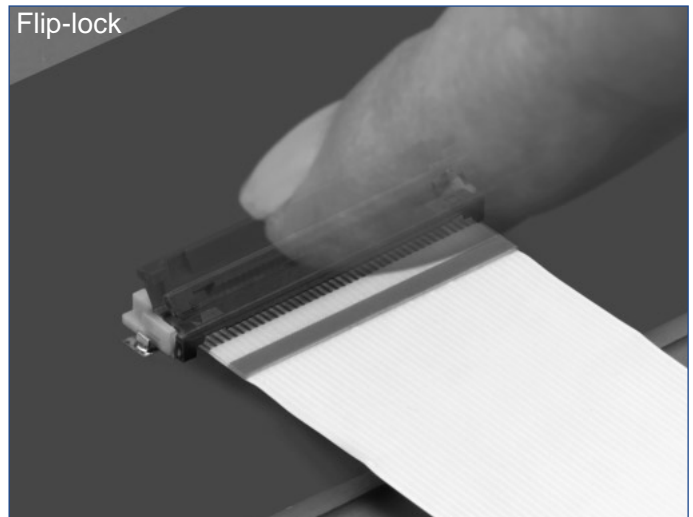
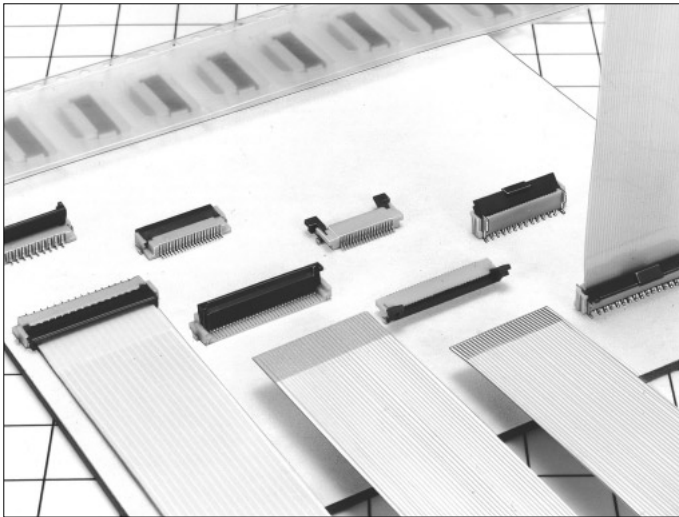


0.5mm and 1mm Pitch Connectors For FPC/FFC

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

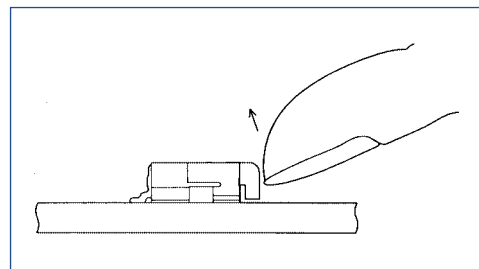
FH12 is offered in Top & Bottom Contact and Vertical Mount and offered in both a 0.5mm contact pitch as well as a 1.0mm contact pitch (bottom contact only).

■ Applications

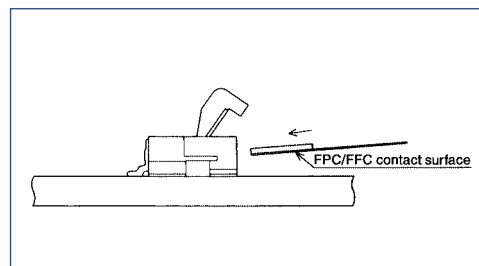
Notebook computers, printers, PDAs, digital cameras and other compact devices for interconnecting the main circuit board with the LCD, HDD or other device.

Rotating One-touch Mechanism

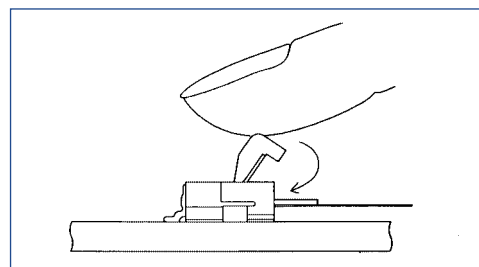
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Product Specifications

| | | | |
|--------|-------------------------|--|--|
| Rating | Current rating: 0.4A DC | Operating Temperature Range: -40 to +70°C (Note 1) | Storage Temperature Range: -10 to +50°C (Note 2) |
| | Voltage rating: 50V AC | Operating Humidity Range: Relative humidity, 90% max. (Not dewed) | Storage Humidity Range: Relative humidity, 90% max. (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 No damage, cracks, or parts dislocation. | 20 cycles |
| 5. Vibration | No electrical discontinuity of 1μs or more Contact resistance: 50m ohms maximum. No damage, cracks, or parts dislocation. | Frequency: 10 to 55 Hz, single amplitude of 0.75 mm, 2 hours in each of the 3 directions. |
| 6. Shock | No electrical discontinuity of 1μs or more Contact resistance: 50m ohms maximum. No damage, cracks, or parts dislocation. | Acceleration of 490 m/s ² , 11 ms duration, sine half-wave waveform, 3 cycles in each of the 3 axis. |
| 7. Humidity(Steady state) | Contact resistance: 50m ohms maximum. Insulation resistance: 50M ohms minimum. No damage, cracks, or parts dislocation. | 96 hours at temperature of 40°C and humidity of 90% to 95% |
| 8. Temperature Cycle | Contact resistance: 50m ohms maximum. Insulation resistance: 50M ohms minimum. No damage, cracks, or parts dislocation. | 5 cycles under conditions as follows; Temperature: -40°C → 15 to 35°C → 85°C → 15 to 35°C, Time: 30 → 5 max. → 30 → 5 max.(minutes) |
| 9. Resistance to Soldering heat | No deformation of components affecting performance. | Reflow: At the recommended temperature profile Manual soldering: 350±5°C 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 | |

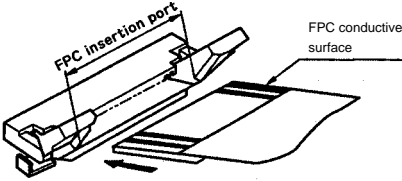
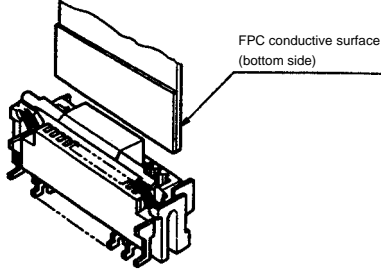
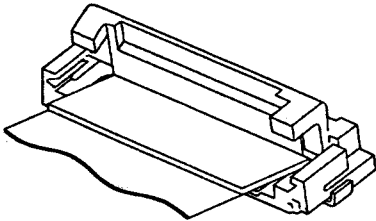
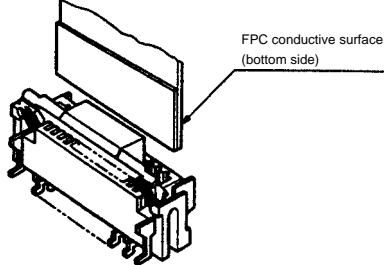
Ordering Information

FH12 **A** - **10** (**4**) - **S** **A** - **0.5** **SH** (**55**)

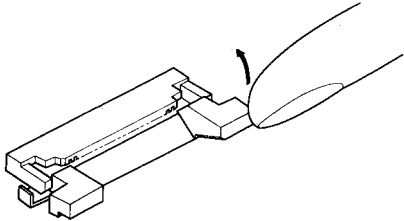
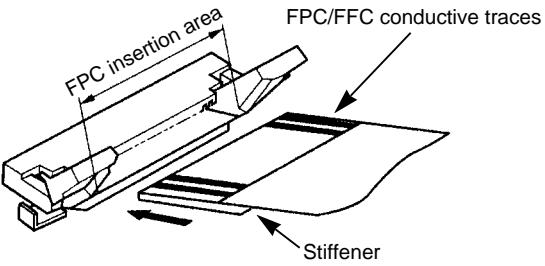
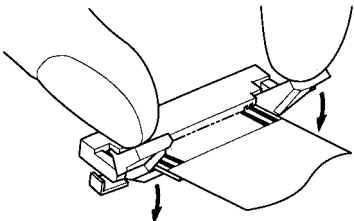
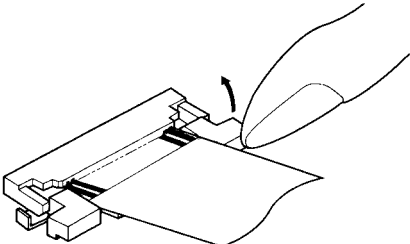
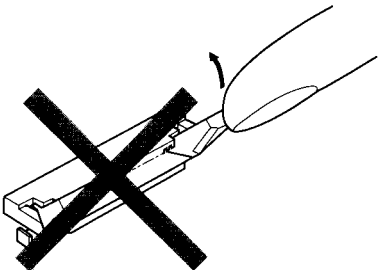
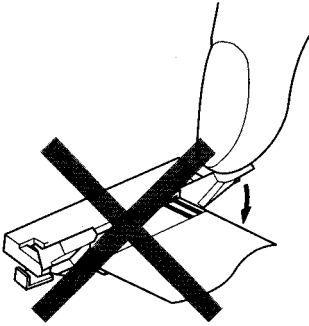
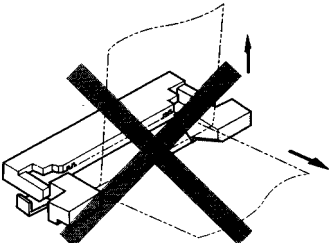
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|--|--|
| ① Series Name : FH12 | ⑤ Contact alignment: Single |
| ② Blank : standard type A : Top contact type S : Type with strengthened flip-lock actuator F : Type with 0.18mm FPC End Thickness | ⑥ Eccentric direction: Blank : standard type A : Eccentric type |
| ③ Standard type : Number of contacts Eccentric type : Number of contacts in 0.5mm housing | ⑦ Contacts Pitch : 0.5mm, 1mm |
| ④ Standard type : Blank Eccentric type : Number of contacts | ⑧ Contact type SH : SMT horizontal mounting type SV : SMT vertical mounting type |
| | ⑨ Plating specification Blank : Tin-lead plated (55) : Gold plated |

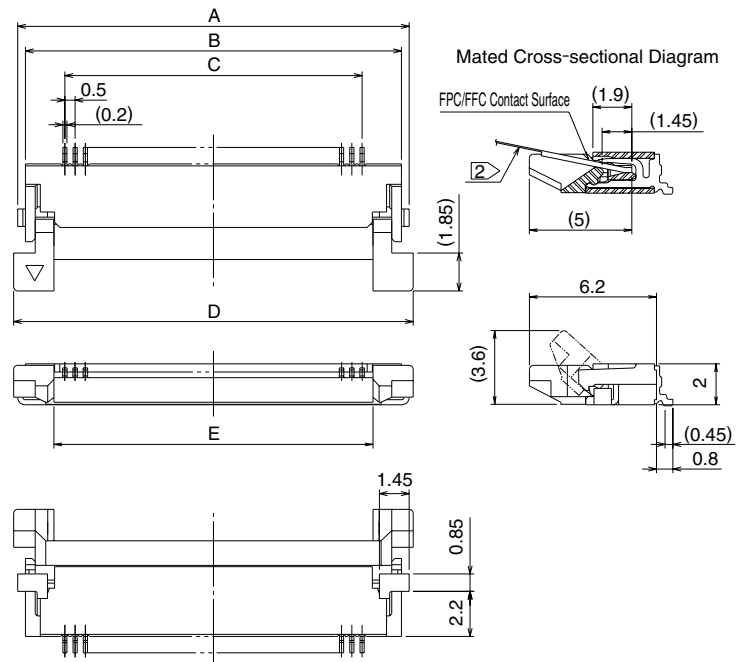
◆ Series Configuration

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

● Top Contact Type

| Operation | Precautions |
|--|--|
| <p>1. FPC/FFC Termination procedure. Connector installed on the board.</p> <p>1) Lift up the actuator. Use thumb or index finger.</p>  <p>2) Fully insert the FPC/FFC parallel to mounting surface, with the exposed conductive traces facing UP.</p>  <p>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.</p>  <p>2. FPC/FFC Removal</p> <p>1) Lift up the actuator.</p> <p>2) Carefully remove the FPC/FFC.</p>  | <p>1) Avoid forcing the actuator up or down without the FPC/FFC inserted.</p>  <p>2) When closing down the actuator apply equal pressure to both sides of the actuator.</p>  <p>3) Avoid forced pulling of the FPC. Forced pulling will cause the FPC to become disconnected or damaged.</p>  |

■0.5mm Pitch Top Contact Type



Unit:mm

| Part Number | CL No. | Number of Contacts | A | B | C | D | E |
|-----------------|------------|--------------------|------|-------|------|------|-------|
| FH12A-10S-0.5SH | 586-0550-9 | 10 | 9.1 | 8.35 | 4.5 | 9.5 | 5.57 |
| FH12A-12S-0.5SH | 586-0696-4 | 12 | 10.1 | 9.35 | 5.5 | 10.5 | 6.57 |
| FH12A-15S-0.5SH | 586-0551-1 | 15 | 11.6 | 10.85 | 7.0 | 12.0 | 8.07 |
| FH12A-16S-0.5SH | 586-0552-4 | 16 | 12.1 | 11.35 | 7.5 | 12.5 | 8.57 |
| FH12A-18S-0.5SH | 586-0553-7 | 18 | 13.1 | 12.35 | 8.5 | 13.5 | 9.57 |
| FH12A-20S-0.5SH | 586-0554-0 | 20 | 14.1 | 13.35 | 9.5 | 14.5 | 10.57 |
| FH12A-22S-0.5SH | 586-0686-0 | 22 | 15.1 | 14.35 | 10.5 | 15.5 | 11.57 |
| FH12A-24S-0.5SH | 586-0555-2 | 24 | 16.1 | 15.35 | 11.5 | 16.5 | 12.57 |
| FH12A-26S-0.5SH | 586-0663-5 | 26 | 17.1 | 16.35 | 12.5 | 17.5 | 13.57 |
| FH12A-28S-0.5SH | 586-0725-0 | 28 | 18.1 | 17.35 | 13.5 | 18.5 | 14.57 |
| FH12A-29S-0.5SH | 586-0585-3 | 29 | 18.6 | 17.85 | 14.0 | 19.0 | 15.07 |
| FH12A-30S-0.5SH | 586-0556-5 | 30 | 19.1 | 18.35 | 14.5 | 19.5 | 15.57 |
| FH12A-32S-0.5SH | 586-0687-3 | 32 | 20.1 | 19.35 | 15.5 | 20.5 | 16.57 |
| FH12A-33S-0.5SH | 586-0570-6 | 33 | 20.6 | 19.85 | 16.0 | 21.0 | 17.07 |
| FH12A-34S-0.5SH | 586-0670-0 | 34 | 21.1 | 20.35 | 16.5 | 21.5 | 17.57 |
| FH12A-36S-0.5SH | 586-0662-2 | 36 | 22.1 | 21.35 | 17.5 | 22.5 | 18.57 |
| FH12A-40S-0.5SH | 586-0557-8 | 40 | 24.1 | 23.35 | 19.5 | 24.5 | 20.57 |
| FH12A-42S-0.5SH | 586-0698-0 | 42 | 25.1 | 24.35 | 20.5 | 25.5 | 21.57 |
| FH12A-45S-0.5SH | 586-0558-0 | 45 | 26.6 | 25.85 | 22.0 | 27.0 | 23.07 |
| FH12A-50S-0.5SH | 586-0559-3 | 50 | 29.1 | 28.35 | 24.5 | 29.5 | 25.57 |

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

Note ②: The design is such that the FPC/FFC protrudes on an upward angle so that other parts can be mounted beneath the PFC/FFC. In view of this, please take note of the gap at the top surface of the connector.

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

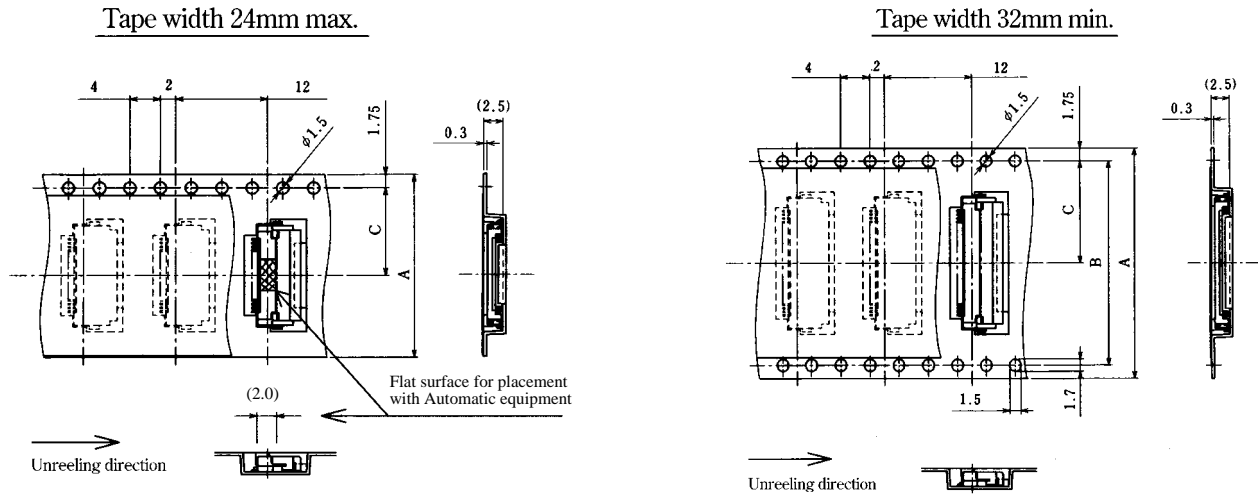
●0.5mm Pitch Product

| | FPC/FFC dimensions | Land / Metal Mask dimensions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|------------------------------|-------------|------------------------------|---|--|-----------|-----------|-----|-----|-----------|------|------|----|-----|-----|----|------|------|----|-----|-----|----|------|------|----|-----|-----|----|------|------|----|-----|-----|----|------|------|----|-----|-----|----|------|------|----|-----|-----|----|------|------|----|-----|------|----|------|------|----|------|------|----|------|------|----|------|------|----|------|------|----|-----|-----|----|------|------|---|-----------|------|----|-----------|------|----|-----|------|-----|------|------|------|------|------|-----|------|------|------|------|------|-----|------|------|--|-----------|-----|-----|----|-----------|------|----|-----|-----|-----|------|------|----|------|------|------|------|------|------|------|-----|------|------|------|----|------|------|-----|------|------|------|------|------|-----|------|------|----|------|------|------|------|------|------|-----|----|------|------|------|----|-----|------|-----|----|------|------|------|----|-----|------|-----|----|------|------|------|----|-----|------|-----|----|------|------|------|----|-----|------|------|----|------|------|------|----|-----|------|------|----|------|------|------|----|-----|------|------|----|------|------|------|----|-----|------|------|----|------|------|------|----|------|------|------|----|------|------|------|----|------|------|------|----|------|------|------|
| 0.5mm Pitch Bottom Contact Type 0.5mm Pitch Top Contact Type | <table border="1"> <thead> <tr> <th>Product Type</th> <th>C Dimension</th> </tr> </thead> <tbody> <tr> <td>Types other than those below</td> <td>0.3±0.05min Stiffener thickness should be 0.188 mm (7.5 mil) min</td> </tr> <tr> <td>Types with an FPC end thickness of 0.18 mm</td> <td>0.18±0.05</td> </tr> </tbody> </table> <p style="text-align: right;">Unit: mm</p> <table border="1"> <thead> <tr> <th>Dimension</th> <th>A</th> <th>B</th> <th>Dimension</th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr><td>6</td><td>2.5</td><td>3.5</td><td>25</td><td>12.0</td><td>13.0</td></tr> <tr><td>10</td><td>4.5</td><td>5.5</td><td>26</td><td>12.5</td><td>13.5</td></tr> <tr><td>11</td><td>5.0</td><td>6.0</td><td>28</td><td>13.5</td><td>14.5</td></tr> <tr><td>12</td><td>5.5</td><td>6.5</td><td>29</td><td>14.0</td><td>15.0</td></tr> <tr><td>13</td><td>6.0</td><td>7.0</td><td>30</td><td>14.5</td><td>15.5</td></tr> 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3.5 | 25 | 12.0 | 13.0 | 10 | 4.5 | 5.5 | 26 | 12.5 | 13.5 | 11 | 5.0 | 6.0 | 28 | 13.5 | 14.5 | 12 | 5.5 | 6.5 | 29 | 14.0 | 15.0 | 13 | 6.0 | 7.0 | 30 | 14.5 | 15.5 | 14 | 6.5 | 7.5 | 32 | 15.5 | 16.5 | 15 | 7.0 | 8.0 | 33 | 16.0 | 17.0 | 16 | 7.5 | 8.5 | 34 | 16.5 | 17.5 | 17 | 8.0 | 9.0 | 36 | 17.5 | 18.5 | 18 | 8.5 | 9.5 | 40 | 19.5 | 20.5 | 19 | 9.0 | 10.0 | 42 | 20.5 | 21.5 | 20 | 9.5 | 10.5 | 45 | 22.0 | 23.0 | 22 | 10.5 | 11.5 | 50 | 24.5 | 25.5 | 24 | 11.5 | 12.5 | 53 | 26.0 | 27.0 | <p style="text-align: center;">Recommended metal mask thickness : 0.15mm</p> <p style="text-align: right;">Unit: mm</p> <table border="1"> <thead> <tr> <th>Dimension</th> <th>A</th> <th>B</th> <th>C</th> <th>Dimension</th> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr><td>6</td><td>2.5</td><td>8.1</td><td>4.5</td><td>25</td><td>12.0</td><td>17.6</td><td>14.0</td></tr> <tr><td>10</td><td>4.5</td><td>10.1</td><td>6.5</td><td>26</td><td>12.5</td><td>18.1</td><td>14.5</td></tr> <tr><td>11</td><td>5.0</td><td>10.6</td><td>7.0</td><td>28</td><td>13.5</td><td>19.1</td><td>15.5</td></tr> <tr><td>12</td><td>5.5</td><td>11.1</td><td>7.5</td><td>29</td><td>14.0</td><td>19.6</td><td>16.0</td></tr> <tr><td>13</td><td>6.0</td><td>11.6</td><td>8.0</td><td>30</td><td>14.5</td><td>20.1</td><td>16.5</td></tr> <tr><td>14</td><td>6.5</td><td>12.1</td><td>8.5</td><td>32</td><td>15.5</td><td>21.1</td><td>17.5</td></tr> <tr><td>15</td><td>7.0</td><td>12.6</td><td>9.0</td><td>33</td><td>16.0</td><td>21.6</td><td>18.0</td></tr> <tr><td>16</td><td>7.5</td><td>13.1</td><td>9.5</td><td>34</td><td>16.5</td><td>22.1</td><td>18.5</td></tr> <tr><td>17</td><td>8.0</td><td>13.6</td><td>10.0</td><td>36</td><td>17.5</td><td>23.1</td><td>19.5</td></tr> <tr><td>18</td><td>8.5</td><td>14.1</td><td>10.5</td><td>40</td><td>19.5</td><td>25.1</td><td>21.5</td></tr> <tr><td>19</td><td>9.0</td><td>14.6</td><td>11.0</td><td>42</td><td>20.5</td><td>26.1</td><td>22.5</td></tr> <tr><td>20</td><td>9.5</td><td>15.1</td><td>11.5</td><td>45</td><td>22.0</td><td>27.6</td><td>24.0</td></tr> <tr><td>22</td><td>10.5</td><td>16.1</td><td>12.5</td><td>50</td><td>24.5</td><td>30.1</td><td>26.5</td></tr> <tr><td>24</td><td>11.5</td><td>17.1</td><td>13.5</td><td>53</td><td>26.0</td><td>31.6</td><td>28.0</td></tr> </tbody> </table> | Dimension | A | B | C | Dimension | A | B | C | 6 | 2.5 | 8.1 | 4.5 | 25 | 12.0 | 17.6 | 14.0 | 10 | 4.5 | 10.1 | 6.5 | 26 | 12.5 | 18.1 | 14.5 | 11 | 5.0 | 10.6 | 7.0 | 28 | 13.5 | 19.1 | 15.5 | 12 | 5.5 | 11.1 | 7.5 | 29 | 14.0 | 19.6 | 16.0 | 13 | 6.0 | 11.6 | 8.0 | 30 | 14.5 | 20.1 | 16.5 | 14 | 6.5 | 12.1 | 8.5 | 32 | 15.5 | 21.1 | 17.5 | 15 | 7.0 | 12.6 | 9.0 | 33 | 16.0 | 21.6 | 18.0 | 16 | 7.5 | 13.1 | 9.5 | 34 | 16.5 | 22.1 | 18.5 | 17 | 8.0 | 13.6 | 10.0 | 36 | 17.5 | 23.1 | 19.5 | 18 | 8.5 | 14.1 | 10.5 | 40 | 19.5 | 25.1 | 21.5 | 19 | 9.0 | 14.6 | 11.0 | 42 | 20.5 | 26.1 | 22.5 | 20 | 9.5 | 15.1 | 11.5 | 45 | 22.0 | 27.6 | 24.0 | 22 | 10.5 | 16.1 | 12.5 | 50 | 24.5 | 30.1 | 26.5 | 24 | 11.5 | 17.1 | 13.5 | 53 | 26.0 | 31.6 | 28.0 |
| | Product Type | C Dimension | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Types other than those below | 0.3±0.05min Stiffener thickness should be 0.188 mm (7.5 mil) min | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Types with an FPC end thickness of 0.18 mm | 0.18±0.05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dimension | A | B | Dimension | A | B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 2.5 | 3.5 | 25 | 12.0 | 13.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 4.5 | 5.5 | 26 | 12.5 | 13.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | 5.0 | 6.0 | 28 | 13.5 | 14.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | 5.5 | 6.5 | 29 | 14.0 | 15.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 6.0 | 7.0 | 30 | 14.5 | 15.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 6.5 | 7.5 | 32 | 15.5 | 16.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | 7.0 | 8.0 | 33 | 16.0 | 17.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | 7.5 | 8.5 | 34 | 16.5 | 17.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | 8.0 | 9.0 | 36 | 17.5 | 18.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | 8.5 | 9.5 | 40 | 19.5 | 20.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | 9.0 | 10.0 | 42 | 20.5 | 21.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 9.5 | 10.5 | 45 | 22.0 | 23.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | 10.5 | 11.5 | 50 | 24.5 | 25.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | 11.5 | 12.5 | 53 | 26.0 | 27.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dimension | A | B | C | Dimension | A | B | C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 2.5 | 8.1 | 4.5 | 25 | 12.0 | 17.6 | 14.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 4.5 | 10.1 | 6.5 | 26 | 12.5 | 18.1 | 14.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | 5.0 | 10.6 | 7.0 | 28 | 13.5 | 19.1 | 15.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | 5.5 | 11.1 | 7.5 | 29 | 14.0 | 19.6 | 16.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 6.0 | 11.6 | 8.0 | 30 | 14.5 | 20.1 | 16.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 6.5 | 12.1 | 8.5 | 32 | 15.5 | 21.1 | 17.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | 7.0 | 12.6 | 9.0 | 33 | 16.0 | 21.6 | 18.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | 7.5 | 13.1 | 9.5 | 34 | 16.5 | 22.1 | 18.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | 8.0 | 13.6 | 10.0 | 36 | 17.5 | 23.1 | 19.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | 8.5 | 14.1 | 10.5 | 40 | 19.5 | 25.1 | 21.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | 9.0 | 14.6 | 11.0 | 42 | 20.5 | 26.1 | 22.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 9.5 | 15.1 | 11.5 | 45 | 22.0 | 27.6 | 24.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | 10.5 | 16.1 | 12.5 | 50 | 24.5 | 30.1 | 26.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | 11.5 | 17.1 | 13.5 | 53 | 26.0 | 31.6 | 28.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.5mm Pitch Vertical Mounting Type | <p style="text-align: center;">*Set the stiffener thickness to 0.188 (7.5mil) min.</p> <p style="text-align: right;">Unit: mm</p> <table border="1"> <thead> <tr> <th>Dimension</th> <th>A</th> <th>B</th> <th>Dimension</th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr><td>10</td><td>4.5</td><td>5.5</td><td>26</td><td>12.5</td><td>13.5</td></tr> <tr><td>12</td><td>5.5</td><td>6.5</td><td>30</td><td>14.5</td><td>15.5</td></tr> <tr><td>13</td><td>6.0</td><td>7.0</td><td>32</td><td>15.5</td><td>16.5</td></tr> <tr><td>15</td><td>7.0</td><td>8.0</td><td>33</td><td>16.0</td><td>17.0</td></tr> <tr><td>16</td><td>7.5</td><td>8.5</td><td>34</td><td>16.5</td><td>17.5</td></tr> <tr><td>17</td><td>8.0</td><td>9.0</td><td>36</td><td>17.5</td><td>18.5</td></tr> <tr><td>18</td><td>8.5</td><td>9.5</td><td>40</td><td>19.5</td><td>20.5</td></tr> <tr><td>20</td><td>9.5</td><td>10.5</td><td>45</td><td>22.0</td><td>23.0</td></tr> <tr><td>22</td><td>10.5</td><td>11.5</td><td>49</td><td>24.0</td><td>25.0</td></tr> <tr><td>24</td><td>11.5</td><td>12.5</td><td>50</td><td>24.5</td><td>25.5</td></tr> <tr><td></td><td></td><td></td><td>60</td><td>29.5</td><td>30.5</td></tr> </tbody> </table> | Dimension | A | B | Dimension | A | B | 10 | 4.5 | 5.5 | 26 | 12.5 | 13.5 | 12 | 5.5 | 6.5 | 30 | 14.5 | 15.5 | 13 | 6.0 | 7.0 | 32 | 15.5 | 16.5 | 15 | 7.0 | 8.0 | 33 | 16.0 | 17.0 | 16 | 7.5 | 8.5 | 34 | 16.5 | 17.5 | 17 | 8.0 | 9.0 | 36 | 17.5 | 18.5 | 18 | 8.5 | 9.5 | 40 | 19.5 | 20.5 | 20 | 9.5 | 10.5 | 45 | 22.0 | 23.0 | 22 | 10.5 | 11.5 | 49 | 24.0 | 25.0 | 24 | 11.5 | 12.5 | 50 | 24.5 | 25.5 | | | | 60 | 29.5 | 30.5 | <p style="text-align: center;">Recommended metal mask thickness : 0.15mm</p> <p style="text-align: right;">Unit: mm</p> <table border="1"> <thead> <tr> <th>Dimension</th> <th>A</th> <th>B</th> <th>Dimension</th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr><td>10</td><td>6.5</td><td>4.5</td><td>26</td><td>14.5</td><td>12.5</td></tr> <tr><td>12</td><td>7.5</td><td>5.5</td><td>30</td><td>16.5</td><td>14.5</td></tr> <tr><td>13</td><td>8.0</td><td>6.0</td><td>32</td><td>17.5</td><td>15.5</td></tr> <tr><td>15</td><td>9.0</td><td>7.0</td><td>33</td><td>18.0</td><td>16.0</td></tr> <tr><td>16</td><td>9.5</td><td>7.5</td><td>34</td><td>18.5</td><td>16.5</td></tr> <tr><td>17</td><td>10.0</td><td>8.0</td><td>36</td><td>19.5</td><td>17.5</td></tr> <tr><td>18</td><td>10.5</td><td>8.5</td><td>40</td><td>21.5</td><td>19.5</td></tr> <tr><td>20</td><td>11.5</td><td>9.5</td><td>45</td><td>24.0</td><td>22.0</td></tr> <tr><td>22</td><td>12.5</td><td>10.5</td><td>49</td><td>26.0</td><td>24.0</td></tr> <tr><td>24</td><td>13.5</td><td>11.5</td><td>50</td><td>26.5</td><td>24.5</td></tr> <tr><td></td><td></td><td></td><td>60</td><td>31.5</td><td>29.5</td></tr> </tbody> </table> | Dimension | A | B | Dimension | A | B | 10 | 6.5 | 4.5 | 26 | 14.5 | 12.5 | 12 | 7.5 | 5.5 | 30 | 16.5 | 14.5 | 13 | 8.0 | 6.0 | 32 | 17.5 | 15.5 | 15 | 9.0 | 7.0 | 33 | 18.0 | 16.0 | 16 | 9.5 | 7.5 | 34 | 18.5 | 16.5 | 17 | 10.0 | 8.0 | 36 | 19.5 | 17.5 | 18 | 10.5 | 8.5 | 40 | 21.5 | 19.5 | 20 | 11.5 | 9.5 | 45 | 24.0 | 22.0 | 22 | 12.5 | 10.5 | 49 | 26.0 | 24.0 | 24 | 13.5 | 11.5 | 50 | 26.5 | 24.5 | | | | 60 | 31.5 | 29.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dimension | A | B | Dimension | A | B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 4.5 | 5.5 | 26 | 12.5 | 13.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | 5.5 | 6.5 | 30 | 14.5 | 15.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 6.0 | 7.0 | 32 | 15.5 | 16.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | 7.0 | 8.0 | 33 | 16.0 | 17.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | 7.5 | 8.5 | 34 | 16.5 | 17.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | 8.0 | 9.0 | 36 | 17.5 | 18.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | 8.5 | 9.5 | 40 | 19.5 | 20.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 9.5 | 10.5 | 45 | 22.0 | 23.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | 10.5 | 11.5 | 49 | 24.0 | 25.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | 11.5 | 12.5 | 50 | 24.5 | 25.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 60 | 29.5 | 30.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dimension | A | B | Dimension | A | B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 6.5 | 4.5 | 26 | 14.5 | 12.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | 7.5 | 5.5 | 30 | 16.5 | 14.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 8.0 | 6.0 | 32 | 17.5 | 15.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | 9.0 | 7.0 | 33 | 18.0 | 16.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | 9.5 | 7.5 | 34 | 18.5 | 16.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | 10.0 | 8.0 | 36 | 19.5 | 17.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | 10.5 | 8.5 | 40 | 21.5 | 19.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 11.5 | 9.5 | 45 | 24.0 | 22.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | 12.5 | 10.5 | 49 | 26.0 | 24.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | 13.5 | 11.5 | 50 | 26.5 | 24.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 60 | 31.5 | 29.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

◆ Packaging Specification

Embossed Carrier Tape Dimensions

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



● 0.5mm Pitch Bottom/Top Contact Type

Unit:mm

| Dimension Number of Contacts | A | B | C | D | Dimension Number of Contacts | A | B | C | D |
|---------------------------------|----|---|------|------|---------------------------------|----|------|------|------|
| 6 | 16 | — | 7.5 | 16.5 | 25 | 24 | — | 11.5 | 24.5 |
| 10 | 16 | — | 7.5 | 16.5 | 26 | 24 | — | 11.5 | 24.5 |
| 11 | 16 | — | 7.5 | 16.5 | 28 | 32 | 28.4 | 14.2 | 32.5 |
| 12 | 24 | — | 11.5 | 24.5 | 29 | 32 | 28.4 | 14.2 | 32.5 |
| 13 | 24 | — | 11.5 | 24.5 | 30 | 32 | 28.4 | 14.2 | 32.5 |
| 14 | 24 | — | 11.5 | 24.5 | 32 | 32 | 28.4 | 14.2 | 32.5 |
| 15 | 24 | — | 11.5 | 24.5 | 33 | 32 | 28.4 | 14.2 | 32.5 |
| 16 | 24 | — | 11.5 | 24.5 | 34 | 32 | 28.4 | 14.2 | 32.5 |
| 17 | 24 | — | 11.5 | 24.5 | 36 | 44 | 40.4 | 20.2 | 44.5 |
| 18 | 24 | — | 11.5 | 24.5 | 40 | 44 | 40.4 | 20.2 | 44.5 |
| 19 | 24 | — | 11.5 | 24.5 | 42 | 44 | 40.4 | 20.2 | 44.5 |
| 20 | 24 | — | 11.5 | 24.5 | 45 | 44 | 40.4 | 20.2 | 44.5 |
| 22 | 24 | — | 11.5 | 24.5 | 50 | 44 | 40.4 | 20.2 | 44.5 |
| 24 | 24 | — | 11.5 | 24.5 | 53 | 44 | 40.4 | 20.2 | 44.5 |

Note: 2,000 pieces per reel.

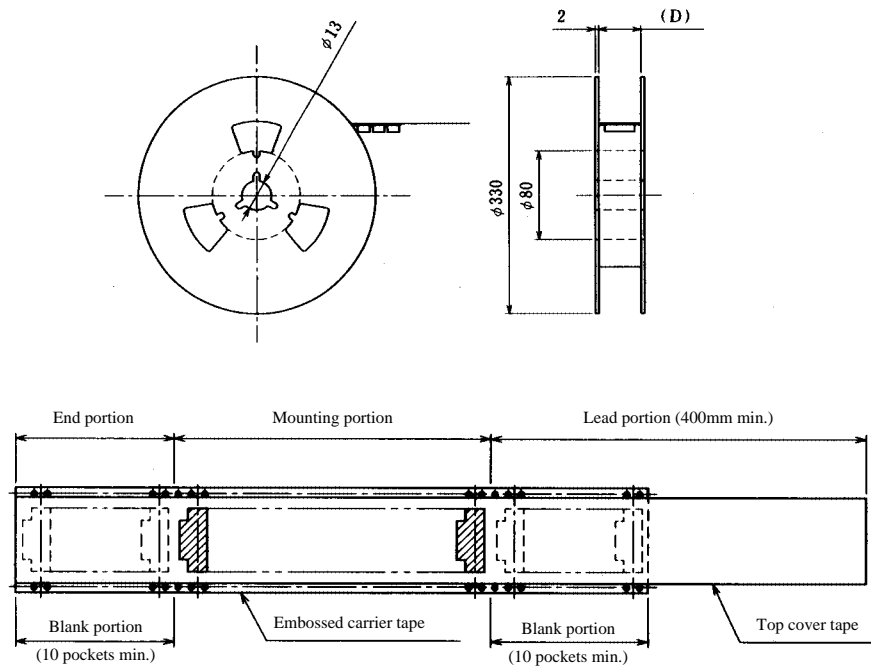
● 1mm Pitch Bottom Contact Type

Unit:mm

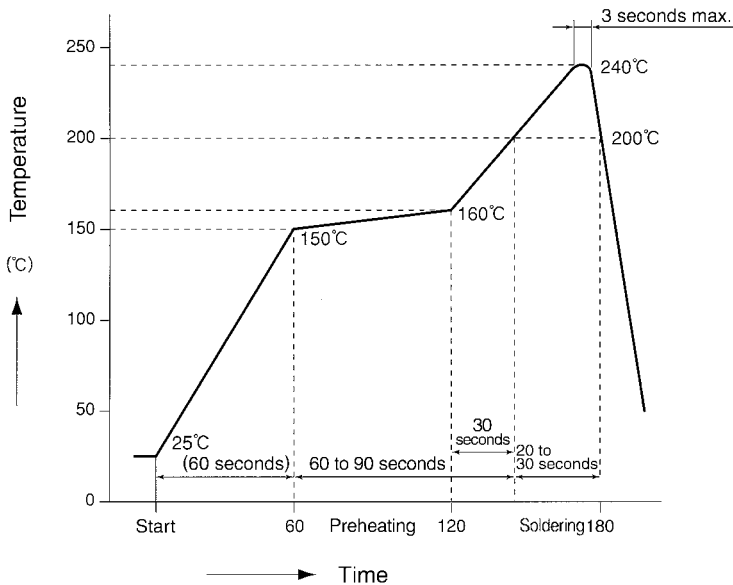
| Dimension Number of Contacts | A | B | C | D | Dimension Number of Contacts | A | B | C | D | | |
|---------------------------------|----|------|------|------|---------------------------------|----------------|----|----|------|------|------|
| Standard Type | 5 | 16 | — | 7.5 | 16.5 | Eccentric Type | 4 | 16 | — | 7.5 | 16.5 |
| | 6 | 24 | — | 11.5 | 24.5 | | 6 | 24 | — | 11.5 | 24.5 |
| | 7 | 24 | — | 11.5 | 24.5 | | 8 | 24 | — | 11.5 | 24.5 |
| | 8 | 24 | — | 11.5 | 24.5 | | 10 | 24 | — | 11.5 | 24.5 |
| | 9 | 24 | — | 11.5 | 24.5 | | 11 | 24 | — | 11.5 | 24.5 |
| | 11 | 24 | — | 11.5 | 24.5 | | 14 | 32 | 28.4 | 14.2 | 32.5 |
| | 16 | 32 | 28.4 | 14.2 | 32.5 | | 19 | 44 | 40.4 | 20.2 | 44.5 |
| | 22 | 44 | 40.4 | 20.2 | 44.5 | | 24 | 44 | 40.4 | 20.2 | 44.5 |
| 26 | 44 | 40.4 | 20.2 | 44.5 | | | | | | | |

Note: 2,000 pieces per reel.

Reel Dimensions (Common to All Types)



Recommended Temperature Profile



HRS test conditions

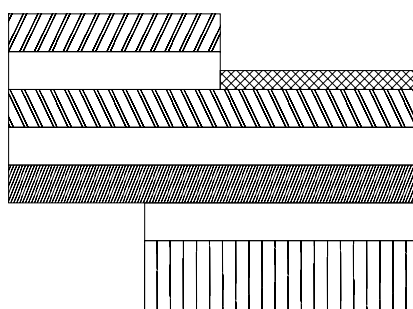
| | |
|--------------------|---|
| Solder method | :Reflow, IR/hot air (Nihon Den-netsu Co., Ltd.'s Part Number: SENSBY NR- II) |
| Environment: | :Room air |
| Solder composition | :Paste, 63%Sn/37%Pb (Senju Metal Industry, Co., Ltd.'s Part Number: OZ63-201C-50-9) |
| Test board | :Glass epoxy 40mm×80mm×1.6mm thick |
| Land dimensions | :Top and bottom contact type 0.3mm×1.3mm Vertical mounting type 0.6mm×1.5mm |
| Metal mask | :Top and bottom contact type 0.25mm×1.3mm×0.15mm thick Vertical mounting type 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 $\pm 20 \mu\text{m}$ (275 to 315 μm)

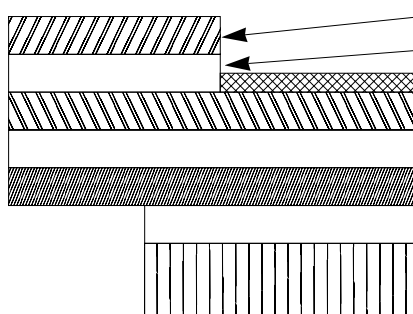
Note: Use of a thicker FFC results in a stiffer lock action and the lock is more easily released.

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 ($t=0.3 \pm 0.05$).
2. For details about the construction, please contact the FPC/FFC manufacturers.