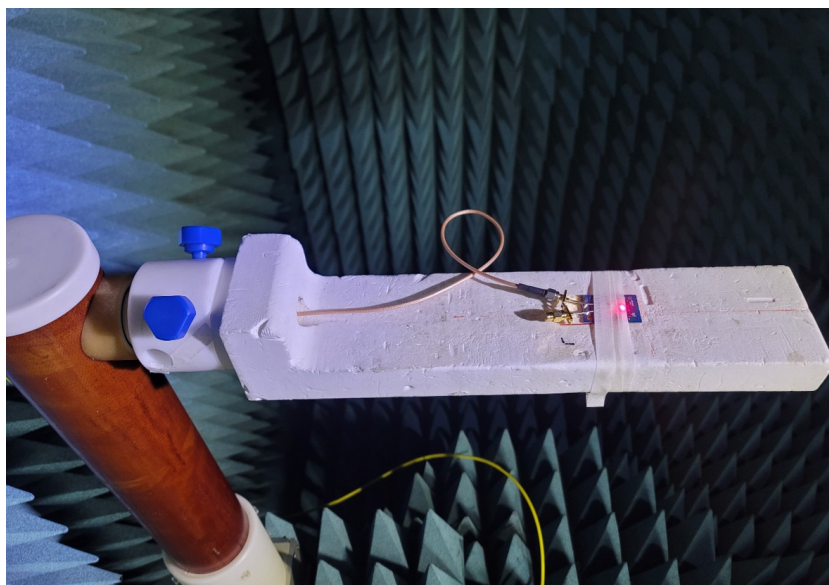
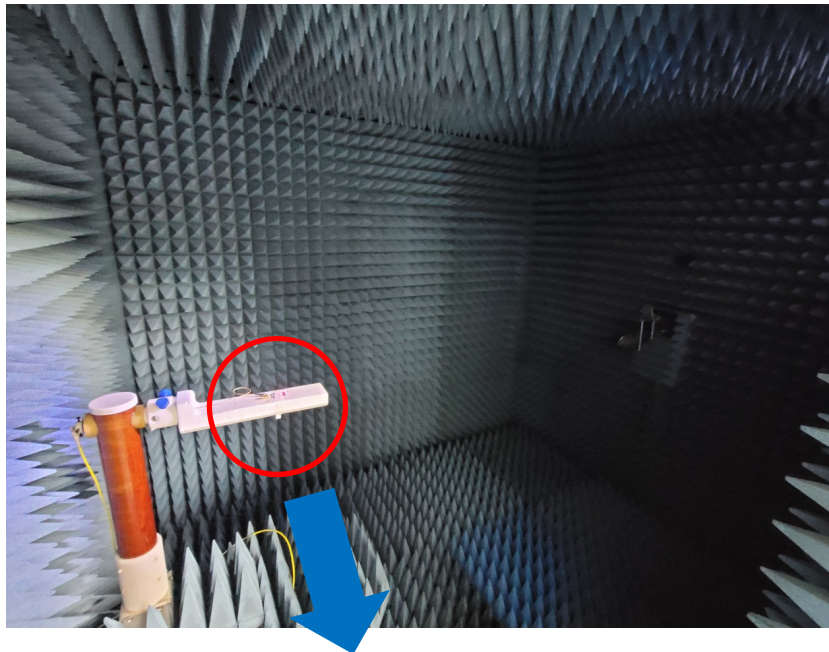


Antenna Specification

Test Condition

- ATM610 PCB Printed Antenna
- Test Chamber : SJIT OTA Chamber
- (Address : IoT R&D Center, 54-11, Dongtanhana 1-gil, Hwaseong-si, Gyeonggi-do, 18423 KOREA)
- Network Analyzer : Return Loss
- 3D Passive Chamber : Gain and Efficiency
- Measured by Sungkwon Park 2024/07/01

Test Environment



Antenna Gain Measurement Procedure and Software

The KSS Software is used to test antenna gain in the far field 3D OTA chamber.

The overview of the far field 3D OTA chamber is shown in Fig.1 and the antenna turntable rotation sampling is shown in Fig.2.

The antenna gain can be measured by the following steps

1. Place the AUT (Antenna Under Test) on the biaxial 3D turntable.
2. The test horn antenna maintains horizontal polarization, and the turntable rotation is controlled by the KSS test system and the value of each angular horizontal polarization of the AUT is read.
3. The test horn antenna maintains vertical polarization, and the turntable rotation is controlled by the KSS test system and the value of each angular vertical polarization of the AUT is read.
4. The KSS test system compares the obtained test values with the standard antenna to obtain the final gain values.

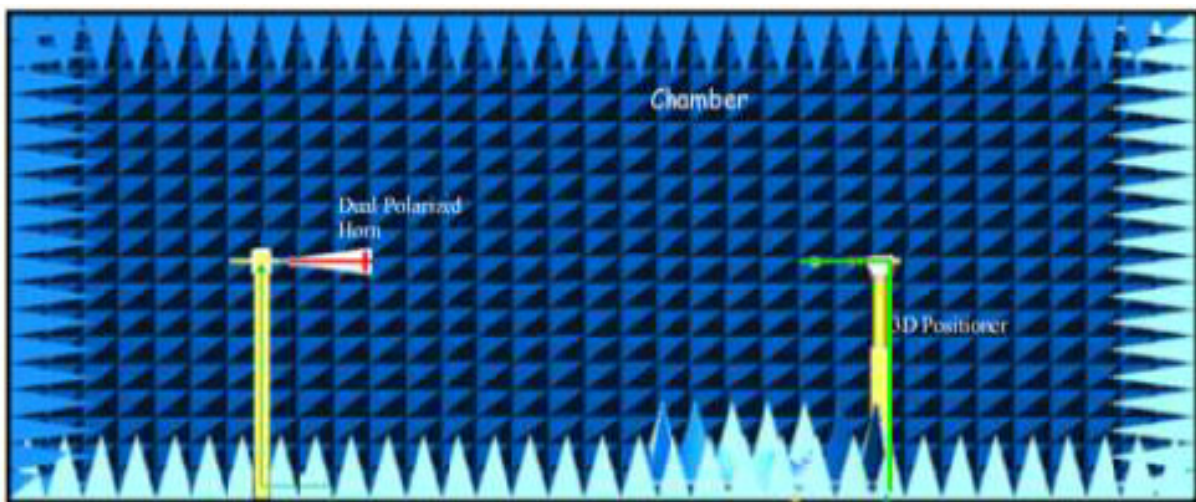


Fig.1 Overview of 3D Chamber

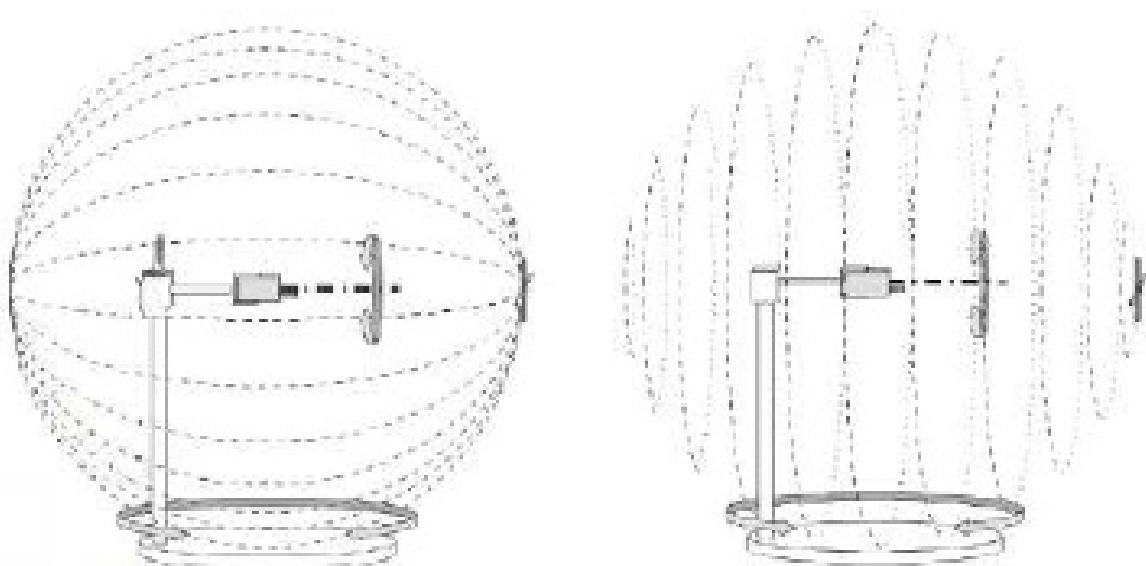
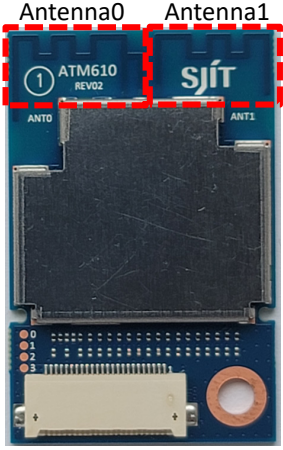


Fig.2 Antenna turntable rotation sampling

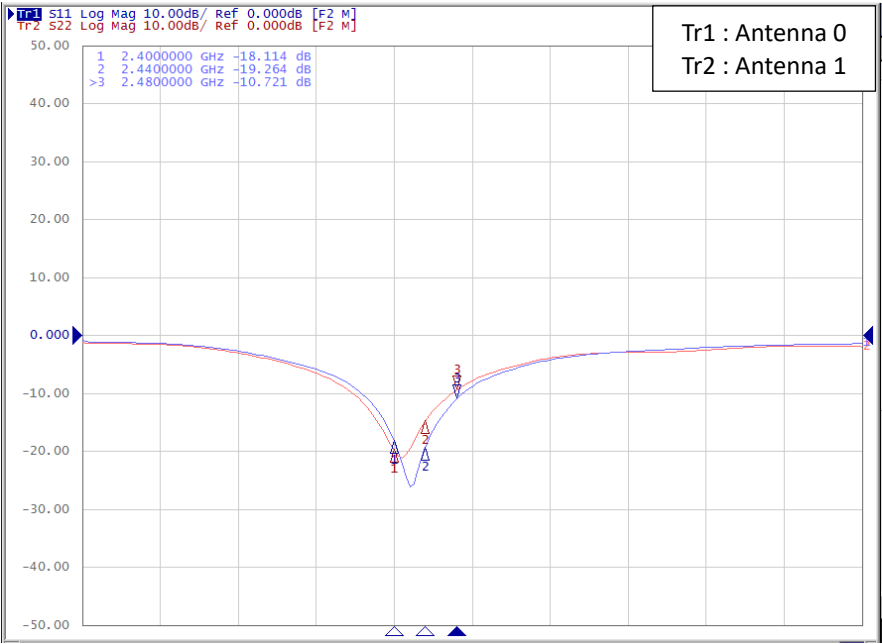
Measuring Instruments

Item	Measuring Instruments	Latest Calibration Schedule
1	OTA Chamber	2024/06/10
2	Network Analyzer Agilent Technologies 5071C	2024/03/08

Antenna Characteristics

Antenna Type	PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
Antenna0Antenna1  PCB Printed Antenna	Frequency Range		2400		2480	MHz
	Return Loss	ANT0			-10	dB
		ANT1			-10	
	Peak Gain	ANT0			2.7	dBi
		ANT1			2.7	
	Average Gain	ANT0	-3.4		-2.6	dBi
		ANT1	-3.1		-2.6	
	Efficiency	ANT0	46		55	%
		ANT1	48		55	%
	Impedance				50	Ω

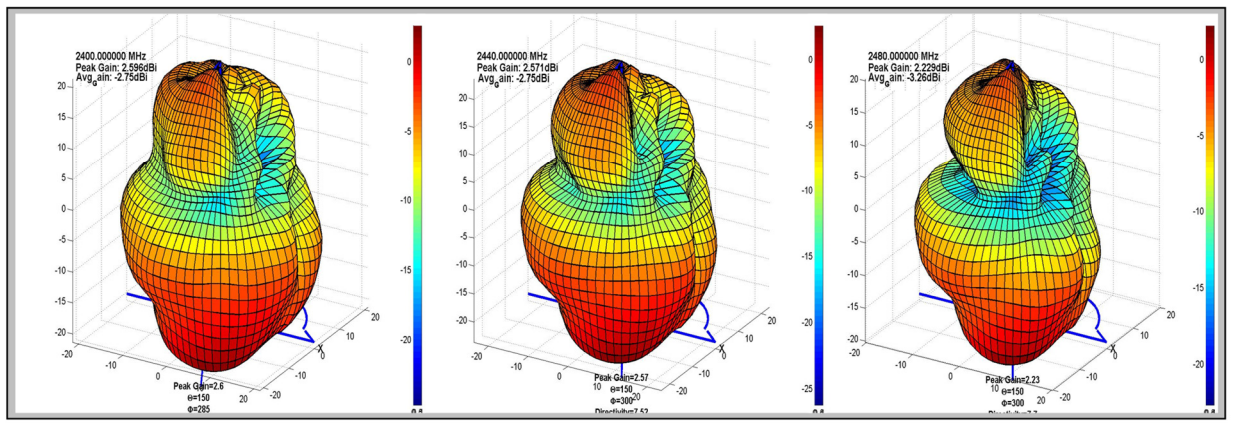
Antenna VSWR



Antenna Efficiency & Gain

Antenna0_Left

Frequency	Efficiency	Average Gain			Max Gain		
		Ver	Hor	Total	Ver	Hor	Total
2400.000000 MHz	53.0 %	-6.5 dBi	-5.1 dBi	-2.8 dBi	-2.8 dBi	1.3 dBi	2.6 dBi
2410.000000 MHz	52.1 %	-6.6 dBi	-5.2 dBi	-2.8 dBi	-2.9 dBi	1.2 dBi	2.5 dBi
2420.000000 MHz	54.4 %	-6.4 dBi	-5.0 dBi	-2.6 dBi	-2.8 dBi	1.4 dBi	2.7 dBi
2430.000000 MHz	54.5 %	-6.4 dBi	-5.0 dBi	-2.6 dBi	-2.7 dBi	1.5 dBi	2.7 dBi
2440.000000 MHz	53.1 %	-6.6 dBi	-5.1 dBi	-2.8 dBi	-2.8 dBi	1.3 dBi	2.6 dBi
2450.000000 MHz	51.7 %	-6.7 dBi	-5.2 dBi	-2.9 dBi	-2.9 dBi	1.3 dBi	2.5 dBi
2460.000000 MHz	53.0 %	-6.6 dBi	-5.0 dBi	-2.8 dBi	-2.8 dBi	1.5 dBi	2.7 dBi
2470.000000 MHz	46.1 %	-7.3 dBi	-5.6 dBi	-3.4 dBi	-3.4 dBi	0.9 dBi	2.1 dBi
2480.000000 MHz	47.2 %	-7.2 dBi	-5.5 dBi	-3.3 dBi	-3.2 dBi	1.1 dBi	2.2 dBi



Antenna1_Right

Frequency	Efficiency	Average Gain			Max Gain		
		Ver	Hor	Total	Ver	Hor	Total
2400.000000 MHz	54.8 %	-6.1 dBi	-5.2 dBi	-2.6 dBi	-1.6 dBi	2.2 dBi	2.7 dBi
2410.000000 MHz	51.3 %	-6.4 dBi	-5.5 dBi	-2.9 dBi	-2.0 dBi	1.9 dBi	2.4 dBi
2420.000000 MHz	49.8 %	-6.6 dBi	-5.6 dBi	-3.0 dBi	-2.2 dBi	1.8 dBi	2.3 dBi
2430.000000 MHz	53.4 %	-6.3 dBi	-5.2 dBi	-2.7 dBi	-2.0 dBi	2.1 dBi	2.7 dBi
2440.000000 MHz	53.4 %	-6.3 dBi	-5.2 dBi	-2.7 dBi	-1.9 dBi	2.1 dBi	2.7 dBi
2450.000000 MHz	48.5 %	-6.8 dBi	-5.6 dBi	-3.1 dBi	-2.4 dBi	1.7 dBi	2.3 dBi
2460.000000 MHz	50.7 %	-6.6 dBi	-5.4 dBi	-3.0 dBi	-2.2 dBi	1.9 dBi	2.5 dBi
2470.000000 MHz	51.8 %	-6.6 dBi	-5.3 dBi	-2.9 dBi	-2.1 dBi	1.9 dBi	2.6 dBi
2480.000000 MHz	51.3 %	-6.7 dBi	-5.3 dBi	-2.9 dBi	-2.1 dBi	1.9 dBi	2.5 dBi

