

# ANTENNA INFORMATION

|                                                           |                            |
|-----------------------------------------------------------|----------------------------|
| OEM                                                       | Lenovo                     |
| ODM                                                       | Huaqin Technology Co.,Ltd. |
| Platform model name                                       | Yoga 7 2-in-1 14ILL10      |
| Intel platform (ex: Yes, No or NA)                        | Yes                        |
| Platform type (ex: regular NB, convertible PC, AIO...etc) | Convertible PC             |
| SAR minimum separation (mm)                               | FCC (1g) 2.65mm            |
|                                                           | ISED (1g) 2.65             |
|                                                           | ISED (10g) N/A             |

|                      |                 |                                                                                        |
|----------------------|-----------------|----------------------------------------------------------------------------------------|
| Antenna manufacturer | Company name    | Luxshare-ICT                                                                           |
|                      | Address         | Block A,SANYO New Industrial Zone, West HaoYi,Shajing, Bao'an,Shenzhen, 518104, China. |
| Test location        | Company name    | Luxshare-ICT                                                                           |
|                      | Address         | Block A,SANYO New Industrial Zone, West HaoYi,Shajing, Bao'an,Shenzhen, 518104, China. |
| Test Personnel       | Name(Full name) | Huaiyang Zou                                                                           |
|                      | E-mail          | Huaiyang.Zou@luxshare-ict.com                                                          |
|                      | Tel/Mobile      | 16620809787                                                                            |
| Testing date         |                 | 2024/9/23                                                                              |

|                                       |      |               |
|---------------------------------------|------|---------------|
| Antenna Part number                   | Main | L01RF454-NB-H |
|                                       | Aux  | L01RF453-NB-H |
| Antenna type (ex: PIFA, Dipole...etc) |      | PIFA          |

| Antenna 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                                   | -1.29                     | 0.06                   | -0.35                  | 2.4                    | 2.64                   | 2.64                   | 2.72                   | 2.74                   | 2.27                   | 2.93                    |
| Aux                                    | -0.01                     | 2.58                   | 2.58                   | 1.98                   | 1.13                   | 1.49                   | 2.08                   | 1.28                   | 1.81                   | 1.22                    |

| Cable Assembly Part Number and Information |                      |                  |                    |                |                |
|--------------------------------------------|----------------------|------------------|--------------------|----------------|----------------|
|                                            | Cable PN             | Cable length(mm) | Cable diameter(mm) | Impedance(ohm) | Connector type |
| Main                                       | I-PEX(20565-001R-13) | 277              | 1.13               | 50             | IPEX4          |
| Aux                                        | I-PEX(20565-001R-13) | 82               | 1.13               | 50             | IPEX4          |

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

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## 1. Intel Reference Gain and Type

| Antenna Peak gain w/ cable loss (dBi) |                         |                           |                        |                        |                        |                        |                        |                        |                        |                        |                         |
|---------------------------------------|-------------------------|---------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|
| Band/Frequency                        |                         | 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 |
| Design                                | EU/UK                   | 3.00                      | 5.00                   | 5.00                   | 5.00                   | 5.00                   | 5.00                   | 5.00                   | 5.00                   | 5.00                   | 5.00                    |
| PIFA                                  | For WiFi 6E and earlier | 3.24                      | 3.64                   | 3.73                   | 4.77                   | 4.97                   | 4.72                   | 4.83                   | 4.30                   | 5.37                   | 5.59                    |
|                                       | From WiFi 7             | 2.95                      | 5.11                   | 4.55                   | 5.15                   | 5.13                   | 4.45                   | 5.02                   | 5.02                   | 4.96                   | 4.96                    |
| Dipole                                | For WiFi 6E and earlier | 2.89                      | 2.92                   | 3.19                   | 4.41                   | 4.22                   | 4.22                   | 4.83                   | 4.30                   | 4.49                   | 5.34                    |
|                                       | From WiFi 7             | 2.95                      | 4.03                   | 4.11                   | 5.15                   | 5.13                   | 4.45                   | 5.02                   | 4.71                   | 4.49                   | 4.96                    |
| Monopole                              | From WiFi 7             | 2.83                      | 4.57                   | 4.44                   | 4.95                   | 4.95                   | 4.43                   | 4.87                   | 4.91                   | 4.91                   | 4.79                    |

### 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.

## 2. Document Revision History

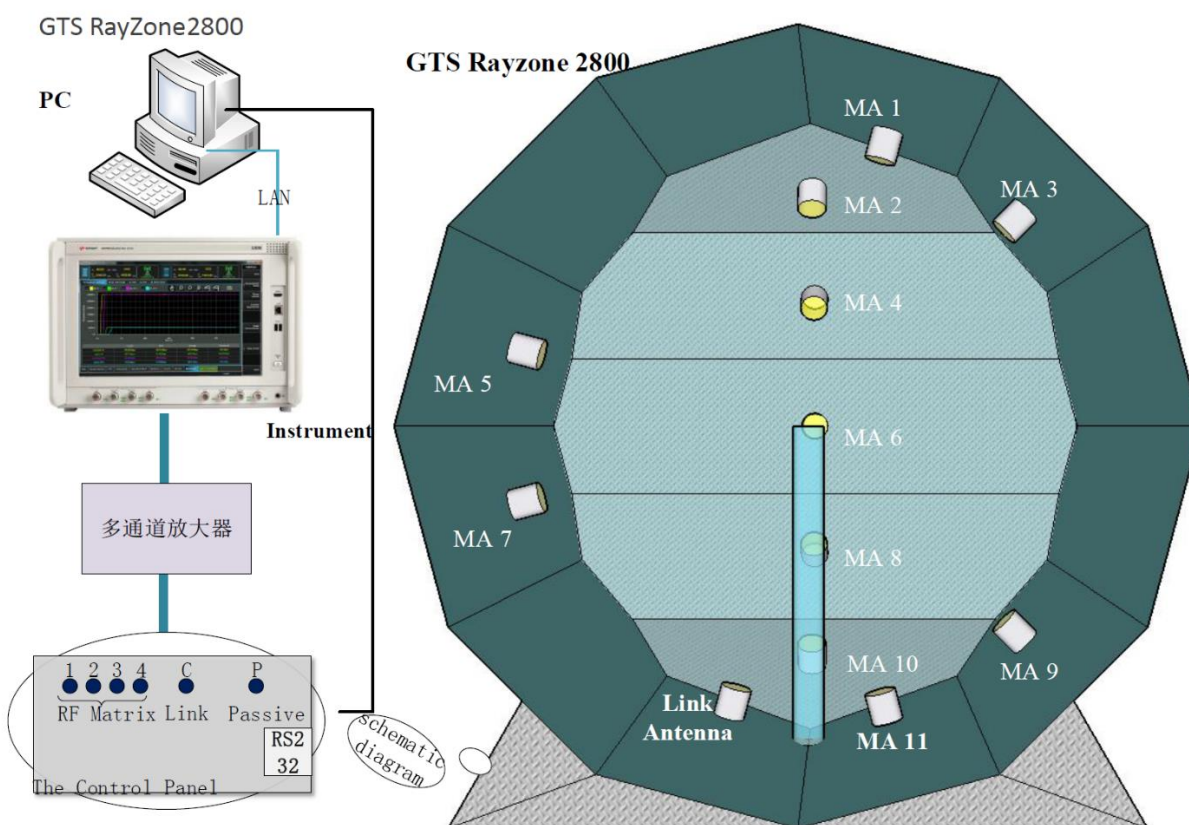
| Revision # | Revision Details | Issued Date |
|------------|------------------|-------------|
| Rev. 00    | First Issue      | 2024/9/23   |

### 3. Test & System Description

#### 3.1 Measurement Method and System

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

#### 3.2 Test setup



### 3.3 Equipment list

| Number | Device                    | Type/Model         | Serial#    | Manufacturer | Cal. Date  | Cal. Due Date |
|--------|---------------------------|--------------------|------------|--------------|------------|---------------|
| 1      | GTS Chamber               | RayZone-2800       | 1603000026 | GTS          | 2023/10/09 | 2024/12/21    |
| 2      | RF Amplifier Unit         | RayZone-2800       | 1612000032 | GTS          | 2023/10/09 | 2024/12/21    |
| 3      | Test software             | GTS<br>MaxSign 100 | 1603000054 | GTS          | 2023/10/09 | 2024/12/21    |
| 4      | Test system host          | Lenovo             | 1603000056 | GTS          | 2023/10/09 | 2024/12/21    |
| 5      | 23 Probe Antenna          | TEM23              | 1603000057 | GTS          | 2023/10/09 | 2024/12/21    |
| 6      | Wi-Fi Dynamic Amplifier   | WDAP               | 1604000002 | GTS          | 2023/10/09 | 2024/12/21    |
| 7      | RF line TX                | FL18-SM            | 1612000078 | GTS          | 2023/10/09 | 2024/12/21    |
| 8      | RF line RX                | FL18-SM            | 1612000559 | GTS          | 2023/10/09 | 2024/12/21    |
| 9      | Cable 0.6m – 50MHz -18GHz | UFB                | 1604000339 | GTS          | 2023/10/09 | 2024/12/21    |
| 10     | Cable 0.8m – 50MHz -18GHz | UFB                | 1608000001 | GTS          | 2023/10/09 | 2024/12/21    |
| 11     | General-purpose Tester    | CMW500             | 1608000036 | RS           | 2023/10/09 | 2024/12/21    |
| 12     | EXA Signal Analyzer       | N9020A             | 1612000560 | KeySight     | 2023/10/09 | 2024/12/21    |
| 13     | Network analyzer          | E5071C             | 1608000022 | KeySight     | 2023/10/09 | 2024/12/21    |

N/A: Not Applicable

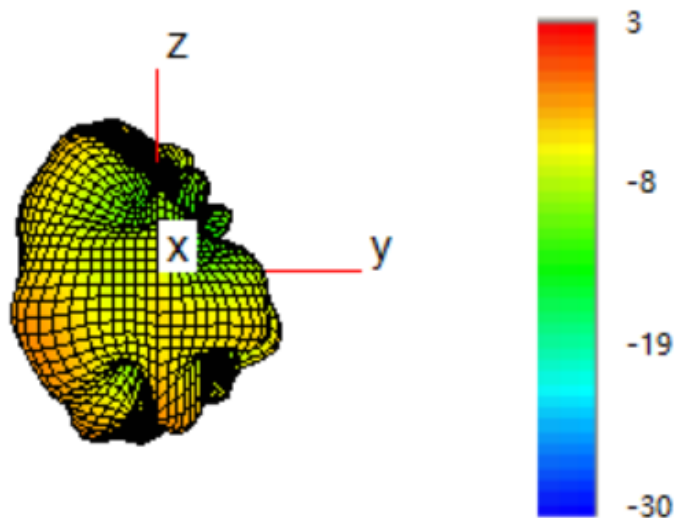
Note: Chamber calibration included full set of implement

#### 4. Radiation characteristics of antenna loaded in Host Platform

##### Main Antenna

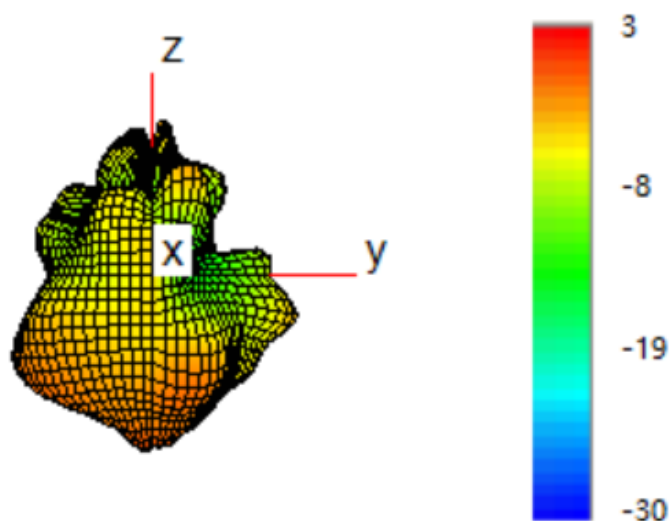
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 2400-2483.5     | -1.29                         |



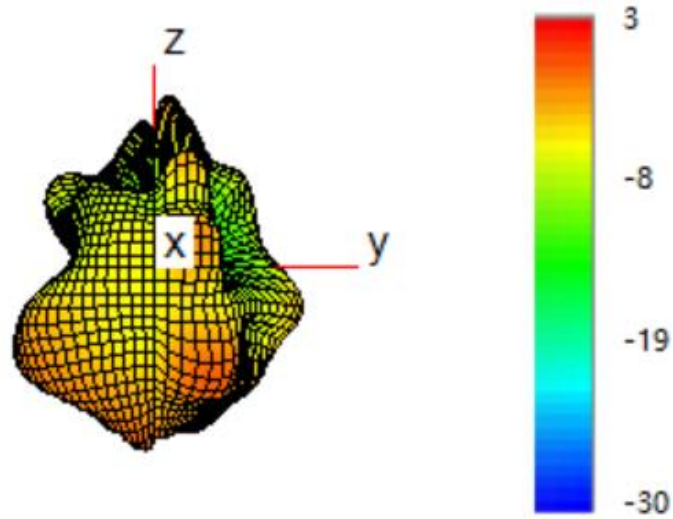
Max Antenna 3D Radiation Pattern 5150-5250 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5150-5250       | 0.06                          |



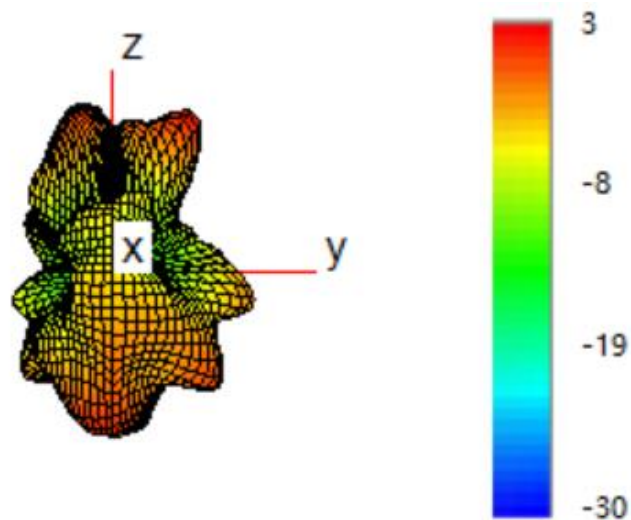
## Max Antenna 3D Radiation Pattern 5250-5350 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5250-5350       | -0.35                         |



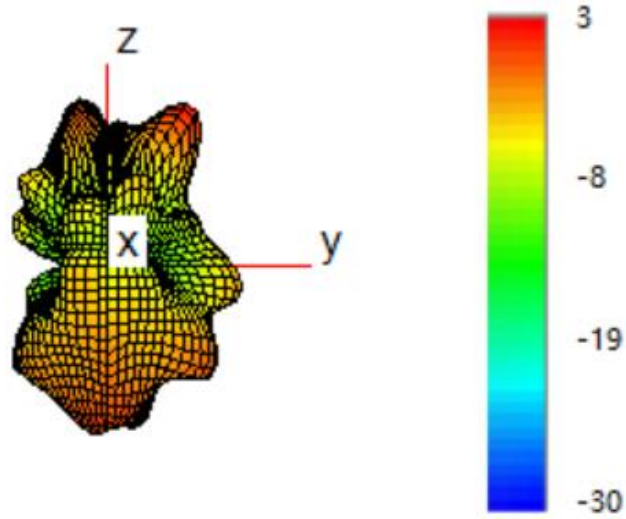
## Max Antenna 3D Radiation Pattern 5470-5725 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5470-5725       | 2.4                           |



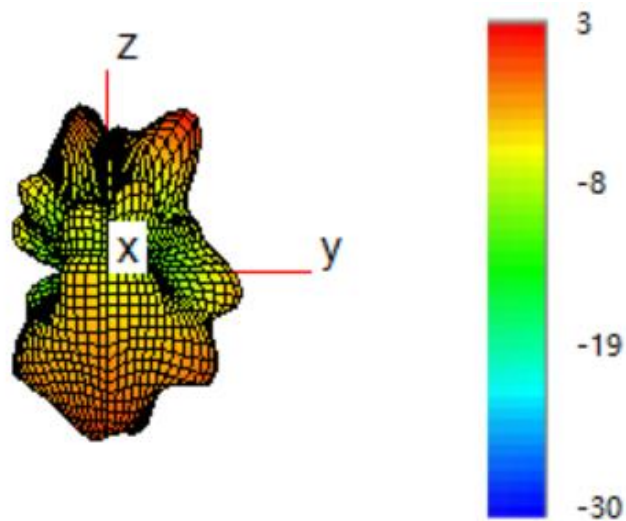
## Max Antenna 3D Radiation Pattern 5725-5850 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5725-5850       | 2.64                          |



## Max Antenna 3D Radiation Pattern 5850-5895 MHz

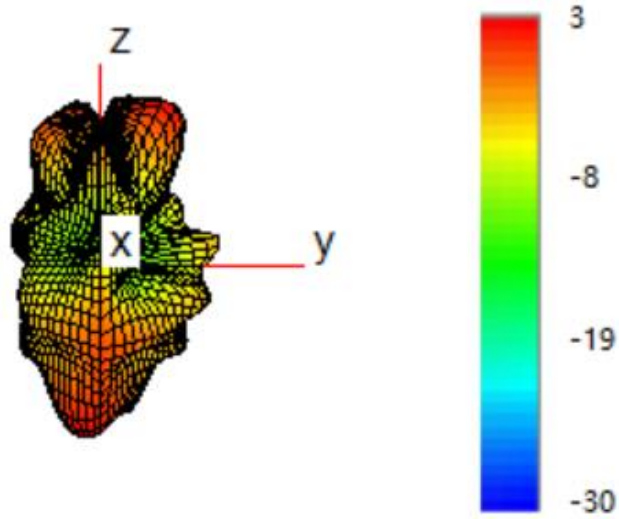
| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5850-5895       | 2.64                          |





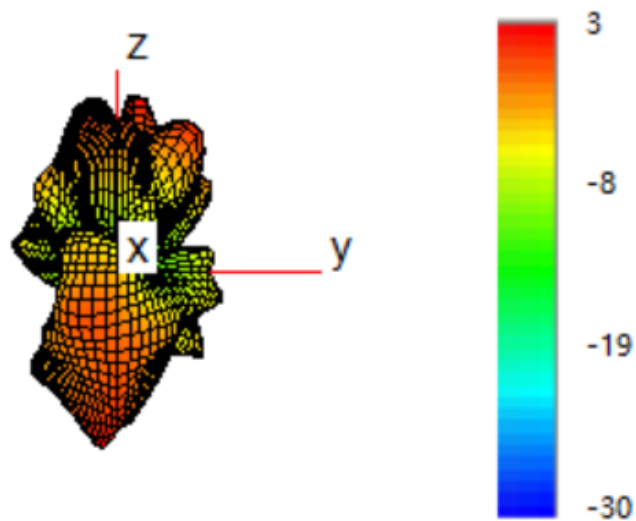
## Max Antenna 3D Radiation Pattern 5925-6425 MHz

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



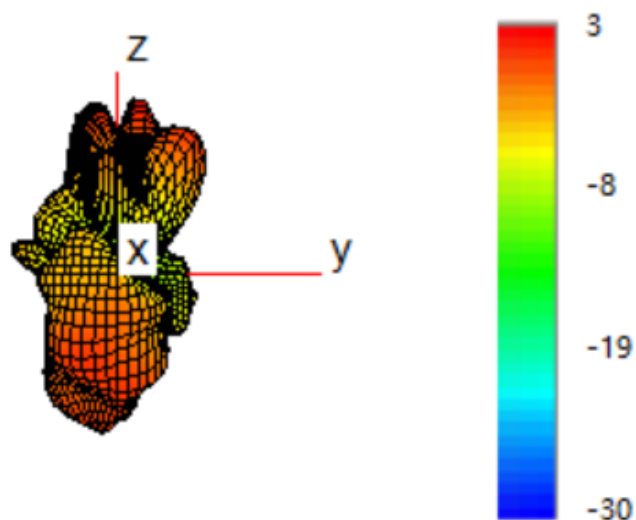
## Max Antenna 3D Radiation Pattern 6425-6525 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6425-6525       | 2.74                          |



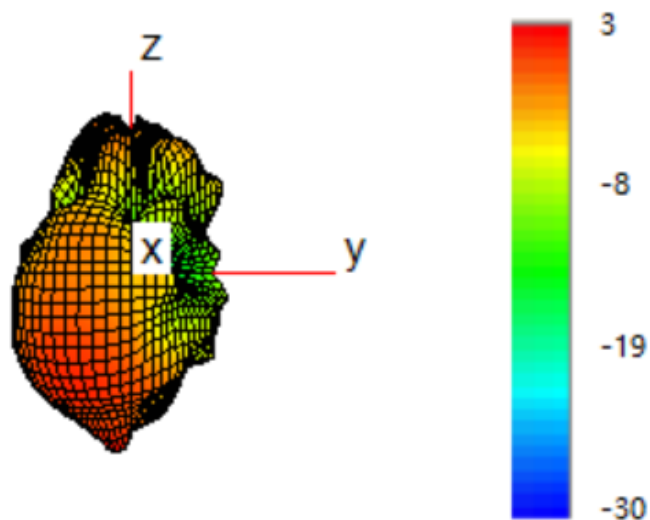
## Max Antenna 3D Radiation Pattern 6525-6875 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6525-6875       | 2.27                          |



## Max Antenna 3D Radiation Pattern 6875-7125 MHz

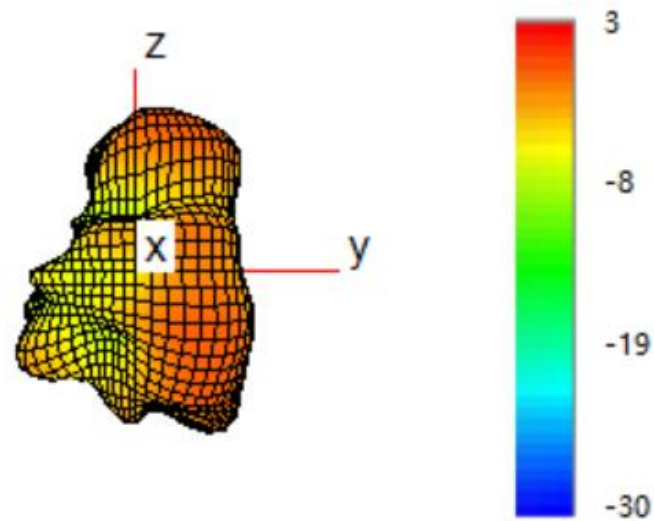
| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6875-7125       | 2.93                          |



## Auxiliary Antenna

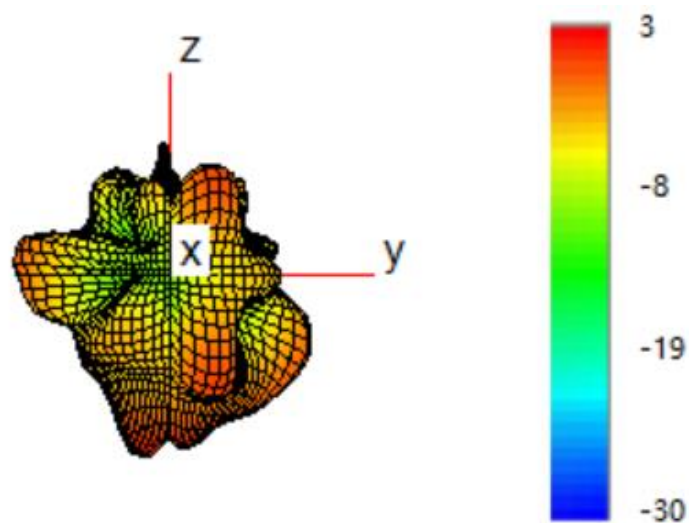
### Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 2400-2483.5     | -0.01                         |



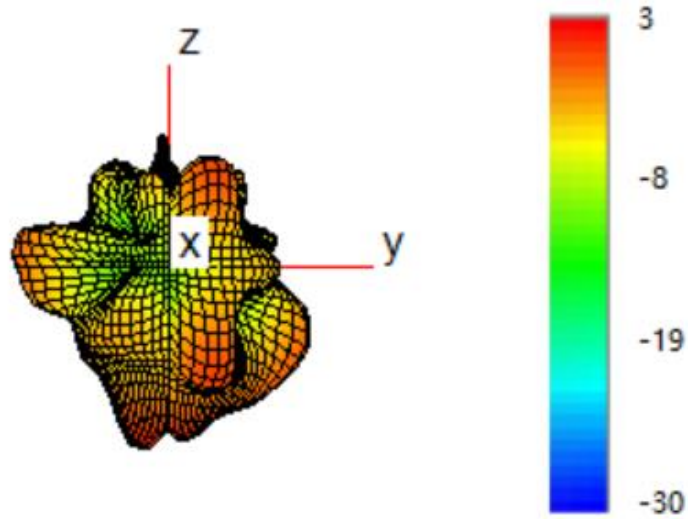
### Max Antenna 3D Radiation Pattern 5150-5250 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5150-5250       | 2.58                          |



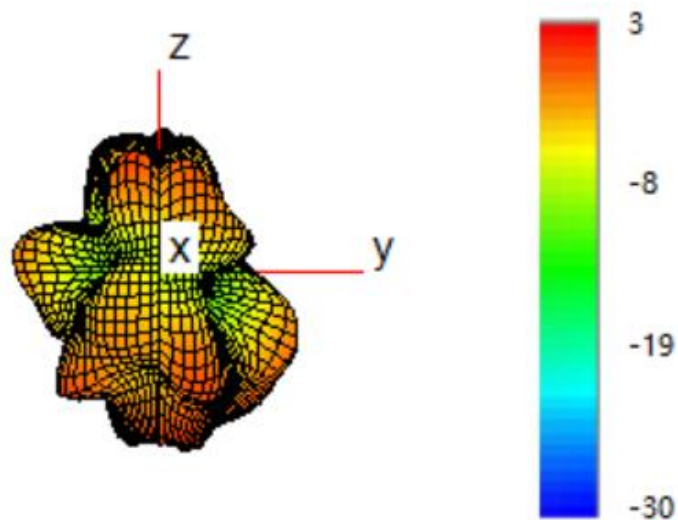
## Max Antenna 3D Radiation Pattern 5250-5350 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5250-5350       | 2.58                          |



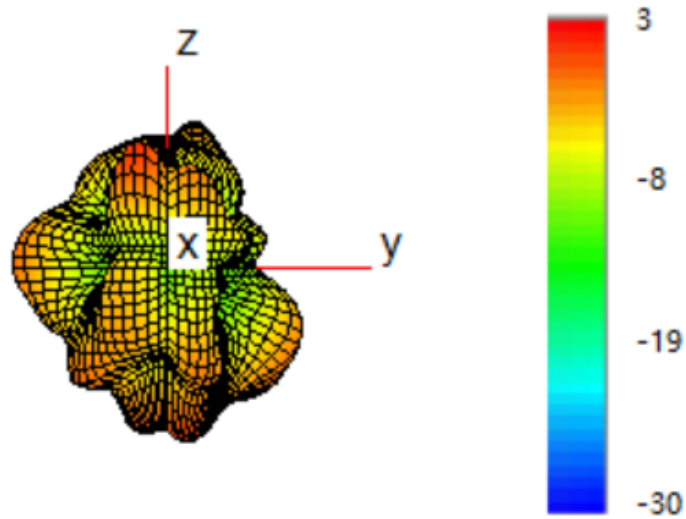
## Max Antenna 3D Radiation Pattern 5470-5725 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5470-5725       | 1.98                          |



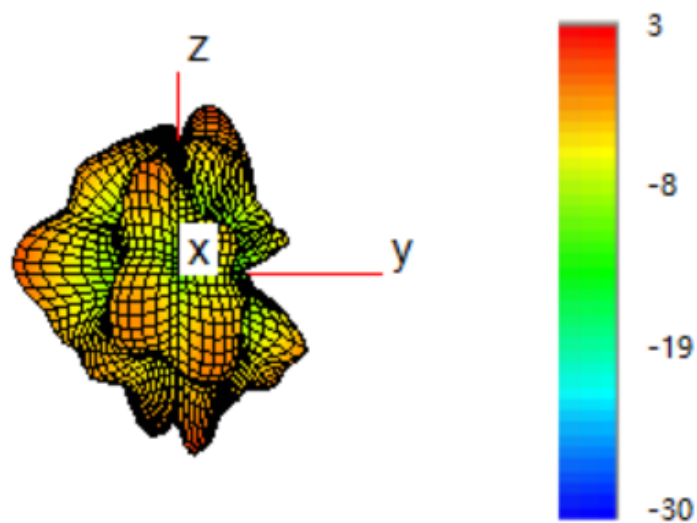
## Max Antenna 3D Radiation Pattern 5725-5850 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5725-5850       | 1.13                          |



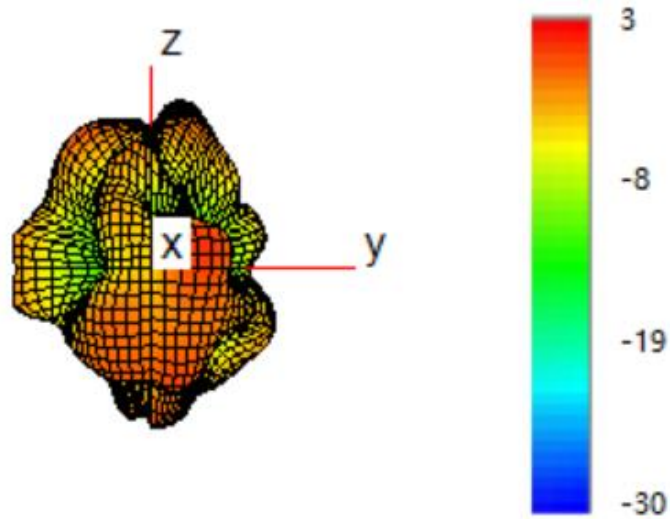
## Max Antenna 3D Radiation Pattern 5850-5895 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5850-5895       | 1.49                          |



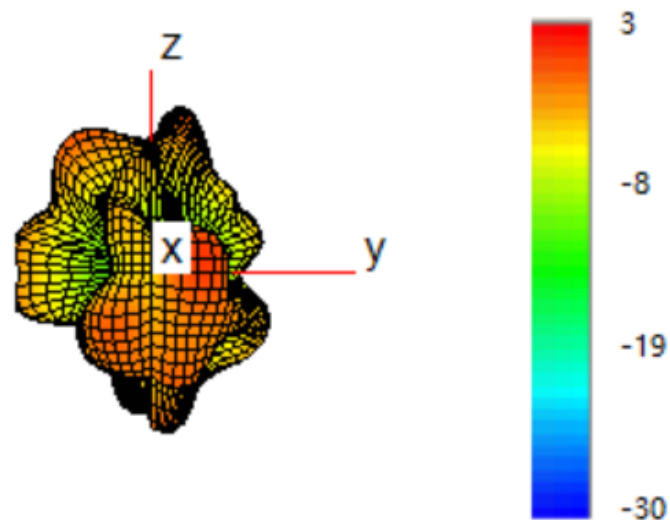
## Max Antenna 3D Radiation Pattern 5925-6425 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 5925-6425       | 2.08                          |



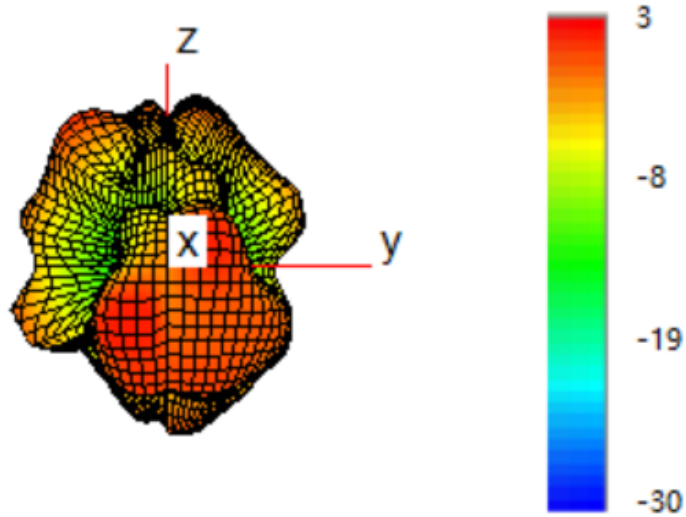
## Max Antenna 3D Radiation Pattern 6425-6525 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6425-6525       | 1.28                          |



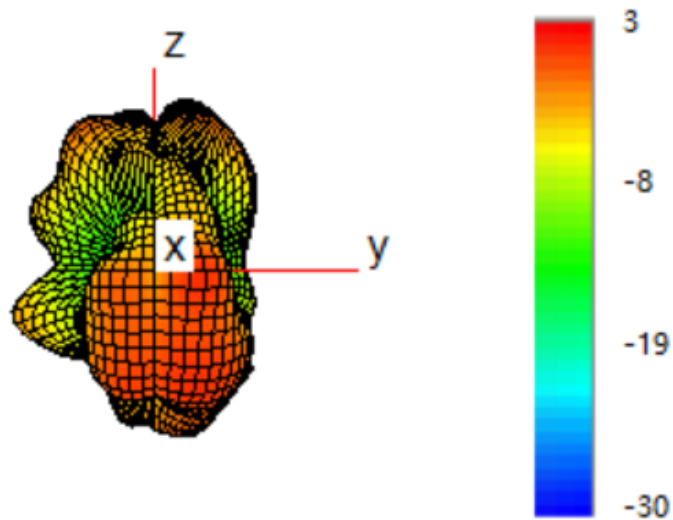
## Max Antenna 3D Radiation Pattern 6525-6875 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6525-6875       | 1.81                          |



## Max Antenna 3D Radiation Pattern 6875-7125 MHz

| Frequency (MHz) | Peak Gain w/ Cable Loss (dBi) |
|-----------------|-------------------------------|
| 6875-7125       | 1.22                          |

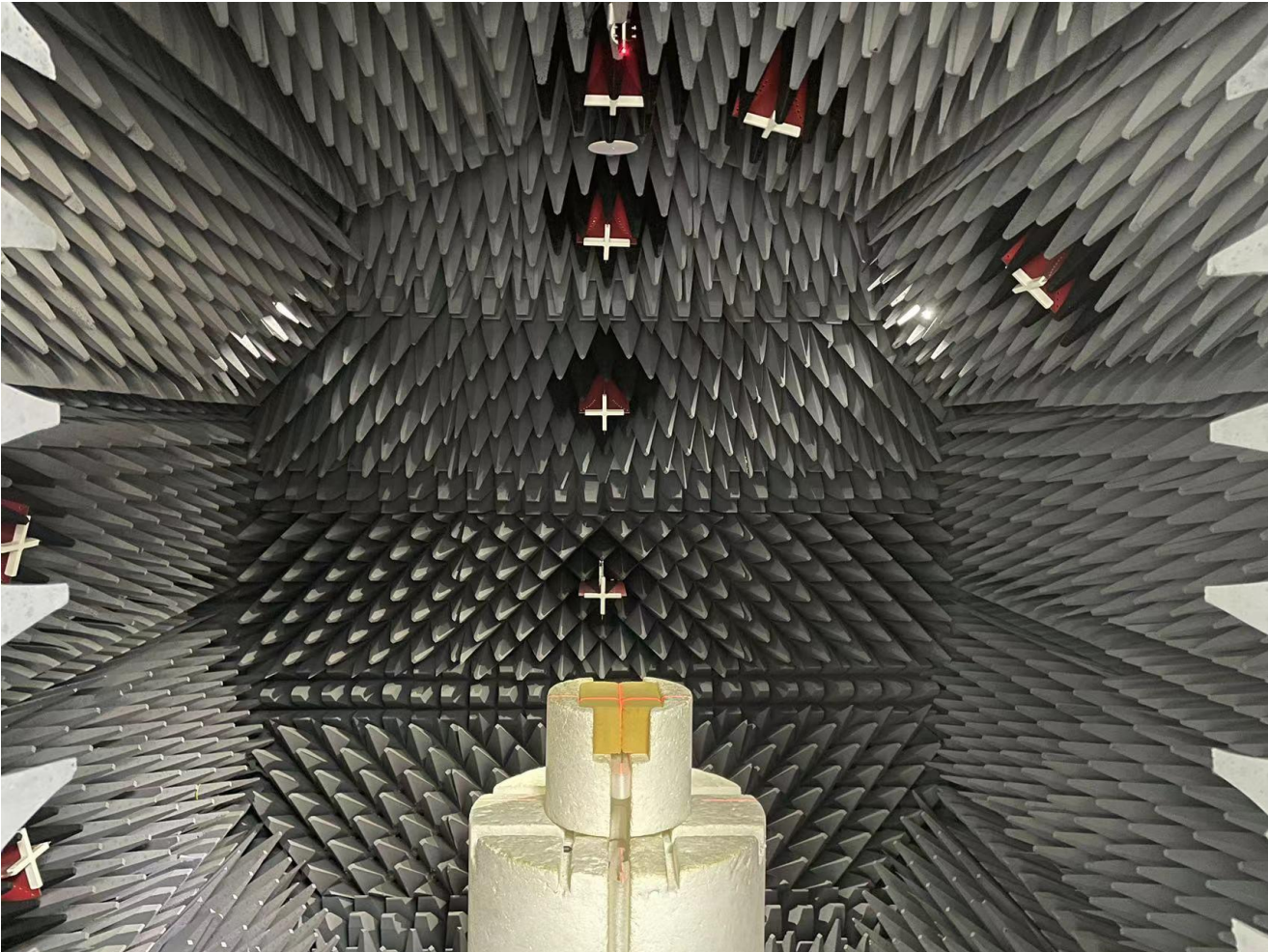




# Annex A. Photographs

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## A.1 Setup Photo

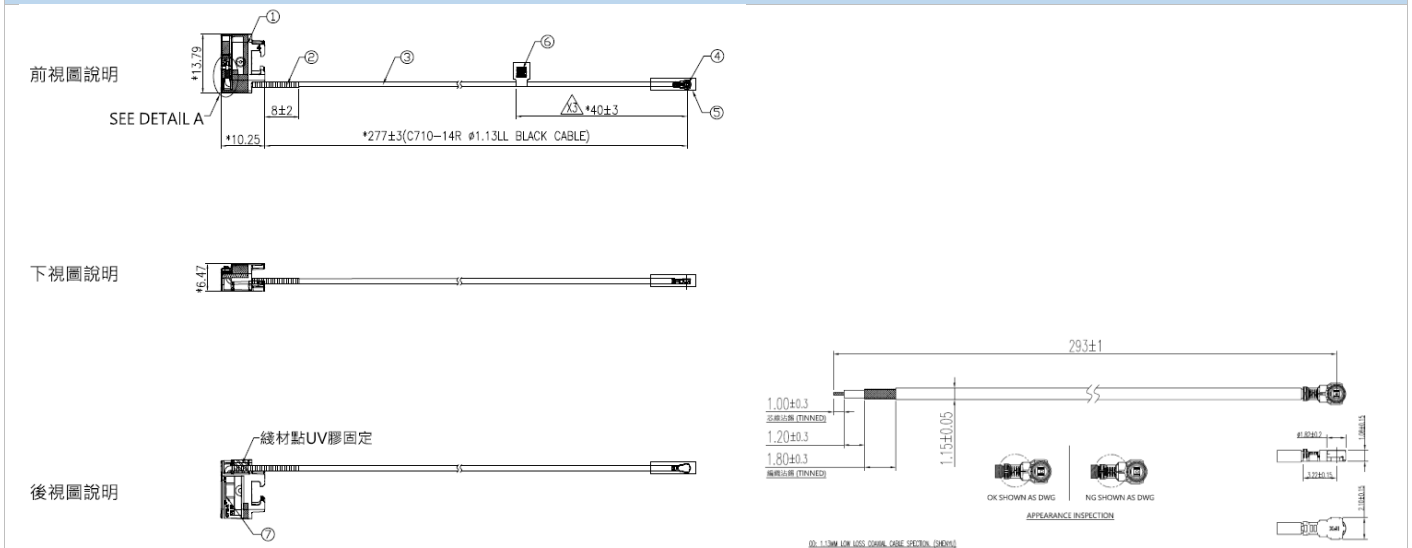




## A.2 Test sample

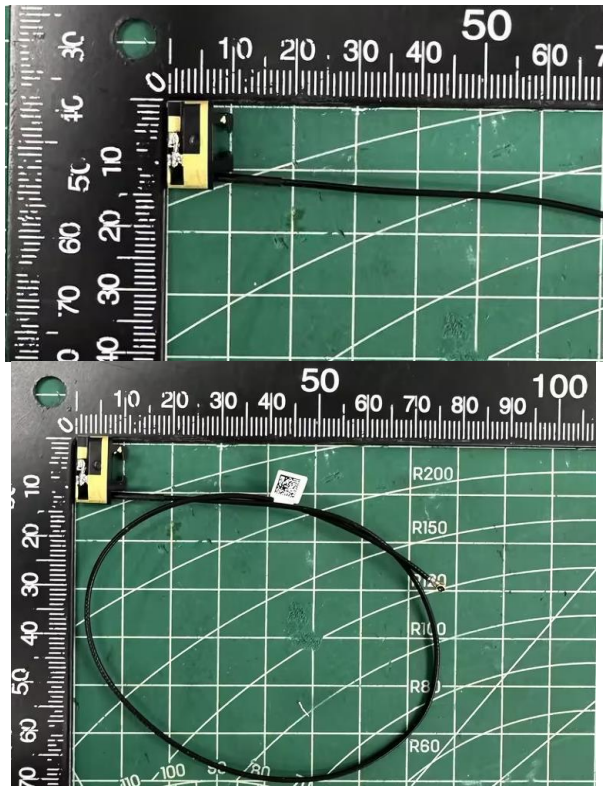
### Main Antenna

#### Antenna Drawing

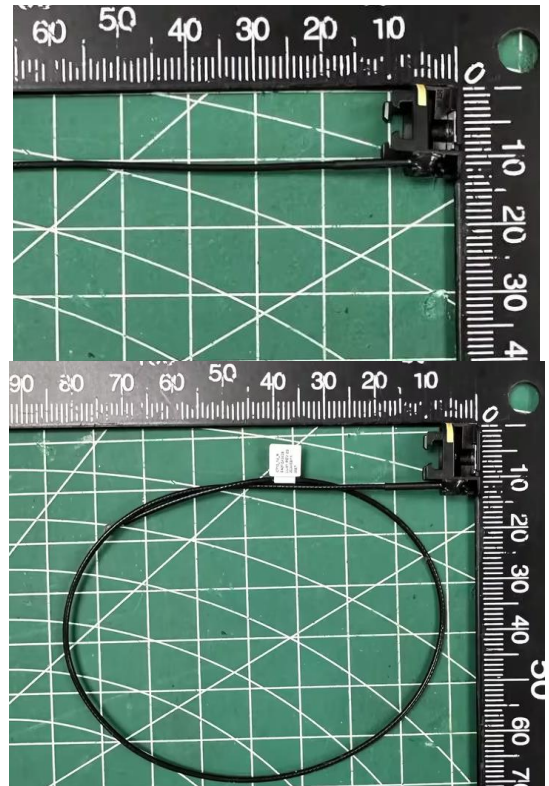


#### Antenna Photo

##### Front



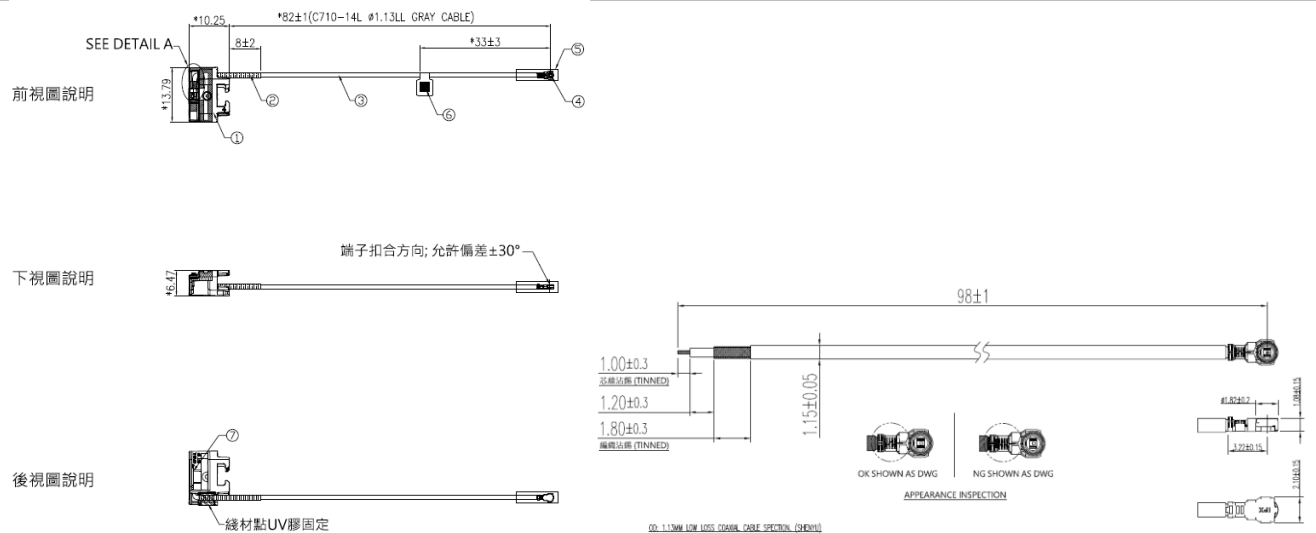
##### Back



Note: antenna photo should include L type ruler

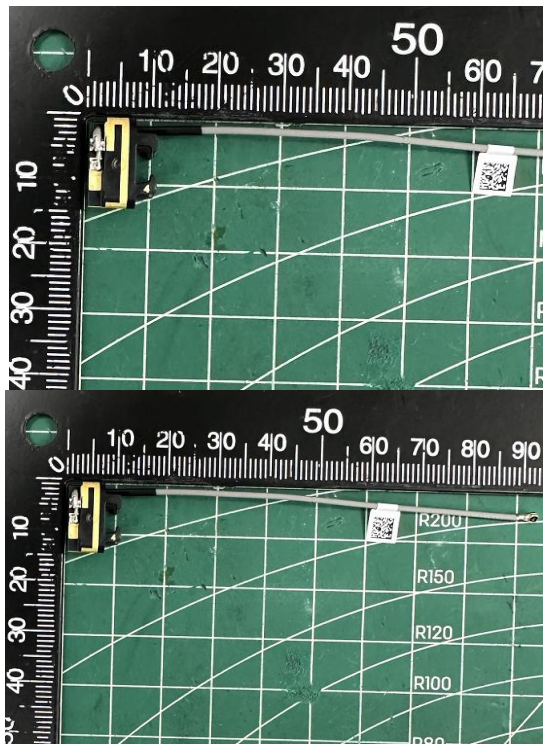
## Aux Antenna

### Antenna Drawing

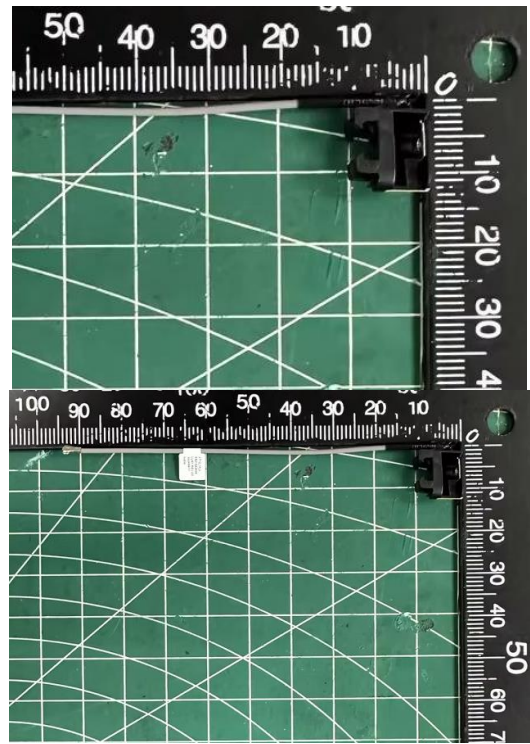


### Antenna Photo

#### Front



#### Back



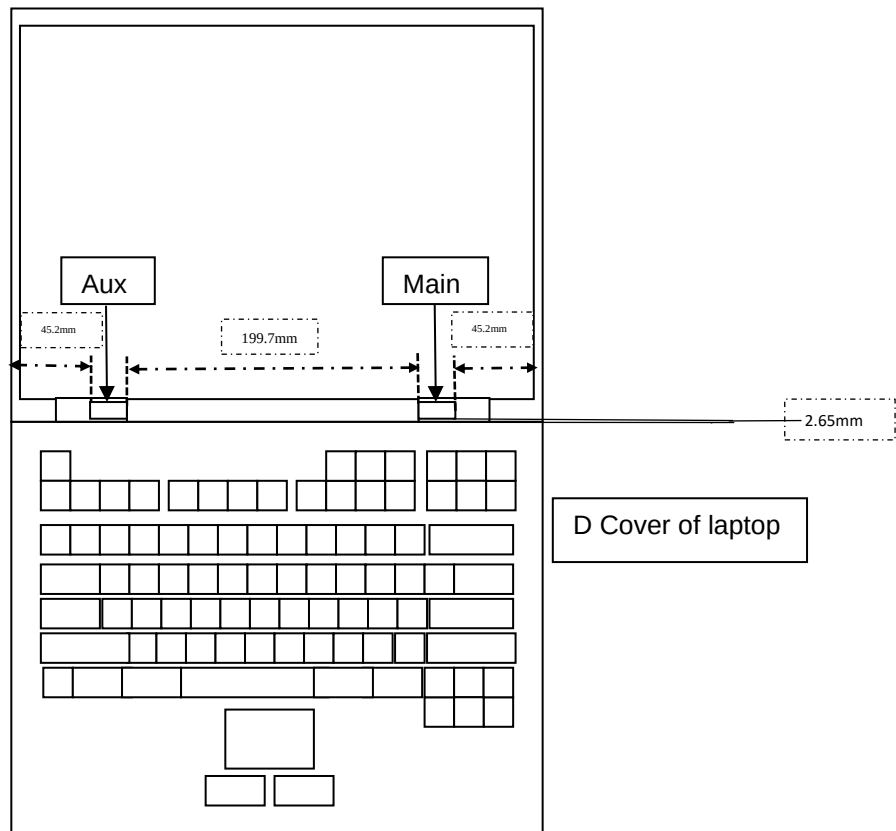
Note: antenna photo should include L type ruler

# Annex B. Antenna Location

## B.1 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).

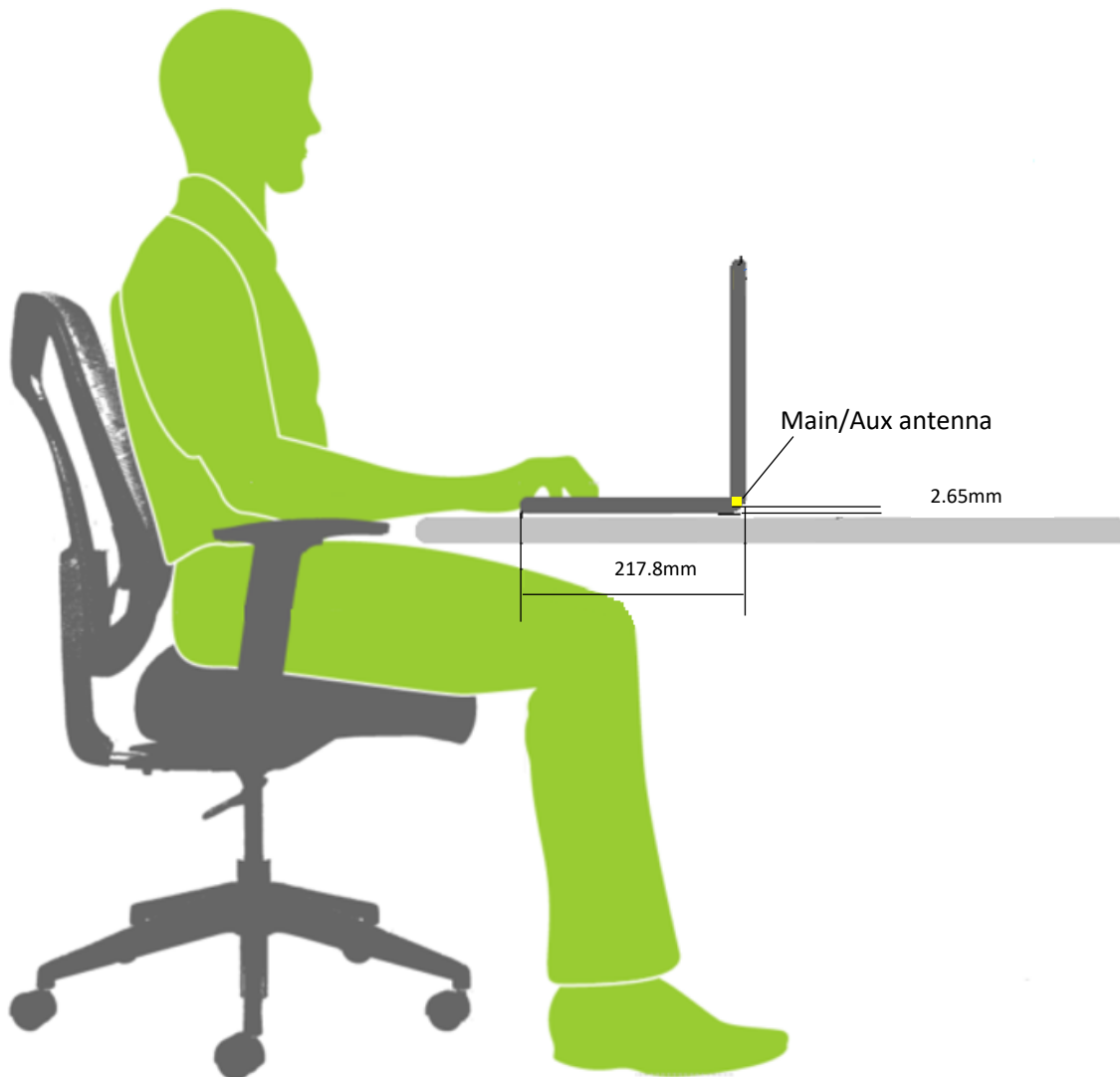
Any antenna that transmits must show dimensions to bottom of laptop. Provide a description of the materials that are used for supporting or surrounding transmit antennas; for example, non-conductive plastics vs. conductive coated plastic or metallic materials.



## B.2 Antenna dimensional information for SAR evaluation

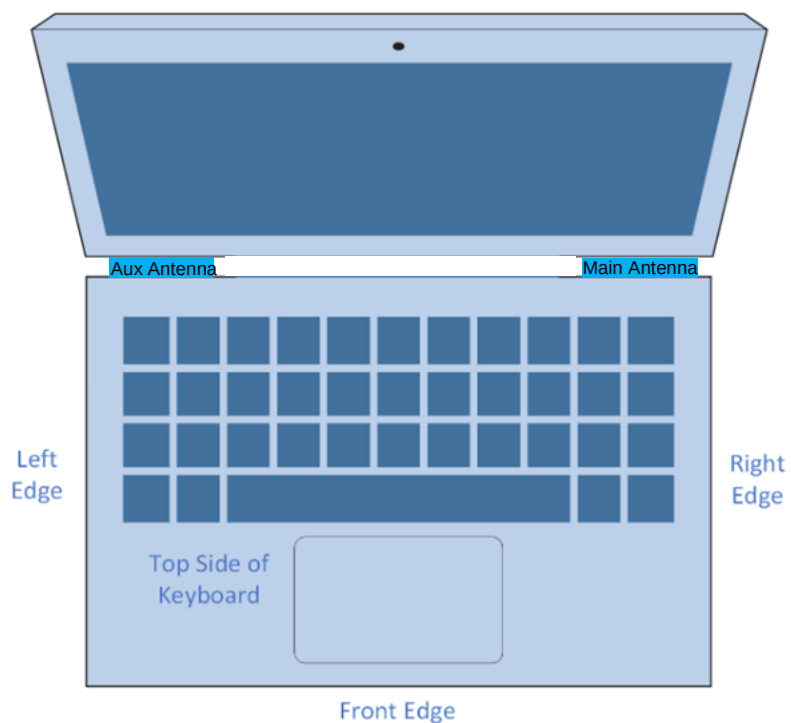
Include a dimensioned photo(s) or dimensioned drawing(s) showing the distance (mm) between the transmit antennas and the user. For notebook/laptop hosts show lapheld position (example below). For tablet hosts show all orientations including lapheld, primary & secondary portrait, primary & secondary landscape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

### Antennas on the panel section



| Measuring Surface | Antenna | Separation Distance(antenna-to- Surface)(mm) | 1g SAR   |
|-------------------|---------|----------------------------------------------|----------|
| Bottom Side       | Main    | 2.65                                         | FCC/ISED |
|                   | Aux     | 2.65                                         | FCC/ISED |

## Antennas on the keyboard section



| Measuring Surface    | Antenna | Separation Distance(antenna-to-Surface)(mm) | 1g or 10g SAR |
|----------------------|---------|---------------------------------------------|---------------|
| Bottom Side          | Main    | <b>2.65</b>                                 | 1g (FCC/ISED) |
|                      | Aux     | <b>2.65</b>                                 | 1g (FCC/ISED) |
| Front Edge           | Main    | <b>N/A</b>                                  | 1g (ISED)     |
|                      | Aux     | <b>N/A</b>                                  | 1g (ISED)     |
| Left Edge            | Main    | <b>N/A</b>                                  | 10g (ISED)    |
|                      | Aux     | <b>N/A</b>                                  | 10g (ISED)    |
| Right Edge           | Main    | <b>N/A</b>                                  | 10g (ISED)    |
|                      | Aux     | <b>N/A</b>                                  | 10g (ISED)    |
| Top side of Keyboard | Main    | <b>N/A</b>                                  | 10g (ISED)    |
|                      | Aux     | <b>N/A</b>                                  | 10g (ISED)    |