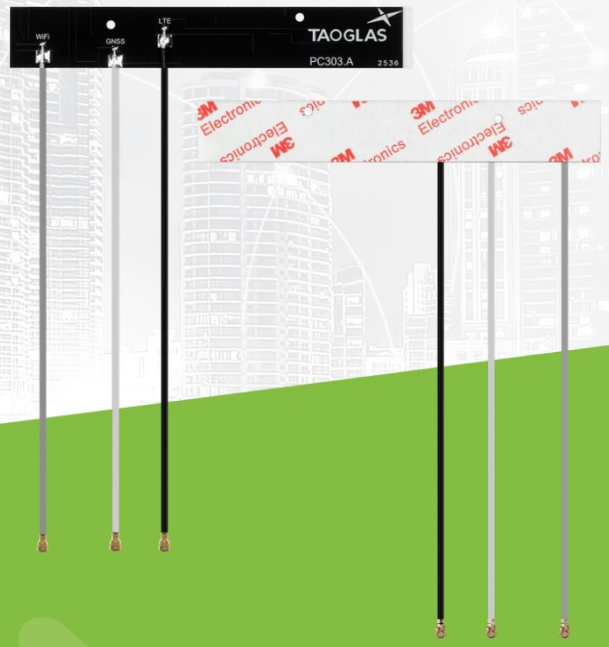
TAOGLAS



Datasheet

Part No:
PC303.A.001

Description

FR4 PCB Combination Antenna (130x20mm) for Cellular, GNSS and Wi-Fi with 150mm Black, White and Grey 1.37 Cable and I-PEX MHFI Connector

Features:

FR4 PCB Combination Antenna
1 * GNSS covering L1, B1I, G1 and L-Band
1 * Cellular covering 600MHz – 8000MHz
1 * Wi-Fi covering 2.4GHz, 5.8GHz, 7.125GHz
Cable: 150mm of 1.37 Coaxial
Connector: I-PEX MHFI
Dims: 130 x 20 x 0.24 mm
RoHS & Reach Compliant

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IATF16949

1. Introduction

The **PC303** FR4 PCB Combination Antenna is a high-performance, rigid PCB antenna designed to cover Cellular (600 MHz–8000 MHz), Wi-Fi (2.4 / 5.8 / 7.125 GHz), and GNSS (L1, B1I, G1, and L-Band) frequencies.

With its compact construction (130 x 20 x 0.24 mm), the PC303 provides excellent efficiency, ground-plane independence, and quick integration into compact wireless devices ideal for applications requiring robust global connectivity across multiple wireless standards.

By integrating Cellular, Wi-Fi, and GNSS capabilities into a single compact antenna, it delivers a space-saving and cost-efficient solution. This allows designers to incorporate advanced wireless communication and precise positioning into their products without needing multiple antennas.

Typical Applications:

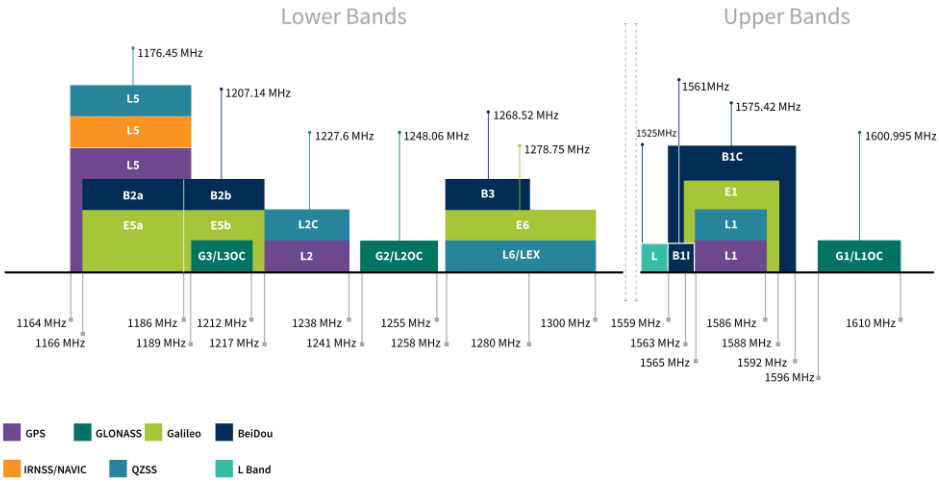
- Asset tracking
- Telematics
- E-Mobility
- Smart agriculture
- Connected healthcare devices
- Wearables and other IoT solutions

Installation is quick and simple with a “peel-and-stick” 3M adhesive backing, enabling secure mounting on non-metal surfaces such as plastic or glass. With peak gains ranging from 1 to 5 dBi across Cellular, Wi-Fi, and GNSS bands, the PC303 allows designers to cover multiple frequency bands with a single antenna reducing cost, complexity, and time-to-market.

The antenna is supplied with a pre-assembled cable and connector for plug-and-play integration, both of which can be customized to meet specific project requirements. Different cable colors are available to simplify identification and streamline the assembly process during production, supporting efficient integration and minimizing the potential for connection errors. For further optimization or assistance in testing antenna performance within your device, please contact your regional Taoglas Customer Support Team.

2. Specification

GNSS Frequency Bands					
GPS	L1 1575.42 MHz	L2 1227.6 MHz	L5 1176.45 MHz		
	■	□	□		
GLONASS	G1 1602 MHz	G2 1248 MHz	G3 1207 MHz		
	■	□	□		
Galileo	E1 1575.24 MHz	E5a 1176.45 MHz	E5b 1201.5 MHz	E6 1278.75 MHz	
	■	□	□	□	
BeiDou	B1C 1575.42 MHz	B1I 1561 MHz	B2a 1176.45 MHz	B2b 1207.14 MHz	B3 1268.52 MHz
	■	■	□	□	□
L-Band	L-Band 1542 MHz				
	■				
QZSS (Regional)	L1 1575.42 MHz	L2C 1227.6 MHz	L5 1176.45 MHz	L6 1278.75e6	
	■	□	□	□	
IRNSS (Regional)	L5 1176.45 MHz				
	□				
SBAS	L1/E1/B1 1575.42 MHz	L5/B2a/E5a 1176.45 MHz	G1 1602 MHz	G2 1248 MHz	G3 1207 MHz
	■	□	■	□	□



GNSS Bands and Constellations

GNSS Electrical				
Frequency (MHz)	**1542**	**1561**	**1575.42**	**1602**
VSWR (max.)	1.5:1	1.5:1	1.5:1	1.5:1
Efficiency (%)	57.0	60.8	59.6	56.5
Average Gain (dB)	-2.3	-2.2	-2.2	-2.5
Peak Gain (dBi)	3.3	3.6	3.6	3.3
Polarization	Linear			
Impedance	50 Ω			

Cellular Electrical								
Band	**Frequency (MHz)**	**Efficiency (%)**	**Average Gain (dB)**	**Peak Gain (dBi)**	**Impedance**	**Polarization**	**Radiation Pattern**	**Max. input power**
5GNR/4G Band71	617-698	53.5	-2.72	1.27	50 Ω	Linear	Omni directional	5W
4G/3G Band 12,13,14,17,28,29	698-806	65.7	-1.82	2.58				
4G/3G/NB-IoT/Cat M Band 5,8,18,19,20,26,27	824-960	58.3	-2.34	3.74				
5GNR/4G Band 21,32,74,75,76	1427-1518	42.8	-3.68	2.31				
4G/3G Band 1,2,3,4,9,23,25,35,39,66	1710-2200	68.2	-1.66	3.82				
4G/3G Band 7,30,38,40,41	2300-2690	63.9	-1.94	3.54				
5GNR/4G Band 22,42,48,77,78,79	3300-5000	38.8	-4.11	4.41				
LTE5200/Wi-Fi5800	5150-5925	30.8	-5.11	3.14				
Wi-Fi - 6GHz	5925-7125	51.2	-2.91	5.76				

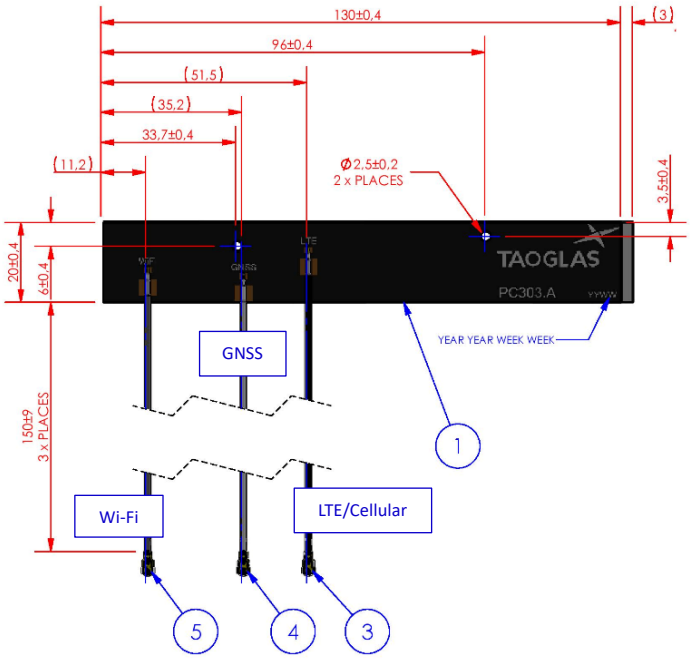
Wi-Fi Electrical								
Band	**Frequency (MHz)**	**Efficiency (%)**	**Average Gain (dB)**	**Peak Gain (dBi)**	**Impedance**	**Polarization**	**Radiation Pattern**	**Max. input power**
Wi-Fi - 2GHz	2400-2500	45.1	-3.45	2.02	50 Ω	Linear	Omni directional	5W
Wi-Fi - 5GHz	5150-5850	55.3	-2.57	5.30				
Wi-Fi - 6GHz	5925-7125	50.3	-2.99	5.20				

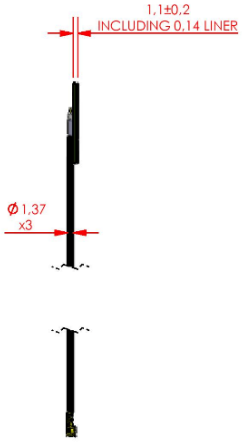
5G/4G Bands			
Band Number	**5GNR / FR1 / LTE / LTE-Advanced / WCDMA / HSPA / HSPA+ / TD-SCDMA / NTN**		
	Uplink	**Downlink**	**Covered**
B1	1920 to 1980	2110 to 2170	✓
B2	1850 to 1910	1930 to 1990	✓
B3	1710 to 1785	1805 to 1880	✓
B4	1710 to 1755	2110 to 2155	✓
B5	824 to 849	869 to 894	✓
B7	2500 to 2570	2620 to 2690	✓
B8	880 to 915	925 to 960	✓
B9*	1749.9 to 1784.9	1844.9 to 1879.9	✓
B11	1427.9 to 1447.9	1475.9 to 1495.9	✓
B12	699 to 716	729 to 746	✓
B13	777 to 787	746 to 756	✓
B14	788 to 798	758 to 768	✓
B17	704 to 716	734 to 746	✓
B18	815 to 830	860 to 875	✓
B19	830 to 845	875 to 890	✓
B20	832 to 862	791 to 821	✓
B21	1447.9 to 1462.9	1495.9 to 1510.9	✓
B22*	3410 to 3490	3510 to 3590	✓
B23 / n23	2000 to 2020	2180 to 2200	✓
B24 / n255	1626.5 to 1660.5	1525 to 1559	✓
B25	1850 to 1915	1930 to 1995	✓
B26	814 to 849	859 to 894	✓
B27*	807 to 824	852 to 869	✓
B28	703 to 748	758 to 803	✓
B29	717 to 728		✓
B30	2305 to 2315	2350 to 2360	✓
B31	452.5 to 457.5	462.5 to 467.5	✗
B32	1452 to 1496		✓
B34	2010 to 2025		✓
B35	1850 to 1910		✓
B36	1930 to 1990		✓
B37	1910 to 1930		✓
B38	2570 to 2620		✓
B39	1880 to 1920		✓
B40	2300 to 2400		✓
B41	2496 to 2690		✓
B42	3400 to 3600		✓
B43	3600 to 3800		✓
B45	1447 to 1467		✓
B46	5150 to 5925		✓
B47	5855 to 5925		✓
B48	3550 to 3700		✓
B49	3550 to 3700		✓
B50	1432 to 1517		✓
B51	1427 to 1432		✓
B52	3300 to 3400		✓
B53	2483.5 to 2495		✓
B65	1920 to 2010	2110 to 2200	✓
B66	1710 to 1780	2110 to 2200	✓
B68	698 to 728	753 to 783	✓
B69	2570 to 2620		✓
B70	1695 to 1710	1995 to 2020	✓
B71	663 to 698	617 to 652	✓
B72	451 to 456	461 to 466	✗
B73	450 to 455	460 to 465	✗
B74	1427 to 1470	1475 to 1518	✓
B75	1432 to 1517		✓
B76	1427 to 1432		✓
B77	3300 to 4200		✓
B78	3300 to 3800		✓
B79	4400 to 5000		✓
B85	698 to 716	728 to 746	✓
B87	410 to 415	420 to 425	✗
B88	412 to 417	422 to 427	✗
n256	1980 to 2010	2170 to 2200	✓

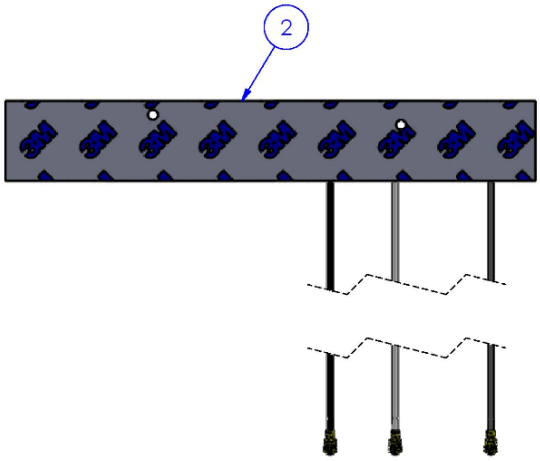
Mechanical	
Dimensions	130mm x 20mm x 0.24 mm
Weight	6.9g
Material	FR4 (NP-140)
Mount	Adhesive, 3M 9448 HK
Connector	I-PEX MHFI
Cable	GNSS: 150 mm of 1.37 (White) Cellular: 150 mm of 1.37 (Black) Wi-Fi: 150mm of 1.37(Grey)

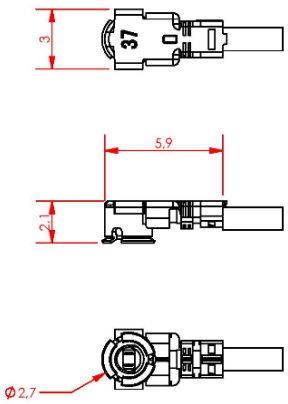
Environmental	
Operation Temperature	-40°C to 85°C
Storage Temperature	-40°C to 85°C
Relative Humidity	Non-condensing 65°C 95% RH

3. Mechanical Drawing









ITEM NO.	DESCRIPTION	MATERIAL	FINISH	QTY.
1	PCB_PCB.000307_Single Layer_L20_W130_H0.8mm_NP-140_35um	NP-140	BLACK	1
2	PC303.A Adhesive Tape	3M-9448HK	WHITE PAPER LINER	1
3	4FXAD00157AA400110-IPEX IPEX I (U.FL Compatible)_Au Plated for 1.37 Micro Coax(Black) 157mm, TIN/STRIP/OPEN(1.5/1.5/4mm),No Winding	COAX	BLACK	1
4	4FXBJ00150AA400110-IPEX IPEX I (U.FL Compatible)_Au Plated for 1.37 Micro Coax(white) 150mm, TIN/STRIP/OPEN(1.5/1.5/4mm),No Winding	COAX	WHITE	1
5	4FXCP00153AA400110-IPEX IPEX I (U.FL Compatible)_Au Plated for 1.37 Micro Coax(Grey) 153mm, TIN/STRIP/OPEN(1.5/1.5/4mm),No Winding	COAX	GREY	1

ISOMETRIC VIEWS

4. Packaging

☑ 50 PCS / PE bag

☑ PE bag(mm): 230x330 (Ref)

☑ Weight (Kg): 0.7 ±3%

☑ SPQ Label

☑ 2000 PCS / Carton

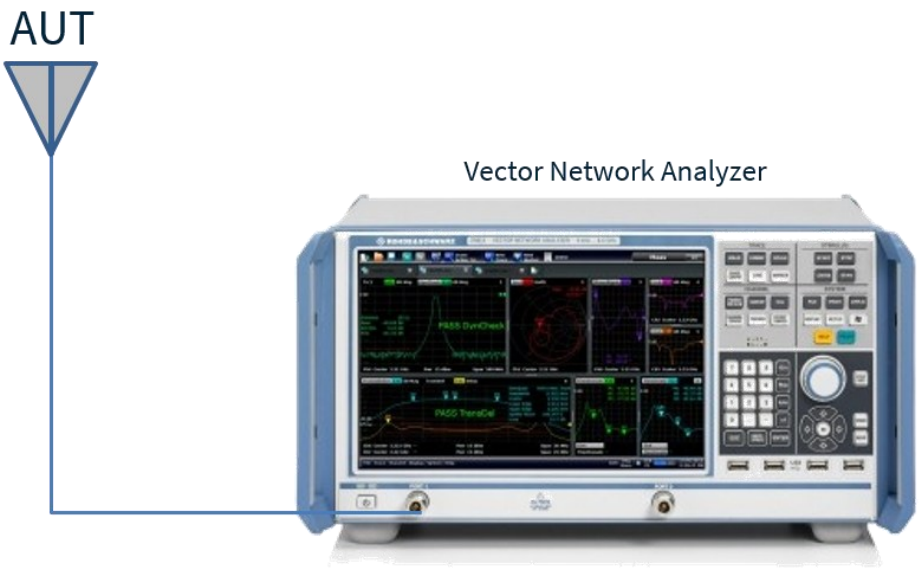
☑ Carton(mm): 360x310x160

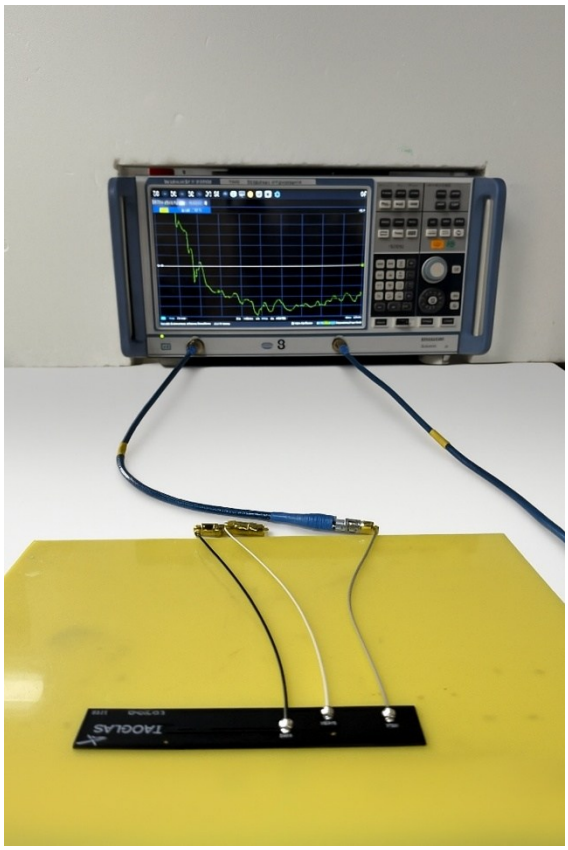
☑ Weight (Kg): 14.54 ±3%

☑ Carton Label

5. Antenna Characteristics

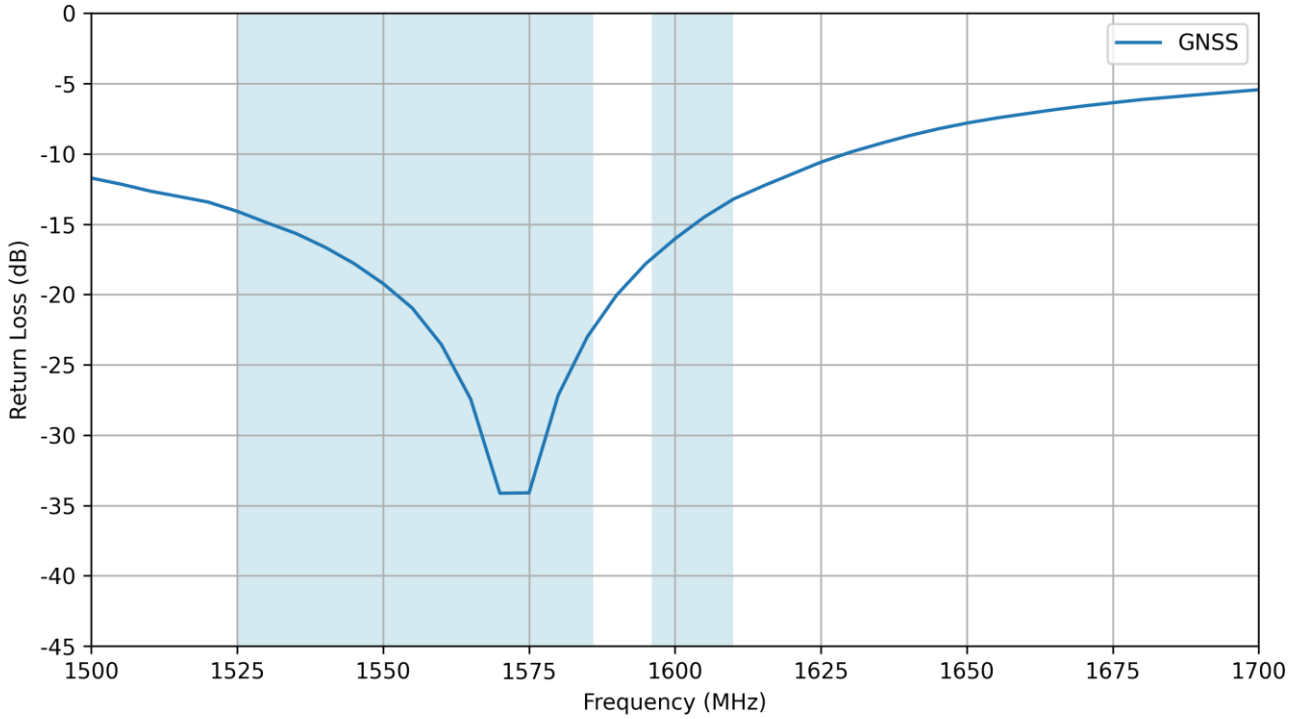
5.1 Test Setup



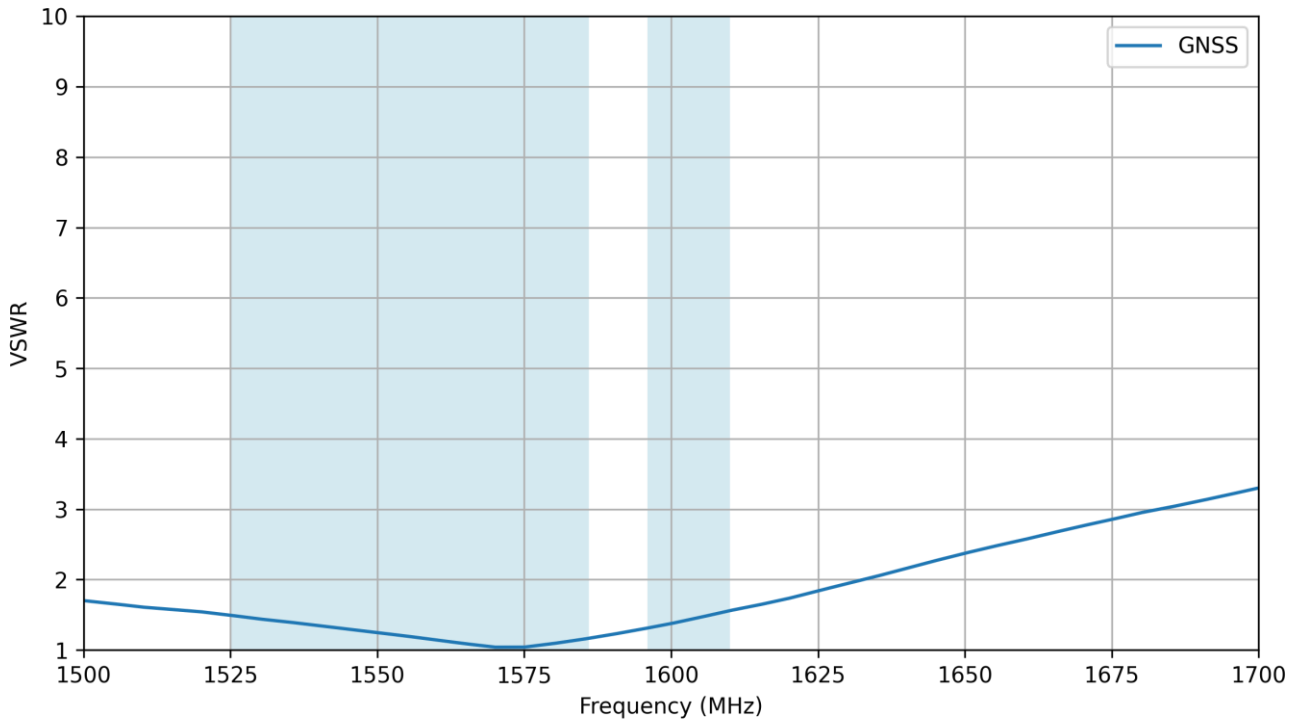


VNA Test Setup on 2mm ABS

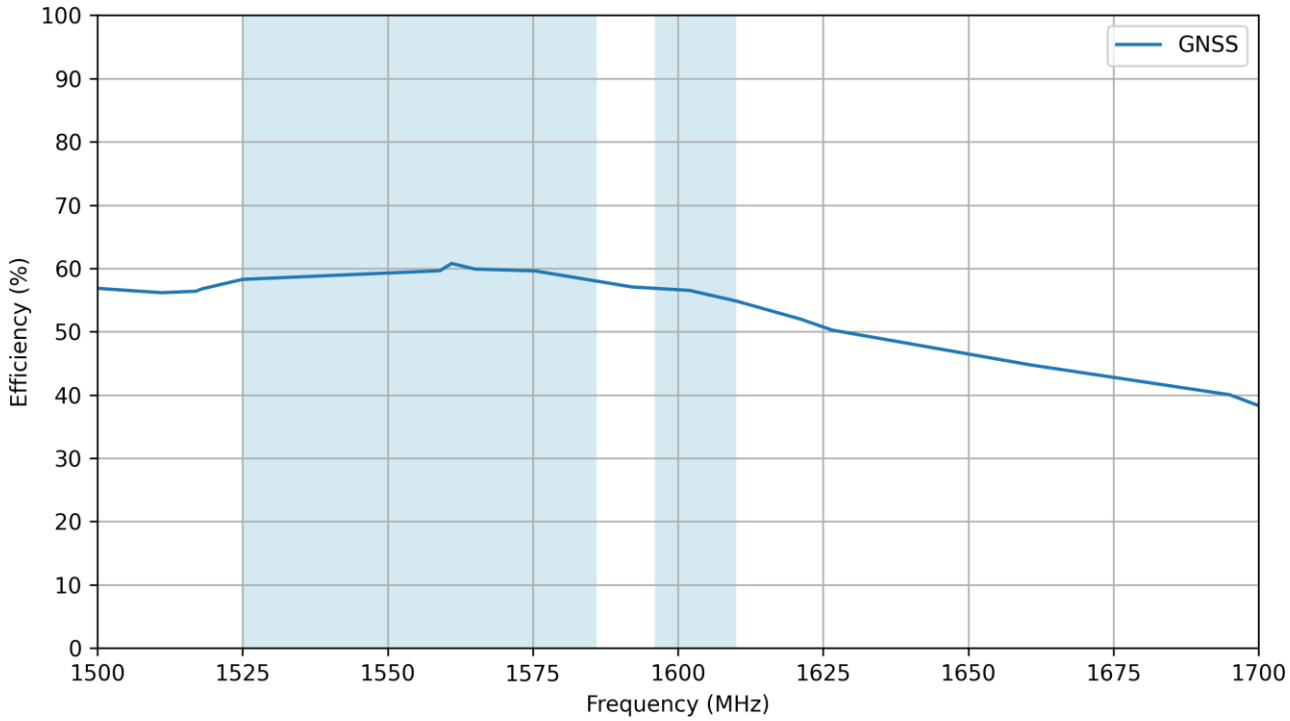
5.2 GNSS - Return Loss



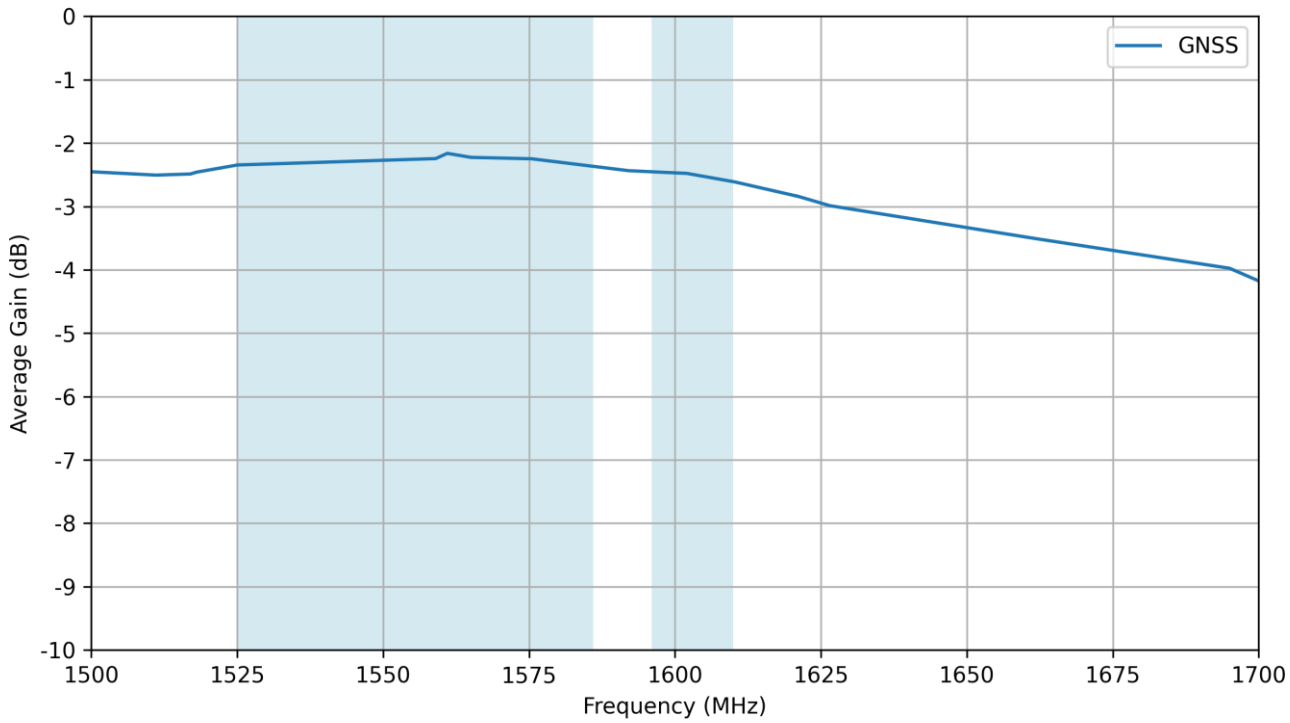
5.3 GNSS - VSWR



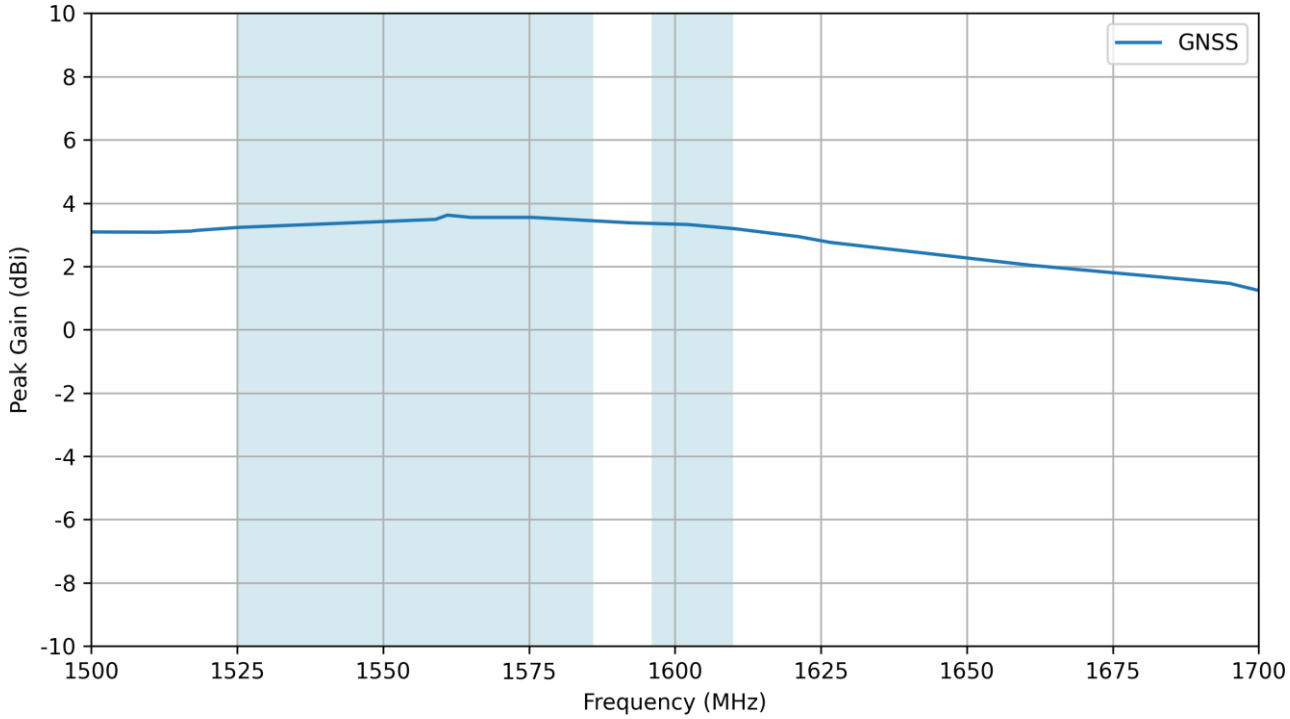
5.4 GNSS - Efficiency



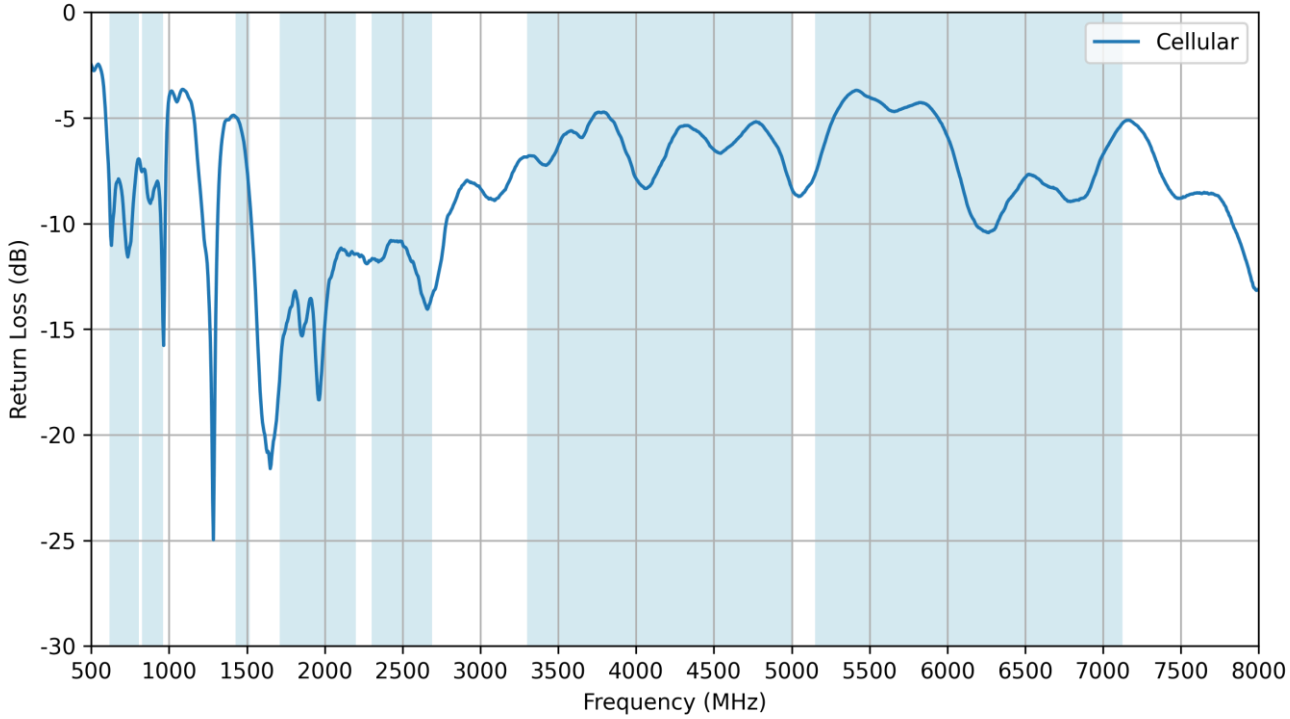
5.5 GNSS - Average Gain



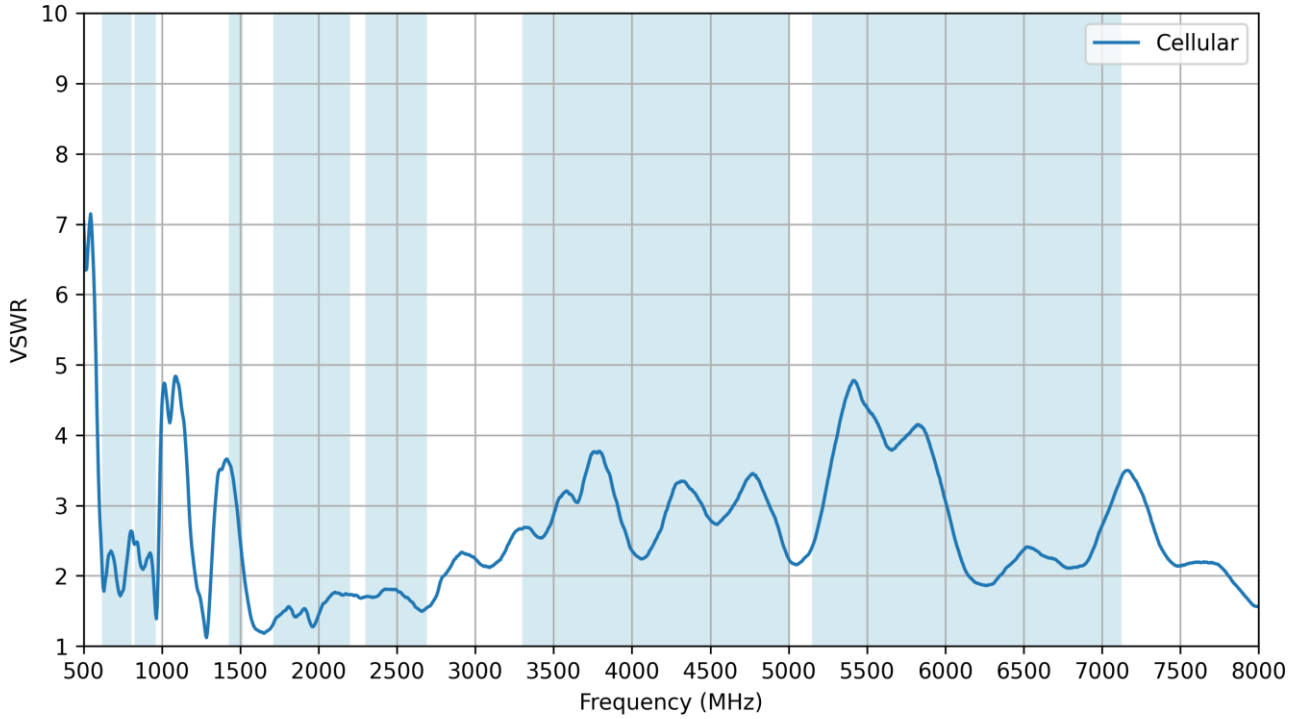
5.6 GNSS - Peak Gain



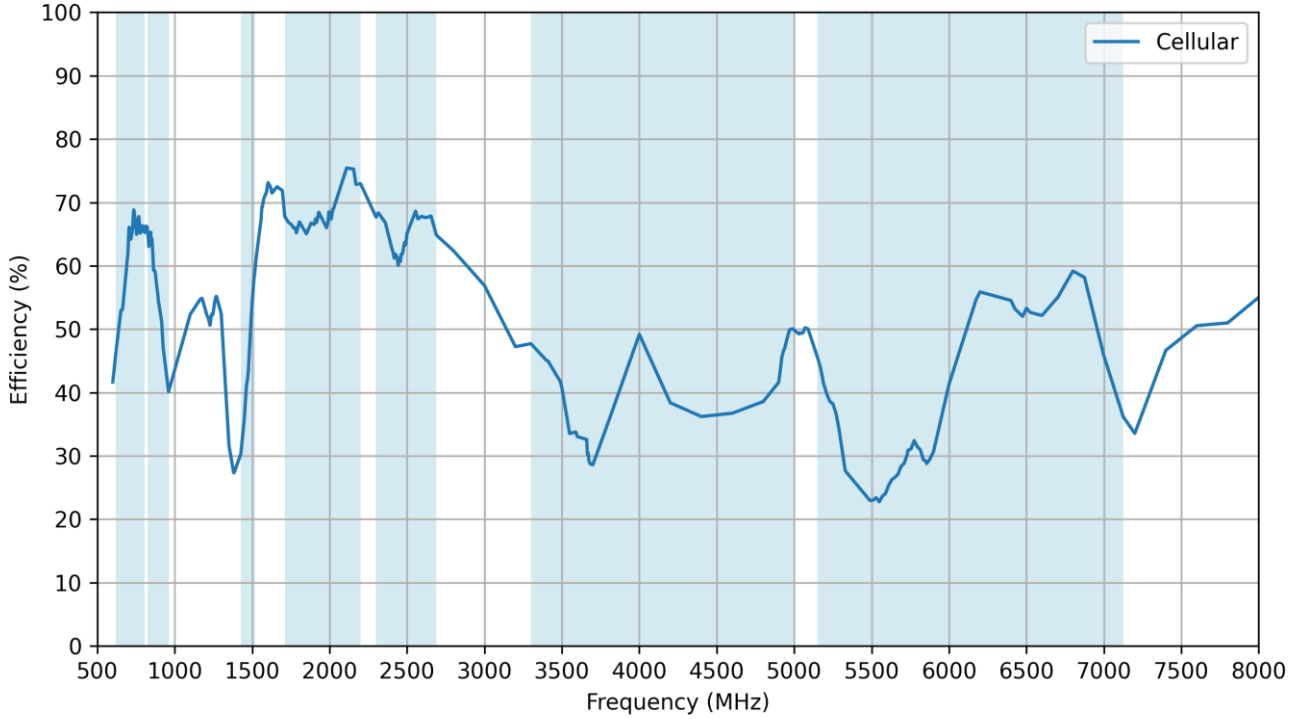
5.7 Cellular - Return Loss



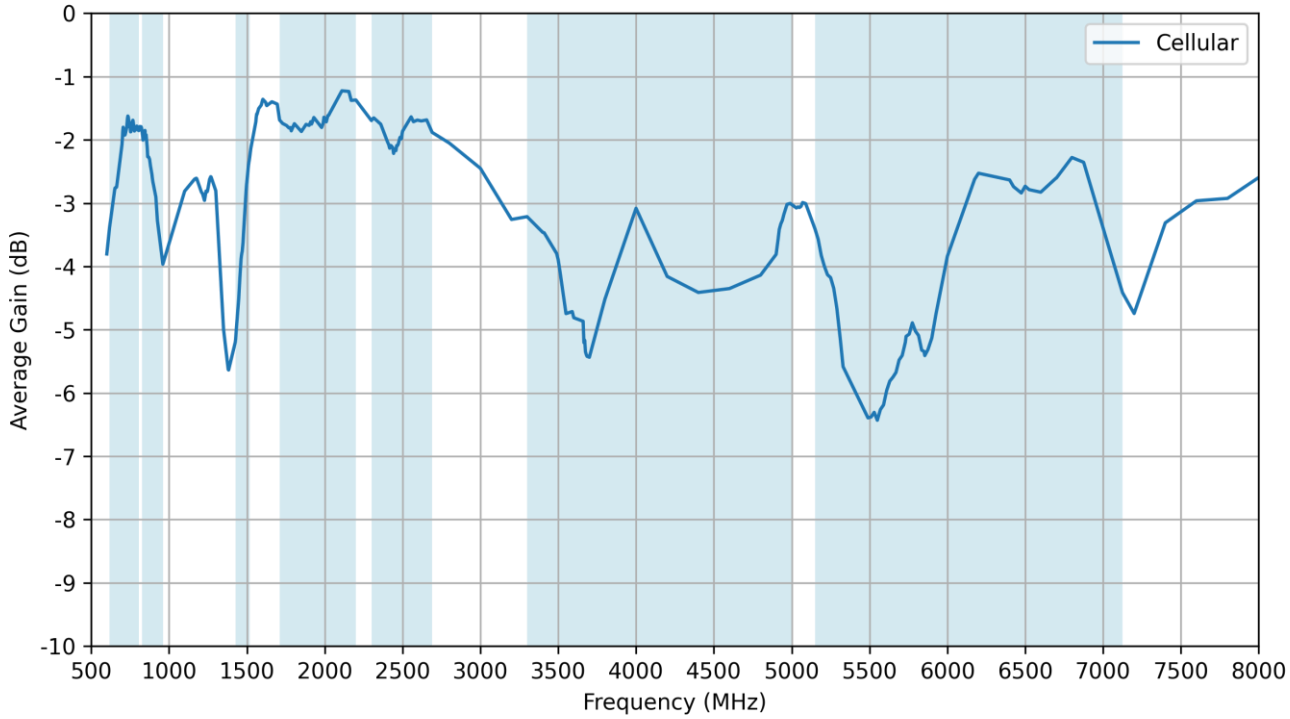
5.8 Cellular - VSWR



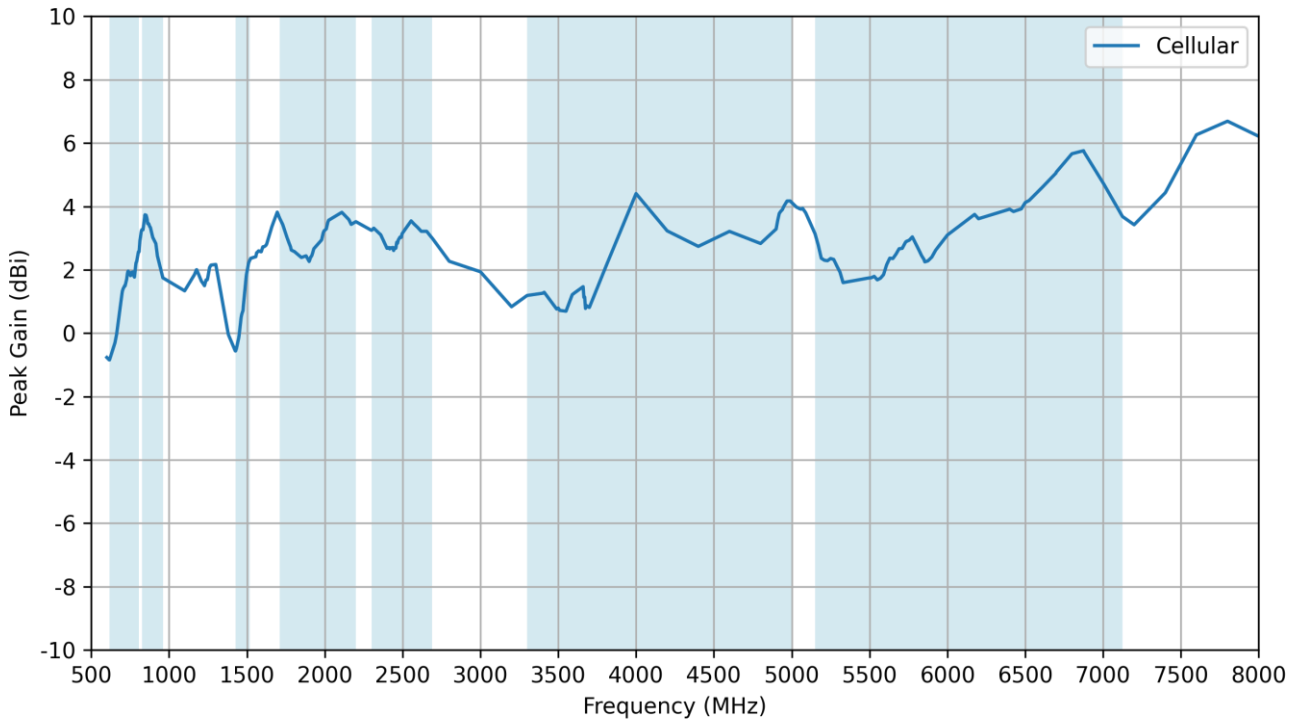
5.9 Cellular - Efficiency



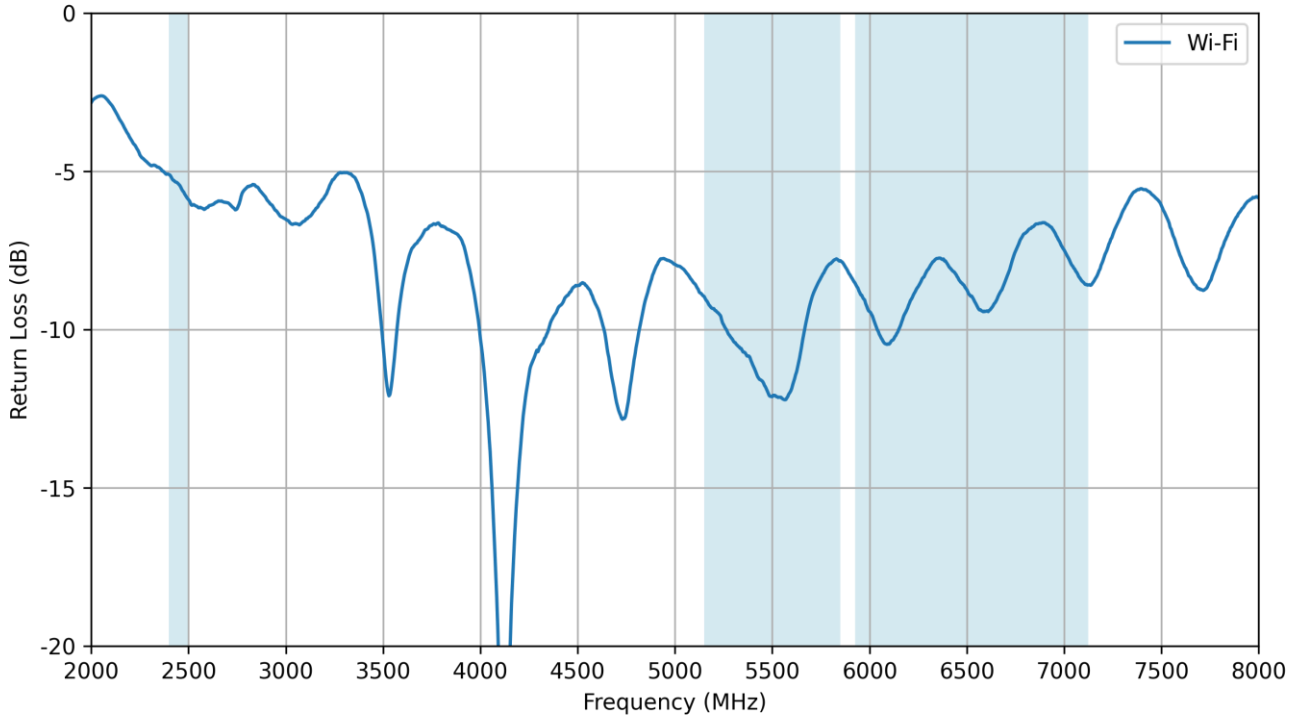
5.10 Cellular - Average Gain



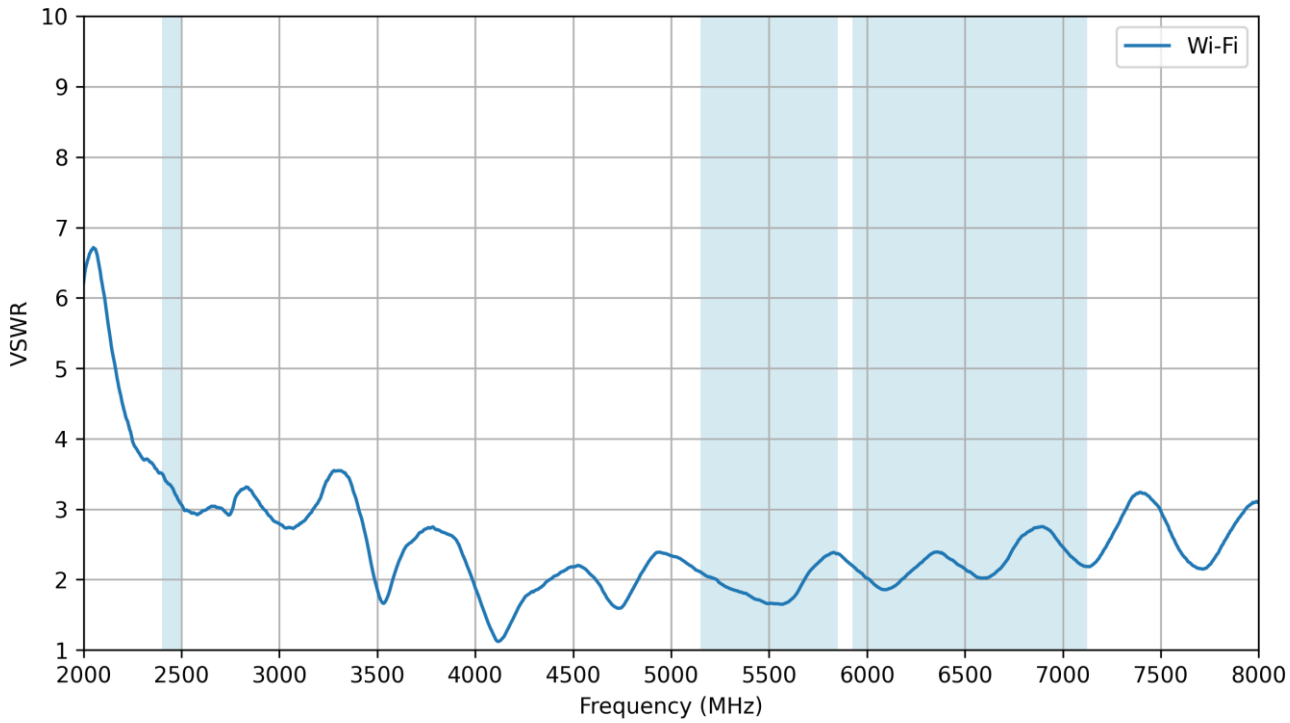
5.11 Cellular - Peak Gain



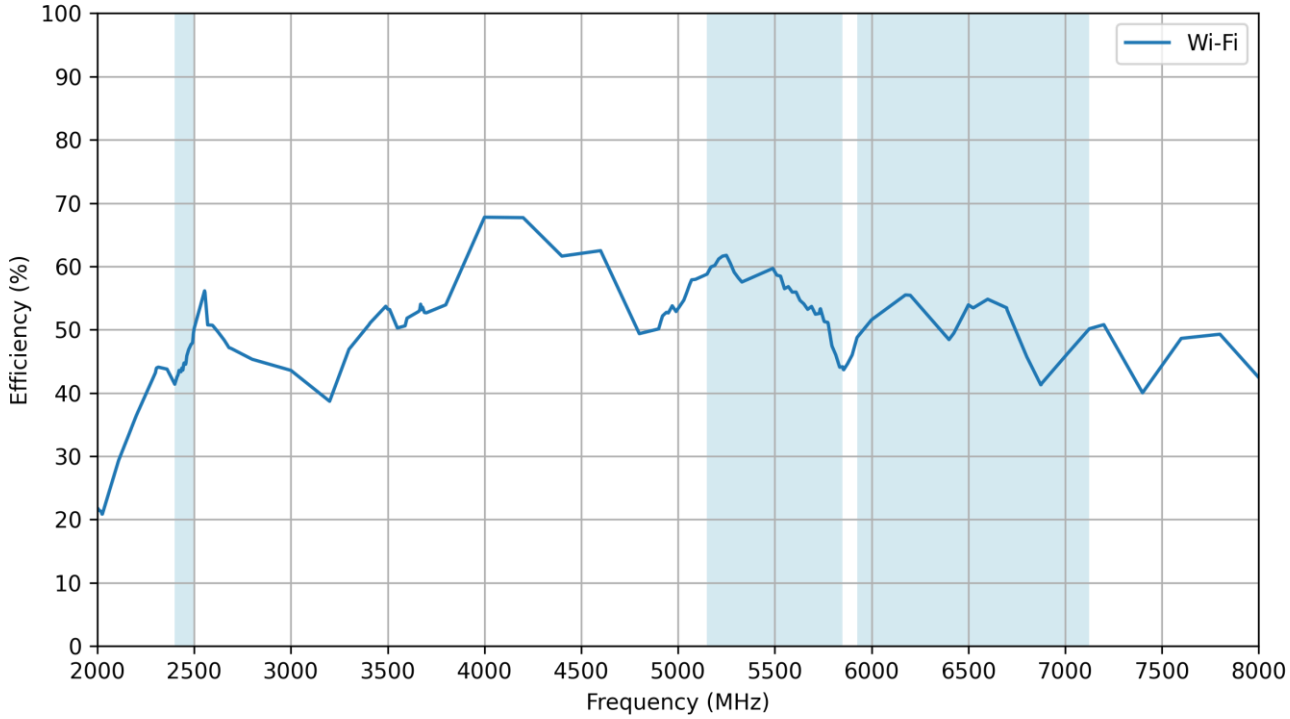
5.12 Wi-Fi - Return Loss



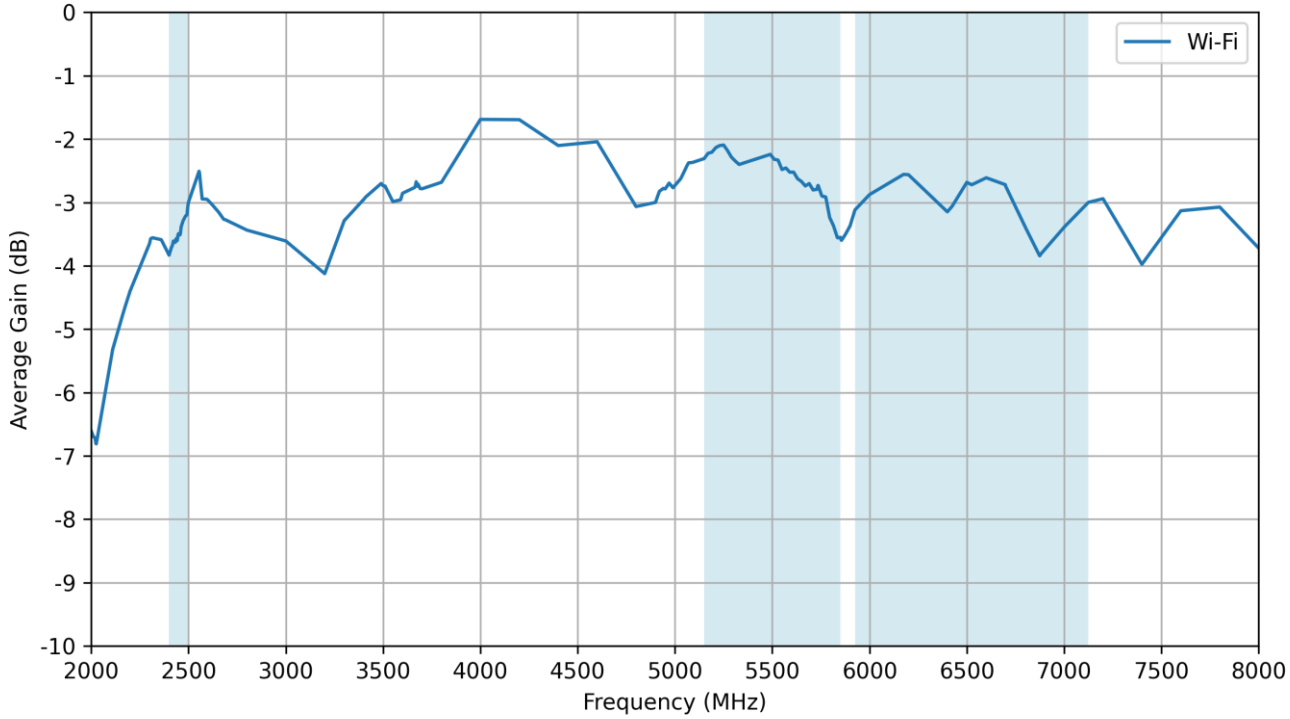
5.13 Wi-Fi - VSWR



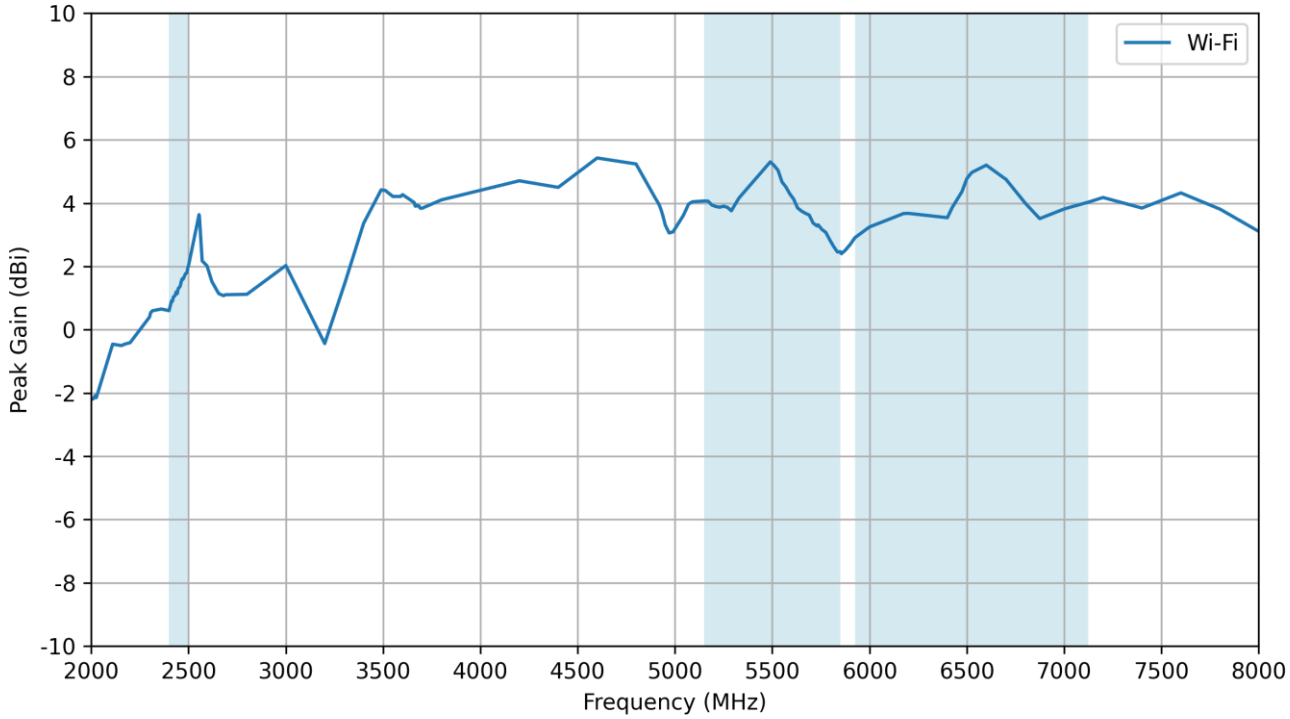
5.14 Wi-Fi - Efficiency



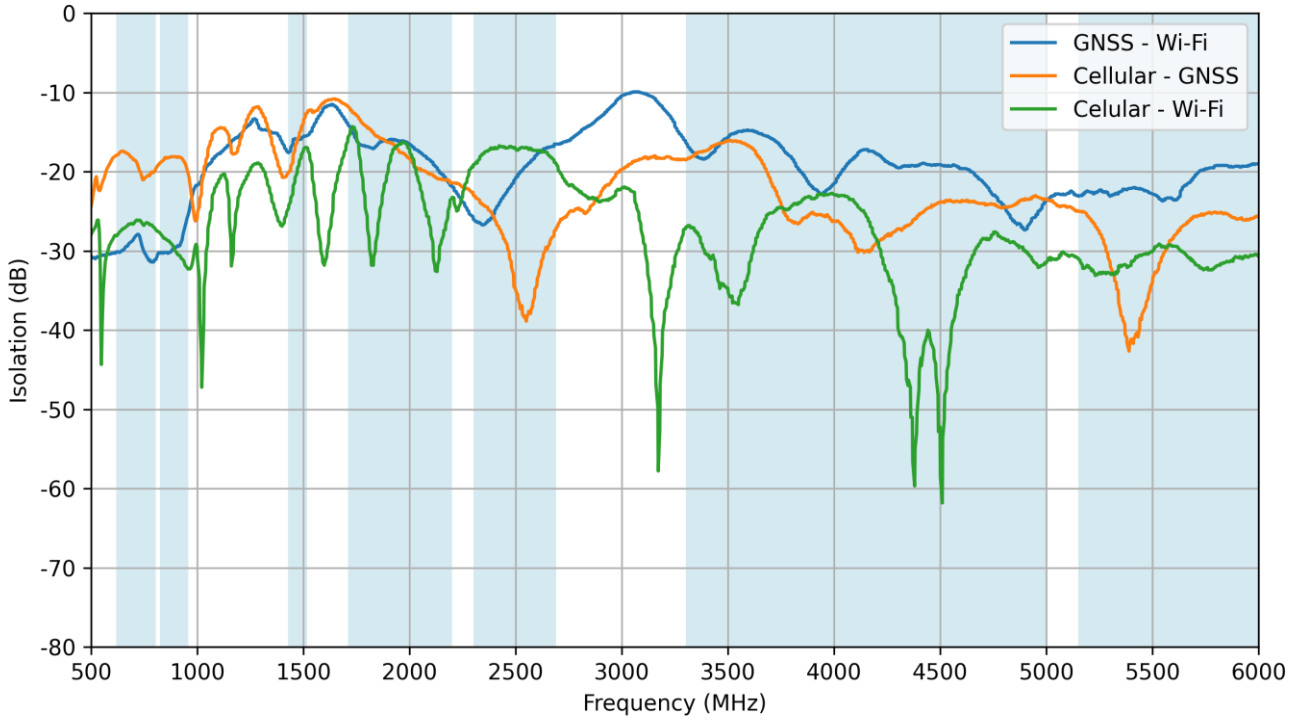
5.15 Wi-Fi - Average Gain



5.16 Wi-Fi - Peak Gain

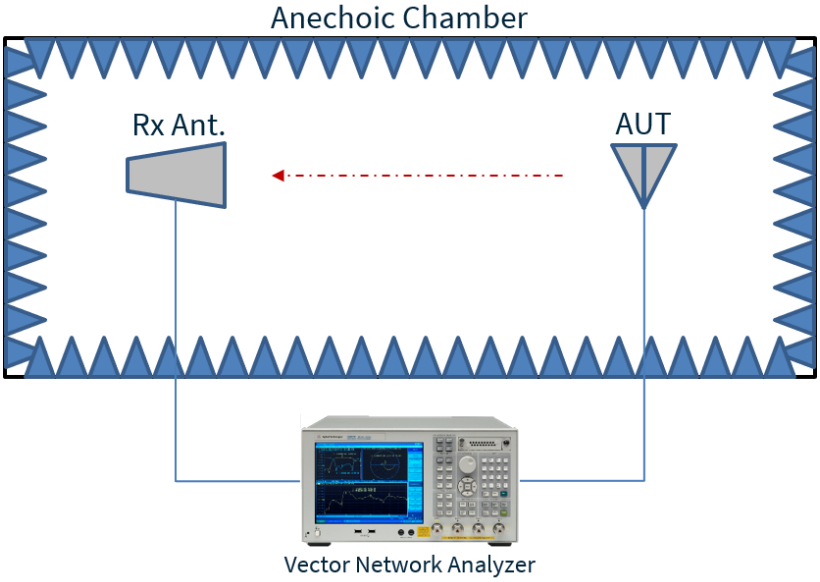


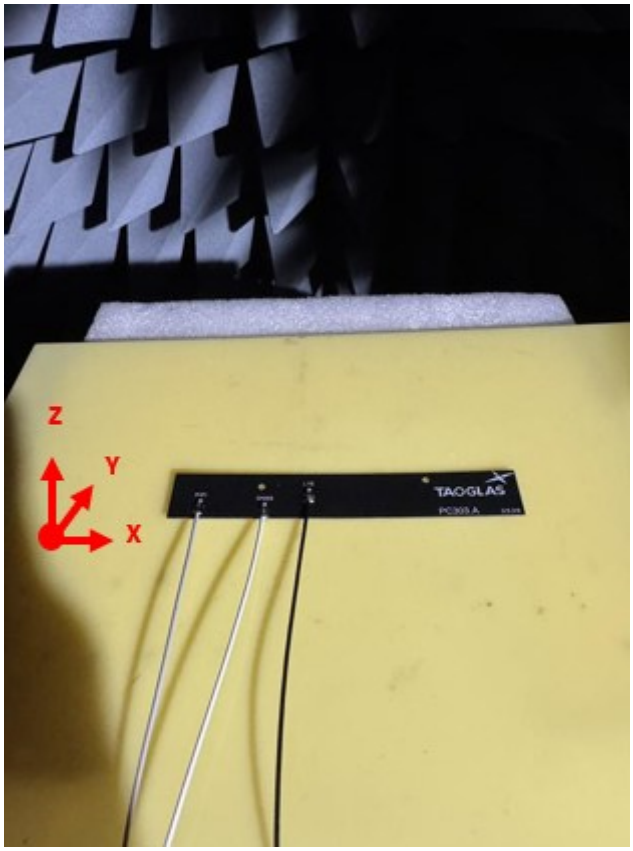
5.17 Isolation



6. Radiation Patterns

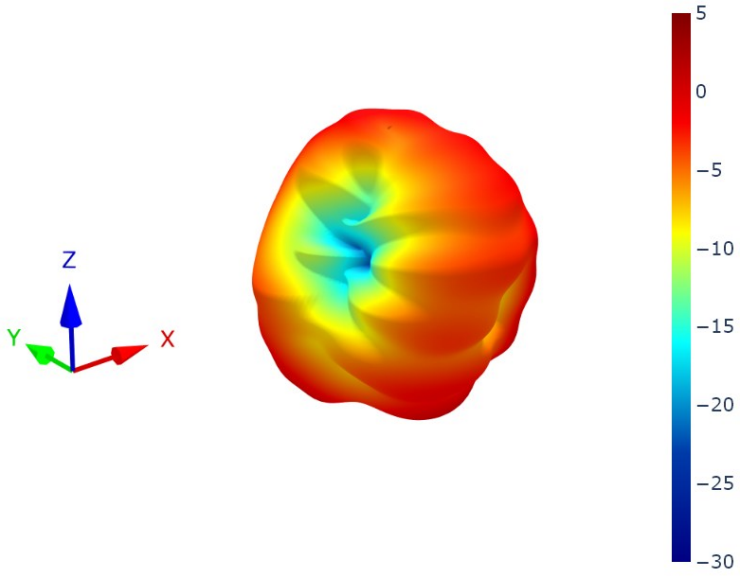
6.1 Test Setup



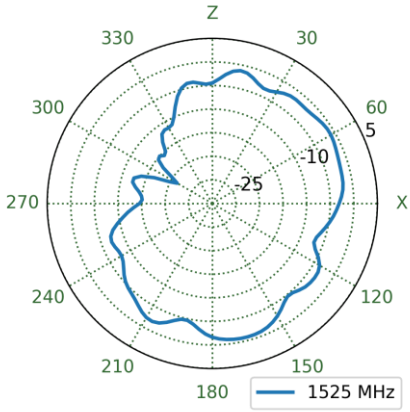


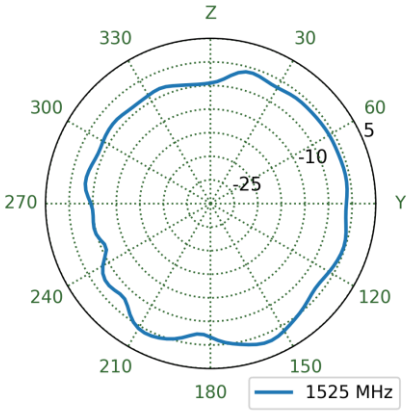
Chamber Test Setup on 2mm ABS

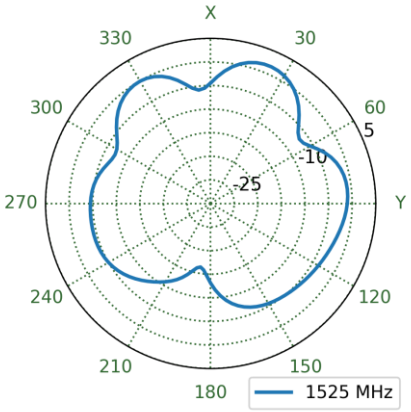
6.2 GNSS Patterns at 1525 MHz



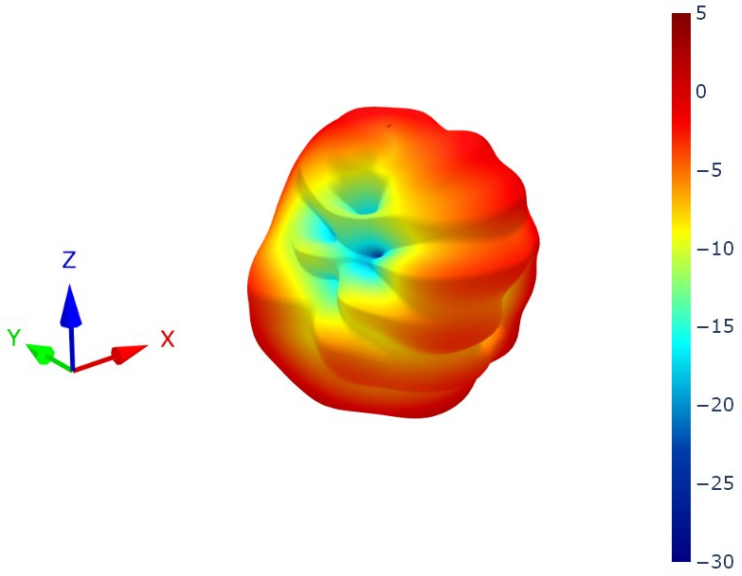
XZ Plane	YZ Plane	XY Plane



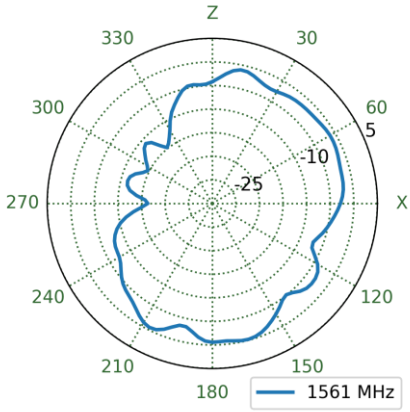


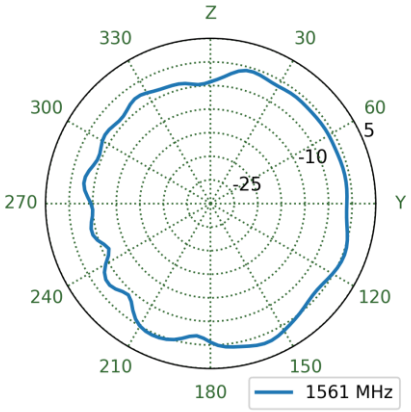


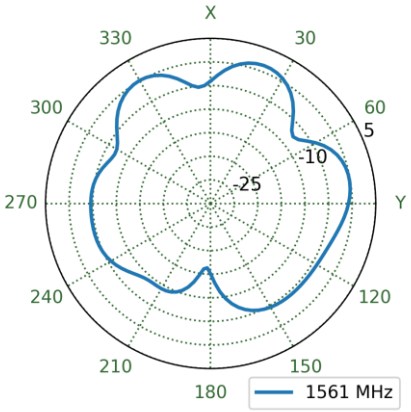
6.3 GNSS Patterns at 1561 MHz



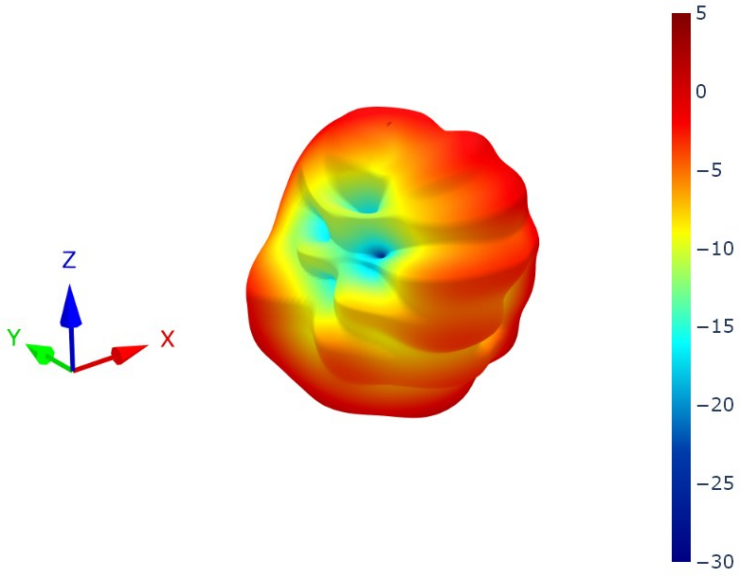
XZ Plane	YZ Plane	XY Plane



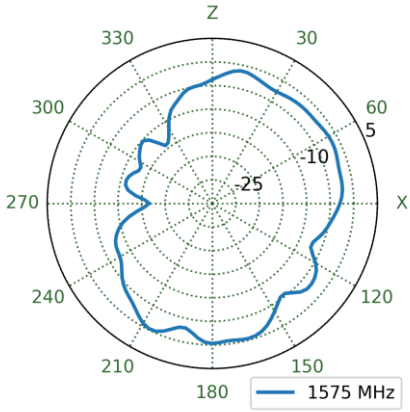


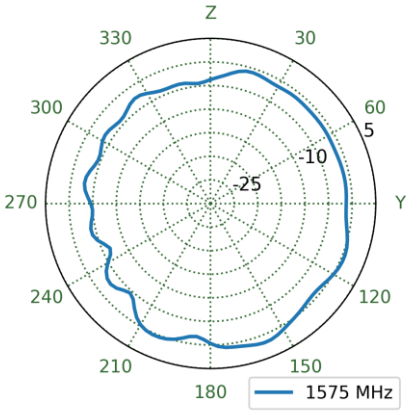


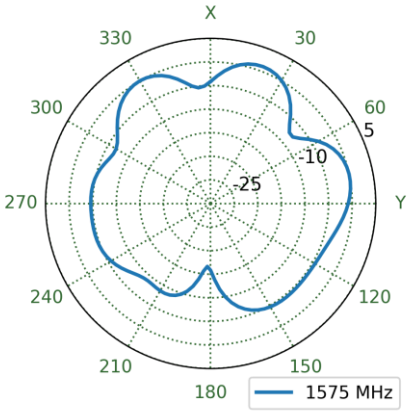
6.4 GNSS Patterns at 1575 MHz



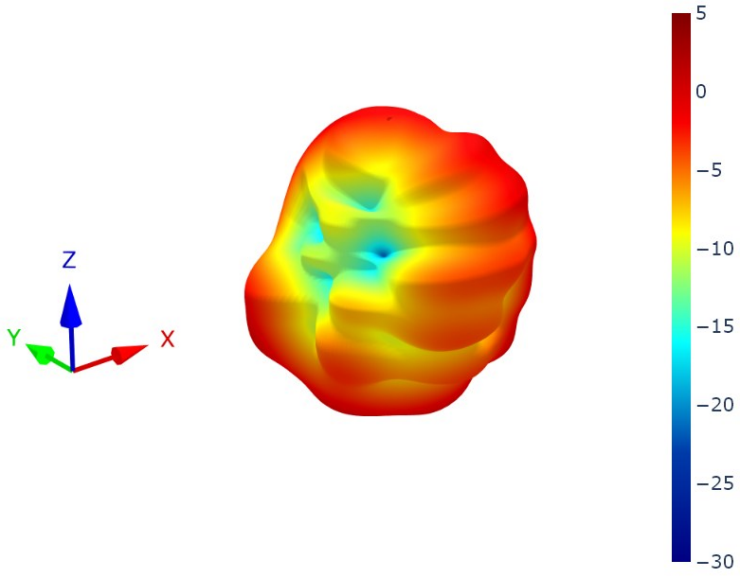
XZ Plane	YZ Plane	XY Plane



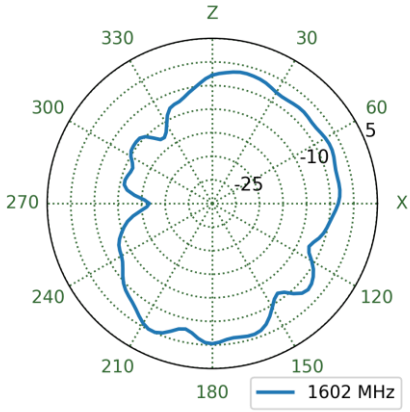


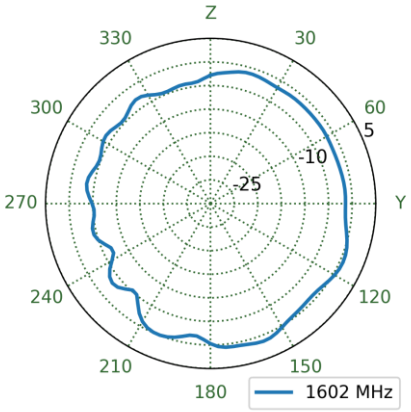


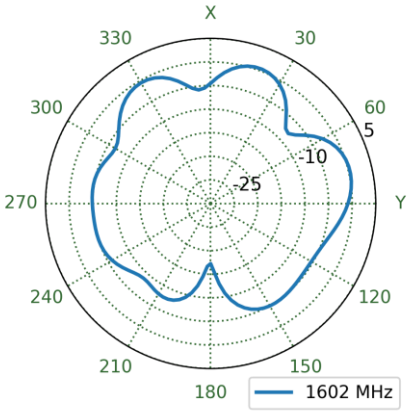
6.5 GNSS Patterns at 1602 MHz



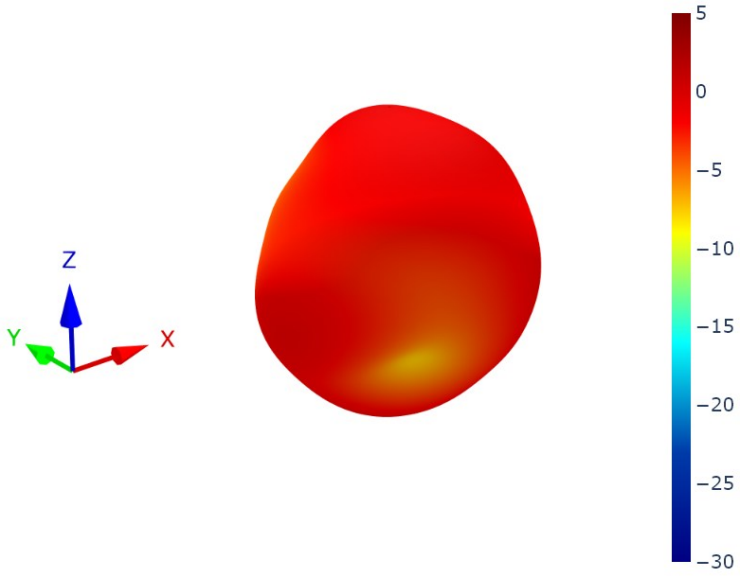
XZ Plane	YZ Plane	XY Plane



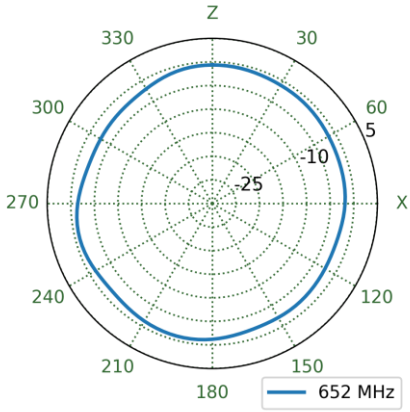


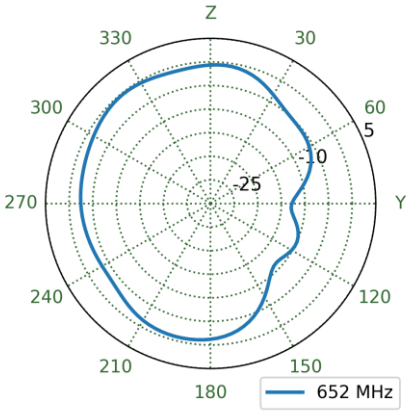


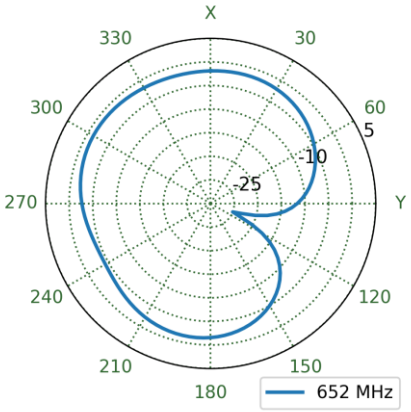
6.6 Cellular Patterns at 652 MHz



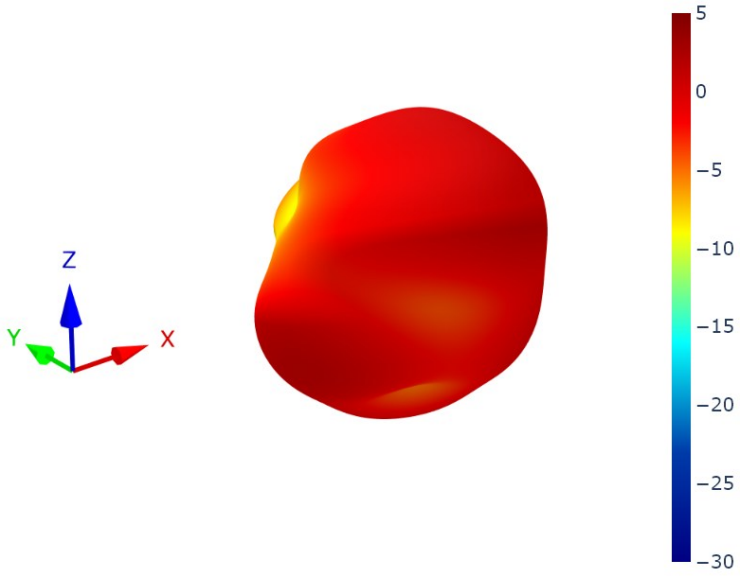
XZ Plane	YZ Plane	XY Plane



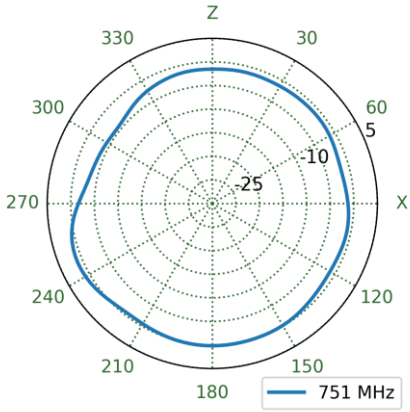


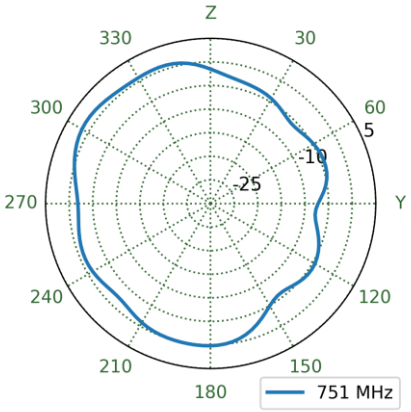


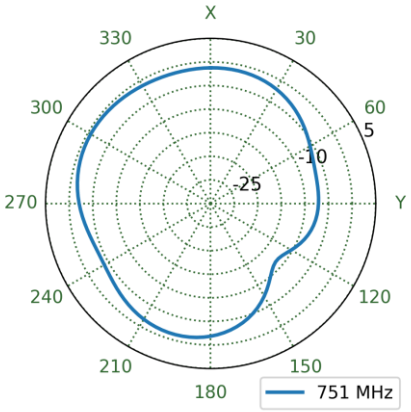
6.7 Cellular Patterns at 751 MHz



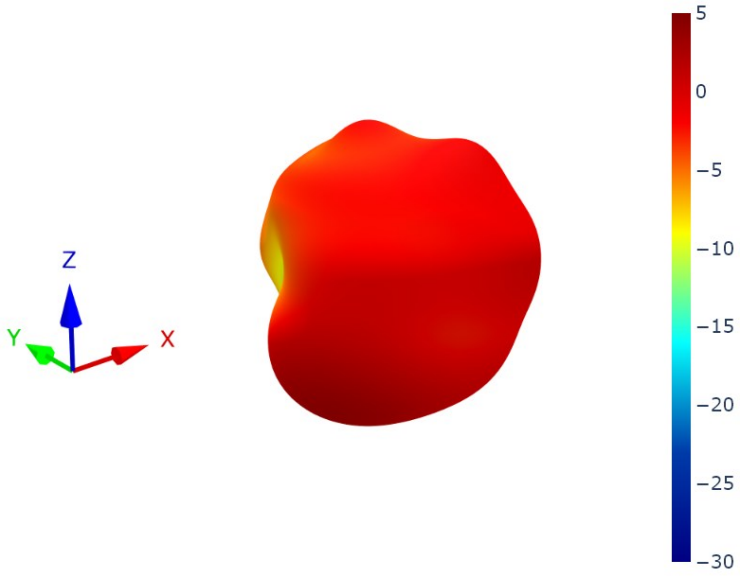
XZ Plane	YZ Plane	XY Plane



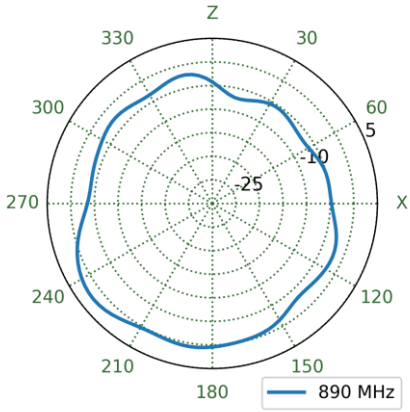


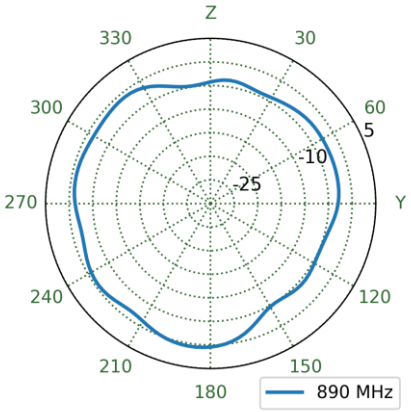


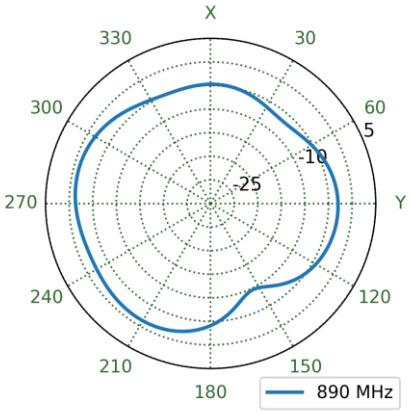
6.8 Cellular Patterns at 890 MHz



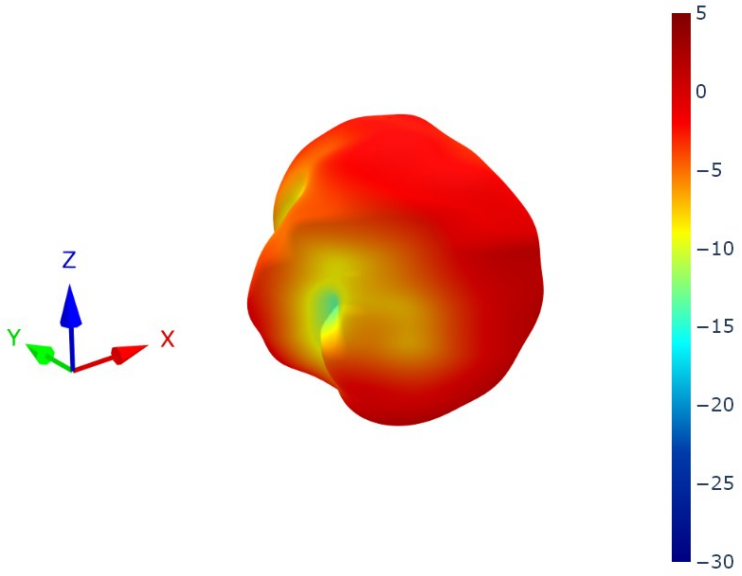
XZ Plane	YZ Plane	XY Plane



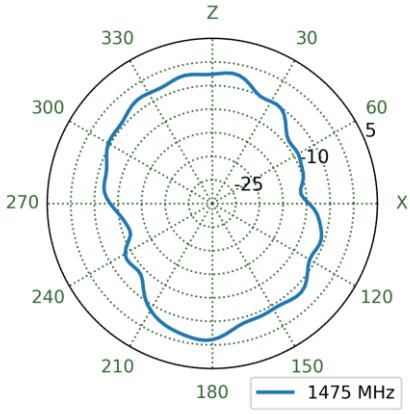


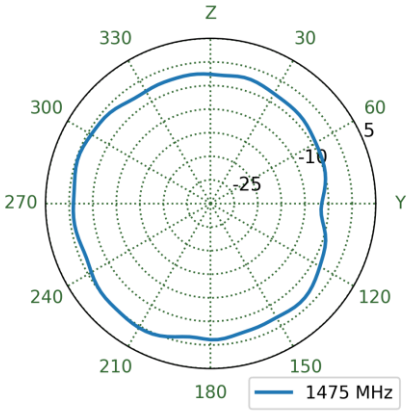


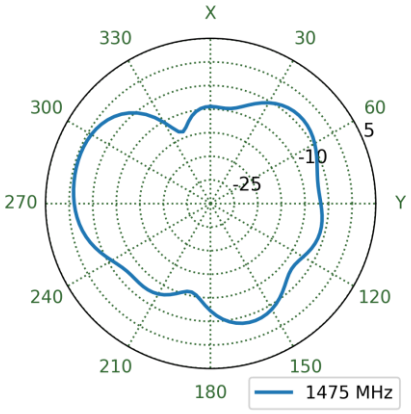
6.9 Cellular Patterns at 1475 MHz



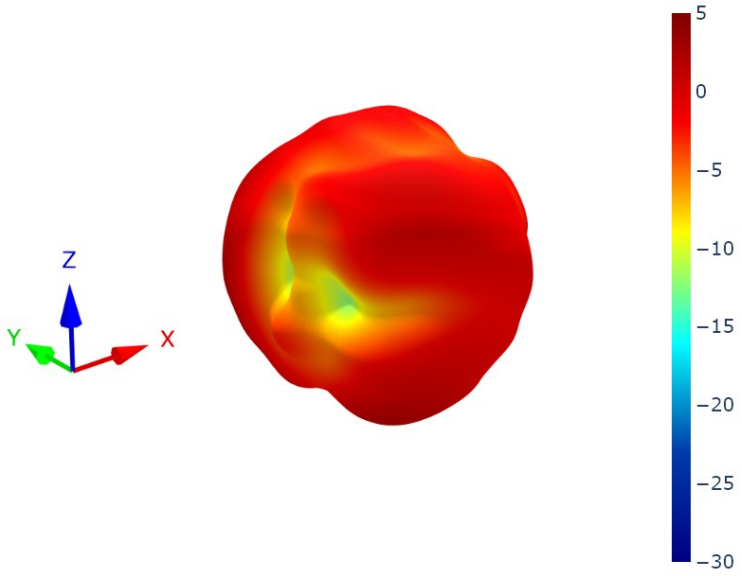
XZ Plane	YZ Plane	XY Plane



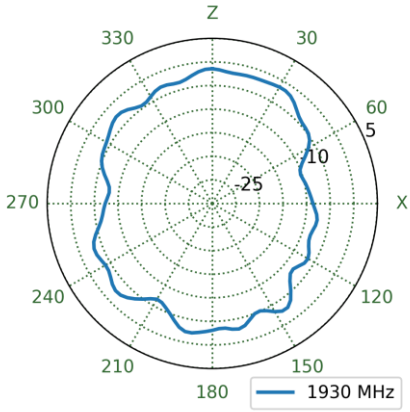


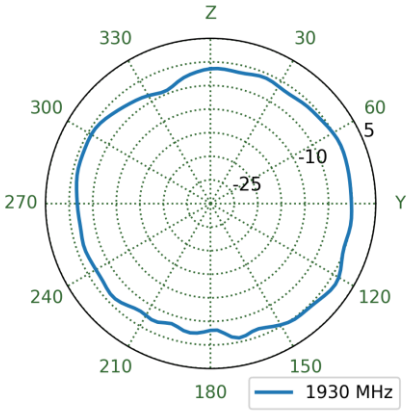


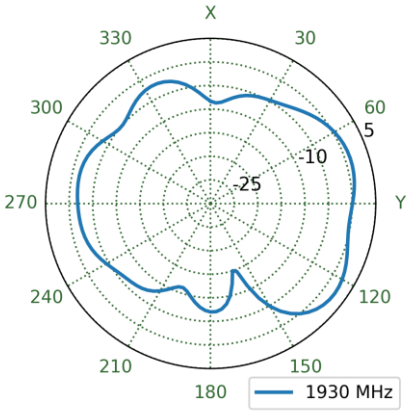
6.10 Cellular Patterns at 1930 MHz



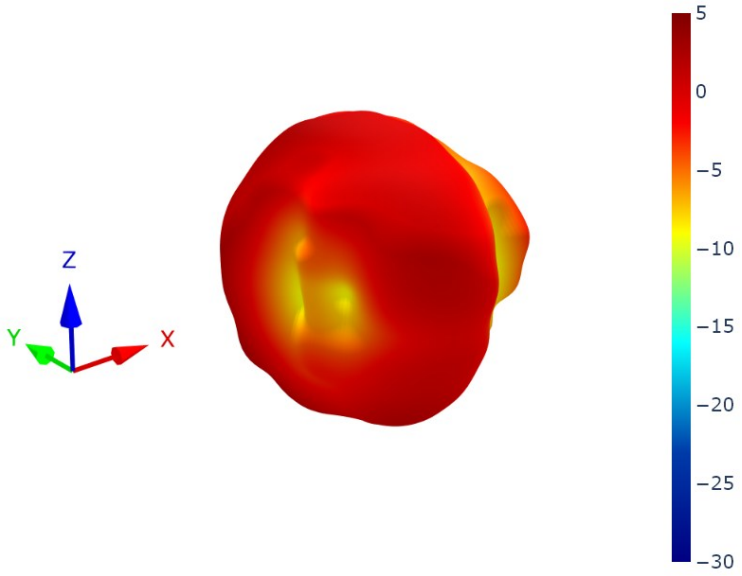
XZ Plane	YZ Plane	XY Plane



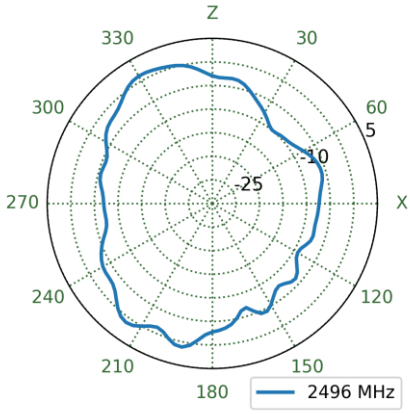


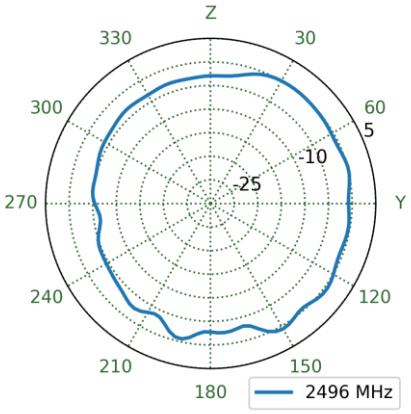


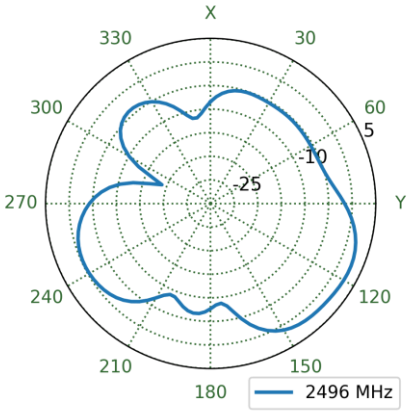
6.11 Cellular Patterns at 2496 MHz



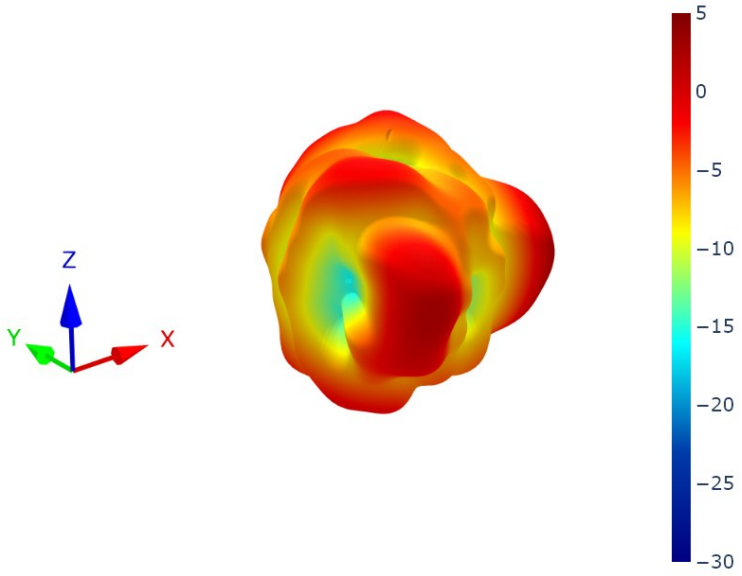
XZ Plane	YZ Plane	XY Plane



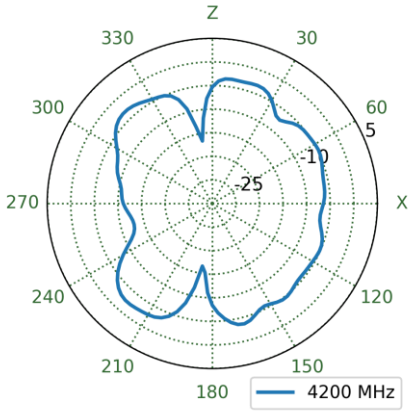


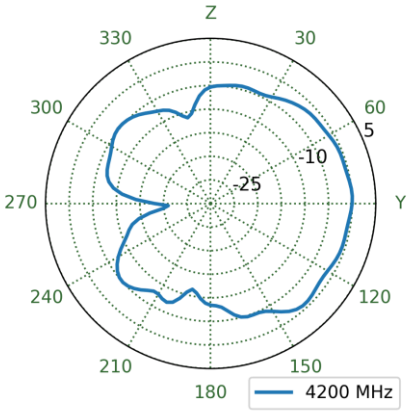


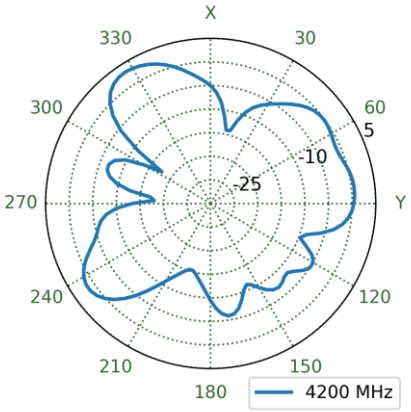
6.12 Cellular Patterns at 4200 MHz



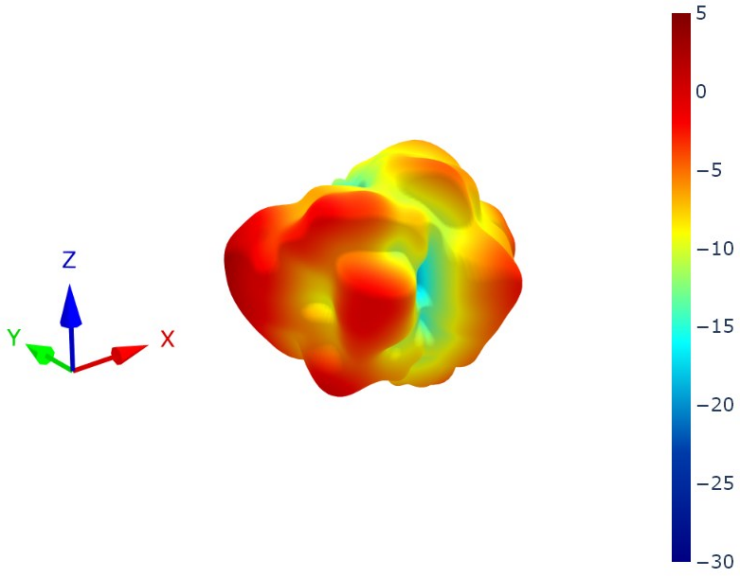
XZ Plane	YZ Plane	XY Plane



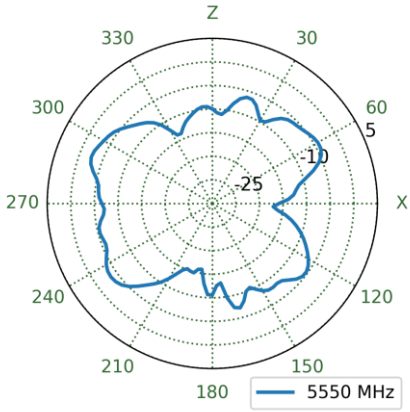


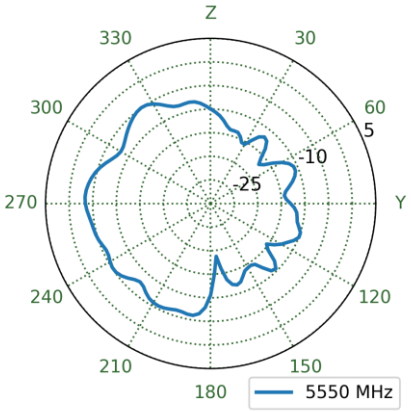


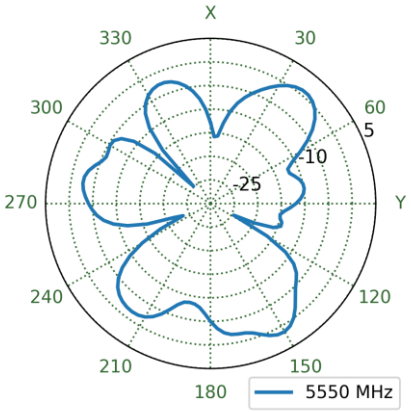
6.13 Cellular Patterns at 5550 MHz



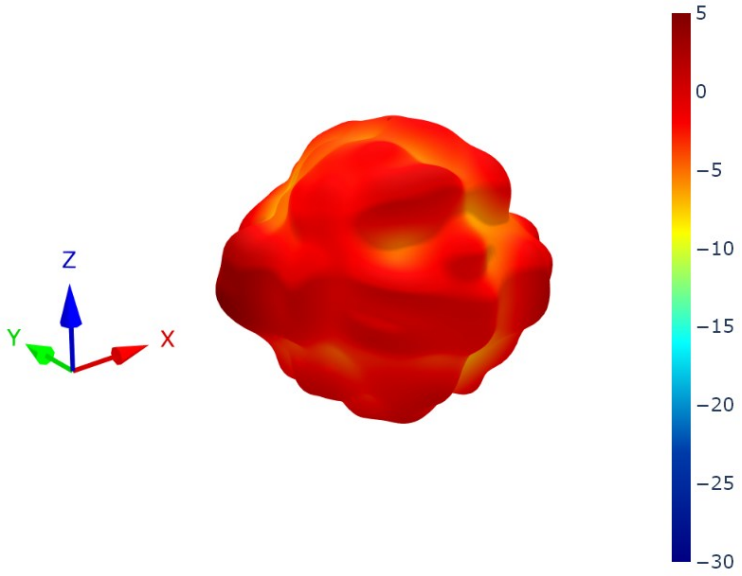
XZ Plane	YZ Plane	XY Plane



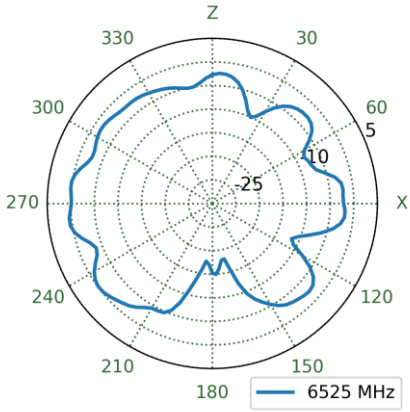


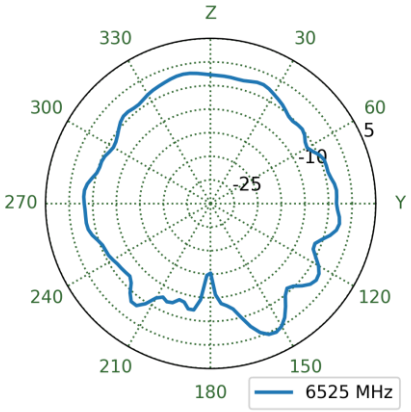


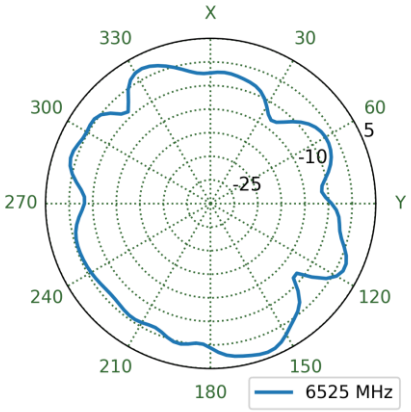
6.14 Cellular Patterns at 6525 MHz



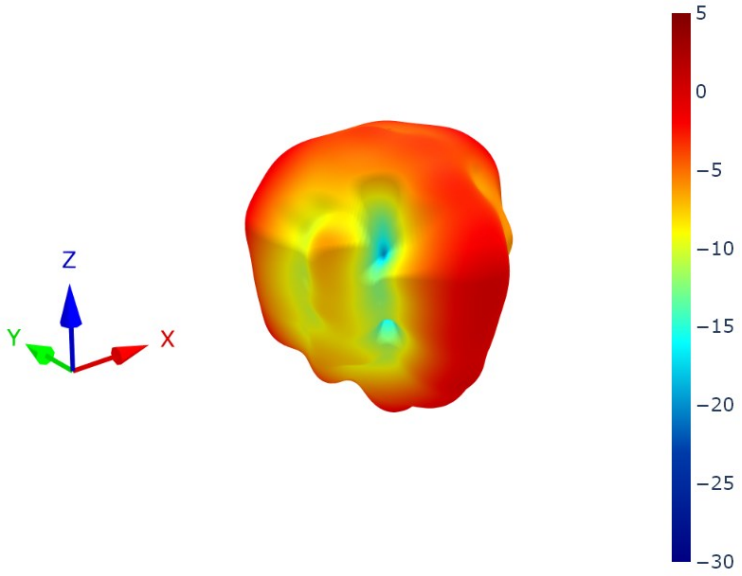
XZ Plane	YZ Plane	XY Plane



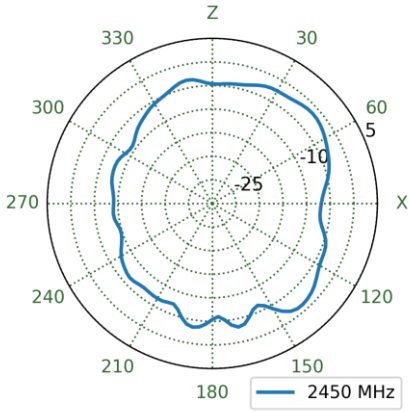


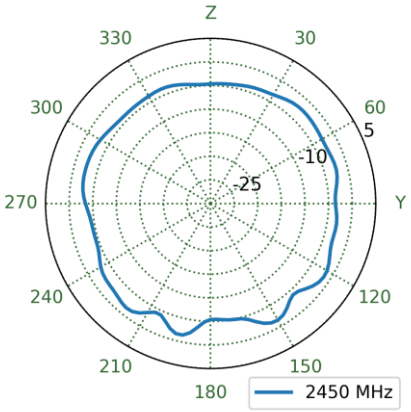


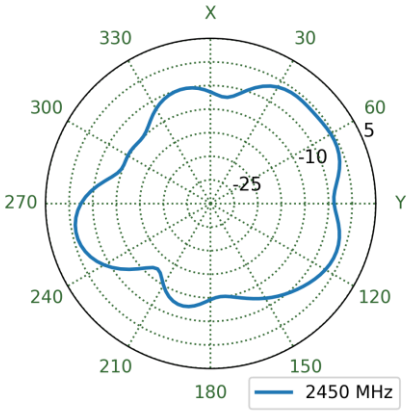
6.15 Wi-Fi Patterns at 2450 MHz



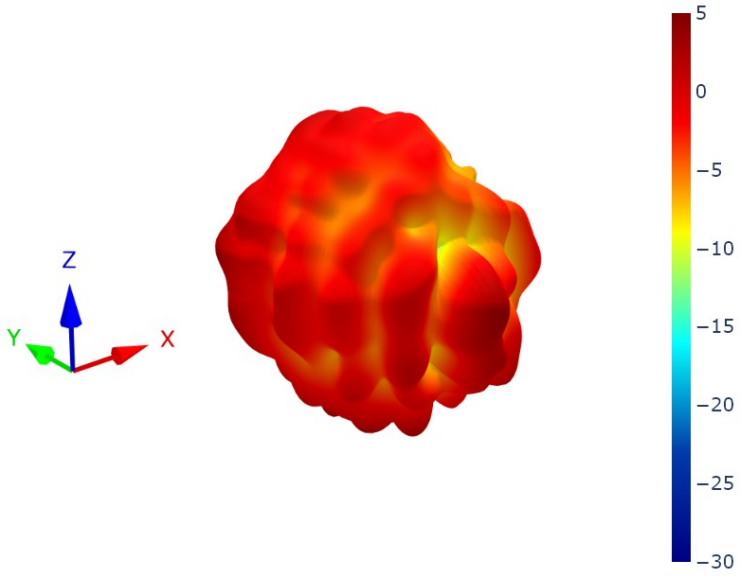
XZ Plane	YZ Plane	XY Plane



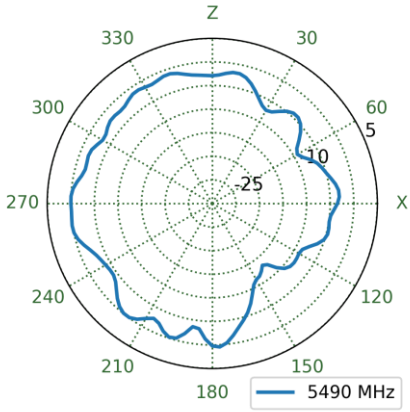


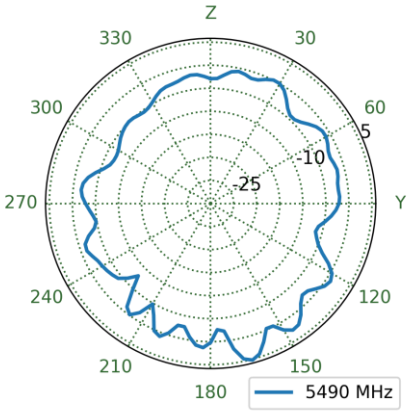


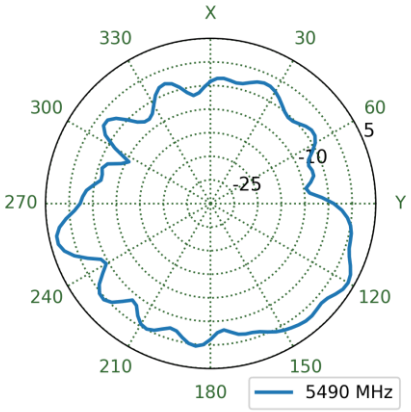
6.16 Wi-Fi Patterns at 5490 MHz



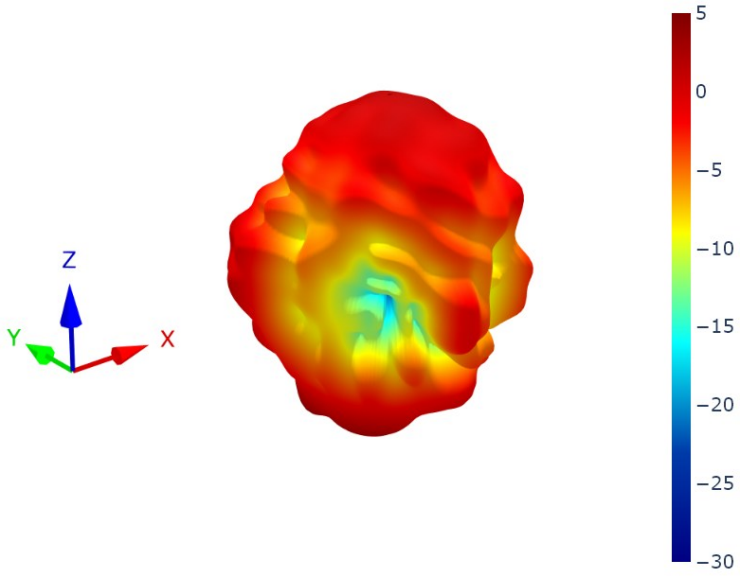
XZ Plane	YZ Plane	XY Plane



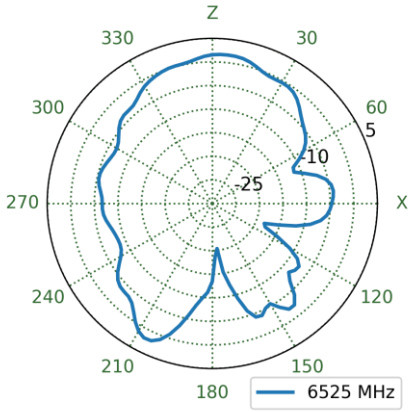


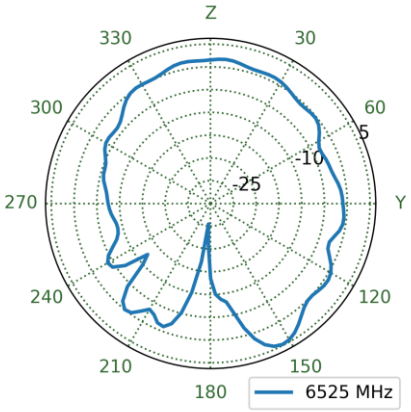


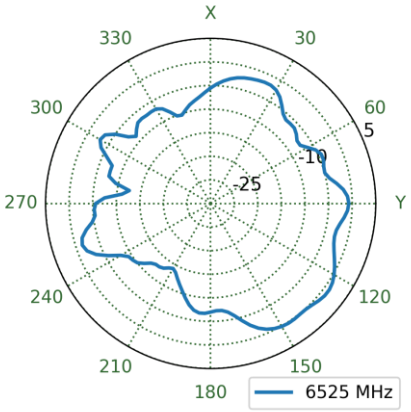
6.17 Wi-Fi Patterns at 6525 MHz



XZ Plane	YZ Plane	XY Plane







Changelog for the datasheet

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Date:	2025-09-26
Notes:	Initial Release
Author:	Gary West

Previous Revisions

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