

# Regulatory WLAN Antenna Information

| 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)           |                           |                        |                        |                         |                                                                                    |
| Framework                                                                                                                                                                      | COMPAL                      | FRANPC0000                 | Yes                                   | Regular NB                                                   | 7.1mm (w/bumper)<br>4.3mm (w/o bumper) |                           |                        |                        |                         |                                                                                    |
| ****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) |                        |                        |                         |                                                                                    |
| AWAN                                                                                                                                                                           |                             | PIFA                       | AYF6Y-200005<br>(DC33002SE00)         |                                                              |                                        |                           |                        |                        |                         |                                                                                    |
| 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                 | 6.2GHz<br>5925-6425MHz    | 6.5GHz<br>6425-6525MHz | 6.7GHz<br>6525-6875MHz | 7.0 GHz<br>6875-7125MHz |                                                                                    |
| Main                                                                                                                                                                           | 2.72                        | 1.31                       | 1.17                                  | 1.03                                                         | 0.88                                   | 0.87                      | 0.81                   | 0.92                   | 0.91                    |                                                                                    |
| Aux                                                                                                                                                                            | 1.62                        | 1.67                       | 1.76                                  | 0.36                                                         | 2.30                                   | 2.34                      | 0.10                   | 0.08                   | 0.13                    |                                                                                    |
| 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                 | 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                    | Generic: refer to modular FCC SAR report<br>Mid-power: ≥ 8 mm<br>Low power: ≥ 5 mm |
| PIFA                                                                                                                                                                           | 3.24                        | 3.64                       | 3.73                                  | 4.77                                                         | 4.97                                   | 4.83                      | 4.30                   | 5.37                   | 5.59                    |                                                                                    |
| Dipole                                                                                                                                                                         | 2.89                        | 2.92                       | 3.19                                  | 4.41                                                         | 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

- A. The 3D chamber provides less than -40dB reflectivity from 600MHz to 8GHz and a 40cm diameter spherical quiet zone. The measurement results are calibrated using both dipoles and standard gain horns
- B. The antenna under tested is arranged in the turned table and a decoupling sleeve is used to reduce feed line radiation
- C. The measured results of the radiation patterns and antenna gain are obtained from the control system and showed on the monitor

## 2. Test & System Description

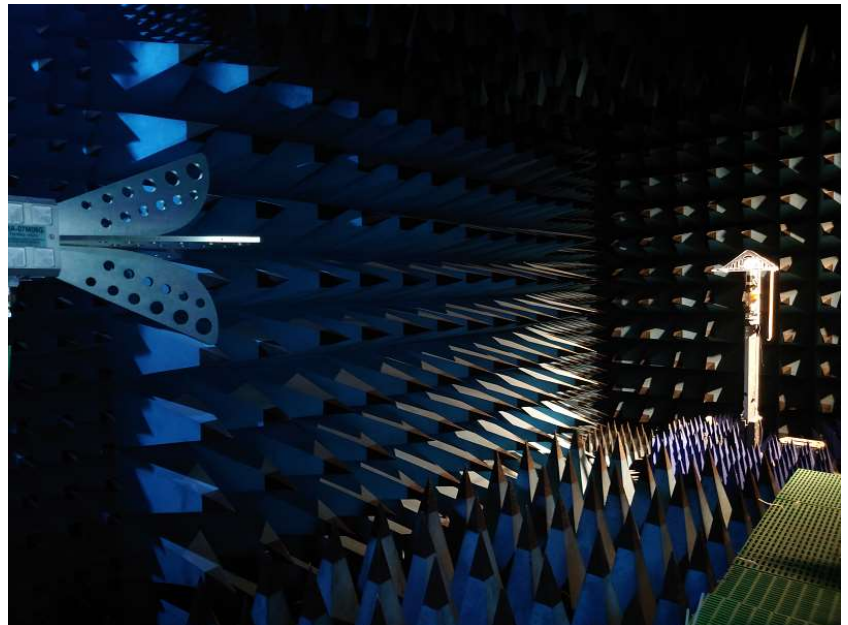
### a. Test setup

**Size :** 8M(L) X 4M(W) X 4M(H)

**Measurement property :**

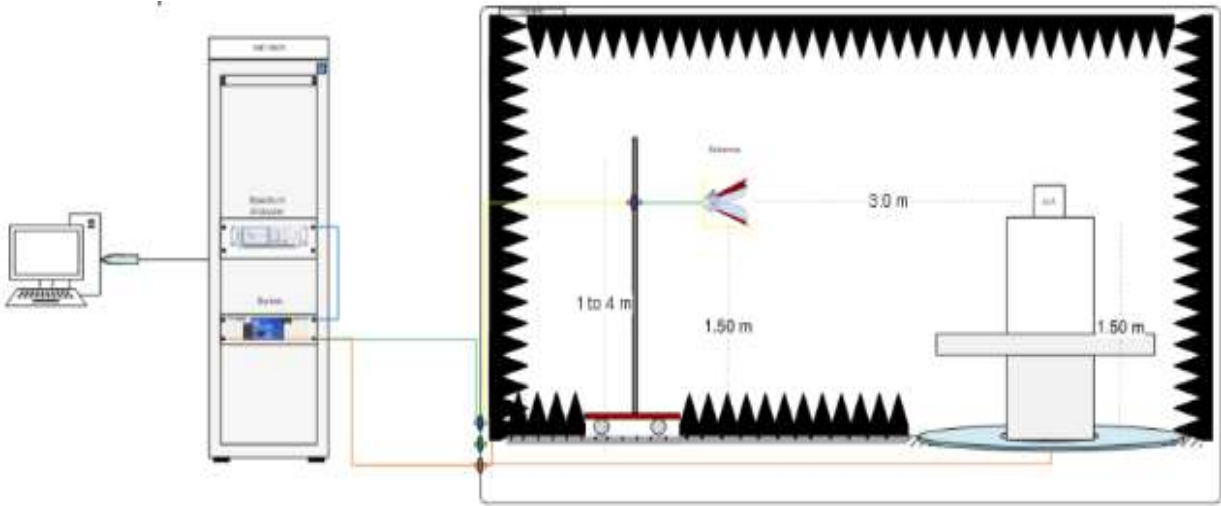
Passive Antenna Radiation Pattern / Gain.

Frequency range 600 MHz ~ 8000 MHz

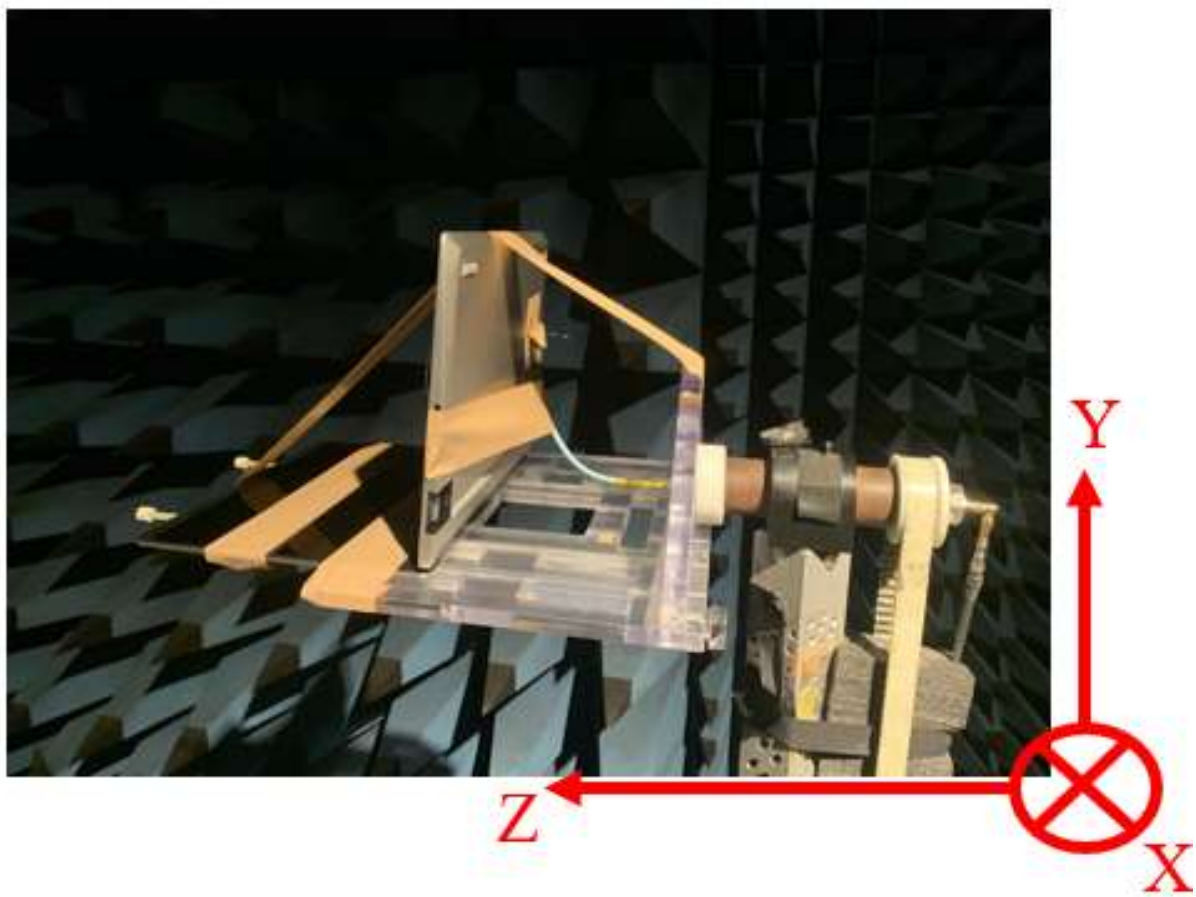


b. Equipment list

| Device                  | Type/Module   | Manufacturer    |
|-------------------------|---------------|-----------------|
| Anechoic Chamber        |               | Topline System  |
| Turn Table              | Topline       | Topline System  |
| Rotate controller       | TLS100        | Topline System  |
| Horn Antenna            | HA-07M06G     | MTJ Cooperation |
| Vector Network Analyzer | ZVB 8         | Rohde & Schwarz |
| Cable 40cm DC-18 GHz    | 201EH01201400 | MTJ Cooperation |



### 3. Setup photo



# Antenna Information

## Section 1. Antenna Assembly Specifications

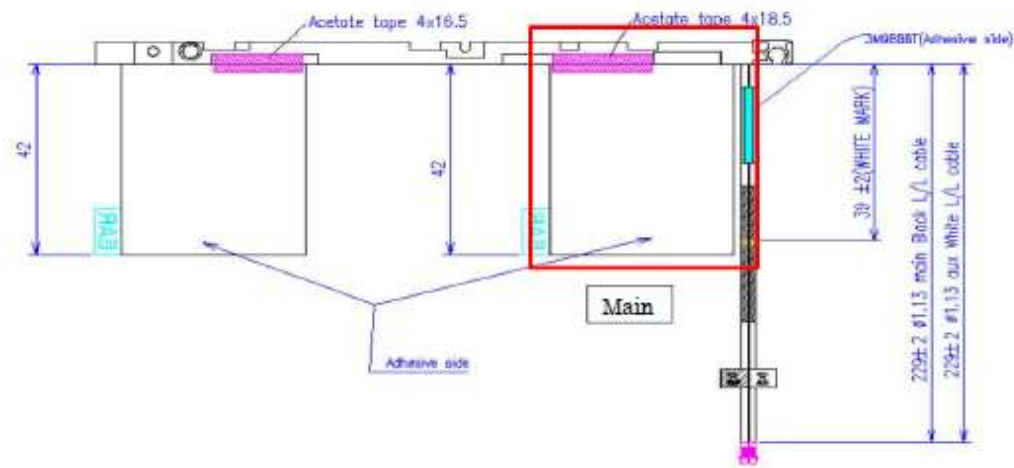
| 1A<br>Antenna Part Number                        | 1B<br>Manufacturer | 1C<br>Antenna Type | 1D<br>Cable Assembly Part Number and Information                                                         | Freq Range<br>MHz | 1E<br>* Peak Gain W/ Cable loss (dBi) | 1F<br>Peak Gain w/o Cable Loss (dBi) | 1G<br>Max VSWR | 1H<br>Cable Loss (dB) |
|--------------------------------------------------|--------------------|--------------------|----------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------|--------------------------------------|----------------|-----------------------|
| AYF6Y-200005<br>(DC33002SE00)<br>Main<br>Antenna | AWAN               | PIFA               | 1)Shen-Yu/KAIBO<br>2)50ohm coaxial cable<br>3)length: 229 mm<br>4)Connector P/N:<br>I-pex: 20565-001R-13 | 2400-2483.5       | 2.72 dBi(peak)                        | 3.29 dBi(peak)                       | 2 max          | 0.57 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 5150-5250         | 1.31 dBi(peak)                        | 2.25 dBi(peak)                       | 2 max          | 0.94 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 5250-5350         | 1.17 dBi(peak)                        | 2.12 dBi(peak)                       | 2 max          | 0.95 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 5470-5725         | 1.03 dBi(peak)                        | 1.99 dBi(peak)                       | 2 max          | 0.96 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 5725-5850         | 0.88 dBi(peak)                        | 1.85 dBi(peak)                       | 2 max          | 0.97 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 5925-6425         | 0.87 dBi(peak)                        | 1.85 dBi(peak)                       | 2 max          | 0.98 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 6425-6525         | 0.81 dBi(peak)                        | 1.79 dBi(peak)                       | 2 max          | 0.98 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 6525-6875         | 0.92 dBi(peak)                        | 1.91 dBi(peak)                       | 2 max          | 0.99 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 6875-7125         | 0.91 dBi(peak)                        | 2.01 dBi(peak)                       | 2 max          | 1.10 dBi(peak)        |
| AYF6Y-200005<br>(DC33002SE00)<br>Aux<br>Antenna  | AWAN               | PIFA               | 1)Shen-Yu/KAIBO<br>2)50ohm coaxial cable<br>3)length: 229 mm<br>4)Connector P/N:<br>I-pex: 20565-001R-13 | 2400-2483.5       | 1.62 dBi(peak)                        | 2.19 dBi(peak)                       | 2 max          | 0.57 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 5150-5250         | 1.67 dBi(peak)                        | 2.61 dBi(peak)                       | 2 max          | 0.94 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 5250-5350         | 1.76 dBi(peak)                        | 2.71 dBi(peak)                       | 2 max          | 0.95 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 5470-5725         | 0.36 dBi(peak)                        | 1.32 dBi(peak)                       | 2 max          | 0.96 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 5725-5850         | 2.30 dBi(peak)                        | 3.27 dBi(peak)                       | 2 max          | 0.97 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 5925-6425         | 2.34 dBi(peak)                        | 3.32 dBi(peak)                       | 2 max          | 0.98 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 6425-6525         | 0.10 dBi(peak)                        | 1.08 dBi(peak)                       | 2 max          | 0.98 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 6525-6875         | 0.08 dBi(peak)                        | 1.07 dBi(peak)                       | 2 max          | 0.99 dBi(peak)        |
|                                                  |                    |                    |                                                                                                          | 6875-7125         | 0.13 dBi(peak)                        | 1.23 dBi(peak)                       | 2 max          | 1.10 dBi(peak)        |

- 3D Antenna Peak Gain required being test in system basis.
- The antenna gain was measured in Anechoic Chamber.

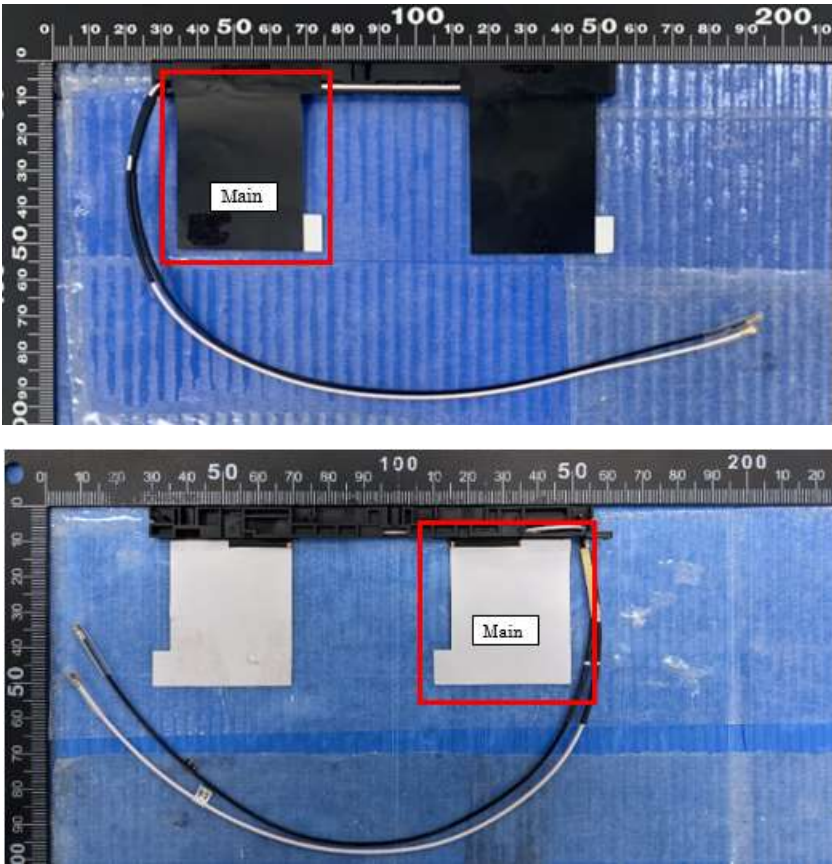
Section 2. Dimensioned Photos and Drawings of Antennas

Include the dimensioned photo and drawing of Main antenna here.

Main Antenna Drawing:



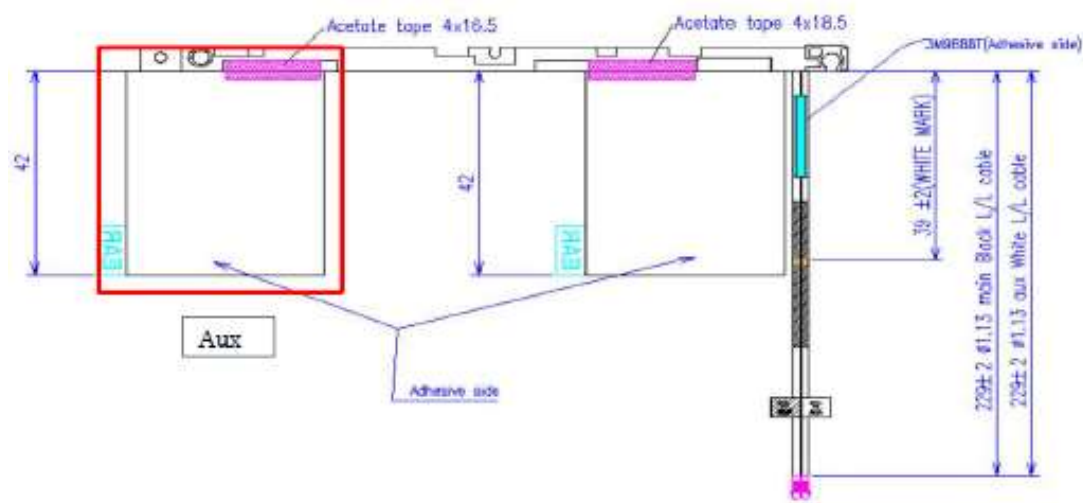
Main Antenna Photo (Front/Back):



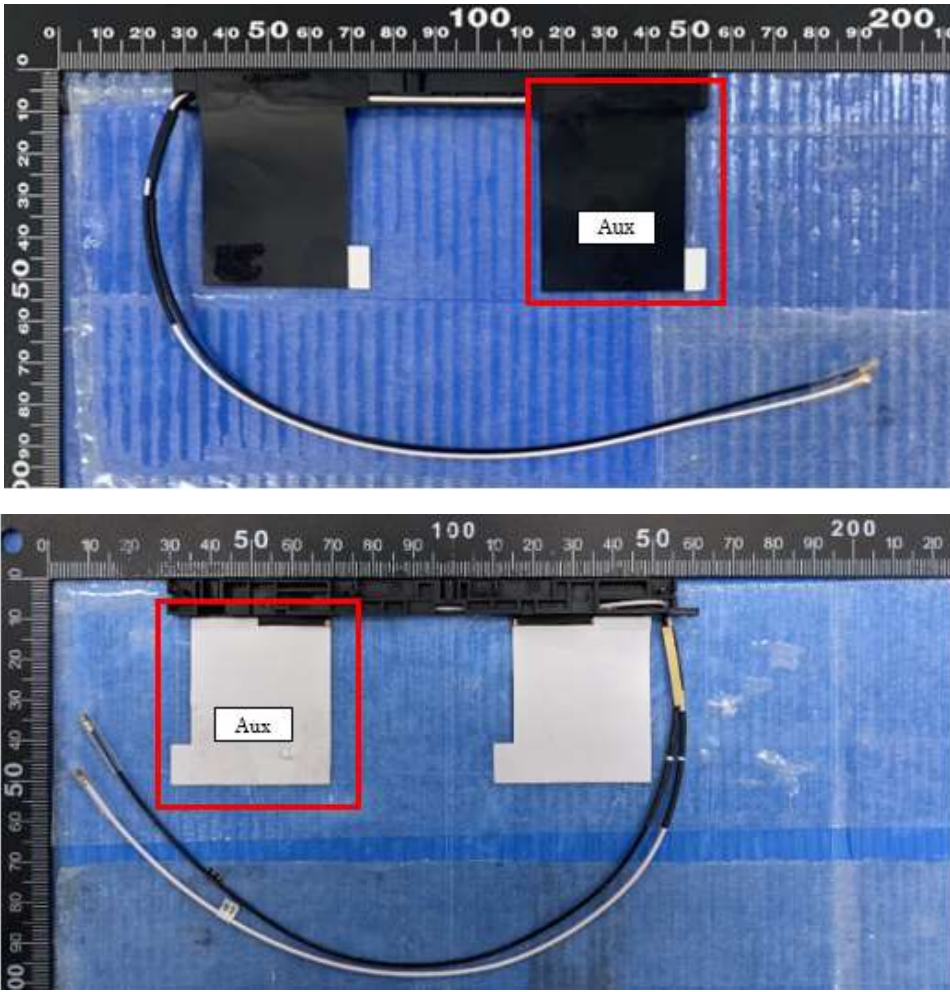
Note: antenna photo should include L type ruler

Include the dimensioned photo and drawing of Aux antenna here.

Aux Antenna Drawing:



Aux Antenna Photo (Front/Back):



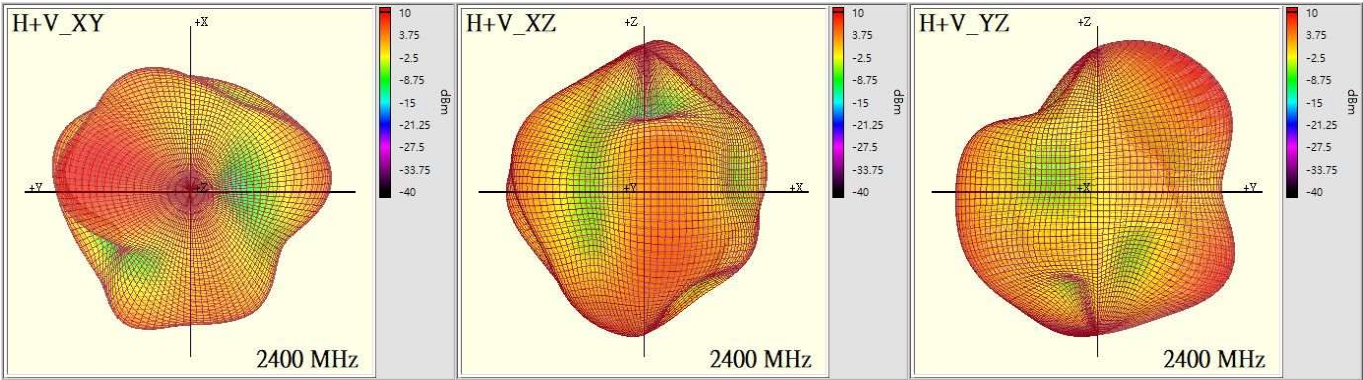
Note: antenna photo should include L type ruler

Section 3. Radiation characteristics of antenna loaded in Host Platform

Main Antenna

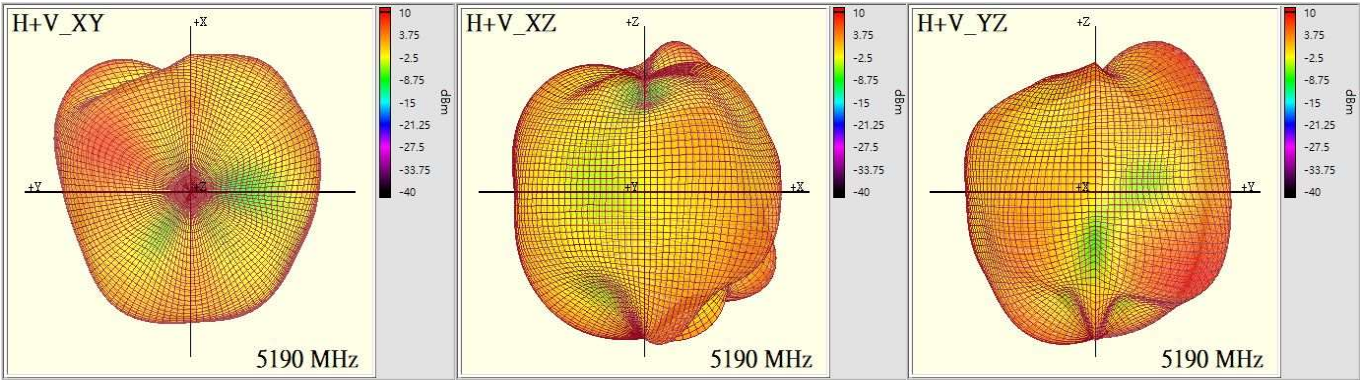
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 2400-2483.5     | 2.72                          |



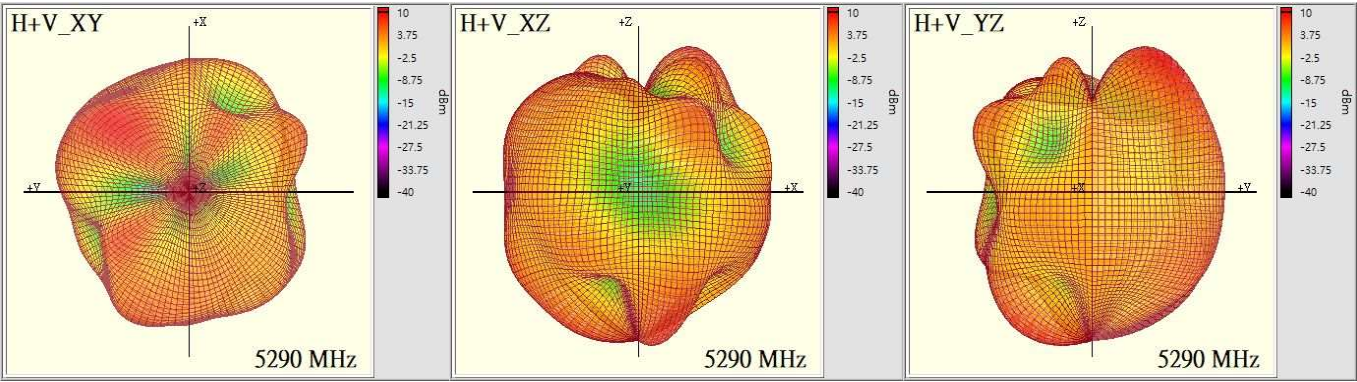
Max Antenna 3D Radiation Pattern 5150-5250 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5150-5250       | 1.31                          |



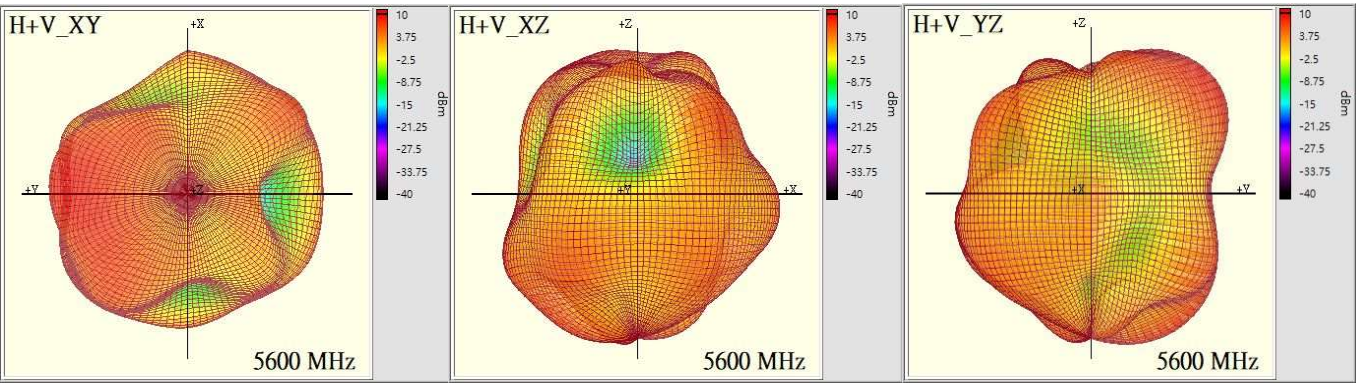
Max Antenna 3D Radiation Pattern 5250-5350 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5250-5350       | 1.17                          |



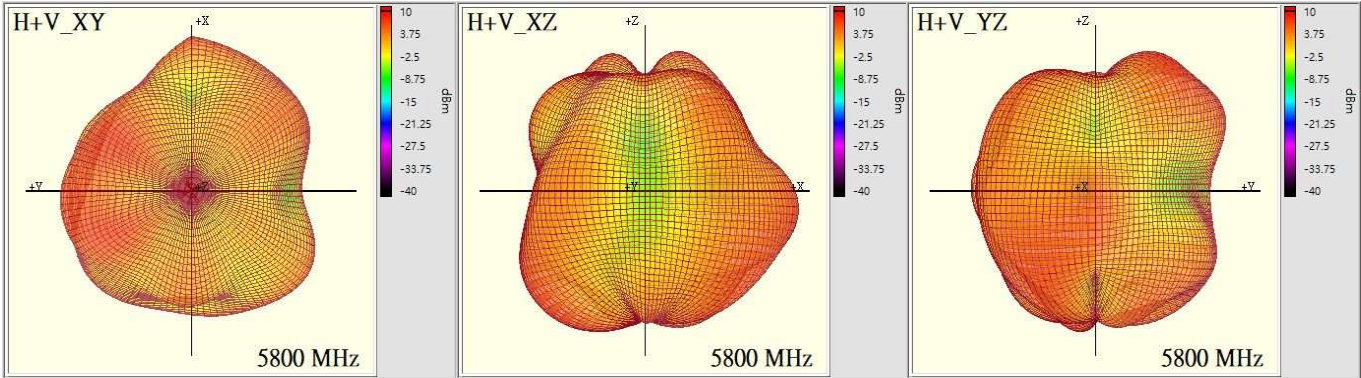
Max Antenna 3D Radiation Pattern 5470-5725 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5470-5725       | 1.03                          |



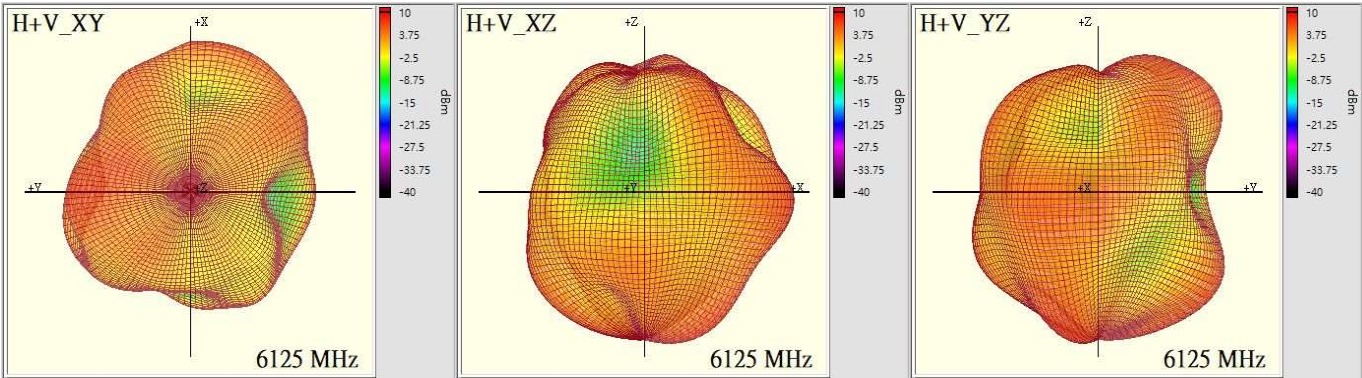
Max Antenna 3D Radiation Pattern 5725-5850 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5725-5850       | 0.88                          |



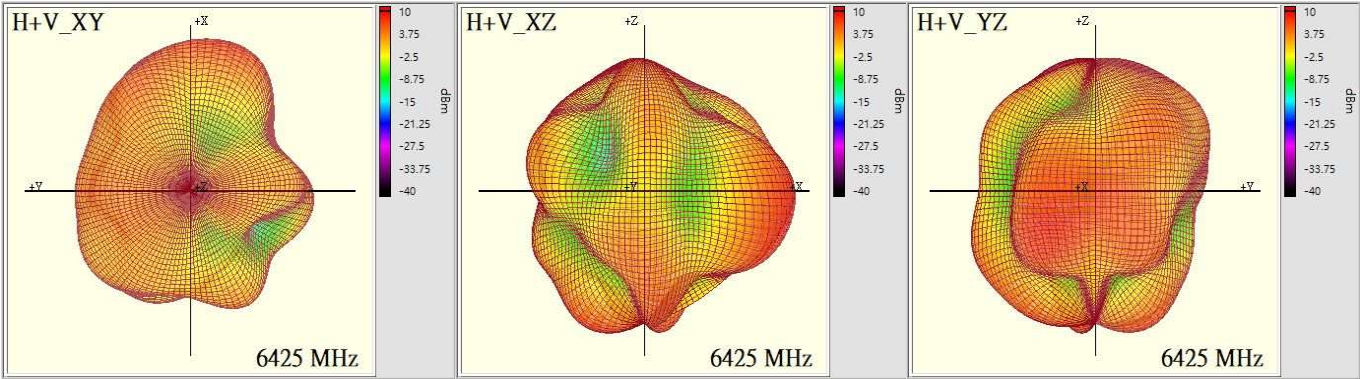
Max Antenna 3D Radiation Pattern 5925-6425 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5925-6425       | 0.87                          |



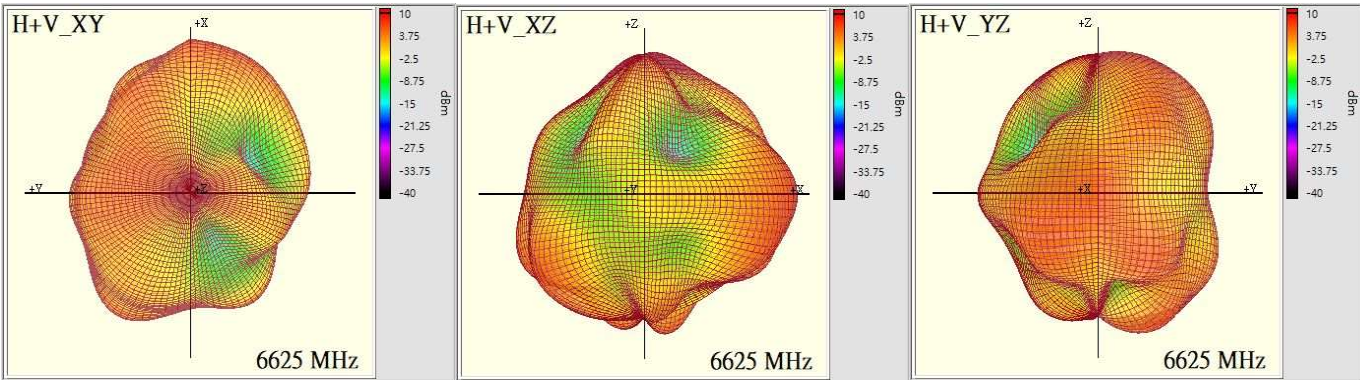
Max Antenna 3D Radiation Pattern 6425-6525 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6425-6525       | 0.81                          |



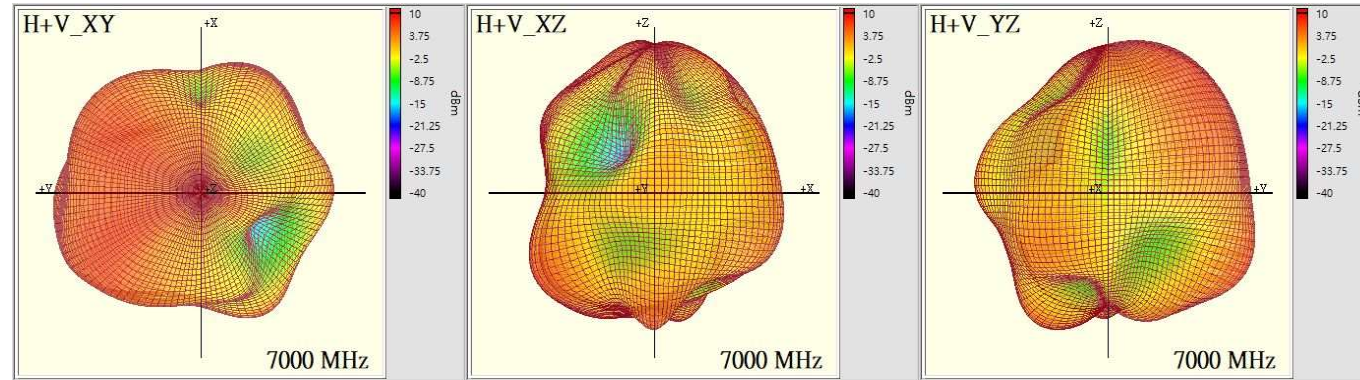
Max Antenna 3D Radiation Pattern 6525-6875 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6525-6875       | 0.92                          |



Max Antenna 3D Radiation Pattern 6875-7125 MHz

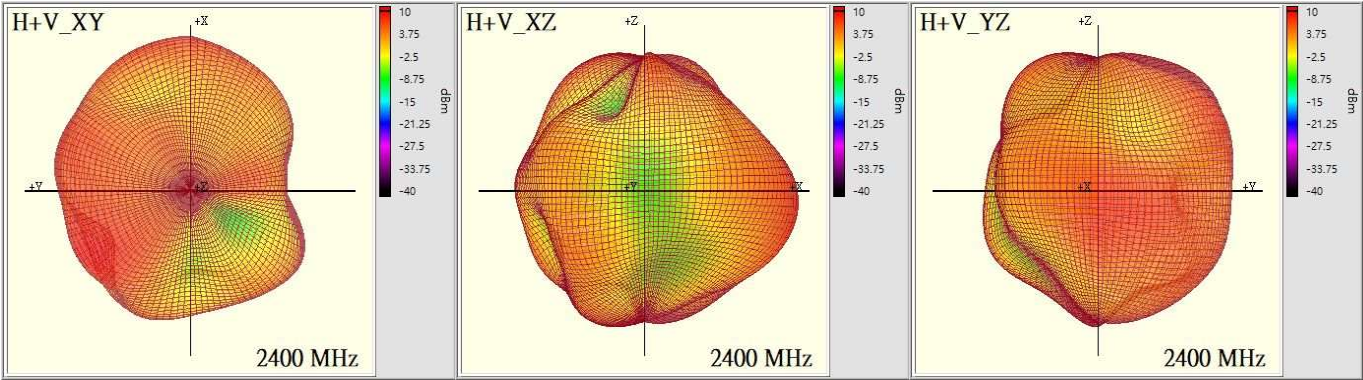
| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6875-7125       | 0.91                          |



Auxiliary Antenna

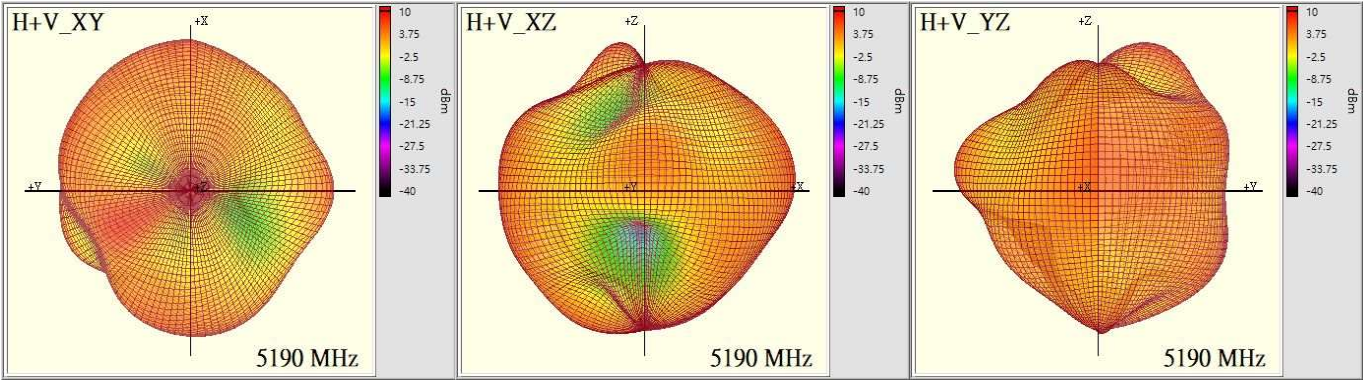
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 2400-2483.5     | 1.62                          |



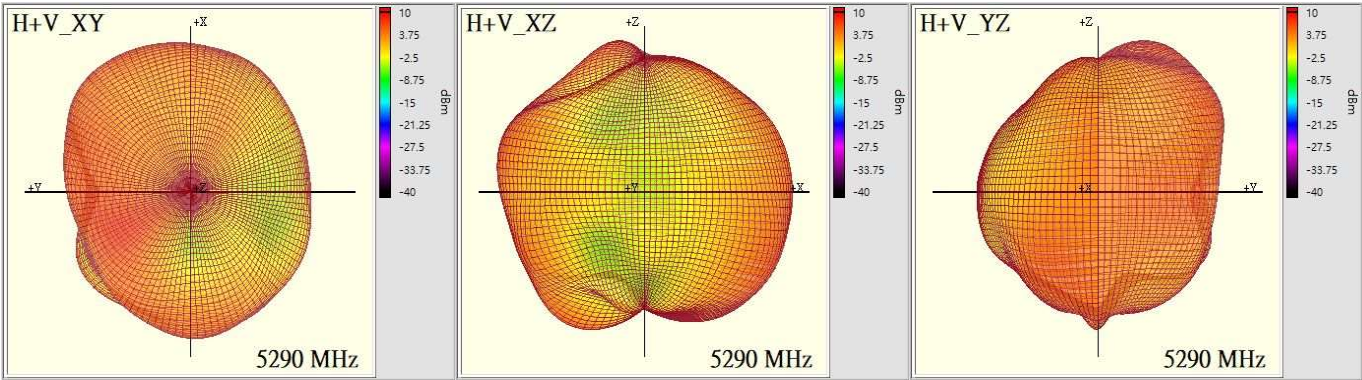
Max Antenna 3D Radiation Pattern 5150-5250 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5150-5250       | 1.67                          |



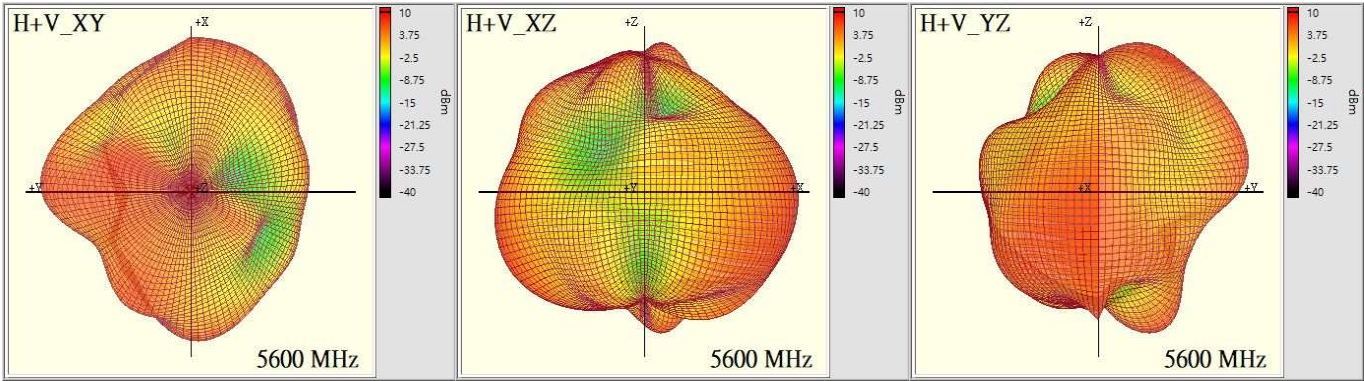
Max Antenna 3D Radiation Pattern 5250-5350 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5250-5350       | 1.76                          |



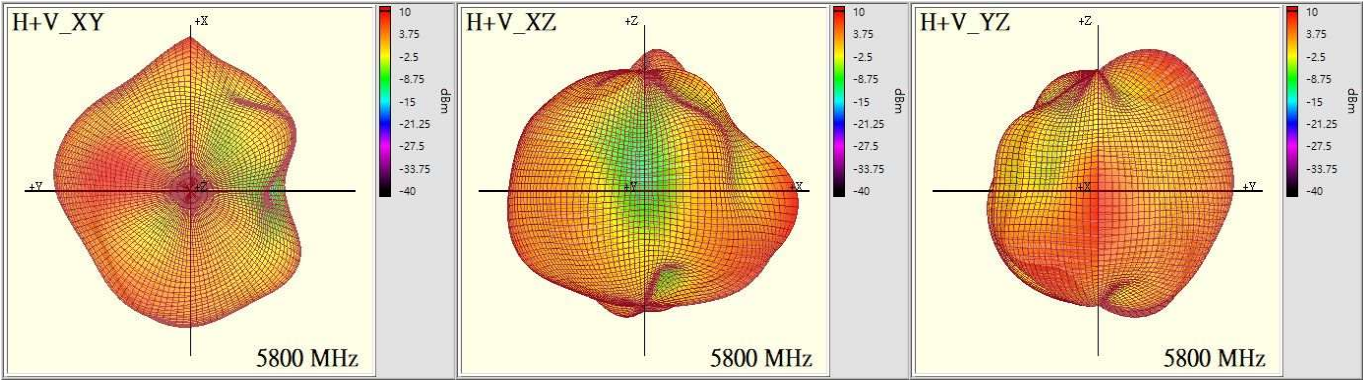
Max Antenna 3D Radiation Pattern 5470-5725 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5470-5725       | 0.36                          |



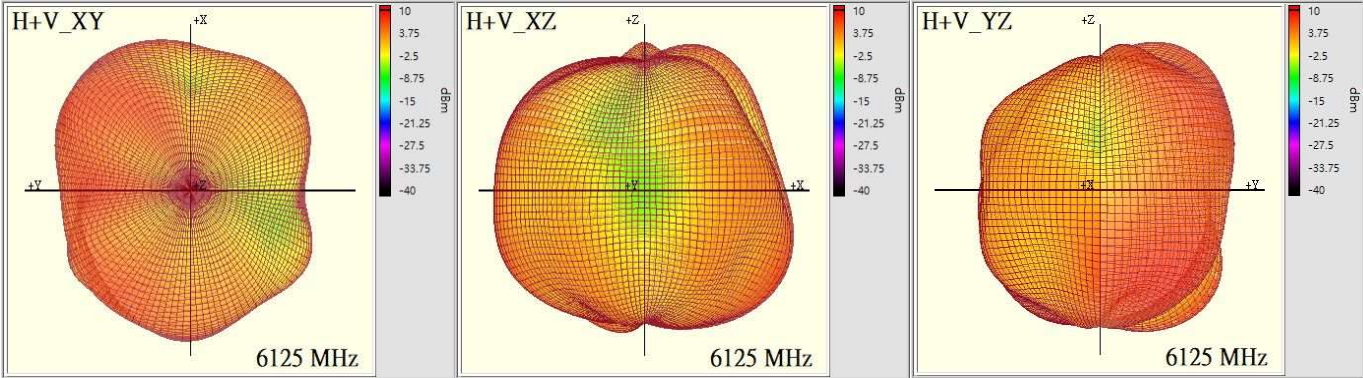
Max Antenna 3D Radiation Pattern 5725-5850 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5725-5850       | 2.30                          |



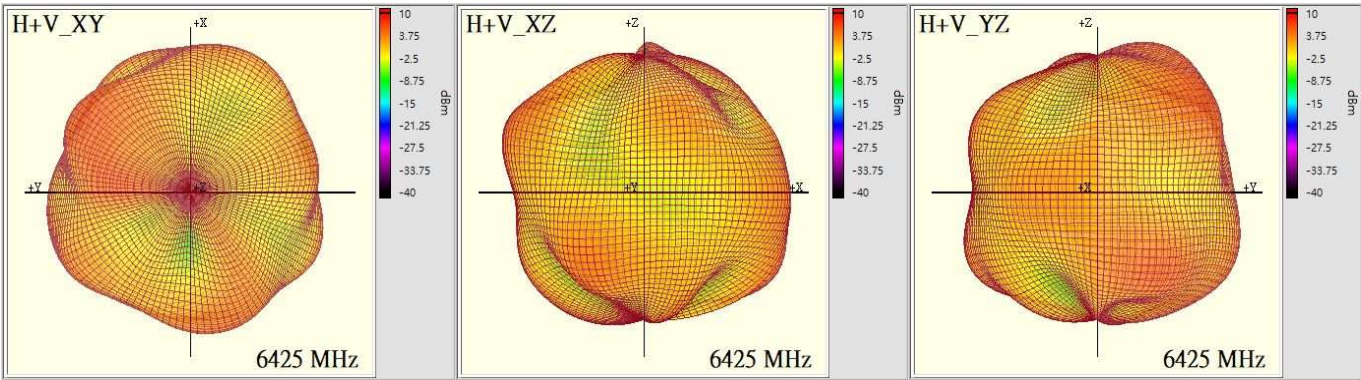
Max Antenna 3D Radiation Pattern 5925-6425 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5925-6425       | 2.34                          |



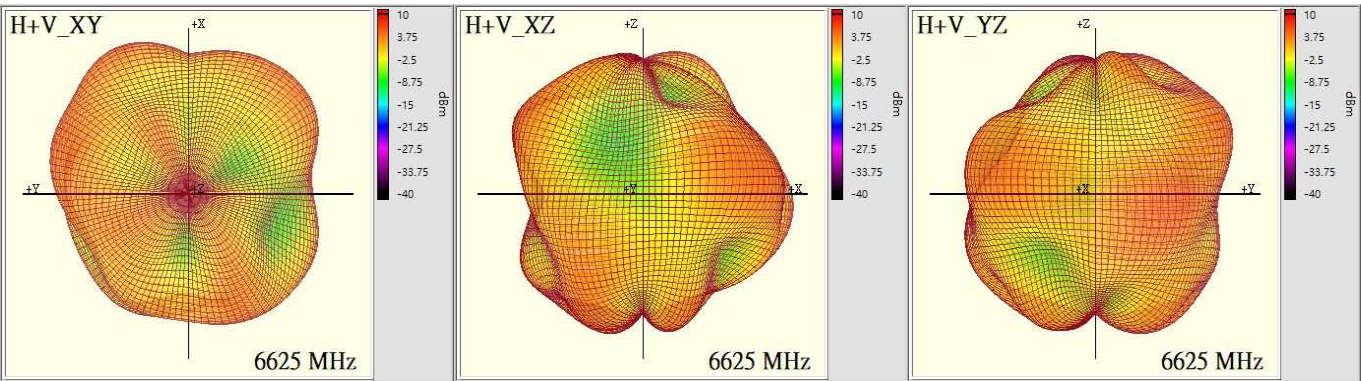
Max Antenna 3D Radiation Pattern 6425-6525 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6425-6525       | 0.10                          |



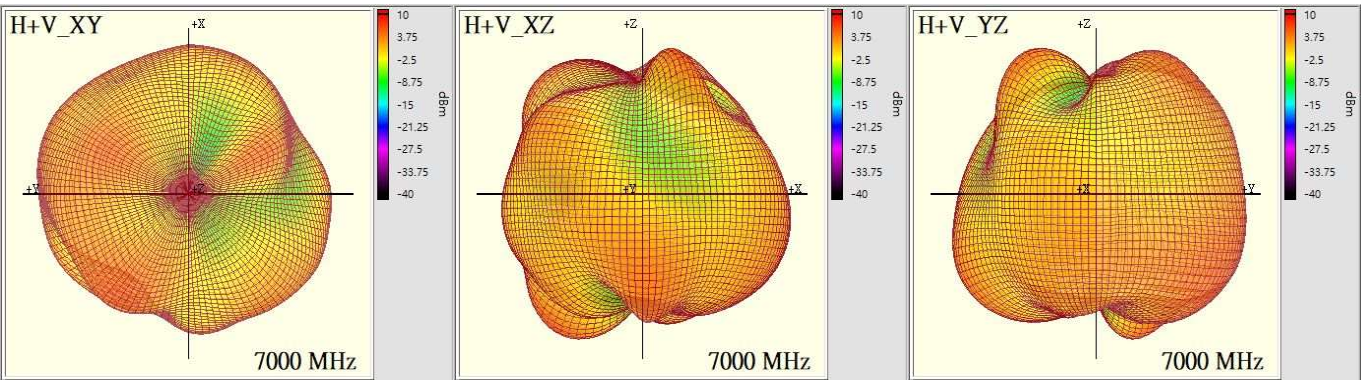
Max Antenna 3D Radiation Pattern 6525-6875 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6525-6875       | 0.08                          |



Max Antenna 3D Radiation Pattern 6875-7125 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6875-7125       | 0.13                          |

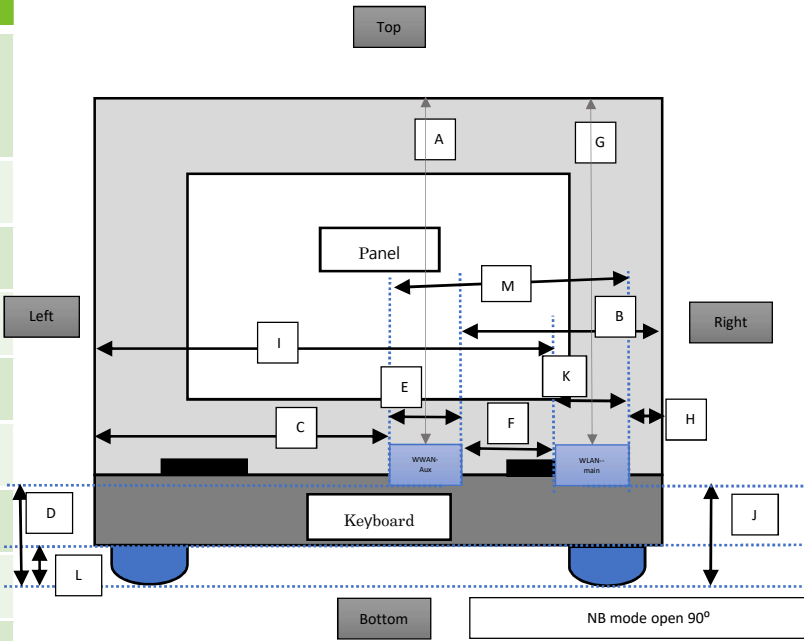


Section 4. Antenna Host Platform Location Information

Include a **dimensioned photo(s) or dimensioned drawing(s)** of Main and Aux antenna placements (measurements are not required for receive-only antenna).

Any antenna that transmits must show dimensions to bottom of laptop. Provide a description of the materials that are used for supporting or surrounding transmit antennas; for example, non-conductive plastics vs. conductive coated plastic or metallic materials.

| Minimum Separation Distance |            |                     |               |
|-----------------------------|------------|---------------------|---------------|
| Item                        | Antenna    | Position            | Distance (mm) |
| A                           | WLAN- Aux  | to Top              | 222.33        |
| B                           | WLAN- Aux  | to Right            | 137.92        |
| C                           | WLAN- Aux  | to Left             | 124.22        |
| D                           | WLAN- Aux  | to Bottom           | 7.1           |
| E                           | WLAN-Aux   | Main Antenna Length | 34.5          |
| F                           | Main- Aux  | Main to Aux         | 45.5          |
| G                           | WLAN- Main | to Top              | 222.33        |
| H                           | WLAN- Main | to Right            | 57.92         |
| I                           | WLAN- Main | to Left             | 204.22        |
| J                           | WLAN- Main | to Bottom           | 7.1           |
| K                           | WLAN- Main | Aux Antenna Length  | 34.5          |
| L                           | NB         | Bumper thickness    | 2.8           |
| M                           | Main + Aux | combi               | 130.3         |



## Section 5. Antenna dimensional information for SAR evaluation

Include a **dimensioned photo(s) or dimensioned drawing(s)** showing the distance (mm) between the transmit antennas and the user. For notebook/laptop hosts show lapheld position (example below). For tablet hosts show all orientations including lapheld, primary & secondary portrait, primary & secondary landscape positions. Include a description of any proximity sensors or power throttling implementations that limit or exclude use of any host orientation.

