



TAOGLAS®



Datasheet

Olympian II 5G/4G

Part No:
G45.A.201111

Description:

Olympian II - 5G/4G Permanent Mount Antenna
with 2m RG-174 and SMA(M)

Features:

5G/4G Permanent Mount Antenna
Covering Sub 6GHz 5G NR Bands
Covering Worldwide 5G Bands
3G/2G Backward compatible
IP67 Rated Enclosure
IK10 Rated Enclosure
Cable: 2m RG-174
Connector: SMA(M)
Dimensions: Ø50.15*48.5mm
RoHS & REACH Compliant

1. Introduction	3
2. Specifications	4
3. Antenna Characteristics	8
4. Radiation Patterns	10
5. Mechanical Drawing	31
6. Packaging	32
7. Application Note	33
Changelog	38

Taoglas makes no warranties based on the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Taoglas reserves all rights to this document and the information contained herein. Reproduction, use or disclosure to third parties without express permission is strictly prohibited.



1. Introduction



The Taoglas Olympian II G45 is a low profile, robust external 5G/4G Antenna. The permanent mount antenna has a compact housing at only 48.5mm tall and 50mm in diameter. It is ideal for external use, due to its IP67 rated housing, on vehicles and outdoor assets requiring cellular connectivity. The 5G/4G antenna, covers all major worldwide cellular bands including Sub 6GHz, 5G FR1 bands, worldwide 4G bands and includes fallback to 3G/2G where necessary.

Typical Applications Include:

- Digital Signage
- Gateways/Routers
- Transportation

The G45 can be mounted on metal or plastic but if the lower frequency bands are required, it functions best when mounted on a metal ground-plane. The antenna can still work well with short cable lengths below 1m on plastic structures. Taoglas recommends minimum of 1m cable length for stable antenna performance. When mounted on a ground-plane, the antenna can function well at all frequencies up to 3 meters cable length.

The IP67 rated enclosure is made from a durable, UV resistant ABS material making it resistant to vandalism due to an IK10 rating. An integrated rubber O-ring under the enclosure prevents water ingress underneath the antenna. It is mounted from the inside of the user device enclosure and the small thread allows for installation in the tightest of environments.

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	34.5	-4.6	0.9	50Ω	2W	Linear	Omni
		30x30cm	21.4	-6.7	1.3				
4G/3G Band 12,13,14,17,28,29	698~806	Free space	22.8	-6.4	-2.1				
		30x30cm	36.7	-4.4	0.6				
4G/3G Band 5,8,18,19,20,26,27	824~960	Free space	42.9	-3.7	0.8				
		30x30cm	49.8	-3	1.4				
5G/4G Band 21,32,74,75,76	1427~1518	Free space	25.9	-5.4	-0.8				
		30x30cm	23.1	-6.4	-1.2				
4G/3G Band 1,2,3,4,9,23,25,35,39,66	1710~2200	Free space	41.8	-3.8	1.5				
		30x30cm	45.6	-3.3	1.1				
4G/3G Band 7,30,38,40,41	2300~2690	Free space	43.2	-5	1				
		30x30cm	23.2	-6.4	-1.9				
5G NR Band 22,42,48,77,78	3300~4200	Free space	21.3	-6.7	-1.3				
		30x30cm	14	-8.7	-3.5				
5G NR Band 79	4400~5000	Free space	24.4	-6.2	0.2				
		30x30cm	23.4	-6.3	0.7				

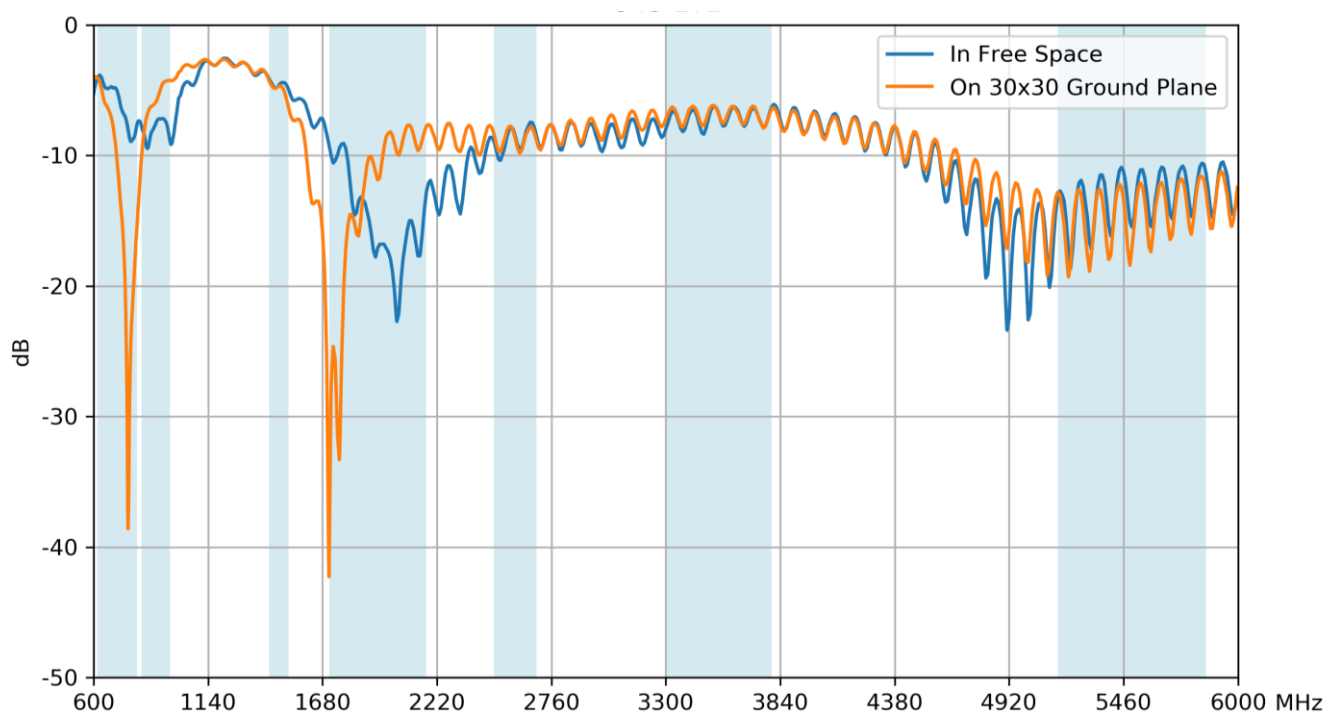
Mechanical	
Height	48.5 mm
Planner Dimension	Ø50.15mm
Casing	ABS + Anti-UV
Cable	2000mm of RG-174
Connector	SMA(M)
Base and Thread	Brass with nickel plated
Thread Diameter	M12
Sealant	Rubber
Weight	75g
Impact Rating	IK10
Environmental	
Protection	IP67
Temperature Range	-40°C to 85°C
Humidity	Non-condensing 65°C 95% RH
Thermal Shock	200 cycles -40°C to +90°C
Shock (Drop Test)	1m drop on concrete 6 axes
Cable Pull	8kgf

5G/4G Bands Free Space			
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	✓
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 - 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	✓

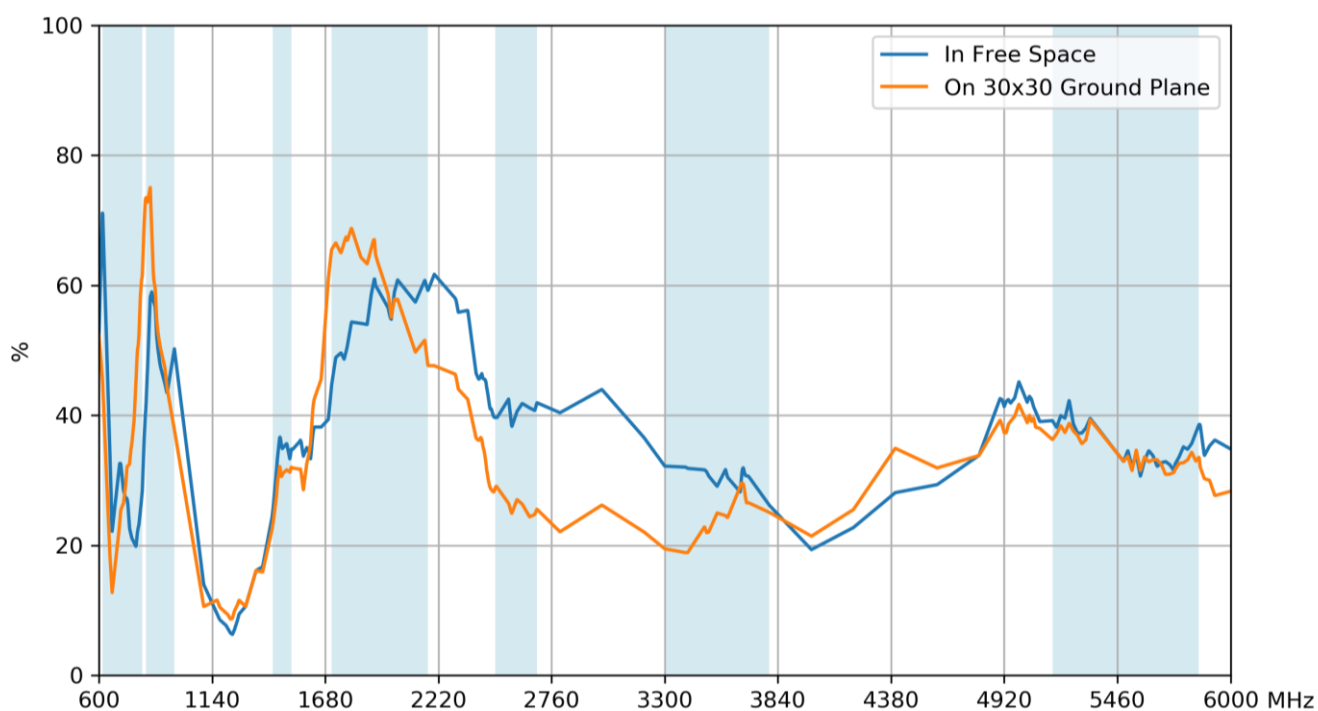
5G/4G Bands 30x30cm Ground Plane			
Band Number	5G NR / FR1 / LTE / LTE-Advanced / WCDMA / HSPA / HSPA+ / TD-SCDMA		
	Uplink	Downlink	Covered
1	UL: 1920 to 1980	DL: 2110 to 2170	✓
2	UL: 1850 to 1910	DL: 1930 to 1990	✓
3	UL: 1710 to 1785	DL: 1805 to 1880	✓
4	UL: 1710 to 1755	DL: 2110 to 2155	✓
5	UL: 824 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	✓
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 - 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

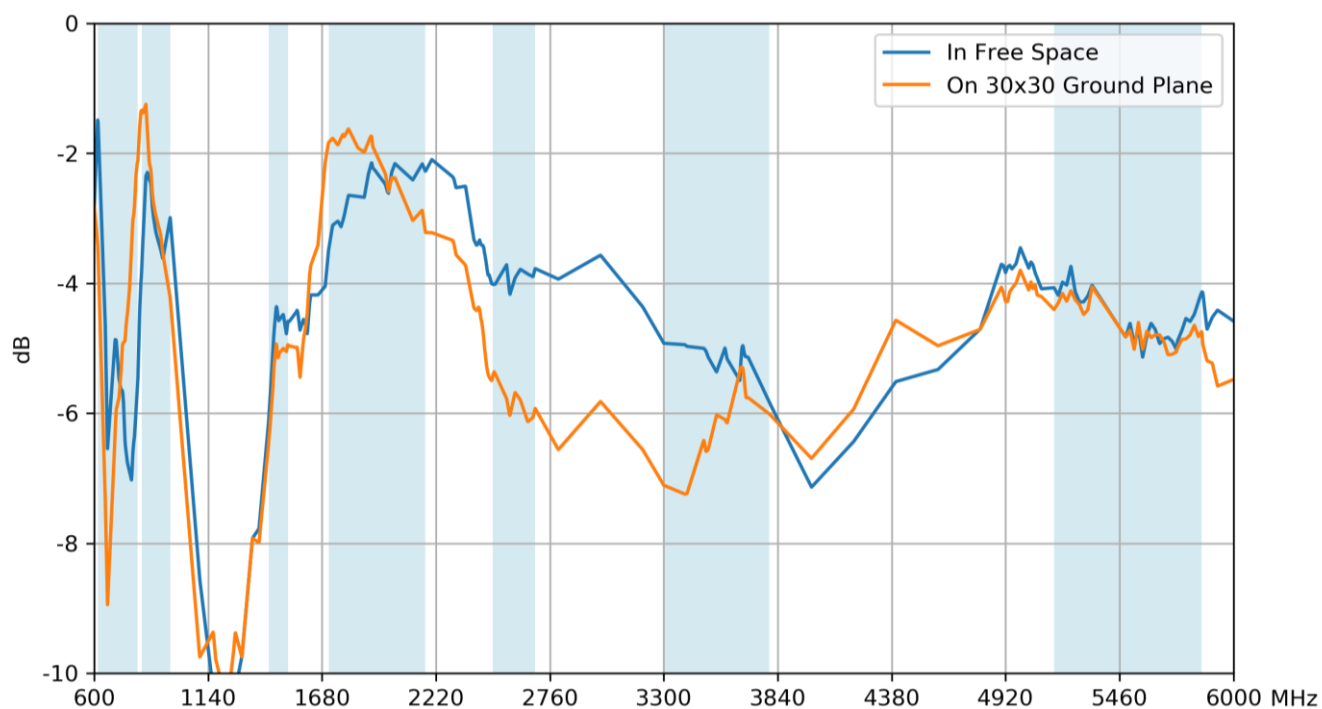
3.1 Return Loss



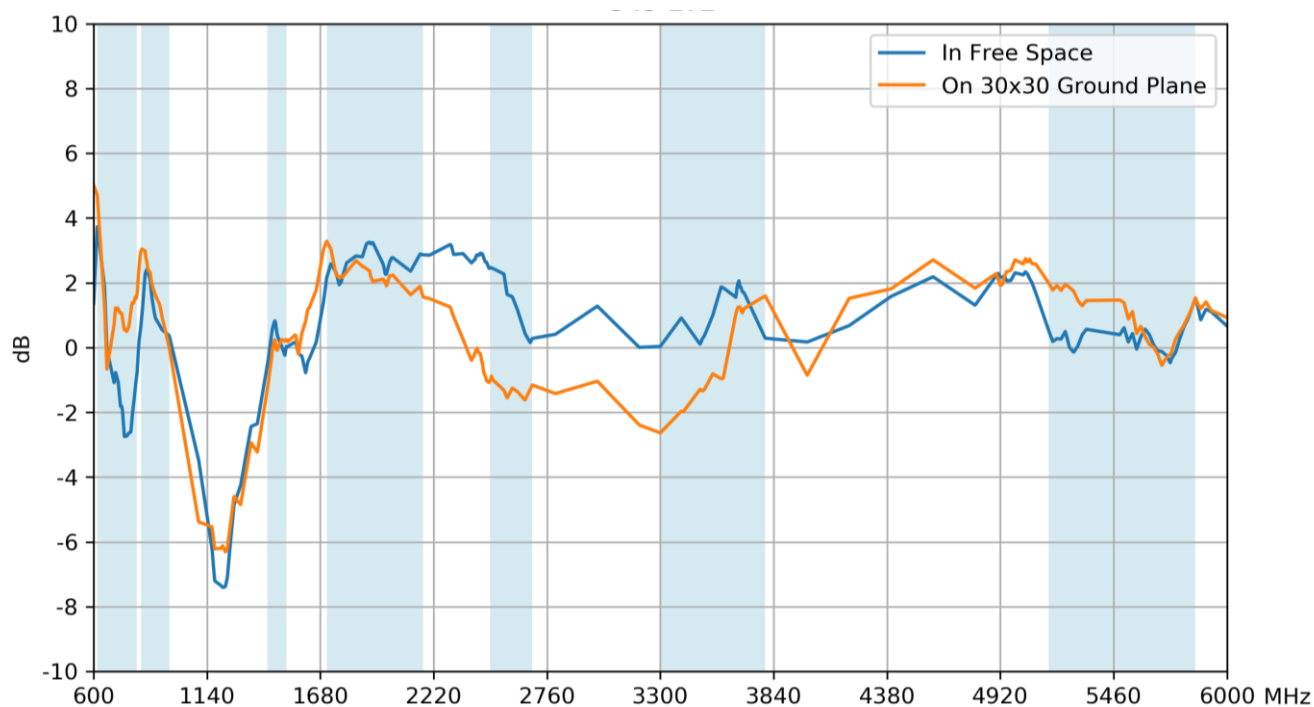
3.2 Efficiency



3.3 Average Gain

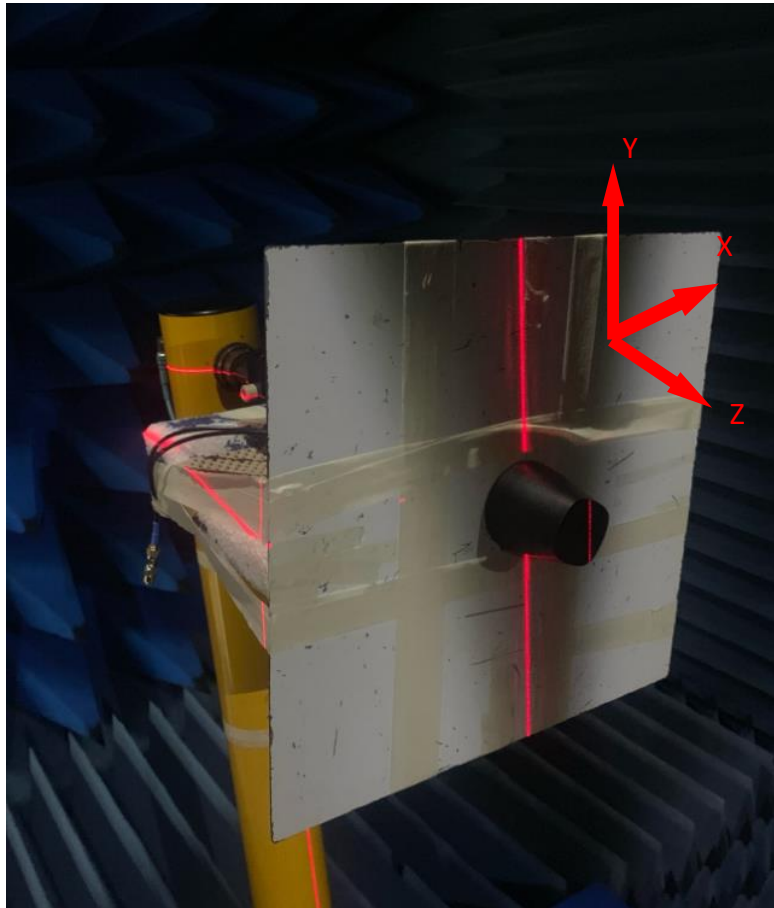


3.4 Peak Gain



4. Radiation Patterns

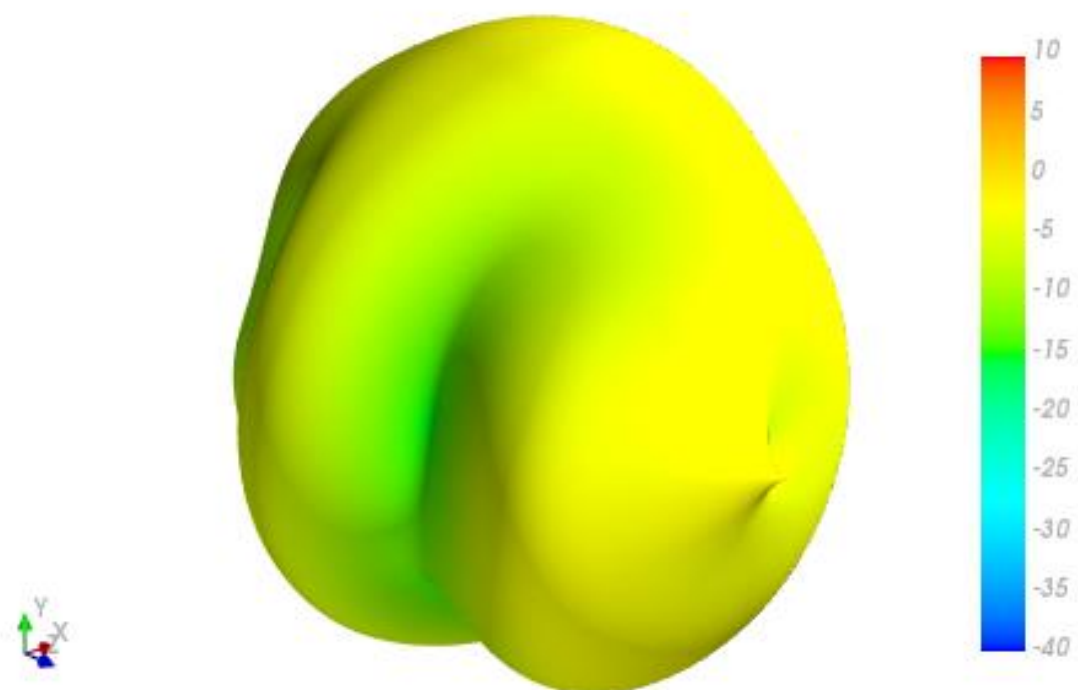
4.1 Test Setup



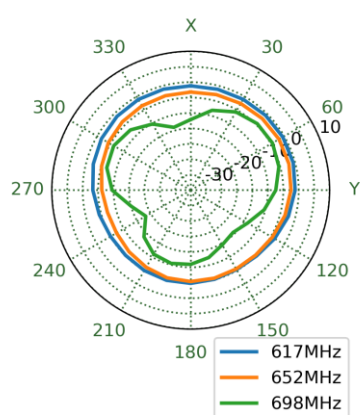
On 30x30cm Ground Plane

4.2 Free Space 3D and 2D Radiation Patterns

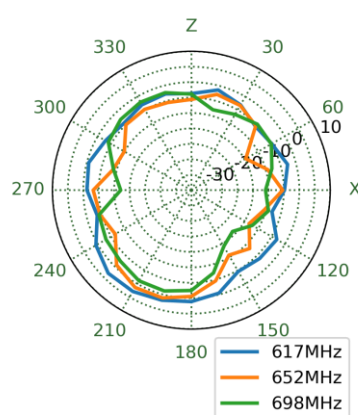
652MHz



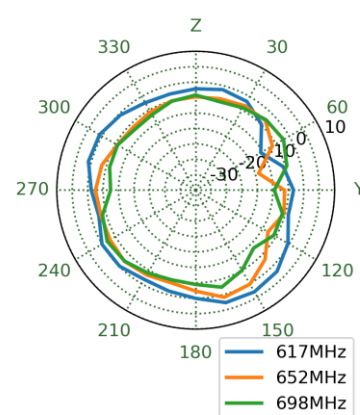
XY Plane



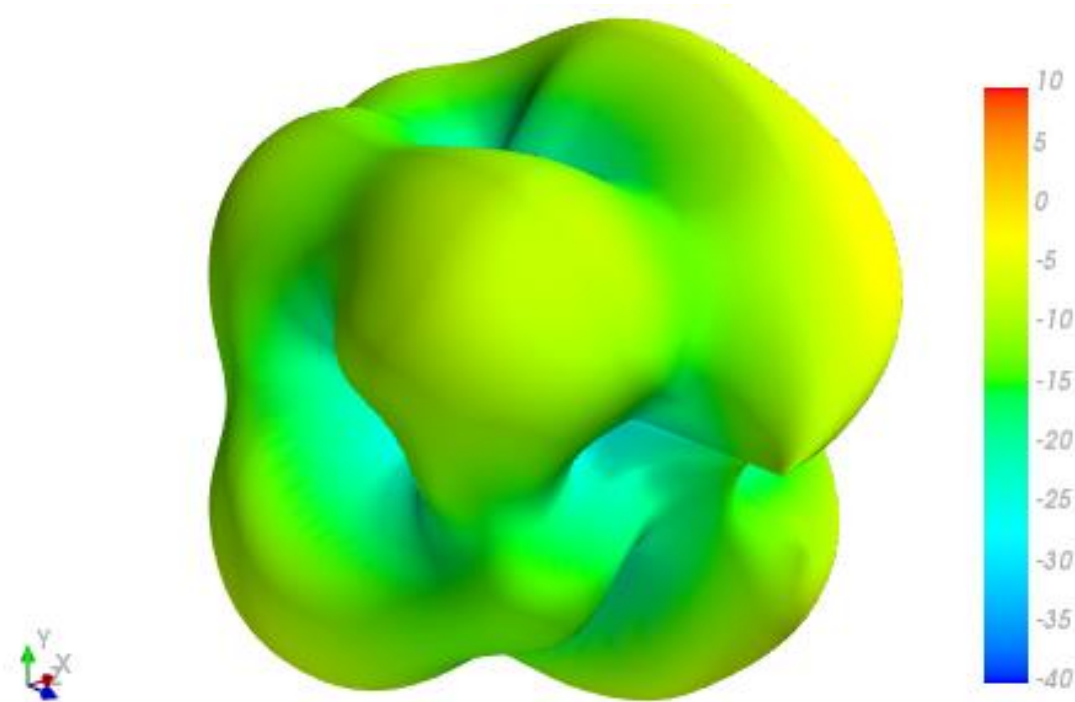
XZ Plane



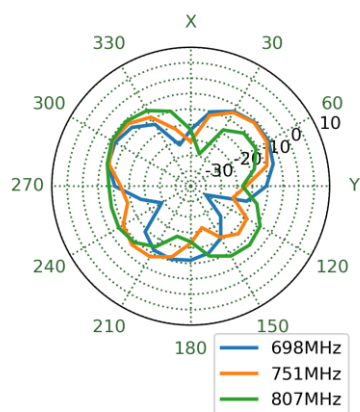
YZ Plane



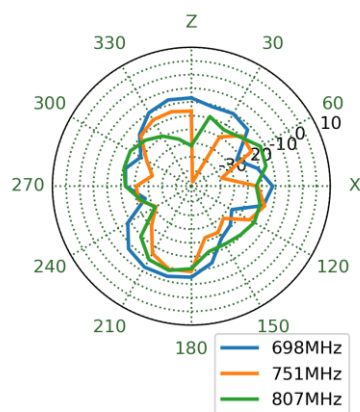
751MHz



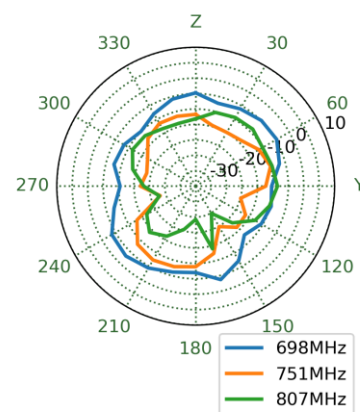
XY Plane



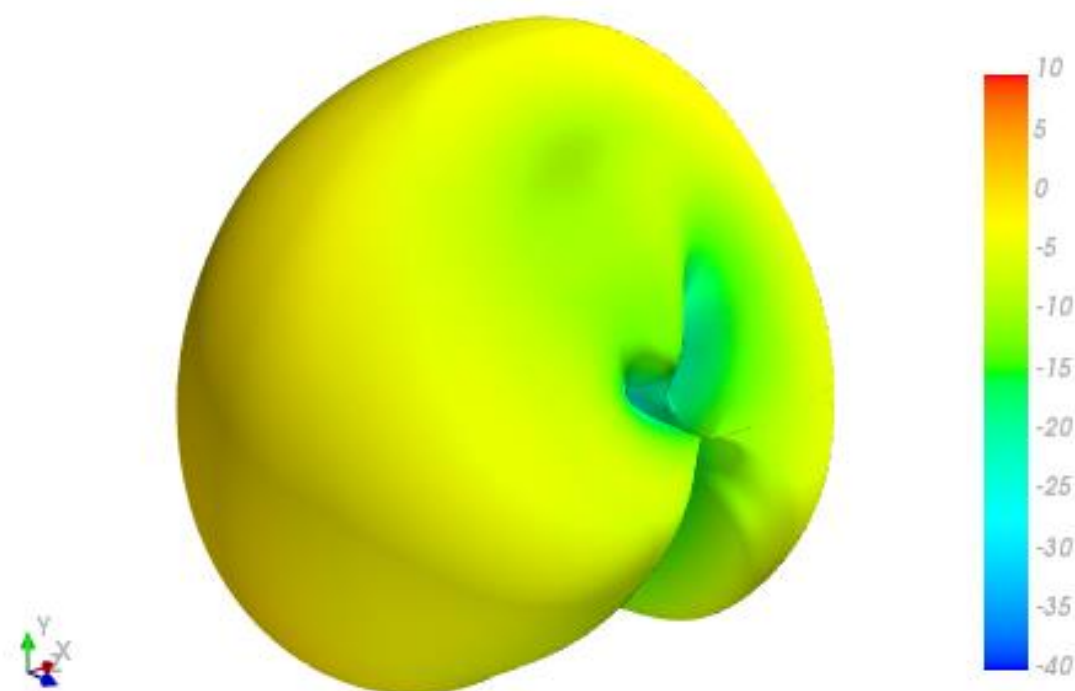
XZ Plane



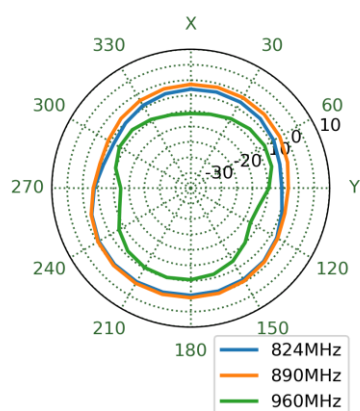
YZ Plane



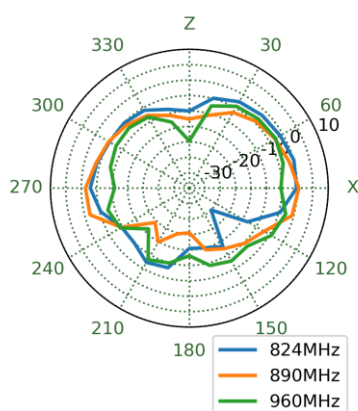
890MHz



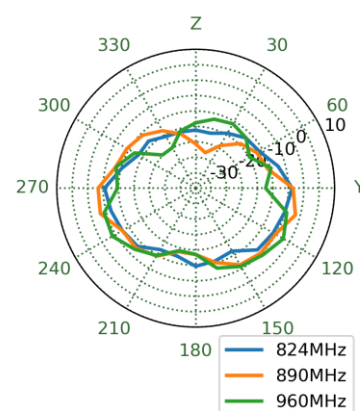
XY Plane



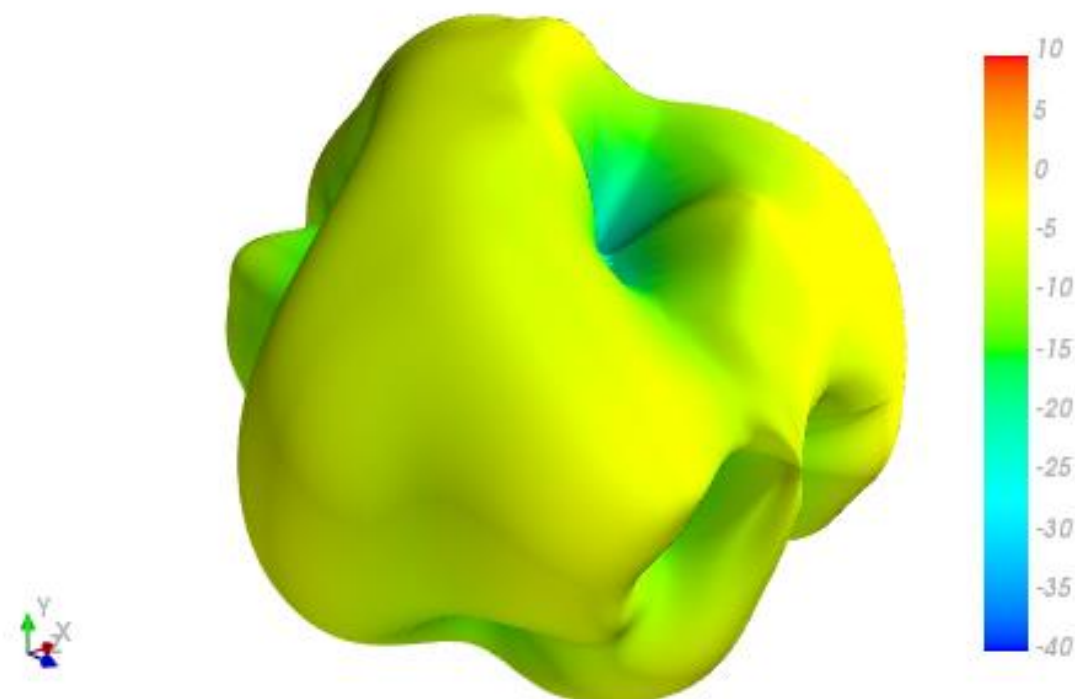
XZ Plane



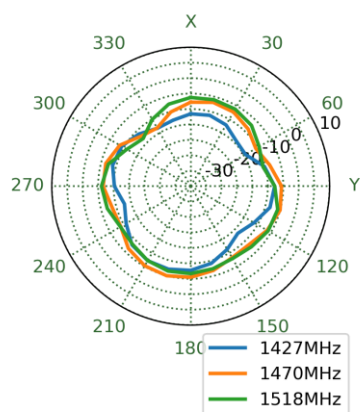
YZ Plane



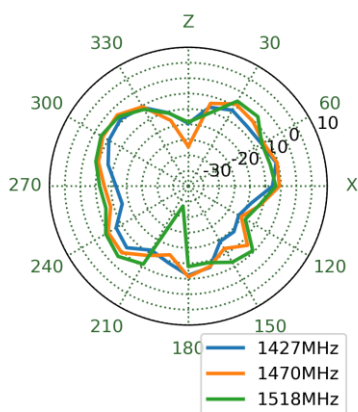
1470MHz



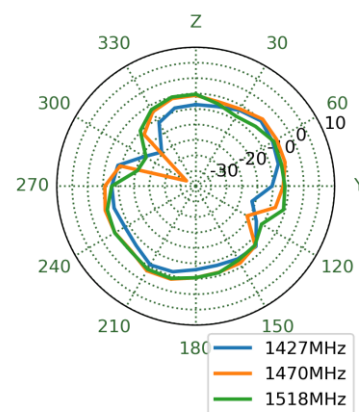
XY Plane



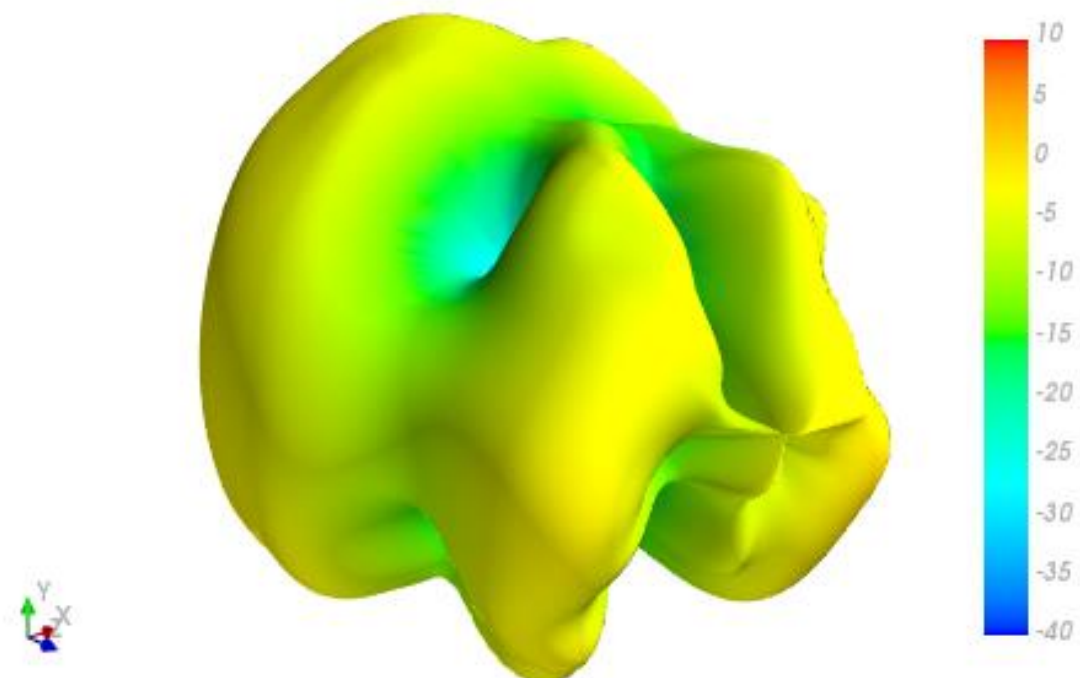
XZ Plane



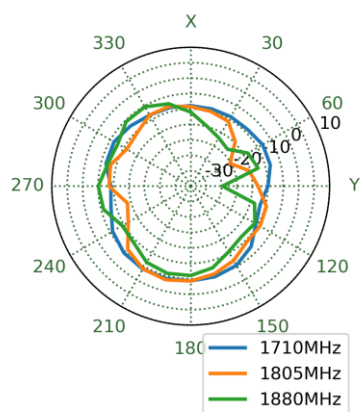
YZ Plane



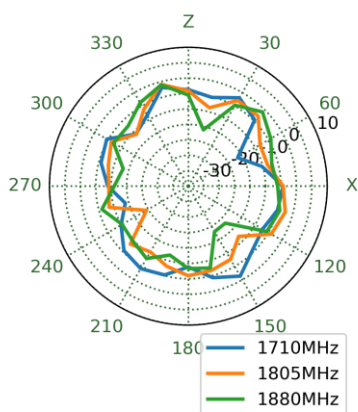
1805MHz



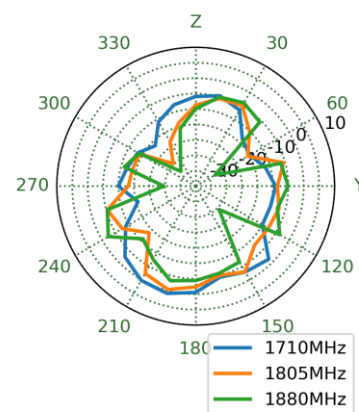
XY Plane



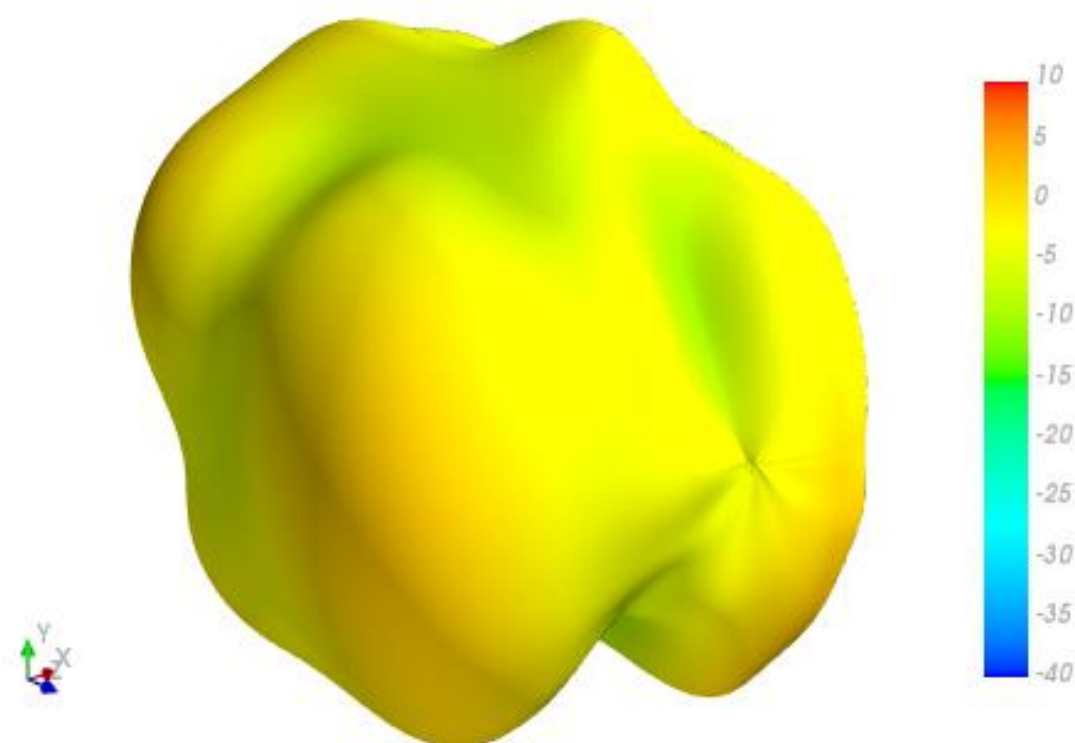
XZ Plane



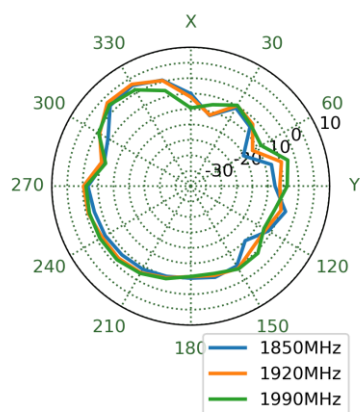
YZ Plane



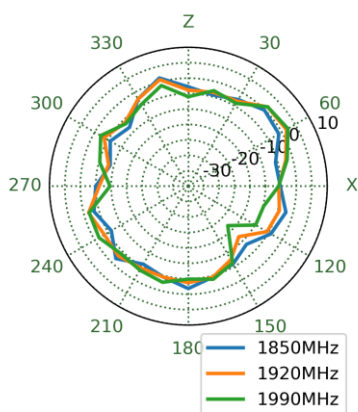
1920MHz



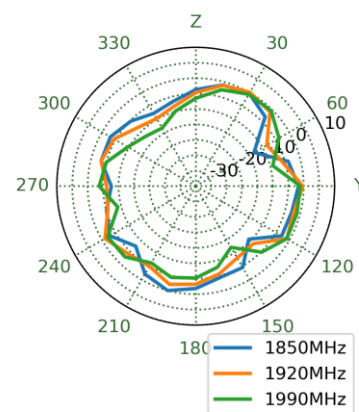
XY Plane



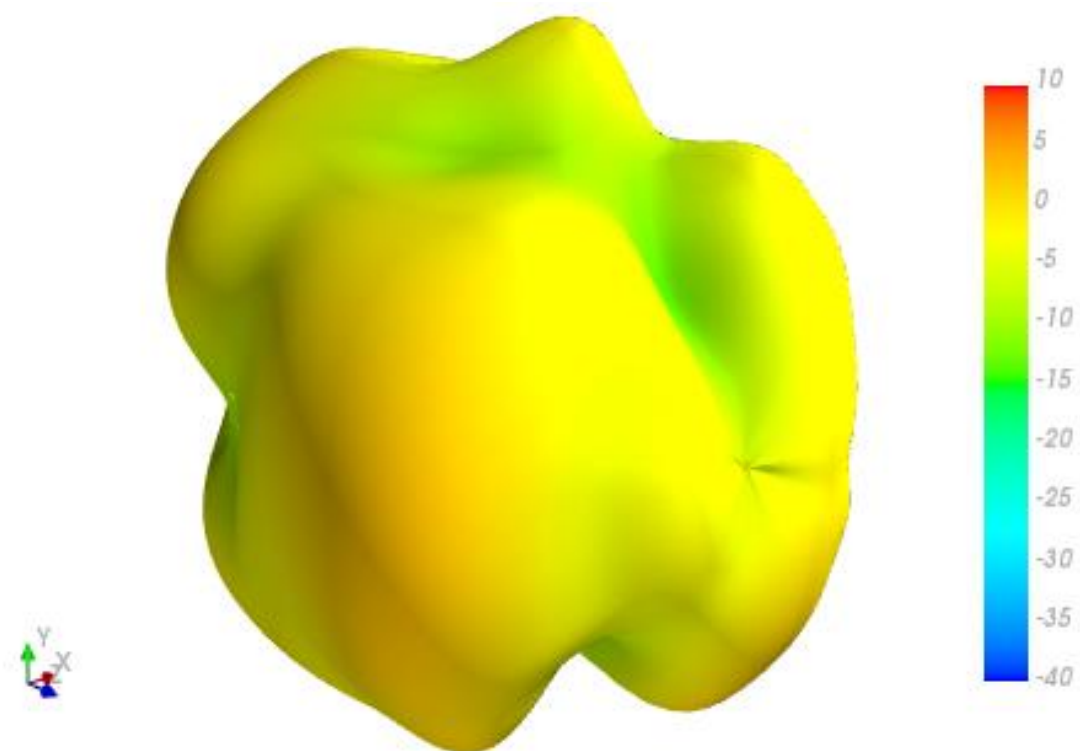
XZ Plane



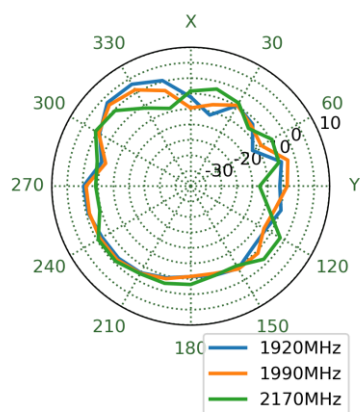
YZ Plane



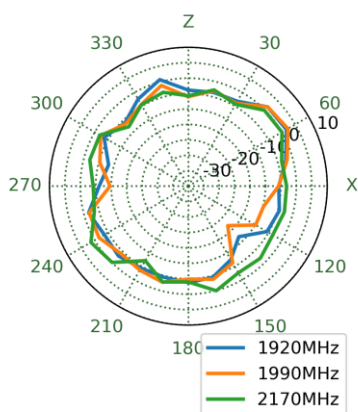
1990MHz



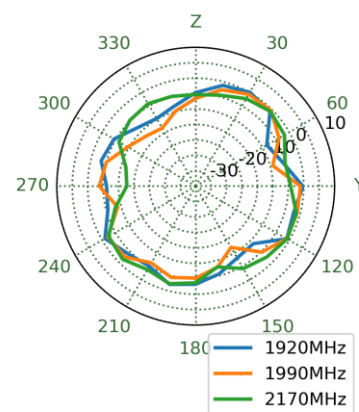
XY Plane



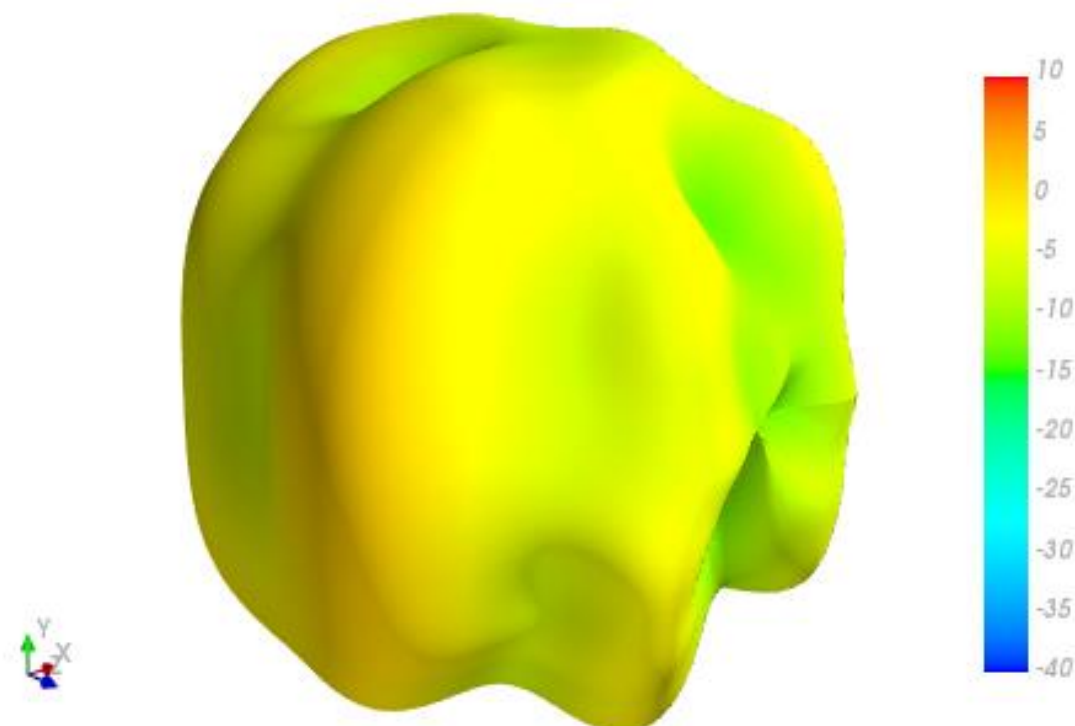
XZ Plane



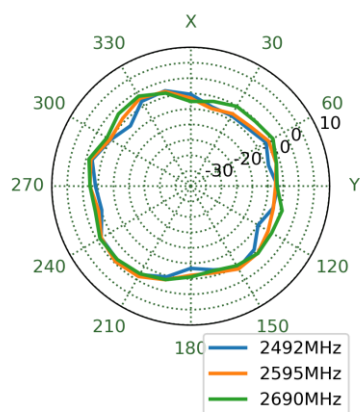
YZ Plane



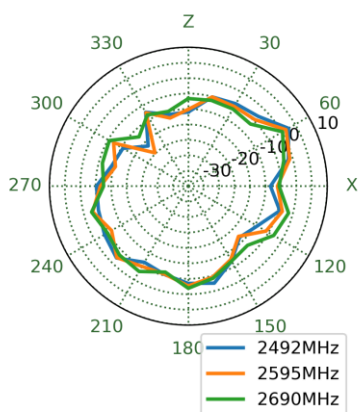
2592MHz



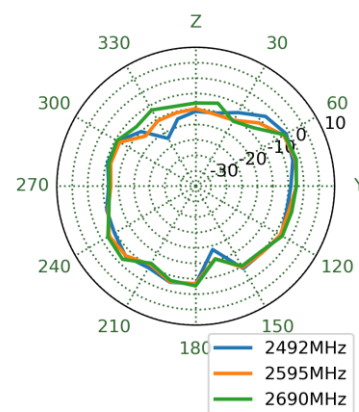
XY Plane



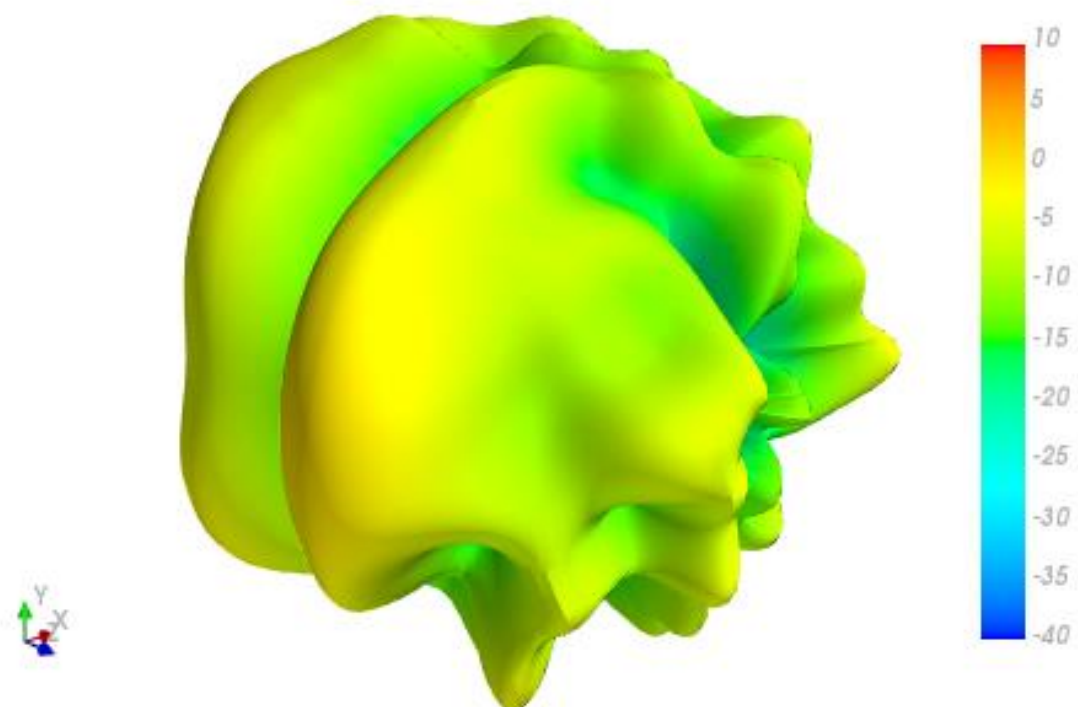
XZ Plane



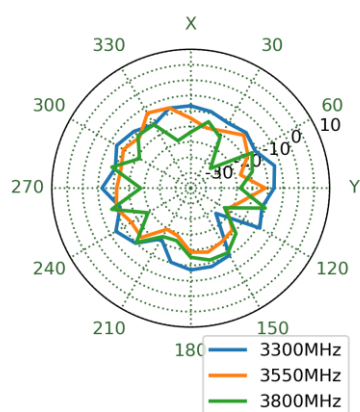
YZ Plane



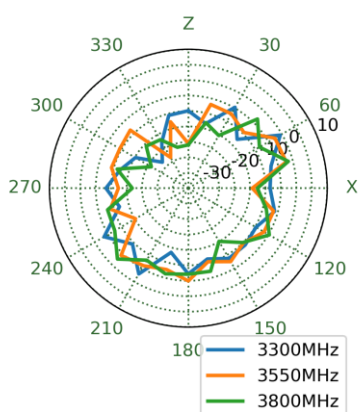
3550MHz



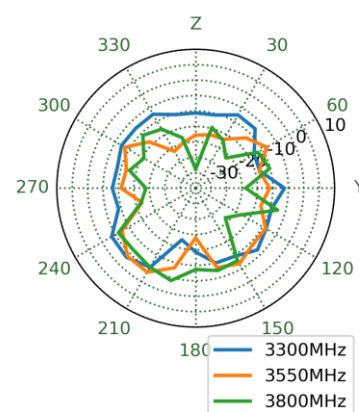
XY Plane



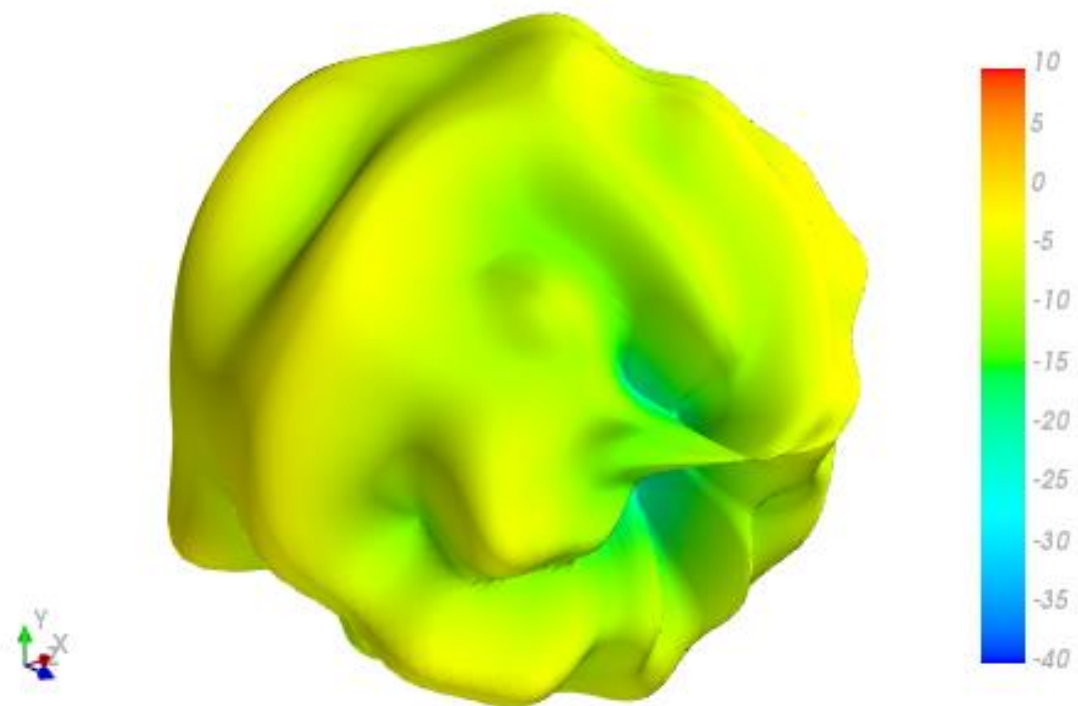
XZ Plane



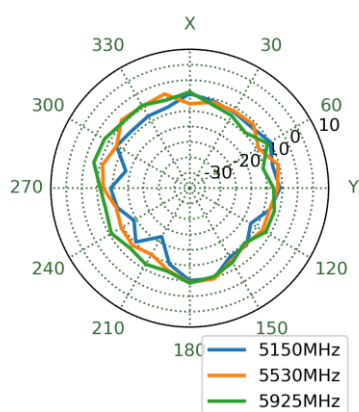
YZ Plane



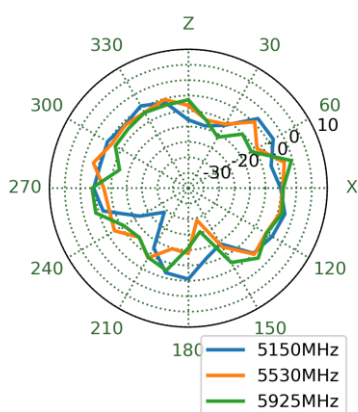
5330MHz



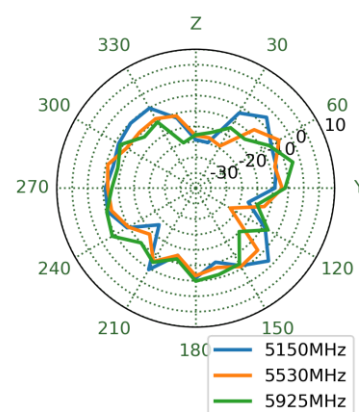
XY Plane



XZ Plane

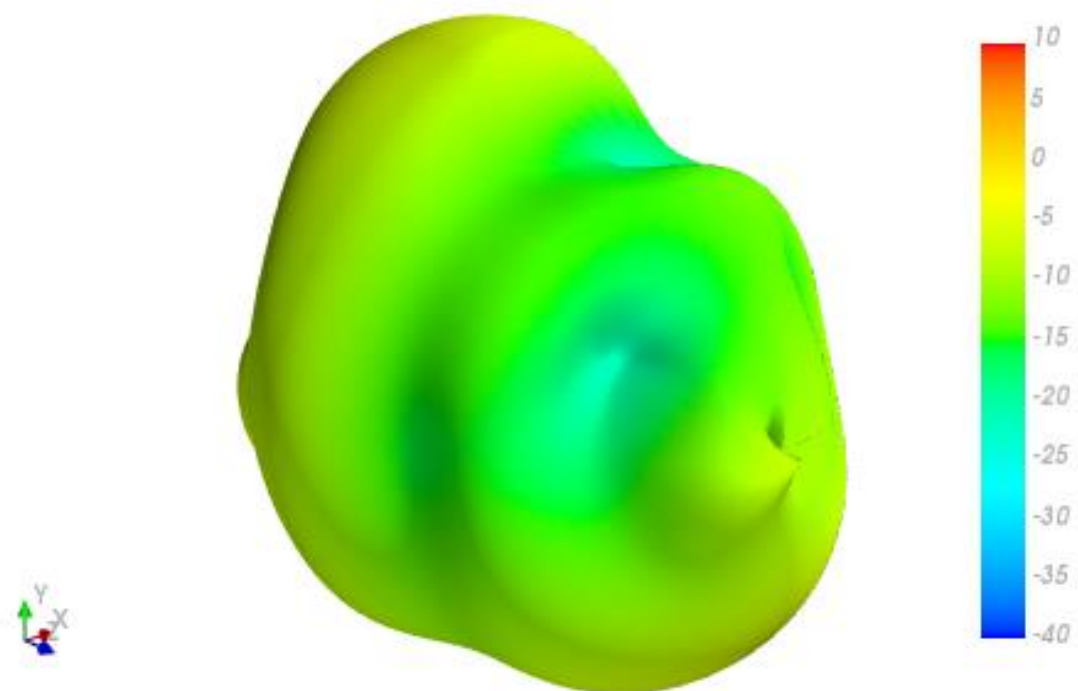


YZ Plane

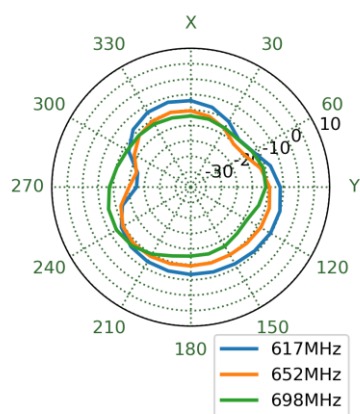


4.3 30*30cm Ground Plane 3D and 2D Radiation Patterns

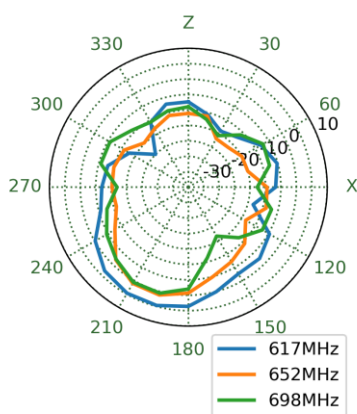
652MHz



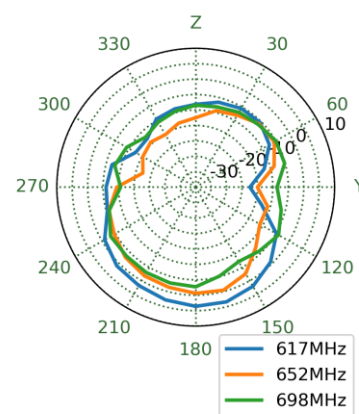
XY Plane



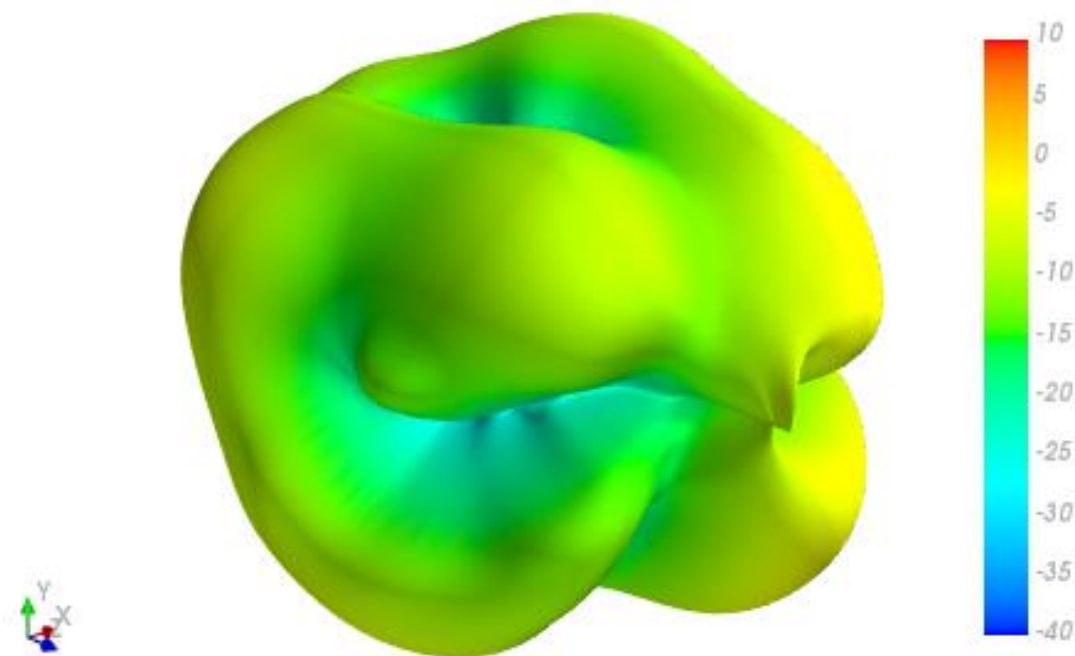
XZ Plane



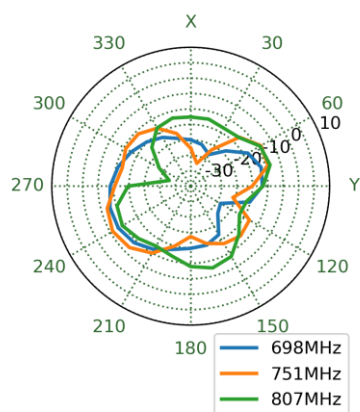
YZ Plane



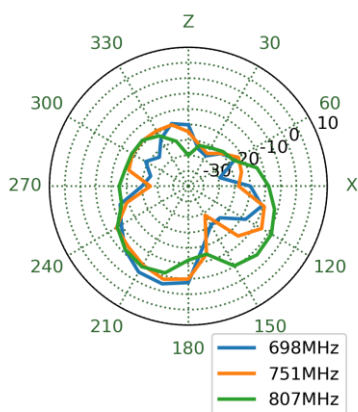
751MHz



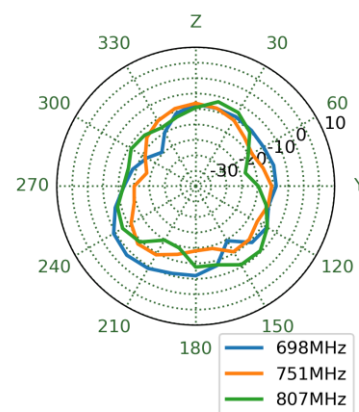
XY Plane



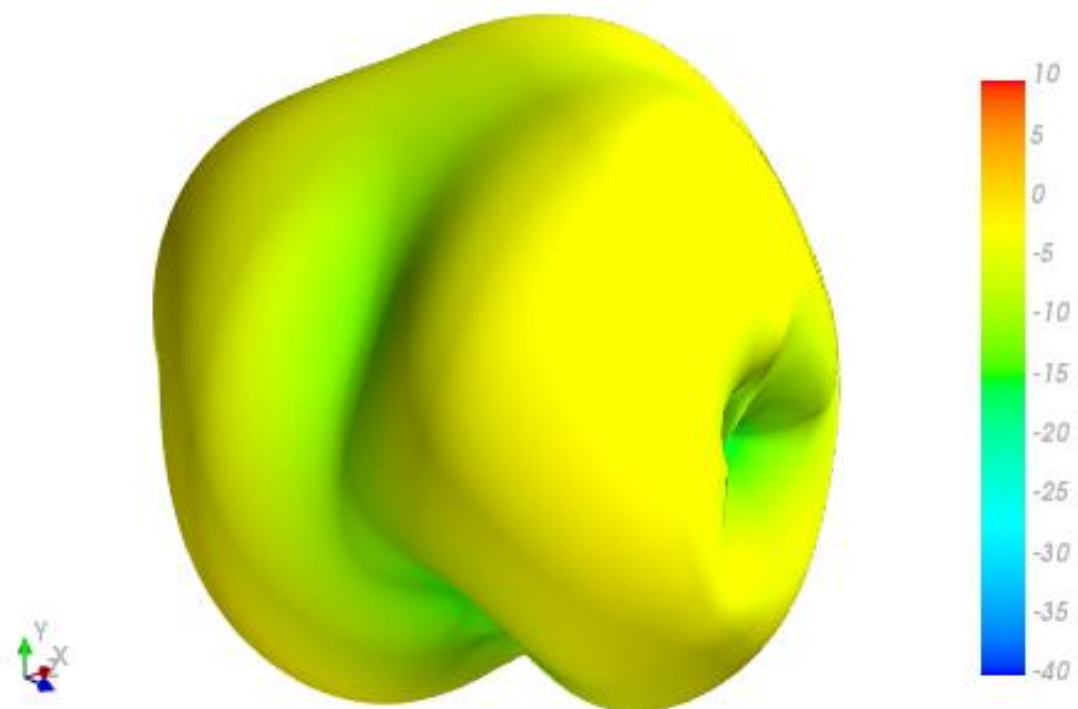
XZ Plane



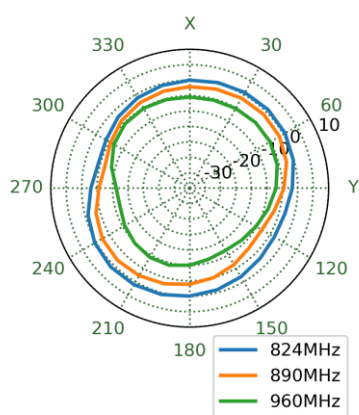
YZ Plane



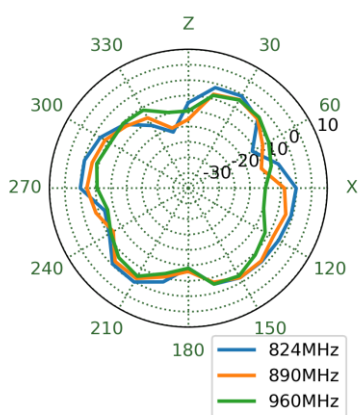
890MHz



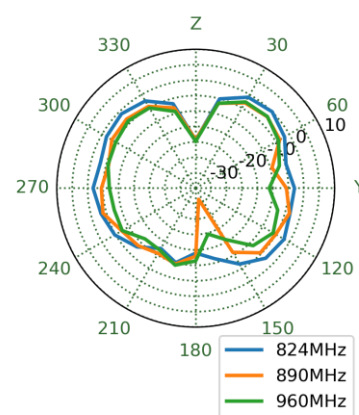
XY Plane



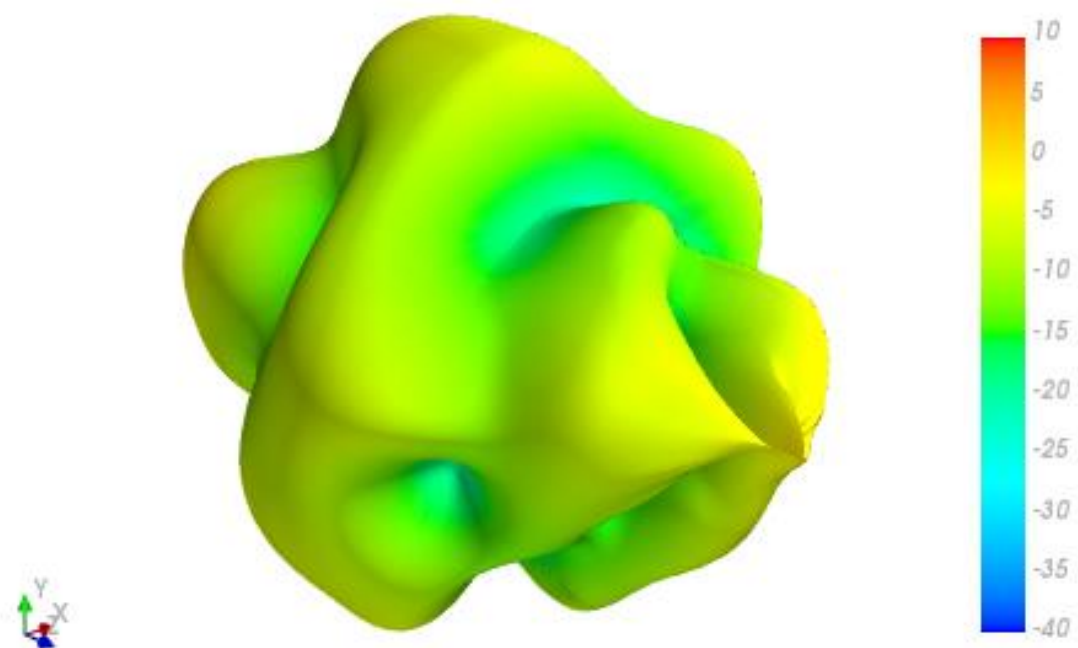
XZ Plane



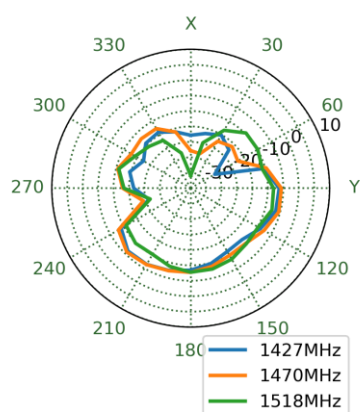
YZ Plane



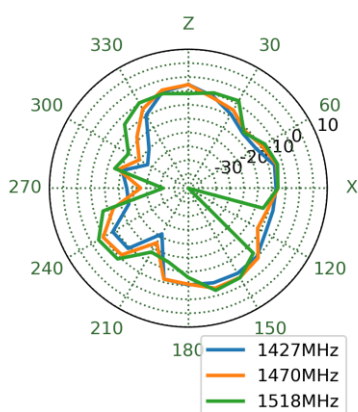
1470MHz



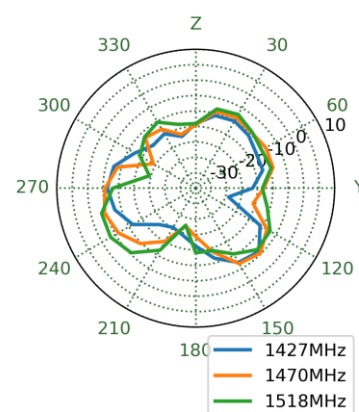
XY Plane



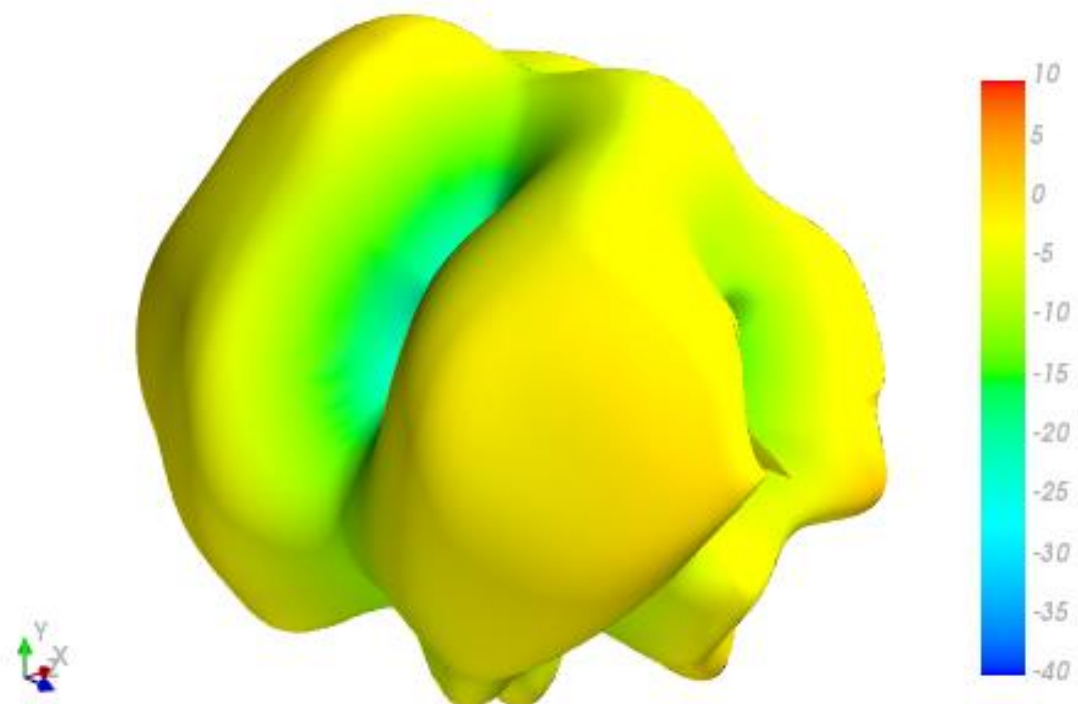
XZ Plane



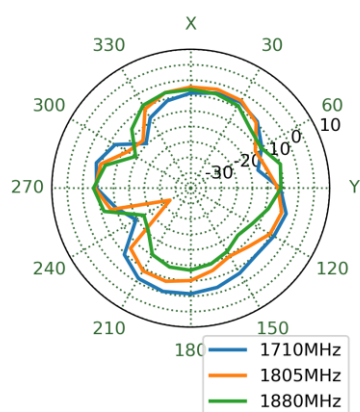
YZ Plane



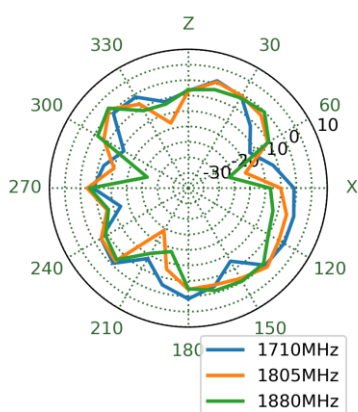
1805MHz



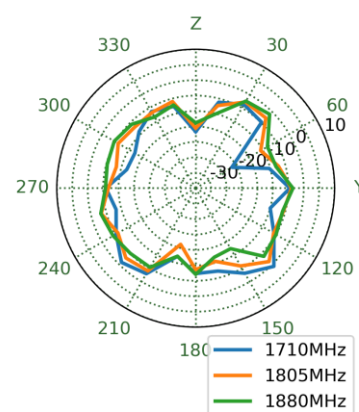
XY Plane



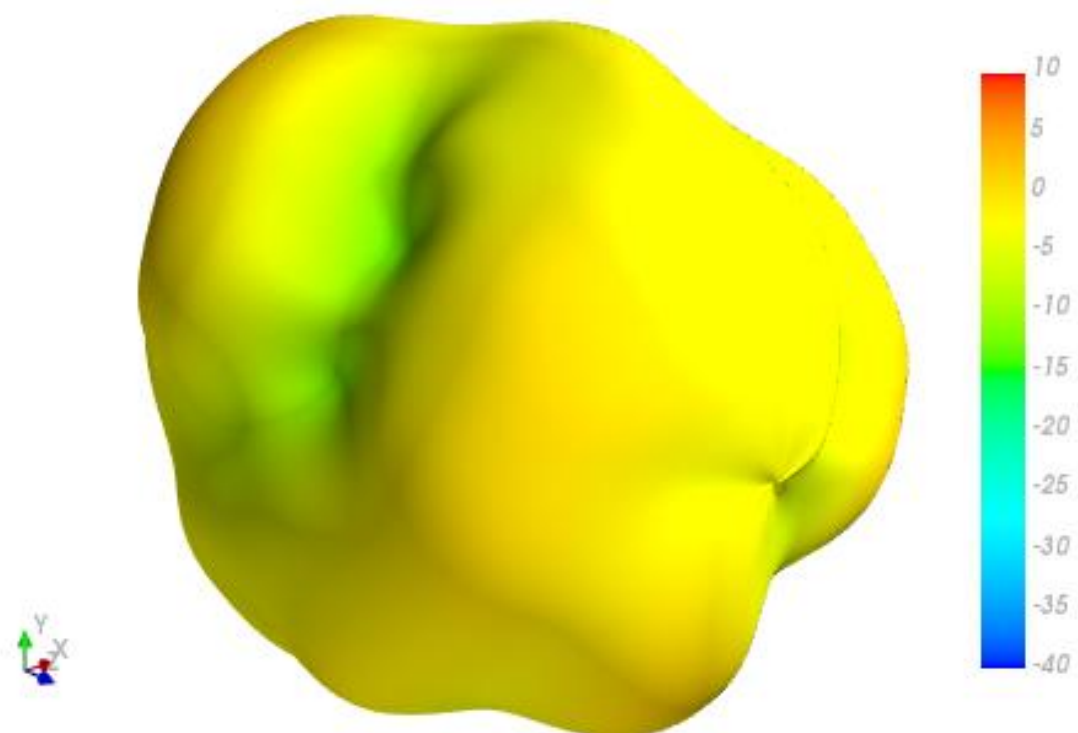
XZ Plane



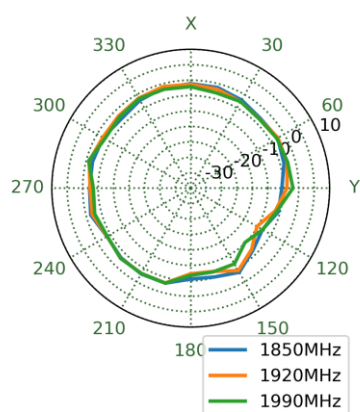
YZ Plane



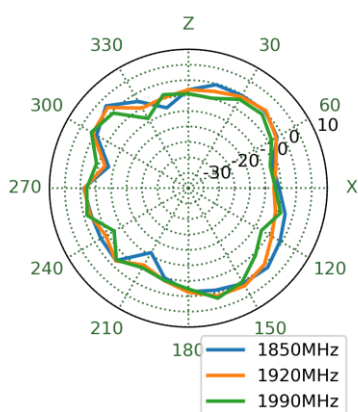
1920MHz



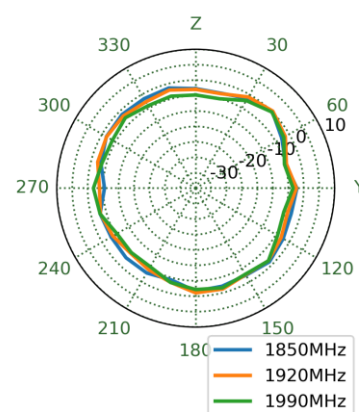
XY Plane



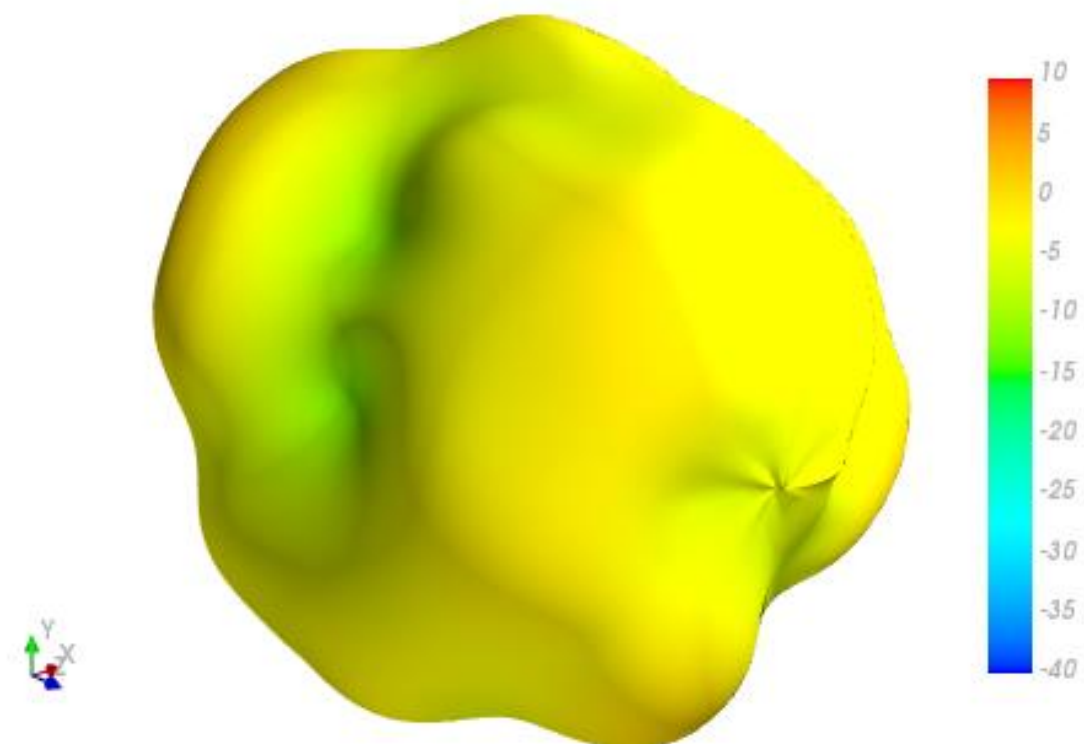
XZ Plane



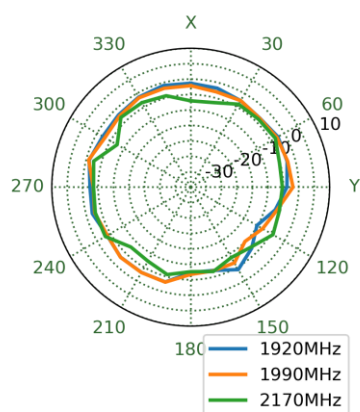
YZ Plane



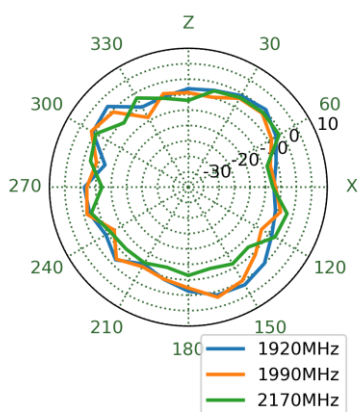
1990MHz



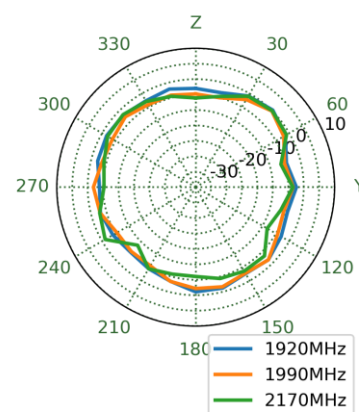
XY Plane



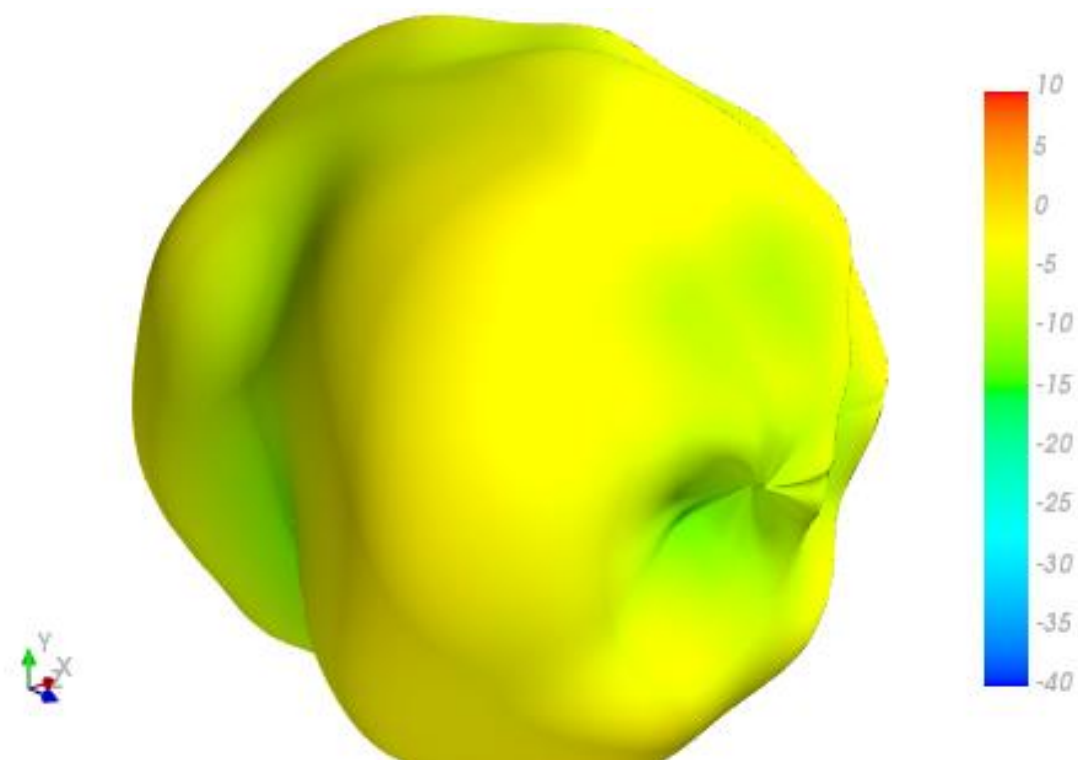
XZ Plane



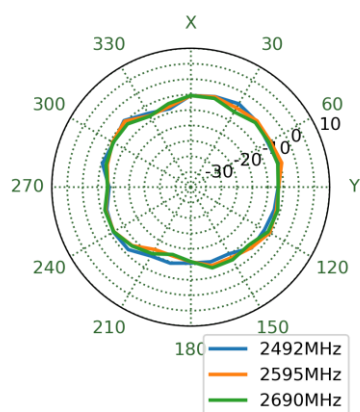
YZ Plane



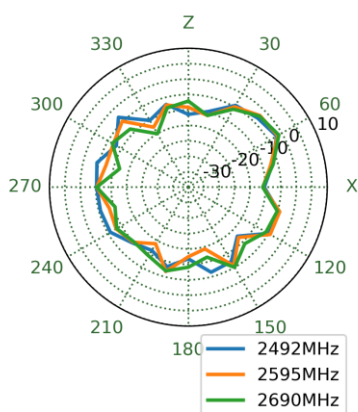
2595MHz



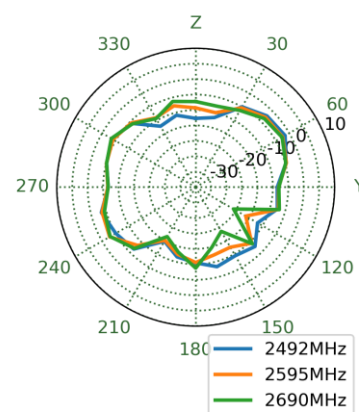
XY Plane



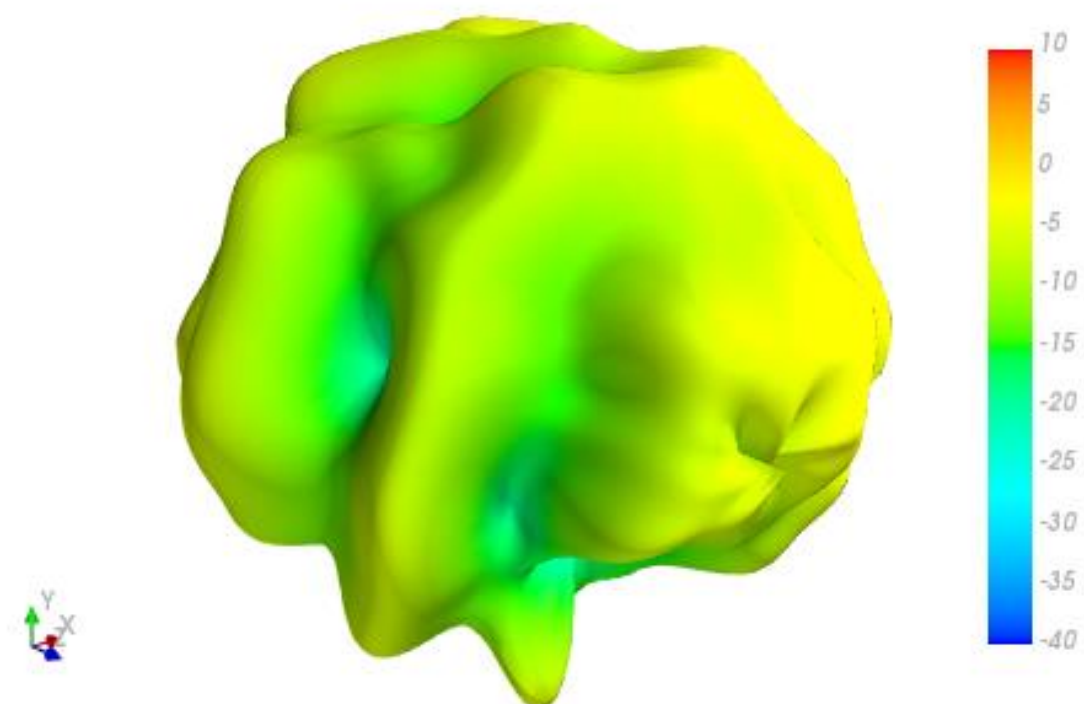
XZ Plane



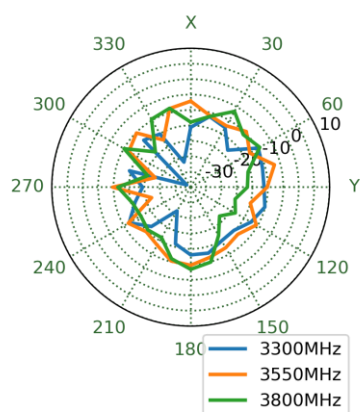
YZ Plane



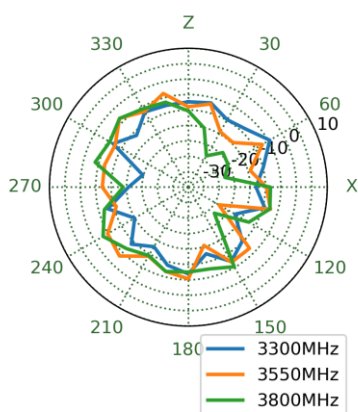
3550MHz



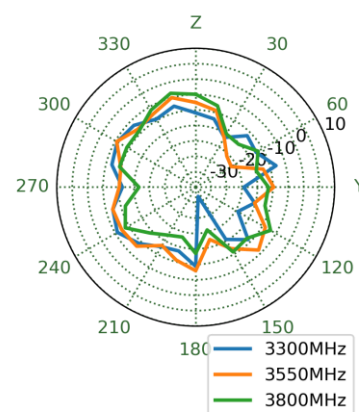
XY Plane



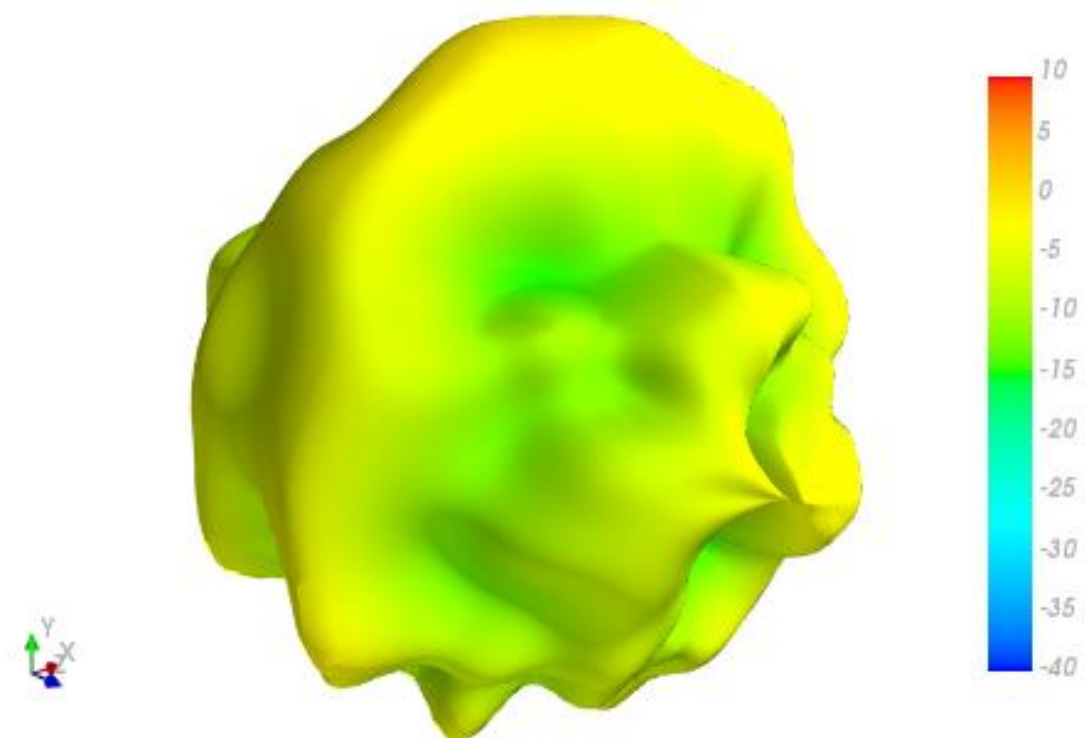
XZ Plane



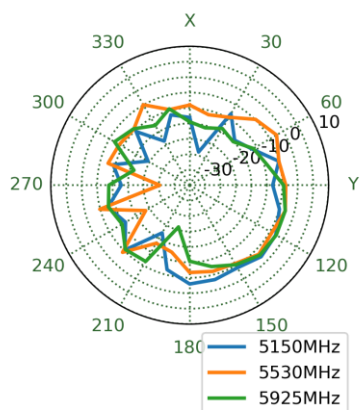
YZ Plane



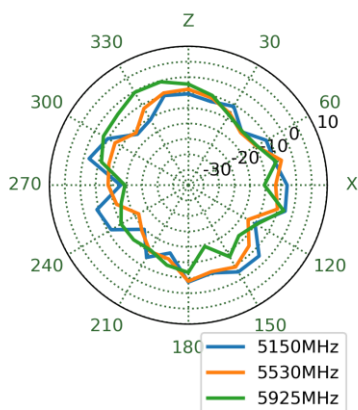
5530MHz



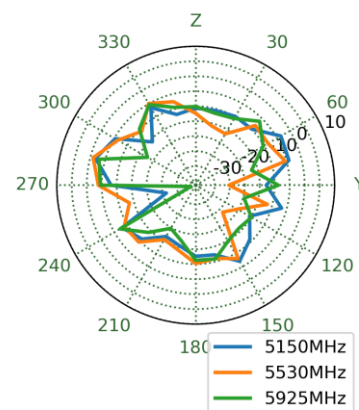
XY Plane



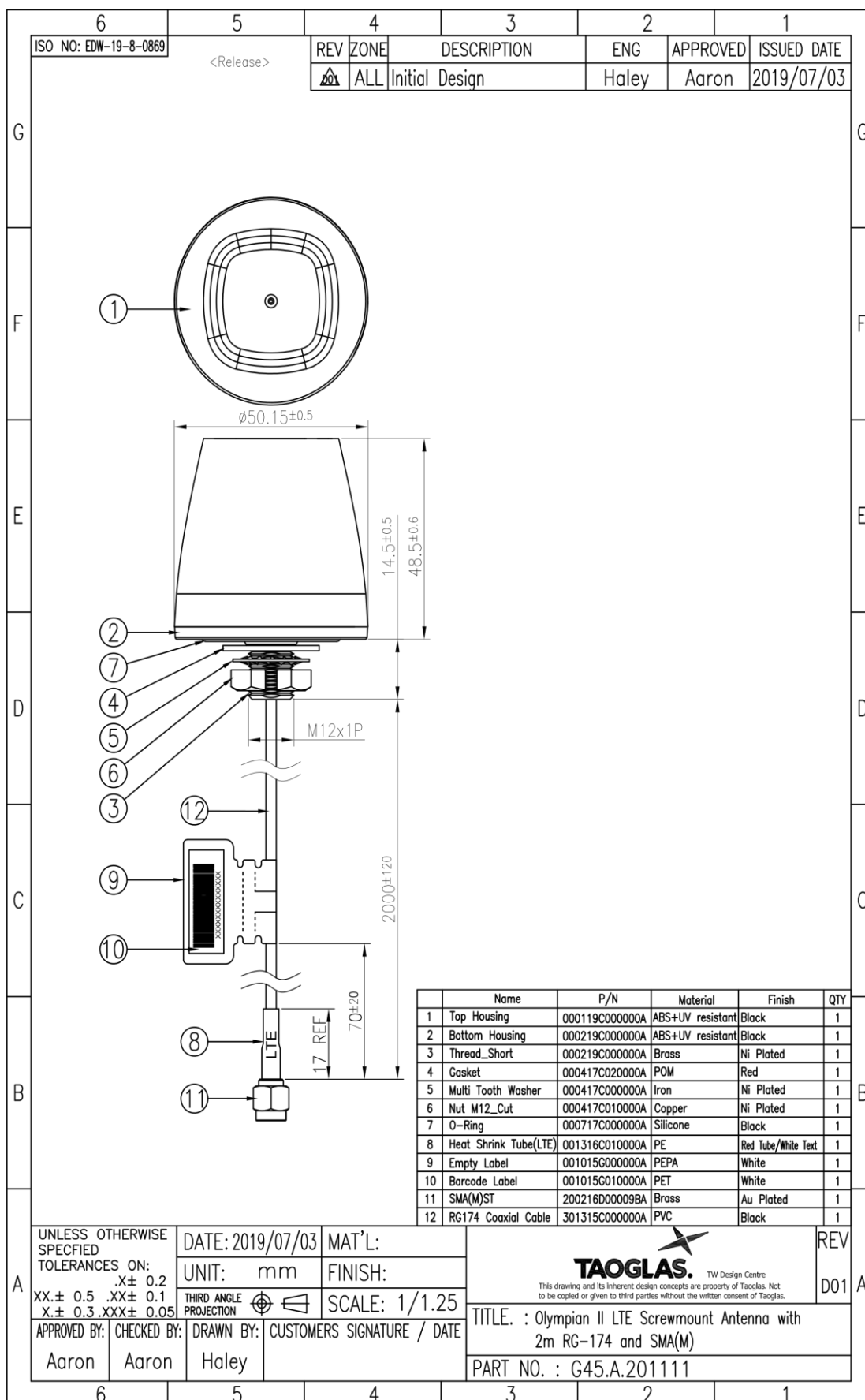
XZ Plane



YZ Plane



5. Mechanical Drawing (Units: mm)



6. Packaging

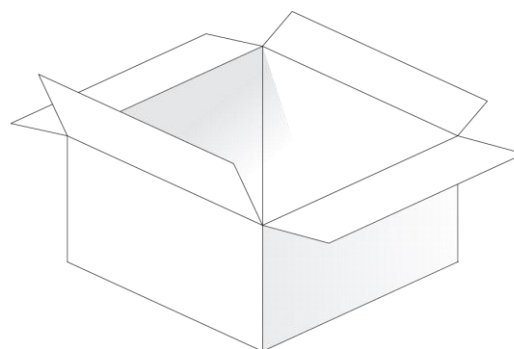
1pc G45.A.201111 per PE Bag
Weight: 75g



10pcs G45.A.201111 per Large PE Bag
Weight: 850g

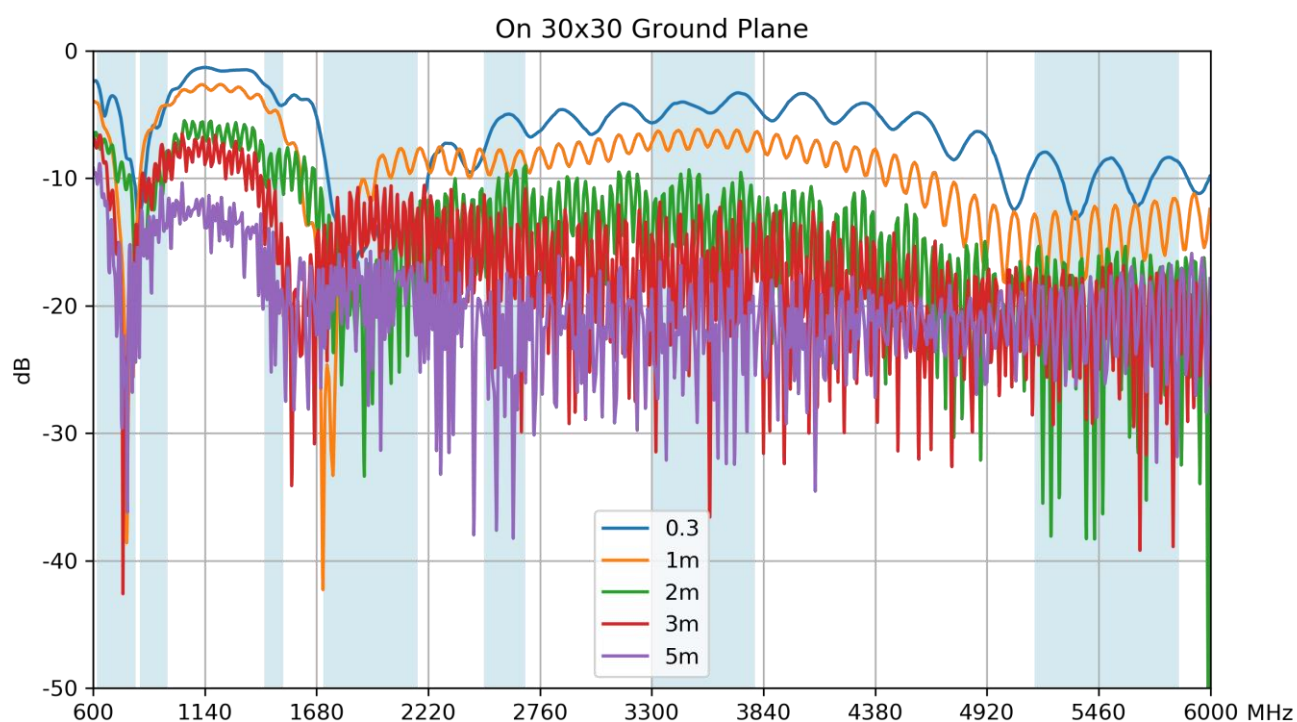
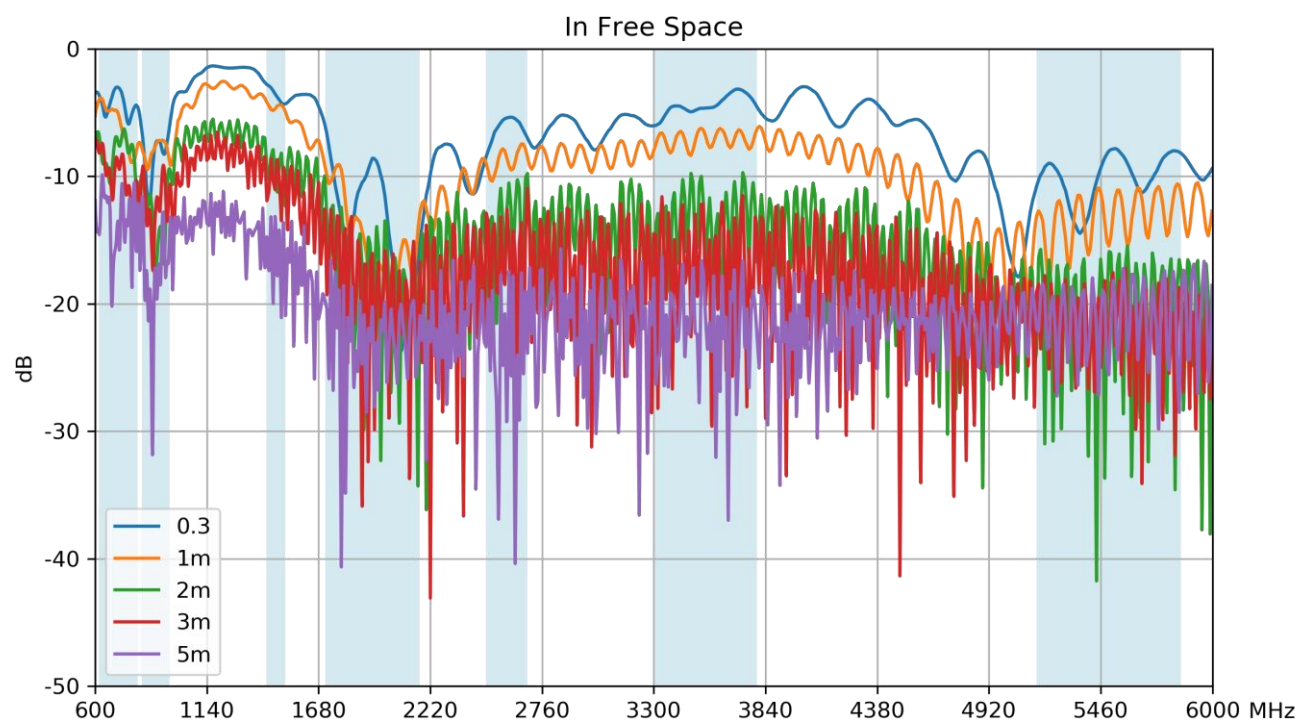


80pcs G45.A.201111 per Carton
Weight: 7.2Kg

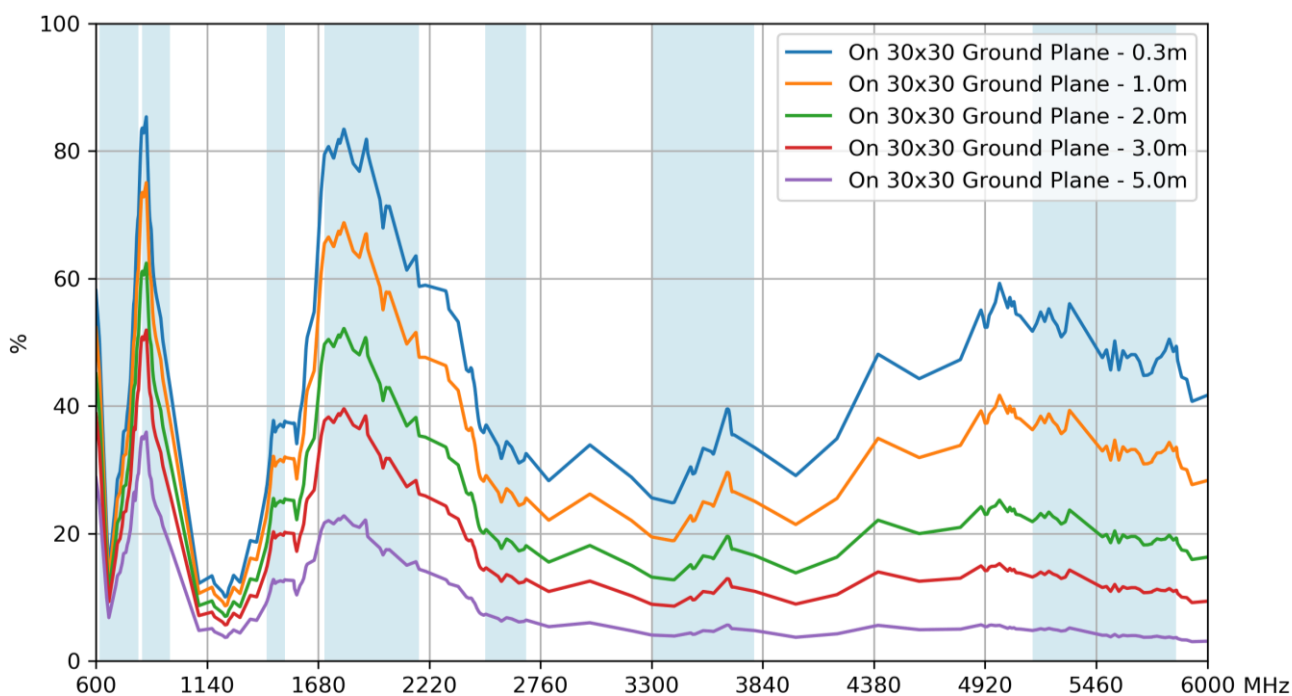
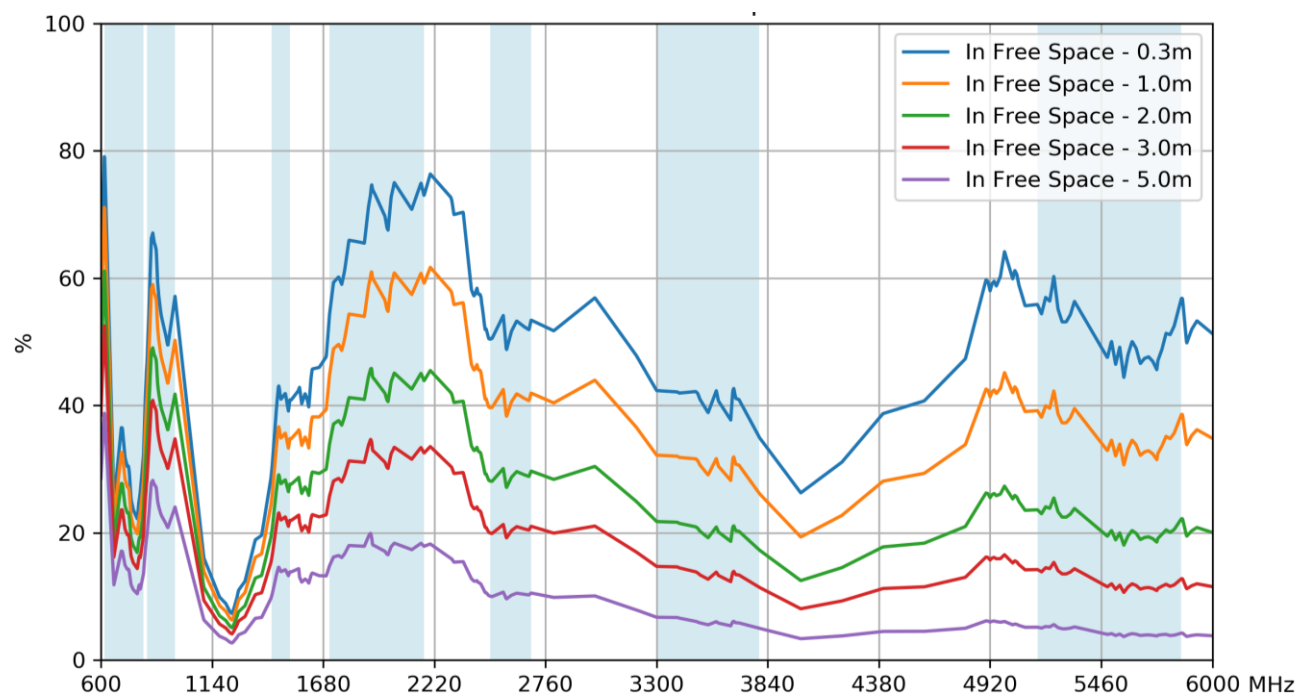


7. Application Note

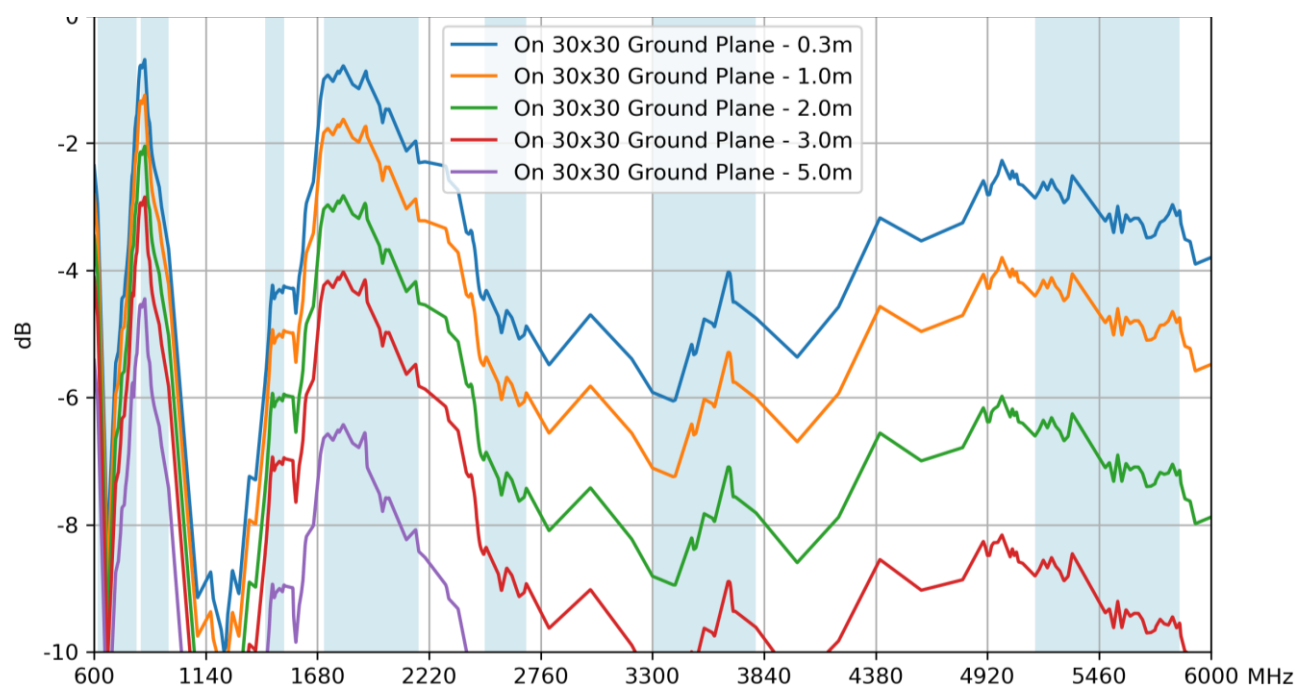
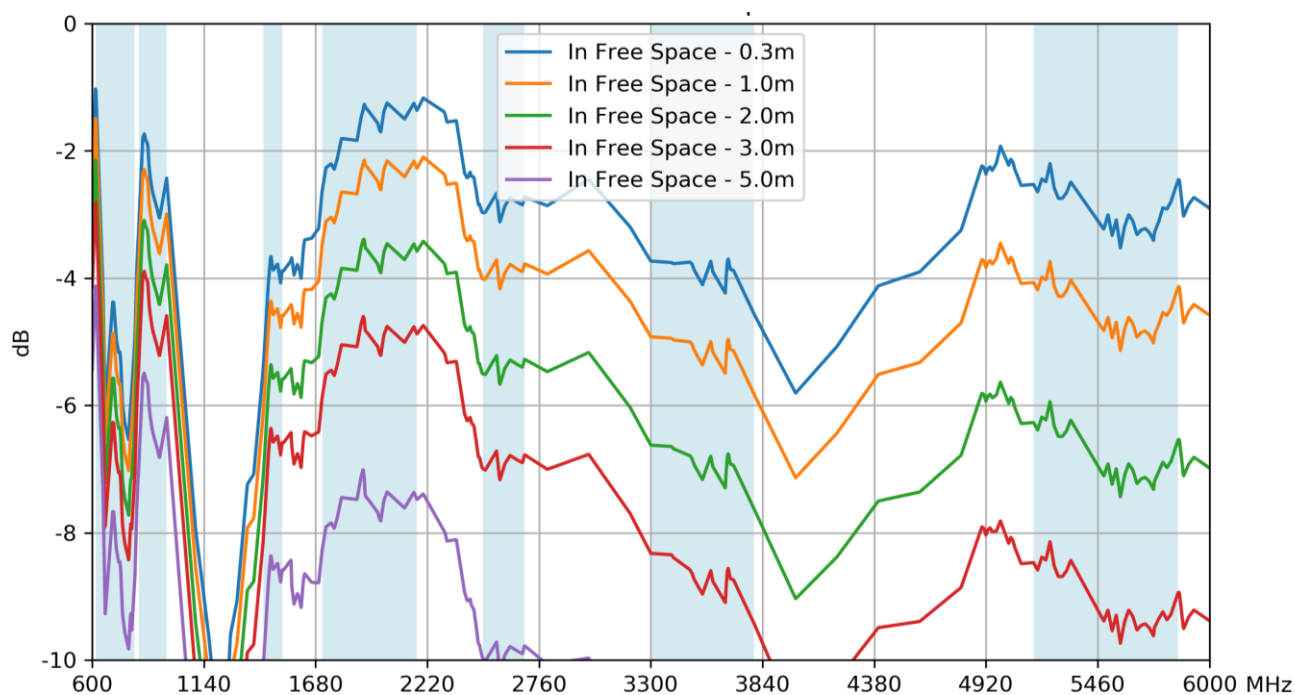
7.1 Return Loss



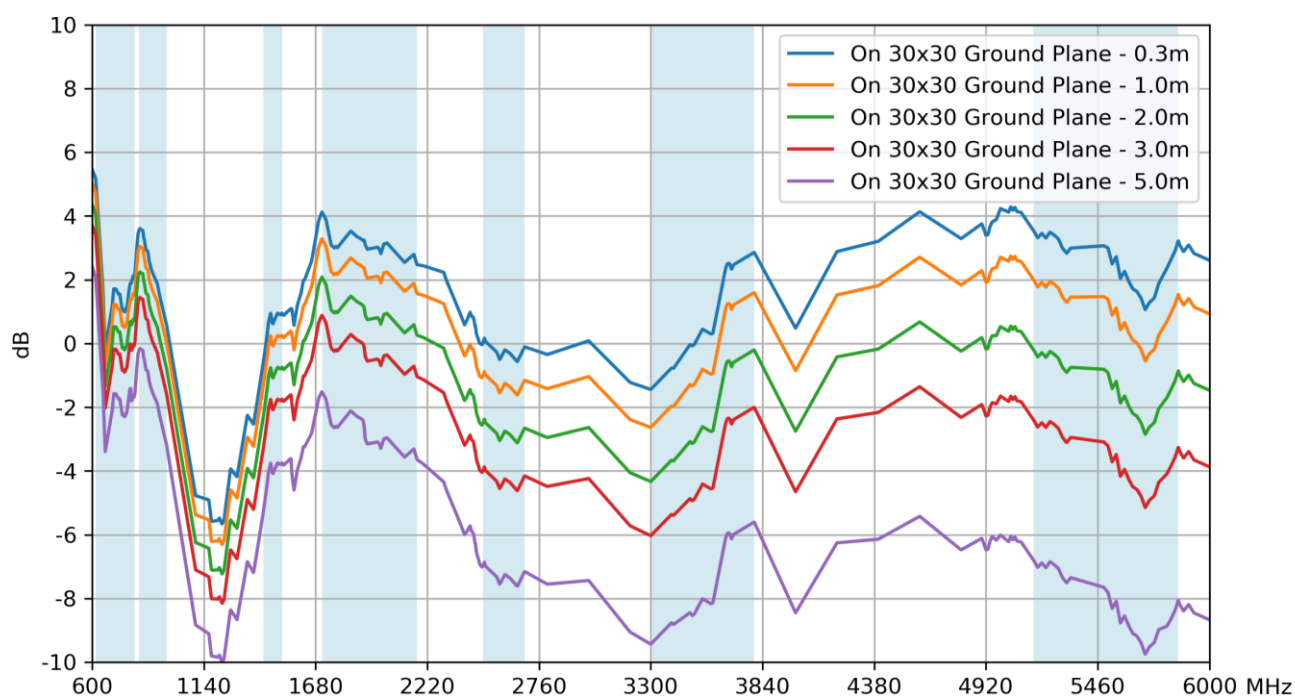
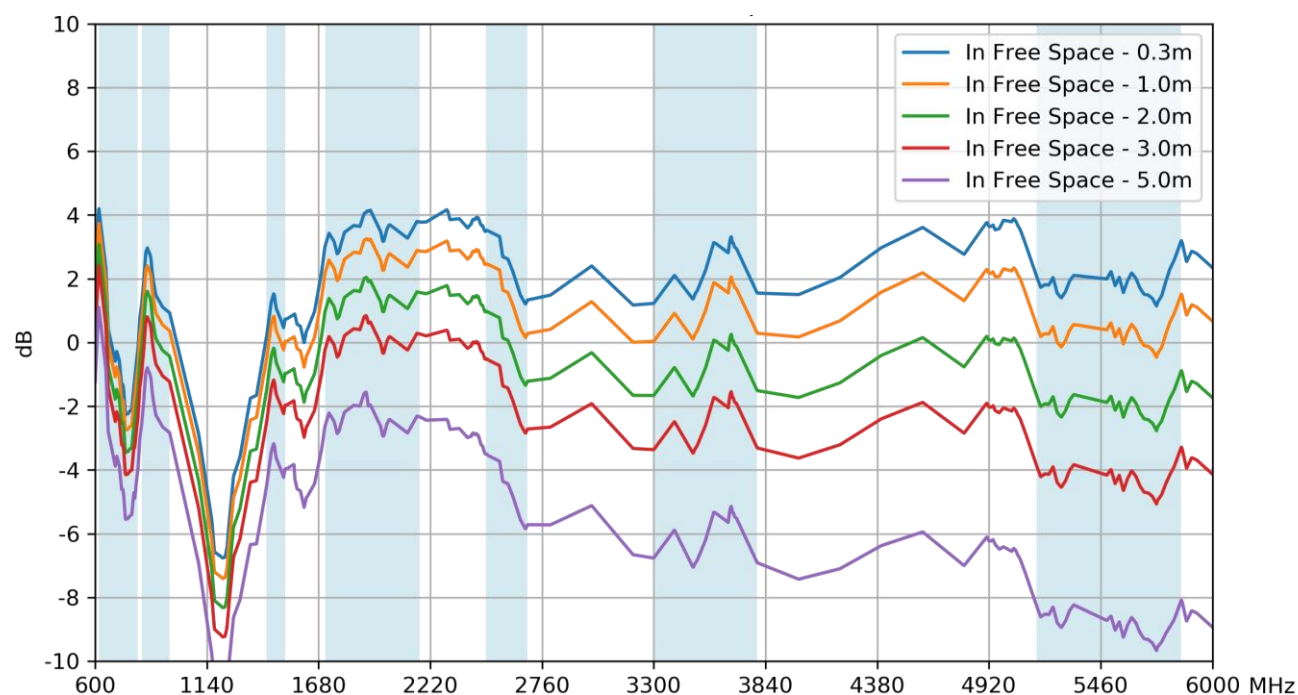
7.2 Efficiency



7.3 Average Gain



7.4 Peak Gain



7.5 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 ~5000	5150 ~5925
Efficiency (%)											
Free Space	0.3m	44.92	30.41	58.63	38.27	61.29	70.56	72.08	56.45	42.08	51.43
	1.0m	40.29	27.01	51.54	32.57	50.51	57.68	58.45	44.67	31.79	35.54
	2.0m	34.50	22.80	42.87	25.87	38.32	43.25	43.33	31.98	21.30	20.97
	3.0m	29.54	19.25	35.65	20.55	29.07	32.44	32.12	22.90	14.27	12.37
	5.0m	21.65	13.73	24.67	12.97	16.73	18.25	17.65	11.74	6.41	4.31
30x30cm Ground Plane	0.3m	27.80	49.15	68.06	34.23	80.12	77.53	69.59	40.89	27.02	48.80
	1.0m	24.94	43.58	59.83	29.13	66.03	63.40	56.43	32.37	20.40	33.73
	2.0m	21.35	36.72	49.76	23.14	50.09	47.56	41.83	23.19	13.66	19.91
	3.0m	18.28	30.93	41.39	18.38	37.99	35.68	31.01	16.61	9.14	11.75
	5.0m	13.40	21.97	28.64	11.60	21.86	20.09	17.04	8.53	4.10	4.10
Average Gain (dB)											
Free Space	0.3m	-3.48	-5.17	-2.32	-4.17	-2.13	-1.51	-1.42	-2.48	-3.76	-2.89
	1.0m	-3.95	-5.69	-2.88	-4.87	-2.97	-2.39	-2.33	-3.50	-4.98	-4.49
	2.0m	-4.62	-6.42	-3.68	-5.87	-4.17	-3.64	-3.63	-4.95	-6.72	-6.78
	3.0m	-5.30	-7.16	-4.48	-6.87	-5.37	-4.89	-4.93	-6.40	-8.46	-9.08
	5.0m	-6.64	-8.62	-6.08	-8.87	-7.77	-7.39	-7.53	-9.30	-11.93	-13.65
30x30cm Ground Plane	0.3m	-5.56	-3.09	-1.67	-4.66	-0.96	-1.11	-1.57	-3.88	-5.68	-3.12
	1.0m	-6.03	-3.61	-2.23	-5.36	-1.80	-1.98	-2.48	-4.90	-6.90	-4.72
	2.0m	-6.71	-4.35	-3.03	-6.36	-3.00	-3.23	-3.78	-6.35	-8.65	-7.01
	3.0m	-7.38	-5.10	-3.83	-7.36	-4.20	-4.48	-5.08	-7.80	-10.39	-9.30
	5.0m	-8.73	-6.58	-5.43	-9.36	-6.60	-6.97	-7.68	-10.69	-13.87	-13.87
Peak Gain (dBi)											
Free Space	0.3m	2.00	-0.90	2.11	0.90	3.24	3.84	3.64	3.46	1.66	2.03
	1.0m	1.53	-1.42	1.55	0.20	2.40	2.97	2.73	2.44	0.45	0.42
	2.0m	0.85	-2.15	0.75	-0.80	1.20	1.72	1.43	0.99	-1.29	-1.88
	3.0m	0.18	-2.89	-0.05	-1.80	-0.00	0.47	0.13	-0.46	-3.03	-4.18
	5.0m	-1.17	-4.37	-1.65	-3.80	-2.40	-2.02	-2.47	-3.36	-6.50	-8.77
30x30cm Ground Plane	0.3m	2.47	1.83	2.78	0.52	3.37	3.19	2.92	0.55	-0.59	2.62
	1.0m	2.00	1.31	2.22	-0.18	2.53	2.31	2.01	-0.47	-1.81	1.02
	2.0m	1.33	0.58	1.42	-1.18	1.33	1.06	0.71	-1.92	-3.56	-1.27
	3.0m	0.65	-0.16	0.62	-2.18	0.13	-0.18	-0.59	-3.36	-5.30	-3.56
	5.0m	-0.70	-1.63	-0.98	-4.18	-2.27	-2.68	-3.19	-6.26	-8.79	-8.13

Changelog for the datasheet

SPE-19-8-115 – G45.A.201111

Revision: B (Current Version)

Date: 2020-12-08

Notes:

Author: Jack Conroy

Previous Revisions

Revision: A (Original First Release)

Date: 2019-08-26

Notes:

Author: David Connolly



www.taoglas.com

