

mmWave OTA Test System

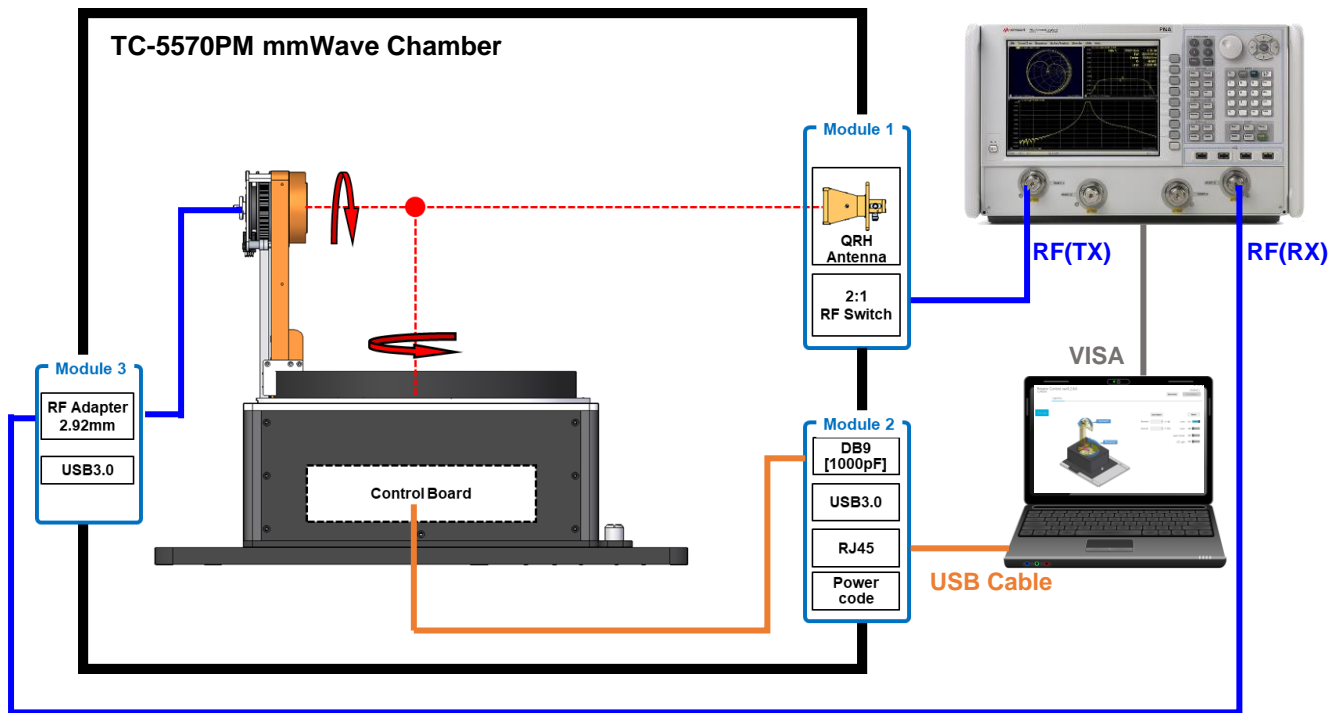
TC-5570PM



Features

- Small chamber specially designed for OTA testing of a DUT antenna in the millimeter wave band
 - Provides OTA test environment applying with the optimized absorber in millimeter wave band
 - Operating frequency range: 18 GHz ~ 67 GHz
 - Shielding Performance: > 60 dB
 - Easy-to-use wheel mounted
- Rotation fixture for 3D radiation pattern measurement
 - 2-axis rotating system
 - Mechanically designed to avoid cable twist using slip ring and RF rotary joint
- Quad Ridged Horn Antenna installed: 18 GHz ~ 40 GHz
 - The antenna can be replaced in module type.
 - Passive & Antenna performance test

OTA Chamber System Configuration



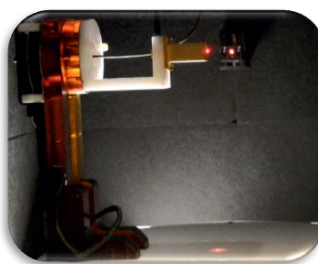
TC-5570PM (OTA Chamber)

TC-5570PM is a '5G & mmWave' OTA chamber designed to allow OTA (over the air) testing under the far-field conditions even in a small space.

It provides an environment for performance testing of mm-Wave antennas by applying an optimized absorber for '5G and mmWave OTA' tests.

But for the large radiator antennas, it may be difficult to meet Far-Field test conditions. (antenna size within 51 mm at 28 GHz, 42 mm at 40 GHz).

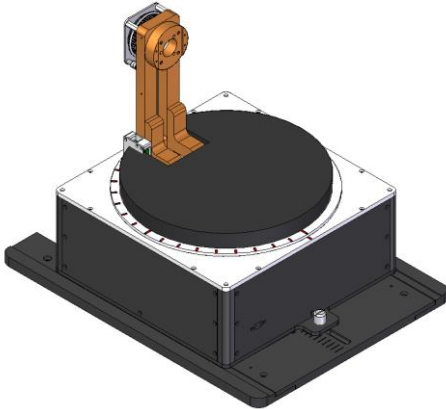
2 laser pointers are installed orthographically in the TC-5570PM system, so DUT can be easily positioned and set on a test zone. Moreover, for measuring convenience, LED light can be supported and an angle-adjustable camera module is installed inside the chamber for a user can check the 3D rotator status on a PC.



TC-5500A (3D Rotator)

In 5G technology, a highly directional beamforming technique is necessary to compensate for the large path loss, so adaptive beamforming (smart antenna) that adjusts the antenna in the optimal direction and beam tracking technology to track the signal are very important

The 3D Rotator provides precision within $\pm 1^\circ$ and reliability of repeated measurements to perform these tests. In order to select the optimum position of the DUT, the DUT holder can be easily adjusted to the X / Y / Z axis according to the antenna position of the DUT.



TC-5570PM system has a 3D rotator of 2-axis rotating system measuring the 3D radiation pattern and all components are designed and manufactured by considering dielectric constant.

The 3D Rotator is equipped with an RF thru connector to provide RF signals to the DUT and is designed to be rotated without twisting power and data lines using the rotary slip ring.

Antennas

TESCOM offers a wide range of antennas suitable for testing in the 5G mmWave band.

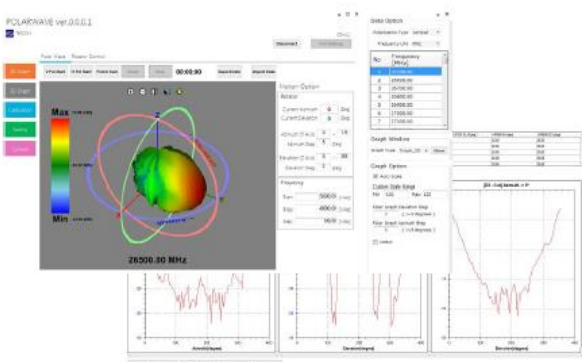
As a standard test antenna, Quad Ridged Horn Antenna, which features dual polarization in which polarization is allowed within 18 ~ 40 GHz, is installed.

Also it provides RF switch for test convenience and can be controlled remotely. Using another optional test antenna allows the extension of test frequency.

This antennal option is modular type anyone can replace it easily.



Software (S5500P: PolarWave)



PolarWave, an antenna measurement software, provides a measurement solution by combining various hardware of the TC-5570PM system.

It displays 2D/3D radiation patterns, based on measurements such as Gain, Efficiency and etc.

PolarWave updates the measurement values in real time and provides convenience in measurement.

Specifications

Typical RF Shielding

It is measured with Blank panels. Shielding performance may vary different depending on I/O interface.

Frequency	Shielding Effectiveness (dB)
18 to 67 GHz	> 60 dB

Absorber Reflectivity

Being measured based on the metal plate (0 dB @ 18 GHz to 67 GHz), and measures the value that is reduced when the radio wave absorber is inserted,.

Frequency	Absorber Reflectivity (dB)
18 to 67 GHz	> 20 dB

Mechanical Specifications

TC-5570PM (OTA Chamber)

Dimension	
Inside	805(W) x 764.5(D) x 645(H) mm
Outside	941(W) x 943(D) x 855.5(H) mm
Door	624(W) x 624(H) mm
Weight	75 kg
*Packing	
Size	1100 (W) x 1100(D) x 1020(H) mm
Weight	Approx. 90 kg

TC-5500A (3D Rotator)

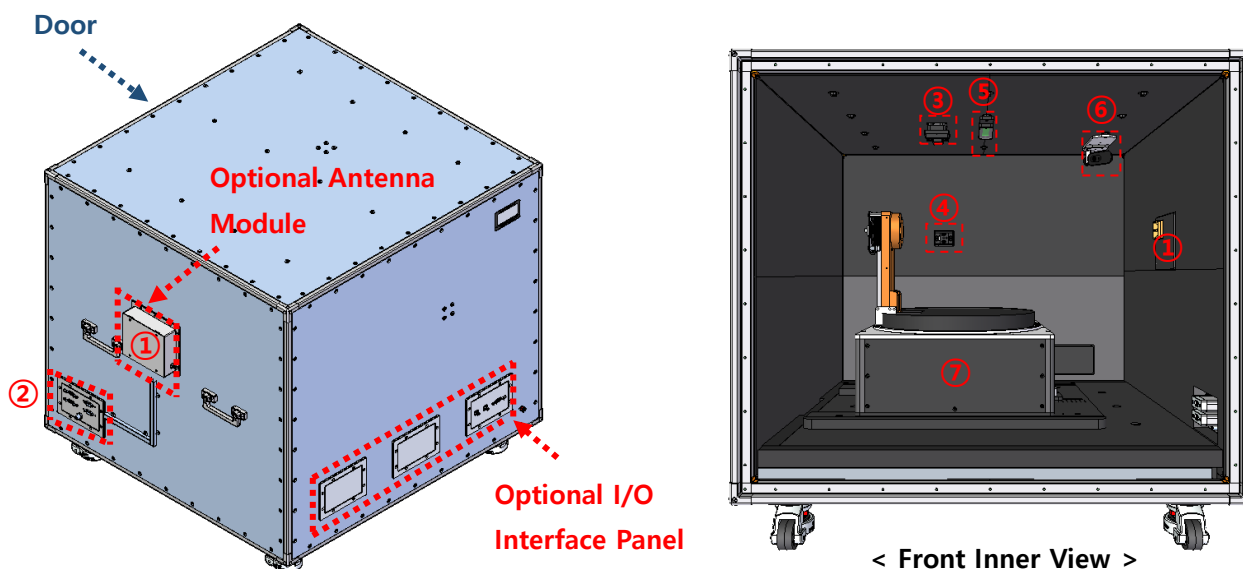
Rotation axis	Elevation and Azimuth (Automated / Homing)
Rotation Range	
Theta-Axis(EL)	0°~360°
Phi-Axis(AZ)	0°~180°
Rotation Speed	Elevation: 12 ~ 13 RPM Azimuth: 8 ~ 9 RPM
Positioning Accuracy	Elevation & Azimuth < 1°
Material	Resin series
Max. DUT Size	162 mm x 76.5 mm x 8.8 mm
Max. DUT Weight	0.5 kg
Control Interface	USB, RS-232C
Power Supply	24 V DC Adapter
Size (Length x Width x Height)	438 mm x 400 mm x 427 mm
Weight	Approx. 18 kg

[Test Antenna: Dual Polarization Antenna]

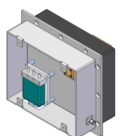


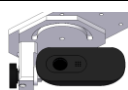

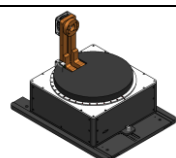
Antenna Type	Quad Ridged Horn Antenna
Frequency Range	18 GHz to 40 GHz
RF Connector	K-TYPE 2.92 mm Female
Normal Gain, dBi	Typical 15 dBi (see Antenna measurements)
VSWR	< 2
Impedance	50 Ω
Cross Port Isolation	> 20 dB
Half Power Beam Width	Typical 30°
Size (Length x Width x Height)	70 mm x 54 mm x 54 mm
Weight	Approx. 313 g

* A packing size or weight may be different depending on packing method.

System Components



TC-5570PM OTA Chamber Configuration (Full Option)


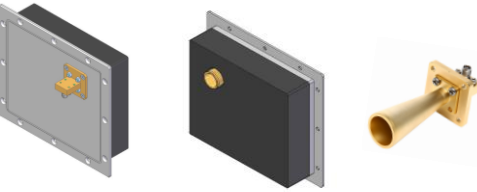

No.	Detail View	Description	No.	Detail View	Description
①		H5570PM02A, QRH Antenna Module • QRH Antenna : TC-93470A • 2:1 RF Switch(DC ~ 40 GHz)	⑤		LED Fixture
②		M5570A12A, Data Interface Module • two(2) DB9 1000 pF pi filter • two(2) USB 3.0 Adapter • DC Jack	⑥		F5570PM04A Camera Fixture
③,④		Laser Point	⑦		TC-5500A 3D Rotator

Ordering Information

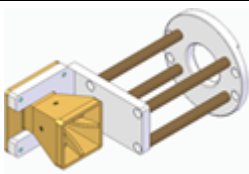
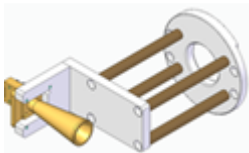
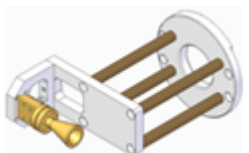
■ TC-5570PM OTA Chamber System Full Option

System Configuration	Order Number	Description
OTA Chamber	TC-5570PM	mmWave OTA Chamber (including accessories below) <ul style="list-style-type: none"> Operating Manual Test Report
Test Antenna Module	H5570PM02A	QRH Antenna Module (including accessories below) <ul style="list-style-type: none"> Antenna : TC-93470A, Dual Polarized Frequency: 18 GHz to 40 GHz 2:1 RF Switch (DC ~ 40 GHz) RF Adapter: K-type 2.92 mm
Rotator	TC-5500A	3D Rotator (including accessories below) <ul style="list-style-type: none"> Slip-ring Standard DUT Holder
Antenna Measurement Software	S5500P	PolarWave: Antenna 3D Pattern Measurement Program <ul style="list-style-type: none"> Gain / Efficiency (dB Scale, Percentage Scale) Radiation Pattern (3D-Pattern, 2D-Pola, 2D-Ractangular) Ant. Calibration (표준 안테나에 대한 Pathloss Calibration) Half Power Beamwidth (HPBW)

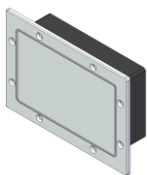

■ Test Antenna Module

Antenna Module	Order Number	Configuration
	H5570PM02A	<ul style="list-style-type: none"> QRH Antenna Module - Frequency: 18 GHz to 40 GHz - Antenna: TC-93470, Dual Polarized - 2:1 RF Switch (DC to 40 GHz) - RF Connector: K-type 2.92 mm - Antenna Typical Gain: 14.5 dBi @ 28GHz
	H5570PM06A	<ul style="list-style-type: none"> WR-28 Horn Antenna & 2.92 mm Female Waveguide: - Frequency: 26.5 GHz to 40 GHz - Antenna: TC-93471A - Waveguide: TC-93480A - Antenna Typical Gain: 13 dBi @ 28GHz
	H5570PM05A	<ul style="list-style-type: none"> WR-15 Horn Antenna & 1.85 mm Female Waveguide: - Frequency: 50 GHz to 67 GHz - Antenna: TC-93670A - Waveguide: TC-93680A - Antenna Typical Gain: 15 dBi @ 60GHz




■ Calibration Antenna Fixture

Antenna Module	Order Number	Configuration
 <p>QRH Antenna Calibration Fixture</p>	F93470A01A	<ul style="list-style-type: none"> Frequency: 18 GHz to 40 GHz RF Adapter: K-type 2.92 mm, Female
 <p>WR28 Horn Antenna Calibration Fixture</p>	F93471A01A	<ul style="list-style-type: none"> Frequency: 26.5 GHz to 40 GHz RF Adapter: K-type 2.92 mm, Female
 <p>WR15 Horn Antenna Calibration Fixture</p>	F93670A01A	<ul style="list-style-type: none"> Frequency: 50 GHz to 67 GHz RF Adapter: 1.85 mm, Female

■ Optional I/O Interface Panel

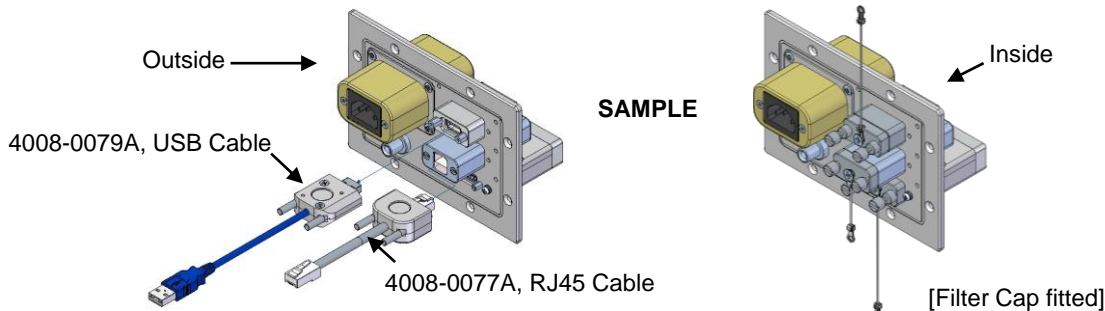
I/O Interface Panel	Order Number	Configuration
	M5570A10A	<ul style="list-style-type: none"> Blank module (Absorber)
	M5570A08A	<ul style="list-style-type: none"> Two(2), 2.92 mm RF Connector One(1), USB3.0 Adaptor






■ Optional RF Connector

I/O Interface	Description / Order Number	Frequency Range / Impedance / V.S.W.R
	RF, 2.92 mm Thru Adapter includes / 3407-0024	From DC to 40 GHz, 50 Ω , 1.3 max
	RF, 2.4 mm Thru Adapter / 3407-0027	From DC to 50 GHz, 50 Ω , 1.3 max
	RF, 1.85 Thru Adapter / 3412-0001	From DC to 67 GHz, 50 Ω , 1.5 max

Custom I/O Interface Panel

- Customized I/O Interface Panel is available by selecting below I/O interfaces and combine.
Please contact Tescom sales team or your local distributor.

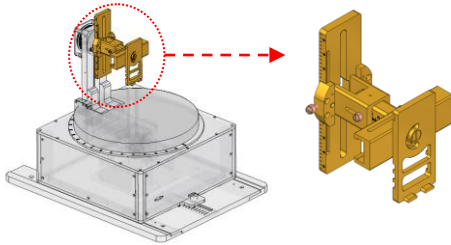


I/O Interface	Description / Order Number	Typical Data Rate / Line Voltage	Typical Shielding ^(*)
	USB 2.0 Filter / 3409-0018A-3^(a)	480 Mbps / 5 V, 500 mA / Max Current: 5 A	>60 dB from 0.5 to 2 GHz >70 dB from 2 to 3 GHz >70 dB from 3 to 6 GHz >70 dB from 6 to 67 GHz
	USB 3.0 Filter(Active)/ 3409-0042A-2^(a)	5000 Mbps / 5 V, 600 mA / Max Current: 1.5 A	>80 dB from 0.5 to 2 GHz >80 dB from 2 to 3 GHz >75 dB from 3 to 6 GHz >60 dB from 6 to 67 GHz
	RJ-45 Filter / 3409-0022A^(b)	RJ45 Filter: 1 Gbit/s Copper Line Ethernet (1000 BASE-T)	>60 dB from 0.5 to 2 GHz >70 dB from 2 to 3 GHz >70 dB from 3 to 6 GHz >60 dB from 6 to 67 GHz
	DC Power Adaptor / 3406-0004A	50 VDC, 3 Amps max	>70 dB from 0.5 to 2 GHz >80 dB from 2 to 3 GHz >80 dB from 3 to 6 GHz >70 dB from 6 to 67 GHz
	AC Power Adaptor / 3103-0009A	250 VAC, 7 Amps max	>70 dB from 0.5 to 2 GHz >80 dB from 2 to 3 GHz >80 dB from 3 to 6 GHz >70 dB from 6 to 67 GHz

- ^(a) : Exclusive cables should be used.
(USB Cable, 4008-0079A, 2 M, USB 3.0 A(M) - USB 3.0 A(M), Housing: Aluminum)
- ^(b) : Exclusive cables should be used.
(RJ-45 Cable, 4008-0077A, 2 M, RJ-45(M) – RJ-45(M), Housing: Aluminum)
- ^(*) : 1) Shielding effectiveness is measured when each I/O interface panel, which is shown above, is mounted.
2) Above data was measured by Tescom, The Shielding Effectiveness might be different based on the measuring method and condition.
3) This data has been measured under the condition that the cables are not connected to each filters.
When the cables are connected it can affect the shielding performance.

■ Standard DUT Holder

Fixture	Order Number	Configuration
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- Exclusive DUT holder for TC-5500A

Standard DUT Holder

It can be changed without any prior notice.