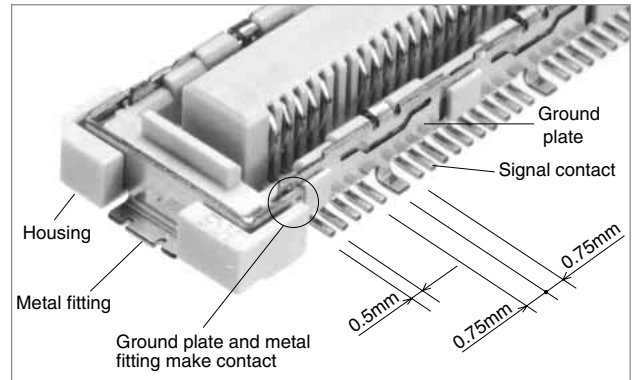
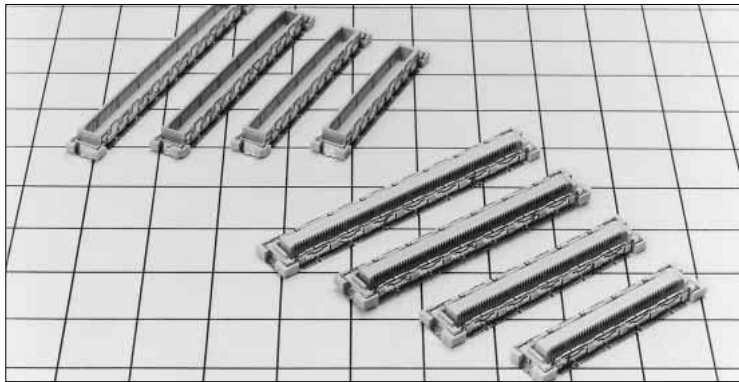


# 0.5mm Pitch Connectors with Ground Plate for Board-to-Board Connections

## FX10 Series



### ■ Features

#### 1. Improved Transmission Efficiency Between Boards

Transmission characteristics have been improved through a design that fixes ground plates to both sides of the header and receptacle.

#### 2. 10 Signal:1 Ground Arrangement

Signal and ground are arranged in a ratio of 10:1 with the ground plate SMT connected to the board. The ground stability achieved serves to reduce noise.

#### 3. Metal Fittings for Added Solder Weld Strength

Metal fittings provide greater adhesion to the board, protecting against peeling. The unique connector design provides a connection between the fitting and the ground plate for a stronger ground.

#### 4. Suited to High-Density Applications

The signal contact pitch of 0.5 mm produces a smaller connector utilizing less board area for mounting.

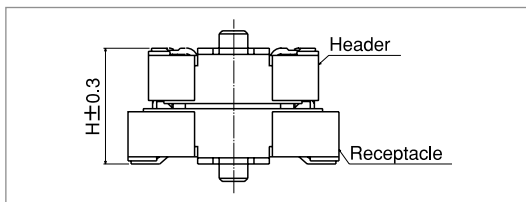
#### 5. High contact reliability

Effective mating length is 1.1 mm for signal contacts.

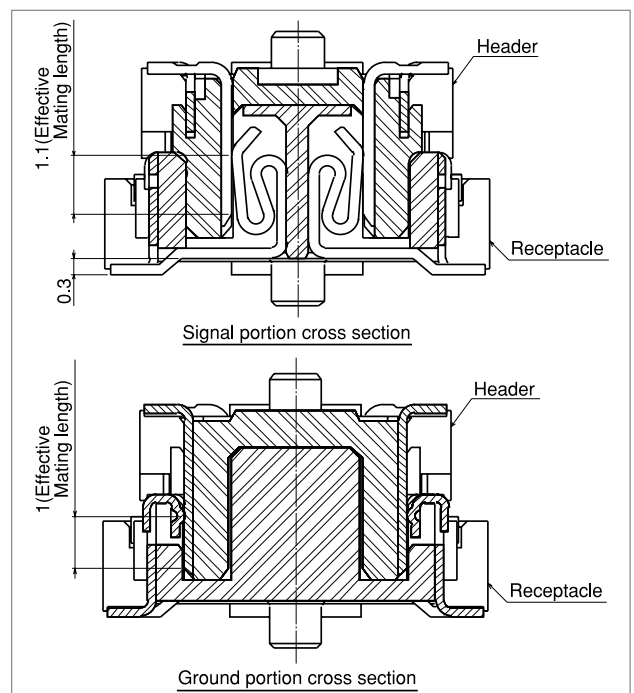
#### 6. Optional Ground Plate

An alternate style without the ground plate is available. The space provided by the ground plate removal has been filled with additional signal contacts.

#### 7. Board-To-Board Dimensions of 4mm and 5 mm Are Available



### ● Cross-Section of Mating



### ◆ Stack Height

#### ● With ground plate

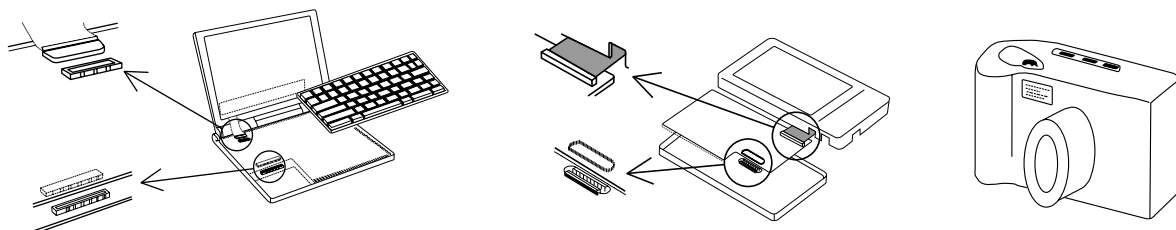
| Headers       |  | FX10#-*P/*-SV | FX10#-*P/*-SV1 |
|---------------|--|---------------|----------------|
| Receptacles   |  | 4mm           | 5mm            |
| FX10#-*S/*-SV |  |               |                |

#### ● Without ground plate

| Headers     |  | FX10-*P-SV | FX10-*P-SV1 |
|-------------|--|------------|-------------|
| Receptacles |  | 4mm        | 5mm         |
| FX10-*S-SV  |  |            |             |

### ■ Applications

Notebook computers, PDA, and other miniature electronic equipment.



## Product Specifications

|        |                                |                           |   |   |   |   |
|--------|--------------------------------|---------------------------|---|---|---|---|
| Rating | Rated current<br>Rated voltage | 0.3 A (Note 1)<br>50 V AC | Operating temperature range<br>Operating humidity range | -55 to 85°C<br>Relative humidity 95% or less<br>(No condensation) | Storage temperature range<br>Storage humidity range | -10 to +60°C (Note 1)<br>40 to 70% (Note 1) |
|--------|--------------------------------|---------------------------|---|---|---|---|

| Item                            | Requirements   | Conditions  |
|---------------------------------|--|---|
| 1. Insulation resistance        | 100 MΩ or greater  | Measured at 100 V DC  |
| 2. Voltage resistance           | No flashover or breakdown  | 150 V AC applied for one minute   |
| 3. Contact resistance           | 60 mΩ or less  | Measured at 100 mA  |
| 4. Vibration                    | No electrical discontinuity for 1μs or greater<br>No damage, cracks, or parts looseness                                | Frequency: 10 to 55 Hz, amplitude of 0.75 mm in 3 directions, 10 cycles each  |
| 5. Shock                        | No electrical discontinuity for 1μs or longer<br>No damage, cracks, or parts looseness                                 | Acceleration of 490 m/s <sup>2</sup> , 11 ms duration, sine half-wave waveform, for 3 cycles in the both directions of each of the 3 axes |
| 6. Damp heat (Steady state)     | Contact resistance of 70 mΩ or less, insulation resistance of 100 MΩ or greater, no damage, cracks, or parts looseness | Temperature of 40°C, humidity of 90 to 95%, duration 96 h   |
| 7. Temperature cycle            | Contact resistance of 70 mΩ or less, insulation resistance of 100 MΩ or greater, no damage, cracks, or parts looseness | Temperature: -55°C → 15 to 35°C → 85°C → 15 to 35°C<br>Time: 30 min. → 2 to 3 min. → 30 min. → 2 to 3 min. for 5 cycles                   |
| 8. Durability                   | Contact resistance of 70 mΩ or less<br>No damage, cracks, or parts looseness   | 50 times  |
| 9. Resistance to soldering heat | No melting of resin portion which affects performance  | Reflow: At the recommended temperature profile<br>Soldering iron temperature: 360°C for 5 seconds   |

Note 1: The term storage refers to an unused products prior to board mounting (including packing materials) that is being kept for a long period. The operating temperature and humidity range are suited to the non-conducting condition following board assembly.

Note 2: The aforementioned specifications are representative of this series. For information on specific parts, confirm with Sales Office.

Note 3: Information contained in this catalog represents general requirements for this Series. Contact us for the drawings and specifications for a specific part number shown.

## Materials

| Part          | Material        | Process     | Notes   |
|---------------|-----------------|-------------|---|
| Insulator     | LCP             | Beige       | UL94V-0   |
| Contacts      | Phosphor bronze | Header      | Engagement Area: Gold plating of 0.1μm<br>Termination Area: Tin plating   |
|               |                 | Receptacle  | Engagement Area: Gold plating of 0.1μm<br>Termination Area: Flash plating |
| Ground plate  | Phosphor bronze | Tin plating | _____   |
| Metal fitting | Phosphor bronze | Tin plating | _____   |

## Product Number Configuration

**FX10 # - \* P / \* - SV 1 (\*\*)**  

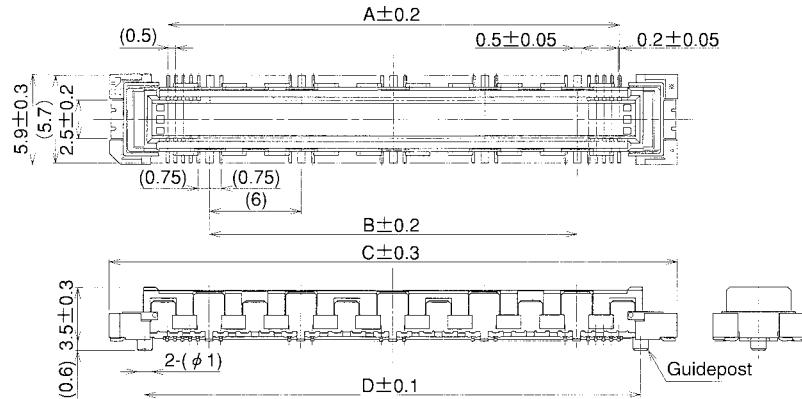
①
②
④
⑤
⑥
⑦
  

③

|   |   |
|---|---|
| <p>① Series name: FX10</p> <p>② Form Symbol<br/>A: With guide post<br/>B: Without guide post</p> <p>③ Number of contacts<br/> <input type="text" value="With ground plate"/><br/>                     Signal/Ground: 80/8, 100/10, 120/12, 140/14<br/> <input type="text" value="Without ground plate"/><br/>                     Signal: 96, 120, 144, 168</p> <p>④ Connector type<br/>P: Header<br/>S: Receptacle</p> | <p>⑤ Contact form<br/>SV: Straight SMT</p> <p>⑥ Product height<br/>Blank: Standard<br/>1 : Standard + 1mm</p> <p>⑦ Packaging classification<br/>Blank(71): Tray packaging<br/>(21), (91): Embossed tape packaging</p> |
|---|---|

## ■ Headers with ground plate

### ● 4mm Stacking Height



Unit: mm

| Part No.             | CL No.          | Number of Contacts |        | A    | B  | C    | D    | E    | F    | Remarks            | RoHS |
|----------------------|-----------------|--------------------|--------|------|----|------|------|------|------|--------------------|------|
|                      |                 | Signal             | Ground |      |    |      |      |      |      |                    |      |
| FX10A- 80P/ 8-SV(71) | CL570-0001-5-71 | 80                 | 8      | 23.5 | 18 | 31.1 | 26.4 | 31.5 | 28.3 | With guideposts    | YES  |
| FX10A-100P/10-SV(71) | CL570-0002-8-71 | 100                | 10     | 29.5 | 24 | 37.1 | 32.4 | 37.5 | 34.3 |                    |      |
| FX10A-120P/12-SV(71) | CL570-0003-0-71 | 120                | 12     | 35.5 | 30 | 43.1 | 38.4 | 43.5 | 40.3 |                    |      |
| FX10A-140P/14-SV(71) | CL570-0004-3-71 | 140                | 14     | 41.5 | 36 | 49.1 | 44.4 | 49.5 | 46.3 |                    |      |
| FX10B- 80P/ 8-SV(71) | CL570-0021-2-71 | 80                 | 8      | 23.5 | 18 | 31.1 | —    | 31.5 | 28.3 | Without guideposts |      |
| FX10B-100P/10-SV(71) | CL570-0022-5-71 | 100                | 10     | 29.5 | 24 | 37.1 | —    | 37.5 | 34.3 |                    |      |
| FX10B-120P/12-SV(71) | CL570-0023-8-71 | 120                | 12     | 35.5 | 30 | 43.1 | —    | 43.5 | 40.3 |                    |      |
| FX10B-140P/14-SV(71) | CL570-0024-0-71 | 140                | 14     | 41.5 | 36 | 49.1 | —    | 49.5 | 46.3 |                    |      |

[Specifications number] -\*\* , (\*\*)  
 (71): Tray packaging  
 (91): Embossed tape packaging

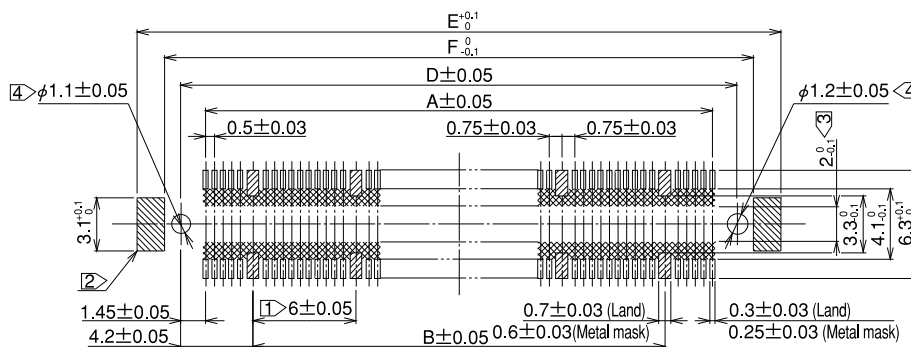
Note 1: There is no polarity in terms of board mounting for this product.

Note 2: The coplanarity of this product's SMT leads is 0.1mm or less.

Note 3: Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)


## ◆ Recommended Land Pattern Dimensions (Metal Mask Dimensions)

Recommended metal mask thickness: 0.15 mm



Note ① Cross-hatched portions, totaling n places, indicate the ground circuits.

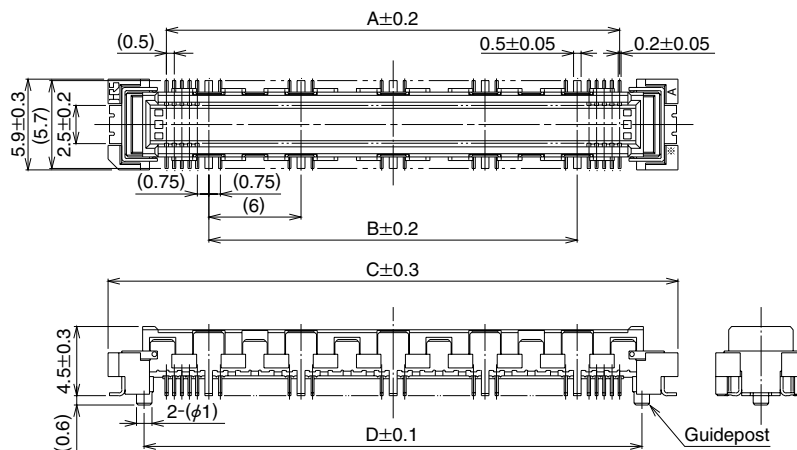
Note ② Cross-hatched portions, 2 places on both sides, indicate the metal fittings.

Note ③ The cross-hatched area  inside the SMT land may come into contact with the connector contacts and thus care should be taken that the pattern does not extend beyond the SMT land width.

Note ④ Not required in products without guideposts.

## ■Headers with ground plate

### ●5mm Stacking Height



Unit: mm

| Part No.              | CL No.          | Number of Contacts |        | A    | B  | C    | D    | E    | F    | Remarks            | RoHS |
|-----------------------|-----------------|--------------------|--------|------|----|------|------|------|------|--------------------|------|
|                       |                 | Signal             | Ground |      |    |      |      |      |      |                    |      |
| FX10A- 80P/ 8-SV1(71) | CL570-0101-0-71 | 80                 | 8      | 23.5 | 18 | 31.1 | 26.4 | 31.5 | 28.3 | With guideposts    | YES  |
| FX10A-100P/10-SV1(71) | CL570-0102-2-71 | 100                | 10     | 29.5 | 24 | 37.1 | 32.4 | 37.5 | 34.3 |                    |      |
| FX10A-120P/12-SV1(71) | CL570-0103-5-71 | 120                | 12     | 35.5 | 30 | 43.1 | 38.4 | 43.5 | 40.3 |                    |      |
| FX10A-140P/14-SV1(71) | CL570-0104-8-71 | 140                | 14     | 41.5 | 36 | 49.1 | 44.4 | 49.5 | 46.3 |                    |      |
| FX10B- 80P/ 8-SV1(71) | CL570-0121-7-71 | 80                 | 8      | 23.5 | 18 | 31.1 | —    | 31.5 | 28.3 | Without guideposts |      |
| FX10B-100P/10-SV1(71) | CL570-0122-0-71 | 100                | 10     | 29.5 | 24 | 37.1 | —    | 37.5 | 34.3 |                    |      |
| FX10B-120P/12-SV1(71) | CL570-0123-2-71 | 120                | 12     | 35.5 | 30 | 43.1 | —    | 43.5 | 40.3 |                    |      |
| FX10B-140P/14-SV1(71) | CL570-0124-5-71 | 140                | 14     | 41.5 | 36 | 49.1 | —    | 49.5 | 46.3 |                    |      |

[Specifications number] - \* \*, (\* \*)  
 (71): Tray packaging  
 (91): Embossed tape packaging

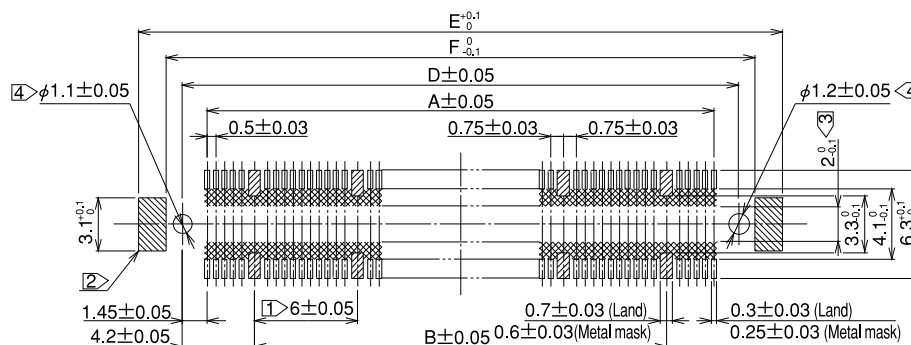
Note 1: There is no polarity in terms of board mounting for this product.

Note 2: The coplanarity of this product's SMT leads is 0.1 mm or less.

Note 3: Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

## ◆Recommended Land Pattern Dimensions (Metal Mask Dimensions)

Recommended metal mask thickness: 0.15 mm



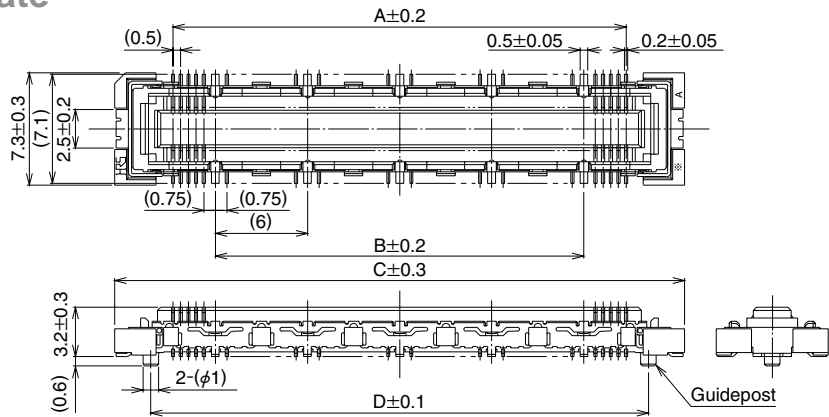
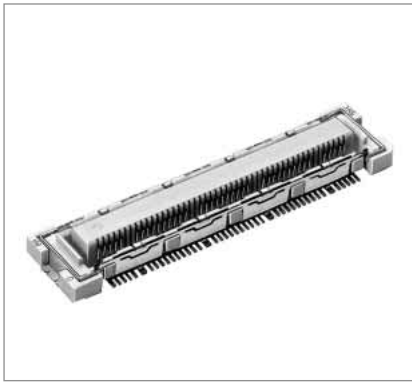
Note ① Cross-hatched portions, totaling n places, indicate the ground circuits.

② Cross-hatched portions, 2 places on both sides, indicate the metal fittings.

③ The cross-hatched area inside the SMT land may come into contact with the connector contacts and thus care should be taken that the pattern does not extend beyond the SMT land width.

④ Not required in products without guideposts.

## ■Receptacles with ground plate



Unit: mm

| Part No.             | CL No.          | Number of Contacts |        | A    | B  | C    | D    | E    | F    | Remarks            | RoHS |     |
|----------------------|-----------------|--------------------|--------|------|----|------|------|------|------|--------------------|------|-----|
|                      |                 | Signal             | Ground |      |    |      |      |      |      |                    |      |     |
| FX10A- 80S/ 8-SV(71) | CL570-0201-4-71 | 80                 | 8      | 23.5 | 18 | 31.1 | 26.4 | 31.5 | 28.3 | With guideposts    | YES  |     |
| FX10A-100S/10-SV(71) | CL570-0202-7-71 | 100                | 10     | 29.5 | 24 | 37.1 | 32.4 | 37.5 | 34.3 |                    |      |     |
| FX10A-120S/12-SV(71) | CL570-0203-0-71 | 120                | 12     | 35.5 | 30 | 43.1 | 38.4 | 43.5 | 40.3 |                    |      |     |
| FX10A-140S/14-SV(71) | CL570-0204-2-71 | 140                | 14     | 41.5 | 36 | 49.1 | 44.4 | 49.5 | 46.3 |                    |      |     |
| FX10B- 80S/ 8-SV(71) | CL570-0221-1-71 | 80                 | 8      | 23.5 | 18 | 31.1 | —    | 31.5 | 28.3 | Without guideposts |      | YES |
| FX10B-100S/10-SV(71) | CL570-0222-4-71 | 100                | 10     | 29.5 | 24 | 37.1 | —    | 37.5 | 34.3 |                    |      |     |
| FX10B-120S/12-SV(71) | CL570-0223-7-71 | 120                | 12     | 35.5 | 30 | 43.1 | —    | 43.5 | 40.3 |                    |      |     |
| FX10B-140S/14-SV(71) | CL570-0224-0-71 | 140                | 14     | 41.5 | 36 | 49.1 | —    | 49.5 | 46.3 |                    |      |     |

[Specifications number]- \*\*,(\*\*)  
 (71): Tray packaging  
 (91): Embossed tape packaging

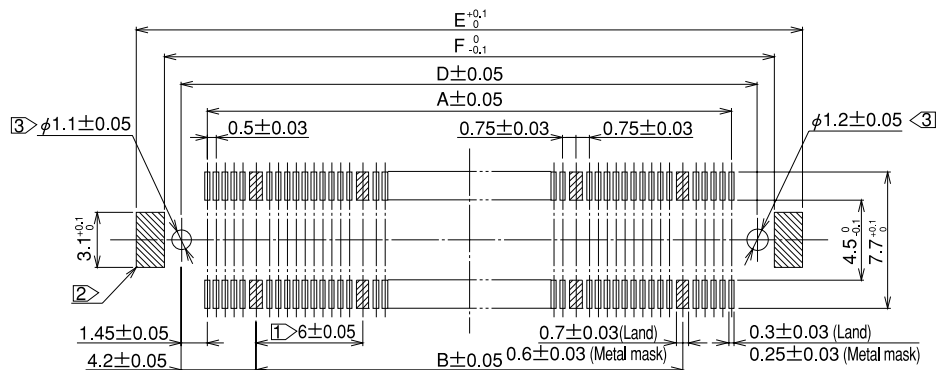
Note 1: There is no polarity in terms of board mounting for this product.

Note 2: The coplanarity of this product's SMT leads is 0.1 mm or less.

Note 3: Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

## ◆Recommended Land Pattern Dimensions (Metal Mask Dimensions)

Recommended metal mask thickness: 0.15 mm



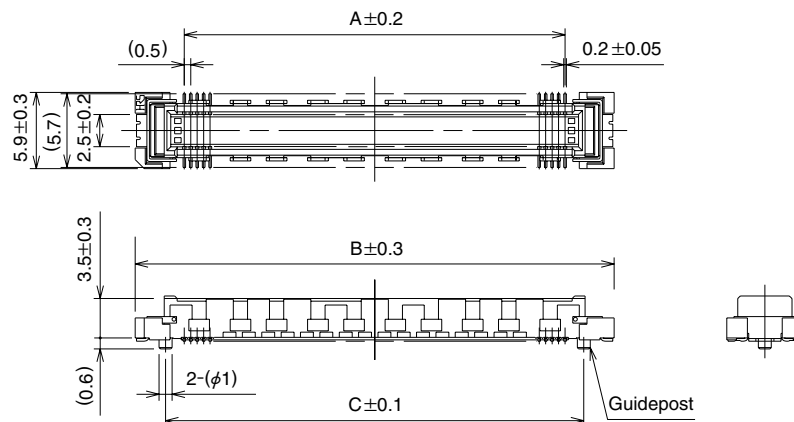
Note ① Cross-hatched portions, totaling n places, indicate the ground circuits.

Note ② Cross-hatched portions, 2 places on both sides, indicate the metal fittings.

Note ③ Not required in products without guideposts.

## ■ Headers without ground plate

### ●4mm Stacking Height



Unit: mm

| Part No.          | CL No.          | Number of Contacts | A    | B    | C    | D    | E    | Remarks            | RoHS |
|-------------------|-----------------|--------------------|------|------|------|------|------|--------------------|------|
|                   |                 | Signal             |      |      |      |      |      |                    |      |
| FX10A- 96P-SV(71) | CL570-0041-0-71 | 96                 | 23.5 | 31.1 | 26.4 | 31.5 | 28.3 | With guideposts    | YES  |
| FX10A-120P-SV(71) | CL570-0042-2-71 | 120                | 29.5 | 37.1 | 32.4 | 37.5 | 34.3 |                    |      |
| FX10A-144P-SV(71) | CL570-0043-5-71 | 144                | 35.5 | 43.1 | 38.4 | 43.5 | 40.3 |                    |      |
| FX10A-168P-SV(71) | CL570-0044-8-71 | 168                | 41.5 | 49.1 | 44.4 | 49.5 | 46.3 |                    |      |
| FX10B- 96P-SV(71) | CL570-0051-3-71 | 96                 | 23.5 | 31.1 | —    | 31.5 | 28.3 | Without guideposts |      |
| FX10B-120P-SV(71) | CL570-0052-6-71 | 120                | 29.5 | 37.1 | —    | 37.5 | 34.3 |                    |      |
| FX10B-144P-SV(71) | CL570-0053-9-71 | 144                | 35.5 | 43.1 | —    | 43.5 | 40.3 |                    |      |
| FX10B-168P-SV(71) | CL570-0054-1-71 | 168                | 41.5 | 49.1 | —    | 49.5 | 46.3 |                    |      |

[Specifications number]- \*\*>(\* \*)  
 (71): Tray packaging  
 (91): Embossed tape packaging

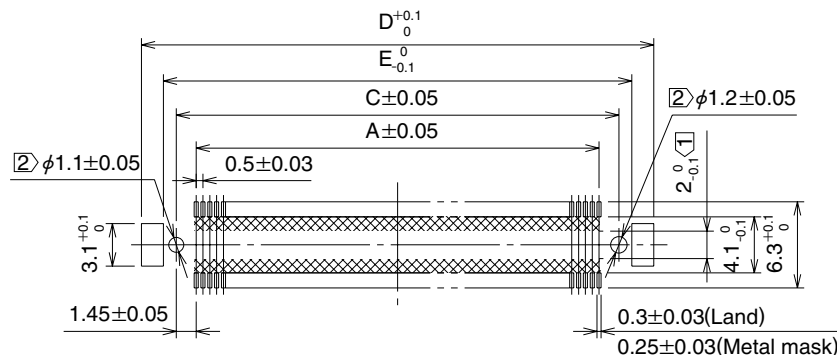
Note 1: There is no polarity in terms of board mounting for this product.

Note 2: The coplanarity of this product's SMT leads is 0.1 mm or less.

Note 3: Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

## ◆Recommended Land Pattern Dimensions (Metal Mask Dimensions)

Recommended metal mask thickness: 0.15 mm



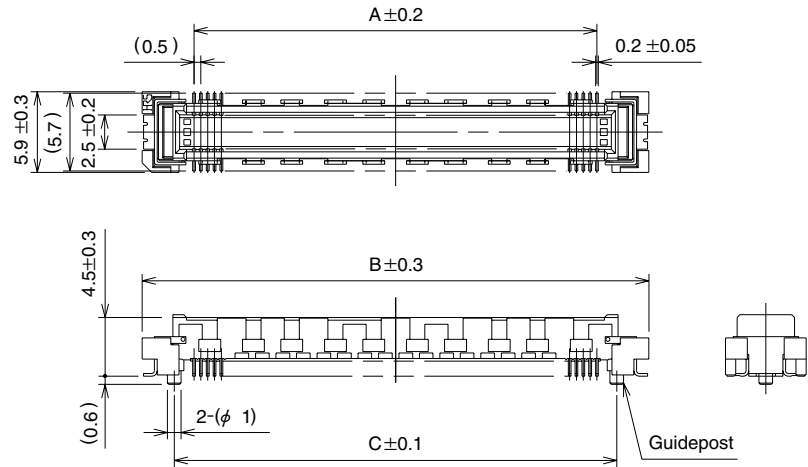
Note ① The cross-hatched area inside the SMT land may come into contact with the connector contacts and thus care should be taken that the pattern does not extend beyond the SMT land width.

Note ② Not required in products without guideposts.



## ■ Headers without ground plate

### ● 5mm Stacking Height



Unit: mm

| Part No.           | CL No.          | Number of Contacts | A    | B    | C    | D    | E    | Remarks            | RoHS |
|--------------------|-----------------|--------------------|------|------|------|------|------|--------------------|------|
|                    |                 | Signal             |      |      |      |      |      |                    |      |
| FX10A- 96P-SV1(71) | CL570-0141-4-71 | 96                 | 23.5 | 31.1 | 26.4 | 31.5 | 28.3 | With guideposts    | YES  |
| FX10A-120P-SV1(71) | CL570-0142-7-71 | 120                | 29.5 | 37.1 | 32.4 | 37.5 | 34.3 |                    |      |
| FX10A-144P-SV1(71) | CL570-0143-0-71 | 144                | 35.5 | 43.1 | 38.4 | 43.5 | 40.3 |                    |      |
| FX10A-168P-SV1(71) | CL570-0144-2-71 | 168                | 41.5 | 49.1 | 44.4 | 49.5 | 46.3 |                    |      |
| FX10B- 96P-SV1(71) | CL570-0151-8-71 | 96                 | 23.5 | 31.1 | —    | 31.5 | 28.3 | Without guideposts |      |
| FX10B-120P-SV1(71) | CL570-0152-0-71 | 120                | 29.5 | 37.1 | —    | 37.5 | 34.3 |                    |      |
| FX10B-144P-SV1(71) | CL570-0153-3-71 | 144                | 35.5 | 43.1 | —    | 43.5 | 40.3 |                    |      |
| FX10B-168P-SV1(71) | CL570-0154-6-71 | 168                | 41.5 | 49.1 | —    | 49.5 | 46.3 |                    |      |

[Specifications number]- \*\*>(\* \*)  
 (71): Tray packaging  
 (91): Embossed tape packaging

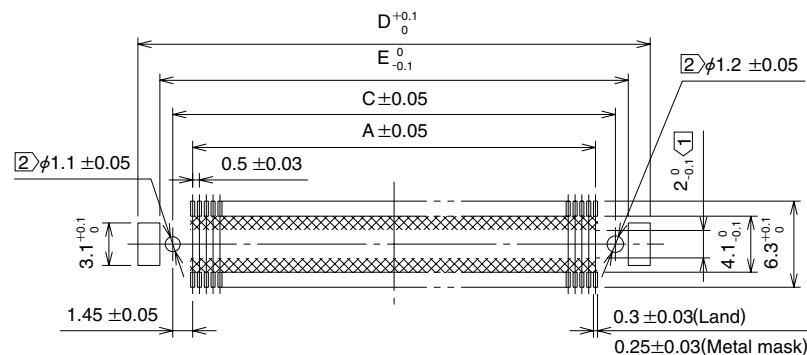
Note 1: There is no polarity in terms of board mounting for this product.

Note 2: The coplanarity of this product's SMT leads is 0.1 mm or less.

Note 3: Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

## ◆ Recommended Land Pattern Dimensions (Metal Mask Dimensions)

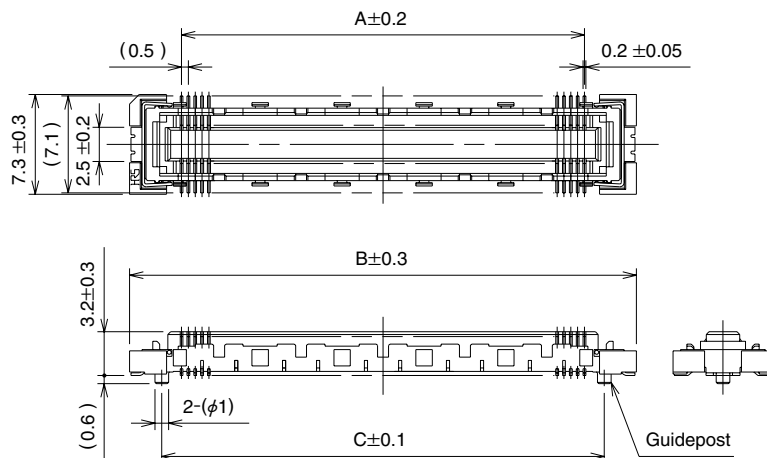
Recommended metal mask thickness: 0.15 mm



Note ① The cross-hatched area inside the SMT land may come into contact with the connector contacts and thus care should be taken that the pattern does not extend beyond the SMT land width.

Note ② Not required in products without guideposts.

## ■ Receptacles without ground plate



Unit: mm

| Part No.          | CL No.           | Number of Contacts | A    | B    | C    | D    | E    | Remarks            | RoHS |
|-------------------|------------------|--------------------|------|------|------|------|------|--------------------|------|
|                   |                  | Signal             |      |      |      |      |      |                    |      |
| FX10A- 96S-SV(**) | CL570-0241-9-**- | 96                 | 23.5 | 31.1 | 26.4 | 31.5 | 28.3 | With guideposts    | YES  |
| FX10A-120S-SV(**) | CL570-0242-1-**- | 120                | 29.5 | 37.1 | 32.4 | 37.5 | 34.3 |                    |      |
| FX10A-144S-SV(**) | CL570-0243-4-**- | 144                | 35.5 | 43.1 | 38.4 | 43.5 | 40.3 |                    |      |
| FX10A-168S-SV(**) | CL570-0244-7-**- | 168                | 41.5 | 49.1 | 44.4 | 49.5 | 46.3 |                    |      |
| FX10B- 96S-SV(**) | CL570-0251-2-**- | 96                 | 23.5 | 31.1 | —    | 31.5 | 28.3 | Without guideposts |      |
| FX10B-120S-SV(**) | CL570-0252-5-**- | 120                | 29.5 | 37.1 | —    | 37.5 | 34.3 |                    |      |
| FX10B-144S-SV(**) | CL570-0253-8-**- | 144                | 35.5 | 43.1 | —    | 43.5 | 40.3 |                    |      |
| FX10B-168S-SV(**) | CL570-0254-0-**- | 168                | 41.5 | 49.1 | —    | 49.5 | 46.3 |                    |      |

[Specifications number]- \*\*,(\*\*)  
 Blank: Tray packaging  
 (21) : Embossed tape packaging

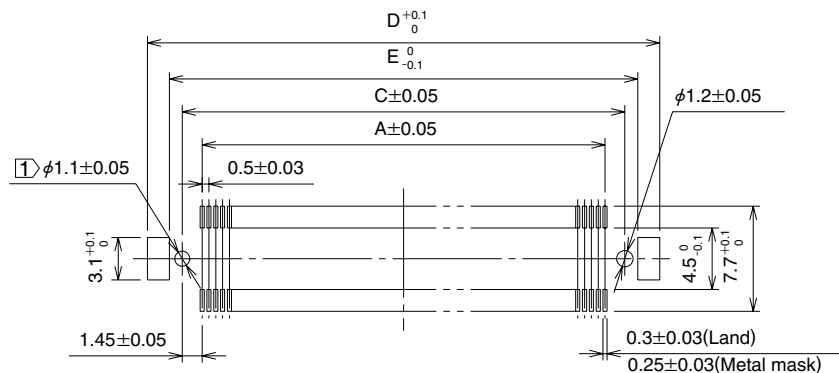
Note 1: There is no polarity in terms of board mounting for this product.

Note 2: The coplanarity of this product's SMT leads is 0.1 mm or less.

Note 3: Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

## ◆ Recommended Land Pattern Dimensions (Metal Mask Dimensions)

Recommended metal mask thickness: 0.15 mm

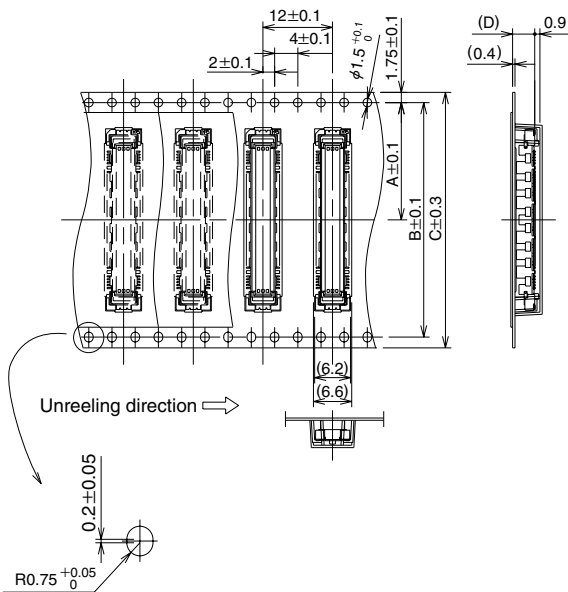


Note ① Not required in products without guideposts.

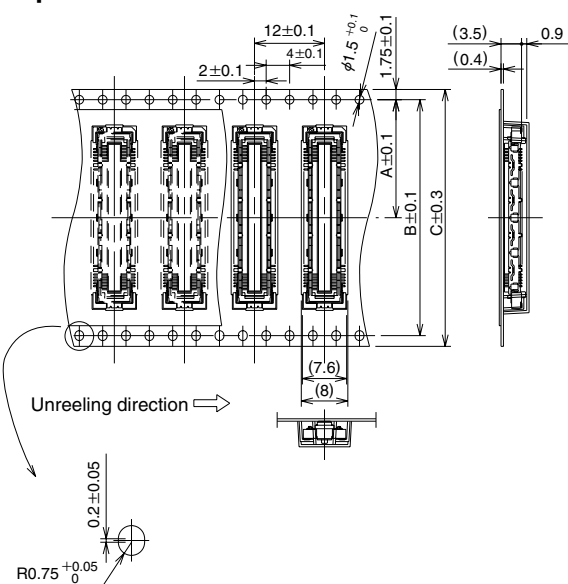


## ◆ Embossed Carrier Tape Dimensions

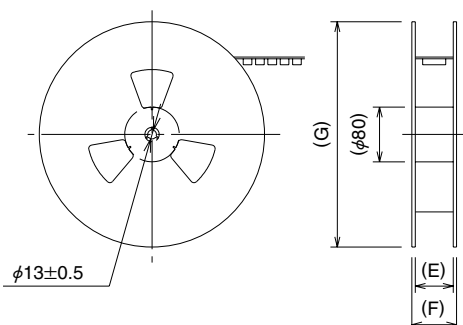
### ● Headers



### ● Receptacles



### ● Reel Dimensions



Unit: mm

| Insertion Connector | A    | B    | C  | D    | E    | F    | G   |
|---------------------|------|------|----|------|------|------|-----|
| FX10#- 80P/ 8-SV1   | 20.2 | 40.4 | 44 | 3.8  | 45.5 | 50.5 | 330 |
| FX10#-100P/10-SV1   | 26.2 | 52.4 | 56 |      | 59   | 64   |     |
| FX10#-120P/12-SV1   |      |      |    |      | 76.5 | 81.5 |     |
| FX10#-140P/14-SV1   | 34.2 | 68.4 | 72 |      | 45.5 | 50.5 |     |
| FX10#-196P/ -SV1    | 20.2 | 40.4 | 44 |      | 59   | 64   |     |
| FX10#-120P/ -SV1    | 26.2 | 52.4 | 56 |      | 76.5 | 81.5 |     |
| FX10#-144P/ -SV1    | 34.2 | 68.4 | 72 | 4.8  | 45.5 | 50.5 | 370 |
| FX10#- 80P/ 8-SV1   | 20.2 | 40.4 | 44 |      | 59   | 64   |     |
| FX10#-100P/10-SV1   |      |      |    |      | 76.5 | 81.5 |     |
| FX10#-120P/12-SV1   | 26.2 | 52.4 | 56 |      | 45.5 | 50.5 |     |
| FX10#-140P/14-SV1   | 34.2 | 68.4 | 72 |      | 59   | 64   |     |
| FX10#-196P/ -SV1    | 20.2 | 40.4 | 44 |      | 76.5 | 81.5 |     |
| FX10#-120P/ -SV1    | 26.2 | 52.4 | 56 | 3.8  | 45.5 | 50.5 | 330 |
| FX10#-144P/ -SV1    | 34.2 | 68.4 | 72 |      | 59   | 64   |     |
| FX10#-168P/ -SV1    | 34.2 | 68.4 | 72 | 76.5 | 81.5 |      |     |

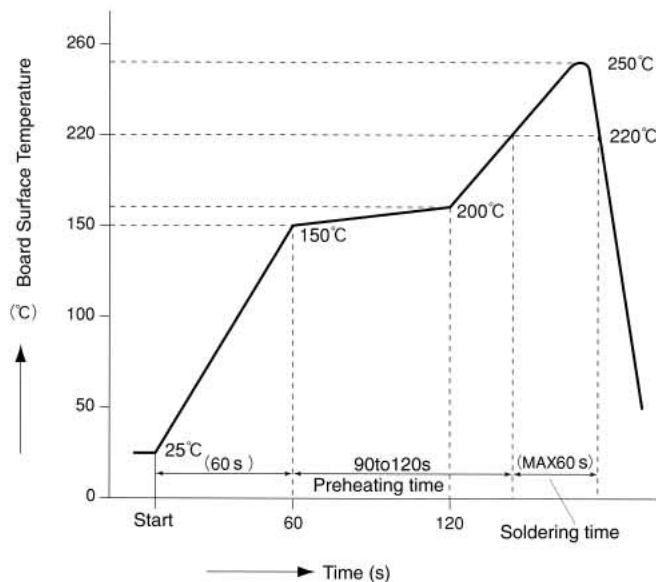
Note: There is no polarity in terms of embossed tape packaging for this product.

Unit: mm

| Insertion Connector | A    | B    | C  | E    | F    | G   |
|---------------------|------|------|----|------|------|-----|
| FX10#- 80P/ 8-SV1   | 20.2 | 40.4 | 44 | 45.5 | 50.5 | 330 |
| FX10#-100P/10-SV1   | 26.2 | 52.4 | 56 | 59   | 64   |     |
| FX10#-120P/12-SV1   |      |      |    | 76.5 | 81.5 |     |
| FX10#-140P/14-SV1   | 20.2 | 40.4 | 44 | 45.5 | 50.5 |     |
| FX10#-196P/ -SV1    | 26.2 | 52.4 | 56 | 59   | 64   |     |
| FX10#-120P/ -SV1    | 34.2 | 68.4 | 72 | 76.5 | 81.5 |     |
| FX10#-144P/ -SV1    | 34.2 | 68.4 | 72 | 76.5 | 81.5 |     |

Note: There is no polarity in terms of embossed tape packaging for this product.

## ◆ Recommended Temperature Profile



### HRS test Conditions

Test board Glass epoxy 161mm×100mm×1.6mm thick  
 Solder method :Reflow  
 Solder composition :Paste, 96.5%Sn/3%Ag/0.5%Cu  
 Metal mask :0.15mm thick  
 Reflow cycles :2 cycles

The 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.

## ◆ Washing Conditions

### Organic Solvent Washing

| Solvent                           | Room temperature washing | Heated washing |
|-----------------------------------|--------------------------|----------------|
| IPA<br>(Isopropyl alcohol)        | Yes                      | Yes            |
| HCFC<br>(Hydrochlorofluorocarbon) | Yes                      | Yes            |

### Water Type Washing

When using water type cleaning agents (e.g., terpene, and alkali saponifiers), select the cleaning agent based on the documentation issued by the various manufacturers of cleaning agents which describes the effects on metals and resins. Be careful that parts are not left with moisture remaining on them.

### Washing Precautions

Residual flux or cleaning agent on the contacts when washing with organic solvents or water type cleaners can give rise to the deterioration of electrical performance. In this regard it is important to check whether a thorough washing has been performed.

## ◆ Connector Handling Precautions

### 1. Allowable Creepage Dimensions at Time of Mating

The effective mating length of this product is 1.1 mm for the signal portion and 1 mm for the ground portion. The creepage of the header and receptacle at the time of mating should be within 0.5 mm of the completely mating condition.

### 2. Retension of Boards

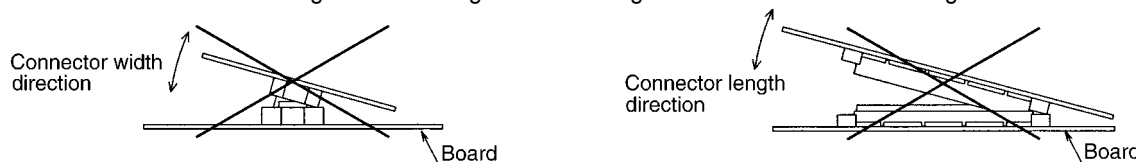
Avoid the support of boards by connectors alone and adopt a locking measure that does not rely on the connectors.

### 3. Solder Repair

Flux may rise as far as the contact portion of the connector depending on the flux coating and other factors at the time of repair. This will cause poor contact reliability; therefore, before use, the aforementioned washing conditions should be taken into consideration prior to connector washing.

### 4. Miscellaneous

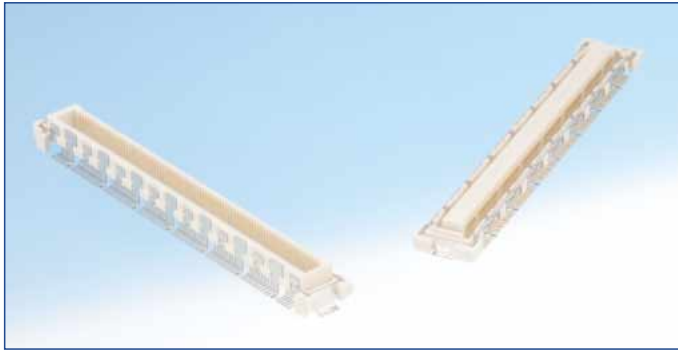
·Note that excessive twisting while inserting or withdrawing connectors will cause damage.



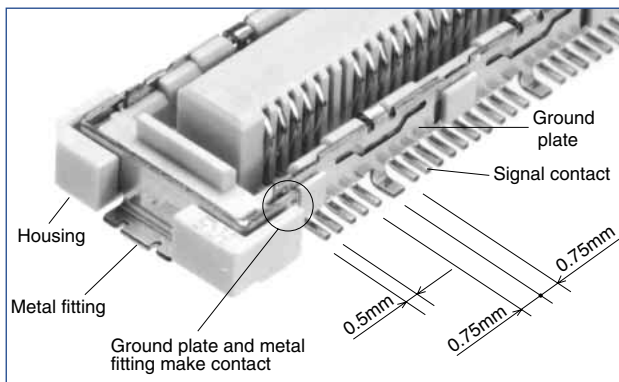
·The shade of the molded items may vary somewhat depending on the manufacturing lot; however, this does not affect performance.

# 10<sup>+</sup>Gbps 0.5mm pitch Stacking Connectors

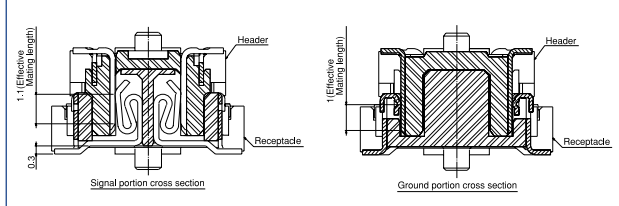
**FX10 Series** Electrical Interface for the OIF 100G Long-Haul DWDM Transmission Module (MSA-100GLH)



## With GND Plate Type



### Cut Section



## Mechanical Features

- **0.5mm Pitch**
- **Stacking Height : 4 ~ 8mm**
- **Number of Contacts**  
With ground plate type : 80 / 100 / 120 / 140  
Without ground plate type : 96 / 120 / 144 / 168
- **Improved Transmission Efficiency Between Boards**

Transmission characteristics have been improved through a design that fixes ground plates to both sides of the header and receptacle.

### 10 Signal:1 Ground Arrangement

Signal and ground are arranged in a ratio of 10:1 with the ground plate SMT connected to the board. The ground stability achieved serves to reduce noise.

### Metal Fittings for Added Solder Weld Strength

Metal fittings provide greater adhesion to the board, protecting against peeling. The unique connector design provides a connection between the fitting and the ground plate for a stronger ground.

### Suited to High-Density Applications

The signal contact pitch of 0.5 mm produces a smaller connector utilizing less board area for mounting.

### High contact reliability

Effective mating length is 1.1 mm for signal contacts.

### Optional Ground Plate

An alternate style without the ground plate is available. The space provided by the ground plate removal has been filled with additional signal contacts.

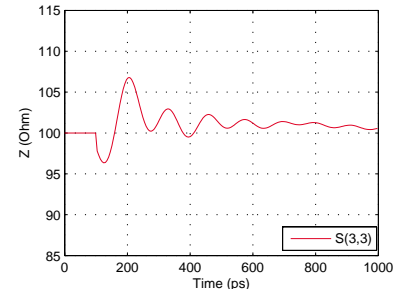
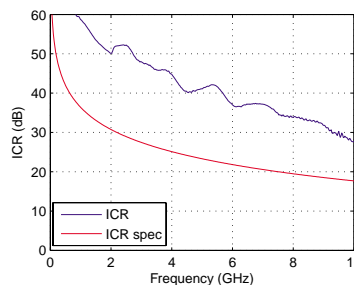
## Signal Integrity Features

### Insertion-Loss-to-Crosstalk-Ratio(ICR)

The insertion-loss-to-crosstalk-ratio (ICR) with five-aggressor differential FEXT meets the extrapolated IEEE 802.3ap specification for 10<sup>+</sup>Gbps.

### Differential Impedance

The differential impedance is within 100 +/- 10 ohms at 30ps rise time (20% to 80%).



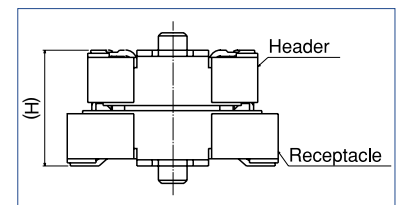
## Stack Height

### With ground plate

|             |               |                |
|-------------|---------------|----------------|
| Headers     | FX10#-*P/*-SV | FX10#-*P/*-SV1 |
| Receptacles | FX10#-*S/*-SV | 4mm / 5mm      |

### Without ground plate

|             |             |             |                |                |                |
|-------------|-------------|-------------|----------------|----------------|----------------|
| Headers     | FX10#-*P-SV | FX10-*P-SV1 | FX10#-168P-SV2 | FX10#-168P-SV3 | FX10#-168P-SV4 |
| Receptacles | FX10#-*S-SV | 4mm         | 5mm            | 6mm            | 7mm / 8mm      |



(H):Reference dimension

# MSA-100GLH Electrical Interface



## Product Specifications (Rating)

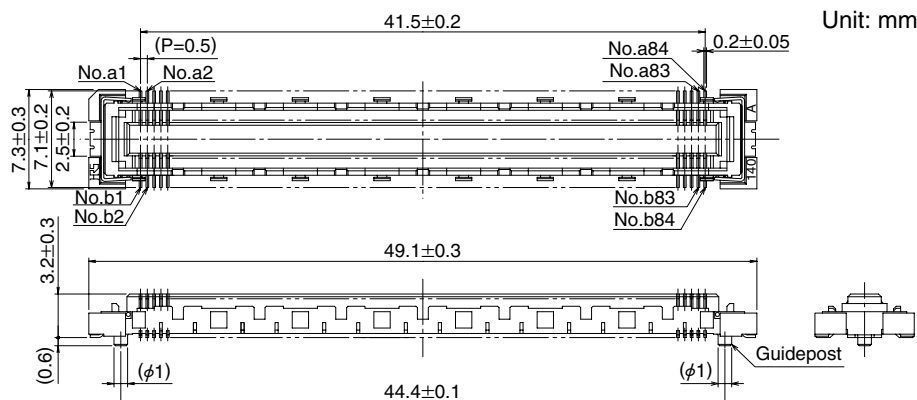
|        |               |                   |                             |   |                           |                       |
|--------|---------------|-------------------|-----------------------------|---|---------------------------|-----------------------|
| Rating | Rated current | Note 1<br>50 V AC | Operating temperature range | -55 to 85°C                                 | Storage temperature range | -40 to +60°C (Note 2) |
|        | Rated voltage |                   | Operating humidity range    | Relative humidity 95% max (No condensation) | Storage humidity range    | 40 to 70% (Note 2)    |

Note 1: Refer to FX10-168pin derating curves from test reports TR570E-20587.

Note 2: The term storage refers to an unused products prior to board mounting (including packing materials) that is being kept for a long period. The operating temperature and humidity range are suited to the non-conducting condition following board assembly.

Note 3: Other information are shown in General Product Specifications.

## Receptacles without ground plate



| Part No.           | CL No.        | Number of Contacts | Remarks            |
|--------------------|---------------|--------------------|--------------------|
|                    |               | Signal             |                    |
| FX10A-168S-SV (**) | 570-0244-7-** | 168                | With guideposts    |
| FX10B-168S-SV (**) | 570-0254-0-** |                    | Without guideposts |

[Specifications number] -\*\* , (\*\*)

(83): Embossed tape packaging / AuP 0.76μm

(93): Tray packaging / AuP 0.76μm

Note 1: There is no polarity in terms of board mounting for this product.

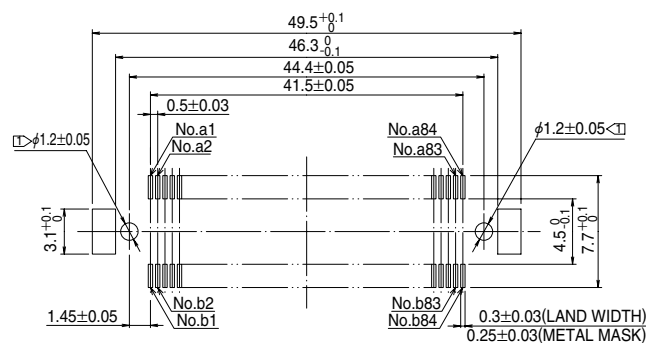
Note 2: The coplanarity of this product's SMT leads is 0.1 mm or less.

Note 3: Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

Note 4: Using multiple connectors between identical boards is not recommended.

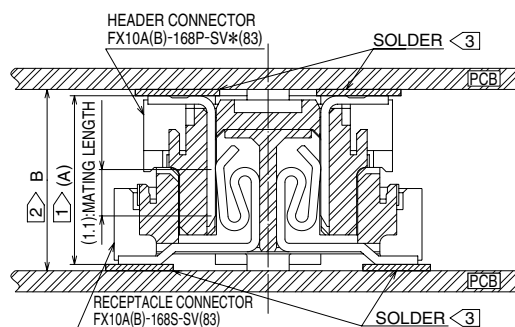
## Recommended Land Pattern Dimensions (Metal Mask Dimensions)

Recommended metal mask thickness: 0.15mm



Note ① Not required in products without guideposts.

## Board-to-Board Distance



|                       | FX10A(B)-168S-SV(83) |           |
|-----------------------|----------------------|-----------|
|                       | ① > (A)              | ② > B     |
| FX10A(B)-168P-SV(83)  | 4                    | 4.3±0.127 |
| FX10A(B)-168P-SV1(83) | 5                    | 5.3±0.127 |
| FX10A(B)-168P-SV2(83) | 6                    | 6.0±0.127 |
| FX10A(B)-168P-SV3(83) | 7                    | 7.0±0.127 |
| FX10A(B)-168P-SV4(83) | 8                    | 8.0±0.127 |

Note ① Stacking height from lead to lead (reference dimensions)

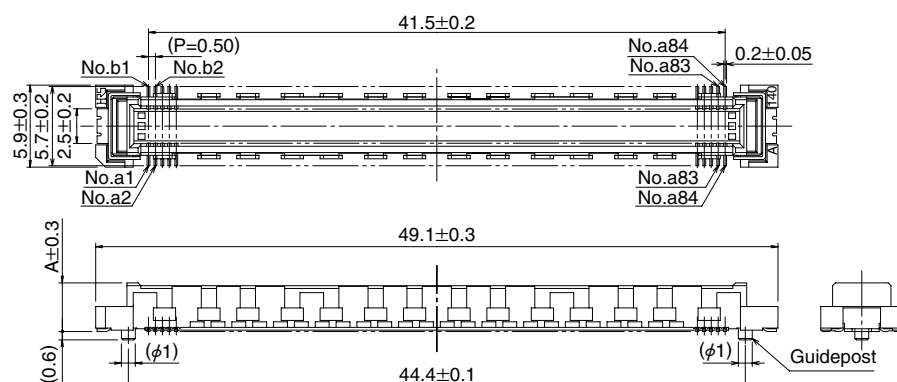
② Board-to-board distance

③ Stencil (metal mask) shall be based on Hirose's recommended aperture and thickness.

# MSA-100GLH Electrical Interface



## ■Headers without ground plate



Unit: mm

| Part No.            | CL No.           | Number of Contacts | A    | Quantity/Reel<br>(Note 3) | Remarks            |
|---------------------|------------------|--------------------|------|---------------------------|--------------------|
|                     |                  | Signal             |      |                           |                    |
| FX10A-168P-SV (**)  | 570-0044-8- (**) | 168                | 3.5  | 1,000                     | With guideposts    |
| FX10A-168P-SV1 (**) | 570-0144-2- (**) |                    | 4.5  | 1,000                     |                    |
| FX10A-168P-SV2 (**) | 570-0302-1- (**) |                    | 5.25 | 900                       |                    |
| FX10A-168P-SV3 (**) | 570-0304-7- (**) |                    | 6.25 | 800                       |                    |
| FX10A-168P-SV4 (**) | 570-0306-2- (**) |                    | 7.25 | 700                       | Without guideposts |
| FX10B-168P-SV (**)  | 570-0054-1- (**) |                    | 3.5  | 1,000                     |                    |
| FX10B-168P-SV1 (**) | 570-0154-6- (**) |                    | 4.5  | 1,000                     |                    |
| FX10B-168P-SV2 (**) | 570-0303-4- (**) |                    | 5.25 | 900                       |                    |
| FX10B-168P-SV3 (**) | 570-0305-0- (**) |                    | 6.25 | 800                       |                    |
| FX10B-168P-SV4 (**) | 570-0307-5- (**) |                    | 7.25 | 700                       |                    |

[Specifications number] -\*, (\*\*)  
 (83): Embossed tape packaging / AuP 0.76μm (93): Tray packaging / AuP 0.76μm

Note 1: There is no polarity in terms of board mounting for this product.

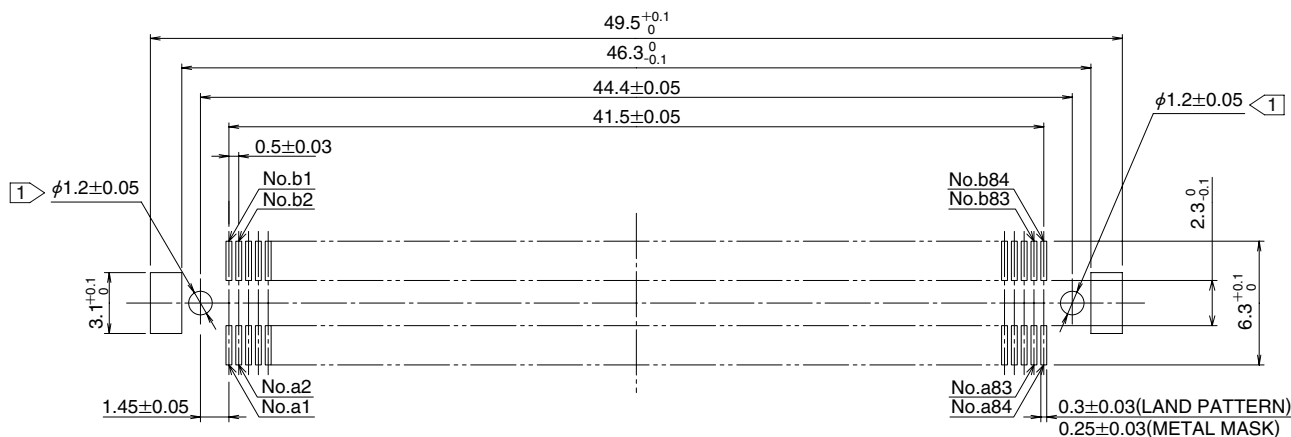
Note 2: The coplanarity of this product's SMT leads is 0.1 mm or less.

Note 3: Please order embossed tape packaged items by the reel.

Note 4: Using multiple connectors between identical boards is not recommended.

## ■Recommended Land Pattern Dimensions (Metal Mask Dimensions)

Recommended metal mask thickness: 0.15 mm

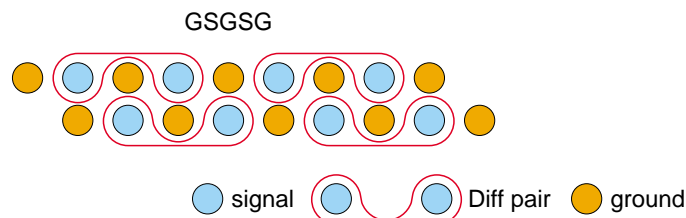


Note 1) Not required in products without guideposts.

## Signal integrity

### Pin assignment

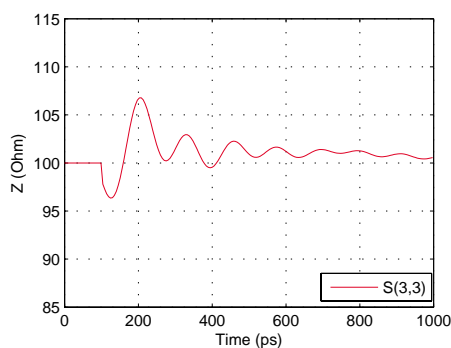
To match 100 ohm differential impedance and to reduce crosstalk, a staggered GSGSG pin assignment is recommended. (G=ground and S=signal)



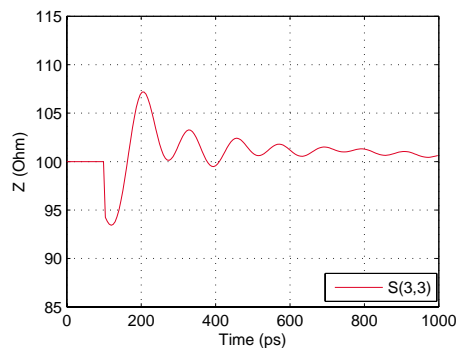
### Impedance

The differential impedance is 100 +/- 10 ohm for FX10 at 30 ps rise time (20% to 80%).

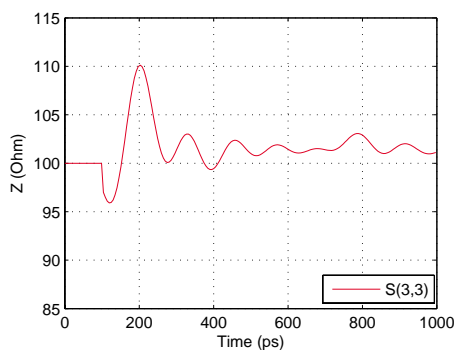
4 mm (without GND)



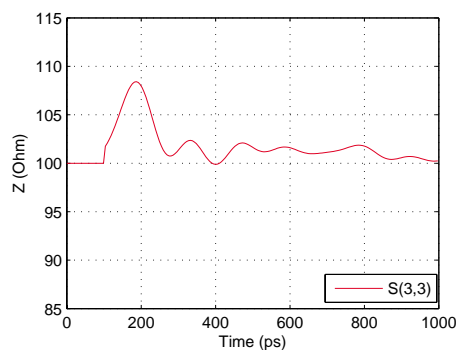
5 mm (without GND)



4 mm (with GND)



5 mm (with GND)



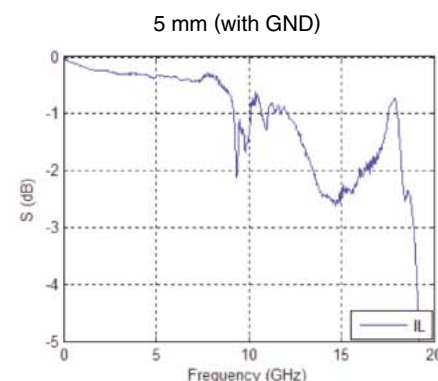
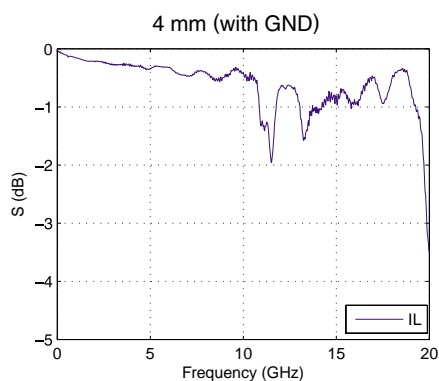
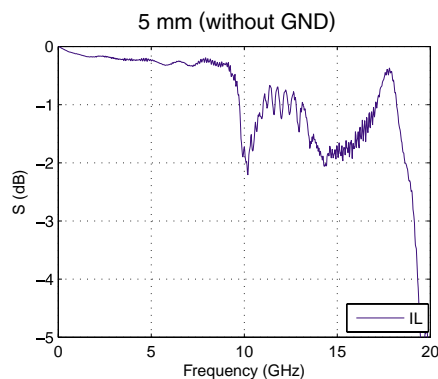
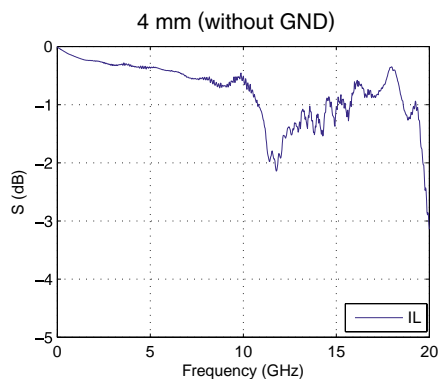
### Propagation delay

The propagation delay is 62 and 67 ps for FX10 of 4mm and 5mm height (with and without GND), respectively.



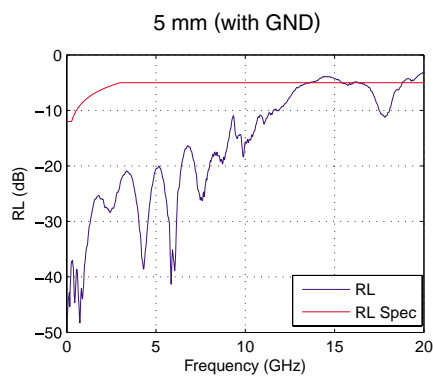
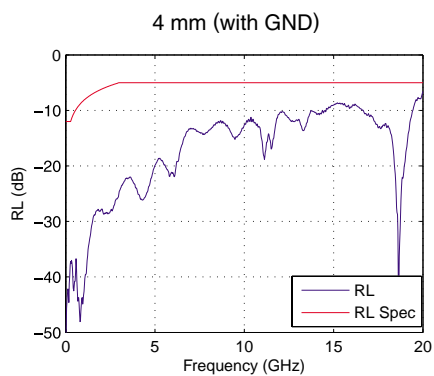
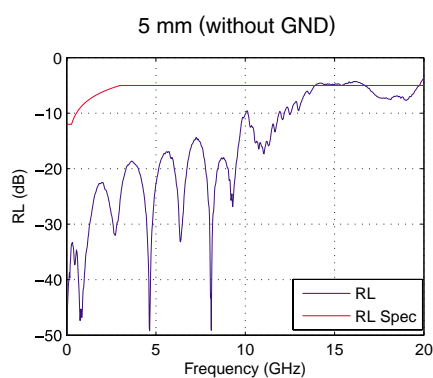
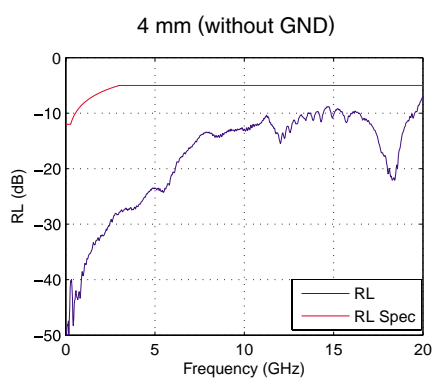
### ● Insertion loss

The differential insertion loss crosses 1 dB at 10.8 and 9.2 GHz for FX10 of 4mm and 5mm height, respectively.



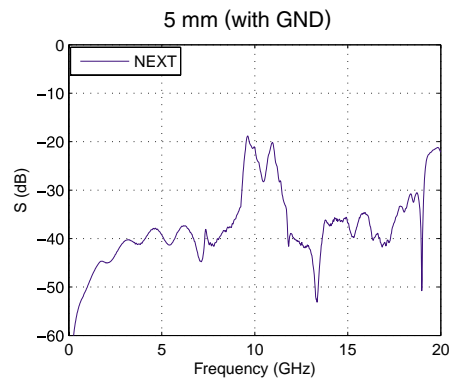
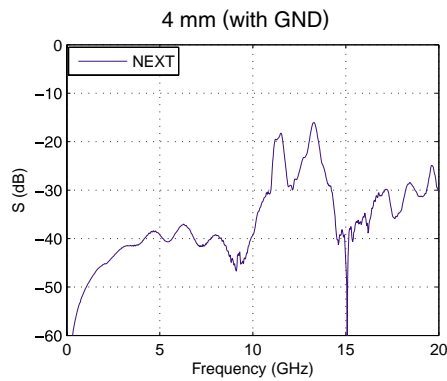
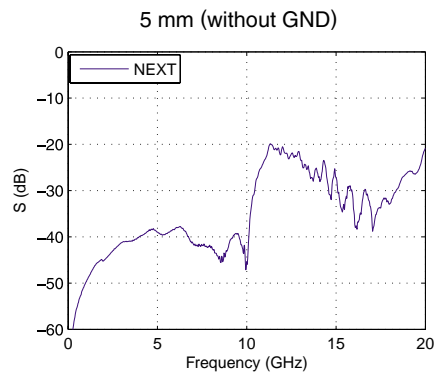
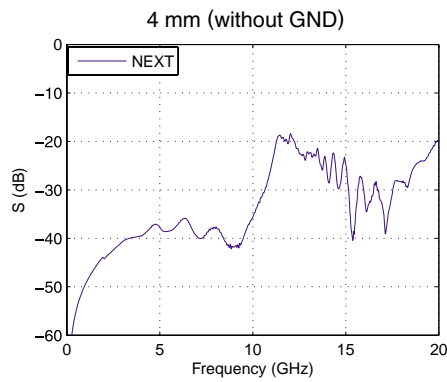
### ● Return loss

The differential return loss meets the IEEE 802.3ap specification to 20+ and 13.5 GHz for FX10 of 4mm and 5mm height, respectively.



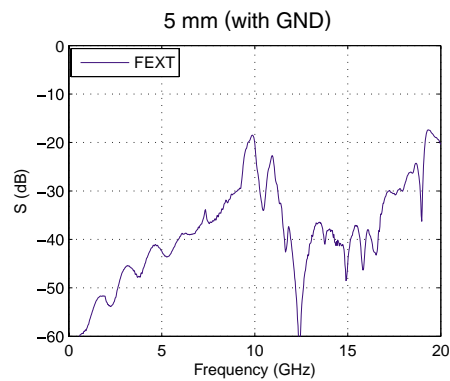
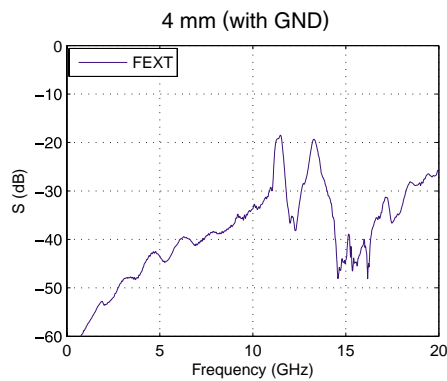
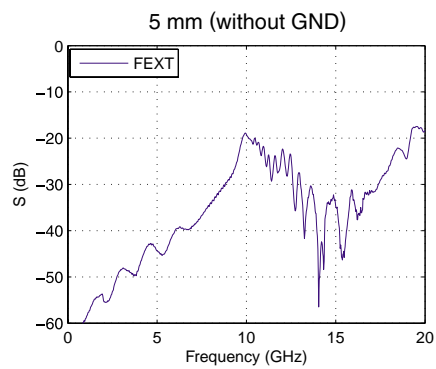
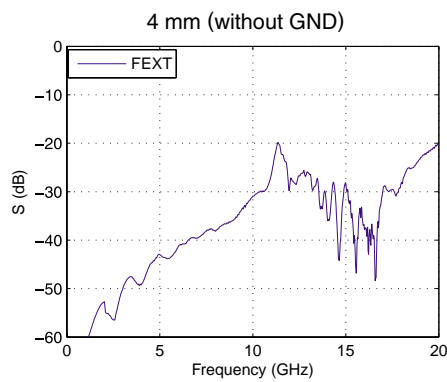
### ● Near-end crosstalk (NEXT)

The staggered GSGSG pin assignment results in low differential NEXT between neighboring pairs.



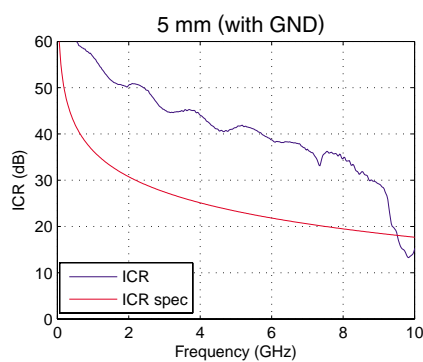
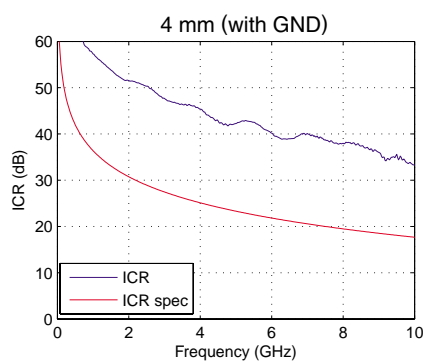
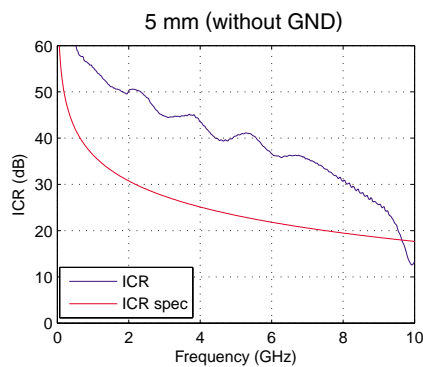
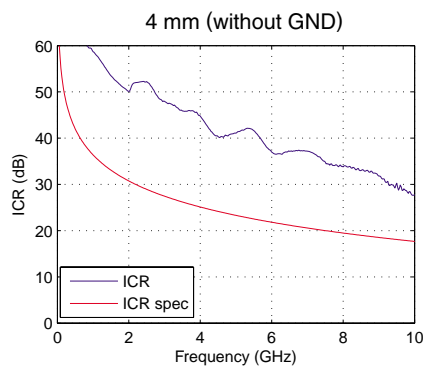
### ● Far-end crosstalk (FEXT)

The staggered GSGSG pin assignment results in low differential FEXT between neighboring pairs.



### ● Insertion-loss-to-crosstalk ratio (ICR)

The insertion-loss-to-crosstalk ratio (ICR) with five-aggressor differential FEXT meets the extrapolated IEEE 802.3ap specification to 10+ Gbps.



## General Product Specifications

|        |               |         |                             |  |                           |                       |
|--------|---------------|---------|-----------------------------|--|---------------------------|-----------------------|
| Rating | Rated current | 0.3 A   | Operating temperature range | -55 to 85°C (Note 1)                           | Storage temperature range | -10 to +60°C (Note 2) |
|        | Rated voltage | 50 V AC | Operating humidity range    | Relative humidity 95% max<br>(No condensation) | Storage humidity range    | 40 to 70% (Note 2)    |

| Item                            | Requirements  | Conditions  |
|---------------------------------|---|---|
| 1. Insulation resistance        | 100 M ohm min   | Measured at 100 V DC  |
| 2. Voltage resistance           | No flashover or breakdown   | 150 V AC applied for one minute   |
| 3. Contact resistance           | 60 m ohm max  | Measured at 100 mA  |
| 4. Vibration                    | No electrical discontinuity for 1 μs min<br>No damage, cracks, or parts looseness                                 | Frequency: 10 to 55 Hz, amplitude of 0.75 mm in 3 directions, 10 cycles each  |
| 5. Shock                        | No electrical discontinuity for 1 μs min<br>No damage, cracks, or parts looseness                                 | Acceleration of 490 m/s <sup>2</sup> , 11 ms duration, sine half-wave waveform, for 3 cycles in the both directions of each of the 3 axes |
| 6. Damp heat (Steady state)     | Contact resistance of 70 m ohm max, insulation resistance of 100 M ohm min, no damage, cracks, or parts looseness | Temperature of 40°C, humidity of 90 to 95%, duration 96 h   |
| 7. Temperature cycle            | Contact resistance of 70 m ohm max, insulation resistance of 100 M ohm min, no damage, cracks, or parts looseness | Temperature: -55°C → 15 to 35°C → 85°C → 15 to 35°C<br>Time: 30 min. → 2 to 3 min. → 30 min. → 2 to 3 min. for 5 cycles                   |
| 8. Durability                   | Contact resistance of 70 m ohm max<br>No damage, cracks, or parts looseness                                       | 50 times  |
| 9. Resistance to soldering heat | No melting of resin portion which affects performance   | Reflow: At the recommended temperature profile<br>Soldering iron temperature: 360°C for 5 seconds   |

Note 1: Includes temperature rise caused by current flow.

Note 2: The term storage refers to an unused products prior to board mounting (including packing materials) that is being kept for a long period. The operating temperature and humidity range are suited to the non-conducting condition following board assembly.

Note 3: Information contained in this catalog represents general requirements for this series. Contact us for the drawings and specifications for a specific part number shown.

## Materials

| Part          | Material        | Process  | Notes   |
|---------------|-----------------|--|---------|
| Insulator     | LCP             | Beige  | UL94V-0 |
| Contacts      | Phosphor bronze | Header<br>Contact Area: Gold plating<br>Lead Area: Tin plating       | _____   |
|               |                 | Receptacle<br>Contact Area: Gold plating<br>Lead Area: Flash plating |         |
| Ground plate  | Phosphor bronze | Tin plating  | _____   |
| Metal fitting | Phosphor bronze | Tin plating  | _____   |

## Ordering Information

**FX10 # - \* P / \* - SV 1 (\*\*)**  

①
②

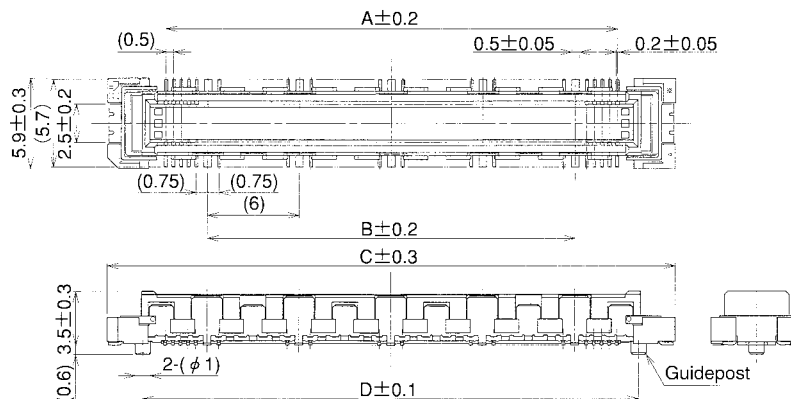
④
⑤
⑥
⑦

③

|  |   |
|--|---|
| ① Series name : FX10   | ④ Connector type<br>P : Header<br>S : Receptacle  |
| ② Form symbol<br>A : With guide post<br>B : Without guide post   | ⑤ Contact form<br>SV : Straight SMT   |
| ③ Number of contacts<br>With ground plate<br>Signal/Ground: 80/8, 100/10, 120/12,<br>140/14<br>Without ground plate<br>Signal: 96, 120, 144, 168 | ⑥ Product height<br>Blank : Standard<br>1 : Standard + 1mm  |
|  | ⑦ Packaging classification<br>Blank, (71) : Tray packaging<br>(21), (91): Embossed tape packaging |

## ■Headers with ground plate

### ●4mm Stacking Height



Unit: mm

| Part No.             | CL No.           | Number of Contacts |        | A    | B  | C    | D    | E    | F    | Remarks            |
|----------------------|------------------|--------------------|--------|------|----|------|------|------|------|--------------------|
|                      |                  | Signal             | Ground |      |    |      |      |      |      |                    |
| FX10A- 80P/ 8-SV(**) | CL570-0001-5-*** | 80                 | 8      | 23.5 | 18 | 31.1 | 26.4 | 31.5 | 28.3 | With guideposts    |
| FX10A-100P/10-SV(**) | CL570-0002-8-*** | 100                | 10     | 29.5 | 24 | 37.1 | 32.4 | 37.5 | 34.3 |                    |
| FX10A-120P/12-SV(**) | CL570-0003-0-*** | 120                | 12     | 35.5 | 30 | 43.1 | 38.4 | 43.5 | 40.3 |                    |
| FX10A-140P/14-SV(**) | CL570-0004-3-*** | 140                | 14     | 41.5 | 36 | 49.1 | 44.4 | 49.5 | 46.3 |                    |
| FX10B- 80P/ 8-SV(**) | CL570-0021-2-*** | 80                 | 8      | 23.5 | 18 | 31.1 | —    | 31.5 | 28.3 | Without guideposts |
| FX10B-100P/10-SV(**) | CL570-0022-5-*** | 100                | 10     | 29.5 | 24 | 37.1 | —    | 37.5 | 34.3 |                    |
| FX10B-120P/12-SV(**) | CL570-0023-8-*** | 120                | 12     | 35.5 | 30 | 43.1 | —    | 43.5 | 40.3 |                    |
| FX10B-140P/14-SV(**) | CL570-0024-0-*** | 140                | 14     | 41.5 | 36 | 49.1 | —    | 49.5 | 46.3 |                    |

[Specifications number] -\*\* , (\*\*\*)  
 (71): Tray packaging  
 (91): Embossed tape packaging

Note 1: There is no polarity in terms of board mounting for this product.

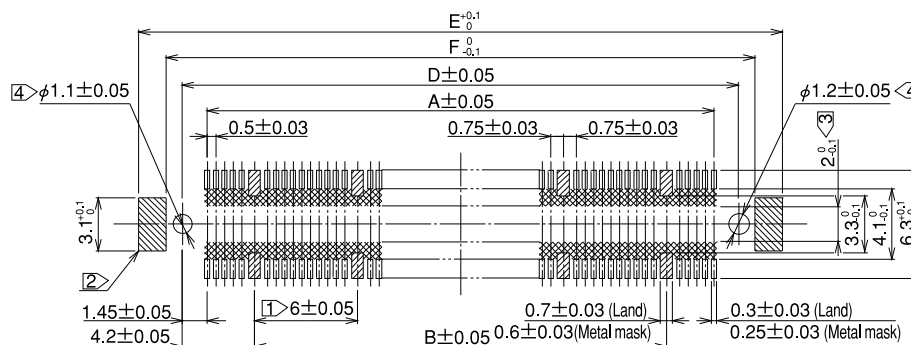
Note 2: The coplanarity of this product's SMT leads is 0.1mm or less.

Note 3: Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

Note 4: Using multiple connectors between identical boards is not recommended.

## ■Recommended Land Pattern Dimensions (Metal Mask Dimensions)

Recommended metal mask thickness: 0.15 mm



Note ① Cross-hatched portions, totaling n places, indicate the ground circuits.

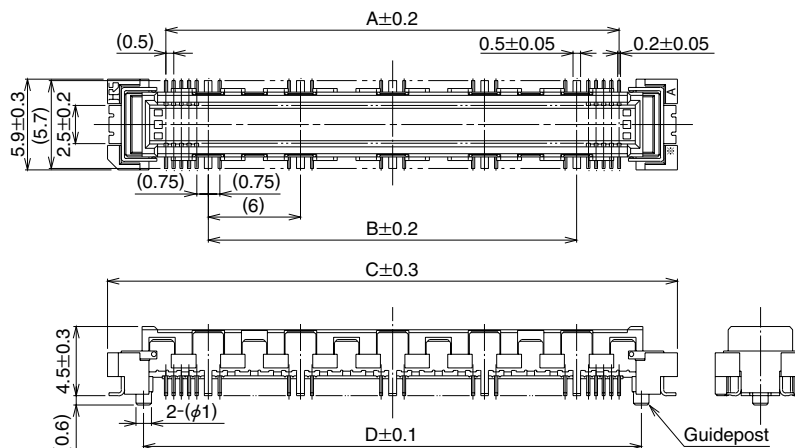
Note ② Cross-hatched portions, 2 places on both sides, indicate the metal fittings.

Note ③ The cross-hatched area inside the SMT land may come into contact with the connector contacts and thus care should be taken that the pattern does not extend beyond the SMT land width.

Note ④ Not required in products without guideposts.

## ■ Headers with ground plate

### ● 5mm Stacking Height



Unit: mm

| Part No.              | CL No.           | Number of Contacts |        | A    | B  | C    | D    | E    | F    | Remarks            |
|-----------------------|------------------|--------------------|--------|------|----|------|------|------|------|--------------------|
|                       |                  | Signal             | Ground |      |    |      |      |      |      |                    |
| FX10A- 80P/ 8-SV1(**) | CL570-0101-0-**- | 80                 | 8      | 23.5 | 18 | 31.1 | 26.4 | 31.5 | 28.3 | With guideposts    |
| FX10A-100P/10-SV1(**) | CL570-0102-2-**- | 100                | 10     | 29.5 | 24 | 37.1 | 32.4 | 37.5 | 34.3 |                    |
| FX10A-120P/12-SV1(**) | CL570-0103-5-**- | 120                | 12     | 35.5 | 30 | 43.1 | 38.4 | 43.5 | 40.3 |                    |
| FX10A-140P/14-SV1(**) | CL570-0104-8-**- | 140                | 14     | 41.5 | 36 | 49.1 | 44.4 | 49.5 | 46.3 |                    |
| FX10B- 80P/ 8-SV1(**) | CL570-0121-7-**- | 80                 | 8      | 23.5 | 18 | 31.1 | —    | 31.5 | 28.3 | Without guideposts |
| FX10B-100P/10-SV1(**) | CL570-0122-0-**- | 100                | 10     | 29.5 | 24 | 37.1 | —    | 37.5 | 34.3 |                    |
| FX10B-120P/12-SV1(**) | CL570-0123-2-**- | 120                | 12     | 35.5 | 30 | 43.1 | —    | 43.5 | 40.3 |                    |
| FX10B-140P/14-SV1(**) | CL570-0124-5-**- | 140                | 14     | 41.5 | 36 | 49.1 | —    | 49.5 | 46.3 |                    |

[Specifications number] -\*, (\*\*)  
 (71): Tray packaging  
 (91): Embossed tape packaging

Note 1: There is no polarity in terms of board mounting for this product.

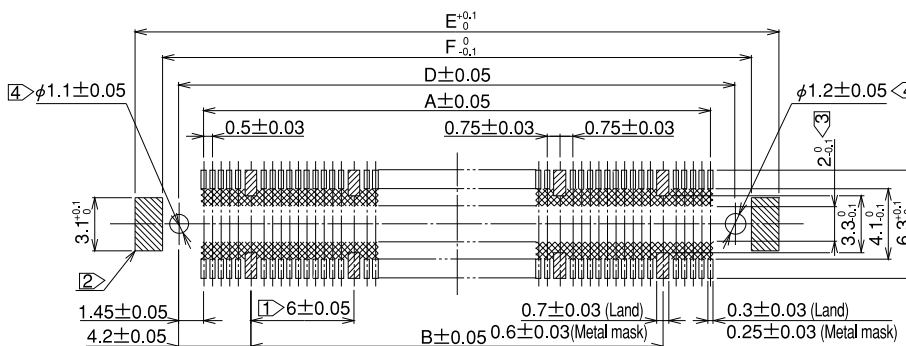
Note 2: The coplanarity of this product's SMT leads is 0.1 mm or less.

Note 3: Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

Note 4: Using multiple connectors between identical boards is not recommended.

## ■ Recommended Land Pattern Dimensions (Metal Mask Dimensions)

Recommended metal mask thickness: 0.15 mm



Note ① Cross-hatched portions, totaling n places, indicate the ground circuits.

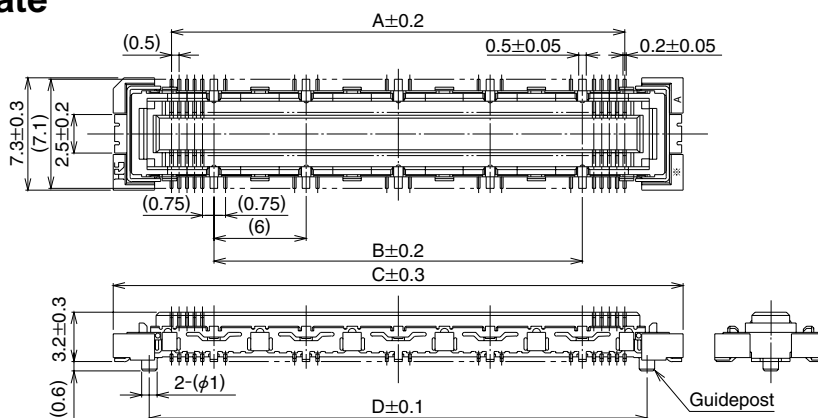
② Cross-hatched portions, 2 places on both sides, indicate the metal fittings.

③ The cross-hatched area inside the SMT land may come into contact with the connector contacts and thus care should be taken that the pattern does not extend beyond the SMT land width.

④ Not required in products without guideposts.



## ■Receptacles with ground plate



Unit: mm

| Part No.             | CL No.          | Number of Contacts |        | A    | B  | C    | D    | E    | F    | Remarks            |
|----------------------|-----------------|--------------------|--------|------|----|------|------|------|------|--------------------|
|                      |                 | Signal             | Ground |      |    |      |      |      |      |                    |
| FX10A- 80S/ 8-SV(**) | CL570-0201-4-** | 80                 | 8      | 23.5 | 18 | 31.1 | 26.4 | 31.5 | 28.3 | With guideposts    |
| FX10A-100S/10-SV(**) | CL570-0202-7-** | 100                | 10     | 29.5 | 24 | 37.1 | 32.4 | 37.5 | 34.3 |                    |
| FX10A-120S/12-SV(**) | CL570-0203-0-** | 120                | 12     | 35.5 | 30 | 43.1 | 38.4 | 43.5 | 40.3 |                    |
| FX10A-140S/14-SV(**) | CL570-0204-2-** | 140                | 14     | 41.5 | 36 | 49.1 | 44.4 | 49.5 | 46.3 |                    |
| FX10B- 80S/ 8-SV(**) | CL570-0221-1-** | 80                 | 8      | 23.5 | 18 | 31.1 | —    | 31.5 | 28.3 | Without guideposts |
| FX10B-100S/10-SV(**) | CL570-0222-4-** | 100                | 10     | 29.5 | 24 | 37.1 | —    | 37.5 | 34.3 |                    |
| FX10B-120S/12-SV(**) | CL570-0223-7-** | 120                | 12     | 35.5 | 30 | 43.1 | —    | 43.5 | 40.3 |                    |
| FX10B-140S/14-SV(**) | CL570-0224-0-** | 140                | 14     | 41.5 | 36 | 49.1 | —    | 49.5 | 46.3 |                    |

[Specifications number] - \*\* , (\*\* \*)  
 (71): Tray packaging  
 (91): Embossed tape packaging

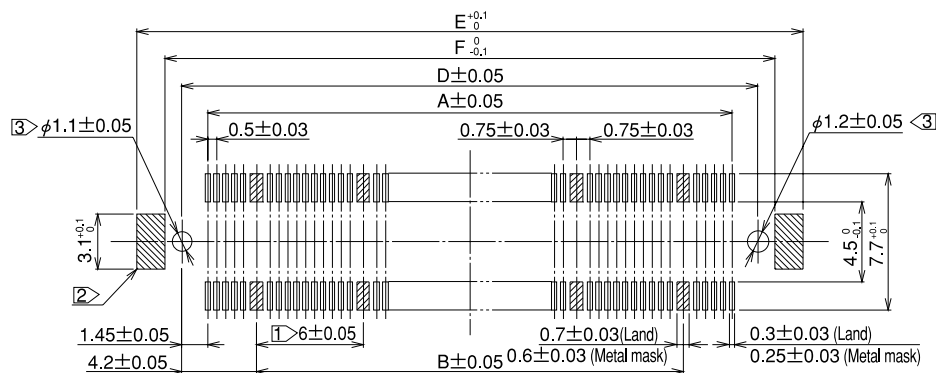
Note 1: There is no polarity in terms of board mounting for this product.

Note 2: The coplanarity of this product's SMT leads is 0.1 mm or less.

Note 3: Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

## ■Recommended Land Pattern Dimensions (Metal Mask Dimensions)

Recommended metal mask thickness: 0.15 mm



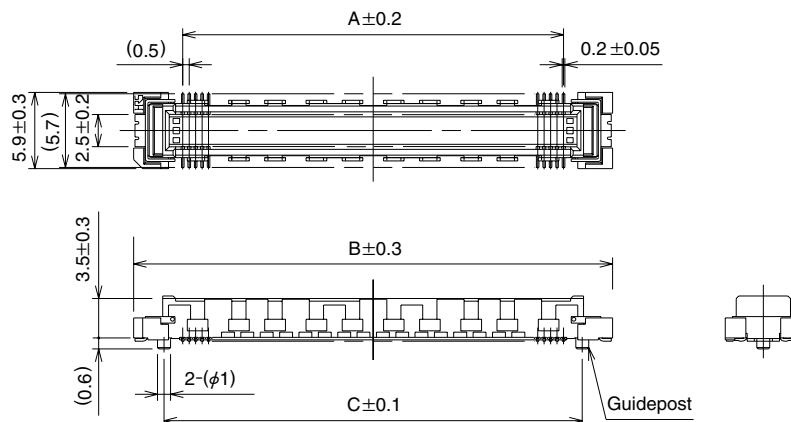
Note ① Cross-hatched portions, totaling n places, indicate the ground circuits.

Note ② Cross-hatched portions, 2 places on both sides, indicate the metal fittings.

Note ③ Not required in products without guideposts.

## ■ Headers without ground plate

### ● 4mm Stacking Height



Unit: mm

| Part No.          | CL No.          | Number of Contacts | A    | B    | C    | D    | E    | Remarks            |
|-------------------|-----------------|--------------------|------|------|------|------|------|--------------------|
|                   |                 | Signal             |      |      |      |      |      |                    |
| FX10A- 96P-SV(**) | CL570-0041-0-** | 96                 | 23.5 | 31.1 | 26.4 | 31.5 | 28.3 | With guideposts    |
| FX10A-120P-SV(**) | CL570-0042-2-** | 120                | 29.5 | 37.1 | 32.4 | 37.5 | 34.3 |                    |
| FX10A-144P-SV(**) | CL570-0043-5-** | 144                | 35.5 | 43.1 | 38.4 | 43.5 | 40.3 |                    |
| FX10A-168P-SV(**) | CL570-0044-8-** | 168                | 41.5 | 49.1 | 44.4 | 49.5 | 46.3 |                    |
| FX10B- 96P-SV(**) | CL570-0051-3-** | 96                 | 23.5 | 31.1 | —    | 31.5 | 28.3 | Without guideposts |
| FX10B-120P-SV(**) | CL570-0052-6-** | 120                | 29.5 | 37.1 | —    | 37.5 | 34.3 |                    |
| FX10B-144P-SV(**) | CL570-0053-9-** | 144                | 35.5 | 43.1 | —    | 43.5 | 40.3 |                    |
| FX10B-168P-SV(**) | CL570-0054-1-** | 168                | 41.5 | 49.1 | —    | 49.5 | 46.3 |                    |

[Specifications number] -\* \*, (\* \*)  
 (71): Tray packaging  
 (91): Embossed tape packaging

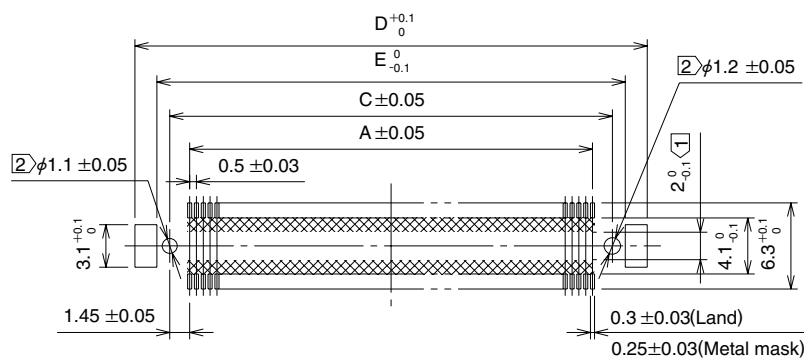
Note 1: There is no polarity in terms of board mounting for this product.

Note 2: The coplanarity of this product's SMT leads is 0.1 mm or less.

Note 3: Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

## ■ Recommended Land Pattern Dimensions (Metal Mask Dimensions)

Recommended metal mask thickness: 0.15 mm

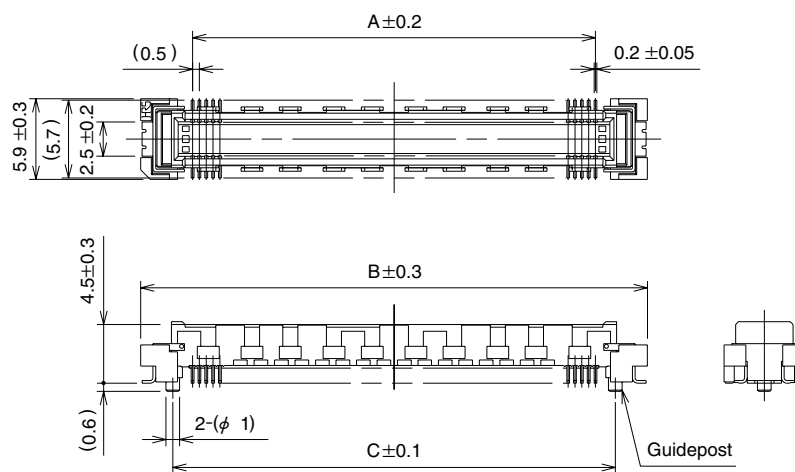


Note ① The cross-hatched area inside the SMT land may come into contact with the connector contacts and thus care should be taken that the pattern does not extend beyond the SMT land width.

Note ② Not required in products without guideposts.

## ■ Headers without ground plate

### ●5mm Stacking Height



Unit: mm

| Part No.           | CL No.           | Number of Contacts | A    | B    | C    | D    | E    | Remarks            |
|--------------------|------------------|--------------------|------|------|------|------|------|--------------------|
|                    |                  | Signal             |      |      |      |      |      |                    |
| FX10A- 96P-SV1(**) | CL570-0141-4-*** | 96                 | 23.5 | 31.1 | 26.4 | 31.5 | 28.3 | With guideposts    |
| FX10A-120P-SV1(**) | CL570-0142-7-*** | 120                | 29.5 | 37.1 | 32.4 | 37.5 | 34.3 |                    |
| FX10A-144P-SV1(**) | CL570-0143-0-*** | 144                | 35.5 | 43.1 | 38.4 | 43.5 | 40.3 |                    |
| FX10A-168P-SV1(**) | CL570-0144-2-*** | 168                | 41.5 | 49.1 | 44.4 | 49.5 | 46.3 |                    |
| FX10B- 96P-SV1(**) | CL570-0151-8-*** | 96                 | 23.5 | 31.1 | —    | 31.5 | 28.3 | Without guideposts |
| FX10B-120P-SV1(**) | CL570-0152-0-*** | 120                | 29.5 | 37.1 | —    | 37.5 | 34.3 |                    |
| FX10B-144P-SV1(**) | CL570-0153-3-*** | 144                | 35.5 | 43.1 | —    | 43.5 | 40.3 |                    |
| FX10B-168P-SV1(**) | CL570-0154-6-*** | 168                | 41.5 | 49.1 | —    | 49.5 | 46.3 |                    |

[Specifications number] - \*\* , (\*\* \*)  
 (71): Tray packaging  
 (91): Embossed tape packaging

Note 1: There is no polarity in terms of board mounting for this product.

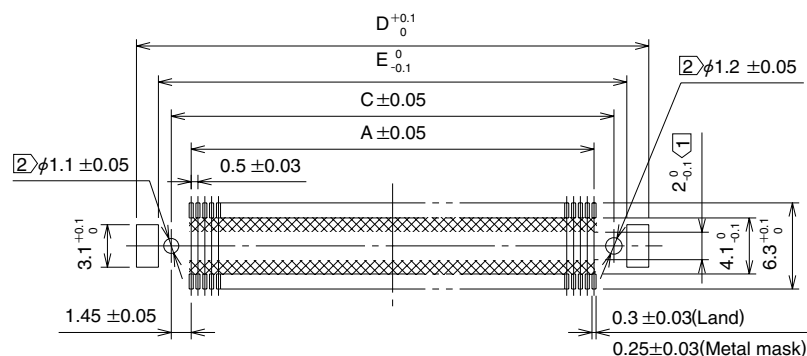
Note 2: The coplanarity of this product's SMT leads is 0.1 mm or less.

Note 3: Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

Note 4: Using multiple connectors between identical boards is not recommended.

## ■ Recommended Land Pattern Dimensions (Metal Mask Dimensions)

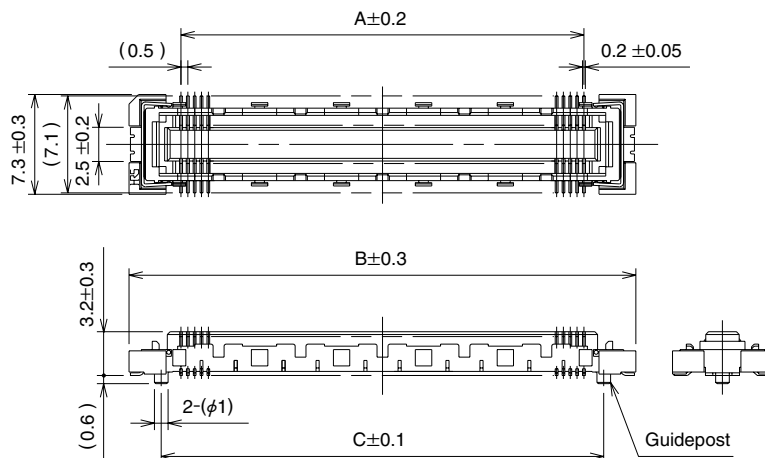
Recommended metal mask thickness: 0.15 mm



Note ① The cross-hatched area inside the SMT land may come into contact with the connector contacts and thus care should be taken that the pattern does not extend beyond the SMT land width.

Note ② Not required in products without guideposts.

## ■Receptacles without ground plate



Unit: mm

| Part No.          | CL No.           | Number of Contacts | A    | B    | C    | D    | E    | Remarks            |
|-------------------|------------------|--------------------|------|------|------|------|------|--------------------|
|                   |                  | Signal             |      |      |      |      |      |                    |
| FX10A- 96S-SV(**) | CL570-0241-9-**- | 96                 | 23.5 | 31.1 | 26.4 | 31.5 | 28.3 | With guideposts    |
| FX10A-120S-SV(**) | CL570-0242-1-**- | 120                | 29.5 | 37.1 | 32.4 | 37.5 | 34.3 |                    |
| FX10A-144S-SV(**) | CL570-0243-4-**- | 144                | 35.5 | 43.1 | 38.4 | 43.5 | 40.3 |                    |
| FX10A-168S-SV(**) | CL570-0244-7-**- | 168                | 41.5 | 49.1 | 44.4 | 49.5 | 46.3 |                    |
| FX10B- 96S-SV(**) | CL570-0251-2-**- | 96                 | 23.5 | 31.1 | —    | 31.5 | 28.3 | Without guideposts |
| FX10B-120S-SV(**) | CL570-0252-5-**- | 120                | 29.5 | 37.1 | —    | 37.5 | 34.3 |                    |
| FX10B-144S-SV(**) | CL570-0253-8-**- | 144                | 35.5 | 43.1 | —    | 43.5 | 40.3 |                    |
| FX10B-168S-SV(**) | CL570-0254-0-**- | 168                | 41.5 | 49.1 | —    | 49.5 | 46.3 |                    |

[Specifications number] -\*\* , (\*\*)  
 (71): Tray packaging  
 (91): Embossed tape packaging

Note 1: There is no polarity in terms of board mounting for this product.

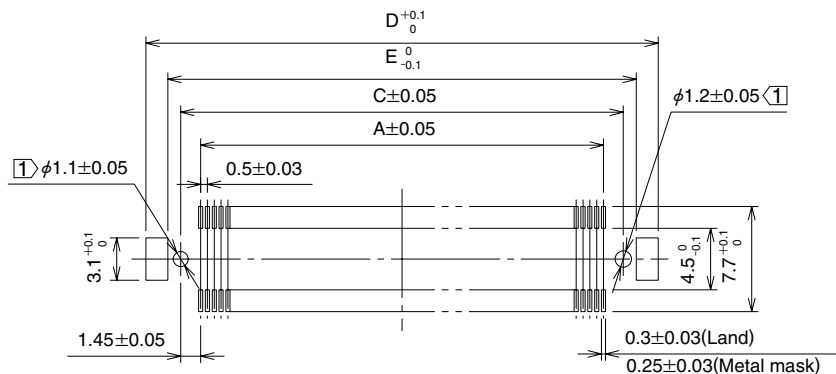
Note 2: The coplanarity of this product's SMT leads is 0.1 mm or less.

Note 3: Please order embossed tape packaged items by the reel. (One reel holds 1,000 pieces.)

Note 4: Using multiple connectors between identical boards is not recommended.

## ■Recommended Land Pattern Dimensions (Metal Mask Dimensions)

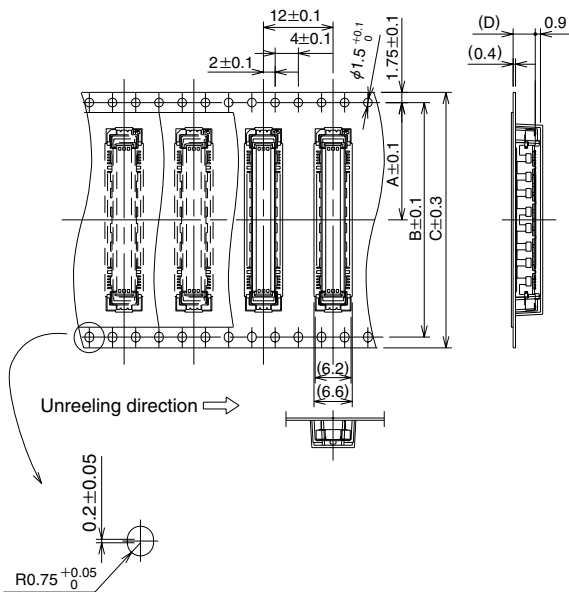
Recommended metal mask thickness: 0.15 mm



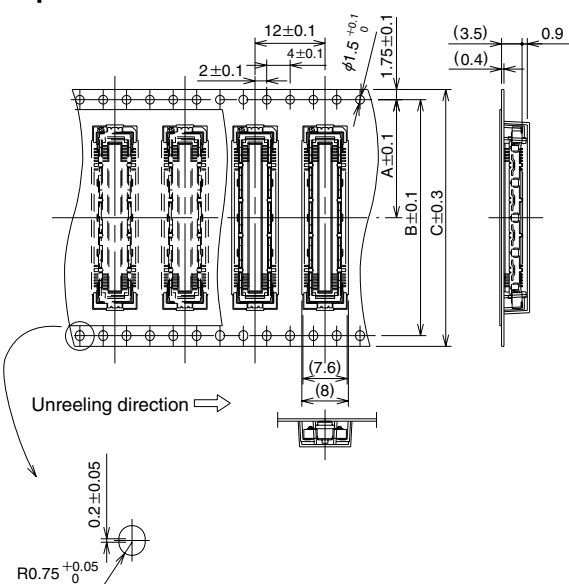
Note ① Not required in products without guideposts.

## ■ Embossed Carrier Tape Dimensions

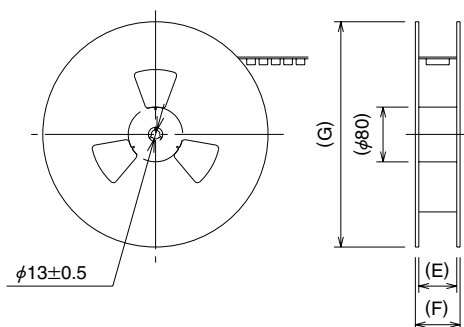
### ● Headers



### ● Receptacles



### ● Reel Dimensions



Unit: mm

| Insertion Connector | A    | B    | C  | D   | E    | F    | G   |
|---------------------|------|------|----|-----|------|------|-----|
| FX10#- 80P/ 8-SV    | 20.2 | 40.4 | 44 | 3.8 | 45.5 | 50.5 | 330 |
| FX10#-100P/10-SV    | 26.2 | 52.4 | 56 |     | 59   | 64   |     |
| FX10#-120P/12-SV    |      |      |    |     | 76.5 | 81.5 |     |
| FX10#-140P/14-SV    | 34.2 | 68.4 | 72 |     | 45.5 | 50.5 |     |
| FX10#- 96P -SV      | 20.2 | 40.4 | 44 |     | 59   | 64   |     |
| FX10#-120P -SV      | 26.2 | 52.4 | 56 |     | 76.5 | 81.5 |     |
| FX10#-144P -SV      | 34.2 | 68.4 | 72 |     | 45.5 | 50.5 |     |
| FX10#-168P -SV      | 20.2 | 40.4 | 44 |     | 59   | 64   |     |
| FX10#- 80P/ 8-SV1   | 20.2 | 40.4 | 44 | 4.8 | 45.5 | 50.5 | 370 |
| FX10#-100P/10-SV1   | 26.2 | 52.4 | 56 |     | 59   | 64   |     |
| FX10#-120P/12-SV1   |      |      |    |     | 76.5 | 81.5 |     |
| FX10#-140P/14-SV1   | 34.2 | 68.4 | 72 |     | 45.5 | 50.5 |     |
| FX10#- 96P -SV1     | 20.2 | 40.4 | 44 |     | 59   | 64   |     |
| FX10#-120P -SV1     | 26.2 | 52.4 | 56 |     | 76.5 | 81.5 |     |
| FX10#-144P -SV1     | 34.2 | 68.4 | 72 |     | 45.5 | 50.5 |     |
| FX10#-168P -SV1     | 20.2 | 40.4 | 44 |     | 59   | 64   |     |

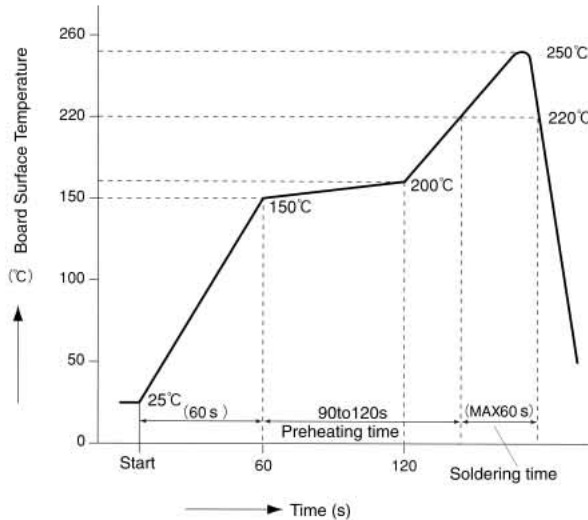
Note: There is no polarity in terms of embossed tape packaging for this product.

Unit: mm

| Insertion Connector | A    | B    | C  | E    | F    | G   |
|---------------------|------|------|----|------|------|-----|
| FX10#- 80S/ 8-SV    | 20.2 | 40.4 | 44 | 45.5 | 50.5 | 330 |
| FX10#-100S/10-SV    | 26.2 | 52.4 | 56 | 59   | 64   |     |
| FX10#-120S/12-SV    |      |      |    | 76.5 | 81.5 |     |
| FX10#-140S/14-SV    | 34.2 | 68.4 | 72 | 45.5 | 50.5 |     |
| FX10#- 96S -SV      | 20.2 | 40.4 | 44 | 59   | 64   |     |
| FX10#-120S -SV      | 26.2 | 52.4 | 56 | 76.5 | 81.5 |     |
| FX10#-144S -SV      | 34.2 | 68.4 | 72 | 45.5 | 50.5 |     |
| FX10#-168S -SV      | 20.2 | 40.4 | 44 | 59   | 64   |     |

Note: There is no polarity in terms of embossed tape packaging for this product.

## Recommended Temperature Profile



### HRS test Conditions

Test board Glass epoxy 161mm×100mm×1.6mm thick  
 Solder method :Reflow  
 Solder composition :Paste,  
 96.5%Sn/3%Ag/0.5%Cu  
 Metal mask :0.15mm thick  
 Reflow cycles :2 cycles

The 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.

## Washing Conditions

### Organic Solvent Cleaning

| Solvent                        | Room temperature washing | Heated washing |
|--------------------------------|--------------------------|----------------|
| IPA (Isopropyl alcohol)        | Yes                      | Yes            |
| HCFC (Hydrochlorofluorocarbon) | Yes                      | Yes            |

### Water Type Cleaning

When using water based cleaning agents (e.g., terpene, and alkali saponifiers), select the cleaning agent based on the documentation issued by the various manufacturers of cleaning agents which describes the effects on metals and resins. Be careful that parts are not left with moisture remaining on them.

### Cleaning Precautions

Residual flux or cleaning agent on the contacts when washing with organic solvents or water type cleaners can give rise to the deterioration of electrical performance. In this regard it is important to check whether a thorough washing has been performed.

## Connector Handling Precautions

### 1. Allowable Creepage Dimensions at Time of Mating

The effective mating length of this product is 1.1 mm for the signal portion and 1 mm for the ground portion. The creepage of the header and receptacle at the time of mating should be within 0.5 mm of the completely mating condition.

### 2. Retension of Boards

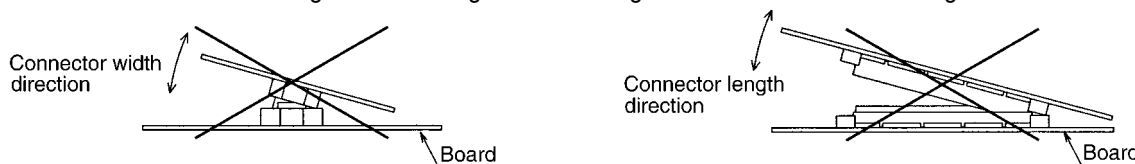
Avoid the support of boards by connectors alone and adopt a locking measure that does not rely on the connectors.

### 3. Solder Repair

Flux may rise as far as the contact portion of the connector depending on the flux coating and other factors at the time of repair. This will cause poor contact reliability; therefore, before use, the aforementioned washing conditions should be taken into consideration prior to connector washing.

### 4. Miscellaneous

·Note that excessive twisting while inserting or withdrawing connectors will cause damage.



·The shade of the molded items may vary somewhat depending on the manufacturing lot; however, this does not affect performance.