

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

## W.FL Series

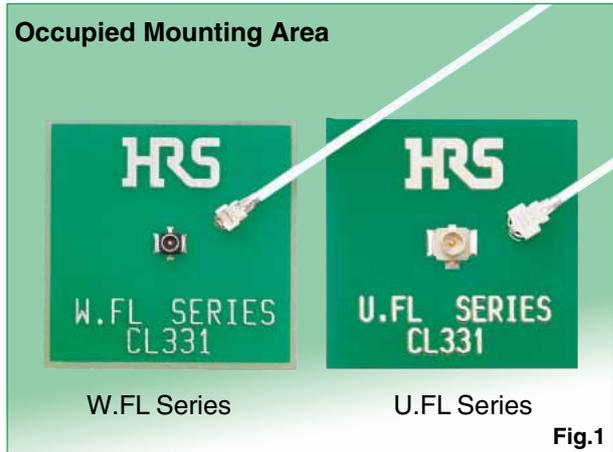
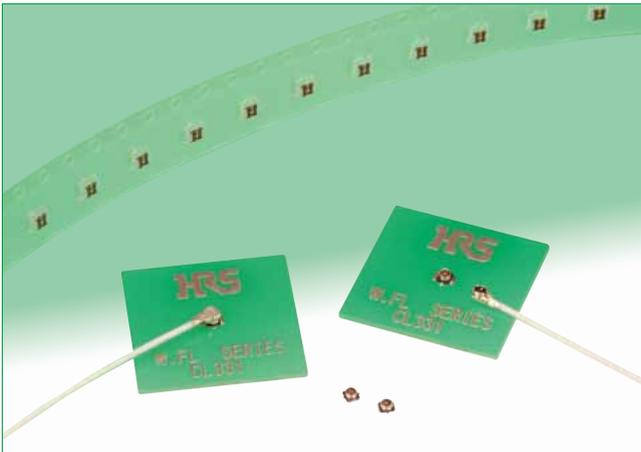


Fig.1

### ■ 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

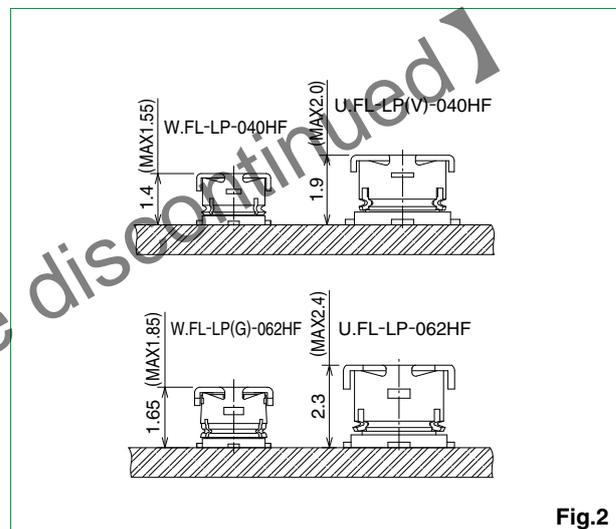


Fig.2

### W. FL Plug and Receptacle

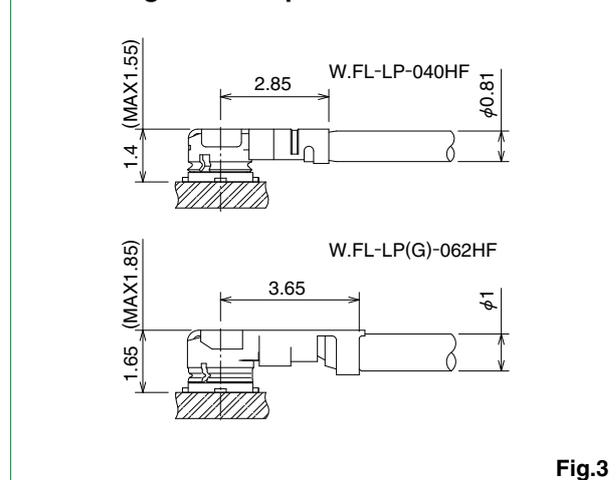
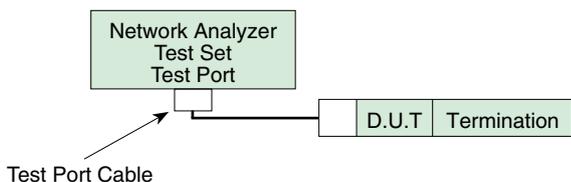


Fig.3

## Specifications

Rating	Nominal characteristic impedance	50Ω	Operating temperature range	-40°C to +90°C (90% RH max.)
	Frequency range	DC to 6 GHz	Storage temperature range	-30°C to +70°C (90% RH max.)
Item	Specification		Conditions	
1. Contact resistance	Center contact : 20mΩ max. 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. 1.4 Max.		Up to 3 GHz 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

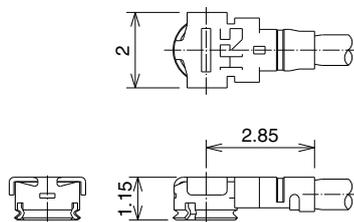
Part	Material	Finish / Remarks
Shell	Phosphor bronze	Silver plated
Female center contact	Phosphor bronze	Gold plated
Insulator	PBT	Color : Gray, UL94V HB(040HF, 062HF)

### ● Receptacle

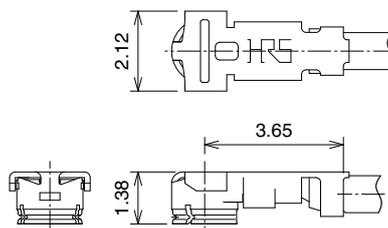
Part	Material	Finish / Remarks
Shell	Phosphor bronze	Silver plated
Insulator	LCP	Color : Black, UL94V-0
Male center contact	Brass	Gold plated

## Cable Assembly(Plug)

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

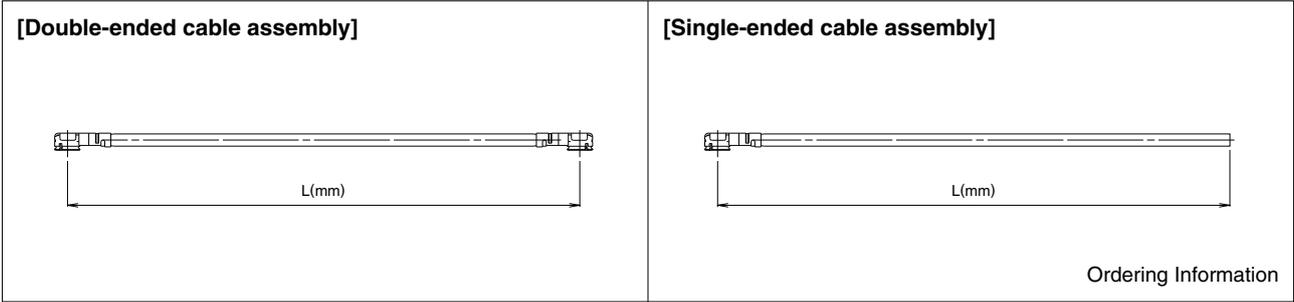


W.FL-LP-062HF(06) (Applicable cable : outer diameter 0.95)



[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 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 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

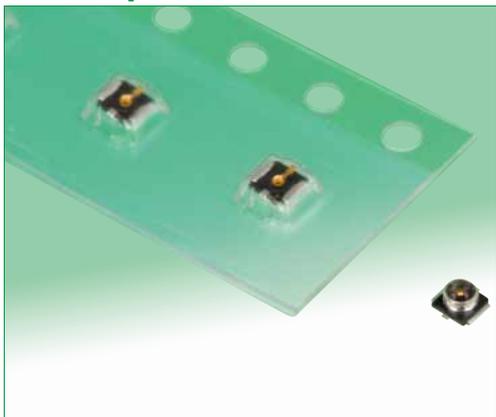
① Series name	W.FL
② Assembly type	LPG : Single ended 2LPG : Double ended
③ Environmental compliant	HF6 : Halogen-free
④ Cable type	062N : 0.95mm dia. ultra-fine coaxial cable
⑤ Cable Color	1 : Gray 2 : Black 3 : White
⑥ Cable outer conductor	D : Copper tape + Outer tin plated braided wire
⑦ Total length(mm)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

### ●Standard tolerances for (L)

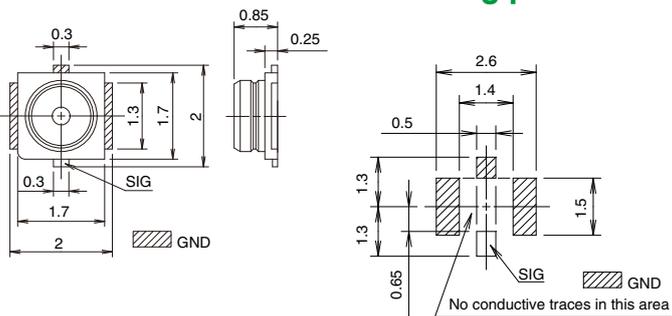
(L)mm	Standard tolerance(mm)
*L=35 to 200	±4
L=200 to 500	±8
L=500 to 1000	±12
L=Longer than 1000	±1.5% of (L)

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.

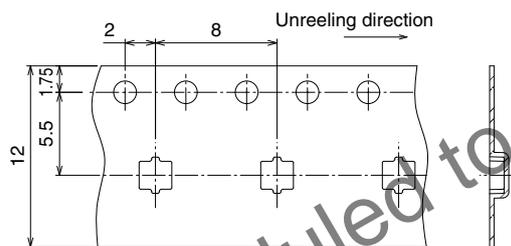
All dimensions : mm

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)

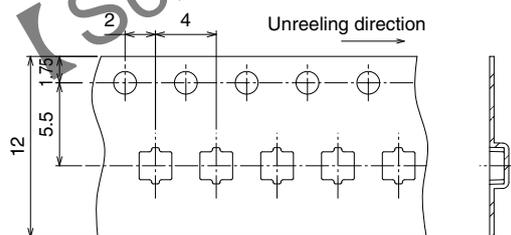
**Embossed Carrier Tape Dimensions(IEC 60286-3 compliant)**

**Embossed Carrier Tape Dimensions**

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

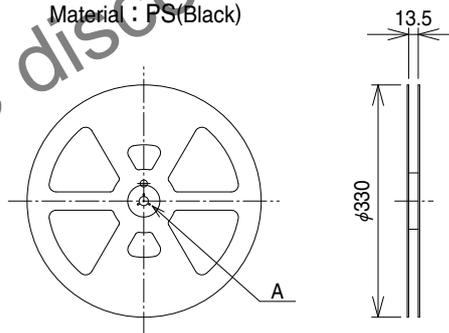


(W.FL-R-SMT-1(80) 4mm pitch)

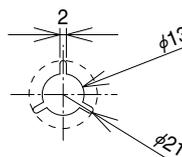


**Reel Dimensions**

Material : PS(Black)



A(SCALE FREE)

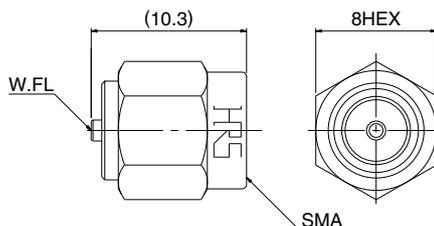


Scheduled to be discontinued

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## ■ Conversion Adapters

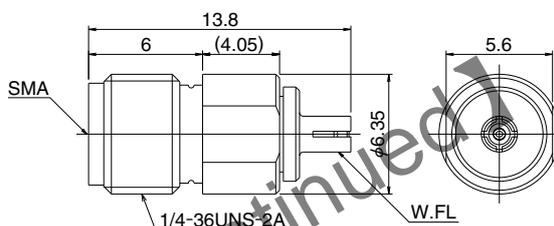
### ● SMA Conversion Adapter (W.FL side jack – SMA side plug)



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

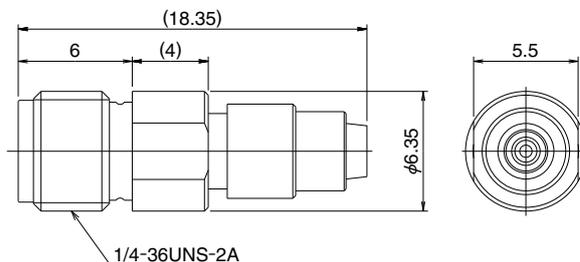
### ● SMA Conversion Adapter (W.FL side plug – SMA side jack)



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

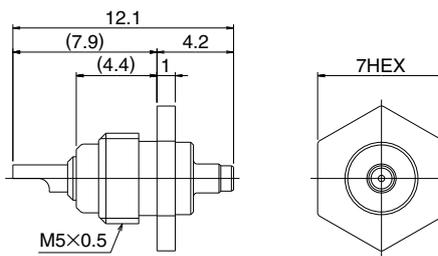


Note : When mating with corresponding part (W.FL-R-SMT-1) it must be pressed down and held to make complete connection.

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

### ■ Receptacle Inspection Adapter

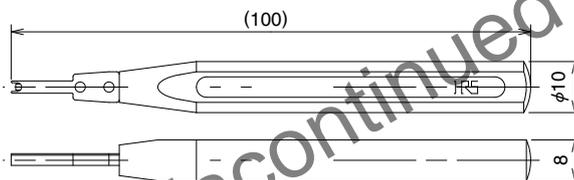
Used for inspecting the performance parameters of the cable assembly.



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

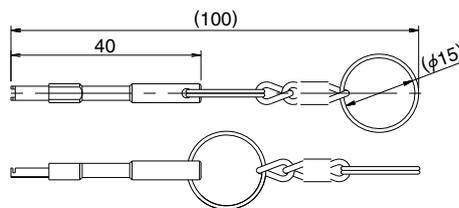
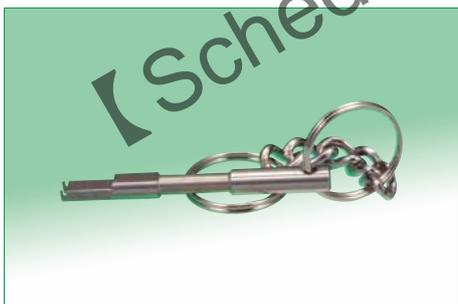
### ◆ Plug-Mating Tool

This tool is used for mating a plug.



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

### ◆ Plug-Extraction Tool

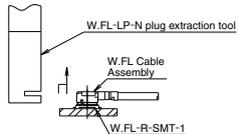
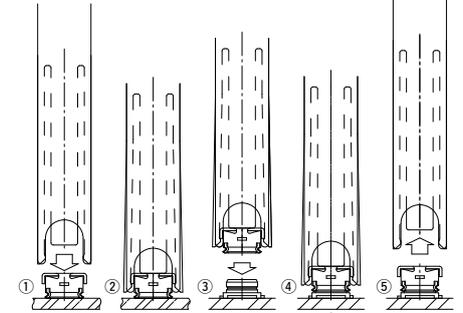
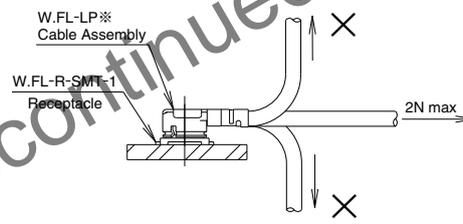


Part No.	HRS No.	Packaging
W.FL-LP-N	331-0492-0	1

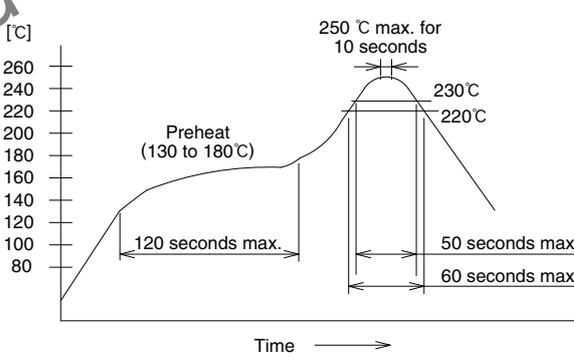
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**◆ Precautions**

**1. Plug**

<p>(1) Mating / unmating</p>	<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. 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>Align the mating tool W.FL-LP-IN or the mating end of the tool over the plug end of the cable assembly.</li> <li>Firmly place the tool over the plug until it is secured in the tool.</li> <li>Place the plug cable assembly (held in the tool) over the corresponding receptacle.</li> <li>Assuring that the plug and receptacle are aligned press-down perpendicular to the mounting surface until both connectors are fully mated.</li> <li>Remove the mating tool by carefully pulling it up. Removal of the tool.</li> </ol>  <p>Plug pickup → Insertion to a receptacle → Removal of the tool</p>
<p>(2) Pull forces on the cable after connectors are mated</p>	<p>After the connectors are mating, do not apply a load to the cable in excess of the values indicated in the diagram.</p> 
<p>(3) Precautions</p>	<p>Do not twist connectors excessively during mating / unmating.</p>

**2. Receptacle**

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

**3. Operating environment and storage conditions**

<p>(1) Operating environment</p>	<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>
<p>(2) Storage conditions - Receptacle</p>	<p>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.</p>

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