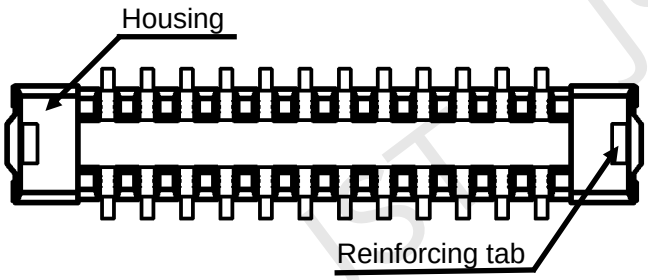
Title of Document:	HANDLING MANUAL	Issue No. CHM-1-2636	Rev. 0
Customer:	GENERAL	Issue date: April 1, 2019	
Title subject:	JAK Connector	Revision date:	

This manual describes important and required points of handling about the JAK connector (embossed-taping product).
Be sure to read this manual thoroughly before using the JAK connector.

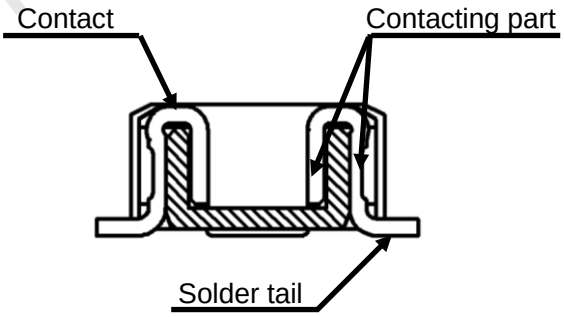
C O N T E N T S

1. Part Name

Plug

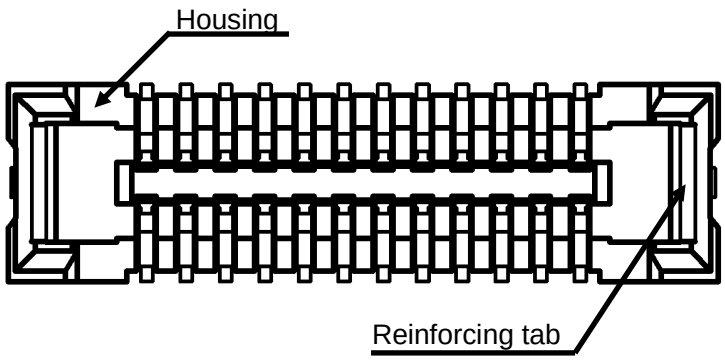


Top view

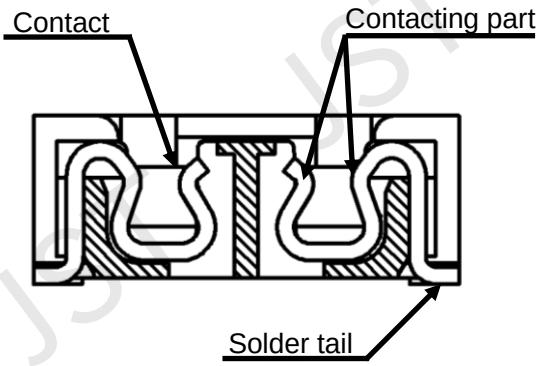


Cross sectional view

Receptacle



Top view



Cross sectional view

2. Model Number

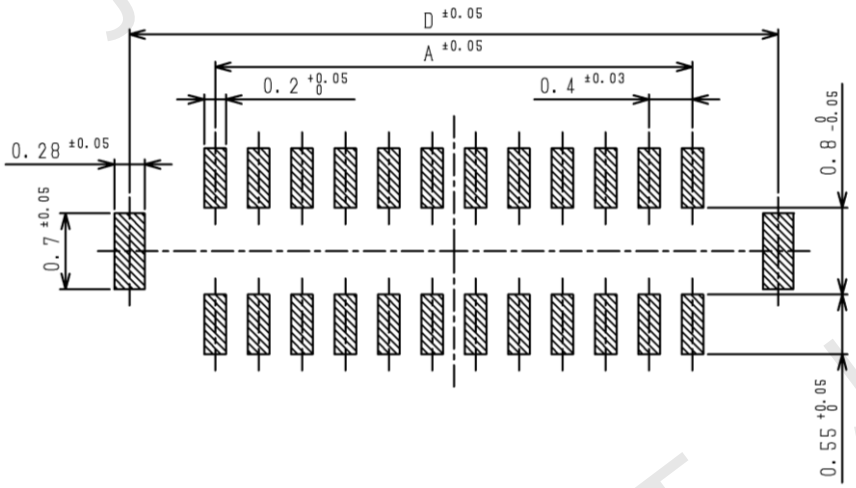
Part name		Model No.
Plug side	Embossed-taping product	( )P-JAKK-GSAN-TF(HF)
	Loose piece product	( )P-JAKK-GSAN(HF)
Receptacle side	Embossed-taping product	( )R-JAKK-GSAN-TF(HF) ( )R-JAKK-GSAN-1-TF(HF)
	Loose piece product	( )R-JAKK-GSAN(HF) ( )R-JAKK-GSAN-1(HF)

Note$_1$: Number of circuits in two-digit figure is indicated in ( ).
Note$_2$: JAK connector is supplied on embossed tape.
(15,000 pcs./reel for plug, 15,000 pcs./reel for receptacle).

3. PC Board Pattern Layout

We recommend using the following PC board pattern layout.

- Plug

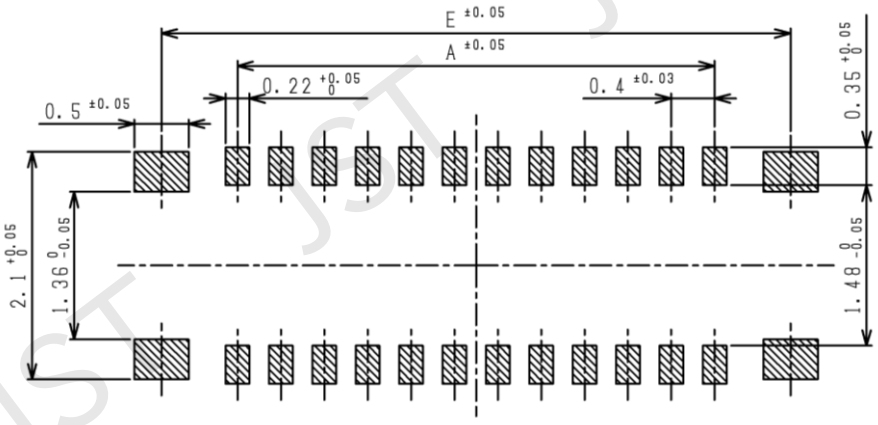


Dimension	
A	0.4(n/2-1)
D	0.4(n/2-1)+1.58

n: Circuit number

Recommended PC board pattern layout

- Receptacle



Dimension	
A	0.4(n/2-1)
E	0.4(n/2-1)+1.4

n: Circuit number

Recommended PC board pattern layout

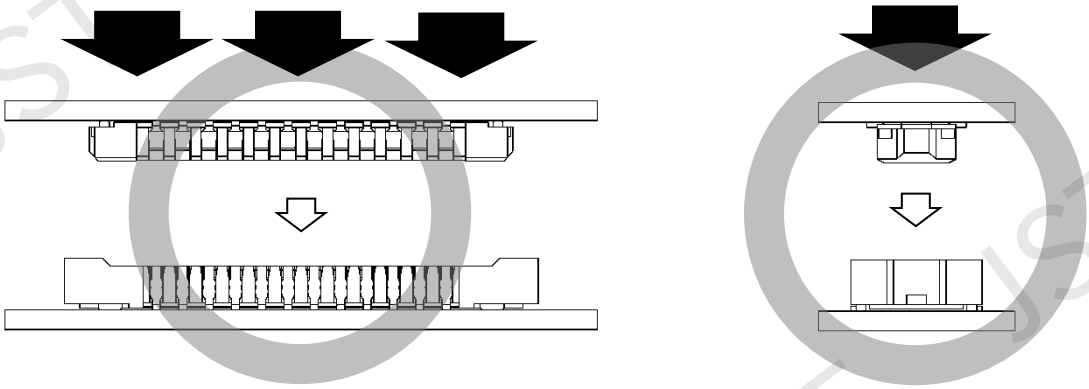
4. Handling Precautions

4-1 Mating operation

Normal operation method: Straight mating of the plug connector and the receptacle one.

① Mate the both connectors on the same axis without applying a force such as prying. When the mating operation is conducted forcibly without guiding, the breakdown of the connector such as scratches and dents on the housing may be caused.

② Push the whole of the connector softly and mate the plug housing with the receptacle one straightly. When the mating completes properly, there is a click sound. In case of no click, the mating may be insufficient, so redo the mating operation.
(The frequency of the redo should be kept to the minimum.)



Note$_3$: Judging from the operation condition in the normal mass-production line, we think that it is difficult to mate the plug side connector with the receptacle side one straightly on the mating axis until the mating completes.
Therefore, although it is assumed that the mating operation is conducted by either of the following two methods on the next page, compared with the normal operation method, a larger load applies to the connector. (It also may cause the breakdown of the connector.)

Pay careful attention to the following items during the mating operation in particular:

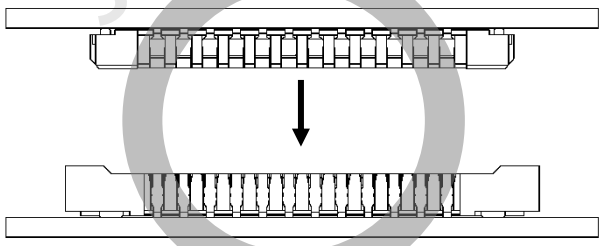
- Do the mating operation in a straight line from the above.
- Do not mate the connectors with the pitch being out of the alignment as much as possible.
- Do not apply force to the mating (perpendicular) direction in grope mating from the condition that the mating position is out of alignment.
- There is a feeling of click when the mating operation completes properly.
- Do not press further down the connector from the above with more than 5N plus the requirement of the insertion force after the mating operation.
- The repeat of the mating and unmating operation should be kept to the minimum

Other operation method

Method 1:	Diagonal mating operation in the direction to pitch (Mating in the direction of the connector length)

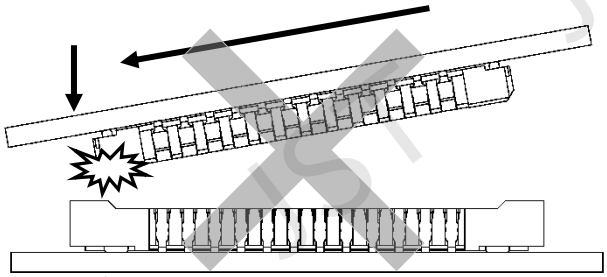
① Mate the connectors as nearly parallel as possible.

② In mating, press down not one portion of the connector but the whole of the connector gently in a straight line.
There is a “click” sound (you feel a click) when the mating operation completes.
When there is no feeling of a click, redo the mating operation.



Prohibited matter in mating operation

Do not mate the connector with being out of alignment widely to the direction to the pitch, because electrical discontinuity occurs due to the breakage of the connector housing part and the deformation of the receptacle contact’s spring part, and a critical defect may occur.

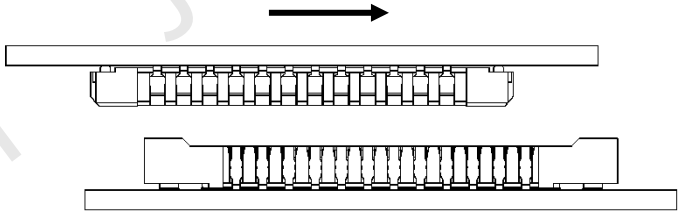


Method 2:	Grope mating operation in the direction to pitch (Mating in the direction of the connector length)

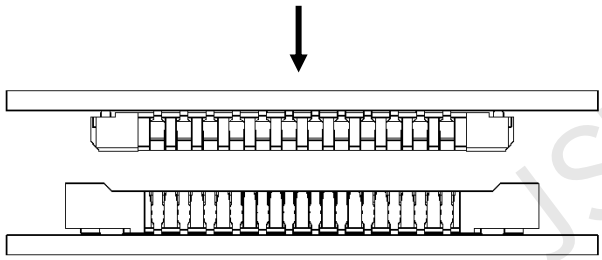
Grope mating in the alignment of the connector

When the mating position of the connector is aligned with that of the counterpart one, slide it softly in the horizontal direction to meet the mating position, and do the mating operation.
At this time, do not push it in perpendicularly.
When the mating position comes to the proper position, the connector fits in the counterpart.

① Alignment of the mating position
Slide the connector softly in the horizontal direction to the fitting position in the counterpart.

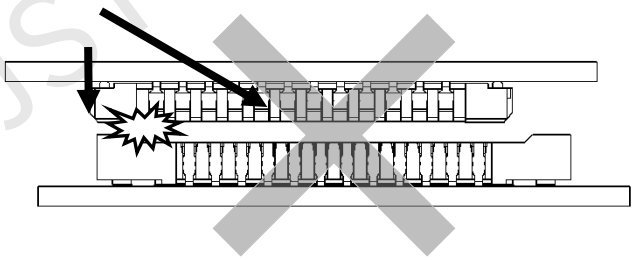


② Mating operation
Push the connector in perpendicularly.



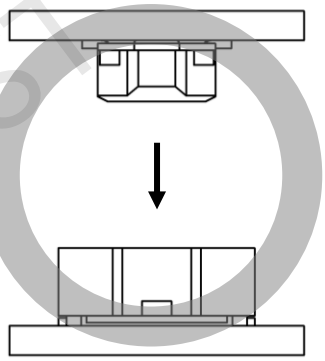
Prohibited matter in mating operation

Do not push the connector in perpendicularly with sliding it in the horizontal direction, because such handling may cause the deviation of the connector pitch. Also, electrical discontinuity occurs due to the breakage of the connector housing part and the deformation of the receptacle contact's spring part, which may result in a critical defect.

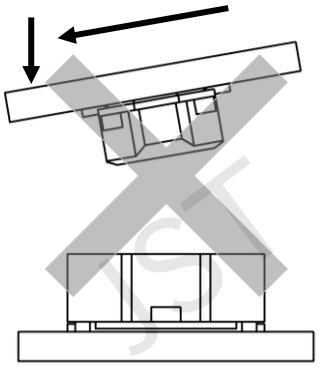


Method 3:	Diagonal mating operation in the rectangular direction to pitch (Mating in the direction of the connector width)

① Mate the connectors as nearly parallel as possible.
② In mating, press down not one portion of the connector but the whole of the connector gently in a straight line.
There is a “click” sound (you feel a click) when the mating operation completes.
When there is no feeling of a click, redo the mating operation.



Prohibited matter in mating operation
Do not mate the connector with being out of alignment widely to the perpendicular direction to the pitch (the direction of the connector width), because electrical discontinuity occurs due to the deformation of the receptacle contact spring part, which may result in a critical defect.

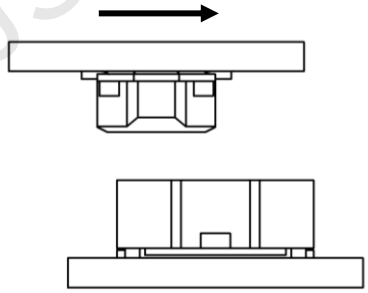


Method 4:	Grope mating operation in the rectangular direction to pitch (Mating in the direction of the connector width)

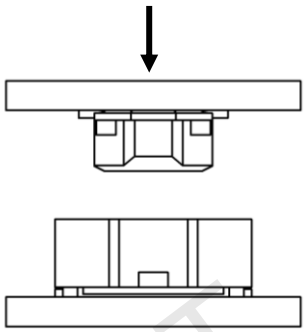
Grope mating in the alignment of the connector

When the mating position of the connector is aligned with that of the counterpart one, slide it softly in the horizontal direction to meet the mating position, and do the mating operation.
At this time, do not push it in perpendicularly.
When the mating position comes to the proper position, the connector fits in the counterpart.

① Alignment of the mating position
Slide the connector softly in the horizontal direction to the fitting position in the counterpart.

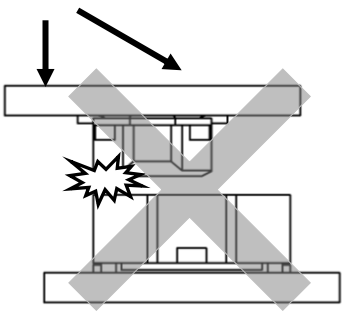


② Mating operation
Push the connector in perpendicularly.



Prohibited matter in mating operation

Do not push the connector in perpendicularly with sliding it in the horizontal direction, because electrical discontinuity occurs due to the breakage of the connector housing part and the deformation of the receptacle contact's spring part, which may result in a critical defect.

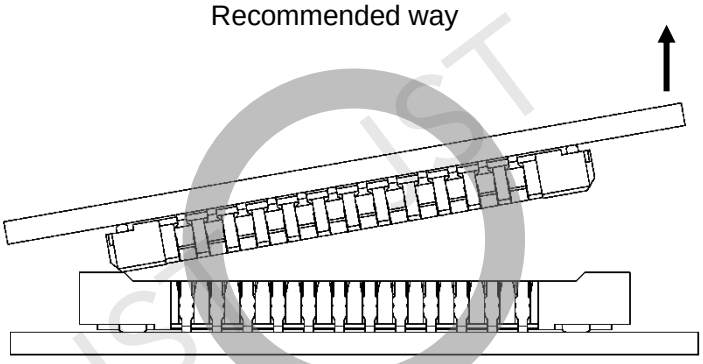


4-2 Unmating operation

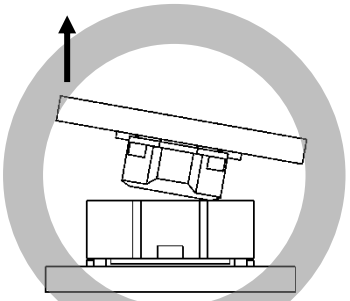
Normal operation method: Extract the plug side connector from the receptacle side one with holding one end in the direction to pitch. (or contrary).

① When the mated connector is unmated from the counterpart one, hold either end of the connector as shown below, and unmate the connector.

Recommended way

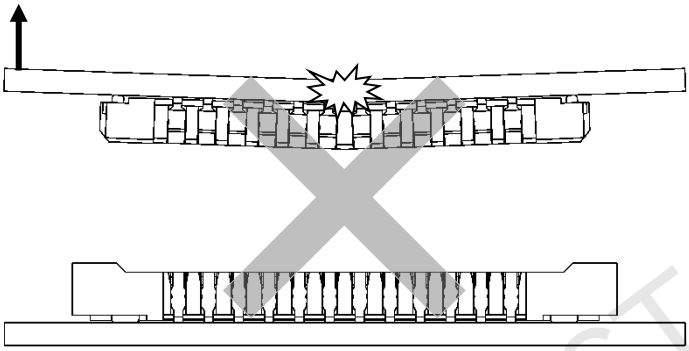


In the direction to pitch

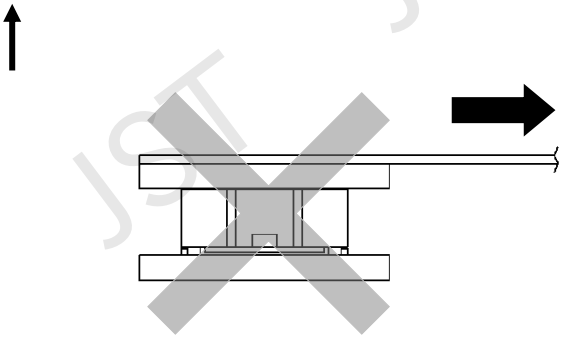


In the perpendicular direction

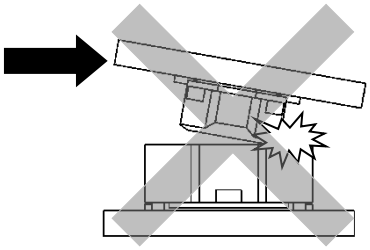
Do not apply undue load to the connector as shown below, because it may break.



Do not pull out the connector with holding the both ends.



Do not pull FPC toward the horizontal direction.

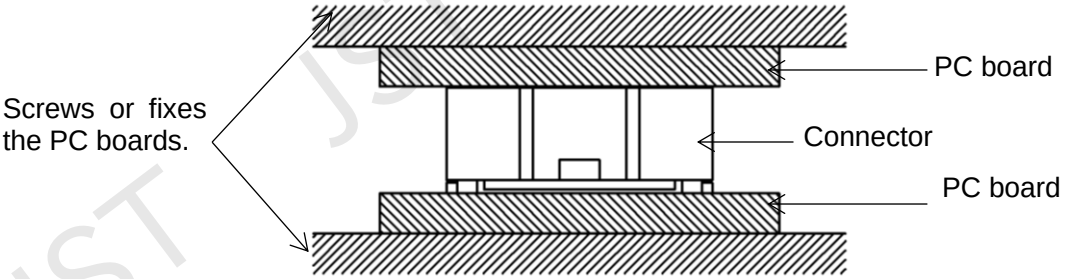


Do not apply a large load to the horizontal direction of the connector.

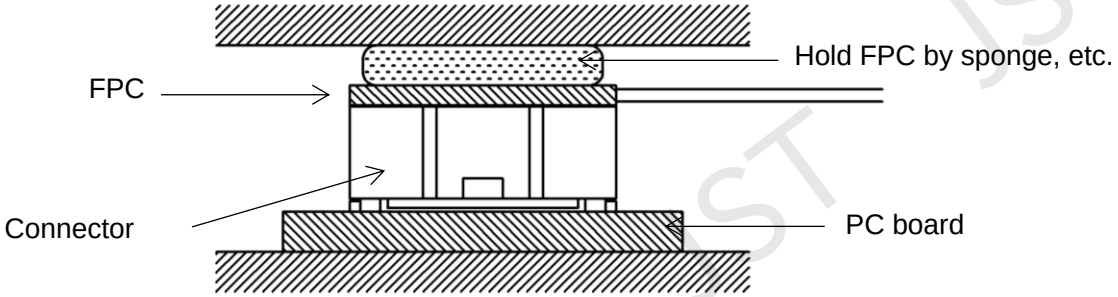
4-3 Handling of the connector after mating

(1) When the plug side and the receptacle side connectors are mounted on rigid PC boards, fix the PC boards so as not to fall them due to vibration and shock.

(2) After the PC boards are screwed or fixed, avoid the condition that an external force applies to the connector due to the misalignment between the PC boards, because critical defects such as solder crack may occur.

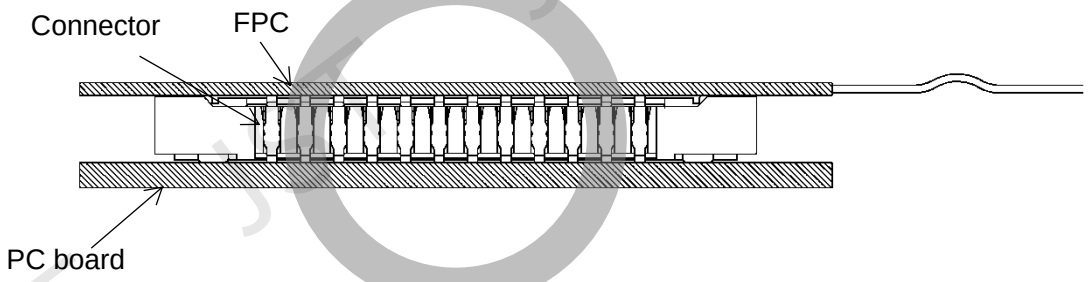


(3) When the connectors are mounted on FPC and a rigid PC board, fix the FPC and the PC board by holding to the mating direction or screwing, because the mated connectors may come off by stress due to dropping, shock and handling of FPC.

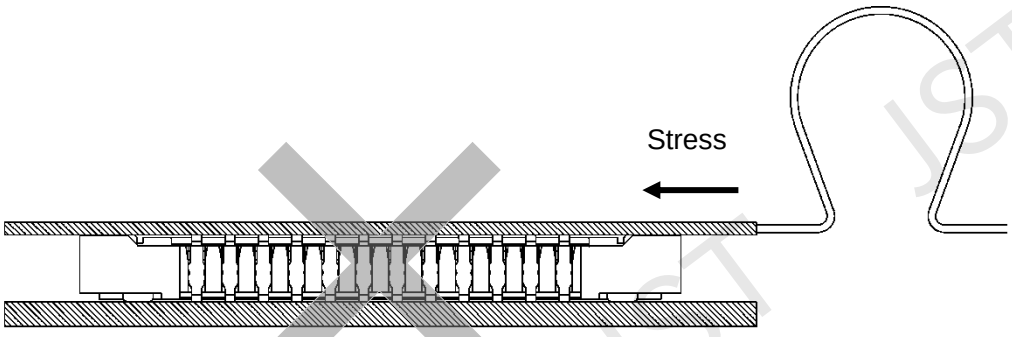


(4) When the connector is mounted on FPC as shown below, keep the FPC enough length in handling because such an external force as bending and tension of FPC applies to the connector.

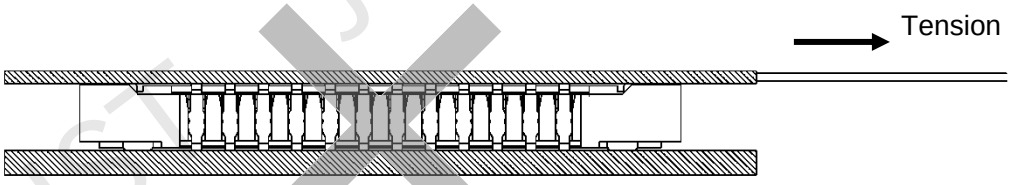
The length of FPC is enough long not to apply loads to the connector unduly.



The bending portion of FPC is so close to the connector that lateral load applies to it.



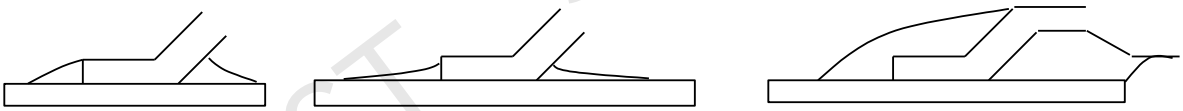
Tension applies to the connector due to the insufficient length of FPC in handling.



5. Soldering Precautions

5-1 PC board pattern

① When the pattern is designed longer than the requirement, solder flows into pattern as shown below and sufficient fillet configuration is not formed, so that defective soldering and solder crack may be caused.



JST recommended configuration

Pattern is designed longer than recommended layout.

Pattern and metal mask are designed longer. (Amount of solder is increased.)

Besides, when the pattern and the metal mask are designed longer than the recommended layout, the amount of flux also increases as the amount of solder increases.
As a result, flux rising and unnecessary solder rising occur, which may result in the deterioration of the connector performance.

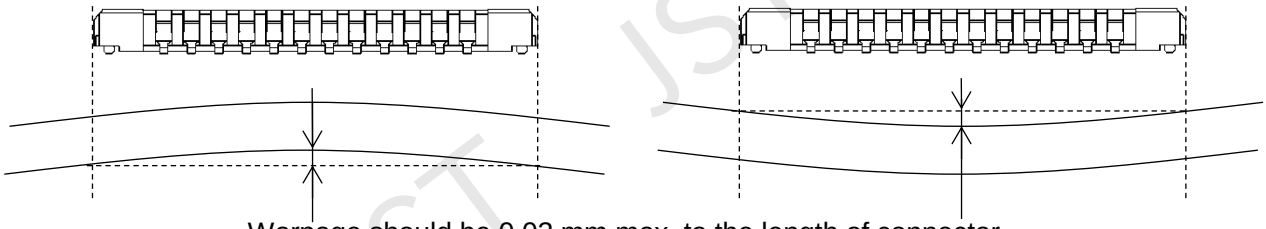
② When the opening width of the metal mask is small, smoothness of solder flow becomes bad. On the contrary, when the opening width is designed wider, because the dimension between the circuits becomes narrow as below, solder becomes easy to overflow and there is a high possibility that soldering troubles such as bridge and flux rising happen.
Be sure to follow JST recommended PC board's pattern dimension and the metal mask pattern width in soldering.

0.17 ~ 0.22 mm: ○
JST recommended dimension

0.22 mm or more : ×
Wider than the recommended dimension

5-2 PC board (FPC) specification

Keep warpage at the connector mounting under the dimension shown below.



Warpage should be 0.03 mm max. to the length of connector.

In case that either plug or receptacle for the JAK connector is mounted on FPC, please use it under following conditions. Otherwise, poor soldering or some problems such as peeling of FPC pattern may appear.

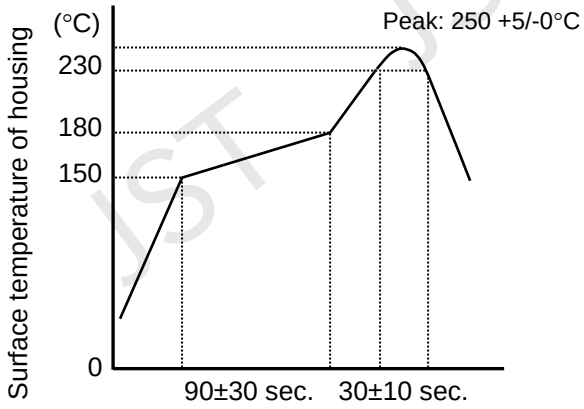
(1) Be sure to attach the backing reinforcing plate to the back part of the connector mounting part of FPC.

(2) Use something like the stainless board or glass-base epoxy resin board for backing reinforcing plate so that that enough strength and flatness can be kept.

(3) The outer dimension of the backing reinforcing plate should be larger than that of the JAK connector.

5-3 Soldering condition

① Reflow temperature profile
We recommend soldering according to the following temperature profile.

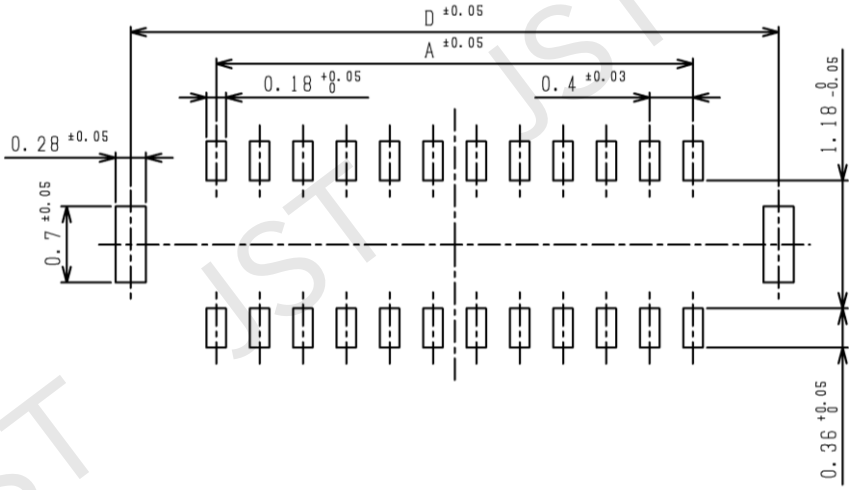


Temperature profile of lead-free reflow soldering

② Solder paste
As the JAK connector is a fine pitch connector, the blanking part of the metal mask is very small, so we recommend using solder paste for fine pitch in soldering.

③ Reflow soldering type
We recommend using hot air reflow soldering.
In case of N_2 reflow soldering, it is necessary to check the soldering condition.

④ Specification of metal mask (amount of solder)
As for the plug side, we recommend the dimensions of the metal mask that the opening ration shown below against the recommended pattern layout shown on page 3 has been cut.
If the metal mask with 100% opening ratio is used, solder or flux rising or short circuit between adjacent terminals may be caused.



Dimension	
A	0.4(n/2-1)
D	0.4(n/2-1)+1.58

n: Circuit number

If the conditions ① to ④ change, some troubles, such as flux rising and lack of smoothness of solder flow in soldering, may occur. When the condition is changed, it is necessary to check the solderability.

6. Storage

Store the JAK connector (embossed-taping product) in the following ambience.

Storage temperature	5 ~ 35 °C
Relative humidity	60% max.