NEW

SMT Ultra-Miniature Coaxial Connectors -- Coupling Heights Owing to the World's Lowest Profile and the Lightest

U.FL Series

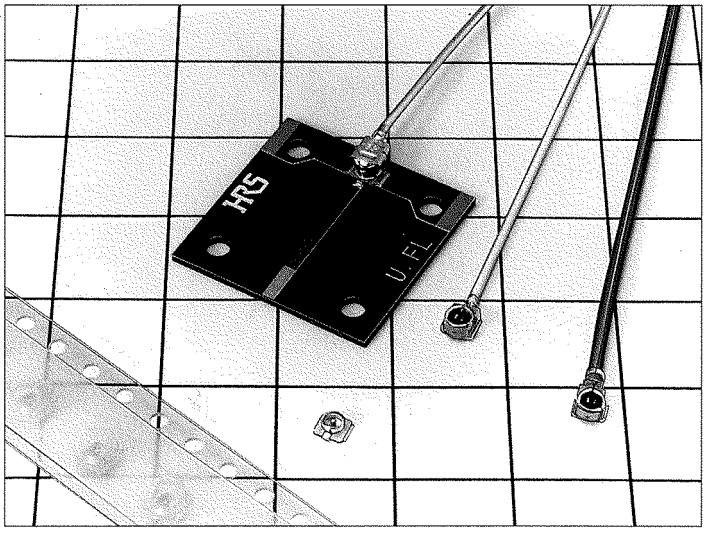
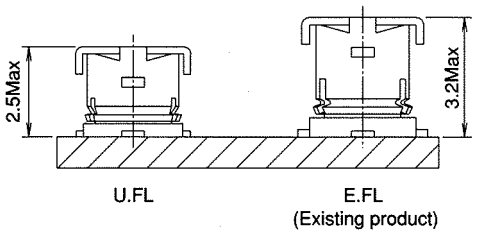


Figure 1. Coupling Height Comparison (with Hirose Electric Products)



■Features

1. Coupling Heights Owing to World's Lowest Profile

Height from the printed circuit board when couples a receptacle with a (right-angle) plug is 2.5 mm, maximum. This low Profile is at the world's shortest level.

2. Extremely Small Board Occupation Area

In comparison with our E.FL Series of SMT coaxial connectors, the receptacles offer a reduction of approximately 18% of the board occupation area resulting in an area of just 7.7 mm².

3. World's Lightest

These are the world's lightest coaxial connectors.
Receptacle: 15.7 mg
Right-angle plugs + Female center contacts
For ϕ 0.8 mm cable: 53.7 mg
For ϕ 1.32 mm cable: 59.1 mg

4. Can Be Used Up to a Frequency of 3 GHz

To meet the frequency requirements of a wide variety of miniature equipment, these connectors offer high frequency performance from DC to 3 GHz with a V.S.W.R. of 1.3 or less.

5. Can Be Used with Automatic Mounting

The embossed tape packaging specification of the receptacles permits automatic mounting.

6. Use of Ultra-Fine Teflon Cable

From among the types of suitable cable, ϕ 0.8 mm (single-layer shielded) outside diameter ultra-fine Teflon coaxial cable has been made a standard specification in consideration of improving the construction qualities and construction area.
An external diameter ϕ1.32 mm (double-layer shielded) ultra-fine Teflon coaxial cable specification is also available. (To be released soon.)

7. Simple Removal of Connectors

The extraction jig permits simple removal of connectors.

8. Coupling Checks Are Easy

Subminiature size notwithstanding, the lock sensation permits a check of sure coupling.

●Space Factor of Coupled Connector

Figure 2. U.FL-LP-040 and U.FL-R-SMT

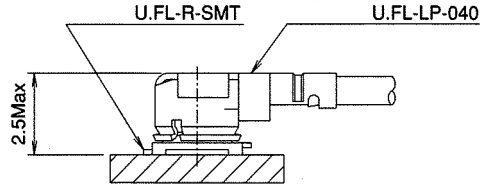
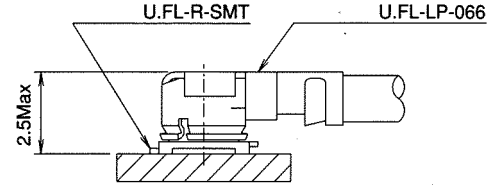


Figure 3. U.FL-LP-066 (To be released soon) and U.FL-R-SMT



■Applications

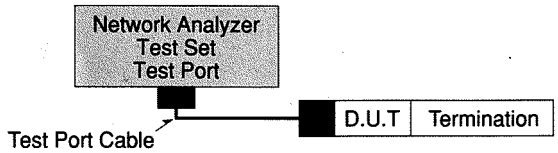
Portable telephones, mobile phones, wireless communications equipment, electronic measuring instruments, GPS, and a host of other applications.

■Product Specifications

Ratings	Nominal characteristic impedance Rated voltage Rated frequency	50Ω 60 V AC (rms) DC to 3 GHz	Operating temperature range Operating humidity	-40°C to +90°C 90% or less

Item	Specification	Conditions
1. Contact resistance	Center : 20 mΩ or less Outside: 10 mΩ or less	Measured at 10 mA or less
2. Insulation resistance	500 MΩ or greater	Measured at 100 V DC
3. Withstand voltage	No line or insulation breakdown	200 V AC for 1 minute
4. V.S.W.R.*	1.3 or less	DC to 3 GHz
5. Female contact holding force	0.15 N or greater	Measured with a ϕ0.475 pin gauge
6. Repetitive operation	Contact resistance 25 mΩ or less (Center) 15 mΩ or less (Outside)	30 cycles of insertion and disengagement
7. Vibration resistance	No momentary disconnections of 1 μs or longer No damage, cracks, or parts looseness	Frequency of 10 to 100 Hz, single amplitude of 1.5 mm, acceleration of 59 m/s², for 5 cyles in the direction of each of the 3 axes
8. Shock resistance	No momentary disconnections of 1 μs or longer No damage, cracks, or parts looseness	Acceleration of 735 m/s², 11 ms duration, sine half-wave waveform, for 6 cycles in the direction of each of the 3 axes
9. Humidity resistance	Contact resistance 25 mΩ or less (Center) 15 mΩ or less (Outside) Insulation resistance 100 MΩ or greater	Temperature of 40°C, humidity of 95%, let stand for 96 hours
10. Temperature cycle	Contact resistance 25 mΩ or less (Center) 15 mΩ or less (Outside) Insulation resistance 100 MΩ or greater	Temperature: +40°C → 5 to 35°C → +90°C → 5 to 35°C Time: 30 min.→ Within 5 min.→ 30 min.→ Within 5 min. Cycles: 5
11. Salt spray test	No excessive corrosion	48 hours continuous exposure to 5% salt water

*V.S.W.R. Measurement System
The above V.S.W.R. standard values were measured using the measurement system of the diagram below.



NOTE 1: Cable type connectors were measured with SMA conversion adapters attached to both ends of the harness product of a suitable 10-cm cable.
NOTE 2: Board type connectors were mounted to a 50Ω glass epoxy board and measurements were conducted with SMA conversion adapters attached.

■Materials

Part	Material		Processing	UL Specification
Shell	Phosphor bronze		Silver plating	———
Male center contact	Brass		Gold plating	———
Female center contact	Phosphor bronze		Gold plating	———
Insulator	Plug	PBT resin	Black	UL94V-0
	Receptacle	Liquid crystal polymer	Beige	UL94V-0

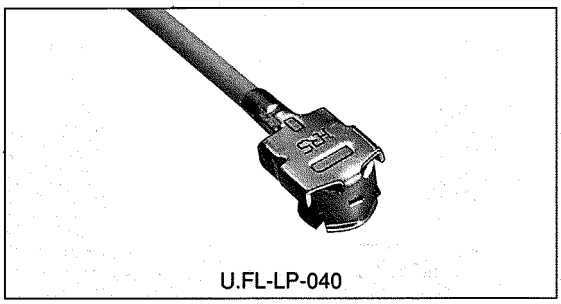
■Structure of the Product Number

This information is used to determine the product specifications from the product number expression.
At the time of ordering, select from the product number expressions on Pages 3 to 4 of this catalog.
[Please order plugs with the cable harness specifications.]

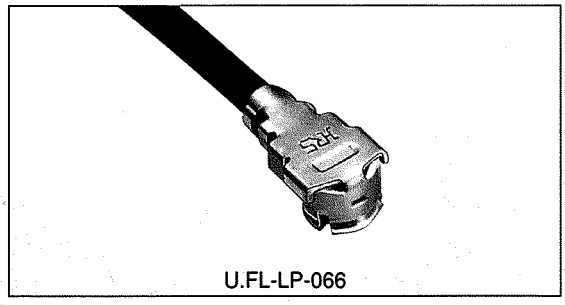
U.FL - ☐ - ☐ - (**)
❶ ❷ ❸ ❹

❶ Series name: U.FL	❸ Suitable cable or board mounting method For plugs 040: ϕ0.8 mm (single-layer shielded) cable 066: ϕ1.32 mm (double-layer shielded) cable For receptacles SMT: Printed circuit board surface mounting type	❹ Packaging (01): Packaged merchandise (100 pieces per pack) (10): Reel merchandise (2,500 pieces per reel) NOTE: Specification (10) is only for receptacles.
❷ Connector types LP: Right-angle plug R : Straight receptacle		

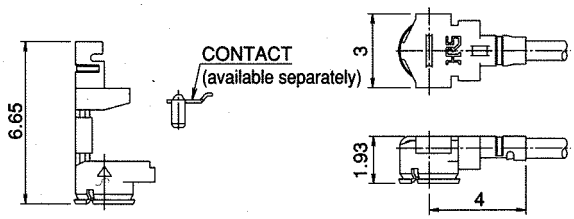
■Plugs



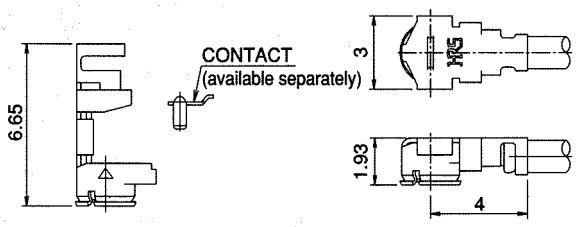
U.FL-LP-040



U.FL-LP-066



Form of Plug After Cable Wiring



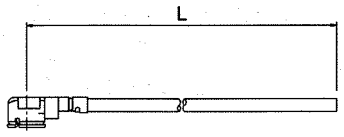
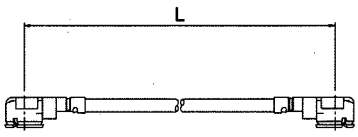
Form of Plug After Cable Wiring

Item	HRS No.	Product Name	Sales Quantity	Suitable Cable	Weight (mg)
Right-angle plug shell (for ϕ 0.8 cable)	CL331-0451-2-01	U.FL-LP-040(01)	Sold by the package (100 pieces per package)	RF-MF5010 Manufactured by Nissei Electric Co., Ltd. CO-6F-SB-CX50 Manufactured by Hitachi Cable, Ltd. F12B0074-B Manufactured by Junkosha Co., Ltd. 0.4DS-PBA Manufactured by Sumitomo Electric Industries, Ltd.	51.3/unit
Right-angle receptacle (for ϕ 1.32 cable)	CL331-0452-5-01	U.FL-LP-066(01) [To be released soon]	Sold by the package (100 pieces per package)	A12B0733 Manufactured by Junkosha Co., Ltd. CO-6F-DSB-CX-50 Manufactured by Hitachi Cable, Ltd.	56.7/unit
Female center contact	CL331-0461-6	U.FL-CONTACT	Sold by the reel (10,000 pieces per reel)	Same as the above cables	2.4/unit

[Please order plugs with the cable harness specifications.]
NOTE 1: Right-angle plug shells and female center contacts are sold in different sales quantities.
Right-angle plug shells are available by the pack with 100 pieces per pack. Please order in pack units. Also note that female contacts are sold by the reel (which contains 10,000 pieces). Please order in reel units.
NOTE 2: Female center contacts are separate sales items. (They are not included with the right-angle plug shells.)

■Cable Harness Specifications

Dimension specifications of U.FL Series harness products should be made as indicated below.

Connector Single-Ended Harness	Connector Double-Ended Harness
	

●General Structure of the Cable Harness Product Name

U.FL - ☐ LP - ☐ - A - (L)

❶ ❷ ❸ ❹

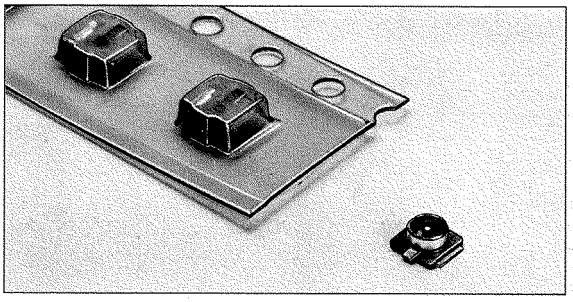
❶ Series name	U.FL
❷ Harness type	Blank: Single ended 2 : Double ended
❸ Cable type	04 : For use with ϕ 0.8 cable 066: For use with ϕ 1.32 cable
❹ Overall length (mm)	Length L is expressed in mm units.

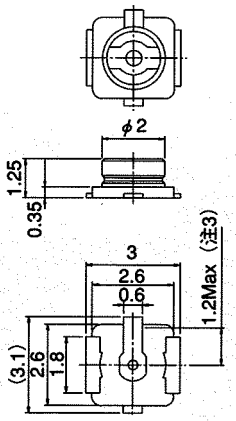
●Cable Harness Overall Length Standard Tolerance

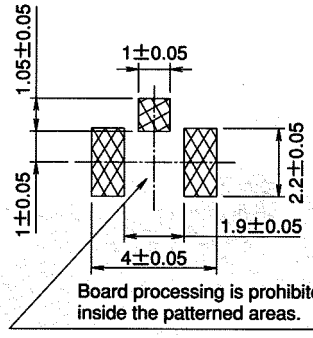
Overall Length L (mm)	Standard Tolerance (mm)
35≦L≦ 200	± 4
200<L≦ 500	± 8
500<L≦1000	±12
1000<L	±1.5%

NOTE: Shortest length L is 35 mm.

■Receptacles







Recommended Board Pattern Diagram

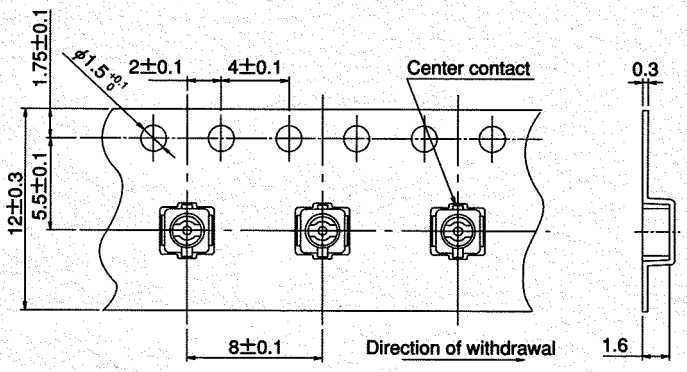
NOTE 1: Receptacles of the (01) specification are sold by the pack with 100 pieces per pack. Please order in pack units.
NOTE 2: Receptacles of the (10) specification are sold by the reel (which contains 2,500 pieces). Please order in reel units.
NOTE 3: Permissible value for mold resin which gets onto the center contact.

HRS No.	Product Name	Sales Quantity	Weight (mg)
CL331-0471-0-01	U.FL-R-SMT (01)	Pack sales (100 pieces per pack)	15.7/unit
CL331-0471-0-10	U.FL-R-SMT (10)	Reel sales (2,500 pieces per reel)	

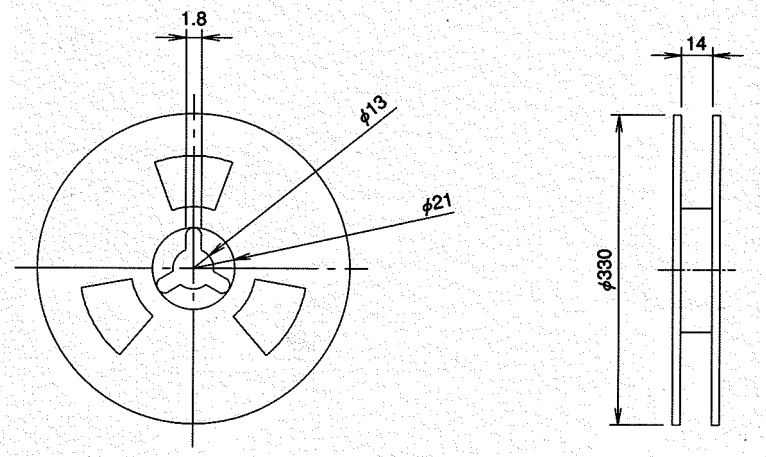
●Embossed Tape Carrier Dimensions Diagram (JIS-C-0806 Compliant)

The U.FL-R-SMT(10) embossed tape carrier dimensions diagram is illustrated below.

Embossed Taping Specifications Diagram

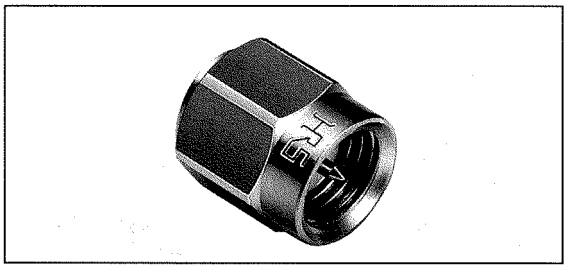


Reel Specifications Diagram

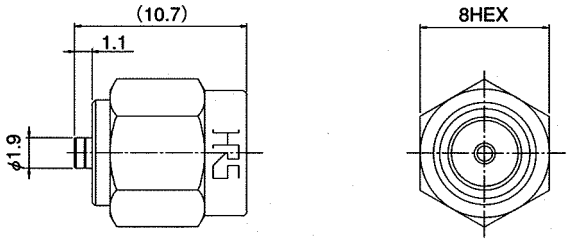


■Conversion Adapter

●SMA Conversion Adapter (Coupling portion: U.FL side jack - SMA side plug)

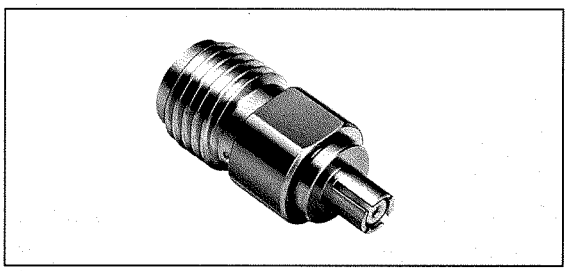


NOTE: The U.FL side coupling portion has a weaker lock than the regular product and, therefore, cannot be used for purposes other than performance measurements.

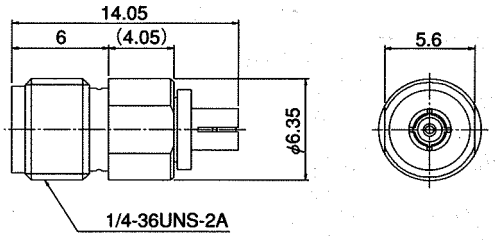


HRS No.	Product No.
CL311-0300-2	HRMP-U.FLJ

●SMA Conversion Adapter (Coupling portion: U.FL side plug - SMA side jack)



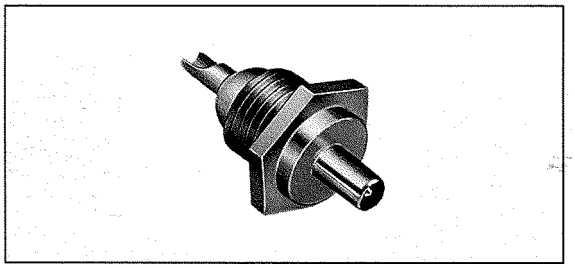
NOTE: The U.FL side coupling portion has a weaker lock than the regular product and, therefore, cannot be used for purposes other than performance measurements.



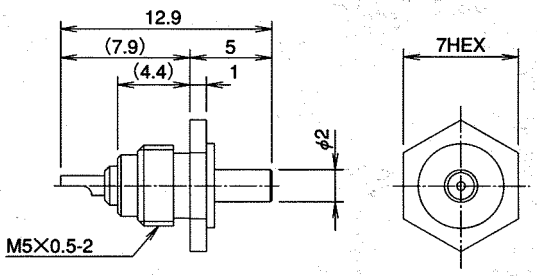
HRS No.	Product No.
CL311-0301-5	HRMJ-U.FLP

■Inspection Receptacle

This receptacle is used for inspecting the continuity, withstand voltage, and other aspects of the harness product.



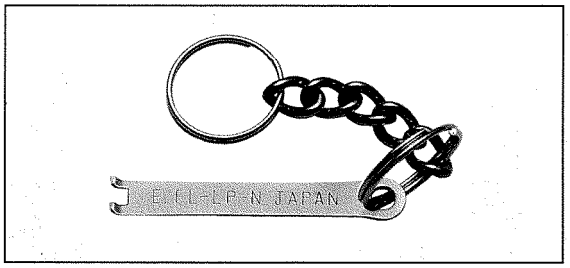
NOTE: The U.FL side coupling portion does not have a lock and, therefore, cannot be used for purposes other than continuity and withstand voltage inspections.



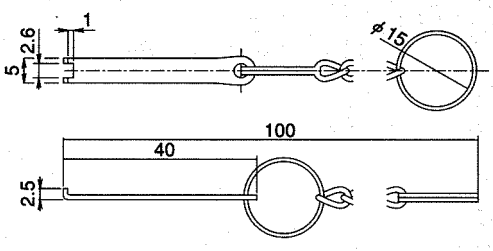
HRS No.	Product No.
CL331-0466-0	U.FL-R-1

■Extraction Jig

This jig is used for extraction from a coupled condition.



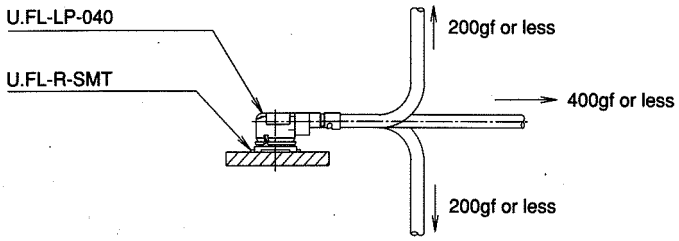
NOTE: The extraction jig is the same one used with the E.FL Series



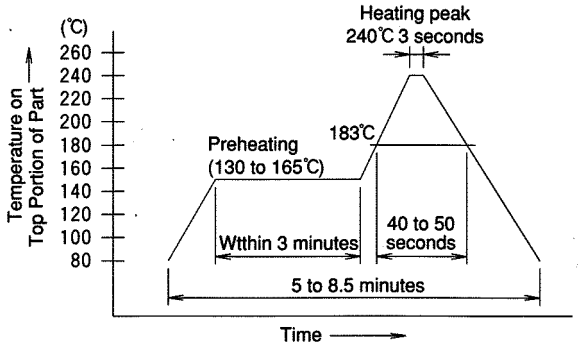
HRS No.	Product No.
CL331-0441-9	E.FL-LP-N

■Usage Precautions

1. Plugs

(1) Connection/ disconnection of connectors	1) To disconnect connectors, hook the end portion of E.FL-LP-N onto the connector cover and pull off vertically in the direction of the connector coupling axis. To remove the connector directly, hold the connector cover and pull off vertically in the direction of the connector coupling axis. (Please exercise caution so as not to injure fingertips or nails.) 2) To couple the connectors, the coupling axes of both connectors are aligned and the connectors are inserted as perpendicularly as possible. Do not attempt to insert on an extreme angle.
(2) Permissible load on the cable after connector coupling.	After the connectors are coupled, do not apply a load to the cable in excess of the values indicated in the diagram below. 
(3) Precautions	Please note that excessive twisting in the action of insertion or removal will cause damage.

2. Receptacles

(1) Recommended temperature profile (Reference)	Recommended Temperature Profile (Reference)  1) The temperature indicates the printed circuit board surface temperature of the connector lead portion. 2) The reflow soldering method should be performed at a peak temperature of 240˚C or less at the surface of the printed circuit board. 3) The temperature profile will change depending on conditions which include such factors as the size of the board, the solder used, and the solder thickness.
(2) Recommended hand soldering conditions (Reference)	Soldering iron temperature: 350˚C Soldering time: Within 5 seconds
(3) Recommended screen thickness	0.15 mm

Creative Links to World Electronics ®

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