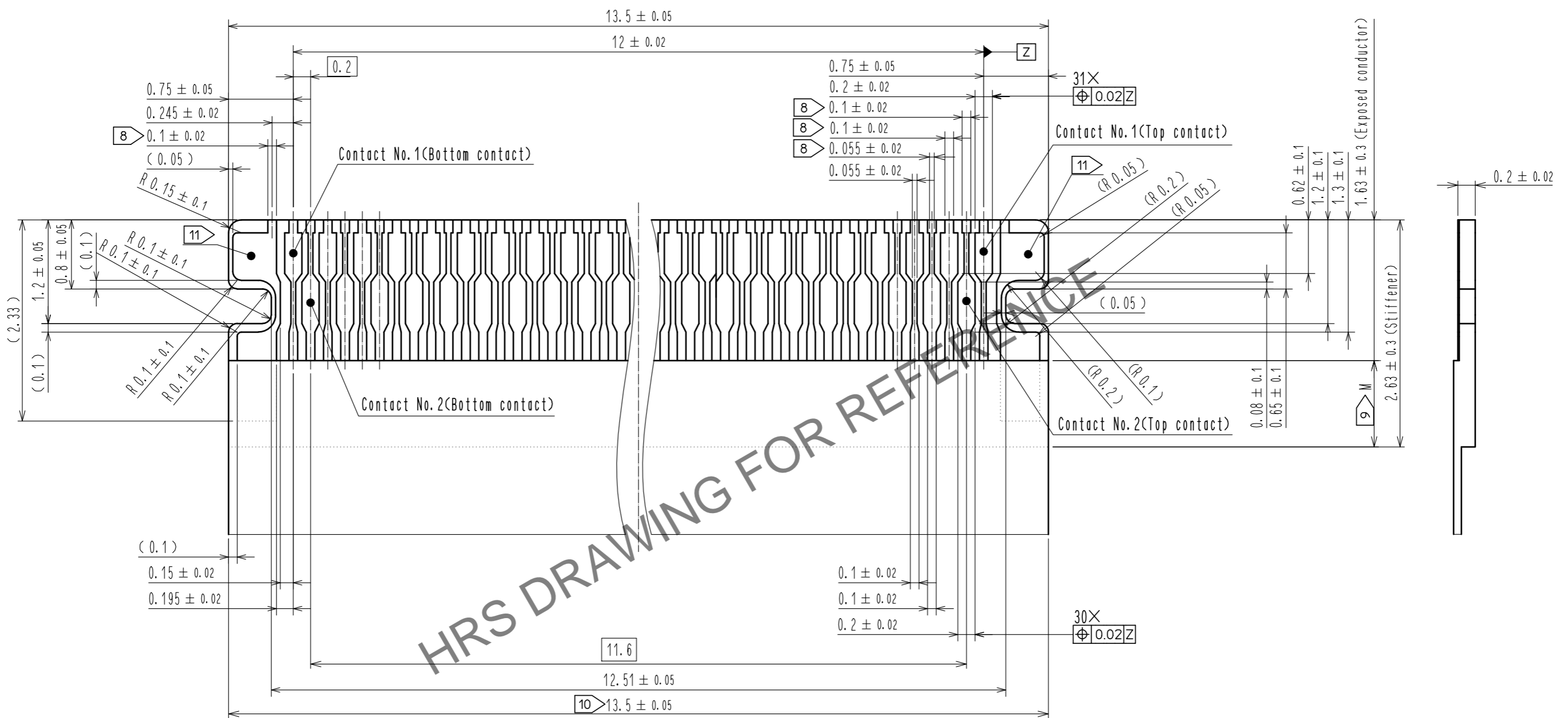


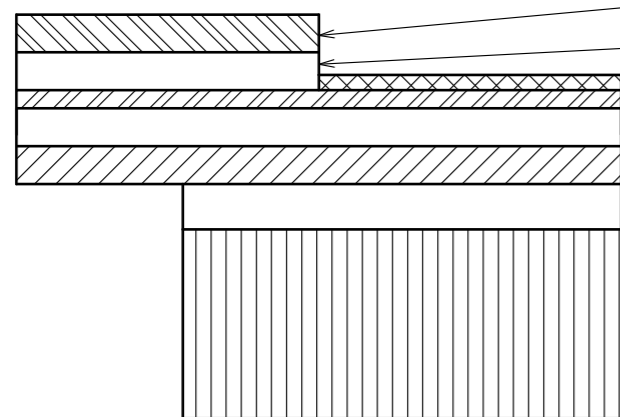
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RECOMMENDED FPC (20:1)

(Exposed conductor area thickness: $t=0.20\pm 0.02$)



FPC CONFIGURATION (REFERENCE EXAMPLE) (FREE)



MATERIAL NAME	MATERIAL	THICKNESS (μm)
Covering film layer.	Polyimide 1mil	25
Cover adhesive		25
Surface treatment	1μm to 6μm nickel underplated 0.2μm gold plated	(4)
Copper foil	Cu 1/2 oz	18
Base adhesive	Heat-hardened adhesive	No adhesion material
Base film	Polyimide 1mil	25
Reinforcement material adhesive	Heat-hardened adhesive	30
Stiffener	Polyimide 5mil	125

- NOTES
- 8 Shows recommended dimension when lead for plating is required.
 - 9 Dimension M must be 0.5mm minimum.
 - 10 Indicated tolerance is applicable to the exposed conductor.
 - 11 Both end side of contact pad on FPC can not be used for signal transmission.
 - 12 Recommended puncher direction:
From conductor side to stiffener side.

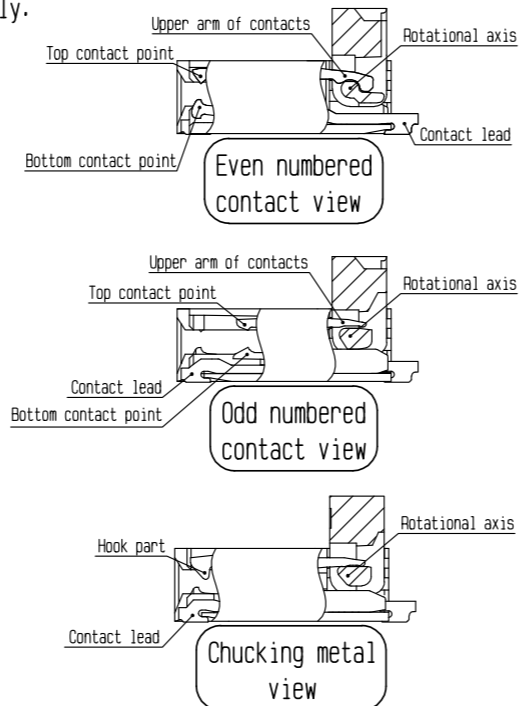
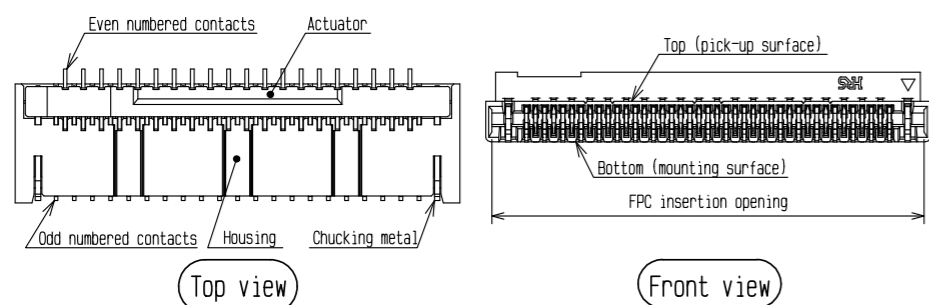
<RECOMMENDED FPC>

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This connector features small and thin, requiring delicate and careful handling.
 To prevent connector/FPC breakage and contact failure (mating failure, FPC pattern breakage, etc),
 read through the instructions shown below and handle the connector properly.

[Connector Part Nomenclature]



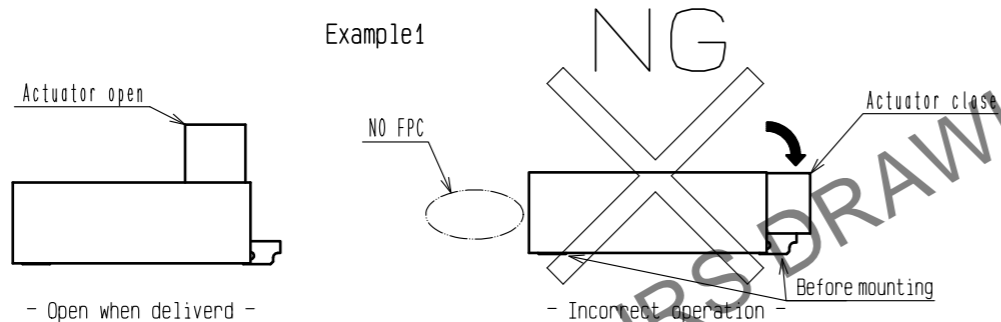
[Operation and Precautions]

1. Initial condition

Actuator does not have to be operated before inserting FPC,
 as the connector is delivered with the actuator opened.

[Caution]

- Do not close the actuator before inserting FPC.
- Closing the actuator without FPC could make the contact gap smaller, which could increase the FPC insertion force. (Example1)
- Do not insert FPC or operate actuator before mounting. (Example1)

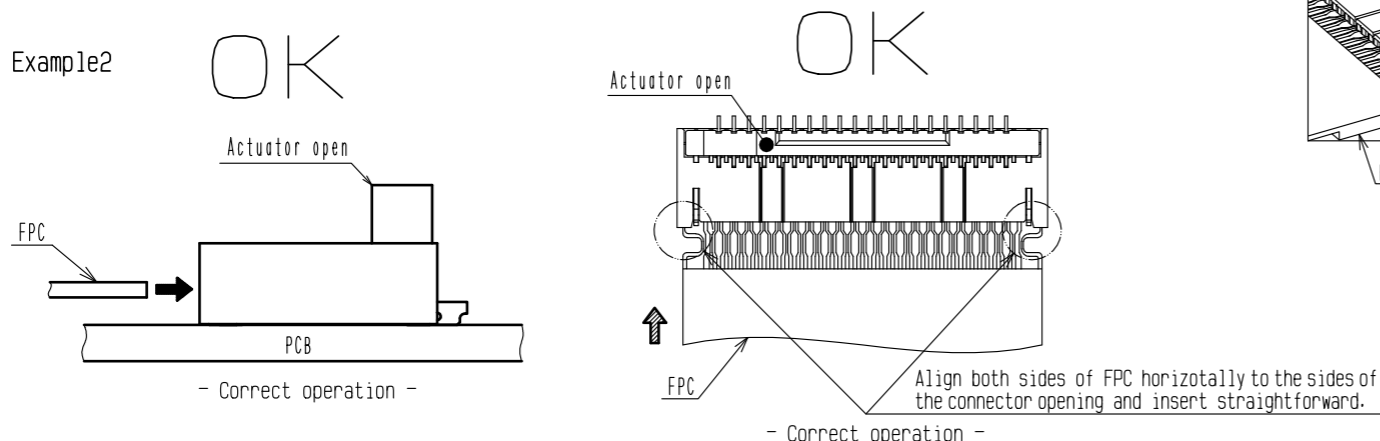


2. How to insert FPC

Insert the FPC into the connector opening horizontally to the PCB plane.
 Insert it properly to the very end. (Example2)

[Caution]

- Do not insert the FPC with the actuator closed. (Example3)
- Do not twist the FPC to up and down, right and left or an angle. (Example4)

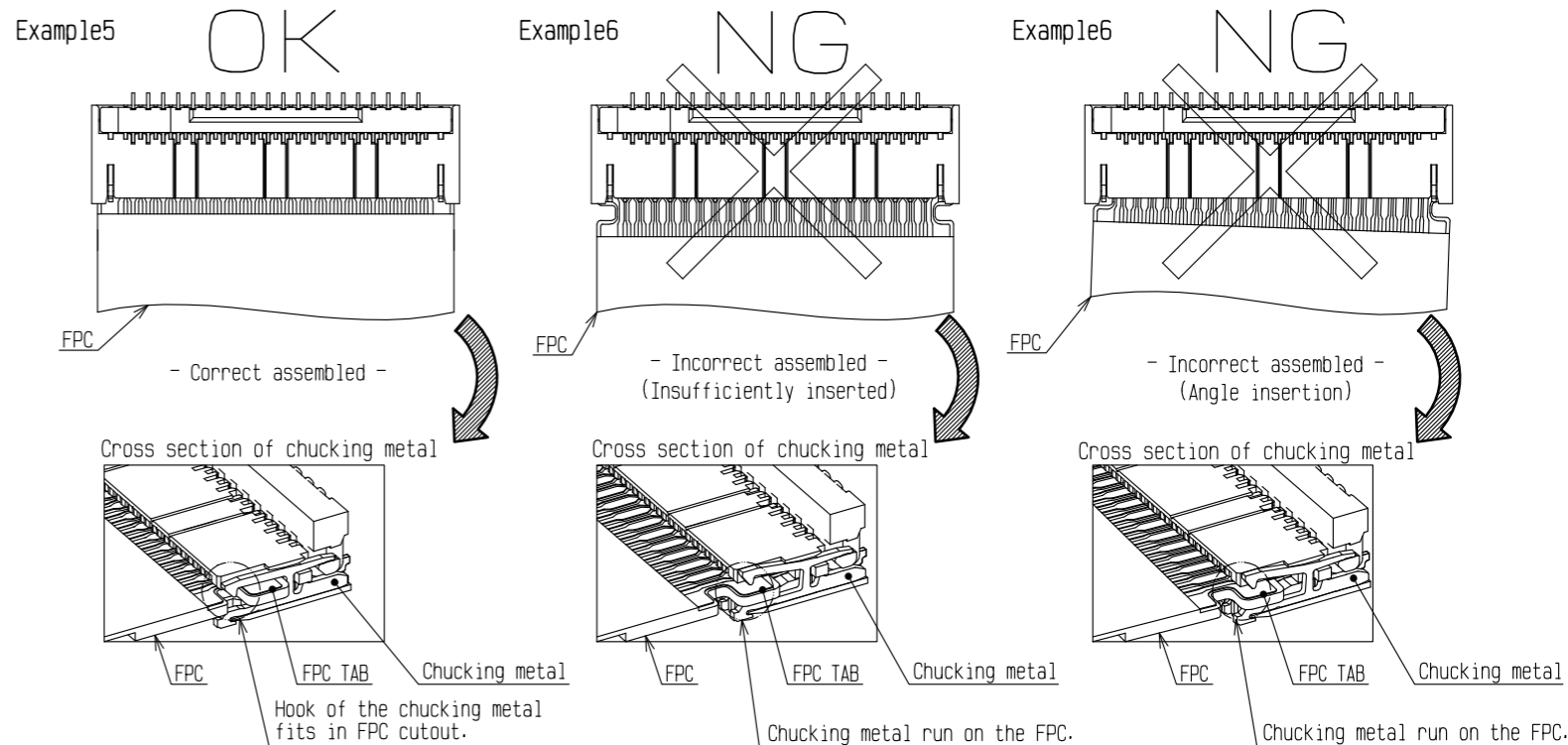


3. FPC insertion check

Chucking metals guide the FPC tabs to the correct position.
 Make sure that the FPC tabs are located in proper position as shown in the figure below after FPC insertion. (Example5)

[Caution]

- Do not insert the FPC at an angle and/or stop it before insertion is completed. (Example6)(Example7)



<INSTRUCTION MANUAL (1)>

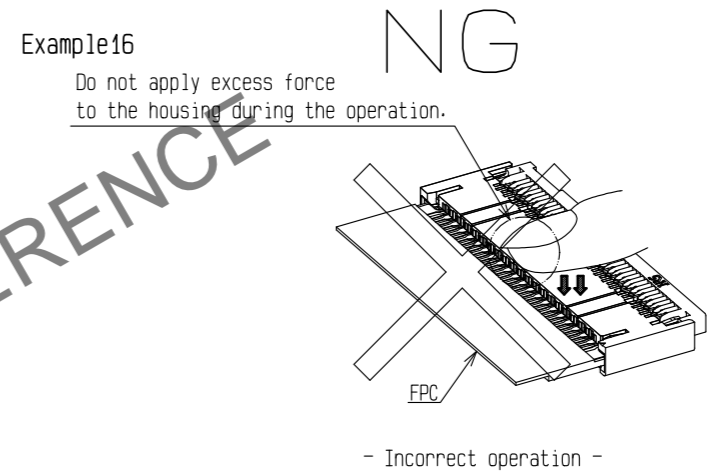
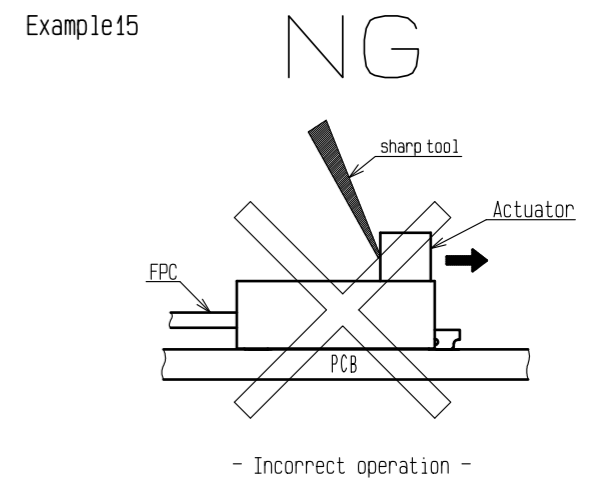
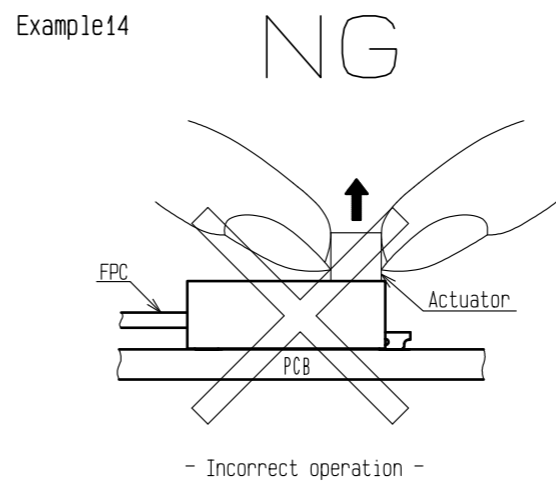
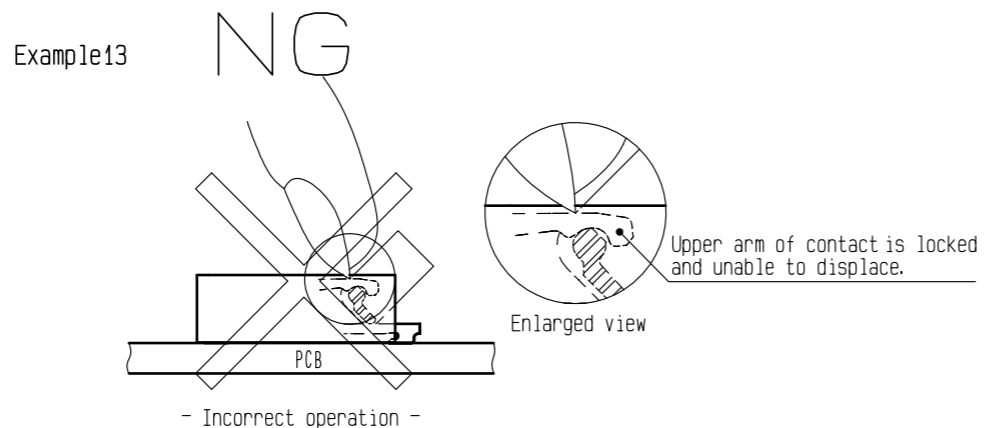
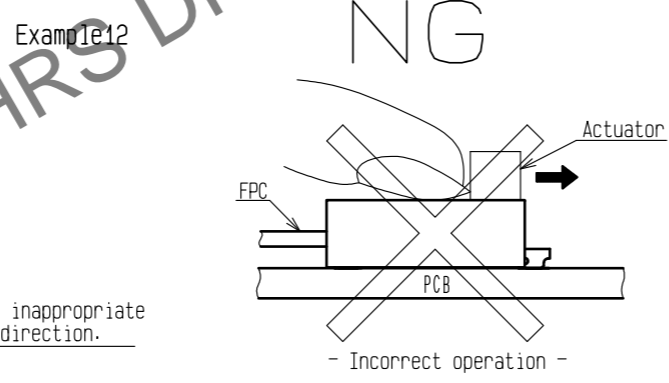
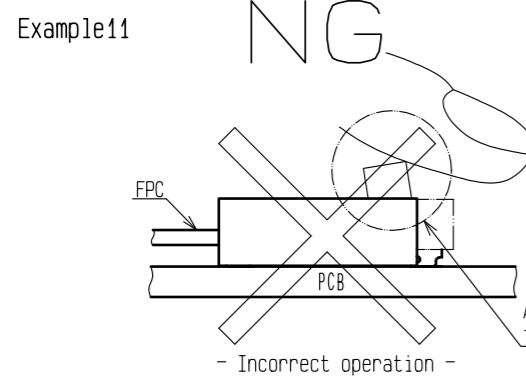
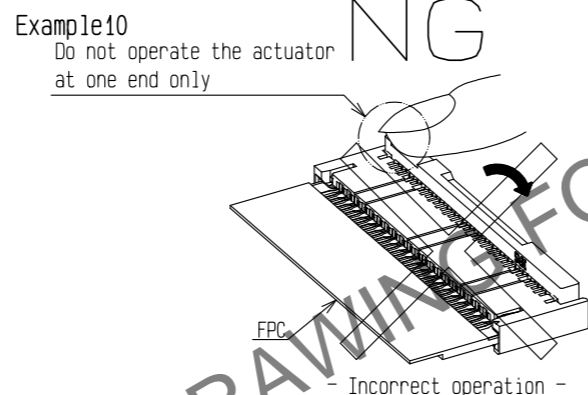
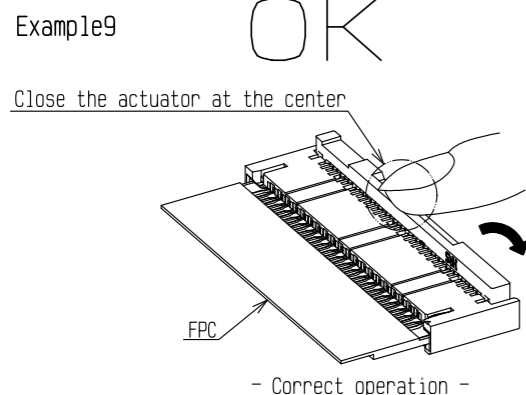
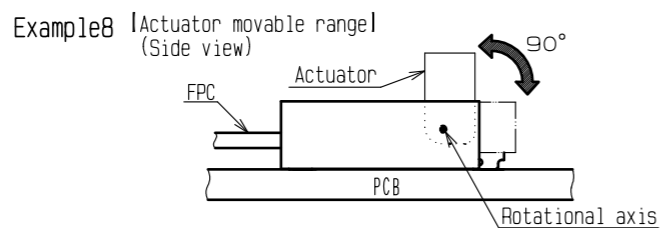
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4. How to lock

The actuator rotates around the rotational axis as shown below.
Apply load to rotate the actuator by 90 degree after inserting the FPC. (Example8)

[Caution]

- To close the actuator, operate at the center of the actuator. (Example9)
- To close the actuator, do not operate the actuator at one end only. (Example10)
- Do not rotate the actuator to the counter direction. (Example11)
- Do not push out the actuator horizontally. (Example12)
- Do not operate the actuator while the upper contact arm is pressed down. (Example13)
- Do not pick the actuator to lift. (Example14)
- Operate the actuator by hand without using sharp tool such as Tweezers. (Example15)
- Do not apply excess force to the housing during the operation. (Example16)



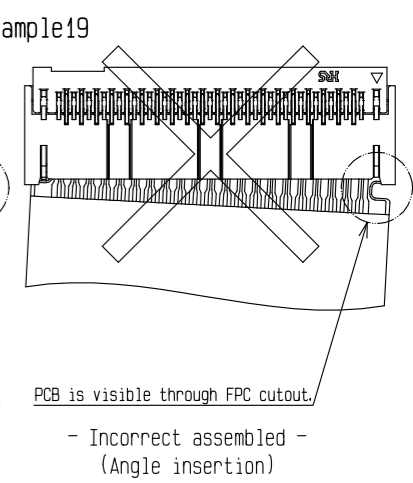
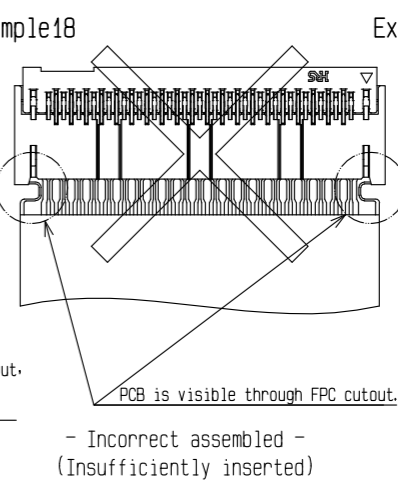
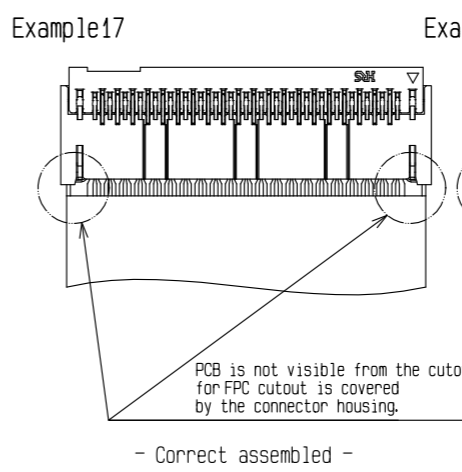
HRS DRAWING FOR REFERENCE

5. Mating confirmation of the FPC

Visually confirm the FPC positioning after closing the actuator. (Example17)

[Caution]

- Do not insert the FPC at an angle and/or stop it before insertion is completed. (Example18)(Example19)



<INSTRUCTION MANUAL (2)>

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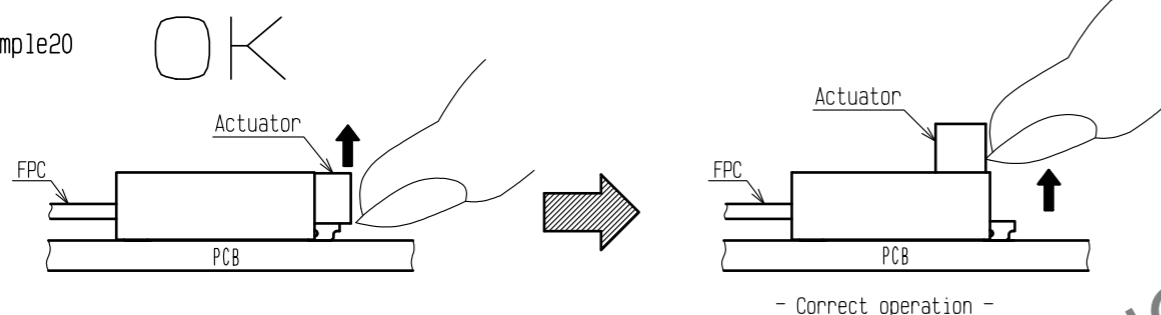
6. How to unlock

Slowly flip up the actuator to release the lock. (Example20)

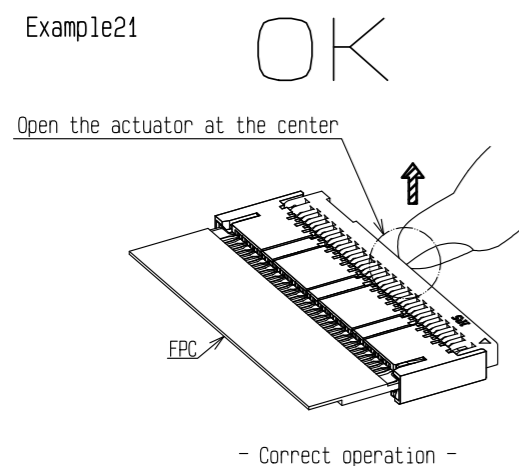
[Caution]

- To open the actuator, operate at the center of the actuator. (Example21)
- To open the actuator, do not operate the actuator at one end only. (Example22)
- The actuator is opened up to the movable limit, 90 degree. (Example23)
- Do not open the actuator beyond the specified degree or apply excess force to the actuator.
- Open the actuator right above.
- Do not attempt to open further or to open it by applying horizontal force as this may cause its damage. (Example24)
- Do not pick the actuator to lift. (Example25)
- Operate the actuator by hand without using sharp tool such as Tweezers. (Example26)
- Do not apply excess force to the housing during the operation. (Example27)
- Please note that the connector is back flip style connector, and the opening for FPC insertion and the actuator face the opposite direction.
- Do not try to lift the actuator at the FPC insertion opening side. (Example28)

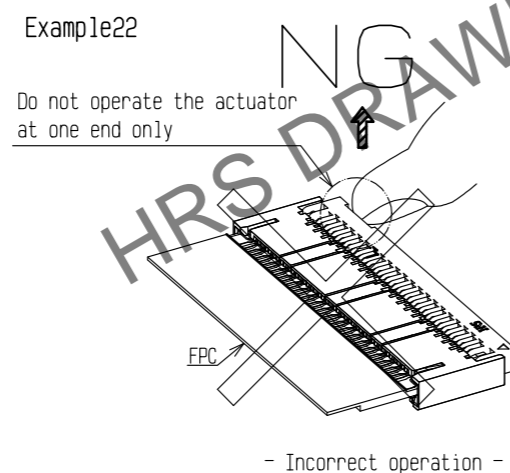
Example20



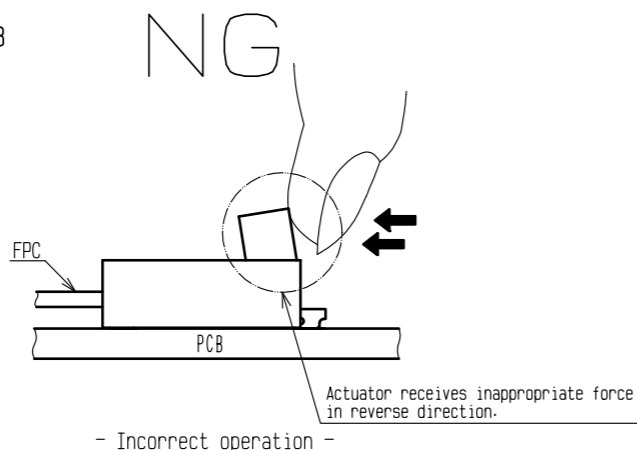
Example21



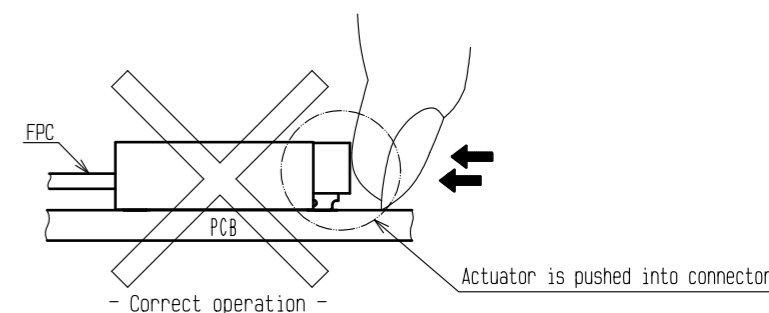
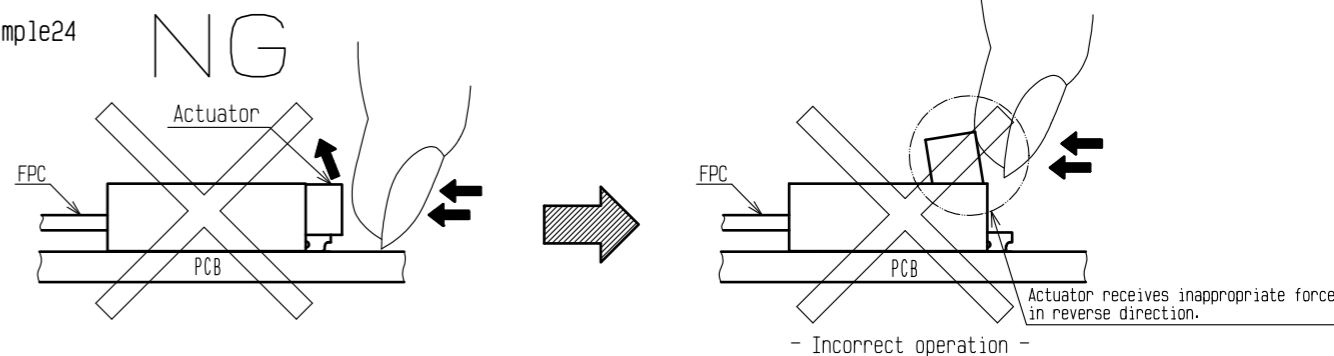
Example22



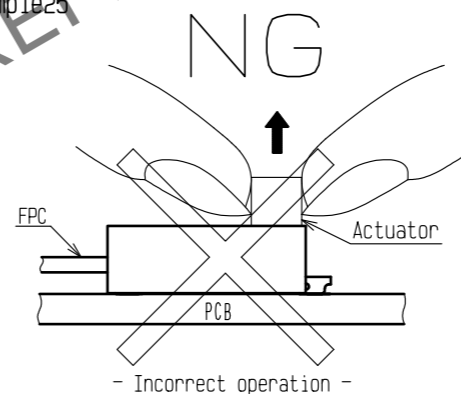
Example23



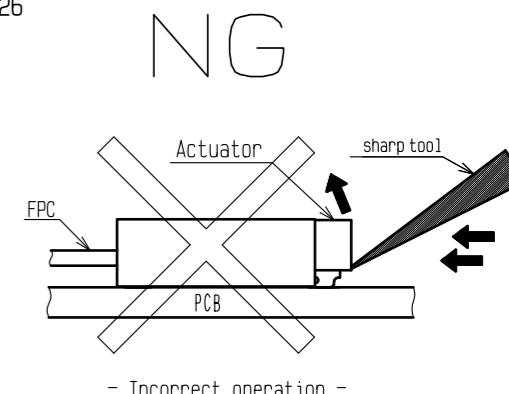
Example24



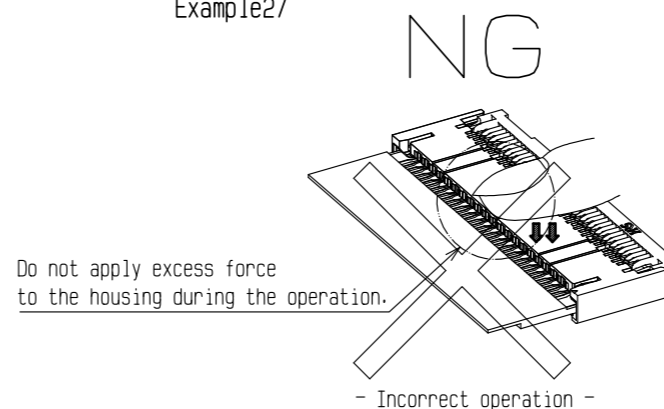
Example25



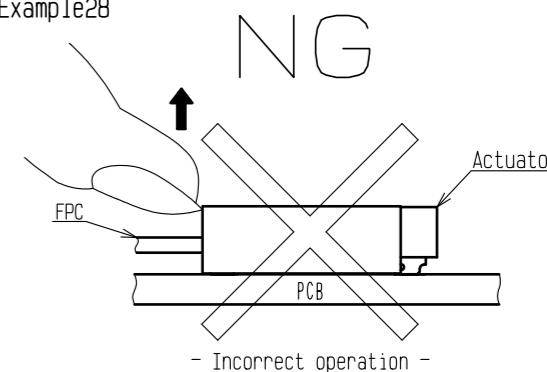
Example26



Example27



Example28



<INSTRUCTION MANUAL (3)>

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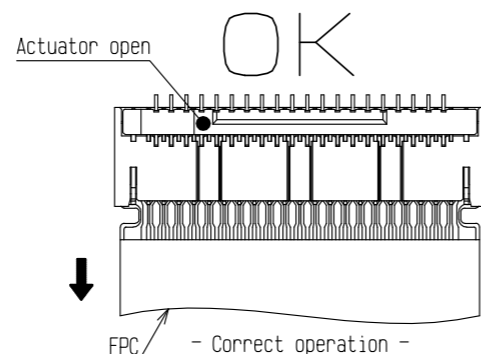
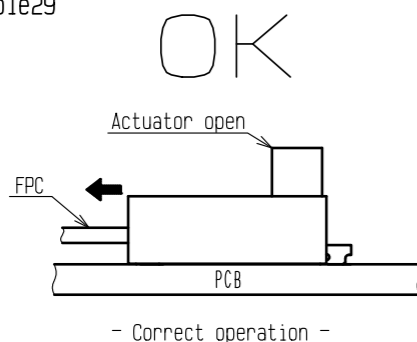
7. How to remove FPC

After rotating the actuator to the fully opened position carefully withdraw the FPC pulling out horizontally. (Example29)

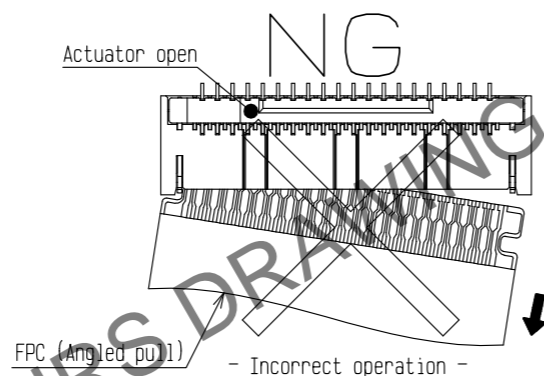
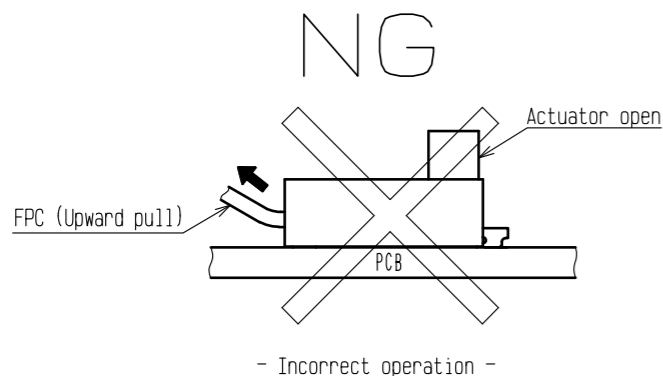
[Caution]

- This connector has a temporary FPC holding structure with chucking metals.
- For FPC removal, do not pull out the FPC upward or angled direction. (Example30)
- Do not attempt to pull the FPC without unlocking the actuator (Example31).

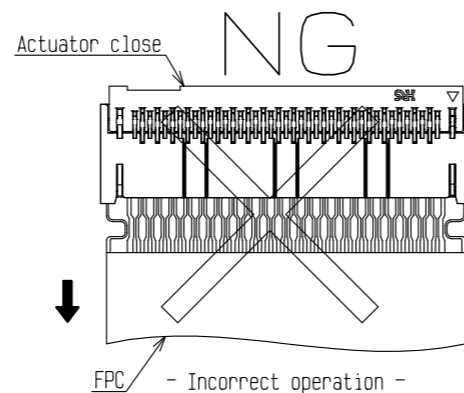
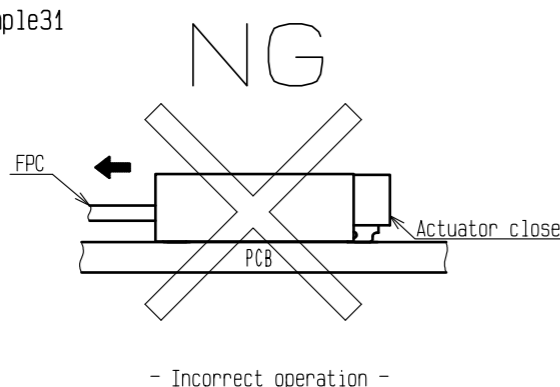
Example29



Example30



Example31



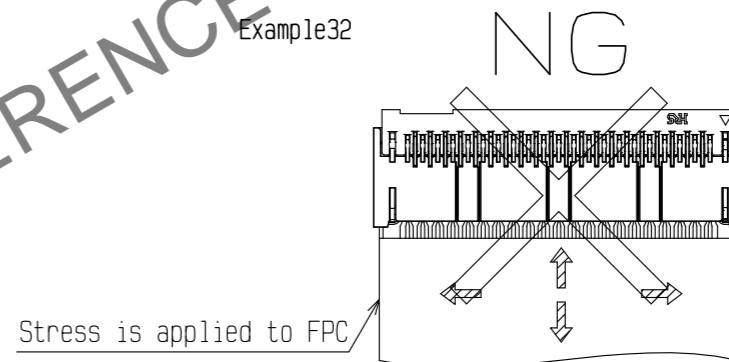
[Precautions for component layout]

Depending on a FPC rounding, a load is applied to the connector, and a contact failure may occur. To prevent a failure, take the following notes into a consideration during mechanism design.

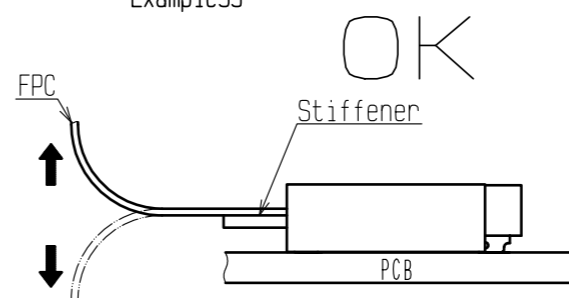
[Caution]

- Avoid applying forces to/pulling the FPC along/perpendicular to the direction of FPC insertion. (Example32)
- Avoid pushing/pulling the FPC upwards/downwards. (Example34)
- If the FPC has to be curled/bended in your cabling design, please keep enough degree of freedom in your design to keep the FPC tension free. In this regard, the stiffener is parallel to the PCB. (Example33)
- During FPC wiring, ensure that stress is not applied directly to the connector. Do not bend the FPC excessively near the connector during use, or it may cause contact failure or FPC breakage. Stabilizing the FPC is recommended. (Example34)
- Do not mount other components underneath the FPC stiffener which may interfere with the connection. (Example35)
- Please consult with the FPC manufacturer about FPC bending performance and wire breakage strength while making design.
- Keep sufficient operating space for FPC insertion during layout design in order to avoid incorrect FPC insertion. Please keep enough FPC length and component layout space for assembly during design process. FPC with too short length may make the assembly difficult.
- Keep enough space for the rotation of the actuator during PCB and component layout design.
- Please consult with our sales representative if you are using FPC with different configuration from our recommendation.

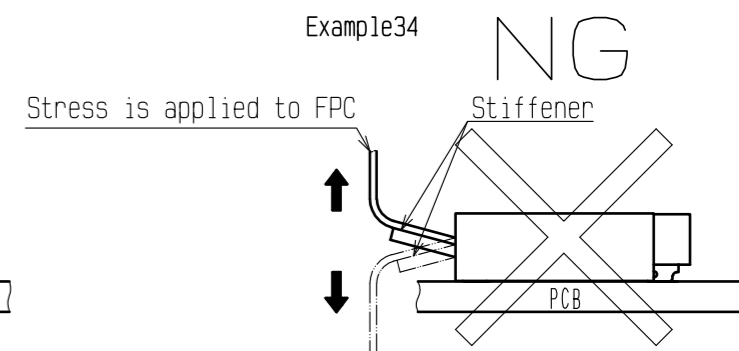
Example32



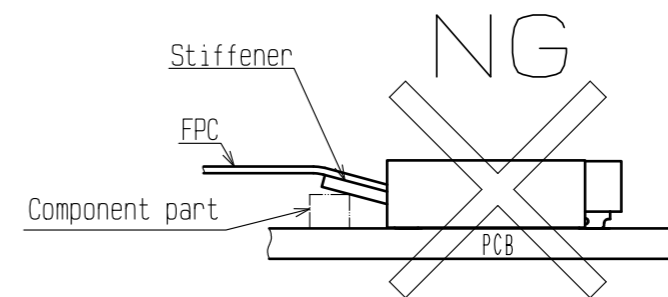
Example33



Example34



Example35



<INSTRUCTION MANUAL (4)>

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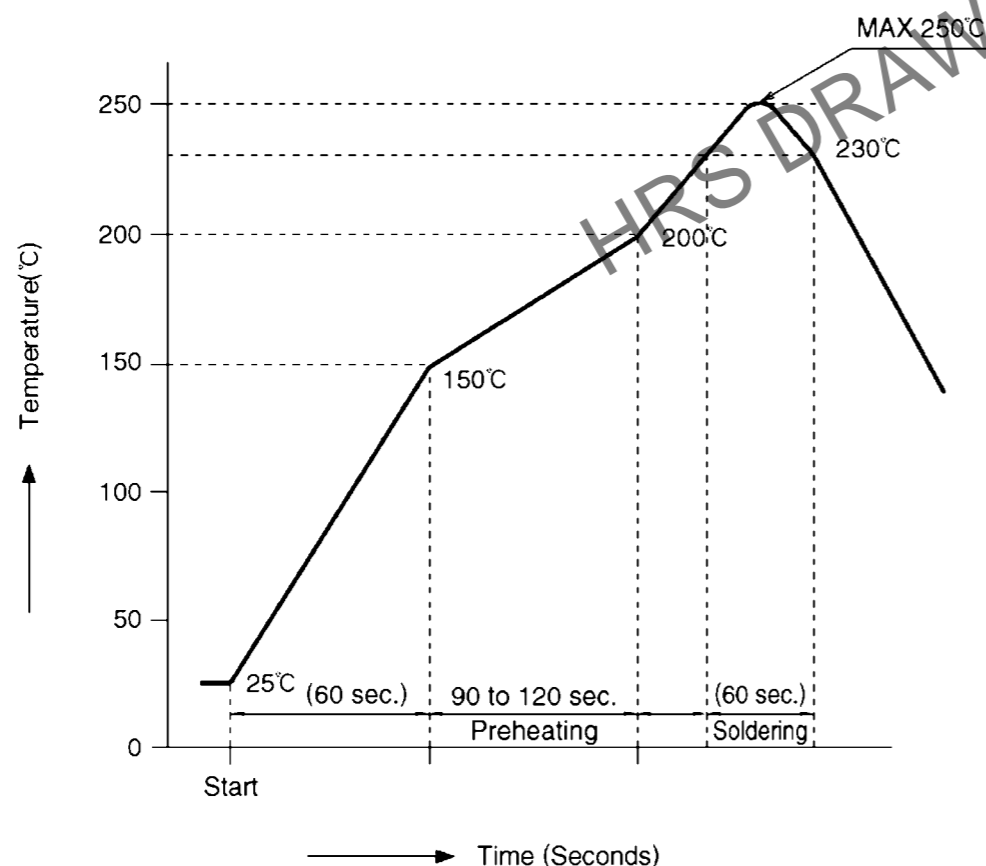
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[Instructions for mounting on the PCB]

Follow the instructions shown below when mounting on the PCB.

[Caution]

- Refer to recommended layouts on the page 1 for PCB and stencil pattern.
- Using either narrower land pattern or wider stencil pattern than recommendation may end up with excessive amount of solder/flux climbing on contact. Please inspect the size of solder fillet and flux climbing height of the mounted connector while using different land/stencil pattern from our recommendation.
- Clearance between the mounting surface of the connector contact leads and the bottom of the housing is very small. Solder resist/silk screening applied underneath the connector may interfere with the connector. This may lead to soldering defect/insufficient fillet formation. Please verify your solder resist/silk screening design carefully before implementing the design.
- Please try to minimize the warpage of the PCB. Soldering failure could still occur due to the PCB warpage even if the coplanarity of the connector is under 0.1mm.
- If the connector is mounting on FPC, please make sure to put a stiffener on the backside of the FPC.
Recommended stiffener: Glass epoxy material with thickness of 0.3mm MIN.
- Do not apply 0.5N or greater external force on the connector when unreeling or handling the connector before mounting. Excessive mechanical stress may damage the connector before mounting.
- Apply reflow temperature profile within the specified conditions. For specific applications, the recommended temperature may vary depending on type/ volume/thickness of solder paste and size/thickness of PCB. Please consult with your solder paste and equipment manufacturer for specific recommendations. The temperatures mentioned below refer to the PCB surface temperature near the connector contact leads.
- Reflow method: IR reflow
- Number of reflow cycles: 2 cycles MAX.

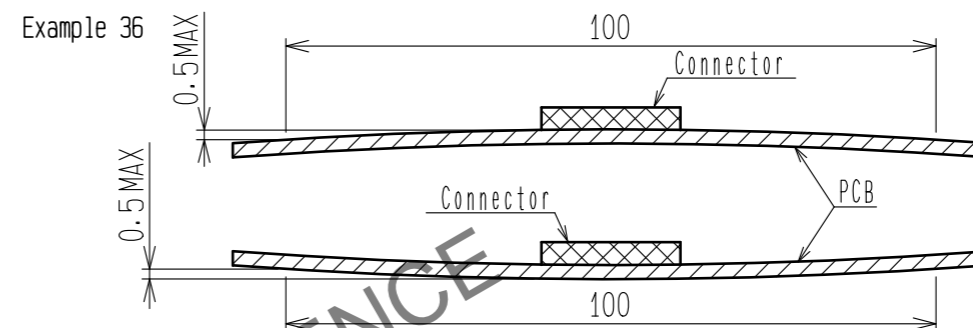


[Instructions for PCB handling after mounting the connector]

Follow the instructions shown below when mounting on the PCB.

[Caution]

- Splitting a large PCB into several pieces
 - Installing mounting screw on PCB
- During the assembly processes described above, care shall be taken so as not to give any stresses of deflection or twisting to the PCB. Stresses applied on PCB may damage the connector as well.
- The warpage of a 100 mm wide PCB should remain within 0.5mm. (example36)
- The warpage of PCB may apply excessive stress on the connector and damage the connector.



[Instructions on manual soldering]

Follow the instructions shown below when soldering the connector manually during repair work, etc.

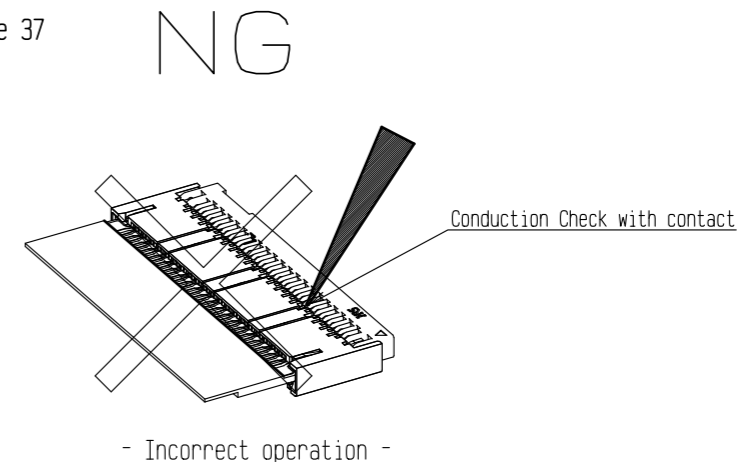
[Caution]

- Do not perform manual soldering with the FPC inserted into the connector.
 - Do not heat the connector excessively. Be very careful not to let the soldering iron contact any parts other than connector leads. Otherwise, the connector may be deformed or melt.
 - Do not supply excessive solder (or flux).
- If excessive solder (or flux) is supplied on the contact lead, solder or flux may adhere to the contact point or rotating parts of the actuator, resulting in conduction or rotation failure of the actuator. Supplying excessive solder to the chucking metals may hinder actuator rotation, resulting in breakage of the connector.

[Others]

- Attachment of foreign particles with the connector contact may lead to conduction failure. In this particular case, the conduction failure may be fixed by re-inserting the FPC.
- Please perform conduction check with caution. Conductivity probe may damage the connector contacts. (Example37)

Example 37



<INSTRUCTION MANUAL (5)>

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