

SPECIFICATION

- Part No. : **MA750.A.ABICG.003**
- Product Name : Pantheon Antenna 5in1 MA.750
Screw-Mount (Permanent Mount)
4G/3G/2G MIMO, GPS/GLONASS/GALILEO,
2.4/5GHz MIMO
- Feature : 2 x cellular (4G/3G/2G) Antennas (MIMO)
(698~960MHz, 1710~2170MHz,2300~2700MHz,
2900-3500MHz)
- 1*MIMO main antenna
 - 1*MIMO diversity antenna
- 1 x GPS/GLONASS/GALILEO 1575.42/1602MHz
Active Antenna
- 2 x 2.4GHZ/ 5GHz Antennas (MIMO)
- 1*MIMO main antenna
 - 1*MIMO diversity antenna
- IP67 Waterproof
Front End SAW Filter
High Efficiency / Peak Gain Outdoor Antenna
RoHS Compliant



1. Introduction

The MA.750 Pantheon antenna is an omni-directional heavy-duty, fully IP67 waterproof external M2M antenna for use in telematics, transportation and remote monitoring applications.

This unique antenna delivers powerful MIMO antenna technology for cellular/LTE and Wi-Fi 802.11n and emerging 802.11ac, plus GPS/GLONASS/GALILEO for next generation multiple wireless technology systems, such as telematics. The GPS/GLONASS/GALILEO antenna has a Front End SAW Filter.

Examples are new fleet management and real time video applications that demand high speed video uplink and downlink. High efficiency and high gain MIMO antennas are necessary to achieve the required signal to noise ratio and throughput required to solve these challenges.

Five (5) high performance antennas are integrated into an extremely robust IP67 direct/permanent mount antenna package with excellent isolation (20dB+).

The antenna has its own ground-plane and can radiate on any mounting environment like metal or plastic without affecting performance. The cables are low loss allowing for lengths of up to 10 meters (32' and 9.70"), critical for buses, trains and other commercial transport applications.

Customized cables and connector version available.

2. Specification Table

| 4G/3G/2G MIMO | | | | | |
|---------------|----------|-----------|-----------|-----------|----------|
| Frequency | 698~960 | 1710~2170 | 2300~2700 | 2900-3500 | MHz |
| VSWR | 3 Max | | | | |
| Polarization | Vertical | | | | |
| Impedance | 50 | | | | Ω |

| 2.4GHz / 5GHz MIMO | | | |
|--------------------|---------|----------|-----|
| Frequency | 2.4~2.5 | 4.5~5.85 | GHz |
| VSWR | 2 Max | | |
| Polarization | Linear | | |
| Impedance | 50 | | Ohm |

| GPS-GLONASS-GALILEO | | | | | | |
|-----------------------|--|-------------|----------------------------------|-------------|----------------------------------|-------------|
| Centre Frequency | 1575.42MHz / 1602MHz | | | | | |
| Bandwidth | 10MHz | | | | | |
| Radiation Efficiency | 50(without cable) | | | | | |
| Passive Gain @ Zenith | 4.0 typ(with $\psi=140$ mm ground) | | | | | |
| VSWR | 2 | | | | | |
| Impedance | 50 Ω | | | | | |
| DC Power Input Range | 3 ~ 5V | | | | | |
| DC input | 3.3V | | 4.0V | | 5.5V | |
| MHz | 1575.42 | 1602 | 1575.42 | 1602 | 1575.42 | 1602 |
| VSWR | 2 | 2 | 2 | 2 | 2 | 2 |
| LNA Gain | 29.2 | 29 | 31 | 31 | 32.3 | 32 |
| Noise Figure | 3.1 | 3.1 | 3.2 | 3.2 | 3.4 | 3.4 |
| Power Consumption | 7.5 | 7.5 | 9.4 | 9.4 | 15 | 15 |
| Band Attenuation | 1520MHz: -20dB 1642MHz: -20dB | | 1520MHz: -20dB 1642MHz: -20dB | | 1520MHz: -20dB 1642MHz: -20dB | |
| Cable | 3m RG-174 standard, fully customizable | | | | | |
| Connector | SMA(M) standard, fully customizable | | | | | |

| MECHANICAL | |
|---------------------------------|----------------------------------|
| Antenna Dimensions | Height 85.7mm x Diameter 145.6mm |
| Casing | Wonderloy PC-540 PC/ABS Alloy |
| Waterproof | IP67 |
| 2G/3G/4G MIMO 1 | 3M CFD-200 SMA(M) |
| 2G/3G/4G MIMO 2 | 3M CFD-200 SMA(M) |
| 2.4/5GHz MIMO 1 | 3M CFD-200 RP-SMA(M) |
| 2.4/5GHz MIMO 2 | 3M CFD-200 RP-SMA(M) |
| GPS/GLONASS/GALILEO | 3M RG-174 SMA(M) |
| Base and thread | CAN10 Zinc Alloy |
| Thread diameter | M30 x 2 (30mm) |
| Nut | Nickel Plated Steel |
| Foam | 3M 9448HK |
| Waterproof | IP67 |
| Weight(kg) | 1.29(antenna) 1.53(with box) |
| Recommended Torque for Mounting | 49 N·m |
| Max Torque for Mounting | 58.8N·m |
| ENVIRONMENTAL | |
| Operation Temperature | -40°C to 85°C |
| Storage Temperature | -40°C to 90°C |
| Humidity | Non-condensing 65°C 95% RH |

* all measurements were conducted with 3m low loss CFD200 cable

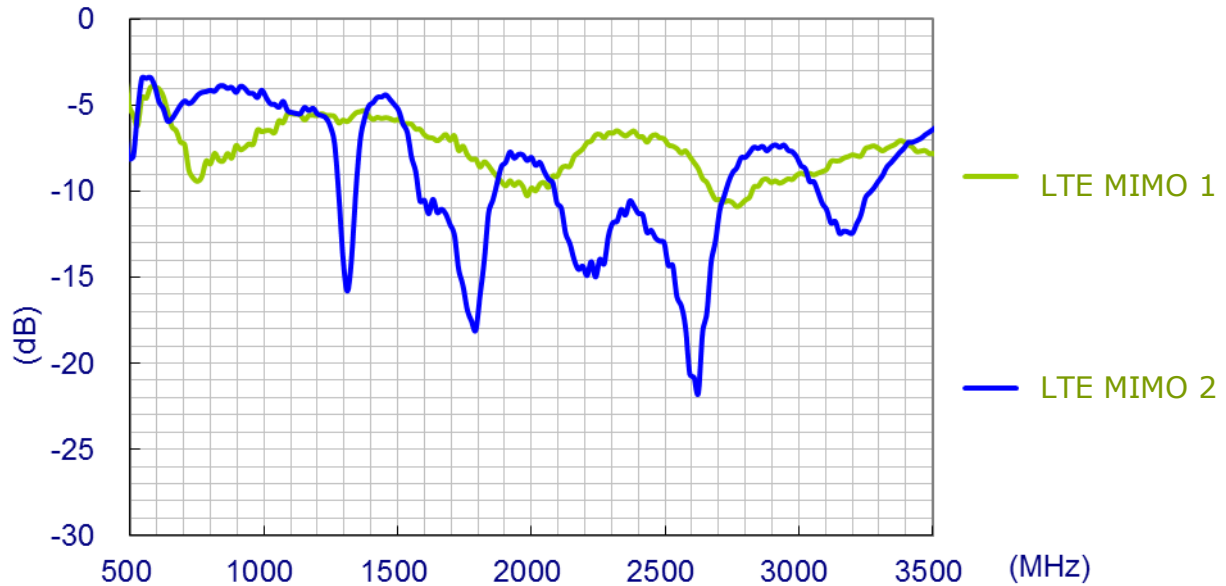
| LTE BANDS | | | | |
|-------------|--|-------------------------------|--------|--------|
| Band Number | LTE / LTE-Advanced / WCDMA / HSPA / HSPA+ / TD-SCDMA | | | |
| | Uplink | Downlink | MIMO 1 | MIMO 2 |
| 1 | UL: 1920 to 1980 | DL: 2110 to 2170 | ✓ | ✓ |
| 2 | UL: 1850 to 1910 | DL: 1930 to 1990 | ✓ | ✓ |
| 3 | UL: 1710 to 1785 | DL: 1805 to 1880 | ✓ | ✓ |
| 4 | UL: 1710 to 1755 | DL: 2110 to 2155 | ✓ | ✓ |
| 5 | UL: 824 to 849 | DL: 869 to 894 | ✓ | ✗ |
| 7 | UL: 2500 to 2570 | DL: 2620 to 2690 | ✓ | ✓ |
| 8 | UL: 880 to 915 | DL: 925 to 960 | ✓ | ✗ |
| 9 | UL: 1749.9 to 1784.9 | DL: 1844.9 to 1879.9 | ✓ | ✓ |
| 11 | UL: 1427.9 to 1447.9 | DL: 1475.9 to 1495.9 | ✗ | ✗ |
| 12 | UL: 699 to 716 | DL: 729 to 746 | ✓ | ✓ |
| 13 | UL: 777 to 787 | DL: 746 to 756 | ✓ | ✓ |
| 14 | UL: 788 to 798 | DL: 758 to 768 | ✓ | ✓ |
| 17 | UL: 704 to 716 | DL: 734 to 746 (LTE only) | ✓ | ✓ |
| 18 | UL: 815 to 830 | DL: 860 to 875 (LTE only) | ✓ | ✗ |
| 19 | UL: 830 to 845 | DL: 875 to 890 | ✓ | ✗ |
| 20 | UL: 832 to 862 | DL: 791 to 821 | ✓ | ✗ |
| 21 | UL: 1447.9 to 1462.9 | DL: 1495.9 to 1510.9 | ✗ | ✗ |
| 22 | UL: 3410 to 3490 | DL: 3510 to 3590 | ✓ | ✗ |
| 23 | UL: 2000 to 2020 | DL: 2180 to 2200 (LTE only) | ✓ | ✓ |
| 24 | UL: 1625.5 to 1660.5 | DL: 1525 to 1559 (LTE only) | ✓ | ✓ |
| 25 | UL: 1850 to 1915 | DL: 1930 to 1995 | ✓ | ✓ |
| 26 | UL: 814 to 849 | DL: 859 to 894 | ✓ | ✗ |
| 27 | UL: 807 to 824 | DL: 852 to 869 (LTE only) | ✓ | ✗ |
| 28 | UL: 703 to 748 | DL: 758 to 803 (LTE only) | ✓ | ✗ |
| 29 | UL: - | DL: 717 to 728 (LTE only) | ✓ | ✓ |
| 30 | UL: 2305 to 2315 | DL: 2350 to 2360 (LTE only) | ✓ | ✓ |
| 31 | UL: 452.5 to 457.5 | DL: 462.5 to 467.5 (LTE only) | ✗ | ✗ |
| 32 | UL: - | DL: 1452 - 1496 | ✗ | ✗ |
| 35 | | 1850 to 1910 | ✓ | ✓ |
| 38 | | 2570 to 2620 | ✓ | ✓ |
| 39 | | 1880 to 1920 | ✓ | ✓ |
| 40 | | 2300 to 2400 | ✓ | ✓ |
| 41 | | 2496 to 2690 | ✓ | ✓ |
| 42 | | 3400 to 3600 | ✓ | ✗ |
| 43 | | 3600 to 3800 | ✗ | ✗ |

*Covered bands represent an efficiency greater than 20%

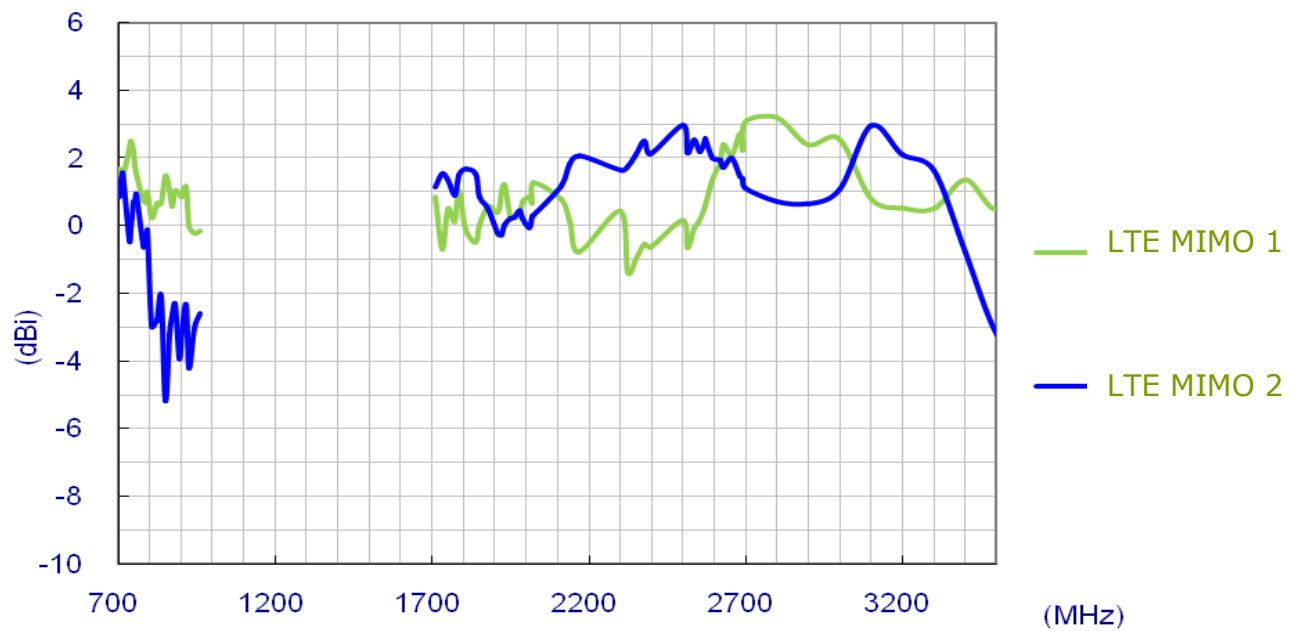
3. LTE MIMO

3.1. LTE MIMO 1 and LTE MIMO 2 Specification

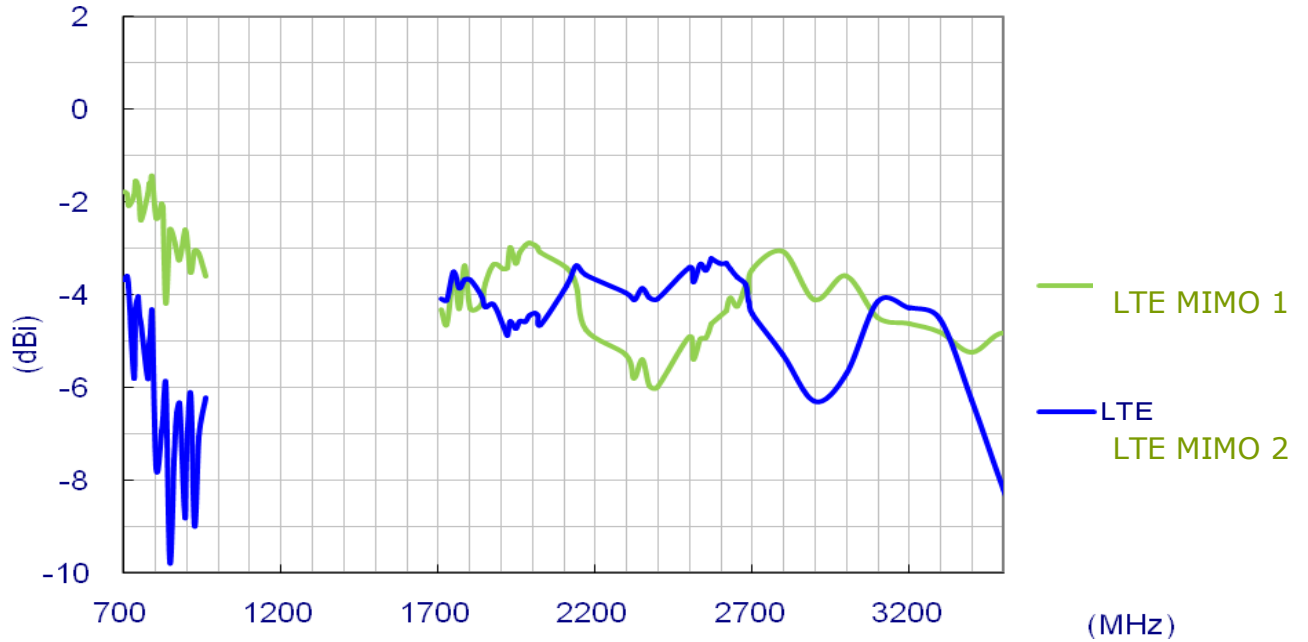
3.1.1. Return Loss



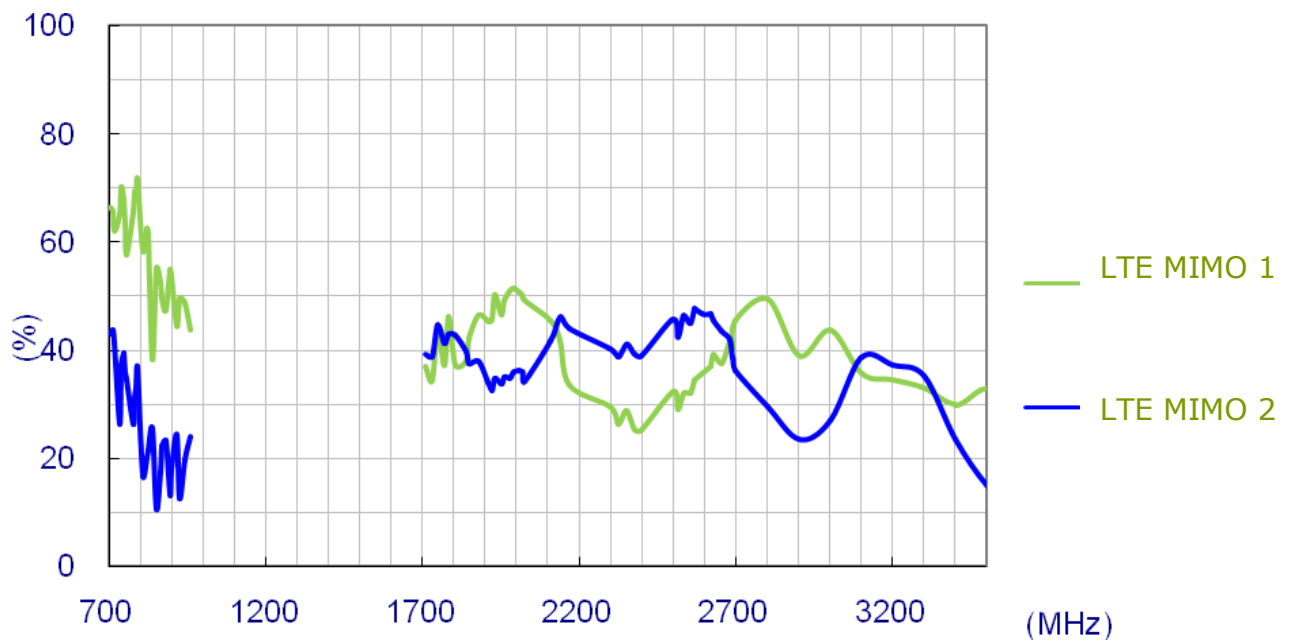
3.1.2. Maximum Gain



3.1.3. Average Gain



3.1.4. Efficiency

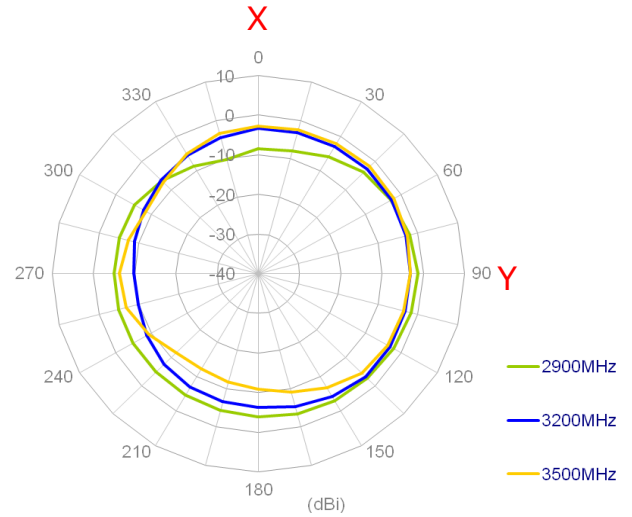
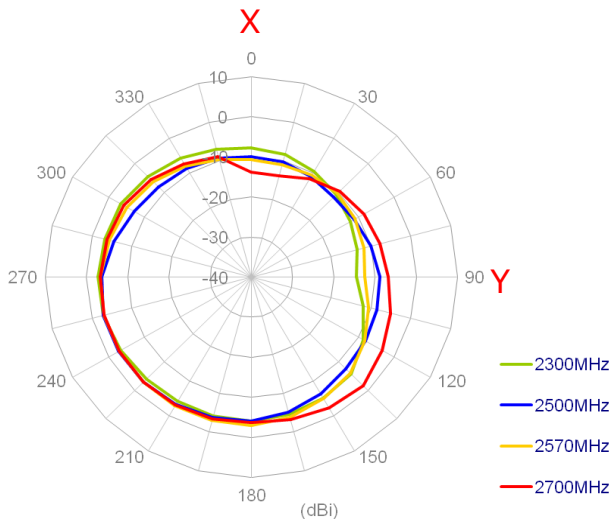
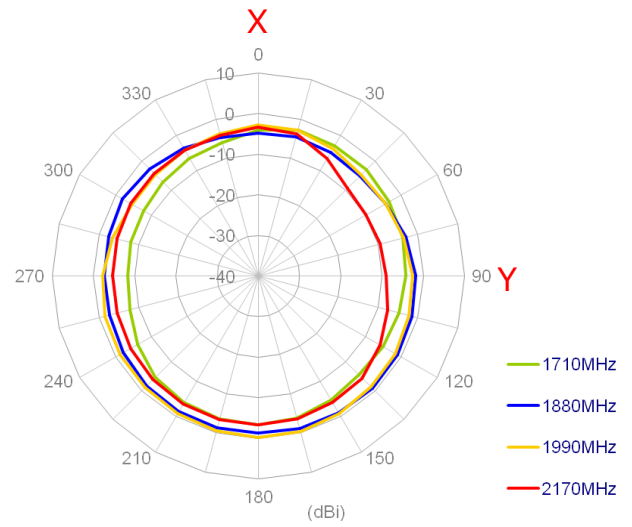
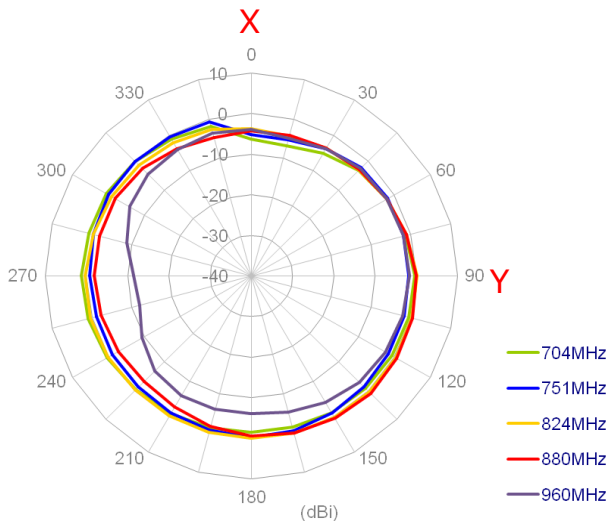


3.2. Radiation Patterns

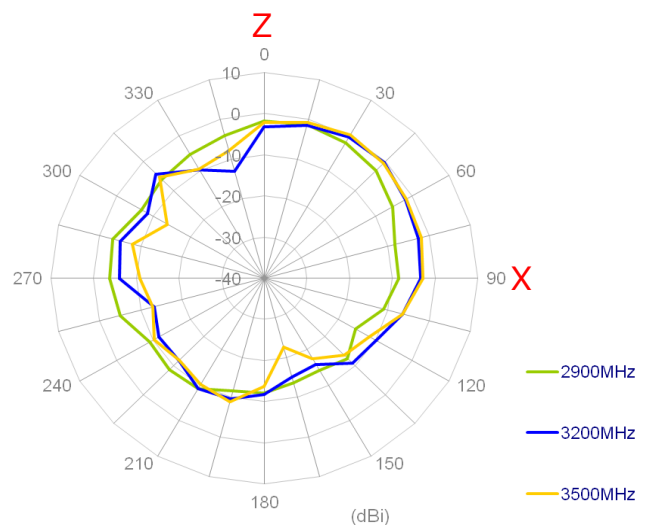
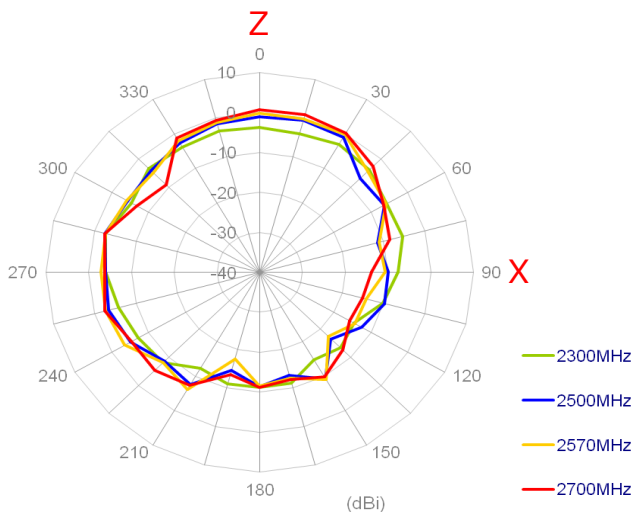
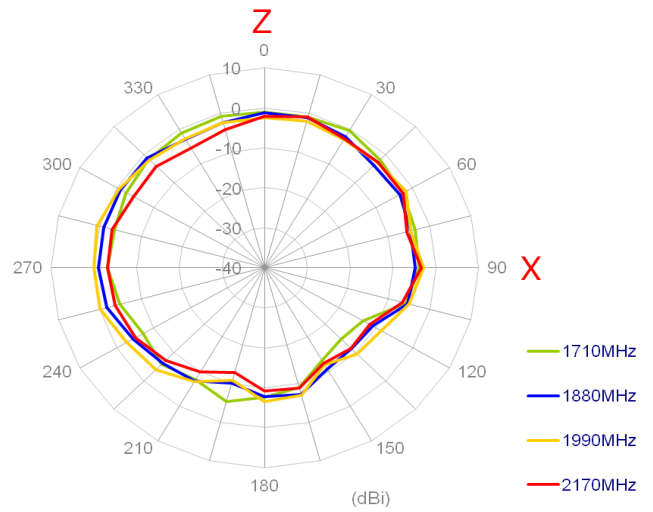
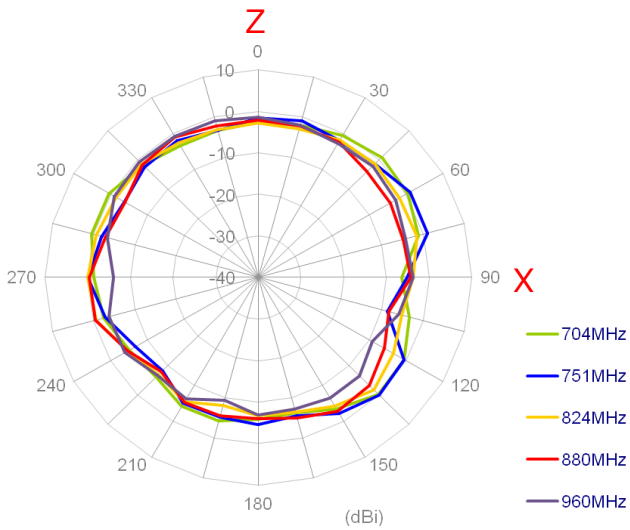


3.2.1. LTE MIMO 1 Radiation Pattern

XY Plane

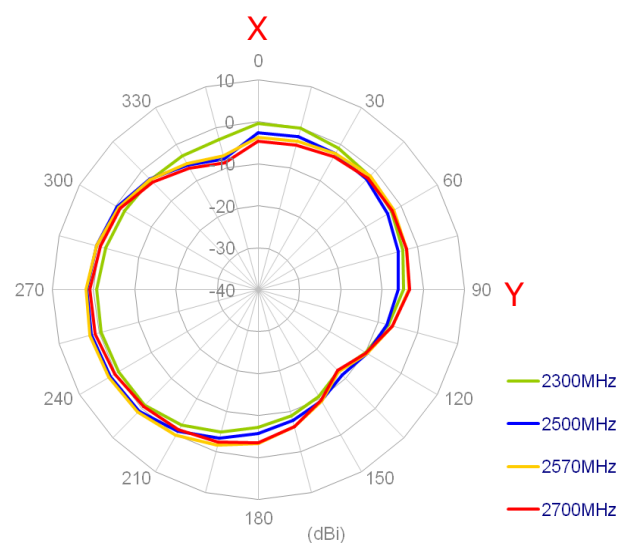
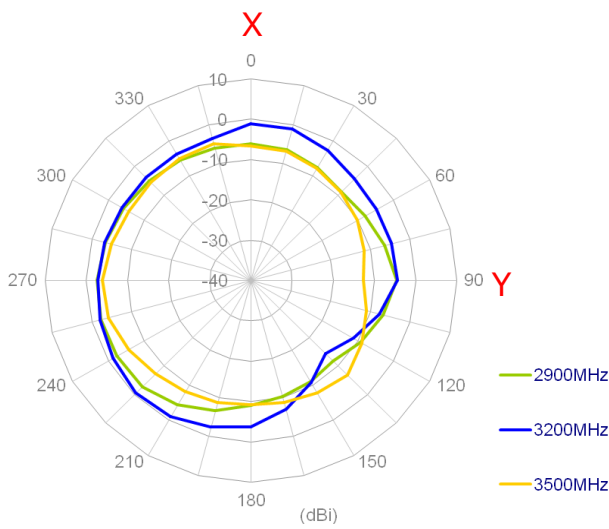
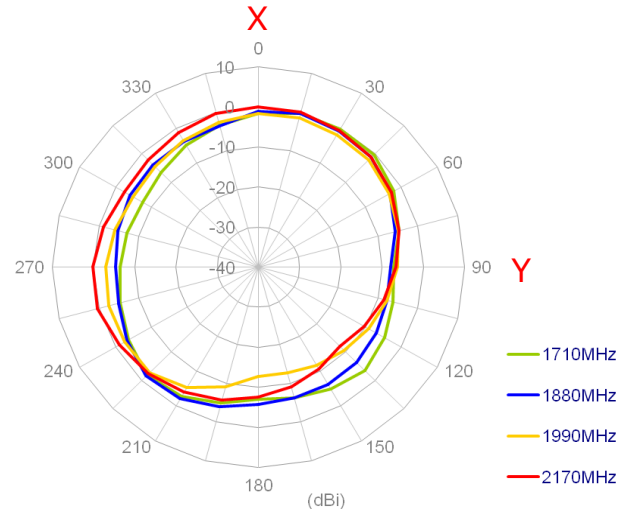
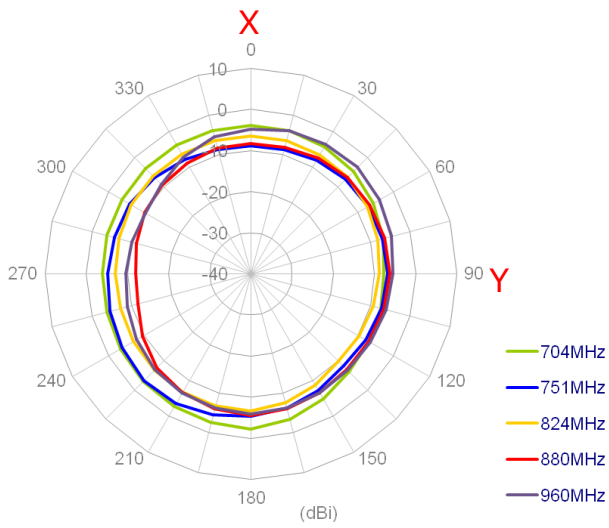


XZ Plane

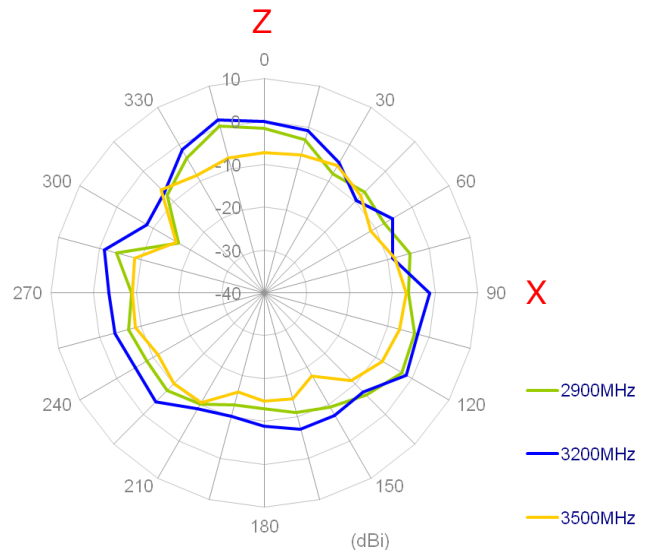
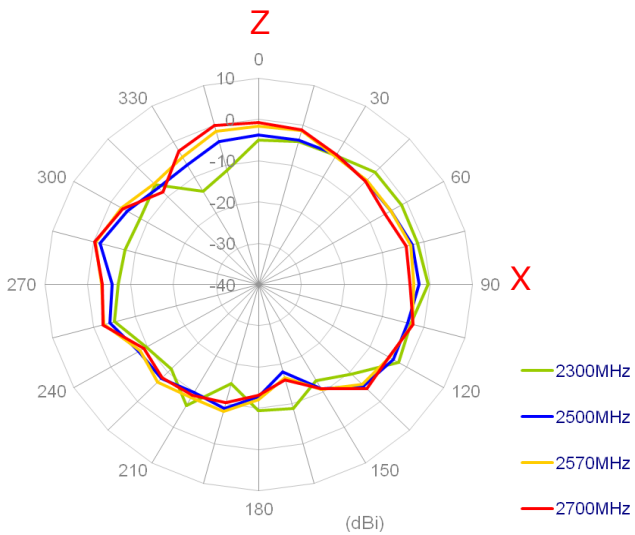
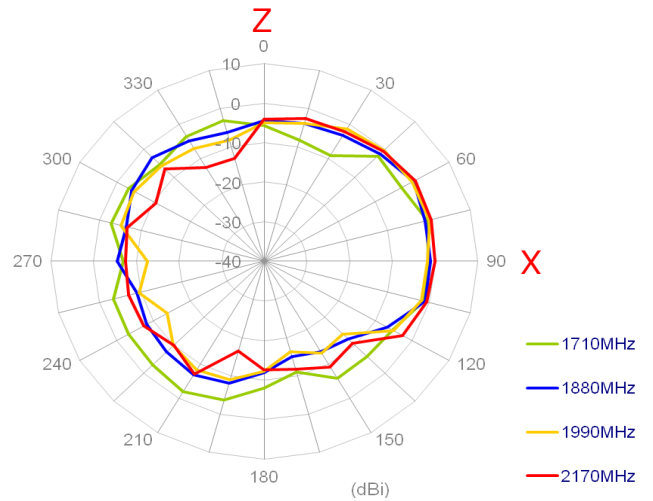
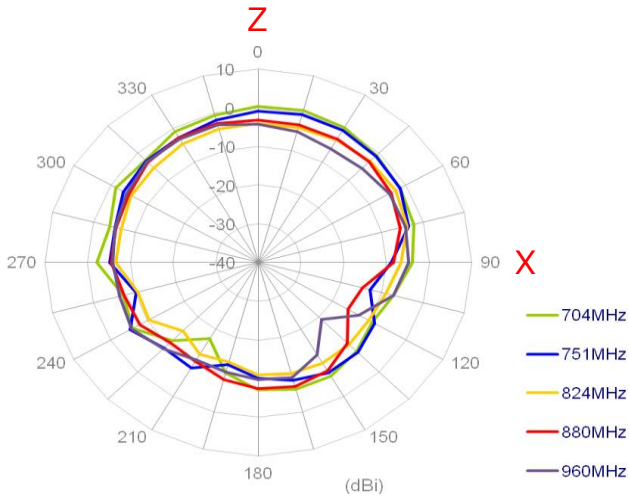


3.2.2. LTE MIMO 2 Radiation Pattern

XY Plane



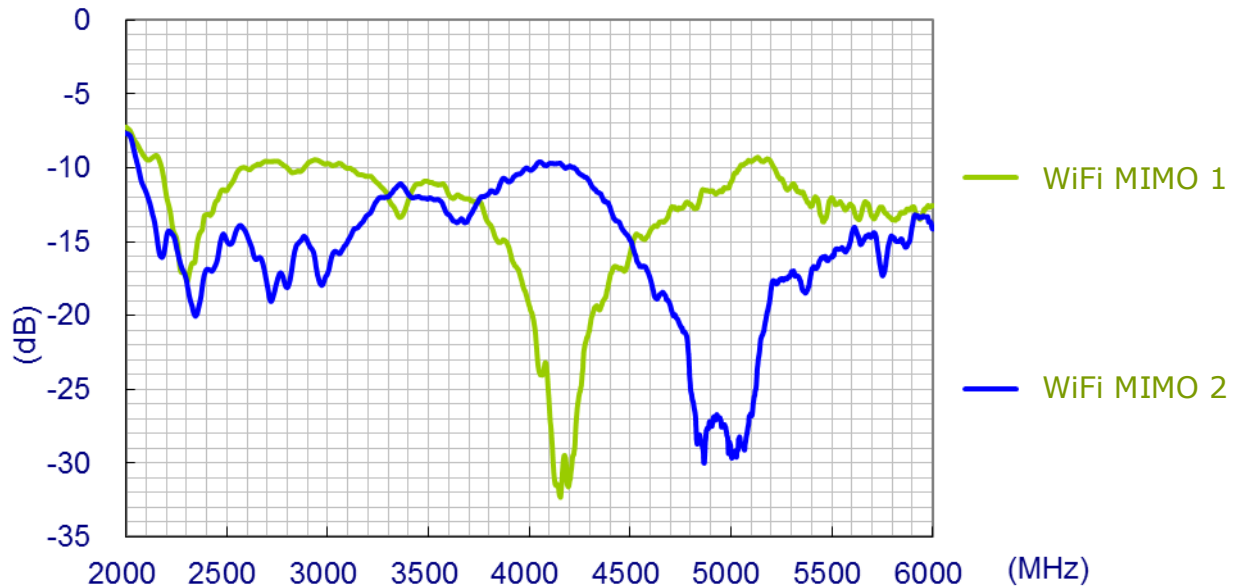
XZ Plane



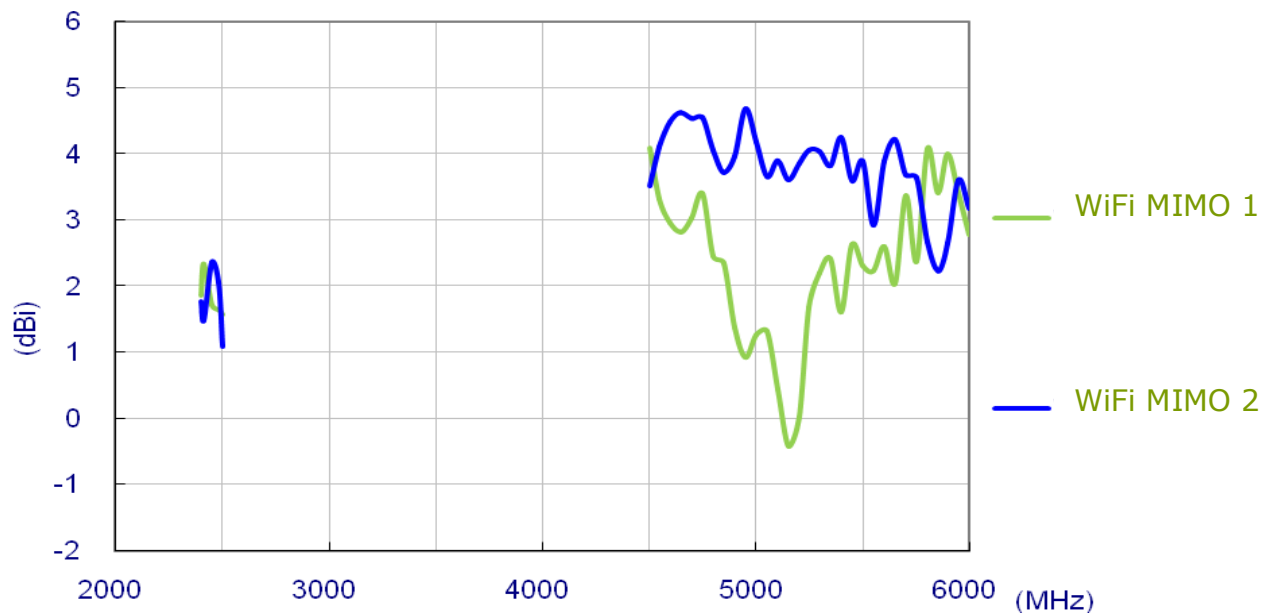
4. 2.4/5GHz MIMO

4.1. 2.4/5 GHz MIMO 1 and MIMO 2 Specification

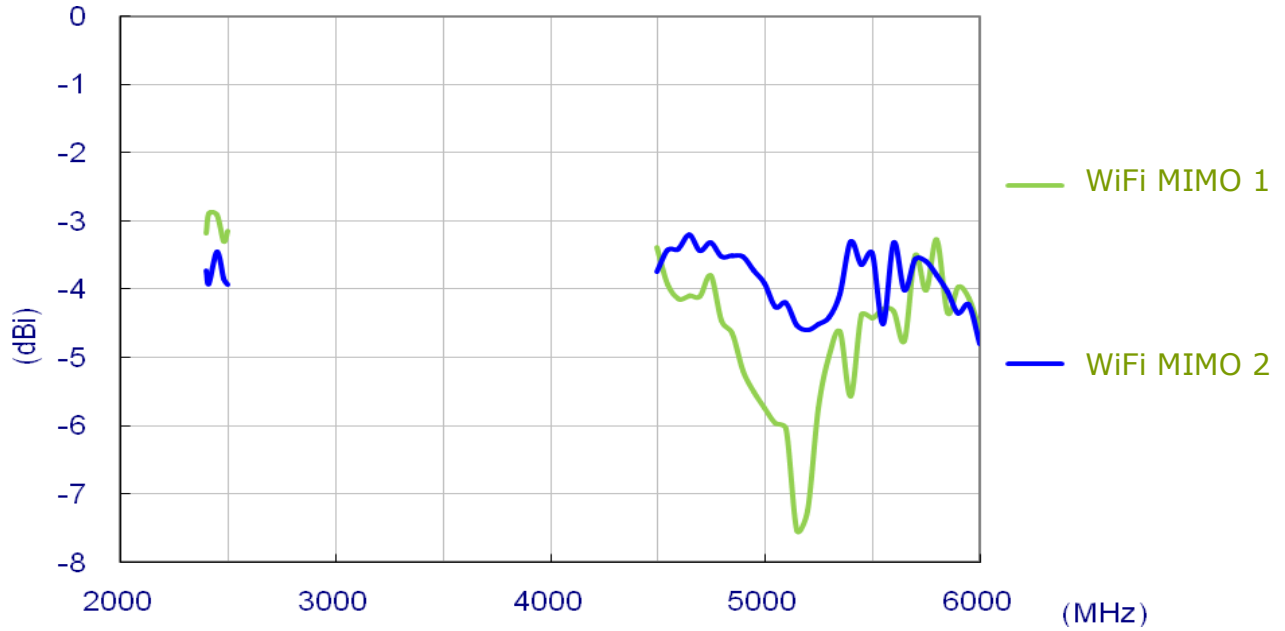
4.1.1. Return Loss



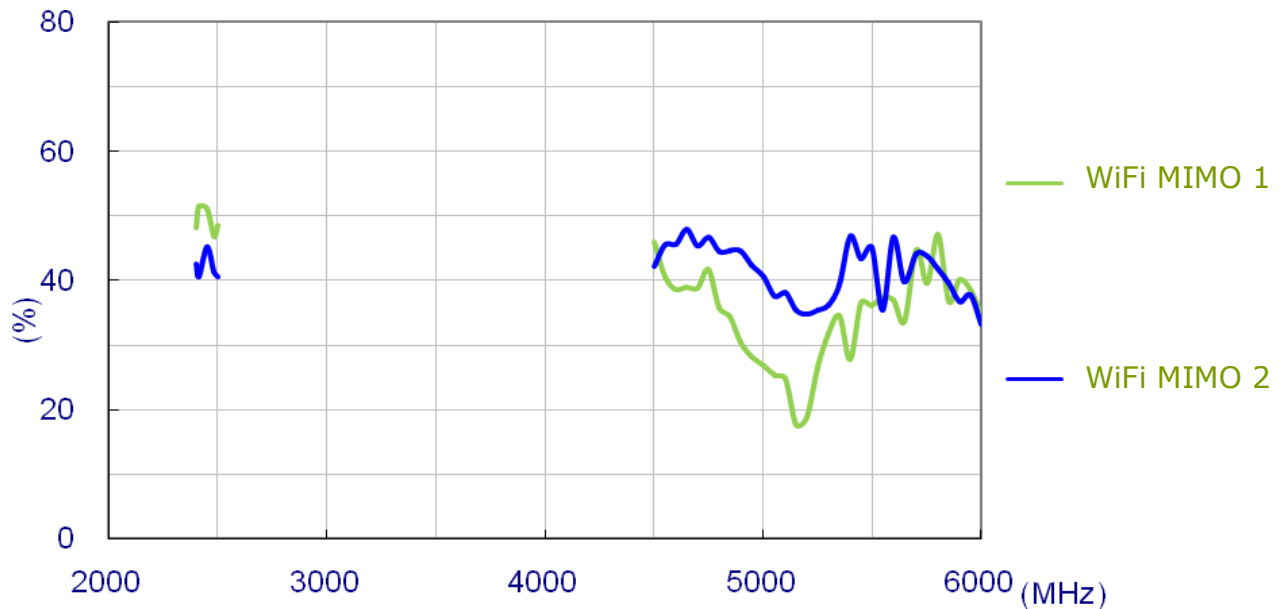
4.1.2. Maximum Gain



4.1.3. Average Gain



4.1.4. Efficiency



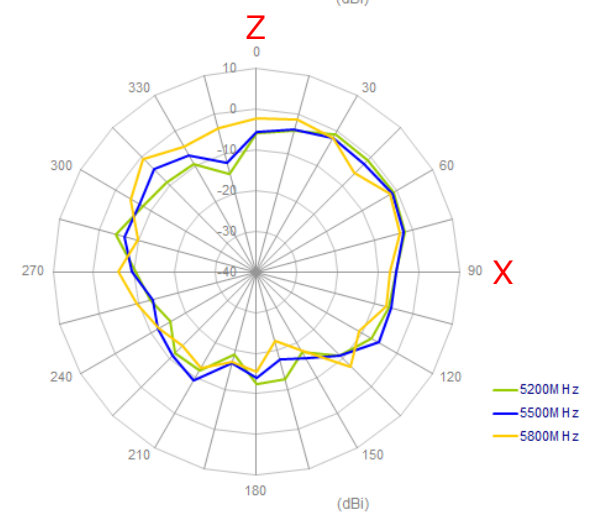
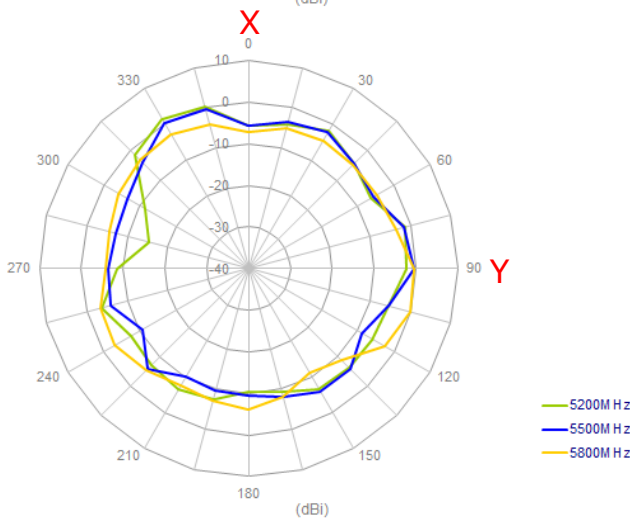
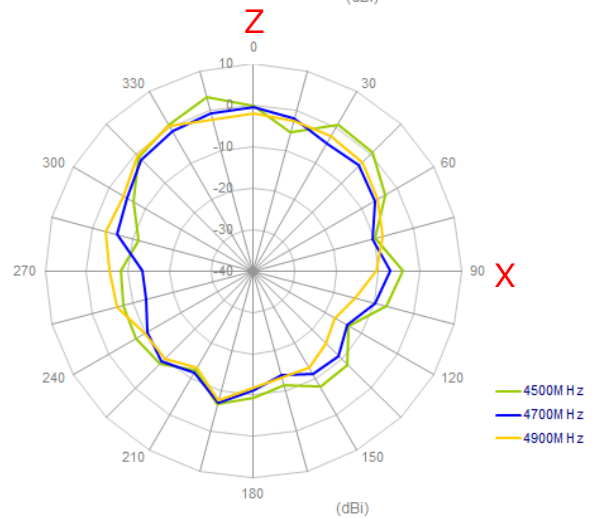
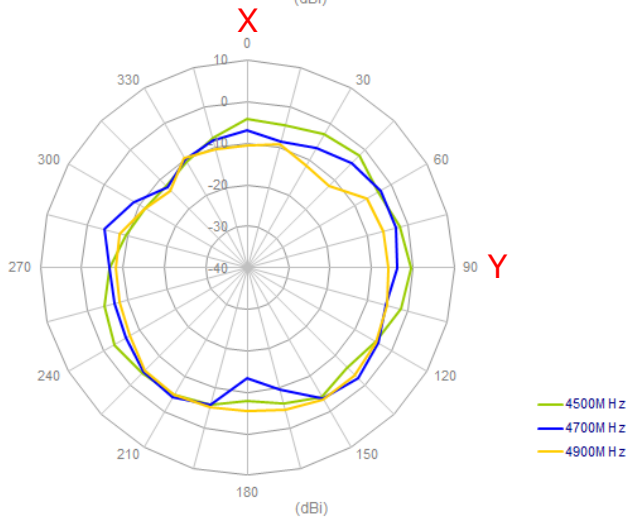
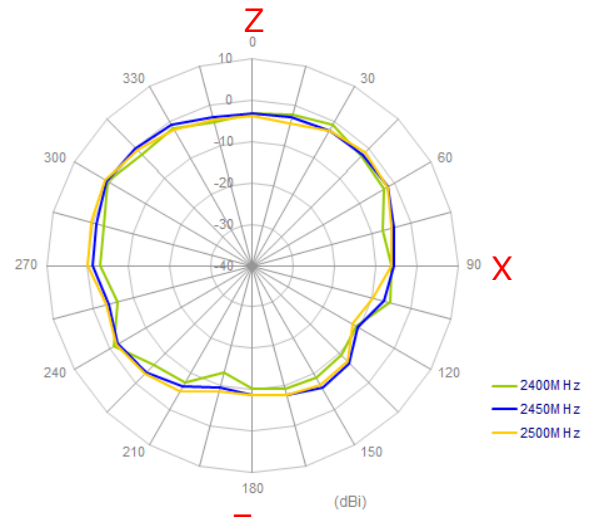
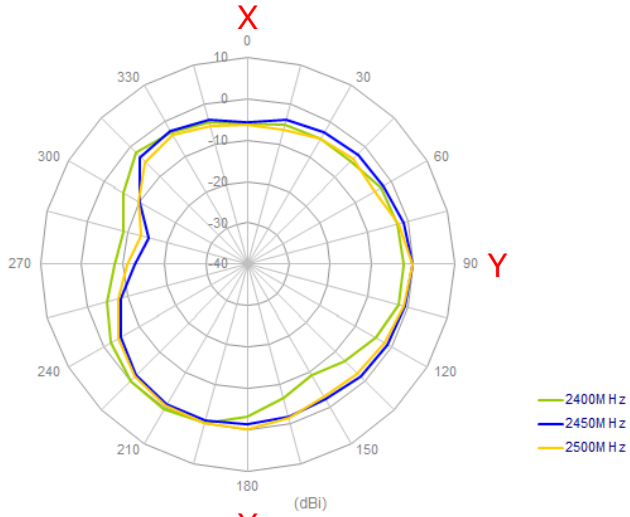
4.2. Radiation Patterns



4.2.1. 5GHz MIMO 1

XY Plane

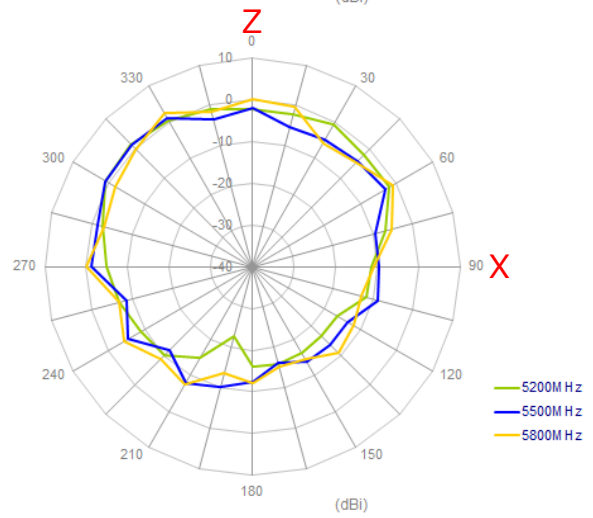
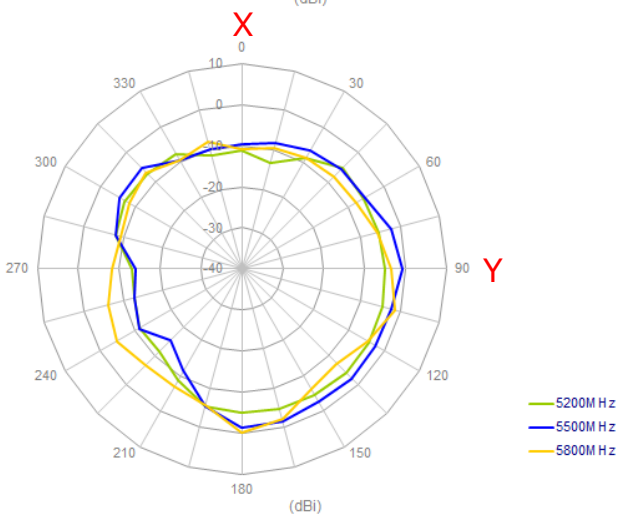
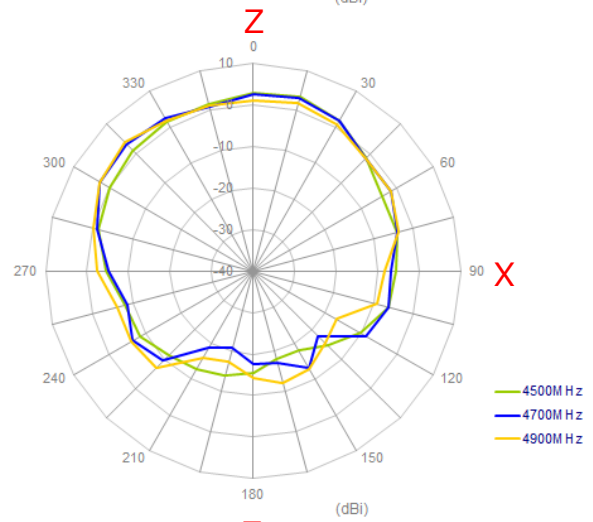
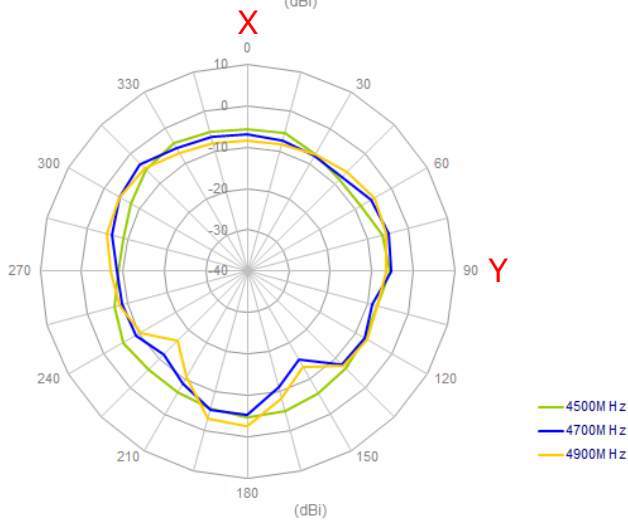
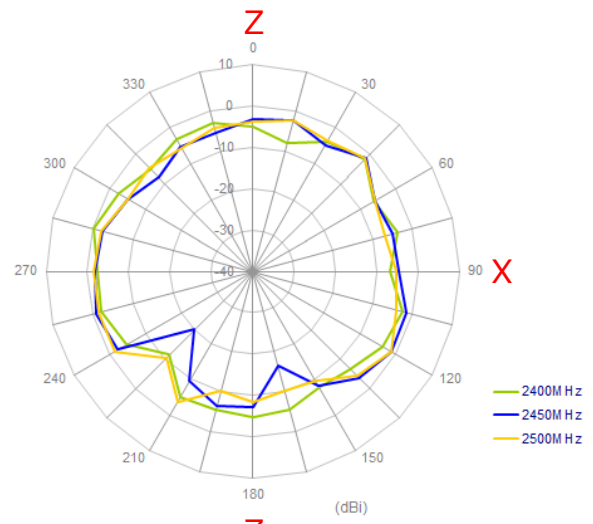
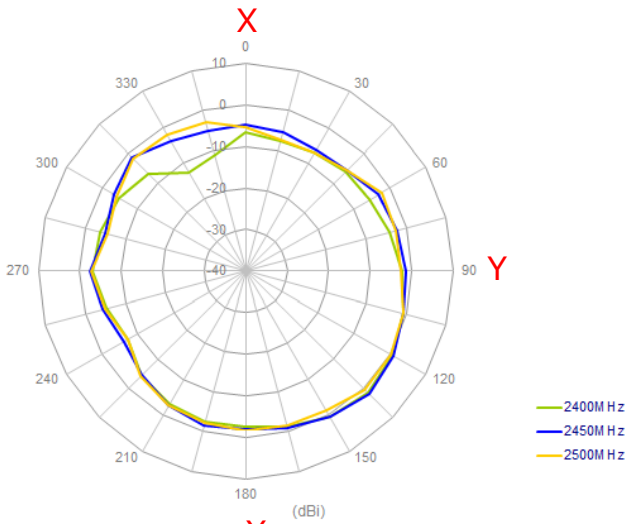
XZ Plane



4.2.2. 2.4/5GHz MIMO 2

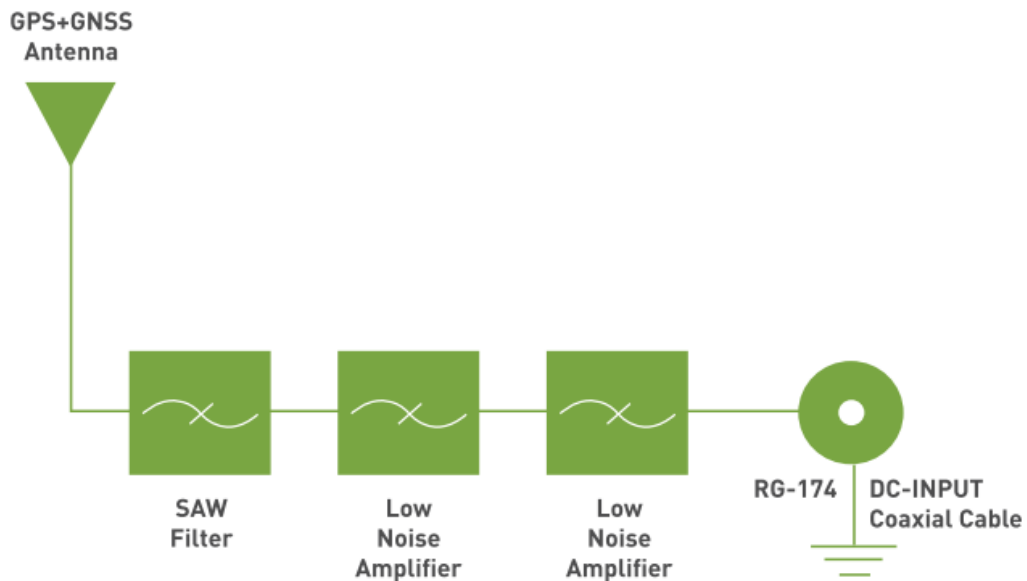
XY Plane

XZ Plane

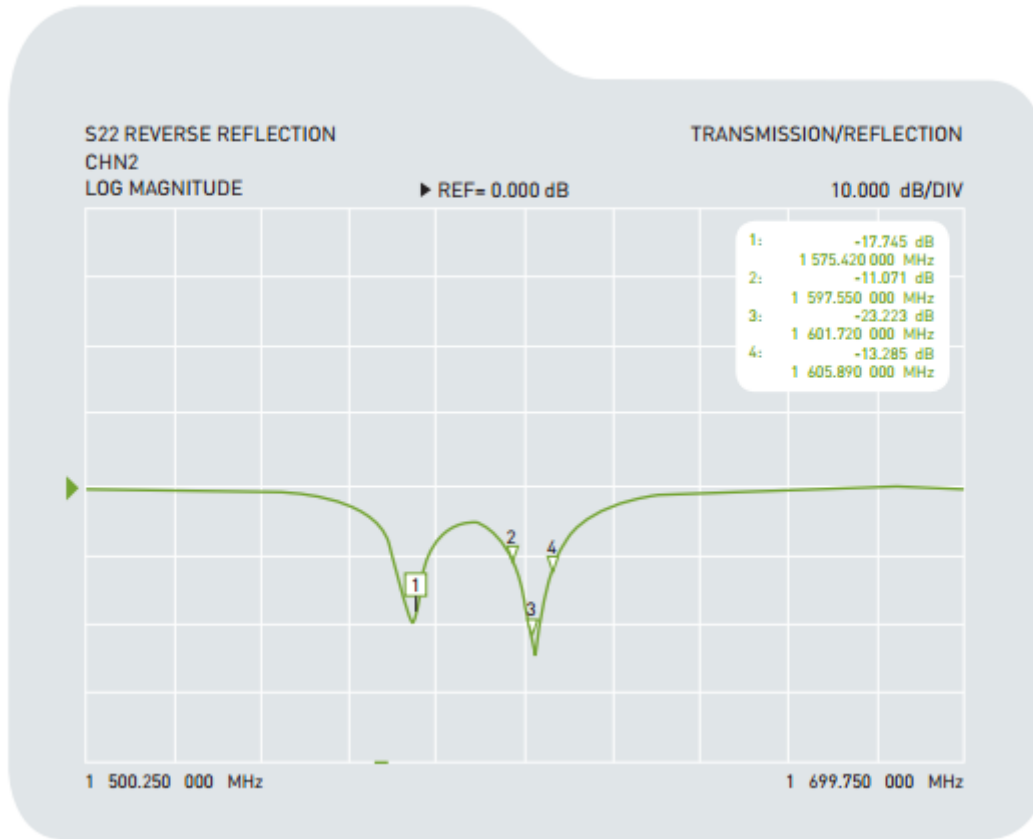


5. GPS/GLONASS/GALILEO Antenna Characteristics

5.1. Block diagram



5.2. Return Loss

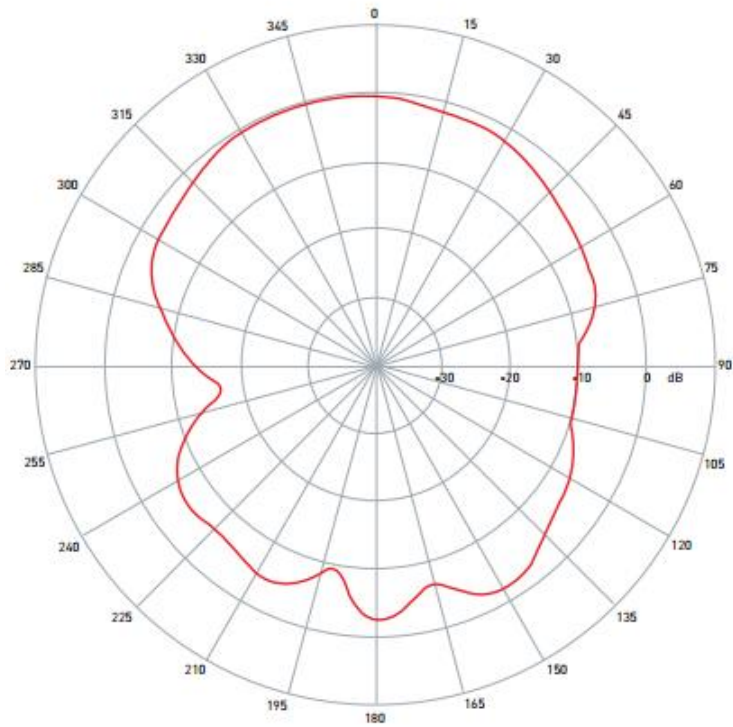


5.3. GPS/GLONASS/GALILEO Antenna Radiation Pattern

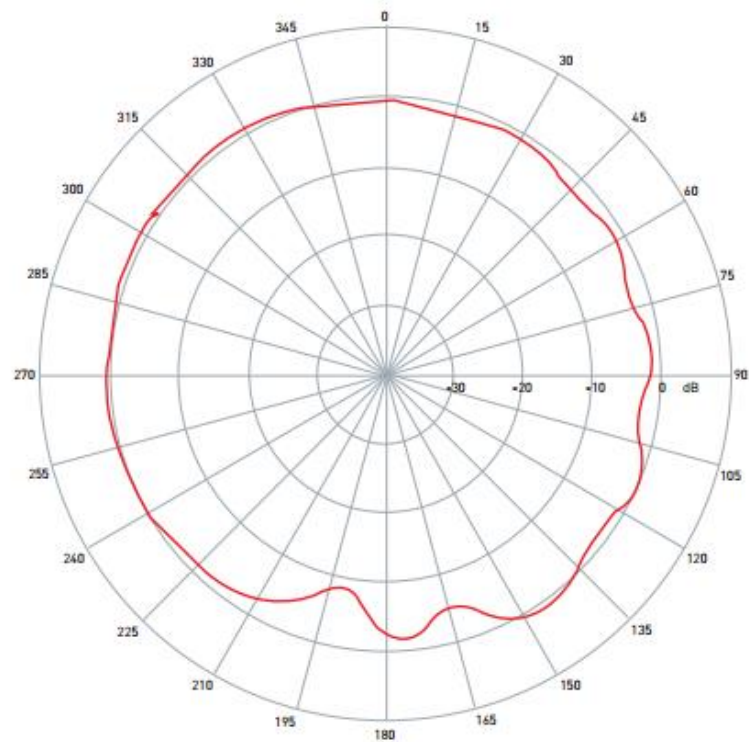


XYZ co-ordinate for reference.

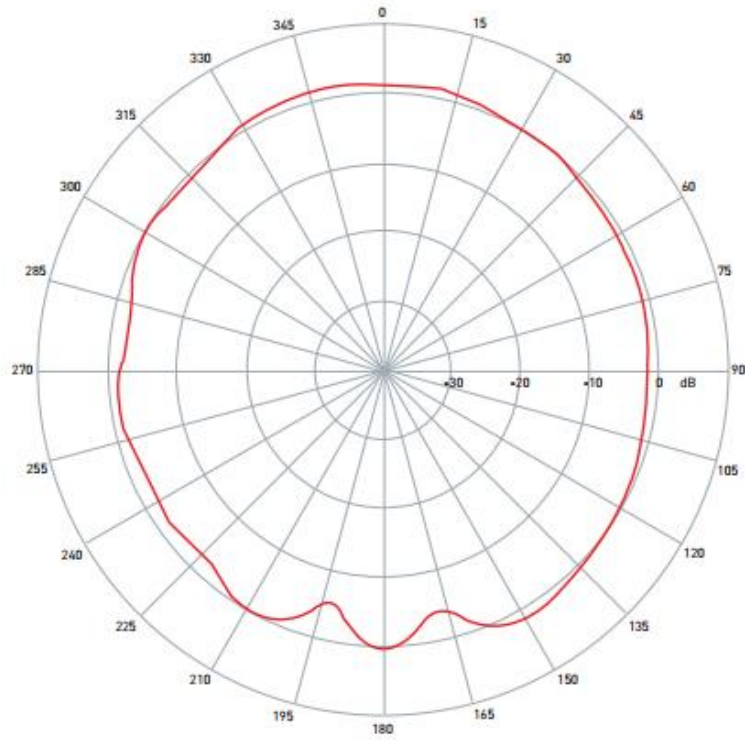
XZ Plane Free Space @1575.42MHz



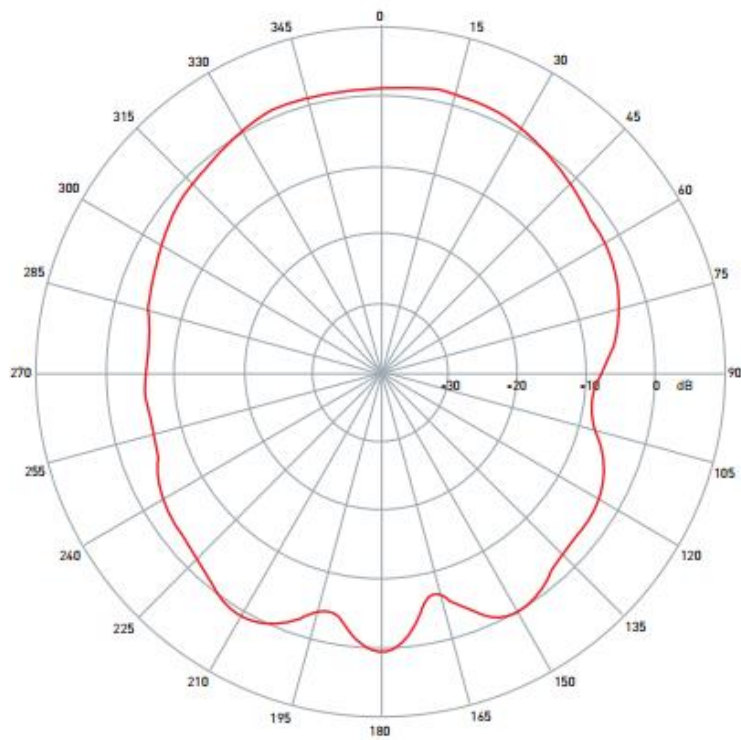
YZ Plane Free Space @1575.42MHz



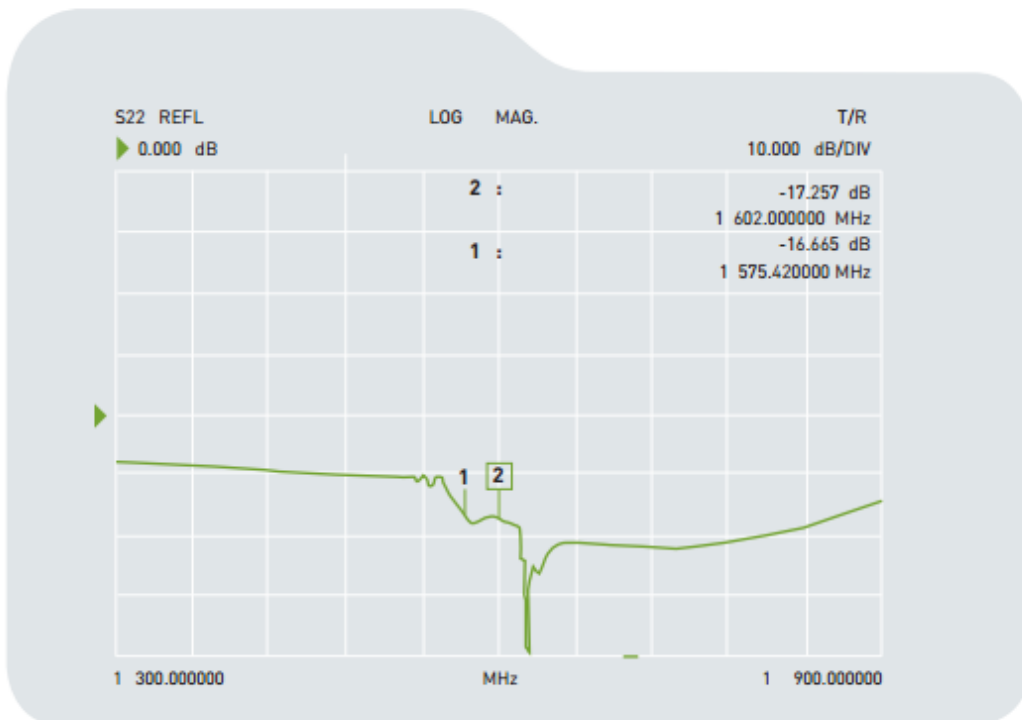
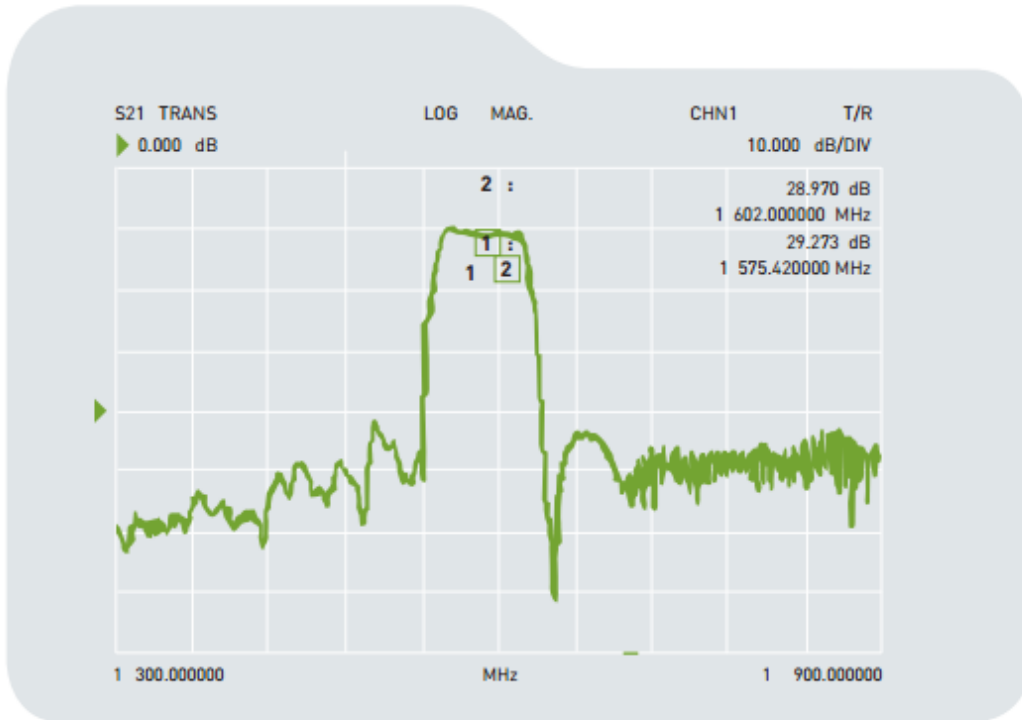
XZ Plane Free Space @1602MHz



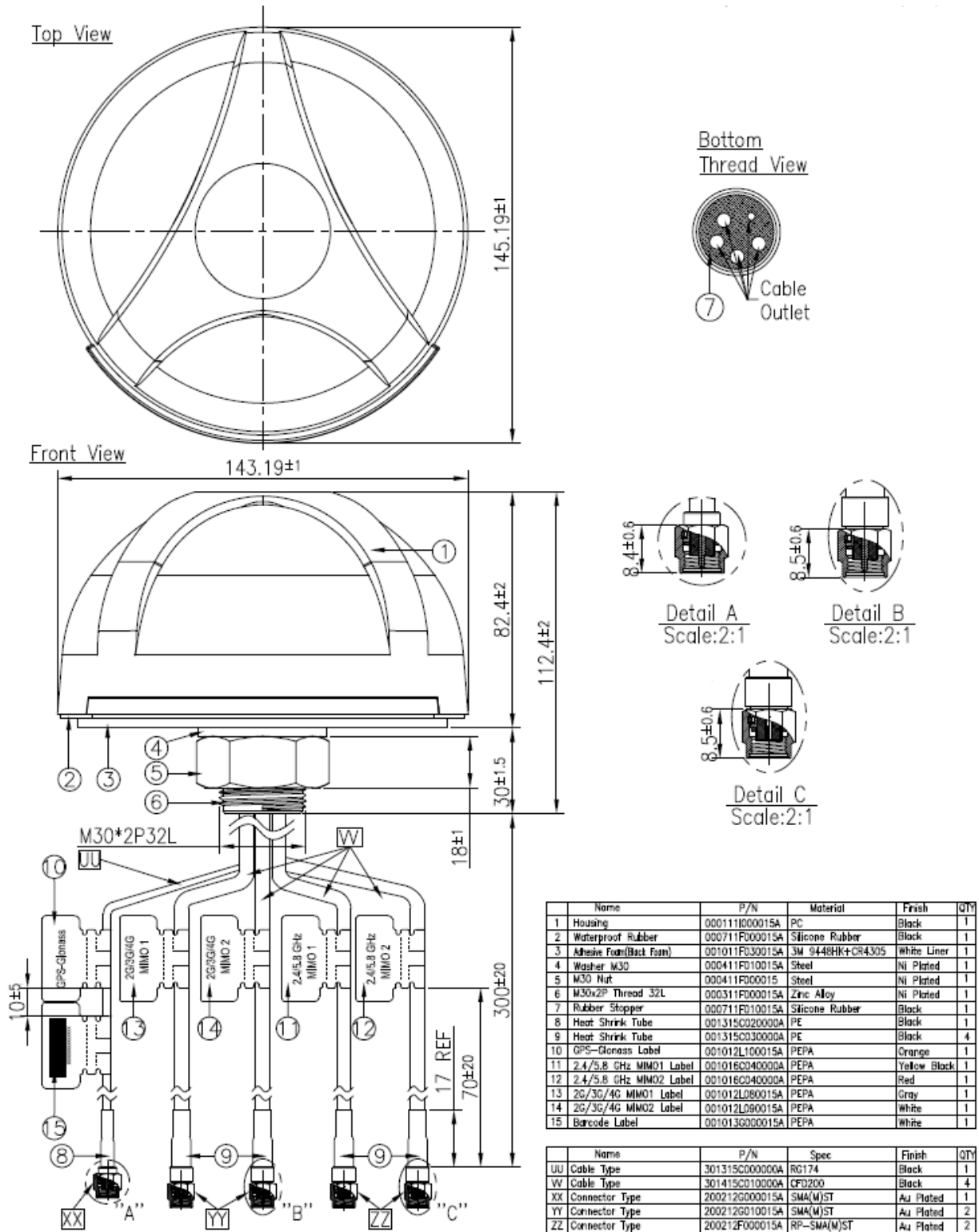
YZ Plane Free Space @1602MHz



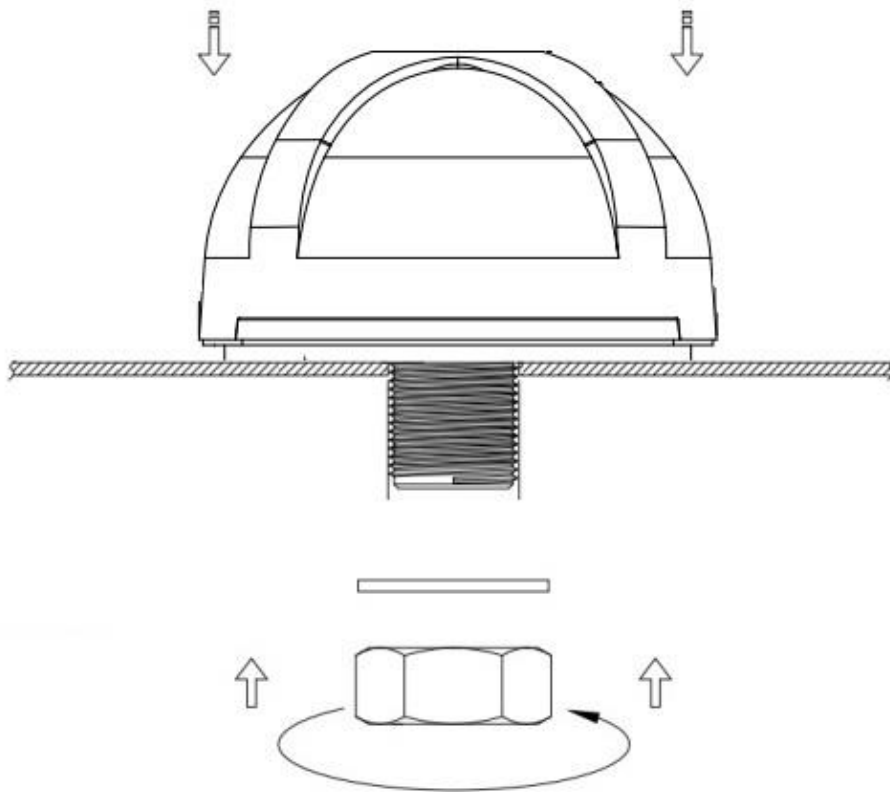
5.4. GPS/GLONASS/GALILEO LNA



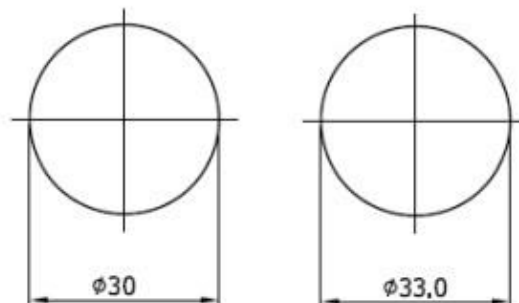
6. Drawing (Unit: mm)



7. Installation



Recommended Torque for Mounting 49 N·m
 Maximum Torque for Mounting 58.8 N·m



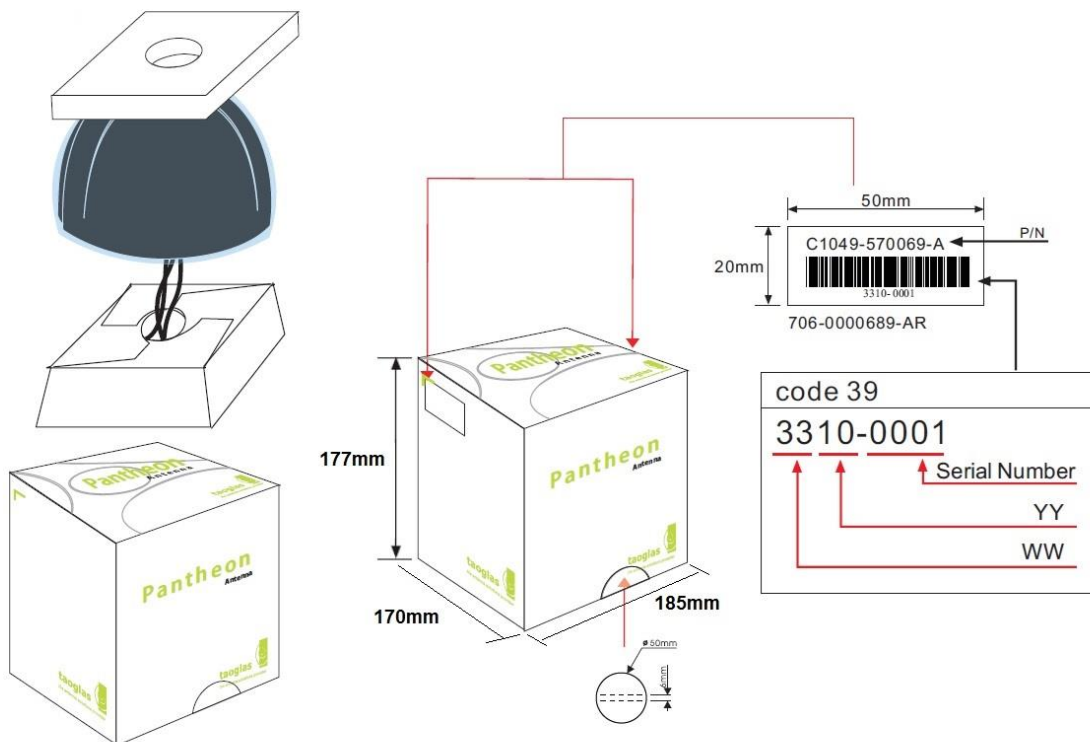
**Thread
 Diameter**

**Recommended
 Mounting Hole**

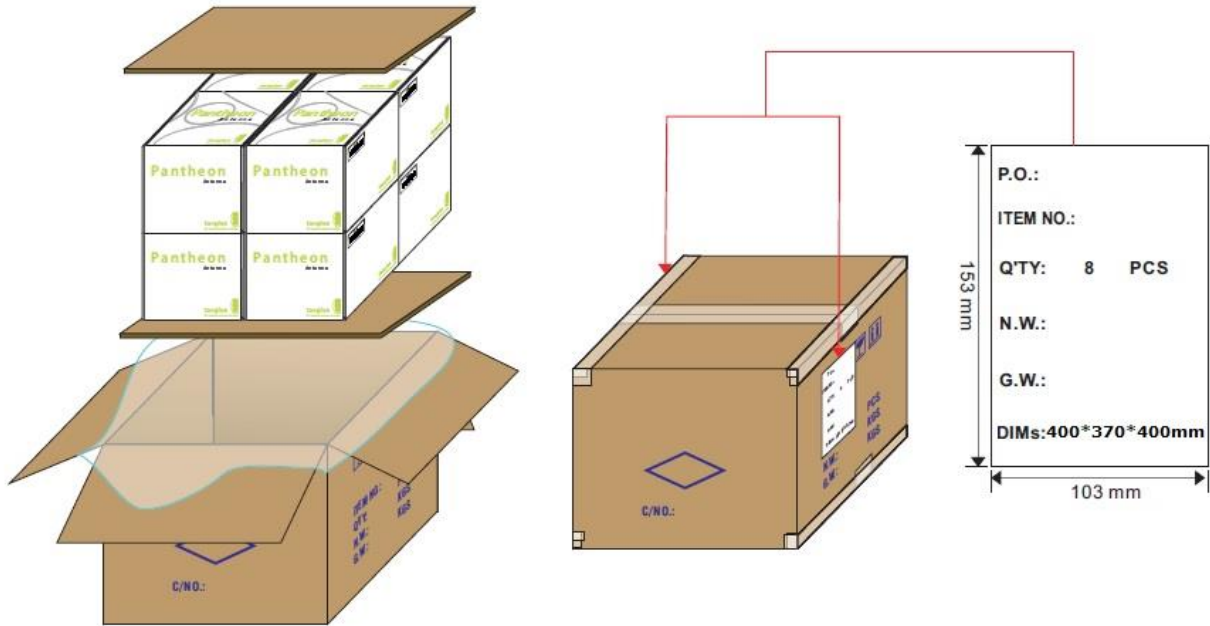
Unit: mm

8. Packaging

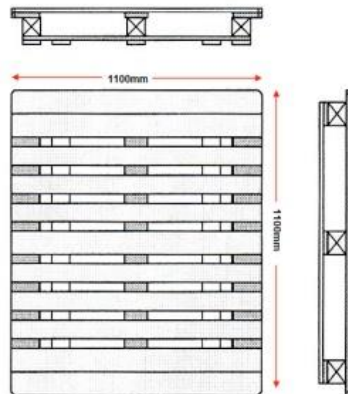
- 1 Antenna Individual Box
- Weight: 1.53Kg



8 Individual boxes per carton



32 cartons per pallet (110*110cm)
256 pieces per pallet



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