PRODUCT CATALOG

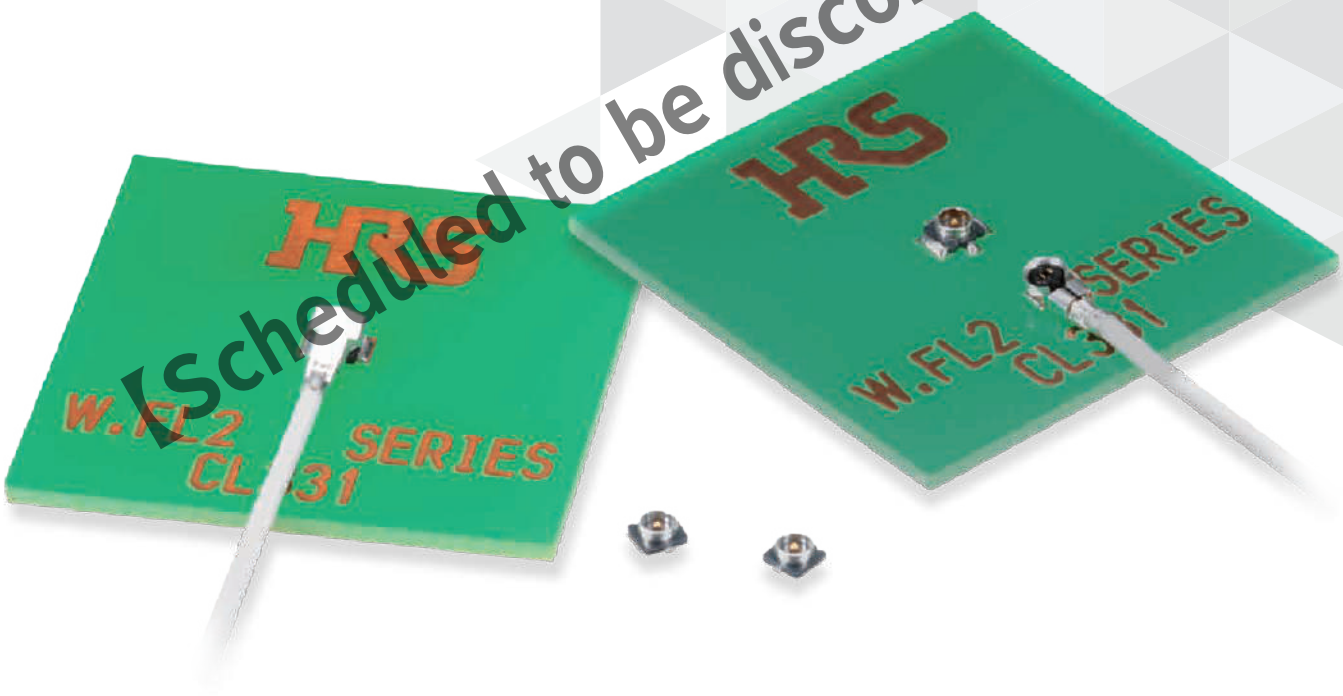
HIROSE ELECTRIC CO.,LTD.

W.FL2 Series

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

RF Compact Wide Variation

[Scheduled to be discontinued]



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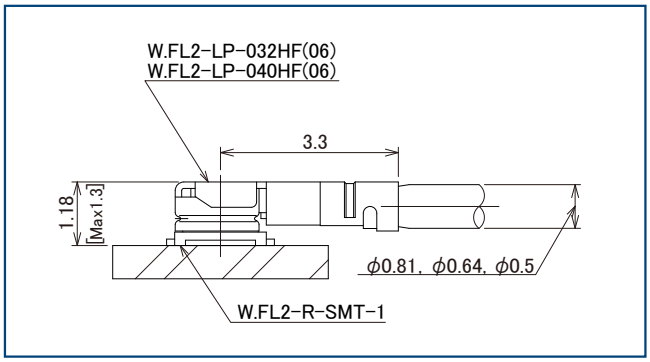
Product Page
https://www.hirose.com/en/product/series/W.FL2

Oct. 2022

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.

[Scheduled to be discontinued]

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7. Halogen-Free

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

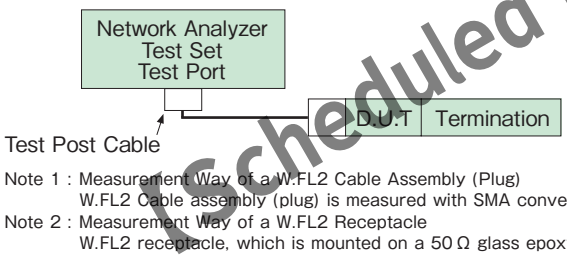
Product Specifications

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

[Scheduled to be discontinued]

* 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	-

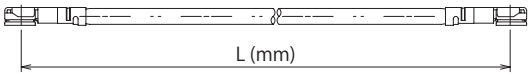
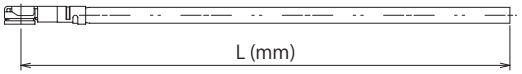
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Product Number Structure

■ 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)

[Scheduled to be discontinued]

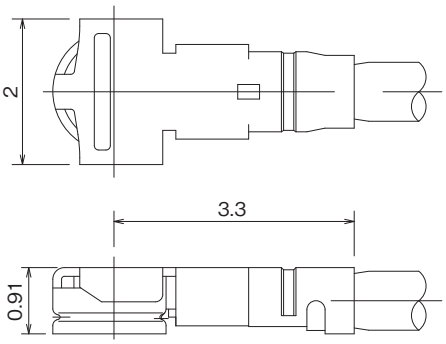
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Cable Assembly Plug

Please order the plug in cable assembly specifications.

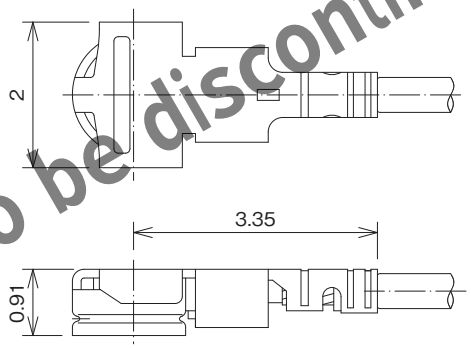
● W.FL2-LP-040HF(06)
(Applicable Cable : Outer Diameter φ0.81 and φ0.64)





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





[Scheduled to be discontinued]

● 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

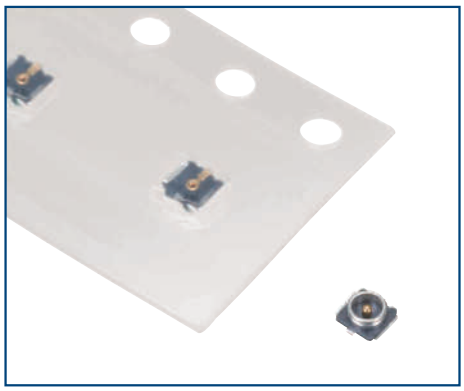
Standard Tolerances for (L)

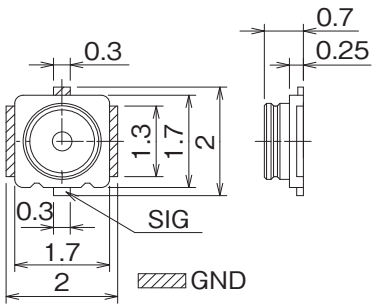
L (mm)	Standard Tolerance (mm)
35 ≦ L ≦ 200	± 4
200 < L ≦ 500	± 8
500 < L ≦ 1000	± 12
1000 < L	± 1.5%

Note : The shortest length is L = 35mm.

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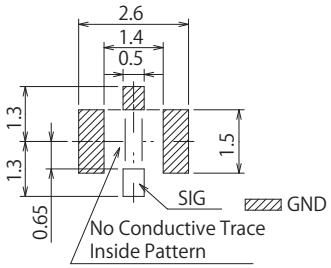
Receptacle





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

■ Recommended PCB Layout

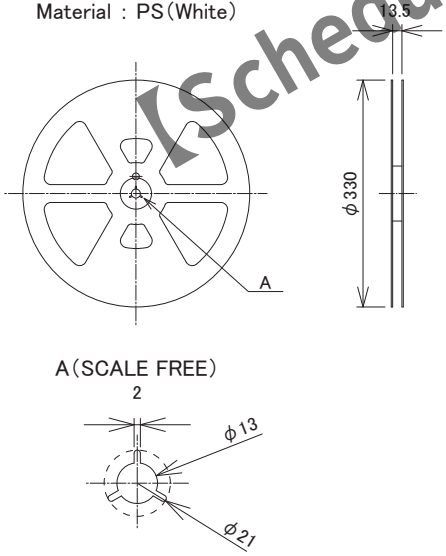


Note : PCB Layout is same with X.FL and W.FL connector.

[Scheduled to be discontinued]

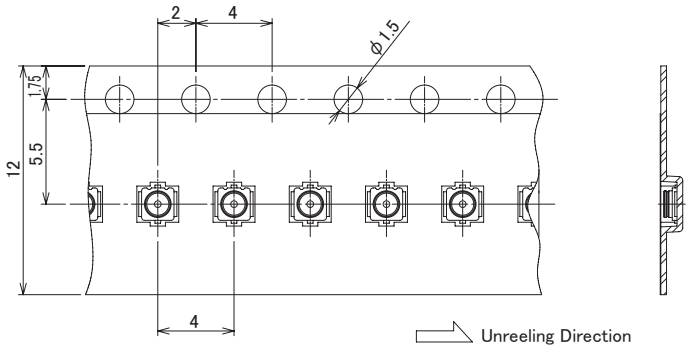
● Reel Dimensions

Material : PS(White)



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

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

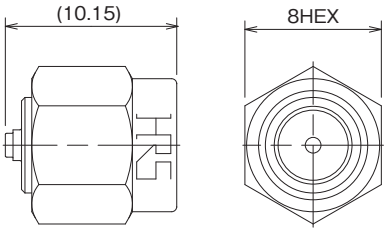


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Conversion Adapter

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



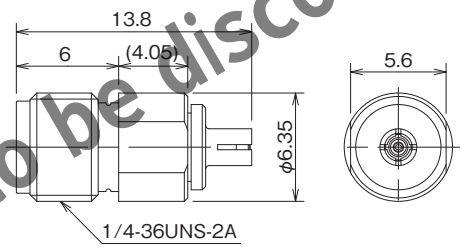


Part No.	HRS No.	Purchase Unit
HRMP-W.FL2J	CL0311-0394-6-00	20pcs per bag

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)





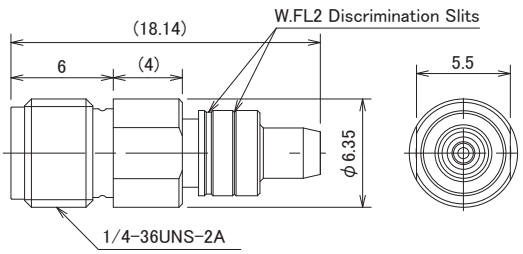
(Scheduled to be discontinued)

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)





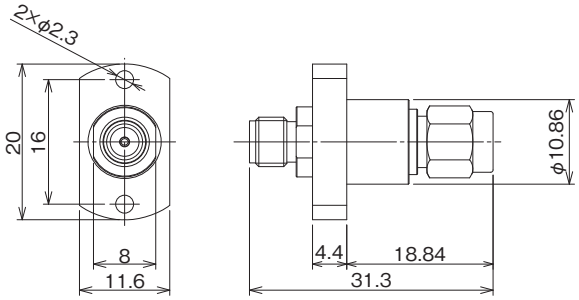
Part No.	HRS No.	Purchase Unit
HRMJ-W.FL2P-ST3	CL0311-0417-0-00	20pcs per bag

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

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

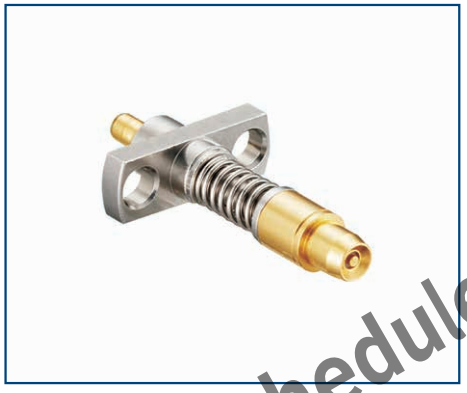


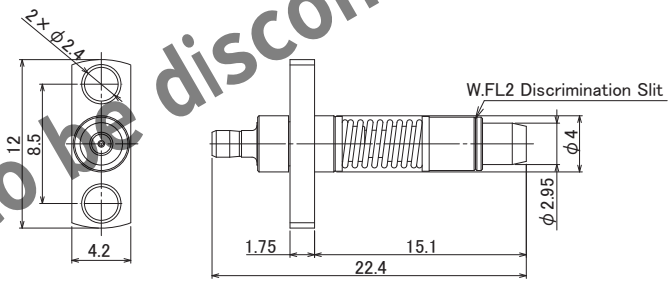


Part No.	HRS No.	Purchase Unit
HRM-PA-PJ(F)-1(40)	CL0323-0805-9-40	20pcs per bag

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)



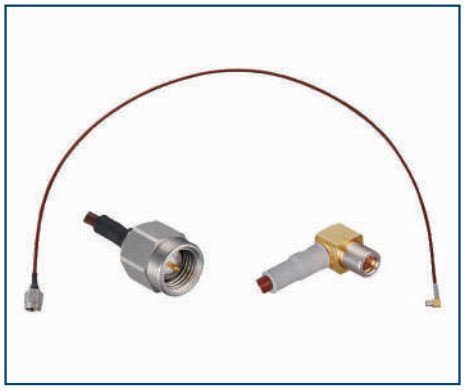


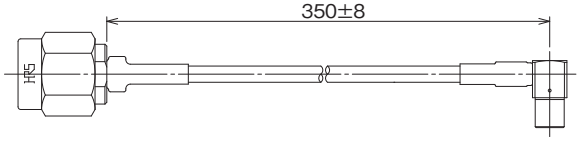
[Scheduled to be discontinued]

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

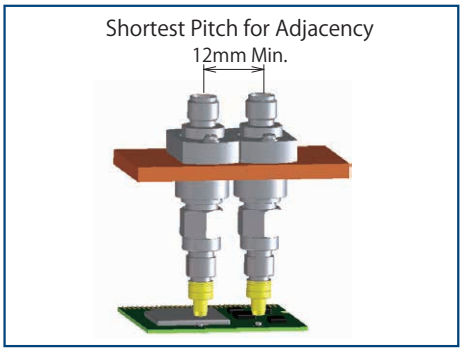
Note : Used to connect W.FL2P-ML51.J-PA(F)-ST and measuring device.
As for the cable length, we recommend that Item provide slack so that the shaft displacement can be absorbed smoothly.

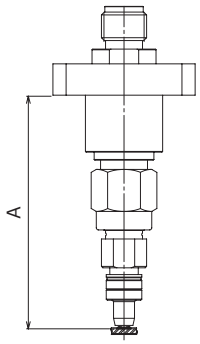
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Inspection Probe

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

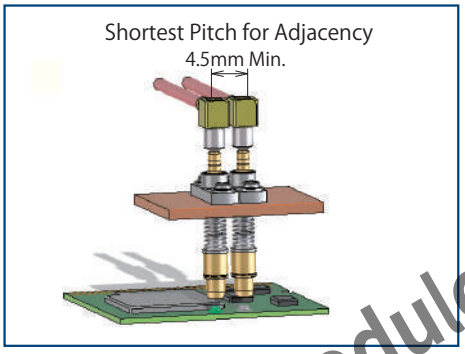


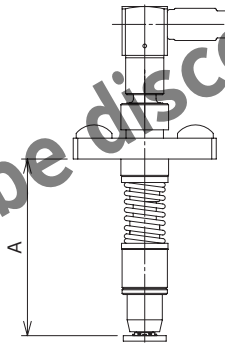


Flange to Board Surface	A
Recommendation for Measurement	32 ± 0.2
Starting Load	32.7

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

[Scheduled to be discontinued]



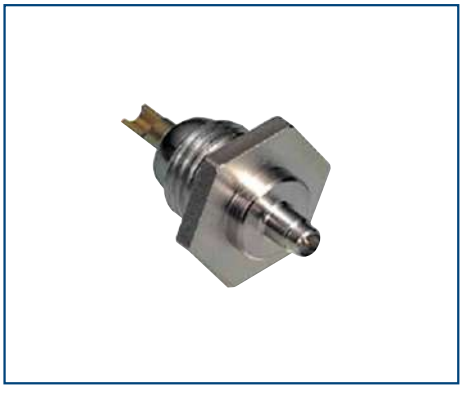


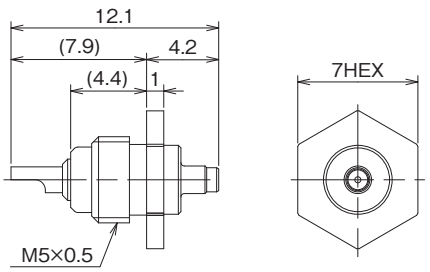
Flange to Board Surface	A
Recommendation for Measurement	14.55 ± 0.2
Starting Load	15.5

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

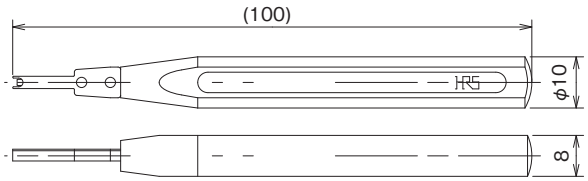
Note1 : Product can be used for W.FL and W.FL2 connector.
Note2 : Product cannot be used for purposes other than conduction or withstanding voltage inspection because there is no lock on the mating portion.

Tool

● Plug Mating Tool (Space-saving Type)

This tool is used for plug mating.





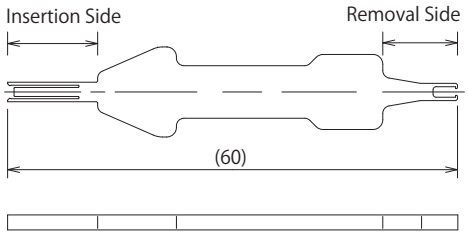
Part No.	HRS No.	Purchase Unit
W.FL-LP-IN (Note)	CL0331-0323-2-00	1pc per bag

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

【Scheduled to be discontinued】

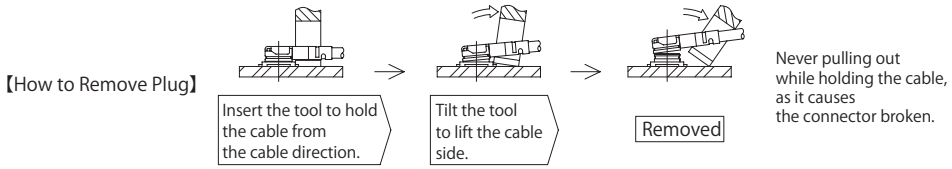
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Precautions

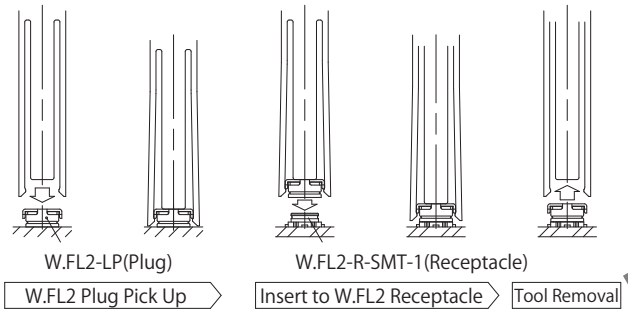
1. Plugs

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.

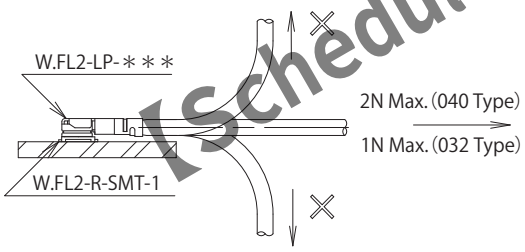


(2) When inserting the connector, use the insertion side of the insertion and removal tool or W.FL-LP-IN.
Align the mating shafts of both connectors, check that the guide of shell part, and insert them as vertically as possible. (See diagram below)
Also, do not insert at an extreme angle, as it causes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



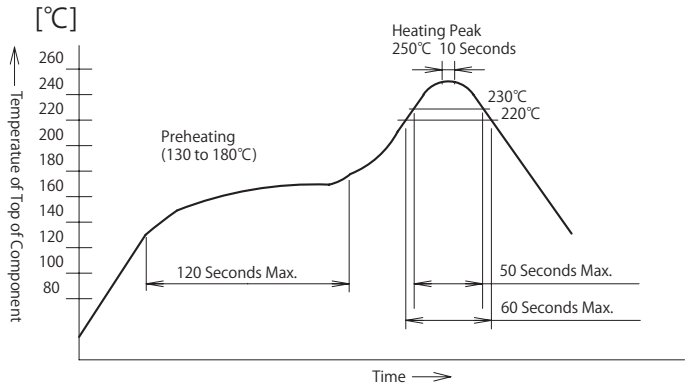
3. Precautions

Do not twist connectors excessively during mating / unmating.

【Scheduled to be discontinued】

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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.

[Scheduled to be discontinued]

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While Taking into Consideration

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

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