



IAP2701A

Antenna DVT Test Report



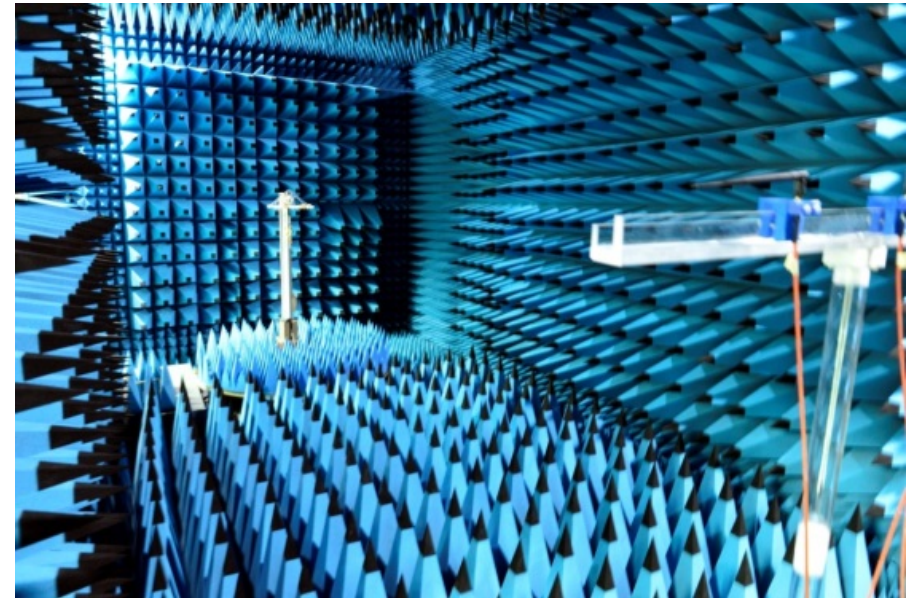
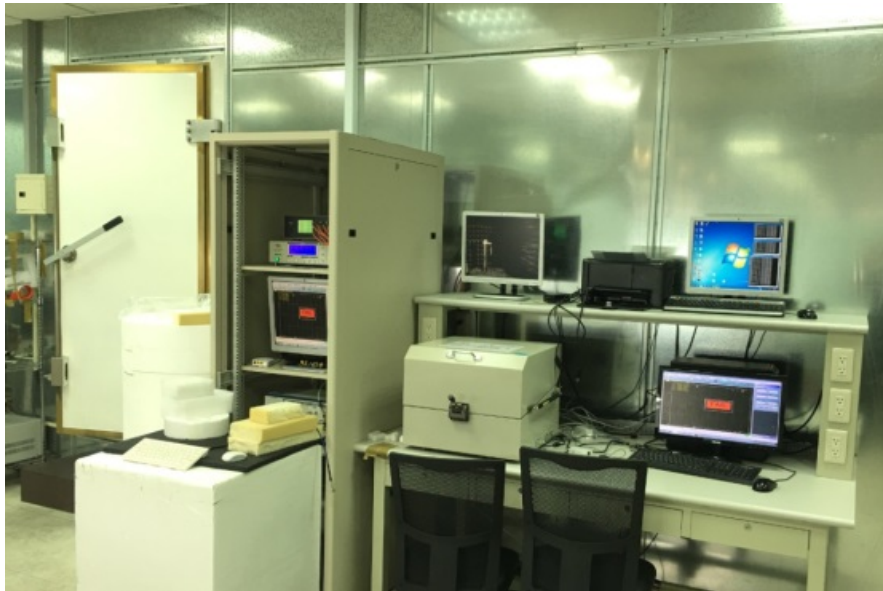
Senao Networks, Inc.

| | |
|---------------------|---|
| Customer | EnGenius |
| Project | IAP2701A |
| Project Description | 2.4G antenna *2 5G antenna *2 6G antenna *2 BLE antenna *1 |
| Date | 2024/04/10 |
| Prepared by | Daniel |
| Checked | Tony |
| Report Version | A02 |

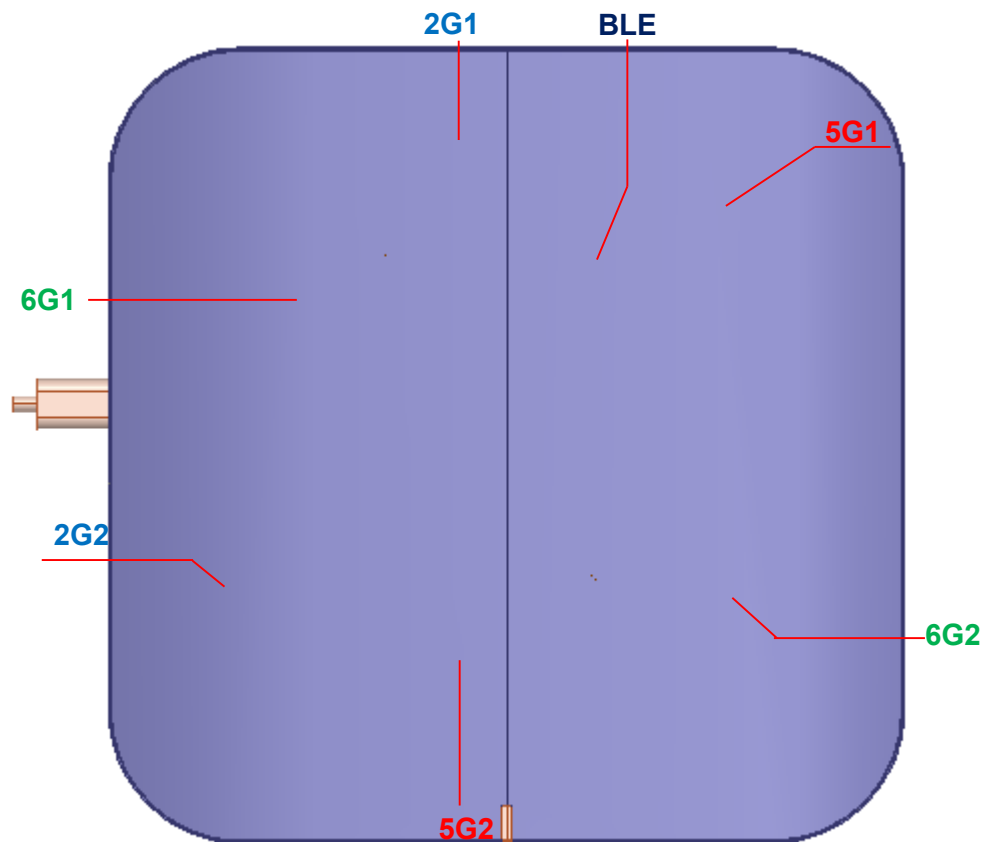
- **Agenda**
 - Antenna Development Resource
 - Antenna Testing Set Up
 - Placement and Specification
 - S11 & Isolation
 - Radiation Pattern
 - Efficiency and Gain

3D Anechoic Chamber - BWANT

- Size: 7.32M(L)x3.66M(W)X3.66M(H)
- Testing range from 400MHz to 7GHz
- Chamber Isolation : 10KHz to 10GHz >100dB (NSA 94-106)
- Calibration antenna : BWANT SD650 /SD740 /SD900 /SD1150 /SD1575 /SD1800 /SD2140 /SD2450 /SD3200 /SD3600 /SD4550 /SD5400 /HA-0508
- Calibration date: 2022/10/27
- Test software : BWANT 3D Passive



3D Anechoic Chamber



| Ant No. | Operating Band | Gain (dBi) | Efficiency (%) | Ant type | Material | Feeding | Dimension |
|---------|--------------------|------------|----------------|-------------|----------|---------|------------------------------|
| 2G1~2G2 | 2400MHz ~ 2500 MHz | 4.0~4.4 | 66.5~69.7 | PIFA | Metal | Cable | 33.5*5.3*9.5 mm ³ |
| 5G1~5G2 | 5150MHz ~ 5895 MHz | 4.6~5.6 | 60.3~69.1 | PIFA | Metal | Cable | 21*5*10 mm ³ |
| 6G1~6G2 | 5925MHz ~ 7125 MHz | 4.4~5.6 | 65.3~69.2 | Alford loop | PCB | Cable | 25*25*0.8 mm ³ |
| BLE | 2400MHz ~ 2500 MHz | 3.0~3.2 | 61.3~67.4 | Dipole | PCB | Cable | 51*6.5*0.4 mm ³ |

Radio_1 Ant.1~2
 Wi-Fi Frequency 2400~2500MHz
 Return Loss -10dB
 Antenna Type Pifa
 Material Metal
 Feeding Cable

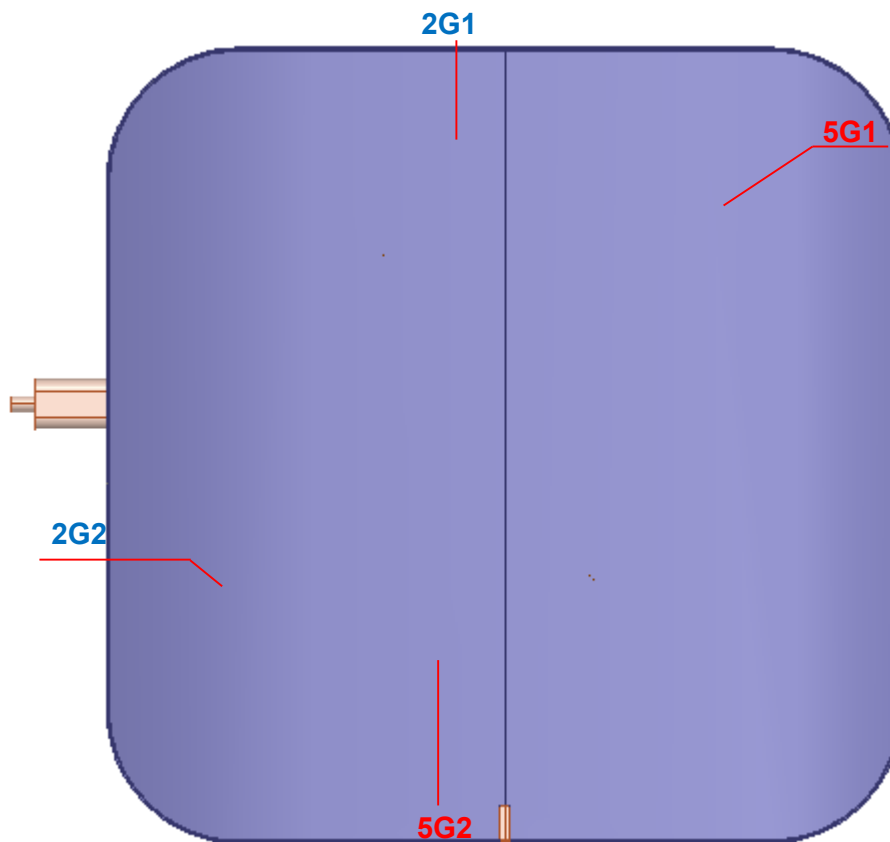
Radio_2 Ant.3~4
 Wi-Fi Frequency 5150~5895MHz
 Return Loss -10dB
 Antenna Type Pifa
 Material Metal
 Feeding Cable

Ant.1
 Brand Name : Enrack
 P/N 7102A1222000

Ant.2
 Brand Name : Enrack
 P/N 7102A1223000

Ant.3
 Brand Name : Enrack
 P/N 7102A1224000

Ant.4
 Brand Name : Enrack
 P/N 7102A1225000

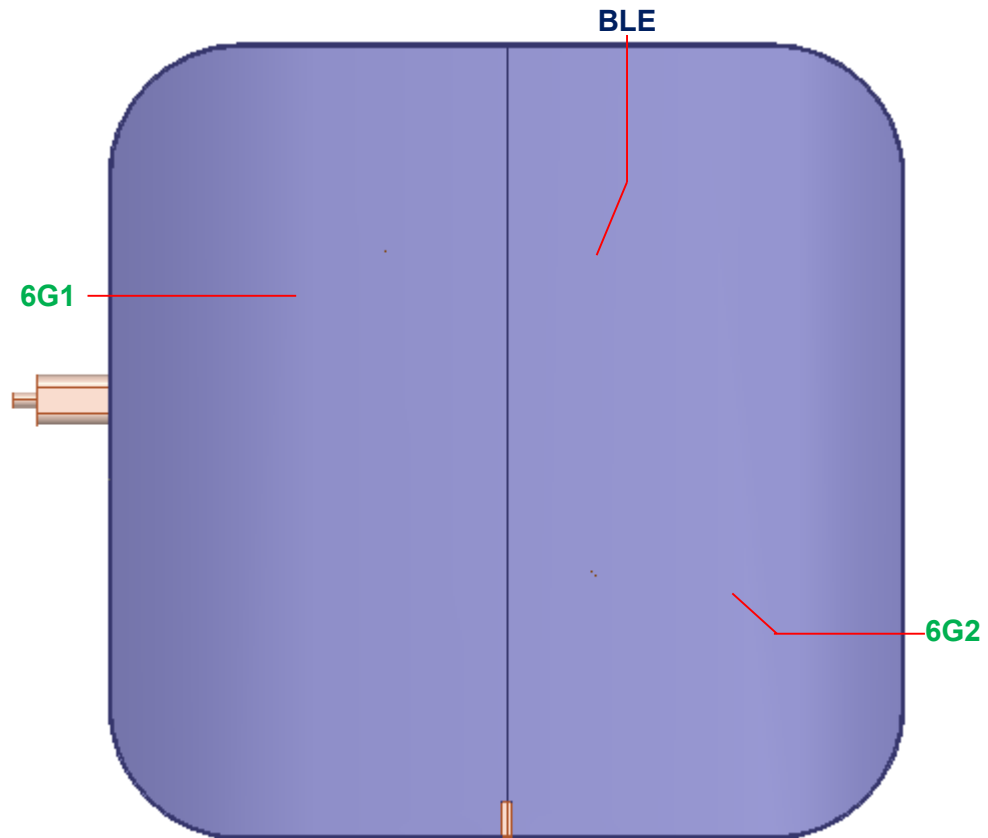


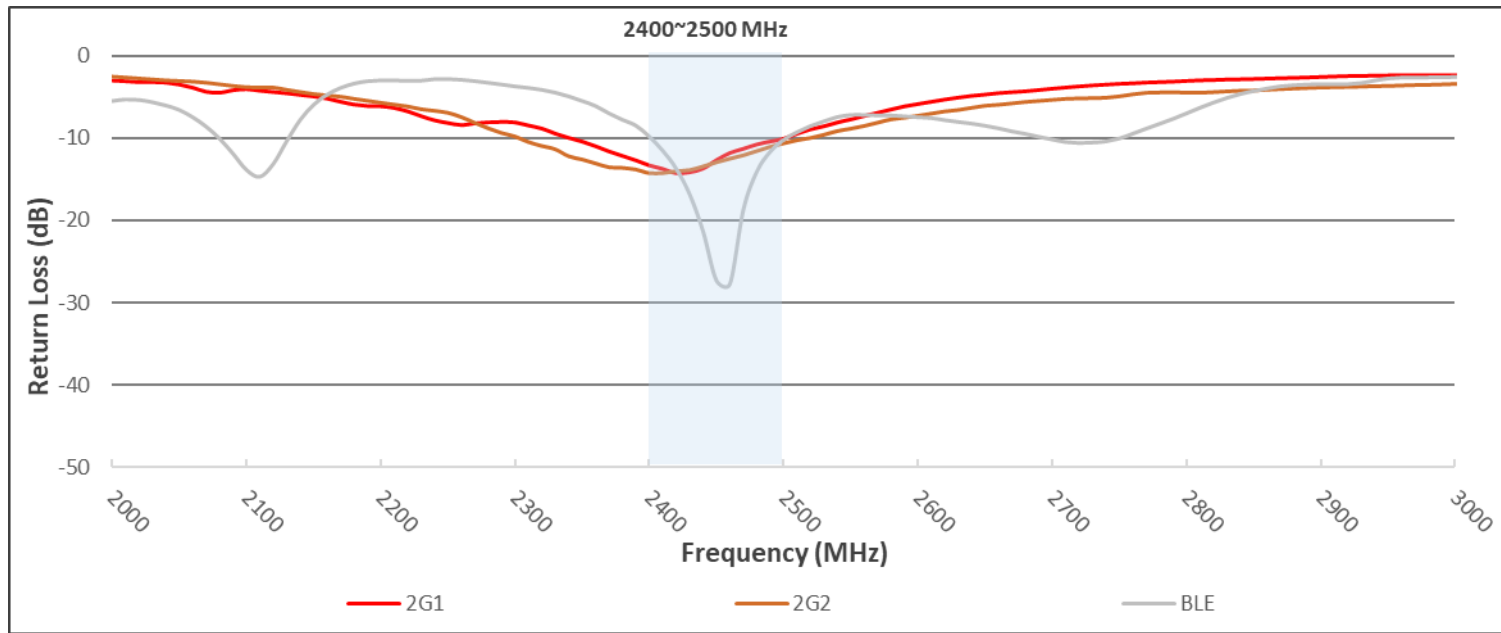
| |
|------------------------------|
| Radio_3 Ant.5~6 |
| Wi-Fi Frequency 5925~7125MHz |
| Return Loss -10dB |
| Antenna Type Alford Loop |
| Material FR4 |
| Feeding Cable |

| |
|-------------------|
| Ant.5 |
| Brand Name : AWAN |
| P/N 7102A0952000 |

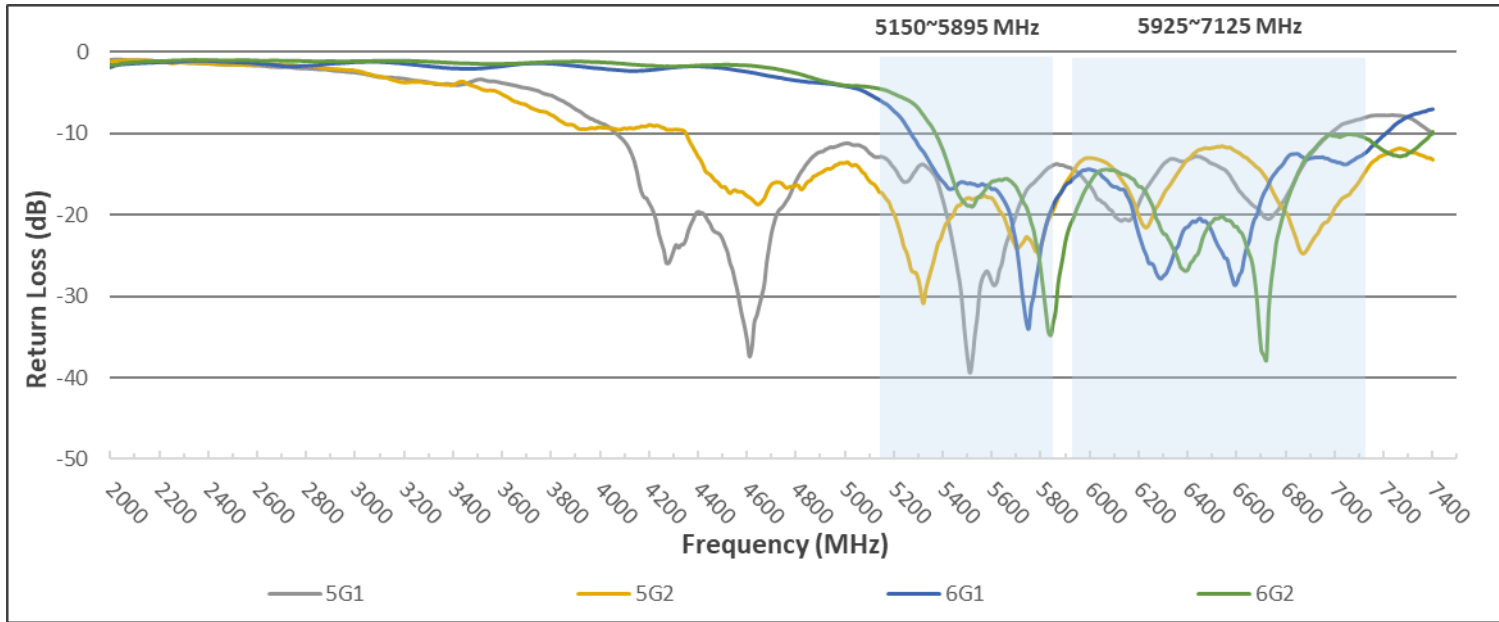
| |
|-------------------|
| Ant.6 |
| Brand Name : AWAN |
| P/N 7102A0951000 |

| |
|------------------------------|
| BLE/Zigbee Ant.7 |
| Wi-Fi Frequency 2400~2500MHz |
| Return Loss -10dB |
| Antenna Type Dipole |
| Material FR4 |
| Feeding Cable |
| Brand Name : AWAN |
| P/N 7102A0953000 |

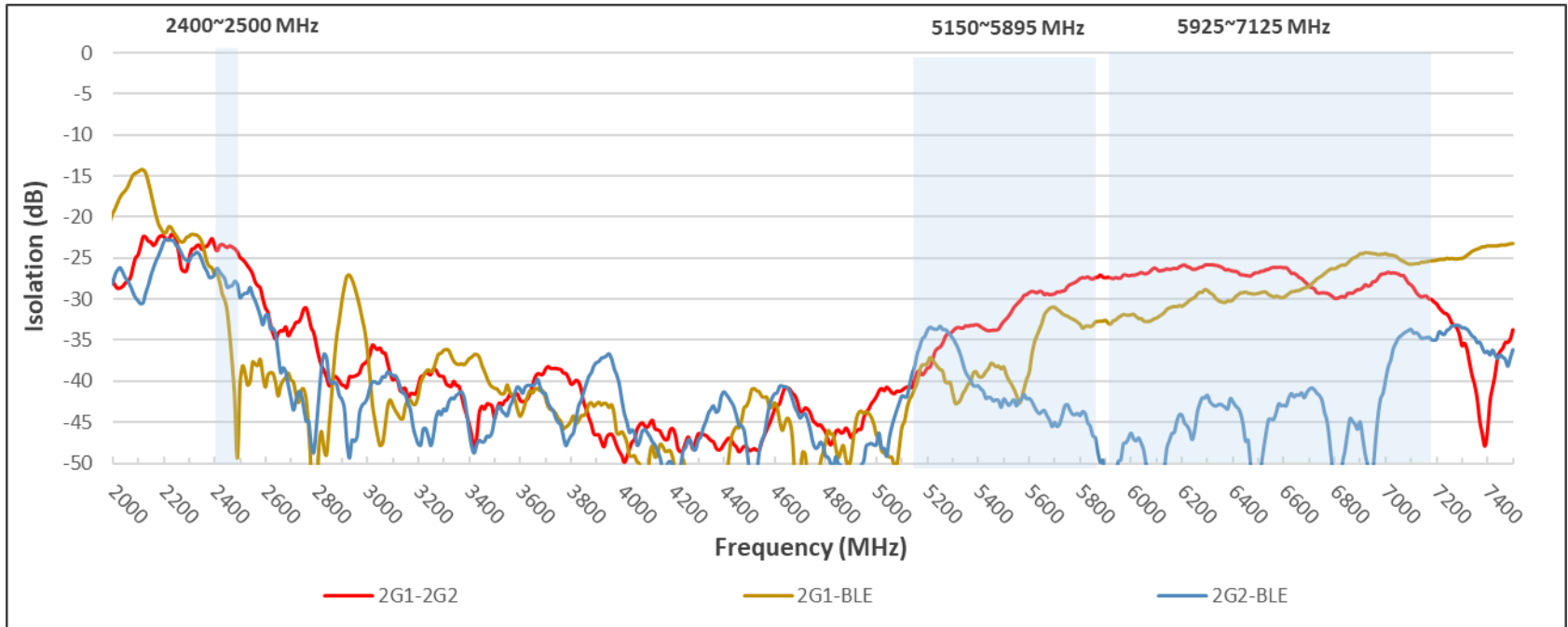




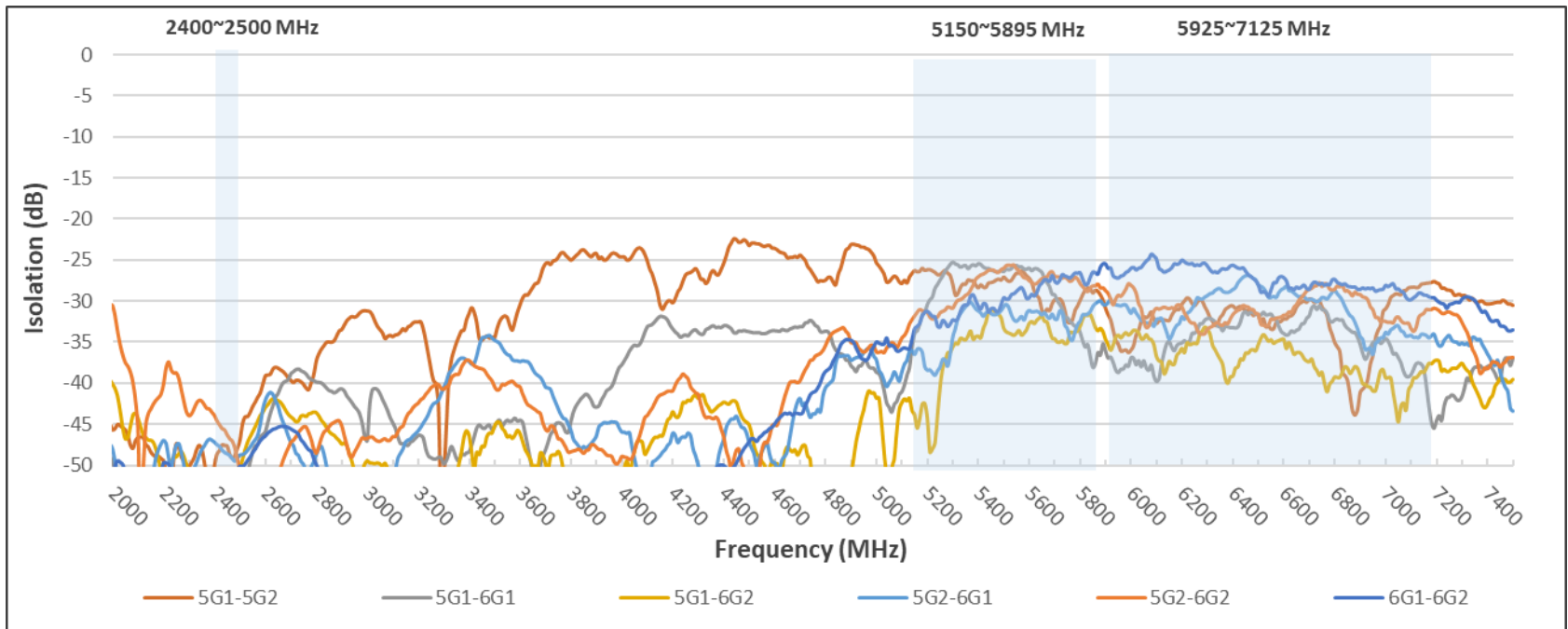
| S11 | | | |
|-------------|--------|--------|--------|
| Freq. (MHz) | 2G1 | 2G2 | BLE |
| 2400 | -13.37 | -14.23 | -10.16 |
| 2450 | -12.73 | -12.92 | -27.28 |
| 2500 | -10.13 | -10.61 | -10.15 |



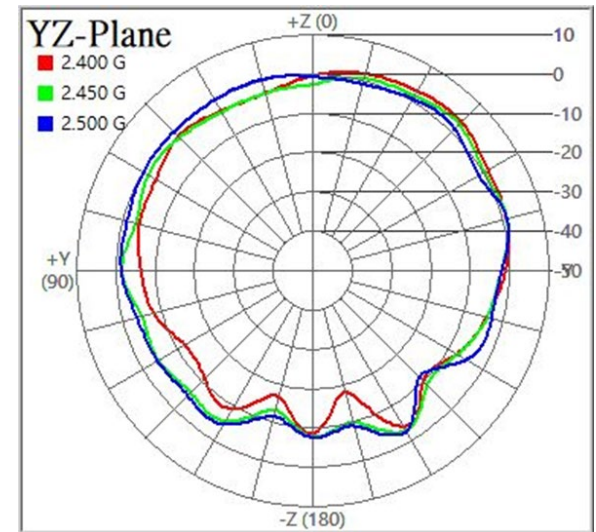
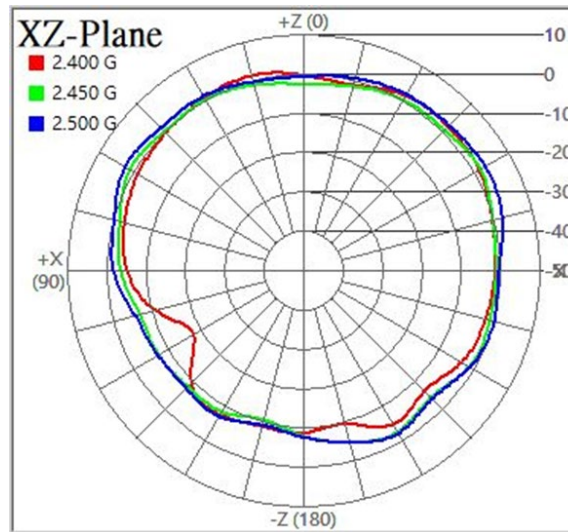
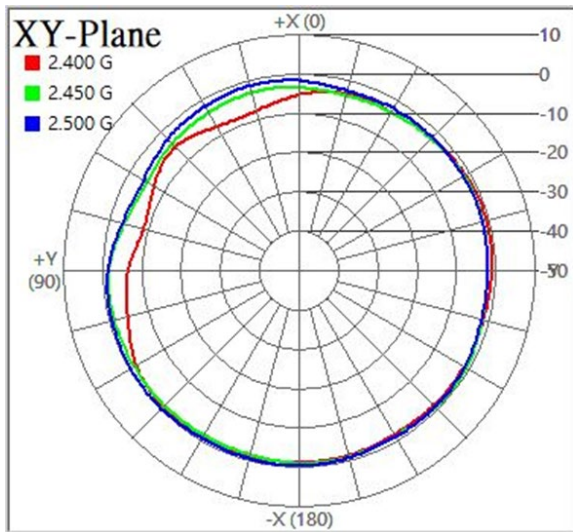
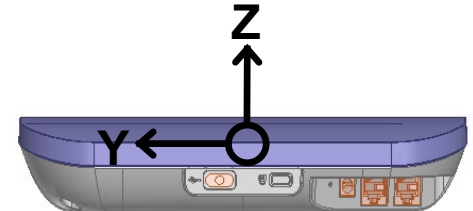
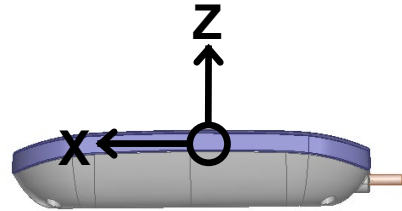
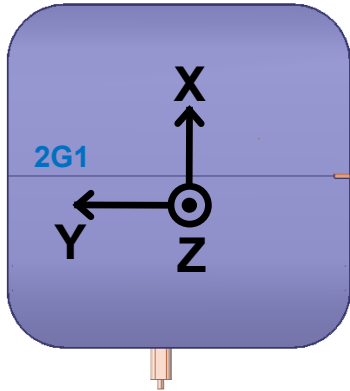
| S11 | | | | |
|-------------|--------|--------|--------|--------|
| Freq. (MHz) | 5G1 | 5G2 | 6G1 | 6G2 |
| 5150 | -12.79 | -17.31 | | |
| 5500 | -37.46 | -17.94 | | |
| 5850 | -13.82 | -19.46 | | |
| 5895 | -13.98 | -16.18 | | |
| 5925 | | | -15.09 | -18.95 |
| 6500 | | | -22.19 | -20.84 |
| 7125 | | | -11.56 | -11.05 |

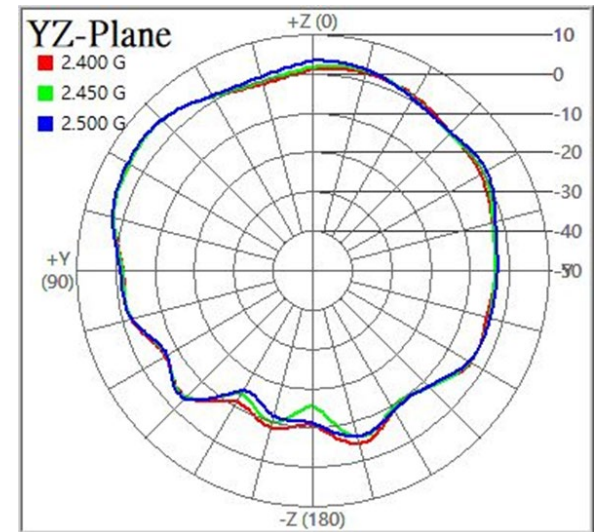
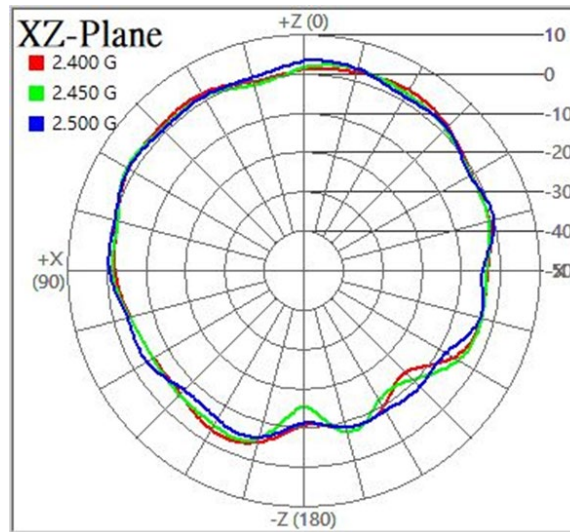
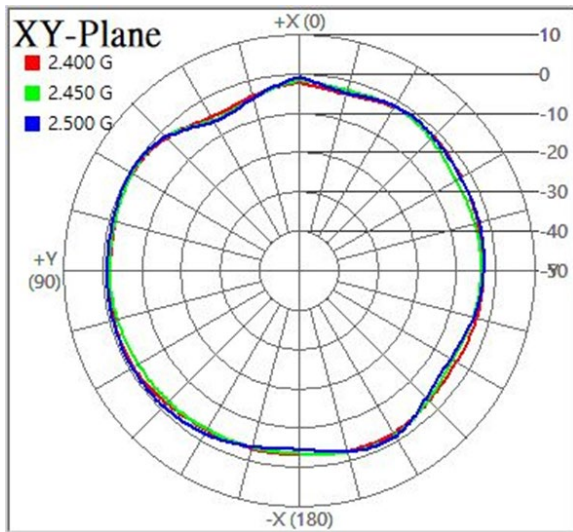
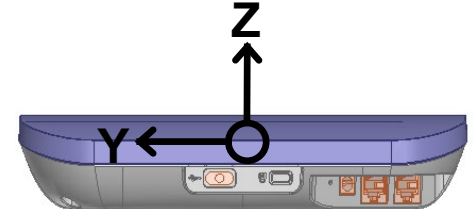
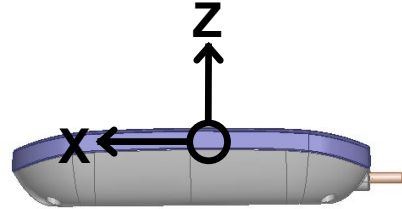
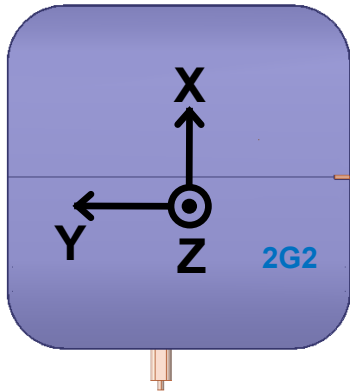


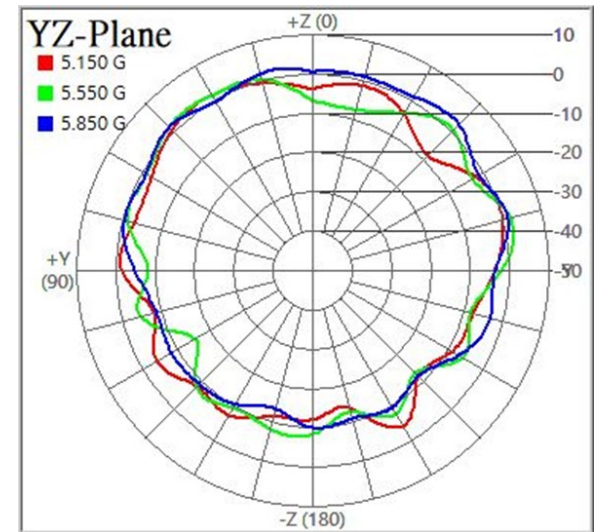
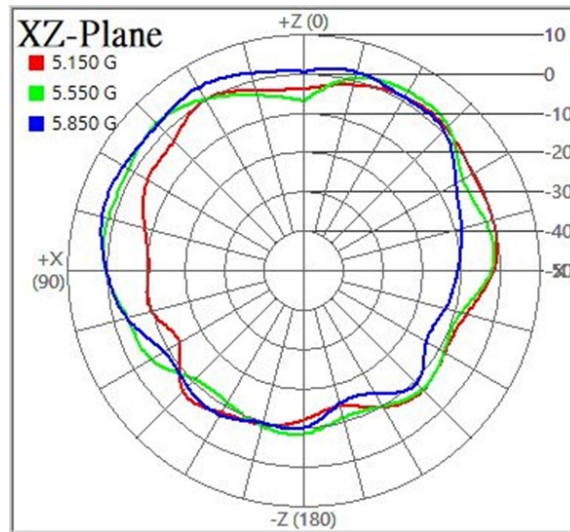
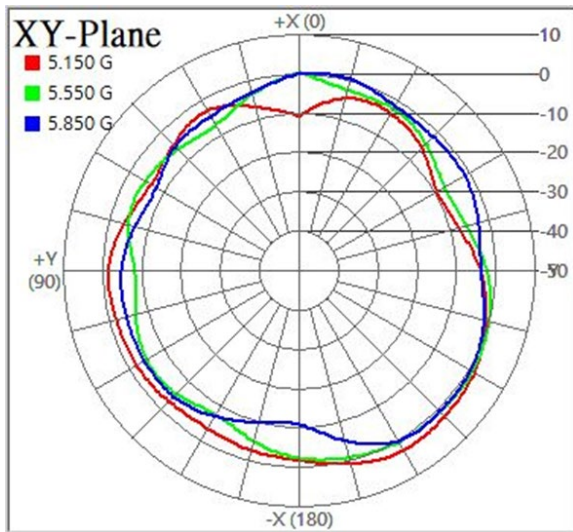
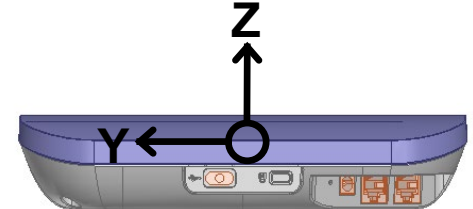
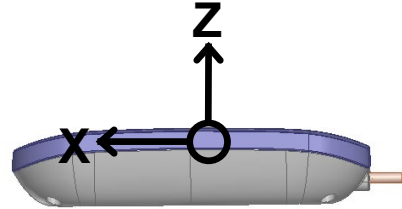
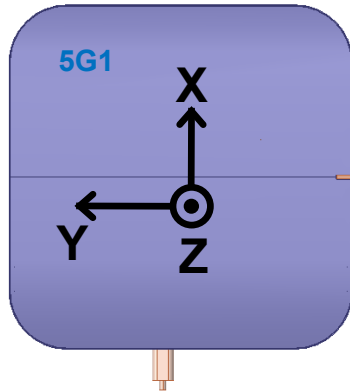
| Isolation | | | |
|-------------|---------|---------|---------|
| Freq. (MHz) | 2G1-2G2 | 2G1-BLE | 2G2-BLE |
| 2400 | -23.49 | -26.91 | -27.09 |
| 2450 | -23.75 | -31.42 | -28.58 |
| 2500 | -24.95 | -40.48 | -29.84 |

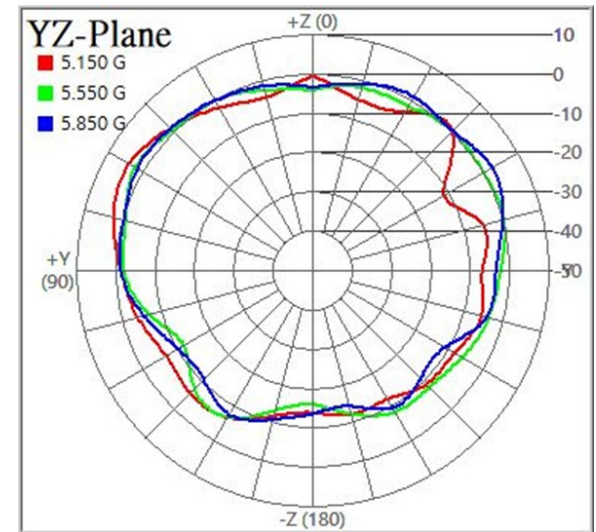
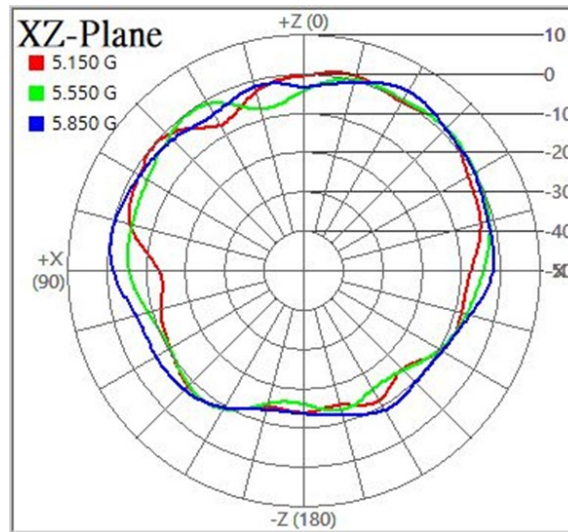
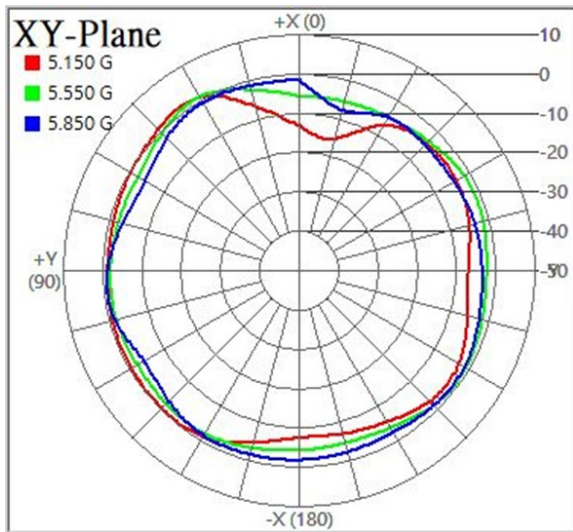
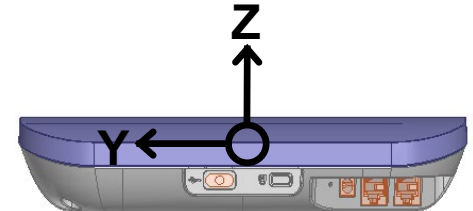
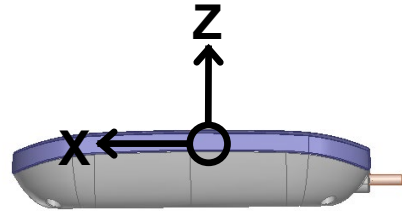
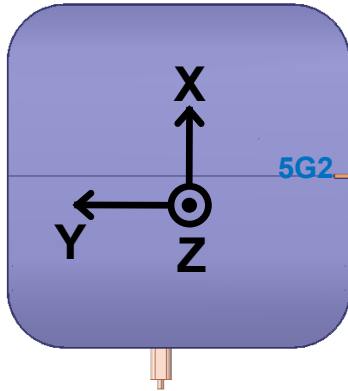


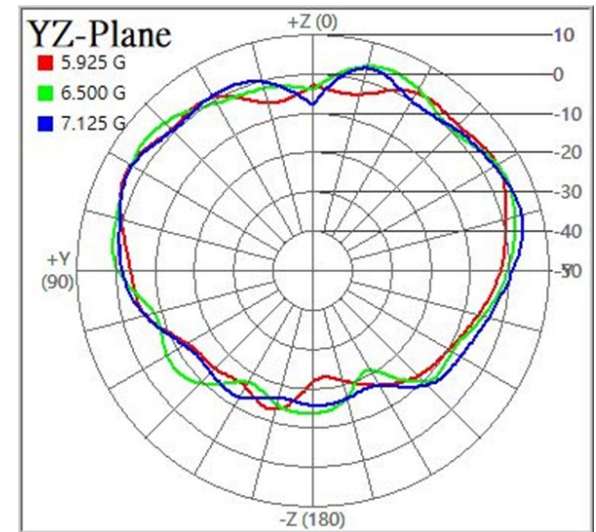
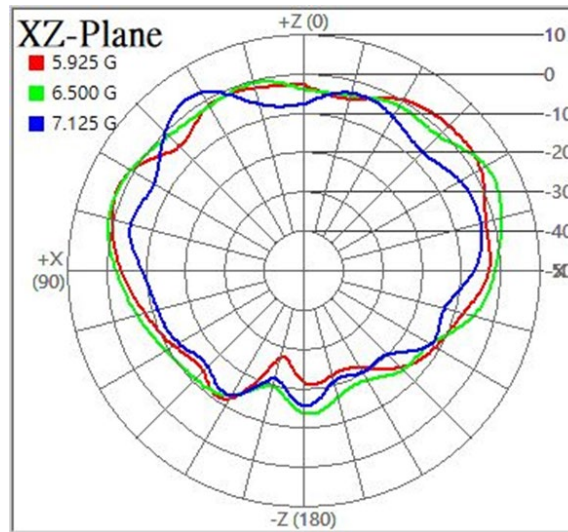
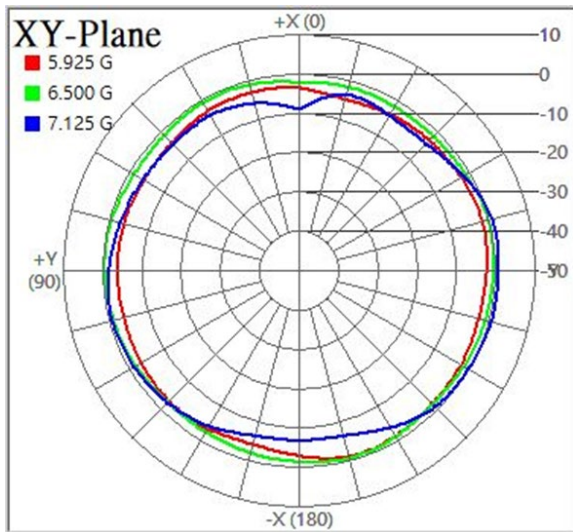
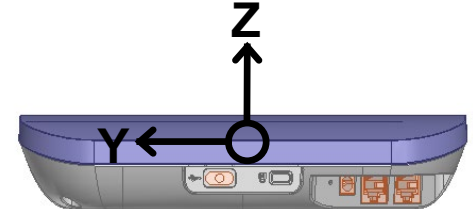
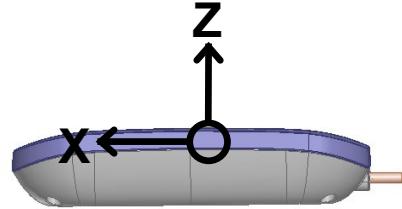
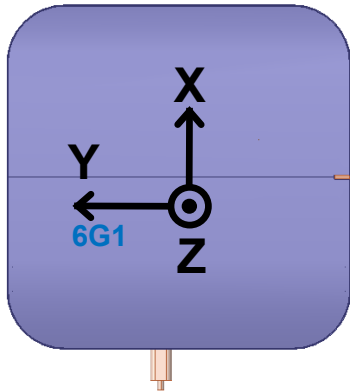
| Isolation | | | | | | |
|-------------|---------|---------|---------|---------|---------|---------|
| Freq. (MHz) | 5G1-5G2 | 6G1-6G2 | 5G1-6G1 | 5G1-6G2 | 5G2-6G1 | 5G2-6G2 |
| 5150 | -26.27 | | -33.95 | -43.90 | -36.48 | -31.78 |
| 5500 | -27.05 | | -26.42 | -33.36 | -30.65 | -26.00 |
| 5850 | -28.98 | | -38.11 | -32.40 | -30.64 | -28.15 |
| 5895 | -30.88 | | -36.10 | -34.71 | -30.43 | -28.73 |
| 5925 | | -27.16 | -38.73 | -34.18 | -30.49 | -29.27 |
| 6500 | | -27.97 | -31.69 | -35.31 | -28.04 | -31.58 |
| 7125 | | -29.22 | -38.27 | -38.74 | -34.04 | -31.47 |

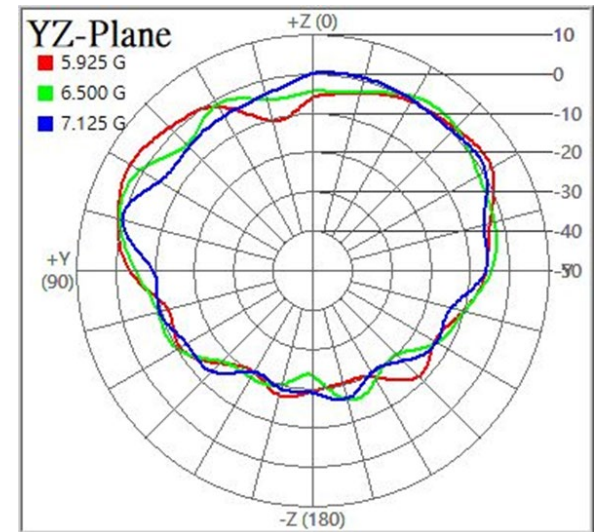
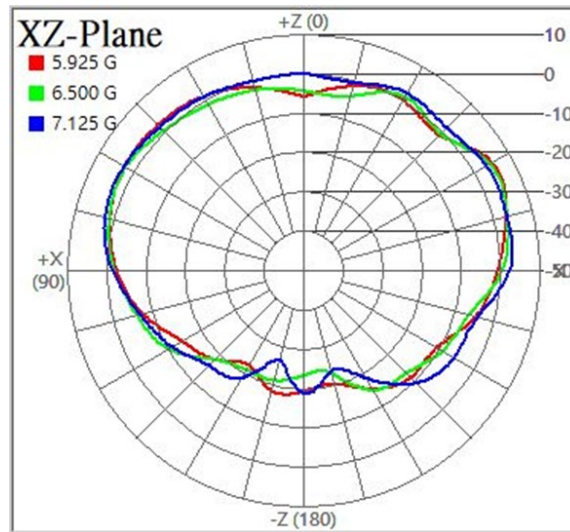
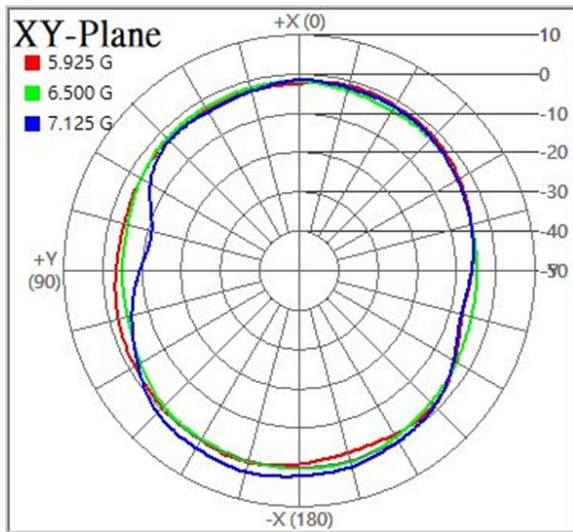
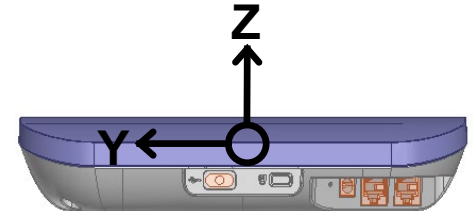
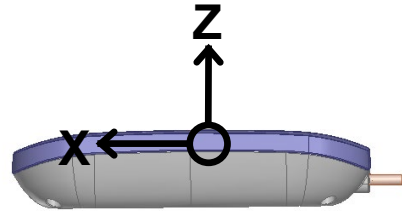
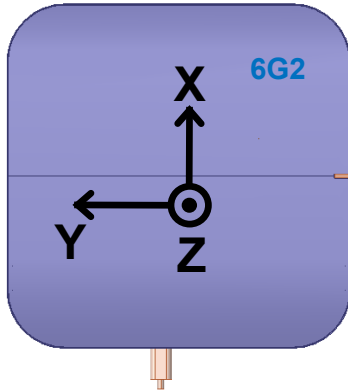


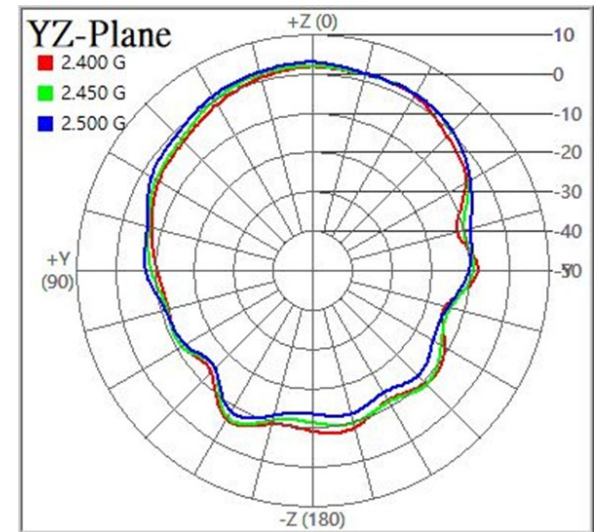
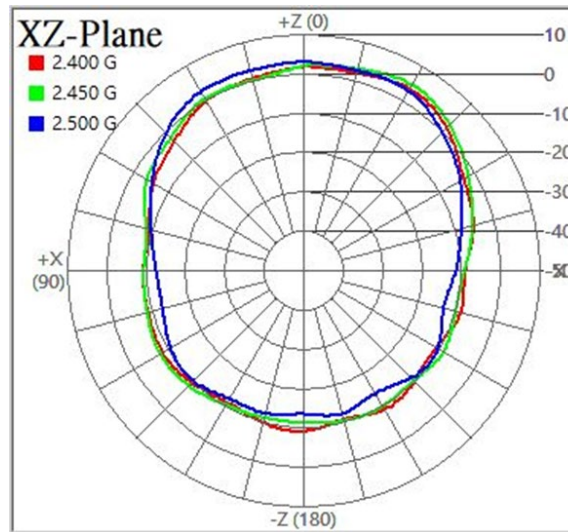
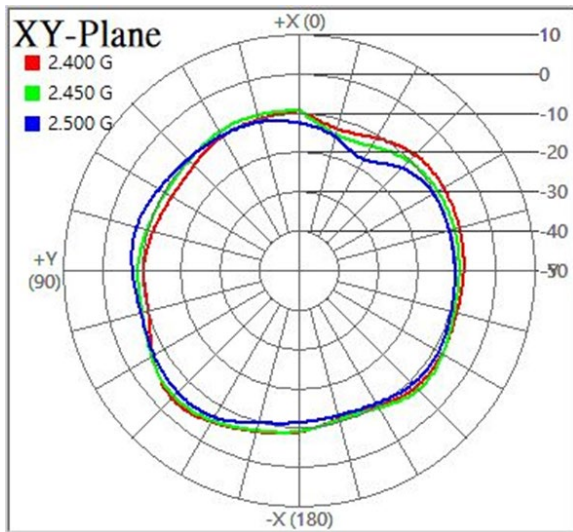
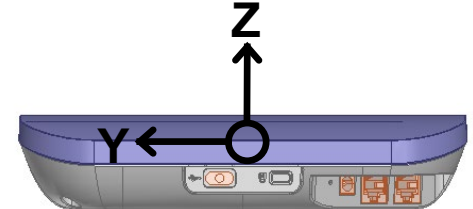
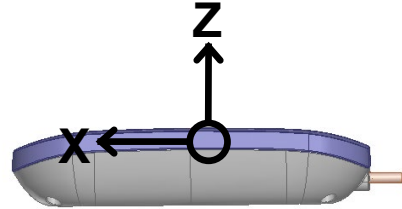
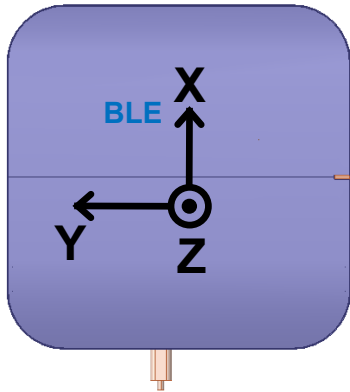




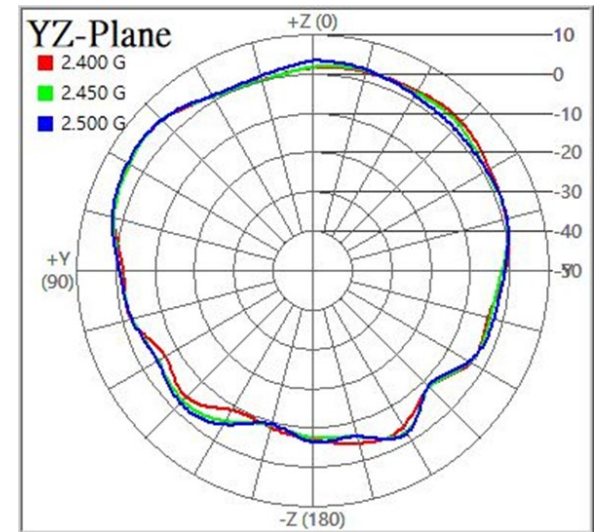
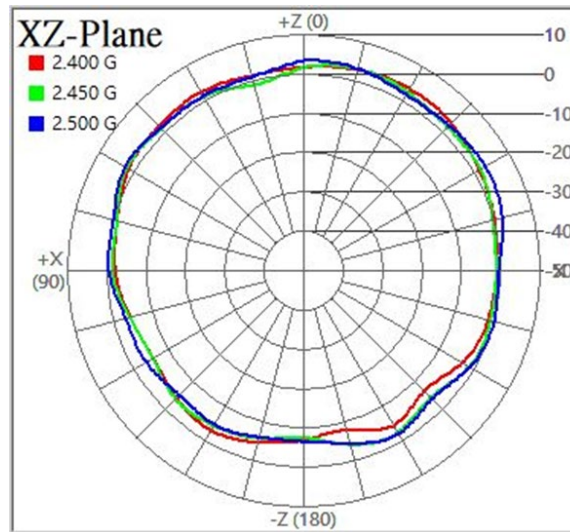
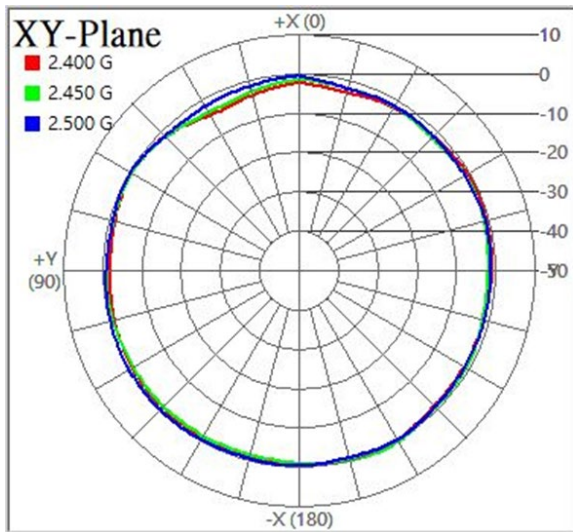
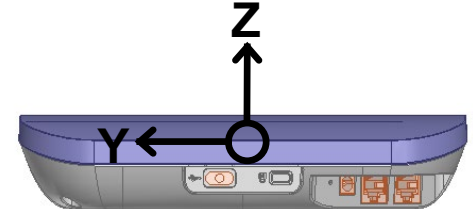
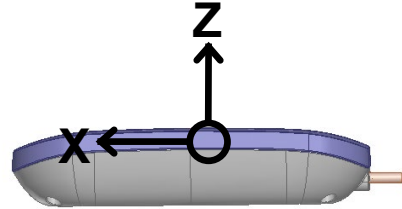
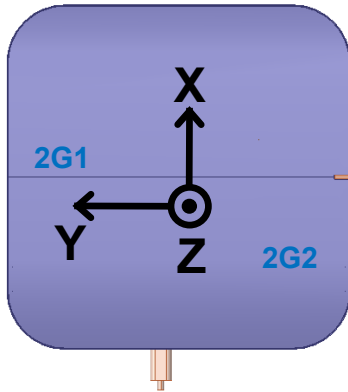




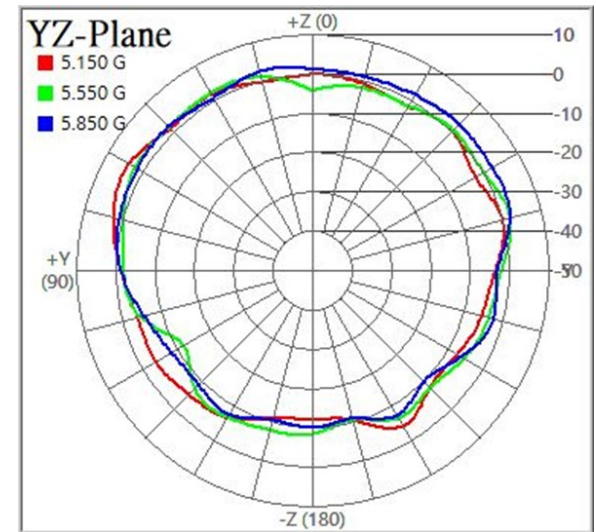
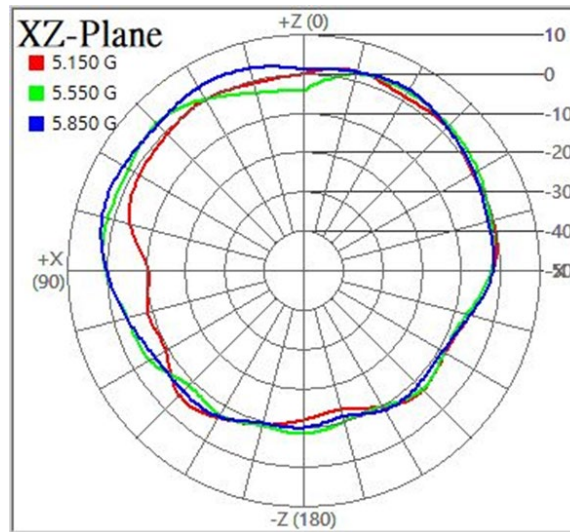
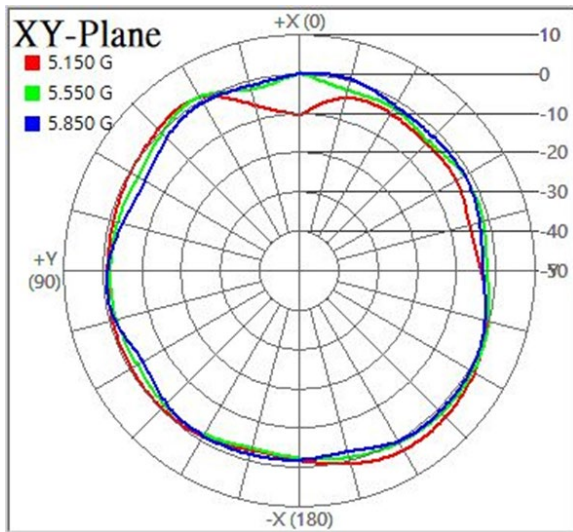
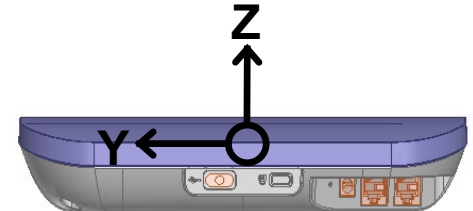
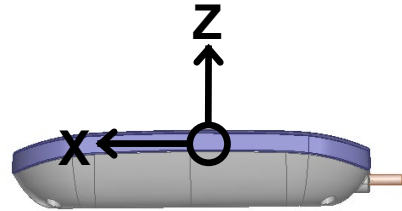
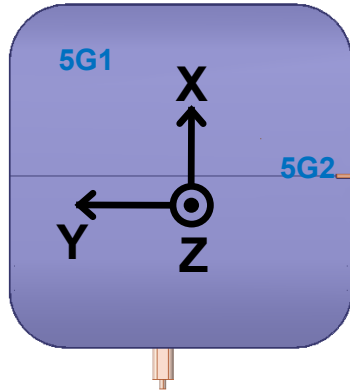




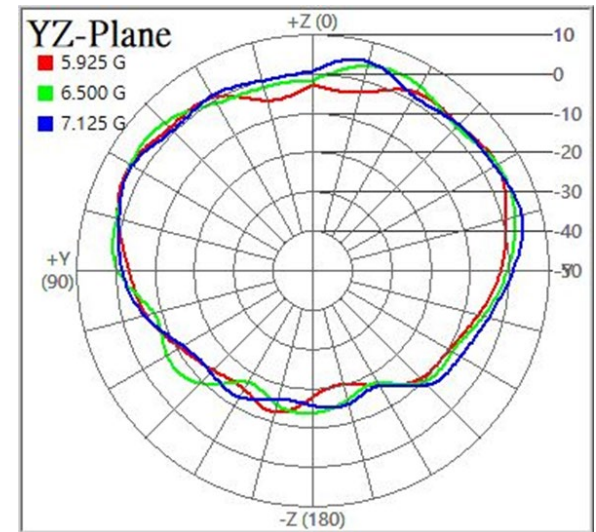
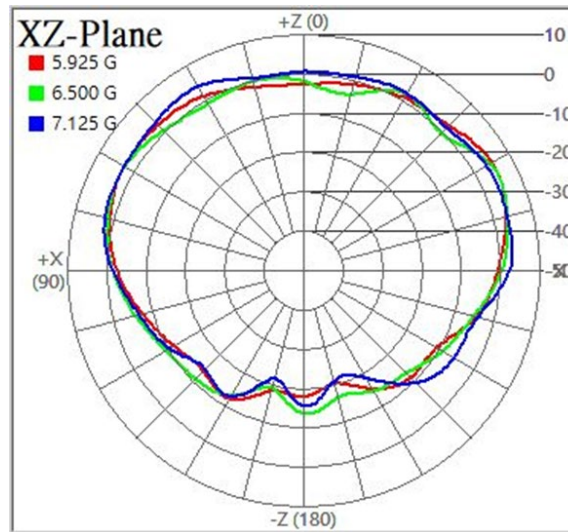
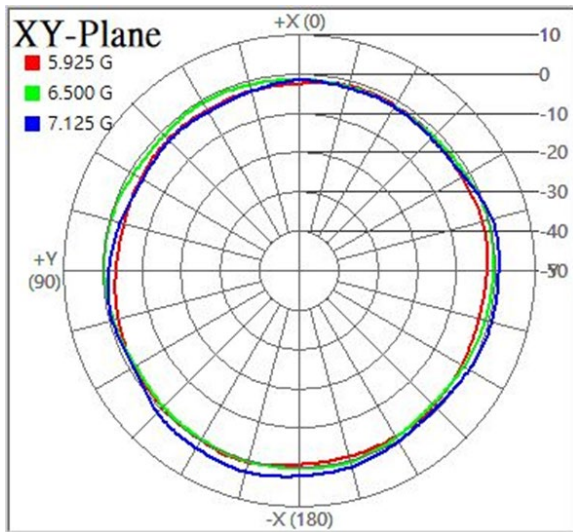
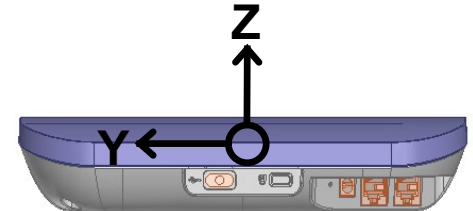
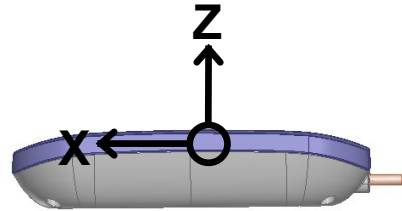
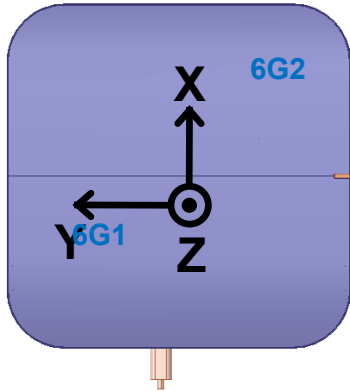
Combine pattern – 2G @ 2.45 GHz



Combine pattern – 5G @ 5.55 GHz



Combine pattern – 6G @ 6.5 GHz



Antenna Efficiency and Gain

| Antenna Performance | | | | |
|---------------------|----------------|-----------------|----------------|-----------------|
| Freq. (MHz) | 2G1 | | 2G2 | |
| | Efficiency (%) | Peak Gain (dBi) | Efficiency (%) | Peak Gain (dBi) |
| 2400 | 66.5 | 4.4 | 67.2 | 4.2 |
| 2450 | 68.1 | 4.3 | 69.8 | 4.2 |
| 2500 | 69.7 | 4.0 | 69.7 | 4.3 |

| Antenna Performance | | |
|---------------------|----------------|-----------------|
| Freq. (MHz) | BLE | |
| | Efficiency (%) | Peak Gain (dBi) |
| 2400 | 61.3 | 3.1 |
| 2450 | 62.5 | 3.2 |
| 2500 | 67.4 | 3.0 |

| Antenna Performance | | | | |
|---------------------|----------------|-----------------|----------------|-----------------|
| Freq. (MHz) | 5G1 | | 5G2 | |
| | Efficiency (%) | Peak Gain (dBi) | Efficiency (%) | Peak Gain (dBi) |
| 5150 | 64.0 | 5.5 | 60.3 | 5.0 |
| 5500 | 61.9 | 4.6 | 65.5 | 4.6 |
| 5850 | 68.5 | 5.6 | 67.8 | 5.2 |
| 5895 | 67.5 | 5.3 | 69.1 | 4.9 |

| Antenna Performance | | | | |
|---------------------|----------------|-----------------|----------------|-----------------|
| Freq. (MHz) | 6G1 | | 6G2 | |
| | Efficiency (%) | Peak Gain (dBi) | Efficiency (%) | Peak Gain (dBi) |
| 5925 | 68.2 | 5.0 | 69.2 | 5.6 |
| 6500 | 68.8 | 4.7 | 67.3 | 4.4 |
| 7125 | 65.3 | 5.1 | 66.7 | 4.7 |