

SPECIFICATION

- Part No. : **MA761.B.BICG.003**
- Product Name : Pantheon Antenna 4in1 MA761
Screw-Mount [Permanent Mount]
2G/3G/4G MIMO/ 2.4/5GHz MIMO
- Feature :
 - 2 x 2G/3G/4G MIMO Antenna (698~960MHz, 1710~2170MHz, 2300~2700MHz, 2900-3500MHz)
 - MIMO1 antenna
 - MIMO2 antenna
 - 2 x 2.4GHz/5GHz MIMO Antenna
 - MIMO1 antenna
 - MIMO2 antenna

IP67 Waterproof
High Efficiency / Peak Gain Outdoor Antenna
RoHS Compliant





1. Introduction

MA761 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 LTE and Wi-Fi 802.11n and emerging 802.11ac for next generation high bandwidth telematics systems.

New fleet management and video location technology allows for real-time video uplink and downlink. High efficiency high gain MIMO antennas are necessary to achieve the high signal to noise ratio and throughput required to solve these challenges.

We have packed 4 high efficiency and gain antennas in an extremely robust IP67 direct mount antenna package with good isolation (10dB+)*. 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

| 2G/3G/4G MIMO | | | | | | | | |
|----------------------|---|-------------|-------------|---------------|---------------|---------------|---------------|---------------|
| Band | LTE 700 | GSM 850 | GSM 900 | DCS | PCS | UMTS 1 | LTE 2600 | LTE 3500 |
| Frequency (MHz) | 698~ 824 | 824~ 894 | 880~ 960 | 1710~ 1880 | 1850~ 1990 | 1920~ 2170 | 2500~ 2690 | 2900~ 3500 |
| MIMO 1 | | | | | | | | |
| Peak Gain (dBi) * | 2.45 | 2.35 | 1.10 | 2.01 | 2.07 | 1.64 | 0.28 | 0.36 |
| Average Gain (dBi) * | -2.33 | -2.76 | -3.99 | -2.29 | -2.42 | -2.60 | -5.00 | -5.52 |
| Efficiency (%)* | 58.64 | 53.04 | 40.41 | 59.15 | 57.38 | 55.26 | 31.79 | 31.40 |
| Return loss (dB) * | <-6 | | | | | | | |
| MIMO 2 | | | | | | | | |
| Peak Gain (dBi) * | 1.98 | 1.39 | 0.60 | 1.57 | 1.84 | 1.80 | -2.54 | -5.16 |
| Average Gain (dBi) * | -2.41 | -2.13 | -2.94 | -2.35 | -2.46 | -2.49 | -8.06 | -11.41 |
| Efficiency (%) * | 58.17 | 61.36 | 51.05 | 58.43 | 56.87 | 56.43 | 15.78 | 9.25 |
| Return loss (dB) * | <-6 | | | | | | | |
| Polarization | Linear | | | | | | | |
| Impedance | 50Ω | | | | | | | |
| Cable | 3m CFD-200 standard, fully customizable | | | | | | | |
| Connector | SMA Male Straight, fully customizable | | | | | | | |

| 2.4GHz/5GHz MIMO | | |
|----------------------|---|-----------|
| Frequency (GHz) | 2.4~2.5 | 5.15~5.85 |
| MIMO 1 | | |
| Peak Gain (dBi) * | 2.46 | 3.61 |
| Average Gain (dBi) * | -3.24 | -4.55 |
| Efficiency (%)* | 47.46 | 35.17 |
| Return loss (dB) * | <-10 | |
| MIMO 2 | | |
| Peak Gain (dBi) * | 2.61 | 3.17 |
| Average Gain (dBi) * | -3.12 | -4.66 |
| Efficiency (%)* | 48.81 | 34.32 |
| Return loss (dB) * | <-10 | |
| Polarization | Linear | |
| Impedance | 50Ω | |
| Cable | 3m CFD-200 standard, fully customizable | |

| | |
|-----------|--|
| Connector | RP-SMA Male Straight, fully customizable |
|-----------|--|

| MECHANICAL | |
|---------------------------------|----------------------------------|
| Antenna Dimensions | Height 84.5mm x Diameter 143.2mm |
| Casing | Wonderloy PC-540 PC |
| Waterproof | IP67 |
| Recommended Torque for Mounting | 49N·m |
| Max Torque for Mounting | 58.8N·m |
| Weight | 1.16kg/1pcs |
| ENVIRONMENTAL | |
| Operation Temperature | -40°C to 85°C |
| Storage Temperature | -40°C to 90°C |
| Humidity | Non-condensing 65°C 95% RH |

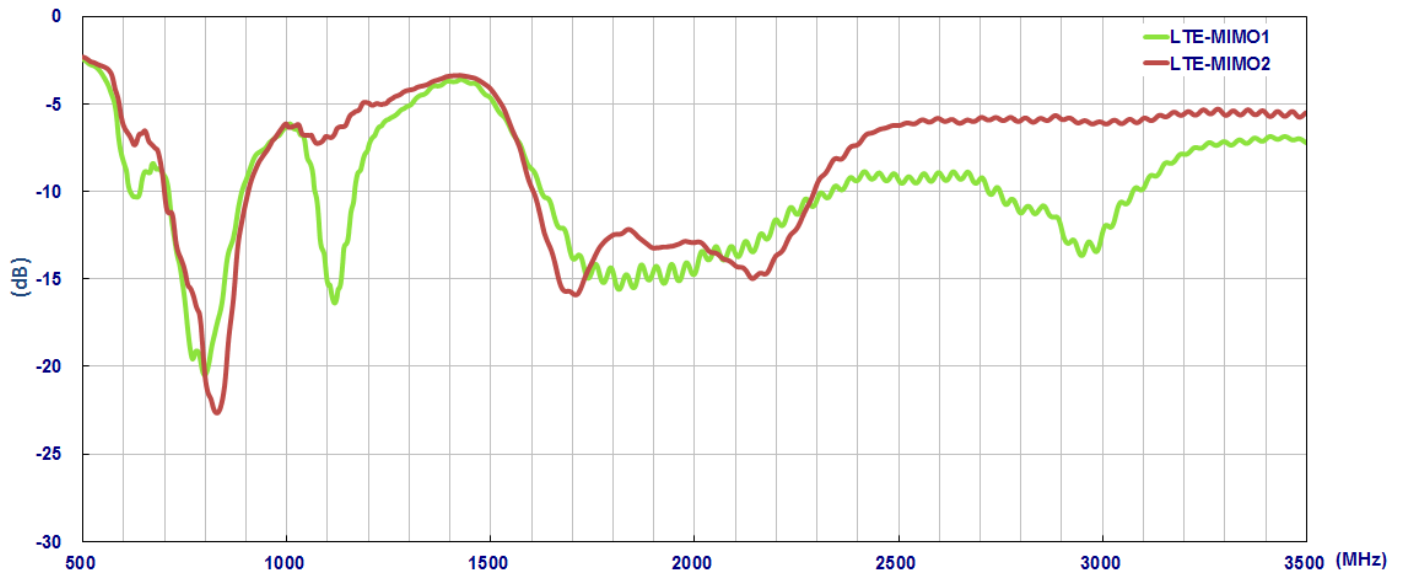
* All measurements were conducted with 3m cable length

| LTE BANDS | | | | |
|-------------|-------------------------------------|-------------------------------|--------|--------|
| Band Number | LTE/LTE- Advanced /WCDMA/HSPA.HSPA+ | | | |
| | 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 (LET 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 | ✗ | ✗ |

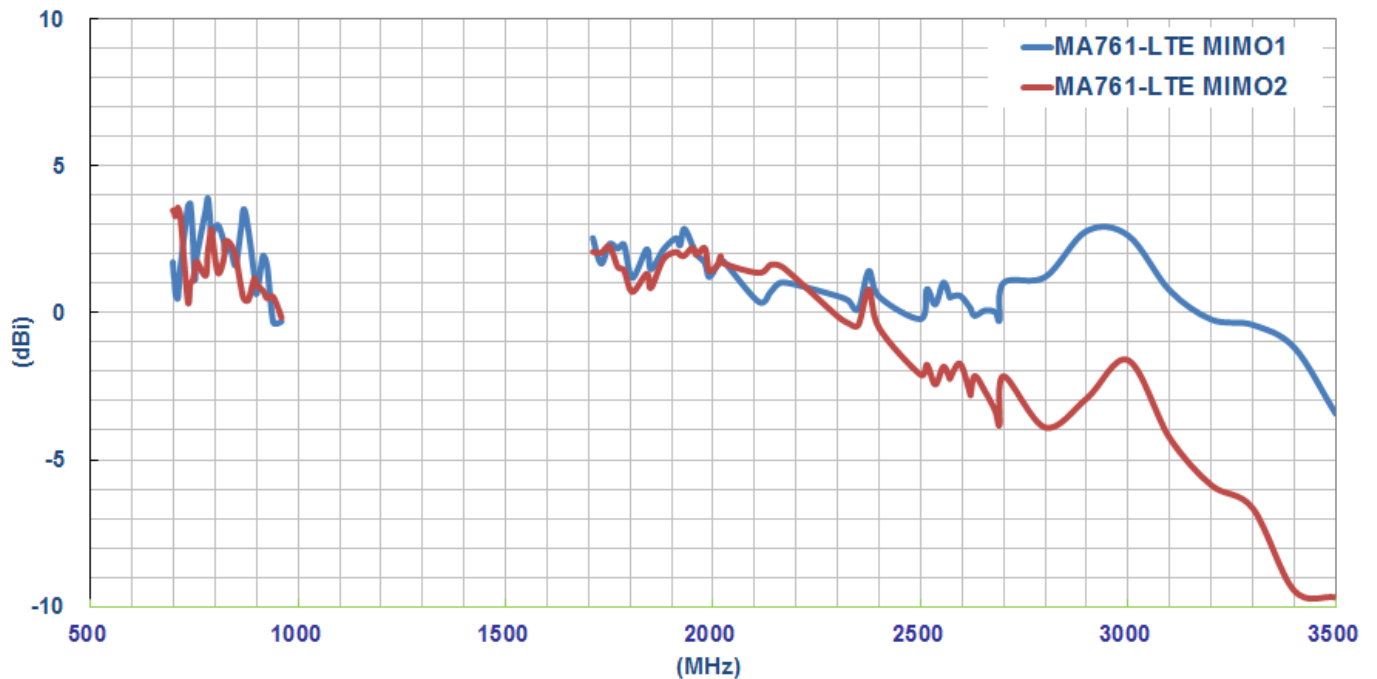
3. LTE MIMO

3.1. LTE MIMO1 and MIMO2 Characteristics

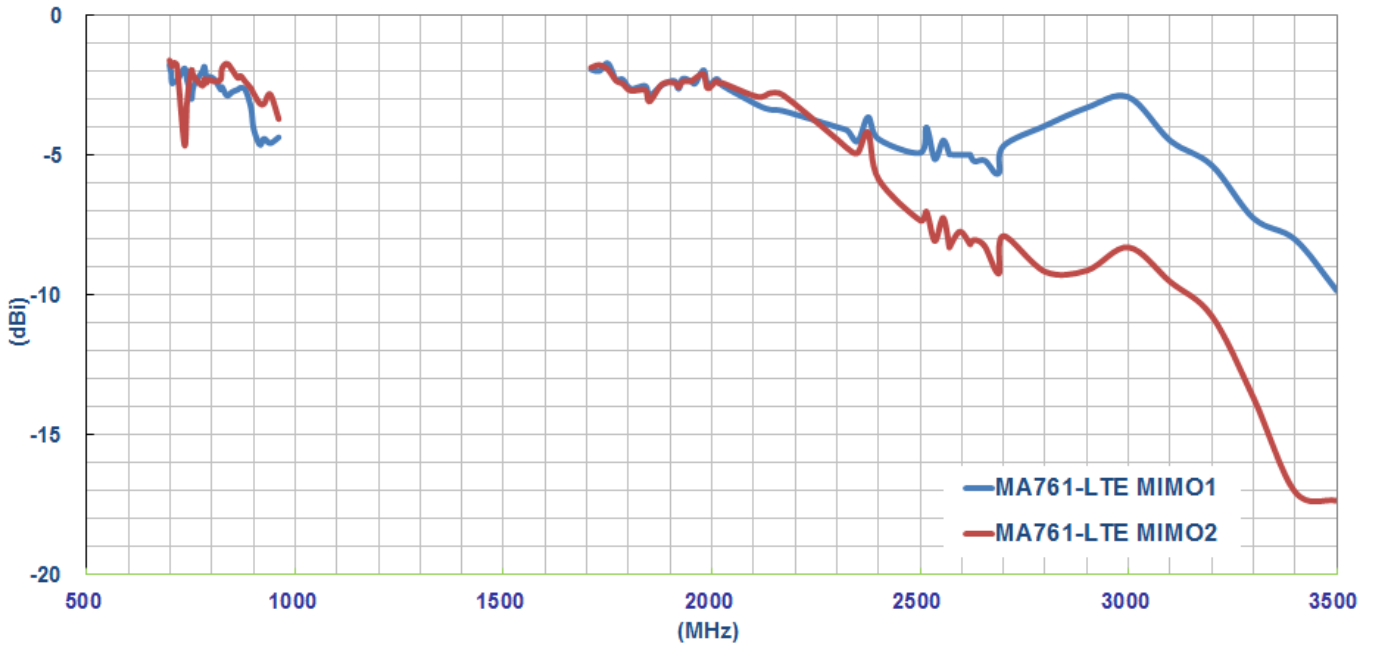
3.1.1. Return Loss



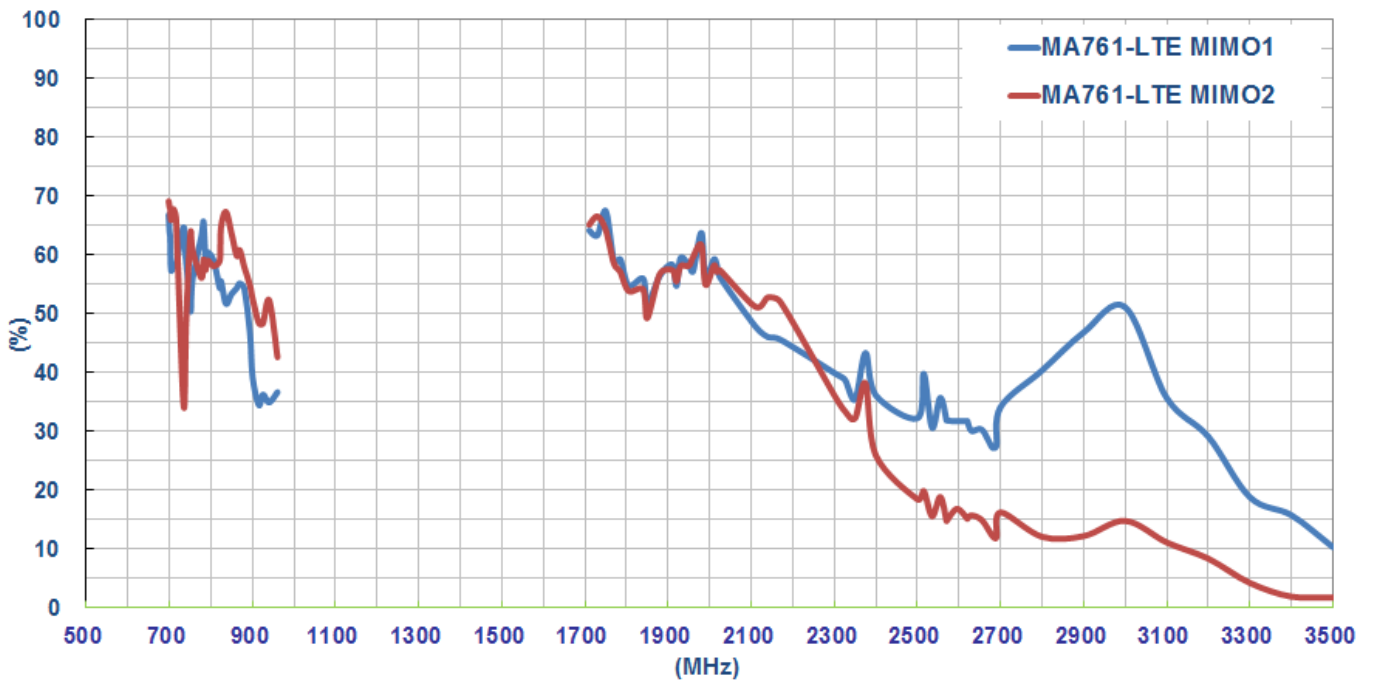
3.1.2. Maximum Gain



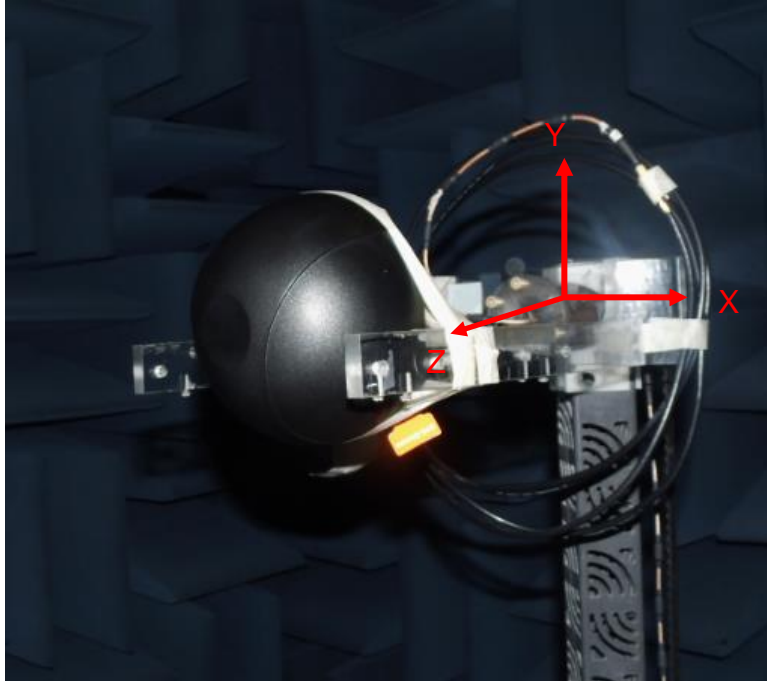
3.1.3. Average Gain



3.1.4. Efficiency

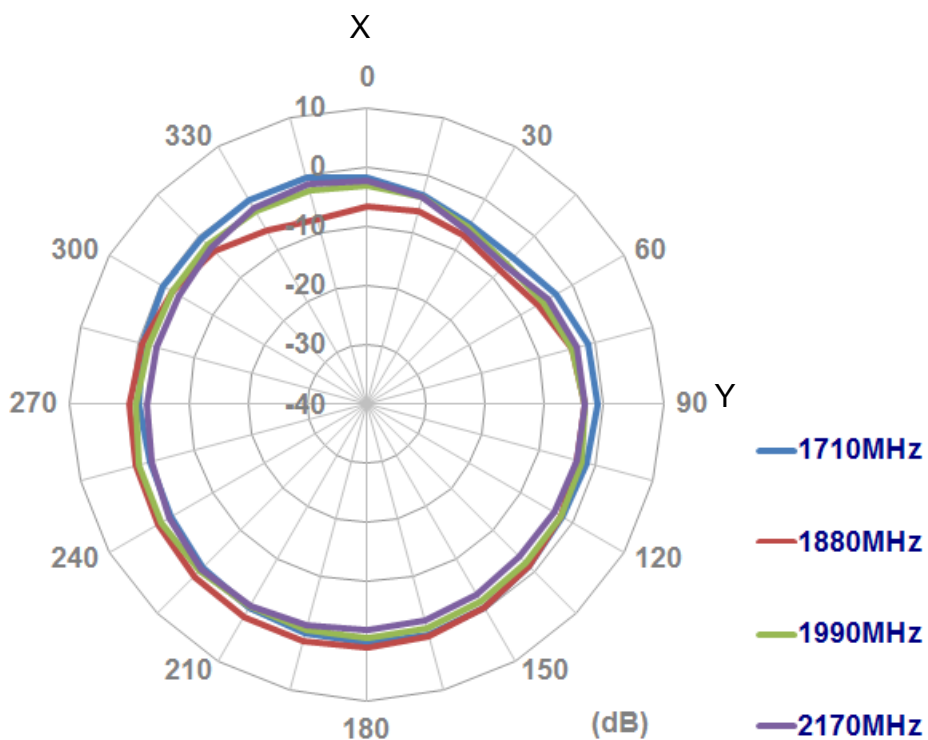
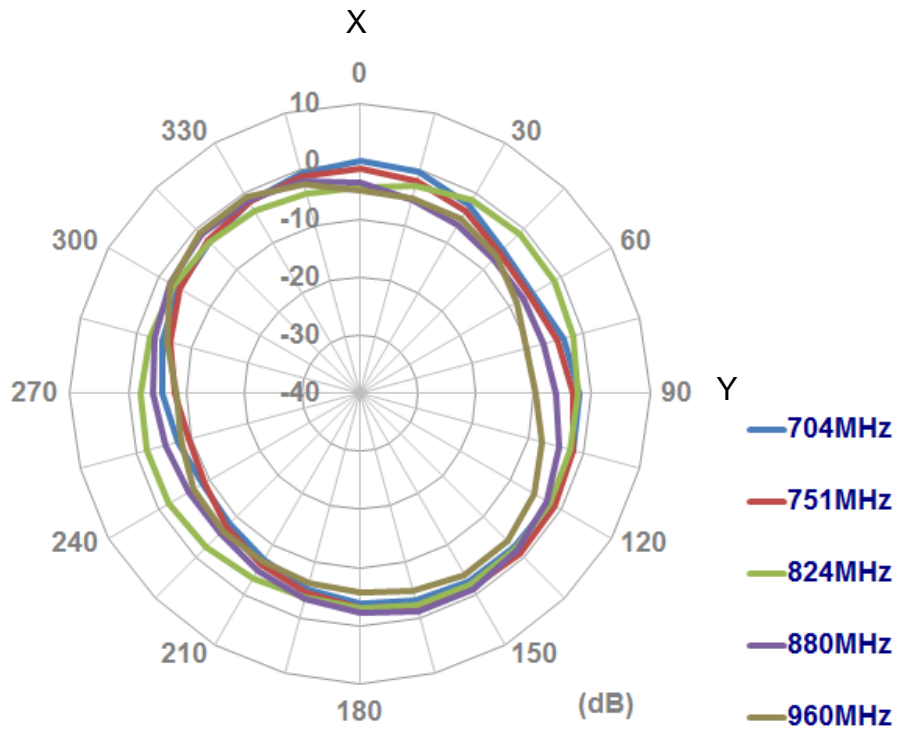


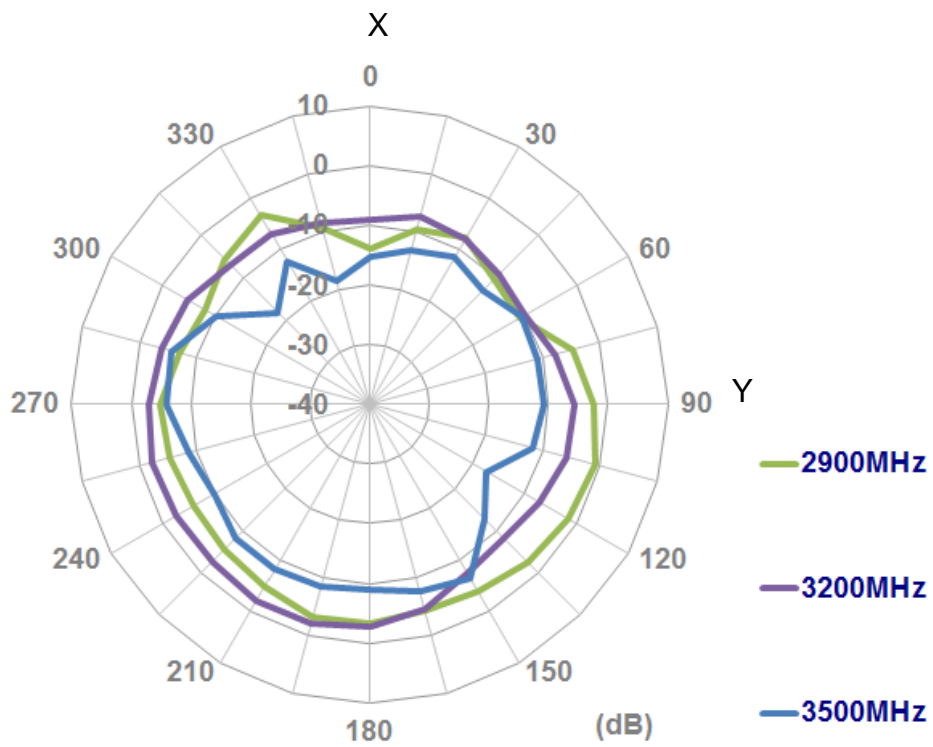
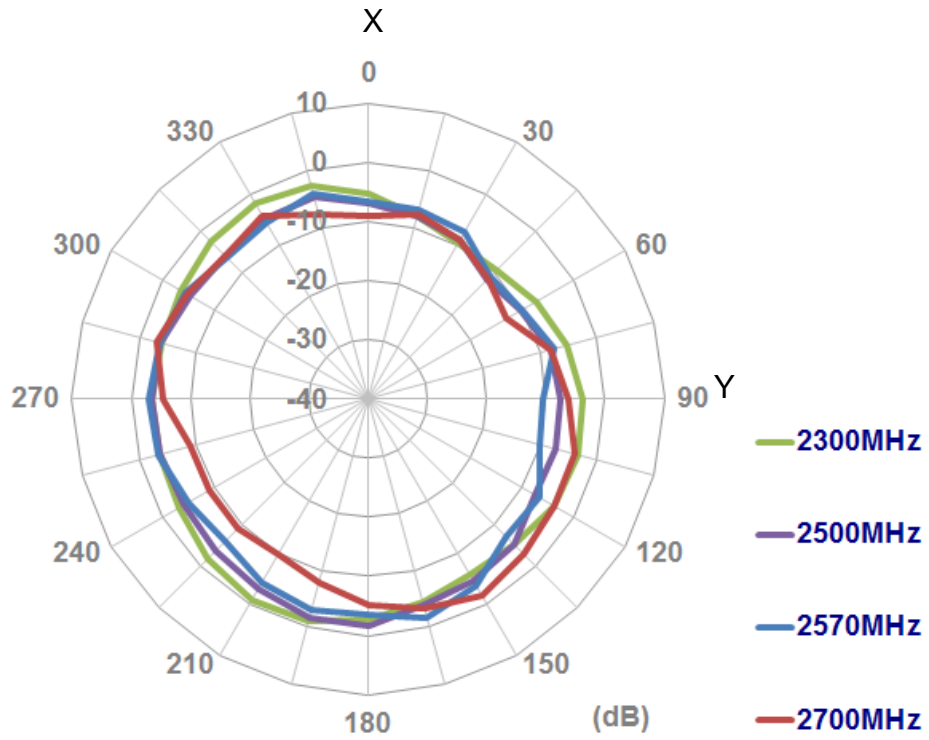
3.2. Radiation Pattern



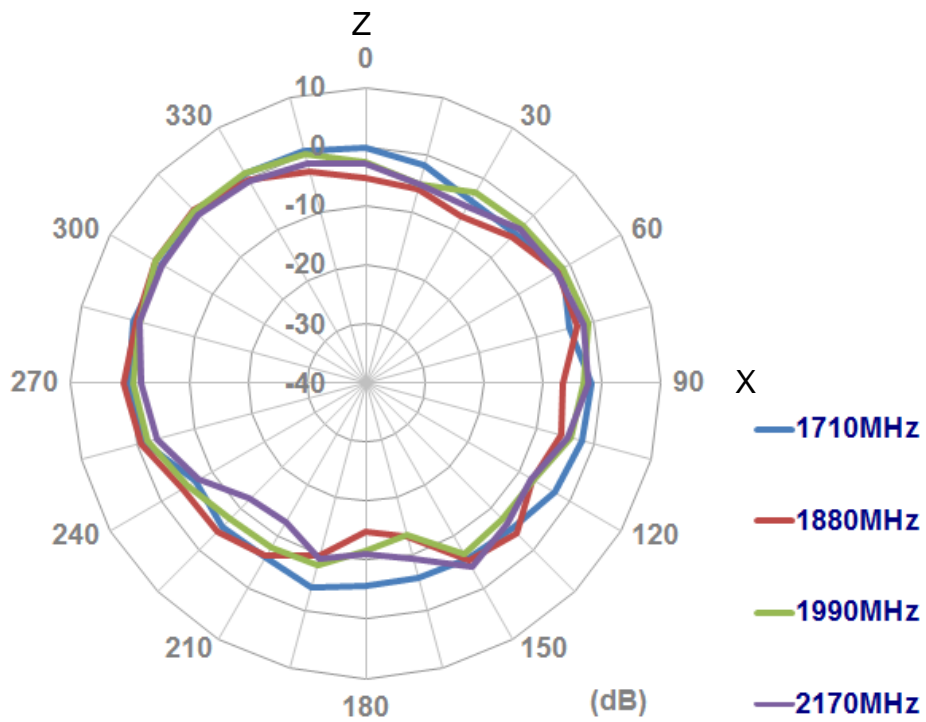
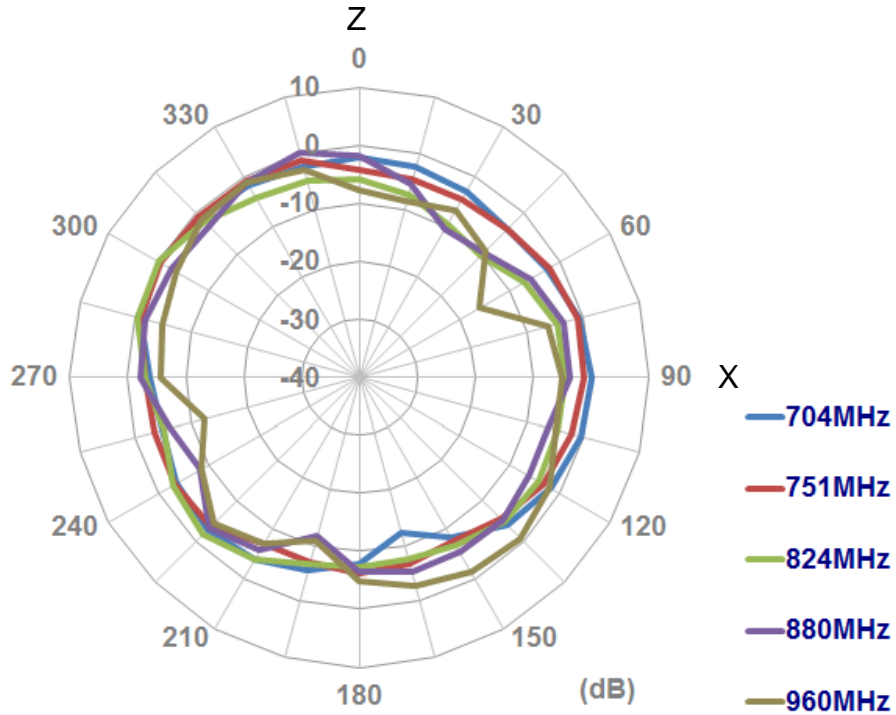
3.2.1 LTE MIMO1 Radiation Pattern

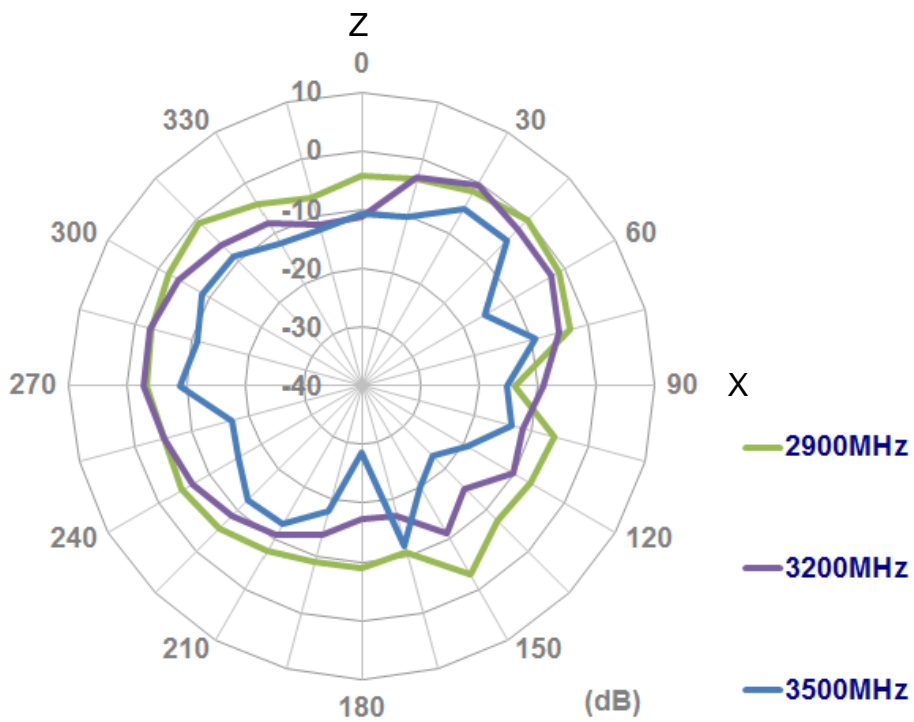
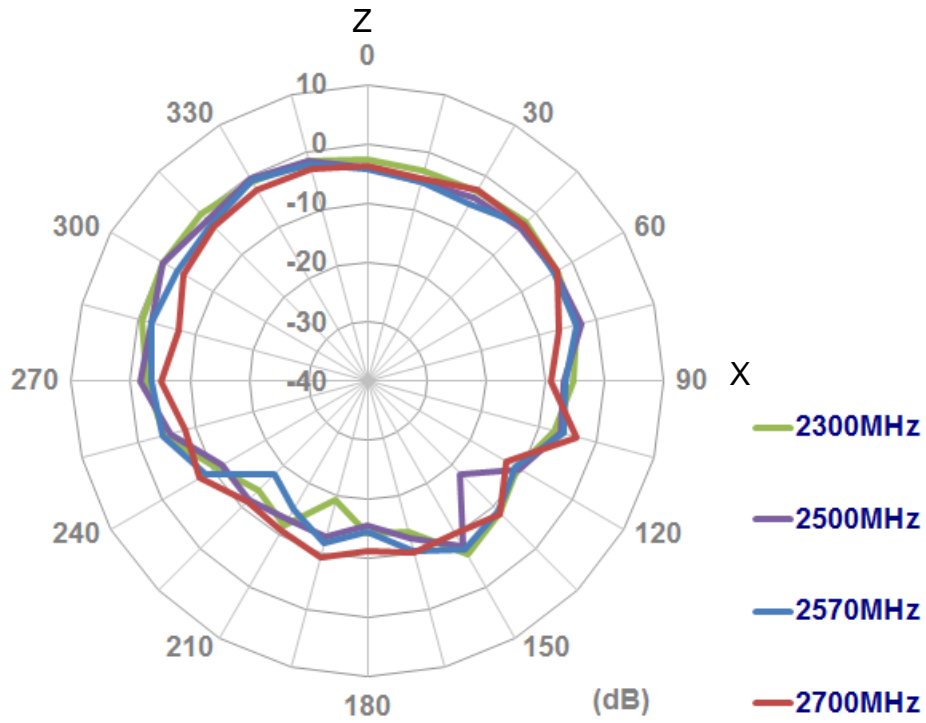
XY plane



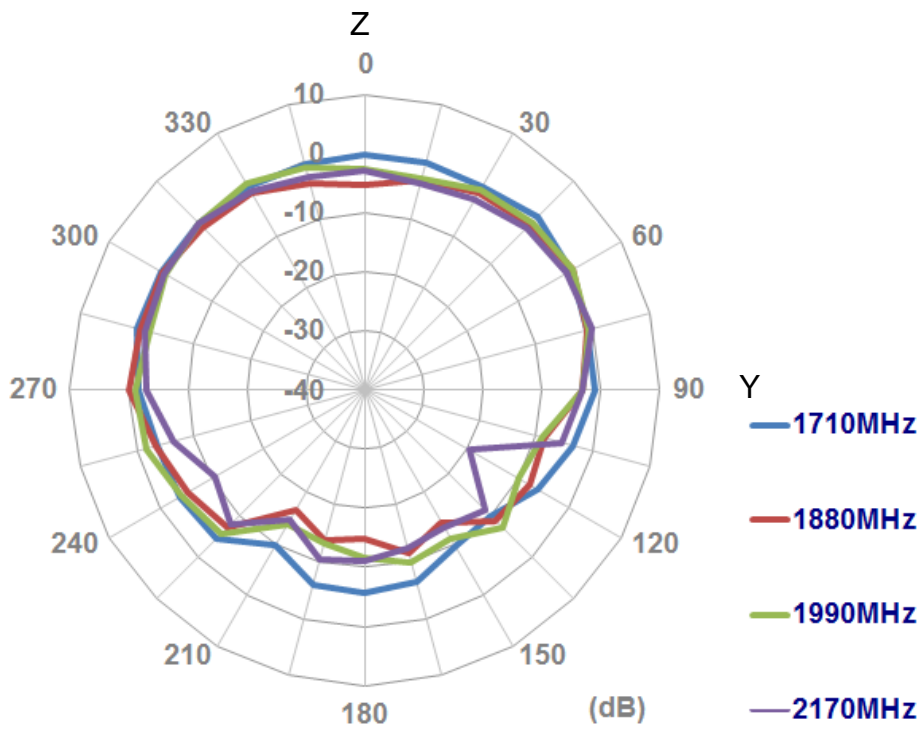
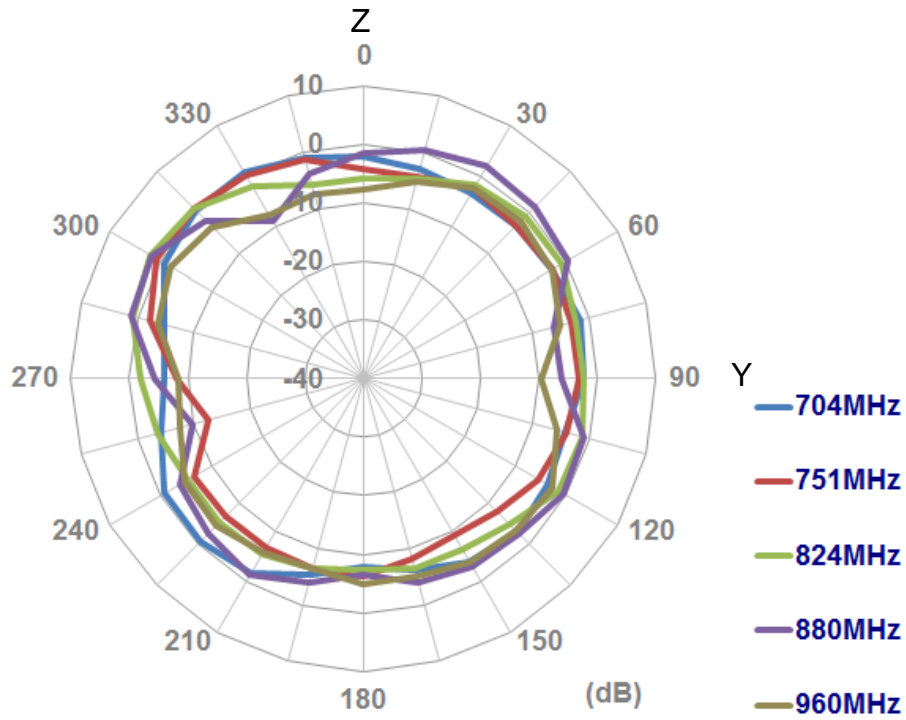


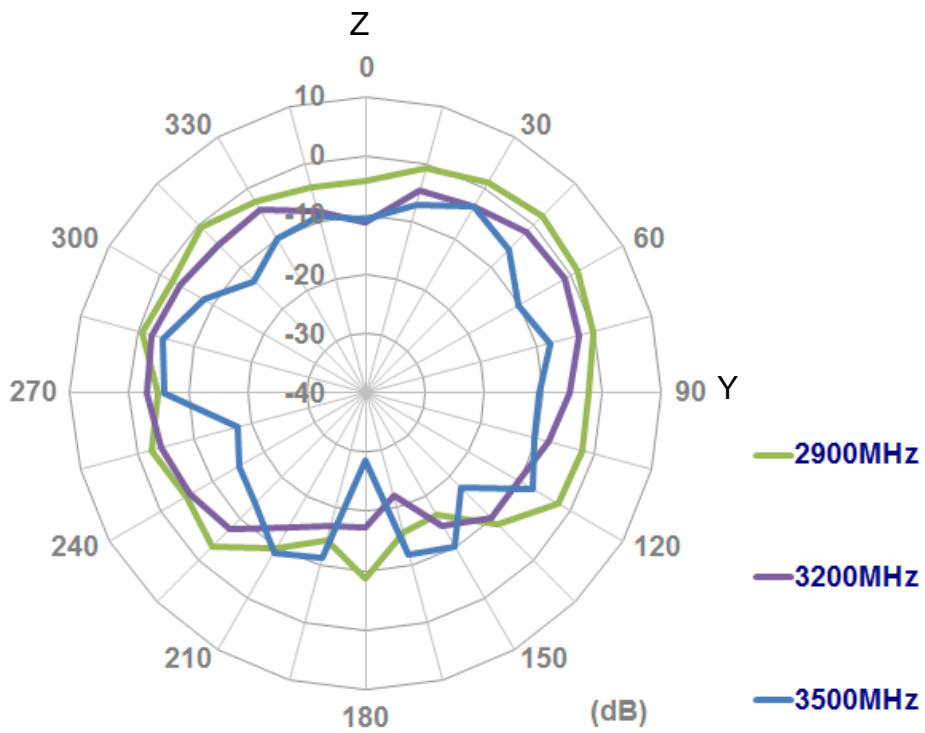
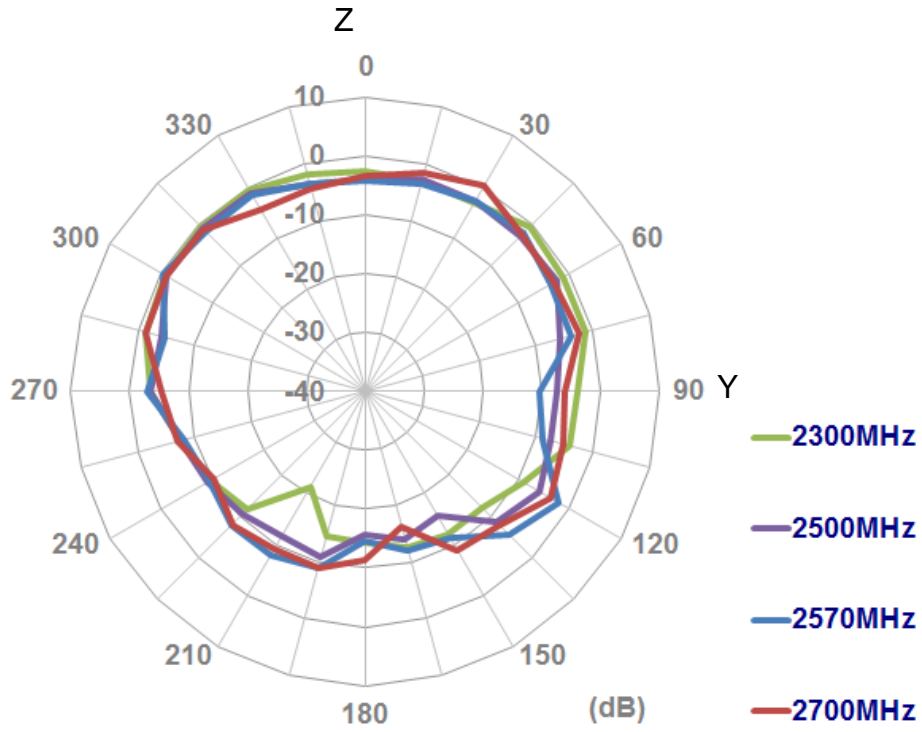
XZ plane





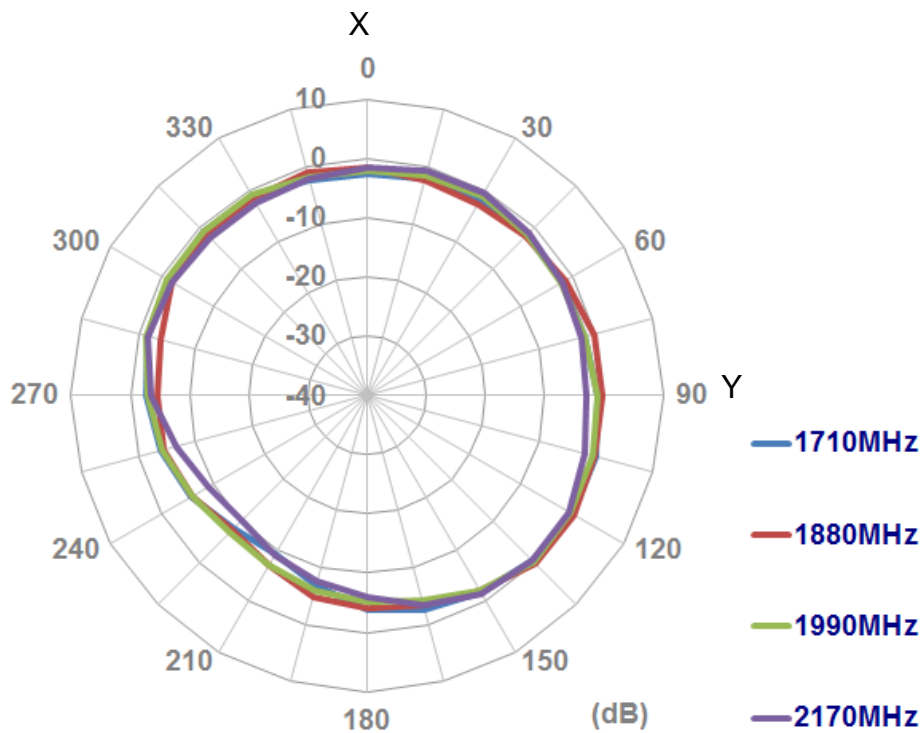
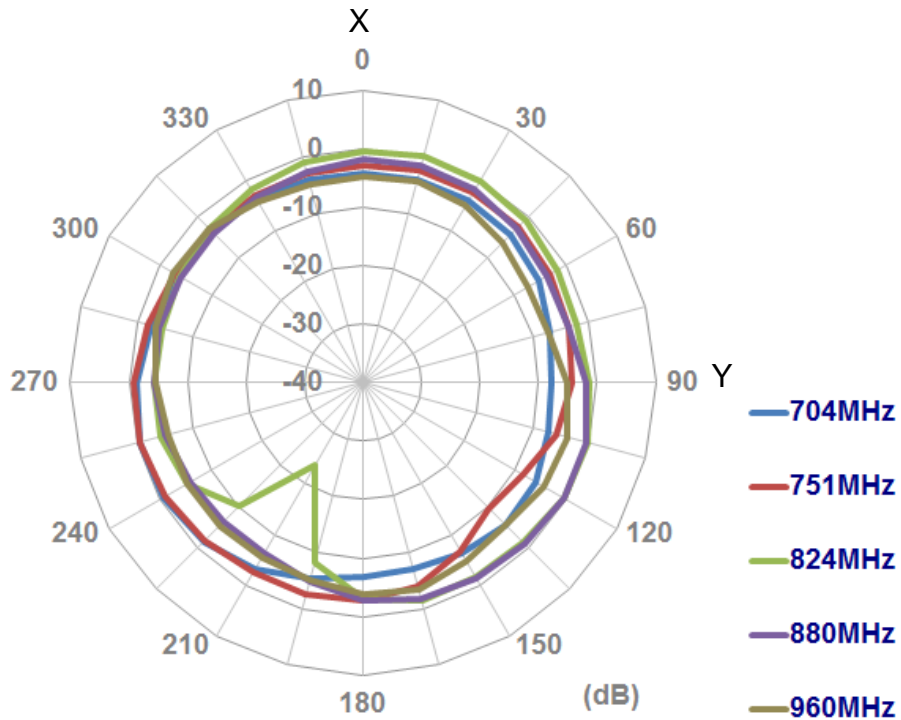
YZ plane

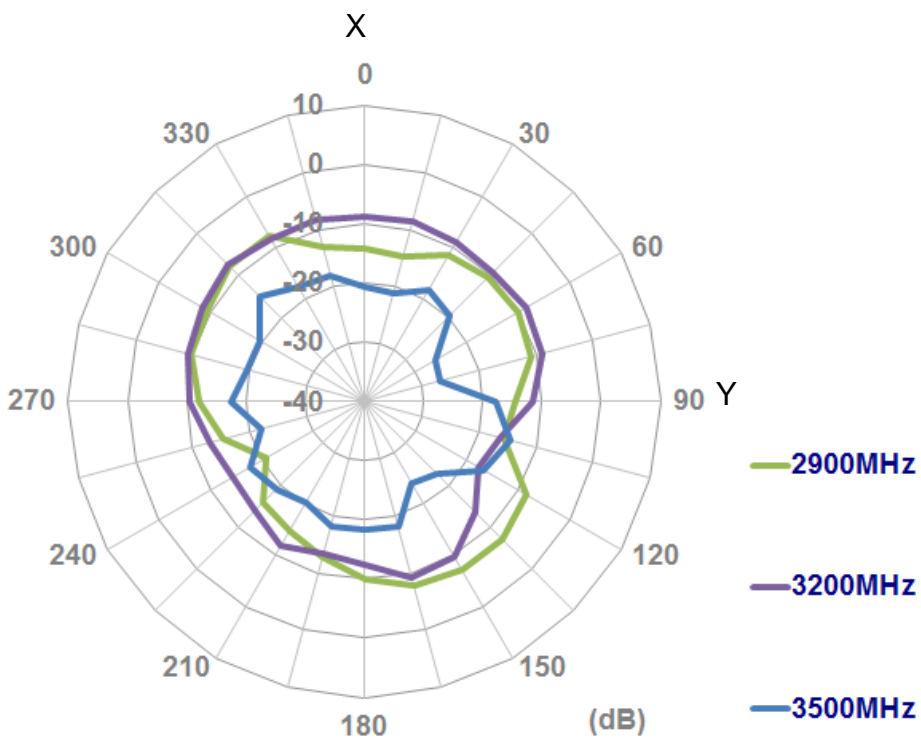
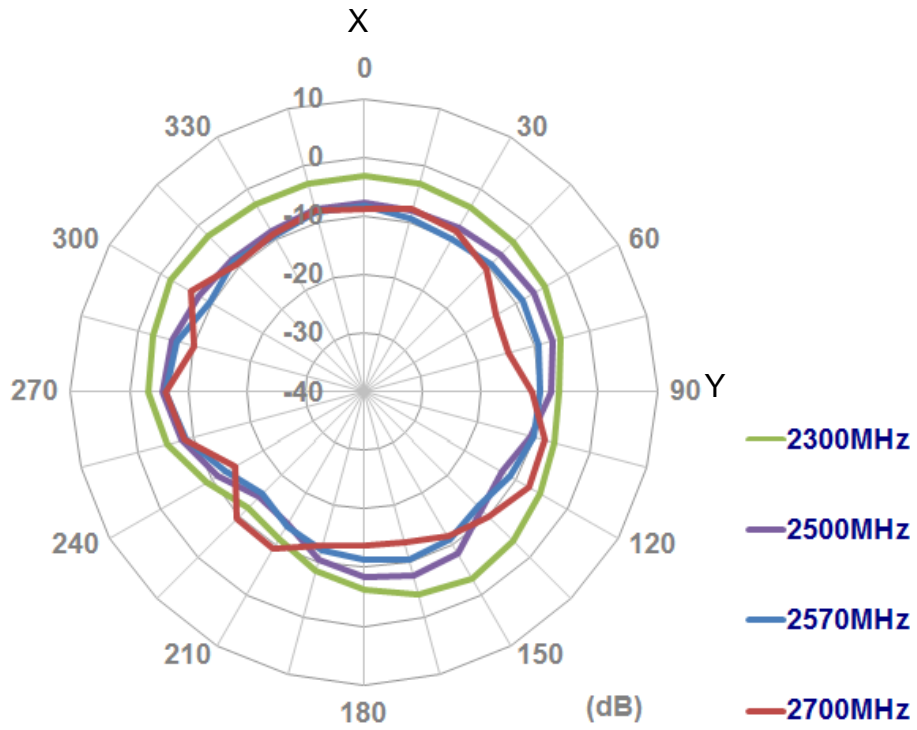




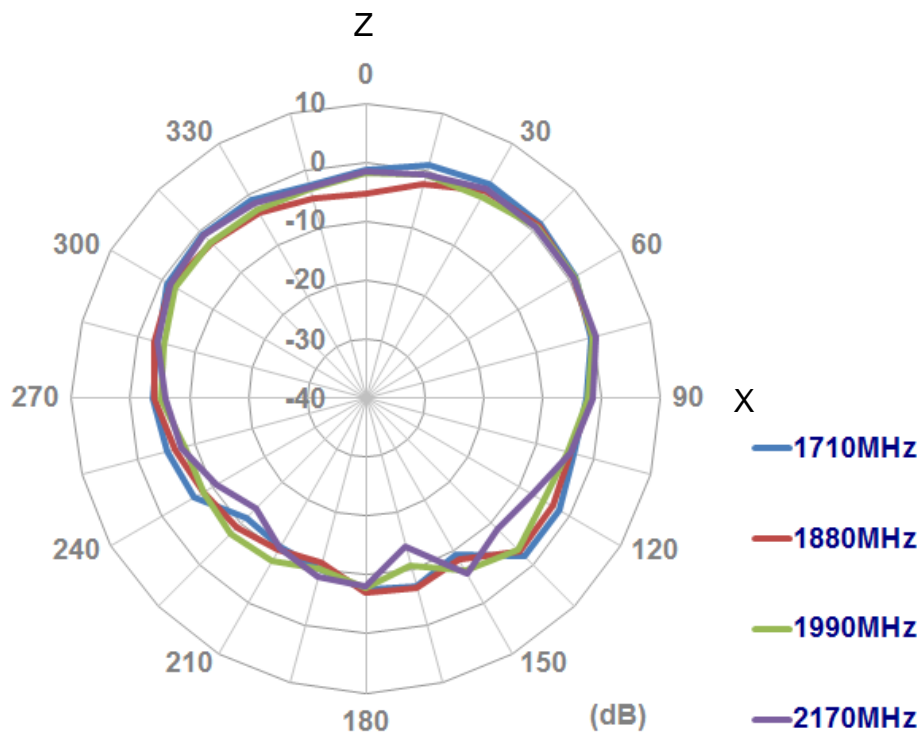
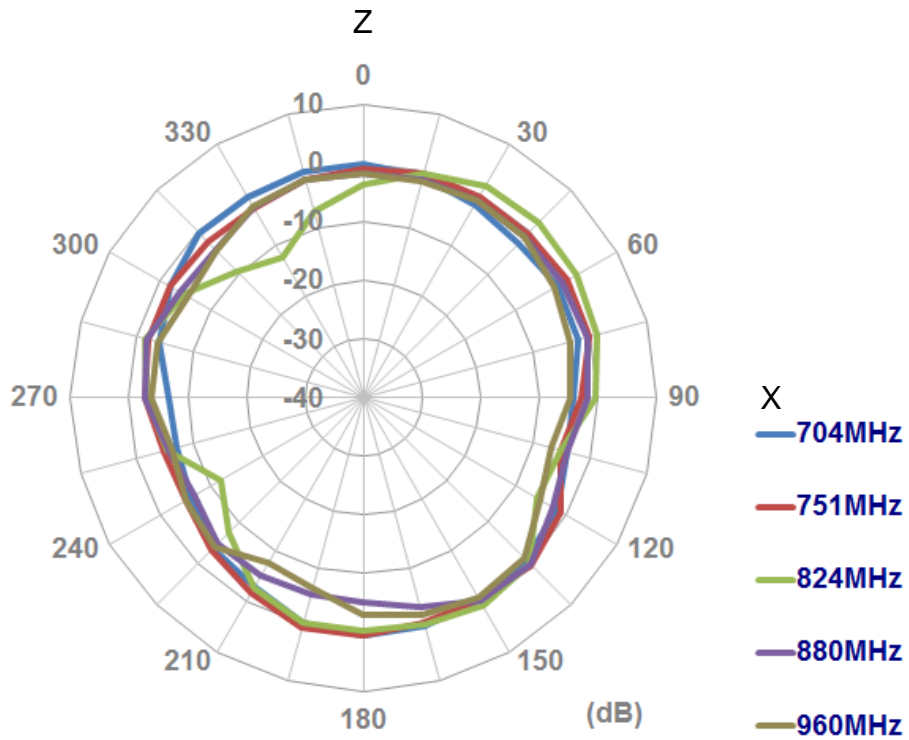
3.2.2 LTE MIMO2 Radiation Pattern

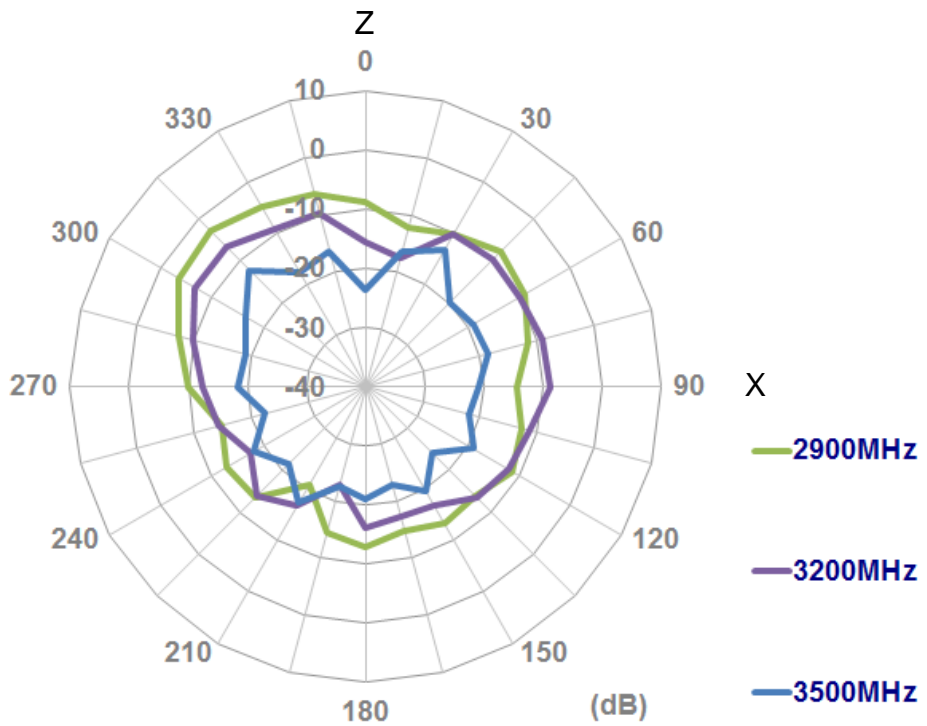
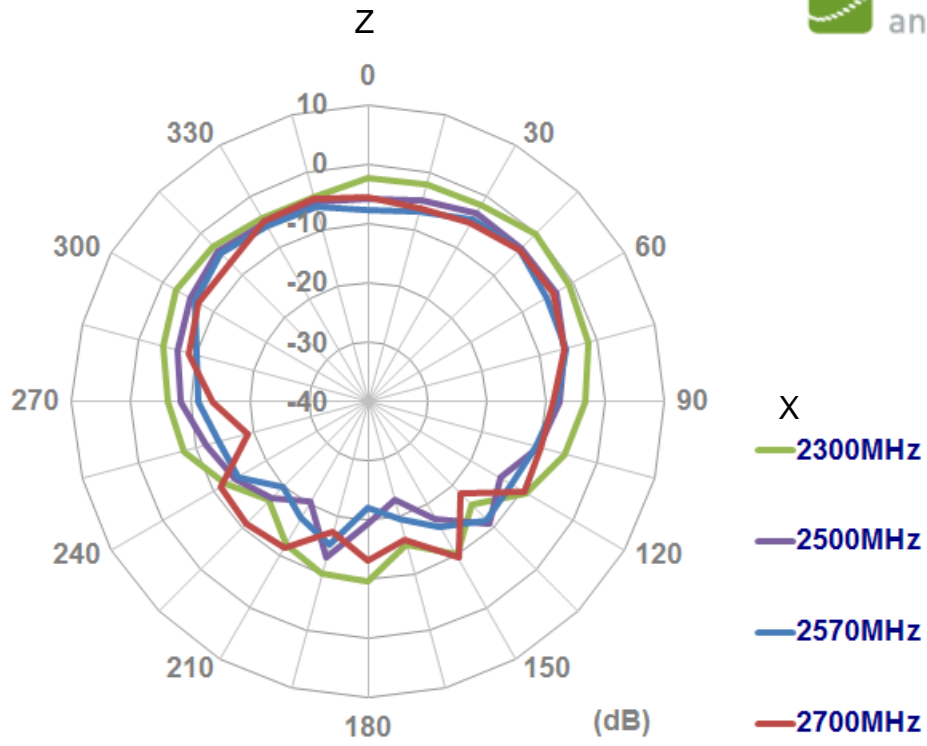
XY plane



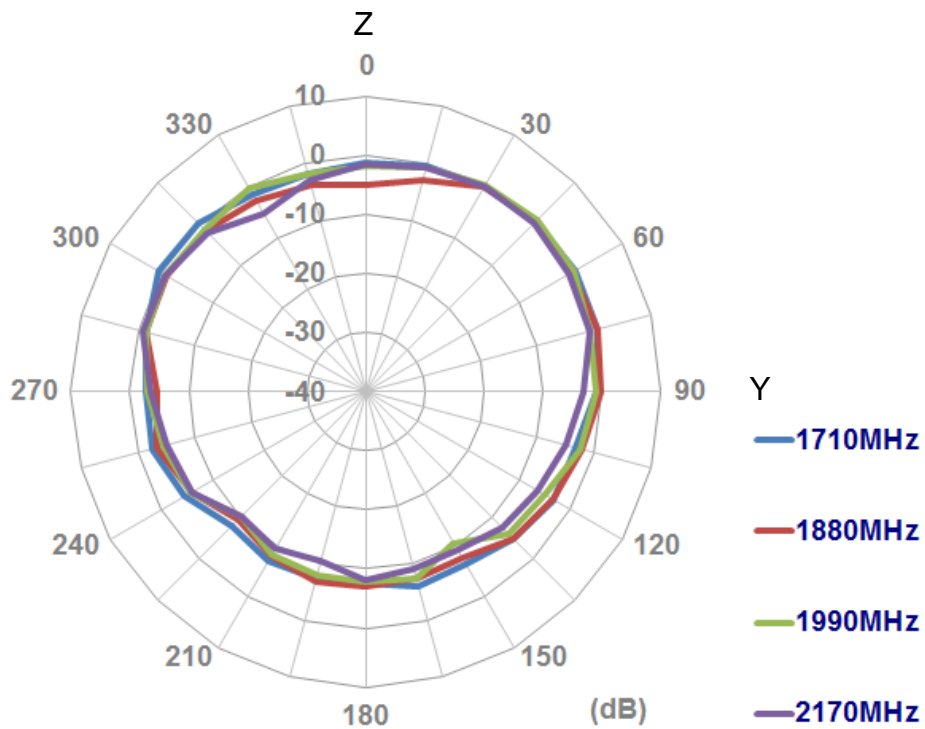
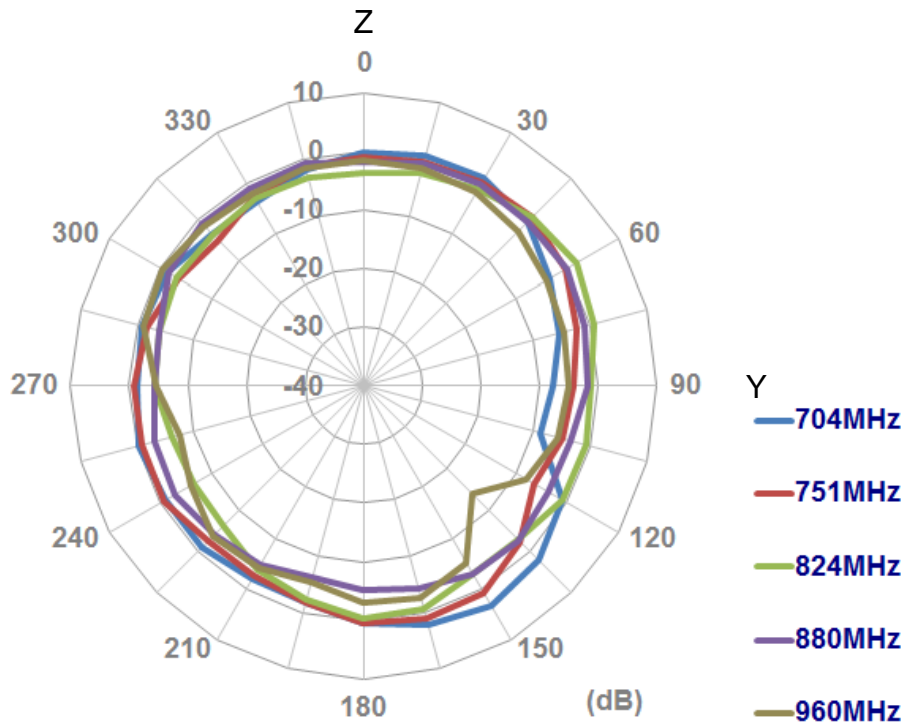


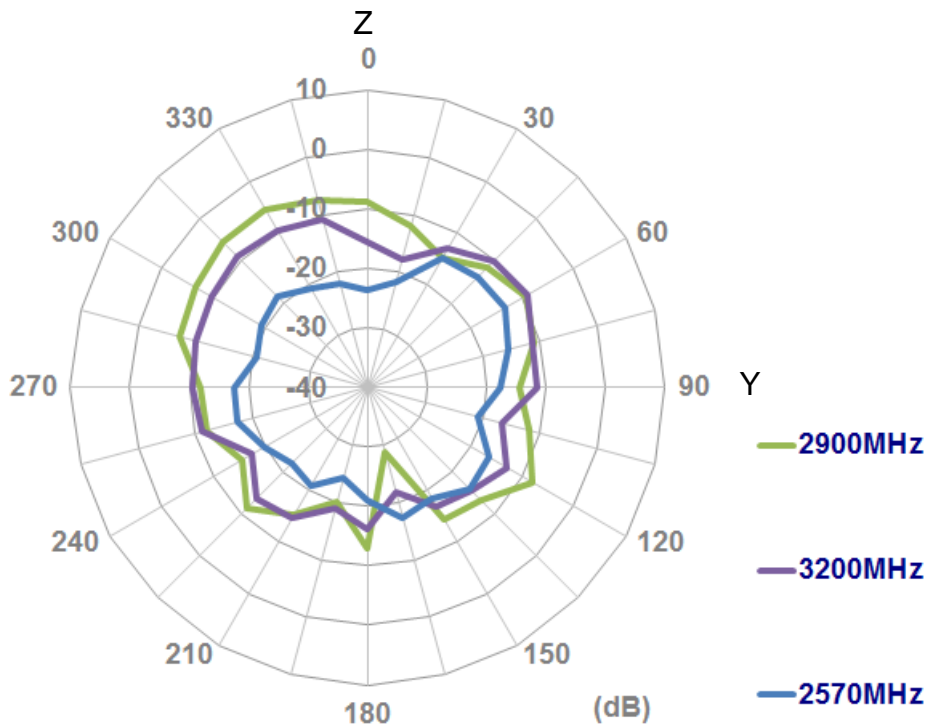
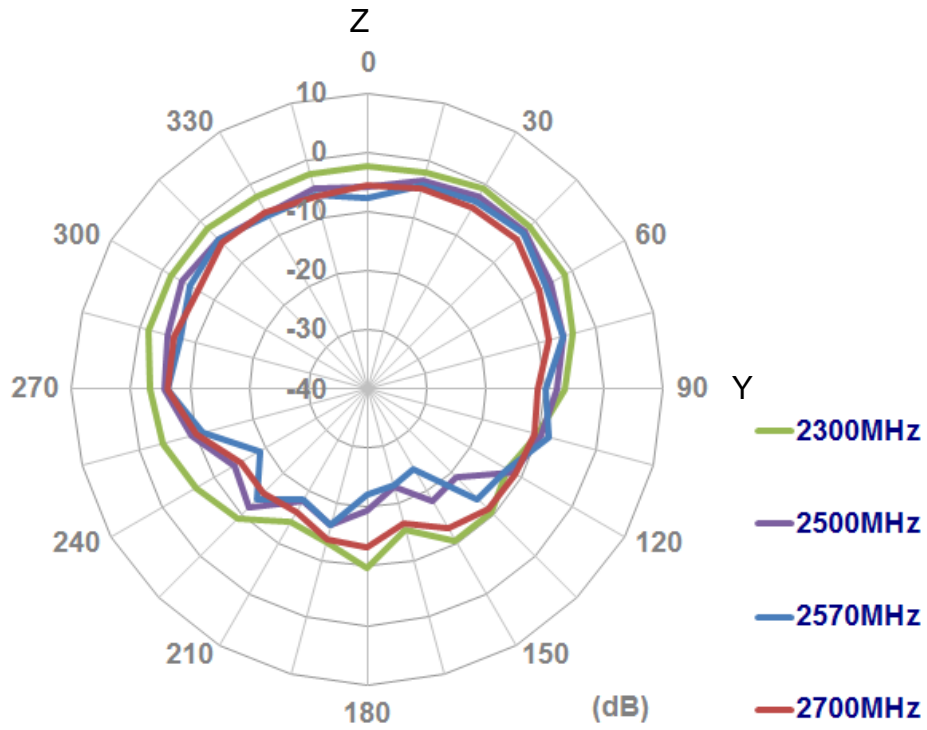
XZ plane





YZ plane

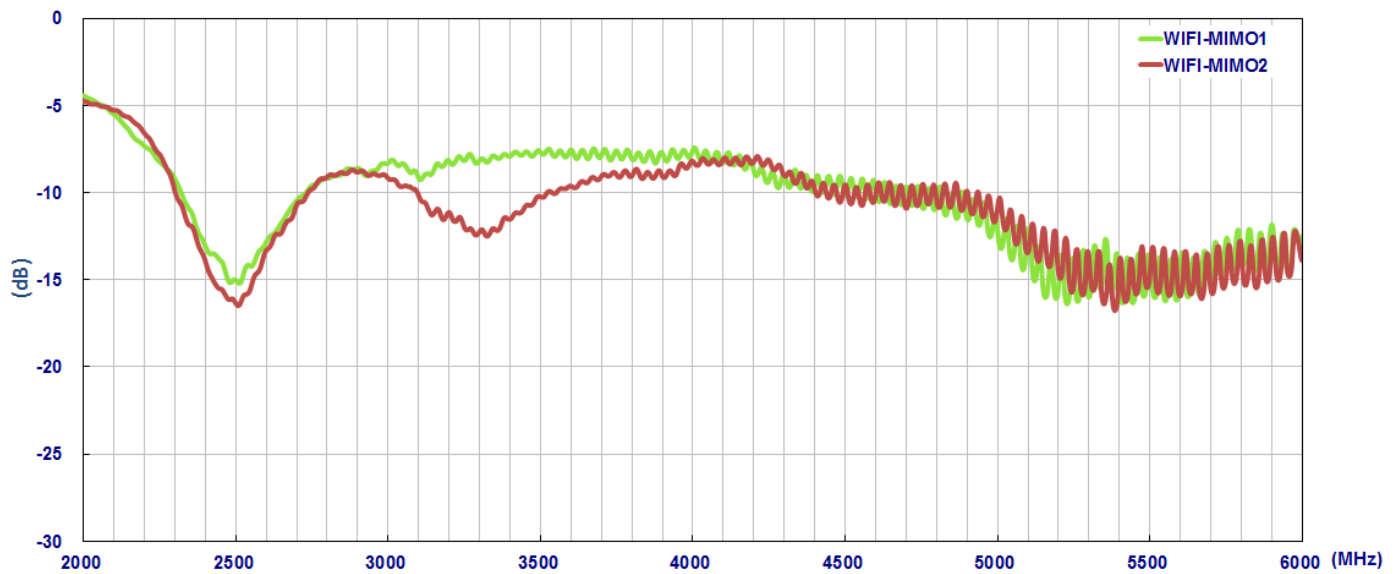




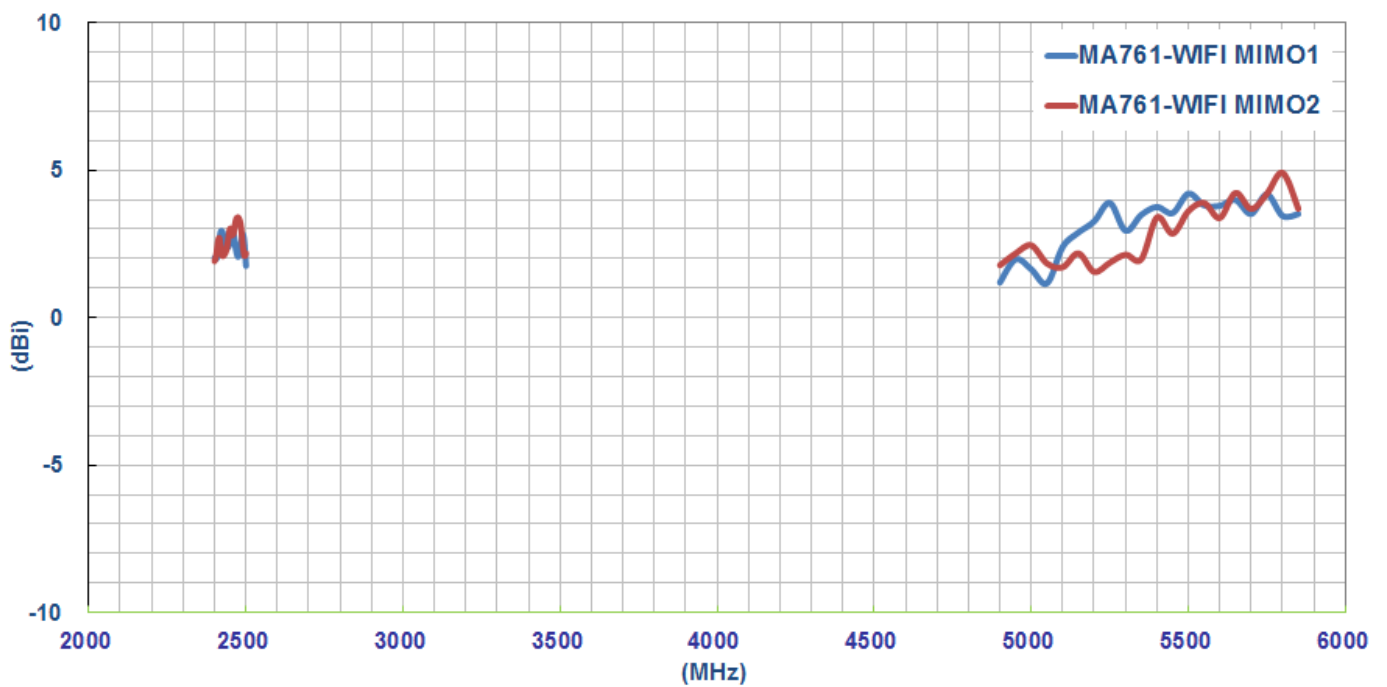
4.2.4/5GHz MIMO

4.1. 2.4/5GHz MIMO1 and MIMO2 Characteristics

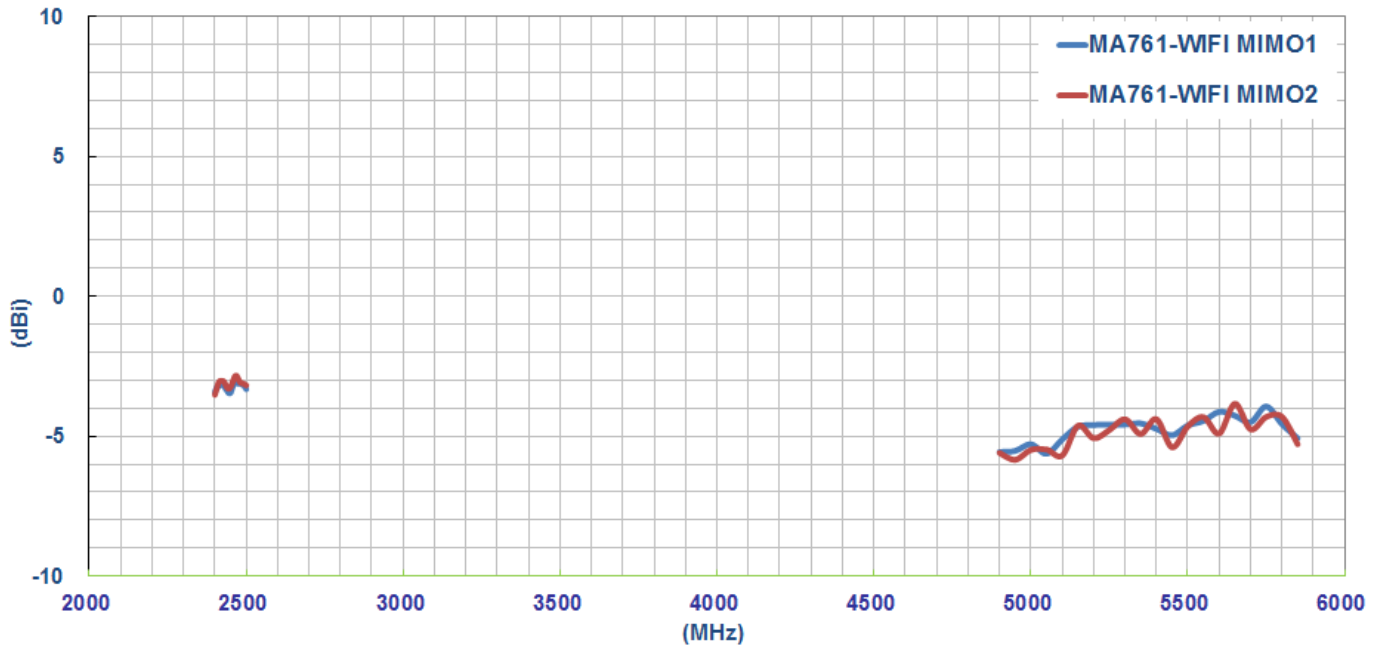
4.1.1. Return Loss



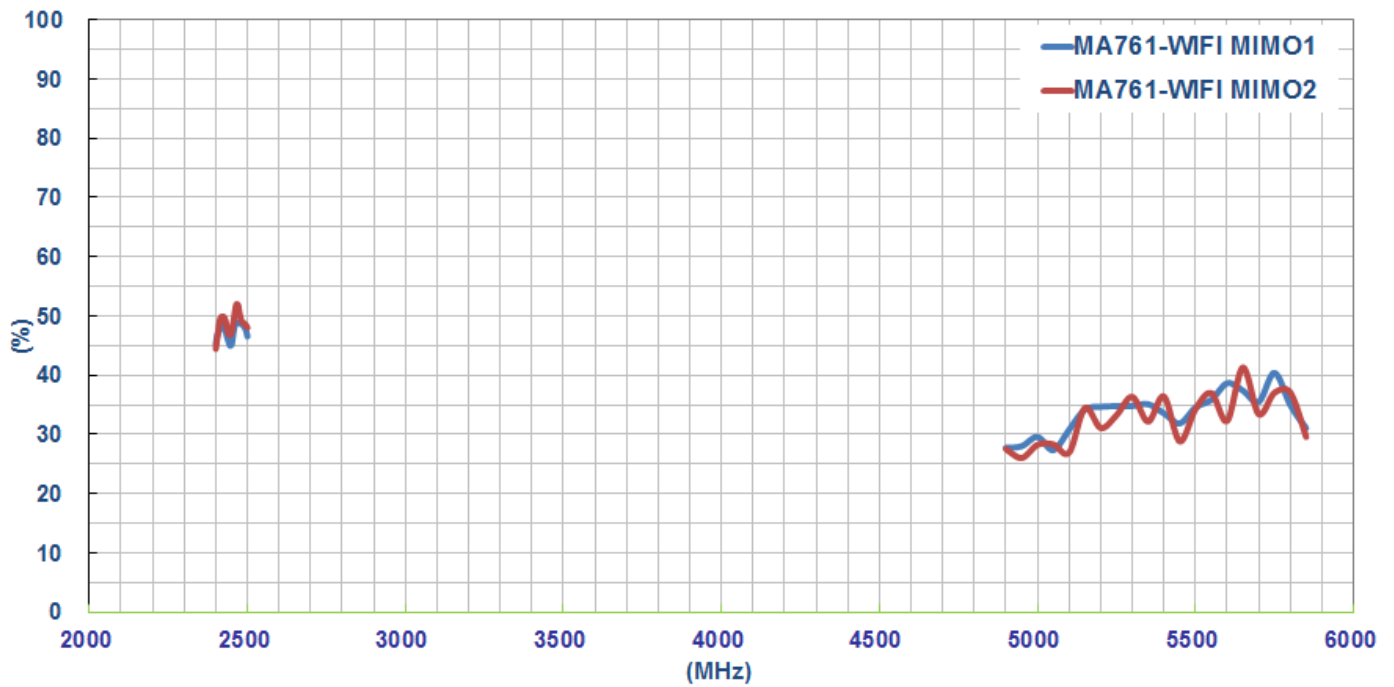
4.1.2. Maximum Gain



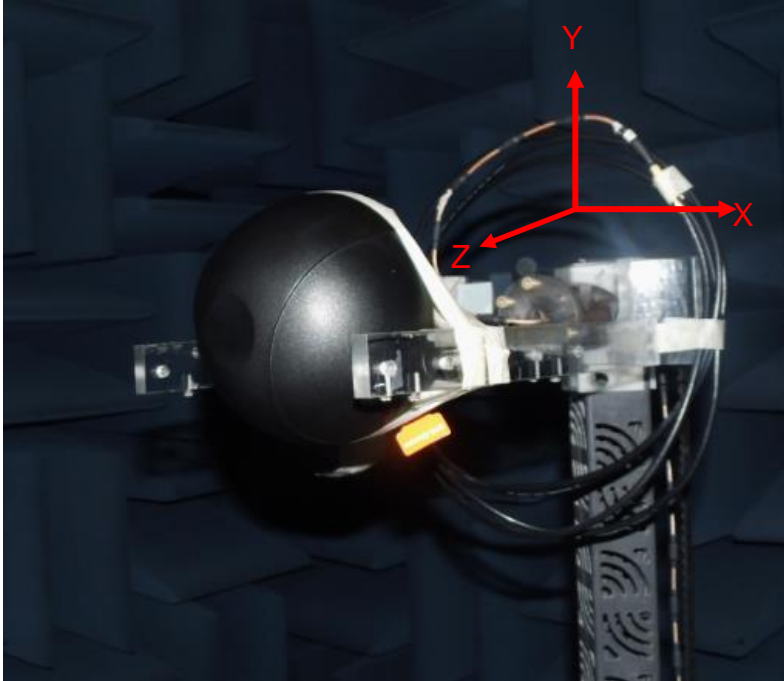
4.1.3. Average Gain



4.1.4. Efficiency

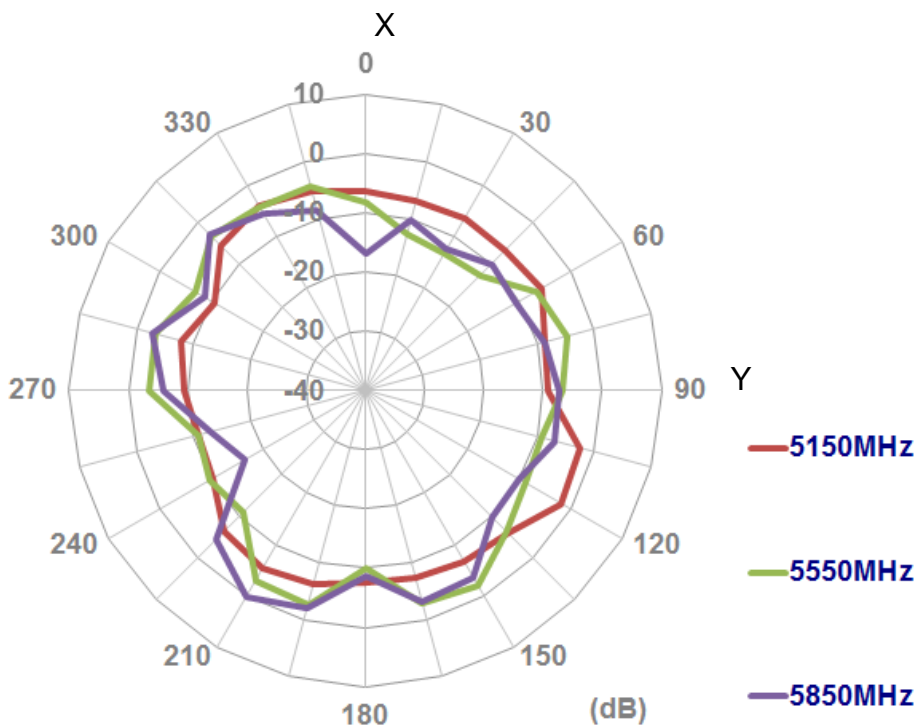
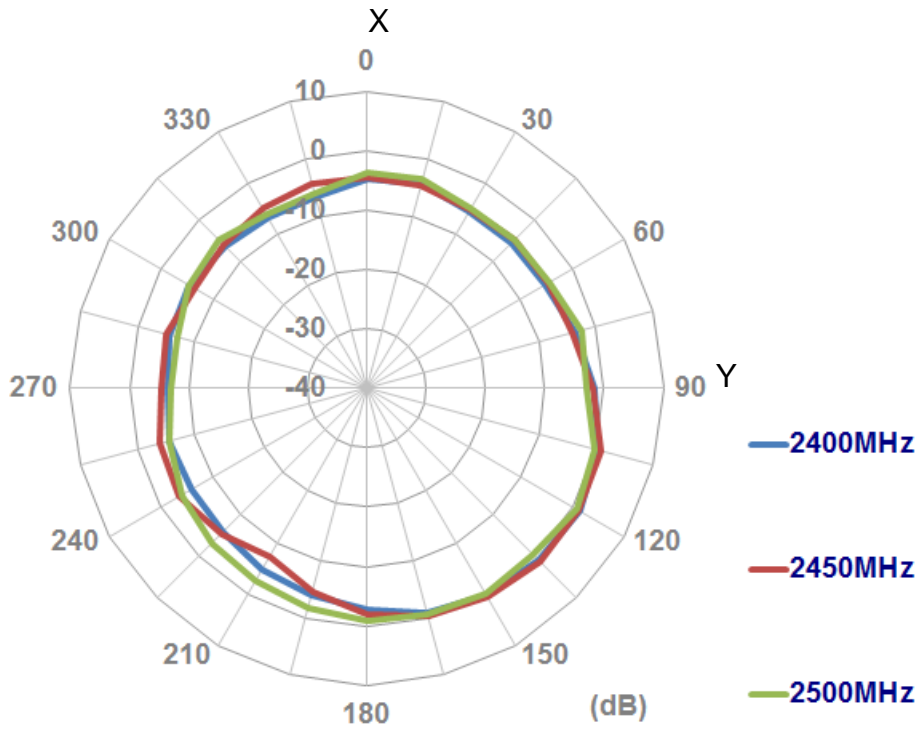


4.2. Radiation Patterns

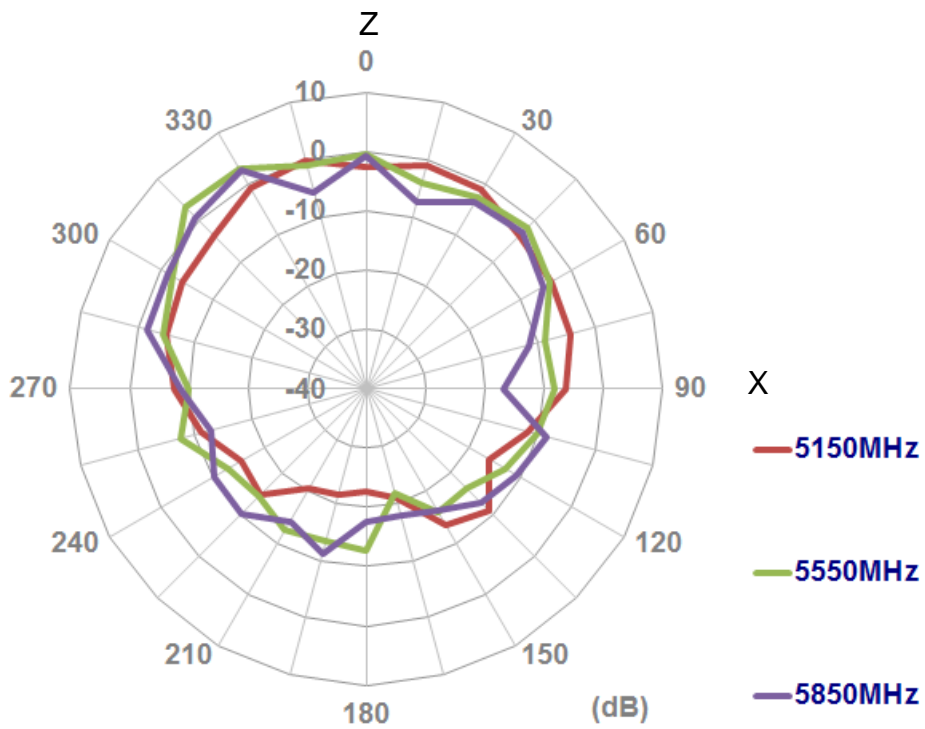
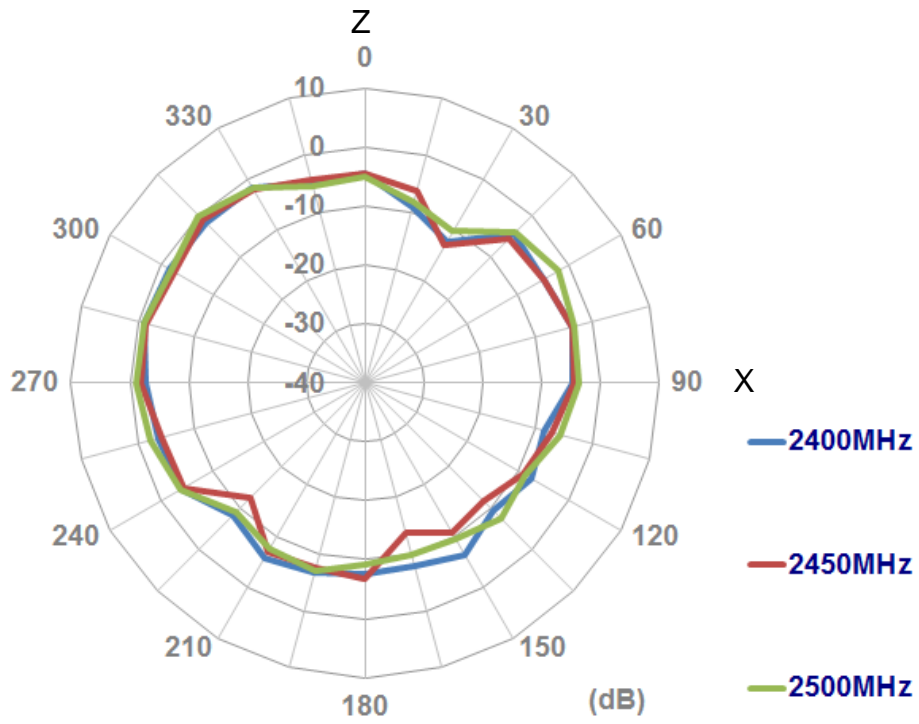


4.2.1. 2.4/5GHz MIMO1 Radiation pattern

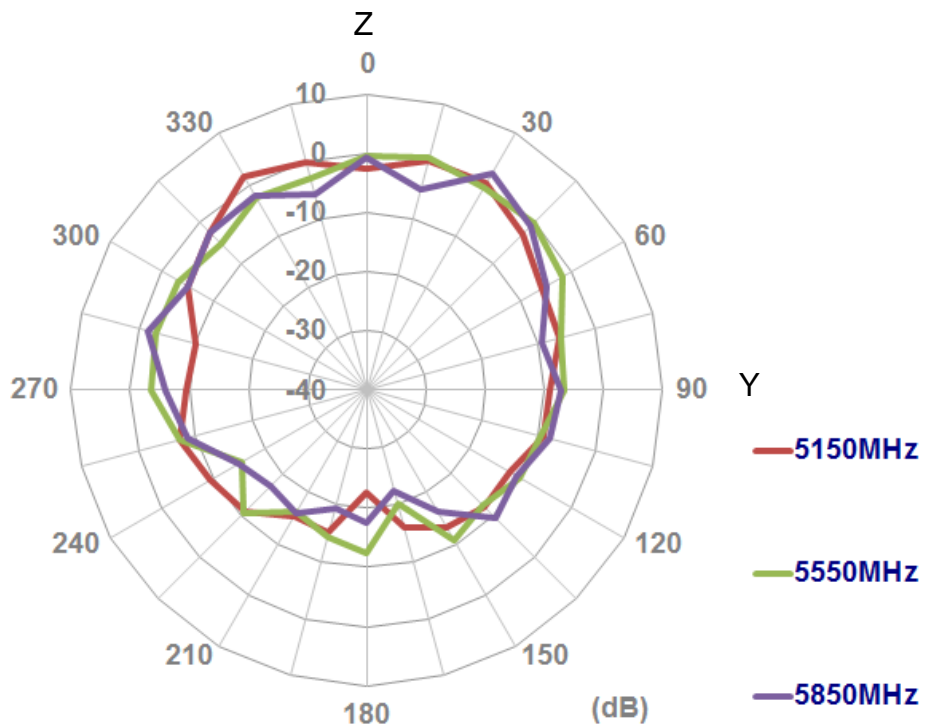
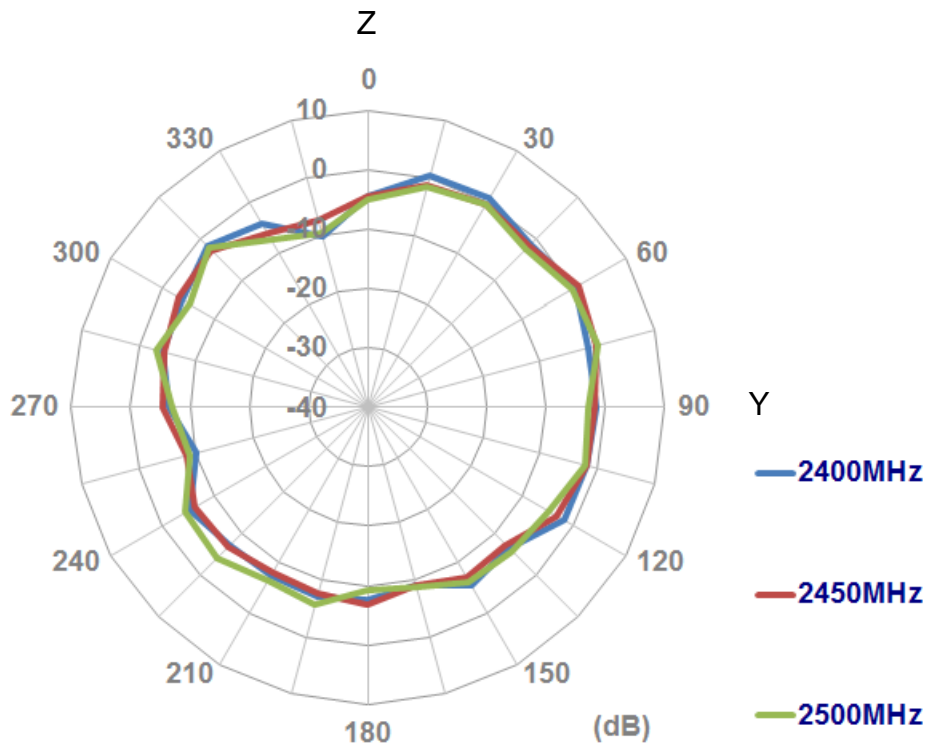
XY plane



XZ plane

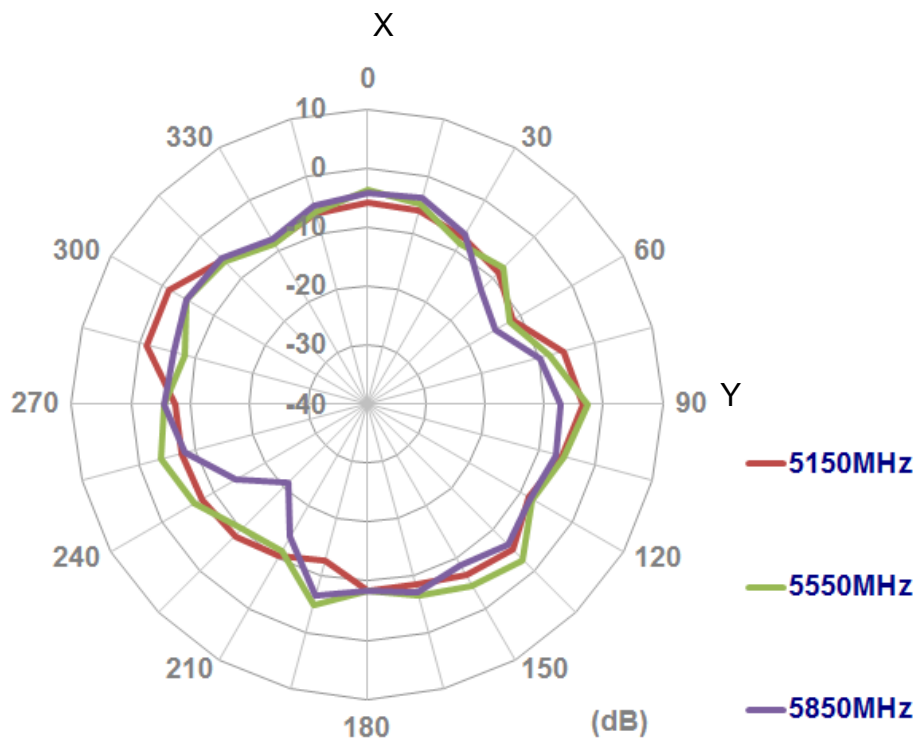
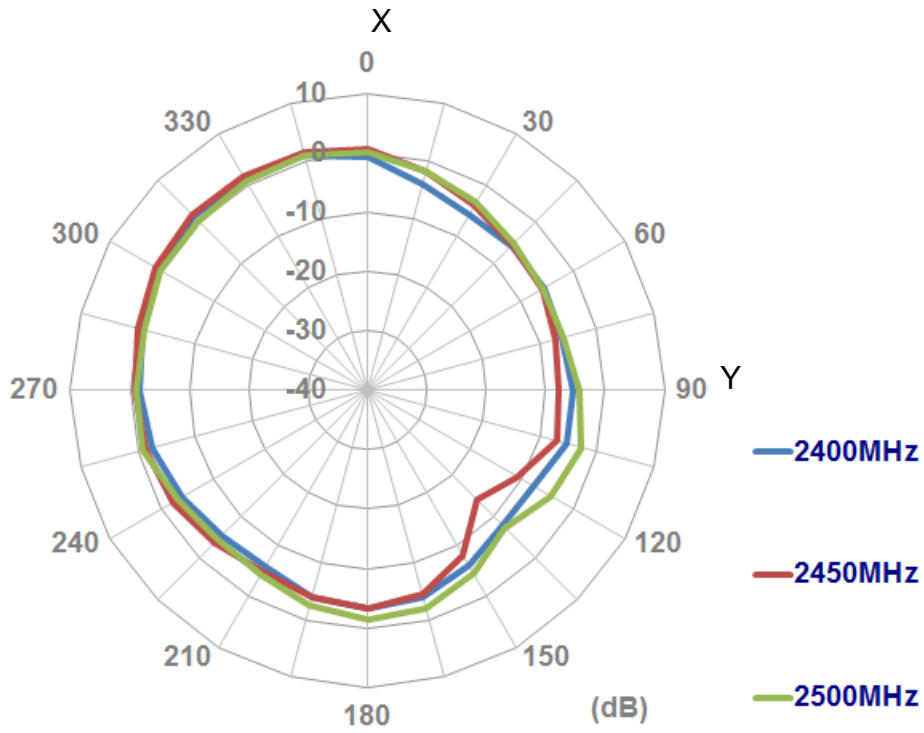


YZ plane

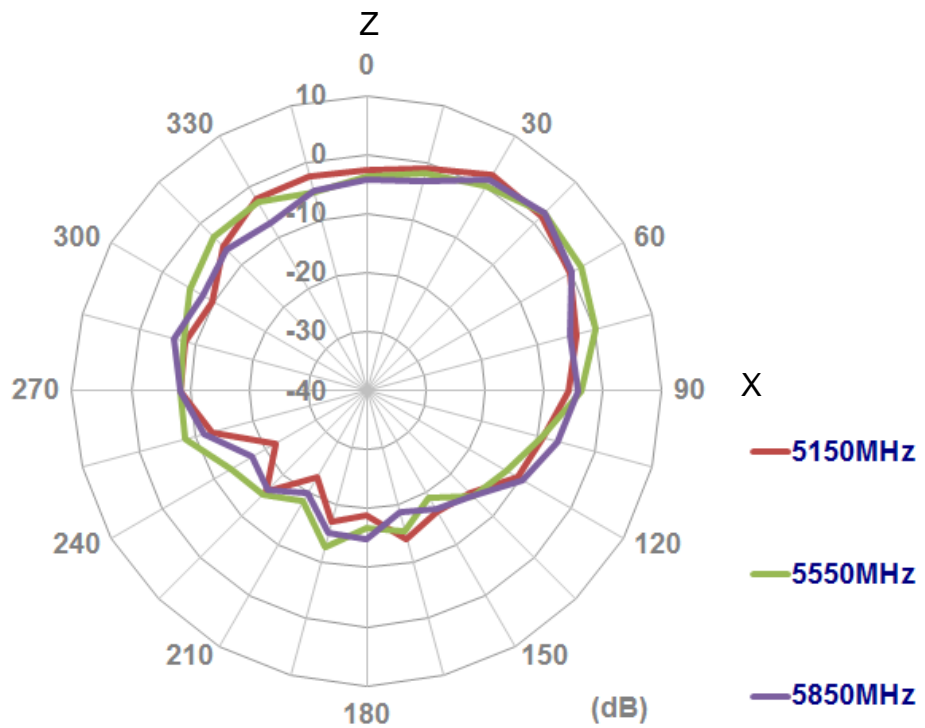
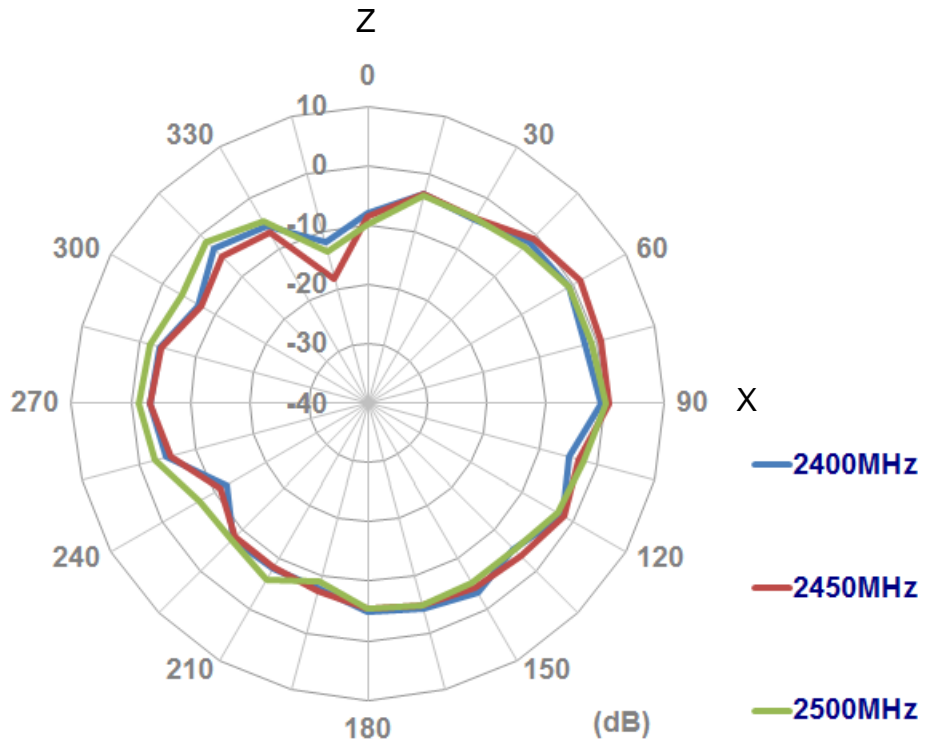


4.2.2. 2.4/5GHz MIMO2 Radiation pattern

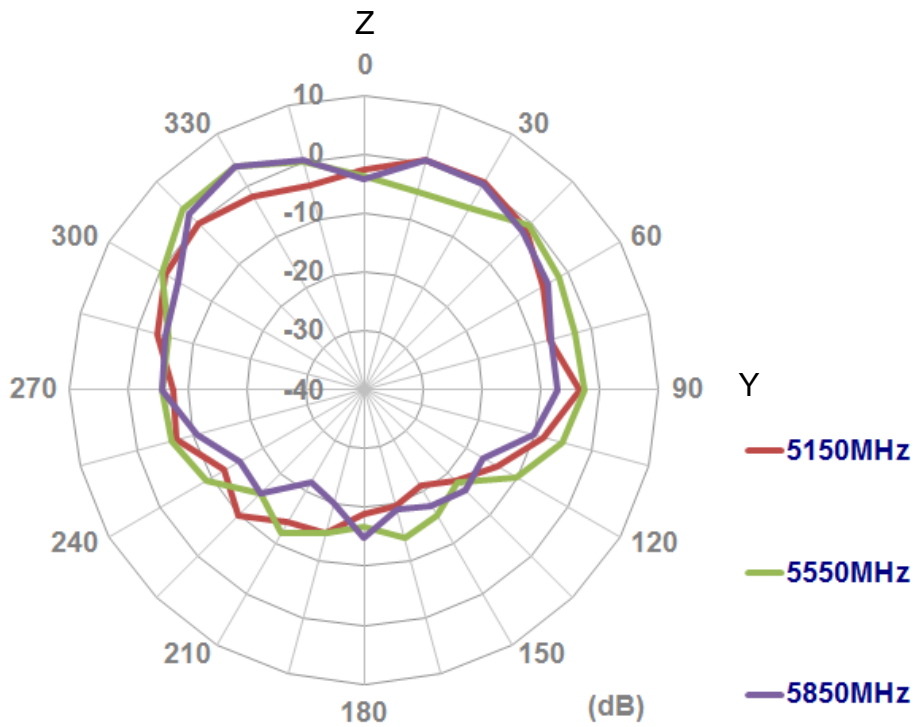
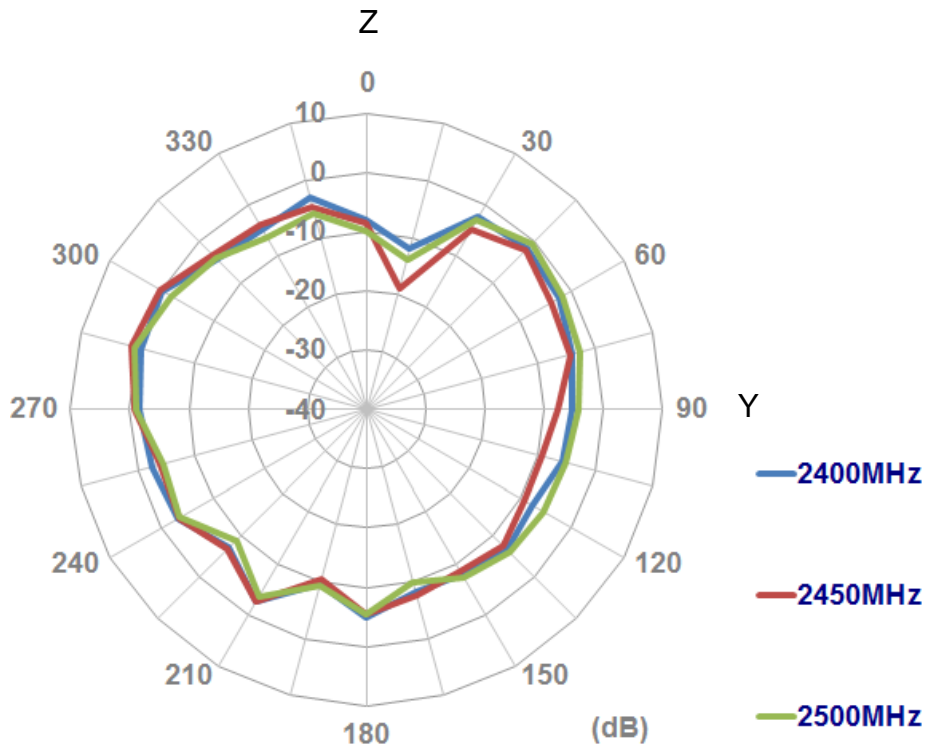
XY plane



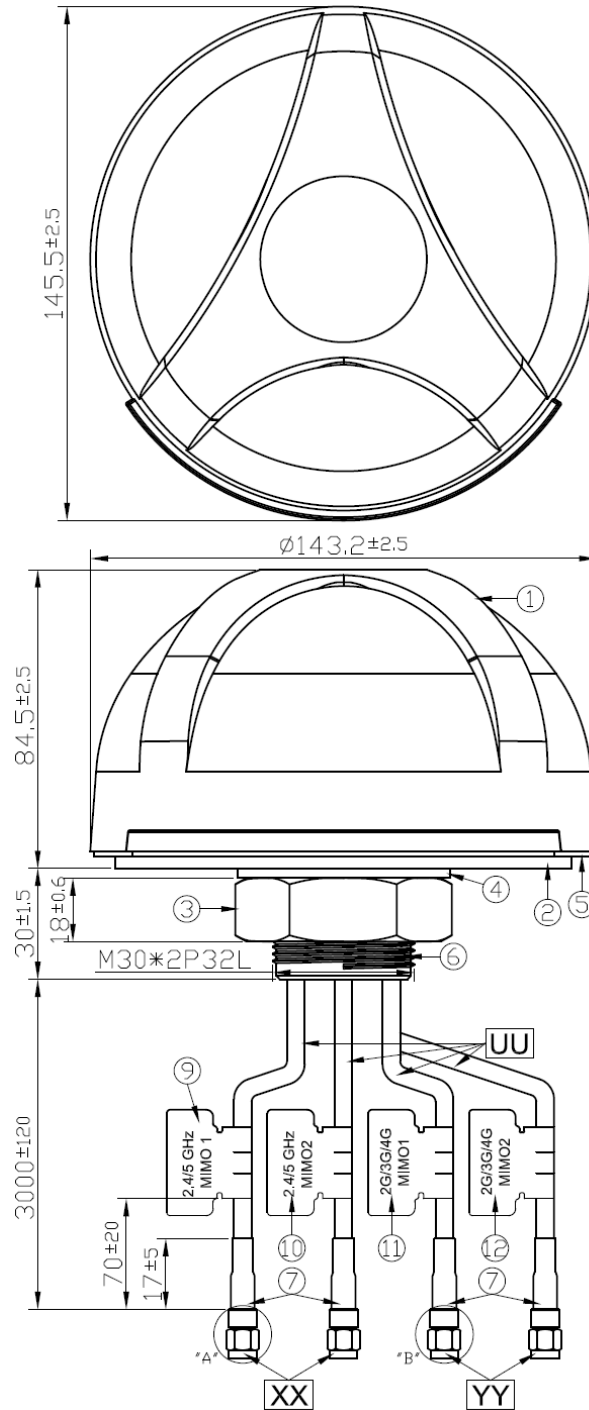
XZ plane

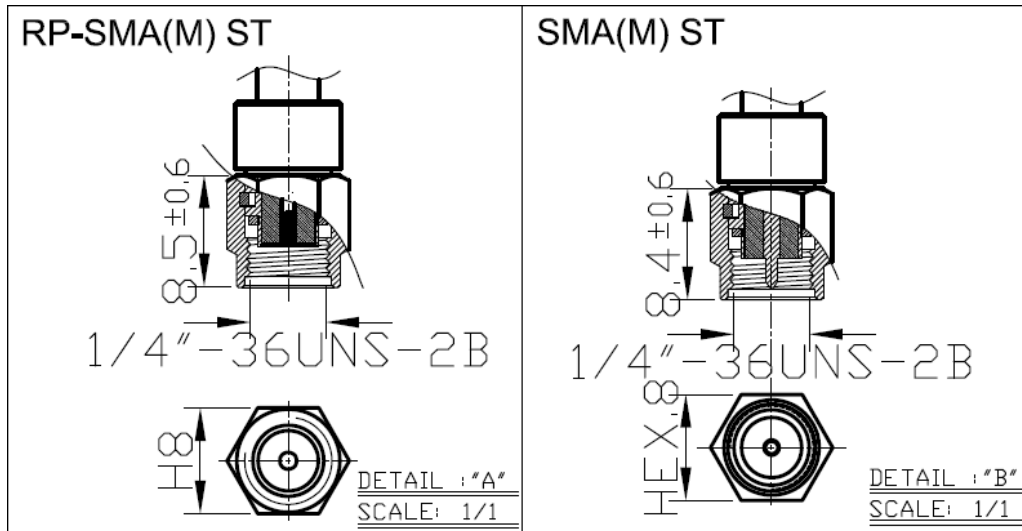


YZ plane



5. Drawing

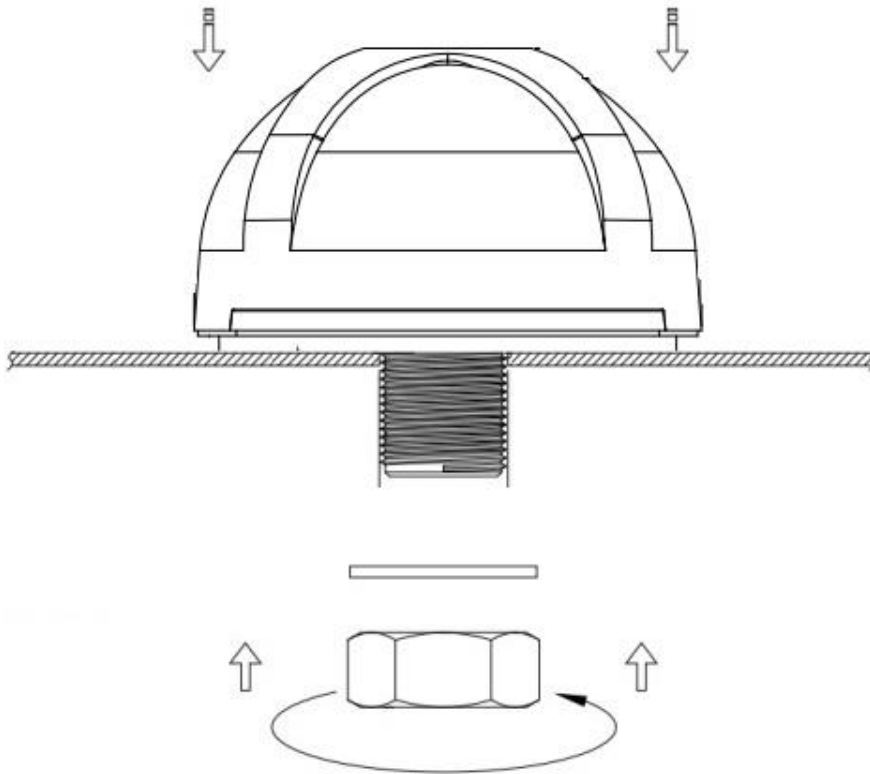




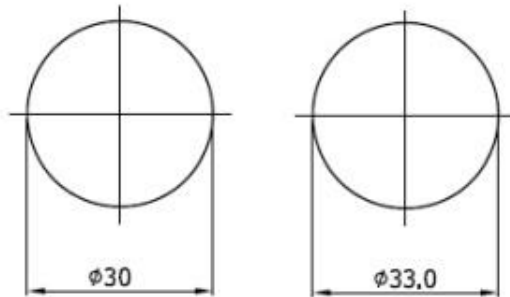
| | Name | P/N | Material | Finish | QTY |
|----|-----------------------|----------------|-----------------|-------------|-----|
| 1 | Housing | 000111I000015A | PC 540 | Black | 1 |
| 2 | Closed Cell Foam | 001011F030015A | CR4305 | White Liner | 1 |
| 3 | M30 Nut | 000411F000015A | Steel AISI 1215 | Ni Plated | 1 |
| 4 | Washer | 000411F010015A | Steel AISI 1215 | Ni Plated | 1 |
| 5 | Waterproof Rubber | 000711F000015A | Sillcon Rubber | Black | 1 |
| 6 | M30x 2 Thread 32L | 000311F000015A | Zinc Alloy | Ni Plated | 1 |
| 7 | Heat Shrink Tube | 001311F010015A | PE (CFD200) | Black | 4 |
| 8 | Rubber Stopper | 000711F010015A | Sillcone Rubber | Black | 1 |
| 9 | 2.4/5 GHz MIMO1 Label | 001012L100015A | Coated Paper | DarkGreen | 1 |
| 10 | 2.4/5 GHz MIMO2 Label | 001012L110015A | Coated Paper | GreenYellow | 1 |
| 11 | 2G/3G/4G MIMO1 Label | 001012L080015A | Coated Paper | Gray | 1 |
| 12 | 2G/3G/4G MIMO2 Label | 001012L090015A | Coated Paper | White | 1 |

| | Name | P/N | Spec | Finish | QTY |
|----|----------------|----------------|--------------|--------|-----|
| UU | Cable Type | 301412K000015A | CFD200 | Black | 4 |
| XX | Connector Type | 200212F000015A | RP-SMA(M) ST | Gold | 2 |
| YY | Connector Type | 200212G010015A | SMA(M) ST | Gold | 2 |

6. Installation



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



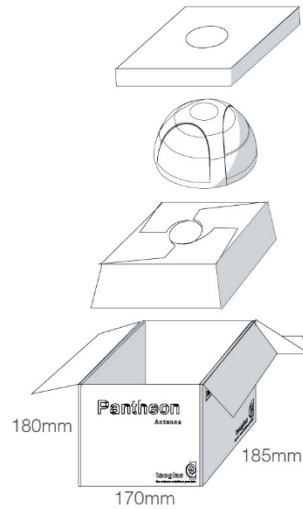
**Thread
 Diameter**

**Recommended
 Mounting Hole**

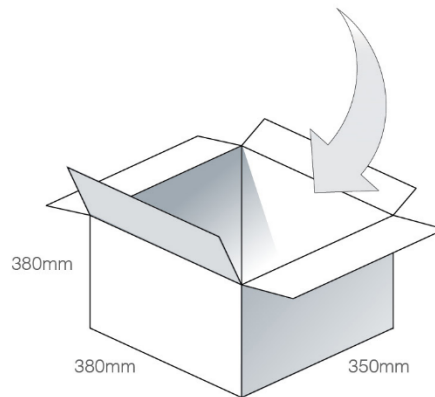
Unit: mm

7. Packaging

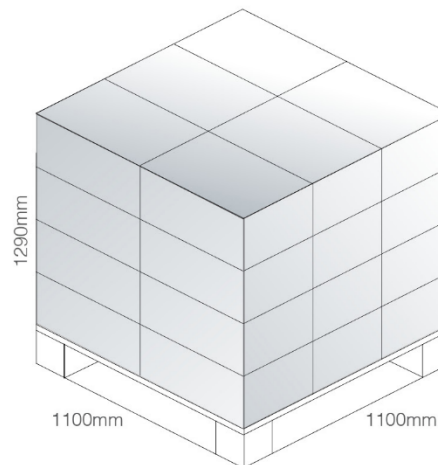
1 MA761.B.BICG.003 per box
 Box Dimensions - 185*170*180 mm
 Total Weight - 1.52Kg



8 boxes per carton
 Carton Dimensions - 380*350*380 mm
 Weight - 13.3Kg



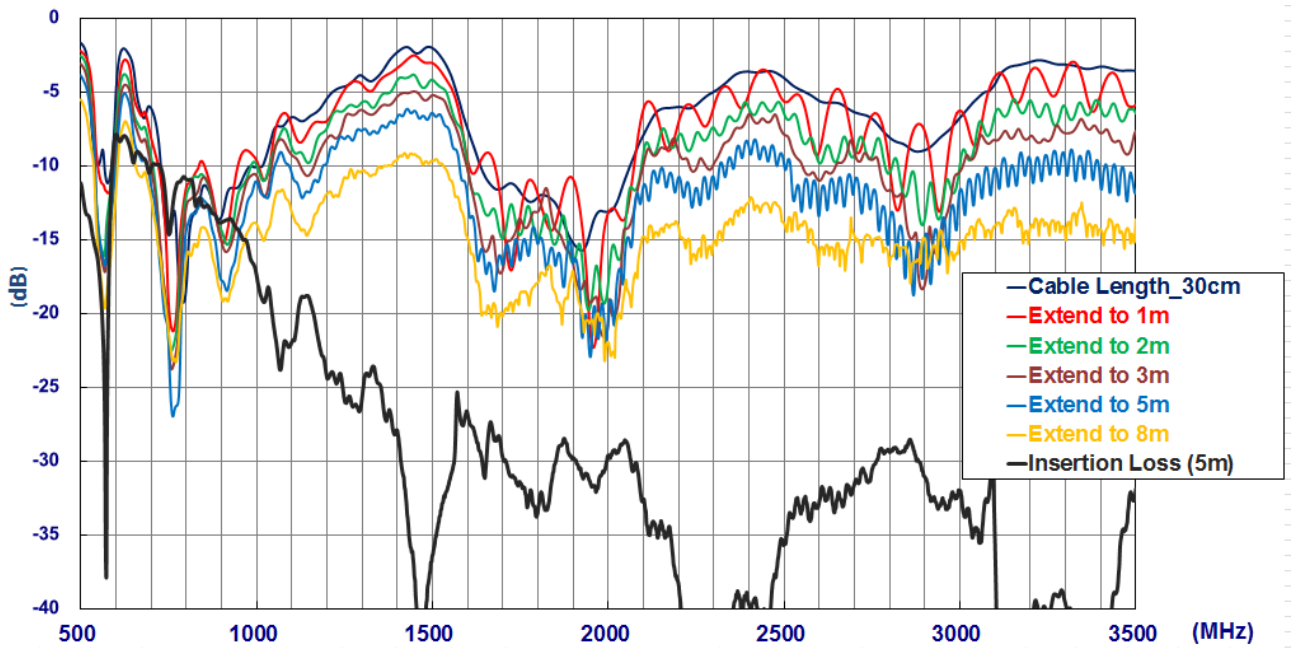
Pallet Dimensions 1100*1100*1290mm
 24 Cartons per pallet
 6 Cartons per layer
 4 Layers



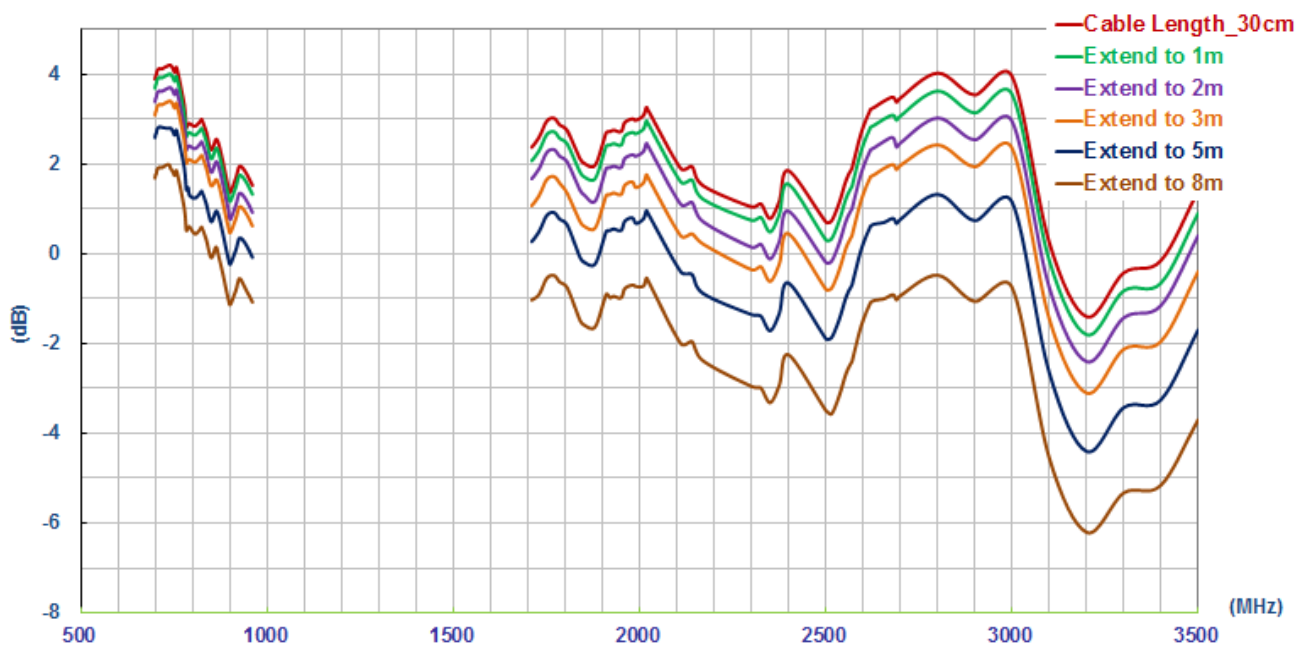
8. Application Note

8.1. LTE MIMO1 Antenna

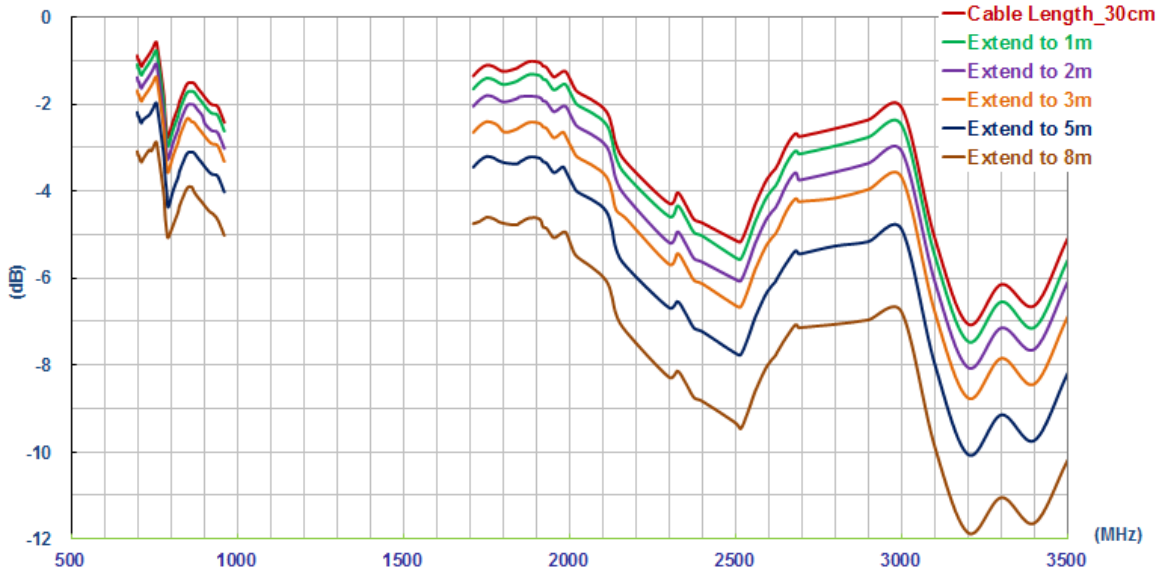
8.1.1. Return Loss



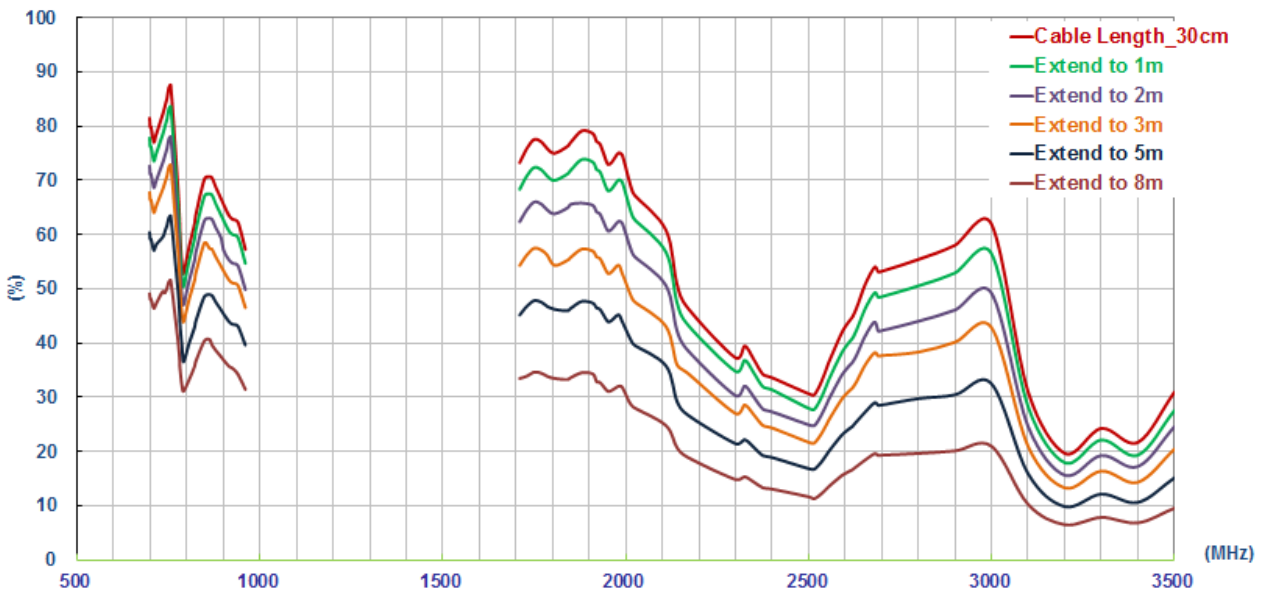
8.1.2. Maximum Gain



8.1.3. Average Gain

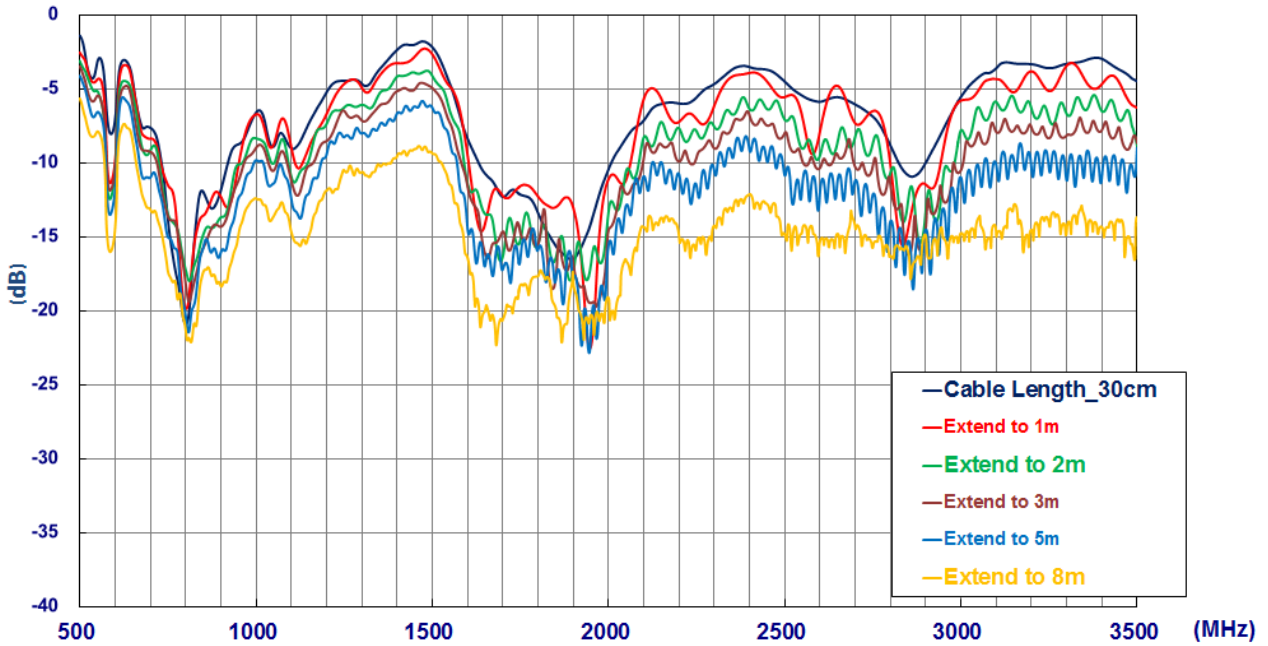


8.1.4. Efficiency

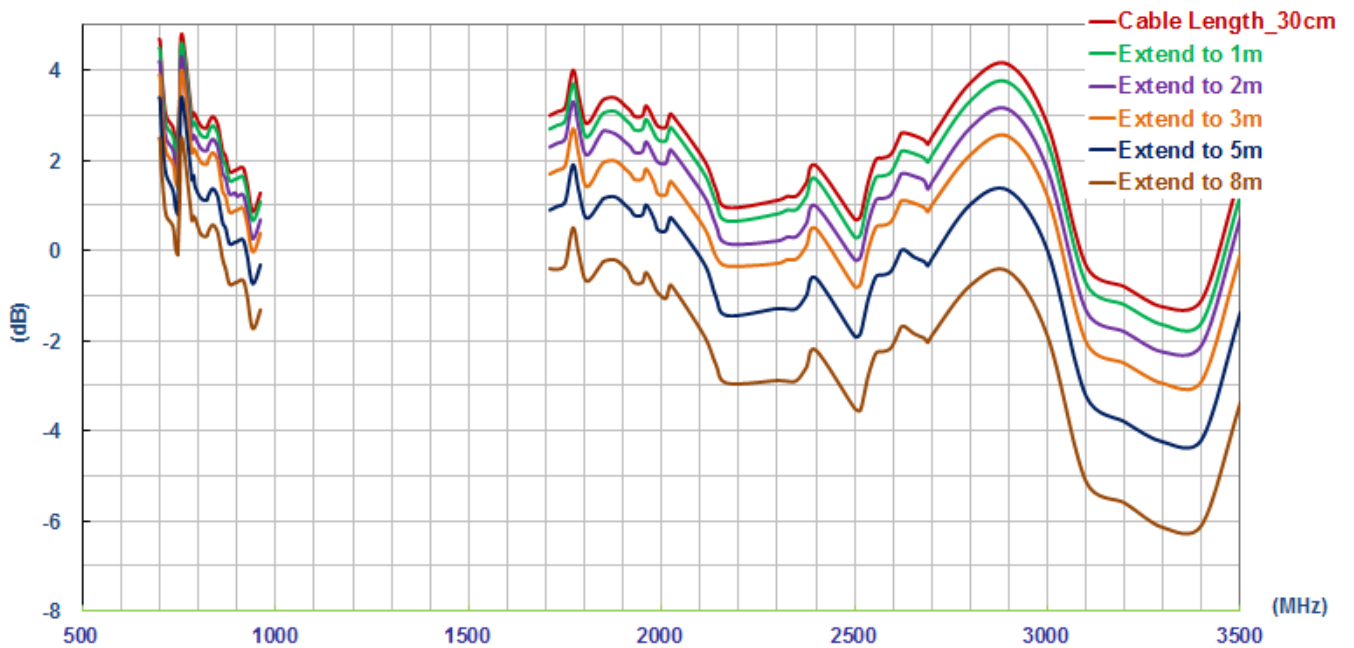


8.2. LTE MIMO2 Antenna

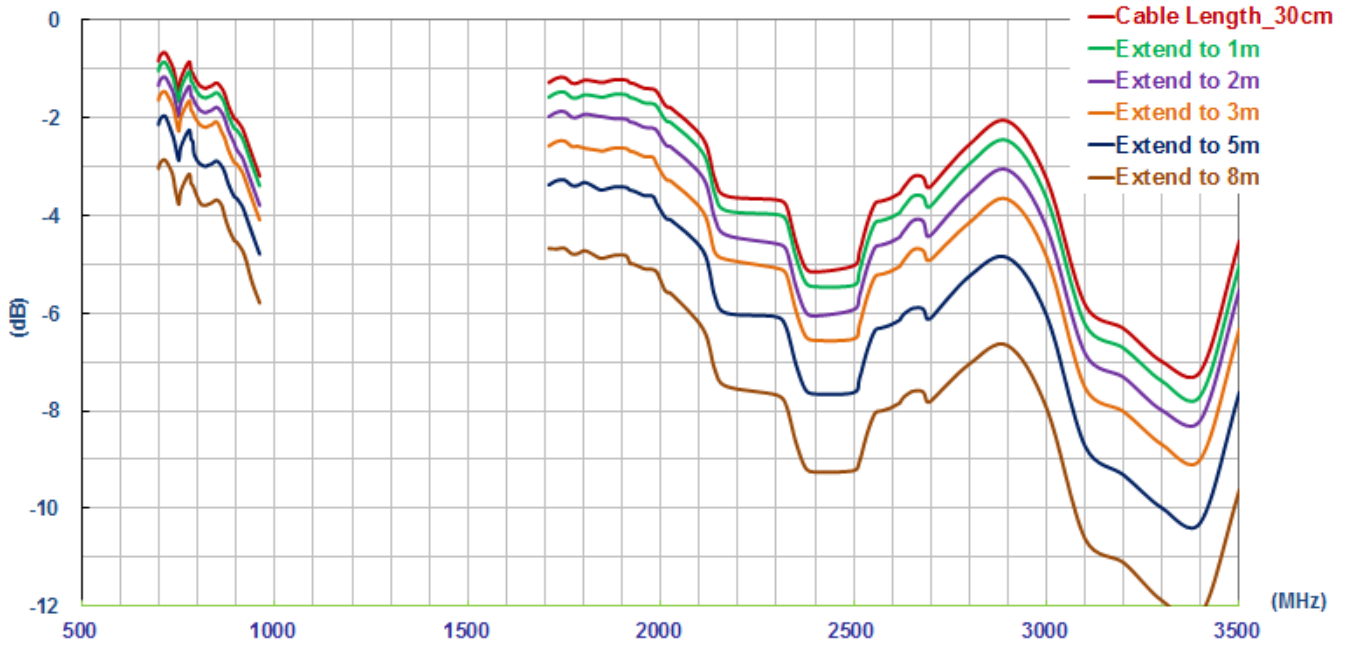
8.2.1. LTE MIMO2 Return Loss



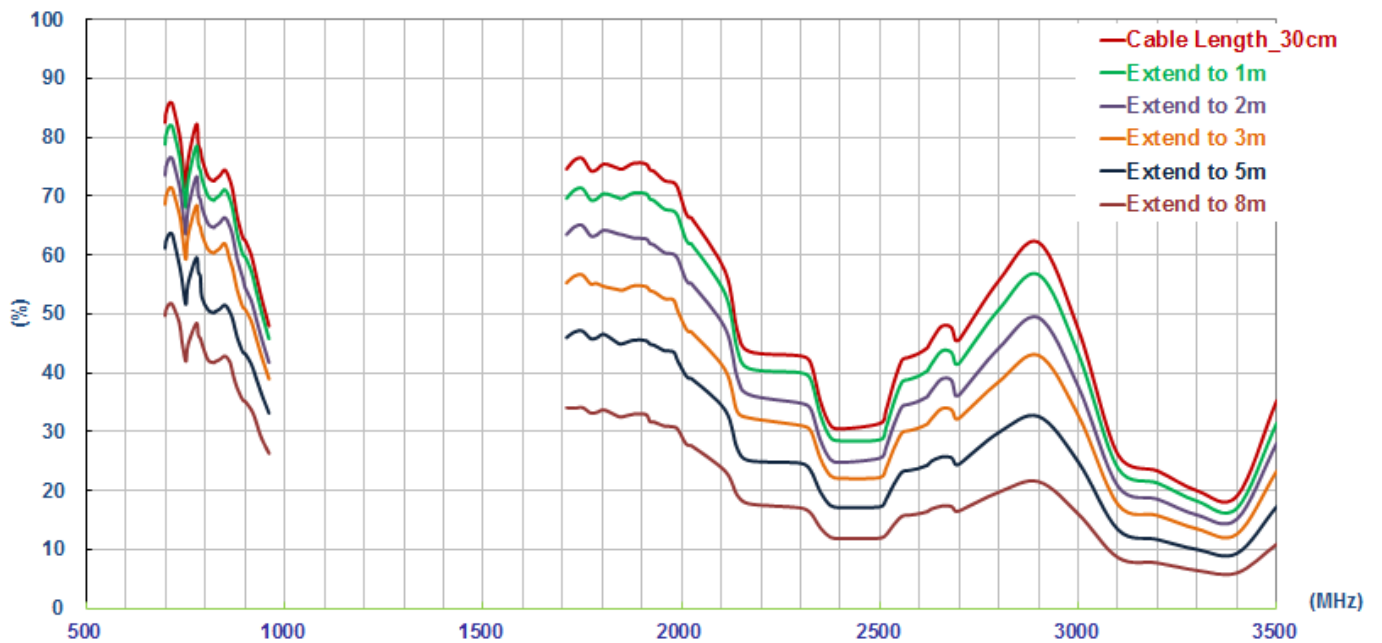
8.2.2. Maximum Gain



8.2.3. Average Gain

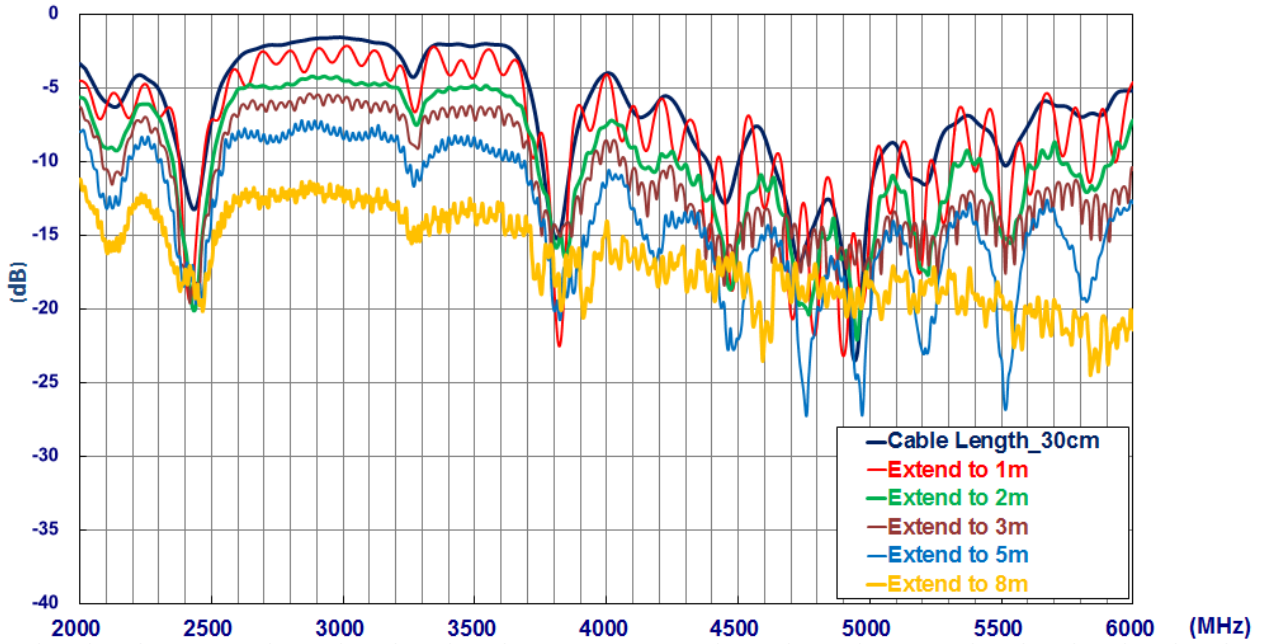


8.2.4. Efficiency

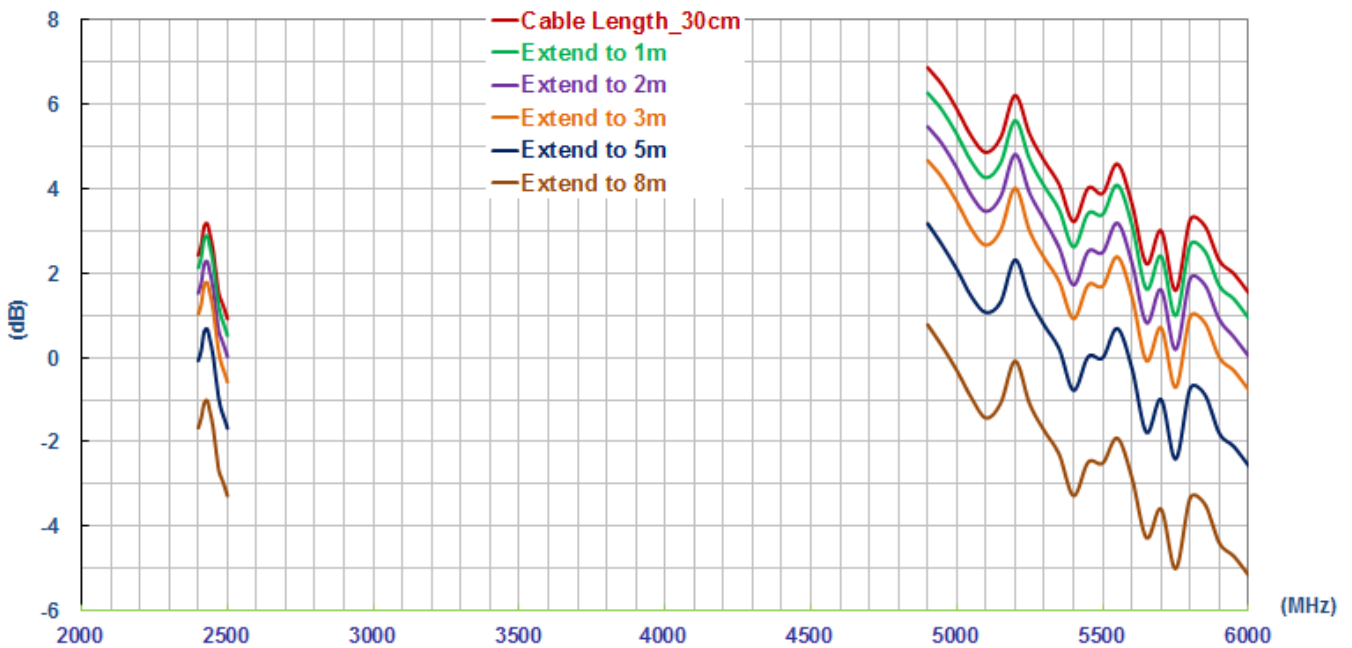


8.3. 2.4/5GHz MIMO1 Antenna

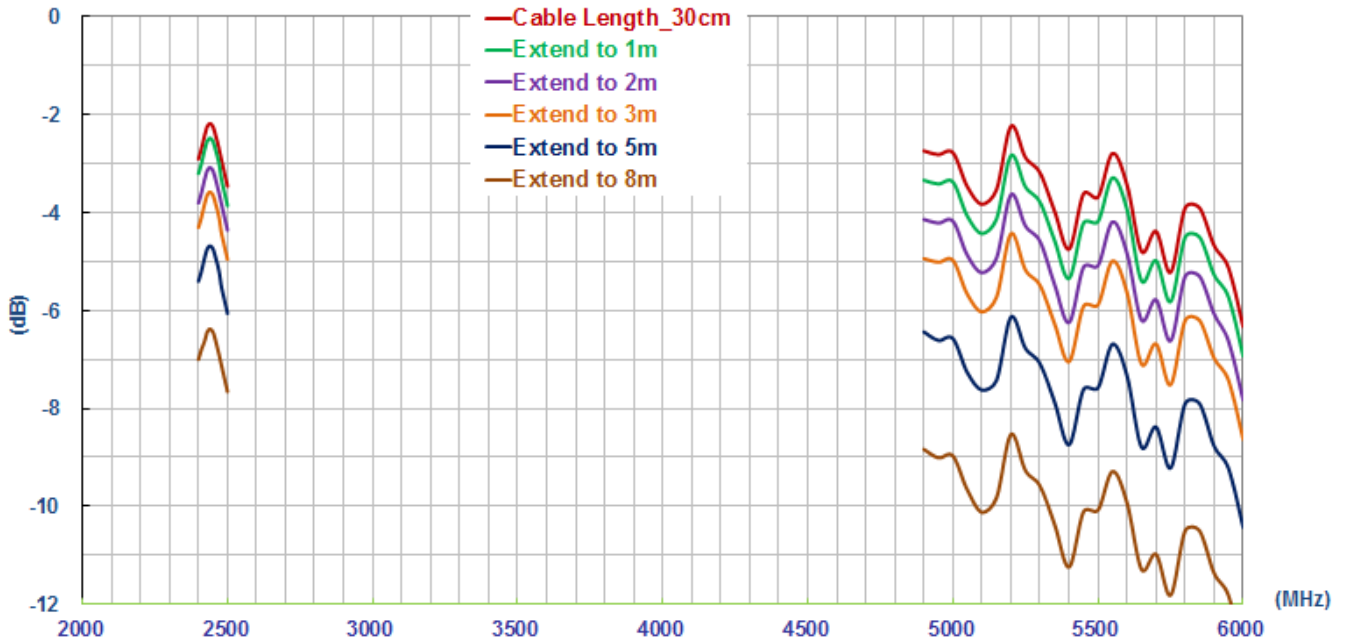
8.3.1. Return Loss



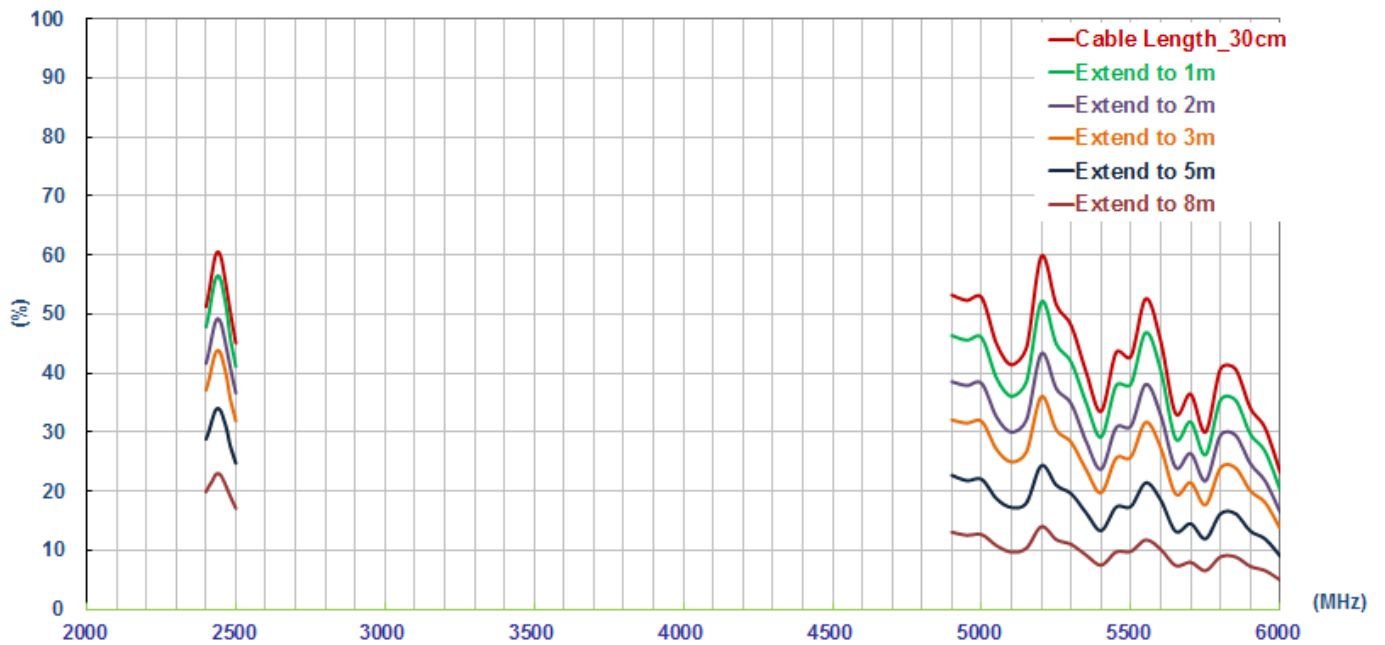
8.3.2. Maximum Gain



8.3.3. Average Gain

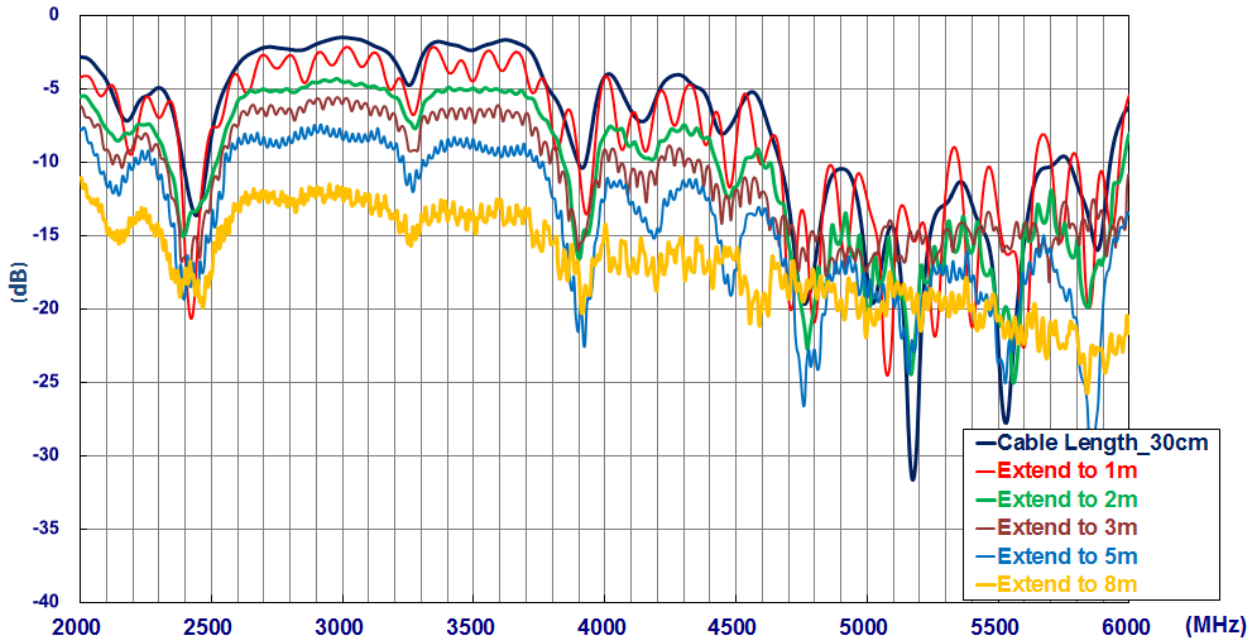


8.3.4. Efficiency

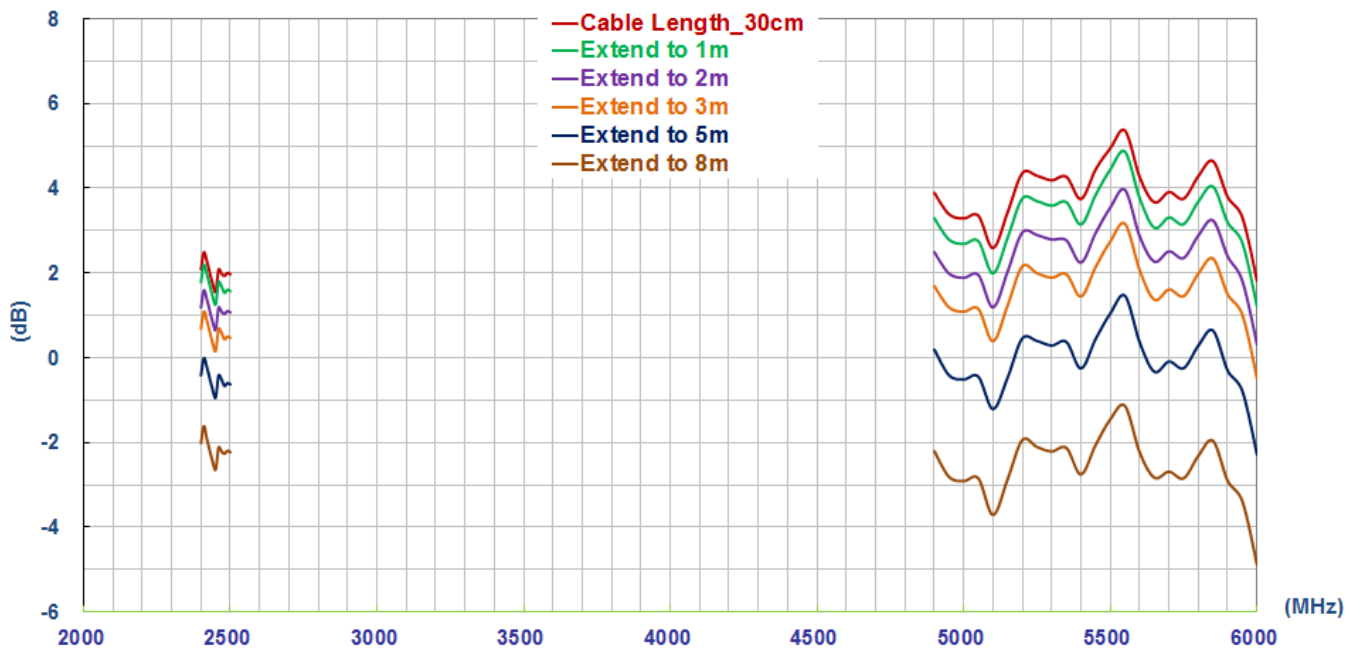


8.4. 2.4/5GHz MIMO2 Antenna

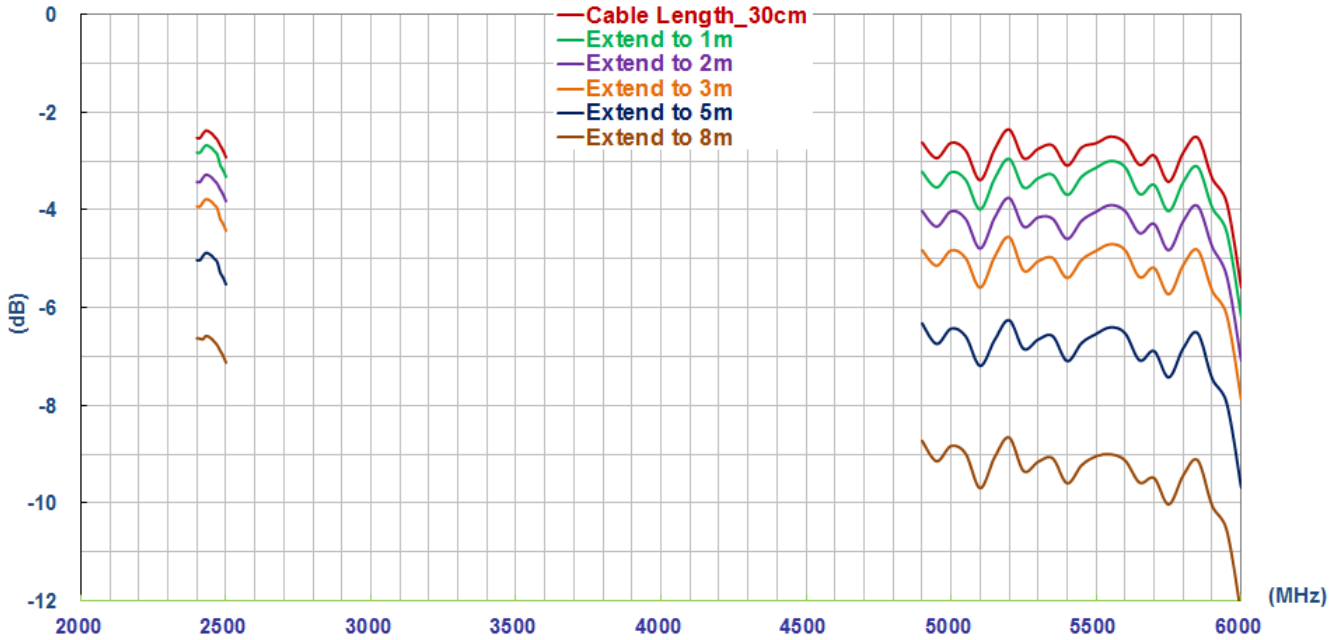
8.4.1. Return Loss



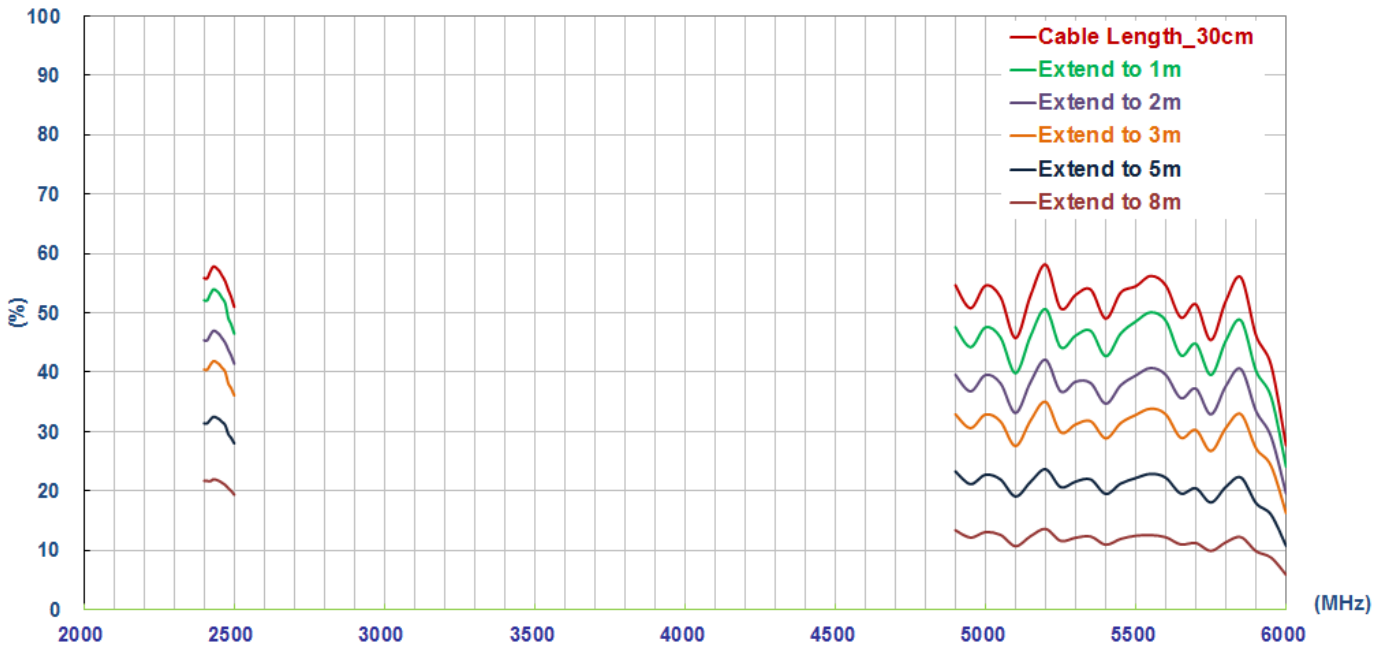
8.4.2. Maximum Gain



8.4.3. Average Gain



8.4.4. Efficiency





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