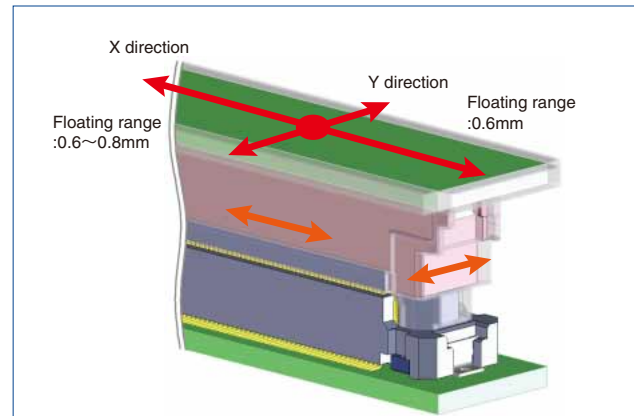
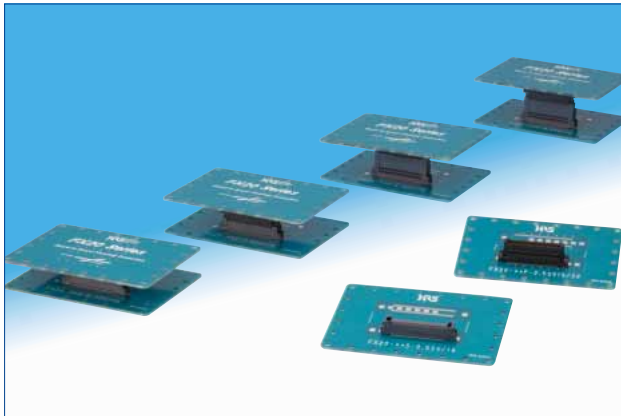


# 0.5mm Pitch, Board to Board Connector with Floating Structure

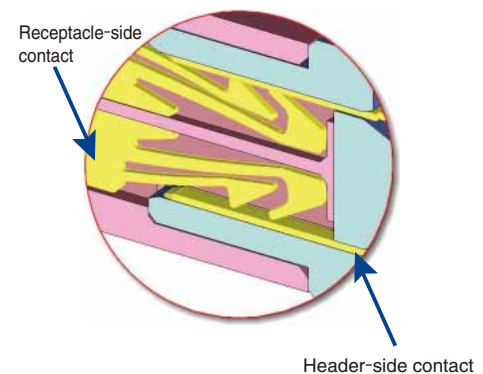
## FX20 Series



### ■ Features

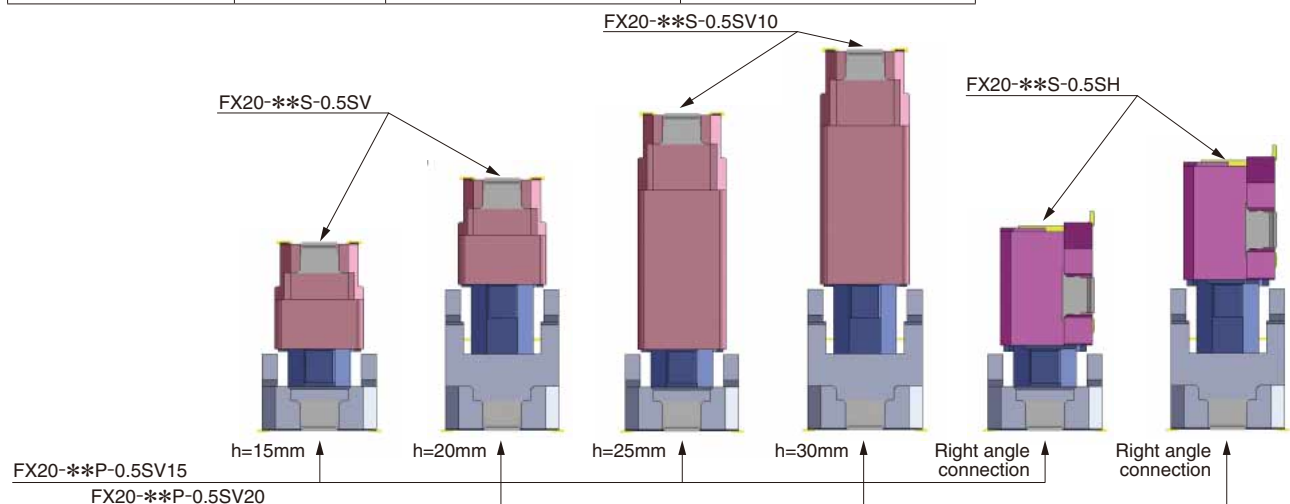
1. 0.5mm pitch
2. Connection type: Right angle / Vertical
3. Pin counts : 20, 40, 60, 80, 100, 120 and 140
4. Floating range :  $\pm 0.6$  to 0.8mm in the X direction and  $\pm 0.6$ mm in the Y direction
5. A double beam contact structure produces a highly reliable contact (Refer to the figure on the right)
6. Current capacity : 0.5A per pin
7. Effective mating length of 1.5mm  
This connector utilizes a 1.5mm effective mating length for signal contacts and provides a sufficient margin for its mating stroke.
8. No conductive trace surface is not specified
9. Contains the vacuum pick up area needed to allow automatic mounting
10. Self-aligning and self-guiding structure  
Built-in guide posts enable self-alignment and ensure a secure connection

### Enlarged view of the contact area



### ■ Stacking height chart

| Receptacle        | Header      | FX20-***P-0.5SV15      | FX20-***P-0.5SV20      |
|-------------------|-------------|------------------------|------------------------|
| FX20-***S-0.5SV   |             | h=15mm                 | h=20mm                 |
| FX20-***S-0.5SV10 |             | h=25mm                 | h=30mm                 |
| FX20-***S-0.5SH   |             | Right angle connection | Right angle connection |
| Floating range    | X direction | $\pm 0.6$ mm           | $\pm 0.8$ mm           |
|                   | Y direction | $\pm 0.6$ mm           | $\pm 0.6$ mm           |



Product Specifications

|                                |                                                                                                             |                                                                                                                |
|--------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Ratings                        | Rated current 0.5A<br>Rated voltage AC 50V                                                                  | Operating temperature range : -55 to 85°C (Note 1)<br>Storage temperature range : -10 to 60°C (Note 2)         |
| Item                           | Standards                                                                                                   | Condition                                                                                                      |
| 1. Contact resistance          | 70mΩ max.                                                                                                   | 100mA(DC or 1000Hz)                                                                                            |
| 2. Insulation resistance       | 100MΩ min.                                                                                                  | 100V DC.                                                                                                       |
| 3. Voltage proof               | No flashover or breakdown.                                                                                  | 150V AC for 1 min.                                                                                             |
| 4. Mechanical operation        | Contact resistance : Variation from initial value 20mΩ or less.<br>No damage, crack and looseness of parts. | 50 times insertions and extractions.                                                                           |
| 5. Vibration                   | No electrical discontinuity of 1μs.<br>No damage, crack and looseness of parts.                             | Frequency : 10 to 55 to 10Hz, approx 5 min<br>Single amplitude : 0.75mm, 10 cycles for 3 axial directions.     |
| 6. Shock                       |                                                                                                             | 490m/s <sup>2</sup> , duration of pulse 11ms<br>at 3 times for 3 both axial directions.                        |
| 7. Damp heat (Steady state)    | Contact resistance : Variation from initial value 20mΩ or less.                                             | Exposed at 40±2°C, 90~95%, 96h.                                                                                |
| 8. Rapid change of temperature | Insulation resistance : 100MΩ min.<br>No damage, crack and looseness of parts.                              | Temperature : -55 → +85°C<br>Time : 30 → 30 min.<br>Under 5 cycles(relocation time to chamber : within 2~3min) |

Note 1 : Includes temperature rise caused by current flow.  
Note 2 : The term "storage" here refers to products stored for a long period prior to board mounting and use.

Materials / Finish

|               |            |                 |                            |             |
|---------------|------------|-----------------|----------------------------|-------------|
| Part          | Material   |                 | Finish                     | UL standard |
| Insulator     | Header     | PA              | Black                      | UL94V-0     |
|               | Receptacle | LCP             | Black                      | UL94V-0     |
| Contacts      | Header     | Copper alloy    | Contact area: Gold plated  | _____       |
|               | Receptacle | Phosphor bronze | Mounting area: Gold plated | _____       |
| Metal Fitting | Brass      |                 | Tin plated                 | _____       |

Product Number Structure

Refer to the chart below when determining the product specifications from the product number.  
Please select from the product numbers listed in this catalog when placing orders.

●Straight receptacle

FX20 - 60 S - 0.5 SV 10  
①                      ②                      ③                      ④                      ⑤                      ⑥

●Straight header

FX20 - 60 P - 0.5 SV 15  
①                      ②                      ③                      ④                      ⑤                      ⑥

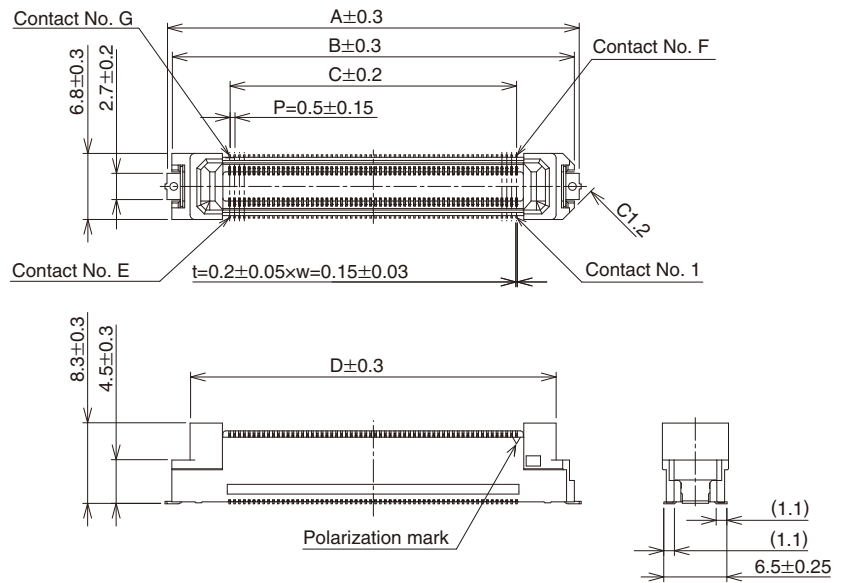
●Right angle receptacle

FX20 - 60 S - 0.5 SH  
①                      ②                      ③                      ④                      ⑤

|                         |                                                                                   |
|-------------------------|-----------------------------------------------------------------------------------|
| ① Series name           | : FX20                                                                            |
| ② Number (contacts) :   |                                                                                   |
| ③ Connector type        | S : Receptacle type<br>P : Header type                                            |
| ④ Contact pitch         | : 0.5mm                                                                           |
| ⑤ Housing configuration | : SV : Straight type SH : Right angle type                                        |
| ⑥ Stacking height type  | Mating height [mm] =<br>Height of the receptacle-side + Height of the header-side |

## ●Straight receptacle

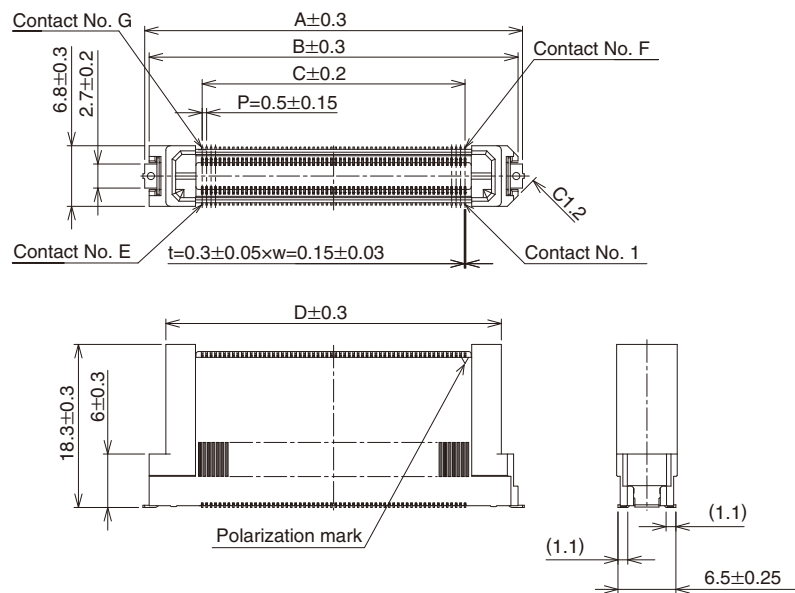
[ FX20-\*\*-S-0.5SV ]



Unit : mm

| Part No.        | HRS No.    | No. of contacts | A    | B    | C    | D     | E  | F  | G   |
|-----------------|------------|-----------------|------|------|------|-------|----|----|-----|
| FX20-20S-0.5SV  | 570-1114-7 | 20              | 17.4 | 16.4 | 4.5  | 12.65 | 10 | 11 | 20  |
| FX20-40S-0.5SV  | 570-1101-5 | 40              | 22.4 | 21.4 | 9.5  | 17.65 | 20 | 21 | 40  |
| FX20-60S-0.5SV  | 570-1102-8 | 60              | 27.4 | 26.4 | 14.5 | 22.65 | 30 | 31 | 60  |
| FX20-80S-0.5SV  | 570-1103-0 | 80              | 32.4 | 31.4 | 19.5 | 27.65 | 40 | 41 | 80  |
| FX20-100S-0.5SV | 570-1104-3 | 100             | 37.4 | 36.4 | 24.5 | 32.65 | 50 | 51 | 100 |
| FX20-120S-0.5SV | 570-1105-6 | 120             | 42.4 | 41.4 | 29.5 | 37.65 | 60 | 61 | 120 |
| FX20-140S-0.5SV | 570-1106-9 | 140             | 47.4 | 46.4 | 34.5 | 42.65 | 70 | 71 | 140 |

[ FX20-\*\*-S-0.5SV10 ]

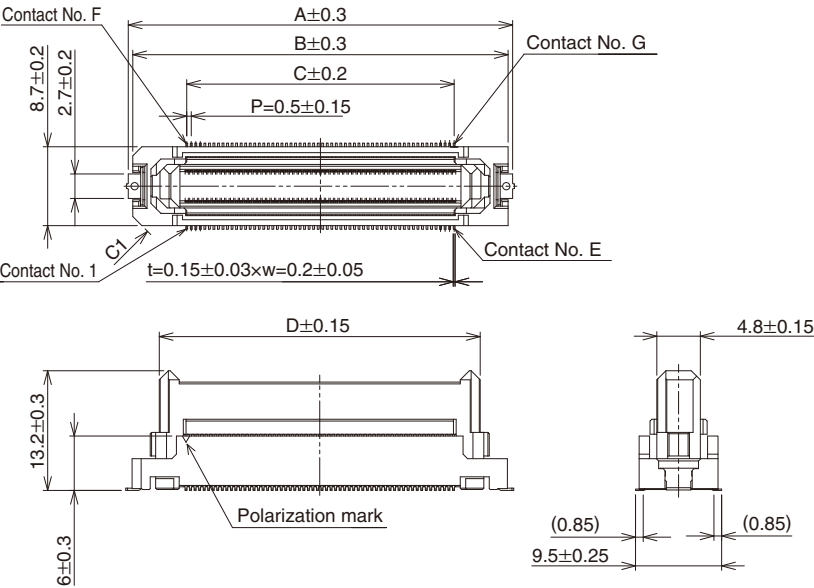


Unit : mm

| Part No.          | HRS No.    | No. of contacts | A    | B    | C    | D     | E  | F  | G   |
|-------------------|------------|-----------------|------|------|------|-------|----|----|-----|
| FX20-20S-0.5SV10  | 570-1115-0 | 20              | 17.4 | 16.4 | 4.5  | 12.65 | 10 | 11 | 20  |
| FX20-40S-0.5SV10  | 570-1107-1 | 40              | 22.4 | 21.4 | 9.5  | 17.65 | 20 | 21 | 40  |
| FX20-60S-0.5SV10  | 570-1108-4 | 60              | 27.4 | 26.4 | 14.5 | 22.65 | 30 | 31 | 60  |
| FX20-80S-0.5SV10  | 570-1109-7 | 80              | 32.4 | 31.4 | 19.5 | 27.65 | 40 | 41 | 80  |
| FX20-100S-0.5SV10 | 570-1110-6 | 100             | 37.4 | 36.4 | 24.5 | 32.65 | 50 | 51 | 100 |
| FX20-120S-0.5SV10 | 570-1111-9 | 120             | 42.4 | 41.4 | 29.5 | 37.65 | 60 | 61 | 120 |
| FX20-140S-0.5SV10 | 570-1112-1 | 140             | 47.4 | 46.4 | 34.5 | 42.65 | 70 | 71 | 140 |

●Straight header

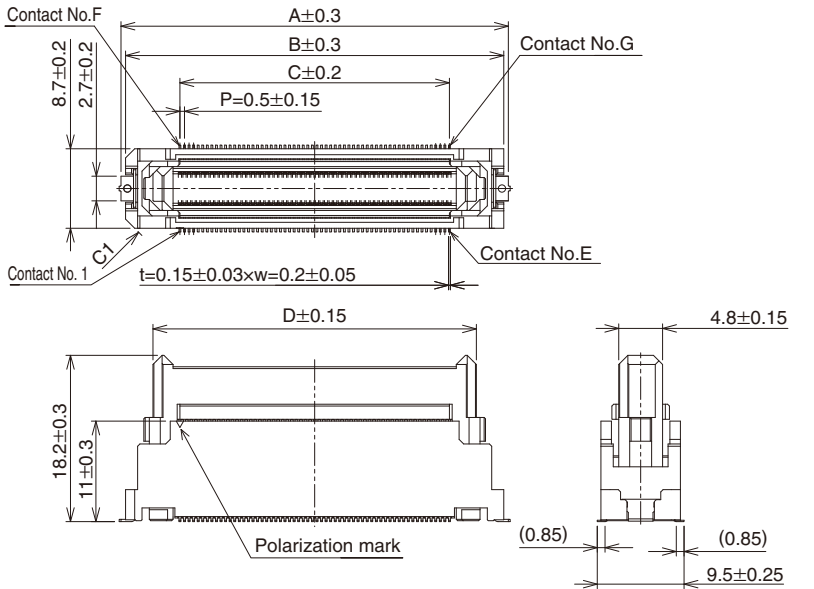
[ FX20-\*\*P-0.5SV15 ]



Unit : mm

| Part No.          | HRS No.    | No. of contacts | A    | B    | C    | D    | E  | F  | G   |
|-------------------|------------|-----------------|------|------|------|------|----|----|-----|
| FX20-20P-0.5SV15  | 570-1014-2 | 20              | 17.4 | 16.4 | 4.5  | 10.4 | 10 | 11 | 20  |
| FX20-40P-0.5SV15  | 570-1001-0 | 40              | 22.4 | 21.4 | 9.5  | 15.4 | 20 | 21 | 40  |
| FX20-60P-0.5SV15  | 570-1002-3 | 60              | 27.4 | 26.4 | 14.5 | 20.4 | 30 | 31 | 60  |
| FX20-80P-0.5SV15  | 570-1003-6 | 80              | 32.4 | 31.4 | 19.5 | 25.4 | 40 | 41 | 80  |
| FX20-100P-0.5SV15 | 570-1004-9 | 100             | 37.4 | 36.4 | 24.5 | 30.4 | 50 | 51 | 100 |
| FX20-120P-0.5SV15 | 570-1005-1 | 120             | 42.4 | 41.4 | 29.5 | 35.4 | 60 | 61 | 120 |
| FX20-140P-0.5SV15 | 570-1006-4 | 140             | 47.4 | 46.4 | 34.5 | 40.4 | 70 | 71 | 140 |

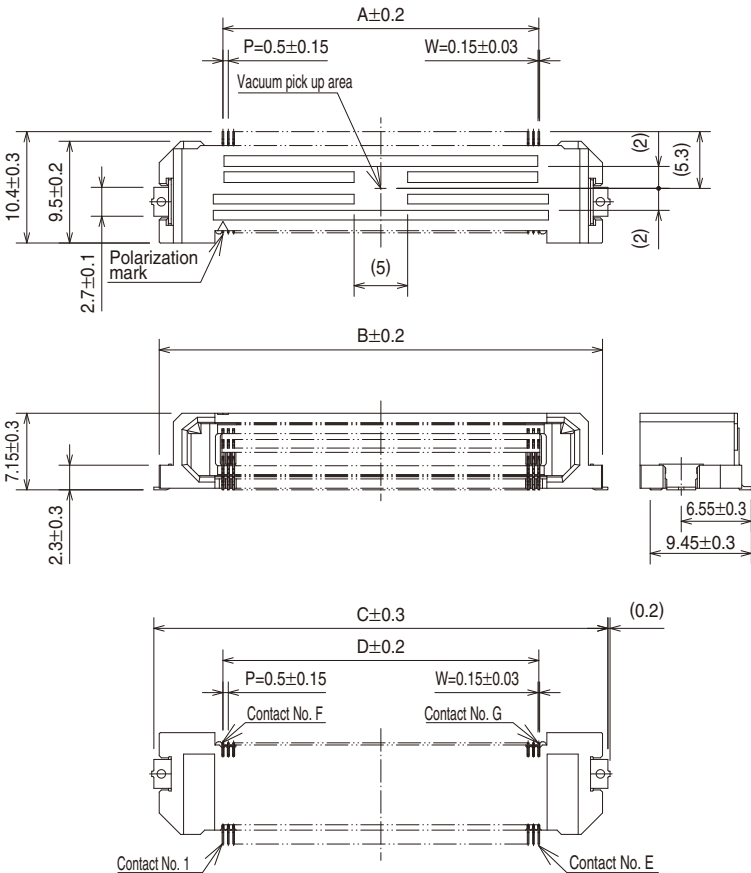
[ FX20-\*\*P-0.5SV20 ]



Unit : mm

| Part No.          | HRS No.    | No. of contacts | A    | B    | C    | D    | E  | F  | G   |
|-------------------|------------|-----------------|------|------|------|------|----|----|-----|
| FX20-20P-0.5SV20  | 570-1015-5 | 20              | 17.4 | 16.4 | 4.5  | 10.4 | 10 | 11 | 20  |
| FX20-40P-0.5SV20  | 570-1007-7 | 40              | 22.4 | 21.4 | 9.5  | 15.4 | 20 | 21 | 40  |
| FX20-60P-0.5SV20  | 570-1008-0 | 60              | 27.4 | 26.4 | 14.5 | 20.4 | 30 | 31 | 60  |
| FX20-80P-0.5SV20  | 570-1009-2 | 80              | 32.4 | 31.4 | 19.5 | 25.4 | 40 | 41 | 80  |
| FX20-100P-0.5SV20 | 570-1010-1 | 100             | 37.4 | 36.4 | 24.5 | 30.4 | 50 | 51 | 100 |
| FX20-120P-0.5SV20 | 570-1011-4 | 120             | 42.4 | 41.4 | 29.5 | 35.4 | 60 | 61 | 120 |
| FX20-140P-0.5SV20 | 570-1012-7 | 140             | 47.4 | 46.4 | 34.5 | 40.4 | 70 | 71 | 140 |

●Right angle receptacle  
[ FX20-\*\*S-0.5SH ]



Unit : mm

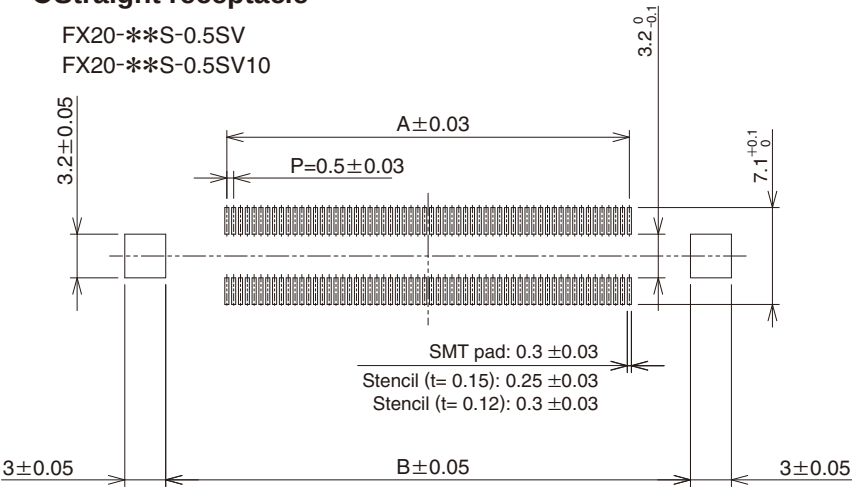
| Part No.        | HRS No.    | No. of contacts | A    | B    | C    | D    | E  | F  | G   |
|-----------------|------------|-----------------|------|------|------|------|----|----|-----|
| FX20-20S-0.5SH  | 570-1611-1 | 20              | 4.5  | 16.4 | 17.4 | 4.5  | 10 | 11 | 20  |
| FX20-40S-0.5SH  | 570-1601-8 | 40              | 9.5  | 21.4 | 22.4 | 9.5  | 20 | 21 | 40  |
| FX20-60S-0.5SH  | 570-1602-0 | 60              | 14.5 | 26.4 | 27.4 | 14.5 | 30 | 31 | 60  |
| FX20-80S-0.5SH  | 570-1603-3 | 80              | 19.5 | 31.4 | 32.4 | 19.5 | 40 | 41 | 80  |
| FX20-100S-0.5SH | 570-1604-6 | 100             | 24.5 | 36.4 | 37.4 | 24.5 | 50 | 51 | 100 |
| FX20-120S-0.5SH | 570-1605-9 | 120             | 29.5 | 41.4 | 42.4 | 29.5 | 60 | 61 | 120 |
| FX20-140S-0.5SH | 570-1606-1 | 140             | 34.5 | 46.4 | 47.4 | 34.5 | 70 | 71 | 140 |

◆Recommended PCB layout

(PCB thickness: t= 1.6 mm/Stencil thickness: t= 0.15 mm, t= 0.12 mm)

●Straight receptacle

FX20-\*\*-S-0.5SV  
FX20-\*\*-S-0.5SV10

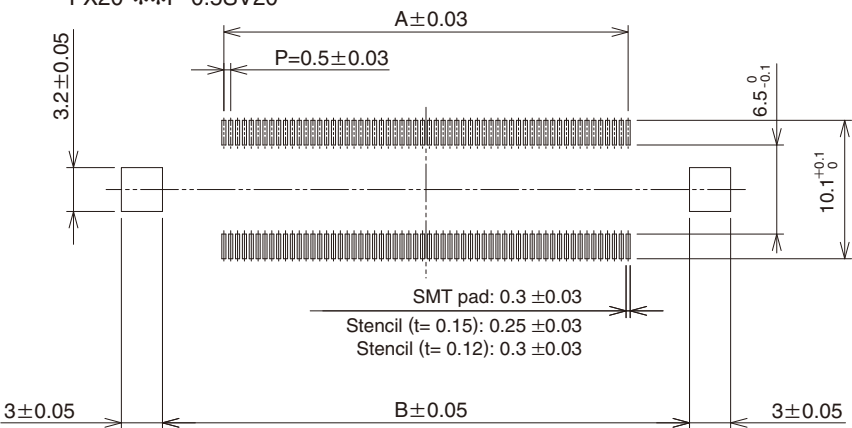


Unit: mm

| **  | A    | B     |
|-----|------|-------|
| 20  | 4.5  | 13.46 |
| 40  | 9.5  | 18.46 |
| 60  | 14.5 | 23.46 |
| 80  | 19.5 | 28.46 |
| 100 | 24.5 | 33.46 |
| 120 | 29.5 | 38.46 |
| 140 | 34.5 | 43.46 |

●Straight header

FX20-\*\*-P-0.5SV15  
FX20-\*\*-P-0.5SV20

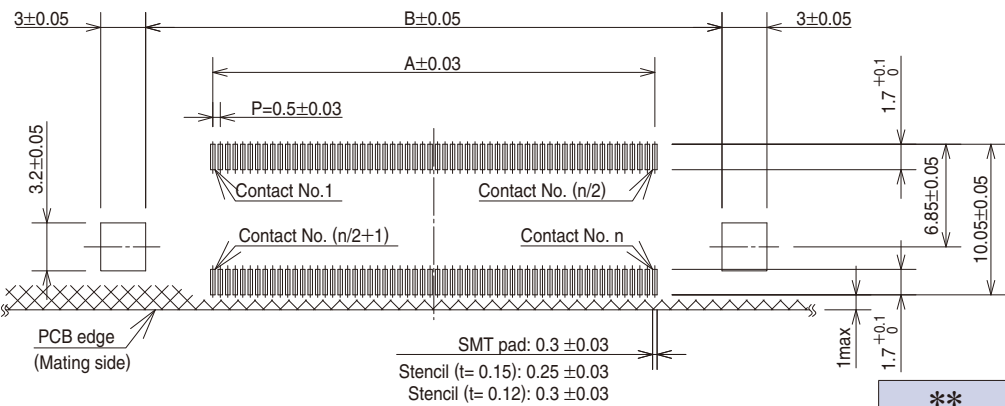


Unit: mm

| **  | A    | B     |
|-----|------|-------|
| 20  | 4.5  | 13.46 |
| 40  | 9.5  | 18.46 |
| 60  | 14.5 | 23.46 |
| 80  | 19.5 | 28.46 |
| 100 | 24.5 | 33.46 |
| 120 | 29.5 | 38.46 |
| 140 | 34.5 | 43.46 |

●Right angle receptacle

FX20-\*\*-S-0.5SH

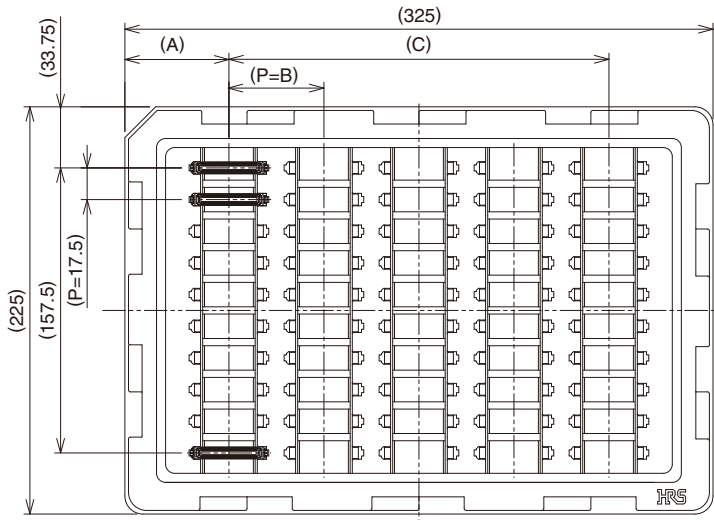


Unit: mm

| **  | A    | B     |
|-----|------|-------|
| 20  | 4.5  | 13.46 |
| 40  | 9.5  | 18.46 |
| 60  | 14.5 | 23.46 |
| 80  | 19.5 | 28.46 |
| 100 | 24.5 | 33.46 |
| 120 | 29.5 | 38.46 |
| 140 | 34.5 | 43.46 |

## Tray package drawing

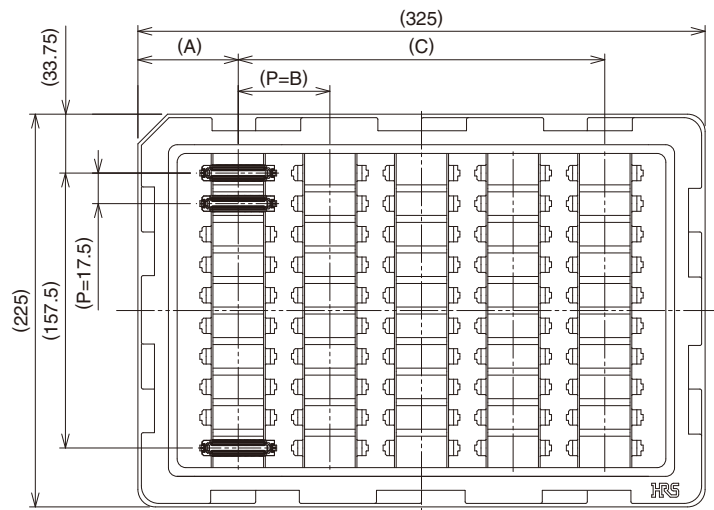
### ●Straight receptacle



Unit: mm

| Part No.          | Quantity | A    | B    | C   |
|-------------------|----------|------|------|-----|
| FX20-20S-0.5SV    | 90       | 42.5 | 30   | 240 |
| FX20-20S-0.5SV10  |          |      |      |     |
| FX20-40S-0.5SV    | 80       | 40   | 35   | 245 |
| FX20-40S-0.5SV10  |          |      |      |     |
| FX20-60S-0.5SV    | 70       | 50   | 37.5 | 225 |
| FX20-60S-0.5SV10  |          |      |      |     |
| FX20-80S-0.5SV    | 60       | 50   | 45   | 225 |
| FX20-80S-0.5SV10  |          |      |      |     |
| FX20-100S-0.5SV   | 60       | 47.5 | 46   | 230 |
| FX20-100S-0.5SV10 |          |      |      |     |
| FX20-120S-0.5SV   | 50       | 57.5 | 52.5 | 210 |
| FX20-120S-0.5SV10 |          |      |      |     |
| FX20-140S-0.5SV   | 50       | 51.5 | 55.5 | 222 |
| FX20-140S-0.5SV10 |          |      |      |     |

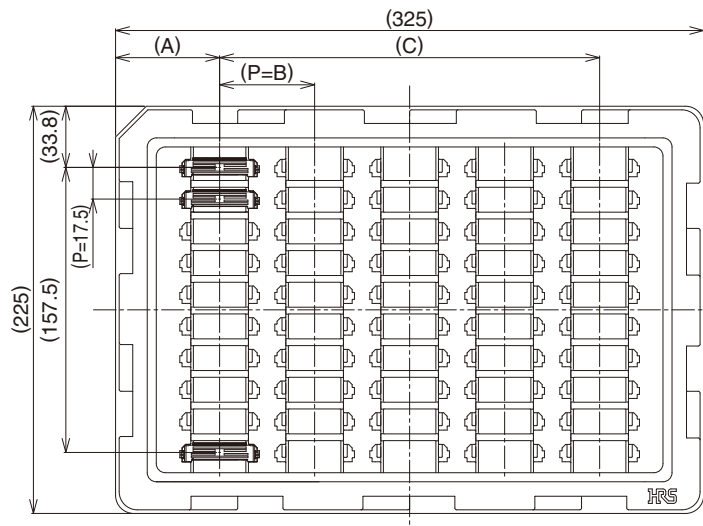
### ●Straight header



Unit: mm

| Part No.          | Quantity | A    | B    | C   |
|-------------------|----------|------|------|-----|
| FX20-20P-0.5SV15  | 90       | 42.5 | 30   | 240 |
| FX20-20P-0.5SV20  |          |      |      |     |
| FX20-40P-0.5SV15  | 80       | 40   | 35   | 245 |
| FX20-40P-0.5SV20  |          |      |      |     |
| FX20-60P-0.5SV15  | 70       | 50   | 37.5 | 225 |
| FX20-60P-0.5SV20  |          |      |      |     |
| FX20-80P-0.5SV15  | 60       | 50   | 45   | 225 |
| FX20-80P-0.5SV20  |          |      |      |     |
| FX20-100P-0.5SV15 | 60       | 47.5 | 46   | 230 |
| FX20-100P-0.5SV20 |          |      |      |     |
| FX20-120P-0.5SV15 | 50       | 57.5 | 52.5 | 210 |
| FX20-120P-0.5SV20 |          |      |      |     |
| FX20-140P-0.5SV15 | 50       | 51.5 | 55.5 | 222 |
| FX20-140P-0.5SV20 |          |      |      |     |

### ●Right angle receptacle

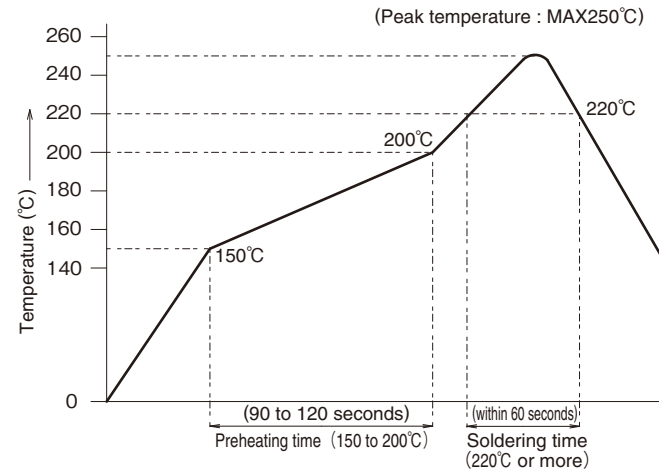


Unit: mm

| Part No.        | Quantity | A    | B    | C   |
|-----------------|----------|------|------|-----|
| FX20- 20S-0.5SH | 90       | 42.5 | 30   | 240 |
| FX20- 40S-0.5SH | 80       | 40   | 35   | 245 |
| FX20- 60S-0.5SH | 70       | 50   | 37.5 | 225 |
| FX20- 80S-0.5SH | 60       | 50   | 45   | 225 |
| FX20-100S-0.5SH | 60       | 47.5 | 46   | 230 |
| FX20-120S-0.5SH | 50       | 57.5 | 52.5 | 210 |
| FX20-140S-0.5SH | 50       | 51.5 | 55.5 | 222 |

◆Recommended Solder

●This temperature profile is based on the setting conditions shown below and is for reference only. For individual applications, the temperature profile may vary in accordance with the conditions. Please confirm the profile before mounting.



- <Applicable Conditions>
- Test PCB dimensions : 110 × 50 × 1.6mm
  - Material : Glass epoxy
  - Solder composition : Sn- 3 Ag- 0.5 Cu
  - Flux content : 11 wt%
  - Stencil thickness : 0.12mm, 0.15mm
  - Reflow count : 2 times
  - Reflow area : 220°C or more, 60 sec max.
  - Preheating unit : 150 to 200°C, 90 to 120 sec

\* The temperature profile may vary due to external conditions such as the type of cream solder, manufacturer, and board size. Please contact the solder manufacturer for their specifications.

◆Cleaning condition

●Organic solvent-based cleaning

| Solvent type            | Room temperature cleaning | Heated cleaning |
|-------------------------|---------------------------|-----------------|
| IPA (Isopropyl alcohol) | ○                         | ○               |

●Water based cleaning

When using water based cleaning agents (including terpene, and alkali saponifiers), pay special attention to how the cleaning agent will react to specific metals and plastics before selecting one of them. Various cleaning agent manufacturers publish reaction tables for their cleaning agents. Do not leave connectors with moisture remaining on them.

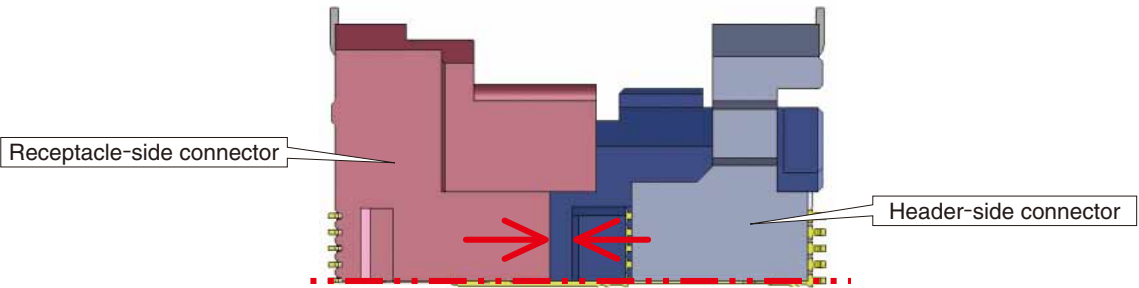
●Caution when washing

The electrical performance may deteriorate if the flux or cleaning detergent is left on the connector after the cleaning. Check thoroughly to ensure that there is no residue left on any of the surfaces.

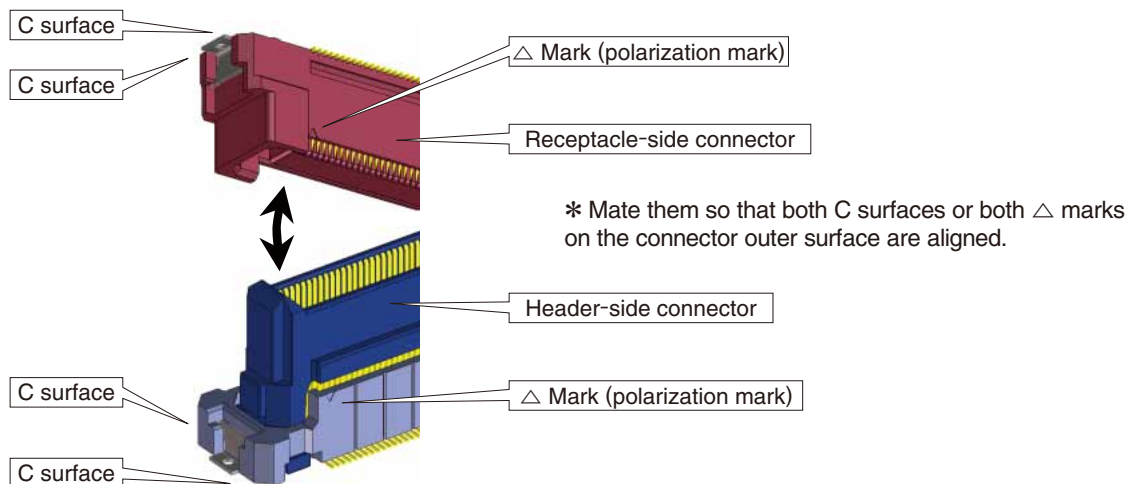
◆Precautions

●Tolerance clearance on mating

The effective contact length of each product is 1.5mm. In the mated condition, the header and receptacle shall have a clearance or gap between them of no more than 1mm.



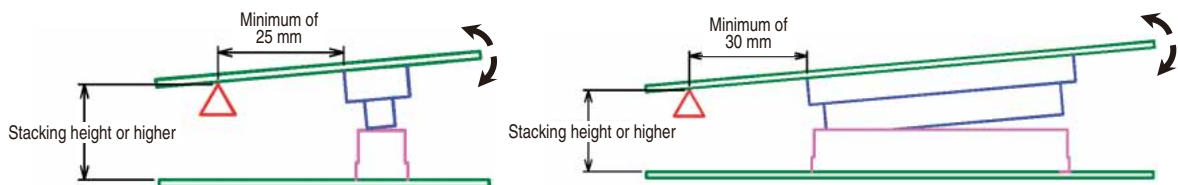
- Using excessive force when mating these connectors may result in damage and alter their performance. Although they are designed with a prevention mechanism to resist incorrect insertion, do not forcibly mate them. Before mating the connector, confirm the connector polarity as shown below.



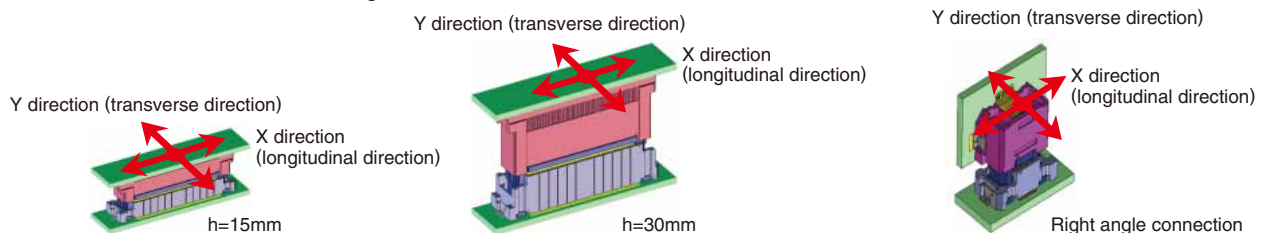
- Provide another form of support to the PCB. This connector was not designed to be the main form of support.
- Mating and un-mating with excessive prying force or rotating force may result in damage to the connector or contact failure.



If you have no choice but to mate and un-mate with prying force based on your usage environment, use a point as a pivot shown by △ mark in the figure below when you apply those forces. The point shall be a certain distance away from the connector end and has equal or higher height of the mating height.  
(Please refer to the guideline for details including the relationship between the pivot position and the connector position, and usage examples.)



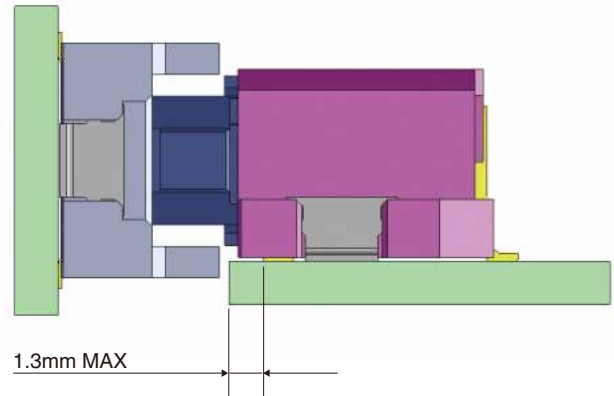
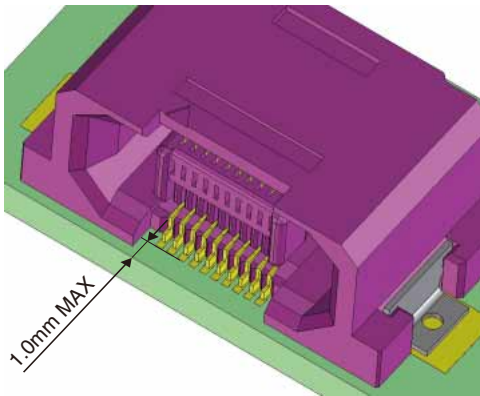
- This connector has a floating structure, but the floating range may vary depending on the height of connector on the header side (which has a floating mechanism).



| Header-side       | Receptacle-side   | Stack height | Floating range                       |                                    |
|-------------------|-------------------|--------------|--------------------------------------|------------------------------------|
|                   |                   |              | X direction (longitudinal direction) | Y direction (transverse direction) |
| FX20-**-P-0.5SV15 | FX20-**-S-0.5SV   | 15mm         | 0.6mm                                | 0.6mm                              |
| FX20-**-P-0.5SV20 |                   | 20mm         | 0.8mm                                | 0.6mm                              |
| FX20-**-P-0.5SV15 | FX20-**-S-0.5SV10 | 25mm         | 0.6mm                                | 0.6mm                              |
| FX20-**-P-0.5SV20 |                   | 30mm         | 0.8mm                                | 0.6mm                              |
| FX20-**-P-0.5SV15 | FX20-**-S-0.5SH   | —            | 0.6mm                                | 0.6mm                              |
| FX20-**-P-0.5SV20 |                   | —            | 0.8mm                                | 0.6mm                              |

- If the right angle type connector is positioned too far back from the recommended connector mounting position, the straight type connector will make contact with the PCB, and these may lead to damaged product or abnormal connections.

The location of right angle type SMT pad should be set to within 1mm from the edge of the PCB, and the mounting position should be set so that the clearance from the head of the connector to the edge of the PCB is 1.3mm or less.



[illegible]

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