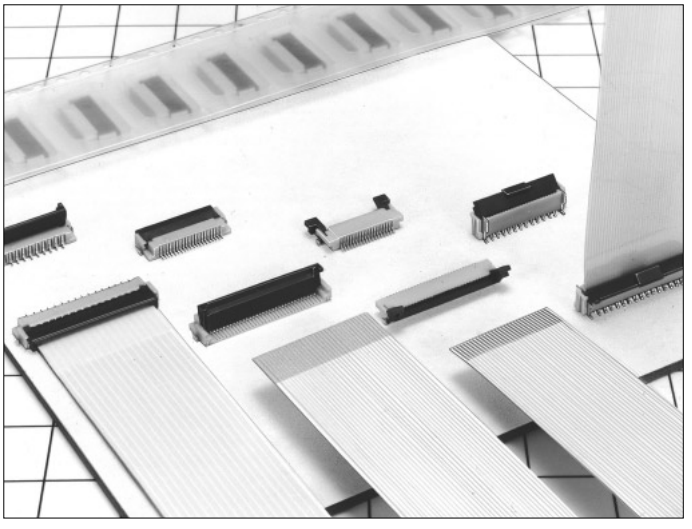
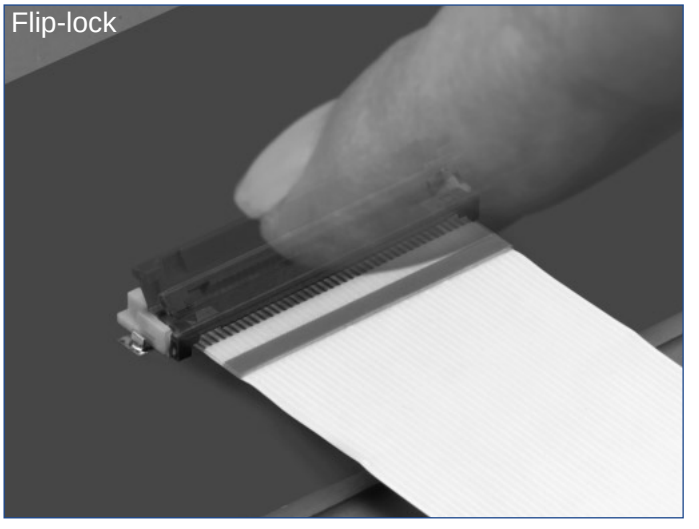
# 0.5mm and 1mm Pitch Connectors For FPC/FFC

## FH12 Series






## ■Features

### 1. Ease of Use and Space Savings

Only one finger or 6.9N (Newtons) of force is required to lock Hirose's rotational actuator (flip-lock) as compared to using 2 fingers and 39.2N to close a FFC/FPC connector from our competition.

The Flip-Lock design also allows customers to place 2 or more connectors side by side as there is no need to waste additional board space for a side latch.

### 2. Strengthened Flip-lock Actuator

The standard Flip-Lock requires only 2.0mm height above the board. A strengthened lock lever is available which only requires an additional 0.4mm.

### 3. Supports Thin FPC (0.18mm)

Hirose does not require double-sided FPC to have any additional strengthening plate or stiffener and can therefore support a thickness of as little as 0.18mm +/- 0.05.

### 4. Hirose Ensures Reliability

Hirose's patented half tuning fork contacts maintain the required normal force without relying on the connector housing. With our competitor's conventional products the housing walls support the contact force, which does not provide for long-term reliability.

### 5. Prevention of Solder Bridge

Excess solder cavity absorbs excessive solder and avoids solder bridging.

### 6. Three different assembly types

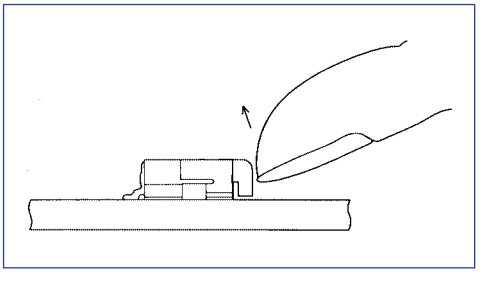
FH12 is offered in Top & Bottom Contact and Vertical Mount and offered in both a 0.5mm contact pitch as well as a 1.0mm contact pitch (bottom contact only).

## ■Applications

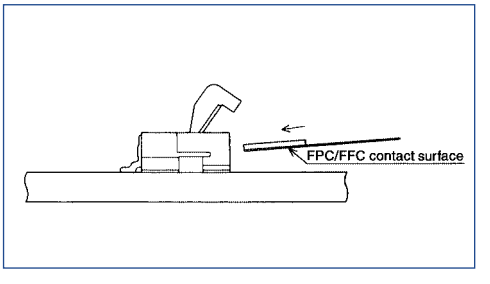
Notebook computers, printers, PDAs, digital cameras and other compact devices for interconnecting the main circuit board with the LCD, HDD or other device.

### Rotating One-touch Mechanism

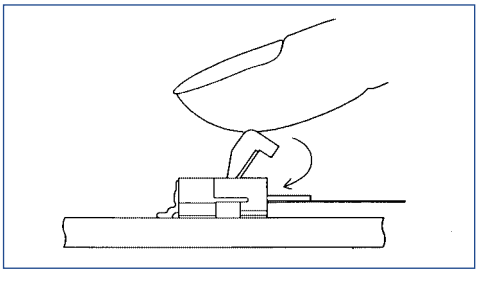
①



②




③



## ■Product Specifications

| | | | |
|---|---|---|---|
| Rating | Current rating: 0.4A DC<br>Voltage rating: 50V AC | Operating Temperature Range:−40 to +70℃ (Note 1)<br>Operating Humidity Range:Relative humidity, 90% max.<br>(Not dewed) | Storage Temperature Range:−10 to +50℃ (Note 2)<br>Storage Humidity Range:Relative humidity, 90% max.<br>(Not dewed) |

| | | |
|---|---|---|
| Applicable FPC | t=0.3±0.05 Tin-lead plated(Note 3) | t=0.18 ± 0.05 for FH12F-✻S-0.5SH |

| Item | Specification | Conditions |
|---|---|---|
| 1. Insulation resistance | 500M ohms minimum | 100V DC |
| 2. Withstanding voltage | No flashover or insulation breakdown. | 150V AC/1 minute |
| 3. Contact resistance | 50m ohms maximum | 1mA |
| 4. Durability (Insertion/withdrawal) | Contact resistance: 50m ohms maximum<br>No damage, cracks, or parts dislocation. | 20 cycles |
| 5. Vibration | No electrical discontinuity of 1μs or more<br>Contact resistance: 50m ohms maximum.<br>No damage, cracks, or parts dislocation. | Frequency: 10 to 55 Hz, single amplitude of 0.75 mm,<br>2 hours in each of the 3 directions. |
| 6. Shock | No electrical discontinuity of 1μs or more<br>Contact resistance: 50m ohms maximum.<br>No damage, cracks, or parts dislocation. | Acceleration of 490 m/s², 11 ms duration,<br>sine half-wave waveform, 3 cycles in each of the 3 axis. |
| 7. Humidity(Steady state) | Contact resistance: 50m ohms maximum.<br>Insulation resistance: 50M ohms minimum.<br>No damage, cracks, or parts dislocation. | 96 hours at temperature of 40℃ and humidity of 90% to 95% |
| 8. Temperature Cycle | Contact resistance: 50m ohms maximum.<br>Insulation resistance: 50M ohms minimum.<br>No damage, cracks, or parts dislocation. | 5 cycles under conditions as follows;<br>Temperature: -40℃ → 15 to 35℃ → 85℃ → 15 to 35℃,<br>Time: 30 → 5 max. → 30 → 5 max.(minutes) |
| 9.Resistance to Soldering heat | No deformation of<br>components affecting performance. | Reflow: At the recommended temperature profile<br>Manual soldering: 350±5℃ for 3 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 Range and Humidity range covers nonconducting condition of installed connectors in storage, shipment or during transportation.
Note 3: When FPC is gold plated, the connector contacts should be also gold plated: Select the (55) specification.

## ■Material

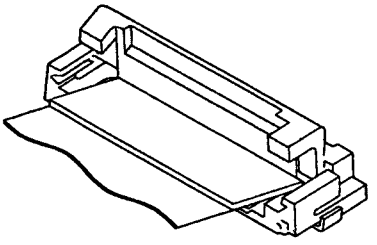
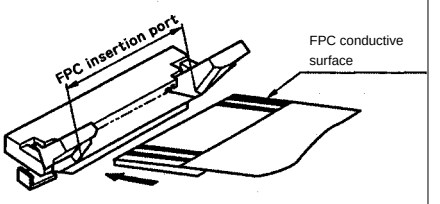
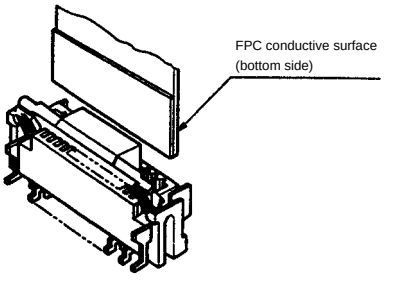
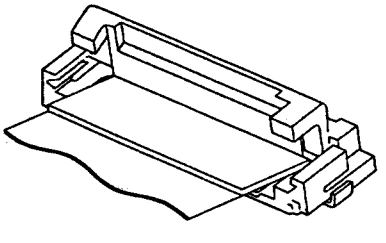
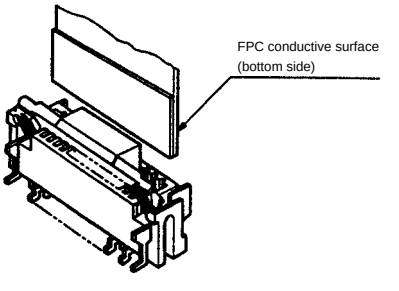
| Part | Material | Finish | Remarks |
|---|---|---|---|
| Insulator | Polyamide, LCP(60 pos.) | Color : Beige | UL94V-0 |
| | PPS | Color : Dark brown | |
| Contact | Phosphor bronze | Tin-lead plated | ——— |
| Metal Fittings | Brass | Tin-lead plated | |

## ■Ordering Information

**FH12 A - 10 (4) - S A - 0.5 SH (55)**
❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾

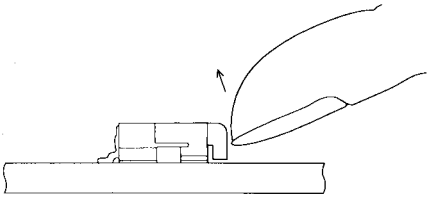
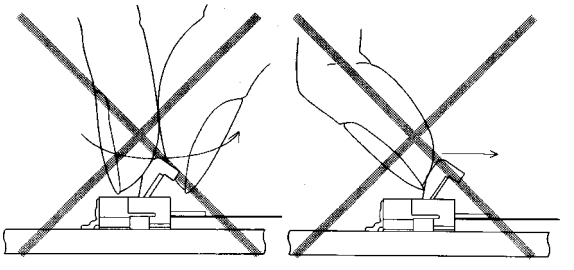
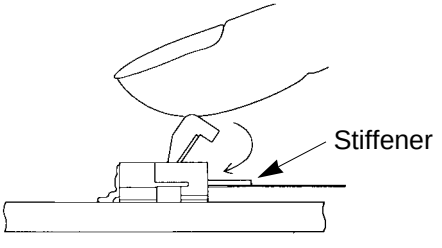
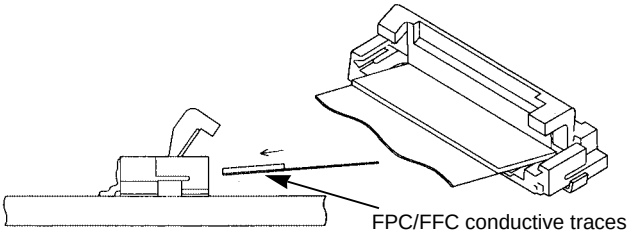
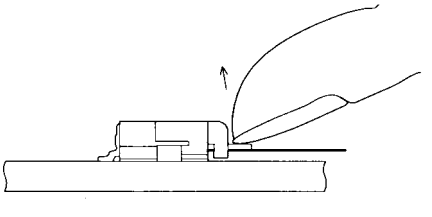
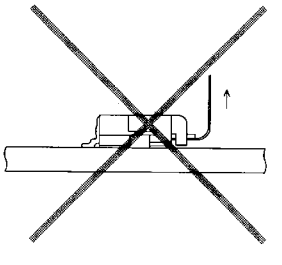
| | |
|---|---|
| ❶ Series Name : FH12 | ❺ Contact alignment: Single |
| ❷ Blank : standard type<br>A : Top contact type<br>S : Type with strengthed flip-lock actuator<br>F : Type with 0.18mm FPC End Thickness | ❻ Eccentric direction:<br>Blank : standard type<br>A : Eccentric type |
| ❸ Standard type : Number of contacts<br>Eccentric type : Number of contacts in 0.5mm housing | ❼ Contacts Pitch : 0.5mm, 1mm |
| ❹ Standard type : Blank<br>Eccentric type : Number of contacts | ❽ Contact type<br>SH : SMT horizontal mounting type<br>SV : SMT vertical mounting type |
| | ❾ Plating specification<br>Blank : Tin-lead plated<br>(55) : Gold plated |

## ◆Series Configuration

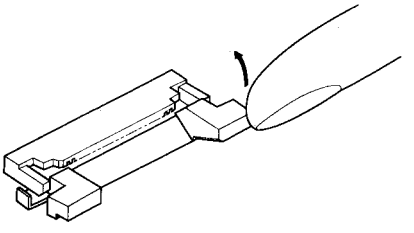
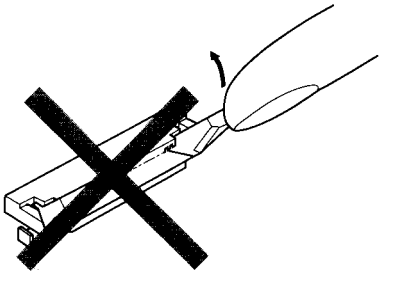
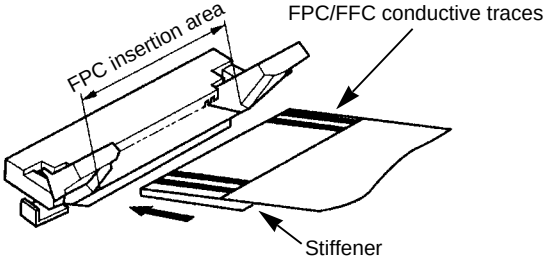
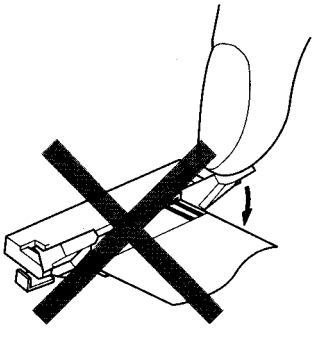
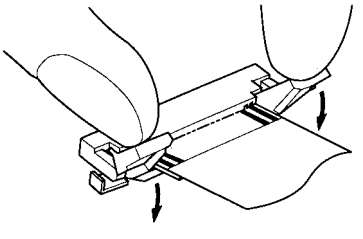
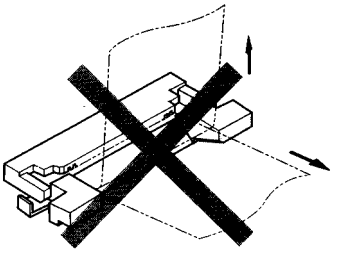
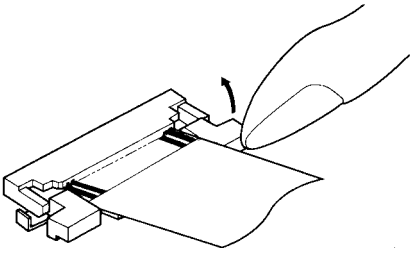
| Pitch | Bottom Contact Type | Top Contact Type | Vertical mounting Type |
|---|---|---|---|
| 0.5mm |  <br>**FH12- ✻✻ S-0.5SH** P.12<br>Number of contacts 6, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 33, 34, 36, 40, 45, 50, 53<br>Type with Strengthened Lock Lever<br>**FH12S- ✻✻ S-0.5SH** P.13<br>Number of contacts 30, 40, 45, 50, 53<br>Type with 0.18mm FPC End Thickness<br>**FH12F- ✻✻ S-0.5SH** P.14<br>Number of contacts 6, 10, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 28, 30, 32, (33), 34, 36, 40 |  <br>**FH12A- ✻✻ S-0.5SH** P.15<br>Number of contacts 10, 12 ,15, 16, 18, 20, 22, 24, 26, 28, 29, 30, 32, 33, 34, 36, 40, 42, 45, 50 |  <br>**FH12- ✻✻ S-0.5SV** P.16<br>Number of contacts 10, 12, 13, 15, 16, 17, 18, 20, 22, 24, 26, 30, 32, 33, 34, 36, 40, 45, 49, 50, 60 |
| 1mm |  <br>Standard **FH12- ✻✻ S-1SH** P.18<br>Eccentric **FH12- ✻✻ (✻✻) S-1SH**<br>Standard<br>Number of contacts 5, 6, 7, 8, 9, 11, 16, 22, 26<br>Eccentric<br>Number of contacts 4, 6, 8, 10, 11, 14, 19, 24 | |  <br>**FH12- ✻✻ S-1SV** P.19<br>Number of contacts 6, 7, 8, 16, 20, 22, 24 |

## ◆Connector Operating Instructions, precautions and recommendations

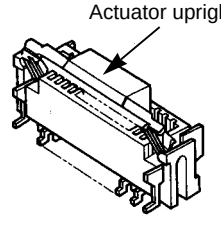
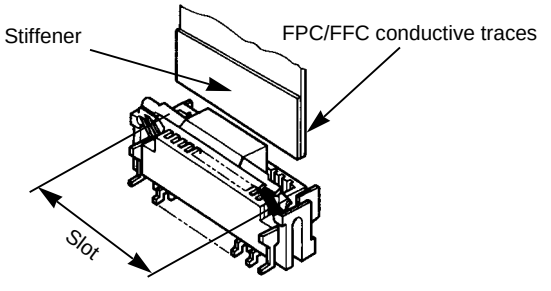
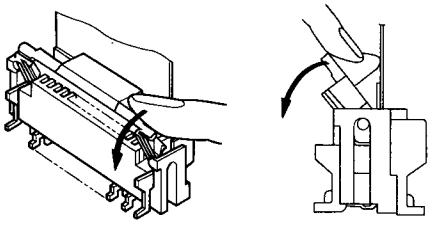
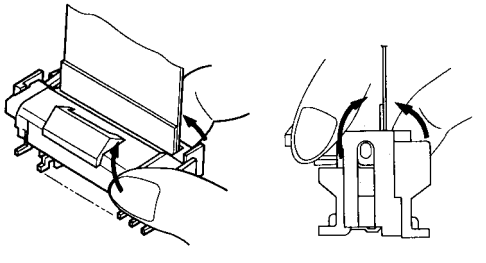
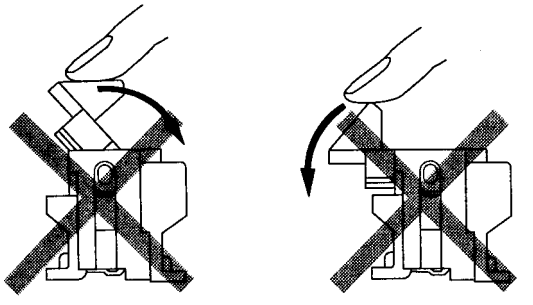
## ●Bottom Contact Type (common for 0.5mm/1mm)

| Operation | Precautions |
|---|---|
| **1. FPC/FFC Termination procedure. Connector installed on the board.**<br>1) Lift up the actuator. Use thumb or index finger. | 1) Avoid grasping the actuator with two fingers or lifting the actuator with fingernail. |
|  |  |
| 2) Rotate down the actuator until firmly closed. It is critical that the inserted FPC/FFC is not moved and remains fully inserted. Should the FPC/FFC be moved, open the actuator and repeat the process, starting with Step 1 above. | 2) Fully insert the FPC/FFC parallel to mounting surface, with the exposed conductive traces facing down. |
|  |  |
| **2. FPC/FFC Removal**<br>1) Lift up the actuator.<br>2) Carefully remove the FPC/FFC. | 3) Due to the structure of the connectors, they do not have strong resistance to upward pulling; therefore, support the FPC/FFC when a pulling force is applied to it. |
|  |  |

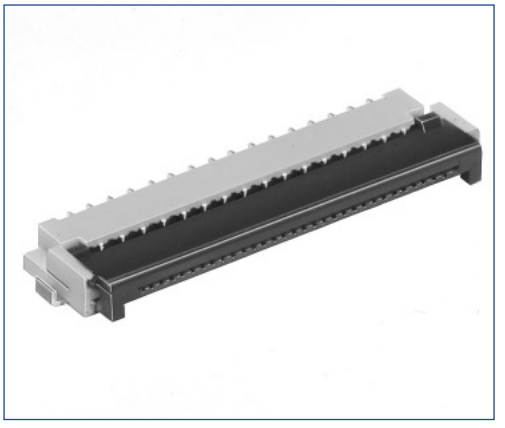
## ●Top Contact Type

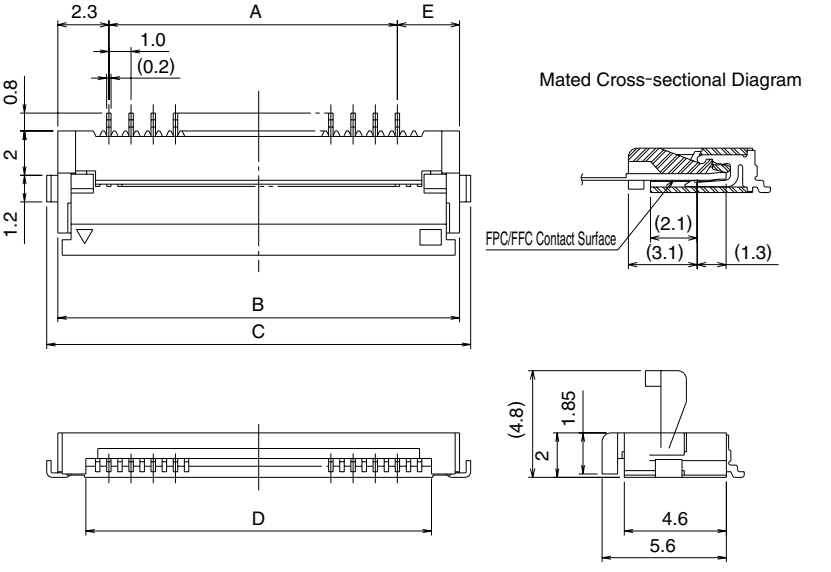
| Operation | Precautions |
|---|---|
| **1. FPC/FFC Termination procedure. Connector installed on the board.**<br>1) Lift up the actuator. Use thumb or index finger. | 1) Avoid forcing the actuator up or down without the FPC/FFC inserted. |
|  |  |
| 2) Fully insert the FPC/FFC parallel to mounting surface, with the exposed conductive traces facing UP. | 2) When closing down the actuator apply equal pressure to both sides of the actuator. |
|  |  |
| 3) Rotate down the actuator until firmly closed. It is critical that the inserted FPC/FFC is not moved and remains fully inserted. Should the FPC/FFC be moved, open the actuator and repeat the process, starting with Step 1 above. | 3) Avoid forced pulling of the FPC. Forced pulling will cause the FPC to become disconnected or damaged. |
|  |  |
| **2. FPC/FFC Removal**<br>1) Lift up the actuator.<br>2) Carefully remove the FPC/FFC. | |
|  | |

## ●Vertical Mounting Type

| Operation | Precautions |
|---|---|
| **1. FPC/FFC Termination procedure. Connector installed on the board.**<br>1) Verify that the actuator is positioned upright. If the actuator has rotated to the side, carefully rotate it upright.<br>  <br>2) Insert the FPC/FFC vertically in the connector slot assuring that the conductive traces of the FPC/FFC are facing away from the actuator.<br>  <br>3) Press down the actuator in the direction shown.<br>  <br>**2. FPC/FFC Removal**<br>Rotate the actuator upward and withdraw the FPC/FFC.<br>  | 1) Avoid forcing the actuator up or down without the FPC/FFC inserted.<br>  |

## ■1mm Pitch Type Bottom Contact Type






Unit:mm

| | Part Number | CL No. | Number of Contacts | A | B | C | D | E |
|---|---|---|---|---|---|---|---|---|
| Standard type | FH12- 5S-1SH | 586-0591-6 | 5 | 4 | 8.6 | 9.6 | 6.07 | 2.3 |
| | FH12- 6S-1SH | 586-0607-4 | 6 | 5 | 9.6 | 10.6 | 7.07 | 2.3 |
| | FH12- 7S-1SH | 586-0535-5 | 7 | 6 | 10.6 | 11.6 | 8.07 | 2.3 |
| | FH12- 8S-1SH | 586-0579-0 | 8 | 7 | 11.6 | 12.6 | 9.07 | 2.3 |
| | FH12- 9S-1SH | 586-0540-5 | 9 | 8 | 12.6 | 13.6 | 10.07 | 2.3 |
| | FH12-11S-1SH | 586-0668-9 | 11 | 10 | 14.6 | 15.6 | 12.07 | 2.3 |
| | FH12-16S-1SH | 586-0536-8 | 16 | 15 | 19.6 | 20.6 | 17.07 | 2.3 |
| | FH12-22S-1SH | 586-0547-4 | 22 | 21 | 25.6 | 26.6 | 23.07 | 2.3 |
| | FH12-26S-1SH | 586-0592-9 | 26 | 25 | 29.6 | 30.6 | 27.07 | 2.3 |
| Eccentric type | FH12-10(4)SA-1SH | 586-0537-0 | 4 | 3 | 8.1 | 9.1 | 5.57 | 2.8 |
| | FH12-14(6)SA-1SH | 586-0538-3 | 6 | 5 | 10.1 | 11.1 | 7.57 | 2.8 |
| | FH12-18(8)SA-1SH | 586-0539-6 | 8 | 7 | 12.1 | 13.1 | 9.57 | 2.8 |
| | FH12-22(10)SA-1SH | 586-0541-8 | 10 | 9 | 14.1 | 15.1 | 11.57 | 2.8 |
| | FH12-24(11)SA-1SH | 586-0542-0 | 11 | 10 | 15.1 | 16.1 | 12.57 | 2.8 |
| | FH12-30(14)SA-1SH | 586-0543-3 | 14 | 13 | 18.1 | 19.1 | 15.57 | 2.8 |
| | FH12-40(19)SA-1SH | 586-0546-1 | 19 | 18 | 23.1 | 24.1 | 20.57 | 2.8 |
| | FH12-50(24)SA-1SH | 586-0548-7 | 24 | 23 | 28.1 | 29.1 | 25.57 | 2.8 |

Note 1: Embossed tape reel packaging (2,000 pieces/reel).
Order by number of reels.

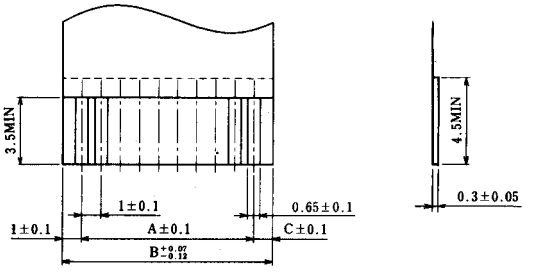
Note 2: The 1mm version of FH12 is constructed by loading every other contact into the 0.5mm housing. When a housing designed for an odd number of 0.5mm pitch contacts is used; the spacing from the edge to the first contact on either side is the same as the distance between each contact, 1.0mm. Hirose considers this design to be a **standard-type 1.0mm** connector.
An **eccentric-type** connector using a housing designed for an even number of 0.5mm pitch contacts and consequently one side has 1.5mm distance from the edge to the first contact. (See FPC/FFC dimensional drawing on page 19) The part number for the eccentric type describes the size of the 0.5mm housing used and lists the number of 1.0mm pitch contacts in parentheses () as shown in the above table.

## ◆Recommended FPC/FFC dimensions and Land/Metal Mask dimensions

## ●1mm Pitch Product

### 1mm Pitch Bottom Contact Type

#### FPC/FFC dimensions



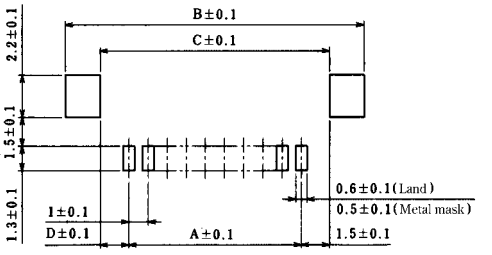

※Set the stiffener thickness to 0.188 (7.5mil) min.

Unit: mm

| | Number of Contacts | A | B | C |
|---|---|---|---|---|
| Standard Type | 5 | 4 | 6 | 1 |
| | 6 | 5 | 7 | 1 |
| | 7 | 6 | 8 | 1 |
| | 8 | 7 | 9 | 1 |
| | 9 | 8 | 10 | 1 |
| | 11 | 10 | 12 | 1 |
| | 16 | 15 | 17 | 1 |
| | 22 | 21 | 23 | 1 |
| | 26 | 25 | 27 | 1 |

| | Number of Contacts | A | B | C |
|---|---|---|---|---|
| Eccentric Type | 4 | 3 | 5.5 | 1.5 |
| | 6 | 5 | 7.5 | 1.5 |
| | 8 | 7 | 9.5 | 1.5 |
| | 10 | 9 | 11.5 | 1.5 |
| | 11 | 10 | 12.5 | 1.5 |
| | 14 | 13 | 15.5 | 1.5 |
| | 19 | 18 | 20.5 | 1.5 |
| | 24 | 23 | 25.5 | 1.5 |

#### Land / Metal Mask dimensions




Recommended metal mask thickness : 0.15mm

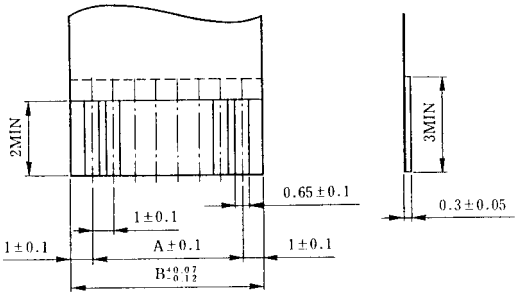
Unit: mm

| | Number of Contacts | A | B | C | D |
|---|---|---|---|---|---|
| Standard Type | 5 | 4 | 10.6 | 7 | 1.5 |
| | 6 | 5 | 11.6 | 8 | 1.5 |
| | 7 | 6 | 12.6 | 9 | 1.5 |
| | 8 | 7 | 13.6 | 10 | 1.5 |
| | 9 | 8 | 14.6 | 11 | 1.5 |
| | 11 | 10 | 16.6 | 13 | 1.5 |
| | 16 | 15 | 21.6 | 18 | 1.5 |
| | 22 | 21 | 27.6 | 24 | 1.5 |
| | 26 | 25 | 31.6 | 28 | 1.5 |

| | Number of Contacts | A | B | C | D |
|---|---|---|---|---|---|
| Eccentric Type | 4 | 3 | 10.1 | 6.5 | 2 |
| | 6 | 5 | 12.1 | 8.5 | 2 |
| | 8 | 7 | 14.1 | 10.5 | 2 |
| | 10 | 9 | 16.1 | 12.5 | 2 |
| | 11 | 10 | 17.1 | 13.5 | 2 |
| | 14 | 13 | 20.1 | 16.5 | 2 |
| | 19 | 18 | 25.1 | 21.5 | 2 |
| | 24 | 23 | 30.1 | 26.5 | 2 |

### 1mm Pitch Vertical Mounting Type

#### FPC/FFC dimensions

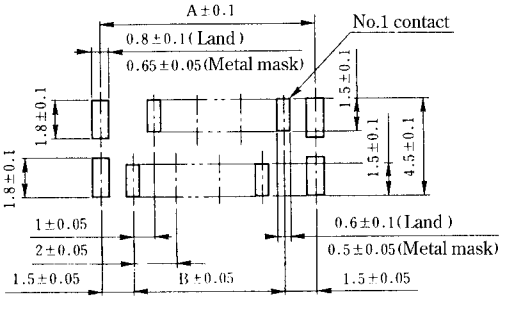



※Set the stiffener thickness to 0.188 (7.5mil) min.

Unit: mm

| Number of Contacts | A | B |
|---|---|---|
| 6 | 5 | 7 |
| 7 | 6 | 8 |
| 8 | 7 | 9 |
| 16 | 15 | 17 |
| 20 | 19 | 21 |
| 22 | 21 | 23 |
| 24 | 23 | 25 |

#### Land / Metal Mask dimensions




Recommended metal mask thickness : : 0.15mm

Unit: mm

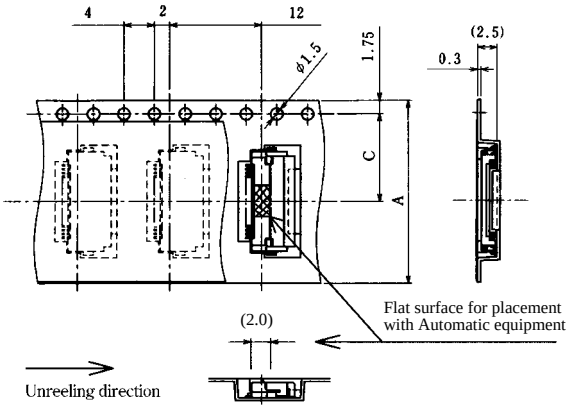
| Number of Contacts | A | B |
|---|---|---|
| 6 | 8 | 5 |
| 7 | 9 | 6 |
| 8 | 10 | 7 |
| 16 | 18 | 15 |
| 20 | 22 | 19 |
| 22 | 24 | 21 |
| 24 | 26 | 23 |

# ◆Packaging Specification

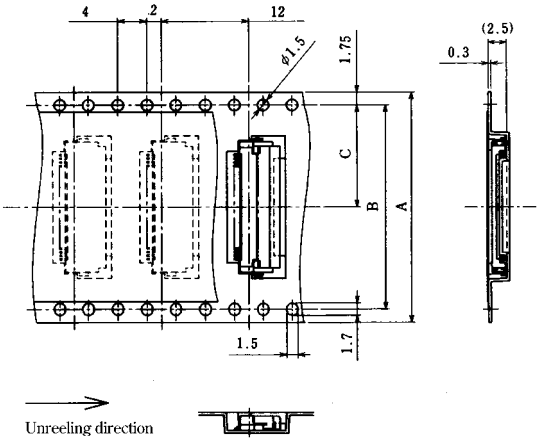
## Embossed Carrier Tape Dimensions

### Horizontal Type (Common to Bottom/Top Contact, 0.5mm/1mm Pitch)

Tape width 24mm max.




Tape width 32mm min.




### ●0.5mm Pitch Bottom/Top Contact Type

Unit:mm

| Number of Contacts \ Dimension | A | B | C | D |
|---|---|---|---|---|
| 6 | 16 | —— | 7.5 | 16.5 |
| 10 | 16 | —— | 7.5 | 16.5 |
| 11 | 16 | —— | 7.5 | 16.5 |
| 12 | 24 | —— | 11.5 | 24.5 |
| 13 | 24 | —— | 11.5 | 24.5 |
| 14 | 24 | —— | 11.5 | 24.5 |
| 15 | 24 | —— | 11.5 | 24.5 |
| 16 | 24 | —— | 11.5 | 24.5 |
| 17 | 24 | —— | 11.5 | 24.5 |
| 18 | 24 | —— | 11.5 | 24.5 |
| 19 | 24 | —— | 11.5 | 24.5 |
| 20 | 24 | —— | 11.5 | 24.5 |
| 22 | 24 | —— | 11.5 | 24.5 |
| 24 | 24 | —— | 11.5 | 24.5 |

| Number of Contacts \ Dimension | A | B | C | D |
|---|---|---|---|---|
| 25 | 24 | —— | 11.5 | 24.5 |
| 26 | 24 | —— | 11.5 | 24.5 |
| 28 | 32 | 28.4 | 14.2 | 32.5 |
| 29 | 32 | 28.4 | 14.2 | 32.5 |
| 30 | 32 | 28.4 | 14.2 | 32.5 |
| 32 | 32 | 28.4 | 14.2 | 32.5 |
| 33 | 32 | 28.4 | 14.2 | 32.5 |
| 34 | 32 | 28.4 | 14.2 | 32.5 |
| 36 | 44 | 40.4 | 20.2 | 44.5 |
| 40 | 44 | 40.4 | 20.2 | 44.5 |
| 42 | 44 | 40.4 | 20.2 | 44.5 |
| 45 | 44 | 40.4 | 20.2 | 44.5 |
| 50 | 44 | 40.4 | 20.2 | 44.5 |
| 53 | 44 | 40.4 | 20.2 | 44.5 |

Note: 2,000 pieces per reel.

### ● 1mm Pitch Bottom Contact Type

Unit:mm

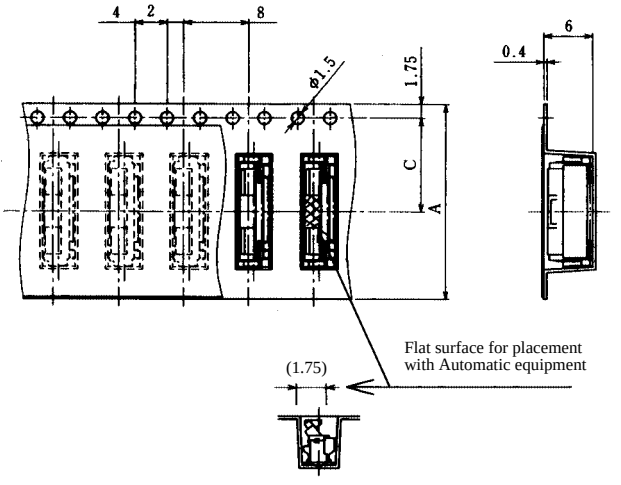
| | Number of Contacts \ Dimension | A | B | C | D |
|---|---|---|---|---|---|
| Standard Type | 5 | 16 | —— | 7.5 | 16.5 |
| | 6 | 24 | —— | 11.5 | 24.5 |
| | 7 | 24 | —— | 11.5 | 24.5 |
| | 8 | 24 | —— | 11.5 | 24.5 |
| | 9 | 24 | —— | 11.5 | 24.5 |
| | 11 | 24 | —— | 11.5 | 24.5 |
| | 16 | 32 | 28.4 | 14.2 | 32.5 |
| | 22 | 44 | 40.4 | 20.2 | 44.5 |
| | 26 | 44 | 40.4 | 20.2 | 44.5 |

| | Number of Contacts \ Dimension | A | B | C | D |
|---|---|---|---|---|---|
| Eccentric Type | 4 | 16 | —— | 7.5 | 16.5 |
| | 6 | 24 | —— | 11.5 | 24.5 |
| | 8 | 24 | —— | 11.5 | 24.5 |
| | 10 | 24 | —— | 11.5 | 24.5 |
| | 11 | 24 | —— | 11.5 | 24.5 |
| | 14 | 32 | 28.4 | 14.2 | 32.5 |
| | 19 | 44 | 40.4 | 20.2 | 44.5 |
| | 24 | 44 | 40.4 | 20.2 | 44.5 |

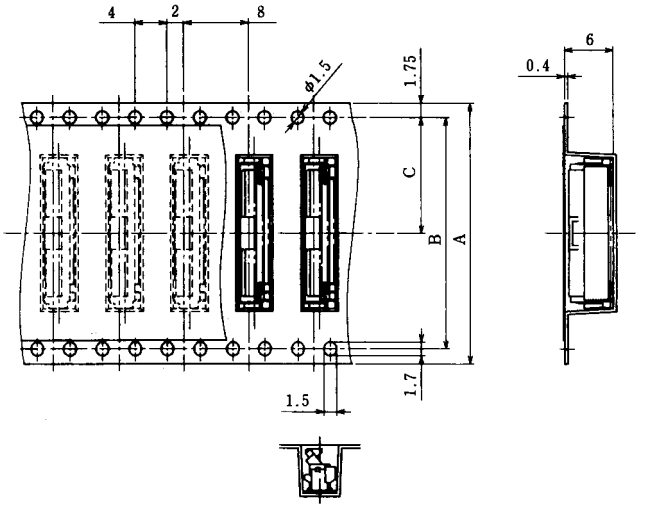
Note: 2,000 pieces per reel.

## Vertical Mounting Type (Common to 0.5mm/1mm Pitch)

Tape width 24mm max.




Tape width 32mm min.




### ●0.5mm Pitch Vertical mounting Type

Unit:mm

| Number of Contacts \ Dimension | A | B | C | D |
|---|---|---|---|---|
| 10 | 16 | —— | 7.5 | 16.5 |
| 12 | 16 | —— | 7.5 | 16.5 |
| 13 | 24 | —— | 11.5 | 24.5 |
| 15 | 24 | —— | 11.5 | 24.5 |
| 16 | 24 | —— | 11.5 | 24.5 |
| 17 | 24 | —— | 11.5 | 24.5 |
| 18 | 24 | —— | 11.5 | 24.5 |
| 20 | 24 | —— | 11.5 | 24.5 |
| 22 | 24 | —— | 11.5 | 24.5 |
| 24 | 24 | —— | 11.5 | 24.5 |

| Number of Contacts \ Dimension | A | B | C | D |
|---|---|---|---|---|
| 26 | 24 | —— | 11.5 | 24.5 |
| 30 | 32 | 28.4 | 14.2 | 32.5 |
| 32 | 32 | 28.4 | 14.2 | 32.5 |
| 33 | 32 | 28.4 | 14.2 | 32.5 |
| 34 | 44 | 40.4 | 20.2 | 44.5 |
| 36 | 44 | 40.4 | 20.2 | 44.5 |
| 40 | 44 | 40.4 | 20.2 | 44.5 |
| 45 | 44 | 40.4 | 20.2 | 44.5 |
| 49 | 44 | 40.4 | 20.2 | 44.5 |
| 50 | 44 | 40.4 | 20.2 | 44.5 |
| 60 | 56 | 52.4 | 26.2 | 56.5 |

Note: 1,000 pieces per reel.

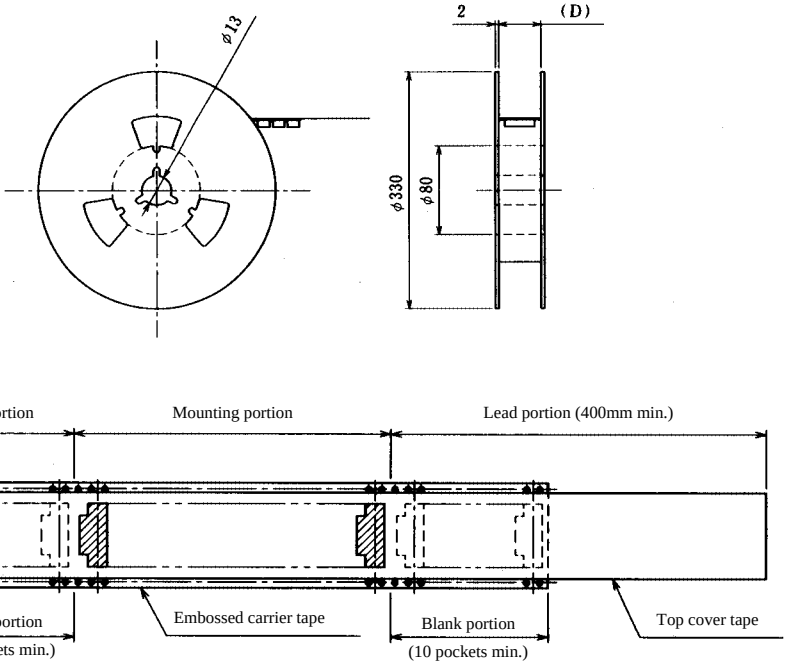
### ●1mm Pitch Vertical mounting Type

Unit:mm

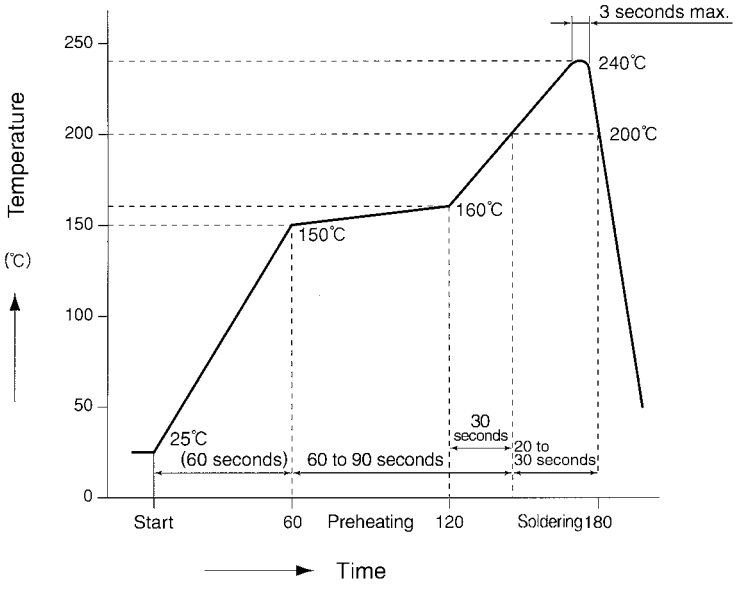
| Number of Contacts \ Dimension | A | B | C | D |
|---|---|---|---|---|
| 6 | 24 | —— | 11.5 | 24.5 |
| 7 | 24 | —— | 11.5 | 24.5 |
| 8 | 24 | —— | 11.5 | 24.5 |
| 16 | 32 | 28.4 | 14.2 | 32.5 |
| 20 | 44 | 40.4 | 20.2 | 44.5 |
| 22 | 44 | 40.4 | 20.2 | 44.5 |
| 24 | 44 | 40.4 | 20.2 | 44.5 |

Note: 1,000 pieces per reel.

## Reel Dimensions (Common to All Types)




## ◆Recommended Temperature Profile




**HRS test conditions**

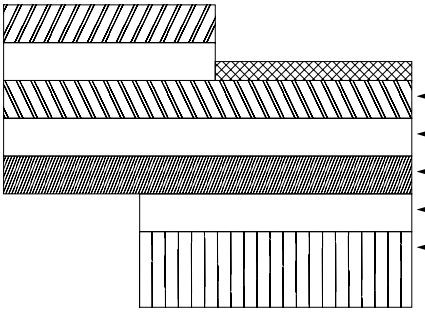
| | |
|---|---|
| Solder method | :Reflow, IR/hot air<br>(Nihon Den-netsu Co., Ltd.'s<br>Part Number: SENSBY NR-Ⅱ) |
| Environment: | :Room air |
| Solder composition | :Paste, 63%Sn/37%Pb<br>(Senju Metal Industry, Co., Ltd.'s<br>Part Number: OZ63-201C-50-9) |
| Test board | :Glass epoxy 40mm×80mm×1.6mm thick |
| Land dimensions | :Top and bottom<br>contact type 0.3mm×1.3mm<br>Vertical mounting type 0.6mm×1.5mm |
| Metal mask | :Top and bottom contact type<br>0.25mm×1.3mm×0.15mm thick<br>Vertical mounting type<br>0.5mm×1.5mm×0.15mm thick |

This temperature profile is based on the above conditions.
In individual applications the actual temperature may vary, depending on solder paste type, volume/thickness and board size/thickness. Consult your solder paste and equipment manufacturer for specific recommendations.

## ◆FH12 Series FPC/FFC Construction (Recommended Specifications)

### 1. FFC

### FFC : Flexible Flat Cable



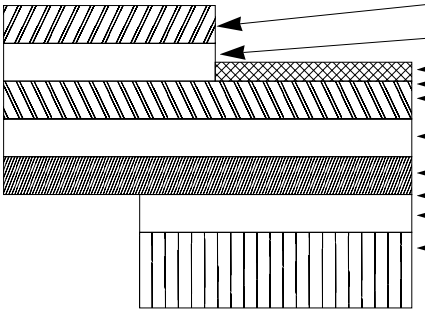
| Material Name | Material | Thickness (μm) | |
|---|---|---|---|
| Hard copper foil with tin plating | | 35 | |
| Adhesive | Polyester type | 30 | |
| Polyester | | 12 | |
| Adhesive | Polyester type | 30 | |
| Stiffener | Polyester type | 188 | (Note) |
| | Total | 295 | |

✻Real tolerance of thickness dimension is on the order of ±20 μm (275 to 315 μm)

Note: Use of a thicker FFC results in a stiffer lock action and the lock is more easily released.
A factor that contributes to thicker FFC is the use of 250 μm stiffener which is thicker than the standard (188 μm) product. This results in a total thickness of 357 μm.
When using FFC, control of FFC thickness becomes easy if you indicate to us the thickness of the stiffener.

### 2. FPC

### FPC : Flexible Printed Circuit



| Material Name | Material | Thickness (μm) |
|---|---|---|
| Covering layer film | Polyamide 1 mil | 25 |
| Cover adhesive | | 25 |
| Surface treatment | Tin-lead | 5 |
| Copper foil | Cu 1oz | 35 |
| Base adhesive | | 25 |
| Base film | Polyamide 1 mil | 25 |
| Reinforcement material adhesive | Heat-hardened adhesive | 30 |
| Stiffener | Polyamide 7 mil | 175 |
| | Total | 295 |

### 3. Precautions

1. This specification is a recommendation for the construction of the FH12 Series FPC and FFC (t=0.3 ±0.05).
2. For details about the construction, please contact the FPC/FFC manufacturers.