

FH79 Series

0.3mm Pitch, 1.2mm Height, Top & Bottom Contact, 125°C Heat Resistance, Back Flip FPC Connector for Automotive



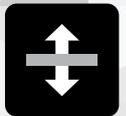
™ Flip-Lock Pioneer Hirose



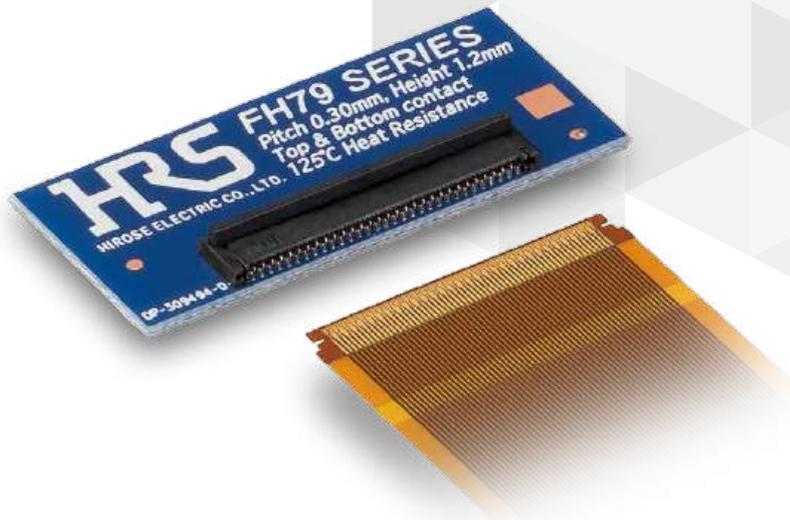
P= 0.3mm



High Temp



Top/Bottom Contact



CODICO GmbH

Zwingenstraße 6-8, 2380 Perchtoldsdorf, Austria
Telefon: +43 1 86 305-0, Fax: +43 1 86 305-5000
e-mail: office@codico.com, www.codico.com
FN 436940i, Landesgericht Wr. Neustadt

Zertifiziert nach ISO 9001:2015



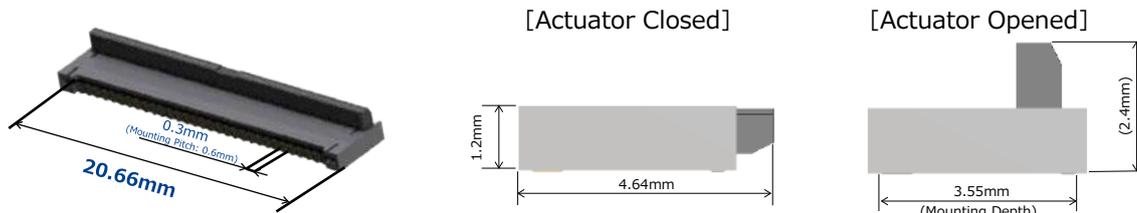
Product Page
<https://www.hirose.com/en/product/series/FH79>

Features

1. Compact and Space-Saving

One of the world's smallest FPC connectors for automotive applications.

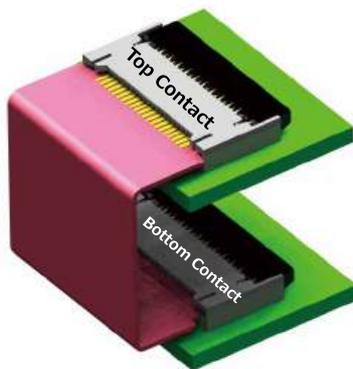
- Narrow Pitch : 0.3mm (Mounting Pitch : 0.6mm)
- Low-Profile : 1.2mm



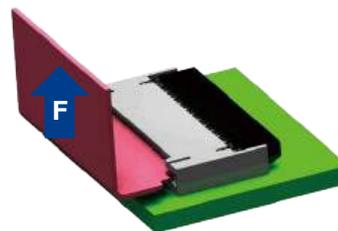
2. Board Design Flexibility

- Features a back-flip design for universal FPC contact direction.
- Enhanced resistance to upward FPC routing.

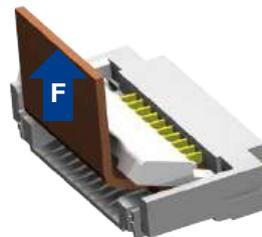
Universal Compatibility Regardless of Contact Orientation



Back Flip Design Prevents Unintended Actuator Opening in Both Upward and Downward Routing



Prevents unexpected actuator opening



Front Flip Design : Easy to Open

3. Enhanced Operability

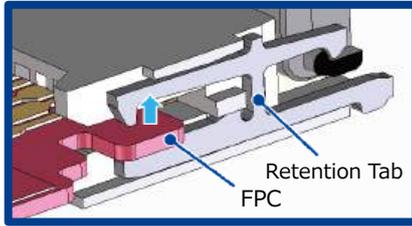
The movable lock lever on the retention tab prevents incomplete insertion and temporarily holds the FPC.

- Delivered with the actuator open for easy mating in two steps:
1. Insert FPC → 2. Close actuator.

4. High FPC Retention Force

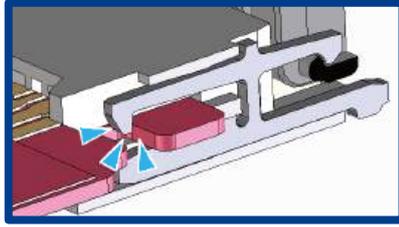
The movable lock lever ensures strong FPC retention, even with low pin counts.

1. Insert FPC



The FPC raises the lock lever on the retention tab during insertion.

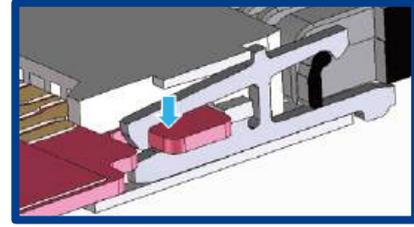
2. When FPC is fully inserted



The lock lever returns to its original position with a **distinct tactile click, preventing incomplete insertion.**

Temporarily holds the FPC before it is locked.

3. Locked



The lock lever securely holds the FPC notch.

Ensures strong FPC retention, even with low pin counts.

5. 125°C Heat Resistance

Designed to withstand 125°C, meeting stringent automotive testing standards.

Note: If the FPC heat resistance is lower than 125°C, the FPC's heat resistance applies.

6. Highly Reliable Connector Meets Stringent Automotive Testing Requirements

Designed to meet rigorous automotive testing standards, including:

Example: Temperature Cycle Test

- Temperature: -55°C → +15 to +35°C → +125°C → +15 to +35°C
- Time: 30 min → 2-3 min → 30 min → 2-3 min (for 3,000 cycles)

7. Halogen-Free

- Contains no chlorine or bromine exceeding standard limits.

As defined by IEC 61249-2-21:

- Br: 900ppm max.
- Cl: 900ppm max.
- Br + Cl: 1,500ppm max.

Product Specifications

Rated Current	0.3A	Operating Temperature (Note 1)(Note 2)	-55 to +125°C
Rated Voltage	50V AC/DC	Operating Humidity Range	RH 90% Max. (No Condensation)
		Storage Temperature (Note 3)	-10 to +50°C
		Storage Humidity Range (Note 3)	RH 90% Max. (No Condensation)

Applicable FPC Specifications	t=0.2 ± 0.02mm, Gold Plating
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Item	Specifications	Conditions
Insulation Resistance	500M Ω Min.	Measured at 100V DC
Withstanding Voltage	No insulation breakdown	150V AC for 1 min.
Contact Resistance	Initial: 70m Ω Max., After Testing: 90m Ω Max. *Includes FPC conductor resistance.	Measured at 20mV AC Max., 1mA
Mating Durability	Contact Resistance: 90m Ω Max. No damage, crack and looseness of parts.	10 times
Vibration Resistance	No electrical discontinuity of 1 μ s Min. Contact Resistance: 90m Ω Max. No damage, crack and looseness of parts.	Frequency: 10 to 55 Hz, single amplitude of 0.75mm, 10 cycles in each of the 3 axis
Shock Resistance	No electrical discontinuity of 1 μ s Min. Contact Resistance: 90m Ω Max. No damage, crack and looseness of parts.	Acceleration of 981m/s ² , 6ms duration of pulse, sine halfwave, 3 times in each of the 3 axis
Moisture Resistance	Contact Resistance: 90m Ω Max. Insulation Resistance: 50M Ω Min. No damage, crack and looseness of parts.	Left for 1,000 hours at 85°C and humidity of 90 to 95%
Temperature Cycle	Contact Resistance: 90m Ω Max. Insulation Resistance: 50M Ω Min. No damage, crack and looseness of parts.	Temperature: -55 → +15 to +35 → +125 → +15 to +35°C Time: 30 → 2 to 3 → 30 → 2 to 3 minutes Above conditions repeated for 1,000 cycles
Solder Heat Resistance	No deformation in appearance or significant damage to contacts.	Reflow: At the recommended temperature profile Manual soldering: 400 ± 10°C for 5 ± 1 seconds

Note 1: Includes the temperature rise due to current flow.

Note 2: When the heat resistant temperature is less than 125°C for FPC, the heat resistant temperature of the FPC is applied.

Note 3: Storage refers to long-term storage of products before board mounting. The operating temperature and humidity apply to the non-energized state after mounting.

Material / Finish

Component	Material	Finish/Remarks
Insulation Case	LCP	Gray
Actuator	PA 9T	Black
Contact	Copper Alloy	Partially Gold Plating
Retention Tab	Copper Alloy	Pure Tin Reflow Plating

Product Number Structure

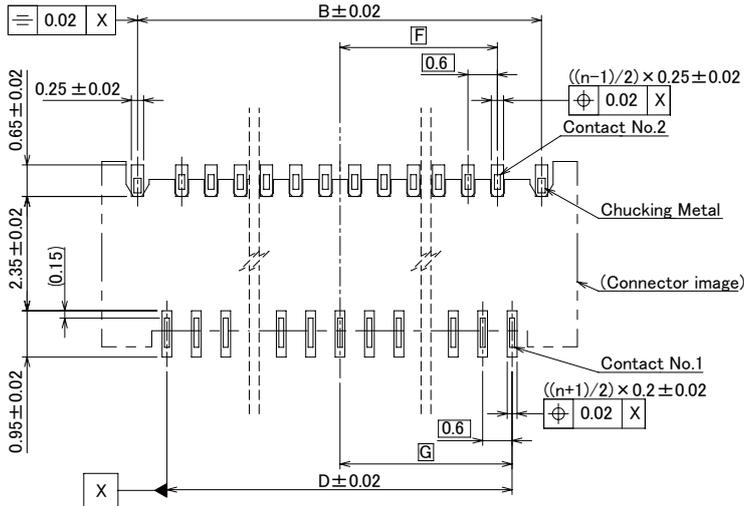
Refer to the chart below when determining the product specifications from the product number.
Please select from the product numbers listed in this catalog when placing orders.

FH79 - 61S - 0.3 SHW (##)

- ① ② ③ ④ ⑤

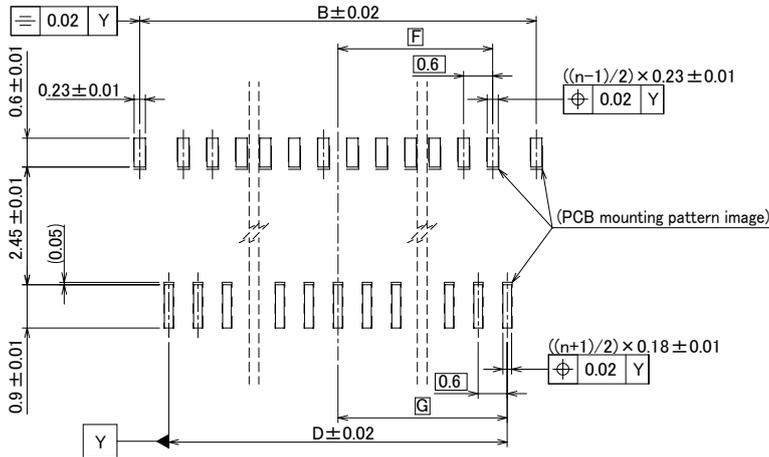
① Series Name	FH79	④ Contact Shape	SHW: SMT Horizontal Staggered Array Type
② No. of Pos.	61	⑤ Specifications	None: Standard (3,500pcs per reel)
③ Contact Pitch	0.3mm		

Recommended Land Dimensions



Note: 'n' indicated the number of positions.

Recommended Metal Mask Dimensions



(Recommended Metal Mask Thickness : $t=0.1$)

Note: 'n' indicated the number of positions.

Unit : mm

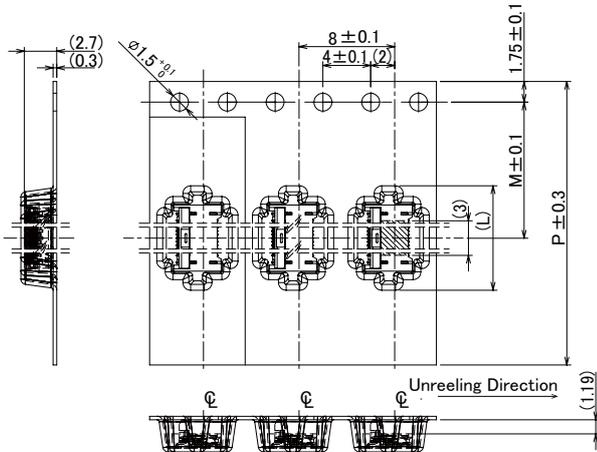
Part No.	HRS No.	No. of Pos.	B	D	F	G
FH79-11S-0.3SHW	Under Planning (Note)	11	4.2	3.0	1.2	1.5
FH79-21S-0.3SHW	Under Planning (Note)	21	7.2	6.0	2.7	3.0
FH79-31S-0.3SHW	Under Planning (Note)	31	10.2	9.0	4.2	4.5
FH79-41S-0.3SHW	Under Planning (Note)	41	13.2	12.0	5.7	6.0
FH79-51S-0.3SHW	Under Planning (Note)	51	16.2	15.0	7.2	7.5
FH79-61S-0.3SHW	CL0580-5900-0-00	61	19.2	18.0	8.7	9.0

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

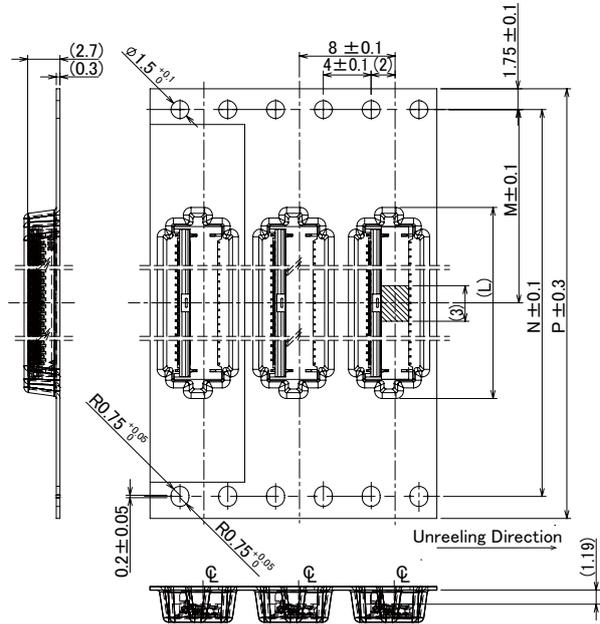
Packaging Specifications

● Embossed Carrier Tape Dimensions

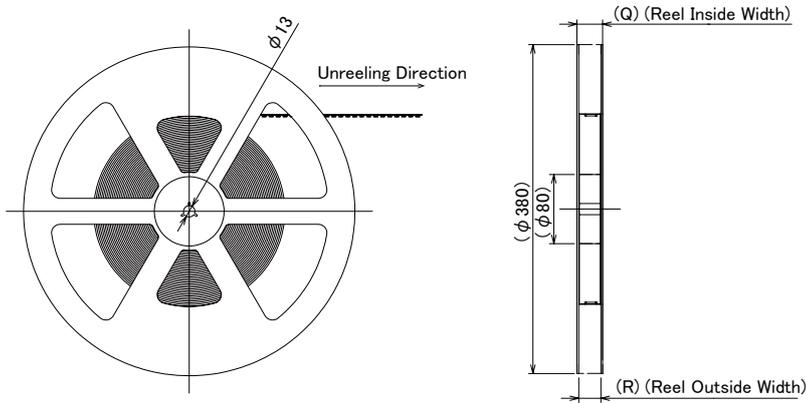
Tape Width : 24mm Max.



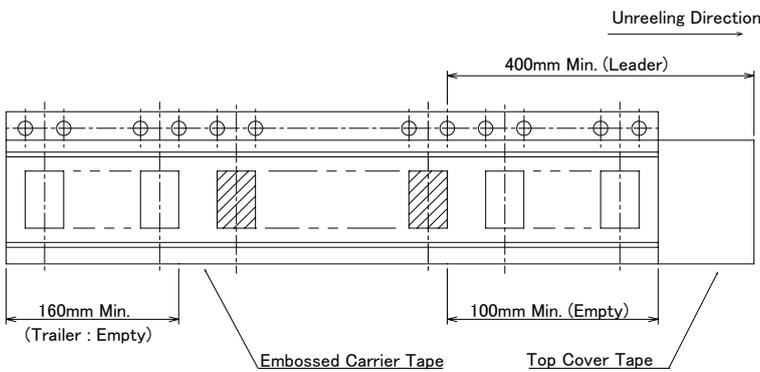
Tape Width : 32mm Min.



● Reel Dimensions



● Leader, Trailer Dimensions



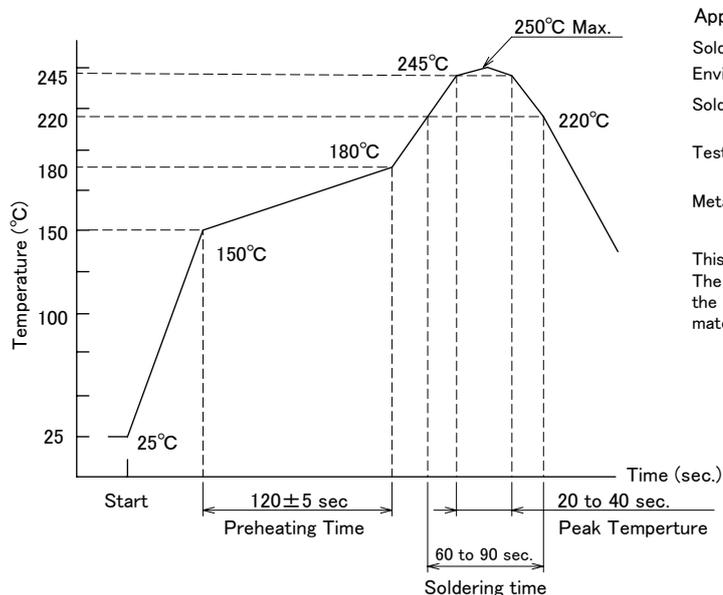
This packaging meets JIS C 0806 and IEC 60286-3 (Packaging of Components for Automatic Handling) standards.

Unit : mm

Part No.	HRS No.	No. of Pos.	L	M	N	P	Q	R
FH79-11S-0.3SHW	Under Planning (Note)	11	8.8	11.5	-	24.0	25.4	29.4
FH79-21S-0.3SHW	Under Planning (Note)	21	11.8	11.5	-	24.0	25.4	29.4
FH79-31S-0.3SHW	Under Planning (Note)	31	14.8	11.5	-	24.0	25.4	29.4
FH79-41S-0.3SHW	Under Planning (Note)	41	17.8	14.2	28.4	32.0	33.4	37.4
FH79-51S-0.3SHW	Under Planning (Note)	51	20.8	20.2	40.4	44.0	45.4	49.4
FH79-61S-0.3SHW	CL0580-5900-0-00	61	20.8	20.2	40.4	44.0	45.4	49.4

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

Recommended Reflow Temperature Profile



Applicable Conditions

Solder Method: Reflow, IR/Hot air

Environment: Room Air

Solder Composition: Paste SN/3.0Ag/0.5Cu

(Senju Metal Industry, co. Ltd Part Number: M705-GRN360-K2-V)

Test Board: Board materials and size: Glass epoxy 80x100x1.6mm

As listed on "Recommended Land Dimensions"

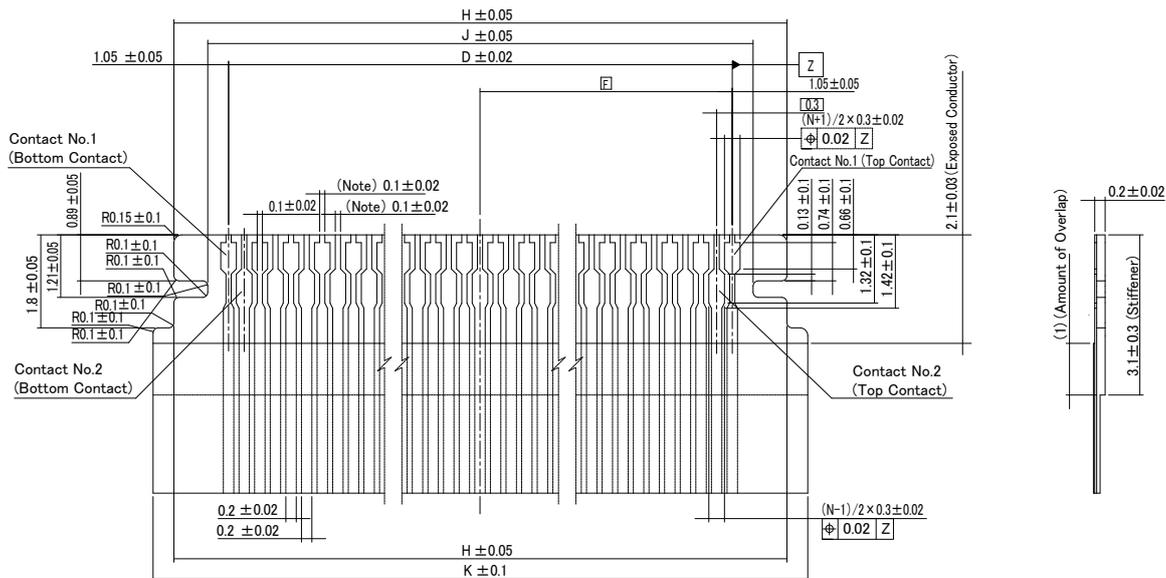
Metal Mask: Recommended thickness and aperture dimensions

As listed on "Recommended Metal Mask Dimensions"

This temperature profile is for the above conditions.

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 the mounting status before use.

Recommended FPC Pattern



Note: Show recommended dimension when lead for plating is required.

Unit : mm

Part No.	HRS No.	No. of Pos.	D	H	J	K
FH79-11S-0.3SHW	Under Planning (Note)	11	3.0	5.1	3.8	5.9
FH79-21S-0.3SHW	Under Planning (Note)	21	6.0	8.1	6.8	8.9
FH79-31S-0.3SHW	Under Planning (Note)	31	9.0	11.1	9.8	11.9
FH79-41S-0.3SHW	Under Planning (Note)	41	12.0	14.1	12.8	14.9
FH79-51S-0.3SHW	Under Planning (Note)	51	15.0	17.1	15.8	17.9
FH79-61S-0.3SHW	CL0580-5900-0-00	61	18.0	20.1	18.8	20.9

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)
Cover Film Layer	Polymide 1mil	25
Cover Adhesive		25
Surface Treatment	1 μm to 6 μm nickel underplated 0.2 μm gold plated	(4)
Copper Foil	Cu 1 oz	35
Base Adhesive	Heat-hardend Adhesive	25
Base Film	Polymide 1mil	25
Reinforcement Material Adhesive	Heat-hardend Adhesive	40
Stiffener	Polymide 3mil	75

Note 1: This is a reference specification for the FH79 Series FPC construction ($t=0.2 \pm 0.02\text{mm}$).
The thickness of the FPC mated portion should be $0.2 \pm 0.02\text{mm}$ in reference to the construction materials.

Note 2: Contact a FPC maker for details on component construction.

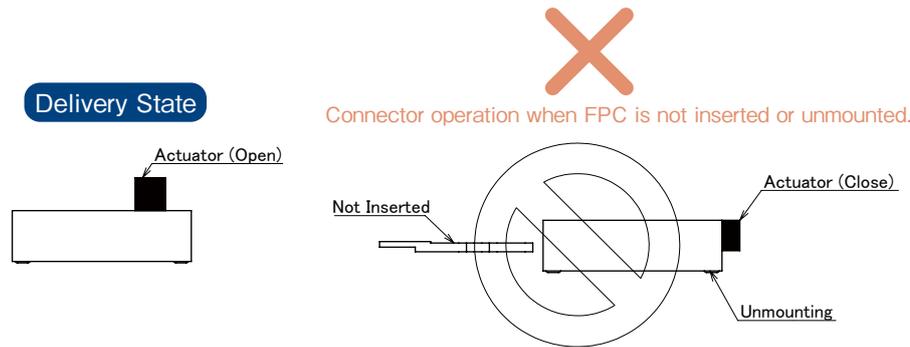
Connector Operation and Precautions

[Operating Method]

Please use this connector after confirming the following operation instructions in order to prevent connector or FPC damage and contact failure (incomplete mating, FPC pattern disconnection).

1. Initial condition

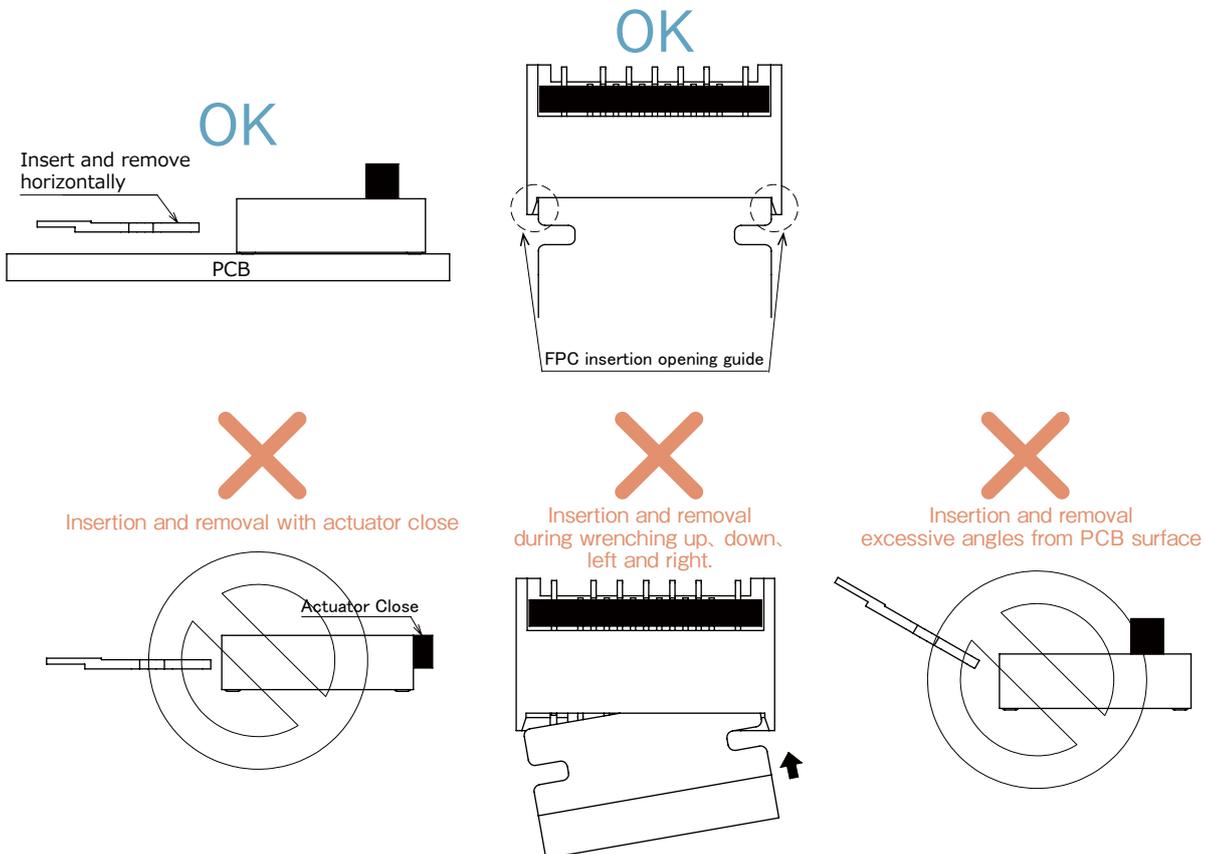
Actuator does not have to be operated before inserting FPC, as the connector is delivered with the actuator opened.



2. How to insert and remove FPC

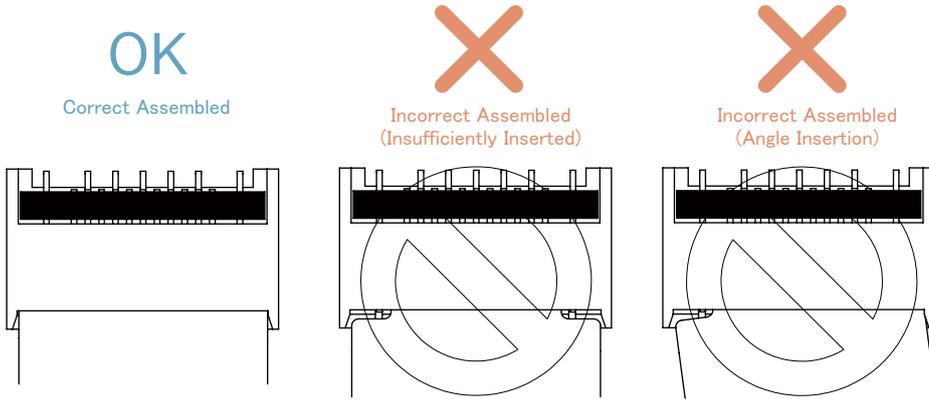
With the actuator in the open position, perform the following operations.

- 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, please pull it 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.

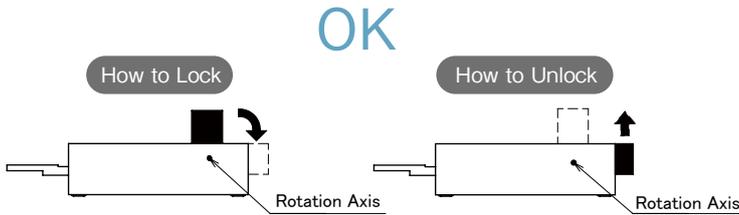


4. How to lock and unlock

The actuator rotates around the rotational axis.

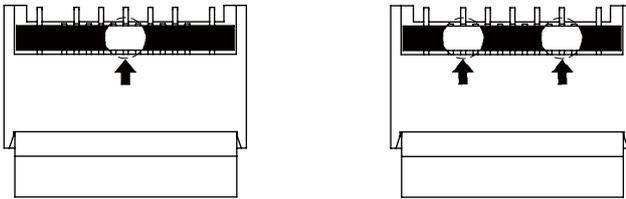
Lock: Apply load to rotate the actuator by 90 degree after inserting the FPC.

Unlock: Slowly flip up the Actuator lock



Operate the center of the actuator

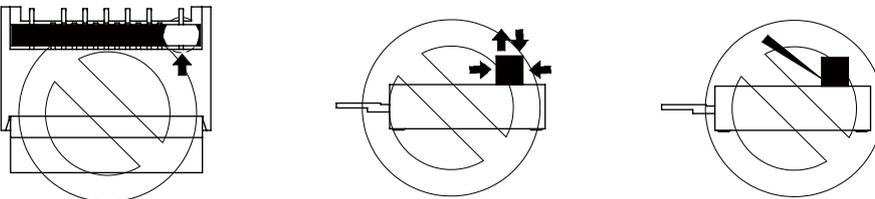
Operate near both-ends of the actuator at the same timing moment. (Around 2 pin from the end)



Operate at one end of the actuator

Operations other than rotation

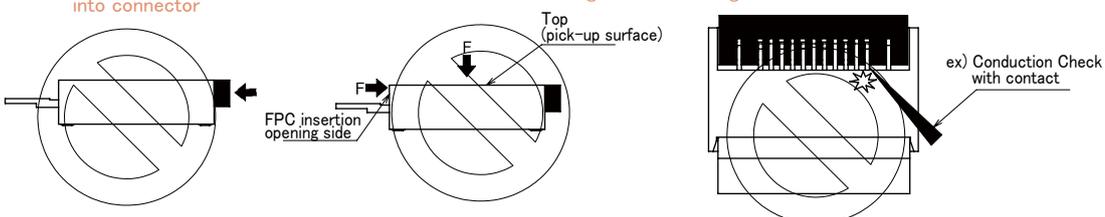
Operate with a sharp tool



Operation to push the actuator into connector

Excessive force to housing

Damage connector contacts.

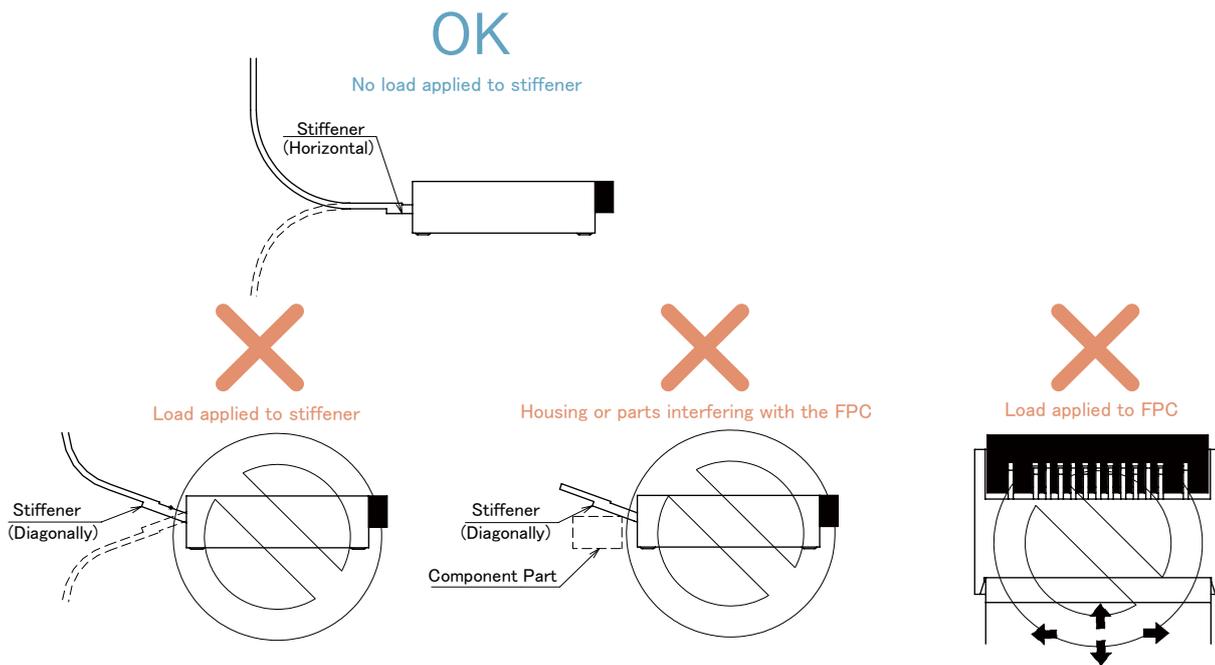


[Instructions for PCB layout]

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.
- 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.



[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..

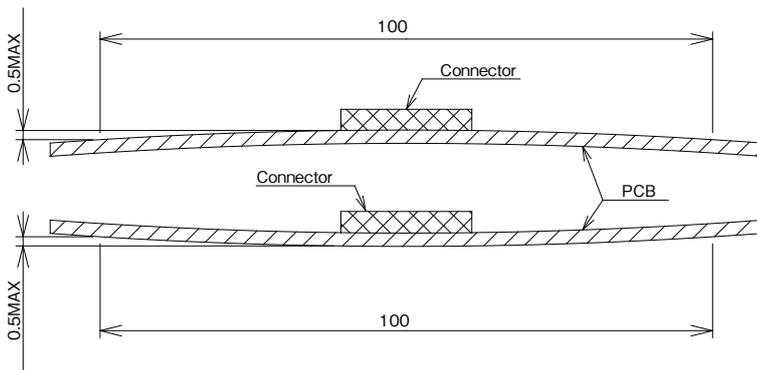
- Do not apply 0.5N or greater external force on the connector when unreeling or handling the connector before mounting.

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).

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.

HIROSE**HIROSE ELECTRIC CO.,LTD.**2-6-3 Nakagawa Chuoh, Tsuzuki-Ku, Yokohama-Shi 224-8540, JAPAN
<https://www.hirose.com>