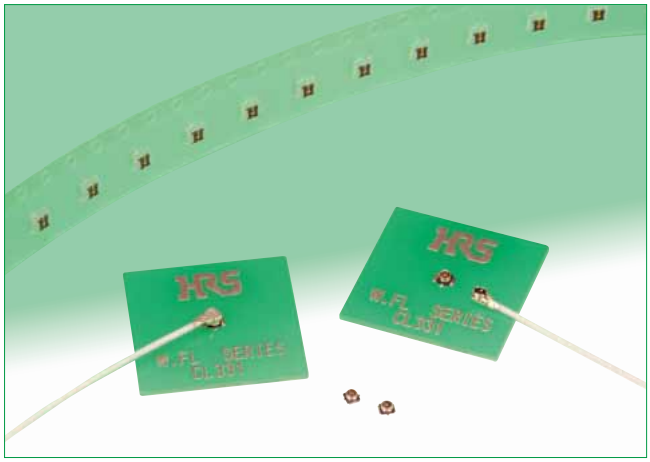
Ultra Small Surface Mount Coaxial Connectors 1.4mm or 1.65mm Mated Height

W.FL Series



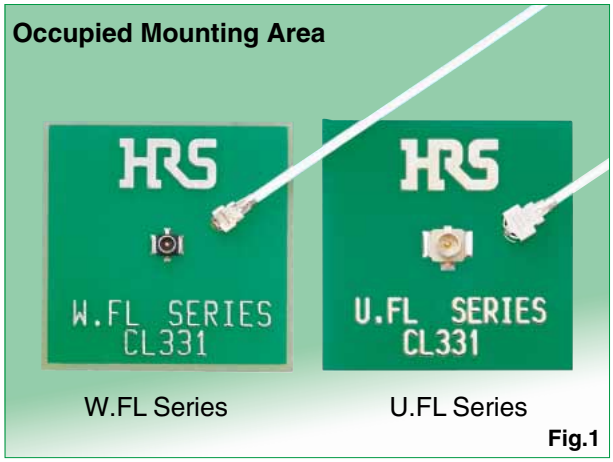


Fig.1

■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 3.4mm² 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

Mated height comparison

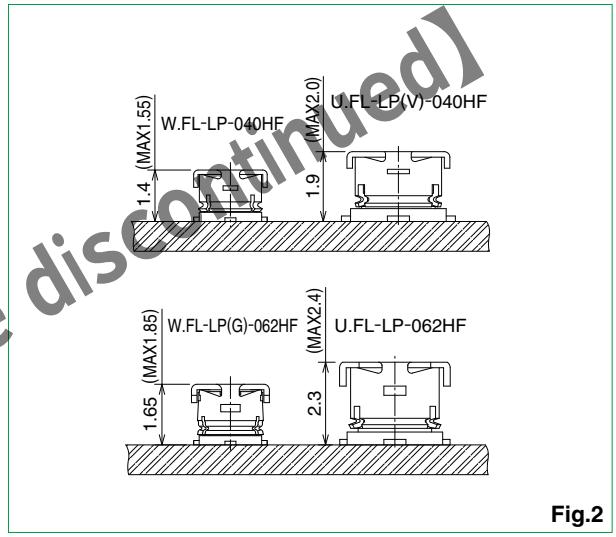


Fig.2

W. FL Plug and Receptacle

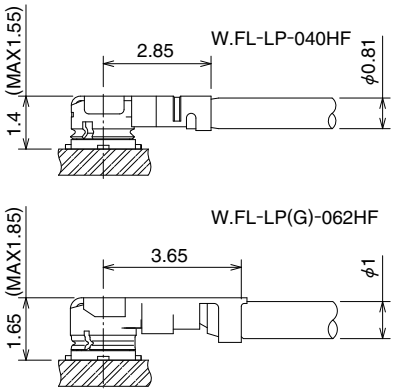


Fig.3

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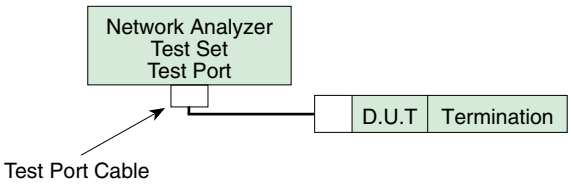
■Specifications

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

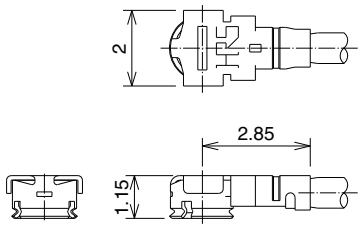
Part	Material	Finish / Remarks
Shell	Phosphor bronze	Silver plated
Female center contact	Phosphor bronze	Gold plated
Insulator	PBT	Color : Gray, UL94V HB(040HF, 062HF)

●Receptacle

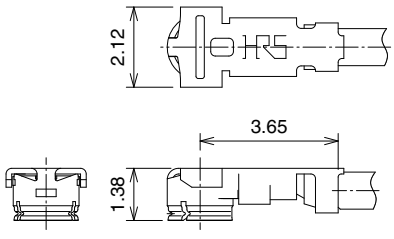
Part	Material	Finish / Remarks
Shell	Phosphor bronze	Silver plated
Insulator	LCP	Color : Black, UL94V-0
Male center contact	Brass	Gold plated

■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.]

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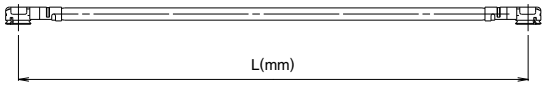
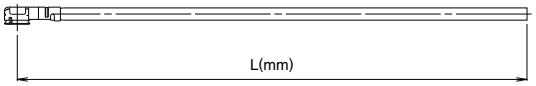
How to Specify Cable Assembly

[Double-ended cable assembly]	[Single-ended cable assembly]
	
	Ordering Information

●Ordering Information

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

Double-Ended

W.FL – 2LP HF6 – 04N ⌜⌟ TV – A – L

❶ ❷ ❸ ❹ ❺ ❻ ❼

Single-Ended

W.FL – LP HF6 – 04N ⌜⌟ TV – A – L

❶ ❷ ❸ ❹ ❺ ❻ ❼

❶	Series name	W.FL
❷	Assembly type	LP : Single ended 2LP : Double ended
❸	Environmental compliant	HF6 : Halogen-free
❹	Cable type	04N : 0.81mm dia. ultra-fine coaxial cable
❺	Cable Color	1 : White 2 : Black
❻	Cable outer conductor	TV : Tin plated braided wire
❼	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

❶ ❷ ❸ ❹ ❺ ❻ ❼

Single-Ended

W.FL – LPG HF6 – 062N ⌜⌟ D – A – L

❶ ❷ ❸ ❹ ❺ ❻ ❼

❶	Series name	W.FL
❷	Assembly type	LPG : Single ended 2LPG : Double ended
❸	Environmental compliant	HF6 : Halogen-free
❹	Cable type	062N : 0.95mm dia. ultra-fine coaxial cable
❺	Cable Color	1 : Gray 2 : Black 3 : White
❻	Cable outer conductor	D : Copper tape + Outer tin plated braided wire
❼	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.

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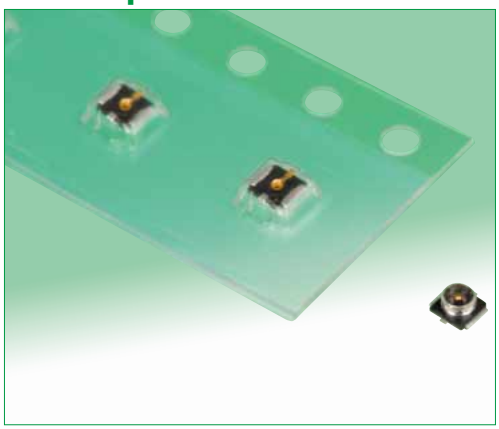
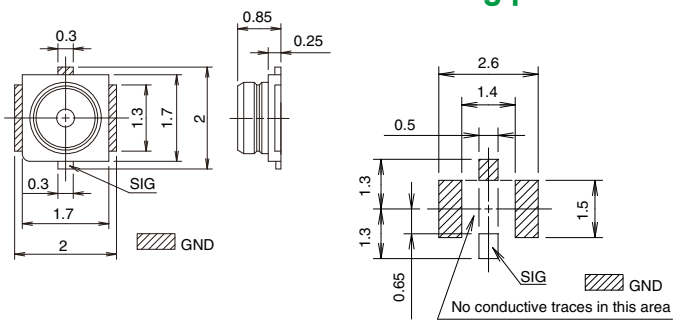
■Receptacle



◆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)

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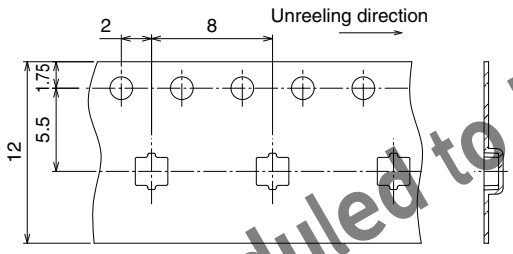
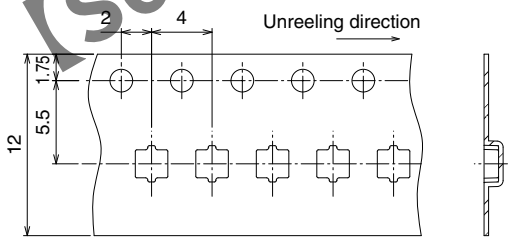
●Embossed Carrier Tape Dimensions(IEC 60286-3 compliant)

Embossed Carrier Tape Dimensions

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

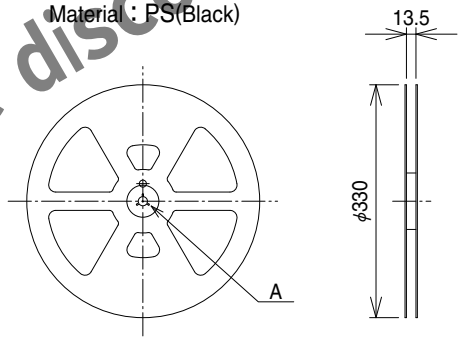


(W.FL-R-SMT-1(80) 4mm pitch)

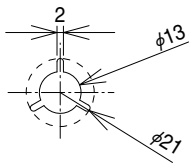


Reel Dimensions

Material : PS(Black)



A(SCALE FREE)



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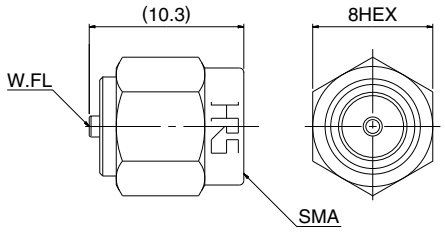
■Conversion Adapters

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

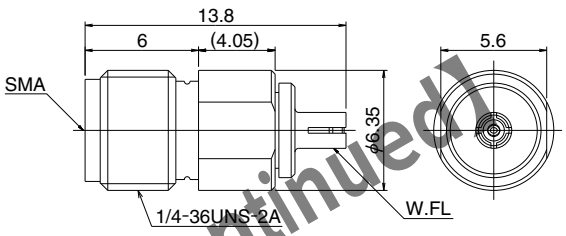
Note : Used for performance measurements only. The W.FL mating side has lower retention force than the regular product when mated to the corresponding part.



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

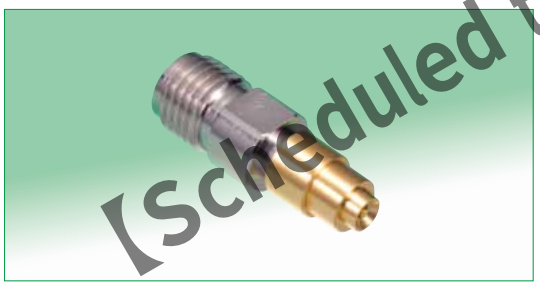
●SMA Conversion Adapter (W.FL side plug – SMA side jack)

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.

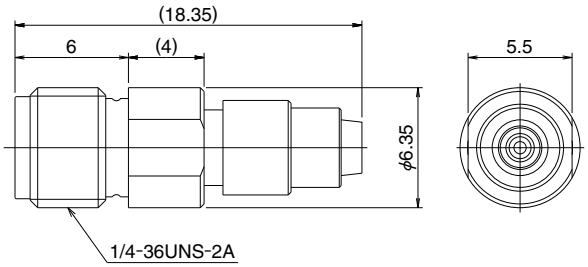


Part No.	HRS No.	Packaging
HRMJ-W.FLP(40)	311-0368-6 40	1

●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

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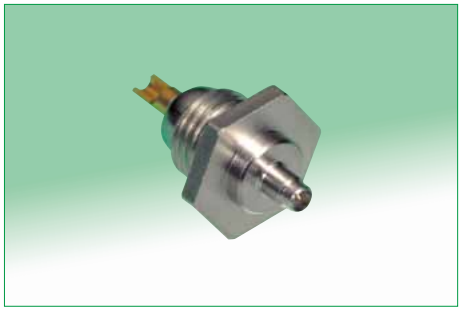
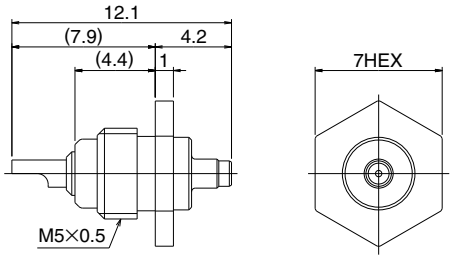
■Receptacle Inspection Adapter

Used for inspecting the performance parameters of the cable assembly.

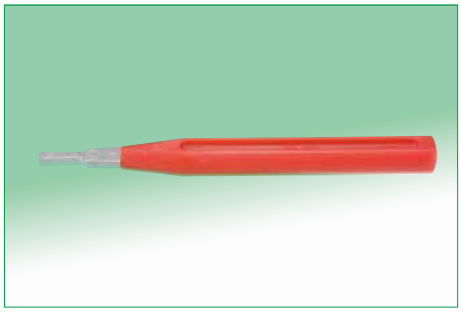


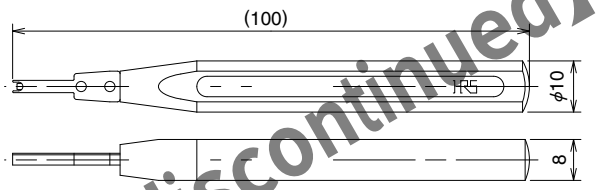


Part No.	HRS No.	Packaging
W.FL-R-1	331-0483-9	1

◆Plug-Mating Tool

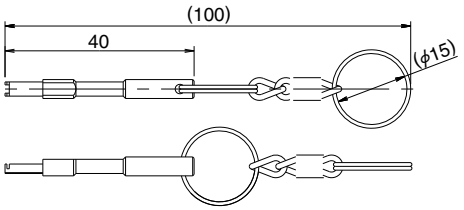
This tool is used for mating a plug.





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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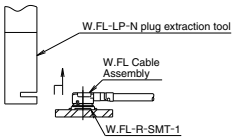
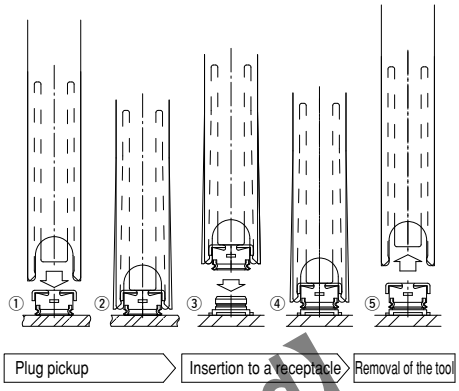
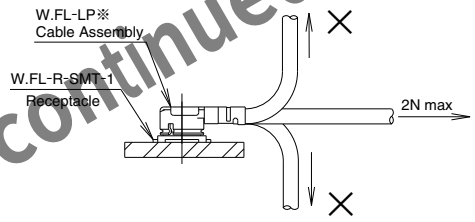
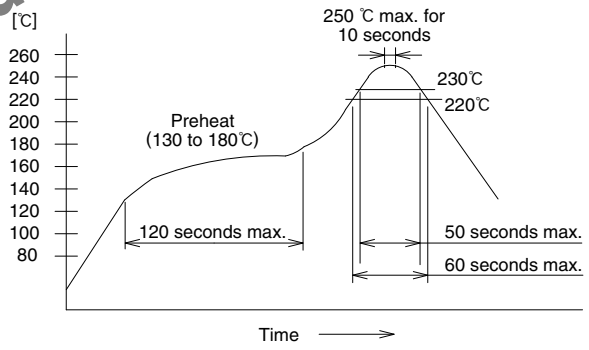
◆Precautions

1. Plug

(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. ●Recomended 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. Consuly your solder paste and equipment manufacturer for specific recommendations.
(2) Recommended metal mask thickness	0.1mm to 0.12mm
(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℃, 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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The characteristics and the specifications contained herein are for reference purpose. Please refer to the latest customer drawings prior to use.
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