0.35mm Pitch, 2.0mm Depth, 0.6mm Stacking Height Multi-RF Compatible Board-to-Board Connector

BM46 Series

■ Features
1. Multi-RF capable Board-to-Board connector, World’s smallest width class
   Pitch : 0.35mm, Width : 2.0mm, Stacking height : 0.6mm
2. Contact design ideal for both high speed digital transmission and RF signal
3. Superior RF Signal Transmission
   V.S.W.R. 0-3GHz : 1.3 Max.
   3-6GHz : 1.4 Max.
   6-12GHz : 1.6 Max.
4. Center shield prevents signal noise between opposing rows
5. Robust metal mating guides

■ Applications
Thin devices such as cell phones, tablet PCs, routers, etc. that require space-saving components.

■ Environmental
- Halogen-free*
  In accordance with IEC 61249-2-21
  Br : 900ppm max, Cl : 900ppm max
  Br+Cl : 1500ppm max

In cases where the application will demand a high level of reliability, such as automotive, please contact a company representative for further information.
BM46 Series
● 0.35mm Pitch, 2.0mm Depth, 0.6mm Stacking Height Multi-RF Compatible Board-to-Board Connector

■ Product Specifications

<table>
<thead>
<tr>
<th>Item Specifications</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Current : Signal Contact : 0.3A</td>
<td>Operating Temperature : -55 to +85°C (Note 1)</td>
</tr>
<tr>
<td>Rated Voltage 30V AC/DC</td>
<td>Storage Temperature Range : -55 to +60°C</td>
</tr>
<tr>
<td>Characteristic Impedance : 50Ω</td>
<td>Operating Humidity Range : 90% RH Max. (Note 3)</td>
</tr>
<tr>
<td></td>
<td>Operating Humidity Range : 90% RH Max. (Note 2, 3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contact Resistance</td>
<td>Signal Contact 100mΩ Max.</td>
<td>Measured at 20mV AC, 1kHz, and 1mA</td>
</tr>
<tr>
<td>2. Insulation Resistance</td>
<td>100MΩ Min.</td>
<td>Measured at 100V DC</td>
</tr>
<tr>
<td>3. Withstanding Voltage</td>
<td>No flashover or dielectric breakdown</td>
<td>150V AC for 1 minute</td>
</tr>
<tr>
<td>4. Mating Durability</td>
<td>Signal Contact 100mΩ Max.</td>
<td>10 Mating Cycles</td>
</tr>
<tr>
<td>5. Vibration</td>
<td>No electrical discontinuity of 1µs or more.</td>
<td>Frequency : 10 to 55Hz ; half amplitude of 0.75mm,10 cycles in each of 3 axis directions for 5 minutes/cycle, 30 cycles total</td>
</tr>
<tr>
<td>6. Shock Resistance</td>
<td>No electrical discontinuity of 1µs or more.</td>
<td>Acceleration : 450m/s², duration : 11ms, 3-axis half sine wave in both directions, 3 cycles for each</td>
</tr>
<tr>
<td>7. Humidity</td>
<td>Signal Contact : 100mΩ Max. Insulation Resistance : 50mΩ</td>
<td>Left for 96 hours at a temperature of 40 ±2°C and a humidity range from 90 to 95%</td>
</tr>
<tr>
<td>8. Temperature Cycle</td>
<td>Signal Contact : 100mΩ Max. Insulation Resistance : 100mΩ Min.</td>
<td>-55±3°C : 30 minutes → 85±2°C : 30 minutes, 5 cycles</td>
</tr>
<tr>
<td>9. Solder Heat Resistance</td>
<td>No dissolution or melting of the resin that will affect performance.</td>
<td>Reflow : with recommended temperature profile ; Hand soldering at soldering iron temperature of 350°C for 3 seconds max.</td>
</tr>
<tr>
<td>10. V.S.W.R.</td>
<td>1.3 Max. 1.4 Max. 1.6 Max.</td>
<td>0-3GHz 3-6GHz 6-12GHz</td>
</tr>
</tbody>
</table>

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 and humidity range apply when the product is not powered after PCB mounting and when temporarily stored during transportation.
Note 3 : Use without condensation.

■ Materials/ Finish

<table>
<thead>
<tr>
<th>Product / Part</th>
<th>Materials</th>
<th>Finish</th>
<th>UL Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Header / Receptacle Insulator</td>
<td>LCP</td>
<td>Black</td>
<td>UL94V-0</td>
</tr>
<tr>
<td>Contact</td>
<td>Phosphor Bronze</td>
<td>Gold Plated</td>
<td>–</td>
</tr>
</tbody>
</table>

■ 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.

● Header / Receptacle

BM46 B - * DP - 0.35 V (**)  

1. Series Name : BM46  
2. No. of Signal Contacts : 12  
3. Connector Type : DP : Header DS : Receptacle  
4. Contact Pitch : 0.35mm  
5. Termination Type : Straight SMT  
6. Gold plating and packaging conditions  
   (51) : Gold plating Embossed tape packaging (20,000 pcs/reel)  
   (53) : Gold plating Embossed tape packaging (1,000 pcs/reel)
BM46 Series 0.35mm Pitch, 2.0mm Depth, 0.6mm Stacking Height Multi-RF Compatible Board-to-Board Connector

Header

Recommended PCB Layout

Recommended Metal Mask Dimensions (Mask Thickness : 80μm)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>BM46B-12DP-0.35V(***</td>
<td>673-7055-0 **</td>
<td>12</td>
<td>3.85</td>
<td>1.75</td>
<td>2.33</td>
<td>1.75</td>
<td>2.27</td>
<td>1.75</td>
<td>2.27</td>
</tr>
</tbody>
</table>

Note 1 : Please place orders in full reel quantities.
Note 2 : This connector has no polarity.
BM46 Series
0.35mm Pitch, 2.0mm Depth, 0.6mm Stacking Height Multi-RF Compatible Board-to-Board Connector

**Receptacle**

![Image of Receptacle](image)

**Recommended PCB Layout**

![Recommended PCB Layout Diagram](image)

**Recommended Metal Mask Dimensions (Mask Thickness : 80μm)**

![Recommended Metal Mask Dimensions Diagram](image)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>Q</th>
<th>R</th>
<th>S</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>BM46B-12DS-0.35V(***</td>
<td>673-7054-0 ***</td>
<td>12</td>
<td>4.49</td>
<td>1.75</td>
<td>2.33</td>
<td>2.12</td>
<td>1.75</td>
<td>0.98</td>
<td>1.3</td>
<td>2.27</td>
<td>3.32</td>
<td>3.83</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>U</td>
<td>W</td>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td>AA</td>
<td>AB</td>
<td>AC</td>
<td>AD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.68</td>
<td>2.08</td>
<td>1.75</td>
<td>0.94</td>
<td>1.34</td>
<td>2.27</td>
<td>3.32</td>
<td>3.83</td>
<td>4.59</td>
<td></td>
</tr>
</tbody>
</table>

Note 1: Please place orders in full reel quantities.
Note 2: This connector has no polarity.
### Embossed Tape Dimensions (IEC 60286-3, JIS C 0806)

#### Header

<table>
<thead>
<tr>
<th>Part No.</th>
<th>No. of Contacts</th>
<th>AE</th>
<th>AF</th>
<th>AG</th>
<th>AH</th>
</tr>
</thead>
<tbody>
<tr>
<td>BM46B-12DP-0.35V(***</td>
<td>12</td>
<td>7.5</td>
<td>16</td>
<td>17.4</td>
<td>21.4</td>
</tr>
</tbody>
</table>

#### Receptacle

<table>
<thead>
<tr>
<th>Part No.</th>
<th>No. of Contacts</th>
<th>AJ</th>
<th>AK</th>
<th>AL</th>
<th>AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>BM46B-12DS-0.35V(***</td>
<td>12</td>
<td>7.5</td>
<td>16</td>
<td>17.4</td>
<td>21.4</td>
</tr>
</tbody>
</table>

### Reel Dimensions

- Note: Specification 53 is Ø180±2.
### Precautions

1. **Recommended Solder Temperature Profile**

   ![Temperature Profile Graph](image)

   **[Conditions]**
   1. Peak temperature: Maximum of 250°C
   2. Heating: 220°C min., within 60 sec
   3. Preheating: 150 to 180°C, 90 to 120 sec
   4. Number of Reflow Cycles: Maximum of 2 cycles

   **Note 1:** The temperature refers to the surface temperature of the PCB near the connector lead.
   **Note 2:** When using nitrogen reflow, oxygen concentration must be 1000 [ppm] or more for mounting. If it is less than 1000 [ppm], please contact a Hirose representative.

2. **Recommended Manual Soldering Conditions**

<table>
<thead>
<tr>
<th>Soldering iron temperature: 340 ± 10°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soldering time: within 3 seconds</td>
</tr>
</tbody>
</table>

3. **Recommended Stencil Thickness and Open Area to PCB Pattern Area Ratio**

   | Thickness: 0.08mm |
   | Aperture Ratio: Receptacle Side: 100%, Header Side: 100% |

4. **Board Warpage**

   A maximum of 0.02mm at the center of the connector relative to each end of the connector.

5. **Cleaning Conditions**

   Cleaning is not recommended. If you clean this product, please evaluate its performance before using it.
   (Cleaning may impair the mating/unmating properties and lower resistance to environmental factors)

6. **Precautions**

   - Care should be taken when mating/unmating the connector when it is not mounted on the PCB as it may cause damage/deformation to contacts.
   - Avoid supporting the PCB only with the connectors.
   - Support it by other means such as bolts, screws, posts, etc.
   - Excessive prying during unmating/mating may result in damage.
   - In the case of hand soldering, please do not apply any flux which could cause flux wicking.
   - This product may have slight color differences due to production lot variability, but this does not affect the performance.
   - Please refer to the following page for handling precautions when inserting and removing.
   - Because the product can disengage if dropped (or other impact), or by FPC routing, it is advised to secure the mated connectors to the board with housings and cushioning materials.
   - 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.
   - Refer to the specifications and guidelines for board pattern dimensions, board cautions, and connector treatment.
   - Please contact Hirose if connector usage in conditions other than those described in the specifications and the guidelines is being considered.
Connector Handling Precautions

Disengagement Prevention
Please use cushioning

The connector may come off due to impact such as dropping. Cushioning should be large enough to cover the entire connector.

Mating Method

1) Locate the guide port and align.
   This product has a guide rib on the receptacle side to ensure proper engagement. Align the connector based on the guide rib.

2) Once aligned, the connector engages.
   You can feel the mated height of the connector lower.
   Move the connector forward and backward, left and right to find the guide port.

3) In the engaged state, the connectors are parallel to each other, and the connectors cannot move forward, backward, left, or right. Complete mating from this state.

4) Check that mating is completed.
   If one side is floating, or if it is mated diagonally, remove and re-mate.
Handling Precautions for Connector Removal

1) When removing the connector, it is preferable to pull it out in the upward direction from the connector mounting surface. However when removing the FPC from the circuit board it becomes more difficult to remove it vertically with higher pin counts and thin FPCs.

2) If difficult to remove, extract the connector diagonally in the direction of the pitch. Note that removal from the widthwise side will apply a large load to the contacts. When removing from the width direction, pull the end of the FPC in the upward direction. (When a force is applied in the horizontal direction, a large load is applied to the contact.)

3) If the FPC does not have sufficient rigidity, solder stripping or connector breakage may occur. Please use it after checking the repetitive operation with the flexible board you during a trial manufacture run. Refrain from holding the corner of the flexible board and removing it diagonally as it will result in a large load to the contacts.