PRODUCT CATALOG

HIROSE ELECTRIC CO.,LTD.

N.FL Series

1.4mm Mated Height, Lightweight SMT Miniature Coaxial Connector

RF Compact Wide Variation

【Scheduled to be discontinued】



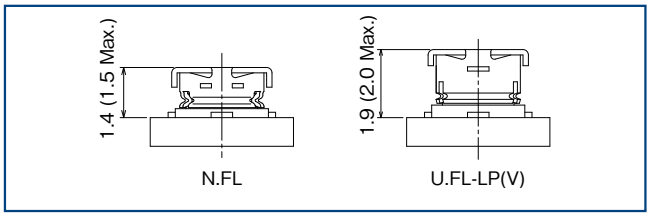
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Dec. 2021

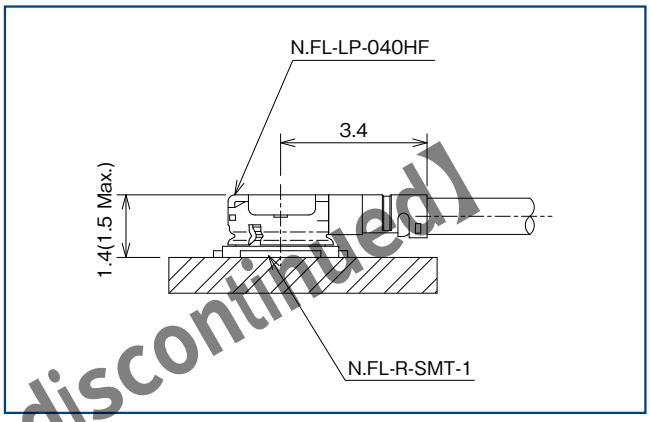
Features

1. 1.4mm Mated Height (1.5mm Max.)

The receptacle and right angle plug produce a mated height of only 1.5mm Max. from the PCB. Achieve the handling ease of the U.FL Series with a reduced mated height.



N.FL and U.FL-LP(V) Mated Height Comparison



N.FL-LP-040HF and N.FL-R-SMT-1

2. Occupied PCB Space

The receptacle has the same occupied PCB space as the U.FL Series at 7.7mm^2

3. Light Weight

Receptacle : 14mg
Right Angle Plug : 28mg

4. Supports Up to 6GHz Frequency

High frequency performance of DC to 6GHz and V.S.W.R. of 1.3 Max. in order to support the high frequency needs of various compact devices.

5. Supports Automatic Mounting

Tape and Reel packaging allows for pick-and-place mounting.

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6. Ultra-fine Coaxial (Fluorinated Resin Insulated) Cables

Compatible with ultra-fine ϕ0.81mm diameter coaxial cables for smooth and easy installment.

7. Environmental Compatibility

RoHS2 Compliant

Halogen Free
Chlorine and bromine above the standard values are not used for receptacle and plug harnesses.
*As defined by IEC61249-2-21
Br 900 ppm Max. , Cl 900 ppm Max. , and Br+Cl 1500 ppm Max.

8. Easy Connector Removal

Extraction tool enables easy removal of the connector.

9. Easy Mating Confirmation

Compact product with a clear, tactile click for reliable mating confirmation.

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Product Specifications

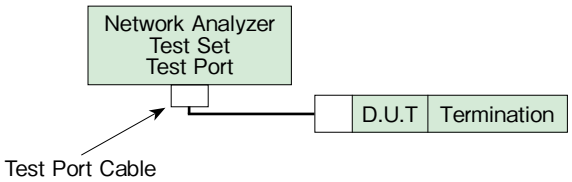
Nominal Characteristic Impedance	50Ω	Operating Temperature	-40 to +90℃ (90% RH Max.)
Frequency Range	DC to 6GHz	Storage Temperature Range	-30 to +70℃ (90% RH Max.)

Item	Specifications	Conditions
Contact Resistance	Center : 25mΩ Max. Outer : 25mΩ Max.	Measured with 10mA Max.
Insulation Resistance	500MΩ以上	Measured with 100V DC
Withstanding Voltage	No flashover or insulation breakdown	200V AC for 1 min.
V.S.W.R.*	1.3 Max.	DC to 6GHz
Female Contact Retention Force	0.1N Min.	Measured with φ0.475 pin gauge
Mating Durability	Contact Resistance : 30mΩ Max. (Center) 30mΩ Max. (Outer) No damage, cracks or parts dislocation.	20 times
Vibration Resistance	No electrical discontinuity of 1μs min. No damage, cracks or parts dislocation.	Frequency : 10 to 100Hz, single amplitude of 1.5mm, acceleration of 59m/s^2, for 5 cycles in the direction of each of the 3 axis.
Shock Resistance	No electrical discontinuity of 1μs min. No damage, cracks or parts dislocation.	Acceleration of 735m/s^2, 11ms duration, sine half-wave waveform, 3 cycles in each of 3 axes.
Humidity Resistance (Steady State)	Insulation Resistance : 100MΩ Min. (High Humidity) 500MΩ Min. (When Dry) No damage, cracks or parts dislocation.	96 hours at temperature of 40℃ and humidity of 95%.
Temperature Cycle	No damage, cracks or parts dislocation.	Temperature : -40℃ → +5 to +35℃ → +90℃ → +5 to +35℃ Time : 30 minn. → 5 min. Max. → 30 min. → 5 min. Max. 5 cycles
Salt Spray	No excessive corrosion	5% salt water solution for 48 consecutive hours

[Scheduled to be discontinued]

*V.S.W.R. Measurement System

The above V.S.W.R. standard values were measured using the measurement system shown below.



Note 1 : Cable type connectors were measured with SMA conversion adapters attached to the cable assembly at both ends of a compatible 100cm cable.
Note 2 : Board type connectors were mounted to a 50Ω glass epoxy board and measurements were conducted with SMA conversion adapters attached.

Materials / Finish

Item	Part	Material	Finish	Flame Retardancy
Right Angle Plug	Shell	Phosphor Bronze	Silver Plated	-
	Insulator	PBT	Gray	UL94HB
	Female Center Contact	Phosphor Bronze	Gold Plated	-
Receptacle	Shell	Phosphor Bronze	Silver Plated	-
	Insulator	LCP	Black	UL94V-0
	Male Center Contact	Brass	Gold Plated	-

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Product Number Structure

Refer to the chart below when determining the product specifications from the product number.
Please select from the product numbers listed in this catalog when placing orders.

● Receptacle

N.FL - R - SMT - 1 (10)
❶ ❷ ❸ ❹

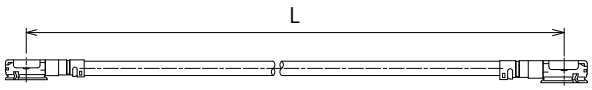
❶ Series Name	N.FL	❸ Board Mounting Method	SMT : Printed Circuit Board Surface Mount Type
❷ Connector Type	R : Receptacle	❹ Packing Type	(10) : Reel Packing (2,000pcs per reel)

Note : Plugs can be ordered only as terminated cable assemblies.

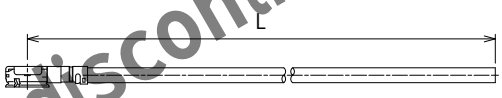
● How to Designate Plug Cable Assembly Dimensions

The dimension specifications of the N.FL Series harness are as follows.

[Double-ended Cable Assembly]



[Single-ended Cable Assembly]



Please contact a Hirose representative about cable end processing.

Note : Designate the dimensions from the center of the connector for both single-ended and double-ended cable assemblies. (Please write length L in mm.)

(Scheduled to be discontinued)

● Cable Assembly Product Number Structure

NFL - 2LP HF6 - 04N 1 TV - A - L
❶ ❷ ❸ ❹ ❺ ❻ ❼

❶ Series Name	NFL	❹ Cable Type	04N : ϕ 0.81mm Cable
❷ Assembly Type	LP : Single Ended 2LP : Double Ended	❺ Cable Color	1 : White 2 : Black
		❻ Cable Outer Conductor	TV : Tin Plated Braided Wire
❸ Environmental Compliance	HF6 : Halogen-free Plug	❼ Total Length (mm)	L length (mm)

● Standard Tolerances for (L)

Total Length (mm)	Standard Tolerance (mm)
35 ≦ L ≦ 200	± 4
200 < L ≦ 500	± 8
500 < L ≦ 1000	± 12
1000 < L	± 1.5%

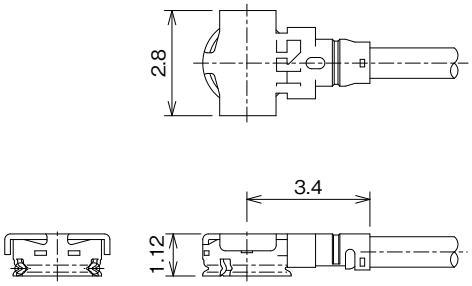
Note : The shortest length is L=35mm.

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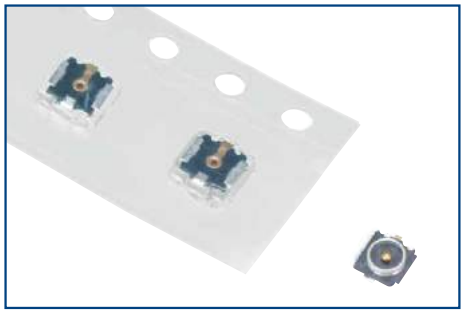
Plug

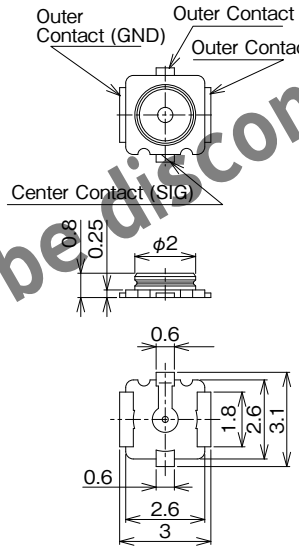
Please order the plug in cable assembly specifications.





Receptacle

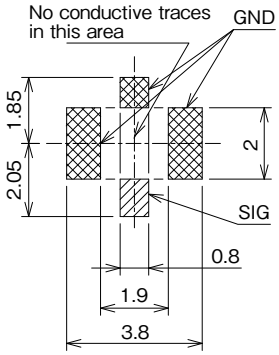




[Scheduled to be discontinued]

Part No.	HRS No.	Purchase Unit
N.FL-R-SMT-1(10)	CL0331-0332-3-10	2,000pcs per reel

● Recommended PCB Mounting Pattern

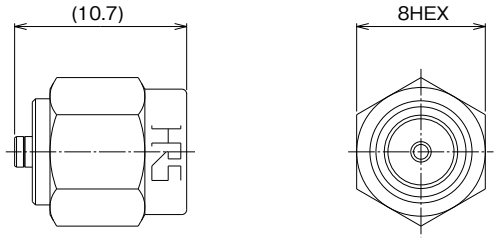


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Conversion Adapter

SMA Conversion Adapter
(Mated Portion- U.FL/N.FL Side : Jack, SMA Side : Plug)





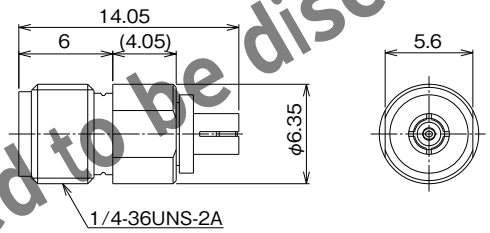
Part No.	HRS No.	Purchase Unit
HRMP-U.FLJ(40) (Note 1)	CL0311-0300-2-40	20pcs per bag

Note 1 : Compatible with both N.FL and U.FL.
Note 2 : Since the U.FL/N.FL side mating portion has a weaker lock than standard products, it cannot be used for purposes other than performance measurement.

SMA Conversion Adapter
(Mated Portion- U.FL/N.FL Side : Plug, SMA Side : Jack)

[Scheduled to be discontinued]



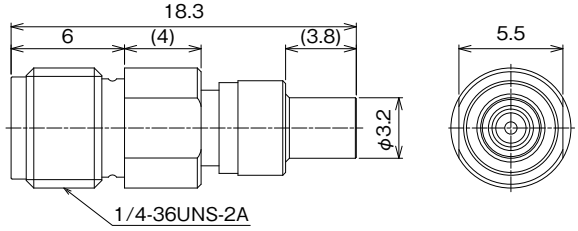


Part No.	HRS No.	Purchase Unit
HRMJ-U.FLP(40) (Note 1)	CL0311-0301-5-40	20pcs per bag

Note 1 : Compatible with both N.FL and U.FL.
Note 2 : Since the U.FL/N.FL side mating portion has a weaker lock than standard products, it cannot be used for purposes other than performance measurement.

SMA Conversion Probe
(Mated Portion- N.FL Side : Plug, SMA Side : Jack)





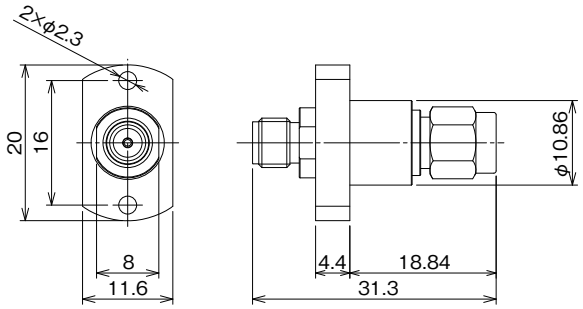
Part No.	HRS No.	Purchase Unit
HRMJ-N.FLP-ST5	CL0311-0423-2-00	20pcs per bag

Note : This connector is used by pressing the mating portion of the N.FL side with the mating portion of N.FL-R-SMT-1.

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SMA Conversion Adapter
(Mated Portion : SMA Jack (Measuring Device Connection Side) - SMA Plug)





Part No.	HRS No.	Purchase Unit
HRM-PA-PJ(F)-1(40)	CL0323-0805-9-40	20pcs per bag

Note : HRMJ-N.FLP-ST5 aborbs misalignment when it is mated with the plug (coupling side) and the jack is connected to the measuring device.

(Scheduled to be discontinued)

Inspection Probe

HRMJ-N.FLP-ST5 and HRM-PA-PJ(F)-1(40) Combination and Usage

Shortest Pitch when Adjacent



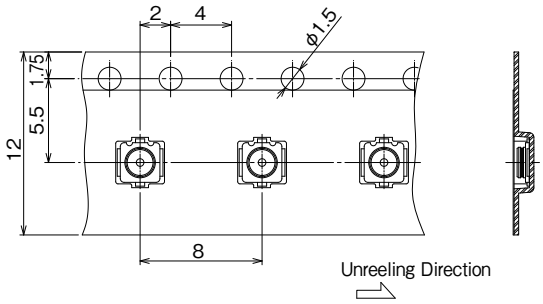
Flange to Board Surface	(A)
Recommendation for Measurement	32 ± 0.2
Starting Load	32.7

Note : For the inspection probe, be careful not to tilt the tip of the contact due to the tensile load of the connecting cable.

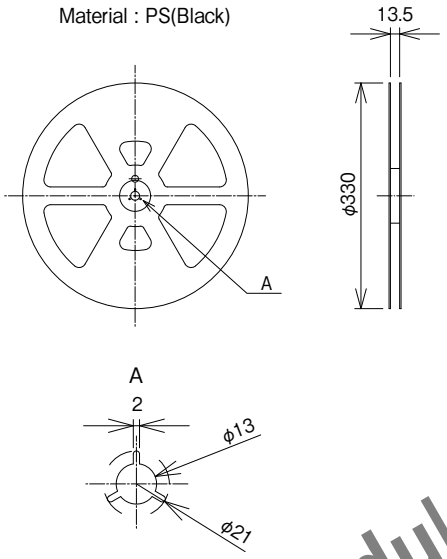
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Embossed Carrier Tape Dimensions (JIS C 0806／IEC 60286)

Embossed Carrier Tape Dimensions



Reel Dimensions



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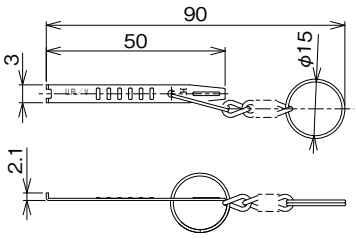
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Applicable Tools

Extraction Tool

Tool for Unmating.





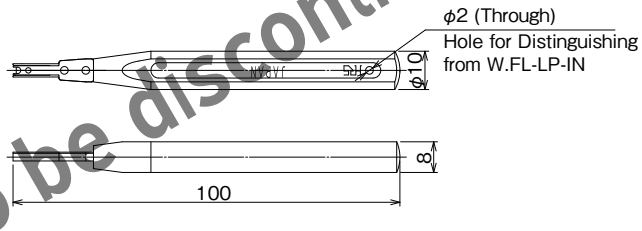
Part No.	HRS No.	Purchase Unit
U.FL-LP(V)-N-2 (Note)	CL0331-0493-2-00	1pc per bag

Note : Compatible with the U.FL-LP(V)-040 and U.FL-LP-062.

Mating Tool

Tool for Mating.





Part No.	HRS No.	Purchase Unit
U.FL-LP-IN (Note)	CL0331-0334-9-00	1pc per bag

Note: Compatible with the U.FL connector.

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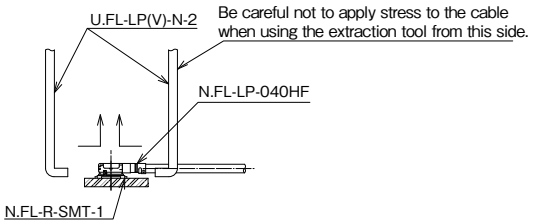
Usage Precautions

1. Plugs

(1) Mating/ Unmating

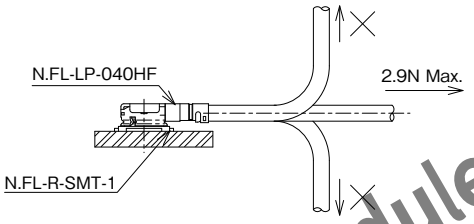
①To disconnect the connector, insert the extraction tool (U.FL-LP(V)-N-2) under the connector flange.
Pull in a perpendicular direction in line with the connector's mating axis.
When removing the connector directly, hold the connector lid and pull out vertically in relation to the connector's mating axis. (Be careful not to damage the connector with fingers or nails.)

②When mating, align the mating axes between the receptacle and cable assembly, and insert the cable assembly downward and perpendicular into the receptacle.
Do not insert the cable assembly at a slanted angle.



(2) Tolerable Load to a Cable After Mating

Once the connector has been mated do not apply forces exceeding the values in the diagram below.

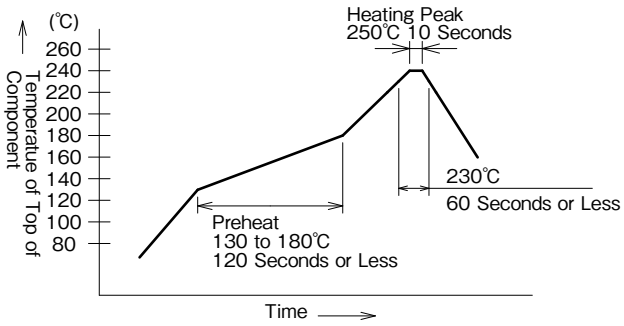


(3) Precautions

Do not use excessive prying to mate or un-mate the connectors as it may lead to damage.

【Scheduled to be discontinued】

2. Receptacles

(1) Recommended Reflow Temperature Profile	 1. Temperature refers to the temperature of the PCB surface at the terminal leads. 2. Reflow soldering should be performed at a printed circuit surface temperature of 250℃ Max. 3. The temperature profile may vary depending on board size, solder used and solder thickness.
(2) Recommended Manual Soldering Conditions	Manual soldering : 350℃ for 5 seconds
(3) Recommended Metal Mask Thickness	0.1 to 0.12mm
(4) Reflow Cycles	2 times

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3. Operating Environment and Storage Conditions

(1) Operation Environment

This product was designed for use in a normal environment.
Please be advised that using this product in the environments described below may result in discoloration and other types of degradation.
・Exposure to excessive amounts of fine particles and dust.
・Regions/areas with a high concentration of gases like sulfur dioxide, hydrogen sulfide and nitrogen dioxide.
・Areas with drastic temperature changes, such as locations near a heater.

(2) Storage Conditions

Store this product in Hirose's packaging or similar conditions.
Temperature : -10 to +40℃ Humidity : 85% or less (recommended storage conditions)
We recommend the product be used within six months from delivery.
Products that have been stored beyond the recommended storage period need to be tested for mounting and solderability before use.

(3) Silver Plating Discoloration

Discoloration occurs only on the plating surface. Since the contact portion is wiped, there is no effect on the electrical contact.

【Scheduled to be discontinued】

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While Taking into Consideration

Specifications mentioned in this catalog are reference values.
When considering to order or use this product, please confirm the Drawing and Product Specifications sheets.
Use an appropriate cable when using the connector in combination with cables.
If considering usage of a non-specified cable, please contact your sales representative.
If assembly process is done by jigs & tools which are not identified by Hirose, assurance will not be given.
If considering usage for below mentioned applications, please contact your sales representative.
In cases where the application will demand a high level of reliability, such as automotive, medical instruments, public infrastructure, aerospace/ defense etc. Hirose must review before assurance of reliability can be given.