HIROSE ELECTRIC CO.,LTD.

TITLE:	BM55 Series Guideline	ETAD-H1044-00
PRODUCT:	HYBRID BOARD TO FPC CONNECTOR Pitch:0.3mm, Width:1.5mm Stacking height:0.5mm, Power:5A	PAGE: 1 OF 10

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BM55 Series Guideline

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REVISIONS			RevNo	0
Designer	Checker	Approver	DATE	

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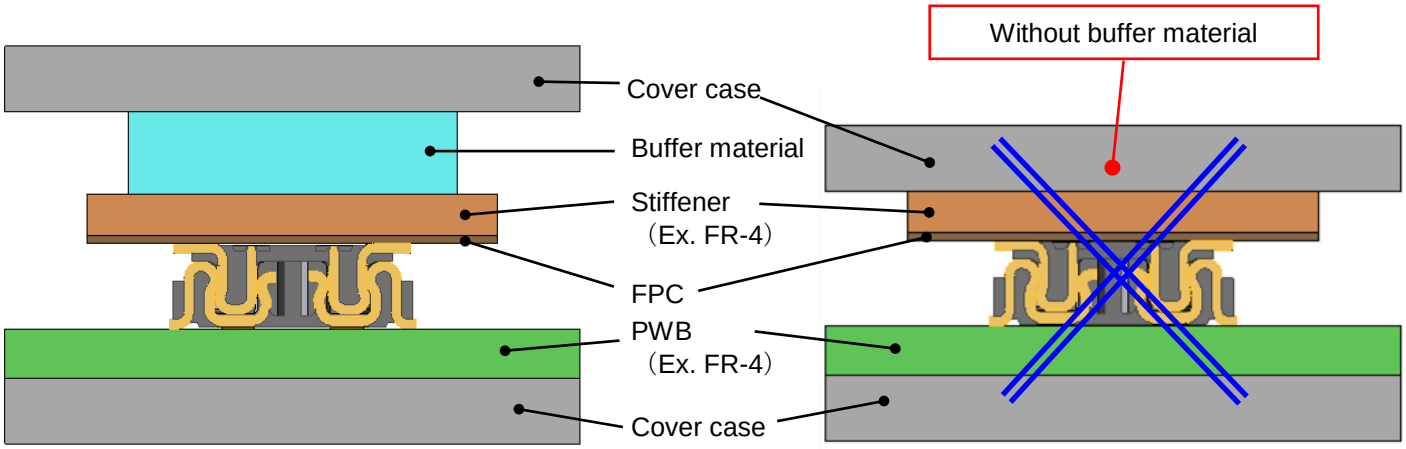
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1. Notice for Device Handling

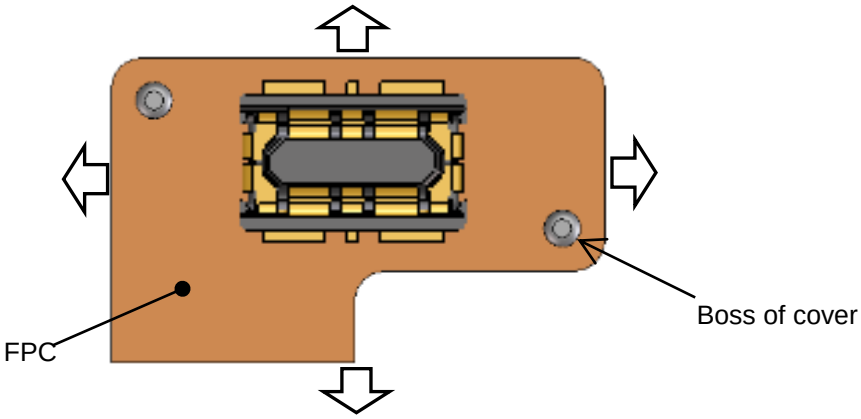
1.1 Notice for mechanical designing

There is still possibility that connectors are disengaged if strong impact, such as dropping, is put against connectors in use. In order to prevent connectors from disengaging, please make sure to put buffer material between a connector and a cover case to hold down the connector pair to the mating direction.
If a connector is directly pressed down by a cover case, there is a possibility that the cover case is bent and it may cause connector disengagement when the device is dropped. Please avoid a design that the connector is directly pressed by cover case, instead, use put the buffer material to press down the connector.
Buffer material must be the size which is able to cover all over the connector mounting area.



1.2 FPC fixing

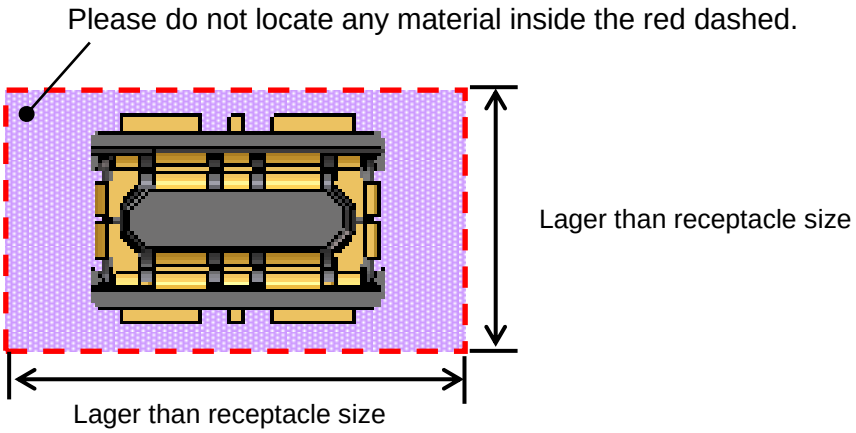
If FPC position is fixed, connector will get direct stress from dropping impact. Please do not design FPC positioning bosses which prevent flexibility of FPC.



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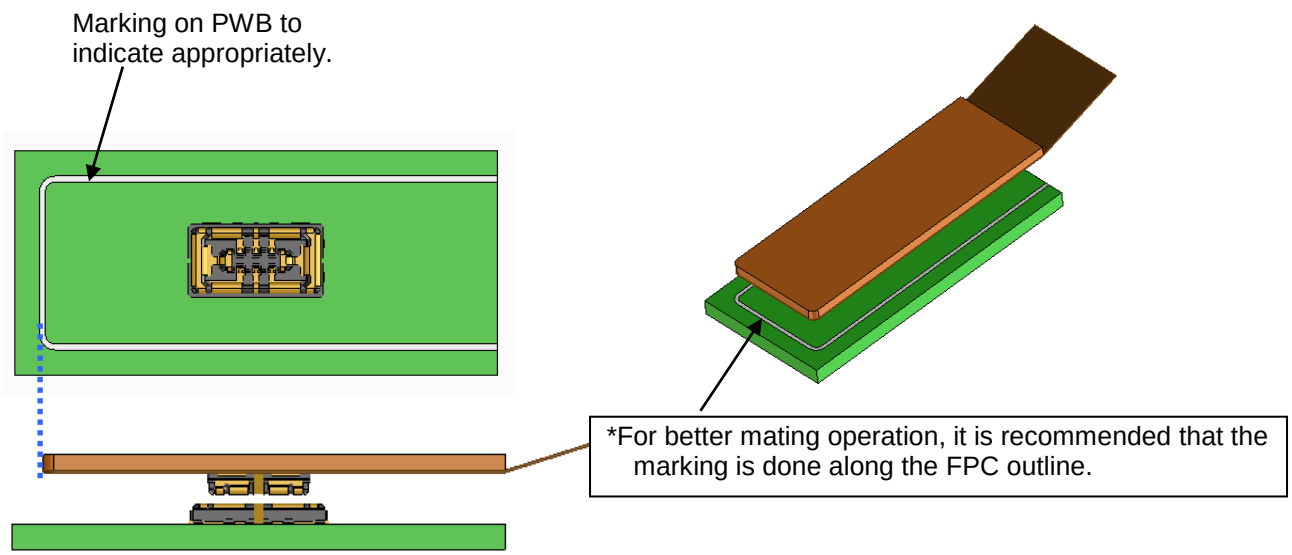
1.3 Allocation of other components around connector

Please do not locate any material which may affect connector mating around the connectors.



1.4 Marking for mating position

When mating a connector on the FPC side against the other side manually, in order to operate mating in the appropriate position without misalignment, please put some marking to indicate the exact mating position on the PWB.



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2. Notice for PWB designing

2.1 Recommended PWB pattern and connector location

For the recommended PWB pattern and the position between the connector and pad, please see the product drawing.

2.2 PWB designing

-Please design PWB layout properly so that front fillet, back fillet and side fillet are formed.
The recommended PWB layout is designed so that the connector can be soldered to the PWB appropriately.
- In case that the pad layout is narrower than our recommendation, If the pad layout is not wide enough, there is a possibility that solder wicking or flux splashing may occur.
Please contact and discuss with us if the PWB layout is different from the recommended PWB layout.
-If there is not enough clearance on the inner side of PWB pattern, there is a possibility that the connector is pushed up by solder paste.
-In case those patterns are designed under a connector, there is a possibility to cause solder failure if there are physical height. Please conduct mounting test for the check.

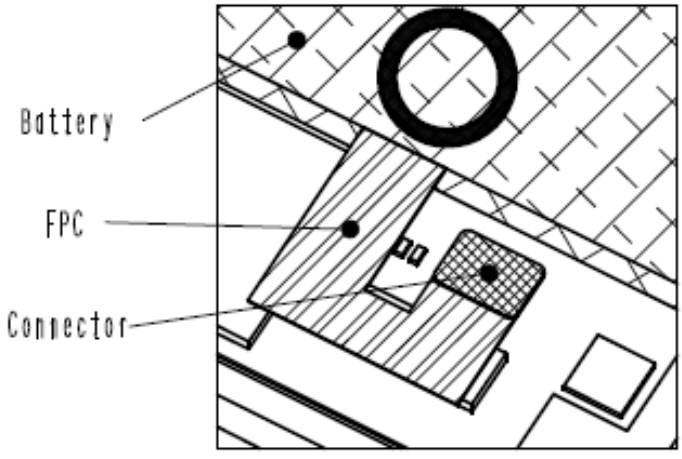
2.3 FPC designing

Please make sure to put a stiffener on the backside of the FPC.
Pad peeling or connector bent may occur.
【Note】Please consult HRS contact window when you use thinner stiffer than our recommendation.

Recommended thickness of stiffener
FR-4：0.3mm MIN
SUS：0.2mm MIN

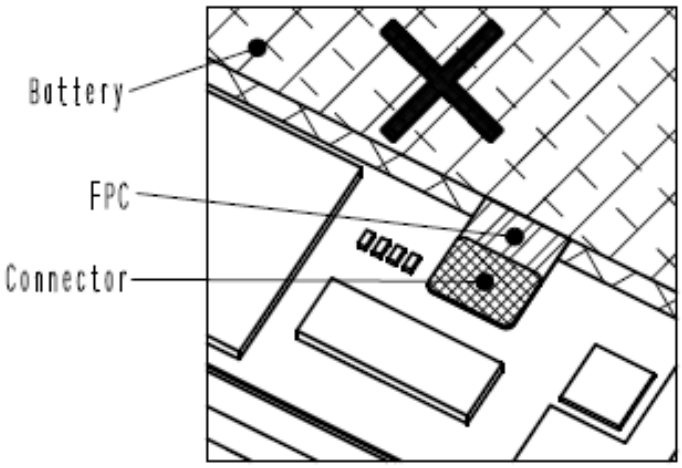
Please consider the warpage of the FPC board when mounting. Warpage may occur during heating.

Please design the FPC to have a flexibility to absorb the displacement of the connecter caused by PWB and battery, so that the load of the battery does not affect the connector. Drop impact, etc., may apply a large load to the connector and cause damage. If the recommended FPC design cannot be performed, be careful not to apply any load to the connector.



Recommended FPC Routing

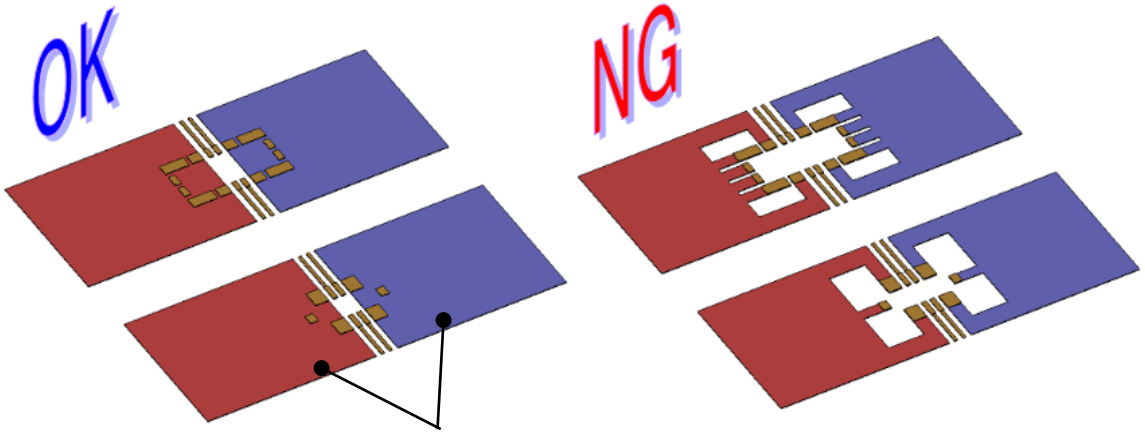
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Unrecommended FPC Routing
(Too short, not winding)

2.4 Notice for PWB design

Recommended PWB pattern width is 1mm（Copper foil thickness=35μm）/1A
Please design circuit of power supply pad without splitting current flow.
Electric current might be concentrated in a certain circuit and cause over current.



Power supply part circuit

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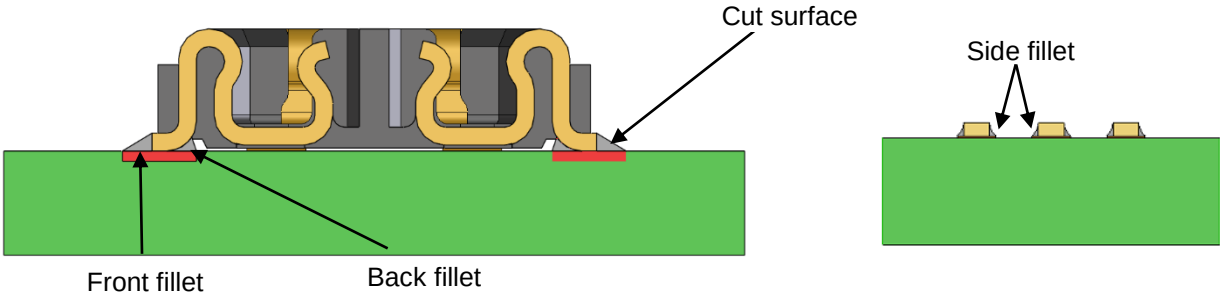
3. Notice for Mounting

3.1 Metal mask design

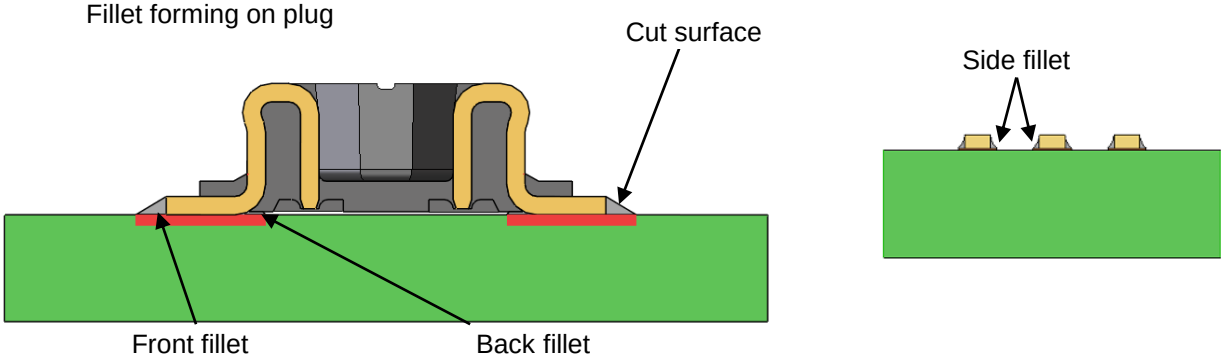
For the recommended metal mask design, please see the product drawing.

3.2 Fillet forming

Fillet forming on receptacle



Fillet forming on plug



Likewise the other (receptacle) side, as the contact lead edge, on where “front fillet” is formed is a metal cut surface, phosphor bronze is exposed. The exposed area is easy to process thermal oxidation from reflow heating, so it is difficult for soldering paste to get wet and be spread over the area. If the fillet formation needs to be judged defective/not defective, please judge by “side fillet” forming.

3.3 Reflow Profile

For the recommended reflow profile, please see the product drawing.

3.4 Repair Condition

Soldering iron 350°C, 3seconds MAX
Notice:
•Please do not put stress on contacts.
•Please do not touch housing with a soldering iron.
•Please protect contact from flux or soldering paste splashing (ex. set a cover over the contact area).

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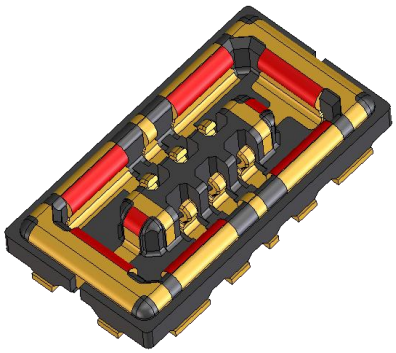
4. Notice for Connector Handling

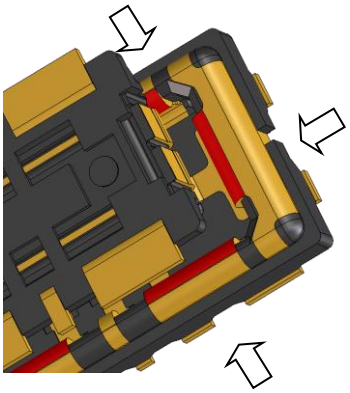
4.1 Connector insertion operation

Please mate this connector by hands.

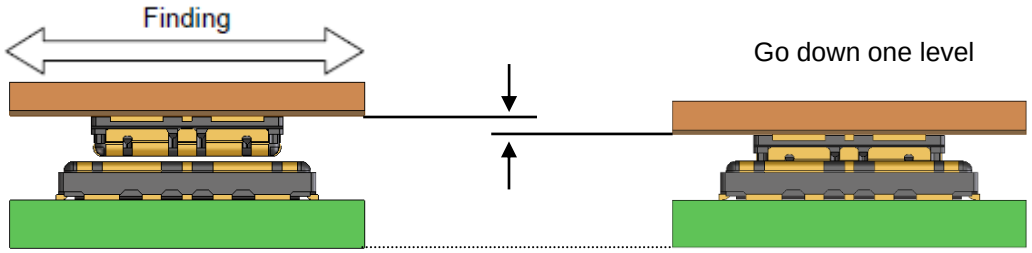
Manual for inserting operation

1) Find the alignment area with hand to locate the connector in the appropriate mating position. This connector has alignment chamfer (guidance ribs) on receptacle side and R on plug side, so that the connector can be self-aligned.

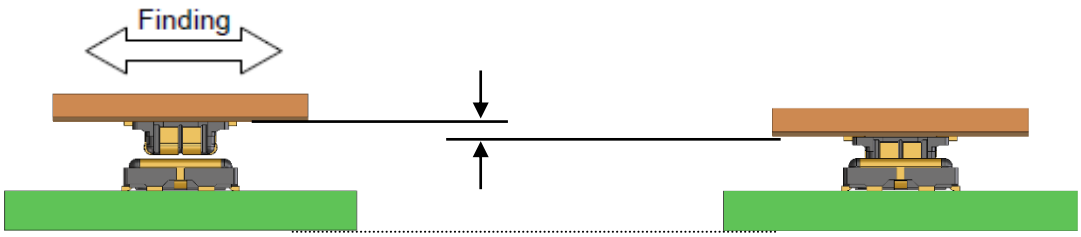




2) When the connector comes to the appropriate position, the connector comes into the aligned position. If the connector comes into aligned position. It can be recognized by hand that the connector goes down.



3) When the connectors are in alignment position, the connector pair cannot be moved back and forth and around as they are mated in a parallel position. Please mate the connectors completely, by putting force in this condition.



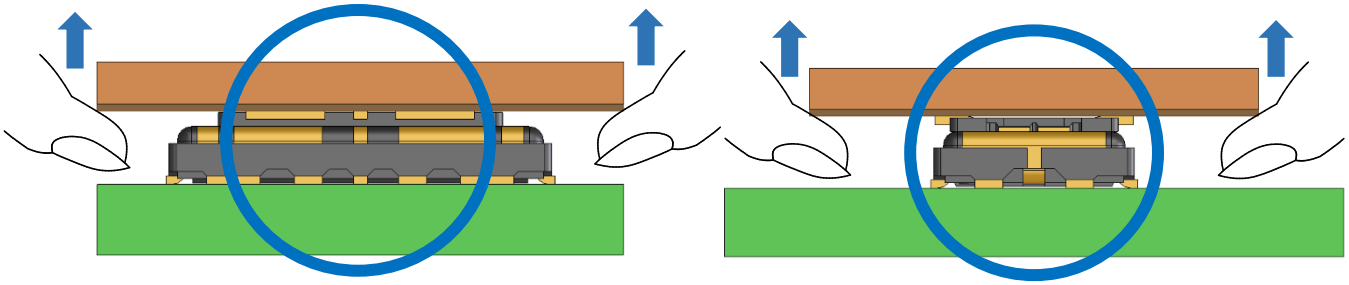
4) Please make sure connectors are mated completely. If one side is floating or the connectors are mated at a slant, please unmate once, and then mate them once again, following the procedures above from the beginning.



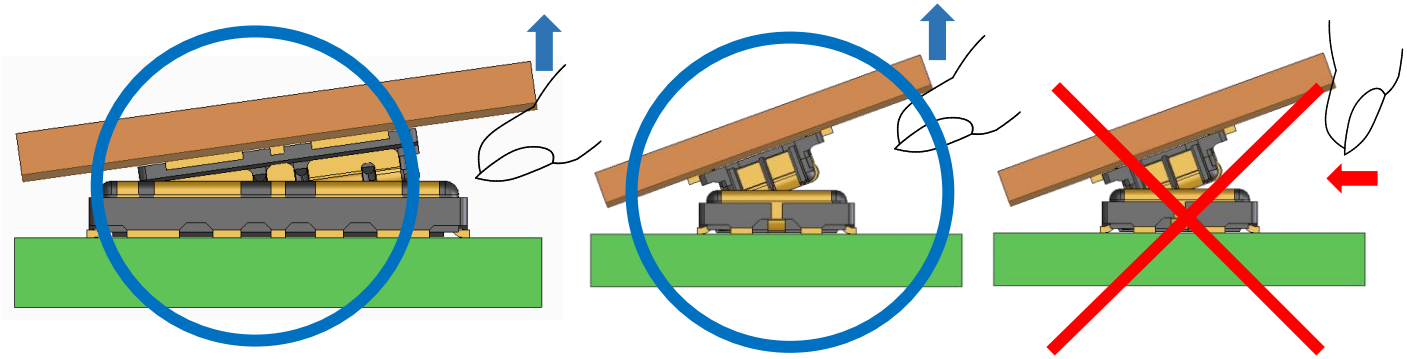
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4.2 Connector withdrawal operation

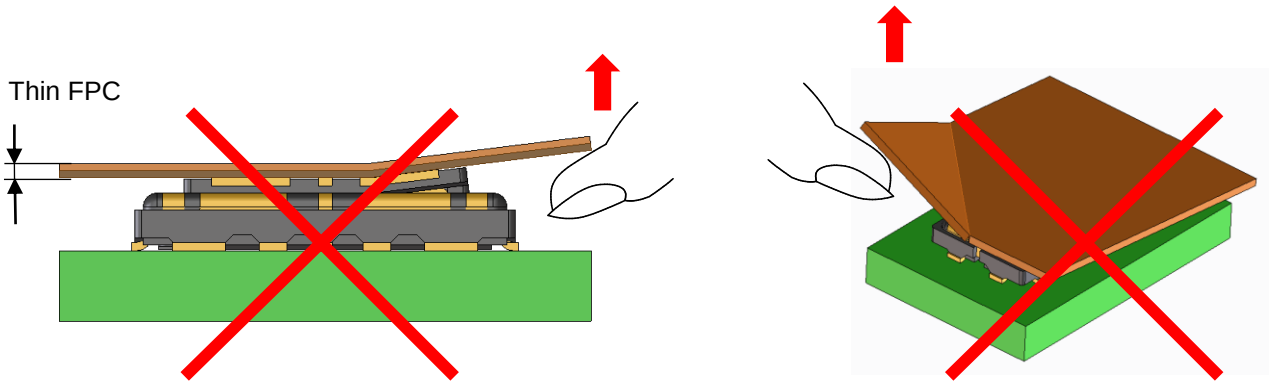
1) It is desirable to withdraw the connector in the vertical direction against mating direction. However, in the case connector has high pin counts or thinner FPC and stiffener, it makes more difficult to withdraw the connector in the vertical direction.



2) If it is difficult to withdraw the connector, please withdraw the connector diagonally against the contact pitch direction. Please carefully withdraw the connector from the width side as a strong load is put on the plug.



3) If the FPC is not strong enough, there is a possibility that contacts may be pulled off or broken. Please make sure to conduct the test on FPC to repeat operation several times in an early stage build. Please carefully withdraw the connector in the slanted direction, picking the FPC corner, as it can be a risk to put a strong load on contacts.



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5. Additional information

5.1 PWB cleaning

Do not wash the board because it may be cause malfunction of the connector.

5.2 PWB handling

In the operation which could give stress to the mounted connector, including cutting or bending PWB, keep soldering area from mechanical stress.

5.3 Connector storage

1) Void could be occurred on the housing surface due to high heat during reflow. In order to prevent this problem, avoid storing connectors under humid condition. For long term storage, keep them at humidity manageable place.
2) Depending on the production LOT of the connector, its housing color could be varied, or ultraviolet during storage changes connector surface color. However, these color differences do not affect the connector performance.
3) During PWB assembly and module assembly, make sure not to apply excessive stress to the stored connectors.
4) Avoid storing connectors in dusty area, or it could cause contact failure.

End of report

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