

LYNwave Technology

Antenna & Thermal solution provider

Antenna Field Test Report

Company:

Project Name:

Antenna Part No:

Antenna Type:

Ability

CR35C10

ALX23M-222AA6-00 (Ant 1)
ALX23M-222AA7-00 (Ant 2)
AOX23X-107AA1-00 (Ant 3)

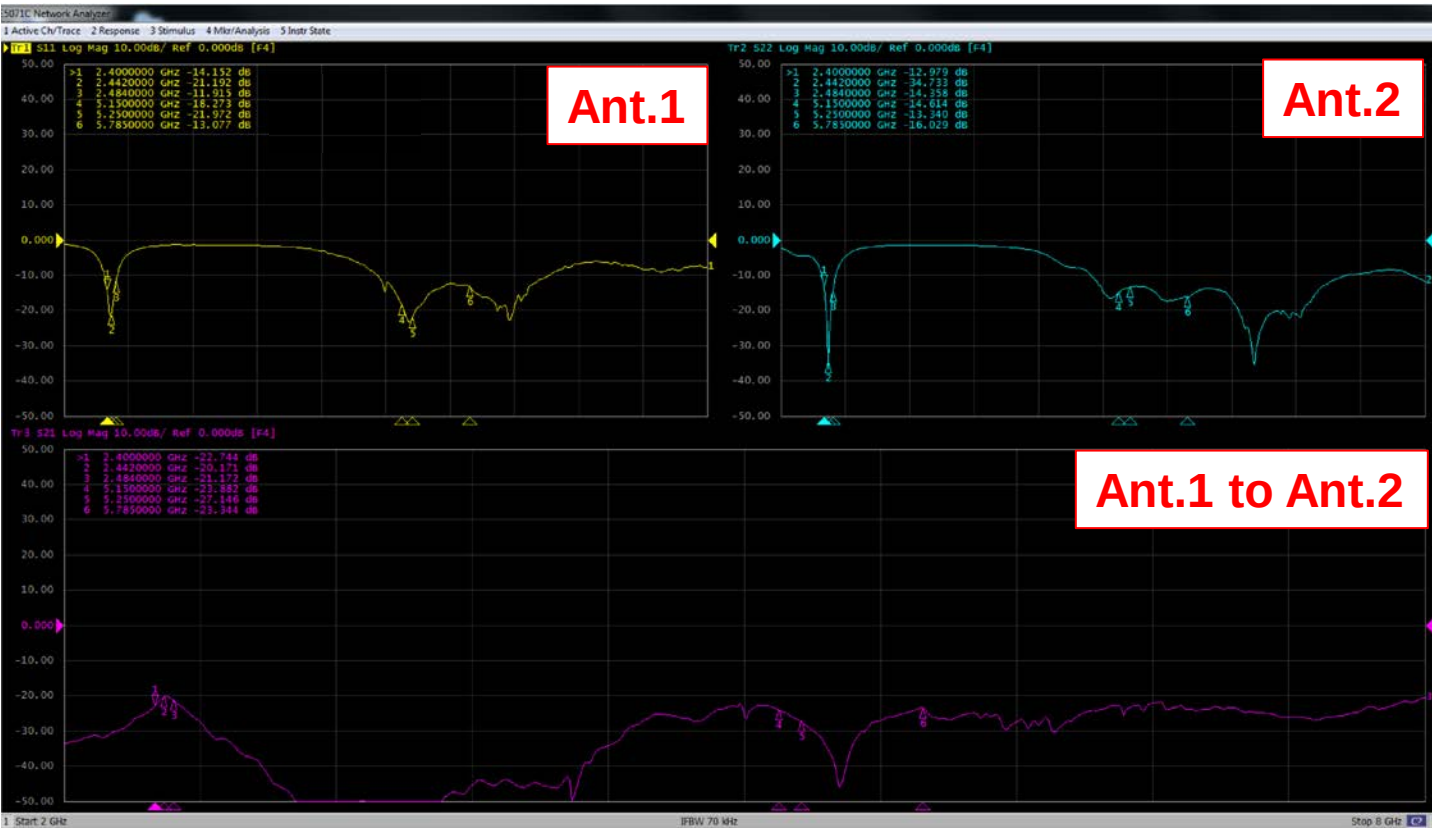
PIFA (Ant 1, 2)
Ceramic Patch (Ant 3)

Date	Owner	Revision
2023/04/20	Peter	1. Initial simulation
2023/06/01	Peter	1. Second simulation
2023/06/12	Michael	1. Optimize Isolation for 2.4GHz
2023/06/12	peter	1. Update report
2023/06/29	peter	1. Update report
2023/07/07	peter	1. Antenna redesign for model assembled
2023/08/24	peter	1. EVT sample antenna tuning and measurement
2023/12/08	peter	1. EVT-2 sample antenna tuning and measurement
2024/03/20	peter	1. DVT-2 sample antenna measurement

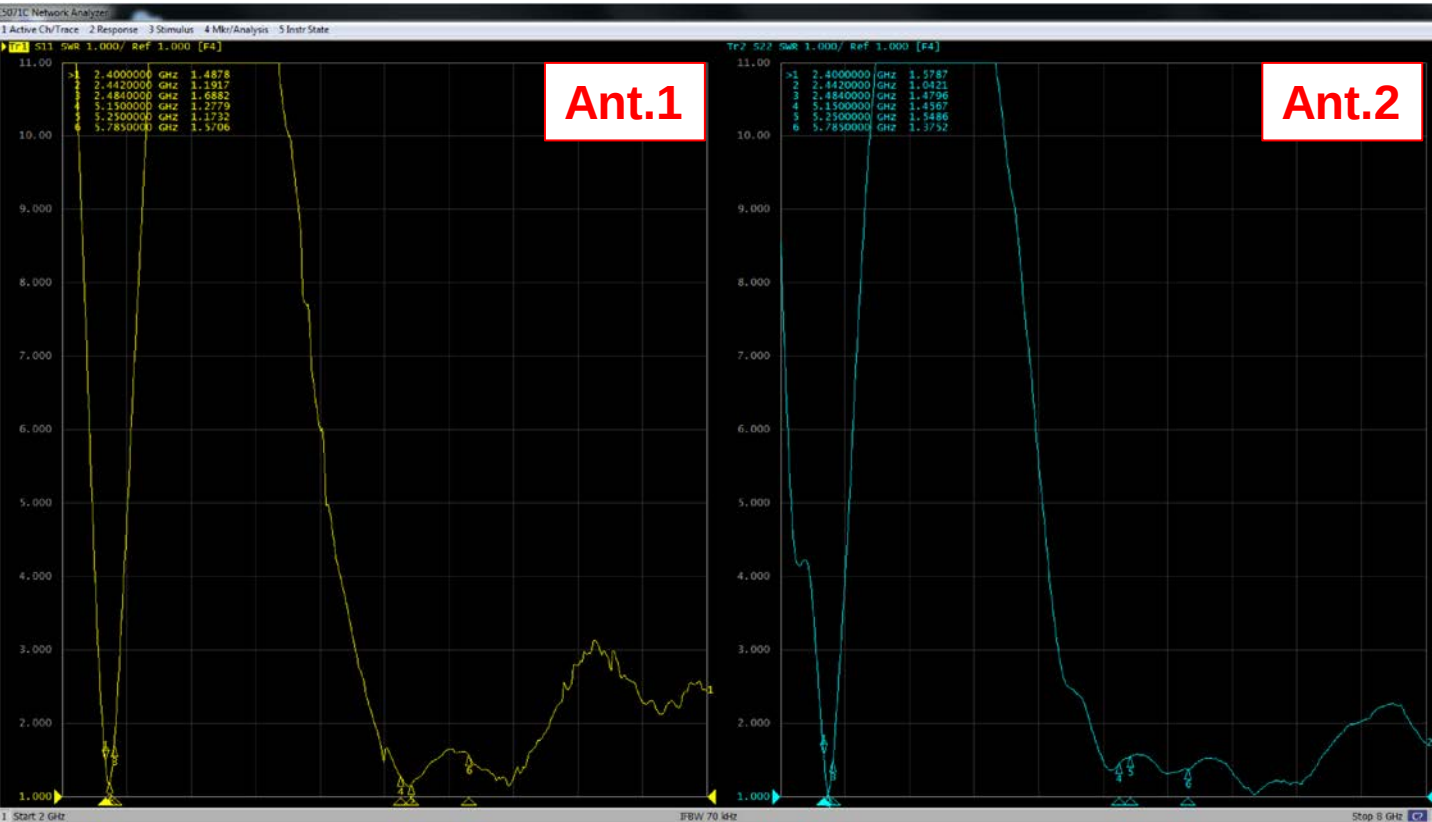
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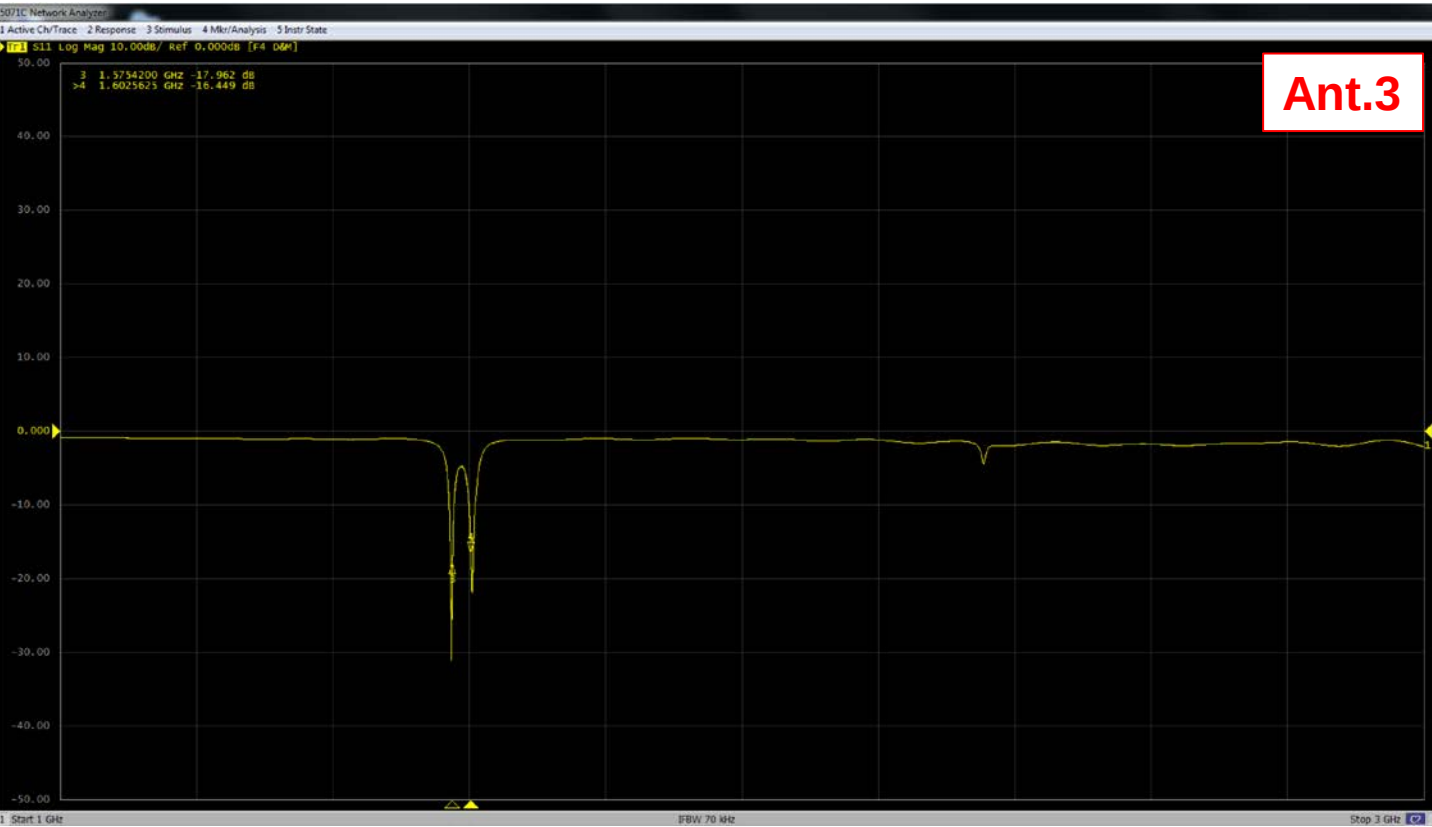
Wi-Fi Dual Band S-parameters



Wi-Fi Dual Band V.S.W.R



GPS/GLONASS S-parameters



Gain Table

Ant.1						
Frequency(MHz)	2400	2450	2484	5150	5250	5785
Peak Gain(dBi)	1.0	1.1	1.0	3.1	3.0	4.0
Efficiency(%)	50	50	51	55	56	58
Average Gain (dB)	-3.0	-3.0	-2.9	-2.6	-2.5	-2.4

Ant.2						
Frequency(MHz)	2400	2450	2484	5150	5250	5785
Peak Gain(dBi)	1.0	1.0	1.2	3.2	3.2	4.0
Efficiency(%)	50	51	51	54	55	58
Average Gain (dB)	-3.0	-2.9	-2.9	-2.7	-2.6	-2.4

Ant.3		
Frequency(MHz)	1575.42	1602.5625
Peak Gain(dBi)	2.6	2.5
Efficiency(%)	45	43
Average Gain (dB)	-3.5	-3.7

The antenna characteristics

- **Return Loss**
 - Dual Band < -10dB in operating band
 - GPS Band < -10dB in operating band
- **Gain**
 - Dual Band 2.4GHz : 1.0~ 1.2dBi
 - Dual Band 5GHz : 3.0~ 4.0dBi
 - GPS Band :2.5~2.6dBi
- **Efficiency**
 - Dual Band > 50%
 - GPS Band > 40%
- **Isolation**
 - Dual Band > 20dB

Equipment : Satimo

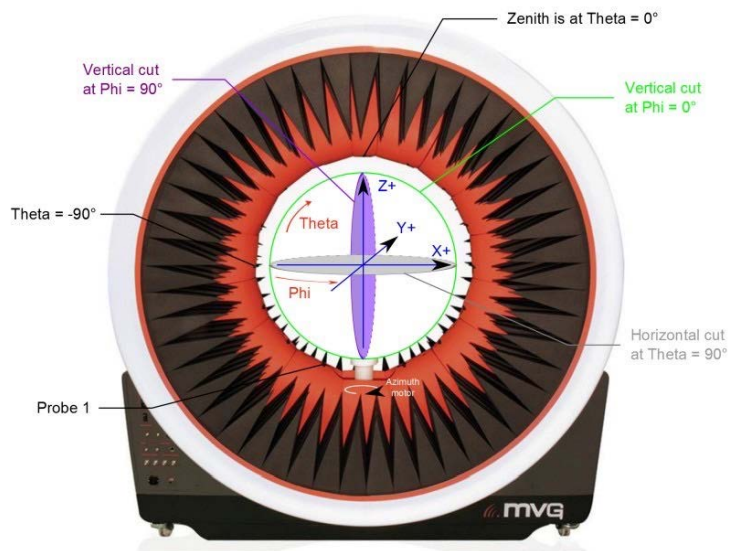
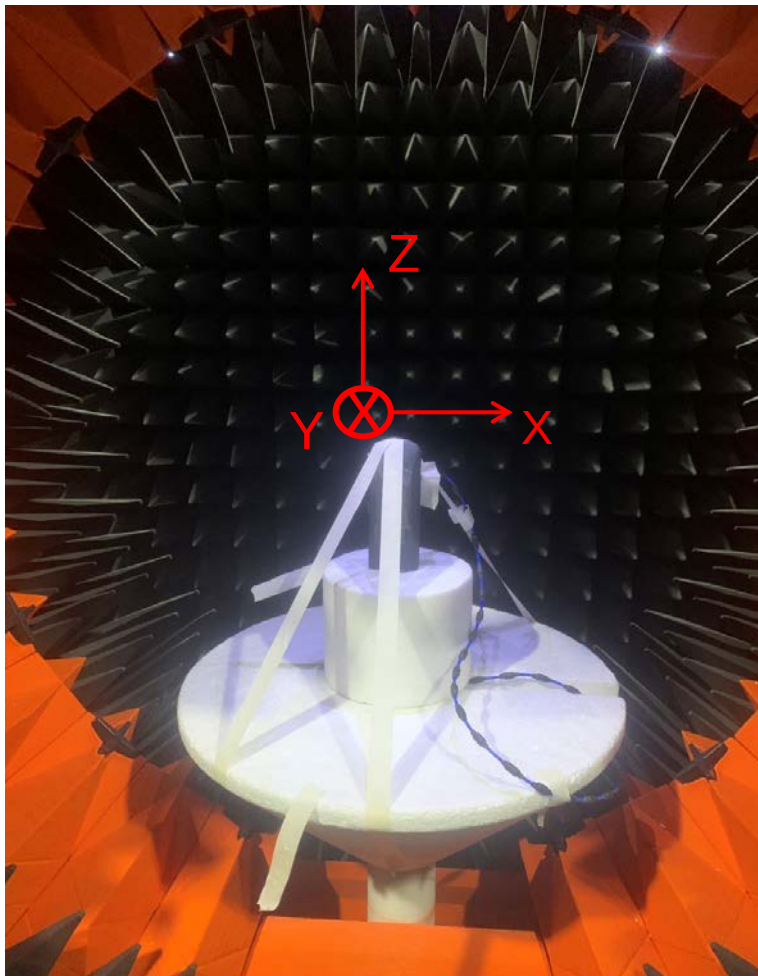


Figure 3.12: StarLab spherical coordinate system



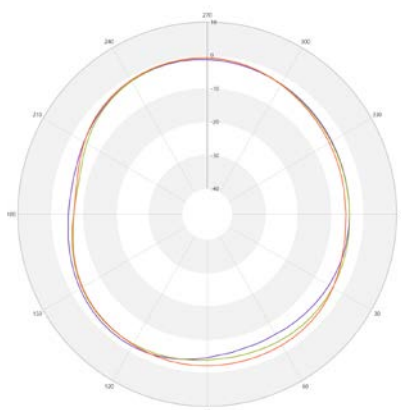
***Measurement is based on the antenna center is aligned with center of Satimo chamber**

Ant.1_2.4GHz 2D Radiation Pattern

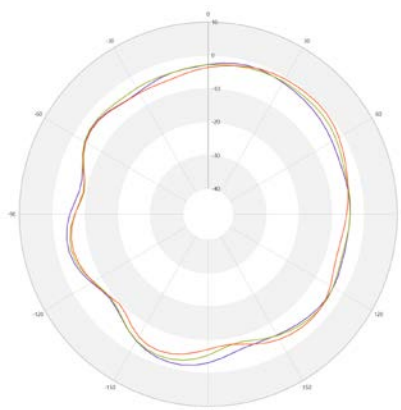
Frequency(MHz) : 2400~2500

Radiation Pattern :

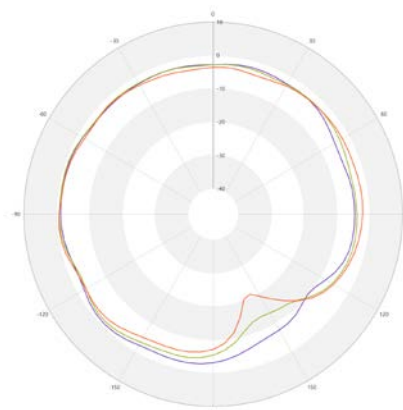
Azimuth Plane
Theta = 90



Elevation Plane
phi = 0



Elevation Plane
phi = 90



— 2400.00 MHz
— 2442.00 MHz
— 2484.00 MHz

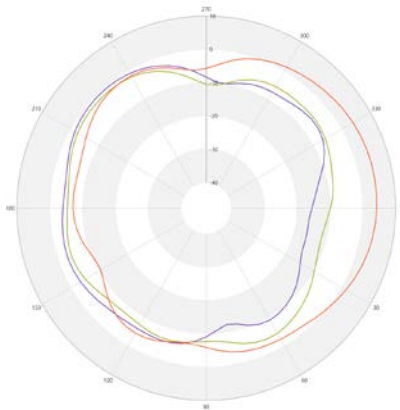
Setup :

Ant.1_5GHz 2D Radiation Pattern

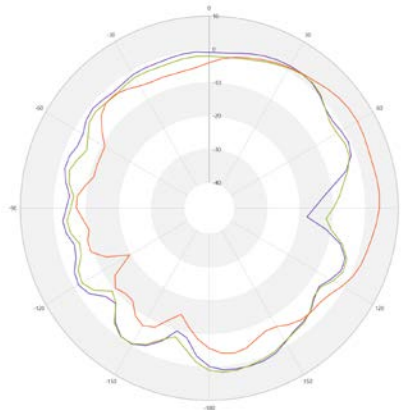
Frequency(MHz) : 5150~5850

Radiation Pattern :

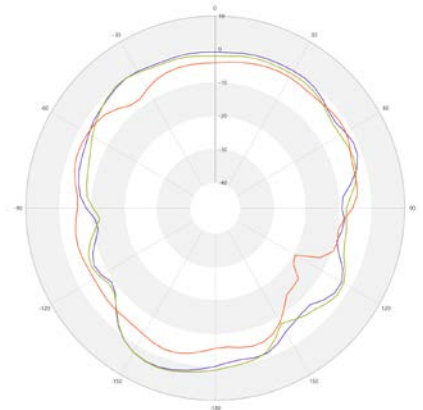
Azimuth Plane
Theta = 90



Elevation Plane
phi = 0



Elevation Plane
phi = 90



— 5150.00 MHz
— 5250.00 MHz
— 5785.00 MHz

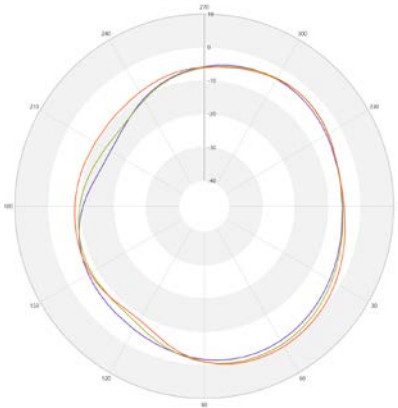
Setup :

Ant.2_2.4GHz 2D Radiation Pattern

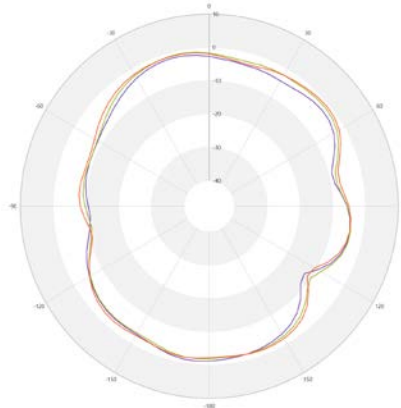
Frequency(MHz) : 2400~2500

Radiation Pattern :

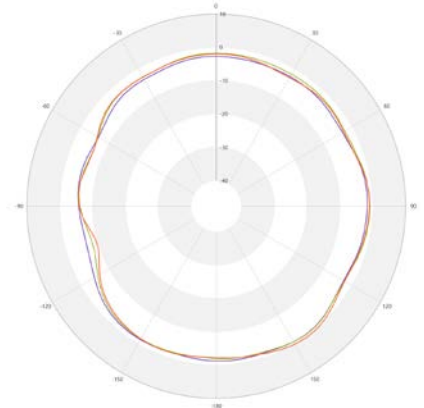
Azimuth Plane
Theta = 90



Elevation Plane
phi = 0



Elevation Plane
phi = 90



— 2400.00 MHz
— 2442.00 MHz
— 2484.00 MHz

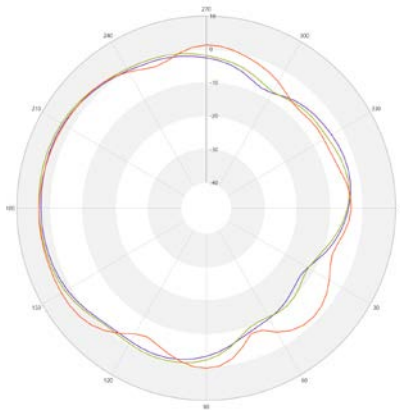
Setup :

Ant.2_5GHz 2D Radiation Pattern

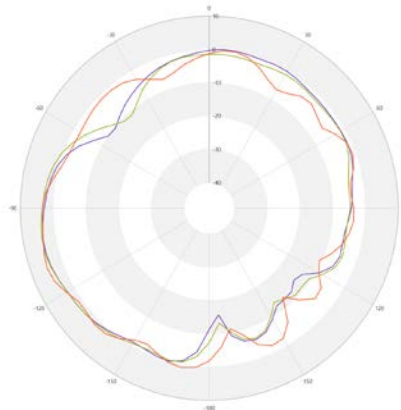
Frequency(MHz) : 5150~5850

Radiation Pattern :

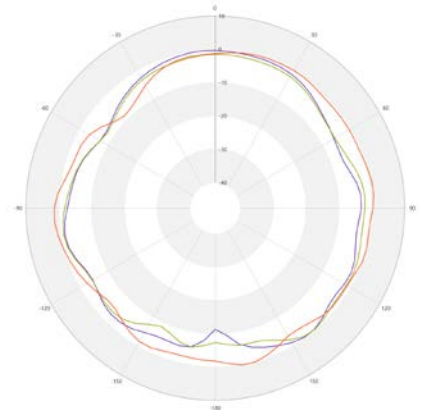
Azimuth Plane
Theta = 90



Elevation Plane
phi = 0



Elevation Plane
phi = 90



— 5150.00 MHz
— 5250.00 MHz
— 5785.00 MHz

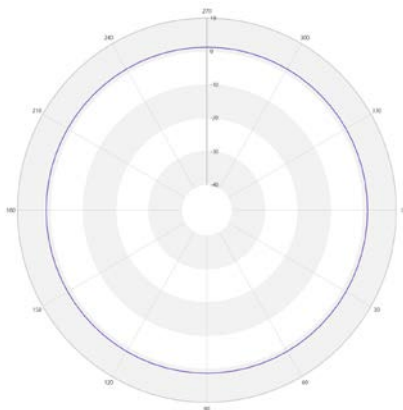
Setup :

Ant.3_GPS 2D Radiation Pattern

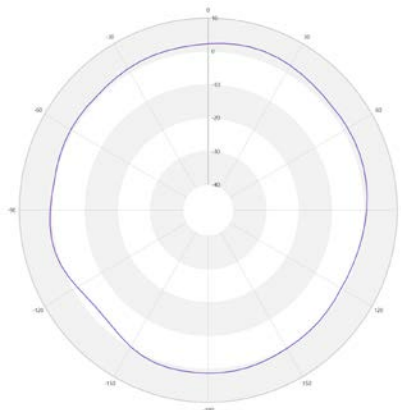
Frequency(MHz) : 1575.42

Radiation Pattern :

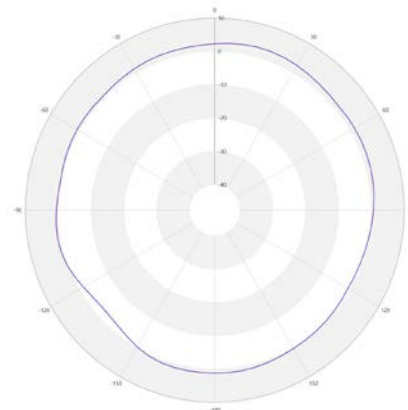
Azimuth Plane
Theta = 90



Elevation Plane
phi = 0



Elevation Plane
phi = 90



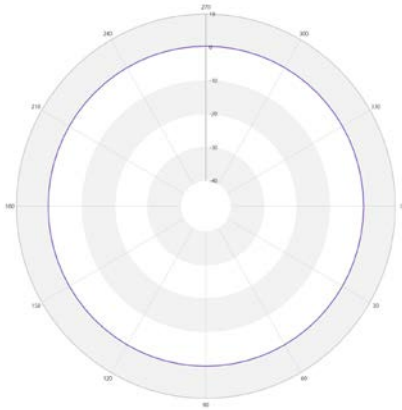
Setup :

Ant.3_GPS 2D Radiation Pattern

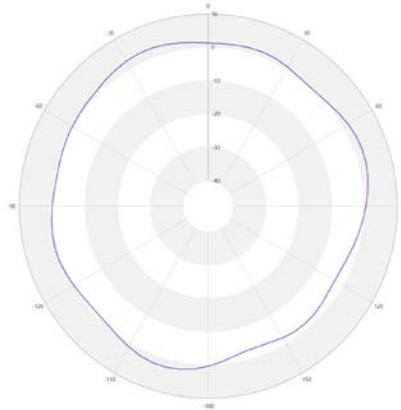
Frequency(MHz) : 1602.5625

Radiation Pattern :

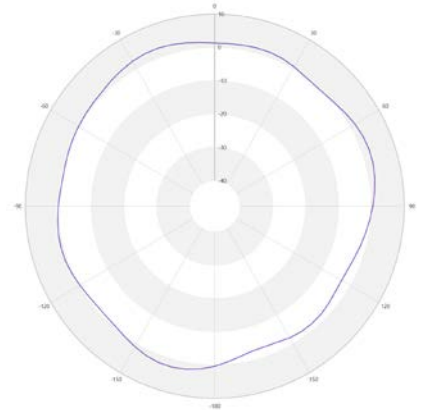
Azimuth Plane
Theta = 90



Elevation Plane
phi = 0



Elevation Plane
phi = 90

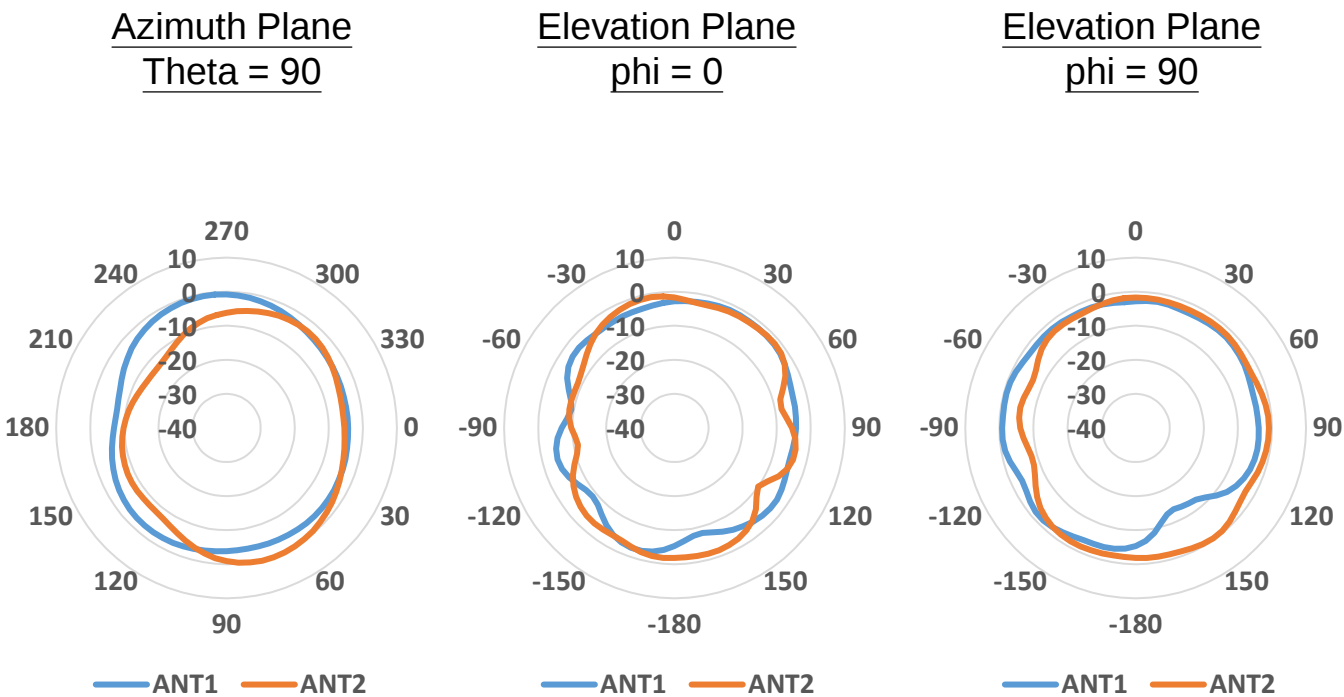


Setup :

WiFi Dual band Radiation Pattern – Total Coverage

Frequency(MHz) : 2442

Radiation Pattern :

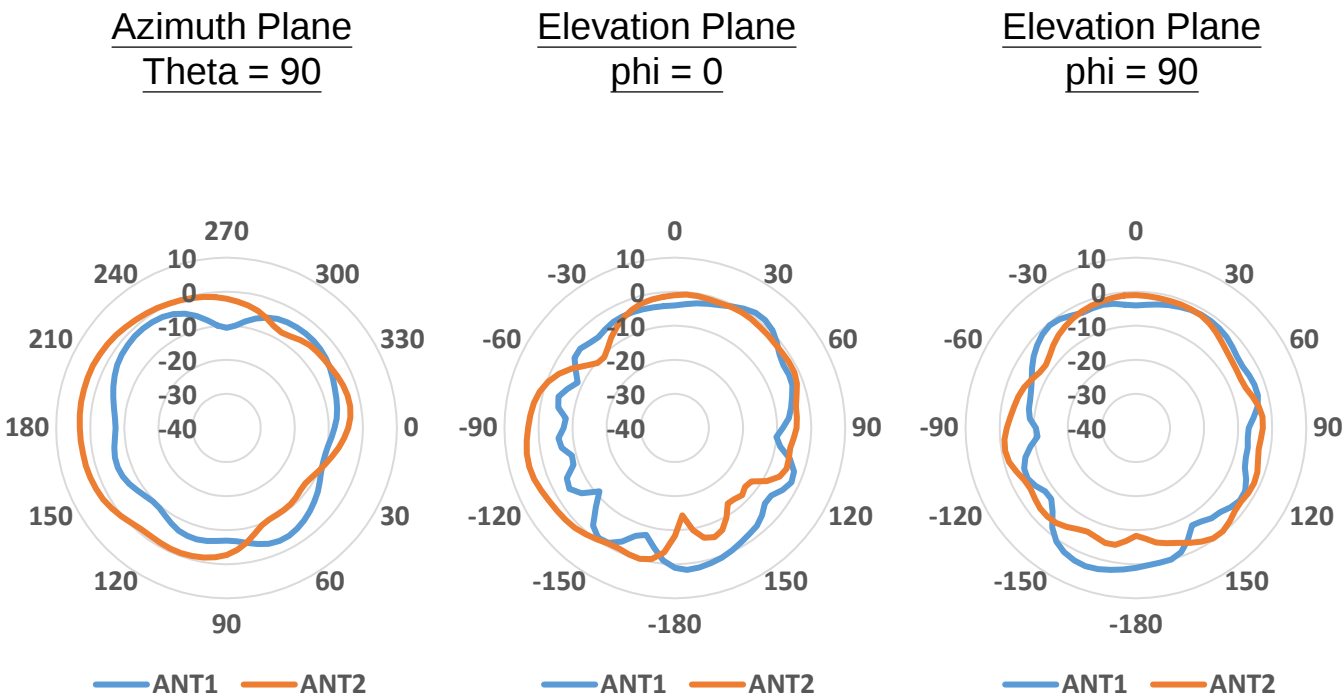


Setup :

WiFi Dual band Radiation Pattern – Total Coverage

Frequency(MHz) : 5200

Radiation Pattern :

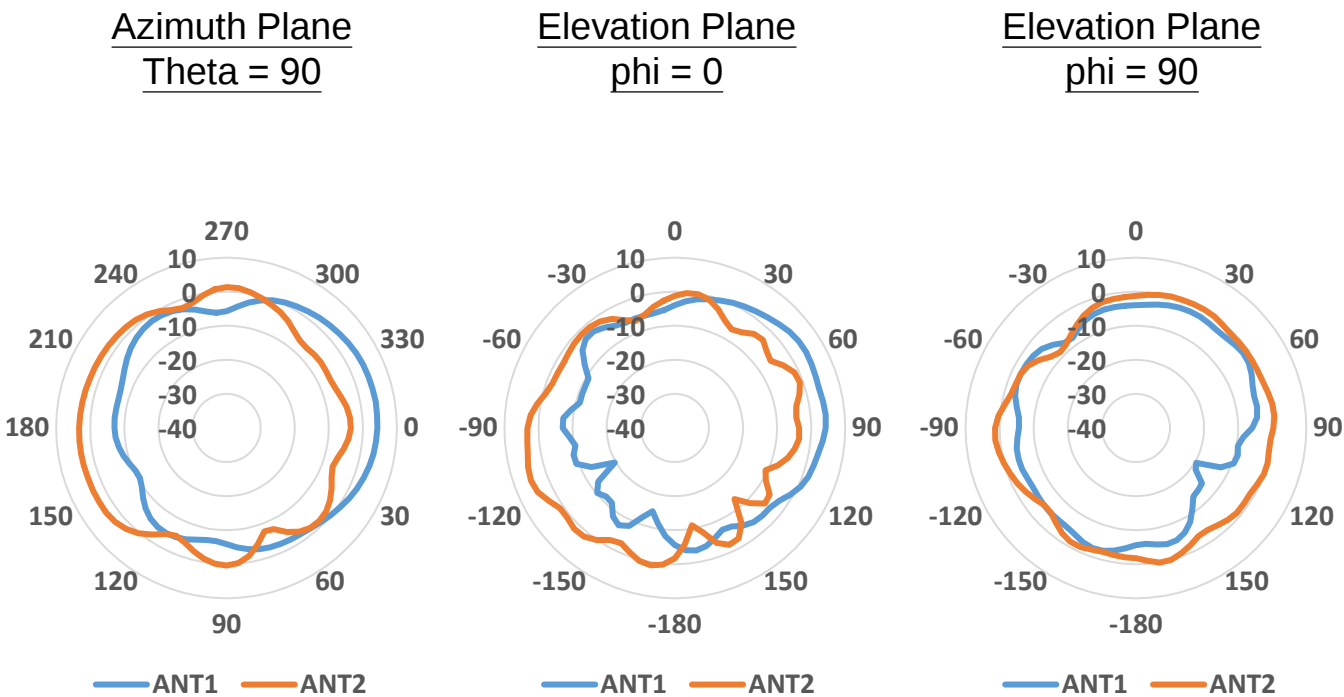


Setup :

WiFi Dual band Radiation Pattern – Total Coverage

Frequency(MHz) : 5785

Radiation Pattern :



Setup :

Summary

The antenna characteristics

- **Return Loss**
 - Dual Band < -10dB in operating band
 - GPS Band < -10dB in operating band
- **Gain**
 - Dual Band 2.4GHz : 1.0~ 1.2dBi
 - Dual Band 5GHz : 3.0~ 4.0dBi
 - GPS Band :2.5~2.6dBi
- **Efficiency**
 - Dual Band > 50%
 - GPS Band > 40%
- **Isolation**
 - Dual Band > 20dB

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