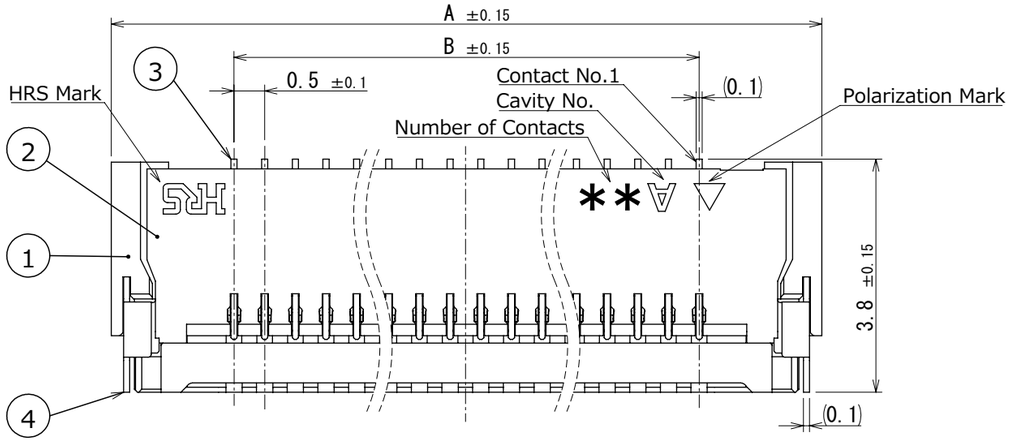
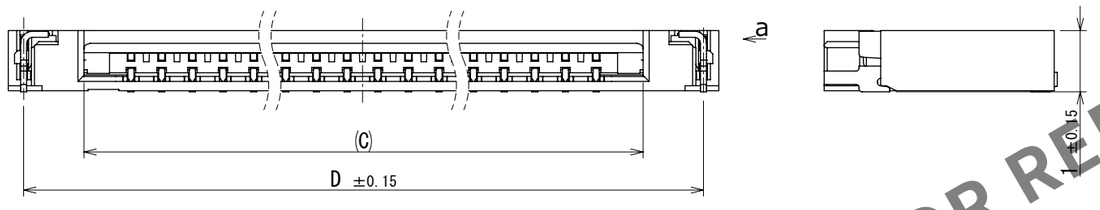
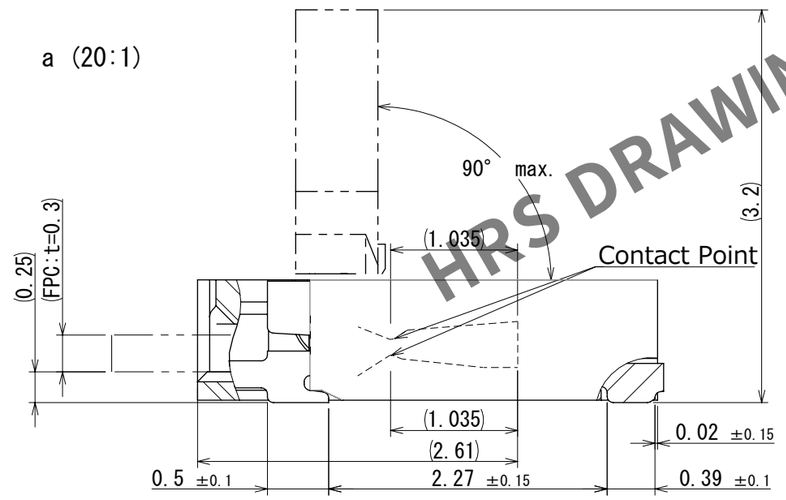
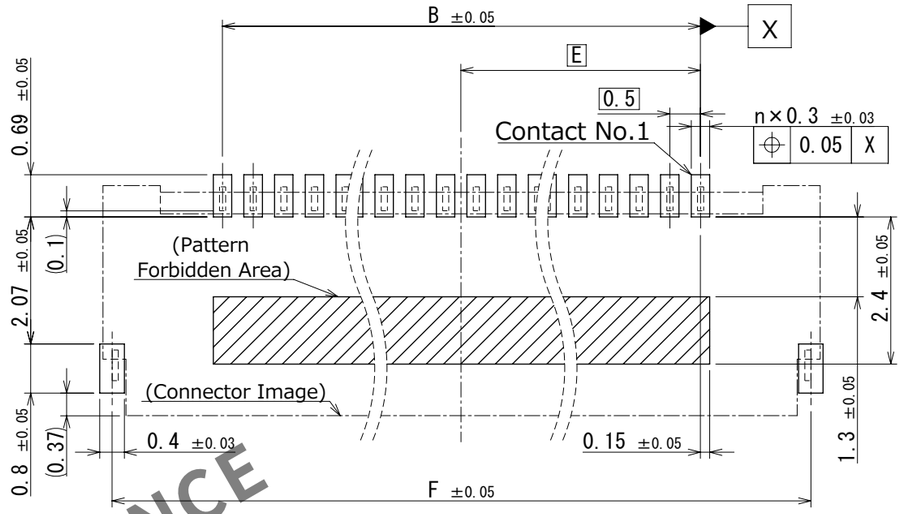




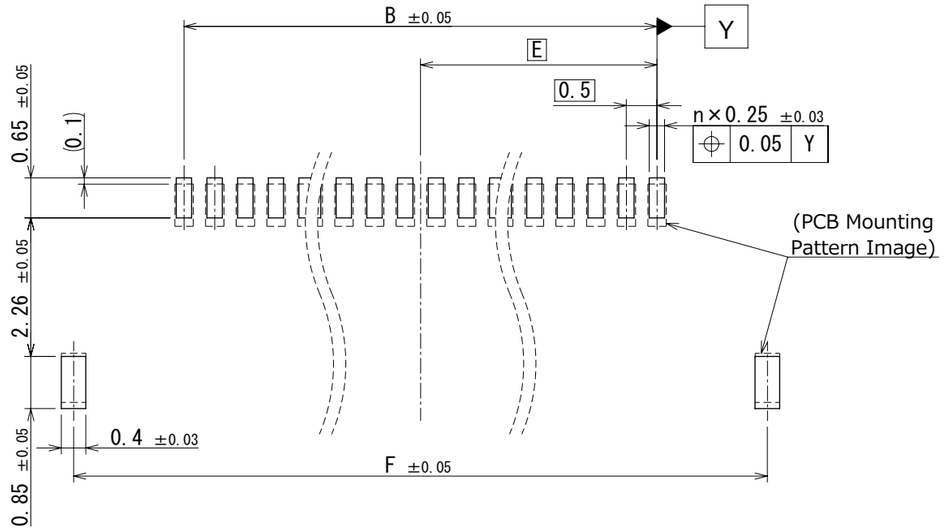


Recommended PCB Mounting Pattern



Recommended Stencil Pattern

(Recommended stencil thickness:t=0.1)



Notes
1. The dimension in parentheses are for reference.
2. Lead co-planarity including reinforced metal fitting shall be 0.1 max.
3. Note that preventive hole for sink mark or slit could be added for improvement.
4. The quality remains good, even with the dark spots, which could occasionally occur on molded plastic.
5. This product satisfies halogen free requirements defined as 900ppm maximum chlorine, 900ppm maximum bromine, and 1500ppm maximum total of chlorine and bromine.
6. "n" represents the number of contacts.

NO.	MATERIAL	FINISH , REMARKS	NO.	MATERIAL	FINISH , REMARKS
4	Phosphor bronze	Tin plating 1μm MIN. over Copper 0.5μm MIN.	8	Polystyrene	
3	Copper alloy	(Contact area,Lead) Gold plating 0.03μm MIN. over Nickel 1μm MIN. (Other) Nickel plating 1μm MIN.	7	(Connector)	
2	LCP	BLACK	6	Polyester	
1	LCP	BEIGE	5	Polystyrene	

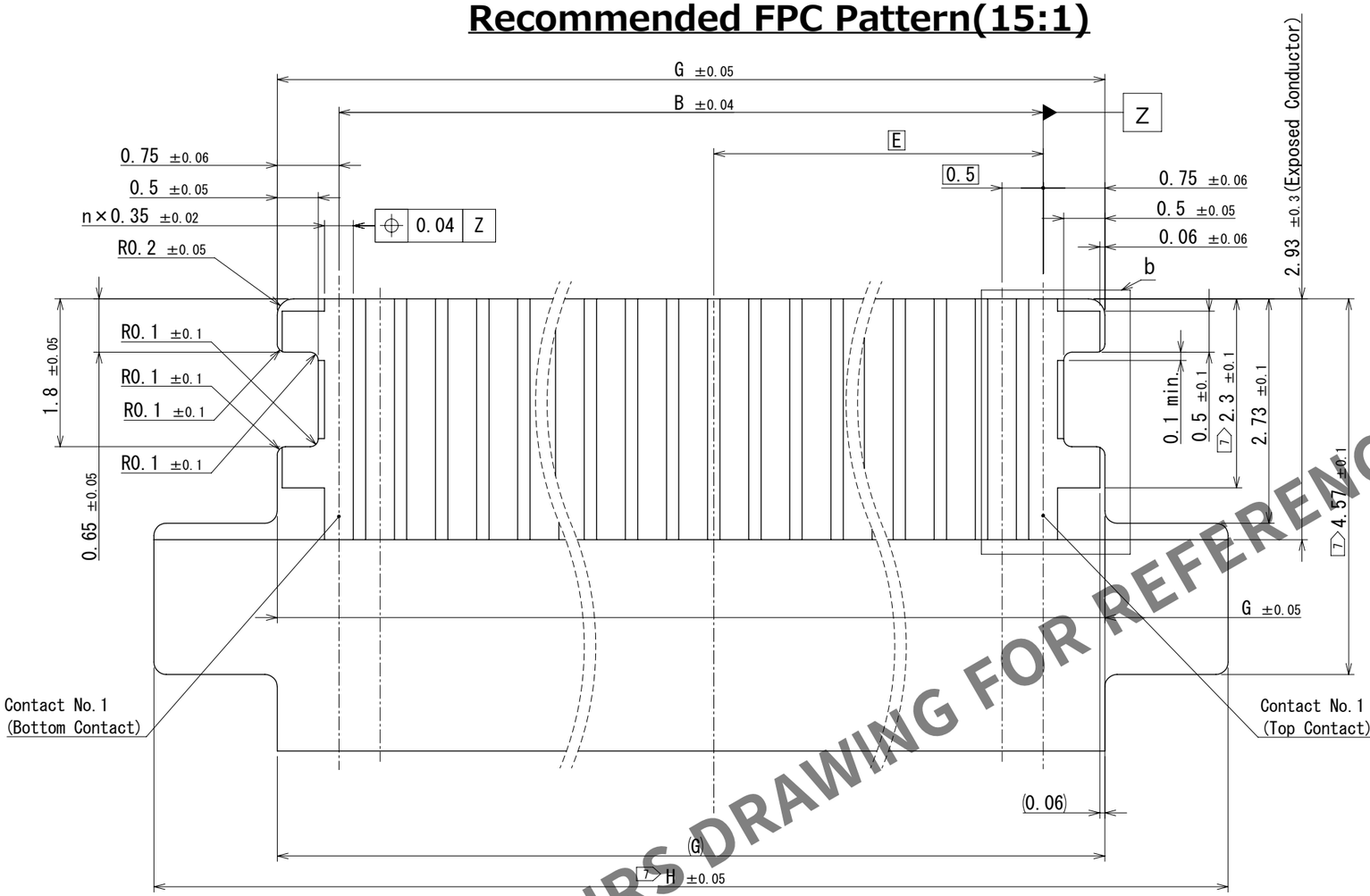
UNITS	SCALE	COUNT	DESCRIPTION OF REVISIONS	DESIGNED	CHECKED	DATE
mm	10:1	0				

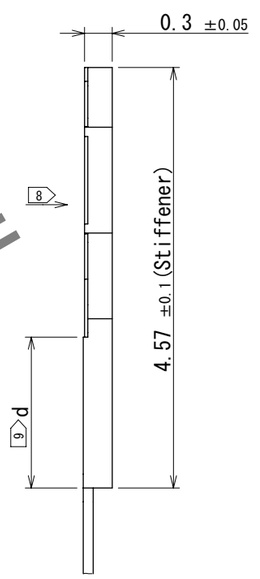
HIROSE ELECTRIC CO., LTD.

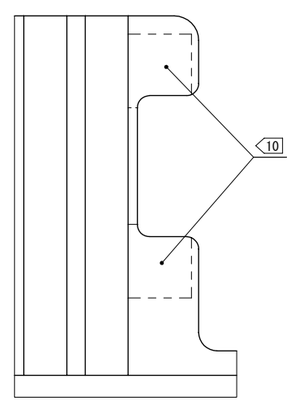
APPROVED	HH. MURAKAMI	2025.04.02	DRAWING NO. EDCX-408946-00-00
CHECKED	HY. YAMAZAKI	2025.04.01	PART NO. FH81-**S-0.5SH
DESIGNED	YT. SASAKI	2025.03.31	
DRAWN	YT. SASAKI	2025.03.31	CODE NO. CL0005-0682-0-00

0 1/8

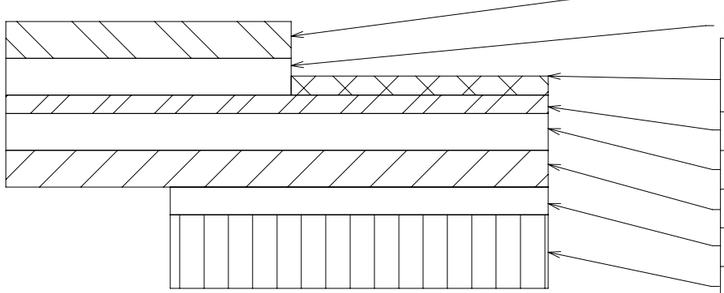
Recommended FPC Pattern(15:1)







FPC Configuration(Reference Example) (Free)



Material name	Material	Thickness(μm)
Covering film layer	Polyimide 1mil	25
Cover adhesive		25
Surface treatment	1μm to 5μm nickel underplated 0.2μm gold plated	(3)
Copper foil	Cu 1 oz	35
Base adhesive	Heat-hardend adhesive	25
Base film	Polyimide 1mil	25
Reinforcement material adhesive	Heat-hardend adhesive	35
Stiffener	Polyimide 7mil	175

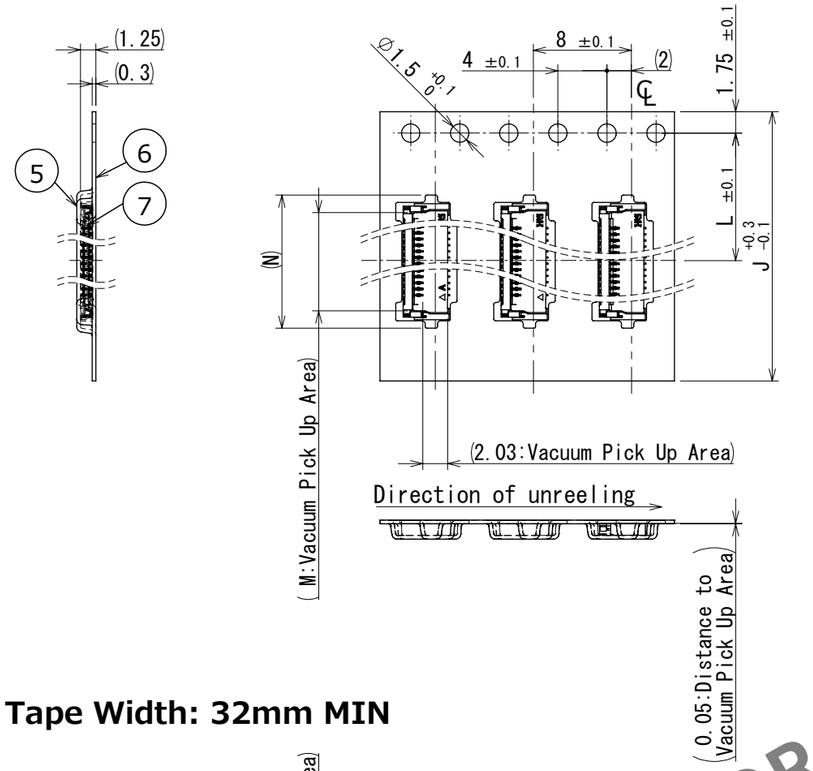
Notes
7 FPC without tab is also available.
8 Recommended puncher direction:
From conductor side to stiffener side.
9 Dimension d must be 0.5mm MIN.
10 Patterns at both ends are optional.

HRS	DRAWING NO.	EDCX-408946-00-00
	PART NO.	FH81-**S-0.5SH
	CODE NO.	CL0005-0682-0-00 △0 2/8

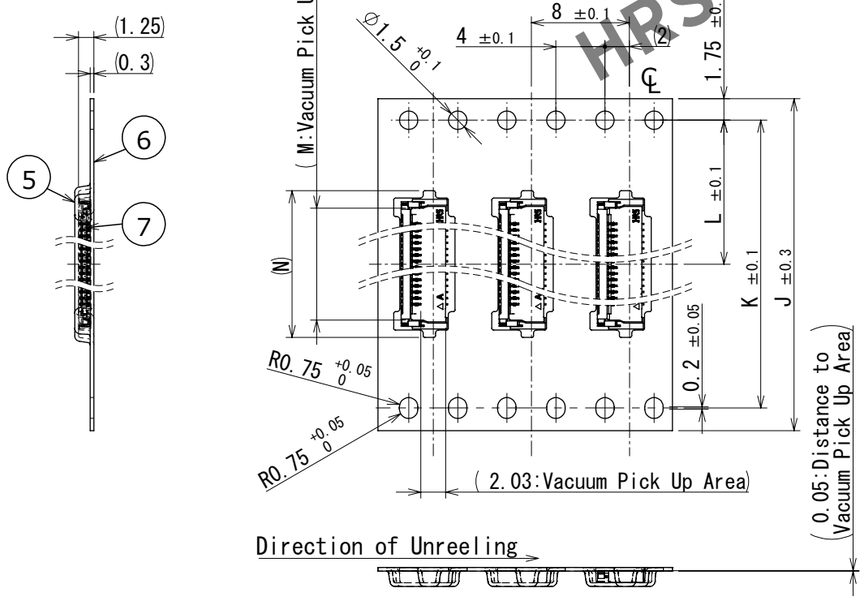
3D Model File Name:FH81-XXS-0p5SH_CustomerDrawing

Embossed Carrier Tape Dimensions(2:1)

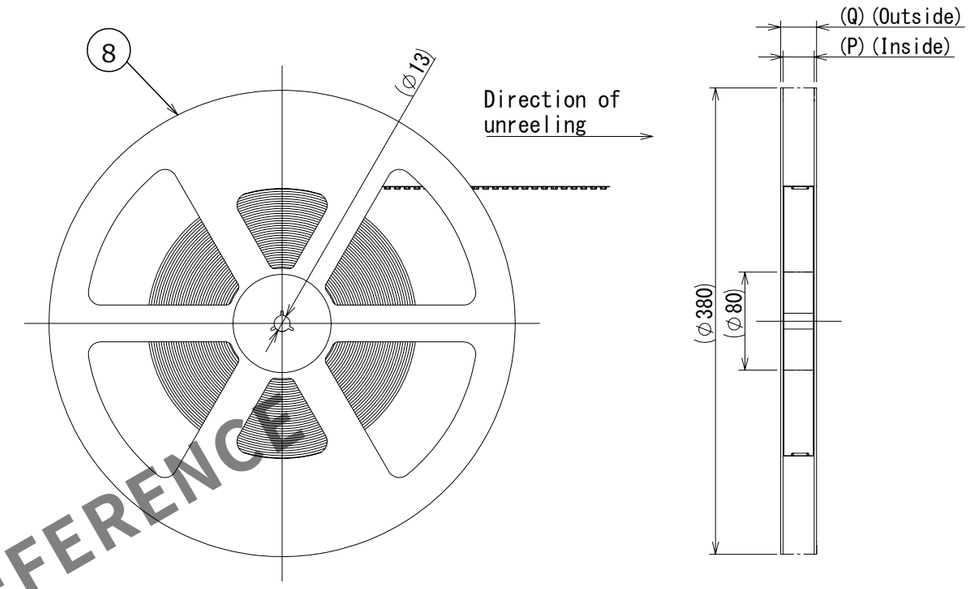
Tape Width: 24mm MAX



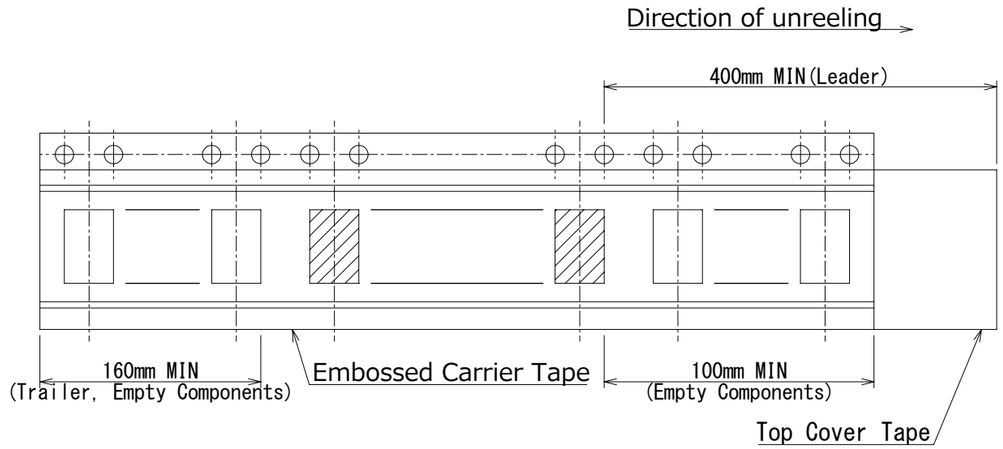
Tape Width: 32mm MIN



Reel Dimension (Free)



Leader,Trailer Dimension (Free)



Notes 11. Per reel : 6500 connectors.
12. Refer to JIS C 0806 and IEC 60286-3.
(Packing of components for automatic handling.)

HRS	DRAWING NO.	EDCX-408946-00-00
	PART NO.	FH81-**S-0.5SH
	CODE NO.	CL0005-0682-0-00 △0 3/8

3D Model File Name:FH81-XXS-0p5SH_CustomerDrawing

Part Number	Code Number*	Number of Contacts : n	Dimensions								Packing Specification Dimensions						
			A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
FH81-4S-0.5SH	-	4	5.5	1.5	3.03	5	0.75	5.1	3	6	24	-	11.5	4.06	6.9	25.4	29.4
FH81-6S-0.5SH	-	6	6.5	2.5	4.03	6	1.25	6.1	4	7				5.06	7.9		
FH81-8S-0.5SH	-	8	7.5	3.5	5.03	7	1.75	7.1	5	8				6.06	8.9		
FH81-10S-0.5SH	-	10	8.5	4.5	6.03	8	2.25	8.1	6	9				7.06	9.9		
FH81-16S-0.5SH	-	16	11.5	7.5	9.03	11	3.75	11.1	9	12				10.06	12.9		
FH81-20S-0.5SH	-	20	13.5	9.5	11.03	13	4.75	13.1	11	14	32	28.4	14.2	12.06	14.9	33.4	37.4
FH81-24S-0.5SH	CL0580-6004-0-00	24	15.5	11.5	13.03	15	5.75	15.1	13	16				14.06	16.9		
FH81-26S-0.5SH	-	26	16.5	12.5	14.03	16	6.25	16.1	14	17				15.06	17.9		

* The products without code number are currently under planning.
Please contact Hirose for detailed information about product variation.

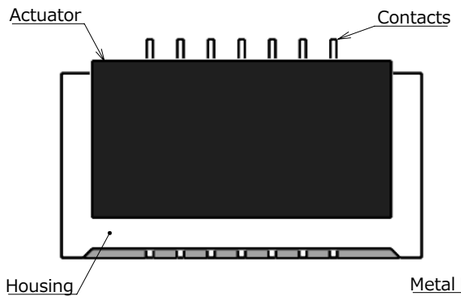
HRS	DRAWING NO.	EDCX-408946-00-00
	PART NO.	FH81-**S-0.5SH
	CODE NO.	CL0005-0682-0-00

FORM HC0011-28

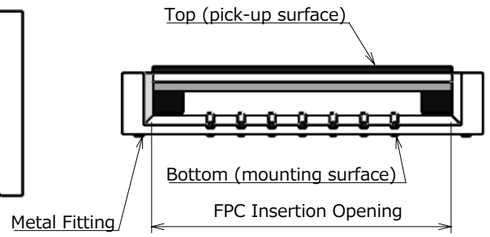
3D Model File Name:FH81-XXS-0p5SH_CustomerDrawing

Indicates Connector Usage for a Typical OneAction Structure.

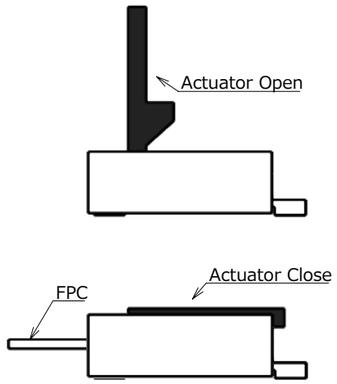
To prevent connector/FPC breakage and contact failure (mating failure, FPC pattern breakage, etc), read through the instructions shown below and handle the connector properly.
Although this instruction manual is applicable to usage with FPC/FFC.



- Top View -

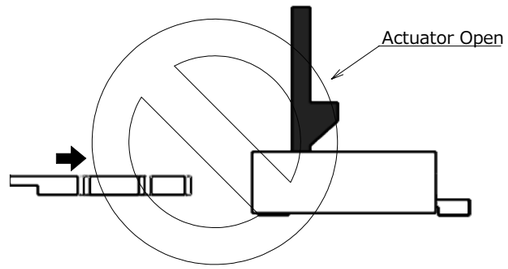


- Front View -

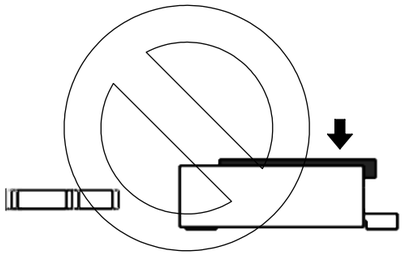


- Side View -

NG
Insertion with actuator open



NG
Insertion with a load to actuator

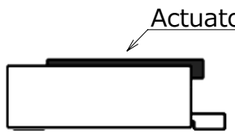


【Operation and Cautions】

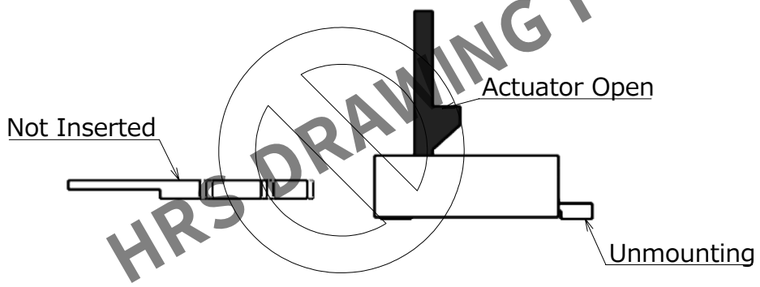
1. Initial Condition

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

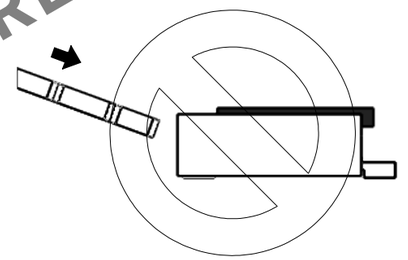
NG
Connector operation when FPC is not inserted or unmounted.



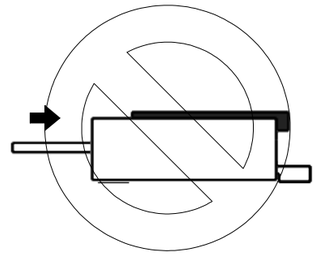
- When Delivered -



NG
Insertion excessive angles from PCB surface

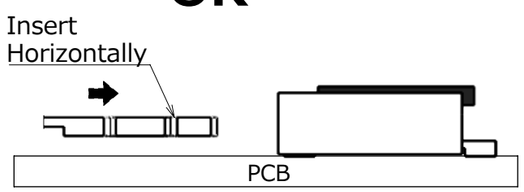


NG
Extra force to the FPC after insertion

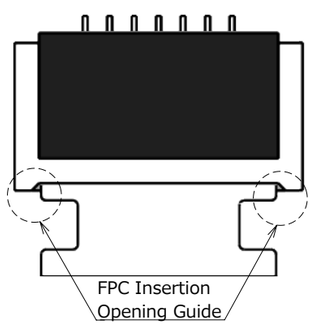


2. How to Insert FPC
With the actuator in the close position, perform the following operations .
- When inserting the FPC, insert the FPC horizontally to the PCB mounting surface.
Also, please position both ends of the FPC by insertion opening guide and then insert it straightly.

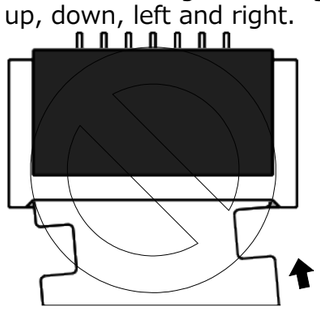
OK



OK

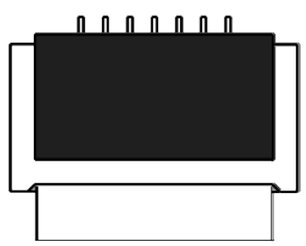


NG
Insertion during wrenching up, down, left and right.



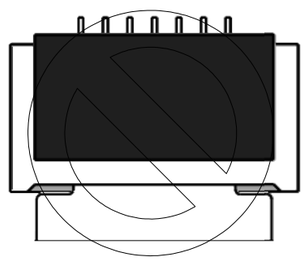
3. FPC insertion check and mating confirmation of the FPC (For FPC with tabs)
Make sure that the FPC tabs are located in correct position as shown in the figure below after FPC insertion and mating.

OK



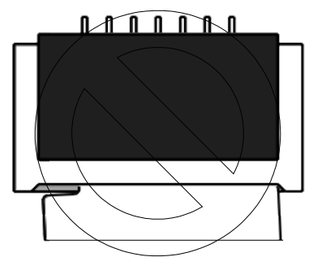
- Correct Assembled -

NG



- Incorrect Assembled -
(Insufficiently Inserted)

NG

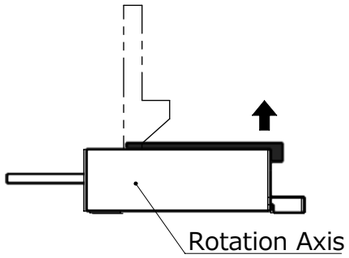


- Incorrect Assembled -
(Angle Insertion)

HRS	DRAWING NO.	EDCX-408946-00-00
	PART NO.	FH81-**S-0.5SH
	CODE NO.	CL0005-0682-0-00

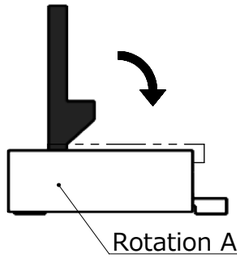
4. How to Operate the Actuator
The actuator rotates around the rotational axis.
Open : Slowly flip up the actuator
Close : Slowly rotate the actuator

OK



- How to Open -

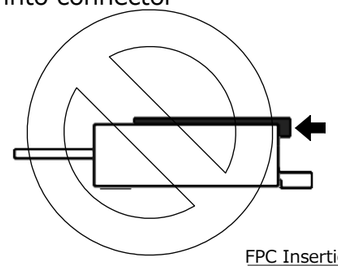
OK



- How to Close -

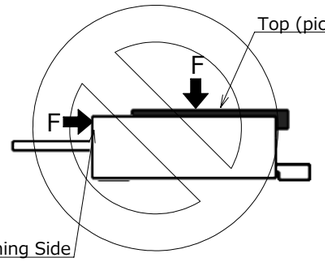
NG

Operation to push the actuator into connector



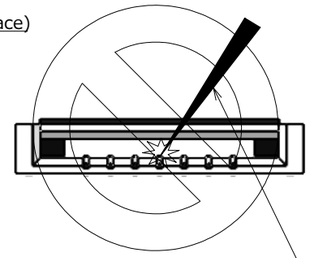
NG

Excessive force to housing



NG

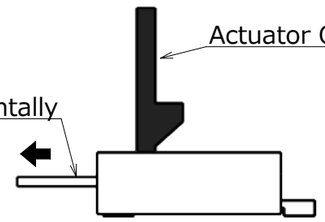
Damage connector contacts.



ex) Conduction Check with Contact

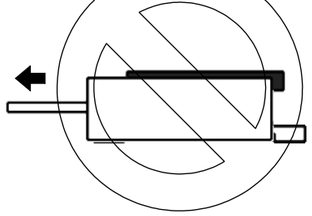
5. How to Remove FPC
With the actuator in the open position, perform the following operations .
- When removing the FPC, please pull it horizontally.

OK



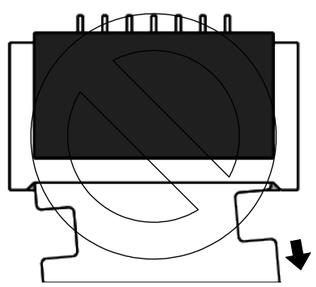
NG

Removal with Actuator Close



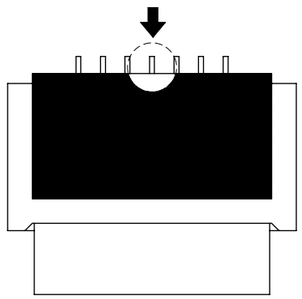
NG

Remove during wrenching up, down, left and right.



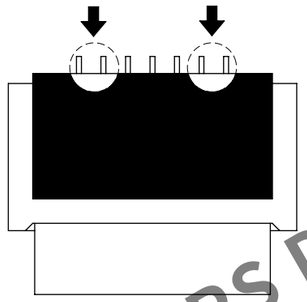
OK

Operate the center of the actuator



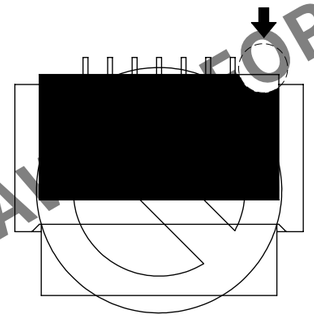
OK

Operate near both-ends of the actuator at the same timing moment. (Around 2 PIN from the end)



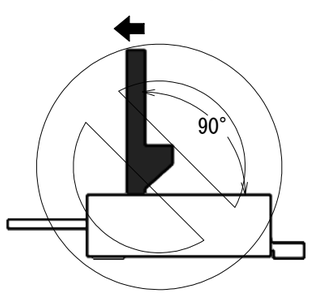
NG

Operate at one end of the actuator



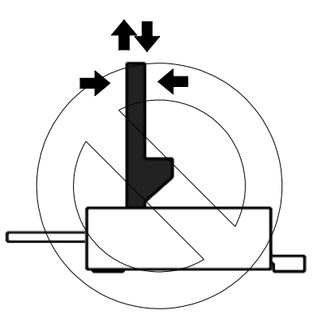
NG

Open the actuator beyond 90 degree



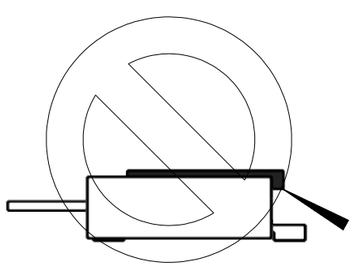
NG

Operations other than rotation



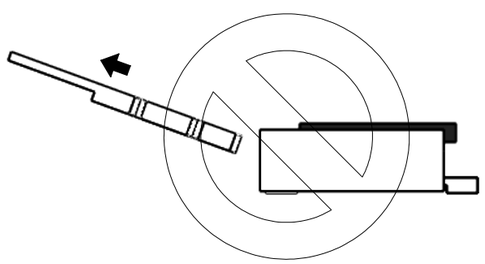
NG

Operate with a sharp tool



NG

Remove excessive angles from PCB surface



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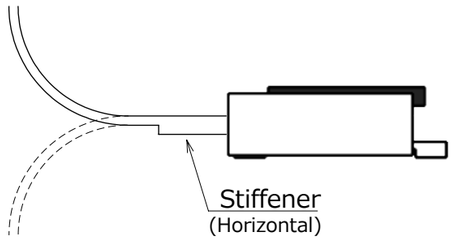
【Instructions for PCB Layout】

Please design a PCB layout not to apply load to connector and FPC.

[Cautions]
- 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.
- Do not mount other components underneath the FPC stiffener which may interfere with the connection.
- Please consult with the FPC manufacturer about FPC bending performance and wire breakage strength while making design.
- When mating the FPC with the connector while there are enclosures or components above the connector, please ensure a clearance of at least 2.5 mm from the connector mounting surface.
- When designing the PCB layout, please ensure sufficient space for the actuator's rotational movement when removing the FPC.
- Please check the usability when mounting in the center of the board.
- Please consult with our sales representative if you are using FPC with different configuration from our recommendation.

OK

No load applied to stiffener



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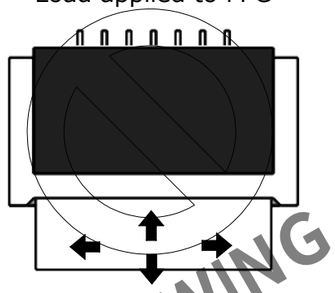
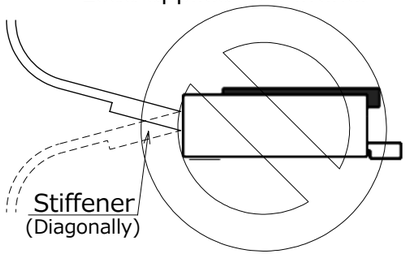
Load applied to FPC



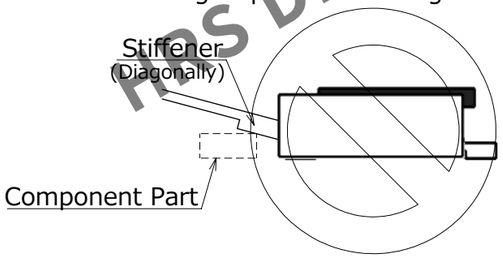
NG

Load applied to stiffener



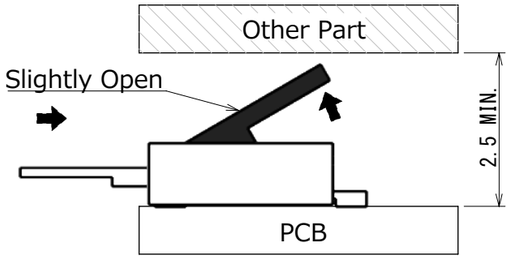
NG

Housing or parts interfering with the FPC



OK

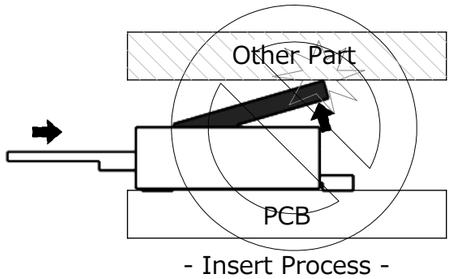
Enough clearance above the connector



- Insert Process -

NG

Not enough clearance above the connector



- Insert Process -

【Instructions for Mounting on the PCB】

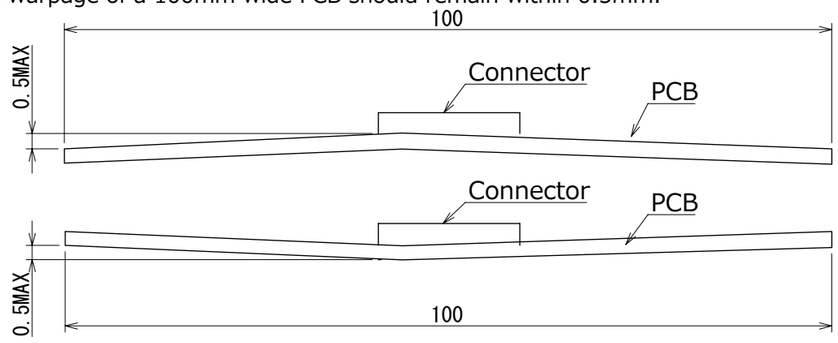
- Refer to recommended layouts for PCB、stencil pattern and FPC dimension. Please inspect the size of solder fillet and flux climbing height of the mounted connector while using different land/stencil pattern from our recommendation.
- Please verify your solder resist/silk screening design carefully before implementing the design.
- 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.
- 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 stiffner: 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.

【Instructions for PCB Handling after Mounting the Connector】

The warpage of PCB may apply excessive stress on the connector and damage the connector.

- During the assembly processes decribed below, care shall be taken so as not to give any stresses of deflection or twisting to the PCB.
  - Splitting a large PCB into several pieces
  - Installing mounting screw on PCB

- The warpage of a 100mm wide PCB should remain within 0.5mm.



【Instructions of Manual Soldering】

- Do not perform hand soldering with the FPC inserted into the connector.
- Do not apply excessive heat. And soldering iron must not touch connector except terminal leads area.
- Do not supply excessive solder (flux).

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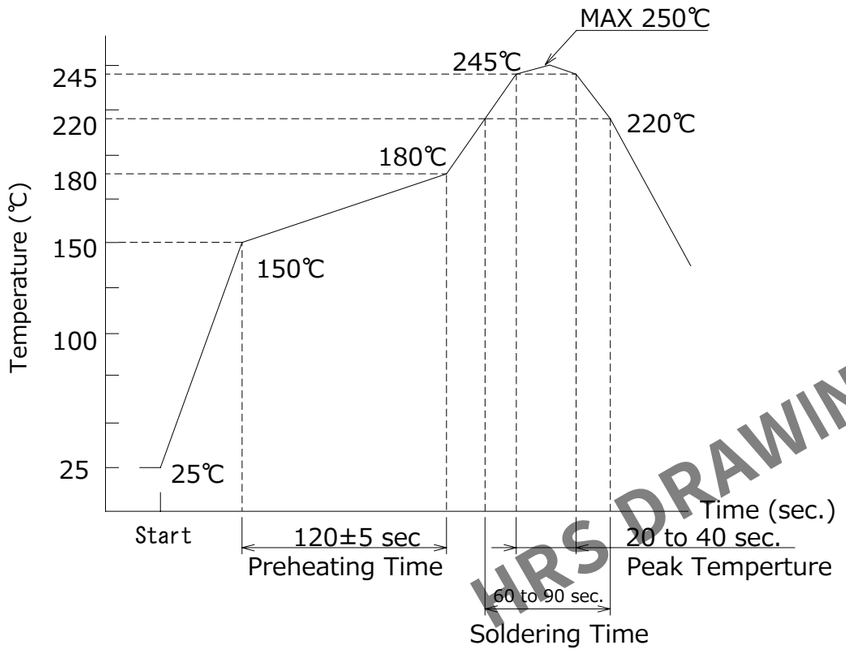
【Recommended Reflow Temperature Profile】

The temperatures mentioned above refer to the PCB surface temperature near the connector leads.
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.

- Reflow method:IR reflow
- Number of reflow cycles:2 cycles MAX.



【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.

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