Features
1. Nominal mated height of 1.4 mm or 1.65mm (Max. 1.55 or 1.85mm)(Fig.2)
2. Small board footprint
   The W.FL Series is about 55% smaller than our U.FL Series connector and only uses 3.4mm² of PCB space. The PCB layout for the W.FL Series is the same as for W.FL2 and X.FL Series.
   Note: This product is not compatible with W.FL2 Series and X.FL Series.(Fig.1)
3. Extremely light weight
   Receptacle: 5.6 mg
   Right-angle plug: 18.6 mg(040), 28.2mg(062)
4. Frequency range up to 6 GHz
   DC to 3 GHz: V.S.W.R. of 1.3 max.
   3 GHz to 6 GHz: V.S.W.R. of 1.4 max.
5. Automatic board placement
   Packaged on tape-and-reel the receptacles can be placed with vacuum nozzles of the automatic placement equipment.
6. Plugs are terminated with ultra-fine coaxial (fluorinated resin insulated) cable
   The use of ultra-fine coaxial (fluorinated resin insulated) cables on these connectors offer the ability to complete connections in small, confined spaces with a smooth, easy operation.
7. Simple connector mating / unmating
   Use of the available mating/un-mating tools assures correct connection/disconnection of the plug and receptacle.
8. Halogen-free*(Receptacle, Plug(HF type))
   *As defined by IEC61249-2-21
   Br-900ppm maximum, Cl-900 ppm maximum, Cl+Br combined-1,500 ppm maximum

Applications
Mobile phones, wireless communication devices, electronic measuring instruments, GPS, wireless LAN, Bluetooth and any application requiring high frequency transmission using small coaxial connectors.
### Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contact resistance</td>
<td>Center contact: 20m ohms max. Outer contact: 10m ohms max.</td>
<td>10mA max.</td>
</tr>
<tr>
<td>2. Insulation resistance</td>
<td>500M ohms min.</td>
<td>100V DC</td>
</tr>
<tr>
<td>3. Withstanding voltage</td>
<td>No flashover or insulation breakdown</td>
<td>200V AC / 1 minute</td>
</tr>
<tr>
<td>4. V.S.W.R.*</td>
<td>1.3 Max. 1.4 Max.</td>
<td>Up to 3 GHz 3 to 6 GHz</td>
</tr>
</tbody>
</table>

*V.S.W.R. Measurement System
Measured as shown on the block diagram below.

---

### Materials

#### Plug – right angle

<table>
<thead>
<tr>
<th>Part</th>
<th>Material</th>
<th>Finish / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shell</td>
<td>Phosphor bronze</td>
<td>Silver plated</td>
</tr>
<tr>
<td>Female center contact</td>
<td>Phosphor bronze</td>
<td>Gold plated</td>
</tr>
<tr>
<td>Insulator</td>
<td>PBT</td>
<td>Color: Black, UL94V-0(040) Color: Gray, UL94V HB(040HF, 062HF)</td>
</tr>
</tbody>
</table>

#### Receptacle

<table>
<thead>
<tr>
<th>Part</th>
<th>Material</th>
<th>Finish / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shell</td>
<td>Phosphor bronze</td>
<td>Silver plated</td>
</tr>
<tr>
<td>Insulator</td>
<td>LCP</td>
<td>Color: Black, UL94V-0</td>
</tr>
<tr>
<td>Male center contact</td>
<td>Brass</td>
<td>Gold plated</td>
</tr>
</tbody>
</table>

### Cable Assembly(Plug)

**W.FL-LP-040(06), W.FL-LP-040HF(06) (Applicable cable: outer diameter 0.81)**

W.FL-LP-062HF(06) (Applicable cable: outer diameter 1.0)

[Plugs can be ordered only as terminated cable assemblies.]
How to Specify Cable Assembly

[Double-ended cable assembly]

[Double-ended cable assembly]

[Single-ended cable assembly]

Ordering Information

Used plug: W.FL-LP-040(06), W.FL-LP-040HF(06) (Dia. 0.81)  

Double-Ended  
W.FL – 2LP HF6-04N [ ] TV-A – L  
1 2 3 4 5 6 7

Single-Ended  
W.FL – LP HF6-04N [ ] TV-A – L  
1 2 3 4 5 6 7

| Series name | LP : Single ended  
2 | 2LP : Double ended  
3 | HF6 : Halogen-free  
4 | 6 : RoHS compliant  
5 | 04N : 0.81mm dia. ultra-fine coaxial cable  
6 | 1 : White  
7 | 2 : Black  
8 | TV : Tin plated braided wire  
9 | Total length(mm) Length(L)  

Used plug: W.FL-LP(G)-062HF(06) (Dia. 1)  

Double-Ended  
W.FL – 2LPG HF-062N [ ] D – A – L  
1 2 3 4 5 6 7

Single-Ended  
W.FL – LPG HF-062N [ ] D – A – L  
1 2 3 4 5 6 7

| Series name | W.FL  
2 | Assembly type  
3 | LPG : Single ended  
4 | 2LPG : Double ended  
5 | HF : Halogen-free  
6 | Cable type 062N: 1.0mm dia. ultra-fine coaxial cable  
7 | 1 : Gray  
8 | 2 : Black  
9 | 3 : White  
10 | D : Copper tape + Outer tin plated braided wire  
11 | Total length(mm) Length(L)  

Standard tolerances for (L)  

| (L)mm | Standard tolerance(mm)  
1 | <L=35 to 200 ±4  
2 | L=200 to 500 ±8  
3 | L=500 to 1000 ±12  
4 | L=Longer than 1000 ±1.5% of (L)  
Note: Minimum available length(L) is 35mm.
## Receptacle

### Recommended PCB mounting pattern

![Recommended PCB mounting pattern](image)

Note: The land pattern is the same as that of the X.FL, W.FL2 series connectors.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>W.FL-R-SMT-1(60)</td>
<td>331-0482-6</td>
<td>Reel (5,000 pcs/reel)</td>
<td>Yes</td>
</tr>
<tr>
<td>W.FL-R-SMT-1(80)</td>
<td>331-0482-6</td>
<td>Reel (10,000 pcs/reel)</td>
<td></td>
</tr>
</tbody>
</table>

### Embossed Carrier Tape Dimensions (IEC 60286-3 compliant)

#### Embossed Carrier Tape Dimensions

(W.FL-R-SMT-1(60) 8mm pitch)

![Embosed Carrier Tape Dimensions 8mm pitch](image)

(W.FL-R-SMT-1(80) 4mm pitch)

![Embosed Carrier Tape Dimensions 4mm pitch](image)

#### Reel Dimensions

Material: PS (Black)

![Reel Dimensions](image)
### Conversion Adapters

#### SMA Conversion Adapter (W.FL side jack – SMA side plug)

![SMA Conversion Adapter (W.FL side jack – SMA side plug)](image)

Note: Used for performance measurements only. The W.FL mating side has lower retention force than the regular product when mated to the corresponding part.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRMP-W.FLJ(40)</td>
<td>311-0367-3 40</td>
<td>1</td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### SMA Conversion Adapter (W.FL side plug – SMA side jack)

![SMA Conversion Adapter (W.FL side plug – SMA side jack)](image)

Note: Used for performance measurements only. The W.FL mating side has lower retention force than the regular product when mated to the corresponding part.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRMJ-W.FLP(40)</td>
<td>311-0368-6 40</td>
<td>1</td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### SMA Conversion Adapter

![SMA Conversion Adapter](image)

Note: When mating with corresponding part (W.FL-R-SMT-1) it must be pressed down and held to make complete connection.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRMJ-W.FLP-ST1(40)</td>
<td>311-0386-8 40</td>
<td>1</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### Receptacle Inspection Adapter

Used for inspecting the performance parameters of the cable assembly.

![Receptacle Inspection Adapter](image1)

### Plug-Mating Tool

This tool is used for mating a plug.

![Plug-Mating Tool](image2)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>W.FL-R-1</td>
<td>331-0483-9</td>
<td>1</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Plug-Extraction Tool

![Plug-Extraction Tool](image3)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>W.FL-LP-IN</td>
<td>331-0323-2</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>W.FL-LP-N</td>
<td>331-0492-0</td>
<td>1</td>
<td>Yes</td>
</tr>
</tbody>
</table>
**Precautions**

1. **Plug**

   (1) Mating / unmating

   **Unmating** Insert both ends of the extraction tool under the plug (from the direction opposite to the cable termination), as shown and pull-up in the direction perpendicular to the mounting surface of the receptacle.

   ● Recommended the use of the extraction tool for unmating. Any attempt of unmating by pulling on the cable may result in damage and affect the mechanical / electrical performance.

   **Mating**

   1. Align the mating tool W.FL-LP-IN or the mating end of the tool over the plug end of the cable assembly.
   2. Firmly place the tool over the plug until it is secured in the tool.
   3. Place the plug cable assembly (held in the tool) over the corresponding receptacle.
   4. Assuring that the plug and receptacle are aligned press-down perpendicular to the mounting surface until both connectors are fully mated.
   5. Remove the mating tool by carefully pulling it up. Removal of the tool.

   (2) Pull forces on the cable after connectors are mated

   After the connectors are mating, do not apply a load to the cable in excess of the values indicated in the diagram.

   (3) Precautions

   Do not twist connectors excessively during mating / unmating.

2. **Receptacle**

   (1) Recommended reflow temperature profile

   ① The temperature of the printed circuit board surface temperature at the points of contact with the terminals.
   ② Reflow soldering should be performed at a printed circuit surface temperature of 250°C max.
   ③ In individual applications the actual temperature may vary, depending on the solder paste type, volume / thickness and board size / thickness. Consult your solder paste and equipment manufacturer for specific recommendations.

   (2) Recommended metal mask thickness

   0.1 mm to 0.12 mm

   (3) Reflow cycles

   2 times

3. **Operating environment and storage conditions**

   (1) Operating environment

   The connectors are not designed to operate in the following environments:
   • Exposed to a excessive amounts of fine particles and dust
   • Regions and places having a high density of sulfur dioxide, hydrogen sulfide, nitrogen dioxide or other corrosive gasses.
   • Environments having large rapid variations in temperature.

   (2) Storage conditions - Receptacle

   Store in the Hirose Electric packaging.
   Temperature: -10 to +40°C, Humidity: 85% max.
   Use within 6 months of delivery.
   Receptacles for which the storage period has elapsed must be tested for solderability to the PC board mounting surface.
W.FL Series●Ultra Small Surface Mount Coaxial Connectors 1.4mm or 1.65mm Mated Height

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 11/2014. Contents are subject to change without notice for the purpose of improvements.