Title of Document:	HANDLING MANUAL	Issue No. CHM-1-2338	Rev. 5
Customer:		Issue date: March 12, 2010	
Title subject:	FXRH Connector (Both-Sided Contact Type)	Revision date: January 13, 2021	

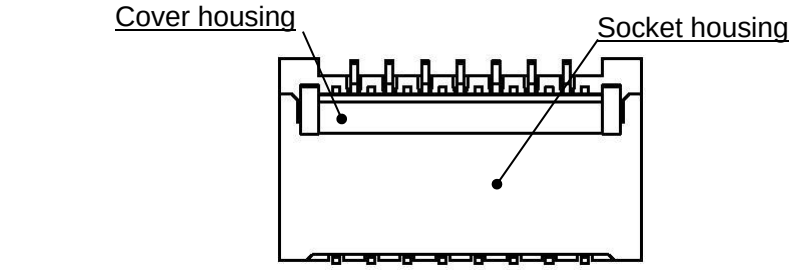
This manual describes important and required points of handling about FXRH connector both-sided contact type (embossed-taping product).
Be sure to read this manual thoroughly before using FXRH connector.

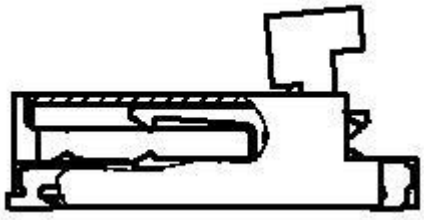
C O N T E N T S

JST	Title subject: FXRH Connector (Both-Sided Contact Type)	No. CHM-1-2338

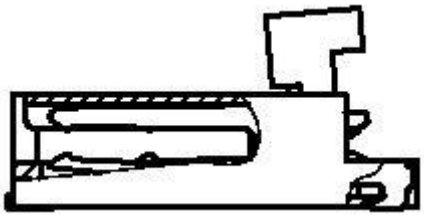
1. Part Name

Each part name of the connector is as follows.





Contact-A



Contact-B

2. Model Number

Part name		Model No.
FXRH connector	Loose piece product	**FXRH-SM1-GAN-( )TF
	Embossed-taping product	**FXRH-SM1-GAN

Note$_1$: ** denotes 2-digit circuit number.

e.g.: 51FXRH-SM1-GAN-TF (LF)(SN)
51-circuit FXRH connector both-sided contact type (embossed-taping product)
Lead-free product plated with partially gold-plated over nickel undercoating

Note$_2$: A letter in ( ) denotes the anti-statistic specification of the embossed-tape.

e.g.: 51FXRH-SM1-GAN-TF (LF)(SN)
51-circuit FXRH connector both-sided contact type (embossed-taping product)
Non-antistatic specification

51FXRH-SM1-GAN-ETF (LF)(SN)
51-circuit FXRH connector both-sided contact type (embossed-taping product)
Antistatic specification

3. Storage

3-1 Storing the connectors

Recommended storage condition: Temperature: 5 – 35 ˚C, Relative humidity 60 % or less
(Under packaging like the state of JST shipment)

Keep off direct sunlight, places exposing to such corrosive gas as industrial gas (generate from a stove and whatnot) and ammonia gas (generate from a toilet and whatnot) and dusty place.

Note that the resin molding part may break due to transportation and handling, such as processing and mating, under dry or low temperature condition.
After unpacking, return the products in the original package to store.

3-2 Storing the processed products

Not leaving the crimped contact to stand in a place exposed to high humidity and direct sunshine, and not placing them directly on the ground. Keep them in a clean storage room.

4. Applicable FPC

Item	Rated value
Applicable FPC (See the attached drawing) Gold-plated copper foil: KRD-32140-2 R1	Conductor: Gold-plated copper foil Conductor pitch: 0.3 mm Conductor width: 0.3 mm Mating part thickness: 0.20 ±0.03 mm

Note$_3$: The dimensions of the FPC greatly influence on the contacting reliability with the connector. Conform the dimensions to those of the applicable FPC described in the drawing.

Note$_4$: Especially, a narrow pitch connector has a high possibility to cause the deviation of its contact point due to the warpage, the deformation, the diagonal insertion and the insufficient insertion of FPC. In order to reduce these risks, the dimensional control of the FPC is necessary so that the important dimensions, such as the conductor width, the length, the pitch, the FPC total width and the position misalignment between the conductor and the FPC width, meet the given tolerances, considering the variations of those dimensions.

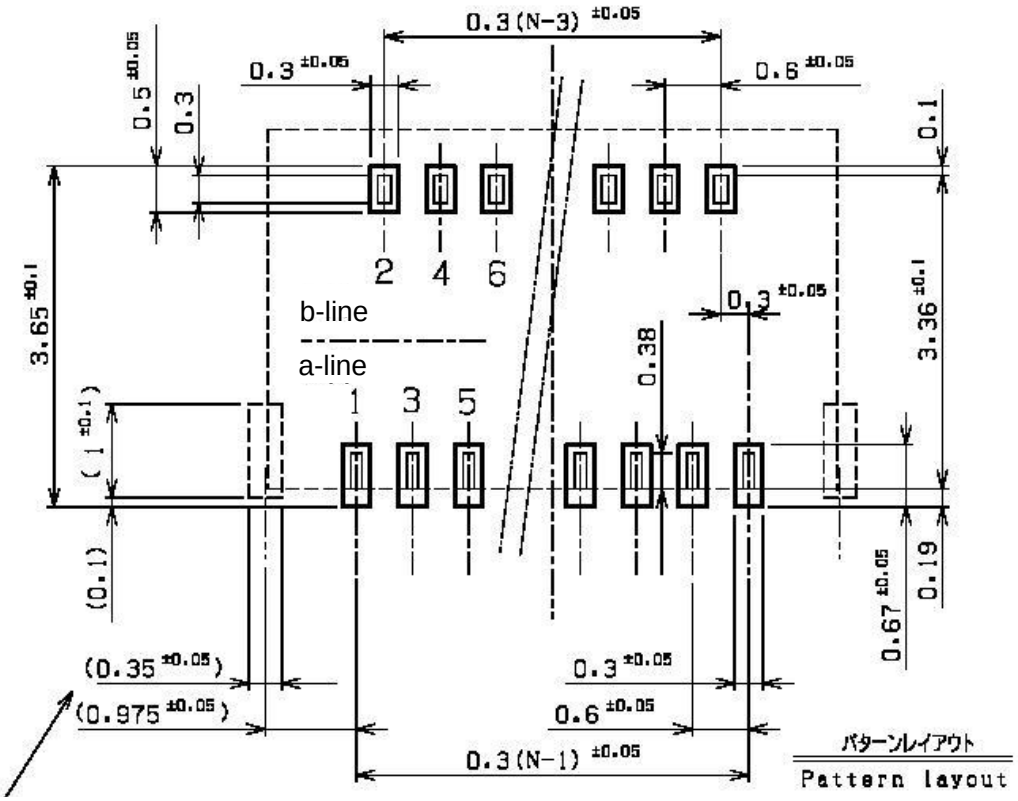
Note$_5$: Confirm the applicability of the connector with FPC to be used before using. The FPC, which the applicability with the connector has not been confirmed, might not be able to guarantee the performance.

Note$_6$: The blanking shall be conducted toward the reinforcing plate side from the conductor side.

Note$_7$: The material of the reinforcing plate should be polyimide.

5. PC Board Pattern Layout

The following PC board pattern layout is recommended. (N: Circuits No.)



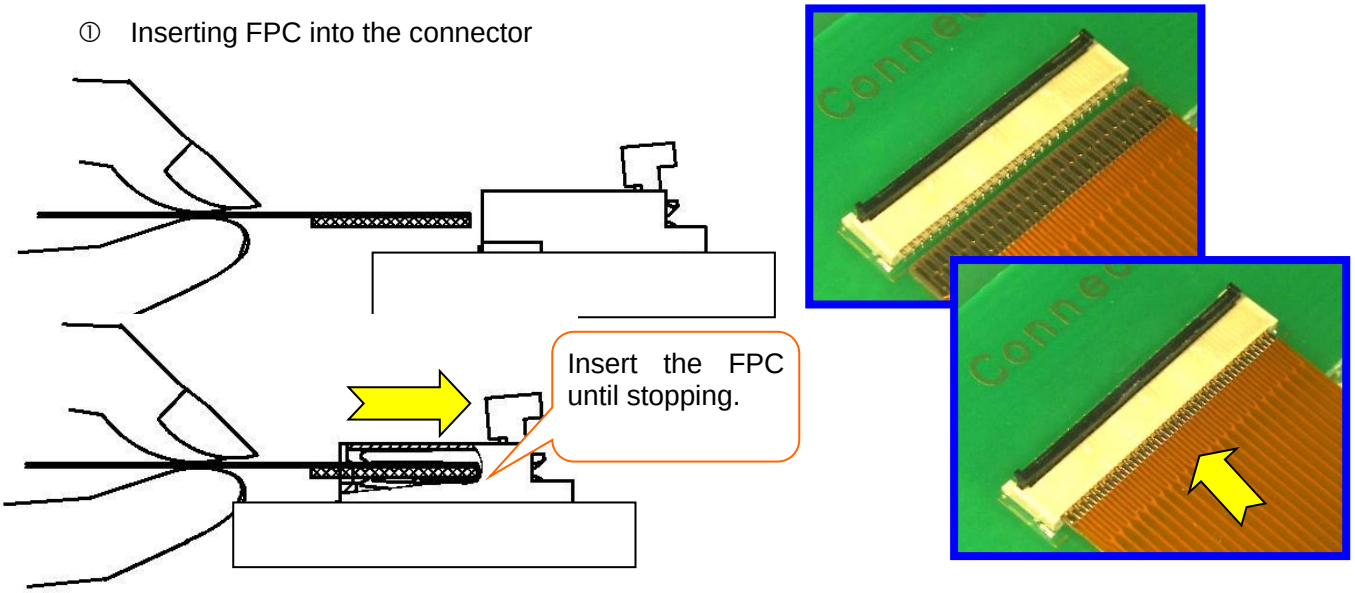
The dimension inside bracket is a reference value when the pattern is shared with FXR connector.

Fig.4: PC board pattern layout

6. Handling Precautions

6-1 Inserting FPC

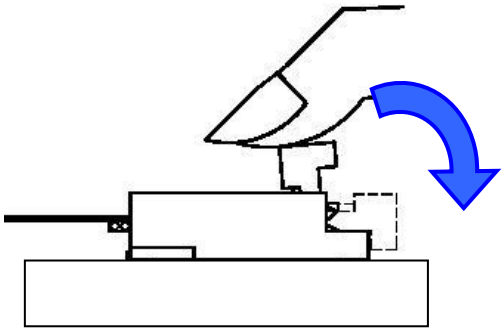
① Inserting FPC into the connector

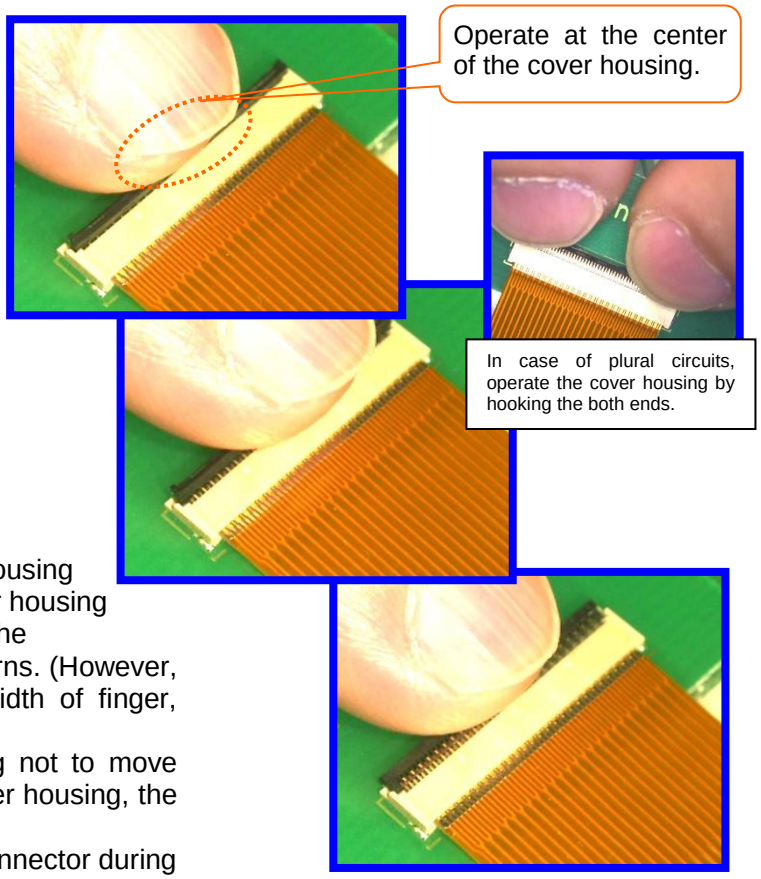


Insert FPC straightly into its mating entrance of the mounted connector on a PC board. When the FPC has been inserted up to the innermost, the front end hits the housing inside the connector.

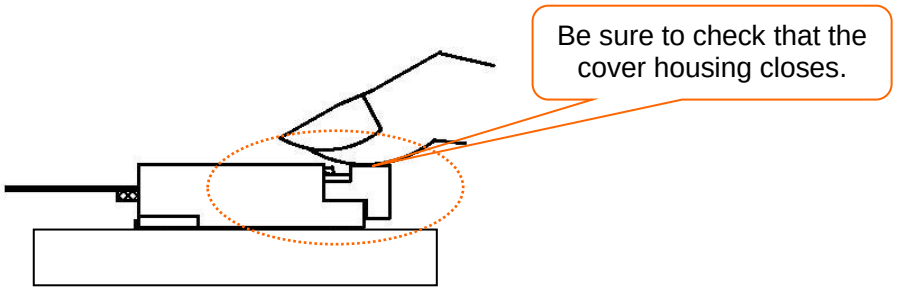
Note$_8$: Even if the cover housing is closed with FPC not inserted fully until stopping, there is a possibility the FPC has not been mated with the connector. So, be sure to insert the FPC until it hits the innermost of the connector.

② Closing cover housing

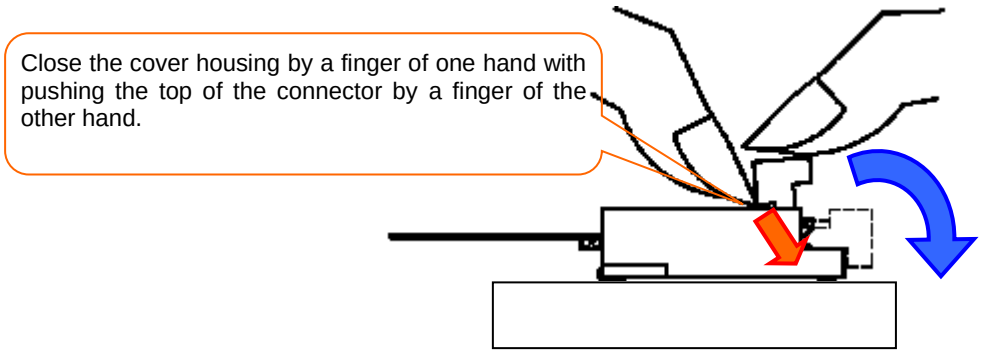




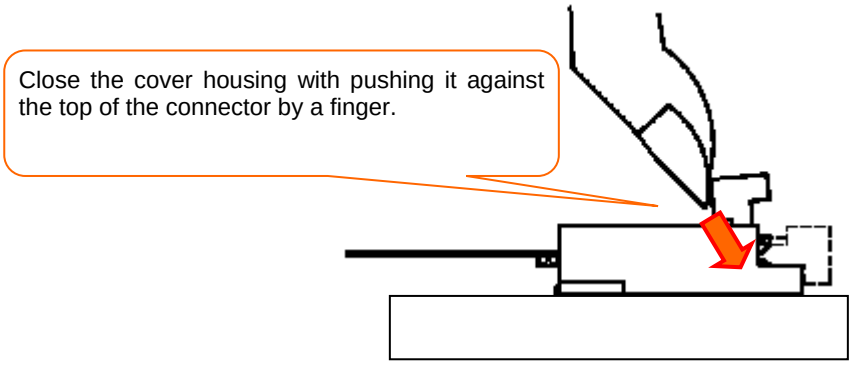
Hook around the center of the cover housing by a fingertip and push down the cover housing of the connector with FPC inserted in the the direction that the cover housing turns. (However, in case of plural circuits over the width of finger, operate it at the both ends.)
At this time, close the cover housing not to move FPC. If FPC moves in closing the cover housing, the mating defect may be caused.
When FPC moves or comes off the connector during the operation, open the cover housing again and reinsert FPC straightly into the connector.
After the operation, check that the cover housing is securely closed.



Defective case



Improper operation 1

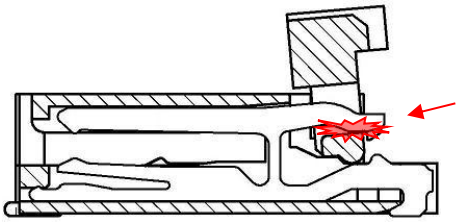


Improper operation 2

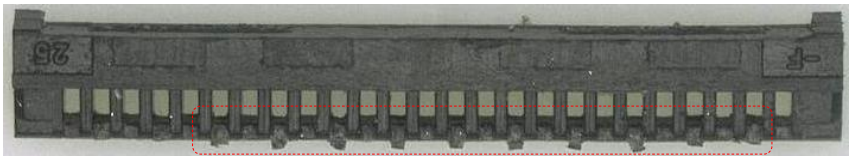
Improper operation 1 and 2

When an external load applies to the upper contact spring at the cover housing eccentric cam part in closing the cover, the eccentric cam turns under the condition that the upper spring pushes down the eccentric cam part, and the upper contact spring may cut the eccentric cam.

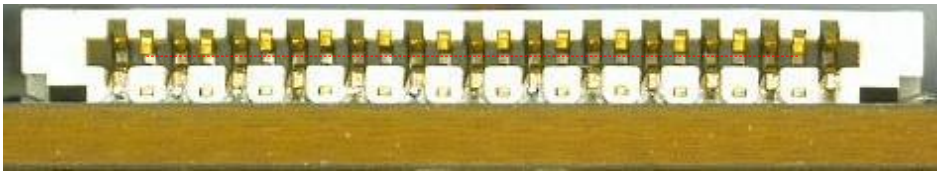
If the eccentric cam is cut, even if the cover housing is closed, the upper contact point does not come down, resulting in poor contact. When the cover housing is closed, operate it according to the points shown in the previous page.



When the cover housing is improperly handled, the upper contact spring may cut the eccentric cam.



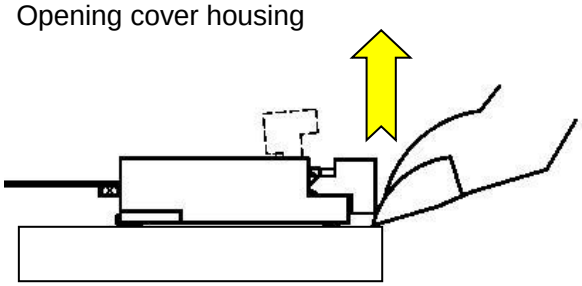
The cover housing eccentric cam part is cut.

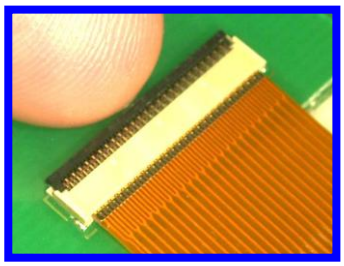


The upper contact point does not come down even if the cover housing is close.

6-2 Extracting FPC

① Opening cover housing

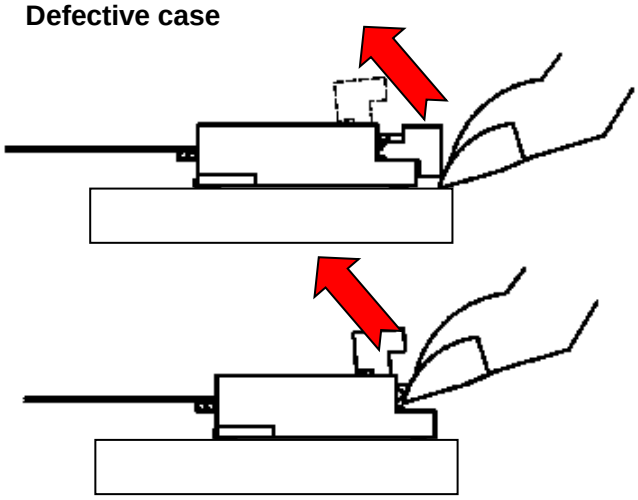


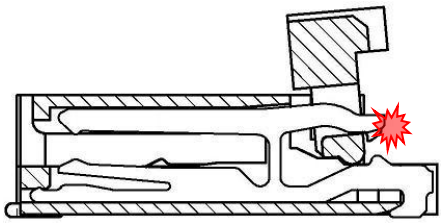


Hook the center of the cover housing and raise the cover housing by a fingertip.
Turn the cover housing to unlock.

Note9: During the operation, do not apply a load partially on the cover housing and do not pull the cover housing by picking it up with fingertips, because the cover housing may be broken.
Do not hook a fingernail on the contact in opening the cover housing, because the cover housing may be deformed.

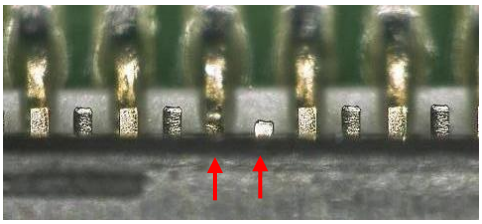
Defective case



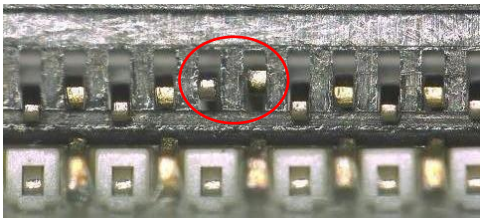


Improper handling

When the cover housing is opened by a fingertip, the contact is caught on a fingertip, possibly resulting in the deformation.
Due to the deformation of the upper contact spring at the cover housing side, the upper contact point of the mating side goes down, resulting in hitting the inserted FPC.

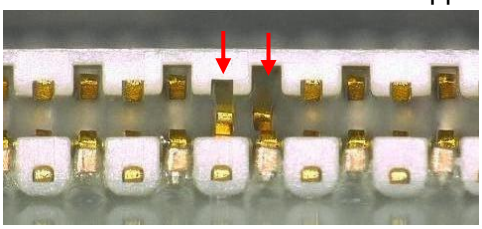


Top view



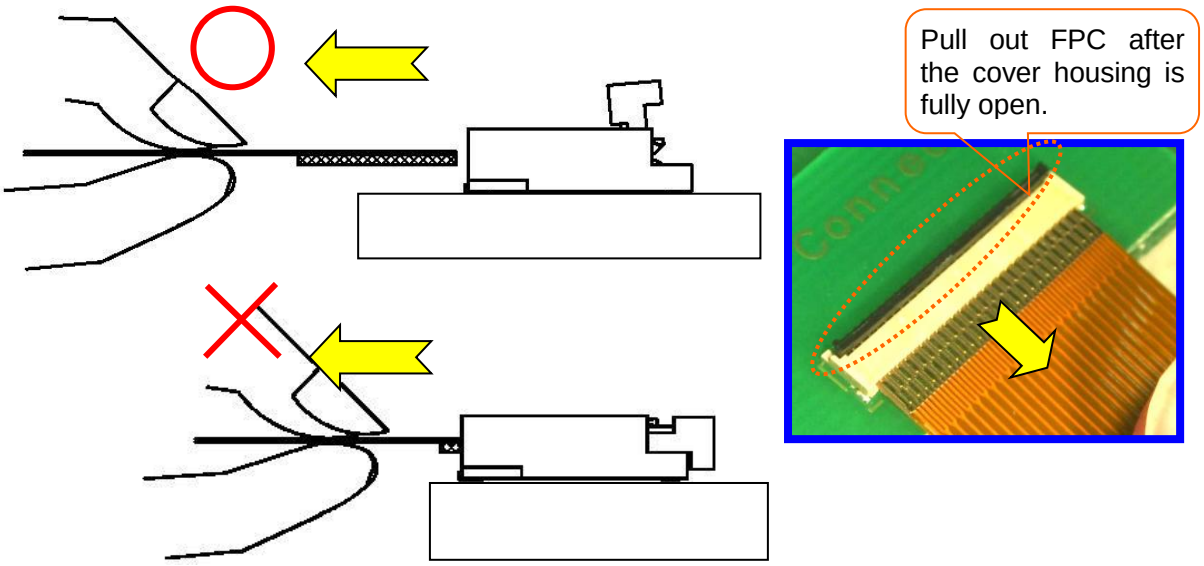
A view from the cover housing (lead side)

Deformation condition of the upper contact spring at the cover housing side



Contact deformation condition at the mating side

② Extracting FPC from connector

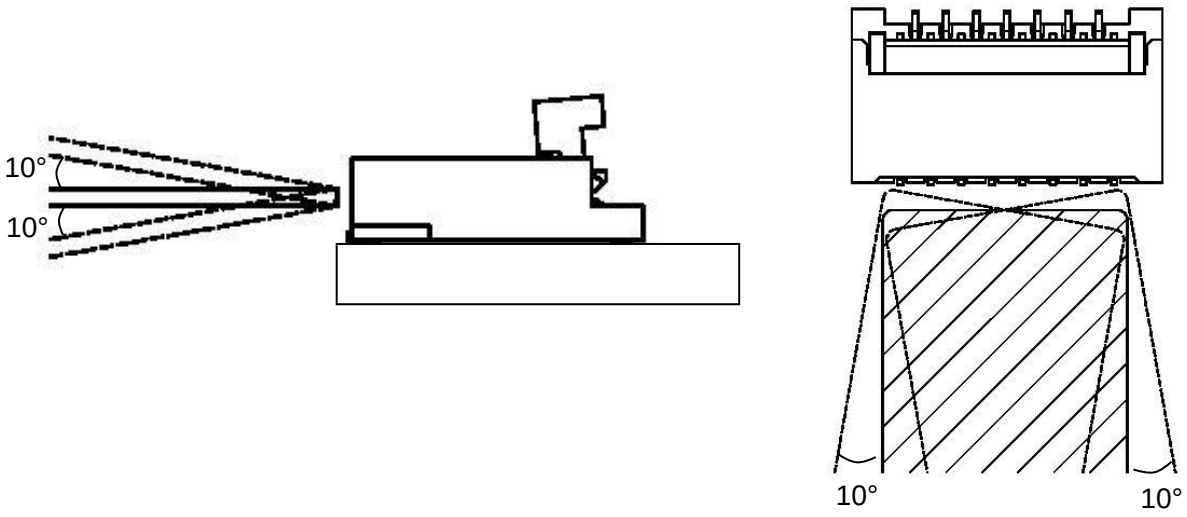


The cover housing is open fully at 90 degrees. At the state, pull FPC from the connector on the same axis.

Note$_{10}$:Do not extract FPC without opening the cover housing fully, because the mating without inserting FPC may be caused.
Do not push the cover housing that has been fully open by excessive force, because the cover housing may be broken.

6-3 Inserting and releasing FPC

Insert in and release FPC from the FXRH connector as straight as possible on the same axis with the cover housing opened. When the operation on the mating axis is difficult, operate smoothly within 10 degrees to each 4-direction of up/down and right/left as shown in the figure below.



6-4 Handling of FPC after mounting the connector on PC board

Pay careful attention to handling FPC as shown below.

<table>
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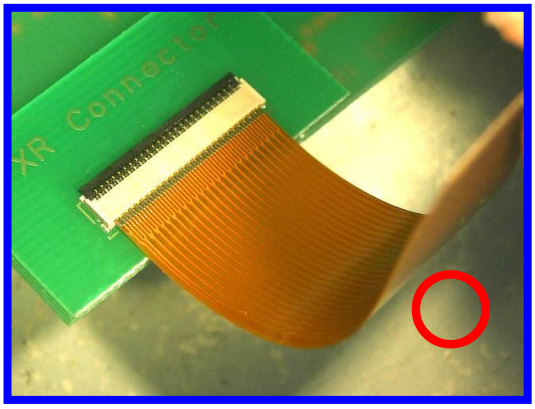
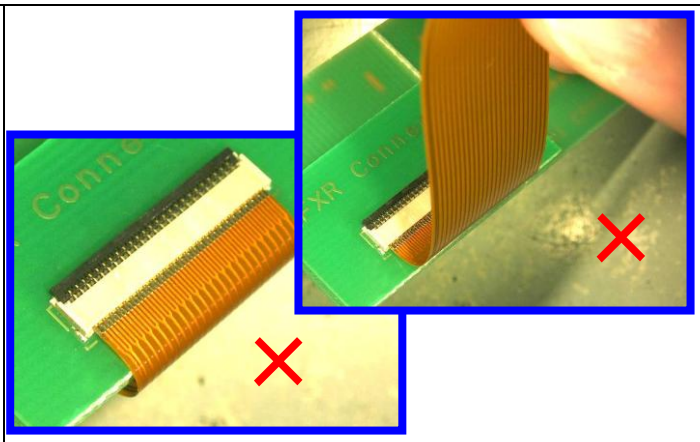
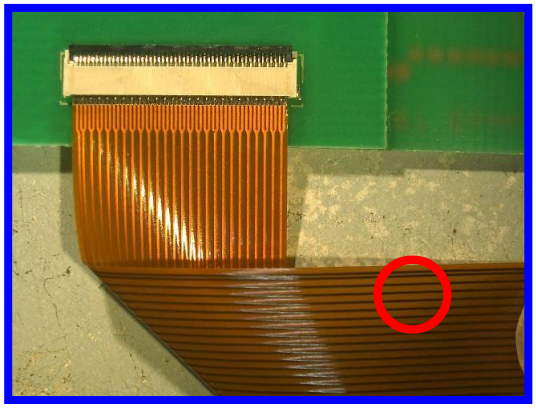
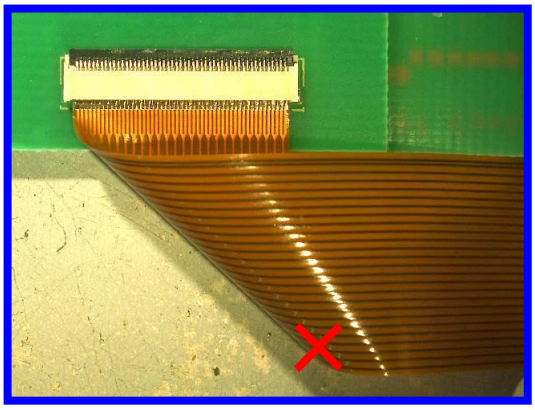
<td> 

When the inserted FPC is handled upward, keep sufficient distance away from the connector.</td>
<td> 
If FPC inserted into connector is pulled upward near the connector, the connector and FPC may be damaged.</td>
</tr>
<tr>
<td> 
When FPC is handled to the lateral direction, use the FPC that forming has been done.</td>
<td> 
Do not apply lateral force to FPC.</td>
</tr>
</table>

Give attention to using the connector at the place where FPC inserted in the connector moves by the mechanism of the rotating axis of devices or together with the operation of the moveable part, because poor contact may be caused due to fretting corrosion.

6-5 Precautions for soldering operation

6-5-1 Solder iron method

Solder the mounted specimen on a PC board every 1 pin quickly by using a soldering iron of 350°C, and check the soldering appearance with microscope. (Especially, check that the contacting part and the lead part are free from abnormalities.)

Note$_{11}$: When using a soldering iron, be sure to solder the connector with the cover housing opened. If the cover is close during soldering, the connector warps, resulting in poor soldering.

Note$_{12}$: Do not strongly press the tip of the soldering iron on the contact lead part nor apply an abnormal load such as lateral load. If done, dismount and exchange the connector, and conduct soldering again. Do not reuse the dismounted connector.

6-5-2 Reflow soldering method

We recommend soldering at lower temperature than the temperature profile of reflow soldering described in item “Resistance to Soldering Heat” of the product specification.
As the recommended reflow temperature varies depending on soldering material, such as solder paste, do soldering according to the condition.

When bridge trouble appears in the process of reflow soldering method and soldering repair is conducted by hand, strictly conduct item 6-5-1 “Soldering iron method.”

6-5-3 Amount of soldering

We recommend the 100 to 120μm-thick metal mask, which is the recommendable solder coating amount when the opening area of the metal mask is 100% to the PC board’s land area.

When the thicker metal mask than 120 μm is used, adjust the area by making the opening area smaller than the PC board land area.
(e.g.: In case of using 150μm-thick metal mask, make the opening area small.)

6-5-4 N2 reflow soldering

In reflow soldering, be sure to use N2 reflow soldering paste, because other solder paste may cause solder rising. Confirm soldering with solder paste to be use before using because the characteristics may depend on solder paste.

6-5-5 Handling points

Never heat the connector with the cover housing closed by such as soldering because poor soldering due to deformation, or critical problems affect the mating performance may arise.

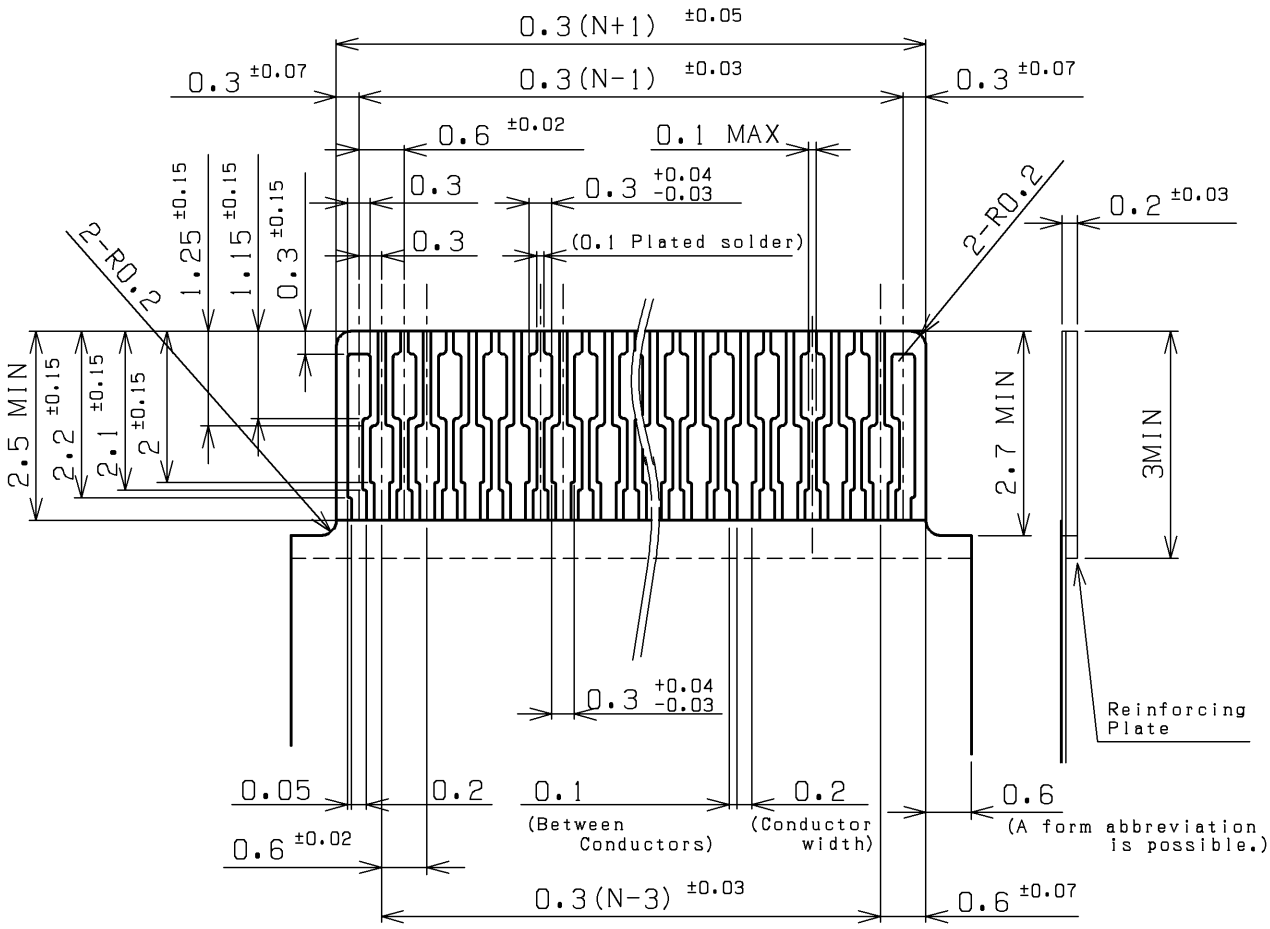
6-6 Other precautions

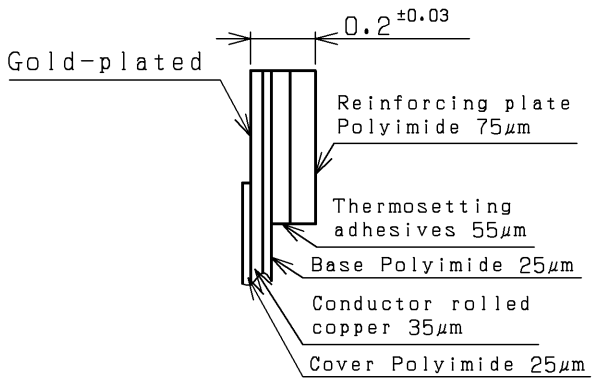
① Especially when operating the cover housing or handling FPC, be sure to read through the aforementioned handling methods.

② Do not extract FPC forcibly with the cover housing closed after the insertion of FPC, because the connector and FPC may be broken.

③ Do not close the cover housing of the mounted connector without FPC or do not extract FPC out by force with the cover housing closed, because the connector becomes the mating condition with no FPC, resulting in influence on the connector performance.

REV.	DESCRIPTION	DATE	0
1	Applicable CONNECTOR Add FXRH.	MAR.13.2010	
2	Drawing format changed.	NOV. 6.2020	





Applicable dimensions of FPC conductor Part

NOTE

1) FPC which applicability of the connector with the FPC used, before use.
2) N:Number of circuit.
3) Gold Plated: 0.03 to 0.09μm
   Nickel under plated:3~9μm
4) The plating method is the thing of electrolysis plating
5) Blanking shall be conducted in the direction from conductor side to reinforcing plate side.

No.	PART NAME	MATERIAL	SURFACE FINISH	REMARKS

SIZE	UNIT	SCALE	PROJECTION	DATE
A4	METRIC	10:1		OCT.27.2006

CUSTOMER

SERIES NAME	Applicable FPC for FXR/FXRH CONNECTOR dimensions (Reference) 1
PART No.	
DRAWING No.	KRD-32140-1 R2

J.S.T.MFG.CO., LTD

EC4118-4
20210113J166150