Features

1. **Positive lock**
   Positive lock with blade lock design. Prevents offset mating due to impact.

2. **Supports high speed transmission**
   Meets USB Type C and PCIe Gen3 standards.

3. **Shield and grounding design**
   Excellent EMI shielding.

4. **Long effective mating length**
   The world’s longest effective mating length of 0.45mm, producing high contact reliability.

5. **Smooth mating operation**
   Guidance ribs ensure 0.4mm self-alignment range. In addition, secure mating with clear tactile click.

Usage

Suitable for devices which require high mating reliability and shock-resistance, such as on-board, medical and portable devices etc.

Environmental

*Halogen-free*

*As defined by IEC 61249-2-21*

- Br: 900ppm max, Cl: 900ppm max
- Br+Cl: 1500ppm max

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<Advantages of positive lock design>

Conventional connectors needed shock absorbent material to prevent offset mating due to impact. DF40GL Series eliminates the need for the shock absorbent material with a positive lock design.

<Advantages of shielding and grounding design>

DF40GL Series has shield and lead ground producing excellent EMI performance.

Near magnetic field simulation (4.5GHz MAX)

- Without shield: 100.2dμA/m
- With shield: 81.7dμA/m

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

<table>
<thead>
<tr>
<th>Ratings</th>
<th>Specifications</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Current</td>
<td>0.35A (Note 1)</td>
<td>Measured with DC 100V</td>
</tr>
<tr>
<td>Rated Voltage</td>
<td>AC, DC 30V</td>
<td>-</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>-55 to +85°C (Note 1)</td>
<td>Left at temperature 40 ± 2°C, humidity 90 to 95%, 96 hours</td>
</tr>
<tr>
<td>Operating Humidity Range</td>
<td>20 to 80%</td>
<td>-</td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>-10 to +60°C (Note 2)</td>
<td>-</td>
</tr>
<tr>
<td>Storage Humidity Range</td>
<td>40 to 70% (Note 2)</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Insulation Resistance</td>
<td>50MΩ min</td>
<td>-</td>
</tr>
<tr>
<td>2. Withstanding Voltage</td>
<td>No flashover or breakdown</td>
<td>Apply AC 100V for 1 minute</td>
</tr>
<tr>
<td>3. Contact Resistance</td>
<td>90mΩ max</td>
<td>Measured with AC 20mV, 1 kHz and 1mA</td>
</tr>
<tr>
<td>4. Vibration Resistance</td>
<td>No electrical discontinuity of 1µs or greater</td>
<td>Frequency 10-55 Hz, half amplitude 0.75mm, 3 directions for 2 hours</td>
</tr>
<tr>
<td>5. Humidity Resistance</td>
<td>Contact resistance : 90mΩ max Insulation resistance : 25mΩ min</td>
<td>-</td>
</tr>
<tr>
<td>6. Temperature Cycles</td>
<td>Contact resistance : 90mΩ max Insulation resistance : 50mΩ min</td>
<td>(-55°C : 30 minutes → 5<del>35°C : 10 minutes → 85°C : 30 minutes → 5</del>35°C : 10 minutes) 5 cycles</td>
</tr>
<tr>
<td>7. Durability</td>
<td>Contact resistance : 90mΩ max</td>
<td>30 mating cycles</td>
</tr>
<tr>
<td>8. Lock strength</td>
<td>30N min</td>
<td>Apply pull force in vertical direction.</td>
</tr>
<tr>
<td>9. Soldering Heat Resistance</td>
<td>Should be no melting of resin parts that affects its performance</td>
<td>Reflow : according to the Recommended Temperature Profile Hand solder : Soldering iron temperature 350°C, no more than 3 seconds.</td>
</tr>
</tbody>
</table>

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. The operating temperature and humidity range covers the non-energized condition of connectors after board mounting and the temporary storage conditions during transportation, etc.

## Materials / Finish

<table>
<thead>
<tr>
<th>Product / Component</th>
<th>Materials</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receptacle/Header Insulator</td>
<td>LCP</td>
<td>Black</td>
</tr>
<tr>
<td>Contact</td>
<td>Phosphor bronze</td>
<td>Gold plating</td>
</tr>
<tr>
<td>Receptacle Shielding</td>
<td>Phosphor bronze</td>
<td>Gold plating</td>
</tr>
<tr>
<td>Receptacle Lock lever</td>
<td>Stainless steel</td>
<td>Gold plating</td>
</tr>
<tr>
<td>Header Metal fittings lock</td>
<td>Stainless steel</td>
<td>Gold plating</td>
</tr>
</tbody>
</table>

## Product Number Structure

Refer to the chart below when determining the product specifications from the product number.

### Receptacle/Header

**DF 40 GL − * DS − 0.4 V (51)**

1. **Series Name : DF**
2. **Series No. : 40**
3. **Style : G : With shield L : Positive lock**
4. **No. of Contacts**
5. **Connector Type : DS : Double row receptacle DP : Double row header**
6. **Contact Pitch : 0.4mm**
7. **Mating direction V : Vertical SMT**
8. **Gold plating specification and packaging**
   - (51) : Gold plating thickness 0.05µm
   - Emboss tape packaging
     - (Receptacle : 4,000pcs/reel)
     - (Header : 5,000pcs/reel)
   - (58) : Gold plating thickness 0.05µm
   - Emboss tape packaging
     - (Receptacle, Header : 1,000pcs/reel)
DF40GL Series
●0.4mm Pitch/1.5mm Height, Positive Lock, Shielded Board to Board/Board to FPC Connector
■Receptacle

Recommended PCB mounting pattern

Recommended metal mask dimensions
(metal mask thickness 120µm)

Recommended PCB mounting pattern

Recommended metal mask dimensions
(metal mask thickness 120µm)

Part No. HRS No. No. of Contacts
DF40GL-44DS-0.4V (51) 684-4411-051 44

Note 1: Please place orders by full reel.

Note 2: This connector is Not polarized.

CAUTION! To insure proper lock lever operation, the FPC needs to be within the dimensions specified.

Part No. HRS No. No. of Contacts
DF40GL-44DP-0.4V (51) 684-4412-051 44

Note 1: Please place orders by full reel.

Recommended PCB mounting pattern

Recommended metal mask dimensions
(metal mask thickness 120µm)
Embosed Carrier Tape Dimensions (JIS C 0806 compliant)

Receptacle

Reel Condition Dimensions

Product label

Unreeling Direction

Header

Reel Condition Dimensions

Vacuum pick up area

Part No. No. of Contacts
DF40GL-44DS-0.4V(51) 44

Part No. No. of Contacts
DF40GL-44DS-0.4V(51) 44

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## Operating Precautions

1. **Recommended Solder Profile**

![Solder Profile Graph]

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Peak temperature</td>
<td>Max of 250°C</td>
</tr>
<tr>
<td>2. Heating part</td>
<td>Min of 220°C within 60 seconds</td>
</tr>
<tr>
<td>3. Preheating part</td>
<td>150 to 180°C 90 to 120 seconds</td>
</tr>
<tr>
<td>4. Number of times</td>
<td>Maximum of 2 cycles</td>
</tr>
</tbody>
</table>

*Note 1: The temperature shows PCB surface temperature near the connector lead part.*

2. **Recommended hand solder conditions**

- Soldering iron temperature 340 ±10°C, solder time no more than 3 seconds

3. **Recommended screen thickness: Opening ratio (pattern area ratio)**

- Thickness: 0.12mm
- Opening ratio: 80% for contact, and 100% for shielding on the DS side.
- 80% for contact, and 100% for metal fittings on the DP side.

4. **Leaning of PCB**

- Max 0.02mm at the center of connector (using both edges of connector as criteria)

5. **Washing**

- Cleaning/washing is not recommended for this connector. Cleaning agents can deteriorate the mechanical operation and the environmental resistance of this connector.

6. **Precautions**

- Do not mate or unmate these connectors until they are mounted, failure to follow this precaution can lead to deformation or damage to these connectors.
- Provide another form of support to the PCB, this connector was not designed to be the main form of support.
- Mating and unmating with excessive force can cause damage.
- Do not apply excessive amounts of flux as it may cause excess solder and flux wicking.
- There may be a slight variance in the color of the molding between production lots, this variance will not affect the performance of the connector.
- Refer to the next page for the handling precautions when mating and unmating the connectors.
● Handle with care when mating a connector

When aligning, look for the guide port by moving the connector in X and Y directions parallel to the mating connector.

If Z axis pressure is applied while not parallel to the mate, the connector may crack or edges shaved.

When the connector is correctly aligned, it is guided and lowers into place, which can be felt by the operator. After connectors are aligned and can’t be moved in the X and Y axis. Complete mating operation.
**Handle with care when un-mating connectors**

<table>
<thead>
<tr>
<th>DF40GL Series ● 0.4mm Pitch/1.5mm Height, Positive Lock, Shielded Board to Board/Board to FPC Connector</th>
</tr>
</thead>
</table>

To unmate, press and hold the lock release lever while the connector is unmated.

**STEP1**

Push the lock lever to release the lock. By pushing the rim of the FPC, the lock lever is pressed at the same time, and the lock is released.

**STEP2**

Raise the FPC upward direction while pressing the lock lever.
Caution! If unmated forcefully, the connector may be damaged.

Attempting to unmate the connector without releasing the lock could cause damage.

Pulling the FPC without releasing the lock could cause damage.

**PCB layout**

Space is required to operate the lock lever. Consider PCB layout when placing parts around the connector.

Space to allow a finger in

Secure the protruding amount of the lock lever

Caution! The lock lever must protrude beyond the FPC to allow the lock lever to operate properly. When designing FPC, please refer to 1 on page 3.