

Hirose

Field Replaceable Coaxial Connector Guideline

HV-R-FR*(**) (1.85mm)

H2.4-R-FR*(**) (2.4mm)

HK-R-FR*(**) (2.92mm)



— Contents —

1. Purpose	3
1. Purpose of this guideline	3
2. Product Information	4
2.1 Features	4
2.2 Part Numbers and Dimensions	5
2.3 High-Frequency Performance	11
2.4 Specifications	15
2.5 Precautions on Mounting and Handling	16
3. Panel Design Information.....	18
3. Recommended Mounting Hole Dimensions	18
4. Precautions	20
5. Update history	21

Section 1. Purpose

1 Purpose of this guideline

This guideline provides product and handling of connectors: Hirose's Field Replaceable.

1.85mm	(67 GHz)	HV-R-FR*(**)
2.4mm	(50 GHz)	H2.4-R-FR*(**)
2.92mm	(43.5 GHz)	HK-R-FR*(**)

This guideline is intended to provide only general product concept information to customers and does not guarantee results under all conditions. The information in this guideline is subject to change without any prior notice.

Section 2. Product Information

2.1 Features

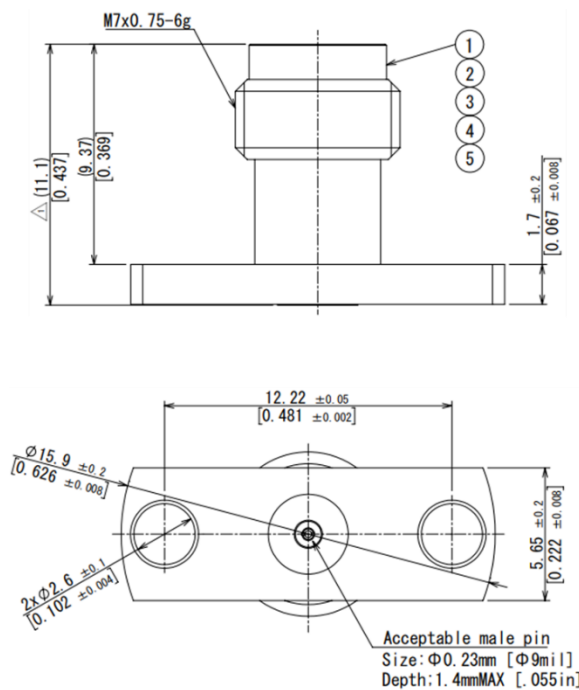
- ✓ Connector can be mated with dia. 0.23 mm (9 mil) male pin and achieve excellent high-frequency performance.
- ✓ There are some connector flange shape variations for each 1.85mm, 2.4mm and 2.92mm series.

Unit [mm/inch]

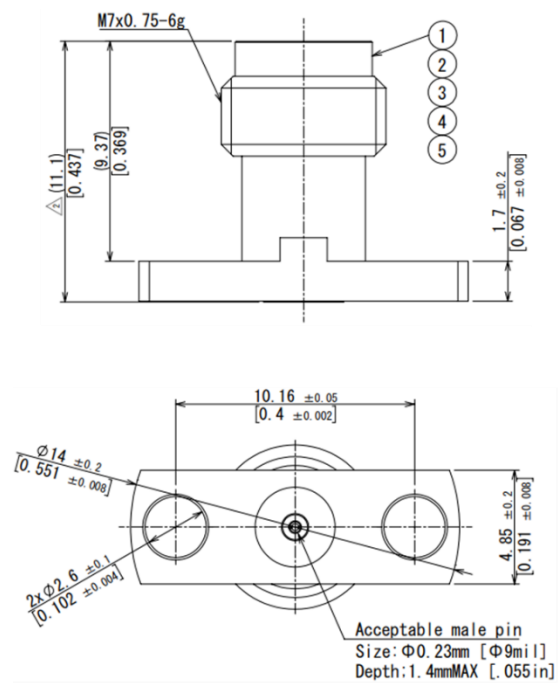
Part Number	Connector type	Screw hole pitch	Acceptable Pin dia.
HV-R-FR2(12.22)	2holes 1.85mm	12.22 mm [0.481 inch]	Φ0.23 mm [Φ9 mil]
HV-R-FR2(10.16)	2holes 1.85mm	10.16 mm [0.400 inch]	Φ0.23 mm [Φ9 mil]
HV-R-FR2(9.02)	2holes 1.85mm	9.02 mm [0.355 inch]	Φ0.23 mm [Φ9 mil]
HV-R-FR4(8.64)	4holes 1.85mm	8.64 mm [0.340 inch]	Φ0.23 mm [Φ9 mil]
H2.4-R-FR2(12.22)	2holes 2.4mm	12.22 mm [0.481 inch]	Φ0.23 mm [Φ9 mil]
H2.4-R-FR2(10.16)	2holes 2.4mm	10.16 mm [0.400 inch]	Φ0.23 mm [Φ9 mil]
H2.4-R-FR2(9.02)	2holes 2.4mm	9.02 mm [0.355 inch]	Φ0.23 mm [Φ9 mil]
H2.4-R-FR4(8.64)	4holes 2.4mm	8.64 mm [0.340 inch]	Φ0.23 mm [Φ9 mil]
HK-R-FR2(12.22)	2holes 2.92mm	12.22 mm [0.481 inch]	Φ0.23 mm [Φ9 mil]
HK-R-FR2(10.16)	2holes 2.92mm	10.16 mm [0.400 inch]	Φ0.23 mm [Φ9 mil]
HK-R-FR2(9.02)	2holes 2.92mm	9.02 mm [0.355 inch]	Φ0.23 mm [Φ9 mil]
HK-R-FR4(8.64)	4holes 2.92mm	8.64 mm [0.340 inch]	Φ0.23 mm [Φ9 mil]

2.2 Part Numbers and Dimensions

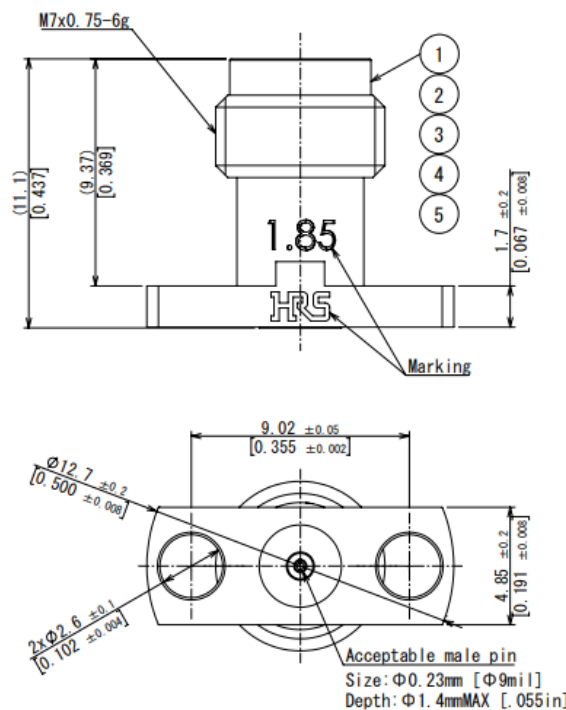
- 1.85mm Field Replaceable Connector -



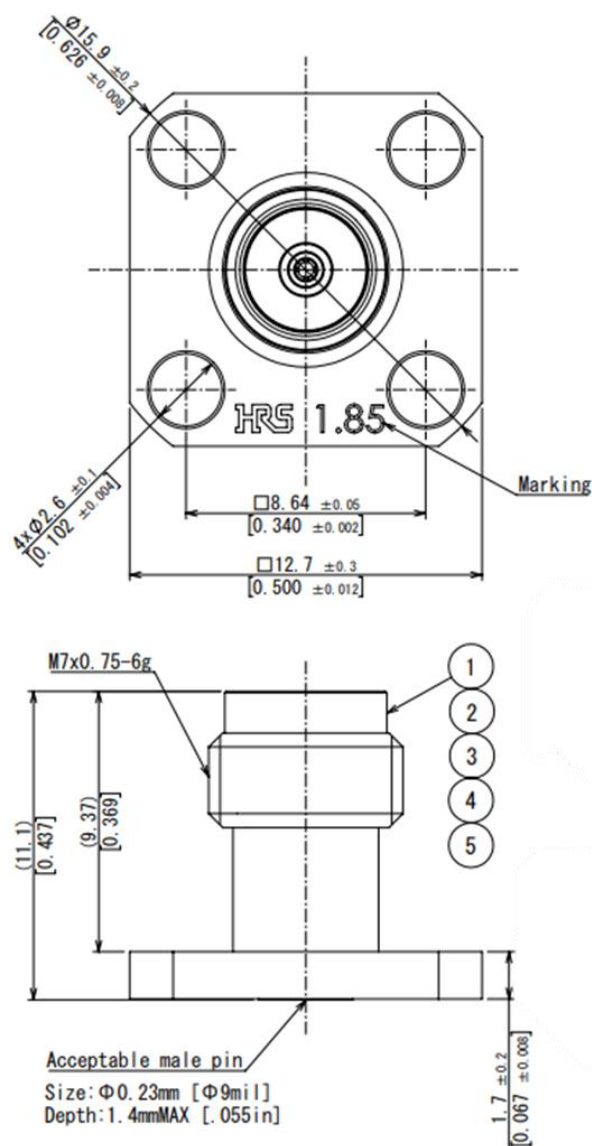
HV-R-FR2(12.22)



HV-R-FR2(10.16)



HV-R-FR2(9.02)

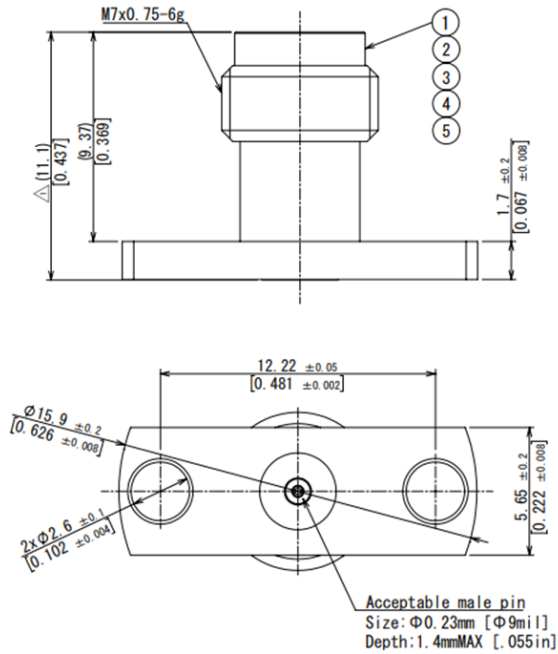


HV-R-FR4(8.64)

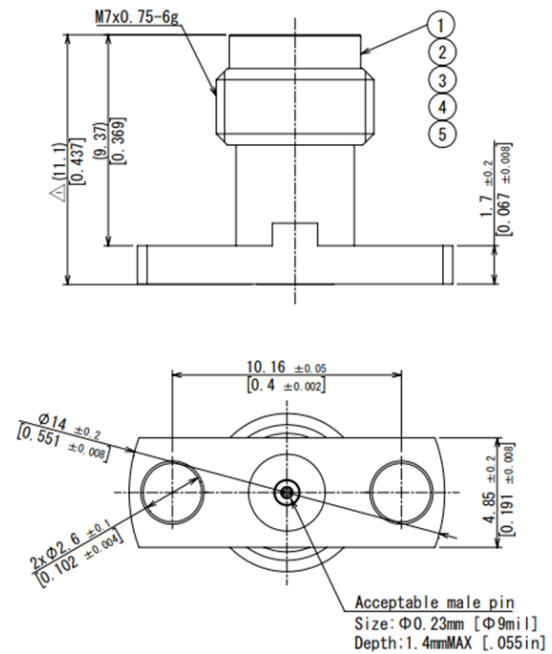
Unit [mm/inch]

Part Number	HRS No.	Screw hole pitch	Screw size	Acceptable Pin dia.
HV-R-FR2(12.22)	338-0016-0	12.22 mm [0.481 inch]	no2-56UNC, M2.2 or M2.5	$\phi 0.23\text{ mm}$ [$\phi 9\text{ mil}$]
HV-R-FR2(10.16)	338-0032-0	10.16 mm [0.400 inch]	no2-56UNC, M2.2 or M2.5	$\phi 0.23\text{ mm}$ [$\phi 9\text{ mil}$]
HV-R-FR2(9.02)	338-0040-0	9.02 mm [0.355 inch]	no2-56UNC	$\phi 0.23\text{ mm}$ [$\phi 9\text{ mil}$]
HV-R-FR4(8.64)	338-0026-0	8.64 mm [0.340 inch]	no2-56UNC, M2.2 or M2.5	$\phi 0.23\text{ mm}$ [$\phi 9\text{ mil}$]

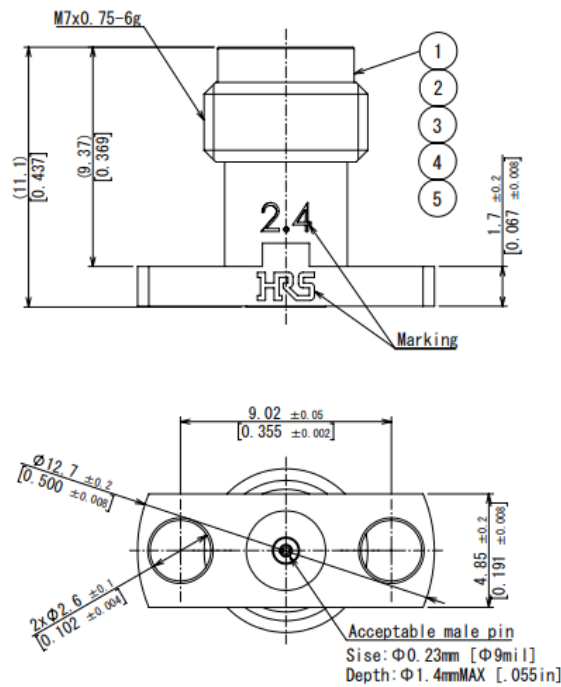
- 2.4mm Field Replaceable Connector -



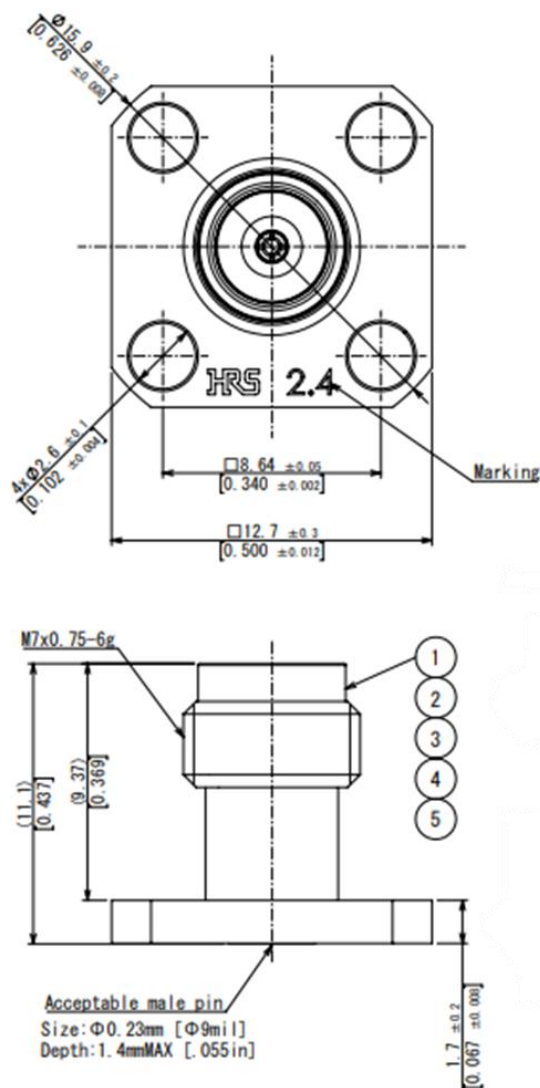
H2.4-R-FR2(12.22)



H2.4-R-FR2(10.16)



H2.4-R-FR2(9.02)

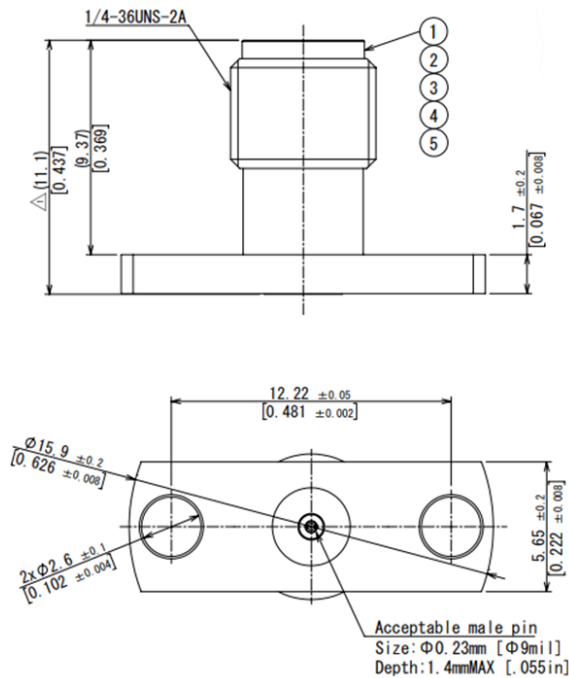


H2.4-R-FR4(8.64)

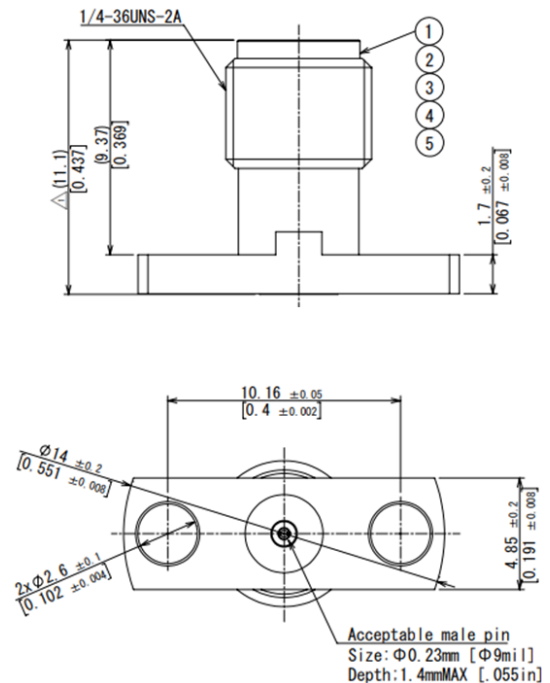
Unit [mm/inch]

Part Number	HRS No.	Screw hole pitch	Screw size	Acceptable Pin dia.
H2.4-R-FR2(12.22)	338-0017-0	12.22 mm [0.481 inch]	no2-56UNC, M2.2 or M2.5	Φ0.23 mm [Φ9 mil]
H2.4-R-FR2(10.16)	338-0024-0	10.16 mm [0.400 inch]	no2-56UNC, M2.2 or M2.5	Φ0.23 mm [Φ9 mil]
H2.4-R-FR2(9.02)	338-0042-0	9.02 mm [0.355 inch]	no2-56UNC	Φ0.23 mm [Φ9 mil]
H2.4-R-FR4(8.64)	338-0027-0	8.64 mm [0.340 inch]	no2-56UNC, M2.2 or M2.5	Φ0.23 mm [Φ9 mil]

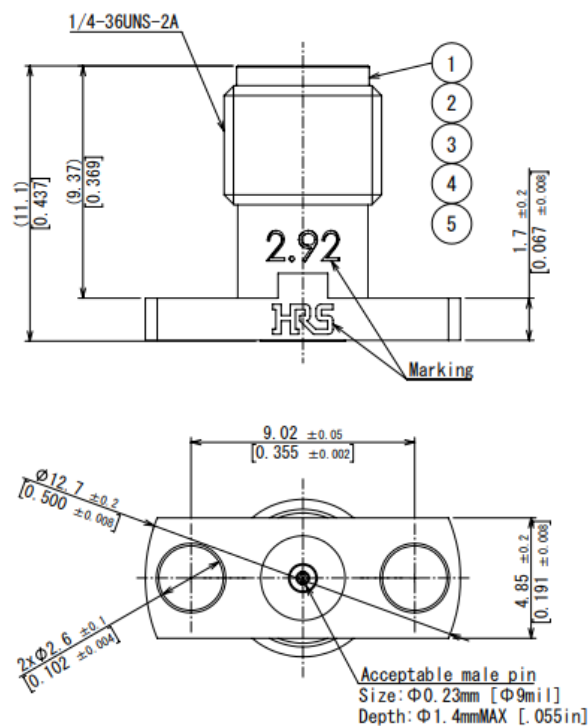
- 2.92mm Field Replaceable Connector -



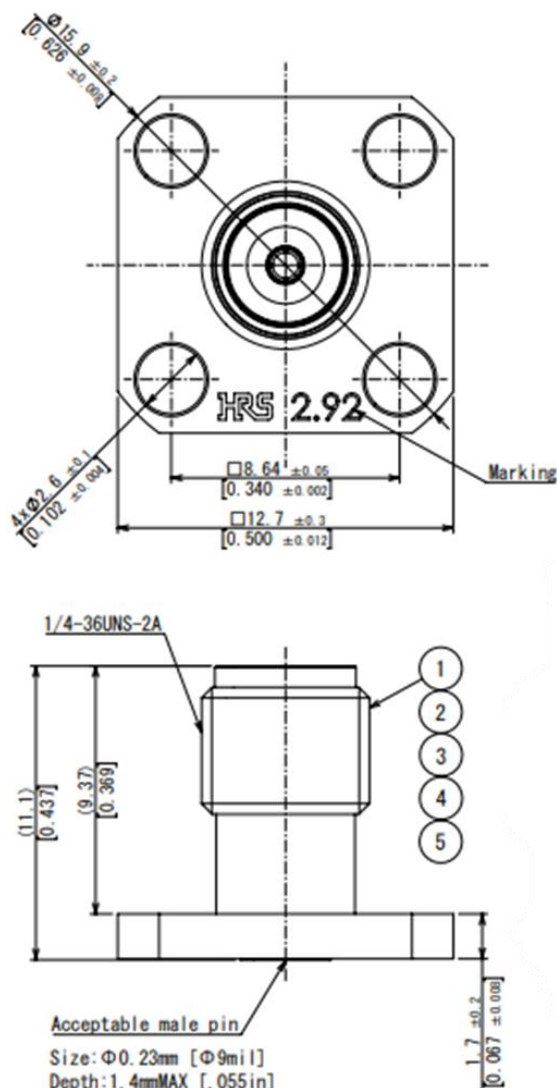
HK-R-FR2(12.22)



HK-R-FR2(10.16)



HK-R-FR2(9.02)



HK-R-FR4(8.64)

Unit [mm/inch]

Part Number	HRS No.	Screw hole pitch	Screw size	Acceptable Pin dia.
HK-R-FR2(12.22)	338-0031-0	12.22 mm [0.481 inch]	no2-56UNC, M2.2 or M2.5	$\phi 0.23$ mm [$\phi 9$ mil]
HK-R-FR2(10.16)	338-0025-0	10.16 mm [0.400 inch]	no2-56UNC, M2.2 or M2.5	$\phi 0.23$ mm [$\phi 9$ mil]
HK-R-FR2(9.02)	338-0043-0	9.02 mm [0.355 inch]	no2-56UNC	$\phi 0.23$ mm [$\phi 9$ mil]
HK-R-FR4(8.64)	338-0037-0	8.64 mm [0.340 inch]	no2-56UNC, M2.2 or M2.5	$\phi 0.23$ mm [$\phi 9$ mil]

2.3 High-Frequency Performance

The performance data in the following performance is measured under the below PNA set up with each Field Replaceable Connector mating with typical HRS designed adapter.

【Keysight PNA Network Analyzer N5227B】

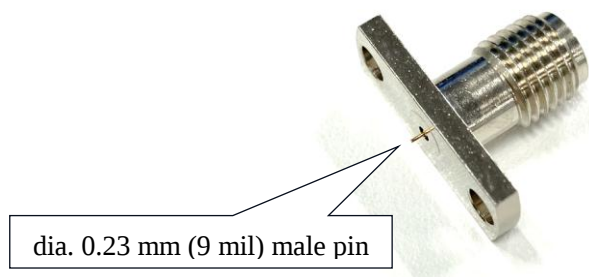


PNA set up

Frequency range : 10 MHz ~ 67 GHz (1.85mm)
: 10 MHz ~ 50 GHz (2.4mm)
: 10 MHz ~ 43.5 GHz (2.92mm)
IF bandwidth : 300 Hz
Number of point : 801 points

【Adapter for Field Replaceable Connector】

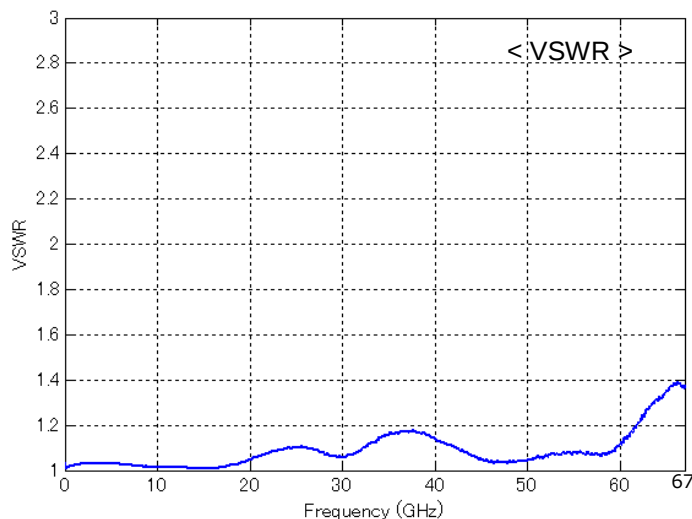
The inner structure of each adapter is the same as each Field Replaceable Connector structure, but each adapter has dia. 0.23 mm (9 mil) male pin on the flange side.



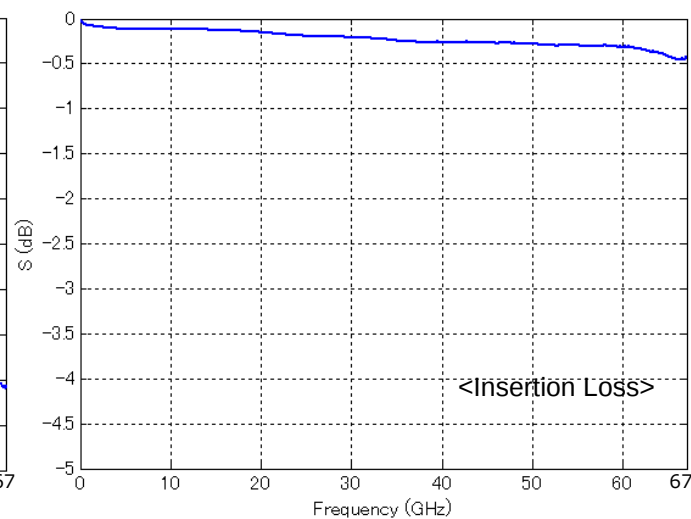
Adapter for Field Replaceable Connector

HV-R-FR*()** 1.85mm Field Replaceable Connector

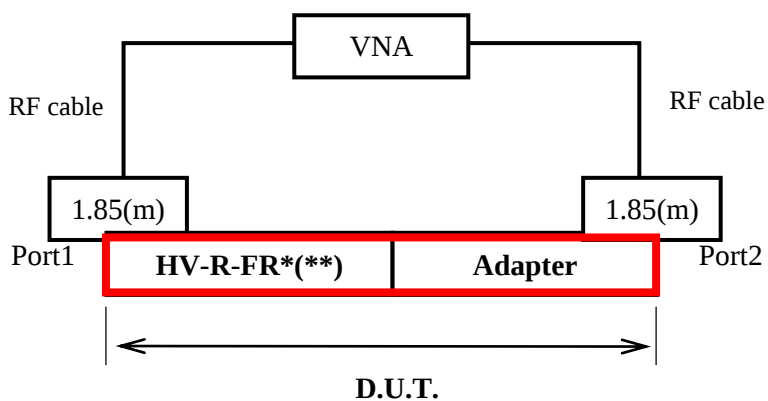
Measured



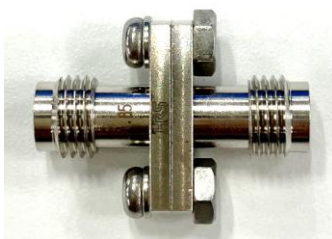
Measured



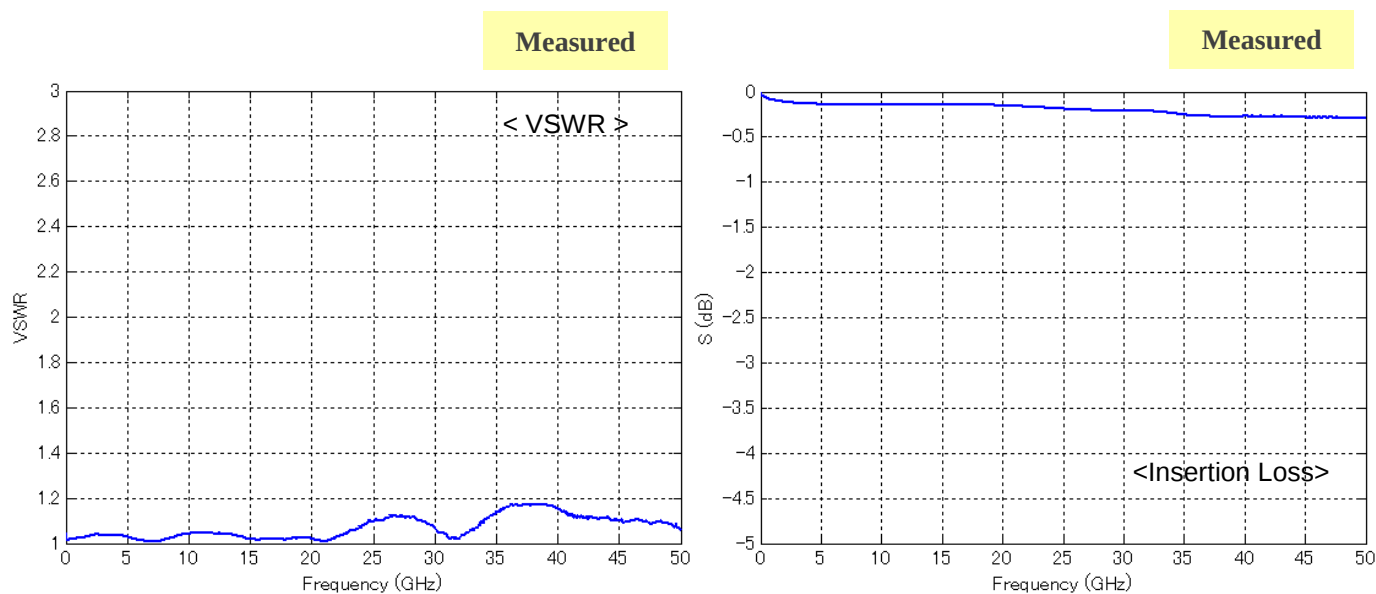
Measurement circuit



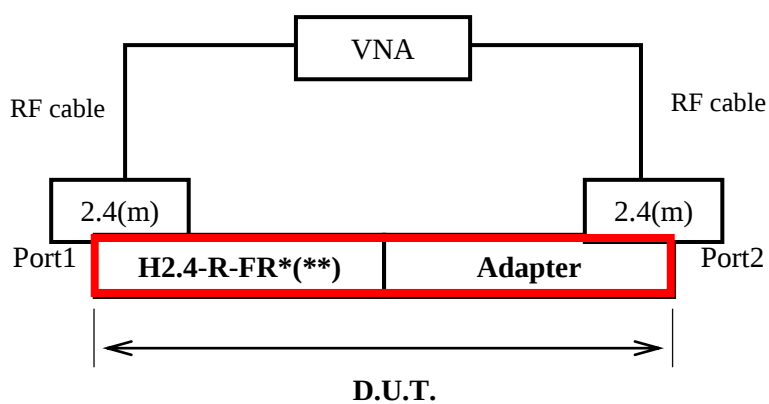
D.U.T. (connector with adapter)



H2.4-R-FR*(**) 2.4mm Field Replaceable Connector



Measurement circuit

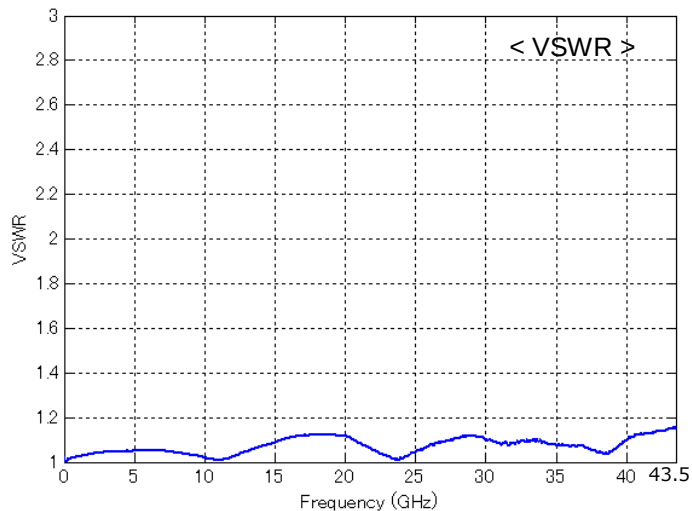


D.U.T. (connector with adapter)

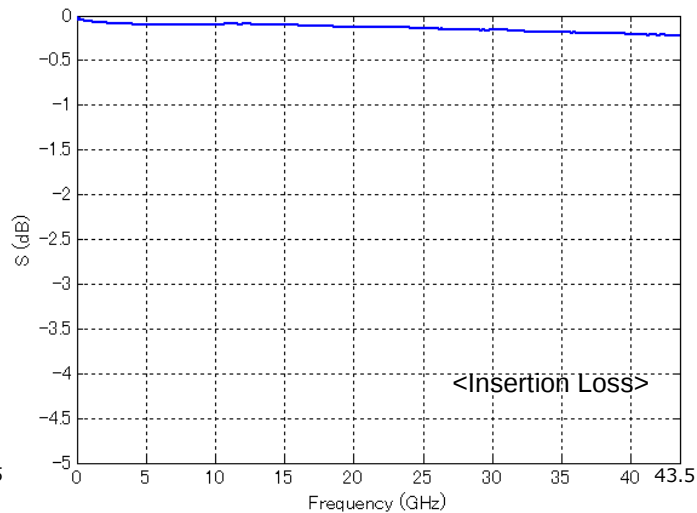


HK-R-FR*()** 2.92mm Field Replaceable Connector

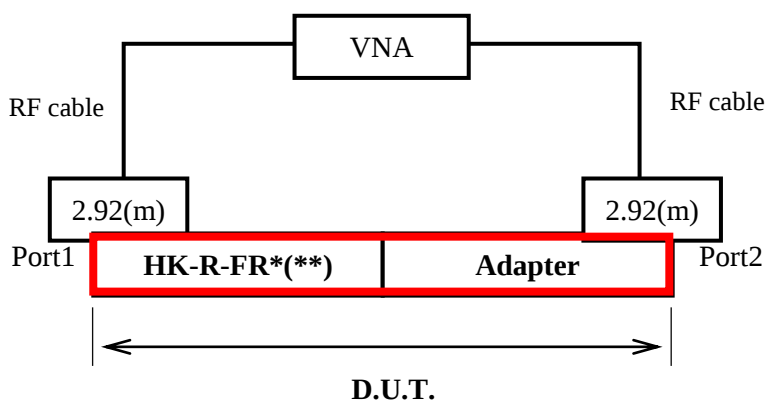
Measured



Measured



Measurement circuit



D.U.T. (connector with adapter)



2.4 Specifications

■Material / Finish

Shell	Brass / Nickel Plated
Outer conductor	Stainless steel / Passivated
Center conductor	Beryllium copper / Gold plated
Insulator	PTFE / PEI

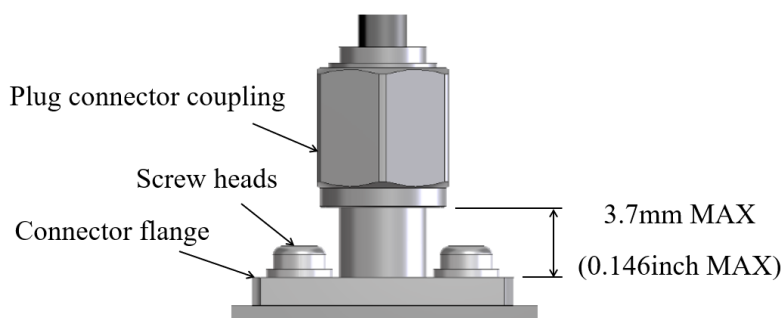
■Product Specifications

Contact resistance	Center: 10 mΩ Max External: 2 mΩ Max
Withstanding voltage	300 V AC for 1 minute (current leakage 2 mA Max)
Insulation resistance	500 MΩ Min (250 V DC)
Mating cycles	500 times
V.S.W.R. *	HV-R-FR*(**) (1.85mm) 1.3 Max [0~50 GHz] 1.5 Max [50~60 GHz] 1.7 Max [60~67 GHz] H2.4-R-FR*(**) (2.4mm) 1.3 Max [0~50 GHz] HK-R-FR*(**) (2.92mm) 1.3 Max [0~43.5 GHz]

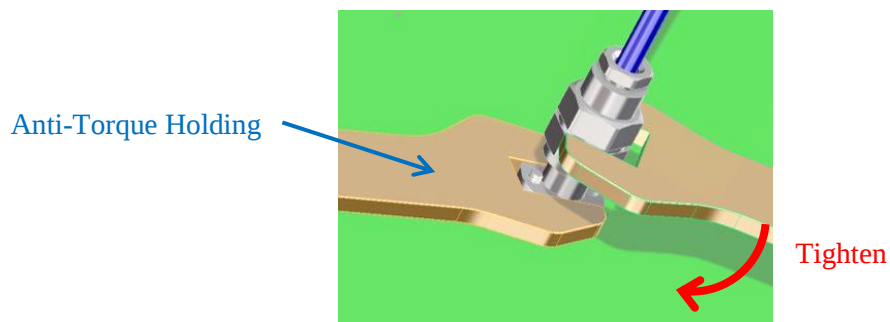
*V.S.W.R. is measured with HRS designed adapter.

2.5 Precautions on Mounting and Handling

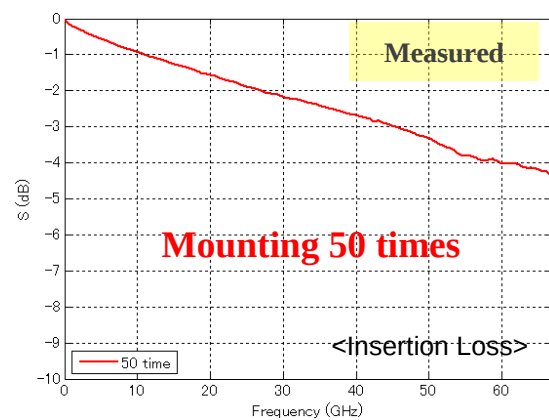
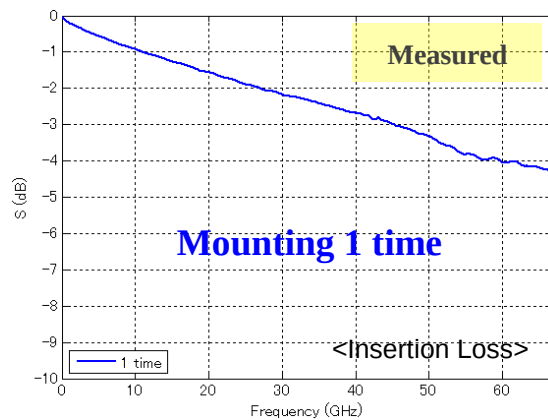
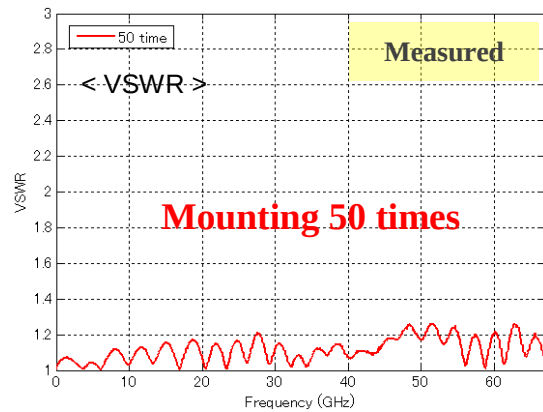
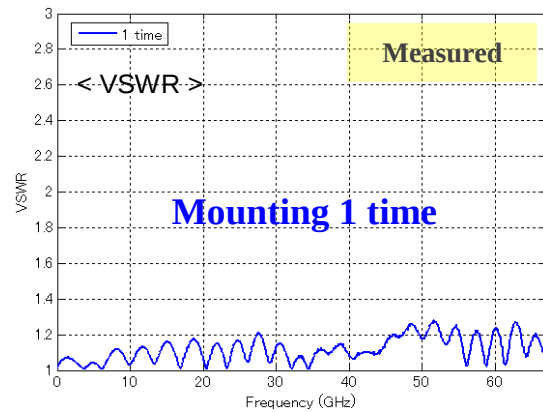
- ✓ The recommended tightening torque for No.2-56UNC, M2.2, M2.5 or equivalent screw is 0.09 N·m. When tightening the screws, tighten them evenly and alternately, and then re-tighten both sides with the recommended torque.
- ✓ The recommended screw length is depending on the customer's panel conditions. The connector flange thickness is 1.7 mm (0.067 inch) and the spring washer is recommended to be used.
- ✓ The height from the connector flange to the screw head tops is 3.7 mm (0.146 inch) MAX to avoid stopping the plug connector coupling rotation.



- ✓ Since the male pin (dia. 0.23 mm/9 mil) from the panel is very tiny and thin, please be careful not to be damaged when connecting to the Field Replaceable Connector female contact.
- ✓ When connecting the Field Replaceable Connector female contact to the male pin at the panel, please make sure to align the female contact axis with male pin axis by using microscope. The tip of male pin should be round or chamfered. The length of the male pin from the panel should be 1.4 mm (0.055 inch) MAX.
- ✓ It is recommended to hold the connector flange with a spanner wrench so that torque will not be applied to the panel.



- ✓ Since this connector is screw mounting, it can be reused on other panels after mounting.
It is recommended not to remount connectors more than 50 times.



D.U.T. include Field Replaceable Connector(1.85mm), panel connector, PCB and edge mount connector(1.85mm).

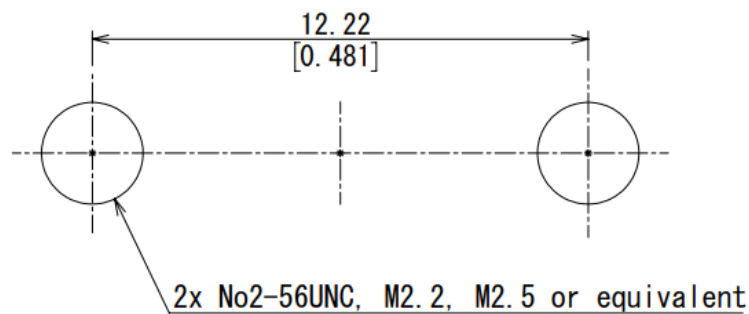


Section 3. Panel Design Information

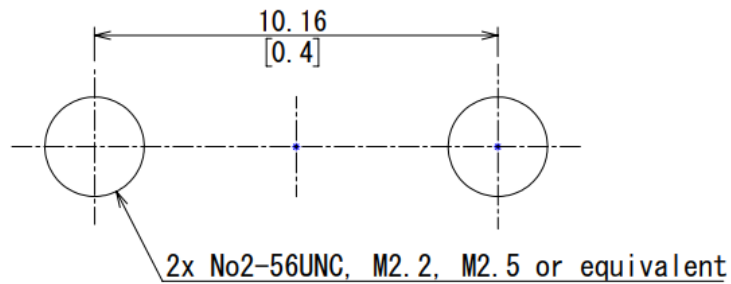
3. Recommended Mounting Hole Dimensions

This is an example based on Hirose evaluation kit.

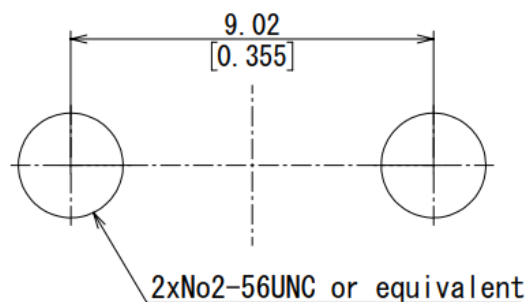
H*-R-FR2(12.22) 12.22 mm (0.481 inch) pitch between two holes



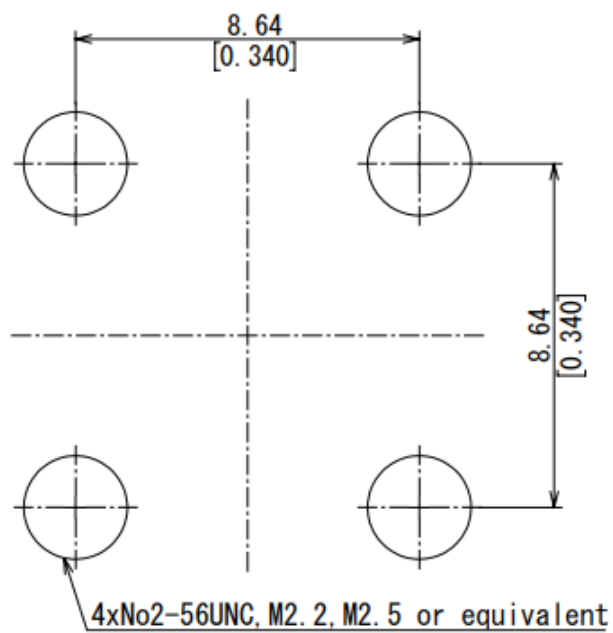
H*-R-FR2(10.16) 10.16 mm (0.400 inch) pitch between two holes



H*-R-FR2(9.02) 9.02 mm (0.355 inch) pitch between two holes



H*-R-FR4(8.64) 8.64 mm (0.340 inch) pitch between four holes



Section 4. Precautions

(Notes on changes to posted content)

- The contents of this material, such as the data of the connectors (hereinafter referred to as the products) listed in this material, This may be changed without prior notice. For details on specifications, please contact us.

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