

Vertical Launch Connectors

withwave

SMA, 2.92 mm, 2.4 mm, 1.85 mm, 1.0 mm & 0.8 mm Next Generation Connectivity

WithWave's Vertical Launch Connectors are specially designed for solderless vertical PCB launch on test & measurement board. These connectors have excellent electrical transition performance up to **26.5, 50 GHz, 67 GHz, 110 GHz & 145 GHz** respectively as well as reduce installation time by eliminating soldering.



**1.0 mm type
(110 GHz)**

**0.8 mm type
(145 GHz)**

■ Features

- DC to 26.5 GHz(SMA), 40 GHz(2.92 mm) ,50 GHz(2.4 mm), 67 GHz(1.85 mm), 110 GHz(1.0 mm) 145 GHz(0.8 mm)
- SMA, 2.92 mm, 2.4 mm, 1.85 mm, 1.0 mm & 0.8 mm type (Female, Male)
- Excellent Vertical transition (VSWR)
SMA, 2.92 mm, 2.4 mm : < 1.3
1.85 & 1.0 mm : < 1.6
0.8 mm : < 2.0
- Easy & Solderless Installation on designed substrate

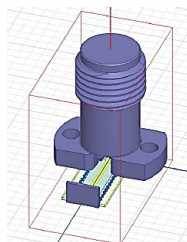
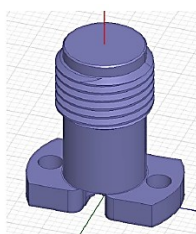
■ Application

- Test and measurement
- High Speed Digital Test Boards
- Test and Characterization Boards



■ Design Assistance

- 3D Model for Mechanical Layout (STEP file)
- **ANSYS HFSS models** (version 17.0 or newer) for 3D EM(Electromagnetic) Simulation



■ Specification (SMA Connector)

Scope	Items	Specification
Electrical	Freq. range	DC to 26.5 GHz
	Impedance	50 Ohm
	VSWR(Max)	1.3 : 1 (DC to 26.5 GHz)
	Connector type	SMA type (Female, Male)
Material	Body & Block	Stainless Steel
	PIN	BeCu with Gold Plated
	Operating Temperature	-40 to + 125 °C

* RoHS Compliant

■ Ordering Information (SMA Connector)

Stripline type



Application	Type	Part No.
Stripline	Female	VC06FS001
	Male	VC06MS001

Microstrip type



Application	Type	Part No.
Microstrip	Female	VC06FS002
	Male	VC06MS002

■ Specification (2.92 mm Connector)

Scope	Items	Specification
Electrical	Freq. range	DC to 40 GHz
	Impedance	50 Ohm
	VSWR(Max)	1.3 : 1 (DC to 40 GHz)
Material	Connector type	2.92 mm type (Female, Male)
	Body & Block	Stainless Steel
	PIN	BeCu with Gold Plated

* RoHS Compliant

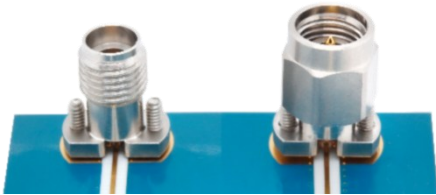
■ Ordering Information (2.92 mm Connector)

Stripline type



Application	Type	Part No.
Stripline	Female	VC03FS001
	Male	VC03MS001

Microstrip type



Application	Type	Part No.
Microstrip	Female	VC03FS002
	Male	VC03MS002

■ Specification (2.4 mm Connector)

Scope	Items	Specification
Electrical	Freq. range	DC to 50 GHz
	Impedance	50 Ohm
	VSWR(Max)	1.3 : 1 (DC to 50 GHz)
Material	Connector type	2.4 mm type (Female, Male)
	Body & Block	Stainless Steel
	PIN	BeCu with Gold Plated

* RoHS Compliant

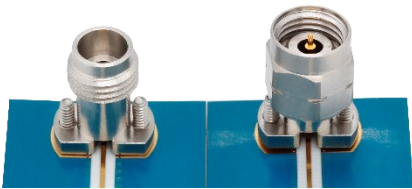
■ Ordering Information (2.4 mm Connector)

Stripline type



Application	Type	Part No.
Stripline	Female	VC02FS001
	Male	VC02MS001

Microstrip type



Application	Type	Part No.
Microstrip	Female	VC02FS002
	Male	VC02MS002

■ Specification (1.85 mm Connector)

Scope	Items	Specification
Electrical	Freq. range	DC to 67 GHz
	Impedance	50 Ohm
	VSWR(Max)	1.6 : 1 (DC to 67 GHz)
Material	Connector type	1.85 mm type (Female)
	Body & Block	Stainless Steel
	PIN	BeCu with Gold Plated

* RoHS Compliant

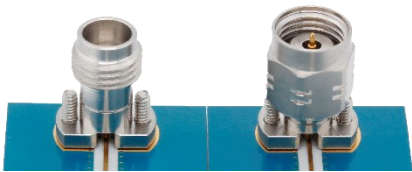
■ Ordering Information (1.85 mm Connector)

Stripline type



Application	Type	Part No.
Stripline	Female	VC01FS001
	Male	VC01MS001

Microstrip type



Application	Type	Part No.
Microstrip	Female	VC01FS002
	Male	VC01MS002

■ Specification (1.0 mm Connector)

Scope	Items	Specification
Electrical	Freq. range	DC to 110 GHz
	Impedance	50 Ohm
	VSWR(Max)	1.6 : 1 (DC to 110 GHz)
Material	Connector type	1.0 mm type (Female)
	Body & Block	Stainless Steel
	PIN	BeCu with Gold Plated

* RoHS Compliant

■ Ordering Information (1.0 mm Connector)

Stripline type



Application	Type	Part No.
Stripline	Female	VC00FS001

Microstrip type



Application	Type	Part No.
Microstrip	Female	VC00FS002



■ Specification (0.8 mm Connector)

Scope	Items	Specification
Electrical	Freq. range	DC to 145 GHz
	Impedance	50 Ohm
	VSWR(Max)	2.0 : 1 (DC to 145 GHz)
Material	Connector type	0.8 mm type (Female)
	Body & Block	Stainless Steel
	PIN	BeCu with Gold Plated

* RoHS Compliant

■ Ordering Information (0.8 mm Connector)

Stripline type



Application	Type	Part No.
Stripline	Female	VC23FS001

Microstrip type



Application	Type	Part No.
Microstrip	Female	VC23FS002

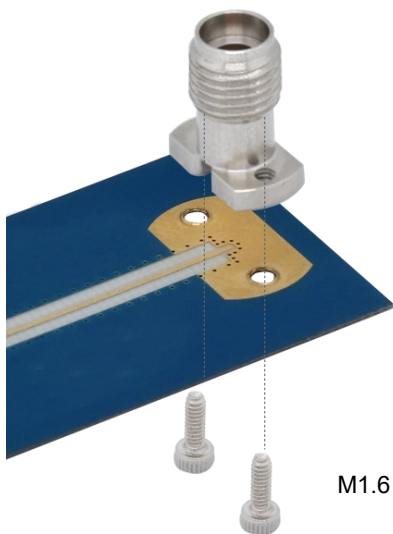
Vertical Launch Connectors

■ Installation Procedure

STEP 1 :

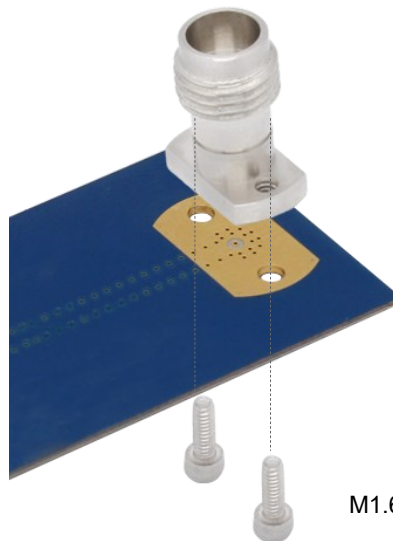
Launch vertical connector on the position of substrate.

Microstrip Line



M1.6 Screw Bolting

Stripline

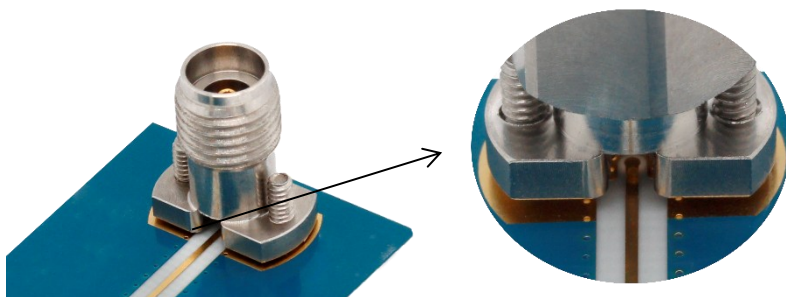


M1.6 Screw Bolting

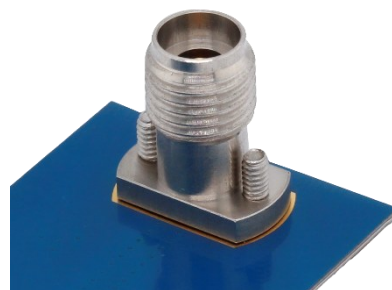
STEP 2:

Ensure Connector Body should be tighten against the substrate using two screws while ensuring center pin should be centered on the trace.

Microstrip Line



Stripline



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SMA, 2.92 mm, 2.4 mm, 1.85 mm, 1.0 mm & 0.8 mm Next Generation Connectivity

■ Accessories (Ground Block)

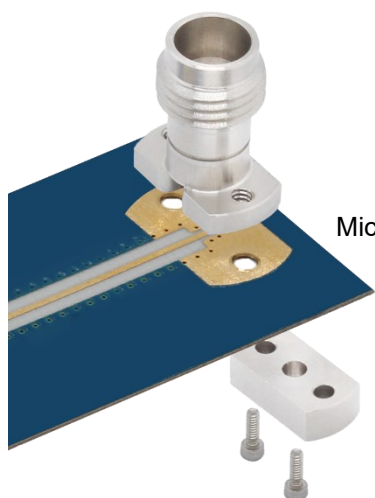
Ground block can be used on the backside of the *thin PCB* and It supports the stability of the thin PCB for mechanical stress(or distortion) and the solder point and components at the PCB against breaking. the contact issue is solved.



Ground Block

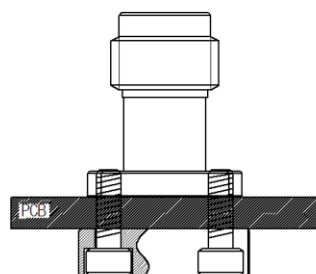
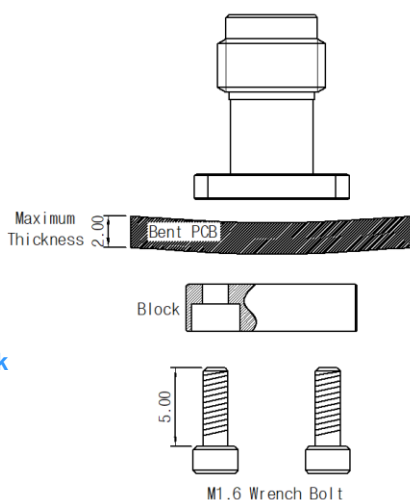
■ Advantage

- Better contacting the center Pin at the thin PCB (higher contact pressure)
- Mechanically stabilize the very thin PCB. No solder points get broken



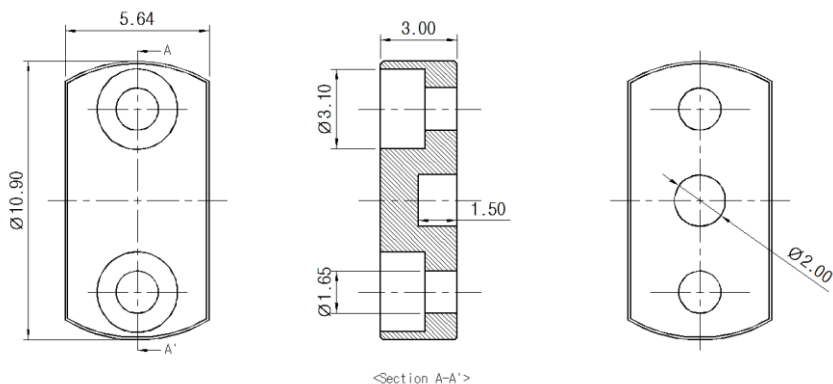
Microstrip Line

Ground Block



■ Drawing (Part No: WB0642F03)

Unit : mm



Vertical Launch Connectors

■ Torque Specifcation

SMA, 2.92mm 2.4 mm, 1.85mm type Interface
Torque spec : 8 in-lbs Max.



M1.6 Hex Bolt
Torque spec : 2 in-lbs Max.

1.0mm, 0.8 mm type Interface
Torque spec : 6 in-lbs Max.



M1.6 Hex Bolt
Torque spec : 2 in-lbs Max.

Vertical Launch Connectors

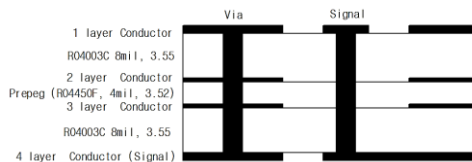
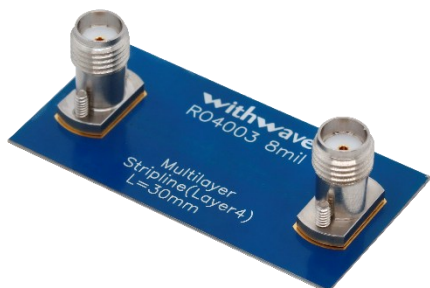
SMA, 2.92 mm, 2.4 mm, 1.85 mm, 1.0 mm & 0.8 mm Next Generation Connectivity

SMA Connector

■ Test Result (Stripline type)

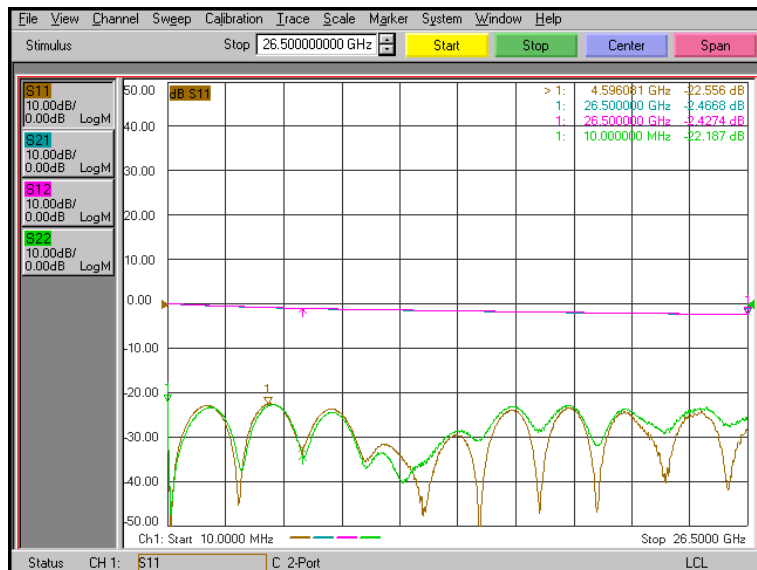
Female type

Part No. : VC06FS001



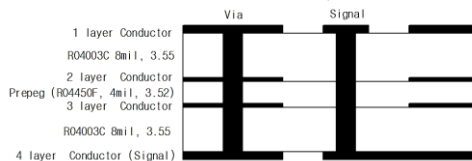
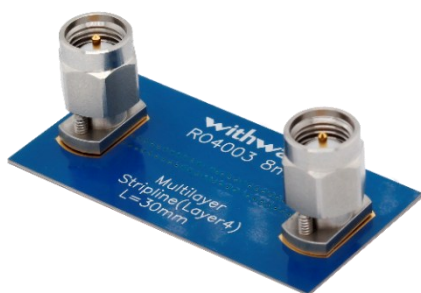
- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (stripline)

Freq. : 10 MHz to 26.5 GHz



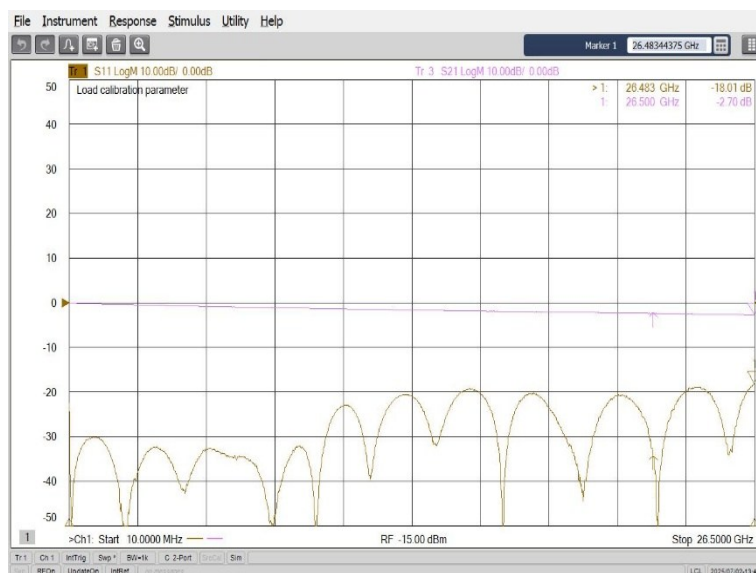
Male type

Part No. : VC06MS001



- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (stripline)

Freq. : 10 MHz to 26.5 GHz

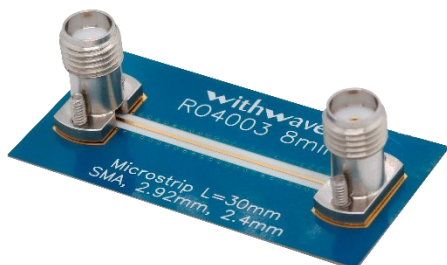


SMA Connector

■ Test Result (Microstrip type)

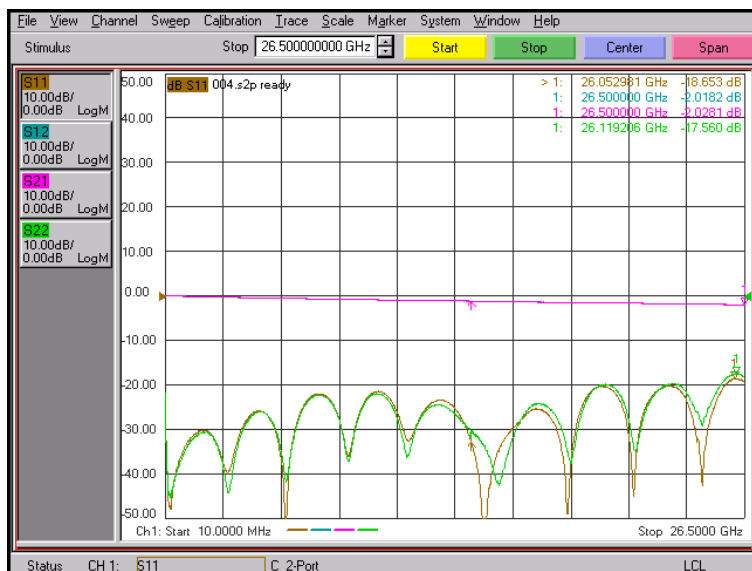
Female type

Part No. : VC06FS002



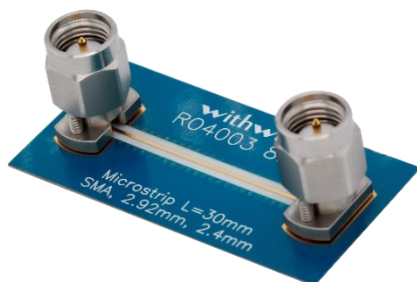
- Substrate : RO4003C(8 mil)
- Trace length : 60 mm (microstrip)

Freq. : 10 MHz to 26.5 GHz



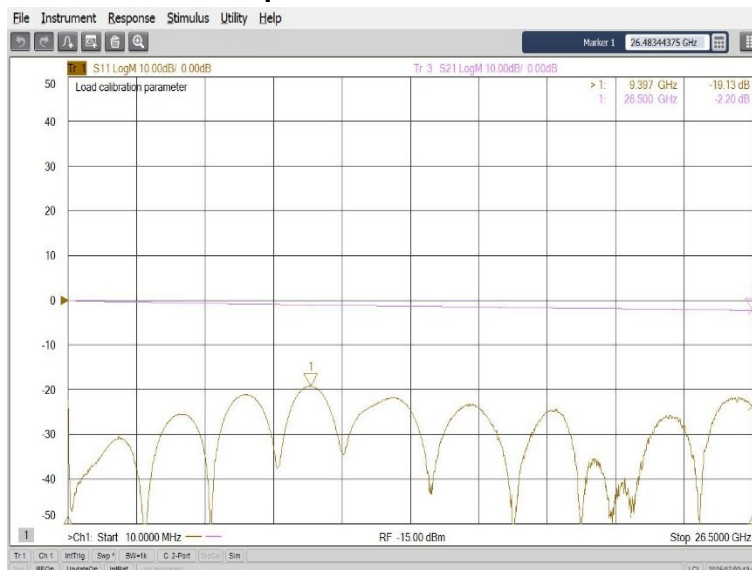
Male type

Part No. : VC06MS002



- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (microstrip)

Freq. : 10 MHz to 26.5 GHz



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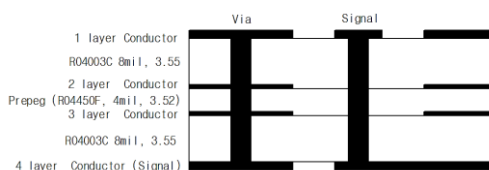
SMA, 2.92 mm, 2.4 mm, 1.85 mm, 1.0 mm & 0.8 mm Next Generation Connectivity

2.92 mm Connector

■ Test Result (Stripline type)

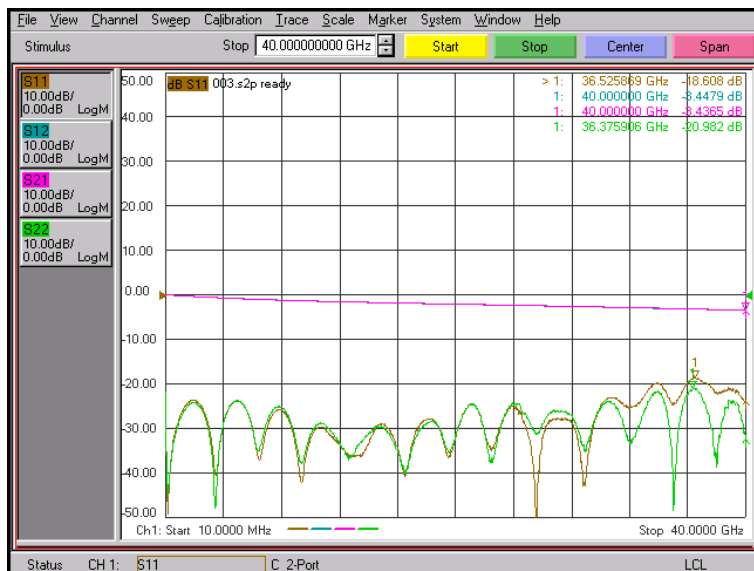
Female type

Part No. : VC03FS001



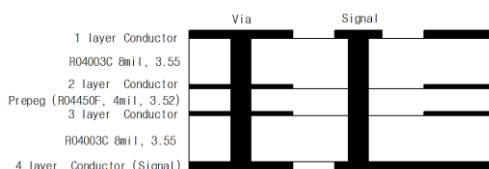
- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (stripline)

Freq. : 10 MHz to 40 GHz



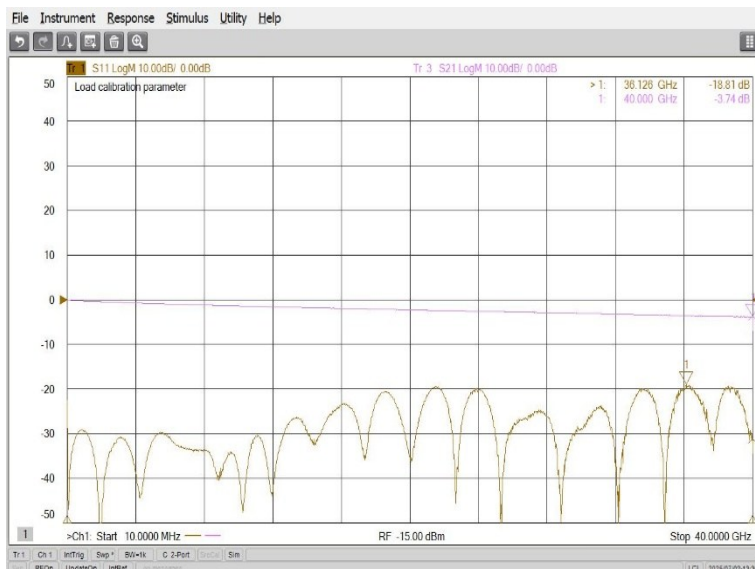
Male type

Part No. : VC03MS001



- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (stripline)

Freq. : 10 MHz to 40 GHz



Vertical Launch Connectors

SMA, 2.92 mm, 2.4 mm, 1.85 mm, 1.0 mm & 0.8 mm Next Generation Connectivity

2.92 mm Connector

■ Test Result (Microstrip type)

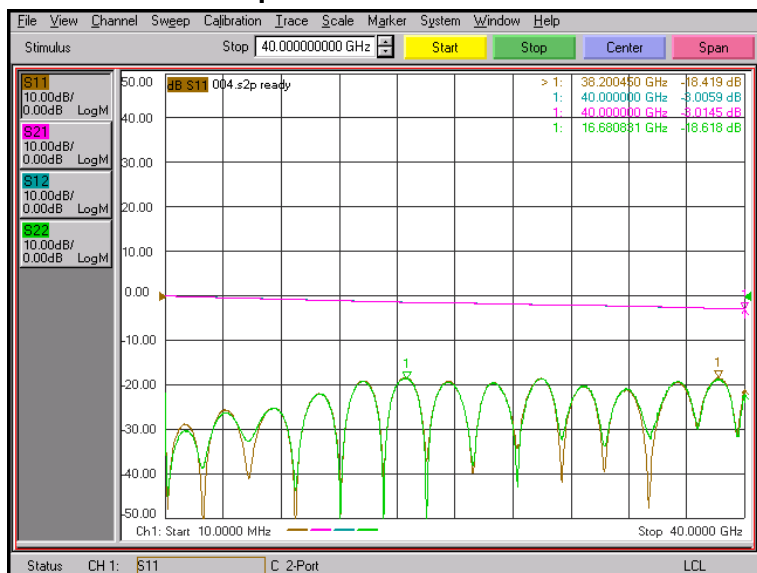
Female type

Part No. : VC03FS002



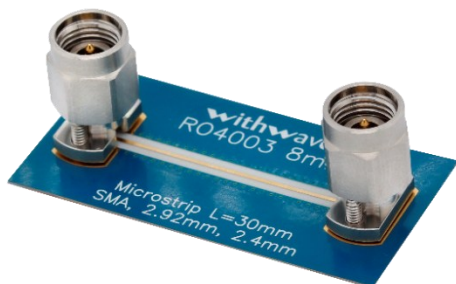
- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (microstrip)

Freq. : 10 MHz to 40 GHz



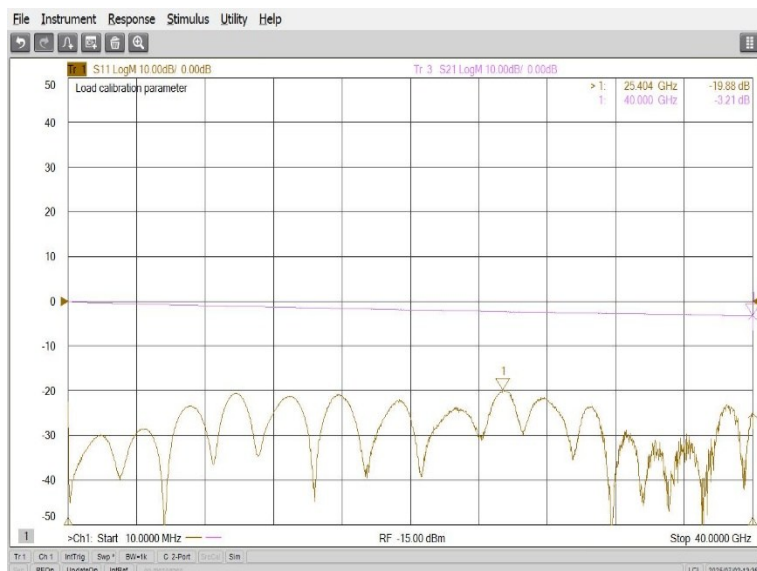
Male type

Part No. : VC03MS002



- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (microstrip)

Freq. : 10 MHz to 40 GHz



Vertical Launch Connectors

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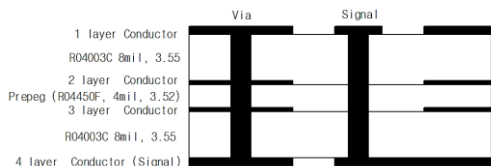
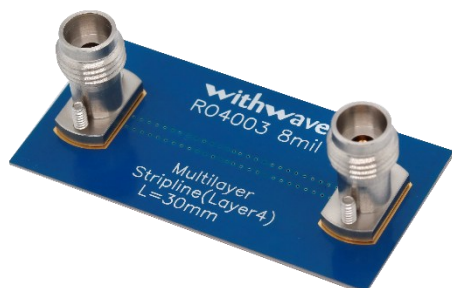
SMA, 2.92 mm, 2.4 mm, 1.85 mm, 1.0 mm & 0.8 mm Next Generation Connectivity

2.4 mm Connector

■ Test Result (Stripline)

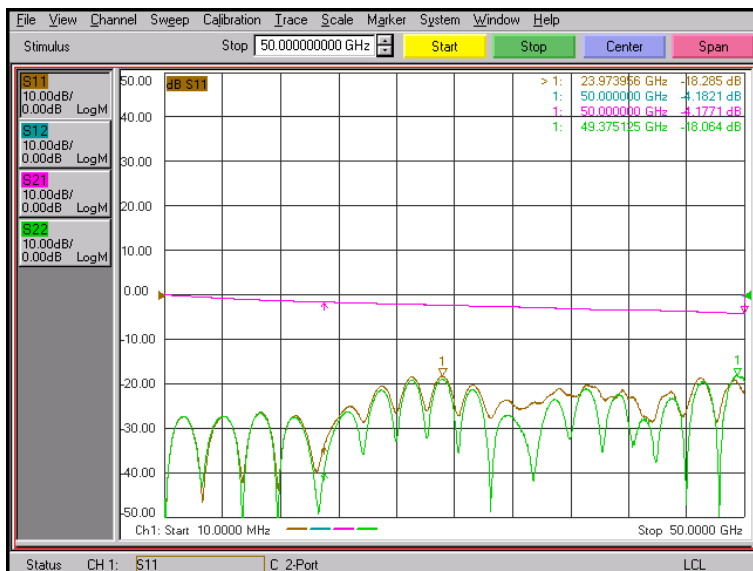
Female type

Part No. : VC02FS001



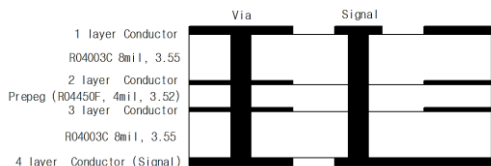
- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (stripline)

Freq. : 10 MHz to 50 GHz



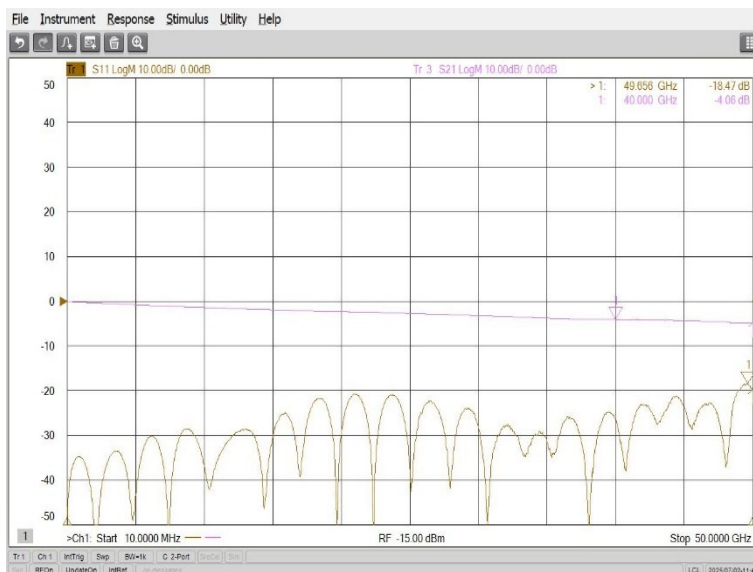
Male type

Part No. : VC02MS001



- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (stripline)

Freq. : 10 MHz to 50 GHz



Vertical Launch Connectors

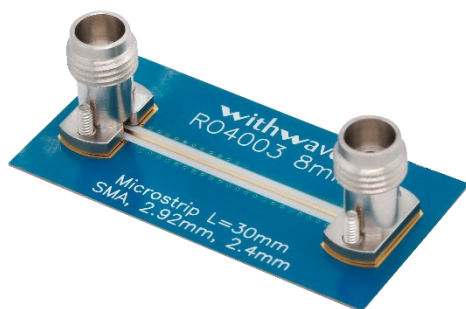
SMA, 2.92 mm, 2.4 mm, 1.85 mm, 1.0 mm & 0.8 mm Next Generation Connectivity

2.4 mm Connector

■ Test Result (Microstrip type)

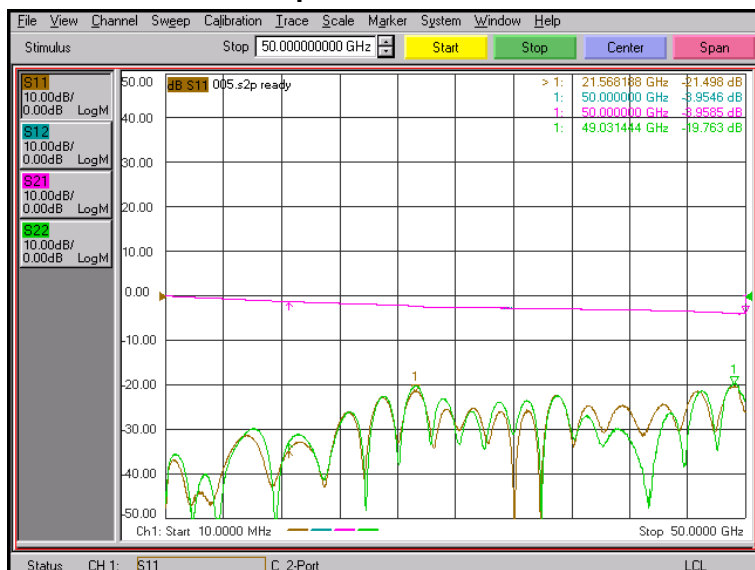
Female type

Part No. : VC02FS002



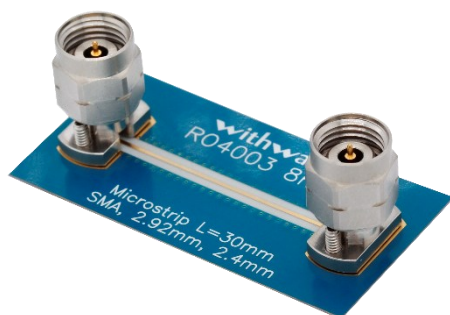
- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (microstrip)

Freq. : 10 MHz to 50 GHz



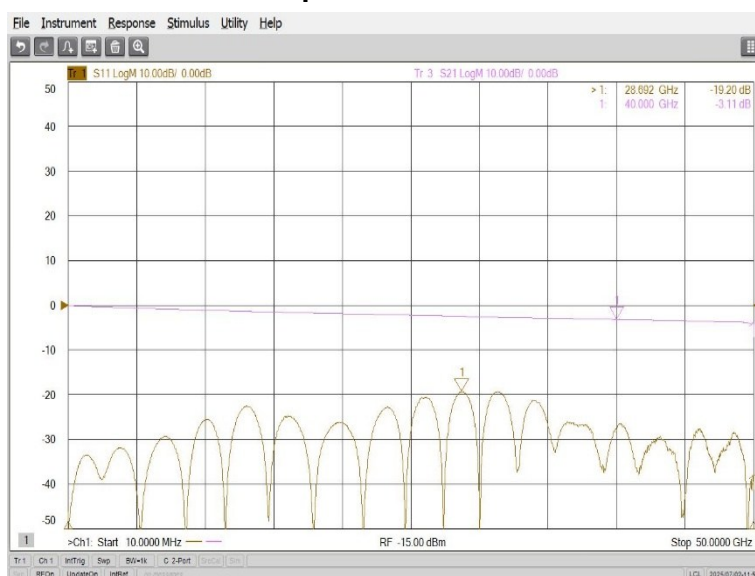
Male type

Part No. : VC02MS002



- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (microstrip)

Freq. : 10 MHz to 50 GHz



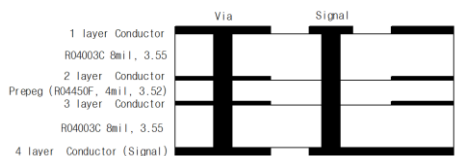
Vertical Launch Connectors

1.85 mm Connector

Test Result (Stripline)

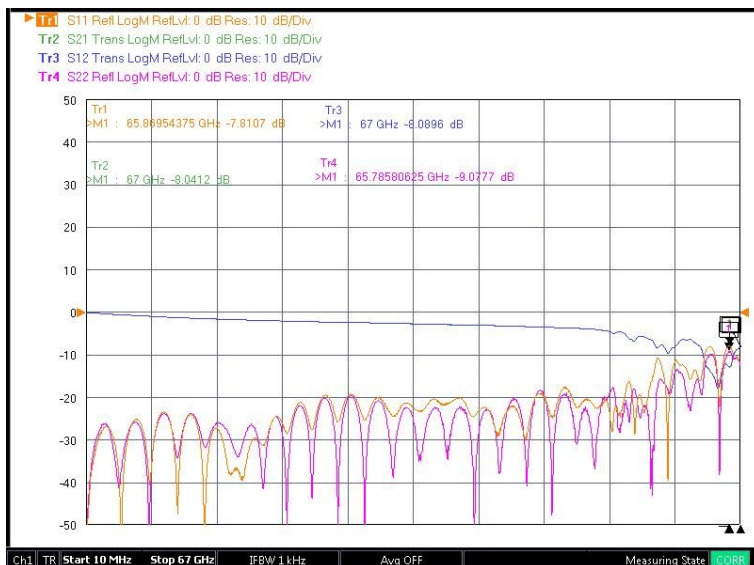
Female type

Part No. : VC01FS001



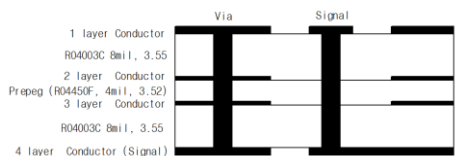
- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (stripline)

Freq. : 10 MHz to 67 GHz



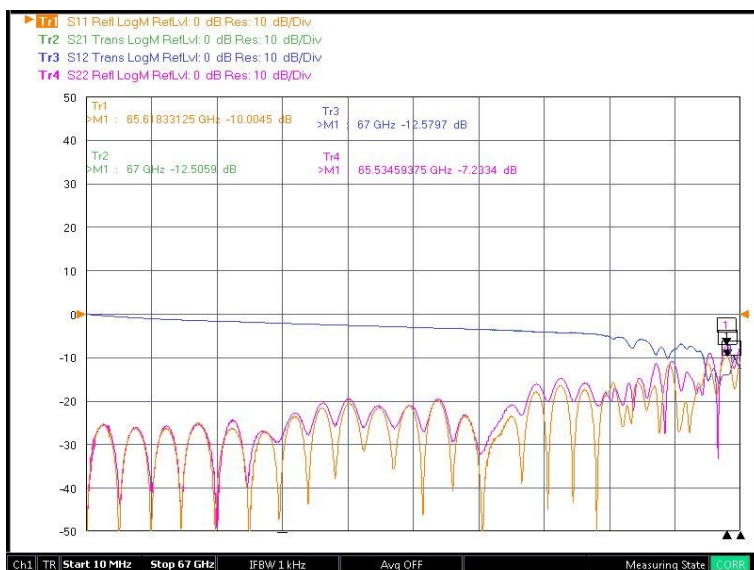
Male type

Part No. : VC01MS001



- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (stripline)

Freq. : 10 MHz to 67 GHz

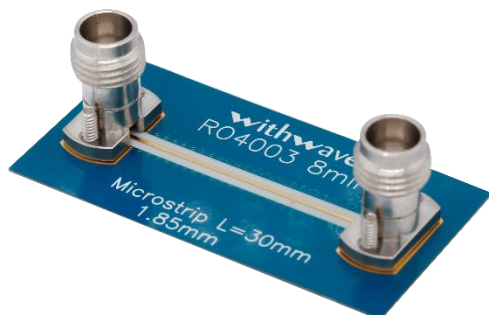


1.85 mm Connector

■ Test Result (Microstrip type)

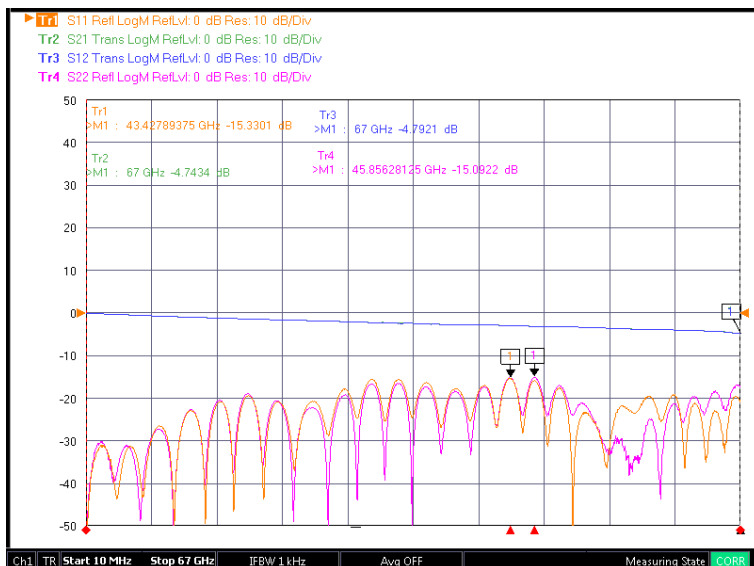
Female type

Part No. : VC01FS002



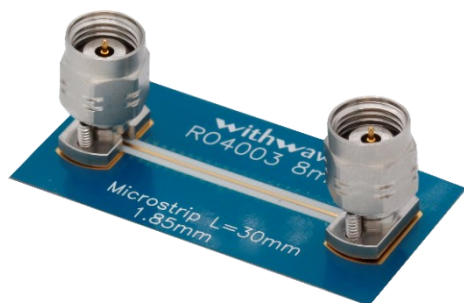
- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (microstrip)

Freq. : 10 MHz to 67 GHz



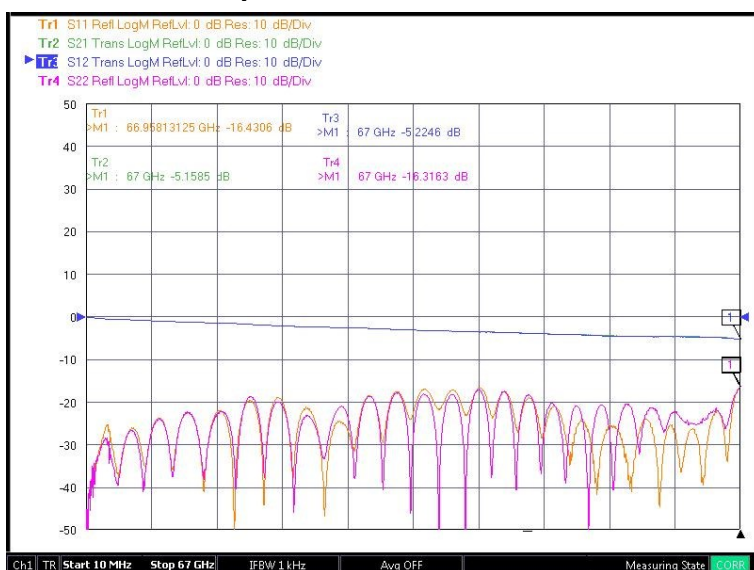
Male type

Part No. : VC01MS002



- Substrate : RO4003C(8 mil)
- Trace length : 30 mm (microstrip)

Freq. : 10 MHz to 67 GHz



Vertical Launch Connectors

SMA, 2.92 mm, 2.4 mm, 1.85 mm, 1.0 mm & 0.8 mm *Next Generation Connectivity*



1.0 mm Connector

■ Test Result (Stripline type)

Female type

Part No. : VC00FS001

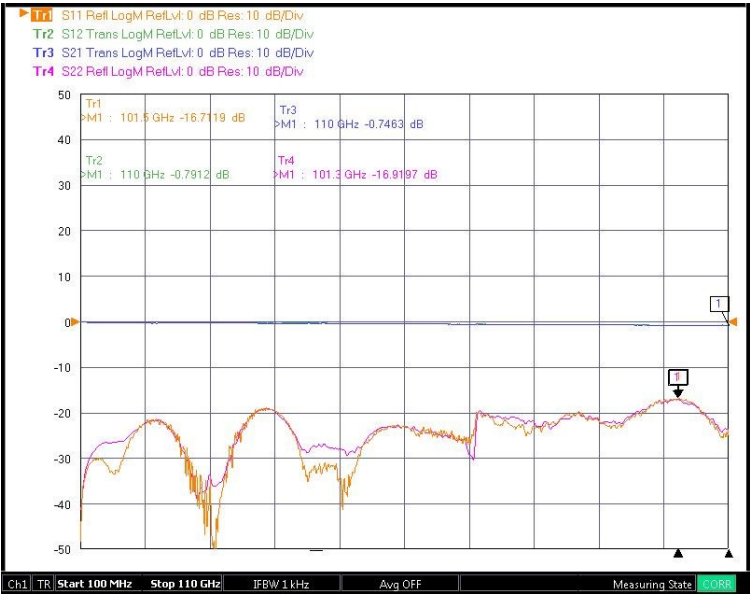
Back to Back Test

Vertical 1.0 mm

Vertical 1.0 mm



Freq. : 10 MHz to 110 GHz



1.0 mm Connector

■ Test Result (Microstrip type)

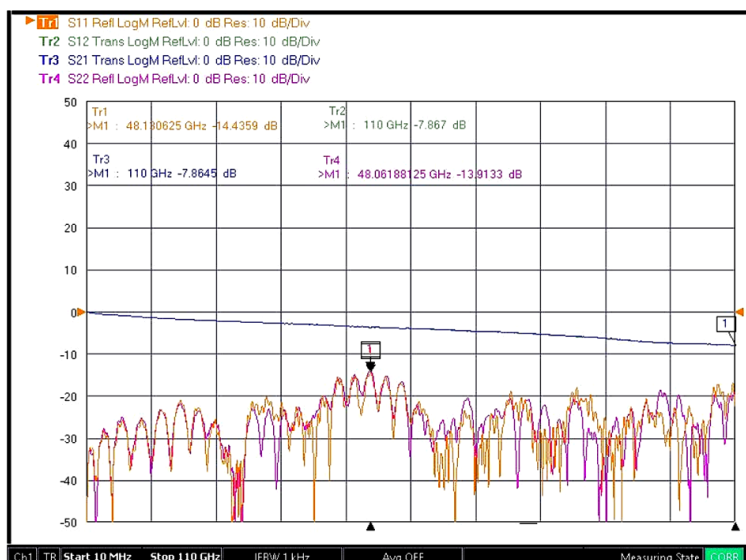
Female type

Part No. : VC00FS002



- Substrate : RO3003(5 mil)
- Trace length : 30.15 mm (microstrip)

Freq. : 10 MHz to 110 GHz



0.8 mm Connector

■ **Test Result (Stripline type)**

Female type

Part No. : VC23FS001

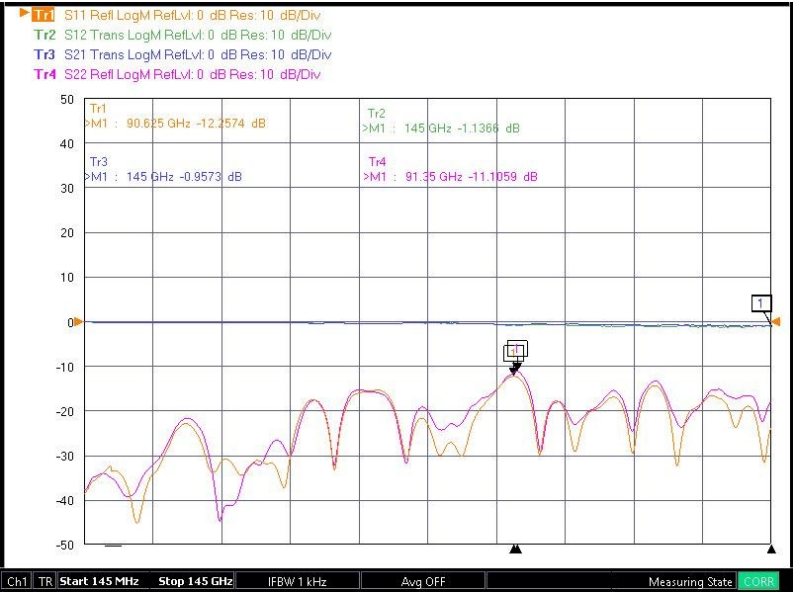
Back to Back Test

Vertical 0.8 mm

Vertical 0.8 mm



Freq. : 10 MHz to 145 GHz



0.8 mm Connector

■ Test Result (Microstrip type)

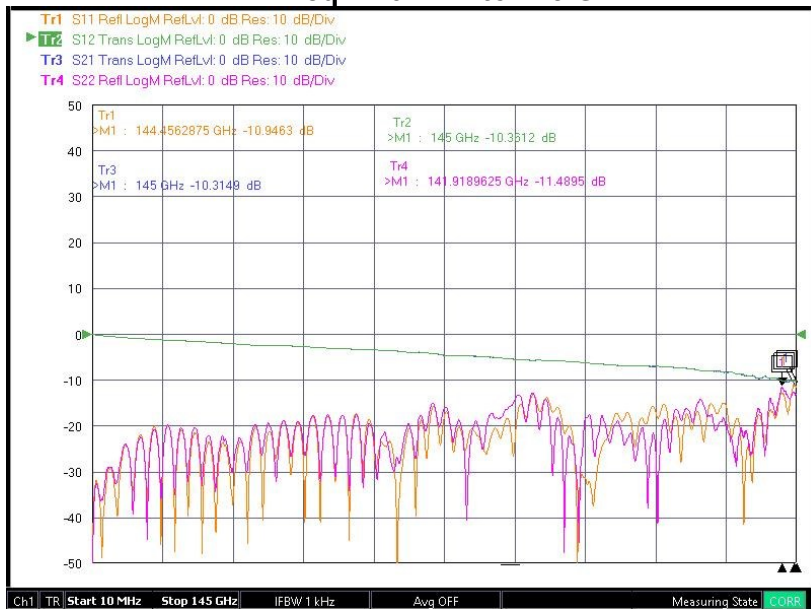
Female type

Part No. : VC23FS002



- Substrate : RO3003(5 mil)
- Trace length : 30.15 mm (microstrip)

Freq. : 10 MHz to 145 GHz



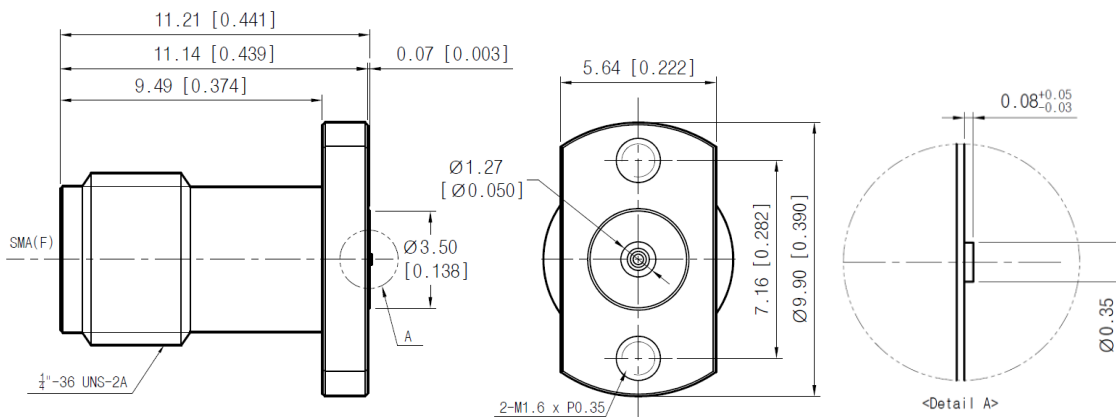
SMA Connector

■ Drawing

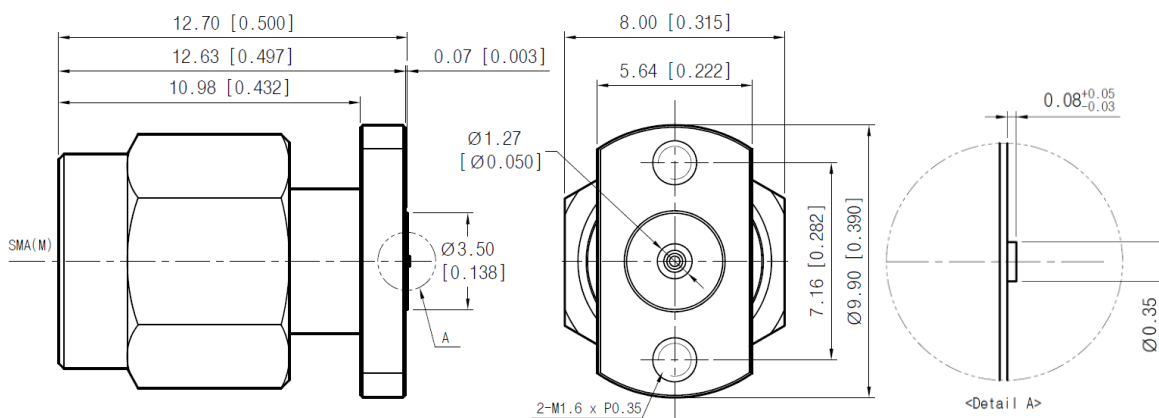
Stripline type

Unit : mm

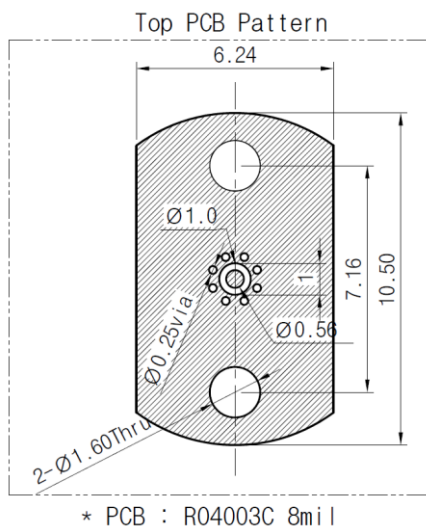
Female type



Male type



<Recommended PCB pattern>



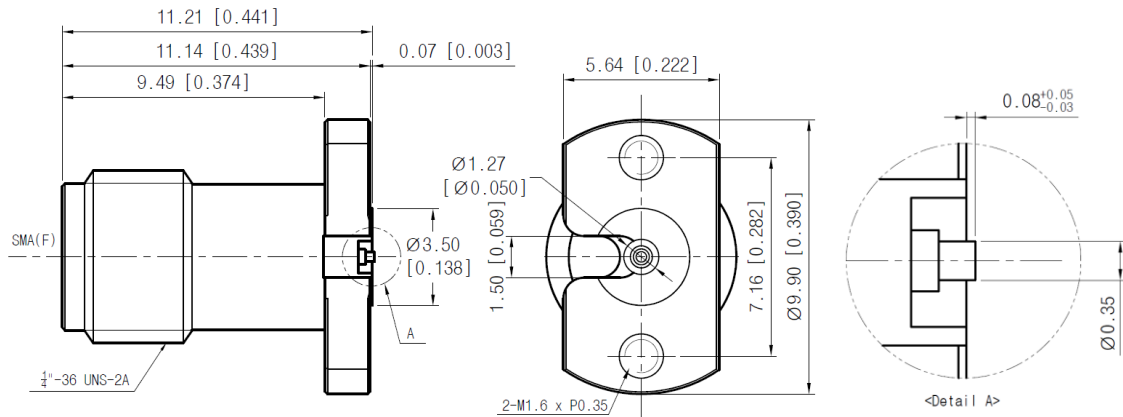
SMA Connector

■ *Drawing*

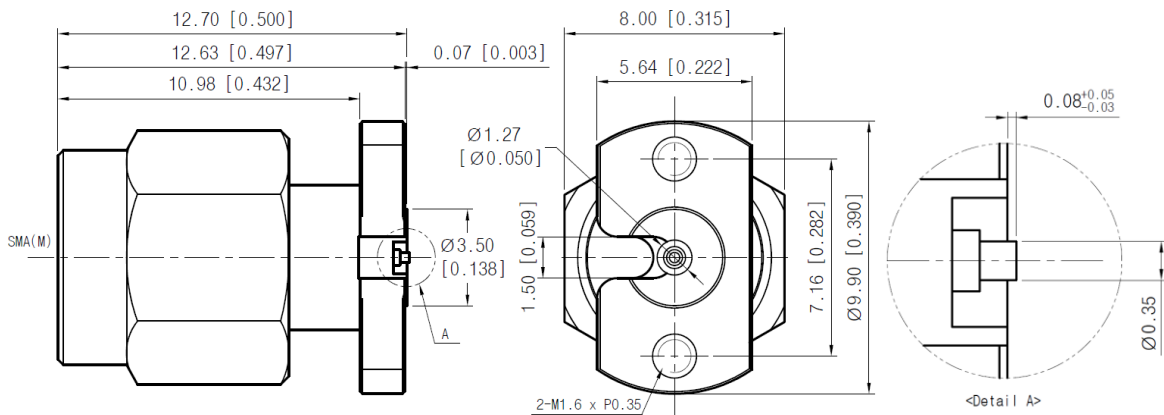
Microstrip type

Unit : mm

Female type

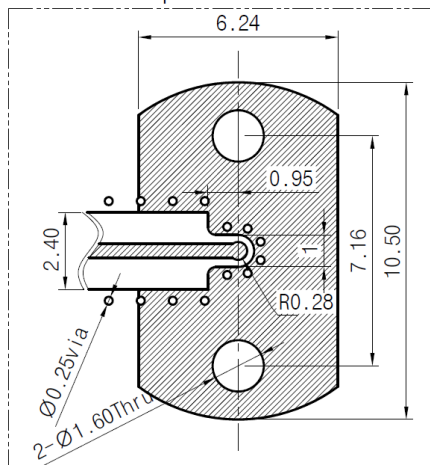


Male type

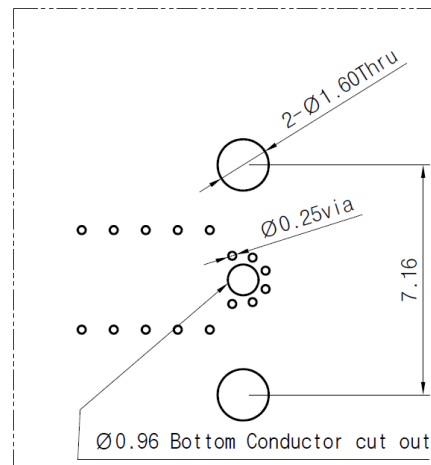


<Recommended PCB pattern>

Top PCB Pattern



Bottom PCB Pattern



* PCB : R04003C 8mi l

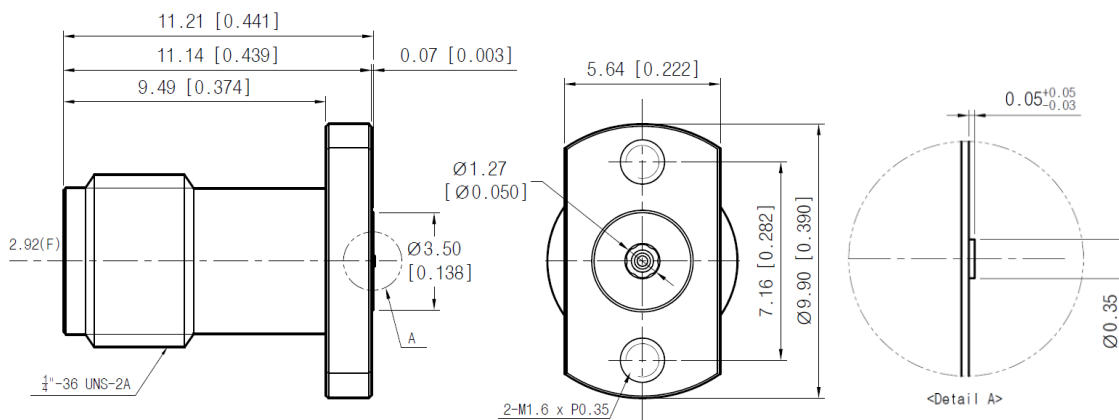
2.92 mm Connector

■ Drawing

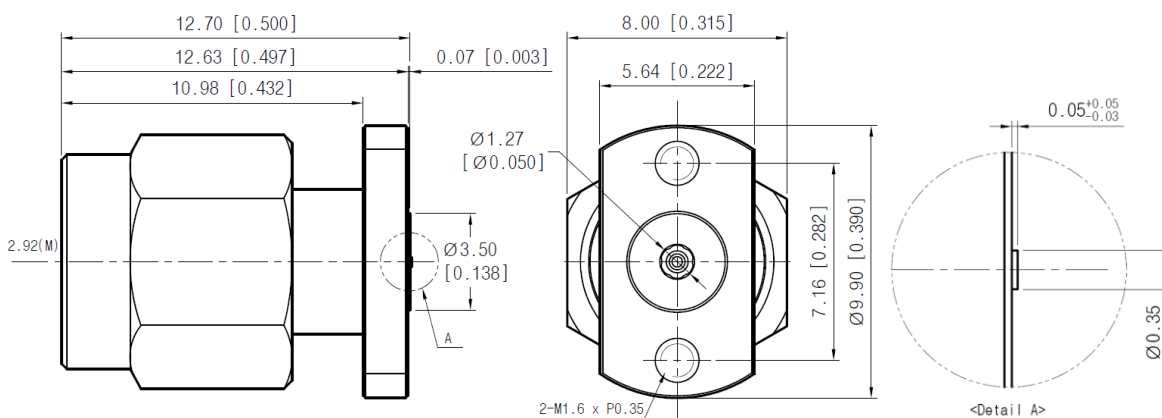
Stripline type

Unit : mm

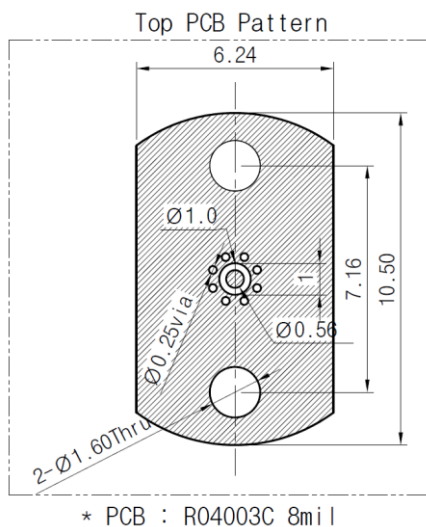
Female type



Male type



<Recommended PCB pattern>



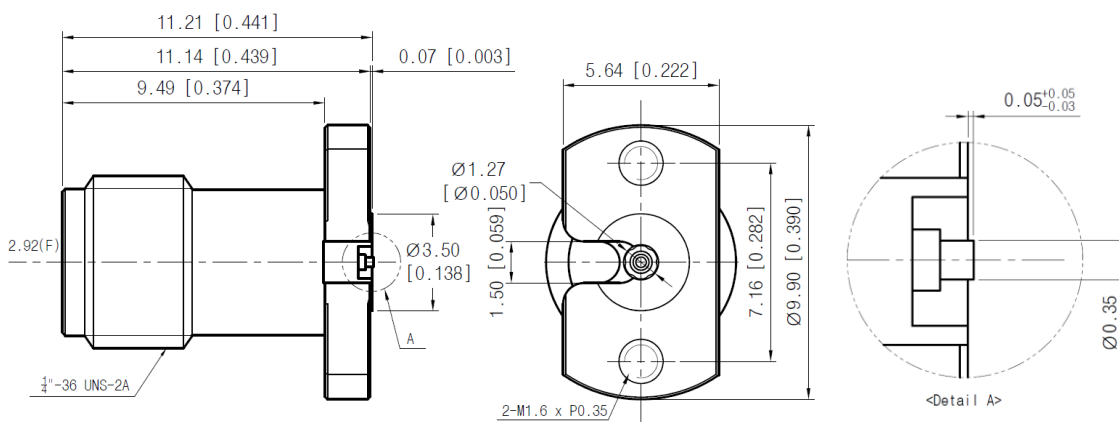
2.92 mm Connector

■ Drawing

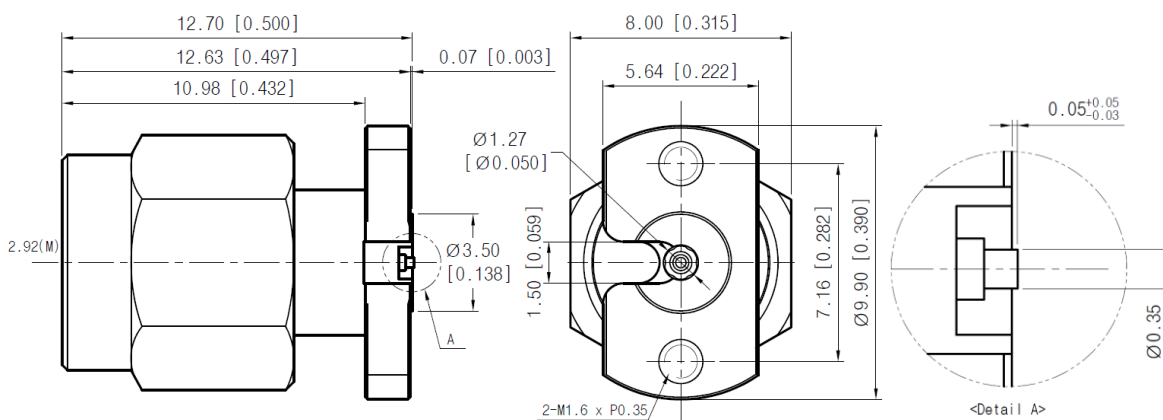
Microstrip type

Unit : mm

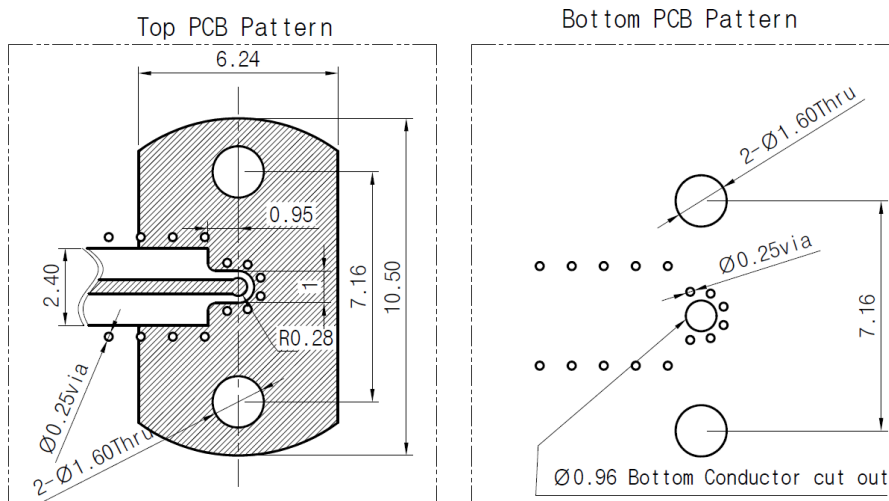
Female type



Male type



<Recommended PCB pattern>



* PCB : R04003C 8mil

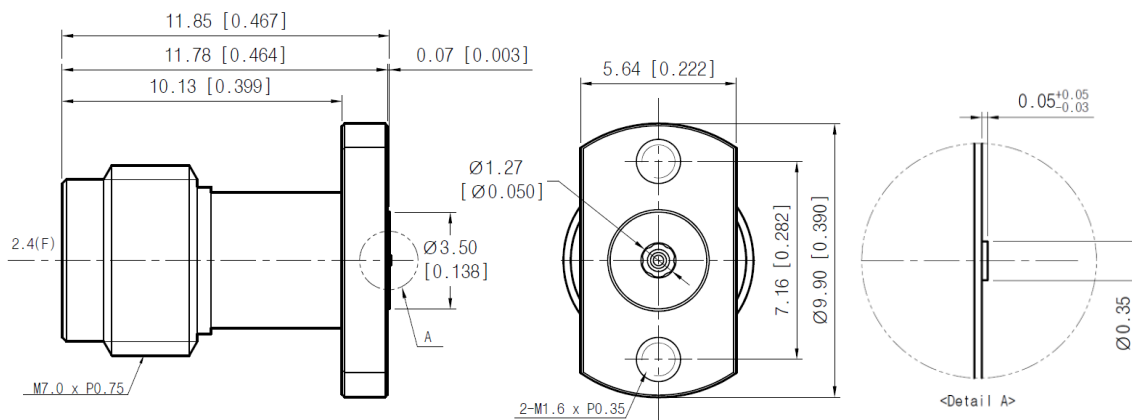
2.4 mm Connector

■ Drawing

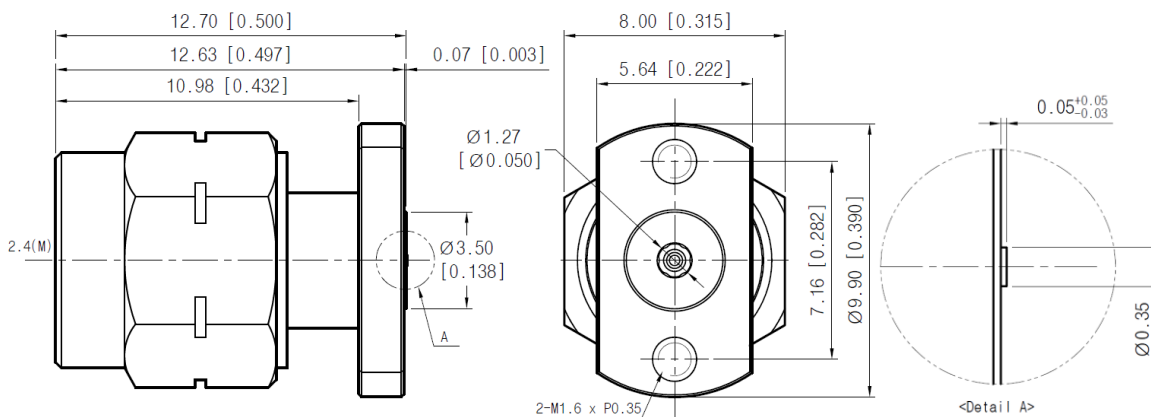
Stripline type

Unit : mm

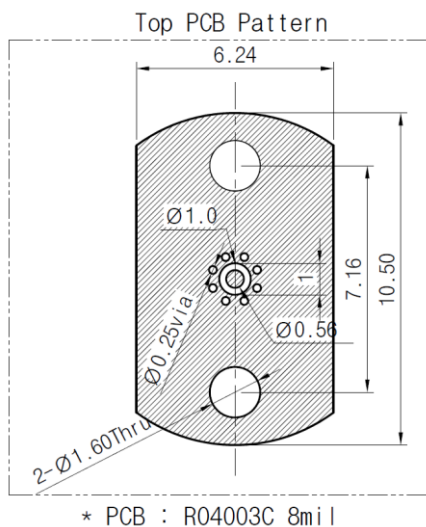
Female type



Male type



<Recommended PCB pattern>



* PCB : R04003C 8mil

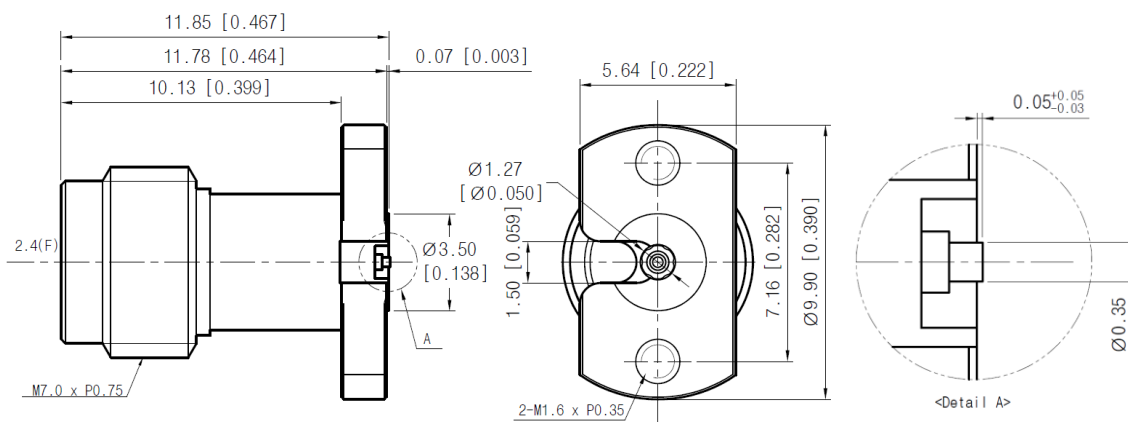
2.4 mm Connector

■ Drawing

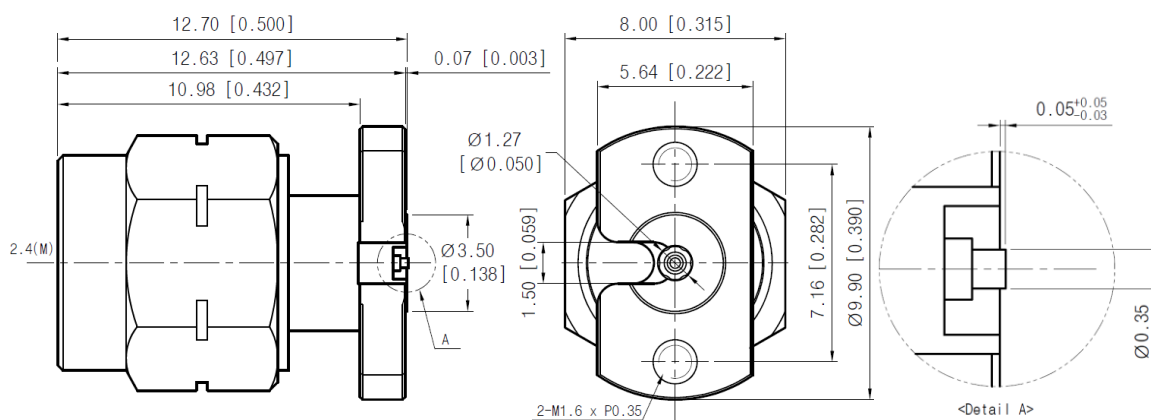
Microstrip type

Unit : mm

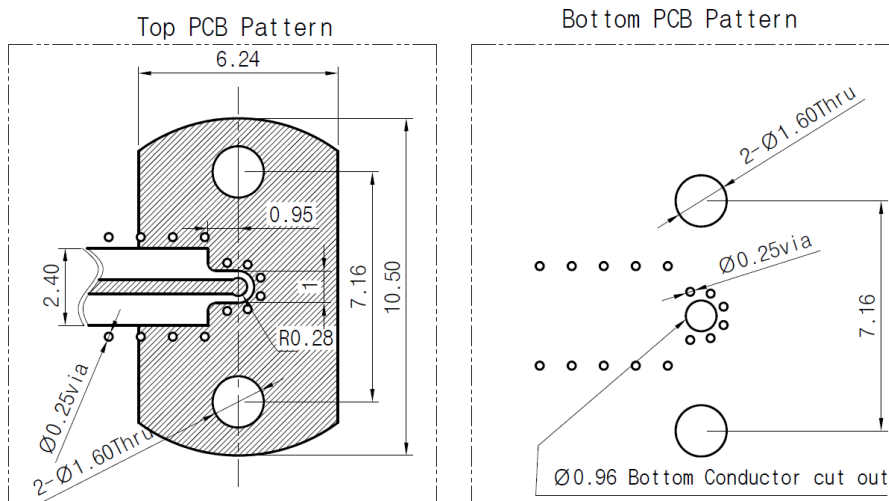
Female type



Male type



<Recommended PCB pattern>



* PCB : R04003C 8mil

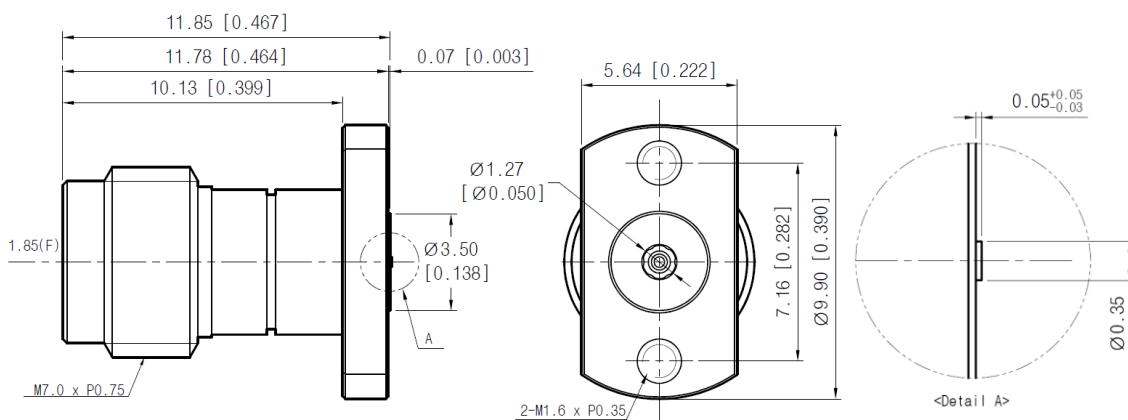
1.85 mm Connector

■ Drawing

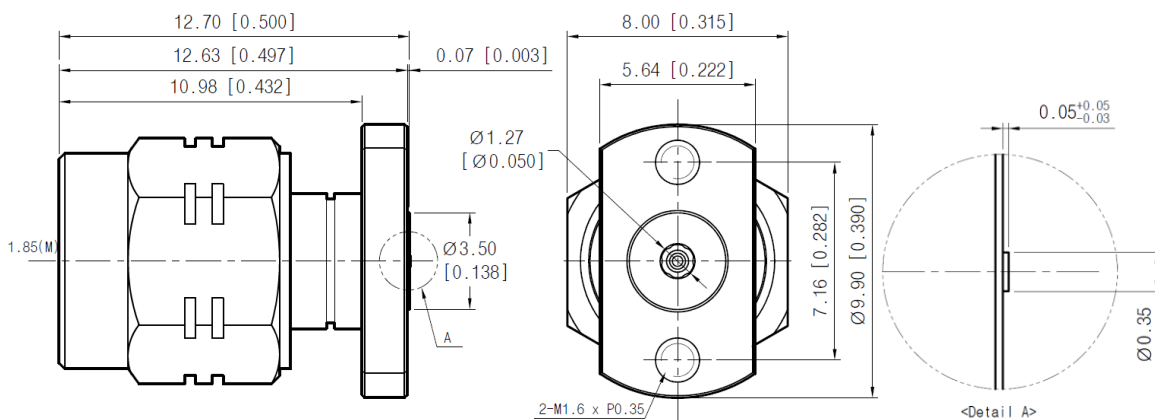
Stripline type

Unit : mm

Female type



Male type



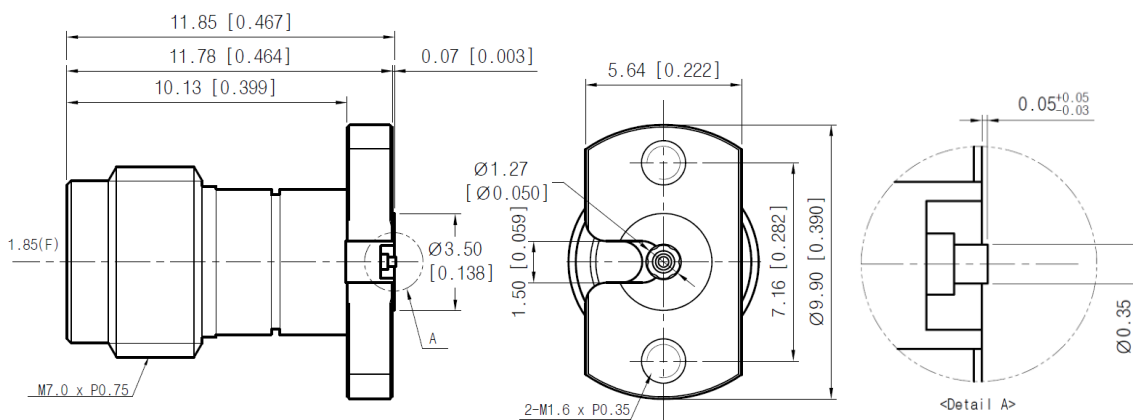
1.85 mm Connector

■ Drawing

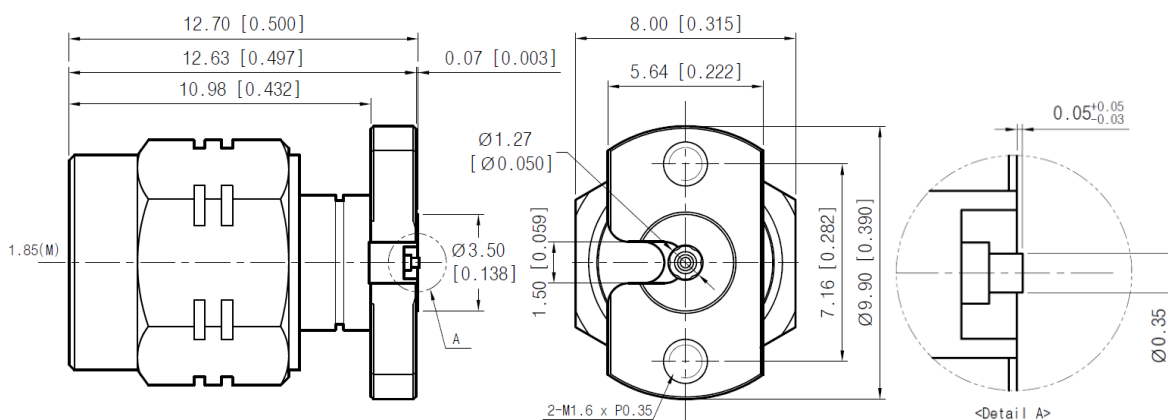
Microstrip type

Unit : mm

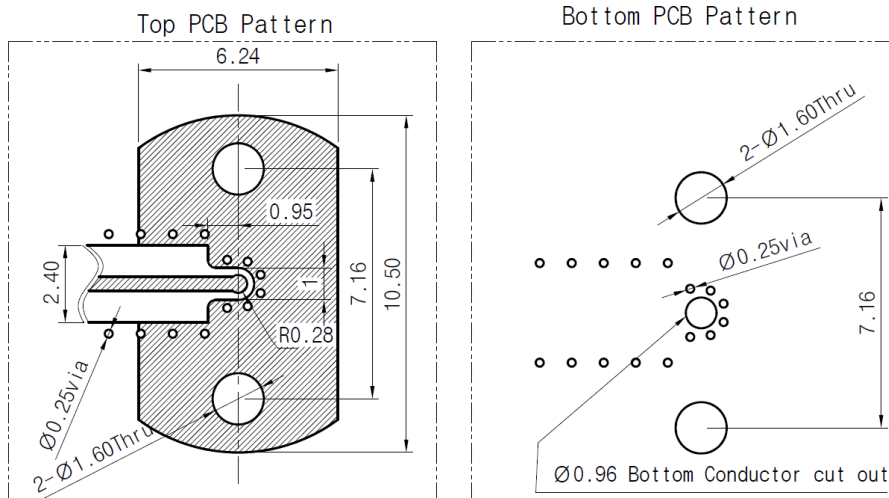
Female type



Male type



<Recommended PCB pattern>



* PCB : R04003C 8mil

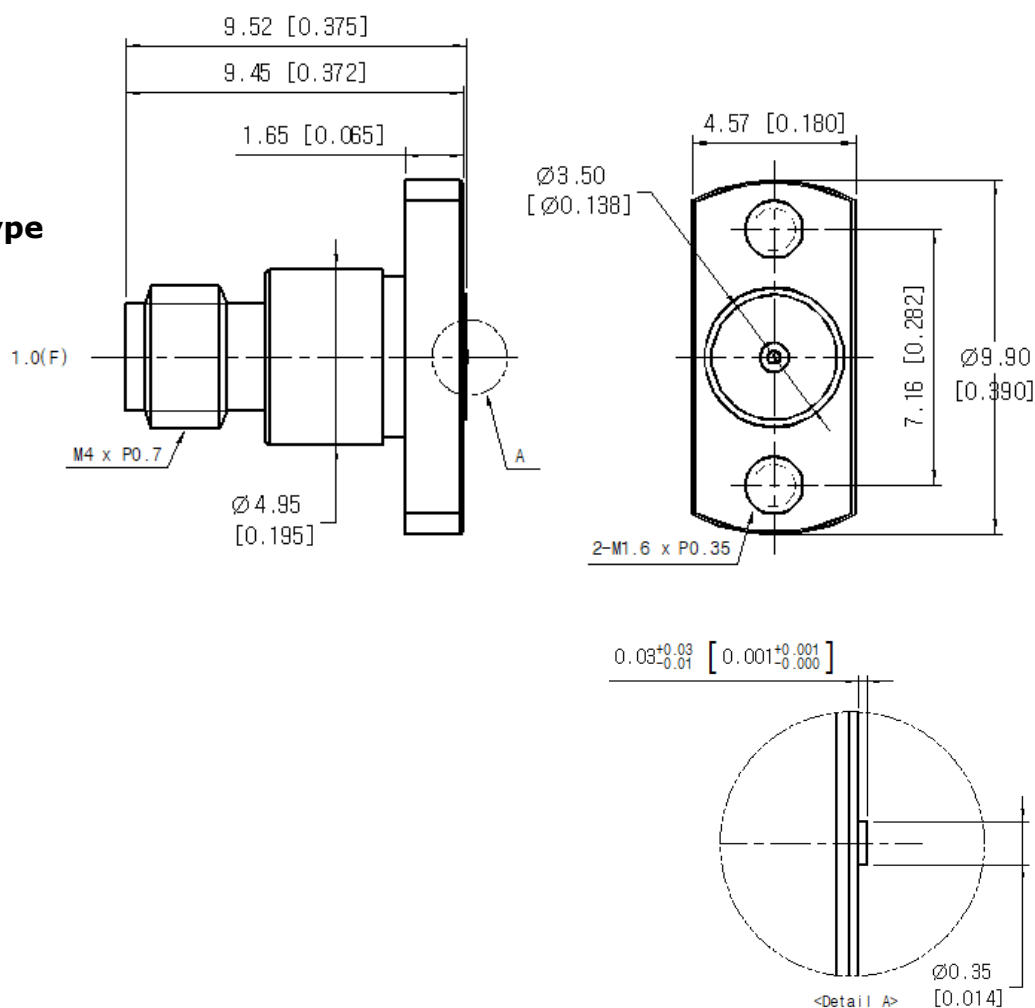
1.0 mm Connector

■ Drawing

Stripline type

Unit : mm

Female type



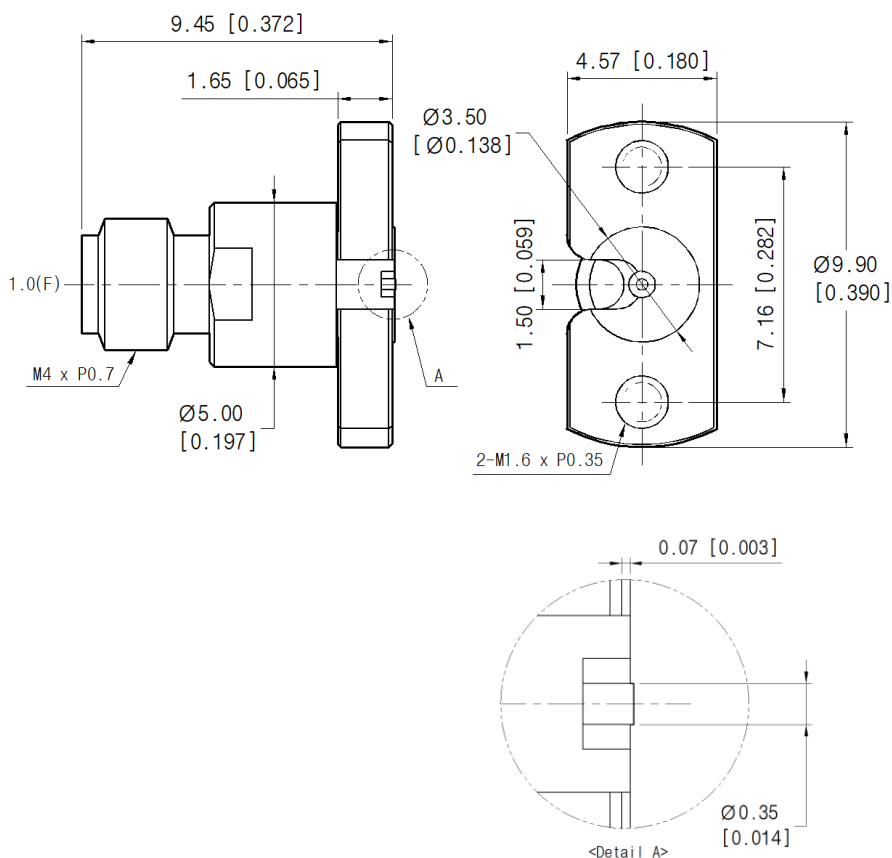
1.0 mm Connector

■ Drawing

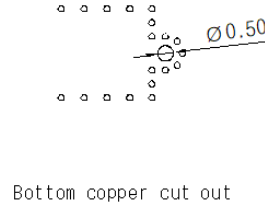
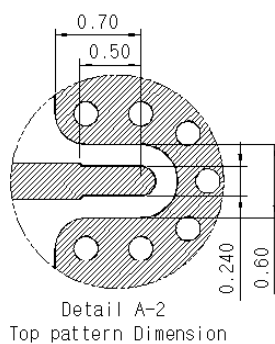
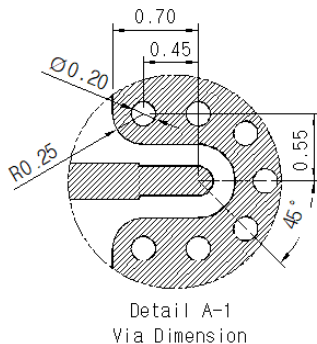
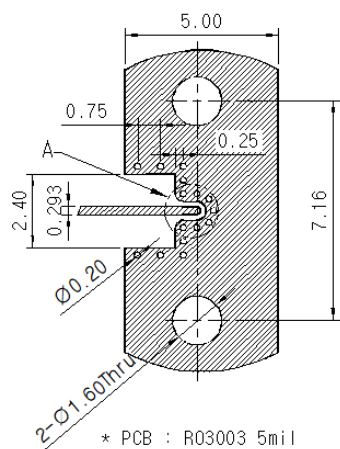
Microstrip type

Unit : mm

Female type



<Recommended PCB pattern>



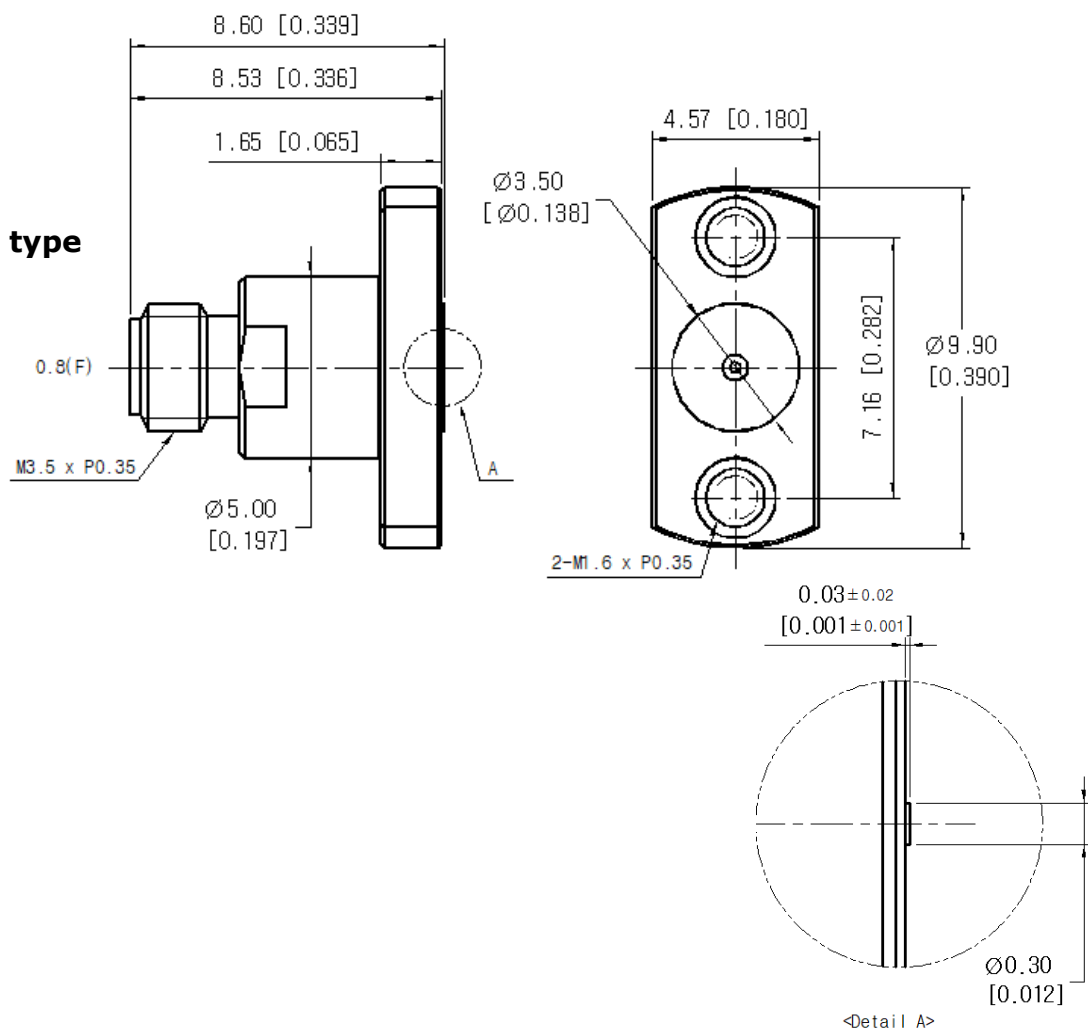
0.8 mm Connector

■ Drawing

Stripline type

Unit : mm

Female type



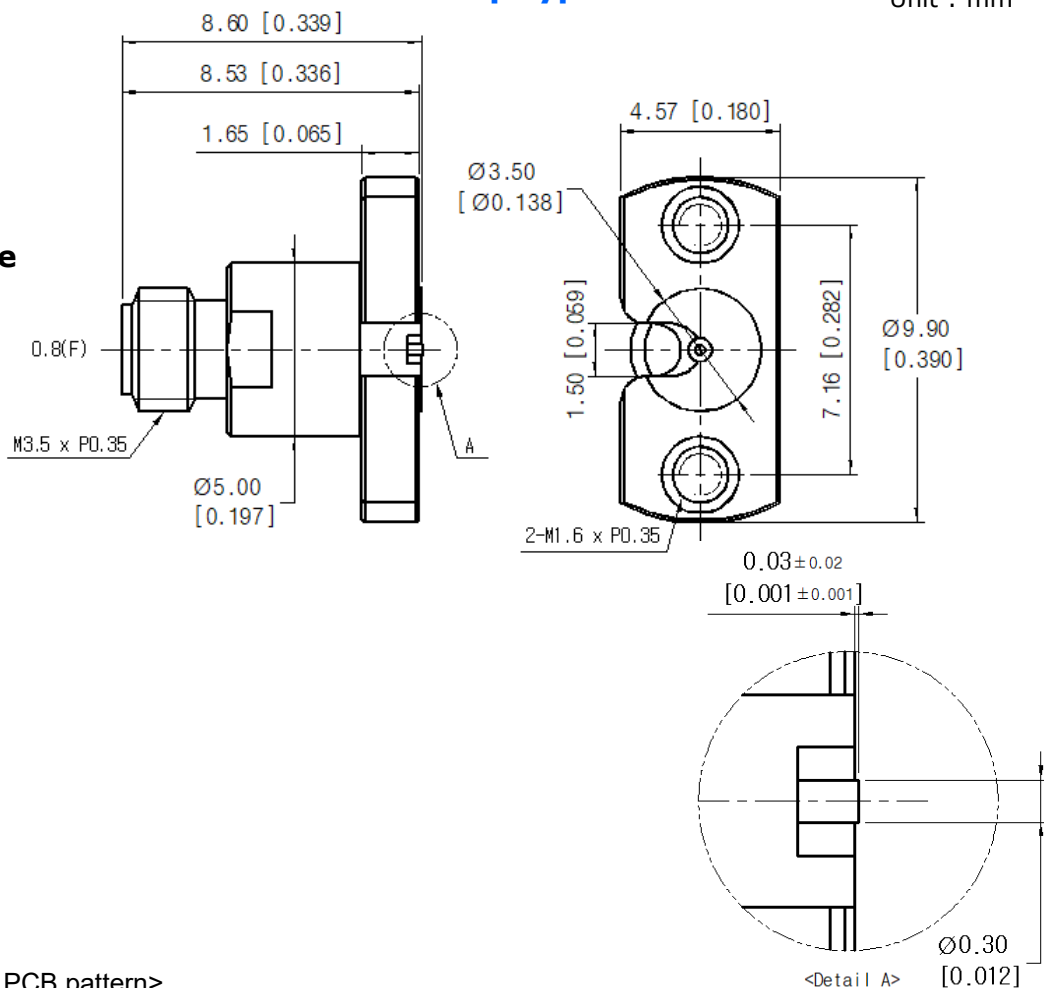
0.8 mm Connector

■ Drawing

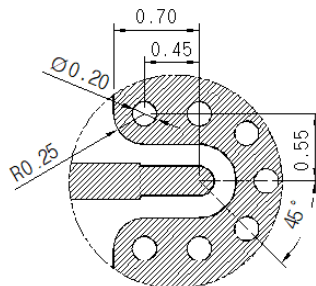
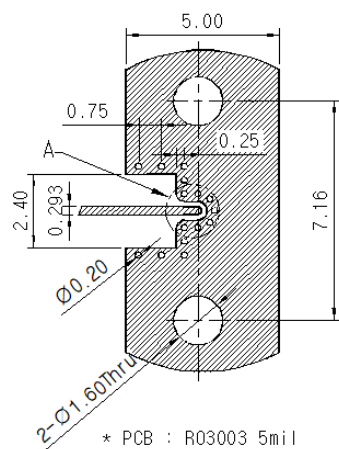
Microstrip type

Unit : mm

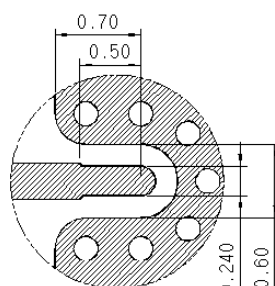
Female type



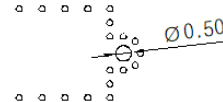
<Recommended PCB pattern>



Detail A-1
Via Dimension



Detail A-2
Top pattern Dimension



Bottom copper cut out

* PCB : R03003 5mil

■ Revision History

Revision	Date	Changes
Ver 1.1	2017-06-30	Changed Test result for Stripline type
Ver 2.0	2017-07-28	Add Vertical Launch 2.92 mm Connectors
Ver 2.1	2017-10-12	Updated Recommended PCB pattern
Ver 2.2	2018-01-02	Updated Drawing
Ver 3.0	2018-02-27	Add Vertical Launch SMA connectors
Ver 3.1	2018-05-24	Add installation procedure for Stripline type
Ver.4.0	2019-02-14	Add Vertical Launch 1.85 mm Connectors
Ver 5.0	2020-03-01	Add Design Assistance for ANSYS HFSS 3D model
Ver 6.0	2020-10-26	Add Vertical Launch 1.0 mm Connectors
Ver 6.1	2020-12-08	Add test result
Ver 6.2	2021-02-01	Add Ground Block
Ver 7.0	2022-08-10	Updated Test Results
Ver 8.0	2023-04-20	Changed new photos and updated Test Results
Ver 9.0	2024-11-24	Add Vertical Launch 0.8 mm Connectors
Ver 10.0	2025-07-01	Updated SMA, 2.92 mm, 2.4 mm Male Type Test Results