

FH76 Series

0.175mm Pitch, 0.5mm Height, One Action Lock, Top Contact, FPC Connector



OneAction

Flip-Lock Pioneer **H**irose



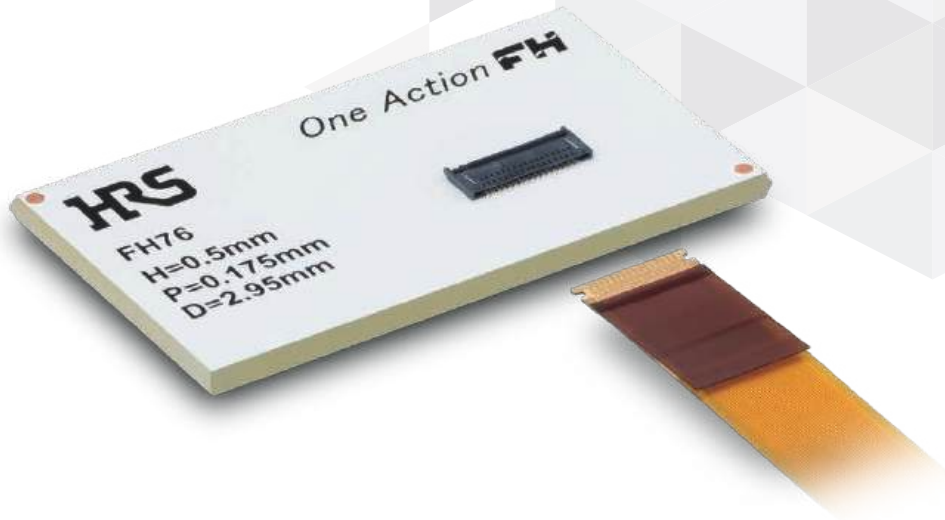
One Action



Ultra Low Profile



P= 0.175mm



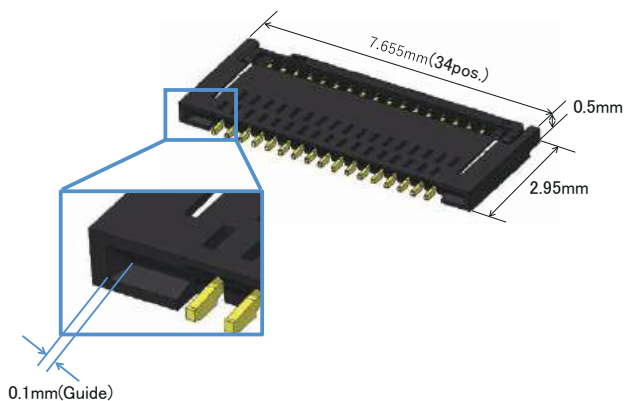
NEW



Features

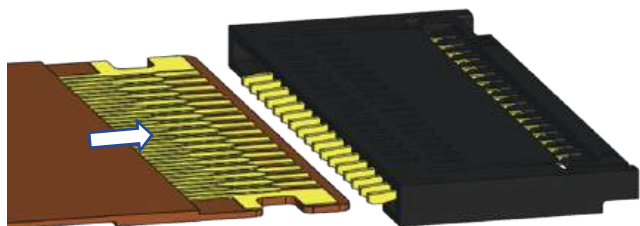
1. Ultra Low Height, Space-saving

Height: 0.5 mm, pitch: 0.175 mm, realizing space-saving.



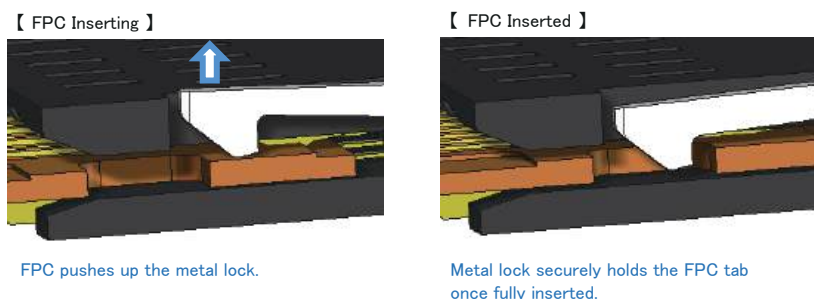
2. Automatic One Action Locking Design

No actuator operation is required during FPC inserting.



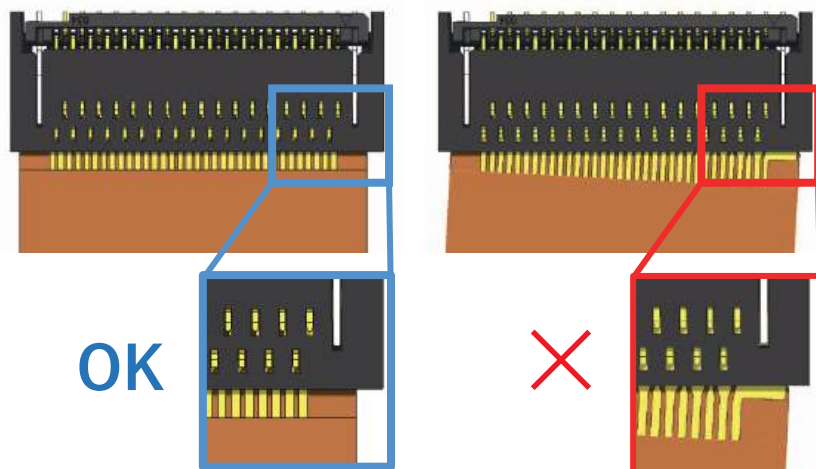
3. Improved FPC Retention Force with Lock Structure

Metal lock firmly catches cutout of FPC



4. Unique Mechanism Detects Mis-mating of FPC

Detects incomplete mating by checking the FPC tab position.



5. Environmental Compatibility

Halogen free

No chlorine or bromine exceeding the standard values are used in this connector.

*As defined by IEC 61249-2-21.

Br: 900ppm Max, Cl: 900ppm Max, Br+Cl: 1,500ppm Max.

Product Specifications

Rated Current	0.15A	Operating Temperature (Note 1)	-55 to +85°C
Rated Voltage	50V AC/DC	Operating Humidity Range	RH 90% Max. (No Condensation)
		Storage Temperature (Note 2)	-10 to +50°C
		Storage Humidity Range	RH 90% Max. (No Condensation)

Recommended FPC Specifications	t=0.12 ± 0.02mm Gold Plated
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Note 1: Includes temperature rise due to current flow.

Note 2: The term "storage" refers to products stored for long period of time prior to mounting and use. Operating temperature and humidity range are applicable to the non-energized state after board mounting.

Item	Specifications	Conditions
Insulation Resistance	50M Ω Min.	Measured at 100V DC
Withstanding Voltage	No insulation breakdown	200V AC for 1 min.
Contact Resistance	Contact Resistance: 50m Ω Max. *The conductor resistance including the FPC pattern 8mm is 200m Ω Max.	Measured at closed circuit voltage 20 mV AC Max., 1mA
Mating Durability	Contact Resistance: 50m Ω Max. *The conductor resistance including the FPC pattern 8mm is 200m Ω Max. No damage, cracks or part dislocation.	10 times
Vibration Resistance	No electrical discontinuity of 1 μ s Min. Contact Resistance: 50m Ω Max. *The conductor resistance including the FPC pattern 8mm is 200m Ω Max. No damage, cracks or part dislocation.	Frequency: 10 to 55Hz, Half amplitude: 0.75mm, 10 cycles in each of the 3 axis
Shock Resistance	No electrical discontinuity of 1 μ s Min. Contact Resistance: 50m Ω Max. *The conductor resistance including the FPC pattern 8mm is 200m Ω Max. No damage, cracks or part dislocation.	Acceleration: 981m/s ² Duration: 6ms Sine halfwave: 3 times each in 3 axial both directions
Steady-state Moisture Resistance	Contact Resistance: 50m Ω Max. *The conductor resistance including the FPC pattern 8mm is 200m Ω Max. Insulation Resistance: 50M Ω Min. No damage, cracks or part dislocation.	Leave in a temperature of +40°C and humidity of 90 to 96% for 96 hours.
Temperature Cycle	Contact Resistance: 50m Ω Max. *The conductor resistance including the FPC pattern 8mm is 200m Ω Max. Insulation Resistance: 50M Ω Min. No damage, cracks or part dislocation.	Temperature: -55 → +15 to +35 → +85 → +15 to +35°C Time: 30 → 2 to 3 → 30 → 2 to 3min. 5 cycles under the above conditions
Solder Heat Resistance	No deformation in appearance or significant damage to contacts.	Reflow: At recommended temperature profile Hand Solder: 350 ± 10°C , 5 seconds

Materials / Finish

Component	Material	Color / Finish
Insulator	LCP	Black
	LCP	Black
Contact	Copper Alloy	Nickel Barrier Gold Plated
Retention Tab	Phosphorous Bronze	Tin Reflow Plated

Product Number Structure

Refer to the chart below when determining the product specifications from the product number.
Please select from the product numbers listed in this catalog when placing orders.

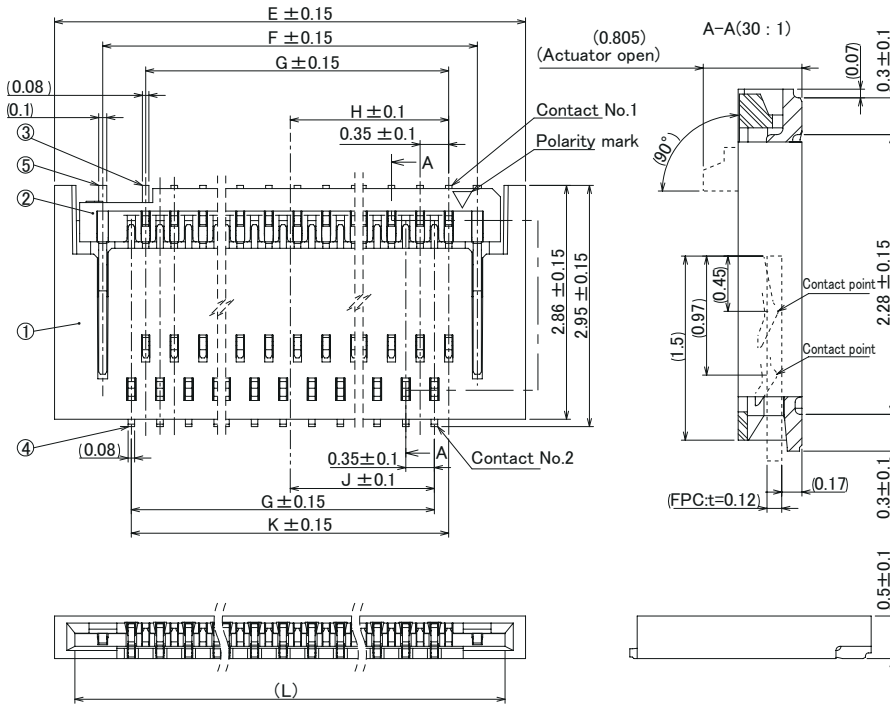
FH 76 - 34S - 0.175 SHW

① ② ③ ④ ⑤

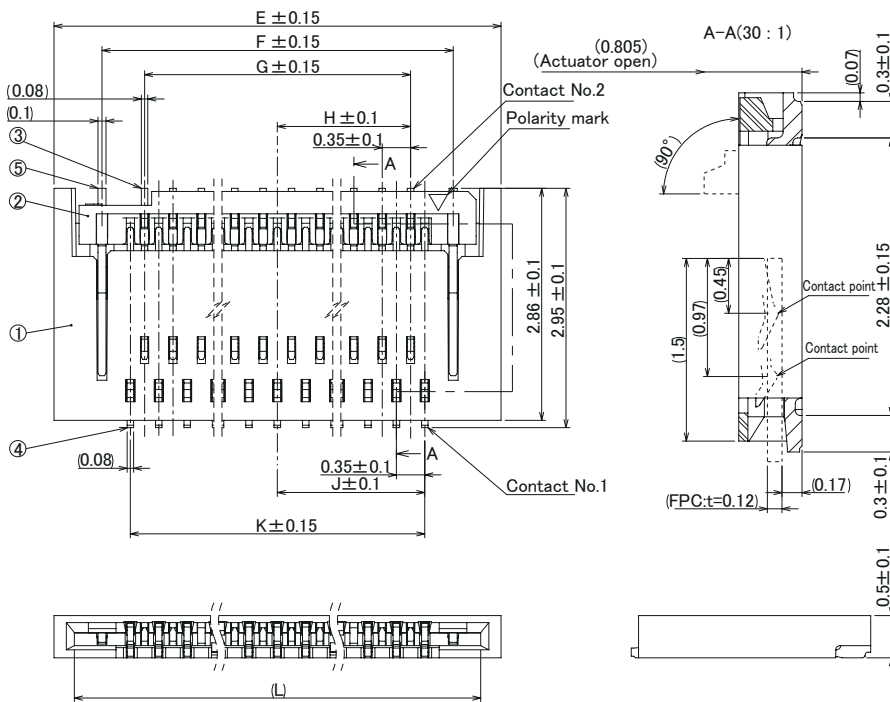
① Series Name	FH	④ Contact Pitch	0.175mm
② Series No.	76	⑤ Contact Type	SHW: SMT Horizontal Mounting Type
③ No. of Pos.	34		

Connector Dimensions

Even number of contacts



Odd number of contacts



Unit : mm

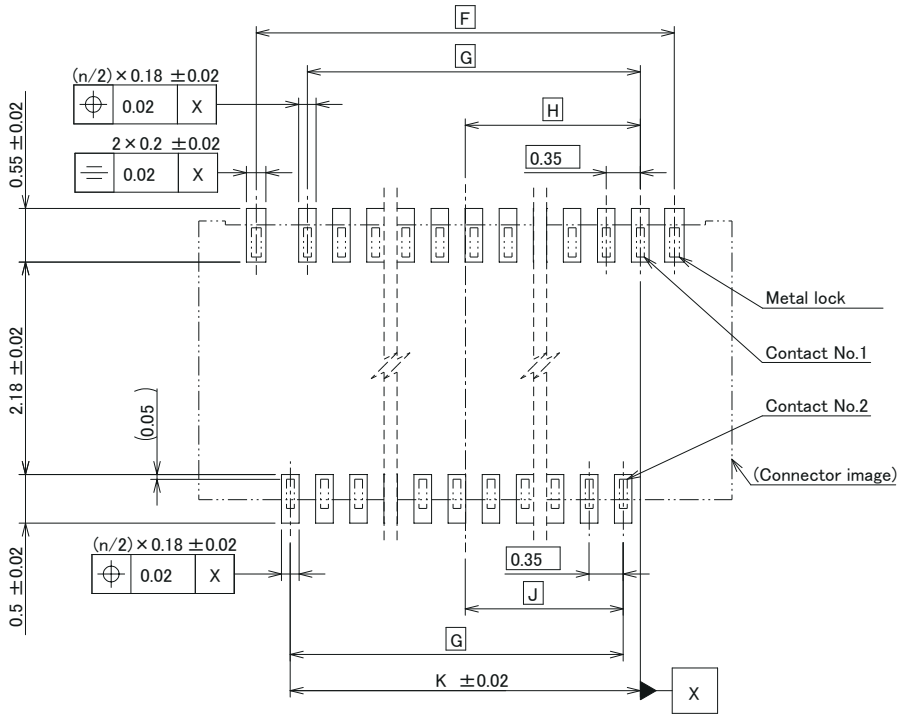
Part No.	HRS No.	No. of Pos.	E	F	G	H	J	K	L	Purchase Unit
FH76-21S-0.175SHW	Under Planning (Note)	21	5.38	4.2	3.15	1.575	1.75	3.5	4.88	10,000pcs per reel
FH76-25S-0.175SHW	Under Planning (Note)	25	6.08	4.9	3.85	1.925	2.1	4.2	5.58	
FH76-34S-0.175SHW	CL0580-5600-0-00	34	7.655	6.475	5.6	2.8875	2.7125	5.775	7.155	
FH76-41S-0.175SHW	Under Planning (Note)	41	8.88	7.7	6.65	3.325	3.5	7	8.38	

Note: Products without HRS No. are currently being planned for development. Please contact a Hirose representative regarding questions on pin count variation development.

Recommended Land, Metal Mask Dimensions

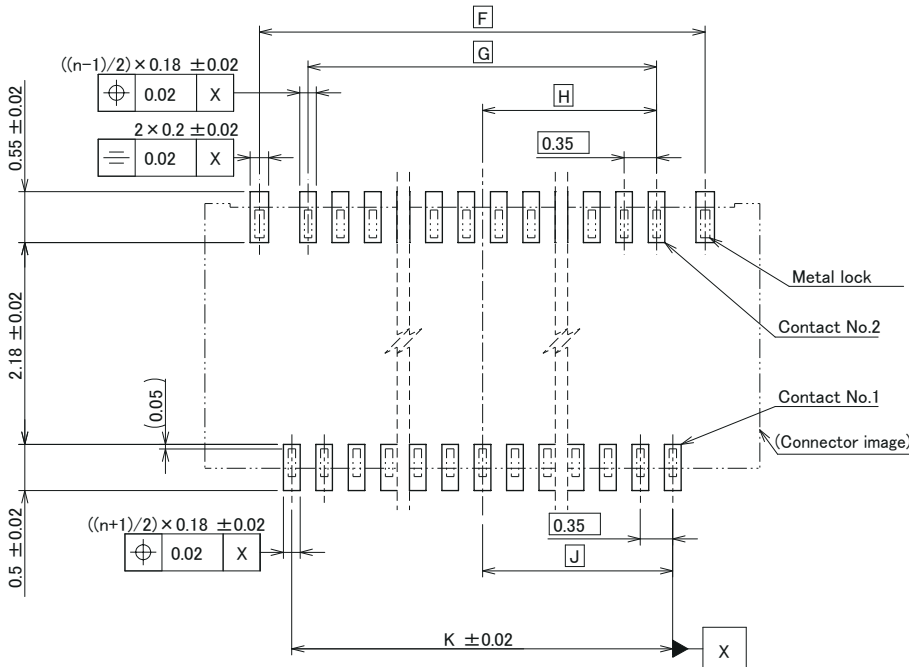
Recommended Land Dimensions

Even number of contacts



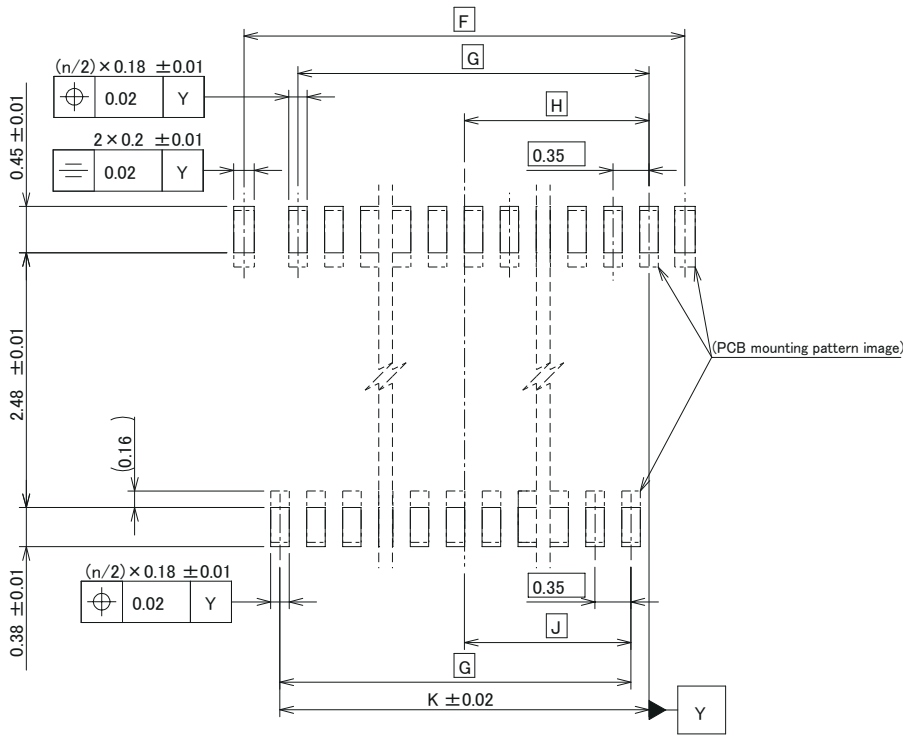
Note: 'n' indicated the number of positions.

Odd number of contacts



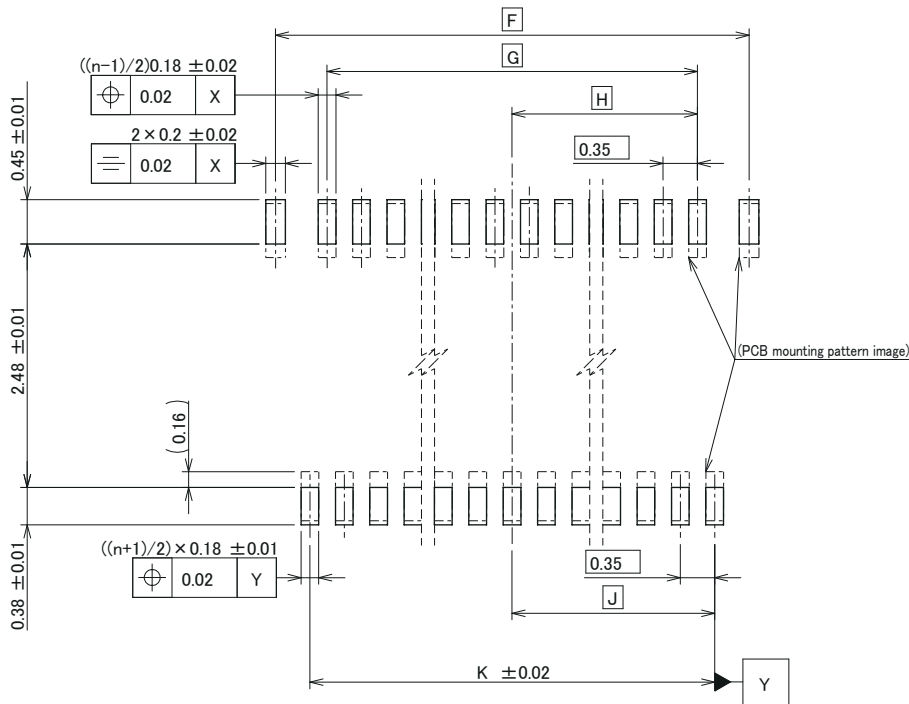
Note: 'n' indicated the number of positions.

Recommended Metal Mask Dimensions Even number of contacts



(Recommended Metal Mask Thickness: $t=0.1$)
Note: 'n' indicated the number of positions.

Odd number of contacts



(Recommended Metal Mask Thickness: $t=0.1$)
Note: 'n' indicated the number of positions.

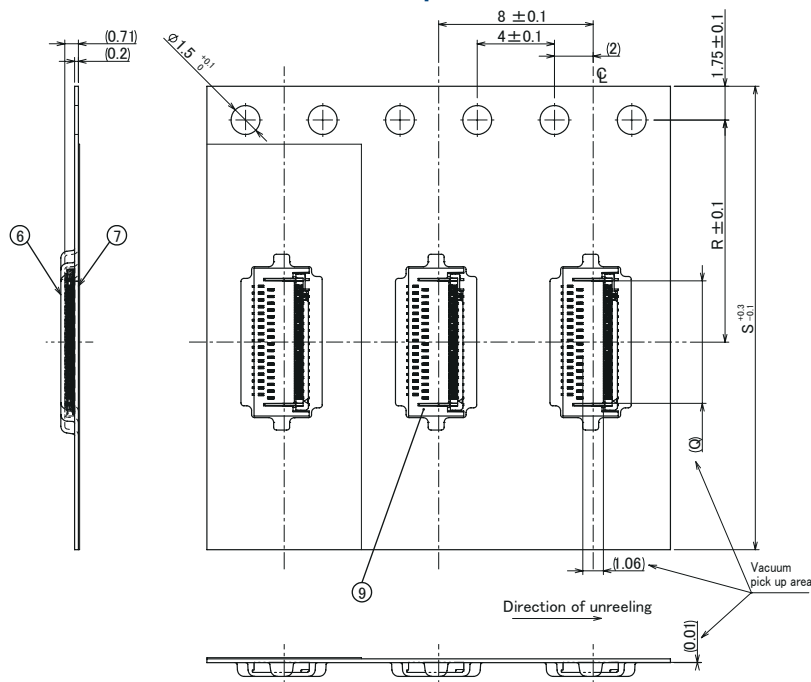
Unit : mm

Part No.	HRS No.	No. of Pos.	F	G	H	J	K
FH76-21S-0.175SHW	Under Planning (Note)	21	4.2	3.15	1.575	1.75	3.5
FH76-25S-0.175SHW	Under Planning (Note)	25	4.9	3.85	1.925	2.1	4.2
FH76-34S-0.175SHW	CL0580-5600-0-00	34	6.475	5.6	2.8875	2.7125	5.775
FH76-41S-0.175SHW	Under Planning (Note)	41	7.7	6.65	3.325	3.5	7

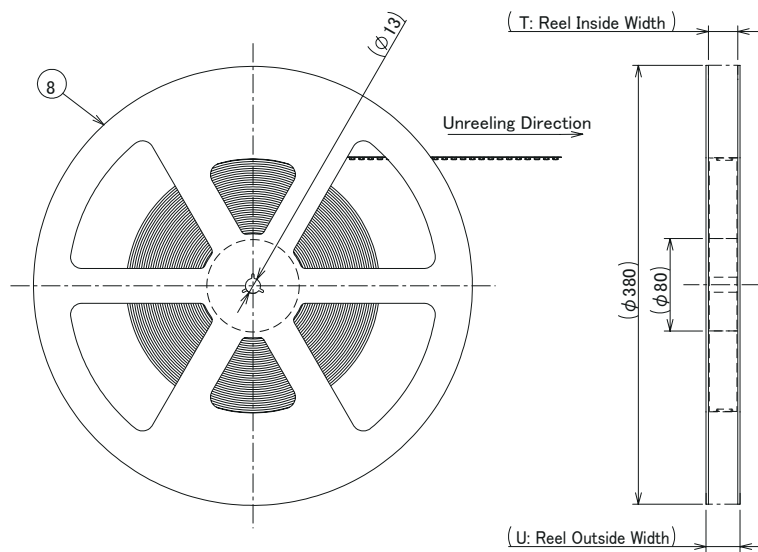
Note: Products without HRS No. are currently being planned for development. Please contact a Hirose representative regarding questions on pin count variation development.

Packaging Specifications

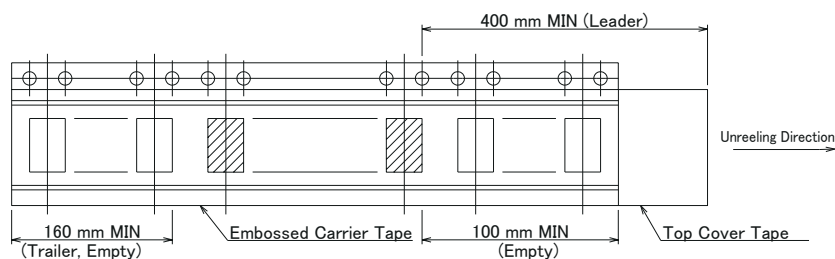
● Embossed Carrier Tape Dimensions



● Reel Dimensions



● Leader, Trailer Dimensions



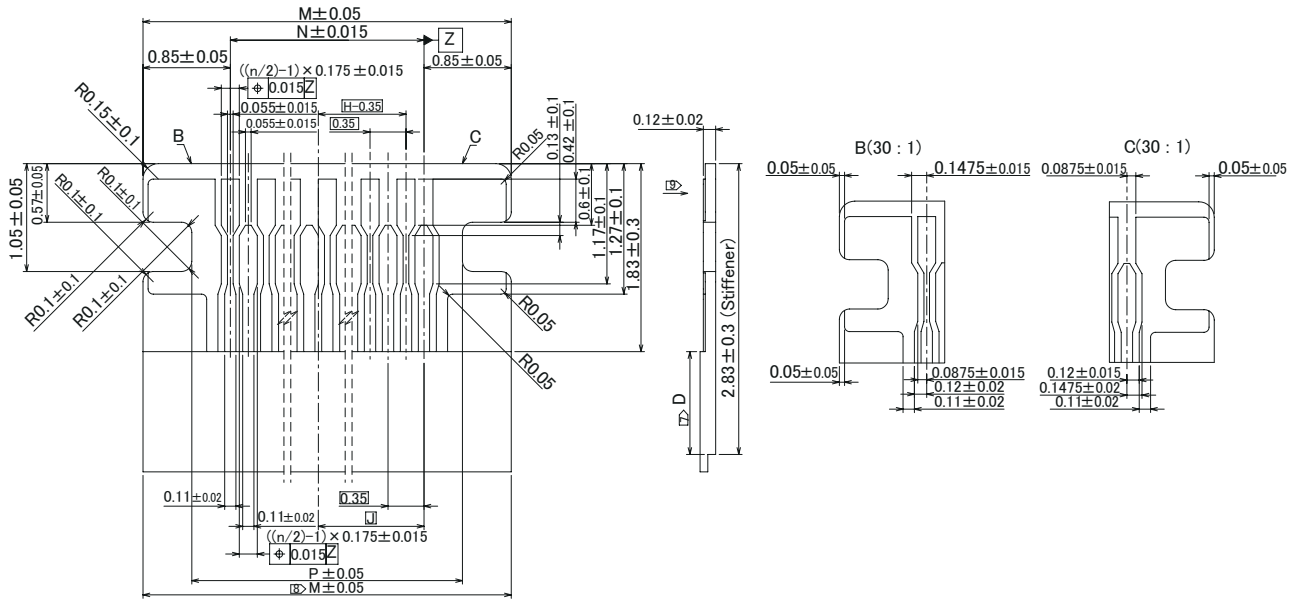
Unit : mm

Part No.	HRS No.	No. of Pos.	Q	R	S	T	U
FH76-21S-0.175SH	Under Planning (Note)	21	4.07	11.5	24	25.4	29.4
FH76-25S-0.175SH	Under Planning (Note)	25	4.77				
FH76-34S-0.175SH	CL0580-5600-0-00	34	6.34				
FH76-41S-0.175SH	Under Planning (Note)	41	7.57				

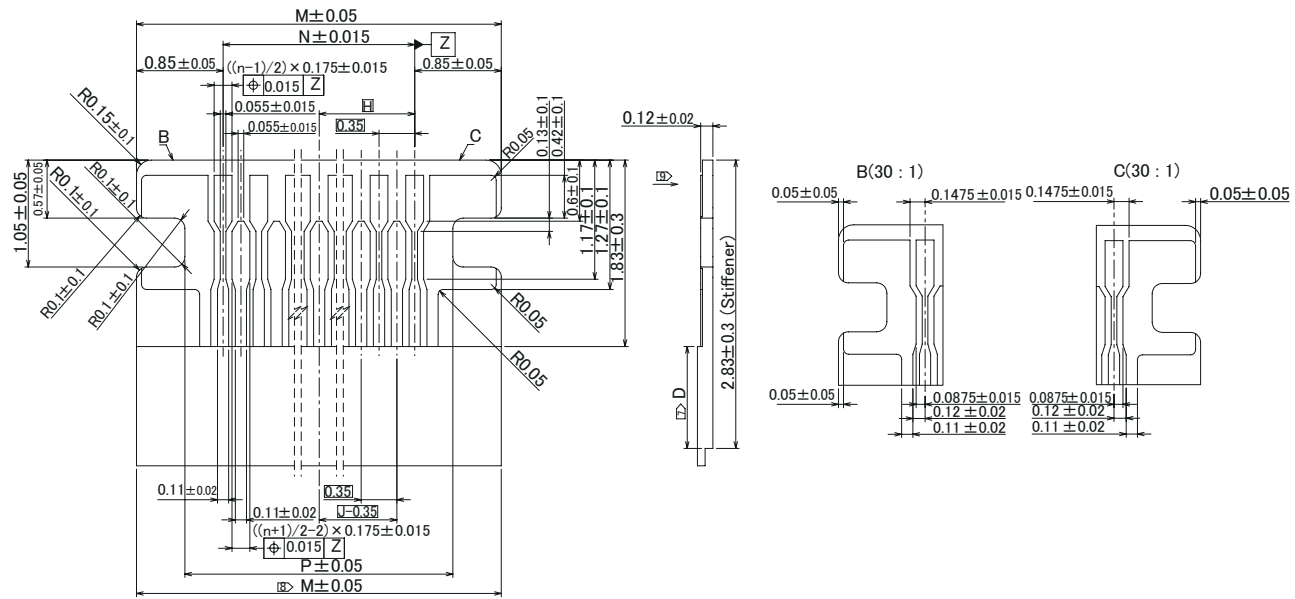
Note: Products without HRS No. are currently being planned for development. Please contact a Hirose representative regarding questions on pin count variation development.

Recommended FPC Pattern

Even number of contacts



Odd number of contacts

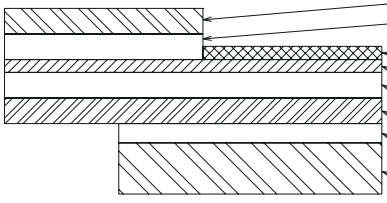


Unit : mm

Part No.	HRS No.	No. of Pos.	H	J	M	N	P
FH76-21S-0.175SHW	Under Planning (Note)	21	1.575	1.75	4.85	3.15	3.9
FH76-25S-0.175SHW	Under Planning (Note)	25	1.925	2.1	5.55	3.85	4.6
FH76-34S-0.175SHW	CL0580-5600-0-00	34	2.8875	2.7125	7.125	5.425	6.175
FH76-41S-0.175SHW	Under Planning (Note)	41	3.325	3.5	8.35	6.65	7.4

Note: Products without HRS No. are currently being planned for development. Please contact a Hirose representative regarding questions on pin count variation development.

FPC Configuration (Reference Example)



Material name	Material	Thickness (μm)
Covering film layer	Polyimide 1mil	25
Cover adhesive		25
Surface treatment	Nickel underplated $1\ \mu\text{m}$ to $6\ \mu\text{m}$ + Gold plated $0.2\ \mu\text{m}$	(4)
Copper foil	Cu 1/2 oz	18
Base adhesive	Heat-hardend adhesive	No adhesion material
Base film	Polyimide 1mil	25
Reinforcement material adhesive	Heat-hardend adhesive	30
Stiffener	Polyimide 2mil	50

Temperature Profile

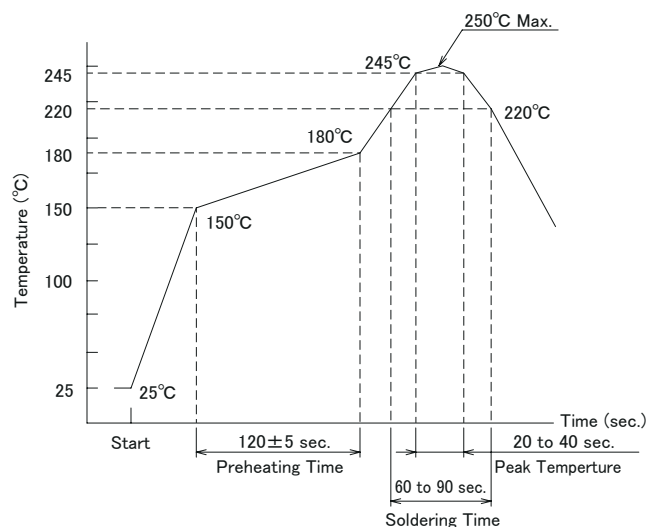
[Recommended Reflow Temperature Profile]

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

The temperature profile may vary depending on the type of cream solder, the manufacturer, the board size and other conditions such as mounting materials.

Please check before use.

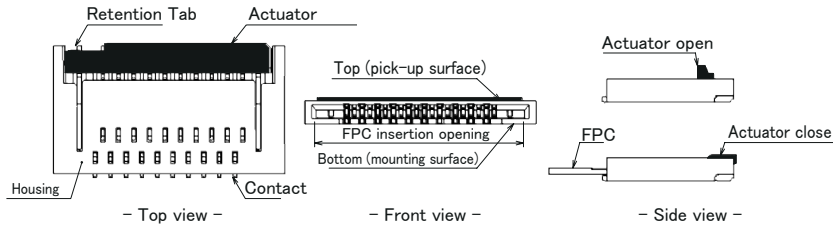
- Reflow method: IR reflow
- Number of reflow cycles: 2 cycles Max.



Connector Operation and Precautions

Indicates connector usage for a typical one action structure.

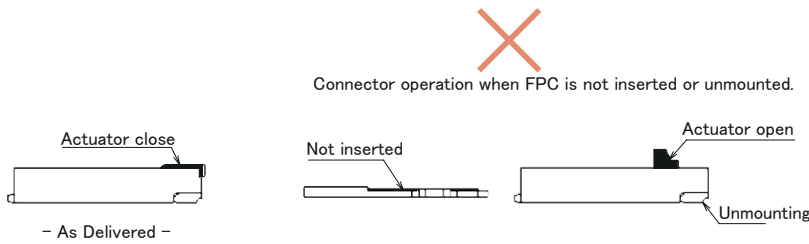
To prevent connector/FPC breakage and contact failure (mating failure, FPC pattern breakage, etc), read through the instructions shown below and handle the connector properly.



【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.



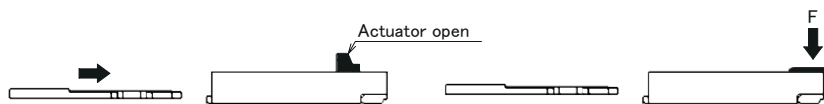
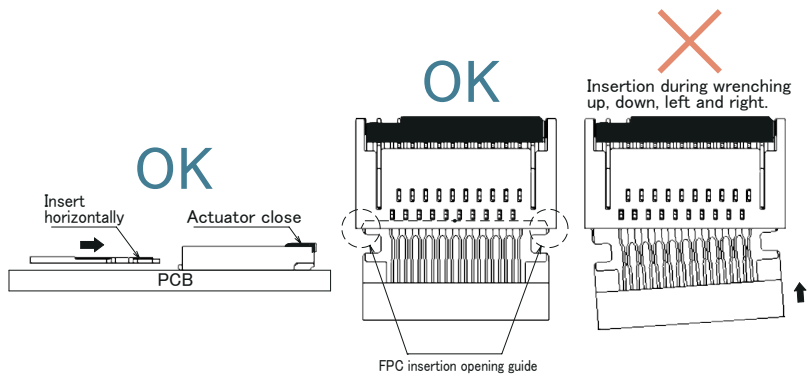
2. How to Insert FPC

With the actuator in the close position, perform the following operations.

When inserting the FPC, insert the FPC horizontally to the PCB mounting surface.

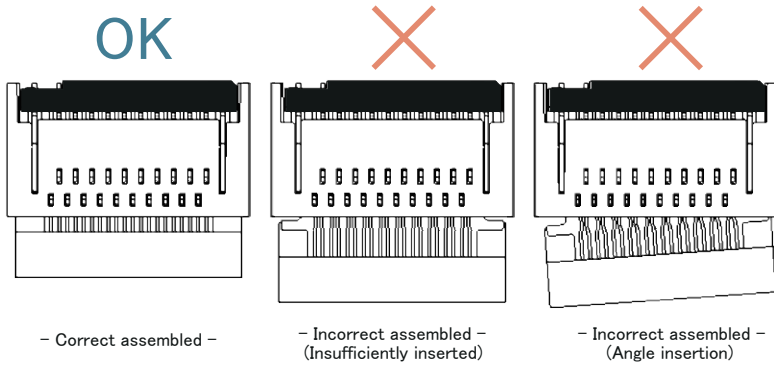
Also, please position both ends of the FPC by insertion opening guide and then insert it straightly.

When removing the FPC, pull it out horizontally.



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.

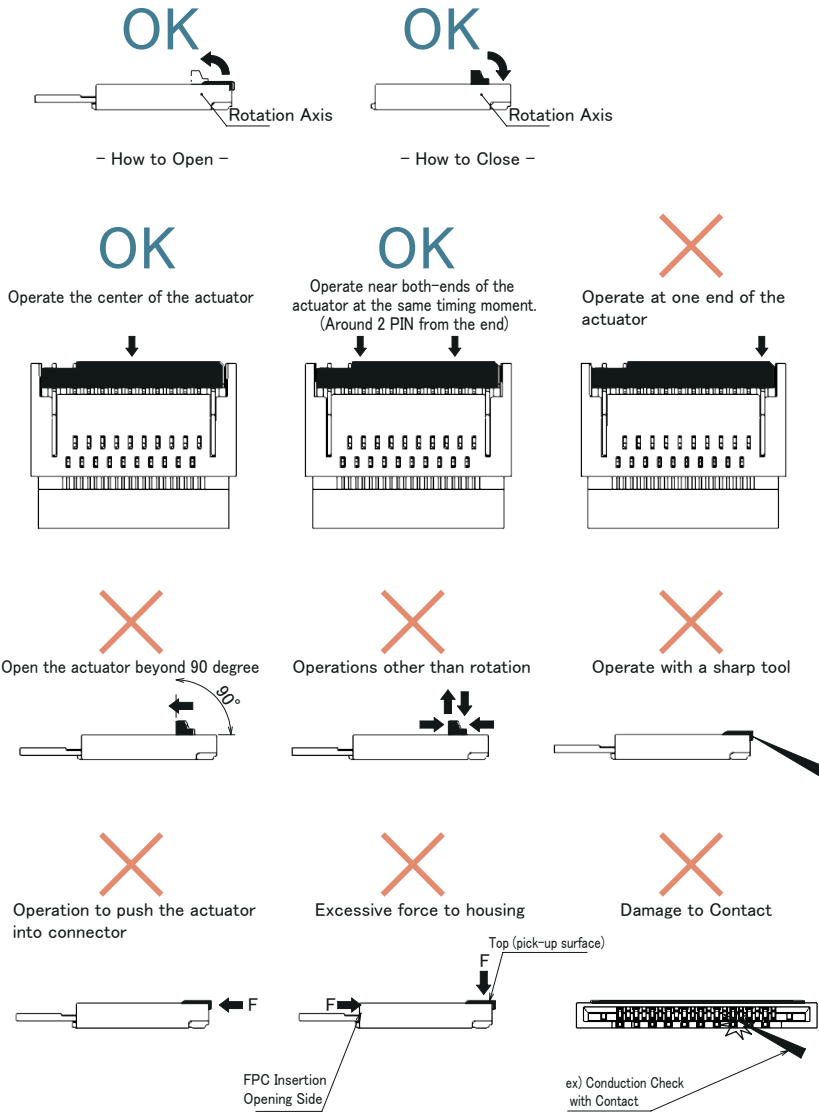


4. How to Operate the Actuator

The actuator rotates around the rotational axis.

Open : Slowly flip up the actuator

Close : Slowly rotate the actuator

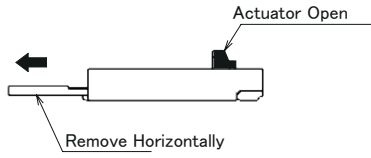


5. How to Remove FPC

With the actuator in the open position, perform the following operations .

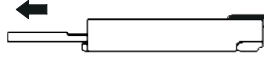
- When removing the FPC, please pull it horizontally.

OK



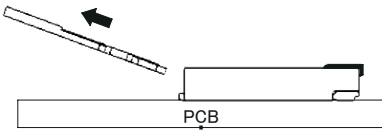
X

Removal with Actuator Close



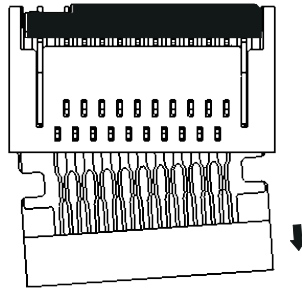
X

Remove excessive angles from PCB surface



X

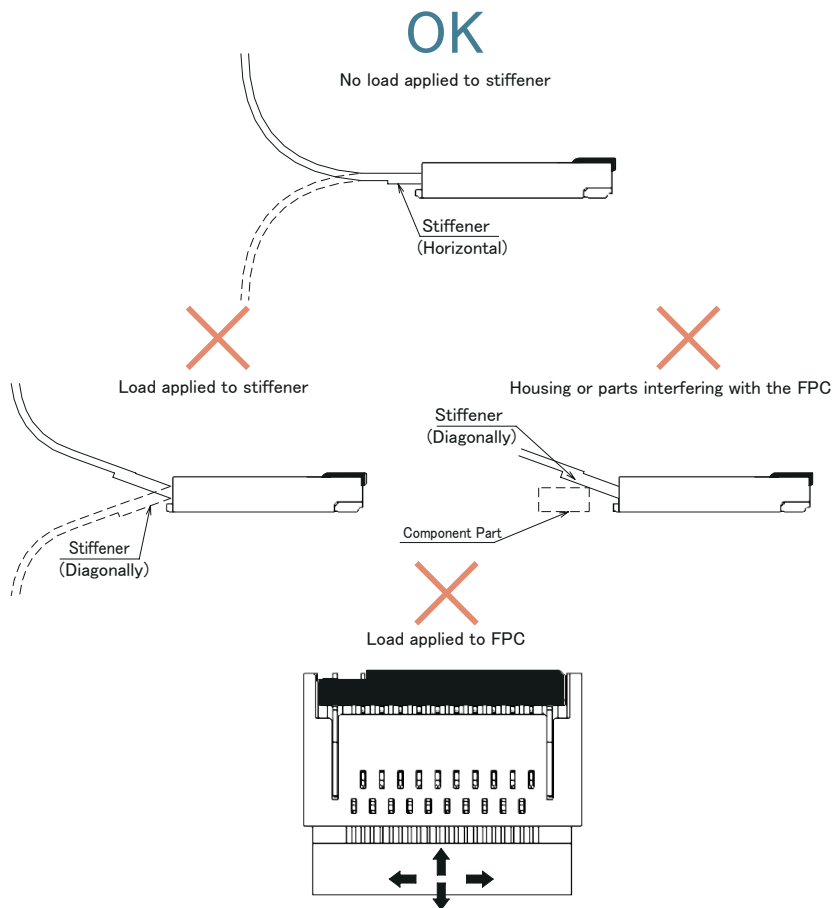
Remove during wrenching up, down, left and right.



[Instructions for PCB Layout]

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

- 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.
- Keep enough space for the rotation of the actuator during PCB and component layout design.
- 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.



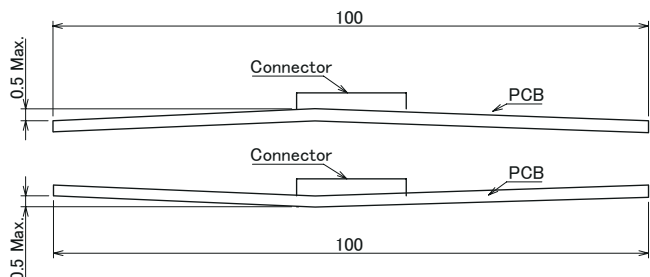
[Instructions for Mounting on the PCB]

- 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 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.

[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 described 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.

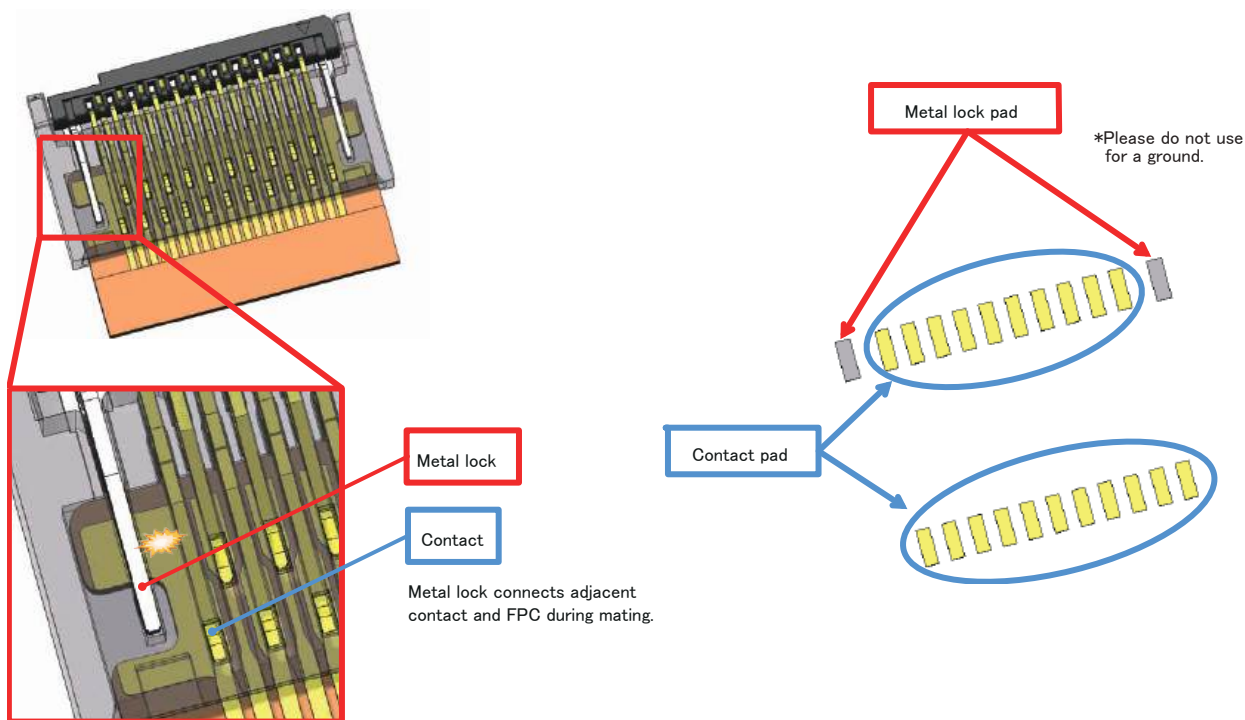


[Instructions of Manual Soldering]

- 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).

[Others]

- Attachment of foreign particles to the connector contacts may lead to conduction failure. In such cases, the conduction failure may be resolved by re-inserting the FPC.
- The metal lock conducts to both ends of the contacts through the conductor pattern of the FPC. Please do not use the metal lock pad as a ground.



While Taking into Consideration

Specifications mentioned in this catalog are reference values.

When considering to order or use this product, please review the Drawing and Product Specifications sheets.

Use an appropriate cable when using the connector in combination with cables.

If considering usage of a non-specified cable, please contact your sales representative.

If assembly process is done by jigs & tools which are not identified by Hirose, the warranty of the product may be affected.

If considering usage for below mentioned applications, please contact your sales representative.

In cases where the application will demand a high level of reliability, such as automotive, medical instruments, public infrastructure, aerospace/defense etc. Hirose must review before assurance of reliability can be given.

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<https://www.hirose.com>

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