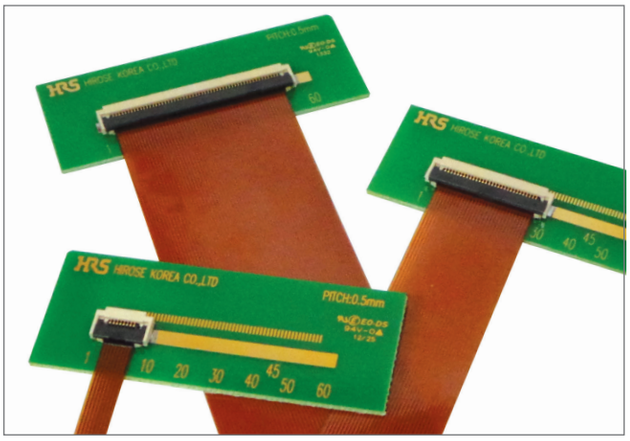
NEW

# 0.5mm and 1.0mm Pitch Connector for FFC/FPC

## TF31 Series



Compatible with other popular Hirose connectors

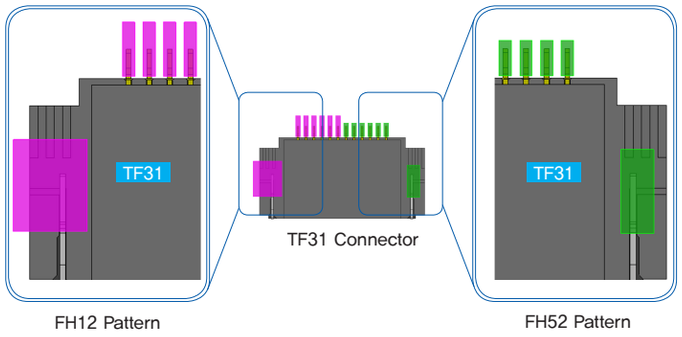



Figure.1

## ■ Features

### 1. Cost-effective and compatible with other popular Hirose connectors

The TF31 series utilizes the same FFC/FPC and PCB mounting patterns as two of Hirose's most popular connectors, the FH12 and FH52 series. This flexibility allows you to replace the FH12 and FH52 with the TF31 without having to re-design the board, providing a cost-effective solution. (see figure.1)

### 2. Multiple height and pitch variations available

This series offers two different contact pitches of 0.5 and 1.0 mm and two different heights of 1.75 and 2.0 mm. These options give engineers the ability to choose which connector will best fit their applications design. (See figure. 2)

### 3. FPC side catcher design

The TF31 series incorporates Hirose's FPC side catcher technology. This design feature puts the tabbed FPC into the correct position and also helps to achieve stability and deliver excellent retention force of the FPC. (See figure. 3)

### 4. Easy FPC insertion

The actuator has been designed to open to a wide, 110 degrees. This wide of an opening provides an easier, user friendly FPC insertion operation.

### 5. Prevents actuator separation

Each terminal is attached to the actuator, which provides support to the actuator across its whole length. This prevents the actuator from separating from the housing.

### 6. Actuator protection

The TF31 series has adopted an interference design that prevents the actuator from unintentionally opening. This prevents any damage that might occur when the mounted connector is transported, handled or placed into stock.

### 7. Maximizes board space

The bottom surface of the connector is over-molded. This allows the PCB space under the connector to be utilized for additional patterning.

### 8. Automatic board placement capable

The wide upper surface area of the connector and the tape and reel packaging allow this product to be utilized with automatic "pick-and-place" equipment.

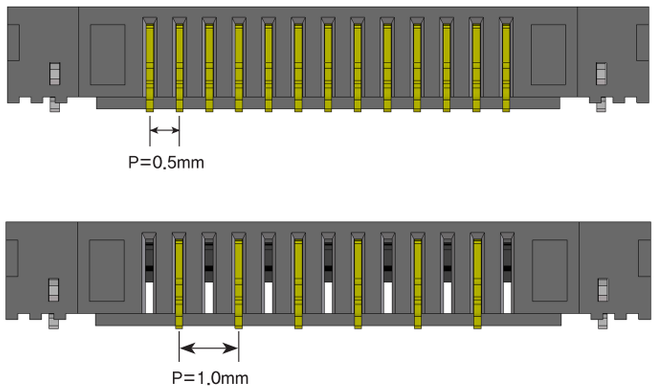
### 9. RoHS compliant, and halogen free

The TF31 is compliant to the current RoHS and halogen-free standards.

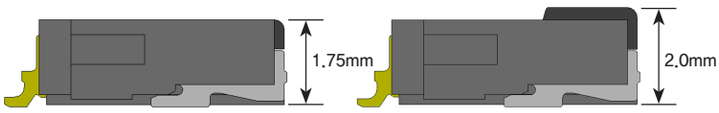
※As defined by IEC61249-2-21
Br 900ppm or less, Cl 900 ppm or less, Br + Cl 1,500 ppm or less

Multiple height and pitch variations available

Pitch variations




Height variations




4~20 Pin　　21~60 Pin

Figure.2

FPC side catcher design

Applicable for tabbed FPC by side catcher design

Applicable for normal FPC/FFC

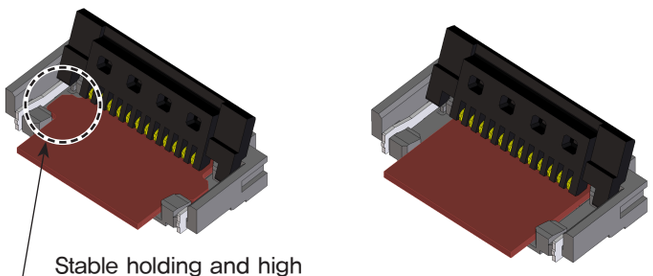



Figure.3

## ■Product Specifications

| | | | |
|---|---|---|---|
| Rating | Current rating : 0.5A DC (Note 1)<br>Voltage rating : 50V AC | Operating Temperature Range : −40 to +85℃ (Note 2)<br>Operating Humidity Range : Relative humidity, 90% max. (Not dewed) | Storage Temperature Range : −10 to +50℃ (Noet 3)<br>Storage Humidity Range : Relative humidity, 90% max. (Not dewed) |

| | |
|---|---|
| Applicable FPC | t=0.3±0.03 Gold plated |

| 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, total amplitude of 1.5mm,<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/s$^2$, 6 ms duration,<br>sine half−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 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. | Temperature : −40℃ → 15 to 35℃ → 85℃ → 15 to 35℃.<br>Time 30 → 2 to 3 → 30 → 2 to 3 (minutes)<br>5 cycles |
| 9. Resistance to Soldering heat | No deformation of components affecting performance. | Reflow : At the recommended temperature profile<br>Manual soldering : 350±10℃ for 5 seconds |

Note 1 : When passing the current through all of the contacts, use 70% of the current rating.
Note 2 : Includes temperature rise caused by current flow.
Note 3 : 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 conditon of installed connectors in storage, shipment or during transportation.
Note 4 : Informaiton contained in this catalog represents general requirements for this series. Contact us for the drawings and specifications for a specific part number shown.

## ■Material

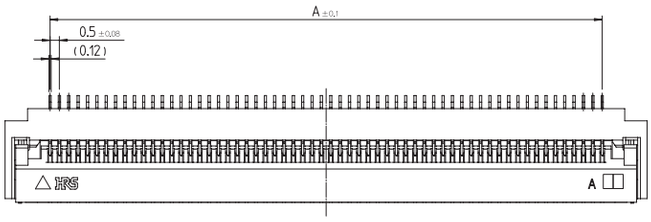
| Part | Material | Finish | Remarks |
|---|---|---|---|
| Insulator | LCP | Color : Beige | UL94V−0 |
| Actuator | LCP | Color : Black | |
| Contact | Phosphor bronze | Gold plated | ——— |
| Metal Fittings | Brass | Tin plated | |

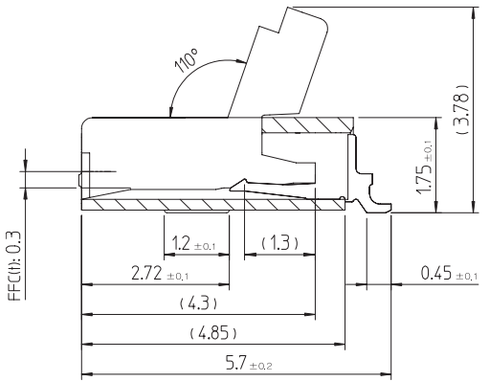
## ■Ordering Information

TF 31 − 40 (20) S B−1 SH (***)
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

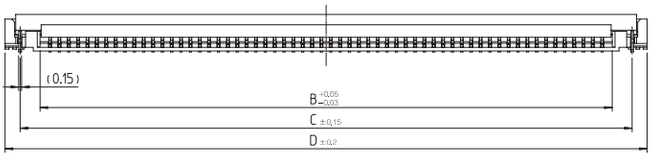
| | |
|---|---|
| ① Series Name : TF | ⑤ Eccentric direction:<br>Blank : Standard type<br>A, B : Eccentric type |
| ② Series No. : 31 | |
| ③ Standard type : Number of contacts<br>Eccentric type : Number of contacts in 0.5mm housing | ⑥ Contact Pitch : 0.5mm, 1.0mm |
| ④ Standard type : Blank<br>Eccentric type : Number of contacts | ⑦ Contact type<br>SH : SMT horizontal mounting type |
| | ⑧ Plating specification : (800)··Gold plating, 3,000 pieces / reel |

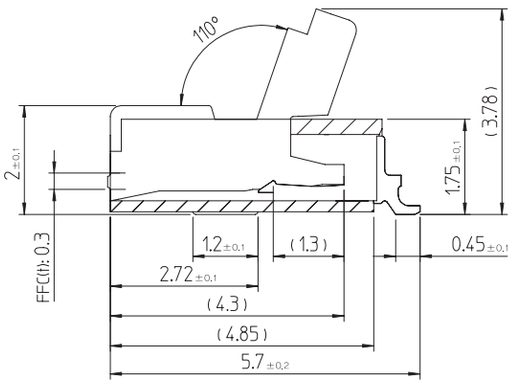
## ■0.5mm Pitch Bottom Contact Type




4～20 CONTACTS




21～60 CONTACTS

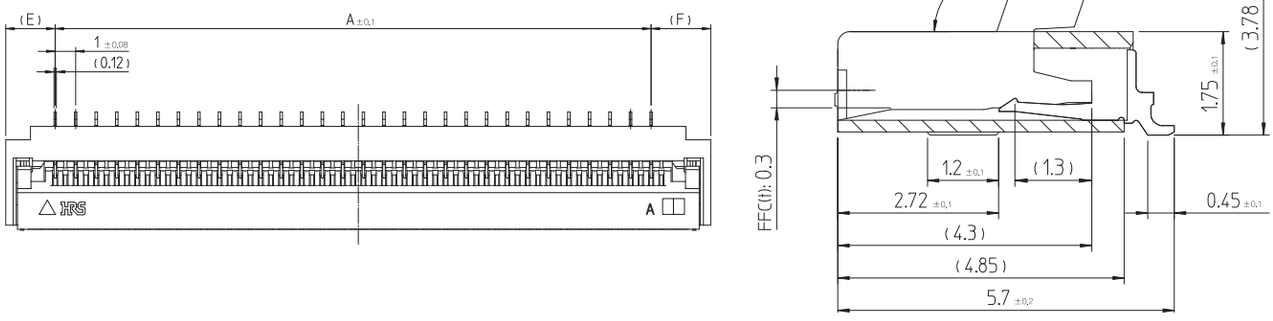
Note1 : The coplanarity of each terminal lead within specified dimension is 0.1mm Max.
Note2 : Packaged on tape and reel only. Check packaging specification.
Note3 : Slight variations in color of the plastic compounds do not affect form, fit or function of the connector.
Note4 : After reflow, the terminal plating may change color, however this does not represent a quality issue.

Unit : mm

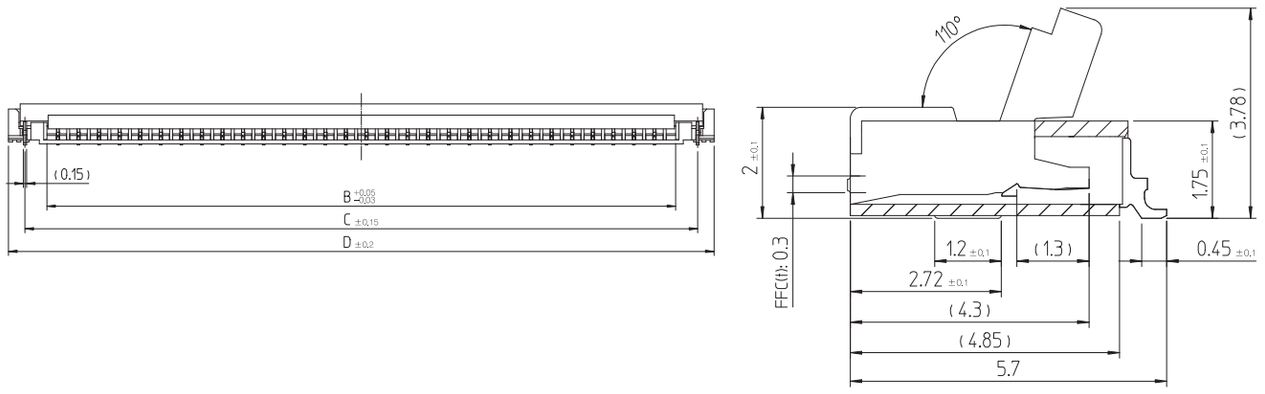
| PART NUMBER | HRS No. | NUMBER OF CONTACTS | A | B | C | D |
|---|---|---|---|---|---|---|
| TF31-4S-0.5SH(800) | CL480-0235-5-00 | 4 | 1.5 | 2.57 | 4.7 | 6.3 |
| TF31-6S-0.5SH(800) | CL480-0154-5-00 | 6 | 2.5 | 3.57 | 5.7 | 7.3 |
| TF31-8S-0.5SH(800) | CL480-0184-6-00 | 8 | 3.5 | 4.57 | 6.7 | 8.3 |
| TF31-10S-0.5SH(800) | CL480-0130-7-00 | 10 | 4.5 | 5.57 | 7.7 | 9.3 |
| TF31-12S-0.5SH(800) | CL480-0131-0-00 | 12 | 5.5 | 6.57 | 8.7 | 10.3 |
| TF31-13S-0.5SH(800) | CL480-0177-0-00 | 13 | 6.0 | 7.07 | 9.2 | 10.8 |
| TF31-14S-0.5SH(800) | CL480-0155-8-00 | 14 | 6.5 | 7.57 | 9.7 | 11.3 |
| TF31-16S-0.5SH(800) | CL480-0178-3-00 | 16 | 7.5 | 8.57 | 10.7 | 12.3 |
| TF31-17S-0.5SH(800) | CL480-0185-9-00 | 17 | 8.0 | 9.07 | 11.2 | 12.8 |
| TF31-18S-0.5SH(800) | CL480-0161-0-00 | 18 | 8.5 | 9.57 | 11.7 | 13.3 |
| TF31-20S-0.5SH(800) | CL480-0132-2-00 | 20 | 9.5 | 10.57 | 12.7 | 14.3 |
| TF31-21S-0.5SH(800) | CL480-0186-1-00 | 21 | 10.0 | 11.07 | 13.2 | 14.8 |
| TF31-22S-0.5SH(800) | CL480-0143-9-00 | 22 | 10.5 | 11.57 | 13.7 | 15.3 |
| TF31-26S-0.5SH(800) | CL480-0162-3-00 | 26 | 12.5 | 13.57 | 15.7 | 17.3 |
| TF31-28S-0.5SH(800) | CL480-0156-0-00 | 28 | 13.5 | 14.57 | 16.7 | 18.3 |
| TF31-30S-0.5SH(800) | CL480-0179-6-00 | 30 | 14.5 | 15.57 | 17.7 | 19.3 |
| TF31-32S-0.5SH(800) | CL480-0157-3-00 | 32 | 15.5 | 16.57 | 18.7 | 20.3 |
| TF31-35S-0.5SH(800) | CL480-0261-0-00 | 35 | 17.0 | 18.07 | 20.2 | 21.8 |
| TF31-36S-0.5SH(800) | CL480-0163-6-00 | 36 | 17.5 | 18.57 | 20.7 | 22.3 |
| TF31-40S-0.5SH(800) | CL480-0133-5-00 | 40 | 19.5 | 20.57 | 22.7 | 24.3 |
| TF31-45S-0.5SH(800) | CL480-0134-8-00 | 45 | 22.0 | 23.07 | 25.2 | 26.8 |
| TF31-50S-0.5SH(800) | CL480-0135-0-00 | 50 | 24.5 | 25.57 | 27.7 | 29.3 |
| TF31-55S-0.5SH(800) | CL480-0187-4-00 | 55 | 27.0 | 28.07 | 30.2 | 31.8 |
| TF31-60S-0.5SH(800) | CL480-0136-3-00 | 60 | 29.5 | 30.57 | 32.7 | 34.3 |

Note1 : Embossed tape reel packaging (3,000pecies/reel).
Order by number of reels.

## ■1.0mm Pitch Bottom Contact Type




4～8 CONTACTS




10～30 CONTACTS

Note1 : The coplanarity of each terminal lead within specified dimension is 0.1mm Max.
Note2 : Packaged on tape and reel only. Check packaging specification.
Note3 : Slight variations in color of the plastic compounds do not affect form, fit or function of the connector.
Note4 : After reflow, the terminal plating may change color, however this does not represent a quality issue.

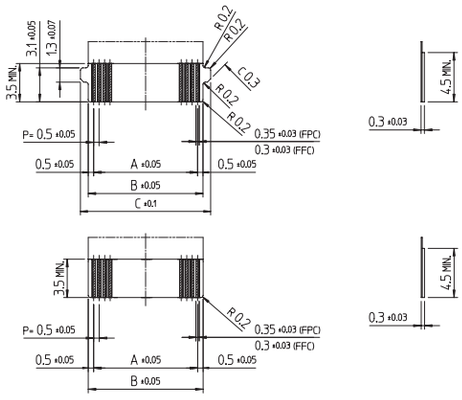
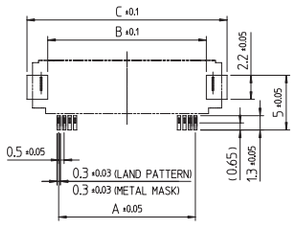
Unit : mm

| PART NUMBER | HRS No. | NUMBER OF CONTACTS | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|
| TF31-10(4)SA-1SH(800) | CL480-0169-2-00 | 4 | 3.0 | 5.57 | 7.7 | 9.3 | 2.9 | 3.4 |
| TF31-6S-1SH(800) | CL480-0168-0-00 | 6 | 5.0 | 7.07 | 9.2 | 10.8 | 2.9 | 2.9 |
| TF31-8S-1SH(800) | CL480-0211-7-00 | 8 | 7.0 | 9.07 | 11.2 | 12.8 | 2.9 | 2.9 |
| TF31-10S-1SH(800) | CL480-0212-0-00 | 10 | 9.0 | 11.07 | 13.2 | 14.8 | 2.9 | 2.9 |
| TF31-40(20)SB-1SH(800) | CL480-0213-2-00 | 20 | 19.0 | 20.57 | 22.7 | 24.3 | 2.4 | 2.9 |
| TF31-60(30)SB-1SH(800) | CL480-0180-5-00 | 30 | 29.0 | 30.57 | 32.7 | 34.3 | 2.4 | 2.9 |

Note1 : Embossed tape reel packaging (3,000pecies/reel).
Order by number of reels.

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

### ●0.5mm Pitch Product

| | FPC / FFC dimensions | Land / Metal Mask dimensions |
|---|---|---|
| 0.5mm Pitch Bottom Contact Type |  |  |



Recommended metal mask thickness : 0.12mm

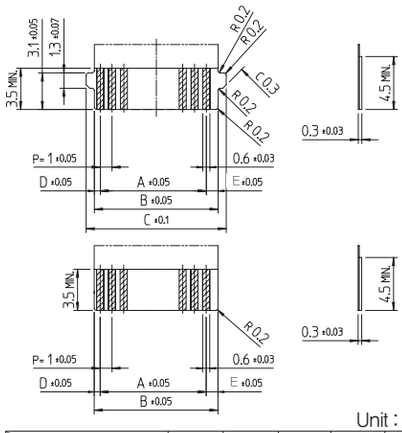
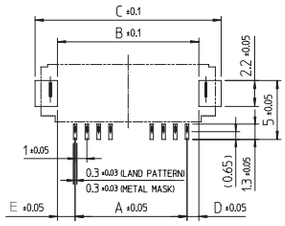


Unit : mm

| NUMBER OF CONTACTS \ DIMENSION | A | B | C |
|---|---|---|---|
| 4 | 1.5 | 2.5 | 3.9 |
| 6 | 2.5 | 3.5 | 4.9 |
| 8 | 3.5 | 4.5 | 5.9 |
| 10 | 4.5 | 5.5 | 6.9 |
| 12 | 5.5 | 6.5 | 7.9 |
| 13 | 6.0 | 7.0 | 8.4 |
| 14 | 6.5 | 7.5 | 8.9 |
| 16 | 7.5 | 8.5 | 9.9 |
| 17 | 8.0 | 9.0 | 10.4 |
| 18 | 8.5 | 9.5 | 10.9 |
| 20 | 9.5 | 10.5 | 11.9 |
| 21 | 10.0 | 11.0 | 12.4 |
| 22 | 10.5 | 11.5 | 12.9 |
| 26 | 12.5 | 13.5 | 14.9 |
| 28 | 13.5 | 14.5 | 15.9 |
| 30 | 14.5 | 15.5 | 16.9 |
| 32 | 15.5 | 16.5 | 17.9 |
| 35 | 17.0 | 18.0 | 19.4 |
| 36 | 17.5 | 18.5 | 19.9 |
| 40 | 19.5 | 20.5 | 21.9 |
| 45 | 22.0 | 23.0 | 24.4 |
| 50 | 24.5 | 25.5 | 26.9 |
| 55 | 27.0 | 28.0 | 29.4 |
| 60 | 29.5 | 30.5 | 31.9 |

Unit : mm

| NUMBER OF CONTACTS \ DIMENSION | A | B | C |
|---|---|---|---|
| 4 | 1.5 | 3.5 | 7.3 |
| 6 | 2.5 | 4.5 | 8.3 |
| 8 | 3.5 | 5.5 | 9.3 |
| 10 | 4.5 | 6.5 | 10.3 |
| 12 | 5.5 | 7.5 | 11.3 |
| 13 | 6.0 | 8.0 | 11.8 |
| 14 | 6.5 | 8.5 | 12.3 |
| 16 | 7.5 | 9.5 | 13.3 |
| 17 | 8.0 | 10.0 | 13.8 |
| 18 | 8.5 | 10.5 | 14.3 |
| 20 | 9.5 | 11.5 | 15.3 |
| 21 | 10.0 | 12.0 | 15.8 |
| 22 | 10.5 | 12.5 | 16.3 |
| 26 | 12.5 | 14.5 | 18.3 |
| 28 | 13.5 | 15.5 | 19.3 |
| 30 | 14.5 | 16.5 | 20.3 |
| 32 | 15.5 | 17.5 | 21.3 |
| 35 | 17.0 | 19.0 | 22.8 |
| 36 | 17.5 | 19.5 | 23.3 |
| 40 | 19.5 | 21.5 | 25.3 |
| 45 | 22.0 | 24.0 | 27.8 |
| 50 | 24.5 | 26.5 | 30.3 |
| 55 | 27.0 | 29.0 | 32.8 |
| 60 | 29.5 | 31.5 | 35.3 |

| | | |
|---|---|---|
| 1.0mm Pitch Bottom Contact Type |  |  |



Recommended metal mask thickness : 0.12mm



Unit : mm

| NUMBER OF CONTACTS \ DIMENSION | A | B | C | D | E |
|---|---|---|---|---|---|
| 4 | 3.0 | 5.5 | 6.9 | 1.0 | 1.5 |
| 6 | 5.0 | 7.0 | 8.4 | 1.0 | 1.0 |
| 8 | 7.0 | 9.0 | 10.4 | 1.0 | 1.0 |
| 10 | 9.0 | 11.0 | 12.4 | 1.0 | 1.0 |
| 20 | 19.0 | 20.5 | 21.9 | 0.5 | 1.0 |
| 30 | 29.0 | 30.5 | 31.9 | 0.5 | 1.0 |

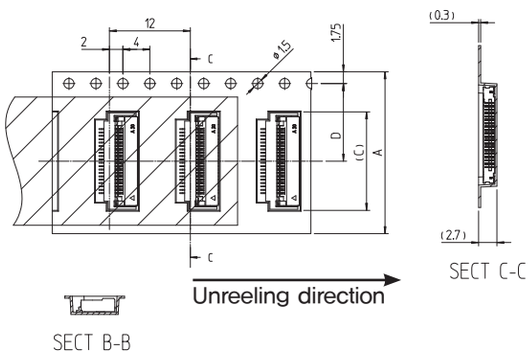
Unit : mm

| NUMBER OF CONTACTS \ DIMENSION | A | B | C | D | E |
|---|---|---|---|---|---|
| 4 | 3.0 | 6.5 | 10.3 | 1.5 | 2.0 |
| 6 | 5.0 | 8.0 | 11.8 | 1.5 | 1.5 |
| 8 | 7.0 | 10.0 | 13.8 | 1.5 | 1.5 |
| 10 | 9.0 | 12.0 | 15.8 | 1.5 | 1.5 |
| 20 | 19.0 | 21.5 | 25.3 | 1.0 | 1.5 |
| 30 | 29.0 | 31.5 | 35.3 | 1.0 | 1.5 |

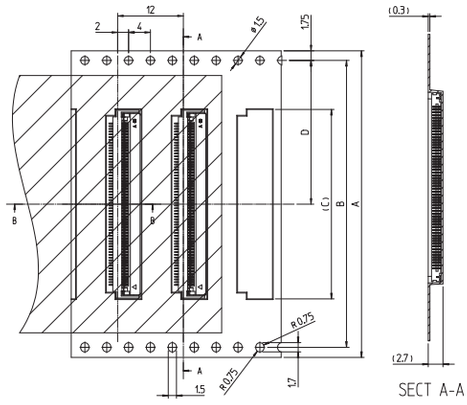
## ■Packaging Specification

### ●Embossed Carrier Tape Dimensions

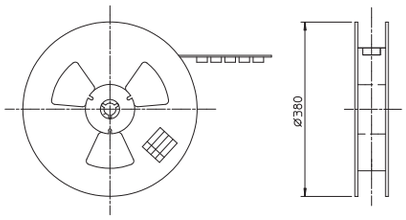
Tape width 24mm max.

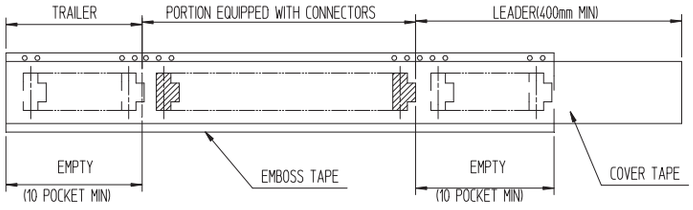



Tape width 32mm min.




### ●Reel Dimensions




Note 1 : 1REEL CONTAINS 3,000PCS.
Note 2 : MATERIAL
1) EMBOSS TAPE : Tape width 24mm MAX : PS (ANTISTATIC TREATMENT)
Tape width 36mm MIN : PET (ANTISTATIC TREATMENT)
2) COVER TAPE : PET (ANTISTATIC TREATMENT)

[0.5mm PITCH]

Unit : mm

| DIMENSION / NUMBER OF CONTACTS | A | B | C | D |
|---|---|---|---|---|
| 4 | 16 | — | 6.6 | 7.5 |
| 6 | 16 | — | 7.6 | 7.5 |
| 8 | 16 | — | 8.6 | 7.5 |
| 10 | 16 | — | 9.6 | 7.5 |
| 12 | 24 | — | 10.6 | 11.5 |
| 13 | 24 | — | 11.1 | 11.5 |
| 14 | 24 | — | 11.6 | 11.5 |
| 16 | 24 | — | 12.6 | 11.5 |
| 17 | 24 | — | 13.1 | 11.5 |
| 18 | 24 | — | 13.6 | 11.5 |
| 20 | 24 | — | 14.6 | 11.5 |
| 21 | 32 | 28.4 | 15.1 | 14.2 |
| 22 | 32 | 28.4 | 15.6 | 14.2 |
| 26 | 32 | 28.4 | 17.6 | 14.2 |
| 28 | 32 | 28.4 | 18.6 | 14.2 |
| 30 | 32 | 28.4 | 19.6 | 14.2 |
| 32 | 32 | 28.4 | 20.6 | 14.2 |
| 35 | 44 | 40.4 | 22.1 | 20.2 |
| 36 | 44 | 40.4 | 22.6 | 20.2 |
| 40 | 44 | 40.4 | 24.6 | 20.2 |
| 45 | 44 | 40.4 | 27.1 | 20.2 |
| 50 | 44 | 40.4 | 29.6 | 20.2 |
| 60 | 56 | 52.4 | 34.6 | 26.2 |

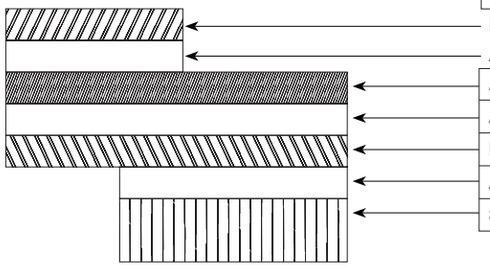
[1.0mm PITCH]

Unit : mm

| DIMENSION / NUMBER OF CONTACTS | A | B | C | D |
|---|---|---|---|---|
| 4 | 16 | — | 9.6 | 7.5 |
| 6 | 24 | — | 11.1 | 11.5 |
| 8 | 24 | — | 13.1 | 11.5 |
| 10 | 32 | 28.4 | 15.1 | 14.2 |
| 20 | 44 | 40.4 | 24.6 | 20.2 |
| 30 | 56 | 52.4 | 34.6 | 26.2 |

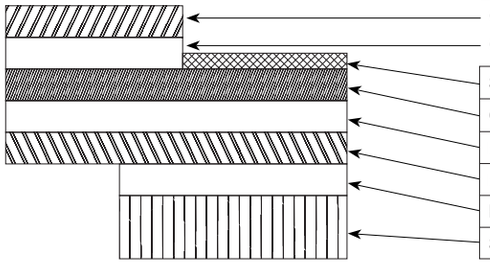
## ■ TF31 Series FPC/FFC Construction (Recommended Specifications)

### 1.FFC　FFC : Flexible Flat Cable



| Material Name | Material | Thickness (μm) |
|---|---|---|
| Polyester film | | (12) |
| Adhesive | Polyester thermoplastic type | (30) |
| Annealed copper foil(gold-plated nickel) | | 35 |
| Adhesive | Polyester type | 30 |
| Polyester | | 12 |
| Adhesive | Polyester type | 30 |
| Stiffener | Polyester type | 188 |
| | Total | 295 |

### 2.FPC　FPC : Flexible Printed Circuit

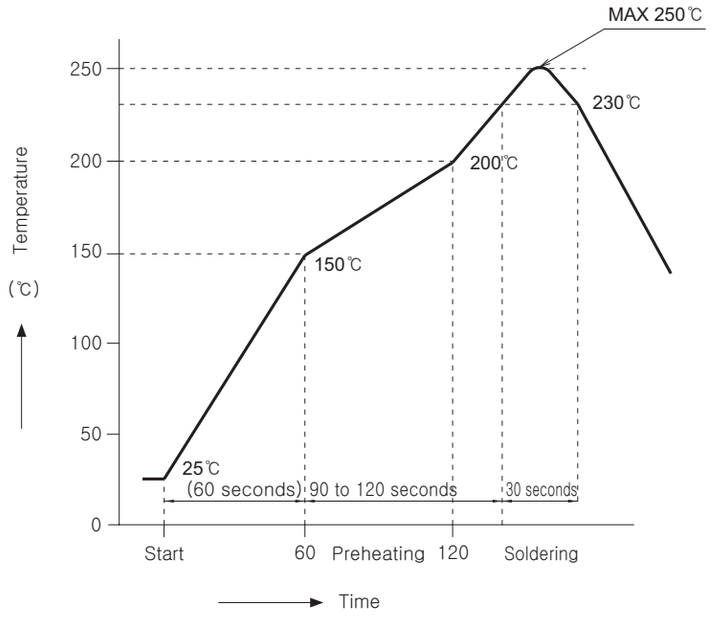


| Material Name | Material | Thickness (μm) |
|---|---|---|
| Covering layer film | Polyamide 1mil | (25) |
| Cover adhesive | | (25) |
| Surface treatment | Nickel 1~5μm + gold plating 0.2μm | 3 |
| Copper foil | Cu 1oz | 35 |
| Base adhesive | Thermoset adhesive | 25 |
| Base film | Polyamide 1mil | 25 |
| Reinforcement material adhesive | Thermoset adhesive | 30 |
| Stiffener | Polyamide 7mil | 175 |
| | Total | 293 |

### 3.Precautions

1. This specification is a recommendation for the construction of the TF31 Series FPC and FFC (t=0.3 ±0.03).
2. For details about the construction, please contact the FPC/FFC manufacturers.

## ■Recommended Temperature Profile




## HRS test conditions

| | |
|---|---|
| Solder method | : Reflow, IR/hot air |
| Environment | : Room air |
| Solder composition | : Paste, 96.5%Sn/3%Ag/0.5%Cu (Senju Metal Industry, Co., Ltd.'s Part Number: M705-221CM5-32-10.5) |
| Test board | : Glass epoxy 40mm×80mm×1.6mm thick |
| Land dimensions | : 0.3mm×1.3mm |
| Metal mask | : 0.3mm×1.3mm×0.12mm thick |

The temperature profile provided was based on the conditions explained above. In each individual application the actual temperature may vary depending on the volume/thickness of solder paste type, and the size/thickness of the board. Please contact the manufacturer of the solder paste and the equipment manufacturer for their specific recommendations.

## ■Connector Operating Instructions, precautions and recommendations
## ●Bottom Contact Type (common for 0.5mm/1mm Pitch)

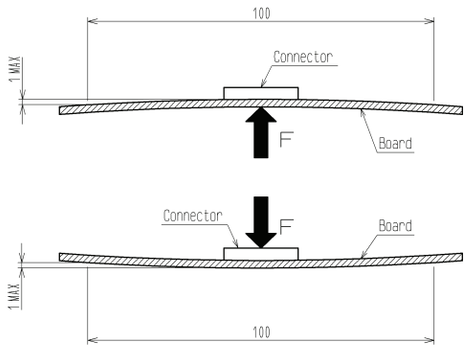
### INSTRUCTIONS FOR MOUNTING ON THE BOARD

#### ◆ Board Distortion
Be sure to minimize the board distortion as much as possible. The lead co-planarity is 0.1 mm or less, and includes the reinforced metal fittings. If the board becomes too warped or distorted this may result in a soldering failures and co-planarity issues.

#### ◆ Connector Load
If the connector is not mounted onto a board, refrain from doing any of the following actions: Do not apply a force of 1 N or more to the connector. Do not insert the FFC or operate the connector. Any of these actions may damage or break the connector.

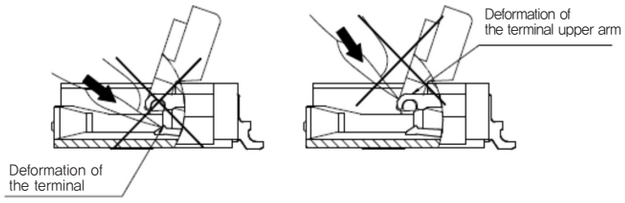
#### ◆ Board stress
It may advisable to split larger boards into smaller sections to reduce overall board stress. Avoid placing any excess force on the board during the assembly process. When using screws to secure the boards, be sure to check for any unwanted stress that may occur from this operation as well.

#### ◆ Acceptable amount of board deflection
A 100 mm wide board has an acceptable warp range of 1 mm or less. Excessive amounts of warping will place stress on the connector which will damage the connector and cause malfunction.

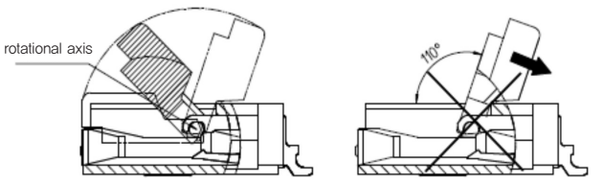


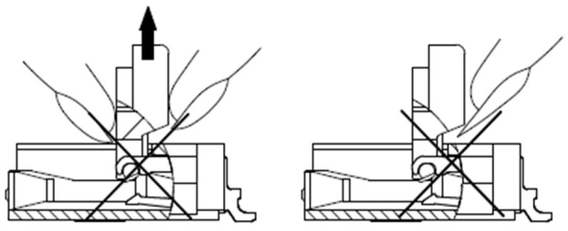

### INSTRUCTIONS ON INSERTING FFC/FPC AND CONNECTION

#### ◆ Actuator precautions and Handling instructions
1. Do not apply excessive force on the actuator when releasing it from its initial position. If you use your nail or finger as shown below, the terminals might become deformed.




2. The actuator rotates around an axis as shown below. Make sure to rotate the whole actuator and not just the center portion.
3. The actuator opens up to 110°. Do not force the actuator beyond this point. Doing so may damage or break off the actuator.
4. Rotate the whole actuator downward and not just the center portion.
5. Do not pull or pick at the actuator as shown below, doing so may damage it. (Do not carry out any operation other than rotating the actuator.)

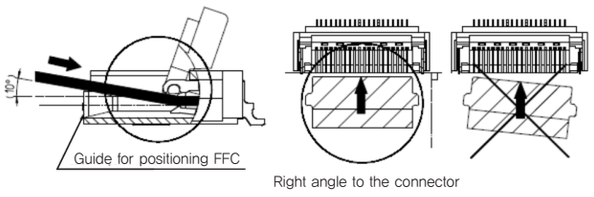


#### ◆ Contact orientation
This connector utilizes bottom contacts. Insert the FFC/FPC with the exposed conductors face down.

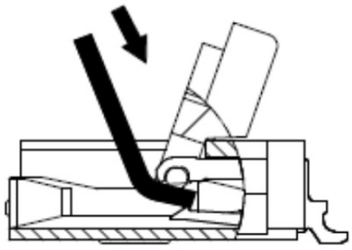
### ◆ Inserting the FFC/FPC

1. Insert the FFC/FPC straight into the connector, but at a 10° angle (see illustration below). Make sure that it has been fully inserted.

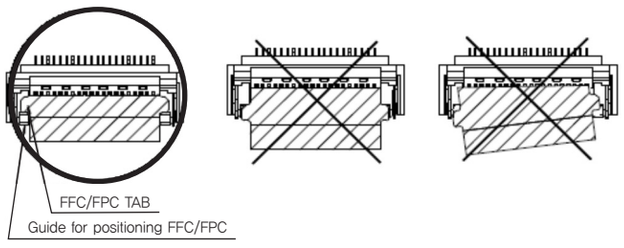



2. Do not insert the FFC/FPC in a diagonal manner. If the FFC/FPC is inserted in skewed orientation as illustrated above, the FFC/FPC may be caught by the terminals resulting in deformation of the terminals.

※Design the correct layout for these parts. Doing so will allow for sufficient space to properly insert the FFC/ FPC to its proper position and depth. Consult with your FPC/FFC manufacturer to select a flex circuit that has the correct flex characteristics to avoid breakage.



3. Do not try to operate the actuator until the FFC/FPC has been correctly positioned into the connector. If the FFC/FPC is sitting on the guides, using the actuator may damage the connector.




### ◆ Ensuring a completed connection

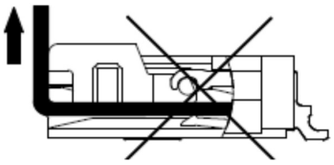
After completing the locking operation, be sure to check that the actuator is horizontal to the board surface. Use caution when checking the actuator. Do not apply excessive force, doing so may damage the terminals.

## Instructions on FFC/FPC layout after connection

### ◆ Load to FFC/FPC

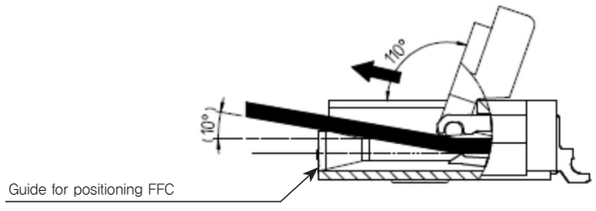
Do not apply direct force to the connector after inserting the FFC/FPC. Doing so may lead to the connector becoming unlocked or damage to the FFC/FPC. In general the FFC/FPC should not be bent sharply near the insertion opening. Sharps bends can cause malfunction and a disrupted connection.

Load : 0.1 x n N Max
(n : number of contacts)



## Instructions on removing FFC/FPC

- ◆ Rotate the whole actuator upward and not just the center portion.
- ◆ Pull the FFC/FPC straight out of the connector at a 10° angle.




## Other instructions

### ◆ Instructions on Manual Soldering

Follow the instructions shown below when soldering the connector manually during repair work, etc.

1. Do not perform reflow soldering or manual soldering with the FFC inserted into the connector.
2. Do not overheat the connector. Do not allow the soldering iron to contact any part other than the intended connector leads. Unnecessary contact may lead to damage and deformities of the connector.
3. Do not use excessive solder (or flux). If excessive solder (or flux) is used on the terminals, solder or flux may adhere to the contacts or rotating parts of the actuator, resulting in poor contact or a rotation failure of the actuator. Supplying excessive solder to the reinforcing bracket may hinder actuator rotation, resulting in breakage of the connector.
4. Do not use excessive solder (flux) on these connectors. Doing so may result in poor contact performance, malfunctioning actuators / reinforcing brackets due to the excessive solder and may ultimately lead to a broken connector.

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