



ADA-X4YZ External 3 in 1 Combination Antenna

Feature:

- GNSS / LTE/5G /WiFi / 3 in 1 Combination Antenna
- GPS/GLONASS/Beidou/Galileo/QZSS Supporting
- LTE MIMO or Dual Band WiFi MIMO + Full Band GNSS
- Versatile Combination with up to 3 Cables
- IP69K fully waterproof and ESD Protection
- Magnetic / Adhesive / Screw Mounted Options
- Cable & Connector are customizable

Application:

- Navigation System Application
- Machine to Machine Application
- IoT Application

RoHS/Reach

Specifications:

| Category | GNSS | | |
|-----------------------------|---|------------------|------------|
| Application Band | BeiDou | GPS | GLONASS |
| Frequency(MHz) | 1561 | 1575.42 | 1602 |
| Efficiency(%) | 49.89 | 42.76 | 58.61 |
| Average Gain(dBi) | -3.02 | -3.69 | -2.32 |
| Peak Gain(dBi) | 1.21 | 1.21 | 1.44 |
| Active antenna performance | | | |
| Application band | BeiDou | GPS | GLONASS |
| Frequency(MHz) | 1561±2.046MHz | 1575.42±1.023MHz | 1602 ±5MHz |
| Gain(dB) | 27 | 27 | 27 |
| Noise(dB) | 0.98 | 0.98 | 0.92 |
| Current Consumption | 9.0mA(typical) | | |
| Output Impedance | 50Ω | | |
| GNSS_outband rejection | | | |
| Frequency(MHz) | 600~1300 | 1300~1530 | 1650~3000 |
| Gain(dB) | 55 | 30 | 30 |
| Passive antenna performance | | | |
| VSWR | < 2 | | |
| Return loss | < -10 | | |
| Impedance | 50Ω | | |
| Polarization | RHCP | | |
| ESD Protection | +/- 8 KV (direct discharge) +/- 15kV (air discharge) | | |
| Cable/Connector | H-100, 3 meters , SMA(M) | | |

| Category | | LTE | | | | | | |
|------------------------------|------|---------|-------------|-----------|-----------|-----------|-----------|-------------|
| Application Band | | LTE 700 | GSM 850/900 | DCS | PCS | UMTS1 | LTE2600 | 5G NR Band* |
| Frequency (MHz) | | 698~824 | 824~960 | 1710~1880 | 1850~1990 | 1920~2170 | 2300~2690 | 3300~3800 |
| Efficiency(%) | | | | | | | | |
| Free space | 30cm | 55.81 | 70.29 | 67.89 | 73.24 | 64.68 | 58.18 | 15.73 |
| | 1m | 54.29 | 68.18 | 65.13 | 70.22 | 61.80 | 55.05 | 14.78 |
| | 2m | 49.51 | 61.59 | 56.73 | 61.00 | 53.11 | 45.79 | 12.02 |
| | 3m | 45.16 | 55.63 | 49.41 | 52.99 | 45.64 | 38.08 | 9.77 |
| | 5m | 37.56 | 45.39 | 37.48 | 39.99 | 33.70 | 26.35 | 6.45 |
| On the 30*30 cm ground plane | 30cm | 40.09 | 48.87 | 52.66 | 60.24 | 57.01 | 40.48 | 17.21 |
| | 1m | 38.99 | 47.40 | 50.52 | 57.75 | 54.47 | 38.30 | 16.17 |
| | 2m | 35.56 | 42.81 | 44.00 | 50.17 | 46.81 | 31.86 | 13.14 |
| | 3m | 32.43 | 38.67 | 38.32 | 43.58 | 40.23 | 26.50 | 10.68 |
| | 5m | 26.98 | 31.56 | 29.07 | 32.89 | 29.71 | 18.33 | 7.06 |
| Average Gain(dBi) | | | | | | | | |
| Free space | 30cm | -2.53 | -1.53 | -1.68 | -1.35 | -1.89 | -2.35 | -8.03 |
| | 1m | -2.65 | -1.66 | -1.86 | -1.54 | -2.09 | -2.59 | -8.30 |
| | 2m | -3.05 | -2.11 | -2.46 | -2.15 | -2.75 | -3.39 | -9.20 |
| | 3m | -3.45 | -2.55 | -3.06 | -2.76 | -3.41 | -4.19 | -10.10 |
| | 5m | -4.25 | -3.43 | -4.26 | -3.98 | -4.72 | -5.79 | -11.90 |
| On the 30*30 cm ground plane | 30cm | -3.97 | -3.11 | -2.79 | -2.20 | -2.44 | -3.93 | -7.64 |
| | 1m | -4.09 | -3.24 | -2.97 | -2.38 | -2.64 | -4.17 | -7.91 |
| | 2m | -4.49 | -3.68 | -3.57 | -3.00 | -3.30 | -4.97 | -8.81 |
| | 3m | -4.89 | -4.13 | -4.17 | -3.61 | -3.96 | -5.77 | -9.71 |
| | 5m | -5.69 | -5.01 | -5.37 | -4.83 | -5.27 | -7.37 | -11.51 |
| Peak Gain(dBi) | | | | | | | | |
| Free space | 30cm | 3.74 | 4.39 | 4.95 | 4.95 | 4.49 | 7.36 | -0.51 |
| | 1m | 3.62 | 4.24 | 4.77 | 4.77 | 4.31 | 7.12 | -0.78 |
| | 2m | 3.22 | 3.74 | 4.17 | 4.17 | 3.71 | 6.32 | -1.68 |
| | 3m | 2.82 | 3.24 | 3.57 | 3.57 | 3.11 | 5.52 | -2.58 |

| | | | | | | | | |
|------------------------------------|------|-------------------|-------|-------|-------|-------|-------|-------|
| | 5m | 2.02 | 2.24 | 2.37 | 2.37 | 1.91 | 3.92 | -4.38 |
| On the 30*30 cm ground plane | 30cm | 2.42 | 3.82 | 3.61 | 4.60 | 4.62 | 3.75 | 1.30 |
| | 1m | 2.30 | 3.70 | 3.43 | 4.39 | 4.41 | 3.51 | 1.03 |
| | 2m | 1.90 | 3.30 | 2.83 | 3.79 | 3.79 | 2.71 | 0.13 |
| | 3m | 1.50 | 2.90 | 2.23 | 3.19 | 3.19 | 1.91 | -0.77 |
| | 5m | 0.70 | 2.10 | 1.03 | 1.99 | 1.99 | 0.31 | -2.57 |
| VSWR | | < 3 | | | | | | |
| Return loss | | < -6 | | | | | | |
| Impedance | | 50Ω | | | | | | |
| Polarization | | Linear | | | | | | |
| Category | | WiFi | | | | | | |
| Frequency (MHz) | | 2400 | 2450 | 2500 | 5150 | 5350 | 5725 | 5850 |
| Efficiency(%) | | | | | | | | |
| Free space | | 73.45 | 71.61 | 74.47 | 59.84 | 57.15 | 49.66 | 40.46 |
| On the 30*30 cm ground plane | | 49.09 | 46.77 | 50.00 | 53.83 | 55.98 | 49.43 | 36.39 |
| Average Gain(dBi) | | | | | | | | |
| Free space | | -1.34 | -1.45 | -1.28 | -2.23 | -2.43 | -3.04 | -3.93 |
| On the 30*30 cm ground plane | | -3.09 | -3.30 | -3.01 | -2.69 | -2.52 | -3.06 | -4.39 |
| Peak Gain(dBi) | | | | | | | | |
| Free space | | 6.44 | 7.23 | 7.87 | 6.97 | 4.89 | 4.46 | 4.19 |
| On the 30*30 cm ground plane | | 3.44 | 2.85 | 3.19 | 4.64 | 5.25 | 5.26 | 1.62 |
| VSWR | | < 2 | | | | | | |
| Return loss | | < -10 | | | | | | |
| Impedance | | 50 Ω | | | | | | |
| Polarization | | Linear | | | | | | |
| PHYSICAL CONSTRUCTION | | | | | | | | |
| Dimension | | Φ64.7mm, H:15.8mm | | | | | | |
| ENVIRONMENTAL CONDITIONS | | | | | | | | |
| Operation Temperature | | -40~85℃ | | | | | | |

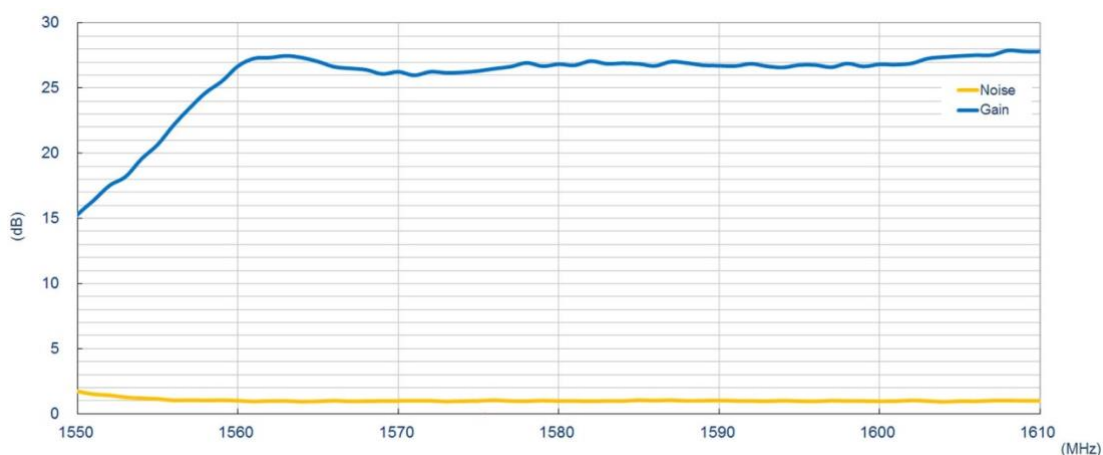
Storage Temperature

-40~85°C

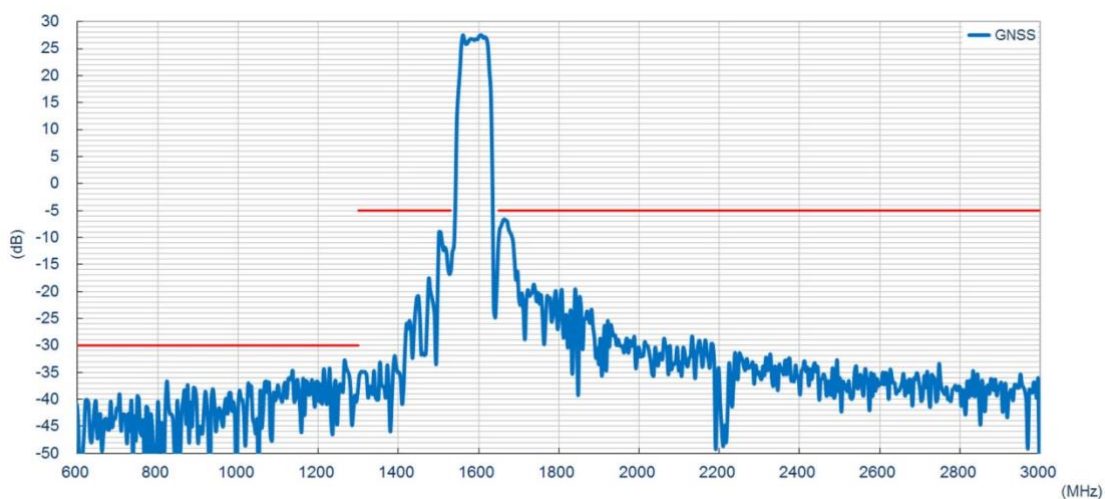
- **5G band is not yet optimized in this datasheet**

Analysis Antenna Performance:

GNSS_Noise & gain :

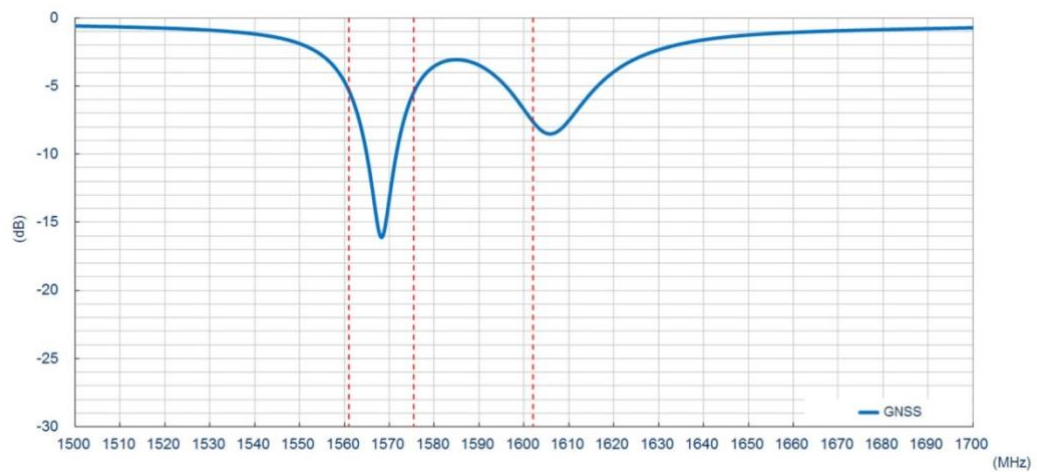


GNSS_outband rejection :

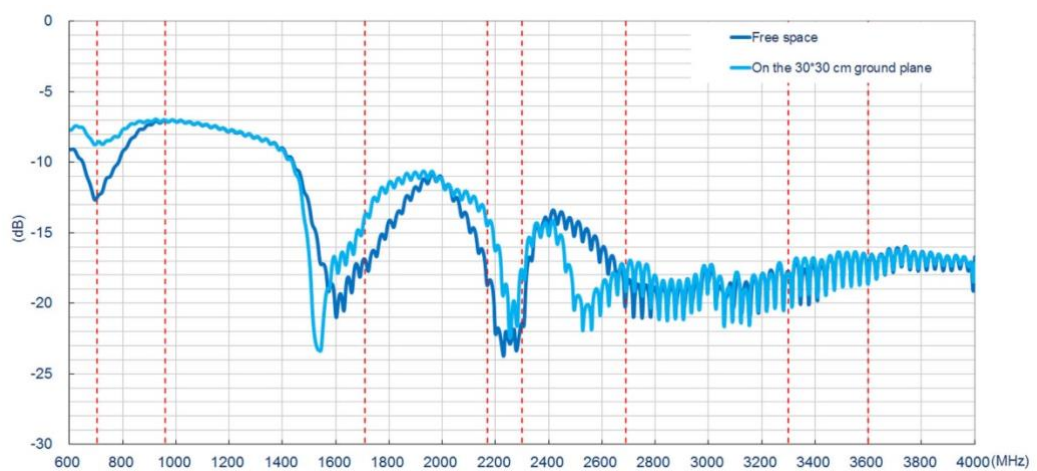


S-parameters:

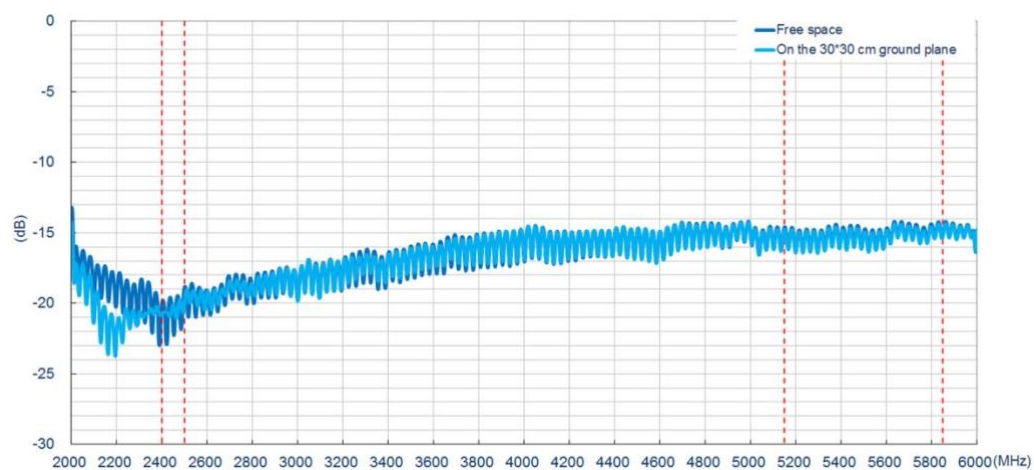
GNSS



LTE

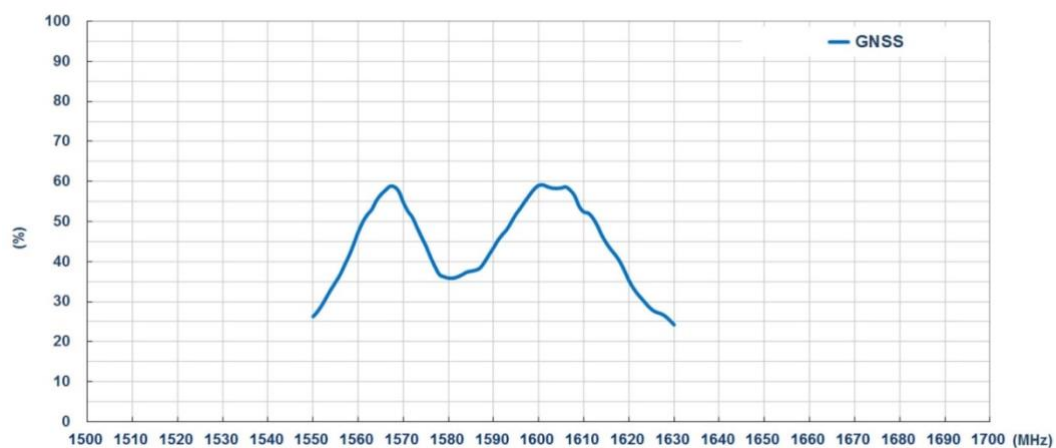


WIFI

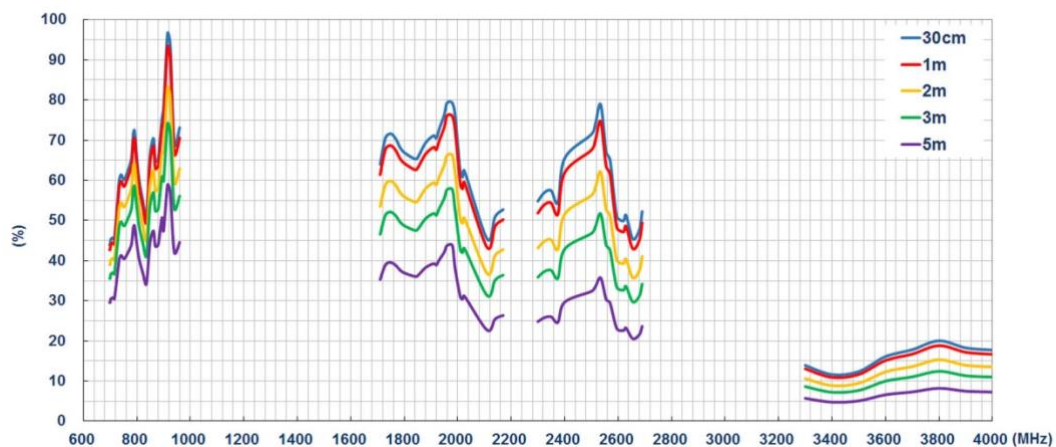


Efficiency:

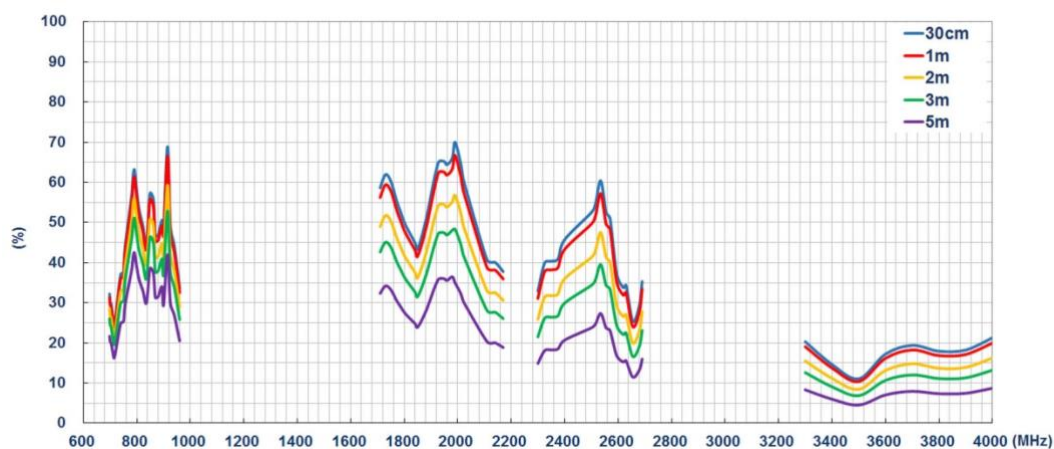
GNSS



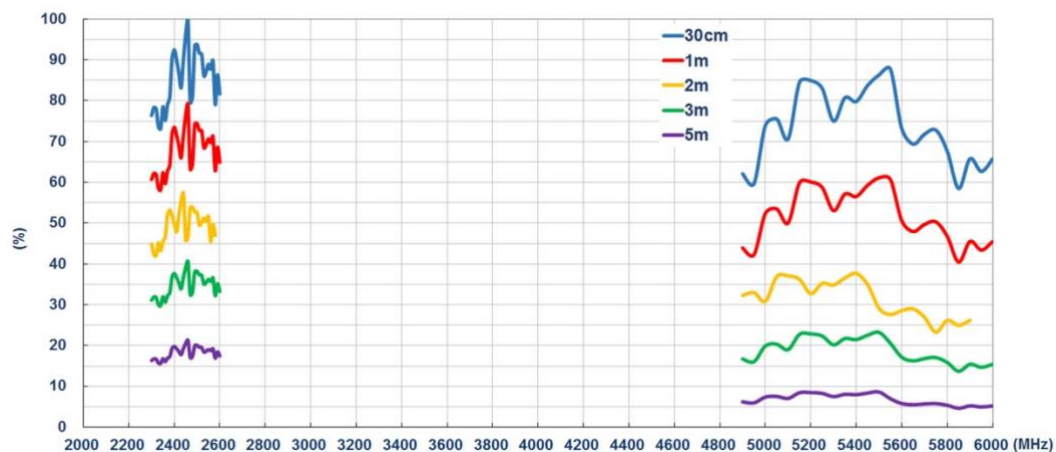
LTE (Free space)



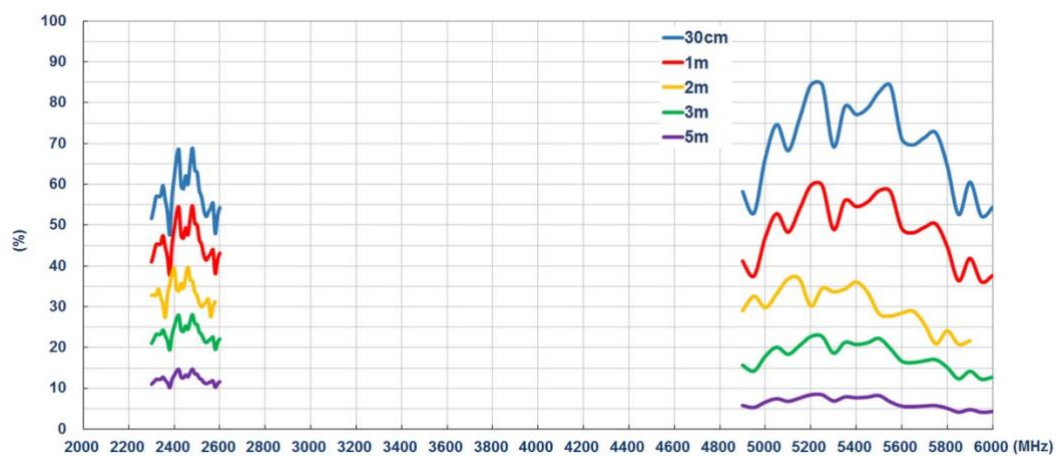
LTE (On the 30*30 cm ground plane)



WIFI (Free space)

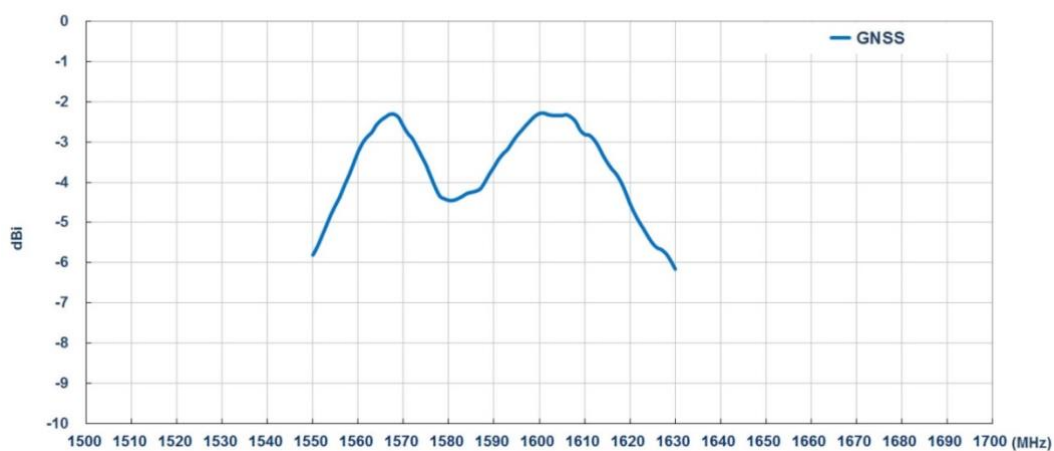


WIFI (On the 30*30 cm ground plane)

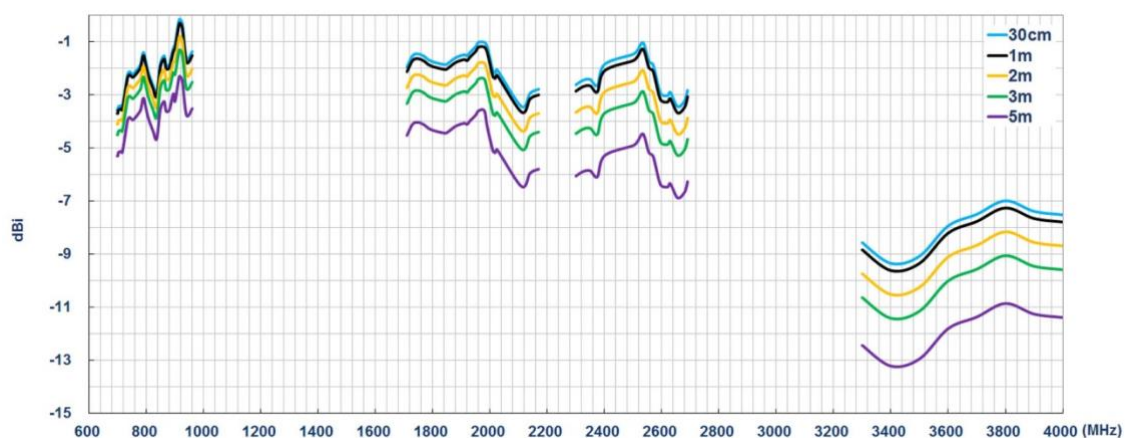


Average Gain:

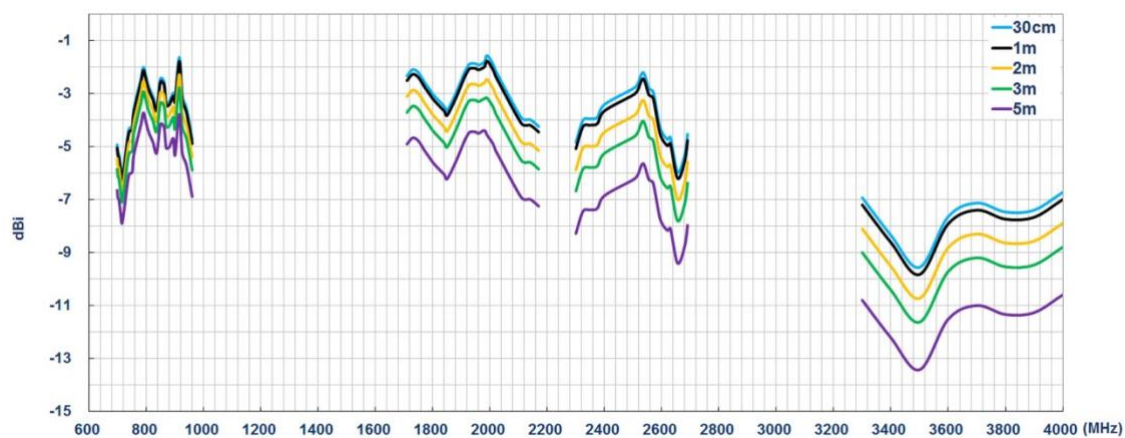
GNSS



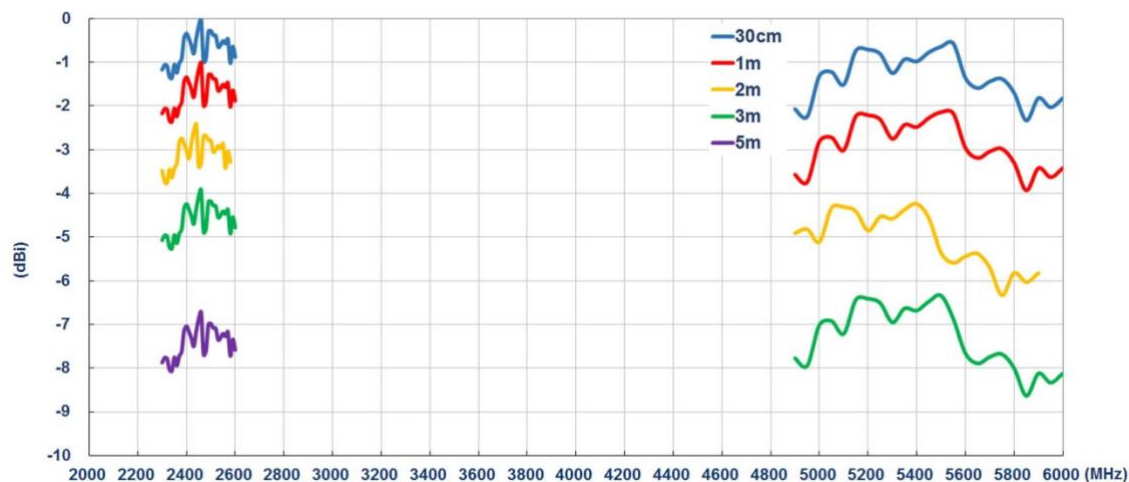
LTE (Free space)



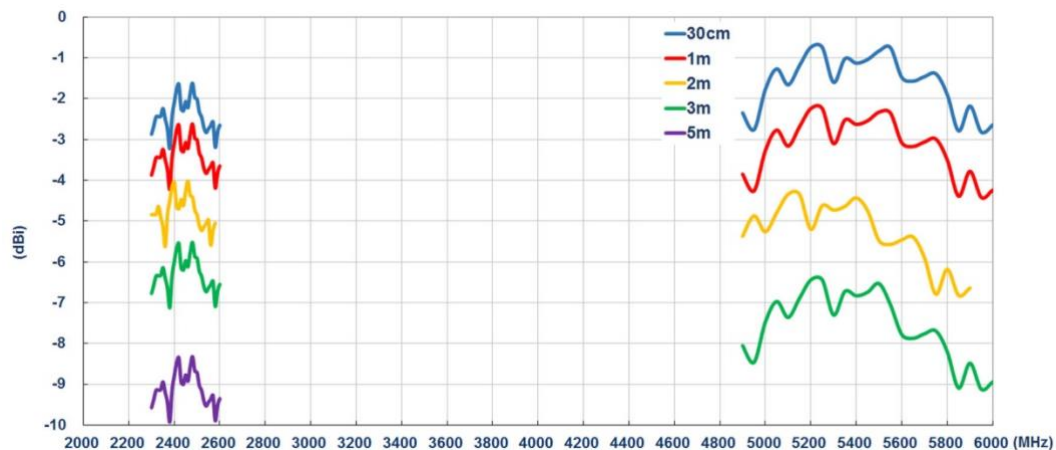
LTE (On the 30*30 cm ground plane)



WIFI (Free space)

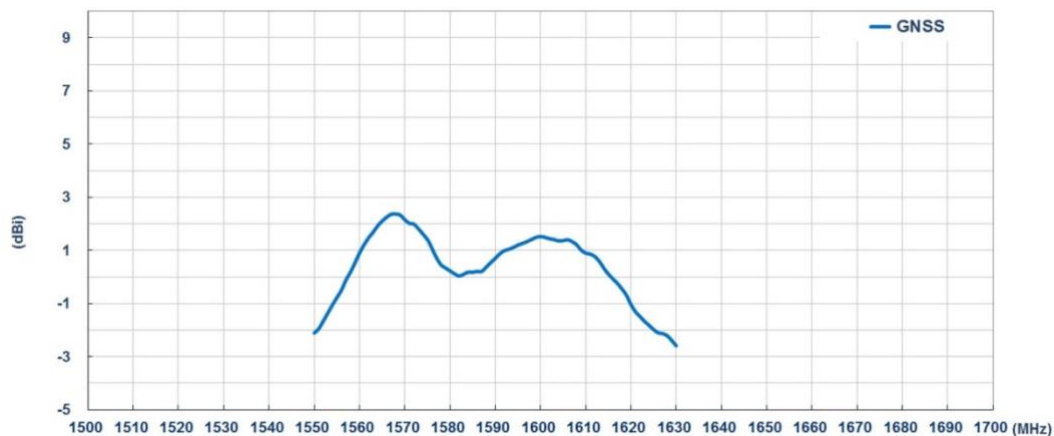


WIFI (On the 30*30 cm ground plane)

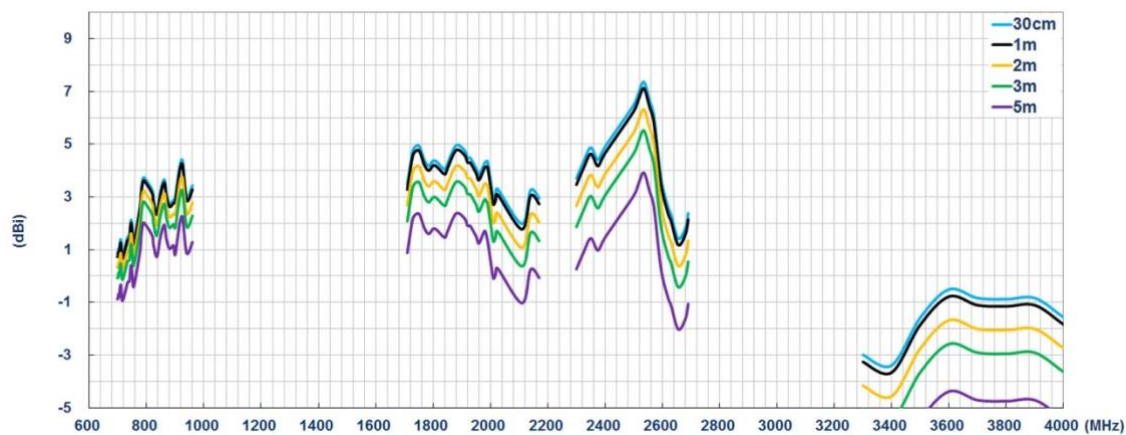


Peak Gain :

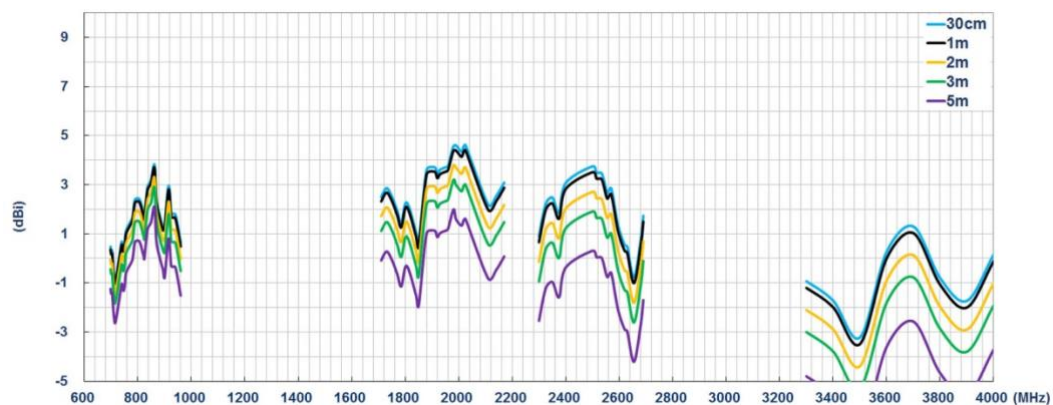
GNSS



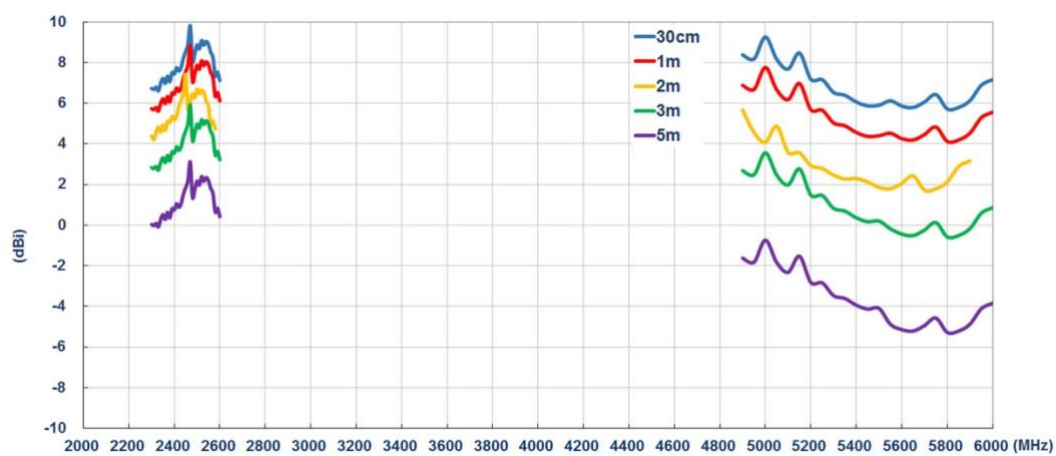
LTE (Free space)



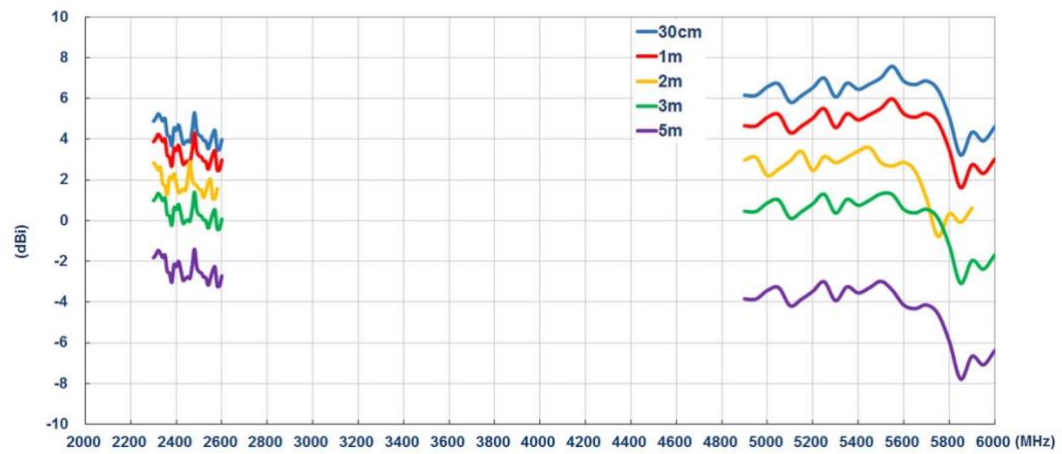
LTE (On the 30*30 cm ground plane)



WIFI (Free space)



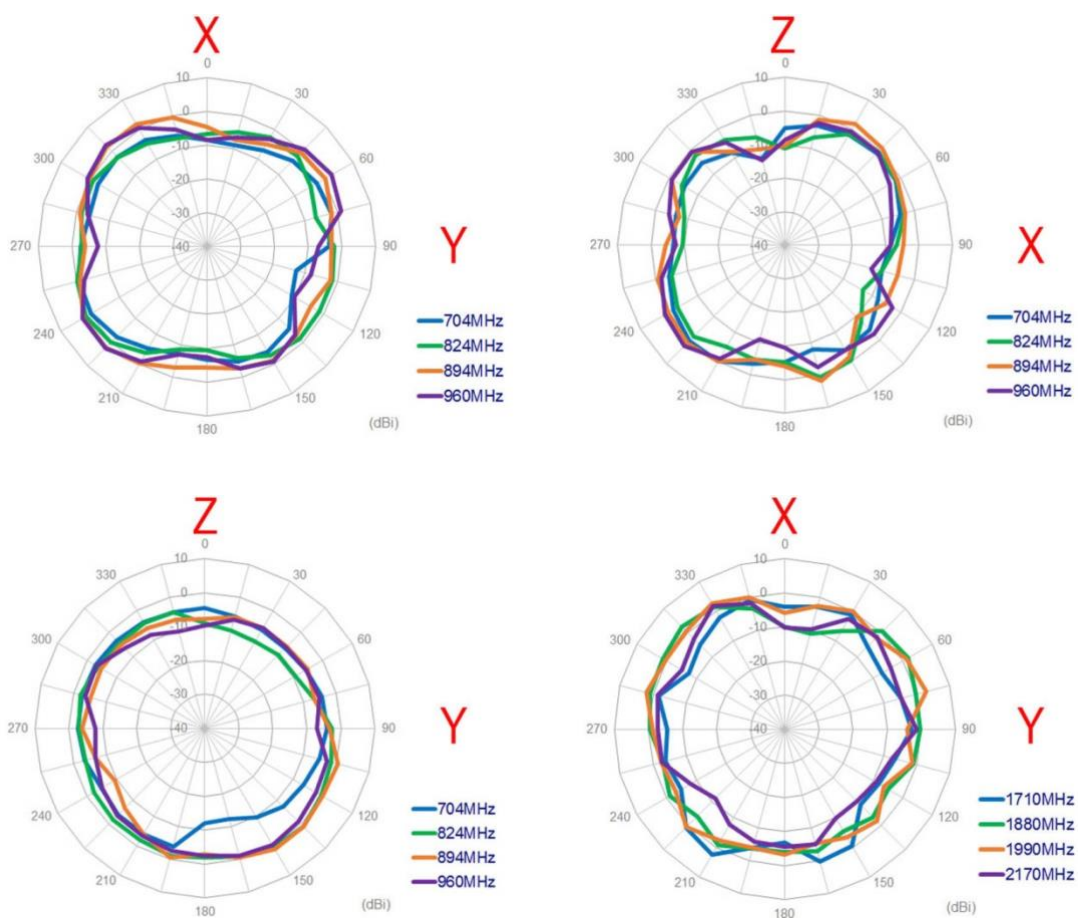
WIFI (On the 30*30 cm ground plane)

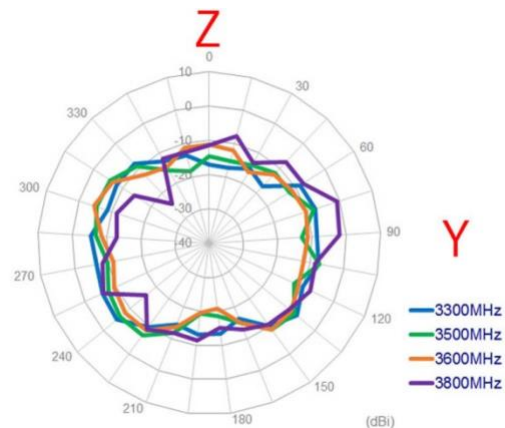
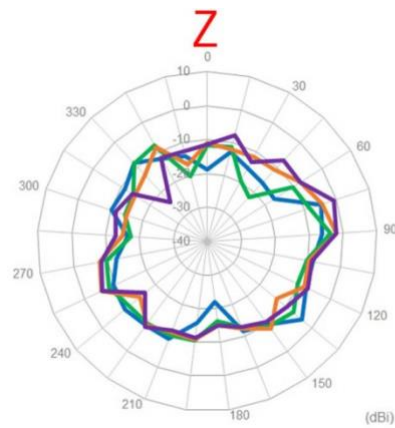
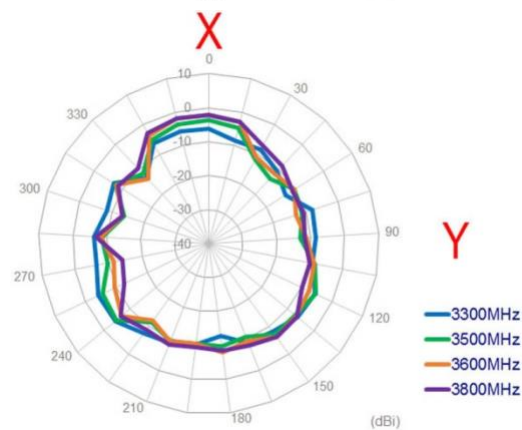
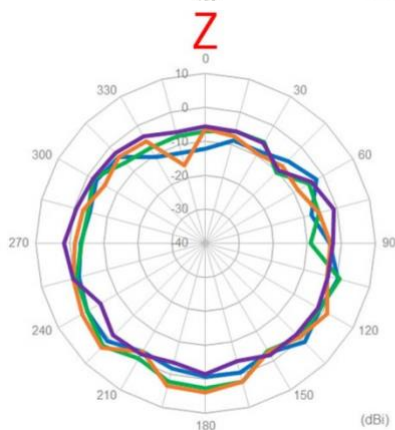
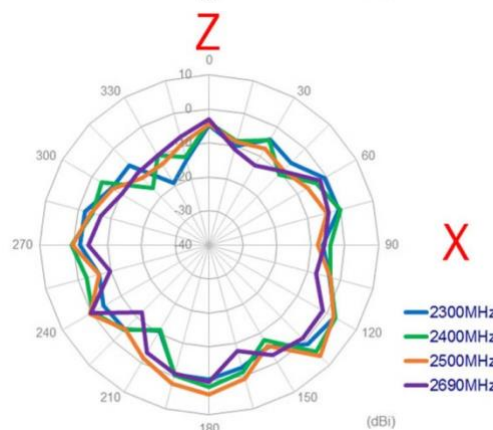
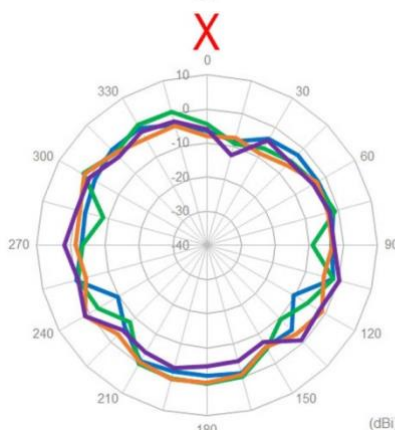
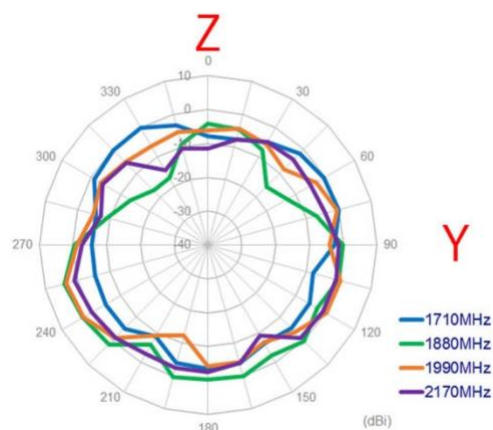
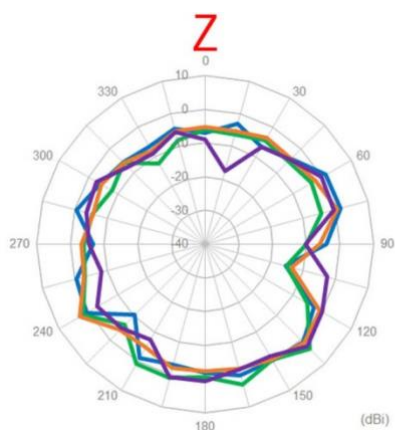


Antenna Radiation Pattern Measurement:

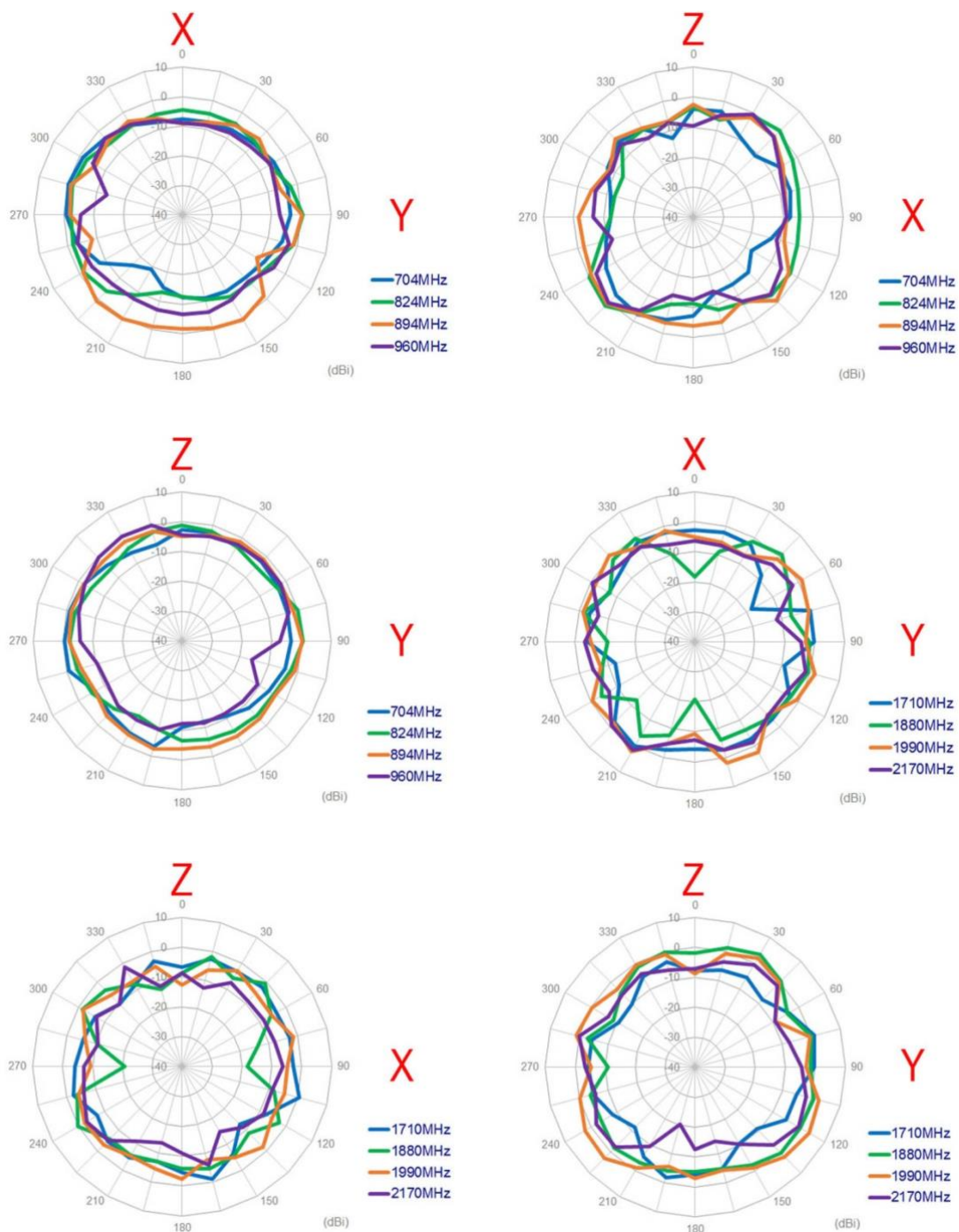
2D radiation pattern :

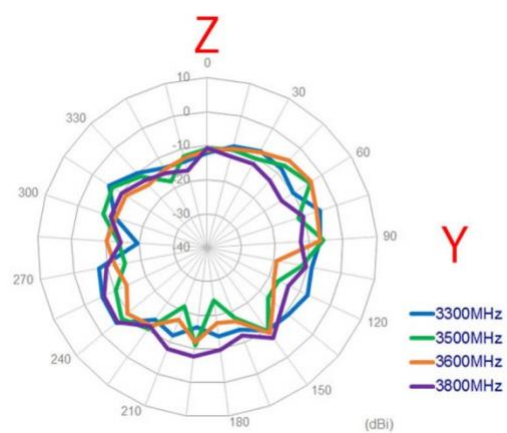
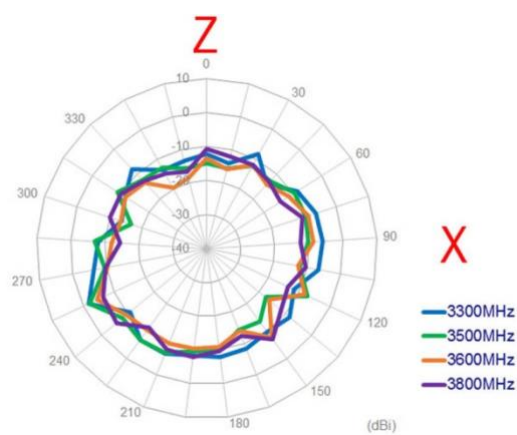
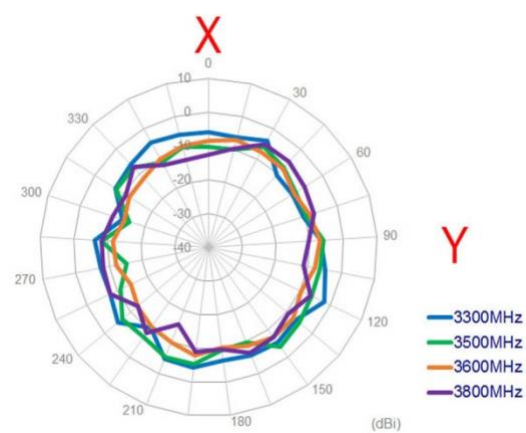
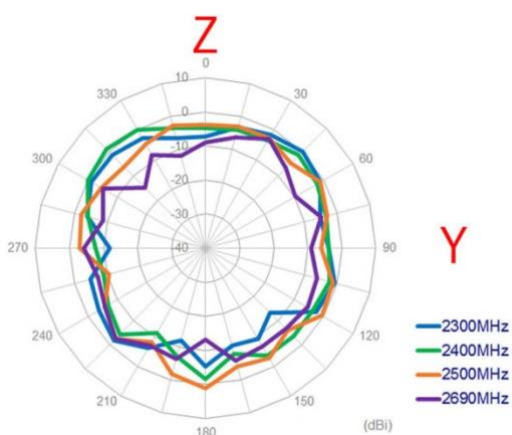
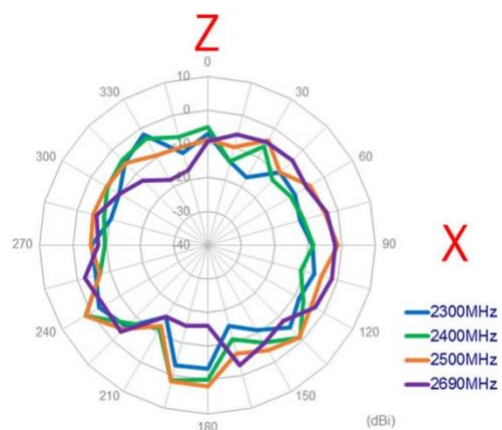
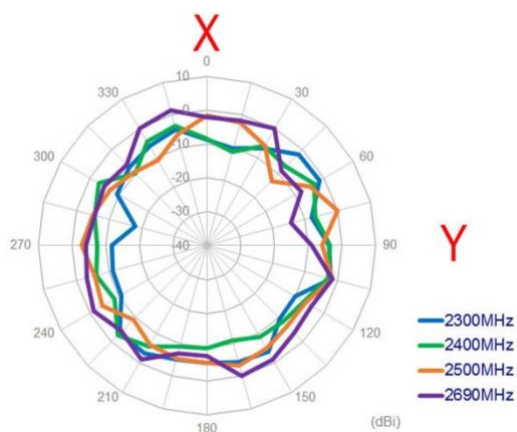
LTE (Free space)



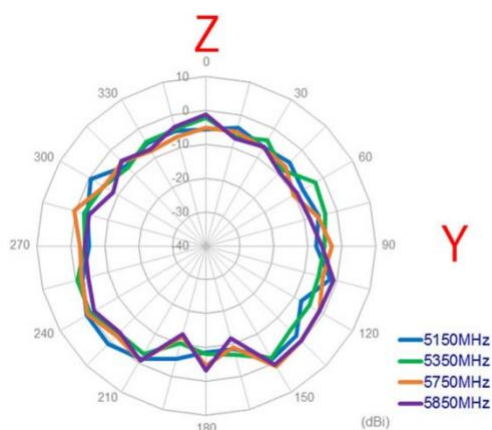
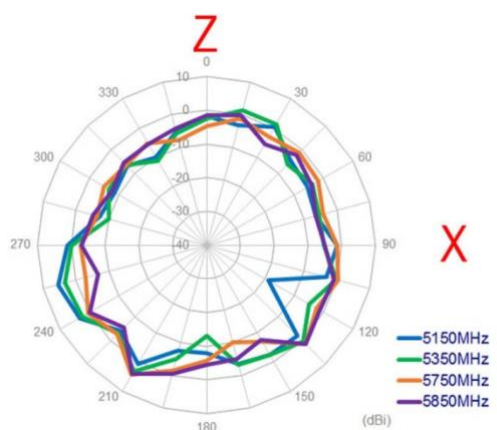
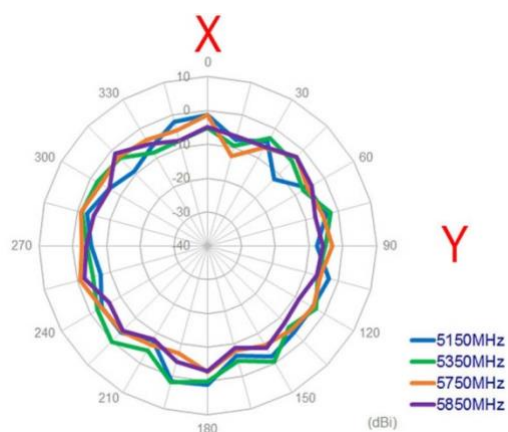
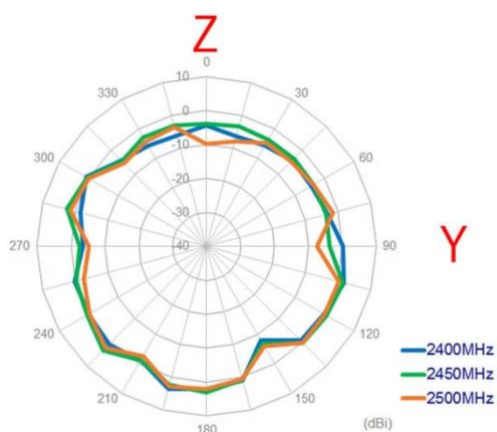
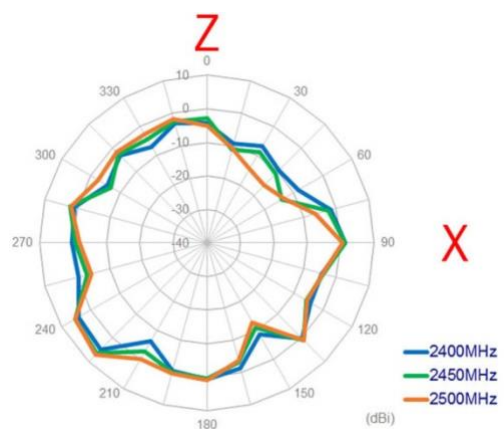
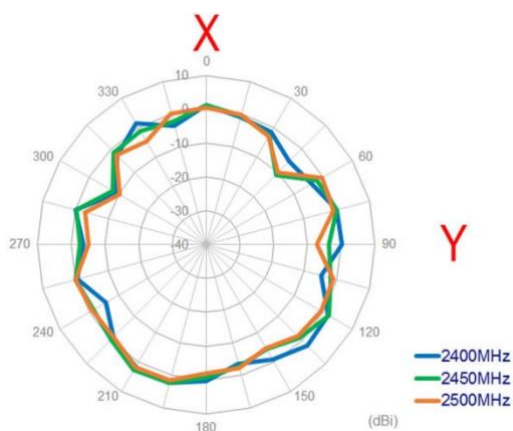


LTE (On the 30*30 cm ground plane)

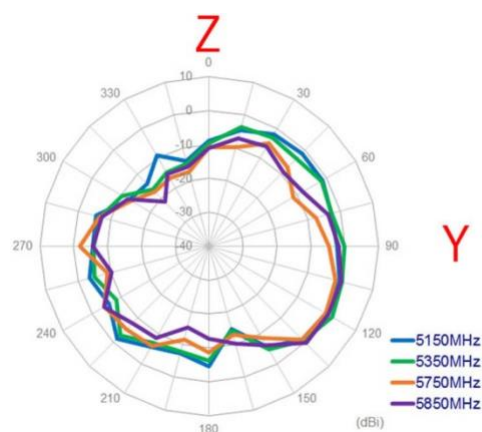
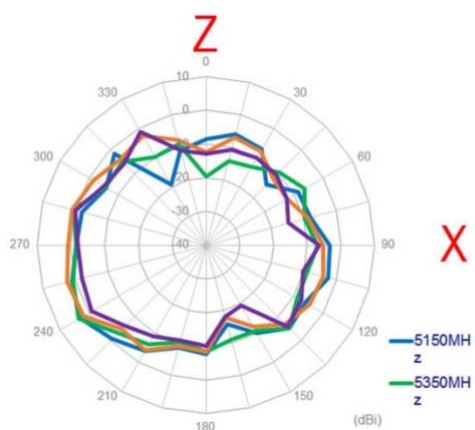
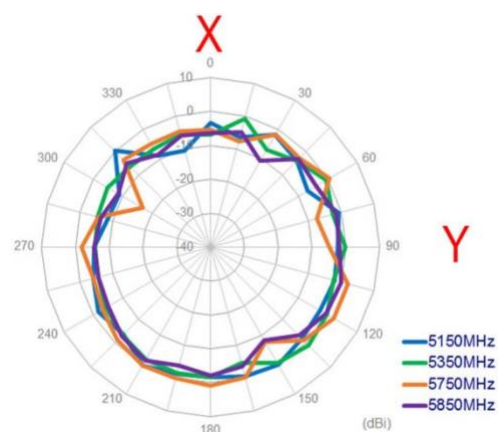
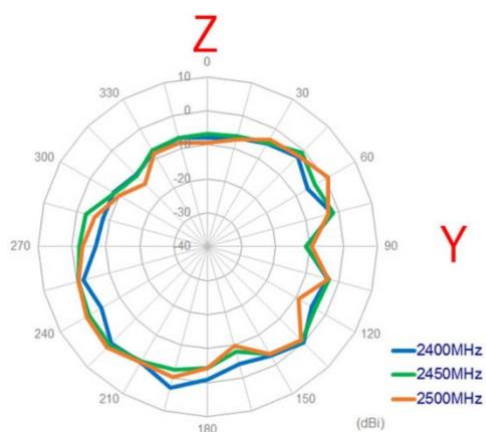
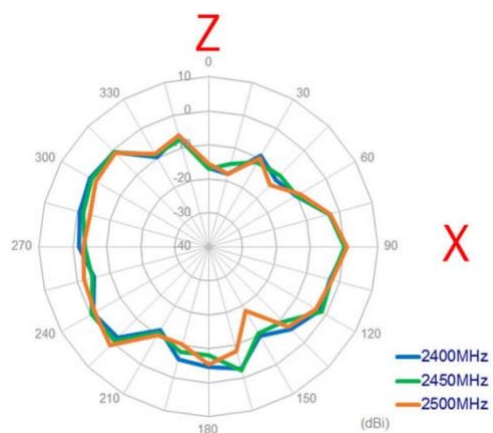
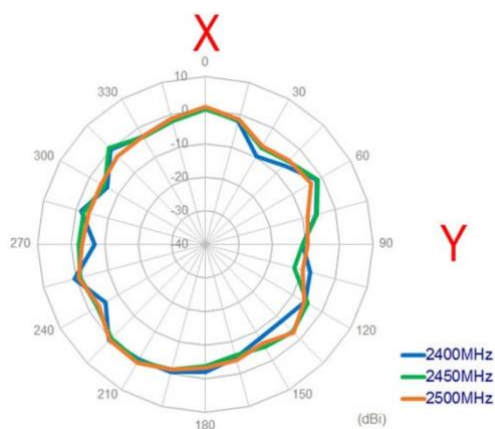




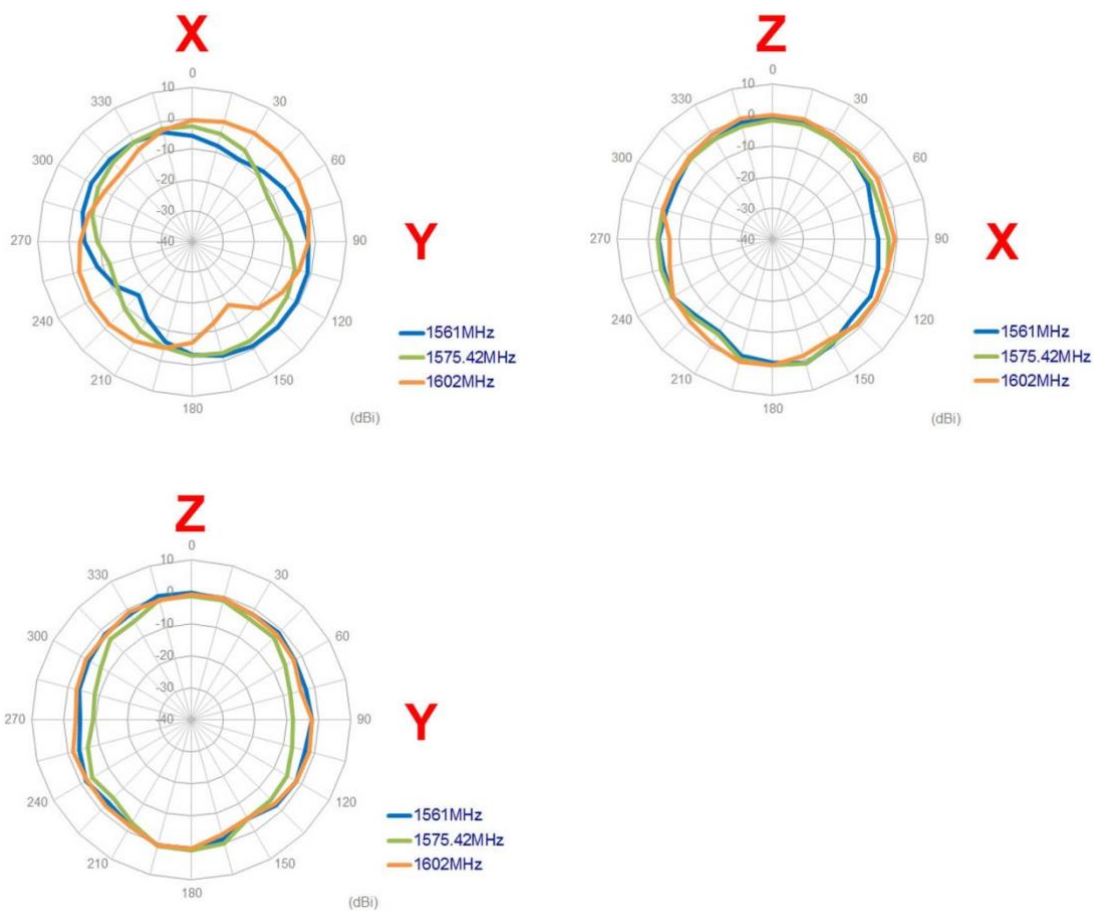
WIFI (Free space)



WIFI (On the 30*30 cm ground plane)

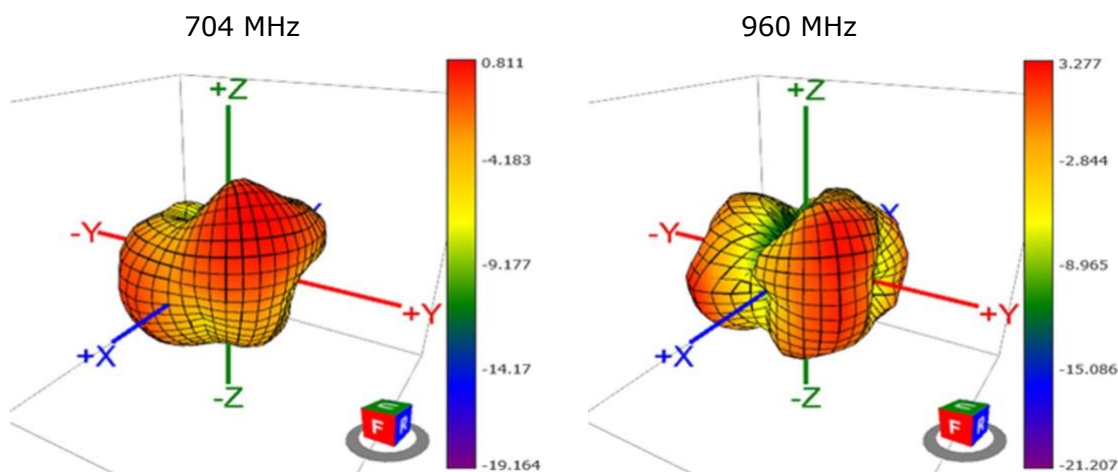


GNSS



3D radiation pattern :

LTE (Free space)

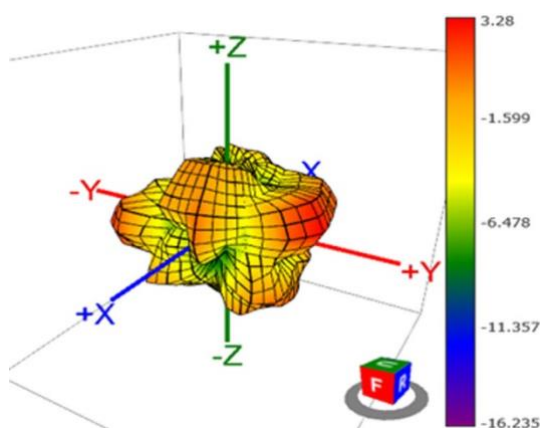


Adactus AB, Mariehillsvägen 19, 133 37 Saltsjöbaden, Sweden

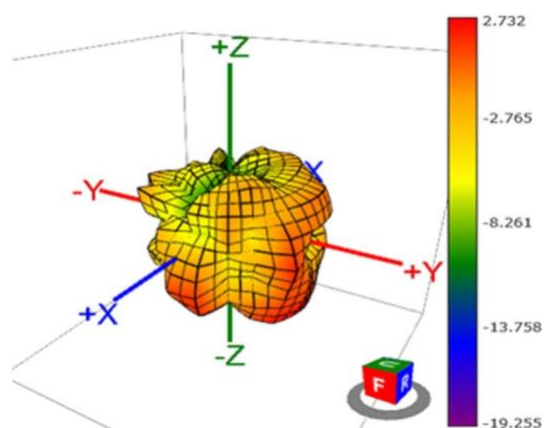
Tel: +46 8 608 17 70, Fax: +46 8 608 07 10

E-mail: m2m@adactus.se <http://www.adactus.se/>

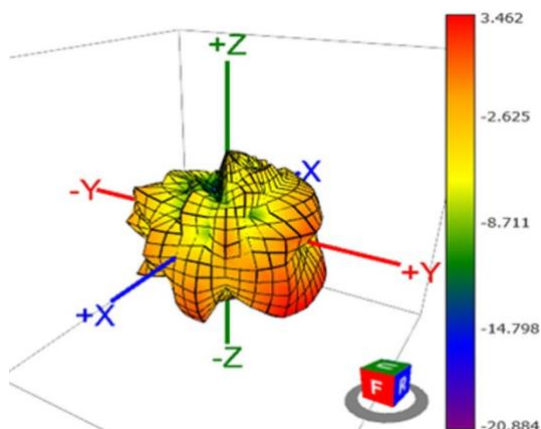
1710 MHz



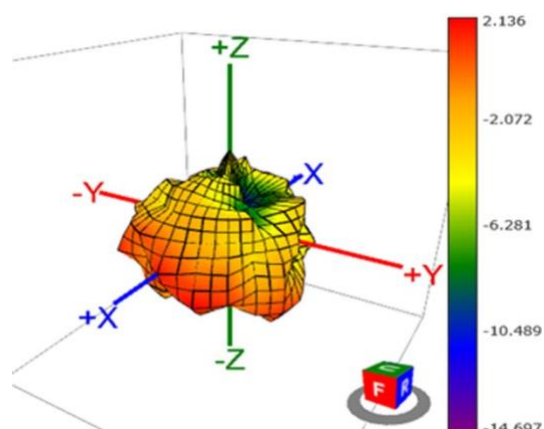
2170 MHz



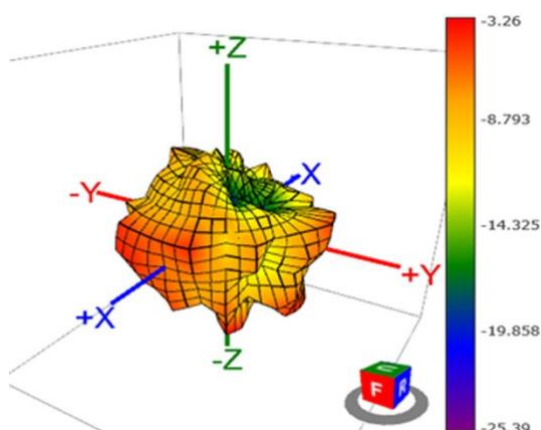
2300 MHz



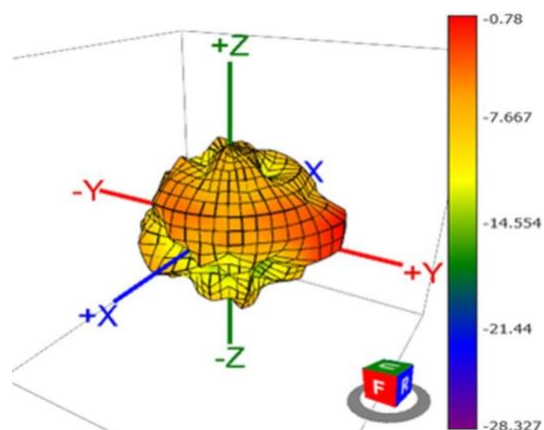
2690 MHz



3300 MHz

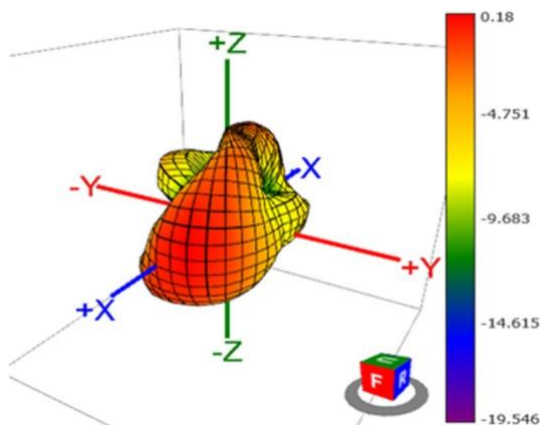


3800 MHz

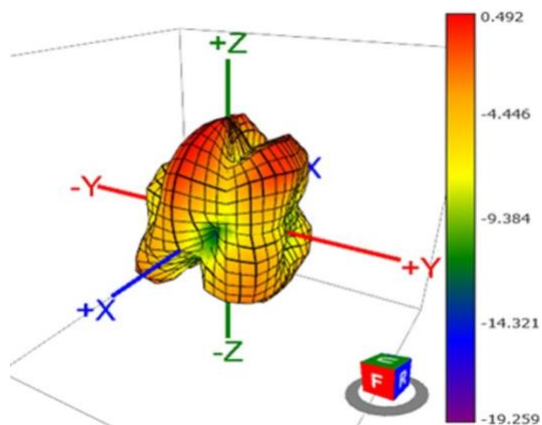


LTE (On the 30*30 cm ground plane)

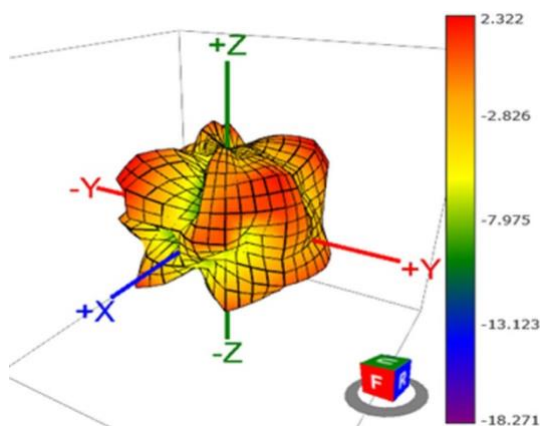
704 MHz



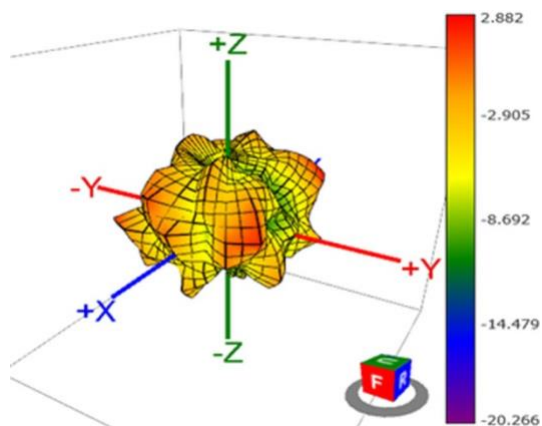
960 MHz



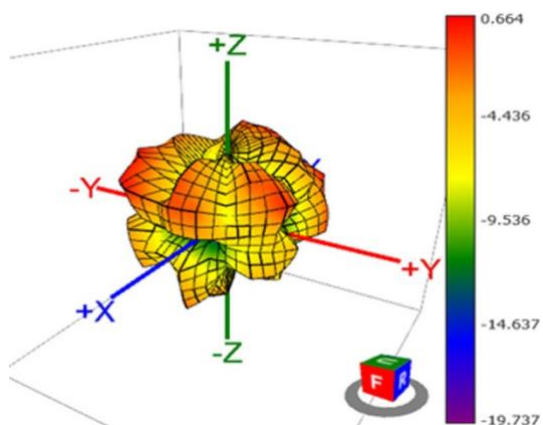
1710 MHz



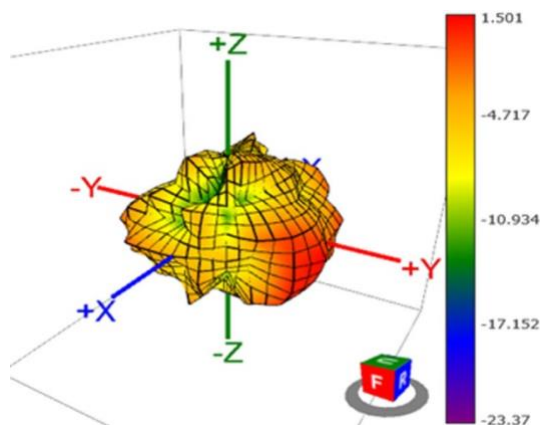
2170 MHz



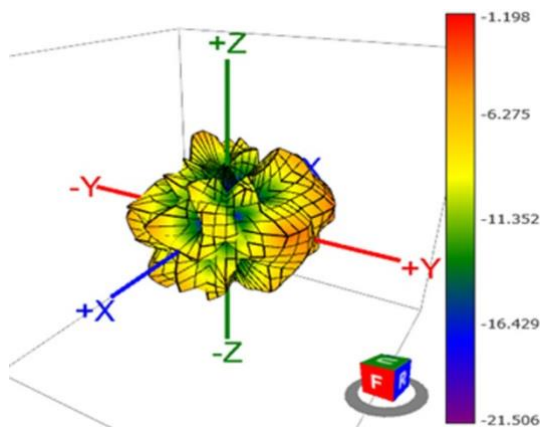
2300 MHz



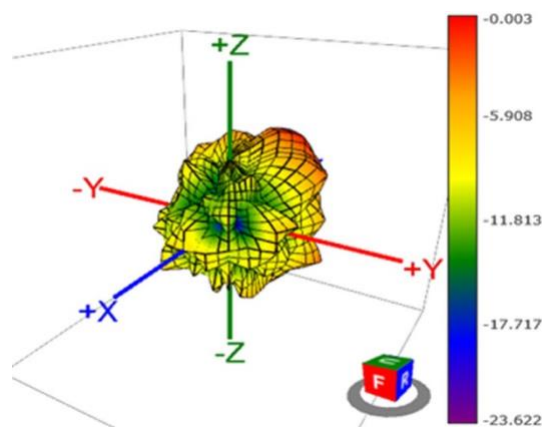
2690 MHz



3300 MHz

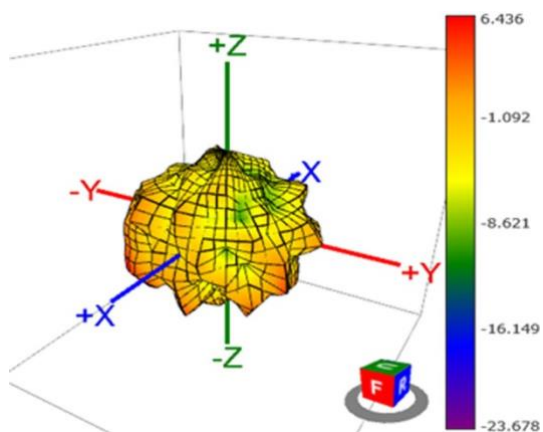


3800 MHz

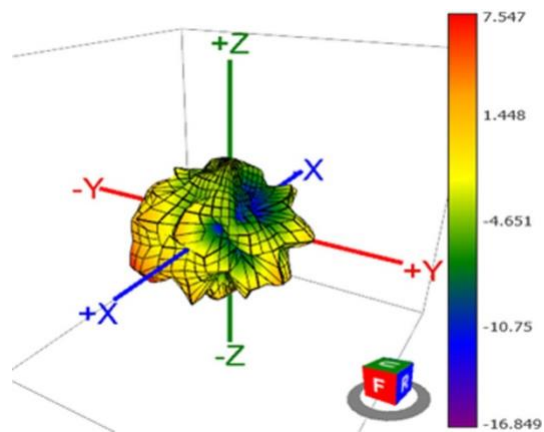


WIFI (Free space)

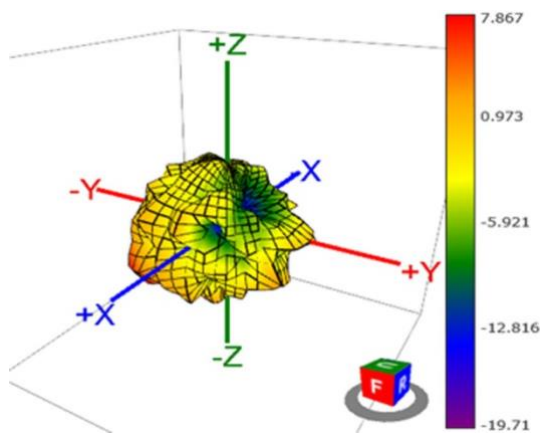
2400 MHz



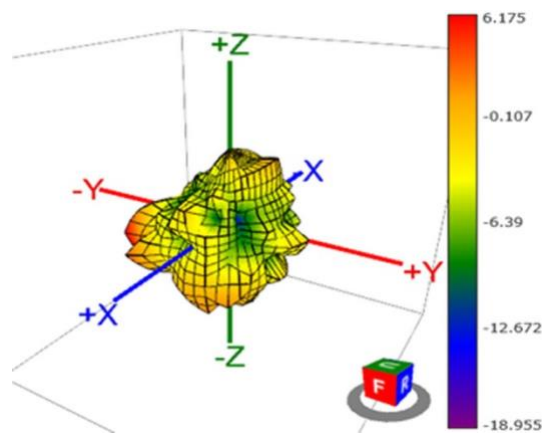
2450 MHz



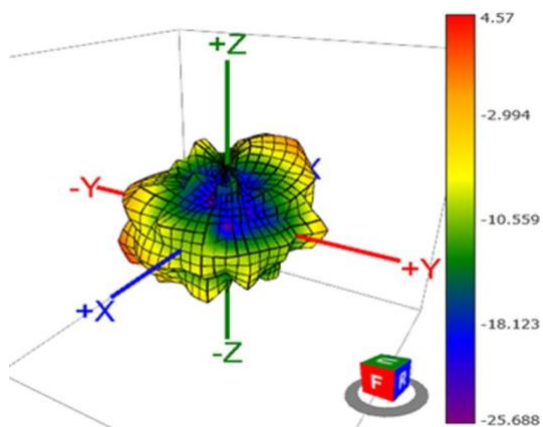
2500 MHz



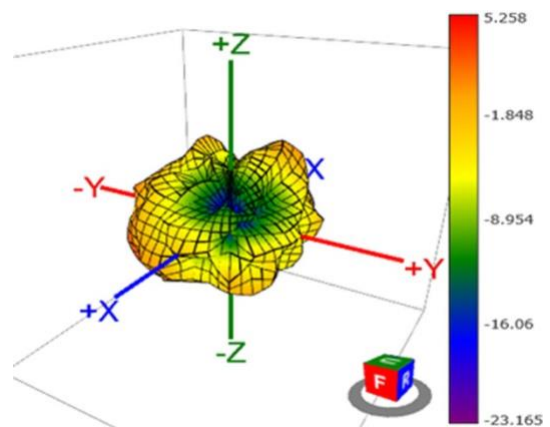
5150 MHz



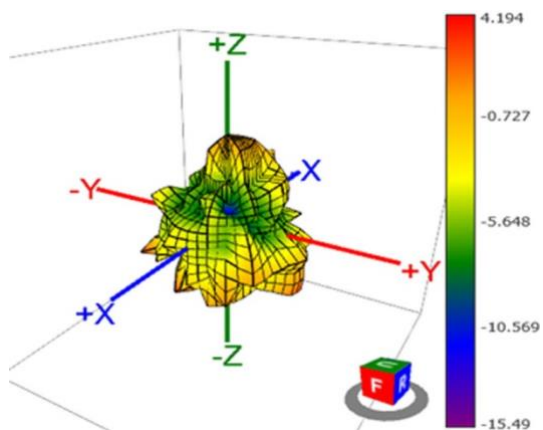
5350 MHz



5725 MHz

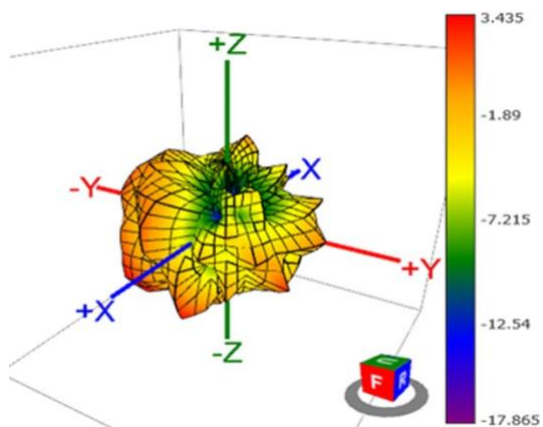


5850 MHz

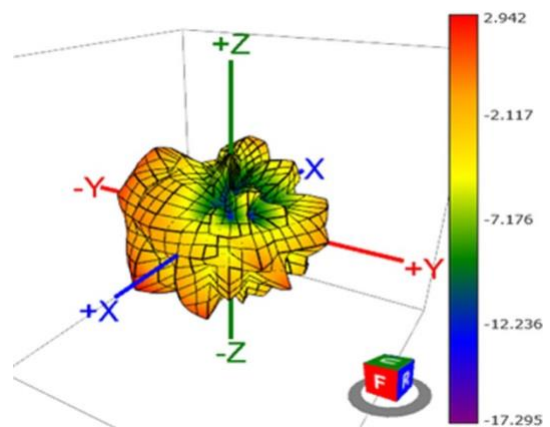


WIFI (On the 30*30 cm ground plane)

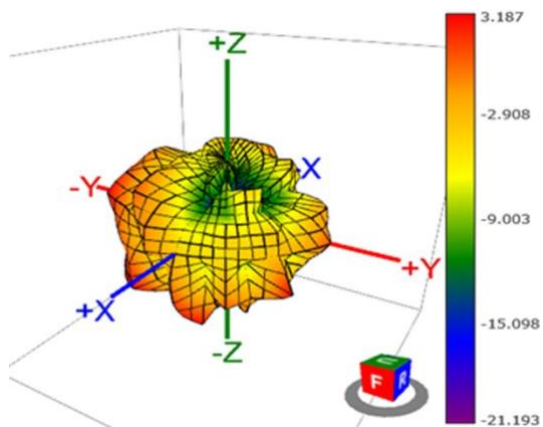
2400 MHz



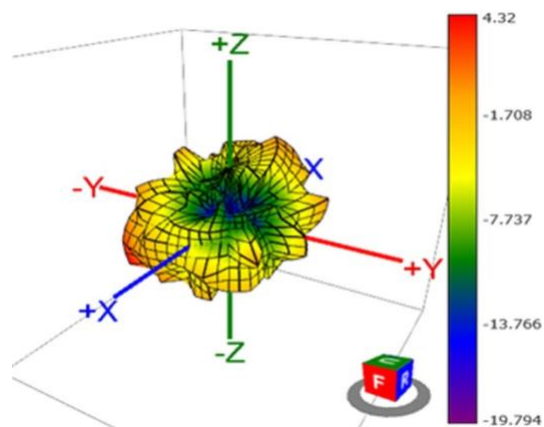
2450 MHz



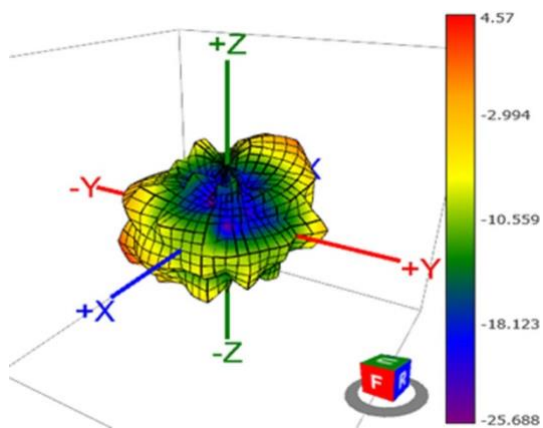
2500 MHz



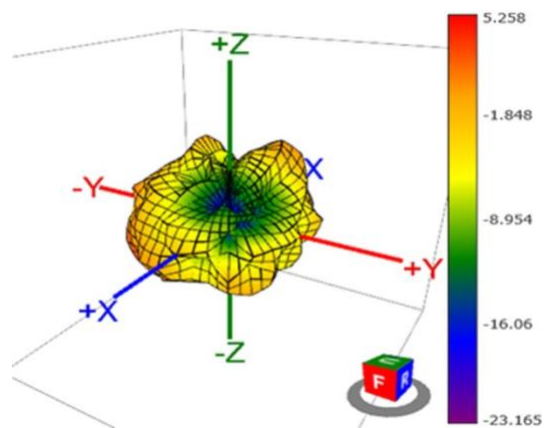
5150 MHz



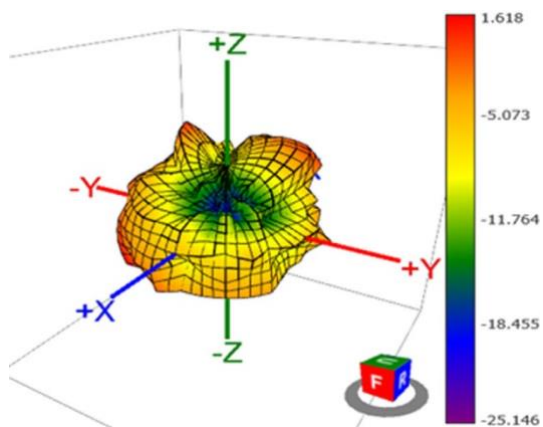
5350 MHz



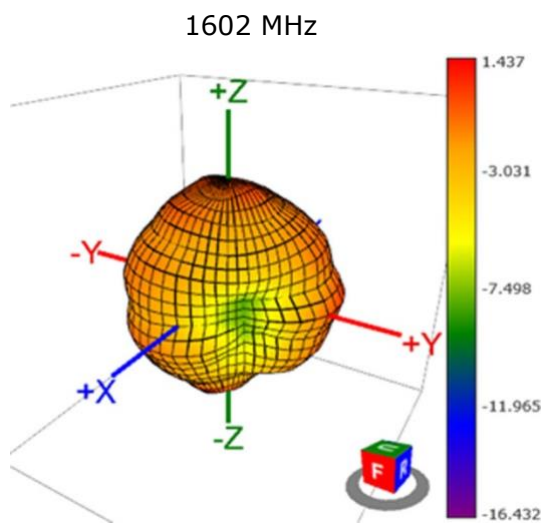
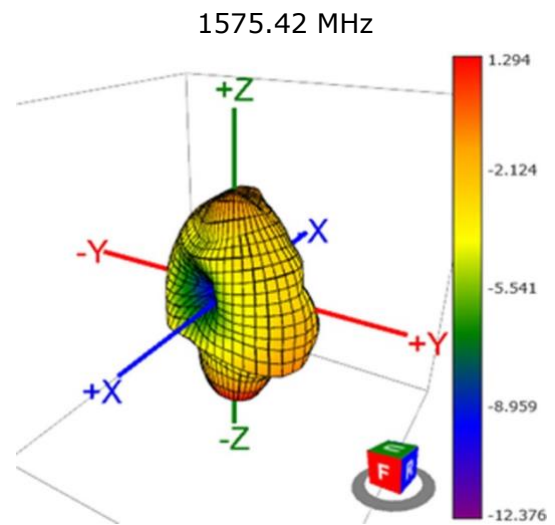
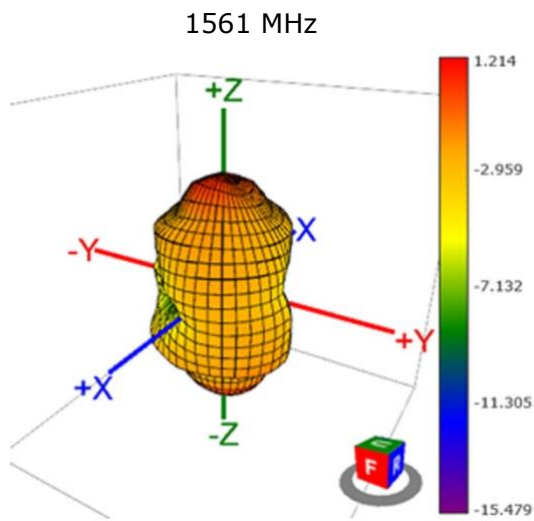
5725 MHz



5850 MHz



GNSS



Mechanical Drawing (Unit:mm):

