

# Test Report for Antenna Specifications for 5F99F2

## Product details:

FCC-ID: 2AEUPBHART011

ID: 20271-BHART011

Product Model Number: 5F99F2

Entity / Grantee Name: Ring, LLC

**Test Site Name:** Sunnyvale, SJC11

**Test Date:** 05/01/2024

**Test Engineer Name in the report:** Yohannes Samuel / Sumitra Dey

## Antenna Specification:

### Operating Frequency Range:

BLE antenna: 2.4 GHz – 2.48 GHz

WIFI Antenna: 2.4 GHz – 2.48 GHz

### Antenna Type:

BLE antenna: Meandered Loop antenna, which is a trace antenna on MLB Bottom layer

WIFI Antenna: Inverted F antenna (IFA), which is a trace antenna on MLB Top layer

### Peak Antenna Gain:

Band	Peak Gain (dBi)	
	BLE antenna	WIFI antenna
2.4 GHz (2400-2480 MHz)	2.5	2.0

## Antenna Gain Measurement:

### Measurement Test Method:

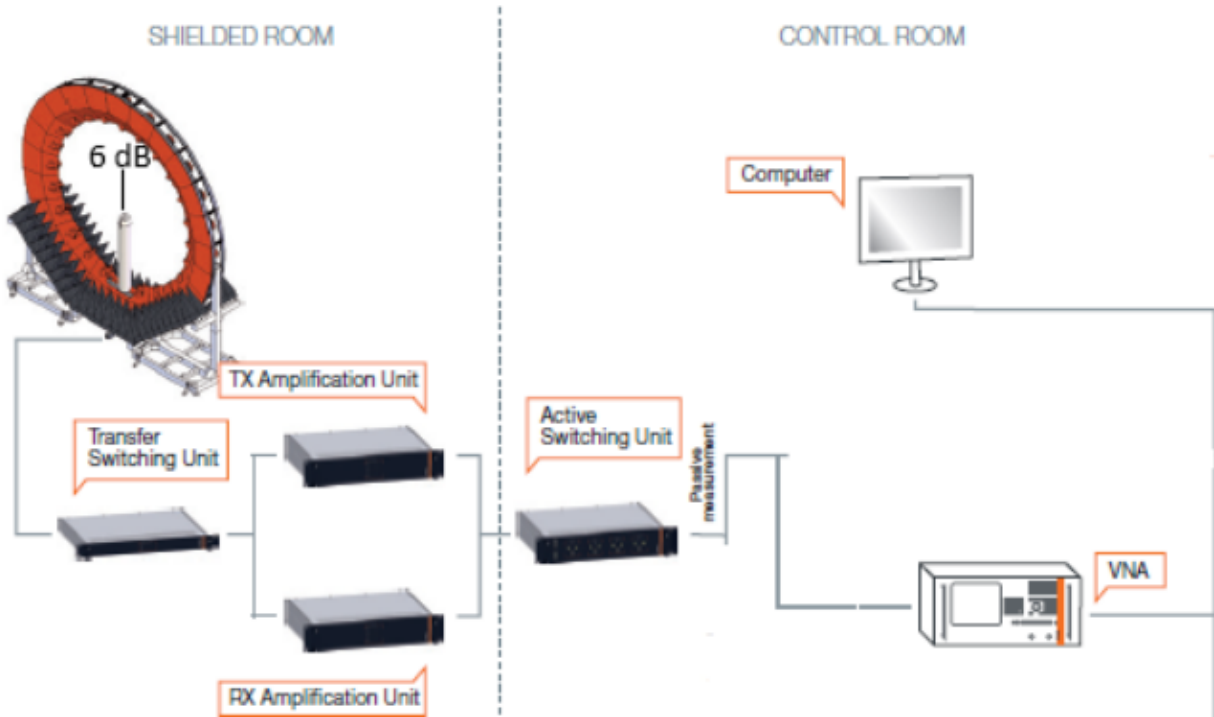
Solder pigtailed on feeding point of antennas and measure passive antenna performance by VNA and OTA chamber system, and the measurement was done in device level.

**Test Equipment Used:**

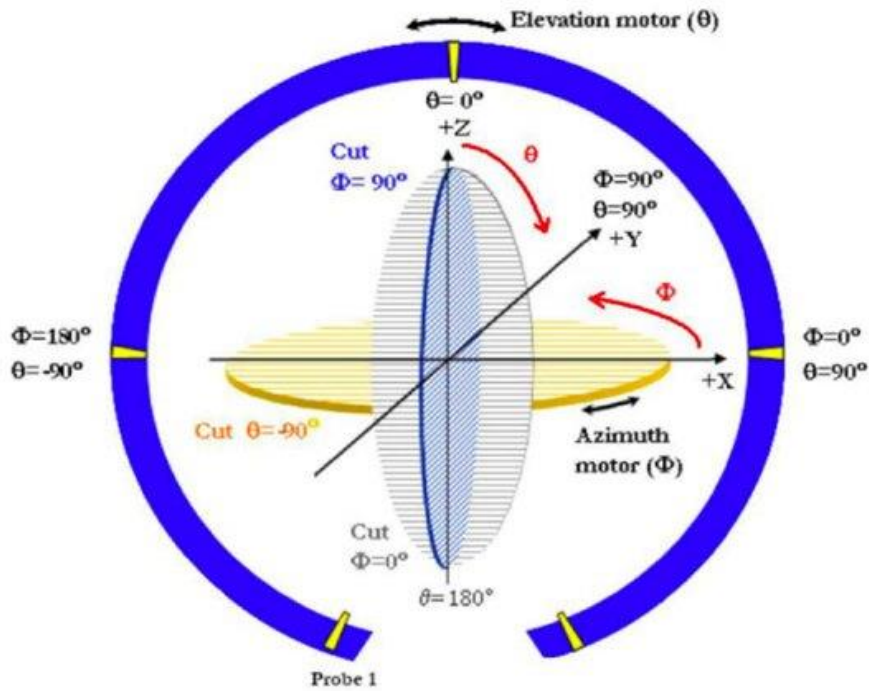
Description	Manufacturer	Model	Serial Number	Cal from	Cal Due
Test Chamber	Satimo-MVG	Star Gate 24	ATL541S	Aug 2023	
Vector Network Analyzer	Rohde & Schwarz	ZNB 8	1311.6010K44-102143-Wv	10/31/2023	1 year

**Test Setup:**

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



## 2. Turn table angle definition



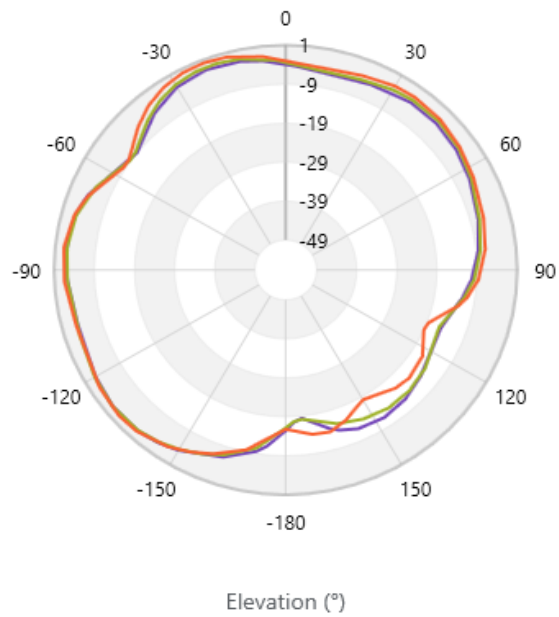
### 2D Radiation Pattern:

BLE antenna radiation pattern:

Azimuth = 0 deg

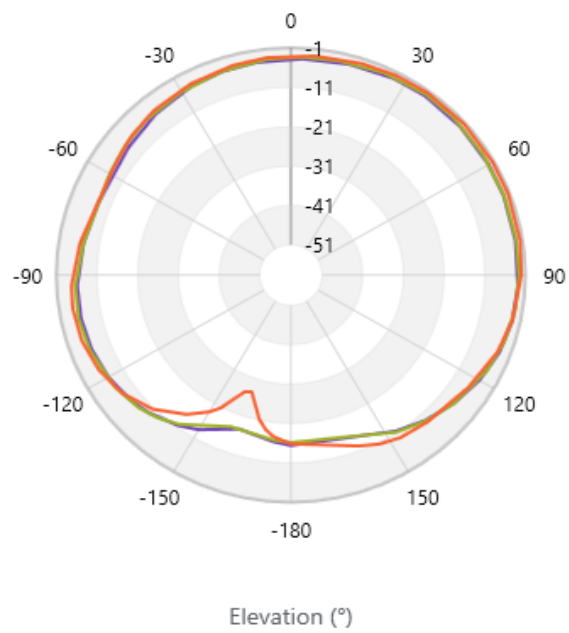
XZ plane

- 0° 2400.00 MHz ETotal
- 0° 2420.00 MHz ETotal
- 0° 2480.00 MHz ETotal



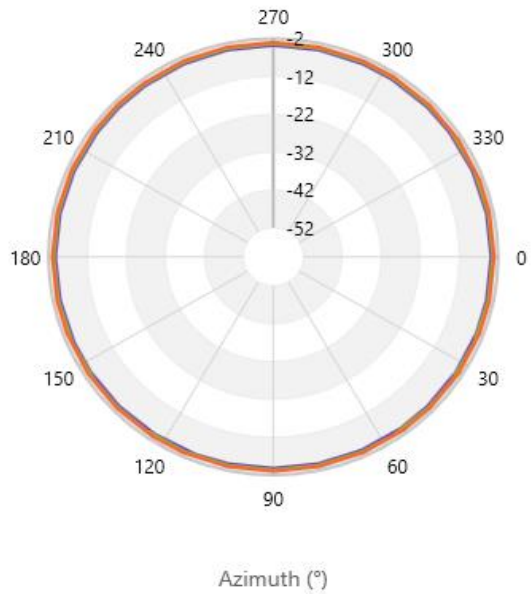
**Azimuth = 90 deg**  
YZ plane

- 90° 2400.00 MHz ETotal
- 90° 2420.00 MHz ETotal
- 90° 2480.00 MHz ETotal



**Elevation = 0 deg**  
XY plane

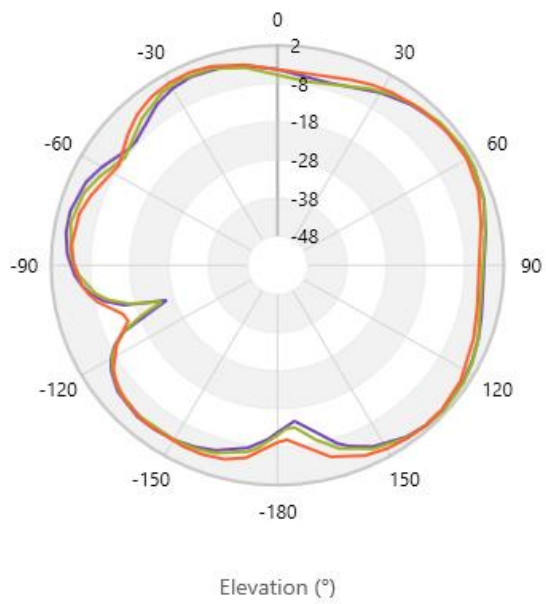
- 0° 2400.00 MHz ETotal
- 0° 2420.00 MHz ETotal
- 0° 2480.00 MHz ETotal



**WIFI antenna radiation pattern:**

**Azimuth = 0 deg**  
XZ plane

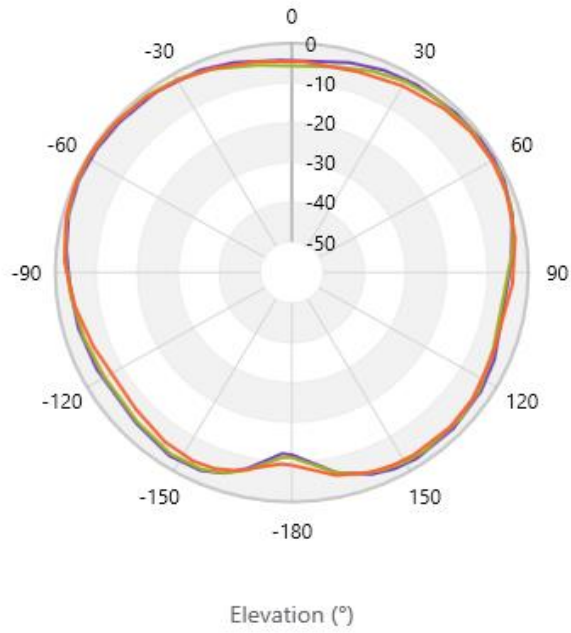
- 0° 2400.00 MHz ETotal
- 0° 2420.00 MHz ETotal
- 0° 2480.00 MHz ETotal



**Azimuth = 90 deg**

YZ plane

- 90° 2400.00 MHz ETotal
- 90° 2420.00 MHz ETotal
- 90° 2480.00 MHz ETotal



**Elevation = 0 deg**

XY plane

- 0° 2400.00 MHz ETotal
- 0° 2420.00 MHz ETotal
- 0° 2480.00 MHz ETotal

