

# Regulatory WLAN Antenna Information

*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><small>(ex: Yes, No or NA)</small> |                                       | Platform type<br><small>(ex: regular NB, convertible PC, AIO...etc)</small> |                                        | *SAR minimum separation (mm)                                                               |
| Lenovo                                                                                                                                                                         |                                          | LCFC                                  |                                       | IP 5 Chrome 16IAU7                    |                                       | Yes                                                  |                                       | NB                                                                          |                                        | 9.45mm                                                                                     |
| *****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)              |                                                                                            |
| SPEED                                                                                                                                                                          |                                          |                                       | PIFA                                  |                                       |                                       | DC33001YD00                                          |                                       |                                                                             | DC33001YD00                            |                                                                                            |
| 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> | 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                                                                                                                                                                           | 1.98                                     | 2.94                                  | 2.98                                  | 2.71                                  | 2.71                                  | 2.81                                                 | 2.47                                  | 2.80                                                                        | 2.80                                   |                                                                                            |
| Aux                                                                                                                                                                            | 0.88                                     | 0.64                                  | 1.29                                  | 1.44                                  | 1.81                                  | 2.92                                                 | 2.28                                  | 2.89                                                                        | 2.89                                   |                                                                                            |
| Intel Reference Gain/Type/ Separation distance                                                                                                                                 |                                          |                                       |                                       |                                       |                                       |                                                      |                                       |                                                                             |                                        |                                                                                            |
| Antenna Type                                                                                                                                                                   | Antenna Peak gain (In dBi)*              |                                       |                                       |                                       |                                       |                                                      |                                       |                                                                             |                                        | Distance to the end user (mm)                                                              |
|                                                                                                                                                                                | 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> | 6.2GHz<br><small>5925-6425MHz</small>                | 6.5GHz<br><small>6425-6525MHz</small> | 6.7GHz<br><small>6525-6875MHz</small>                                       | 7.0GHz<br><small>6875-7125MHz</small>  | Generic: refer to modular FCC SAR report<br><br>Mid-power: ≥ 8 mm<br><br>Low power: ≥ 5 mm |
|                                                                                                                                                                                | Design                                   | 3.00                                  | 5.00                                  | 5.00                                  | 5.00                                  | 5.00                                                 | 5.00                                  | 5.00                                                                        | 5.00                                   |                                                                                            |
|                                                                                                                                                                                | PIFA                                     | 3.24                                  | 3.64                                  | 3.73                                  | 4.77                                  | 4.97                                                 | 4.83                                  | 4.30                                                                        | 5.37                                   |                                                                                            |
| 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. |                                          |                                       |                                       |                                       |                                       |                                                      |                                       |                                                                             |                                        |                                                                                            |

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## 1. Applicable test methods

<insert test description here for test method>

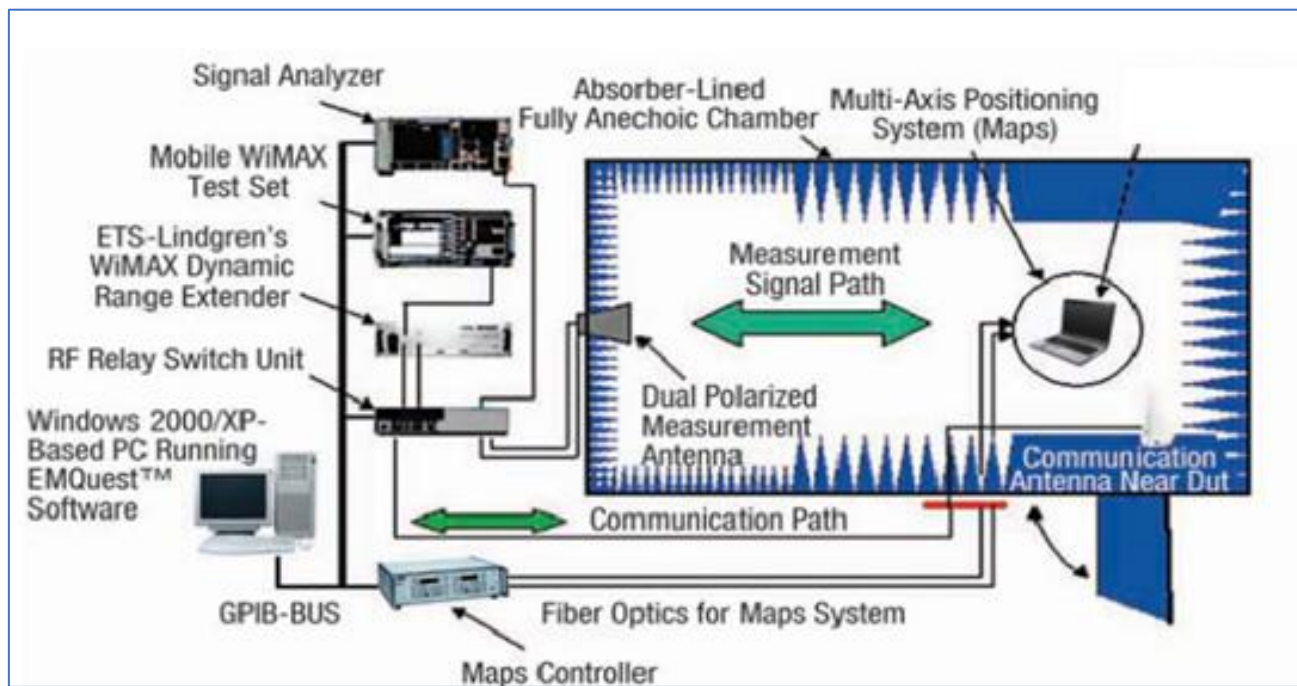
This test report is prepared for host antenna testing under a Full Anechoic Chamber.

This test with host with fixed position and allow to UUT turn different angels.

## 2. Test & System Description

### a. Test setup

<insert test diagram here for test site utilized>

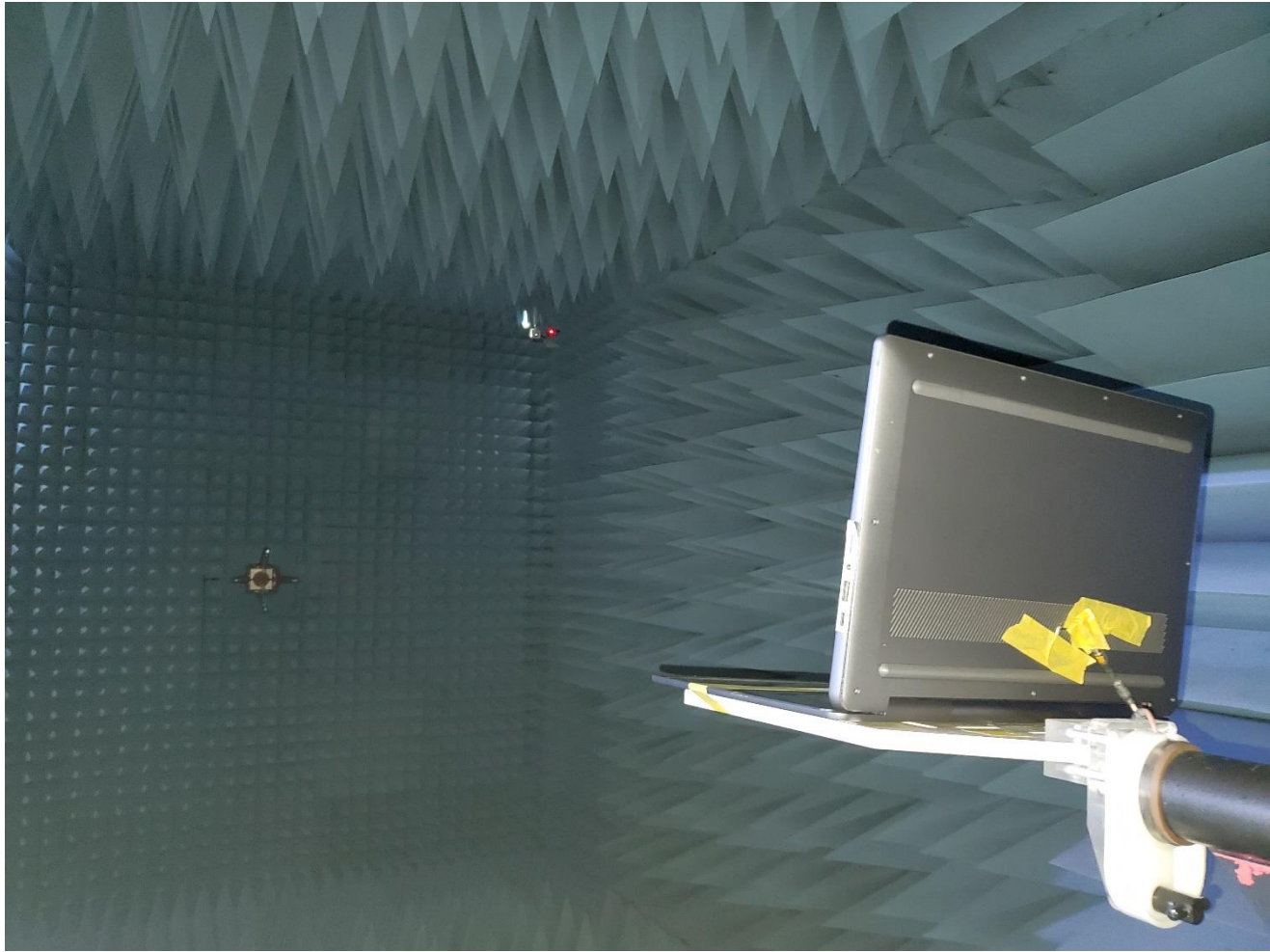


## b. Equipment list

&lt;insert test diagram here for test site utilized&gt;

| Device                            | Type/Model            | Serial#                | Manufacturer         | Cal. Date | Cal. Due Date |
|-----------------------------------|-----------------------|------------------------|----------------------|-----------|---------------|
| Anechoic Chamber                  | AMS-8500              | 1191                   | ETS-Lindgren         | 2022/3/9  | 2024/3/9      |
| Turn Table                        | 2090                  | -                      | ETS-Lindgren         | N/A       | N/A           |
| Switch & Positioning systems      | 7001-002              | 116599                 | ETS-Lindgren         | N/A       | N/A           |
| Measurement SW                    | EMQuest v1.0.8        | 1352                   | ETS-Lindgren         | N/A       | N/A           |
| Boresight antenna mast            | 2090                  | -                      | ETS-Lindgren         | N/A       | N/A           |
| Spectrum Analyzer                 | N9010A                | X16-96096              | Agilent Technologies | 2021/7/25 | 2023/7/25     |
| Horn antenna                      | 3164-08               | 00143257               | ETS-Lindgren         | 2022/4/3  | 2024/4/3      |
| Horn antenna + Amplifier + HPF6.4 | 115195                | 00117614               | ETS-Lindgren         | 2021/8/18 | 2023/8/18     |
| Cable 2.5m - 30MHz to 18GHz       | 0500990992500KE       | 19.23.395              | Radial               | 2022/1/10 | 2024/1/10     |
| Cable 1.2m - 18 to 40GHz          | UFA147A-0-0480-200200 | MFR<br>64639223720-003 | Micro-caox           | 2022/1/10 | 2024/1/10     |
| Cable 1m - 1GHz to 18GHz          | UFA147A               | -                      | Utileflex            | 2022/1/10 | 2024/1/10     |
| Cable 2m - 26.5MHz to 40GHz       | 794-9191-200A         | E00327                 | Atem                 | 2022/1/10 | 2024/1/10     |
| Cable 1m - 30MHz to 18GHz         | UFB311A-0-0590-50U50U | MFR<br>64639223230-001 | Micro-caox           | 2022/1/10 | 2024/1/10     |
| Cable 7m - DC-18GHz               | 0501051057000GX       | 19.35.850              | Radial               | 2022/1/10 | 2024/1/10     |
| Cable 7m - 18GHz to 40GHz         | R286304009            | -                      | Radial               | 2022/1/10 | 2024/1/10     |
| Cable 1.5m - DC-18GHz             | CBL-1.5M-SMSM+        | 202879                 | Mini-Circuits        | 2022/1/10 | 2024/1/10     |
| Temp & Humidity Logger            | GM-108A               | -                      |                      | 2021/5/2  | 2023/5/2      |

### 3. Setup photo



# Antenna Information

## Section 1. Antenna Assembly Specifications

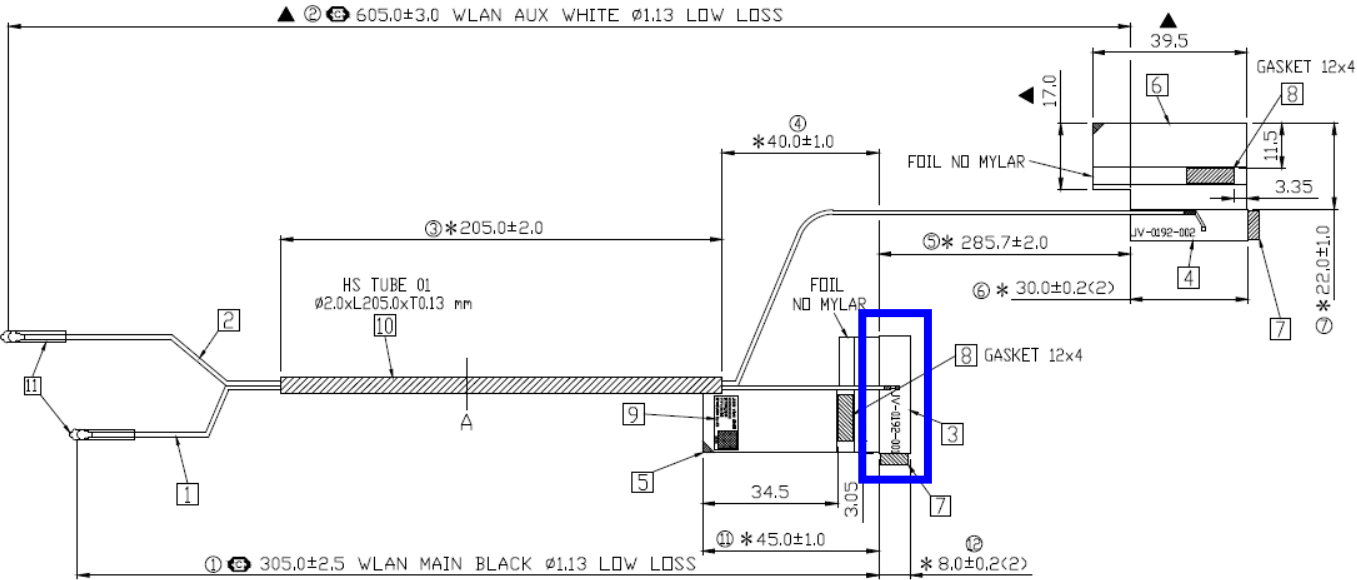
| 1A                                 | 1B           | 1C           | 1D                                                                  |                | 1E                              | 1F                             | 1G       | 1H              |
|------------------------------------|--------------|--------------|---------------------------------------------------------------------|----------------|---------------------------------|--------------------------------|----------|-----------------|
| 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) |
| (P/N: DC33001YD00)<br>Main Antenna | Speed        | PIFA         | (P/N: 113L)<br>50 ohm Coaxial<br>length: 30.5cm<br>diameter: 1.13mm | 2400-2483.5    | 1.98                            | 2.85                           | 2.5      | 0.87            |
|                                    |              |              |                                                                     | 5150-5250      | 2.94                            | 4.24                           | 2.5      | 1.30            |
|                                    |              |              |                                                                     | 5250-5350      | 2.98                            | 4.30                           | 2.5      | 1.32            |
|                                    |              |              |                                                                     | 5470-5725      | 2.71                            | 4.09                           | 2.5      | 1.38            |
|                                    |              |              |                                                                     | 5725-5850      | 2.71                            | 4.11                           | 2.5      | 1.40            |
|                                    |              |              |                                                                     | 5925-6425      | 2.81                            | 4.29                           | 2.5      | 1.48            |
|                                    |              |              |                                                                     | 6425-6525      | 2.47                            | 3.97                           | 2.5      | 1.50            |
|                                    |              |              |                                                                     | 6525-6875      | 2.80                            | 4.35                           | 2.5      | 1.55            |
|                                    |              |              |                                                                     | 6875-7125      | 2.80                            | 4.39                           | 2.5      | 1.59            |
| (P/N: DC33001YD00)<br>Aux Antenna  | Speed        | PIFA         | (P/N: 113L)<br>50 ohm Coaxial<br>length: 60.5cm<br>diameter: 1.13mm | 2400-2483.5    | 0.88                            | 2.60                           | 2.5      | 1.72            |
|                                    |              |              |                                                                     | 5150-5250      | 0.64                            | 3.21                           | 2.5      | 2.57            |
|                                    |              |              |                                                                     | 5250-5350      | 1.29                            | 3.89                           | 2.5      | 2.60            |
|                                    |              |              |                                                                     | 5470-5725      | 1.44                            | 4.15                           | 2.5      | 2.71            |
|                                    |              |              |                                                                     | 5725-5850      | 1.81                            | 4.56                           | 2.5      | 2.75            |
|                                    |              |              |                                                                     | 5925-6425      | 2.92                            | 5.84                           | 2.5      | 2.92            |
|                                    |              |              |                                                                     | 6425-6525      | 2.28                            | 5.23                           | 2.5      | 2.95            |
|                                    |              |              |                                                                     | 6525-6875      | 2.89                            | 5.94                           | 2.5      | 3.05            |
|                                    |              |              |                                                                     | 6875-7125      | 2.89                            | 6.02                           | 2.5      | 3.13            |

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

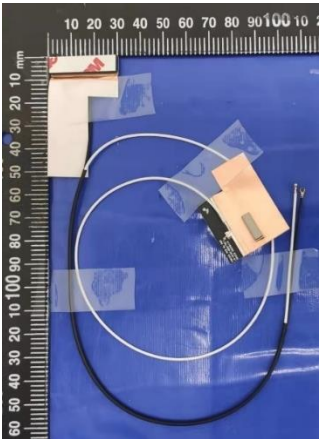
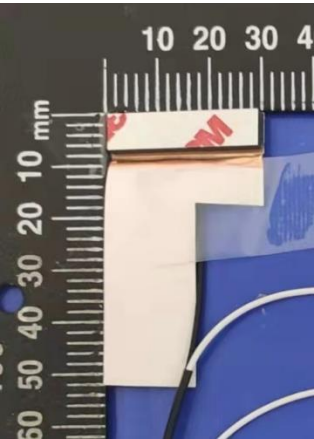
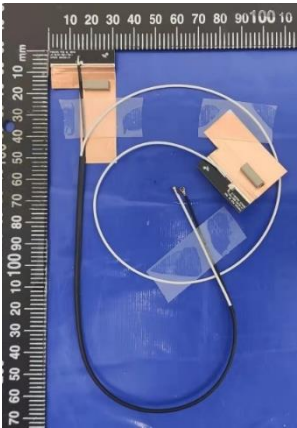
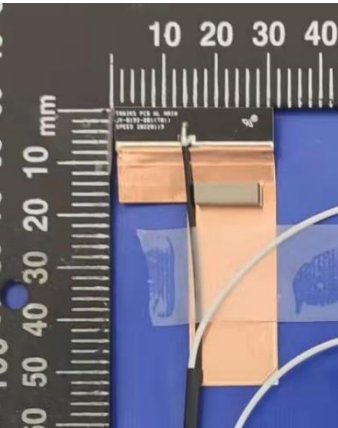
Section 2. Dimensioned Photos and Drawings of Antennas

Include the dimensioned photo and drawing of Main antenna here.

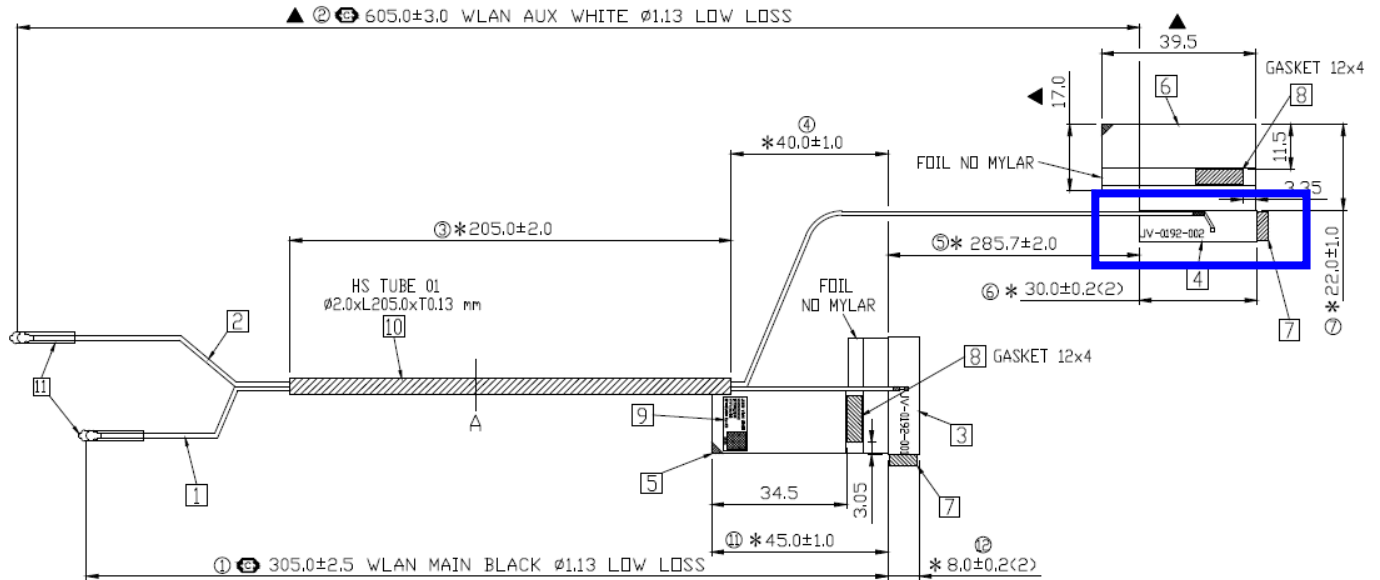
Main Antenna Drawing:



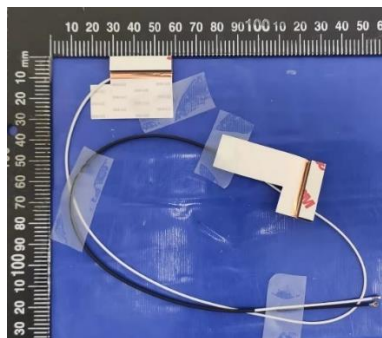
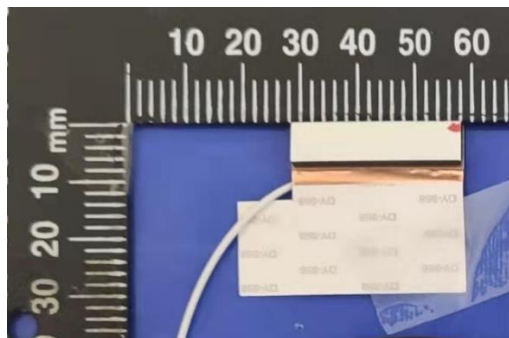
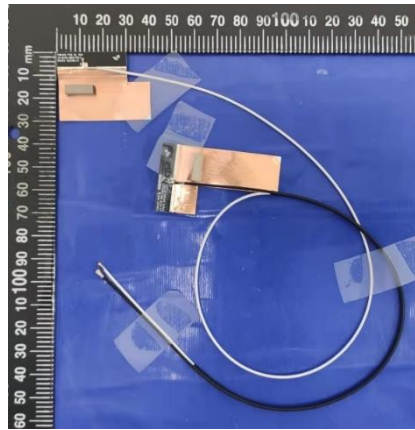
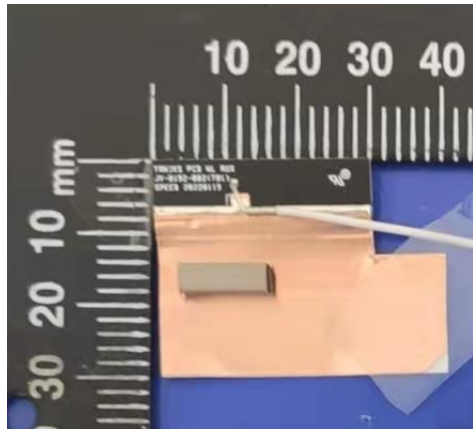
Main Antenna Photo (Front/Back):



### Aux Antenna Drawing:



### Aux Antenna Photo (Front/Back):



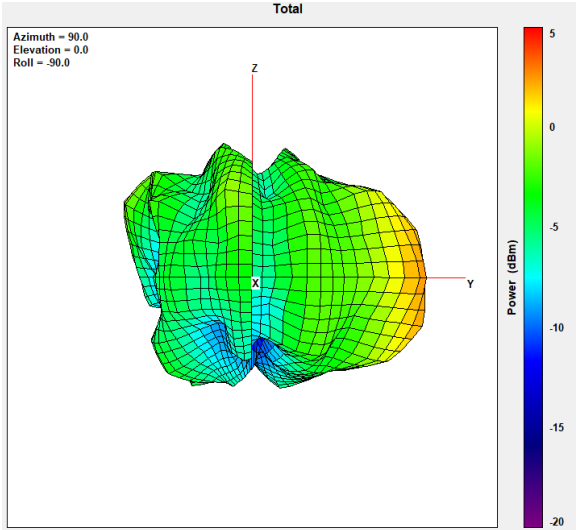
**Note: antenna photo should include L type ruler**

Section 3. Radiation characteristics of antenna loaded in Host Platform

Main Antenna

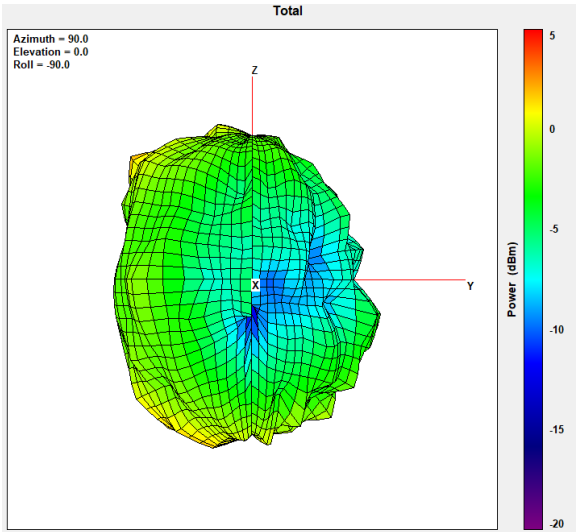
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 2400-2483.5     | 1.98                          |



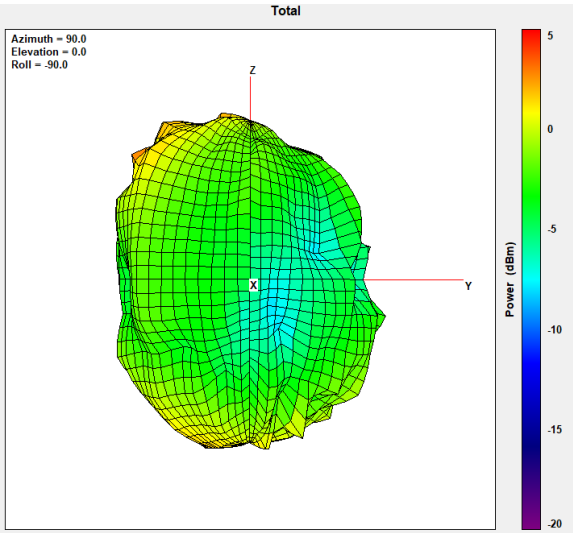
Max Antenna 3D Radiation Pattern 5150-5250 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5150-5250       | 2.94                          |



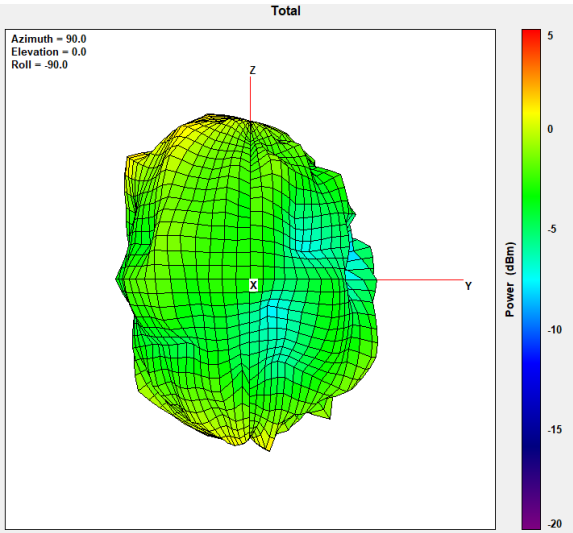
Max Antenna 3D Radiation Pattern 5250-5350 MHz

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



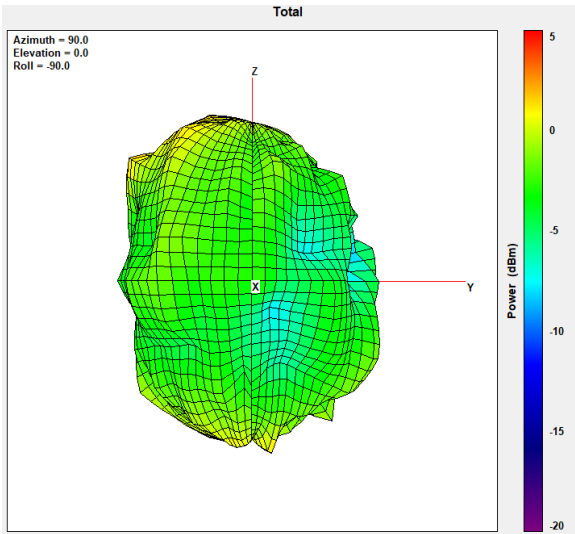
Max Antenna 3D Radiation Pattern 5470-5725 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5470-5725       | 2.71                          |



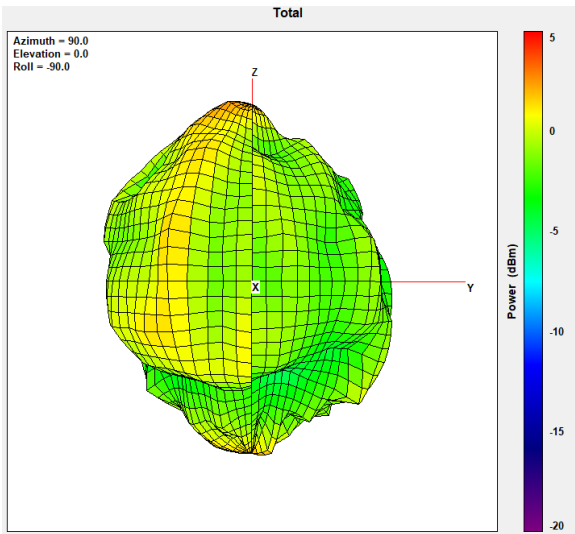
Max Antenna 3D Radiation Pattern 5725-5850 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5725-5850       | 2.71                          |



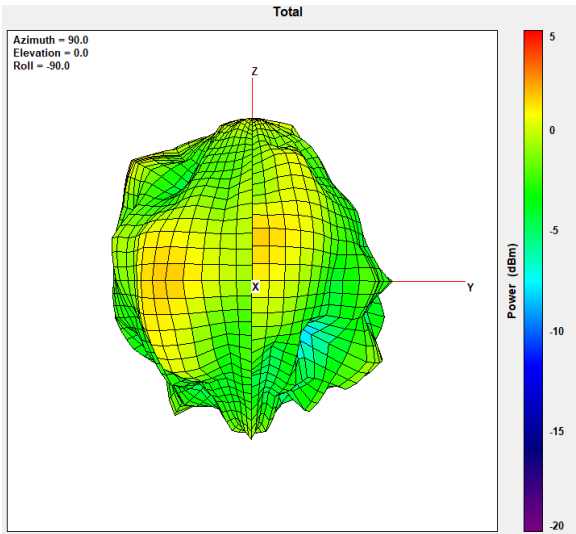
Max Antenna 3D Radiation Pattern 5925-6425 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5925-6425       | 2.81                          |



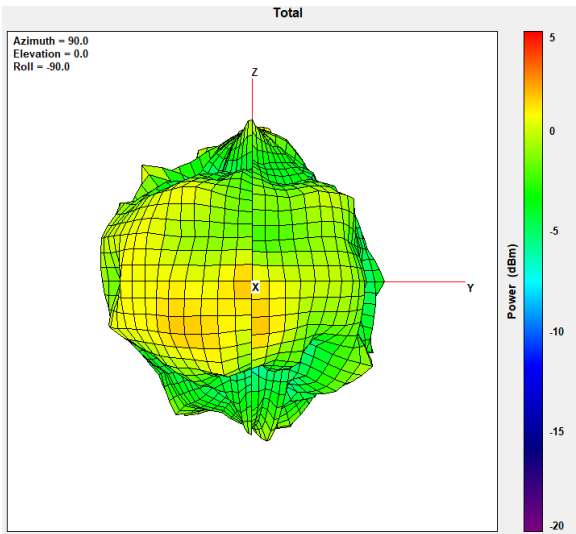
Max Antenna 3D Radiation Pattern 6425-6525 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6425-6525       | 2.47                          |



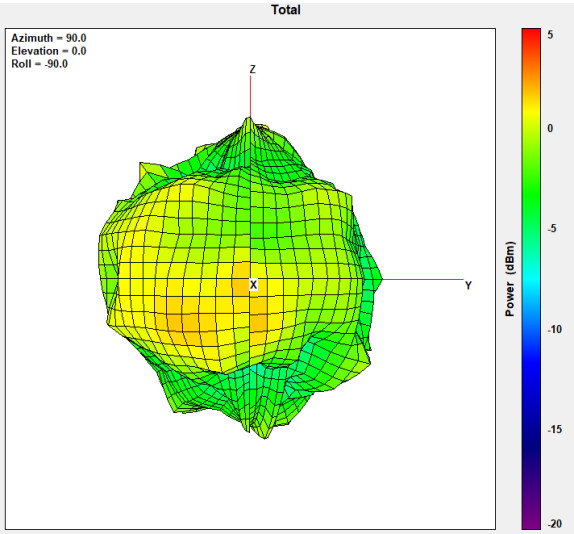
Max Antenna 3D Radiation Pattern 6525-6875 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6525-6875       | 2.80                          |



Max Antenna 3D Radiation Pattern 6875-7125 MHz

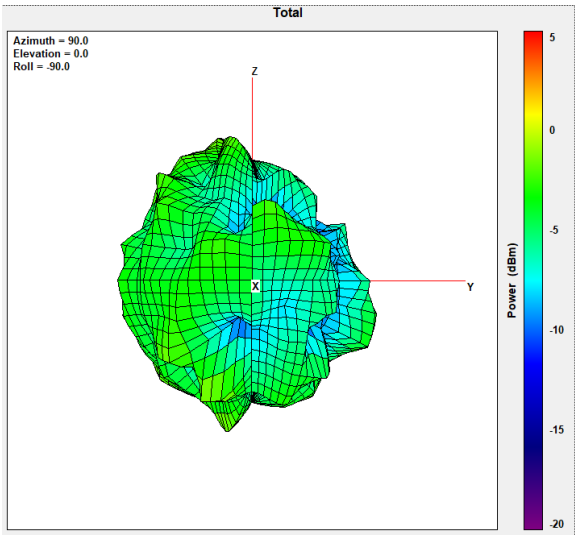
| Frequency<br>(MHz) | Peak Gain w/ Cable Loss<br>(dBi) |
|--------------------|----------------------------------|
| 6875-7125          | 2.80                             |



Auxiliary Antenna

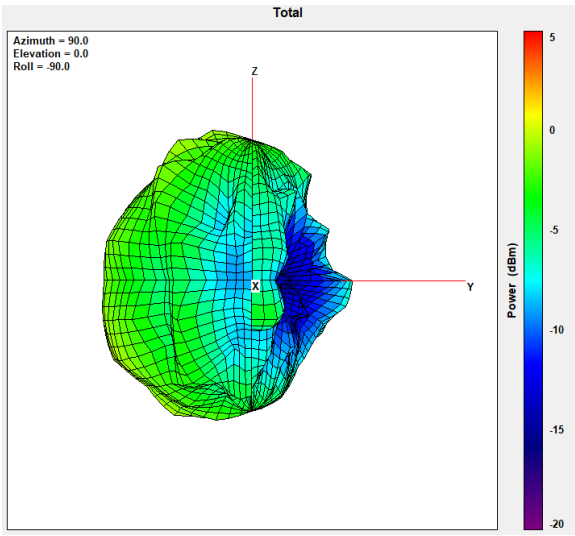
Aux Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 2400-2483.5     | 0.88                          |



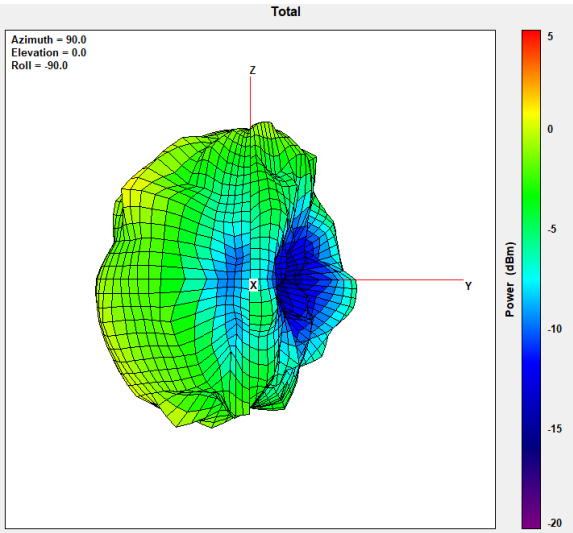
Aux Antenna 3D Radiation Pattern 5150-5250 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5150-5250       | 0.64                          |



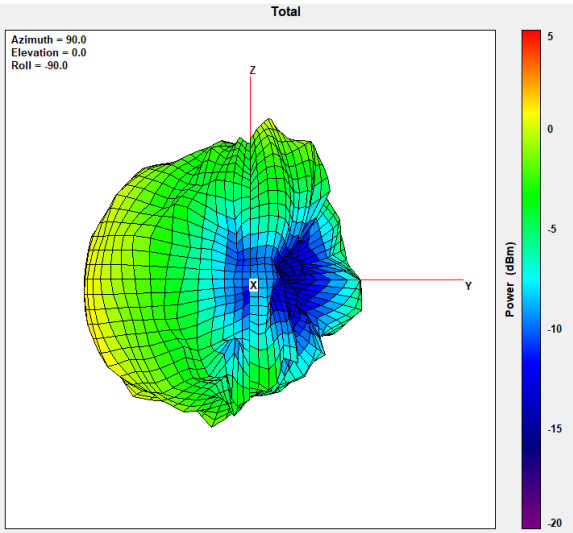
Aux Antenna 3D Radiation Pattern 5250-5350 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5250-5350       | 1.29                          |



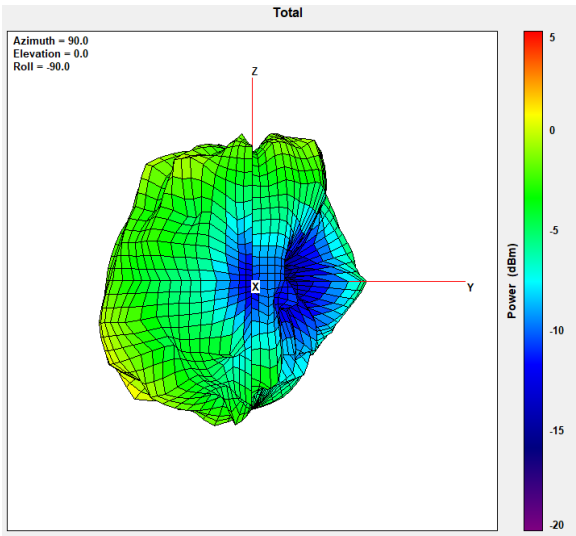
Aux Antenna 3D Radiation Pattern 5470-5725 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5470-5725       | 1.44                          |



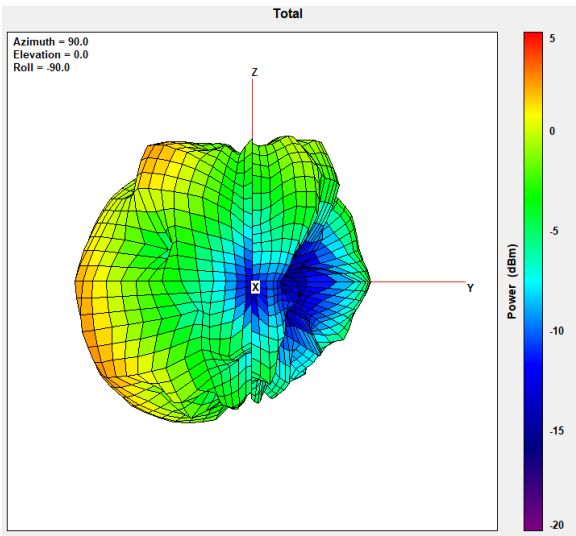
Aux Antenna 3D Radiation Pattern 5725-5850 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5725-5850       | 1.81                          |



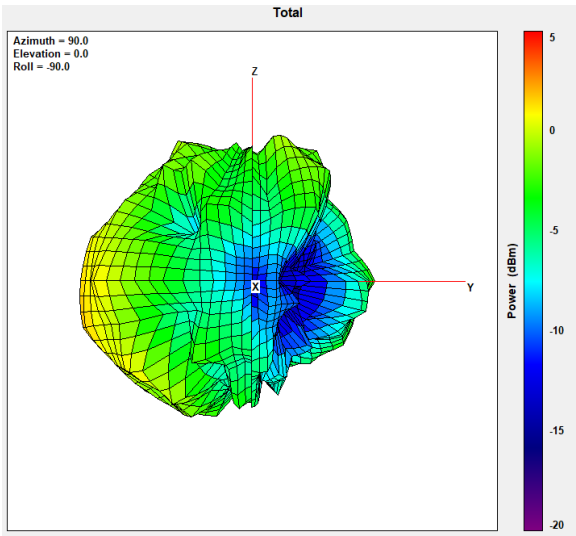
Aux Antenna 3D Radiation Pattern 5925-6425 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5925-6425       | 2.92                          |



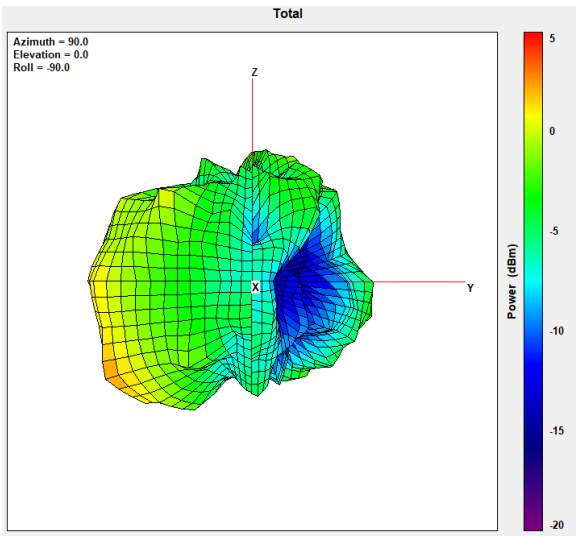
Aux Antenna 3D Radiation Pattern 6425-6525 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6425-6525       | 2.28                          |



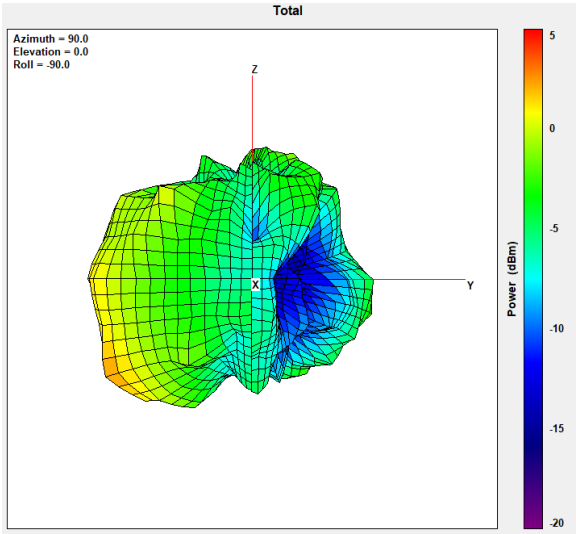
Aux Antenna 3D Radiation Pattern 6525-6875 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6525-6875       | 2.89                          |



Aux Antenna 3D Radiation Pattern 6875-7125 MHz

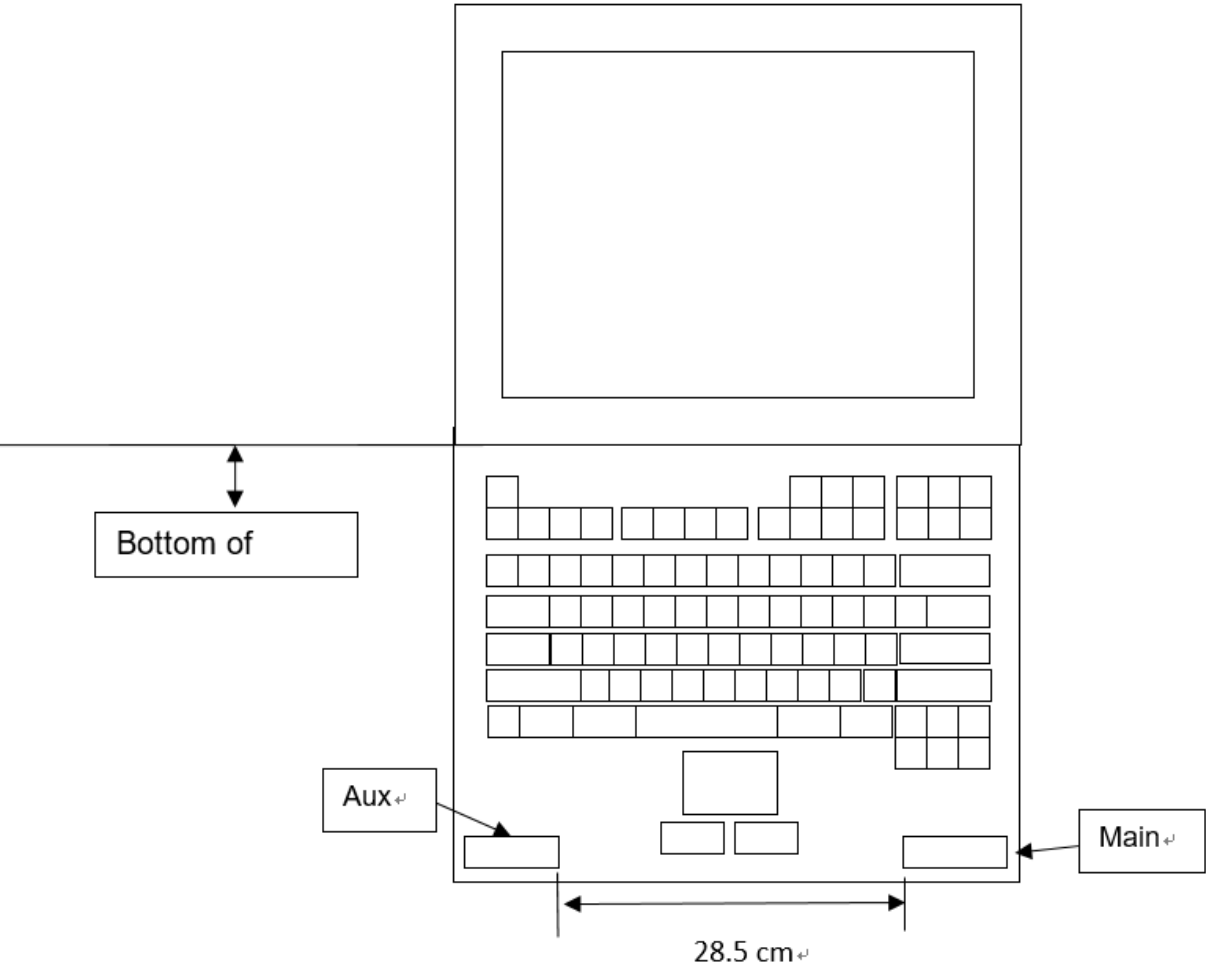
| Frequency<br>(MHz) | Peak Gain w/ Cable Loss<br>(dBi) |
|--------------------|----------------------------------|
| 6875-7125          | 2.89                             |



Section 4. Antenna Host Platform Location Information

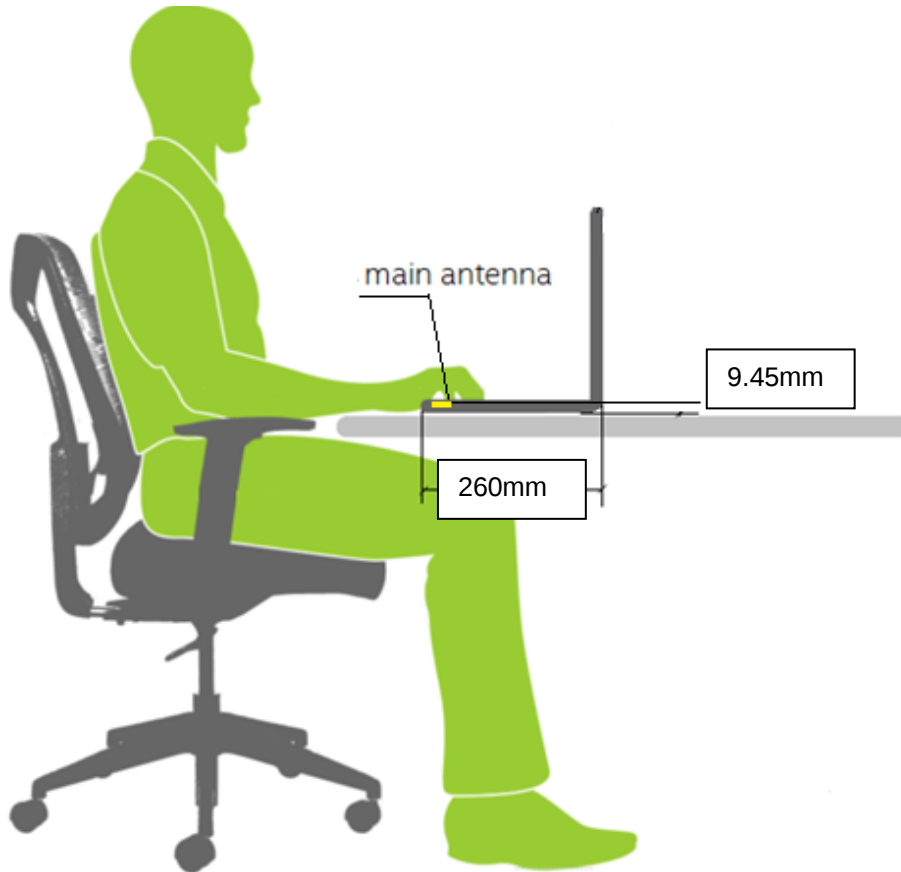
Include a **dimensioned photo(s) or dimensioned drawing(s)** of Main and Aux antenna placements (measurements are not required for receive-only antenna).

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.



## 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.



Section 6. Diagram Example of Co-Location Antenna Separation

Include a **dimensioned photo or dimensioned drawing** showing the distance (mm) between all WLAN transmit antennas and other co-located radiator transmit antenna such as Bluetooth, WWAN,..

(Note: Due to the evolving rules regarding co-location, each platform will need to be reviewed on a case by case basis)

