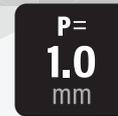


FH52C Series

1.0mm Pitch, 2.0mm Height, Bottom Contact, Front Flip, CIC Connector



TM Flip-Lock Pioneer Hirose



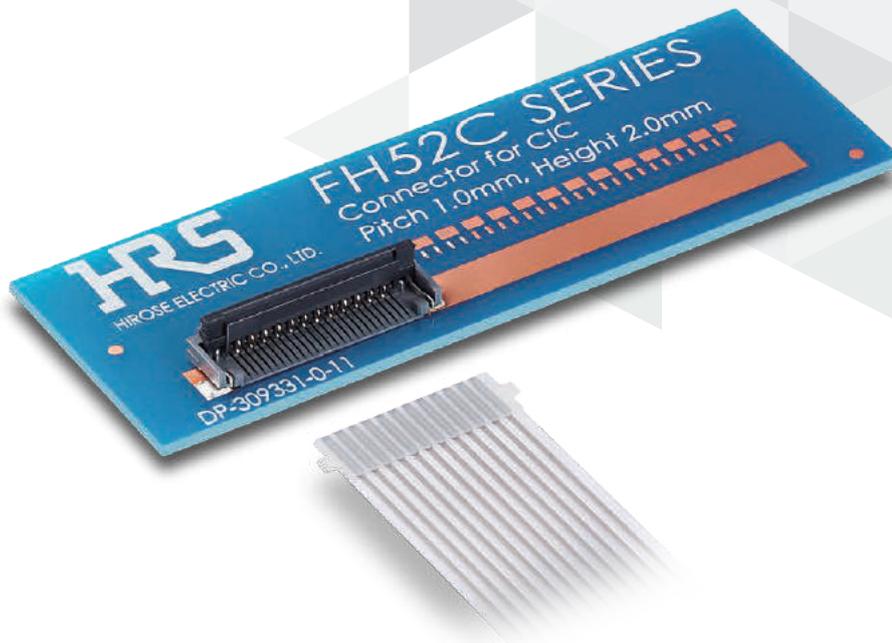
P = 1.0mm



CIC



Robust



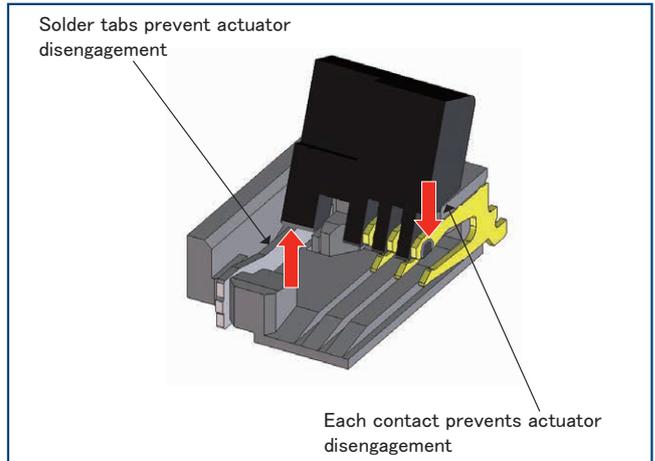
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Features

1. Highly reliable connection and robust design

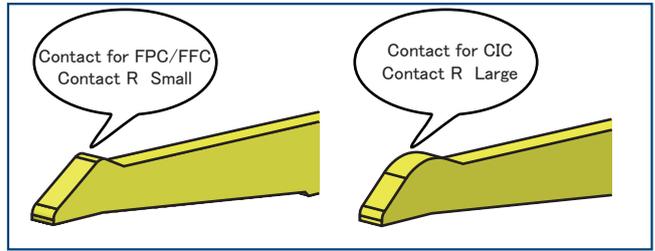
As connectors are increasingly produced with higher pin counts, the need for higher connector body strength and CIC connection reliability grows. The FH52C offers enhanced connection reliability through its CIC positioning mechanism and provides a secure connection that prevents unlocking, thanks to its original robust design.



Secure Actuator Retention

2. Contact shape where carbon is hard to be scraped

By increasing the R of the contact area compared to conventional items, scraping of the carbon from the CIC is minimized.

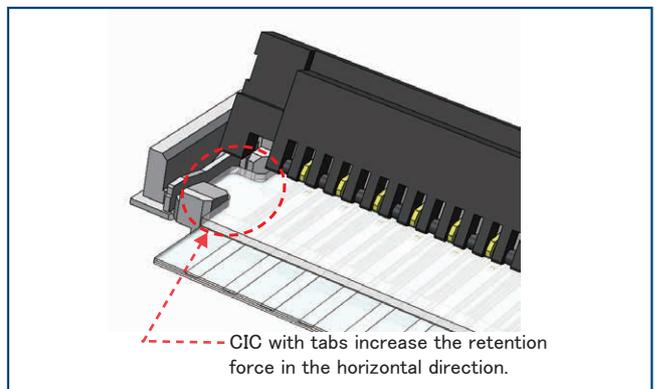


3. Flip lock simplifies operations

The flip lock features a one-touch rotation design that simplifies the CIC connection process, requiring less effort. It produces a clear tactile click upon locking, offering an enhanced secure connection compared to existing products like the FH12 horizontal mounting type.

4. High CIC retention force

Tabbed CIC increases the retention force horizontally.



Connection Utilizing CIC Position Alignment Design

5. Accepts standard 0.3mm thick CIC

The connector supports a standard thickness of 0.3mm for CIC, known for easy manufacturing and excellent insertion performance.

6. No Pattern Prohibited Area

The bottom surface of the connector uses an overmolding design, is fully enclosed to eliminate contact exposure, removes PCB pattern restrictions, and enhances board design flexibility.

7. Halogen-free

All materials and substances used to produce this product comply with Halogen-free standards.

As defined in IEC 61249-2-21.

Br : 900ppm or less, Cl : 900ppm or less,

Br+Cl : 1,500ppm or less

8. Supports automatic pick & place mounting

Available in tape and reel packaging suitable for automatic machine mounting, accommodating 3,000 pieces per reel.

9. 500pcs per reel packing option available

While standard packaging offers 3,000 pieces per reel, a smaller option of 500 pieces per reel is also available for FH52C, with the reel outer diameter being ϕ 180mm.

Product Specifications

| | | | |
|---------------|--------|---------------------------------|-------------------------------|
| Rated Current | 3mA | Operating Temperature (Note 1) | -40 to +105°C |
| Rated Voltage | 50V AC | Operating Humidity Range | RH 90% Max. (No Condensation) |
| | | Storage Temperature (Note 2) | -10 to +50°C |
| | | Storage Humidity Range (Note 2) | RH 90% Max. (No Condensation) |

| | |
|-------------------------------------|--|
| Adaptive CIC Contact Specifications | t = 0.3 ± 0.05mm (Carbon Hardness : Pencil Hardness H or higher) |
|-------------------------------------|--|

| Items | Specifications | Conditions |
|--|---|---|
| Insulation Resistance | 500M Ω Min. | 100V DC |
| Withstanding Voltage | No insulation breakdown | 150V AC for 1 min. |
| Contact Resistance | 50 Ω Max. Includes CIC conductor resistance | 0.1mA (AC or 1000Hz) |
| Mating Durability (Insertion / Withdrawal) | Contact Resistance : 70 Ω Max. No damage, cracks, or parts dislocation | 5 cycles |
| Vibration | No electrical discontinuity of 1 μs or more Contact Resistance : 70 Ω Max. No damage, cracks, or parts dislocation | Frequency : 10 to 55Hz, single amplitude of 0.75mm, 10 cycles in each of the 3 directions |
| Shock | No electrical discontinuity of 1 μs or more Contact Resistance : 70 Ω Max. No damage, cracks, or parts dislocation | Acceleration of 981m/s ² , duration of 6 ms, sine half-wave waveform, 3 cycles in each of the 3 axes |
| Humidity (Steady State) | Contact Resistance : 70 Ω Max. Insulation Resistance : 50M Ω Min. Withstanding Voltage : No insulation breakdown No damage, cracks, or parts dislocation | 1000 hours at temperature of 60°C and humidity of 90% to 95% |
| Temperature Cycle | Contact Resistance : 70 Ω Max. Insulation Resistance : 50M Ω Min. Withstanding Voltage : No insulation breakdown No damage, cracks, or parts dislocation | Temperature : -40 → +15 to +35 → +105 → +15 to +35°C Time : 30 → 2 to 3 → 30 → 2 to 3 min. 1000 cycles |
| Resistance to Soldering Heat | No deformation of components affecting performance | Reflow : Peak temperature 250°C Max., 230°C Min., 60 seconds Max. Manual soldering : 400 ± 10°C for 5 seconds |

Note 1 : Includes temperature rise caused by 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 covers non-conducting condition of installed connectors in storage, shipment or during transportation.

Materials / Finish

| Part | Materials | Color/Finish |
|-------------|--------------|-----------------------|
| Insulator | LCP | Grey |
| | | Black |
| Contacts | Copper Alloy | Partially Gold Plated |
| Solder Tabs | Brass | Tin 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.

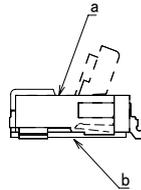
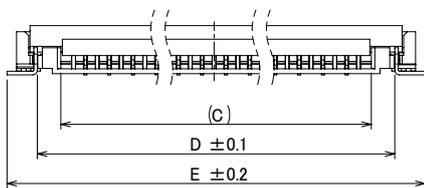
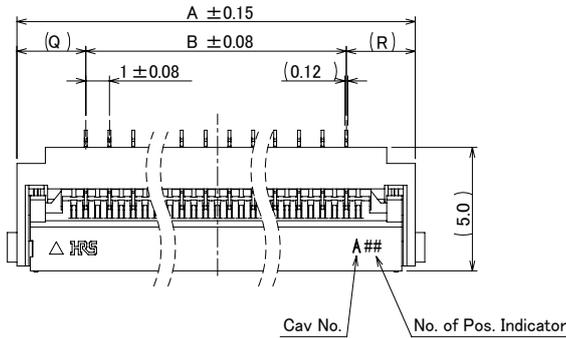
FH52 C - 50 (25) S B - 1 SH (##)

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

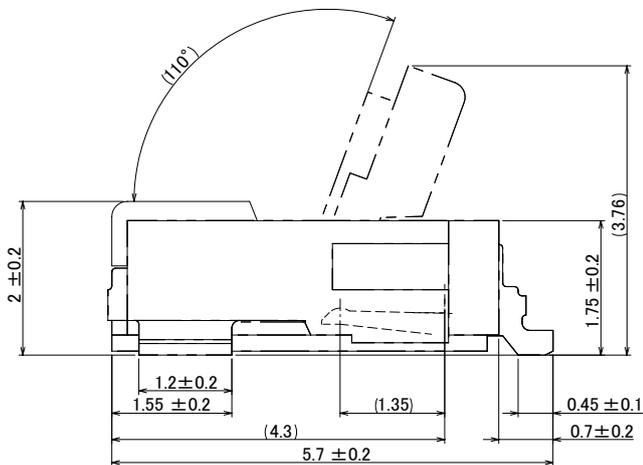
| | | | |
|------------------|---|-------------------------|--|
| ① Series Name | FH52C | ⑤ Contact Arrangement | Single (pole piece array) |
| ② Connector Type | C : CIC Connection | ⑥ Alternating Direction | No Symbol : Standard Type (All Contacts Loaded) A : Alternating Contact Type (Alternating on the Polarity Side) B : Alternating Contact Type (Alternating on Opposite the Polarity Side) |
| ③ No. of Pos. | Standard Type : No. of Pos. Alternating Contact Type : Mold Size | ⑦ Contact Pitch | 1mm |
| | | ⑧ Contact Type | SH : SMT Horizontal Mounting Type |
| ④ No. of Pos. | Standard Type : No Symbol Alternating Contact Type : No. of Pos. | ⑨ Specification | Blank : Standard, Partially Gold Plated, 3,000pcs per reel (99) : Partially Gold Plated, 500pcs per reel |

Connector Dimensional Drawing

FH52C 1.0mm Pitch Product



- Note 1 : The coplanarity of the contact and solder tab lead is 0.1 Max.
- Note 2 : The contact lead position indicates the dimension from b, the bottom surface of the insulator body.
- Note 3 : Packaged in tape and reel only. Check the "Packaging Specification" for details.
- Note 4 : Sink mark reliefs may be added due to improvements.
- Note 5 : Sight variations in color of the plastic compounds do not affect form, fit or function. After reflow, the contact plating may change color, however this does not represent a quality issue.
- Note 6 : The actuator design of the 60pos. type are shown in the figure.

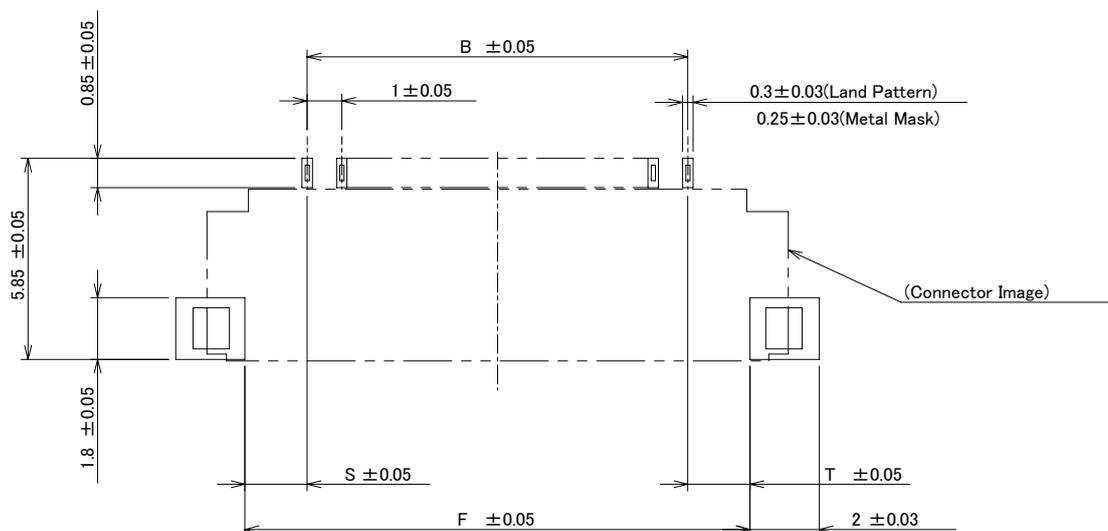


Unit : mm

| Part No. | HRS No. | No. of Pos. | A | B | C | D | E | Q | R | Purchase Unit (##) : (00) | Purchase Unit (##) : (99) |
|------------------------|------------------|-------------|------|------|-------|-------|------|-----|-----|---------------------------|---------------------------|
| FH52C-8(4)SA-1SH(##) | - | 4 | 8.3 | 3.0 | 4.57 | 6.55 | 9.1 | 2.9 | 2.4 | 3000pcs per reel | 500pcs per reel |
| FH52C-12(6)SA-1SH(##) | - | 6 | 10.3 | 5.0 | 6.57 | 8.55 | 11.1 | 2.9 | 2.4 | | |
| FH52C-20(10)SA-1SH(##) | - | 10 | 14.3 | 9.0 | 10.57 | 12.55 | 15.1 | 2.9 | 2.4 | | |
| FH52C-12S-1SH(##) | CL0580-4661-0-## | 12 | 16.8 | 11.0 | 13.07 | 15.05 | 17.6 | 2.9 | 2.9 | | |
| FH52C-32(16)SA-1SH(##) | - | 16 | 20.3 | 15.0 | 16.57 | 18.55 | 21.1 | 2.9 | 2.4 | | |
| FH52C-40(20)SA-1SH(##) | - | 20 | 24.3 | 19.0 | 20.57 | 22.55 | 25.1 | 2.9 | 2.4 | | |
| FH52C-22S-1SH(##) | - | 22 | 26.8 | 21.0 | 23.07 | 25.05 | 27.6 | 2.9 | 2.9 | | |
| FH52C-60(30)SA-1SH(##) | - | 30 | 34.3 | 29.0 | 30.57 | 32.55 | 35.1 | 2.9 | 2.4 | | |
| FH52C-68(34)SA-1SH(##) | - | 34 | 38.3 | 33.0 | 34.57 | 36.55 | 39.1 | 2.9 | 2.4 | | |

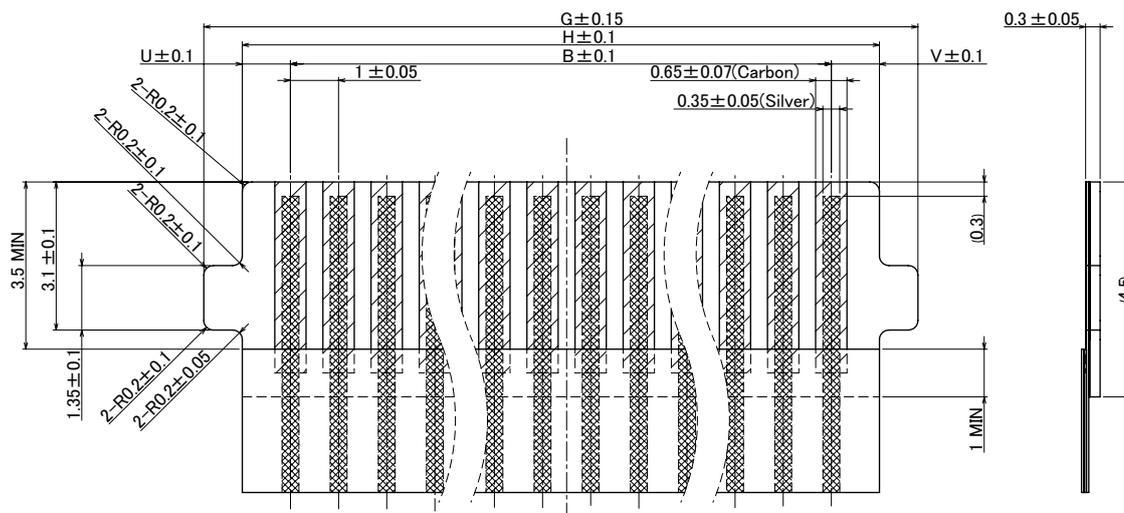
FH52C 1.0mm Pitch Product

Recommended PCB Mounting Pattern and Metal Mask Dimensions



Recommended metal mask thickness : 0.12mm

Recommended CIC Dimensions

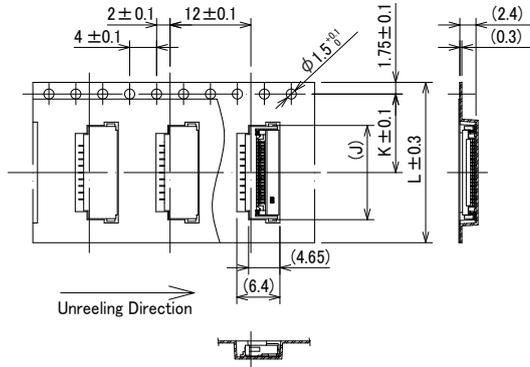


Unit : mm

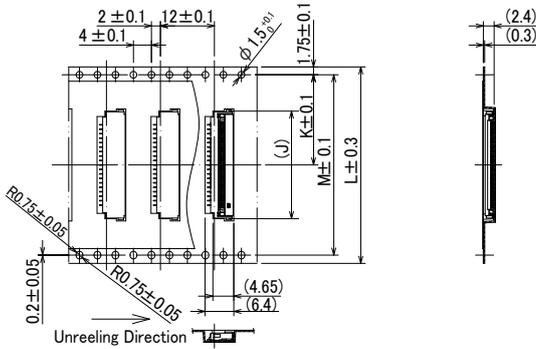
| Part No. | HRS No. | No. of Pos. | B | F | G | H | S | T | U | V |
|------------------------|------------------|-------------|------|------|------|------|-----|-----|-----|-----|
| FH52C-8(4)SA-1SH(##) | - | 4 | 3.0 | 6.1 | 6.1 | 4.5 | 1.8 | 1.3 | 0.5 | 1.0 |
| FH52C-12(6)SA-1SH(##) | - | 6 | 5.0 | 8.1 | 8.1 | 6.5 | 1.8 | 1.3 | 0.5 | 1.0 |
| FH52C-20(10)SA-1SH(##) | - | 10 | 9.0 | 12.1 | 12.1 | 10.5 | 1.8 | 1.3 | 0.5 | 1.0 |
| FH52C-12S-1SH(##) | CL0580-4661-0-## | 12 | 11.0 | 14.6 | 14.6 | 13.0 | 1.8 | 1.8 | 1.0 | 1.0 |
| FH52C-32(16)SA-1SH(##) | - | 16 | 15.0 | 18.1 | 18.1 | 16.5 | 1.8 | 1.3 | 0.5 | 1.0 |
| FH52C-40(20)SA-1SH(##) | - | 20 | 19.0 | 22.1 | 22.1 | 20.5 | 1.8 | 1.3 | 0.5 | 1.0 |
| FH52C-22S-1SH(##) | - | 22 | 21.0 | 24.6 | 24.6 | 23.0 | 1.8 | 1.8 | 1.0 | 1.0 |
| FH52C-60(30)SA-1SH(##) | - | 30 | 29.0 | 32.1 | 32.1 | 30.5 | 1.8 | 1.3 | 0.5 | 1.0 |
| FH52C-68(34)SA-1SH(##) | - | 34 | 33.0 | 36.1 | 36.1 | 34.5 | 1.8 | 1.3 | 0.5 | 1.0 |

Packaging Specification

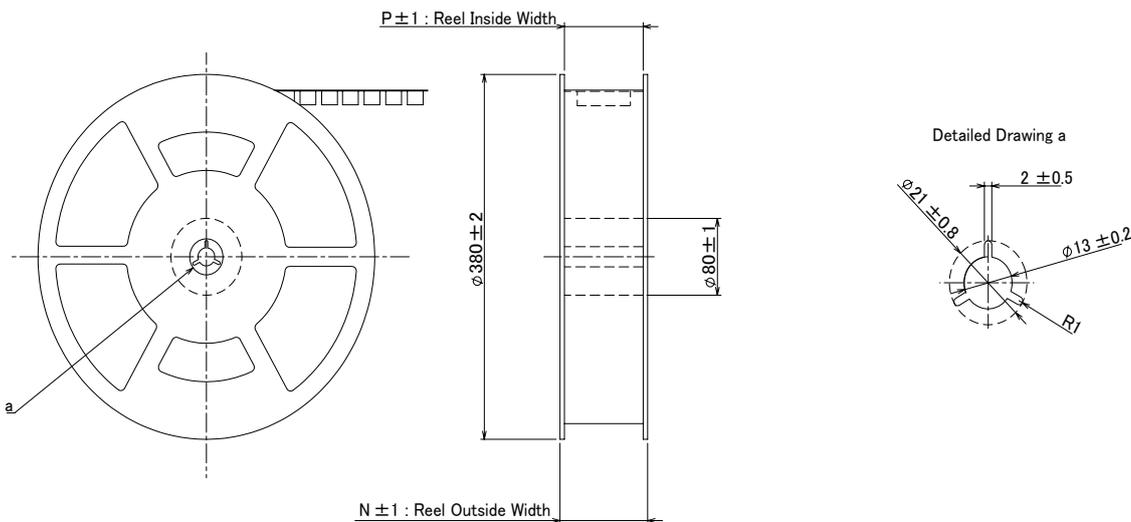
● Embossed Carrier Tape Dimensions (Tape Width 24mm Max.)



● Embossed Carrier Tape Dimensions (Tape Width 32mm Min.)



● Reel Dimensions



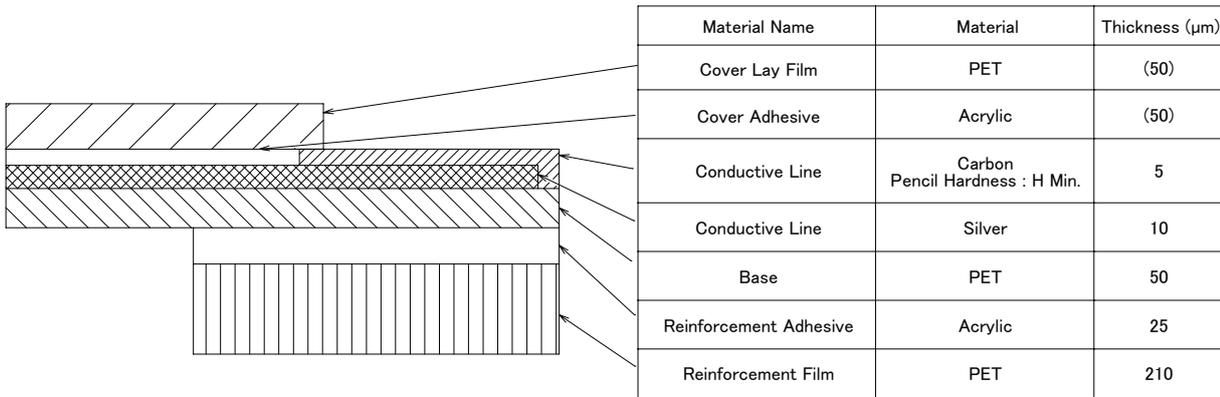
FH52C 1mm Pitch Product

Unit : mm

| Part No. | HRS No. | No. of Pos. | J | K | L | M | N | P |
|------------------------|------------------|-------------|------|------|------|------|------|------|
| FH52C-8(4)SA-1SH(##) | - | 4 | 8.6 | 11.5 | 24.0 | - | 29.4 | 25.4 |
| FH52C-12(6)SA-1SH(##) | - | 6 | 10.6 | 11.5 | 24.0 | - | 29.4 | 25.4 |
| FH52C-20(10)SA-1SH(##) | - | 10 | 14.6 | 11.5 | 24.0 | - | 29.4 | 25.4 |
| FH52C-12S-1SH(##) | CL0580-4661-0-## | 12 | 17.1 | 14.2 | 32.0 | 28.4 | 37.4 | 33.4 |
| FH52C-32(16)SA-1SH(##) | - | 16 | 20.6 | 20.2 | 44.0 | 40.4 | 49.4 | 45.4 |
| FH52C-40(20)SA-1SH(##) | - | 20 | 24.6 | 20.2 | 44.0 | 40.4 | 49.4 | 45.4 |
| FH52C-22S-1SH(##) | - | 22 | 27.1 | 20.2 | 44.0 | 40.4 | 49.4 | 45.4 |
| FH52C-60(30)SA-1SH(##) | - | 30 | 34.6 | 26.2 | 56.0 | 52.4 | 61.4 | 57.4 |
| FH52C-68(34)SA-1SH(##) | - | 34 | 38.6 | 26.2 | 56.0 | 52.4 | 61.4 | 57.4 |

CIC Construction (Recommended Specifications)

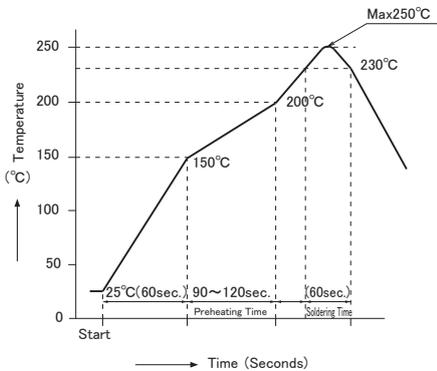
1. CIC Construction Example (CIC : Carbon inked circuit)



2. Precautions

1. This is a reference CIC construction. Make the thickness of the CIC mated portion $0.30 \pm 0.05\text{mm}$ in reference to the CIC construction.
2. Contact an CIC maker for details on component construction.

Recommended Temperature Profile



Applicable Conditions

- Solder Method : Reflow, IR
- Environment : Room air
- Solder Composition : Paste Sn/3.0Ag/0.5Cu
(Senju Metal Industry's Part Number : M705-221CM5-32-10.5)
- Test Board : Material and Size
Glass epoxy 80 × 100 × 1.6mm thick
Land Dimensions 0.3 × 0.85mm
- Metal Mask Dimensions : 0.12mm thick
Opening dimensions 0.25 × 0.85mm

This temperature profile is for the above applicable 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.

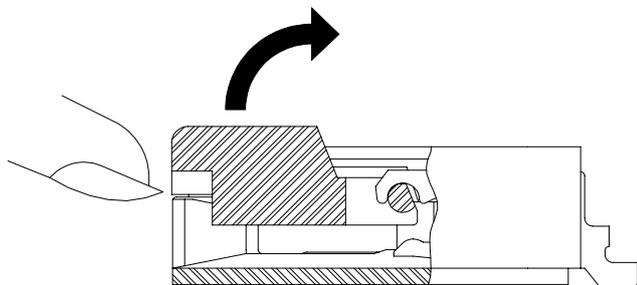
Operation and Precautions

【Operation】

1. CIC Insertion

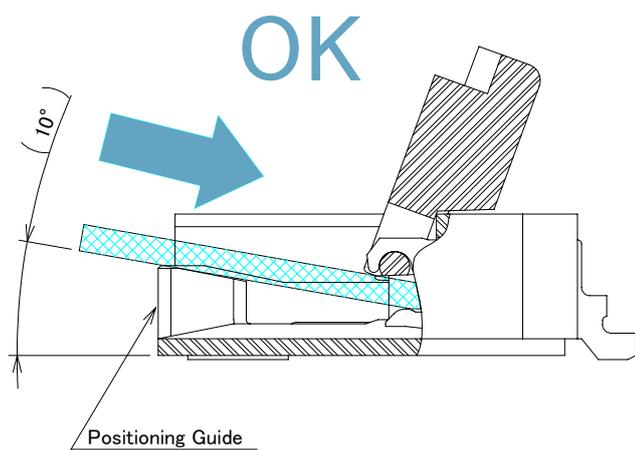
① Lift the actuator upward. (Lock release)

You can easily pop it up with the thumbnail or index-finger nail.

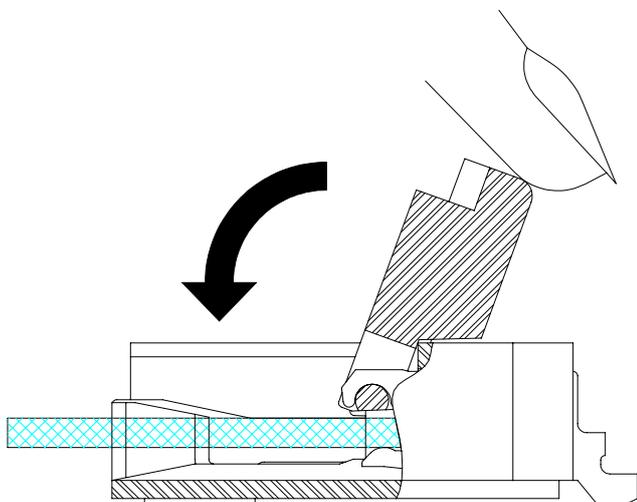


② Insert the CIC with the exposed conductive traces facing down.

When connecting a tabbed CIC, ensure that the CIC is inserted at an angle of approximately 10° with respect to the board surface and perpendicular to the connector.

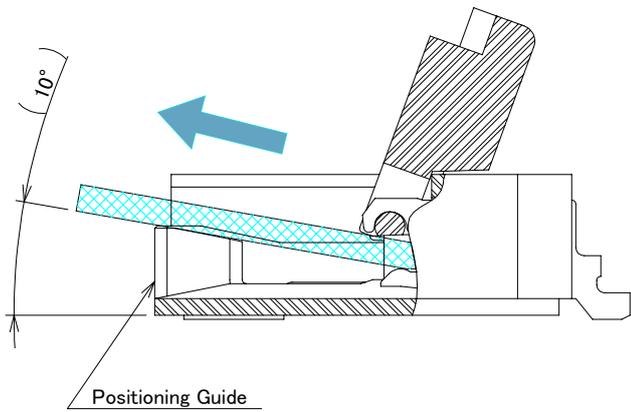
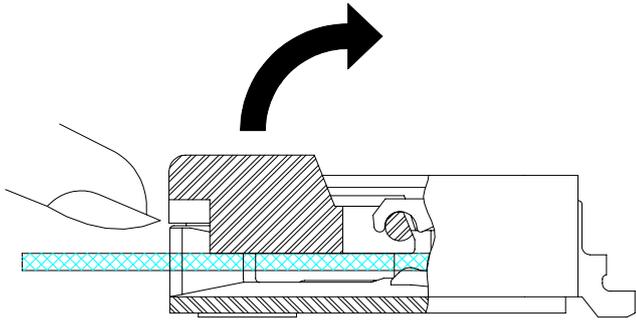


③ Rotate down the actuator until firmly closed.



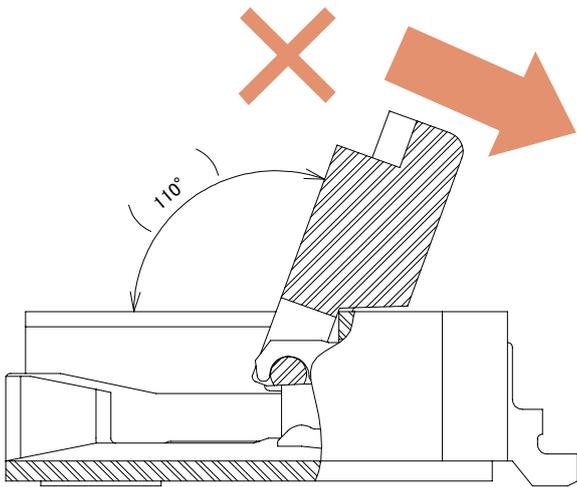
2. CIC Removal

Lift the actuator upward. After the lock has been released slightly lift up the CIC and pull it out.

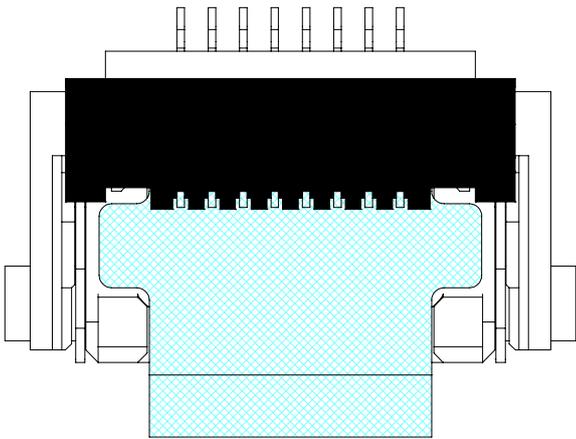


【Precautions】

- ① The FH52C Series actuator does not rotate open beyond 110°. Do not apply a force to open it beyond this point. The actuator may come off or be permanently damaged.



- ② Insert the CIC properly to the opening of the connector.
Improper insertion may lead to a break or poor continuity of the CIC.



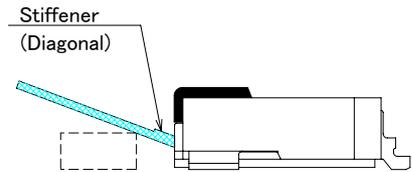
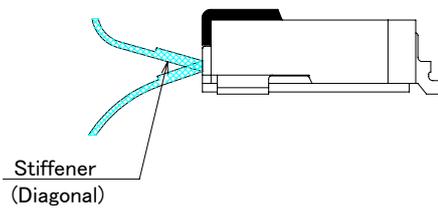
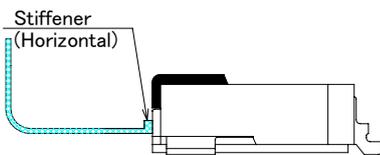
- ③ The connector does not have a strong upward tensile strength due to its design.
Secure the CIC when it is subjected to a tensile force.

OK

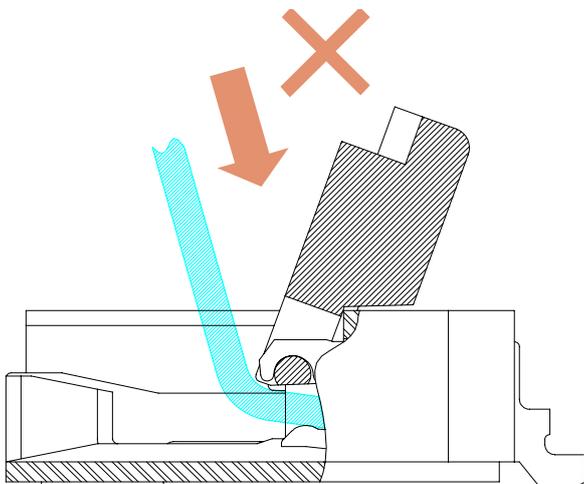


Condition in which the stiffener is under load

Condition in which case and component interfere with the CIC



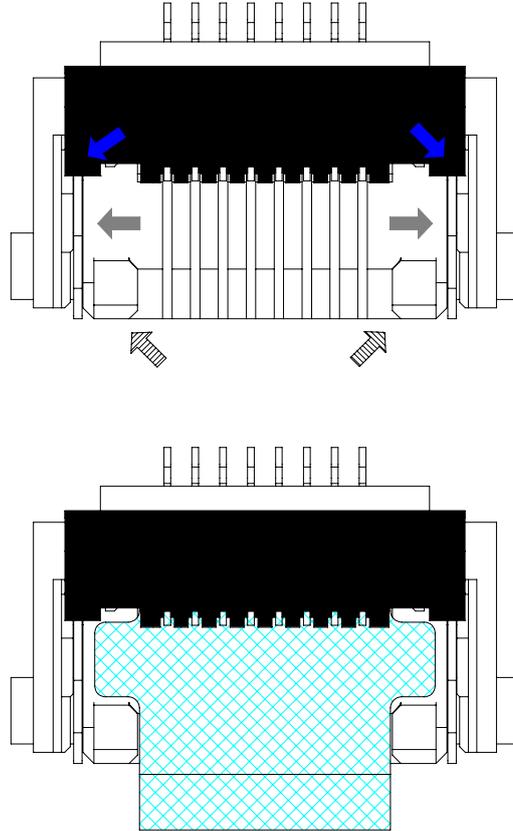
- ④ When inserting an CIC, do not rub it vigorously against the bottom side of the connector opening.
Excessive contact between the contacts and the CIC may result in the deformation of contacts, peeling of conductive traces, or other faults.



Precautions when Mating/Unmating CIC with Tabs for Positioning Guidance

【How to insert】

Insert the cable so that the positioning tabs are secured into the gap (→) between the molded walls on both sides of the connector (⇨) and the guide walls on both sides of the connector interior (→).

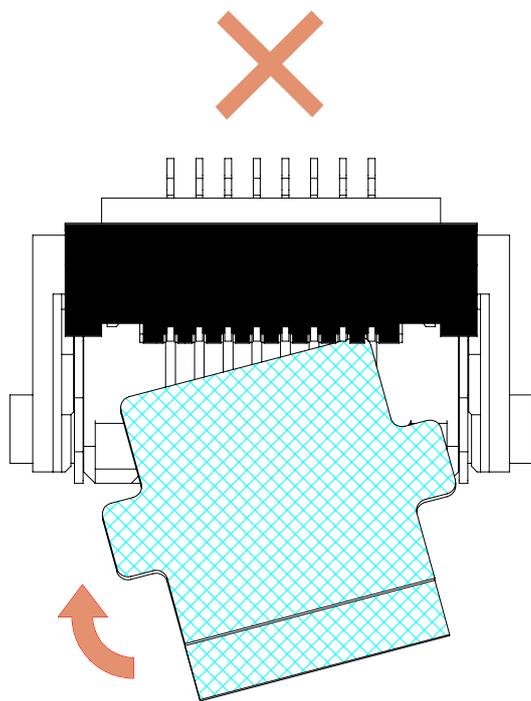


[Precautions when mating/ un-mating]

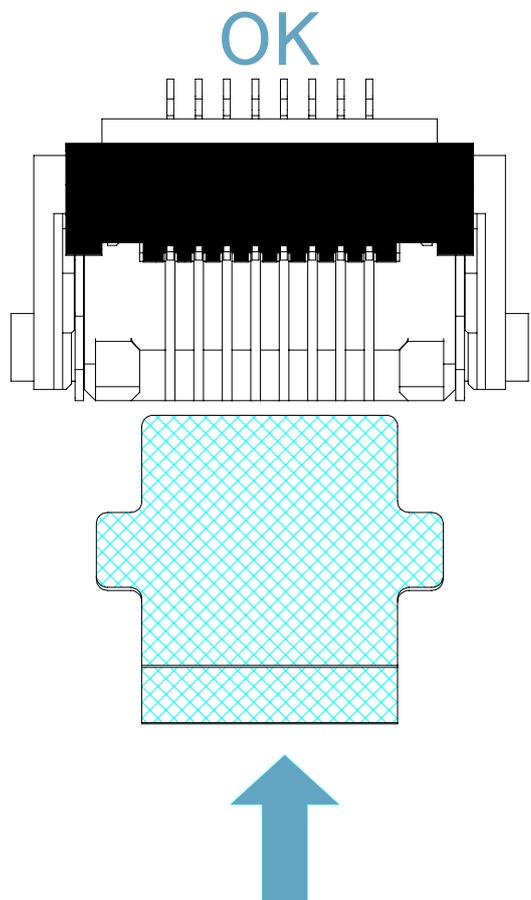
① Avoid insertion in diagonal direction.

Do not insert the cable in diagonal direction.

The corner of the cable may touch the contact, resulting in contact deformation.

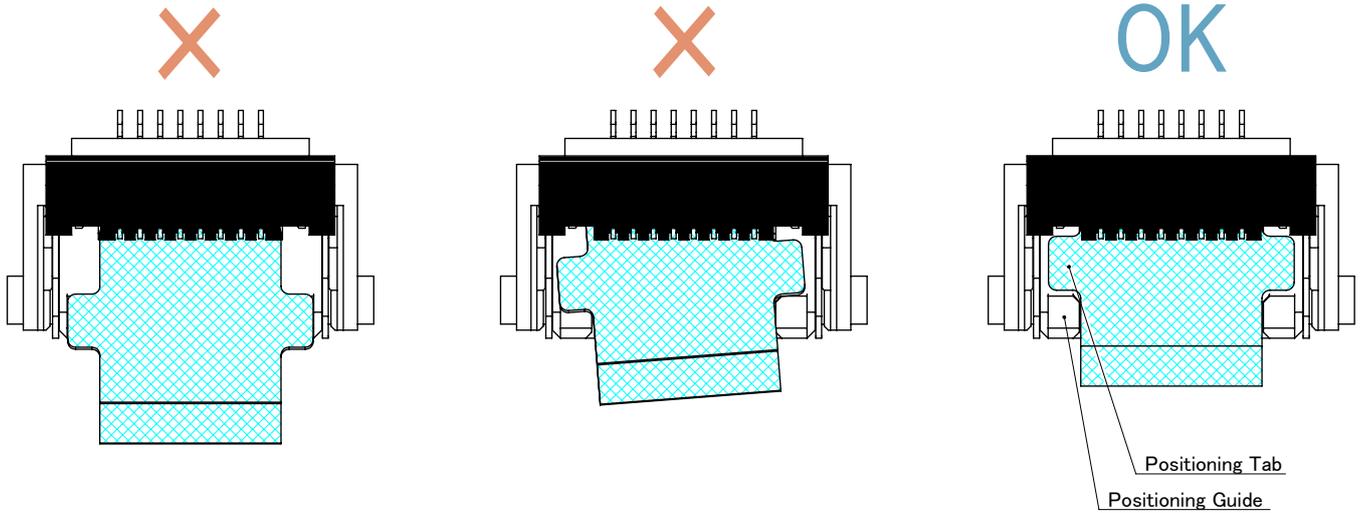


Be sure to insert the CIC straight into the connector opening.



② Avoid Overlap

Avoid inserting the cables in way that it overlaps the guides on either side. Do not close the actuator with the cables overlapped on the guides as it may result in conduction failure.



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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