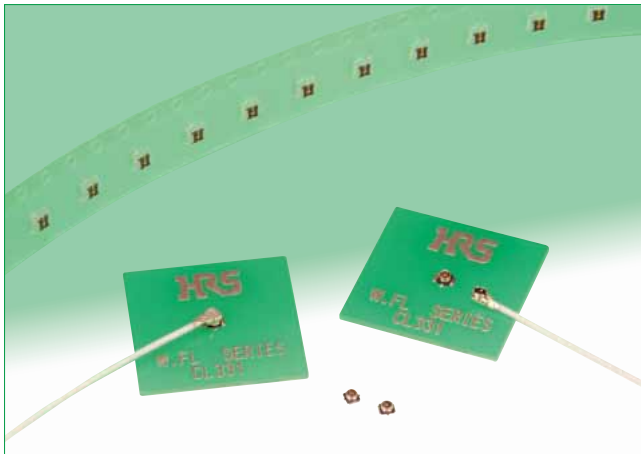


# Ultra Small Surface Mount Coaxial Connectors 1.4mm or 1.65mm Mated Height

## W.FL Series



### Occupied Mounting Area



W.FL Series

U.FL Series

Fig.1

### ■ Features

#### 1. Nominal mated height of 1.4mm 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 3.4mm<sup>2</sup> 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

### Mated height comparison

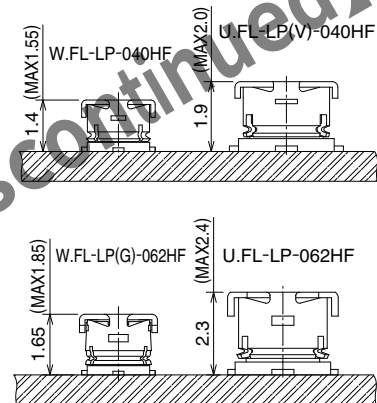


Fig.2

### W. FL Plug and Receptacle

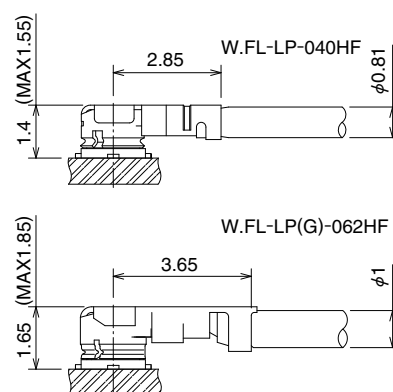
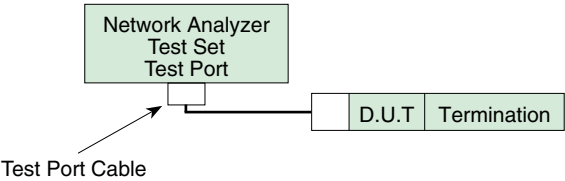


Fig.3

■Specifications

|                          |                                                         |             |                             |                                 |
|--------------------------|---------------------------------------------------------|-------------|-----------------------------|---------------------------------|
| Rating                   | Nominal characteristic impedance                        | 50Ω         | Operating temperature range | -40°C to +90°C<br>(90% RH max.) |
|                          | Frequency range                                         | DC to 6 GHz | Storage temperature range   | -30°C to +70°C<br>(90% RH max.) |
| Item                     | Specification                                           |             | Conditions                  |                                 |
| 1. Contact resistance    | Center contact : 20mΩ max.<br>Outer contact : 10mΩ max. |             | 10mA max.                   |                                 |
| 2. Insulation resistance | 500MΩ min.                                              |             | 100V DC                     |                                 |
| 3. Withstanding voltage  | No flashover or insulation breakdown                    |             | 200V AC / 1 minute          |                                 |
| 4. V.S.W.R.*             | 1.3 Max.<br>1.4 Max.                                    |             | Up to 3 GHz<br>3 to 6 GHz   |                                 |

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



Note1 : Measurement way of a W.FL Cable assembly (plug)  
W.FL Cable assembly (plug) is measured with SMA conversion adapters mated with W.FL plugs at both ends of a 100cm coaxial cable harness

Note2 : Measurement way of a W.FL receptacle  
W.FL receptacle, which is mounted on a 50Ω glass epoxy board, is measured with a SMA conversion adapter

■Materials / Finish

●Plug – right angle

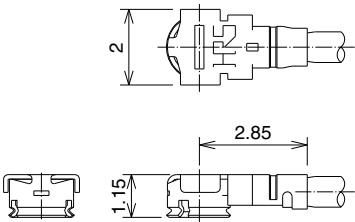
| Part                  | Material        | Finish / Remarks                     |
|-----------------------|-----------------|--------------------------------------|
| Shell                 | Phosphor bronze | Silver plated                        |
| Female center contact | Phosphor bronze | Gold plated                          |
| Insulator             | PBT             | Color : Gray, UL94V HB(040HF, 062HF) |

●Receptacle

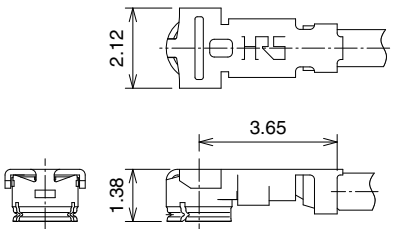
| Part                | Material        | Finish / Remarks       |
|---------------------|-----------------|------------------------|
| Shell               | Phosphor bronze | Silver plated          |
| Insulator           | LCP             | Color : Black, UL94V-0 |
| Male center contact | Brass           | Gold plated            |

■Cable Assembly(Plug)

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

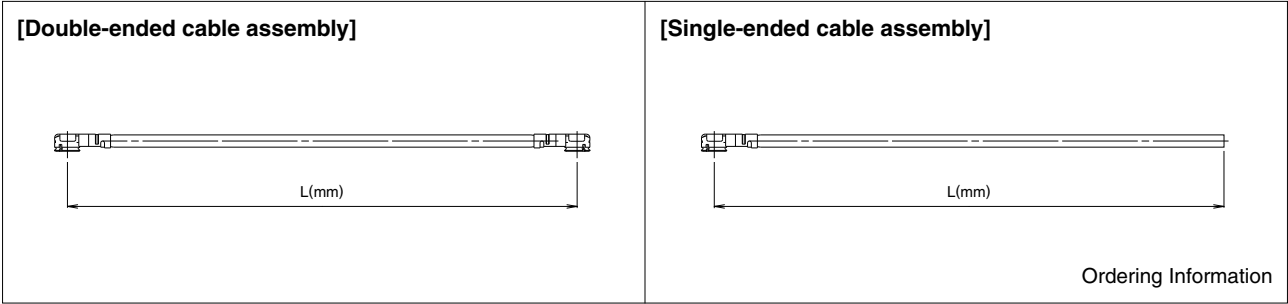


W.FL-LP-062HF(06) (Applicable cable : outer diameter 0.95)



[Plugs can be ordered only as terminated cable assemblies.]

◆How to Specify Cable Assembly



●Ordering Information

Used plug : 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

|                           |                                            |
|---------------------------|--------------------------------------------|
| ① Series name             | W.FL                                       |
| ② Assembly type           | LP : Single ended<br>2LP : Double ended    |
| ③ Environmental compliant | HF6 : Halogen-free                         |
| ④ Cable type              | 04N : 0.81mm dia. ultra-fine coaxial cable |
| ⑤ Cable Color             | 1 : White<br>2 : Black                     |
| ⑥ Cable outer conductor   | TV : Tin plated braided wire               |
| ⑦ Total length(mm)        | Length(L)                                  |

Used plug: W.FL-LP(G)-062HF(06) (Dia. 0.95)

Double-Ended

**W.FL – 2LPG HF6 – 062N [ ] D – A – L**

① ② ③ ④ ⑤ ⑥ ⑦

Single-Ended

**W.FL – LPG HF6 – 062N [ ] D – A – L**

① ② ③ ④ ⑤ ⑥ ⑦

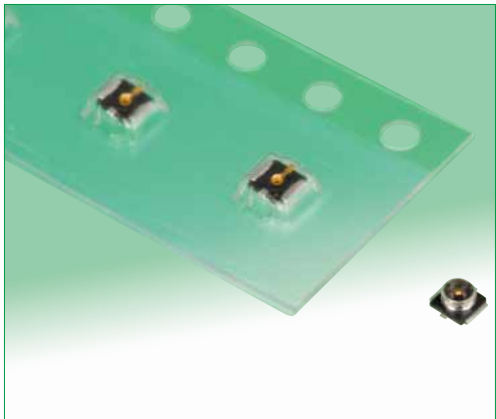
|                           |                                                 |
|---------------------------|-------------------------------------------------|
| ① Series name             | W.FL                                            |
| ② Assembly type           | LPG : Single ended<br>2LPG : Double ended       |
| ③ Environmental compliant | HF6 : Halogen-free                              |
| ④ Cable type              | 062N : 0.95mm dia. ultra-fine coaxial cable     |
| ⑤ Cable Color             | 1 : Gray<br>2 : Black<br>3 : White              |
| ⑥ Cable outer conductor   | D : Copper tape + Outer tin plated braided wire |
| ⑦ Total length(mm)        | Length(L)                                       |

●Standard tolerances for (L)

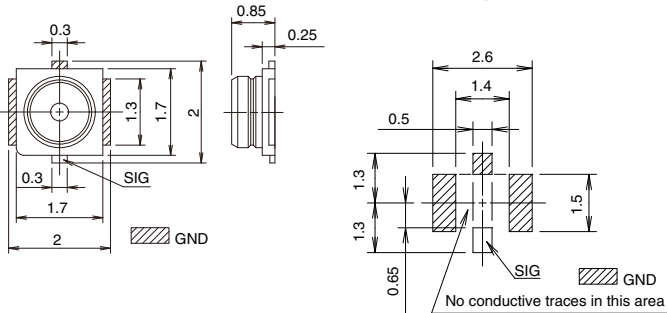
| (L)mm              | Standard tolerance(mm) |
|--------------------|------------------------|
| *L=35 to 200       | ±4                     |
| L=200 to 500       | ±8                     |
| L=500 to 1000      | ±12                    |
| L=Longer than 1000 | ±1.5% of (L)           |

Note : Minimum available length (L) is 35mm.

■Receptacle



◆Recommended PCB mounting pattern



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

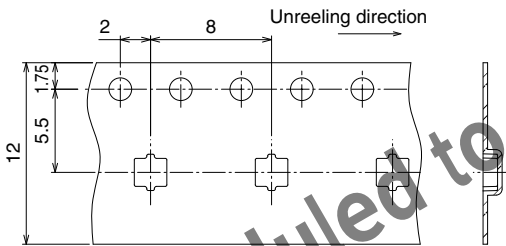
All dimensions : mm

| Part No.         | HRS No.       | Packaging              |
|------------------|---------------|------------------------|
| W.FL-R-SMT-1(60) | 331-0482-6 60 | Reel (5,000 pcs/reel)  |
| W.FL-R-SMT-1(80) | 331-0482-6 80 | Reel (10,000 pcs/reel) |

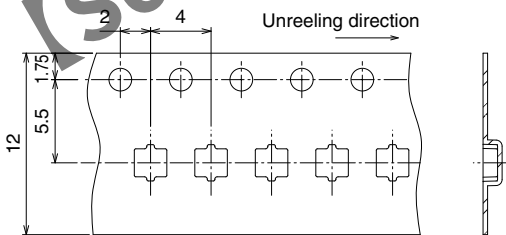
●Embossed Carrier Tape Dimensions(IEC 60286-3 compliant)

Embossed Carrier Tape Dimensions

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

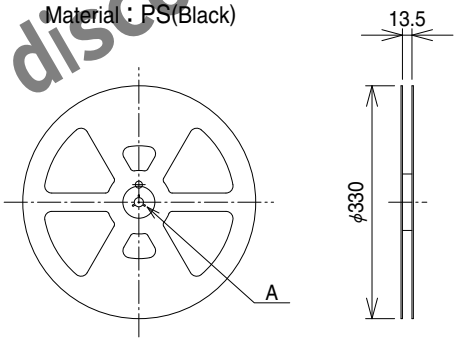


(W.FL-R-SMT-1(80) 4mm pitch)

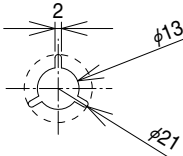


Reel Dimensions

Material : PS(Black)



A(SCALE FREE)

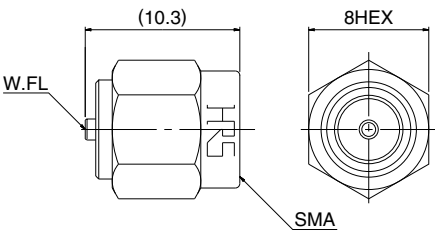


■Conversion Adapters

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



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.

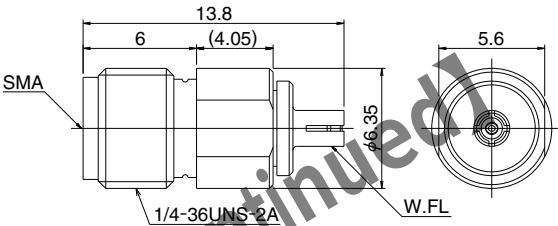


| Part No.       | HRS No.       | Packaging |
|----------------|---------------|-----------|
| HRMP-W.FLJ(40) | 311-0367-3 40 | 1         |

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



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.

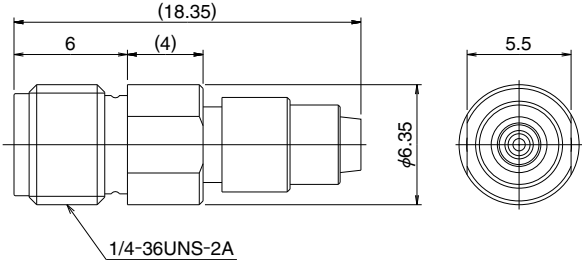


| Part No.       | HRS No.       | Packaging |
|----------------|---------------|-----------|
| HRMJ-W.FLP(40) | 311-0368-6 40 | 1         |

●SMA Conversion Adapter



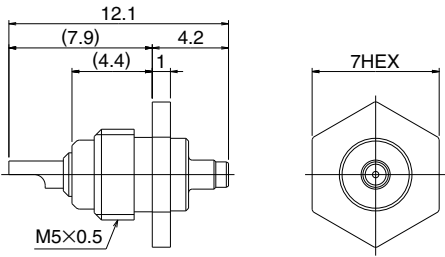
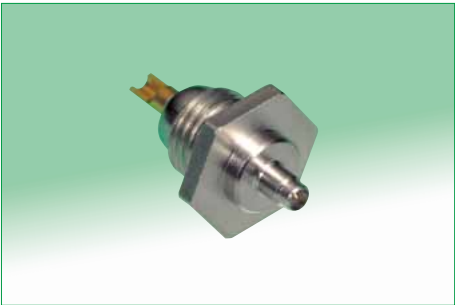
Note : When mating with corresponding part (W.FL-R-SMT-1) it must be pressed down and held to make complete connection.



| Part No.           | HRS No.       | Packaging |
|--------------------|---------------|-----------|
| HRMJ-W.FLP-ST1(40) | 311-0386-8 40 | 1         |

■Receptacle Inspection Adapter

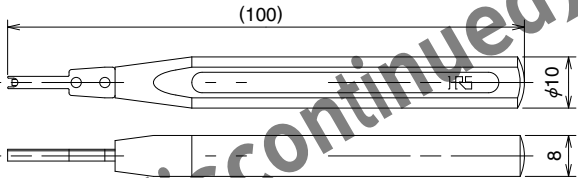
Used for inspecting the performance parameters of the cable assembly.



| Part No. | HRS No.    | Packaging |
|----------|------------|-----------|
| W.FL-R-1 | 331-0483-9 | 1         |

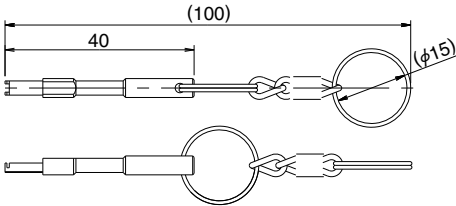
◆Plug-Mating Tool

This tool is used for mating a plug.



| Part No.   | HRS No.    | Packaging |
|------------|------------|-----------|
| W.FL-LP-IN | 331-0323-2 | 1         |

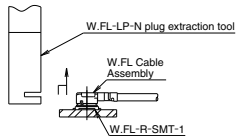
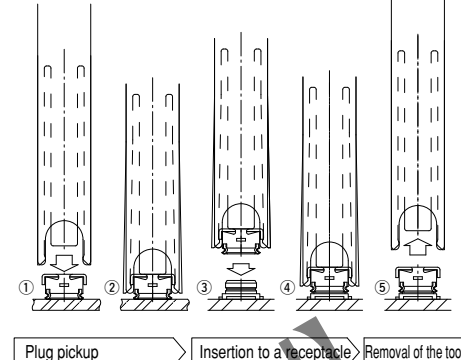
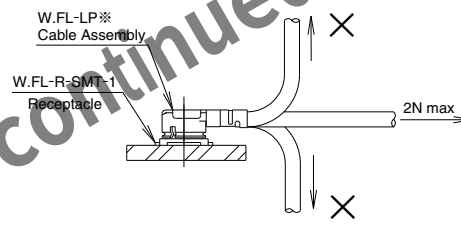
◆Plug-Extraction Tool



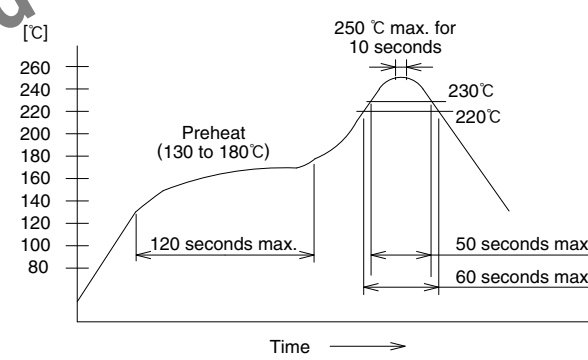
| Part No.  | HRS No.    | Packaging |
|-----------|------------|-----------|
| W.FL-LP-N | 331-0492-0 | 1         |

## ◆Precautions

### 1. Plug

|                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) Mating / unmating                                   | <p>• <b>Unmating</b> 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.</p> <p>●Recommended the use of the extraction tool for unmating.<br/>Any attempt of unmating by pulling on the cable may result in damage and affect the mechanical / electrical performance.</p>  <p>• <b>Mating</b></p> <ol style="list-style-type: none"> <li>①Align the mating tool W.FL-LP-IN or the mating end of the tool over the plug end of the cable assembly.</li> <li>②Firmly place the tool over the plug until it is secured in the tool.</li> <li>③Place the plug cable assembly (held in the tool) over the corresponding receptacle.</li> <li>④Assuring that the plug and receptacle are aligned press-down perpendicular to the mounting surface until both connectors are fully mated.</li> <li>⑤Remove the mating tool by carefully pulling it up. Removal of the tool.</li> </ol>  |
| (2) Pull forces on the cable after connectors are mated | <p>After the connectors are mating, do not apply a load to the cable in excess of the values indicated in the diagram.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| (3) Precautions                                         | Do not twist connectors excessively during mating / unmating.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

### 2. Receptacle

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) Recommended reflow temperature profile |  <p>①The temperature of the printed circuit board surface temperature at the points of contact with the terminals.</p> <p>②Reflow soldering should be performed at a printed circuit surface temperature of 250°C max.</p> <p>③In 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.</p> |
| (2) Recommended metal mask thickness       | 0.1mm to 0.12mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| (3) Reflow cycles                          | 2 times                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

### 3. Operating environment and storage conditions

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) Operating environment           | <p>The connectors are not designed to operate in the following environments:</p> <ul style="list-style-type: none"> <li>• Exposed to a excessive amounts of fine particles and dust</li> <li>• Regions and places having a high density of sulfur dioxide, hydrogen sulfide, nitrogen dioxide or other corrosive gasses.</li> <li>• Environments having large rapid variations in temperature.</li> </ul> |
| (2) Storage conditions - Receptacle | <p>Store in the Hirose Electric packaging.<br/>Temperature : -10 to +40°C, Humidity : 85% max.<br/>Use within 6 months of delivery.<br/>Receptacles for which the storage period has elapsed must be tested for solderability to the PC board mounting surface.</p>                                                                                                                                       |



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