

# LYNwave Technology

Antenna & Thermal solution provider



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## Antenna Measurement Information

- Test Date : 2025-12-30
- Test Engineer : Zino
- Measurement System: StarLab 10GHz version with OTA (Satimo)

Measurement setup:

- Pattern & Gain measurement
  1. MVG chamber: StarLab 10GHz version with OTA (Satimo)
  2. MVG program (WaveStudio)
  3. System overview
- Test item
  1. Antenna passive test: 600MHz~10GHz

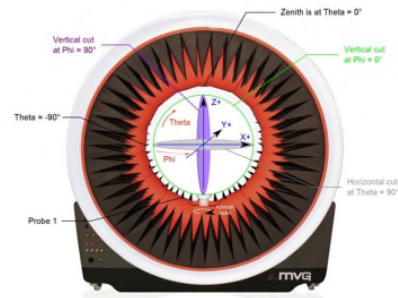


**Figure 3.12:** StarLab spherical coordinate system

- Calibration Information

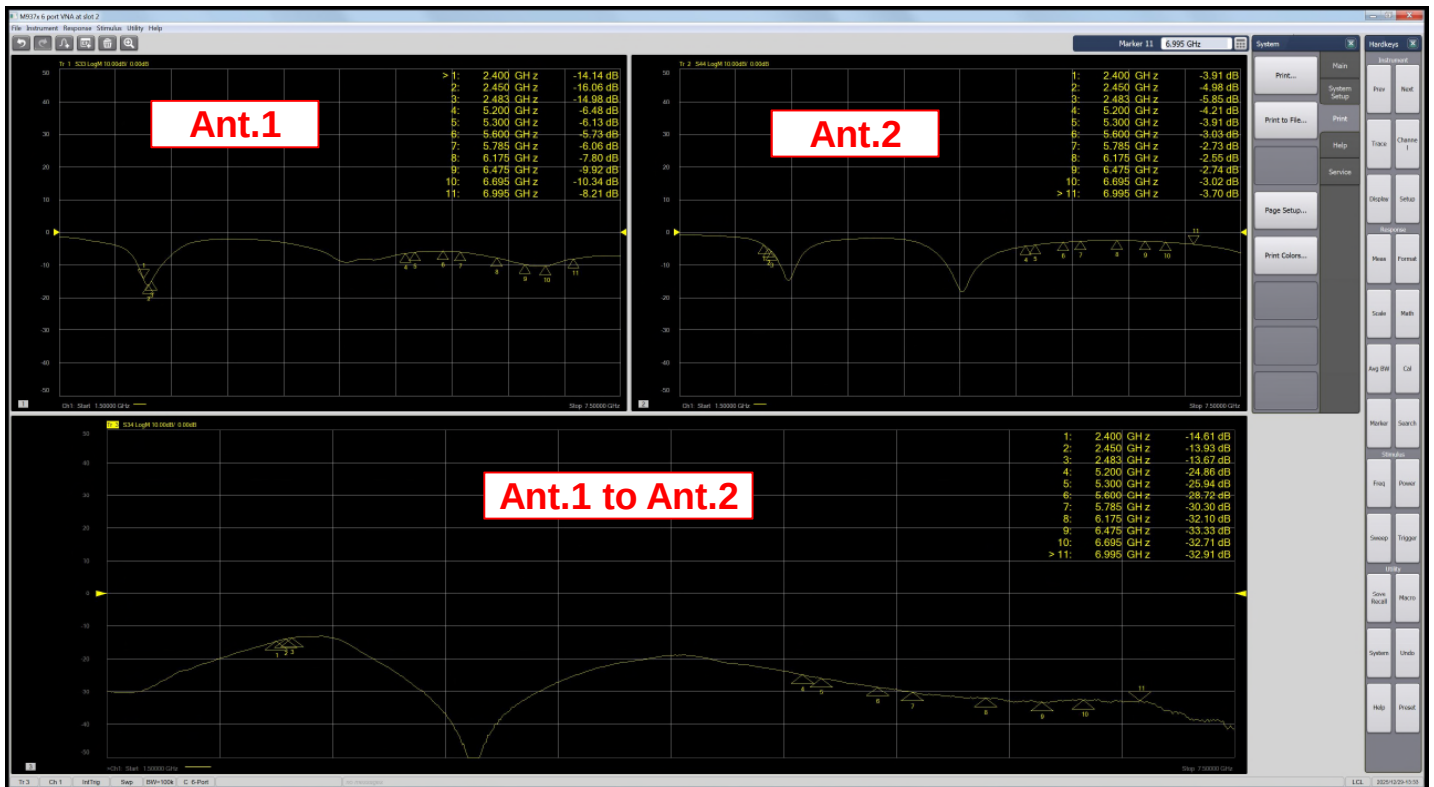
| Description      | Model No.       | Serial # | Calibration Date | Calibration Until |
|------------------|-----------------|----------|------------------|-------------------|
| Chamber          | StarLab         | NA       | 2025/11/22       | 2026/11/22        |
| Network Analyzer | Keysight E5071C | NA       | 2025/10/01       | 2026/10/01        |

## Antenna Placement:

| No.                   | Function          | Type | Material | Frequency(MHz)                      |
|-----------------------|-------------------|------|----------|-------------------------------------|
| Ant.1 (ALA25M-242AA4) | Wi-Fi<br>Tri Band | PIFA | Metal    | 2400-2500<br>5150-5850<br>5925-7125 |
| Ant.2 (ALA25M-242AA4) | Wi-Fi<br>Tri Band | PIFA | Metal    | 2400-2500<br>5150-5850<br>5925-7125 |



# S-Parameters



## Coordinate Definition Equipment: Satimo

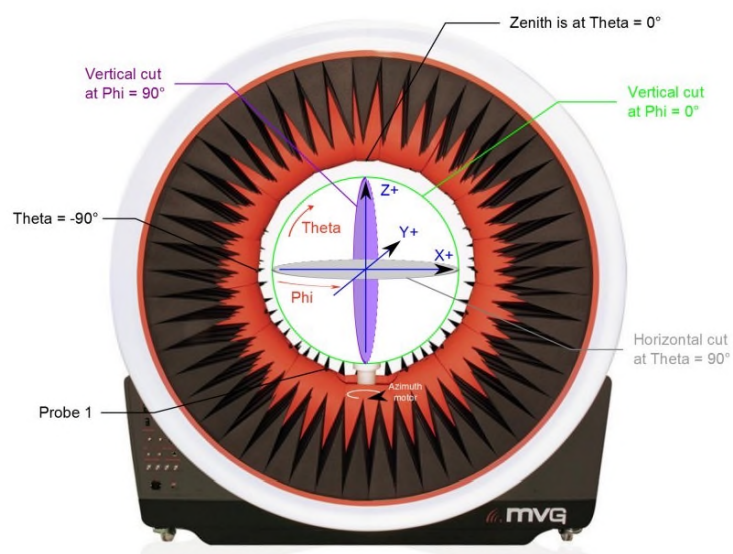


Figure 3.12: StarLab spherical coordinate system



## Gain Table

| 2.4GHz | Frequency(MHz) | 2400 | 2450 | 2483.5 |
|--------|----------------|------|------|--------|
| Ant.1  | Peak Gain(dBi) | -0.5 | -0.6 | -0.8   |
|        | Efficiency(%)  | 36   | 35   | 34     |
| Ant.2  | Peak Gain(dBi) | -3.4 | -3.0 | -3.0   |
|        | Efficiency(%)  | 20   | 20   | 22     |

| 5GHz  | Frequency(MHz) | 5200 | 5300 | 5600 | 5785 |
|-------|----------------|------|------|------|------|
| Ant.1 | Peak Gain(dBi) | -3.4 | -3.5 | -2.7 | -2.1 |
|       | Efficiency(%)  | 12   | 12   | 13   | 14   |
| Ant.2 | Peak Gain(dBi) | -1.3 | -2.1 | -3.2 | -3.5 |
|       | Efficiency(%)  | 21   | 18   | 13   | 12   |

| 6GHz  | Frequency(MHz) | 6175 | 6475 | 6695 | 6995 |
|-------|----------------|------|------|------|------|
| Ant.1 | Peak Gain(dBi) | -1.0 | 0.1  | 0.7  | -1.6 |
|       | Efficiency(%)  | 21   | 31   | 36   | 24   |
| Ant.2 | Peak Gain(dBi) | -4.2 | -4.0 | -3.6 | -1.8 |
|       | Efficiency(%)  | 11   | 12   | 13   | 18   |

### Isolation Table – 2.4GHz (Wi-Fi Tri-Band)

| Item    | Worst mutual isolation (dB)<br>2.4GHz Band |       |
|---------|--------------------------------------------|-------|
| Antenna | Ant.1                                      | Ant.2 |
| Ant.1   |                                            | -13.6 |
| Ant.2   |                                            |       |

### Isolation Table – 5GHz (Wi-Fi Tri-Band)

| Item    | Worst mutual isolation (dB)<br>5GHz Band |       |
|---------|------------------------------------------|-------|
| Antenna | Ant.1                                    | Ant.2 |
| Ant.1   |                                          | -24.8 |
| Ant.2   |                                          |       |

### Isolation Table – 6GHz (Wi-Fi Tri-Band)

| Item    | Worst mutual isolation (dB)<br>6GHz Band |       |
|---------|------------------------------------------|-------|
| Antenna | Ant.1                                    | Ant.2 |
| Ant.1   |                                          | -32.1 |
| Ant.2   |                                          |       |

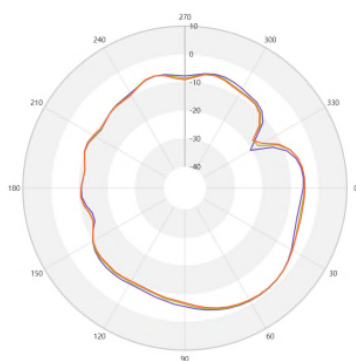
## 2D Radiation Pattern

### Ant.1 (Wi-Fi Tri Band)

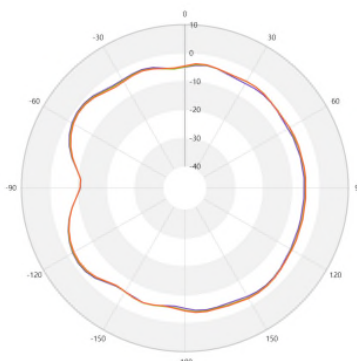
Frequency(MHz) : 2400-2483.5

Radiation Pattern :

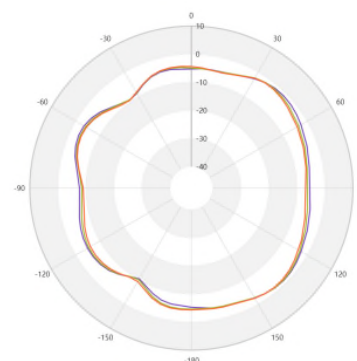
Azimuth Plane  
theta = 90



Elevation Plane  
phi = 0

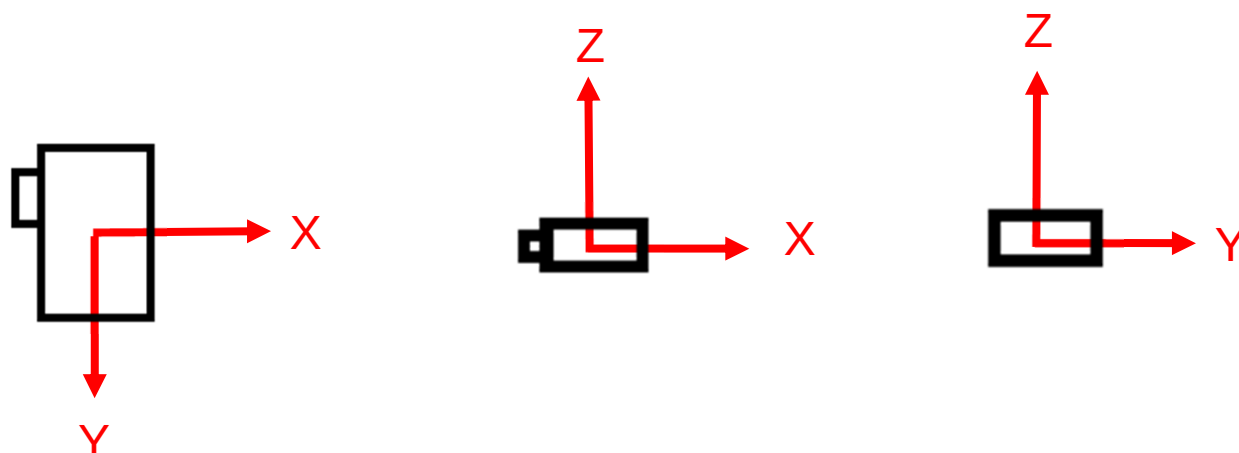


Elevation Plane  
phi = 90



— 2400.00 MHz  
— 2450.00 MHz  
— 2483.50 MHz

Setup :



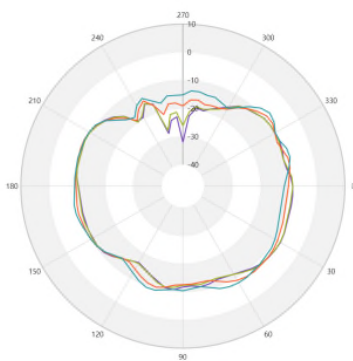
## 2D Radiation Pattern

### Ant.1 (Wi-Fi Tri Band)

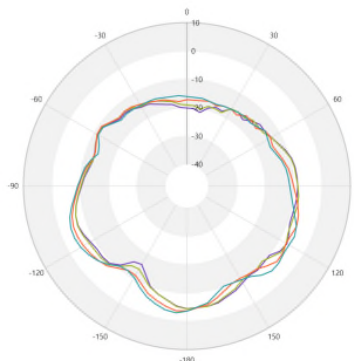
### Frequency(MHz) : 5200-5785

Radiation Pattern :

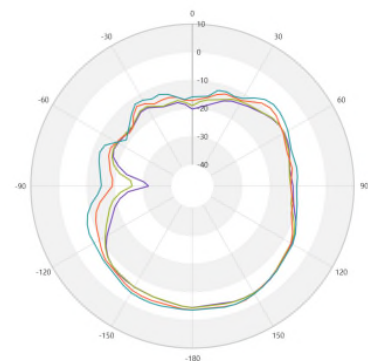
Azimuth Plane  
theta = 90



Elevation Plane  
phi = 0

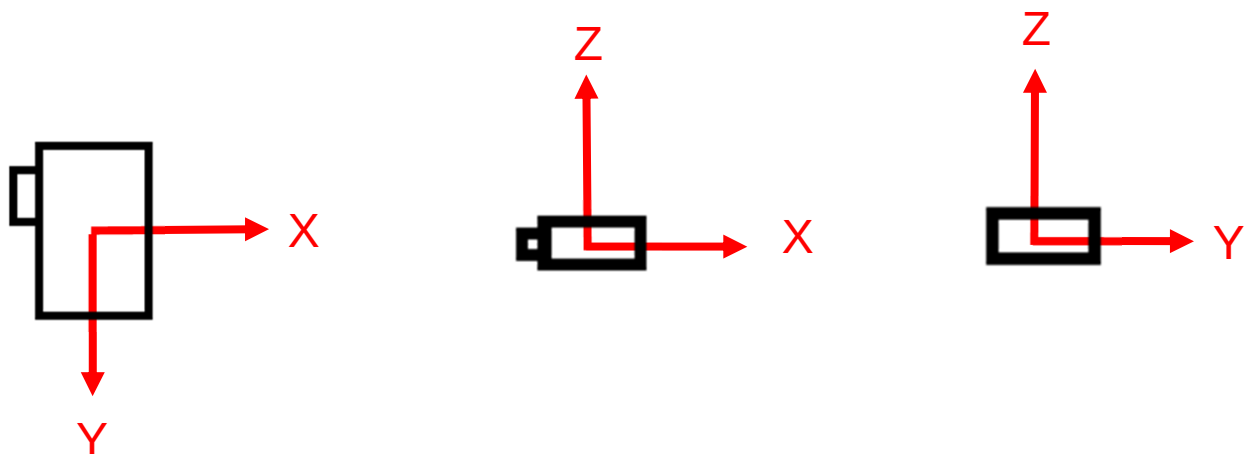


Elevation Plane  
phi = 90



— 5200.00 MHz  
— 5300.00 MHz  
— 5600.00 MHz  
— 5785.00 MHz

Setup :



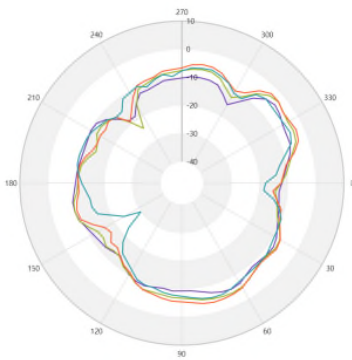
## 2D Radiation Pattern

### Ant.1 (Wi-Fi Tri Band)

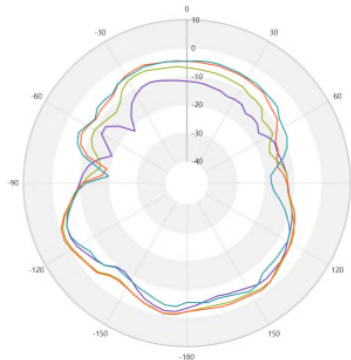
Frequency(MHz) : 6175-6995

Radiation Pattern :

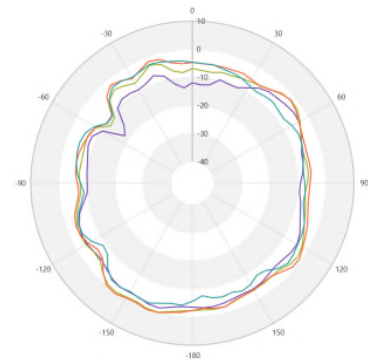
Azimuth Plane  
theta = 90



Elevation Plane  
phi = 0

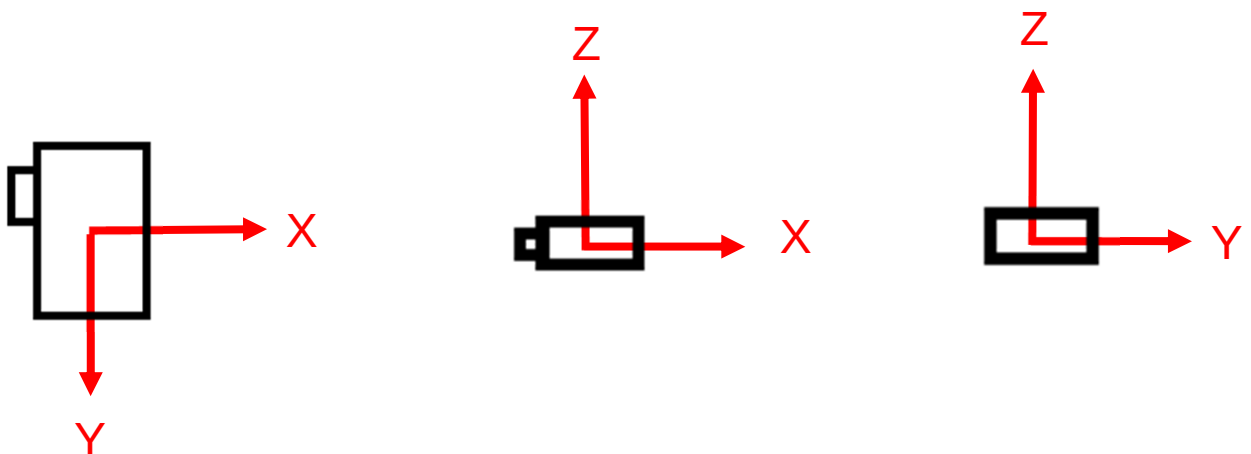


Elevation Plane  
phi = 90



— 6175.00 MHz  
— 6475.00 MHz  
— 6695.00 MHz  
— 6995.00 MHz

Setup :



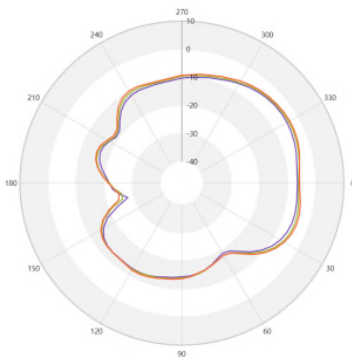
## 2D Radiation Pattern

### Ant.2 (Wi-Fi Tri Band)

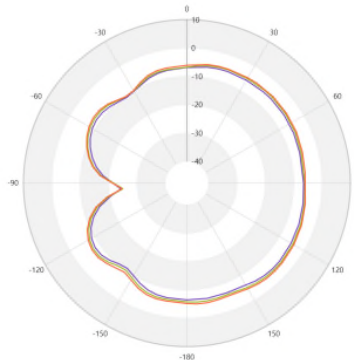
Frequency(MHz) : 2400-2483.5

Radiation Pattern :

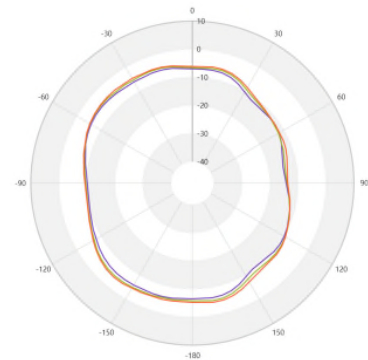
Azimuth Plane  
theta = 90



Elevation Plane  
phi = 0

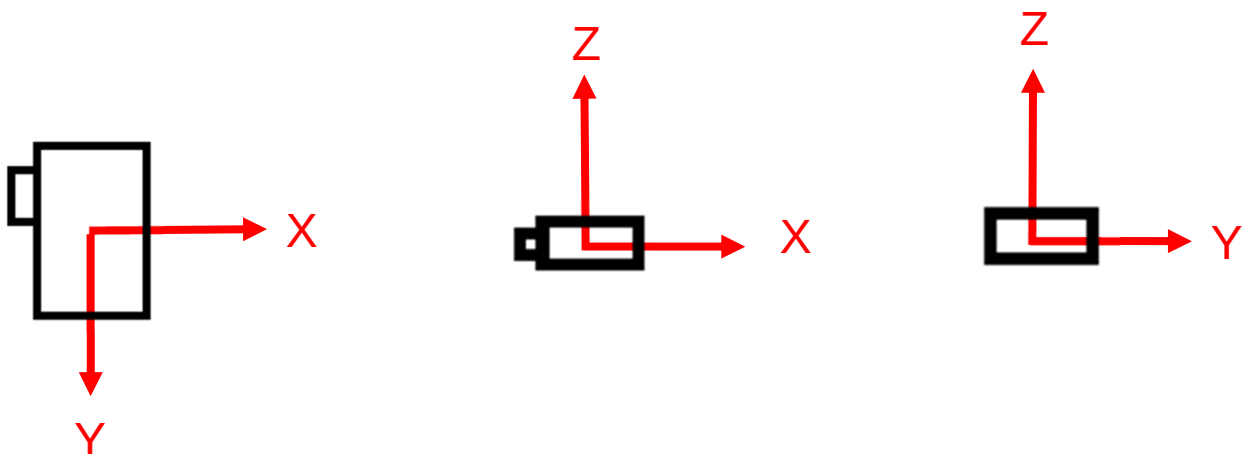


Elevation Plane  
phi = 90



— 2400.00 MHz  
— 2450.00 MHz  
— 2483.50 MHz

Setup :



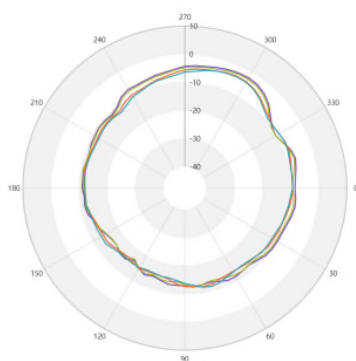
## 2D Radiation Pattern

### Ant.2 (Wi-Fi Tri Band)

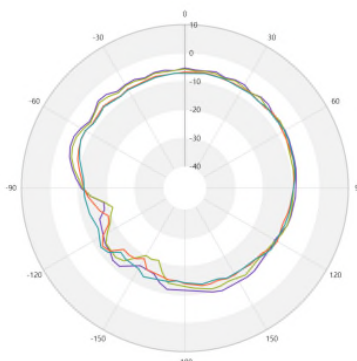
Frequency(MHz) : 5200-5785

Radiation Pattern :

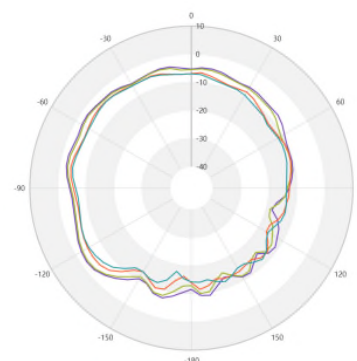
Azimuth Plane  
theta = 90



Elevation Plane  
phi = 0

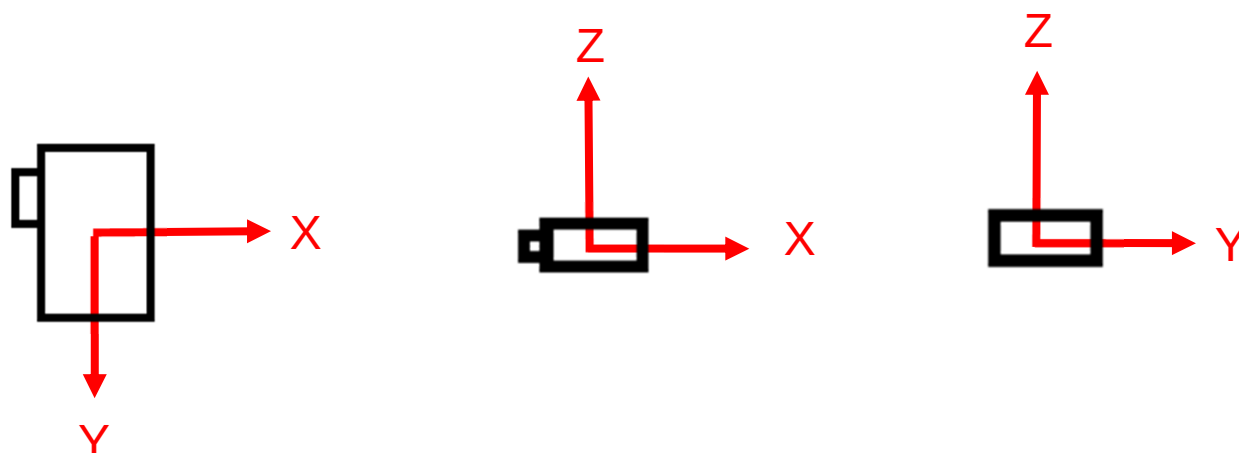


Elevation Plane  
phi = 90



— 5200.00 MHz  
— 5300.00 MHz  
— 5600.00 MHz  
— 5785.00 MHz

Setup :



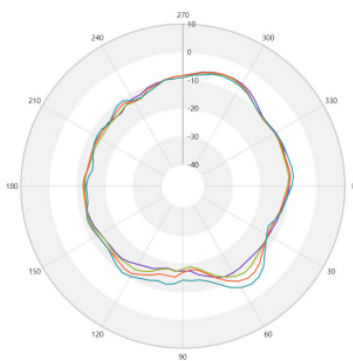
## 2D Radiation Pattern

### Ant.2 (Wi-Fi Tri Band)

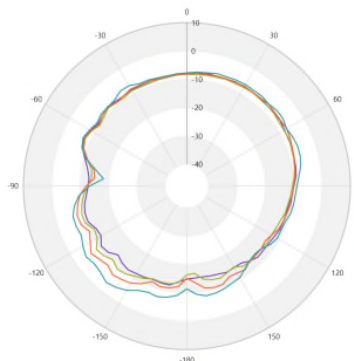
Frequency(MHz) : 6175-6995

Radiation Pattern :

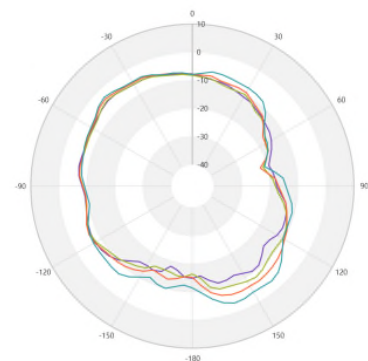
Azimuth Plane  
theta = 90



Elevation Plane  
phi = 0

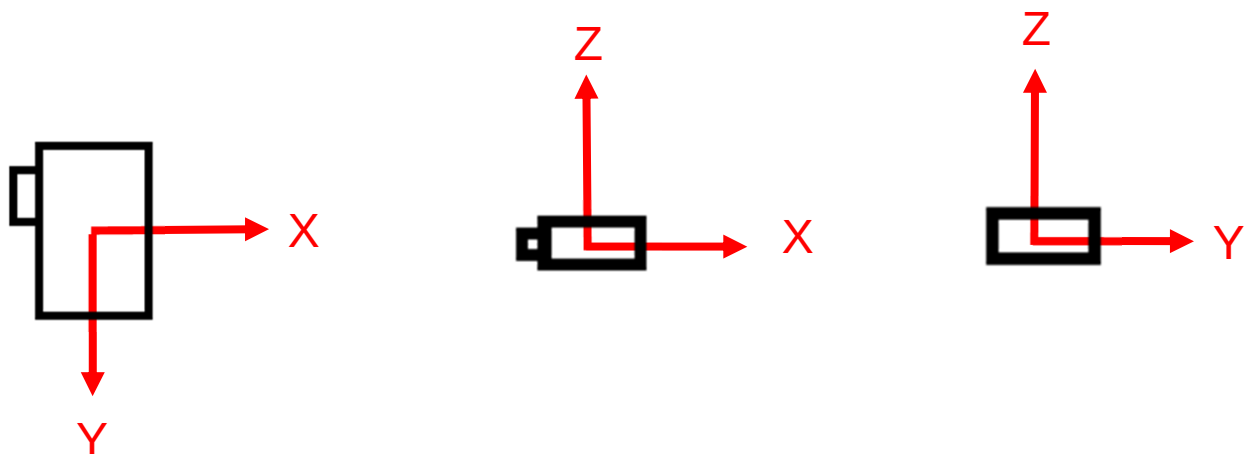


Elevation Plane  
phi = 90



— 6175.00 MHz  
— 6475.00 MHz  
— 6695.00 MHz  
— 6995.00 MHz

Setup :



## Summary

| Summary              | Ant.1          | Ant.2          | Remark |
|----------------------|----------------|----------------|--------|
| Return Loss – 2.4GHz | < -14dB        | < -3dB         |        |
| Efficiency – 2.4GHz  | > 34%          | > 20%          |        |
| Peak Gain – 2.4GHz   | -0.8 – -0.5dBi | -3.4 – -3.0dBi |        |
| Return Loss – 5GHz   | < -5dB         | < -2dB         |        |
| Efficiency – 5GHz    | > 12%          | > 12%          |        |
| Peak Gain – 5GHz     | -3.5 – -2.1dBi | -3.5 – -1.3dBi |        |
| Return Loss – 6GHz   | < -7dB         | < -2dB         |        |
| Efficiency – 6GHz    | > 21%          | > 11%          |        |
| Peak Gain – 6GHz     | -1.6 – 0.7dBi  | -4.2 – -1.8dBi |        |

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