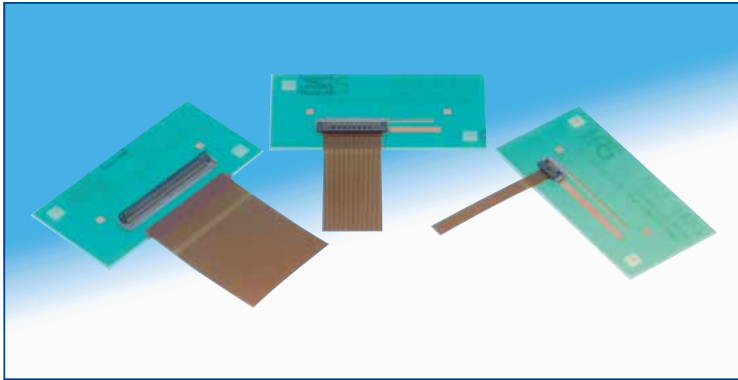


NEW

0.5 mm pitch, 2 mm above the board, FPC/FFC Connector

FH52 Series



■ Features

1. Reliable connectivity and its robust structure

The housing was designed to provide a stronger, more robust structure. This structure also provides an excellent connection between the FPC/FFC and the contacts. Compared to our conventional products FH12 Series with 0.5mm pitch horizontal connection type, the FH52 series delivers:

- A more reliable connection created by its FPC/FFC positioning feature.
- Hirose's unique structure designed to ensure a secure connection and prevent unlocking.

2. Common land pattern shared with the FH12 Series

The FH52 Series and the FH12 Series (horizontal connection type) share the same land pattern and can be mounted without any modification.

3. Flip lock actuator

The flip lock actuator provides a smooth, secure locking function between the FPC/FFC and the connector. An improved tactile click during closing delivers the assurance of a completed locking operation.

4. Excellent FPC/FFC retention force

FPC/FFC with "side-catchers" greatly improves the retention force in horizontal direction.

5. Compatible with 0.3 mm (thickness) FPC/FFC is applicable

FH52 series accepts FPC/FFC with a thickness of 0.3 mm, which is easy to manufacture and insert.

6. Fully enclosed molded structure

The molded housing was designed to protect the contacts on the bottom side of the connector. This removes any PCB patterning issues under the connector and enhances design flexibility.

7. Halogen-Free

Chlorine and bromine exceeding the standard values are not used on these connectors.

*As defined in accordance to IEC61249-2-21
Br 900ppm or less, Cl 900ppm or less, Br + Cl 1,500ppm or less

8. Automatic mounting is supported

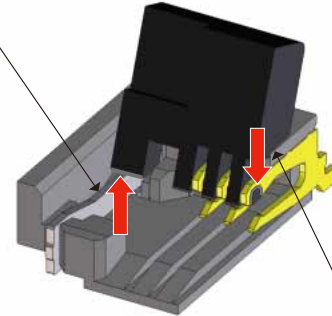
Embossed packaging makes automatic mounting possible.
(3,000 connectors per reel)

9. 500-piece reels available

Now available with 500 pieces per reel as well as 3000 pieces.
(The outer diameter of an embossed reel is ϕ 180 mm)

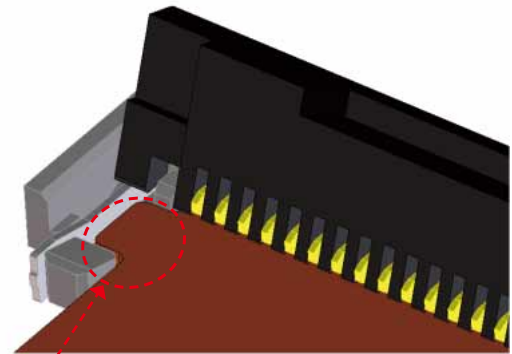
Robust Locking Structure

The reinforcing metal fitting prevents the actuator from coming off.



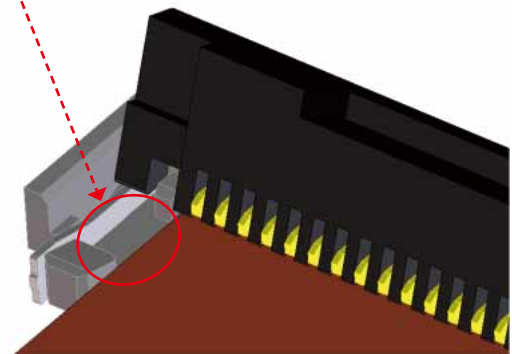
Each contact tip prevents the actuator from coming off.

FPC Positioning Mechanism



FPC with tab increase the retention force in horizontal direction.

Also accepts with straight FPC/FFC (no side catchers).



Product Specifications

Rating	Current rating	0.5 A (Note 1)	Operating temperature	-40 to+85°C (Note 2)	Storage temperature range	-10 to +50°C (Note 3)
	Voltage rating	AC50 Vrms	Operating humidity	Relative humidity of 90% or less (No dew condensation is allowed)	Storage humidity range	Relative humidity of 90% or less (No dew condensation is allowed)

With specifications compatible with FPC/FFC contacts	t=0.3 ± 0.05 mm Gold plating
--	------------------------------

Items	Specifications	Conditions
1.Insulation Resistance	500 mΩ or more.	Measured at DC 100 V
2.Withstanding Voltage	No flashover or breakdown.	AC150 Vrms applied for one minute
3.Contact Resistance	50 mΩ or less. *Including FPC/FFC conductor resistance.	Measured at 1 mA (DC or 1,000 Hz)
4.Durability	Contact resistance: 50 mΩ or less. There should be no breakage/loosening of the parts.	20 times
5.Vibration Resistance	There should be no power flicker of 1 μs or higher. Contact resistance: 50 mΩ or less. There should be no breakage/loosening of the parts.	10 cycles in each of three axial directions at frequency 10-55 Hz, half amplitude 0.75 mm
6.Shock Resistance	There should be no power flicker of 1 μs or higher. Contact resistance: 50 mΩ or less. There should be no breakage/loosening of the parts.	Acceleration of 981 m/S ² ; duration 6 ms, sine half-wave, 3 cycles in each of the 3 axes each in both directions
7.Humidity Resistance in Steady State	Contact resistance: 50 mΩ or less. Insulation resistance: 50 MΩ or higher. There should be no breakage/loosening of the parts.	Left to stand for 96 hours at the temperature of 40°C and the humidity of 90 to 95%
8.Temperature Cycles	Contact resistance: 50 mΩ or less. Insulation resistance: 50 MΩ or higher. There should be no breakage/loosening of the parts.	Temperature: -40 → +15 to +35 → +85 → +15 to +35°C Time: For 30 → 2 to 3 → 30 → 2 to 3 minutes 5 cycles under the above conditions
9.Solder Heat Resistance	No apparent deformation, change of appearance or instability in contacts.	Reflow: Peak temperature at 250°C MAX, 230°C or higher, for 30 seconds or less Hand soldering: 350±10°C for 5 seconds

(Note 1) Use at 70% of the current rating when all pins are energized with current rating.

(Note 2) Temperature rise at the time of electrification is included.

(Note 3) The term “storage” refers to the long-term storage condition of unused products before PCB mounting.

*The operating temperature and humidity ranges apply to non-energized state after PCB mounting.

**The above specifications are the representative one for this series. Please refer to “delivery specifications” for official individual agreement.

Materials

Parts	Material	Color/Treatment	Remarks
Insulator	LCP	Gray	UL94V-0
		Black	
Contacts	Phosphorous Bronze	Partially gold plated	—
Metal fittings	Brass	Pure tin plated	—

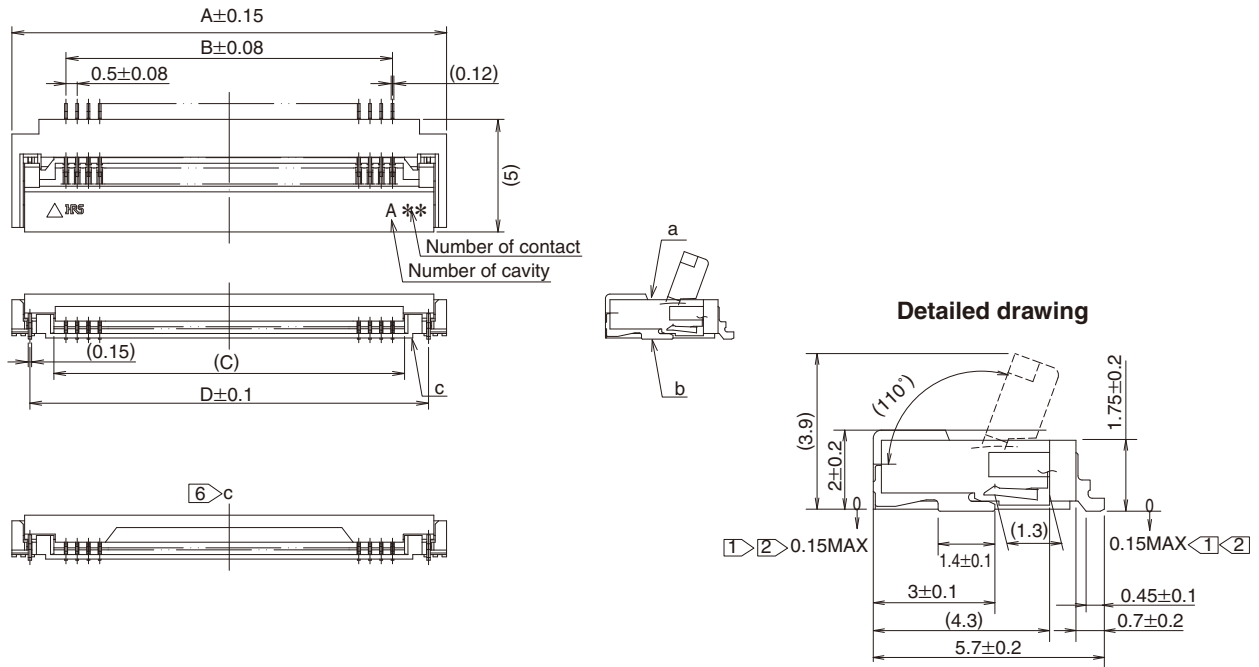
Product Number Structure

Refer to this page when determining product specifications by model types. Please place orders with part numbers listed in this catalog. The characteristics and specifications of the product described in this catalog are reference values. Please make sure to check the latest delivery specifications at the time of product use.

FH **52** - **50S** - **0.5** **SH** **(99)**
 ① ② ③ ④ ⑤ ⑥

① Series Name: FH	⑤ Contact Form SH ... SMT vertical mount type
② Series No.: 52	
③ Number of Contacts: 8-68 contacts	⑥ Specification: None ... Partially gold plated, 3,000-piece packaging (99) ... Partially gold plated, 500-piece packaging
④ Contact Pitch: 0.5 mm	

Connector Dimensions



- Note: **1** The lead coplanarity of contact and metal fitting is MAX 0.1 mm.
2 The position of the contact lead shows the dimension from the face (b) of the case bottom.
3 This product is embossed-packaged. Please refer to the packaging specifications on page 6 for details.
4 Dimensions may be changed to prevent sink marks due to improvement, etc.
5 Black dots, etc., may occur in mold resin but will have no effect on quality. Discoloration of the contact plating may occur after reflow but will have no effect on quality.
6 The geometry of a 60-pole actuator is as shown in the figure.

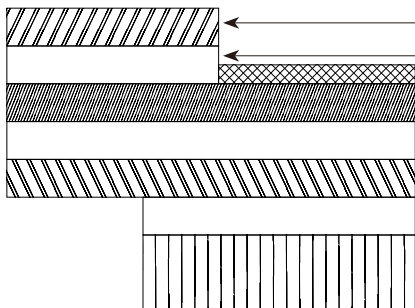
Unit: mm

Product No.	HRS No.	No. of Contacts	A	B	C	D
FH52-4S-0.5SH(**)	_____	4	6.3	1.5	2.57	4.7
FH52-5S-0.5SH(**)	_____	5	6.8	2.0	3.07	5.2
FH52-6S-0.5SH(**)	_____	6	7.3	2.5	3.57	5.7
FH52-8S-0.5SH(**)	CL580-3305-3-*	8	8.3	3.5	4.57	6.7
FH52-10S-0.5SH(**)	CL580-3306-6-*	10	9.3	4.5	5.57	7.7
FH52-11S-0.5SH(**)	CL580-3320-7-*	11	9.8	5.0	6.07	8.2
FH52-12S-0.5SH(**)	CL580-3307-9-*	12	10.3	5.5	6.57	8.7
FH52-15S-0.5SH(**)	CL580-3302-5-*	15	11.8	7.0	8.07	10.2
FH52-16S-0.5SH(**)	_____	16	12.3	7.5	8.57	10.7
FH52-18S-0.5SH(**)	CL580-3321-0-*	18	13.3	8.5	9.57	11.7
FH52-20S-0.5SH(**)	_____	20	14.3	9.5	10.57	12.7
FH52-22S-0.5SH(**)	_____	22	15.3	10.5	11.57	13.7
FH52-24S-0.5SH(**)	_____	24	16.3	11.5	12.57	14.7
FH52-25S-0.5SH(**)	CL580-3316-0-*	25	16.8	12.0	13.07	15.2
FH52-26S-0.5SH(**)	_____	26	17.3	12.5	13.57	15.7
FH52-28S-0.5SH(**)	CL580-3324-8-*	28	18.3	13.5	14.57	16.7
FH52-30S-0.5SH(**)	CL580-3310-3-*	30	19.3	14.5	15.57	17.7
FH52-32S-0.5SH(**)	CL580-3325-0-*	32	20.3	15.5	16.57	18.7
FH52-40S-0.5SH(**)	CL580-3300-0-*	40	24.3	19.5	20.57	22.7
FH52-42S-0.5SH(**)	CL580-3329-1-*	42	25.3	20.5	21.57	23.7
FH52-45S-0.5SH(**)	CL580-3311-6-*	45	26.8	22.0	23.07	25.2
FH52-50S-0.5SH(**)	CL580-3303-8-*	50	29.3	24.5	25.57	27.7
FH52-60S-0.5SH(**)	CL580-3301-2-*	60	34.3	29.5	30.57	32.7

(Note 1) Connectors are packaged in tape and reel. Please order in full reel quantities.
 (Note 2) ** indicates part number suffix. Please refer to the chart under "Product Number Structure" for details.

◆FH52 Series FPC/FFC Material Composition and Recommended Specifications

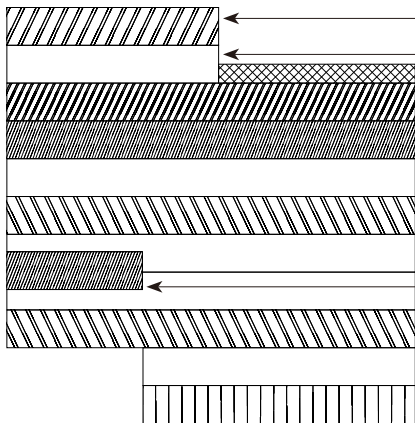
1. In Case of One-Sided FPC



FPC : Flexible Printed Circuit

Name of material	Material property	Thickness (μm)
Cover lay film	Polyimide 1 mil	(25)
Cover adhesive		(25)
Surface treatment	1 to 5μm Nickel underplating +0.2μm Gold plating	3
Copper foil	Cu 1 oz	35
Base adhesive	Thermosetting adhesive	25
Base film	Polyimide 1 mil	25
Reinforcement material adhesive	Thermosetting adhesive	30
Stiffening film	Polyimide 7 mil	175
Total		293

2. In Case of Double-Sided FPC

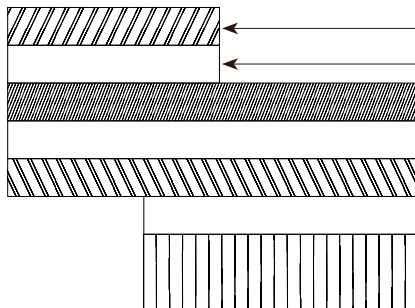


FPC : Flexible Printed Circuit

Name of material	Material property	Thickness (μm)
Cover lay film	Polyimide 1 mil	(25)
Cover adhesive		(25)
Surface treatment	1 to 5μm Nickel underplating +0.2μm Gold plating	3
Through-hole copper	Cu	15
Copper foil	Cu ½ oz	18
Base adhesive	Thermoset adhesive	18
Base film	Polyimide 1 mil	25
Base adhesive	Thermoset adhesive	18
Copper foil	Cu ½ oz	(18)
Cover adhesive	Thermoset adhesive	25
Cover lay film	Polyimide 1 mil	25
Reinforcement material adhesive	Thermoset adhesive	50
Stiffener film	Polyimide 4 mil	100
Total		297

* In case of double-sided FPC, the copper foil on the back side should be eliminated in order to prevent the unlocking due to the bent FPC.

3. In case of FFC



FFC : Flexible Flat Cable

Name of material	Material property	Thickness (μm)
Polyester film		(12)
Adhesive	Thermoplastic type polyester type	(30)
Annealed copper foil (Gold plated over Nickel underplating)		35
Adhesive	Polyester type	30
Polyester		12
Adhesive	Polyester type	30
Stiffening	Polyester type	188
Total		295

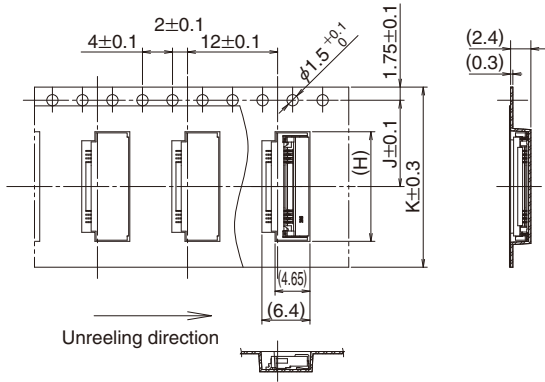
*Practical tolerance of thickness dimension is about ±20μm.

1. This specification is recommended for the material composition of FH52 Series FPC/FFC (t=0.3±0.05 mm).

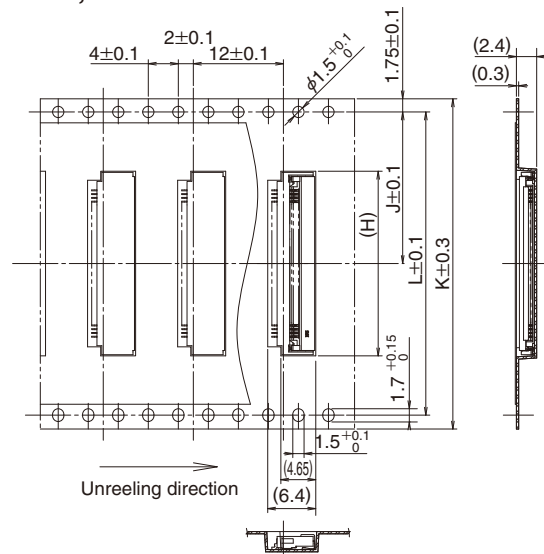
2. Please contact FPC/FFC manufacturers for the details of the material composition.

◆ Packaging Specifications (JIS C 0806)

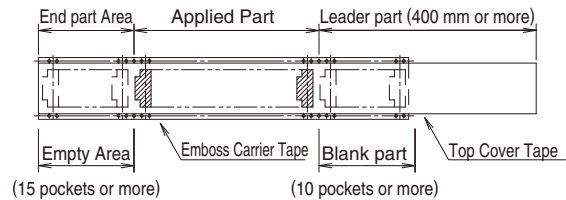
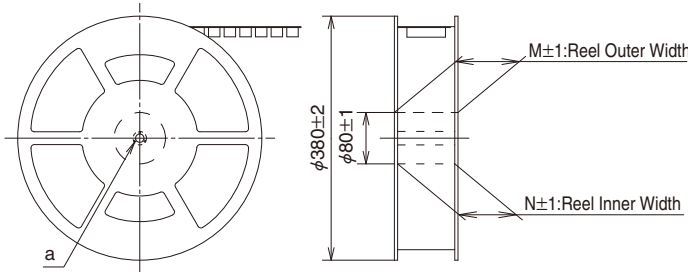
● Embossed Carrier Tape Dimensions for 16 mm and 24 mm Wide Carriers



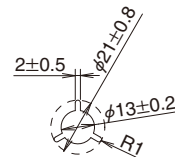
● Embossed Carrier Tape Dimensions for 32 mm, 44 mm and 56 mm Wide Carriers



● Reel Dimensions



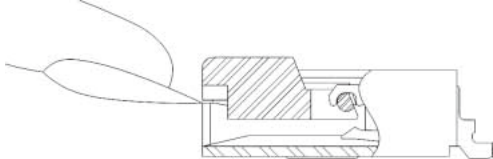
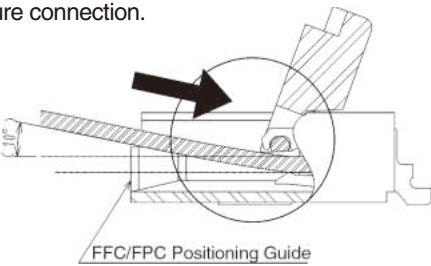
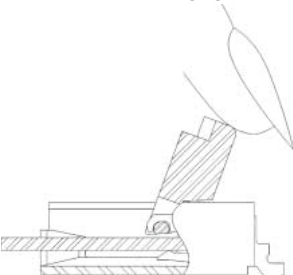
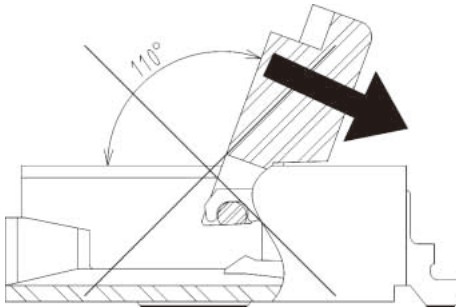
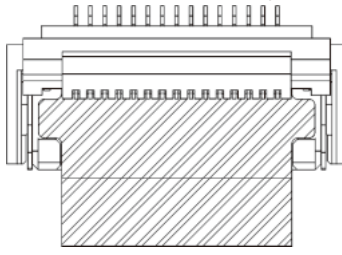
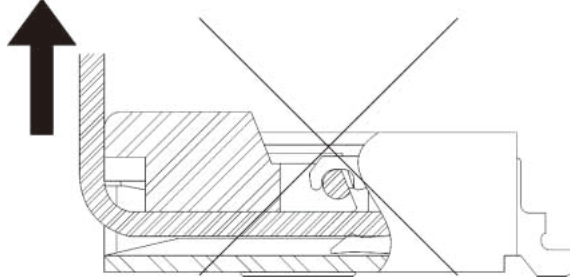
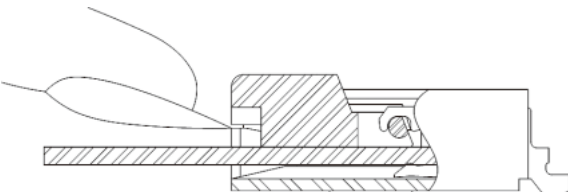
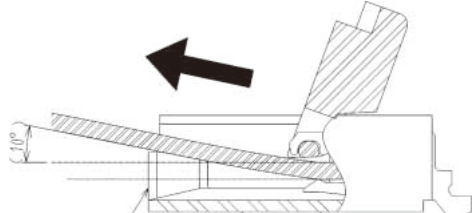
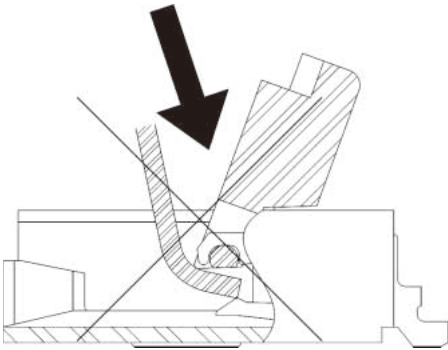
Detailed drawing



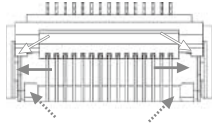
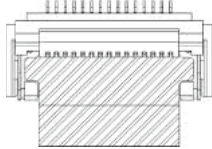
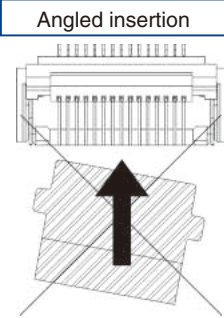
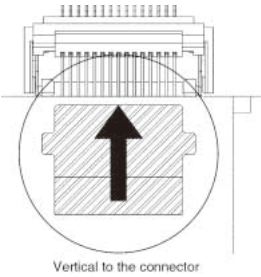
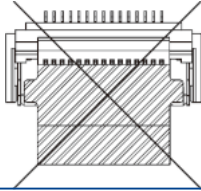
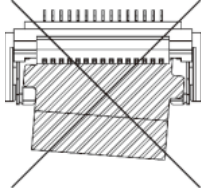
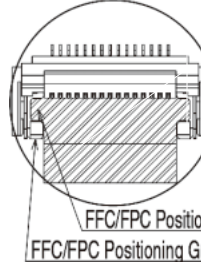
Unit: mm

Product No.	HRS No.	No. of Contacts	H	J	K	L	M	N
FH52-4S-0.5SH(**)	—	4	6.6	7.5	16.0	—	21.4	17.4
FH52-5S-0.5SH(**)	—	5	7.1	7.5	16.0	—	21.4	17.4
FH52-6S-0.5SH(**)	—	6	7.6	7.5	16.0	—	21.4	17.4
FH52-8S-0.5SH(**)	CL580-3305-3-*	8	8.6	11.5	24.0	—	29.4	25.4
FH52-10S-0.5SH(**)	CL580-3306-6-*	10	9.6	11.5	24.0	—	29.4	25.4
FH52-11S-0.5SH(**)	CL580-3320-7-*	11	10.1	11.5	24.0	—	29.4	25.4
FH52-12S-0.5SH(**)	CL580-3307-9-*	12	10.6	11.5	24.0	—	29.4	25.4
FH52-15S-0.5SH(**)	CL580-3302-5-*	15	12.1	11.5	24.0	—	29.4	25.4
FH52-16S-0.5SH(**)	—	16	12.6	11.5	24.0	—	29.4	25.4
FH52-18S-0.5SH(**)	CL580-3321-0-*	18	13.6	11.5	24.0	—	29.4	25.4
FH52-20S-0.5SH(**)	—	20	14.6	11.5	24.0	—	29.4	25.4
FH52-22S-0.5SH(**)	—	22	15.6	11.5	24.0	—	29.4	25.4
FH52-24S-0.5SH(**)	—	24	16.6	14.2	32.0	28.4	37.4	33.4
FH52-25S-0.5SH(**)	CL580-3316-0-*	25	17.1	14.2	32.0	28.4	37.4	33.4
FH52-26S-0.5SH(**)	—	26	17.6	14.2	32.0	28.4	37.4	33.4
FH52-28S-0.5SH(**)	CL580-3324-8-*	28	18.6	14.2	32.0	28.4	37.4	33.4
FH52-30S-0.5SH(**)	CL580-3310-3-*	30	19.6	14.2	32.0	28.4	37.4	33.4
FH52-32S-0.5SH(**)	CL580-3325-0-*	32	20.6	20.2	44.0	40.4	49.4	45.4
FH52-40S-0.5SH(**)	CL580-3300-0-*	40	24.6	20.2	44.0	40.4	49.4	45.4
FH52-42S-0.5SH(**)	CL580-3329-1-*	42	25.6	20.2	44.0	40.4	49.4	45.4
FH52-45S-0.5SH(**)	CL580-3311-6-*	45	27.1	20.2	44.0	40.4	49.4	45.4
FH52-50S-0.5SH(**)	CL580-3303-8-*	50	29.6	20.2	44.0	40.4	49.4	45.4
FH52-60S-0.5SH(**)	CL580-3301-2-*	60	34.6	26.2	56.0	52.4	61.4	57.4

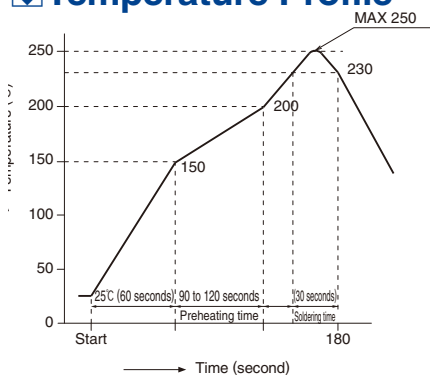
◆ Connector Operational Method and Precautions

Operational Method	Precautions in Use
<p>1. FPC/FFC insertion method</p> <p>① Lift the actuator up in to a 90° angle to unlock. The actuator can be easily operated by a thumb or the nail on your index finger. (See diagram below)</p>  <p>② Insert FPC/FFC with its conductor side facing down. Insert FPC at an angle of approximately 10° against the PCB surface and vertical to the connector. When using FPC/FFC with tabs, make sure to insert them completely and that the tabs clear the FPC/FFC position guiding tab to ensure a secure connection.</p>  <p>③ Push down the actuator to engage the lock.</p> 	<p>① The actuators on the FH52 Series do not open any farther than 110°. Trying to rotate it past this point may cause the actuator to break or disengage.</p>  <p>② Insert the FPC/FFC correctly into the insertion slot of the connector. An incorrectly placed FPC/FFC can cause disconnection or defective continuity.</p>  <p>③ This connector is not structured to handle pull-up force applied to FPC/FFC, be sure to hold down the FPC/FFC when any pull-up force may be applied.</p> 
<p>2. FPC/FFC Extraction Method</p> <p>① Lift the actuator up in to a 90° angle to unlock. After it has been unlocked, lift the FPC/FFC slightly upward and remove it with a smooth motion.</p>   <p>FFC Positioning Guide</p>	<p>④ After insertion of the FPC/FFC, do not exert any direct pressure on the bottom of the connector insertion slot. Doing so may damage the contacts and/or peel-off the conductor of FPC/FFC, and might lead to the connector malfunctioning.</p> 

◆ Precautions when inserting/mating FPC/FFC with positioning tab

Operational Method	Precautions in Use
<p>1. Insertion position</p> <p>After inserting the cable, make sure that the tabs are placed into the gaps (.....) between the mold walls (→) and the guide walls (→) located on both sides the connector.</p>   <p>2. Precautions during insertion/mating</p> <p>① Avoid angled insertion</p> <p>Do not insert the cable at an angle. The end of the cable may get caught on the contact and lead to the deformation of the contact.</p> <p>To ensure a proper connection, make sure to insert the cable completely into the connector.</p>   <p style="text-align: center;">Vertical to the connector</p>	<p>② Avoid mating on top of the guide.</p> <p>Do not place the cable on top of the guides. In addition, do not try to close the actuator with the cable on top of the guides. It may cause damage to the contacts and create an unreliable connection.</p> <p style="text-align: center;">Running on top of the guides on both sides</p>  <p style="text-align: center;">Running on top of the guide on the right side</p>  <p style="text-align: center;">Normal insertion</p>  <p style="text-align: center;">FFC/FFC Positioning Tab FFC/FFC Positioning Guide</p>

◆ Temperature Profile



Applicable Conditions

- Reflow method : Far-infrared/hot-air reflow
- Reflow chamber atmosphere : Air
- Solder : Cream type Sn/3.0 Ag/0.5 Cu
(M705-221CM5-32-10.5; Senju Metal Industry Co., Ltd.)
- Test PCB : PCB material and size
Glass epoxy 80 × 100 × 1.6 mm
Land dimensions 0.3 × 0.85 mm
- Metal mask method : Thickness 0.12 mm
Dimensions of opening 0.25 × 0.85 mm

This temperature profile shown is based on the conditions above.
Please check the actual mounting conditions when using a different solder manufacturer as well as other material changes.



HIROSE ELECTRIC CO.,LTD.

6-3,Nakagawa Chuoh-2-Chome,Tsuzuki-Ku,Yokohama-Shi 224-8540,JAPAN
 TEL: +81-45-620-3526 Fax: +81-45-591-3726
<http://www.hirose.com>
<http://www.hirose-connectors.com>