

# **Antenna Report**

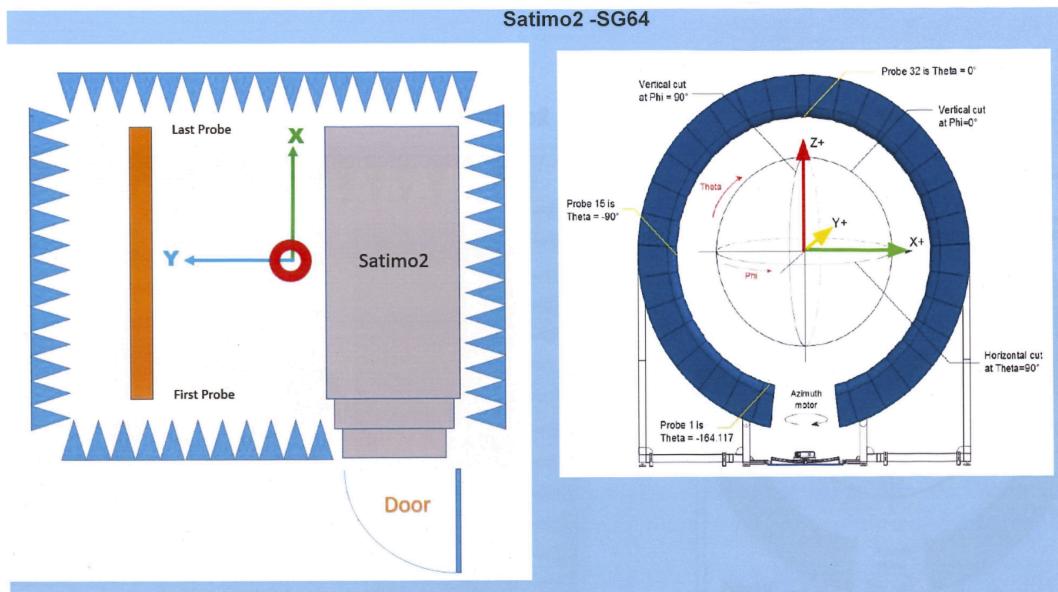
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3/28/2025

# 1. Test Method

The antenna gains are obtained through measurements in a fully anechoic OTA chamber with a 3D positioner.

Measurements are taken in discrete steps in theta and phi direction, data is being recorded using the spectrum analyzer (active) or network analyzer (passive) for both theta and phi polarizations at each position resulting in a 3D gain pattern. Step size is <30 deg along both axes.

Gain is either derived directly through spatial averaging of VNA S21 measurements (passive measurement) or by the ratio of spatial averaging of 3D EIRP/TRP measurements vs the conducted power (active measurement).



Measurements were obtained through passive testing.

# 2. Test Setup

See separate appendix document for pictures of the test setup in this filing.

### 3. Test Equipment

Site Description	Chamber Manufacturer	Type
SG64 Multi Probe Anechoic Chamber	Satimo	Fully Anechoic
Site location:	US-SAN-WBD16618	

Description	Manufacturer	Model
Network Analyzer	Rohde and Schwarz	ZNB20
Signaling Equipment	Anritsu	8821C

### 4. Other information

Equipment calibration status	<ul style="list-style-type: none"><li>- Calibration date: Jan 28, 2025</li><li>- Due of next calibration : Jan 28, 2026</li></ul>
Test dates	<ul style="list-style-type: none"><li>- Feb. 05, 2025</li></ul>
Names of test personnel	<ul style="list-style-type: none"><li>- Faton Tefiku: fatont@google.com</li></ul>

### 5. Antenna Type

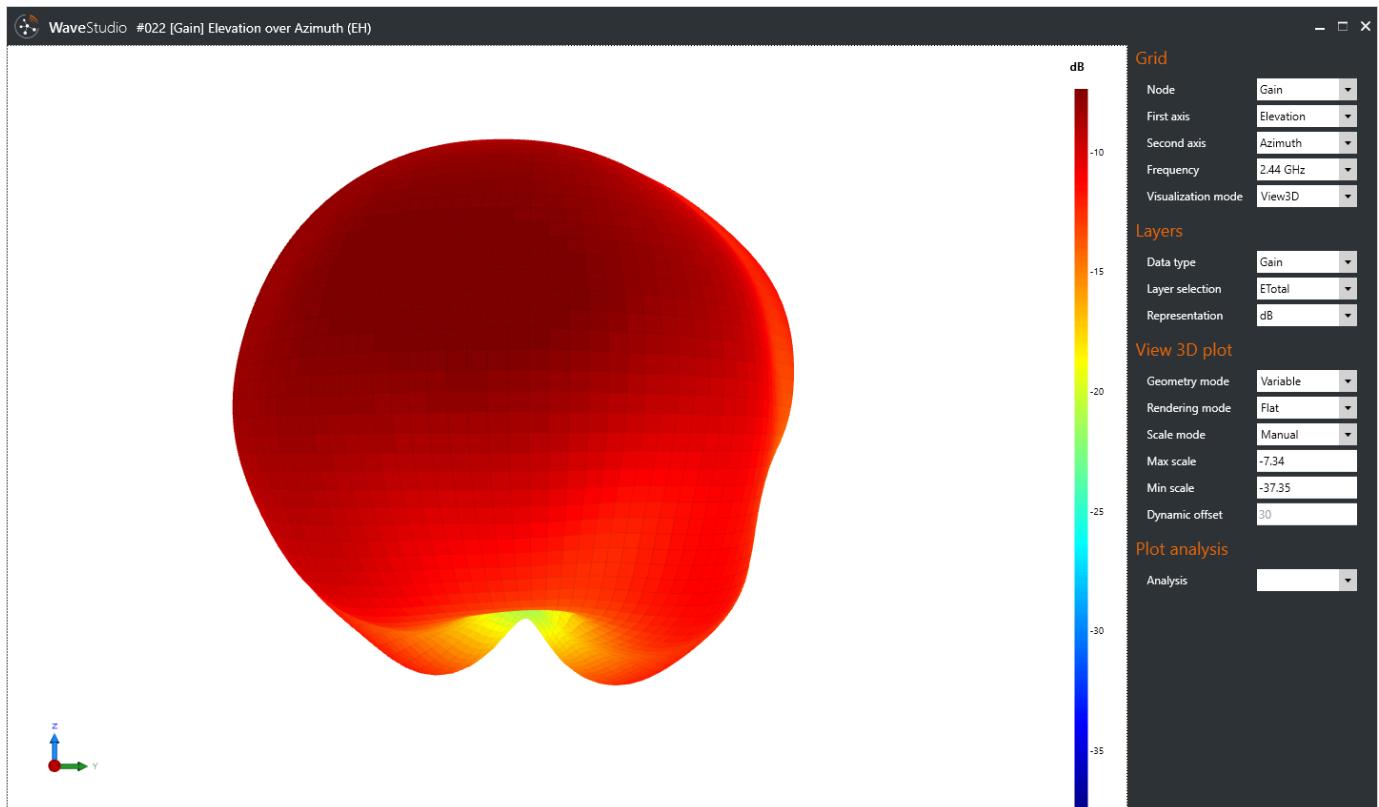
Antenna	Supported band	Type
1	LTE/UMTS LB	PIFA
2	WLAN 2.4GHz/BT GPS WLAN 5GHz UWB CH5, CH9 LTE NTN 255	PIFA

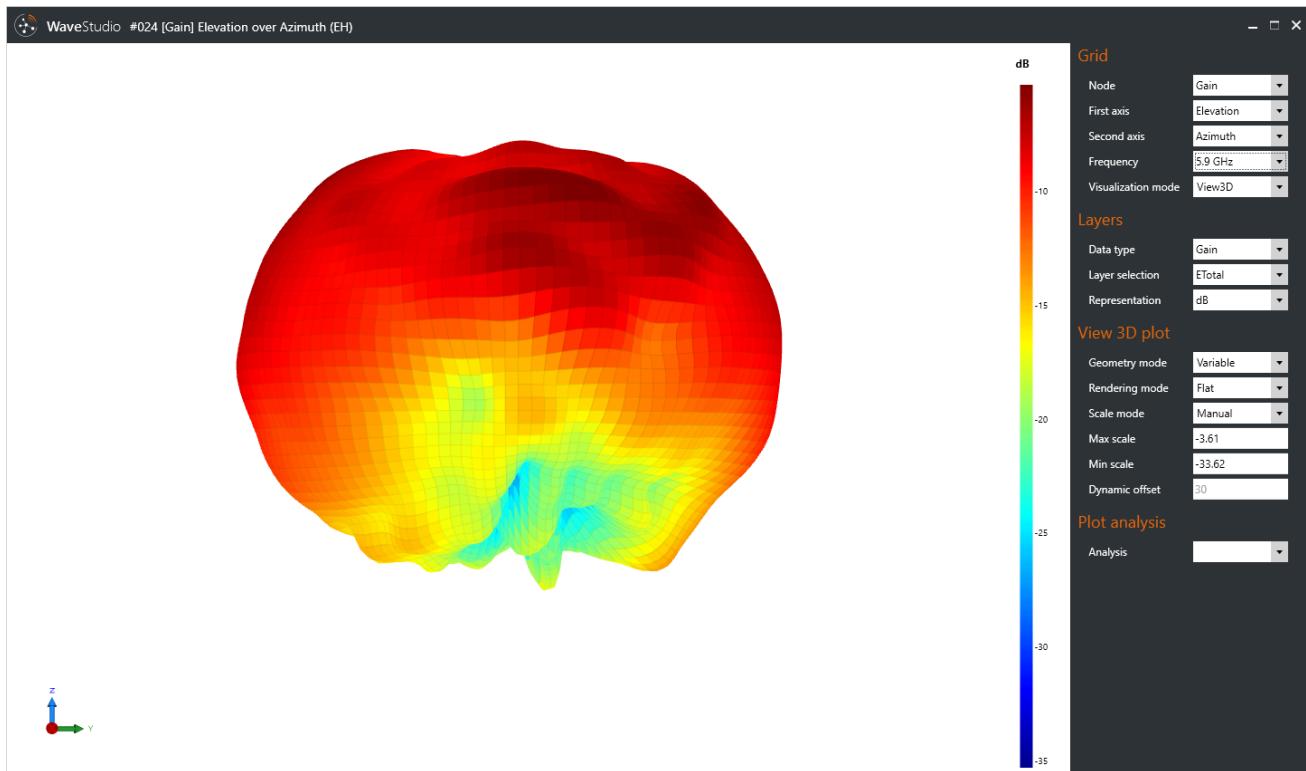
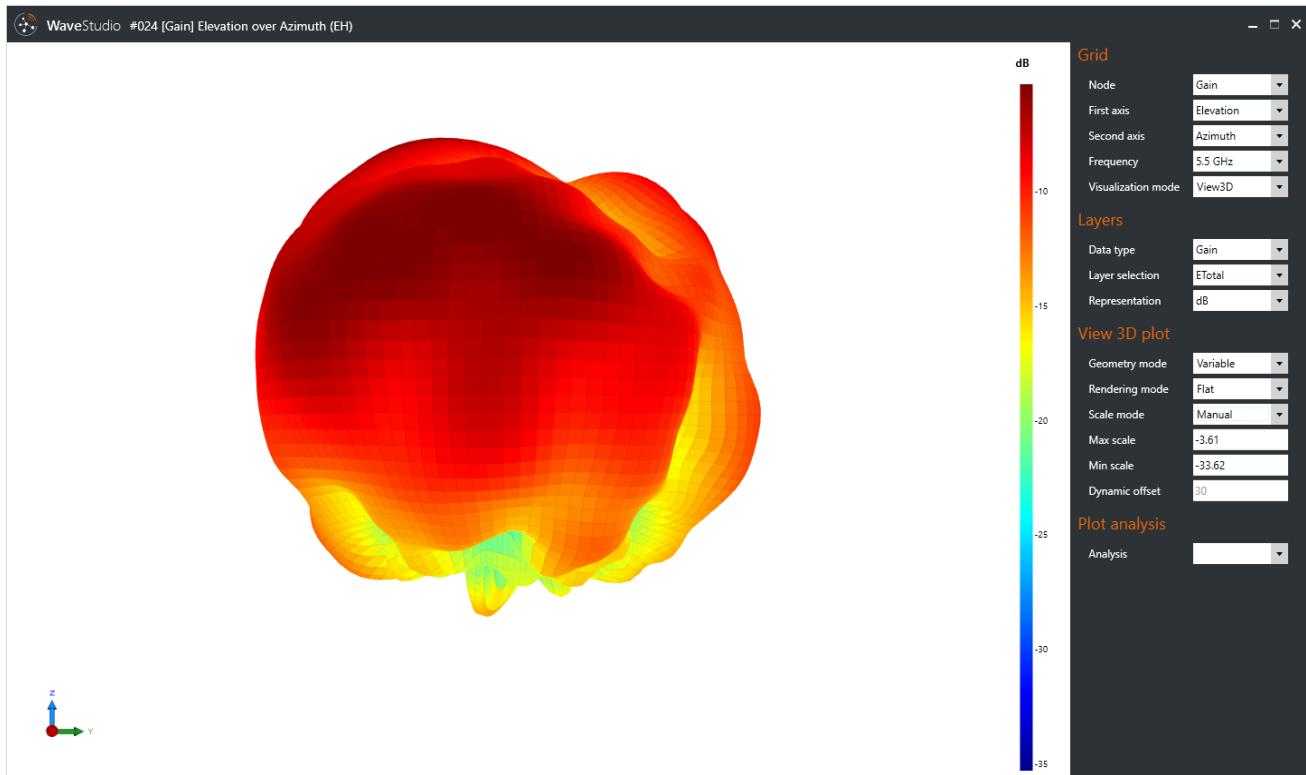
## 6. WLAN/BT/UWB Peak Antenna Gain

Wireless Technology	Band	Frequency ( MHz)	Antenna Gain (dBi)
Wi-Fi/BT/BLE	2G	2400-2483.5	-3.4
	5G UNII-1	5150-5250	-1.4
	5G UNII-2	5250-5730	-1.3
	5G UNII-3	5735-5855	-1.4
	5G UNII-4	5855-5895	-1.2
UWB	CH5	6250-6750	1.8
	CH9	7750-8250	2.8

### Appendix: Radiation Plots

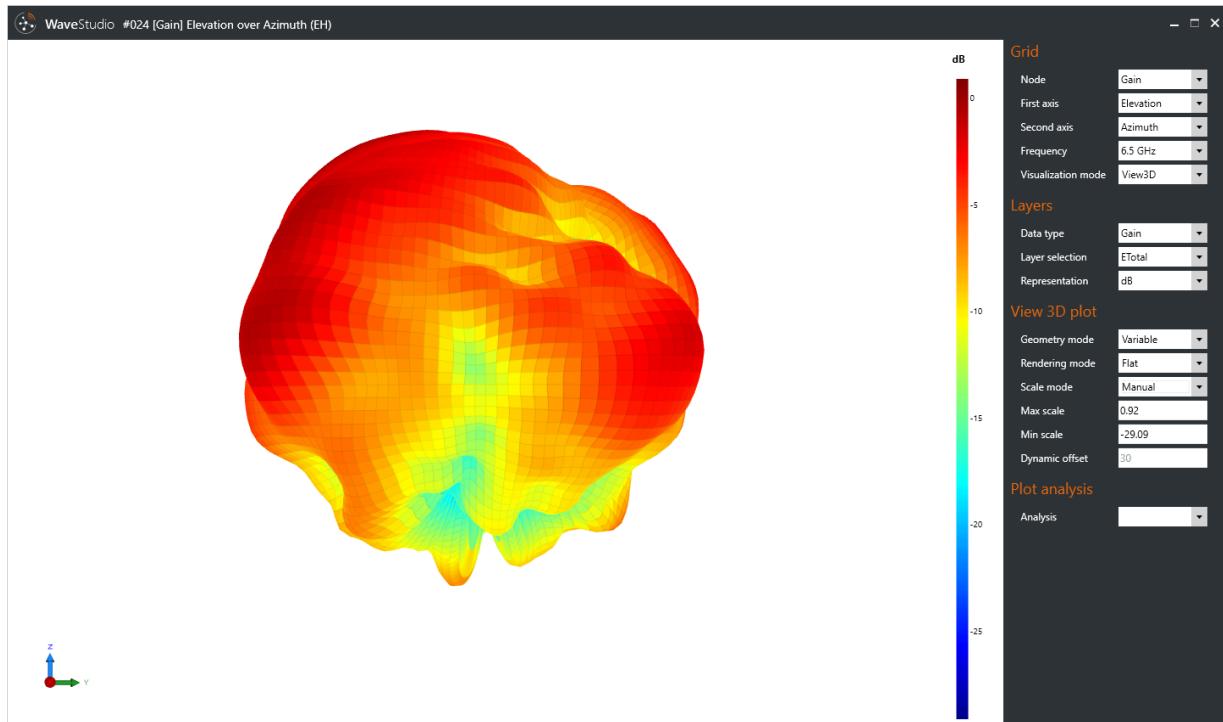
- Wi-Fi, BT/BLE





- UWB

- 6500 MHz ( CH5) :



- 8000 MHz ( CH9):

