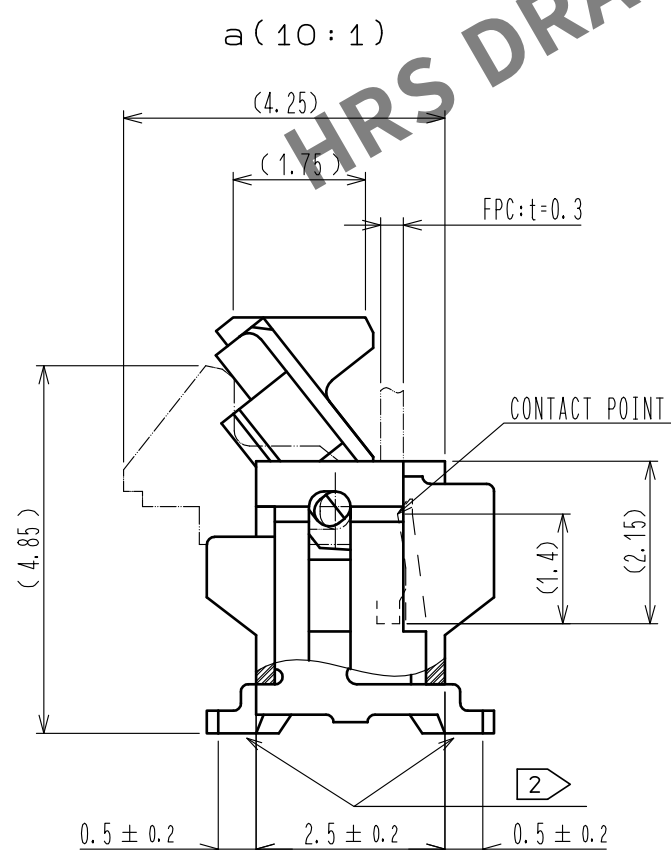
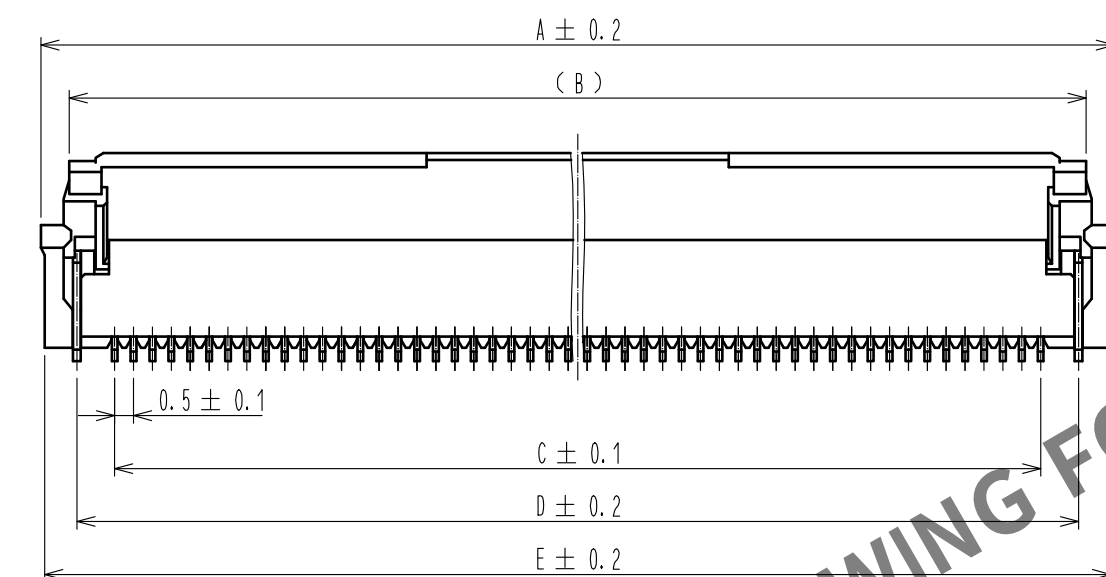




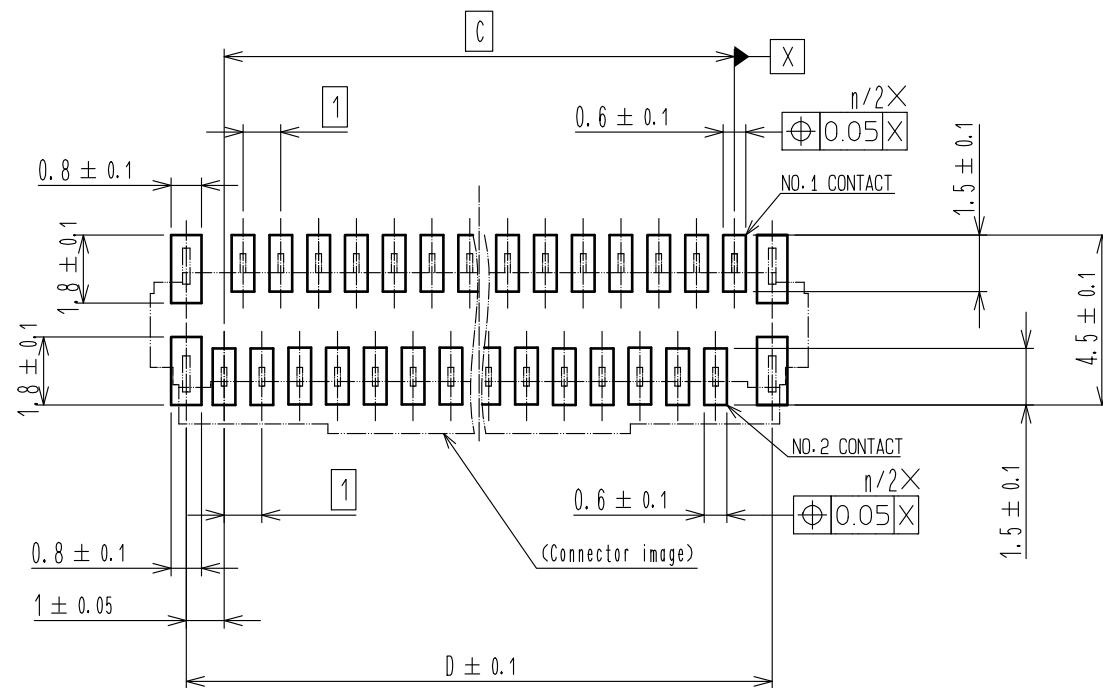
- | NUMBER OF CONTACTS | MATERIAL |
|--------------------|-----------|
| 60 | LCP |
| OTHER | POLYAMIDE |

UNITS mm		SCALE 5:1	COUNT 	DESCRIPTION OF REVISIONS 16 DIS-F-00013777	DESIGNED HN. UCHIUMI	CHECKED KN. SHIBUYA	DATE 20220509
HIROSE ELECTRIC CO., LTD.	APPROVED	HS. SAKAMOTO	20140215	DRAWING NO.	EDC3-159266-03		
	CHECKED	HS. SAKAMOTO	20140215	PART NO.	FH12-**S-0.5SVA(54)		
	DESIGNED	RT. IKEDA	20140213	CODE NO.	CL586		
	DRAWN	NM. SANPEI	20140212				

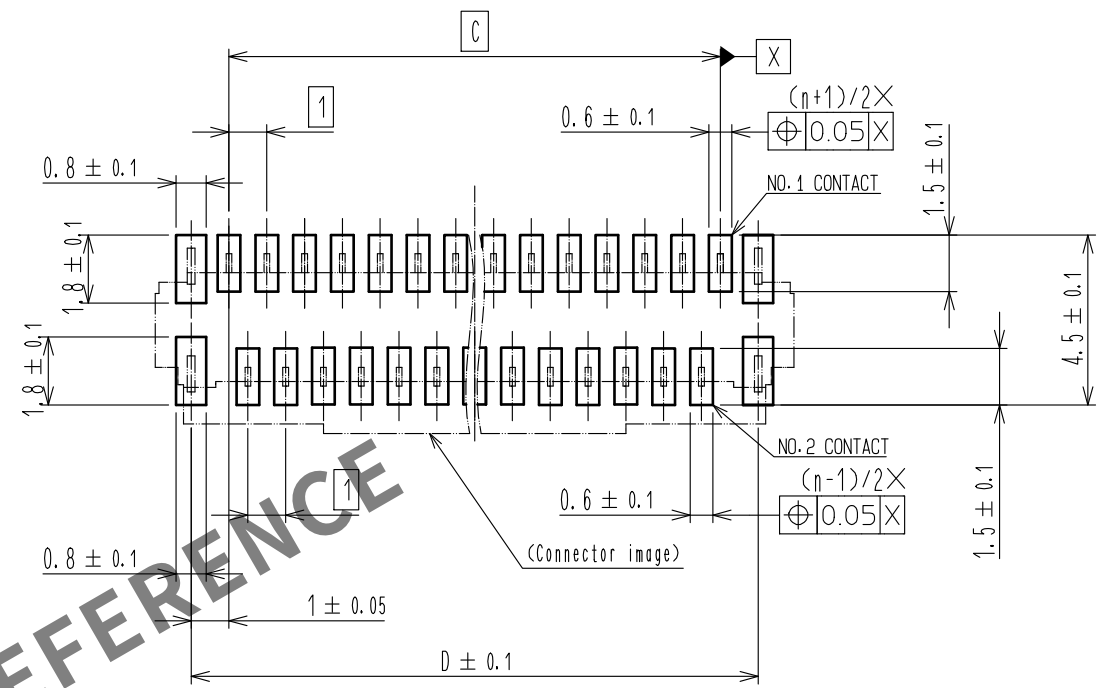
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RECOMMENDED PCB MOUNTING PATTERN

NUMBER OF CONTACTS: EVEN NUMBER

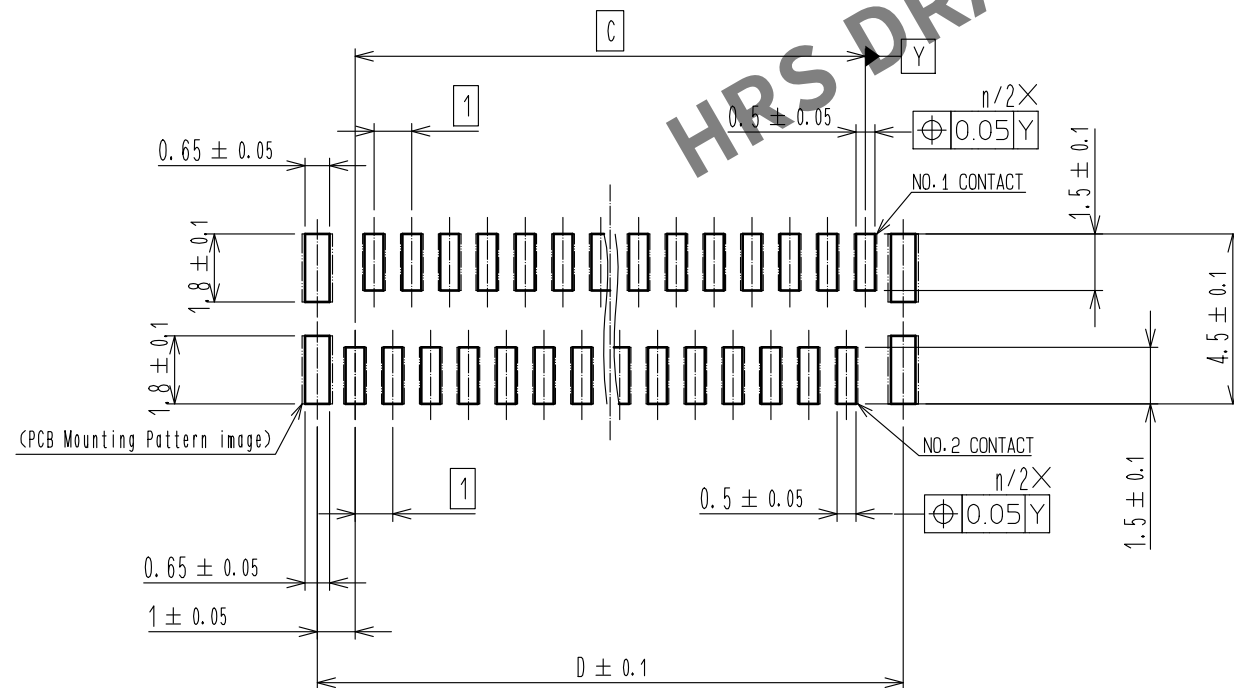


NUMBER OF CONTACTS: ODD NUMBER

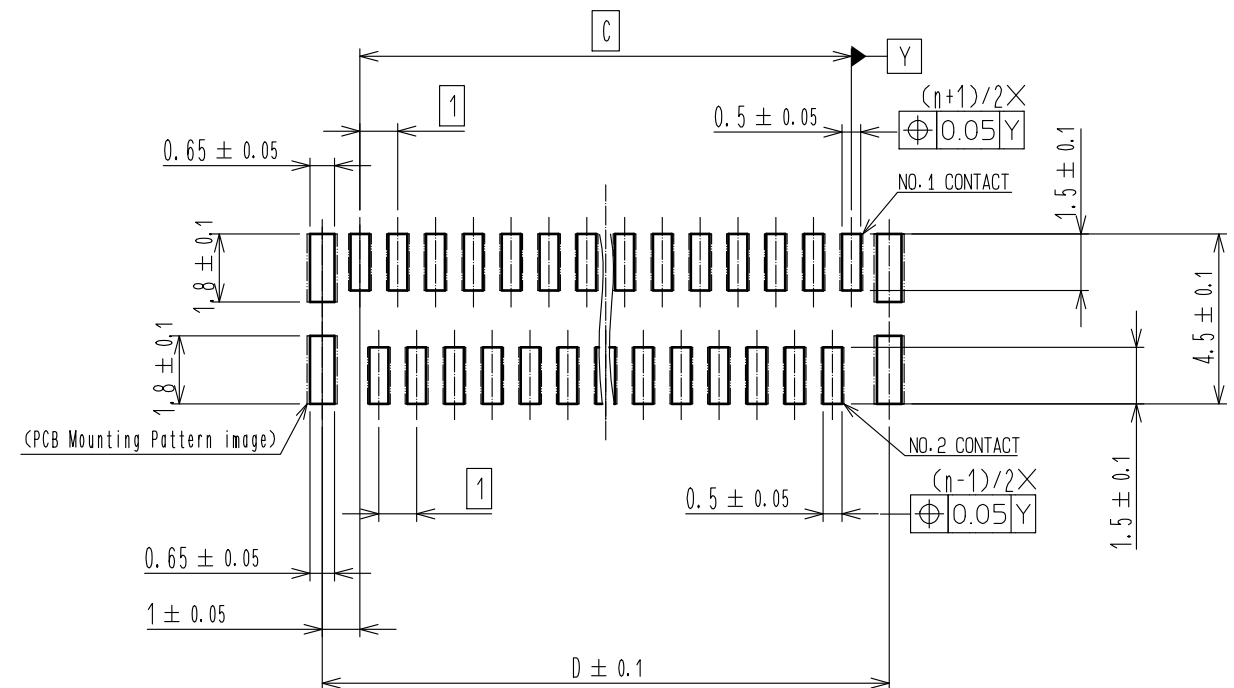


RECOMMENDED STENCIL PATTERN (RECOMMENDED STENCIL THICKNESS : $t=0.15$)

NUMBER OF CONTACTS: EVEN NUMBER



NUMBER OF CONTACTS: ODD NUMBER

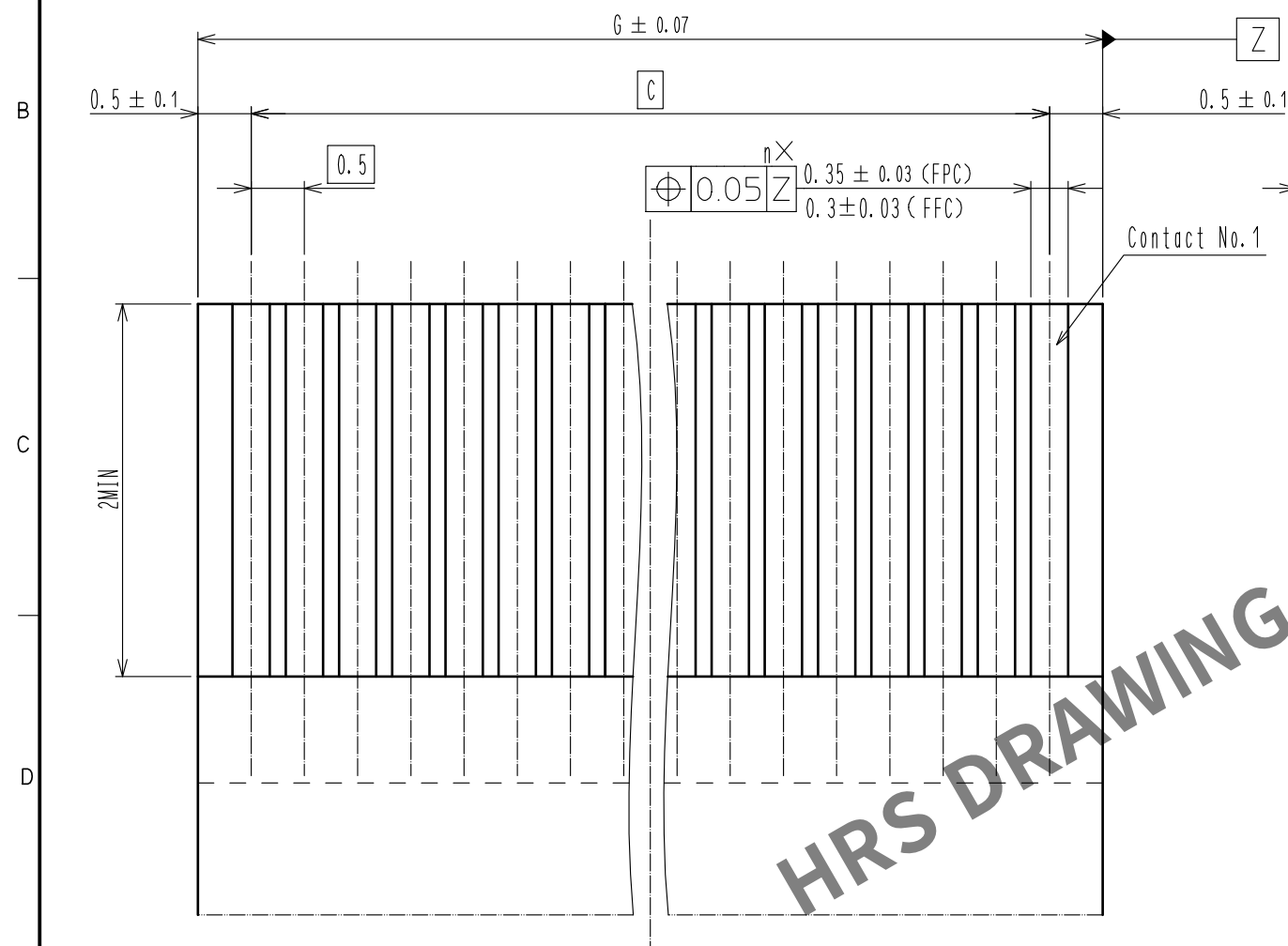


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DRAWING NO.	EDC3-159266-03
PART NO.	FH12-**S-0.5SVA(54)
CODE NO.	CL586

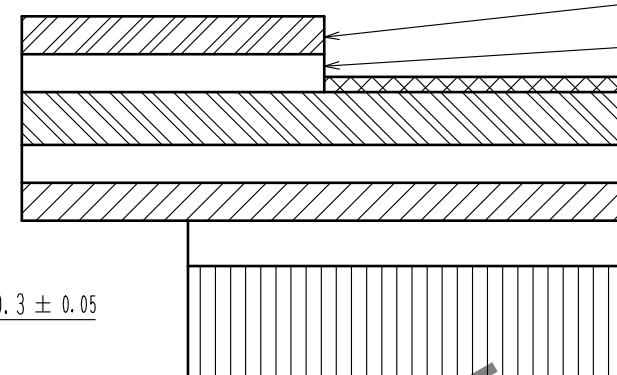
2/9

RECOMMENDED FPC/FFC (15:1)



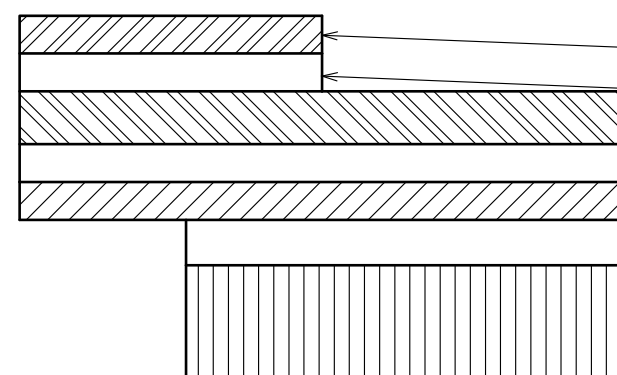
NOTE deleted

FPC CONFIGURATION (REFERENCE EXAMPLE) (SCALE:FREE)



MATERIAL NAME	MATERIAL	THICKNESS(μm)
COVERING FILM LAYER	POLYIMIDE 1mil thick.	(25)
COVER ADHESIVE		(25)
SURFACE TREATMENT	NICKEL UNDERCOAT 1 to 5μm + GOLD PLATING 0.2μm	3
COPPER FOIL	Cu 1 oz	35
BASE ADHESIVE	HEAT-HARDENED ADHESIVE	25
BASE FILM	POLYIMIDE 1mil thick	25
REINFORCEMENT MATERIAL ADHESIVE	HEAT-HARDENED ADHESIVE	30
STIFFENER FILM	POLYIMIDE 7mil thick	175

FFC CONFIGURATION (REFERENCE EXAMPLE) (SCALE:FREE)



MATERIAL NAME	MATERIAL	THICKNESS (mm)
POLYESTER FILM		(12)
ADHESIVE	THERMOPLASTIC POLYESTER	(30)
GOLD PLATED, SOFT COPPER FILM		35
ADHESIVE	POLYESTER	30
POLYESTER		12
ADHESIVE	POLYESTER	30
STIFFENER FILM	POLYESTER	188



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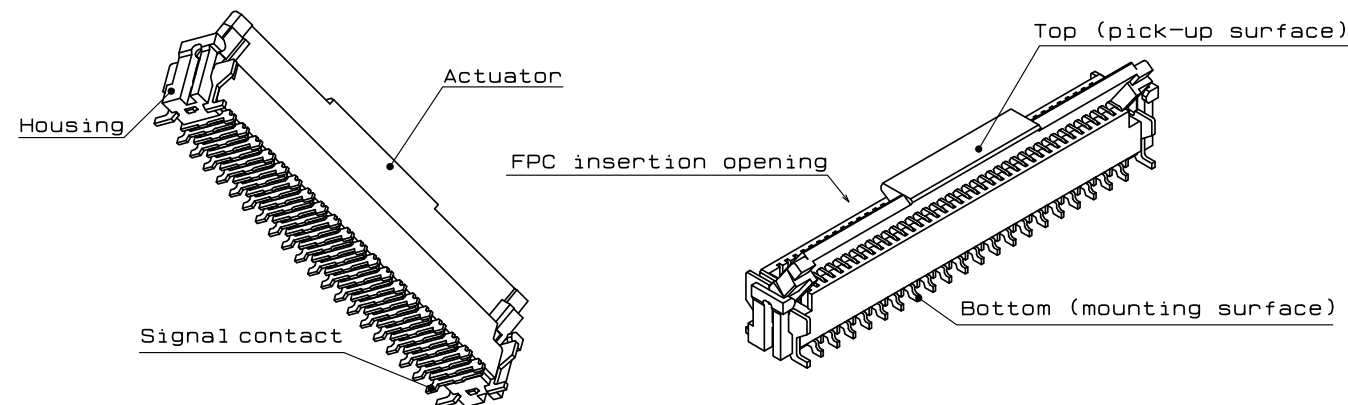
PART NO.	CODE NO.	NUMBER OF CONTACTS	DIMENSION TABLE OF CONNECTOR, FPC, FFC, PCB MOUNTING PATTERN AND STENCIL PATTERN								DIMENSION TABLE OF DRAWING FOR PACKING 						
			A	B	C	D	E	F	G	H	J	K	L	M	N	P	
FH12- 6S-0.5SVA(54)	CL586-0756-4-54	6	6.4	4.9	2.5	4.5	6.2	2	3.5	16	—	7.5	6.5	17.4	21.4	2	
FH12-10S-0.5SVA(54)	CL586-0806-0-54	10	8.4	6.9	4.5	6.5	8.2	4	5.5	16	—	7.5	8.5	17.4	21.4	3	
FH12-12S-0.5SVA(54)	CL586-0757-7-54	12	9.4	7.9	5.5	7.5	9.2	4	6.5	16	—	7.5	9.5	17.4	21.4	4	
FH12-13S-0.5SVA(54)	CL586-0807-3-54	13	9.9	8.4	6	8	9.7	4	7	24	—	11.5	10	25.4	29.4	4	
FH12-15S-0.5SVA(54)	CL586-0808-6-54	15	10.9	9.4	7	9	10.7	4	8	24	—	11.5	11	25.4	29.4	4	
FH12-16S-0.5SVA(54)	CL586-0809-9-54	16	11.4	9.9	7.5	9.5	11.2	4	8.5	24	—	11.5	11.5	25.4	29.4	4	
FH12-17S-0.5SVA(54)	CL586-0810-8-54	17	11.9	10.4	8	10	11.7	4	9	24	—	11.5	12	25.4	29.4	4	
FH12-18S-0.5SVA(54)	CL586-0811-0-54	18	12.4	10.9	8.5	10.5	12.2	4	9.5	24	—	11.5	12.5	25.4	29.4	4	
FH12-20S-0.5SVA(54)	CL586-0812-3-54	20	13.4	11.9	9.5	11.5	13.2	4	10.5	24	—	11.5	13.5	25.4	29.4	4	
FH12-22S-0.5SVA(54)	CL586-0813-6-54	22	14.4	12.9	10.5	12.5	14.2	8	11.5	24	—	11.5	14.5	25.4	29.4	6	
FH12-24S-0.5SVA(54)	CL586-0814-9-54	24	15.4	13.9	11.5	13.5	15.2	8	12.5	24	—	11.5	15.5	25.4	29.4	6	
FH12-26S-0.5SVA(54)	CL586-0815-1-54	26	16.4	14.9	12.5	14.5	16.2	8	13.5	24	—	11.5	16.5	25.4	29.4	6	
FH12-30S-0.5SVA(54)	CL586-0750-8-54	30	18.4	16.9	14.5	16.5	18.2	8	15.5	32	28.4	14.2	18.5	33.4	37.4	6	
FH12-32S-0.5SVA(54)	CL586-0816-4-54	32	19.4	17.9	15.5	17.5	19.2	8	16.5	32	28.4	14.2	19.5	33.4	37.4	6	
FH12-33S-0.5SVA(54)	CL586-0818-0-54	33	19.9	18.4	16	18	19.7	8	17	32	28.4	14.2	20	33.4	37.4	6	
FH12-34S-0.5SVA(54)	CL586-0817-7-54	34	20.4	18.9	16.5	18.5	20.2	8	17.5	44	40.4	20.2	20.5	45.4	49.4	6	
FH12-36S-0.5SVA(54)	CL586-0819-2-54	36	21.4	19.9	17.5	19.5	21.2	8	18.5	44	40.4	20.2	21.5	45.4	49.4	6	
FH12-40S-0.5SVA(54)	CL586-0804-5-54	40	23.4	21.9	19.5	21.5	23.2	8	20.5	44	40.4	20.2	23.5	45.4	49.4	6	
FH12-45S-0.5SVA(54)	CL586-0820-1-54	45	25.9	24.4	22	24	25.7	8	23	44	40.4	20.2	26	45.4	49.4	6	
FH12-49S-0.5SVA(54)	CL586-0821-4-54	49	27.9	26.4	24	26	27.7	8	25	44	40.4	20.2	28	45.4	49.4	6	
FH12-50S-0.5SVA(54)	CL586-0805-8-54	50	28.4	26.9	24.5	26.5	28.2	8	25.5	44	40.4	20.2	28.5	45.4	49.4	6	
FH12-60S-0.5SVA(54)	CL586-0749-9-54	60	33.4	31.9	29.5	31.5	33.2	8	30.5	56	52.4	26.2	33.5	57.4	61.4	6	

	DRAWING NO.	EDC3-159266-03	
	PART NO.	FH12- ** S-0.5SVA(54)	
	CODE NO.	CL586	 5/9

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This connector requires 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.
This instruction manual is applicable to usage with FPC/FFC.

[Connector part nomenclature]



[Operation and precautions]

1. Initial condition

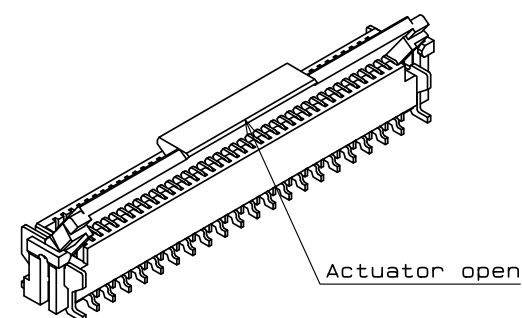
The product is supplied with the actuator opened (actuator is standing vertically state). (Example 1)
Actuator does not have to be operated before inserting FPC.

[Caution]

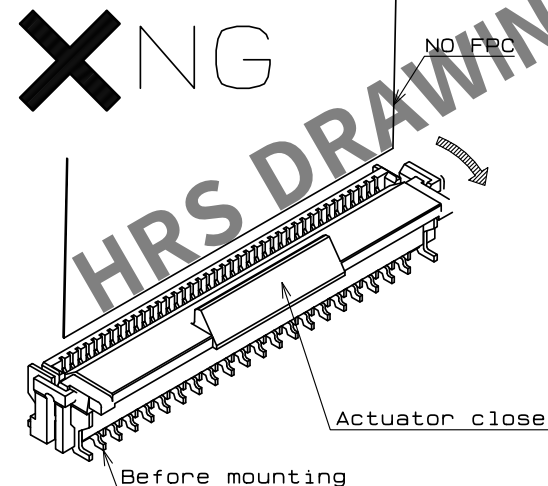
- Do not close the actuator when the FPC is not inserted (Example 2).
- Do not insert FPC or operate actuator before mounting (Example 2).

Example 1)

- When delivered -



Example 2)



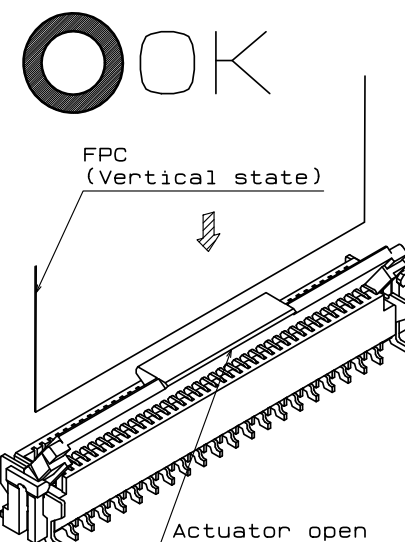
2. How to insert FPC

Insert the FPC into the connector opening vertically to the PCB surface (Example 3).
Insert it properly to the very end.

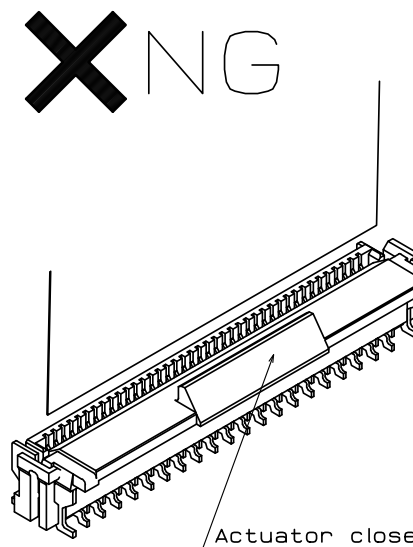
[Caution]

- Make sure the actuator is closed when inserting the FPC.
Do not insert the FPC when the actuator is close (Example 4).
While actuator is close, it is structured so that FPC can't be inserted, but if it is forced to insert FPC it will cause breakage.
- Do not insert the FPC when the actuator is pressed from above a finger (Example 5).
- Insert the FPC pattern surface on the opposite side of the actuator operation part (Example 6).
- Align both sides of the tip of FPC vertically to the sides of the connector opening and insert straight forward (Example 7).
- Do not twist the FPC to up and down or right and left or an angle (Example 8, 9).
- Do not close actuator with fingers when insert FPC (Example 10).

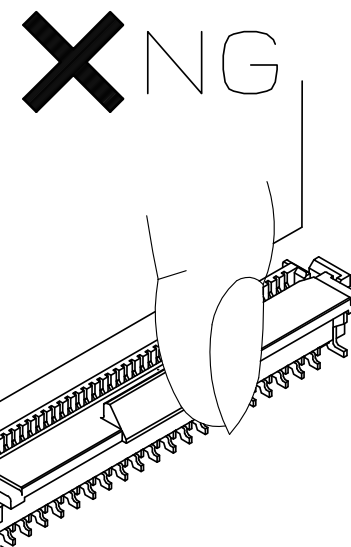
Example 3)



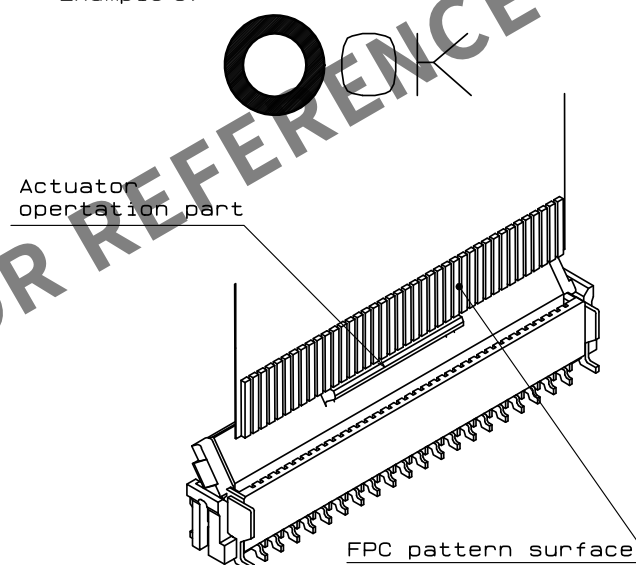
Example 4)



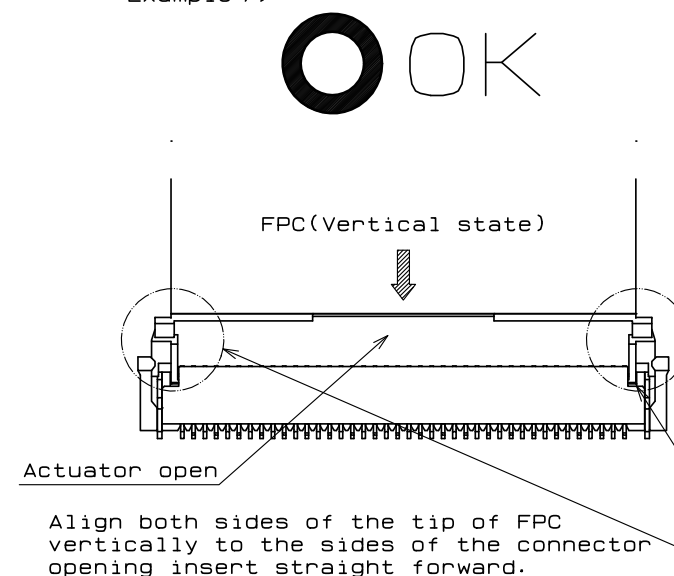
Example 5)



Example 6)



Example 7)



Example 8)



Example 9)



Example 10)



<Instruction manual(1)>

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DRAWING NO.	EDC3-159266-03
PART NO.	FH12-**S-0.5SVA(54)
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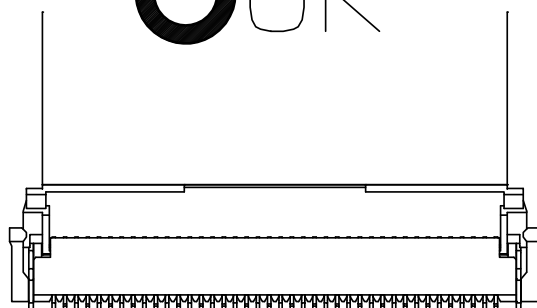
3. FPC insertion check
Make sure that the FPC tabs are located in proper position
after FPC insertion (Example 11).
(The FPC position is to be aligned by the protrusion of the housing.)

[Caution]

- Do not insert the FPC at an angle
and/or stop it before insertion is completed (Example 12).

Example 11)

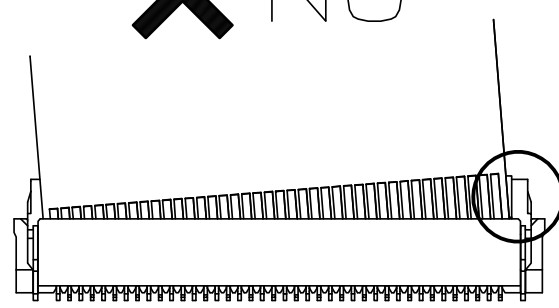
OK



FPC is completely inserted
to the end.

Example 12)

NG



FPC is inserted in slanted angle and
not fully inserted to the end.

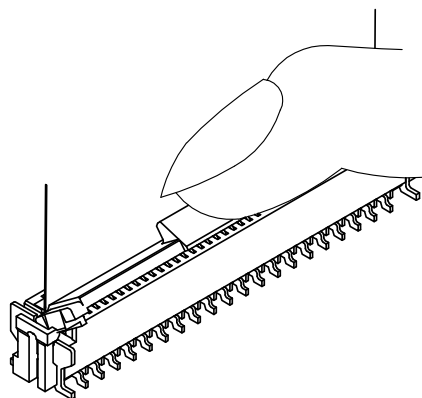
4. Use of the actuator(open/close)
Slowly flip down the actuator to the lock (Example 13).
Slowly flip up the actuator to release the lock (Example 14).

[Caution]

- To open/close the actuator, operate at the center of the actuator (Example 15).
- To open/close the actuator, do not operate the actuator
at one end only (Example 16).
- The actuator is closed up to the movable limit, 90 degree.
Do not close the actuator beyond the specified degree or
apply excess force to the actuator (Example 17).
- Do not pick the actuator to lift and pull it (Example 18).
- Operate the actuator by hand
without using sharp tool such as Tweezers. (Example 19).
- Do not apply excess force to the actuator during the operation (Example 20).

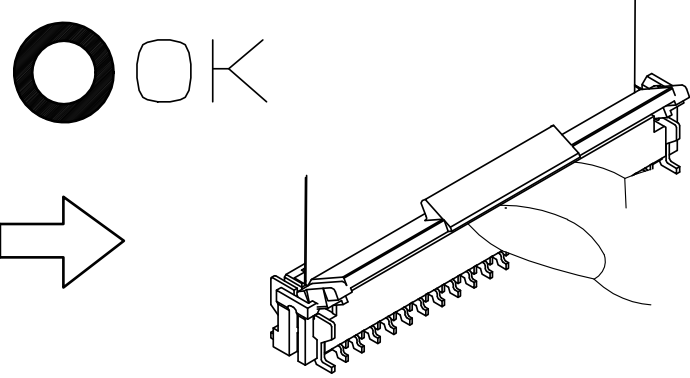
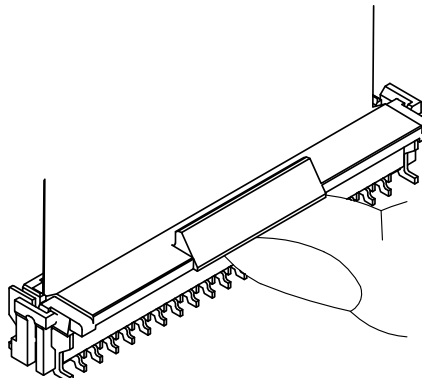
Example 13)

OK



Example 14)

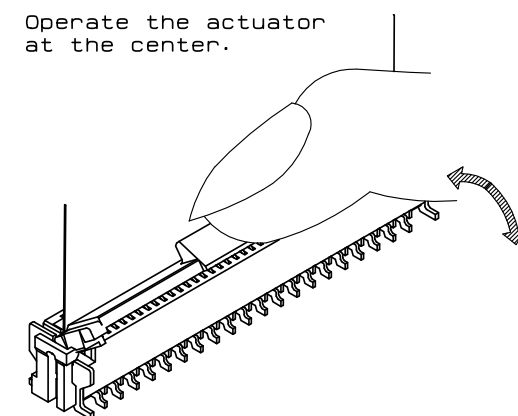
OK



Example 15)

OK

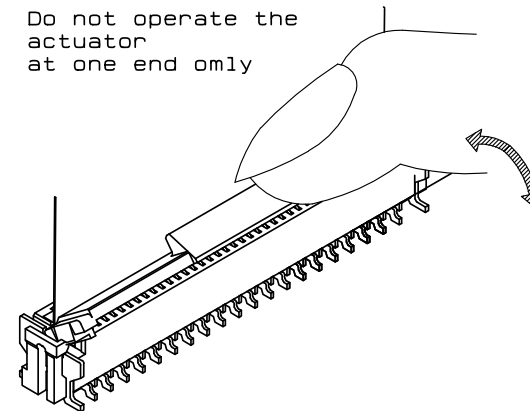
Operate the actuator
at the center.



Example 16)

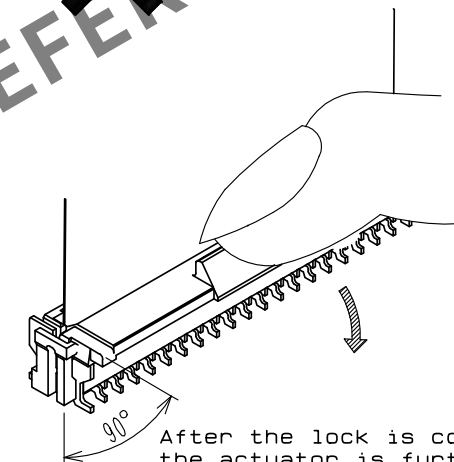
NG

Do not operate the
actuator
at one end only



Example 17)

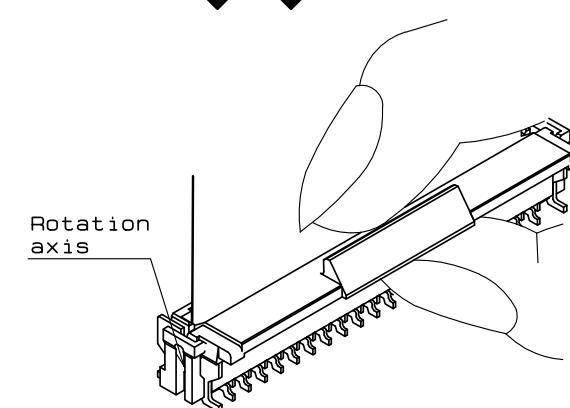
NG



After the lock is completed,
the actuator is further
attempted to close.

Example 18)

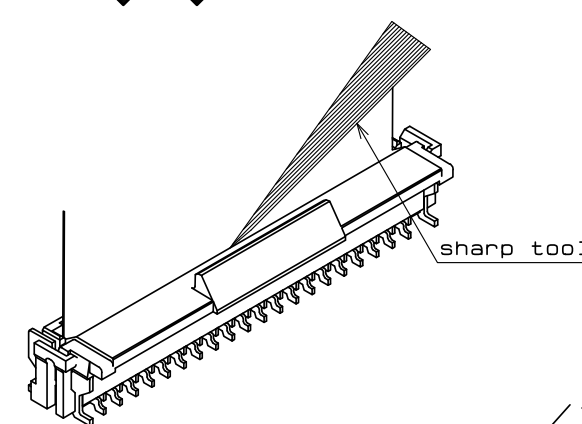
NG



The excess stress which is
applied on the rotation axis.
could cause breakage.

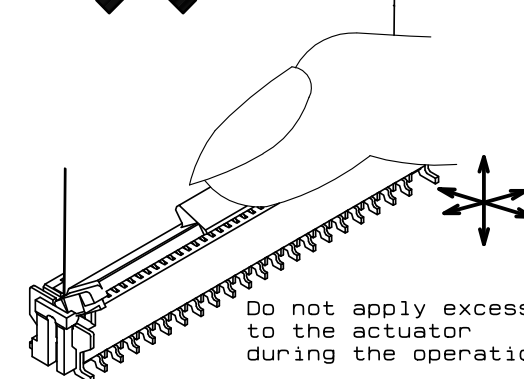
Example 19)

NG



Example 20)

NG



Do not apply excess force
to the actuator
during the operation.

<Instruction manual(2)> 1

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DRAWING NO.	EDC3-159266-03
PART NO.	FH12-**S-0.5SVA(54)
CODE NO.	ClCode

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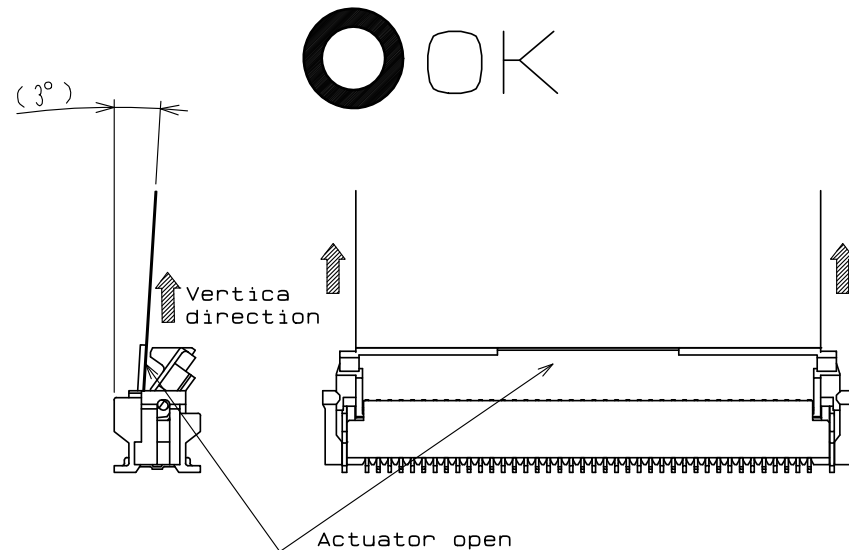
5.How to remove FPC

After flip up the actuator to the fully opened position vertically
withdraw the FPC(Example 21).

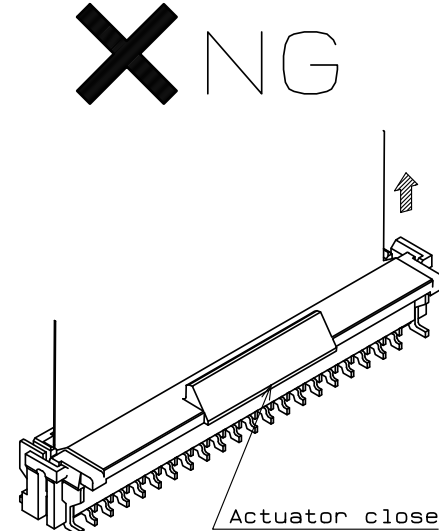
[Caution]

- Do not attempt to pull the FPC without unlocking the housing(Example 22).
- After forcibly remove FPC, retention force of FPC may decrease.
- This connector has a temporary FPC holding structure with the housing.
For FPC removal,do not pull out the FPC other than in the vertically direction
of the PCB(Example 23).

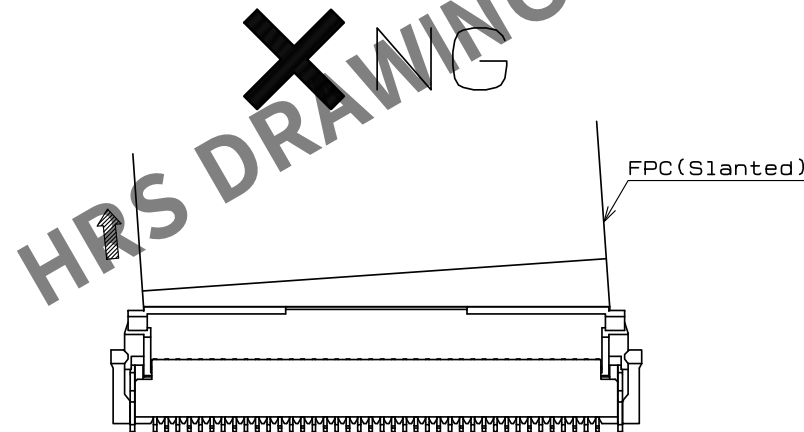
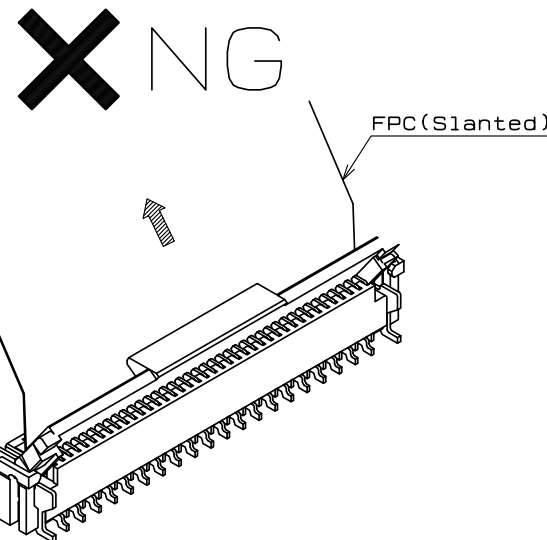
Example 21)



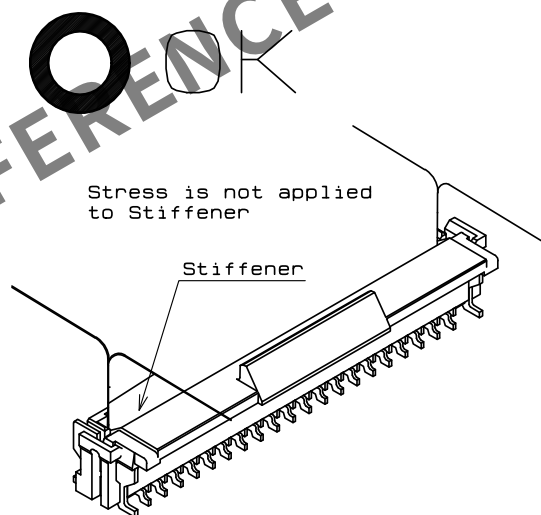
Example 22)



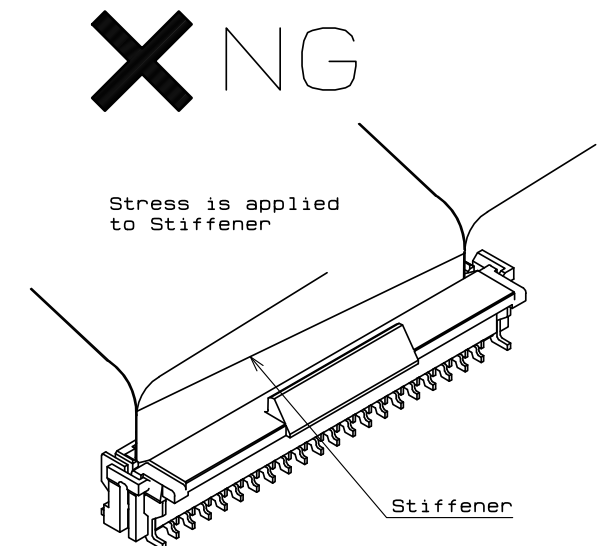
Example 23)



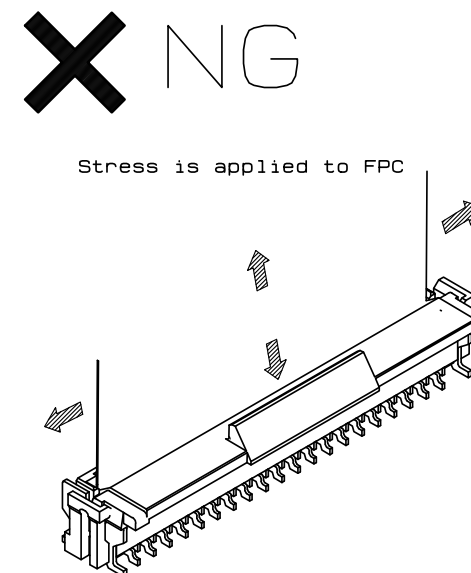
Example 24)



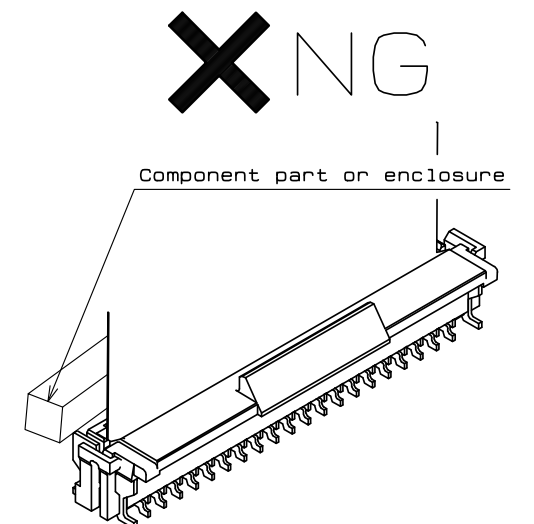
Example 25)



Example 26)



Example 27)



[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]

- When fixing FPC after FPC cabling, avoid pulling FPC, and route the wire FPC with slack.
In this regard,the stiffener is vertical to the PCB(Example24).
- Avoid applying forces to FPC in vertical or horizontal directions.
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(Example 25,26).
- Do not mount other components or enclosure touching to the FPC underneath the FPC stiffener
(Example27).
- Make adjustments with the FPC manufacturer for FPC bending performance and wire breakage.
- Keep a sufficient FPC insertion space in the stage of the layout
in order to avoid incorrect FPC insertion.
Appropriate FPC length and component layout are recommended for assembly ease.
Too short FPC length makes assembly difficult.
- Keep spaces for the locking lever movement and its operation for PCB design
and component layout.
- Please consult with our sales representative you are using FPC/FFCwith different
configuration from our recommendation.

<Instruction manual(3)>△

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DRAWING NO.	EDC3-159266-03
PART NO.	FH12-**S-0.5SVA(54)
CODE NO.	ClCode

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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.
- 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 lead 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 1.0 N or greater external force when unreel or pick and place the connector etc, or it may get broken.

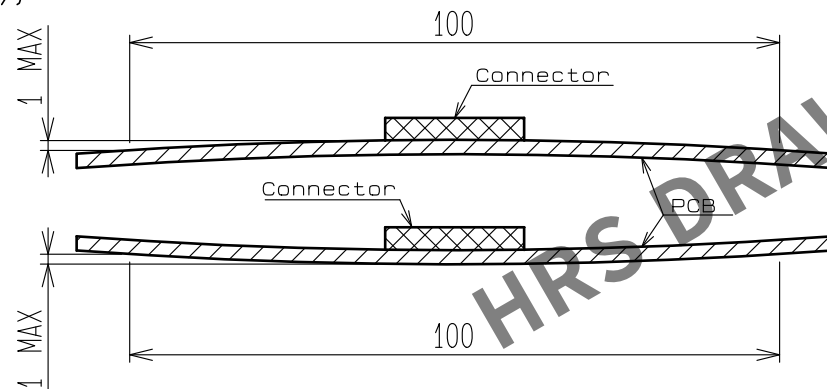
[Instructions for PCB handling after mounting the connector]

Follow the instructions shown below when mounting on the PCB.

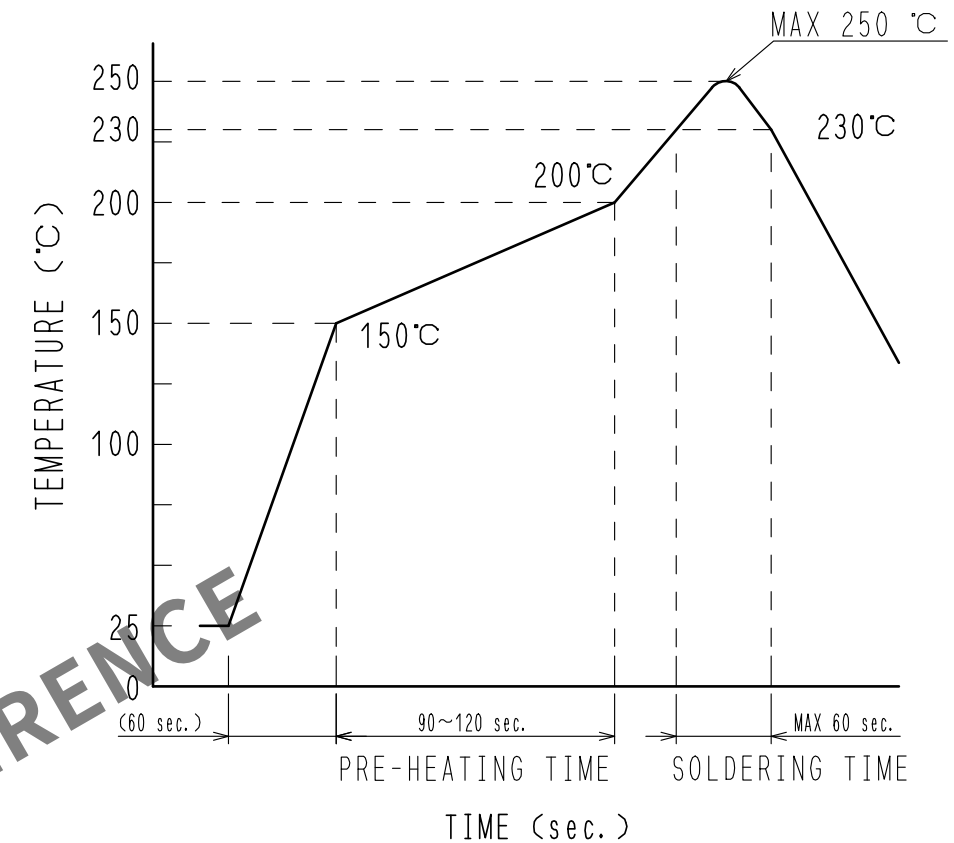
[Caution]

- Splitting a large PCB into several pieces
 - Screwing the PCB
- During the handling described above, do not exert an excessive force on the PCB. Otherwise, the connector may become defective.
- The warp of a 100 mm wide PCB should be 1.0 mm or less. The warp of PCB suffers stress on connector and the connector may become defective (Example 27).

Example 27)



[Recommended reflow temperature profile]



Reflow method: IR reflow
Number of reflow cycles: 2 cycles MAX.
1) Reflow time
Duration above 230°C: 60 sec MAX.
(Peak temperature: 250°C MAX)
2) Pre-heat time
Pre-heat temperature (MIN): 150°C
Pre-heat temperature (MAX): 200°C
Pre-heat time: 90~120 sec.

[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 terminals, solder or flux may adhere to the contacts, resulting in poor contact. Supplying excessive solder to the metal fittings may hinder locking lever rotation, resulting in breakage of the connector.

<Instruction manual(4)>

	DRAWING NO.	EDC3-159266-03
	PART NO.	FH12-**S-0.5SVA(54)
	CODE NO.	ClCode 9/9