

CABLINE®-VS PLUG

Part No. 20453-#\*\*T-###

Assembly Manual

11	S23323	September 21, 2023	T. Ono	M. Nakamura	T. Masunaga
10	S22436	October 4, 2022	K. Baba	R. Takei	H. Ikari
9	S21634	November 25, 2021	R. Morita	T. Masunaga	H. Ikari
8	S19014	January 8, 2019	Y. Miyazaki	T. Masunaga	H. Ikari
Rev.	ECN	Date	Prepared by	Checked by	Approved by

## 1. Purpose :

This manual explains the soldering method and assembly processes for the CABLINE-VS PLUG with a shell-A and pull bar.

## 2. Applicable Connector :

Name: CABLINE-VS PLUG

Parts No.:

Set P/N	Cable Assembly	20453-##*T-###
Discrete P/N	Housing Assembly	20454-##*T-##
	Shell-A	2574-##*#
	Pull-Bar	2576-##*##

## 3. Fixtures :

## 3.1 Components and Instruments Used in the Condition Confirmation

## • Pulse Heater

Name	P/N	Manufacturer
Reflow Head	NA-66	Nippon Avionics Co., Ltd.
Pulse Heat Power Supply	TCW-215	Nippon Avionics Co., Ltd.

## • Heater Tip

	20P	30P	40P	50P
Thickness	0.5 <sup>0</sup> <sub>-0.05</sub>	0.5 <sup>0</sup> <sub>-0.05</sub>	0.5 <sup>0</sup> <sub>-0.05</sub>	0.5 <sup>0</sup> <sub>-0.05</sub>
Width	10.0 <sup>0</sup> <sub>-0.03</sub>	15.0 <sup>0</sup> <sub>-0.03</sub>	20 <sup>0</sup> <sub>-0.03</sub>	25 <sup>0</sup> <sub>-0.03</sub>

Unit: mm

## • Recommended Solder Bar

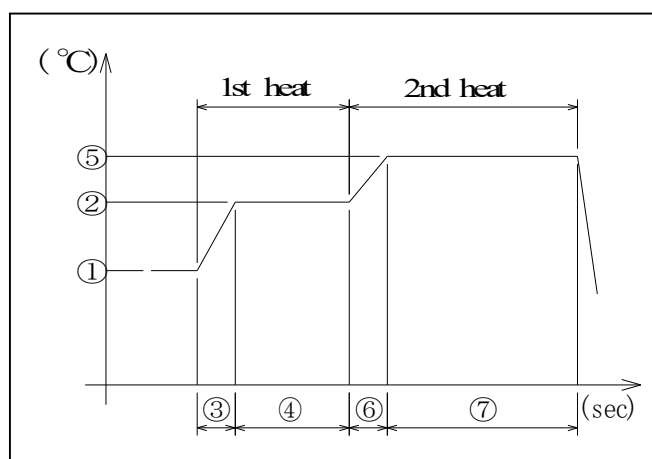
Resin-free solder made by Uchihashi Estec Co., Ltd. was used.

Positions		20P	30P	40P	50P
Solder Size	AWG#40~#44	φ0.1	φ0.1	φ0.1	φ0.1
	AWG#32~#36	φ0.14	φ0.14	φ0.14	φ0.14
Length		10.0 mm Ref.	15.0 mm Ref.	20.0 mm Ref.	25.0 mm Ref.

Unit: mm

## 4. Recommended Pulse Heat Condition

	Micro-Coaxial Cable	Discrete Wire
① Idle Temp.	150 °C	150 °C
② 1 <sup>st</sup> Heat Temp.	220 °C	220 °C
③ " Rise Time	0.5sec.	0.5sec.
④ " Holding Time	3.0sec.	3.0sec.
⑤ 2 <sup>nd</sup> Heat Temp.	340~360 °C	370~390 °C
⑥ " Rise Time	0.5sec.	0.5sec.
⑦ " Holding Time	3.0sec.	3.0sec.
Heater Tip Pressure	15~19N	15~19N



※ This pulse heat condition was evaluated and confirmed by our pulse heat jig and instruments.

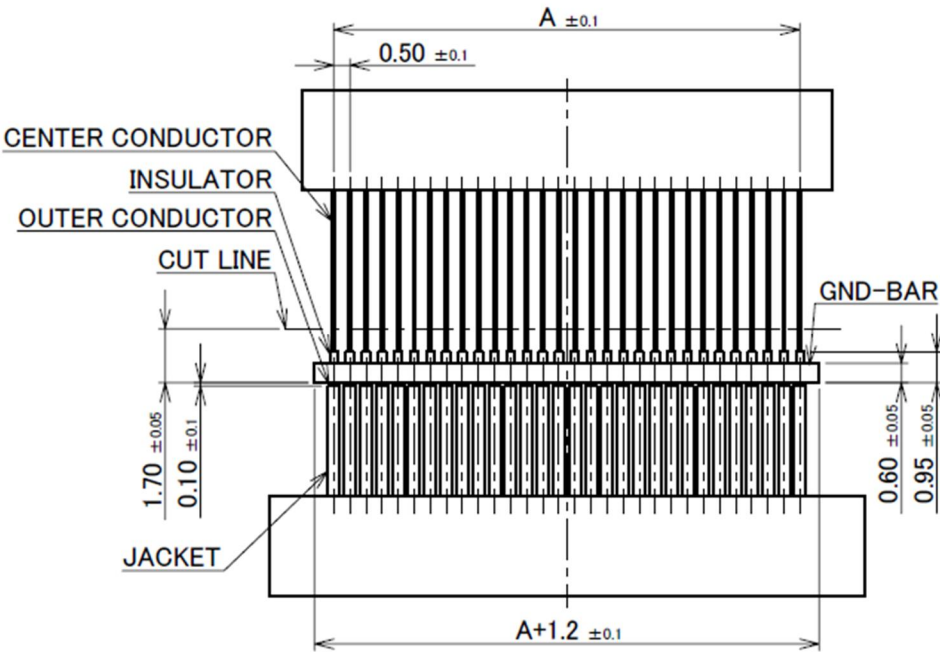
The most optimum condition may change based on the shapes of pulse heat jig and instruments, the environments, or other reason.

Therefore, please examine the pulse heat condition adequately in advance of use.

5. Work Procedures :

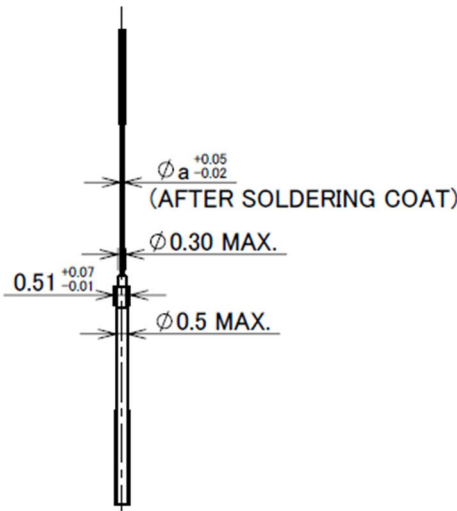
5-1. Soldering of Center-Conductor

①The cables have to be fabricated as shown below in advance of soldering.



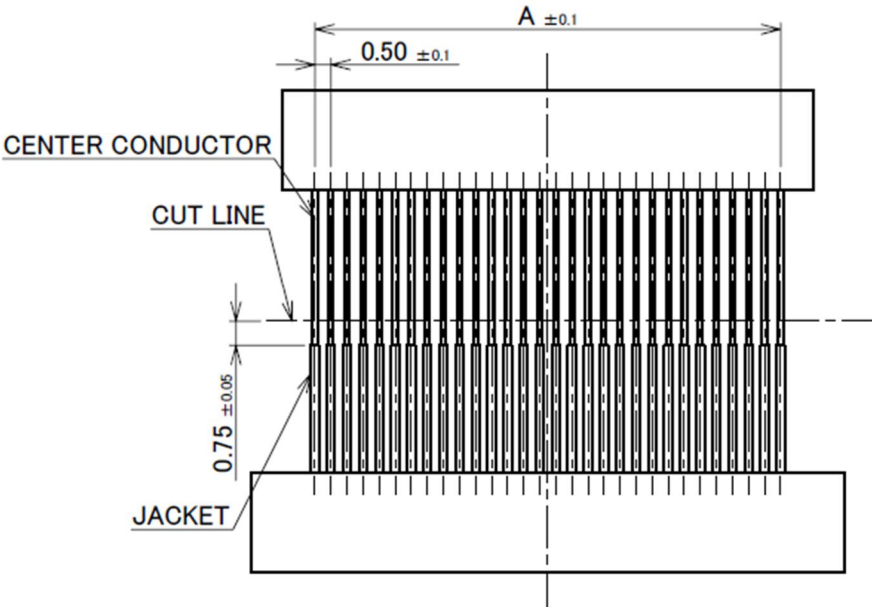
Pos.	A
20P	9.50
30P	14.50
40P	19.50
50P	24.50

Recommended Micro-Coaxial Cable Dimensions



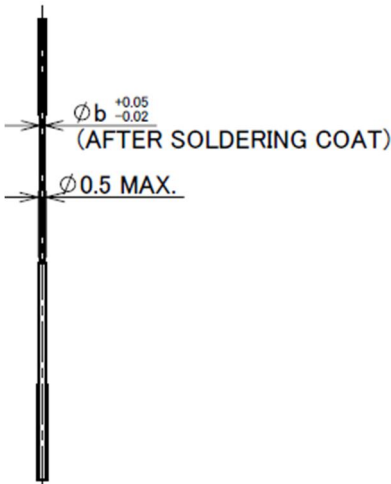
AWG	a
#36	0.15
#38	0.12
#40	0.09
#42	0.075
#44	0.063

Micro-Coaxial Cable AWG#\*\*



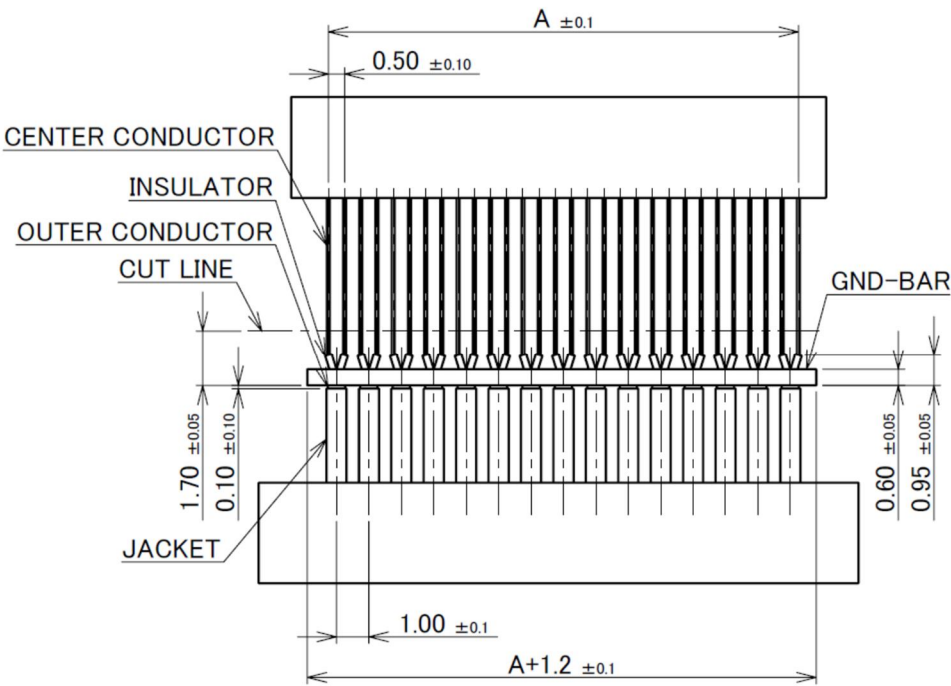
Pos.	A
20P	9.50
30P	14.50
40P	19.50
50P	24.50

Recommended Discrete Wire Dimensions



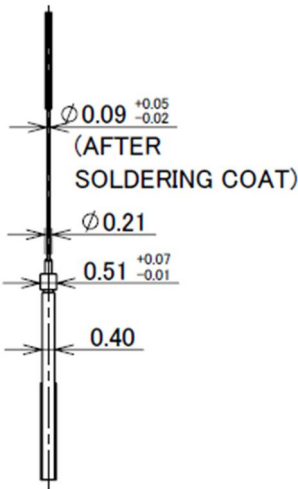
AWG	b
#32	0.24
#34	0.192
#36	0.15

Discrete Wire AWG#\*\*



Pos.	A
20P	9.50
30P	14.50
40P	19.50
50P	24.50

Recommended Twinax Cable Dimensions



Twinax Cable AWG#40

- ② Apply flux to contact by the dispenser etc., and please confirm all contacts were applied flux.

Applying Flux Area

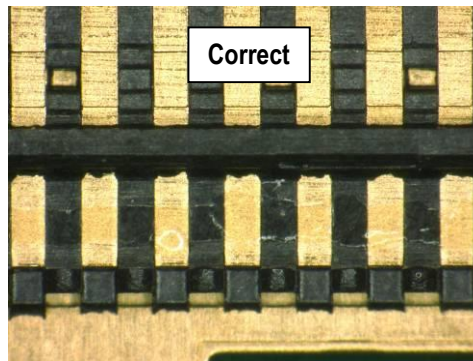
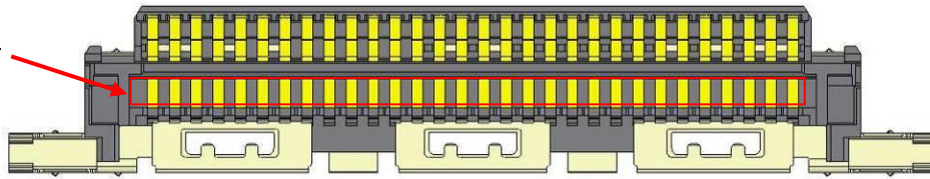


Photo.1 After Applying Flux

- ※ Please do not apply flux too much like Photo.2. It can cause flux splash or leak to the mating area.

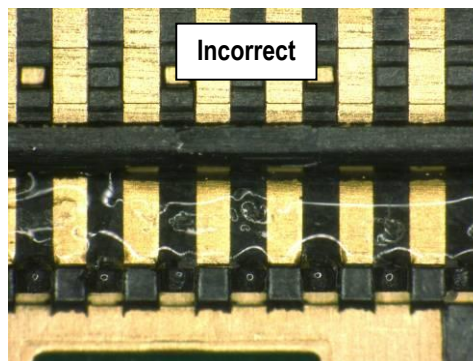


Photo.2 Extra Flux

- ※ Washer must not be used to take flux off because it may cause flux attached to mating area.

- ③ Pre-set and locate solder bar at center of connector (housing assembly).

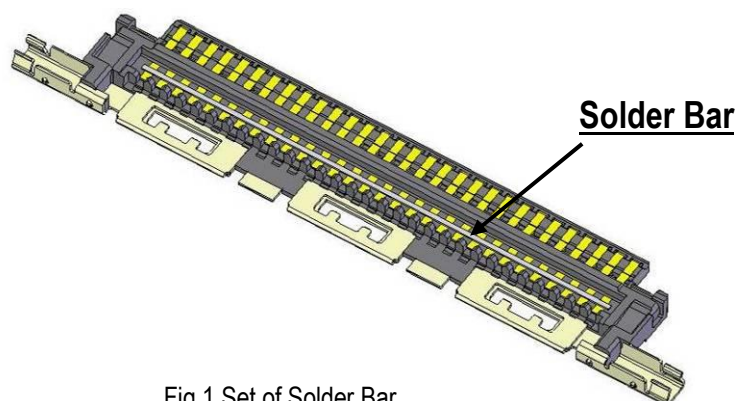


Fig.1 Set of Solder Bar

- ④ Set the cable.

※ Setting discrete wire is to protect 0.2 mm MAX. as Fig.3. There is danger that center conductor touch shell.

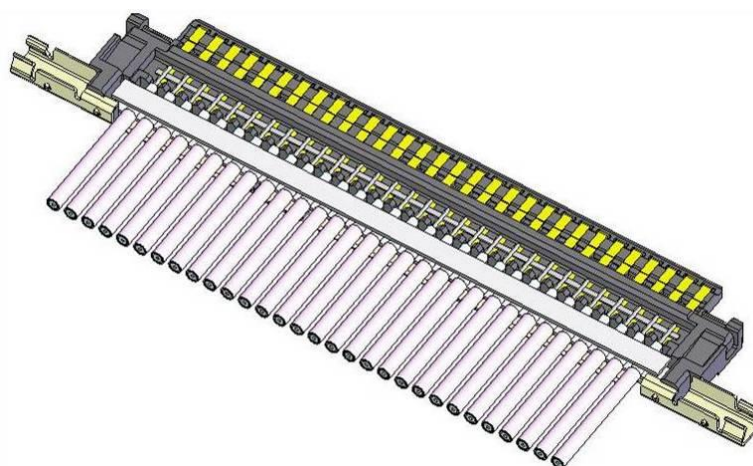


Fig.2 Set of Cable

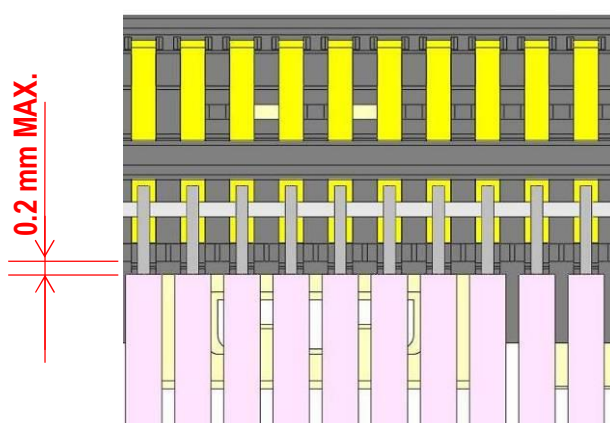


Fig.3 Setting Discrete Wire



⑤Center-conductors are soldered with pulse heater. See Photo.3 of soldering condition.

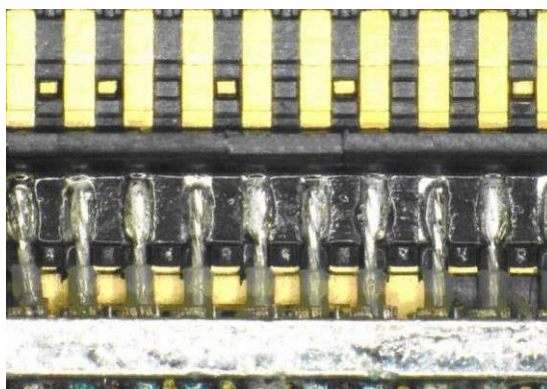


Photo.3 AWG#40

Caution: The shell bottom side of plug housing assembly has convex shape at the points shown in Fig.4, so please make escape shape on the receiving jig of the pulse heater to prevent interference.

	A	B
20P	—	16.0
30P	5.4	21.0
40P	10.4	26.0
50P	15.4	31.0

Unit: mm

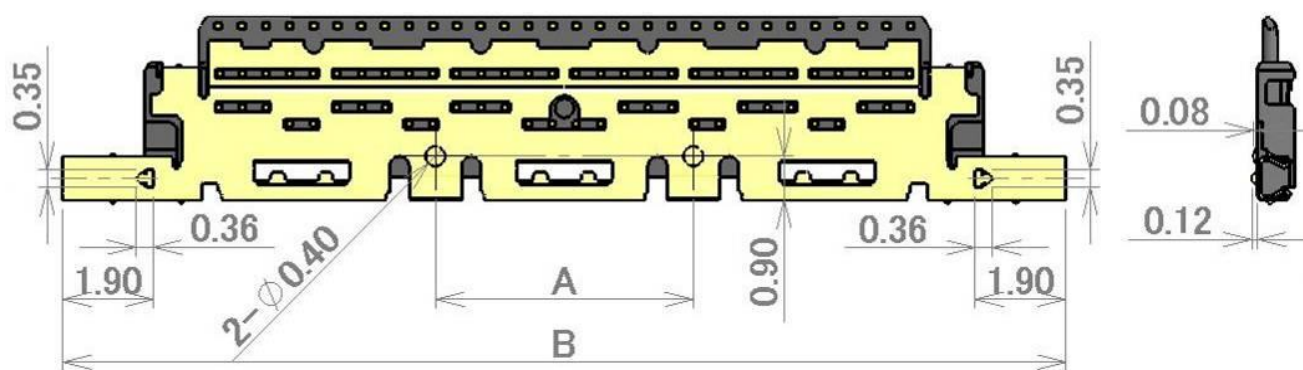


Fig.4 The Shell Bottom Side of Plug Housing Assembly

※When solder bridge is appeared between the terminal, try heating again with pulse heater only one time.

If the bridge isn't repaired, use the soldering iron only the failure point.

Condition of Soldering Iron : 50W

Operating Temperature : 350 °C

Application Time of Soldering Iron : Within 5sec.

※When there is much quantity of solder in hand soldering, and there might be the short circuit with shell-A, put an insulating tape in shell-A before assembly of shell-A.

Caution: Do not forcibly pull the cable toward red arrow direction after soldering or apply excessive load on the soldered area, or it may peel the solder. [Fig. 5]

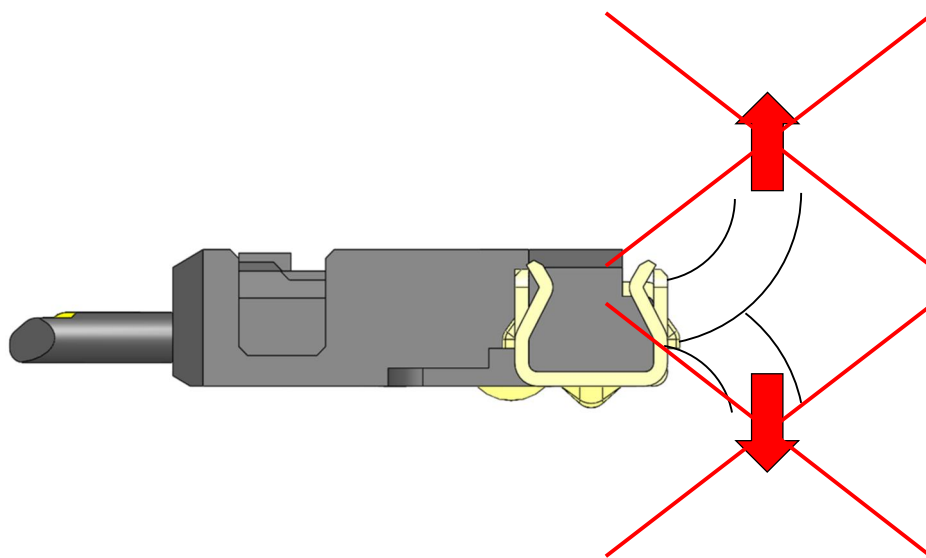
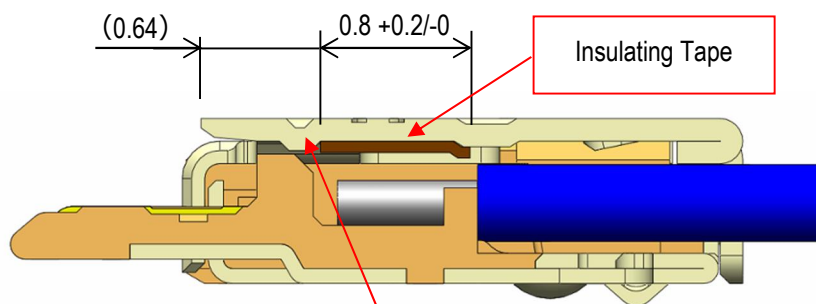


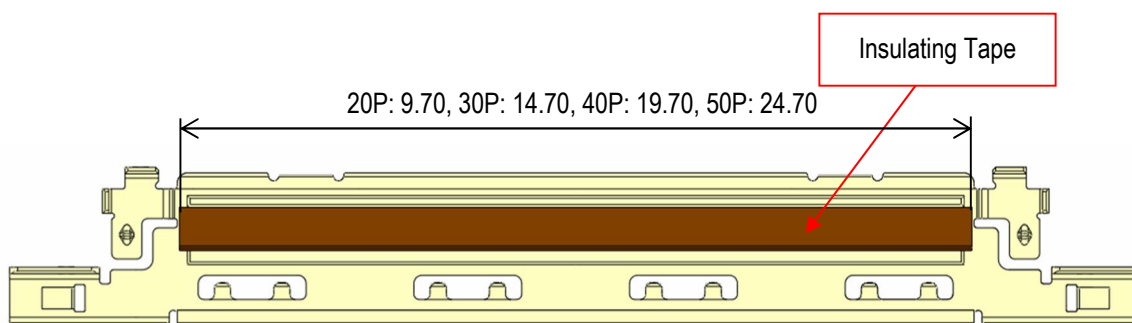
Fig.5 Cause of Solder Peeling

◆ Insulating Tape Thickness  $t = 0.06\text{mm}$

【Shell-A P/N: 2574-#\*\*】



Please avoid touching the convex point on shell-A fore-end.  
It might cause the shell-A float.



## 5-2. Cautions in Treating Shell-A

Shell-A is delivered in the reel with a carrier. The following is the method to cut shell-A from carrier.

Cut carrier on the cut line of a lower left picture (green line) by a scissors for metal.

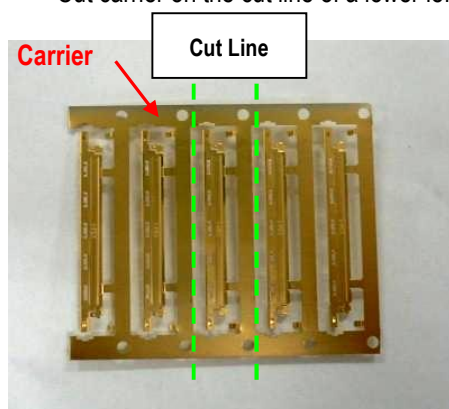


Photo 4. Before Cut

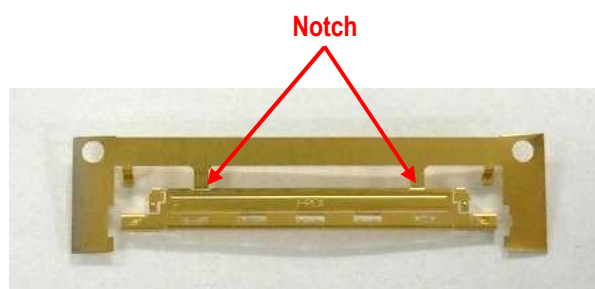


Photo 5. After Cut

- ① Hold the center of plug shell-A and cut it off from notch by  $\pm 45^\circ$  deg of reciprocating work.  
When it does not be cut, try again this reciprocating work.  
After separated, check there is no burr around the cut part. (Photo.7)

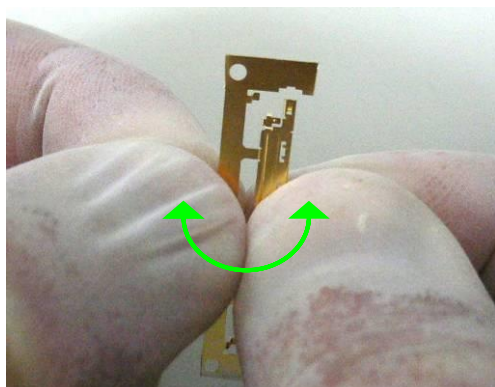
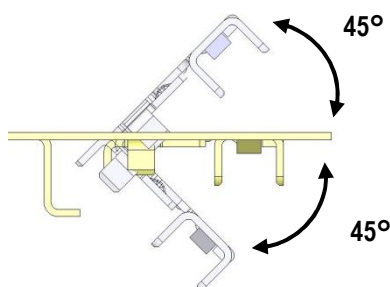


Photo 6. Cut Condition



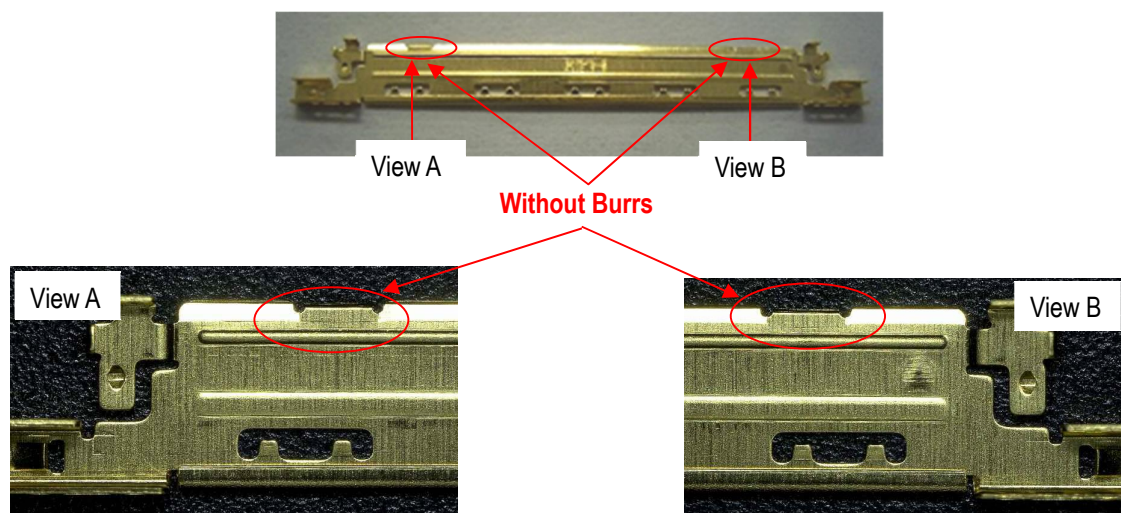


Photo.7 After Cut

Plug Shell-A Detail of Notch

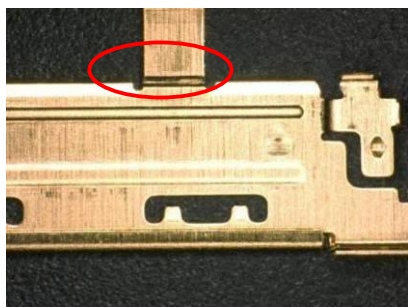


Photo.8 Bottom Side View

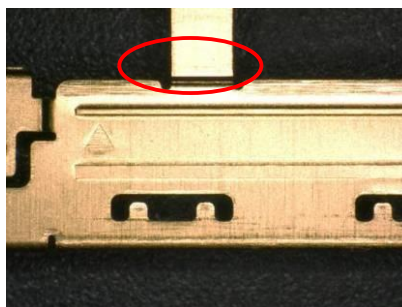


Photo.9 Upper Side View

Caution: By pulling like a lower photo to cut off by force (Red arrow direction), burrs and transformation can be caused.



Photo.10 Cut by Force (Bad Example)



## 5-3. Assembly of Pull-Bar

• In Case of With Pull-Bar (Cable Assembly P/N: 20453-0\*\*T-#1)

& With Insulation Pull-Bar (Cable Assembly P/N: 20453-0\*\*T-#3) .

Pull-bar (pull-tape※1) is assembled to housing assembly.

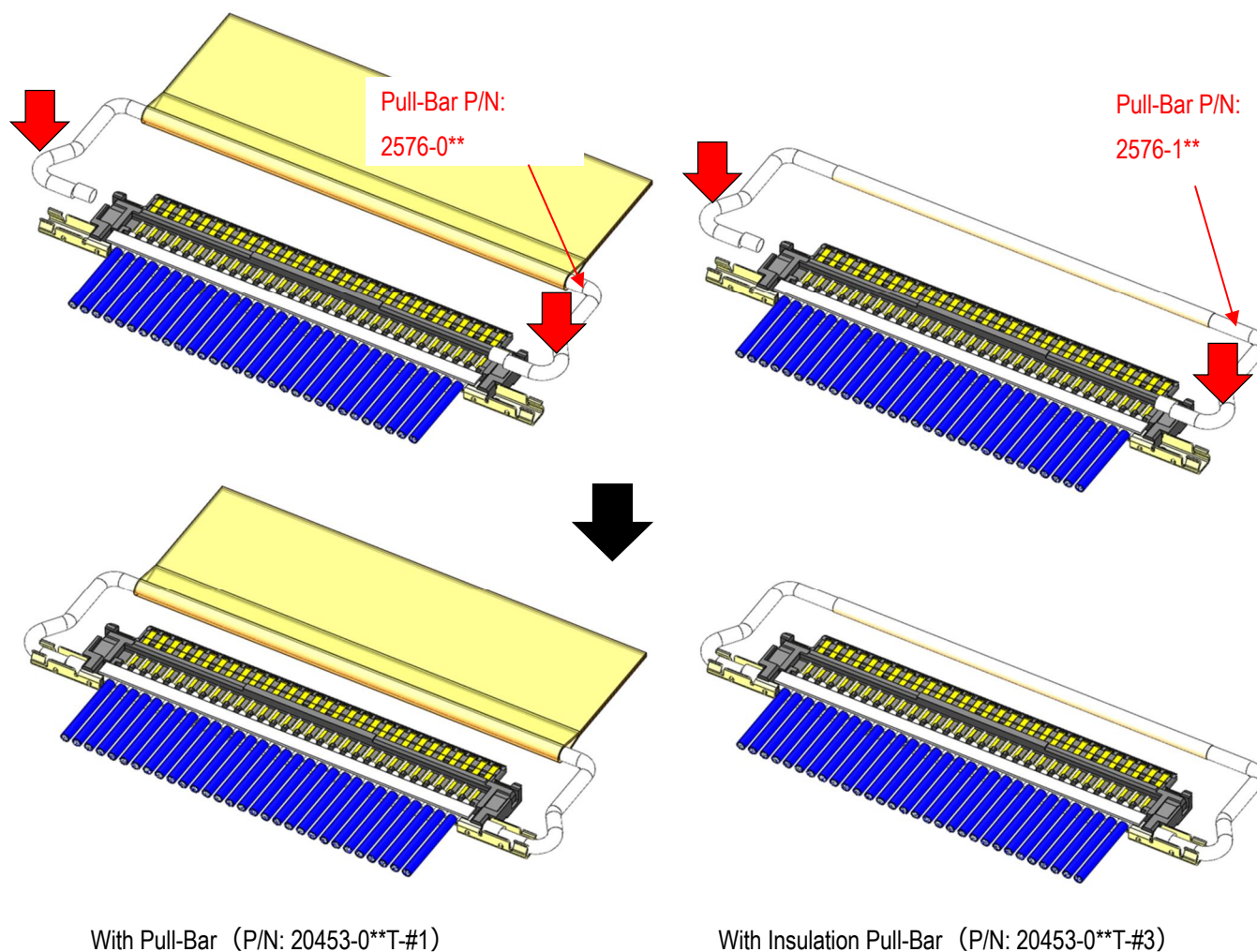


Fig.6-1 Assembly of Pull-Bar

※1 : ① In Case of With Pull-Bar (Cable Assembly P/N: 20453-0\*\*T-#1)

Pull-tape is necessary for insulating. Please make sure to attach it.

② In Case of With Insulation Pull-Bar (Cable Assembly P/N: 20453-0\*\*T-#3)

Pull-tape is arbitrary.

Pull-Tape Thickness: 0.08 mm MAX.

## Recommended Pull-Tape

### • TERAOKA's Insulation Tape

No.650S (#50) Thickness = 0.08 mm

Positions	20P	30P	40P	50P
A	13.0	18.0	23.0	28.0
B	14.45	19.45	24.45	29.45

Unit: mm

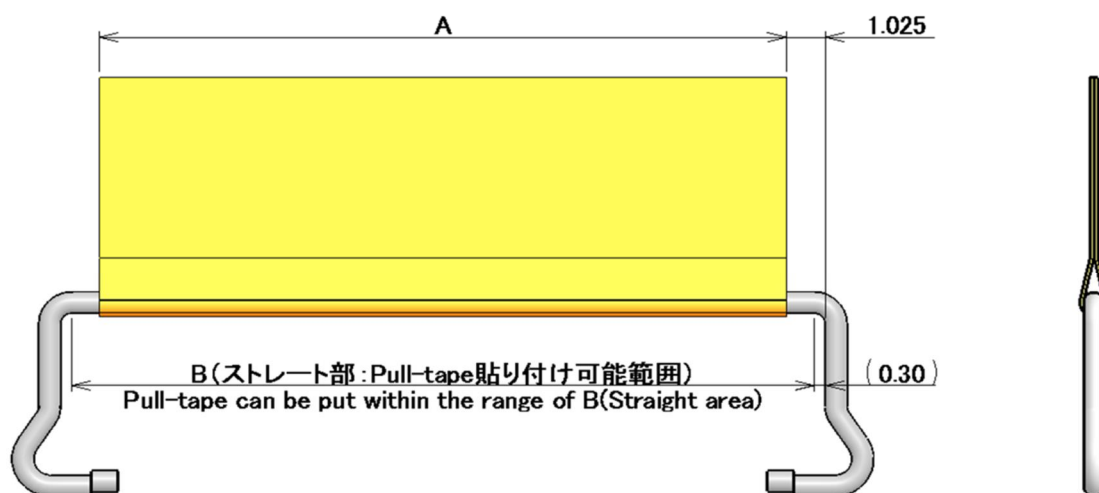


Fig.6-2 Pull-Tape Recommended Dimensions

Caution1: Pull-tape dimensions shall be based on recommended dimensions. Excessively small pull-tape may cause pull-bar deformation.

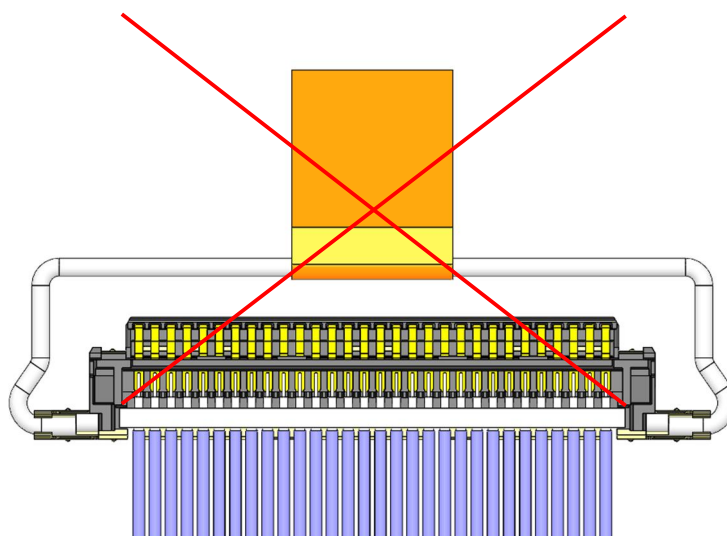


Fig.6-3 Pull-Tape Caution of Pull-Tape Dimensions

Caution 2: Do not apply force toward arrowed directions. It may deform the pull-bar.

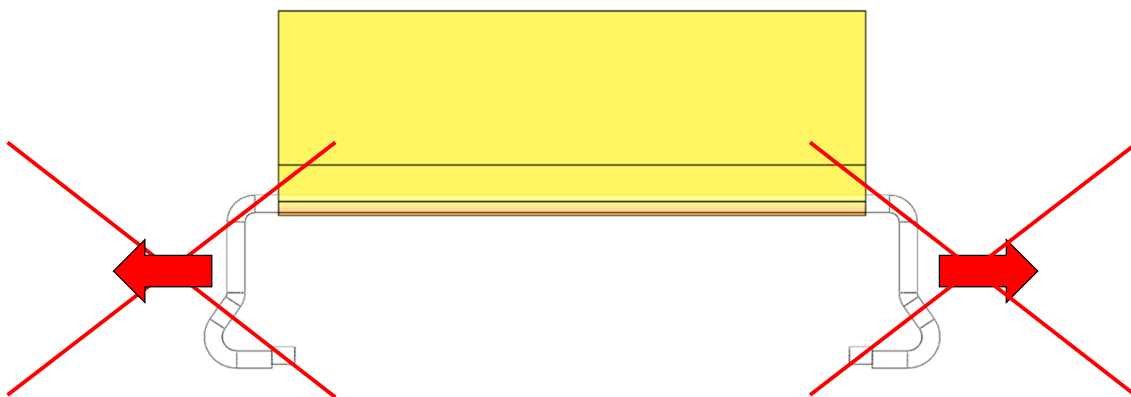


Fig.6-4 Caution of Handling of Pull-Bar

Caution3: Do not attach a pull-bar after shell-A is assembled. It may deform the pull-bar.

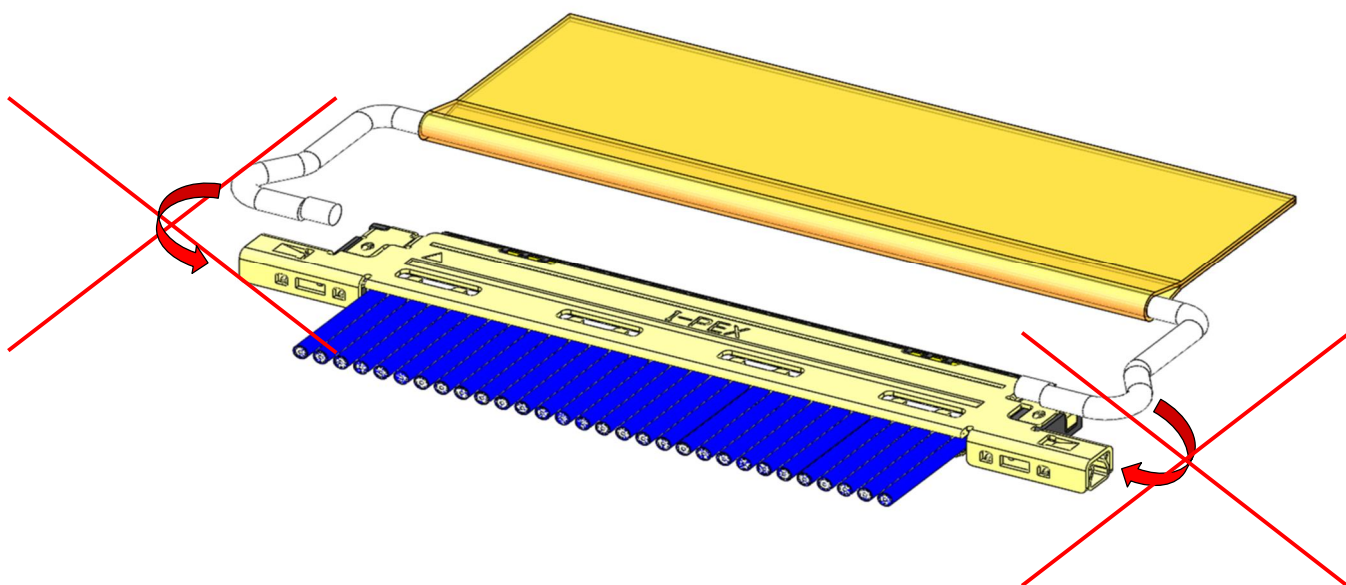


Fig.6-5 Caution of Assembly of Pull-Bar

## 5-4. Assembly of Shell-A

- ① Place the shell-A on the upper surface of the housing assembly and push only the blue shaded areas to assemble them.  
Do not push the red shaded area by itself during assembling, or it may deform tip of the lock and may cause incomplete lock of the connector.

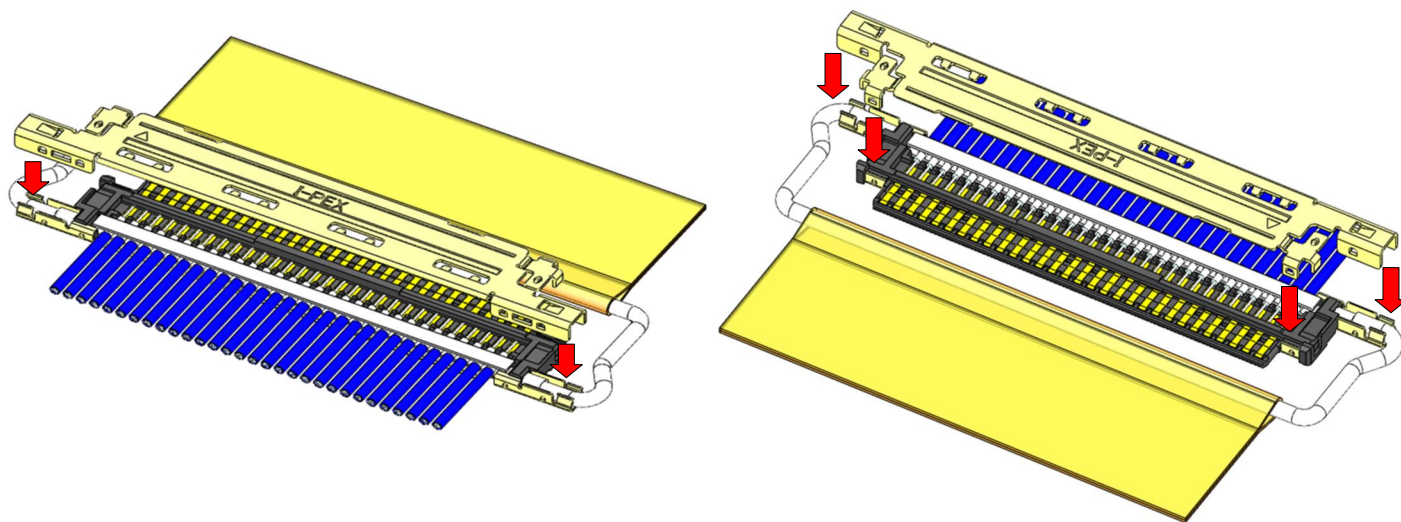


Fig.7-1 Assembly of Shell-A

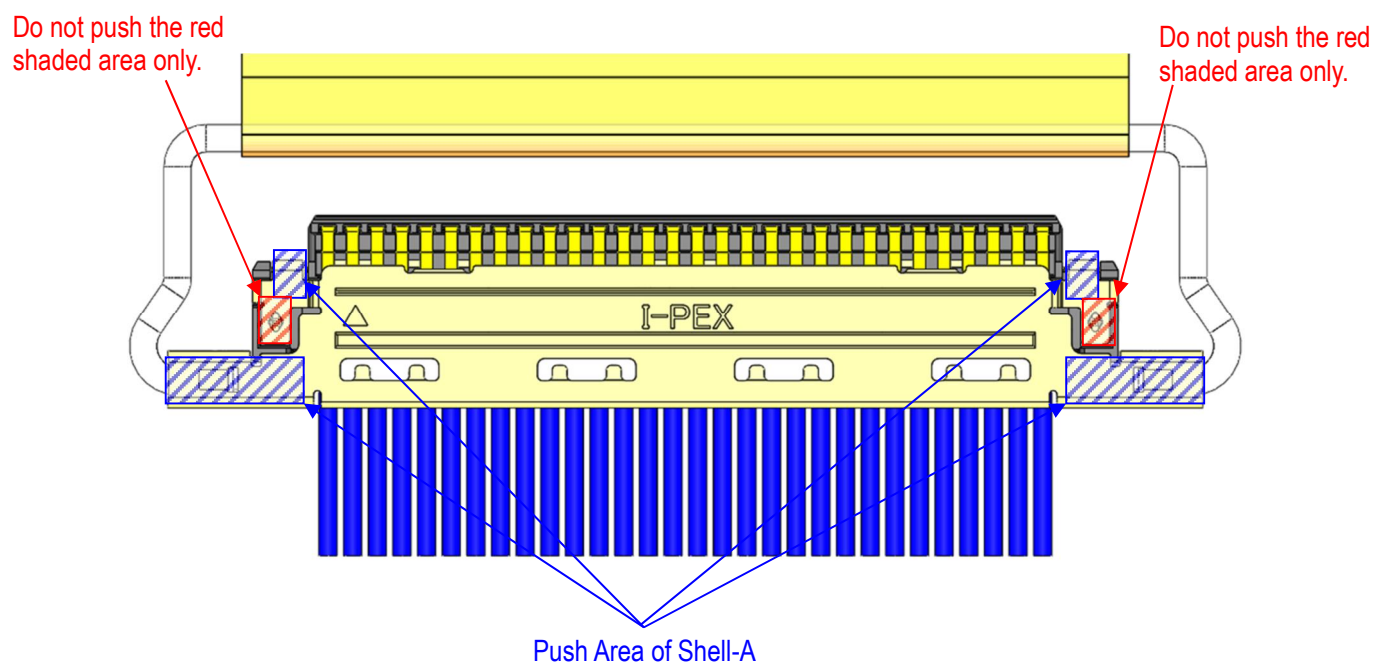


Fig.7-2 Push Area of Shell-A



- ② It confirms whether shell-A is being assembled normally.

Whether shell locks are being assembled normally. (Fig.8★point)

Please refer to Fig.9 for shell-A lock criteria.

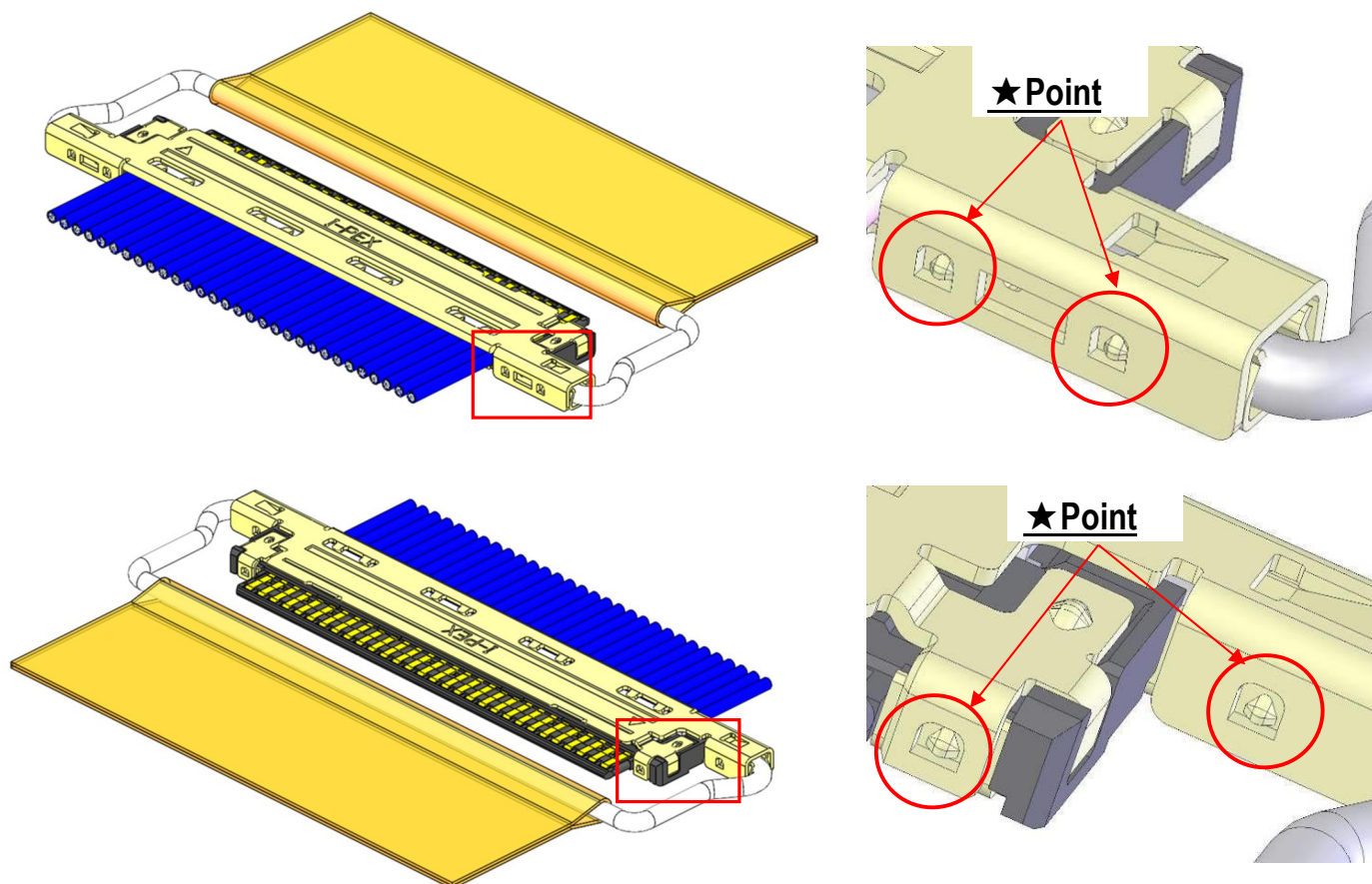


Fig.8 The Assembly Confirmation of Shell-A

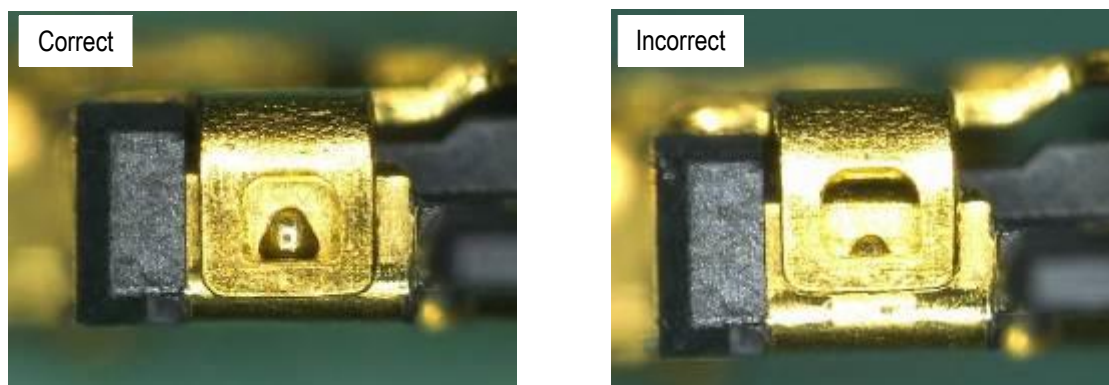


Fig.9 Shell-A Lock Criteria

**Precaution:**

Do not push shell-A toward bottom side as shown in Fig.10, or this may unlock shell-A.

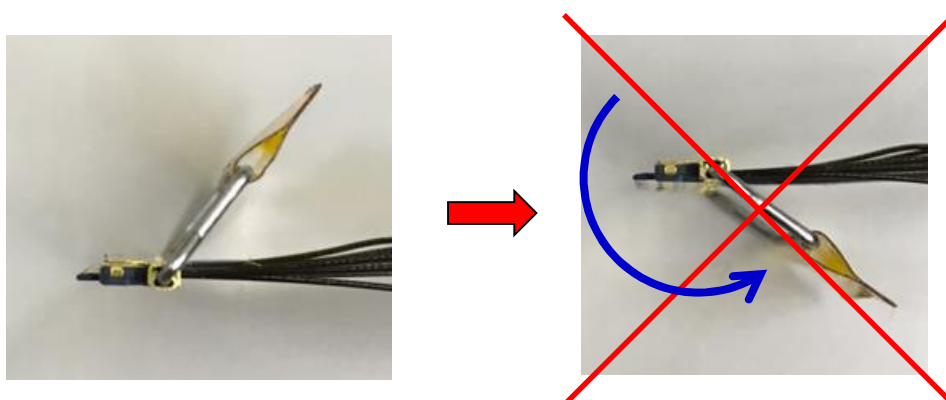


Fig.10 Improper Handling of Shell-A

- ③ Soldering shell-A, B, and ground bar with the soldering iron at all designated points is recommended. (Fig.11,12 ◆ point)

Refer to Fig.15 for a limit of the solder height.

Conditions of Soldering iron refer to sheet 9.

※In case of soldering discrete cable, soldering at Fig.11,12 ◆ point is impossible.

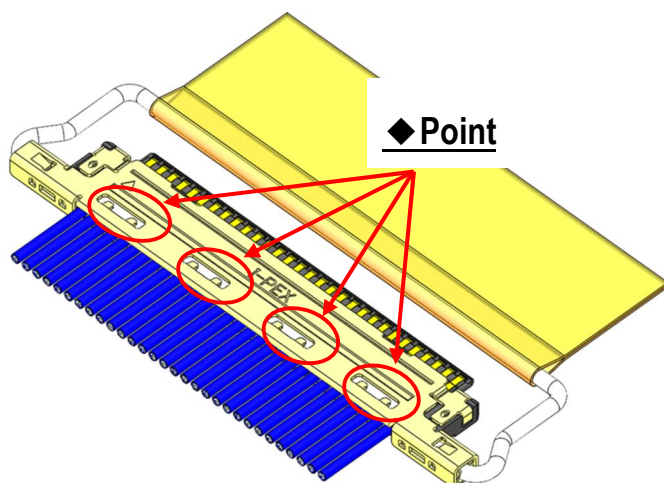


Fig.11 Soldering of Shell-A and Ground Bar

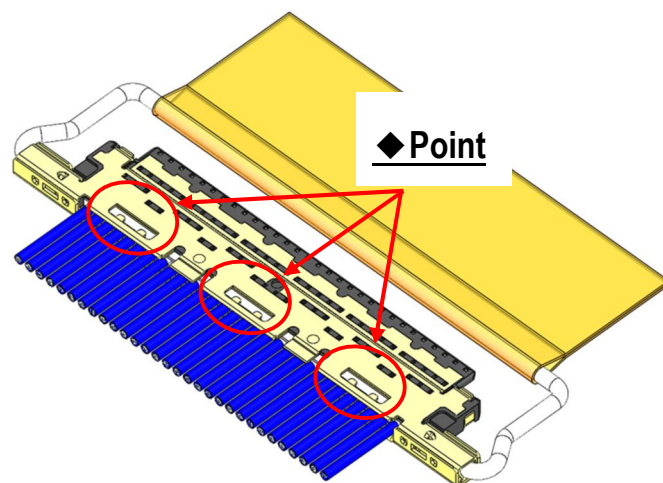


Fig.12 Soldering of Shell-B and Ground Bar

- ④ Soldering shell-A and shell-B with the soldering iron at all designated points (Fig.13 ◆ point)

Conditions of soldering iron refer to sheet 9.

※ In case of soldering discrete cable, soldering at Fig.13 ◆ point is necessary.

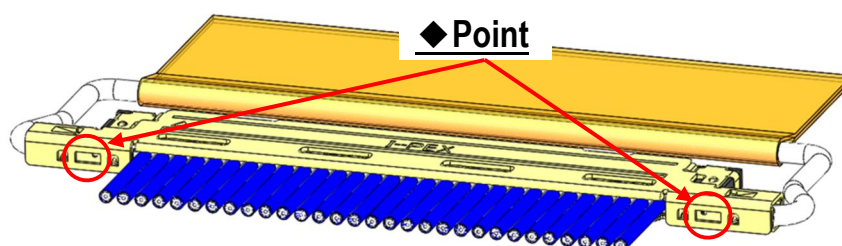


Fig.13 Soldering of Shell-A and Shell-B

## Caution in Soldering:

When using the pull-tape or the insulation pull-tape (P/N: 2576-1\*\*), please be careful the soldering iron does not touch to the pull-tape, or the insulation coated area.

The heat of the soldering iron can melt them and there is possibility to cause short when mating with receptacle.

## 5-5. Cable Fixation

Fix the cable terminal part with the bond.

Bond: LOCTITE 352

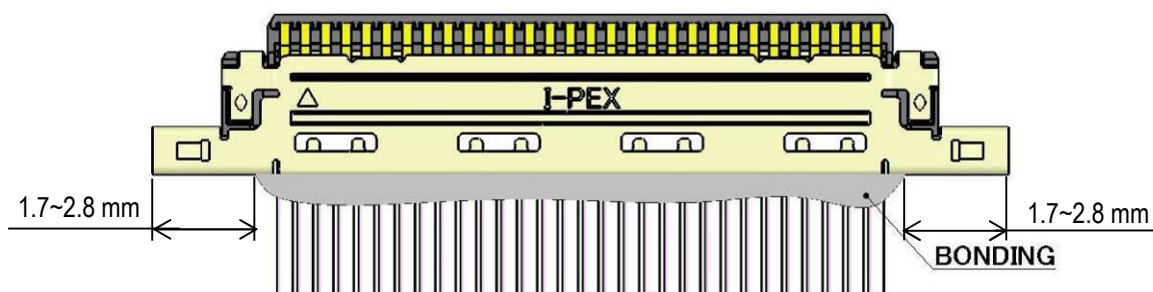


Fig.14 Bonding

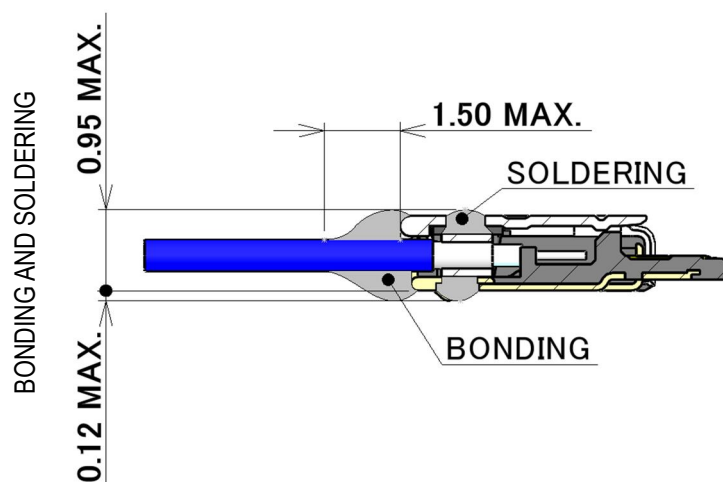


Fig.15 Soldering & Bonding