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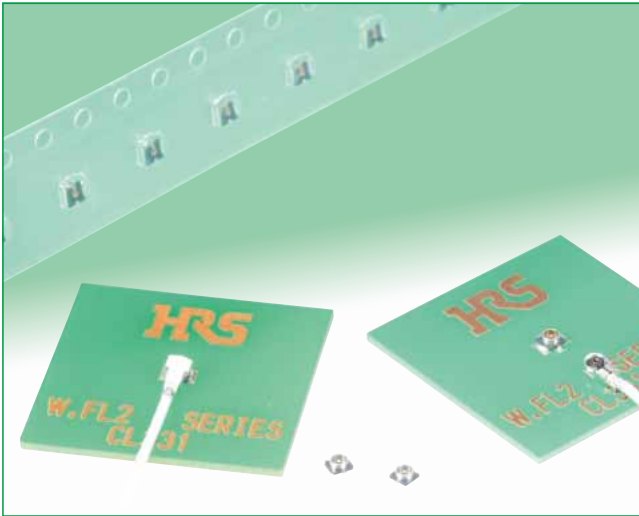
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# Ultra-Small Surface Mount Coaxial Connectors - 1.18mm Mated Height

## W.FL2 Series



### Occupied Mounting Area



### Features

**1. Nominal mated height of 1.18 mm (Max. 1.3 mm)**

**2. Small board footprint**

As with X.FL, W.FL Series, the receptacles occupies an area of 3.4 mm<sup>2</sup> and share the same land pattern.

Note: The W.FL2 Series is not compatible with X.FL, W.FL Series.

**3. Extremely light weight**

The world's smallest and lightest class of coaxial connectors.

Receptacle: 5.0mg

Right angle plug: 16.7mg(062), 17.4mg(040), 15.3mg(032)

**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 / un-mating**

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-900 ppm maximum, Cl-900 ppm maximum, Cl+Br combined-1,500 ppm maximum.

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

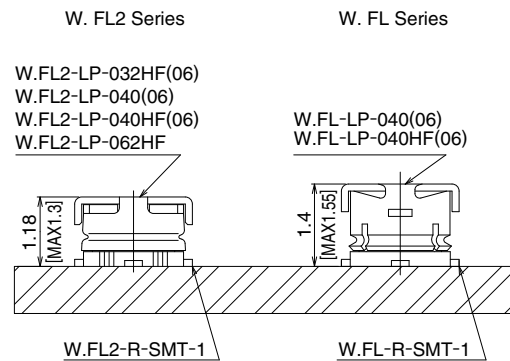


Fig.1

### W.FL2 Plug and Receptacle

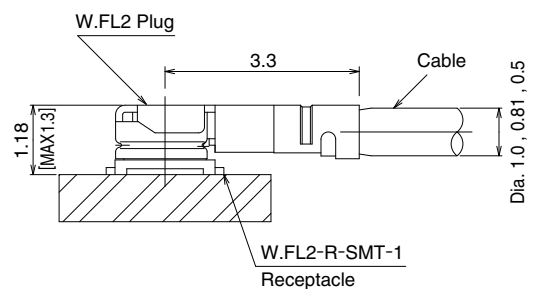


Fig.2

## Specifications

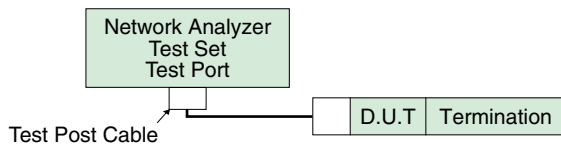
Rating	Nominal characteristic impedance	50Ω	Operating temperature range	-40°C to +90°C (90%RH max.)
	Frequency range	DC to 6 GHz	Storage temperature range	-30°C to +70°C (90%RH max.)Note 1

Item	Specification
1. Contact resistance	20 mΩ max. (center contact), 10 mΩ max. (outer contact)
2. Insulation resistance	500 MΩ min., 100 V DC
3. Withstanding voltage	200 V AC / 1 minute
4. V.S.W.R.	1.3 max. (DC to 3 GHz) 1.4 max. (3 GHz to 6 GHz)

\* V.S.W.R. Measurement

as shown on the block diagram below.

Note: Verify connection and measurement setup.



Note1: Cable assembly measurements with SMA conversion adapters mated with W.FL2 plug at each end of the 100cm long ultra-fine coaxial cable.

Note2: Receptacles mounted on a 50 ohms glass epoxy board. Measurements were conducted with SMA conversion adapters attached.

Note1. The term "storage" refers to products stored for long period of time prior to mounting and use.

## Materials

### Plugs – Right Angle

Part	Material	Finish
Shell	Phosphor bronze	Silver plated/Gold plated(062)
Insulator	PBT	Color: Black, UL94V-0
Insulator (HF type)	LCP	Color: Milky white, UL94V-0
Female center contact	Phosphor bronze	Gold plated

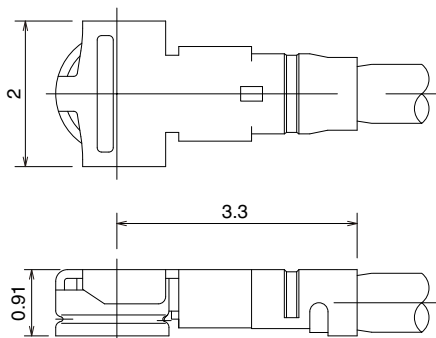
### Receptacle

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

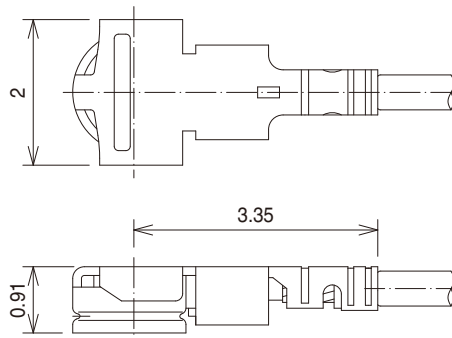


**■ Cable Assembly(Plug)**

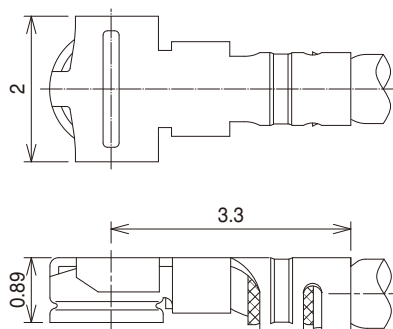
**W.FL2-LP-040(06), W.FL2-LP-040HF(06) (Applicable cable : outer diameter 0.81)**



**W.FL2-LP-032HF(06) (Applicable cable : outer diameter 0.5)**

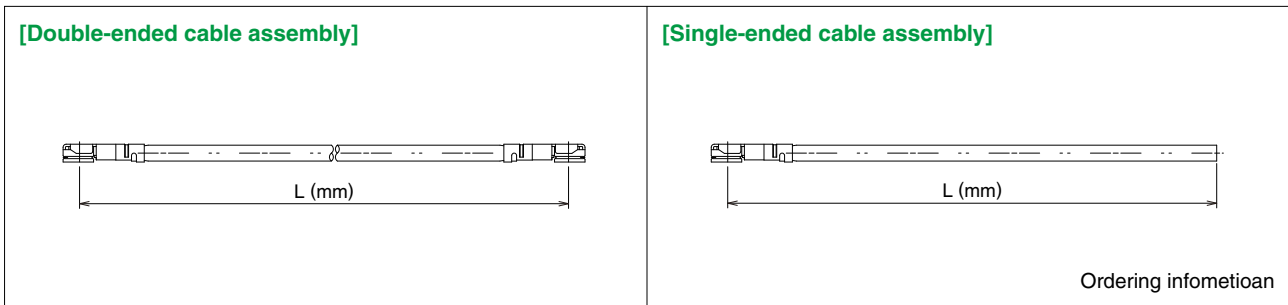


**W.FL2-LP-062HF (Applicable cable : outer diameter 1.0)**



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

## How to specify Cable Assembly



### Ordering information

Used plug: W.FL2-LP-040(06), W.FL2-LP-040HF(06)

**Double-Ended** W.FL2 - 2LP - HF6 - 04N [ ] TV - A - (L)  
 ① ② ③ ④ ⑤ ⑥ ⑦

**Single-Ended** W.FL2 - LP - HF6 - 04N [ ] TV - A - (L)  
 ① ② ③ ④ ⑤ ⑥ ⑦

### 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 1000mm	±1.5% of (L)

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

① Series name	: WFL2, W.FL2	④ Cable type	04N: 0.81mm dia. ultra-fine coaxial cable
② Assembly type	LP: Single ended 2LP: Double ended	⑤ Cable color	1: White, 2: Black
③ Environmental compliant	HF6: Halogen-free 6: RoHS compliant	⑥ Cable outer conductor	TV: Tin Plated braided wire
		⑦ Total length (mm)	Length(L)

Used plug: W.FL2-LP-032HF(06)

**Double-Ended** W.FL2 - 2LP - HF6 - 032N [ ] TS - A - (L)  
 ① ② ③ ④ ⑤ ⑥ ⑦

**Single-Ended** W.FL2 - LP - HF6 - 032N [ ] TS - A - (L)  
 ① ② ③ ④ ⑤ ⑥ ⑦

① Series name	: WFL2, W.FL2	④ Cable type	032N: 0.5mm dia. ultra-fine coaxial cable
② Assembly type	LP: Single ended 2LP: Double ended	⑤ Cable color	1: White, 2: Black
③ Environmental compliant	HF6: Halogen-free	⑥ Cable outer conductor	TS: Tin Plated fiber or paper covered copper winding wire
		⑦ Total length (mm)	Length(L)

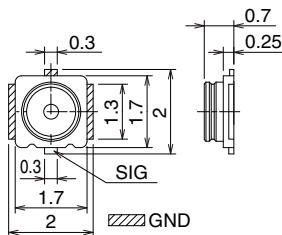
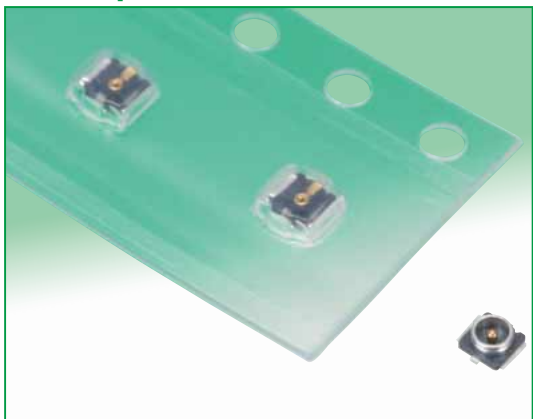
Used plug: W.FL2-LP-062HF

**Double-Ended** W.FL2 - 2LP - HF - 062N [ ] SC - A - (L)  
 ① ② ③ ④ ⑤ ⑥ ⑦

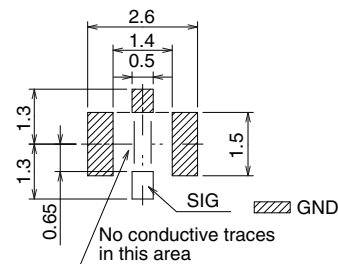
**Single-Ended** W.FL2 - LP - HF - 062N [ ] SC - A - (L)  
 ① ② ③ ④ ⑤ ⑥ ⑦

① Series name	: WFL2, W.FL2	④ Cable type	062N: 1.0mm dia. ultra-fine coaxial cable
② Assembly type	LP: Single ended 2LP: Double ended	⑤ Cable color	1: Gray, 2: Black, 3: White
③ Environmental compliant	HF: Halogen-free	⑥ Cable outer conductor	SC: Outer tin plated braided wire Inner conductor silver plated
		⑦ Total length (mm)	Length(L)

**Receptacles**



**Recommended PCB mounting pattern (Note 1)**



Note 1: The land pattern is the same as that of the X.FL, W.FL series connectors.

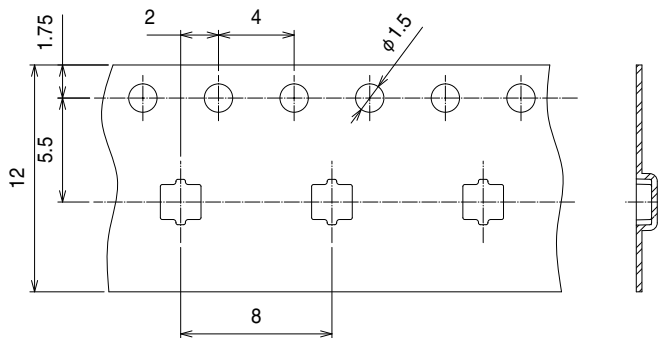
Part No.	HRS No.	Packaging	RoHS
W.FL2-R-SMT-1(60)	331-0315-4 60	Reel (5,000 pcs/reel)	Yes
W.FL2-R-SMT-1(80)	331-0315-4 80	Reel (10,000 pcs/reel)	

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

Embossed Carrier Tape Dimensions

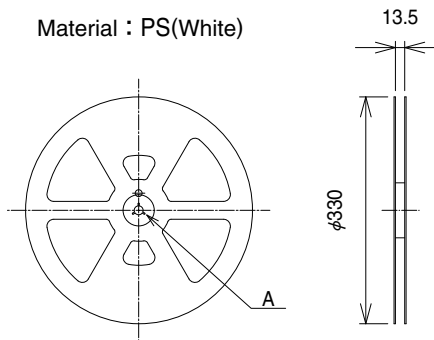
**Embossed Carrier Tape Dimensions**

(W.FL2-R-SMT-1(60) 8mm pitch)

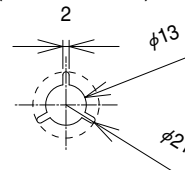


**Reel Dimensions**

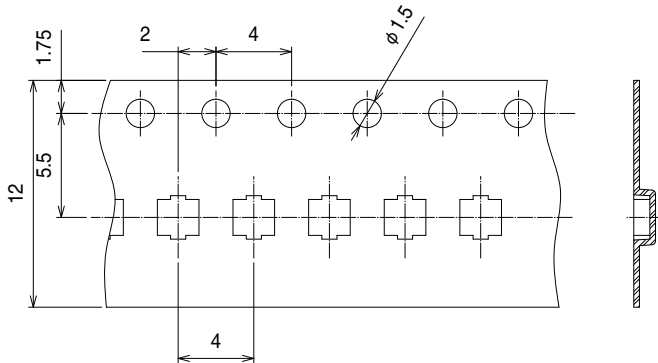
Material : PS(White)



A(SCALE FREE)



(W.FL2-R-SMT-1(80) 4mm pitch)

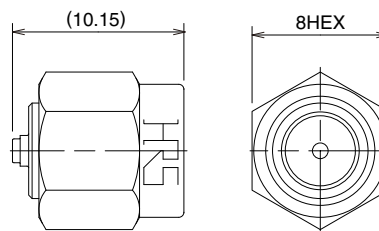


## Conversion Adapters

### SMA Conversion Adapter (W.FL2 side jack – SMA side plug)



Note: Used for performance measurements only.  
The W.FL2 mating side has lower retention force when mated with the corresponding part.



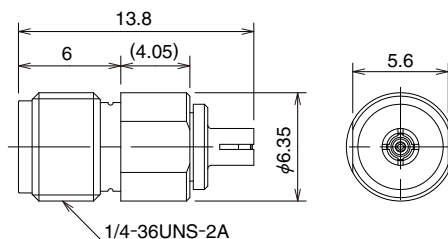
All dimensions: mm

Part No.	HRS No.	Packaging	RoHS
HRMP-W.FL2J	311-0394-6	1	Yes

### SMA Conversion Adapter (W.FL2/W.FL side plug – SMA side jack)



Note: Used for performance measurements only.  
The W.FL/W.FL2 mating side has lower retention force when mated with the corresponding part.



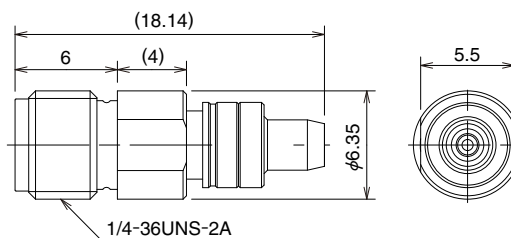
All dimensions: mm

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.FL2-R-SMT-1) must be pressed down and held to make complete connection.

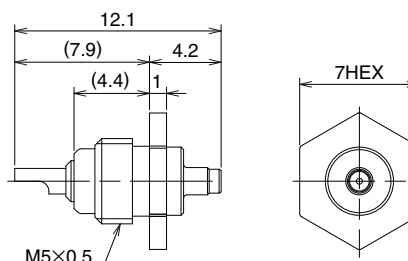
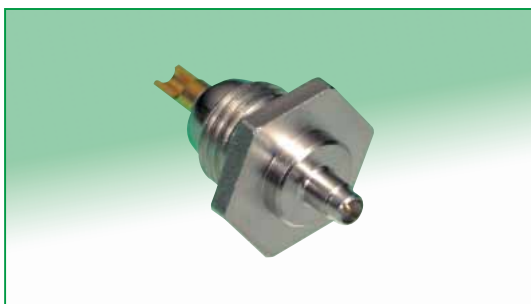


All dimensions: mm

Part No.	HRS No.	Packaging	RoHS
HRMJ-W.FL2P-ST3	311-0417-0	1	Yes

## Receptacle Inspection Adapter (W.FL2/W.FL)

Used for inspecting the performance parameters of the cable assembly.



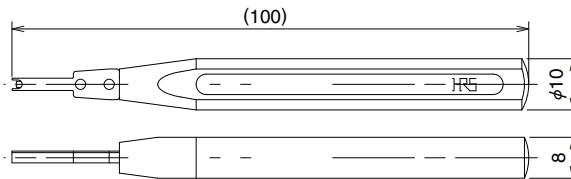
All dimensions: mm

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

**Tools**

**●Plug - Mating (Space saving type)**

This tool is used for mating a plug.

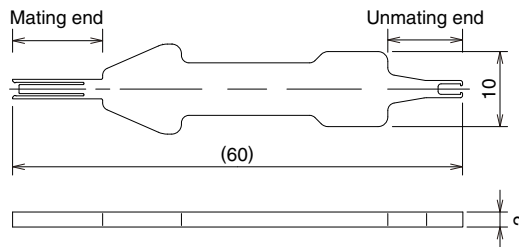
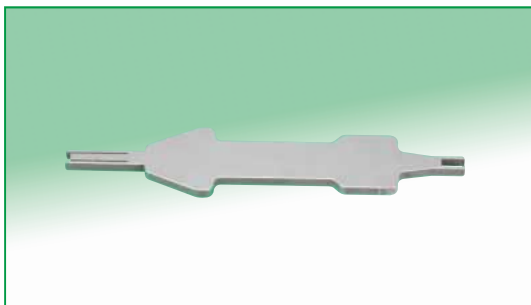


Part No.	HRS No.	RoHS
W.FL-LP-IN	331-0323-2	Yes

Note: Can be used with W.FL, X.FL plugs.

**●Plug - Mating /Unmating (W.FL2-LP-040HF/032HF)**

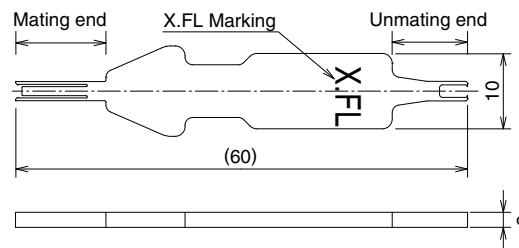
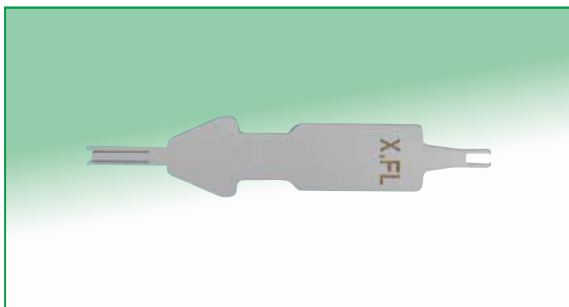
This tool is for mating and unmating a plug.



Part No.	HRS No.	RoHS
W.FL2-LP-IN.OUT	331-0321-7	Yes

**●Plug-Mating/Unmating (W.FL2-LP-062HF)**

This tool is for mating and unmating W.FL2-LP-062HF plug.



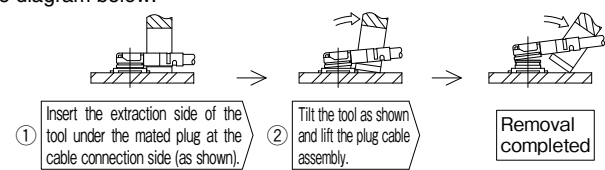
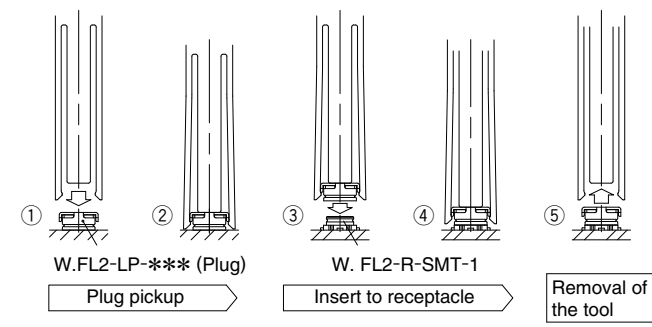
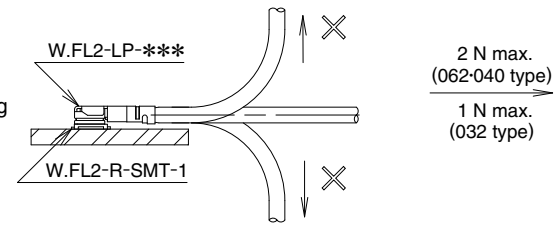
Part No.	HRS No.	RoHS
X.FL-LP-IN.OUT1	331-0715-2	Yes

Note: Can be used with X.FL plug.

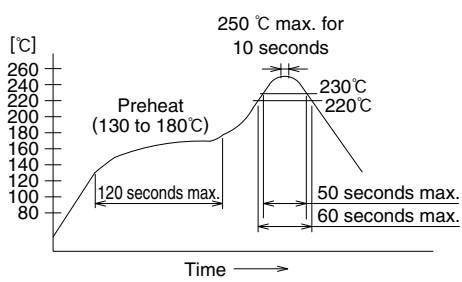


## Precautions

### 1. Plugs

<p>(1) Mating / Unmating</p>	<p>① To disconnect connectors, insert the extraction side of insertion and extraction jig and perform as described in the diagram below.</p> <p><b>• Unmating</b></p>  <p><b>• Mating</b></p> <p>① Align the mating axes of the plug and the receptacle.          ② Confirm that the plug is positioned to be guided. (The both axes are aligned and the plug is positioned stably.)          ③ Remove the tool by carefully pulling it up.</p>  <p><b>● Use of the extraction tool is absolutely mandatory. Any attempt of unmating by pulling on the cable may result in damage and affect the mechanical / electrical performance.</b></p>
<p>(2) Pull forces on the cable after connectors are mated</p>	<p>Do not apply any pull forces after the bending of the cable.</p> 
<p>(3) Precautions</p>	<p>Do not twist connectors excessively during mating / unmating.</p>

### 2. Receptacles

<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.          ② Reflow soldering should be performed at a printed circuit surface temperature of 250°C max.          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>0.1 mm to 0.12 mm</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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