

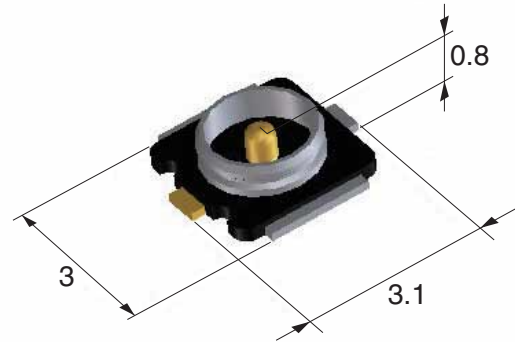
Lightweight SMT Miniature Coaxial Connectors – 1.4 mm Mated Height

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 mm²

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.

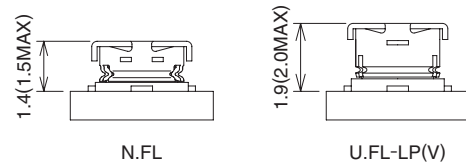
7. Special tool for an extraction

8. RoHS compliant

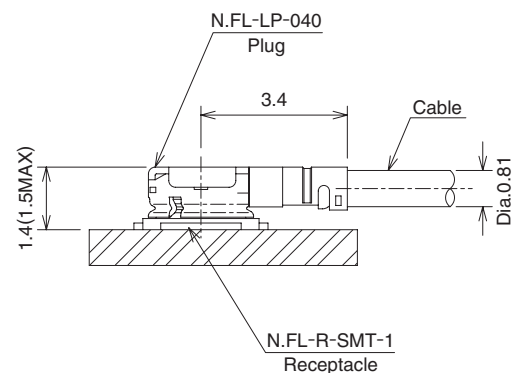
■Applications

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



Wellshow



Wellshow Technology is the top manufacturer of mini coaxial cable assembly and RF connectors in Asia.



Wellshow's strength

- Quick Lead Time
- Competitive price
- Complete quality management
- Full series of RF connectors
- Prompt technique support
- Systemized manufacturing procedure



Product Range

Mini connector and Mini cable

Hirose U.FL/ W.FL/ H.FL/ N.FL/ E.FL/ W.FL2
IPEX MHF/ MHF 2 / MHF 3/ MHF 4
Murata GSC/ HSC

RF connector and RF cable

SMA / SMB / SSMB / SMC / MMCX /
MCX / FME / BNC / TNC / N ...etc.



Contact us

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Keelung City 200, Taiwan

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

■ Specifications

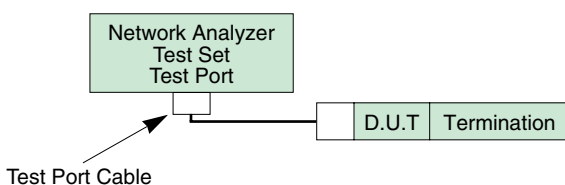
Ratings	Nominal characteristic impedance	50 ohms	Operating temperature range	-40°C to +90°C (90% RH)
	Frequency range	DC to 6 GHz	Storage temperature range	-30°C to +70°C (90% RH)

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 μ s or longer No damage, cracks, or parts dislocation	Frequency: 10 to 100 Hz, single amplitude of 1.5 mm Acceleration: 59 m/s ² , in each of 3 axis 5 cycles
7. Shock	No electrical discontinuity of 1 μ s or longer No damage, cracks, or parts dislocation	Acceleration of 735 m/s ² , 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

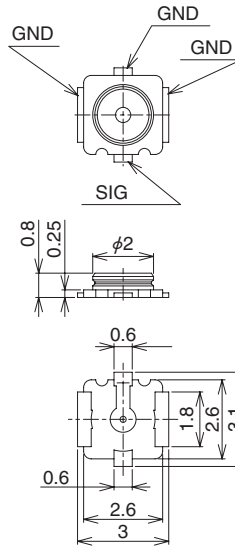
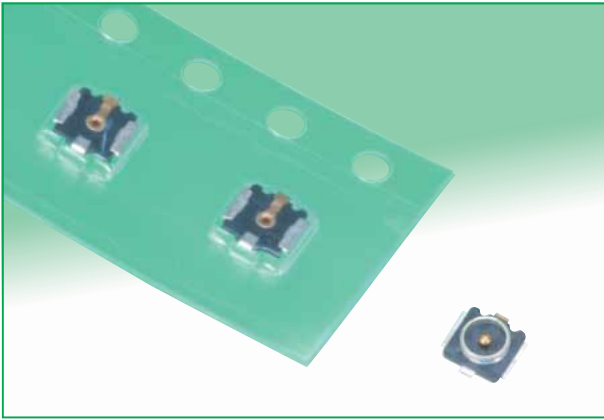
● Plug

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

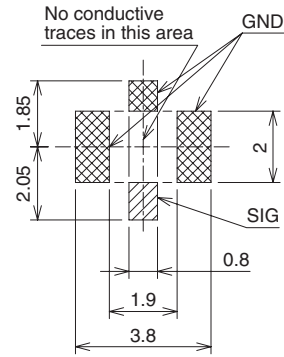
● Receptacle

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



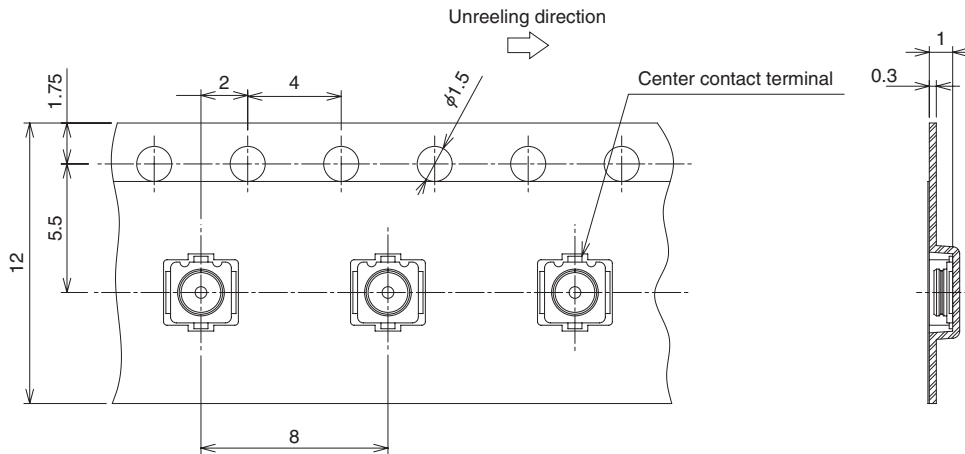
Recommended screen thickness: 0.1mm to 0.12mm

All dimensions: mm

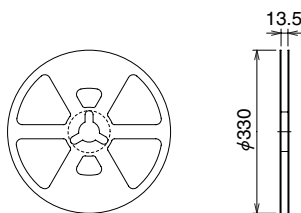
Part Number	CL No.	Packaging	Weight/EA	RoHS
N.FL-R-SMT-1(01)	331-0332-3-01	Bag (100 pieces per bag)	14 mg	YES
N.FL-R-SMT-1(10)	331-0332-3-10	Reel (2,000 pieces per reel)		
N.FL-R-SMT-1(40)	331-0332-3-40	Reel (5,000 pieces per reel)		

● Packaging Specifications

Embossed Carrier Tape Dimensions



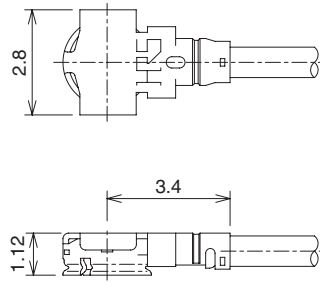
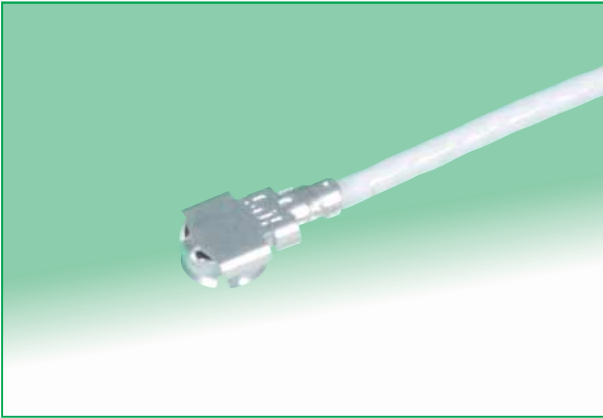
Reel Dimensions



Reel material: Plastic

All dimensions: mm

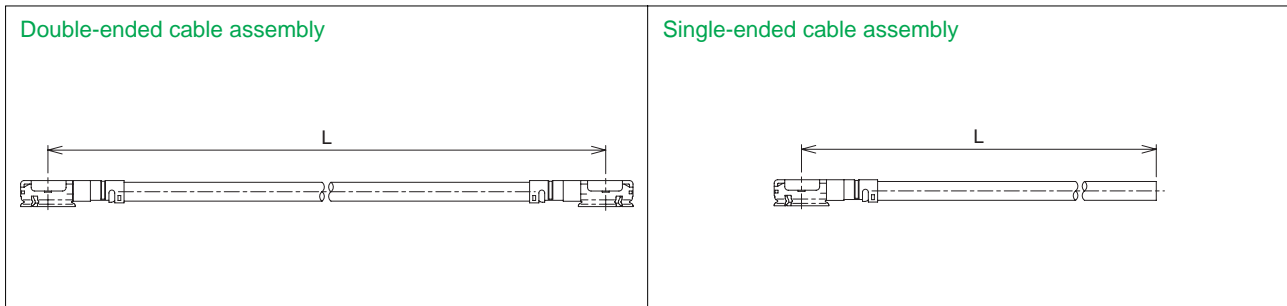
■ Plug Assembly (Plug)



Plugs can be ordered only as terminated cable assemblies.

All dimensions: mm

■ How to Specify Plug Cable Assembly



● Ordering Information

N.F.L – **[] LP** – **04N** **[]** – **A** – **(L)**

① Series name	N.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)

(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

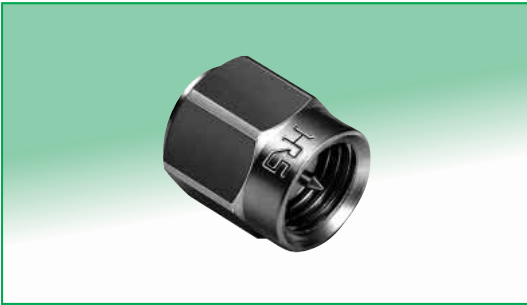
Note2: Contact nearest HRS representative if different tolerances are required.

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

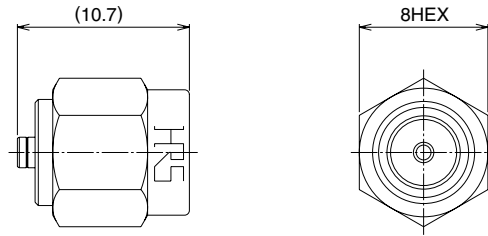
Part No. of Cable Assembly	Description	RoHS
N.F.L-2LP-04N1-A-(L)	Dia. 0.81mm double ended coaxial cable, color: white	YES

■ 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.



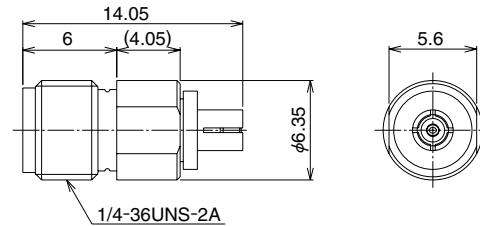
All dimensions: mm

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

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



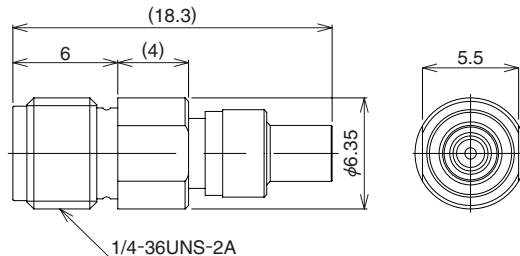
All dimensions: mm

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.

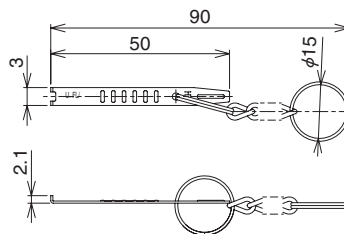


All dimensions: mm

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

Usage Precautions

1. Plug

(1) Mating / unmating	<ul style="list-style-type: none"> • Unmating 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. <ul style="list-style-type: none"> ● 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. • Mating Do not attempt to insert on an extreme angle. 	
(2) Pull forces on the cable after connectors are mated	Do NOT apply any pull forces after the bending of the cable.	
(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"> • 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	<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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