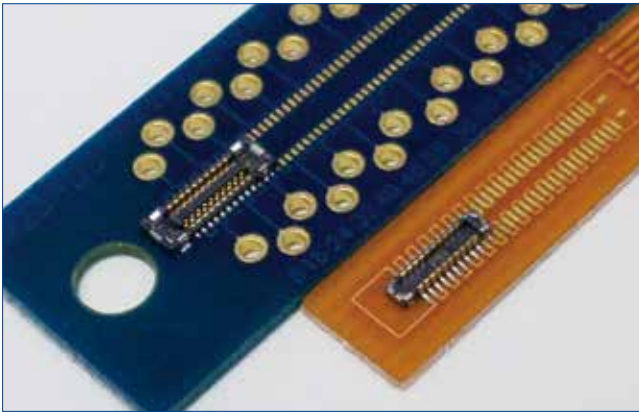


## BM23FR Series



### ■ Features

#### 1. Space-saving design

Compact design ideal for mobile devices (See Fig.1)  
 •Pitch : 0.35mm, Width : 1.98mm, Stacking height : 0.6/0.8mm

#### 2. Robust [Breaking Strength : 90N]

Metal guides prevent housing damage due to incorrect mating. (See Fig.2)

#### 3. Highly reliable contact design

2-point contact design for signal contact ensures high reliability. (See Fig.3)

#### 4. Good mating operation

Wide self alignment range with metal guides offers enhanced mating operation.  
 (0.4mm in pitch direction, 0.35mm in width direction)  
 Furthermore, a clear tactile click generated by the unique locking contact design insures complete mating.

#### 5. Supports USB 3.1 Gen.2 (10Gbps) transmission

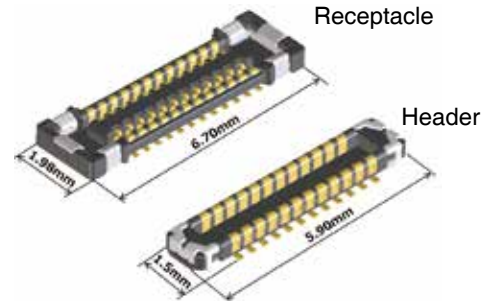
Signal contacts support USB3.1 Gen.2 transmission speed.

### ■ Environmental

- Halogen-free\*  
 As defined by IEC 61249-2-21  
 Br : 900ppm max., Cl : 900ppm max.  
 Br+Cl : 1,500ppm max.

#### Space-saving

Dimension Example : 24 Pos.



Narrow width design allows for use in small spaces.

Fig.1

#### Robust design

Metal guides are designed to reduce connector damage even if mated incorrectly.

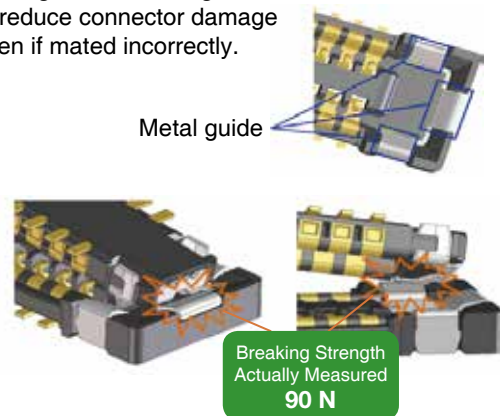


Fig.2

#### Cross-sectional view of mated contact

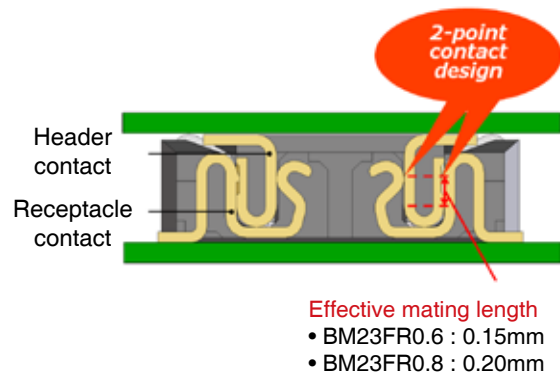


Fig.3

## Product Specifications

|         |               |           |                             |                       |                           |                       |
|---------|---------------|-----------|-----------------------------|-----------------------|---------------------------|-----------------------|
| Ratings | Rated current | 0.3A      | Operating temperature range | -55°C to 85°C (Note1) | Storage temperature range | -10°C to 60°C (Note2) |
|         | Rated voltage | 30V AC/DC | Operating humidity range    | 20% to 80%            | Storage humidity range    | 40% to 70% (Note2)    |

| Items                        | Specifications   | Conditions  |
|------------------------------|--|---|
| 1. Contact resistance        | 100mΩ max.   | Measured at 20mV AC, 1kHz, and 1mA  |
| 2. Insulation resistance     | 50MΩ min.  | Measured at 100V DC   |
| 3. Withstanding voltage      | No flashover or insulation breakdown                                     | 100V AC for 1 minute  |
| 4. Durability                | Contact resistance: 100mΩ max.   | 10 mating cycles  |
| 5. Vibration                 | No electrical discontinuity for more than 1μs.                           | Frequency: 10 to 55Hz, single amplitude : 0.75mm in 3 axis directions for 5 minutes, 10 cycles                            |
| 6. Shock resistance          | No electrical discontinuity of 1μs or more.                              | Acceleration : 490m/s <sup>2</sup> , duration of pulse : 11ms at 3 times for 3 directions                                 |
| 7. Humidity                  | Contact resistance : 100mΩ max.<br>Insulation resistance : 25mΩ min.     | 96 hours at temperature of 40±2°C and a humidity range from 90 to 95%   |
| 8. Temperature cycle         | Contact resistance: 100mΩ max.<br>Insulation resistance: 50MΩ min.       | -55°C for 30 minutes → 85°C for 30 minutes, 5 cycles  |
| 9. Soldering heat resistance | No dissolution or melting of the resin that will affect the performance. | Reflow: with recommended temperature profile;<br>Hand soldering at soldering iron temperature of 350°C for 3 seconds max. |

Note 1 : Includes temperature rise caused by current flow.

Note 2 : Storage refers to long-term-storage of unused items before they are mounted on the PCB.

Operating temperature/humidity range applies to the state of temporary storage such as non-powered after mounting on the PCB, and during transportation, etc.

## Materials / Finish

| Product           | Part          | Material     | Finish       | UL Regulation |
|-------------------|---------------|--------------|--------------|---------------|
| Receptacle Header | Insulator     | LCP          | Black        | UL94V-0       |
|                   | Contact       | Copper alloy | Gold plating | —             |
|                   | Metal Fitting | Copper alloy | Gold plating | —             |

## 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

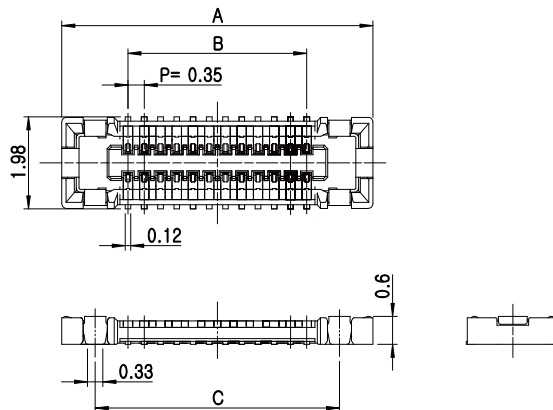
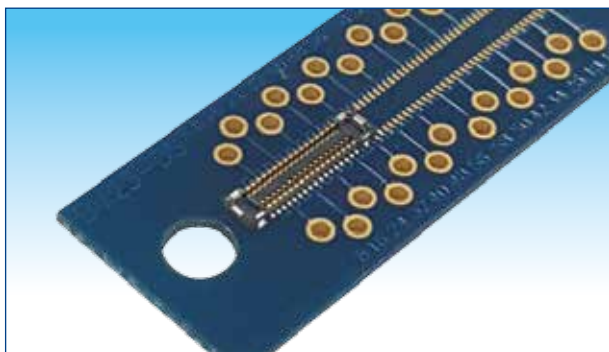
### ● Receptacle / Header

**BM** **23** **FR** **\*\*** - **\*** **DS** - **0.35** **V** **(\*\*\*)**

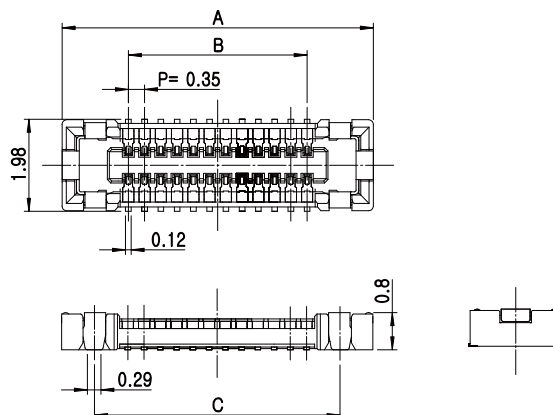
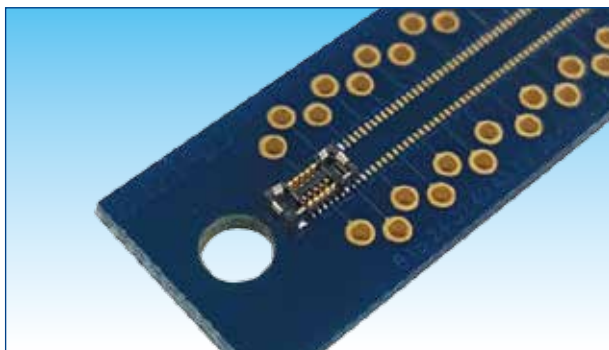
①      ②      ③      ④                      ⑤      ⑥                      ⑦      ⑧      ⑨

|   |  |
|---|--|
| ① Series Name: BM                                 | ⑥ Connector Type<br>DS: Receptacle<br>DP: Header   |
| ② Series No. : 23                                 | ⑦ Contact Pitch : 0.35mm   |
| ③ Shape Symbols<br>FR: With locking metal fitting | ⑧ Terminal type<br>V : Straight SMT  |
| ④ Stacking Height : 0.6mm, 0.8mm                  | ⑨ Gold plated specification and packaging status<br>(51) : Gold plate thickness 0.05μm<br>Embossed tape packaging (10,000pcs/reel)<br>(895) : Gold plate thickness 0.05μm<br>Embossed tape packaging (1,000pcs/reel) |
| ⑤ Number of Contacts                              |  |

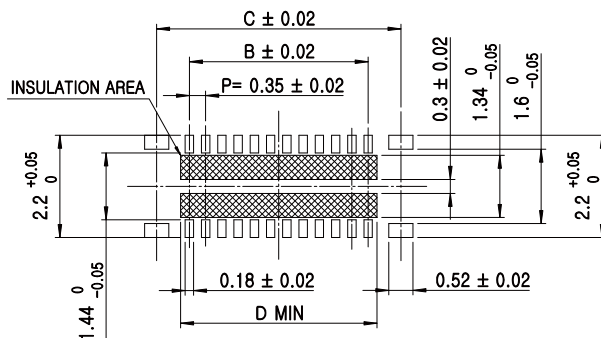
### ■ H=0.6mm Receptacle



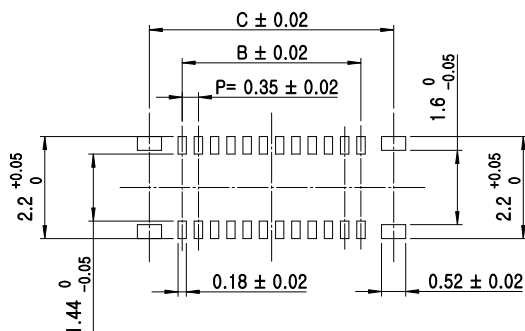
### ■ H=0.8mm Receptacle



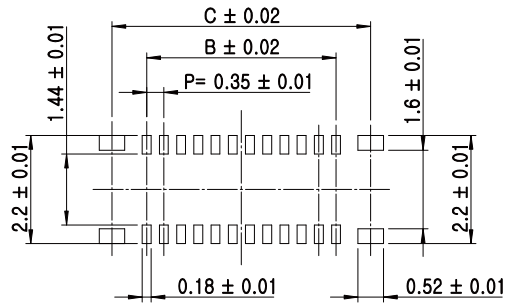
### ◆ Recommended PCB layout [H=0.6 mm]



### ◆ Recommended PCB layout [H=0.8 mm]



◆ Recommended metal mask dimensions (mask thickness : 100μm)  
 [0.6mm and 0.8mm common]



Unit : mm

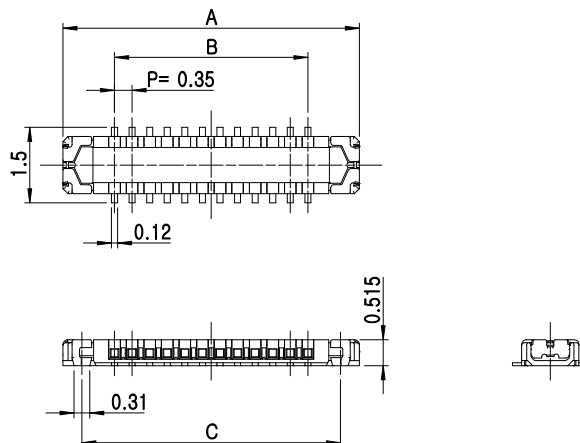
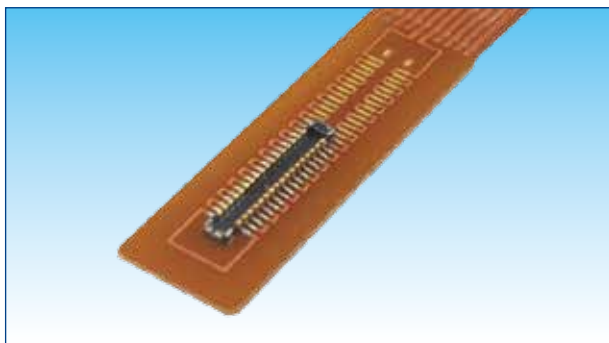
| Part No.                  | HRS No.       | No. of contacts | A     | B     | C     | D    |
|---------------------------|---------------|-----------------|-------|-------|-------|------|
| BM23FR0.6-6DS-0.35V(***)  | 480-0287-0 ** | 6               | 3.55  | 0.70  | 2.11  | 1.08 |
| BM23FR0.6-8DS-0.35V(***)  | 480-0360-0 ** | 8               | 3.90  | 1.05  | 2.46  | 1.43 |
| BM23FR0.6-10DS-0.35V(***) | 480-0258-0 ** | 10              | 4.25  | 1.40  | 2.81  | 1.78 |
| BM23FR0.6-12DS-0.35V(***) | 480-0371-0 ** | 12              | 4.60  | 1.75  | 3.16  | 2.13 |
| BM23FR0.6-16DS-0.35V(***) | 480-0295-0 ** | 16              | 5.30  | 2.45  | 3.86  | 2.83 |
| BM23FR0.6-20DS-0.35V(***) | 480-0272-0 ** | 20              | 6.00  | 3.15  | 4.56  | 3.53 |
| BM23FR0.6-24DS-0.35V(***) | 480-0260-0 ** | 24              | 6.70  | 3.85  | 5.26  | 4.23 |
| BM23FR0.6-30DS-0.35V(***) | 480-0327-0 ** | 30              | 7.75  | 4.90  | 6.31  | 5.28 |
| BM23FR0.6-34DS-0.35V(***) | 480-0274-0 ** | 34              | 8.45  | 5.60  | 7.01  | 5.98 |
| BM23FR0.6-40DS-0.35V(***) | 480-0390-0 ** | 40              | 9.50  | 6.65  | 8.06  | 7.03 |
| BM23FR0.6-50DS-0.35V(***) | 480-0382-0 ** | 50              | 11.25 | 8.40  | 9.81  | 8.78 |
| Part No.                  | HRS No.       | No. of contacts | A     | B     | C     |      |
| BM23FR0.8-10DS-0.35V(***) | 480-0298-0 ** | 10              | 4.25  | 1.40  | 2.81  |      |
| BM23FR0.8-18DS-0.35V(***) | 480-0469-0 ** | 18              | 5.65  | 2.80  | 4.21  |      |
| BM23FR0.8-60DS-0.35V(***) | 480-0300-0 ** | 60              | 13.00 | 10.15 | 11.56 |      |

Note 1 : Please place orders in full reel quantities.

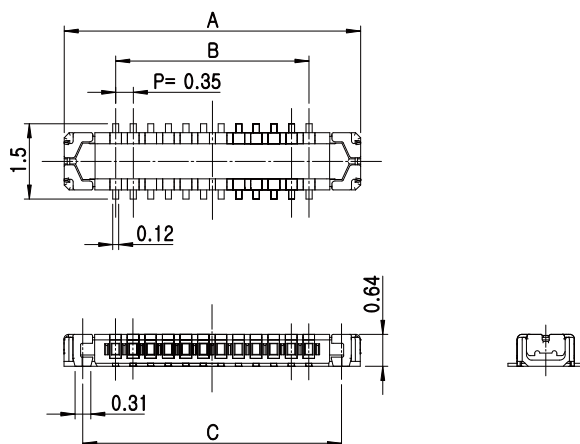
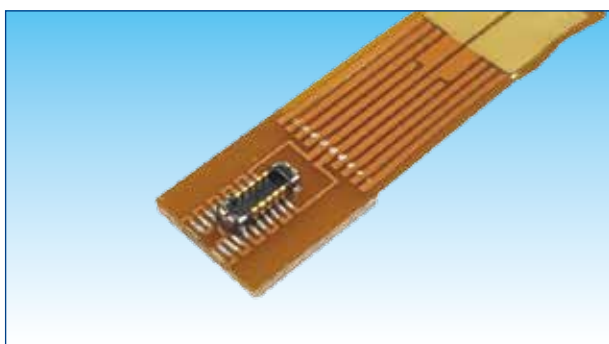
Note 2 : This connector has no polarity.

Note 3 : The specification number(895) in the Part No. changes to(95) in the HRS No.

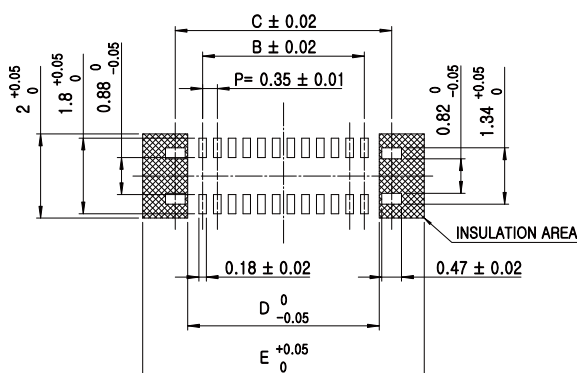
### ■ H=0.6mm Header



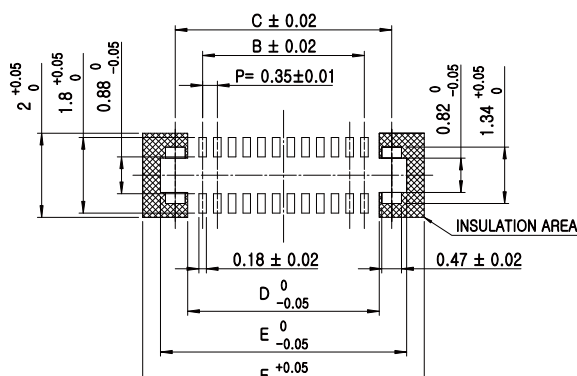
### ■ H=0.8mm Header



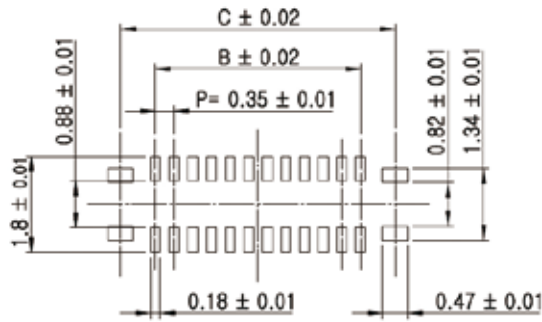
### ◆ Recommended PCB layout [H=0.6mm]



### ◆ Recommended PCB layout [H=0.8mm]



◆ Recommended metal mask dimensions (mask thickness : 100μm)  
 [0.6mm and 0.8mm common]



Unit : mm

| Part No.                  | HRS No.       | No. of contacts | A     | B     | C     | D     | E     |       |
|---------------------------|---------------|-----------------|-------|-------|-------|-------|-------|-------|
| BM23FR0.6-6DP-0.35V(***)  | 480-0286-0 ** | 6               | 2.75  | 0.70  | 2.00  | 1.41  | 3.55  |       |
| BM23FR0.6-8DP-0.35V(***)  | 480-0361-0 ** | 8               | 3.10  | 1.05  | 2.35  | 1.76  | 3.90  |       |
| BM23FR0.6-10DP-0.35V(***) | 480-0257-0 ** | 10              | 3.45  | 1.40  | 2.70  | 2.11  | 4.25  |       |
| BM23FR0.6-12DP-0.35V(***) | 480-0364-0 ** | 12              | 3.80  | 1.75  | 3.05  | 2.46  | 4.60  |       |
| BM23FR0.6-16DP-0.35V(***) | 480-0290-0 ** | 16              | 4.50  | 2.45  | 3.75  | 3.16  | 5.30  |       |
| BM23FR0.6-20DP-0.35V(***) | 480-0273-0 ** | 20              | 5.20  | 3.15  | 4.45  | 3.86  | 6.00  |       |
| BM23FR0.6-24DP-0.35V(***) | 480-0259-0 ** | 24              | 5.90  | 3.85  | 5.15  | 4.56  | 6.70  |       |
| BM23FR0.6-30DP-0.35V(***) | 480-0328-0 ** | 30              | 6.95  | 4.90  | 6.20  | 5.61  | 7.75  |       |
| BM23FR0.6-34DP-0.35V(***) | 480-0275-0 ** | 34              | 7.65  | 5.60  | 6.90  | 6.31  | 8.45  |       |
| BM23FR0.6-40DP-0.35V(***) | 480-0391-0 ** | 40              | 8.70  | 6.65  | 7.95  | 7.36  | 9.50  |       |
| BM23FR0.6-50DP-0.35V(***) | 480-0383-0 ** | 50              | 10.45 | 8.40  | 9.70  | 9.11  | 11.25 |       |
| Part No.                  | HRS No.       | No. of contacts | A     | B     | C     | D     | E     | F     |
| BM23FR0.8-10DP-0.35V(***) | 480-0297-0 ** | 10              | 3.45  | 1.40  | 2.70  | 2.11  | 3.41  | 4.25  |
| BM23FR0.8-18DP-0.35V(***) | 480-0468-0 ** | 18              | 4.85  | 2.80  | 4.10  | 3.51  | 4.81  | 5.65  |
| BM23FR0.8-60DP-0.35V(***) | 480-0299-0 ** | 60              | 12.20 | 10.15 | 11.45 | 10.86 | 12.16 | 13.00 |

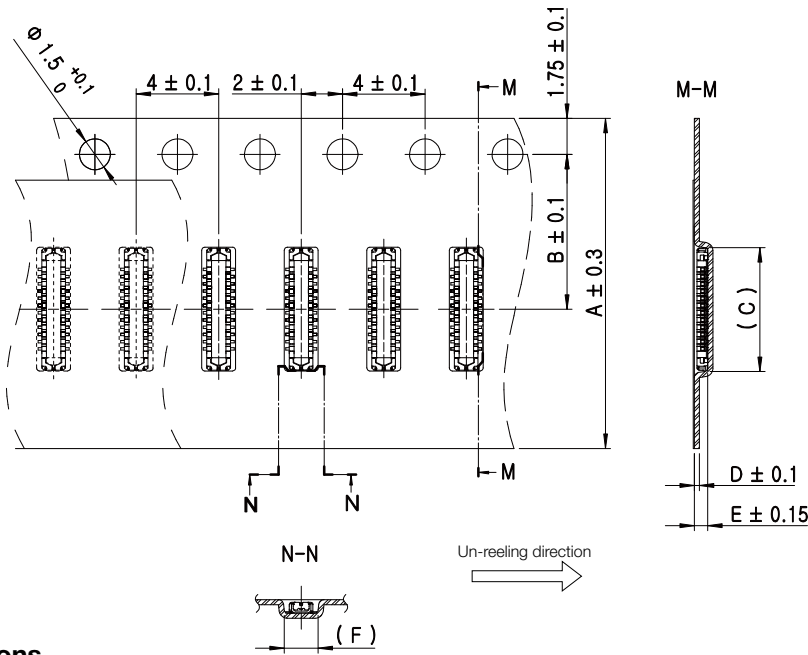
Note 1 : Please place orders in full reel quantities.

Note 2 : This connector has no polarity.

Note 3 : The specification number(895) in the Part No. changes to(95) in the HRS No.

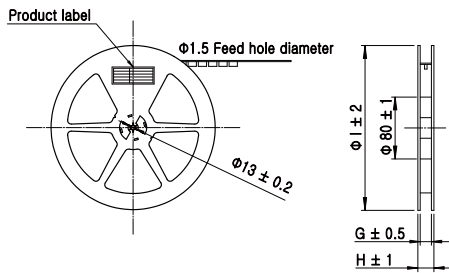
◆ Embossed Tape Dimensions (IEC 602286-3, with JIC C 0806)

● Receptacle

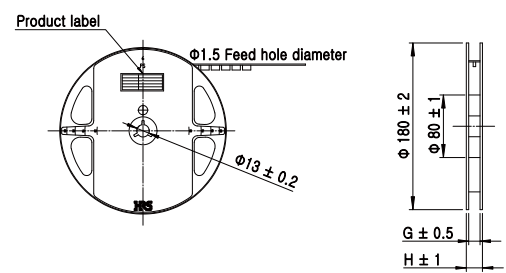


● Reel Dimensions

▶ 10,000pcs/reel



▶ 1,000pcs/reel



Unit : mm

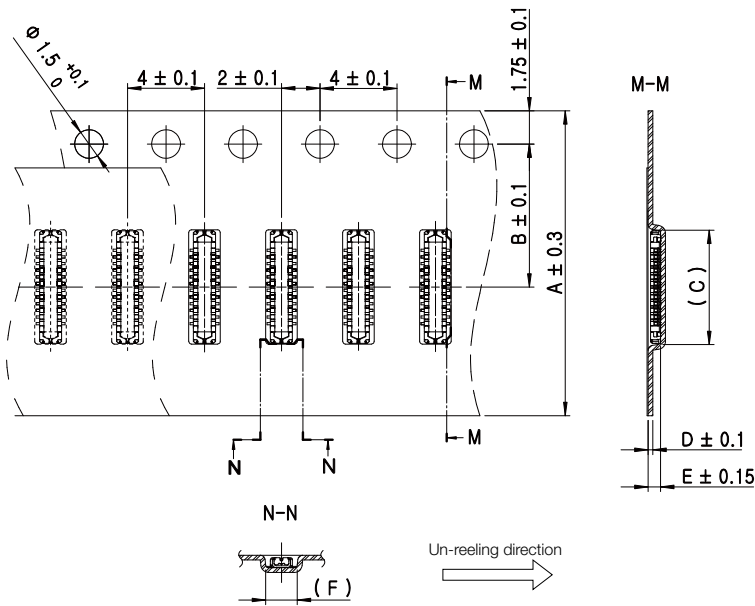
| Part No.                  | HRS No.       | No. of contacts | A  | B    | C     | D    | E   | F    | G    | H    | I   |
|---------------------------|---------------|-----------------|----|------|-------|------|-----|------|------|------|-----|
| BM23FR0.6-6DS-0.35V(***)  | 480-0287-0 ** | 6               | 12 | 5.5  | 3.66  | 0.25 | 0.8 | 2.07 | 13.5 | 17.5 | 330 |
| BM23FR0.6-8DS-0.35V(***)  | 480-0360-0 ** | 8               | 12 | 5.5  | 4.01  | 0.25 | 0.8 | 2.07 | 13.5 | 17.5 | 330 |
| BM23FR0.6-10DS-0.35V(***) | 480-0371-0 ** | 10              | 16 | 7.5  | 4.36  | 0.25 | 0.8 | 2.07 | 17.5 | 21.5 | 380 |
| BM23FR0.6-12DS-0.35V(***) | 480-0295-0 ** | 12              | 16 | 7.5  | 4.71  | 0.25 | 0.8 | 2.07 | 17.5 | 21.5 | 330 |
| BM23FR0.6-16DS-0.35V(***) | 480-0272-0 ** | 16              | 16 | 7.5  | 5.41  | 0.25 | 0.8 | 2.07 | 17.5 | 21.5 | 330 |
| BM23FR0.6-20DS-0.35V(***) | 480-0260-0 ** | 20              | 16 | 7.5  | 6.11  | 0.25 | 0.8 | 2.07 | 17.5 | 21.5 | 380 |
| BM23FR0.6-24DS-0.35V(***) | 480-0327-0 ** | 24              | 16 | 7.5  | 6.81  | 0.25 | 0.8 | 2.07 | 17.5 | 21.5 | 380 |
| BM23FR0.6-30DS-0.35V(***) | 480-0274-0 ** | 30              | 24 | 11.5 | 7.86  | 0.25 | 0.8 | 2.07 | 25.5 | 29.5 | 330 |
| BM23FR0.6-34DS-0.35V(***) | 480-0390-0 ** | 34              | 24 | 11.5 | 8.56  | 0.25 | 0.8 | 2.07 | 25.5 | 29.5 | 380 |
| BM23FR0.6-40DS-0.35V(***) | 480-0382-0 ** | 40              | 24 | 11.5 | 9.61  | 0.25 | 0.8 | 2.07 | 25.5 | 29.5 | 330 |
| BM23FR0.6-50DS-0.35V(***) | 480-0371-0 ** | 50              | 24 | 11.5 | 11.36 | 0.25 | 0.8 | 2.07 | 25.5 | 29.5 | 330 |
| Part No.                  | HRS No.       | No. of contacts | A  | B    | C     | D    | E   | F    | G    | H    | I   |
| BM23FR0.8-10DS-0.35V(***) | 480-0298-0 ** | 10              | 16 | 7.5  | 4.36  | 0.3  | 1.0 | 2.07 | 17.5 | 21.5 | 330 |
| BM23FR0.8-18DS-0.35V(***) | 480-0469-0 ** | 18              | 16 | 7.5  | 5.76  | 0.3  | 1.0 | 2.07 | 17.5 | 21.5 | 330 |
| BM23FR0.8-60DS-0.35V(***) | 480-0300-0 ** | 60              | 24 | 11.5 | 13.11 | 0.3  | 1.0 | 2.07 | 25.5 | 29.5 | 330 |

Note 1 : The specification number(895) in the Part No. changes to(95) in the HRS No.



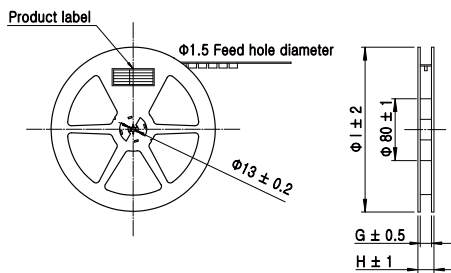
◆ Embossed Tape Dimensions (IEC 602286-3, with JIC C 0806)

● Header

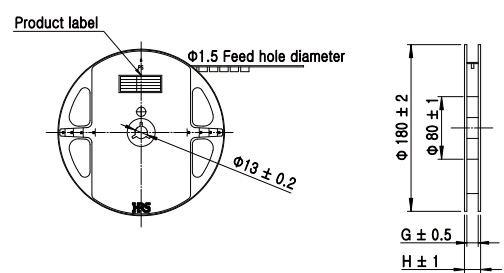


● Reel Dimensions

▶ 10,000pcs/reel



▶ 1,000pcs/reel



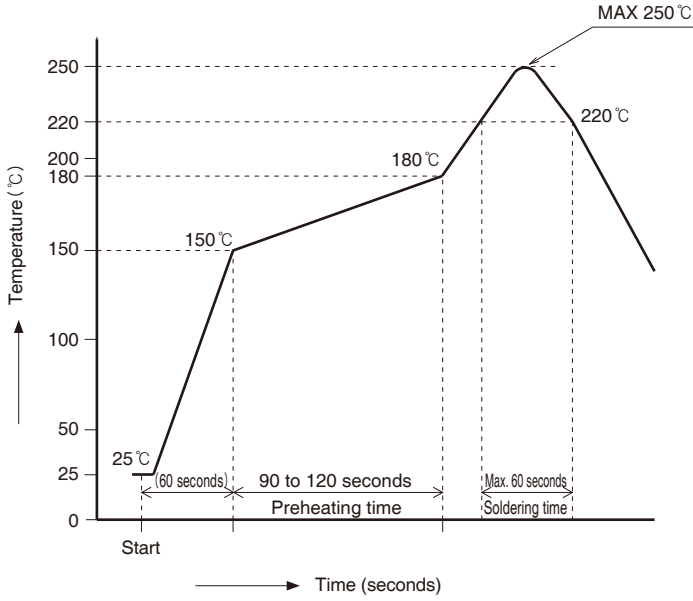
Unit : mm

| Part No.                  | HRS No.       | No. of contacts | A  | B    | C     | D    | E    | F    | G    | H    | I   |
|---------------------------|---------------|-----------------|----|------|-------|------|------|------|------|------|-----|
| BM23FR0.6-6DP-0.35V(***)  | 480-0286-0 ** | 6               | 12 | 5.5  | 2.85  | 0.25 | 0.65 | 1.58 | 13.5 | 17.5 | 330 |
| BM23FR0.6-8DP-0.35V(***)  | 480-0361-0 ** | 8               | 12 | 5.5  | 3.20  | 0.25 | 0.65 | 1.58 | 13.5 | 17.5 | 330 |
| BM23FR0.6-10DP-0.35V(***) | 480-0257-0 ** | 10              | 12 | 5.5  | 3.55  | 0.25 | 0.65 | 1.64 | 13.5 | 17.5 | 380 |
| BM23FR0.6-12DP-0.35V(***) | 480-0364-0 ** | 12              | 12 | 5.5  | 3.90  | 0.25 | 0.65 | 1.64 | 13.5 | 17.5 | 330 |
| BM23FR0.6-16DP-0.35V(***) | 480-0290-0 ** | 16              | 16 | 7.5  | 4.60  | 0.25 | 0.65 | 1.64 | 17.5 | 21.5 | 330 |
| BM23FR0.6-20DP-0.35V(***) | 480-0273-0 ** | 20              | 16 | 7.5  | 5.30  | 0.25 | 0.65 | 1.64 | 17.5 | 21.5 | 380 |
| BM23FR0.6-24DP-0.35V(***) | 480-0259-0 ** | 24              | 16 | 7.5  | 6.00  | 0.25 | 0.65 | 1.64 | 17.5 | 21.5 | 380 |
| BM23FR0.6-30DP-0.35V(***) | 480-0328-0 ** | 30              | 16 | 7.5  | 7.05  | 0.25 | 0.65 | 1.64 | 17.5 | 21.5 | 330 |
| BM23FR0.6-34DP-0.35V(***) | 480-0275-0 ** | 34              | 16 | 7.5  | 7.75  | 0.25 | 0.65 | 1.64 | 17.5 | 21.5 | 380 |
| BM23FR0.6-40DP-0.35V(***) | 480-0391-0 ** | 40              | 24 | 11.5 | 8.80  | 0.25 | 0.65 | 1.64 | 25.5 | 29.5 | 330 |
| BM23FR0.6-50DP-0.35V(***) | 480-0383-0 ** | 50              | 24 | 11.5 | 10.55 | 0.25 | 0.65 | 1.64 | 25.5 | 29.5 | 330 |
| Part No.                  | HRS No.       | No. of contacts | A  | B    | C     | D    | E    | F    | G    | H    | I   |
| BM23FR0.8-10DP-0.35V(***) | 480-0297-0 ** | 10              | 12 | 5.5  | 3.55  | 0.3  | 0.78 | 1.64 | 13.5 | 17.5 | 330 |
| BM23FR0.8-18DP-0.35V(***) | 480-0468-0 ** | 18              | 16 | 7.5  | 4.95  | 0.3  | 0.78 | 1.64 | 17.5 | 21.5 | 330 |
| BM23FR0.8-60DP-0.35V(***) | 480-0299-0 ** | 60              | 24 | 11.5 | 12.30 | 0.3  | 0.78 | 1.64 | 25.5 | 29.5 | 330 |

Note 1 : The specification number (895) in the Part No. changes to (95) in the HRS No.

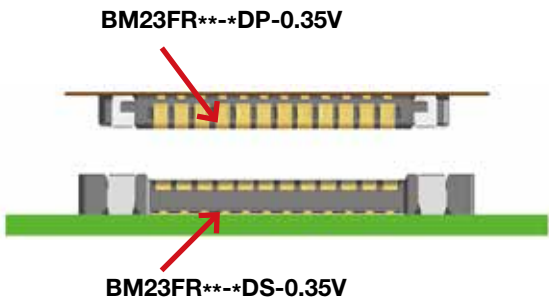
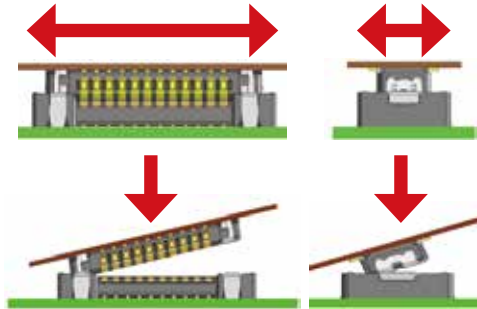
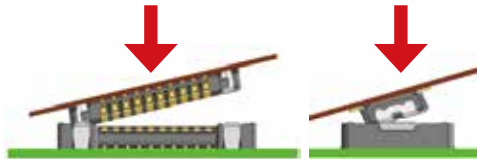




◆ Precautions

|  |   |
|--|---|
| <p>1. Recommended solder temperature profile</p>                               |  <p><b>[Conditions]</b></p> <ol style="list-style-type: none"> <li>1. Peak temperature : Maximum of 250°C</li> <li>2. Heat section : 220°C min., within 60 seconds</li> <li>3. Preheat section : 150 to 180°C, 90 to 120 seconds</li> <li>4. Number of reflow cycles : Maximum of 2 cycles</li> </ol> <p>Note 1 : The temperature is the surface temperature of the PCB in the vicinity of the connector lead part.<br/>                 Note 2 : When using nitrogen reflow process, please mount the product with the oxygen concentration at a minimum of 1,000[ppm].<br/>                 Please contact Hirose if the concentration is below 1,000 [ppm].</p>  |
| <p>2. Recommended manual soldering conditions</p>                              | <p>Soldering iron temperature: 340±10°C<br/>                 Soldering time : within 3 seconds</p>  |
| <p>3. Recommended screen thickness and open area ratio to PCB pattern area</p> | <p>Thickness : 0.1mm<br/>                 Aperture ratio : 100% on the DS side, 100% on the DP side</p>   |
| <p>4. Warpage of the PCB</p>   | <p>A maximum of 0.02mm at the center part of the connector based on both ends of the connector.</p>   |
| <p>5. Cleaning</p>   | <p>Not recommended. If this product is cleaned, please evaluate the performance before using it. Cleaning may cause a change in the mating/unmating properties as well as environmental resistance.</p>   |
| <p>6. Notes</p>  | <ul style="list-style-type: none"> <li>■ Care should be taken when mating/unmating the connector and when it is not mounted on the PCB. Damage or deformation of the contacts may occur.</li> <li>■ Avoid supporting the PCB only with the connectors. Support it by other means such as bolts, screws, posts, etc.</li> <li>■ Care should be taken to avoid excessive prying mating/unmating that could cause damage.</li> <li>■ During manual soldering, do not apply flux which will cause flux oozing on connector.</li> <li>■ This product may have slight color differences due to production lot variability, but this does not have any effect on the performance.</li> <li>■ Please refer to the next page for precautions regarding mating/unmating.</li> <li>■ Because the product can disengage if dropped (or other impact), and by FPC routing, it is advised to secure the mated connectors to the board with housings and cushioning materials.</li> <li>■ Caution! Do not use the connector in non-recommended conditions (i.e., rated current, rated voltage, PCB design and operating environment, etc.). Such usage could lead to material outgassing, ignition, or short-circuit, etc.<br/>                     Refer to the specifications and the guidelines for board pattern dimensions, board cautions, and connector treatment.<br/>                     Please contact Hirose if using the connector under conditions other than those described in the specifications and the guidelines is being considered.</li> </ul> |


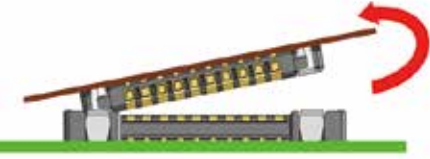
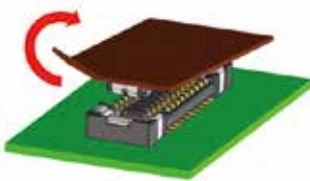
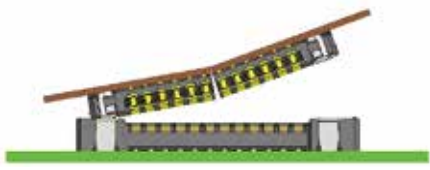
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● Handle with care when mating a connector

|   |   |
|---|---|
|  <p>BM23FR***DP-0.35V</p> <p>BM23FR***DS-0.35V</p>   |   |
| <p>Alignment method</p> <p><b>OK</b></p>  <p><b>NG</b></p>  | <p>When aligning, look for the guide port without applying excessive force.<br/>         Caution! If excessive force is applied, the connector could crack or be shaved which could lead to a defect in contact resistance.</p> |
| <p>Guiding condition</p>  <p>Mated condition</p>        | <p>When guided, the connectors are aligned parallel to each other with longitudinal and lateral movements restricted. Mate them parallel to each other.</p>   |

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● Handle with care when un-mating connectors

|   |  |
|---|--|
| <p><b>OK</b></p>                           | <p>Un-mate connectors parallel to each other.</p>  |
| <p><b>OK</b></p>  <p>Pitch direction</p>   | <p>If the connector cannot be un-mated parallel, it can be removed diagonally from the pitch direction, as shown in the left figure. However, the connector can be broken if the FPC is not rigid. Please confirm rigidity of the FPC at the time of trial production.</p>   |
| <p><b>NG</b></p>  <p>Corner direction</p> | <p>Do not pull from the corner. If it is pulled from the corner as shown in the left figure, the contact and connector could be damaged.</p>   |
| <p><b>NG</b></p>                         | <p>Please provide a reinforcing plate for the FPC. If the rigidity of the FPC is not sufficient, the connector may break as shown in the left figure. Please check the action of the FPC to be used repeatedly. A reinforcing plate of 0.3mm or thicker made of glass epoxy material, or 0.2mm or thicker stainless steel is recommended</p> |

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