



Fleming Antenna Test Report

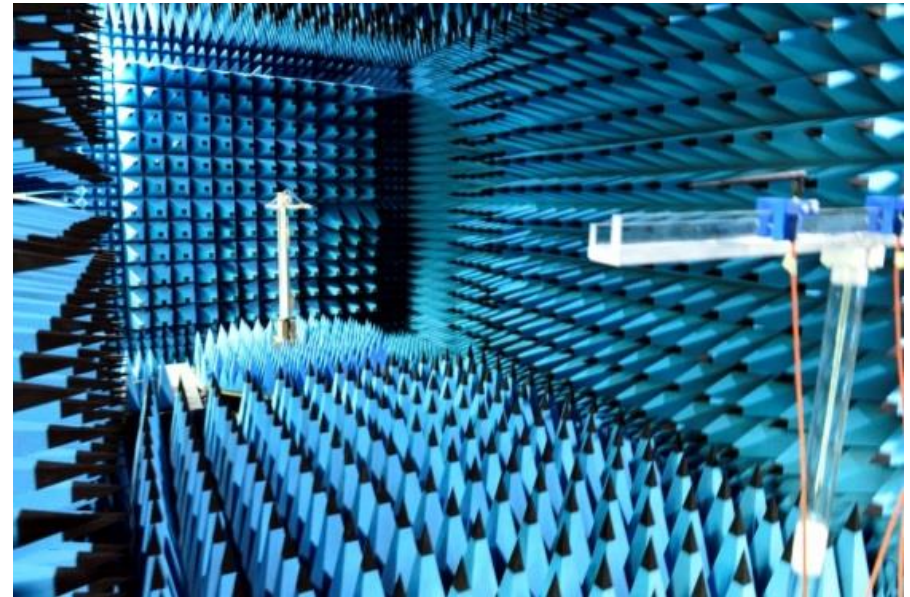
Senao Networks, Inc.

Customer	Verkada
Project	Fleming
Project Description	2.4/5G antenna*2
Test Date	2024/12/26
Test Personnel	Kenny
Report Version	A02

- **Agenda**
 - Antenna Development Resource
 - Antenna Testing Set Up
 - Placement and Specification
 - Return Loss & Isolation
 - Radiation Pattern
 - Efficiency and Gain

3D Anechoic Chamber - BWANT

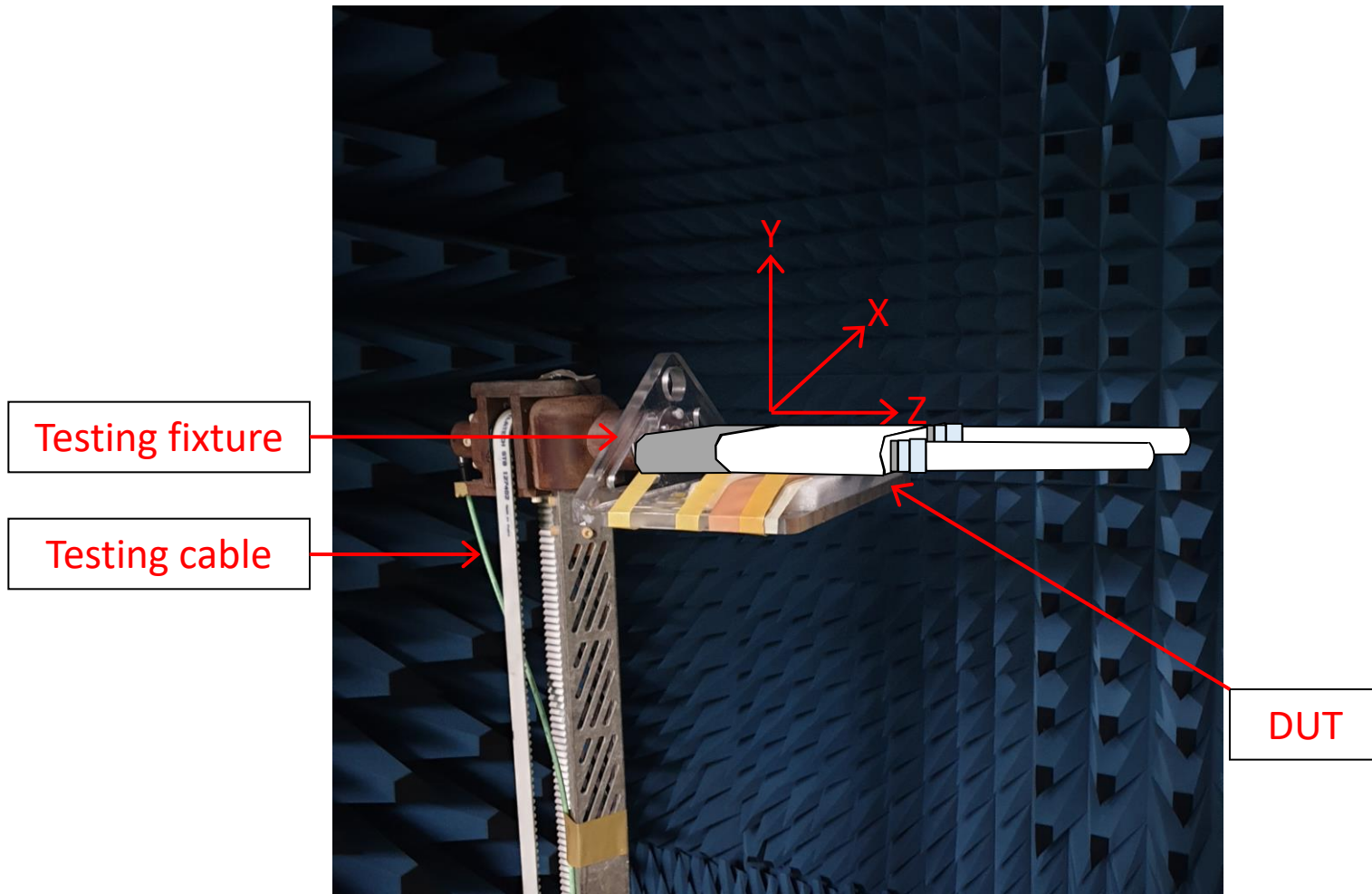
- Size: 7.32M(L)x3.66M(W)x3.66M(H)
- Testing range from 400MHz to 7GHz
- Chamber Isolation : 10KHz to 10GHz >100dB (NSA 94-106)
- Calibration antenna : BWANT SD650 /SD740 /SD900 /SD1150 /SD1575 /SD1800 /SD2140 /SD2450 /SD3200 /SD3600 /SD4550 /SD5400 /HA-0508
- Calibration date: 2024/11/25
- Test software : BWANT 3D Passive



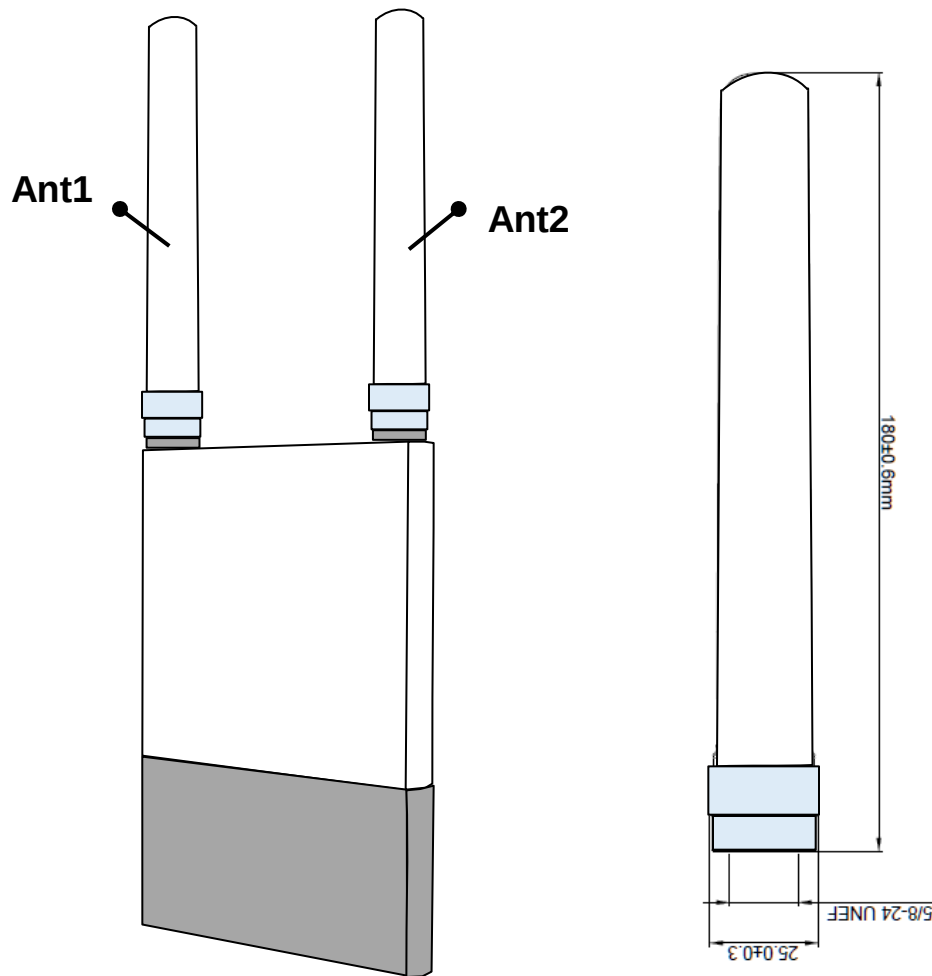
3D Anechoic Chamber

Antenna Testing Set Up

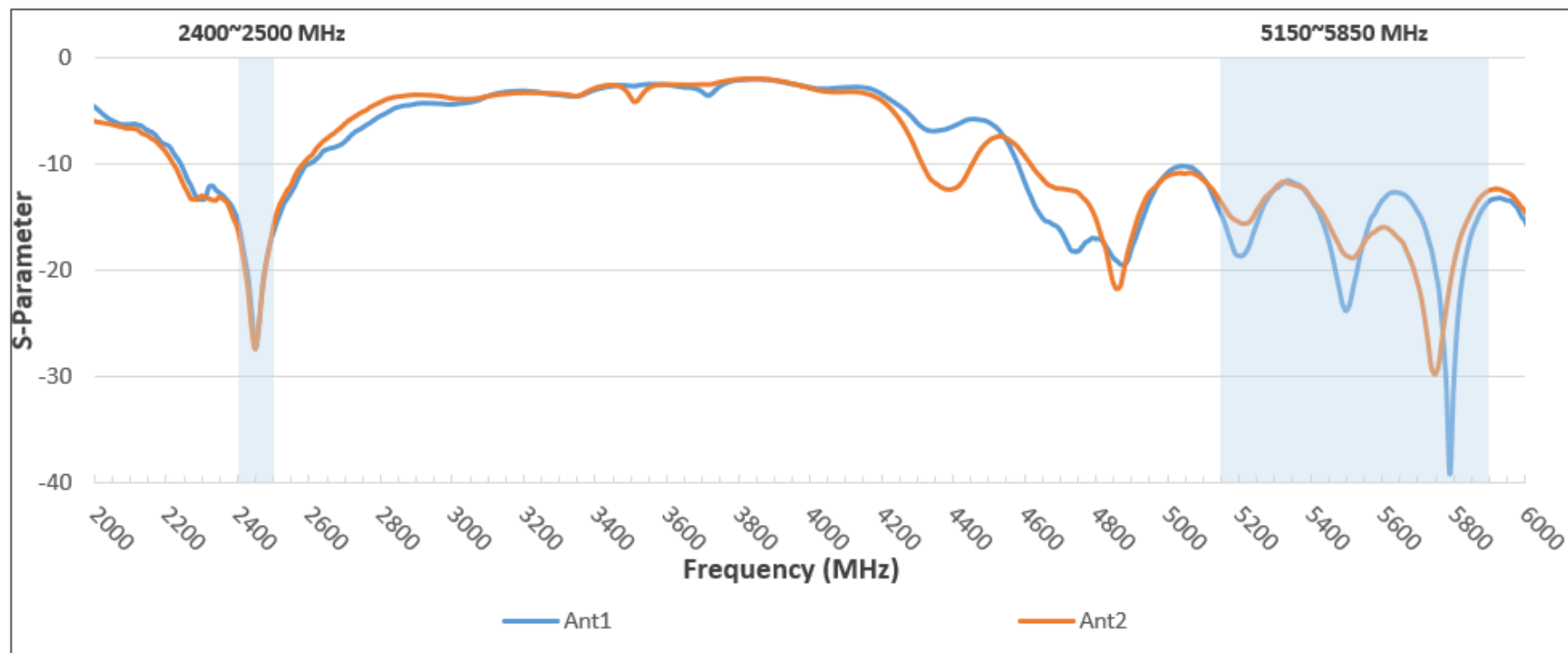
- The DUT is set up on the test fixture and the antenna is connected to the test cable to measure the antenna performance.



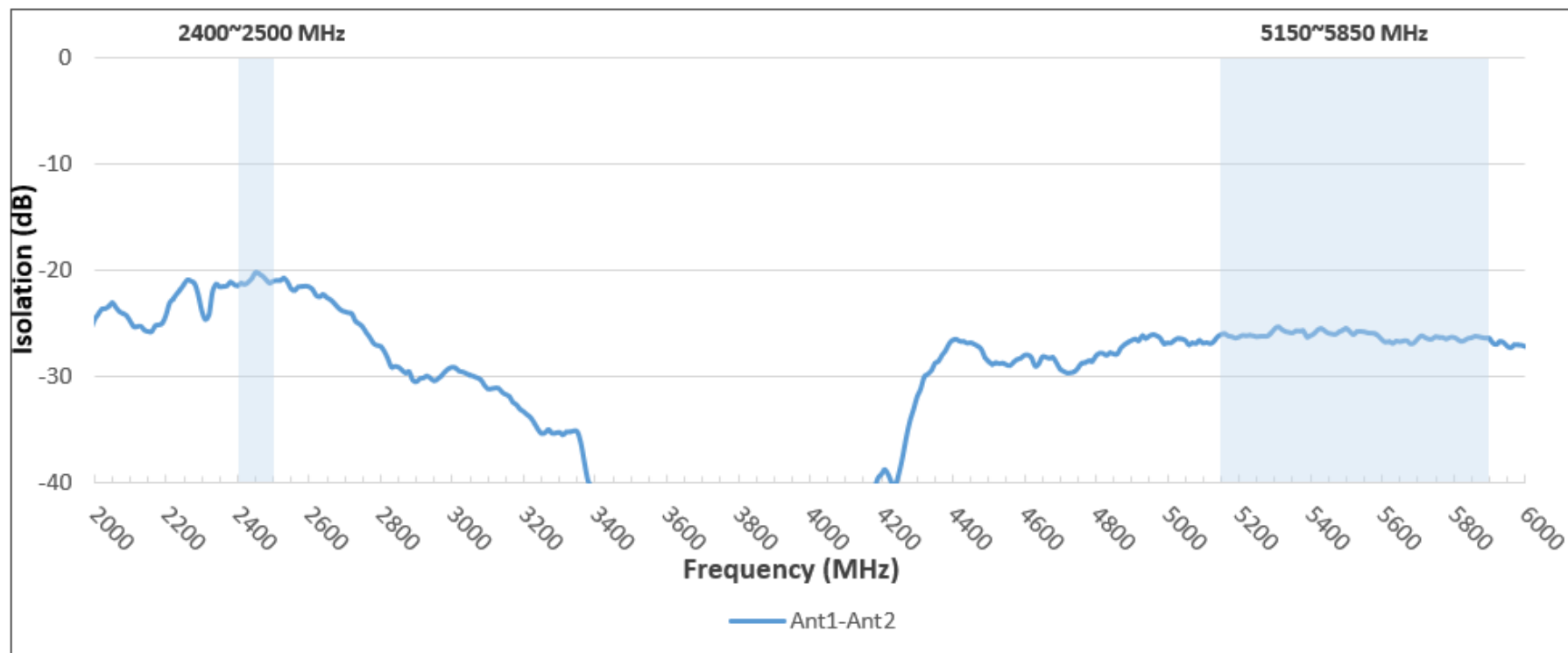
Placement and specification



Ant No.	Brand	Antenna P/N	Operating Band	Ant type	Feeding	Cable length	Dimension
Ant1~Ant2	Senao	7102A1338000	2400MHz ~ 2500 MHz 5150MHz ~ 5850 MHz	Dipole	N-type	160 mm	180*25*28 mm ³

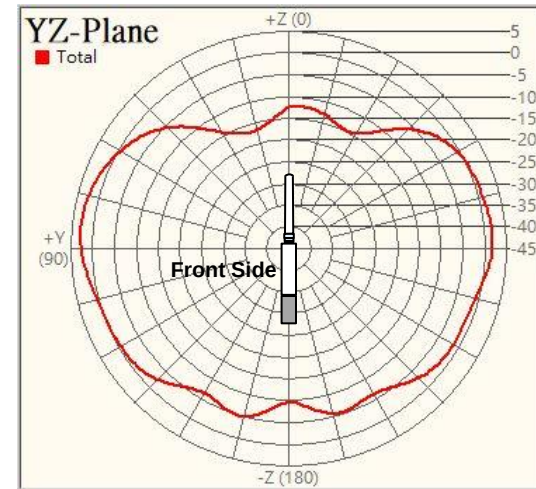
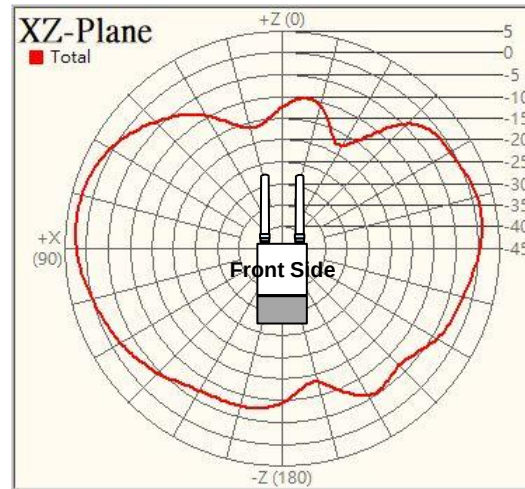
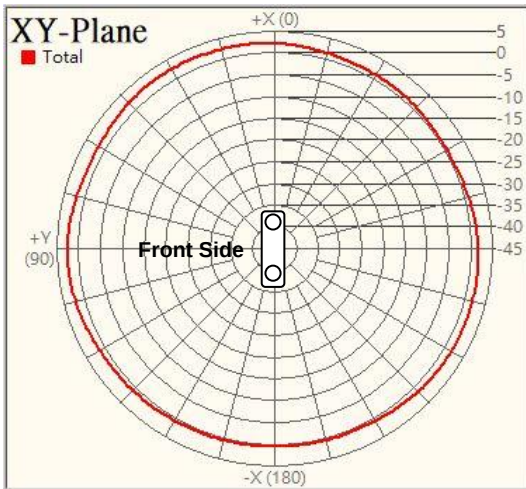


S11		
Freq. (MHz)	Ant1	Ant2
2400	-15.26	-16.00
2450	-27.30	-27.42
2500	-16.47	-16.02
5150	-14.69	-13.55
5550	-17.21	-17.51
5850	-16.58	-14.66

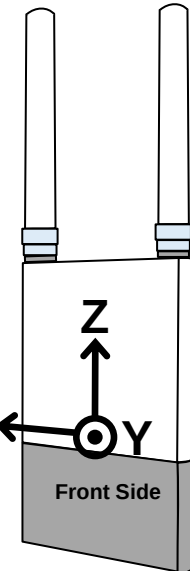


Isolation	
Freq. (MHz)	Ant1-Ant2
2400	-21.50
2450	-20.25
2500	-21.04
5150	-26.08
5550	-25.81
5850	-26.38

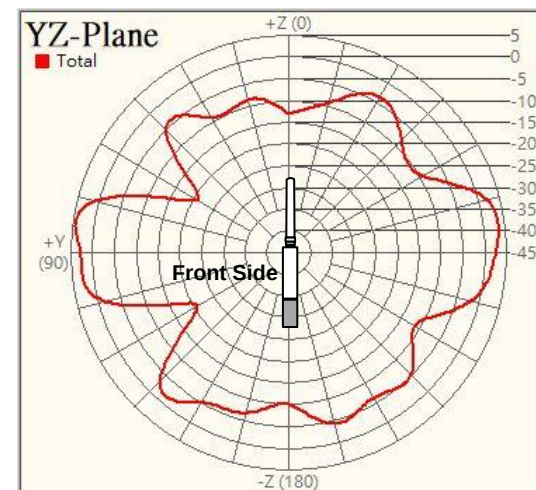
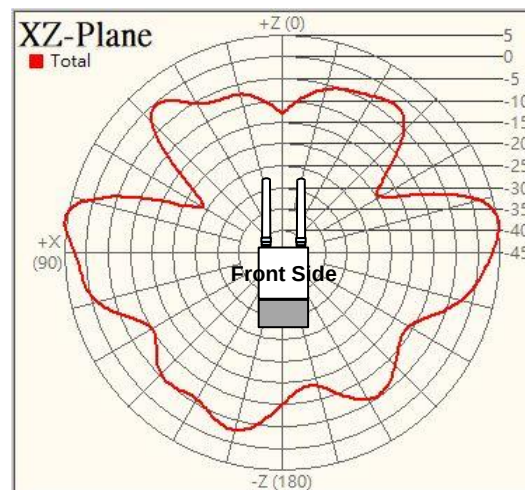
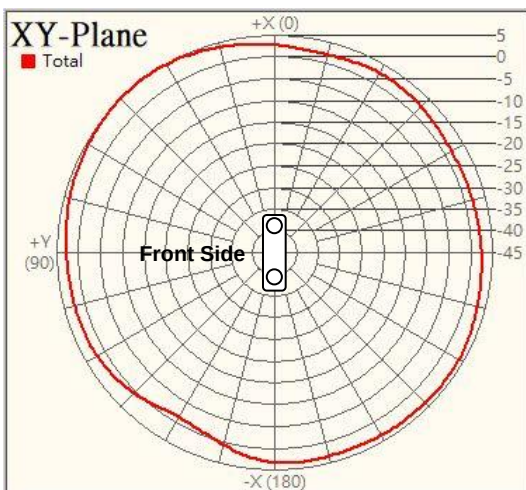
Ant1_2.45GHz



Ant1

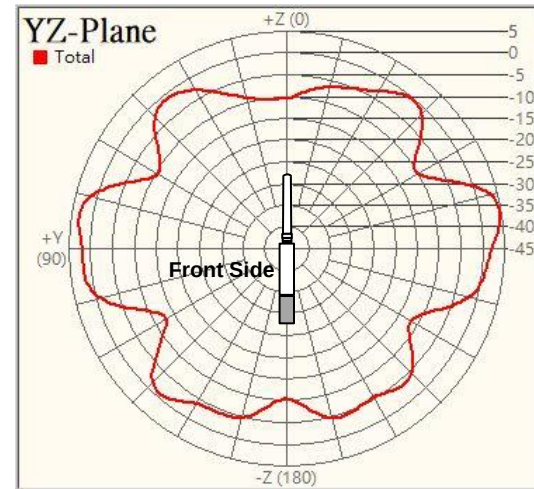
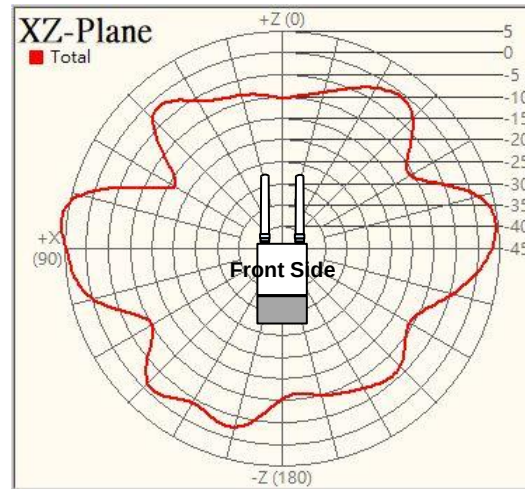
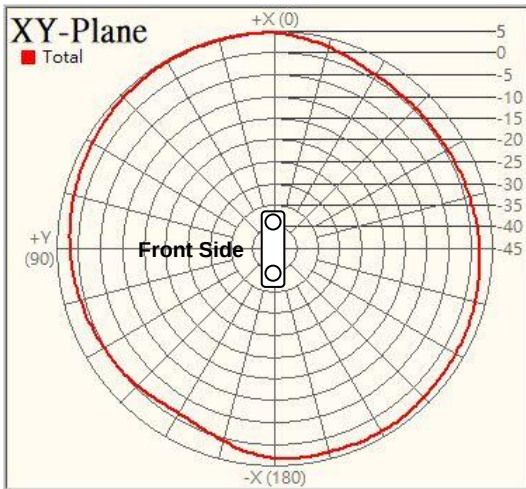


Ant1_5.21GHz

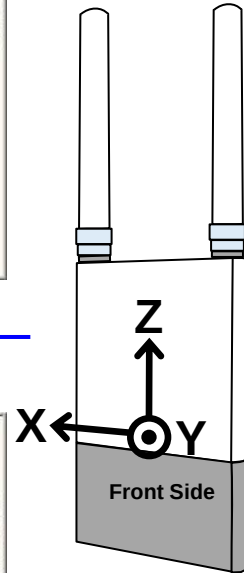


2D Radiation Pattern – Ant1

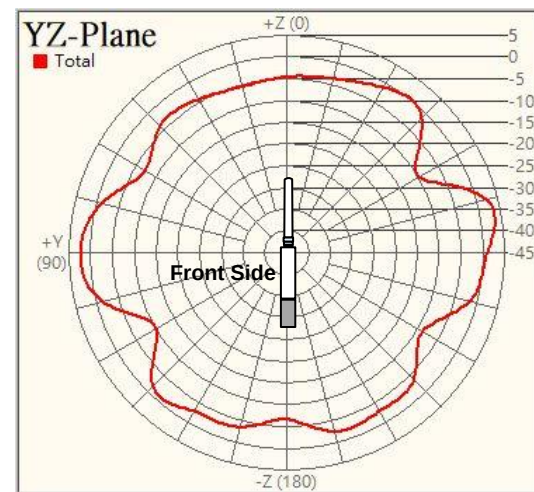
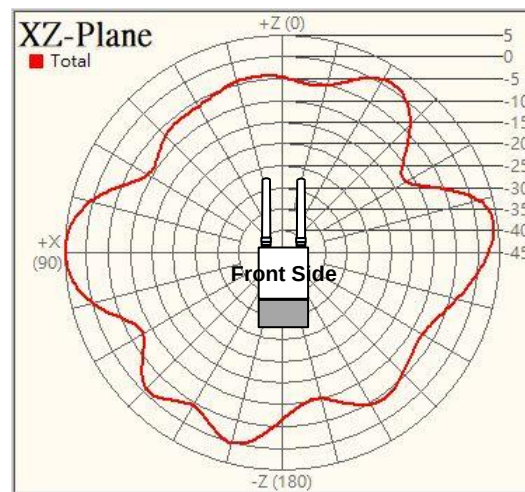
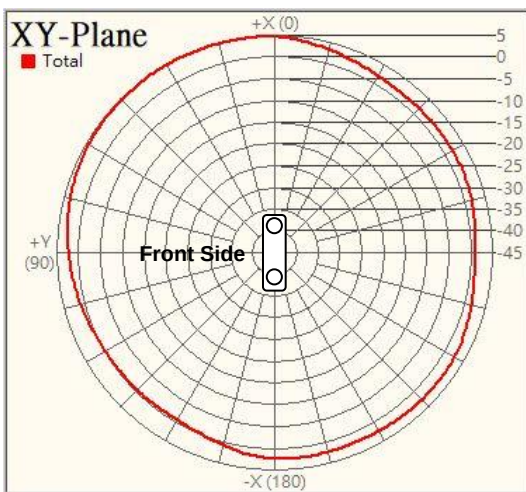
Ant1_5.55GHz



Ant1

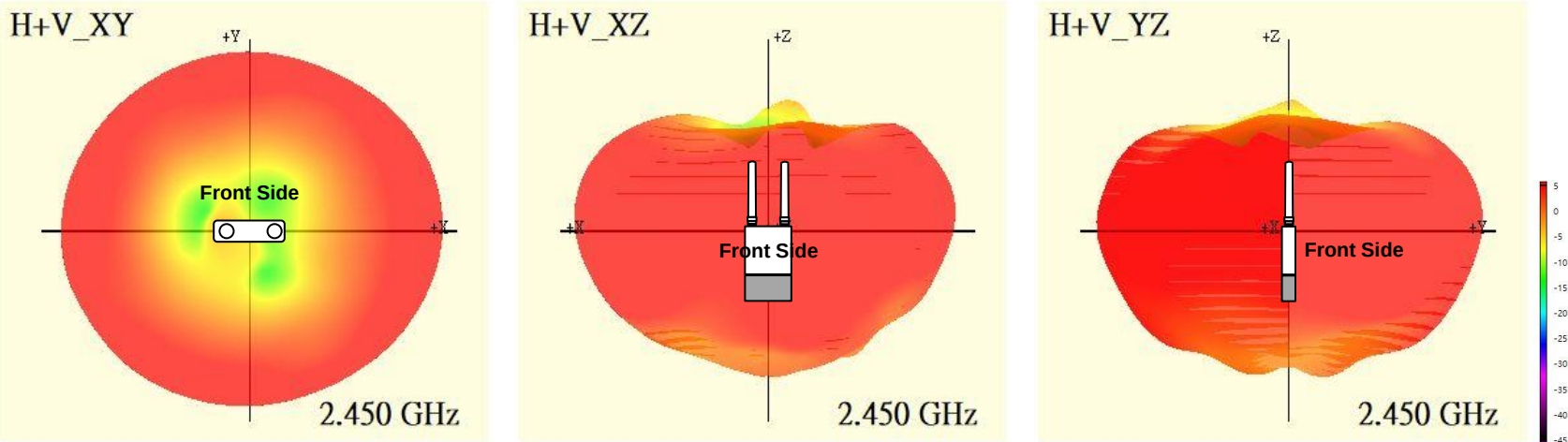


Ant1_5.775GHz

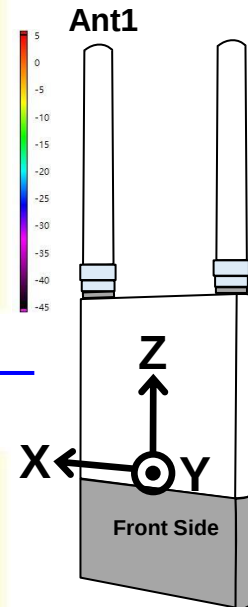
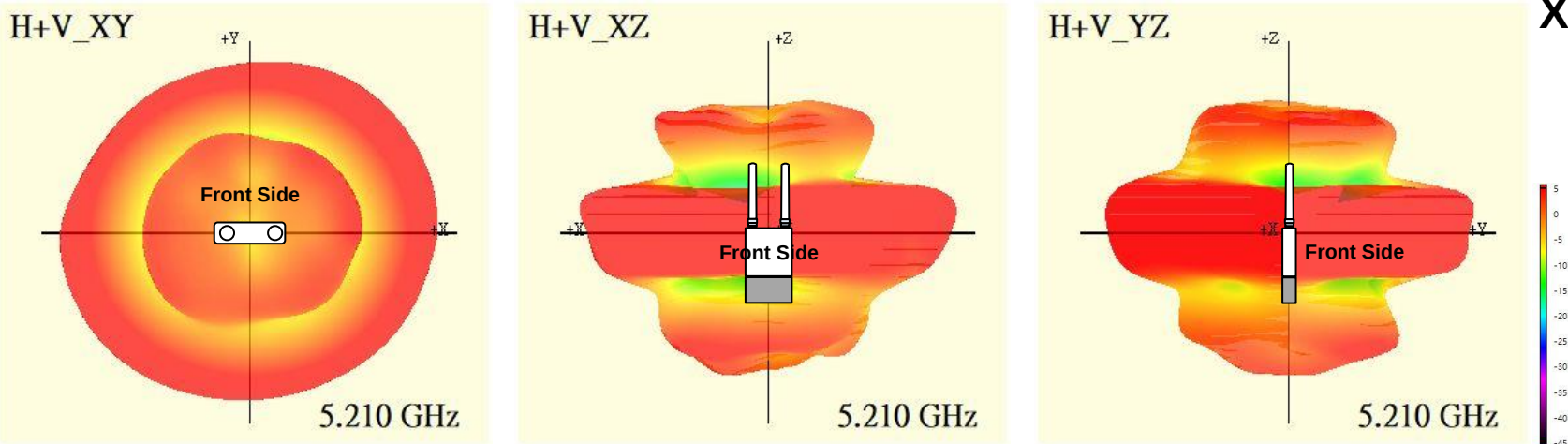


3D Radiation Pattern – Ant1

Ant1_2.45GHz

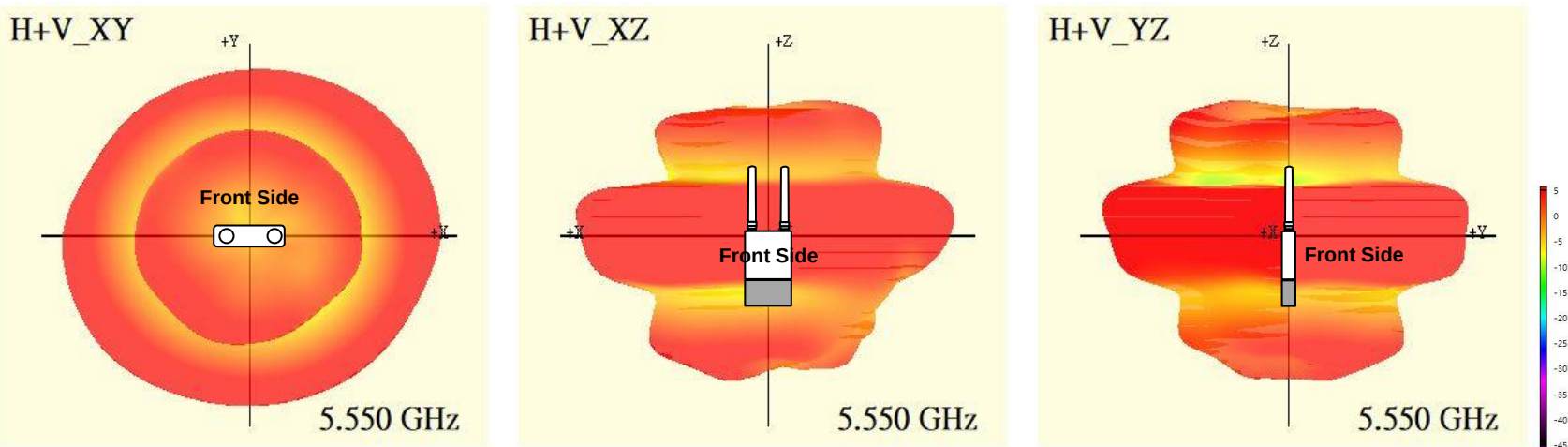


Ant1_5.21GHz

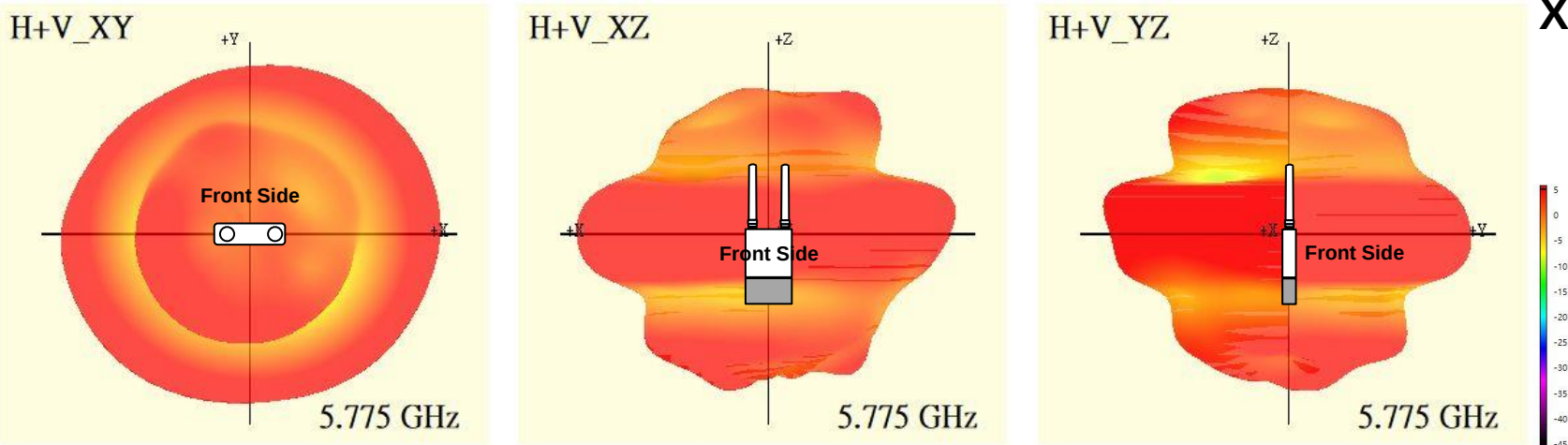


3D Radiation Pattern – Ant1

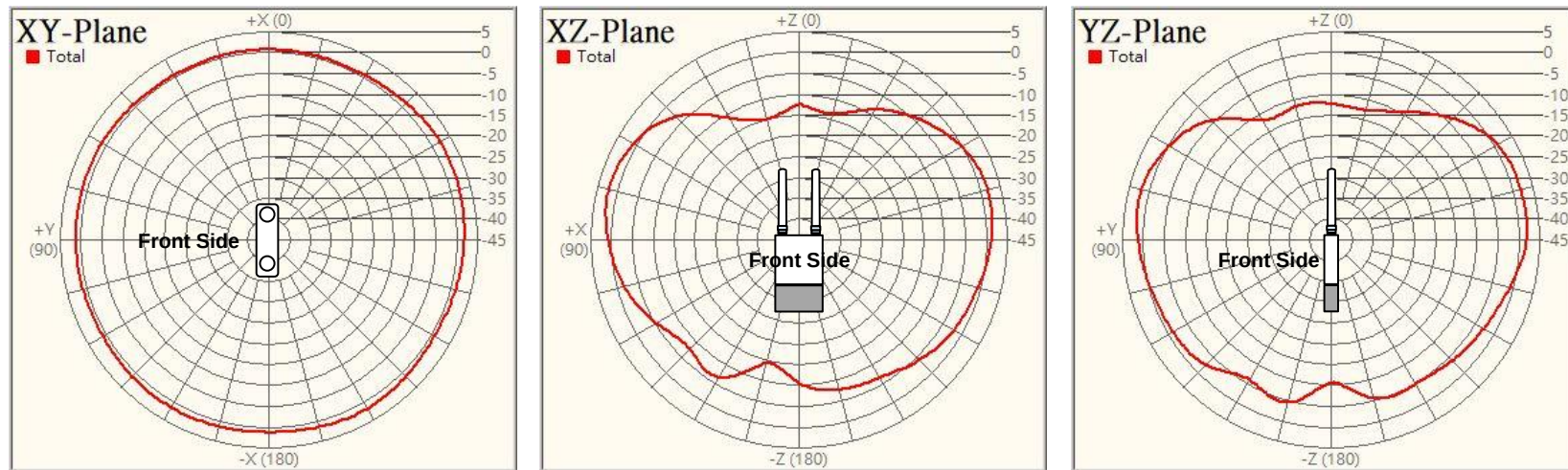
Ant1_5.55GHz



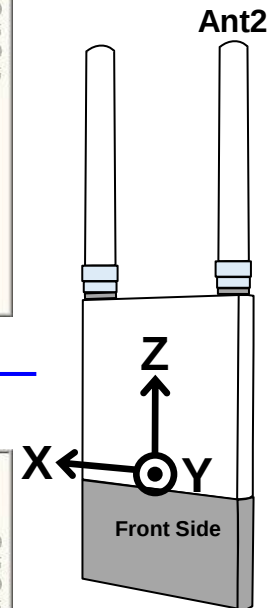
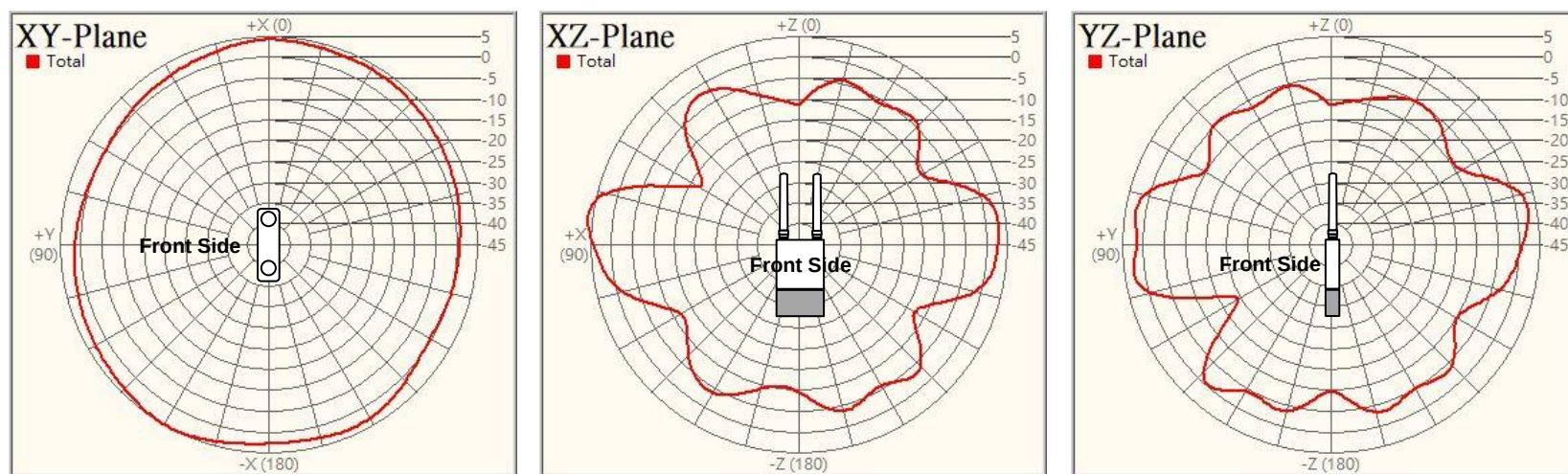
Ant1_5.775GHz



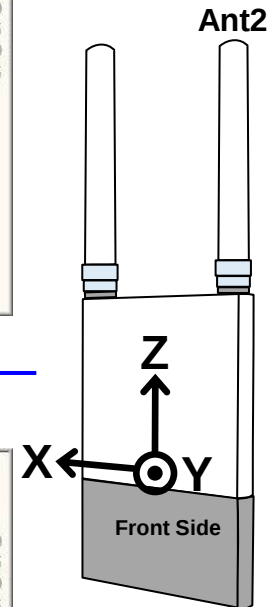
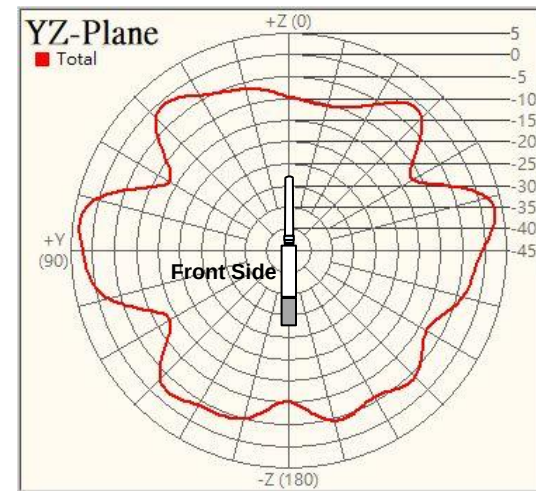
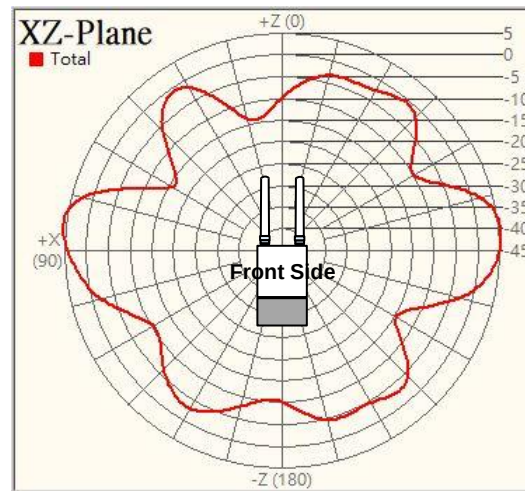
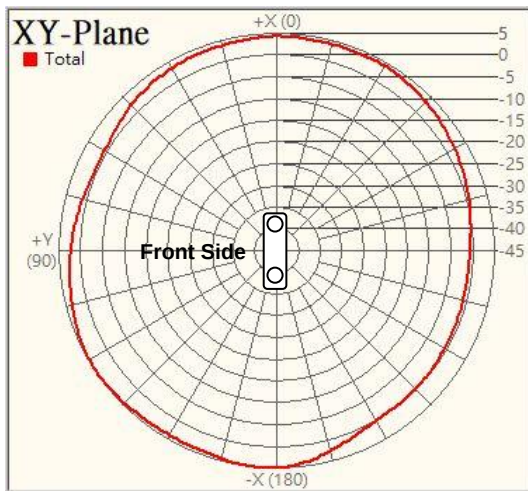
Ant2_2.45GHz



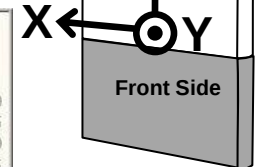
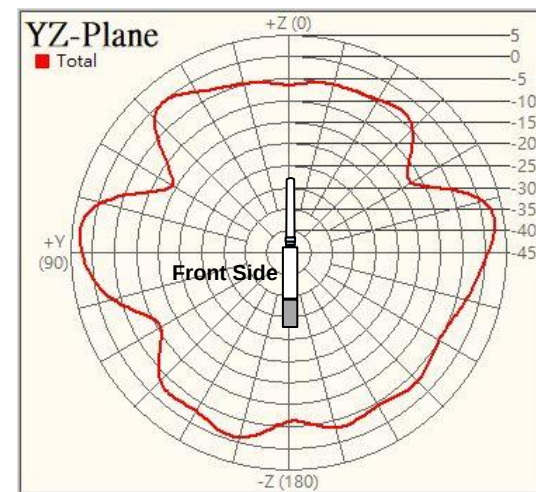
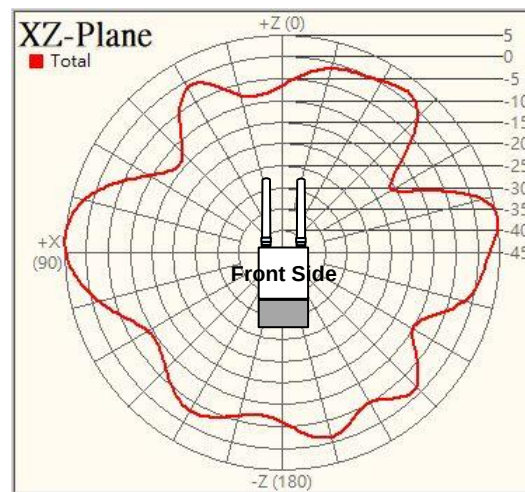
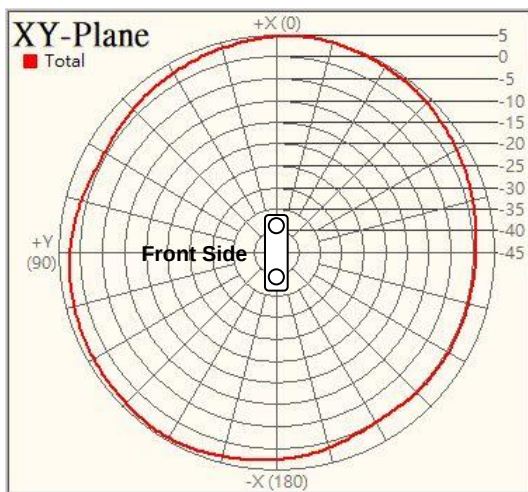
Ant2_5.21GHz



Ant2_5.55GHz

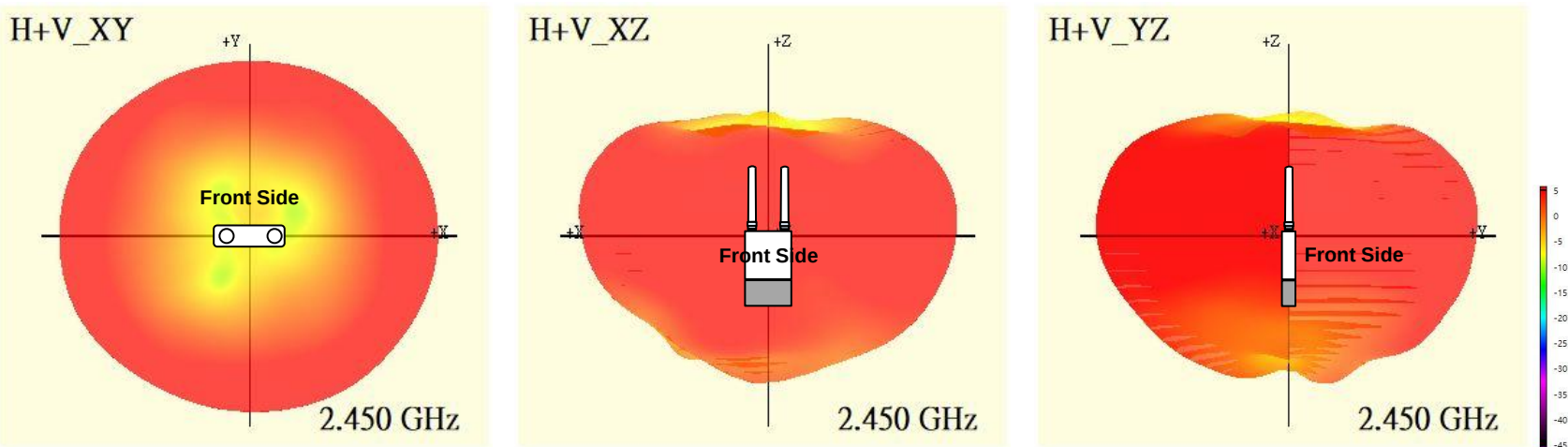


Ant2_5.775GHz

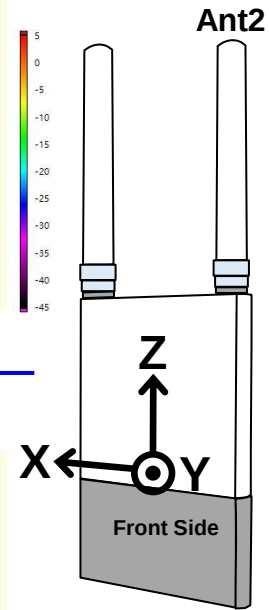
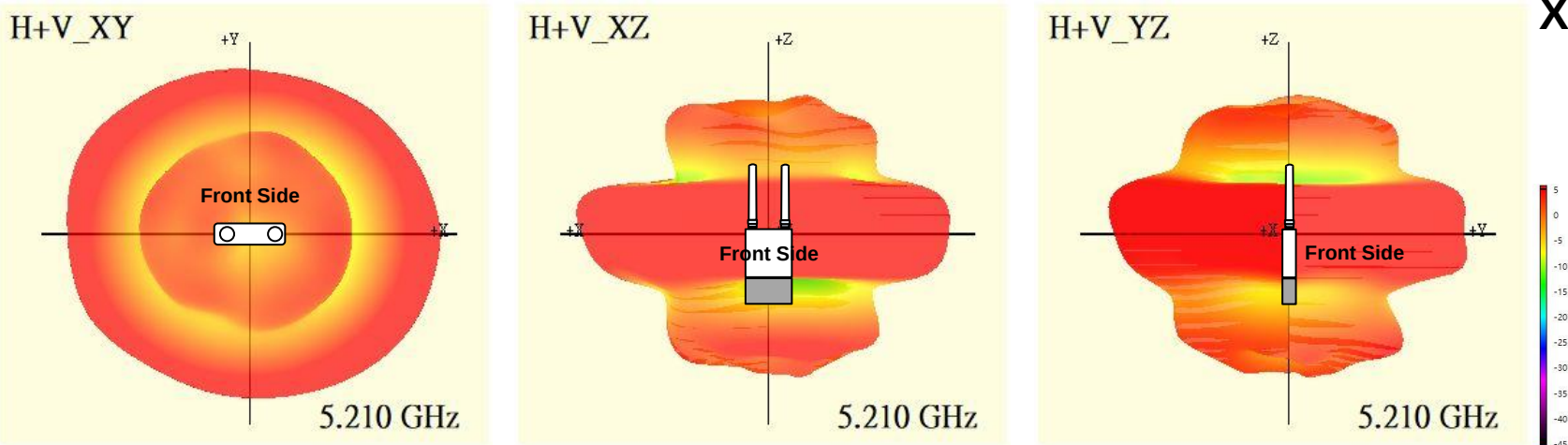


3D Radiation Pattern – Ant2

Ant2_2.45GHz

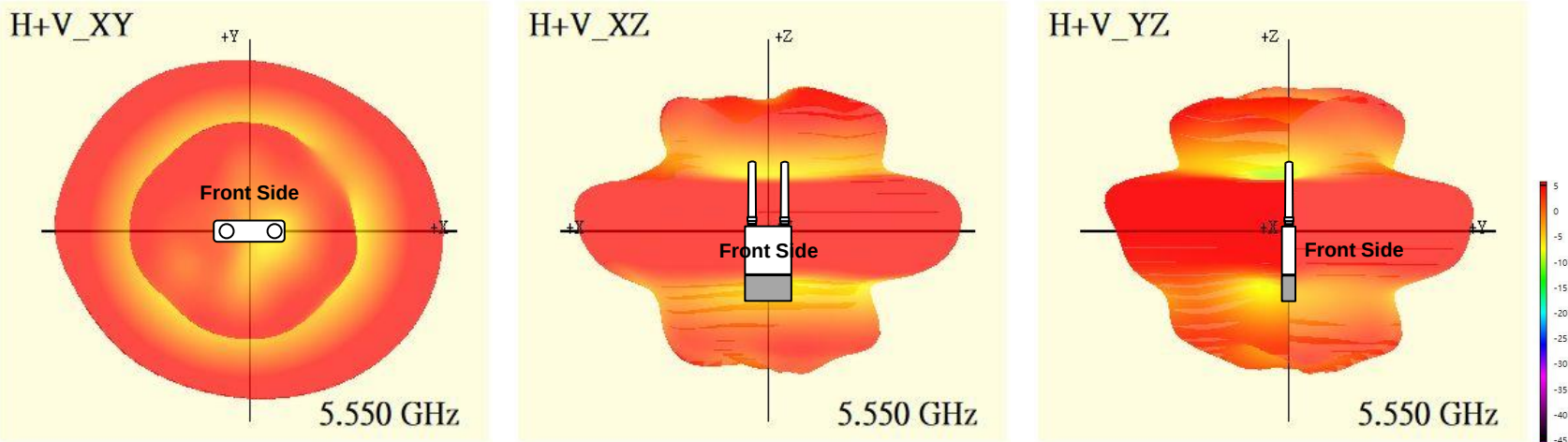


Ant2_5.21GHz

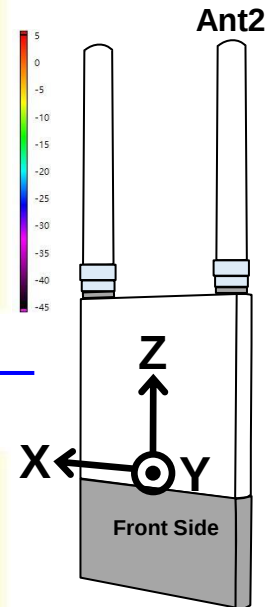
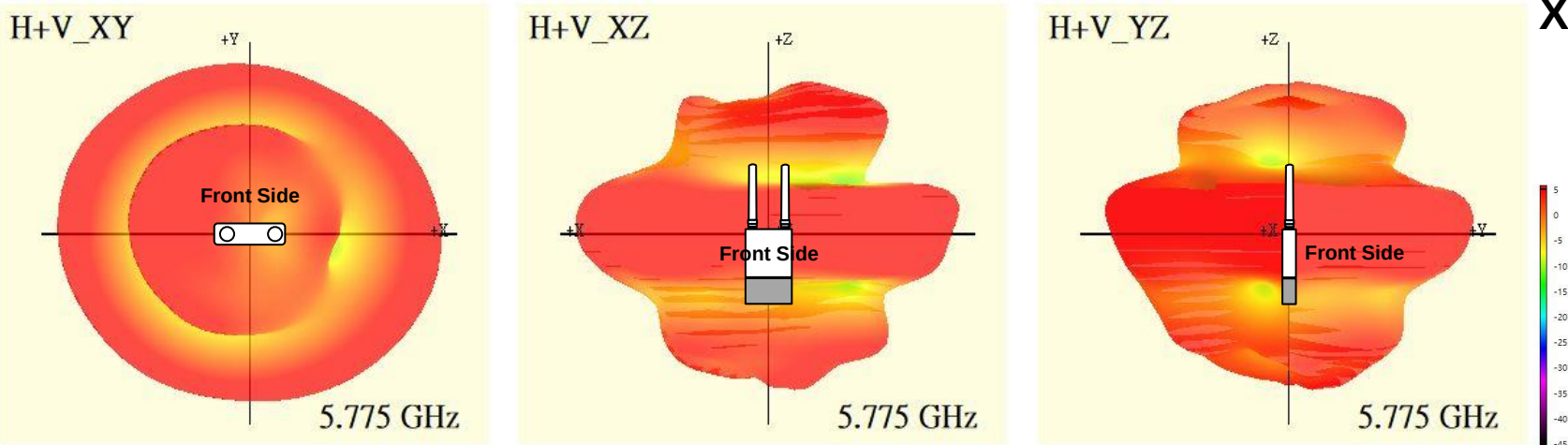


3D Radiation Pattern – Ant2

Ant2_5.55GHz



Ant2_5.775GHz



Antenna Efficiency and Gain

Antenna Performance				
Freq. (MHz)	Ant1		Ant2	
	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)
2400	75.8	2.39	73.6	2.37
2450	77.5	2.79	76.2	2.38
2500	73.4	2.63	74.7	2.64
5150	71.7	5.01	72.2	4.96
5210	71.0	5.07	70.0	4.92
5550	74.8	4.82	71.0	5.04
5775	74.4	4.85	71.5	5.03
5850	71.2	4.42	70.2	4.24

Antenna Horizontal Plane Gain $\theta > 30$ degree			
Freq. (MHz)	Ant1	Ant2	Max
	Peak Gain (dBi)	Peak Gain (dBi)	
5150	-2.74	-1.96	-1.96
5210	-2.57	-2.30	-2.30
5550	-1.02	-1.47	-1.02
5775	0.98	0.57	0.98
5850	-0.47	0.72	0.72