

BLE and Wi-Fi Antenna Test Report

Product details:

Report Date: 08/27/2025

Entity / Grantee Name: Ring, LLC

OTA Engineer: Sumitra Dey (Amazon Lab126)

Address: 1100 Enterprise Way, Sunnyvale, CA. 94089

Antenna Specification:

1 x BLE antenna: 2.4 GHz

1 x WIFI Antenna: 2.4 GHz / 5 GHz

Antenna Type:

BLE Antenna: Stamped metal IFA

WIFI Antenna: Stamped metal IFA

Antenna Efficiency and Peak Gain:

BLE antenna	
BLE Frequency Bands (MHz)	Peak Gain (dBi)
2402	3.5
2440	4
2480	4
Wi-Fi Antenna	
Wi-Fi Frequency Bands (MHz)	Peak Gain (dBi)
1 (2412)	3
6 (2437)	3.5
11 (2462)	3.5
36 (5180)	4
48 (5240)	4
100 (5500)	3

144(5720_	4
149 (5745)	4
165 (5825)	4.5

Antenna Gain Measurement:

Measurement Test Method:

Center antenna in chamber phase center with antenna cable through foam block to device, and measure passive antenna performance by VNA and OTA chamber system, and measurement was done at device level.

Test Equipment Used:

Description	Manufacturer	Model	Serial Number	Cal from	Cal Due
Test Chamber	Satimo-MVG	Star Gate 24	ATL541S	Feb 2025	1 year
Vector Network Analyzer	Rohde & Schwarz	ZNB 8	1311.6010K44-102143-Wv	10/16/2024	1 year

Test Setup:

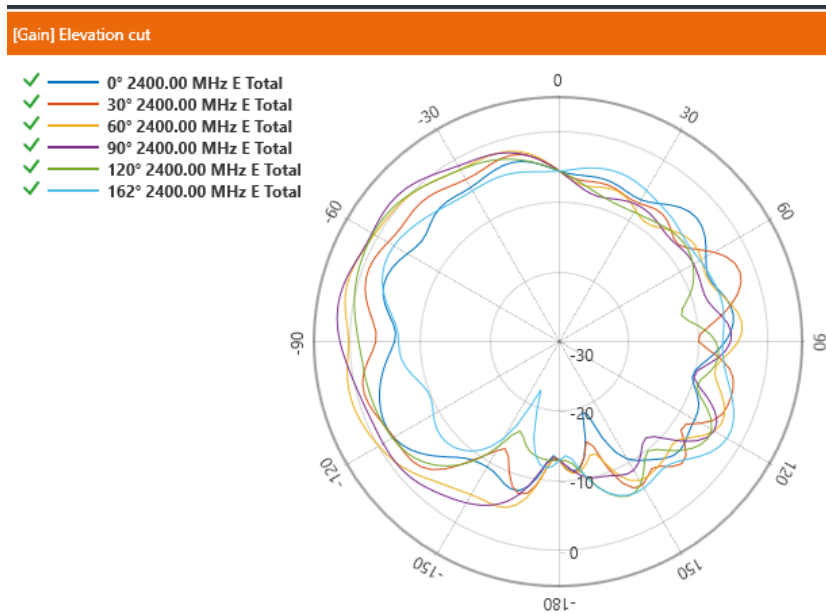
- Below is a block diagram of the antenna measurement setup.

2D Radiation Pattern:

$\phi = 0^\circ \rightarrow$ XZ plane

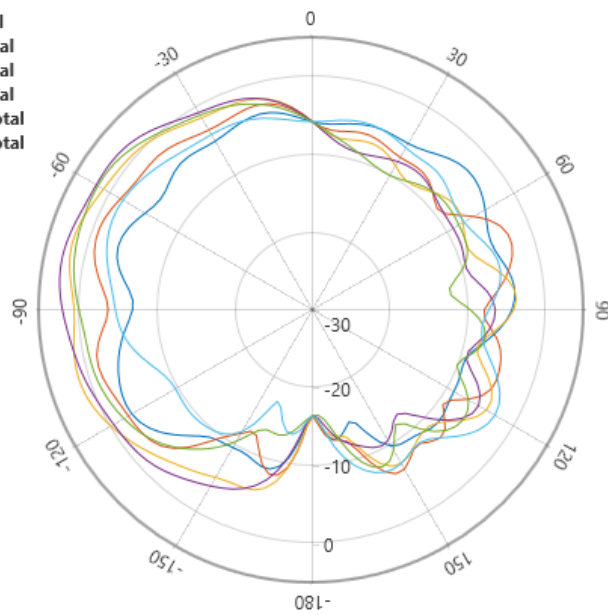
$\phi = 90^\circ \rightarrow$ YZ plane

BLE antenna radiation pattern:



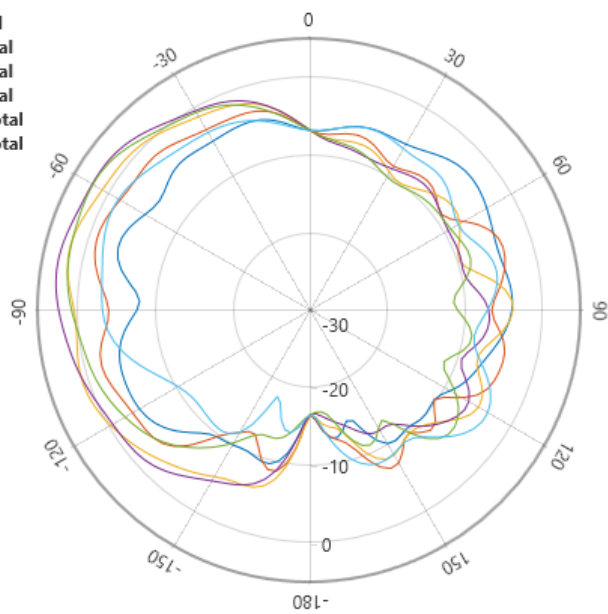
[Gain] Elevation cut

- ✓ 0° 2450.00 MHz E Total
- ✓ 30° 2450.00 MHz E Total
- ✓ 60° 2450.00 MHz E Total
- ✓ 90° 2450.00 MHz E Total
- ✓ 120° 2450.00 MHz E Total
- ✓ 162° 2450.00 MHz E Total



[Gain] Elevation cut

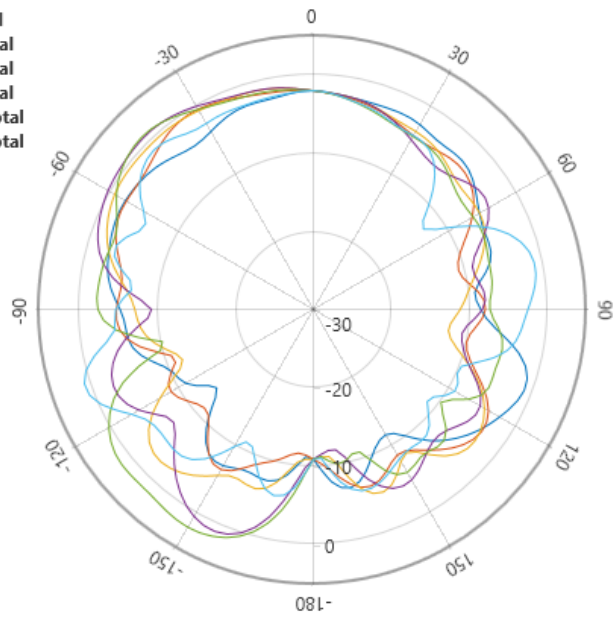
- ✓ 0° 2480.00 MHz E Total
- ✓ 30° 2480.00 MHz E Total
- ✓ 60° 2480.00 MHz E Total
- ✓ 90° 2480.00 MHz E Total
- ✓ 120° 2480.00 MHz E Total
- ✓ 162° 2480.00 MHz E Total



Wi-Fi antenna radiation pattern:

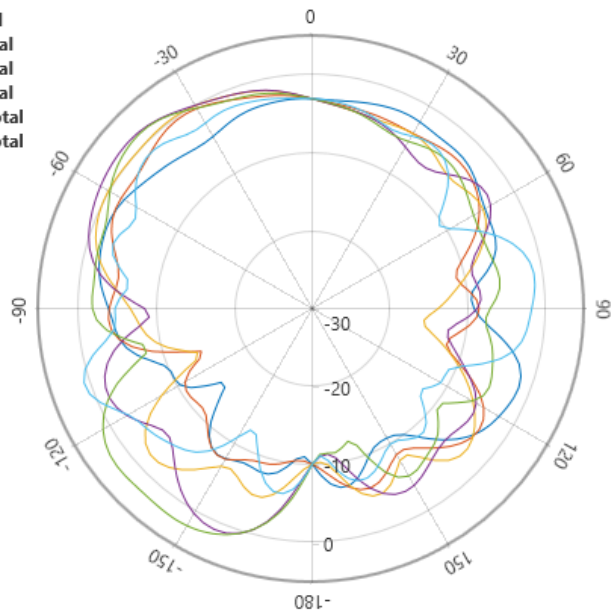
[Gain] Elevation cut

- ✓ 0° 2400.00 MHz E Total
- ✓ 30° 2400.00 MHz E Total
- ✓ 60° 2400.00 MHz E Total
- ✓ 90° 2400.00 MHz E Total
- ✓ 120° 2400.00 MHz E Total
- ✓ 162° 2400.00 MHz E Total



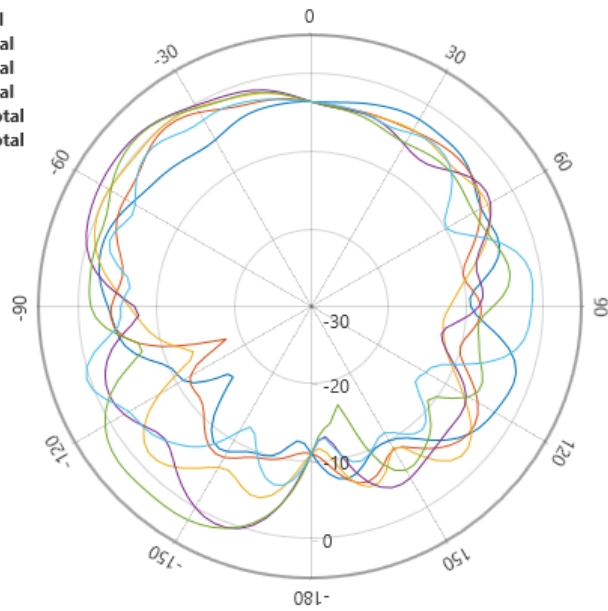
[Gain] Elevation cut

- ✓ 0° 2450.00 MHz E Total
- ✓ 30° 2450.00 MHz E Total
- ✓ 60° 2450.00 MHz E Total
- ✓ 90° 2450.00 MHz E Total
- ✓ 120° 2450.00 MHz E Total
- ✓ 162° 2450.00 MHz E Total



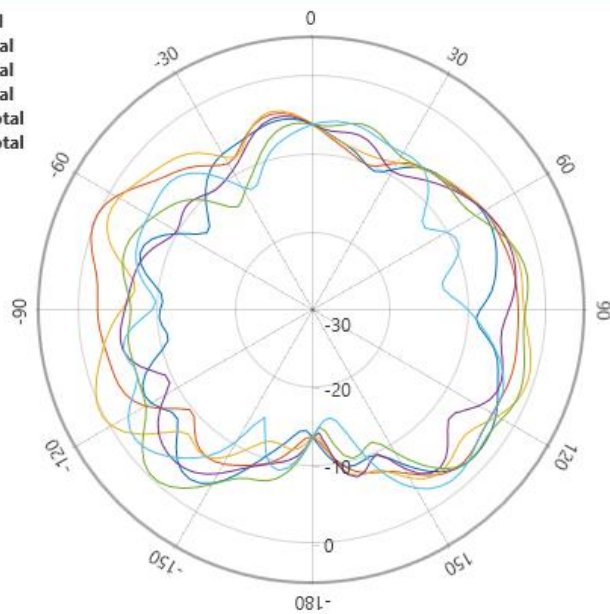
[Gain] Elevation cut

- ✓ 0° 2480.00 MHz E Total
- ✓ 30° 2480.00 MHz E Total
- ✓ 60° 2480.00 MHz E Total
- ✓ 90° 2480.00 MHz E Total
- ✓ 120° 2480.00 MHz E Total
- ✓ 162° 2480.00 MHz E Total



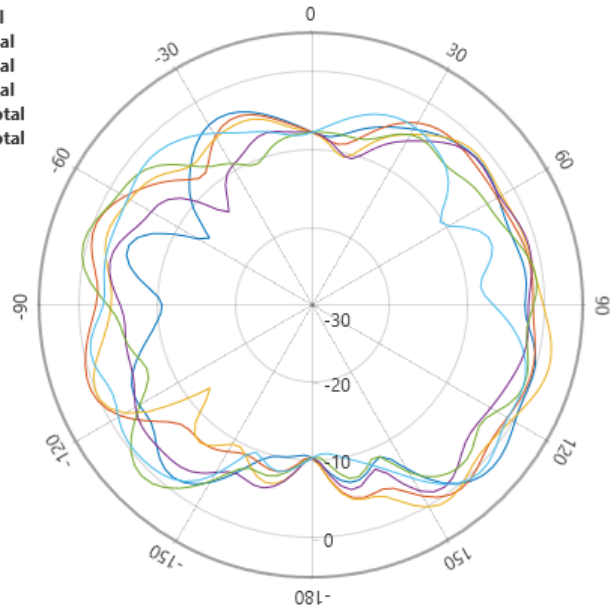
[Gain] Elevation cut

- ✓ 0° 5181.00 MHz E Total
- ✓ 30° 5181.00 MHz E Total
- ✓ 60° 5181.00 MHz E Total
- ✓ 90° 5181.00 MHz E Total
- ✓ 120° 5181.00 MHz E Total
- ✓ 162° 5181.00 MHz E Total



[Gain] Elevation cut

- ✓ 0° 5501.00 MHz E Total
- ✓ 30° 5501.00 MHz E Total
- ✓ 60° 5501.00 MHz E Total
- ✓ 90° 5501.00 MHz E Total
- ✓ 120° 5501.00 MHz E Total
- ✓ 162° 5501.00 MHz E Total



[Gain] Elevation cut

- ✓ 0° 5801.00 MHz E Total
- ✓ 30° 5801.00 MHz E Total
- ✓ 60° 5801.00 MHz E Total
- ✓ 90° 5801.00 MHz E Total
- ✓ 120° 5801.00 MHz E Total
- ✓ 162° 5801.00 MHz E Total

