

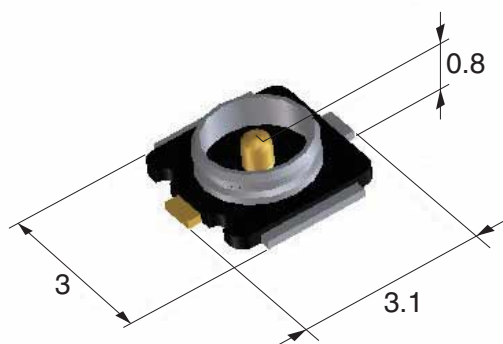
# Lightweight SMT Miniature Coaxial Connectors – 1.4 mm Mated Height

## N.FL Series



### Up to 6 GHz Transmission Speed

#### ●Occupied Mounting Area



### ■Features

#### 1. Low profile

Nominal mated height is 1.4 mm (Max. 1.5 mm)

#### 2. Small size: 7.7 mm<sup>2</sup>

#### 3. Light weight

Receptacle : 14 mg  
Plug : 28 mg

#### 4. Accepts high frequency transmission of DC to 6 GHz.

V.S.W.R. = 1.3 max. (DC to 6 GHz)

#### 5. Board placement with automatic equipment

Receptacles are packaged in embossed carrier tape and reel for automatic mounting.

#### 6. Plugs are terminated with ultra-fine coaxial (fluorinated resin insulated) cable.

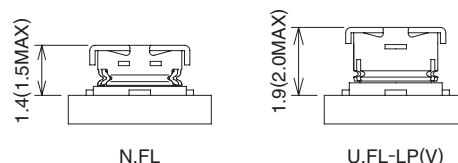
#### 7. Special tool for an extraction

#### 8. RoHS compliant

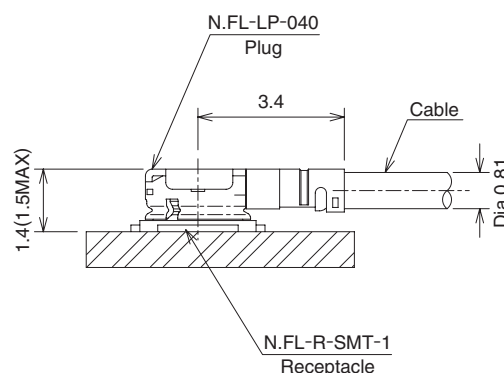
### ■Applications

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.

#### ●Mated height comparison (With U.FL-LP(V) )



#### ●N.FL Plug and Receptacle



## N.F.L Series ● Lightweight SMT Miniature Coaxial Connectors – 1.4 mm Mated Height

### ■ Specifications

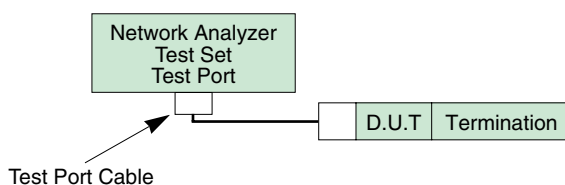
Ratings	Nominal characteristic impedance	50 ohms	Operating temperature range	-40°C to +90°C (90% RH)
	Frequency range	DC to 6 GHz	Storage temperature range	-30°C to +70°C (90% RH)

Item	Specification	Conditions
1. Contact resistance	Center contact: 25 m ohms max. Outer contact: 25 m ohms max.	10 mA max.
2. Insulation resistance	500 M ohms min.	100V DC
3. Withstanding voltage	No flashover or insulation breakdown	200V AC / 1 minute
4. V.S.W.R.(Note)	1.3max.	DC to 6GHz
5. Durability	Contact resistance Center contact: 30 m ohms max. Outer contact: 30 m 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 1.5 mm 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: 100 M ohms min. (high humidity) Insulation resistance: 500 M ohms min. (dry) No damage, cracks, or parts dislocation	96 hours at +40°C, and humidity of 95%
9. Temperature cycle	No damage, cracks, or parts dislocation	Temperature:-40°C→+5°C to +35°C→+90°C→+5°C to +35°C Time: 30 min.→ 5 min. max. → 30 min. → 5 min. max. 5 cycles
10. Salt spray test	No excessive corrosion	5% salt water solution, 48 hours

Note: Information contained in this catalog represents general requirements for this Series. Contact us for the drawings and specifications for a specific part number shown.

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

Measured as shown on the block diagram below.



Note1: A N.F.L Cable assembly (plug) is measured with SMA conversion adapters mated with N.F.L plugs at both ends of a 100cm coaxial cable harness

Note2: A N.F.L receptacle, which is mounted on a 50 ohms glass epoxy board, is measured with a SMA conversion adapter.

### ■ Materials / Finishes

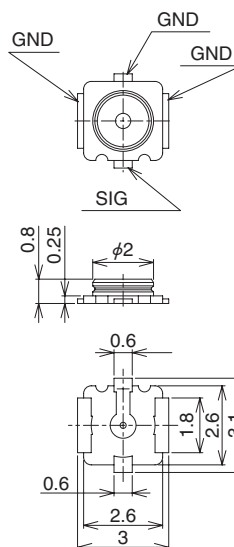
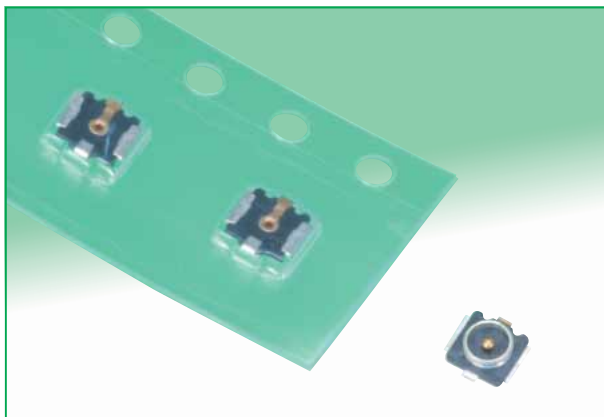
#### ● Plug

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

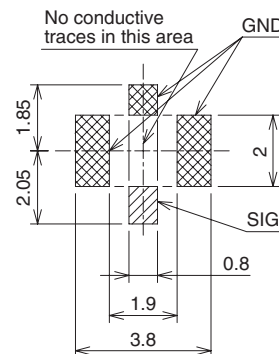
#### ● Receptacle

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

## ■ Receptacle



## ◆ Recommended PCB mounting pattern



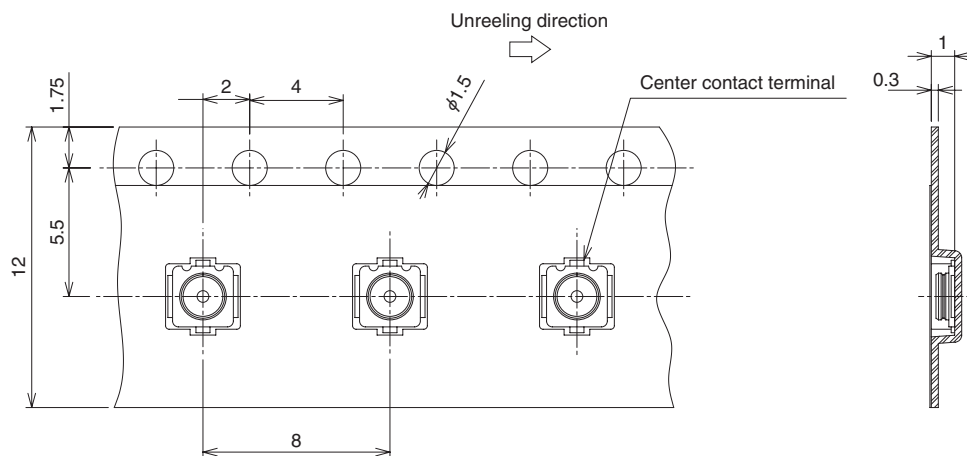
Recommended screen thickness: 0.1mm to 0.12mm

All dimensions: mm

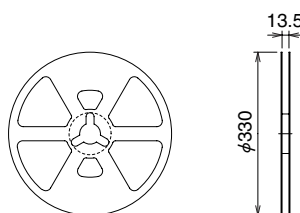
Part Number	CL No.	Packaging	Weight/EA	RoHS
N.FL-R-SMT-1(01)	331-0332-3-01	Bag (100 pieces per bag)	14 mg	YES
N.FL-R-SMT-1(10)	331-0332-3-10	Reel (2,000 pieces per reel)		
N.FL-R-SMT-1(40)	331-0332-3-40	Reel (5,000 pieces per reel)		

## ● Packaging Specifications

### Embossed Carrier Tape Dimensions



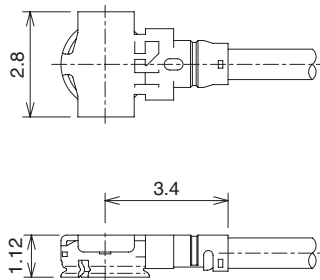
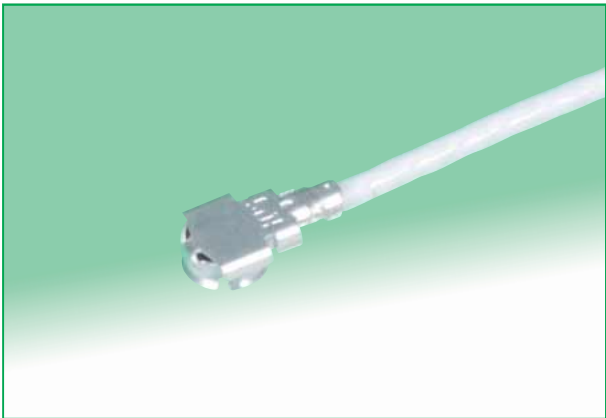
### Reel Dimensions



Reel material: Plastic

All dimensions: mm

■ Plug Assembly (Plug)

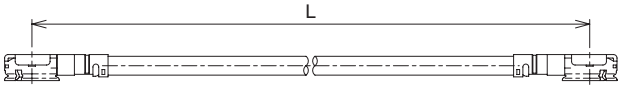


Plugs can be ordered only as terminated cable assemblies.

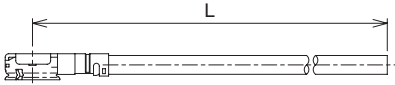
All dimensions: mm

■ How to Specify Plug Cable Assembly

Double-ended cable assembly



Single-ended cable assembly



● Ordering Information

**N.FL – [ ] LP – 04N [ ] – A – (L)**

①                      ②                      ③                      ④                      ⑤

① Series name	N.FL
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)

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

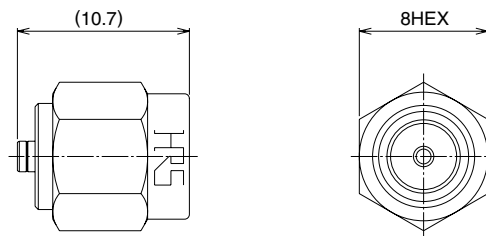
Part No. of Cable Assembly	Description	RoHS
N.FL-2LP-04N1-A-(L)	Dia. 0.81mm double ended coaxial cable, color: white	YES

## ■ Conversion Adapters

### ● SMA Conversion Adapter (N.FL / U.FL side jack - SMA side plug)



Note: The U.FL side mating portions has a lower lock retention force than the regular product, therefore, cannot be used for purposes other than performance measurements.



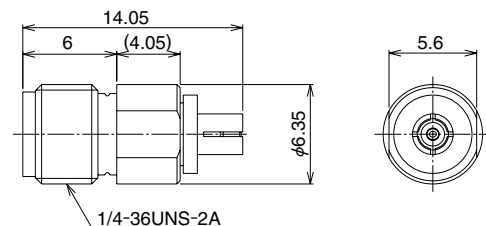
All dimensions: mm

Part Number	CL No.	RoHS
HRMP-U.FLJ(40)	311-0301-5-40	YES

### ● SMA Conversion Adapter (N.FL / U.FL side jack - SMA side jack)



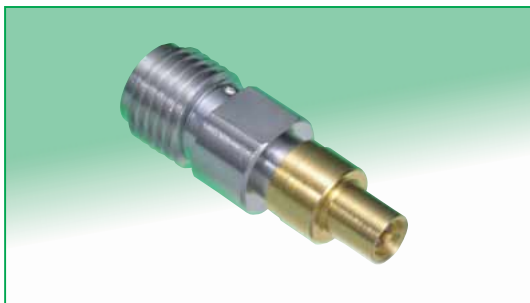
Note: The U.FL side mating portions has a lower lock retention force than the regular product, therefore, cannot be used for purposes other than performance measurements.



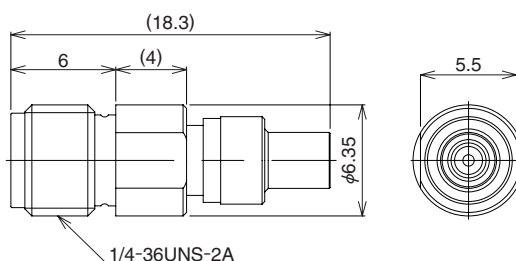
All dimensions: mm

Part Number	CL No.	RoHS
HRMJ-U.FLP(40)	311-0300-2-40	YES

### ● SMA Conversion Adapter



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

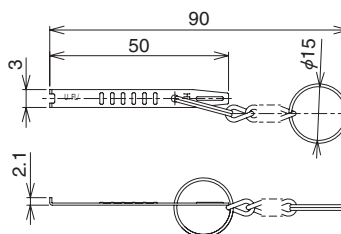


All dimensions: mm

Part Number	CL No.	RoHS
HRMJ-N.FLP-ST5	311-0423-2	YES

## ■ Plug extraction tool

This jig is used for extraction from a mating condition.



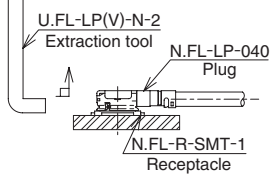
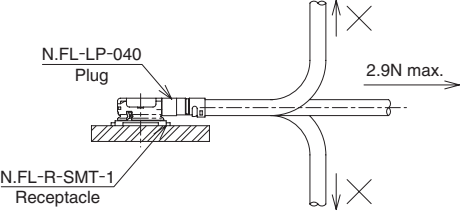
All dimensions: mm

Part Number	CL No.	RoHS
U.FL-LP(V)-N-2	331-0493-2	YES

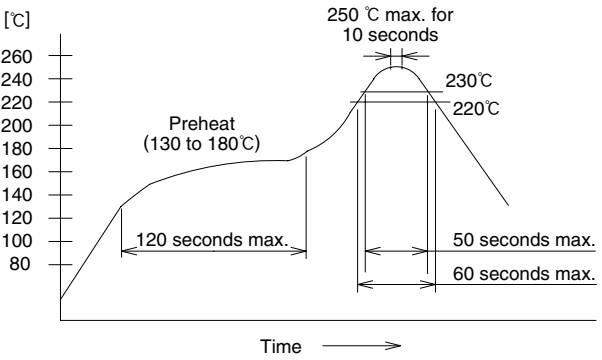
## N.F.L Series ● Lightweight SMT Miniature Coaxial Connectors – 1.4 mm Mated Height

### ■ Usage Precautions

#### 1. Plug

(1) Mating / unmating	<ul style="list-style-type: none"> <li>• <b>Unmating</b> Insert the end of an extraction tool into a space between a plug and receptacle, and pull up the tool in the perpendicular to a mounting surface of a receptacle, as shown in the figure.                      ● Recommended the use of the extraction tool for unmating.                      Any attempt of unmating by pulling on the cable may result in damage to 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>Do NOT apply any pull forces after the bending of the cable.</p> 
(3) Precautions	Do not twist connectors excessively during mating / unmating.

#### 2. Receptacle

(1) Recommended reflow temperature profile	 <p>① The temperature profile indicates the board surface temperature at the point of contacts with the connector leads.                  ② 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 the detailed recommendations.</p>
(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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