G Series RIC 312 Antenna Description

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: March 13, 2025

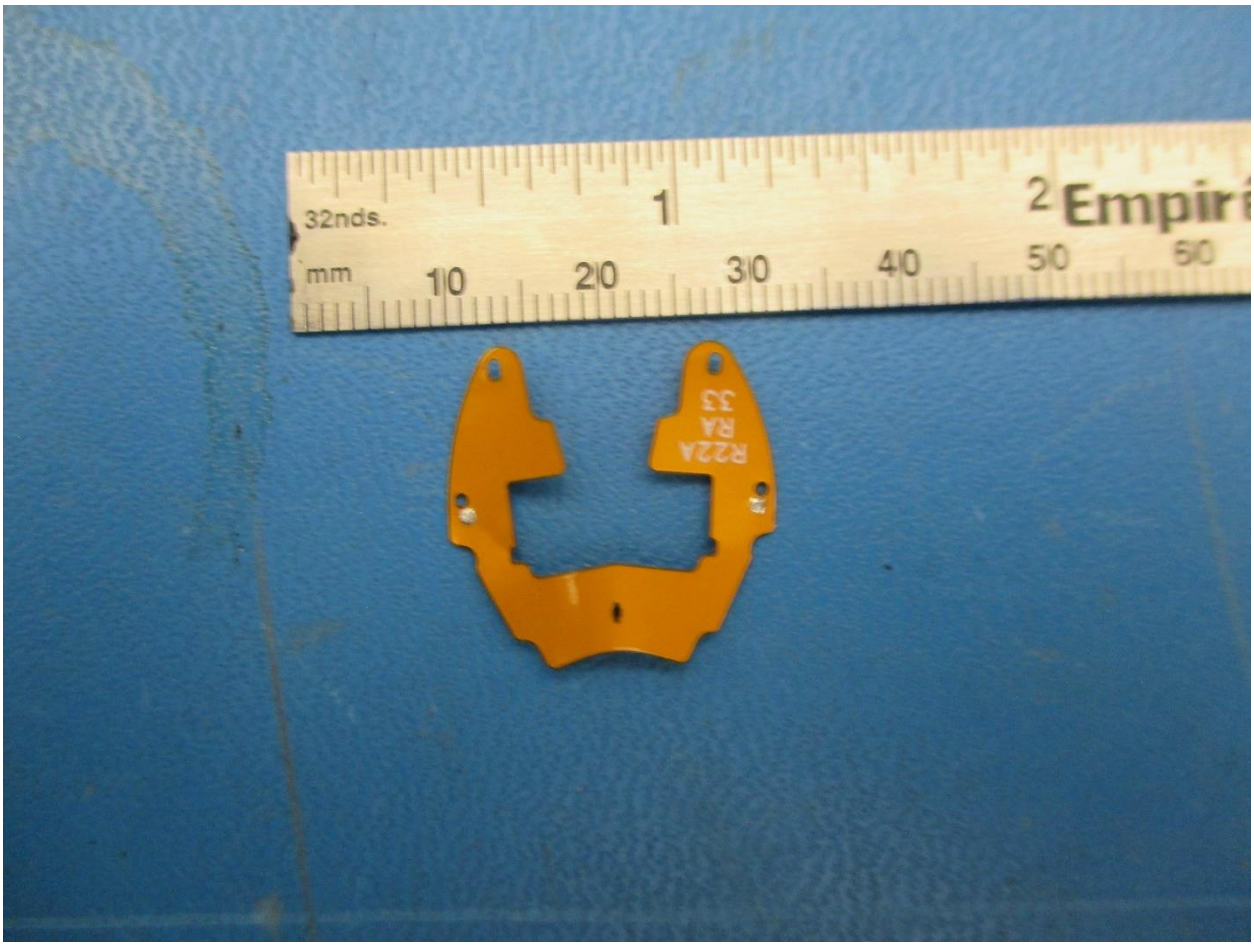


Figure 1 2.4 GHz Antenna (scale in mm)

Three-dimensional pattern

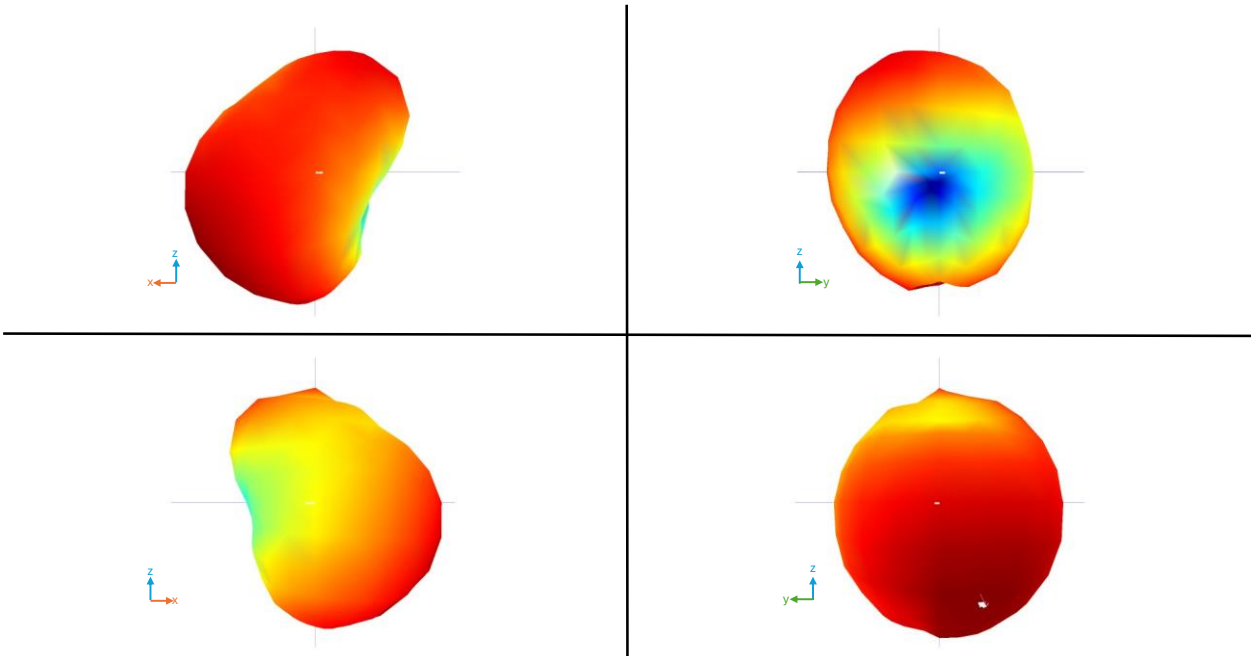
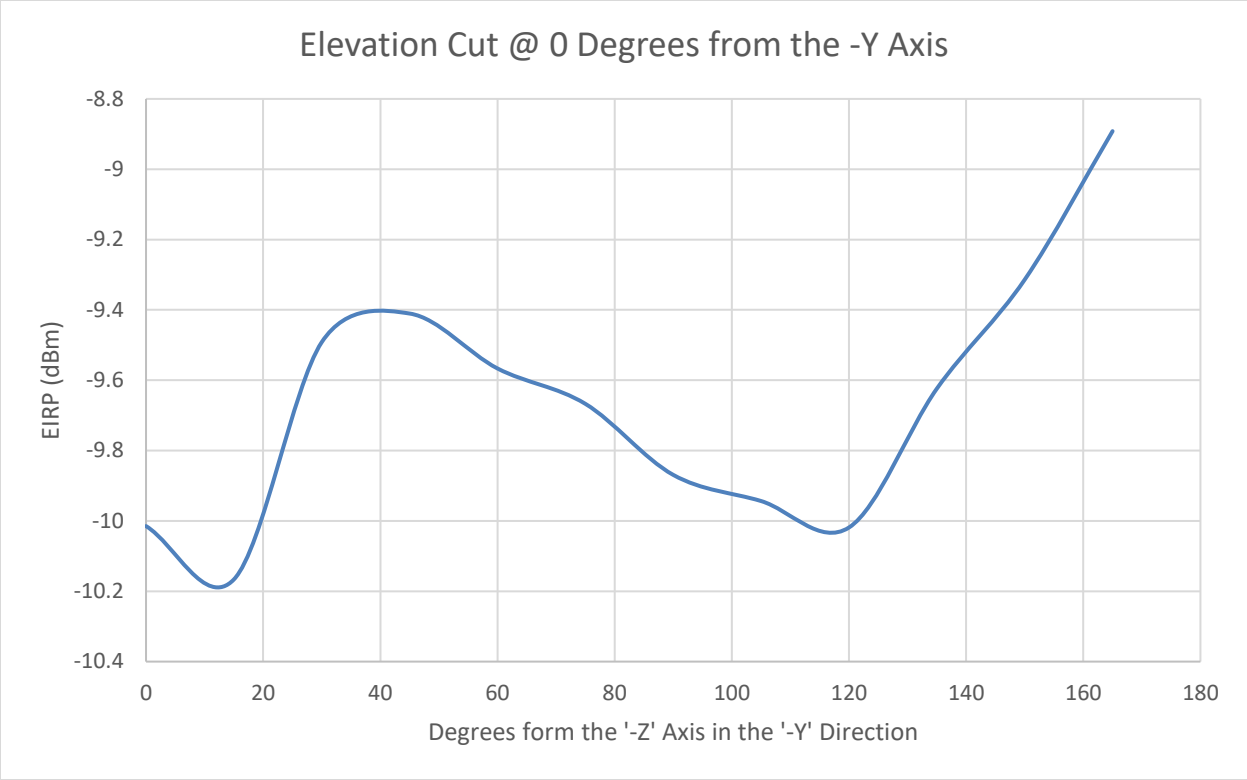


Figure 2a 3-Dimensional Antenna Pattern at 2440 MHz



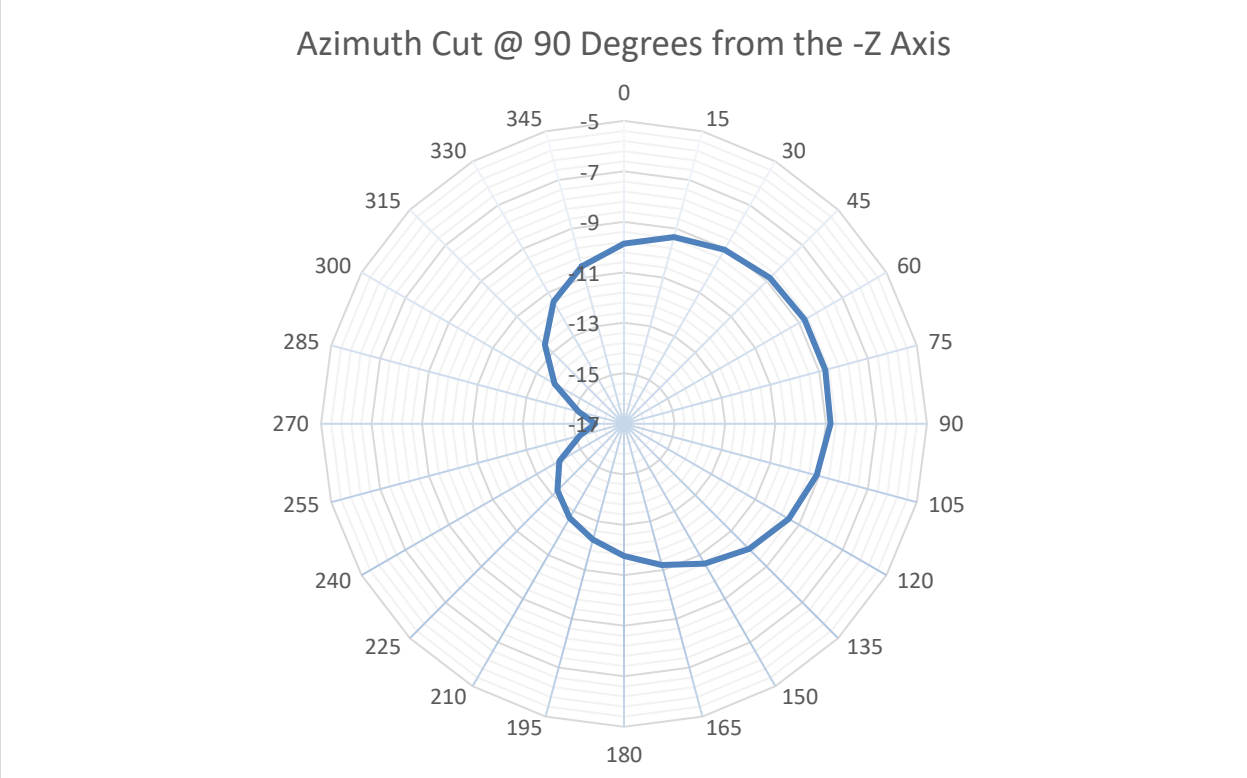


Figure 2b Hearing Aid Antenna Elevation and Azimuth Cuts at 2440 MHz

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.

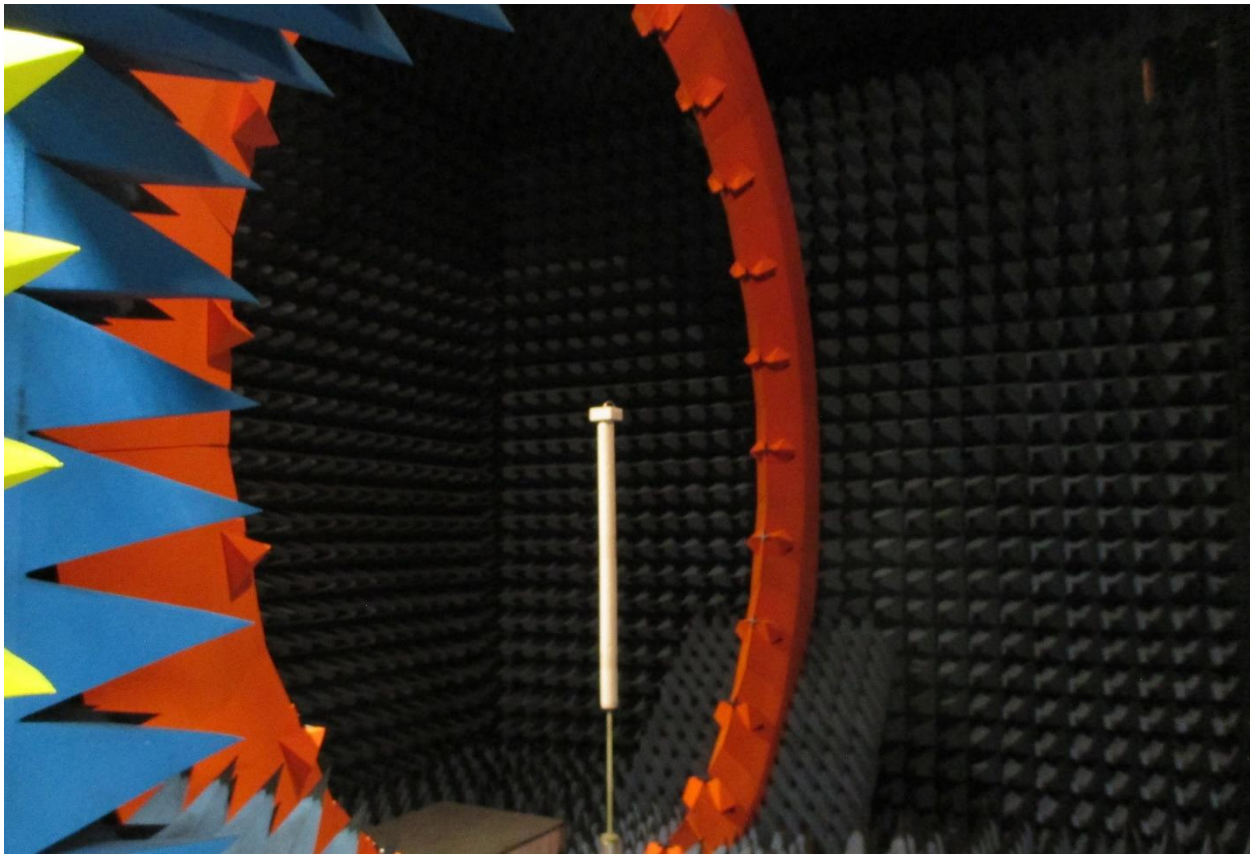


Figure 3a Overall view of SG24L test chamber, showing ring of receiving antennas

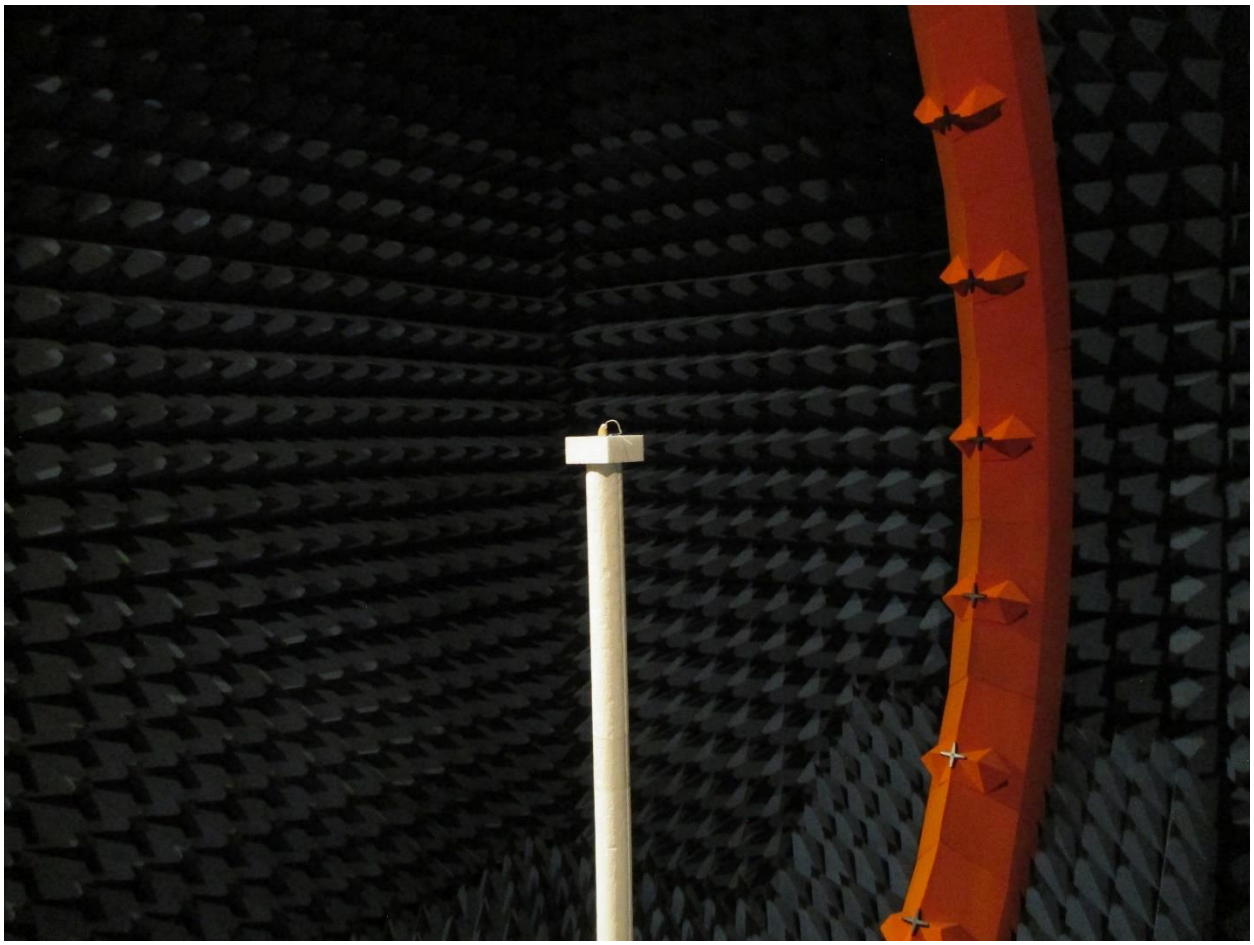


Figure 3b Test stand in SG24L test chamber

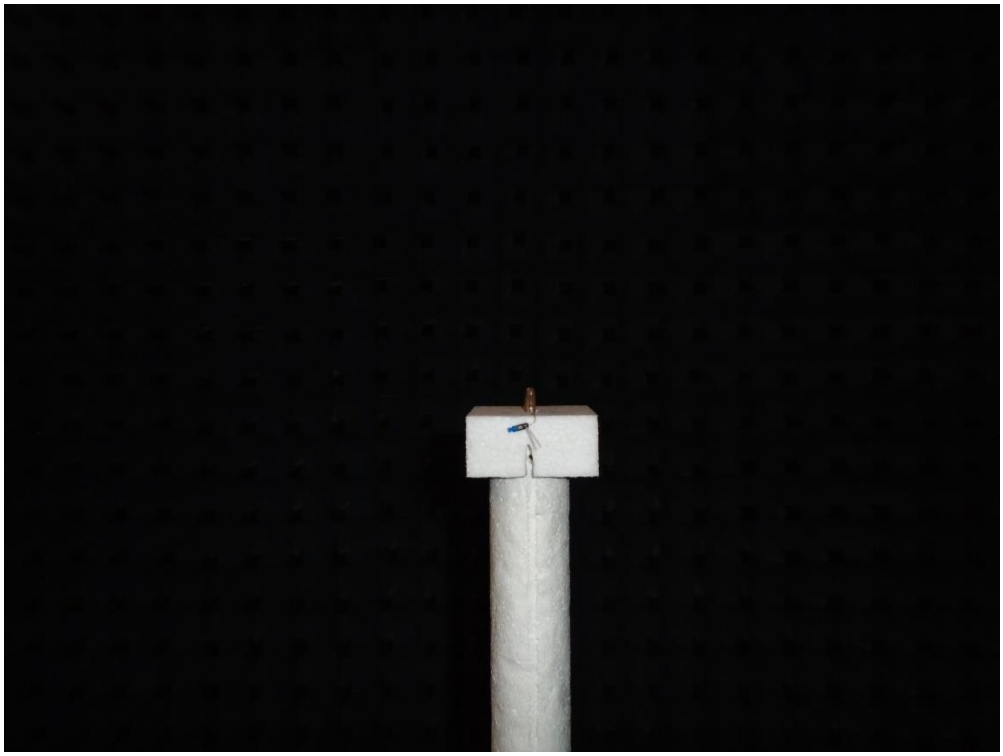


Figure 3c close-up of unit under test in test chamber

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.

Max Antenna Gain = Max EIRP – Power at antenna pads

Where,

Power at antenna pads = BLE Chipset Power Setting – PCB Insertion Loss

= 6dBm – 8dB

= -2dBm

And,

Max EIRP = -8dBm

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

- Max Antenna Gain = -8dBm – (6dBm – 8dB) = -6 dBi