



TAOGLAS®



Datasheet

Raptor X

Part No:

Black - MA8006.A.001

White - MA8006.W.001

Description

6in1 Raptor X Screwmount Antenna 3m 1*GNSS L1/L5 RG-174 SMA(M) 2*5G/4G TGC-302 SMA(M) 3*Wi-Fi TGC-302 RP-SMA(M)

Features:

1*GNSS L1/L5 Bands

2* 5G/4G LTE Cellular 600-6000MHz

3* Wi-Fi 2.4/5.8GHz

Dimensions: 350mm x 70mm x 39mm

M22 Thread

IP69K Rated Enclosure

Cable: GNSS- 3m of RG-174, Wi-Fi & 5G/4G –3m of TGC-302

IK10 Rated Enclosure

Connector: GNSS – SMA(M), 5G/4G – SMA(M), Wi-Fi – RP-SMA(M)

Custom Cables and Connectors Available

RoHS & Reach Compliant

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1. Introduction



The **MA8006 Raptor X** is a 6-in-1 high-performance screw-mount antenna, engineered for next-generation routers, gateways, and mission-critical applications. The MA8006 features dual-band GNSS L1/L5 for precise positioning, two wideband 5G/4G cellular elements covering 600–6000MHz for superior connectivity, and three dual-band Wi-Fi antennas supporting 2.4/5.8GHz for high-throughput, future-proof wireless performance.

Despite its powerful feature set, the MA8006 maintains a compact form factor of just 350 x 70 x 39mm, significantly smaller than competing solutions. At only 39mm in height, it is ideal for low-profile installations such as vehicle rooftops where clearance is limited, and its slim 70mm width allows deployment in constrained spaces such as NEMA enclosures and industrial cabinets.

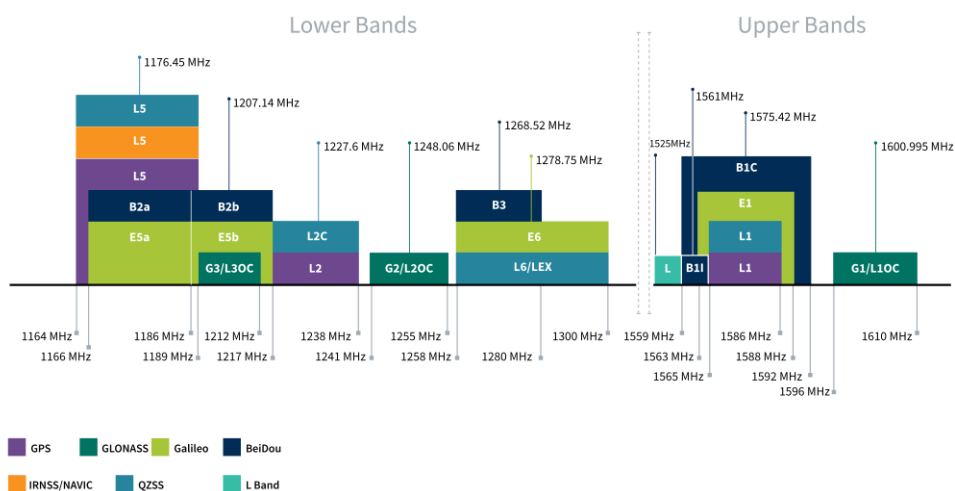
Typical applications include:

- Emergency and First Responder Vehicles
- EV Charging Infrastructure
- Smart Industry and Logistics
- Warehousing and Asset Tracking
- Private LTE / 5G Networks

The MA8006 is built to withstand the harshest environments with an IP69K and IK10 rated enclosure, ensuring protection against water, dust, and mechanical impact. Each antenna element is connected via high-performance 3m cables (GNSS on RG-174, Wi-Fi and 5G/4G on TGC-302) with SMA(M) and RP-SMA(M) connectors, and custom cable/connector configurations are available on request.

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
	■	■	■	□	□



Bands and Constellations Table

GNSS Electrical				
Frequency (MHz)	GPS_L5	BeiDou_B1	GPS_L1	GLONASS_G1
	1164-1189	1559-1592	1565-1586	1596-1610
Average Gain (dB)	-2.95	-2.00	-1.77	-2.62
Efficiency (%)	50.7	63.0	66.5	54.7
Peak Gain (dBi)	2.49	3.93	3.93	3.38
Axial Ratio at Zenith	5	4.8	11.7	13.1
Impedance	50 Ω			
Polarization	RHCP			
*Tested with staggered cable lengths from 200-300mm (Standard Product)				

LNA and Filter Electrical Properties (3.3V Typ.)		
Frequency (MHz)		High-Band
LNA Gain (dB)		32.3
Noise Figure (dB)		2.4
Current Consumption (mA)		16.8
Outer Band Attenuation (dB)	At 500 ~ 1000 MHz	60 dB
	At 2000 ~ 2690MHz	60 dB
	At 3300~ 6000MHz	60 dB
Output Impedance		50 ohm
Input Voltage(V)		+1.8 to 5.5

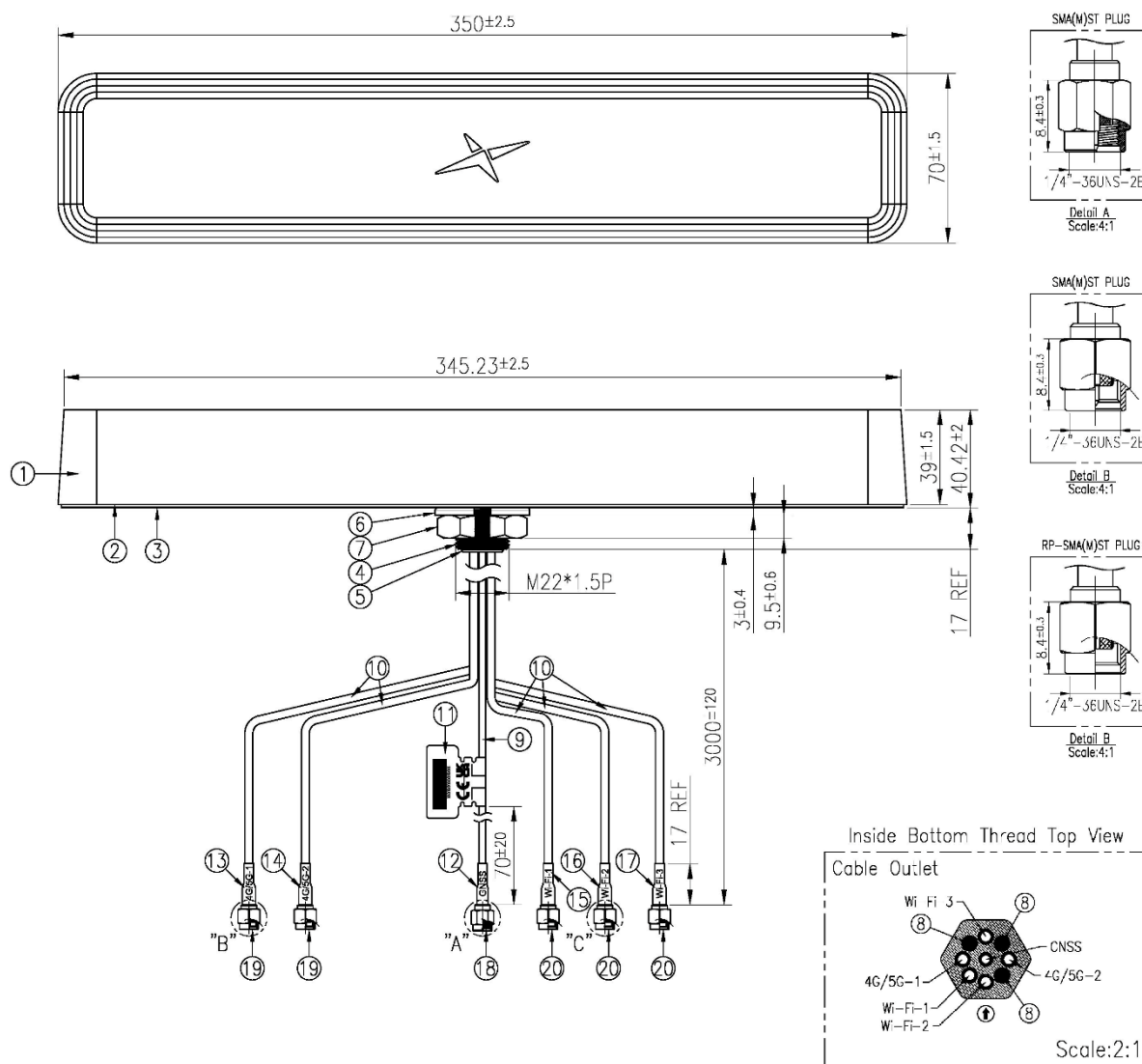
4G-5G Electrical									
Band	Frequency (MHz)	Measurement	Efficiency (%)	Average Gain (dB)	Peak Gain (dBi)	Impedance	Polarization	Radiation Pattern	Max. input power
5GNR/4G Band71	617-698	4G5G-1	49.8	-3.03	0.87	50 Ω	Linear	Omni directional	10W
		4G5G-2	36.6	-4.37	0.91				
4G/3G Band 12,13,14,17,28,29	698-824	4G5G-1	49.7	-3.04	2.94				
		4G5G-2	39.5	-4.03	2.11				
4G/3G/NB-IoT/Cat M Band 5,8,18,19,20,26,27	824-960	4G5G-1	50.8	-2.94	2.64				
		4G5G-2	43.7	-3.60	2.18				
5GNR/4G Band 21,32,74,75,76	1427-1518	4G5G-1	27.9	-5.54	1.01				
		4G5G-2	27.8	-5.56	1.21				
4G/3G Band 1,2,3,4,9,23,25,35,39,66	1710-2200	4G5G-1	47.7	-3.21	5.15				
		4G5G-2	53.7	-2.70	5.44				
4G/3G Band 7,30,38,40,41	2300-2690	4G5G-1	45.2	-3.45	6.16				
		4G5G-2	56.8	-2.45	6.97				
LTE5200/Wi-Fi5800	5150-5925	4G5G-1	48.9	-3.11	5.76				
		4G5G-2	41.2	-3.86	4.93				
5GNR/4G Band 22,42,48,77,78,79	3300-5000	4G5G-1	58.9	-2.30	6.23				
		4G5G-2	58.9	-2.30	6.78				
*Tested with staggered cable lengths from 200-300mm (Standard Product)									

Wi-Fi Electrical									
Band	Frequency (MHz)	Measurement	Efficiency (%)	Average Gain (dB)	Peak Gain (dBi)	Impedance	Polarization	Radiation Pattern	Max. input power
WiFi - 2GHz	2400-2500	Wi-Fi1	40.2	-3.96	3.56	50 Ω	Linear	Omni directional	10W
		Wi-Fi2	53.7	-2.70	6.71				
		Wi-Fi3	50.0	-3.01	6.09				
WiFi - 5GHz	5150-5850	Wi-Fi1	49.2	-3.08	6.56				
		Wi-Fi2	44.3	-3.54	6.82				
		Wi-Fi3	46.8	-3.30	5.42				
*Tested with staggered cable lengths from 200-300mm (Standard Product)									

Mechanical	
Dimensions	350mm * 70mm * 39 mm
Weight	840g
Material	PC
Connector	GNSS: SMA(M), 5G/4G(1-2): SMA(M), Wi-Fi(1-3): – RP-SMA(M)
Cable	GNSS:3m of RG-174, 5G/4G(1-4) Wi-Fi(1-5):3m of TGC-302
Enclosure Impact Rating	IK10

Environmental	
Waterproof Rating	IP69K
Temperature Range	-40°C to + 85°C
Humidity	Non-condensing 65°C 95% RH

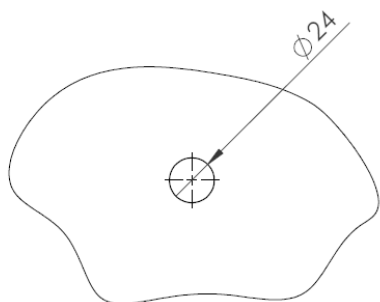
3. Mechanical Drawing



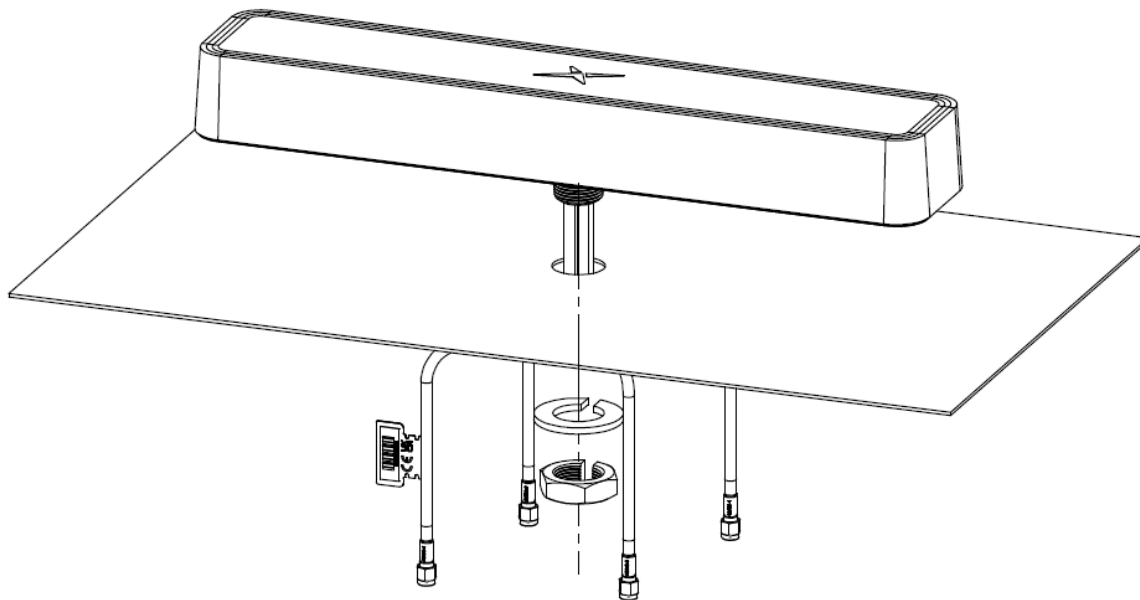
	Name	Material	Finish	QTY
1	Top Housing	PC	White	1
2	Bottom Housing	PC	Black	1
3	Double Sided Adhesive	CR4305+3M9448HK	Black Foam/White Liner	1
4	Metal Stem	Zinc Alloy	Cu-Ni Plated	1
5	Cable Rubber 9IN1	DJSilicone NE-7150	Black	1
6	Washer_Cut	Carbon Steel	Zn-Ni Plated	1
7	Nut_M22x1.5Px9.5H Cut	Carbon Steel	Zn-Ni Plated	1
8	Grommet plug_TGC302	ASA/PW-978B	Black	3
9	RG174 Coaxial Cable	PVC	Black	1
10	TGC302 LL Coaxial Cable	PVC	Black	5
11	CEWEE and UKCA mark logo Label	PEPA	White	1
12	Heat Shrink Tube (GNSS)	PE	Blue Tube /White Text	1
13	Heat Shrink Tube(4G/5G-1)	PE	Red Tube /White Text	1
14	Heat Shrink Tube(4G/5G-2)	PE	Red Tube /White Text	1
15	Heat Shrink Tube (Wi-Fi-1)	PE	Yellow Tube/Black Text	1
16	Heat Shrink Tube (Wi-Fi-2)	PE	Yellow Tube/Black Text	1
17	Heat Shrink Tube (Wi-Fi-3)	PE	Yellow Tube/Black Text	1
18	SMA(M)ST for RG174	Brass	Au Plated	1
19	SMA(M)ST	Brass	Au Plated	2
20	RP-SMA(M)ST	Brass	Au Plated	3

	Name	Material	Finish	QTY
1	Top Housing	PC	Black	1
2	Bottom Housing	PC	Black	1
3	Double Sided Adhesive	CR4305+3M9448HK	Black Foam/White Liner	1
4	Metal Stem	Zinc Alloy	Cu-Ni Plated	1
5	Cable Rubber 9IN1	DJSilicone NE-7150	Black	1
6	Washer_Cut	Carbon Steel	Zn-Ni Plated	1
7	Nut_M22x1.5Px9.5H Cut	Carbon Steel	Zn-Ni Plated	1
8	Grommet plug_TGC302	ASA/PW-978B	Black	3
9	RG174 Coaxial Cable	PVC	Black	1
10	TGC302 LL Coaxial Cable	PVC	Black	1
11	CEWEE and UKCA mark logo Label	PEPA	White	1
12	Heat Shrink Tube (GNSS)	PE	Blue Tube /White Text	1
13	Heat Shrink Tube(4G/5G-1)	PE	Red Tube /White Text	1
14	Heat Shrink Tube(4G/5G-2)	PE	Red Tube /White Text	1
15	Heat Shrink Tube (Wi-Fi-1)	PE	Yellow Tube/Black Text	1
16	Heat Shrink Tube (Wi-Fi-2)	PE	Yellow Tube/Black Text	1
17	Heat Shrink Tube (Wi-Fi-3)	PE	Yellow Tube/Black Text	1
18	SMA(M)ST for RG174	Brass	Au Plated	1
19	SMA(M)ST	Brass	Au Plated	2
20	RP-SMA(M)ST	Brass	Au Plated	3

4. Installation Guide



RECOMMENDED HOLE SIZE FOR MOUNTING
MAX PANEL THICKNESS = 6MM



5. Packaging

1pcs MA8006 per PE Bag
Weight (Kg): 0.84±3%



10pcs MA8006 per carton
Dimensions 370 x 370 x 300mm
Weight (Kg): 9.6±3%



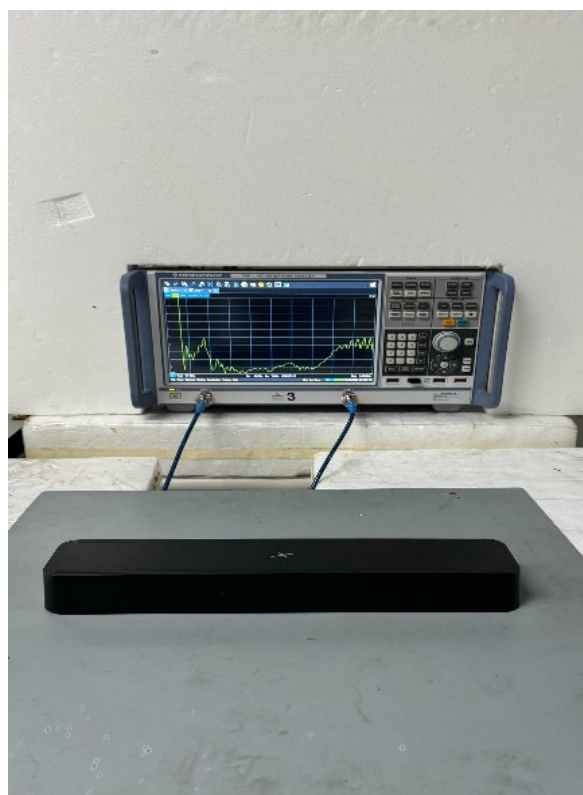
6. Antenna Characteristics

6.1 Test Setup

AUT

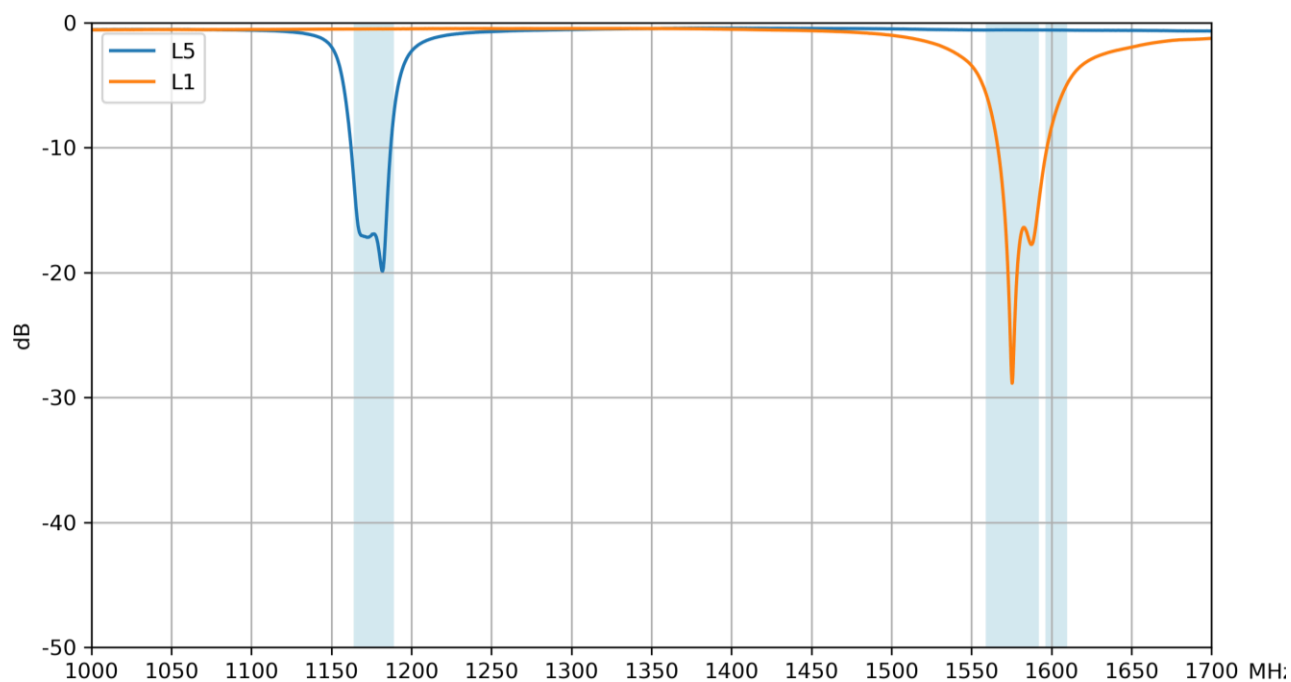


Vector Network Analyzer

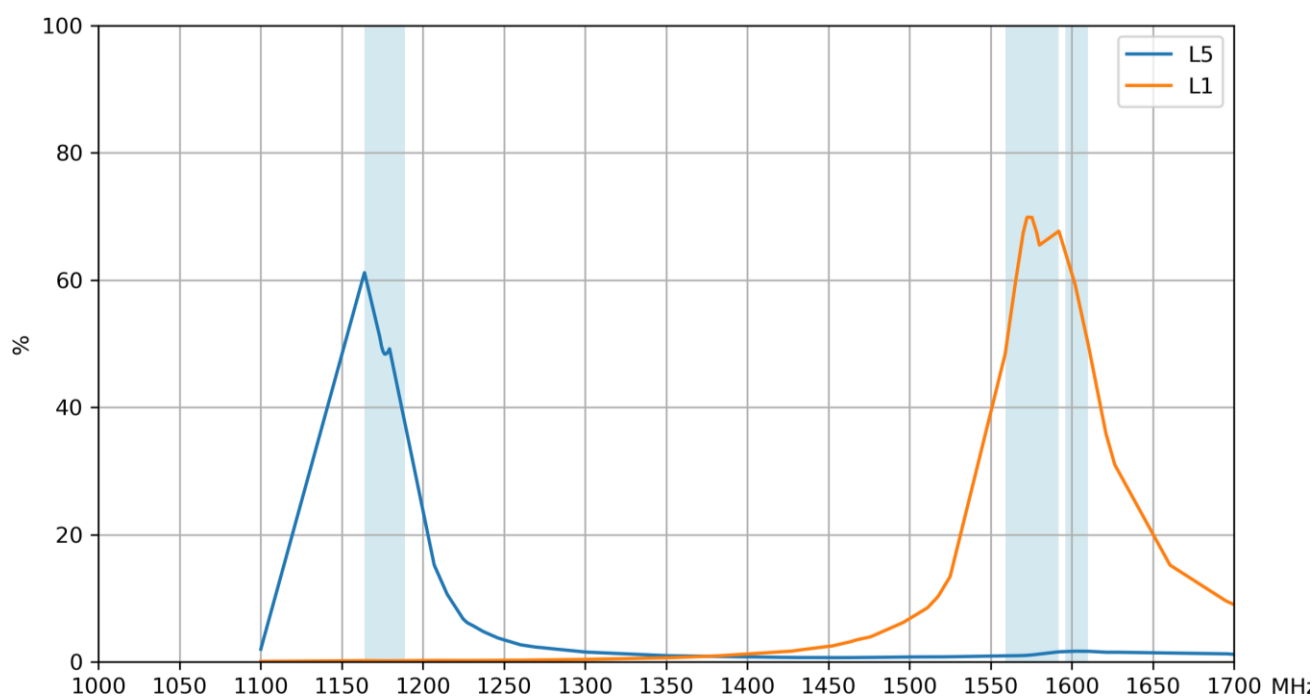


VNA Test Set up

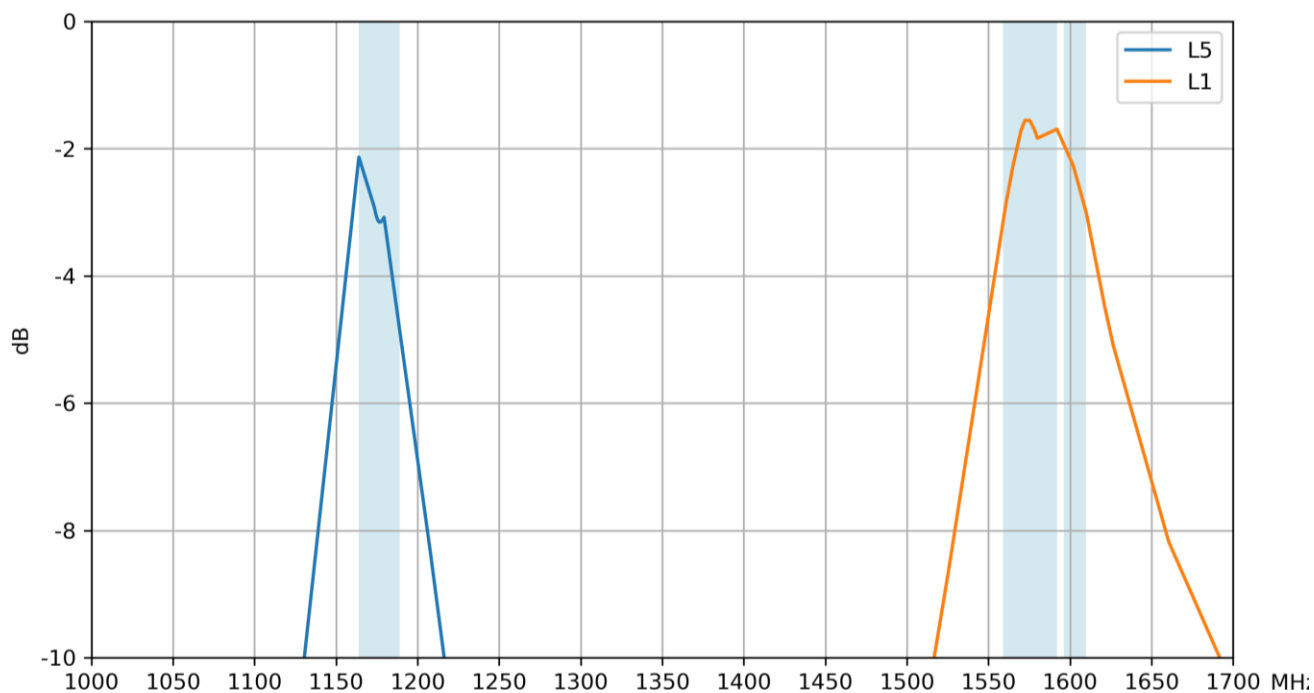
6.2 GNSS - Return Loss



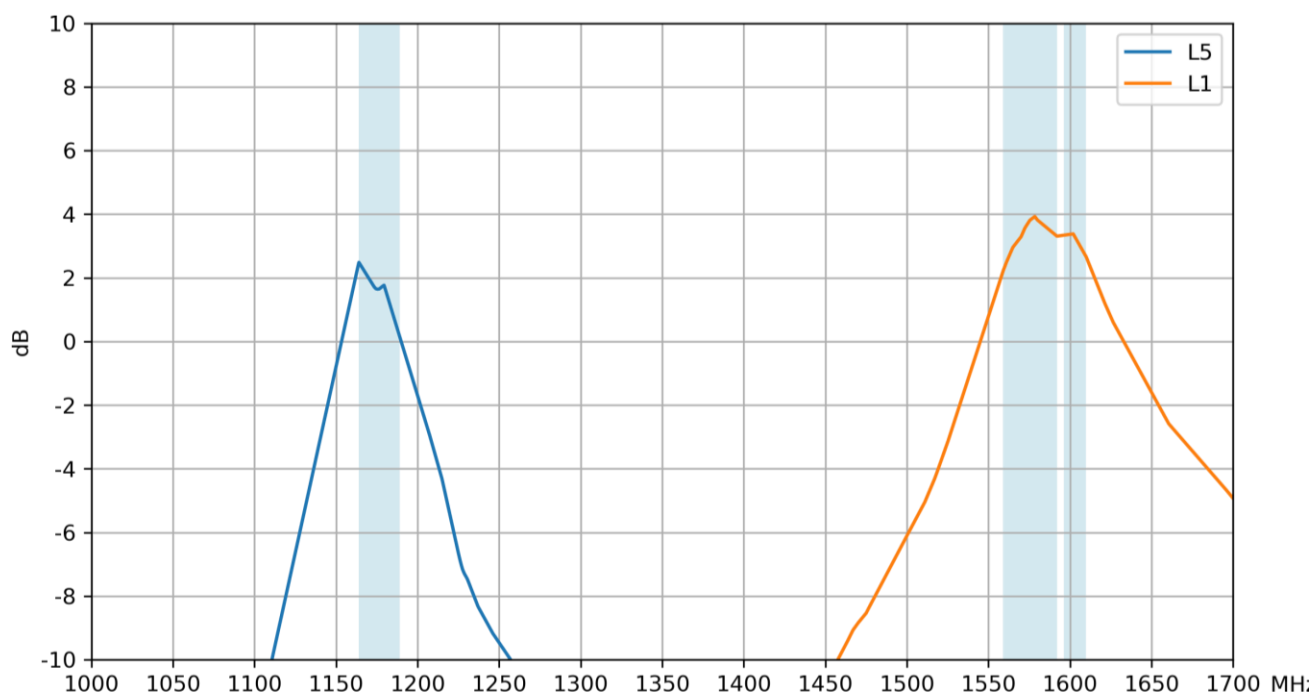
6.3 GNSS - Efficiency



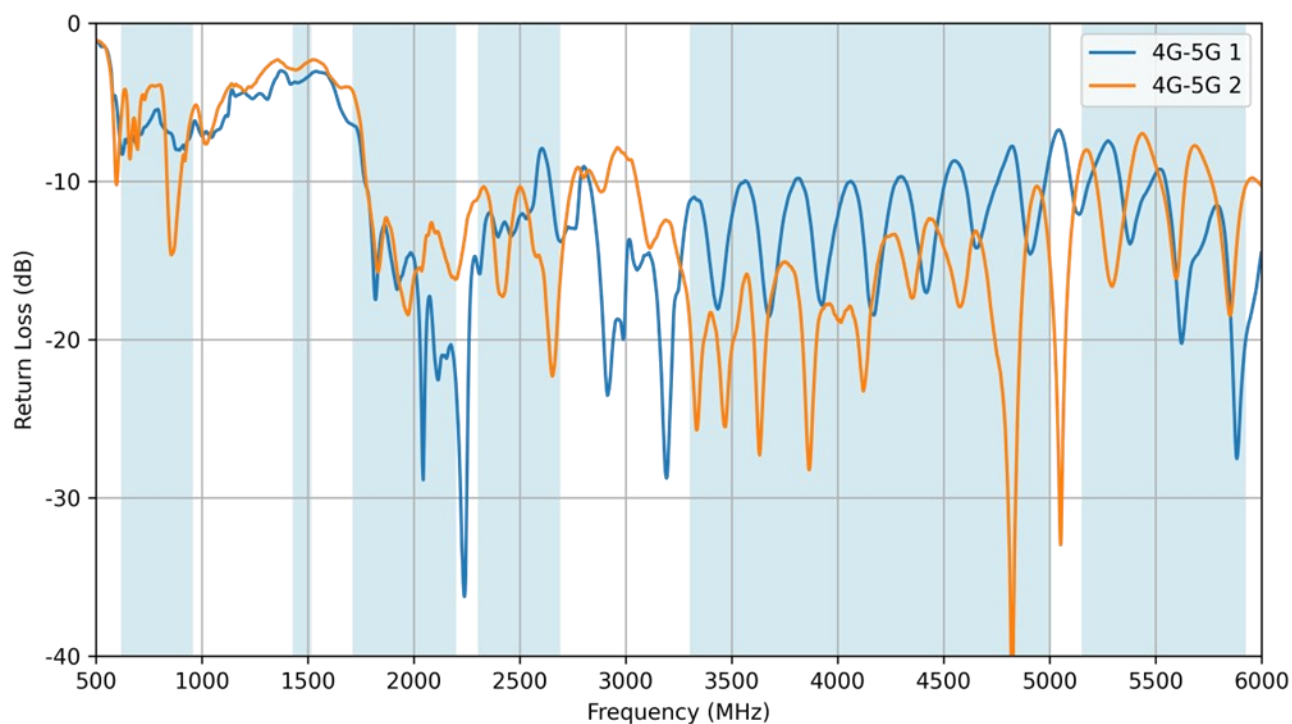
6.4 GNSS - Average Gain



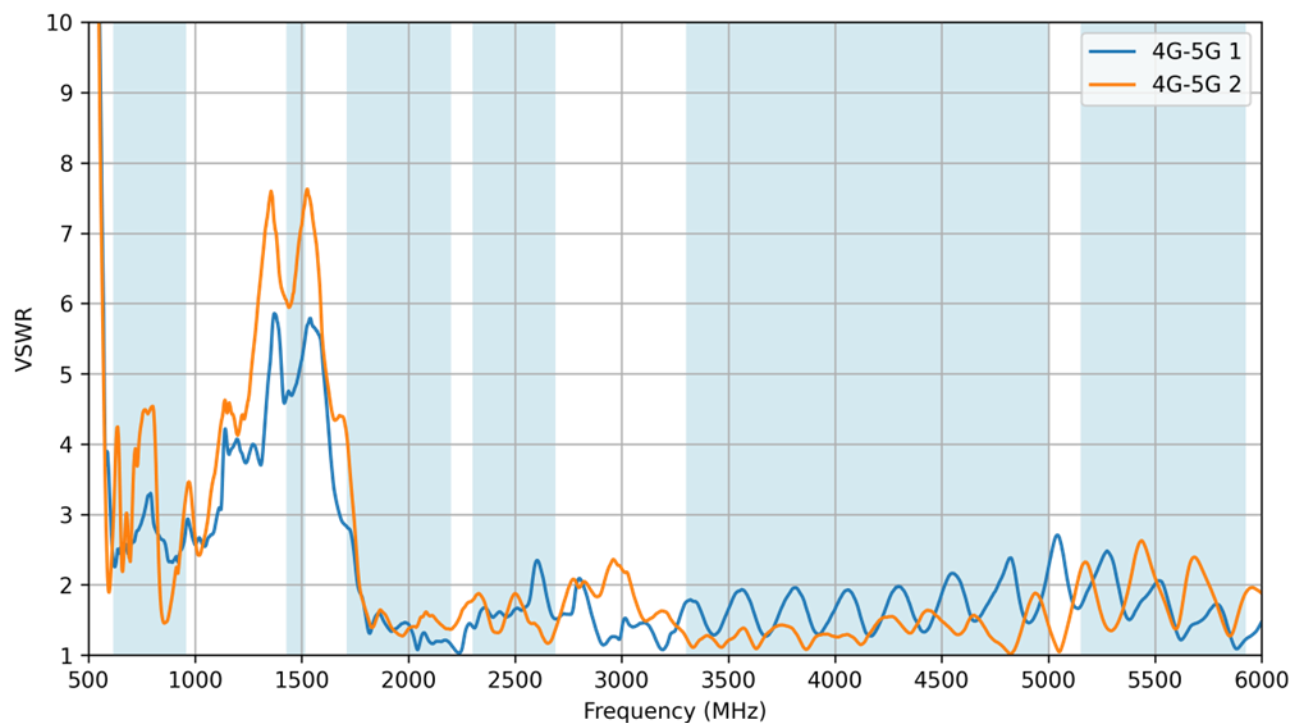
6.5 GNSS - Peak Gain



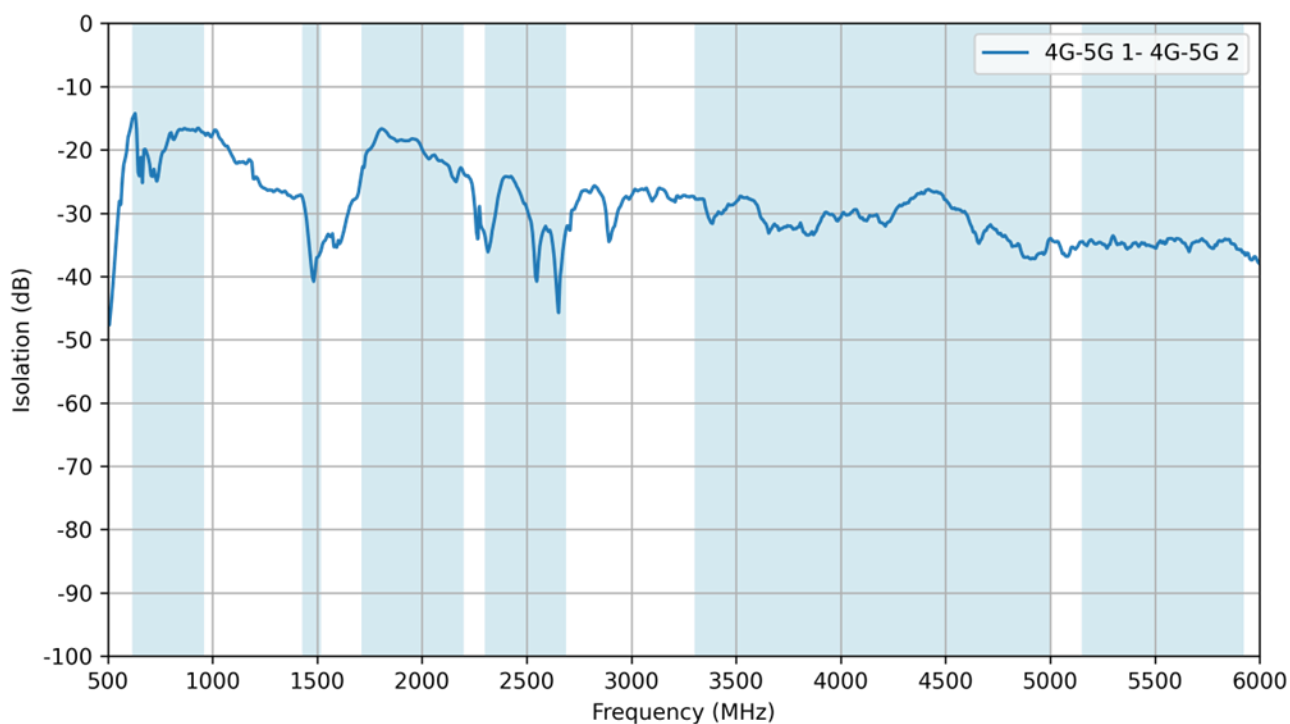
6.6 4G-5G - Return Loss



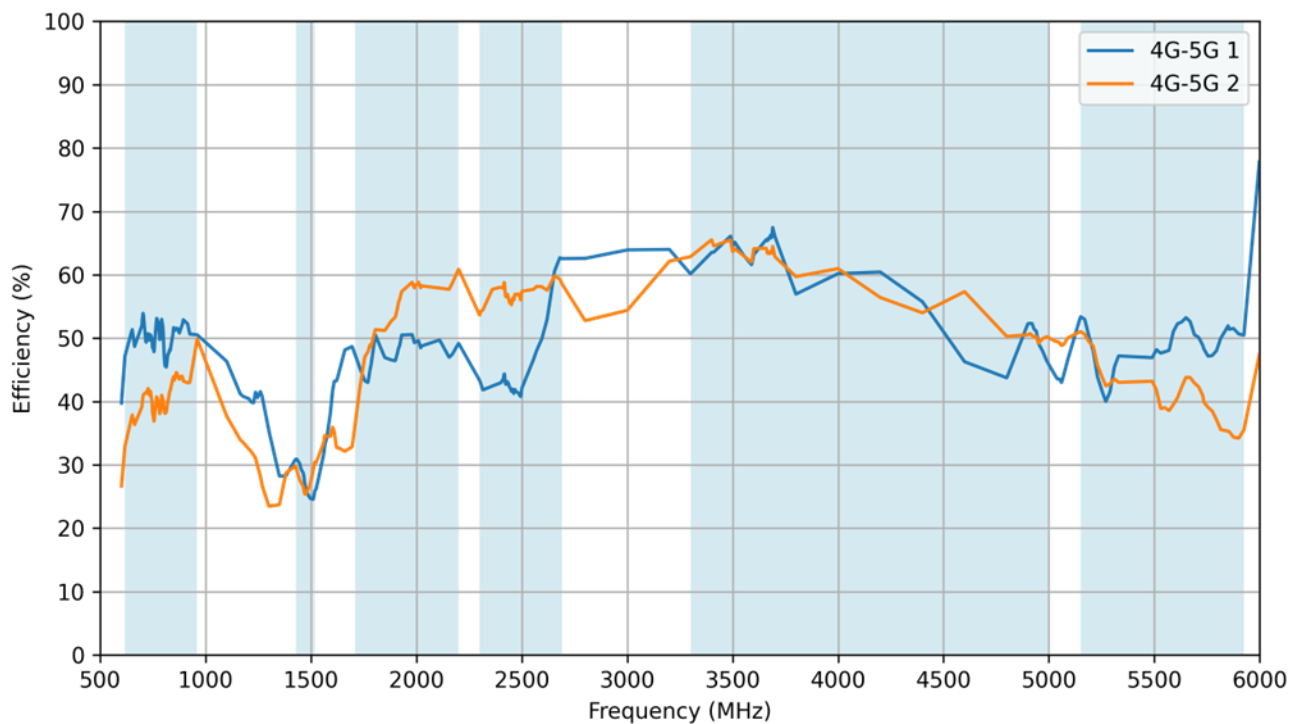
6.7 4G-5G - VSWR



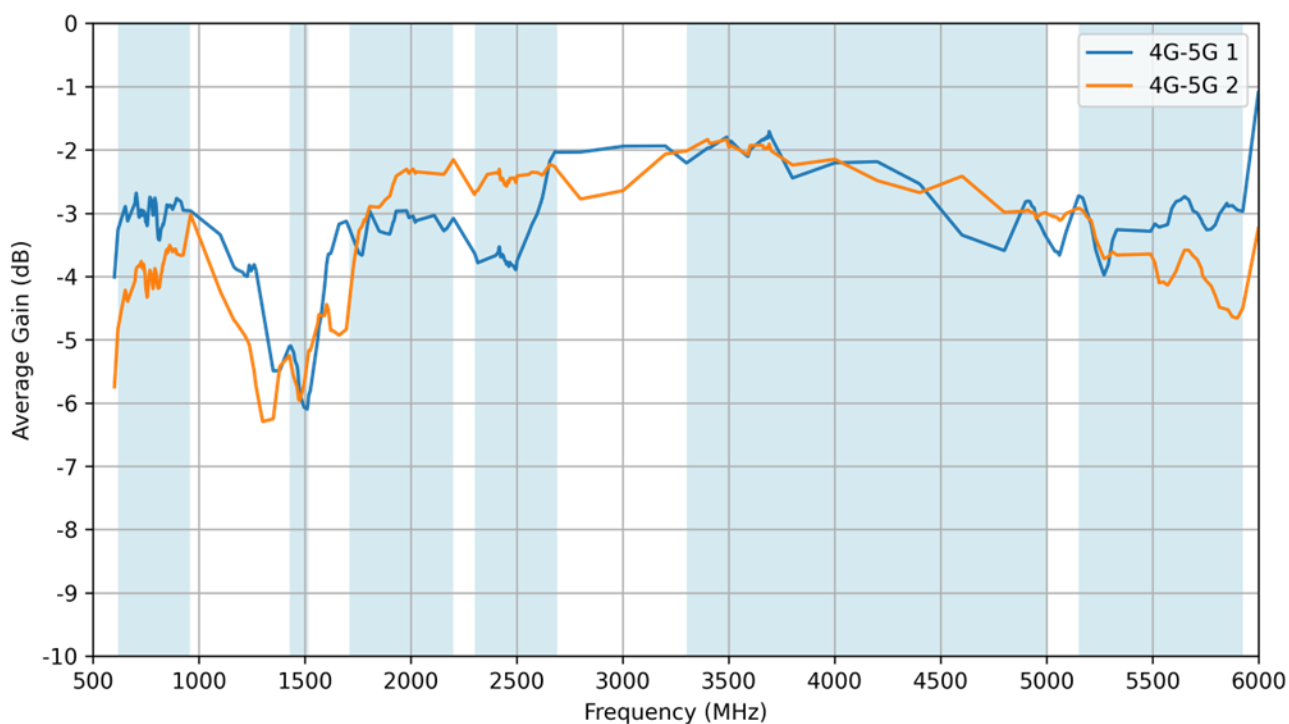
6.8 4G-5G - Isolation



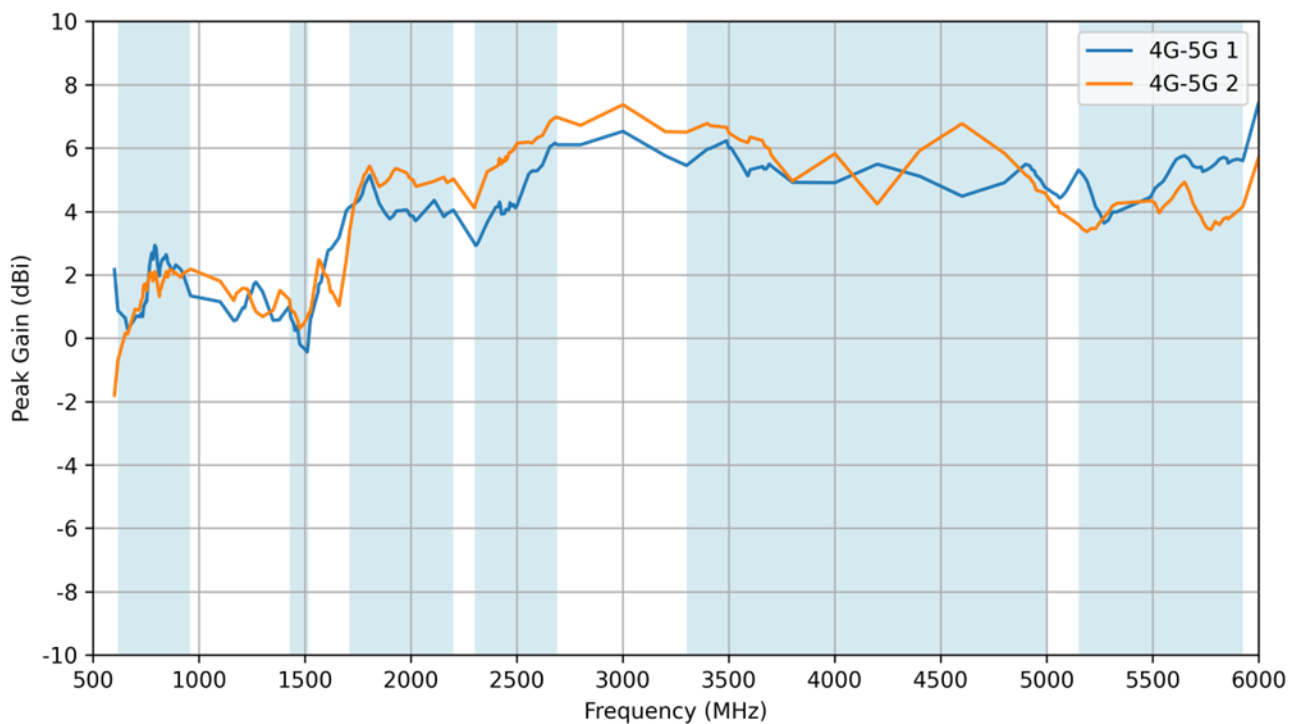
6.9 4G-5G - Efficiency



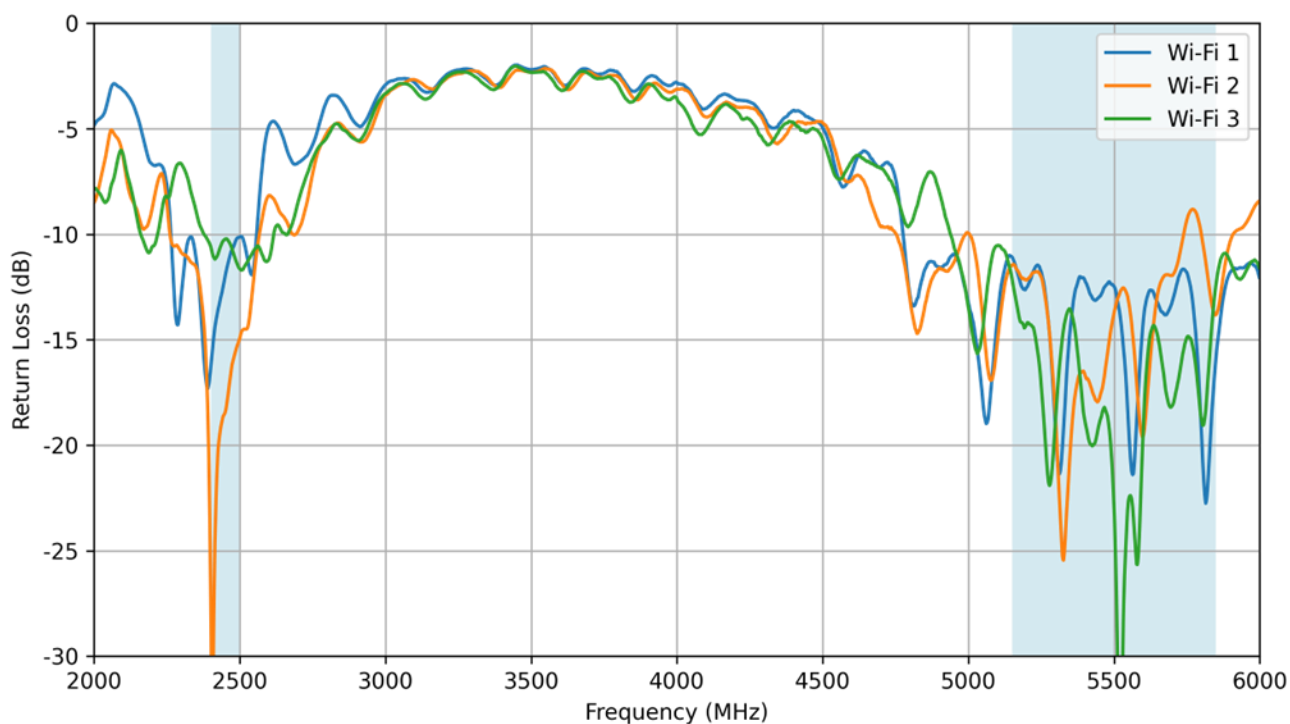
6.10 4G-5G - Average Gain



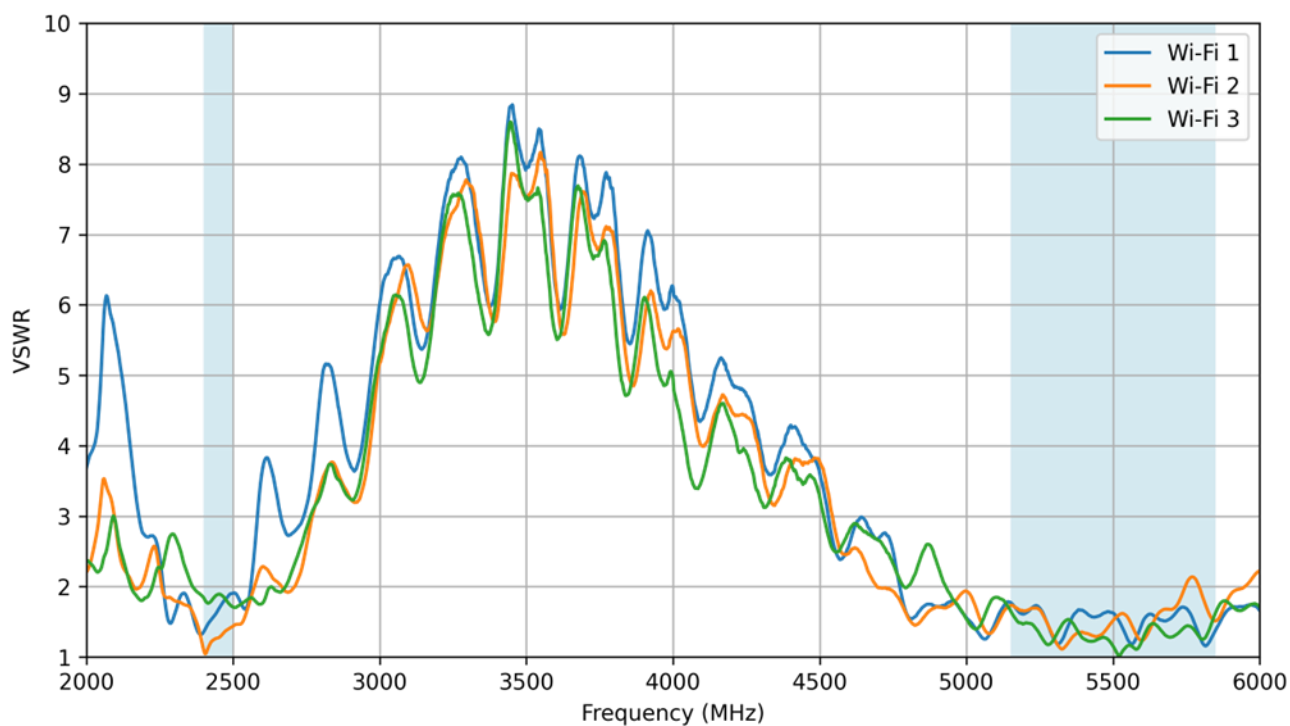
6.11 4G-5G - Peak Gain



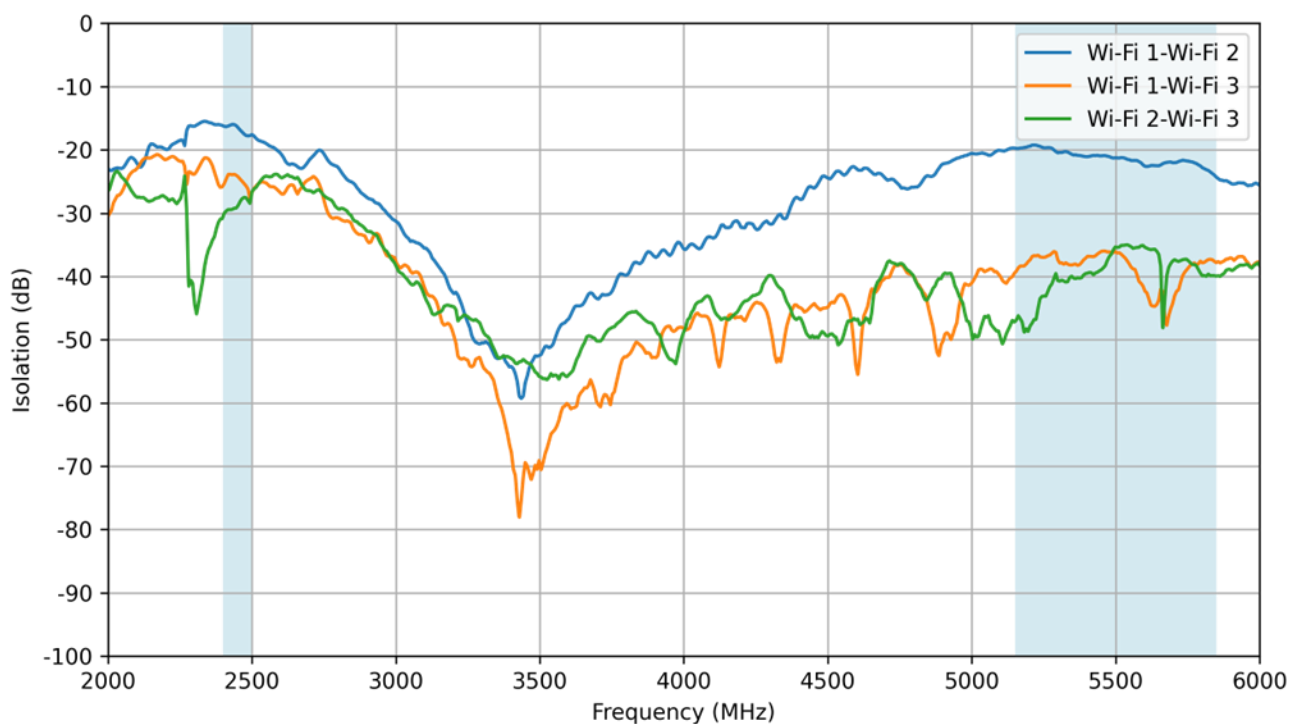
6.12 Wi-Fi - Return Loss



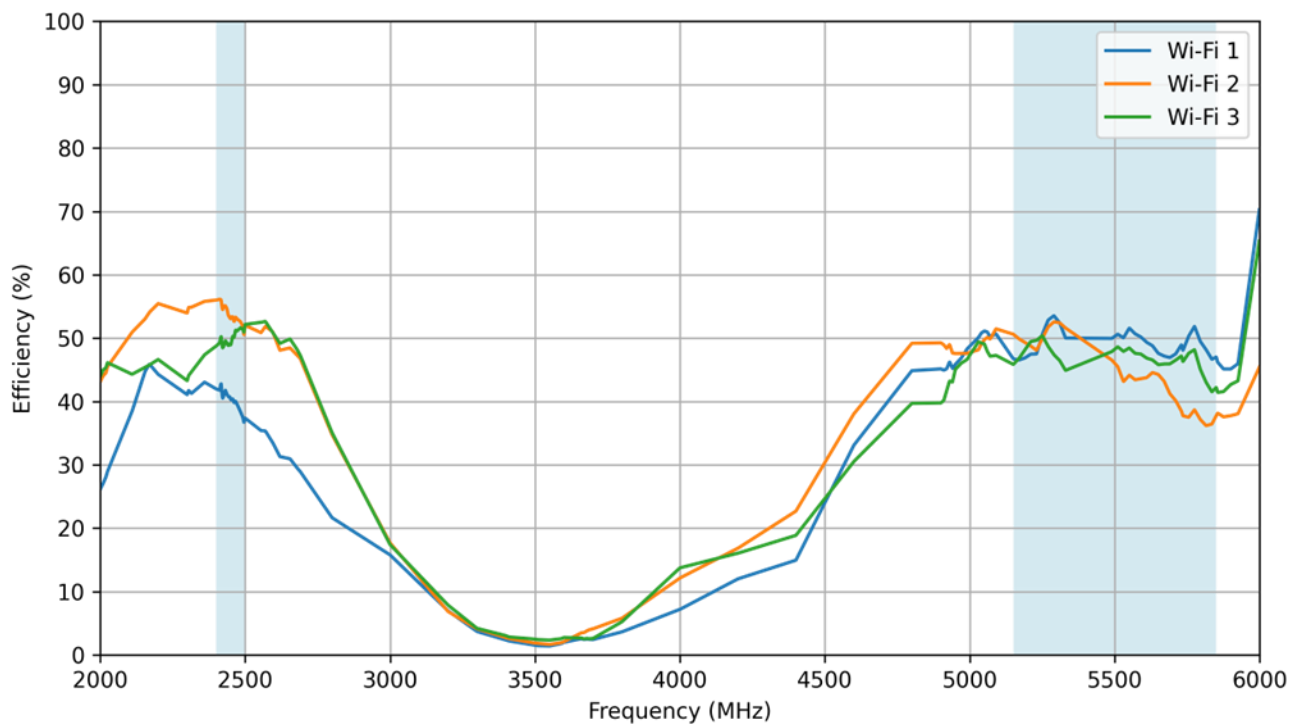
6.13 Wi-Fi - VSWR



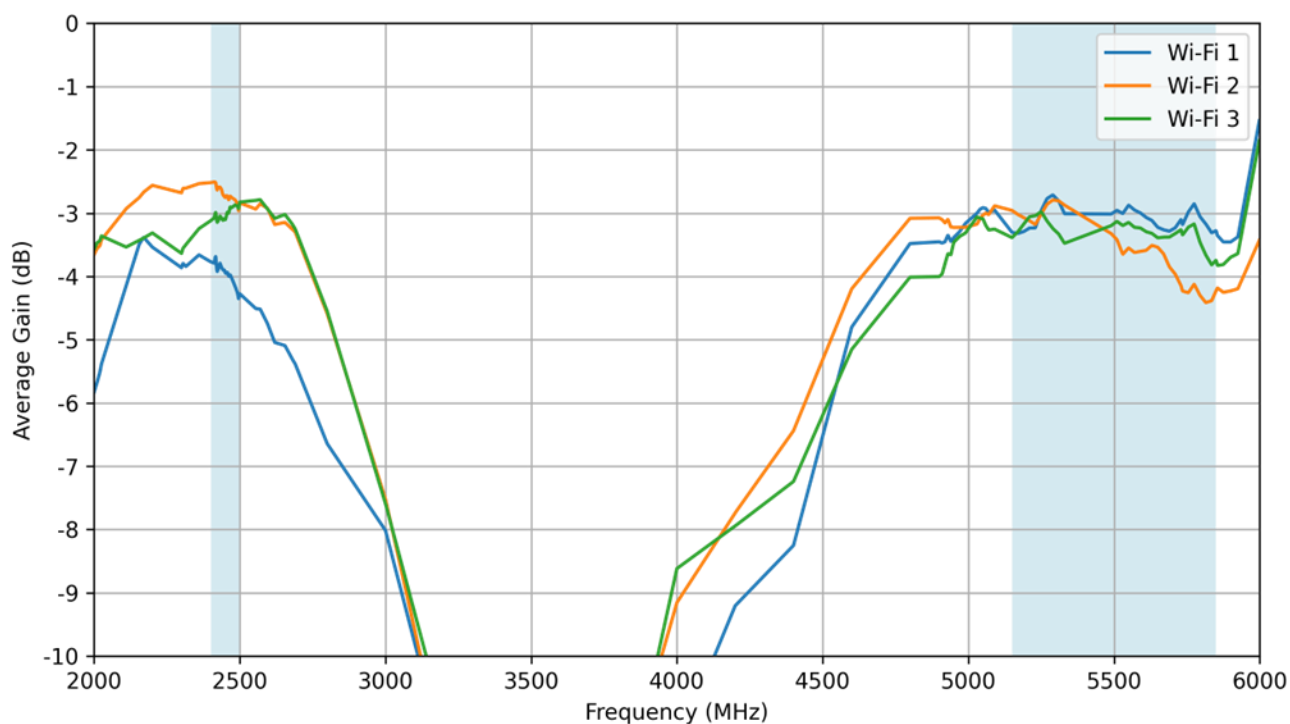
6.14 Wi-Fi - Isolation



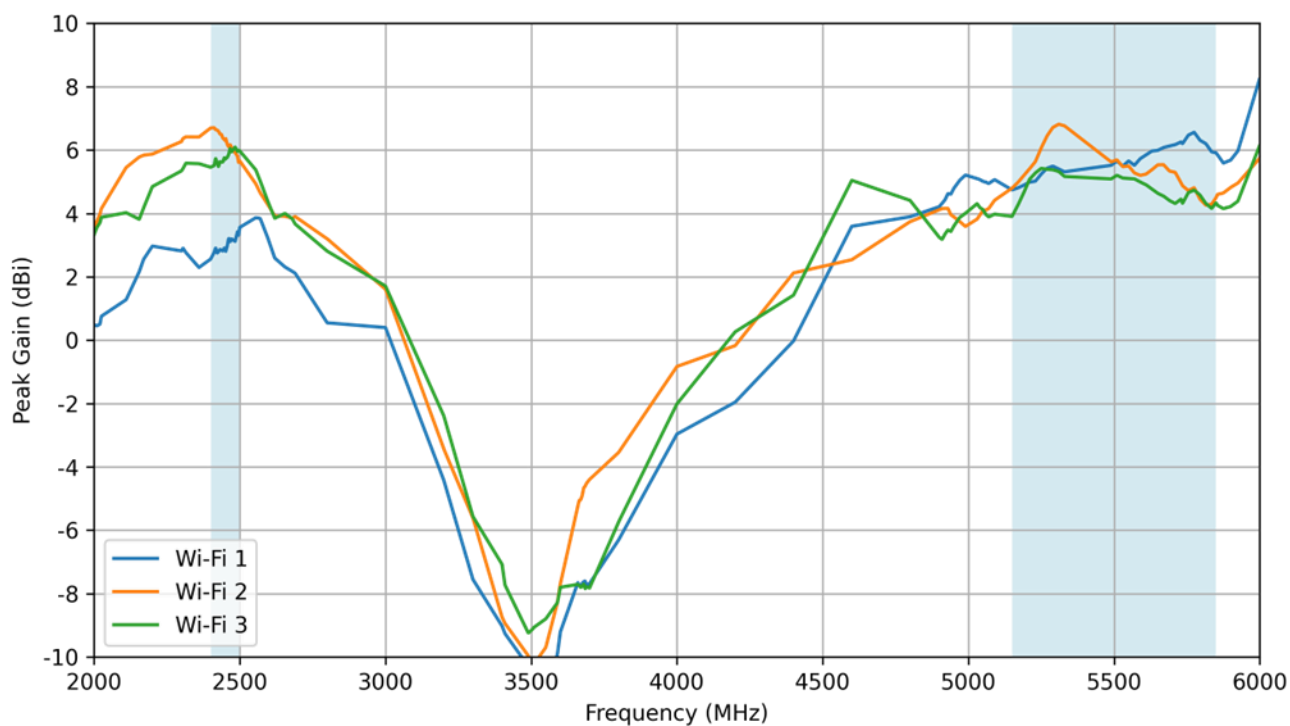
6.15 Wi-Fi - Efficiency



6.16 Wi-Fi - Average Gain

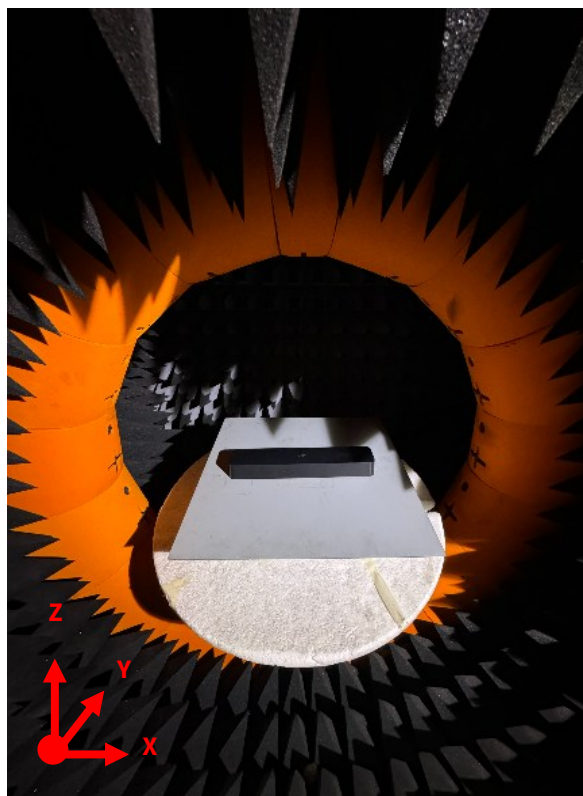
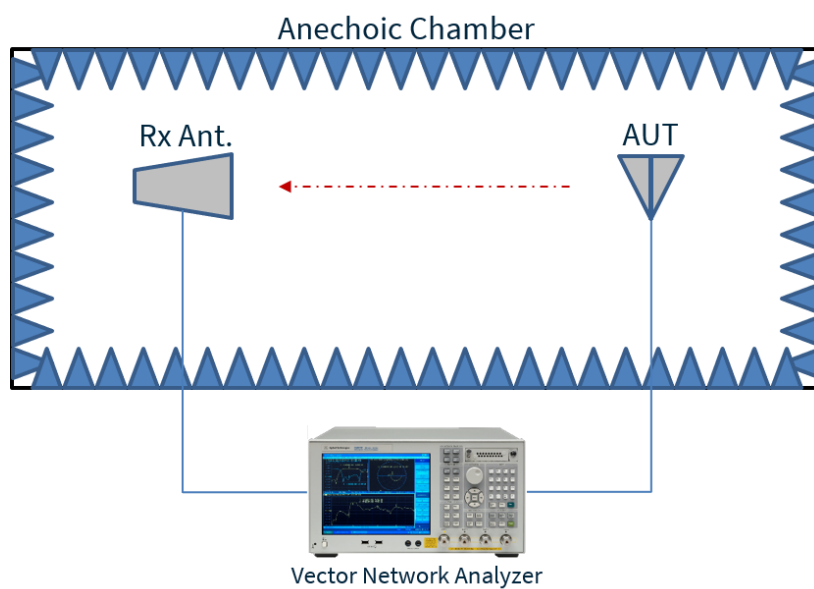


6.17 Wi-Fi - Peak Gain



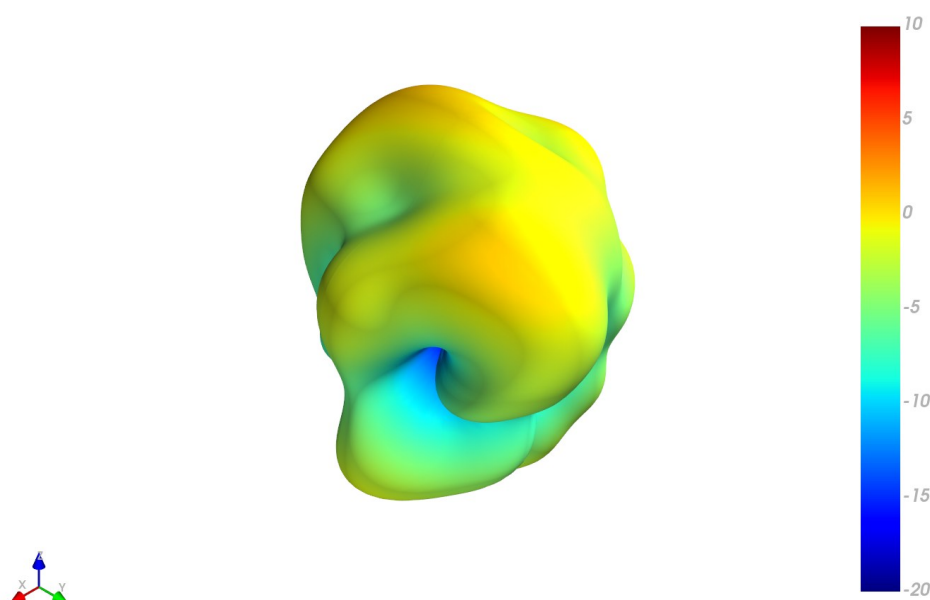
7. Radiation Patterns

7.1 Test Setup

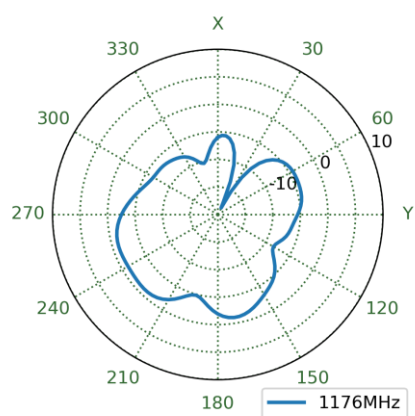


Chamber Test Set up

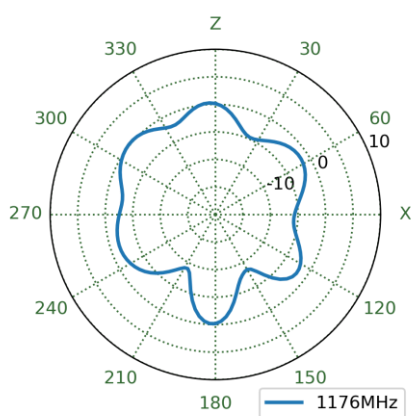
7.2 GNSS - Patterns at 1176 MHz



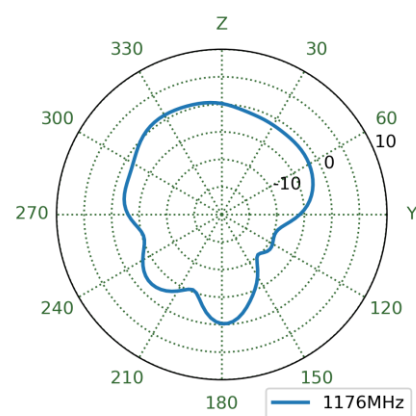
XY Plane



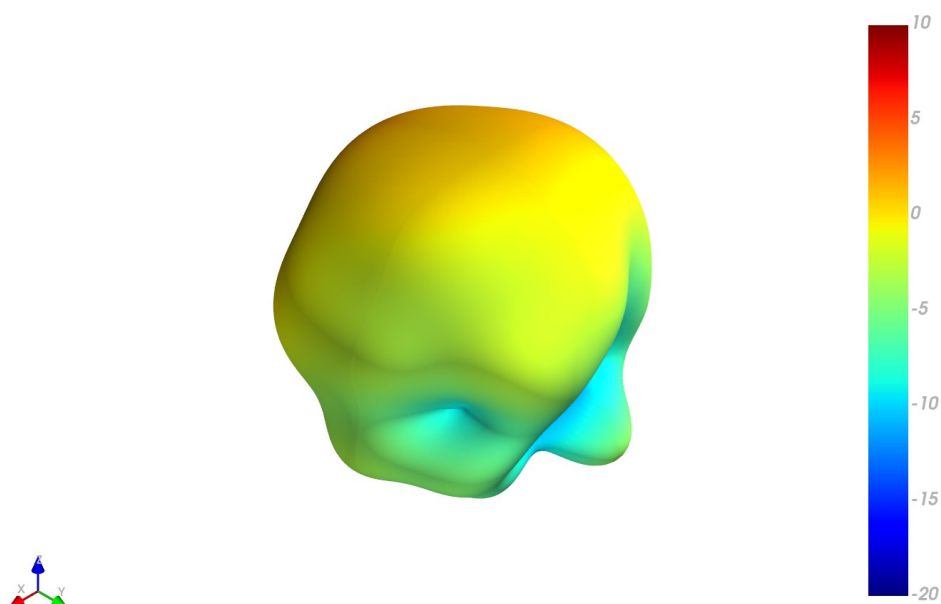
XZ Plane



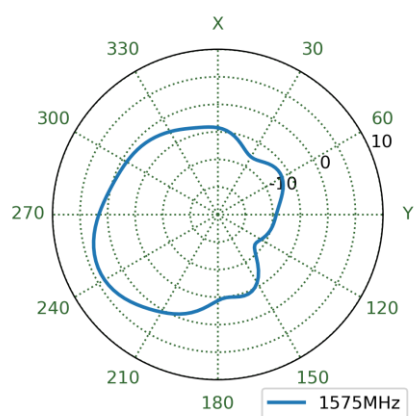
YZ Plane



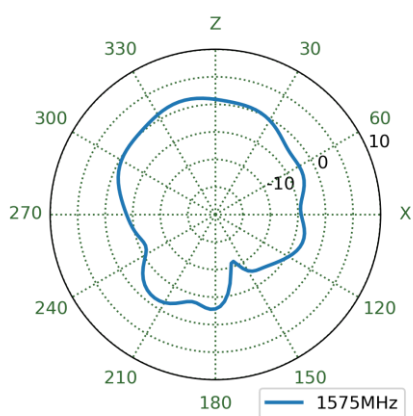
7.3 GNSS - Patterns at 1575 MHz



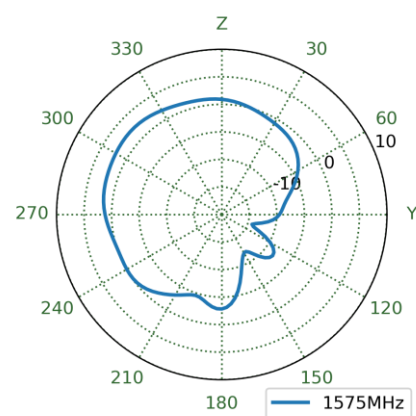
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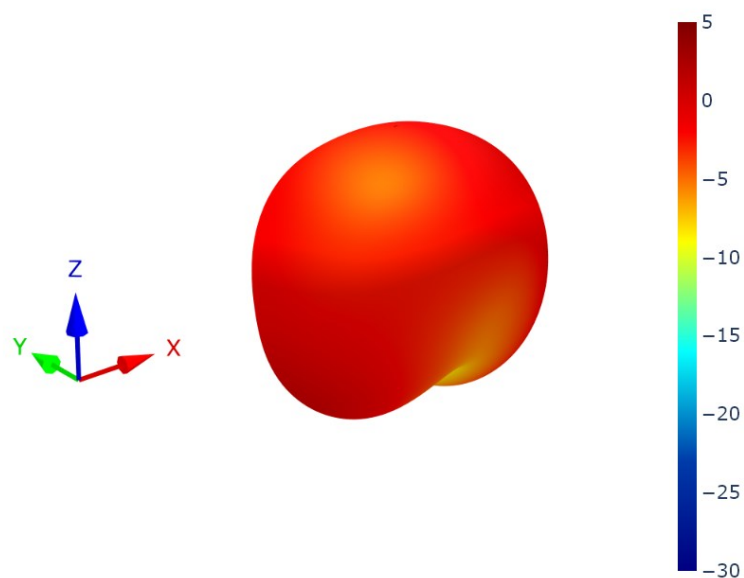
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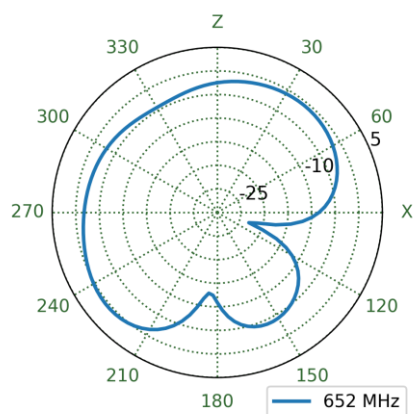
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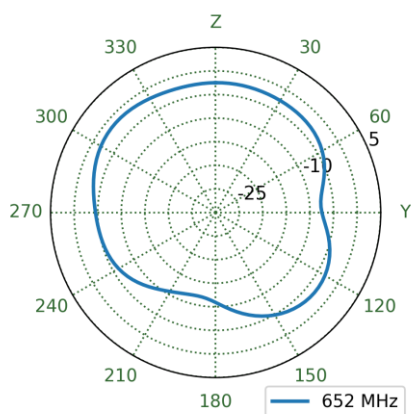
7.4 4G-5G 1 Patterns at 652 MHz



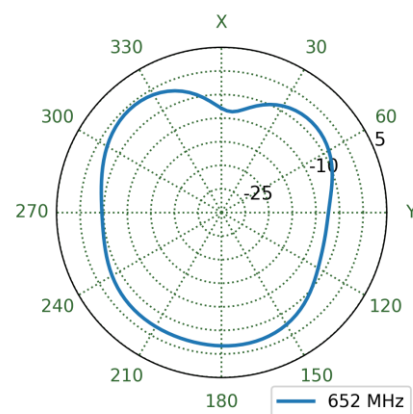
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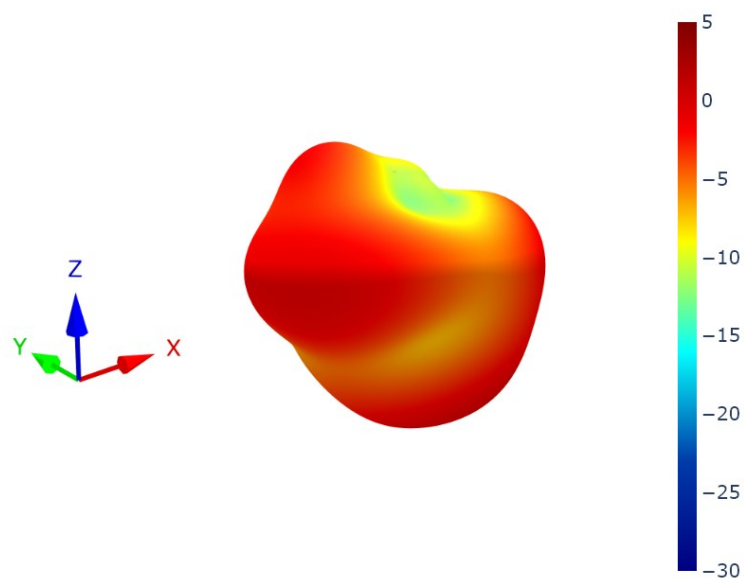
YZ Plane



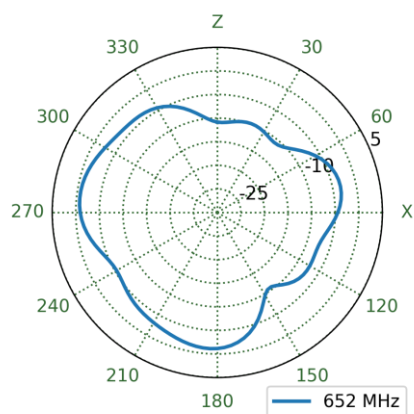
XY Plane



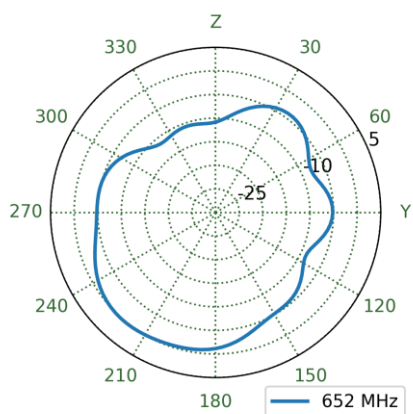
7.5 4G-5G 2 Patterns at 652 MHz



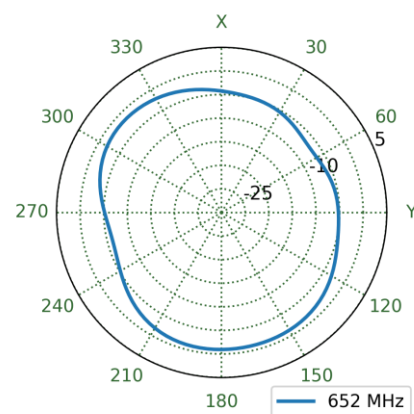
XZ Plane



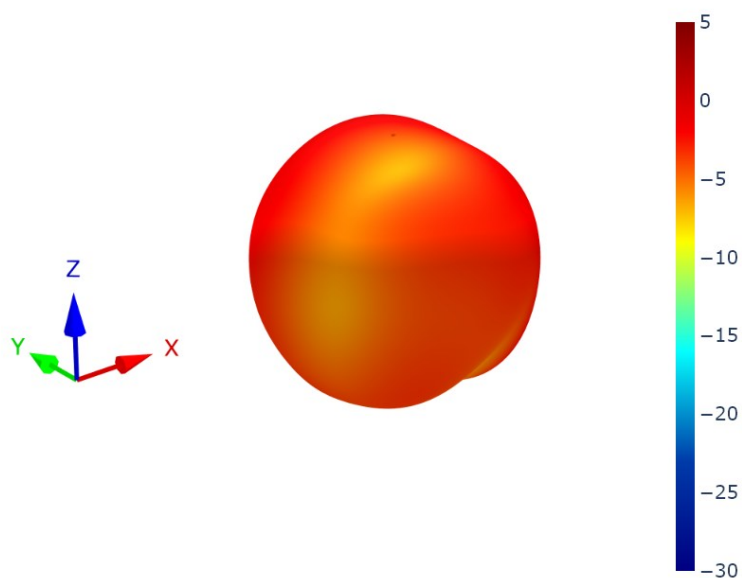
YZ Plane



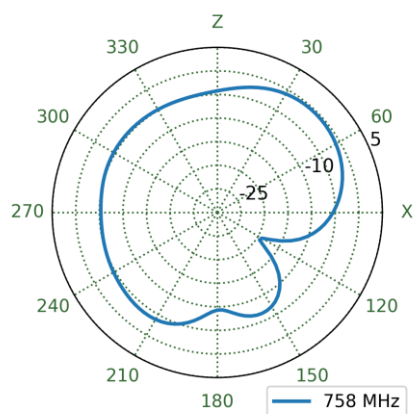
XY Plane



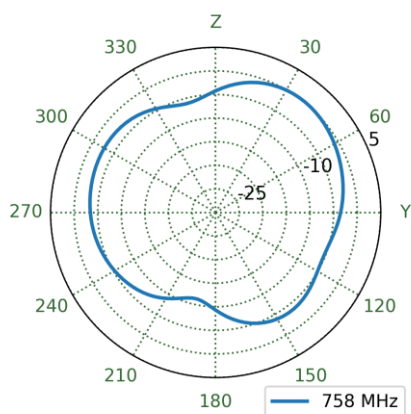
7.6 4G-5G 1 Patterns at 758 MHz



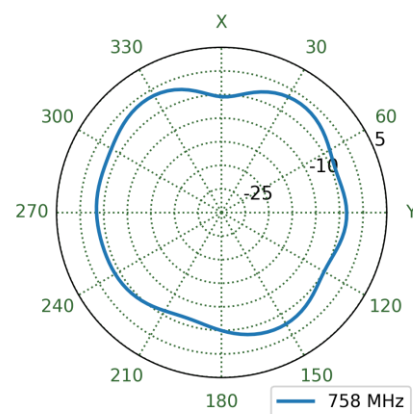
XZ Plane



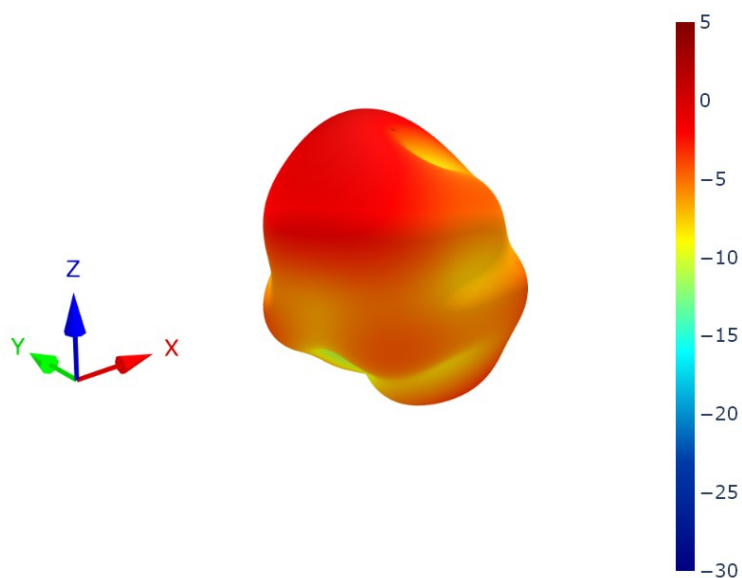
YZ Plane



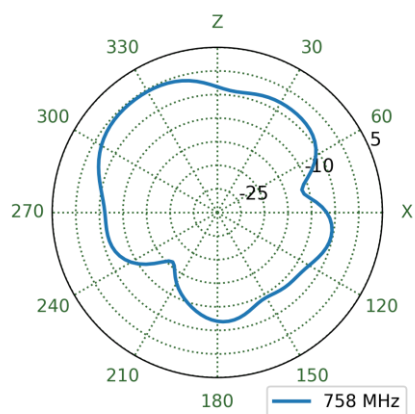
XY Plane



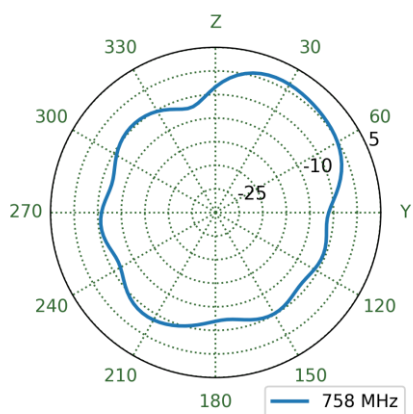
7.7 4G-5G 2 Patterns at 758 MHz



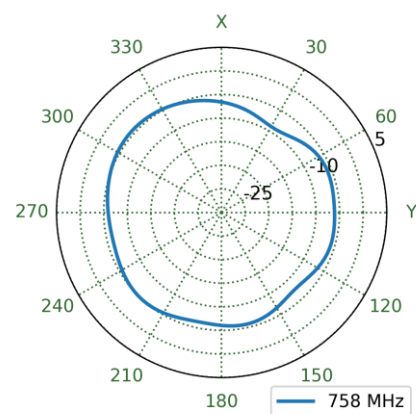
XZ Plane



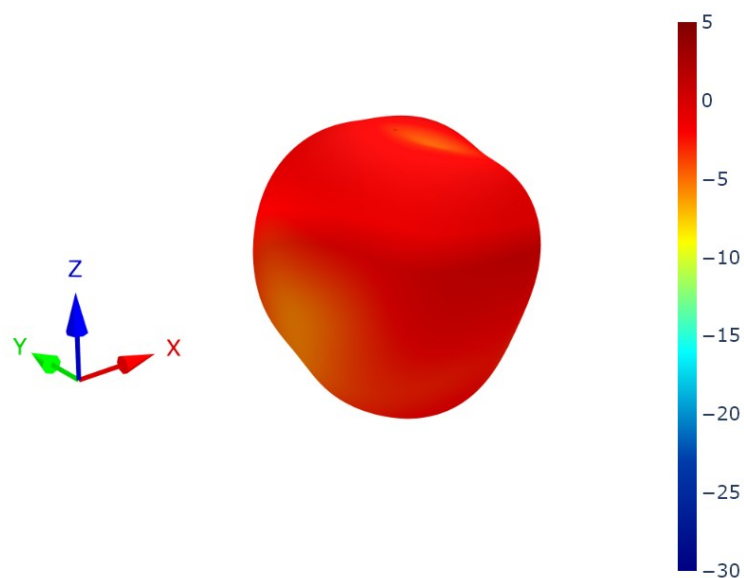
YZ Plane



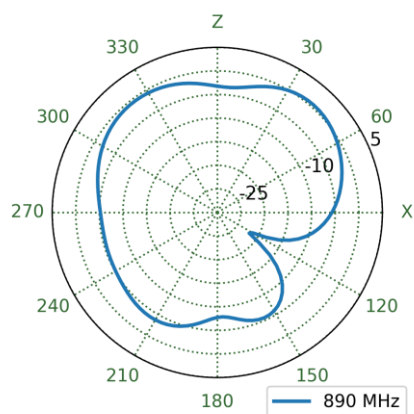
XY Plane



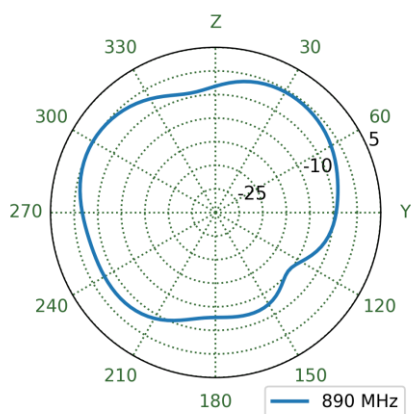
7.8 4G-5G 1 Patterns at 890 MHz



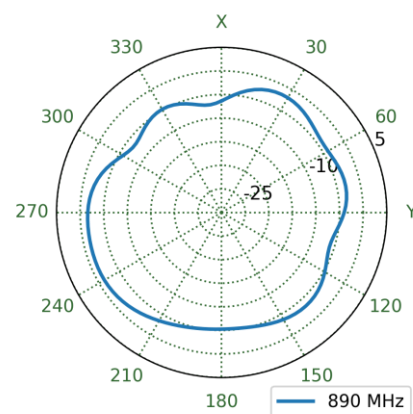
XZ Plane



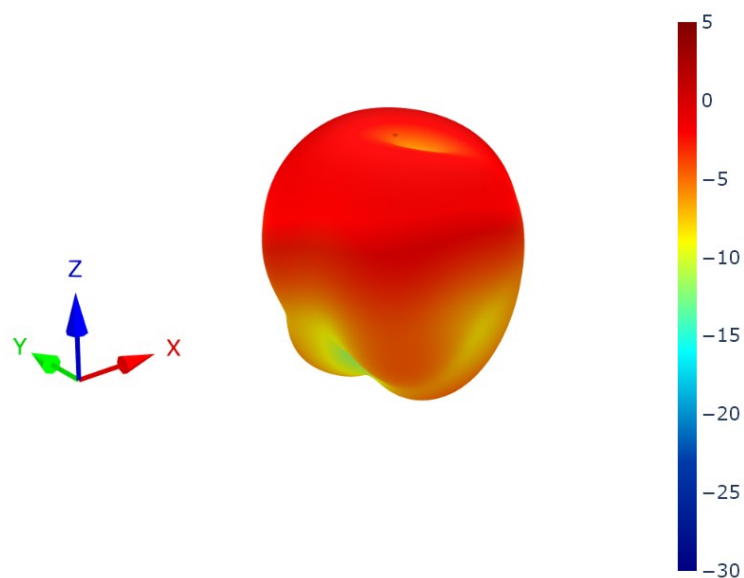
YZ Plane



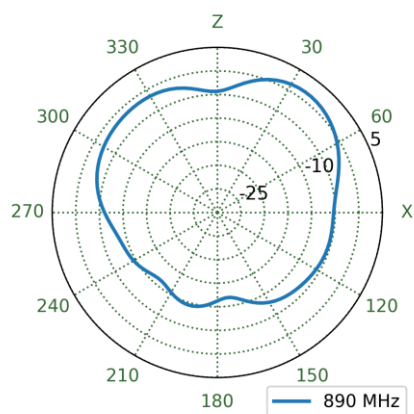
XY Plane



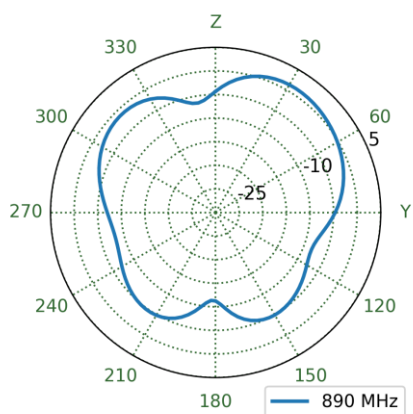
7.9 4G-5G 2 Patterns at 890 MHz



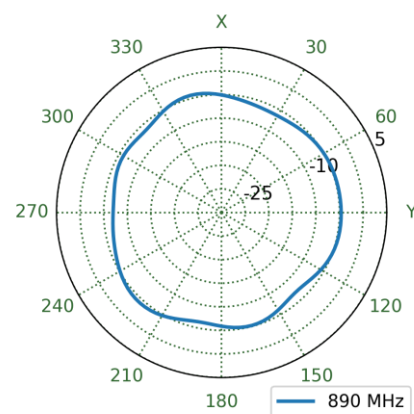
XZ Plane



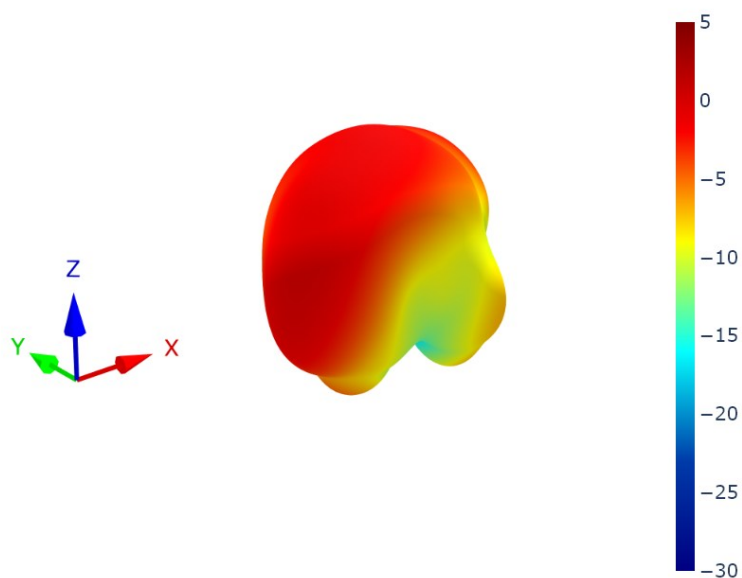
YZ Plane



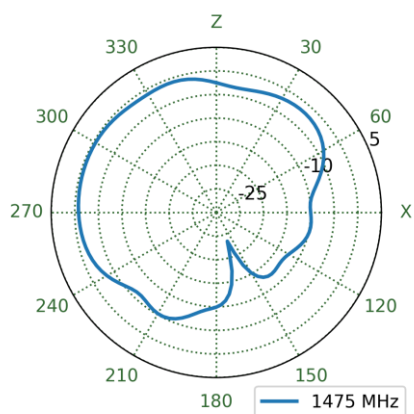
XY Plane



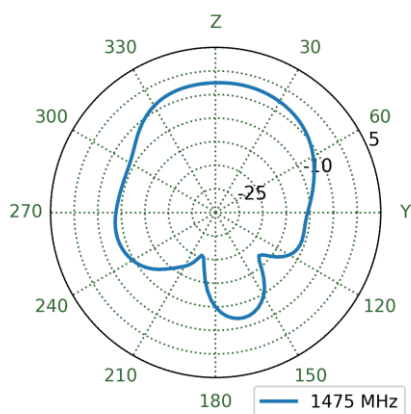
7.10 4G-5G 1 Patterns at 1475 MHz



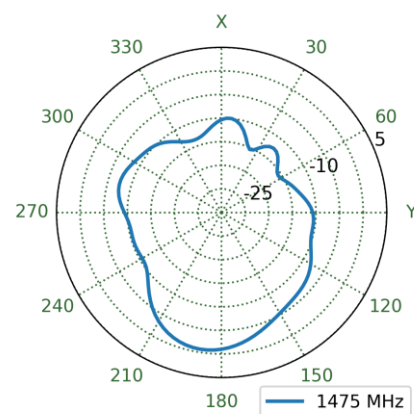
XZ Plane



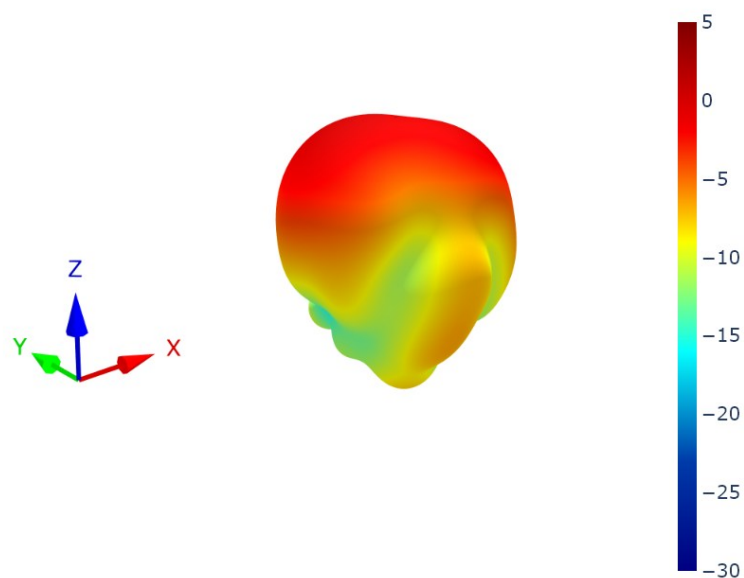
YZ Plane



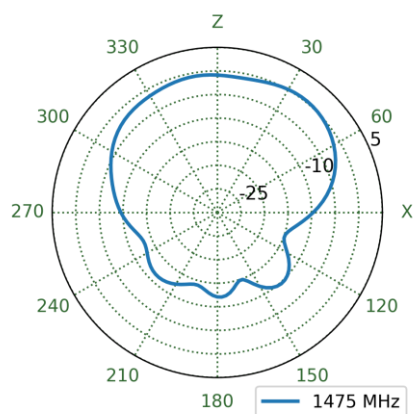
XY Plane



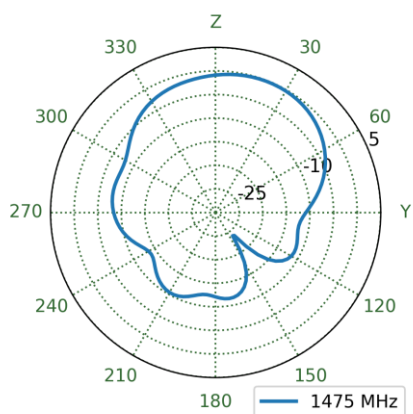
7.11 4G-5G 2 Patterns at 1475 MHz



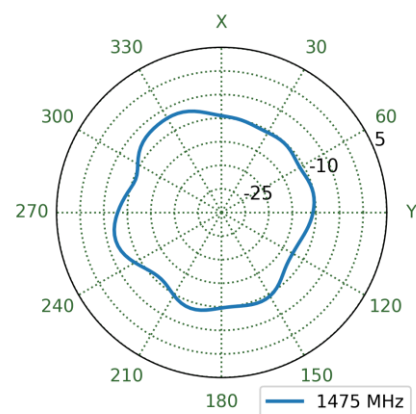
XZ Plane



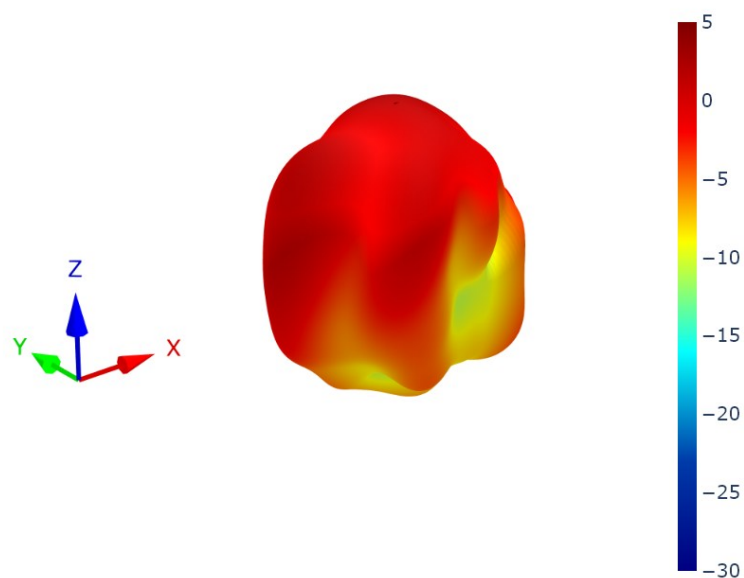
YZ Plane



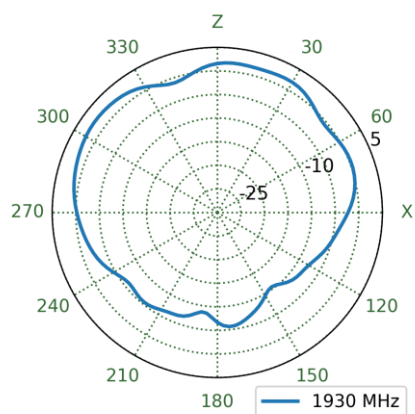
XY Plane



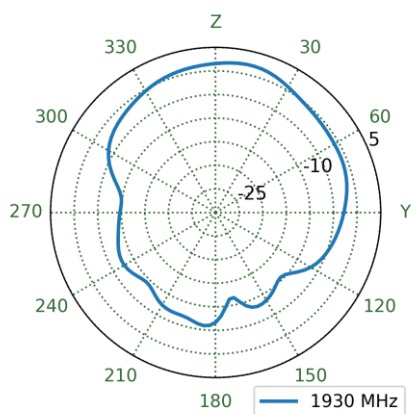
7.12 4G-5G 1 Patterns at 1930 MHz



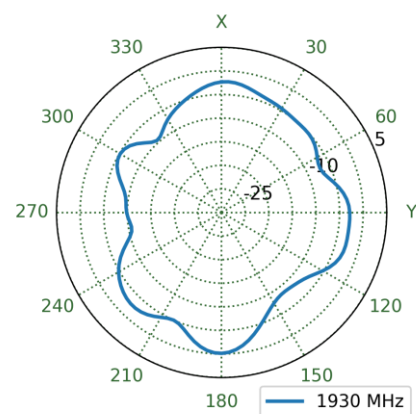
XZ Plane



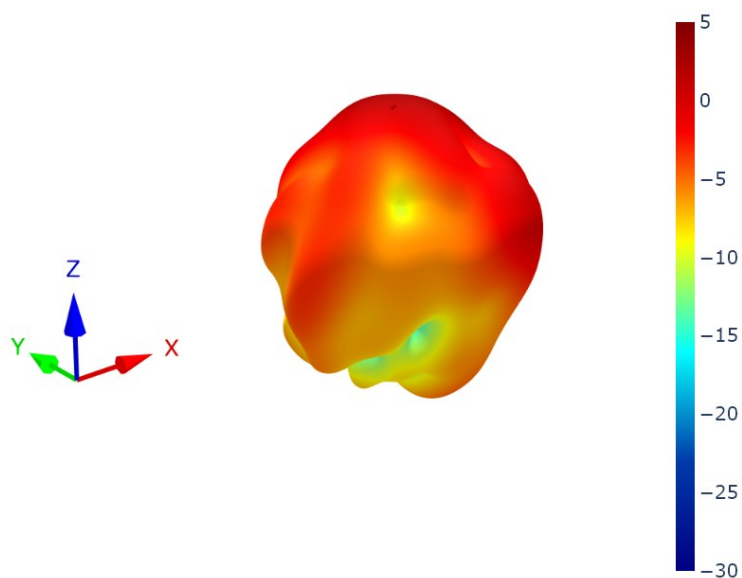
YZ Plane



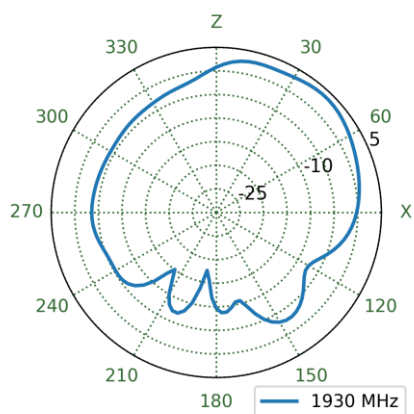
XY Plane



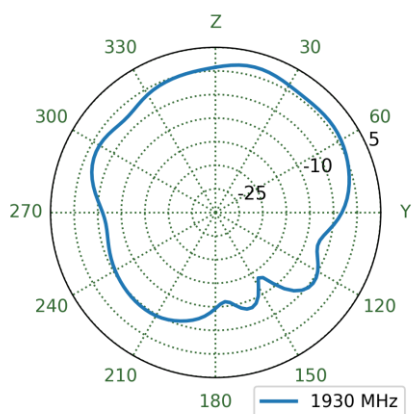
7.13 4G-5G 2 Patterns at 1930 MHz



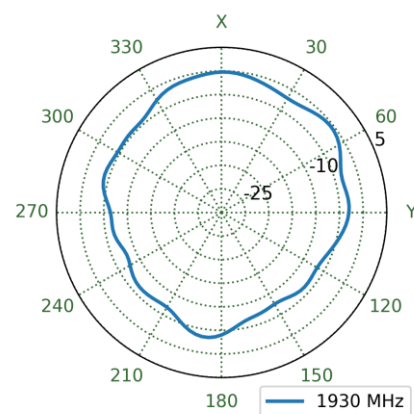
XZ Plane



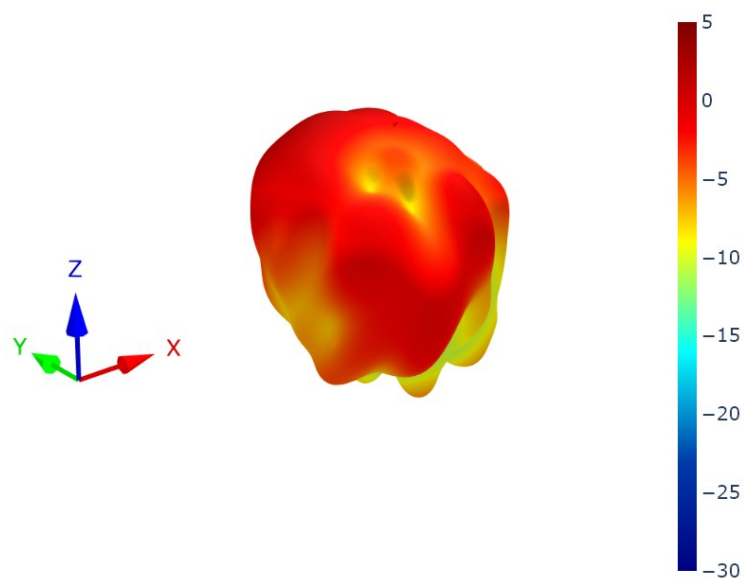
YZ Plane



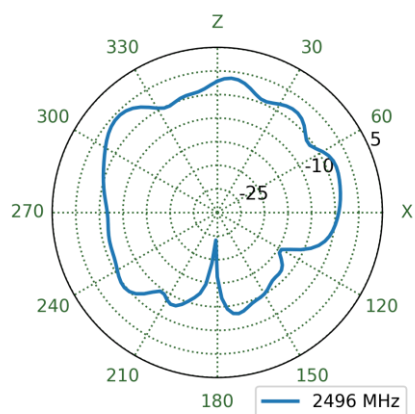
XY Plane



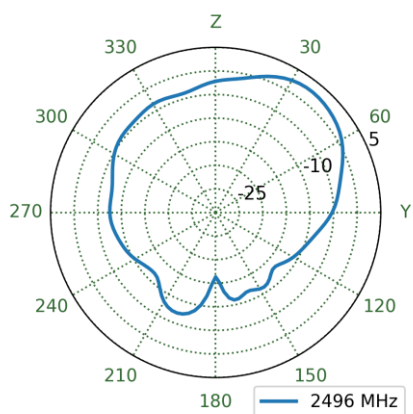
7.14 4G-5G 1 Patterns at 2496 MHz



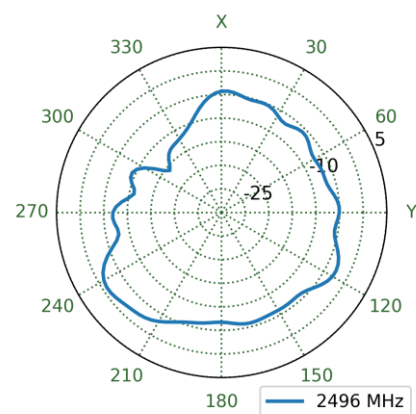
XZ Plane



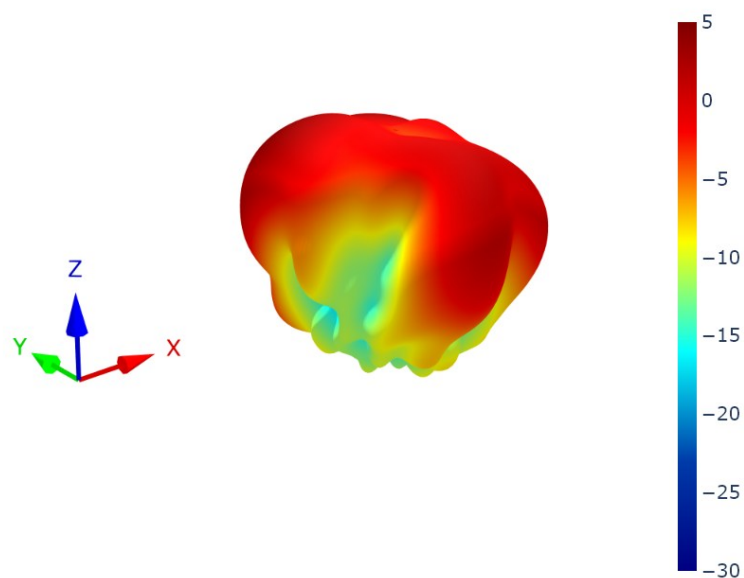
YZ Plane



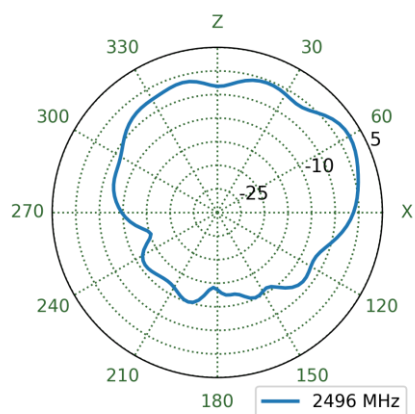
XY Plane



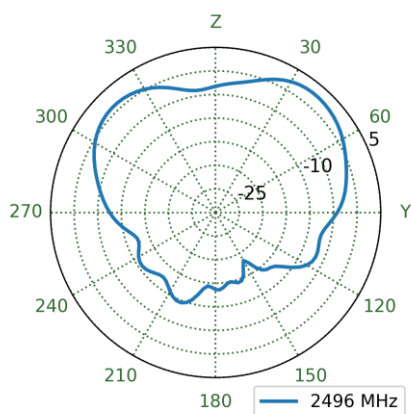
7.15 4G-5G 2 Patterns at 2496 MHz



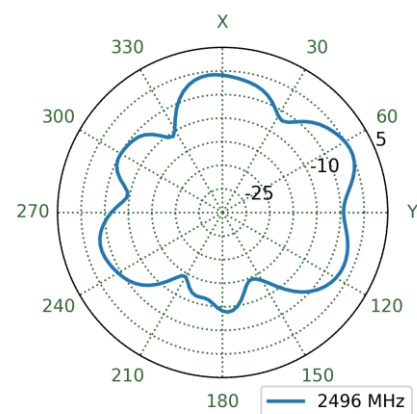
XZ Plane



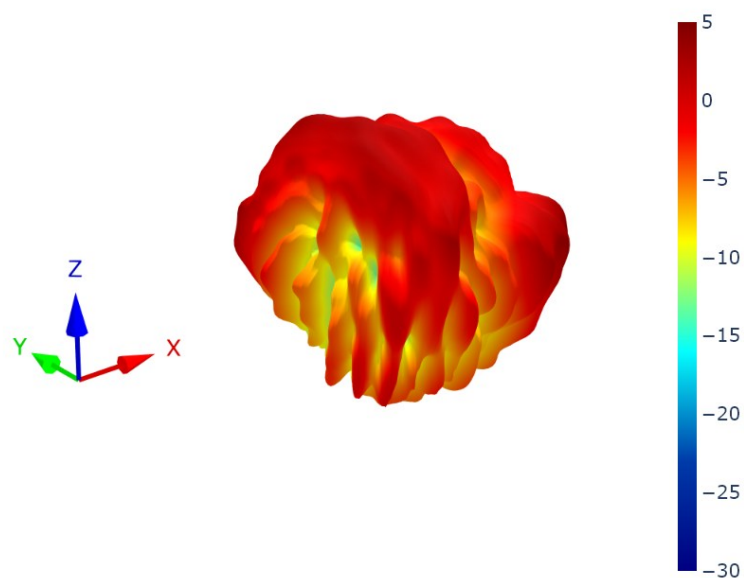
YZ Plane



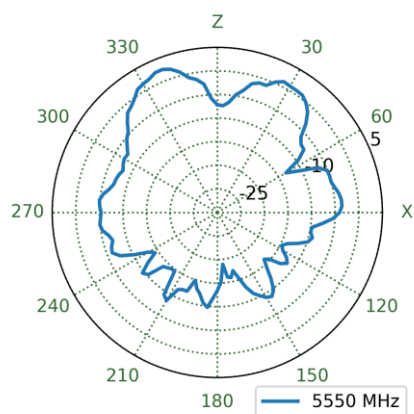
XY Plane



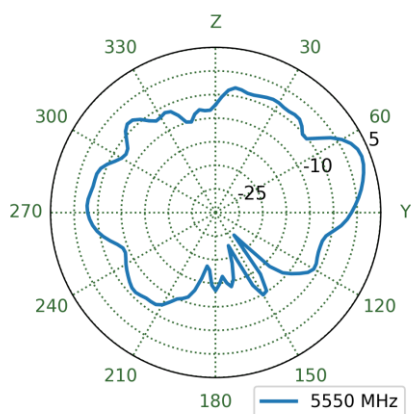
7.16 4G-5G 1 Patterns at 5550 MHz



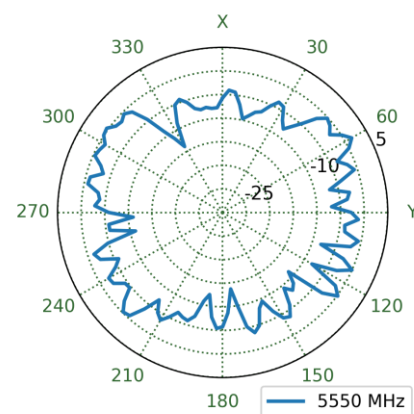
XZ Plane



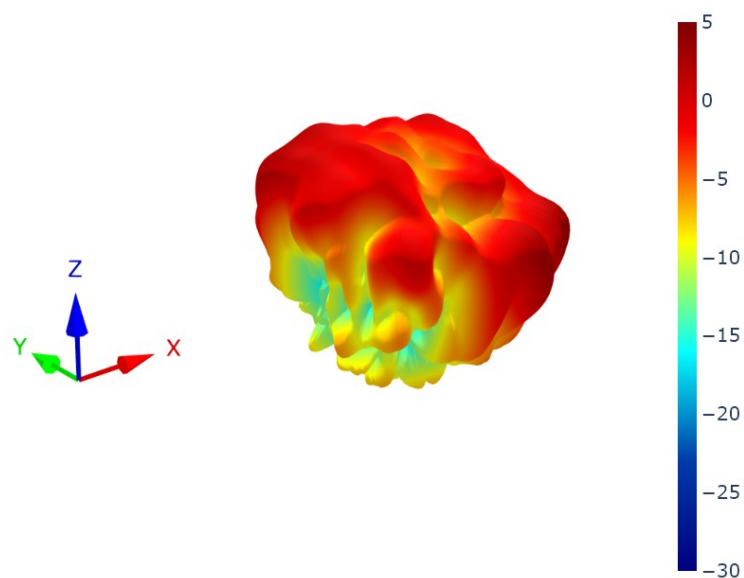
YZ Plane



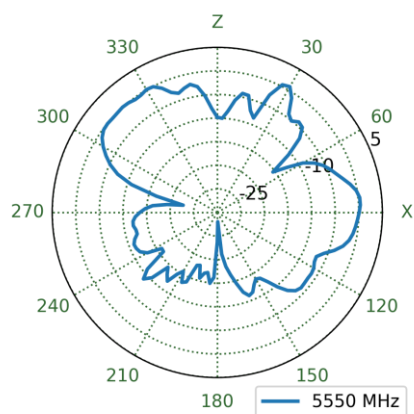
XY Plane



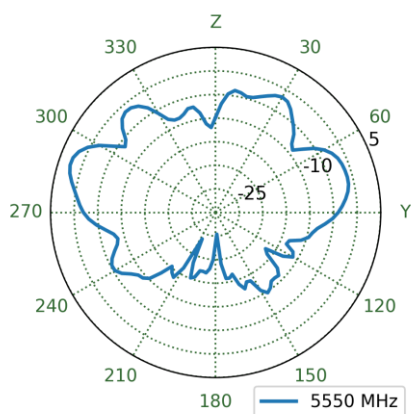
7.17 4G-5G 2 Patterns at 5550 MHz



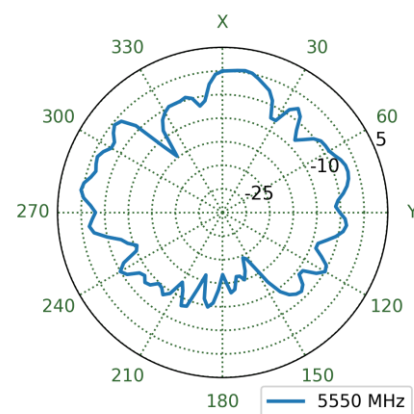
XZ Plane



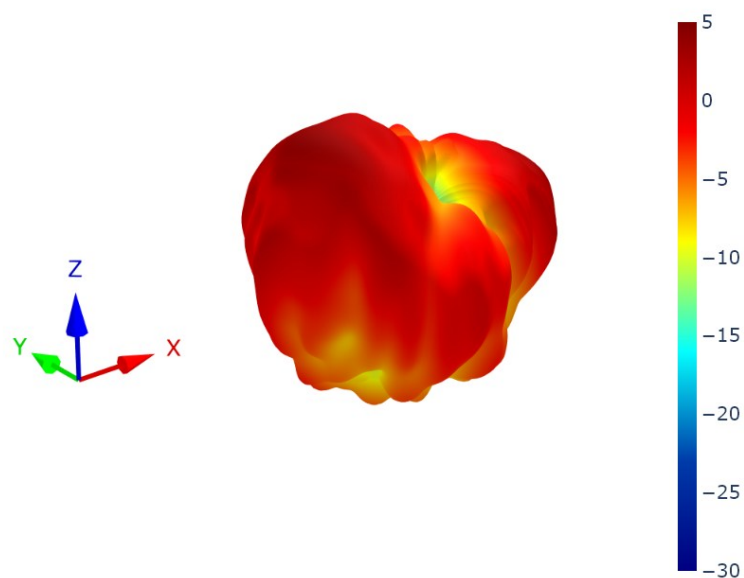
YZ Plane



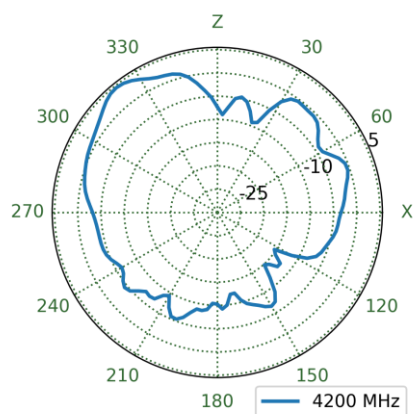
XY Plane



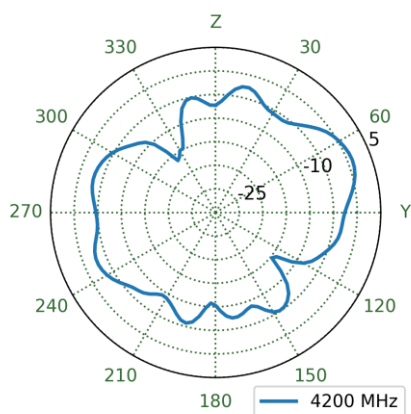
7.18 4G-5G 1 Patterns at 4200 MHz



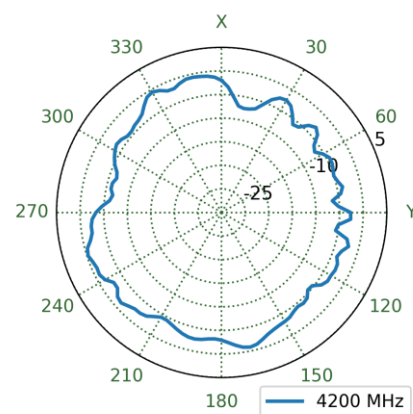
XZ Plane



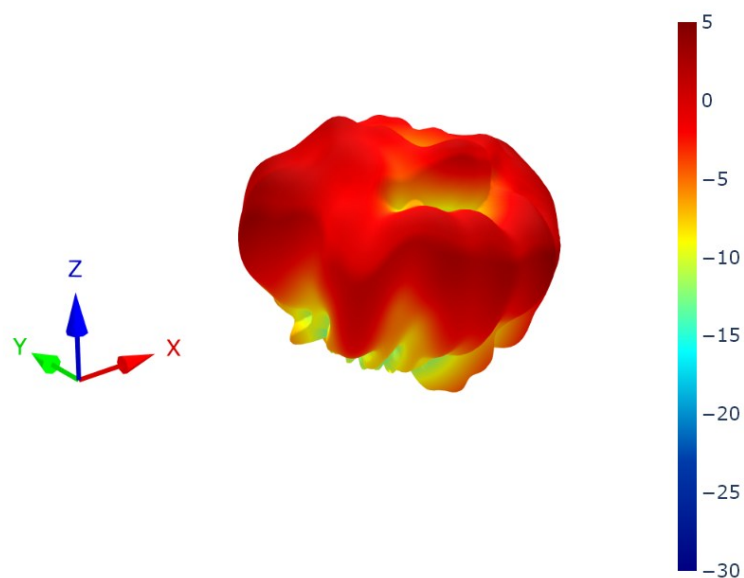
YZ Plane



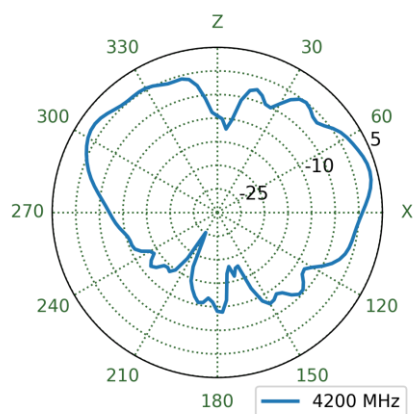
XY Plane



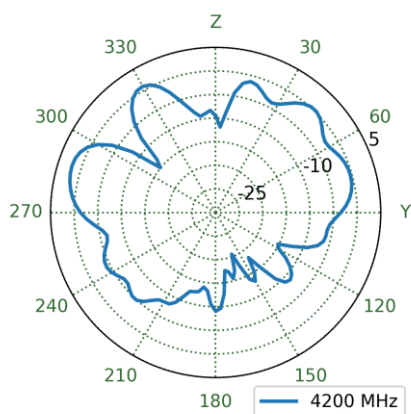
7.19 4G-5G 2 Patterns at 4200 MHz



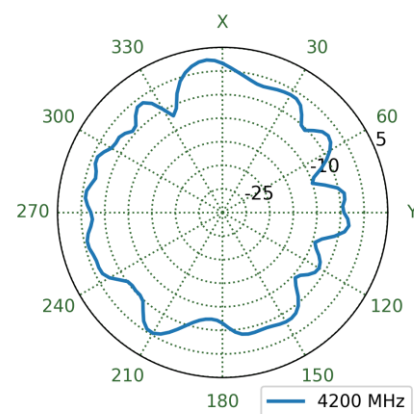
XZ Plane



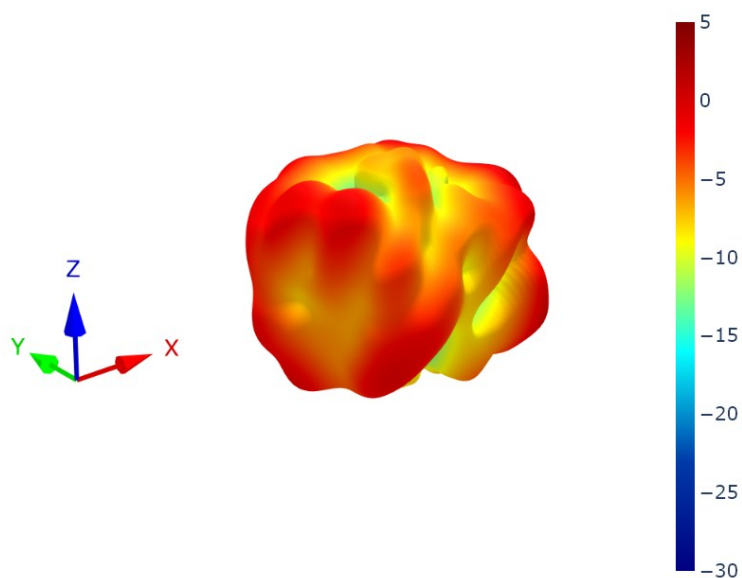
YZ Plane



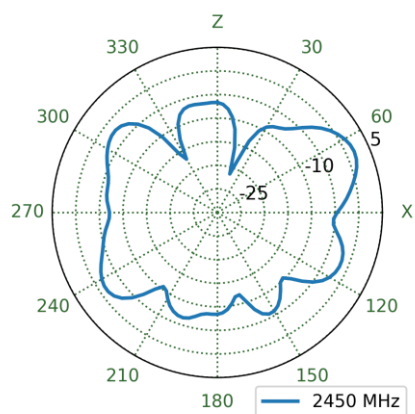
XY Plane



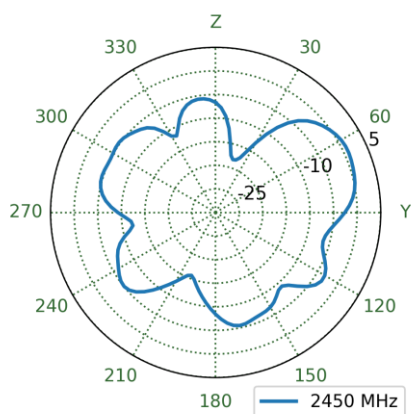
7.20 Wi-Fi 1 Patterns at 2450 MHz



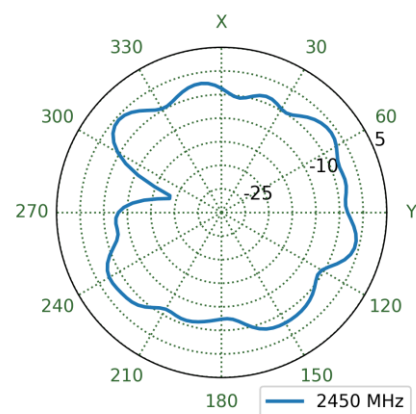
XZ Plane



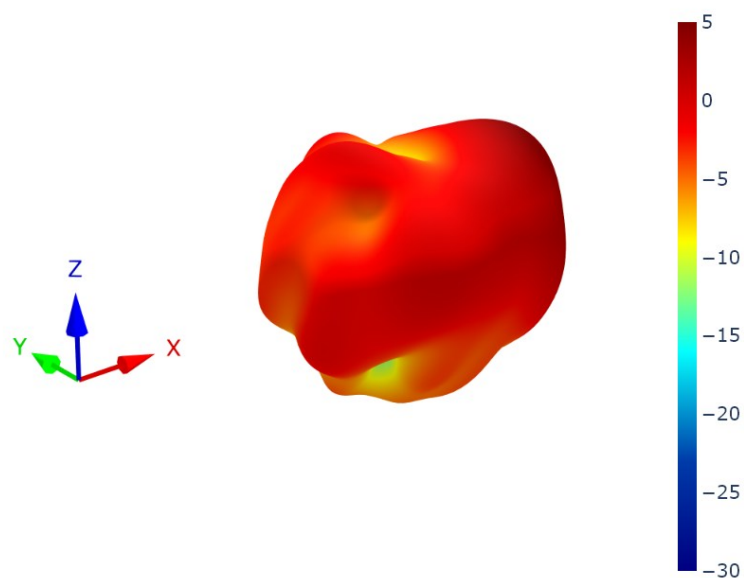
YZ Plane



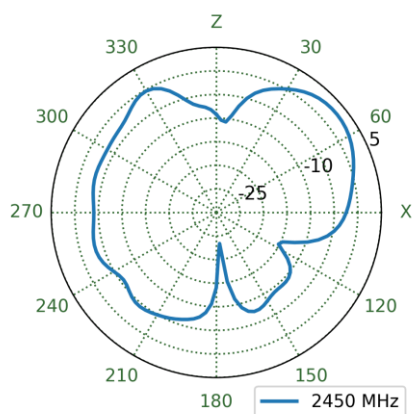
XY Plane



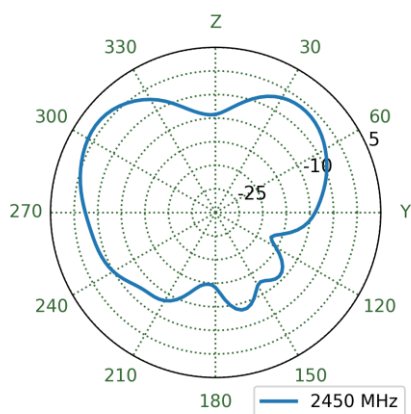
7.21 Wi-Fi 2 Patterns at 2450 MHz



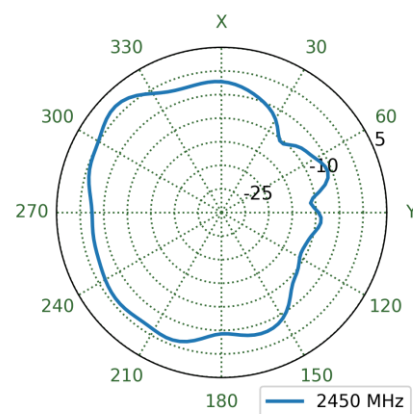
XZ Plane



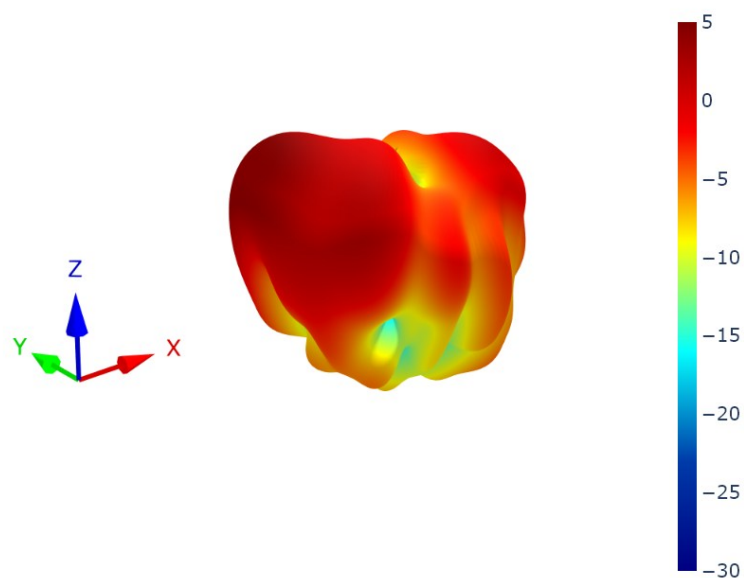
YZ Plane



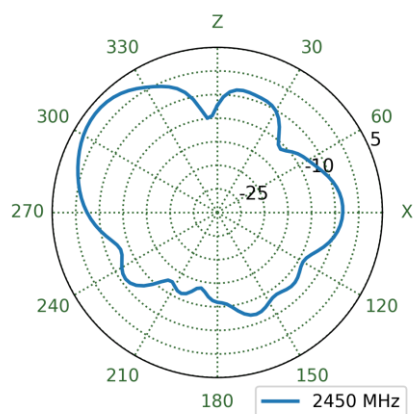
XY Plane



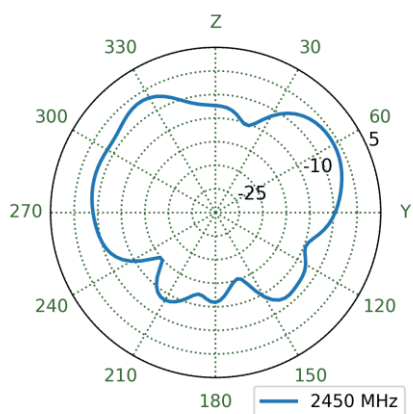
7.22 Wi-Fi 3 Patterns at 2450 MHz



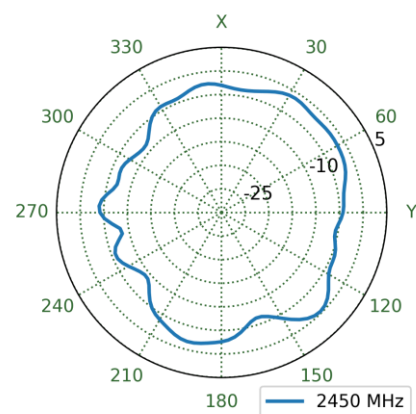
XZ Plane



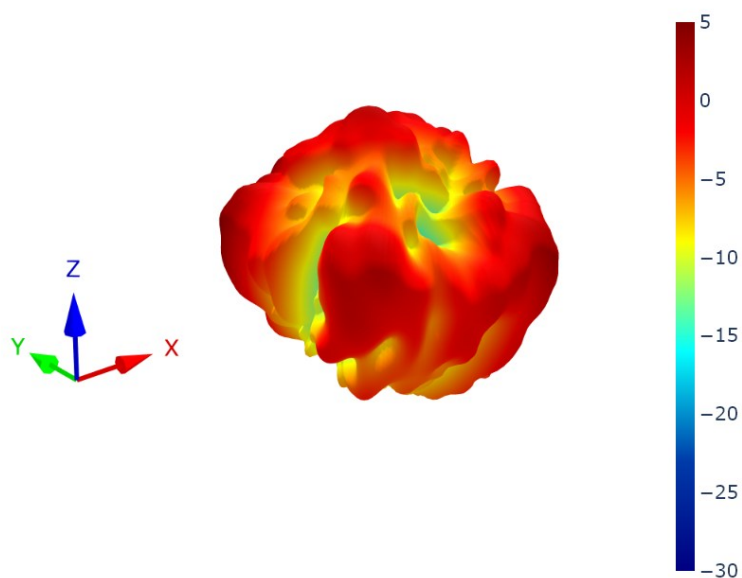
YZ Plane



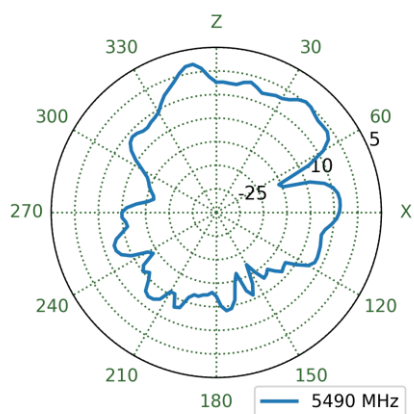
XY Plane



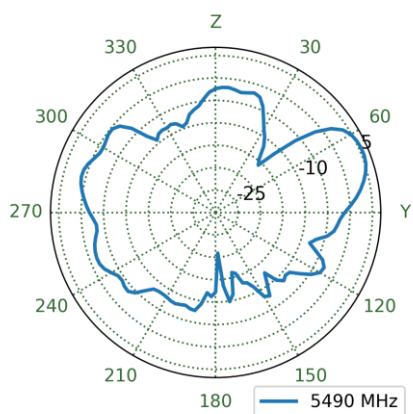
7.23 Wi-Fi 1 Patterns at 5490 MHz



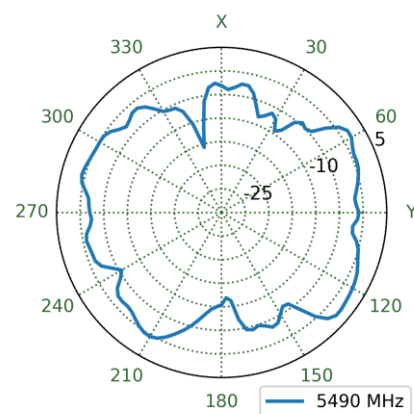
XZ Plane



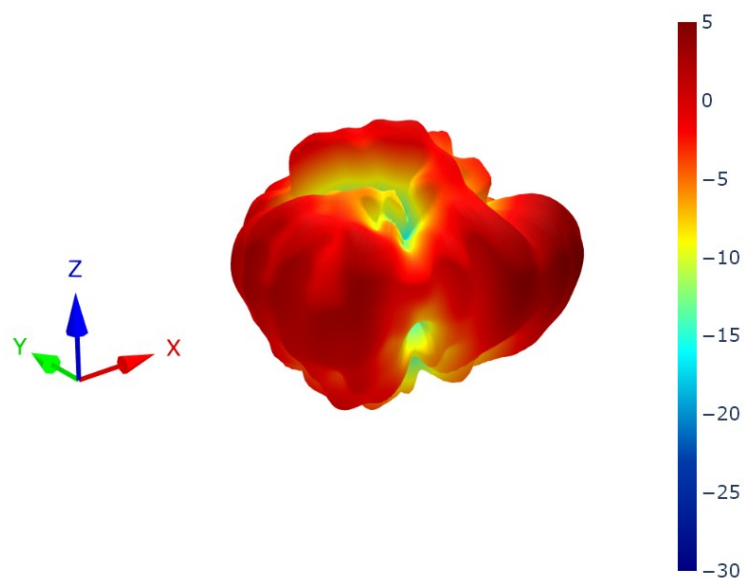
YZ Plane



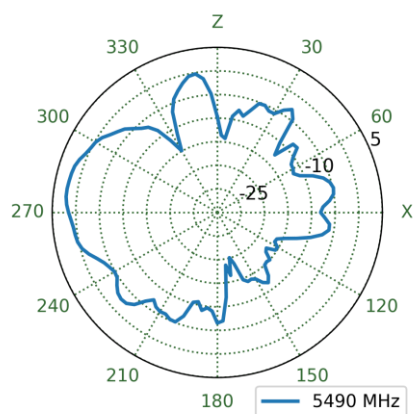
XY Plane



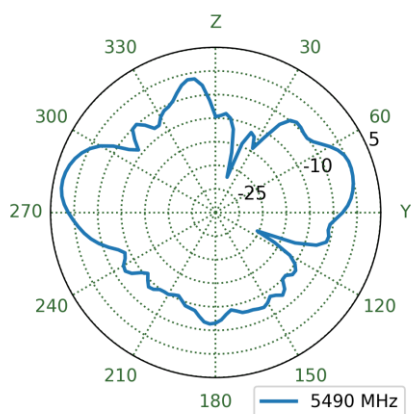
7.24 Wi-Fi 2 Patterns at 5490 MHz



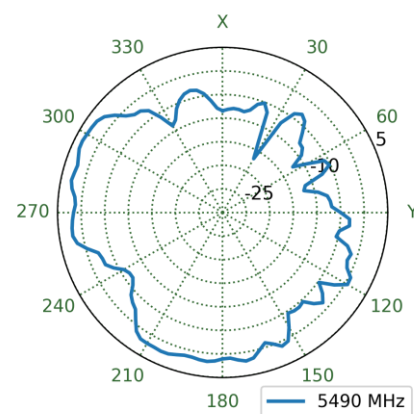
XZ Plane



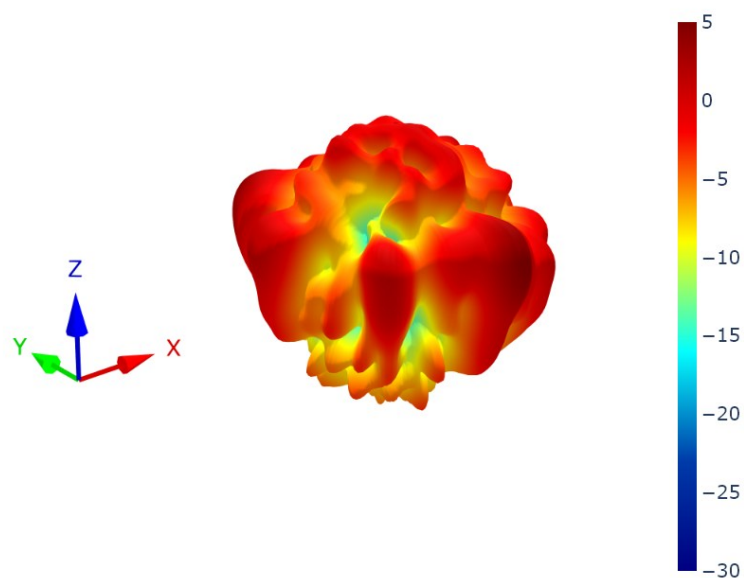
YZ Plane



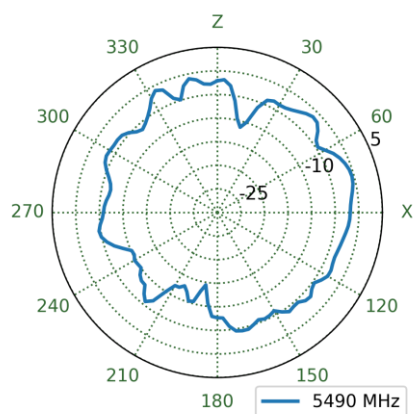
XY Plane



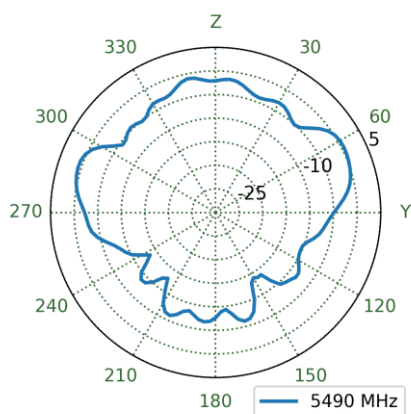
7.25 Wi-Fi 3 Patterns at 5490 MHz



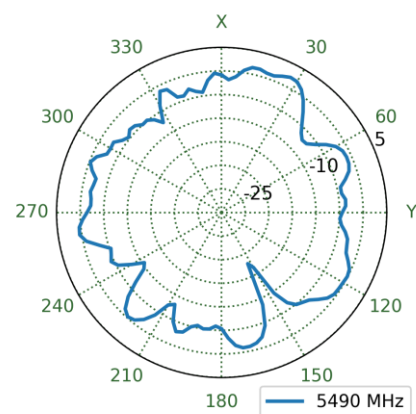
XZ Plane



YZ Plane



XY Plane



Changelog for the datasheet

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Author:	Gary West

Previous Revisions



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