

# Regulatory WLAN Antenna Information (Template)

English Language Required for Intel Regulatory Review / Approval

(OEM/ODM or antenna vendor is required to complete this document with platform antenna information.

Remove Intel references and make this your own document)

| Platform information                                                                                                                                                           |                             |                            |                                       |                                                              |                              |                           |                        |                        |                        |                         |                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------|---------------------------------------|--------------------------------------------------------------|------------------------------|---------------------------|------------------------|------------------------|------------------------|-------------------------|--------------------------------------------------------------------------------------------|
| Brand                                                                                                                                                                          | ODM                         | ****End product model name | Intel platform<br>(ex: Yes, No or NA) | Platform type<br>(ex: regular NB, convertible PC, AIO...etc) | *SAR minimum separation (mm) |                           |                        |                        |                        |                         |                                                                                            |
| Dell                                                                                                                                                                           | Wistron                     | P181G                      | Yes                                   | Regular NB                                                   | 4.3                          |                           |                        |                        |                        |                         |                                                                                            |
| *****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)            |                                                              |                              | Antenna Part number (Aux) |                        |                        |                        |                         |                                                                                            |
| Wistron Corp.                                                                                                                                                                  |                             | PIFA                       | 0JWY5K                                |                                                              |                              | 07M1NC                    |                        |                        |                        |                         |                                                                                            |
| Peak gain w/ cable loss (dBi)*                                                                                                                                                 |                             |                            |                                       |                                                              |                              |                           |                        |                        |                        |                         |                                                                                            |
|                                                                                                                                                                                | 2.4GHz<br>2400-2483.5 MHz   | 5.2GHz<br>5150-5250MHz     | 5.3GHz<br>5250-5350MHz                | 5.6GHz<br>5470-5725MHz                                       | 5.8GHz<br>5725-5850MHz       | 5.9GHz<br>5850-5895MHz    | 6.2GHz<br>5925-6425MHz | 6.5GHz<br>6425-6525MHz | 6.7GHz<br>6525-6875MHz | 7.0 GHz<br>6875-7125MHz |                                                                                            |
| Main                                                                                                                                                                           | 1.18                        | 2.98                       | 2.98                                  | 2.78                                                         | 2.78                         | 2.55                      | 2.72                   | 2.77                   | 4.05                   | 3.64                    |                                                                                            |
| Aux                                                                                                                                                                            | 2.09                        | 2.09                       | 2.69                                  | 3.00                                                         | 2.75                         | 2.78                      | 3.04                   | 2.88                   | 4.02                   | 4.08                    |                                                                                            |
| Intel Reference Gain/Type/ Separation distance                                                                                                                                 |                             |                            |                                       |                                                              |                              |                           |                        |                        |                        |                         |                                                                                            |
| Antenna Type                                                                                                                                                                   | Antenna Peak gain (In dBi)* |                            |                                       |                                                              |                              |                           |                        |                        |                        |                         | Distance to the end user (mm)                                                              |
|                                                                                                                                                                                | 2.4GHz<br>2400-2483.5 MHz   | 5.2GHz<br>5150-5250MHz     | 5.3GHz<br>5250-5350MHz                | 5.6GHz<br>5470-5725MHz                                       | 5.8GHz<br>5725-5850MHz       | 5.9GHz<br>5850-5895MHz    | 6.2GHz<br>5925-6425MHz | 6.5GHz<br>6425-6525MHz | 6.7GHz<br>6525-6875MHz | 7.0GHz<br>6875-7125MHz  |                                                                                            |
| Design                                                                                                                                                                         | 3.00                        | 5.00                       | 5.00                                  | 5.00                                                         | 5.00                         | 5.00                      | 5.00                   | 5.00                   | 5.00                   | 5.00                    | Generic: refer to modular FCC SAR report<br><br>Mid-power: ≥ 8 mm<br><br>Low power: ≥ 5 mm |
| PIFA                                                                                                                                                                           | 3.24                        | 3.64                       | 3.73                                  | 4.77                                                         | 4.97                         | 4.72                      | 4.83                   | 4.30                   | 5.37                   | 5.59                    |                                                                                            |
| Dipole                                                                                                                                                                         | 2.89                        | 2.92                       | 3.19                                  | 4.41                                                         | 4.22                         | 4.22                      | 4.83                   | 4.30                   | 4.49                   | 5.34                    |                                                                                            |
| Notes (marked with *)                                                                                                                                                          |                             |                            |                                       |                                                              |                              |                           |                        |                        |                        |                         |                                                                                            |
| * SAR minimum separation (mm)                                                                                                                                                  |                             |                            |                                       |                                                              |                              |                           |                        |                        |                        |                         |                                                                                            |
| - Regular NB: Minimum antenna-to-body (from antenna bottom to the bottom of the device)                                                                                        |                             |                            |                                       |                                                              |                              |                           |                        |                        |                        |                         |                                                                                            |
| - Tablet / Convertible PC: Minimum antenna-to-edge (5 sides of the device)                                                                                                     |                             |                            |                                       |                                                              |                              |                           |                        |                        |                        |                         |                                                                                            |
| - Mini-tablet: Minimum antenna-to-edge (6 sides of the device)                                                                                                                 |                             |                            |                                       |                                                              |                              |                           |                        |                        |                        |                         |                                                                                            |
| * 3D Peak Antenna gain should be equal or greater than -2 dBi                                                                                                                  |                             |                            |                                       |                                                              |                              |                           |                        |                        |                        |                         |                                                                                            |
| - If a host integrator plans to use a lower gain antenna of the same type, additional CBP(FCC)/EDT(EU) testing need to be performed while the module is installed in the host. |                             |                            |                                       |                                                              |                              |                           |                        |                        |                        |                         |                                                                                            |

# 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. Dimensioned Photos or Drawings of Antennas](#)

[Section 3. Radiation characteristics of antenna loaded in Host Platform](#)

[Section 4. Antenna Host Platform Location Information](#)

[Section 5. Antenna dimensional information for SAR evaluation](#)

[Section 6. Diagram Example of Co-Location Antenna Separation](#)

1. Applicable test methods

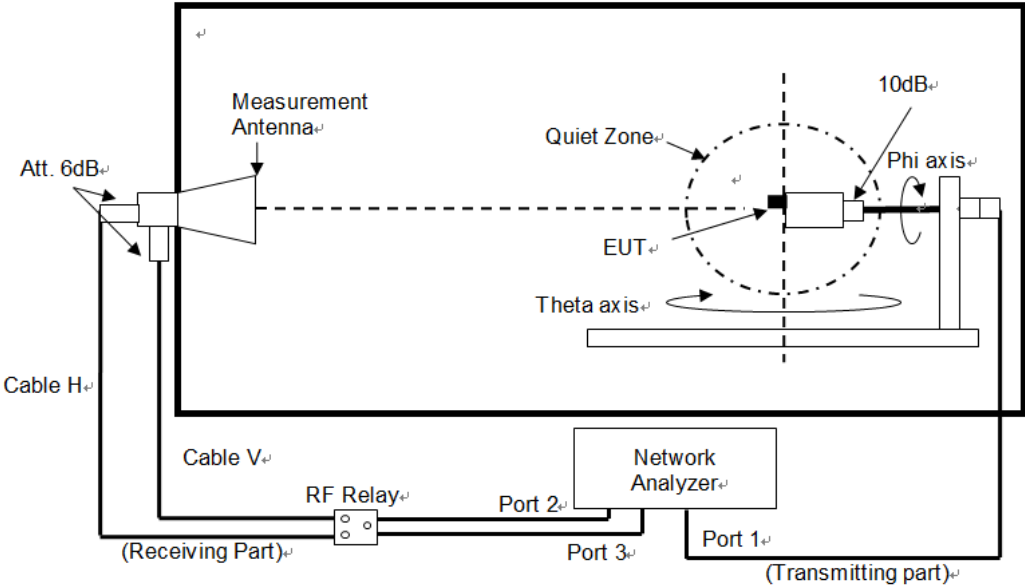
<insert test description here for test method>

[example] This test report is prepared for host antenna testing under a Full Anechoic Chamber.

2. Test & System Description

a. Test setup

<insert test diagram here for test site utilized>



b. Equipment list

<insert test diagram here for test site utilized>

| Huaya-Sporton OTA03                                         |                       |            |               |             |           |
|-------------------------------------------------------------|-----------------------|------------|---------------|-------------|-----------|
| Name                                                        | Manufacturer          | Type/Model | Serial Number | Calibration |           |
|                                                             |                       |            |               | Last Cal.   | Due Date  |
| ENA Series Network Analyzer                                 | Keysight              | E5080B     | MY59101211    | 2022/5/23   | 2023/5/22 |
| RF Switch                                                   | Keysight              | 3499A      | MY42000955    | NCR         | NCR       |
| Multi-Axis Positioner Controller                            | ETS-Lindgren          | 2090       | N/A           | NCR         | NCR       |
| Medium-Duty Positioner                                      | ETS-Lindgren          | 2015       | N/A           | NCR         | NCR       |
| Measurement Horn Antenna                                    | EMCO                  | 3164-08    | 00086722      | NCR         | NCR       |
| Anechoic chamber                                            | ETS-Lindgren          | AMS-8500   | N/A           | 2022/1/6    | 2023/1/5  |
| 12GHz SMA(M)-SMA(M)+20core for 60cm RG316DS Cable Assembly  | Woken Technology Inc. | RG316DS    | N/A           | N/A         | N/A       |
| 12GHz SMA(M)-SMA(M)+30core for 300cm RG316DS Cable Assembly | Woken Technology Inc. | RG316DS    | N/A           | N/A         | N/A       |
| Note: Chamber calibration included full set of implement.   |                       |            |               |             |           |

# 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) |
| Main Antenna<br>P/N: 0JWY5K | Wistron Corp. | PIFA         | 50 ohm Coaxial length: 163mm diameter: 1.13mm Connector□ IPEX | 2400-2483.5    | 1.18                            | 1.54                           | 3.0 max  | 0.36            |
|                             |               |              |                                                               | 5150-5250      | 2.98                            | 3.55                           | 3.0 max  | 0.57            |
|                             |               |              |                                                               | 5250-5350      | 2.98                            | 3.56                           | 3.0 max  | 0.58            |
|                             |               |              |                                                               | 5470-5725      | 2.78                            | 3.40                           | 3.0 max  | 0.62            |
|                             |               |              |                                                               | 5725-5850      | 2.78                            | 3.41                           | 3.0 max  | 0.63            |
|                             |               |              |                                                               | 5850-5895      | 2.55                            | 3.19                           | 3.0 max  | 0.64            |
|                             |               |              |                                                               | 5925-6425      | 2.72                            | 3.40                           | 3.0 max  | 0.68            |
|                             |               |              |                                                               | 6425-6525      | 2.77                            | 3.44                           | 3.0 max  | 0.67            |
|                             |               |              |                                                               | 6525-6875      | 4.05                            | 4.75                           | 3.0 max  | 0.70            |
|                             |               |              |                                                               | 6875-7125      | 3.64                            | 4.37                           | 3.0 max  | 0.73            |
| Aux Antenna<br>P/N: 07M1NC  | Wistron Corp. | PIFA         | 50 ohm Coaxial length: 108mm diameter: 1.13mm Connector□ IPEX | 2400-2483.5    | 2.09                            | 2.33                           | 3.0 max  | 0.24            |
|                             |               |              |                                                               | 5150-5250      | 2.09                            | 2.47                           | 3.0 max  | 0.38            |
|                             |               |              |                                                               | 5250-5350      | 2.69                            | 3.08                           | 3.0 max  | 0.39            |
|                             |               |              |                                                               | 5470-5725      | 3.00                            | 3.41                           | 3.0 max  | 0.41            |
|                             |               |              |                                                               | 5725-5850      | 2.75                            | 3.17                           | 3.0 max  | 0.42            |
|                             |               |              |                                                               | 5850-5895      | 2.78                            | 3.21                           | 3.0 max  | 0.43            |
|                             |               |              |                                                               | 5925-6425      | 3.04                            | 3.49                           | 3.0 max  | 0.45            |
|                             |               |              |                                                               | 6425-6525      | 2.88                            | 3.32                           | 3.0 max  | 0.44            |
|                             |               |              |                                                               | 6525-6875      | 4.02                            | 4.49                           | 3.0 max  | 0.47            |
|                             |               |              |                                                               | 6875-7125      | 4.08                            | 4.55                           | 3.0 max  | 0.47            |

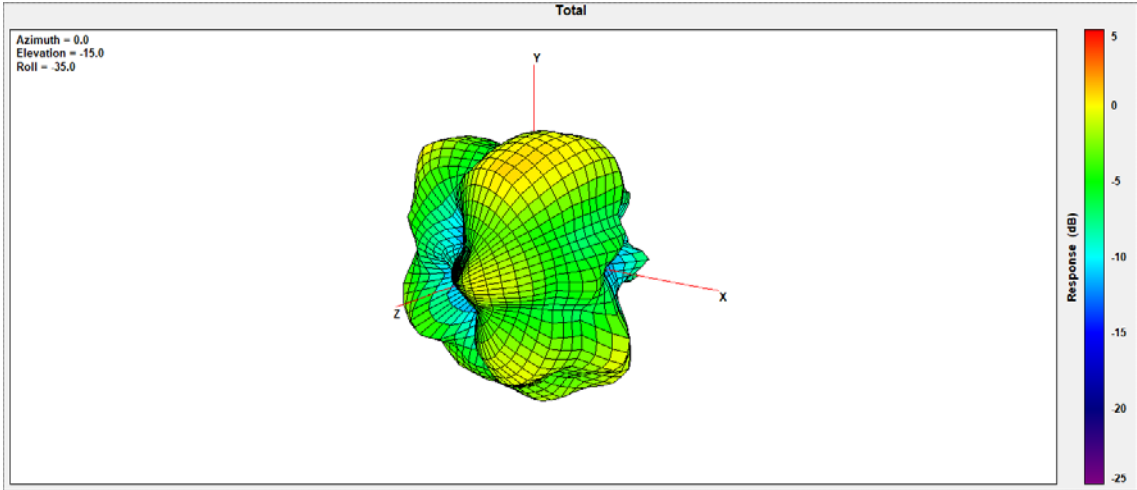
- 3D Antenna Peak Gain required being test in system basis.

Section 3. Radiation characteristics of antenna loaded in Host Platform

Main Antenna

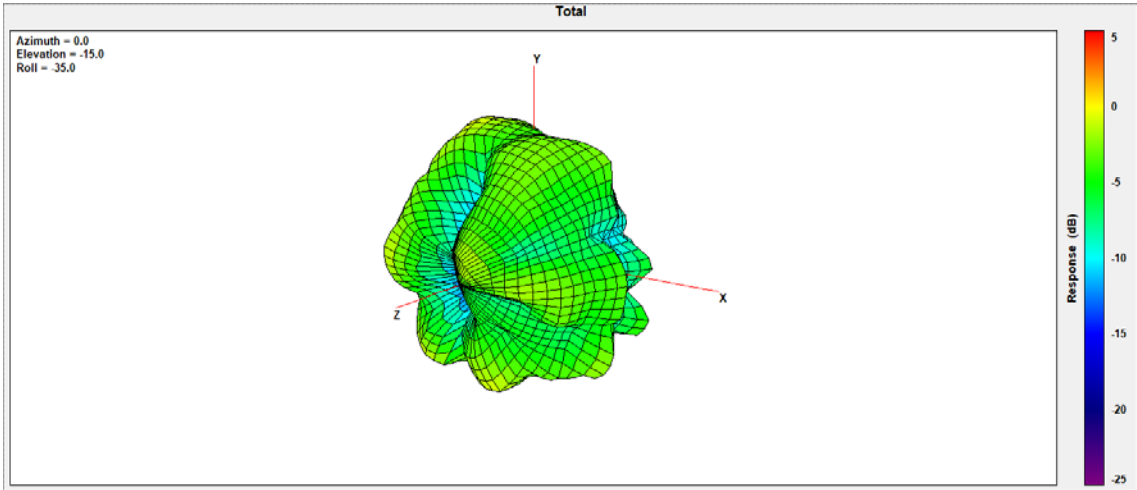
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 2400-2483.5     | 1.18                          |



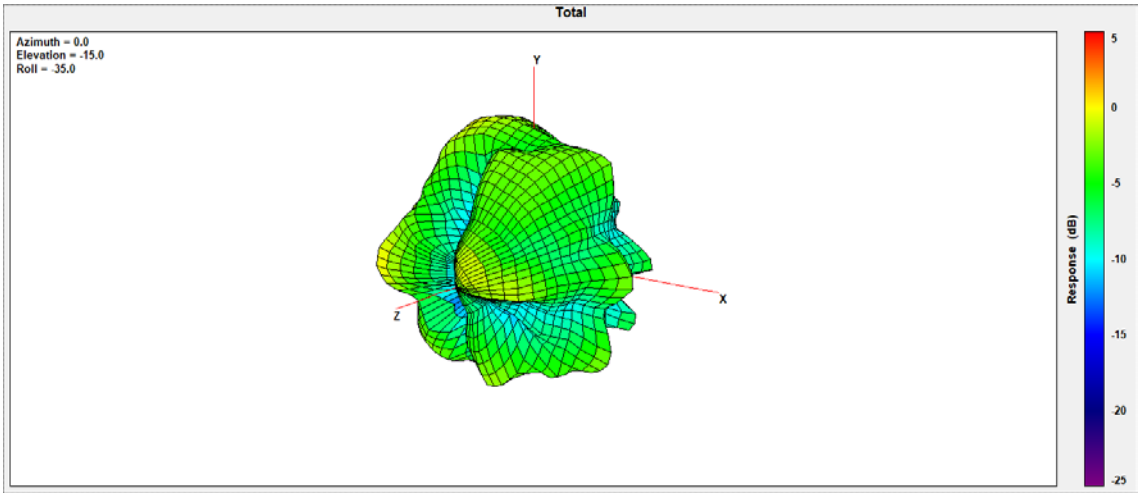
Max Antenna 3D Radiation Pattern 5150-5250 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5150-5250       | 2.98                          |



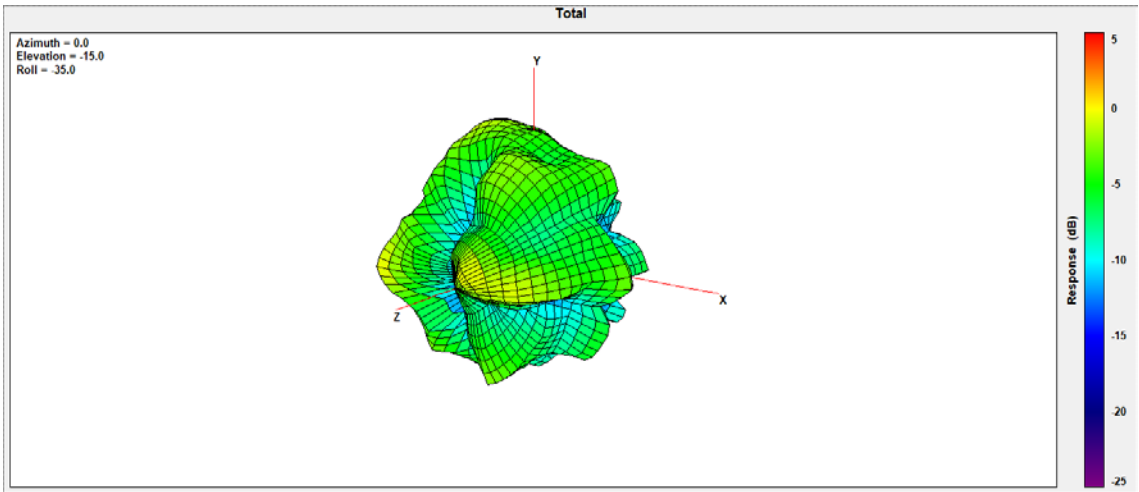
Max Antenna 3D Radiation Pattern 5250-5350 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5250-5350       | 2.98                          |



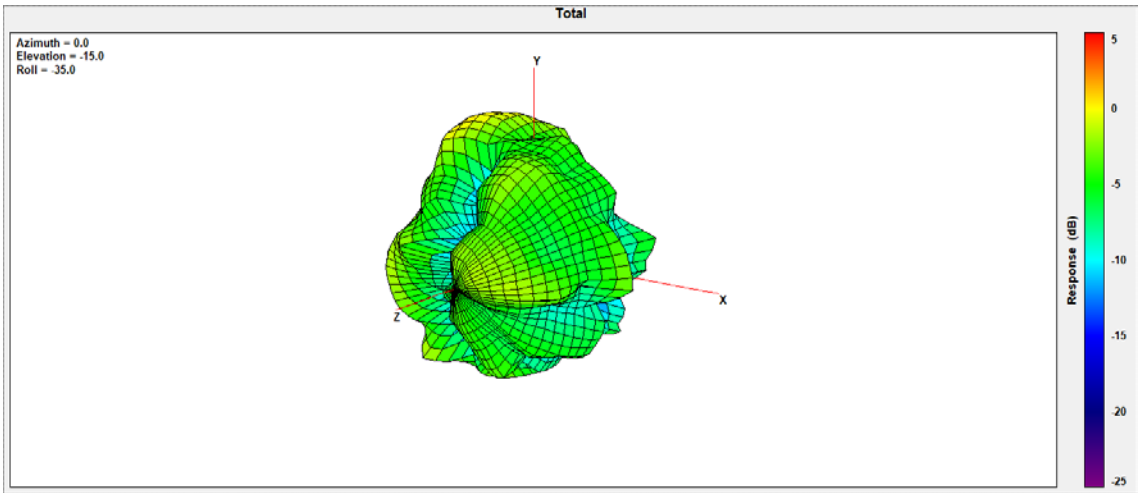
Max Antenna 3D Radiation Pattern 5470-5725 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5470-5725       | 2.78                          |



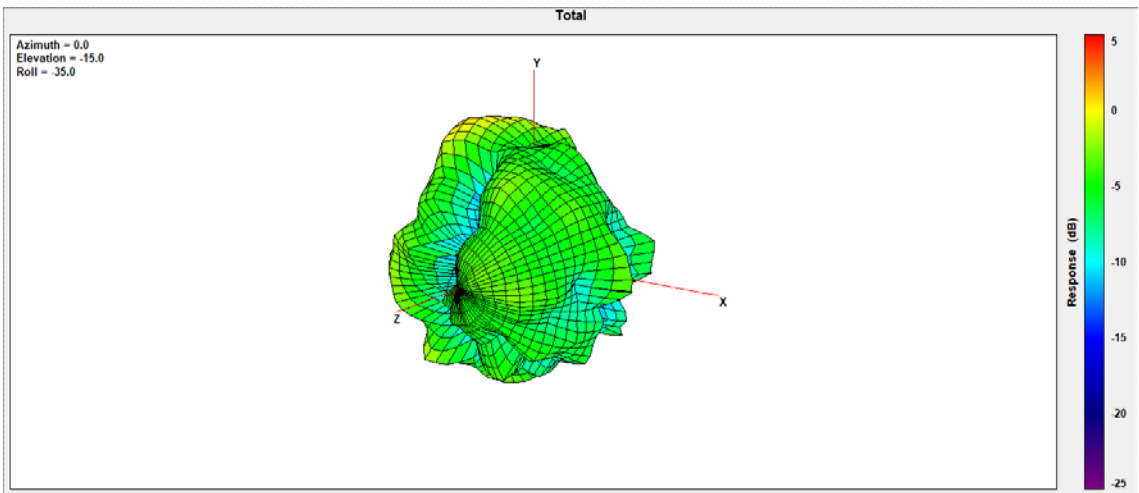
Max Antenna 3D Radiation Pattern 5725-5850 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5725-5850       | 2.78                          |



Max Antenna 3D Radiation Pattern 5850-5895 MHz

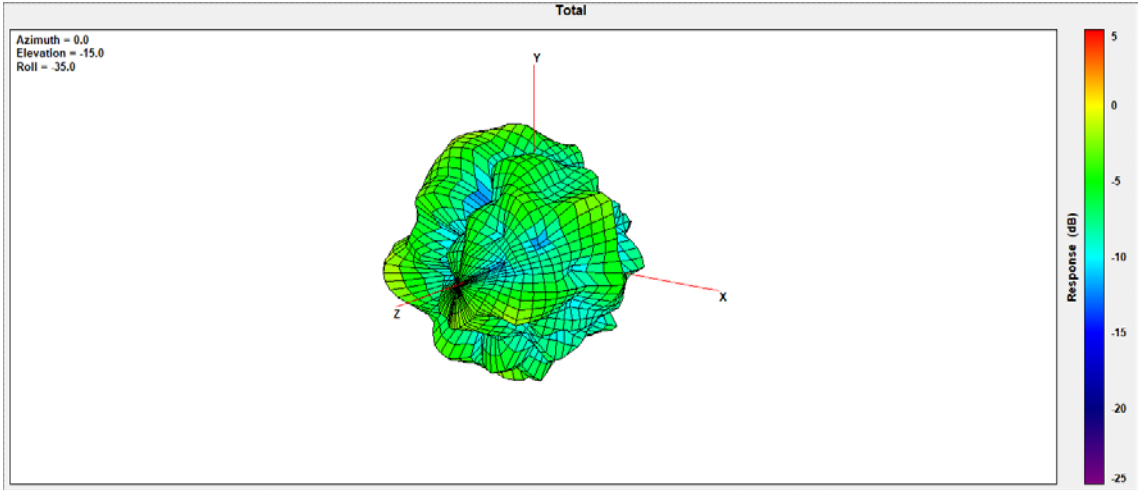
| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5850-5895       | 2.55                          |





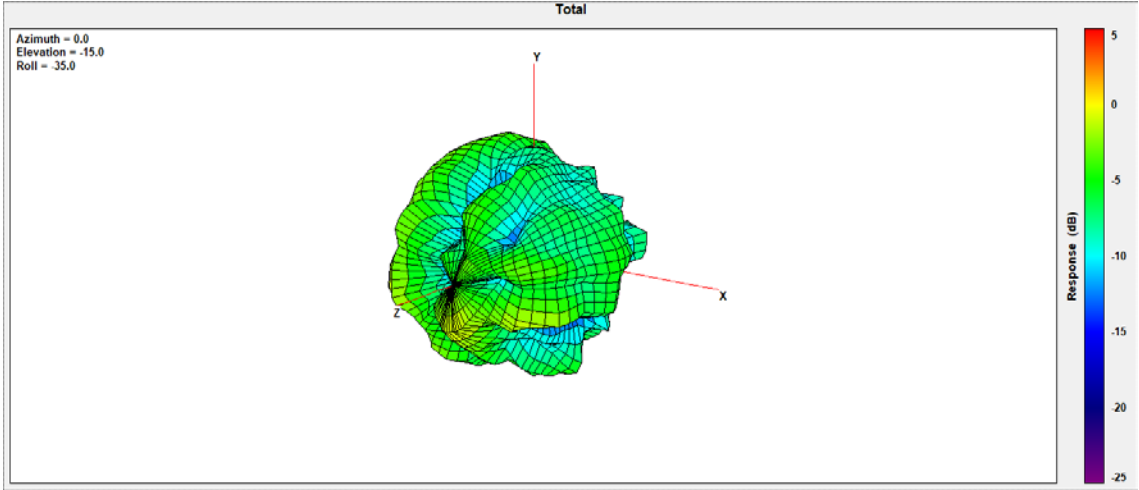
Max Antenna 3D Radiation Pattern 5925-6425 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable Loss<br>(dBi) |
|--------------------|----------------------------------|
| 5925-6425          | 2.72                             |



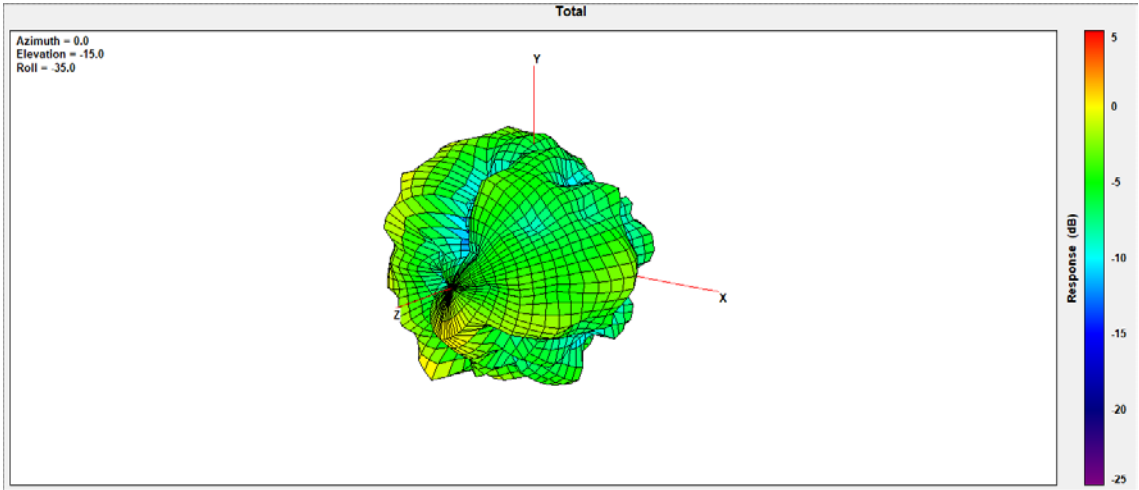
Max Antenna 3D Radiation Pattern 6425-6525 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable Loss<br>(dBi) |
|--------------------|----------------------------------|
| 6425-6525          | 2.77                             |



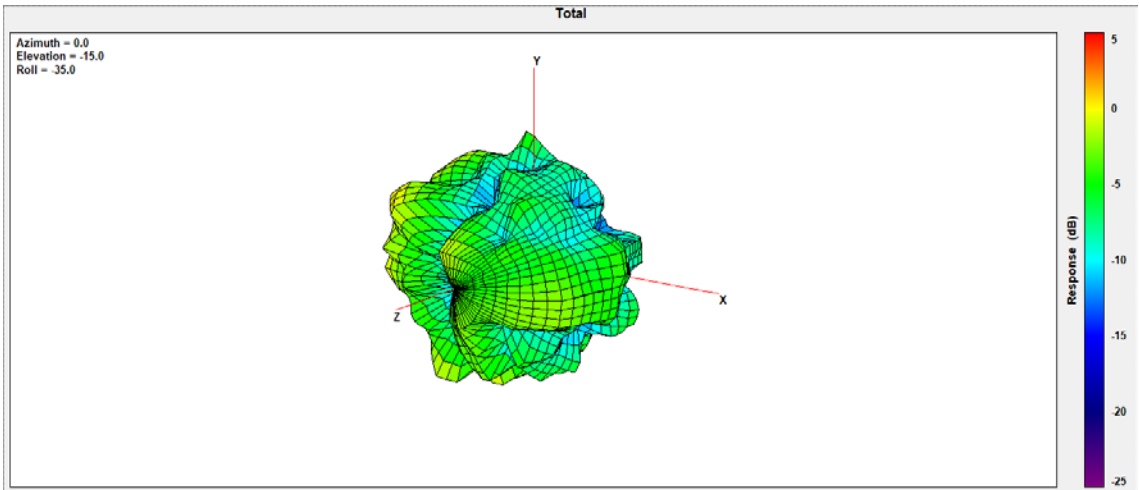
Max Antenna 3D Radiation Pattern 6525-6875 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable Loss<br>(dBi) |
|--------------------|----------------------------------|
| 6525-6875          | 4.05                             |



Max Antenna 3D Radiation Pattern 6875-7125 MHz

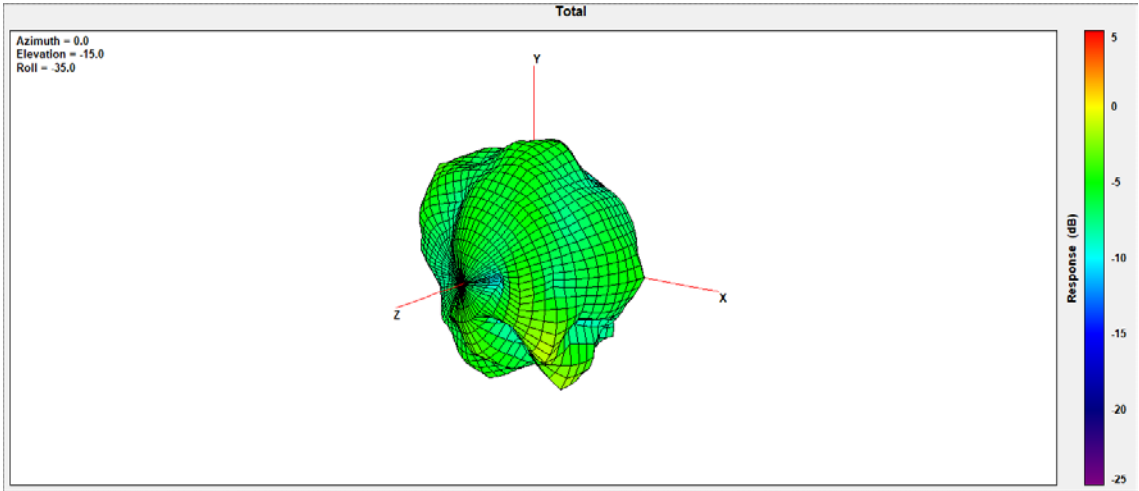
| Frequency<br>(MHz) | Peak Gain w/ Cable Loss<br>(dBi) |
|--------------------|----------------------------------|
| 6875-7125          | 3.64                             |



Auxiliary Antenna

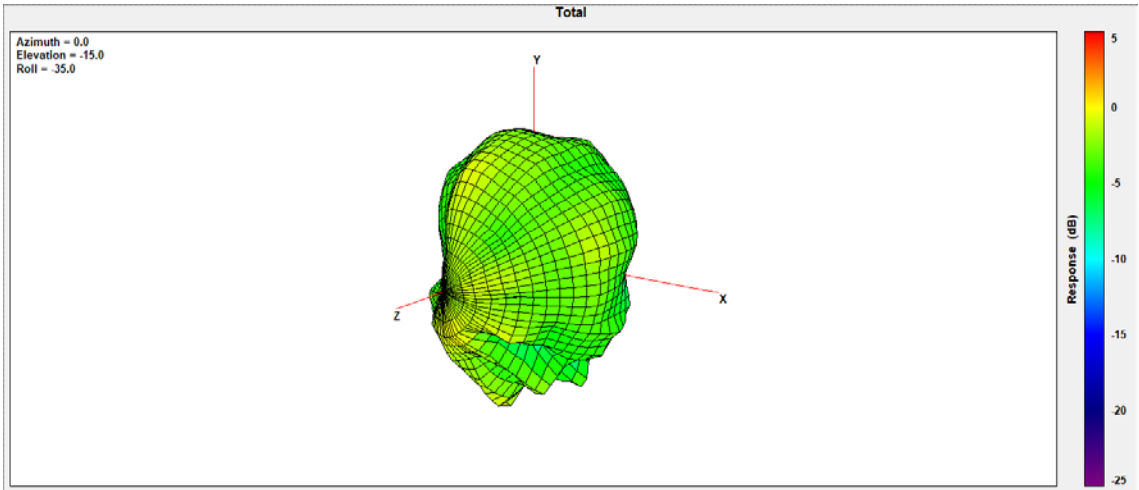
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable Loss<br>(dBi) |
|--------------------|----------------------------------|
| 2400-2483.5        | 2.09                             |



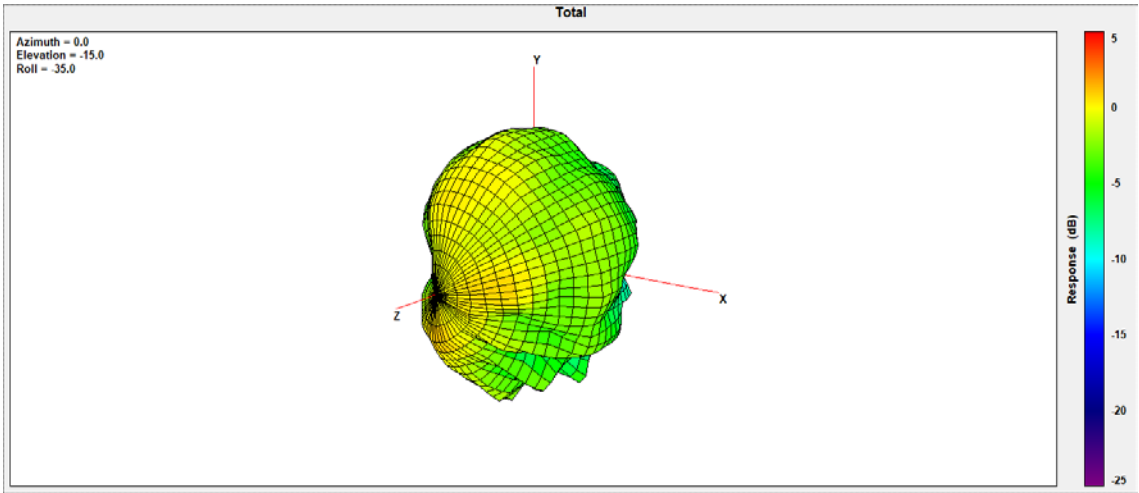
Max Antenna 3D Radiation Pattern 5150-5250 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable Loss<br>(dBi) |
|--------------------|----------------------------------|
| 5150-5250          | 2.09                             |



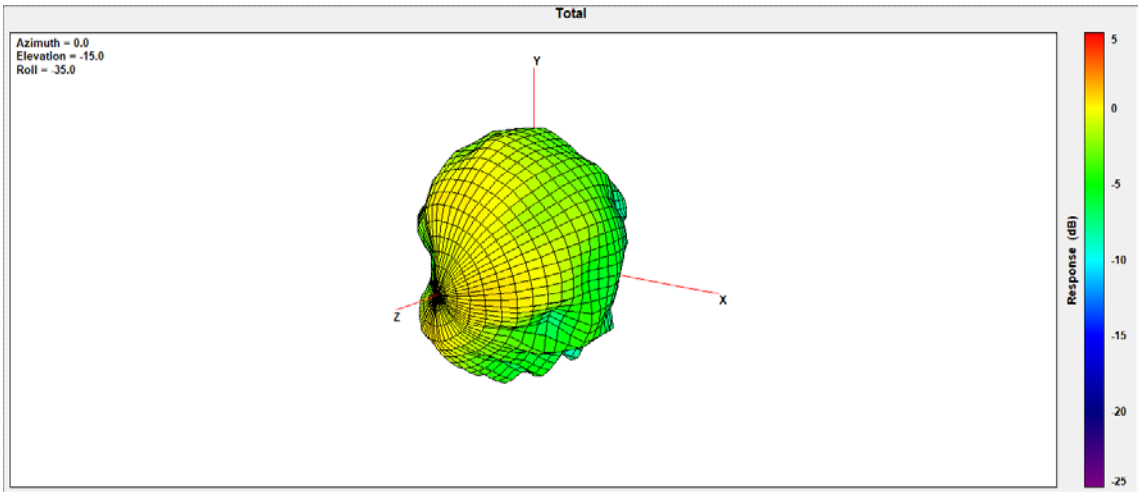
Max Antenna 3D Radiation Pattern 5250-5350 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5250-5350       | 2.69                          |



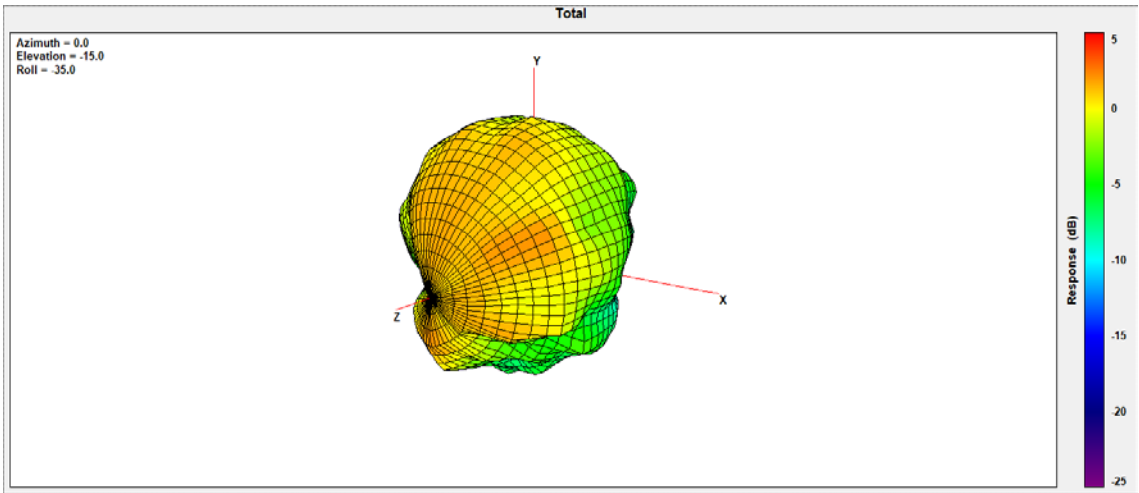
Max Antenna 3D Radiation Pattern 5470-5725 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5470-5725       | 3                             |



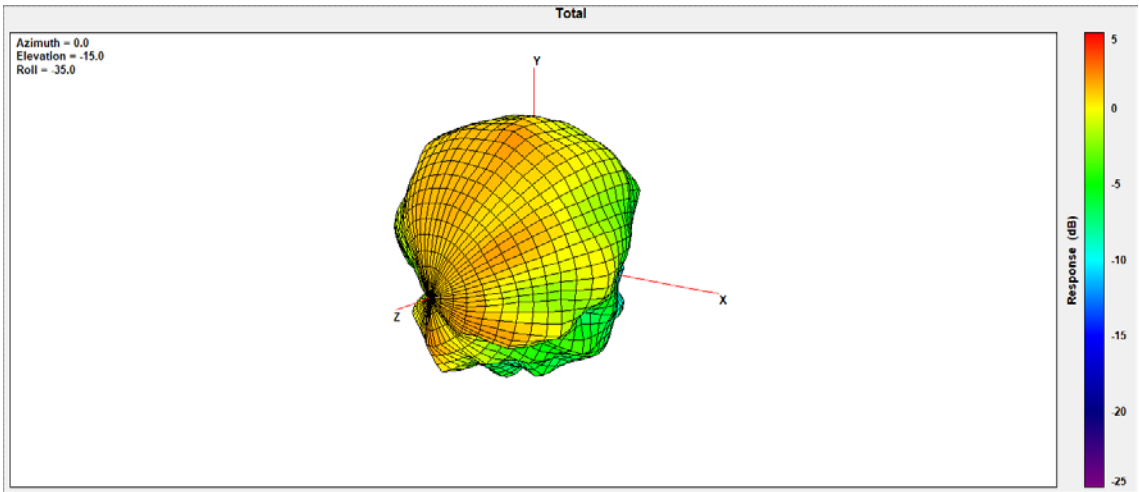
Max Antenna 3D Radiation Pattern 5725-5850 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5725-5850       | 2.75                          |



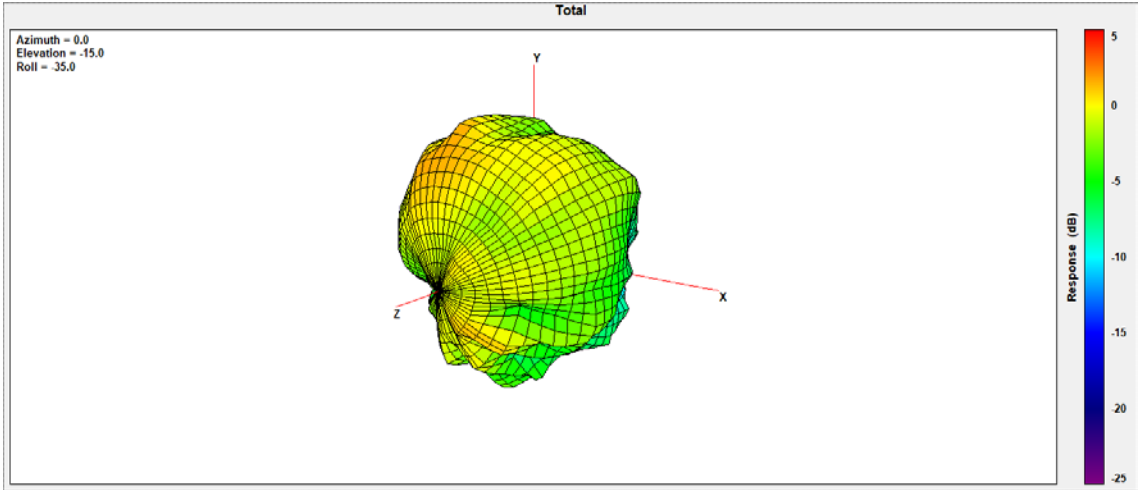
Max Antenna 3D Radiation Pattern 5850-5895 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5850-5895       | 2.78                          |



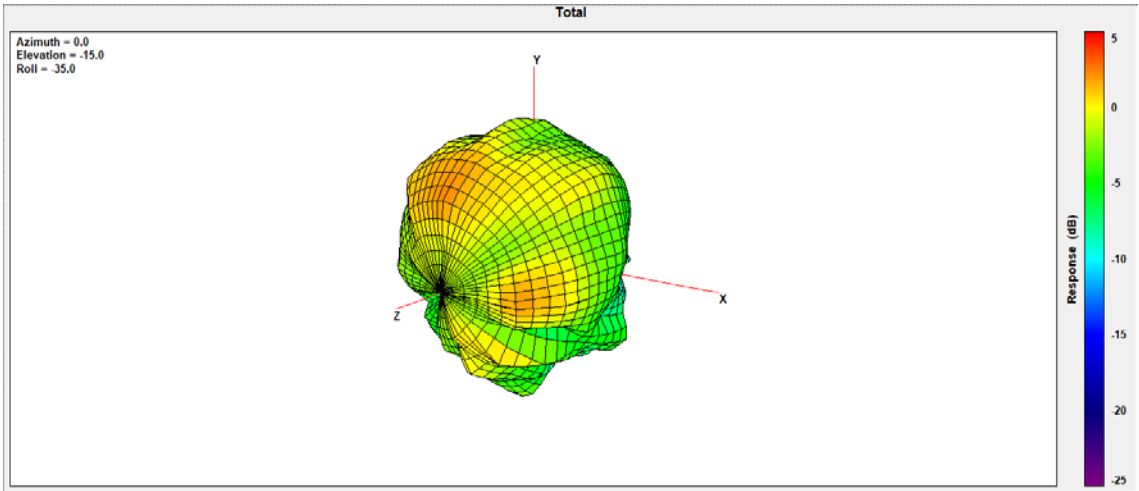
Max Antenna 3D Radiation Pattern 5925-6425 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable Loss<br>(dBi) |
|--------------------|----------------------------------|
| 0.97               | 3.04                             |



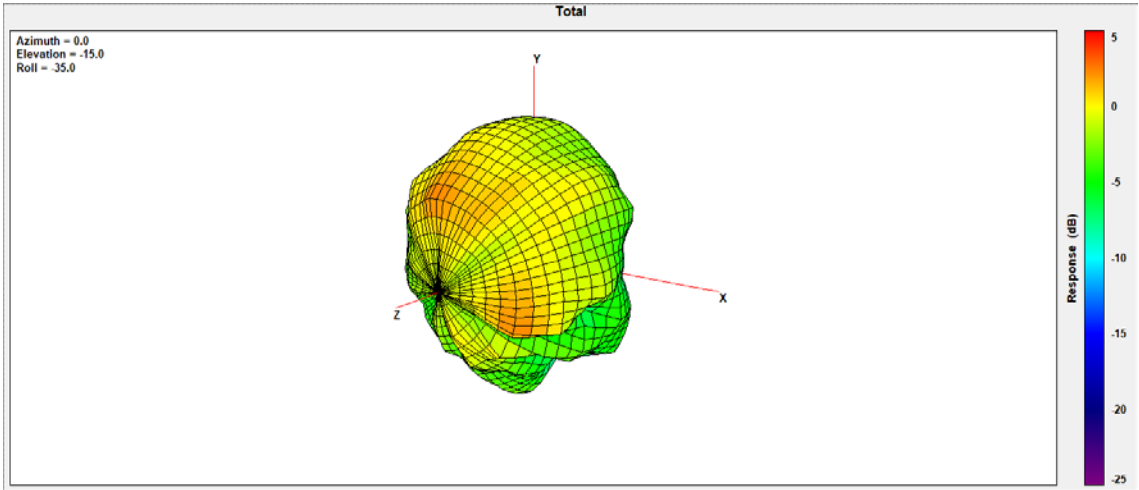
Max Antenna 3D Radiation Pattern 6425-6525 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable Loss<br>(dBi) |
|--------------------|----------------------------------|
| 6425-6525          | 2.88                             |



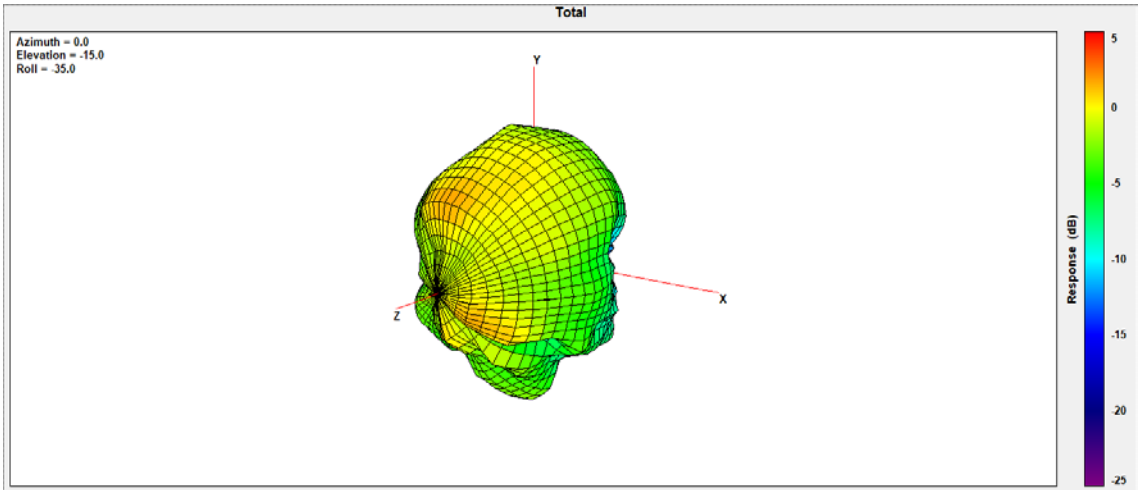
Max Antenna 3D Radiation Pattern 6525-6875 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable Loss<br>(dBi) |
|--------------------|----------------------------------|
| 6525-6875          | 4.02                             |



Max Antenna 3D Radiation Pattern 6875-7125 MHz

| Frequency<br>(MHz) | Peak Gain w/ Cable Loss<br>(dBi) |
|--------------------|----------------------------------|
| 6875-7125          | 4.08                             |



## Revision History

| Revision | Description                                                                                                                                | Date               |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 10.3     | <u>Page2-5</u><br>Add Applicable test method, Test & System Description and Setup photo                                                    | July 24, 2022      |
| 10.4     | <u>Cover page</u><br>Add Intel 5.9GHz reference antenna gain<br><u>Cover page/Section1/Section3</u><br>Add 5.9GHz antenna gain information | September 15, 2022 |