



SPECIFICATION

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SPEC. NO.: PS-50487-XXXXX-XXX REVISION: F

PRODUCT NAME: 1.00 mm PITCH WTB WAFER CONN

PRODUCT NO: 50487 /50420-xxxHxxx-xxx SERIES

| | | |
|--|---|---|
| PREPARED: Dingshuqin DATE: 2023/05/11 | CHECKED: ANDREW DATE: 2023/05/11 | APPROVED: hsieh,fu yu DATE: 2023/05/11 |
|--|---|---|



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1 REVISION HISTORY

| Rev. | ECN # | Revision Description | Prepared | Date |
|------|-------------|---------------------------------|------------|------------|
| O | ECN-1202091 | RELEASE | GAVIN | 2012/02/09 |
| A | ECN-1401240 | ADD WORKING VOLTAGE | XUFEI | 2014/01/14 |
| B | ECN-1604233 | ADD 10PIN MATING/UNMATING FORCE | XIAOXIONG | 2016/04/05 |
| C | ECN-006241 | ADD 12PIN MATING/UNMATING FORCE | DINGSHUQIN | 2021/11/22 |
| D | ECN-007909 | ADD 16PIN MATING/UNMATING FORCE | DINGSHUQIN | 2022/05/03 |
| E | ECN-010763 | ADD 24PIN MATING/UNMATING FORCE | DINGSHUQIN | 2022/12/12 |
| F | ECN-012362 | ADD 50420-xxxHxxx-xxx SERIES | DINGSHUQIN | 2023/05/11 |
| | | | | |

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2 SCOPE

This specification covers performance, tests and quality requirements for 1.0 mm pitch WTB connector.

Aces P/N: Wire Connector:50420 Series

Header Connector:50487 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 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: 50 Volts AC (per pin)
- 4.3.3 Current: AWG#28: 1.0 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. |
| ELECTRICAL | | |
| Item | Requirement | Standard |
| Low Level Contact Resistance | 55 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 ± 3mm/min. |
| Mating / Unmating Forces | Please see Item 2 Mating with lock Unmating without lock | Operation Speed : 25.4 ± 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 ± 3 mm/minute. Measure the contact retention force with tester. |
| Fitting Nail /Housing Retention Force | 0.20 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. |



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| | | |
|--|--|--|
| Crimping Terminal / Housing Retention Force (Cable Side) | 0.6 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 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 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: -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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| | | |
|--|--|--|
| 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 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 conduct by customer request.

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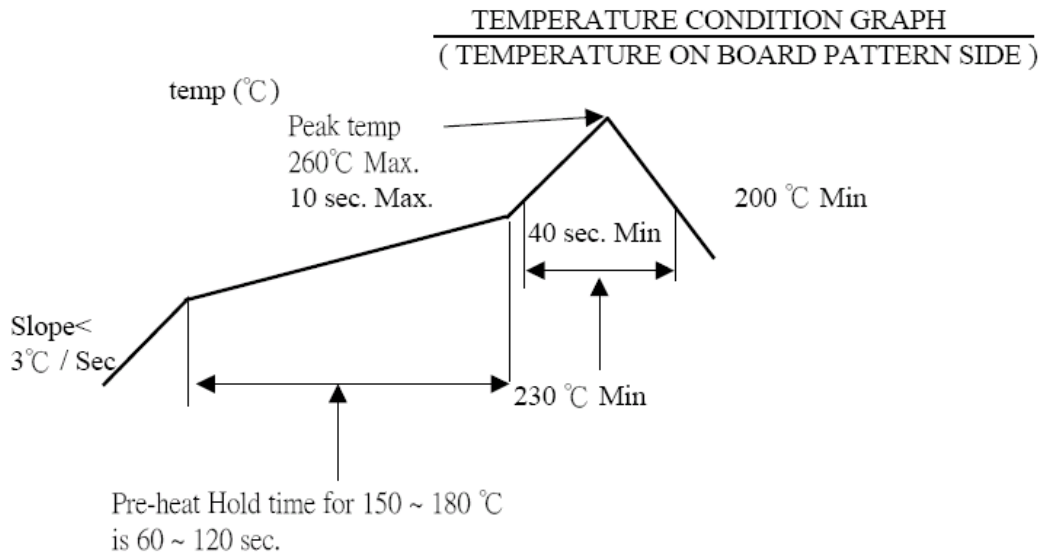
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6 INFRARED REFLOW CONDITION



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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、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 |
| Sample Size | 2 | 4 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 |

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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.) |
| 10 | 2.50 | 0.25 | 0.15 |
| 12 | 2.6 | 0.26 | 0.16 |
| 16 | 2.8 | 0.28 | 0.17 |
| 20 | 3.0 | 0.30 | 0.20 |
| 24 | 3.2 | 0.32 | 0.22 |
| 30 | 3.50 | 0.45 | 0.35 |
| 40 | 4.00 | 0.60 | 0.50 |
| 50 | 4.50 | 0.75 | 0.65 |

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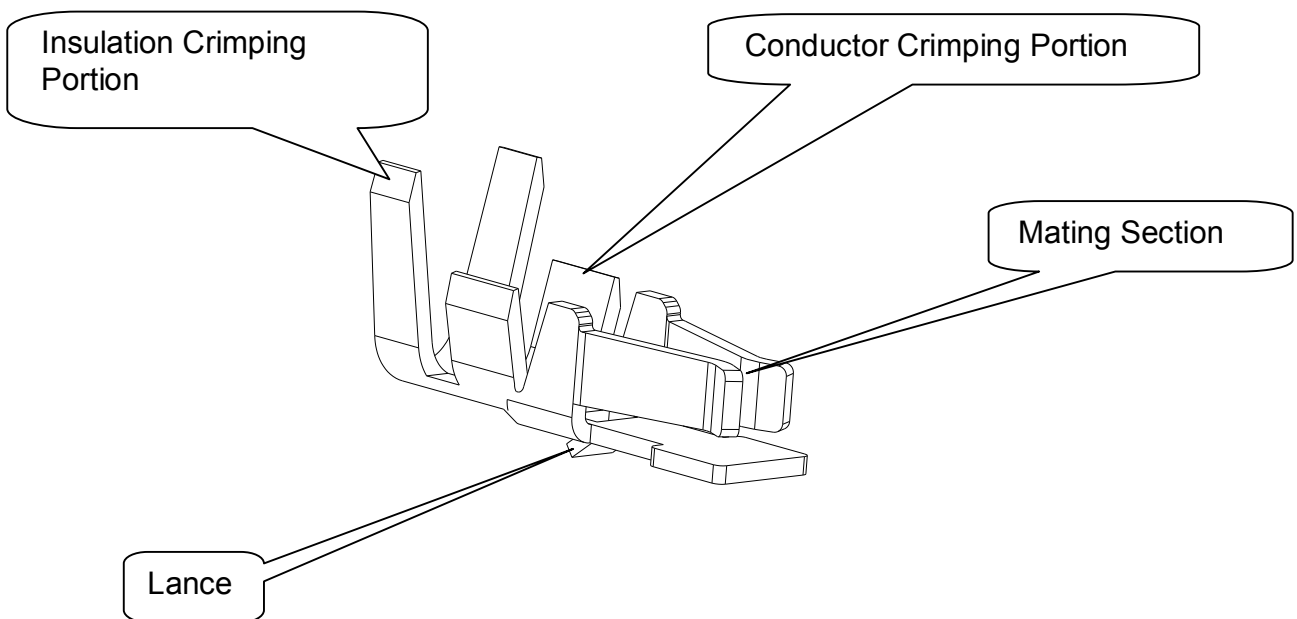
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9 ANATOMY OF CRIMPING TERMINAL



10 APPLICABLE WIRES: UL10584 ETFE WIRE

AWG Size:AWG#28~ AWG#32

Insulation OD: Φ 0.4~ Φ 0.8mm

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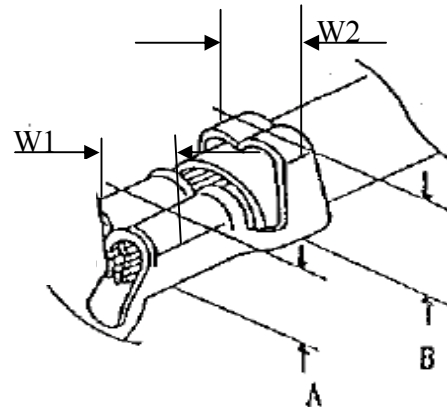
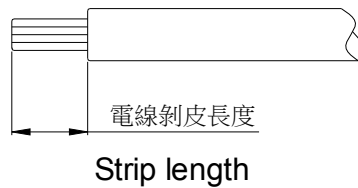
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11 CRIMPING CONDITION

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 |
| 50420-Txxx | UL1007 | 32 | 0.40 | 0.52~0.57 | 0.70~0.90 | 0.75 Max. | 0.80 Max. |
| 50420-Txxx | UL1007 | 30 | 0.60 | 0.57~0.62 | 0.90~1.10 | 0.75 Max. | 0.80 Max. |
| 50420-Txxx | UL1007 | 28 | 0.80 | 0.62~0.67 | 1.10~1.30 | 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)：1.2~1.6mm(參考值)

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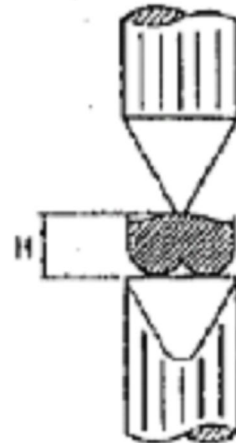
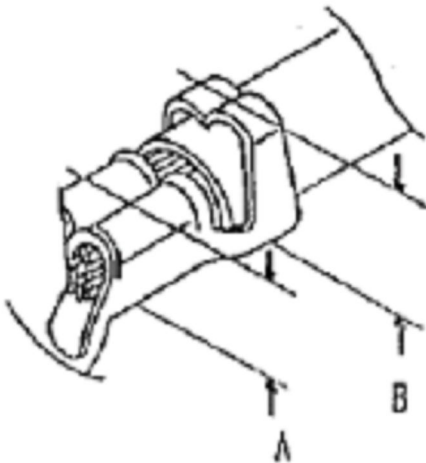
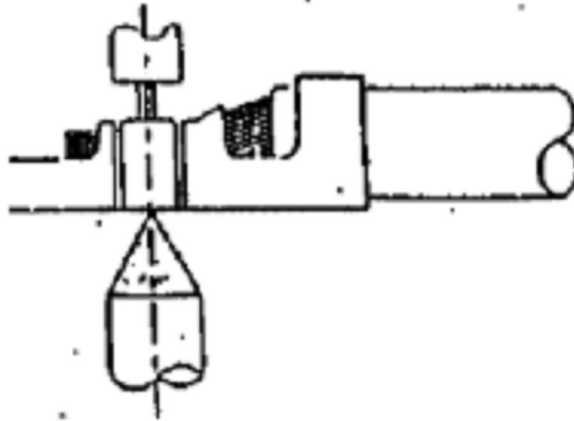
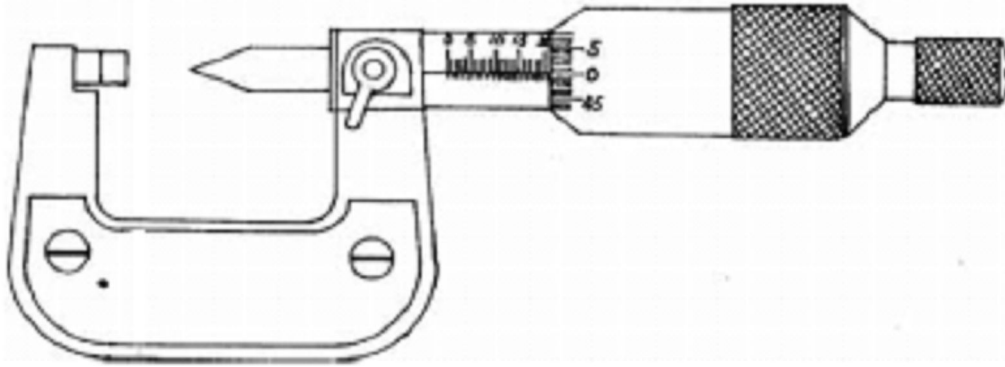
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12 CRIMPING HEIGHT MEASUREMENT



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13 PULL FORCE OF CRIMPING SECTION MEASUREMENT

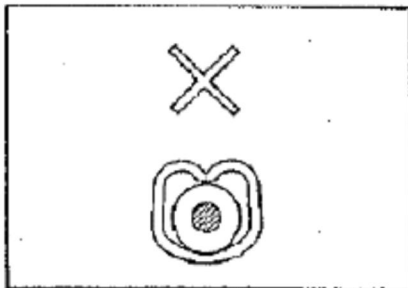


Before test samples, please measure crimp height and do not crimp insulation.

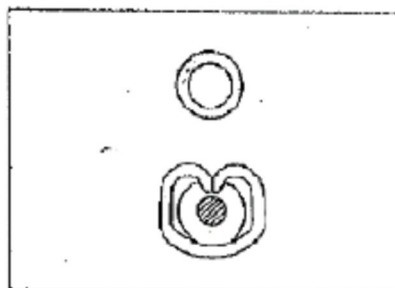


Pull Force of Crimp Section Measurement

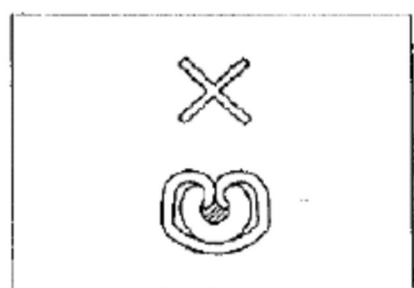
14 STANDARD INSULATION CRIMPING



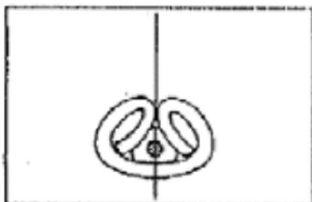
Not enough crimp



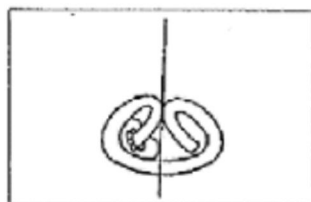
Good



Crimp too much

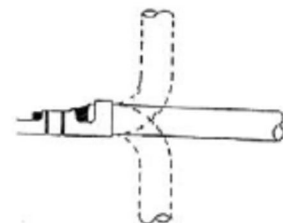


Good



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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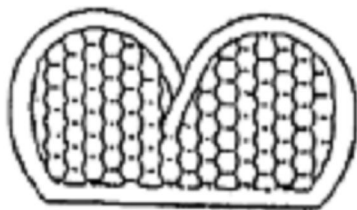
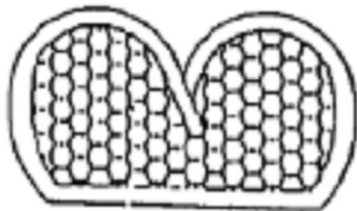
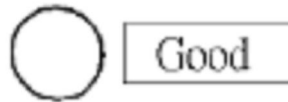
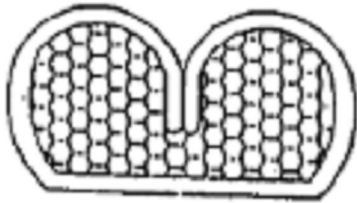
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15 CONDUCTORS CRIMPING CONDITION



Lower conduct
retension force



Good



Large burr

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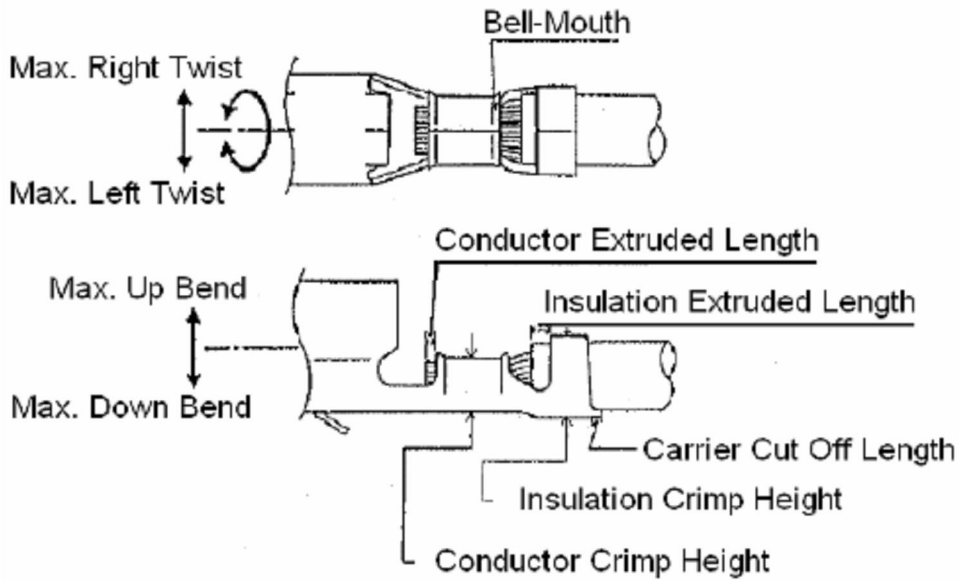
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16 CRIMPING REQUIREMENT



| 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 |