



TAOGLAS®



Datasheet

Phoenix

Part No:
GSA.8827.A.101111

Description:

Phoenix Wideband Cellular 5G/4G I-Bar Antenna
For First-Tier Automotive Applications

Features:

5G/4G Adhesive Mount Antenna
Covering Sub 6GHz 5G NR Bands
Covering Worldwide 5G Bands
3G/2G Backward compatible
Low profile for easy installation
Cable: 1m RG-174
Connector: SMA(M)
Dimensions: 105mm*30*7.7mm
RoHS & REACH Compliant

| | |
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1. Introduction



The GSA.8827 Phoenix Ultra-Wideband I-Bar antenna is a robust high efficiency cellular antenna for use with all 5G/4G cellular modules worldwide.

Its slim-line design allows for covert and convenient installation in automotive vehicles, its omnidirectional gain across all bands ensures constant reception and transmission. GSA.8827 is manufactured and tested in a TS16949 first tier automotive approved facility, and it has gone through full PPAP design, reliability and quality audits.

Typical Applications:

- Telematics
- Transportation
- Gateways and Routers

With its unique ultra-wide band dipole design, the Phoenix has exceptional industry performance characteristics considering its very low profile at 7.7mm and has a compact size of only 105mm*30mm.

This antenna is designed to be mounted on glass or plastic (not on metal). It comes with strong 3M double-sided adhesive for a permanent and secure fix to your vehicle interior. The antenna is UV Resistant.

Customized cable length and connectors are available, contact your regional Taoglas Customer Support Team for more information.

2. Specifications

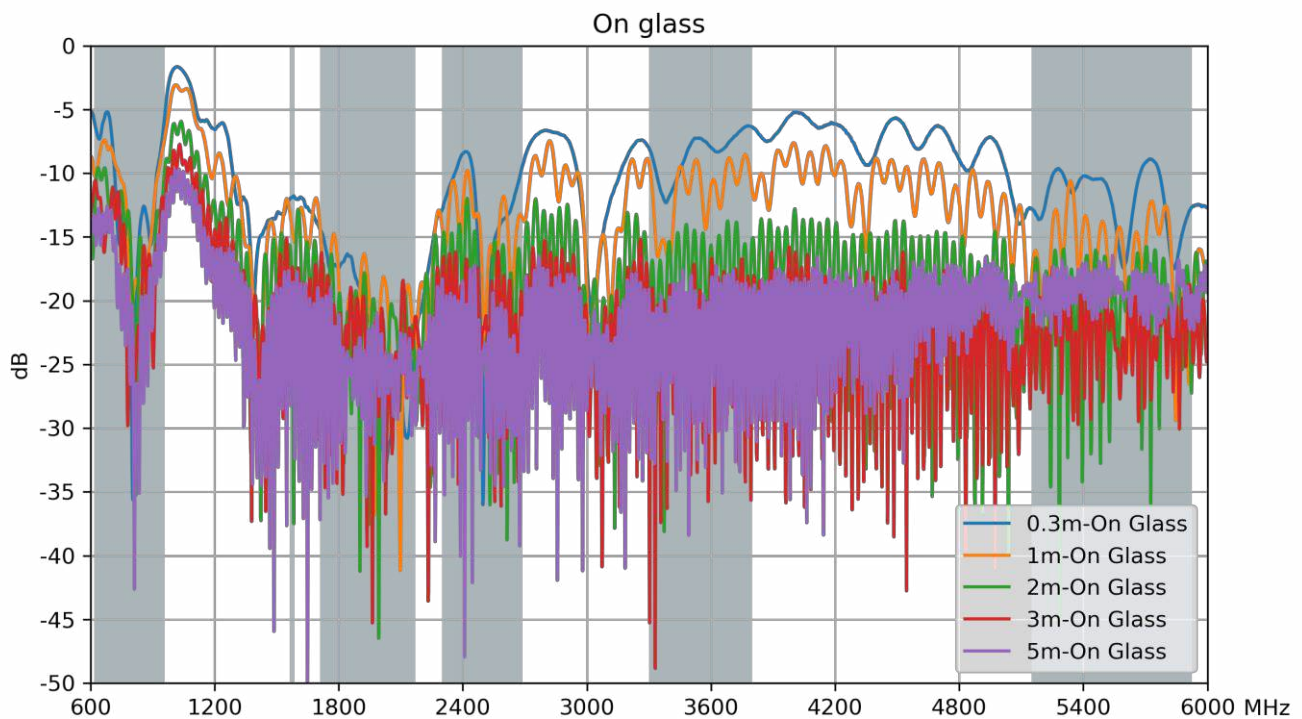
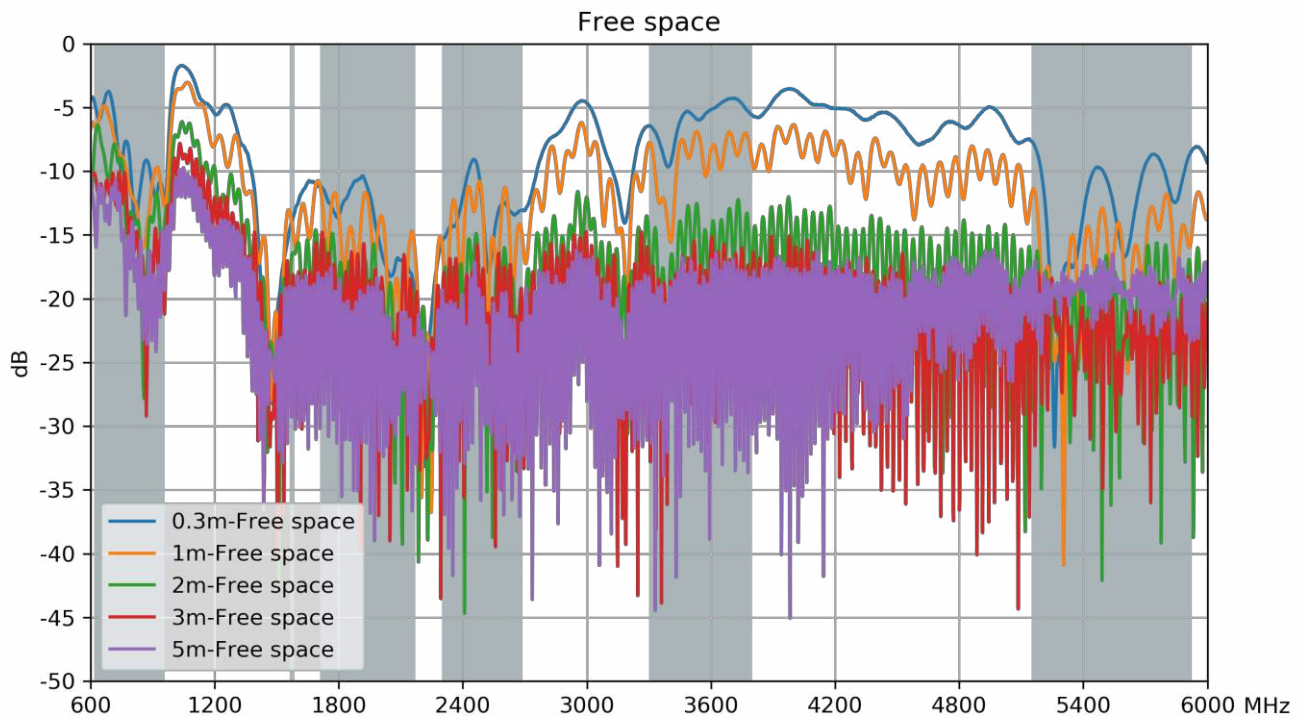
| 5G/4G Electrical | | | | | | | | | |
|--|-----------------|--------------|----------------|-------------------|-----------------|-----------|-----------------|--------------|-------------------|
| Band | Frequency (MHz) | Ground Plane | Efficiency (%) | Average Gain (dB) | Peak Gain (dBi) | Impedance | Max Power Input | Polarization | Radiation Pattern |
| 5G/4G Band 71 | 617~698 | Free space | 20.8 | -6.8 | -1.1 | 50Ω | 10W | Linear | Omni |
| | | On Glass | 28.3 | -5.5 | 0.5 | | | | |
| 4G/3G Band 12,13,14,17,28,29 | 698~806 | Free space | 37.2 | -4.3 | 1.8 | | | | |
| | | On Glass | 47.7 | -3.2 | 1.8 | | | | |
| 4G/3G Band 5,8,18,19,20,26,27 | 824~960 | Free space | 53.2 | -2.7 | 2.8 | | | | |
| | | On Glass | 48.7 | -3.1 | 2.7 | | | | |
| 5G/4G Band 21,32,74,75,76 | 1427~1518 | Free space | 44.8 | -2.4 | 1.6 | | | | |
| | | On Glass | 53 | -2 | 2.4 | | | | |
| 4G/3G Band 1,2,3,4,9,23,25,35,39,66 | 1710~2200 | Free space | 58 | -2.3 | 3 | | | | |
| | | On Glass | 57.5 | -3.4 | 5.9 | | | | |
| 4G/3G Band 7,30,38,40,41 | 2300~2690 | Free space | 37.5 | -4.3 | 4.7 | | | | |
| | | On Glass | 32.4 | -4.9 | 7.3 | | | | |
| 5G NR Band 22,42,48,77,78,79 | 3300~4200 | Free space | 24.6 | -4.8 | 2.3 | | | | |
| | | On Glass | 30.2 | -5.2 | 2.4 | | | | |

| Mechanical | |
|-------------------|----------------------------|
| Dimensions | 105*30*7.7mm |
| Weight | 50g |
| Material | UV Resistant PC/ABS |
| Connector | SMA Male (customizable) |
| Cable | RG-174 |
| Environmental | |
| Cable Pull | 8kgf |
| Temperature Range | -40°C to 85°C |
| Humidity | Non-condensing 65°C 95% RH |
| Shock (Drop Test) | 1m drop on concrete 6 axes |

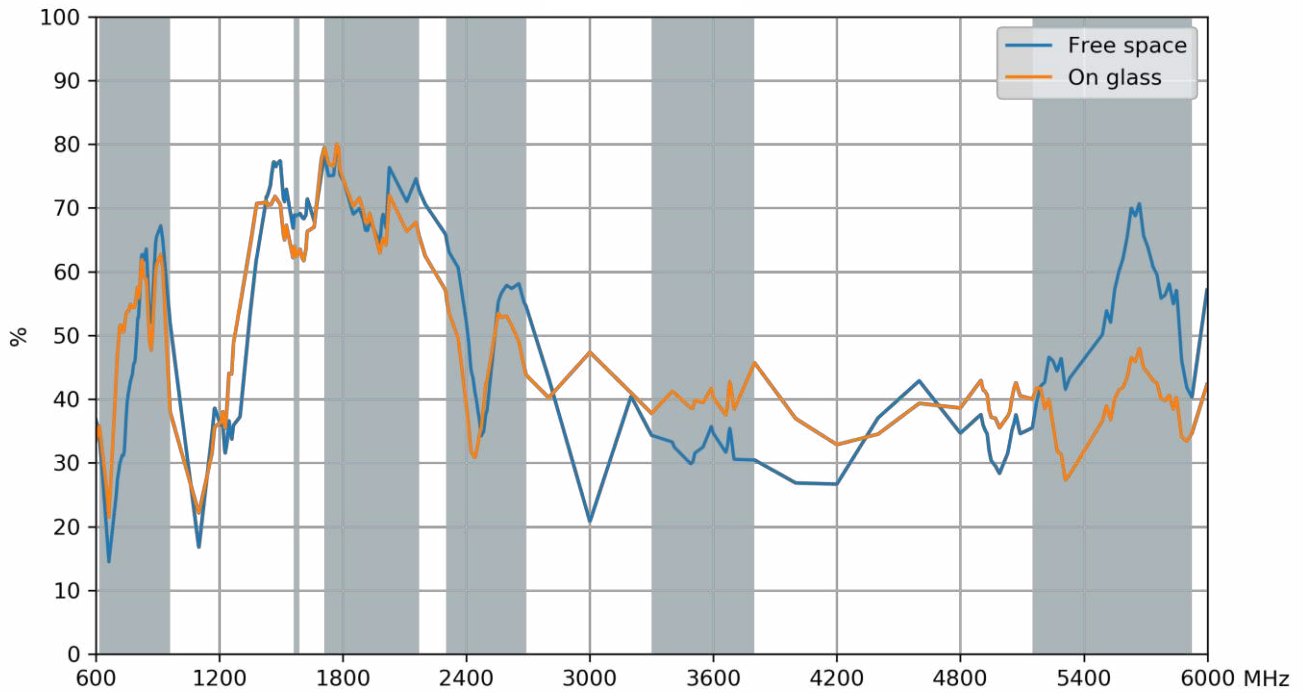
| 5G/4G Bands | | | |
|-------------|---|----------------------|---------|
| Band Number | 5GNR / FR1 / LTE / LTE-Advanced / WCDMA / HSPA / HSPA+ / TD-SCDMA | | |
| | Uplink | Downlink | Covered |
| 1 | UL: 1920 to 1980 | DL: 2110 to 2170 | ✓ |
| 2 | UL: 1850 to 1910 | DL: 1930 to 1990 | ✓ |
| 3 | UL: 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 | ✓ |
| 18 | UL: 815 to 830 | DL: 860 to 875 | ✓ |
| 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 | ✓ |
| 24 | UL: 1625.5 to 1660.5 | DL: 1525 to 1559 | ✓ |
| 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 | ✓ |
| 28 | UL: 703 to 748 | DL: 758 to 803 | ✓ |
| 29 | UL: - | DL: 717 to 728 | ✓ |
| 30 | UL: 2305 to 2315 | DL: 2350 to 2360 | ✓ |
| 31 | UL: 452.5 to 457.5 | DL: 462.5 to 467.5 | ✗ |
| 32 | UL: - | DL: 1452 to 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 | ✓ |
| 77 | | 3300 to 4200 | ✓ |
| 78 | | 3300 to 3800 | ✓ |
| 79 | | 4400 to 5000 | ✓ |

3. Antenna Characteristics

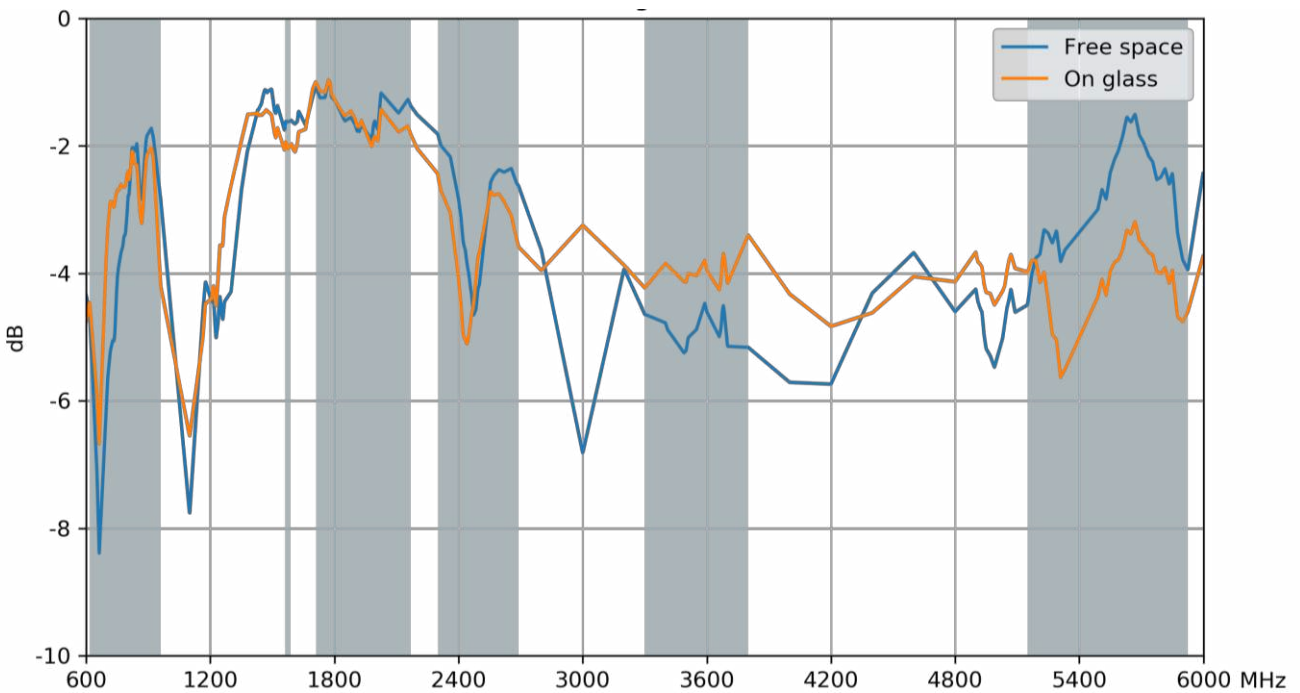
3.1 Return Loss



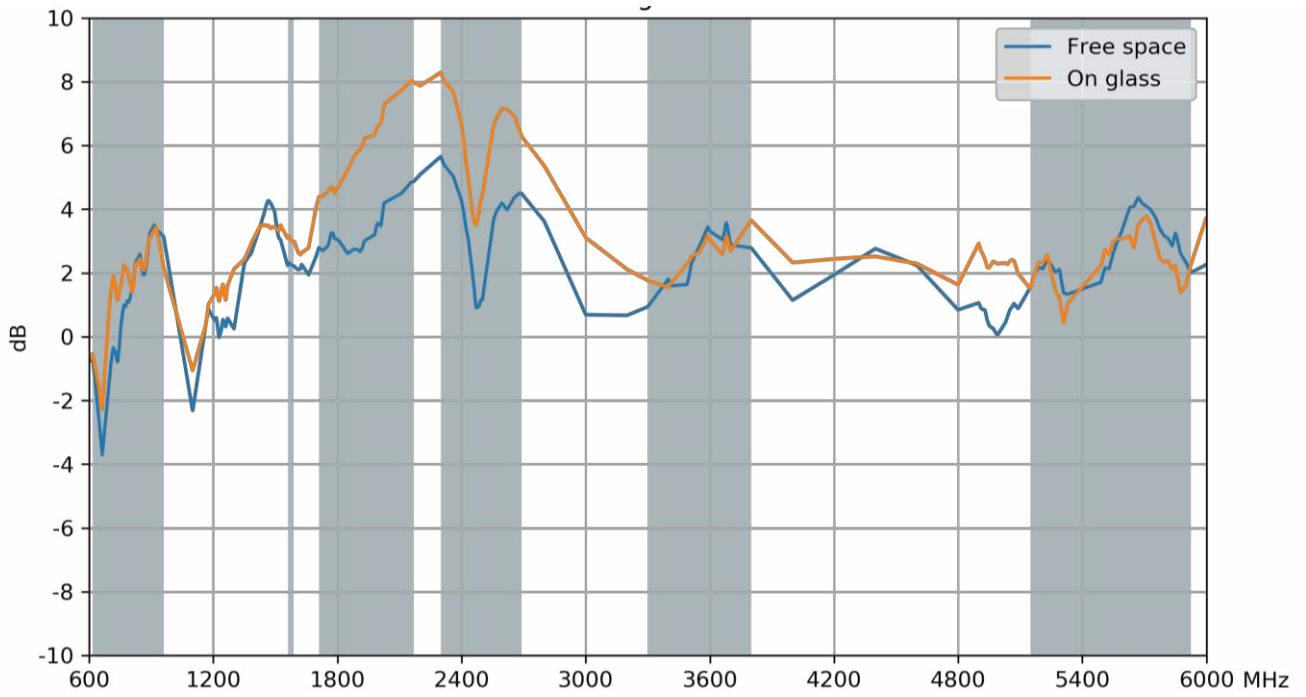
3.2 Efficiency



3.3 Average Gain

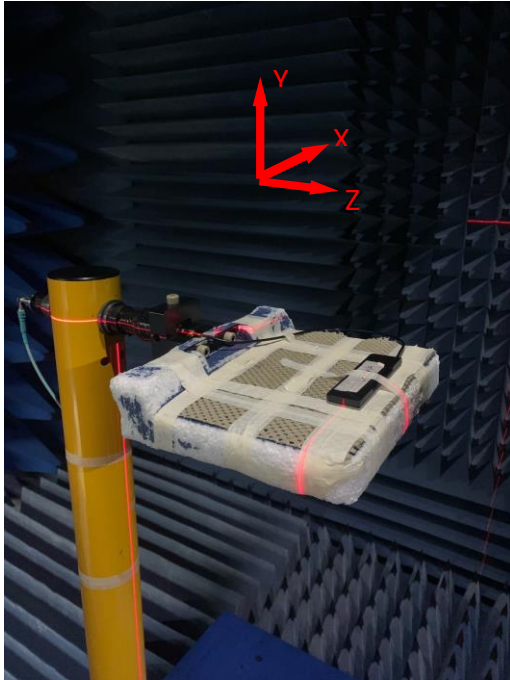


3.4 Peak Gain



4. Radiation Patterns

4.1 Test Setup



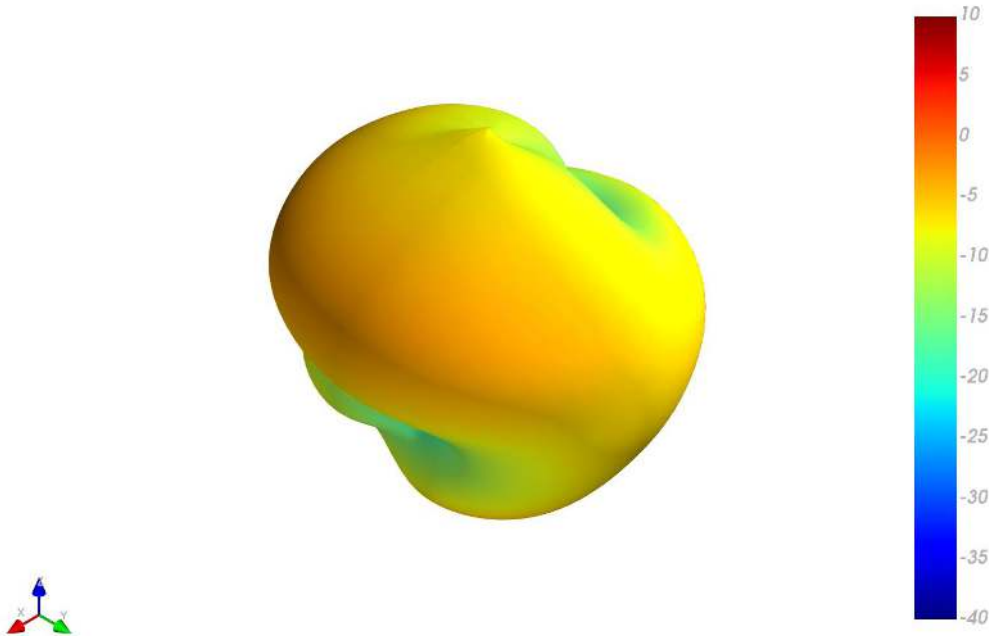
Free Space



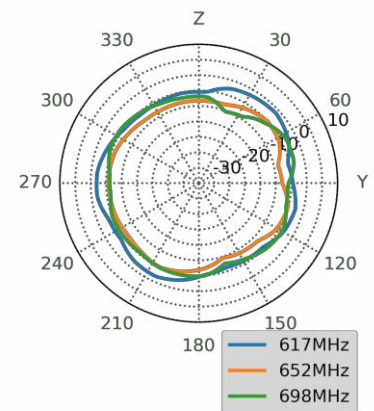
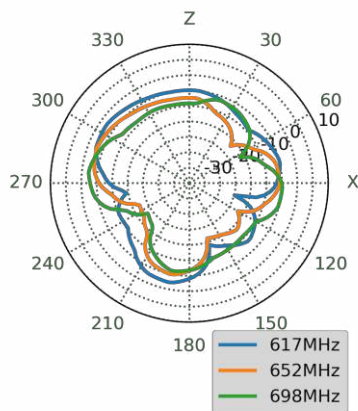
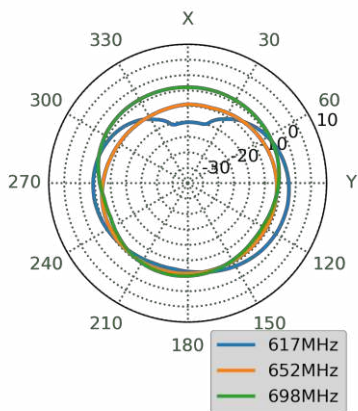
On Glass

4.2 Free Space 3D and 2D Radiation Patterns

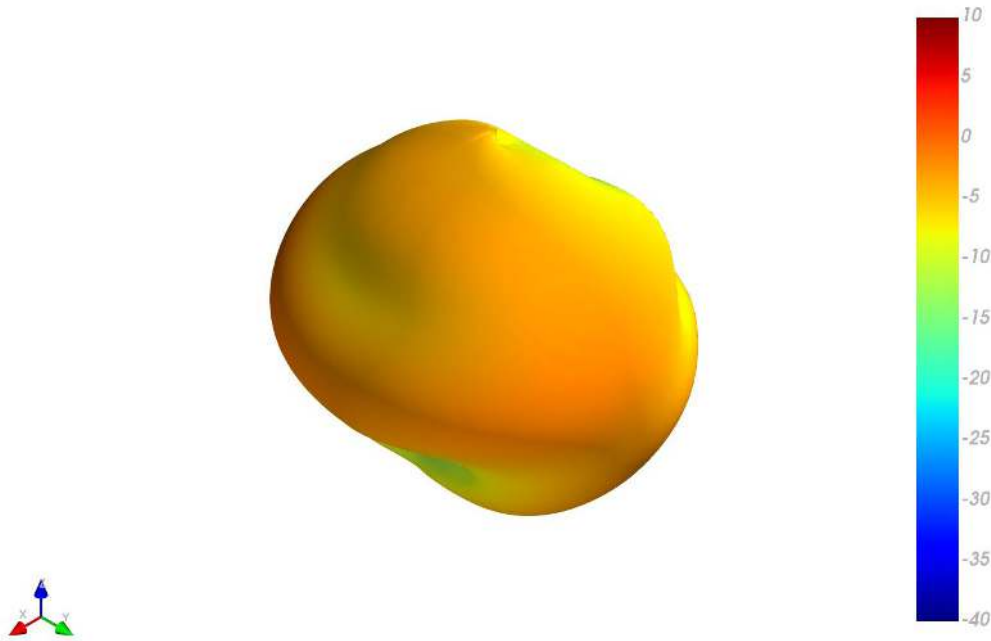
652MHz



XY Plane XZ Plane YZ Plane



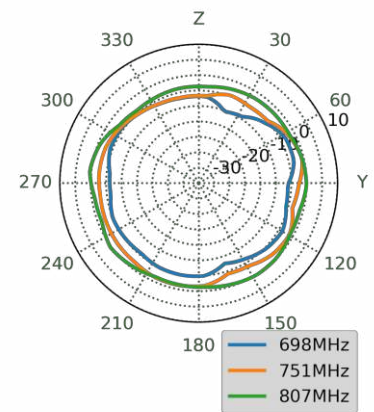
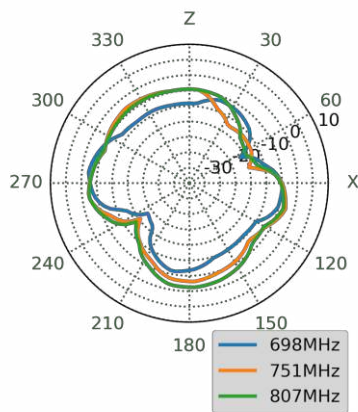
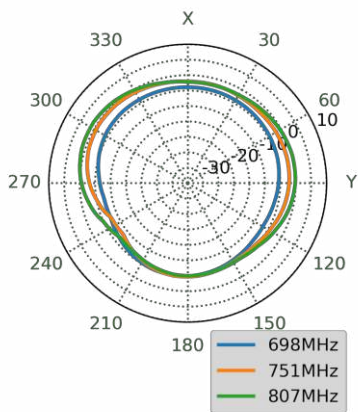
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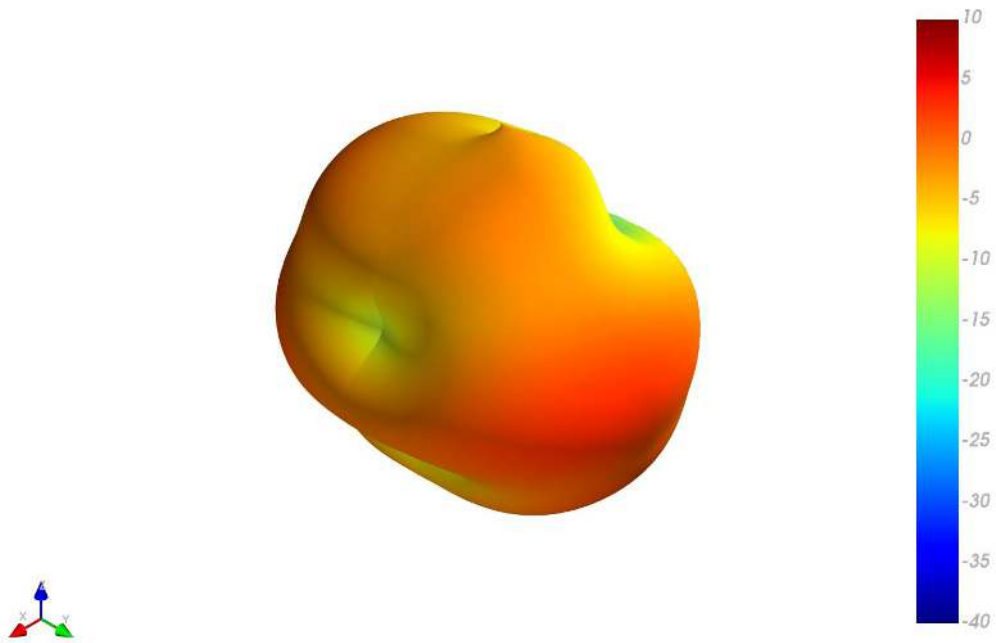
XY Plane

XZ Plane

YZ Plane



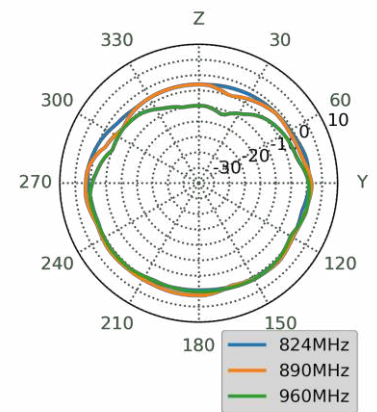
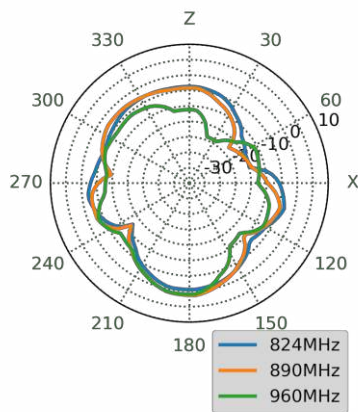
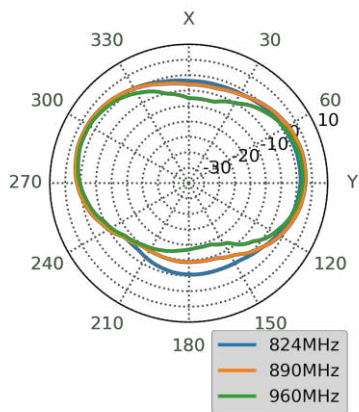
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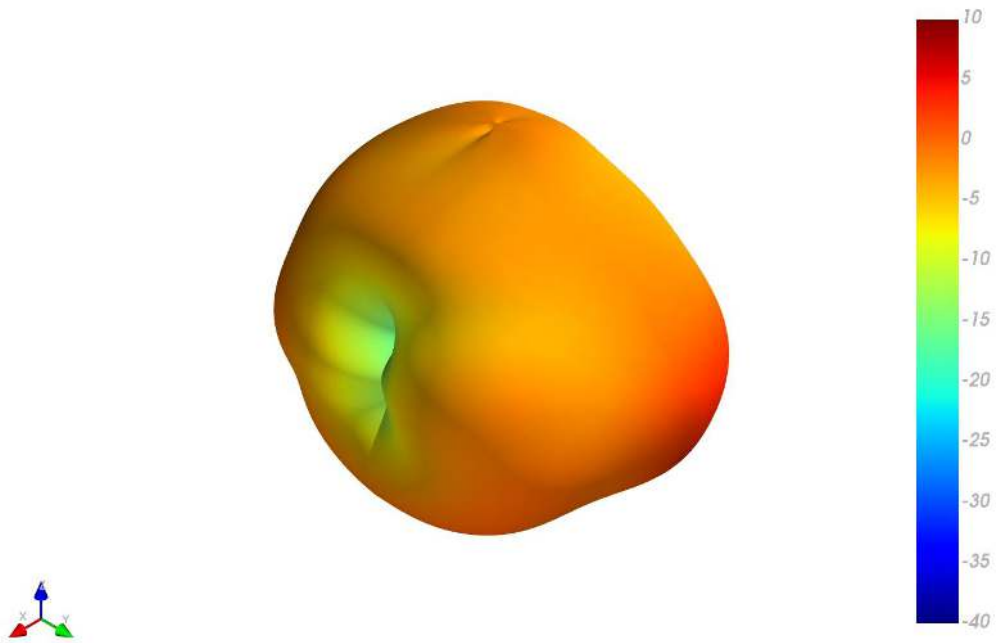
XY Plane

XZ Plane

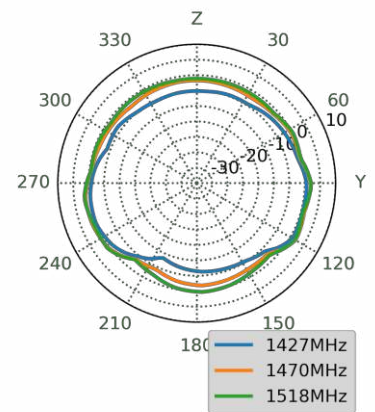
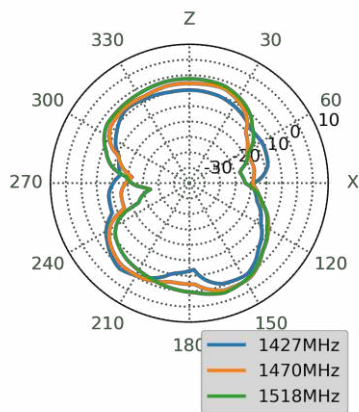
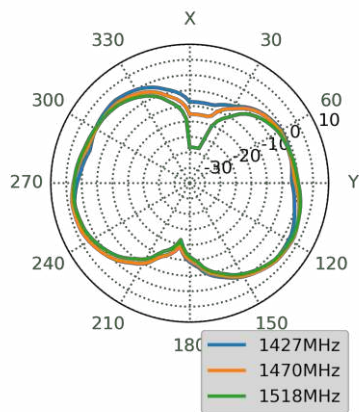
YZ Plane



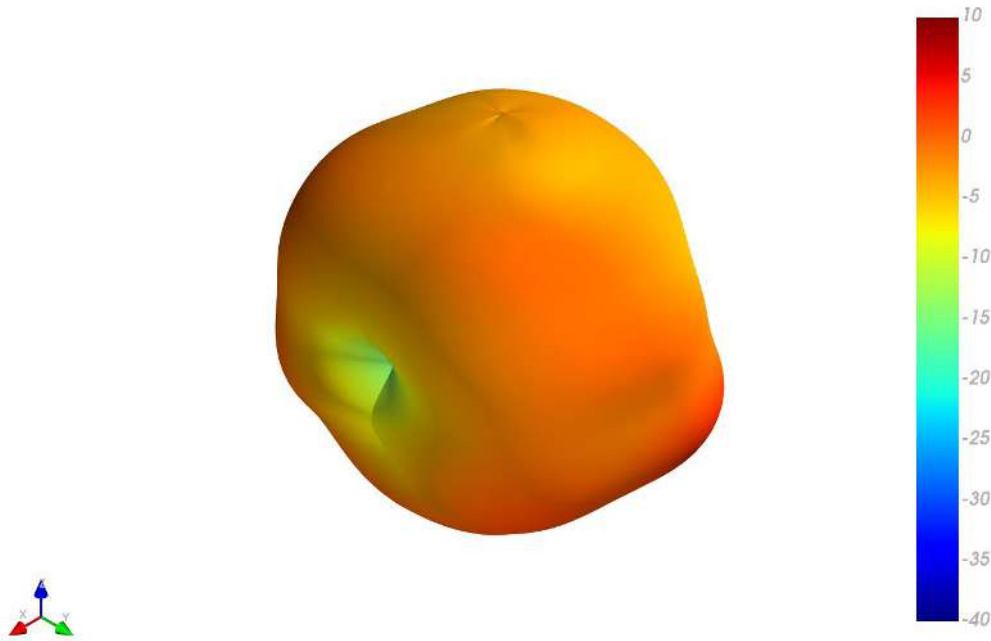
1470MHz



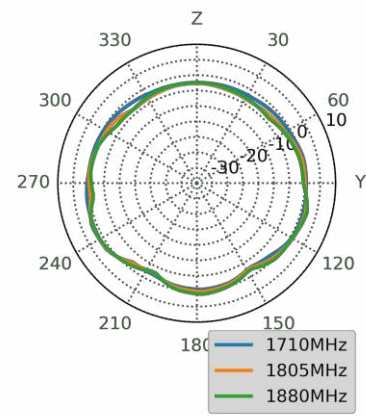
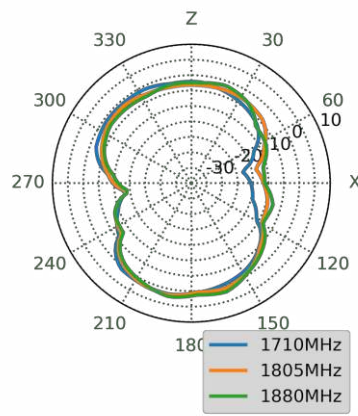
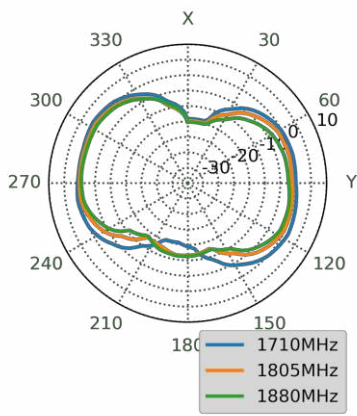
XY Plane XZ Plane YZ Plane



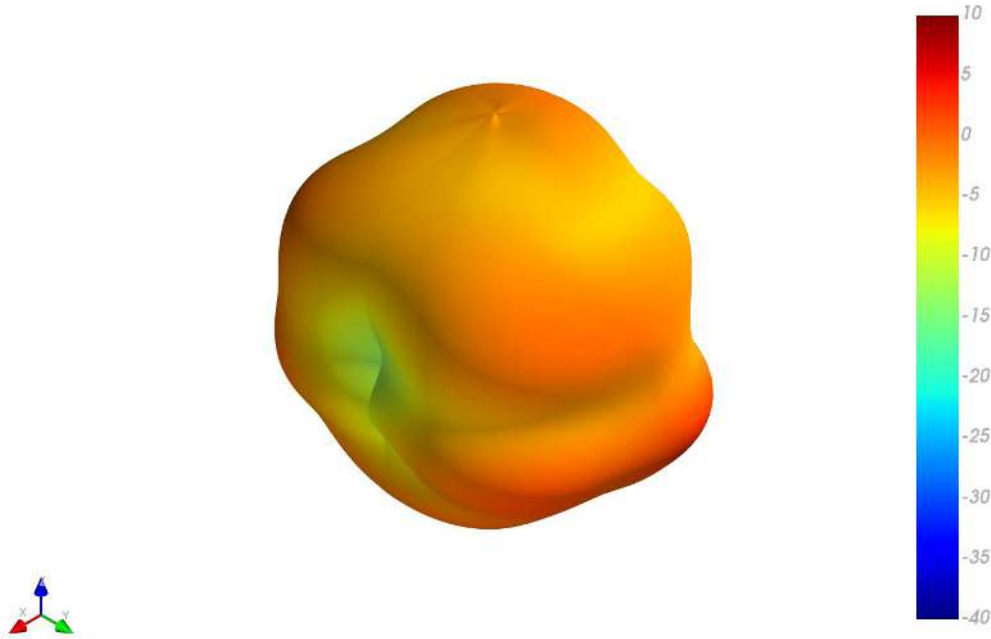
1805MHz



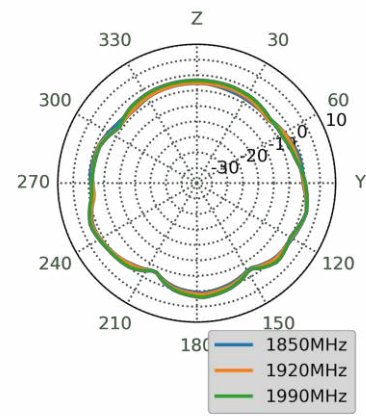
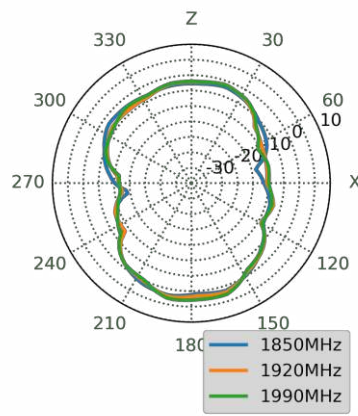
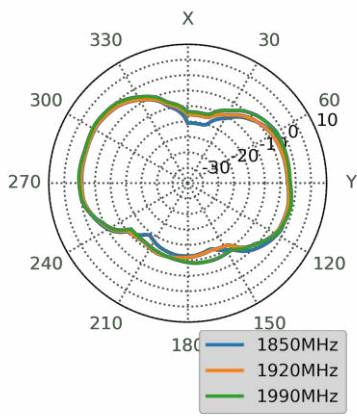
XY Plane XZ Plane YZ Plane



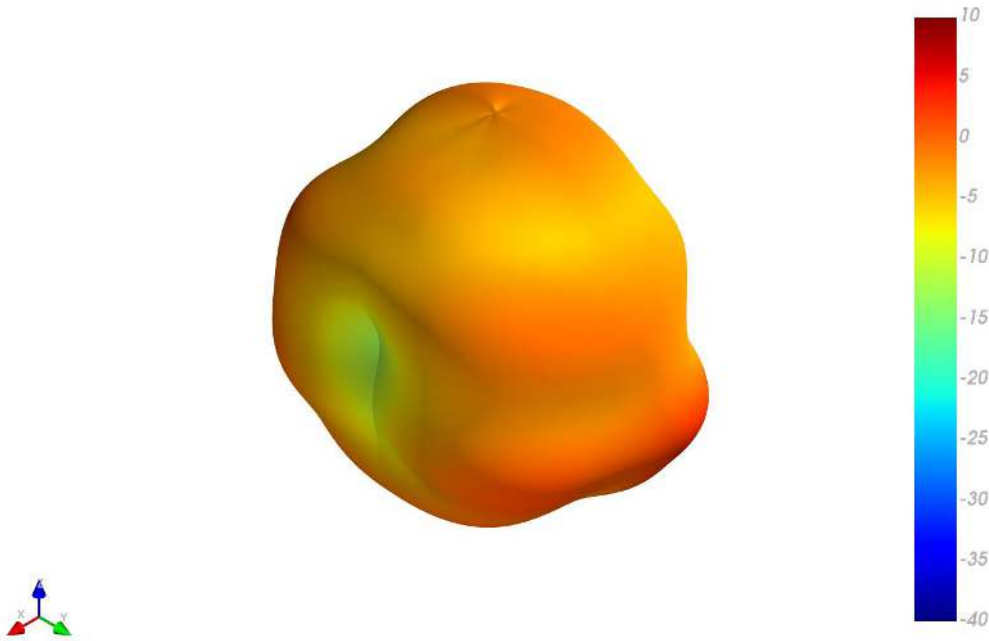
1920MHz



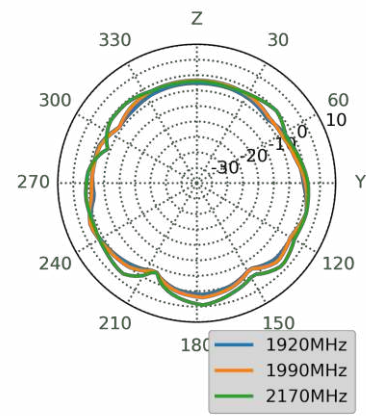
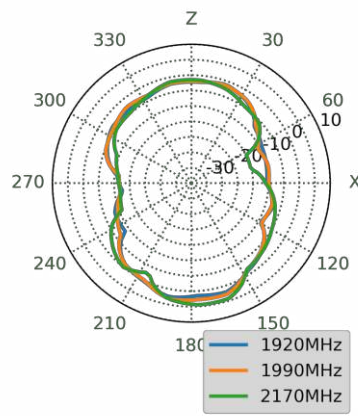
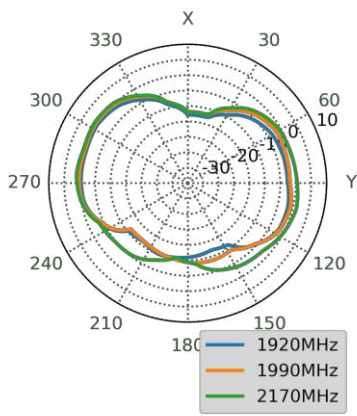
XY Plane XZ Plane YZ Plane



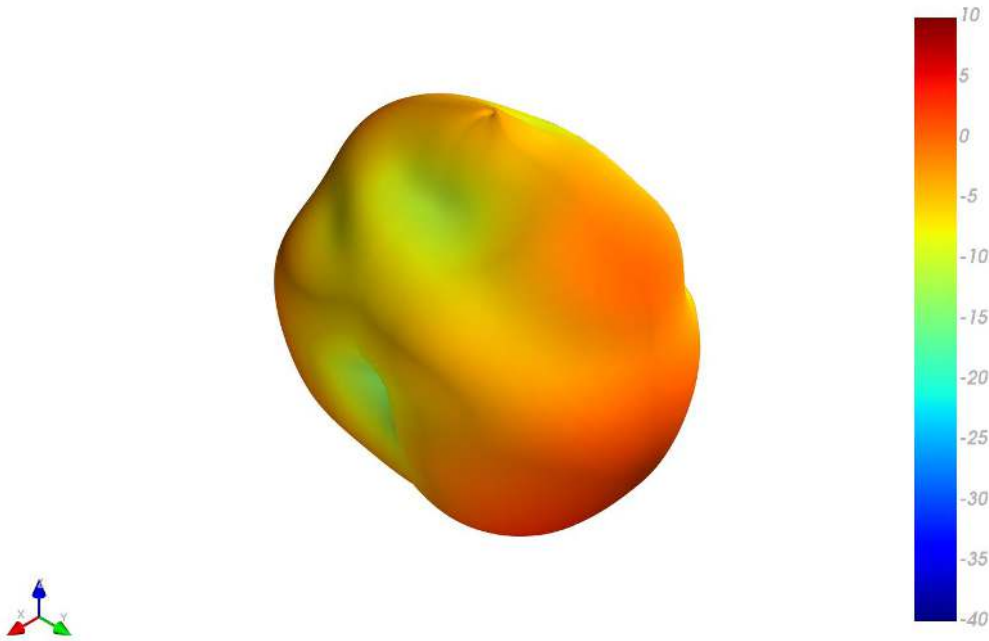
1990MHz



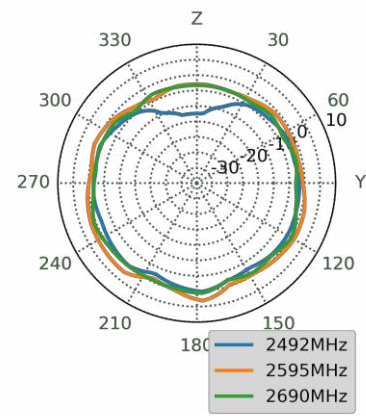
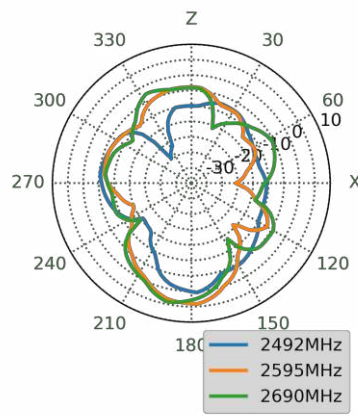
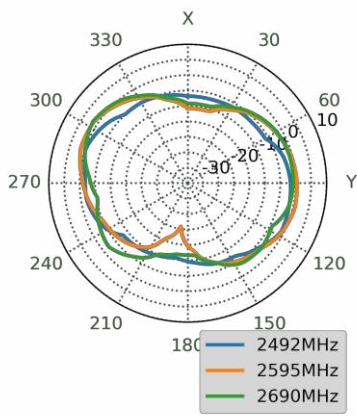
XY Plane XZ Plane YZ Plane



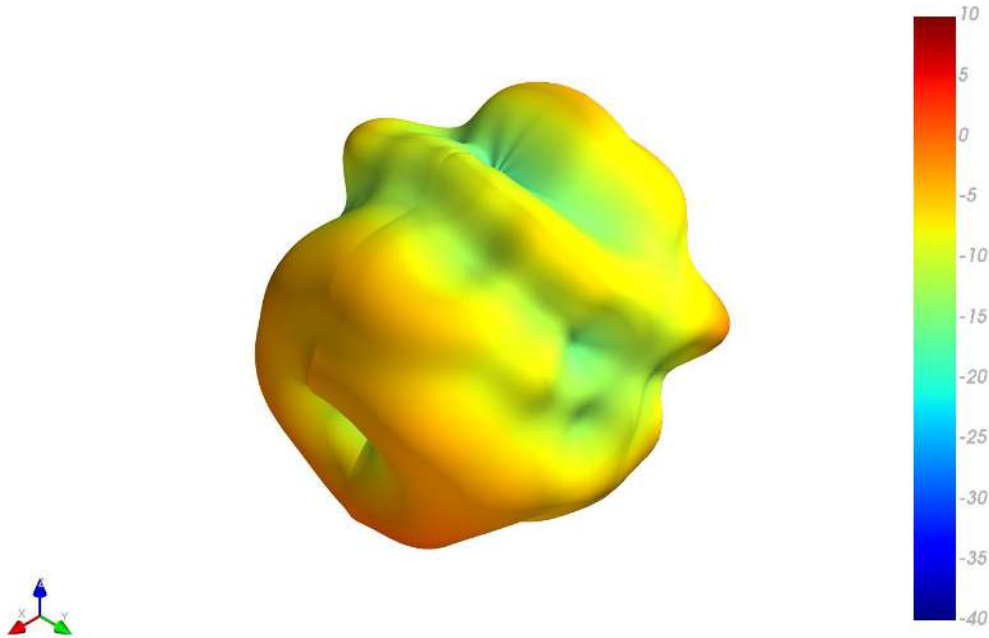
2595MHz



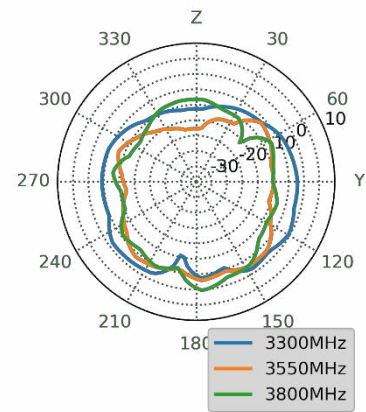
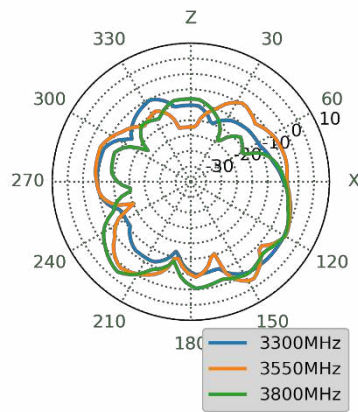
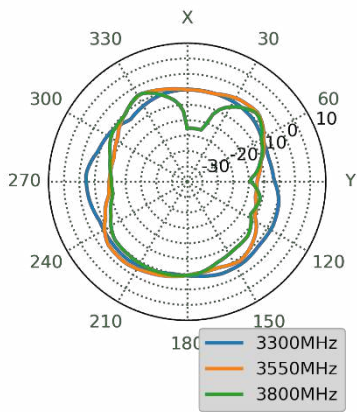
XY Plane XZ Plane YZ Plane



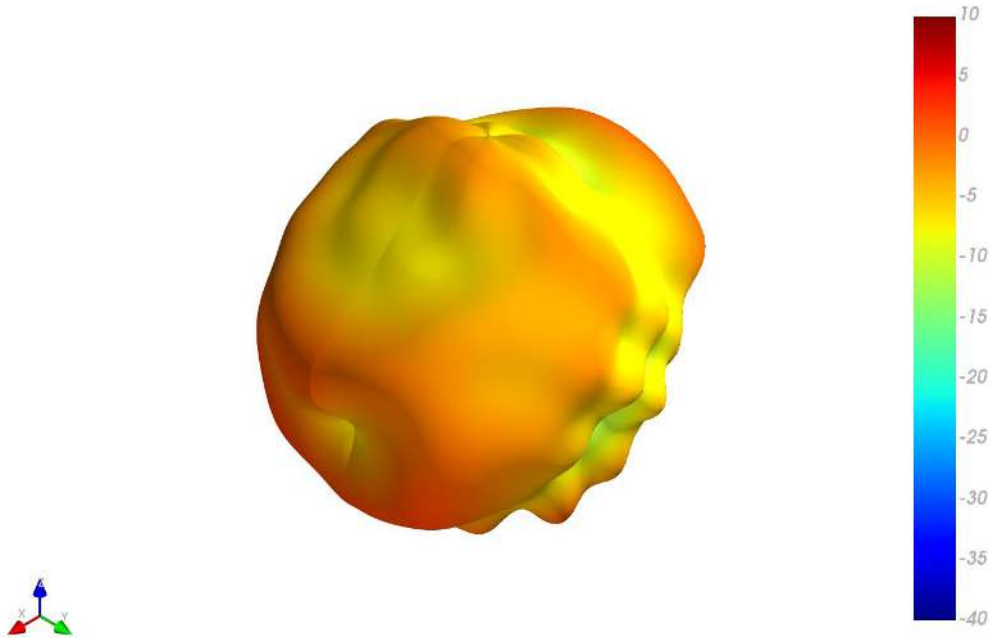
3550MHz



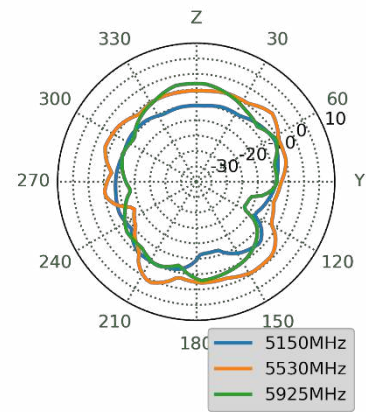
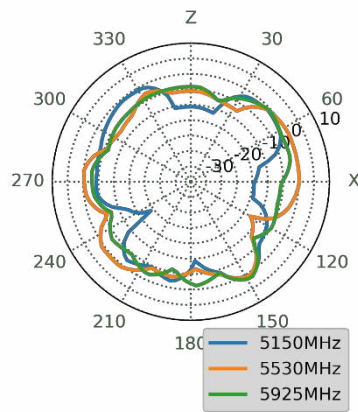
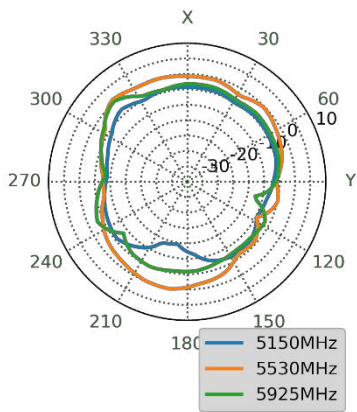
XY Plane XZ Plane YZ Plane



5330MHz

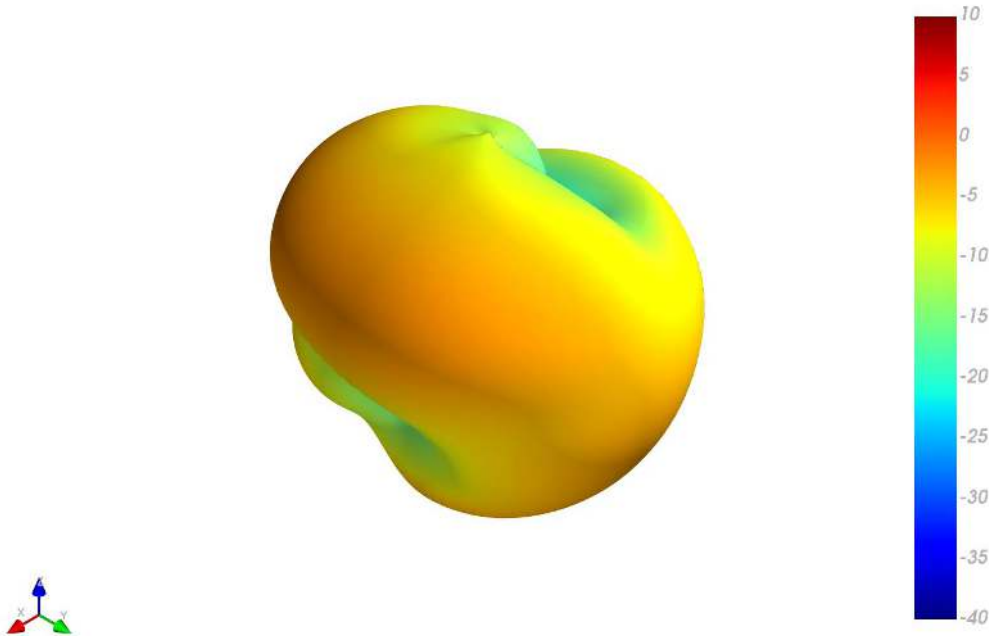


XY Plane XZ Plane YZ Plane

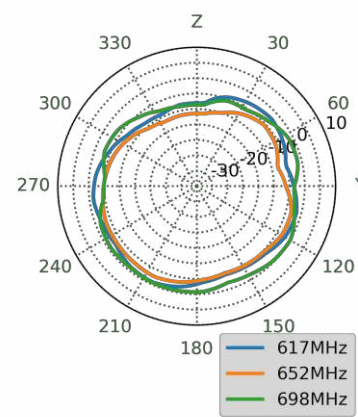
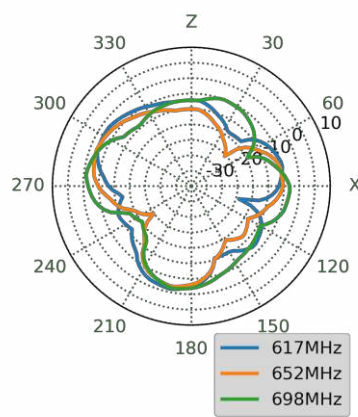
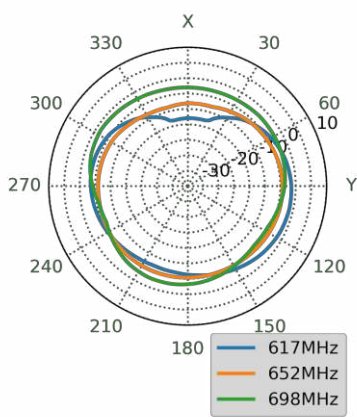


4.3 On Glass 3D and 2D Radiation Patterns

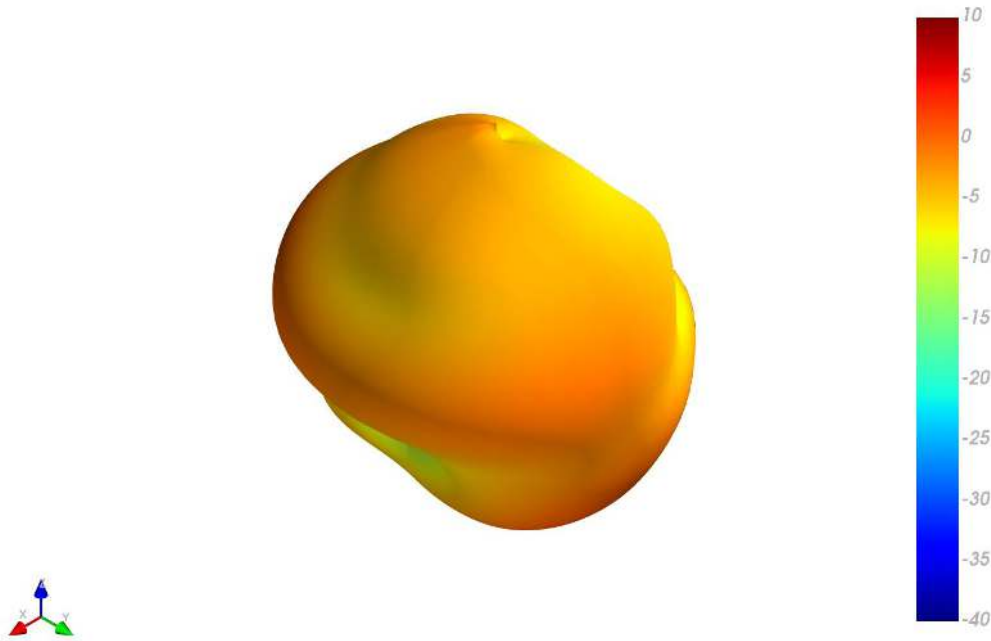
652MHz



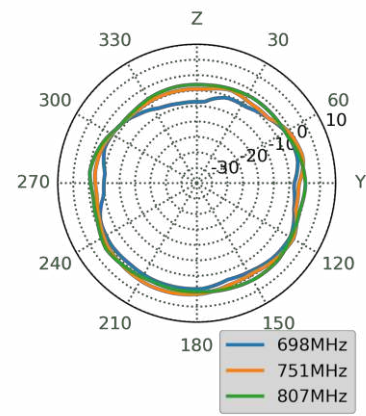
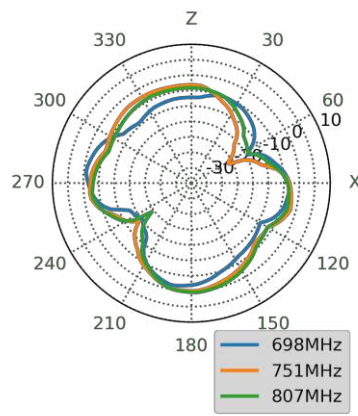
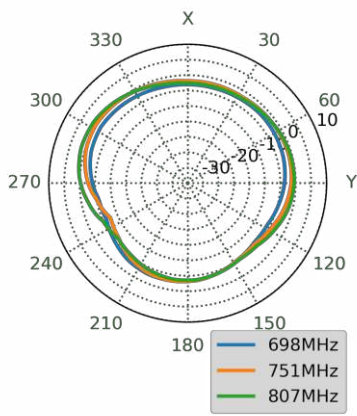
XY Plane XZ Plane YZ Plane



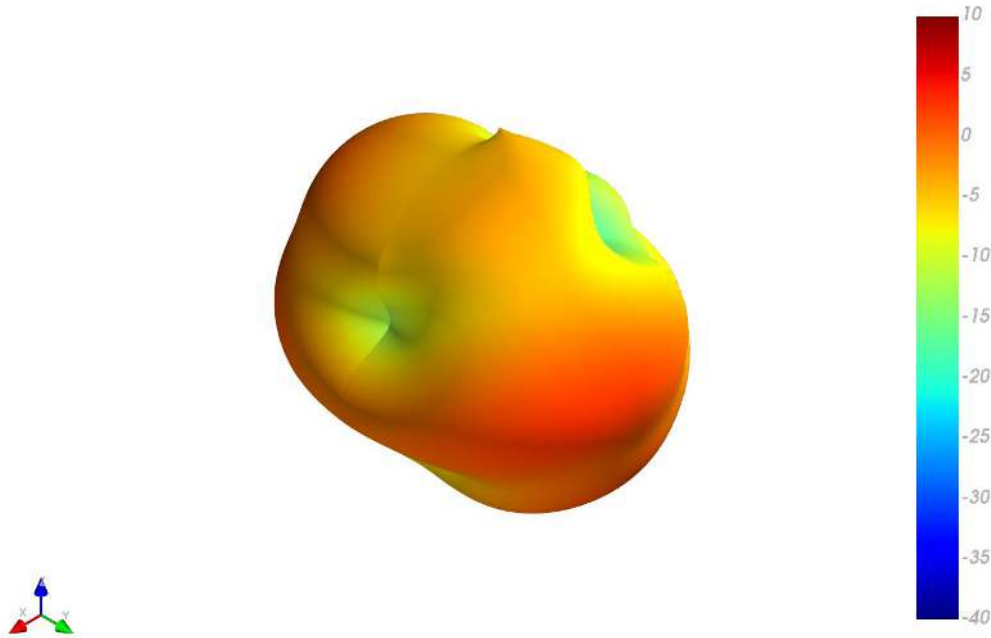
751MHz



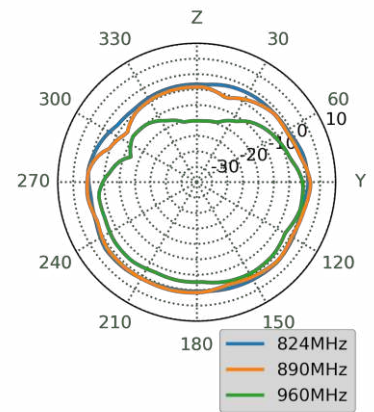
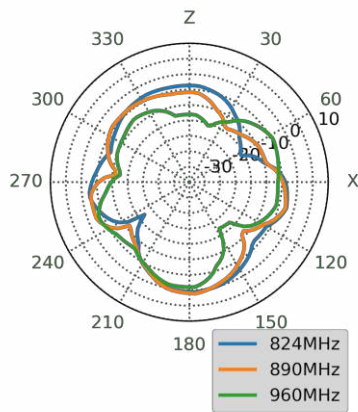
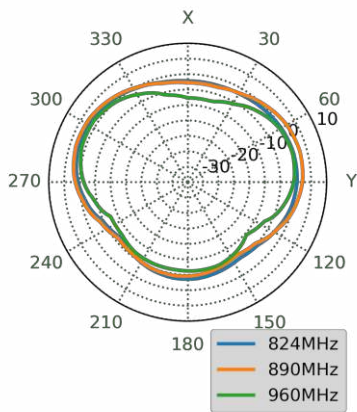
XY Plane XZ Plane YZ Plane



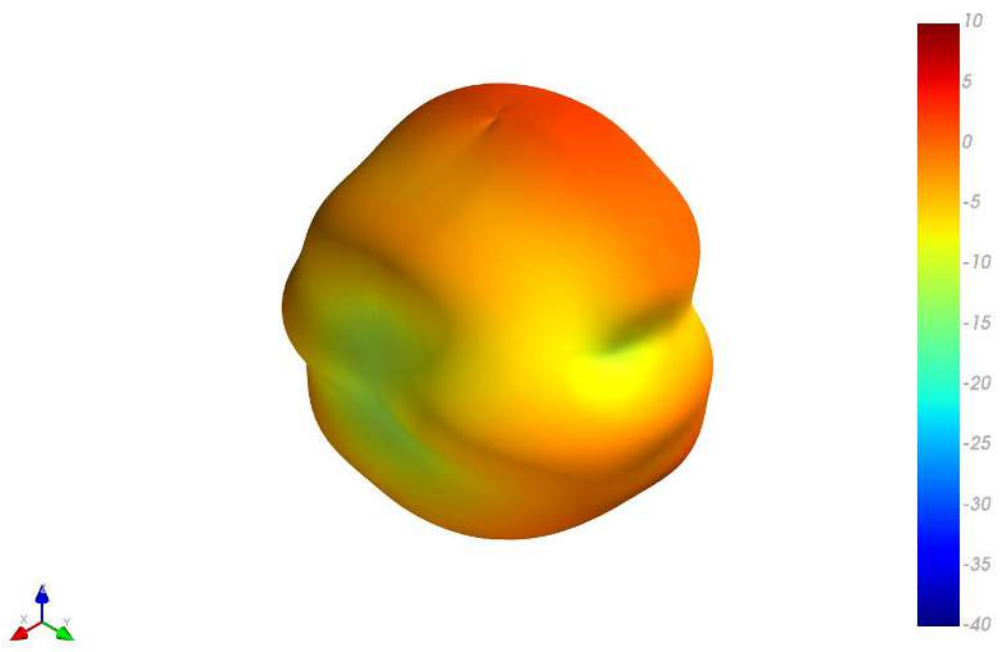
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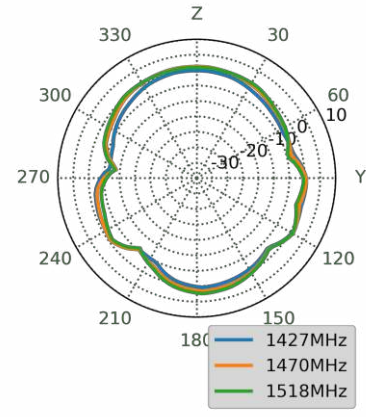
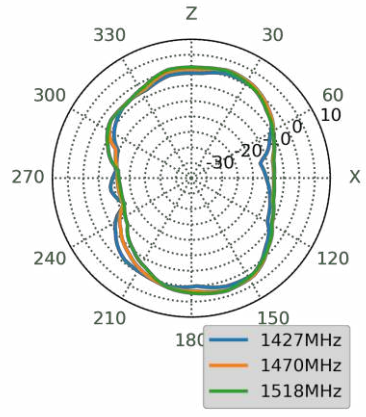
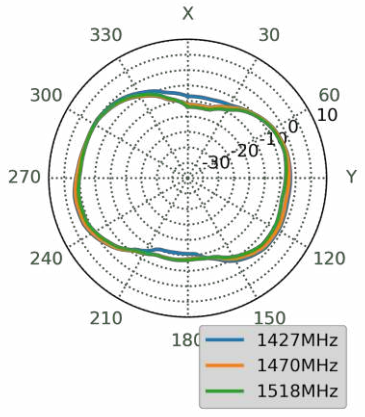
XY Plane XZ Plane YZ Plane



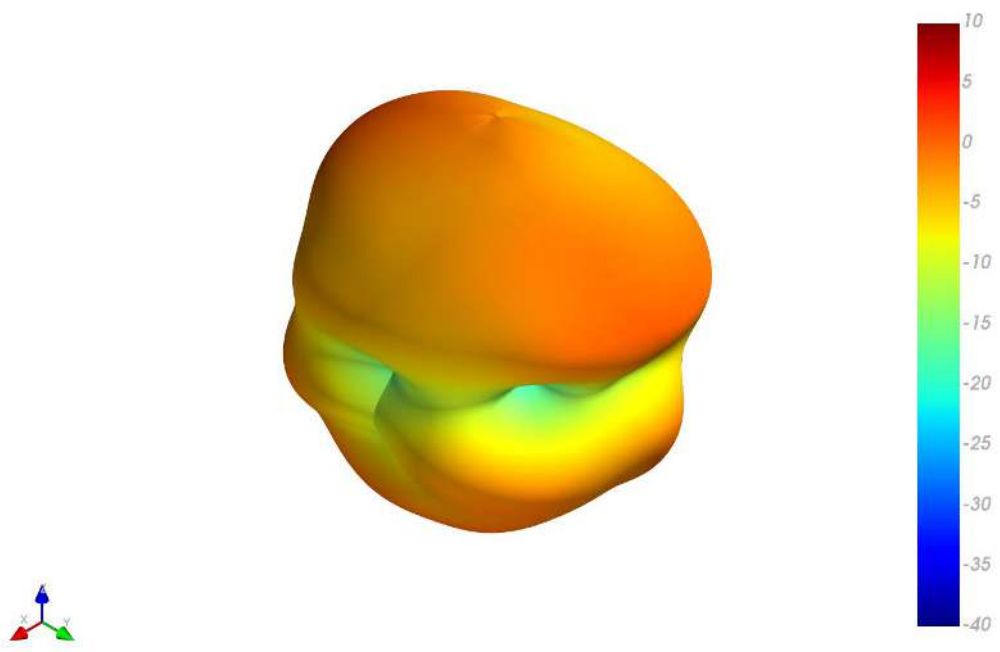
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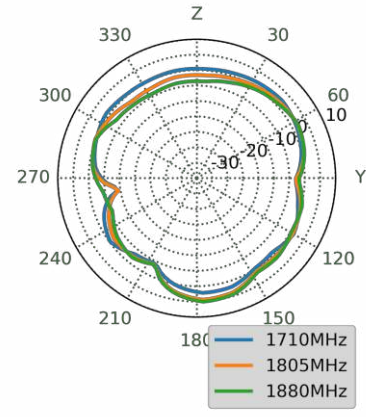
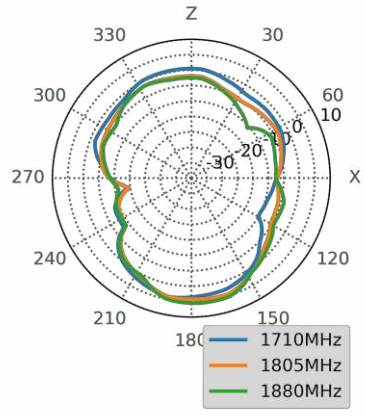
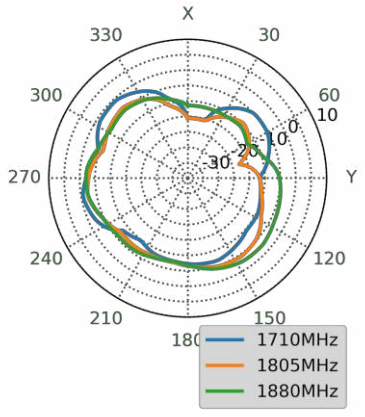
XY Plane XZ Plane YZ Plane



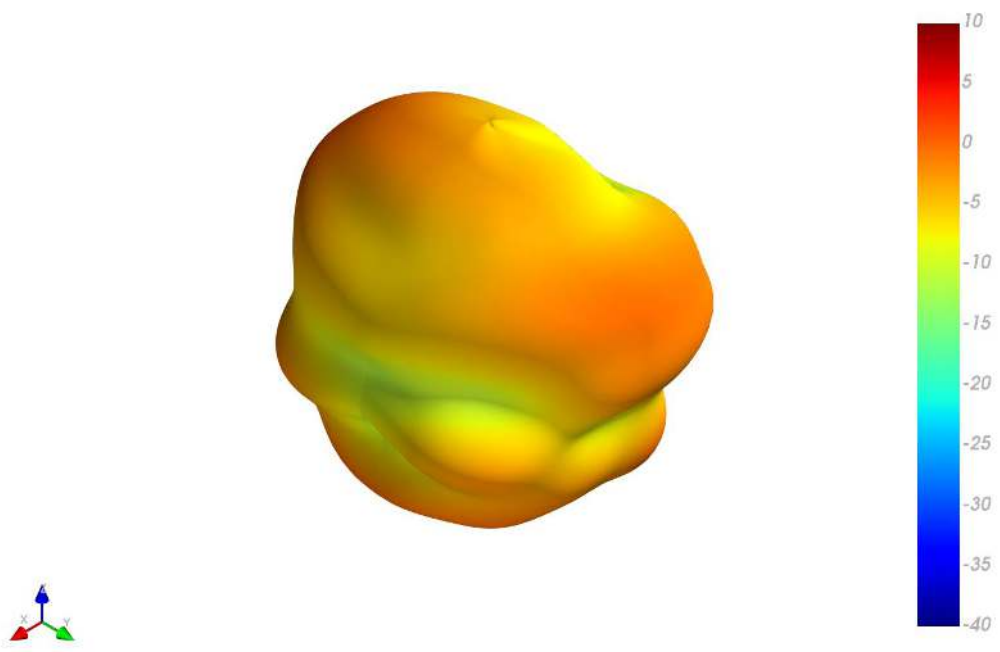
1805MHz



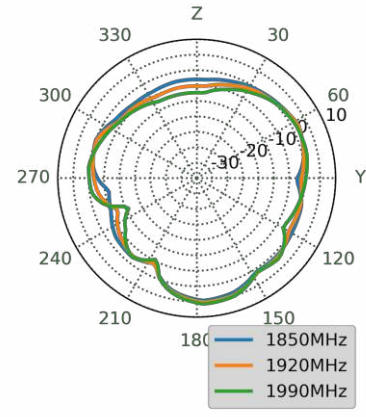
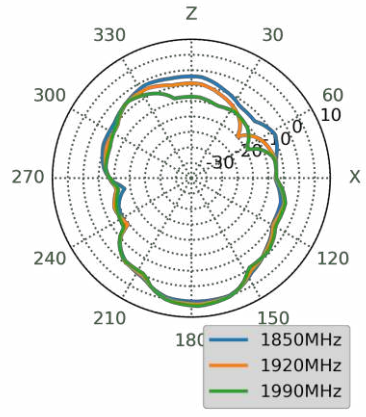
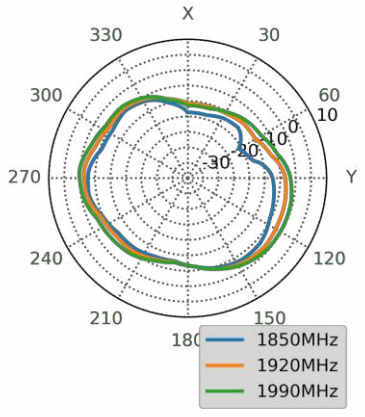
XY Plane XZ Plane YZ Plane



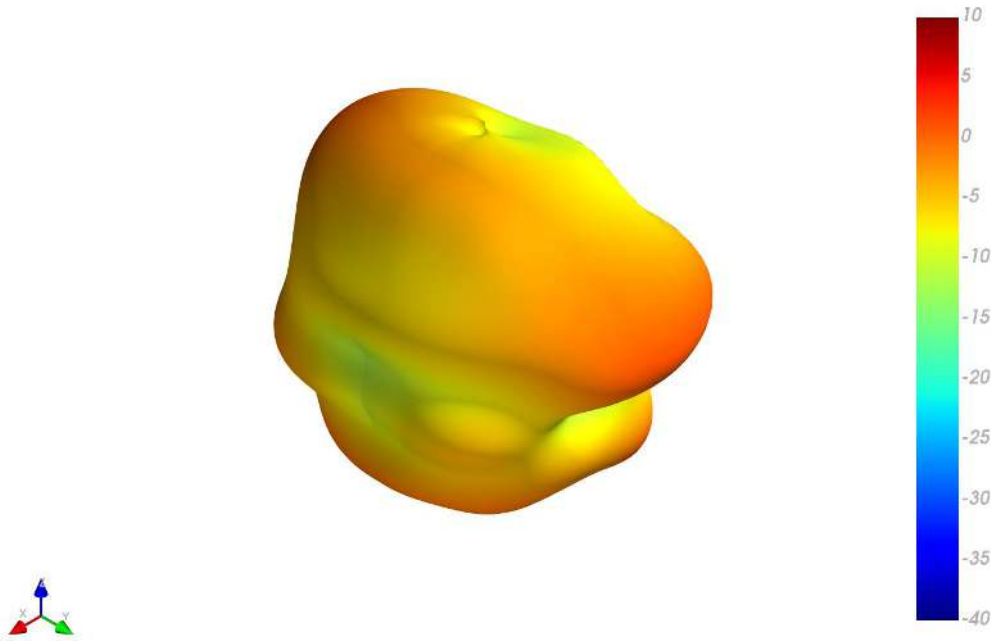
1920MHz



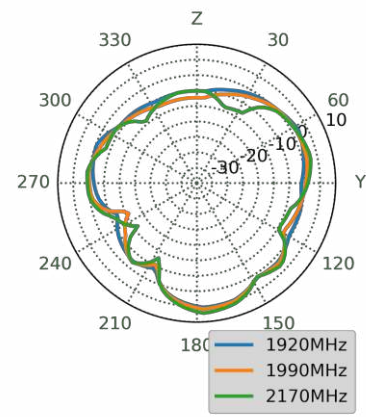
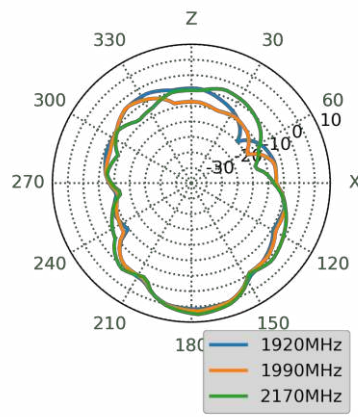
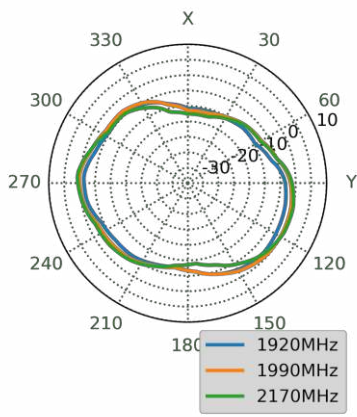
XY Plane XZ Plane YZ Plane



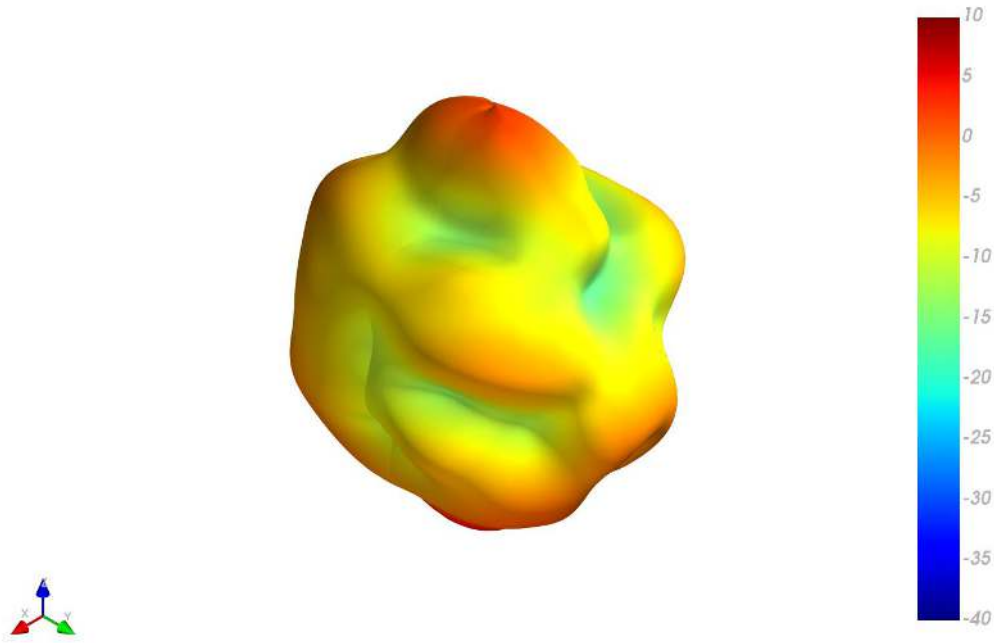
1990MHz



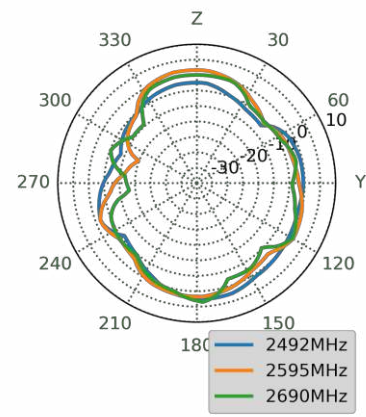
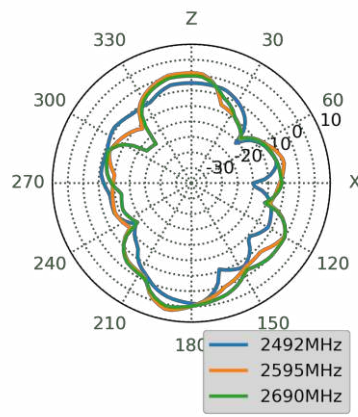
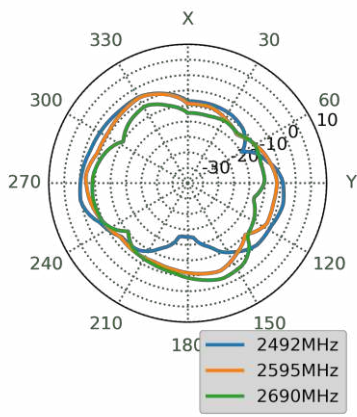
XY Plane XZ Plane YZ Plane



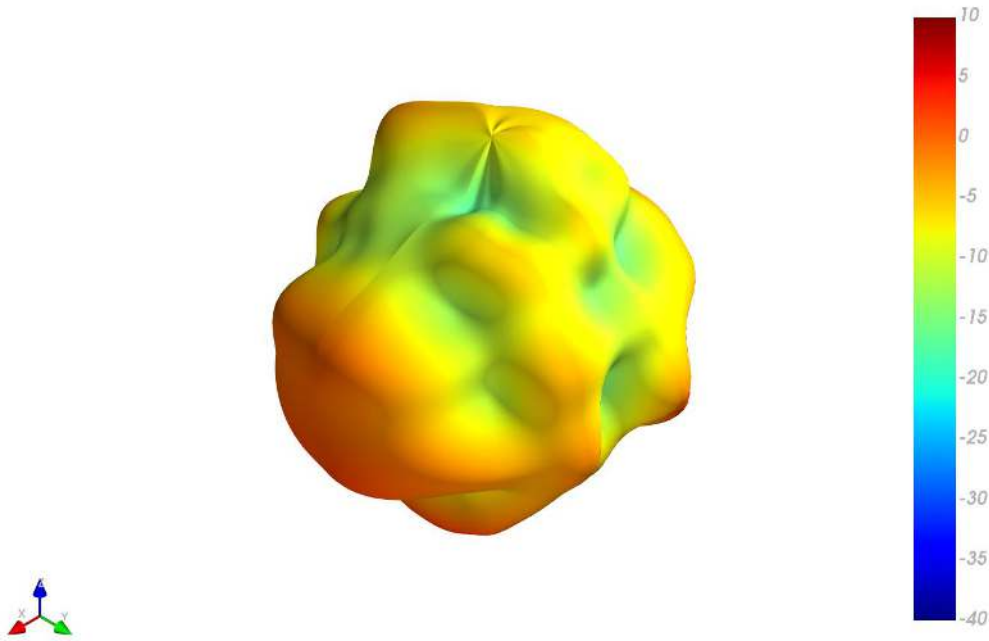
2595MHz



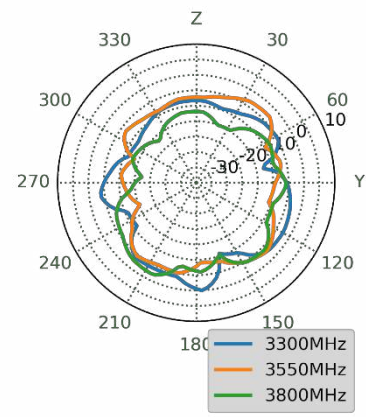
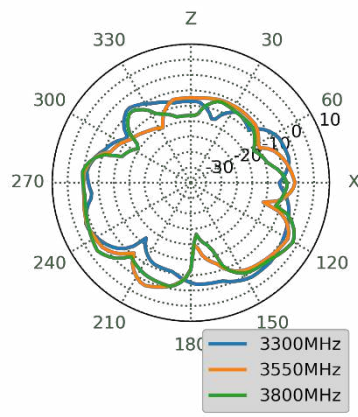
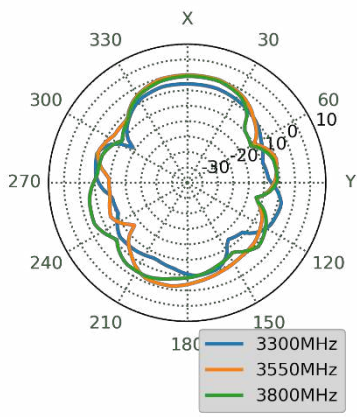
XY Plane XZ Plane YZ Plane



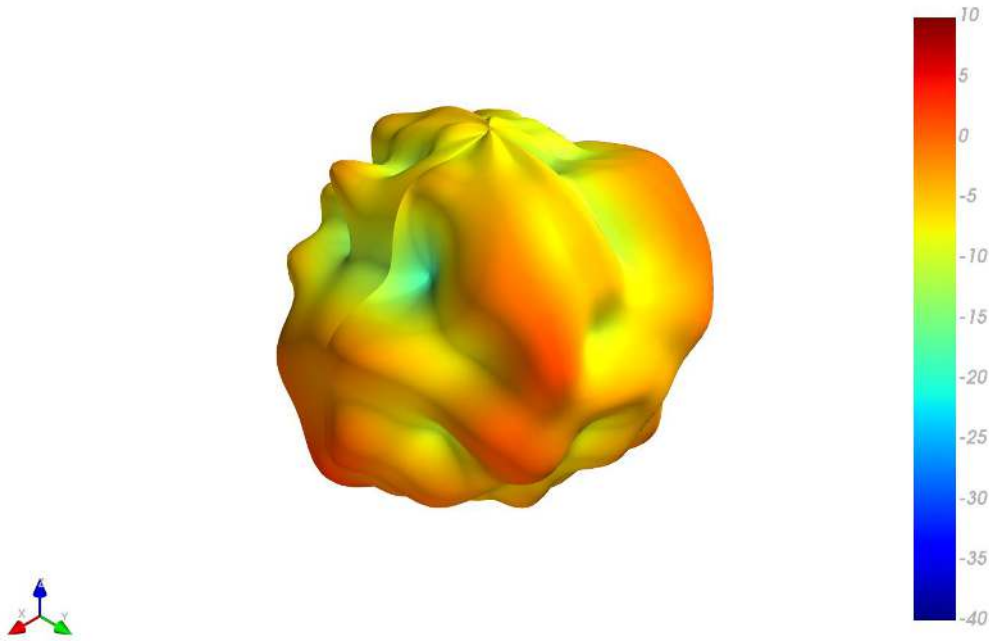
3550MHz



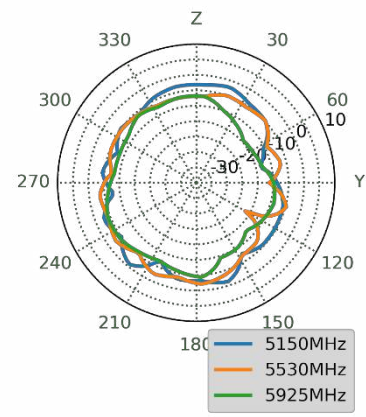
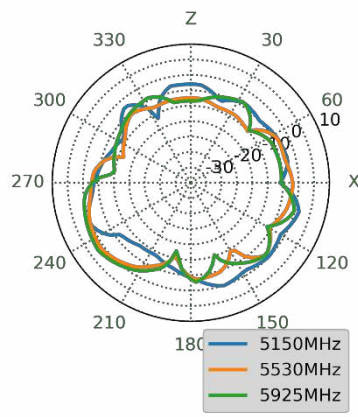
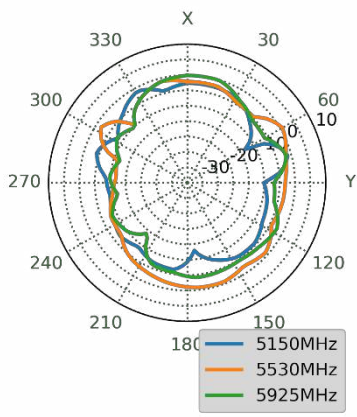
XY Plane XZ Plane YZ Plane



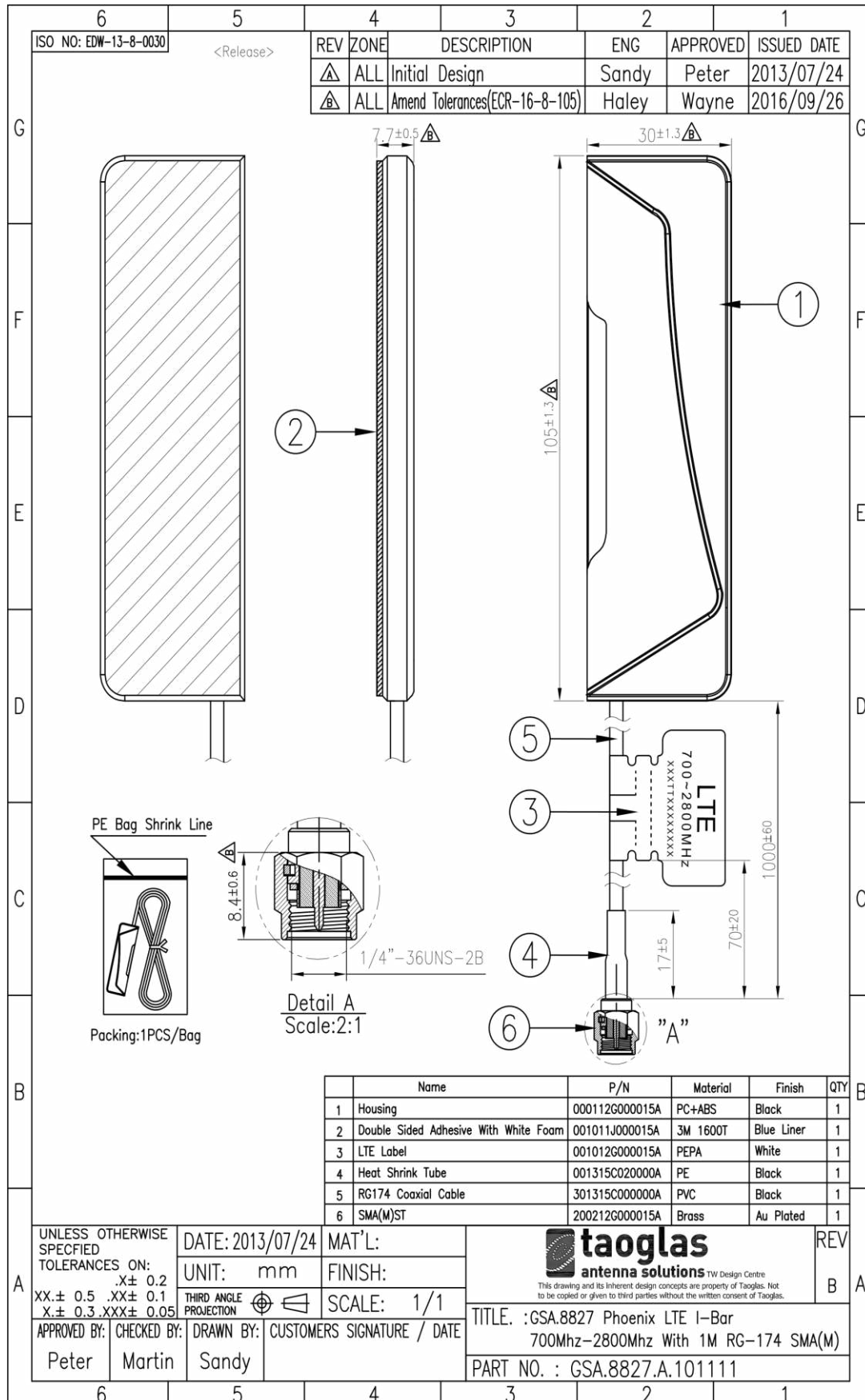
5530MHz



XY Plane XZ Plane YZ Plane

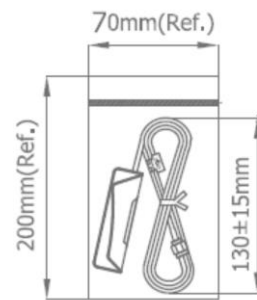


5. Mechanical Drawing

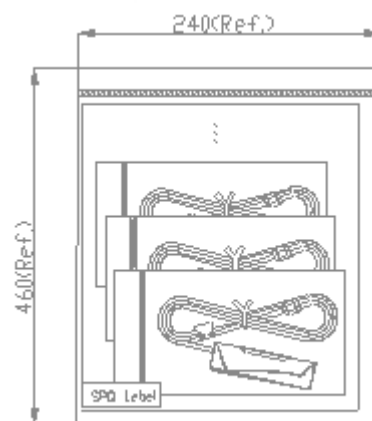


6. Packaging

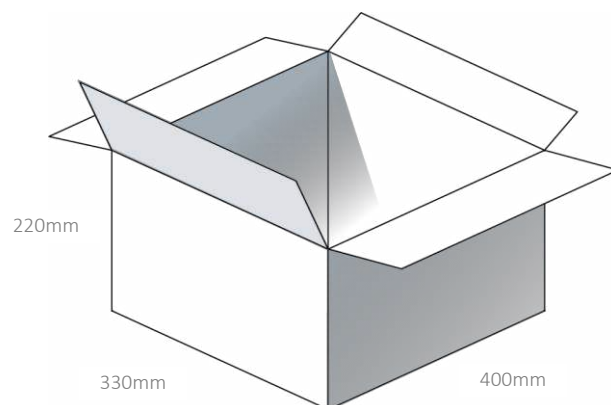
1pc GSA.8827.A.101111 per PE Bag
 Dimensions: 200*70mm
 Weight: 50g



10pcs GSA.8827.A.101111 per Large PE Bag
 Dimensions: 460*260mm
 Weight: 520g

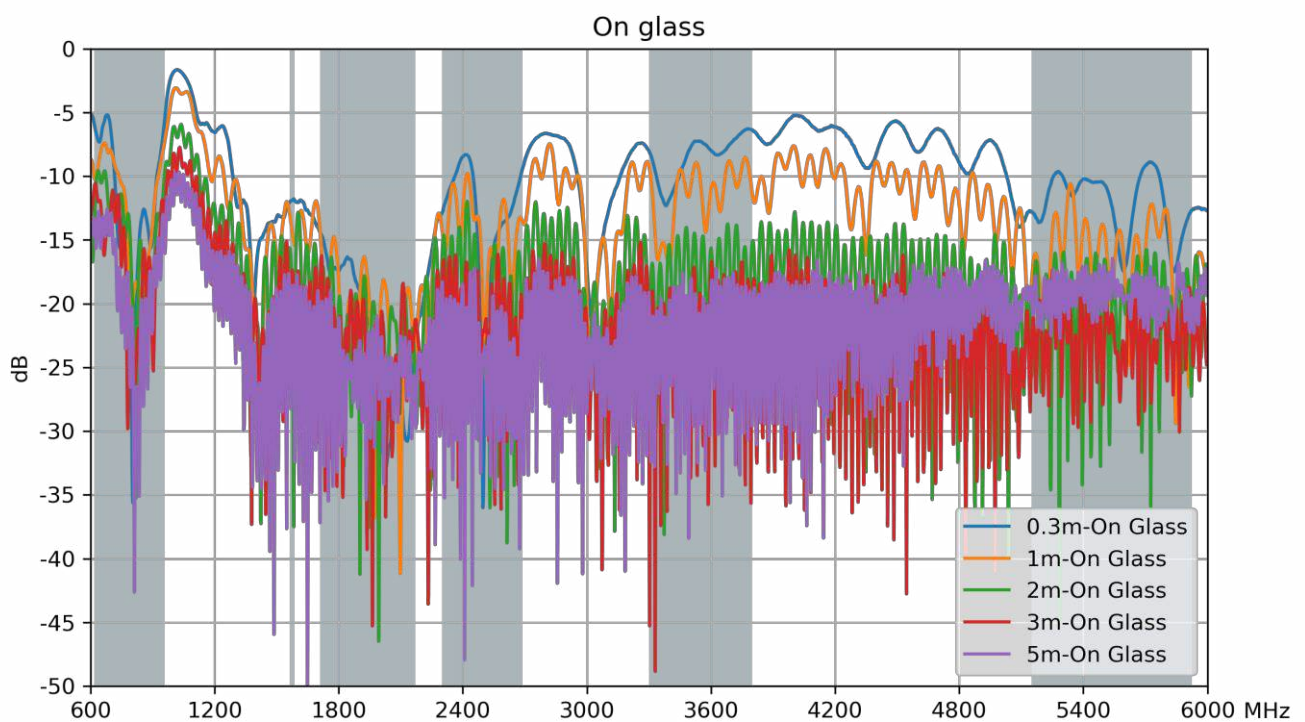
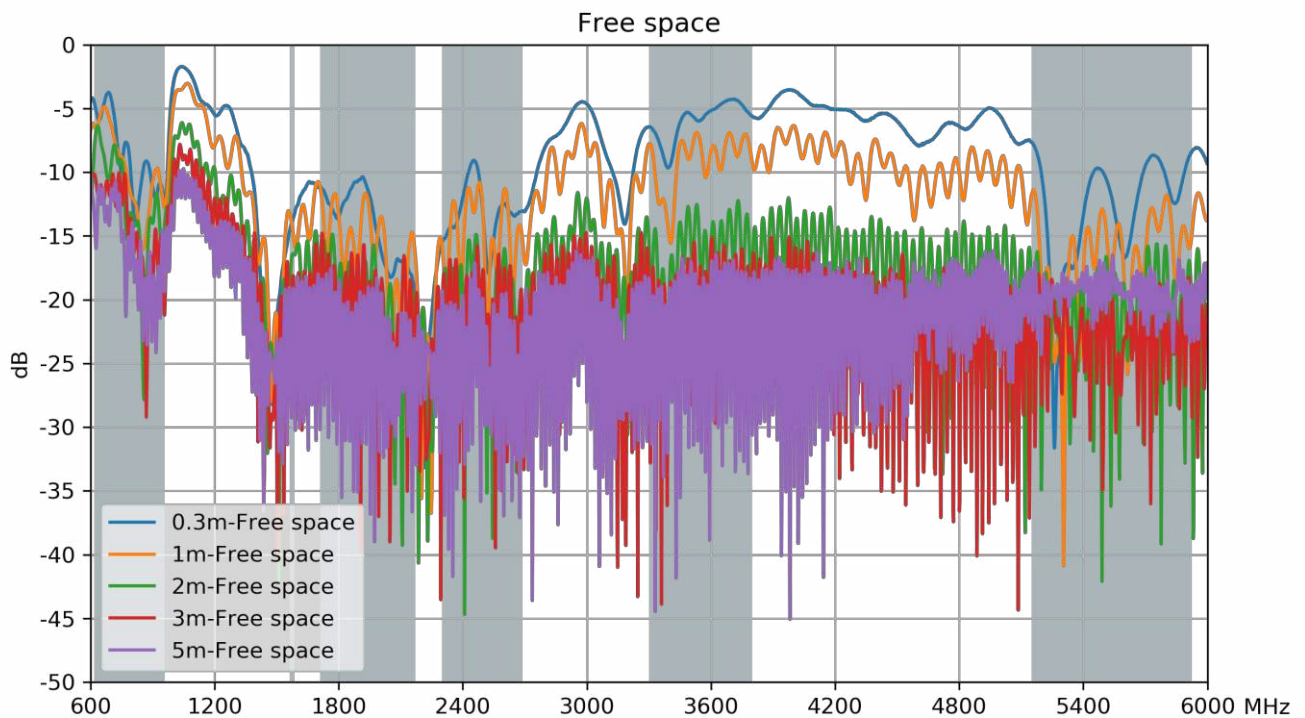


200pcs GSA.8827.A.101111 per Carton
 Dimensions: 400*330*220mm
 Weight: 10.75Kg



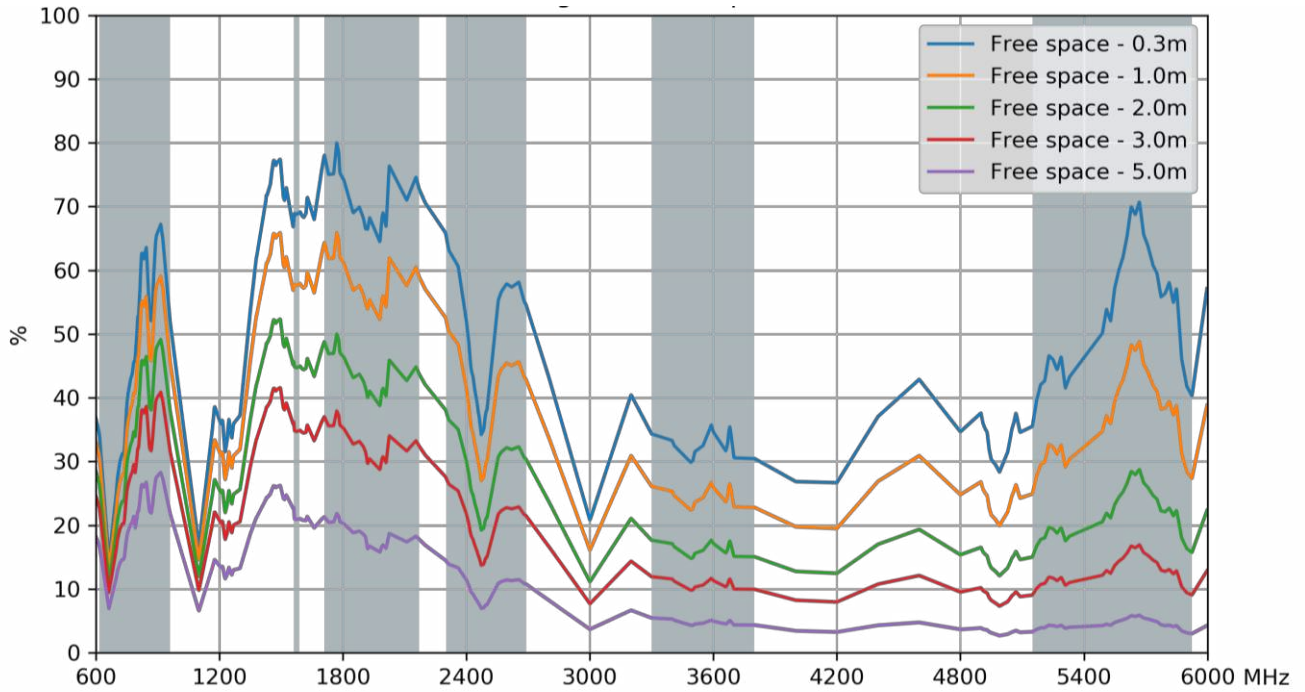
7. Application Note

7.1 Return Loss

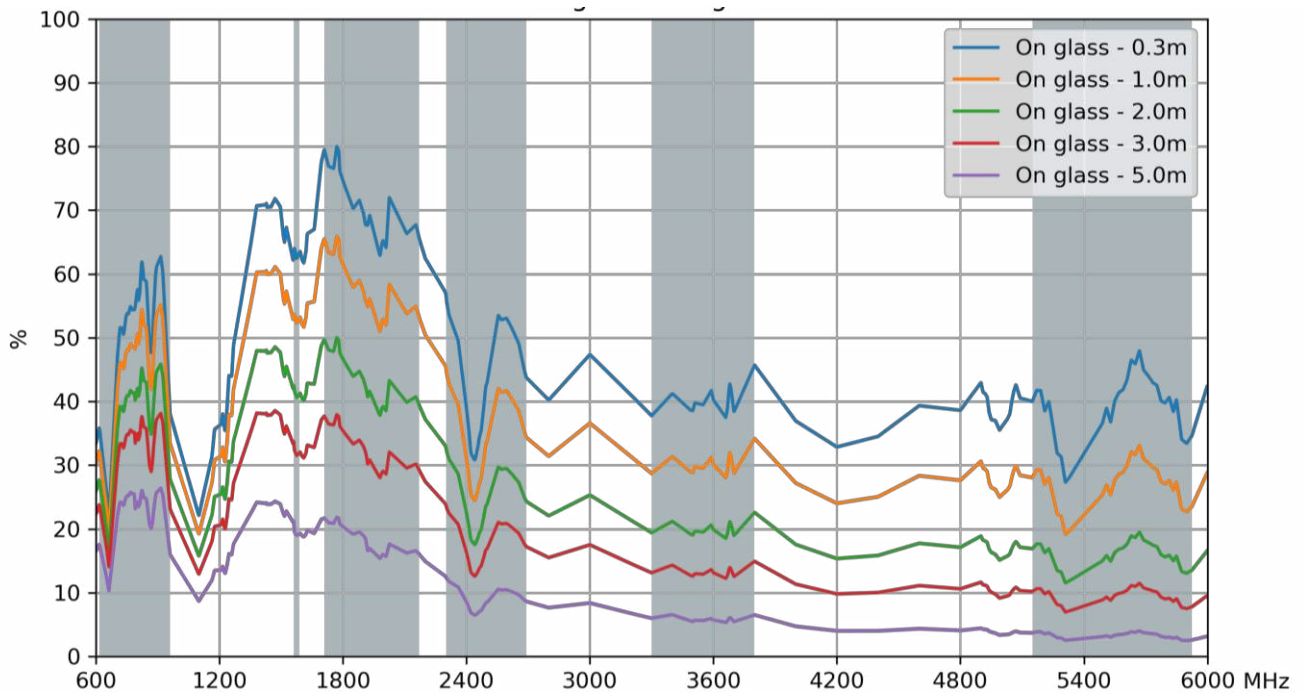


7.2 Efficiency

Free Space

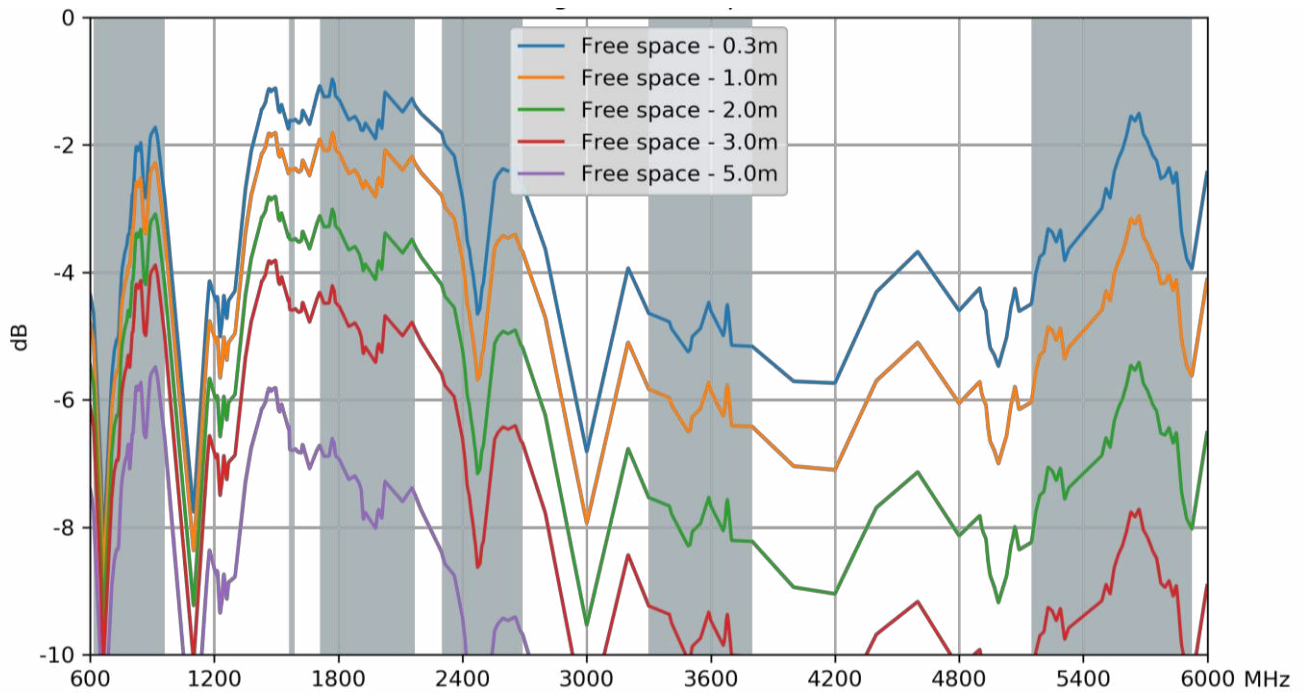


On Glass

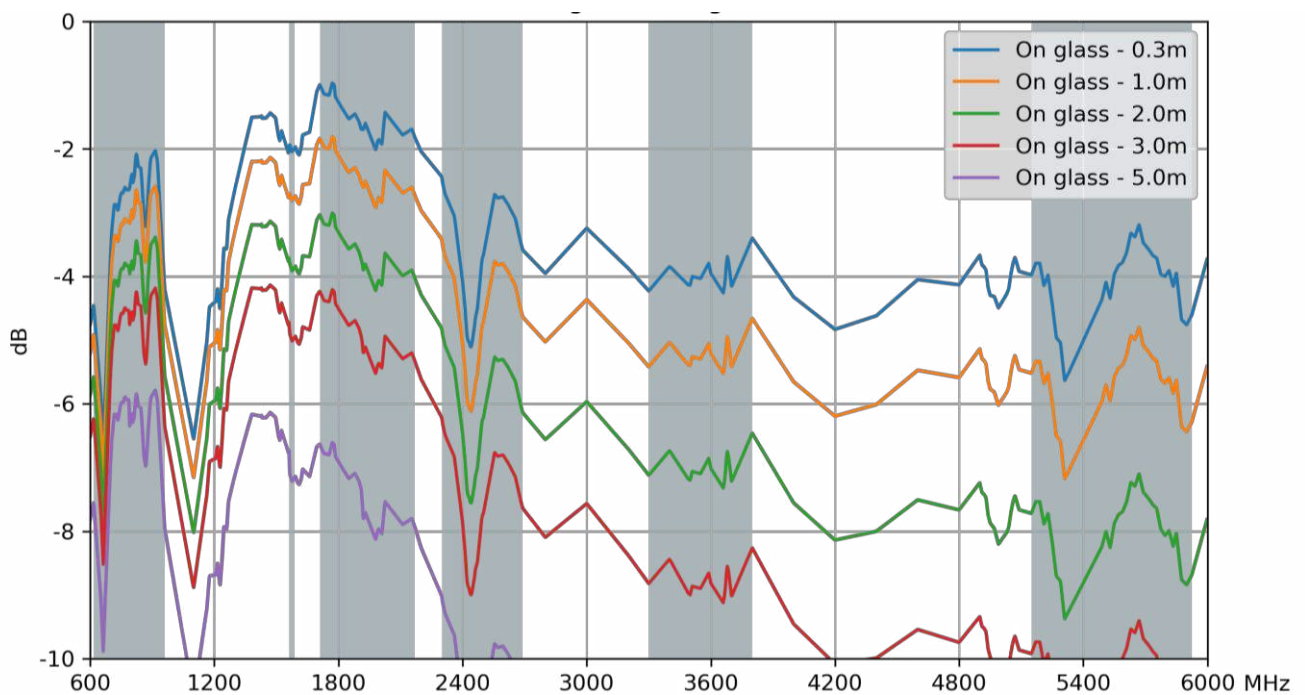


7.3 Average Gain

Free Space

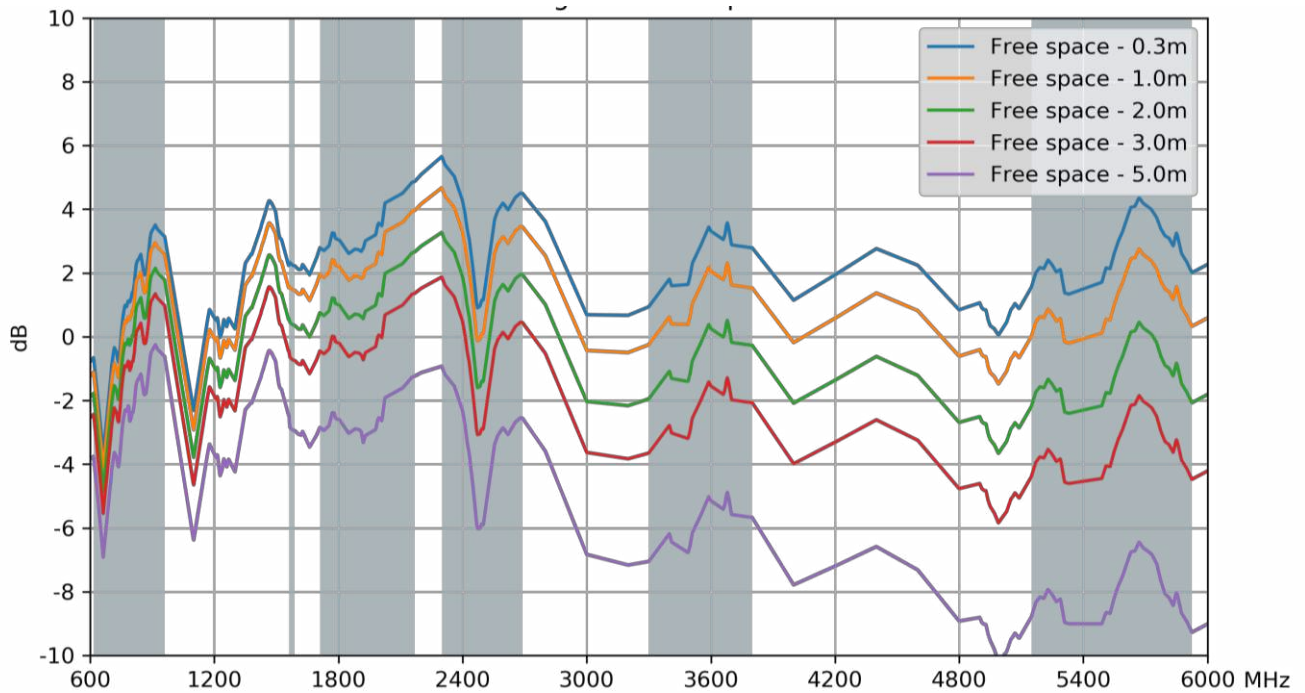


On Glass

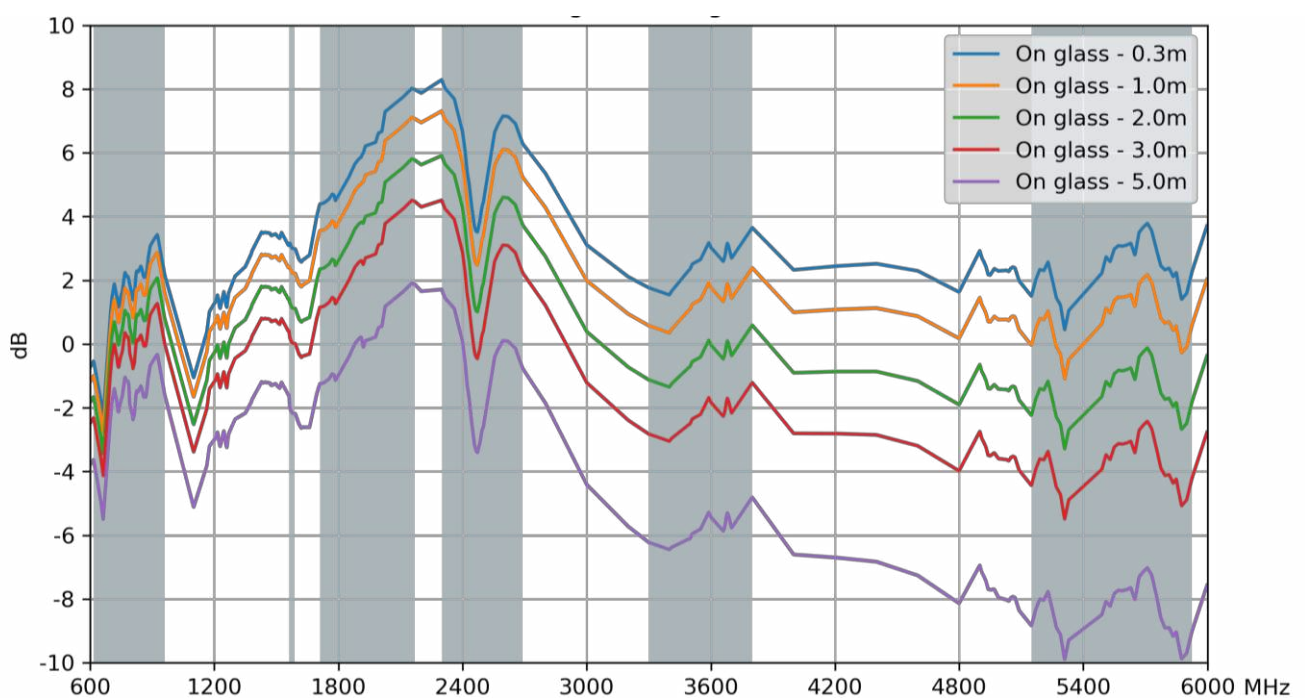


7.4 Peak Gain

Free Space



On Glass



7.5 Performance Table

| Electrical | | | | | | | | | | | |
|-------------------|---------------|-------------|-------------|-----------------------|---------------|---------------|---------------|---------------|-----------------------|--------------------|--------|
| Frequency (MHz) | 5G NR Band 71 | LTE700 | GSM 850/900 | 5G NR Band 74, 75, 76 | 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 | 2300 ~2690 | 3300 ~3800 | 5150 ~5925 | |
| Efficiency (%) | | | | | | | | | | | |
| Free Space | 0.3m | 23.3 | 41.9 | 58.9 | 62.1 | 68.9 | 75.0 | 67.5 | 70.1 | 47.4 | 32.8 |
| | 1.0m | 20.8 | 37.2 | 51.8 | 54.6 | 57.7 | 61.8 | 55.2 | 56.9 | 37.5 | 24.6 |
| | 2.0m | 17.8 | 31.4 | 43.1 | 45.4 | 44.8 | 46.9 | 41.4 | 42.2 | 26.9 | 16.3 |
| | 3.0m | 15.3 | 26.5 | 35.8 | 37.8 | 34.7 | 35.6 | 31.1 | 31.3 | 19.2 | 10.8 |
| | 5.0m | 11.2 | 18.8 | 24.8 | 26.1 | 20.9 | 20.5 | 17.5 | 17.2 | 9.8 | 4.8 |
| On glass | 0.3m | 31.6 | 53.6 | 55.2 | 56.0 | 63.2 | 76.1 | 67.9 | 66.8 | 41.0 | 40.3 |
| | 1.0m | 28.3 | 47.7 | 48.5 | 49.2 | 53.0 | 62.7 | 55.6 | 54.2 | 32.4 | 30.2 |
| | 2.0m | 24.2 | 40.3 | 40.3 | 41.0 | 41.1 | 47.5 | 41.7 | 40.1 | 23.2 | 20.0 |
| | 3.0m | 20.7 | 34.0 | 33.5 | 34.1 | 31.9 | 36.1 | 31.3 | 29.8 | 16.6 | 13.3 |
| | 5.0m | 15.1 | 24.3 | 23.2 | 23.6 | 19.2 | 20.8 | 17.6 | 16.4 | 8.5 | 5.8 |
| Average Gain (dB) | | | | | | | | | | | |
| Free Space | 0.3m | -6.33 | -3.78 | -2.30 | -2.07 | -1.62 | -1.25 | -1.71 | -1.54 | -3.24 | -4.84 |
| | 1.0m | -6.81 | -4.29 | -2.86 | -2.63 | -2.39 | -2.09 | -2.58 | -2.45 | -4.26 | -6.09 |
| | 2.0m | -7.49 | -5.03 | -3.66 | -3.43 | -3.49 | -3.29 | -3.83 | -3.75 | -5.71 | -7.87 |
| | 3.0m | -8.16 | -5.77 | -4.46 | -4.23 | -4.59 | -4.49 | -5.08 | -5.05 | -7.16 | -9.66 |
| | 5.0m | -9.52 | -7.25 | -6.06 | -5.83 | -6.79 | -6.89 | -7.57 | -7.65 | -10.07 | -13.22 |
| On glass | 0.3m | -5.01 | -2.71 | -2.58 | -2.52 | -1.99 | -1.19 | -1.68 | -1.75 | -3.88 | -3.95 |
| | 1.0m | -5.48 | -3.22 | -3.14 | -3.08 | -2.76 | -2.03 | -2.55 | -2.66 | -4.90 | -5.20 |
| | 2.0m | -6.17 | -3.95 | -3.94 | -3.88 | -3.86 | -3.23 | -3.80 | -3.96 | -6.35 | -6.98 |
| | 3.0m | -6.85 | -4.68 | -4.74 | -4.68 | -4.96 | -4.43 | -5.05 | -5.26 | -7.81 | -8.76 |
| | 5.0m | -8.21 | -6.15 | -6.34 | -6.28 | -7.16 | -6.83 | -7.54 | -7.86 | -10.72 | -12.33 |
| Peak Gain (dBi) | | | | | | | | | | | |
| Free Space | 0.3m | -0.65 | 2.31 | 3.26 | 3.51 | 2.33 | 3.26 | 3.51 | 4.88 | 5.65 | 3.58 |
| | 1.0m | -1.11 | 1.75 | 2.70 | 2.95 | 1.56 | 2.42 | 2.60 | 3.97 | 4.67 | 2.32 |
| | 2.0m | -1.77 | 0.95 | 1.90 | 2.15 | 0.46 | 1.22 | 1.30 | 2.67 | 3.27 | 0.52 |
| | 3.0m | -2.43 | 0.15 | 1.10 | 1.35 | -0.64 | 0.02 | -0.00 | 1.37 | 1.87 | -1.28 |
| | 5.0m | -3.75 | -1.45 | -0.50 | -0.25 | -2.84 | -2.38 | -2.60 | -1.23 | -0.93 | -4.88 |
| On glass | 0.3m | 0.97 | 2.29 | 3.12 | 3.44 | 3.16 | 5.66 | 6.56 | 8.02 | 8.29 | 3.65 |
| | 1.0m | 0.48 | 1.77 | 2.56 | 2.88 | 2.39 | 4.82 | 5.65 | 7.11 | 7.31 | 2.39 |
| | 2.0m | -0.22 | 1.07 | 1.76 | 2.08 | 1.29 | 3.62 | 4.35 | 5.81 | 5.91 | 0.59 |
| | 3.0m | -0.92 | 0.37 | 0.96 | 1.28 | 0.19 | 2.42 | 3.05 | 4.51 | 4.51 | -1.21 |
| | 5.0m | -2.32 | -1.03 | -0.64 | -0.32 | -2.01 | 0.02 | 0.45 | 1.91 | 1.71 | -4.81 |

Changelog for the datasheet

SPE-13-8-025 – GSA.8827.A.101111

Revision: E (Current Version)

| | |
|------------------|---|
| Date: | 2020-05-08 |
| Changes: | Updated data to cover 5G frequencies Remove IP65 |
| Changes Made by: | Jack Conroy |

Previous Revisions

Revision: D

| | |
|------------------|-------------------------------------|
| Date: | 2009-06-09 |
| Changes: | Packaging Details & Drawing Updated |
| Changes Made by: | Andy Mahoney |

Revision: C

| | |
|------------------|---------------------------|
| Date: | 2016-05-25 |
| Changes: | Packaging Details Updated |
| Changes Made by: | Aine Doyle |

Revision: B

| | |
|------------------|---------------------------|
| Date: | 2014-11-25 |
| Changes: | Packaging Details Updated |
| Changes Made by: | Aine Doyle |

Revision: A (Original First Release)

| | |
|---------|------------------|
| Date: | 2013-04-09 |
| Notes: | |
| Author: | Technical Writer |



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