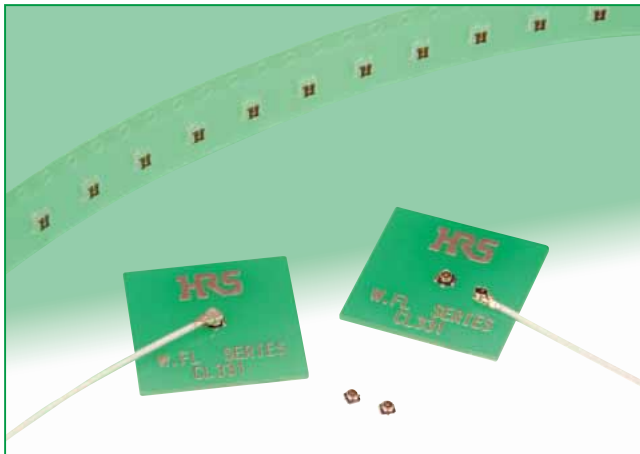


Ultra Small Surface Mount Coaxial Connectors 1.4mm or 1.65mm Mated Height

W.FL Series



Occupied Mounting Area



W.FL Series

U.FL Series

Fig.1

■ Features

1. Nominal mated height of 1.4 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.

Mated height comparison

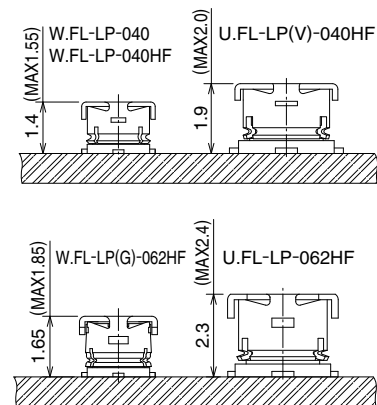


Fig.2

W. FL Plug and Receptacle

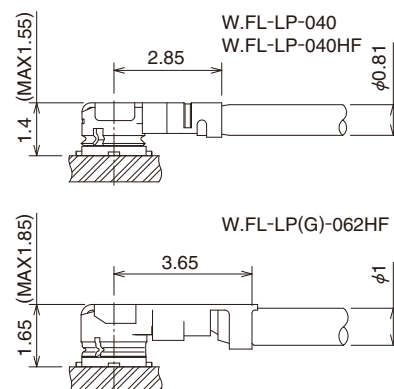
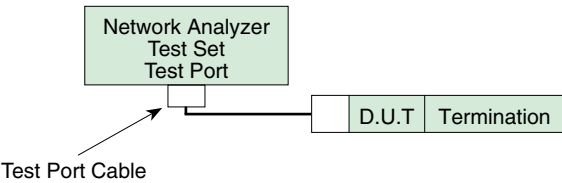


Fig.3

■Specifications

Rating	Nominal characteristic impedance	50 ohms	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: 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. 1.4 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 50 ohms glass epoxy board, is measured with a SMA conversion adapter.

■Materials

●Plug – right angle

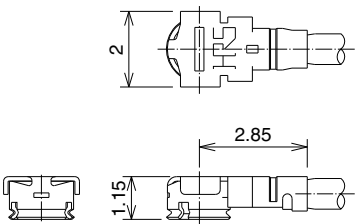
Part	Material	Finish / Remarks
Shell	Phosphor bronze	Silver plated
Female center contact	Phosphor bronze	Gold plated
Insulator	PBT	Color: Black, UL94V-0(040)
		Color: Gray, UL94V HB(040HF, 062HF)

●Receptacle

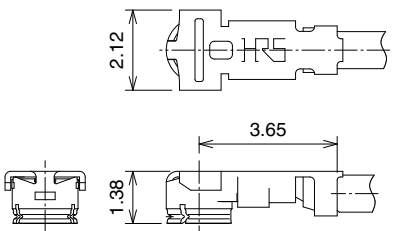
Part	Material	Finish / Remarks
Shell	Phosphor bronze	Silver plated
Insulator	LCP	Color: Black, UL94V-0
Male center contact	Brass	Gold plated

■Cable Assembly(Plug)

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

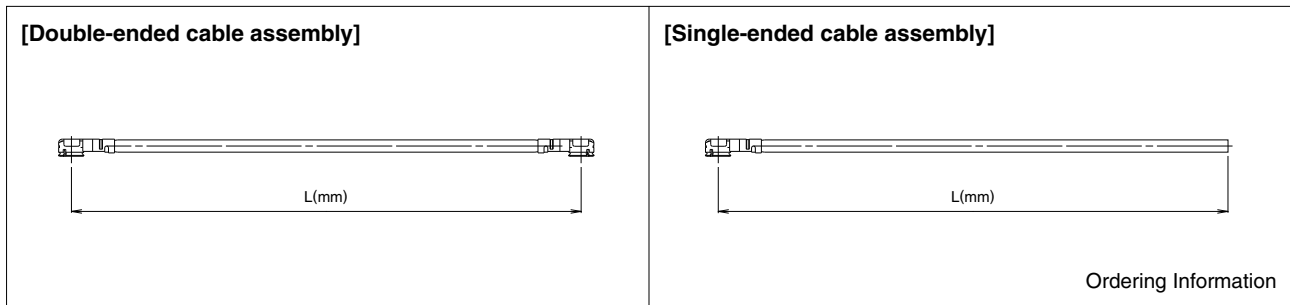


W.FL-LP-062HF(06) (Applicable cable: outer diameter 1.0)



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

◆How to Specify Cable Assembly



●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

① Series name	W.FL
② Assembly type	LP : Single ended 2LP : Double ended
③ Environmental compliant	HF6 : Halogen-free 6 : RoHS compliant
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)

●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.

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

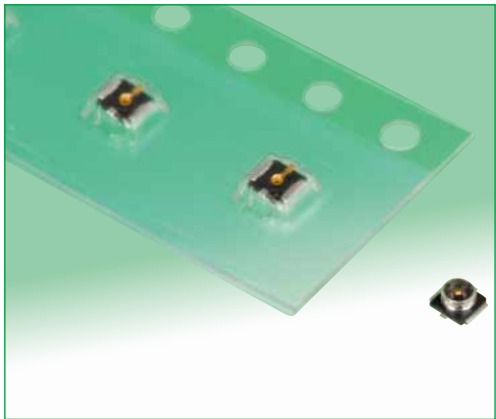
Single-Ended

W.FL-LPG HF-062N [] D-A-L

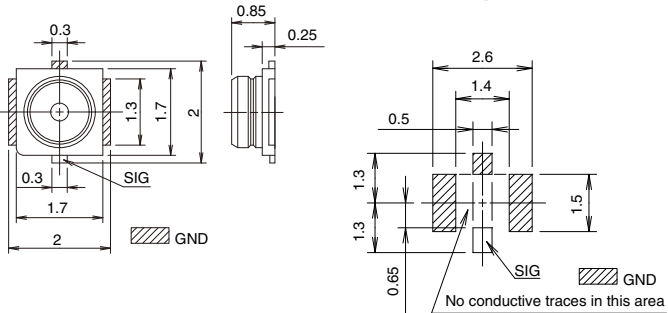
① ② ③ ④ ⑤ ⑥ ⑦

① Series name	W.FL
② Assembly type	LPG : Single ended 2LPG : Double ended
③ Environmental compliant	HF : Halogen-free
④ Cable type	062N: 1.0mm 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)

■Receptacle



◆Recommended PCB mounting pattern



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

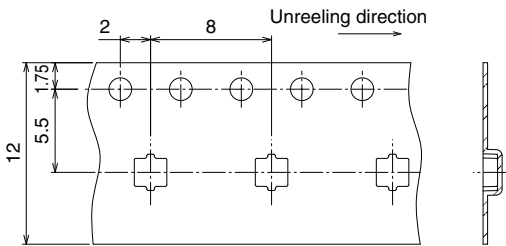
All dimensions: mm

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

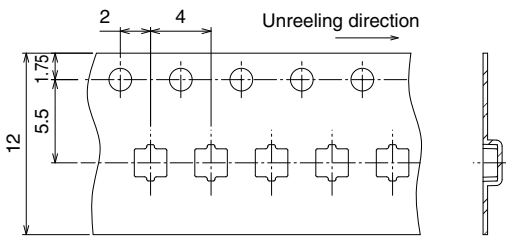
●Embossed Carrier Tape Dimensions(IEC 60286-3 compliant)

Embossed Carrier Tape Dimensions

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

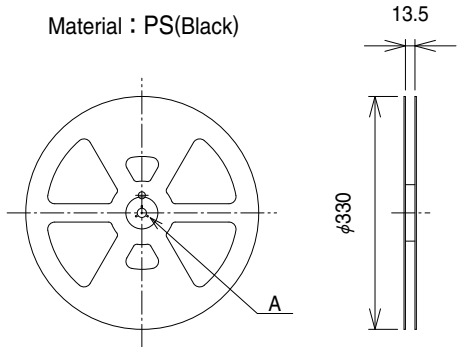


(W.FL-R-SMT-1(80) 4mm pitch)

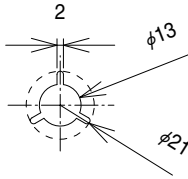


Reel Dimensions

Material : PS(Black)

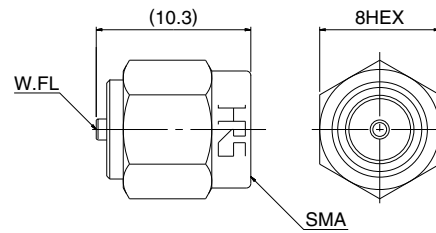


A(SCALE FREE)



■ Conversion Adapters

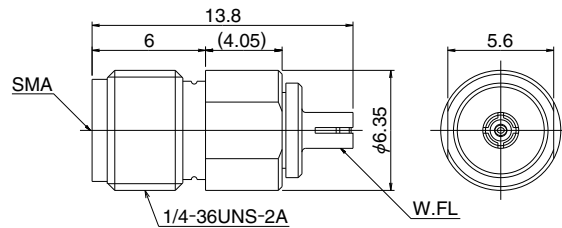
● SMA Conversion Adapter (W.FL side jack – SMA side plug)



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	RoHS
HRMP-W.FLJ(40)	311-0367-3 40	1	Yes

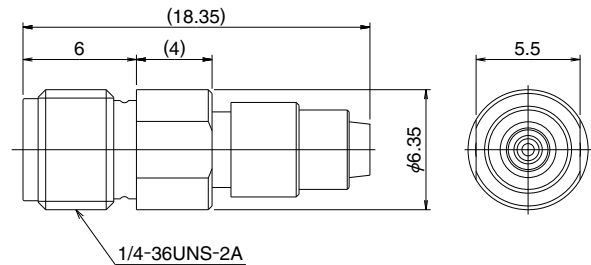
● SMA Conversion Adapter (W.FL side plug – SMA side jack)



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.	HRS No.	Packaging	RoHS
HRMJ-W.FLP(40)	311-0368-6 40	1	Yes

● SMA Conversion Adapter

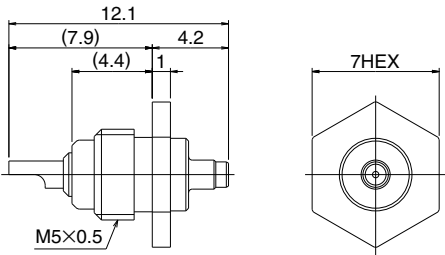
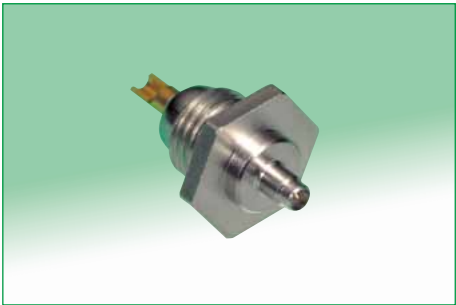


Note:When mating with corresponding part (W.FL-R-SMT-1) it must be pressed down and held to make complete connection.

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

■Receptacle Inspection Adapter

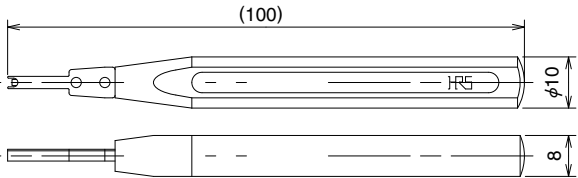
Used for inspecting the performance parameters of the cable assembly.



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

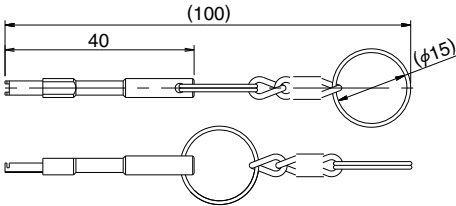
◆Plug-Mating Tool

This tool is used for mating a plug.



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

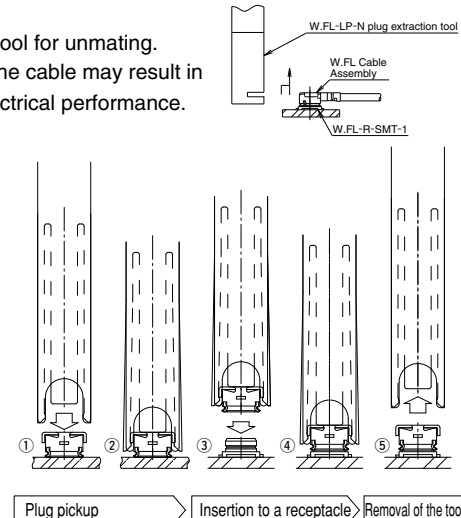
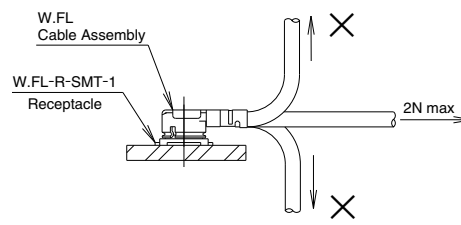
◆Plug-Extraction Tool



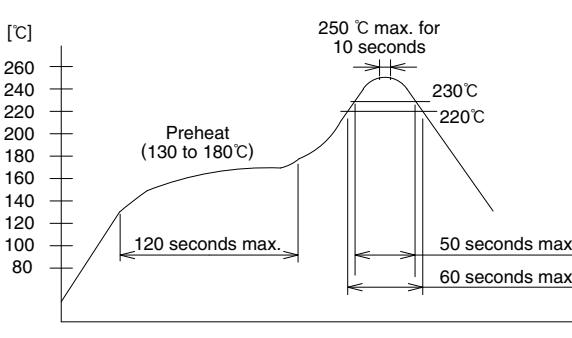
Part No.	HRS No.	Packaging	RoHS
W.FL-LP-N	331-0492-0	1	Yes

◆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 ①Align the mating tool W.FL-LP-IN or the mating end of the tool over the plug end of the cable assembly. ②Firmly place the tool over the plug until it is secured in the tool. ③Place the plug cable assembly (held in the tool) over the corresponding receptacle. ④Assuring that the plug and receptacle are aligned press-down perpendicular to the mounting surface until both connectors are fully mated. ⑤Remove 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	 ①The temperature of the printed circuit board surface temperature at the points of contact with the terminals. ②Reflow soldering should be performed at a printed circuit surface temperature of 250°C max. 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.
(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.

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[04N1-A-\(220\)](#) [W.FL-2LP-04N1-A-\(260\)](#) [W.FL-LP-04N1-A-\(50\)](#) [W.FL-LP-04N1-A-\(250\)](#) [W.FL-LP-04N1-A-\(35\)](#) [W.FL-](#)
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[A-\(170\)](#) [W.FL-2LP-04N1-A-\(160\)](#) [W.FL-2LP-04N1-A-\(120\)](#) [W.FL-2LP-04N1-A-\(290\)](#) [W.FL-2LP-04N1-A-\(900\)](#) [W.FL-](#)
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[W.FL-2LP-04N2-A-\(60\)](#) [W.FL-2LP-04N2-A-\(80\)](#) [W.FL-2LP-04N1-A-\(250\)](#) [W.FL-2LP-04N1-A-\(70\)](#) [W.FL-2LP-04N1-A-](#)
[\(90\)](#) [W.FL-LP-04N1-A-\(1000\)](#) [W.FL-2LP-04N2-A-\(300\)](#) [W.FL-2LP-04N2-A-\(130\)](#) [W.FL-2LP-04N2-A-\(700\)](#) [W.FL-2LP-](#)
[04N2-A-\(150\)](#) [W.FL-2LP-04N2-A-\(110\)](#) [W.FL-2LP-04N2-A-\(190\)](#) [W.FL-2LP-04N2-A-\(170\)](#) [W.FL-2LP-04N1-A-\(35\)](#)
[W.FL-2LP-04N2-A-\(1000\)](#) [W.FL-2LP-04N2-A-\(180\)](#) [W.FL-2LP-04N2-A-\(600\)](#) [W.FL-2LP-04N2-A-\(400\)](#) [W.FL-2LP-](#)
[04N2-A-\(800\)](#) [W.FL-2LP-04N2-A-\(140\)](#) [W.FL-2LP-04N2-A-\(120\)](#) [W.FL-2LP-04N2-A-\(160\)](#) [W.FL-2LP-04N2-A-\(500\)](#)
[W.FL-R-SMT-1\(40\)](#) [W.FL-2LP-04N2-A-\(200\)](#) [W.FL-2LP-04N2-A-\(900\)](#) [W.FL-2LP-04N1-A-\(100\)](#) [W.FL-2LP-04N1-A-](#)
[\(1000\)](#) [W.FL-2LP-04N1-A-\(500\)](#) [W.FL-2LP-04N2-A-\(100\)](#) [W.FL-2LPG-062N2D-A\(100\)](#) [W.FL-2LPG-062N2D-A\(35\)](#)
[W.FL-2LPG-062N2D-A\(40\)](#) [W.FL-2LPG-062N2D-A\(70\)](#) [W.FL-LP-N](#) [W.FL-R-1](#) [W.FL-R-SMT-1\(10\)](#) [W.FL-2LP-04K1T-](#)
[AC-\(200\)](#)