Title of Document:	HANDLING MANUAL	Issue No. CHM-1-2718	Rev. 2
Customer:	GENERAL	Issue date: August 25, 2020	
Title subject:	JMC Connector (Misalignment absorbing Type)	Revision date: May 13, 2022	

This manual describes important and required points of handling about JMC connector, misalignment absorbing type (embossed-taping product).
Be sure to read this manual thoroughly before using this connector.

C O N T E N T S

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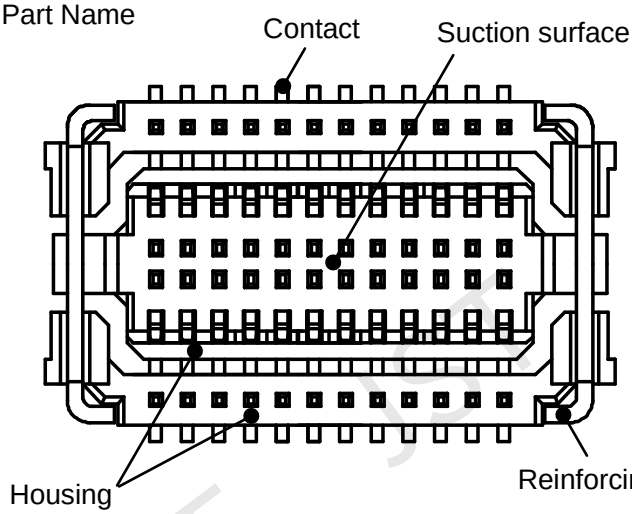
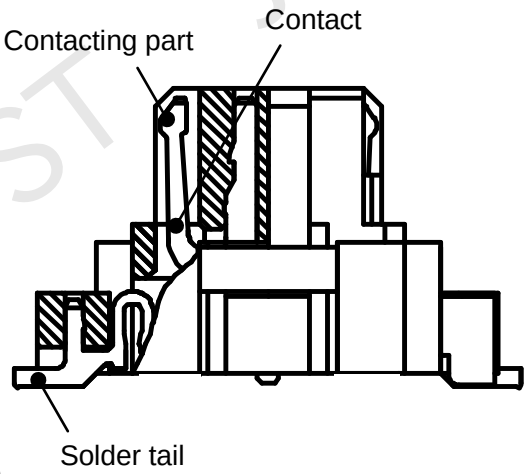
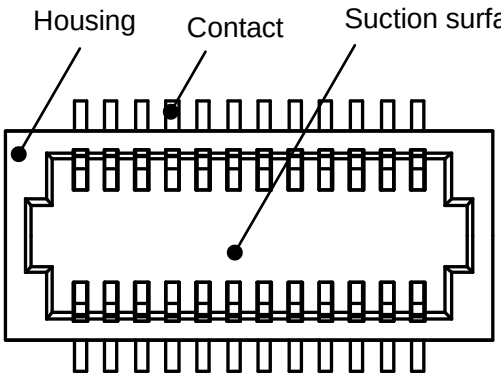
1. Part Name



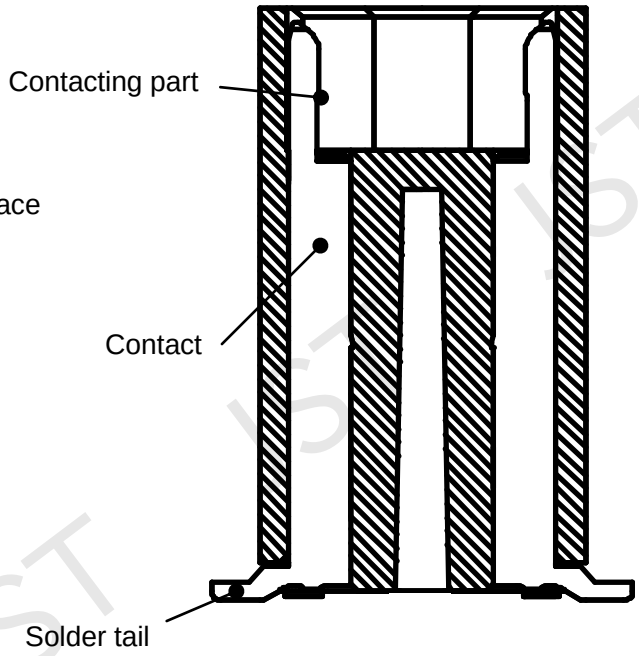
Top view of receptacle



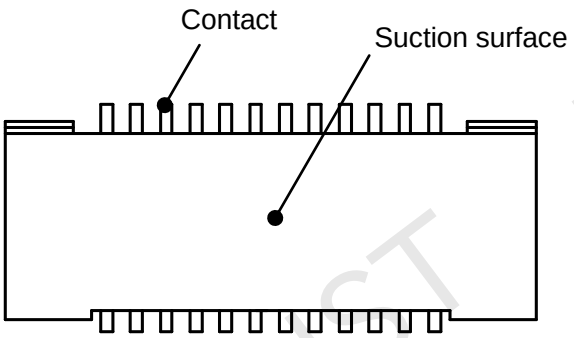
Cross-sectional view of receptacle



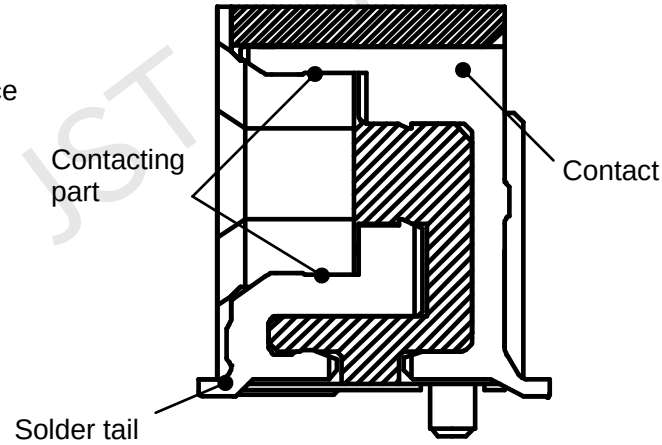
Top view of applicable plug
(Top entry type)



Cross-sectional view of applicable plug
(Top entry type)



Top view of applicable plug
(Side entry type)



Cross-sectional view of applicable plug
(Side entry type)

2. Model Number

Part name		Model No.
Receptacle	Loose piece product	(∗1)RF-JMCS-GAN
	Embossed-taping product	(∗1)RF-JMCS-GAN-TF
Top entry type plug	Loose piece product	(∗1)P(∗2)-JMCS-GAN-A
	Embossed-taping product	(∗1)P(∗2)-JMCS-GAN-A-TF
Side entry type plug	Loose piece product	(∗1)PS-JMCS-GAN-1-A
	Embossed-taping product	(∗1)PS-JMCS-GAN-1-A-TF

Note$_1$: 2-digit figures in "(∗$_1$)" denote the circuit number.
Note$_2$: Figures in "(∗$_3$)" denote the stacking height.

Precaution for applicable plug

As the height of this product (misalignment absorbing type) is 1.0 mm higher than that of the standard type receptacle, the height of applicable top entry type plug should be considered.

- For an example of the combination, when the distance between PC boards (stacking height) is 5.0 mm, the applicable plug connector should be as below.
  Model No.: ( )P4.0-JMCS-GAN-( )-A-TF
  ↖— 1.0 lower than the distance between boards

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), dusty place and condensation.
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 products in the original package to store.

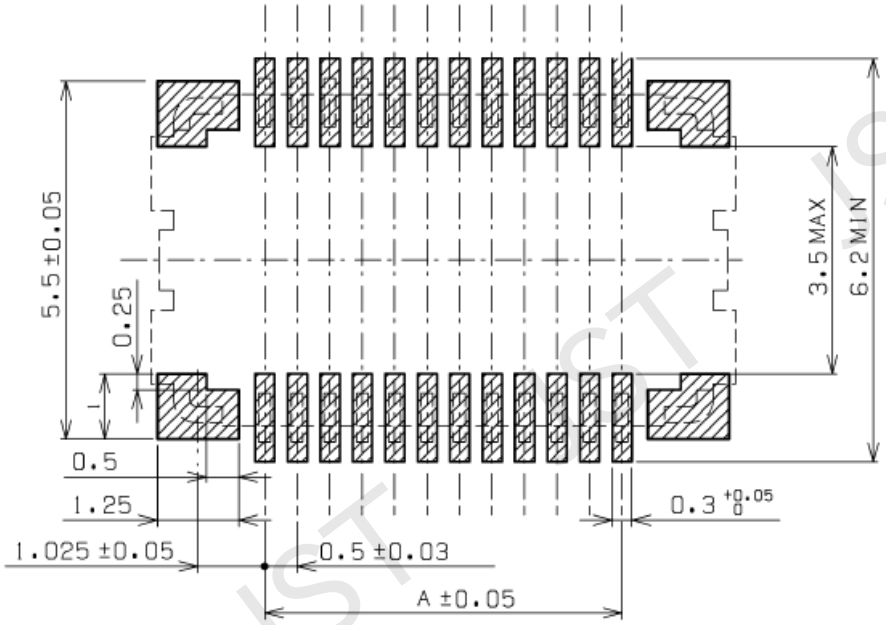
3-2 Storing the processed connectors

Not leaving the processed connectors 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. PC Board Pattern Layout

The following PC board pattern layout is recommended.

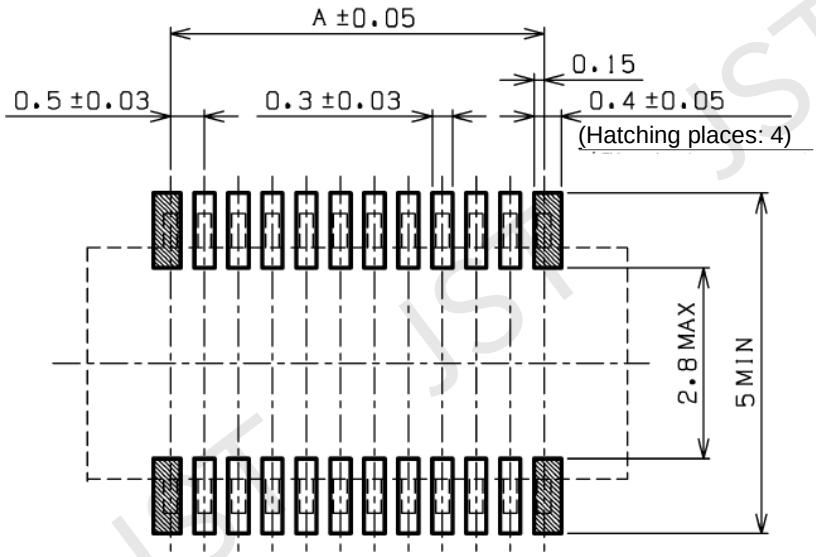
Receptacle side



Circuits	“A” dimension
20	4.5
30	7.0
40	9.5
50	12.0
60	14.5
64	15.5

Reference PC board pattern layout (Viewed from the mounting surface)

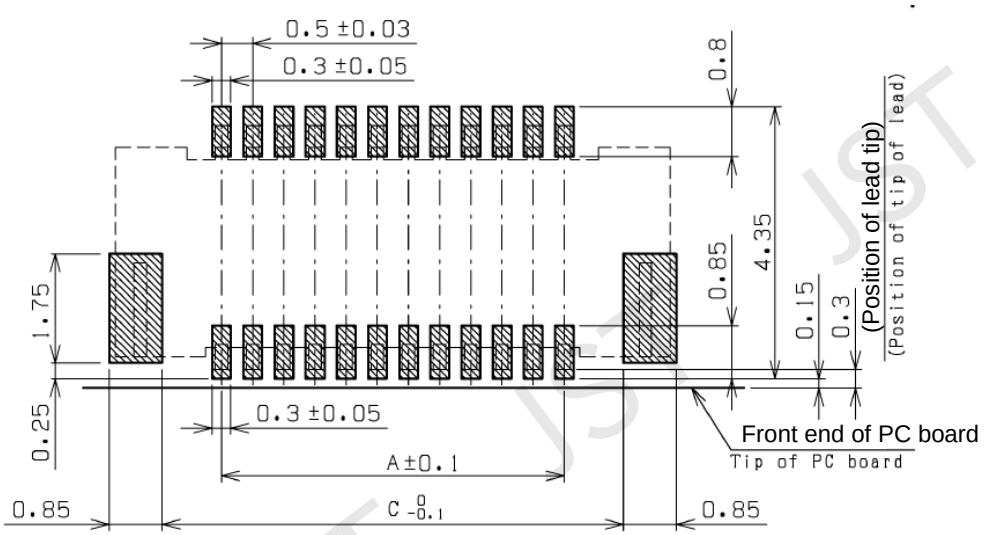
Applicable plug side (top entry type plug)



Circuits	“A” dimension
20	4.5
30	7.0
40	9.5
50	12.0
60	14.5
64	15.5

Reference PC board pattern layout (Viewed from the connector mounting surface)

Applicable plug side (side entry type plug)



Reference PC board pattern layout (Viewed from the connector mounting surface)

Circuits	“A” dimension	“C” dimension
20	4.5	6.4
30	7.0	8.9
40	9.5	11.4
50	12.0	13.9
60	14.5	16.4

5. Handling Precautions

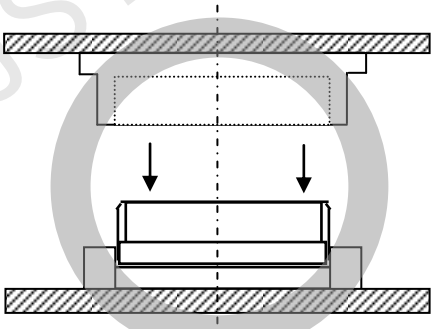
5-1 Mating operation

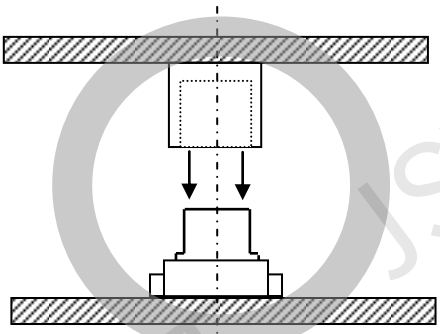
Normal operation method: Mate the plug side straightly with the receptacle side (or vice versa).

① Mate the both housings along the same axis without applying force such as prying.
When the mating operation is conducted forcibly without aligning the both housings, such handling may lead to scratches or hollows on the housing and breakage on the connector.

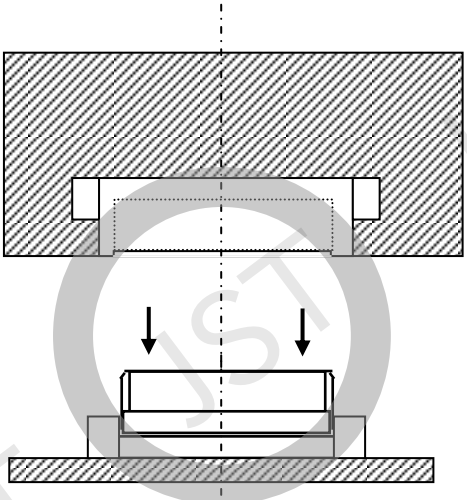
② Press the entire connector gently and mate the plug with the receptacle housing in a straight line.
There is a “click” sound (you feel a click) when the mating operation is properly completed.
When there is no feeling of a click, there is a possibility that the mating is not finished completely.
Conduct the mating operation again.
(The number of such mating and unmating operation should be minimized as much as possible.)

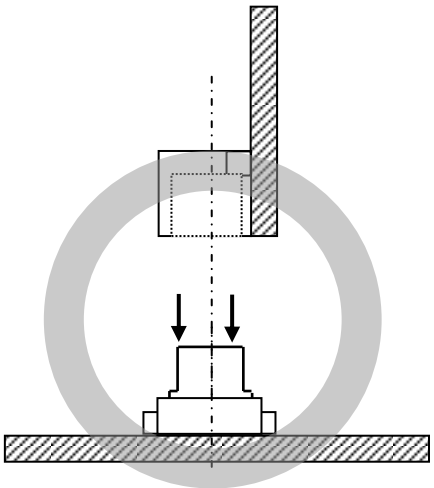
- Top entry type





- Side entry type

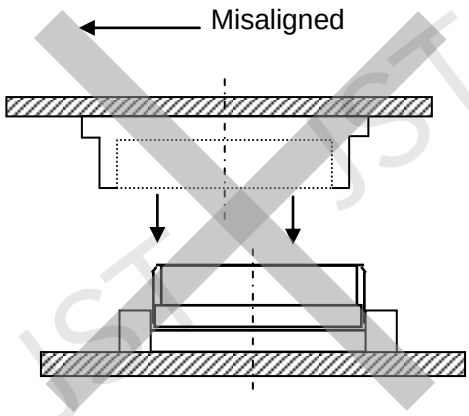


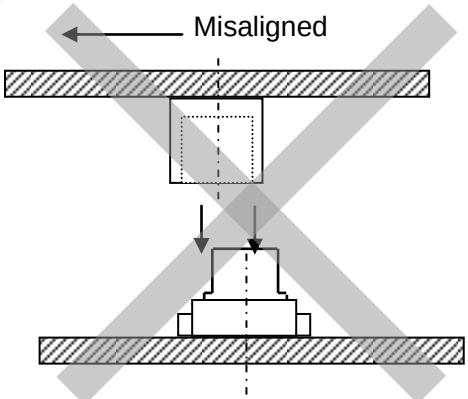


Prohibited matter in mating operation

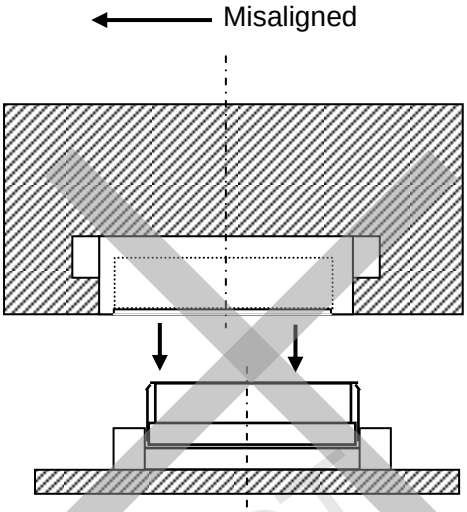
Do not mate the plug with the receptacle with the mating axis misaligned.
(Such handling may deform the contact and cause chips or cracks on the housing.)

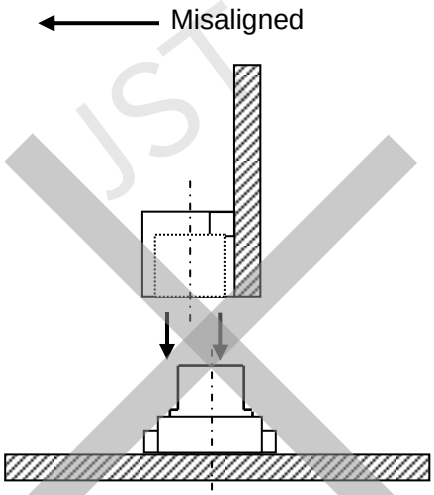
- Top entry type





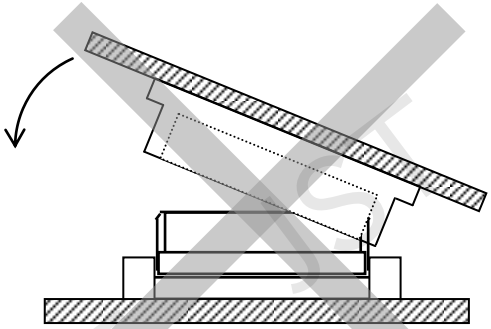
- Side entry type

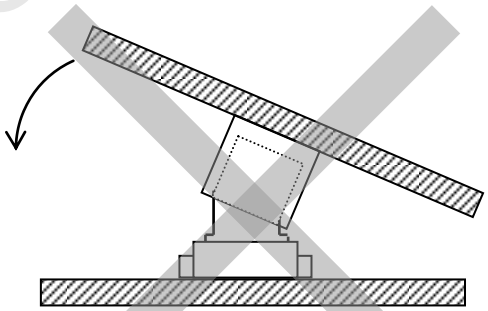




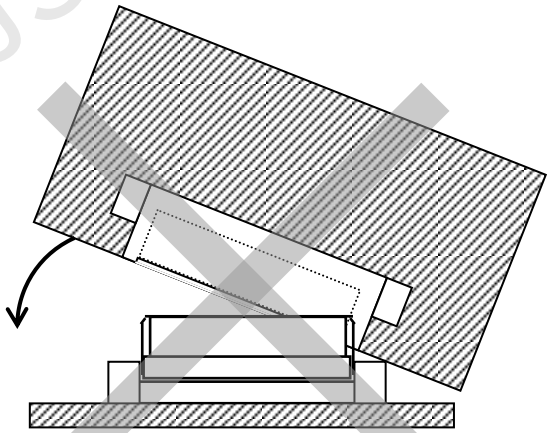
Do not mate the plug with the receptacle by rotating the plug from a state of slanting after mating only one side of the connector as below.
(Such handling may deform the contact and cause chips or cracks on the housing.)

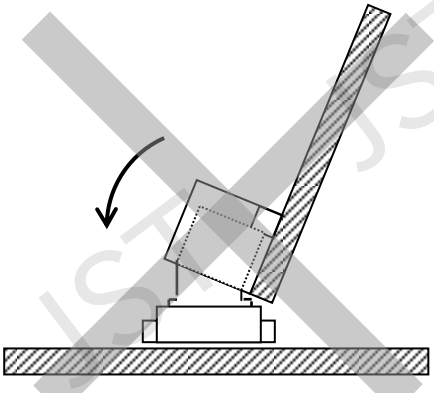
- Top entry type





- Side entry type





Note$_3$: We assume that it is difficult that the plug connector and the receptacle one are mated in a straight line against the mating axis direction until the operation is completed, judging from the work in mass-production line.
Therefore, we imagine that the mating operation is conducted in either of the following two methods on the following page on the real work. These handling methods apply excessive load to the connector more than the normal operation. (It may cause breakage of the connector.)
Pay careful attention to the following points to be especially noted during the mating operation.

- Conduct the mating operation in a straight line from above.
- Do not mate the connectors with the pitch misaligned.
- Do not apply excessive force to one part of the connector during the mating operation.
- There is feeling of a click when the mating operation is properly completed.
- Do not press further down the connector from the above after the mating operation.
- The number of the mating and unmating operation should be minimized as much as possible.

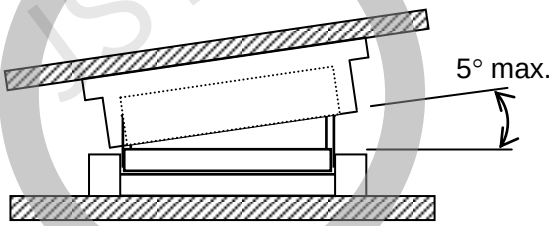
Other operation method

Method 1:	Mating operation at an angle in the direction to pitch (Mating in the direction of the connector length)

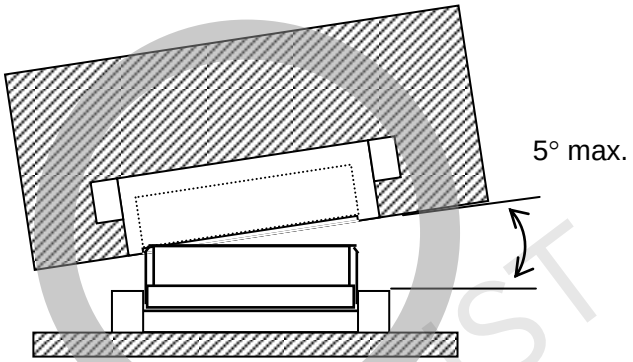
① Mate the connectors as nearly parallel as possible (MAX. 5°).

② Mate the connectors not with pressing down the one part of the connector but gently in a straight line with pressing down the entire connector.
There is a “click” sound (you feel a click) when the mating operation properly completes.
When there is no feeling of a click, conduct the mating operation again.

- Top entry type



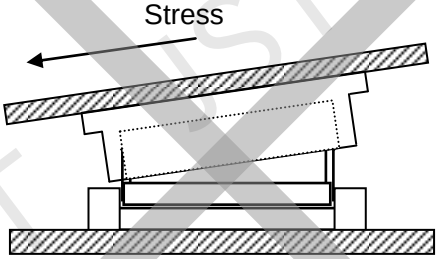
- Side entry type



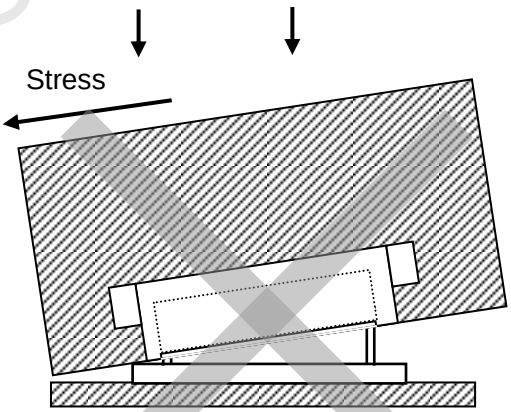
Prohibited matter in mating operation

Do not mate the connector with being greatly misaligned to the direction to the pitch, because such condition may cause misalignment of the pitch or breakage on the housing resin part.

- Top entry type



- Side entry type

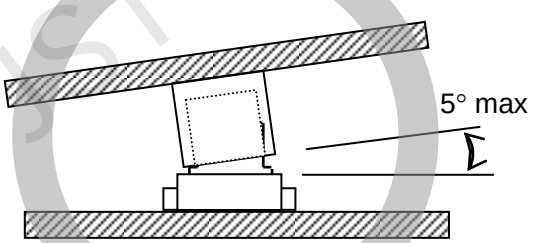


Method 2: Mating operation at an angle in the rectangular direction to pitch (Mating in the direction of the connector width)

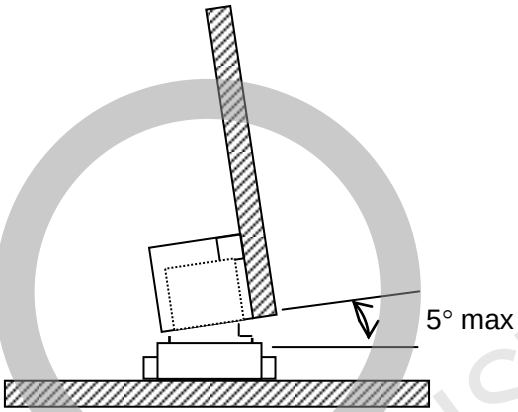
① Mate the connectors as nearly parallel as possible (MAX. 5°).

② Mate the connectors not with pressing down the one part of the connector but gently in a straight line with pressing down the entire connector.
There is a “click” sound (you feel a click) when the mating operation properly completes.
When there is no feeling of a click, conduct the mating operation again.

- Top entry type



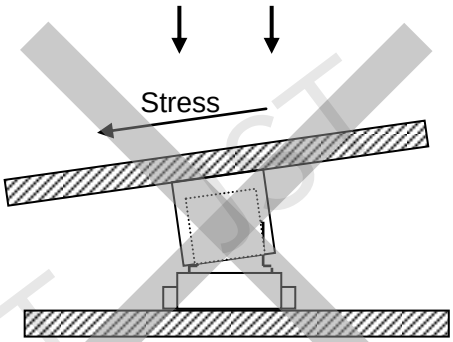
- Side entry type



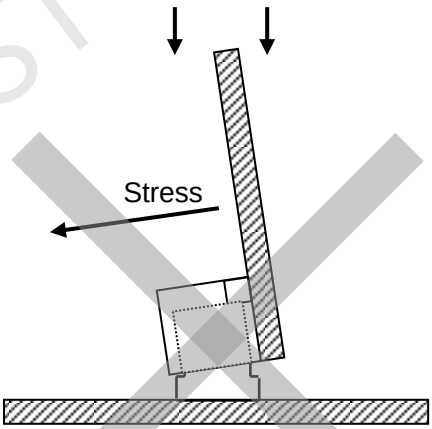
Prohibited matter in mating operation

Do not mate the connector with being greatly misaligned to the direction to the connector width, because the spring part of the receptacle contact is deformed and electrical continuity is not kept, possibly leading to critical defects.

- Top entry type



- Side entry type

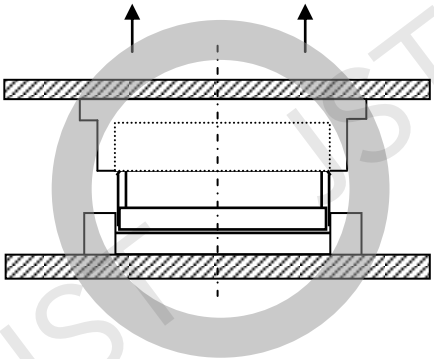


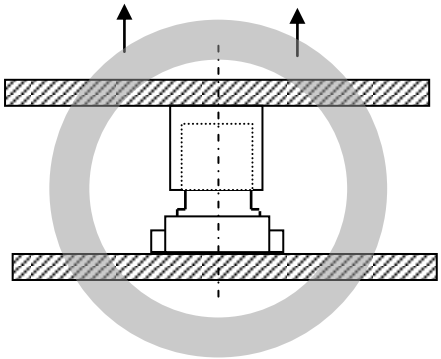
5-2 Unmating operation

Normal operation method: Unmate the plug side straightly from the receptacle side (or vice versa).

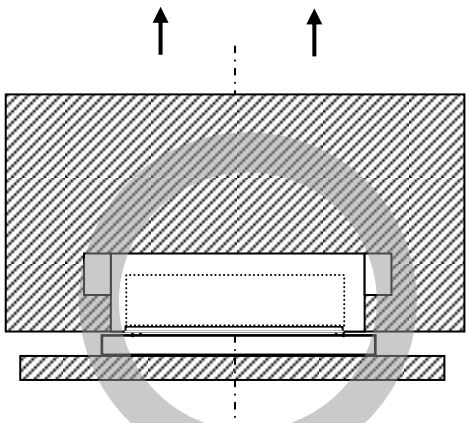
① Unmate the connectors as nearly parallel as possible (MAX. 5°) in the same way as mating.

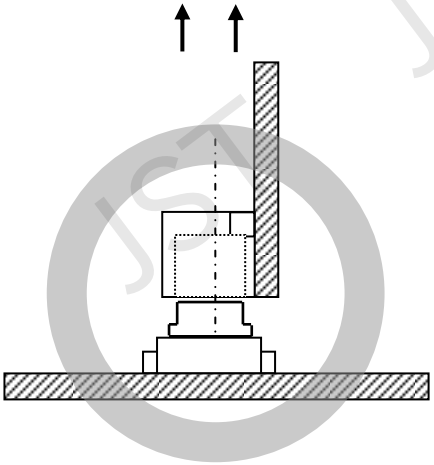
- Top entry type





- Side entry type

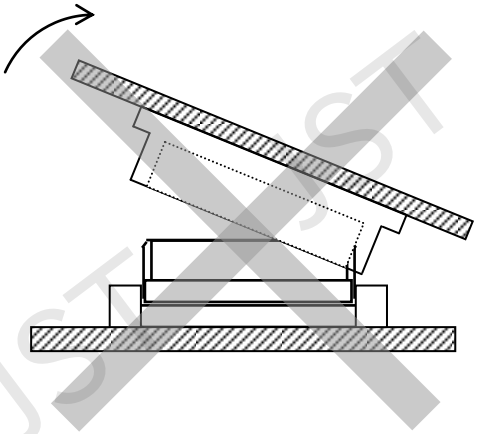


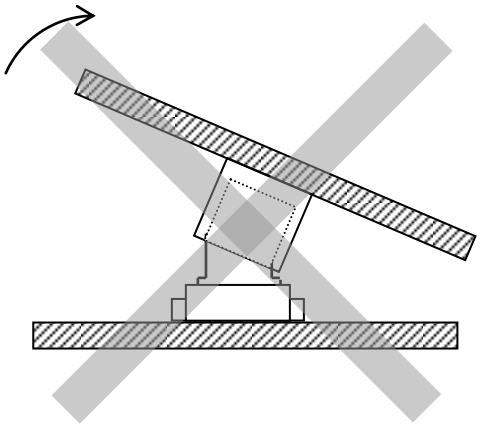


Prohibited matter in unmating operation

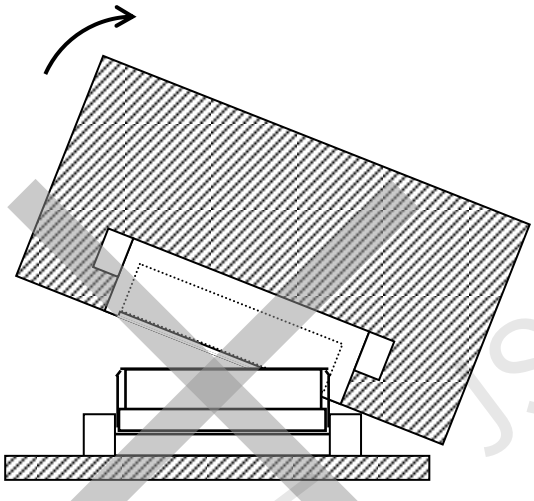
Do not unmate the plug from the receptacle by rotating it with holding one end of PC board as below, because such handling may deform the contact and cause chips and cracks on the housing.

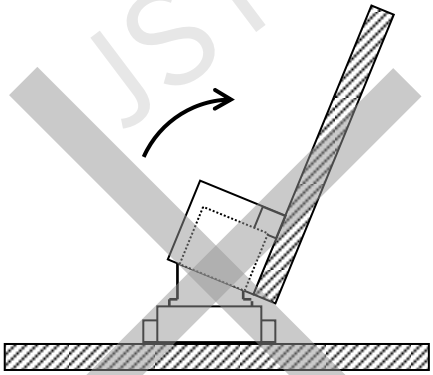
- Top entry type





- Side entry type



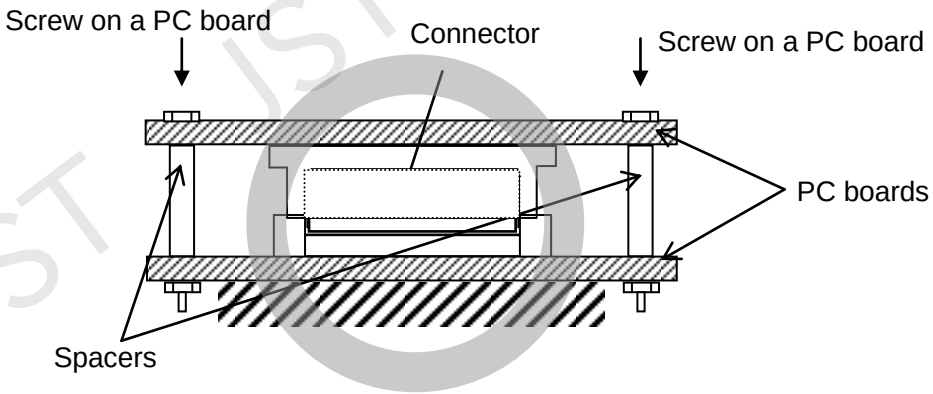


5-3 Handling the connector after mating

① When both connectors are mounted on rigid PC boards, fix the PC boards so that the connector does not come off them due to vibration and shock.

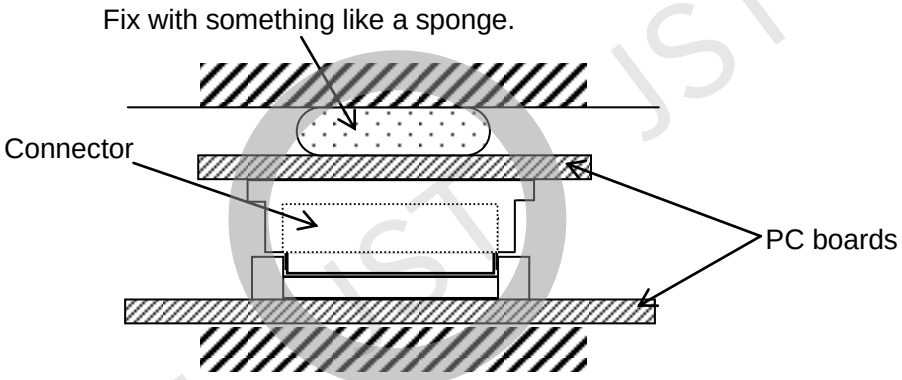
② Do not apply external force to the connector due to misalignment between PC boards after screwing or fixing, because such a critical defect as solder crack may occur.

e.g.: Top entry type



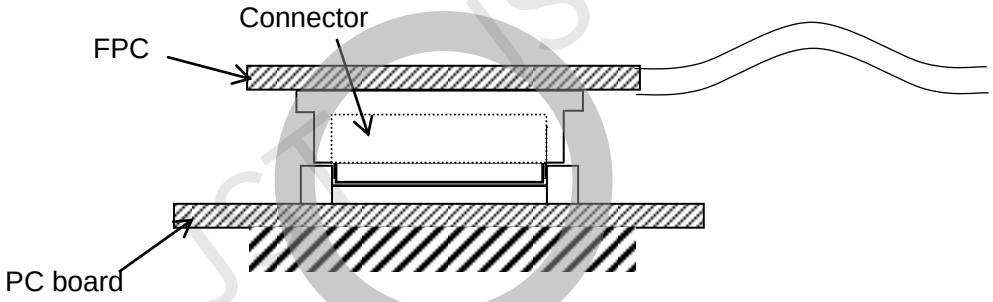
③ When it is difficult to perform the above fixing method due to mounting on FPC, fix FPCs or PC boards by pressing to the mating direction as below.

e.g.: Top entry type

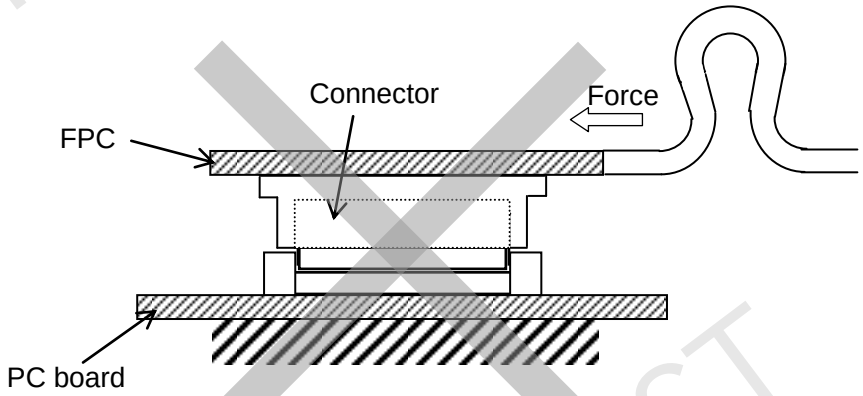


④ When the connector is mounted on a FPC as shown above, provide sufficient FPC length for handling, because force stemmed from bending of FPC or pulling FPC acts on the connector.

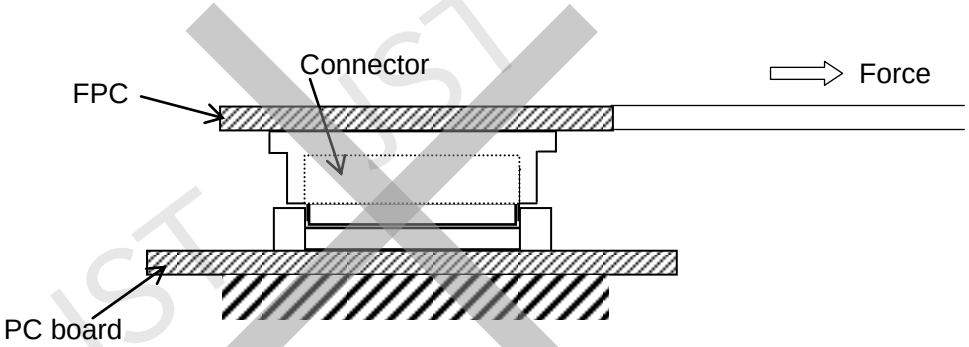
FPC length is long enough not to apply a load to connector.



The bending part of FPC is so close to connector that lateral load is applied to connector.



Pulling force is applied to the connector due to insufficient FPC length

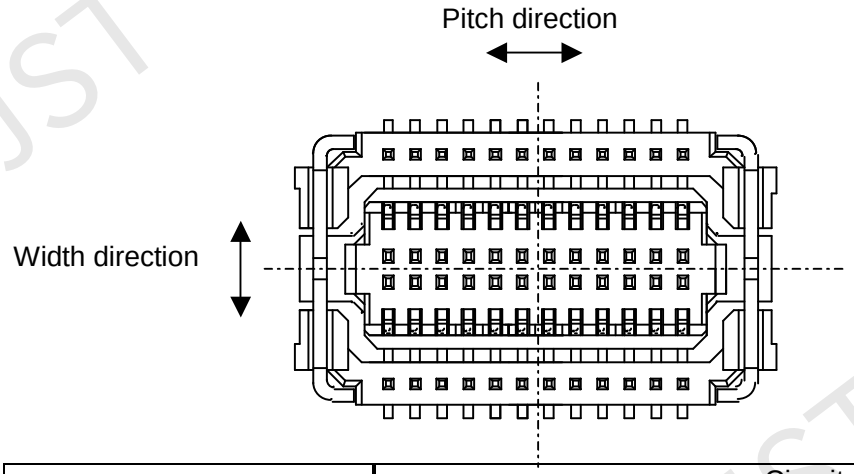


5-4 Misalignment absorbing mechanism

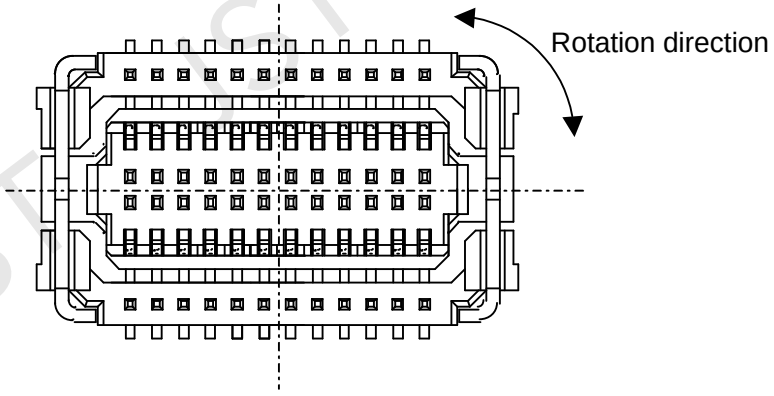
① As JMC connector receptacle adopts 2-piece mechanism, it has the mechanism of absorbing misalignment for the width direction, the pitch direction and the rotation direction between PC boards after mating as below.
However, it does not absorb misalignment for a repeat moving or vibration.

② Excessive misalignment may become a factor of breakage on the connector, leading to critical defects.
Be sure to use the connector within the range shown on the following table.

		Circuit					
		20P	30P	40P	50P	60P	64P
Misalignment direction	Width direction	Max. ±0.15 mm		Max. ±0.25 mm			
	Pitch direction	Max. ±0.25 mm					



		Circuit					
		20P	30P	40P	50P	60P	64P
Misalignment direction	Rotation direction	Max. ±2.2°	Max. ±1.7°	Max. ±2.7°	Max. ±2.2°	Max. ±1.9°	Max. ±1.8°



Note4: The angle in the table stands for rotation angle from the center of the connector (an intersection of the above dotted line).

5-5 Precautions for soldering operation

① Reflow soldering method

We recommend reflow soldering at a 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 condition depends on the materials, such as solder paste, find out the best condition before using.
Considering the handling of this connector in mating operation, the tenacious heat-resistant nylon resin is used for the material of the wafer. But 'blisters' may generate on the outer surface of the wafer during the process of reflow soldering, depending on the condition of water absorption in the wafer and the condition of reflow soldering. However, 'blisters' are not accompanied with changes of the material property, not affecting the connector performance.

When bridge troubles appear in process of reflow soldering and repair is conducted by hand, use a soldering iron with temperature of 350°C and do it quickly within 3 seconds, paying attention not to apply an external load by pushing the pin with the soldering iron tip. If applied, dismount and replace the connector.
Do not reuse the dismounted connector.

② Solder paste

As JMC connector has a fine pitch, the blanking part of the metal mask is very small. Thus, we recommend using a dedicated solder paste for a fine pitch.
In case of solder paste not dedicated for a fine pitch, solder does not smoothly flow from the metal mask, which may deteriorate the soldering performance.

③ Reflow soldering type

Reflow soldering by hot air reflow soldering is recommended.

④ Specification of metal mask (amount of solder)

We recommend using a 120μm-thick metal mask which ratio of the blanking part is 100 % against the recommended PC board pattern layout shown on page 4 and 5. Too much soldering may bring bridges and flux or solder rising, while too small soldering may lead to poor soldering, solder cracks and damaging the connector function.

5-6 Precautions for using FPC

When either JMC connector plug or receptacle is mounted on FPC, use it under the following conditions. Otherwise, troubles such as solder or pattern peel of FPC during unmating the connector may appear.

① Be sure to use FPC by attaching a reinforcing plate to the back of the connector mounting part. The outer dimensions of the reinforcing plate should be kept larger than that of the connector outline.

② Be sure to use the reinforcing plate made of materials which sufficient strength and flat surface can be secured or 0.3mm or more in thickness.