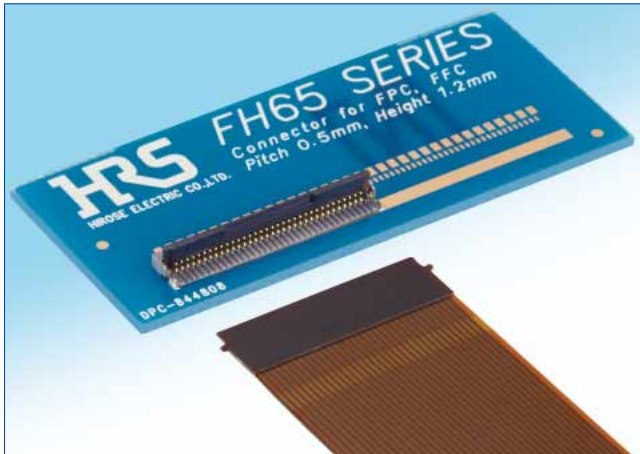


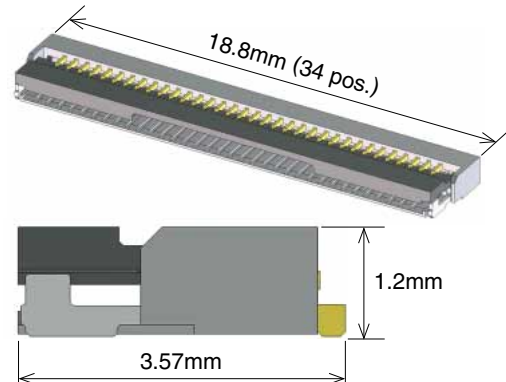
NEW

0.5mm Pitch, 1.2mm Height, 125°C Heat Resistant, FPC/FFC Connector

FH65 Series



Low profile and space-saving are achieved.

**Fig.1**

■Features

1. 125°C heat resistant

125°C heat resistance makes it suitable for applications requiring heat resistance such as automotive components.

2. Low profile, space-saving design

Space-saving with 1.2mm height and 3.57mm depth. (Fig.1)

3. Satisfies severe requirements for various automotive applications

This space saving design satisfies severe requirements for various automotive applications.

(Ex. Temperature cycles)

Temperature

-55 → +15 to +35 → +125 → +15 to 35°C

Time

30 → 2 to 3 → 30 → 2 to 3 minutes

1000 cycles under the above conditions

4. Excellent workability enabled by flip-lock mechanism

The flip-lock (one-touch rotation) ZIF design enables easy and reliable FPC/FFC connecting operation.

In addition, the firm and clear tactile click prevents incomplete lock.

5. High FPC/FFC retention force

The tabbed FPC/FFC provides a high FPC/FFC holding force in horizontal direction. (Fig.2)

6. FPC/FFC can be inserted easily.

The FPC/FFC positioning mechanism enables the FPC/FFC to be temporary held in place in the correct mating position. (Fig.2)

7. Easy visual inspection after mating FPC/FFC

Easy to visually check if FPC/FFC is correctly mated by the FPC/FFC positioning mechanism. (Fig.3)

8. Supports FPC/FFC thickness of 0.3mm

Supports the thickness of 0.3mm, which eases manufacturing and insertion.

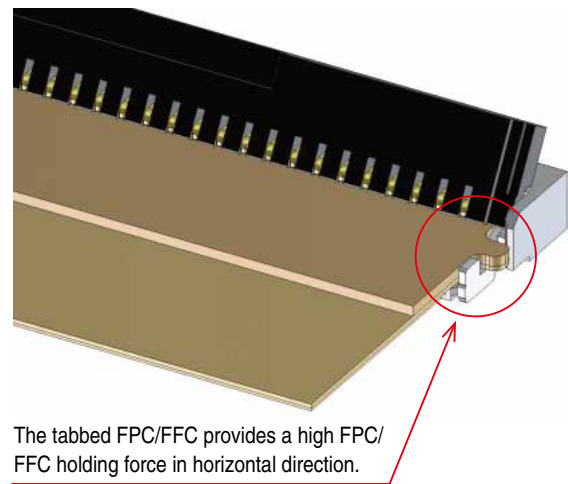
9. Environment

· Halogen free

*AS defined by IEC 61249-2-21.

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

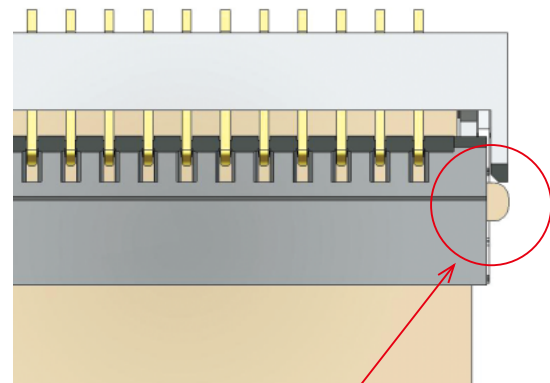
Connection using the FPC/FFC temporary holding mechanism



The tabbed FPC/FFC provides a high FPC/FFC holding force in horizontal direction.

Fig.2

Visual inspection after mating FPC/FFC



Visual inspection possible after mating FPC/FFC (prevents incomplete mating)

Fig.3

Product Specifications

Rating	Current rating	0.5A	Operating Temperature Range	-40 to +125°C (Note 1)	Storage Temperature Range	-10 to +50°C (Note 2)
	Voltage rating	AC 50Vrms	Operating Humidity Range	Relative humidity 90% RH or less (no condensation)	Storage Humidity Range	Relative humidity 90% RH or less (no condensation)

Recommended FPC/FFC SPC	t=0.3±0.05 Gold plated 125°C resistant FPC/FFC
-------------------------	--

Items	Specifications	Conditions
1. Insulation Resistance	500MΩ min	100V DC
2. Withstanding Voltage	No flashover or insulation breakdown	150Vrms AC
3. Contact Resistance	50mΩ max *Including FPC conductor resistance	1mA AC
4. Mechanical Operation	Contact resistance : 50mΩ max No damages, cracks and looseness of parts	20 times insertions and extractions.
5. Vibration Resistance	No electrical discontinuity of 1μs or longer Contact resistance : 50mΩ max No damages, cracks and looseness of parts	Frequency : 10 to 55Hz, half amplitude : 0.75mm, for 10 cycles in 3 axial directions.
6. Shock Resistance	No electrical discontinuity of 1μs or longer Contact resistance : 50mΩ max No damages, cracks and looseness of parts	Acceleration : 981m/s ² , duration 6ms, half-sine wave, at 3 times in 3 axial directions
7. High temperature and high humidity environment	Contact resistance : 50mΩ max Insulation resistance : 50MΩ min No damages, cracks and looseness of parts	1000 hours at 85°C and humidity of 90 to 95%
8. Temperature Cycles	Contact resistance : 50mΩ max Insulation resistance : 50MΩ min No damages, cracks and looseness of parts	Temperature : -55→+15 to +35→+125→+15 to +35°C Time : 30 → 2 to 3 → 30 → 2 to 3 minutes 5 cycles with above conditions
9. Resistance to Soldering Heat	No deformation of case or excessive looseness of the terminals	Reflow : See recommended temperature profile (page 6) Manual soldering : 400±10°C, 5 seconds

Note 1 : Including temperature rise caused by current flow.

Note 2 : The term "storage" refers to the long-term storage condition of unused products before PCB mounting.
For no-electrification state after PCB mounting, the operating temperature and humidity are applied.

Materials / Finish

Parts	Material	Finish	UL Regulation
Insulator	LCP	Gray	UL94V-0
	PPS	Black	
Contact	Coper Alloy	Nickel barrier gold plated	—
Metal fitting	Brass	Pure tin reflow plated	

Product Number Structure

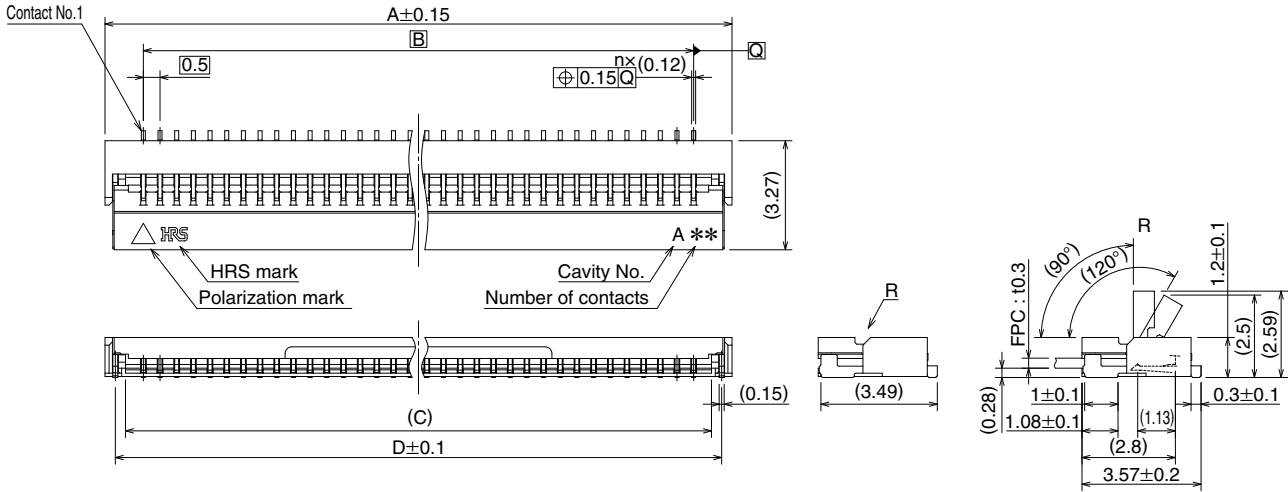
Refer to the chart below when determining the product specifications from the product number.
Please select from the product numbers listed in this catalog when placing orders.

FH 65 – 34S – 0.5 SH (99)

① ② ③ ④ ⑤ ⑥

① Series Name : FH	⑤ Terminal Type SH…SMT horizontal mounting type
② Series No. : 65	
③ No. of Contacts : 34	⑥ Specifications None : Regular (5000 pcs/reel) (99) : 500 pcs/reel
④ Contact Pitch : 0.5mm	

Connector Dimensions



Note

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

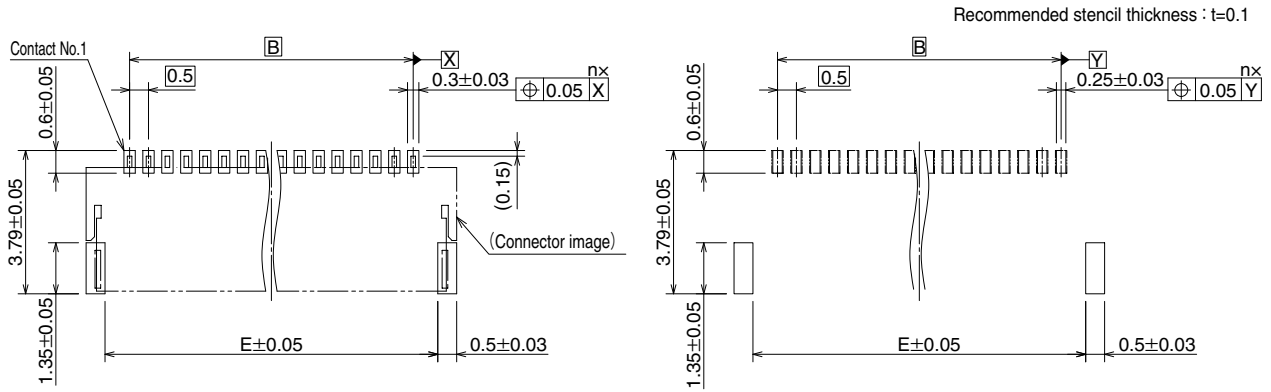
Units : mm

Part No.	HRS No.	No. of Contacts	A	B	C	D
FH65-4S-0.5SH (**)	Under planning (Note 1)	4	3.8	1.5	2.57	3.18
FH65-6S-0.5SH (**)	Under planning (Note 1)	6	4.8	2.5	3.57	4.18
FH65-8S-0.5SH (**)	Under planning (Note 1)	8	5.8	3.5	4.57	5.18
FH65-10S-0.5SH (**)	Under planning (Note 1)	10	6.8	4.5	5.57	6.18
FH65-12S-0.5SH (**)	Under planning (Note 1)	12	7.8	5.5	6.57	7.18
FH65-14S-0.5SH (**)	Under planning (Note 1)	14	8.8	6.5	7.57	8.18
FH65-15S-0.5SH (**)	Under planning (Note 1)	15	9.3	7.0	8.07	8.68
FH65-16S-0.5SH (**)	Under planning (Note 1)	16	9.8	7.5	8.57	9.18
FH65-18S-0.5SH (**)	Under planning (Note 1)	18	10.8	8.5	9.57	10.18
FH65-20S-0.5SH (**)	Under planning (Note 1)	20	11.8	9.5	10.57	11.18
FH65-22S-0.5SH (**)	Under planning (Note 1)	22	12.8	10.5	11.57	12.18
FH65-24S-0.5SH (**)	Under planning (Note 1)	24	13.8	11.5	12.57	13.18
FH65-26S-0.5SH (**)	Under planning (Note 1)	26	14.8	12.5	13.57	14.18
FH65-28S-0.5SH (**)	Under planning (Note 1)	28	15.8	13.5	14.57	15.18
FH65-30S-0.5SH (**)	Under planning (Note 1)	30	16.8	14.5	15.57	16.18
FH65-32S-0.5SH (**)	Under planning (Note 1)	32	17.8	15.5	16.57	17.18
FH65-34S-0.5SH (**)	580-4700-0 **	34	18.8	16.5	17.57	18.18
FH65-36S-0.5SH (**)	Under planning (Note 1)	36	19.8	17.5	18.57	19.18
FH65-40S-0.5SH (**)	Under planning (Note 1)	40	21.8	19.5	20.57	21.18
FH65-45S-0.5SH (**)	Under planning (Note 1)	45	24.3	22.0	23.07	23.68
FH65-50S-0.5SH (**)	Under planning (Note 1)	50	26.8	24.5	25.57	26.18
FH65-60S-0.5SH (**)	Under planning (Note 1)	60	31.8	29.5	30.57	31.18
FH65-64S-0.5SH (**)	Under planning (Note 1)	64	33.8	31.5	32.57	33.18
FH65-68S-0.5SH (**)	Under planning (Note 1)	68	35.8	33.5	34.57	35.18

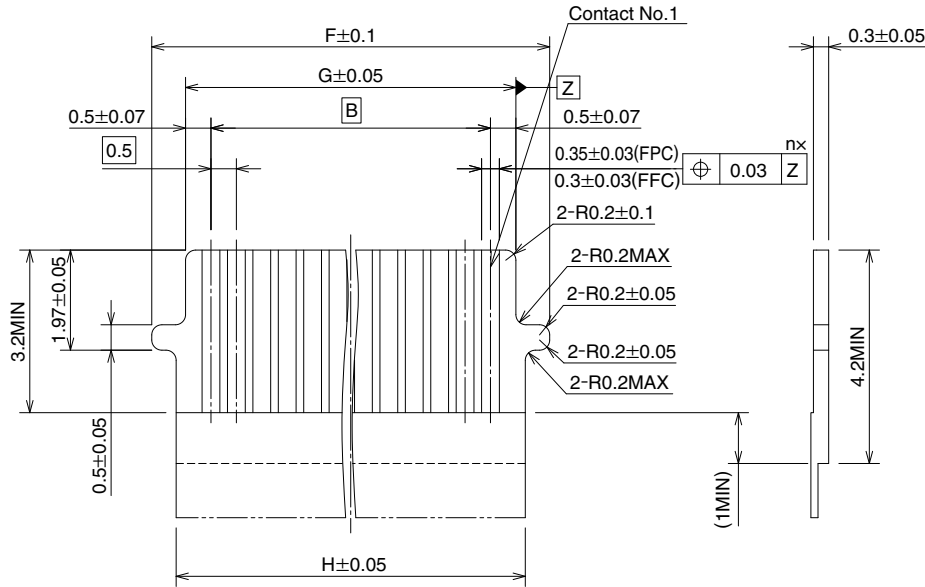
Note 1 : Contact positions without HRS No. are currently under planning.
Please contact hirose for detailed information about product variation.

Recommended PCB Mounting Pattern

Recommended Stencil Pattern



Recommended FPC/FFC Dimensions



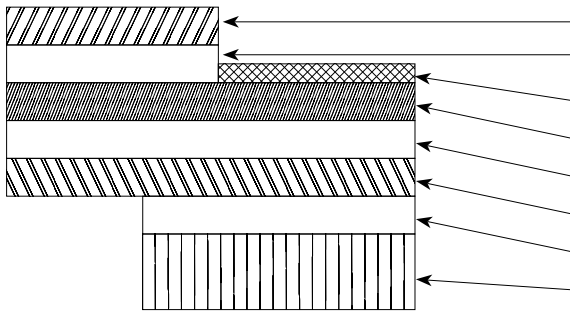
Units : mm

Part No.	HRS No.	No. of Contacts	B	E	F	G	H
FH65-4S-0.5SH (**)	Under planning (Note 1)	4	1.5	2.8	3.83	2.5	2.87
FH65-6S-0.5SH (**)	Under planning (Note 1)	6	2.5	3.8	4.83	3.5	3.87
FH65-8S-0.5SH (**)	Under planning (Note 1)	8	3.5	4.8	5.83	4.5	4.87
FH65-10S-0.5SH (**)	Under planning (Note 1)	10	4.5	5.8	6.83	5.5	5.87
FH65-12S-0.5SH (**)	Under planning (Note 1)	12	5.5	6.8	7.83	6.5	6.87
FH65-14S-0.5SH (**)	Under planning (Note 1)	14	6.5	7.8	8.83	7.5	7.87
FH65-15S-0.5SH (**)	Under planning (Note 1)	15	7.0	8.3	9.33	8.0	8.37
FH65-16S-0.5SH (**)	Under planning (Note 1)	16	7.5	8.8	9.83	8.5	8.87
FH65-18S-0.5SH (**)	Under planning (Note 1)	18	8.5	9.8	10.83	9.5	9.87
FH65-20S-0.5SH (**)	Under planning (Note 1)	20	9.5	10.8	11.83	10.5	10.87
FH65-22S-0.5SH (**)	Under planning (Note 1)	22	10.5	11.8	12.83	11.5	11.87
FH65-24S-0.5SH (**)	Under planning (Note 1)	24	11.5	12.8	13.83	12.5	12.87
FH65-26S-0.5SH (**)	Under planning (Note 1)	26	12.5	13.8	14.83	13.5	13.87
FH65-28S-0.5SH (**)	Under planning (Note 1)	28	13.5	14.8	15.83	14.5	14.87
FH65-30S-0.5SH (**)	Under planning (Note 1)	30	14.5	15.8	16.83	15.5	15.87
FH65-32S-0.5SH (**)	Under planning (Note 1)	32	15.5	16.8	17.83	16.5	16.87
FH65-34S-0.5SH (**)	580-4700-0 (**)	34	16.5	17.8	18.83	17.5	17.87
FH65-36S-0.5SH (**)	Under planning (Note 1)	36	17.5	18.8	19.83	18.5	18.87
FH65-40S-0.5SH (**)	Under planning (Note 1)	40	19.5	20.8	21.83	20.5	20.87
FH65-45S-0.5SH (**)	Under planning (Note 1)	45	22.0	23.3	24.33	23.0	23.37
FH65-50S-0.5SH (**)	Under planning (Note 1)	50	24.5	25.8	26.83	25.5	25.87
FH65-60S-0.5SH (**)	Under planning (Note 1)	60	29.5	30.8	31.83	30.5	30.87
FH65-64S-0.5SH (**)	Under planning (Note 1)	64	31.5	32.8	33.83	32.5	32.87
FH65-68S-0.5SH (**)	Under planning (Note 1)	68	33.5	34.8	35.83	34.5	34.87

Note 1 : Contact positions without HRS No. are currently under planning. Please contact Hirose for detailed information about product variation.

◆ FH65 Series FPC/FFC Construction (Recommended Specifications)

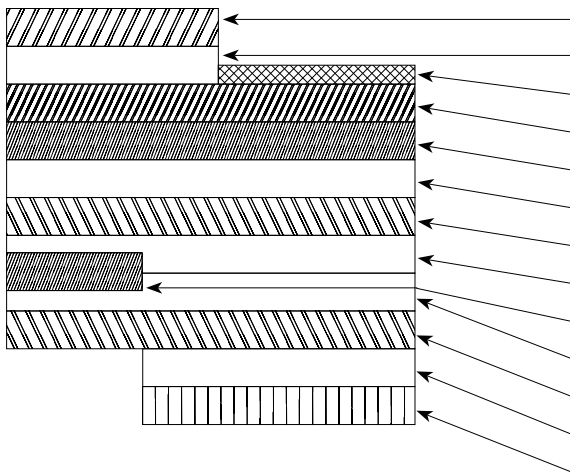
1. Using Single-Sided FPC



FPC : Flexible Printed Circuit

Material name	Material	Thickness (μm)
Covering film layer	Polyimide 1mil	(25)
Cover adhesive	1/2oz	(18)
Surface treatment	0.2 μm thick gold plated over 1 to 5 μm thick nickel underplating	3
Copper foil	Cu 1oz	35
Base adhesive	Thermosetting adhesive	25
Base film	Polyimide 1mil thick	25
Reinforcement material adhesive	Thermosetting adhesive	30
Stiffener	Polyimide 7mil thick	175
Total		293

2. Using Double-Sided FPC

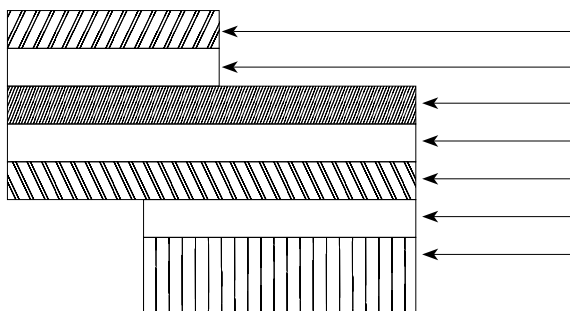


FPC : Flexible Printed Circuit

Material name	Material	Thickness (μm)
Covering film layer	Polyimide 1mil	(25)
Cover adhesive		(25)
Surface treatment	0.2 μm thick gold plated over 1 to 5 μm thick nickel underplating	3
Through-hole copper	Cu	15
Copper foil	Cu 1/2oz	18
Base adhesive	Thermosetting adhesive	18
Base film	Polyimide 1mil thick	25
Base adhesive	Thermosetting adhesive	18
Copper foil	Cu 1/2oz	(18)
Cover adhesive	Thermosetting adhesive	25
Covering layer film	Polyimide 1mil thick	25
Reinforcement material adhesive	Thermosetting adhesive	50
Stiffener	Polyimide 4mil thick	100
Total		297

* To prevent release of the FPC due to its bending, use of the double sided FPC with copper foil on the back side is not recommended.

3. Using FFC



FFC : Flexible Flat Cable

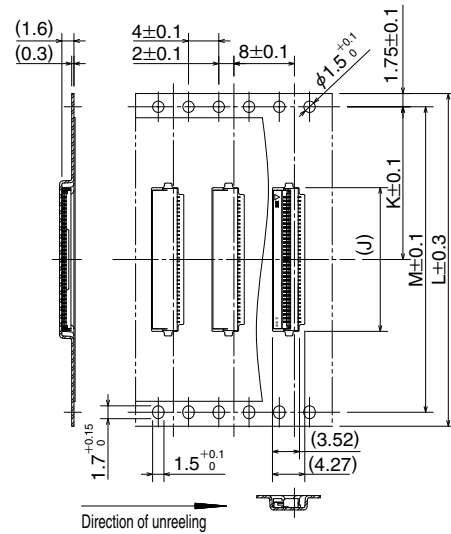
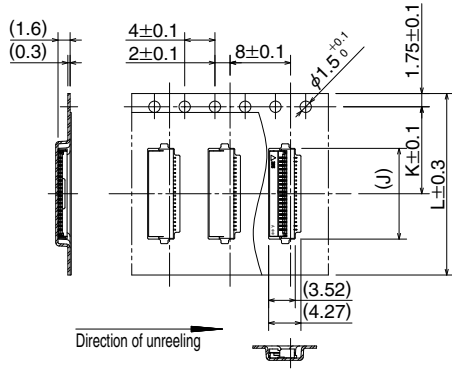
Material name	Material	Thickness (μm)
Polyester film		(12)
Adhesive	Thermoplastic polyester	(30)
Gold plated annealed copper foil		35
Adhesive	Polyester	30
Polyester		12
Adhesive	Polyester	30
Stiffener	Polyester	188
Total		295

* Typical thickness tolerance is about ±20μm

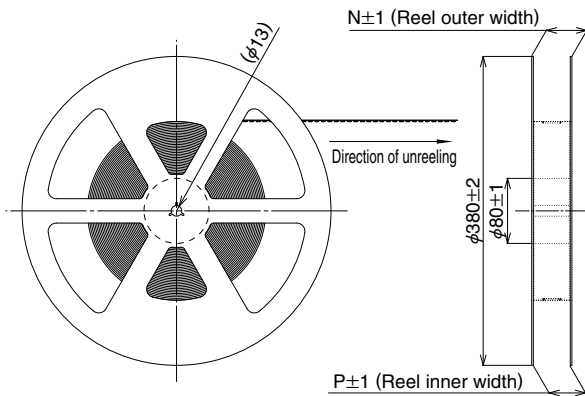
1. This specification is a recommendation for the construction of the FH65 Series FPC and FFC (t = 0.3±0.05mm).
2. For details about the construction, please contact the FPC/FFC manufacturers.

◆ Packaging Specifications

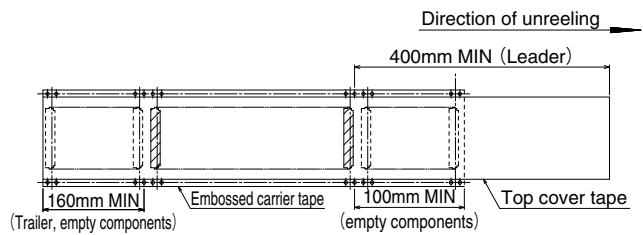
● Embossed Carrier Tape Dimensions



● Reel Dimensions



● Leader, Trailer Dimensions

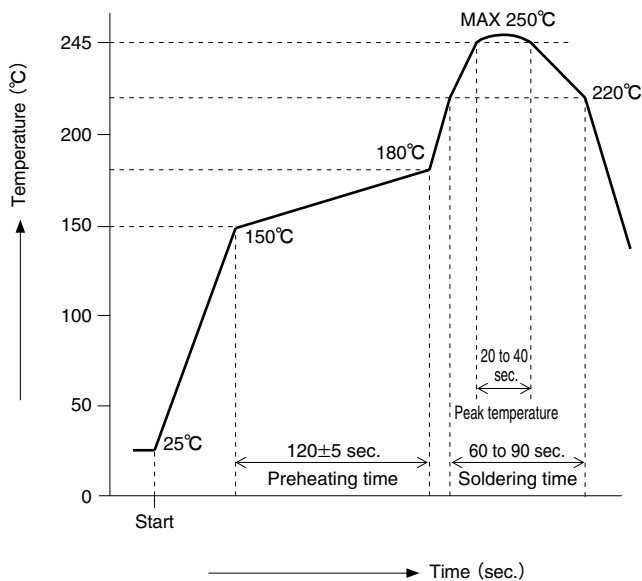


Units : mm

Part No.	HRS No.	No. of Contacts	J	K	L	M	N	P
FH65-4S-0.5SH (**)	Under planning (Note 1)	4	4.0	7.5	16.0	—	21.4	17.4
FH65-6S-0.5SH (**)	Under planning (Note 1)	6	5.0	7.5	16.0	—	21.4	17.4
FH65-8S-0.5SH (**)	Under planning (Note 1)	8	6.0	7.5	16.0	—	21.4	17.4
FH65-10S-0.5SH (**)	Under planning (Note 1)	10	7.0	11.5	24.0	—	29.4	25.4
FH65-12S-0.5SH (**)	Under planning (Note 1)	12	8.0	11.5	24.0	—	29.4	25.4
FH65-14S-0.5SH (**)	Under planning (Note 1)	14	9.0	11.5	24.0	—	29.4	25.4
FH65-15S-0.5SH (**)	Under planning (Note 1)	15	9.5	11.5	24.0	—	29.4	25.4
FH65-16S-0.5SH (**)	Under planning (Note 1)	16	10.0	11.5	24.0	—	29.4	25.4
FH65-18S-0.5SH (**)	Under planning (Note 1)	18	11.0	11.5	24.0	—	29.4	25.4
FH65-20S-0.5SH (**)	Under planning (Note 1)	20	12.0	11.5	24.0	—	29.4	25.4
FH65-22S-0.5SH (**)	Under planning (Note 1)	22	13.0	11.5	24.0	—	29.4	25.4
FH65-24S-0.5SH (**)	Under planning (Note 1)	24	14.0	11.5	24.0	—	29.4	25.4
FH65-26S-0.5SH (**)	Under planning (Note 1)	26	15.0	14.2	32.0	28.4	37.4	33.4
FH65-28S-0.5SH (**)	Under planning (Note 1)	28	16.0	14.2	32.0	28.4	37.4	33.4
FH65-30S-0.5SH (**)	Under planning (Note 1)	30	17.0	14.2	32.0	28.4	37.4	33.4
FH65-32S-0.5SH (**)	Under planning (Note 1)	32	18.0	14.2	32.0	28.4	37.4	33.4
FH65-34S-0.5SH (**)	580-4700-0 **	34	19.0	20.2	44.0	40.4	49.4	45.4
FH65-36S-0.5SH (**)	Under planning (Note 1)	36	20.0	20.2	44.0	40.4	49.4	45.4
FH65-40S-0.5SH (**)	Under planning (Note 1)	40	22.0	20.2	44.0	40.4	49.4	45.4
FH65-45S-0.5SH (**)	Under planning (Note 1)	45	24.5	20.2	44.0	40.4	49.4	45.4
FH65-50S-0.5SH (**)	Under planning (Note 1)	50	27.0	20.2	44.0	40.4	49.4	45.4
FH65-60S-0.5SH (**)	Under planning (Note 1)	60	32.0	26.2	56.0	52.4	61.4	57.4
FH65-64S-0.5SH (**)	Under planning (Note 1)	64	34.0	26.2	56.0	52.4	61.4	57.4
FH65-68S-0.5SH (**)	Under planning (Note 1)	68	36.0	26.2	56.0	52.4	61.4	57.4

Note 1 : Contact positions without HRS No. are currently under planning. Please contact Hirose for detailed information about product variation.

Temperature Profile



Applicable Conditions

- Reflow method : IR/Hot air
- Reflow environment : Room air
- Solder : Paste type Sn/3.0Ag/0.5Cu
(M705-GRN360-K2-V made by Senju Metal Industry Co.)
- Test PCB : PCB material and size
Glass epoxy 80×100×1.6mm
Land size, per recommended on page 4.
- Metal mask : Thickness and opening size
Per recommended on page 4.

This temperature profile is based on the above conditions. It may vastly depending on solder paste type, manufacturer, PCB size and mounting materials. Please use only after checking the mounting conditions.

◆ Operation Methods of Connectors and Precautions

[Operation method]

This connector is a small-sized and thin product, care needs to be taken when handling it. In order to prevent damage and contact failure etc. (incorrect mating, disconnection of FPC/FFC pattern) of connectors and FPC/FFC, please use them after following the below instructions.

The values described in the cautions vary from the product specifications.

1. Initially delivered state

Actuator is locked in the delivered state.

[Caution]

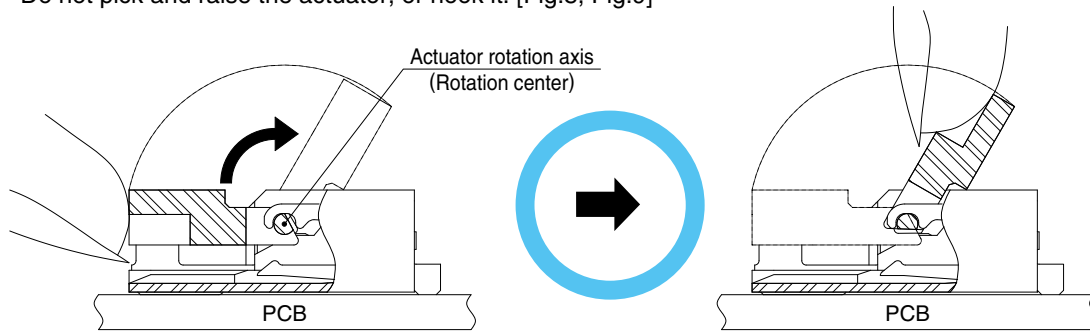
- Don't operate the connector while it is not mounted on the board.

2. How to unlock actuator (FPC/FFC not inserted)

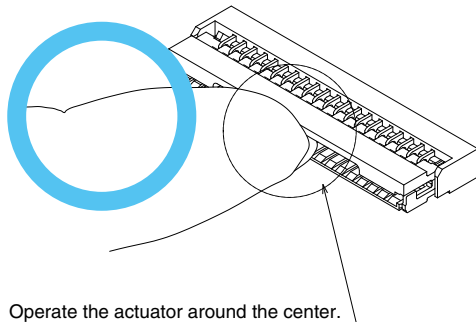
Actuator rotates around the center rotation axis, as shown in the Figure below. Operate the actuator and slowly rotate it, releasing the lock. [Fig.1]

[Caution]

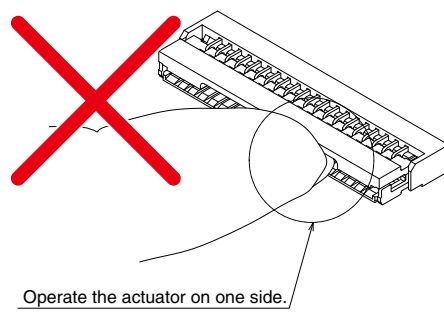
- Operate the actuator about the center. [Fig.2]
- Do not operate the actuator on one side only. [Fig.3]
- Operate the actuator by hand, take care not to allow jigs or claws to get inside the connector. [Fig.4, Fig.5]
- Actuator cannot be opened wider than 120°. Do not open it wider than that angle. [Fig.6]
- Do not apply a strong force in the actuator slide direction. It could prevent the actuator from sliding in, as shown in the Figure. [Fig.7]
- Do not pick and raise the actuator, or hook it. [Fig.8, Fig.9]



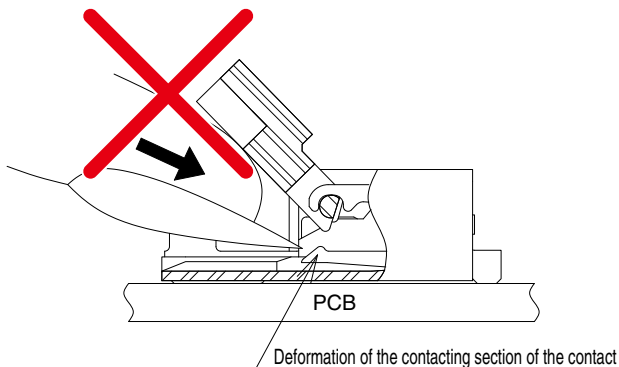
[Fig.1]



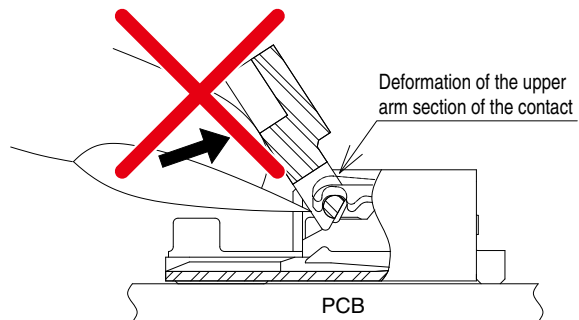
[Fig.2]



[Fig.3]



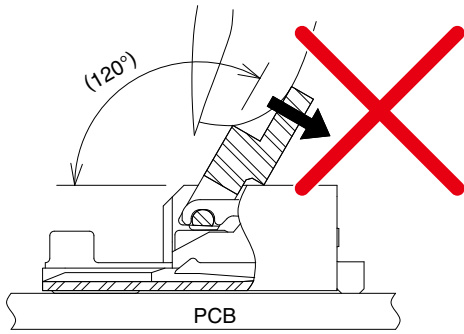
[Fig.4]



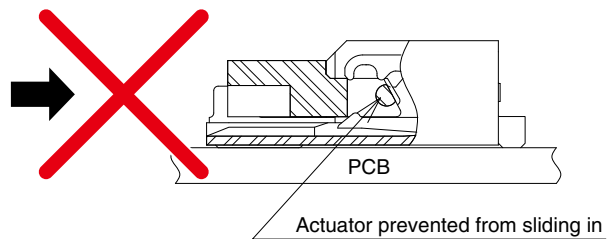
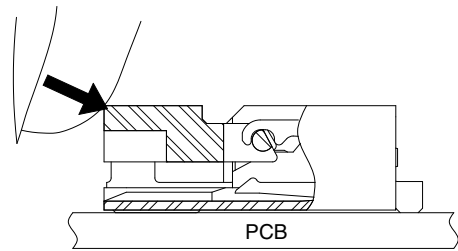
[Fig.5]

◆ Operation Methods of Connectors and Precautions

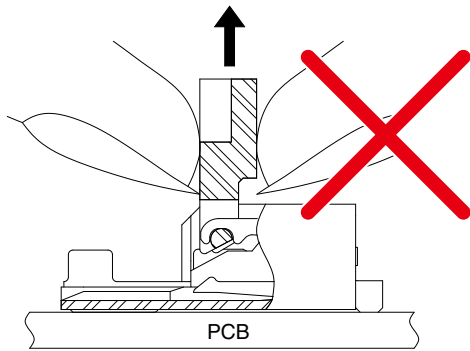
[Operation method]



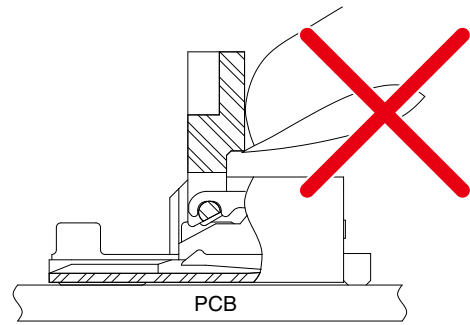
[Fig.6]



[Fig.7]



[Fig.8]



[Fig.9]

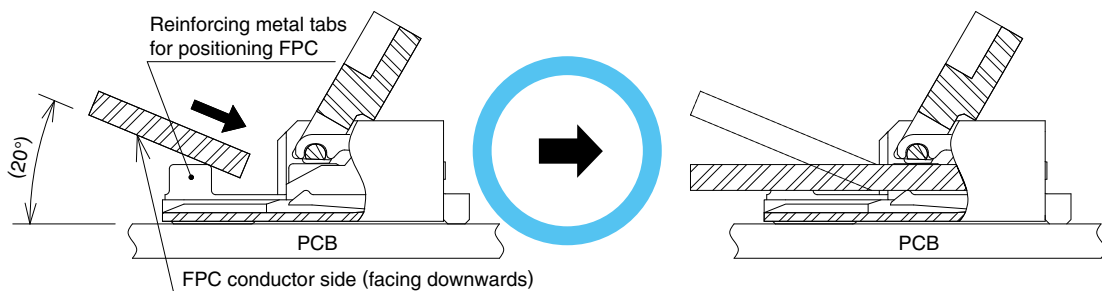
3. How to insert FPC/FFC

This connector uses a bottom contact point. Additionally, this connector is equipped with reinforcing metal tabs for positioning FPC/FFC.

Hold FPC/FFC with the conductor side facing down, and insert FPC/FFC from above diagonally at an angle of about 20° to the board. [Fig.10]

[Caution]

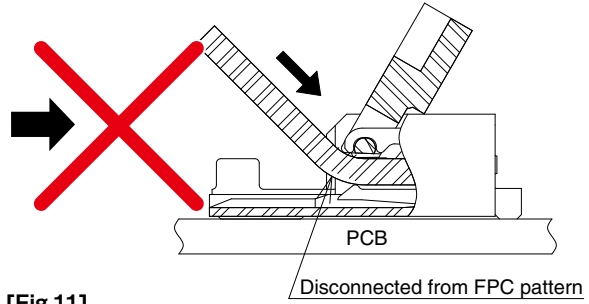
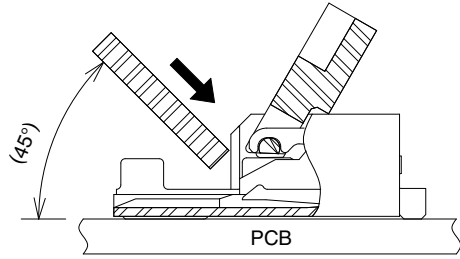
- Be careful not to insert FPC/FFC with the conductor side facing upwards.
- Be sure to insert FPC/FFC to the end.
- Do not insert FPC/FFC from diagonally above. [Fig.11]
- Insert FPC/FFC while the actuator is open. [Fig.12]
- Do not insert FPC/FFC approaching in a vertical, lateral or diagonal direction. [Fig.13]



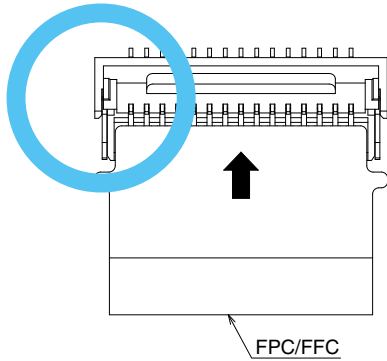
[Fig.10]

◆ Operation Methods of Connectors and Precautions

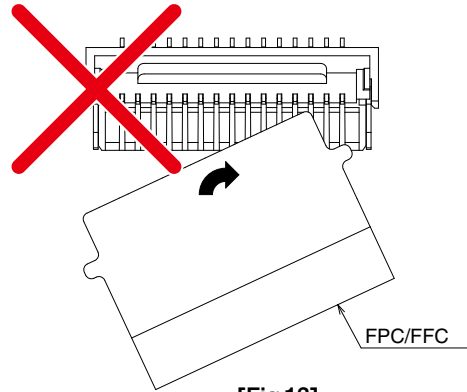
[Operation method]



[Fig.11]



[Fig.12]



[Fig.13]

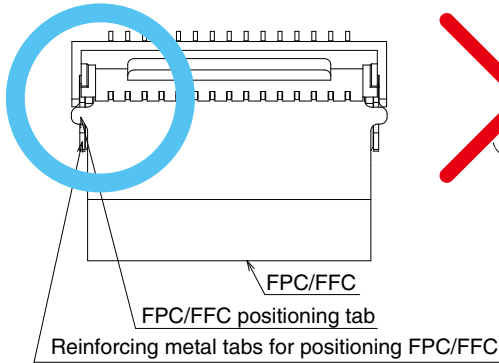
4. Check the inserted state of FPC/FFC

This connector uses reinforcing metal tabs for positioning FPC/FFC.

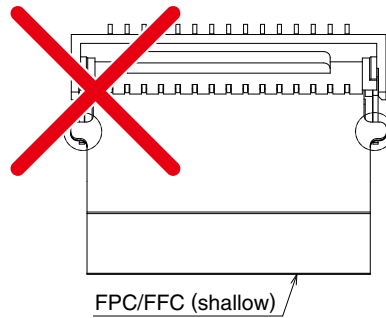
When insertion of FPC/FFC is complete, confirm that the FPC/FFC positioning tab is located at the place shown in the Figure. [Fig.14]

[Caution]

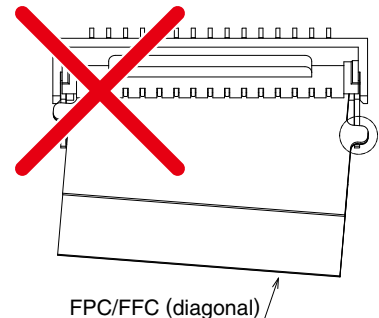
- Do not insert FPC/FFC insufficiently deep or from a diagonal direction. [Fig.15, Fig.16]



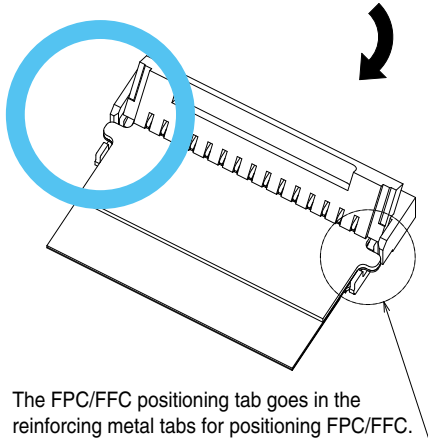
[Fig.14]



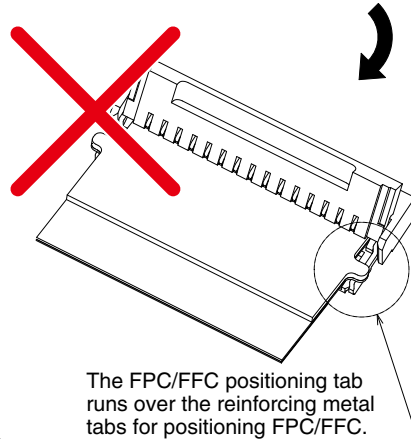
[Fig.15]



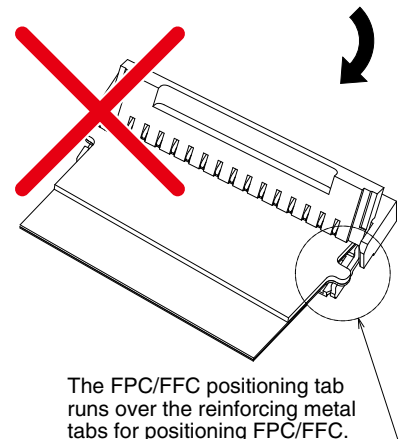
[Fig.16]



The FPC/FFC positioning tab goes in the reinforcing metal tabs for positioning FPC/FFC.



The FPC/FFC positioning tab runs over the reinforcing metal tabs for positioning FPC/FFC.



The FPC/FFC positioning tab runs over the reinforcing metal tabs for positioning FPC/FFC.

◆ Operation Methods of Connectors and Precautions

[Operation method]

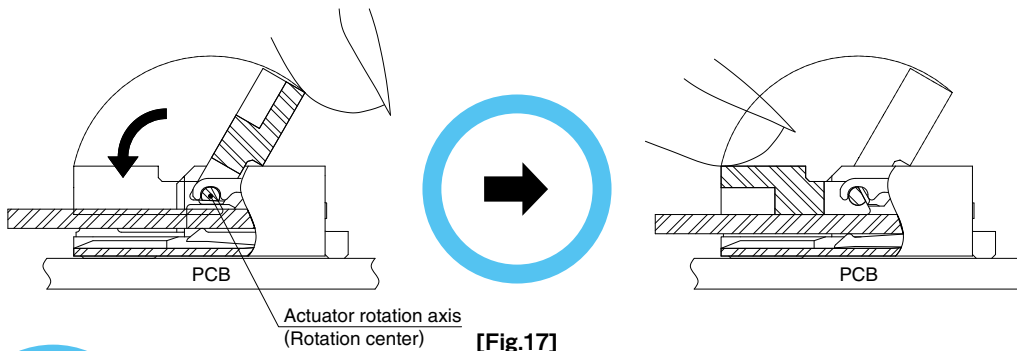
5. Actuator locking mechanism

Actuator rotates around the center.

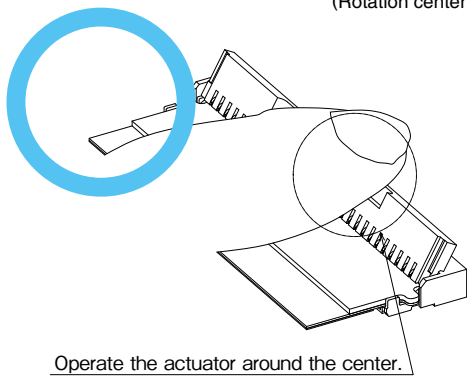
After inserting FPC/FFC correctly to the end, operate the actuator by rotating it, and then lock in place. [Fig.17]

[Caution]

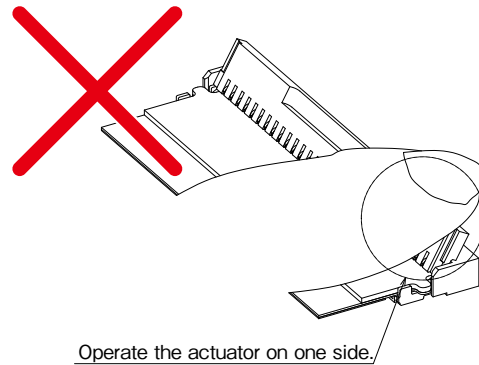
- Operate the actuator around the center. [Fig.18]
- Do not operate the actuator on one side only. [Fig.19]
- Operate the actuator by hand, take care not to allow jigs or claws to get inside the connector.
- Do not operate the actuator in the direction opposite to the closing direction.
- Do not pick and raise the actuator, or hook it.
- Please check to insure the actuator is placed horizontal to the board surface when locked.



[Fig.17]



[Fig.18]



[Fig.19]

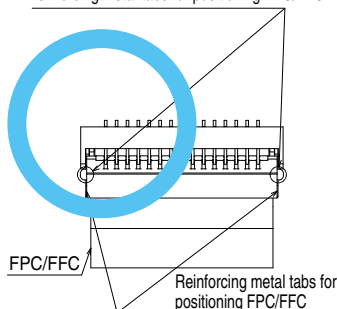
6. Check the mated state of FPC/FFC

When the actuator is completely locked, visually inspect the inserted status of FPC/FFC. [Fig.20]

[Caution]

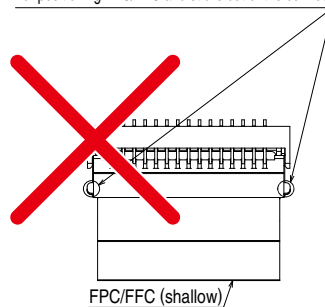
- Do not insert FPC/FFC insufficiently deep or from a diagonal direction. [Fig.21, Fig.22]

When FPC/FFC is correctly inserted, the FPC/FFC positioning tab sits in the reinforcing metal tabs for positioning FPC/FFC.



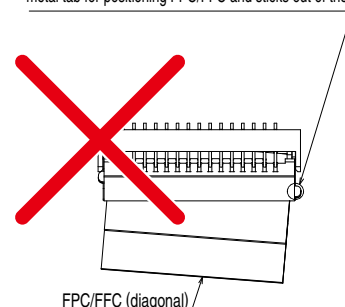
[Fig.20]

If FPC/FFC is not correctly inserted (or is not inserted deep enough), the FPC/FFC positioning tab will not sit in the reinforcing metal tabs for positioning FPC/FFC and sticks out of the connector.



[Fig.21]

If FPC/FFC is not correctly inserted (or is inserted diagonally), part of the FPC/FFC positioning tab does not go in the reinforcing metal tab for positioning FPC/FFC and sticks out of the connector.



[Fig.22]

◆ Operation Methods of Connectors and Precautions

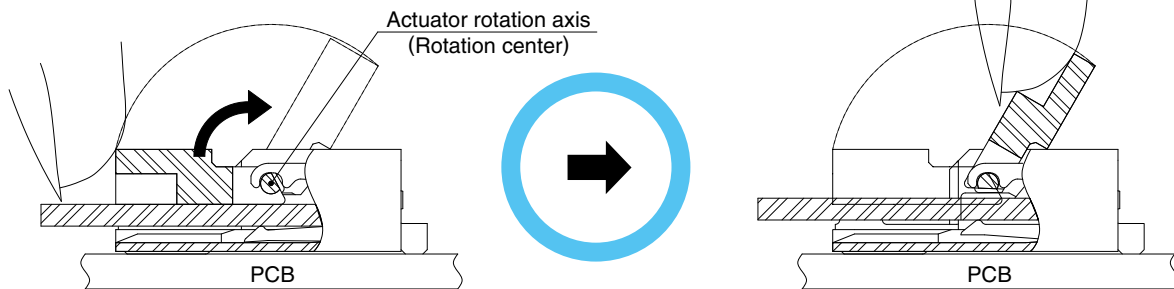
[Operation method]

7. How to unlock actuator (FPC/FFC inserted)

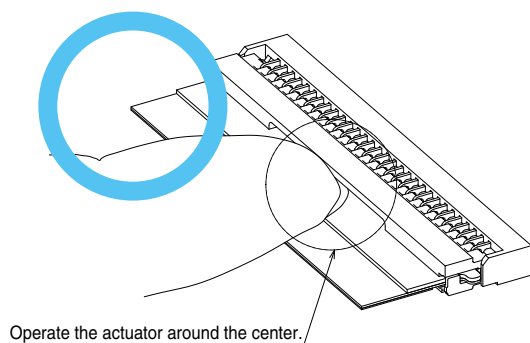
Push the actuator slowly just above and release the lock. [Fig.23]

[Caution]

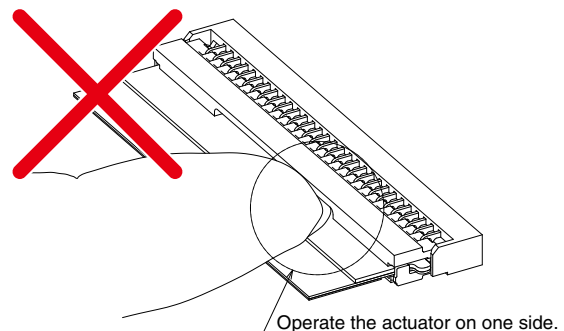
- Operate the actuator around the center. [Fig.24]
- Do not operate the actuator on one side only. [Fig.25]
- Operate the actuator by hand, take care not to allow jigs or claws to get into the connector.
- Actuator cannot be opened wider than 120°. Do not try to open it wider than that angle. [Fig.26]
- Do not pick and raise the actuator, or hook it. [Fig.27]



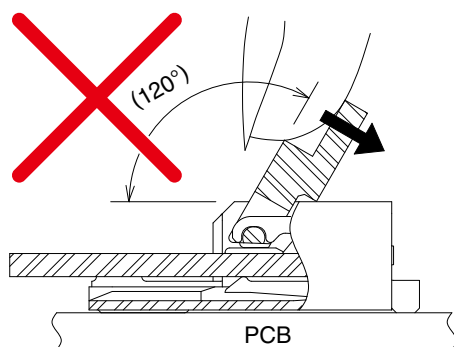
[Fig.23]



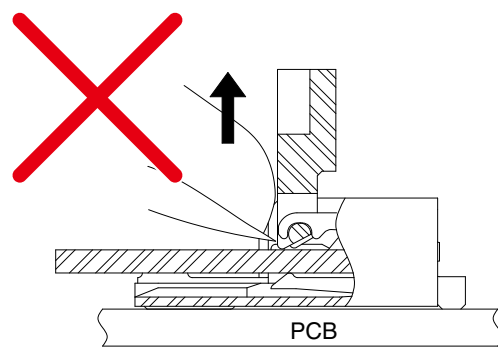
[Fig.24]



[Fig.25]



[Fig.26]



[Fig.27]

◆ Operation Methods of Connectors and Precautions

[Operation method]

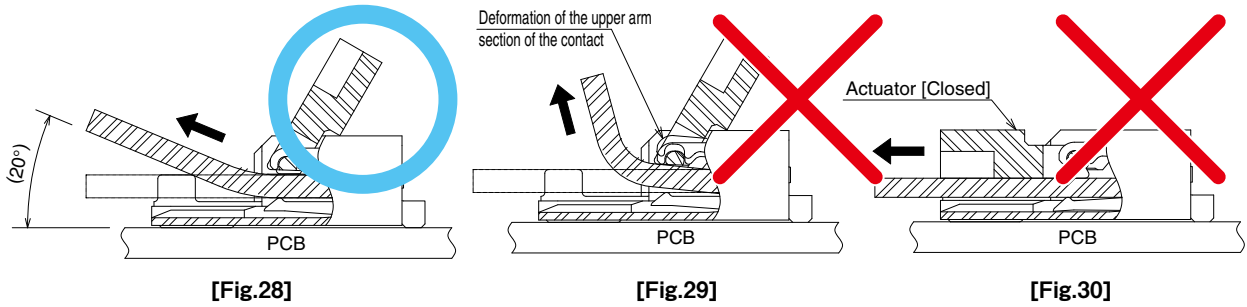
8. How to remove FPC/FFC

This connector uses reinforcing metal tabs for positioning FPC/FFC.

After unlocking the actuator, pull out the FPC/FFC diagonally at an angle of about 20° to the board. [Fig.28]

[Caution]

- Do not remove the FPC/FFC in the horizontal direction.
- Do not remove the FPC/FFC considerably diagonally above. [Fig.29]
- Do not remove the FPC/FFC while the actuator is closed. [Fig.30]

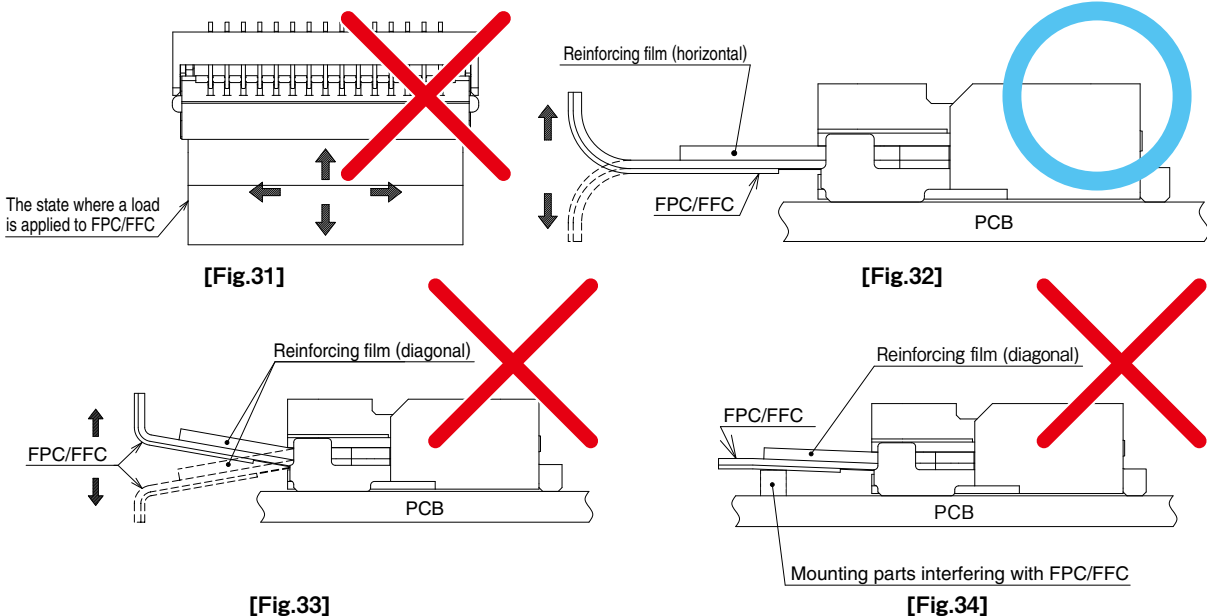


[Cautions for PCB layout]

Depending on the routing of FPC/FFC to mate, a load may be applied to the connector, which could lead to contact failure. In order to prevent any failure, please consider the following.

[Caution]

- Please ensure there is no load applied to the connector in the pulling, inserting or lateral direction. [Fig.31]
Please ensure that no extreme tensile force or upward force etc. is applied to the connector in the vertical direction.
- When routing FPC/FFC, please ensure that the FPC/FFC is not pulled and routing is carried out with adequate margin.
Please check that the reinforcing film is placed horizontal to the board surface. [Fig.32]
- Do not route the FPC/FFC to bend around the connector. [Fig.33]
Please take care with the FPC/FFC so that no direct force is applied to the connector section.
- Please do not place any parts under the FPC/FFC reinforcing film that will interfere with FPC/FFC. [Fig.34]
- Please confirm the recommendations of in this document for the shape of FPC/FFC.
In addition, for the flexibility of FPC/FFC, please make adjustments with the FPC/FFC manufacturer.
- When designing, please ensure there is adequate for FPC/FFC insertion so it is not inserted on an extreme diagonally.
In addition, a short FPC/FFC will make insertion difficult, please use adequate layout and length for FPC/FFC.
- When designing a board layout, please secure the space required for actuator movement.



[Notes for mounting on the board]**[Caution]**

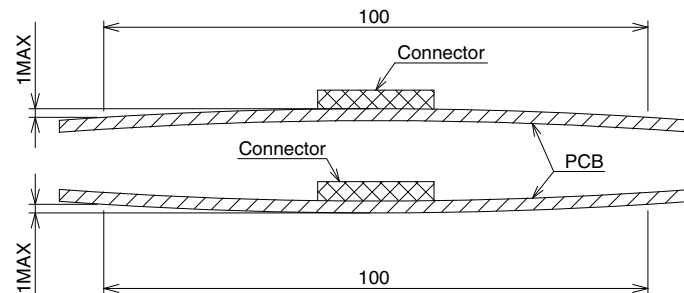
- Please confirm recommendations for mount board land shape, metal mask opening shape, and FPC/FFC shape.
- If the land is narrower than recommended, or if the metal mask opening is wider than recommended, solder (flux) wicking is more likely to occur. If there is difference from the recommendation, please use after checking the mounted state.
- The level difference between the bottom surfaces of contact lead and the mold is designed to be small. When there is silk print etc. on the bottom surface of the connector, it could push up the connector bottom surface, and cause non-sticking solder or defective fillet formation. When there is silk print etc. on the bottom surface of the connector, please use it after checking the mounted state.
- Use the reflow conditions within the specification. The mounted status may vary due to external conditions such as the type of cream solder, manufacturer, and board size. Please use after checking the mounted state.
- Please control the board warpage as much as possible. While the coplanarity of this connector is 0.1mm or less, if there is considerable board warpage, defective soldering could occur.
- When mounted on FPC/FFC, be sure to provide a reinforcing plate to make it easier to handle. A reinforcing plate of 0.3mm or thicker made of glass epoxy material is recommended.
- When you remove the emboss from the reel, or when you absorb the connector from the emboss and so on, do not apply any excessive external force to the connector before mounting. (1N or less)

[Cautions when handling the board after mounting]

Please be careful of the following matters when you handle the board after mounting operation.

[Caution]

- Do not apply any load to the board in the assembly process, such as 'dividing a multi-piece board' or Securing the board to the frame. Such an action could apply a load to the connector and damage it.
- Use the board with the deflection of 1mm or less when the board width is 100mm. [Fig.35]
If the board has some deflection, it could apply a load to the connector and damage it.

**[Fig.35]****[Cautions for hand-soldering]**

Please be careful of the following matters when you carry out hand-soldering such as for repair work etc.

[Caution]

- Do not hand-solder while FPC/FFC is inserted.
- Please be careful not to apply excessive heat, or allow the solder iron to touch any place other than the connector contact lead part. Such an action could cause the connector to be deformed or melted.
- Do not operate the connector while it is not mounted on the board.
- Do not supply an excessive amount of solder (flux). If too much solder (flux) is supplied to the contact, the solder or flux could adhere on the contact point or the rotation section of the actuator. This will cause contact failure or defective rotation of the actuator. Additionally, if too much solder is supplied to the reinforcing metal tabs, the rotational action of the actuator could be damaged.

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