# SPECIFICATION


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**SPEC. NO.:** PS-50376-XXXXX-001 **REVISION:** L

**PRODUCT NAME:** 0.6mm PITCH WTB IDC CONNECTOR

**PRODUCT NO:** 50376 、50476 、50499、51300、51376 52286 SERIES

| PREPARED: | CHECKED: | APPROVED: |
|---|---|---|
| YANJINXIU | BRAVE | BRAVE |
| DATE: 2022/04/02 | DATE: 2022/04/02 | DATE: 2022/04/02 |

# 1 Revision History

| Rev. | ECN # | Revision Description | Prepared | Date |
|---|---|---|---|---|
| O | ECN-1003221 | PRODUCT RELEASE FOR APD980361 | STANLEY | 2010.03.25 |
| A | ECN-1104189 | ADD AWG#34 | BRUCE | 2011.04.25 |
| B | ECN-1112095 | DELETE AWG#34 | GAVIN | 2011.12.09 |
| C | ECN-1204426 | MODIFY CURRENT | BRAVE | 2012.04.26 |
| D | ECN-1304034 | ADD AWG#34 & Add 51224 51223 50497 Series | Warles | 2013.04.01 |
| E | ECN-1305292 | ADD 50476 series | Warles | 2013.05.23 |
| F | ECN-1401180 | ADD 50499 Series | XUFEI | 2014.01.10 |
| G | ECN-1507009 | ADD 51300 Series | ZHUWEI | 2015.04.10 |
| H | ECN-1507351 | ADD 16pin INSERTION/EXTRACTION FORCE | ZHUWEI | 2015.07.23 |
| J | ECN-1903436 | ADD 51376 Series | JINTAO | 2019/01/10 |
| K | ECN-2005307 | ADD Salt Spray (Gold plating 3 u" for 48 hours). | GUOFEI | 2020/07/15 |
| L | ECN-009082 | ADD 52286 Series | YANJINXIU | 2022/04/02 |

## 2 SCOPE

This specification covers performance, tests and quality requirements for 0.6 mm pitch WTB IDC connector.

## 3 APPLICABLE DOCUMENTS

EIA-364: ELECTRONICS INDUSTRIES ASSOCIATION

## 4 REQUIREMENTS

4.1 Design and Construction

Product shall be of design, construction and physical dimensions specified on applicable product drawing.

4.2 Materials and Finish

4.2.1 Terminal: High performance copper alloy (Phosphor Bronze)
Plated: (a) Finish: Refer to the drawing.
(b) Under plate: Refer to the drawing.
4.2.2 Housing: Thermoplastic, High temp. UL94V-0
4.2.3 Fitting: High performance copper alloy
Plated: (a) Finish: Refer to the drawing.
(b) Under plate: Refer to the drawing.

4.3 Ratings

4.3.1 Voltage: 30 Volts DC
4.3.2 Current:
DC 0.50 Amperes (per pin) AWG# 34(51224、50497) Insulation O.D φ0.32mm
DC 0.50 Amperes (per pin) AWG# 36(51223、50476) Insulation O.D φ0.29mm

4.3.3 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 | Initial: 30 m Ω max.<br>After Test: 50 m Ω max. | Mate connectors and measure by dry circuit, 20m V max. 10m A (EIA-364-23) |
| Insulation Resistance | 100 M Ω Min. | Unmated connectors, apply 100 V DC between adjacent terminals. (EIA-364-21) |
| Dielectric Withstanding Voltage | No discharge, flashover or breakdown.<br>Current leakage: 1 mA max. | 200V AC Min. at sea level for 1 minute. Test between adjacent contacts of unmated connectors. (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℃ (EIA-364-70 METHOD 1,CONDITION 1) |
| **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. |
| Insertion /Extraction Forces (Mating/ Un-mating Force) | See item 8 | Operation Speed：<br>25.4 ± 3 mm/minute..<br>Measure the force required to mate/unmate connector. (EIA-364-13) |
| Wire Pull Out Force | See item 10 | Operation Speed：<br>25.4 ± 3 mm/minute.<br>Fix the crimped terminal, apply axial pull out force on the wire. |
| Terminal/Housing Retention force (Board Side) | 70g Min. | Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the terminal assembled in the housing. |

| | | |
|---|---|---|
| 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 | 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

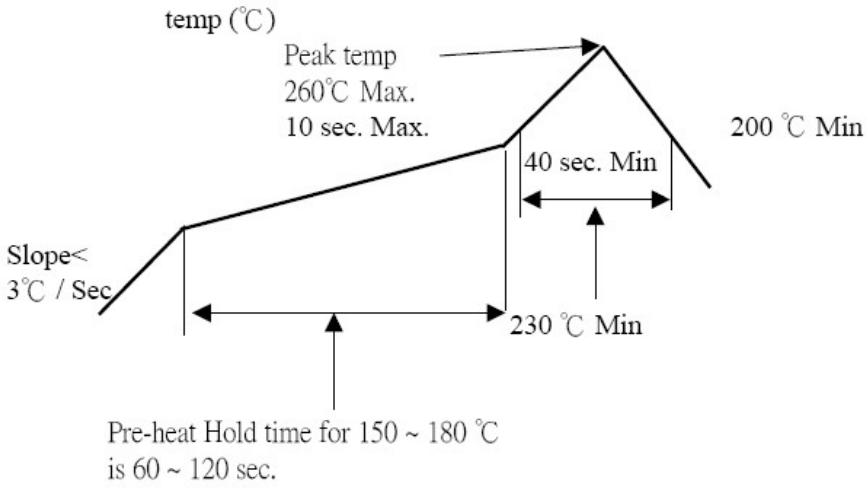
| Item | Requirement | Standard |
|---|---|---|
| Humidity | See Product Qualification and Test Sequence Group 6 | Mated Connector<br>40℃, 90~95% RH,<br>96 hours.<br>(EIA-364-31,Condition A, Method II) |
| Thermal Shock | See Product Qualification and Test Sequence Group 6 | Mate module and subject to follow condition for 5 cycles.<br>1 cycles:<br>-55 +0/-3 ℃, 30 minutes<br>+85 +3/-0 ℃, 30 minutes<br>(EIA-364-32, test condition I) |
| Salt Spray<br>(Only For Gold Plating) | See Product Qualification and Test Sequence Group 7 | Subject mated/unmated connectors to 5% salt-solution concentration, 35℃<br>(I) Gold flash for 8 hours<br>(II) Gold plating 3 u" for 48 hours.<br>(III) Gold plating 5 u" 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: | And then into solder bath, Temperature at 245 ±5℃, for 4-5 sec.<br>(EIA-364-52) |

| | | |
|---|---|---|
| | Solder able area shall have minimum of 75% solder coverage | |
| 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. |
| 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

TEMPERATURE CONDITION GRAPH
( TEMPERATURE ON BOARD PATTERN SIDE )



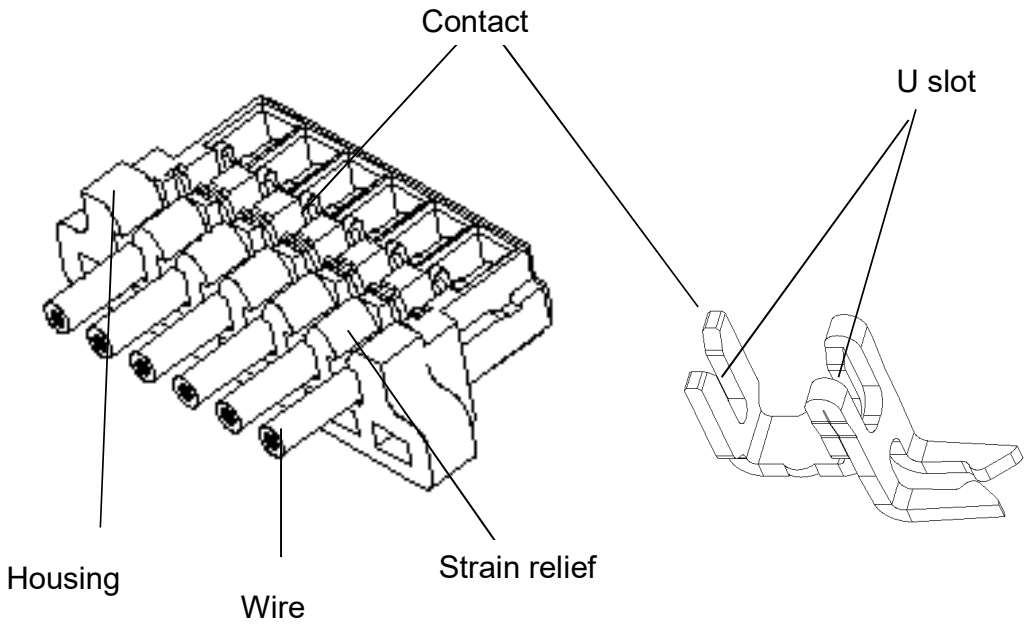
# 7 PRODUCT QUALIFICATION AND TEST SEQUENCE

| Test or Examination | Test Group | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| | Test Sequence | | | | | | | | | | |
| Examination of Product | | 1、6 | 2 | 2 | | 1、7 | 1、4 | | 1、3 | 1 | |
| Contact Resistance | | 2、7 | | | 1、4 | 2、10 | 2、5 | | 4 | | |
| Insulation Resistance | | | | | | 3、9 | | | | | |
| Dielectric Strength | | | | | | 4、8 | | | | | |
| Temperature Rise | 1 | | | | | | | | | | |
| Insertion /Extraction Forces | | 3、5 | | | | | | | | | |
| Wire pull out Forces | | | 1 | | | | | | | | |
| Terminal/Housing Extraction Forces | | | | 1 | | | | | | | |
| Vibration | | | | | 2 | | | | | | |
| Shock | | | | | 3 | | | | | | |
| Humidity | | | | | | 5 | | | | | |
| Thermal Shock | | | | | | 6 | | | | | |
| Solder ability | | | | | | | | 1 | | | |
| Resistance to Soldering Heat (Board Side) | | | | | | | | | 2 | | |
| Salt Spray (Only For Gold Plating) | | | | | | | 3 | | | | |
| Durability | | 4 | | | | | | | | | |
| Hand Soldering Temperature Resistance (Board Side) | | | | | | | | | | 2 | |
| **Sample Size** | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 4 | 4 | |

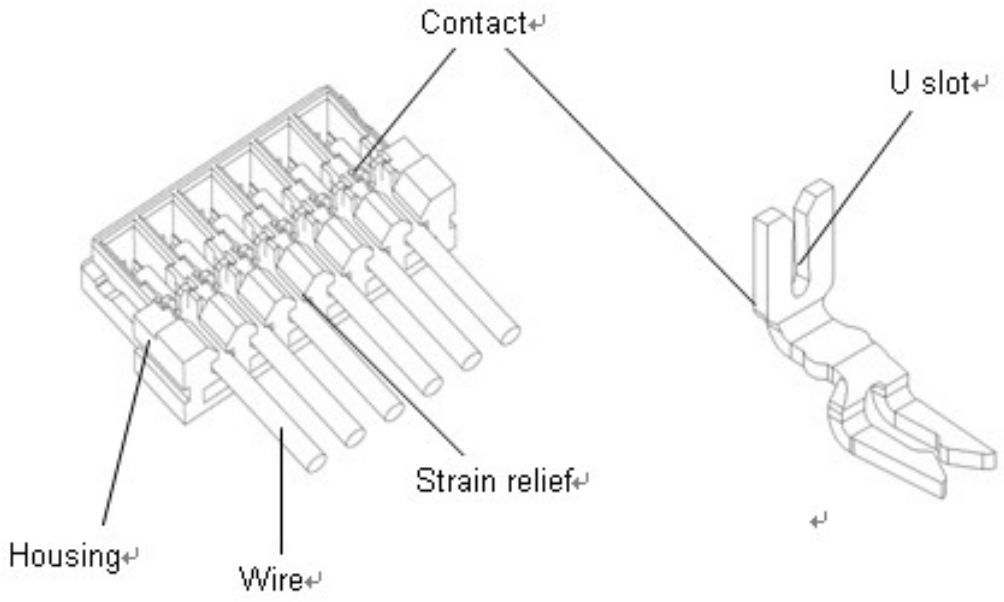
## 8 INSERTION / EXTRACTION FORCE

| NO. OF Ckt. | Initial | | After 30th Cycle |
|---|---|---|---|
| | Insertion Force (Max.) | Withdrawal Force (Min.) | Withdrawal Force (Min) |
| 4~7 | 1.4 Kgf | 0.2 Kgf | 0.15 Kgf |
| 8~16 | 2.0 Kgf | 0.35 Kgf | 0.25 Kgf |

## 9 APPLICABLE SPECIFICATIONS




51224、51223 Series



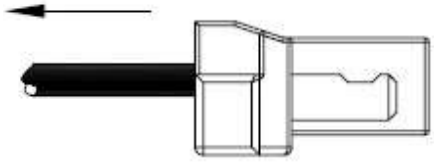

50476、50497 Series

## 10 CONTACT V.S WIRE RETENTION FORCE

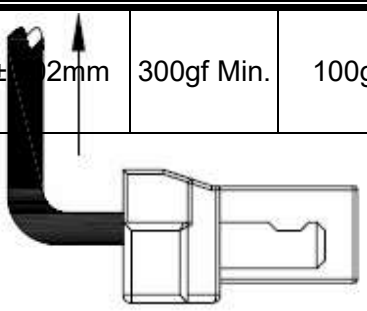
| Wire Size | UL style (REF.) | Material of insulation | Insulation OD | Parallel | Perpendicular |
|---|---|---|---|---|---|
| AWG#36 (51223、50476) | UL10064 | Teflon/PTFE | Φ0.29±0.02mm | 300gf Min. | 100gf Min. |

Note：It is necessary to use the UV glue for the application of the wire retention force increasing.

| | | | | | |
|---|---|---|---|---|---|
| AWG#34 (51224、50497) | UL10064 | Teflon/PTFE | Φ0.32± 2mm | 300gf Min. | 100gf Min. |



Parallel direction



Perpendicular direction

## 11 TERMINATION DEPTH

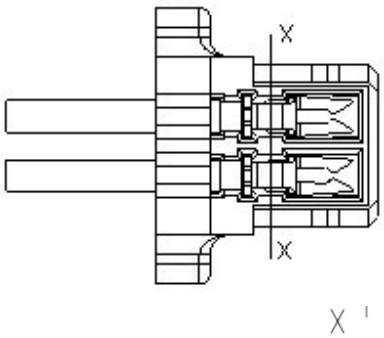



Fig.-1

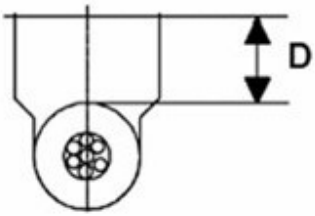



Fig.-2

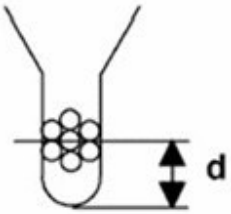



Fig.-3

Measure termination depth dimension “D” in Fig.-2 at X-X part in Fig.-1 where is in then middle part of two U slots and a flattened part pressed by termination punch，and check it satisfies specified value in table

Exact termination depth is measure “d” between bottom of slot and position of center core wire of wire conductors as shown in Fig.-3；Aces specifies termination depth dimension “D” force to facilitate a time-consuming work of measuring “d” as a daily control.

Accordingly, dimension “D” becomes not reference value but control value for the use of the wire to be checked is Aces expect specified wires.

| Wire Size | UL style (REF.) | Insulation OD | Termination Depth D | d |
|---|---|---|---|---|
| AWG#36 (51223、50476 Series) | UL10064 | Φ0.29±0.02mm | D=0.31±0.05mm | d=0.15±0.05mm |
| AWG#34 (51224、50497 Series) | UL10064 | Φ0.32±0.02mm | D=0.28±0.05mm | d=0.16±0.05mm |

## 12 ERMINATION APPEARANCE

Inspect the following points after termination.

12.1 Punching flaws on housing caused by termination punch; Housing must be free from flaws. When connector set position deviation, scratches and deformation caused by termination punch may appear at the diagonally shaded areas in Fig.-4.

12.2 Flaws and deformation at beams of contact. Beams must be free from flaws and dimension. When connector set position deviation to wire axis direction, scratches and deformation caused by termination punch may appear at beams of contact as shown in Fig.-5.
In this case, not only contact but also termination die may be damaged.

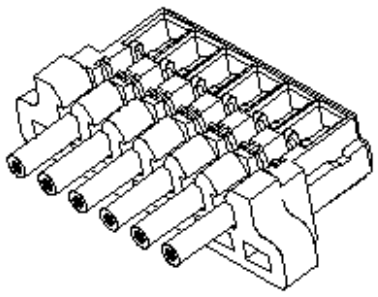
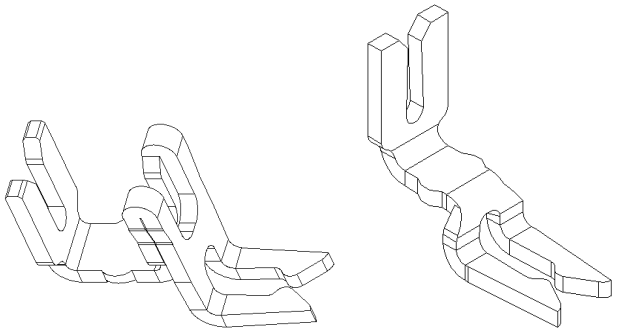


Fig.-4



**51224、51223** **50497、50476**

Fig.-5

12.3 Exposure of wire conductors around beams of contact; Wire conductors must not be exposed. When connector set position deviates to wire axis direction, wire conductors may expose in front or back of beams of contact as shown in Fig.-6.

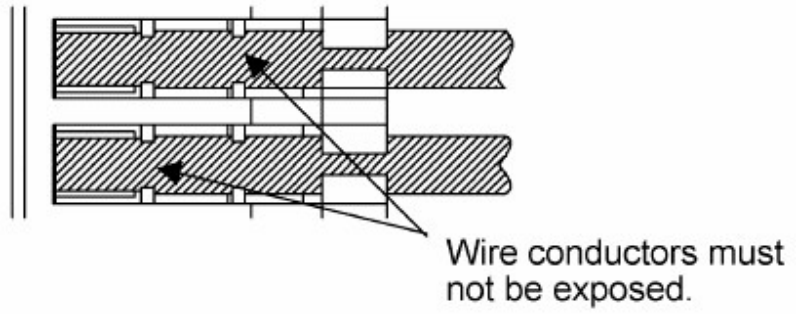



Fig.-6

12.4 Gap between housing wall and wire tip (Wire protruding length) Gap “G” between housing walls and wires tip in Fig.-7 should be 0.2 mm max.

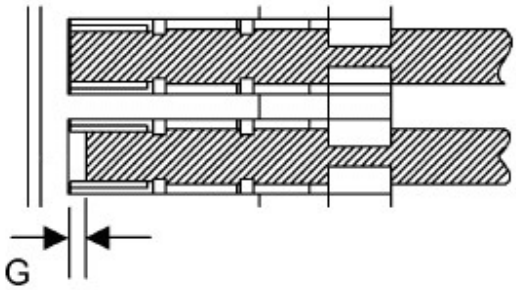



Fig.-7

12.5 Overrun of wire (Wire must not overrun) when wire tension is not adequate, overrun of wire may appear as shown in Fig.-8.

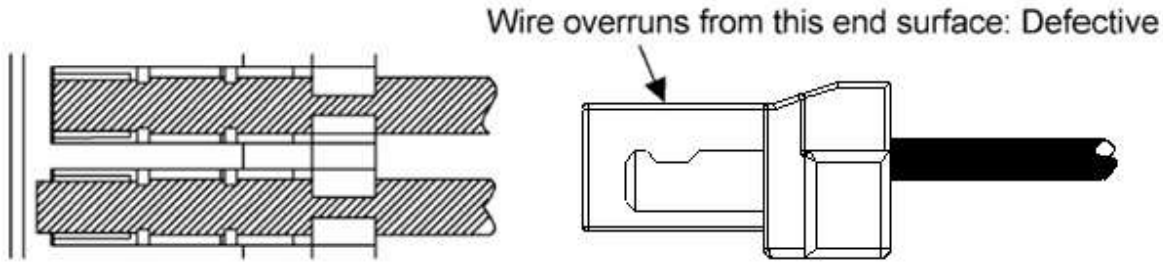



Fig.-8

12.6 Deviation of insulation displacement center (Deviation of insulation displacement center must not happen. When connector set position or wire deviates to pitch direction, termination punch, wire and U slots do not align so that insulation displacement center deviate as shown in Fig.-9 and Fig.-10

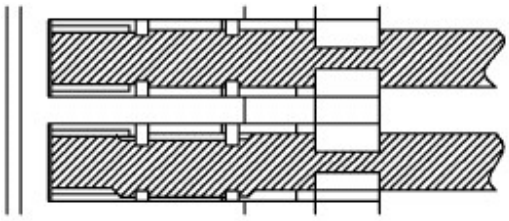


Fig.-9

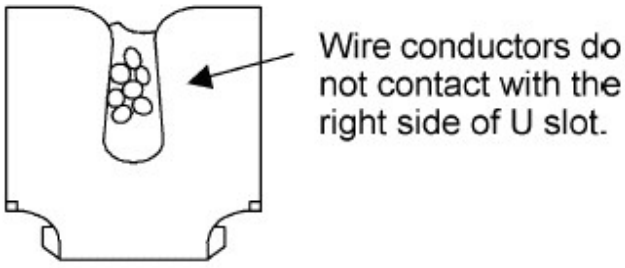



Fig.-10

## 13 MATING/UNMATING METHOD CONNECTOR

13.1 Mating method of connector

Mated receptacle with header straight on same axis. When the position of mating part of header and receptacle is aligned, align one side of mating part of header with the end of receptacle within 20 degrees to mating axis as shown in Fig.-11.

Do not mate receptacle at the angle of 20 degrees or more, because such handling may cause breakage of connector, etc.

When position of receptacle and header is aligned, hold wires in a bundle in order to prevent applying external force to receptacle. Then, mate receptacle with header up to the back straight against mating axis.

Besides, after mating operation, check that there is no clearance between header and receptacle as shown in Fig.-12, because such clearance may lead discontinuity of connector.

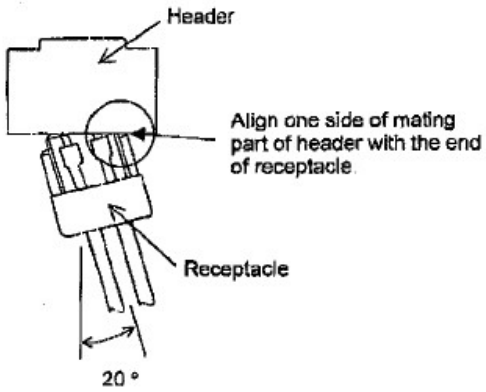



Fig.-11
Align the position (Side entry type)

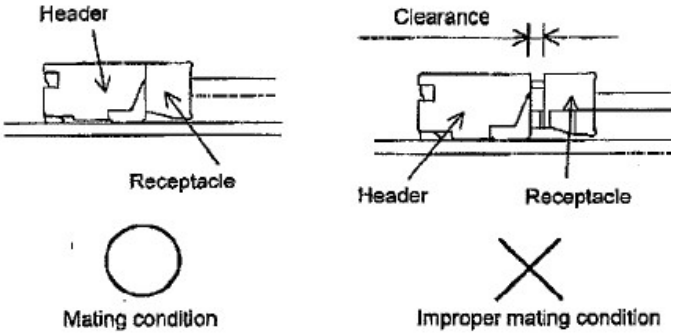



Fig.-12
Mating condition (Side entry type)

13.2 Unmating method of connector

Hold wires in a bundle and unmate receptacle from header on the same axis. At this time, conduct operation within 20 degrees to mating axis.

Do not unmate receptacle forcibly with prying more than 20 degrees, because such handing may cause breakage of connector, etc.

If receptacle is unmated with holding wire of only one end, such handling is the same as prying connector.

Beside, there is a possibility that wire may come off housing when they are unmated without holding in a bundle.

Even when all wires cannot be held in routing of wires, wire more than the number shown in the Table-1 should be held and unmated.

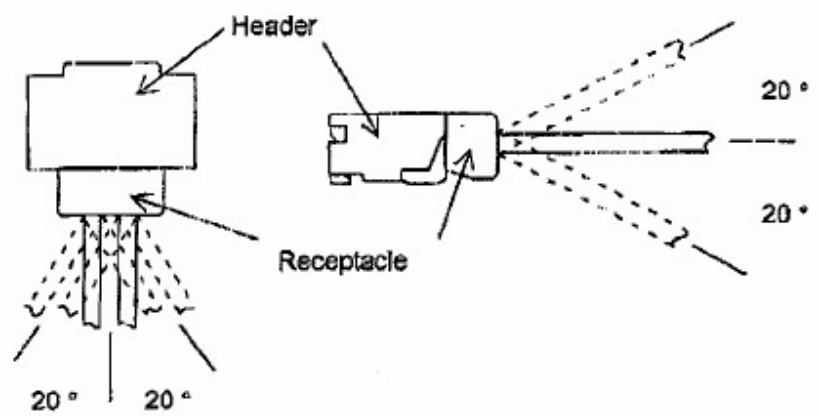



Fig.-13

| CKTS | Wires |
|---|---|
| 2 | hold 2 wires without fail |
| 3~5 | hold more than 3 wires |
| 6~10 | hold more than 4 wires |
| 11~15 | hold more than 5wires |
| 16~20 | hold more than 6 wires |

Table -1

13.3 Routing of wire

In routing wire, careful operation is required so that tension more than 1N may not be applied per connector and one wire (one circuit).