gold plating:<br>Solder able area shall have minimum of 75% solder coverage | And then into solder bath, Temperature at 245 ±5℃, for 4-5 sec.<br>(EIA-364-52) |
| Hand Soldering Temperature Resistance (Board Side) | Appearance: No damage | T≧350℃, 3sec at least. |

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

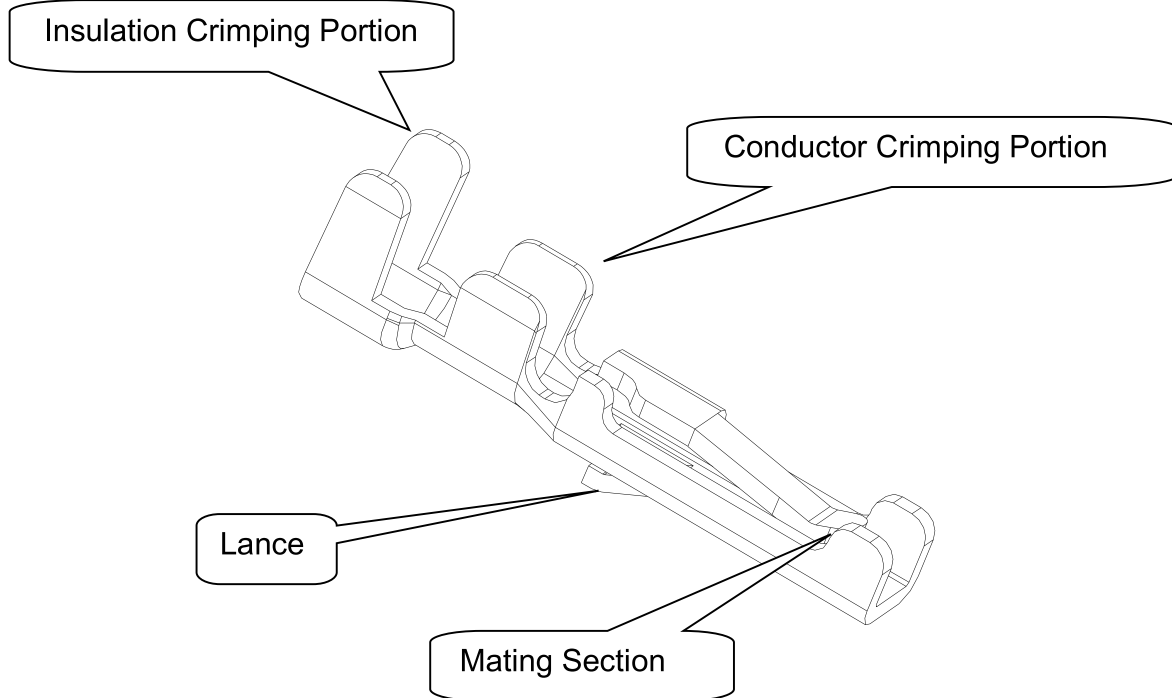
## 6 INFRARED REFLOW CONDITION



# 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 | | |
| Fitting Nail /Housing Retention Force(Board Side) | | | | | | | | | 2 | | |
| Resistance to Soldering Heat (Board Side) | | | | | | | | | | 2 | |
| Hand Soldering Temperature Resistance (Board Side) | | | | | | | | | | | 2 |
| **Sample Size** | 2 | 4 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 |

## 8 ANATOMY OF CRIMPING TERMINAL

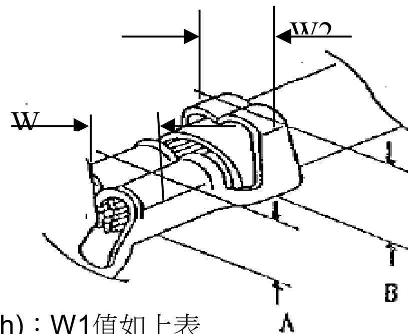


## 9 APPLICABLE WIRES: UL10584 AND UL3302 ETFE WIRE

AWG Size: AWG#26 Insulation OD: Φ0.90mm (UL10584)
AWG#28 Insulation OD: Φ0.80mm (UL10584)
AWG#30 Insulation OD: Φ0.70mm (UL10584)
AWG#32 Insulation OD: Φ0.40mm (UL10584)
AWG#30 Insulation OD: Φ0.60mm (UL3302)

## 10 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 |
| 88232-T | UL10584 | 26 | 0.9 | 0.55~0.65 | 1.10~1.25 | 0.95Max. | 1.0Max. |
| 88232-T | | 28 | 0.8 | 0.56~0.63 | 1.20~1.27 | 0.95Max. | 1.0 Max. |
| 88232-T | | 30 | 0.7 | 0.52~0.59 | 1.03~1.12 | 0.95Max. | 1.0 Max. |
| 88232-T | | 32 | 0.4 | 0.47~0.54 | 0.96~1.03 | 0.95Max. | 1.0 Max. |
| 88232-T | UL3302 | 30 | 0.6 | 0.57~0.63 | 1.00~1.07 | 0.95Max. | 1.0 Max. |




Note:

1、W1為芯線導體鉚壓後之寬度(Conductor Crimping Width)：W1值如上表

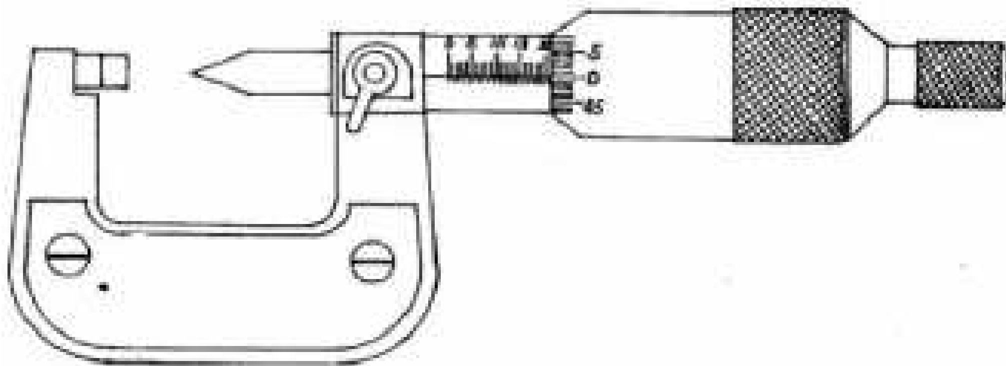
2、W2為電線外被部分鉚壓後之寬度(Insulation Crimping Width)：W2值如上表

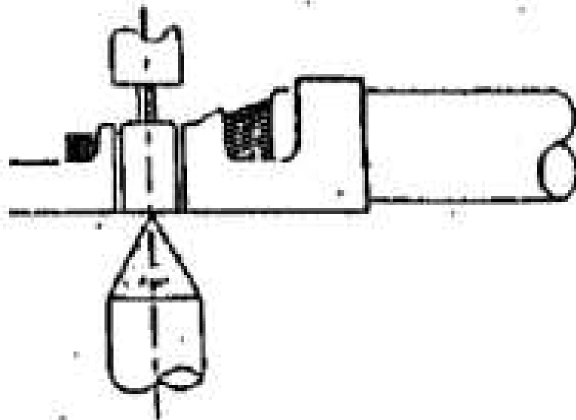
3、A為芯線導體鉚壓後之高度(Conductor Crimping height)：A值如上表(參考值）

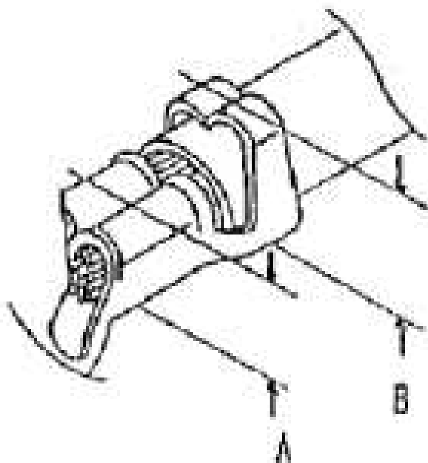
4、B為電線外被鉚壓後之高度(Insulation Crimping height)：B值如上表(參考值）

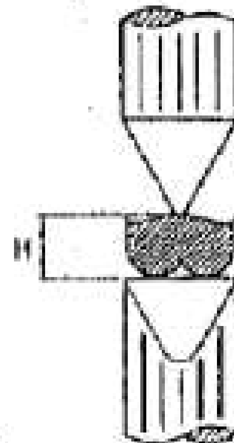
5、電線剝皮長度(Strip length)：1.4~1.9mm(參考值)

## 11 CRIMPING HEIGHT MEASUREMENT

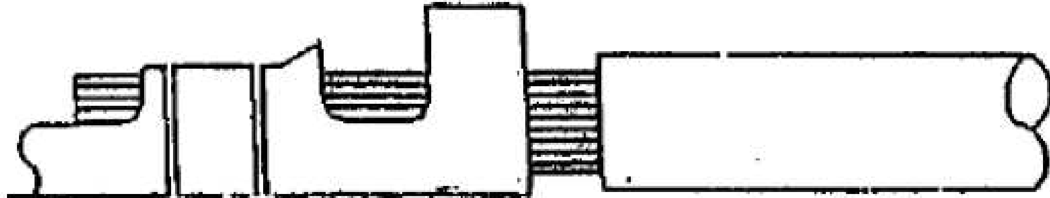




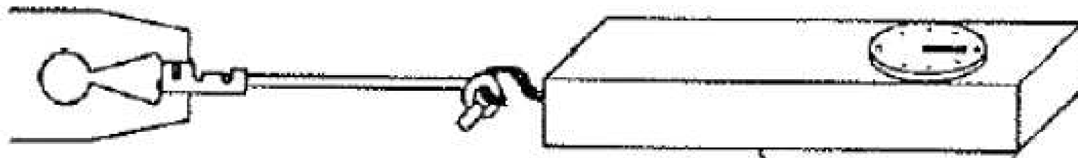


## 12 PULL FORCE OF CRIMPING SECTION MEASUREMENT

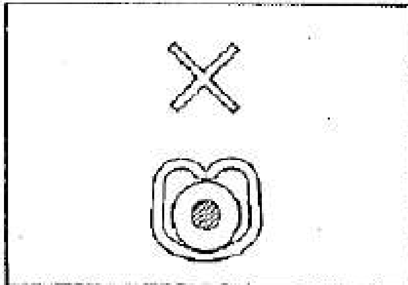


Before test samples, please measure crimp height and do not crimp insulation.

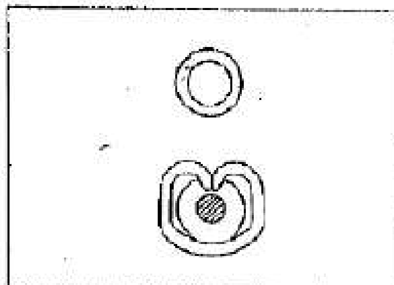


Pull Force of Crimp Section Measurement

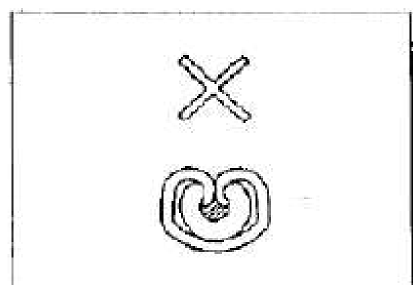
## 13 STANDARD INSULATION CRIMPING



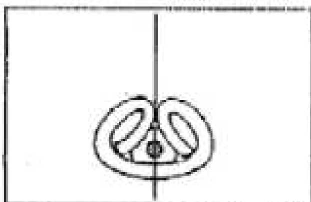
Not enough crimp



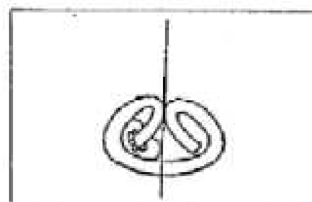
Good



Crimp too much



Good



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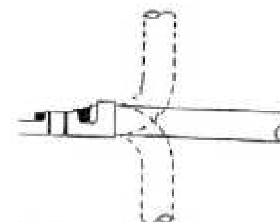
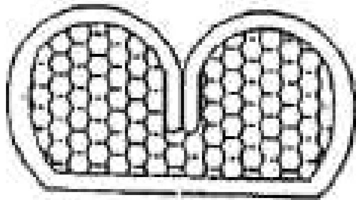
Insulation Crimp Condition

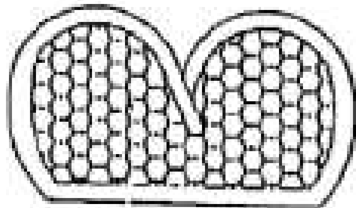


As following figure shown.
It is no problem if wire bent up down 90 degrees 1 cycle and insulation position still in ideal position.

## 14 CONDUCTORS CRIMPING CONDITION

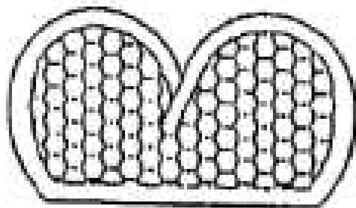


○ Good

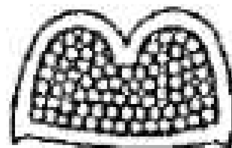


✕ NG

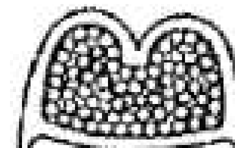
Lower conduct retension force



✕ NG



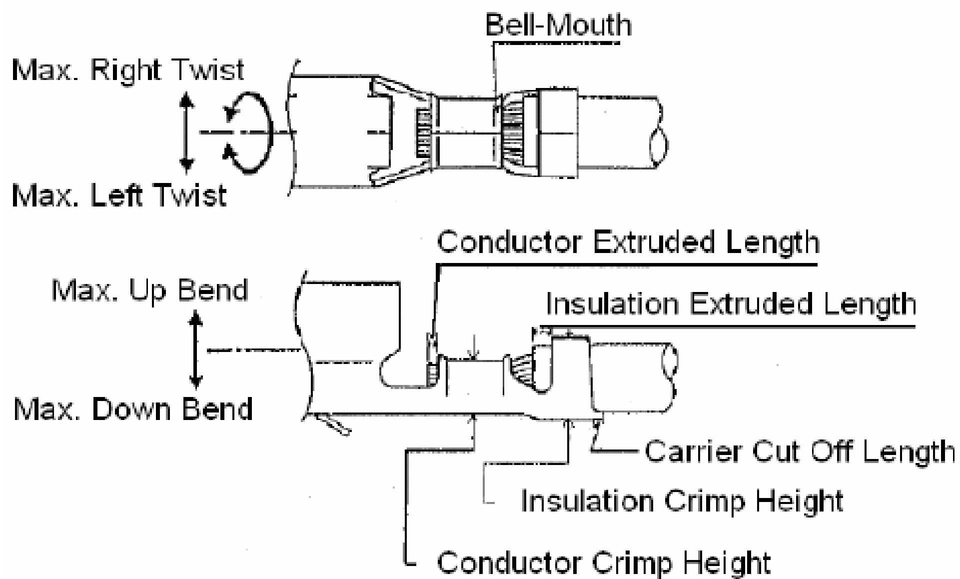
Good



Large burr

NG

## 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 | 0~0.3mm |
| Carrier Cut Off Length | 0~0.2mm |
| Conductor Extruded Length | 0.1~0.3mm |