



# TAOGLAS®



## Datasheet

### Monsoon

**Part No:**  
**GA.170.305111**

#### **Description:**

5G/4G Monsoon Permanent Mount External Antenna  
with 3000mm TGC-200 and SMA(M)

#### **Features:**

1\*5G/4G Antenna  
Worldwide 5G/4G Bands, 600MHz-6GHz  
IP69K Rated, Robust ABS+PC Enclosure  
Permanent (Screw) Mount Antenna  
Cable: 3M TGC-200  
Connector: SMA(M)ST  
Dimensions: 204\*69\*31 mm  
RoHS & Reach Compliant

|                            |    |
|----------------------------|----|
| 1. Introduction            | 3  |
| 2. Specifications          | 4  |
| 3. Antenna Characteristics | 7  |
| 4. Radiation Patterns      | 10 |
| 5. Mechanical Drawing      | 32 |
| 6. Packaging               | 33 |
| 7. Application Note        | 34 |
| Changelog                  | 37 |

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## 1. Introduction



The Taoglas GA.170 Monsoon antenna is a low profile, fully IP69K waterproof external M2M antenna for use on containers for global telematics services. The GA.170 delivers best-in-class 5G/4G antenna performance from 600-6000MHz.

Typical applications include:

- HD Video over LTE
- First Responder and Emergency Services
- Intelligent Transport Systems
- Internet of Things (IoT market)
- High Definition Video Broadcast Systems
- Wireless LTE M2M Devices
- Digital Signage

5G/4G applications demand high speed data uplink and downlink. A high-efficiency and high-gain antenna is required to achieve the required signal to noise ratio and throughput required to solve these challenges. The GA.170 does not require a ground plane. Low loss cables are used to keep efficiency high over long cable lengths.

Cables and connectors are fully customizable. Contact your regional Taoglas customer support team for further information.

## 2. Specifications

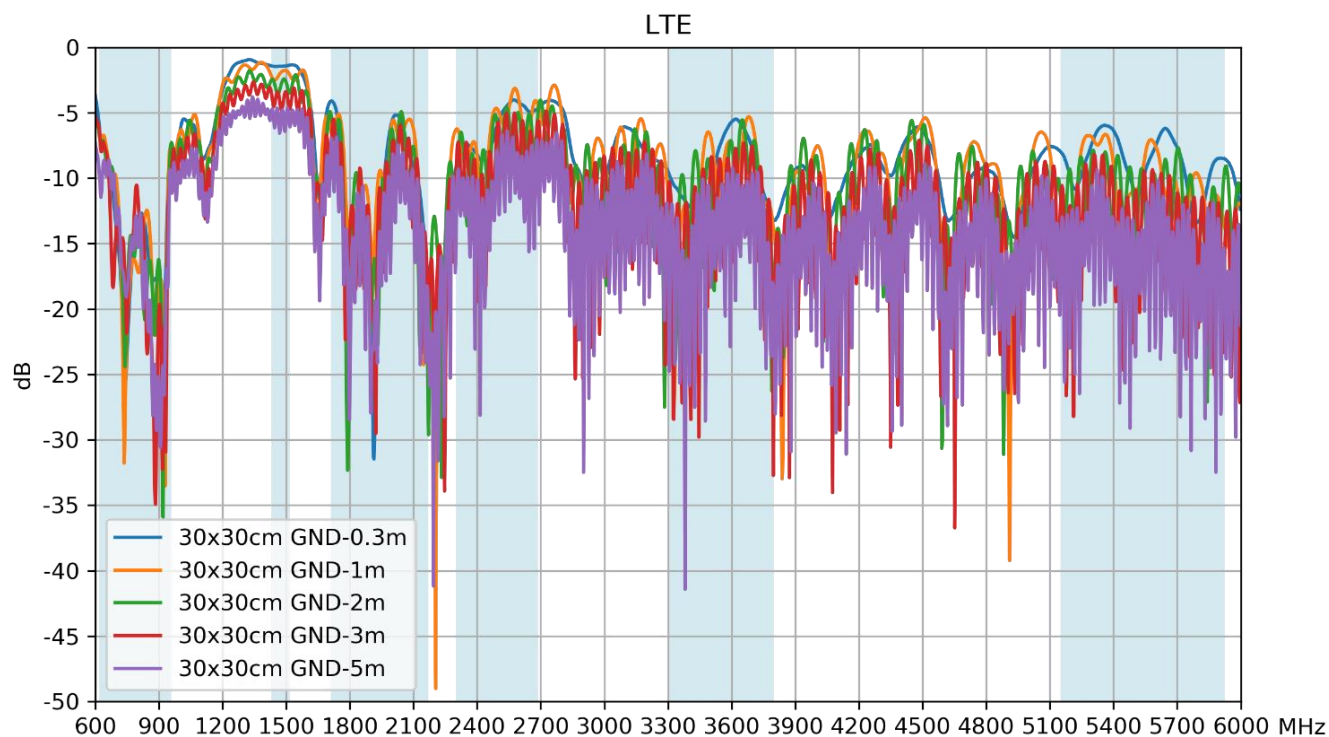
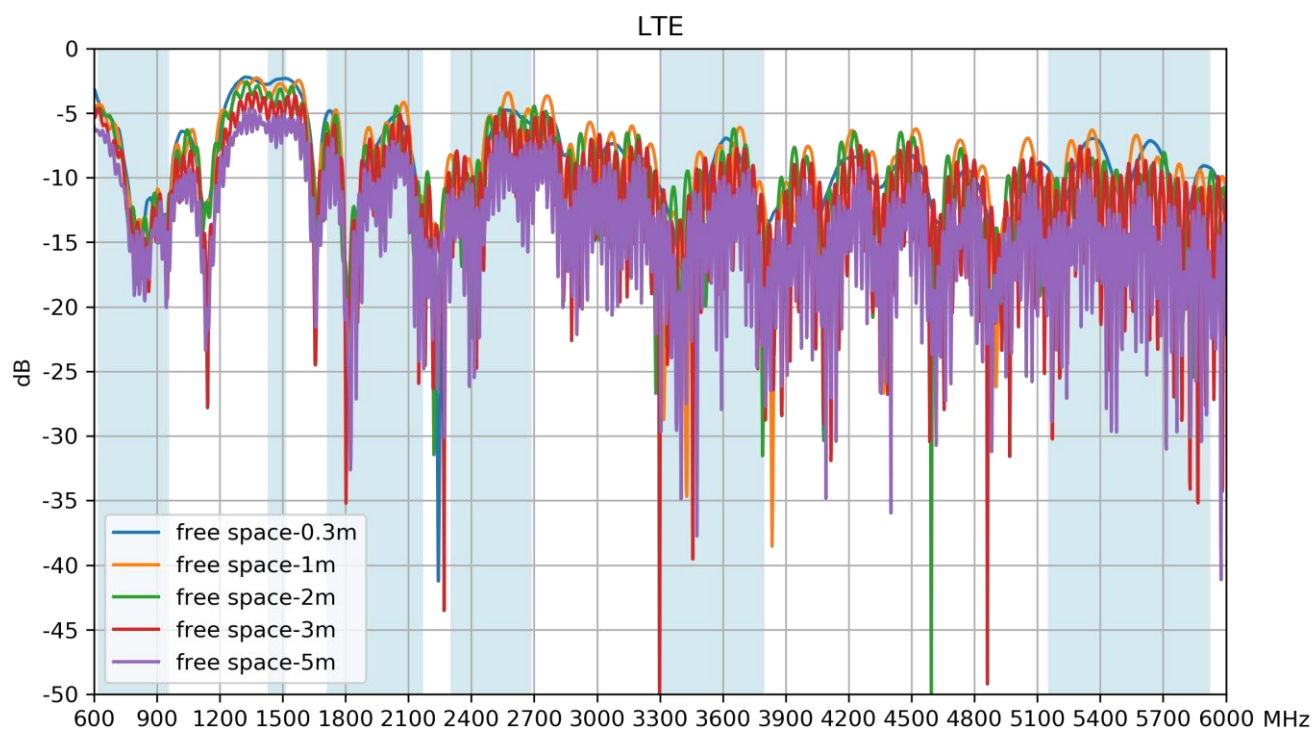
| Cellular             |      |                   |          |             |            |            |            |            |            |                       |                     |
|----------------------|------|-------------------|----------|-------------|------------|------------|------------|------------|------------|-----------------------|---------------------|
| Frequency (MHz)      |      | 5G NR Band        | LTE700   | GSM 850/900 | 5G NR Band | DCS        | PCS        | UMTS1      | LTE2600    | 5G NR Band 77, 78, 79 | LTE5200/ Wi-Fi 5800 |
|                      |      | 617 ~698          | 698 ~806 | 824 ~960    | 1427~ 1518 | 1710 ~1880 | 1850 ~1990 | 1920 ~2170 | 2490 ~2690 | 3300 ~3500            | 5150 ~5925          |
| Efficiency (%)       |      |                   |          |             |            |            |            |            |            |                       |                     |
| Free space           | 0.3m | 33.54             | 55.25    | 57.26       | 25.92      | 54.79      | 54.93      | 52.11      | 52.30      | 58.39                 | 67.81               |
|                      | 1m   | 32.04             | 52.64    | 54.55       | 24.29      | 50.55      | 50.68      | 47.90      | 47.48      | 51.64                 | 57.92               |
|                      | 2m   | 30.02             | 49.13    | 50.91       | 22.13      | 45.05      | 45.17      | 42.47      | 41.36      | 43.34                 | 46.26               |
|                      | 3m   | 28.13             | 45.85    | 47.51       | 20.16      | 40.15      | 40.25      | 37.66      | 36.02      | 36.38                 | 36.94               |
|                      | 5m   | 24.70             | 39.93    | 41.38       | 16.73      | 31.90      | 31.98      | 29.62      | 27.32      | 25.64                 | 23.57               |
| 30x30cm Ground Plane | 0.3m | 42.25             | 57.68    | 66.18       | 16.82      | 60.43      | 61.07      | 53.58      | 51.85      | 57.69                 | 70.42               |
|                      | 1m   | 40.37             | 54.96    | 63.05       | 15.75      | 55.75      | 56.34      | 49.24      | 47.07      | 51.03                 | 60.16               |
|                      | 2m   | 37.83             | 51.29    | 58.85       | 14.35      | 49.69      | 50.22      | 43.65      | 41.00      | 42.83                 | 48.04               |
|                      | 3m   | 35.45             | 47.87    | 54.92       | 13.07      | 44.28      | 44.76      | 38.70      | 35.71      | 35.95                 | 38.36               |
|                      | 5m   | 31.13             | 41.69    | 47.83       | 10.85      | 35.18      | 35.55      | 30.42      | 27.09      | 25.34                 | 24.47               |
| Average Gain         |      |                   |          |             |            |            |            |            |            |                       |                     |
| Free space           | 0.3m | -4.74             | -2.58    | -2.42       | -5.86      | -2.61      | -2.60      | -2.83      | -2.81      | -2.34                 | -1.69               |
|                      | 1m   | -4.94             | -2.79    | -2.63       | -6.15      | -2.96      | -2.95      | -3.20      | -3.23      | -2.87                 | -2.37               |
|                      | 2m   | -5.23             | -3.09    | -2.93       | -6.55      | -3.46      | -3.45      | -3.72      | -3.83      | -3.63                 | -3.35               |
|                      | 3m   | -5.51             | -3.39    | -3.23       | -6.96      | -3.96      | -3.95      | -4.24      | -4.43      | -4.39                 | -4.32               |
|                      | 5m   | -6.07             | -3.99    | -3.83       | -7.76      | -4.96      | -4.95      | -5.28      | -5.63      | -5.91                 | -6.28               |
| 30x30cm Ground Plane | 0.3m | -3.74             | -2.39    | -1.79       | -7.74      | -2.19      | -2.14      | -2.71      | -2.85      | -2.39                 | -1.52               |
|                      | 1m   | -3.94             | -2.60    | -2.00       | -8.03      | -2.54      | -2.49      | -3.08      | -3.27      | -2.92                 | -2.21               |
|                      | 2m   | -4.22             | -2.90    | -2.30       | -8.43      | -3.04      | -2.99      | -3.60      | -3.87      | -3.68                 | -3.18               |
|                      | 3m   | -4.50             | -3.20    | -2.60       | -8.84      | -3.54      | -3.49      | -4.12      | -4.47      | -4.44                 | -4.16               |
|                      | 5m   | -5.07             | -3.80    | -3.20       | -9.65      | -4.54      | -4.49      | -5.17      | -5.67      | -5.96                 | -6.11               |
| Peak Gain            |      |                   |          |             |            |            |            |            |            |                       |                     |
| Free space           | 0.3m | -0.20             | 1.74     | 1.69        | -2.28      | 3.17       | 6.24       | 5.29       | 5.97       | 7.01                  | 6.32                |
|                      | 1m   | -0.40             | 1.53     | 1.48        | -2.56      | 2.82       | 5.89       | 4.93       | 5.55       | 6.48                  | 5.64                |
|                      | 2m   | -0.68             | 1.23     | 1.18        | -2.97      | 2.32       | 5.39       | 4.41       | 4.95       | 5.72                  | 4.66                |
|                      | 3m   | -0.96             | 0.93     | 0.88        | -3.37      | 1.82       | 4.89       | 3.89       | 4.35       | 4.96                  | 3.69                |
|                      | 5m   | -1.52             | 0.33     | 0.28        | -4.18      | 0.82       | 3.89       | 2.86       | 3.15       | 3.44                  | 1.73                |
| 30x30cm Ground Plane | 0.3m | 1.72              | 1.86     | 2.94        | -1.77      | 6.22       | 5.50       | 5.34       | 7.03       | 6.55                  | 7.12                |
|                      | 1.0m | 1.52              | 1.65     | 2.73        | -2.06      | 5.87       | 5.15       | 4.98       | 6.61       | 6.01                  | 6.43                |
|                      | 2.0m | 1.25              | 1.35     | 2.43        | -2.46      | 5.37       | 4.65       | 4.46       | 6.01       | 5.25                  | 5.46                |
|                      | 3.0m | 0.97              | 1.05     | 2.13        | -2.87      | 4.87       | 4.15       | 3.94       | 5.41       | 4.49                  | 4.48                |
|                      | 5.0m | 0.41              | 0.45     | 1.53        | -3.68      | 3.87       | 3.15       | 2.90       | 4.21       | 2.97                  | 2.53                |
| Impedance            |      | 50 $\Omega$       |          |             |            |            |            |            |            |                       |                     |
| Polarization         |      | Linear - Vertical |          |             |            |            |            |            |            |                       |                     |
| Max Input Power      |      | 10W               |          |             |            |            |            |            |            |                       |                     |

| Mechanical                  |                                                         |
|-----------------------------|---------------------------------------------------------|
| Dimensions                  | 204 x 69 x 31 mm                                        |
| Cable                       | LTE : 3000mm TGC-200                                    |
| Connector                   | LTE: SMA(M)                                             |
| Casing                      | PC+ABS                                                  |
| Adhesive                    | 3M 9448HK + CR4305                                      |
| Sealant                     | Rubber Stopper                                          |
| Weight                      | 550 g                                                   |
| Recommended Mounting Torque | 24.5N·m                                                 |
| Maximum Mounting Torque     | 29.5N·m                                                 |
| Environmental               |                                                         |
| IP Rating                   | IP69K                                                   |
| Corrosion                   | 5% NaCl for 96hrs - Nickel plated steel base and thread |
| Temperature Range           | -40°C to +85°C                                          |
| Thermal Shock               | 100 cycles -40°C to +85°C                               |
| Humidity                    | Non-condensing 65°C 95% RH                              |
| Shock (Drop Test)           | 1m drop on concrete 6 axes                              |
| Cable Pull                  | 8 Kgf                                                   |

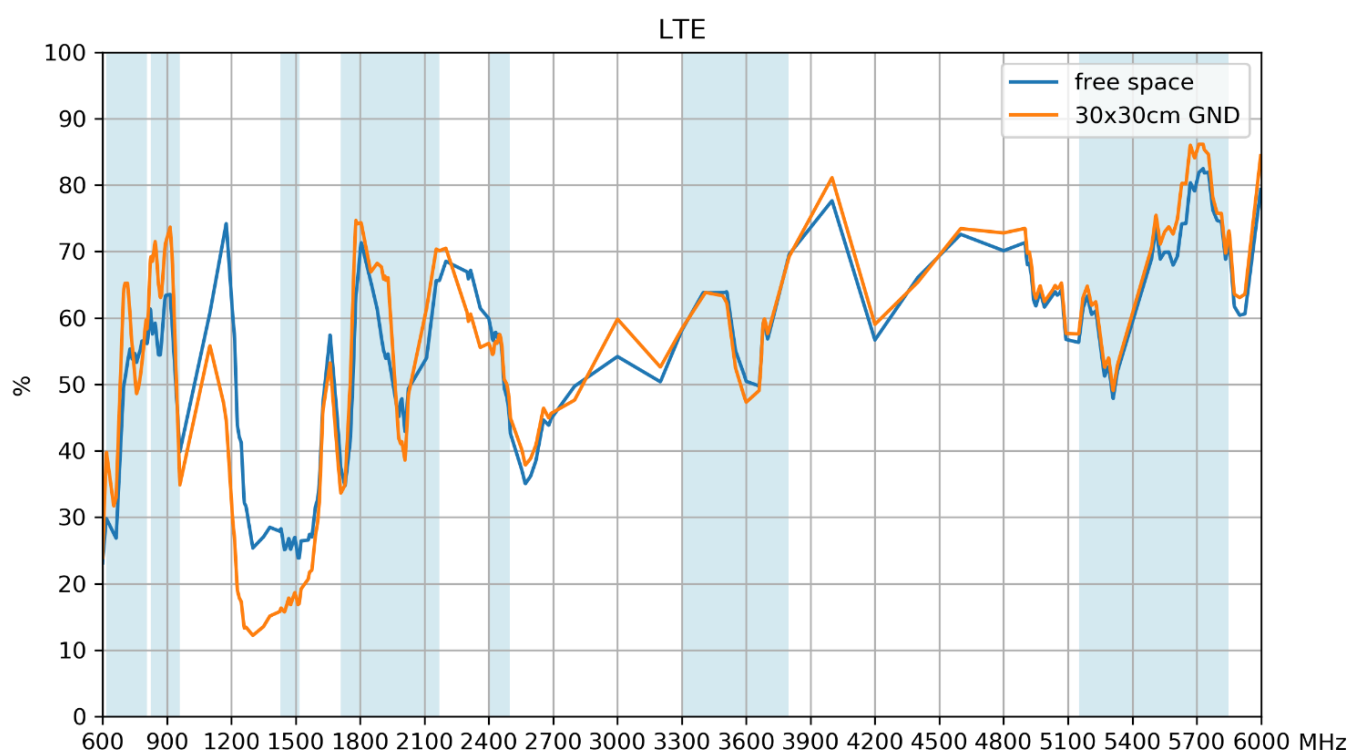
| 5G/4G Bands |                                                                    |                               |         |
|-------------|--------------------------------------------------------------------|-------------------------------|---------|
| Band Number | 5G NR / FR1 / LTE / LTE-Advanced / WCDMA / HSPA / HSPA+ / TD-SCDMA |                               |         |
|             | Uplink                                                             | Downlink                      | Covered |
| 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                  | ✓       |
| 48          |                                                                    | 3550 to 3700                  | ✓       |
| 66          | UL: 1710-1780                                                      | DL: 2110-2200                 | ✓       |
| 71          |                                                                    | 617 to 698                    | ✓       |
| 74/75/76    |                                                                    | 1427 to 1518                  | ✓       |
| 78          |                                                                    | 3300 to 3800                  | ✓       |
| 79          |                                                                    | 4400 to 5000                  | ✓       |

## 3. Antenna Characteristics

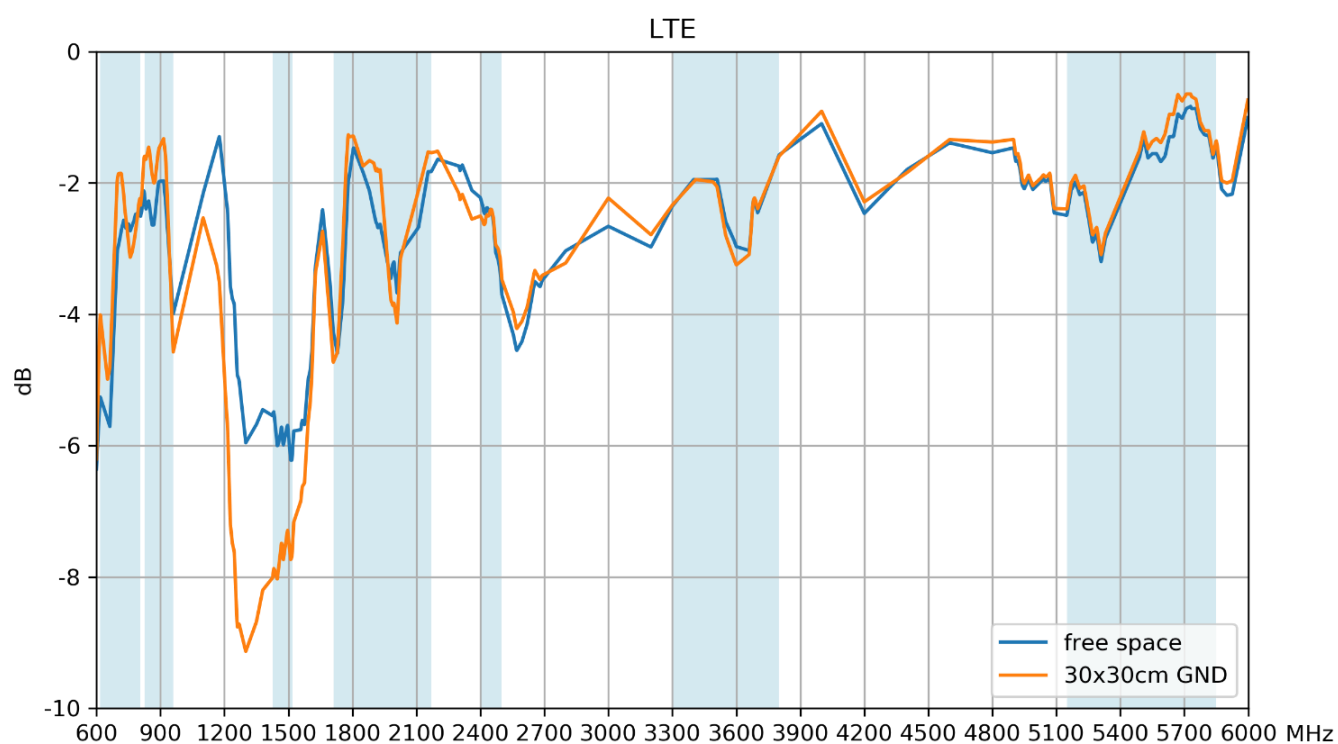
### 3.1 Return Loss



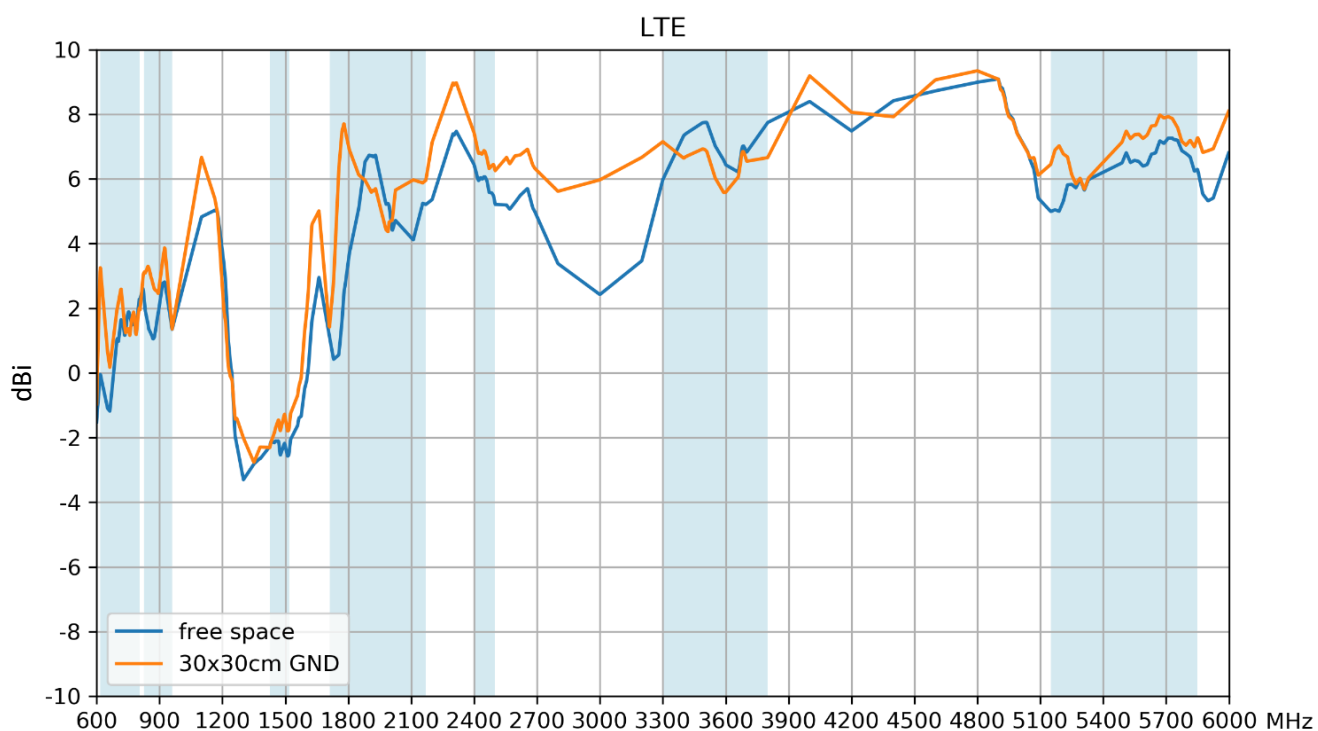
### 3.3 Efficiency



### 3.4 Average Gain



### 3.5 Peak Gain



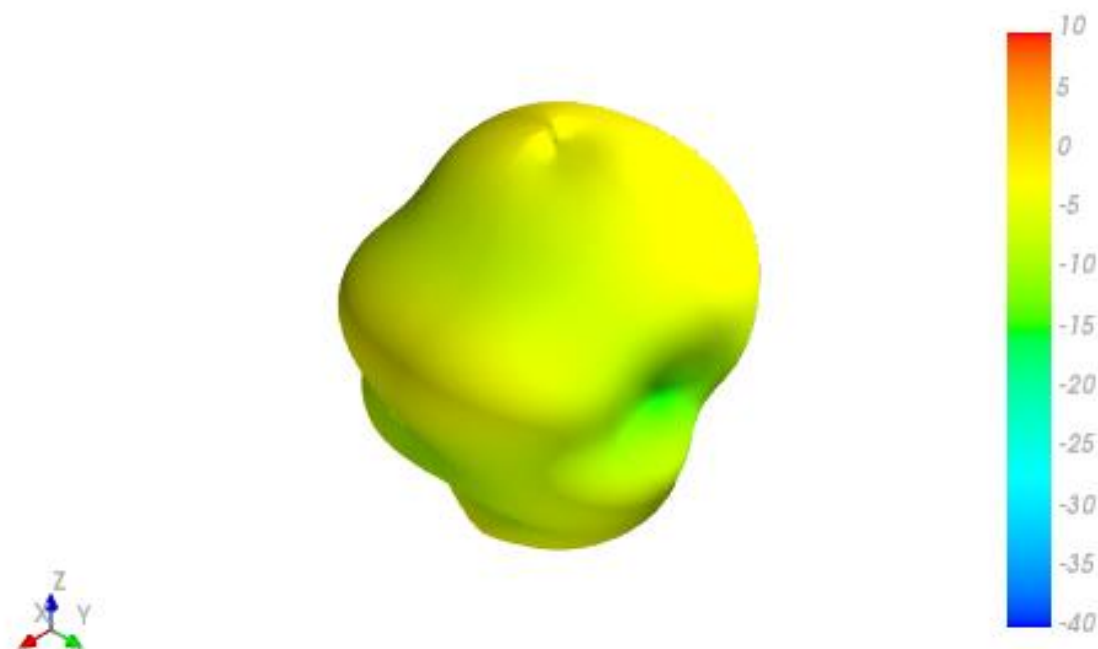
## 4. Radiation Patterns

### 4.1 Test Setup – Free Space

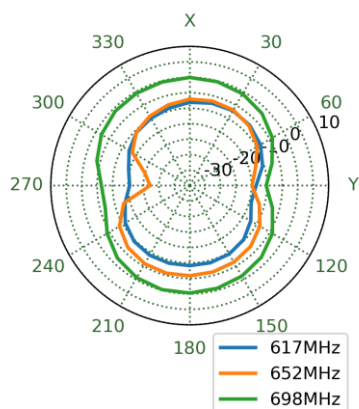


## 4.2 Cellular 3D and 2D Radiation Patterns

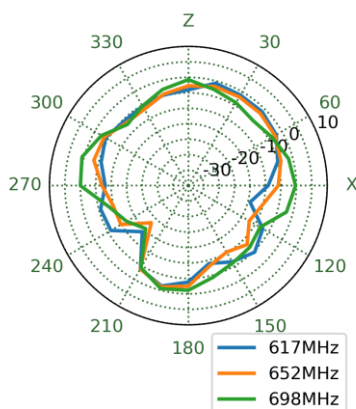
652MHz



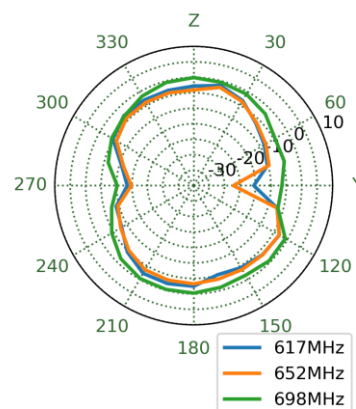
XY Plane



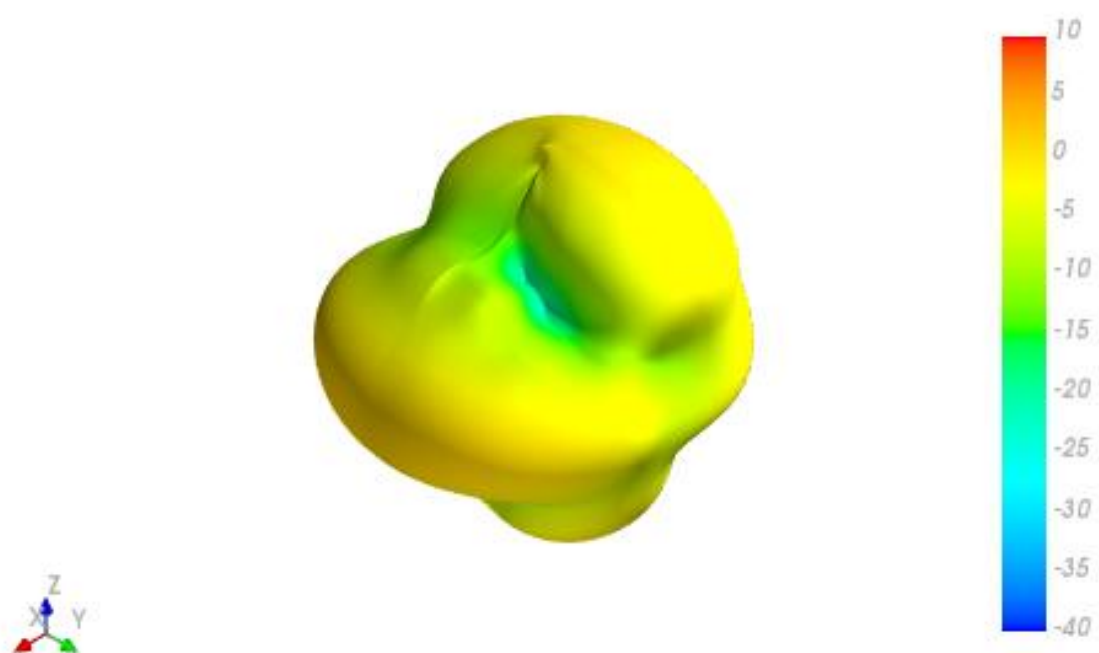
XZ Plane



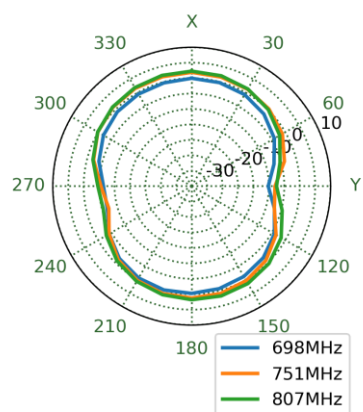
YZ Plane



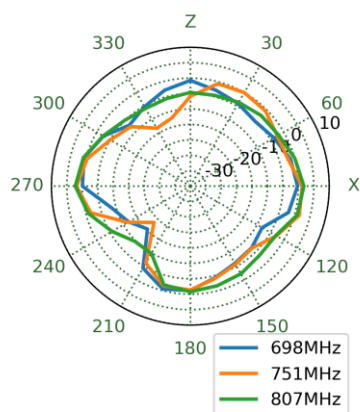
# 751MHz



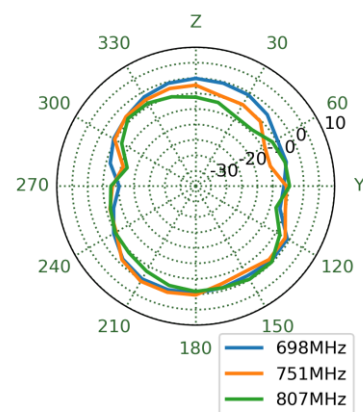
XY Plane



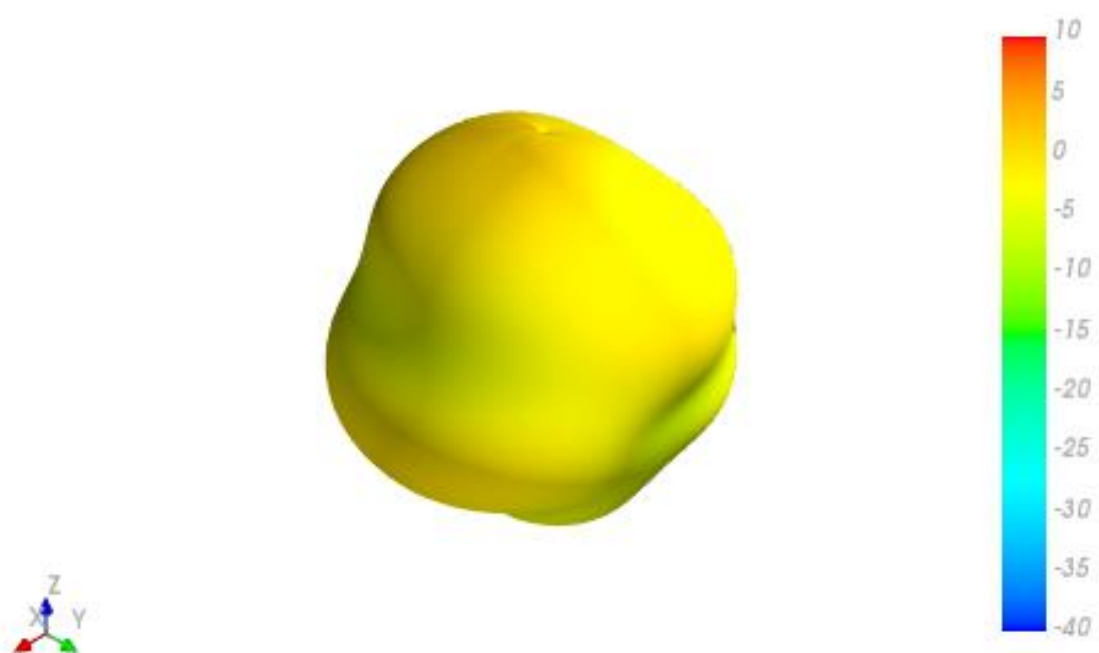
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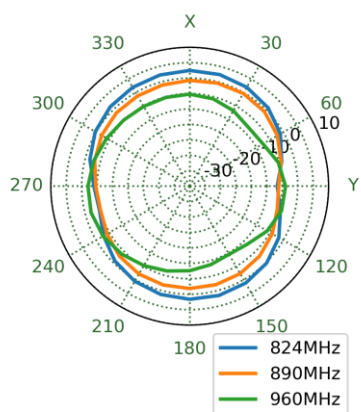
YZ Plane



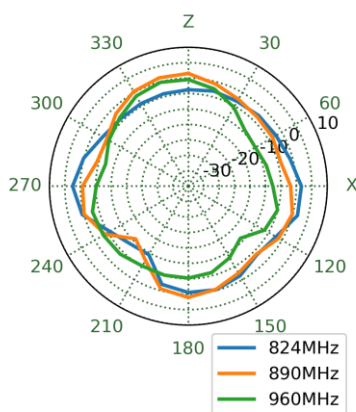
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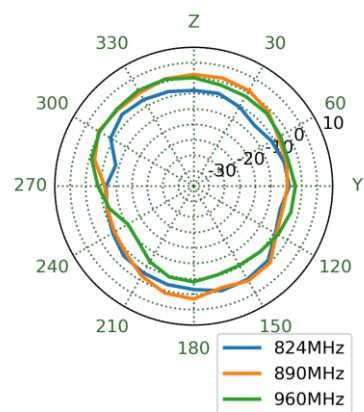
XY Plane



XZ Plane



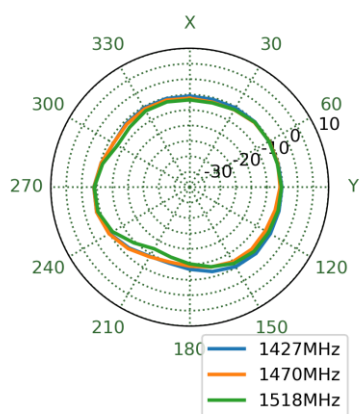
YZ Plane



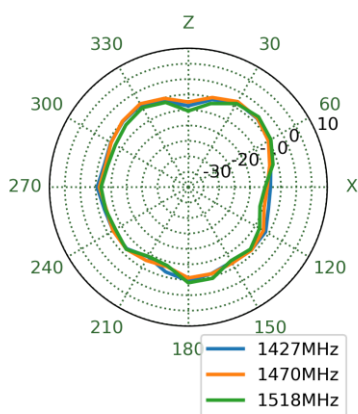
1470MHz



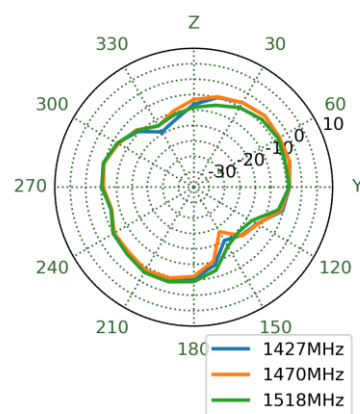
XY Plane



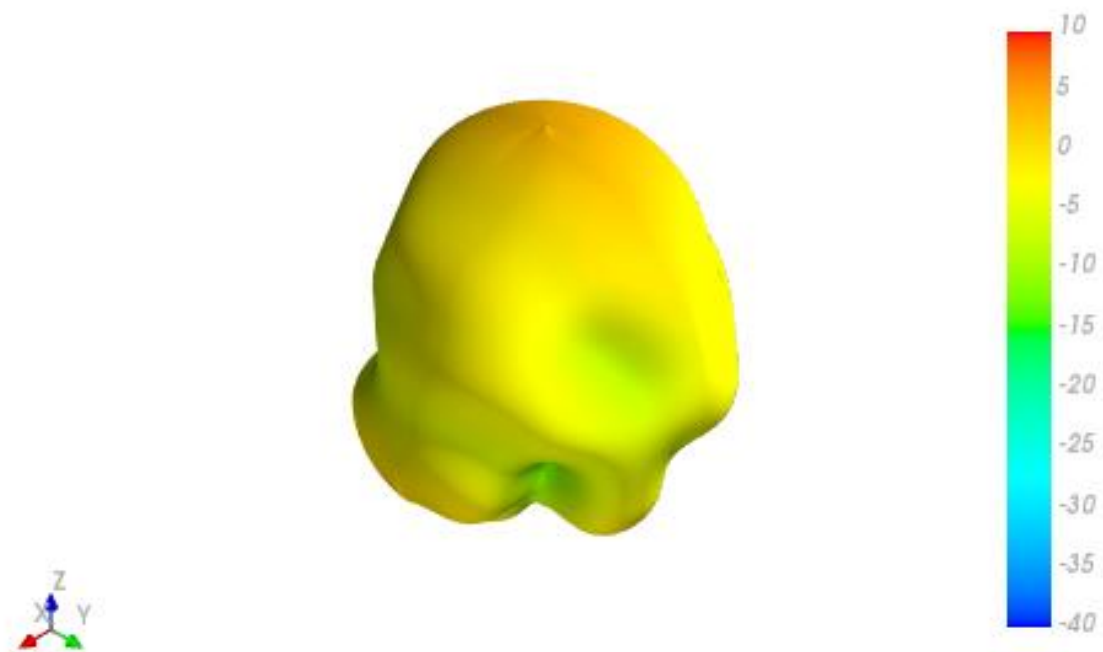
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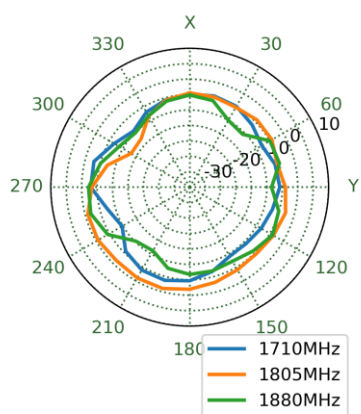
YZ Plane



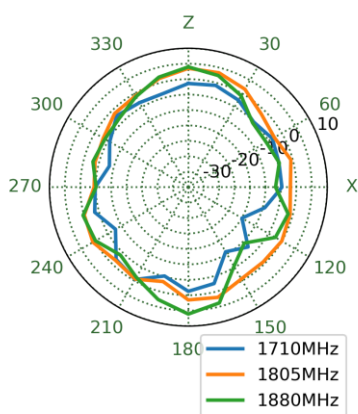
# 1805MHz



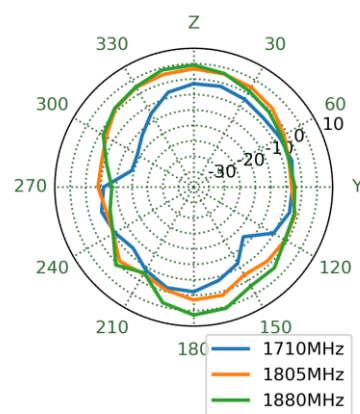
XY Plane



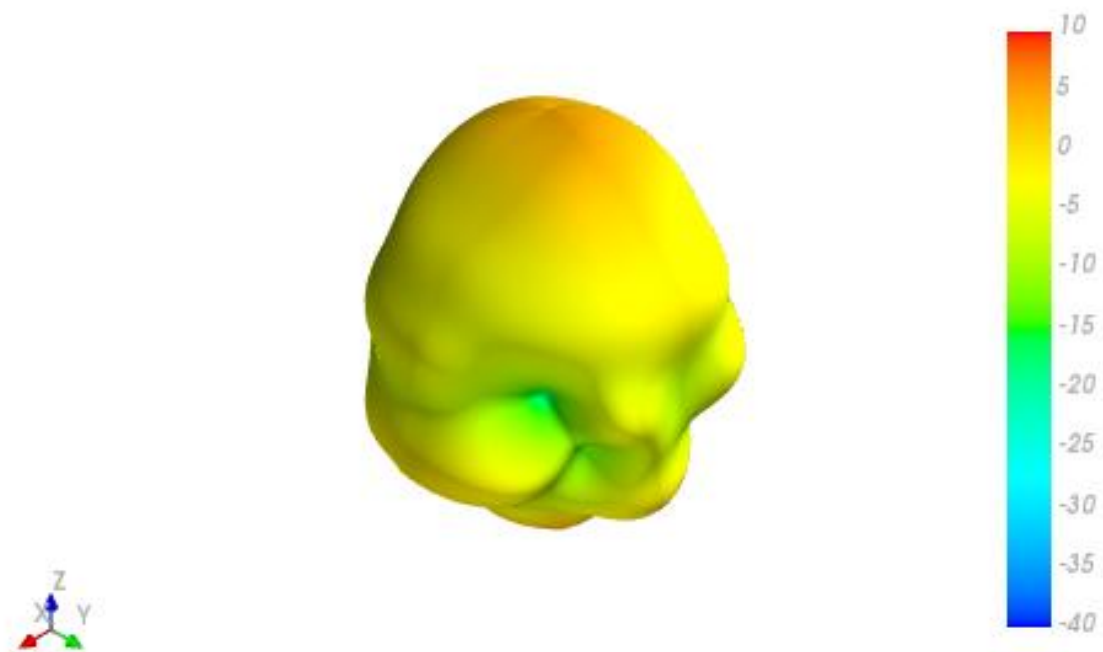
XZ Plane



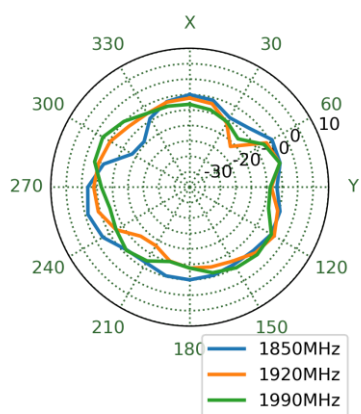
YZ Plane



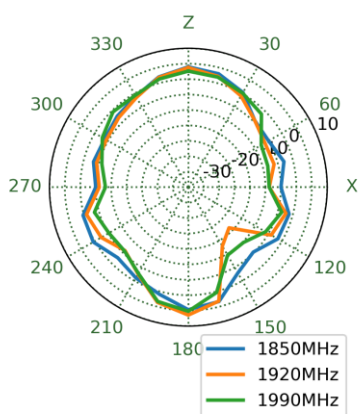
# 1920MHz



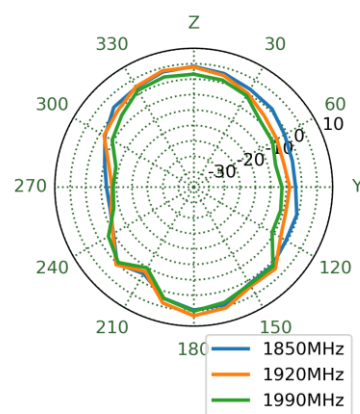
XY Plane



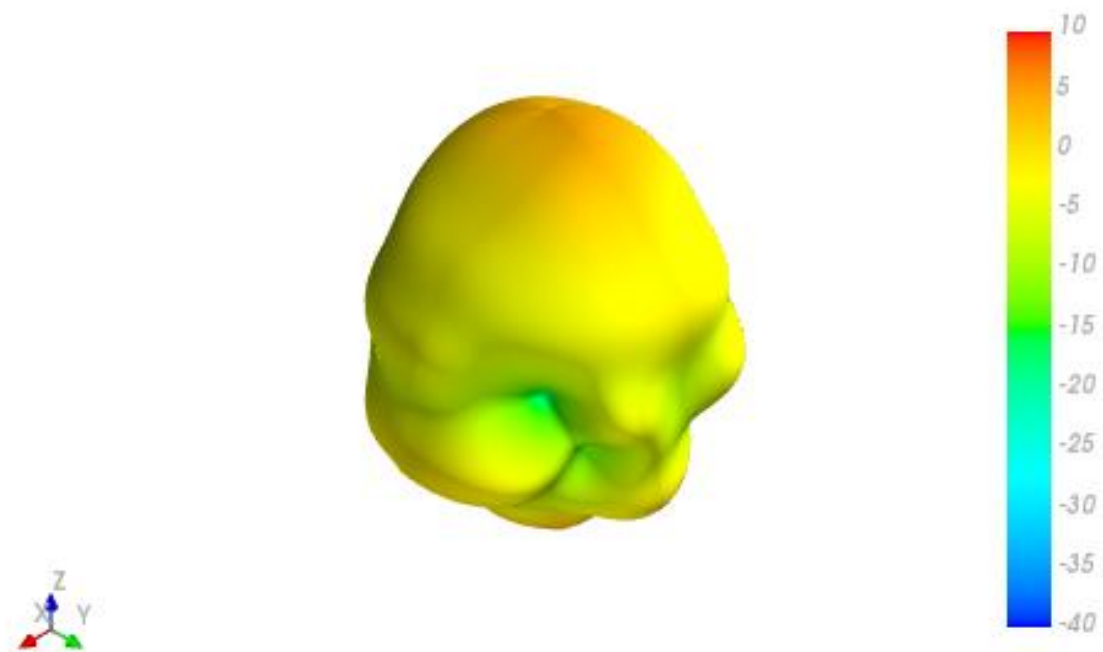
XZ Plane



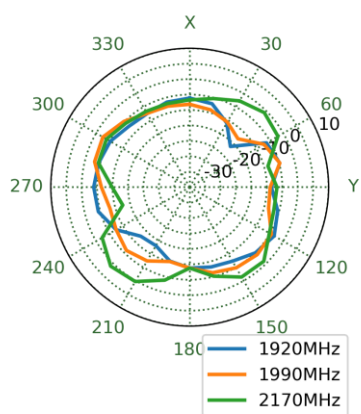
YZ Plane



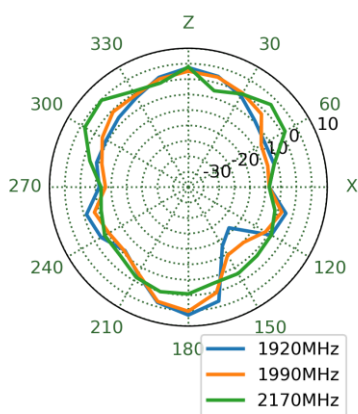
1990MHz



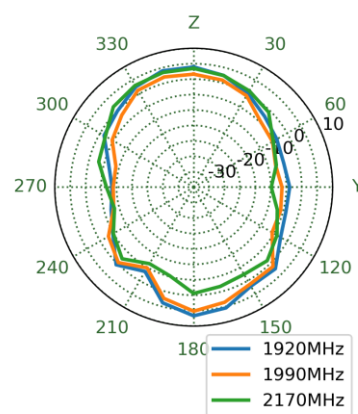
XY Plane



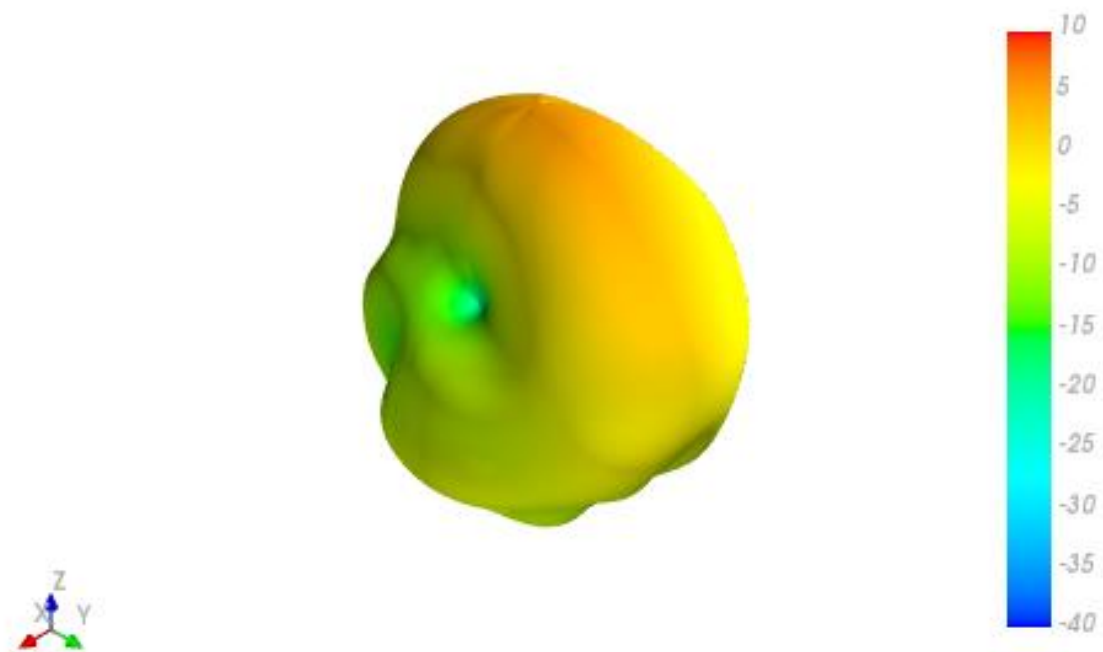
XZ Plane



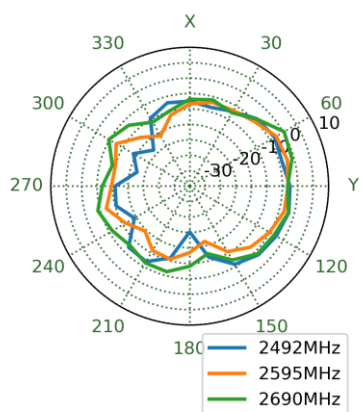
YZ Plane



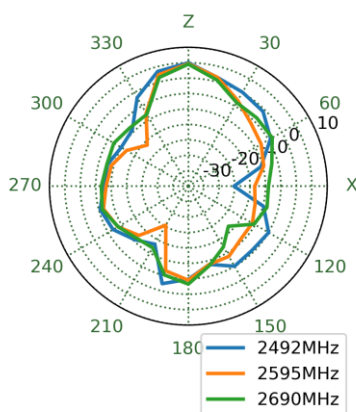
## 2595MHz



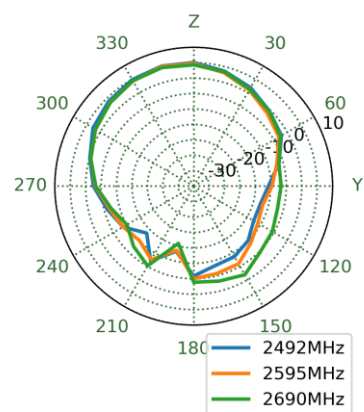
XY Plane



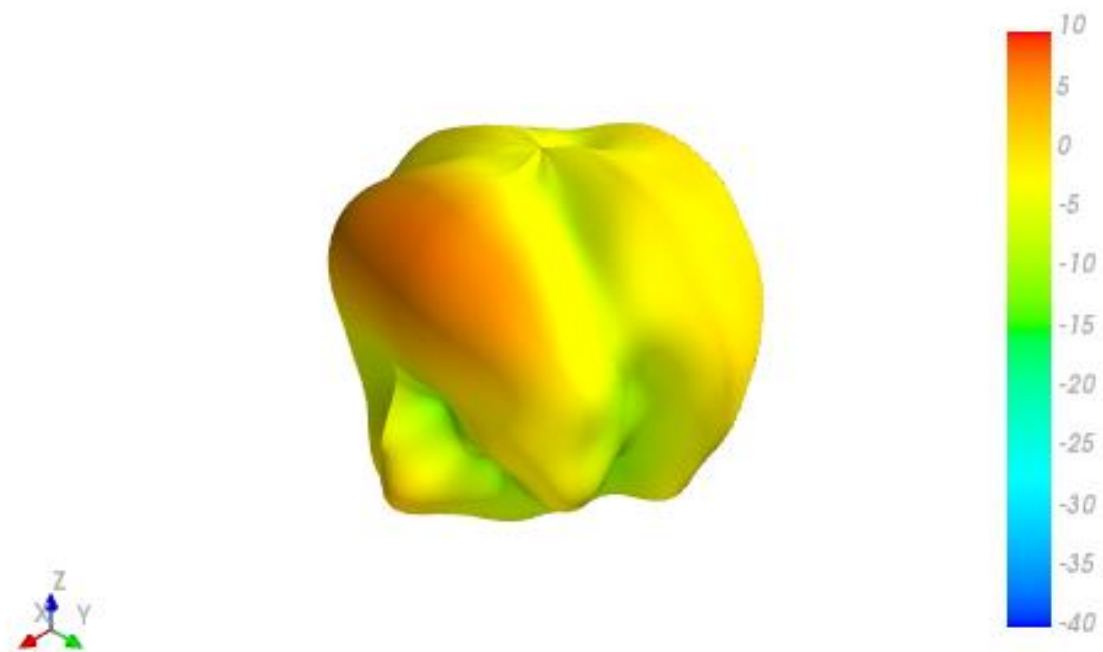
XZ Plane



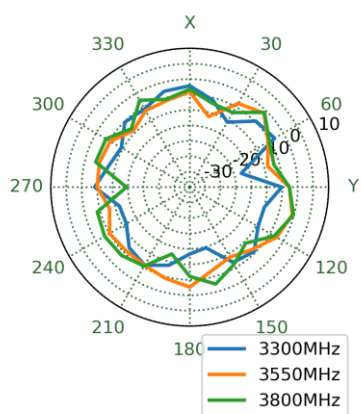
YZ Plane



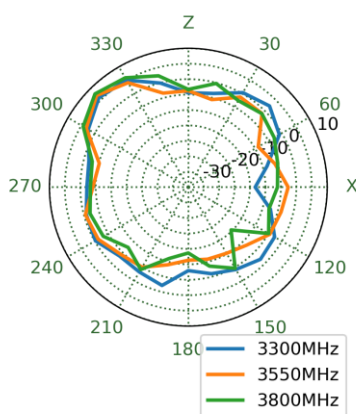
# 3550MHz



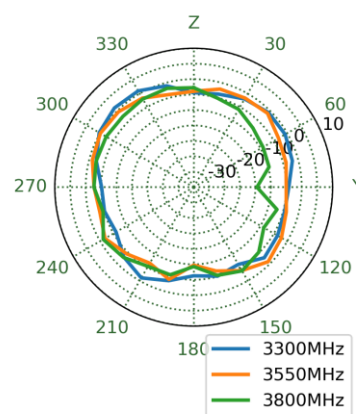
XY Plane



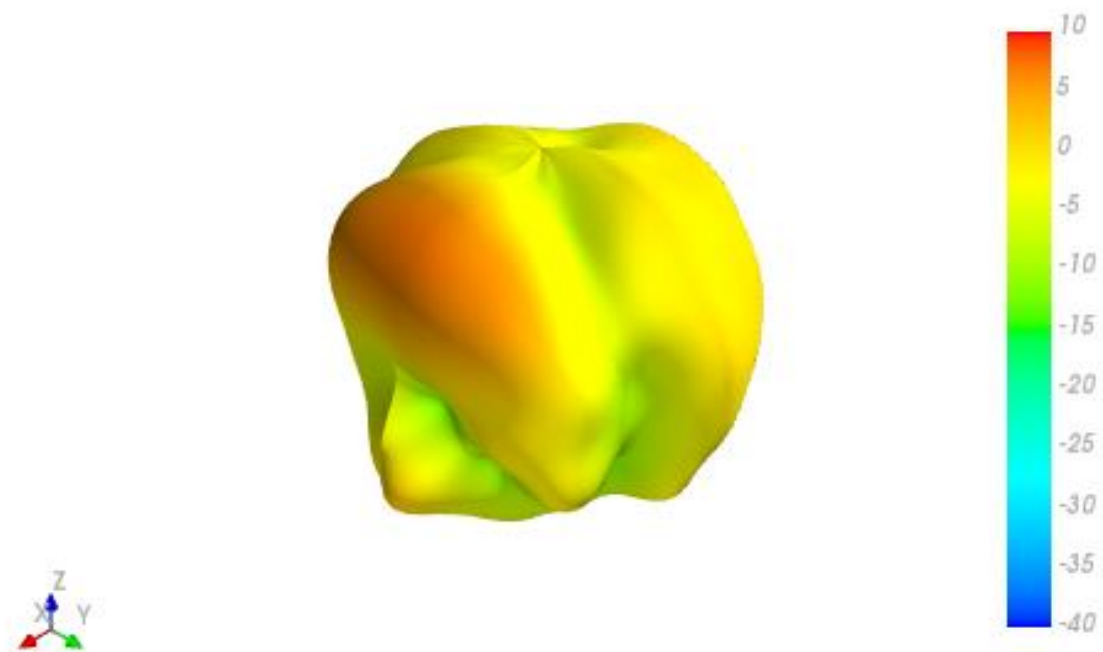
XZ Plane



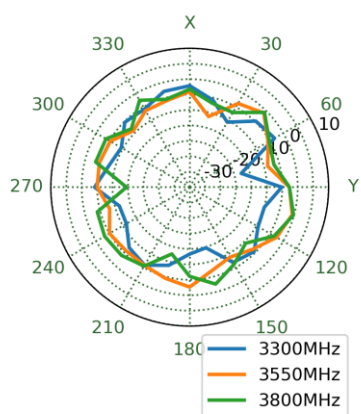
YZ Plane



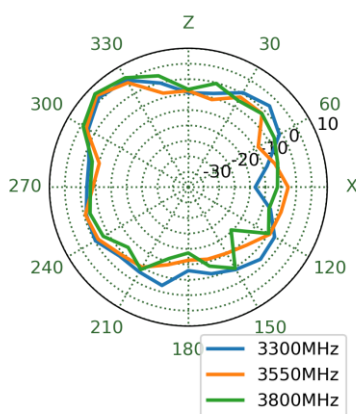
5530MHz



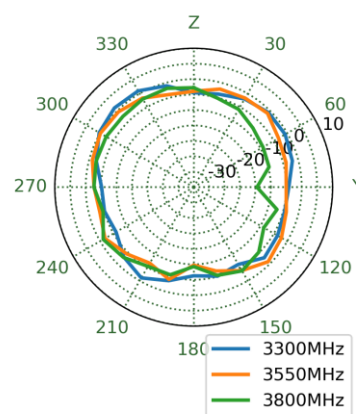
XY Plane



XZ Plane



YZ Plane

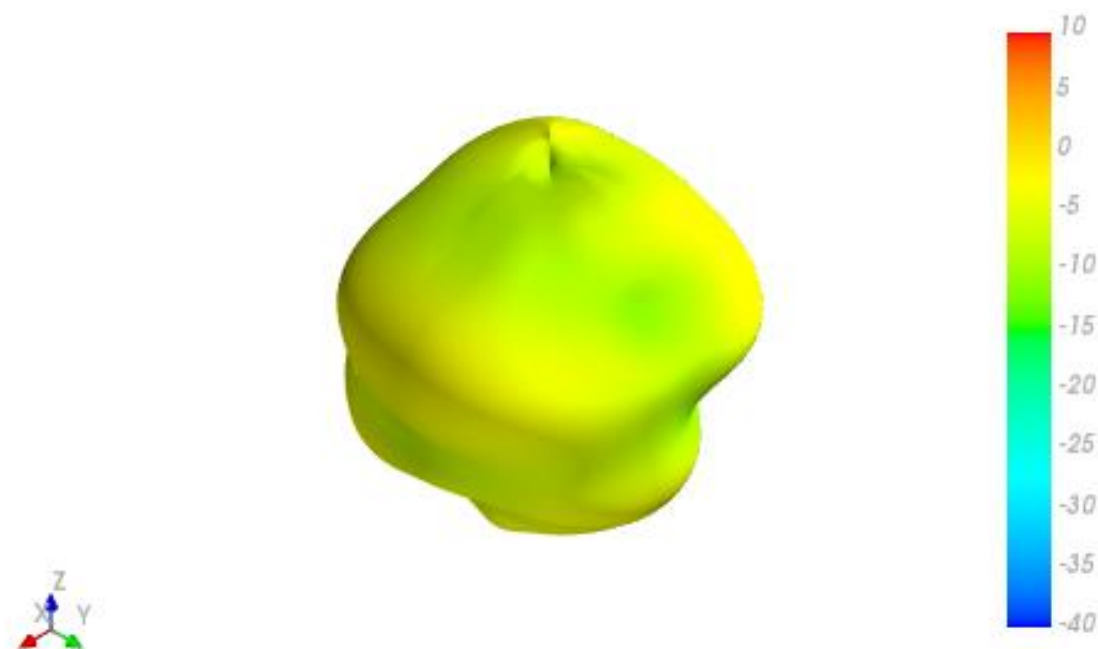


### 4.3 Test Setup – 30\*30cm Ground Plane

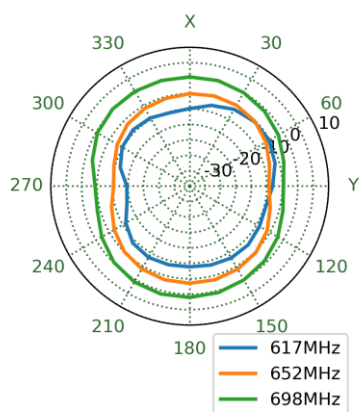


## 4.2 Cellular 3D and 2D Radiation Patterns

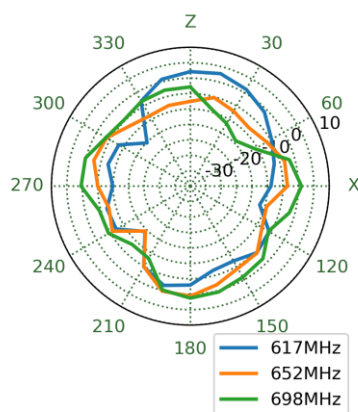
652MHz



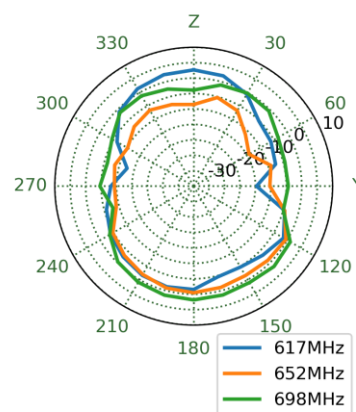
XY Plane



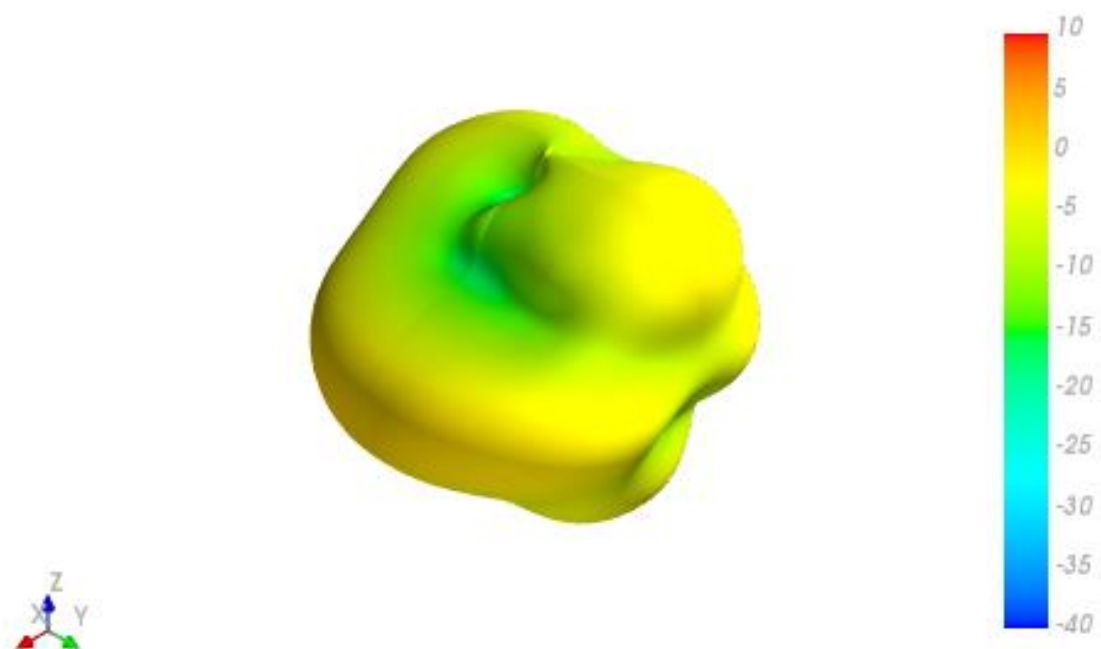
XZ Plane



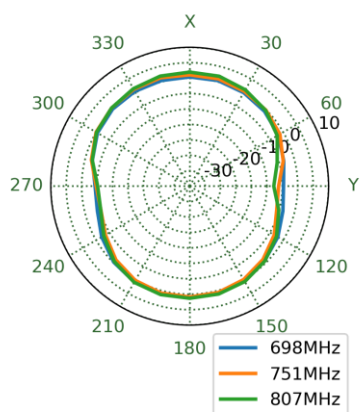
YZ Plane



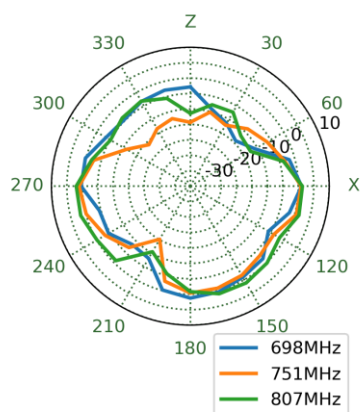
# 751MHz



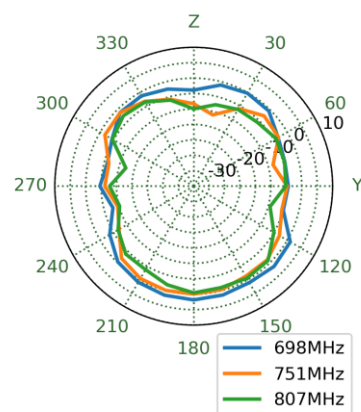
XY Plane



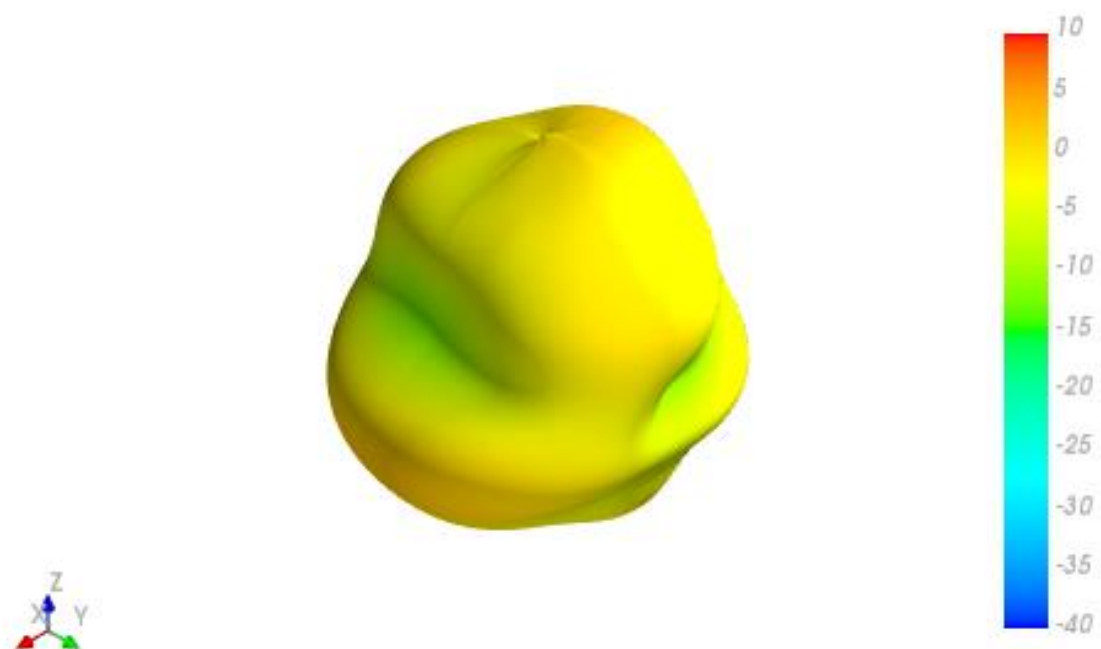
XZ Plane



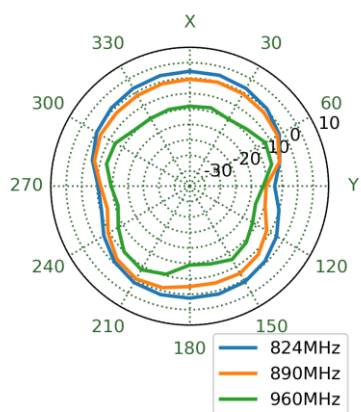
YZ Plane



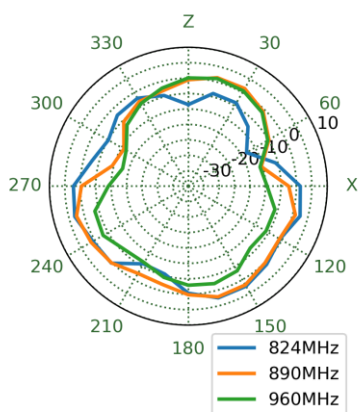
# 890MHz



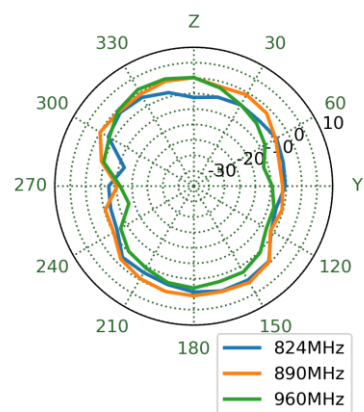
XY Plane



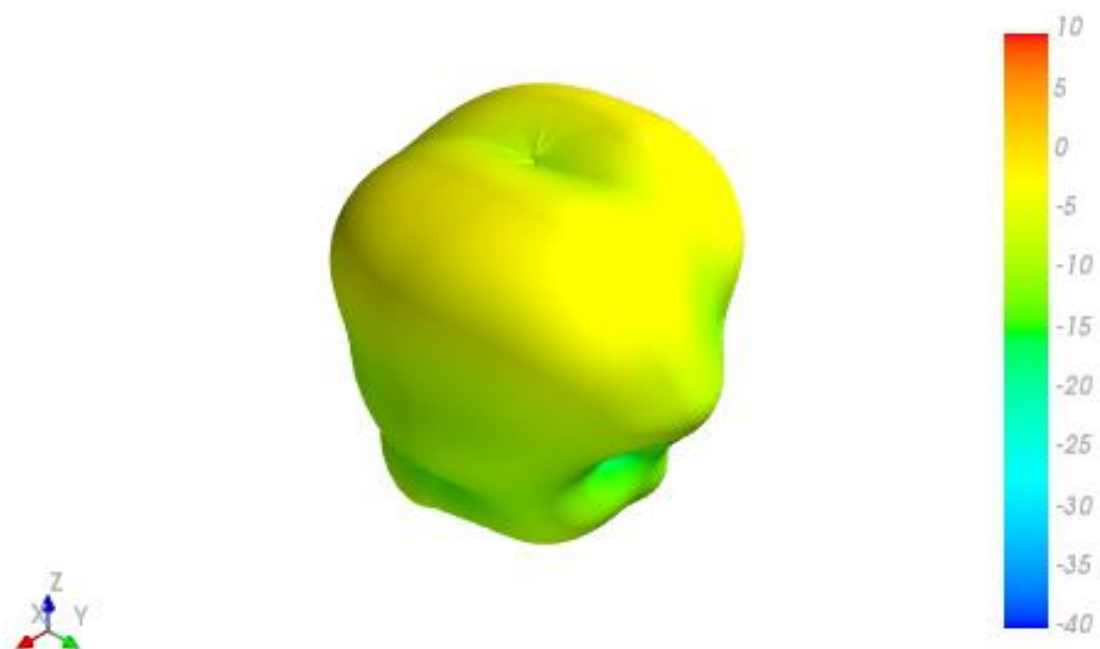
XZ Plane



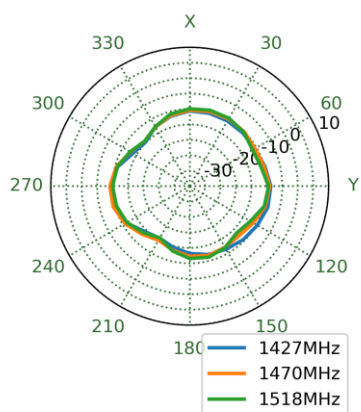
YZ Plane



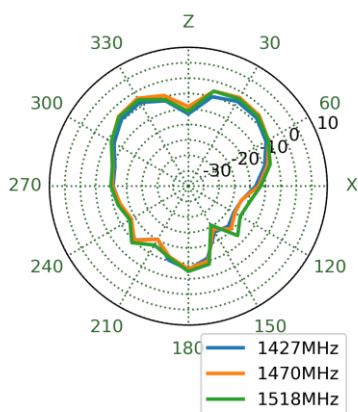
1470MHz



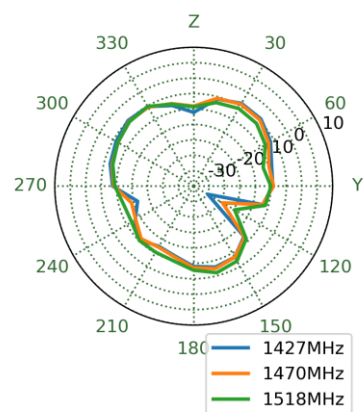
XY Plane



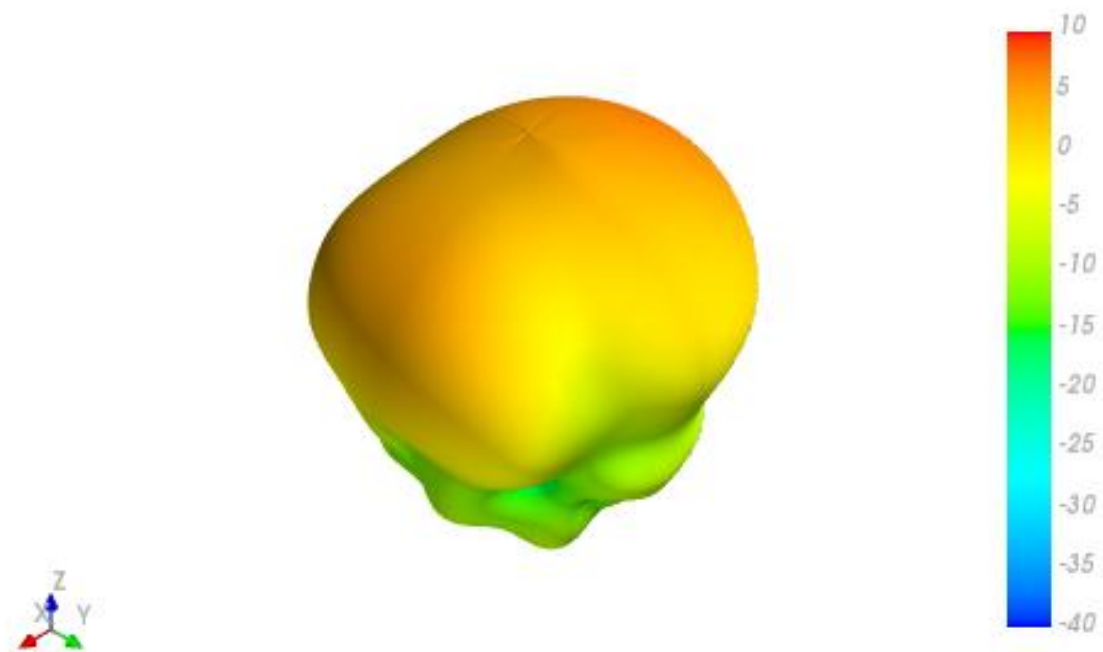
XZ Plane



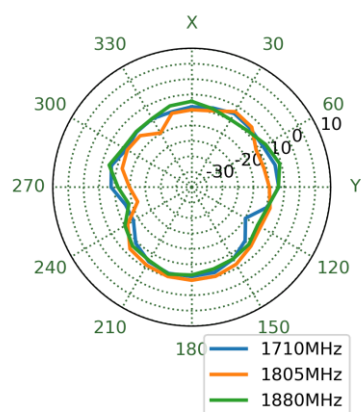
YZ Plane



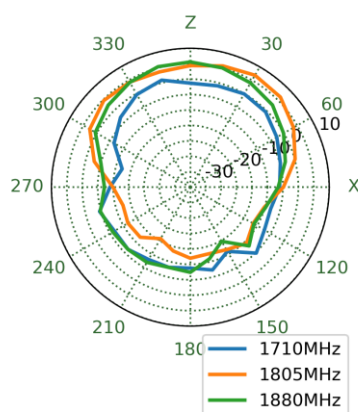
1805MHz



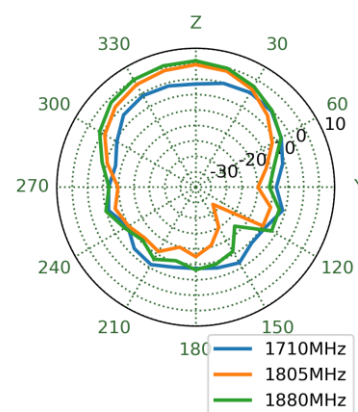
XY Plane



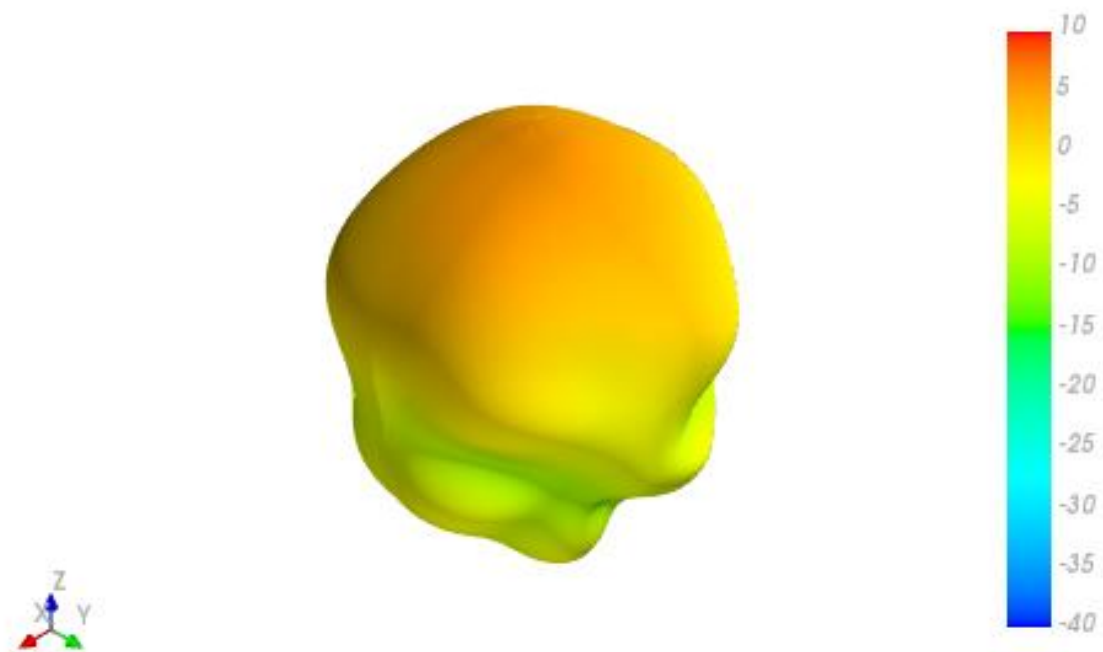
XZ Plane



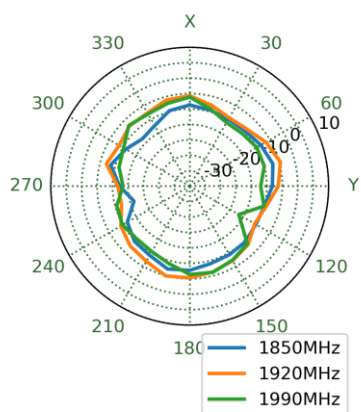
YZ Plane



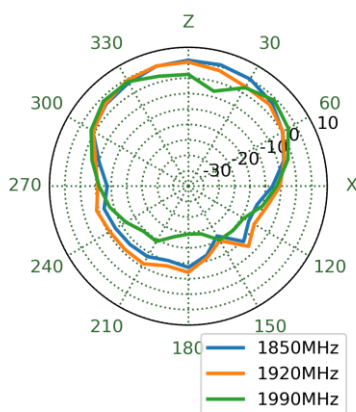
# 1920MHz



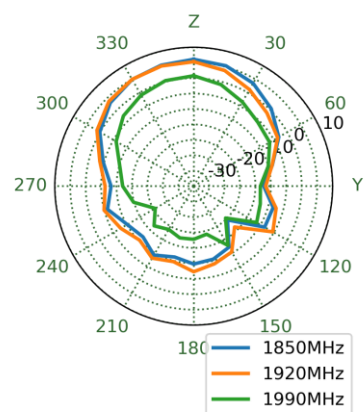
XY Plane



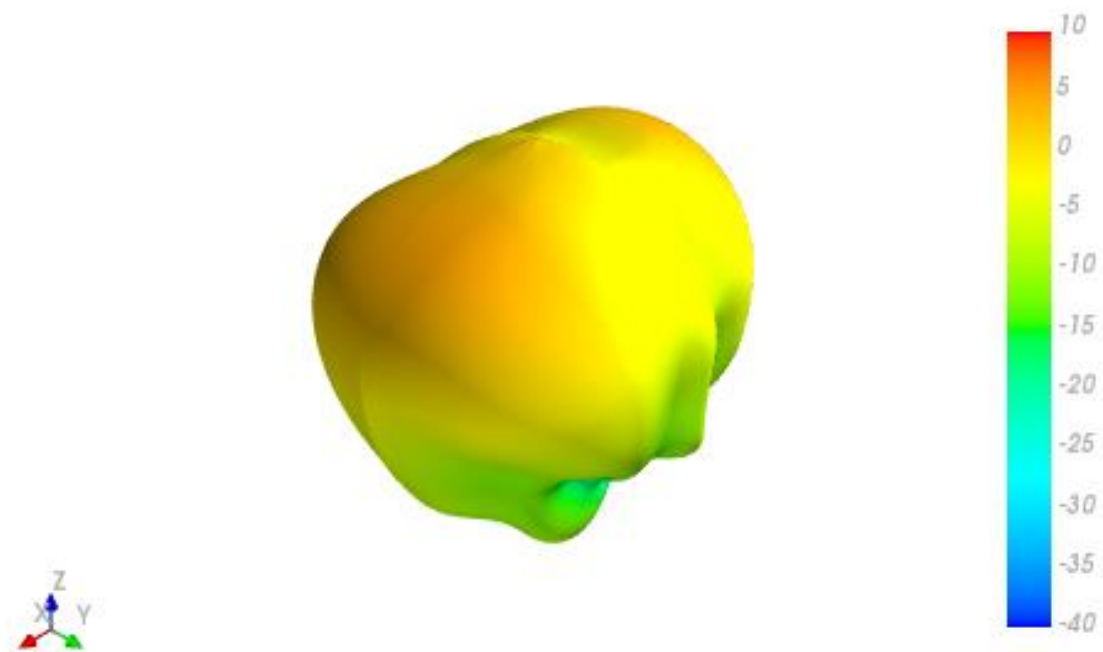
XZ Plane



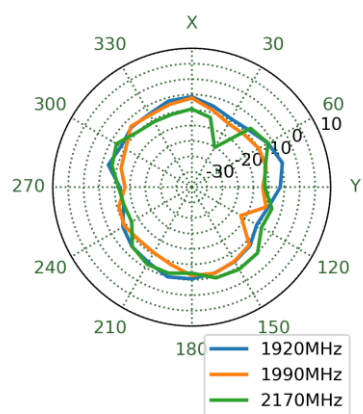
YZ Plane



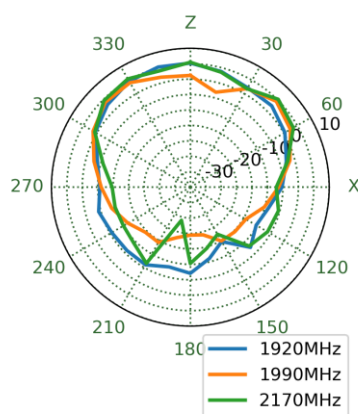
# 1990MHz



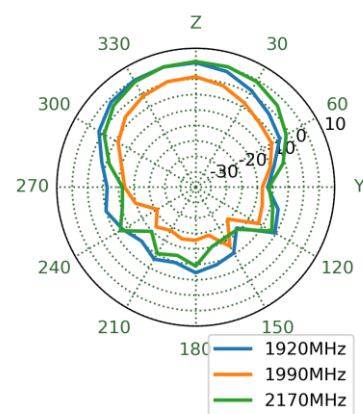
XY Plane



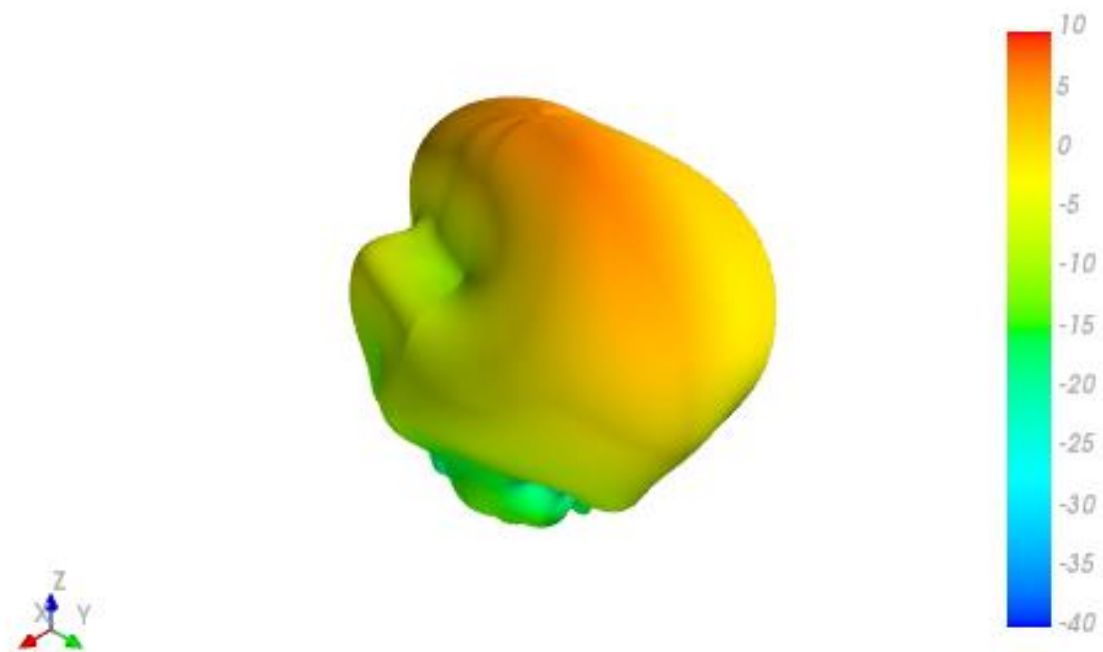
XZ Plane



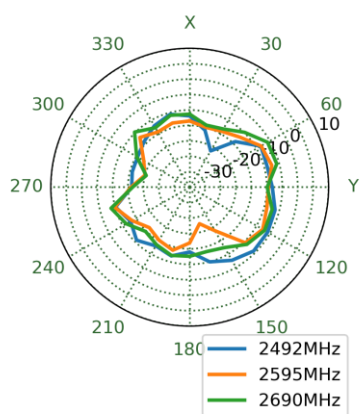
YZ Plane



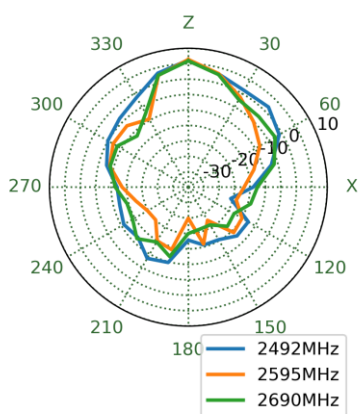
## 2595MHz



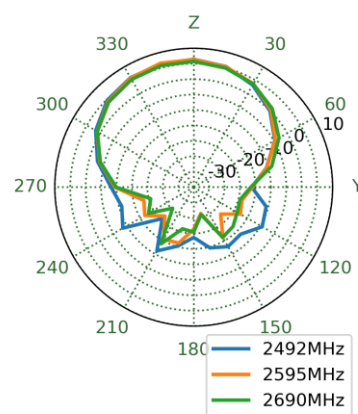
XY Plane



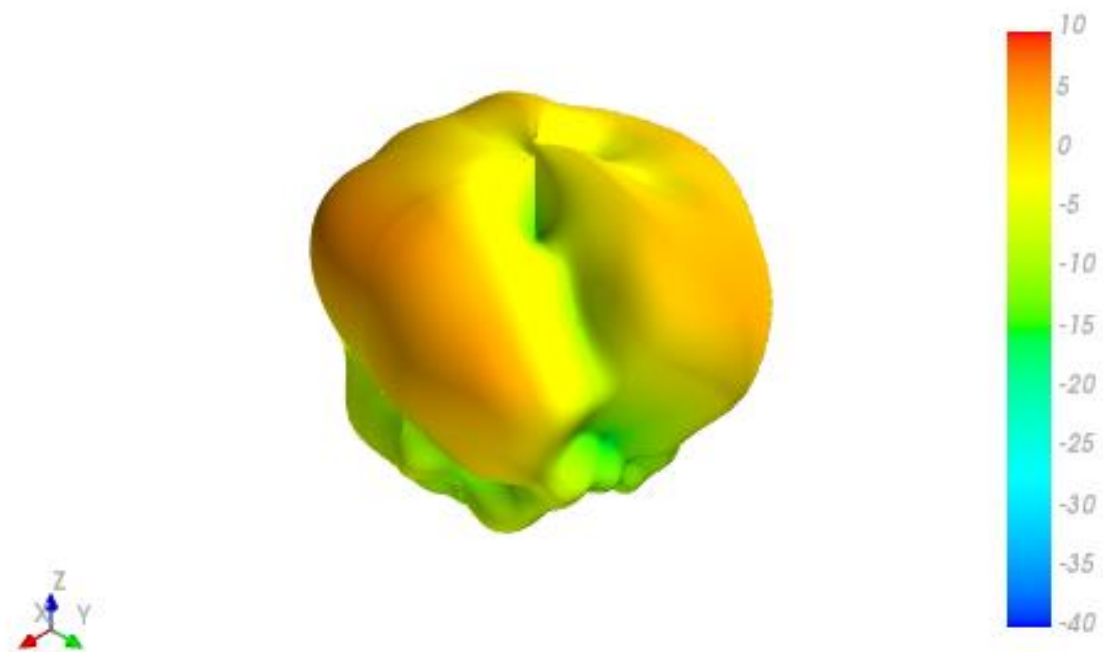
XZ Plane



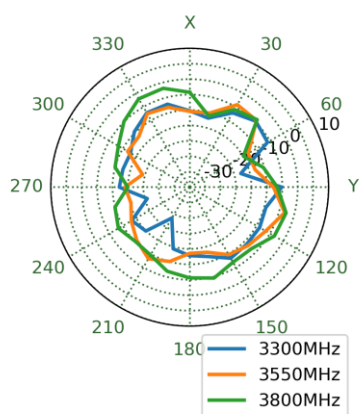
YZ Plane



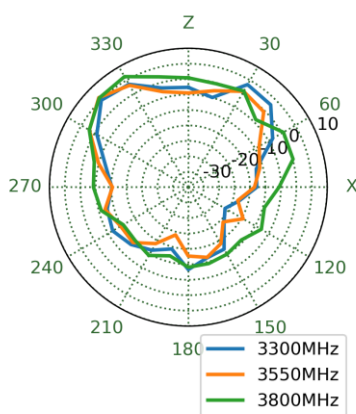
## 3550MHz



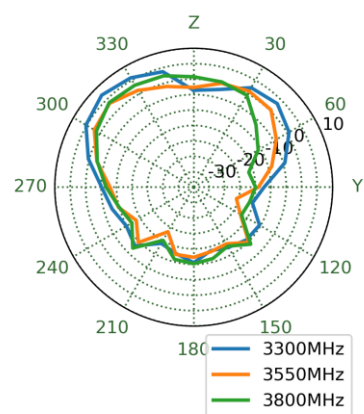
XY Plane



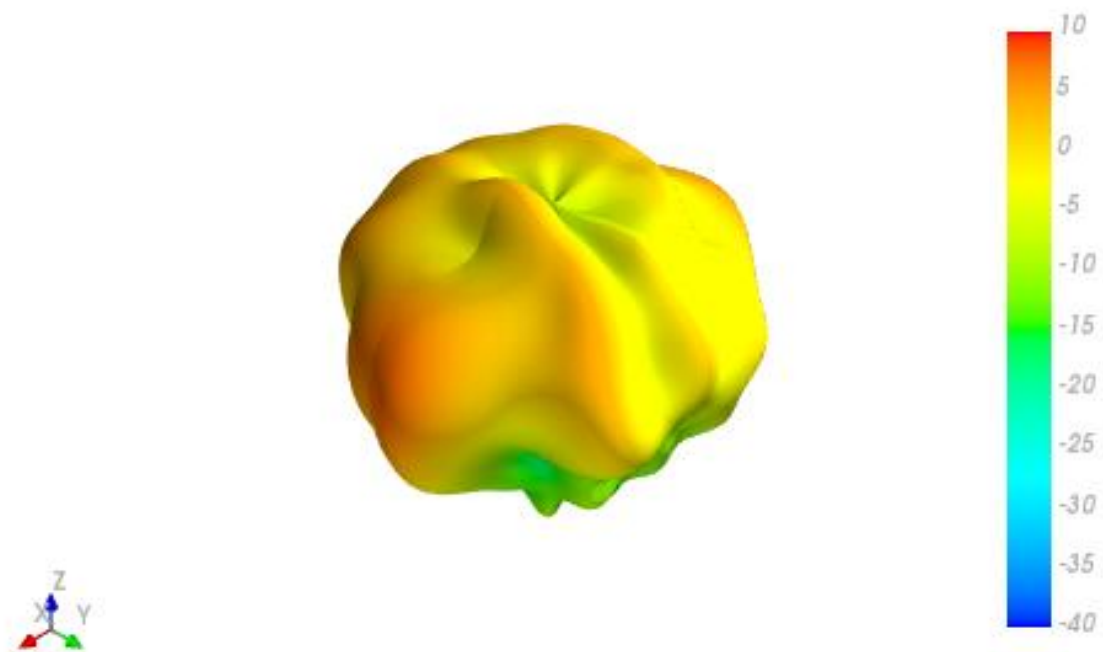
XZ Plane



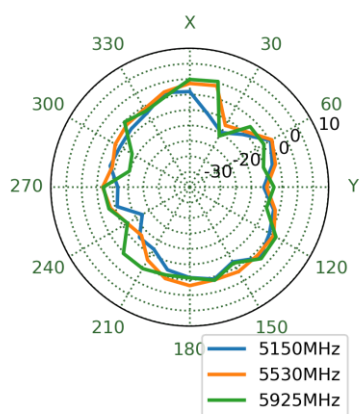
YZ Plane



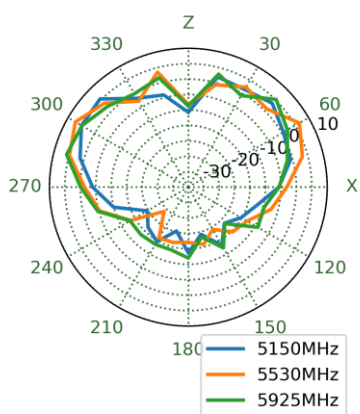
# 5530MHz



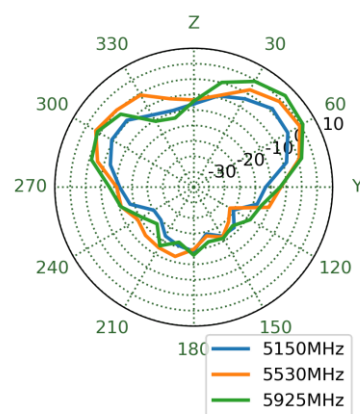
XY Plane



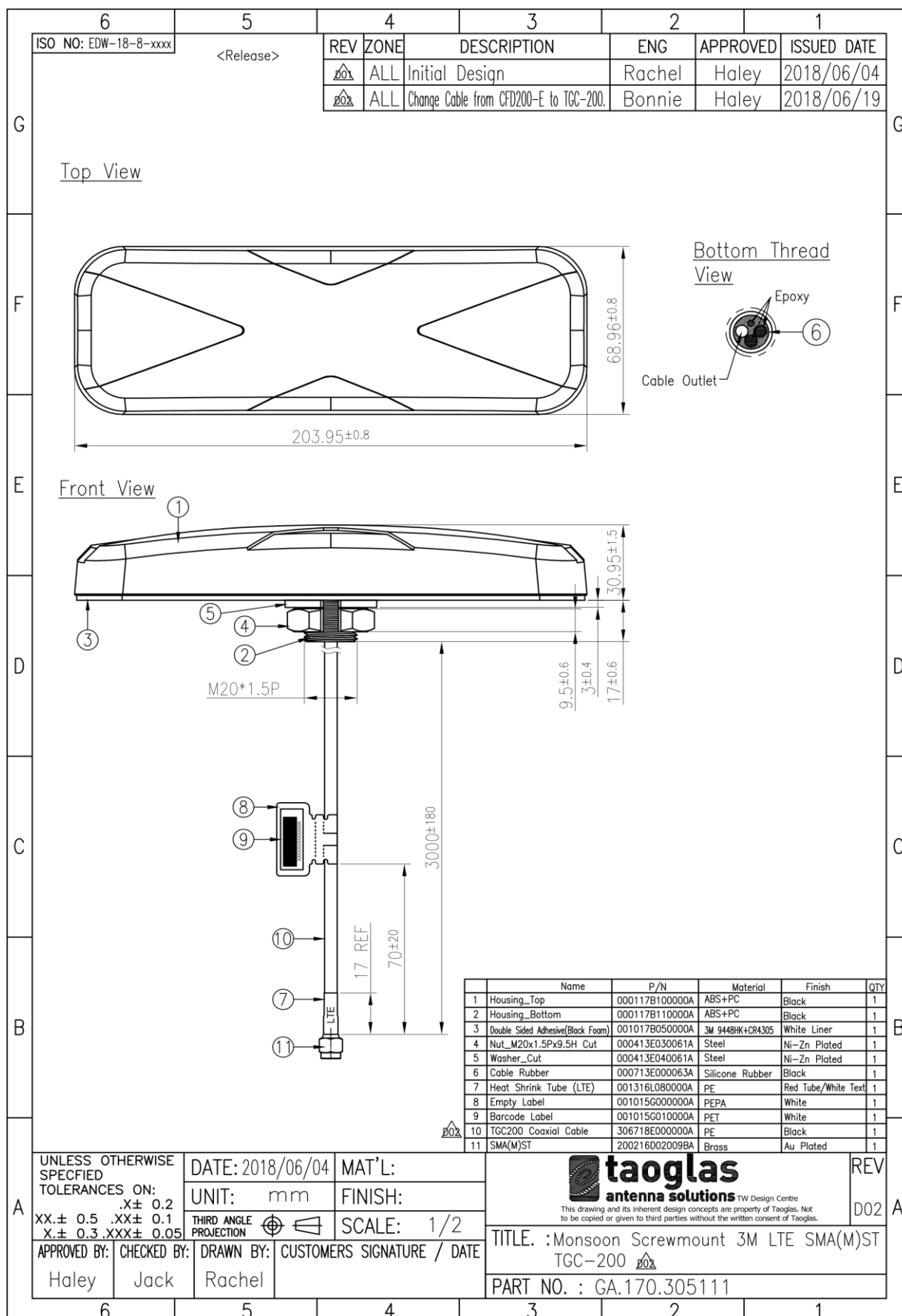
XZ Plane



YZ Plane



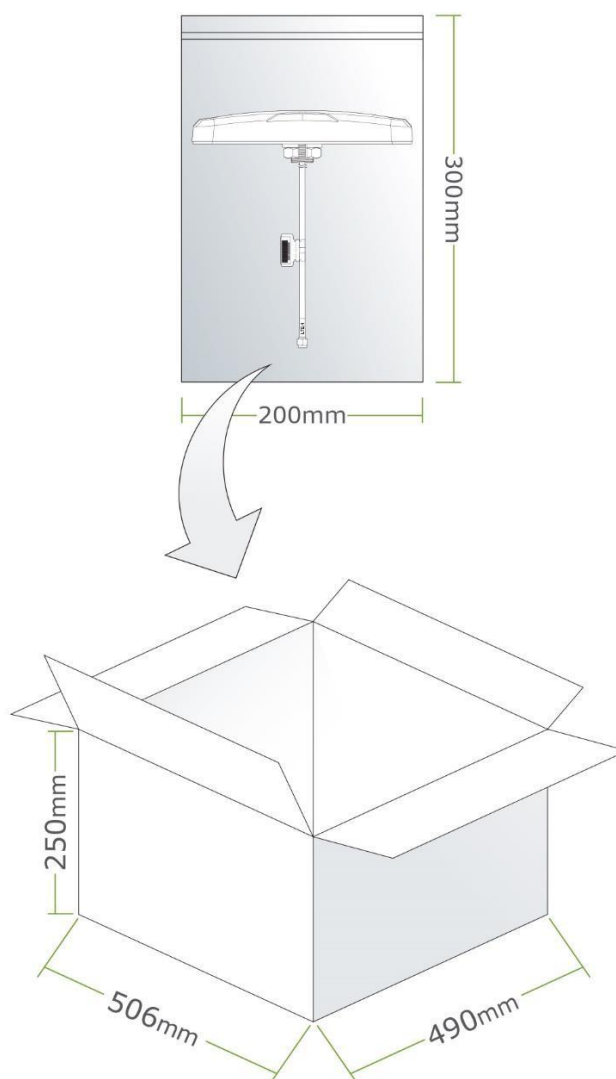
## 5. Mechanical Drawing (Units: mm)



## 6. Packaging

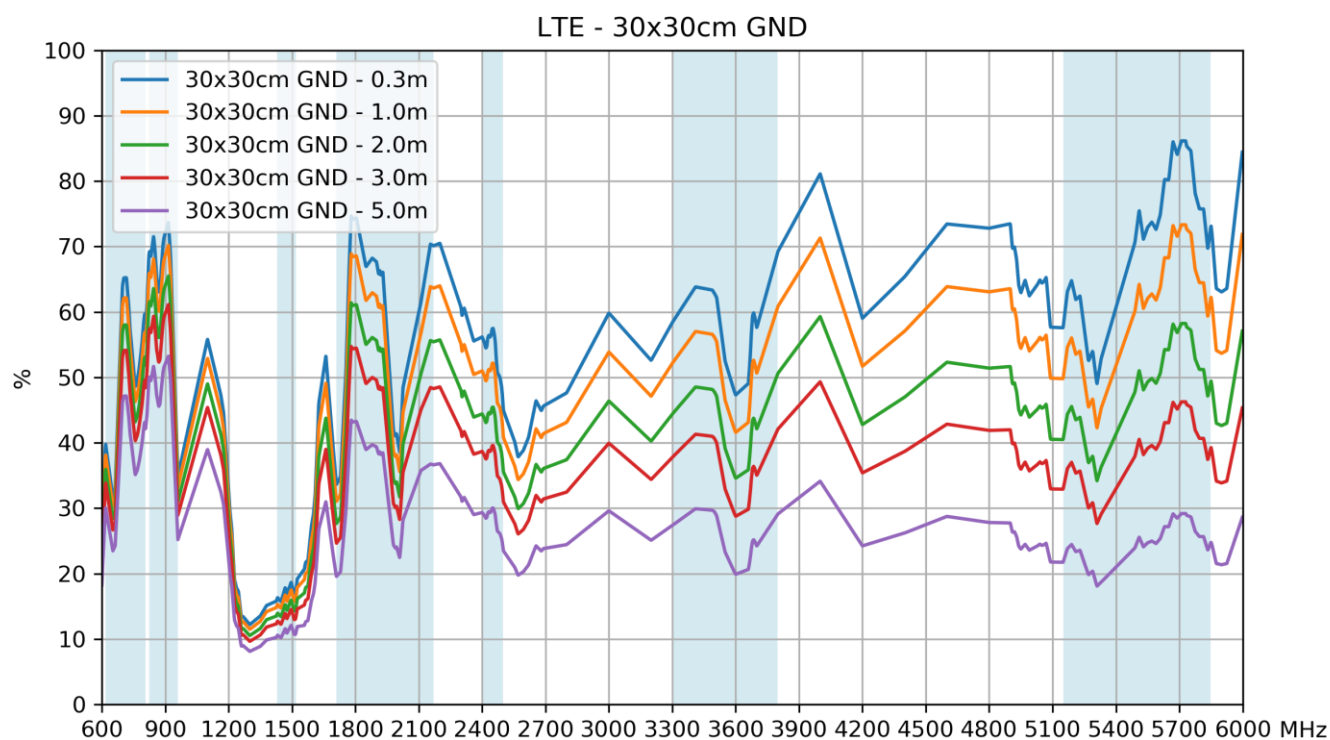
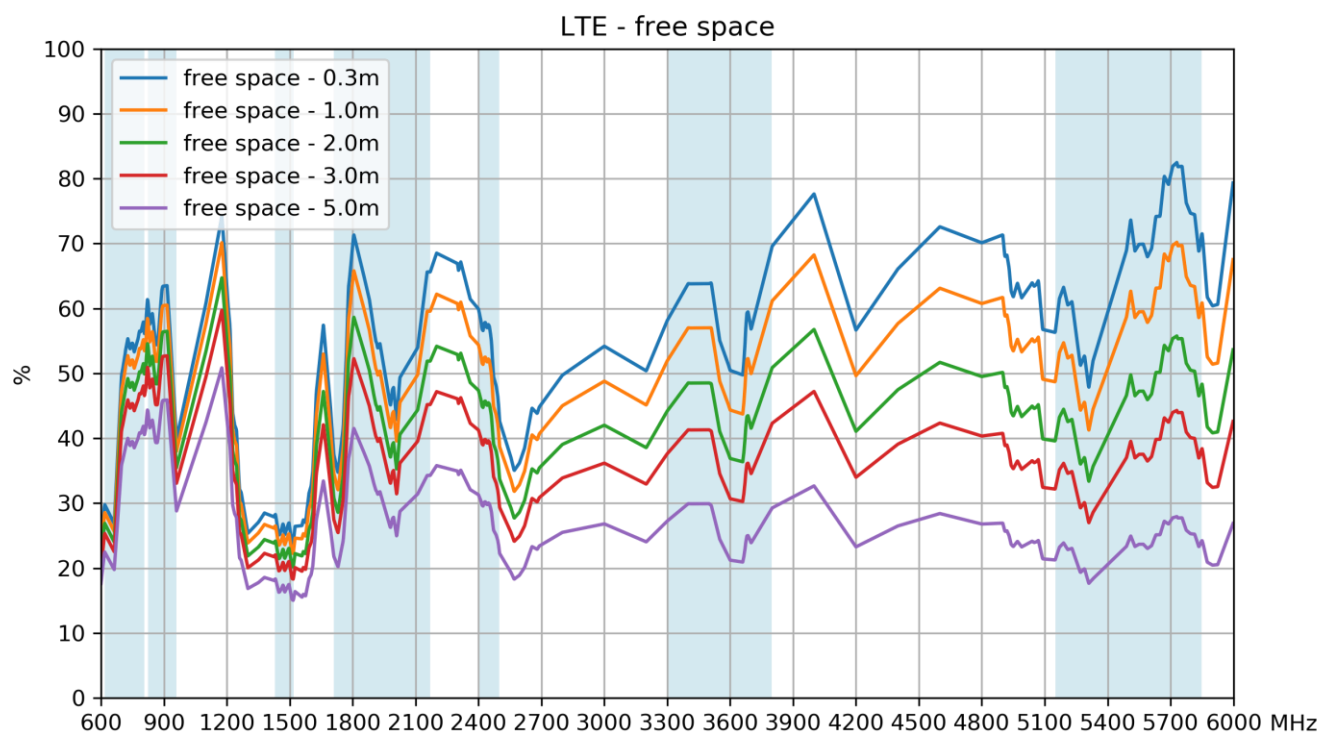
1pc GA.170.305111 per PE Bag  
PE Bag Dimensions - 300\*200mm  
Weight - 410g

18 pcs GA.170.305111 per Carton  
Box Dimensions - 506\*490\*250mm  
Weight - 7.3Kg

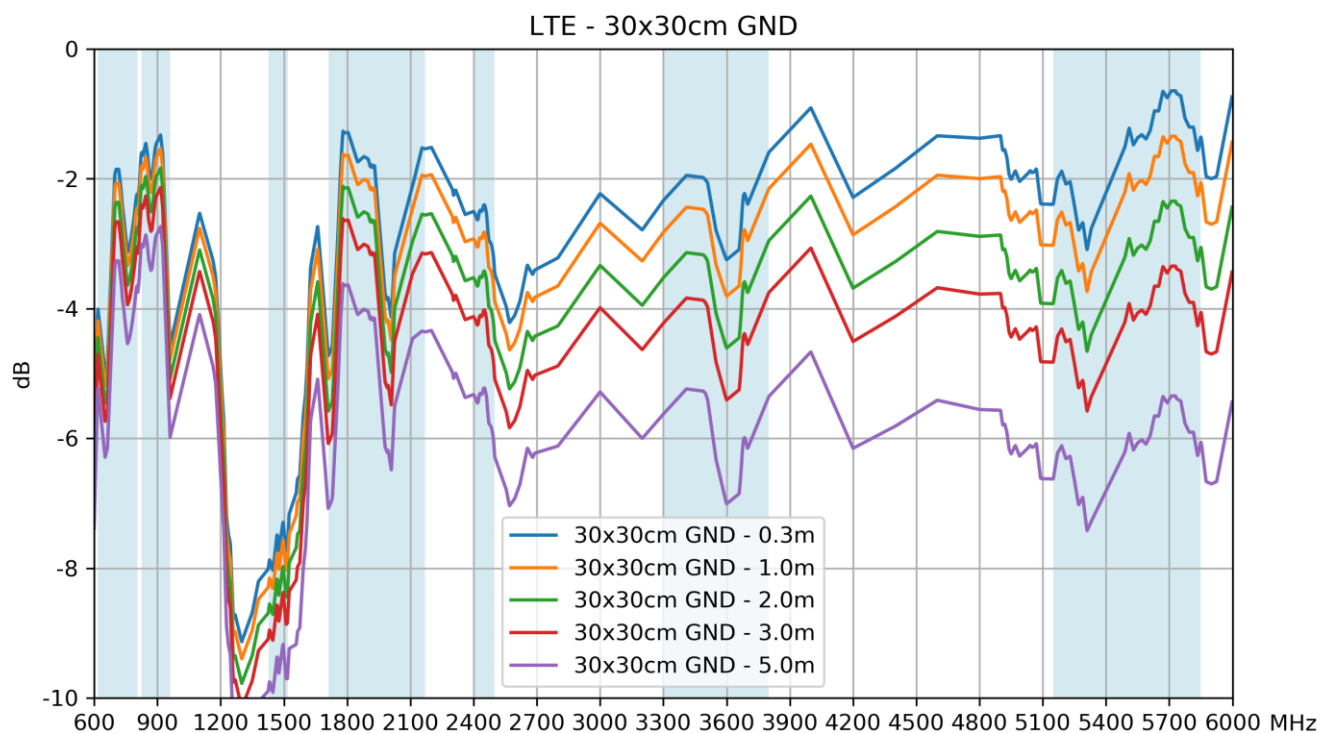
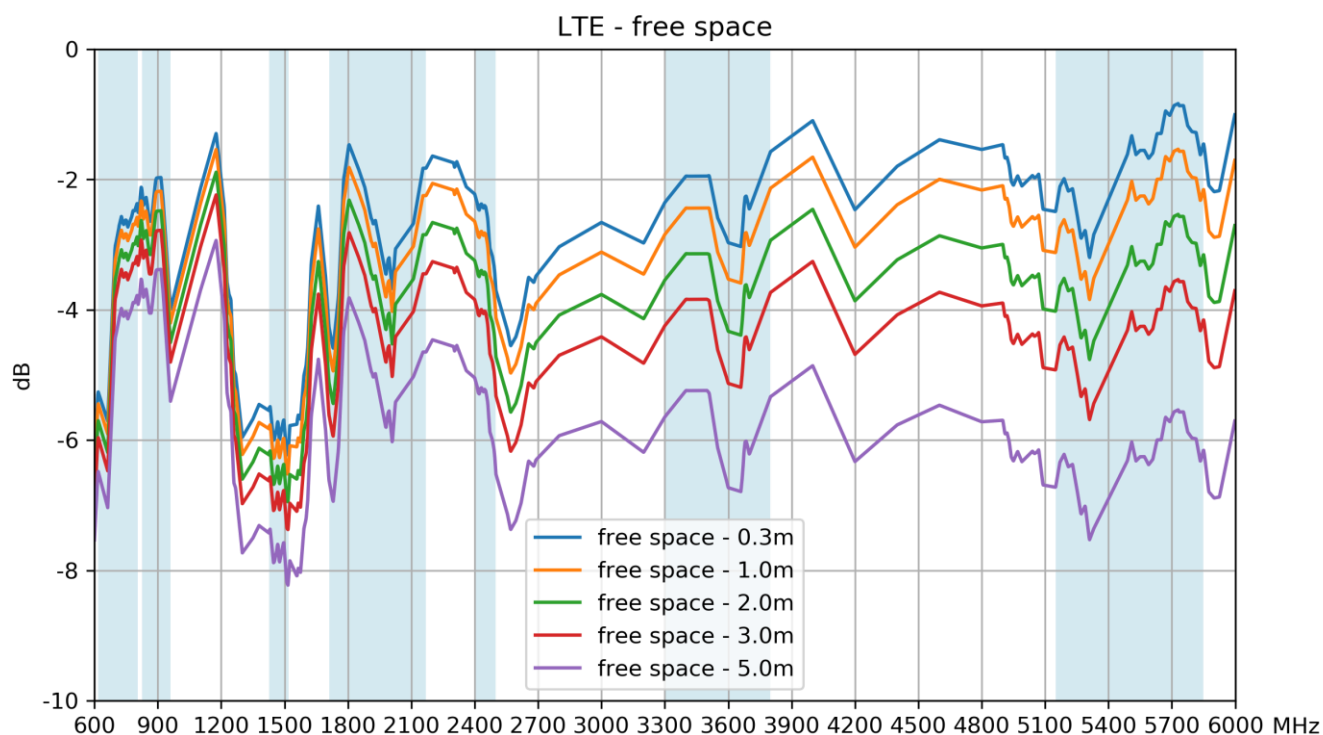


## 7. Application Note

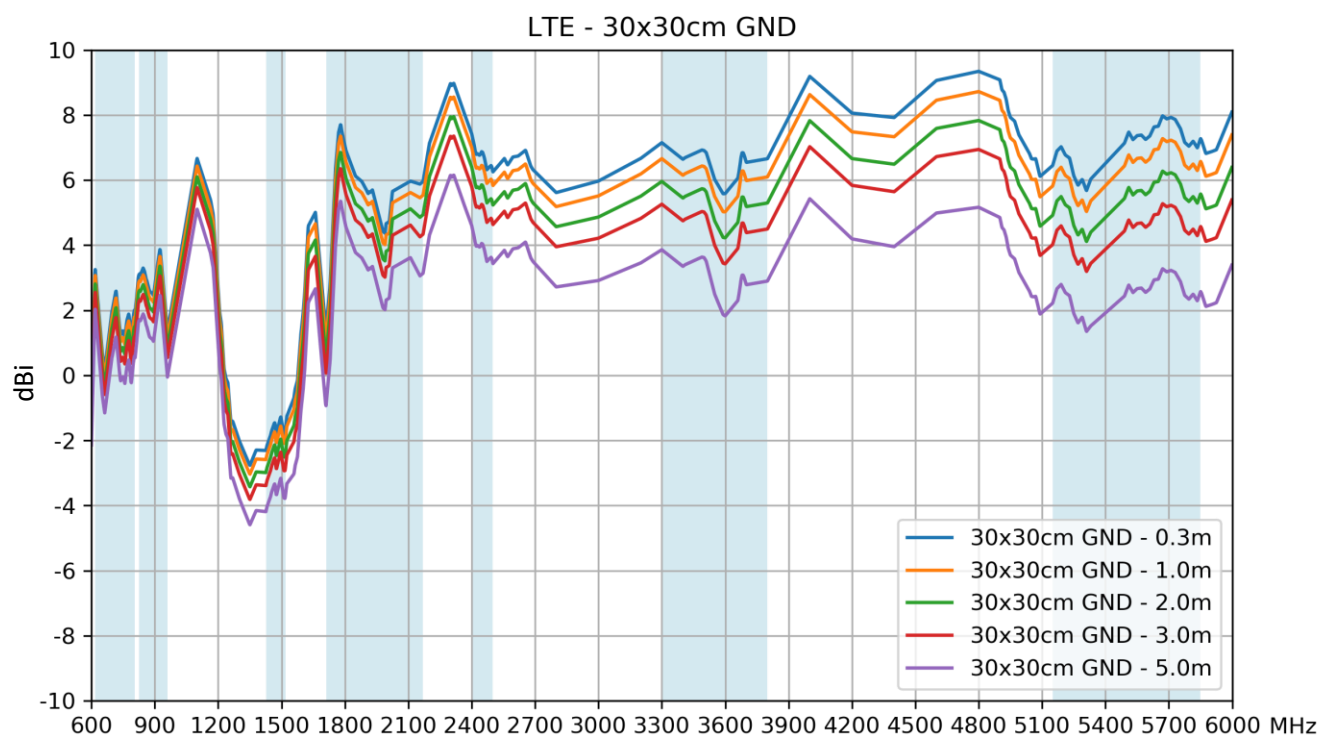
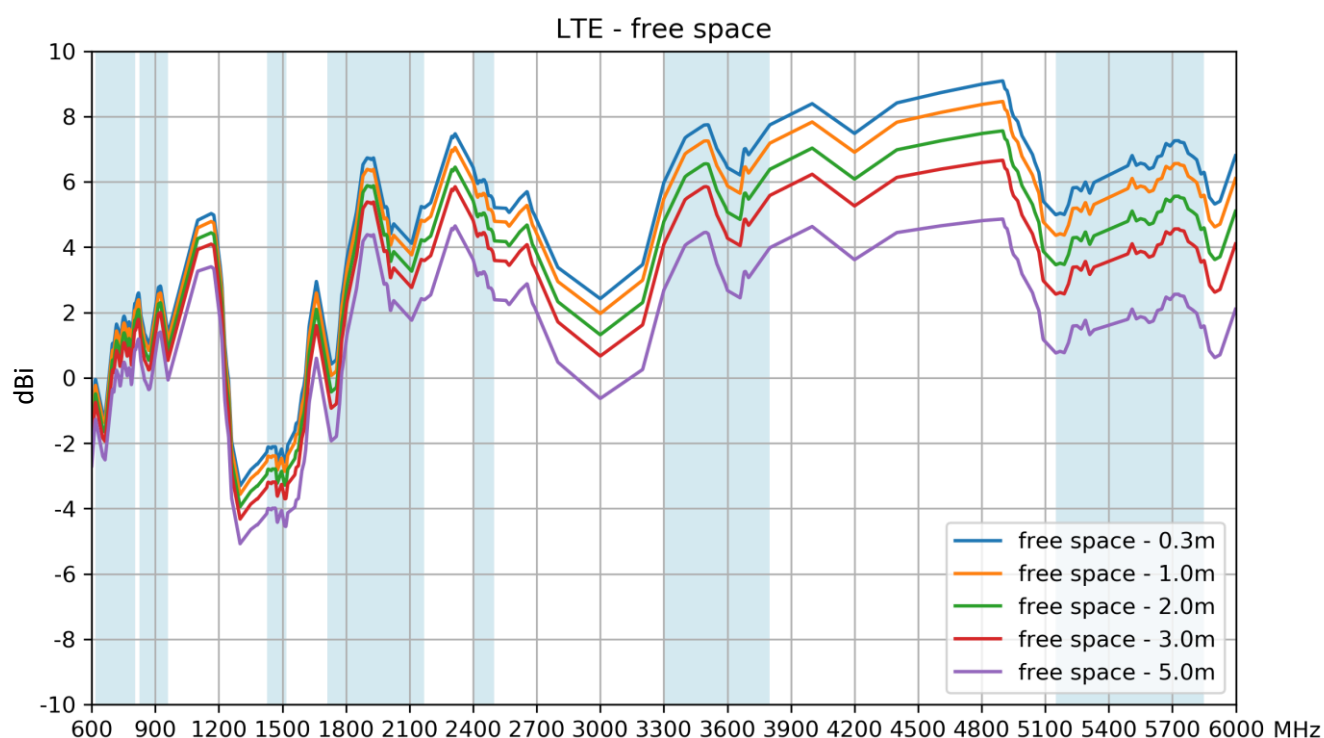
### 7.1 Efficiency



## 7.2 Average Gain



## 7.3 Peak Gain



## Changelog for the datasheet

### SPE-18-8-073 – GA.170.305111

#### Revision: C (Current Version)

|                  |                                   |
|------------------|-----------------------------------|
| Date:            | 2023-07-11                        |
| Changes:         | Updated electrical specifications |
| Changes Made by: | Cesar Sousa                       |

#### Previous Revisions

##### Revision: B

|                  |                            |
|------------------|----------------------------|
| Date:            | 2020-02-11                 |
| Changes:         | Updated to include 5G data |
| Changes Made by: | Jack Conroy                |

##### Revision: A (Original First Release)

|         |             |
|---------|-------------|
| Date:   | 2018-08-01  |
| Notes:  |             |
| Author: | Jack Conroy |



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