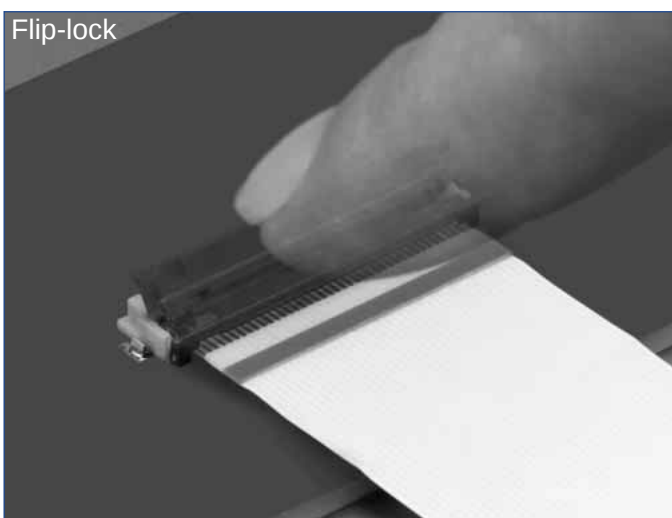
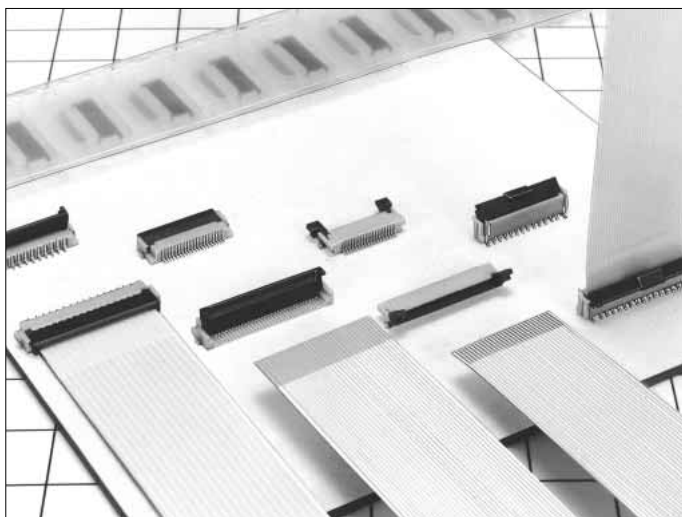


# 0.5mm and 1mm Pitch Connectors For FPC/FFC

## 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

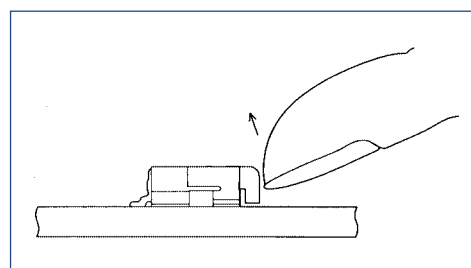
Excess solder cavity absorbs excessive solder and avoids solder bridging.

#### 6. Three different assembly types

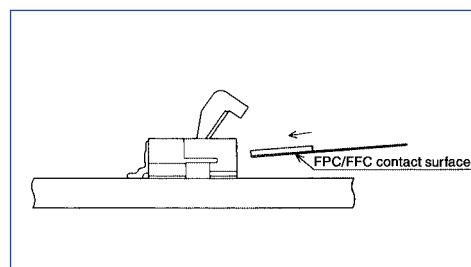
FH12 is offered in Top & Bottom Contact and Vertical Mount and offered in both a 0.5mm contact pitch as well as a 1.0mm contact pitch (bottom contact only).

### Rotating One-touch Mechanism

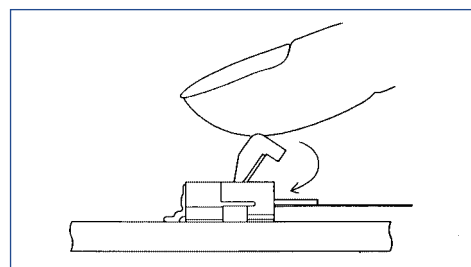
①



②



③



### ■ Applications

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

## Product Specifications

|        |                                                           |                                                                                                                            |                                                                                                                        |
|--------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Rating | Current rating: 0.5A DC(Note 1)<br>Voltage rating: 50V AC | Operating Temperature Range: -40 to +70°C (Note 2)<br>Operating Humidity Range: Relative humidity, 90% max.<br>(Not dewed) | Storage Temperature Range: -10 to +50°C (Note 3)<br>Storage Humidity Range: Relative humidity, 90% max.<br>(Not dewed) |
|--------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|

|                |                        |                                  |
|----------------|------------------------|----------------------------------|
| Applicable FPC | t=0.3±0.05 Gold plated | t=0.18 ± 0.05 for FH12F-*S-0.5SH |
|----------------|------------------------|----------------------------------|

| Item                                 | Specification                                                                                                                   | Conditions                                                                                                         |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| 1. Insulation resistance             | 500M ohms minimum                                                                                                               | 100V DC                                                                                                            |
| 2. Withstanding voltage              | No flashover or insulation breakdown.                                                                                           | 150V AC/1 minute                                                                                                   |
| 3. Contact resistance                | 50m ohms maximum                                                                                                                | 1mA                                                                                                                |
| 4. Durability (Insertion/withdrawal) | Contact resistance: 50m ohms maximum<br>No damage, cracks, or parts dislocation.                                                | 20 cycles                                                                                                          |
| 5. Vibration                         | No electrical discontinuity of 1μs or more<br>Contact resistance: 50m ohms maximum.<br>No damage, cracks, or parts dislocation. | Frequency: 10 to 55 Hz, single amplitude of 0.75 mm,<br>2 hours in each of the 3 directions.                       |
| 6. Shock                             | No electrical discontinuity of 1μs or more<br>Contact resistance: 50m ohms maximum.<br>No damage, cracks, or parts dislocation. | Acceleration of 490 m/s <sup>2</sup> , 11 ms duration,<br>sine half-wave waveform, 3 cycles in each of the 3 axis. |
| 7. Humidity(Steady state)            | Contact resistance: 50m ohms maximum.<br>Insulation resistance: 50M ohms minimum.<br>No damage, cracks, or parts dislocation.   | 96 hours at 40°C 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°C → 15 to 35°C → 85°C → 15 to 35°C,<br>Time: 30 → 5 max. → 30 → 5 max.(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±5°C for 3 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 condition of installed connectors in storage, shipment or during transportation.

## Material

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

## Ordering Information

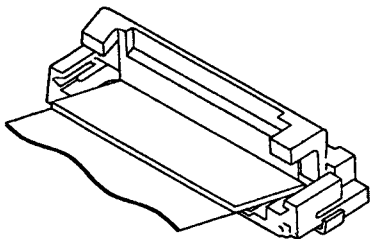
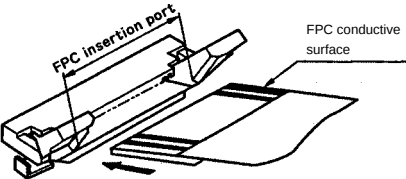
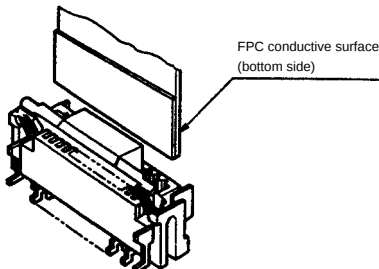
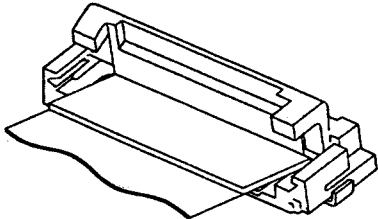
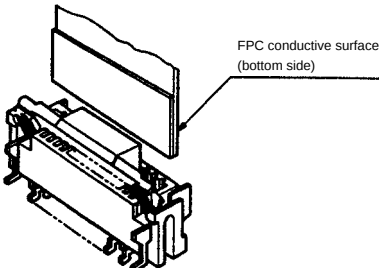
**FH12**   **A** - **10** (**4**) - **S** **A** - **0.5** **SH** (**55**)

①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨

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

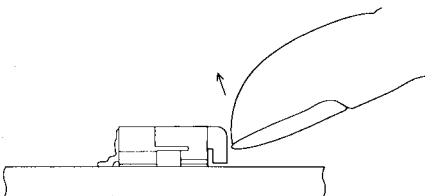
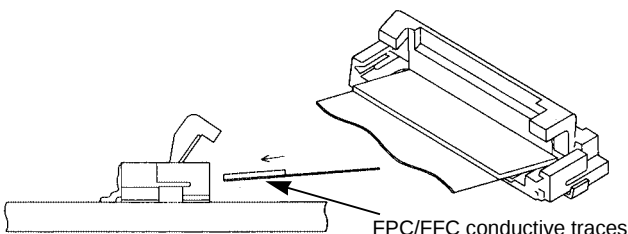
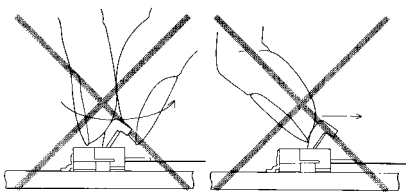
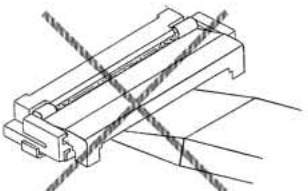
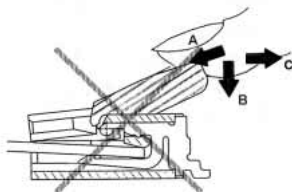
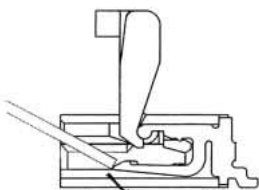
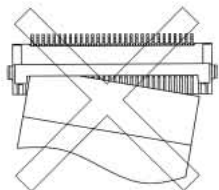
## FH12 Series 0.5mm and 1mm Pitch Connectors For FPC/FPC

### Series Configuration

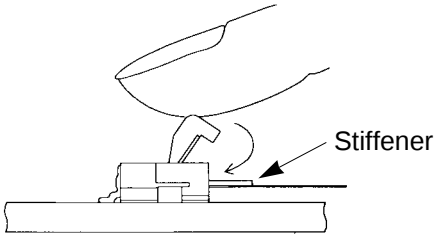
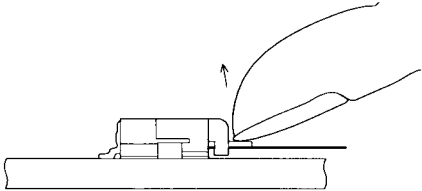
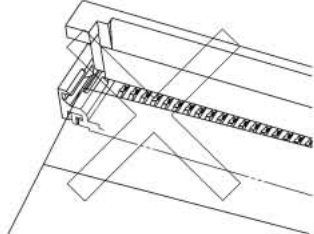
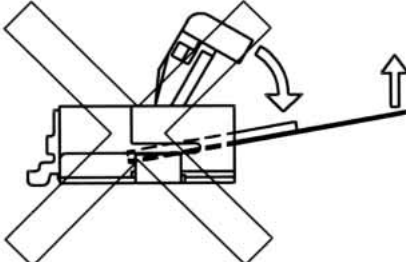
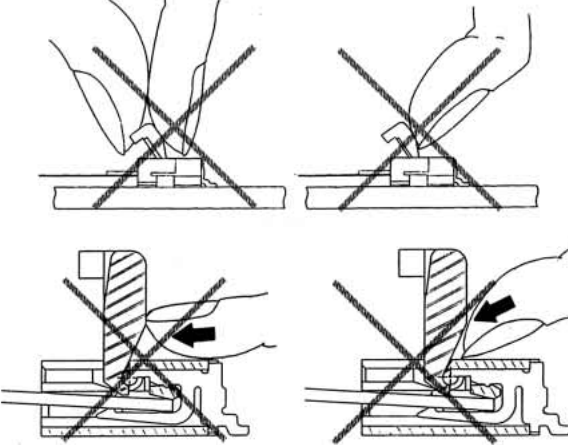
| Pitch | Bottom Contact Type                                                                                                                                                                                                                                                                                                                       | Top Contact Type                                                                                                                                     | Vertical mounting Type                                                                                                                                                           |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0.5mm |  <p><b>FH12- ** S-0.5SH</b> <b>P.12</b></p> <p>Number of contacts 6, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 33, 34, 35, 36, 40, 45, 50, 53</p>                                                                       |                                                                    |                                                                                               |
|       | Type with Strengthened Lock Lever                                                                                                                                                                                                                                                                                                         |                                                                                                                                                      |                                                                                                                                                                                  |
|       | <p><b>FH12S- ** S-0.5SH</b> <b>P.13</b></p> <p>Number of contacts 30, 40, 45, 50, 53</p>                                                                                                                                                                                                                                                  |                                                                                                                                                      |                                                                                                                                                                                  |
|       | Type with 0.18mm FPC End Thickness                                                                                                                                                                                                                                                                                                        |                                                                                                                                                      |                                                                                                                                                                                  |
|       | <p><b>FH12F- ** S-0.5SH</b> <b>P.14</b></p> <p>Number of contacts 6, 8, 10, 12, 13, 14, 15, 16, 18, 20, 22, 24, 25, 26, 28, 30, 32, 34, 36, 40</p>                                                                                                                                                                                        | <p><b>FH12A- ** S-0.5SH</b> <b>P.15</b></p> <p>Number of contacts 10, 12, 15, 16, 18, 20, 22, 24, 26, 28, 29, 30, 32, 33, 34, 36, 40, 42, 45, 50</p> | <p><b>FH12- ** S-0.5SV</b> <b>P.16</b></p> <p>Number of contacts 10, 12, 13, 15, 16, 17, 18, 20, 22, 24, 26, 30, 32, 33, 34, 36, 40, 45, 49, 50, 60</p>                          |
| 1mm   |  <p>Standard <b>FH12- ** S-1SH</b> <b>P.18</b></p> <p>Eccentric <b>FH12- ** (**) SA-1SH</b></p> <p>Standard</p> <p>Number of contacts 5, 6, 7, 8, 9, 11, 12, 16, 17, 22, 26</p> <p>Eccentric</p> <p>Number of contacts 4, 6, 8, 10, 11, 14, 19, 24</p> |                                                                                                                                                      |  <p><b>FH12- ** S-1SV</b> <b>P.19</b></p> <p>Number of contacts 6, 7, 8, 16, 20, 22, 24</p> |

## ◆Connector Operating Instructions, precautions and recommendations

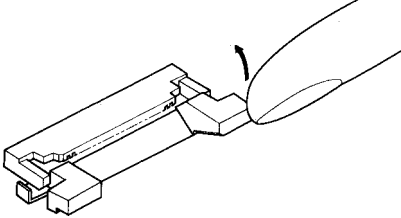
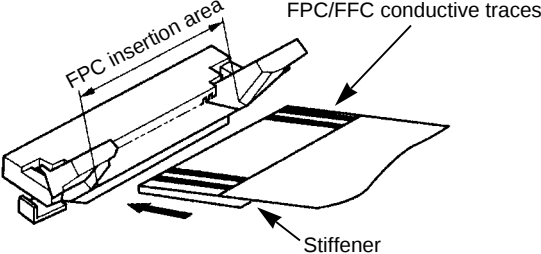
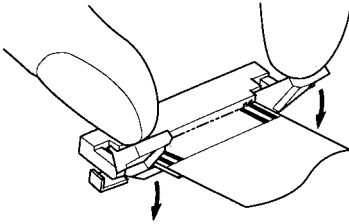
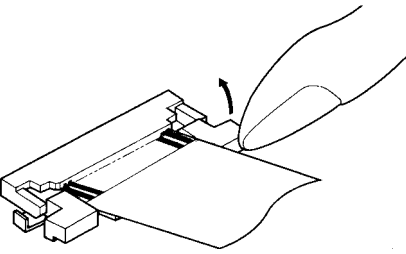
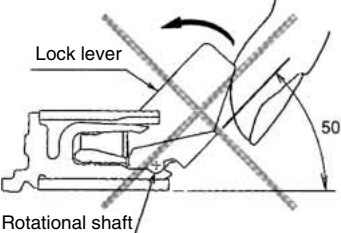
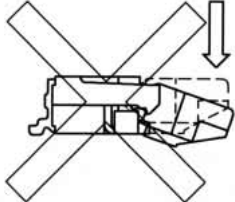
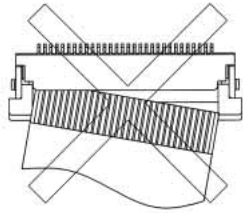
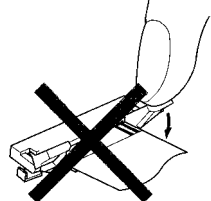
### ●Bottom Contact Type (common for 0.5mm/1mm)

| Operation                                                                                                                                                                                                                                                                                                                                                                                                                                       | Precautions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>1. FPC/FFC Termination procedure.</b><br/> <b>Connector installed on the board.</b></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 down.</p>  | <p>1) Avoid grasping the actuator with two fingers or lifting the actuator with fingernail.</p>  <p>2) Do not use a thin tool such as the tip of a screwdriver to release the lock lever. Doing so will cause deformation of the contacts.</p>  <p>3) Do not apply force in the direction of arrows A, B, or C while the lock lever is open. Doing so will cause the lock lever to become disengaged, or will damage the hook portion of the connector body.</p>  <p>4) When inserting the FPC/FFC, do not forcefully rub against the surface beneath the connector insertion slot. Doing so will result in the FPC/FFC forcefully striking the contacts and this will cause contact deformation, peeling of the FPC/FFC conductors, and other irregularities.</p>  <p>5) Insert the FPC/FFC at the proper position of the connector insertion slot, and insert perpendicularly with respect to the connector. Improper insertion will cause continuity problems, disengagement of the lock lever, and damage to the hook portion.</p>  |

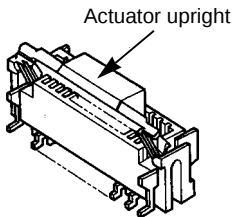
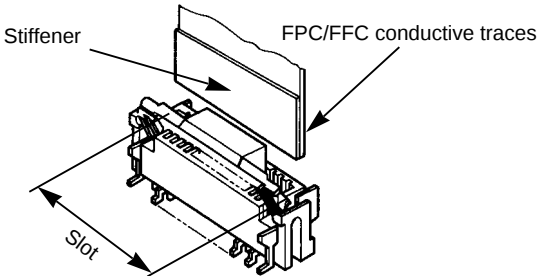
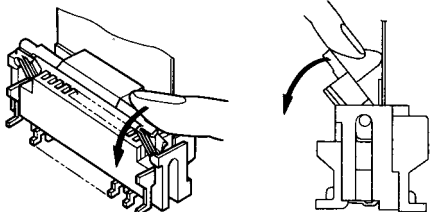
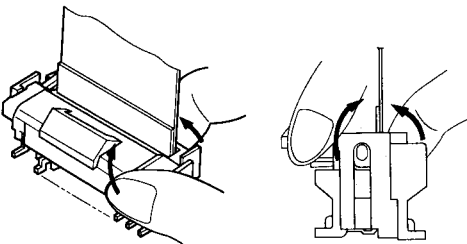
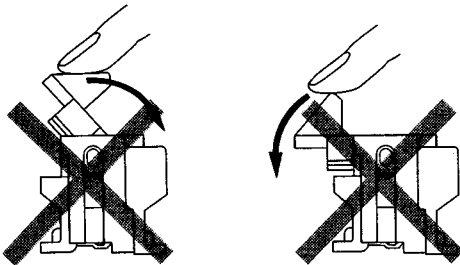
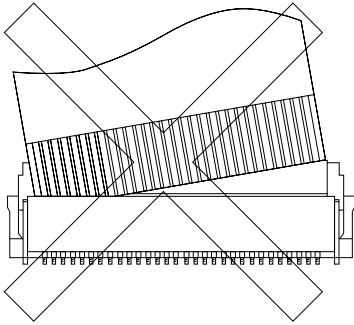
## ●Bottom Contact Type (common for 0.5mm/1mm)

| Operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Precautions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>3) Rotate down the actuator until firmly closed.<br/>                     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.</p>  <p><b>2. FPC/FFC Removal</b></p> <p>1) Lift up the actuator.<br/>                     2) Carefully remove the FPC/FFC.</p>  | <p>6) Partial insertion of the FPC/FFC, offset insertion, and diagonal insertion will result in an unfavorable engagement of the lock lever in which the lock lever is raised. To correct this, first remove the FPC/FFC and then reinsert it. Forcing the lock will damage the connector.</p>  <p>7) When locking, handle the FPC/FFC so that a load is not applied to the FPC/FFC as would occur by pulling the FPC/FFC, or lifting it, etc.<br/>                     When a load is applied in the opposite direction to the rotational movement of the lock, an excessive load will be applied and this will cause connector damage.</p>  <p>8) At the time of lock operation, application of force such as that indicated by the arrows in the diagrams below will cause the lock lever to disengage. When the lock lever has become disengaged, please exchange the entire connector.</p>  |

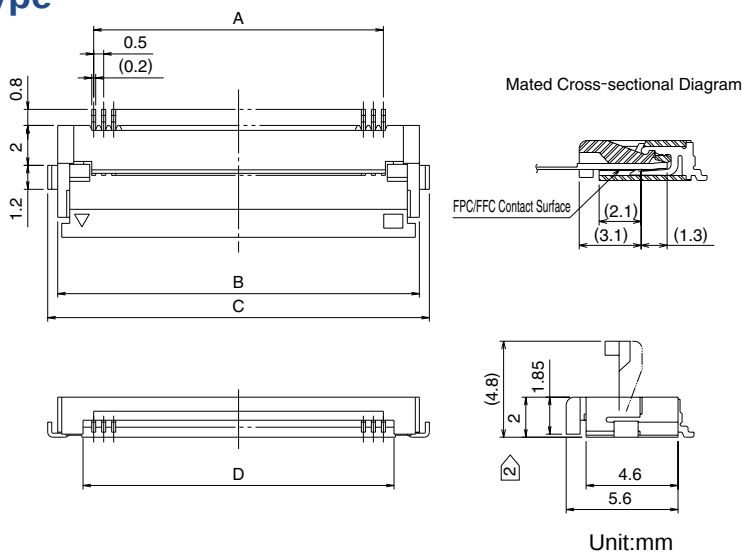
## ●Top Contact Type

| Operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Precautions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>1. FPC/FFC Termination procedure.<br/>Connector installed on the board.</b></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.<br/>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><b>2. FPC/FFC Removal</b></p> <p>1) Lift up the actuator.<br/>2) Carefully remove the FPC/FFC.</p>  | <p>1) Avoid further lifting of the lock lever once the lock has been released. Doing so will cause the lock lever to separate from the rotational shaft, and the lock lever will become disengaged or the hook portion of the connector body will be damaged</p>  <p>2) Avoid further pressing of the lock portion from the locked condition when the FPC/FFC has not yet been inserted. Doing so will cause the lock lever to become disengaged from the rotational shaft, and the hook portion of the connector body will be damaged.</p>  <p>3) Do not insert the FPC/FFC diagonally. Doing so will result in the corners of the FPC/FFC catching on the contacts and will cause deformation of the contacts.</p>  <p>4) When closing down the actuator apply equal pressure to both sides of the actuator.</p>  |

## ●Vertical Mounting Type

| Operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Precautions                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>1. FPC/FFC Termination procedure.<br/>Connector installed on the board.</b></p> <p>1) Verify that the actuator is positioned upright. If the actuator has rotated to the side, carefully rotate it upright.</p>  <p>2) Insert the FPC/FFC vertically in the connector slot assuring that the conductive traces of the FPC/FFC are facing away from the actuator.</p>  <p>3) Press down the actuator in the direction shown.</p>  <p><b>2. FPC/FFC Removal</b><br/>                 Rotate the actuator upward and withdraw the FPC/FFC.</p>  | <p>1) Avoid forcing the actuator up or down without the FPC/FFC inserted.</p>  <p>2) Do not insert the FPC/FFC diagonally. Doing so will result in the corners of the FPC/FFC catching on the contacts and will cause deformation of the contacts.</p>  |

## 0.5mm Pitch Bottom Contact Type

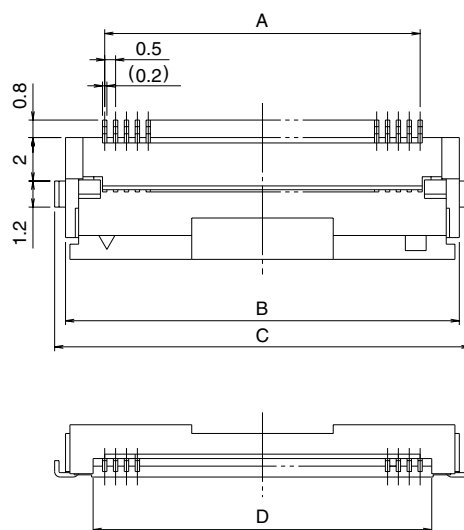


| Part Number               | CL No.        | Number of Contacts | A    | B    | C    | D     | RoHS |
|---------------------------|---------------|--------------------|------|------|------|-------|------|
| FH12- 6S-0.5SH(55)        | 586-0582-5-55 | 6                  | 2.5  | 6.1  | 7.1  | 3.57  | YES  |
| FH12- 8S-0.5SH(55)        | 586-0744-5-55 | 8                  | 3.5  | 7.1  | 8.1  | 4.57  |      |
| FH12-10S-0.5SH(55)        | 586-0522-3-55 | 10                 | 4.5  | 8.1  | 9.1  | 5.57  |      |
| FH12-11S-0.5SH(55)        | 586-0600-5-55 | 11                 | 5    | 8.6  | 9.6  | 6.07  |      |
| FH12-12S-0.5SH(55)        | 586-0704-0-55 | 12                 | 5.5  | 9.1  | 10.1 | 6.57  |      |
| FH12-13S-0.5SH(55)        | 586-0549-0-55 | 13                 | 6    | 9.6  | 10.6 | 7.07  |      |
| FH12-14S-0.5SH(55)        | 586-0533-0-55 | 14                 | 6.5  | 10.1 | 11.1 | 7.57  |      |
| FH12-15S-0.5SH(55)        | 586-0523-6-55 | 15                 | 7    | 10.6 | 11.6 | 8.07  |      |
| FH12-16S-0.5SH(55)        | 586-0531-4-55 | 16                 | 7.5  | 11.1 | 12.1 | 8.57  |      |
| FH12-17S-0.5SH(55)        | 586-0606-1-55 | 17                 | 8    | 11.6 | 12.6 | 9.07  |      |
| FH12-18S-0.5SH(55)        | 586-0530-1-55 | 18                 | 8.5  | 12.1 | 13.1 | 9.57  |      |
| FH12-19S-0.5SH(55)        | 586-0534-2-55 | 19                 | 9    | 12.6 | 13.6 | 10.07 |      |
| FH12-20S-0.5SH(55)        | 586-0524-9-55 | 20                 | 9.5  | 13.1 | 14.1 | 10.57 |      |
| FH12-22S-0.5SH(55)        | 586-0532-7-55 | 22                 | 10.5 | 14.1 | 15.1 | 11.57 |      |
| FH12-24S-0.5SH(55)        | 586-0521-0-55 | 24                 | 11.5 | 15.1 | 16.1 | 12.57 |      |
| FH12-25S-0.5SH(55)        | 586-0692-3-55 | 25                 | 12   | 15.6 | 16.6 | 13.07 |      |
| FH12-26S-0.5SH(55)        | 586-0576-2-55 | 26                 | 12.5 | 16.1 | 17.1 | 13.57 |      |
| FH12-28S-0.5SH(55)        | 586-0612-4-55 | 28                 | 13.5 | 17.1 | 18.1 | 14.57 |      |
| Note ② FH12-30S-0.5SH(55) | 586-0525-1-55 | 30                 | 14.5 | 18.1 | 19.1 | 15.57 |      |
| FH12-32S-0.5SH(55)        | 586-0681-7-55 | 32                 | 15.5 | 19.1 | 20.1 | 16.57 |      |
| FH12-33S-0.5SH(55)        | 586-0520-8-55 | 33                 | 16   | 19.6 | 20.6 | 17.07 |      |
| FH12-34S-0.5SH(55)        | 586-0617-8-55 | 34                 | 16.5 | 20.1 | 21.1 | 17.57 |      |
| FH12-35S-0.5SH(55)        | 586-0740-4-55 | 35                 | 17.0 | 20.6 | 21.6 | 18.07 |      |
| FH12-36S-0.5SH(55)        | 586-0526-4-55 | 36                 | 17.5 | 21.1 | 22.1 | 18.57 |      |
| Note ② FH12-40S-0.5SH(55) | 586-0527-7-55 | 40                 | 19.5 | 23.1 | 24.1 | 20.57 |      |
| Note ② FH12-45S-0.5SH(55) | 586-0528-0-55 | 45                 | 22   | 25.6 | 26.6 | 23.07 |      |
| Note ② FH12-50S-0.5SH(55) | 586-0529-2-55 | 50                 | 24.5 | 28.1 | 29.1 | 25.57 |      |
| Note ② FH12-53S-0.5SH(55) | 586-0595-7-55 | 53                 | 26   | 29.6 | 30.6 | 27.07 |      |

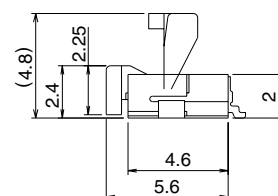
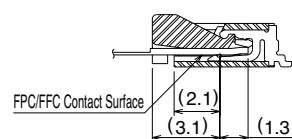
Note 1 : Embossed tape reel packaging (2,000 pieces/reel).  
 Order by number of reels.

Note ② : If there is no problem with the connector height, we recommend the type with the strengthened Flip-lock actuator (FH12S-\*S-0.5SH).  
 Standard type connector height: 2 mm  
 Connector height of type with strengthened Flip-lock actuator: 2.4 mm

## 0.5mm Pitch Bottom Contact Type with Strengthened Flip-lock Actuator



Mated Cross-sectional Diagram

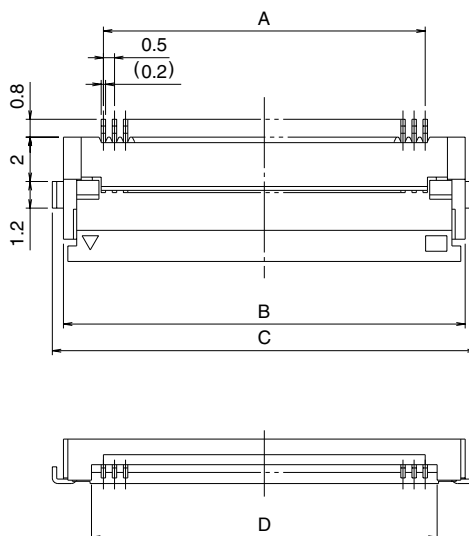


Unit:mm

| Part Number         | CL No.        | Number of Contacts | A    | B    | C    | D     | RoHS |
|---------------------|---------------|--------------------|------|------|------|-------|------|
| FH12S-30S-0.5SH(55) | 586-0667-6-55 | 30                 | 14.5 | 18.1 | 19.1 | 15.57 | YES  |
| FH12S-40S-0.5SH(55) | 586-0640-0-55 | 40                 | 19.5 | 23.1 | 24.1 | 20.57 |      |
| FH12S-45S-0.5SH(55) | 586-0665-0-55 | 45                 | 22.0 | 25.6 | 26.6 | 23.07 |      |
| FH12S-50S-0.5SH(55) | 586-0642-5-55 | 50                 | 24.5 | 28.1 | 29.1 | 25.57 |      |
| FH12S-53S-0.5SH(55) | 586-0691-0-55 | 53                 | 26.0 | 29.6 | 30.6 | 27.07 |      |

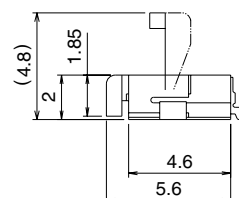
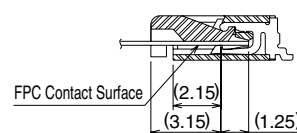
Note 1 Embossed tape reel packaging (2,000 pieces/reel).  
 Order by number of reels.

## 0.5mm Pitch Bottom Contact Type with 0.18mm FPC End Thickness



Applicable FPC end thickness :  $0.18 \pm 0.05$

Mated Cross-sectional Diagram



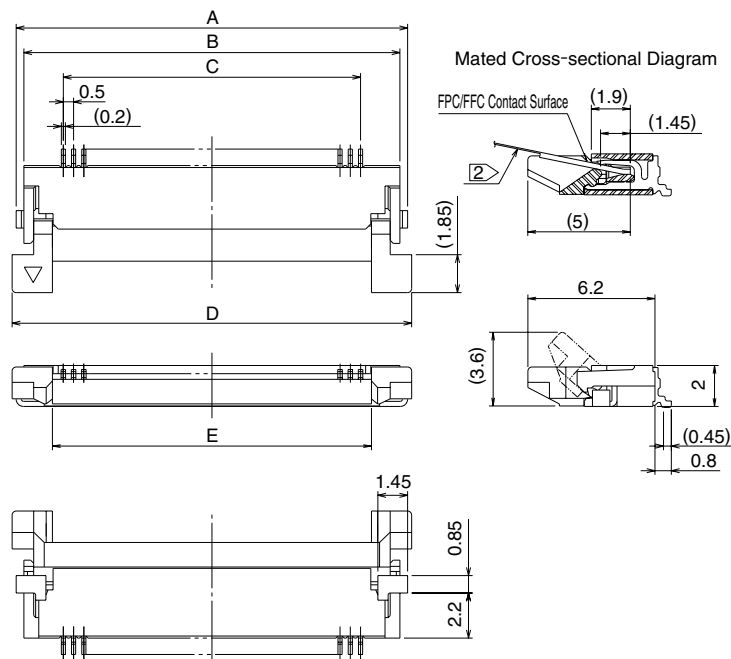
Unit:mm

| Part Number         | CL No.        | Number of Contacts | A    | B    | C    | D     | RoHS |
|---------------------|---------------|--------------------|------|------|------|-------|------|
| FH12F- 6S-0.5SH(55) | 586-0672-6-55 | 6                  | 2.5  | 6.1  | 7.1  | 3.57  | YES  |
| FH12F- 8S-0.5SH(55) | 586-0738-2-55 | 8                  | 3.5  | 7.1  | 8.1  | 4.57  |      |
| FH12F-10S-0.5SH(55) | 586-0709-4-55 | 10                 | 4.5  | 8.1  | 9.1  | 5.57  |      |
| FH12F-12S-0.5SH(55) | 586-0653-1-55 | 12                 | 5.5  | 9.1  | 10.1 | 6.57  |      |
| FH12F-13S-0.5SH(55) | 586-0629-7-55 | 13                 | 6.0  | 9.6  | 10.6 | 7.07  |      |
| FH12F-14S-0.5SH(55) | 586-0655-7-55 | 14                 | 6.5  | 10.1 | 11.1 | 7.57  |      |
| FH12F-15S-0.5SH(55) | 586-0680-4-55 | 15                 | 7.0  | 10.6 | 11.6 | 8.07  |      |
| FH12F-16S-0.5SH(55) | 586-0673-9-55 | 16                 | 7.5  | 11.1 | 12.1 | 8.57  |      |
| FH12F-18S-0.5SH(55) | 586-0626-9-55 | 18                 | 8.5  | 12.1 | 13.1 | 9.57  |      |
| FH12F-20S-0.5SH(55) | 586-0636-2-55 | 20                 | 9.5  | 13.1 | 14.1 | 10.57 |      |
| FH12F-22S-0.5SH(55) | 586-0630-6-55 | 22                 | 10.5 | 14.1 | 15.1 | 11.57 |      |
| FH12F-24S-0.5SH(55) | 586-0632-1-55 | 24                 | 11.5 | 15.1 | 16.1 | 12.57 |      |
| FH12F-25S-0.5SH(55) | 586-0733-9-55 | 25                 | 12.0 | 15.6 | 16.6 | 13.07 |      |
| FH12F-26S-0.5SH(55) | 586-0627-1-55 | 26                 | 12.5 | 16.1 | 17.1 | 13.57 |      |
| FH12F-28S-0.5SH(55) | 586-0643-8-55 | 28                 | 13.5 | 17.1 | 18.1 | 14.57 |      |
| FH12F-30S-0.5SH(55) | 586-0628-4-55 | 30                 | 14.5 | 18.1 | 19.1 | 15.57 |      |
| FH12F-32S-0.5SH(55) | 586-0705-3-55 | 32                 | 15.5 | 19.1 | 20.1 | 16.57 |      |
| FH12F-34S-0.5SH(55) | 586-0677-0-55 | 34                 | 16.5 | 20.1 | 21.1 | 17.57 |      |
| FH12F-36S-0.5SH(55) | 586-0656-0-55 | 36                 | 17.5 | 21.1 | 22.1 | 18.57 |      |
| FH12F-40S-0.5SH(55) | 586-0635-0-55 | 40                 | 19.5 | 23.1 | 24.1 | 20.57 |      |

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

## FH12 Series 0.5mm and 1mm Pitch Connectors For FPC/FFC

### 0.5mm Pitch Top Contact Type



Unit:mm

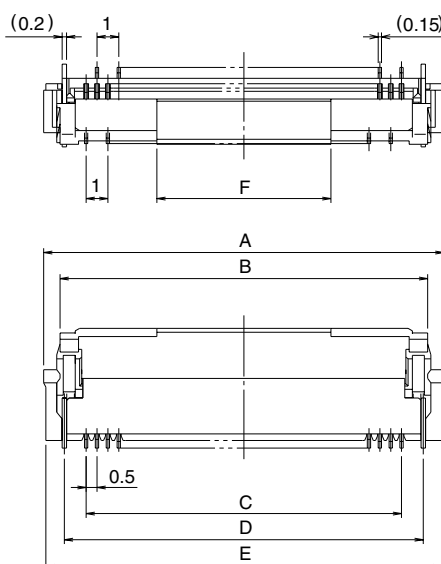
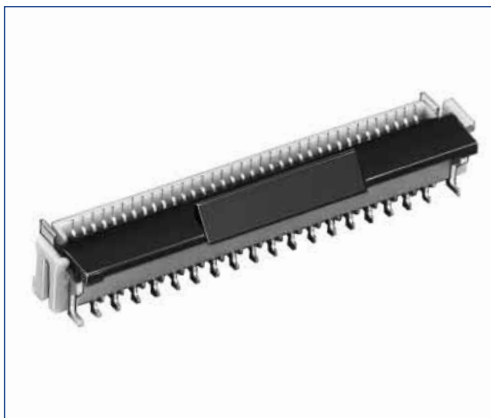
| Part Number         | CL No.        | Number of Contacts | A    | B     | C    | D    | E     | RoHS |
|---------------------|---------------|--------------------|------|-------|------|------|-------|------|
| FH12A-10S-0.5SH(55) | 586-0550-9-55 | 10                 | 9.1  | 8.35  | 4.5  | 9.5  | 5.57  | YES  |
| FH12A-12S-0.5SH(55) | 586-0696-4-55 | 12                 | 10.1 | 9.35  | 5.5  | 10.5 | 6.57  |      |
| FH12A-15S-0.5SH(55) | 586-0551-1-55 | 15                 | 11.6 | 10.85 | 7.0  | 12.0 | 8.07  |      |
| FH12A-16S-0.5SH(55) | 586-0552-4-55 | 16                 | 12.1 | 11.35 | 7.5  | 12.5 | 8.57  |      |
| FH12A-18S-0.5SH(55) | 586-0553-7-55 | 18                 | 13.1 | 12.35 | 8.5  | 13.5 | 9.57  |      |
| FH12A-20S-0.5SH(55) | 586-0554-0-55 | 20                 | 14.1 | 13.35 | 9.5  | 14.5 | 10.57 |      |
| FH12A-22S-0.5SH(55) | 586-0686-0-55 | 22                 | 15.1 | 14.35 | 10.5 | 15.5 | 11.57 |      |
| FH12A-24S-0.5SH(55) | 586-0555-2-55 | 24                 | 16.1 | 15.35 | 11.5 | 16.5 | 12.57 |      |
| FH12A-26S-0.5SH(55) | 586-0663-5-55 | 26                 | 17.1 | 16.35 | 12.5 | 17.5 | 13.57 |      |
| FH12A-28S-0.5SH(55) | 586-0725-0-55 | 28                 | 18.1 | 17.35 | 13.5 | 18.5 | 14.57 |      |
| FH12A-29S-0.5SH(55) | 586-0585-3-55 | 29                 | 18.6 | 17.85 | 14.0 | 19.0 | 15.07 |      |
| FH12A-30S-0.5SH(55) | 586-0556-5-55 | 30                 | 19.1 | 18.35 | 14.5 | 19.5 | 15.57 |      |
| FH12A-32S-0.5SH(55) | 586-0687-3-55 | 32                 | 20.1 | 19.35 | 15.5 | 20.5 | 16.57 |      |
| FH12A-33S-0.5SH(55) | 586-0570-6-55 | 33                 | 20.6 | 19.85 | 16.0 | 21.0 | 17.07 |      |
| FH12A-34S-0.5SH(55) | 586-0670-0-55 | 34                 | 21.1 | 20.35 | 16.5 | 21.5 | 17.57 |      |
| FH12A-36S-0.5SH(55) | 586-0662-2-55 | 36                 | 22.1 | 21.35 | 17.5 | 22.5 | 18.57 |      |
| FH12A-40S-0.5SH(55) | 586-0557-8-55 | 40                 | 24.1 | 23.35 | 19.5 | 24.5 | 20.57 |      |
| FH12A-42S-0.5SH(55) | 586-0698-0-55 | 42                 | 25.1 | 24.35 | 20.5 | 25.5 | 21.57 |      |
| FH12A-45S-0.5SH(55) | 586-0558-0-55 | 45                 | 26.6 | 25.85 | 22.0 | 27.0 | 23.07 |      |
| FH12A-50S-0.5SH(55) | 586-0559-3-55 | 50                 | 29.1 | 28.35 | 24.5 | 29.5 | 25.57 |      |

Note 1 : Embossed tape reel packaging (2,000 pieces/reel).

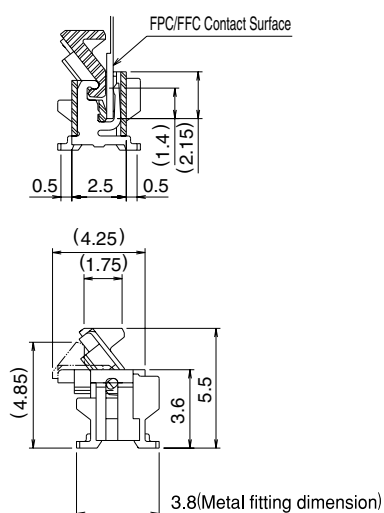
Order by number of reels.

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.

## 0.5mm Pitch Vertical mounting Type



Mated Cross-sectional Diagram



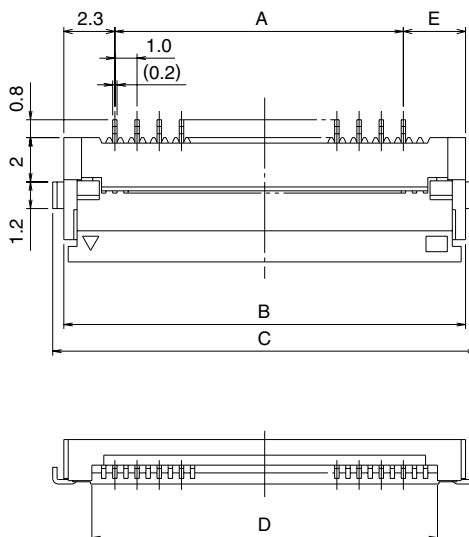
Unit:mm

| Part Number        | CL No.        | Number of Contacts | A    | B    | C    | D    | E    | F | RoHS |
|--------------------|---------------|--------------------|------|------|------|------|------|---|------|
| FH12-10S-0.5SV(55) | 586-0560-2-55 | 10                 | 8.4  | 6.9  | 4.5  | 6.5  | 8.2  | 4 | YES  |
| FH12-12S-0.5SV(55) | 586-0615-2-55 | 12                 | 9.4  | 7.9  | 5.5  | 7.5  | 9.2  | 4 |      |
| FH12-13S-0.5SV(55) | 586-0575-0-55 | 13                 | 9.9  | 8.4  | 6.0  | 8.0  | 9.7  | 4 |      |
| FH12-15S-0.5SV(55) | 586-0561-5-55 | 15                 | 10.9 | 9.4  | 7.0  | 9.0  | 10.7 | 4 |      |
| FH12-16S-0.5SV(55) | 586-0572-1-55 | 16                 | 11.4 | 9.9  | 7.5  | 9.5  | 11.2 | 4 |      |
| FH12-17S-0.5SV(55) | 586-0601-8-55 | 17                 | 11.9 | 10.4 | 8.0  | 10.0 | 11.7 | 4 |      |
| FH12-18S-0.5SV(55) | 586-0573-4-55 | 18                 | 12.4 | 10.9 | 8.5  | 10.5 | 12.2 | 4 |      |
| FH12-20S-0.5SV(55) | 586-0562-8-55 | 20                 | 13.4 | 11.9 | 9.5  | 11.5 | 13.2 | 4 |      |
| FH12-22S-0.5SV(55) | 586-0589-4-55 | 22                 | 14.4 | 12.9 | 10.5 | 12.5 | 14.2 | 8 |      |
| FH12-24S-0.5SV(55) | 586-0563-0-55 | 24                 | 15.4 | 13.9 | 11.5 | 13.5 | 15.2 | 8 |      |
| FH12-26S-0.5SV(55) | 586-0664-8-55 | 26                 | 16.4 | 14.9 | 12.5 | 14.5 | 16.2 | 8 |      |
| FH12-30S-0.5SV(55) | 586-0564-3-55 | 30                 | 18.4 | 16.9 | 14.5 | 16.5 | 18.2 | 8 |      |
| FH12-32S-0.5SV(55) | 586-0699-2-55 | 32                 | 19.4 | 17.9 | 15.5 | 17.5 | 19.2 | 8 |      |
| FH12-33S-0.5SV(55) | 586-0565-6-55 | 33                 | 19.9 | 18.4 | 16.0 | 18.0 | 19.7 | 8 |      |
| FH12-34S-0.5SV(55) | 586-0706-6-55 | 34                 | 20.4 | 18.9 | 16.5 | 18.5 | 20.2 | 8 |      |
| FH12-36S-0.5SV(55) | 586-0641-2-55 | 36                 | 21.4 | 19.9 | 17.5 | 19.5 | 21.2 | 8 |      |
| FH12-40S-0.5SV(55) | 586-0566-9-55 | 40                 | 23.4 | 21.9 | 19.5 | 21.5 | 23.2 | 8 |      |
| FH12-45S-0.5SV(55) | 586-0567-1-55 | 45                 | 25.9 | 24.4 | 22.0 | 24.0 | 25.7 | 8 |      |
| FH12-49S-0.5SV(55) | 586-0602-0-55 | 49                 | 27.9 | 26.4 | 24.0 | 26.0 | 27.7 | 8 |      |
| FH12-50S-0.5SV(55) | 586-0568-4-55 | 50                 | 28.4 | 26.9 | 24.5 | 26.5 | 28.2 | 8 |      |
| FH12-60S-0.5SV(55) | 586-0735-4-55 | 60                 | 33.4 | 31.9 | 29.5 | 31.5 | 33.2 | 8 |      |

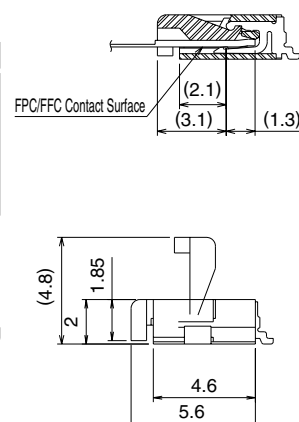
Note 1 : Embossed tape reel packaging (1,000 pieces/reel).  
 Order by number of reels.

## FH12 Series 0.5mm and 1mm Pitch Connectors For FPC/FFC

### ■1mm Pitch Type Bottom Contact Type



Mated Cross-sectional Diagram



Unit:mm

|                | Part Number           | CL No.        | Number of Contacts | A  | B    | C    | D     | E   | RoHS |
|----------------|-----------------------|---------------|--------------------|----|------|------|-------|-----|------|
| Standard type  | FH12- 5S-1SH(55)      | 586-0591-6-55 | 5                  | 4  | 8.6  | 9.6  | 6.07  | 2.3 | YES  |
|                | FH12- 6S-1SH(55)      | 586-0607-4-55 | 6                  | 5  | 9.6  | 10.6 | 7.07  | 2.3 |      |
|                | FH12- 7S-1SH(55)      | 586-0535-5-55 | 7                  | 6  | 10.6 | 11.6 | 8.07  | 2.3 |      |
|                | FH12- 8S-1SH(55)      | 586-0579-0-55 | 8                  | 7  | 11.6 | 12.6 | 9.07  | 2.3 |      |
|                | FH12- 9S-1SH(55)      | 586-0540-5-55 | 9                  | 8  | 12.6 | 13.6 | 10.07 | 2.3 |      |
|                | FH12-11S-1SH(55)      | 586-0668-9-55 | 11                 | 10 | 14.6 | 15.6 | 12.07 | 2.3 |      |
|                | FH12-12S-1SH(55)      | 586-0741-7-55 | 12                 | 11 | 15.6 | 16.6 | 13.07 | 2.3 |      |
|                | FH12-16S-1SH(55)      | 586-0536-8-55 | 16                 | 15 | 19.6 | 20.6 | 17.07 | 2.3 |      |
|                | FH12-17S-1SH(55)      | 586-0739-5-55 | 17                 | 16 | 20.6 | 21.6 | 18.07 | 2.3 |      |
|                | FH12-22S-1SH(55)      | 586-0547-4-55 | 22                 | 21 | 25.6 | 26.6 | 23.07 | 2.3 |      |
|                | FH12-26S-1SH(55)      | 586-0592-9-55 | 26                 | 25 | 29.6 | 30.6 | 27.07 | 2.3 |      |
| Eccentric type | FH12-10(4)SA-1SH(55)  | 586-0537-0-55 | 4                  | 3  | 8.1  | 9.1  | 5.57  | 2.8 |      |
|                | FH12-14(6)SA-1SH(55)  | 586-0538-3-55 | 6                  | 5  | 10.1 | 11.1 | 7.57  | 2.8 |      |
|                | FH12-18(8)SA-1SH(55)  | 586-0539-6-55 | 8                  | 7  | 12.1 | 13.1 | 9.57  | 2.8 |      |
|                | FH12-22(10)SA-1SH(55) | 586-0541-8-55 | 10                 | 9  | 14.1 | 15.1 | 11.57 | 2.8 |      |
|                | FH12-24(11)SA-1SH(55) | 586-0542-0-55 | 11                 | 10 | 15.1 | 16.1 | 12.57 | 2.8 |      |
|                | FH12-30(14)SA-1SH(55) | 586-0543-3-55 | 14                 | 13 | 18.1 | 19.1 | 15.57 | 2.8 |      |
|                | FH12-40(19)SA-1SH(55) | 586-0546-1-55 | 19                 | 18 | 23.1 | 24.1 | 20.57 | 2.8 |      |
|                | FH12-50(24)SA-1SH(55) | 586-0548-7-55 | 24                 | 23 | 28.1 | 29.1 | 25.57 | 2.8 |      |

Note 1: Embossed tape reel packaging (2,000 pieces/reel).

Order by number of reels.

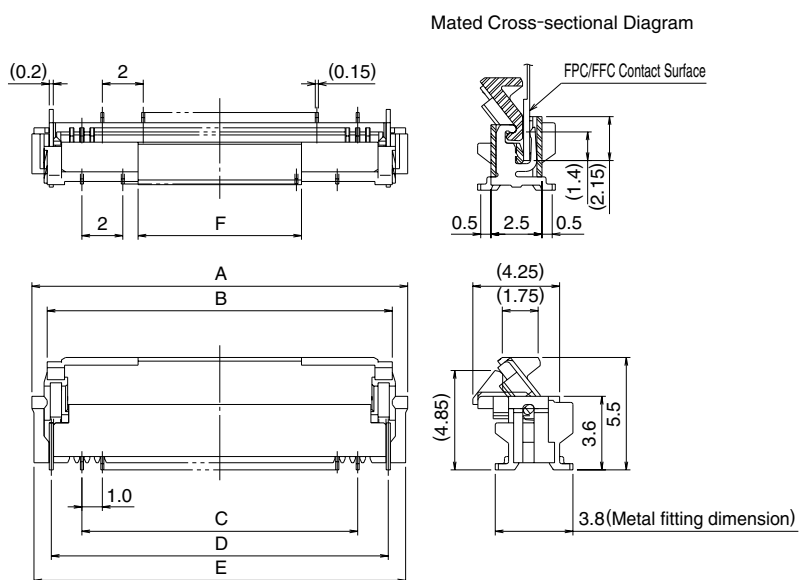
Note 2: The 1mm version of FH12 is constructed by loading every other contact into the 0.5mm housing.

When a housing designed for an odd number of 0.5mm pitch contacts is used; the spacing from the edge to the first contact on either side is the same as the distance between each contact, 1.0mm.

Hirose considers this design to be a **standard-type 1.0mm** connector.

An **eccentric-type** connector using a housing designed for an even number of 0.5mm pitch contacts and consequently one side has 1.5mm distance from the edge to the first contact. (See FPC/FFC dimensional drawing on page 19) The part number for the eccentric type describes the size of the 0.5mm housing used and lists the number of 1.0mm pitch contacts in parentheses () as shown in the above table.

## ■1mm Pitch Vertical Mounting Type



Unit:mm

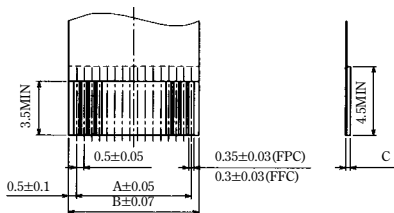
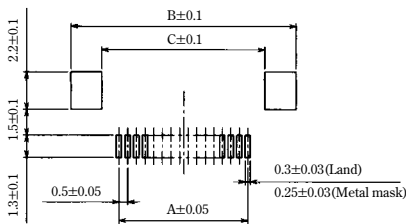
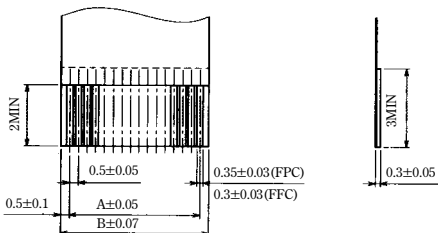
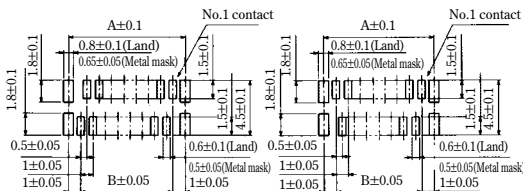
| Part Number      | CL No.        | Number of Contacts | A    | B    | C  | D  | E    | F | RoHS |
|------------------|---------------|--------------------|------|------|----|----|------|---|------|
| FH12- 6S-1SV(55) | 586-0605-9-55 | 6                  | 9.9  | 8.4  | 5  | 8  | 9.7  | 4 | YES  |
| FH12- 7S-1SV(55) | 586-0610-9-55 | 7                  | 10.9 | 9.4  | 6  | 9  | 10.7 | 4 |      |
| FH12- 8S-1SV(55) | 586-0593-1-55 | 8                  | 11.9 | 10.4 | 7  | 10 | 11.7 | 4 |      |
| FH12-16S-1SV(55) | 586-0574-7-55 | 16                 | 19.9 | 18.4 | 15 | 18 | 19.7 | 8 |      |
| FH12-20S-1SV(55) | 586-0634-7-55 | 20                 | 23.9 | 22.4 | 19 | 22 | 23.7 | 8 |      |
| FH12-22S-1SV(55) | 586-0584-0-55 | 22                 | 25.9 | 24.4 | 21 | 24 | 25.7 | 8 |      |
| FH12-24S-1SV(55) | 586-0594-4-55 | 24                 | 27.9 | 26.4 | 23 | 26 | 27.7 | 8 |      |

Note 1: Embossed tape reel packaging (1,000 pieces/reel).

Order by number of reels.

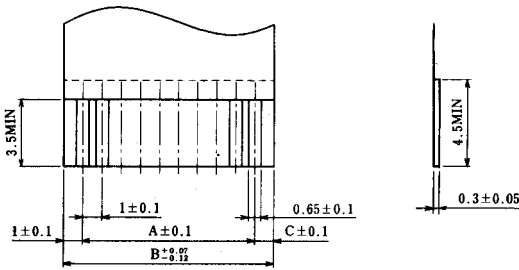
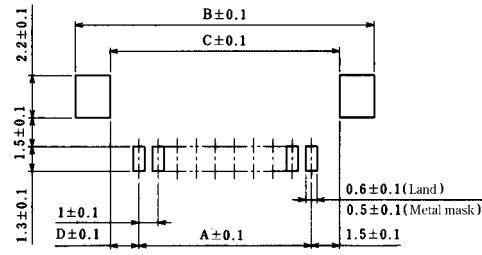
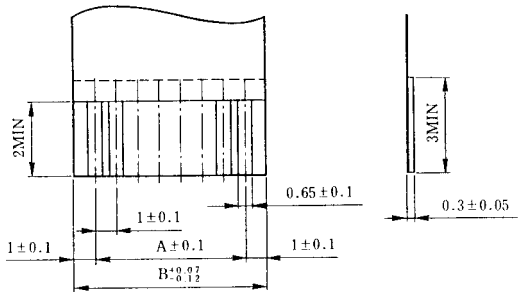
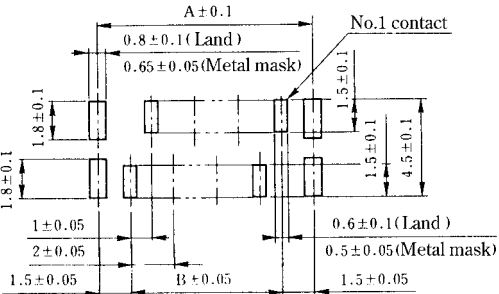
## ◆ Recommended FPC/FFC dimensions and Land/Metal Mask dimensions

### ● 0.5mm Pitch Product

|                                                                                    | <div>FPC/FFC dimensions</div> <div></div> <div><table><tr><th>Product Type</th><th>C Dimension</th></tr><tr><td>Types other than those below</td><td>0.3±0.05min</td></tr><tr><td></td><td>Stiffener thickness should be 0.188 mm (7.5 mil) min</td></tr><tr><td>FH12F</td><td>0.18±0.05</td></tr></table></div> <div>Unit: mm</div> <div><table><tr><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th></tr><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>8</td><td>3.5</td><td>4.5</td><td>26</td><td>12.5</td><td>13.5</td></tr><tr><td>10</td><td>4.5</td><td>5.5</td><td>28</td><td>13.5</td><td>14.5</td></tr><tr><td>11</td><td>5.0</td><td>6.0</td><td>29</td><td>14.0</td><td>15.0</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>14</td><td>6.5</td><td>7.5</td><td>33</td><td>16.0</td><td>17.0</td></tr><tr><td>15</td><td>7.0</td><td>8.0</td><td>34</td><td>16.5</td><td>17.5</td></tr><tr><td>16</td><td>7.5</td><td>8.5</td><td>35</td><td>17.0</td><td>18.0</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>19</td><td>9.0</td><td>10.0</td><td>42</td><td>20.5</td><td>21.5</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>50</td><td>24.5</td><td>25.5</td></tr><tr><td>24</td><td>11.5</td><td>12.5</td><td>53</td><td>26.0</td><td>27.0</td></tr></table></div> | Product Type                    | C Dimension                     | Types other than those below    | 0.3±0.05min                     |      | Stiffener thickness should be 0.188 mm (7.5 mil) min | FH12F | 0.18±0.05 | Dimension<br>Number of Contacts | A  | B    | Dimension<br>Number of Contacts | A  | B   | 6   | 2.5 | 3.5  | 25   | 12.0 | 13.0 | 8   | 3.5 | 4.5  | 26   | 12.5 | 13.5 | 10  | 4.5 | 5.5  | 28   | 13.5 | 14.5 | 11  | 5.0 | 6.0  | 29   | 14.0 | 15.0 | 12  | 5.5 | 6.5  | 30   | 14.5 | 15.5 | 13  | 6.0 | 7.0  | 32   | 15.5 | 16.5 | 14   | 6.5 | 7.5  | 33   | 16.0 | 17.0 | 15   | 7.0 | 8.0  | 34   | 16.5 | 17.5 | 16   | 7.5 | 8.5  | 35   | 17.0 | 18.0 | 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 | <div>Land / Metal Mask dimensions</div> <div></div> <div>Recommended metal mask thickness : 0.15mm</div> <div>Unit: mm</div> <div><table><tr><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th><th>C</th><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th><th>C</th></tr><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>8</td><td>3.5</td><td>9.1</td><td>5.5</td><td>26</td><td>12.5</td><td>18.1</td><td>14.5</td></tr><tr><td>10</td><td>4.5</td><td>10.1</td><td>6.5</td><td>28</td><td>13.5</td><td>19.1</td><td>15.5</td></tr><tr><td>11</td><td>5.0</td><td>10.6</td><td>7.0</td><td>29</td><td>14.0</td><td>19.6</td><td>16.0</td></tr><tr><td>12</td><td>5.5</td><td>11.1</td><td>7.5</td><td>30</td><td>14.5</td><td>20.1</td><td>16.5</td></tr><tr><td>13</td><td>6.0</td><td>11.6</td><td>8.0</td><td>32</td><td>15.5</td><td>21.1</td><td>17.5</td></tr><tr><td>14</td><td>6.5</td><td>12.1</td><td>8.5</td><td>33</td><td>16.0</td><td>21.6</td><td>18.0</td></tr><tr><td>15</td><td>7.0</td><td>12.6</td><td>9.0</td><td>34</td><td>16.5</td><td>22.1</td><td>18.5</td></tr><tr><td>16</td><td>7.5</td><td>13.1</td><td>9.5</td><td>35</td><td>17.0</td><td>22.6</td><td>19.0</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></table></div> | Dimension<br>Number of Contacts | A  | B    | C    | Dimension<br>Number of Contacts | A    | B   | C  | 6    | 2.5  | 8.1 | 4.5  | 25  | 12.0 | 17.6 | 14.0 | 8  | 3.5  | 9.1 | 5.5 | 26   | 12.5 | 18.1 | 14.5 | 10   | 4.5 | 10.1 | 6.5  | 28 | 13.5 | 19.1 | 15.5 | 11   | 5.0  | 10.6 | 7.0 | 29 | 14.0 | 19.6 | 16.0 | 12 | 5.5 | 11.1 | 7.5 | 30 | 14.5 | 20.1 | 16.5 | 13 | 6.0 | 11.6 | 8.0 | 32 | 15.5 | 21.1 | 17.5 | 14 | 6.5 | 12.1 | 8.5 | 33 | 16.0 | 21.6 | 18.0 | 15 | 7.0 | 12.6 | 9.0 | 34 | 16.5 | 22.1 | 18.5 | 16 | 7.5 | 13.1 | 9.5 | 35 | 17.0 | 22.6 | 19.0 | 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 |
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| Product Type                                                                       | C Dimension                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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| Types other than those below                                                       | 0.3±0.05min                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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|                                                                                    | Stiffener thickness should be 0.188 mm (7.5 mil) min                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| FH12F                                                                              | 0.18±0.05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| Dimension<br>Number of Contacts                                                    | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| 6                                                                                  | 2.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 22                                                                                 | 10.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| 8                                                                                  | 3.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 11                                                                                 | 5.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 12                                                                                 | 5.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 13                                                                                 | 6.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 14                                                                                 | 6.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 15                                                                                 | 7.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 16                                                                                 | 7.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 17                                                                                 | 8.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 18                                                                                 | 8.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 19                                                                                 | 9.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 20                                                                                 | 9.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 22                                                                                 | 10.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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    | 30.1 | 26.5                                                 |       |           |                                 |    |      |                                 |    |     |     |     |      |      |      |      |     |     |      |      |      |      |     |     |      |      |      |      |     |     |      |      |      |      |     |     |      |      |      |      |     |     |      |      |      |      |      |     |      |      |      |      |      |     |      |      |      |      |      |     |      |      |      |      |    |     |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 24                                                                                 | 11.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| <div>0.5mm Pitch Bottom Contact Type</div> <div>0.5mm Pitch Top Contact Type</div> | <div></div> <div>*Set the stiffener thickness to 0.188 (7.5mil) min.</div> <div>Unit: mm</div> <div><table><tr><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th></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>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></table></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Dimension<br>Number of Contacts | A                               | B                               | Dimension<br>Number of Contacts | 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 | <div><div>Even contact number</div><div>Odd contact number</div><div></div><div>Recommended metal mask thickness : 0.15mm</div><div>Unit: mm</div><div><table><tr><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th></tr><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></table></div></div> | Dimension<br>Number of Contacts | A  | B   | Dimension<br>Number of Contacts | 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 |    |     |      |     |    |      |      |      |    |     |      |     |    |      |      |      |    |     |      |     |    |      |      |      |    |     |      |     |    |      |      |      |    |     |      |     |    |      |      |      |    |     |      |      |    |      |      |      |    |     |      |      |    |      |      |      |    |     |      |      |    |      |      |      |    |     |      |      |    |      |      |      |    |      |      |  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| Dimension<br>Number of Contacts                                                    | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| 16                                                                                 | 7.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 18                                                                                 | 8.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 20                                                                                 | 9.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 22                                                                                 | 10.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| 24                                                                                 | 11.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| 22                                                                                 | 12.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| 24                                                                                 | 13.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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## ◆Recommended FPC/FFC dimensions and Land/Metal Mask dimensions

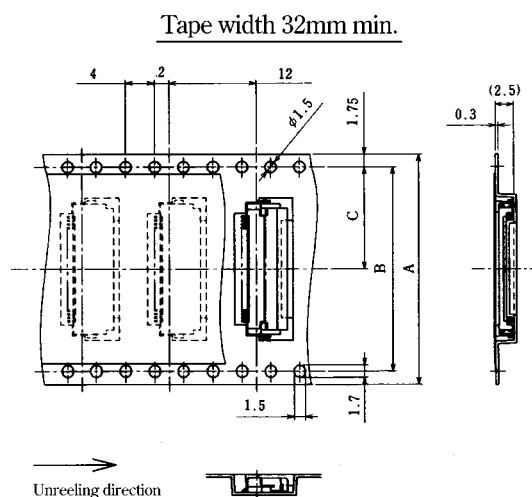
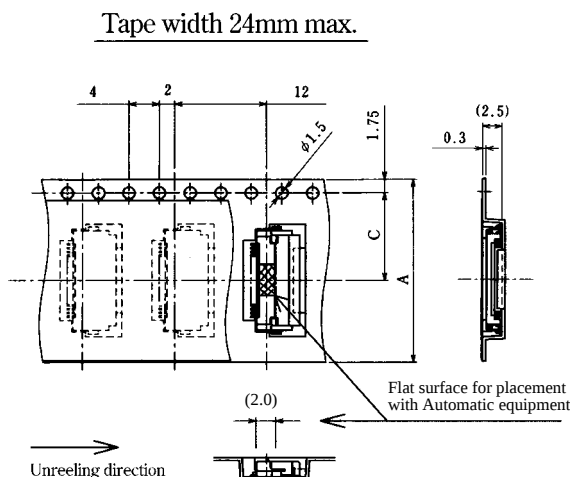
### ●1mm Pitch Product

|                                                     | <div>FPC/FFC dimensions</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <div>Land / Metal Mask dimensions</div> |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|------|-----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----|---|----|----|----|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------------------|---|---|---|---|---|-----|-----|---|---|-----|-----|---|---|-----|-----|----|---|------|-----|----|----|------|-----|----|----|------|-----|----|----|------|-----|----|----|------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---|---|---|---|---|---|------|---|-----|---|---|------|---|-----|---|---|------|---|-----|---|---|------|----|-----|---|---|------|----|-----|----|----|------|----|-----|----|----|------|----|-----|----|----|------|----|-----|----|----|------|----|-----|----|----|------|----|-----|----|----|------|----|-----|---------------------------------|---|---|---|---|---|---|------|-----|---|---|---|------|-----|---|---|---|------|------|---|----|---|------|------|---|----|----|------|------|---|----|----|------|------|---|----|----|------|------|---|----|----|------|------|---|
| <div>1mm Pitch<br/>Bottom Contact<br/>Type</div>    | <div></div> <div>※Set the stiffener thickness to 0.188 (7.5mil) min.</div> <div>Unit: mm</div> <div><table><tr><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th><th>C</th></tr><tr><td>5</td><td>4</td><td>6</td><td>1</td></tr><tr><td>6</td><td>5</td><td>7</td><td>1</td></tr><tr><td>7</td><td>6</td><td>8</td><td>1</td></tr><tr><td>8</td><td>7</td><td>9</td><td>1</td></tr><tr><td>9</td><td>8</td><td>10</td><td>1</td></tr><tr><td>11</td><td>10</td><td>12</td><td>1</td></tr><tr><td>12</td><td>11</td><td>13</td><td>1</td></tr><tr><td>16</td><td>15</td><td>17</td><td>1</td></tr><tr><td>17</td><td>16</td><td>18</td><td>1</td></tr><tr><td>22</td><td>21</td><td>23</td><td>1</td></tr><tr><td>26</td><td>25</td><td>27</td><td>1</td></tr></table><table><tr><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th><th>C</th></tr><tr><td>4</td><td>3</td><td>5.5</td><td>1.5</td></tr><tr><td>6</td><td>5</td><td>7.5</td><td>1.5</td></tr><tr><td>8</td><td>7</td><td>9.5</td><td>1.5</td></tr><tr><td>10</td><td>9</td><td>11.5</td><td>1.5</td></tr><tr><td>11</td><td>10</td><td>12.5</td><td>1.5</td></tr><tr><td>14</td><td>13</td><td>15.5</td><td>1.5</td></tr><tr><td>19</td><td>18</td><td>20.5</td><td>1.5</td></tr><tr><td>24</td><td>23</td><td>25.5</td><td>1.5</td></tr></table></div> | Dimension<br>Number of Contacts         | A    | B   | C | 5 | 4 | 6 | 1 | 6 | 5 | 7 | 1 | 7  | 6  | 8  | 1  | 8  | 7  | 9  | 1  | 9  | 8  | 10 | 1  | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 10                              | 12 | 1 | 12 | 11 | 13 | 1 | 16 | 15 | 17 | 1  | 17 | 16 | 18 | 1  | 22 | 21 | 23 | 1  | 26 | 25 | 27 | 1  | Dimension<br>Number of Contacts | A | B | C | 4 | 3 | 5.5 | 1.5 | 6 | 5 | 7.5 | 1.5 | 8 | 7 | 9.5 | 1.5 | 10 | 9 | 11.5 | 1.5 | 11 | 10 | 12.5 | 1.5 | 14 | 13 | 15.5 | 1.5 | 19 | 18 | 20.5 | 1.5 | 24 | 23 | 25.5 | 1.5 | <div></div> <div>Recommended metal mask thickness : 0.15mm</div> <div>Unit: mm</div> <div><table><tr><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th><th>C</th><th>D</th></tr><tr><td>5</td><td>4</td><td>10.6</td><td>7</td><td>1.5</td></tr><tr><td>6</td><td>5</td><td>11.6</td><td>8</td><td>1.5</td></tr><tr><td>7</td><td>6</td><td>12.6</td><td>9</td><td>1.5</td></tr><tr><td>8</td><td>7</td><td>13.6</td><td>10</td><td>1.5</td></tr><tr><td>9</td><td>8</td><td>14.6</td><td>11</td><td>1.5</td></tr><tr><td>11</td><td>10</td><td>16.6</td><td>13</td><td>1.5</td></tr><tr><td>12</td><td>11</td><td>17.6</td><td>14</td><td>1.5</td></tr><tr><td>16</td><td>15</td><td>21.6</td><td>18</td><td>1.5</td></tr><tr><td>17</td><td>16</td><td>22.6</td><td>19</td><td>1.5</td></tr><tr><td>22</td><td>21</td><td>27.6</td><td>24</td><td>1.5</td></tr><tr><td>26</td><td>25</td><td>31.6</td><td>28</td><td>1.5</td></tr></table><table><tr><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th><th>C</th><th>D</th></tr><tr><td>4</td><td>3</td><td>10.1</td><td>6.5</td><td>2</td></tr><tr><td>6</td><td>5</td><td>12.1</td><td>8.5</td><td>2</td></tr><tr><td>8</td><td>7</td><td>14.1</td><td>10.5</td><td>2</td></tr><tr><td>10</td><td>9</td><td>16.1</td><td>12.5</td><td>2</td></tr><tr><td>11</td><td>10</td><td>17.1</td><td>13.5</td><td>2</td></tr><tr><td>14</td><td>13</td><td>20.1</td><td>16.5</td><td>2</td></tr><tr><td>19</td><td>18</td><td>25.1</td><td>21.5</td><td>2</td></tr><tr><td>24</td><td>23</td><td>30.1</td><td>26.5</td><td>2</td></tr></table></div> | Dimension<br>Number of Contacts | A | B | C | D | 5 | 4 | 10.6 | 7 | 1.5 | 6 | 5 | 11.6 | 8 | 1.5 | 7 | 6 | 12.6 | 9 | 1.5 | 8 | 7 | 13.6 | 10 | 1.5 | 9 | 8 | 14.6 | 11 | 1.5 | 11 | 10 | 16.6 | 13 | 1.5 | 12 | 11 | 17.6 | 14 | 1.5 | 16 | 15 | 21.6 | 18 | 1.5 | 17 | 16 | 22.6 | 19 | 1.5 | 22 | 21 | 27.6 | 24 | 1.5 | 26 | 25 | 31.6 | 28 | 1.5 | Dimension<br>Number of Contacts | A | B | C | D | 4 | 3 | 10.1 | 6.5 | 2 | 6 | 5 | 12.1 | 8.5 | 2 | 8 | 7 | 14.1 | 10.5 | 2 | 10 | 9 | 16.1 | 12.5 | 2 | 11 | 10 | 17.1 | 13.5 | 2 | 14 | 13 | 20.1 | 16.5 | 2 | 19 | 18 | 25.1 | 21.5 | 2 | 24 | 23 | 30.1 | 26.5 | 2 |
|                                                     | Dimension<br>Number of Contacts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | A                                       | B    | C   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 5                                                   | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6                                       | 1    |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 6                                                   | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7                                       | 1    |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 7                                                   | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 8                                       | 1    |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 8                                                   | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 9                                       | 1    |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 9                                                   | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 10                                      | 1    |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 11                                                  | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 12                                      | 1    |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 12                                                  | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 13                                      | 1    |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 16                                                  | 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 17                                      | 1    |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 17                                                  | 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 18                                      | 1    |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 22                                                  | 21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 23                                      | 1    |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 26                                                  | 25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 27                                      | 1    |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| Dimension<br>Number of Contacts                     | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | B                                       | C    |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 4                                                   | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5.5                                     | 1.5  |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 6                                                   | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7.5                                     | 1.5  |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 8                                                   | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 9.5                                     | 1.5  |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 10                                                  | 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 11.5                                    | 1.5  |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 11                                                  | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 12.5                                    | 1.5  |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 14                                                  | 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 15.5                                    | 1.5  |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 19                                                  | 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 20.5                                    | 1.5  |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 24                                                  | 23                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 25.5                                    | 1.5  |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| Dimension<br>Number of Contacts                     | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | B                                       | C    | D   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 5                                                   | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 10.6                                    | 7    | 1.5 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 6                                                   | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 11.6                                    | 8    | 1.5 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 7                                                   | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 12.6                                    | 9    | 1.5 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 8                                                   | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 13.6                                    | 10   | 1.5 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 9                                                   | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.6                                    | 11   | 1.5 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 11                                                  | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 16.6                                    | 13   | 1.5 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 12                                                  | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 17.6                                    | 14   | 1.5 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 16                                                  | 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 21.6                                    | 18   | 1.5 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 17                                                  | 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 22.6                                    | 19   | 1.5 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 22                                                  | 21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 27.6                                    | 24   | 1.5 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 26                                                  | 25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 31.6                                    | 28   | 1.5 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| Dimension<br>Number of Contacts                     | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | B                                       | C    | D   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 4                                                   | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 10.1                                    | 6.5  | 2   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 6                                                   | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 12.1                                    | 8.5  | 2   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 8                                                   | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.1                                    | 10.5 | 2   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 10                                                  | 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 16.1                                    | 12.5 | 2   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 11                                                  | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 17.1                                    | 13.5 | 2   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 14                                                  | 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 20.1                                    | 16.5 | 2   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 19                                                  | 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 25.1                                    | 21.5 | 2   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 24                                                  | 23                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 30.1                                    | 26.5 | 2   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| <div>1mm Pitch<br/>Vertical<br/>Mounting Type</div> | <div></div> <div>※Set the stiffener thickness to 0.188 (7.5mil) min.</div> <div>Unit: mm</div> <div><table><tr><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th></tr><tr><td>6</td><td>5</td><td>7</td></tr><tr><td>7</td><td>6</td><td>8</td></tr><tr><td>8</td><td>7</td><td>9</td></tr><tr><td>16</td><td>15</td><td>17</td></tr><tr><td>20</td><td>19</td><td>21</td></tr><tr><td>22</td><td>21</td><td>23</td></tr><tr><td>24</td><td>23</td><td>25</td></tr></table></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Dimension<br>Number of Contacts         | A    | B   | 6 | 5 | 7 | 7 | 6 | 8 | 8 | 7 | 9 | 16 | 15 | 17 | 20 | 19 | 21 | 22 | 21 | 23 | 24 | 23 | 25 | <div></div> <div>Recommended metal mask thickness : 0.15mm</div> <div>Unit: mm</div> <div><table><tr><th>Dimension<br/>Number of Contacts</th><th>A</th><th>B</th></tr><tr><td>6</td><td>8</td><td>5</td></tr><tr><td>7</td><td>9</td><td>6</td></tr><tr><td>8</td><td>10</td><td>7</td></tr><tr><td>16</td><td>18</td><td>15</td></tr><tr><td>20</td><td>22</td><td>19</td></tr><tr><td>22</td><td>24</td><td>21</td></tr><tr><td>24</td><td>26</td><td>23</td></tr></table></div> | Dimension<br>Number of Contacts | A  | B | 6  | 8  | 5  | 7 | 9  | 6  | 8  | 10 | 7  | 16 | 18 | 15 | 20 | 22 | 19 | 22 | 24 | 21 | 24 | 26 | 23                              |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
|                                                     | Dimension<br>Number of Contacts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | A                                       | B    |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 6                                                   | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7                                       |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 7                                                   | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 8                                       |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
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| 16                                                  | 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 17                                      |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 20                                                  | 19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 21                                      |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 22                                                  | 21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 23                                      |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 24                                                  | 23                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 25                                      |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| Dimension<br>Number of Contacts                     | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | B                                       |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 6                                                   | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                                       |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 7                                                   | 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6                                       |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 8                                                   | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 7                                       |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 16                                                  | 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 15                                      |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 20                                                  | 22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 19                                      |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 22                                                  | 24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 21                                      |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |
| 24                                                  | 26                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 23                                      |      |     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |    |   |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |   |   |   |   |   |     |     |   |   |     |     |   |   |     |     |    |   |      |     |    |    |      |     |    |    |      |     |    |    |      |     |    |    |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |   |   |   |   |   |   |      |   |     |   |   |      |   |     |   |   |      |   |     |   |   |      |    |     |   |   |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |    |    |      |    |     |                                 |   |   |   |   |   |   |      |     |   |   |   |      |     |   |   |   |      |      |   |    |   |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |    |    |      |      |   |

## ◆ Packaging Specification

### Embossed Carrier Tape Dimensions

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



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

Unit:mm

| Dimension<br>Number of Contacts | A  | B | C    | D    | E    |
|---------------------------------|----|---|------|------|------|
| 6                               | 16 | — | 7.5  | 17.4 | 21.4 |
| 8                               | 16 | — | 7.5  | 17.4 | 21.4 |
| 10                              | 16 | — | 7.5  | 17.4 | 21.4 |
| 11                              | 16 | — | 7.5  | 17.4 | 21.4 |
| 12                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 13                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 14                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 15                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 16                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 17                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 18                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 19                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 20                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 22                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 24                              | 24 | — | 11.5 | 25.4 | 29.4 |

| Dimension<br>Number of Contacts | A  | B    | C    | D    | E    |
|---------------------------------|----|------|------|------|------|
| 25                              | 24 | —    | 11.5 | 25.4 | 29.4 |
| 26                              | 24 | —    | 11.5 | 25.4 | 29.4 |
| 28                              | 32 | 28.4 | 14.2 | 33.4 | 37.4 |
| 29                              | 32 | 28.4 | 14.2 | 33.4 | 37.4 |
| 30                              | 32 | 28.4 | 14.2 | 33.4 | 37.4 |
| 32                              | 32 | 28.4 | 14.2 | 33.4 | 37.4 |
| 33                              | 32 | 28.4 | 14.2 | 33.4 | 37.4 |
| 34                              | 32 | 28.4 | 14.2 | 33.4 | 37.4 |
| 35                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 36                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 40                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 42                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 45                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 50                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 53                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |

Note: 2,000 pieces per reel.

#### ● 1mm Pitch Bottom Contact Type

Unit:mm

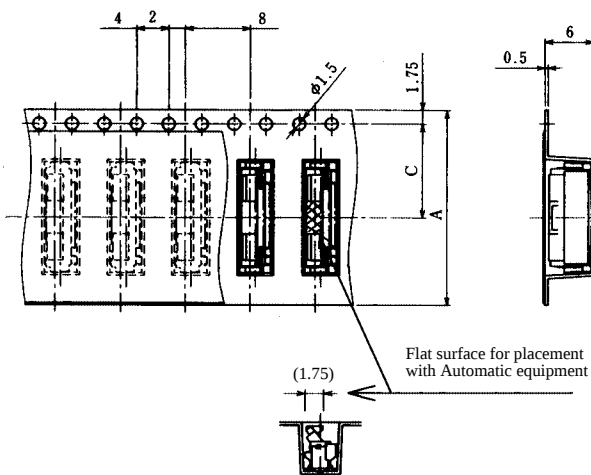
| Dimension<br>Number of Contacts | A  | B    | C    | D    | E    |
|---------------------------------|----|------|------|------|------|
| 5                               | 16 | —    | 7.5  | 17.4 | 21.4 |
| 6                               | 24 | —    | 11.5 | 25.4 | 29.4 |
| 7                               | 24 | —    | 11.5 | 25.4 | 29.4 |
| 8                               | 24 | —    | 11.5 | 25.4 | 29.4 |
| 9                               | 24 | —    | 11.5 | 25.4 | 29.4 |
| 11                              | 24 | —    | 11.5 | 25.4 | 29.4 |
| 12                              | 24 | —    | 11.5 | 25.4 | 29.4 |
| 16                              | 32 | 28.4 | 14.2 | 33.4 | 37.4 |
| 17                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 22                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 26                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |

| Dimension<br>Number of Contacts | A  | B    | C    | D    | E    |
|---------------------------------|----|------|------|------|------|
| 4                               | 16 | —    | 7.5  | 17.4 | 21.4 |
| 6                               | 24 | —    | 11.5 | 25.4 | 29.4 |
| 8                               | 24 | —    | 11.5 | 25.4 | 29.4 |
| 10                              | 24 | —    | 11.5 | 25.4 | 29.4 |
| 11                              | 24 | —    | 11.5 | 25.4 | 29.4 |
| 14                              | 32 | 28.4 | 14.2 | 33.4 | 37.4 |
| 19                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 24                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |

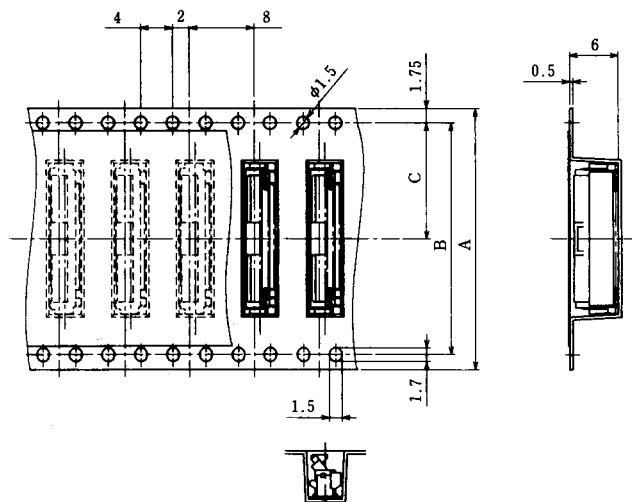
Note: 2,000 pieces per reel.

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

Tape width 24mm max.



Tape width 32mm min.



### 0.5mm Pitch Vertical mounting Type

Unit:mm

| Dimension<br>Number of Contacts | A  | B | C    | D    | E    |
|---------------------------------|----|---|------|------|------|
| 10                              | 16 | — | 7.5  | 17.4 | 21.4 |
| 12                              | 16 | — | 7.5  | 17.4 | 21.4 |
| 13                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 15                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 16                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 17                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 18                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 20                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 22                              | 24 | — | 11.5 | 25.4 | 29.4 |
| 24                              | 24 | — | 11.5 | 25.4 | 29.4 |

Note: 1,000 pieces per reel.

| Dimension<br>Number of Contacts | A  | B    | C    | D    | E    |
|---------------------------------|----|------|------|------|------|
| 26                              | 24 | —    | 11.5 | 25.4 | 29.4 |
| 30                              | 32 | 28.4 | 14.2 | 33.4 | 37.4 |
| 32                              | 32 | 28.4 | 14.2 | 33.4 | 37.4 |
| 33                              | 32 | 28.4 | 14.2 | 33.4 | 37.4 |
| 34                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 36                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 40                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 45                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 49                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 50                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 60                              | 56 | 52.4 | 26.2 | 57.4 | 61.4 |

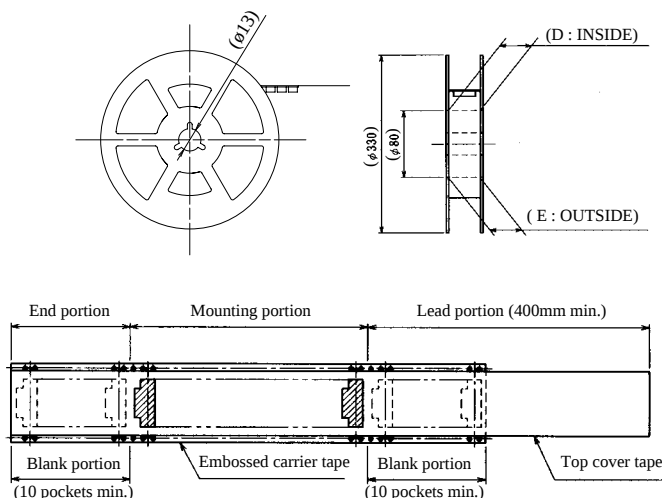
### 1mm Pitch Vertical mounting Type

Unit:mm

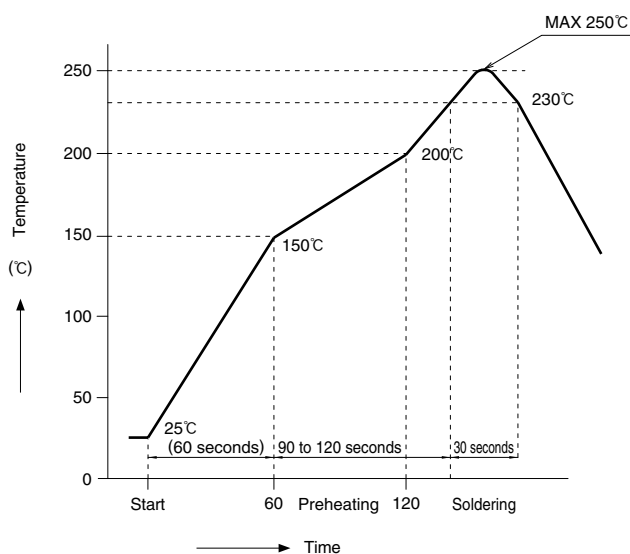
| Dimension<br>Number of Contacts | A  | B    | C    | D    | E    |
|---------------------------------|----|------|------|------|------|
| 6                               | 24 | —    | 11.5 | 25.4 | 29.4 |
| 7                               | 24 | —    | 11.5 | 25.4 | 29.4 |
| 8                               | 24 | —    | 11.5 | 25.4 | 29.4 |
| 16                              | 32 | 28.4 | 14.2 | 33.4 | 37.4 |
| 20                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 22                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |
| 24                              | 44 | 40.4 | 20.2 | 45.4 | 49.4 |

Note: 1,000 pieces per reel.

## Reel Dimensions (Common to All Types)



## Recommended Temperature Profile



### HRS test conditions

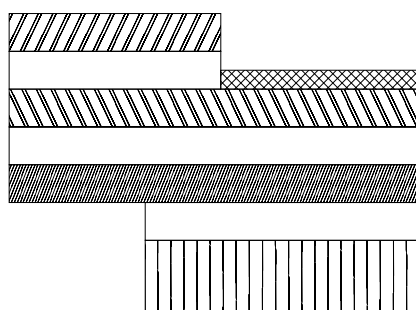
|                    |                                                                                                                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------|
| Solder method      | :Reflow, IR/hot air<br>(Nihon Den-netsu Co., Ltd.'s<br>Part Number: SENSBY NR- II )                             |
| Environment:       | :Room air                                                                                                       |
| Solder composition | :Paste, 96.5%Sn/3%Ag/0.5%Cu<br>(Senju Metal Industry, Co., Ltd.'s<br>Part Number: M705-221CM5-42-10.5)          |
| Test board         | :Glass epoxy 40mm×80mm×1.6mm thick                                                                              |
| Land dimensions    | :Top and bottom<br>contact type 0.3mm×1.3mm<br>Vertical mounting type 0.6mm×1.5mm                               |
| Metal mask         | :Top and bottom contact type<br>0.25mm×1.3mm×0.15mm thick<br>Vertical mounting type<br>0.5mm×1.5mm×0.15mm thick |

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

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

### 1. FFC

### FFC : Flexible Flat Cable



| Material Name                                            | Material       | Thickness (μm) |
|----------------------------------------------------------|----------------|----------------|
| (Nickel under plated / Gold plated),<br>soft copper film |                | 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  $\mu\text{m}$ )

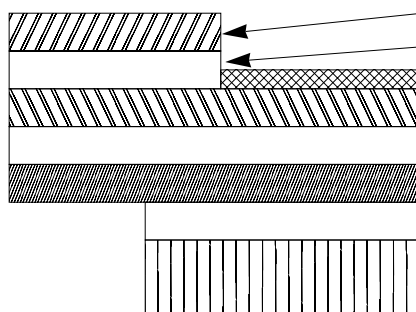
Note: Use of a thicker FFC results in a stiffer lock action and the lock is more easily released.

A factor that contributes to thicker FFC is the use of 250  $\mu\text{m}$  stiffener which is thicker than the standard (188  $\mu\text{m}$ ) product. This results in a total thickness of 357  $\mu\text{m}$ .

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             | Polyimide 1 mil                                    | 25             |
| Cover adhesive                  |                                                    | 25             |
| Surface treatment               | Nickel under plated 1to 5μm /<br>Gold plated 0.2μm | 3              |
| Copper foil                     | Cu 1oz                                             | 35             |
| Base adhesive                   |                                                    | 25             |
| Base film                       | Polyimide 1 mil                                    | 25             |
| Reinforcement material adhesive | Heat-hardened adhesive                             | 30             |
| Stiffener                       | Polyimide 7 mil                                    | 175            |
| Total                           |                                                    | 293            |

### 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.