

Model 2150 Wi-Fi Antenna Gain Report

Peak De-embedded Gain per Band (Gain – AFR Pigtail Loss)

Antenna Vendor & Part Number Details

Category	Sub-field	Details
ANT Tuner boards manufacture	Company name Address	Luxshare Precision Industry Co. Ltd Bao'an District, Shenzhen, Guangdong Province (Luxshare's Headquarters)
ANT Tuner boards Part number	P123 P456 P7 P8	M1378713-005 (EV2) DV will dash roll to -006 M1378717-005 (EV2) DV will dash roll to -006 M1378720-005 (EV2) DV will dash roll to -006 M1378723-005 (EV2) DV will dash roll to -006
ANT Tuner boards type		PCBAM + Coax cable
5G Bucket		HON HAI PRECISION INDUSTRY CO LTD Head office: NO 2, TZU YU STREET TU-CHENG CITY, NEW TAIPEI, TAIWAN Factory: No. 99 Fu Xing Rd, Xi Tang Town, Jia Shan City, Zhe Jiang, China

2. Test Method and Test Setup

- Measurement Facility: Microsoft Antenna Lab
- Dates of Testing: 03/19/2026 to 04/02/2026
- Test Engineer: Chulmin Han and Apoorva Sharma

Chulmin Han

- Equipment: MVG Starlab (formerly known as Satimo)
- Calibration Verification: A reference calibration dipole was measured before the device was tested and compared to the reported values of the manufacturer to verify that the chamber calibration is within measurement uncertainty and in good standing.

Item	Equipment	Manufacturer	Model	Calibration Date
1	SATIMO chamber	MVG	StarGate	02/17/2026
2	NPAC (New Probe Array Controller)	MVG	N/A	02/17/2026
4	Validation Dipole	MVG	SD2450	02/18/2026
5	Validation Dipole	MVG	SD5150	02/18/2026

Test Procedure Flow:

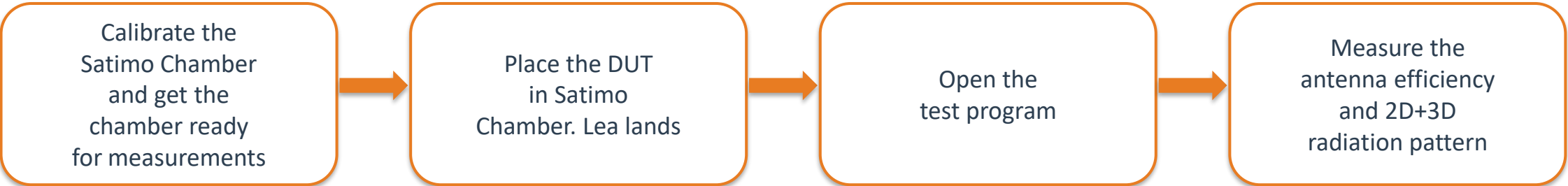


Figure 1: Test Method

Calibration and Measurement Methods

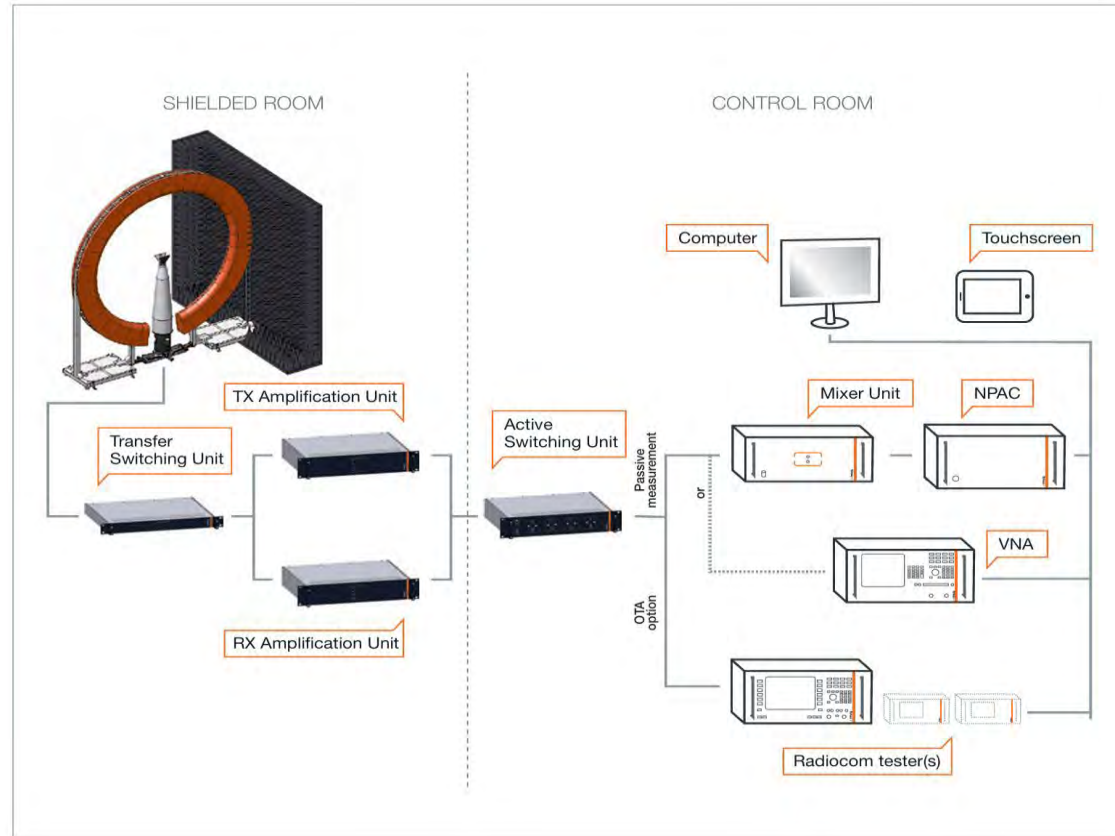
i. Passive Gain Calibration and Test Method

The calibration of the chamber is performed using gain by substitution method. A reference calibration dipole with known antenna gain and efficiency connected in the middle of the chamber in the quiet zone is measured and a calibration file that includes offset values for each frequency to adjust the losses of the system is generated. The device under test was tested the same way as the calibration dipoles and the calibration file described above is used to calculate the gain of each embedded antenna.

ii. Radiation Pattern and Gain Measurement

The radiation pattern and gain measurements were done in the MVG Starlab fully anechoic chamber. The antenna gain reported is the maximum measured in both horizontal and vertical polarizations. The measurement step size in both the Phi (Φ) and Theta (Θ) measurement axes was 3 degrees, meeting the requirements to use Directional MIMO Gains evaluation method.

Test Setup — MVG Starlab Chamber Diagram



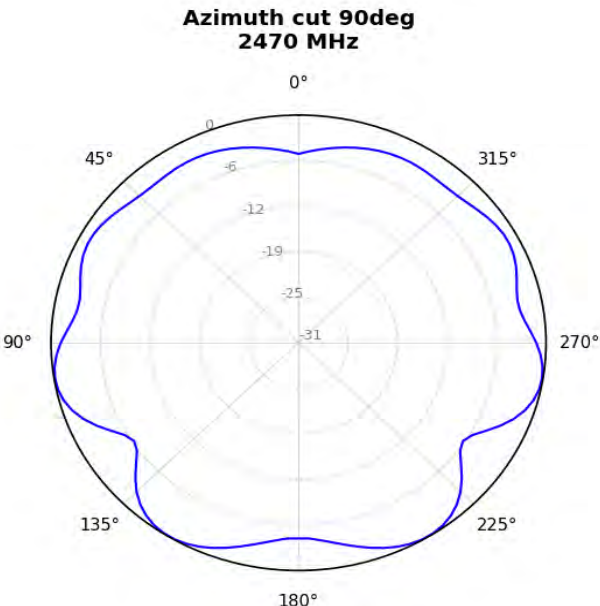
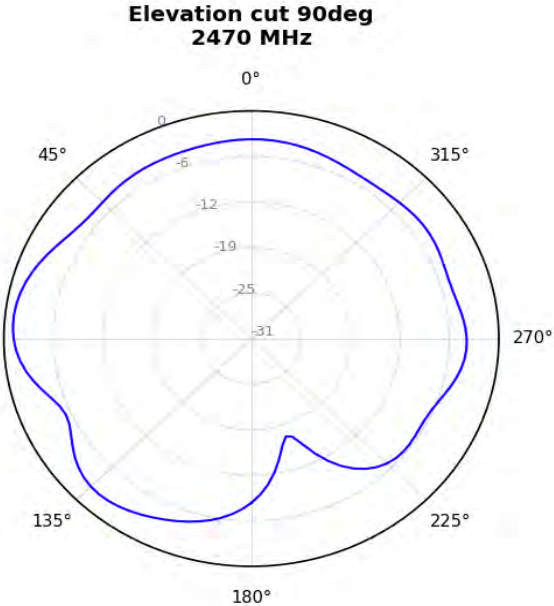
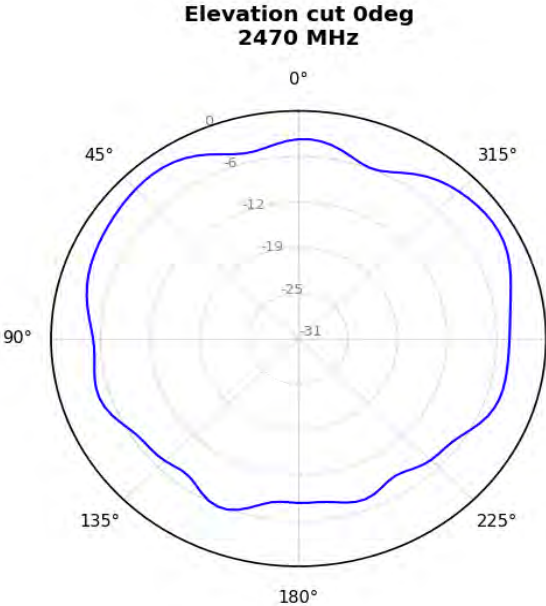
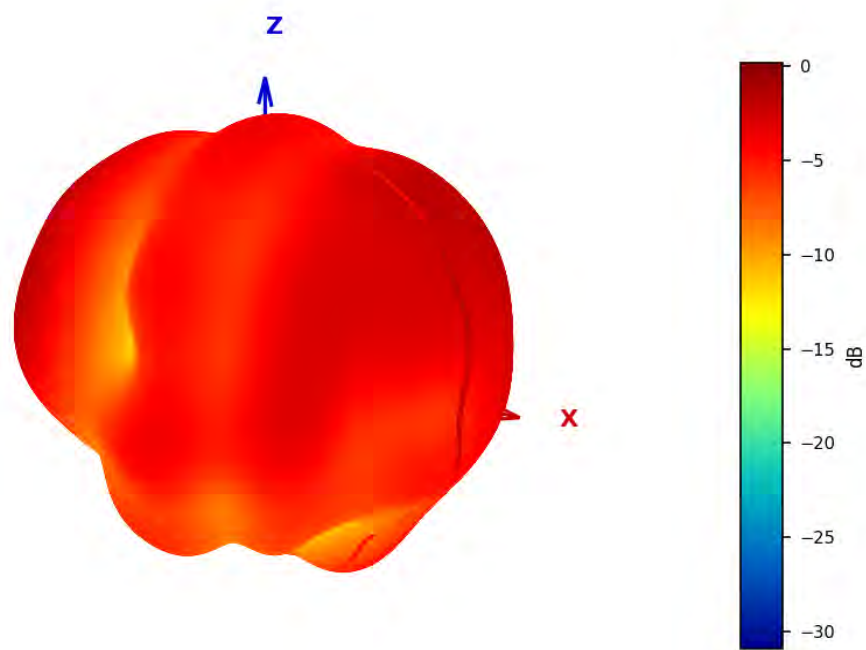
Test setup in the chamber

Antenna Peak Gain w/ Cable Loss (dBi)										
Peak gain at highest-gain frequency within each sub-band Exact Satimo measured frequency (no interpolation)										
Band	2.4GHz	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3	U-NII-4	U-NII-5	U-NII-6	U-NII-7	U-NII-8
Frequency (MHz)	2400-2483.5	5150-5250	5250-5350	5470-5725	5725-5850	5850-5895	5925-6425	6425-6525	6525-6875	6875-7125
Ant 3										
SISO Peak Gain (dBi) (Applies to EU and US/CA Bluetooth)	0.67	3.95	4.70	6.95	7.10	6.41	5.98	3.17	3.49	3.97
Peak Freq (MHz)	2470	5200	5300	5600	5750	5850	5950	6455	6855	7105
θ°, φ°	87°, 99°	99°, 102°	99°, 99°	102°, 99°	105°, 99°	105°, 99°	84°, 93°	90°, 81°	93°, 75°	90°, 114°
Ant 4										
SISO Peak Gain (dBi) (Applies to EU and US/CA Bluetooth)	0.25	3.89	5.13	7.12	7.27	6.36	6.11	3.16	2.06	1.91
Peak Freq (MHz)	2410	5200	5300	5700	5750	5850	5950	6455	6555	6905
θ°, φ°	84°, 84°	99°, 81°	99°, 81°	105°, 90°	105°, 90°	105°, 90°	108°, 93°	87°, 102°	87°, 105°	90°, 108°
New MIMO Gain (dBi)										
Measured MIMO (Uncorrelated)	0.07	3.04	4.65	6.64	6.81	5.95	5.73	3.16	2.69	2.88
Measured MIMO (Correlated)	2.93	5.90	7.63	9.65	9.82	8.96	8.74	5.03	5.68	5.87

Antenna 3

WiFi | Ant. 3 | 2.4GHz (2400-2483.5 MHz)

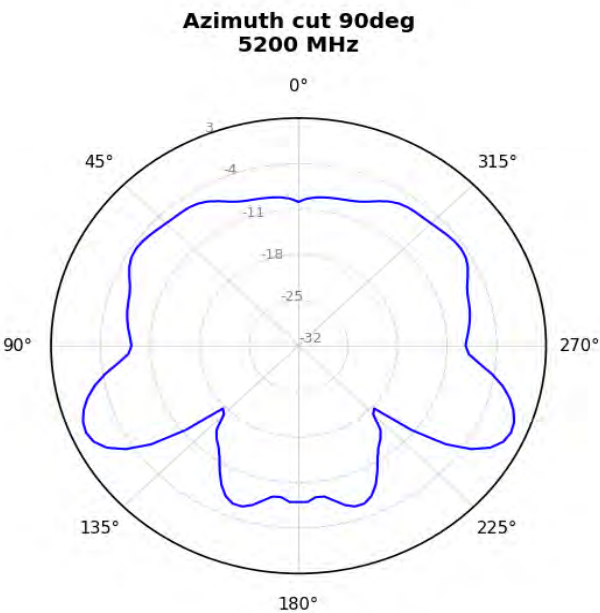
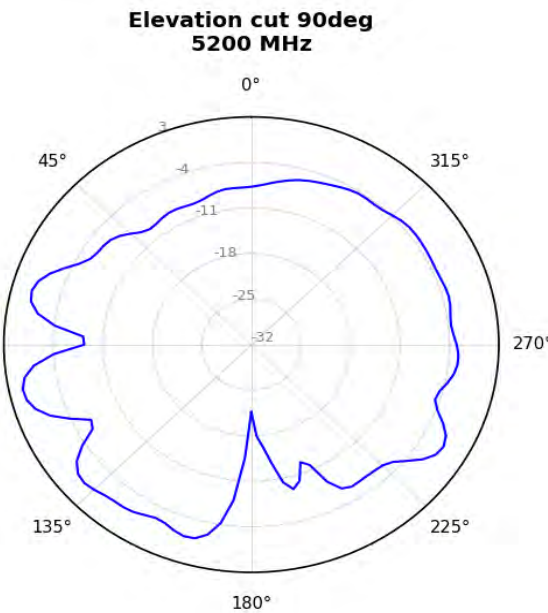
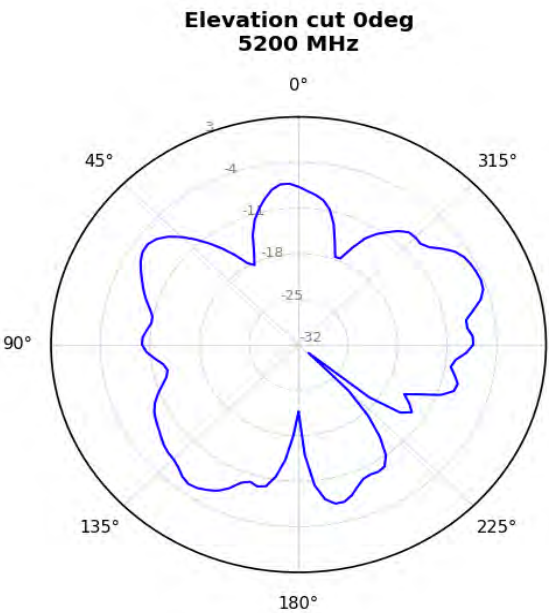
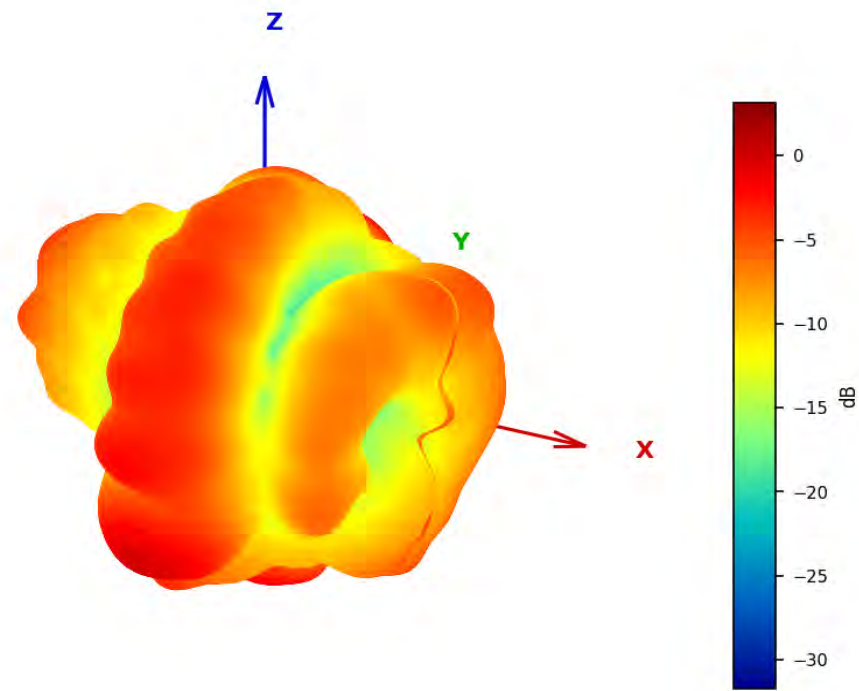
3D Radiation Pattern | 2470 MHz | Peak Gain: 0.67 dBi



3D Radiation Pattern (ETotal)

WiFi | Ant. 3 | U-NII-1 (5150-5250 MHz)

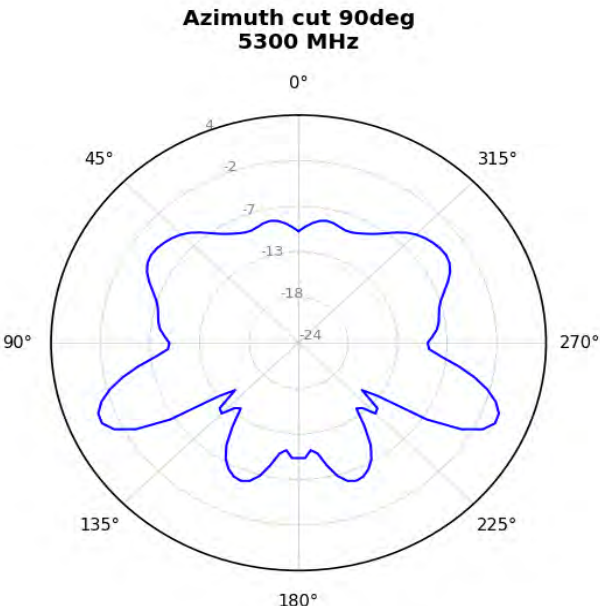
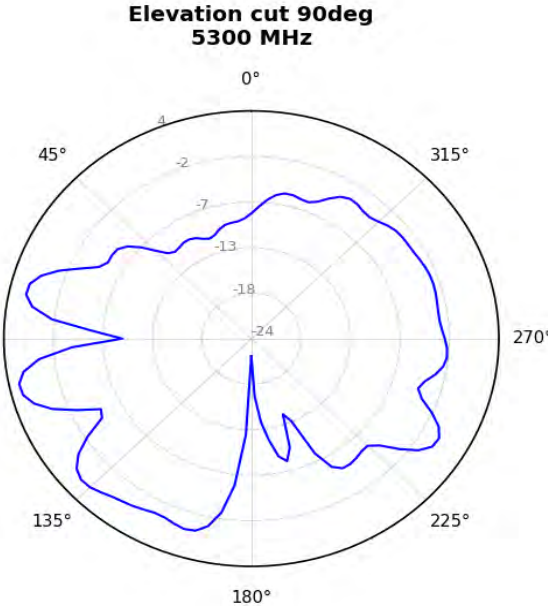
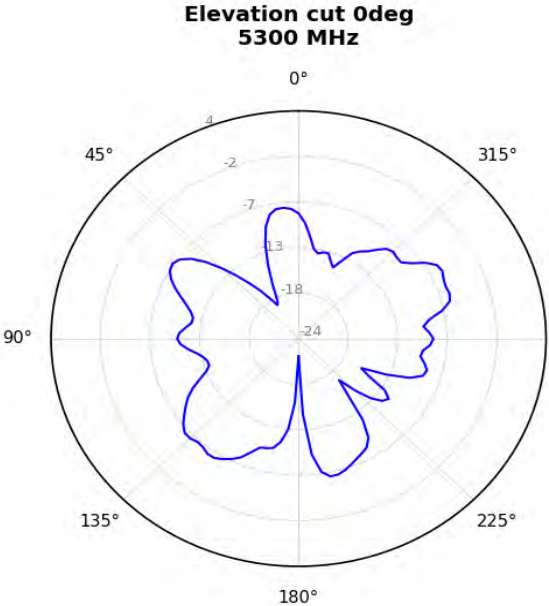
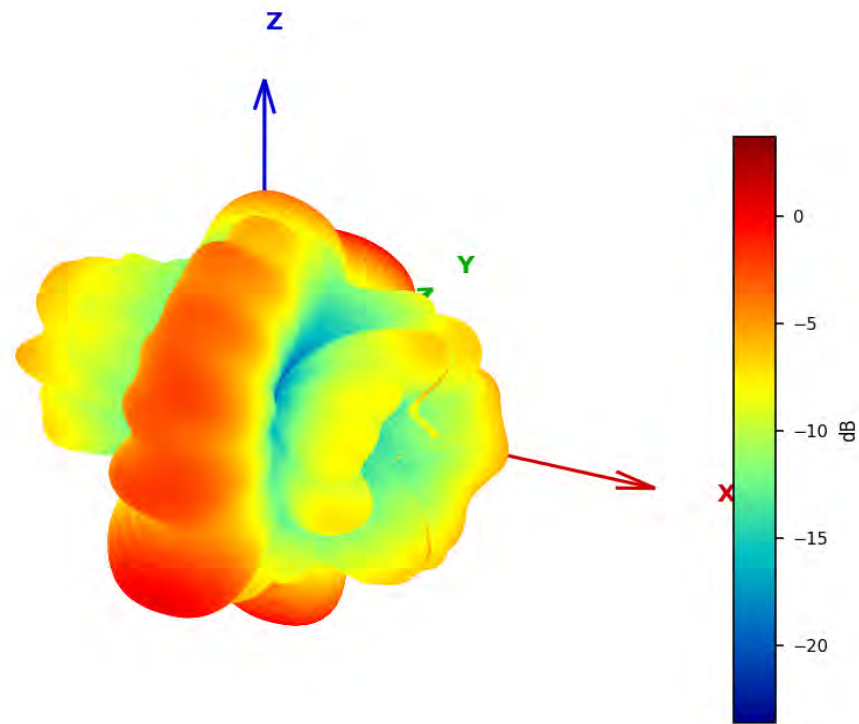
3D Radiation Pattern | 5200 MHz | Peak Gain: 3.95 dBi



3D Radiation Pattern (ETotal)

WiFi | Ant. 3 | U-NII-2A (5250-5350 MHz)

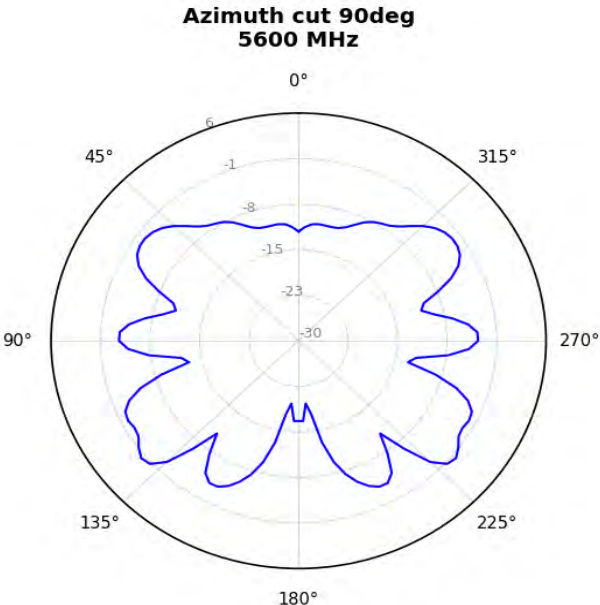
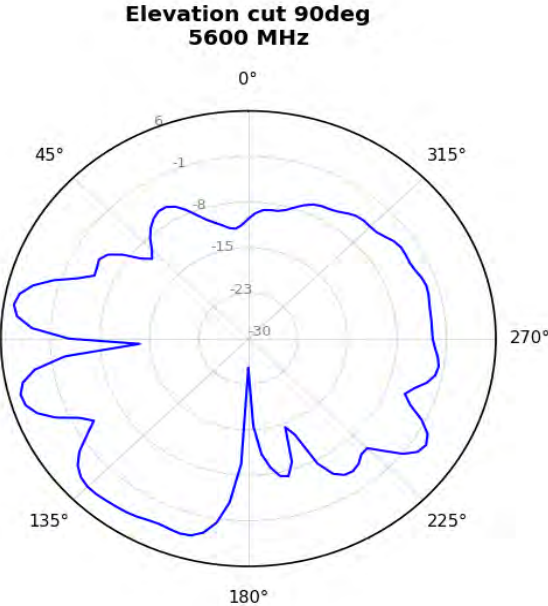
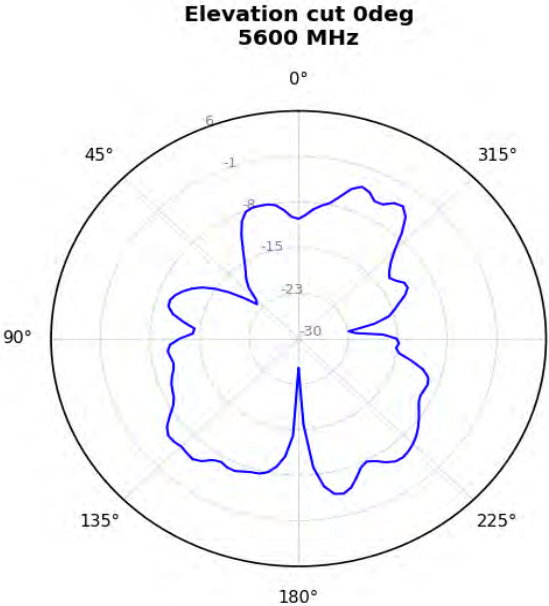
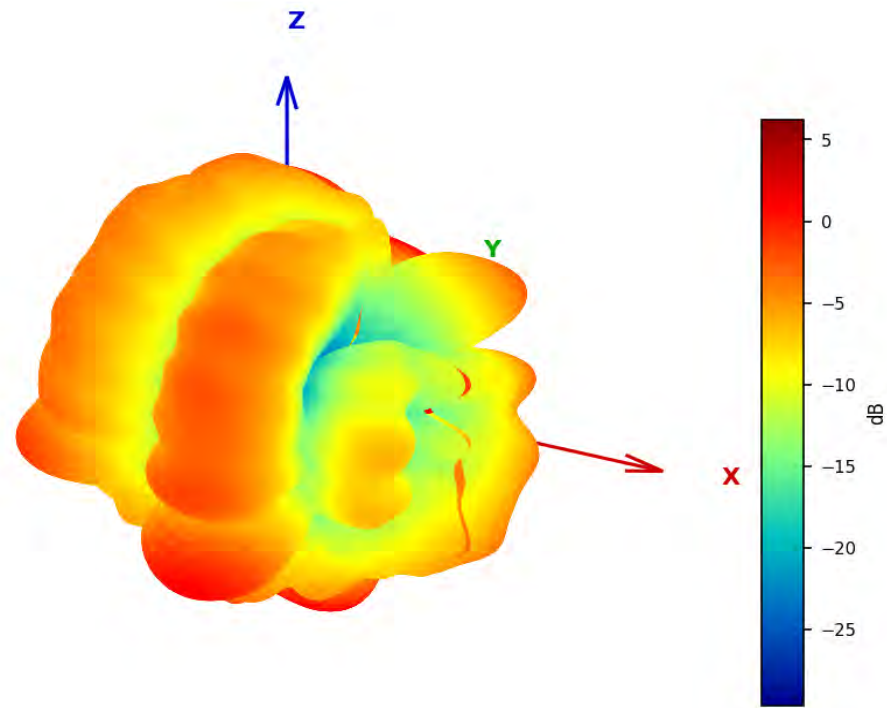
3D Radiation Pattern | 5300 MHz | Peak Gain: 4.70 dBi



3D Radiation Pattern (ETotal)

WiFi | Ant. 3 | U-NII-2C (5470-5725 MHz)

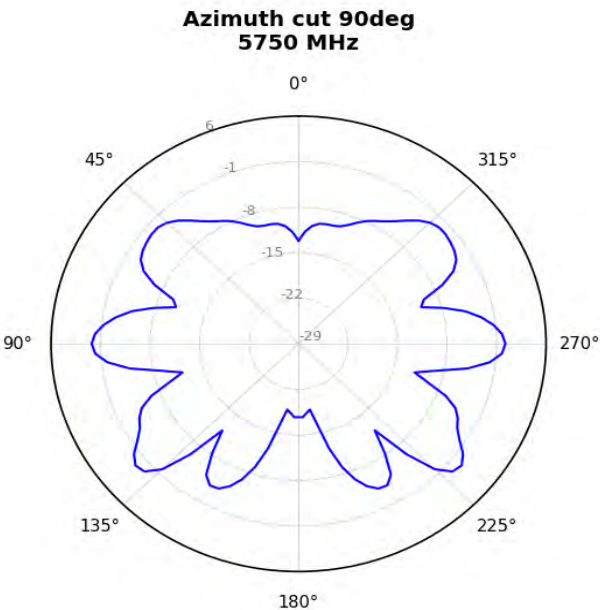
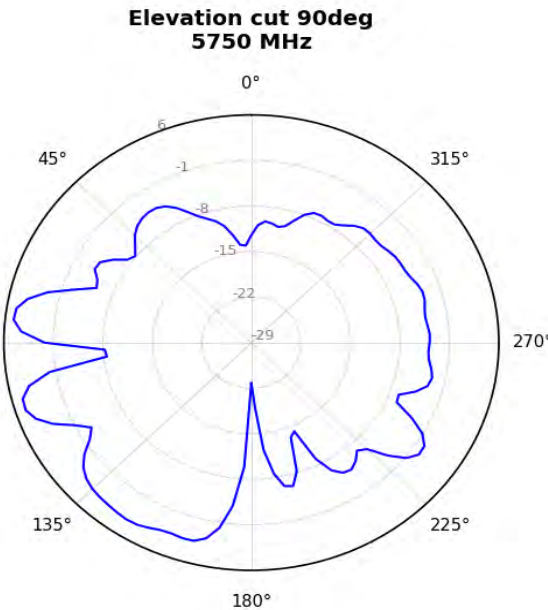
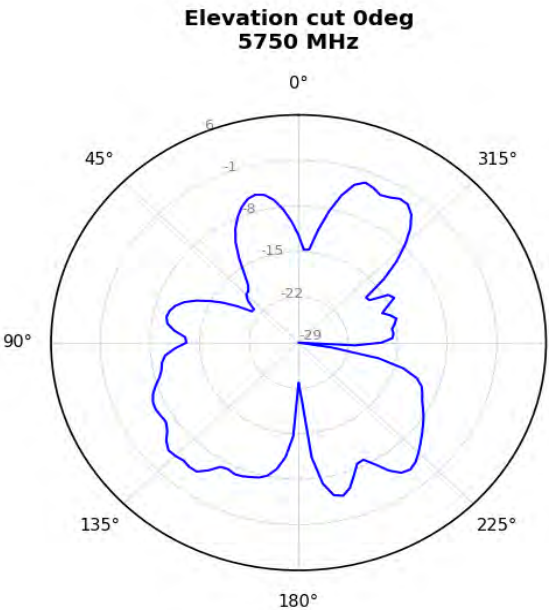
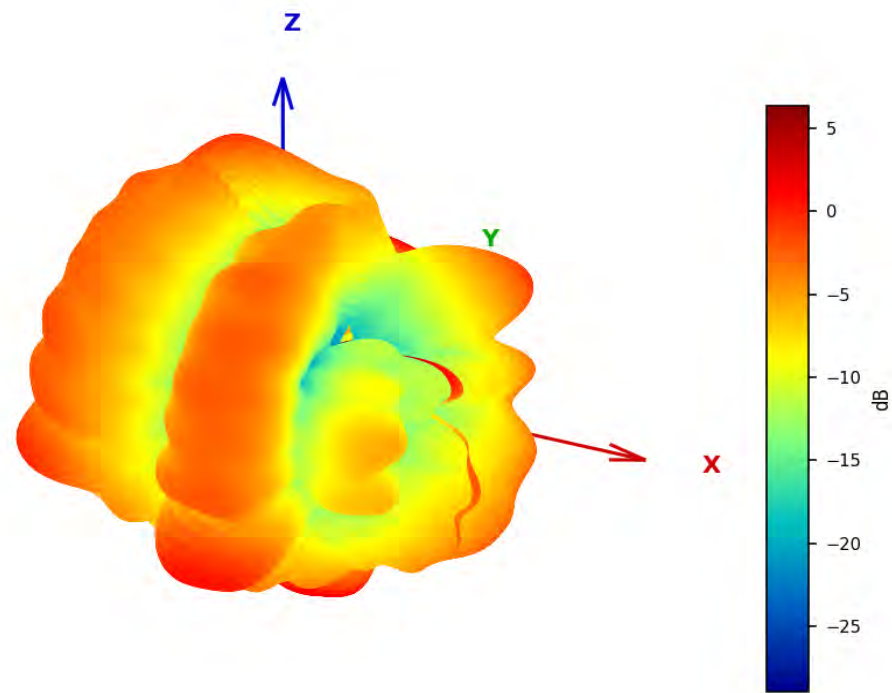
3D Radiation Pattern | 5600 MHz | Peak Gain: 6.95 dBi



3D Radiation Pattern (ETotal)

WiFi | Ant. 3 | U-NII-3 (5725-5850 MHz)

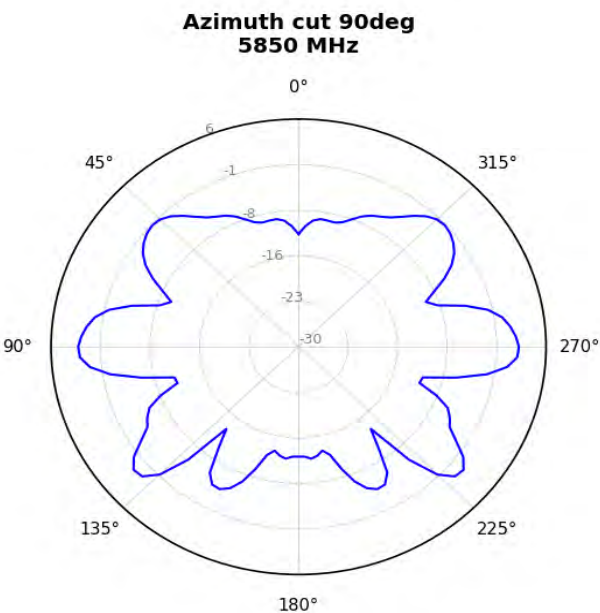
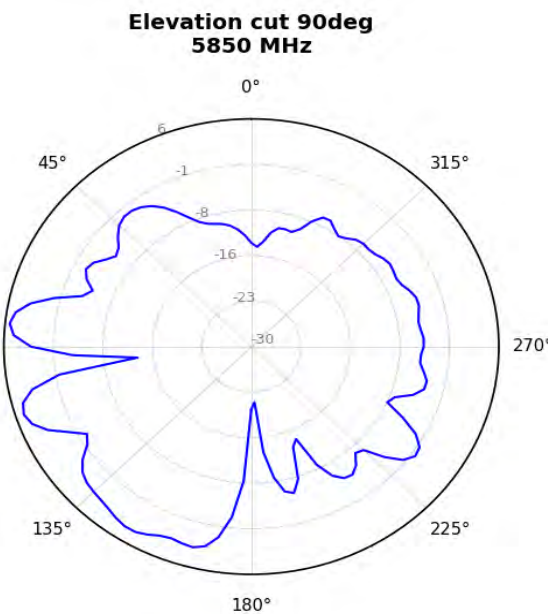
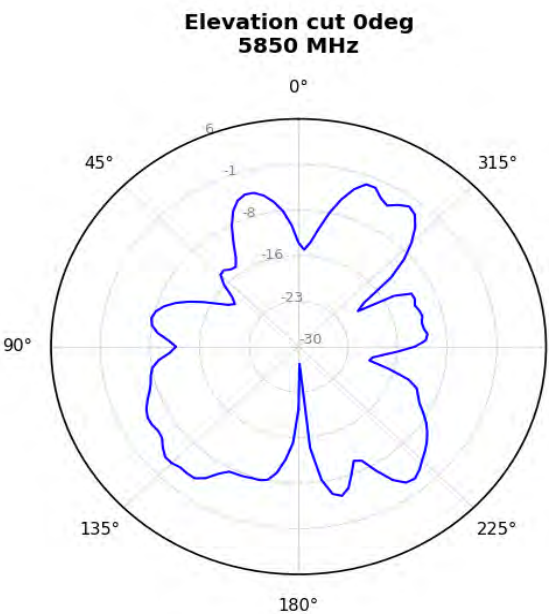
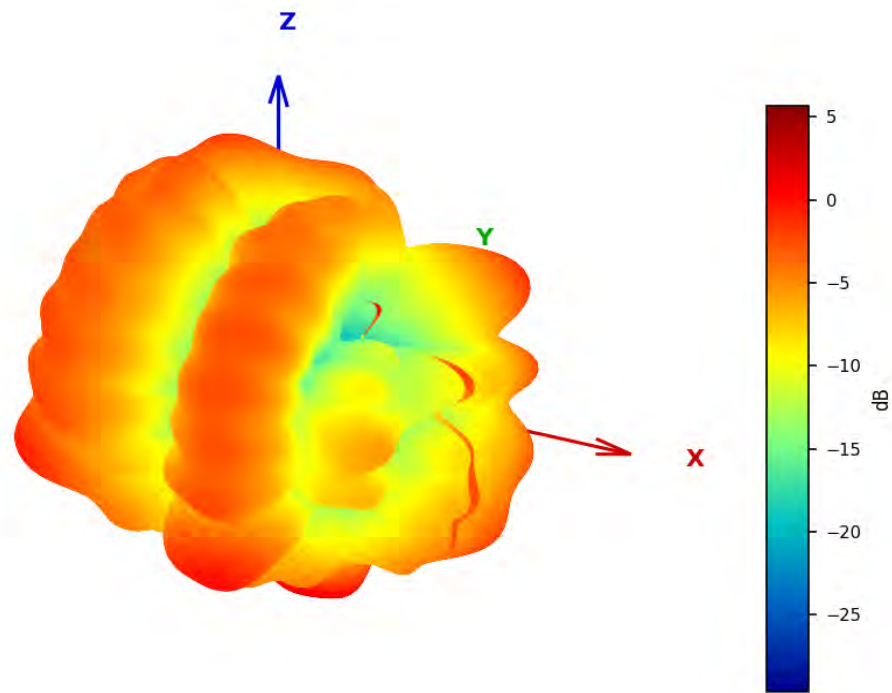
3D Radiation Pattern | 5750 MHz | Peak Gain: 7.10 dBi



3D Radiation Pattern (ETotal)

WiFi | Ant. 3 | U-NII-4 (5850-5895 MHz)

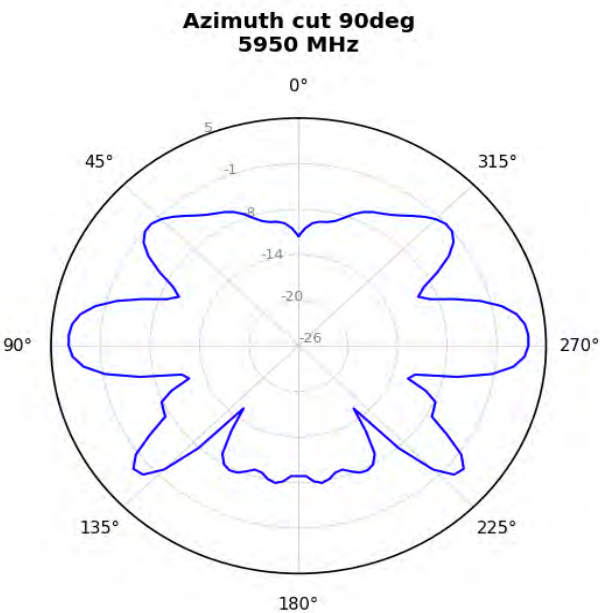
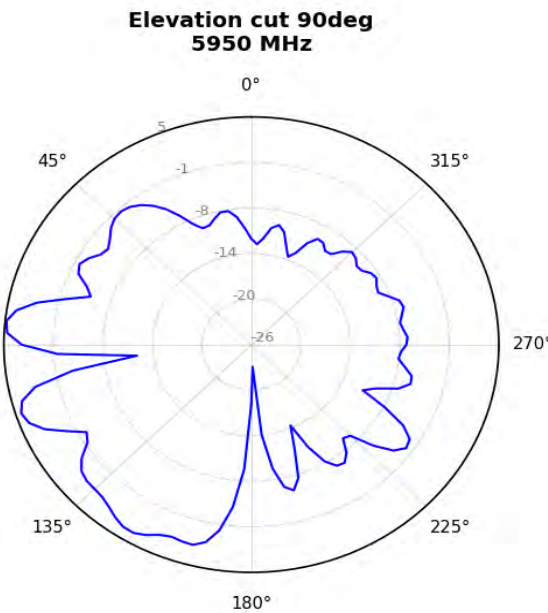
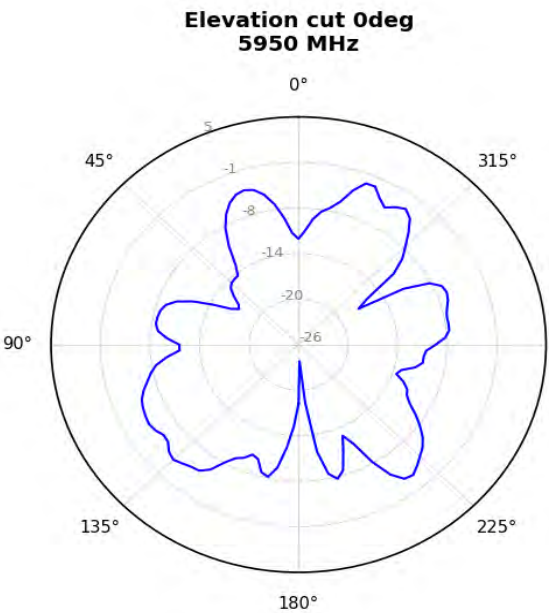
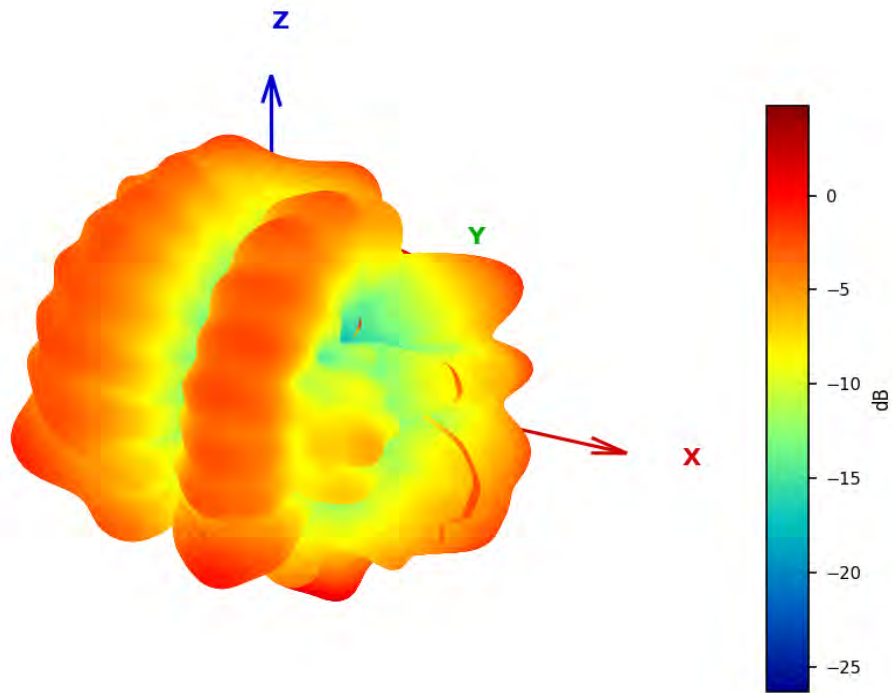
3D Radiation Pattern | 5850 MHz | Peak Gain: 6.41 dBi



3D Radiation Pattern (ETotal)

WiFi | Ant. 3 | U-NII-5 (5925-6425 MHz)

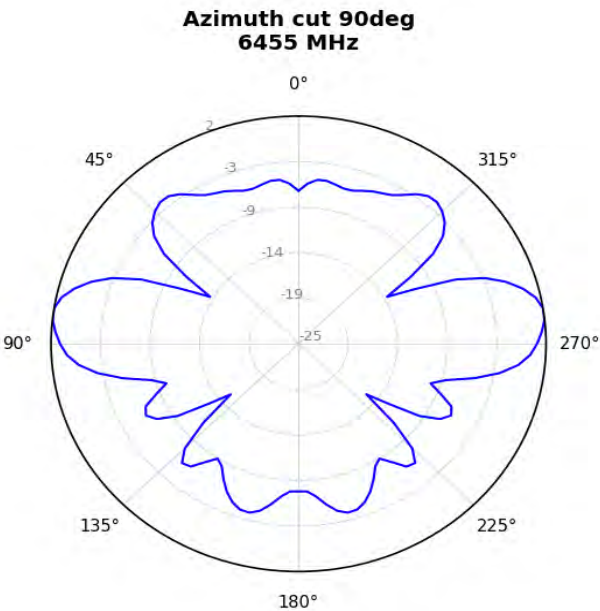
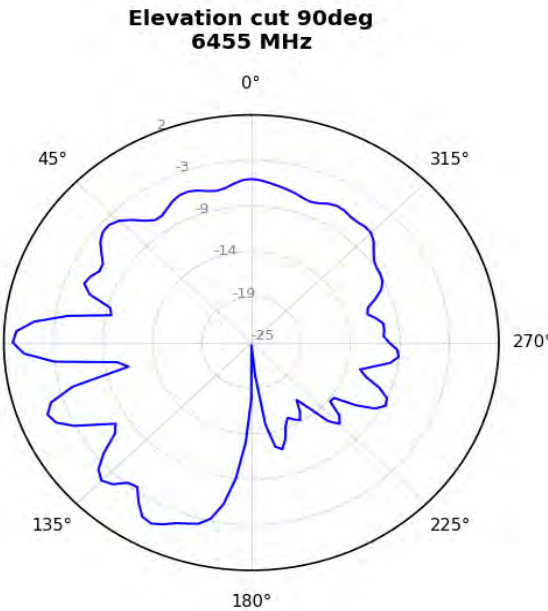
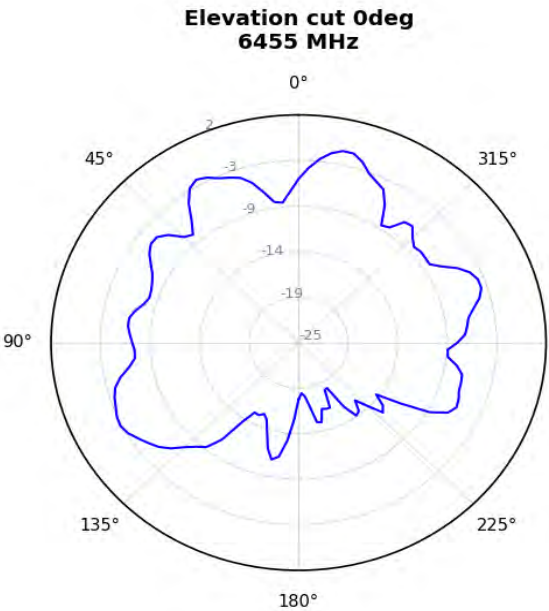
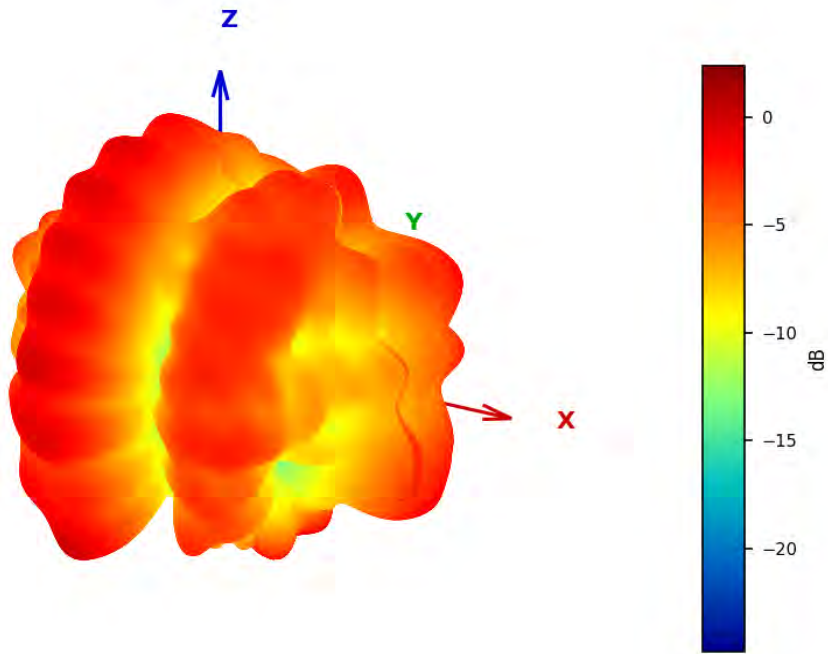
3D Radiation Pattern | 5950 MHz | Peak Gain: 5.98 dBi



3D Radiation Pattern (ETotal)

WiFi | Ant. 3 | U-NII-6 (6425-6525 MHz)

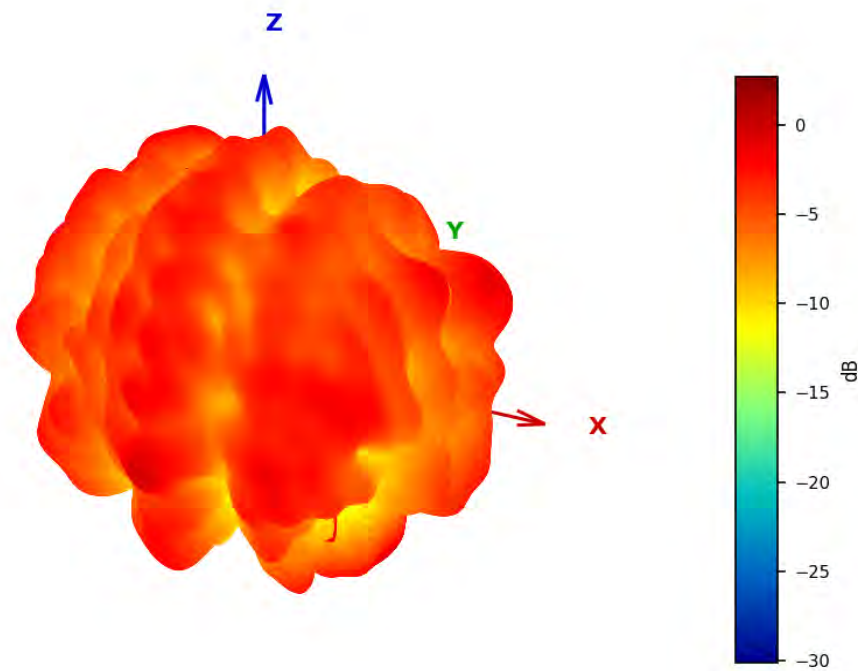
3D Radiation Pattern | 6455 MHz | Peak Gain: 3.17 dBi



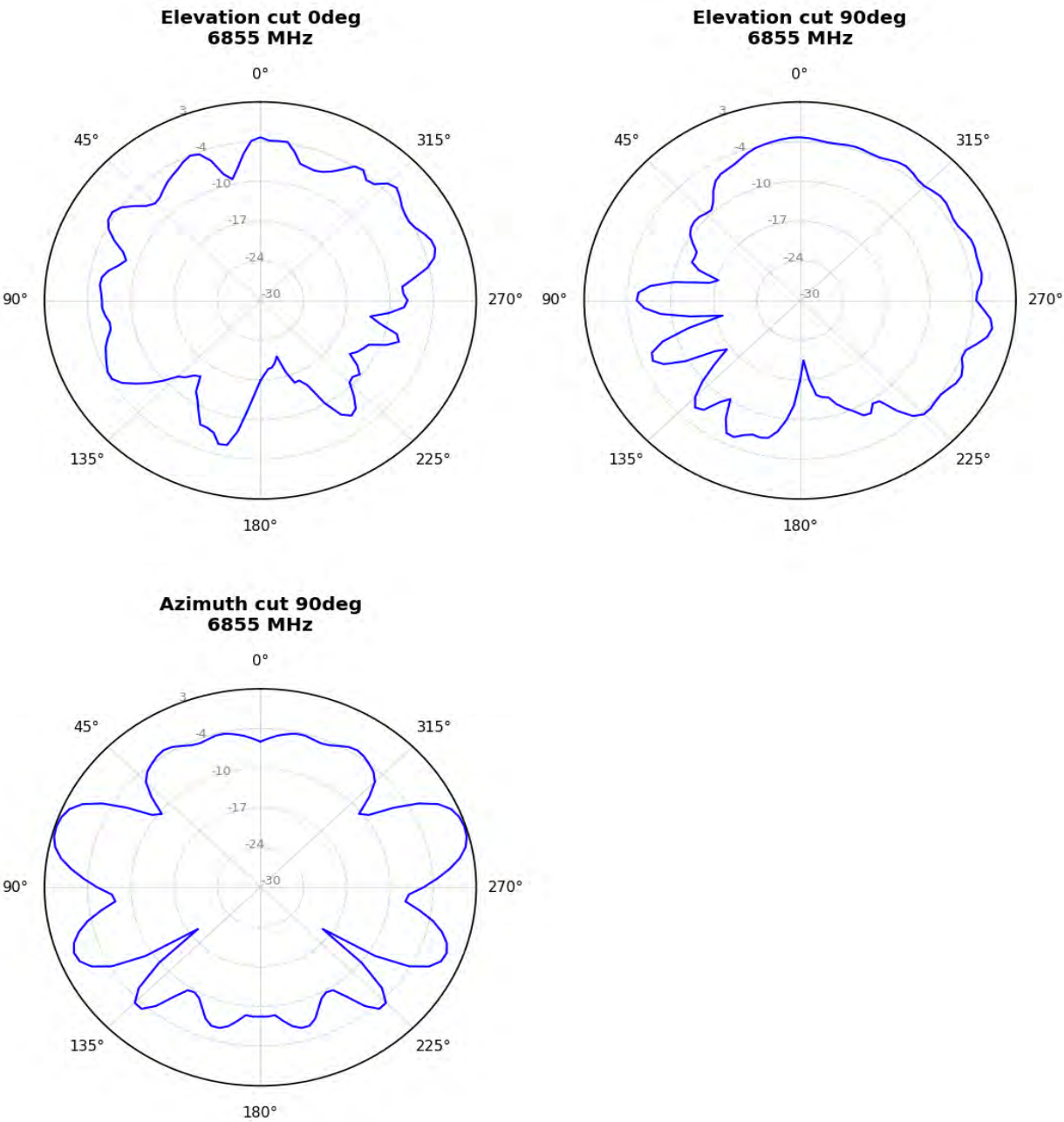
3D Radiation Pattern (ETotal)

WiFi | Ant. 3 | U-NII-7 (6525-6875 MHz)

3D Radiation Pattern | 6855 MHz | Peak Gain: 3.49 dBi

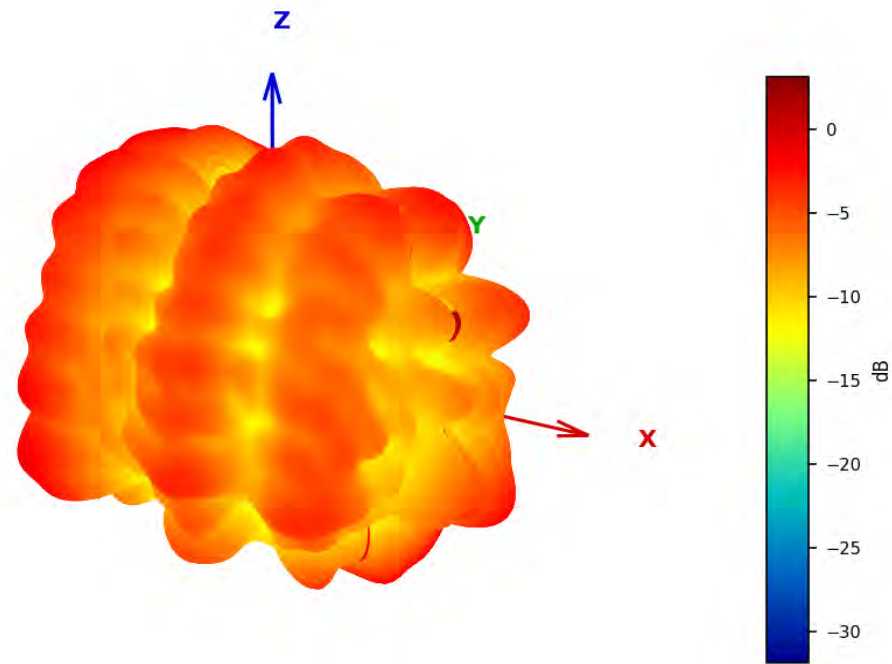


3D Radiation Pattern (ETotal)

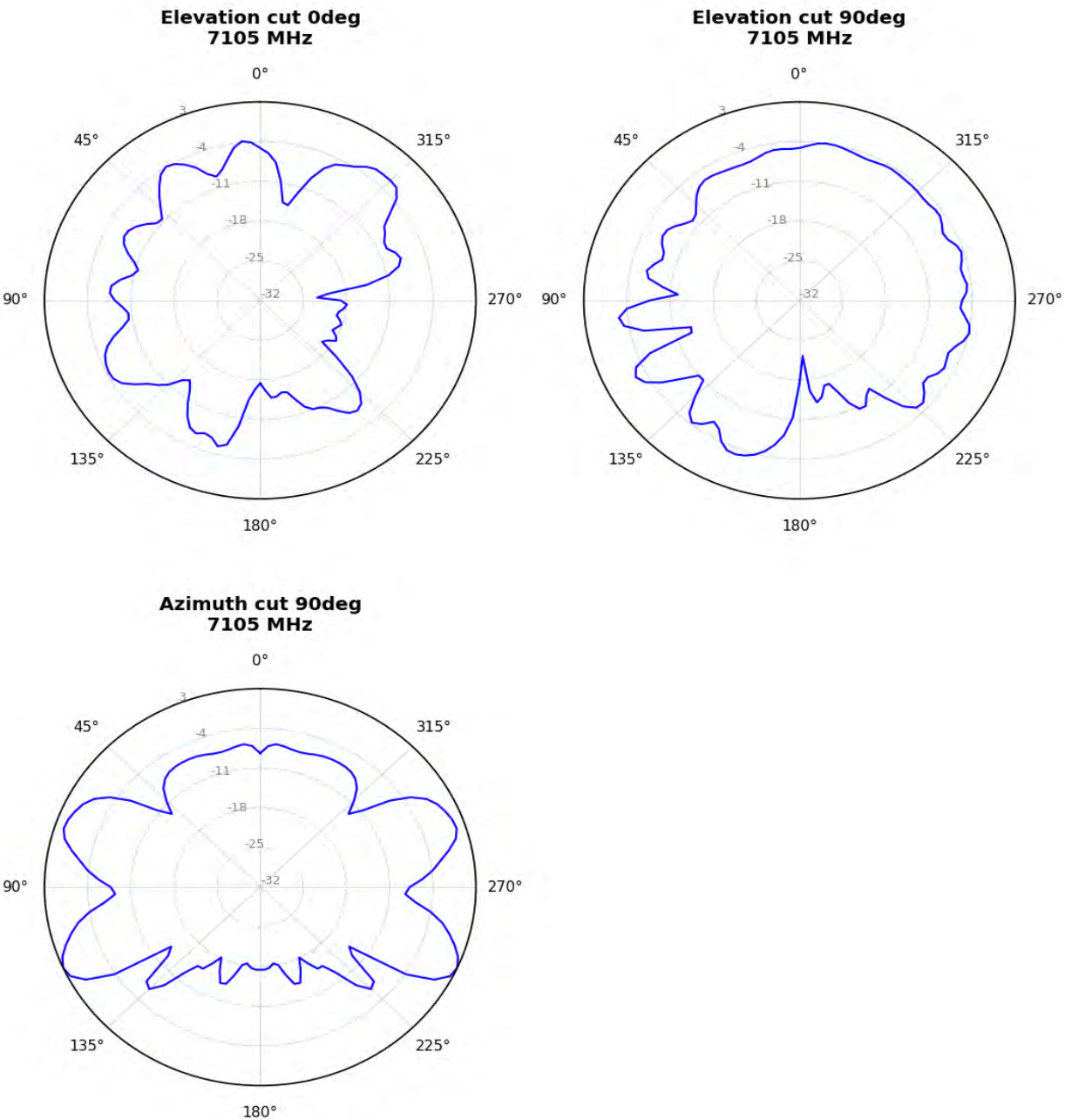


WiFi | Ant. 3 | U-NII-8 (6875-7125 MHz)

3D Radiation Pattern | 7105 MHz | Peak Gain: 3.97 dBi



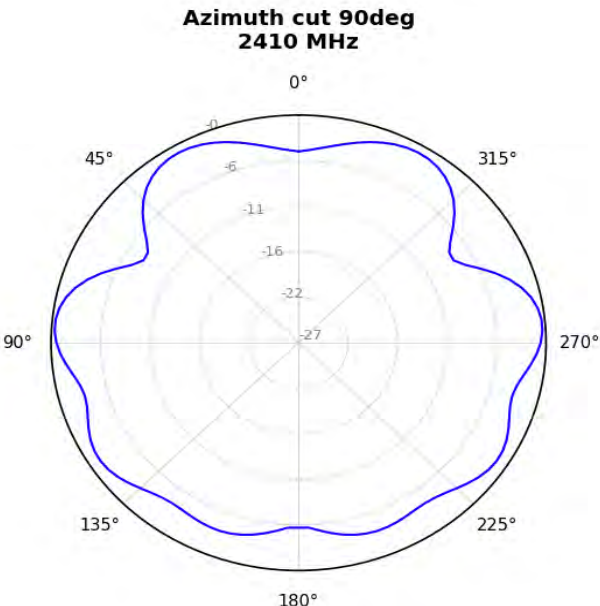
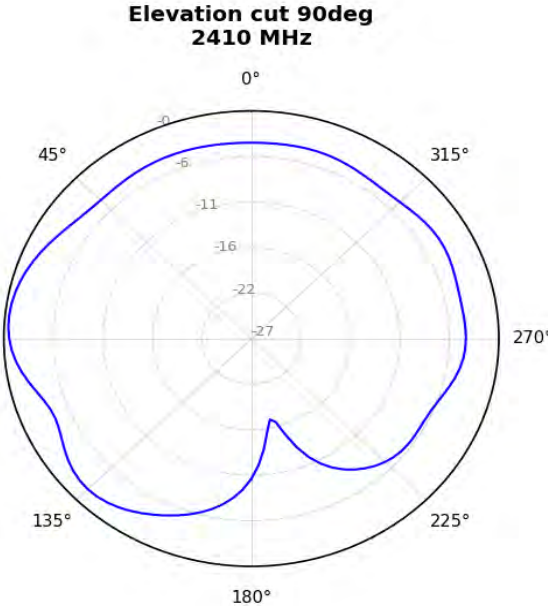
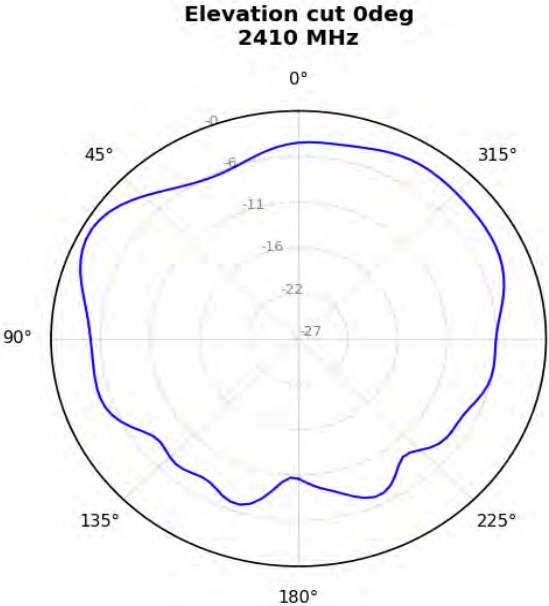
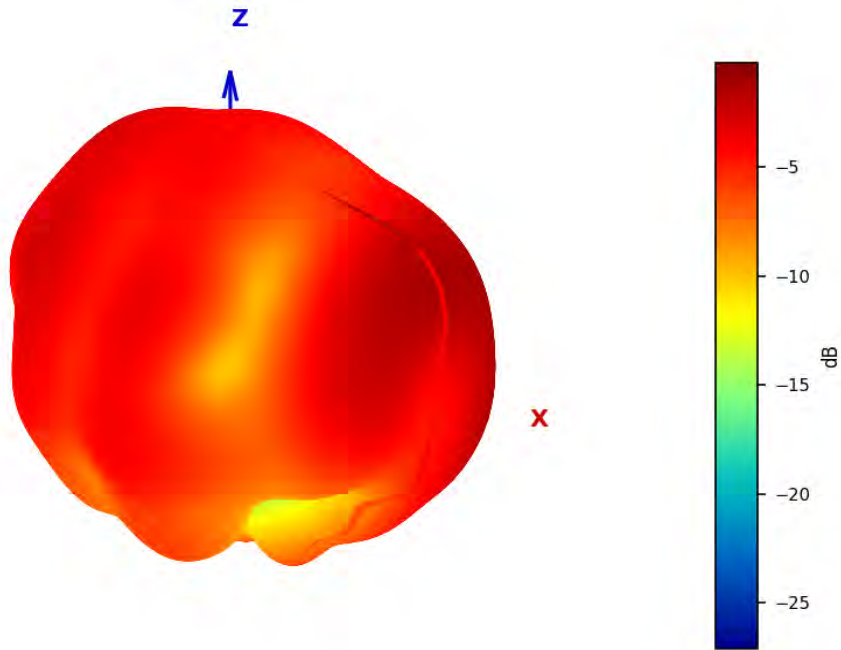
3D Radiation Pattern (ETotal)



Antenna 4

WiFi | Ant. 4 | 2.4GHz (2400-2483.5 MHz)

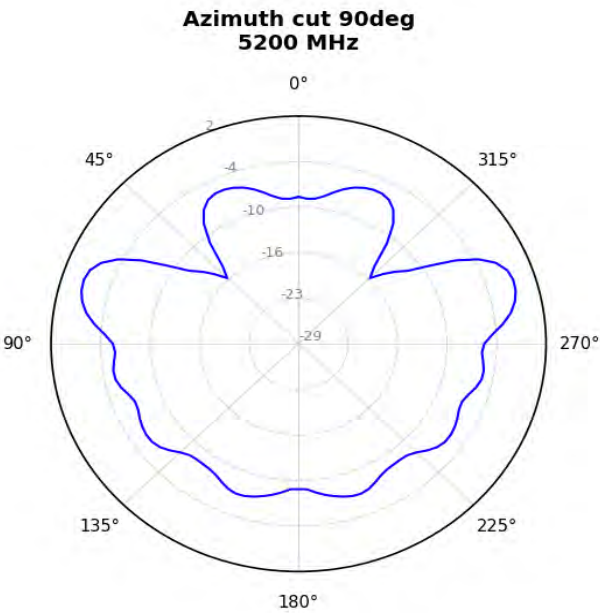
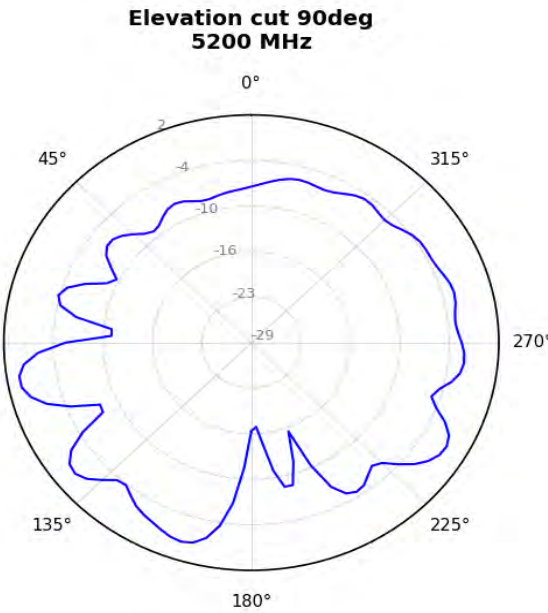
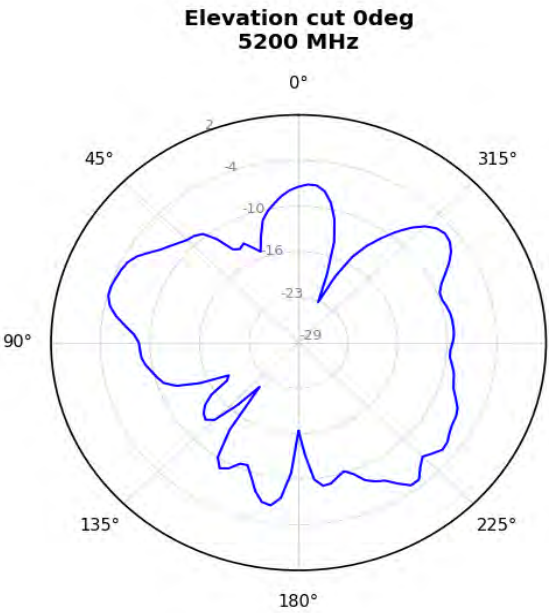
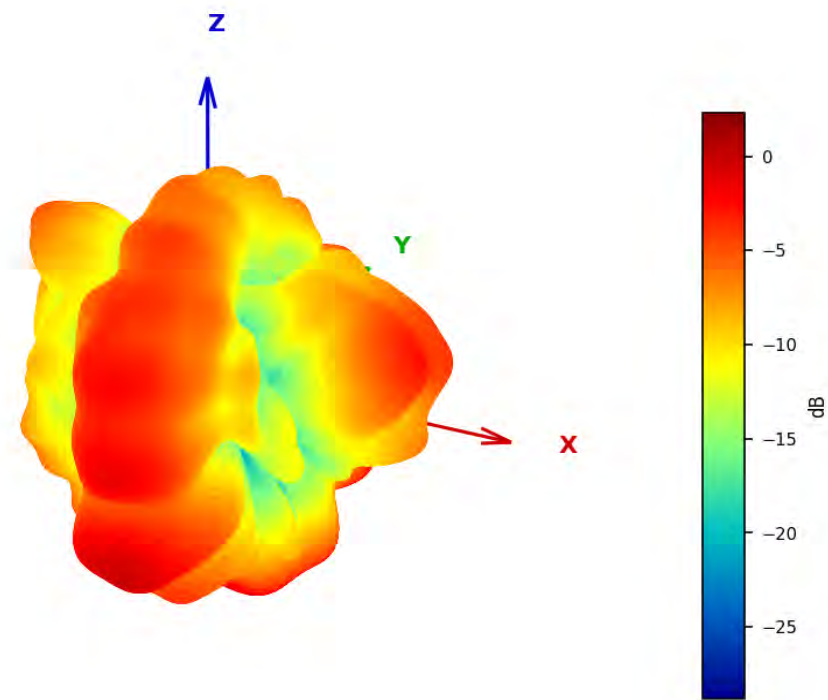
3D Radiation Pattern | 2410 MHz | Peak Gain: 0.25 dBi



3D Radiation Pattern (ETotal)

WiFi | Ant. 4 | U-NII-1 (5150-5250 MHz)

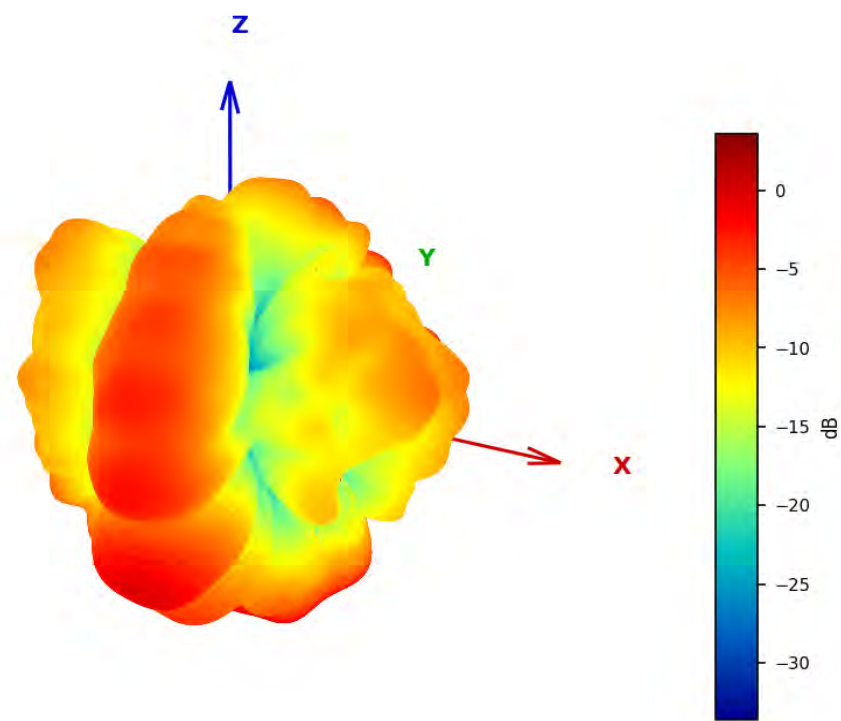
3D Radiation Pattern | 5200 MHz | Peak Gain: 3.89 dBi



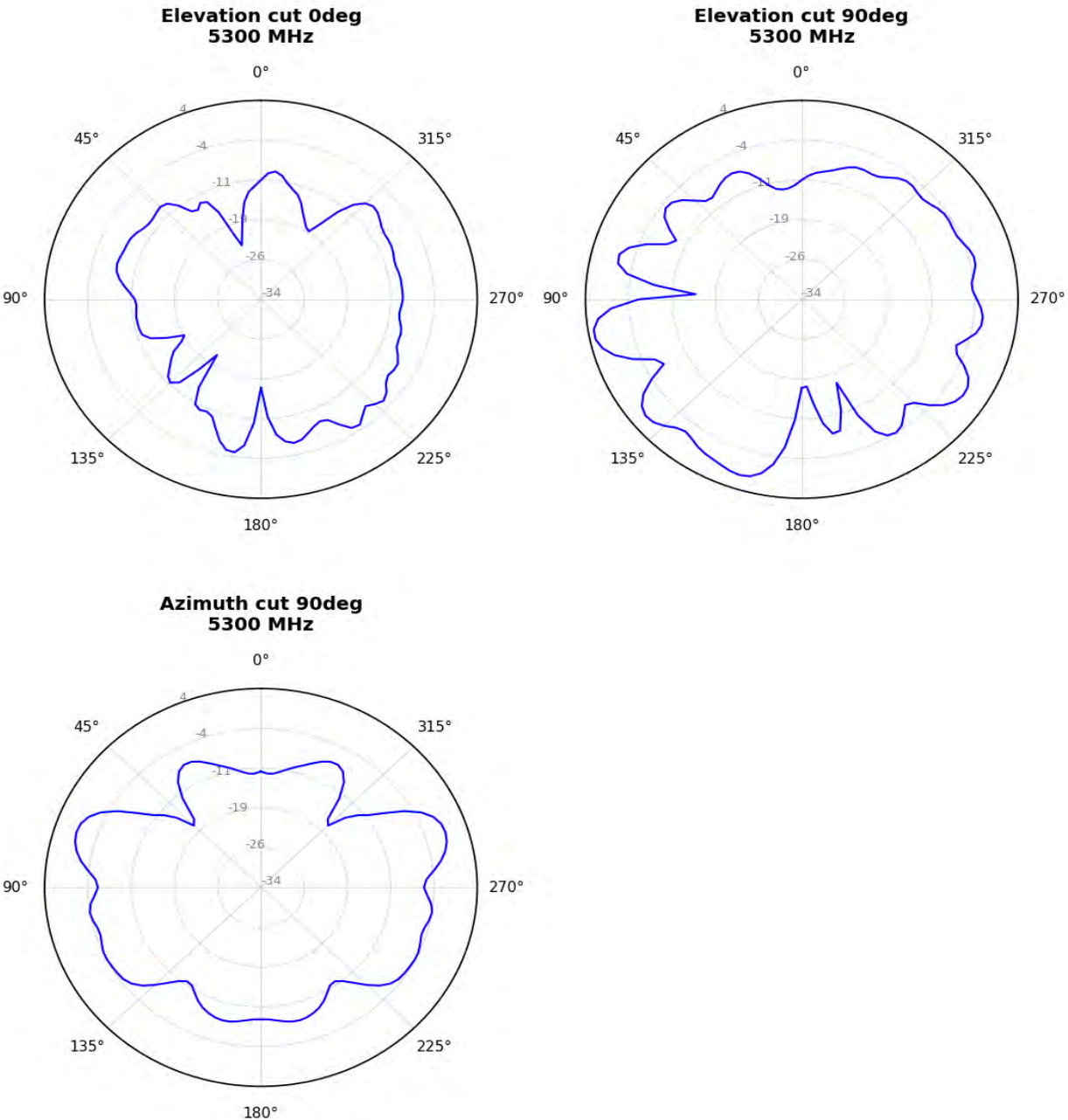
3D Radiation Pattern (ETotal)

WiFi | Ant. 4 | U-NII-2A (5250-5350 MHz)

3D Radiation Pattern | 5300 MHz | Peak Gain: 5.13 dBi

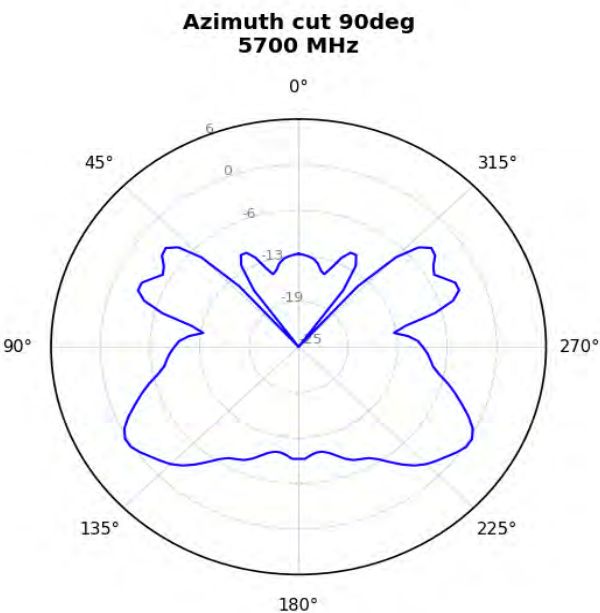
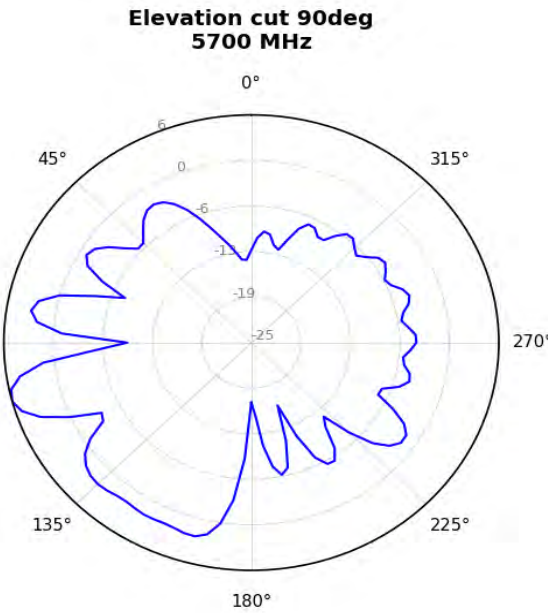
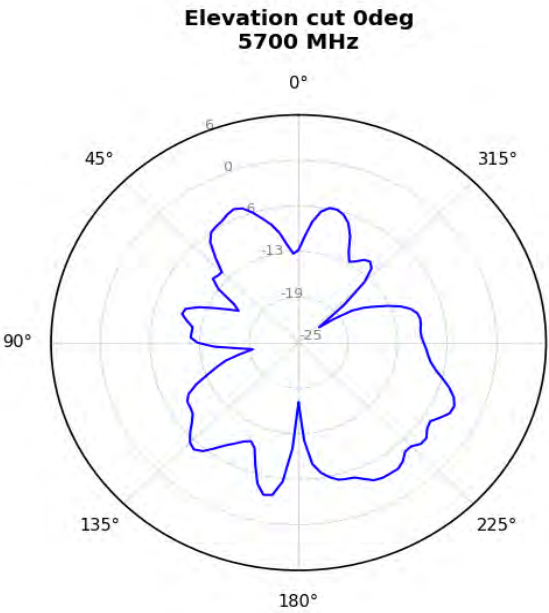
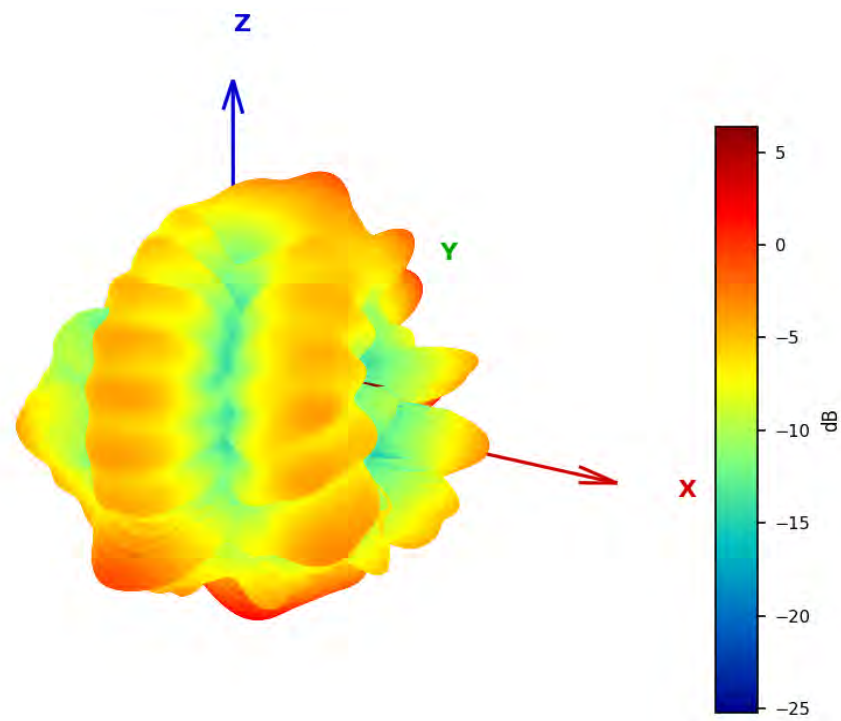


3D Radiation Pattern (ETotal)



WiFi | Ant. 4 | U-NII-2C (5470-5725 MHz)

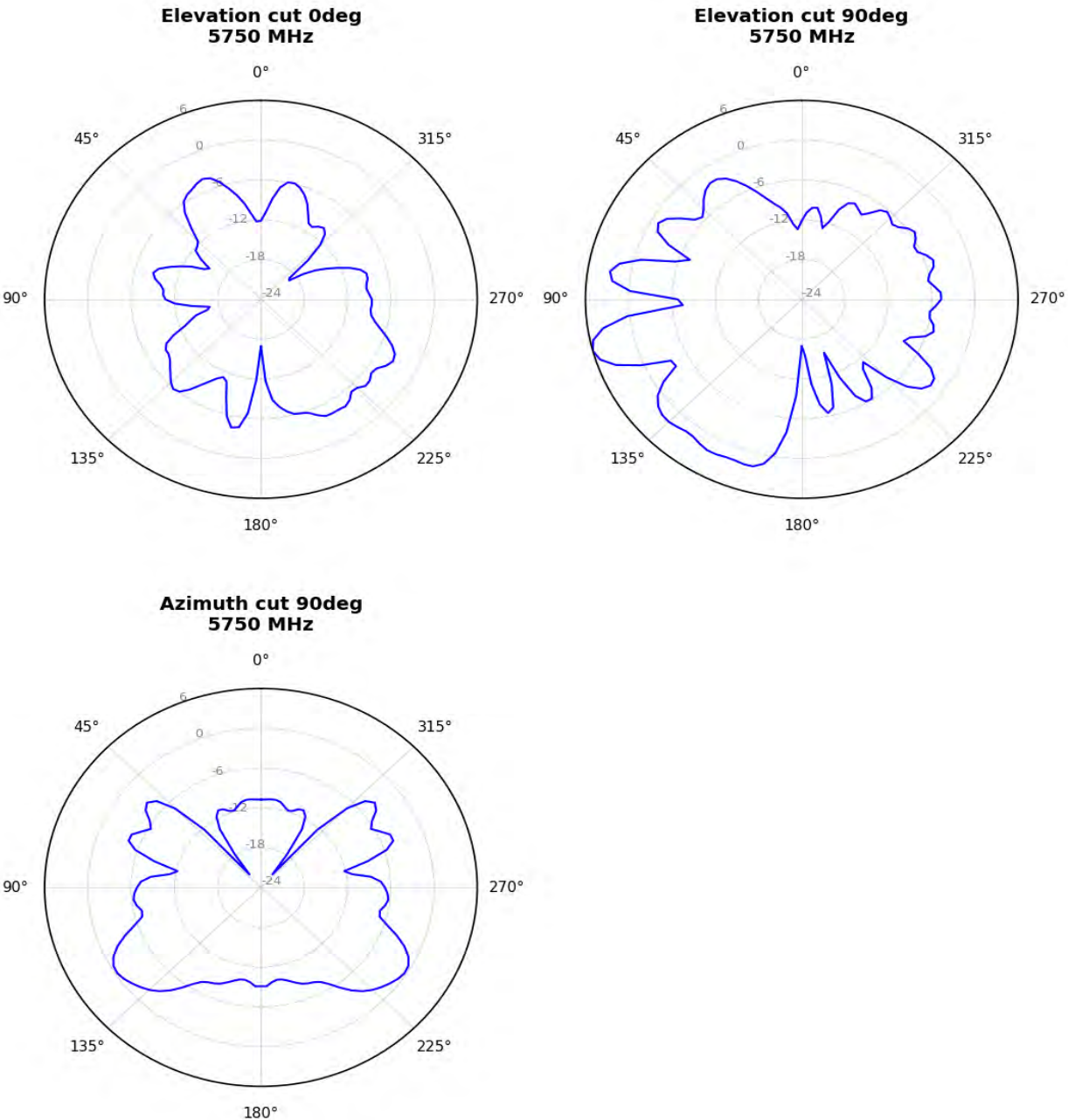
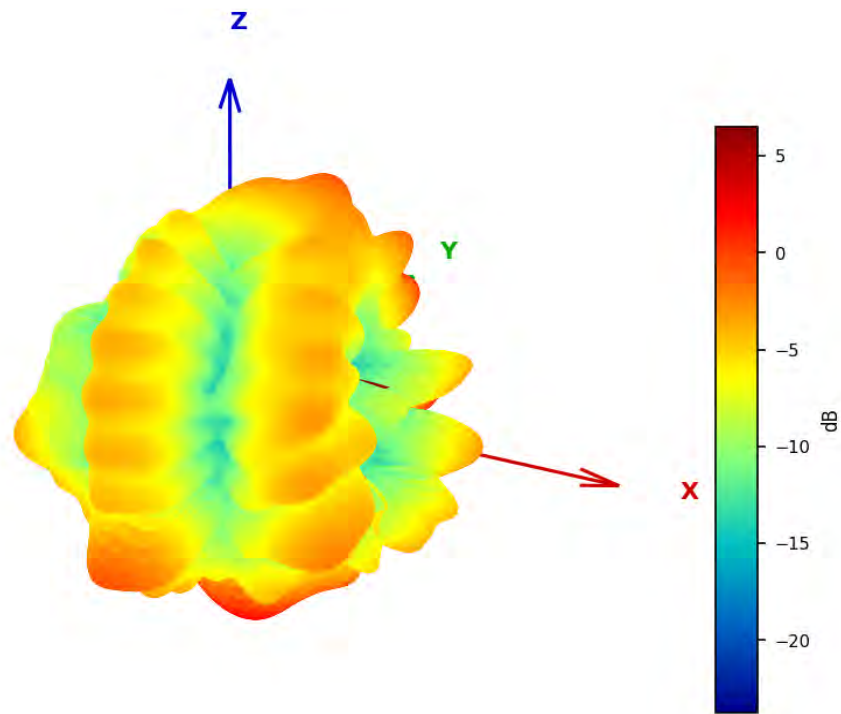
3D Radiation Pattern | 5700 MHz | Peak Gain: 7.12 dBi



3D Radiation Pattern (ETotal)

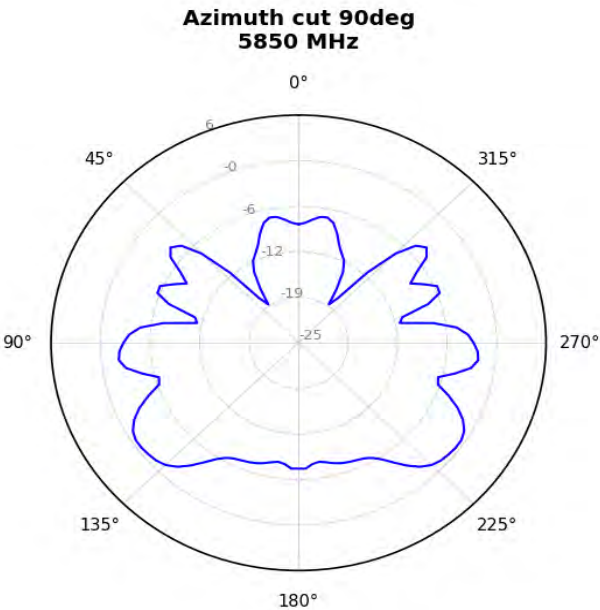
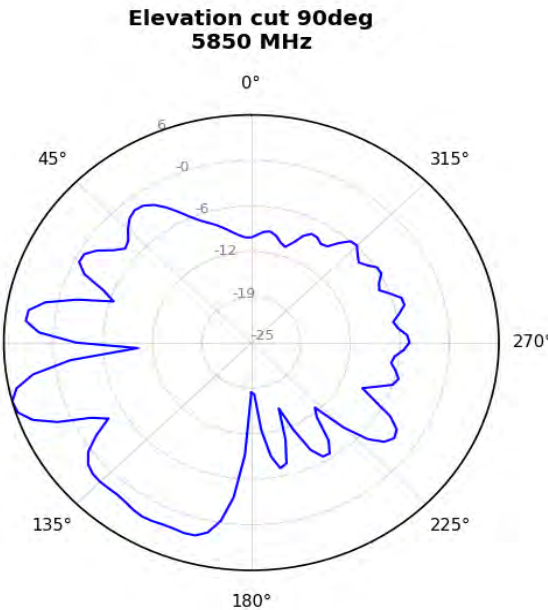
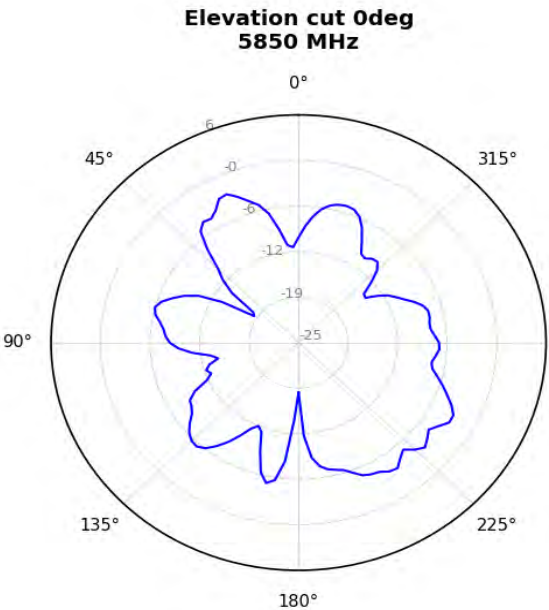
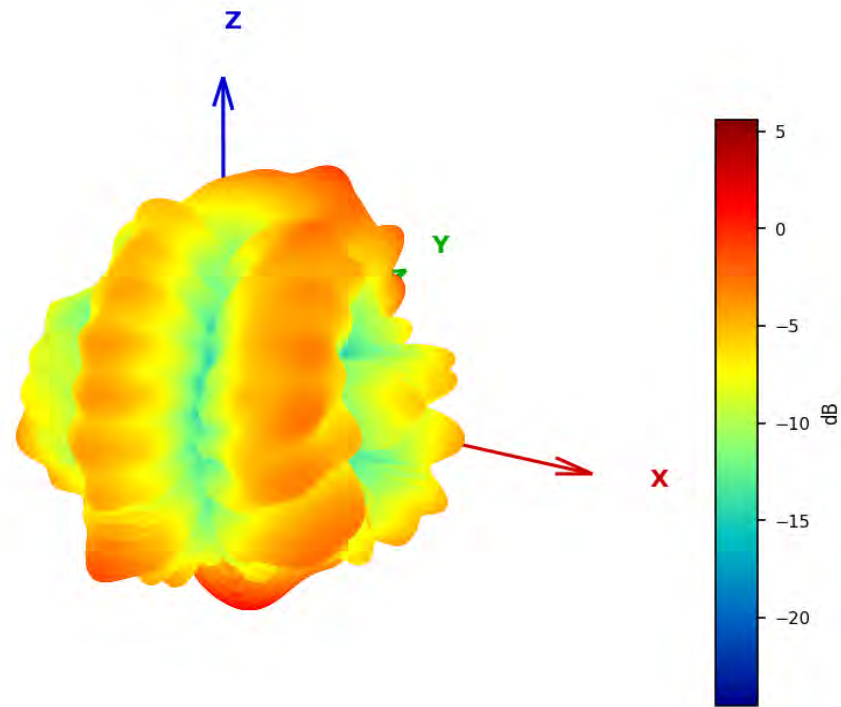
WiFi | Ant. 4 | U-NII-3 (5725-5850 MHz)

3D Radiation Pattern | 5750 MHz | Peak Gain: 7.27 dBi



WiFi | Ant. 4 | U-NII-4 (5850-5895 MHz)

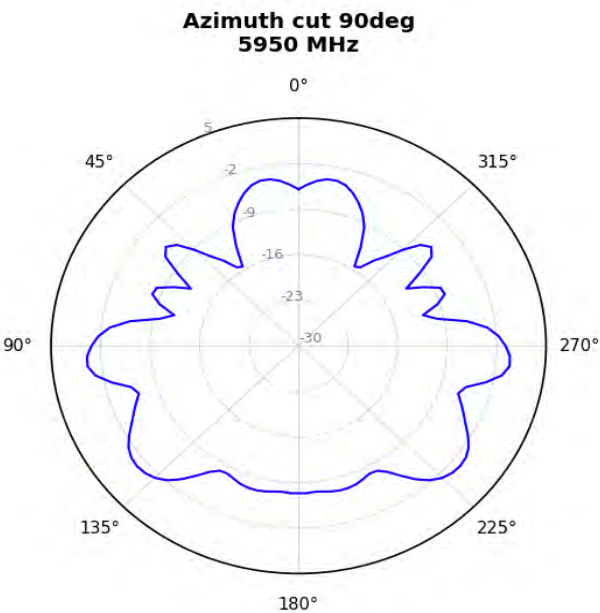
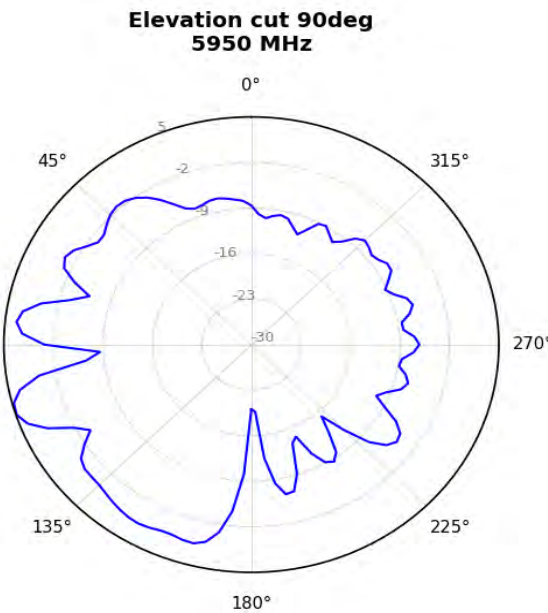
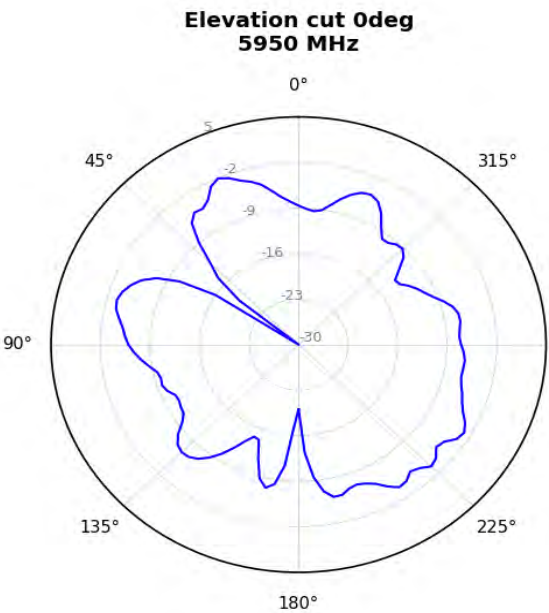
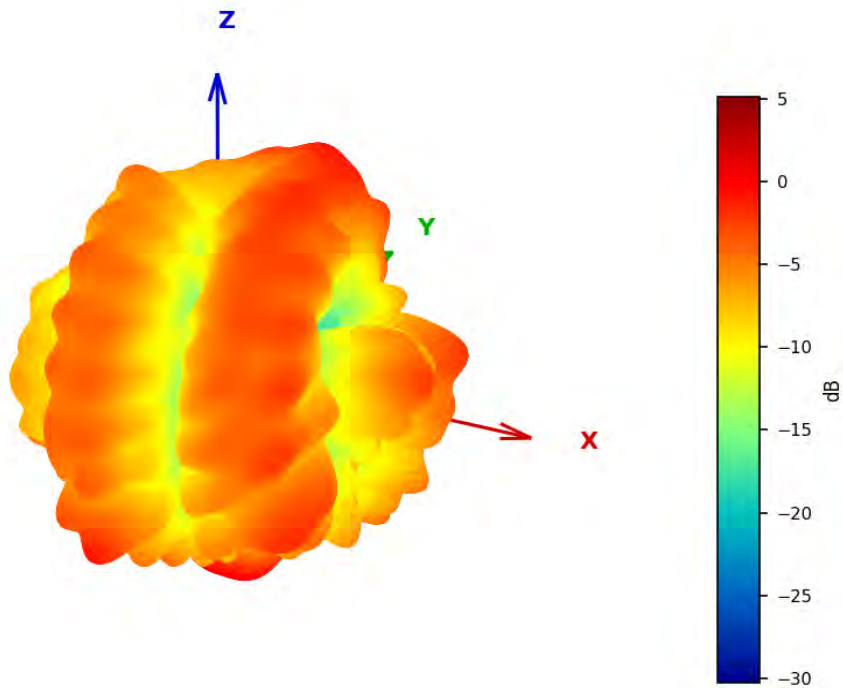
3D Radiation Pattern | 5850 MHz | Peak Gain: 6.36 dBi



3D Radiation Pattern (ETotal)

WiFi | Ant. 4 | U-NII-5 (5925-6425 MHz)

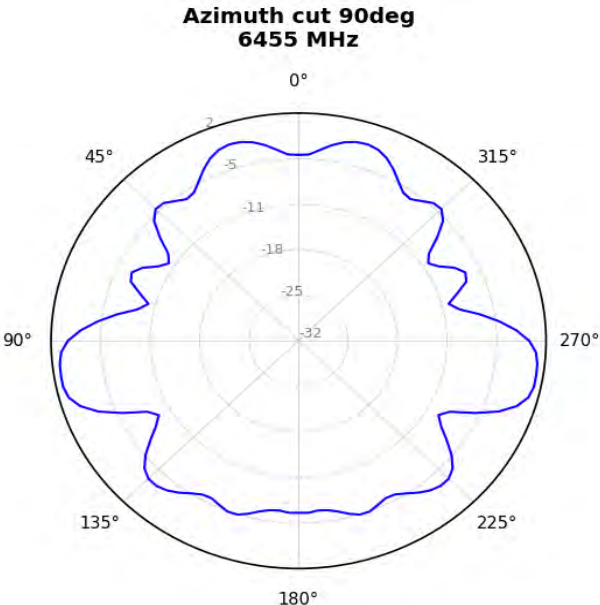
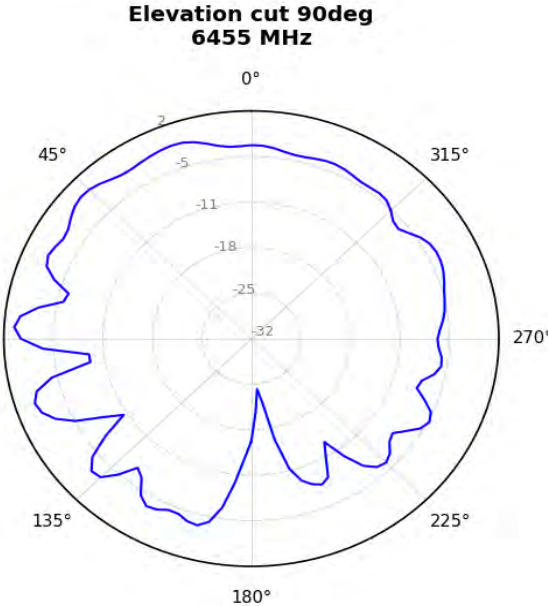
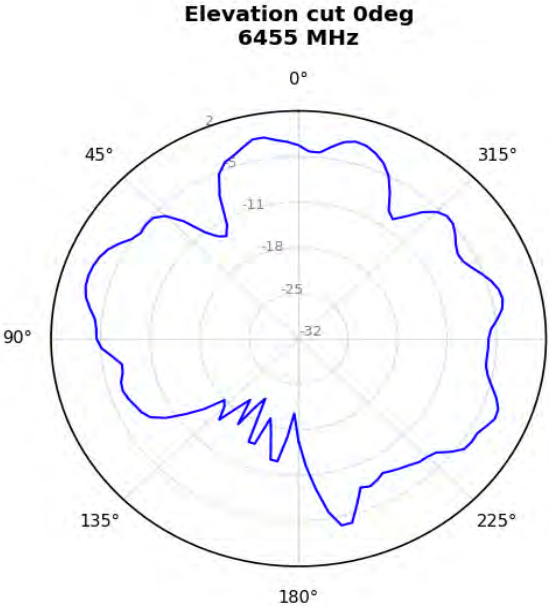
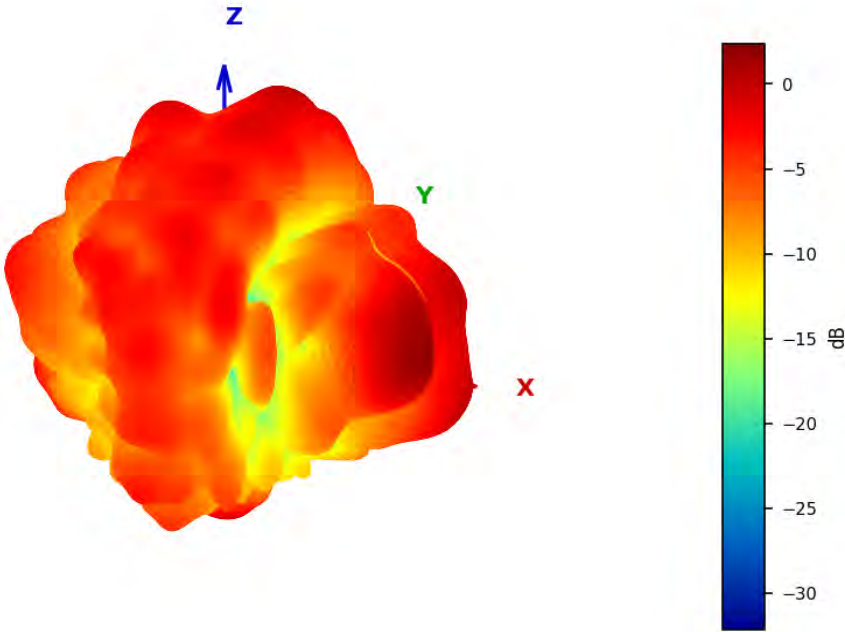
3D Radiation Pattern | 5950 MHz | Peak Gain: 6.11 dBi



3D Radiation Pattern (ETotal)

WiFi | Ant. 4 | U-NII-6 (6425-6525 MHz)

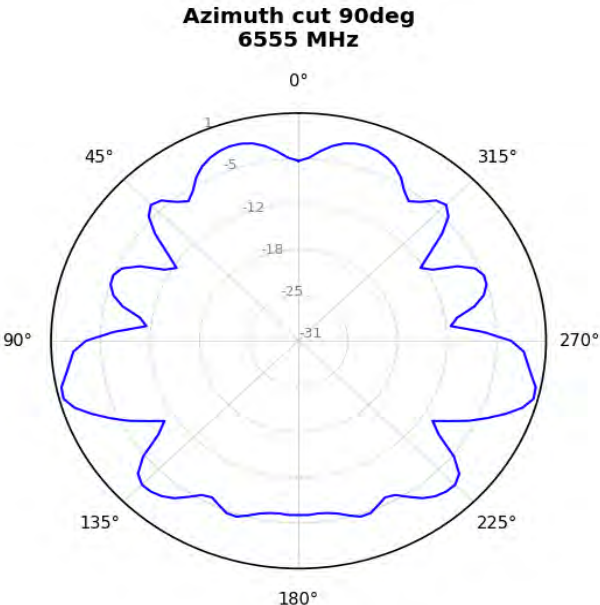
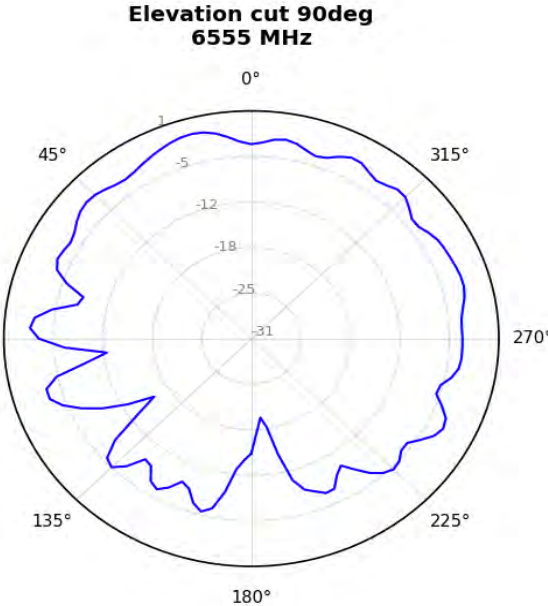
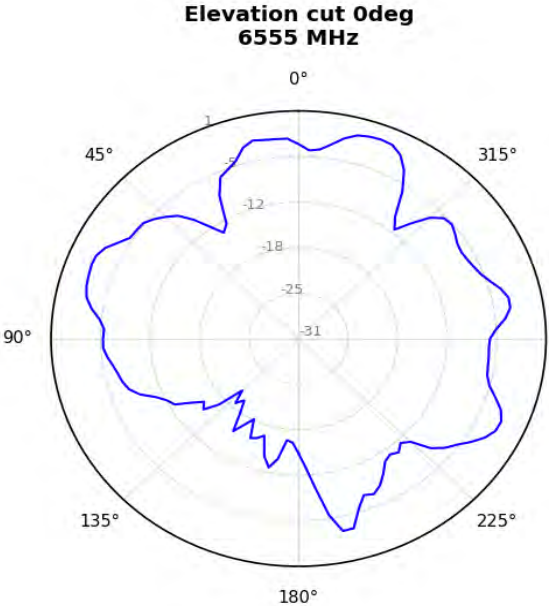
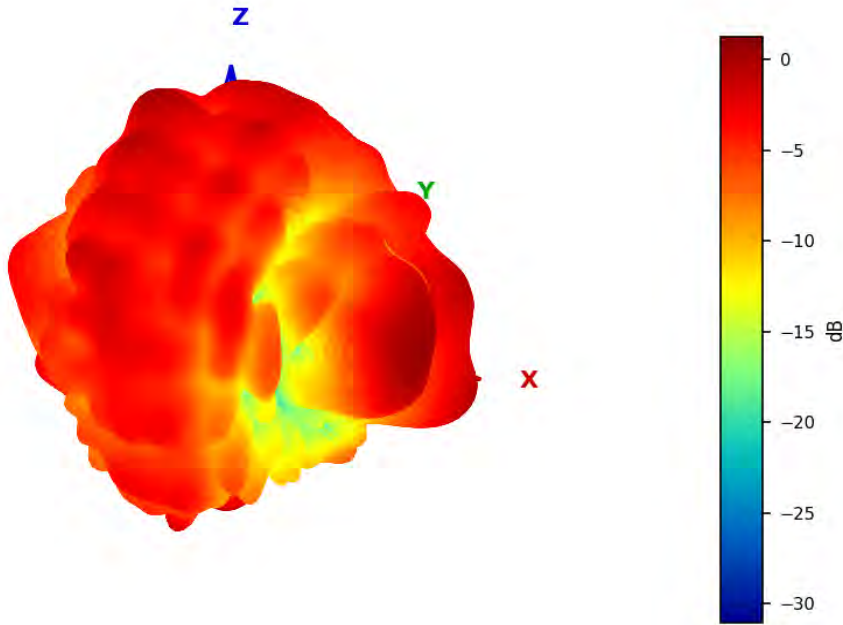
3D Radiation Pattern | 6455 MHz | Peak Gain: 3.16 dBi



3D Radiation Pattern (ETotal)

WiFi | Ant. 4 | U-NII-7 (6525-6875 MHz)

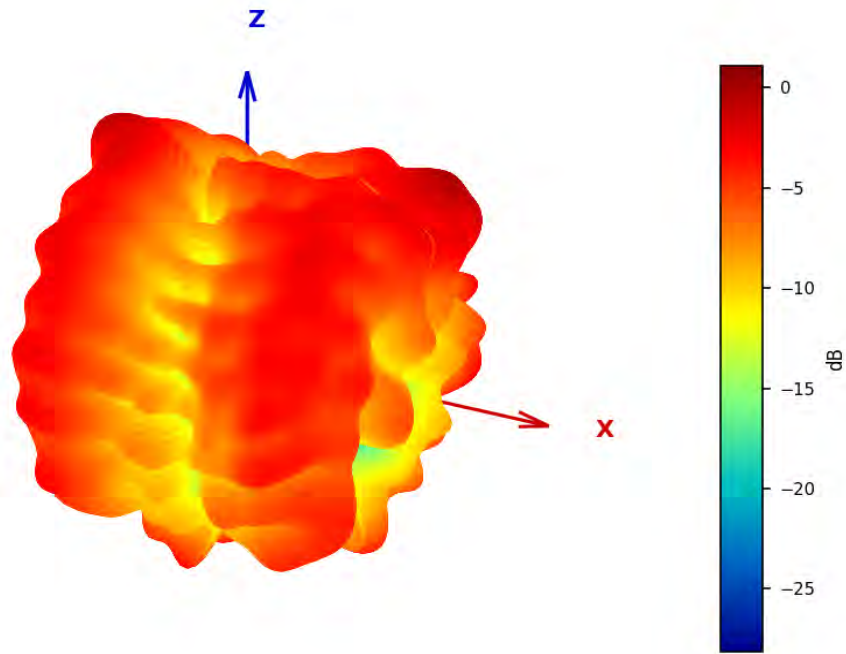
3D Radiation Pattern | 6555 MHz | Peak Gain: 2.06 dBi



3D Radiation Pattern (ETotal)

WiFi | Ant. 4 | U-NII-8 (6875-7125 MHz)

3D Radiation Pattern | 6905 MHz | Peak Gain: 1.91 dBi



3D Radiation Pattern (ETotal)

