0.4 mm Pitch, Horizontal mating, Board- to-Fine Coaxial Cable Connectors

DF49 Series

■Features

1. Ultra low-profile structure
   A low-profile and space-saving item, with a stacking height of 0.7mm (0.8mm MAX).

2. Reliable electrical and mechanical connection
   Despite its small mated height, unique contact configuration assures highly reliable connection, with effective mating length of 0.5mm. (fig. 1)

3. Enhanced shielding and ground connections
   Metal shells on the plug and receptacle connect to each other, assuring reliable ground connection and EMC protection.

4. Simplified lock structure with audible click
   Audibly clicks into place thanks to the two-point lateral lock structure and optimized contact force.

5. Incorrect insertion prevention mechanism
   The bend structure of the shell prevents the reverse insertion of the plug connector and mating failure. (fig. 2)

6. Solder wicking prevention
   Nickel barriers prevent solder wicking in the critical contact areas. (Receptacle)

7. RoHS, Halogen-free*
   *As defined by IEC61249-2-21
   Br - 900 ppm maximum, Cl - 900 ppm maximum, Cl+Br combined - 1,500 ppm maximum

■ Connectors for conductivity tests
   We have a line-up of plug connectors for inspection, usable for electrical testing.

In cases where the application will demand a high level of reliability, such as automotive, please contact a company representative for further information.
Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Insulation resistance</td>
<td>50 MΩ min.</td>
<td>100 V DC</td>
</tr>
<tr>
<td>2. Withstanding voltage</td>
<td>No flashover or insulation breakdown</td>
<td>100 Vrms AC / 1 minute</td>
</tr>
<tr>
<td>3. Contact resistance</td>
<td>Signal: 80mΩ max, Ground 80mΩ max</td>
<td>100 mA (DC or 1,000Hz)</td>
</tr>
<tr>
<td>4. Vibration</td>
<td>No electrical discontinuity of 1 μs or longer</td>
<td>Frequency: 10 to 55 Hz, single amplitude of 0.75mm, 10 cycles in each of the 3 directions</td>
</tr>
<tr>
<td>5. Humidity</td>
<td>Contact resistance (change from initial value) 50 mΩ max. Insulation resistance: 25 MΩ min.</td>
<td>96 hours at of 40 ±2°C, and humidity of 90 to 95%</td>
</tr>
<tr>
<td>6. Temperature cycle</td>
<td>Contact resistance (change from initial value) 50 mΩ max. Insulation resistance: 25 MΩ min.</td>
<td>-55°C → 5 to 35°C → 85°C → 5 to 35°C Time: 30 min. → 2 to 3 min. → 30 min. → 2 to 3 min. 5 cycles</td>
</tr>
<tr>
<td>7. Durability</td>
<td>Contact resistance (change from initial value) 50 mΩ max.</td>
<td>30 cycles</td>
</tr>
<tr>
<td>8. Resistance to soldering heat</td>
<td>No deformation of affecting performance</td>
<td>Reflow: At the recommended temperature profile Manual soldering: 350°C for 3 seconds</td>
</tr>
</tbody>
</table>

Note 1: Includes temperature rise caused by current flow.
Note 2: The term "storage" refers to products stored for a long period prior to mounting and use.
The operating temperature and humidity range covers the non-conducting condition of installed connectors in storage, shipment or during transportation after board mounting.
Note 3: With only the connector portion at an elevated temperature level, the rated current value is set.

Materials

<table>
<thead>
<tr>
<th>Product</th>
<th>Part</th>
<th>Material</th>
<th>Finish</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receptacle</td>
<td>Insulator</td>
<td>LCP</td>
<td>Color: Black</td>
<td>UL94V-0</td>
</tr>
<tr>
<td></td>
<td>Contacts</td>
<td>Phosphor bronze</td>
<td>Gold plating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Metal fittings</td>
<td>Phosphor bronze</td>
<td>Tin plating</td>
<td></td>
</tr>
<tr>
<td>Plug</td>
<td>Insulator</td>
<td>LCP</td>
<td>Color: Black</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contacts</td>
<td>Phosphor bronze</td>
<td>Gold plating</td>
<td>UL94V-0</td>
</tr>
<tr>
<td></td>
<td>Metal cover</td>
<td>Phosphor bronze</td>
<td>Tin plating</td>
<td></td>
</tr>
<tr>
<td>Shell</td>
<td>Metal cover</td>
<td>Phosphor bronze</td>
<td>Tin plating</td>
<td></td>
</tr>
</tbody>
</table>
**Ordering information**

● **Connector**

<table>
<thead>
<tr>
<th>DF</th>
<th>49</th>
<th>J</th>
<th>*</th>
<th>S</th>
<th>0.4</th>
<th>H</th>
<th>(***)</th>
</tr>
</thead>
</table>

| DF | 49 | * | P | SHL |
|----|----|---|----|

1. **Series name:** DF  
2. **Contact pitch:** 0.4mm  
3. **Connector style**  
   - Receptacle/Shell  
   - J: Receptacle for conductivity tests  
   - Blank: Standard  
4. **Termination type**  
   - H: Rightangle SMT  
   - SD: Fine coaxial cable plug  
5. **Number of positions:** 20, 30, 40  
6. **Packaging**  
   - (51): Embossed tape packaging  
7. **Installation item (separate)**  
   - SHL: Metal cover

**Combinations**

[Standard use]

DF49-*S-0.4H(***)+DF49-*P-ASSY

DF49-*P-0.4SD(***)

DF49-*P-SHL

Note: The product specification of the above combination is shown on page 2.

[Receptacle conductivity test]

DF49-*S-0.4H(***)+DF49J-*P-ASSY-(Note)

DF49J-*P-0.4SD(***)

DF49-*P-SHL

Note: This harness item is only usable for the receptacle test.  
For the product specification of the above combination, please contact our sales department.

[Plug conductivity test]

DF49-*S-0.4H(***)+DF49-*P-ASSY

DF49-*P-0.4SD(***)

DF49-*P-SHL

Note: For the product specification, please contact our sales department.  
※: ASSY means a harness item.
DF49 Series 0.4 mm Pitch, Horizontal mating, Board-to-Fine Coaxial Cable Connectors

- **Receptacles (SMT)**

- **Recommended PCB mounting pattern**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CL No.</th>
<th>Number of contacts</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF49-20S-0.4H(***)</td>
<td>662-5503-4-***</td>
<td>20</td>
<td>12.8</td>
<td>7.6</td>
<td>12.03</td>
<td>13.4</td>
</tr>
<tr>
<td>DF49-40S-0.4H(***)</td>
<td>662-5500-6-***</td>
<td>40</td>
<td>20.8</td>
<td>15.6</td>
<td>20.03</td>
<td>21.4</td>
</tr>
</tbody>
</table>

Note 1: Tape and reel packaging (7,000 pieces/reel).
Order by number of reels.
# Plugs

![DF49 Series 0.4 mm Pitch, Horizontal mating, Board- to-Fine Coaxial Cable Connectors](image)

## Recommended Fine Coaxial Cable Preparation

Note 1: Contact Hirose for Termination Procedures.

### Specifications

**Part Number** | **CL No.** | **Number of contacts** | **A** | **B** | **C** | **D**
--- | --- | --- | --- | --- | --- | ---
DF49-20P-0.4SD(***)) | 662-5504-7-*** | 20 | 11.32 | 7.6 | 8.9 | 8.7
DF49-40P-0.4SD(***)) | 662-5501-9-*** | 40 | 19.32 | 15.6 | 16.9 | 16.7

**Unit**: mm

Note 1: Tape and reel packaging (7,000 pieces/reel).

Order by number of reels.

Note 2: The metal cover (DF49-*P-SHL) is required for fine coaxial cable termination.
## Metal cover

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CL No.</th>
<th>Number of contacts</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF49-20P-SHL</td>
<td>662-5505-0</td>
<td>20</td>
<td>4.0</td>
<td>10.1</td>
<td>11.18</td>
</tr>
<tr>
<td>DF49-40P-SHL</td>
<td>662-5502-1</td>
<td>40</td>
<td>12.0</td>
<td>18.1</td>
<td>19.18</td>
</tr>
</tbody>
</table>

Unit: mm

Note 1: Reel packaging (10,000 pieces/reel). Order by number of reels.
Packaging Specification

● Embossed Carrier Tape Dimensions

Reel Dimensions

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CL No.</th>
<th>Number of contacts</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF49-20S-0.4H(51)</td>
<td>662-5503-4-51</td>
<td>20</td>
<td>11.5</td>
<td>–</td>
<td>24.0</td>
<td>24.4</td>
<td>30.4</td>
</tr>
<tr>
<td>DF49-40S-0.4H(51)</td>
<td>662-5500-6-51</td>
<td>40</td>
<td>20.2</td>
<td>40.4</td>
<td>44.0</td>
<td>44.4</td>
<td>50.4</td>
</tr>
</tbody>
</table>

Note 1: Embossed tape will have perforated feed holes on single side (20pos.)
Packaging Specification

Plugs

Reel Dimensions

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CL No.</th>
<th>Number of contacts</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF49-20P-0.4SD(51)</td>
<td>662-5504-7-51</td>
<td>20</td>
<td>11.5</td>
<td>–</td>
<td>24.0</td>
<td>24.4</td>
<td>30.4</td>
</tr>
<tr>
<td>DF49-40P-0.4SD(51)</td>
<td>662-5501-9-51</td>
<td>40</td>
<td>14.2</td>
<td>28.4</td>
<td>32.0</td>
<td>32.4</td>
<td>38.4</td>
</tr>
</tbody>
</table>

Note 1: Embossed tape will have perforated feed holes on single side (20pos.)
### Extraction tool

For details about the extraction tool, please contact your Hirose sales representative.

### Precautions

1. **Recommended temperature profile**

   - **Temperature (°C)**
     - 0 to 50
     - 50 to 100
     - 100 to 150
     - 150 to 200
     - 200 to 250
     - 250°C maximum

   - **Time (sec.)**
     - 0 to 50
     - 50 to 100
     - 100 to 150
     - 150 to 200
     - 200 to 250
     - 250°C max

   - **Solder composition**: Paste, 96.5% Sn/3.0% Ag/0.5% Cu

   - **Note 1**: Up to 2 cycles of Reflow soldering are possible under the same conditions, provided that there is a return to normal temperature between the first and second cycle.

   - **Note 2**: The temperature profile indicates the board surface temperature at the point of contacts with the connector terminals.

2. **Recommended manual soldering**
   - Manual soldering: 350°C for 3 seconds
   - Do NOT use flux compound when manual soldering.

3. **Recommended screen thickness and open area ratio (Pattern area ratio)**
   - Standard thickness: 0.1 mm
   - Open area ratios:
     - Lead terminal: 100%
     - Ground terminal: 75%

4. **Board warpage**
   - Maximum of 0.02 mm at the connector center, with both ends of the connector as reference points.

5. **Cleaning conditions**
   - Refer to “Nylon Connector Use Handbook”.

---

For details about the extraction tool, please contact your Hirose sales representative.
Precautions

Mating / un-mating
Please work according to the following operational procedure:

① Confirmation of insertion direction
   Upon insertion, please check the front and rear of the connector at the cable side.
   On the front side, the △ mark, HRS mark and the display of the pole number are stamped.

② Confirmation of temporary insertion
   Please lay the plug into the receptacle gently and insert up to the temporary insertion position.
   * If inserted up to the temporary insertion position, the connection can be correctly ensured.

③ Confirmation of insertion
   From the temporary insertion position, please push on both sides of the plug simultaneously and with equal force, to confirm the insertion.
<table>
<thead>
<tr>
<th>Precautions</th>
</tr>
</thead>
</table>

**un-mating**

Use a dedicated extraction tool to un-mate the plug. Insert the tool under either end of the plug and pull as illustrated below.

1. Insert the tool under either end of the plug.
2. Pull out the plug (for the horizontal direction).
3. Finish

- Do not mate / un-mate the connectors when receptacle is not mounted on the board.
- In the manual soldering process, don't carry out the flux coating which will cause a flux blister on the connector.
- Excessive scoop insertion or extraction may result in damage.
DF49 Series●0.4 mm Pitch, Horizontal mating, Board- to-Fine Coaxial Cable Connectors

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The characteristics and the specifications contained herein are for reference purpose. Please refer to the latest customer drawings prior to use.

The contents of this catalog are current as of date of 3/2014. Contents are subject to change without notice for the purpose of improvements.

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