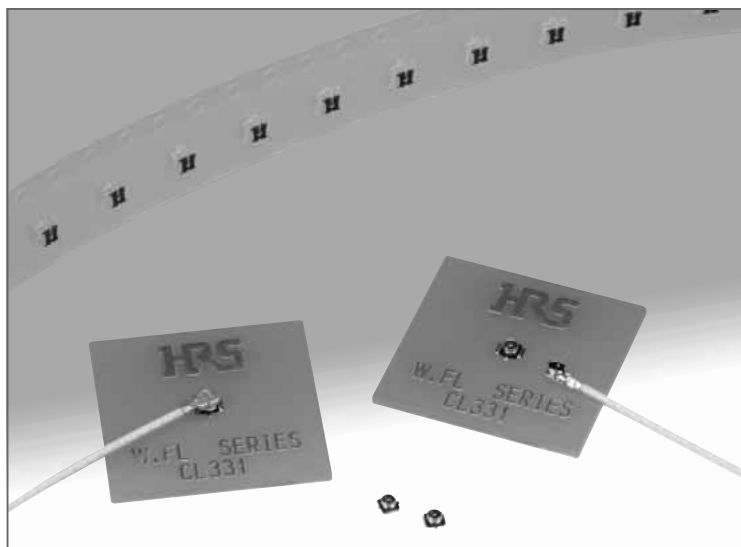


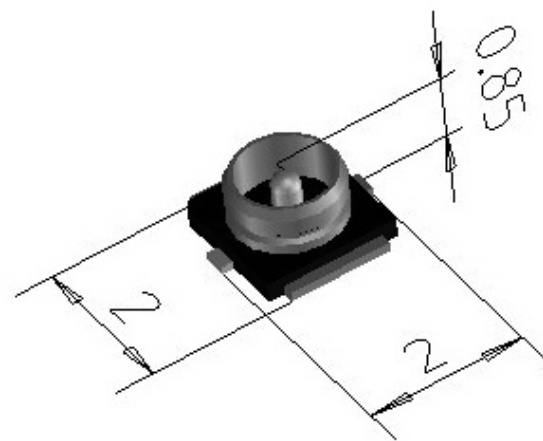
# Ultra Small Surface Mount Coaxial Connectors – 1.4mm Mated Height

## W.FL Series



## Up to 6 GHz Transmission Speed

### Occupied Mounting Area



### ■ Features

#### 1. Nominal mated height of 1.4 mm (Max. 1.5 mm)

#### 2. Small mounting area

The receptacle occupies an area of 3.4mm<sup>2</sup>.

#### 3. Lightweight

Receptacle: 5.6 mg

Right-angle plug: 18.6 mg

#### 4. Accepts high frequency transmission.

To meet the frequency requirements of a wide variety of miniature devices, the connectors offer high frequency performance from DC to 6 GHz, with a V.S.W.R. of 1.35max.

#### 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

Standard ultra-fine coaxial cable of 0.81 mm diameter (single braid shielding) is used for the plug termination, assuring secure and stable connections.

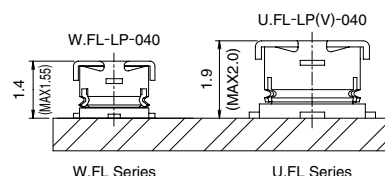
#### 7. Simple connector mating / unmating

Use of available extraction tool assures correct disconnection of the plug and receptacle.

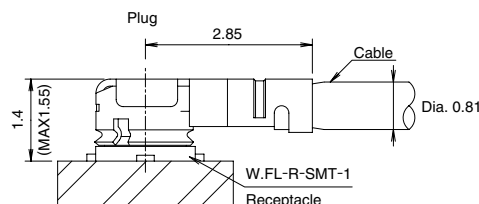
#### 8. Verification of the fully mated condition

Tactile click sensation confirms fully mated condition, assuring complete electrical and mechanical connection.

### Mated height comparison (with U.FL Series)



### W. FL Plug and Receptacle



### ■ Applications

Cellular phones, PHS, mobile phones, wireless communication devices, electronic measuring instruments, GPS, wireless LAN, Bluetooth and any application requiring high frequency transmission using small coaxial connectors.



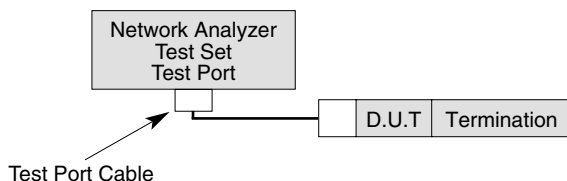
## Specifications

Ratings	Nominal characteristic impedance	50 ohms	Operating temperature range	-40°C to +90°C
	Frequency range	DC to 6 GHz	Operating humidity	90% RH max.

Item	Specification	Conditions
1. Contact resistance	Center contact: 20m ohms max. Outer contact: 10m ohms max.	10mA max.
2. Insulation resistance	500M ohms min.	100V DC
3. Withstanding voltage	No flashover or insulation breakdown	200V AC / 1 minute
4. V.S.W.R.*	1.3 Max. 1.35 Max.	Up to 3 GHz 3 to 6 GHz
5. Durability	Contact resistance Center contact: 25m ohms max. Outer contact: 15m ohms max. No damage, cracks, or parts dislocation	20 cycles
6. Vibration	No electrical discontinuity of 1 $\mu$ s or longer No damage, cracks, or parts dislocation	Frequency: 10 to 100 Hz, single amplitude of 1.5mm Acceleration: 59 m/s <sup>2</sup> , in each of 3 axis 5 cycles
7. Shock	No electrical discontinuity of 1 $\mu$ s or longer No damage, cracks, or parts dislocation	Acceleration of 735 m/s <sup>2</sup> , 11 ms continuous time Waveform: sine half-wave, 3 cycles in each of the 3 axis
8. Humidity	Insulation resistance: 10M ohms min. (high humidity) Insulation resistance: 500M ohms min. (dry) No damage, cracks, or parts dislocation	96 hours at temperature of +40°C and humidity of 95%
9. Temperature cycle	No damage, cracks, or parts dislocation Contact resistance: 25m ohms max. (Center) 15m ohms max. (Outer)	Temperature: -40°C → +5°C to +35°C → +90°C → +5°C to +35°C Time: 30 min. → 3 min. → 30 min. → 3 min. 5 cycles
10. Salt spray test	No excessive corrosion	5% salt water solution, 48 hours

\*V.S.W.R. Measurement System

Measured as shown on the block diagram below.



Note1: Measurement way of a W.F.L Cable assembly (plug)

W.F.L Cable assembly (plug) is measured with SMA conversion adapters mated with W.F.L plugs at both ends of a 100cm coaxial cable harness

Note2: Measurement way of a W.F.L receptacle

W.F.L receptacle, which is mounted on a 50 ohms glass epoxy board, is measured with a SMA conversion adapter.

## Materials / Finishes

### ●Plug – right angle

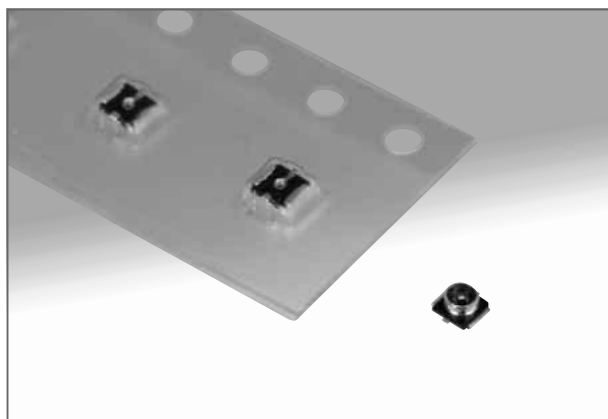
Part	Material	Finish	Remarks
Shell	Phosphor bronze	Silver plated	—
Female center contact	Phosphor bronze	Gold plated	—
Insulator	PBT	Color: Black	UL94V-0

### ●Receptacle

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

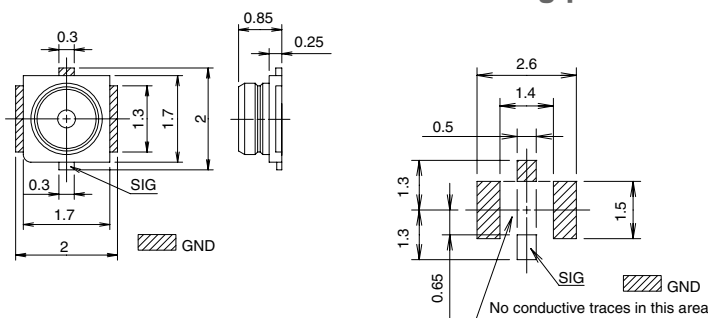


## Receptacle



Note : Receptacles of (10) specification are sold by the reel (2,000 pieces).  
 Order by reel.

## Recommended PCB mounting pattern



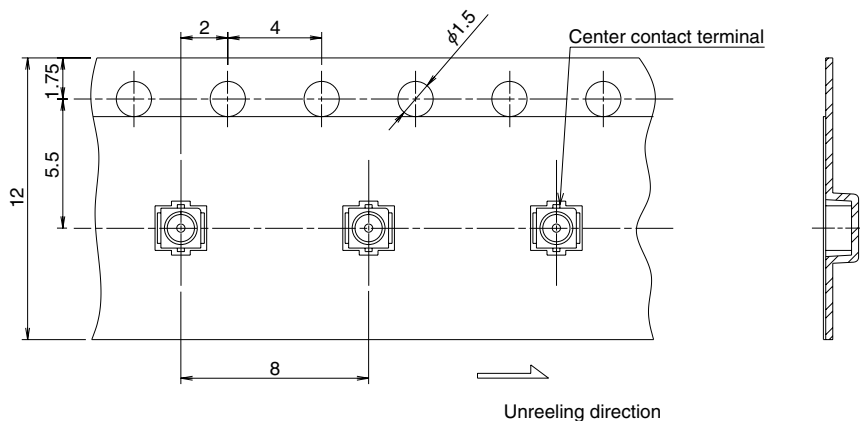
Recommended screen thickness: 0.1mm to 0.12mm

All dimensions: mm

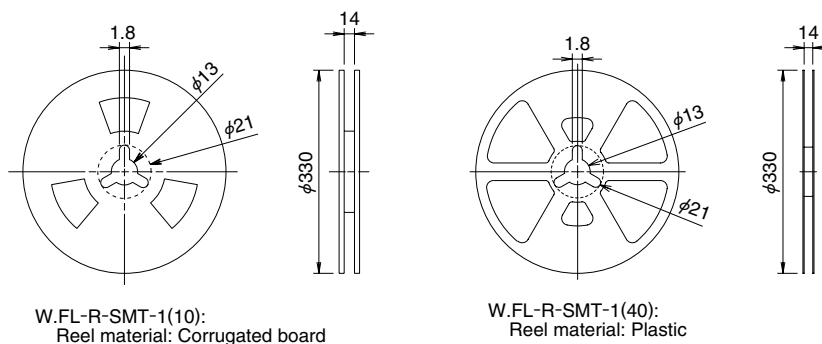
Part Number	CL No.	Packaging	Weight / EA	RoHS
W.FL-R-SMT-1(10)	CL331-0482-6-10	Reel (2000 pieces/reel)	5.6 mg	YES
W.FL-R-SMT-1(40)	CL331-0482-6-40	Reel (5000 pieces/reel)		

## Packaging Specifications

### Embossed Carrier Tape Dimensions



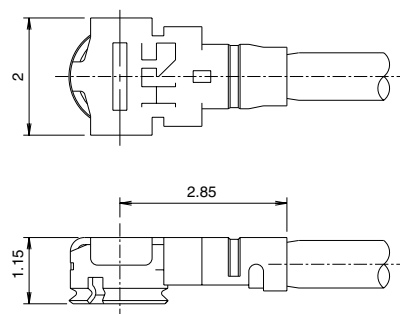
### Reel Dimensions



All dimensions: mm



## ■ Plug Assembly (Plug)

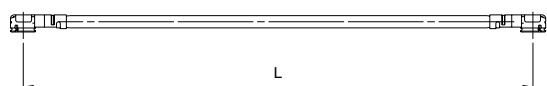


Plugs can be ordered only as terminated cable assemblies.

All dimensions: mm

## ■ How to Specify Plug Cable Assembly

Double-ended cable assembly



Single-ended cable assembly



## ● Ordering Information

**W.F.L – 2LP – 04N [ ] T – A – (L)**

①      ②      ③      ④      ⑤

① Series name	W.F.L
② Assembly type	LP : Single ended 2LP : Double ended
③ Cable type	04N : Dia. 0.81mm ultra-fine coaxial cable
④ Cable color	1: White, 2: Black
⑤ Total length (mm)	Length (L)

### ● Standard tolerances for (L) (Note 2)

(L)	Standard Tolerance
L=35mm to 200mm	±4mm (Note 1)
L=200mm to 500mm	±8mm
L=500mm to 1000mm	±12mm
L= Longer than 1000mm	±1.5% of (L)

Note1: Minimum available length (L) is 35mm

Note2: Contact nearest HRS representative if different tolerances are required.

Note3: Contact Nearest HRS representative if one end requires preparation.

Part No. of Cable Assembly	Description	RoHS
W.F.L-2LP-04N1T-A-(L)	Dia. 0.81mm double ended coaxial cable, color: white	YES

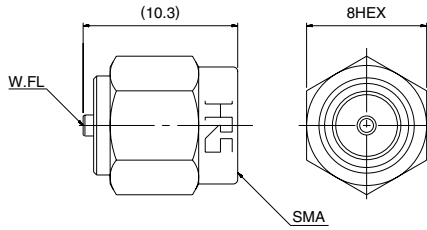


## ■ Conversion Adapters

### ● 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.

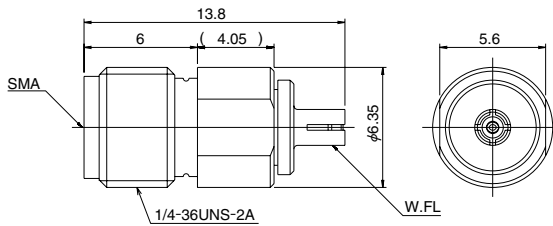


Part No.	CL No.	RoHS
HRMP-W.FLJ(40)	311-0367-3-40	YES

### ● 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.

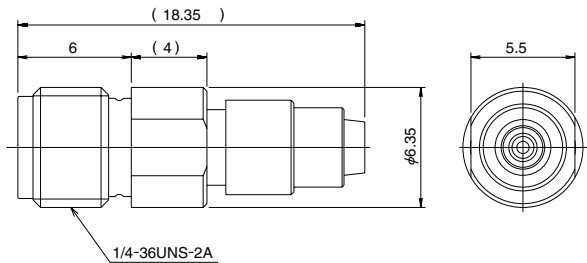


Part No.	CL No.	RoHS
HRMJ-W.FLP(40)	311-0368-6-40	YES

### ● SMA Conversion Adapter

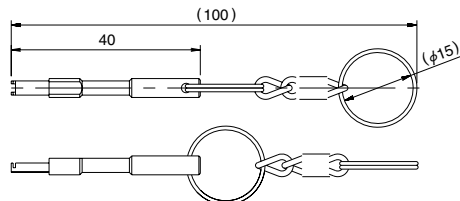


Note:When mating with corresponding part (W.FL-R-SMT-1) it must be pressed down and held to make complete connection.



Part No.	CL No.	RoHS
HRMJ-W.FLP-ST1(40)	311-0386-8-40	YES

## ■ Plug Extraction Tool



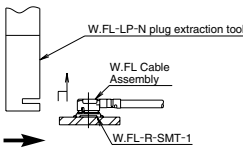
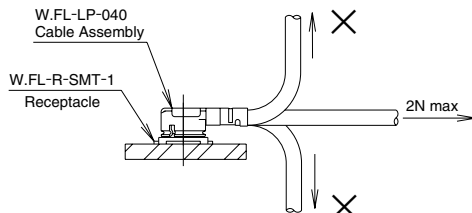
Part No.	CL No.	RoHS
W.FL-LP-N	331-0492-0	YES



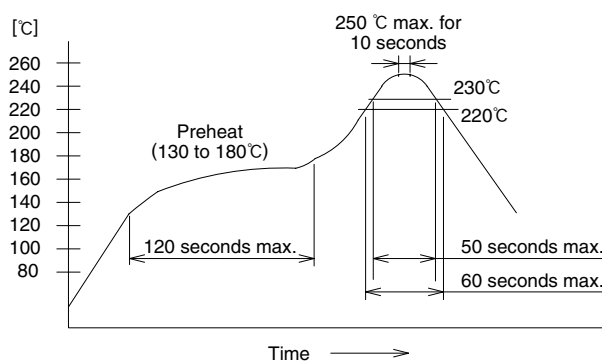
## W.F.L Series Ultra Small Surface Mount Coaxial Connectors – 1.4mm Mated Height

### ■Precautions

#### 1. Plug

(1) Mating / unmating	<ul style="list-style-type: none"> <li>• <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.                      ● 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.</li> <li>• <b>Mating</b> Do not attempt to insert on an extreme angle.</li> </ul> 
(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	 <ul style="list-style-type: none"> <li>① The temperature of the printed circuit board surface temperature at the points of contact with the terminals.</li> <li>② Reflow soldering should be performed at a printed circuit surface temperature of 250°C max.</li> <li>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.</li> </ul>
(2) Manual soldering	Soldering iron temperature: 350°C, Soldering time: for 5 seconds max.
(3) Recommended metal mask thickness	0.1 mm to 0.12 mm
(4) 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.                      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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