



# TAOGLAS®



## Datasheet

### Genesis 5 in 1 Adhesive Mount Antenna

**Part No:**  
MA275.LBICG.002

#### **Description:**

Genesis 5in1 Adhesive Mount Combination Antenna GNSS, 2\* LTE MIMO & 2\* Wi-Fi MIMO 3m cable with SMA type connectors

#### **Features:**

Adhesive Mount Combination Antenna

2\*LTE: 3m CFD-200, SMA(M) Connector

2\*Wi-Fi: 3m CFD-200, RP-SMA(M) Connector

1\*Active GNSS: 3m RG-174, SMA(M) Connector

IP67 Rated Enclosure

Dims: 205.1\*68\*12.5 mm

Custom Cables and Connectors Available

RoHS & Reach Compliant

|    |                         |    |
|----|-------------------------|----|
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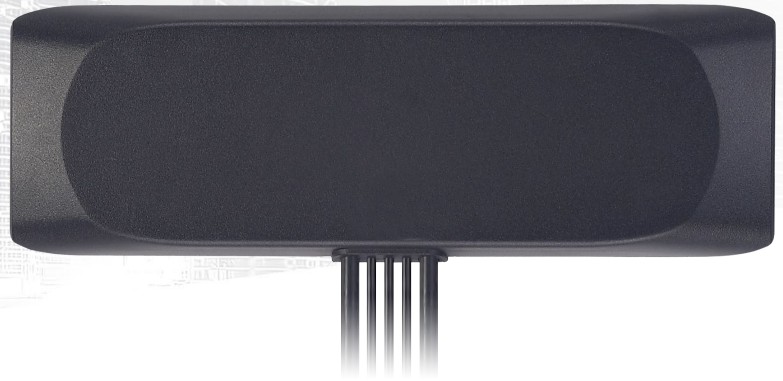
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## 1. Introduction



The Taoglas Genesis MA275 5in1 antenna is a combination of LTE, Wi-Fi and GNSS, 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, Wi-Fi dual-band 2.4/5 GHz as well as GPS-GLONASS for next generation multiple wireless technology systems, such as vehicle telematics.

Potential uses are new fleet management and applications that demand high speed data 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. The GNSS antenna has been carefully designed to work equally well on both GPS/GALILEO and GLONASS bands, leading to higher location accuracy and stability of tracking in urban environments.

Cable length and connector types are customizable. Contact your regional Taoglas sales office for support.

## 2. Specifications

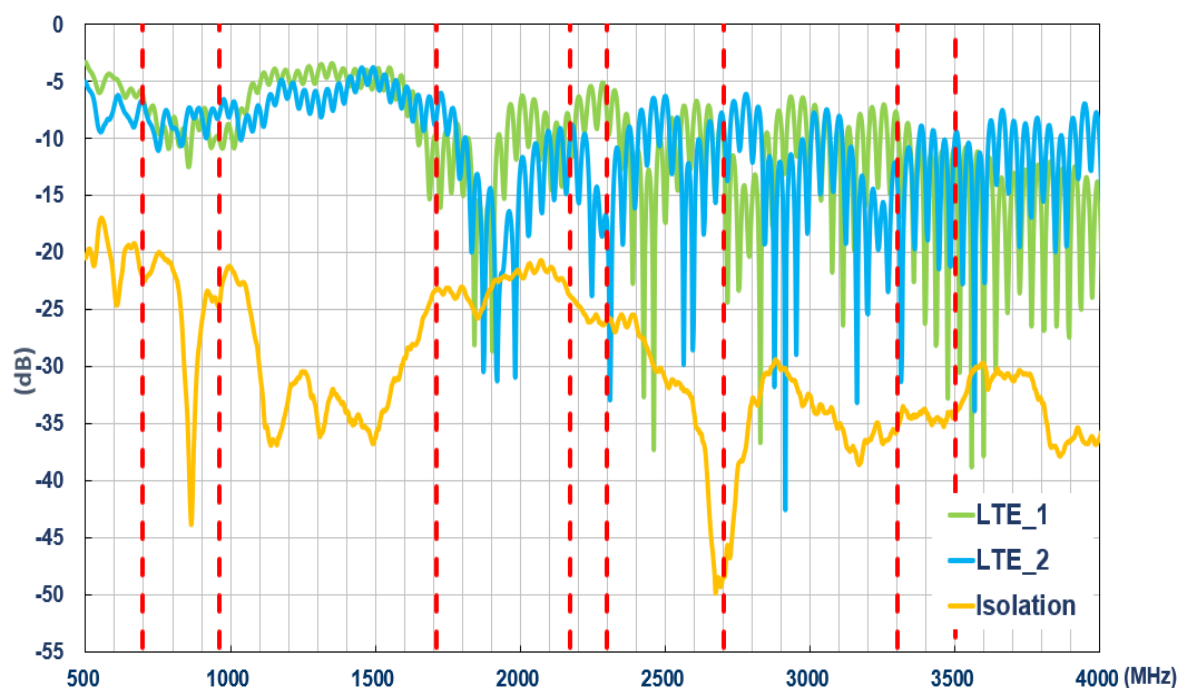
| LTE MIMO 1&2 Antenna |      |         |         |         |           |           |           |           |           |
|----------------------|------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|
| Frequency (MHz)      |      | LTE700  | GSM850  | GSM900  | DCS       | PCS       | UMTS1     | LTE2600   | LTE3500   |
|                      |      | 698~803 | 824~894 | 880~960 | 1710~1880 | 1850~1990 | 1920~2170 | 2300~2690 | 3300~3500 |
| Efficiency (%)       |      |         |         |         |           |           |           |           |           |
| MIMO1                | 0.3M | 41.29   | 48.36   | 65.64   | 62.11     | 56.32     | 48.15     | 70.92     | 72.17     |
|                      | 1M   | 39.11   | 46.19   | 62.72   | 56.67     | 51.37     | 44.38     | 64.68     | 64.30     |
|                      | 2M   | 36.50   | 42.29   | 57.20   | 50.50     | 45.47     | 38.89     | 56.22     | 54.24     |
|                      | 3M   | 33.81   | 39.31   | 53.14   | 44.90     | 40.00     | 34.39     | 48.94     | 46.58     |
|                      | 5M   | 31.32   | 36.54   | 49.36   | 39.92     | 35.19     | 30.42     | 42.60     | 40.01     |
| MIMO2                | 0.3M | 45.77   | 44.37   | 48.64   | 67.81     | 81.95     | 78.16     | 68.89     | 68.09     |
|                      | 1M   | 43.38   | 42.36   | 46.44   | 61.83     | 74.76     | 72.06     | 62.83     | 60.72     |
|                      | 2M   | 40.49   | 38.81   | 42.35   | 55.11     | 66.13     | 63.14     | 54.61     | 51.29     |
|                      | 3M   | 37.48   | 36.05   | 39.37   | 48.96     | 58.18     | 55.84     | 47.57     | 43.99     |
|                      | 5M   | 34.70   | 33.49   | 36.60   | 43.51     | 51.20     | 49.39     | 41.44     | 37.72     |
| Average Gain (dB)    |      |         |         |         |           |           |           |           |           |
| MIMO1                | 0.3M | -2.83   | -2.43   | -0.98   | -1.91     | -1.91     | -2.52     | -0.70     | -0.88     |
|                      | 1M   | -3.13   | -2.63   | -1.18   | -2.31     | -2.31     | -2.92     | -1.10     | -1.38     |
|                      | 2M   | -3.43   | -3.03   | -1.58   | -2.81     | -2.81     | -3.42     | -1.70     | -2.08     |
|                      | 3M   | -3.73   | -3.33   | -1.98   | -3.31     | -3.31     | -4.02     | -2.30     | -2.78     |
|                      | 5M   | -4.03   | -3.63   | -2.38   | -3.81     | -3.81     | -4.62     | -2.90     | -3.48     |
| MIMO2                | 0.3M | -3.39   | -3.53   | -3.13   | -1.69     | -0.86     | -1.07     | -1.62     | -1.67     |
|                      | 1M   | -3.63   | -3.73   | -3.33   | -2.09     | -1.26     | -1.42     | -2.02     | -2.17     |
|                      | 2M   | -3.93   | -4.11   | -3.73   | -2.59     | -1.80     | -2.00     | -2.63     | -2.90     |
|                      | 3M   | -4.26   | -4.43   | -4.05   | -3.10     | -2.35     | -2.53     | -3.23     | -3.57     |
|                      | 5M   | -4.60   | -4.75   | -4.36   | -3.61     | -2.91     | -3.06     | -3.83     | -4.23     |
| Peak Gain (dBi)      |      |         |         |         |           |           |           |           |           |
| MIMO1                | 0.3M | 2.36    | 0.91    | 3.19    | 4.28      | 4.28      | 2.00      | 4.77      | 3.66      |
|                      | 1M   | 2.06    | 0.71    | 2.99    | 3.88      | 3.88      | 1.62      | 4.37      | 3.16      |
|                      | 2M   | 1.76    | 0.31    | 2.59    | 3.38      | 3.38      | 1.08      | 3.77      | 2.46      |
|                      | 3M   | 1.46    | 0.01    | 2.19    | 2.88      | 2.88      | 0.52      | 3.17      | 1.76      |
|                      | 5M   | 1.16    | -0.29   | 1.79    | 2.38      | 2.38      | 0.02      | 2.57      | 1.06      |
| MIMO2                | 0.3M | 1.76    | 1.39    | 1.96    | 3.14      | 3.65      | 3.65      | 3.57      | 4.28      |
|                      | 1M   | 1.46    | 1.19    | 1.76    | 2.74      | 3.25      | 3.25      | 3.17      | 3.78      |
|                      | 2M   | 1.16    | 0.79    | 1.36    | 2.24      | 2.69      | 2.69      | 2.57      | 3.08      |
|                      | 3M   | 0.86    | 0.49    | 0.96    | 1.69      | 2.15      | 2.15      | 1.97      | 2.38      |
|                      | 5M   | 0.56    | 0.19    | 0.56    | 1.19      | 1.65      | 1.65      | 1.37      | 1.68      |
| Impedance            |      |         |         |         | 50 Ω      |           |           |           |           |
| Polarization         |      |         |         |         | Linear    |           |           |           |           |

| Wi-Fi Antenna (2.4GHz/5.8GHz) |             |           |           |
|-------------------------------|-------------|-----------|-----------|
| Frequency (MHz)               |             | 2400~2500 | 4900~5850 |
| Efficiency (%)                |             |           |           |
| MIMO1                         | 0.3M        | 64.46     | 68.73     |
|                               | 1M          | 58.78     | 59.24     |
|                               | 2M          | 51.19     | 48.02     |
|                               | 3M          | 44.59     | 38.90     |
|                               | 5M          | 38.83     | 31.52     |
| MIMO2                         | 0.3M        | 73.89     | 69.93     |
|                               | 1M          | 67.40     | 60.21     |
|                               | 2M          | 58.70     | 48.79     |
|                               | 3M          | 51.13     | 39.50     |
|                               | 5M          | 44.53     | 31.98     |
| Average Gain (dB)             |             |           |           |
| MIMO1                         | 0.3M        | -1.91     | -1.63     |
|                               | 1M          | -2.31     | -2.27     |
|                               | 2M          | -2.91     | -3.19     |
|                               | 3M          | -3.51     | -4.10     |
|                               | 5M          | -4.11     | -5.01     |
| MIMO2                         | 0.3M        | -1.31     | -1.55     |
|                               | 1M          | -1.71     | -2.20     |
|                               | 2M          | -2.31     | -3.12     |
|                               | 3M          | -2.91     | -4.03     |
|                               | 5M          | -3.51     | -4.95     |
| Peak Gain (dBi)               |             |           |           |
| MIMO1                         | 0.3M        | 2.07      | 3.98      |
|                               | 1M          | 1.67      | 3.38      |
|                               | 2M          | 1.07      | 2.48      |
|                               | 3M          | 0.47      | 1.61      |
|                               | 5M          | -0.13     | 0.81      |
| MIMO2                         | 0.3M        | 4.52      | 6.98      |
|                               | 1M          | 4.12      | 6.38      |
|                               | 2M          | 3.52      | 5.48      |
|                               | 3M          | 2.92      | 4.58      |
|                               | 5M          | 2.32      | 3.68      |
| Impedance                     | 50 $\Omega$ |           |           |
| Return loss                   | < -6 dB     |           |           |
| Polarization                  | Linear      |           |           |

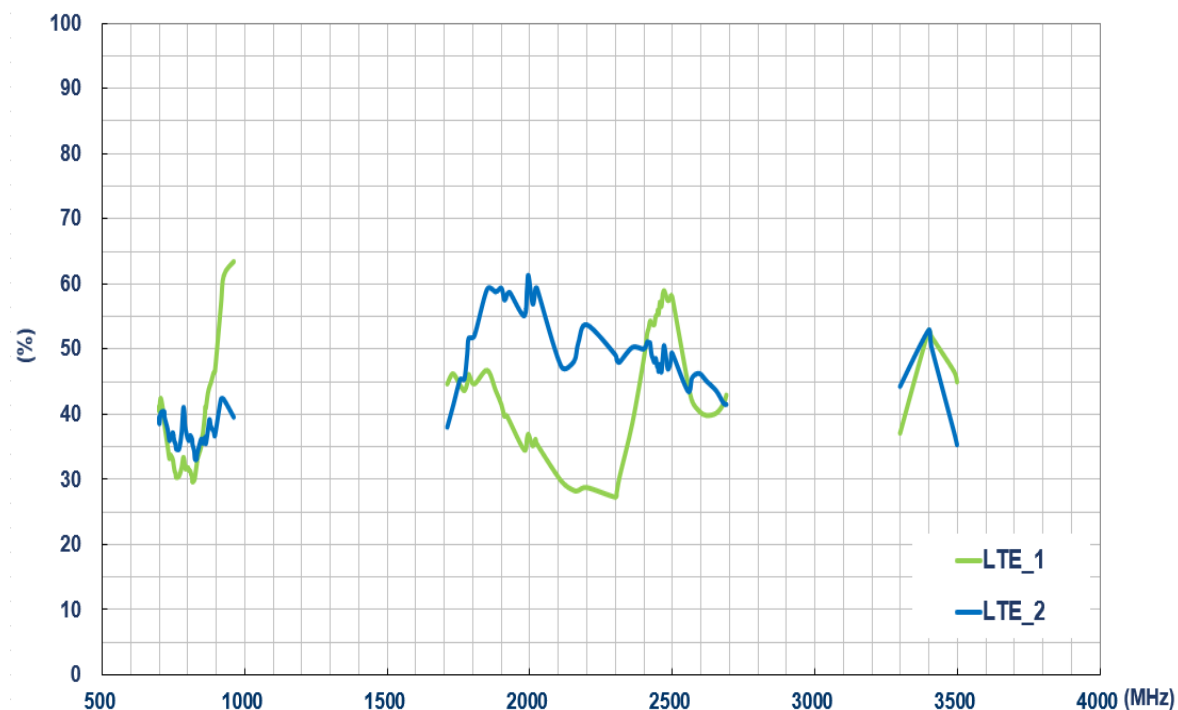
| GNSS Electrical                                   |                                                                                               |           |           |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------|-----------|
| Frequency                                         | GPS L1: 1575.42 MHz ± 1.023 MHz<br>GLONASS L1: 1602 MHz ± 1.023 MHz                           |           |           |
| Bandwidth -<br>Return Loss <-10 dB                | 6 MHz min                                                                                     |           |           |
| Return loss (GPS L1<br>GLONASS L1)                | < -10 dB                                                                                      |           |           |
| Passive Gain at Zenith<br>(GPS L1 and GLONASS L1) | +1.0 dBic typ.                                                                                |           |           |
| Polarization                                      | RHCP                                                                                          |           |           |
| Impedance                                         | 50 Ω                                                                                          |           |           |
| LNA Out-band Attenuation                          | fo = 1575.42MHz<br>fo ± 30 MHz 5dB Min.<br>fo ± 50 MHz 20dB Min.<br>fo ± 100 MHz 25dB Min.    |           |           |
| Input Voltage                                     | Min:1.8V                                                                                      | Typ. 3.0V | Max: 5.5V |
| Total Gain @ Zenith                               | 23dBic                                                                                        | 31dBic    | 34dBic    |
| Current Consumption                               | 8 mA                                                                                          | 15 mA     | 28 mA     |
| Noise Figure                                      | 2.5 dB                                                                                        | 2.3 dB    | 2.6 dB    |
| Mechanical                                        |                                                                                               |           |           |
| Dimensions                                        | 205.1*68*12.5 mm                                                                              |           |           |
| Cable                                             | LTE MIMO1/ MIMO2: 3000mm CFD-200<br>WI-FI MIMO1/ MIMO2: 3000mm CFD-200<br>GNSS: 3000mm RG-174 |           |           |
| Connector                                         | LTE: SMA(M)<br>WI-FI: RP-SMA(M)<br>GNSS: SMA(M)                                               |           |           |
| Casing                                            | PC+ABS                                                                                        |           |           |
| Adhesive                                          | 3M 9448HK + CR4305                                                                            |           |           |
| Sealant                                           | Rubber Stopper                                                                                |           |           |
| Weight                                            | 650g                                                                                          |           |           |
| Environmental                                     |                                                                                               |           |           |
| Protection                                        | IP67                                                                                          |           |           |
| Cable Pull                                        | 8 Kgf                                                                                         |           |           |
| Temperature Range                                 | -40°C to +85°C                                                                                |           |           |
| Temperature Cycle                                 | 30 cycles -40°C to +85°C, 1 cycle 8 hours                                                     |           |           |
| Humidity                                          | Non-condensing 65°C 95% RH                                                                    |           |           |
| Vibration                                         | Frequency: 10~1000Hz, 3 axis, 8 hours / axis                                                  |           |           |

## 3. Antenna Characteristics

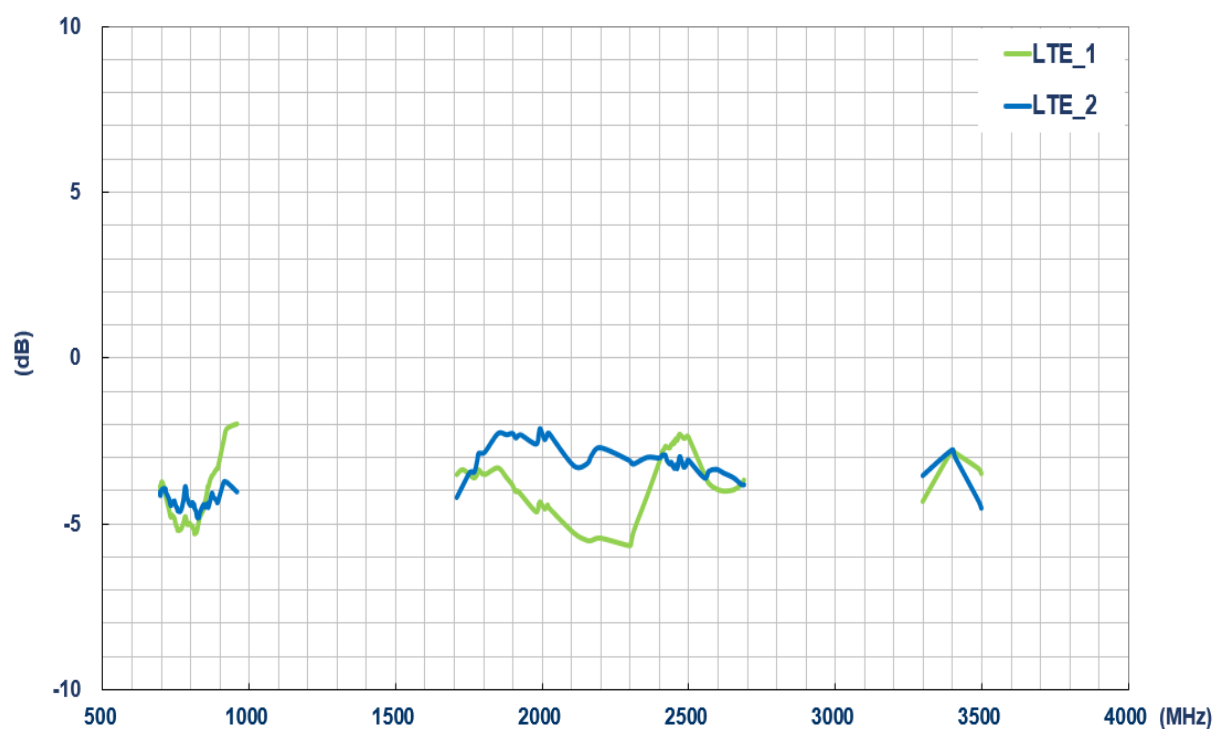
### 3.1 Return Loss – LTE MIMO 1 & 2



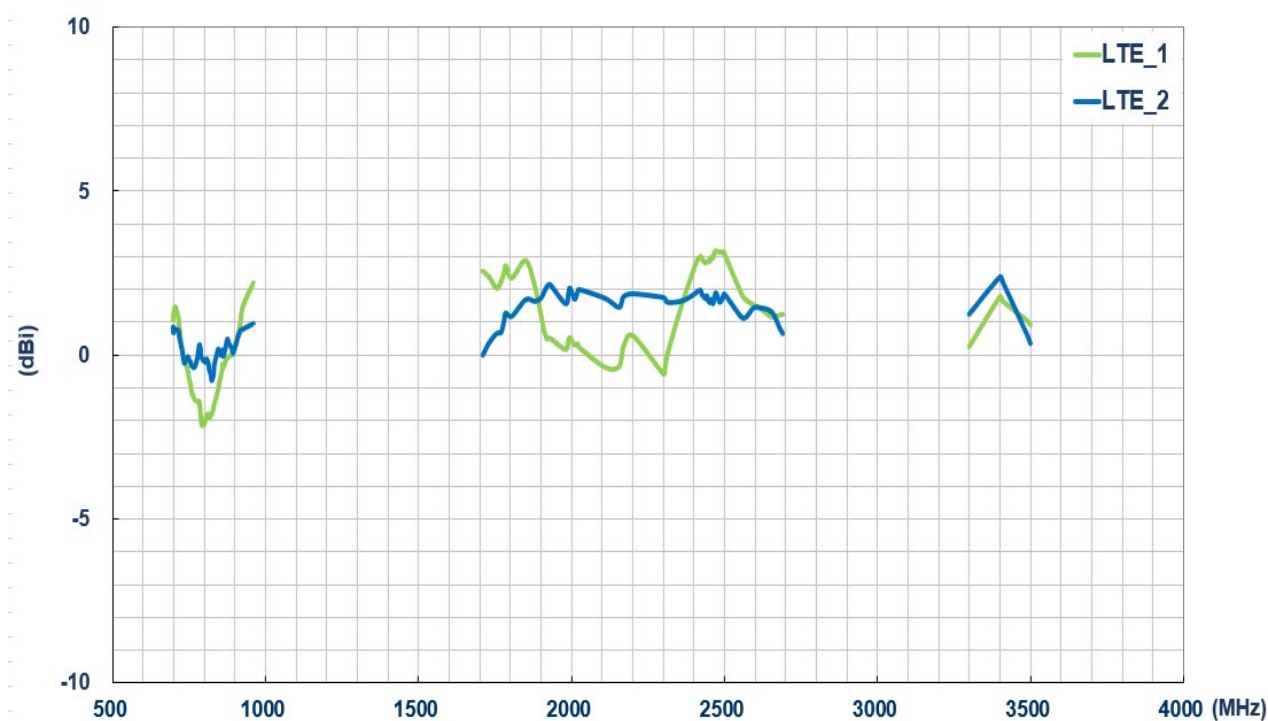
### 3.2 Efficiency – LTE MIMO 1 & 2



### 3.3 Average Gain - LTE MIMO 1 & 2

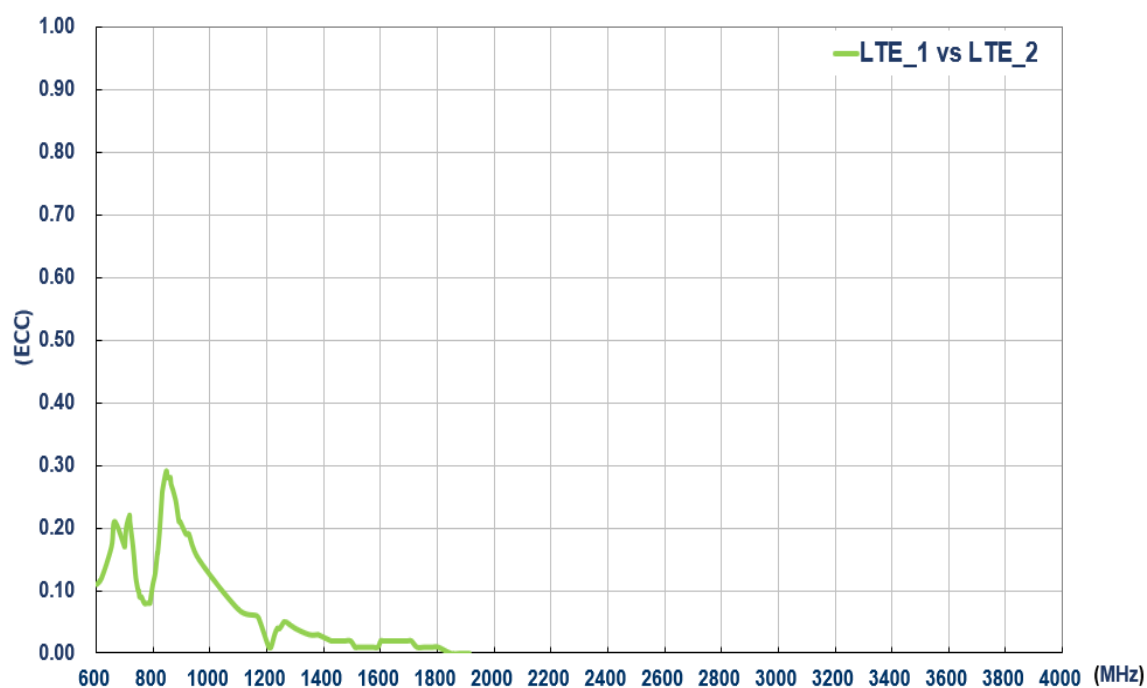


### 3.4 Peak Gain – LTE MIMO 1 & 2

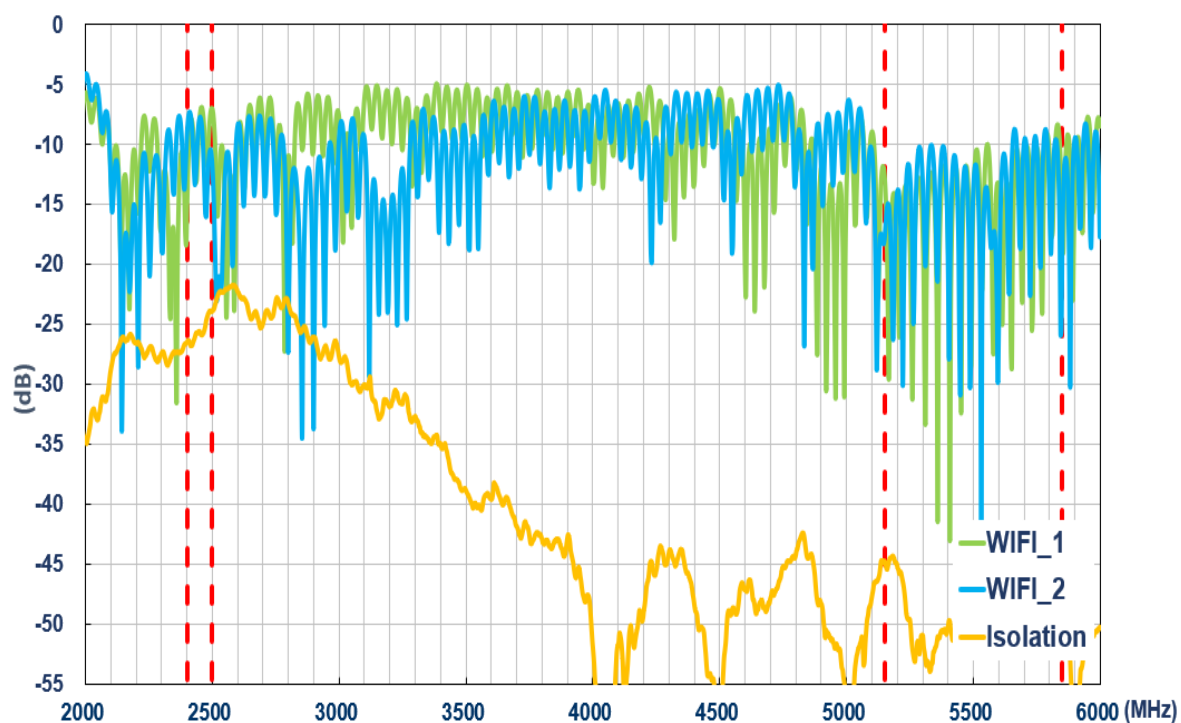




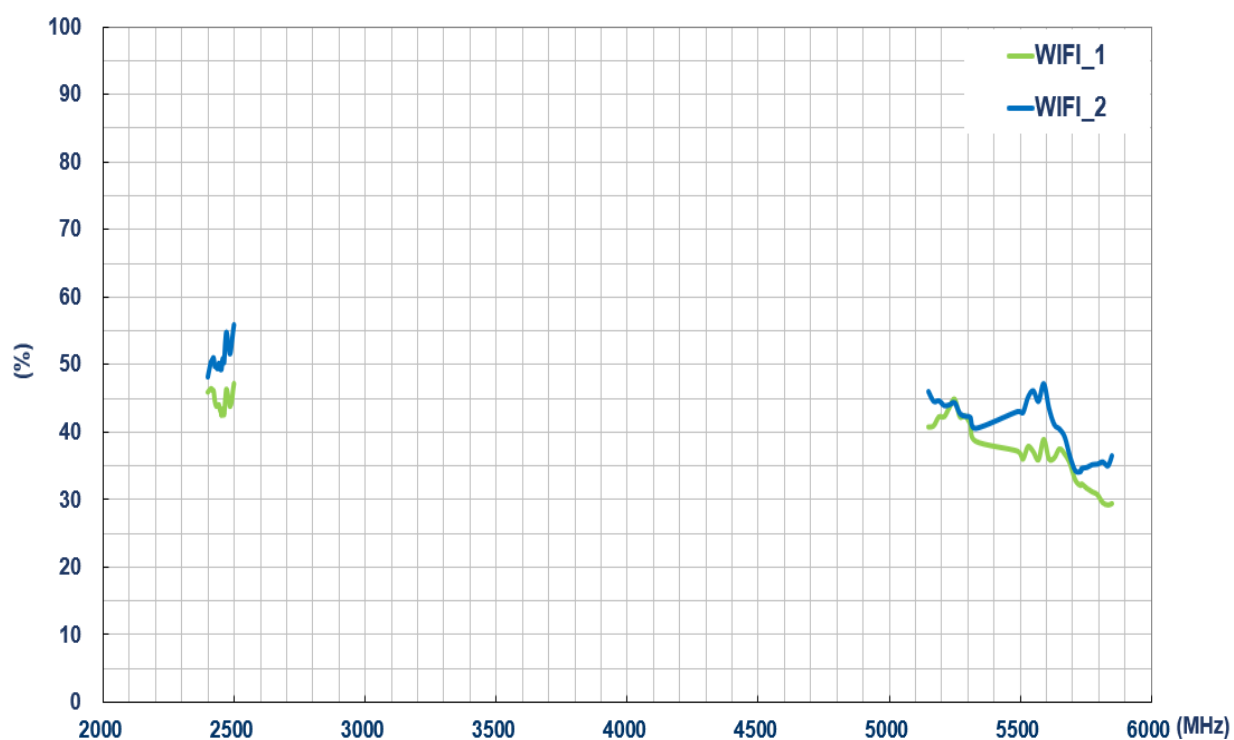
### 3.5 ECC – LTE MIMO 1 & 2



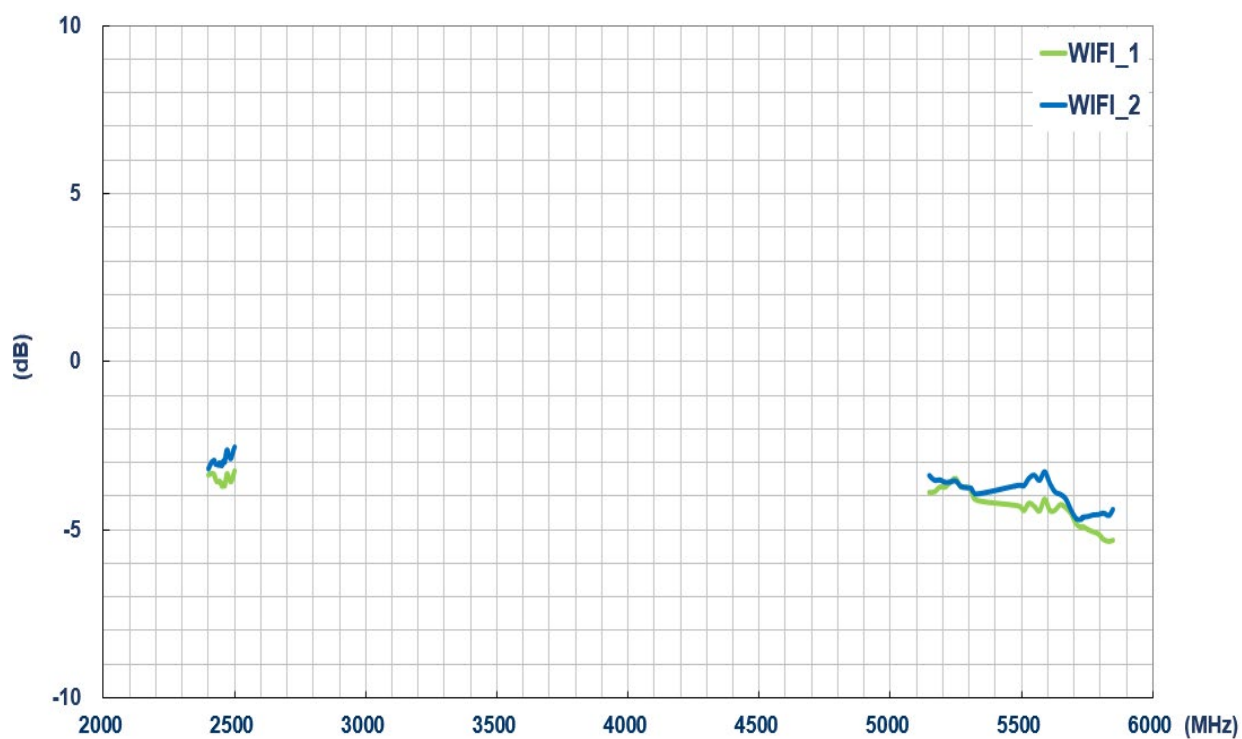
### 3.6 Return Loss – Wi-Fi MIMO 1 & 2



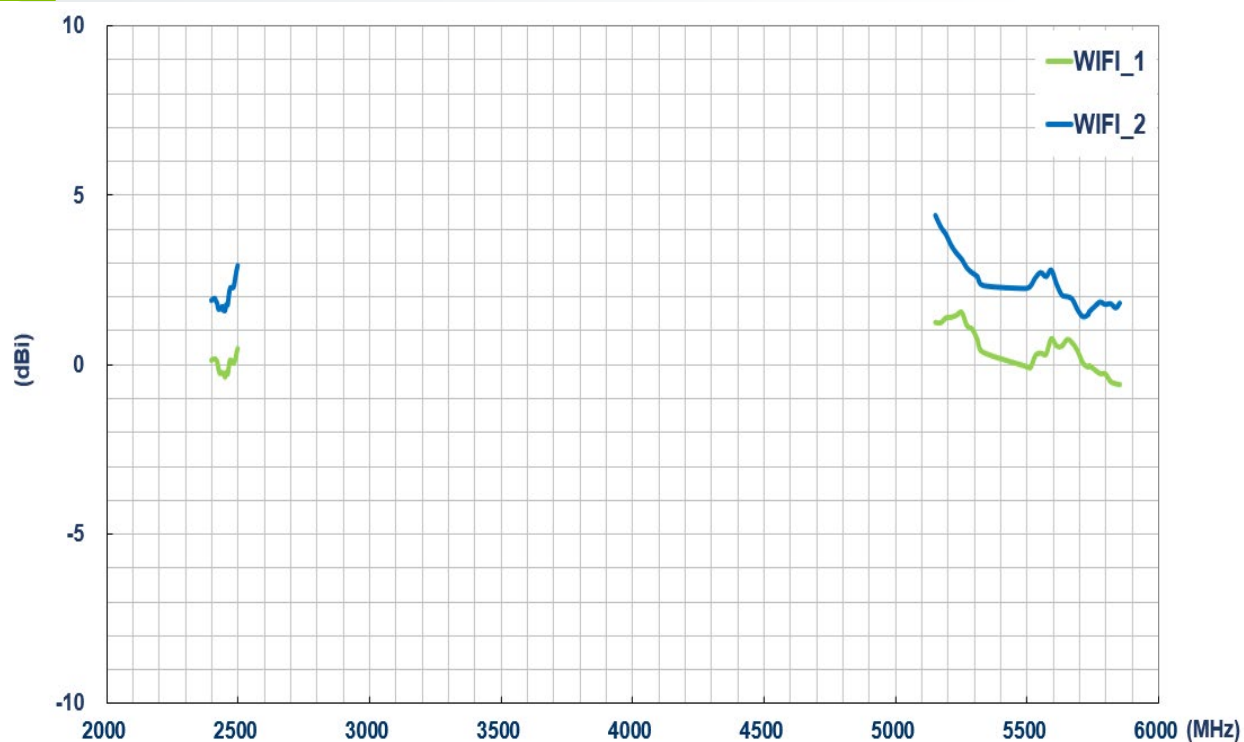
### 3.7 Efficiency – Wi-Fi MIMO 1 & 2



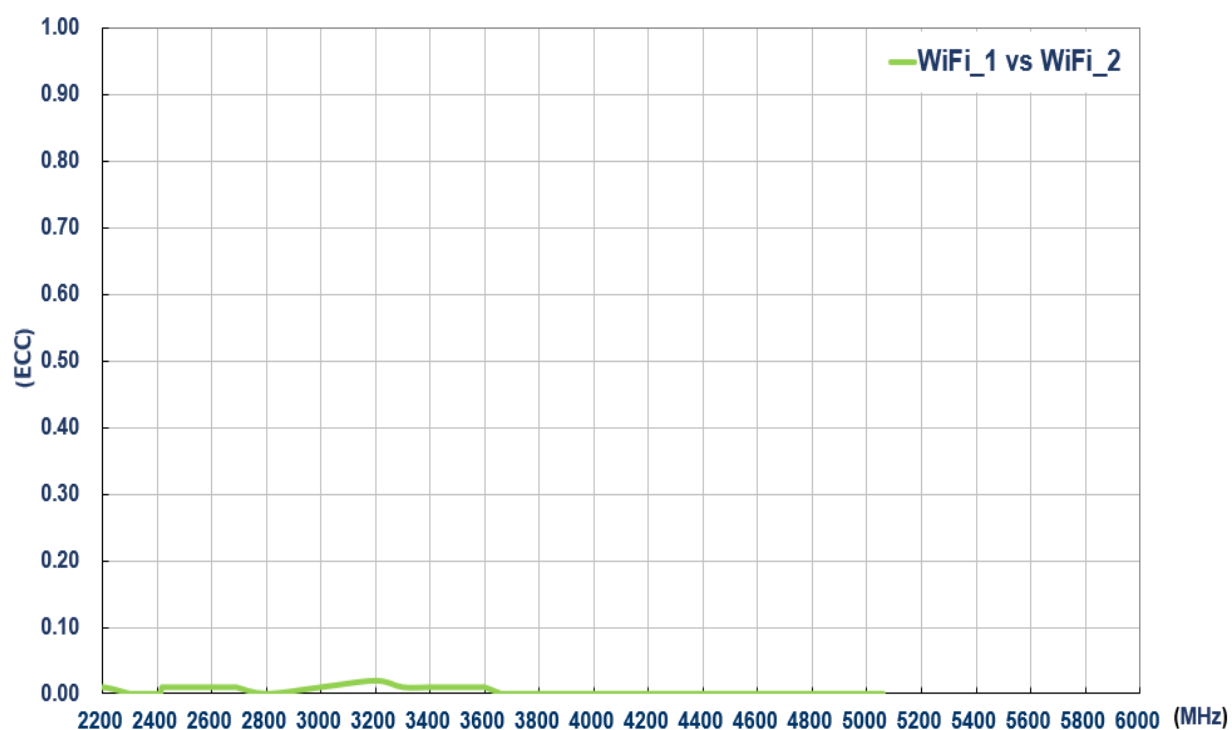
### 3.8 Average Gain – Wi-Fi MIMO 1 & 2



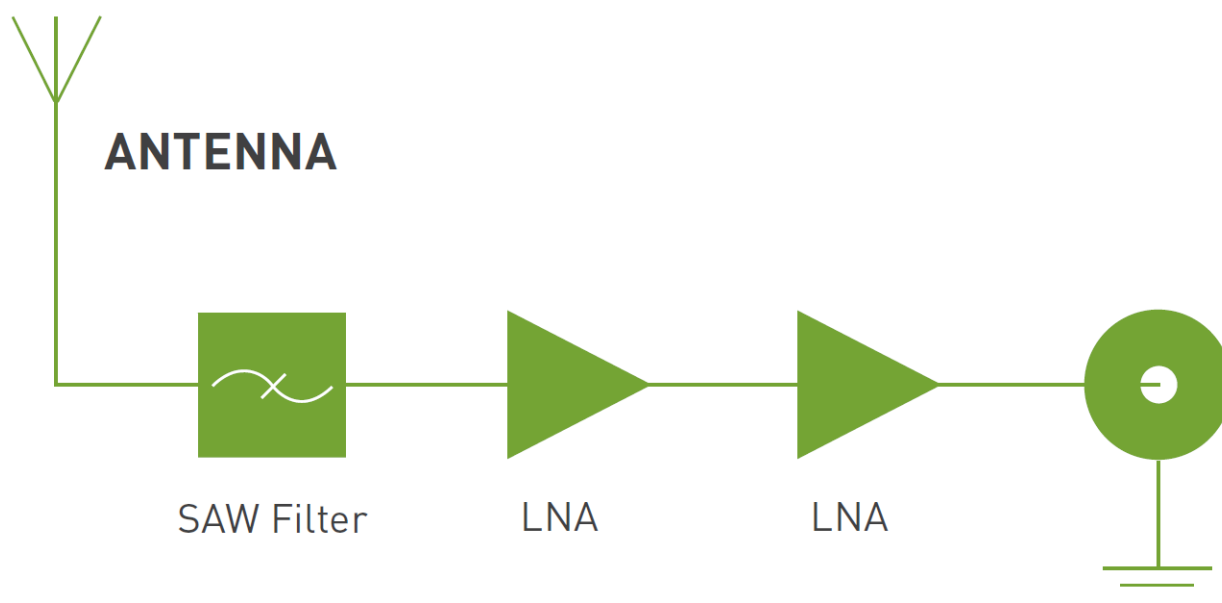
### 3.9 Peak Gain – Wi-Fi MIMO 1 & 2



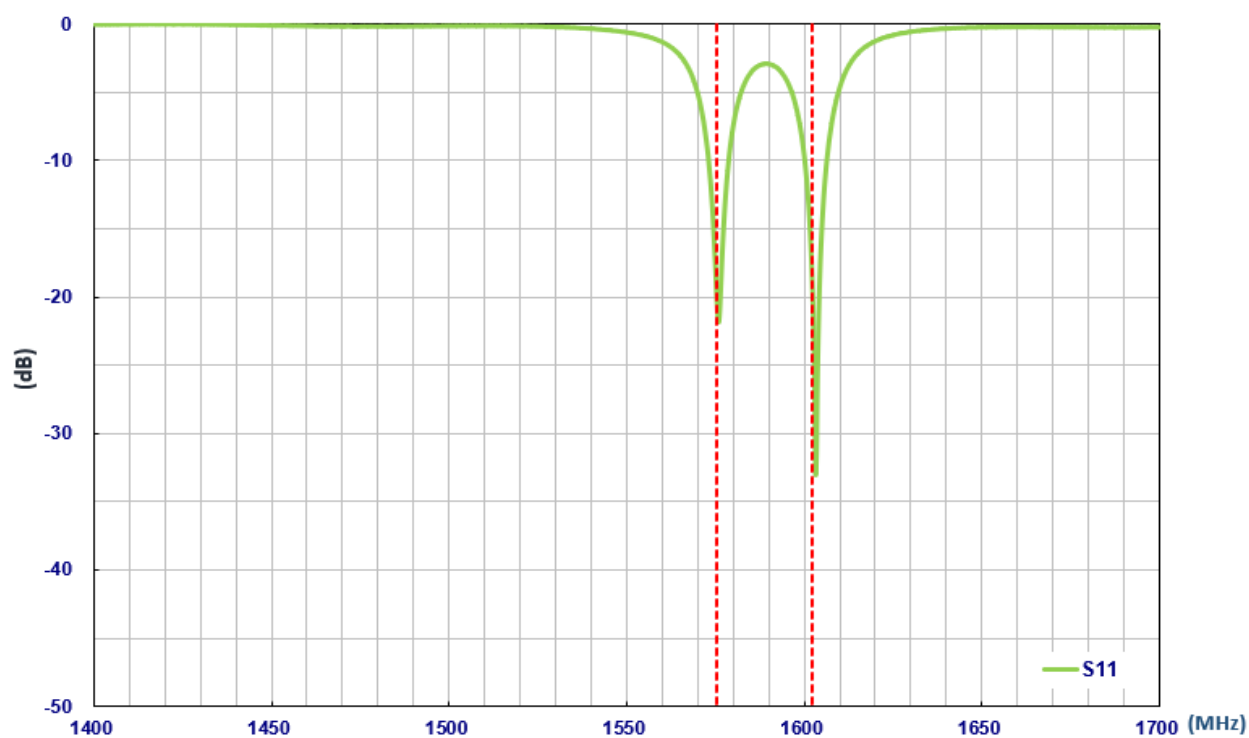
### 3.10 ECC – Wi-Fi MIMO 1 & 2



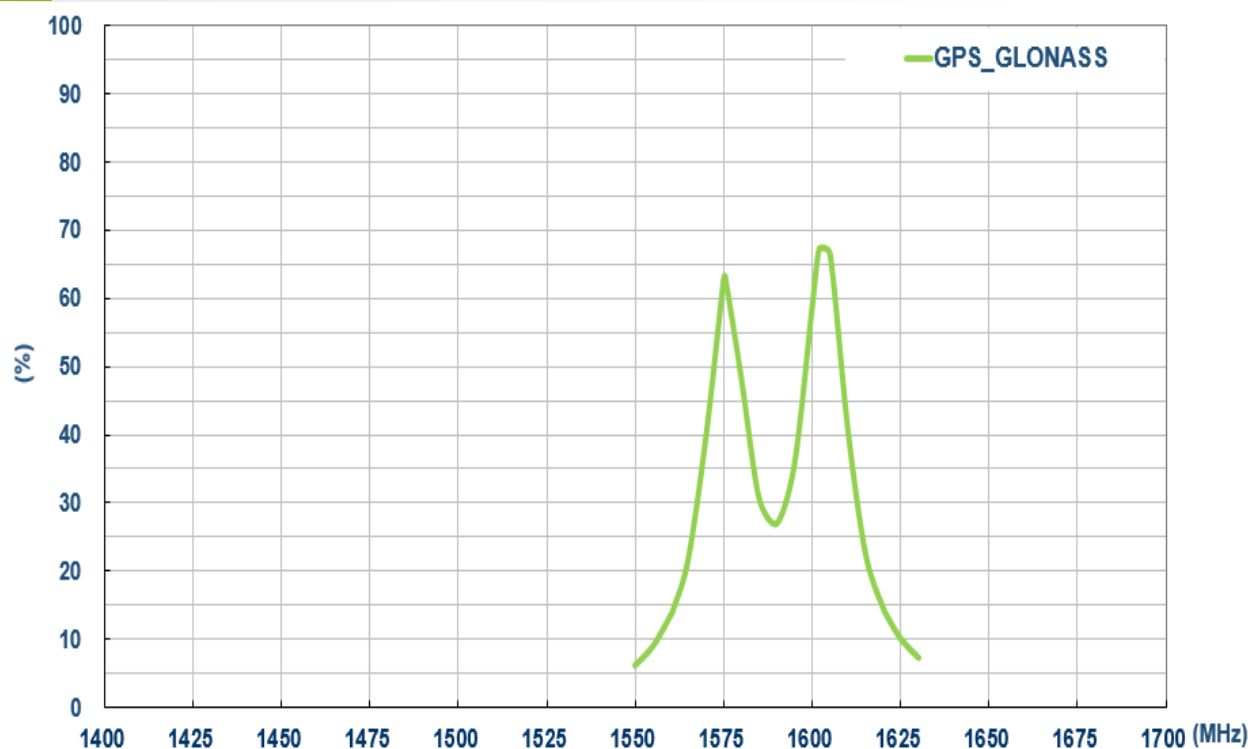
### 3.11 GNSS Antenna – Block Diagram



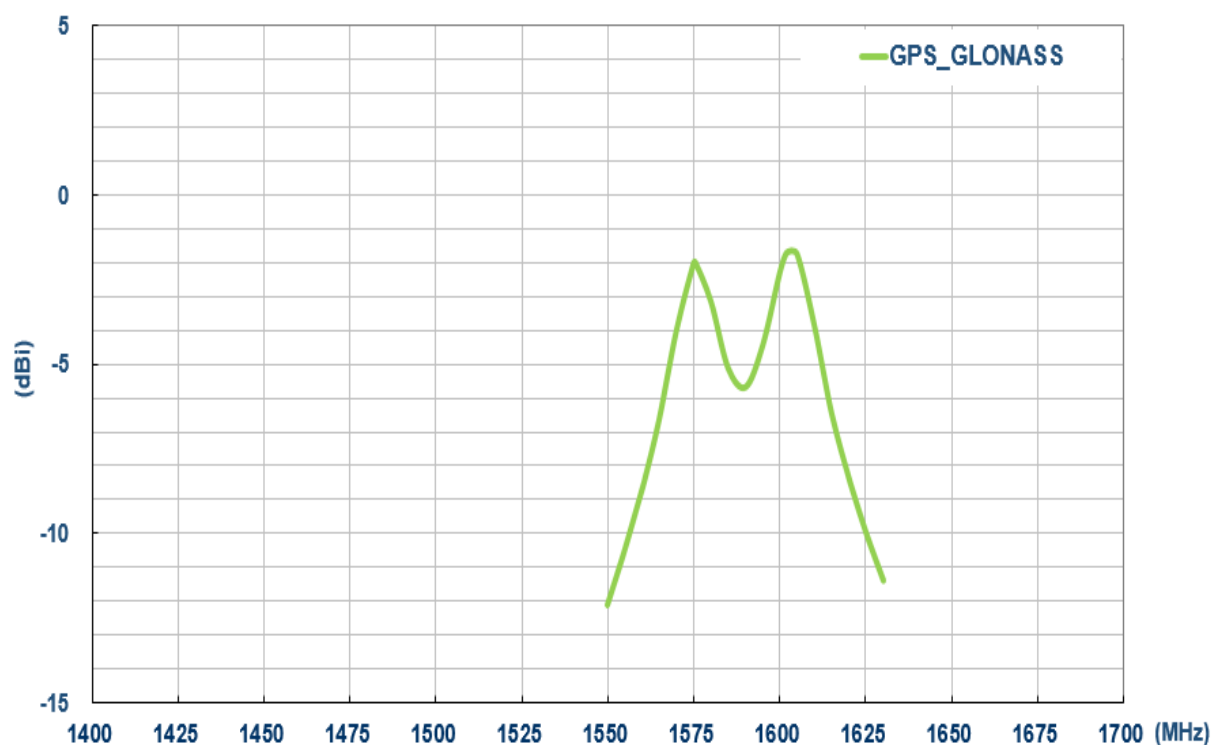
### 3.12 Return Loss – GNSS Antenna



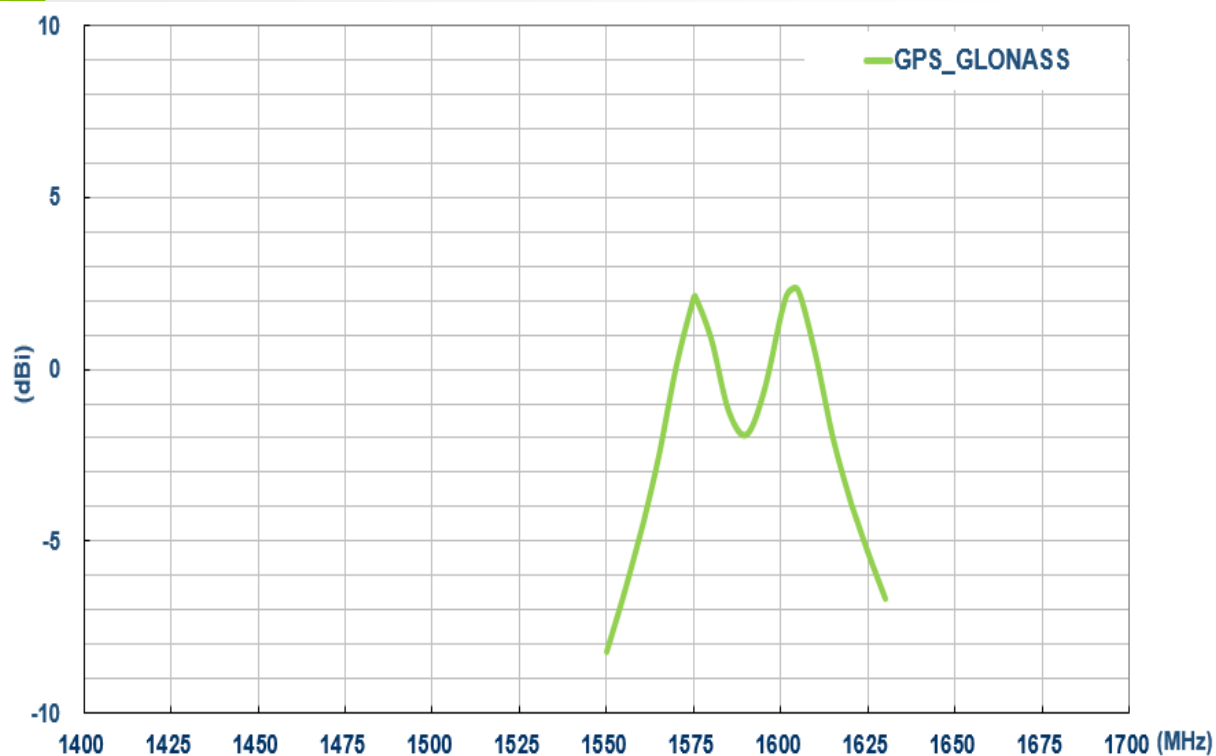
### 3.13 Efficiency – GNSS Antenna



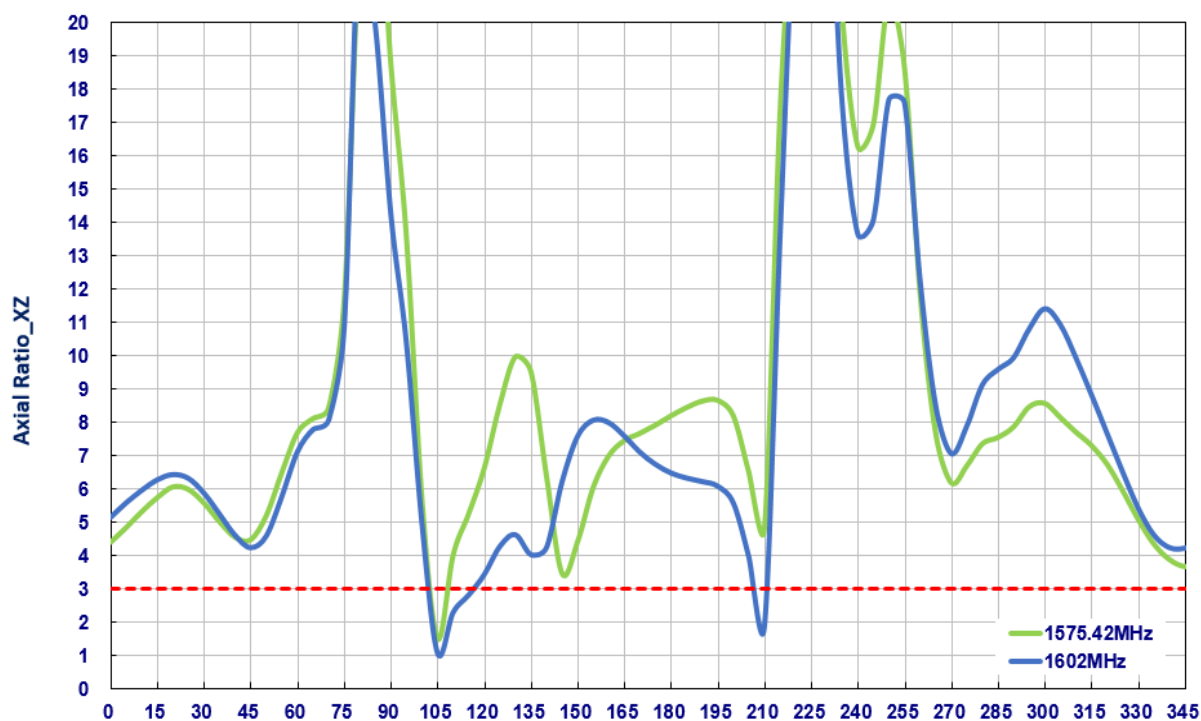
### 3.14 Average Gain – GNSS Antenna



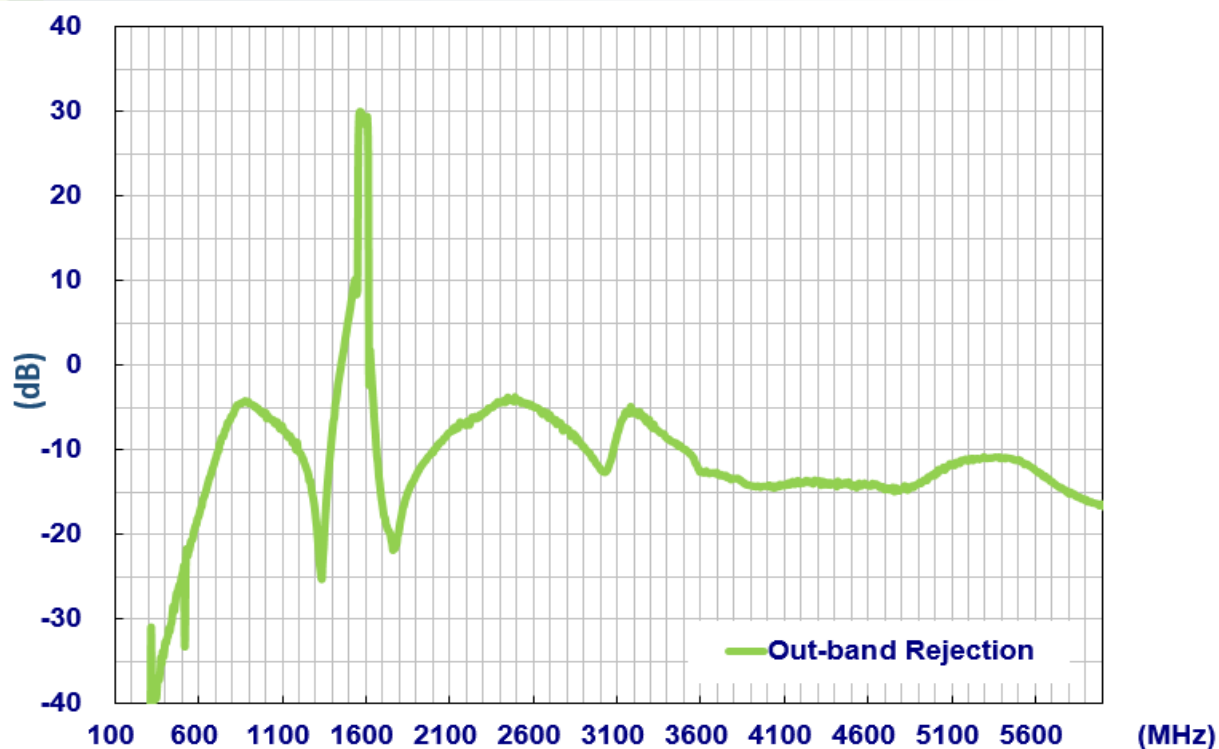
### 3.15 Peak Gain – GNSS Antenna



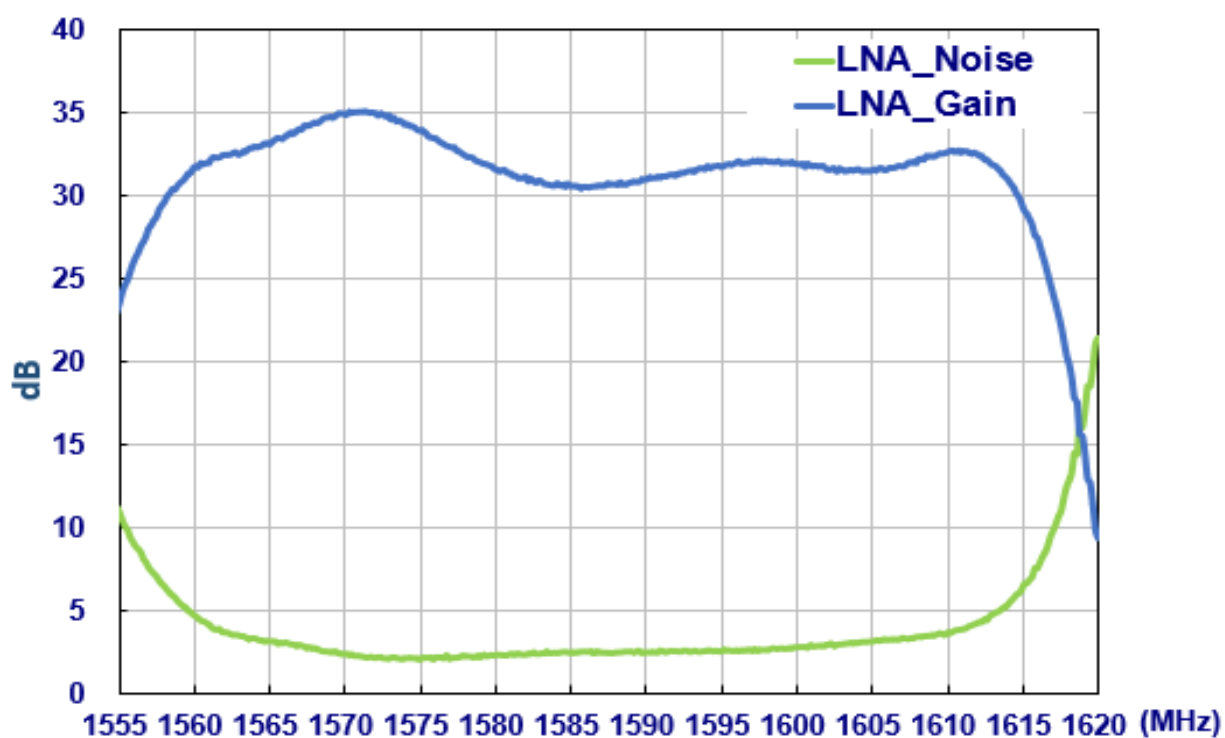
### 3.16 Axial Ratio – GNSS Antenna



### 3.17 Active Measurements LNA Gain @ 3.0V – GNSS Antenna



### 3.18 LNA Gain and Noise Figure @ 3.0V – GNSS Antenna



## 4. 2D Radiation Patterns

### 4.1 Test Setup

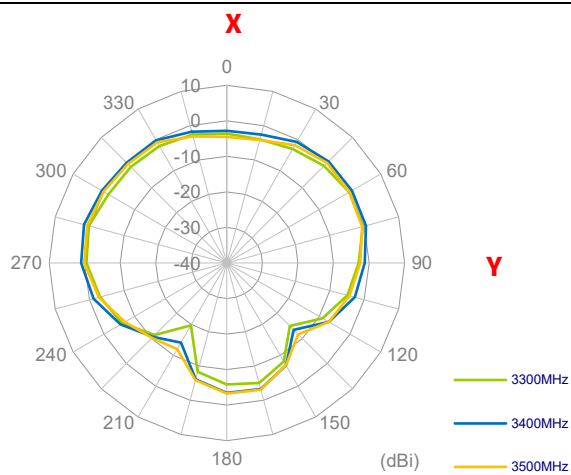
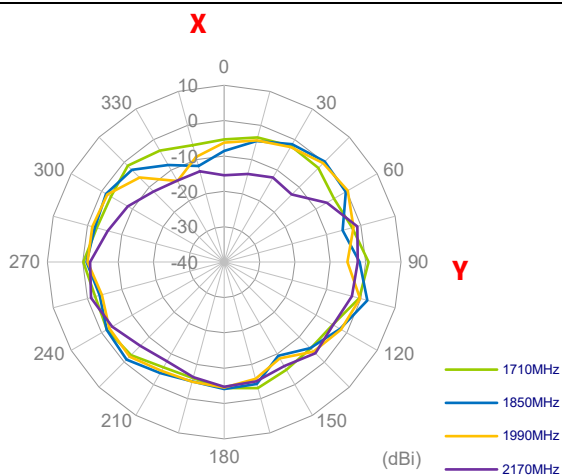
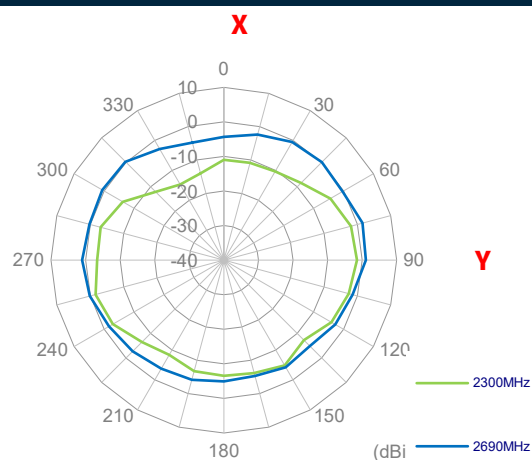
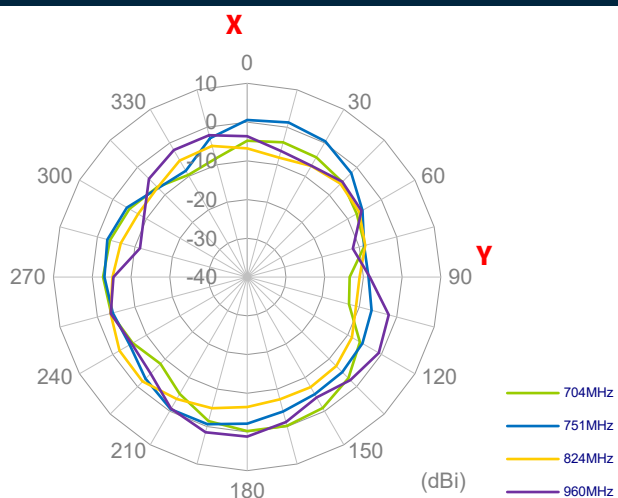


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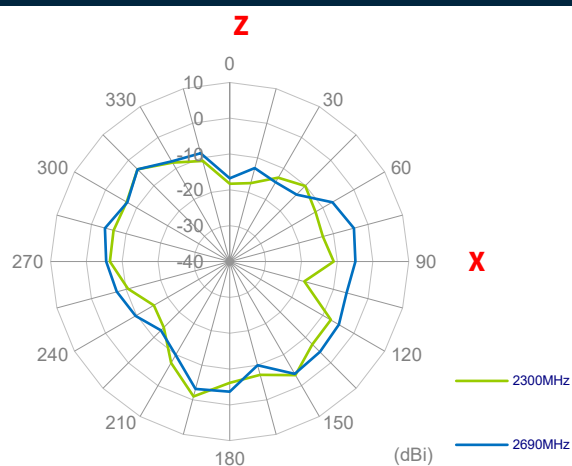
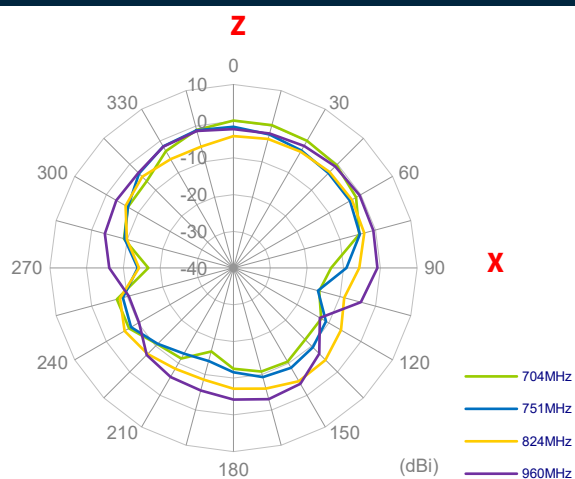


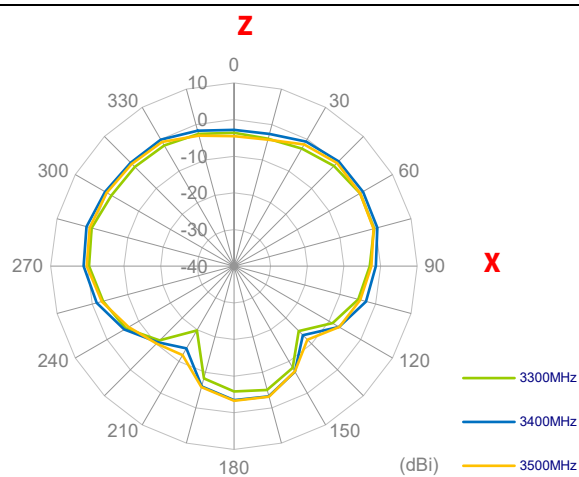
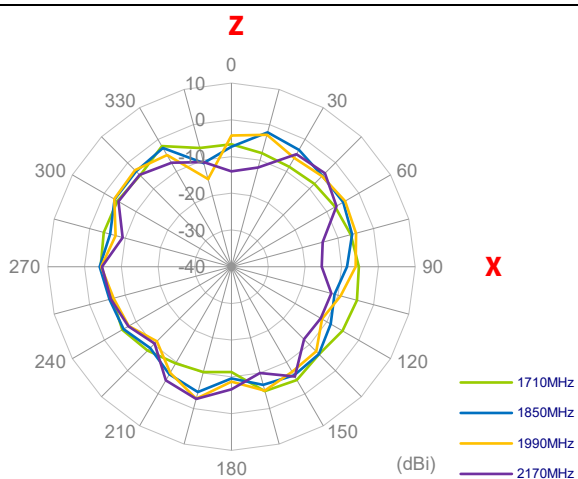
## 4.2 LTE MIMO 1

### XY Plane

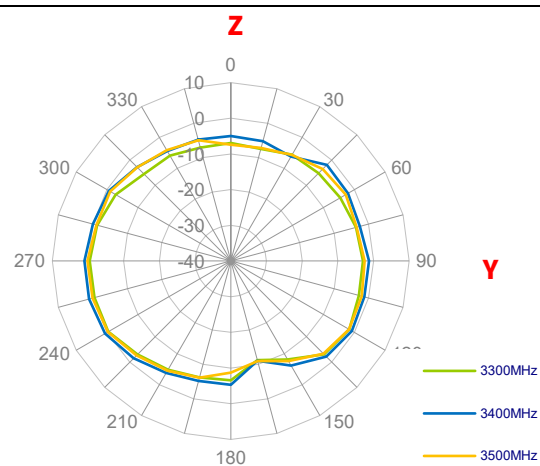
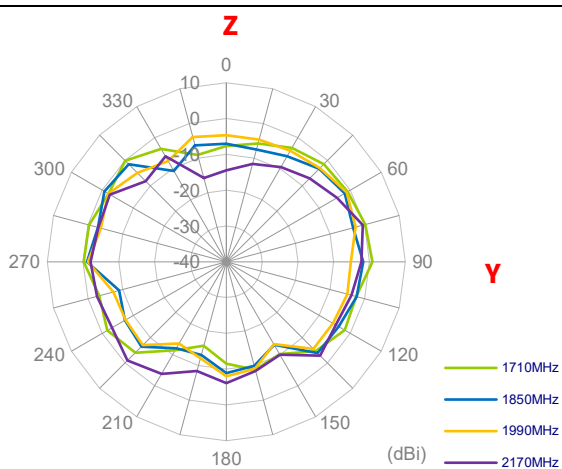
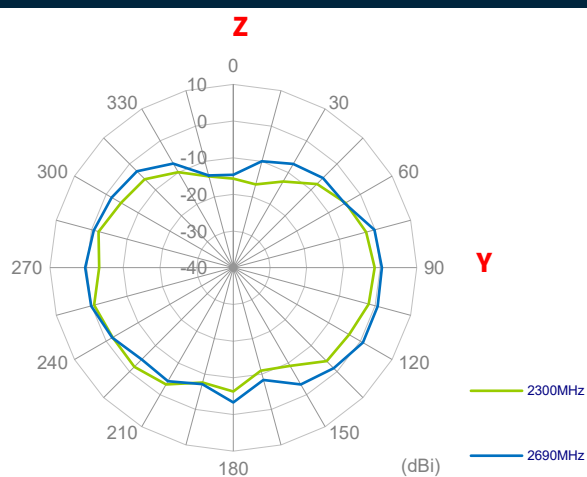
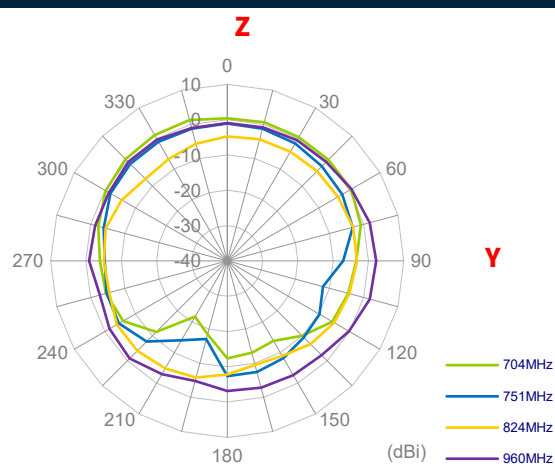


### XZ Plane



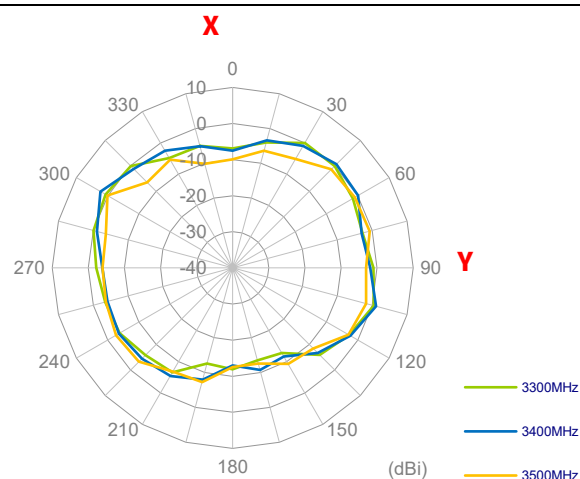
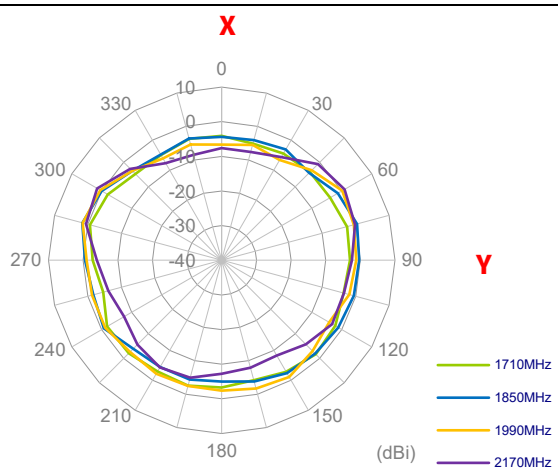
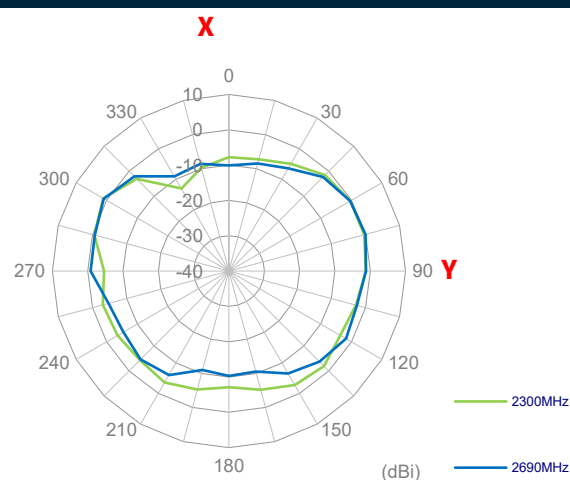
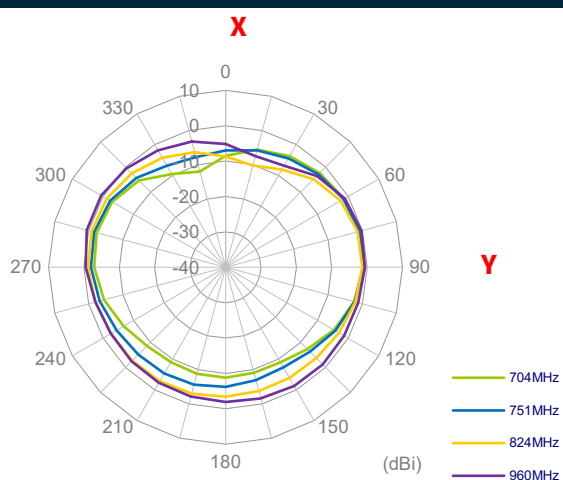


## YZ Plane

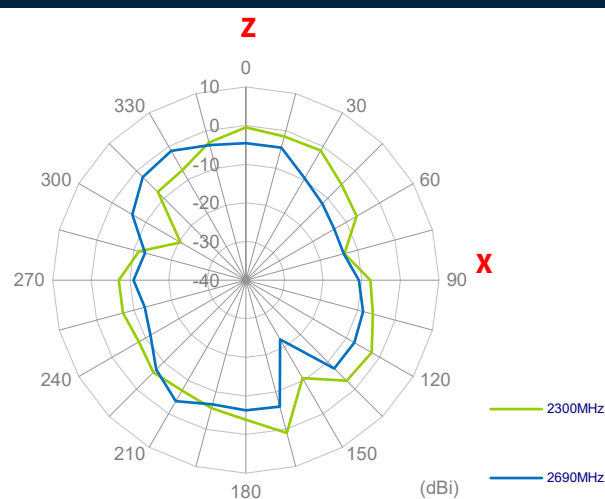
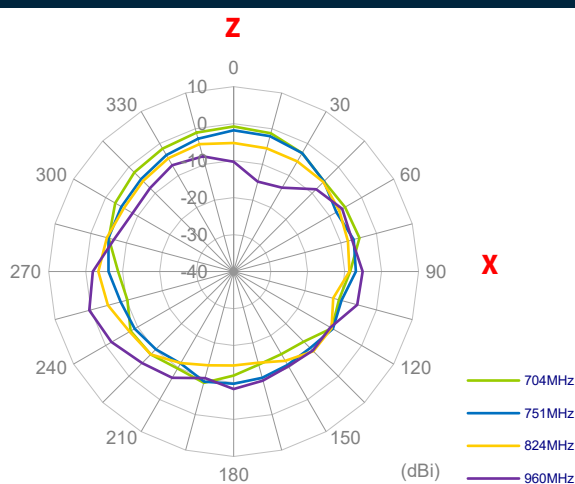


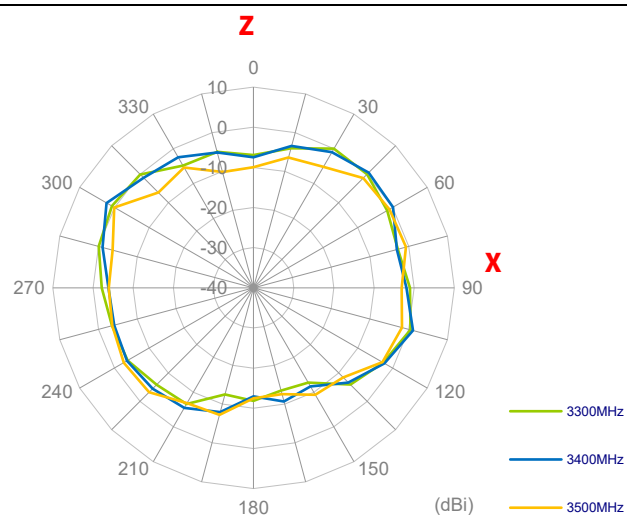
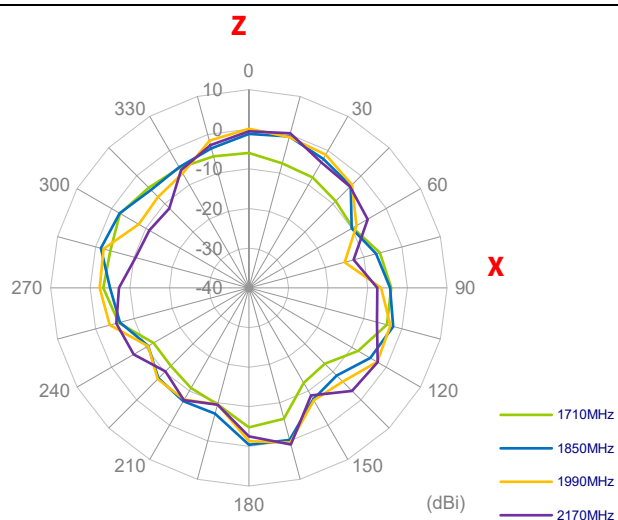
## 4.3 LTE MIMO 2

### XY Plane

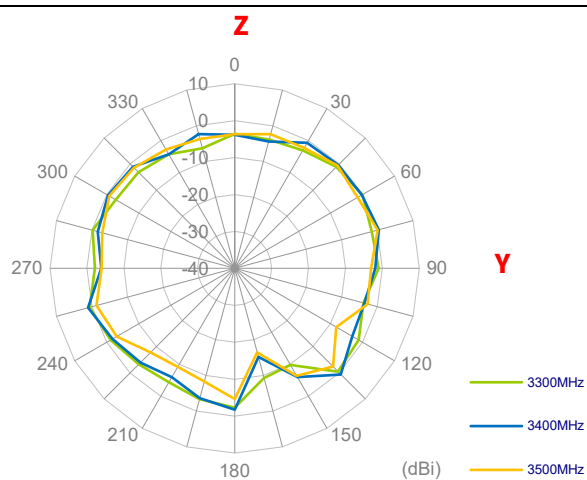
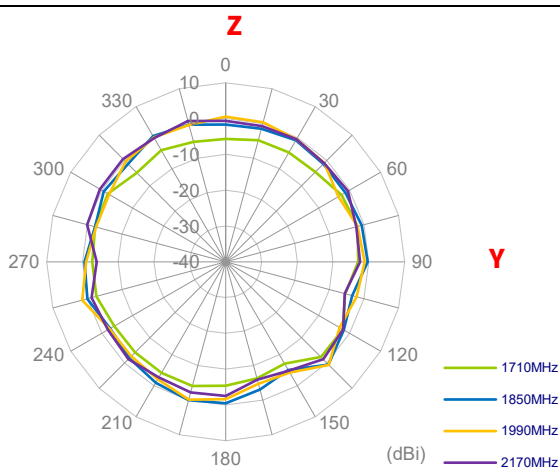
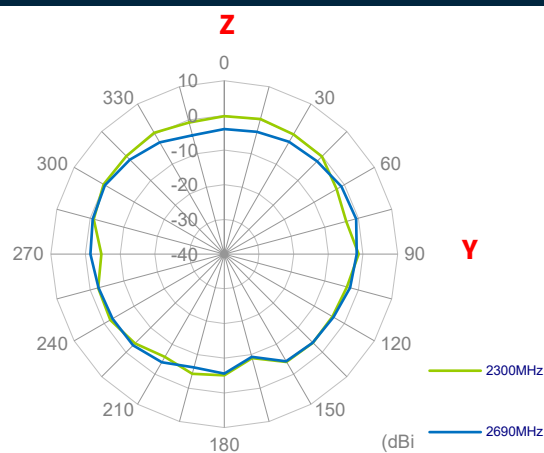
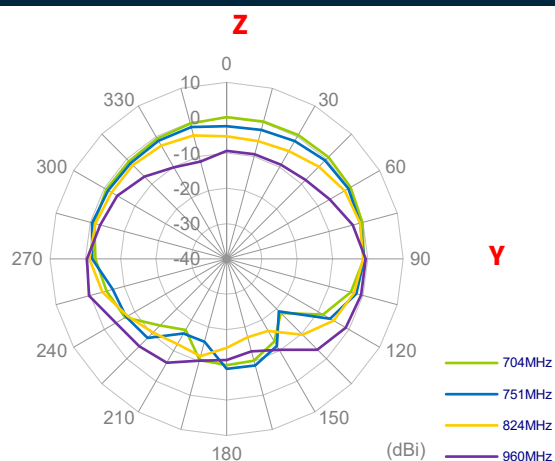


### XZ Plane



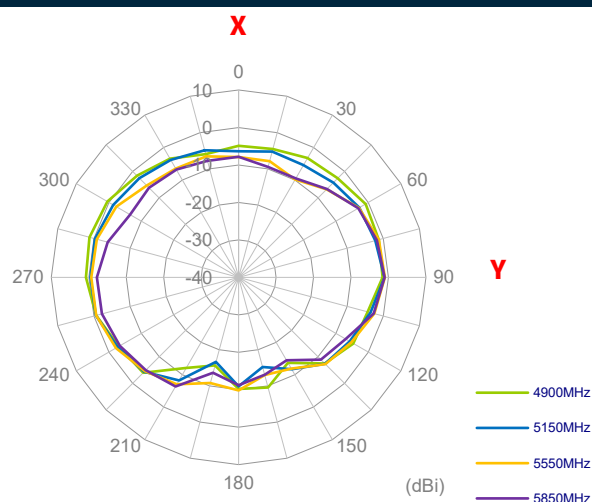
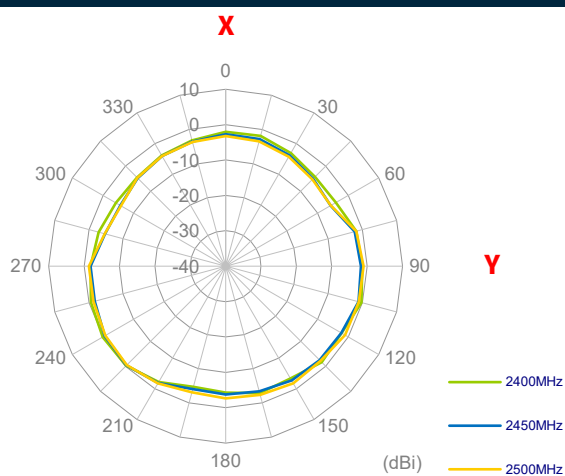


## YZ Plane

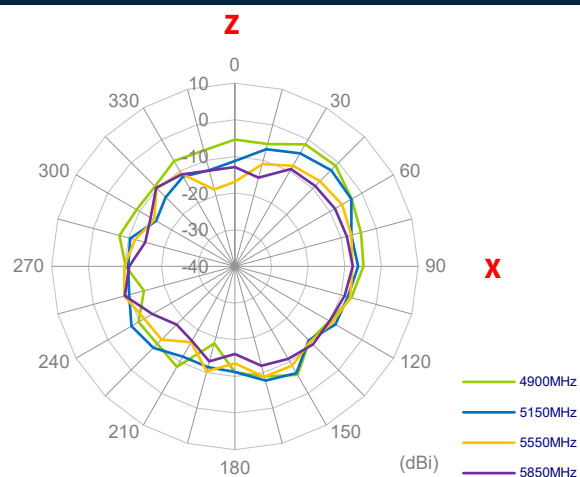
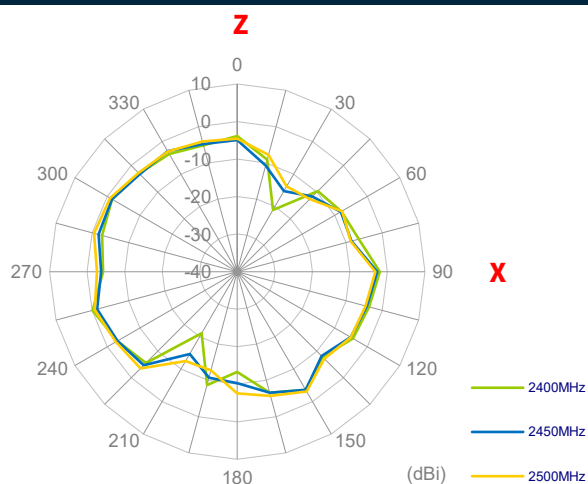


## 4.4 Wi-Fi MIMO 1

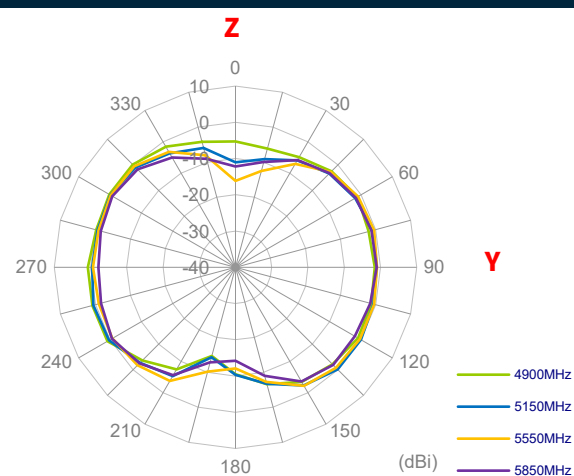
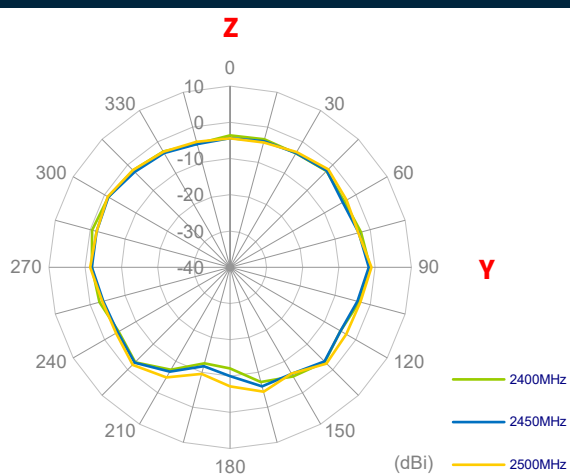
### XY Plane



### XZ Plane

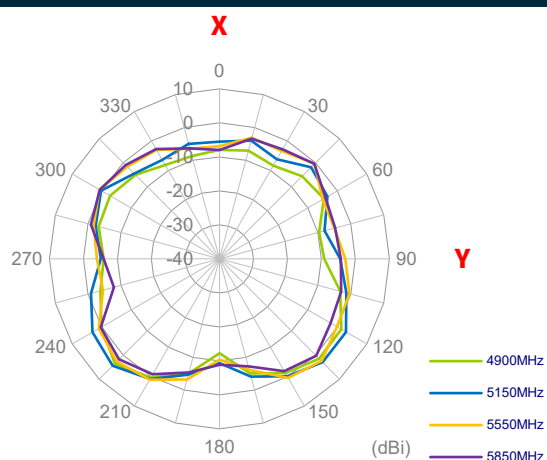
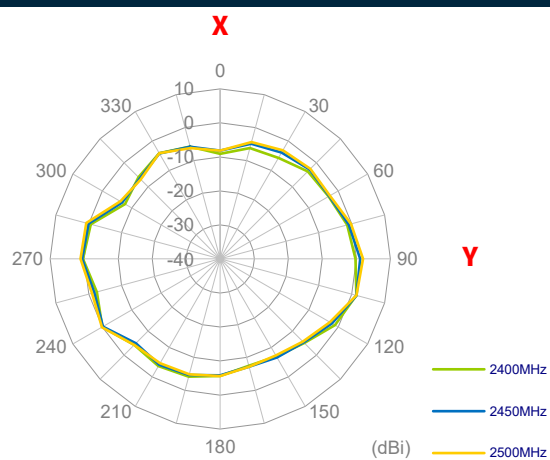


### YZ Plane

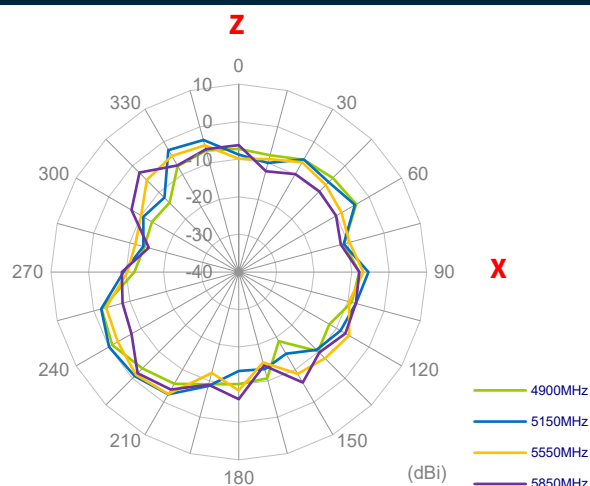
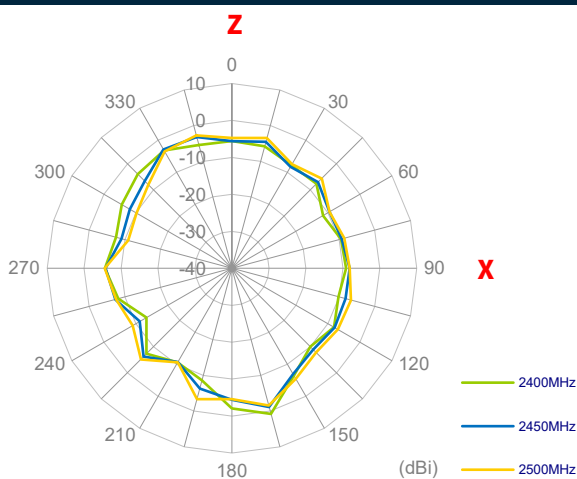


## 4.5 Wi-Fi MIMO 2

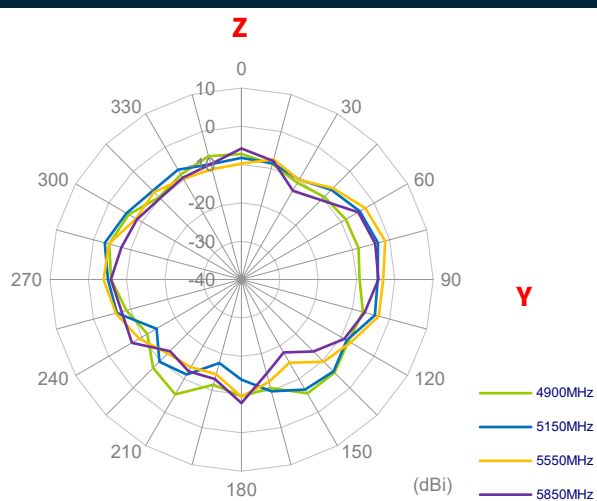
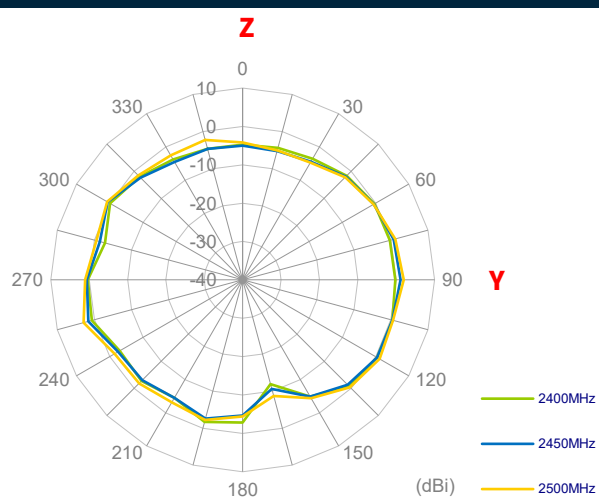
### XY Plane



### XZ Plane

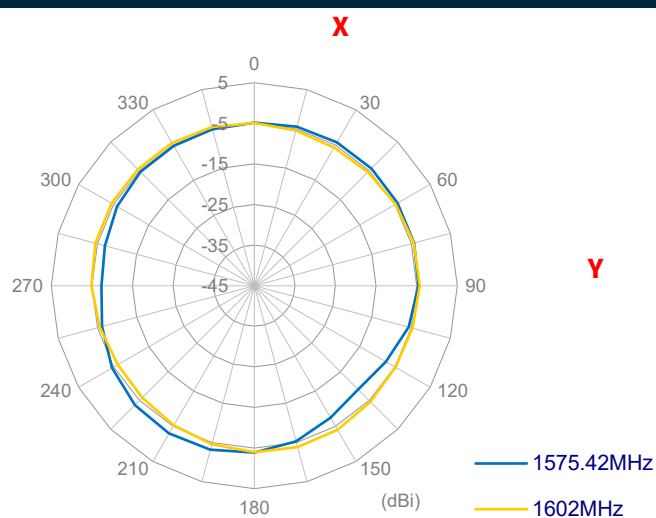


### YZ Plane

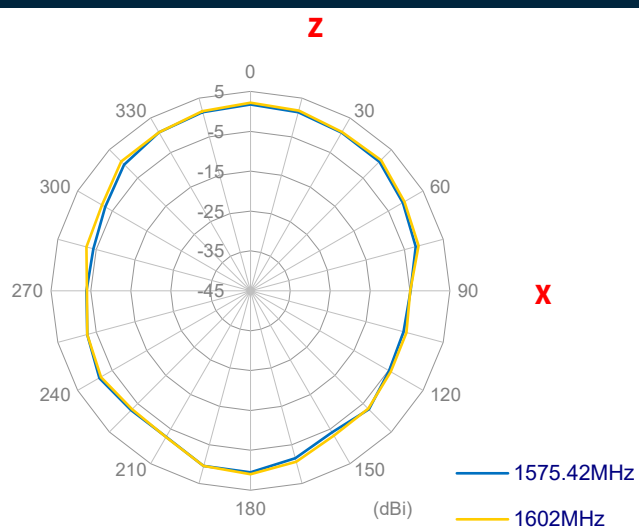


## 4.5 GNSS

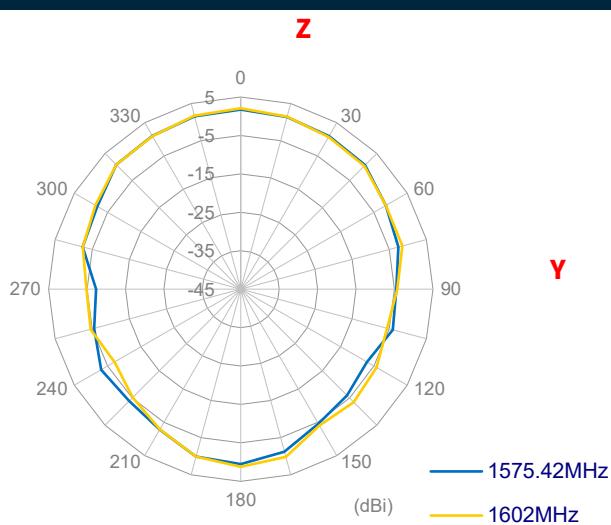
### XY Plane



### XZ Plane



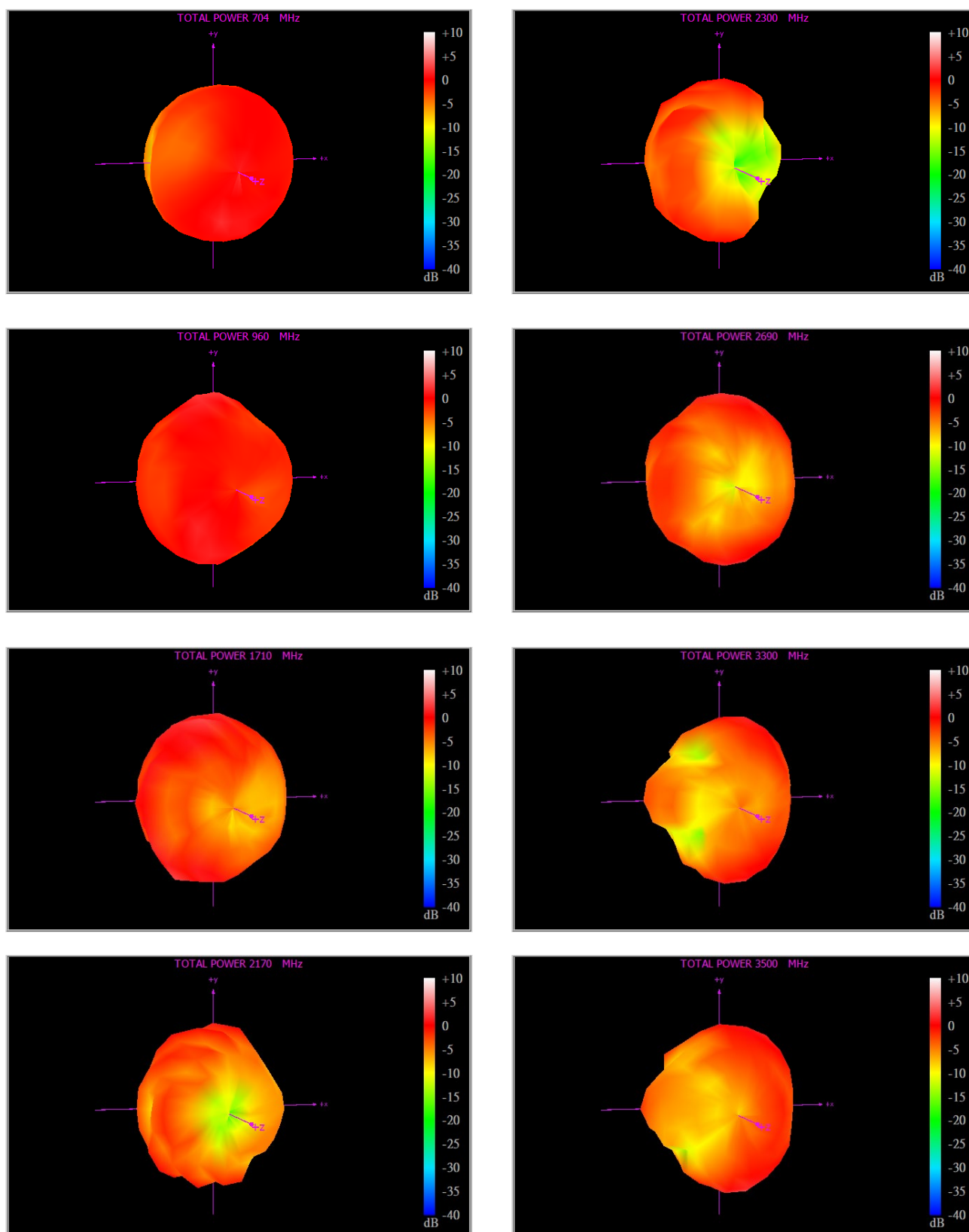
### YZ Plane





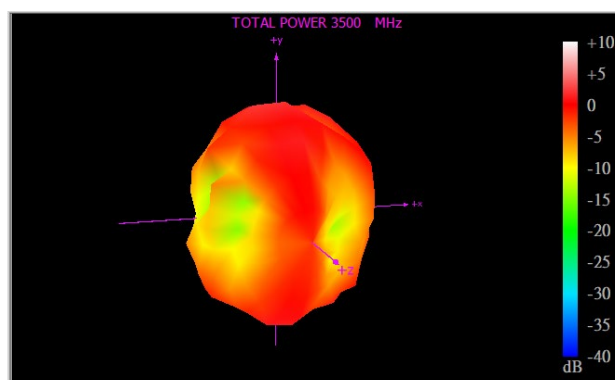
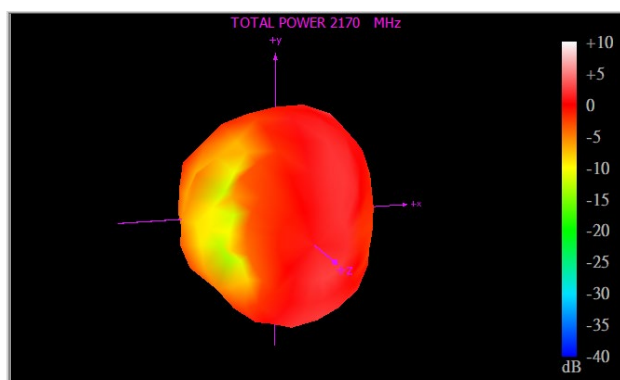
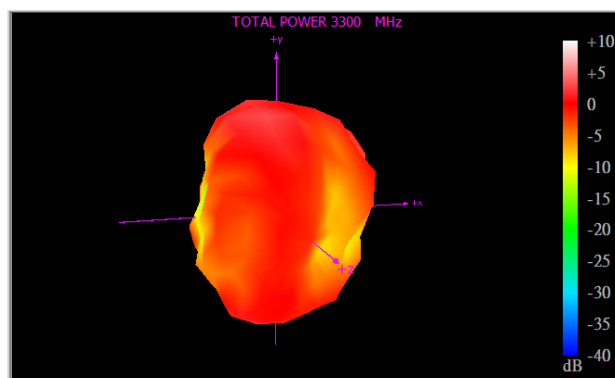
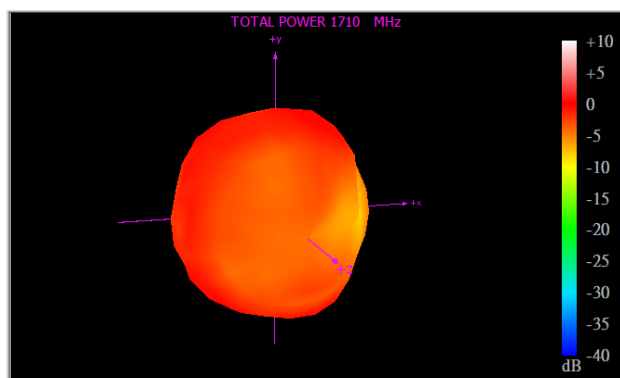
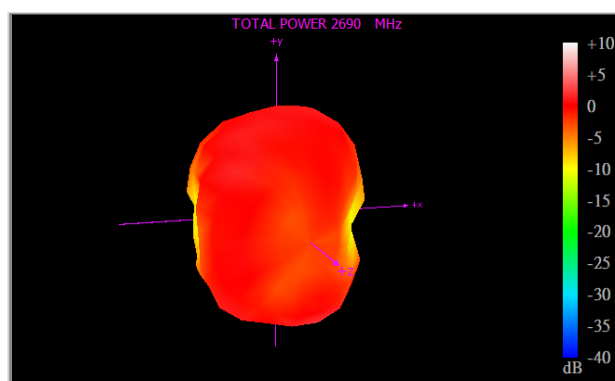
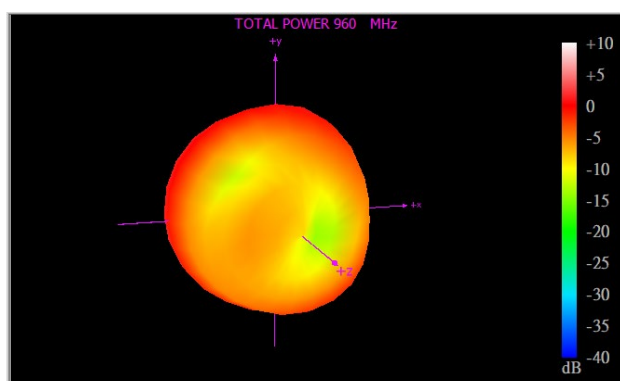
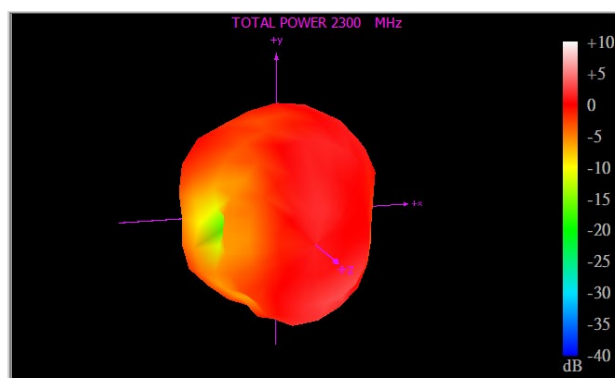
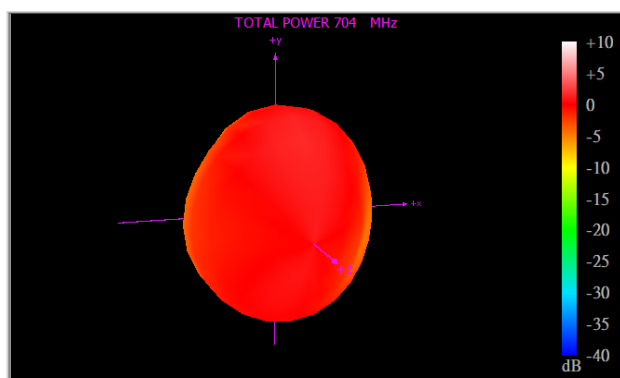
## 5. 3D Radiation Patterns

### 5.1 LTE MIMO 1

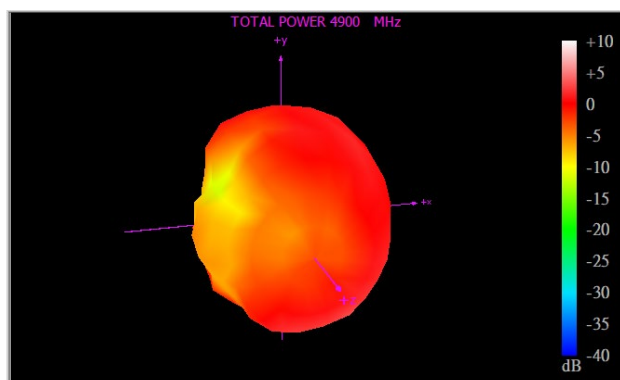
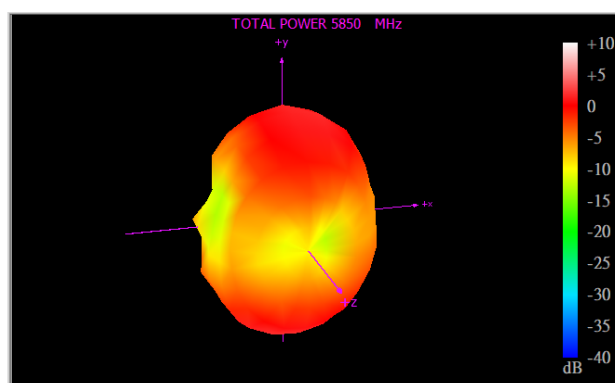
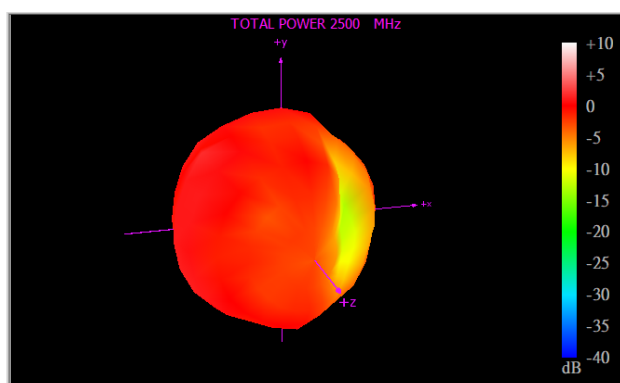
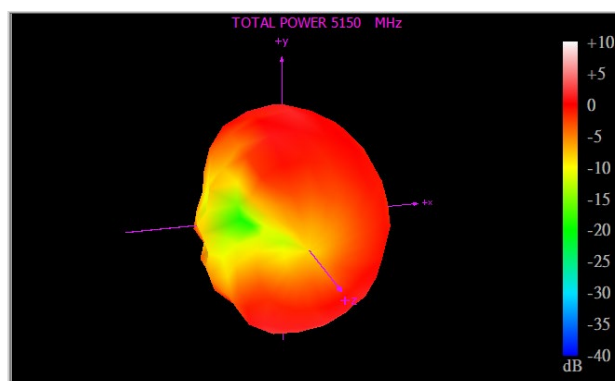
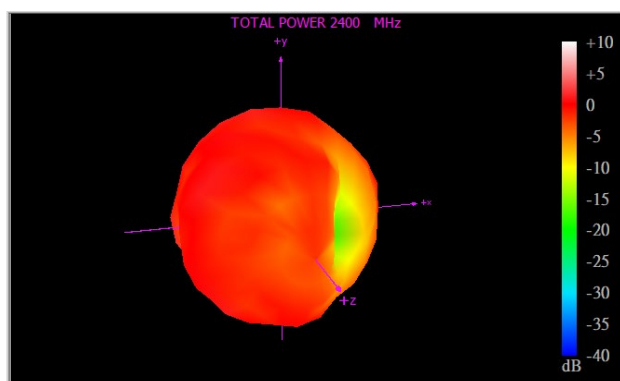




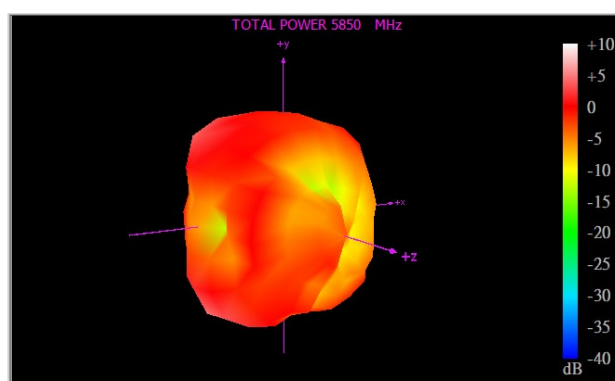
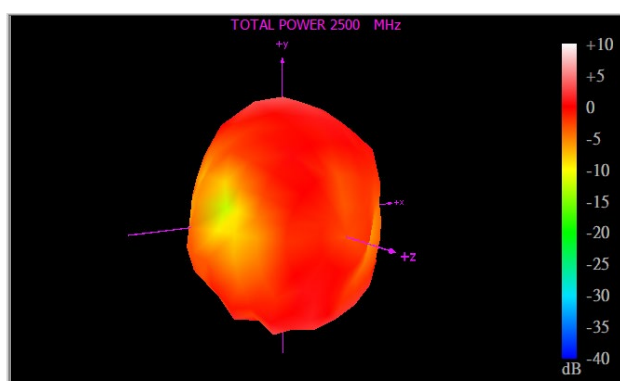
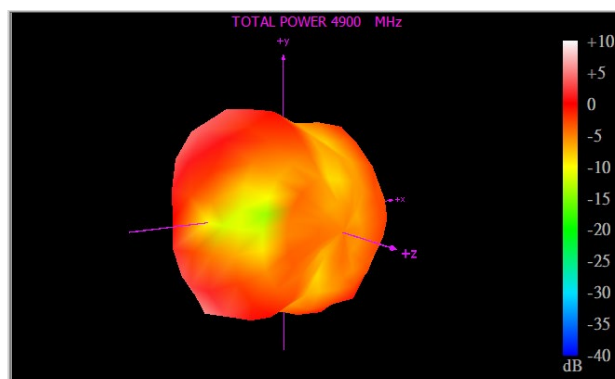
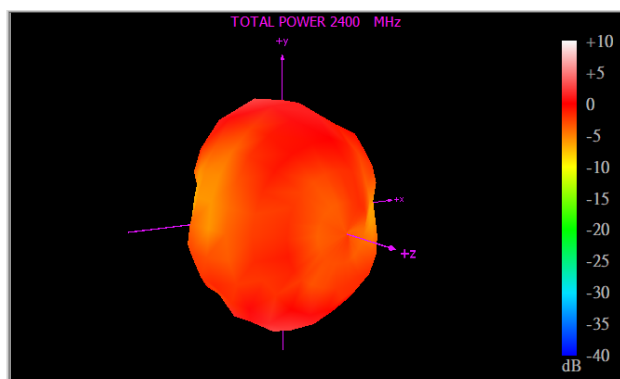
## 5.2 LTE MIMO 2



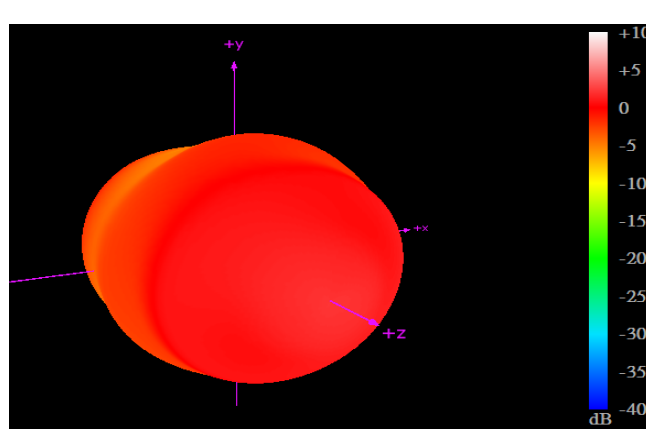
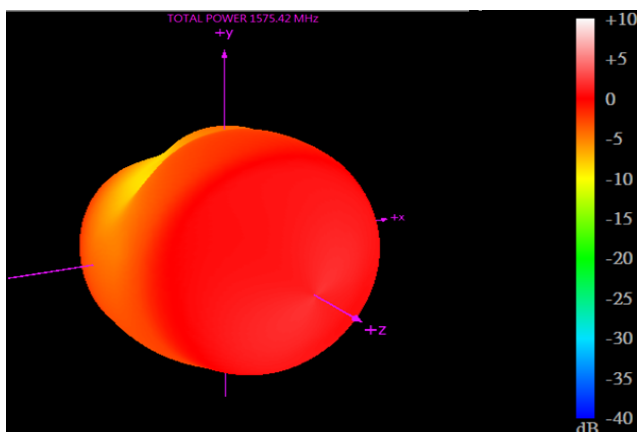
## 5.3 Wi-Fi MIMO 1



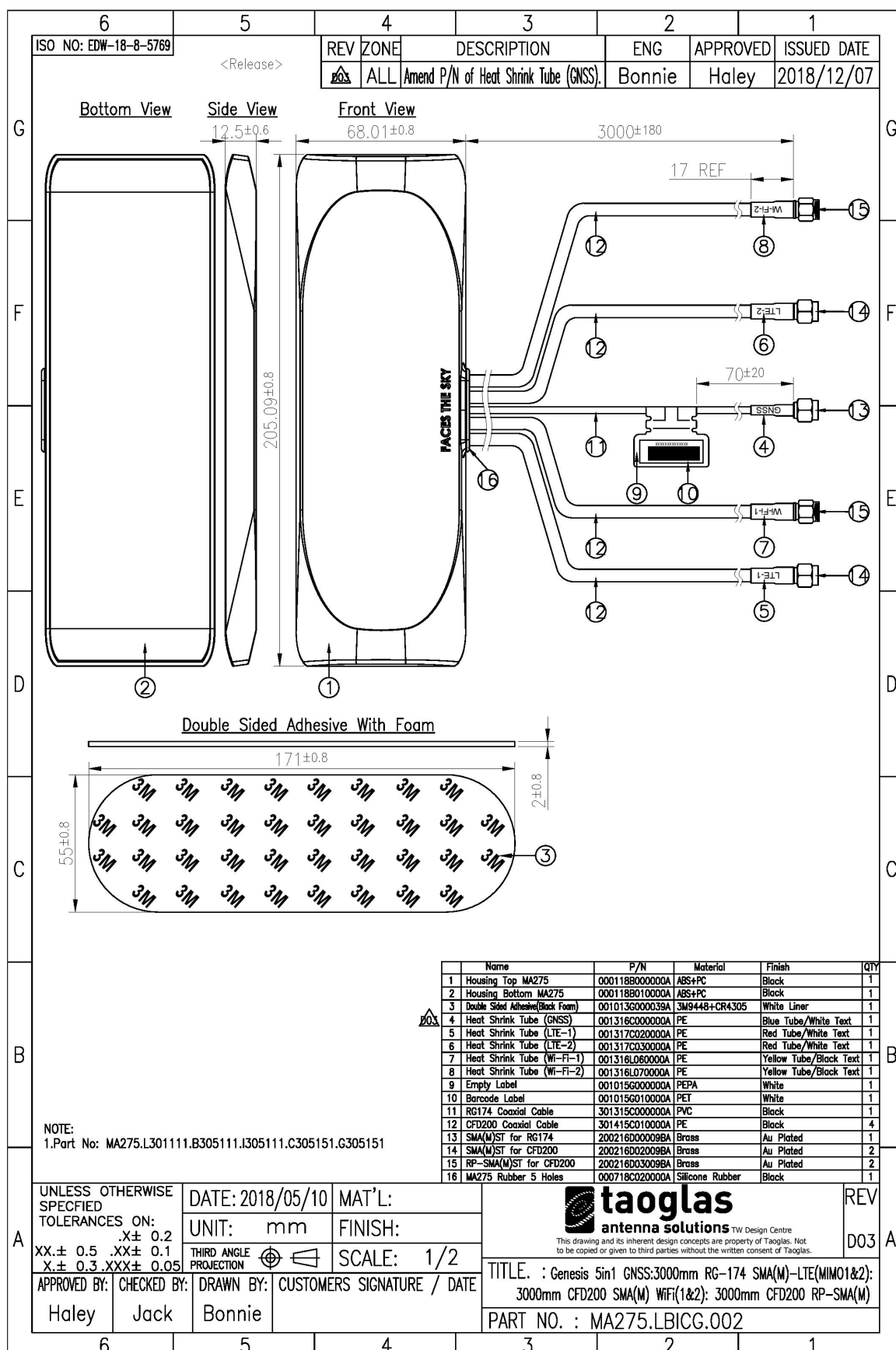
## 5.4 Wi-Fi MIMO 2



## 5.5 GNSS

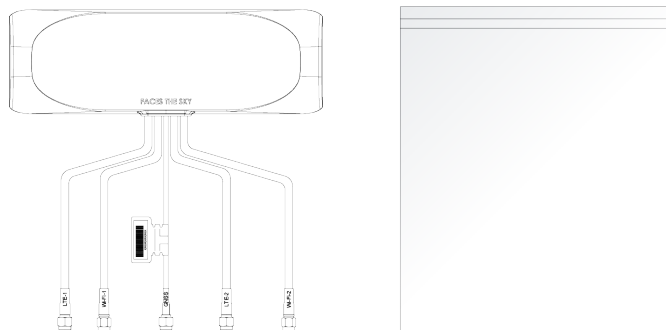


## 6. Mechanical Drawing (Units: mm)

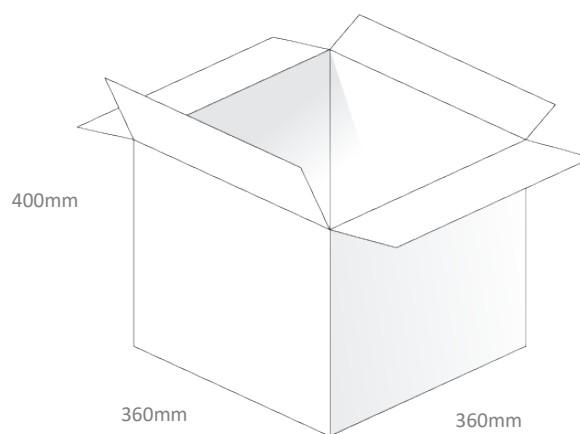


## 7. Packaging

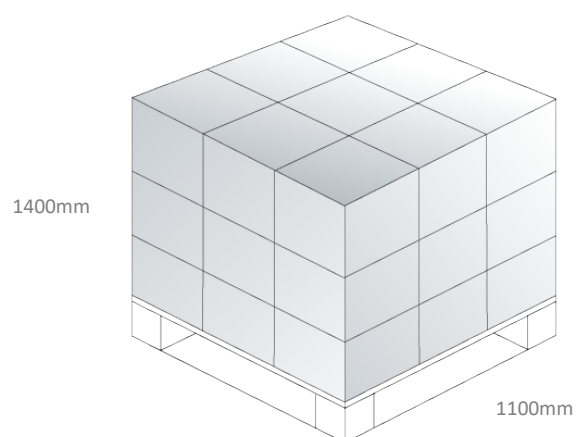
1pc MA275.LBICG.002 per PE Bag  
Dimensions - 360\*300mm  
Weight - 550g



20pcs MA275.LBICG.002 per Carton  
Dimensions - 360\*360\*400mm  
Weight – 11.86Kg

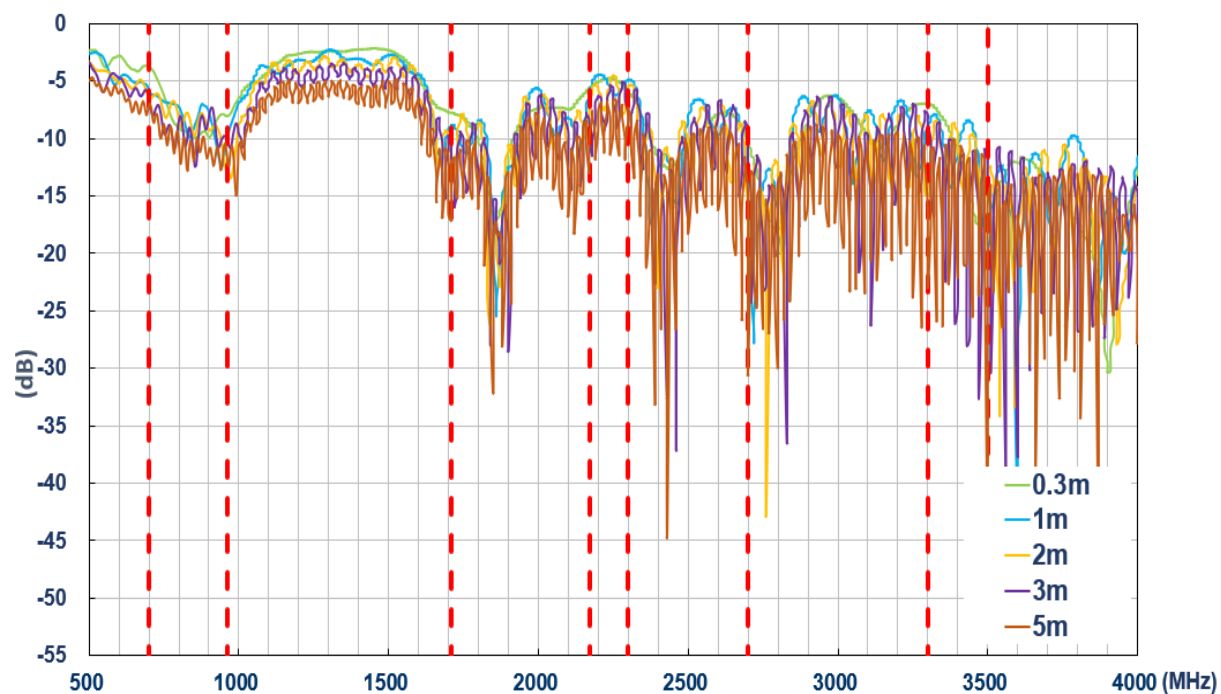


Pallet Dimensions:  
1100\*1100\*1400mm  
27 Cartons Per Pallet  
9 Cartons Per Layer, 4 Layers

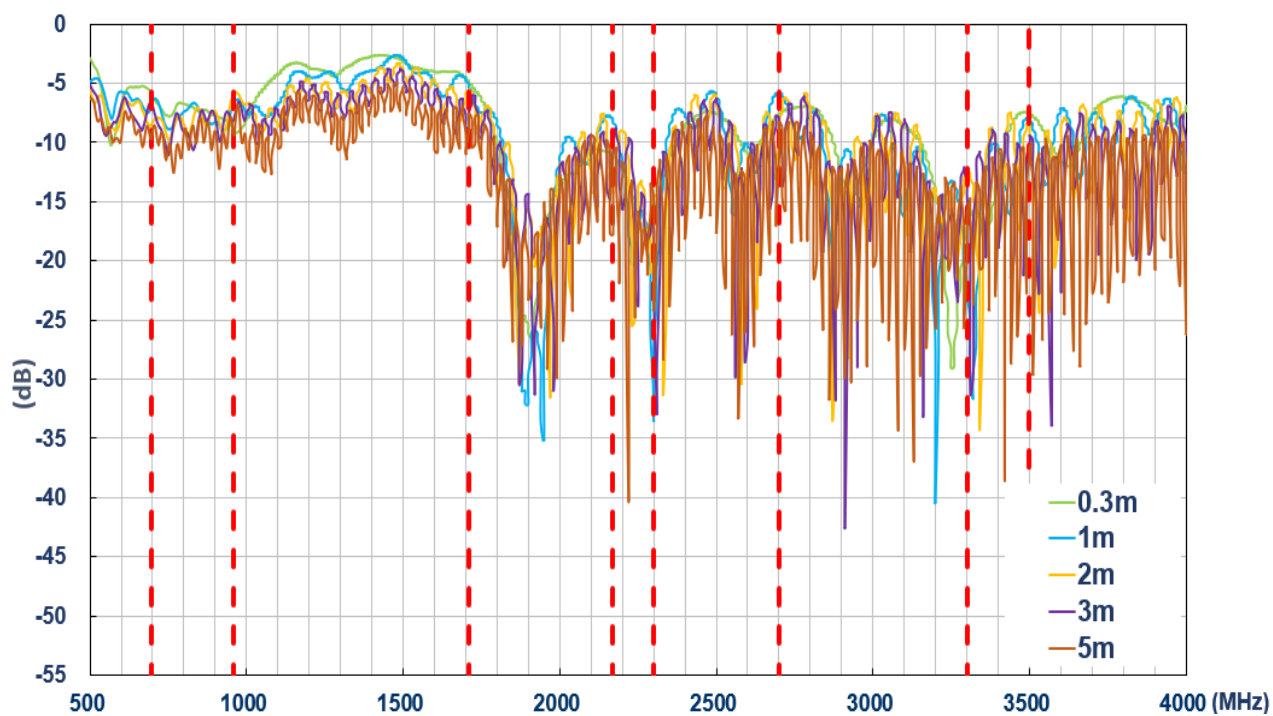


## 8. Application Note

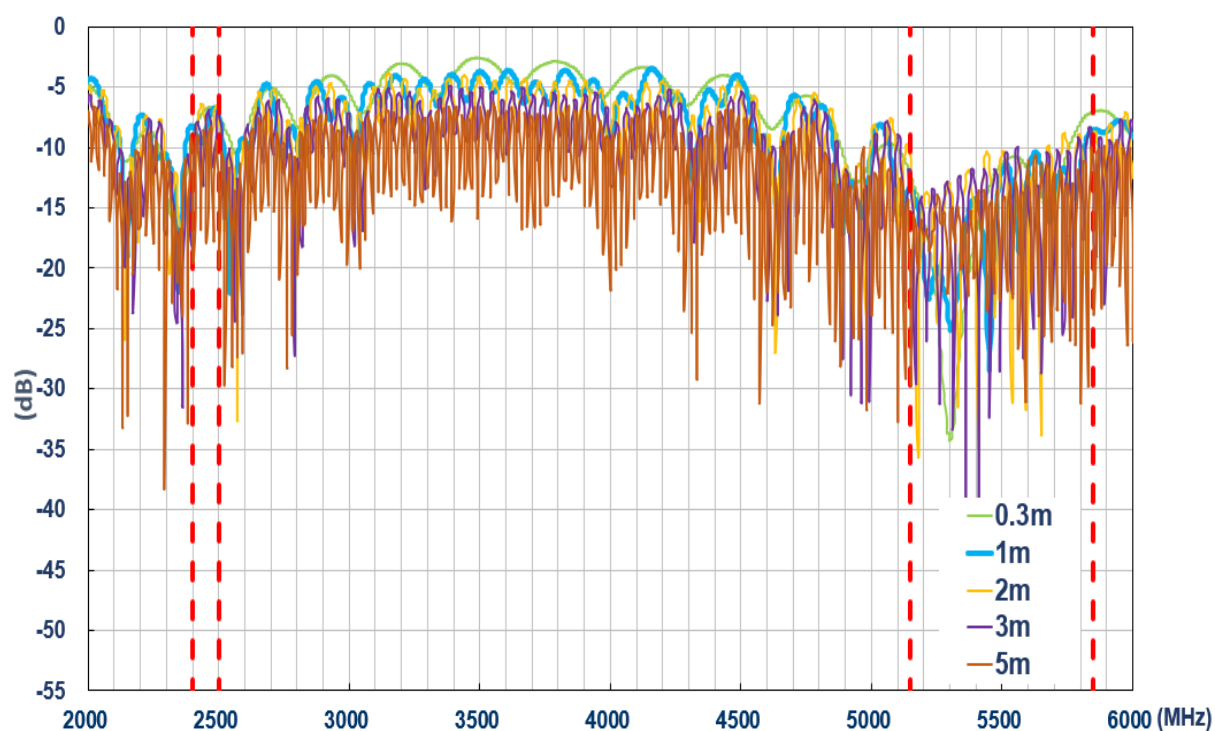
### 8.1 Return Loss – LTE MIMO 1



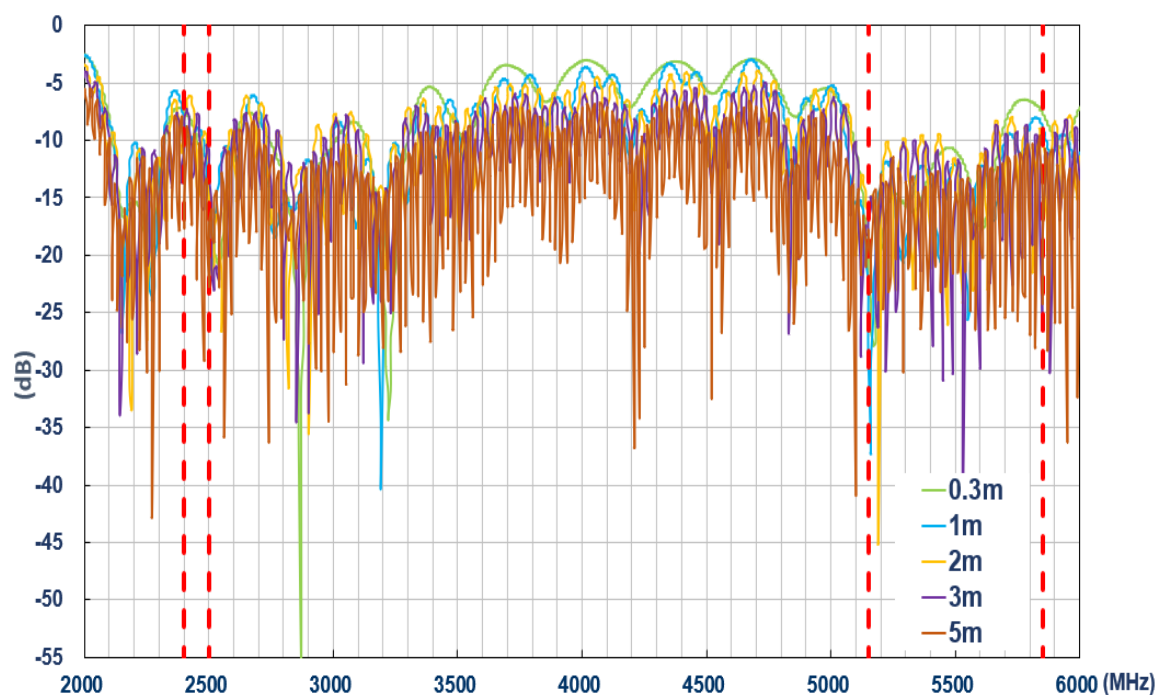
### 8.2 Return Loss – LTE MIMO 2



### 8.3 Return Loss – Wi-Fi MIMO 1

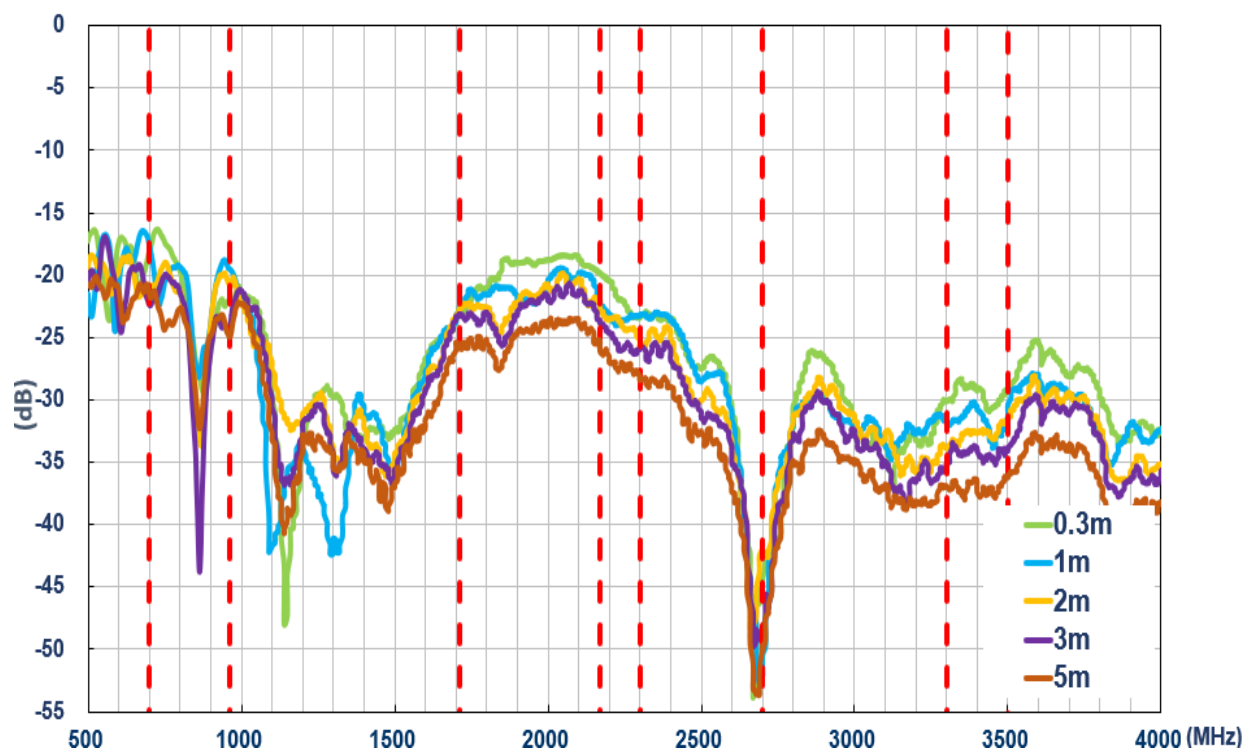


### 8.4 Return Loss – Wi-Fi MIMO 2

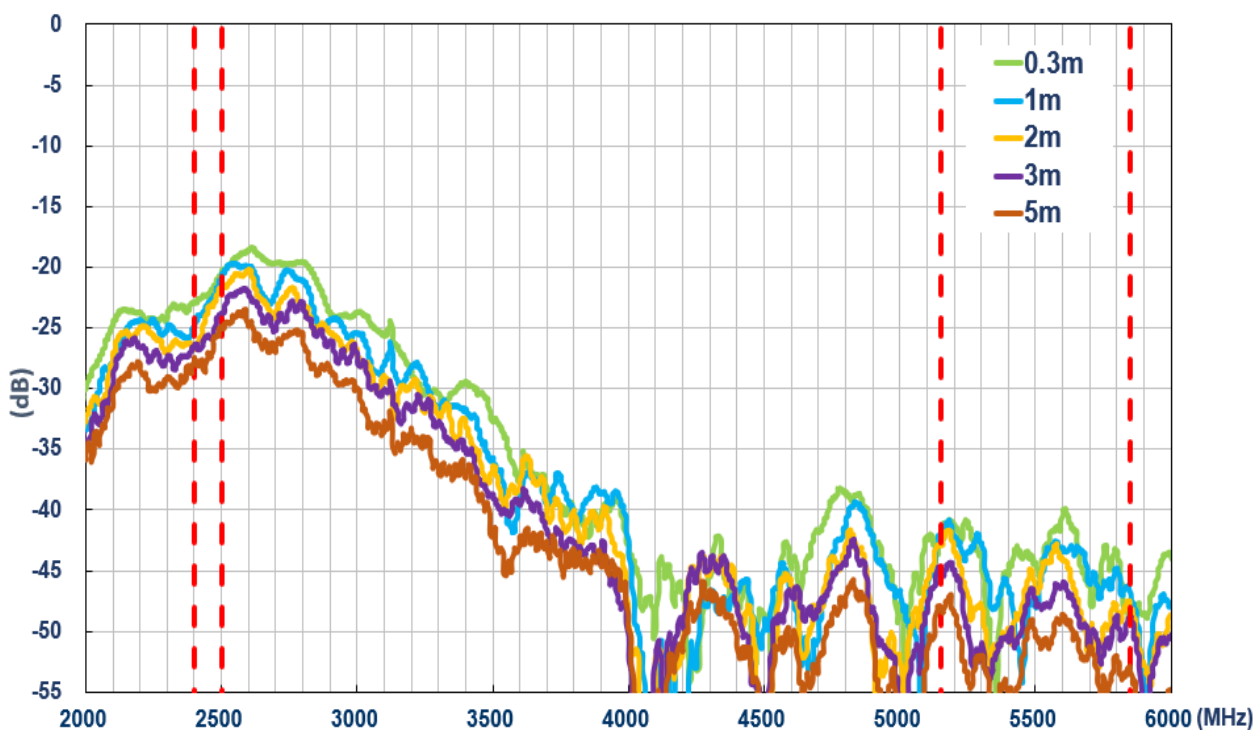




## 8.5 Isolation – LTE MIMO



## 8.6 Isolation – Wi-Fi MIMO

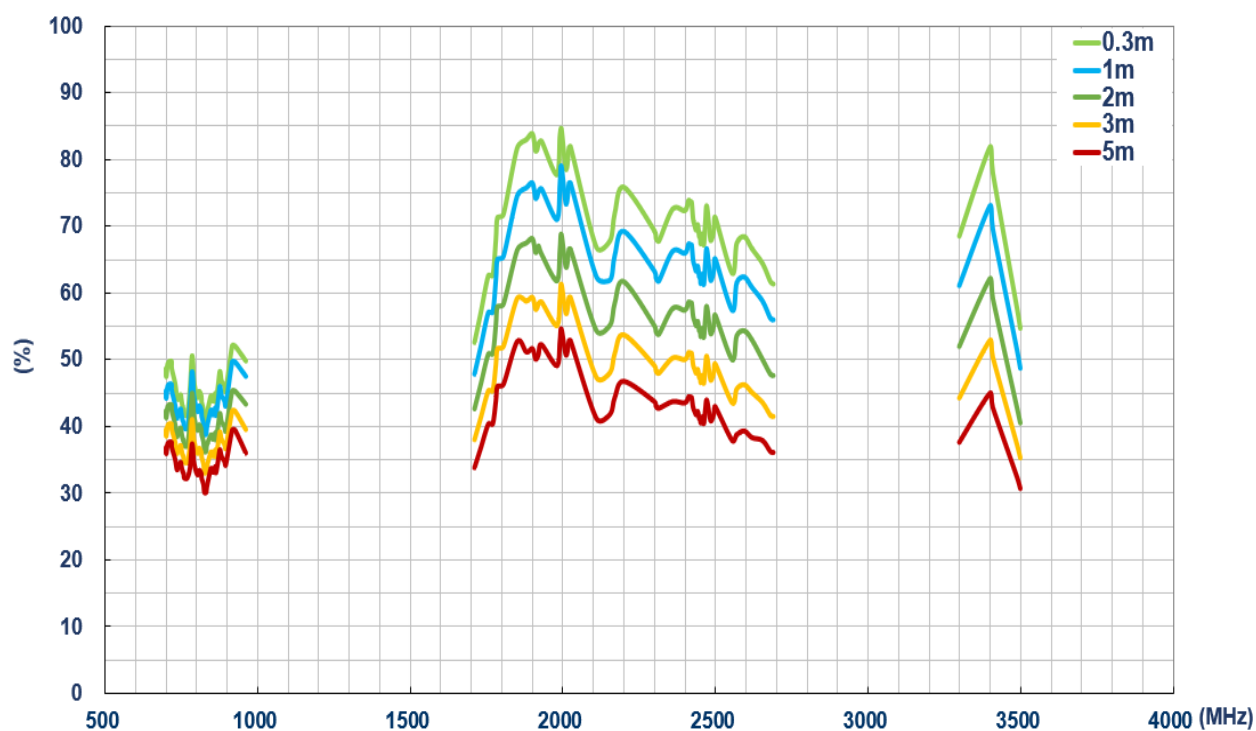




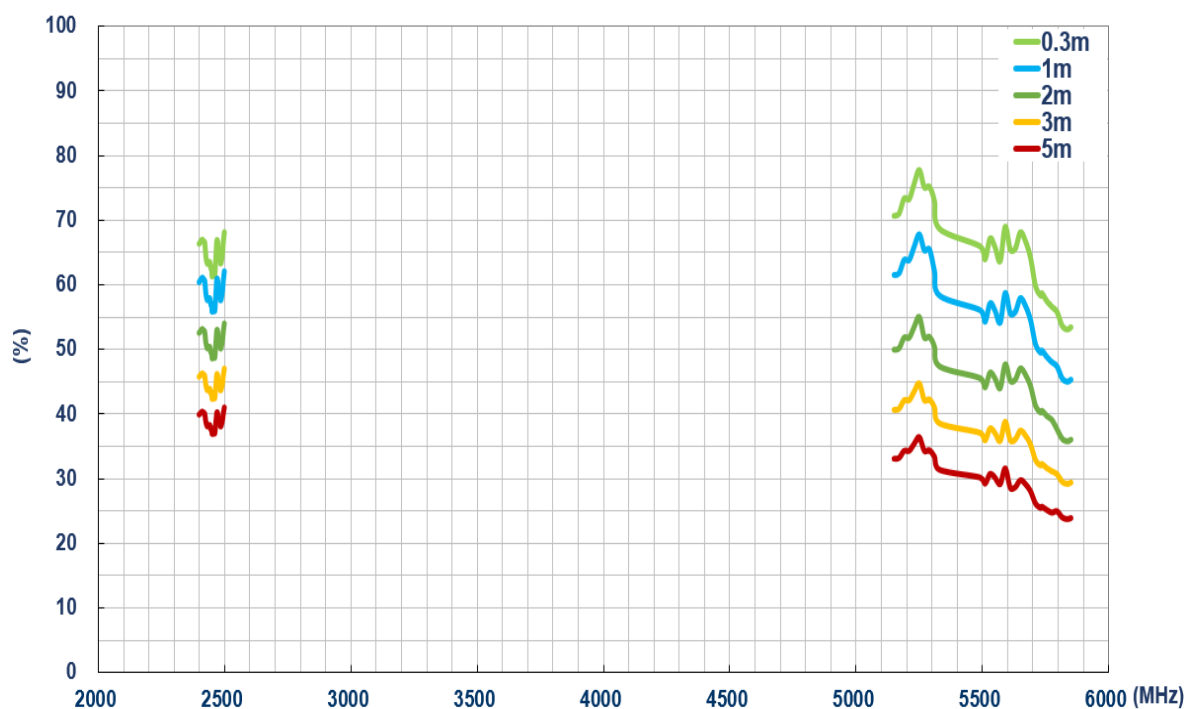
## 8.7 Efficiency – LTE MIMO 1



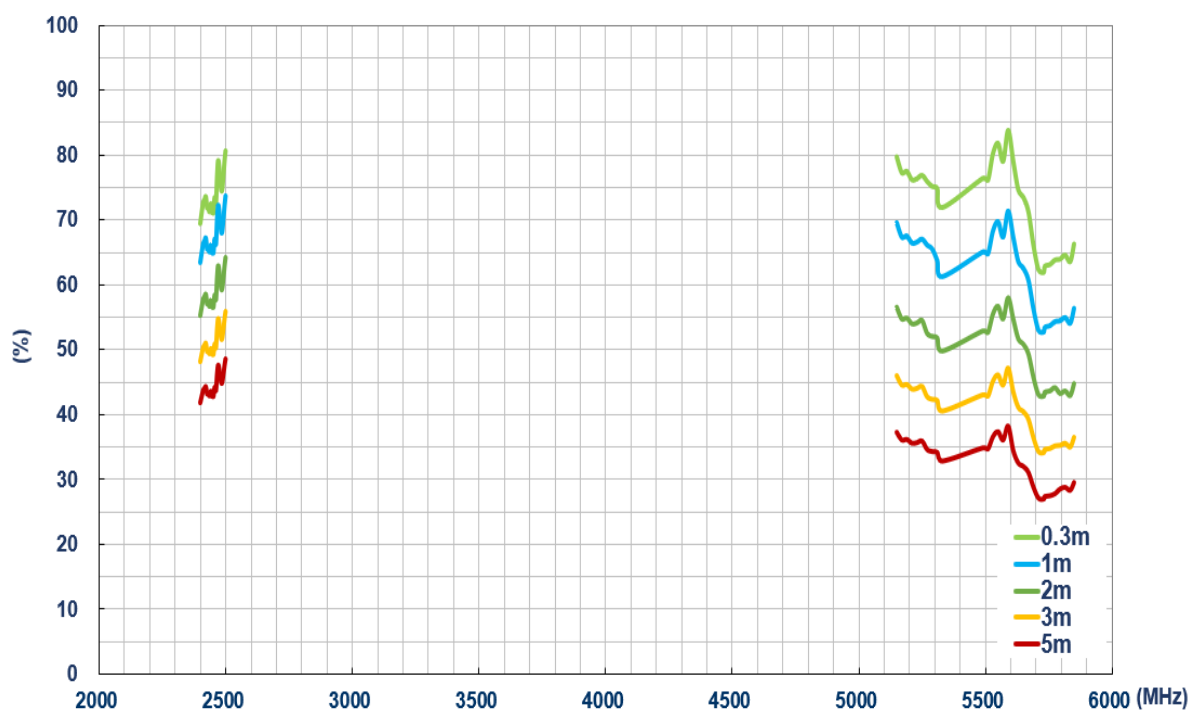
## 8.8 Efficiency – LTE MIMO 2



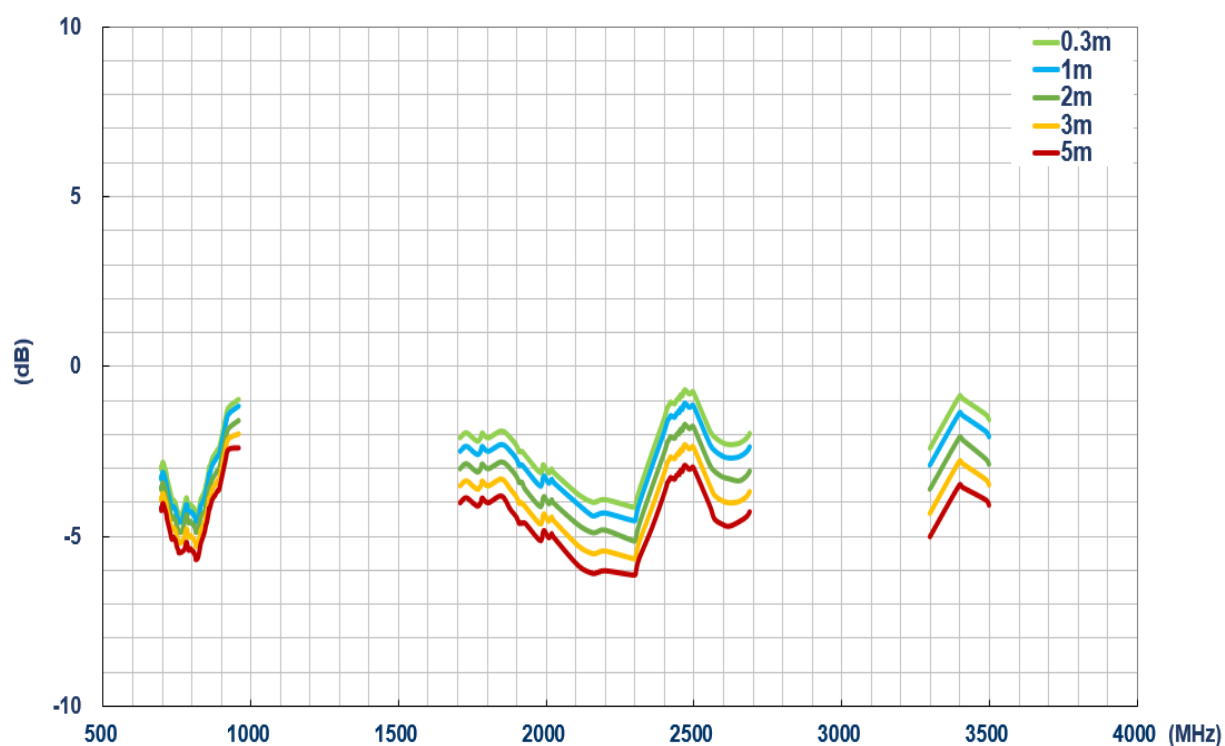
## 8.9 Efficiency – Wi-Fi MIMO 1



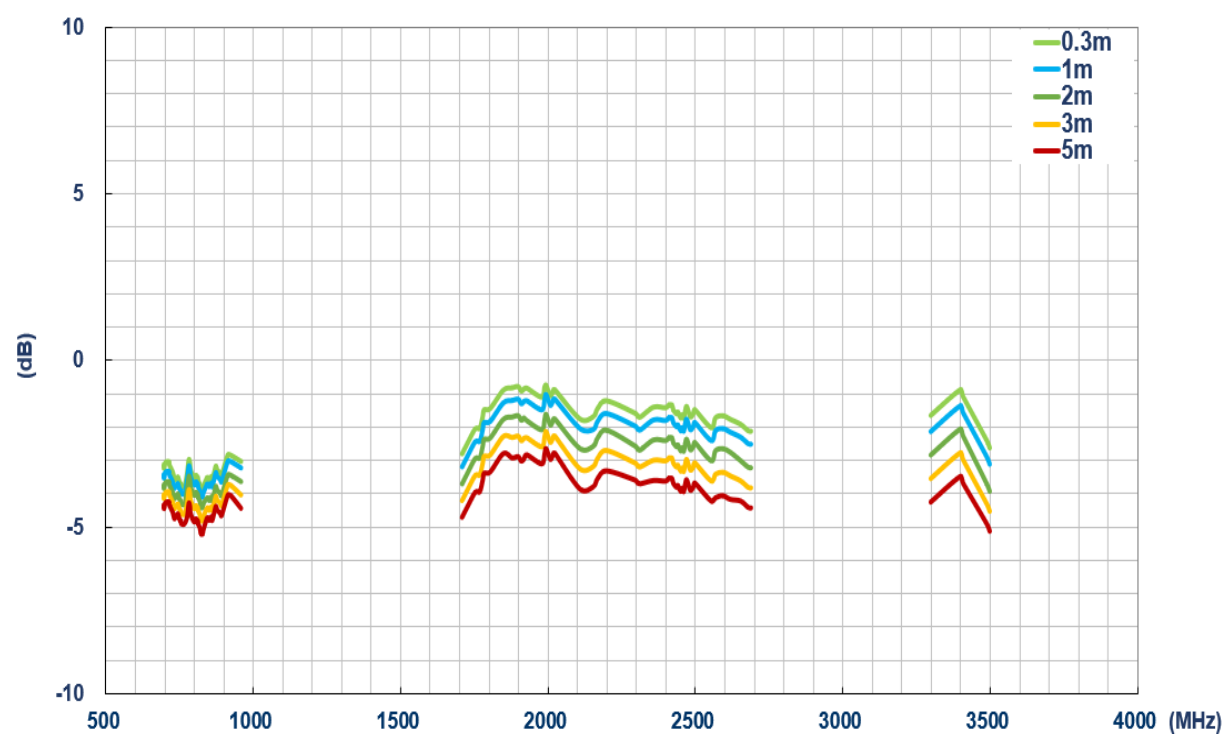
## 8.10 Efficiency – Wi-Fi MIMO 2



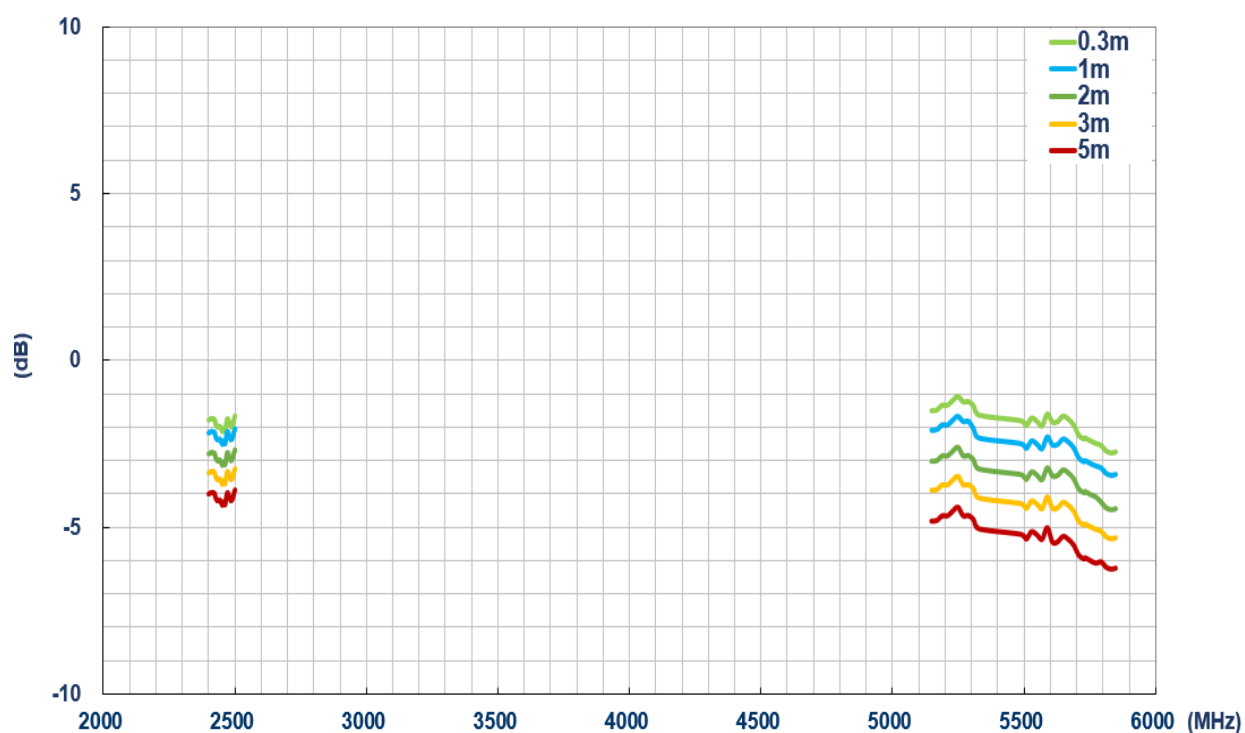
## 8.11 Average Gain – LTE MIMO 1



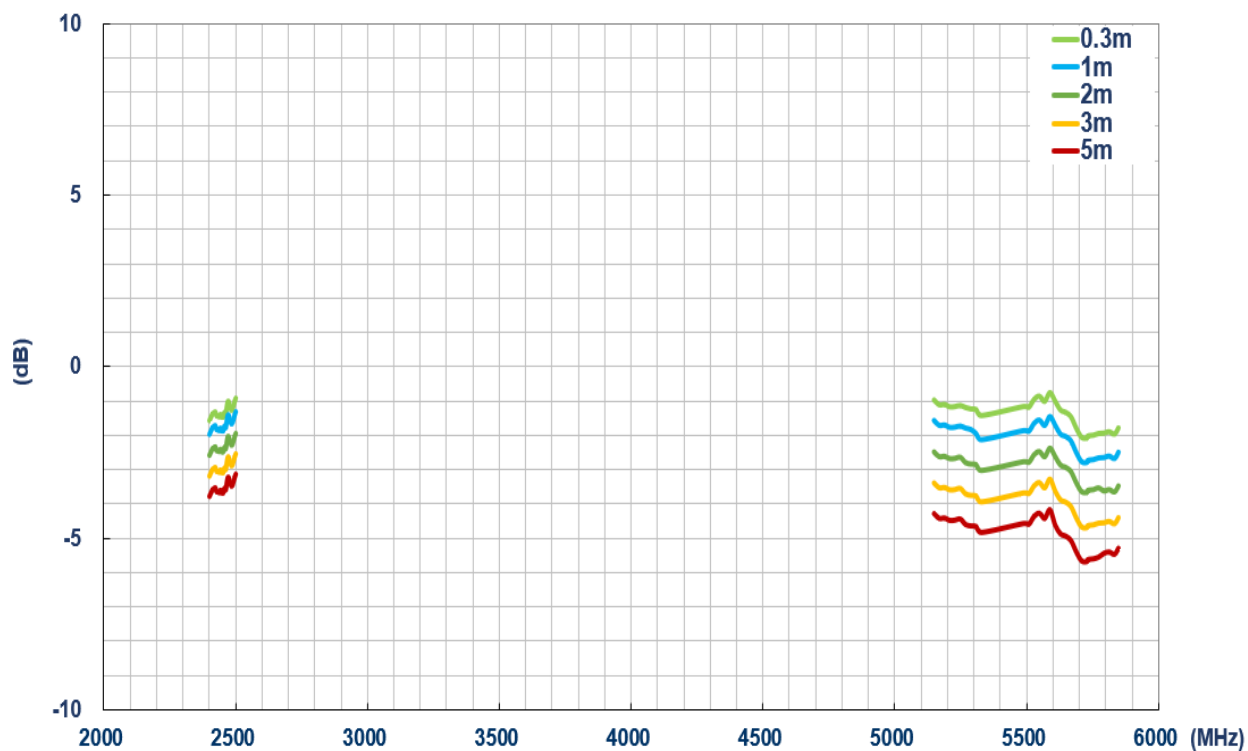
## 8.12 Average Gain – LTE MIMO 2



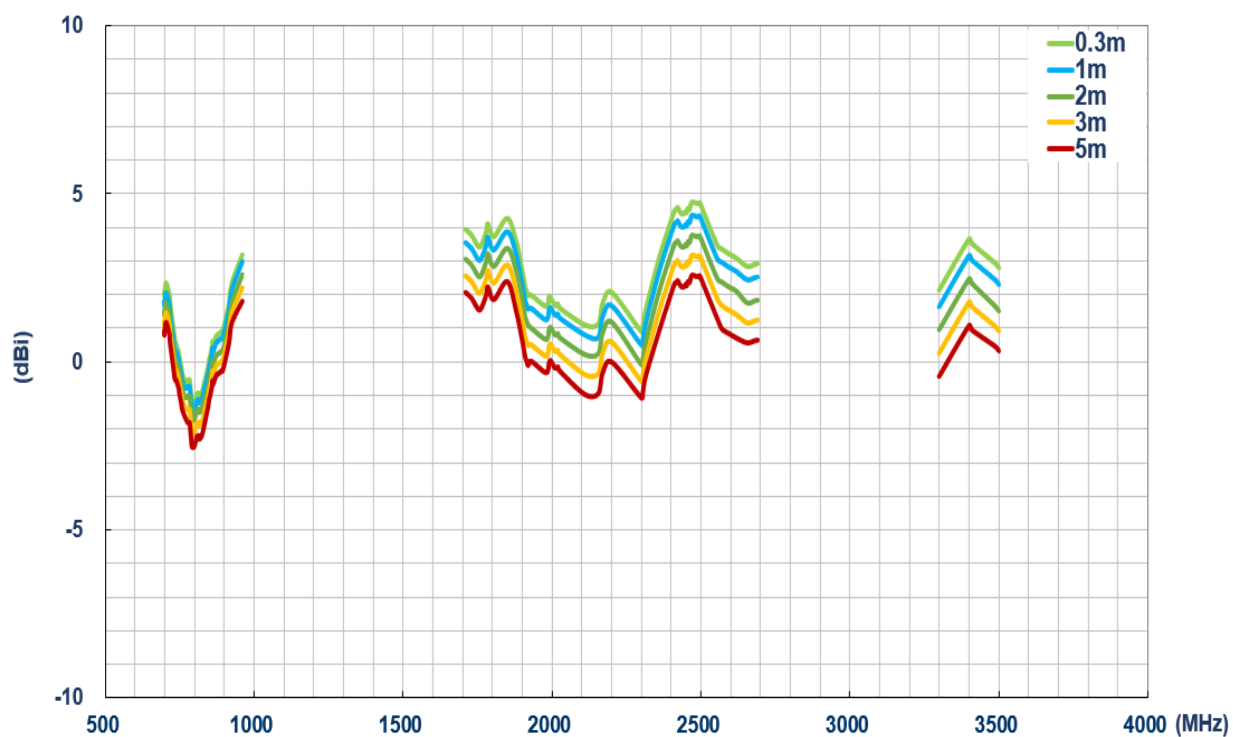
### 8.13 Average Gain – Wi-Fi MIMO 1



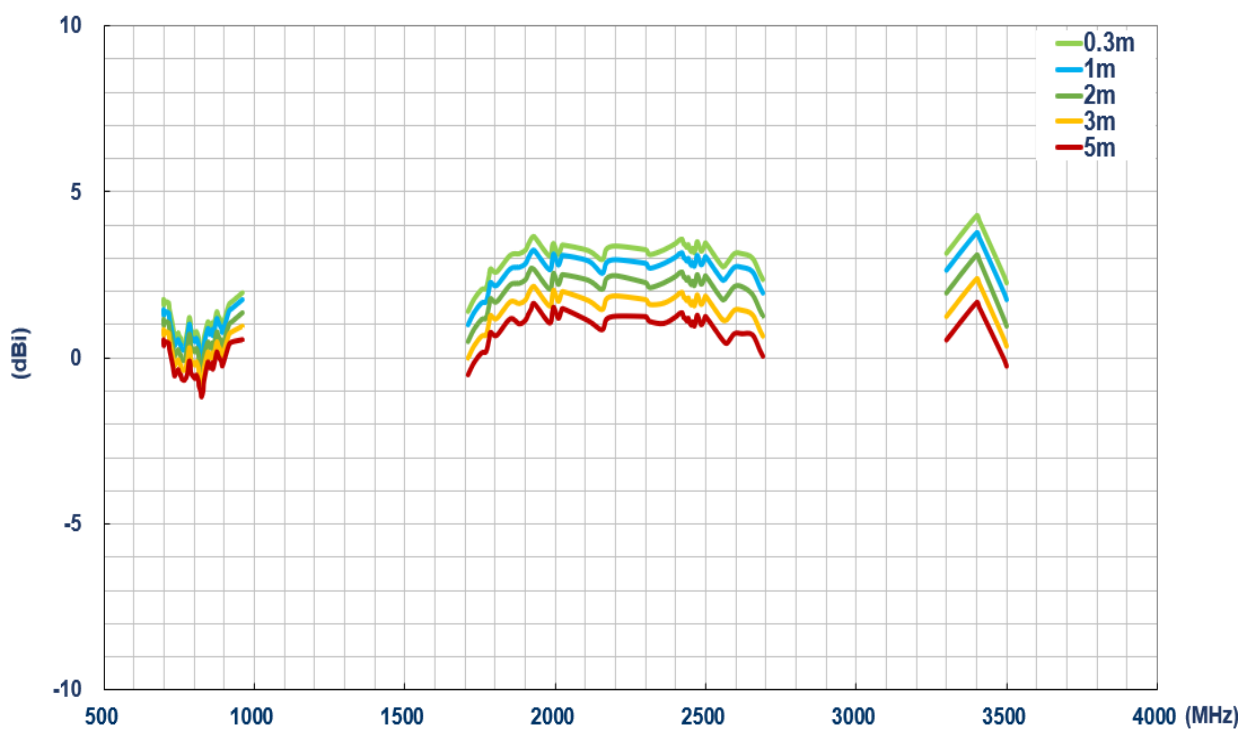
### 8.14 Average Gain – Wi-Fi MIMO 2



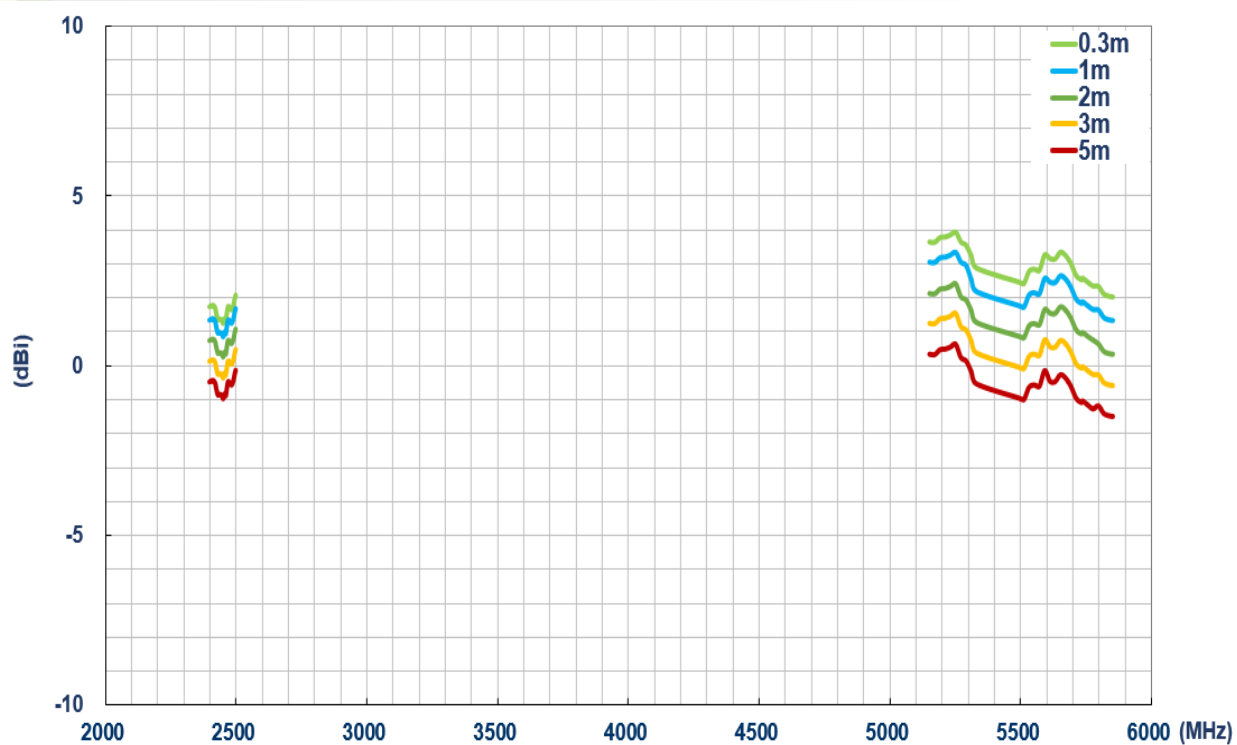
## 8.15 Peak Gain – LTE MIMO 1



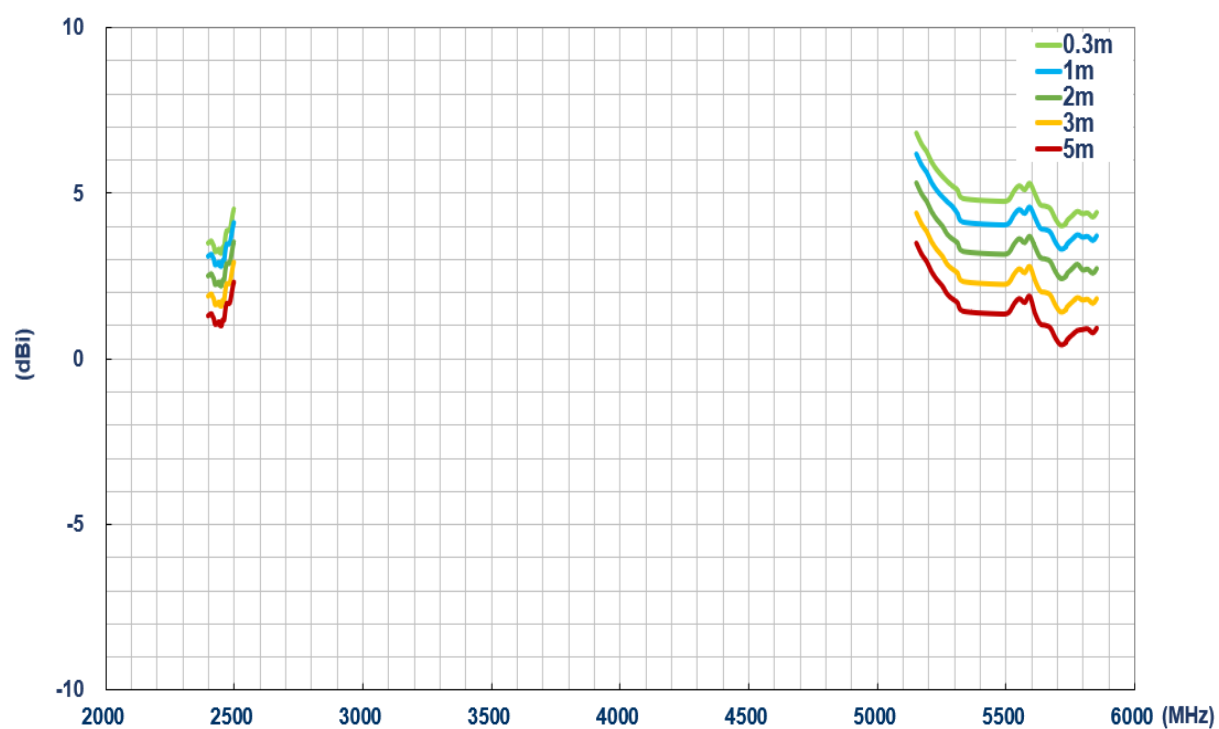
## 8.16 Peak Gain – LTE MIMO 2



## 8.17 Peak Gain – Wi-Fi MIMO 1



## 8.18 Peak Gain – Wi-Fi MIMO 2



Changelog for the datasheet

SPE-19-8-056 – MA275.A.LBICG.002

| Revision: B (Current Version) |                                        |
|-------------------------------|----------------------------------------|
| Date:                         | 2025-02-18                             |
| Notes:                        | Added Genesis references to datasheet. |
| Author:                       | Conor McGrath                          |

Previous Revisions

| Revision: A (Original First Release) |             |
|--------------------------------------|-------------|
| Date:                                | 2019-05-02  |
| Notes:                               |             |
| Author:                              | Jack Conroy |

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