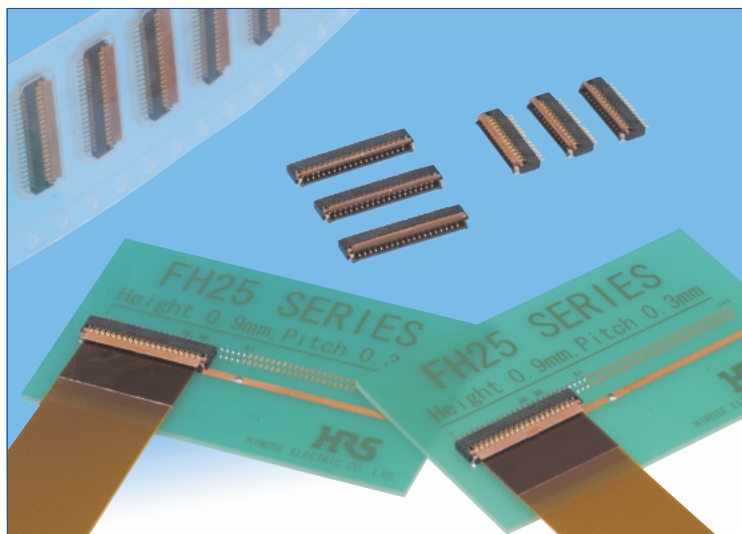


# 0.3 mm Contact Pitch, 0.9 mm above the board, Flexible Printed Circuit ZIF Connectors.

## FH 25 Series



### Features

**1. Extremely light weight**

The largest version, with all contacts loaded, weights only 0.11gramms.

**2. Conductive traces on the PCB can run under the connector**

No exposed contacts on the bottom of the connector.

**3. High density together with reliable solderability on the board**

Staggered contact points and the leads plus the nickel barriers assure sufficient distance to prevents solder bridging.

**4. Easy FPC insertion and reliable electrical connection**

Proven Flip Lock® actuator allows easy insertion of FPC. Tactile sensation when fully closed confirms complete electrical and mechanical connection.

**5. Accepts standard thickness FPC**

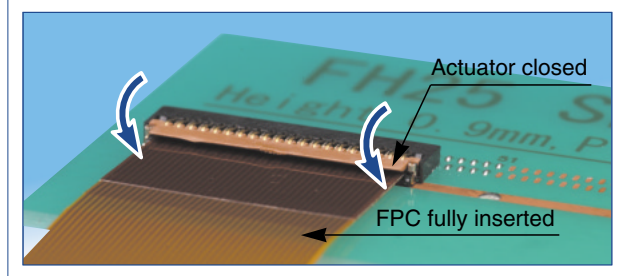
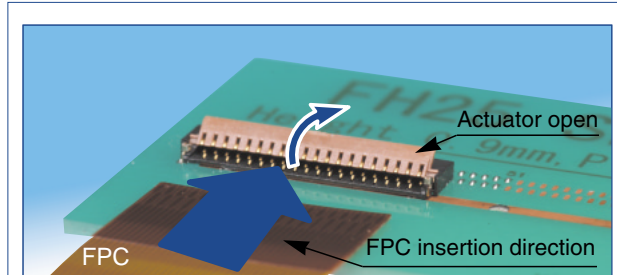
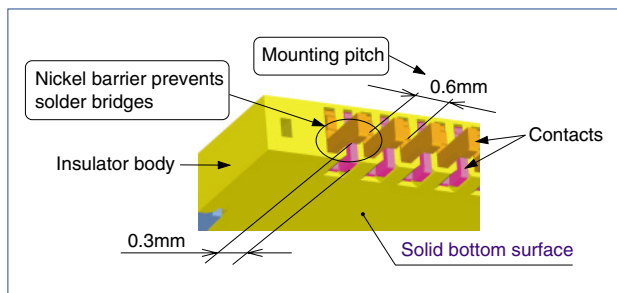
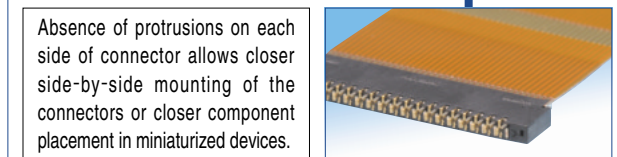
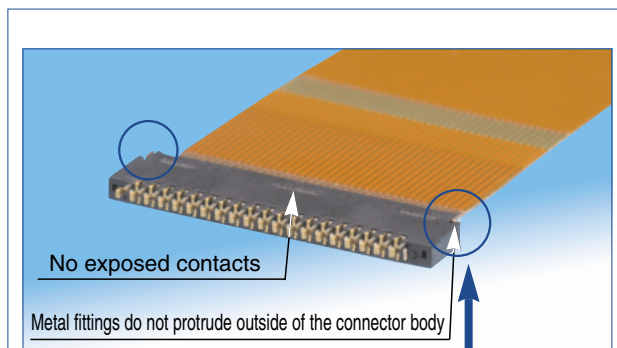
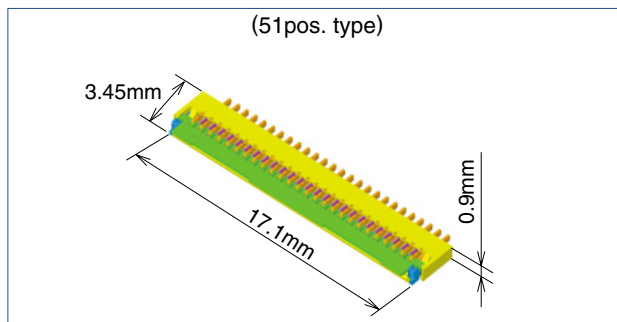
0.2 mm thick standard Flexible Printed Circuit board can be used. This is the only ultra-low profile ZIF connector allowing the use of standard FPC.

**6. Board placement with automatic equipment**

Flat top surface and packaging on the tape-and-reel allows use of vacuum nozzles. Standard reel contains 5,000 connectors.

### Applications

Mobile phones, PDA's, digital cameras, digital video cameras, LCD connections, plasma displays (PDP), camera modules and other compact devices requiring Flexible Printed Circuit connections using high reliability ultra-small profile connectors.



## Product Specifications

|        |  |  |  |
|--------|--|--|--|
| Rating | Rated current 0.15 A DC<br>Rated voltage 30 V AC | Operating temperature range<br>-55°C to +85°C (Note 1)<br>Operating humidity range<br>Relative humidity 90% max. (No condensation) | Storage temperature range<br>-10°C to +50°C (Note 2)<br>Storage humidity range<br>Relative humidity 90% max. |
|--------|--|--|--|

|                 |  |
|-----------------|--|
| Recommended FPC | Thickness: = 0.2±0.03mm thick, gold plated connecting traces |
|-----------------|--|

| Item                                     | Specification   | Conditions  |
|--|---|---|
| 1. Insulation resistance                 | 50 M ohms min.  | 100 V DC  |
| 2. Withstanding voltage                  | No flashover or insulation breakdown.   | 90 V AC /one minute   |
| 3. Contact resistance                    | 100 m ohms max.<br>* Including FPC conductor resistance   | 1 mA  |
| 4. Durability<br>(insertion/ withdrawal) | Contact resistance: 100 m ohms max.<br>No damage, cracks, or parts dislocation.   | 10 cycles   |
| 5. Vibration                             | No electrical discontinuity of 1 μs or more.<br>Contact resistance: 100 m ohms max.<br>No damage, cracks, or parts dislocation. | Frequency: 10 to 55 Hz,<br>single amplitude of 0.75 mm,<br>10 cycles,3 axis.  |
| 6. Shock                                 | No electrical discontinuity of 1 μs. min.<br>Contact resistance: 100 m ohms max.<br>No damage, cracks, or parts dislocation.    | Acceleration of 981 m/s <sup>2</sup> ,<br>6 ms duration, sine half-wave waveform,<br>3 cycles,3 axis.                 |
| 7. Humidity<br>(Steady state)            | Contact resistance: 100 m ohms max.<br>Insulation resistance: 50 M ohms min.<br>No affect on appearance or performance.         | 96 hours at temperature of 40°C and humidity of 90% to 95%.   |
| 8. Temperature cycle                     | Contact resistance: 100 m ohms max.<br>Insulation resistance: 50 M ohms min.<br>No damage, cracks, or parts looseness.          | Temperature: -55°C → +15°C to +35°C → +85°C → +15°C to +35°C<br>Time: 30 → 2 to 3 → 30 → 2 to 3 (Minutes)<br>5 cycles |
| 9. Resistance to<br>soldering heat       | No deformation of components affecting performance.   | Reflow: At the recommended temperature profile<br>Manual soldering: 350°C±5°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 Range and Humidity range covers non- conducting condition of installed connectors in storage, shipment or during transportation.

## Materials

| Part           | Material        | Finish              | Remarks |
|----------------|-----------------|---------------------|---------|
| Insulator      | LCP             | Color: Black        | UL94V-0 |
|                | LCP             | Color: Dark brown   |         |
| Contacts       | Phosphor bronze | Gold plated         | _____   |
| Metal fittings | Phosphor bronze | Tin plated(No-lead) | _____   |

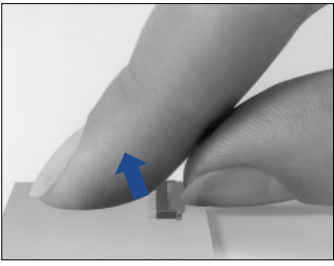
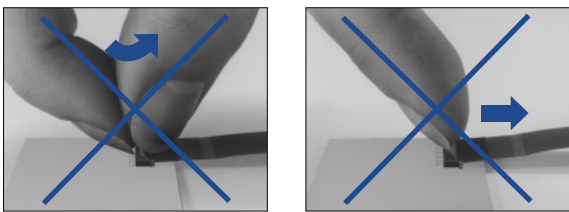
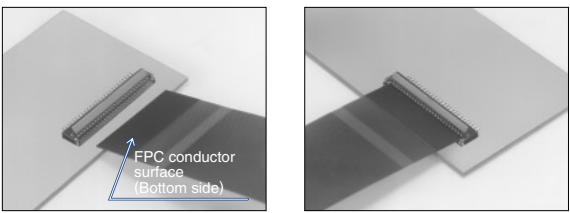
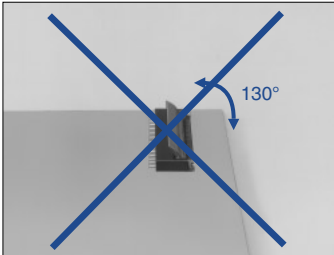
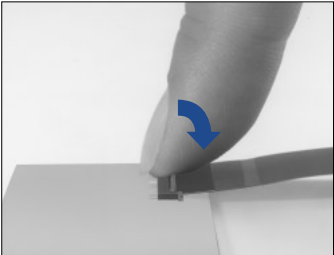
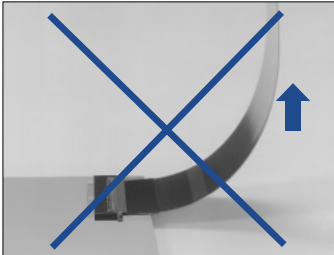
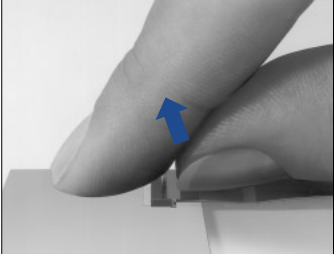
## Ordering information

### FH25- 51S - 0.3 - SH (05)

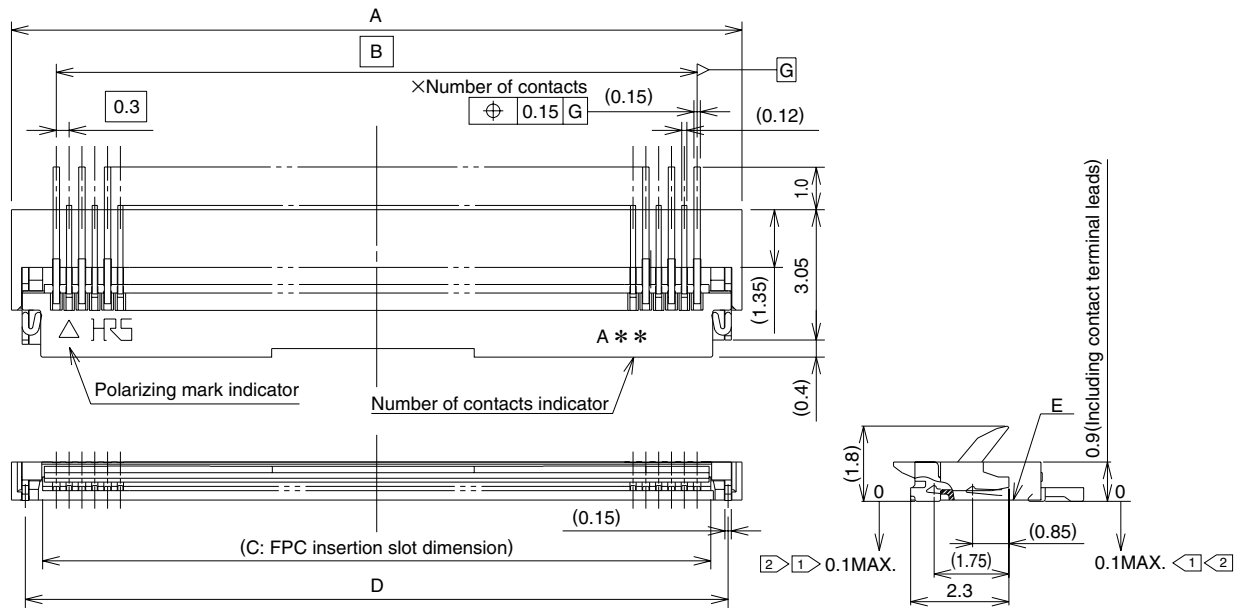
①      ②      ③      ④      ⑤

|   |  |
|---|--|
| ① Series name: FH25   | ④ Terminal type<br>SH: SMT horizontal mounting type            |
| ② No. of contacts<br>Number of contacts: 21, 27, 33, 39, 45, 51 |  |
| ③ Contact pitch: 0.3 mm   | ⑤ Plating specifications<br>(05): Gold, selective flash plated |

## ◆ Operation and Precautions

| Operation  | Precautions   |
|--|---|
| <p><b>1.FPC insertion procedure. Connector installed on the board.</b></p> <p>① Lift up the actuator. Use thumb or index finger.</p>    | <p>① Do not apply excessive force or use any type of tool to operate the actuator.</p>    |
| <p>② Fully insert the FPC in the connector parallel to mounting surface, with the exposed conductive traces facing down.</p>           | <p>② The connector will assure reliable performance when the actuator is open to 130° maximum. Do not exceed this angle, as this may cause permanent damage to the connector.</p>  |
| <p>③ Rotate down the actuator until firmly closed. It is critical that the inserted FPC is not moved and remains fully inserted.</p>  | <p>③ Exercise caution when applying upward force to the connected FPC. FPC conductor surface on opposite side.</p>    |
| <p><b>2.FPC removal</b></p> <p>① Lift up the actuator.<br/>Carefully withdraw the FPC.</p>    |   |

# Specifications



- Notes
- ① The coplanarity of each terminal lead is within 0.1.
  - ② The contact terminal lead position indicates the dimension from the E surface, the bottom surface of the insulator body.
  - ③ Slight variations in color of the plastic compounds do not affect form, fit or function of the connector.

Unit: mm

| Part Number        | CL No.          | Number of Contacts | A    | B    | C     | D     |
|--------------------|-----------------|--------------------|------|------|-------|-------|
| FH25-21S-0.3SH(05) | CL586-1204-3-05 | 21                 | 8.1  | 6.0  | 6.64  | 7.45  |
| FH25-27S-0.3SH(05) | CL586-1205-6-05 | 27                 | 9.9  | 7.8  | 8.44  | 9.25  |
| FH25-33S-0.3SH(05) | CL586-1207-1-05 | 33                 | 11.7 | 9.6  | 10.24 | 11.05 |
| FH25-39S-0.3SH(05) | CL586-1208-4-05 | 39                 | 13.5 | 11.4 | 12.04 | 12.85 |
| FH25-45S-0.3SH(05) | CL586-1209-7-05 | 45                 | 15.3 | 13.2 | 13.84 | 14.65 |
| FH25-51S-0.3SH(05) | CL586-1200-2-05 | 51                 | 17.1 | 15.0 | 15.64 | 16.45 |

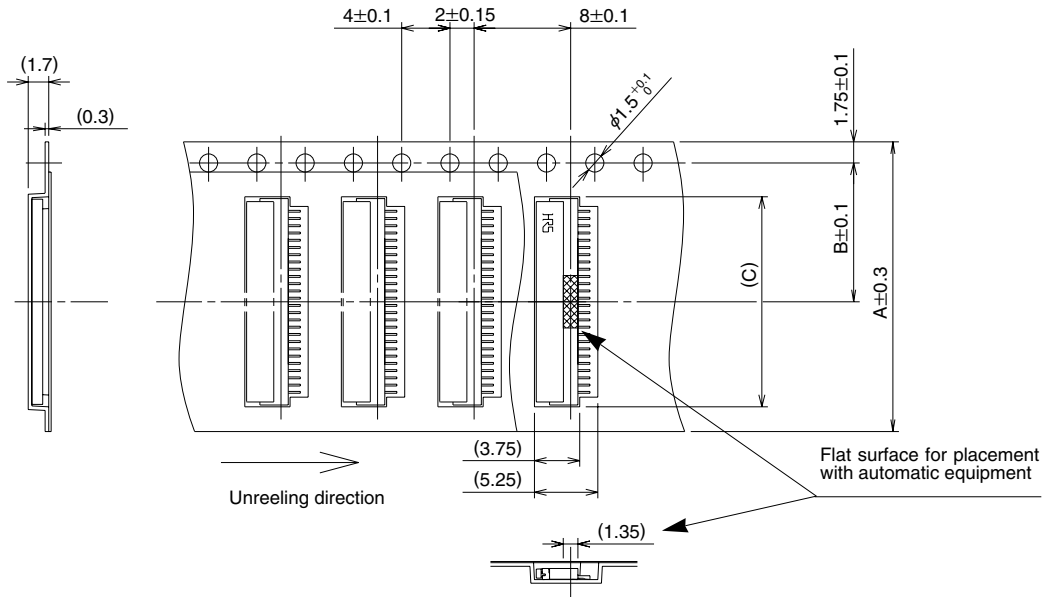
Embossed tape reel packaging (5,000 pieces/reel).

Order by number of reels.



## ◆ Packaging Specification

### ● Embossed Carrier Tape Dimensions

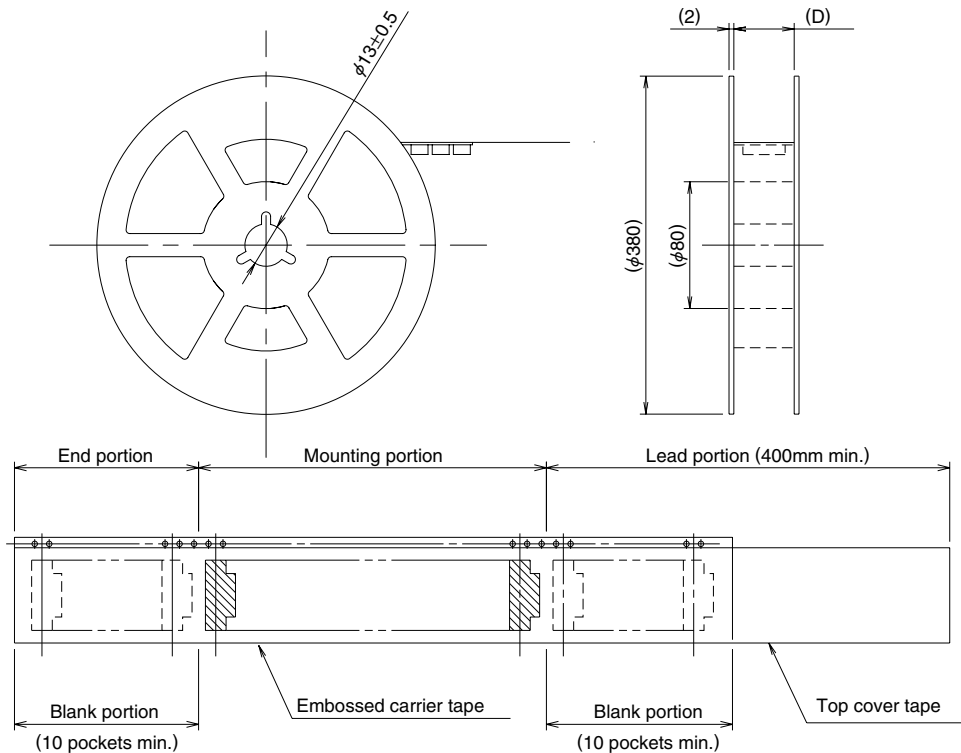


Unit: mm

| Part Number        | CL No.          | Number of Contacts | A  | B    | C    | D    |
|--------------------|-----------------|--------------------|----|------|------|------|
| FH25-21S-0.3SH(05) | CL586-1204-3-05 | 21                 | 16 | 7.5  | 8.4  | 16.5 |
| FH25-27S-0.3SH(05) | CL586-1205-6-05 | 27                 | 24 | 11.5 | 10.2 | 24.5 |
| FH25-33S-0.3SH(05) | CL586-1207-1-05 | 33                 | 24 | 11.5 | 12.0 | 24.5 |
| FH25-39S-0.3SH(05) | CL586-1208-4-05 | 39                 | 24 | 11.5 | 13.8 | 24.5 |
| FH25-45S-0.3SH(05) | CL586-1209-7-05 | 45                 | 24 | 11.5 | 15.6 | 24.5 |
| FH25-51S-0.3SH(05) | CL586-1200-2-05 | 51                 | 24 | 11.5 | 17.4 | 24.5 |

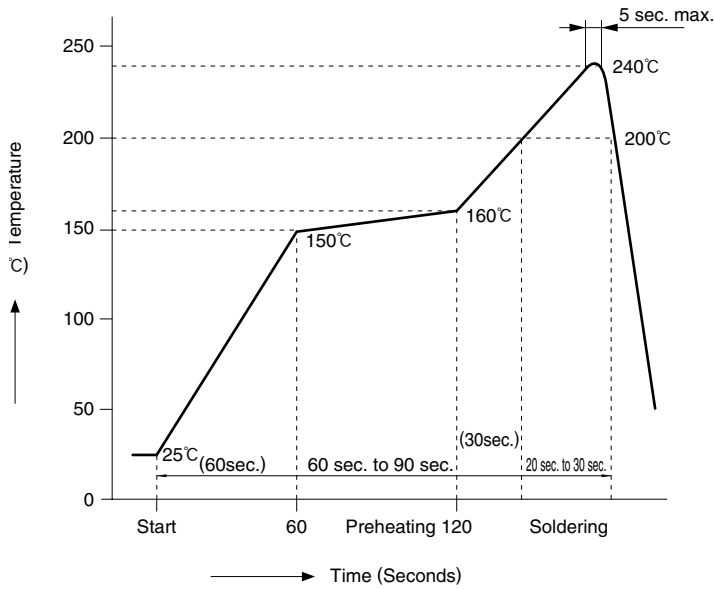
5,000 pieces per reel.

### ● Reel Dimensions



## ◆ Recommended Temperature Profile

### ● Using Typical Solder Paste



#### HRS test conditions

Solder method :Reflow, IR/hot air  
(Nihon Den-nettsu Co., Ltd.'s Part Number: SENSBY NR- II)

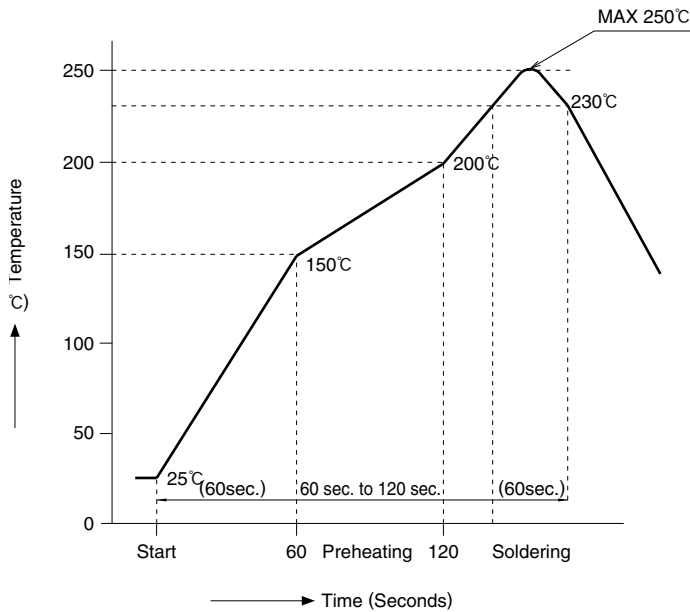
Environment :Room air

Solder composition :Paste, 63%Sn/37%Pb  
(Senju Metal Industry, Co., Ltd.'s Part Number: OZ63-201C-50-9)

Test board :Glass epoxy 70mm×80mm×1.6mm thick  
Land dimensions:  
0.3mm×0.65mm, 0.3mm×0.8mm

Metal mask :0.23×0.55×0.1mm thick,  
0.23×0.65×0.1mm thick

### ● Using Lead-free Solder Paste



#### HRS test condition

Solder method :Reflow, IR/hot air  
(Nihon Den-nettsu Co., Ltd.'s Part Number: SENSBY NR- II)

Environment :Room air

Solder composition :Paste, 96.5%Sn/3.0%Ag/0.5%Cu  
(Senju Metal Industry, Co., Ltd.'s Part Number: M705-221CM5-42-10.5)

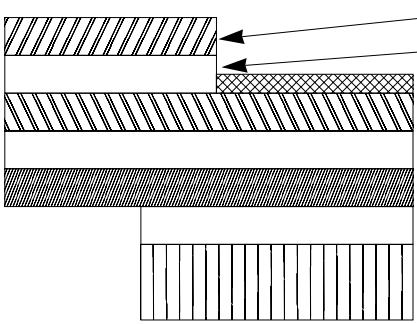
Test board :Glass epoxy 70mm×80mm×1.6mm thick  
Land dimensions:  
0.3mm×0.65mm, 0.3mm×0.8mm

Metal mask :0.23×0.55×0.1mm thick,  
0.23×0.65×0.1mm thick

The temperature profiles are 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.

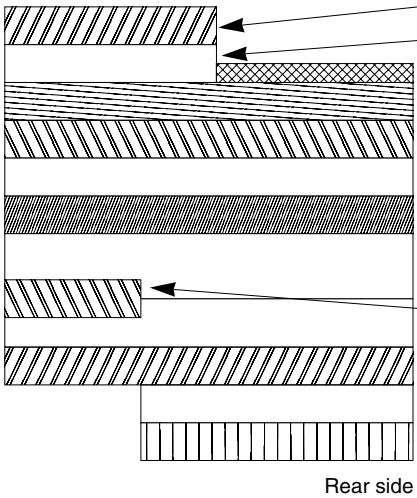
# ◆FH25 Series FPC Construction (Recommended)

## 1. Using Single-sided FPC



| Name                            | Material   | Thickness (μm) |
|---------------------------------|--|----------------|
| Covering film layer             | Polyamide 1 mil thick.                             | 25             |
| Cover adhesive                  |  | 25             |
| Surface treatment               | 1μm to 5μm nickel underplated<br>0.2μm gold plated | (3)            |
| Copper foil                     | Cu 1oz   | 35             |
| Base adhesive                   |  | 25             |
| Base film                       | Polyamide 1 mil thick                              | 25             |
| Reinforcement material adhesive |  | 30             |
| Stiffener                       | Polyamide 3 mil thick                              | 75             |
| Total                           |  | 193            |

## 2. Using Double-sided FPC



| Name                            | Material   | Thickness (μm) |
|---------------------------------|--|----------------|
| Covering film layer             | Polyamide 1 mil thick                              | 25             |
| Cover adhesive                  |  | 25             |
| Surface treatment               | 1μm to 5μm nickel underplated<br>0.2μm gold plated | (3)            |
| Through-hole copper             | Cu   | 15             |
| Copper foil                     | Cu 1/2oz   | 18             |
| Base adhesive                   |  | 18             |
| Base film                       | Polyamide 1 mil thick                              | 25             |
| Base adhesive                   |  | 18             |
| Copper foil                     | Cu 1/2oz   | 18             |
| Cover adhesive                  |  | 25             |
| Covering layer film             | Polyamide 1 mil thick                              | 25             |
| Reinforcement material adhesive |  | 25             |
| Stiffener                       | Polyamide 1 mil thick                              | 25             |
| Total                           |  | 197            |

To prevent release of the lock due to FPC bending, use of the FPC with copper foil on rear side is NOT RECOMMENDED.

## 3. Precautions

Note: Recommended specification for FPC 0.2 ± 0.03 mm thick.



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