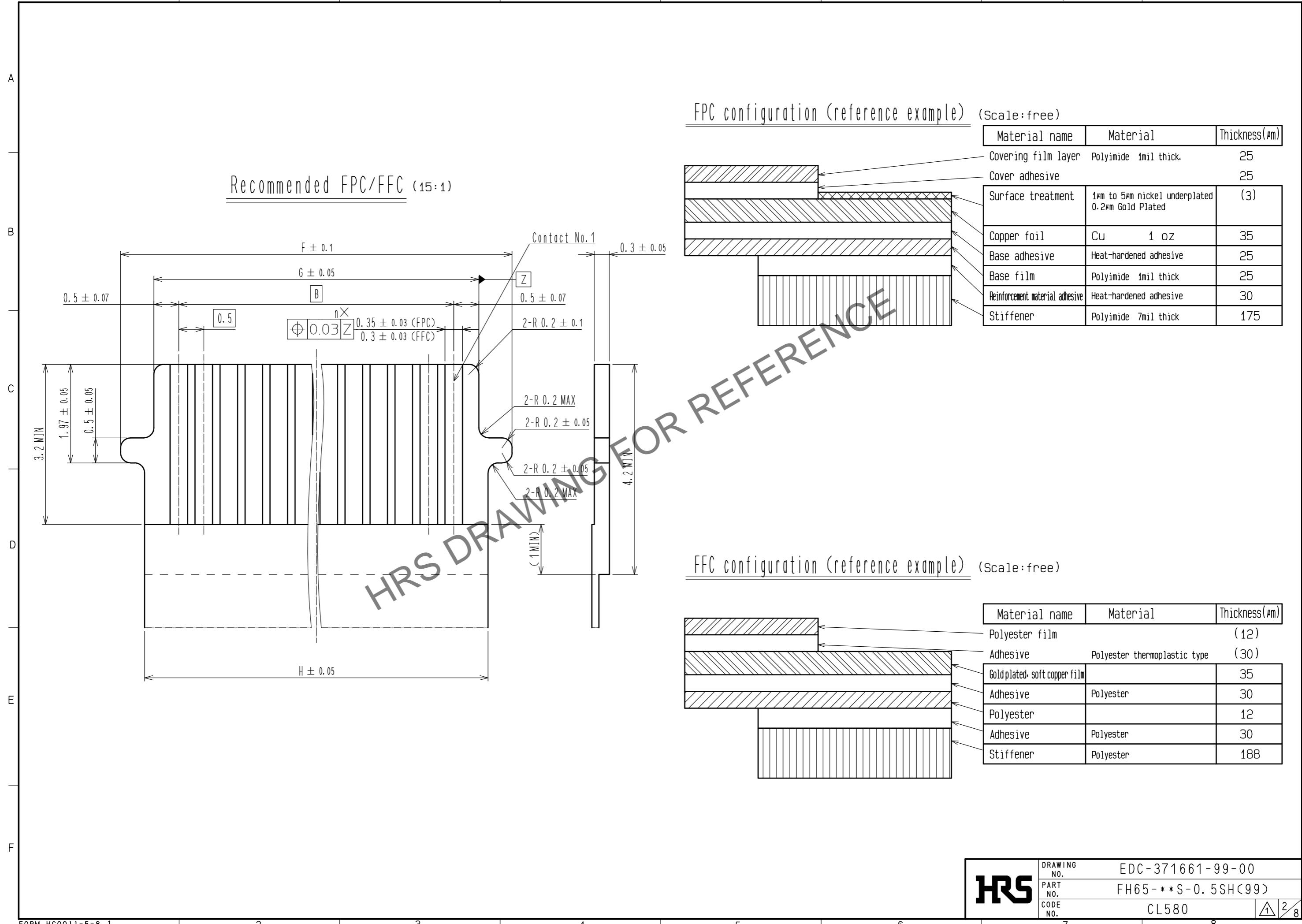


Notes

1. The dimension in parentheses are for reference.
2. Lead co-planarity including reinforced metal fittings shall be 0.1 MAX.
3. To be delivered with tape and reel packaging.
4. Note that preventive hole for sink mark could be added for improvement.
5. The quality remains good, even with the dark spots, which could occasionally occur molded plastics.
6. This product satisfies halogen free requirements defined as 900 ppm maximum chlorine, 900 ppm maximum bromine and 1500 ppm maximum total of chlorine and bromine.
7. 'n' represents the number of contacts.

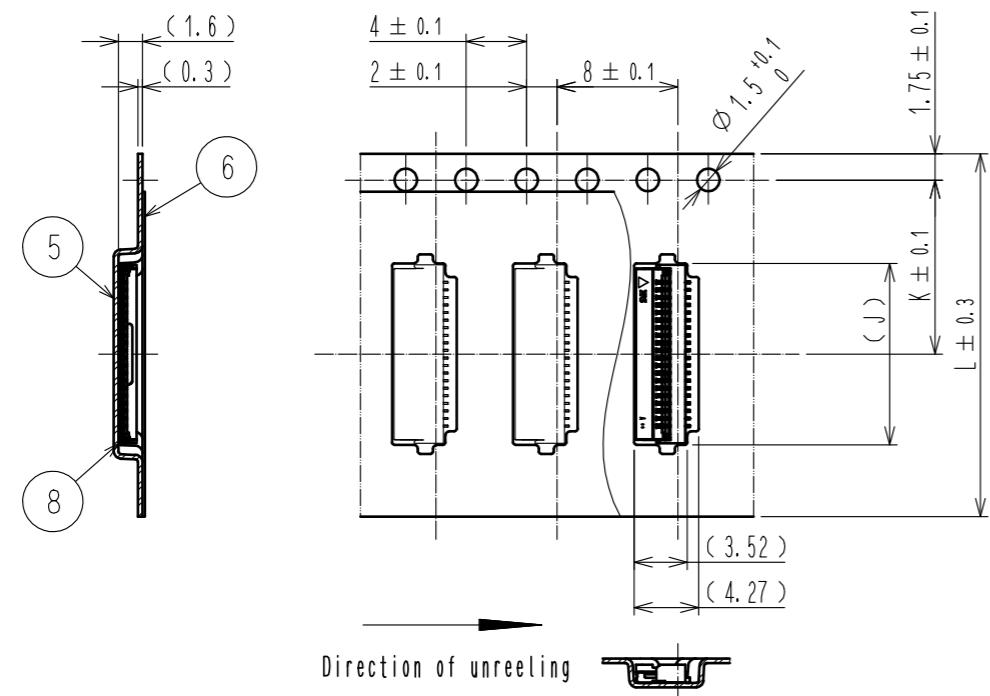
4	Brass (Plated material)	Tin plating (reflow finished) 1μmMIN over copper 0.3μmMIN	8	(Connector)			
3	Copper alloy	(Contact area, lead) Gold plating 0.03μmMIN over nickel 1μmMIN (Other) Nickel plating 1μmMIN	7	Polystyrene			
2	PPS	Black UL94V-0	6	Polyester			
1	LCP	Gray UL94V-0	5	Polystyrene			
NO.	MATERIAL	FINISH, REMARKS	NO.	MATERIAL	FINISH, REMARKS		
UNITS mm	◎ □	SCALE 5 : 1	COUNT 4	DESCRIPTION OF REVISIONS DIS-F-00006619	DESIGNED TA.SUZUKI	CHECKED HS.HIRAHARA	DATE 20200924
 HIROSE ELECTRIC CO., LTD.		APPROVED : HS.SAKAMOTO		20170215	DRAWING NO.	EDC-371661-99-00	
		CHECKED : HS.SAKAMOTO		20170215	PART NO.	FH65-**S-0.5SH(99)	
		DESIGNED : SG.MASAKI		20170214	CODE NO.	CL580	
		DRAWN : SG.MASAKI		20170214			

1 2 3 4 5 6 7 8

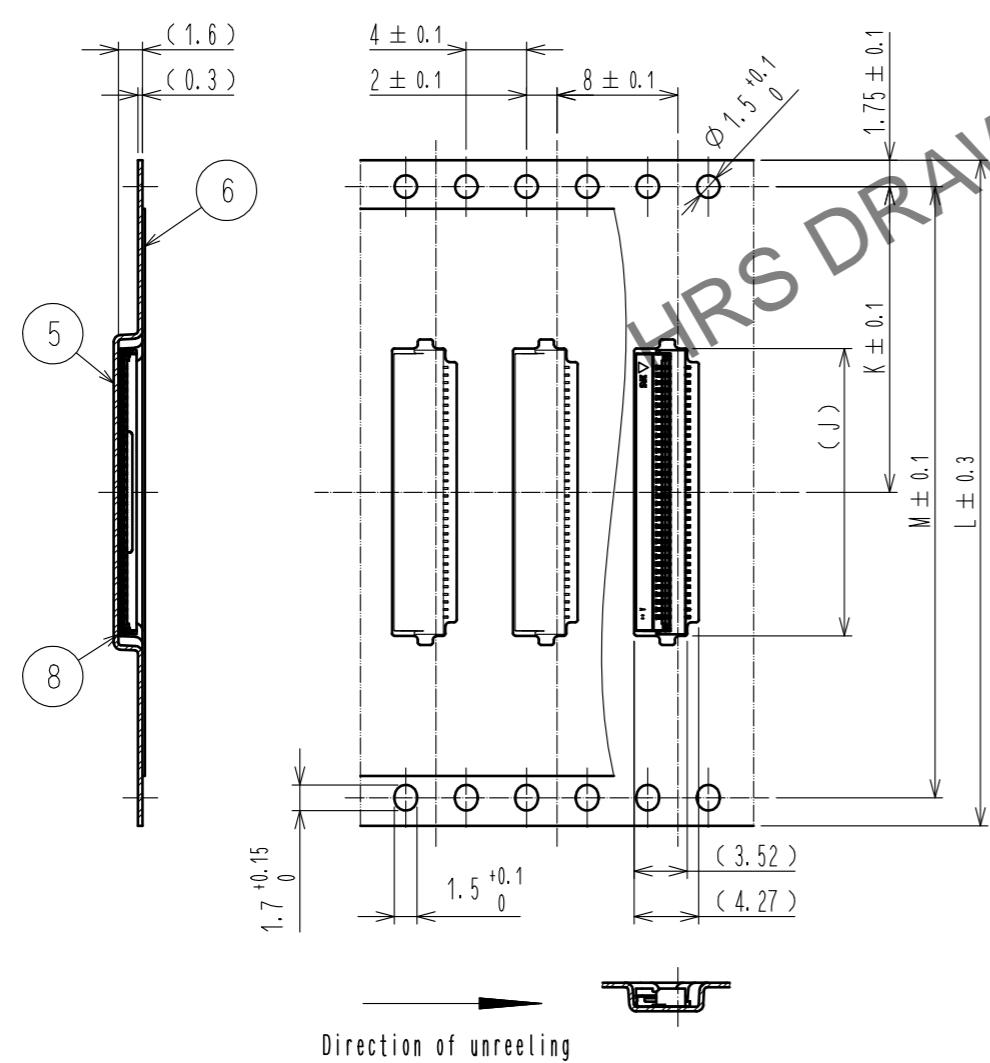


Embossed carrier tape dimensions (2:1)

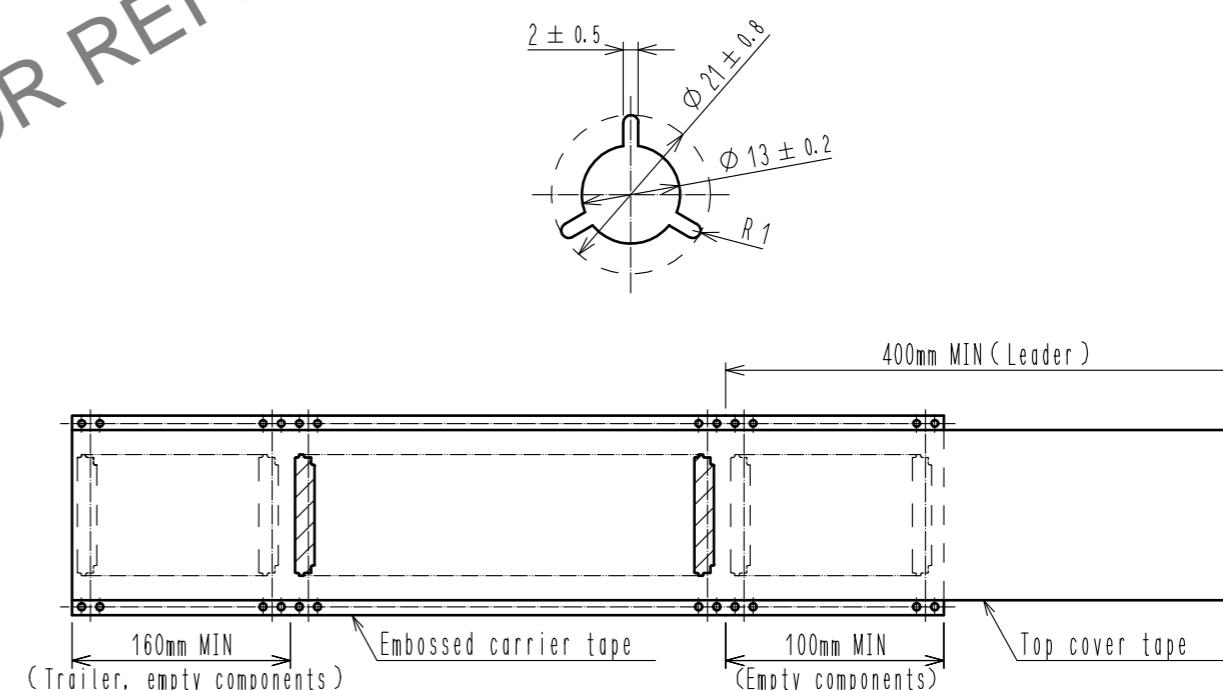
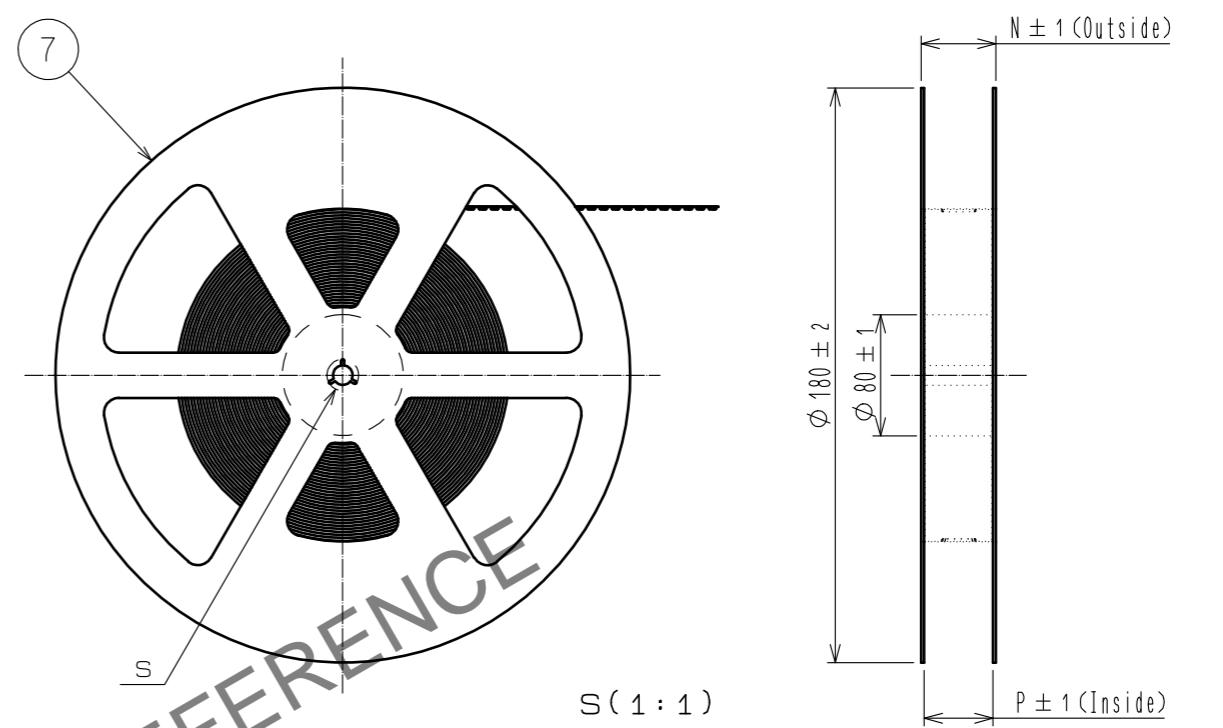
Tape width : 24mm MAX



Tape width : 32mm MIN



Reel dimensions (no scale)



NOTES  
 8. 1 reel : 500 connectors  
 9. Refer to JIS C 0806 and IEC 60286-3  
 (Packaging of components for automatic handling).

**PACKING SPECIFICATIONS**

<b>HRS</b>	DRAWING NO. EDC-371661-99-00
	PART NO. FH65-**S-0.5SH(99)
	CODE NO. CL580
	1 3 8

A

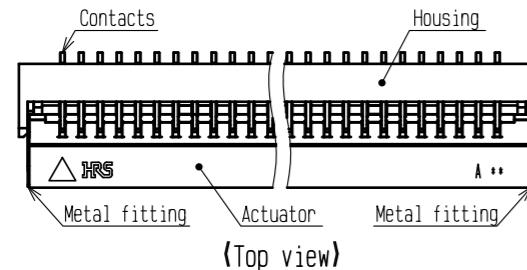
A

Part No.	Code No.	Number of contact	Dimension of connector, PCB mounting pattern, stencil pattern and FFC/FPC								Dimension of drawing for packing					
			A	B	C	D	E	F	G	H	J	K	L	M	N	P
FH65-4S-0.5SH(99)	_____	4	3.8	1.5	2.57	3.18	2.8	3.83	2.5	2.87	4.0	7.5	16.0	—	21.4	17.4
FH65-6S-0.5SH(99)	_____	6	4.8	2.5	3.57	4.18	3.8	4.83	3.5	3.87	5.0	7.5	16.0	—	21.4	17.4
FH65-8S-0.5SH(99)	CL580-4703-0-99	8	5.8	3.5	4.57	5.18	4.8	5.83	4.5	4.87	6.0	7.5	16.0	—	21.4	17.4
FH65-10S-0.5SH(99)	CL580-4704-0-99	10	6.8	4.5	5.57	6.18	5.8	6.83	5.5	5.87	7.0	11.5	24.0	—	29.4	25.4
FH65-12S-0.5SH(99)	_____	12	7.8	5.5	6.57	7.18	6.8	7.83	6.5	6.87	8.0	11.5	24.0	—	29.4	25.4
FH65-14S-0.5SH(99)	_____	14	8.8	6.5	7.57	8.18	7.8	8.83	7.5	7.87	9.0	11.5	24.0	—	29.4	25.4
FH65-15S-0.5SH(99)	CL580-4701-0-99	15	9.3	7.0	8.07	8.68	8.3	9.33	8.0	8.37	9.5	11.5	24.0	—	29.4	25.4
FH65-16S-0.5SH(99)	_____	16	9.8	7.5	8.57	9.18	8.8	9.83	8.5	8.87	10.0	11.5	24.0	—	29.4	25.4
FH65-18S-0.5SH(99)	_____	18	10.8	8.5	9.57	10.18	9.8	10.83	9.5	9.87	11.0	11.5	24.0	—	29.4	25.4
FH65-20S-0.5SH(99)	_____	20	11.8	9.5	10.57	11.18	10.8	11.83	10.5	10.87	12.0	11.5	24.0	—	29.4	25.4
FH65-22S-0.5SH(99)	_____	22	12.8	10.5	11.57	12.18	11.8	12.83	11.5	11.87	13.0	11.5	24.0	—	29.4	25.4
FH65-24S-0.5SH(99)	_____	24	13.8	11.5	12.57	13.18	12.8	13.83	12.5	12.87	14.0	11.5	24.0	—	29.4	25.4
FH65-26S-0.5SH(99)	_____	26	14.8	12.5	13.57	14.18	13.8	14.83	13.5	13.87	15.0	14.2	32.0	28.4	37.4	33.4
FH65-28S-0.5SH(99)	_____	28	15.8	13.5	14.57	15.18	14.8	15.83	14.5	14.87	16.0	14.2	32.0	28.4	37.4	33.4
FH65-30S-0.5SH(99)	_____	30	16.8	14.5	15.57	16.18	15.8	16.83	15.5	15.87	17.0	14.2	32.0	28.4	37.4	33.4
FH65-32S-0.5SH(99)	_____	32	17.8	15.5	16.57	17.18	16.8	17.83	16.5	16.87	18.0	14.2	32.0	28.4	37.4	33.4
FH65-34S-0.5SH(99)	CL580-4700-0-99	34	18.8	16.5	17.57	18.18	17.8	18.83	17.5	17.87	19.0	20.2	44.0	40.4	49.4	45.4
FH65-36S-0.5SH(99)	_____	36	19.8	17.5	18.57	19.18	18.8	19.83	18.5	18.87	20.0	20.2	44.0	40.4	49.4	45.4
FH65-40S-0.5SH(99)	_____	40	21.8	19.5	20.57	21.18	20.8	21.83	20.5	20.87	22.0	20.2	44.0	40.4	49.4	45.4
FH65-45S-0.5SH(99)	_____	45	24.3	22.0	23.07	23.68	23.3	24.33	23.0	23.37	24.5	20.2	44.0	40.4	49.4	45.4
FH65-50S-0.5SH(99)	_____	50	26.8	24.5	25.57	26.18	25.8	26.83	25.5	25.87	27.0	20.2	44.0	40.4	49.4	45.4
FH65-60S-0.5SH(99)	_____	60	31.8	29.5	30.57	31.18	30.8	31.83	30.5	30.87	32.0	26.2	56.0	52.4	61.4	57.4
FH65-64S-0.5SH(99)	_____	64	33.8	31.5	32.57	33.18	32.8	33.83	32.5	32.87	34.0	26.2	56.0	52.4	61.4	57.4
FH65-68S-0.5SH(99)	_____	68	35.8	33.5	34.57	35.18	34.8	35.83	34.5	34.87	36.0	26.2	56.0	52.4	61.4	57.4

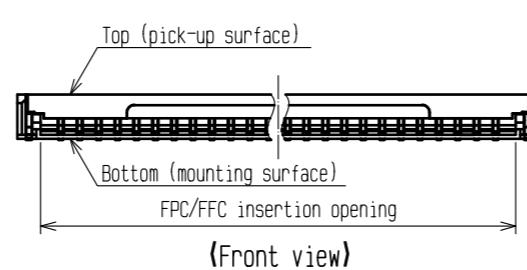
※Contact positions without code numbers are currently under planning.  
Please contact Hirose for detailed information about product variation.

This connector features small and thin, requiring delicate and careful handling. To prevent connector/FPC/FFC breakage and contact failure (mating failure, FPC/FFC pattern breakage, etc), read through the instructions shown below and handle the connector properly. Each values indicating here are for reference and may differ from standard value.

[Connector Part Nomenclature]



(Top view)



(Front view)

[Operation and Precautions]

1. Initial condition

The connector is delivered with the actuator closed.

[Caution]

-Do not insert FPC/FFC or operate actuator before mounting.

2. How to unlock (Before inserting FPC/FFC)

The actuator rotates on its axis as shown below.

Slowly flip up the actuator to release the lock.

[Caution]

-Open the actuator by carefully lifting it at the center.

-Do not lift the actuator at one end only.

-The actuator must be operated by hand only,

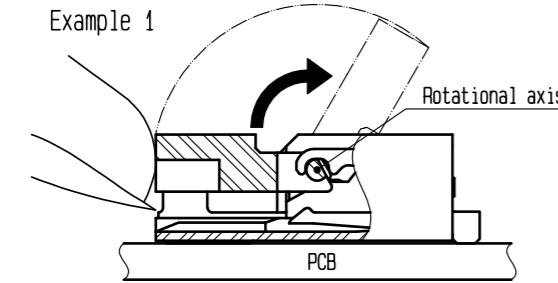
and do not insert any tools or fingernails inside the connector.

-The actuator rotates 120 degrees max.

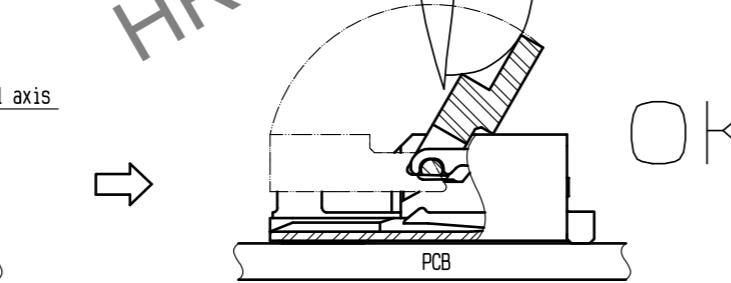
Do not attempt to force the actuator to backside further.

-When operating the actuator do not apply any force in the direction of the connector.

-Do not attempt to dislodge the actuator.

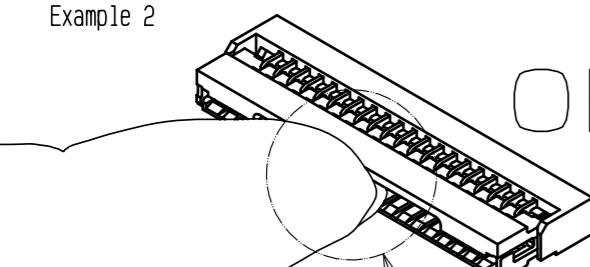


Example 1



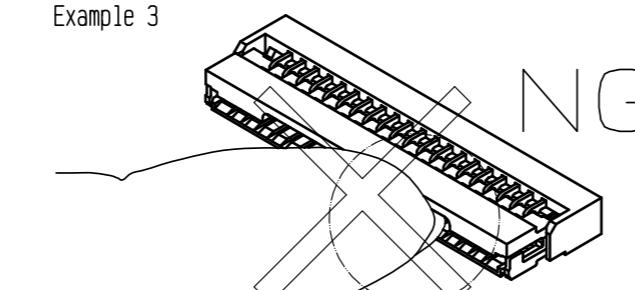
OK

- Correct operation -



Example 2

Example 3

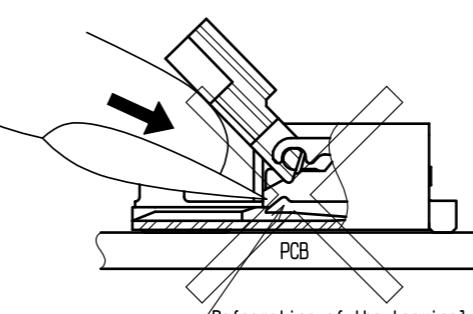


NG

Do not operate the actuator  
at one end only.

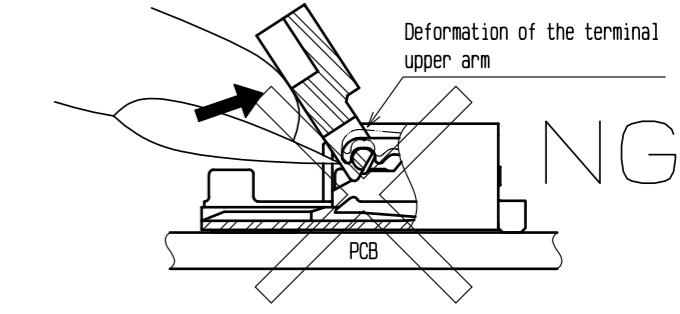
- Incorrect operation -

Example 4



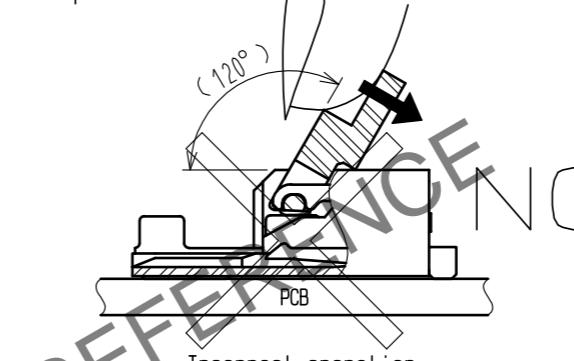
- Incorrect operation -

Example 5



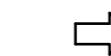
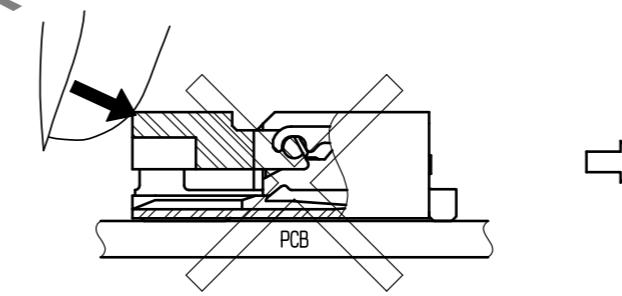
- Incorrect operation -

Example 6



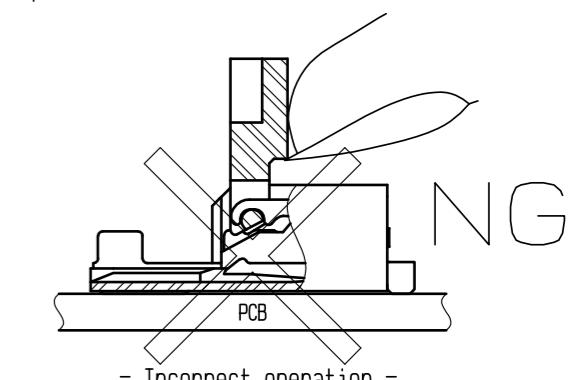
- Incorrect operation -

Example 7



- Incorrect operation -

Example 9



- Incorrect operation -

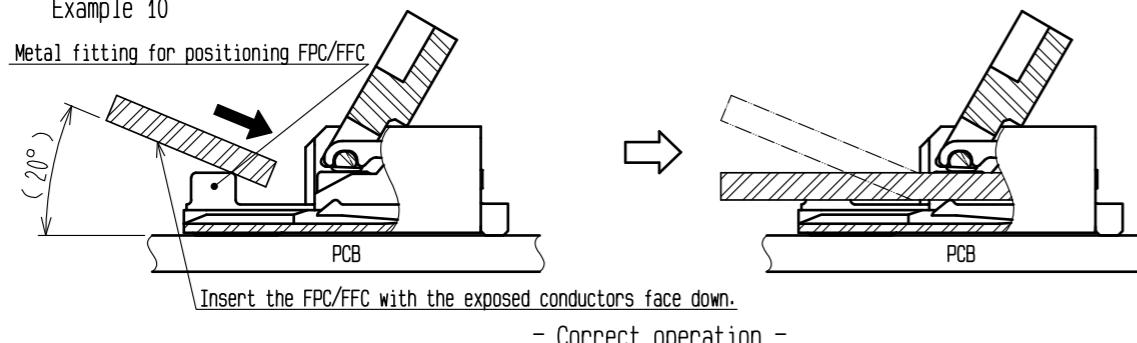
3. How to insert FPC/FFC

This connector has contacts on the bottom, insert the FPC/FFC with the exposed conductors face down.  
This connector has metal fittings, insert the FPC/FFC at about 20 degree angle to the PCB mounting surface.

[Caution]

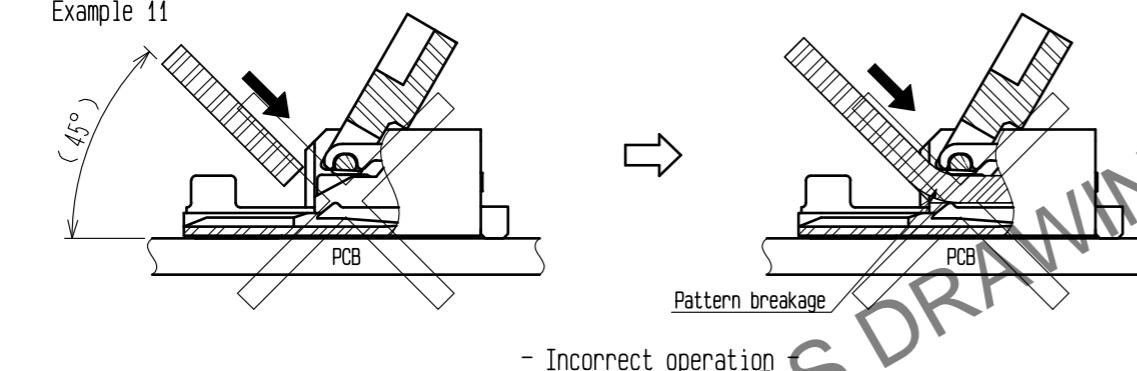
- Do not insert the FPC/FFC with the conductor surface face up.
- Insert the FPC/FFC properly to the very end.
- Do not insert the FPC/FFC at an angle.
- Insert the FPC/FFC with the actuator opened.
- Do not twist the FPC/FFC to up and down, right and left or an angle.

Example 10



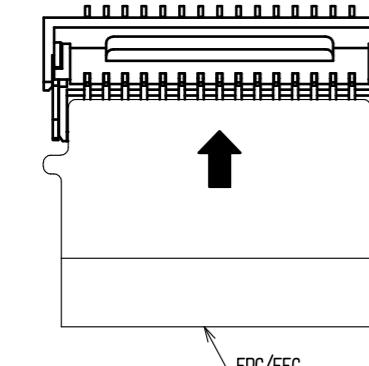
OK

Example 11



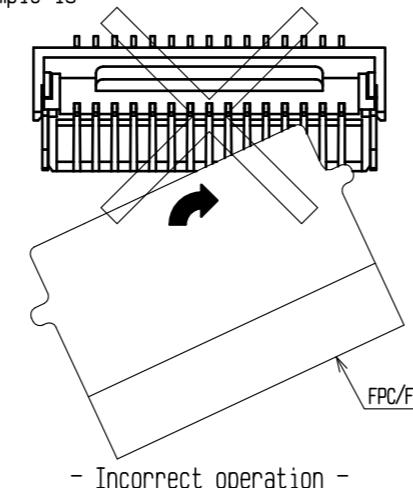
NG

Example 12



OK

Example 13



NG

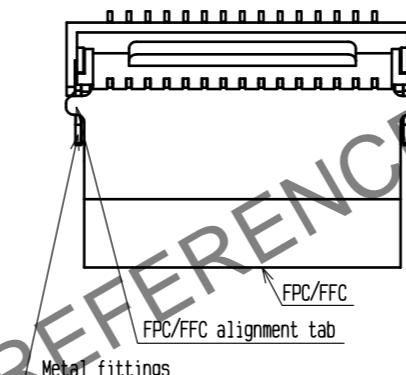
4. FPC/FFC insertion check

Metal fittings guide the FPC/FFC tabs to the correct position.  
Make sure that the FPC/FFC tabs are located in correct position as shown in the figure below after FPC/FFC insertion.

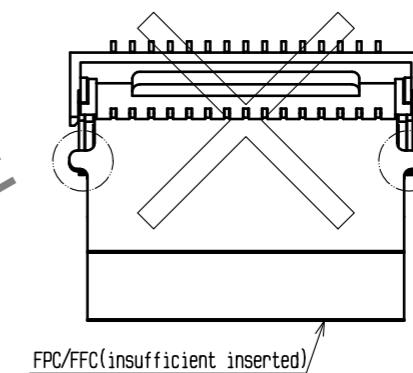
[Caution]

- Do not insert the FPC/FFC at an angle and/or stop it before insertion is completed.

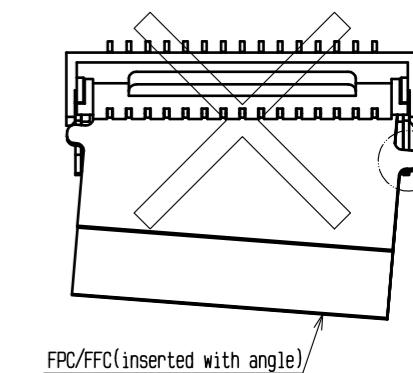
Example 14



Example 15



Example 16



OK

NG

NG

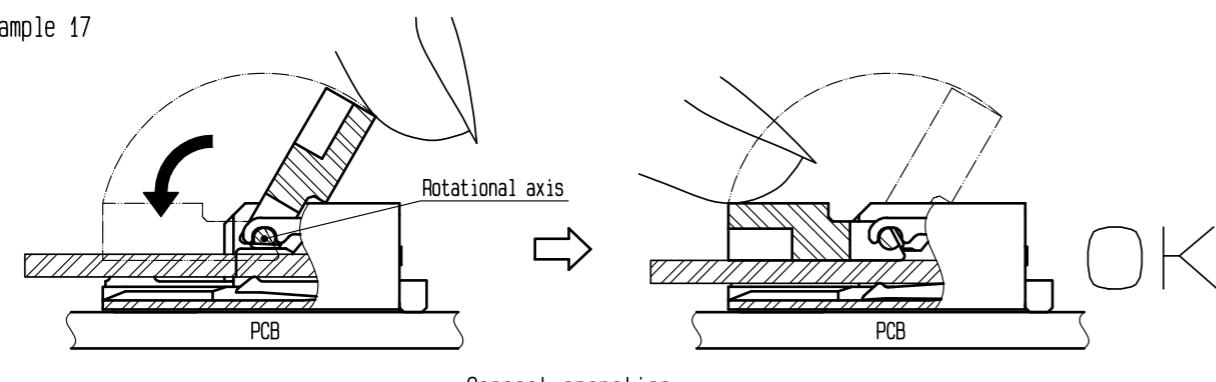
5. How to lock

The actuator rotates on its axis as shown below.  
Apply load to rotate the actuator after inserting the FPC/FFC.

[Caution]

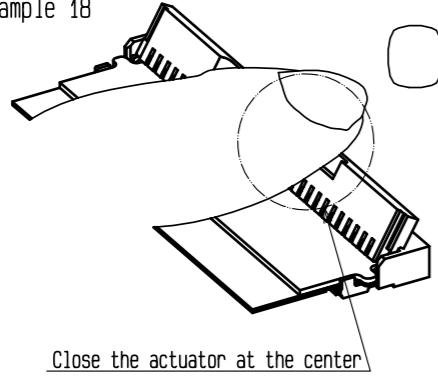
- Close the actuator by carefully operating it at the center.
- Do not operate the actuator at one end only.
- The actuator must be operated by hand only, and do not insert any tools or fingernails inside the connector.
- Do not attempt to force the actuator to backside further.
- Do not attempt to dislodge the actuator.
- Confirm that the actuator completely closed and is parallel to the PCB mounting surface.

Example 17



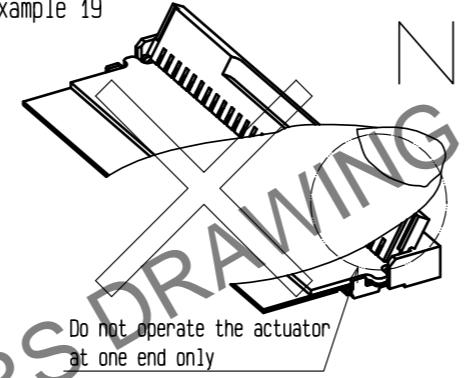
- Correct operation -

Example 18



Close the actuator at the center  
- Correct operation -

Example 19



Do not operate the actuator  
at one end only  
- Incorrect operation -

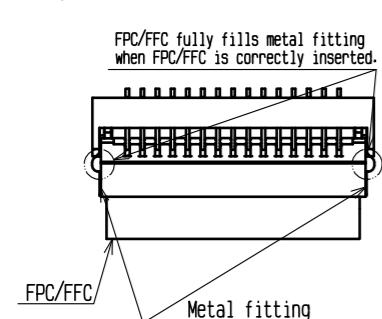
6. Mating confirmation of the FPC/FFC

Visually confirm the FPC/FFC positioning after closing the actuator.

[Caution]

- Do not insert the FPC/FFC at an angle and/or stop it before insertion is completed.

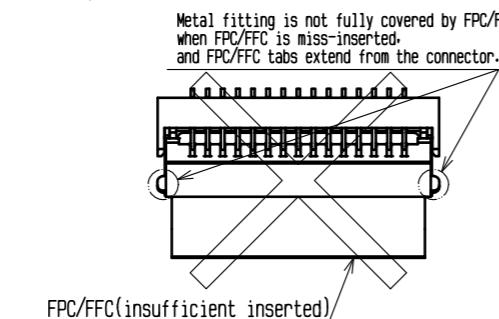
Example 20



- Correct operation -

OK

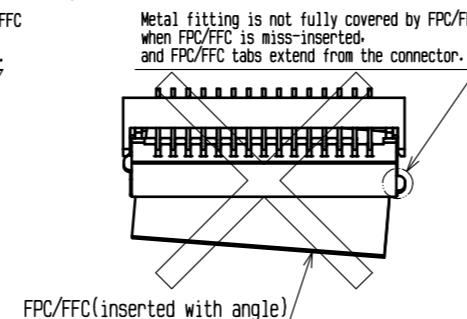
Example 21



- Incorrect operation -

NG

Example 22



- Incorrect operation -

NG

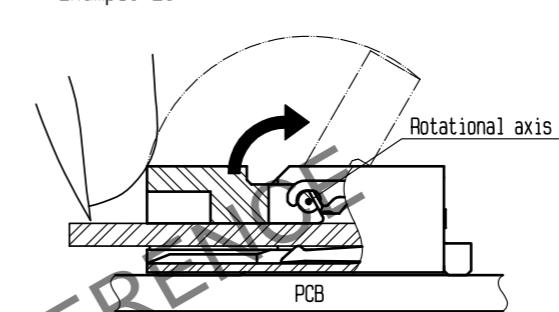
7. How to unlock

Slowly flip up the actuator to release the lock.

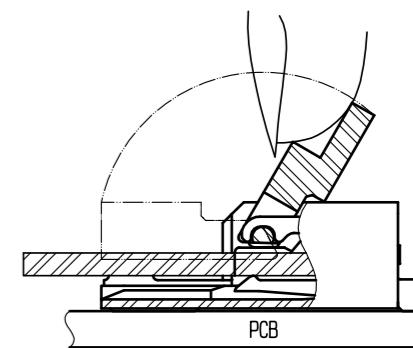
[Caution]

- Open the actuator by carefully lifting it at the center.
- Do not lift the actuator at one end only.
- The actuator must be operated by hand only, and do not insert any tools or fingernails inside the connector.
- The actuator rotates 120 degrees max. Do not attempt to force the actuator to backside further.
- Do not attempt to dislodge the actuator.

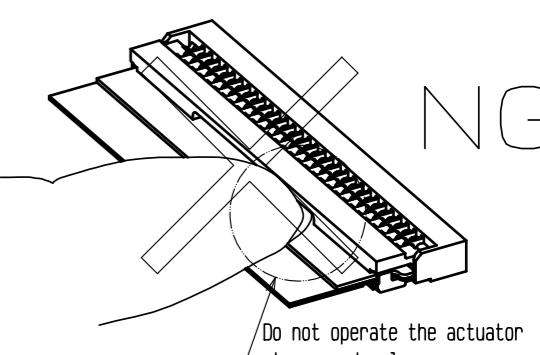
Example 23



- Correct operation -

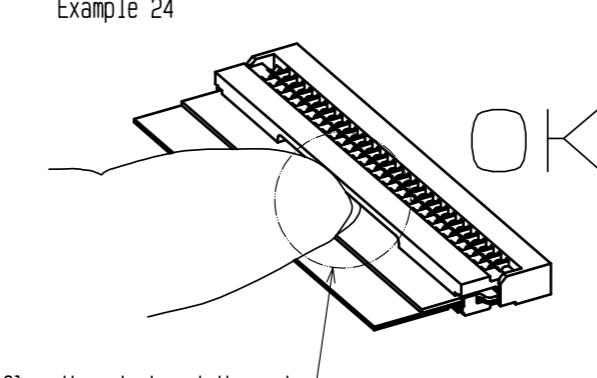


Example 25



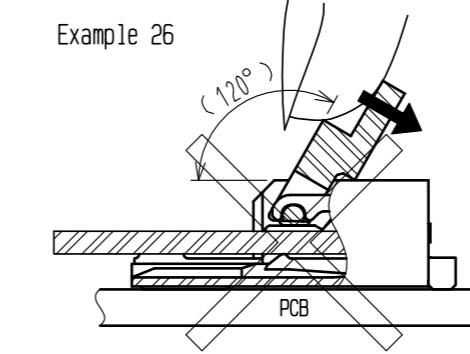
- Incorrect operation -

Example 24



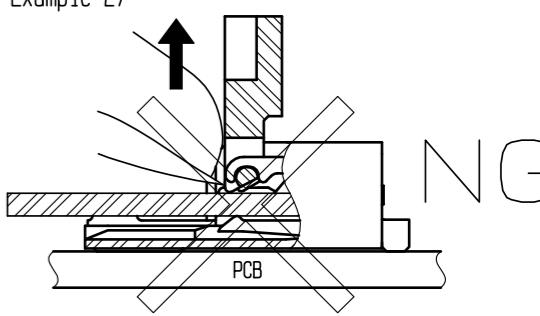
Close the actuator at the center  
- Correct operation -

Example 26



- Incorrect operation -

Example 27



- Incorrect operation -

<INSTRUCTION MANUAL (3)>



DRAWING NO. EDC-371661-99-00  
PART NO. FH65-\*\*S-0.5SH(99)  
CODE NO. CL580

1 7 8

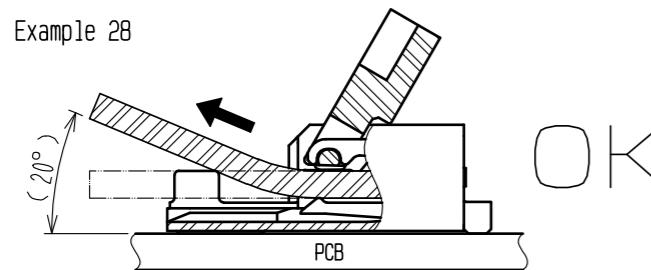
## 8. How to remove FPC/FFC

This connector has a temporary FPC/FFC holding structure with metal fittings. After rotating the actuator to the fully opened position carefully withdraw the FPC/FFC pulling out at about 20 degree angle to the PCB mounting surface.

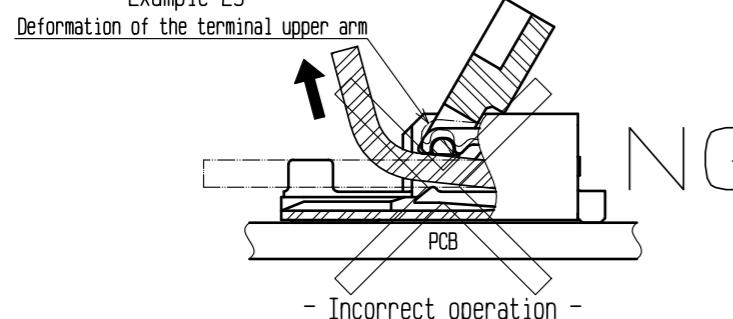
[Caution]

- For FPC/FFC removal, do not pull out the FPC/FFC horizontally.
- Do not withdraw the FPC/FFC at an angle.
- Do not attempt to pull the FPC/FFC without unlocking the actuator.

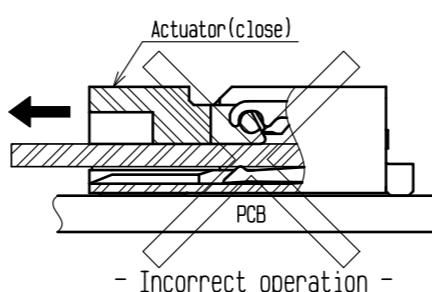
Example 28



Example 29



Example 30



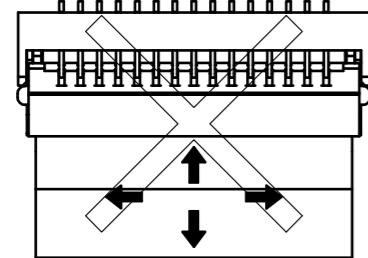
[Precautions for component layout]

Depending on a FPC/FFC 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.

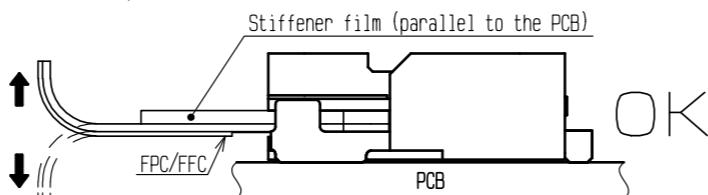
[Caution]

- Avoid applying forces to FPC/FFC in vertical or horizontal directions. In addition, avoid pulling up and down on the FPC/FFC.
- When fixing FPC/FFC after FPC/FFC cabling, avoid pulling FPC/FFC, and route the wire FPC/FFC with slack. In this regard, the stiffener is parallel to the PCB.
- Do not bend the FPC/FFC excessively near the connector during use, or it may cause contact failure or FPC/FFC breakage. Fixing the FPC/FFC is recommended to prevent these failures.
- Do not mount other components touching to the FPC/FFC underneath the FPC/FFC stiffener.
- Follow the recommended FPC/FFC design. Make adjustments with the FPC/FFC manufacturer for FPC/FFC bending performance and wire breakage.
- Keep a sufficient FPC/FFC insertion space in the stage of the layout in order to avoid incorrect FPC/FFC insertion. Appropriate FPC/FFC length and component layout are recommended for assembly ease. Too short FPC/FFC length makes assembly difficult.
- Keep spaces for the actuator movement and its operation for PCB design and component layout.

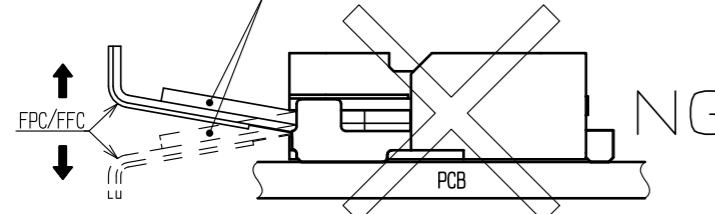
Example 31



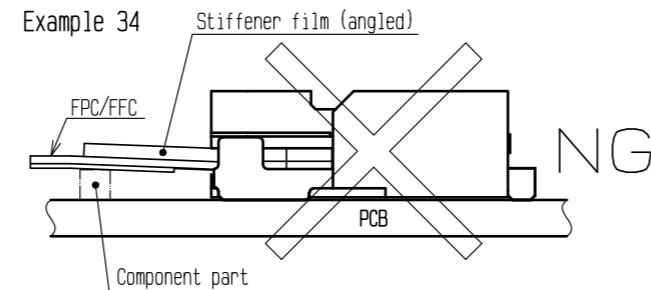
Example 32



Example 33



Example 34



## 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.
- Shorter pattern width than the recommended PCB dimension, could cause solder wicking and/or flux penetration.
- Larger pattern than the recommended stencil dimension, could cause solder wicking and/or flux penetration.
- Clearance underneath the contact and the housing is very small. In case solder resist and/or silk screening are applied on PCB underneath the connector, verify the thickness, or it could push up the connector bottom and may cause soldering defect and/or insufficient fillet formation.
- Apply reflow temperature profile within the specified conditions. In individual applications, the actual temperature may vary, depending on solder paste type, volume/thickness and PCB size/thickness. Consult your solder paste and equipment manufacturer for specific recommendations.
- Prevent warpage of PCB, where possible, since it can cause soldering failure even with 0.1 mm max coplanarity.
- When mounting on the flexible board, please make sure to put a stiffener on the backside of the flexible board. We recommend a glass epoxy material with the thickness of 0.3 mm MIN.
- Do not add 1 N or greater external force when unreel or pick and place the connector etc, or it may get broken.

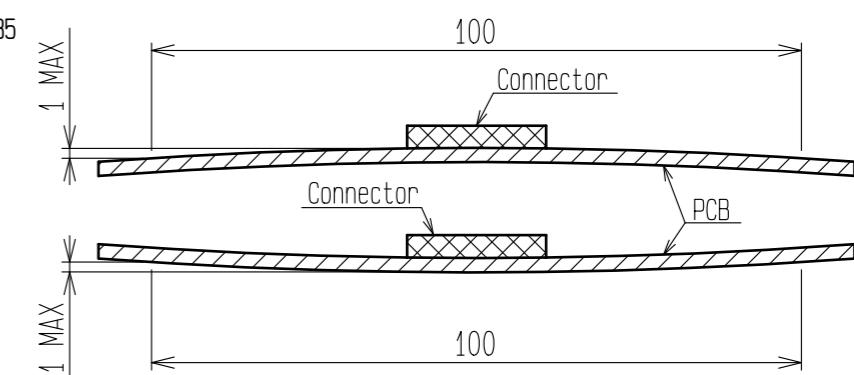
## Instructions for PCB handling after mounting the connector

Follow the instructions shown below when mounting on the PCB.

[Caution]

- Splitting a large PCB into several pieces
- Screwing the PCB
- Avoid the handling described above so that no force is exerted on the PCB during the assembly process. Otherwise, the connector may become defective.
- The warp of a 100 mm wide PCB should be 1 mm or less. The warp of PCB suffers stress on connector and the connector may become defective.

Example 35



## 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/FFC 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 terminals, solder or flux may adhere to the contacts or rotating parts of the actuator, resulting in poor contact or a rotation failure of the actuator. Supplying excessive solder to the metal fittings may hinder actuator rotation, resulting in breakage of the connector.

## <INSTRUCTION MANUAL (4)>

DRAWING NO.	EDC-371661-99-00
PART NO.	FH65-**S-0.5SH(99)
CODE NO.	CL580

