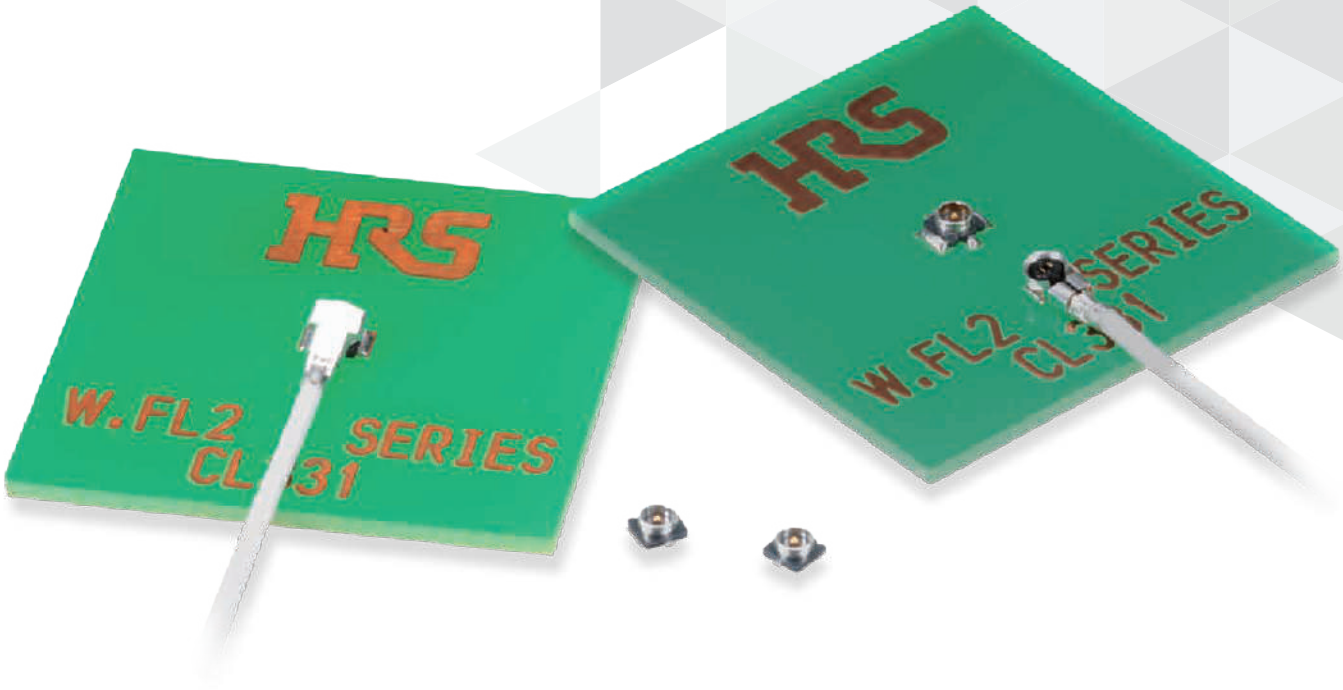
PRODUCT CATALOG

HIROSE ELECTRIC CO.,LTD.

W.FL2 Series

1.18mm Mated Height
Low Profile, Lightweight and Compact SMT Coaxial Connectors

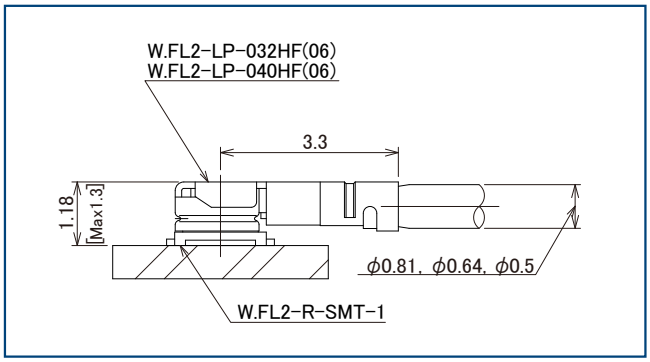
RF Compact Wide Variation



Features

1. Space-saving Design

Contribute to making set devices Small Size.
Mated Height 1.18mm (Max.1.3mm)
Receptacle Weight 5.0mg
Right Angle Plug 15.3mg (φ0.5)
17.4mg (φ0.81 and φ0.64)



Exterior View of Mating

2. PCB Mounting Space 3.4mm^2

Receptacle is 3.4mm^2 as well as the C.FL and X.FL of our minimum SMT connectors.
It can be shared a land pattern with X.FL.
Note : No mating compatibility for each series.

3. RF Performance (up to 8GHz)

High Frequency Performance is showed below.
0 to 3GHz : V.S.W.R. 1.3 Max.
3 to 6GHz : V.S.W.R. 1.4 Max.
(φ0.5 and φ0.81)
3 to 6GHz : V.S.W.R. 1.5 Max. (φ0.64)
6 to 8GHz : V.S.W.R. 1.5 Max. (φ0.81)

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

You can choose from 3 types of cables which has an excellent ease of installation.
W.FL2-LP-032HF(06) : φ0.5
W.FL2-LP-040HF(06) : φ0.64 and φ0.81

5. Supports Automatic Mounting

The receptacles are packaged on reels which supports automatic pick & place mounting.

6. Easy and Good Mating

You can easily insert and remove connectors by using special insertion/removal tools.

7. Halogen-Free

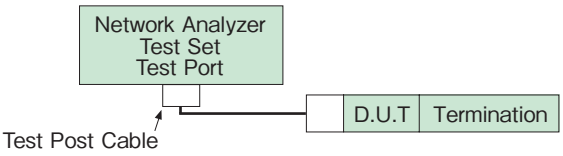
* As defined by IEC 61249-2-21
Br: 900ppm Max., Cl: 900ppm Max.,
Br+Cl: 1,500ppm Max.

Product Specifications

Nominal Characteristic Impedance	50 Ω	Operating Temperature	-40 to +90℃ (90%RH Max.)
Frequency Range	0 to 8GHz	Storage Temperature	-30 to +70℃ (90%RH Max.)

Item	Specifications
Contact Resistance	20m Ω Max.(Center) / 10m Ω Max.(Outer)
Insulation Resistance	500M Ω Min. / 100V DC
Withstanding Voltage	200V AC for 1 min.
V.S.W.R.	1.3 Max. (0 to 3GHz) 1.4 Max. (3GHz to 6GHz) φ0.5 and φ0.81 Cable 1.5 Max. (3GHz to 6GHz) φ0.64 Cable 1.5 Max. (6GHz to 8GHz) φ0.81 Cable

* V.S.W.R. Measurement System
Measured as shown on the block diagram below.



Note 1 : Measurement Way of a W.FL2 Cable Assembly (Plug)
W.FL2 Cable assembly (plug) is measured with SMA conversion adapters mated with W.FL2 plugs at both ends of a 100cm coaxial cable harness.
Note 2 : Measurement Way of a W.FL2 Receptacle
W.FL2 receptacle, which is mounted on a 50 Ω glass epoxy board, is measured with a SMA conversion adapter.

Materials / Finish

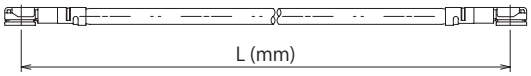
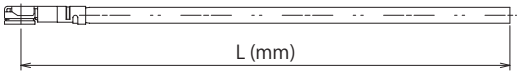
Part	Component	Material	Finish	Remarks
Right Angle Plug	Shell	Phosphor Bronze	Silver Plating	-
	Insulator	LCP (Milky White)	-	UL94V-0
	Female Contact	Phosphor Bronze	Gold Plating	-
Receptacle	Shell		Silver Plating	-
	Insulator	LCP (Black)	-	UL94V-0
	Male Contact	Brass	Gold Plating	-

Product Number Structure

■ Cable Assembly Product Number Structure

Refer to the chart below when determining the product specifications from the product number.

The dimensions of the W.FL2 Series cable assembly should be specified as follows :

[Double-ended Cable Assembly]	[Single-ended Cable Assembly] Only For Ø0.81 Cable
	 Please consult us for cable terminal finish.

■ Applicable Plug : W.FL2-LP-040HF(06)

●φ0.81Cable, φ0.64 Cable

W.FL2 - LP HF6 - 04N [ ] TV - A - (L)
❶ ❷ ❸ ❹ ❺ ❻ ❼

❶ Series Name	W.FL2, WFL2	❹ Cable Type	04N : φ 0.81 Cable 044N and 044Y : φ 0.64 Cable
❷ Assembly Type	LP : Single Ended (φ 0.64 is not applied.) 2LP : Double Ended (LP notation may be omitted.)	❺ Cable Color	1 : White 2 : Black
		❻ Cable Outer Conductor	TV : Tin Plated Braided Wire TS : Tin Plated Spiral Winding Wire
❸ Environmental Compliant	HF6 : Halogen-Free	❼ Total Length (mm)	L mm

■ Applicable Plug : W.FL2-LP-032HF(06)

●φ0.5 Cable

W.FL2 - 2LP HF6 - 032N [ ] TS - A - (L)
❶ ❷ ❸ ❹ ❺ ❻ ❼

❶ Series Name	W.FL2, WFL2	❹ Cable Type	032N : φ 0.5 Cable (032H is also available)
❷ Assembly Type	2LP : Double Ended (Not covered single ended) (LP notation may be omitted.)	❺ Cable Color	1 : White 2 : Black
		❻ Cable Outer Conductor	TS : Tin Plated Spiral Winding Wire
❸ Environmental Compliant	HF6 : Halogen-Free	❼ Total Length (mm)	L mm

■ Receptacle

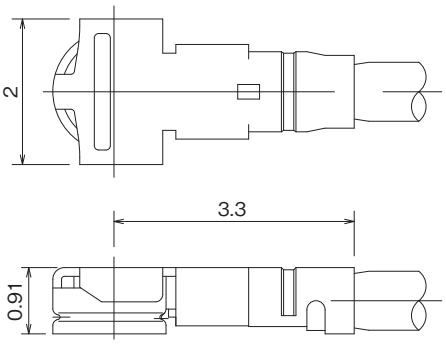
W.FL2 - R - SMT - 1 (80)
❶ ❷ ❸ ❹

❶ Series Name	W.FL2	❸ Board Mounting Method	SMT : Printed Circuit Board Surface Mount Type
❷ Connector Type	R : Straight Receptacle	❹ Packing Type	(80) : Reel Packing (10,000pcs per reel)

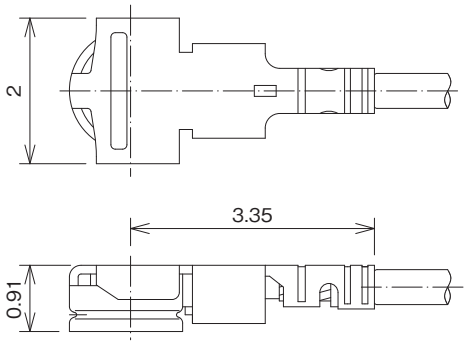
Cable Assembly Plug

Please order the plug in cable assembly specifications.

● W.FL2-LP-040HF(06)
(Applicable Cable : Outer Diameter φ0.81 and φ0.64)



● W.FL2-LP-032HF(06)
(Applicable Cable : Outer Diameter φ0.5)



● Cable Guide

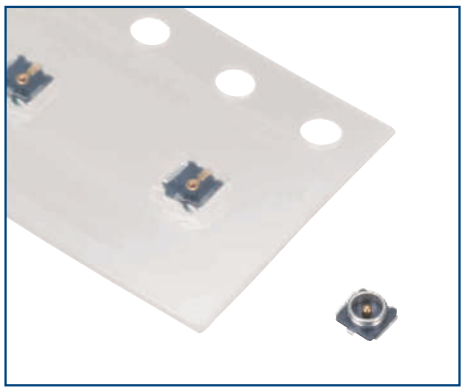
Cable Type	Cable Mark	Cable Specification						
		Center Conductor	Insulator	Outer Conductor	Cable Outer Diameter	Nominal Characteristic Impedance	Attenuation	
							3GHz	6GHz
φ0.81mm Cable	04	7/0.05 (AWG#36) Silver Plated Annealed Copper Wire	φ0.40 Fluorine Resin	Tin Plated Braided Wire	φ0.81 Fluorine Resin	50 Ω	6.5dB/m	9.5dB/m
φ0.64mm Cable	044		φ0.44 Fluorine Resin	Tin Plated Spiral Winding Wire	φ0.64 Fluorine Resin		5.8dB/m	8.5dB/m
φ0.5mm Cable	032	7/0.04 (AWG#38) Silver Plated Copper Alloy Wire	φ0.32 Fluorine Resin		φ0.5 Fluorine Resin		6.1dB/m	8.6dB/m

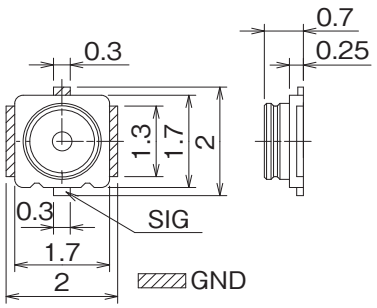
Standard Tolerances for (L)

L (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.

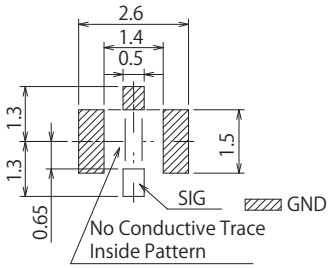
Receptacle





Part No.	HRS No.	Purchase Unit
W.FL2-R-SMT-1(80)	CL0331-0315-4-80	10,000pcs per reel

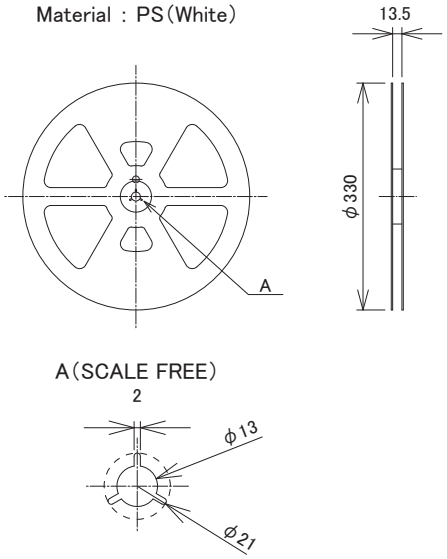
■ Recommended PCB Layout



Note : PCB Layout is same with X.FL and W.FL connector.

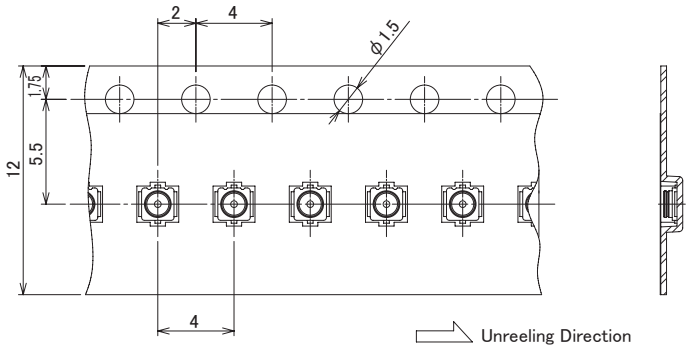
● Reel Dimensions

Material : PS(White)



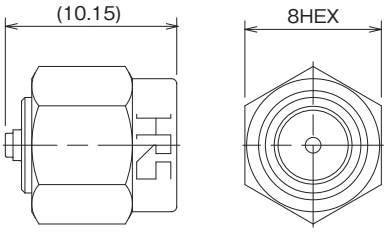
● Embossed Carrier Tape Dimensions (JIS C 0806 / IEC60286 Compliant)

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



Conversion Adapter

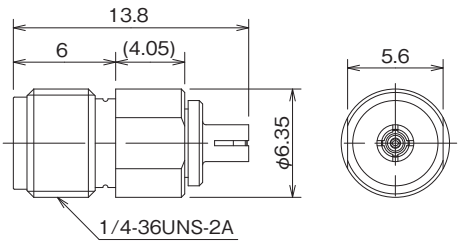
● SMA Conversion Adapter (W.FL2 Side : Jack – SMA Side : Plug)



Part No.	HRS No.	Purchase Unit
HRMP-W.FL2J	CL0311-0394-6-00	20pcs per bag

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

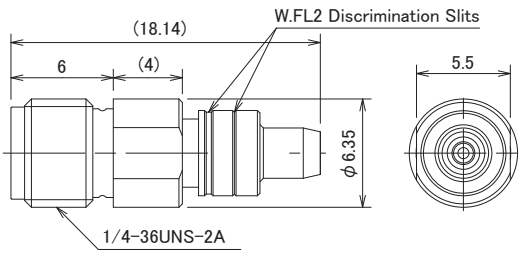
● SMA Conversion Adapter (W.FL/W.FL2 Side : Plug – SMA Side : Jack)



Part No.	HRS No.	Purchase Unit
HRMJ-W.FLP(40) (Note 1)	CL0311-0368-6-40	20pcs per bag

Note1 : It can be used for W.FL and W.FL2 connector.
Note2 : Used for performance measurements only.
The W.FL/W.FL2 mating side has lower retention force than the regular product when mated to the corresponding part.

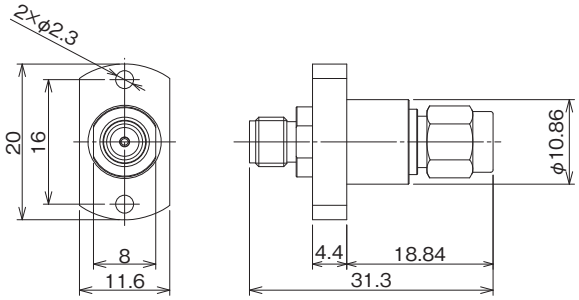
● SMA Conversion Probe (W.FL2 Side : Plug (Without Lock) – SMA Side : Jack)



Part No.	HRS No.	Purchase Unit
HRMJ-W.FL2P-ST3	CL0311-0417-0-00	20pcs per bag

Note : When mating with corresponding part (W.FL2-R-SMT-1), it must be pressed down and held to make complete connection.

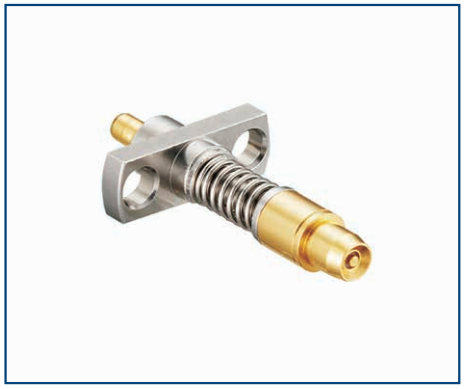
● SMA Conversion Adapter (SMA Jack (Measuring Device Connection Side) - SMA Plug)

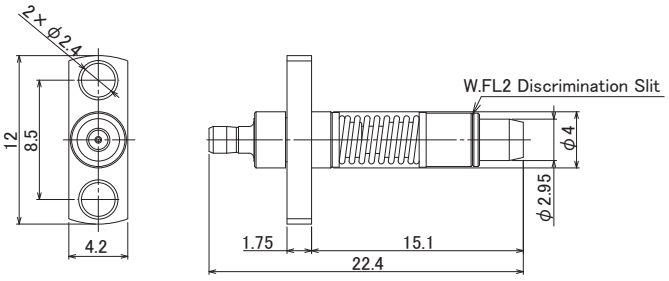


Part No.	HRS No.	Purchase Unit
HRM-PA-PJ(F)-1(40)	CL0323-0805-9-40	20pcs per bag

Note : The HRMJ-W.FL2P-ST3 absorbs shaft displacement by mating the HRMJ-W.FL2P-ST3 to the plug side (coupling side) and connecting the jack side to measuring device.

● Multiple Receptacles Inspection Probe for Narrow Pitch (W.FL2 Plug (Without Lock) - ML51 Jack)

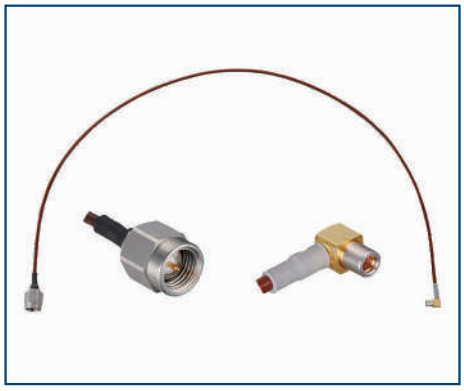


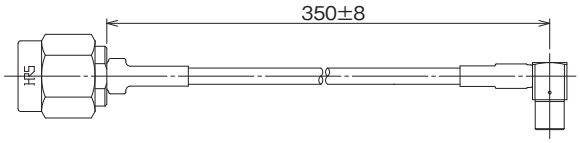


Part No.	HRS No.	Purchase Unit
W.FL2P-ML51.J-PA(F)-ST	CL0311-0457-4-00	20pcs per bag

Note : Our original product ML51 is applied to the junction interface with measuring device.
It is suitable for application of inspection for multiple receptacle mounting with narrow pitch at the same time.

● Harness for Narrow Pitch Probe Connection (SMA Plug (Measuring Device Connection Side) - ML51 Plug)



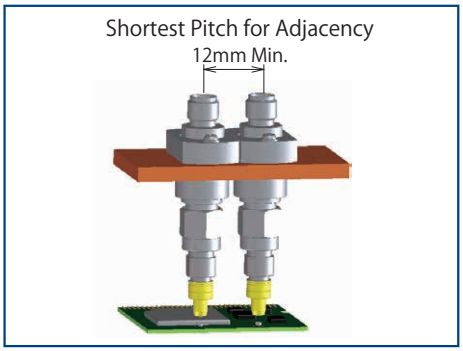


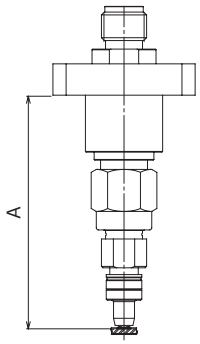
Part No.	HRS No.	Purchase Unit
HRMP-ML51LP-DTR178-350RS	CL0321-4926-2-01	10pcs per bag

Note : Used to connect W.FL2P-ML51.J-PA(F)-ST and measuring device.
As for the cable length, we recommend that Item provide slack so that the shaft displacement can be absorbed smoothly.

Inspection Probe

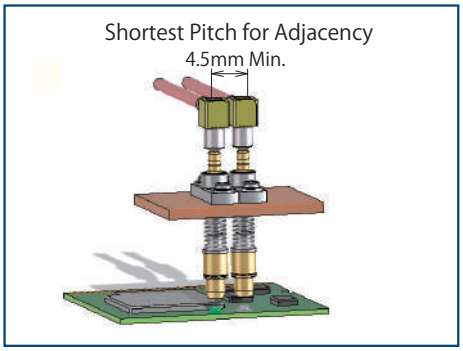
● Combination and Usage for HRMJ-W.FL2P-ST3 and HRM-PA-PJ(F)-1(40)

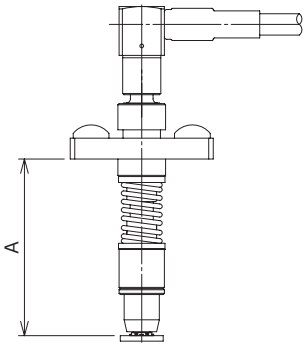




Flange to Board Surface	A
Recommendation for Measurement	32 ± 0.2
Starting Load	32.7

● Combination and Usage for W.FL2P-ML51.J-PA(F) and HRMP-ML51LP-DTR178-350RS



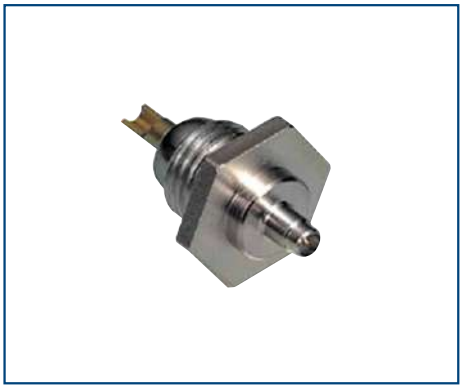


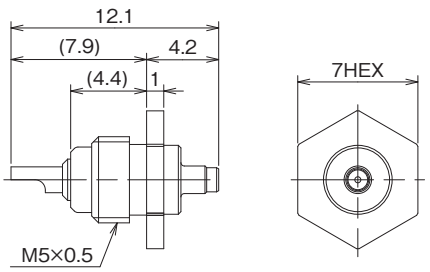
Flange to Board Surface	A
Recommendation for Measurement	14.55 ± 0.2
Starting Load	15.5

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

Inspection Receptacle

This is a Receptacle for inspecting the continuity and withstanding voltage of harness products.





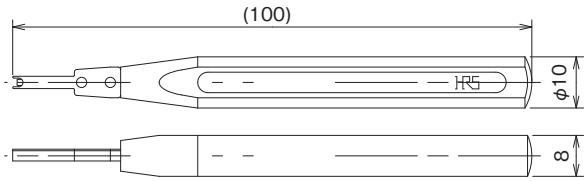
Part No.	HRS No.	Purchase Unit
W.FL-R-1 (Note 1)	CL0331-0483-9-00	20pcs per bag

Note1 : Product can be used for W.FL and W.FL2 connector.
Note2 : Product cannot be used for purposes other than conduction or withstanding voltage inspection because there is no lock on the mating portion.

Tool

● Plug Mating Tool (Space-saving Type)

This tool is used for plug mating.

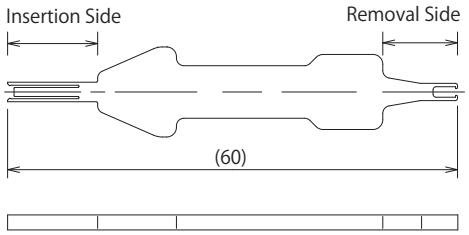


Part No.	HRS No.	Purchase Unit
W.FL-LP-IN (Note)	CL0331-0323-2-00	1pc per bag

Note : Product can be used for W.FL and W.FL-LP(G) connector.

● Plug Mating and Unmating Tool

Tool is used for inserting W.FL2-LP-040HF and W.FL2-LP-032HF and pulling them out of mated condition.



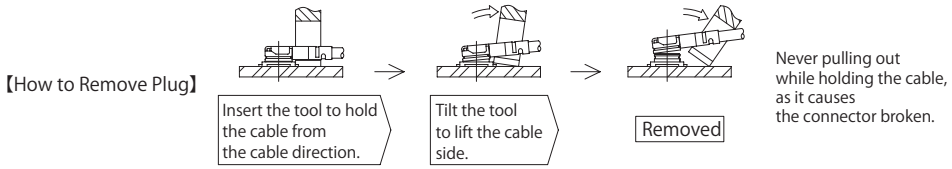
Part No.	HRS No.	Purchase Unit
W.FL2-LP-IN.OUT	CL0331-0321-7-00	1pc per bag

Precautions

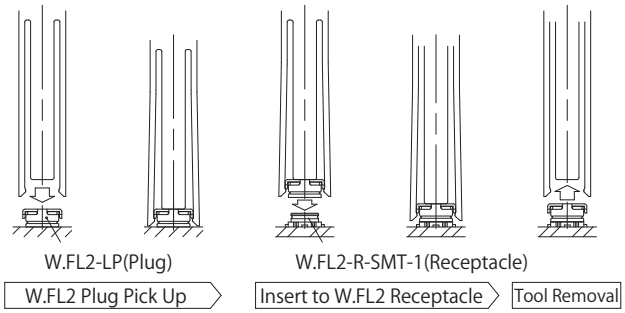
1. Plugs

1. Mating / Removal

(1) When unmating the connector, please use the pull-out side of the insertion and pull-out jig and follow the diagram below.

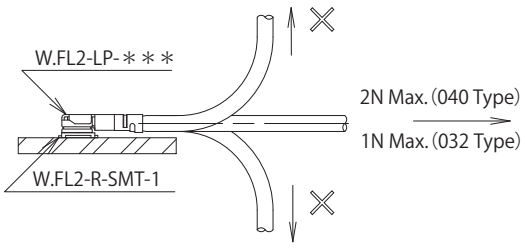


(2) When inserting the connector, use the insertion side of the insertion and removal tool or W.FL-LP-IN.
Align the mating shafts of both connectors, check that the guide of shell part, and insert them as vertically as possible. (See diagram below)
Also, do not insert at an extreme angle, as it causes the connector broken.



2. Allowable Load on Cable after Mating

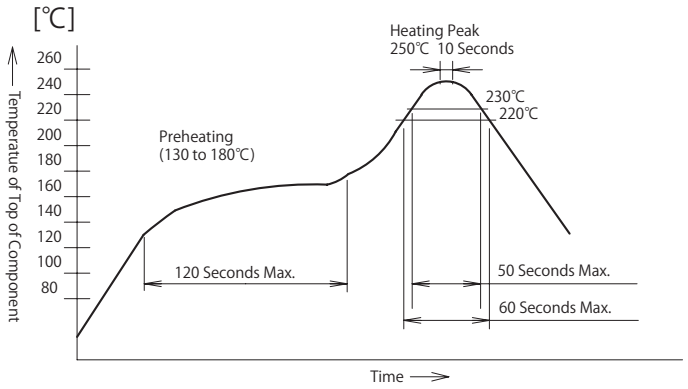
Do not apply more load to the cable than shown in the diagram below after mating.



3. Precautions

Do not twist connectors excessively during mating / unmating.

2. Receptacles

1.Recommended 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) Temperature Profile varies depending on conditions such as the size of the board, the solder, and the solder thickness.
2.Recommended Metal Mask Thickness	0.1mm to 0.12mm
3.Reflow Cycles	2 times

3. Operating Environment and Storage Condition

1. Operating 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.

PRODUCT CATALOG

HIROSE ELECTRIC CO.,LTD.

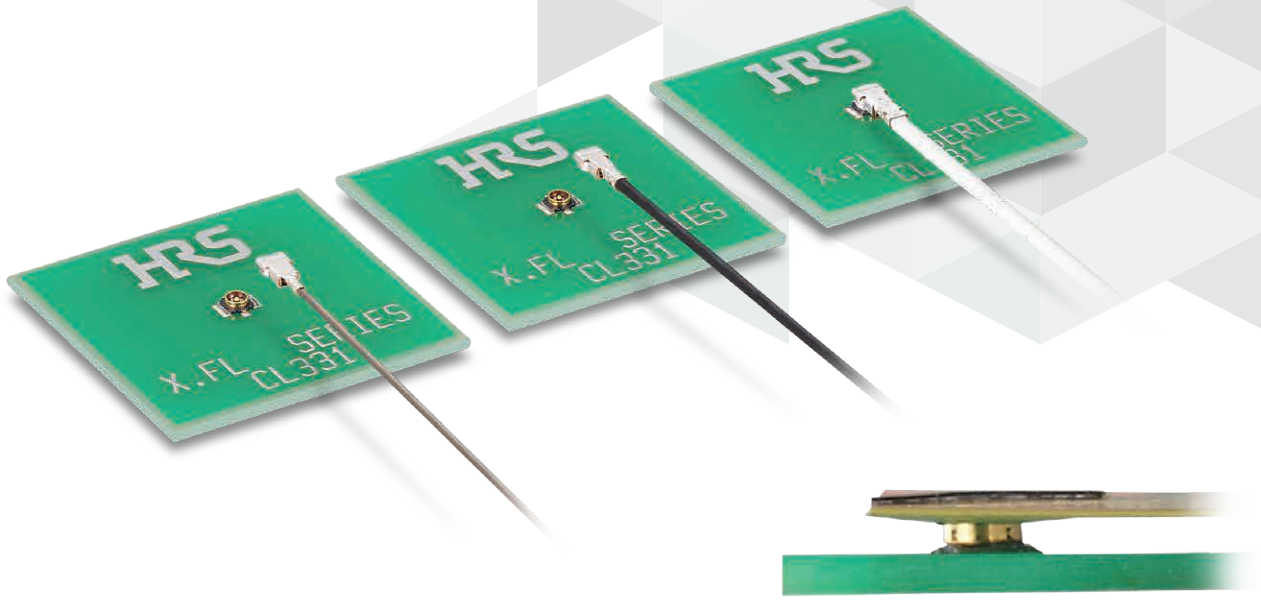
X.FL Series

0.94mm or 1.2mm Mated Height
Low Profile, Lightweight and Compact SMT Coaxial Connectors

RF

Compact

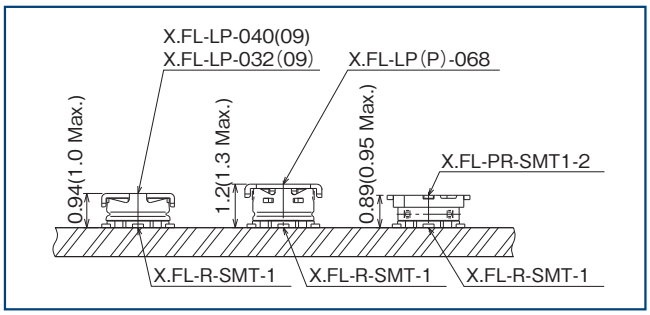
Wide Variation



Features

1. Space-saving Design

Contribute to making set devices Small Size.
Receptacle : 3.2mg
Right Angle Plug : 22mg (068)
15mg (040)
16mg (032)
Plug Receptacle : 5.5mg



Mated Height Comparison

2. PCB Mounting Space3.4mm^2

The receptacle requires a footprint of only 3.4mm^2, which is the same footprint as our W.FL and W.FL2 Series. In addition, the same land patterns can be used.
(Note) The X.FL Series has no mating compatibility with the W.FL2 and W.FL Series.

3. RF Performance (up to 12GHz)

High Frequency Performance is showed below.
~6GHz : φ0.64
~8GHz : φ0.5, φ0.81
~12GHz : φ1.13
(Standardized on WiGig modules)

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

Compatible with ultra-fine coaxial cables for smooth and easy installment.
(φ1.13, φ0.81, φ0.64, φ0.5 diameter)

5. Supports Automatic Mounting

Receptacle and plug receptacle can be pick & place mounted due to the embossed taping packaging specifications.

6. Easy and Good Mating

You can easily insert and remove connectors by using special insertion/ removal tools.

7. Halogen-Free and RoHS2 Compliant

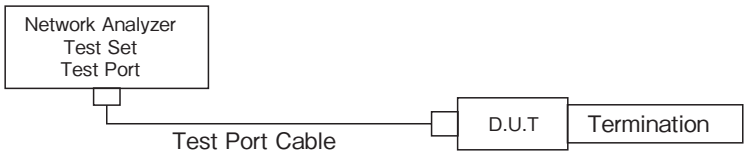
The receptacle and plug do not contain chlorine or bromine above the standard value.
*Defined in accordance with IEC61249-2-21.

Product Specifications

Nominal Characteristic Impedance	50 Ω	Operating Temperature	-40 to +90℃ (90% RH Max.)
Frequency Range	0 to 12GHz	Storage Temperature	-30 to +70℃ (90% RH Max.)

Item	Specifications	Conditions
Contact Resistance	● X.FL-LP-040(09) ● X.FL-LP-032(09) Center : 25m Ω Max. Outer : 25m Ω Max.	Measured at 10mA Max.
	● X.FL-LP(P)-068 Center : 25m Ω Max. Outer : 15m Ω Max.	
	● X.FL-PR-SMT1-2 Center : 25m Ω Max. Outer : 10m Ω Max.	
	● X.FL-R-SMT-1 Depends on the mating plug	
V.S.W.R.*	● X.FL-LP-040(09) ϕ 0.81 Cable V.S.W.R. 1.3 Max. V.S.W.R. 1.4 Max. V.S.W.R. 1.6 Max. ϕ 0.64 Cable V.S.W.R. 1.3 Max. V.S.W.R. 1.5 Max.	 ϕ 0.81 Cable 0 ~ 3GHz 3 ~ 6GHz 6 ~ 8GHz ϕ 0.64 Cable 0 ~ 3GHz 3 ~ 6GHz
	● X.FL-LP-032(09) V.S.W.R. 1.3 Max. V.S.W.R. 1.4 Max. V.S.W.R. 1.5 Max.	 0 ~ 3GHz 3 ~ 6GHz 6 ~ 8GHz
	● X.FL-LP(P)-068 V.S.W.R. 1.3Max. V.S.W.R. 1.4Max. V.S.W.R. 1.7Max.	 0 ~ 3GHz 3 ~ 6GHz 6 ~ 12GHz
	● X.FL-PR-SMT1-2 V.S.W.R. 1.3Max. V.S.W.R. 1.5Max.	 0 ~ 3GHz 3 ~ 6GHz
	● X.FL-R-SMT-1 V.S.W.R. 1.3 Max. V.S.W.R. 1.4 Max. V.S.W.R. 1.5 Max. V.S.W.R. 1.6 Max.	 0 ~ 3GHz 3 ~ 6GHz 6 ~ 9GHz 9 ~ 12GHz
Insulation Resistance	500M Ω Min.	Measured at 100V DC
Withstanding Voltage	No insulation breakdown	200V AC for 1 min.

*V.S.W.R. (Voltage Standing Wave Ratio) Measurement System (Plug type)
The above V.S.W.R. specification 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 50 Ω glass epoxy board and measurements were conducted with SMA conversion adapters attached.

Materials / Finish

Item	Component	Materials	Color / Finish
Right Angle Plug	Shell	Phosphor Bronze	Partially Gold Plating
	Insulator	LCP	Black, UL94V-0
	Female Contact	Phosphor Bronze	Gold Plating
Receptacle	Shell	Phosphor Bronze	Partially Gold Plating
	Insulator	LCP	Black, UL94V-0
	Male Contact	Brass	Partially Gold Plating
Plug Receptacle	Shell	Phosphor Bronze	Partially Gold Plating
	Insulator	LCP	Black, UL94V-0
	Female Contact	Phosphor Bronze	Partially Gold Plating

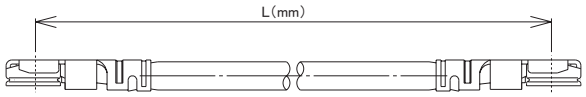
Product Number Structure

■ Cable Assembly Product Number Structure

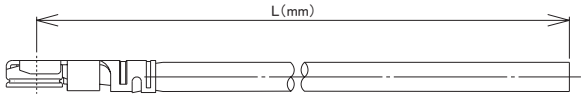
Refer to the chart below when determining the product specifications from the product number.

The dimension specifications of the X.FL Series cable assembly are as follows.

【Double-ended Cable Assembly】



【Single-ended Cable Assembly】 Only for ϕ0.81 and ϕ1.13



Please contact us regarding cable terminal processing.

■ Applicable Plug : X.FL-LP-040(09)

● ϕ0.81 Cable

X.FL - LP9 - 04N [ ] TV - A - (L)
❶ ❷ ❸ ❹ ❺ ❻

❶ Series Name	X.FL (XFL)	❹ Cable Color	1 : White 2 : Black
❷ Assembly Type	LP9 : Single-ended 2LP9 : Double-ended	❺ Cable Outer Conductor	TV : Tin Plated Braided Wire
❸ Cable Type	04N : ϕ 0.81 Coaxial Cable	❻ Total Length L (mm)	L length in mm

● ϕ0.64 Cable

X.FL - 2LP9 - 044N [ ] TS - A - (L)
❶ ❷ ❸ ❹ ❺ ❻

❶ Series Name	X.FL (XFL)	❹ Cable Color	1 : White 2 : Black 4 : Blue
❷ Assembly Type	2LP9 : Double-ended (Not covered single ended)	❺ Cable Outer Conductor	TS : Tin Plated Spiral Winding Wire
❸ Cable Type	044N, 044Y : ϕ 0.64 Coaxial Cable	❻ Total Length L (mm)	L length in mm

■ Applicable Plug : X.FL-LP-032(09)

● φ0.5 Cable

X.FL - 2LP9 - 032H [ ] TS - A - (L)
❶ ❷ ❸ ❹ ❺ ❻

❶ Series Name	X.FL（XFL）	❹ Cable Color	1 : White 2 : Black
❷ Assembly Type	2LP9 : Double-ended (Not covered single ended)	❺ Cable Outer Conductor	TS : Tin Plated Spiral Winding Wire
❸ Cable Type	032H : φ 0.5 Coaxial Cable or 032N	❻ Total Length L (mm)	L length in mm

■ Applicable Plug : X.FL-LP(P)-068

● φ1.13 Cable

X.FL - LP P - 068N [ ] T - A - (L)
❶ ❷ ❸ ❹ ❺ ❻ ❼

❶ Series Name	X.FL（XFL）	❺ Cable Color	1 : Grey 2 : Black
❷ Assembly Type	LP9 : Single-ended 2LP9 : Double-ended	❻ Cable Outer Conductor	T : Tin Plated Braided Wire
❸ Connection Type	P : Batch Connection Type		
❹ Cable Type	068N : φ 1.13 Coaxial Cable	❼ Total Length L (mm)	L length in mm

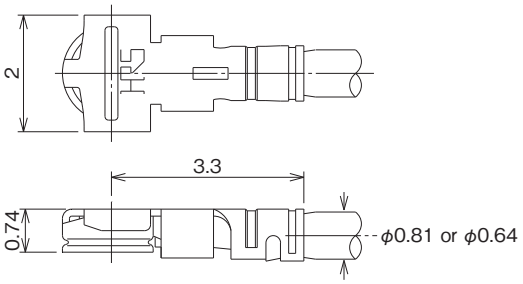
■ Standard Tolerances for (L)

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

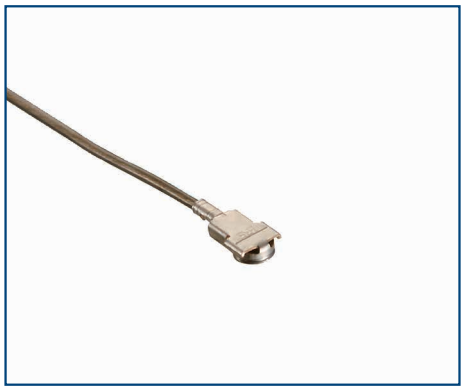
(Note) Shortest length L=35mm (X.FL-LP(P)-068 is 100mm)

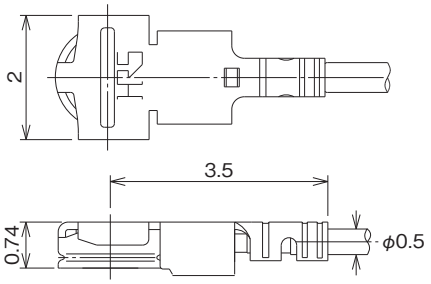
Cable Assembly Plug

X.FL-LP-040(09) (Applicable Cable : Outer Diameter ϕ0.81, ϕ0.64)

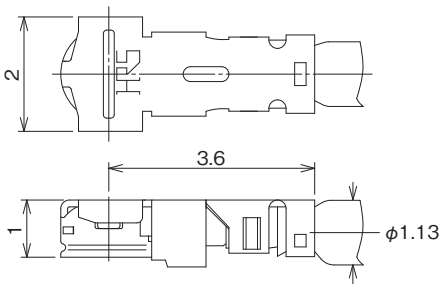


● X.FL-LP-032(09) (Applicable Cable : Outer Diameter ϕ0.5)





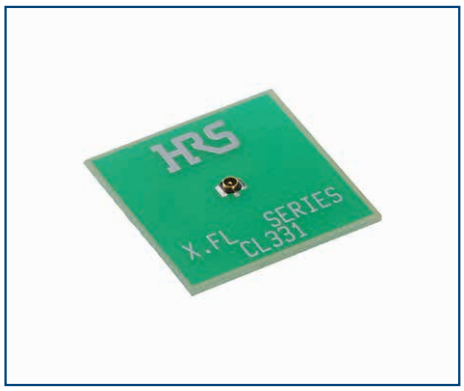
● X.FL-LP(P)-068 (Applicable Cable : Outer Diameter ϕ1.13)

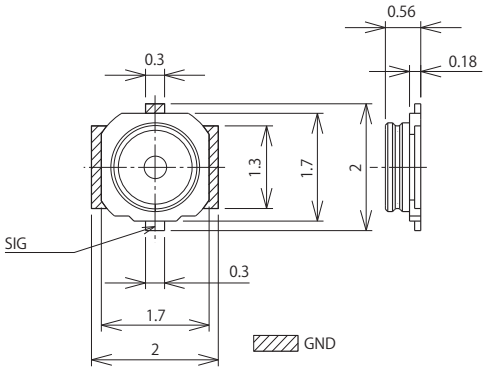


● Cable Guide

Cable Type	Cable Mark	Cable Specification						
		Center Conductor	Dielectric Diameter	Outer Conductor	Jacket Diameter	Nominal Impedance	Nominal Attenuation	
							3GHz	6GHz
ϕ0.81mm Cable	04	7/0.05 (36 AWG) Silver plated annealed copper wire	ϕ0.40 Fluorine Resin	Single-layer braided wire Tin plated	ϕ0.81 FEP	50Ω	5.4dB/m	8.0dB/m
ϕ0.64mm Cable	044		ϕ0.44 Fluorine Resin	Spiral winding wire Tin plated	ϕ0.64 FEP		4.6dB/m	6.5dB/m
ϕ0.5mm Cable	032	7/0.04 (38 AWG) Silver plated annealed copper wire	ϕ0.32 Fluorine Resin	Spiral winding wire Tin plated	ϕ0.5 FEP		6.1dB/m	8.6dB/m
ϕ1.13mm Cable	068	7/0.08 (32 AWG) Silver plated annealed copper wire	ϕ0.68 Fluorine Resin	Single-layer braided wire Tin plated	ϕ1.13 FEP		3.7dB/m	5.4dB/m

Receptacle

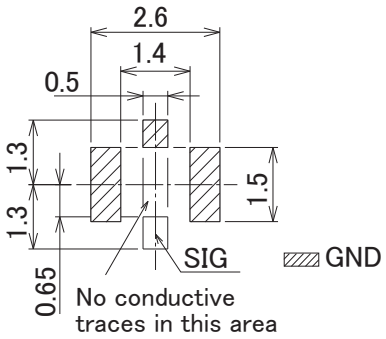




Unit : mm

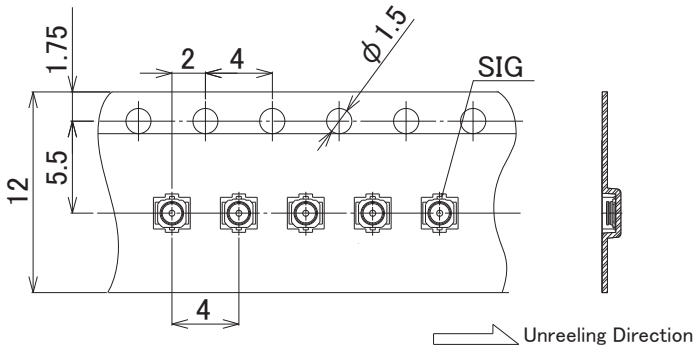
Part No.	HRS No.	Purchase Unit	R	RoHS2, Halogen-free
X.FL-R-SMT-1(02)	CL0331-0701-8-02	500pcs per reel	180	Yes
X.FL-R-SMT-1(80)	CL0331-0701-8-80	10,000pcs per reel	330	
X.FL-R-SMT-1(90)	CL0331-0701-8-90	20,000pcs per reel	380	

■ Recommended PCB Mounting Pattern

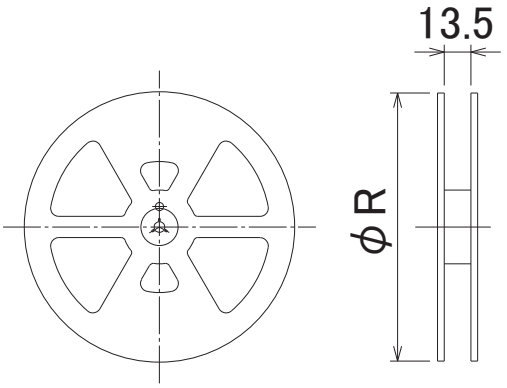


(Note) The pattern is the same as the W.FL and W.FL2 connectors.

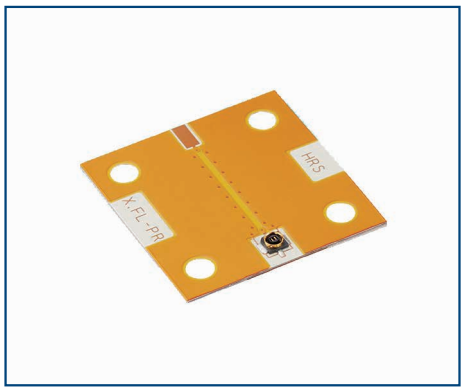
● Embossed Carrier Tape Dimensions (JIS-C-0806/IEC 60286 Compliant)

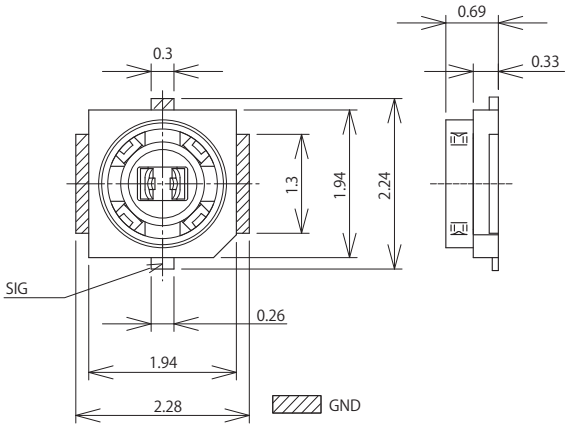


● Reel Dimensions



Plug Receptacle

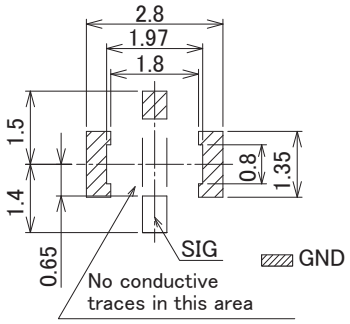




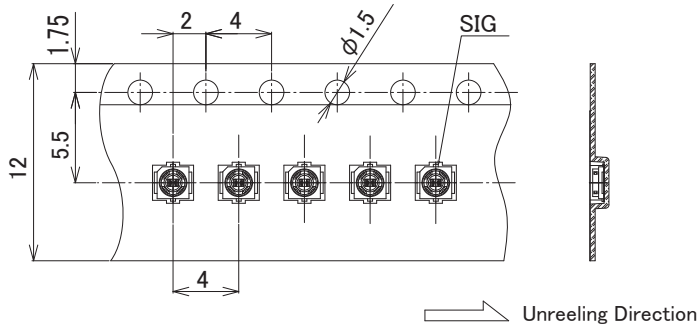
Unit : mm

Part No.	HRS No.	Purchase Unit	R	RoHS2, Halogen-free
X.FL-PR-SMT1-2(80)	CL0331-0713-7-80	10,000pcs per reel	330	Yes
X.FL-PR-SMT1-2(25)	CL0331-0713-7-25	20,000pcs per reel	380	

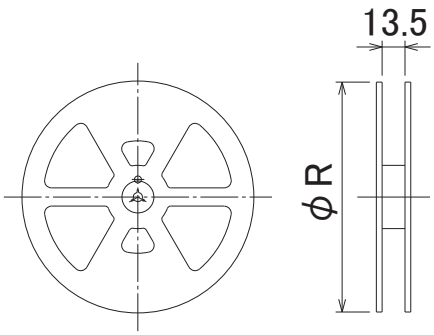
■ Recommended PCB Mounting Pattern



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

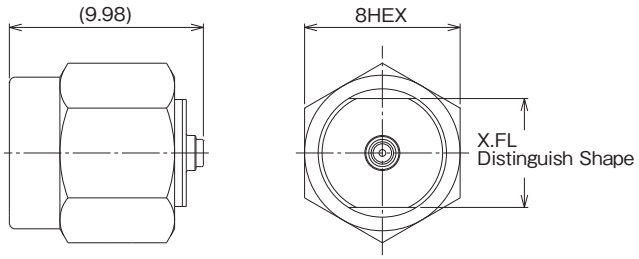


● Reel Dimensions



Conversion Adapter

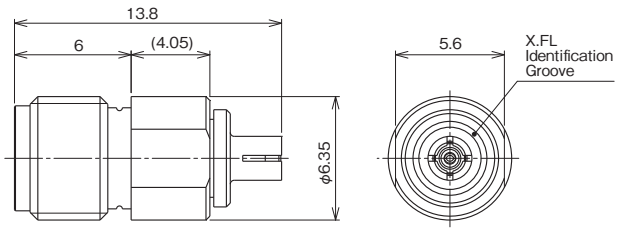
● SMA Conversion Adapter
(Mated Portion - X.FL Side : Jack, SMA Side : Plug)



Part No.	HRS No.	RoHS2
HRMP-X.FLJ	CL0311-0435-1-00	Yes

(Note) Since the X.FL side mating portion has a weaker lock than standard products, it cannot be used for purposes other than performance measurement.

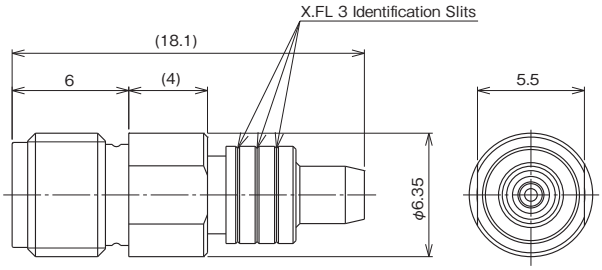
● SMA Conversion Adapter
(Mated Portion - X.FL Side : Plug, SMA Side : Jack)



Part No.	HRS No.	RoHS2
HRMJ-X.FLP	CL0311-0436-4-00	Yes

(Note) Since the X.FL side mating portion has a weaker lock than standard products, it cannot be used for purposes other than performance measurement.

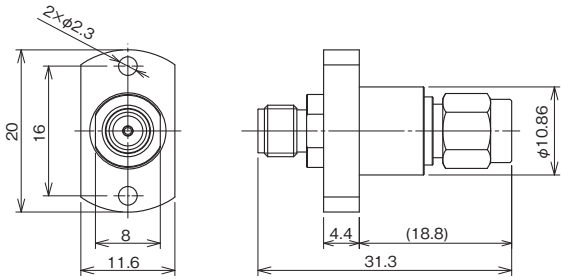
● SMA Conversion Probe
(Mated Portion - X.FL Side : Plug (Without Lock), SMA Side : Jack)



Part No.	HRS No.	RoHS2
HRMJ-X.FLP-ST3	CL0311-0450-5-00	Yes

(Note) This connector is used by pressing the mating portion of the X.FL side with the mating portion of X.FL-R-SMT-1.

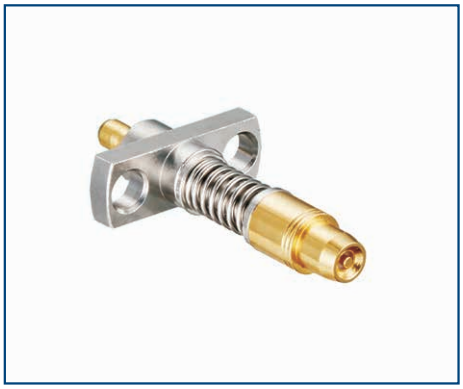
● SMA Conversion Adapter
(Mated Portion : SMA Jack (Measuring Device Connection Side) - SMA Plug)

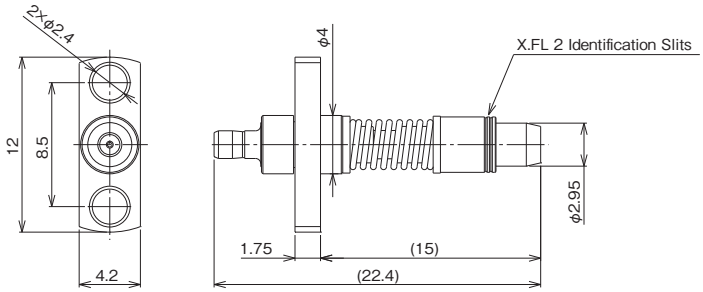


Part No.	HRS No.	RoHS2
HRM-PA-PJ(F)-1(40)	CL0323-0805-9-40	Yes

(Note) HRMJ-X.FLP-ST3 absorbs misalignment when it is mated with the plug (coupling side) and the jack is connected to the measuring device.

● Probe for Inspect of Multiple Receptacles Mounted at a Narrow Pitch
(Mated Portion : X.FL Plug (Without Lock) - ML51 Jack)

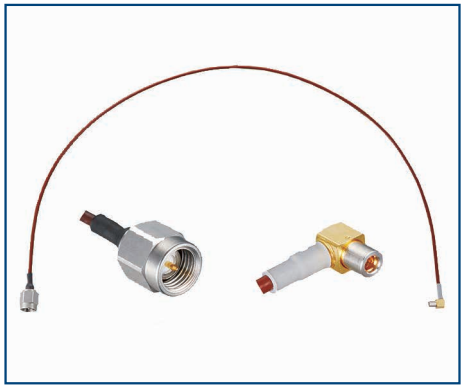


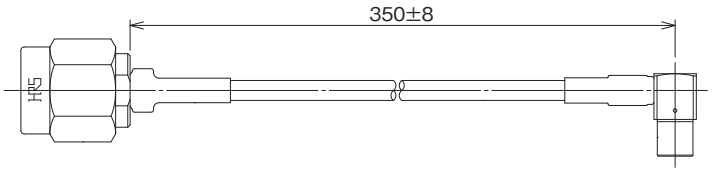


Part No.	HRS No.	RoHS2
X.FLP-ML51.J-PA(F)-ST	CL0311-0469-3-00	Yes

(Note) Hirose's ML51 is used for the measuring device interface. It is ideal for simultaneous inspection of multiple receptacles mounted at a narrow pitch.

● Harness for Narrow Pitch Probe Connection
(Mated Portion : SMA Plug (Measuring Device Connection Side) ML51 Plug)



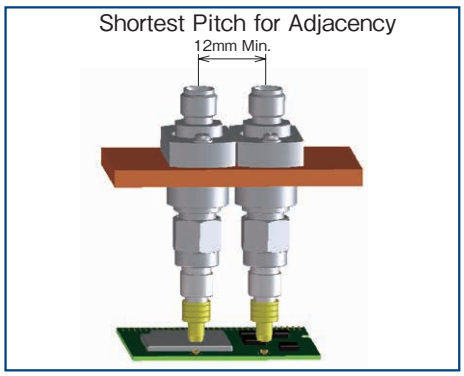


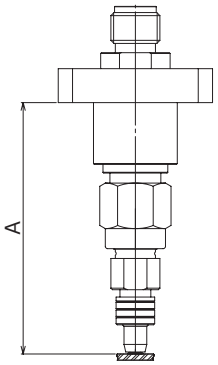
Part No.	HRS No.	RoHS2
HRMP-ML51LP-DTR178-350RS	CL0321-4926-2-01	Yes

(Note) Used to connect X.FLP-ML51J-PA(F)-ST and the measuring device. It is recommended to provide slack to the cable length so that it can absorb misalignment smoothly.

Inspection Probe

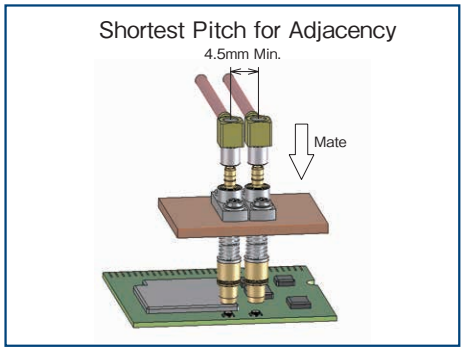
● HRMJ-X.FLP-ST3 and HRM-PA-PJ(F)1 Combination and Usage

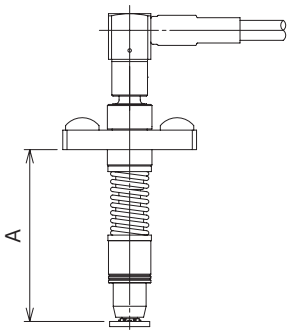




Flange to Board Surface	A
Recommendation for Measurement	31.9 ± 0.2
Starting Load	32.6

● X.FLP-ML51.J-PA(F)-ST and HRMP-ML51LP-DTR178-350RS Combination and Usage





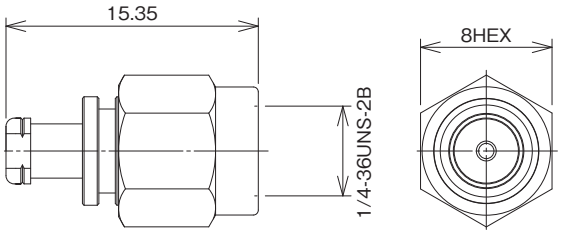
Flange to Board Surface	A
Recommendation for Measurement	14.3 ± 0.2
Starting Load	15.3

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

SMA Connector that Can Be Used With X.FL-LP(P)-068

● Straight Plug

This product can be ordered only in terminated cable assemblies.

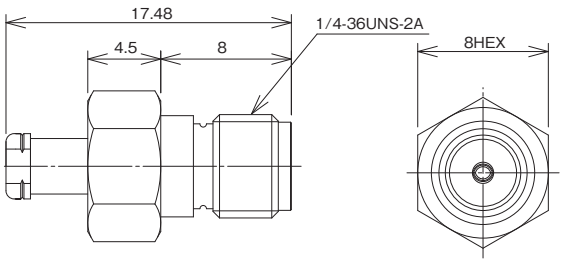


Part No.	HRS No.	RoHS2
HRM(G)-200-066PBN	CL0323-0914-0-00	Yes

(Note) Even though it is an ultra-fine wire connection type, the straight plug maintains stable characteristics up to 12GHz due to the optimized design. (Impedance matching type)

● Straight Jack

This product can be ordered only in terminated cable assemblies.



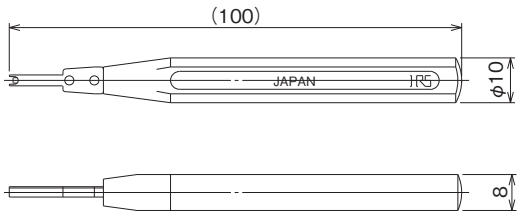
Part No.	HRS No.	RoHS2
HRM(G)-200-066JBN	CL0323-0959-0-00	Yes

(Note) Even though it is an ultra-fine wire connection type, the straight jack maintains stable characteristics up to 12GHz due to the optimized design. (Impedance matching type)

Tool

● Plug Mating Tool (Space-saving Type)

This tool is used for plug mating.

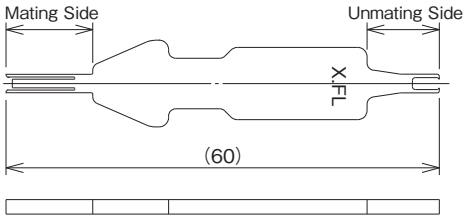


Part No.	HRS No.	RoHS2
W.FL-LP-IN (Note)	CL0331-0323-2-00	Yes

Note: Compatible with the X.FL connector.

● Plug Mating and Unmating Tool

One end of this combined purpose tool is used for mating and the other end is used for unmating.



Part No.	HRS No.	RoHS2
X.FL-LP-IN.OUT1 (Note)	CL0331-0715-2-00	Yes

(Note) X.FL-LP-IN.OUT1 is special tool for both insertion and extraction.

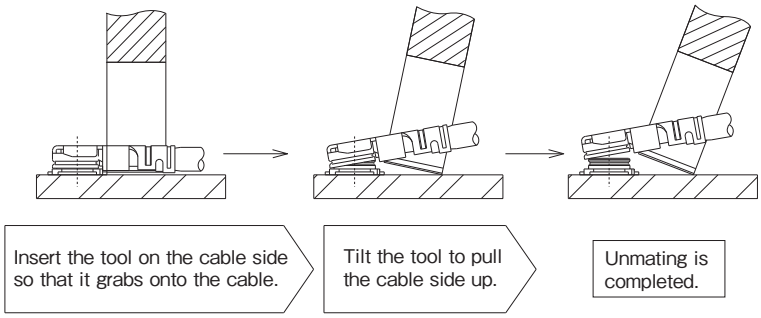
Precautions

1. Plugs

1. Mating/Unmating

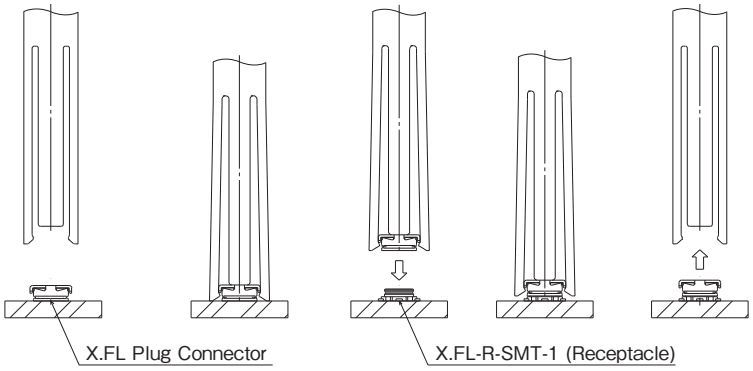
(1) To unmate, use the unmating side of the plug mating and unmating tool X.FL-LP-IN.OUT1 as shown in the following figure.

[How to unmate the plug]



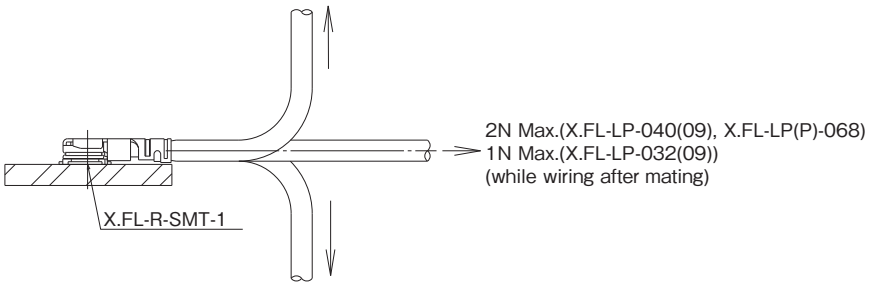
Do not unmate the plug by pulling on the cable, this can damage the connector performance.

(2) To mate, use the mating side of the plug mating and unmating tool X.FL-LPIN.OUT1 or the plug mating tool W.FL-LP-IN. Align the mating axes between both of the connectors and check that the shell is properly aligned. The connector should be inserted perpendicularly as much as possible. (Refer to the following figure) Do not attempt to insert the connector at an extreme angle as it may result in connector damage.

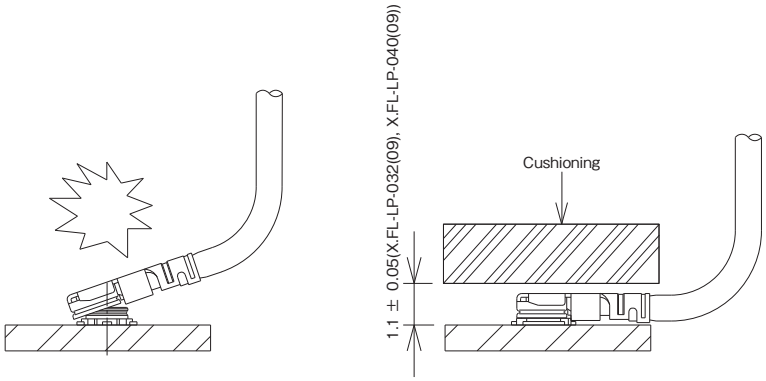


2. Tolerable load to a cable after mating

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



Be careful when applying stress that results in cable lifting as it may cause the connectors to unmate easily.
When routing in a way that causes the cable to lift, it is recommended to place cushioning on the plug in order to prevent unmating. (Refer to the example below).

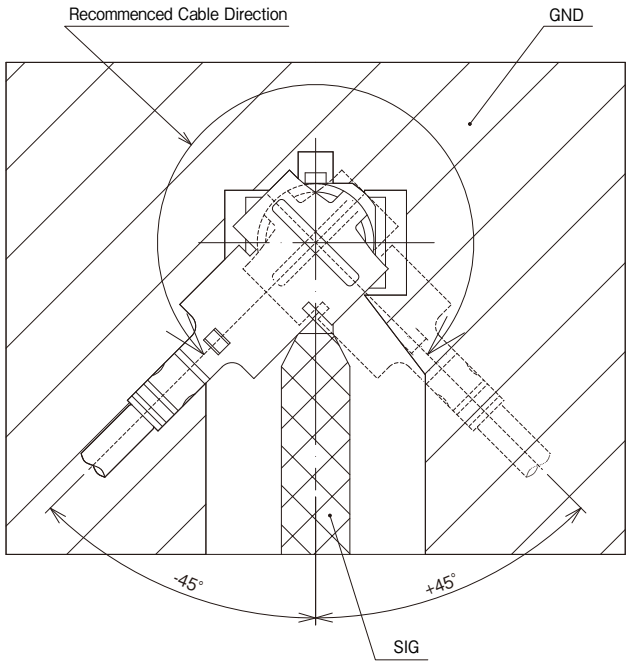


3. Precautions

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

4. Recommended orientation for mating the plug cable assembly to the receptacle

It is recommended that the SIG contact direction of the receptacle be offset from the cable pull direction of the plug cable assembly by at least 45°
(To prevent disturbance of high frequency characteristics due to locally low impedance)



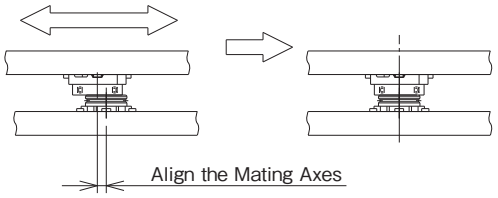
2. Plug Receptacles

1. Mating

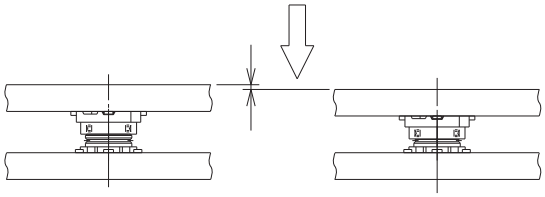
This product should be mated by hand.
Do not apply an excessive load or over handle during the mating process as doing so may result in connector damage.

【Mating Procedure】

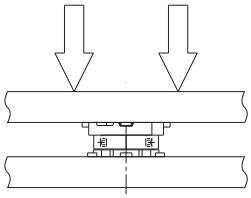
(1) Before inserting the connector, bring the mating surface of the plug receptacle (X.FL-PR-SMT1-2) into slight contact with the receptacle (X.FL-R-SMT-1). Shift them back and forth and left and right to align the mating axes.



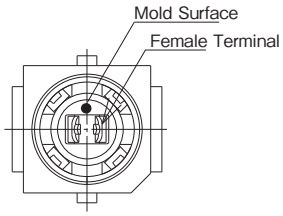
(2) Confirm that the mating axes are aligned by checking for position stability.
When the connector is partially mated with the receptacle it will not move even when a force is applied.



(3) Push the connector down perpendicularly until you feel it click.

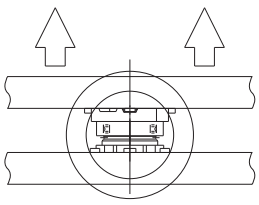


(4) If the mating axes cannot align and the plug cannot be inserted, please check that the contact portion of the female terminal on the plug receptacle has not been damaged as a result of mold deformation from collision with the receptacle shell.

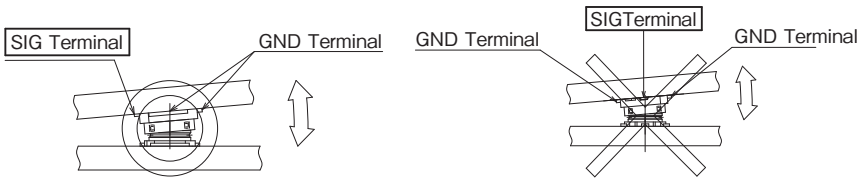


2. Unmating

When unmating, pull the connector in the direction perpendicular to the mating surface as much as possible.



However it may be difficult to remove perpendicularly from a thin, unlined board (FPC, etc.). In such cases remove diagonally as shown in the left diagram. Avoid removing the connector from the direction shown in the right diagram.

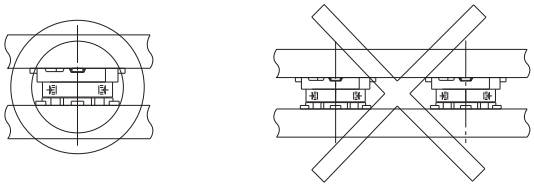


3. Precautions

Do not mate or unmate a connector with an excessive prying force. It may cause connector damage.

4. Notes for mounting

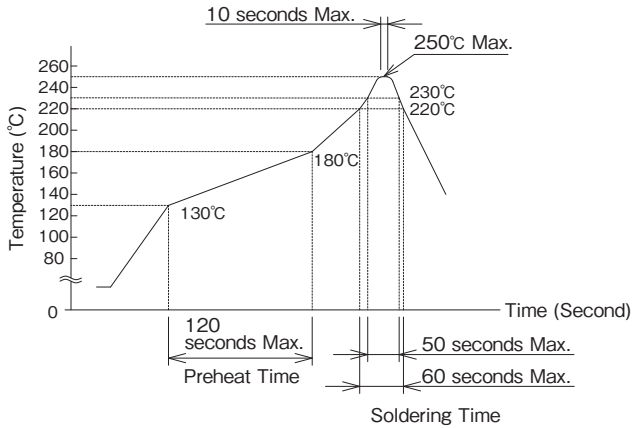
Avoid mounting multiple connectors of this type on the same circuit board.
(If it is unavoidable to mount multiple connectors, take necessary measures for use, such as separating the circuit board between the connectors.)
When the connector is mounted on an FPC, insufficient stiffness may lead to land pattern separation or solder separation. It is recommended that the FPC should be lined with a reinforcing film.



5. Precautions

(1) Do not mate or unmate a connector with an excessive prying force. It may cause connector damage.
(2) The connector may become disconnected if it is dropped, or extreme stress is applied to the FPC.
To prevent disconnection, secure the connector in place by pushing down in the mating direction with the panel or cushioning material.

3. Reflow Conditions of Receptacles and Plug 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 Metal Mask Thickness	0.1mm to 0.12mm
(3) Reflow Cycles	2 times

PRODUCT CATALOG

HIROSE ELECTRIC CO.,LTD.

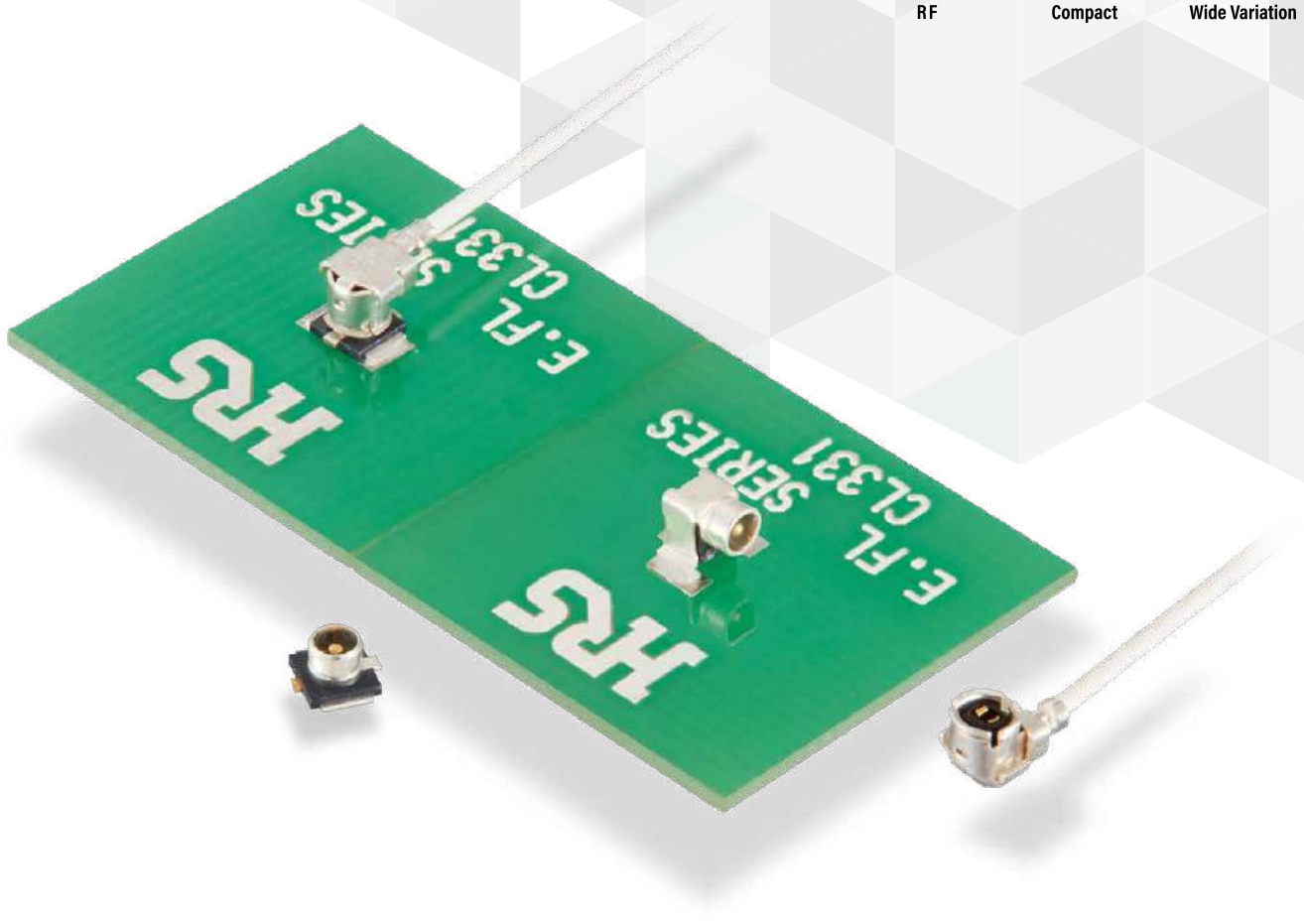
E.FL Series

Compact, Low Profile SMT Coaxial Connector

RF

Compact

Wide Variation

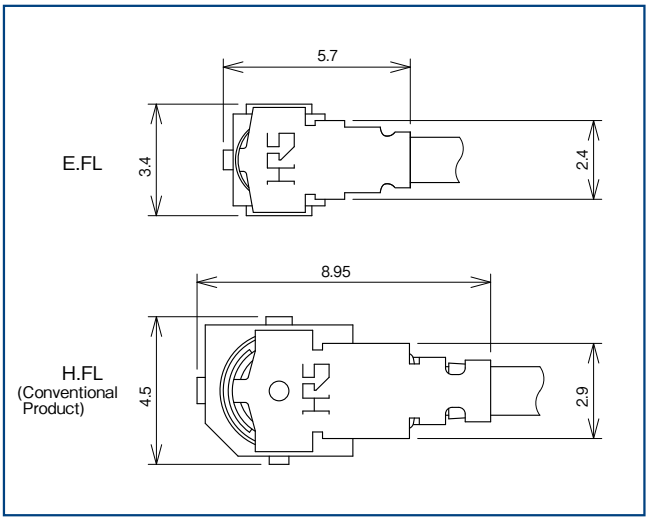


Dec. 2021

Features

1. Small Size, Space-saving

Compared to our H.FL Series, the board occupied mounting space is reduced by about 49 to 56%.
PCB Mounting Space : 9.4mm^2



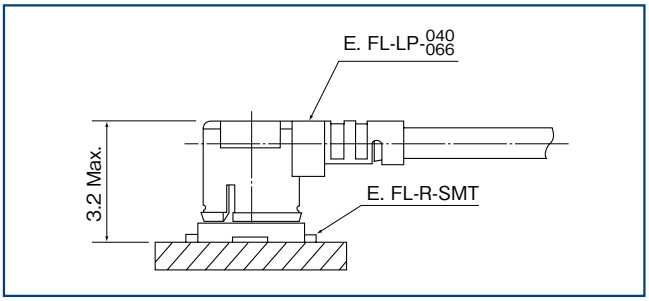
Size Comparison of H.FL Series and E.FL Series

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

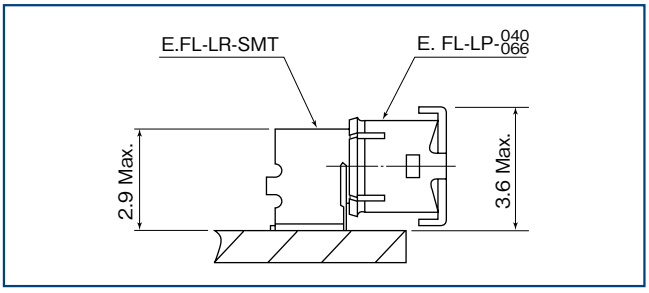
Compatible with easy-to-bend, ultra-fine ϕ0.81mm and ϕ1.32mm size coaxial cables for smooth and easy installment.

3. Low Profile

The maximum height from the board surface when the plug and straight receptacle are mated is 3.2mm Max.
When the plug and right angle receptacle are mated, the mated height from the board is 3.6mm Max.



E.FL-LP-$^{040}_{066}$ and E.FL-R-SMT



E.FL-LP-$^{040}_{066}$ and E.FL-R-SMT

4. RF Performance

V.S.W.R. DC to 2GHz : 1.3 Max.

5. Supports Automatic Mounting

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

6. Clear, Tactile Lock

Compact connector with clear tactile lock enables reliable mating.

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.

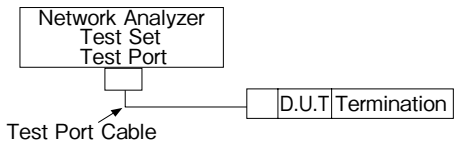
Product Specifications

Nominal Characteristic Impedance	50Ω	Operating Temperature	-40 to +90℃
Rated Voltage	60V AC	Operating Relative Humidity	90% Max.
Frequency Range	DC to 2GHz		

Item	Specifications	Conditions
Insulation Resistance	500MΩ Min.	100V DC
Withstanding Voltage	No flashover or insulation breakdown.	200V AC for 1 min.
Contact Resistance	Center : 20mΩ Max. Outer : 10mΩ Max.	10mA Max.
Female Contact Retention Force	0.15N Min.	Measured with ϕ 0.475 pin gauge
V.S.W.R.*	1.3 Max.	DC to 2GHz
Vibration	No electrical discontinuity of 1 μ s min.	Frequency : 10 to 100Hz, single amplitude of 1.5mm, acceleration of 59m/s^2, 1 hour in the direction of each of the 3 axis.
Humidity (Steady State)	Insulation Resistance : 10MΩ Min. (High Humidity) 500MΩ Min. (When Dry) No damage, cracks or parts dislocation.	96 hours at temperature of 40℃ and humidity of 95%.
Thermal Shock	No damage, cracks or parts dislocation.	Temperature : -40 → +5 to +35 → +90 → +5 to +35℃ Time : 30 → 5 → 30 → 5 minutes for 5 cycles
Mating Durability	Contact Resistance : 25mΩ Max. (Center) 15mΩ Max. (Outer)	50 times
Salt Spray	No significant corrosion	5% salt water solution, 48 hours

*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 connectors attached to the cable assembly at both ends of a compatible 10cm cable.
Note 2 : Board type connectors were mounted to a 50Ω board and measurements were conducted with SMA connectors attached.

Materials / Finish

Part	Materials		Finish	Flame Retardance
Shell	Phosphor Bronze		Silver Plated	—
Male Center Contact	Brass		Gold Plated	—
Female Center Contact	Phosphor Bronze		Gold Plated	—
Insulator	Plug	PBT	Black	UL94V-0
	Receptacle	LCP		

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.

● Plug

E.FL - LP - 040 (01)
❶ ❷ ❸ ❹

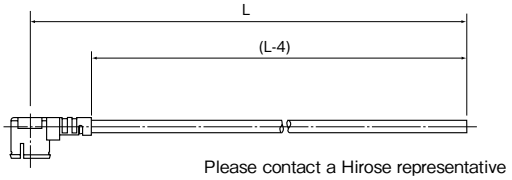
● Receptacle

E.FL - R - SMT (10)
❶ ❷ ❸ ❹

❶ Series Name	E.FL	❸ Compatible Cable or Board Mounting Method	Plug 040 : ϕ 0.81 Single Shield Cable 066 : ϕ 1.32 Double Shield Cable Receptacle SMT : Printed Circuit Board Surface Mount Type
❷ Connecter Type	LP : Right Angle Plug R : Straight Receptacle LR : Right Angle Receptacle	❹ Packing Types	(01) : Packing (100pcs per bag) (10) : Reel Packing (2,500pcs per reel) Note : Specification (10) is only available for the receptacle.

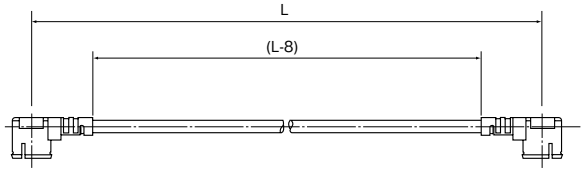
● How to Designate Plug Cable Assembly Dimensions

Single-ended Cable Assembly



Please contact a Hirose representative about cable end processing.

Double-ended Cable Assembly



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.)

● Cable Assembly Product Number Structure

E.FL - 2LP - 04N 1 - A - L
❶ ❷ ❸ ❹ ❺

❶ Series Name	E.FL	❸ Plug Type and Cable Type	04N : Plug E.FL-LP-040, ϕ 0.81 Cable 066N : Plug E.FL-LP-066N, ϕ 1.32 Cable
❷ Assembly Type	LP : Single Ended 2LP : Double Ended	❹ Cable Color	04N : 1 : White, 2 : Black 066N : 1 : Gray, 2 : Black
		❺ Total Length (mm)	L length (mm)

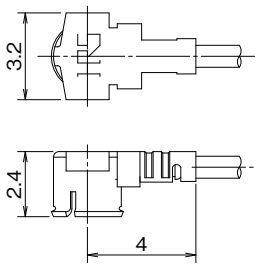
● Standard Tolerances for (L)

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.

Right Angle Plug

We accept cable assembly orders for the plug as well.

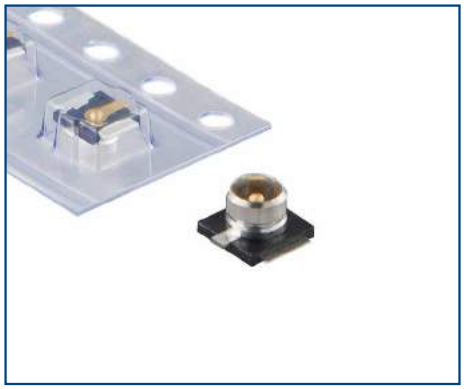


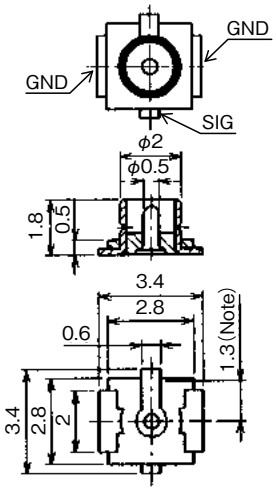
Cable Assembly State

Part No.	HRS No.	Cable Type
E.FL-LP-040(01)	CL0331-0401-4-01	ϕ 0.81 Cable
E.FL-LP-066(01)	CL0331-0402-7-01	ϕ 1.32 Cable

Receptacle

● Straight Receptacle

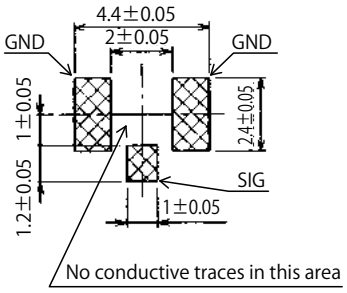




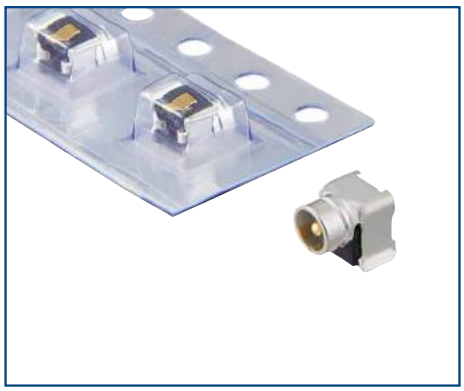
Note : Tolerance value of mold resin applied to center contact.

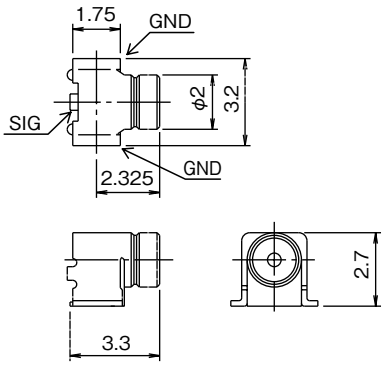
Part No.	HRS No.	Purchase Unit
E.FL-R-SMT(01)	CL0331-0421-1-01	100pcs per bag
E.FL-R-SMT(10)	CL0331-0421-1-10	2,500pcs per reel

Recommended PCB Mounting Pattern



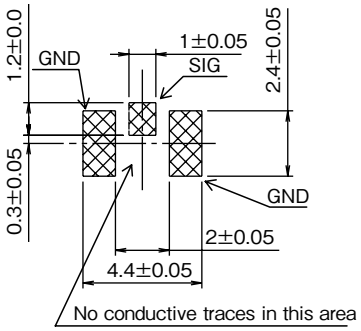
● Right Angle Receptacle





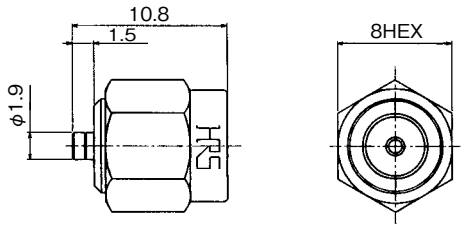
Part No.	HRS No.	Purchase Unit
E.FL-LR-SMT(01)	CL0331-0422-4-01	100pcs per bag
E.FL-LR-SMT(10)	CL0331-0422-4-10	2,500pcs per reel

Recommended PCB Mounting Pattern



Conversion Adapter

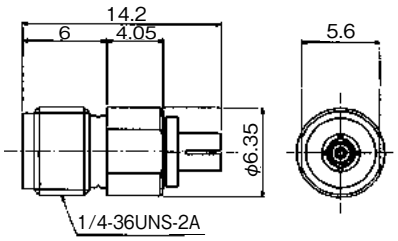
SMA Conversion Adapter (Mated Portion-E.FL Side : Jack, SMA Side : Plug)



Part No.	HRS No.	Purchase Unit
HRMP-E.FLJ(40)	CL0311-0279-8-40	20pcs per bag

Note : Since the E.FL side mating portion has a weaker lock than standard products, it cannot be used for purposes other than performance measurement.

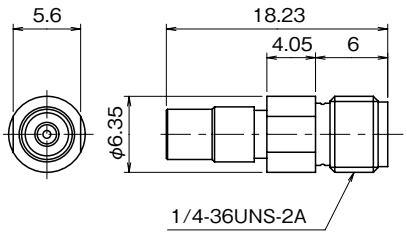
SMA Conversion Adapter (Mated Portion-E.FL Side : Plug, SMA Side : Jack)



Part No.	HRS No.	Purchase Unit
HRMJ-E.FLP(40)	CL0311-0278-5-40	20pcs per bag

Note : Since the E.FL side mating portion has a weaker lock than standard products, it cannot be used for purposes other than performance measurement.

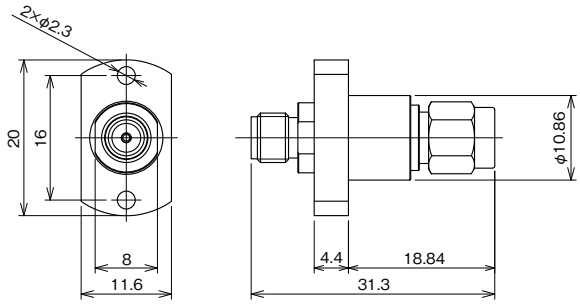
SMA Conversion Probe (Mated Portion-E.FL Side : Plug, SMA Side : Jack)



Part No.	HRS No.	Remarks	Purchase Unit
HRMJ-E.FLP-5(40)	CL0311-0294-1-40	for Mass Production Lines	20pcs per bag

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

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



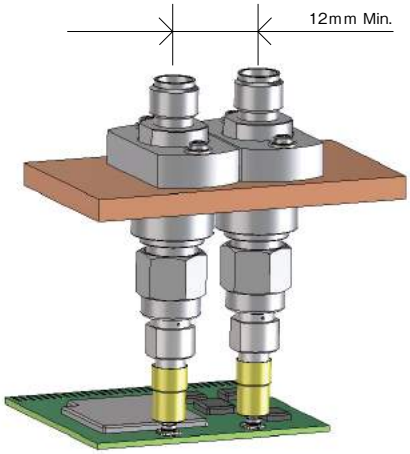
Part No.	HRS No.	Purchase Unit
HRM-PA-PJ(F)-1(40)	CL0323-0805-9-40	20pcs per bag

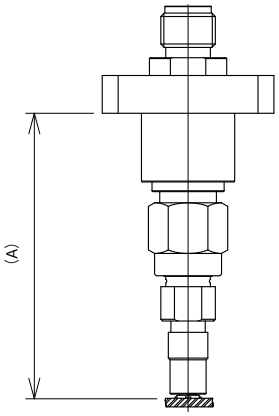
Note : HRMJ-E.FLP-5(40) aborbs misalignment when it is mated with the plug (coupling side) and the jack is connected to the measuring device.

Inspection Probe

HRMJ-E.FLP-5(40) and HRM-PA-PJ(F)1(40) Combination and Usage

Shortest Pitch when Adjacent



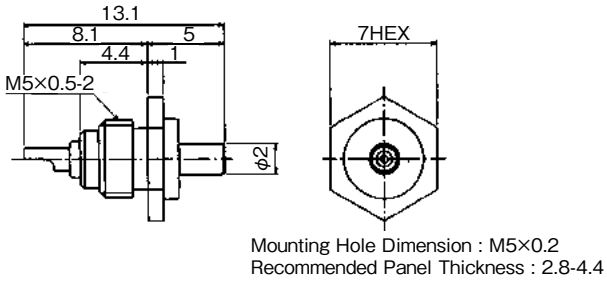


Flange to Board Surface	(A)
Recommendation for Measurement	32.8± 0.2
Starting Load	33.5

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

Inspection Receptacle

Receptacle for testing the conduction, withstanding voltage, etc. of the cable assembly.



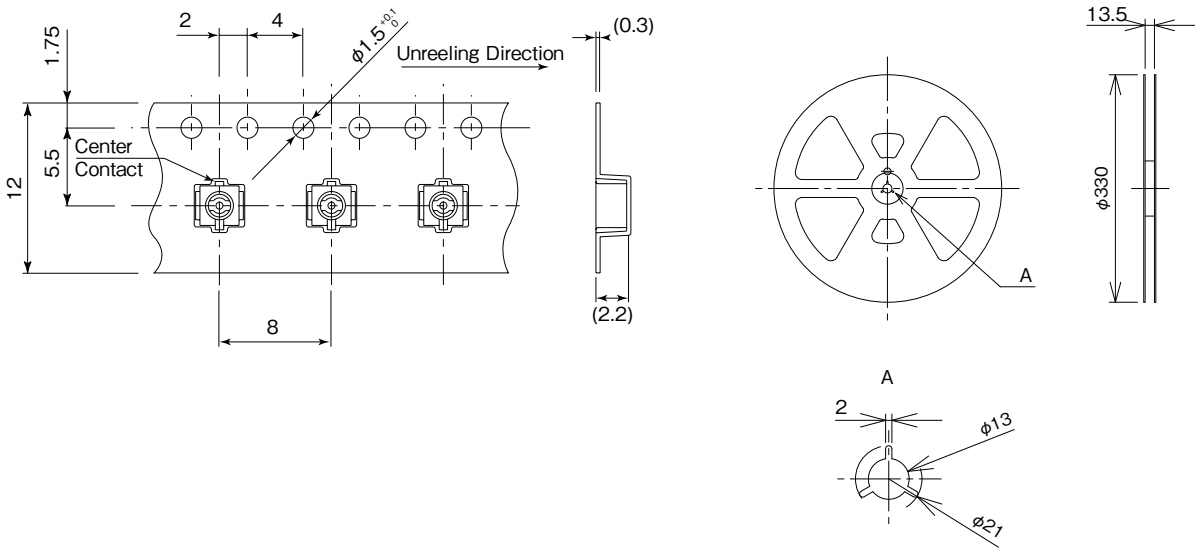
Mounting Hole Dimension : M5×0.2
Recommended Panel Thickness : 2.8-4.4

Part No.	HRS No.	Purchase Unit
E.FL-R-1	CL0331-0416-1-00	20pcs per bag

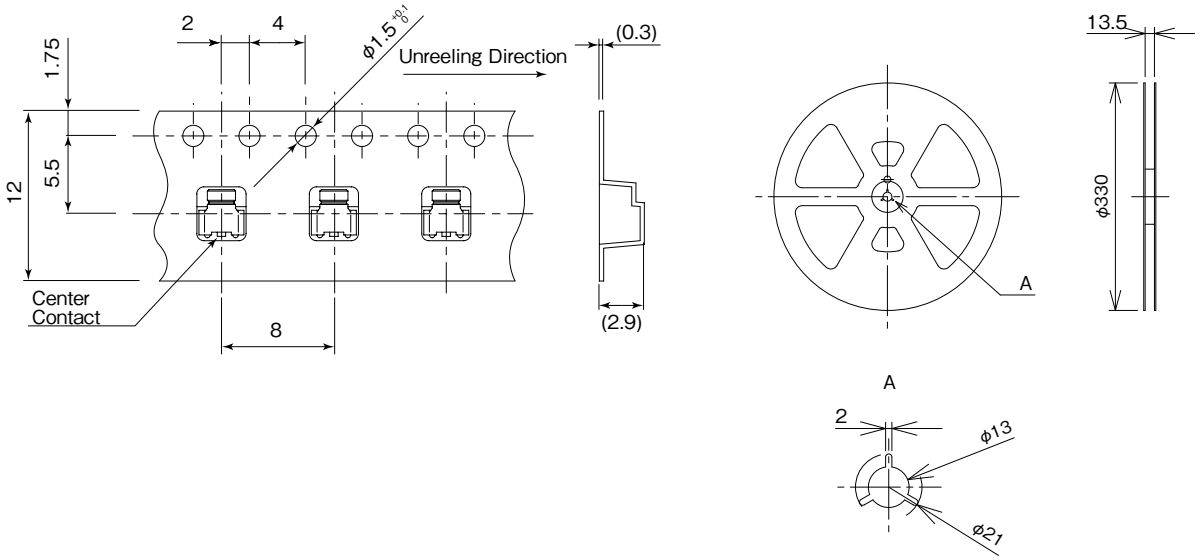
Note : Product cannot be used for purposes other than conduction or withstanding voltage inspection because there is no lock on the mated portion.

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

Straight Receptacle

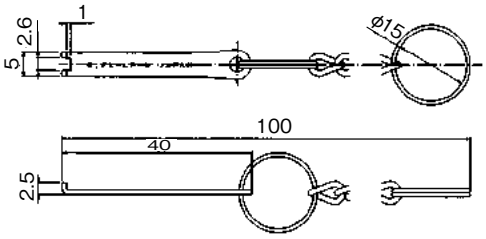


Right Angle Receptacle



Extraction Tool

Tool for Unmating.



Part No.	HRS No.	Purchase Unit
E.FL-LP-N	CL0331-0441-9-00	1pc per bag

Usage Precautions

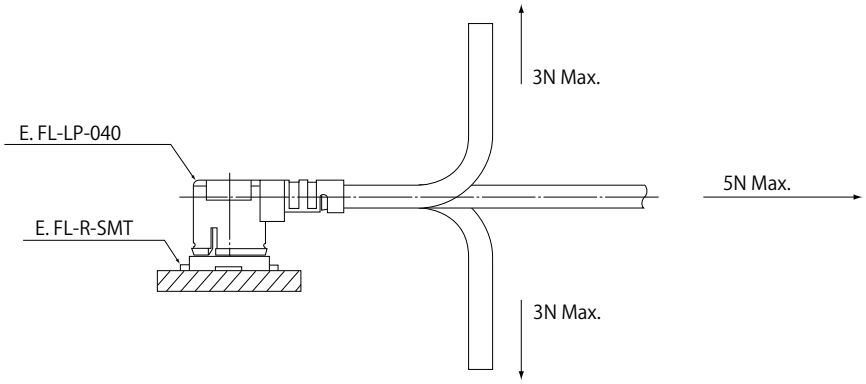
1. Plugs

(1) Mating/ Unmating

①To disconnect the connector, insert the extraction tool (E.FL-LP-N) 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 mating axis. Do not unmate the plug by pulling on the cable, this can damage the connector performance.

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.

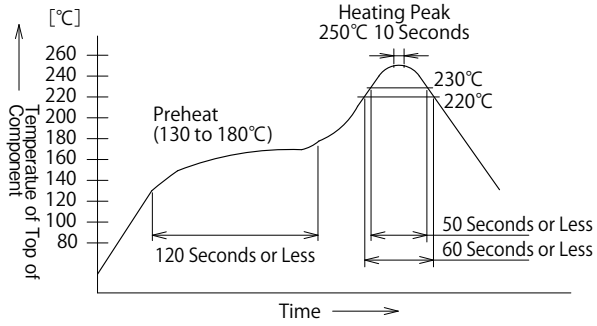
(2) Tolerable Load to a Cable After Mating



(3) Precautions

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

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

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.

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.

PRODUCT CATALOG

HIROSE ELECTRIC CO.,LTD.

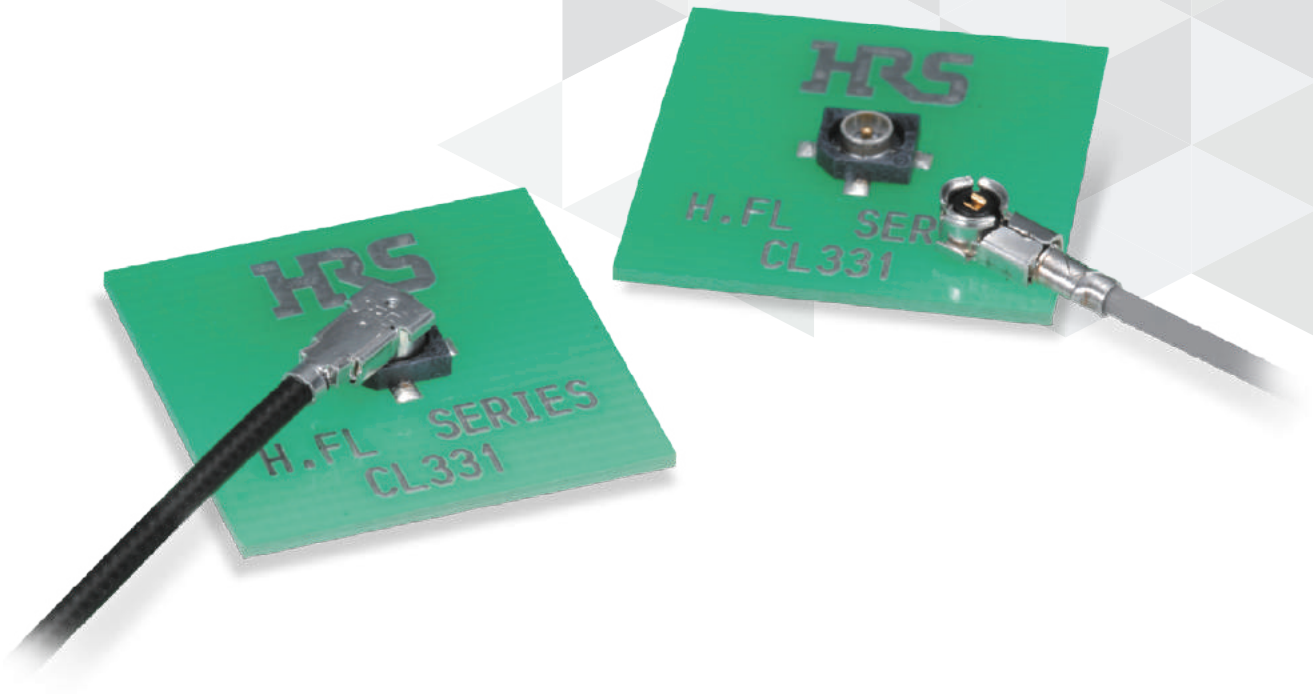
H.FL Series

SMT Low Profile Small Coaxial Connector

RF

Compact

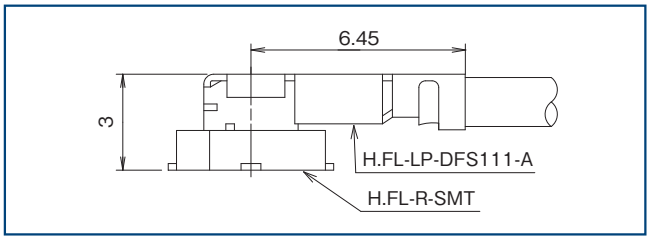
Wide Variation



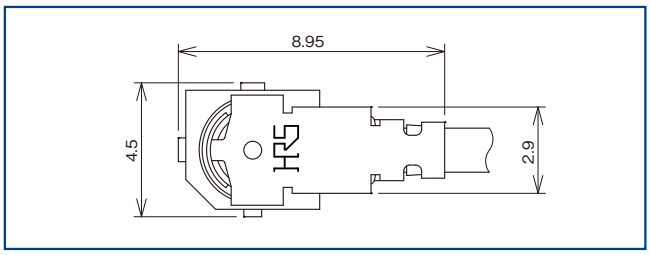
Features

1. Compact 50Ω Coaxial Connector

Mated height of the receptacle and right angle plug is only 3mm.



Mated Connector Dimensions
H.FL-LP-DFS111-A and H.FL-LP-A32-A differ only in cable diameter.



PCB Mounting Space During Mated

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

A choice of two cable types with excellent ease of installation.
Plug for φ1.48mm (Single Shield):
H.FL-LP-DFS111-A

Plug for φ1.32mm (Double Shield):
H.FL-LP-A32-A

3. RF Performance (up to 3GHz)

V.S.W.R. 0 to 3GHz : 1.3 Max.

4. Supports Automatic Mounting

Tape and Reel packaging allows for pick & place mounting.

5. Clear, Tactile Lock

Compact connector with clear tactile lock enables reliable mating.

6. RoHS2 Compliant

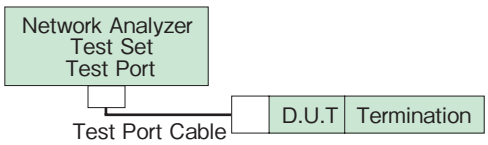
Product Specifications

Nominal Characteristic Impedance	50 Ω	Operating Temperature	-40 to +90℃ (90% RH Max.)
Rated Voltage	60V AC	StorageTemperature Range	-30 to +70℃ (90% RH Max.)
Frequency Range	0 to 3GHz		

Item	Specification	Conditions
Contact Resistance	Center : 20m Ω Max. Outer : 10m Ω Max.	10mA Max.
Insulation Resistance	500M Ω Min	250V DC
Withstanding Voltage	No insulation breakdown.	300V AC for 1 min.
V.S.W.R.*	1.3 Max.	0 to 3GHz
Female Contact Retention Force	0.2N Min.	Measured with ϕ 0.475 pin gauge
Mating Durability (With Corresponding Plug)	Contact Resistance : 25m Ω Max. (Center) 15m Ω Max. (Outer)	50 cycles
Vibration	No electrical discontinuity of 1 μ s 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	No electrical discontinuity of 1 μ s min. No damage, cracks or parts dislocation.	Acceleration of 735m/s^2, 11ms duration, sine half-wave waveform, 3 cycles in each of 6 axis.
Humidity (Steady State)	No damage, cracks or parts dislocation. Insulation Resistance : 10M Ω Min. (High Temperature) 500M Ω Min. (When Dry)	96 hours at temperature of 40℃ and humidity of 95%.
Thermal Shock	No damage, cracks or parts dislocation. Contact Resistance : 25m Ω Max. (Center) 15m Ω Max. (Outer)	Temperature : -40℃ → +5 to +35℃ → +90℃ → +5 to +35℃ Time : 30min. → 5min. → 30min. → 5min. 5 cycles
Salt Spray	No corrosion that impairs function.	5% salt water solution, 48 hours

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

Materials / Finish

Part	Material		Finish	Flame Retardance
Shell	Phosphor Bronze		Silver Plated	–
Male Contact	Brass		Gold Plated	–
Female Contact	Phosphor Bronze			–
Insulator	Plug	PBT	Black	UL94V-0
	Receptacle	LCP		

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.

●Plug

H.FL ❶ - LP ❷ - DFS111 ❸ - A (01) ❺

●Female Terminal

H.FL ❶ - CONTACT ❸

●Receptacle

H.FL ❶ - R ❷ - SMT ❸ (C) ❹ (10) ❺

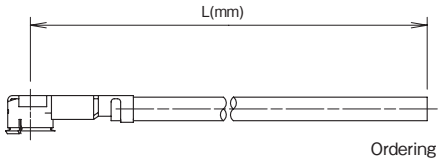
❶ Series Name	H.FL	❹ Receptacle	(C) : With Suction Cap None : Without Suction Cap
❷ Connecter Type	LP :Right Angle Plug R : Receptacle	❺ Packing Types (Note 2)	(01) : Packing (100pcs per pack) (10) : Reel Packing (2,500pcs per Reel)
❸ Compatible Cable or Board Mounting Method	Plug DFS111 : ϕ 1.48 Cable A32 : ϕ 1.32 Cable CONTACT : Female Terminal for Plug Receptacle SMT : Printed Circuit Board Surface Mount Type		

Note 1 : Refer to the "Right Angle Plug" section for plug specifications.
Note 2 : Specification (10) is only available for the receptacle.

●How to Designate Plug Cable Assembly Dimensions

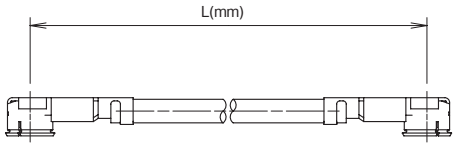
The dimension specifications of the H.FL Series harness are as follows.

[Single-ended Cable Assembly]



Ordering information

[Double-ended Cable Assembly]



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.)

●Cable Assembly Product Number Structure

H.FL - 2LP(A) - # - A - (L)

❶ ❷ ❸ ❹

❶ Series Name	H.FL	❸ Cable Type	111, 084* : ϕ 1.48 Cable 066N* : ϕ 1.32 Cable
❷ Assembly Type	LP(A) : Single Ended 2LP(A) : Double Ended	❹ Total Length (mm)	L length (mm)

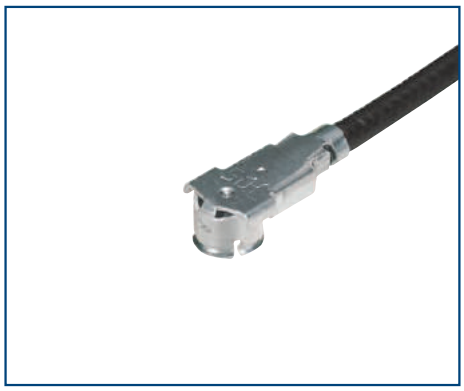
Note : Refer to the "Right Angle Plug" section for plug specifications.

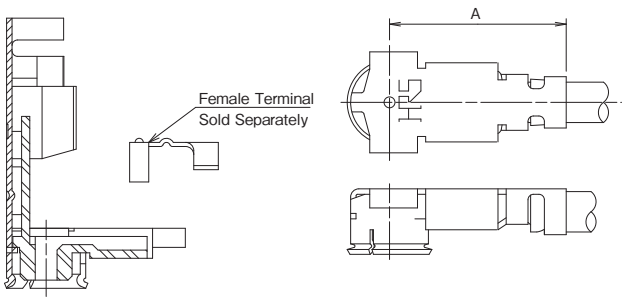
●Standard Tolerances for (L)

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.

Right Angle Plug

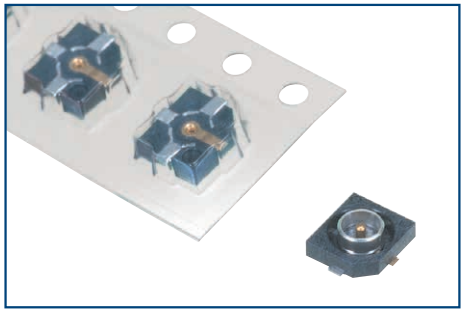


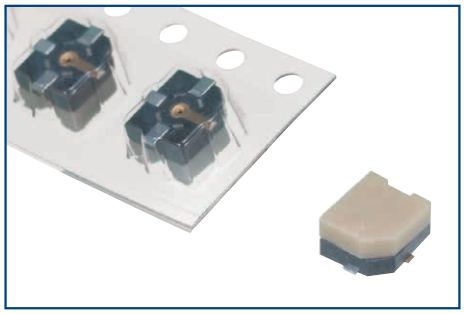


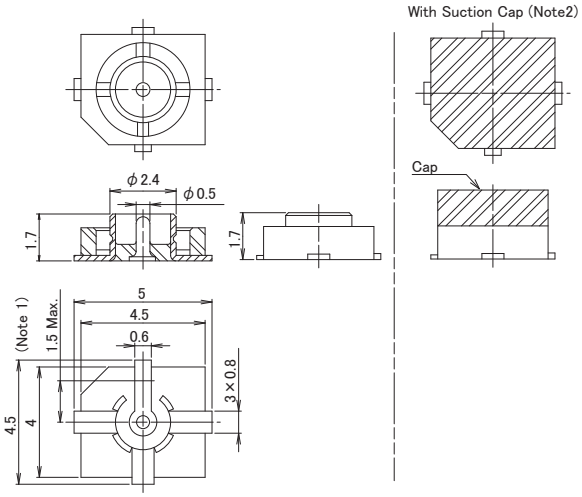
H.FL-LP-DFS111-A(01)ϕ1.48 Cable

Item	Part No.	HRS No.	Dimension A	Purchase Unit
Right Angle Plug Shell (ϕ 1.48 Cable)	H.FL-LP-DFS111-A(01)	CL0331-0507-5-01	6.45	100pcs per pack
Right Angle Plug Shell (ϕ 1.32 Cable)	H.FL-LP-A32-A(01)	CL0331-0508-8-01		
Female Terminal	H.FL-CONTACT	CL0331-0511-2-00	–	10,000pcs per reel

Receptacle





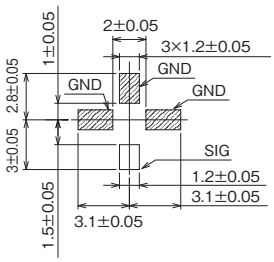


With Suction Cap (Note2)

Part No.	HRS No.	Purchase Unit
H.FL-R-SMT(01)	CL0331-0521-6-01	100pcs per pack
H.FL-R-SMT(10)	CL0331-0521-6-10	2,500pcs per reel
H.FL-R-SMT(C)(10)　(Note 2)	CL0331-0522-9-10	2,500pcs per reel

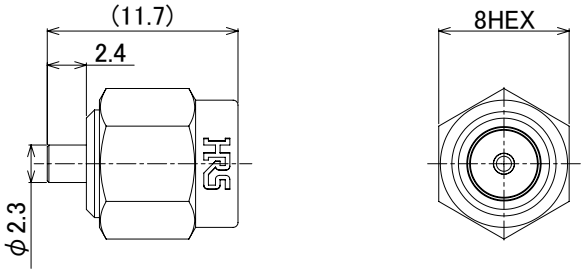
Note 1 : Tolerance value of mold resin applied to center contact.
Note 2 : This product comes with a suction cap compatible with any automated mouting machine.
The receptacle cannot be mated with the cap on, so please remove before use.

●Recommended PCB Mounting Pattern (Common)



Conversion Adapter

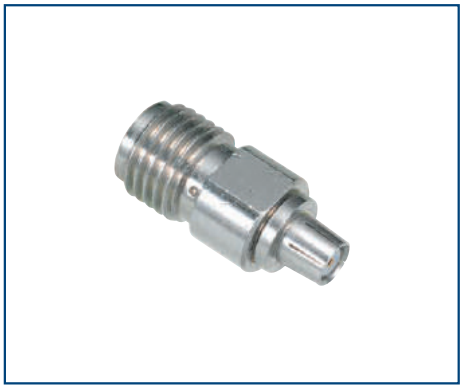
SMA Conversion Adapter (Mated Portion- H.FL Side : Jack, SMA Side : Plug)

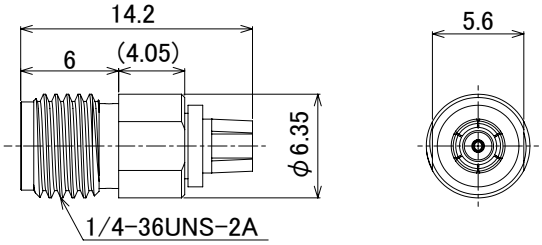


Part No.	HRS No.	Purchase Unit
HRMP-H.FLJ(40)	CL0311-0232-4-40	20pcs per pack

Note : The mating portion on the H.FL side does not have a locking mechanism, so it cannot be used for anything other than performance measurement.

SMA Conversion Adapter (Mated Portion - H.FL Side : Plug, SMA Side : Jack)



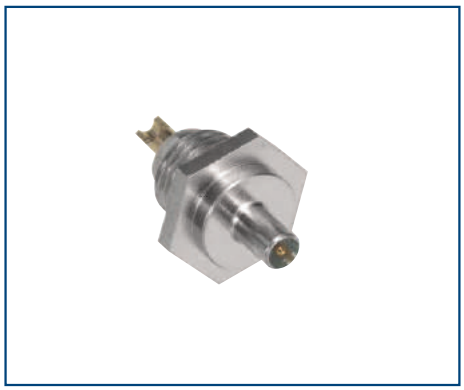


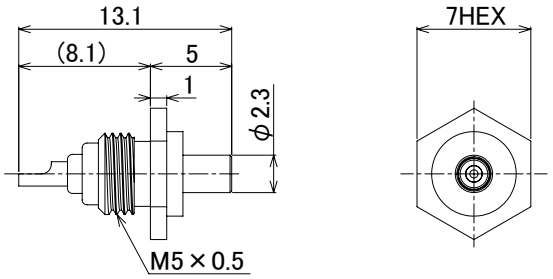
Part No.	HRS No.	Purchase Unit
HRMJ-H.FLP-3(40)	CL0311-0264-0-40	20pcs per pack

Note : The mating portion on the H.FL side does not have a locking mechanism, so it cannot be used for anything other than performance measurement.

Inspection Receptacle

Receptacle for testing the conduction, withstanding voltage, etc. of the cable assembly.



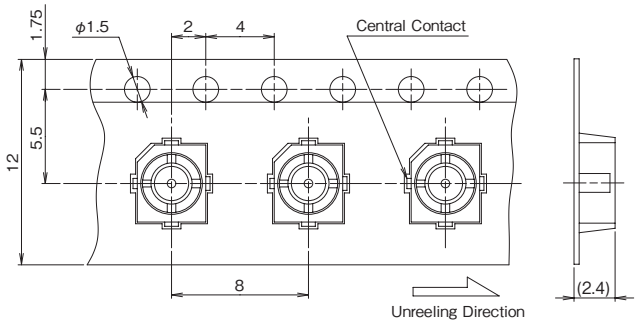


Part No.	HRS No.	Purchase Unit
H.FL-R-1	CL0331-0516-6-00	20pcs per pack

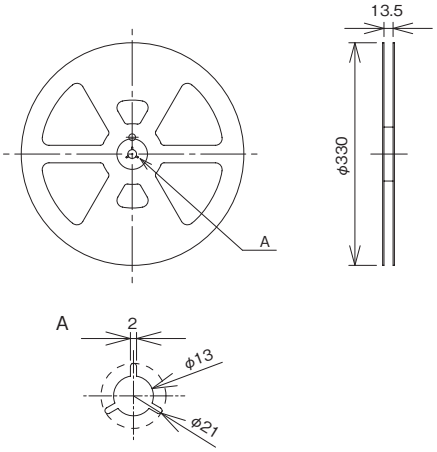
Note : Product cannot be used for purposes other than conduction or withstanding voltage inspection because there is no lock on the mating portion.

Embossed Carrier Tape Dimensions

Dimensions of the Embossed Carrier Tape for H.FL-R-SMT(10) are shown below.

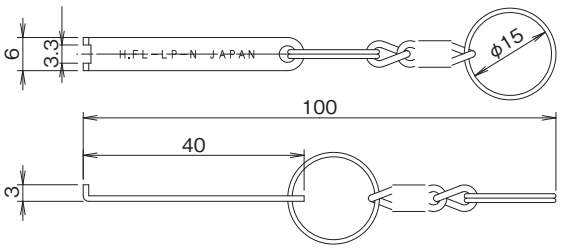


Reel Dimensions



Contact Extraction Tool

Tool for Unmating.



Part No.	HRS No.	Purchase Unit
H.FL-LP-N	CL0331-0551-7-00	1pc per pack

Usage Precautions

1. Plugs

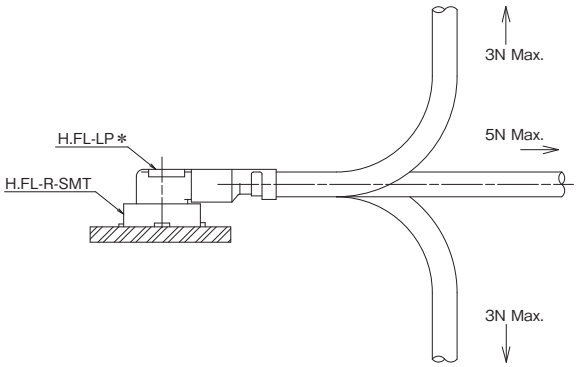
1. Mating/Unmating

(1) To disconnect the connector, insert the extraction tool (H.FL-LP-N) under the connector flange. Pull in a perpendicular direction in line with the connector's mating axis. Do not unmate the plug by pulling on the cable, this can damage the connector performance.

(2) When 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

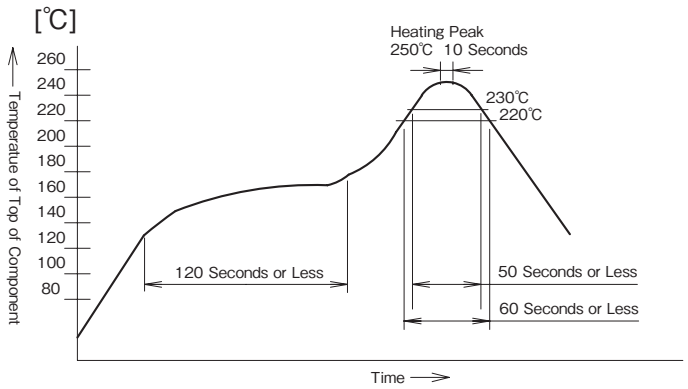
Once the connector has been mated do not apply forces exceeding the values in the diagram below.



3. Precautions

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

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	0.1mm to 0.15mm
(4) Reflow Cycles	2 times

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.

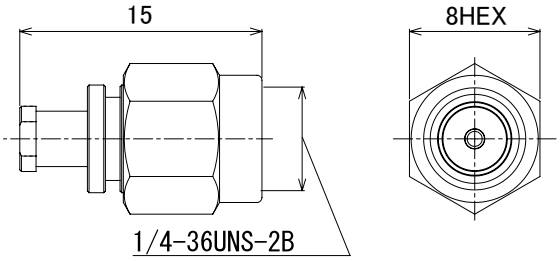
3. Silver Plating Discoloration

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

Standard Connectors the Connect with H.FL

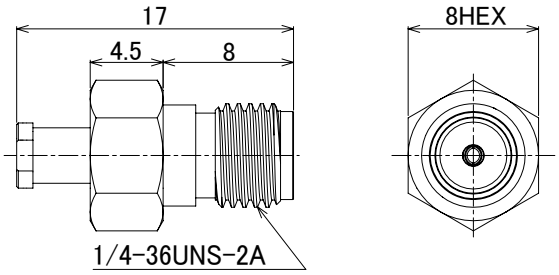
SMA Cable Type (HRM Series)

● Straight Plug



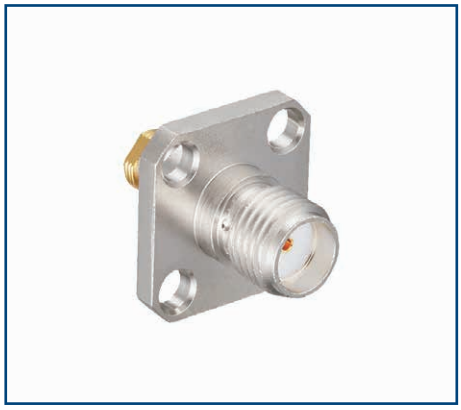
Part No.	HRS No.	Applicable Cable	Remarks
HRM-200-066PBN(40)	CL0323-0791-6-40	ϕ 1.32	SMA (Male Contact)
HRM-200-088PBN(40)	CL0323-0800-5-40	ϕ 1.48	

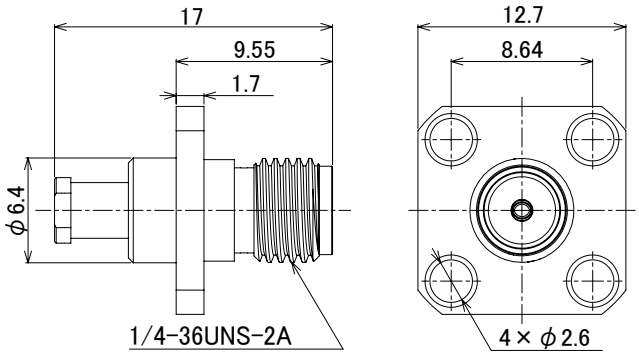
● Straight Jack



Part No.	HRS No.	Applicable Cable	Remarks
HRM-200-066JBN(40)	CL0323-0793-1-40	ϕ 1.32	SMA (Female Contact)
HRM-200-088JBN(40)	CL0323-0801-8-40	ϕ 1.48	

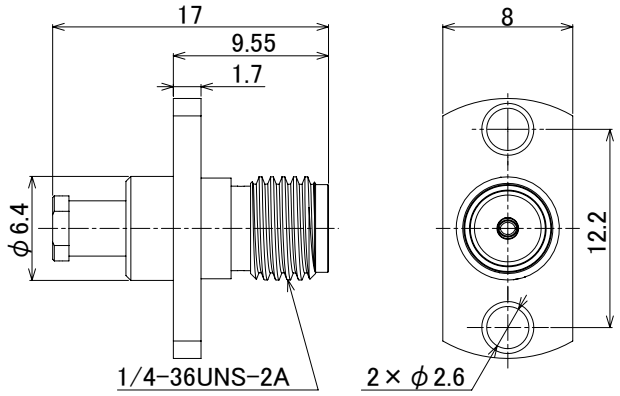
● Panel Jack (4 Screw Type)





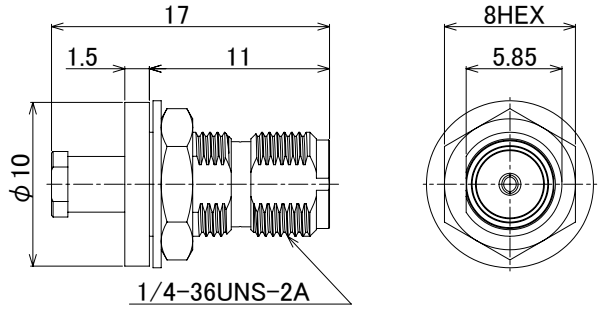
Part No.	HRS No.	Applicable Cable	Remarks
HRM-200-066PJ4BN(40)	CL0323-0796-0-40	ϕ 1.32	SMA (Female Contact)
HRM-200-088PJ4BN(40)	CL0323-0803-3-40	ϕ 1.48	

● Panel Jack (2 Screw Type)



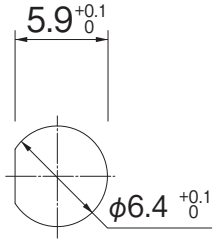
Part No.	HRS No.	Applicable Cable	Remarks
HRM-200-066PJ2BN(40)	CL0323-0788-1-40	ϕ 1.32	SMA (Female Contact)
HRM-200-088PJ2BN(40)	CL0323-0802-0-40	ϕ 1.48	

● Panel Jack (Nut Type)



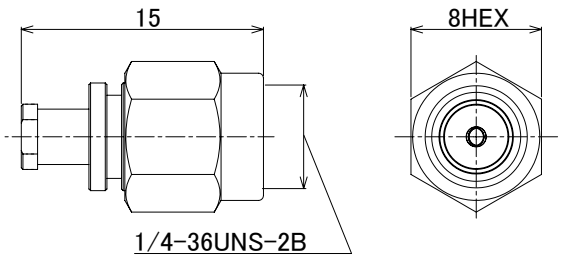
Part No.	HRS No.	Applicable Cable	Remarks
HRM-200-066BPJBN(40)	CL0323-0798-5-40	ϕ 1.32	SMA (Female Contact)
HRM-200-088BPJBN(40)	CL0323-0804-6-40	ϕ 1.48	

Mounting Hole Dimensions



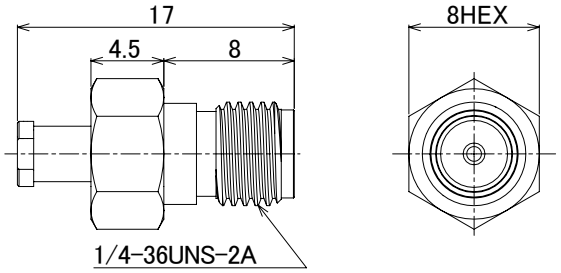
RP-SMA Cable Type (SAM(R) Seires)

● Straight Plug



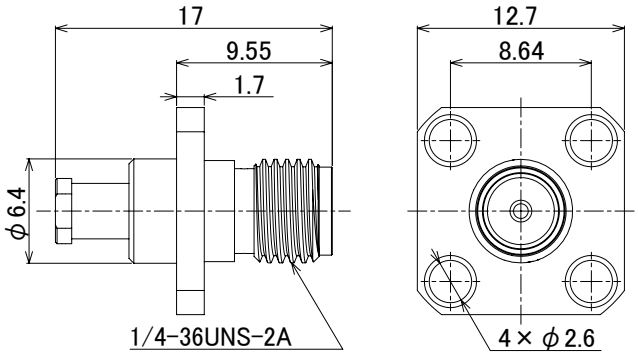
Part No.	HRS No.	Applicable Cable	Remarks
SMA(R)-200-066PBN	CL0323-0930-0-00	ϕ 1.32	SMA Reverse (Female Contact)
SMA(R)-200-088PBN	CL0323-0905-3-00	ϕ 1.48	

● Straight Jack



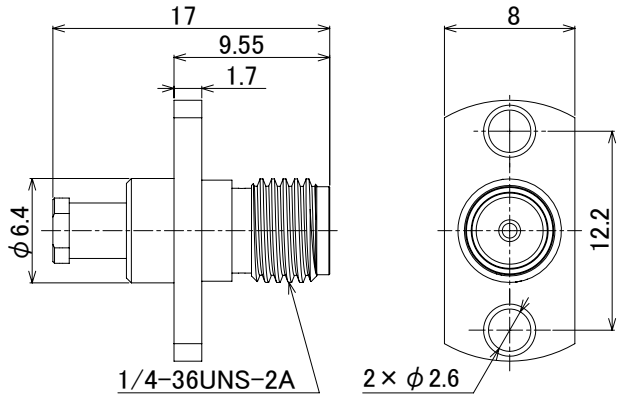
Part No.	HRS No.	Applicable Cable	Remarks
SMA(R)-200-066JBN	CL0323-0931-3-00	ϕ 1.32	SMA Reverse (Male Contact)
SMA(R)-200-088JBN	CL0323-0904-0-00	ϕ 1.48	

● Panel Jack (4 Screw Type)



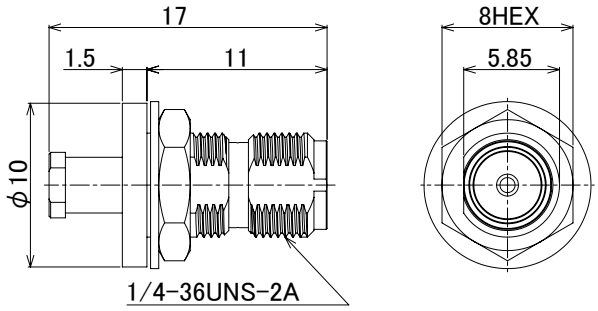
Part No.	HRS No.	Applicable Cable	Remarks
SMA(R)-200-066PJ4BN	CL0323-0932-6-00	ϕ 1.32	SMA Reverse (Male Contact)
SMA(R)-200-088PJ4BN	CL0323-0934-1-00	ϕ 1.48	

● Panel Jack (2 Screw Type)



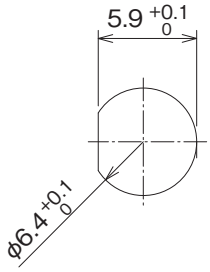
Part No.	HRS No.	Applicable Cable	Remarks
SMA(R)-200-066PJ2BN	CL0323-0933-9-00	ϕ 1.32	SMA Reverse (Male Contact)
SMA(R)-200-088PJ2BN	CL0323-0935-4-00	ϕ 1.48	

● Panel Jack (Nut Type)



Part No.	HRS No.	Applicable Cable	Remarks
SMA(R)-200-066BPJBN	CL0323-0902-5-00	ϕ 1.32	SMA Reverse (Male Contact)
SMA(R)-200-088BPJBN	CL0323-0901-2-00	ϕ 1.48	

Mounting Hole Dimensions



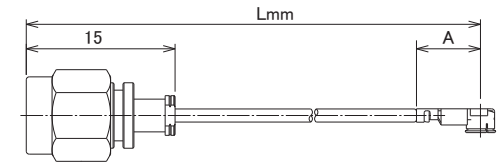
■Applicable Tools for SMA and RP-SMA Cable Type Connectors

Part No.	Wiring Tool	HRS No.	Overview
HRM-200-066PBN(40) HRM-200-088PBN(40)	HRM-200/SO-MD	CL0902-3192-6-00	Cord Soldering Cradle
	HRM-200/SO-MD2	CL0902-3199-5-00	Terminal Soldering Cradle
	HRM-200-PBN/CV-MD	CL0902-3198-2-00	Cord Press-fit Tool
HRM-200-066JBN(40) HRM-200-088JBN(40)	HRM-200/SO-MD	CL0902-3192-6-00	Cord Soldering Cradle
	HRM-200/SO-MD2	CL0902-3199-5-00	Terminal Soldering Cradle
	HRM-200-JBN/CV-MD	CL0902-3195-4-00	Cord Press-fit Tool
HRM-200-066PJ4BN(40) HRM-200-088PJ4BN(40)	HRM-200/SO-MD	CL0902-3192-6-00	Cord Soldering Cradle
	HRM-200/SO-MD2	CL0902-3199-5-00	Terminal Soldering Cradle
	HRM-200-PJ4BN/CV-MD	CL0902-3197-0-00	Cord Press-fit Tool
HRM-200-066PJ2BN(40) HRM-200-088PJ2BN(40)	HRM-200/SO-MD	CL0902-3192-6-00	Cord Soldering Cradle
	HRM-200/SO-MD2	CL0902-3199-5-00	Terminal Soldering Cradle
	HRM-200-PJ2BN/CV-MD	CL0902-3196-7-00	Cord Press-fit Tool
HRM-200-066BPJBN(40) HRM-200-088BPJBN(40)	HRM-200/SO-MD	CL0902-3192-6-00	Cord Soldering Cradle
	HRM-200/SO-MD2	CL0902-3199-5-00	Terminal Soldering Cradle
	HRM-200-BPJBN/CV-MD	CL0902-3194-1-00	Cord Press-fit Tool
SMA(R)-200-066JBN SMA(R)-200-088JBN	HRM-200/SO-MD	CL0902-3192-6-00	Cord Soldering Cradle
	HRM-200/SO-MD2	CL0902-3199-5-00	Terminal Soldering Cradle
	HRM-200-JBN/CV-MD	CL0902-3195-4-00	Cord Press-fit Tool
SMA(R)-200-066J4BN SMA(R)-200-088J4BN	HRM-200/SO-MD	CL0902-3192-6-00	Cord Soldering Cradle
	HRM-200/SO-MD2	CL0902-3199-5-00	Terminal Soldering Cradle
	HRM-200-PJ4BN/CV-MD	CL0902-3197-0-00	Cord Press-fit Tool
SMA(R)-200-066PJ2BN SMA(R)-200-088PJ2BN	HRM-200/SO-MD	CL0902-3192-6-00	Cord Soldering Cradle
	HRM-200/SO-MD2	CL0902-3199-5-00	Terminal Soldering Cradle
	HRM-200-PJ2BN/CV-MD	CL0902-3196-7-00	Cord Press-fit Tool
SMA(R)-200-066BPJBN SMA(R)-200-088BPJBN	HRM-200/SO-MD	CL0902-3192-6-00	Cord Soldering Cradle
	HRM-200/SO-MD2	CL0902-3199-5-00	Terminal Soldering Cradle
	HRM-200-BPJBN/CV-MD	CL0902-3194-1-00	Cord Press-fit Tool

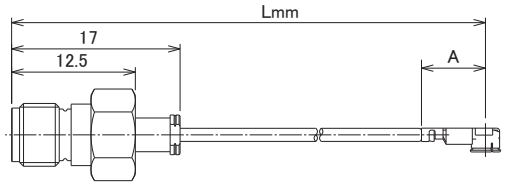
■ Cable Assembly Specifications

Designate and order the length specification of the H.FL Series and SMA or RP-SMA double-ended assembly based on the below length specification diagram.

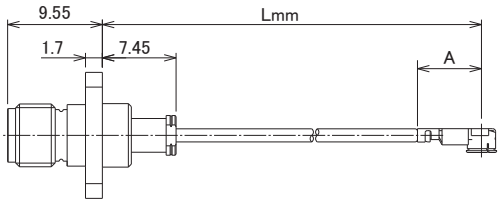
●Straight Plug



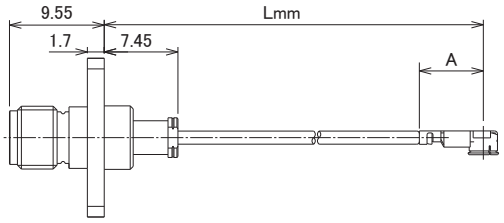
●Straight Jack



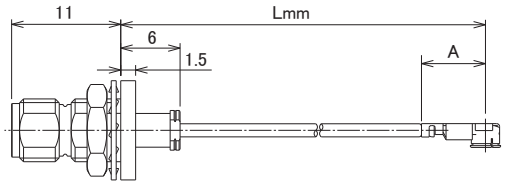
●Panel Jack (4 Screw Type)



●Panel Jack (2 Screw Type)



●Panel Jack (Nut Type)



Note : The shortest length is L = 50mm

Cable	Plug	A
ϕ 1.48	H.FL-LP-DFS111-A(01)	6.45
ϕ 1.32	H.FL-LP-A32-A(01)	