

# Regulatory WLAN Antenna Information (Template)

English Language Required for Regulatory Review / Approval

1

| Platform information                                                                                                                                                 |                                          |                                       |                                       |                                                |                                                                             |                                      |                                       |                                       |                                       |                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------|---------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|----------------------------------------|
| Brand                                                                                                                                                                | Tester's name                            | Tester's signature                    | Test Date                             | platform<br><small>(ex: Yes, No or NA)</small> | Platform type<br><small>(ex: regular NB, convertible PC, AIO...etc)</small> | *SAR minimum separation (mm)         |                                       |                                       |                                       |                                        |
| Hong-Bo                                                                                                                                                              | Eason Tseng                              | Eason Tseng                           | 2021/1/14                             | NA                                             | WiFi Monopole                                                               |                                      |                                       |                                       |                                       |                                        |
| *****Please fill in exact product model name and make sure the model name is visible on product cover or any parts for end users recognize for authority inspection. |                                          |                                       |                                       |                                                |                                                                             |                                      |                                       |                                       |                                       |                                        |
| Antenna information                                                                                                                                                  |                                          |                                       |                                       |                                                |                                                                             |                                      |                                       |                                       |                                       |                                        |
| Vendor                                                                                                                                                               |                                          | Type                                  |                                       |                                                | Antenna Part number (Main)                                                  |                                      |                                       |                                       |                                       |                                        |
| Hong-Bo                                                                                                                                                              |                                          | Monopole                              |                                       |                                                | 260-25084                                                                   |                                      |                                       |                                       |                                       |                                        |
| Peak gain w/ cable loss (dBi)*                                                                                                                                       |                                          |                                       |                                       |                                                |                                                                             |                                      |                                       |                                       |                                       |                                        |
|                                                                                                                                                                      | 2.4GHz<br><small>2400-2483.5 MHz</small> | 5.2GHz<br><small>5150-5250MHz</small> | 5.3GHz<br><small>5250-5350MHz</small> | 5.6GHz<br><small>5470-5725MHz</small>          | 5.8GHz<br><small>5725-5850MHz</small>                                       | 5.9GHz<br><small>5850-5925MH</small> | 6.2GHz<br><small>5925-6425MHz</small> | 6.5GHz<br><small>6425-6525MHz</small> | 6.7GHz<br><small>6525-6875MHz</small> | 7.0 GHz<br><small>6875-7125MHz</small> |
| Main                                                                                                                                                                 | 3.22                                     | 3.35                                  | 3.42                                  | 4.77                                           | 4.72                                                                        | 4.71                                 | 4.75                                  | 4.29                                  | 4.81                                  | 4.74                                   |

# Table of contents

1. Applicable test method
2. Test & System Description
  - a. Test setup
  - b. Equipment list
3. Setup photo

## Section 1. Antenna Assembly Specifications

## Section 2. Radiation characteristics of antenna loaded in Host Platform

4. Antenna information used for conformity with limits

1. Applicable test methods

This test report is prepared for PIFA antenna testing under a AMS-8500 Full Anechoic Chamber.

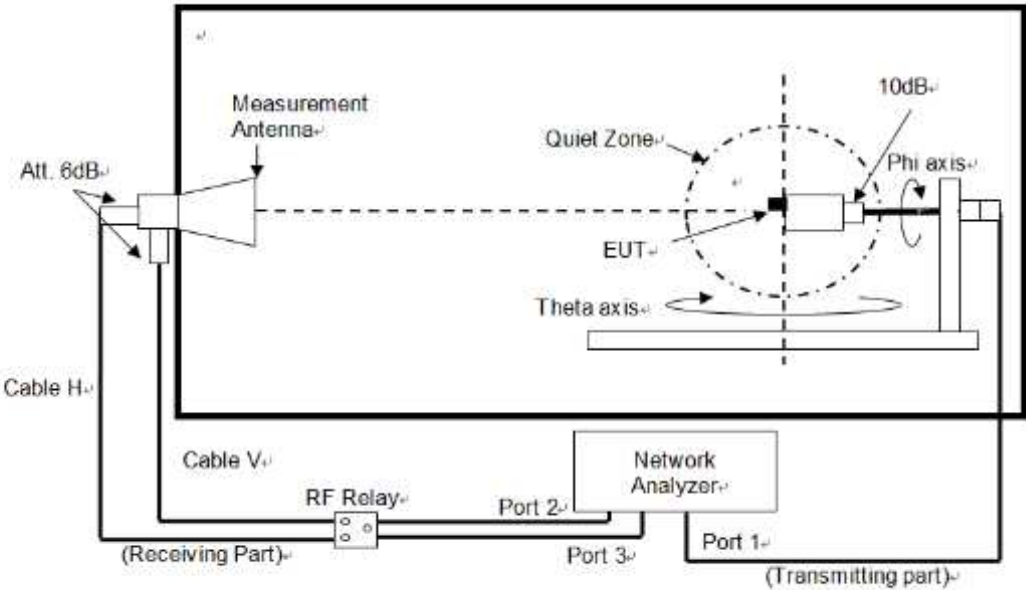
ETS-Lindgren AMS-8500 system is 3D fully anechoic chamber, it is applied to the "Conical Cut test method" the detail description is described as below,

The Conical Cut method requires the ability of the Measurement Antenna to be physically rotated in the theta plane (overhead) of the EUT for implementations using a single Measurement Antenna, Eleven conical cuts are required to capture data at every 15 degrees from the EUT, with the top (0 degrees) and bottom (180 degrees) cuts not being measured. Typically, the EUT will remain affixed to a turntable during the entire measurement process. The Measurement Antenna will be positioned at a starting theta angle.

The EUT will then be rotated around the full 360 degrees of phi rotation, The Measurement Antenna will then be positioned at the next theta angle, and the process repeated.

|         |                | $\theta$ -Axis     | $\Phi$ -Axis      |
|---------|----------------|--------------------|-------------------|
| Passive | Step size      | 15°~165° step: 15° | 0°~345° step: 15° |
|         | N / M (Points) | 12                 | 24                |

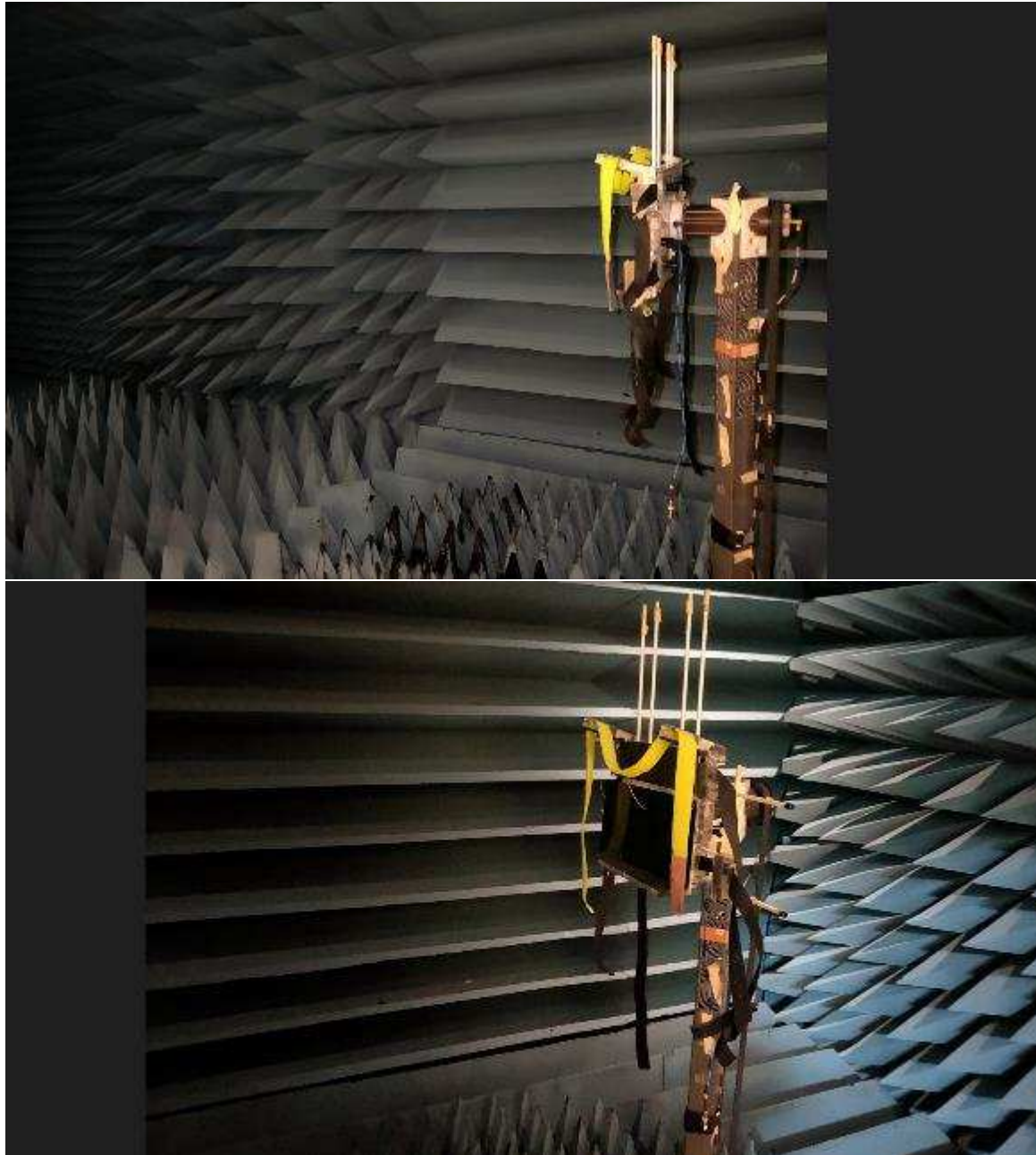
2. Test & System Description



b. Equipment list

| Name                                | Manufacture  | Type/Model | Serial Number | Cal. Date | Cal. Due Date |
|-------------------------------------|--------------|------------|---------------|-----------|---------------|
| ENA Series<br>Network Analyze       | Keysight     | E5071C     | MY46108594    | 2021/8/3  | 2023/8/3      |
| RF Switch                           | Keysight     | 3499A      | MY4200955     | NCR       | NCR           |
| Multi-Axis Positioner<br>Controller | ETS-Lindgren | 2090       | N/A           | NCR       | NCR           |
| Medium-Duty<br>Positioner           | ETS-Lindgren | 2015       | N/A           | NCR       | NCR           |
| Measurement Horn<br>Antenna         | EMCO         | Aug-64     | 86722         | NCR       | NCR           |
| Measurement<br>software             | ETS-Lindgren | EM-Quest   | 1195          | NCR       | NCR           |

### 3. Setup photo



# Antenna Information

## Section 1. Antenna Assembly Specifications

| 1A                  | 1B           | 1C           | 1D                                                                                       |                | 1E                              | 1F                             | 1G       | 1H              |
|---------------------|--------------|--------------|------------------------------------------------------------------------------------------|----------------|---------------------------------|--------------------------------|----------|-----------------|
| Antenna Part Number | Manufacturer | Antenna Type | Cable Assembly Part Number and Information                                               | Freq Range MHz | * Peak Gain W/ Cable loss (dBi) | Peak Gain w/o Cable Loss (dBi) | Max VSWR | Cable Loss (dB) |
| 260-25084           | Hong-Bo      | Monopole     | 50 ohm Coaxial length: 200mm diameter: 1.13LLS<br><br>Connector type: MHF4L MHF-B13-N-01 | 2400-2483.5    | 3.22                            | 3.71                           | 2.5      | 0.49            |
|                     |              |              |                                                                                          | 5150-5250      | 3.35                            | 4.11                           | 2.5      | 0.76            |
|                     |              |              |                                                                                          | 5250-5350      | 3.42                            | 4.19                           | 2.5      | 0.77            |
|                     |              |              |                                                                                          | 5470-5725      | 4.77                            | 5.57                           | 2.5      | 0.80            |
|                     |              |              |                                                                                          | 5725-5850      | 4.72                            | 5.56                           | 2.5      | 0.84            |
|                     |              |              |                                                                                          | 5850-5925      | 4.71                            | 5.55                           | 2.5      | 0.84            |
|                     |              |              |                                                                                          | 5925-6425      | 4.75                            | 5.61                           | 2.5      | 0.86            |
|                     |              |              |                                                                                          | 6425-6525      | 4.29                            | 5.2                            | 2.5      | 0.91            |
|                     |              |              |                                                                                          | 6525-6875      | 4.81                            | 5.77                           | 2.5      | 0.96            |
|                     |              |              |                                                                                          | 6875-7125      | 4.74                            | 5.72                           | 2.5      | 0.98            |

Note: The individual antenna gain is by measurement as indicated in above table. For module transmitter supports MIMO and use same antenna at multiple antenna ports. The direction gain values shall follow section FCC KDB 662911 D01.

- 3D Antenna Peak Gain required being test in system basis.

| Frequency | Peak Gain | Theta angle | Phi angle | Frequency | Peak Gain | Theta angle | Phi angle |
|-----------|-----------|-------------|-----------|-----------|-----------|-------------|-----------|
| MHz       | (dBi)     | ( ° )       | ( ° )     | MHz       | (dBi)     | ( ° )       | ( ° )     |
| 2412      | 3.14      | 120         | 180       | 5470      | 4.46      | 120         | 105       |
| 2422      | 3.14      | 120         | 180       | 5500      | 4.77      | 120         | 105       |
| 2437      | 3.14      | 120         | 180       | 5725      | 4.29      | 120         | 105       |
| 2442      | 3.22      | 120         | 180       | 5785      | 4.49      | 120         | 105       |
| 2452      | 3.18      | 120         | 180       | 5805      | 4.72      | 120         | 105       |
| 2484      | 3.12      | 120         | 180       | 5850      | 4.71      | 120         | 105       |
| 5150      | 3.21      | 120         | 105       | 5875      | 4.64      | 120         | 255       |
| 5180      | 3.35      | 120         | 105       | 5925      | 4.71      | 120         | 255       |
| 5250      | 3.19      | 120         | 105       | 6085      | 4.75      | 120         | 255       |
| 5320      | 3.37      | 120         | 105       | 6245      | 4.74      | 120         | 255       |
| 5350      | 3.42      | 120         | 105       | 6405      | 4.7       | 120         | 255       |

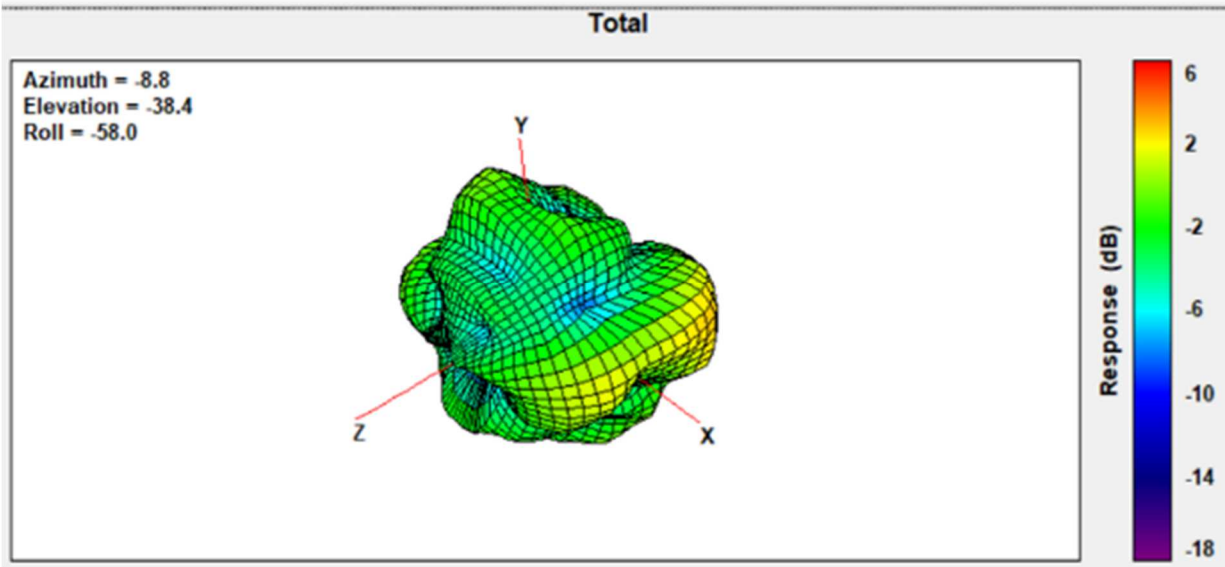
| Frequency | Peak Gain | Theta angle | Phi angle |
|-----------|-----------|-------------|-----------|
| MHz       | (dBi)     | ( ° )       | ( ° )     |
| 6425      | 4.25      | 120         | 255       |
| 6465      | 4.29      | 120         | 255       |
| 6525      | 4.22      | 120         | 255       |
| 6645      | 4.78      | 120         | 255       |
| 6795      | 4.81      | 120         | 270       |
| 6875      | 4.71      | 120         | 270       |
| 6975      | 4.74      | 120         | 90        |
| 7095      | 4.74      | 120         | 90        |
| 7125      | 4.71      | 120         | 90        |

Section 2. Radiation characteristics of antenna loaded in Host Platform

Main Antenna

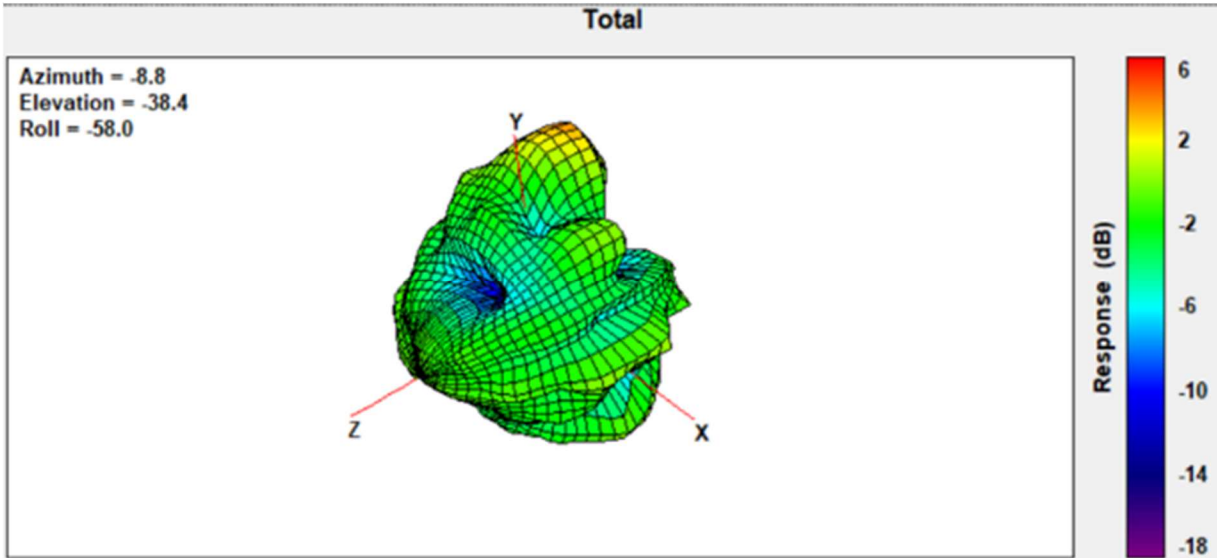
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) | Theta angle ( ° ) | Phi angle ( ° ) |
|-----------------|-------------------------------|-------------------|-----------------|
| 2400-2483.5     | 3.22                          | 120               | 180             |



Max Antenna 3D Radiation Pattern 5150-5250 MHz

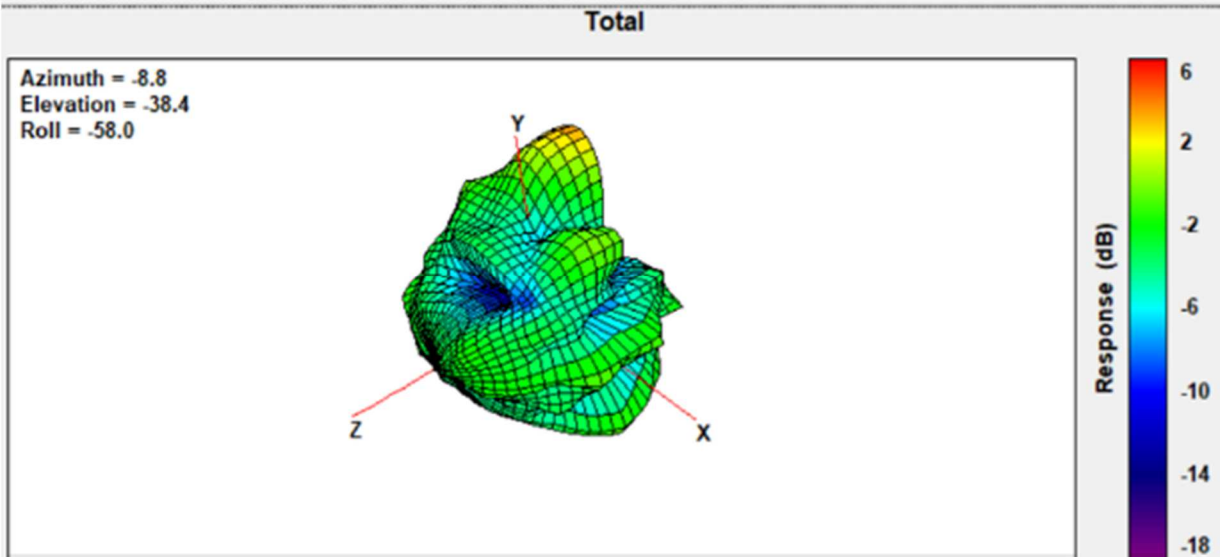
| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) | Theta angle ( ° ) | Phi angle ( ° ) |
|-----------------|-------------------------------|-------------------|-----------------|
| 5150-5250       | 3.35                          | 120               | 105             |





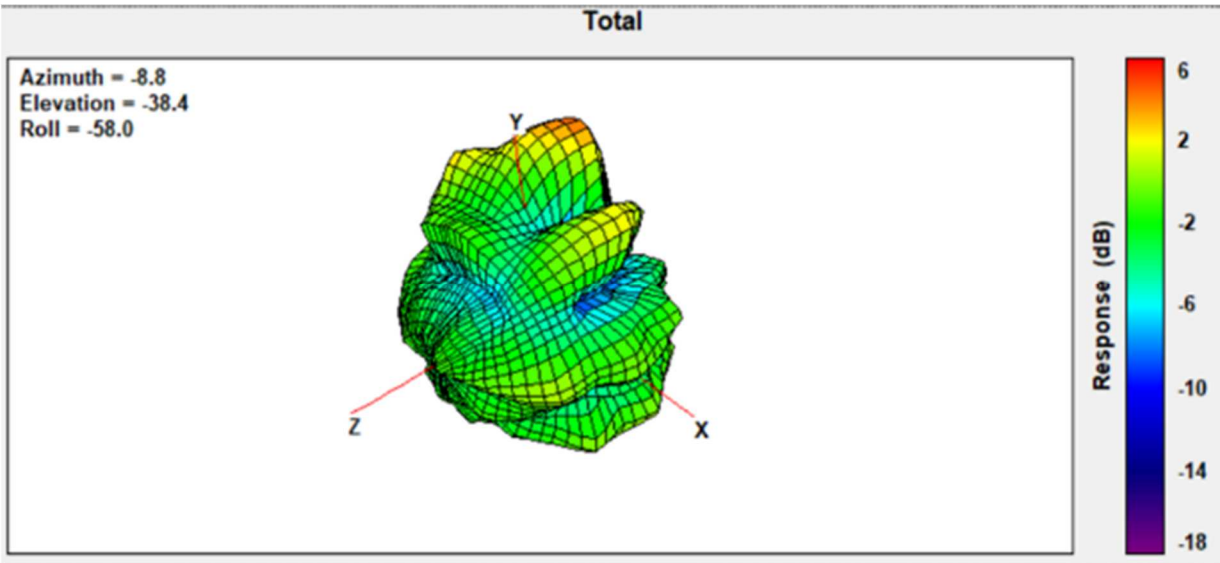
Max Antenna 3D Radiation Pattern 5250-5350 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable<br>Loss (dBi) | Theta angle<br>( ° ) | Phi angle<br>( ° ) |
|--------------------|----------------------------------|----------------------|--------------------|
| 5250-5350          | 3.42                             | 120                  | 105                |



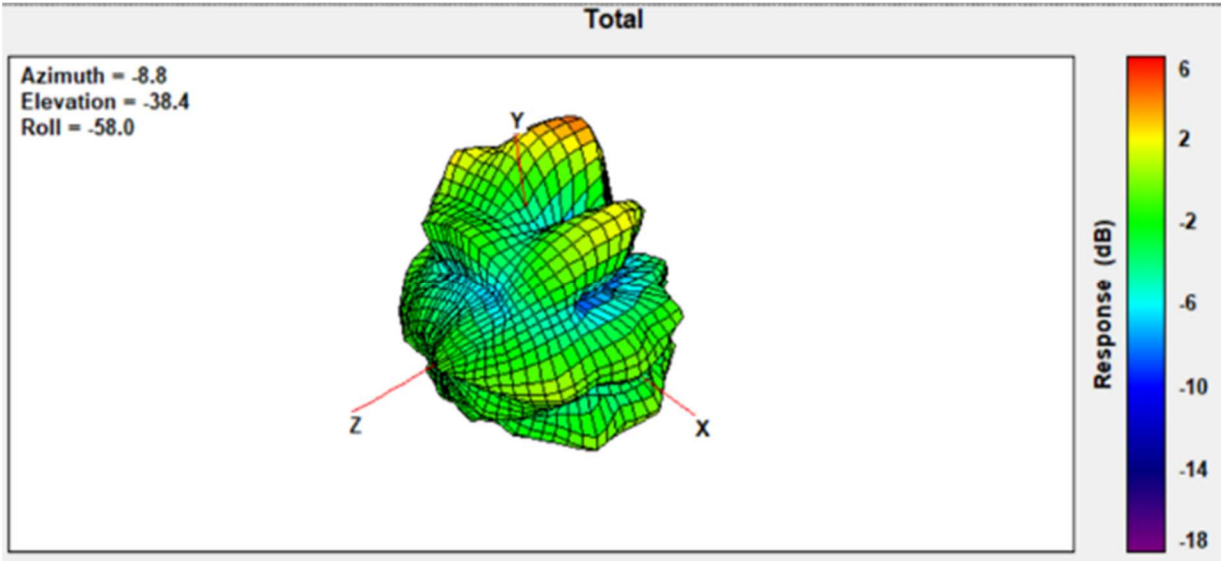
Max Antenna 3D Radiation Pattern 5470-5725 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable<br>Loss (dBi) | Theta angle<br>( ° ) | Phi angle<br>( ° ) |
|--------------------|----------------------------------|----------------------|--------------------|
| 5470-5725          | 4.77                             | 120                  | 105                |



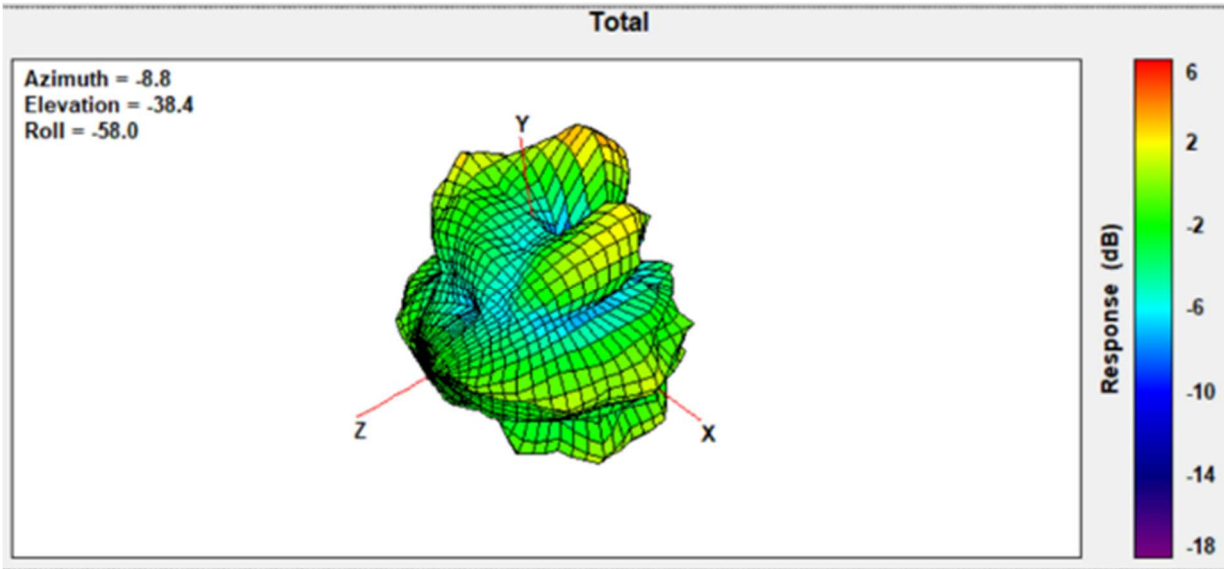
Max Antenna 3D Radiation Pattern 5725-5850 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable<br>Loss (dBi) | Theta angle<br>( ° ) | Phi angle<br>( ° ) |
|--------------------|----------------------------------|----------------------|--------------------|
| 5725-5850          | 4.72                             | 120                  | 105                |



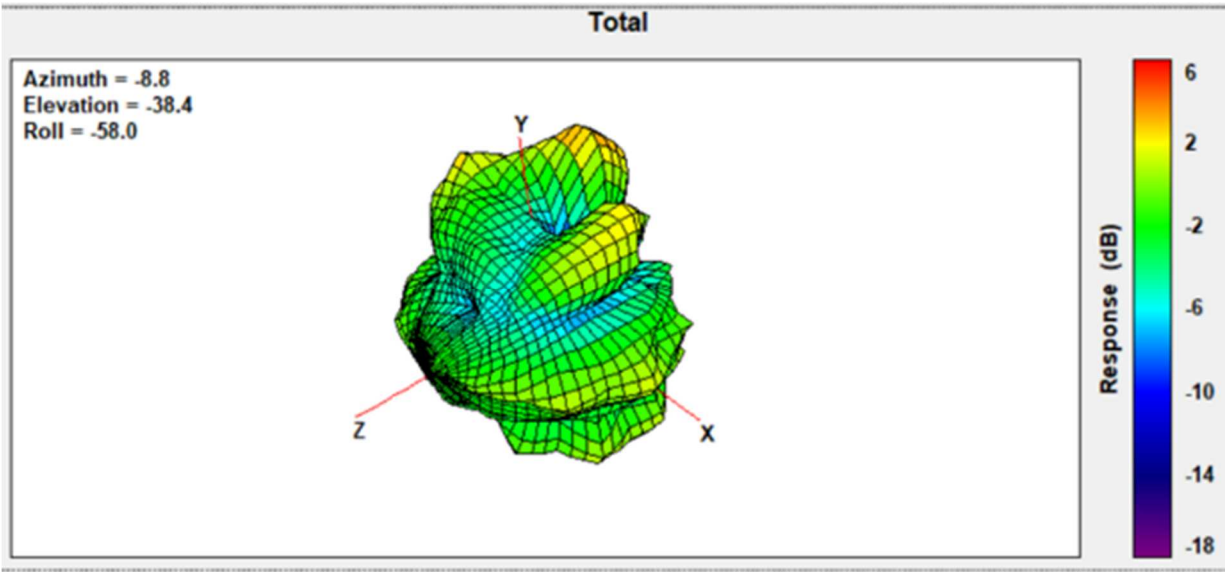
Max Antenna 3D Radiation Pattern 5850-5925 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable<br>Loss (dBi) | Theta angle<br>( ° ) | Phi angle<br>( ° ) |
|--------------------|----------------------------------|----------------------|--------------------|
| 5850-5925          | 4.71                             | 120                  | 105                |



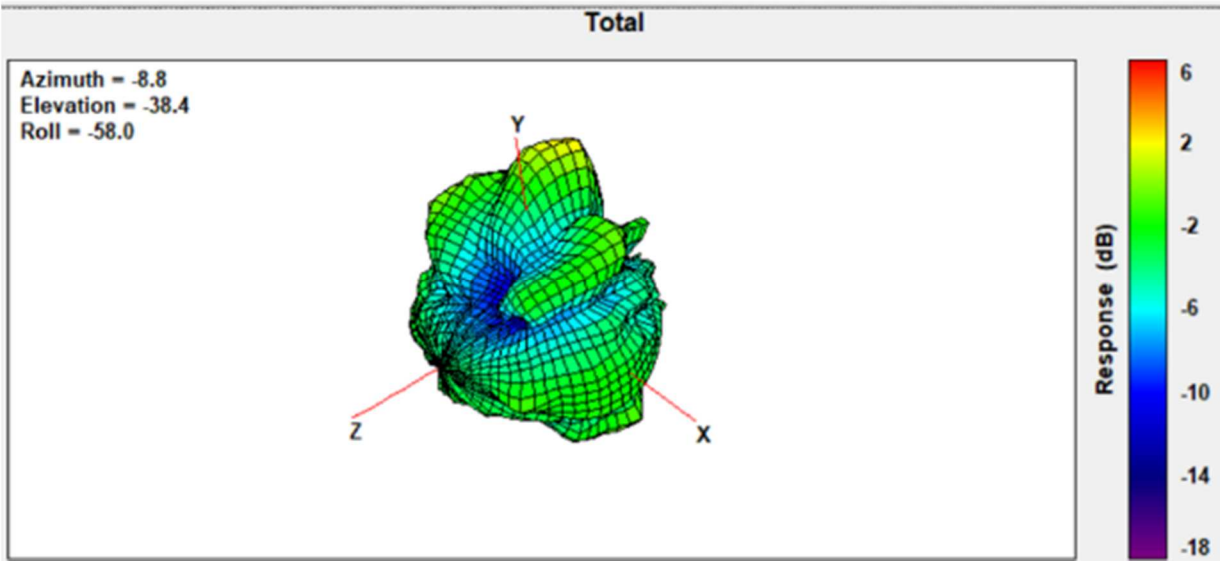
Max Antenna 3D Radiation Pattern 5925-6425 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable<br>Loss (dBi) | Theta angle<br>( ° ) | Phi angle<br>( ° ) |
|--------------------|----------------------------------|----------------------|--------------------|
| 5925-6425          | 4.75                             | 120                  | 255                |



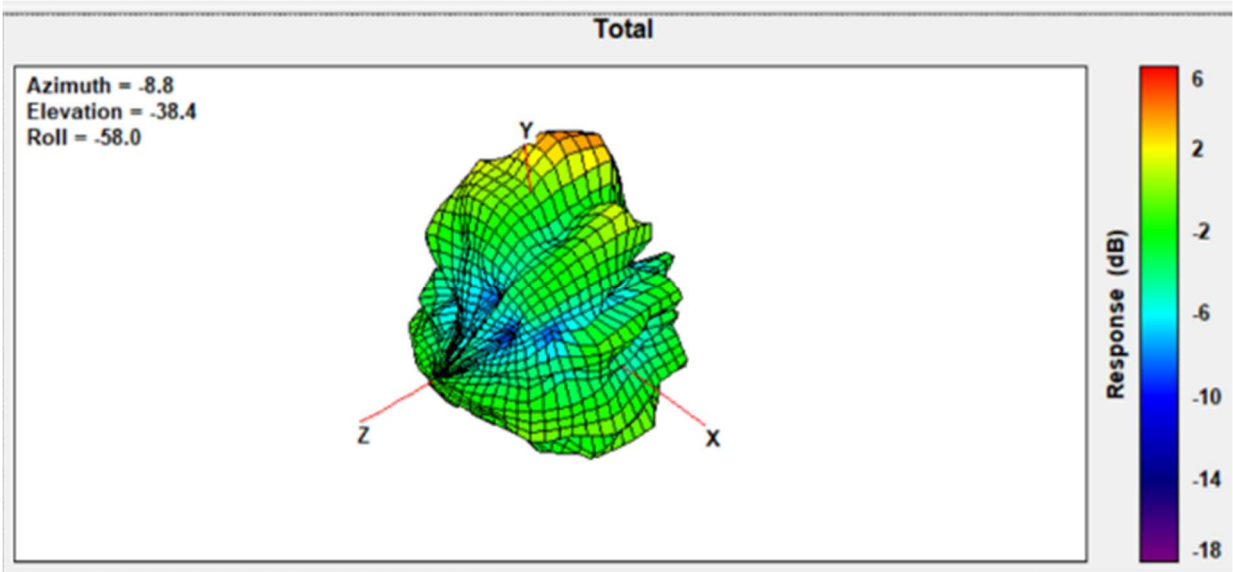
Max Antenna 3D Radiation Pattern 6425-6525 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable<br>Loss (dBi) | Theta angle<br>( ° ) | Phi angle<br>( ° ) |
|--------------------|----------------------------------|----------------------|--------------------|
| 6425-6525          | 4.29                             | 120                  | 255                |



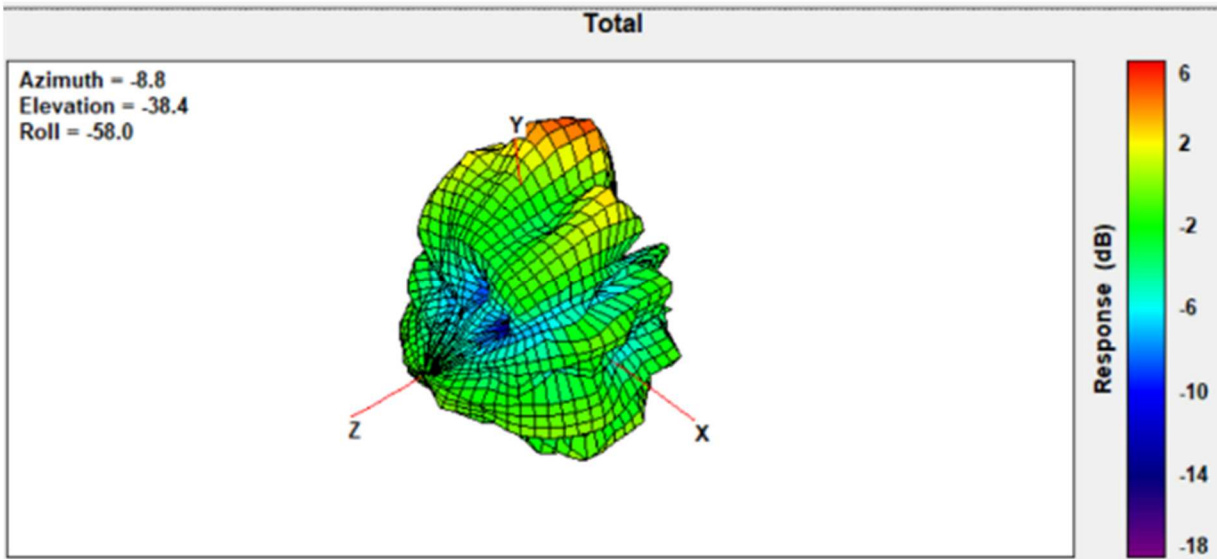
Max Antenna 3D Radiation Pattern 6525-6875 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) | Theta angle (°) | Phi angle (°) |
|-----------------|-------------------------------|-----------------|---------------|
| 6525-6875       | 4.81                          | 120             | 270           |



Max Antenna 3D Radiation Pattern 6875-7125 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) | Theta angle (°) | Phi angle (°) |
|-----------------|-------------------------------|-----------------|---------------|
| 6875-7125       | 4.74                          | 120             | 90            |



#### **4. Antenna information used for conformity with limits**

This is a WIFI/BT typical antenna for modular manufacture regulatory testing purpose. The applicable limit is subjected to modular transmitter design/specification (i.e., SISO or MIMO etc.) and FCC Part 15 regulation. Detail of conformity limit to be described in module FCC test reports.