

# G Series RIC R Antenna Description

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## 2.4 GHz Bluetooth antenna

The Bluetooth 2.4 GHz antenna is a bowtie (butterfly).

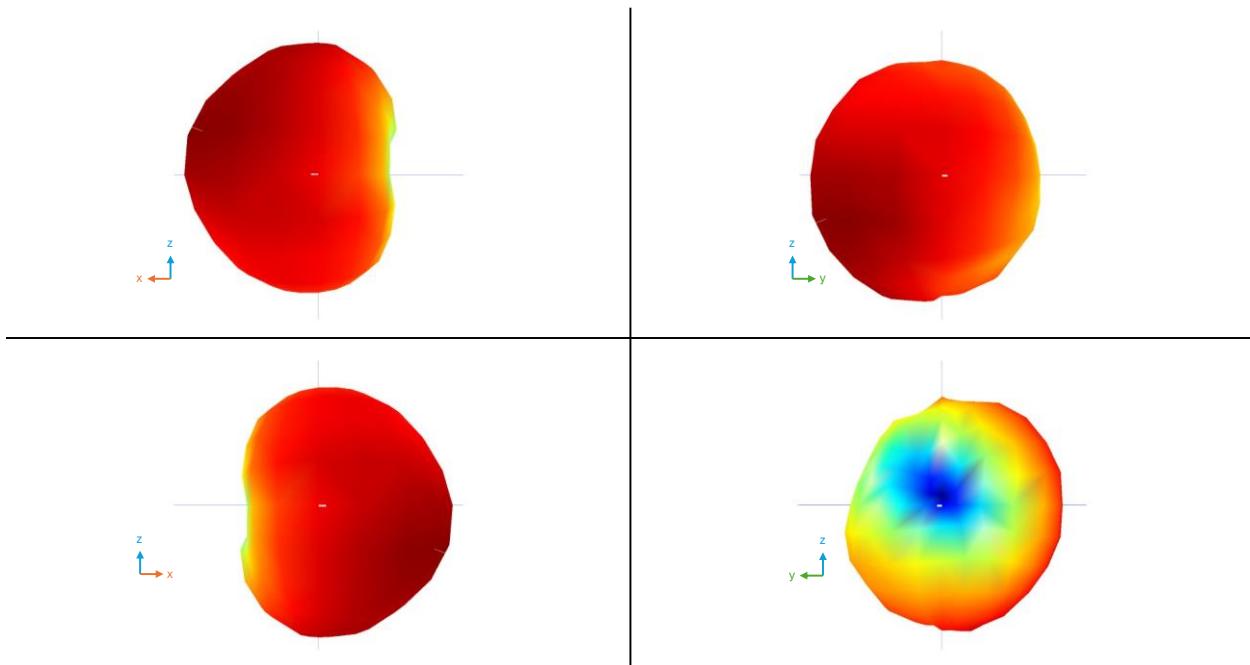
The peak gain of the antenna in the assembled DUT is nominally -6 dBi (see calculations on page 6).

Date of antenna pattern measurement: May 15, 2025

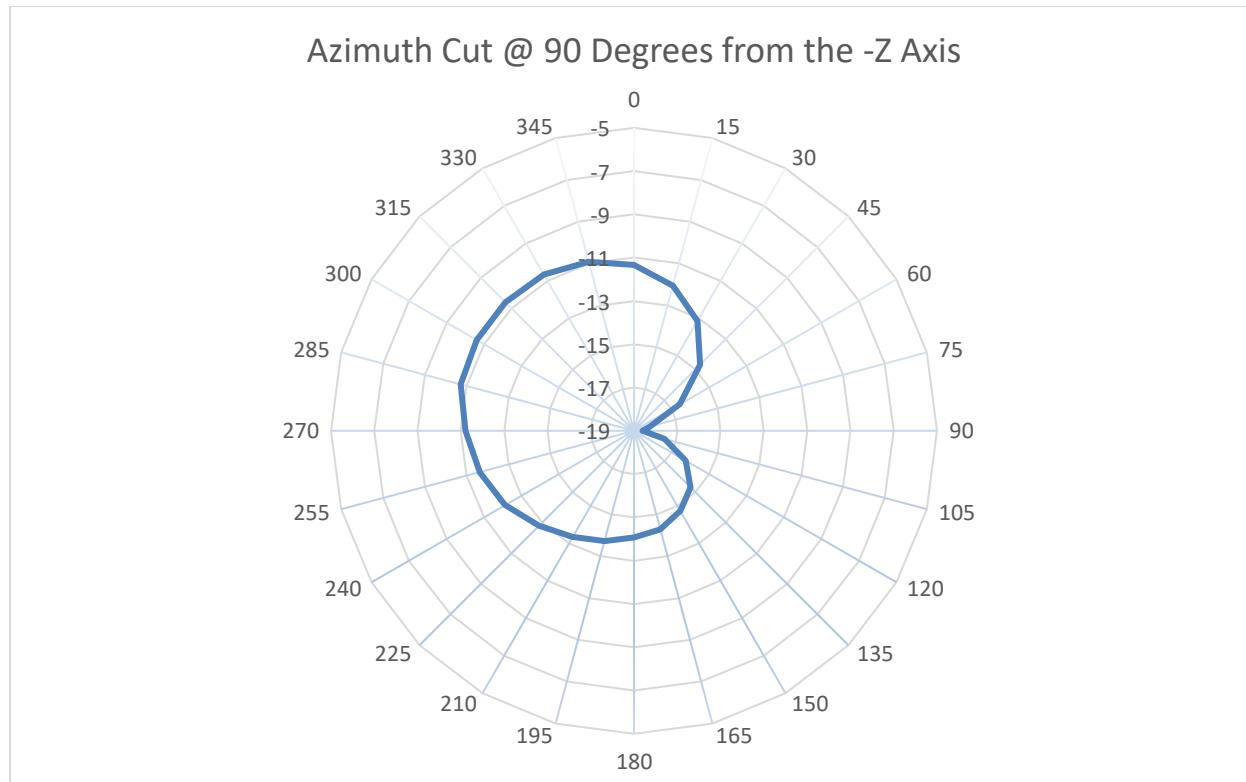
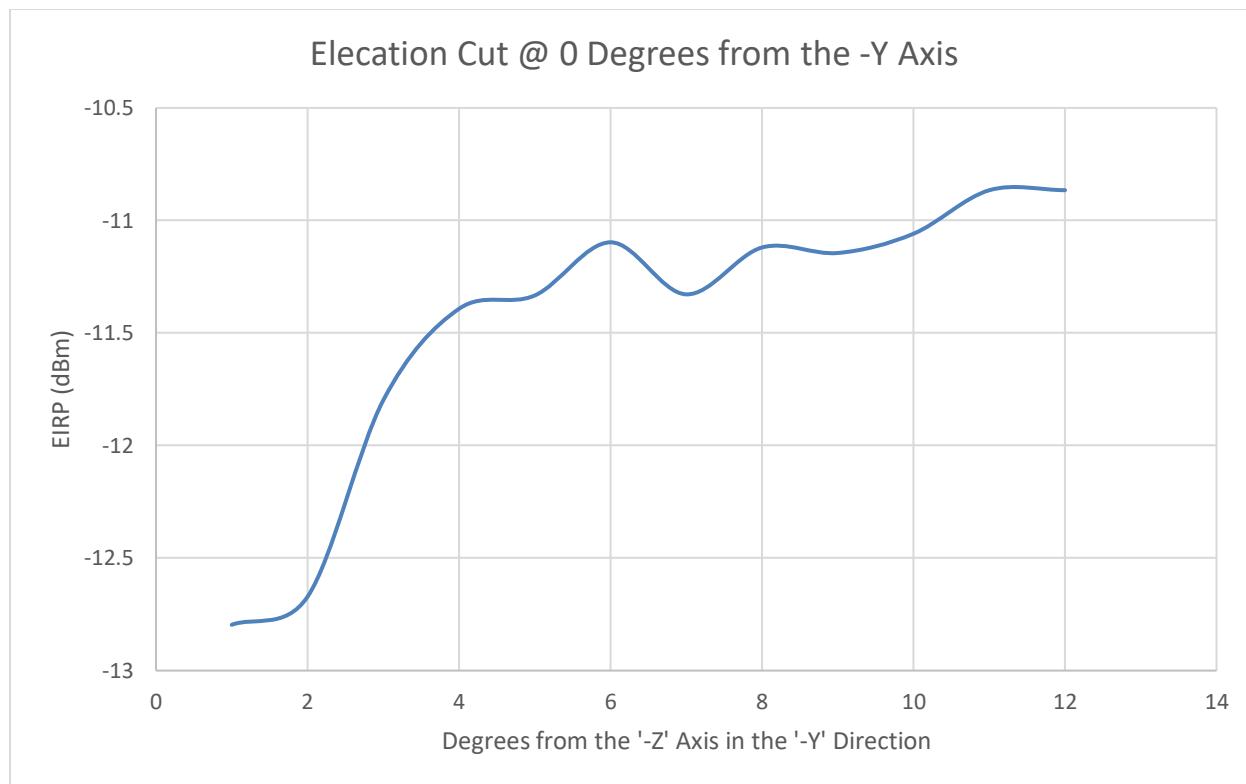


**Figure 1**      **2.4 GHz Antenna (scale in mm)**

Three-dimensional pattern



**Figure 2a** 3-Dimensional Antenna Pattern at 2440 MHz



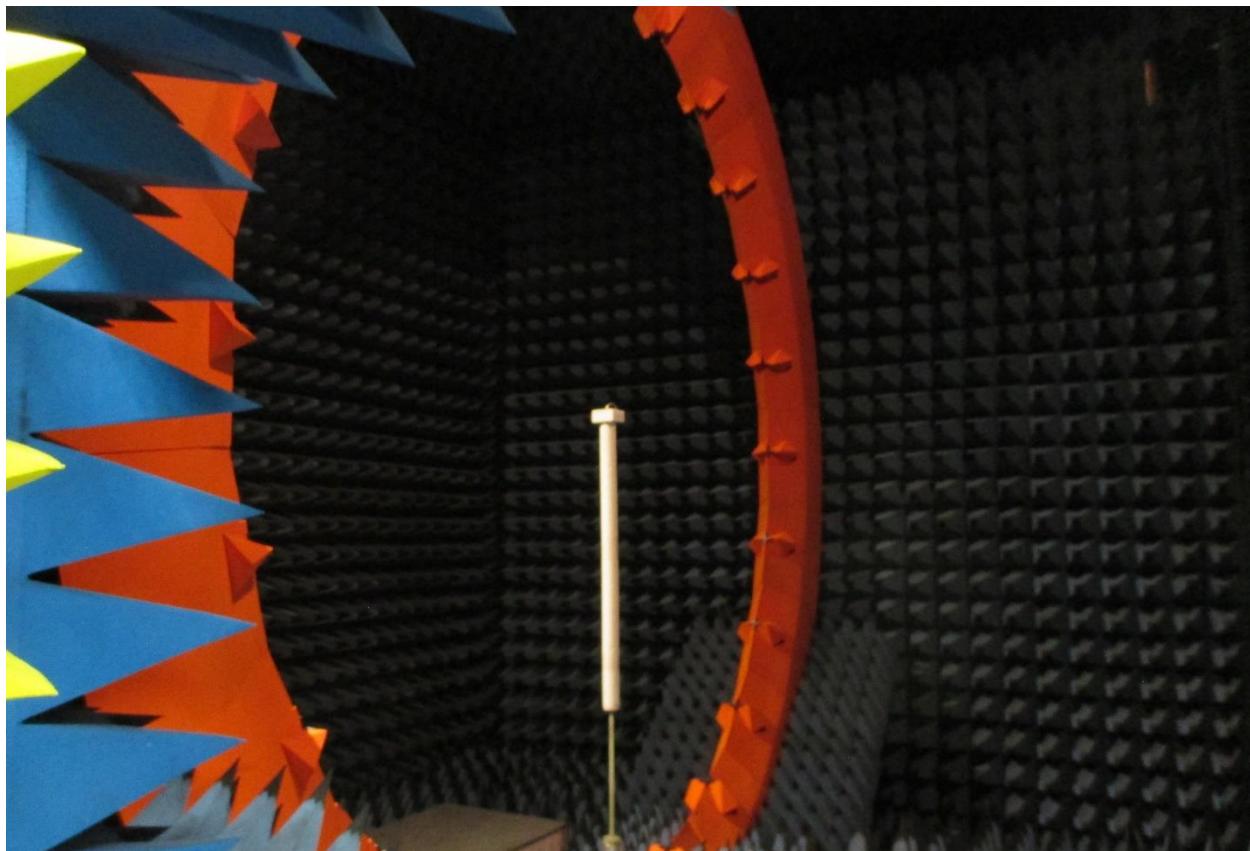
**Figure 2b** Hearing Aid Antenna Elevation and Azimuth Cuts at 2440 MHz

## Antenna Pattern Measurement Information

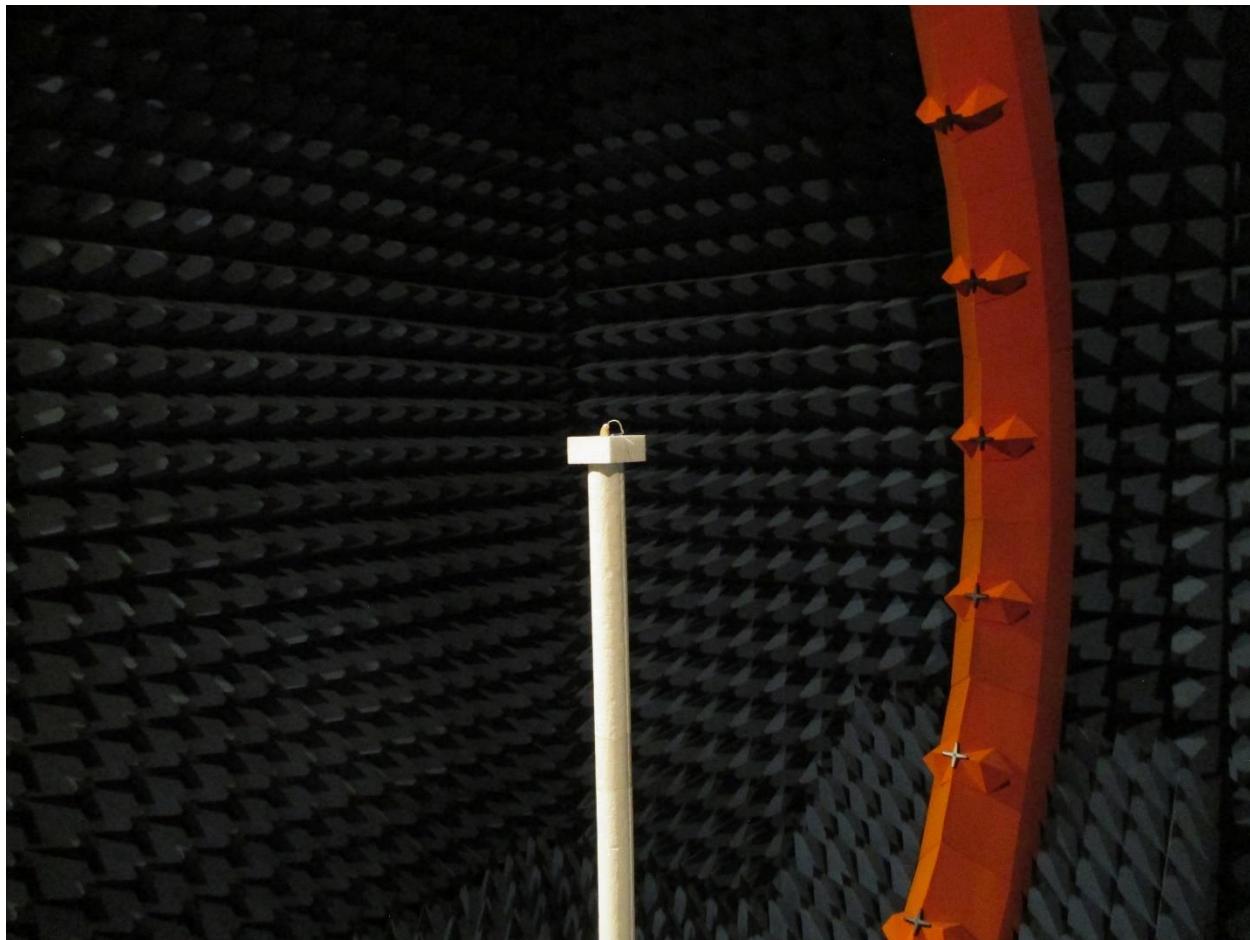
The antenna patterns shown in Figures 2a were measured using a MVG SG24L antenna test system, serial number ATL3843S located at Starkey Laboratories, Inc., 6600 Washington Avenue, South, Eden Prairie, MN 55344. The system was calibrated on October 14, 2024, and due for calibration in March 30, 2026.

Signal levels were measured using a Keysight N9020B MXA Signal Analyzer (Spectrum Analyzer), serial number MY63470227, calibrated on May 04, 2023 and due for calibration on May 04, 2025.

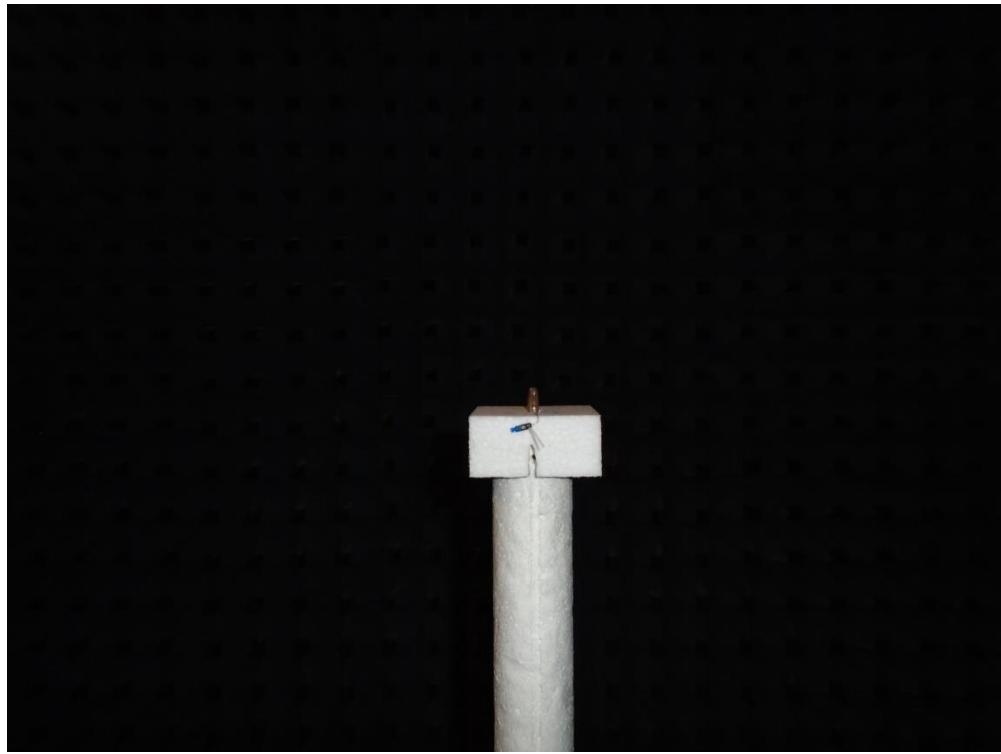
The antenna pattern plots in Figures 2 are generated by the SG24L test system software.



**Figure 3a** Overall view of SG24L test chamber, showing ring of receiving antennas



**Figure 3b**      **Test stand in SG24L test chamber**



**Figure 3c      close-up of unit under test in test chamber**

### Antenna Gain Measurement Information

The MVG SG24L antenna test system runs internal scripts that yield the maximum EIRP from each radiated power measurement. From there, the following equation could be used to calculate the antenna gain in dBi.

$$\text{Max Antenna Gain} = \text{Max EIRP} - \text{Power at antenna pads}$$

Where,

$$\begin{aligned}\text{Power at antenna pads} &= \text{BLE Chipset Power Setting} - \text{PCB Insertion Loss} \\ &= 4\text{dBm} - 3\text{dB} \\ &= 1\text{dBm}\end{aligned}$$

And,

$$\text{Max EIRP} = -8\text{dBm}$$

Subtracting the power at the antenna pads from the EIRP value yields the antenna gain as follows:

- Max Antenna Gain =  $-5\text{dBm} - (4\text{dBm} - 3\text{dB}) = \underline{-6 \text{ dBi}}$