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ACU6 Lite 105560001 - Internal Antenna Specification	ACTIA Group	U - Uncontrolled	1.1	1.2 Released

ACU6 Lite 105560001 - Internal Antenna Specification



Revision history

Table 1 Revision history

Rev	Date	Author(s)	Updates
0.1	2022-12-02	Felix Björk	Document creation
1.0	2022-12-05	Felix Björk	Document release
1.1	2023-04-11		Removed LTE chapter
1.2	2023-04-11		Table updated
1.3	2023-04-11		Watermark removed

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1 INTRODUCTION

1.1 PURPOSE

This document, along with referenced documents, defines the overall individual specifications of the internal antennas present in ACU6 Lite.

1.2 TARGET GROUP

This document should be read by anyone, involved in, or affected by the characteristics of the internal antennas.

1.3 MEASUREMENT SETUP

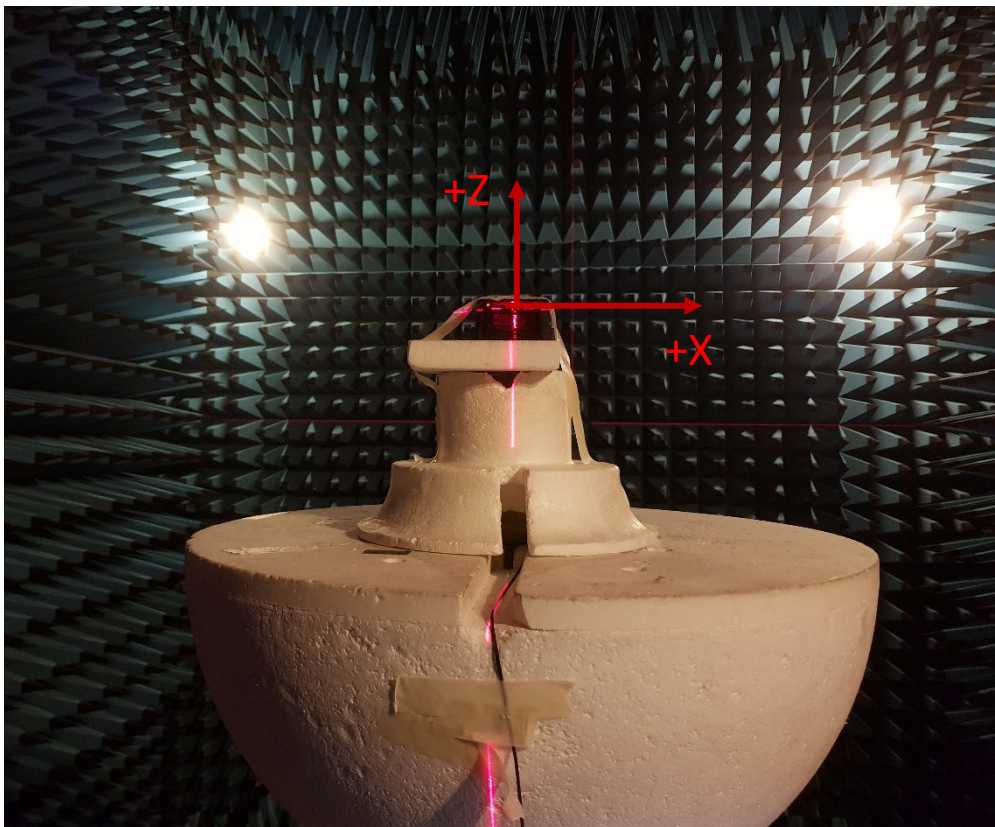


Figure 1 - Picture of DUT in measurement chamber, back side view

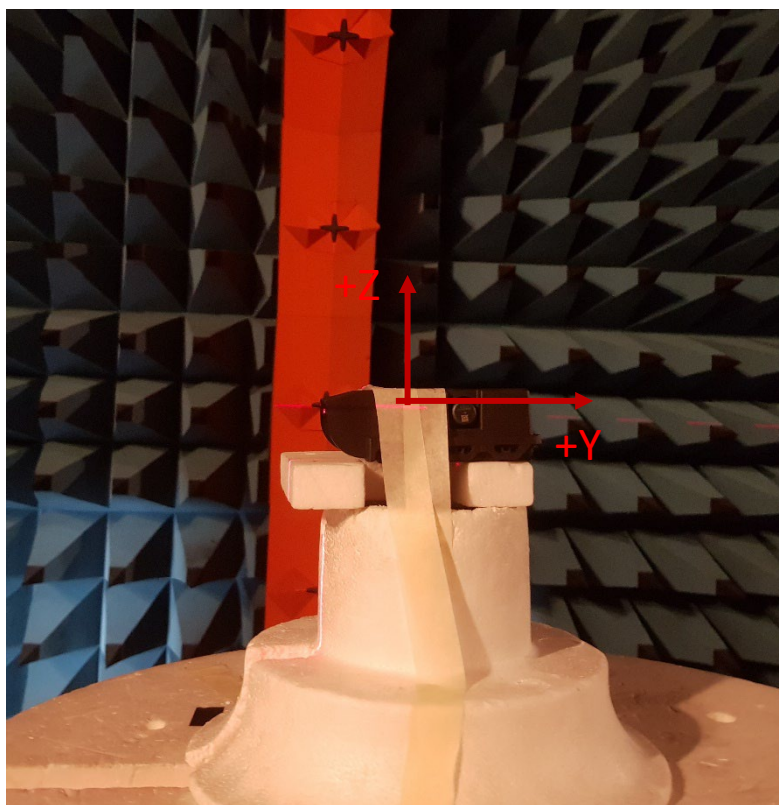


Figure 2 - Picture of DUT in measurement chamber, side view

The antenna was evaluated in Sigma Connectivity in-house anechoic chamber. The chamber is SG 24 from the Microwave Vision Group.

SYSTEM DESCRIPTION – GENERAL OVERVIEW



Coordinate System

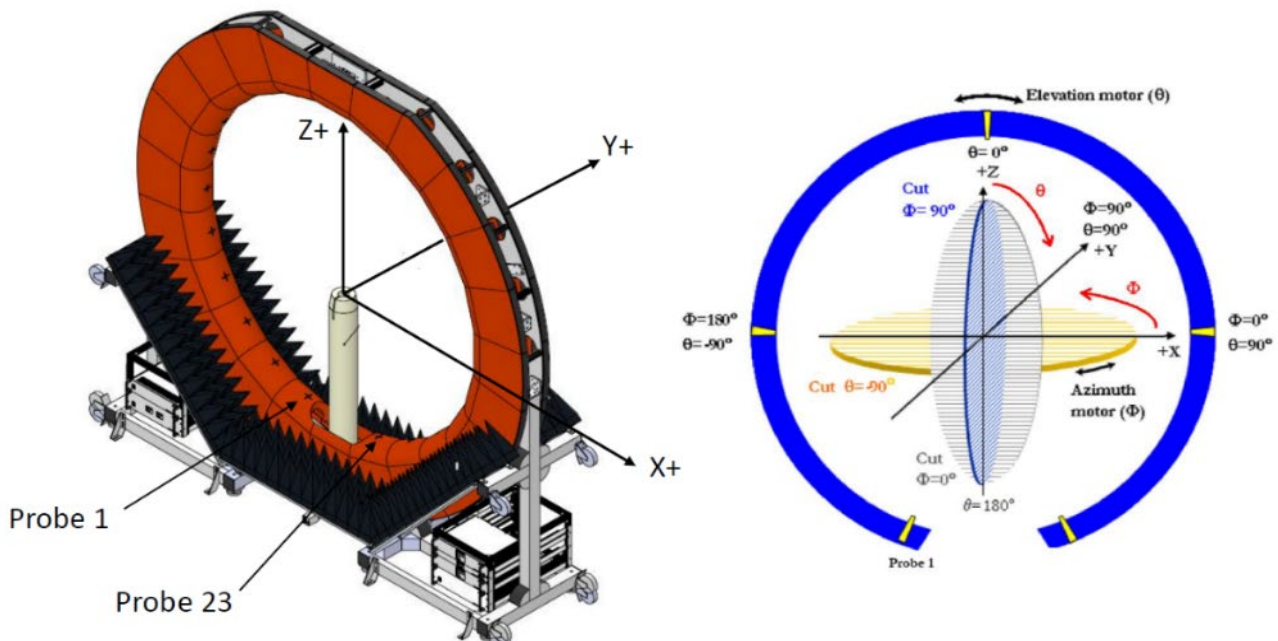


Figure 3 - Measurement system description

All antennas were measured with and without back-up battery mounted to account for differing customer requirements.

2 ANTENNAS

2.1 BLE

2.1.1 Specifications

Table 2 - BLE antenna specifications

Antenna	ACTIA_ACU6_BLE_ANT_VAR1
Standard	Bluetooth Low Energy
Frequency	2400-2484 MHz
Max gain	1.5 dBi
Efficiency	-3.9 dB / 41%
Impedance	50Ω
Polarization	Linear

2.1.2 Max gain

Max gain 1.5 dBi at 2440 MHz.

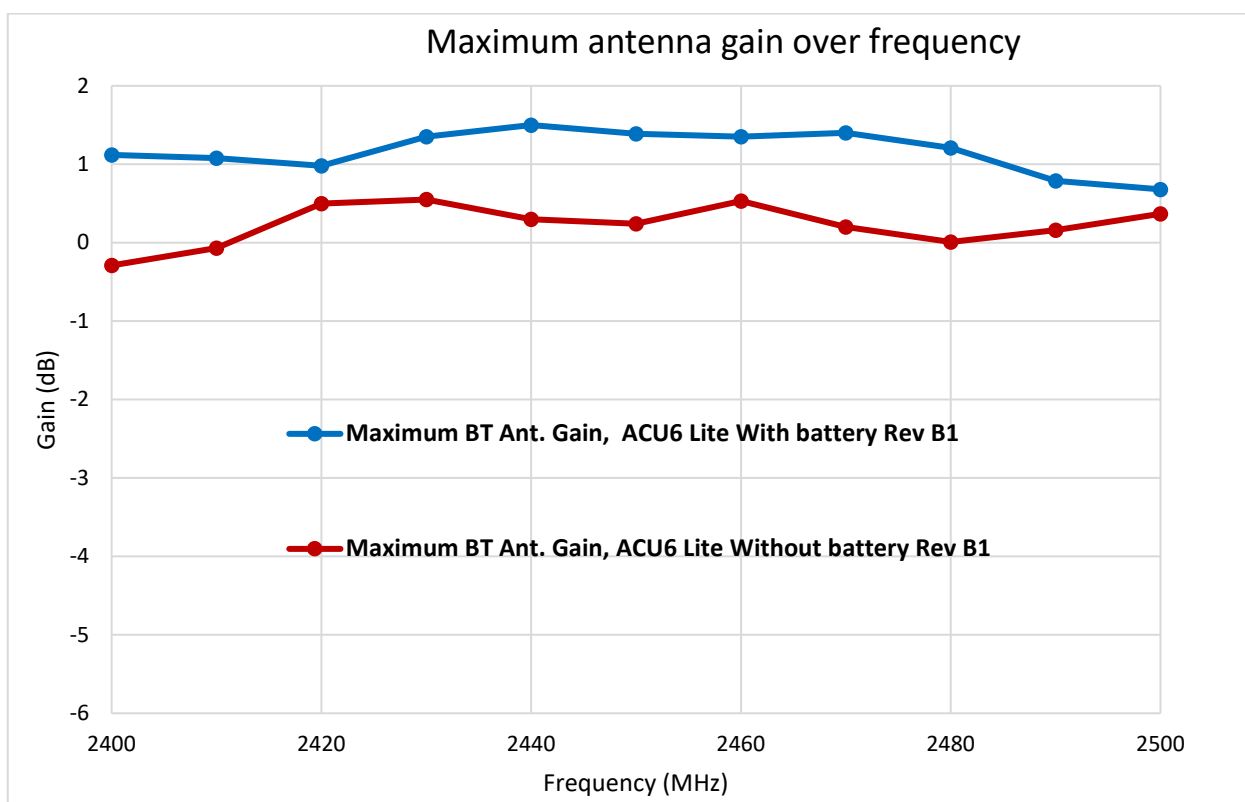


Figure 4 - BLE antenna max gain

2.1.3 Efficiency

Table 3 - BLE antenna efficiency

Frequency [MHz]	2402	2440	2480
With back-up battery	-4.1	-3.8	-4.1
Without back-up battery	-4.1	-3.7	-3.7

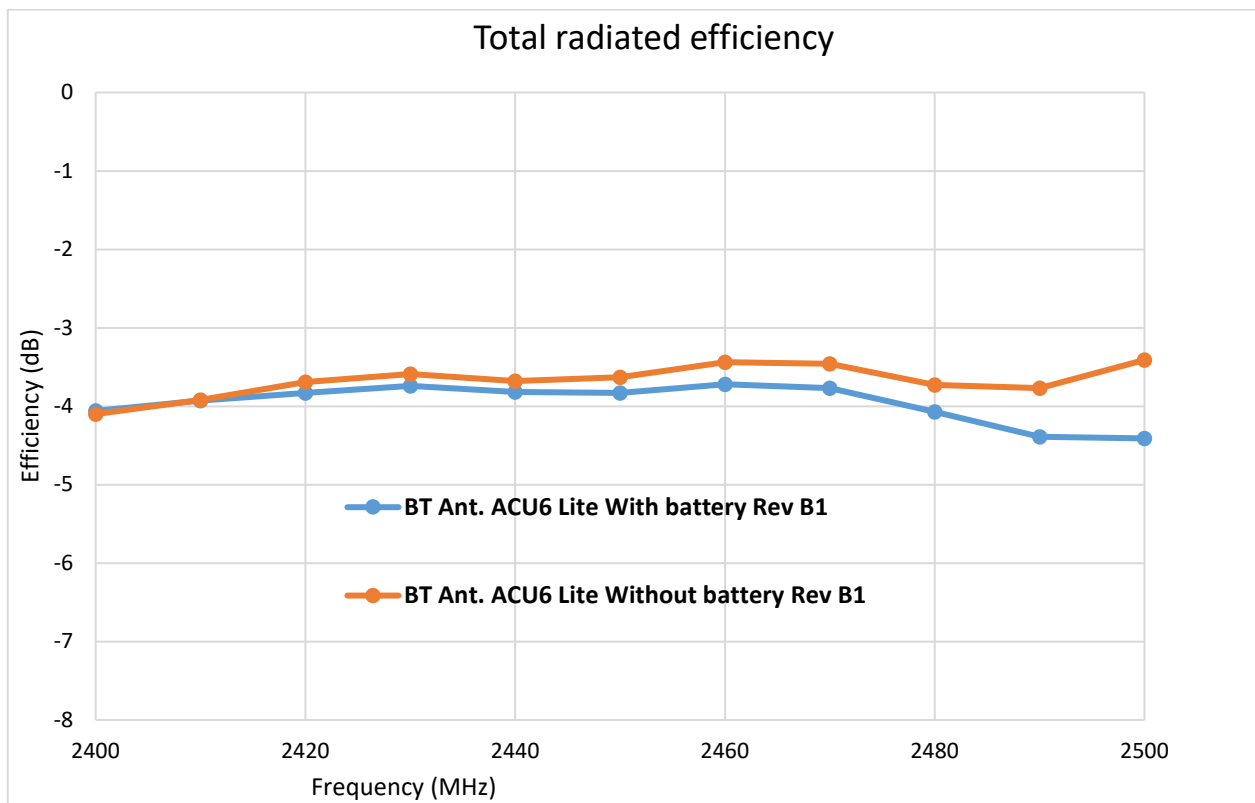


Figure 5 - BLE antenna efficiency

2.1.4 Return Loss/VSWR

Table 4 - BLE antenna VSWR

BLE antenna VSWR		
Frequency	2400	2485
With back-up battery	2.0	1.5
Without back-up battery	2.5	1.3

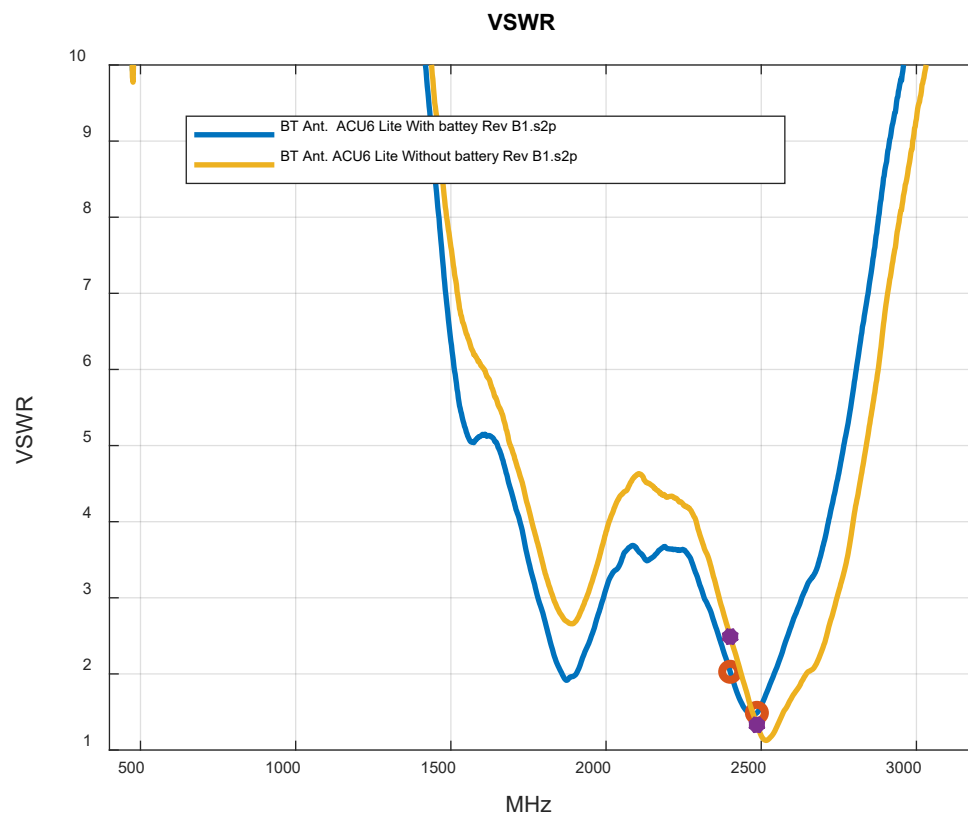


Figure 6 - BLE antenna VSWR

2.1.5 Radiation Pattern

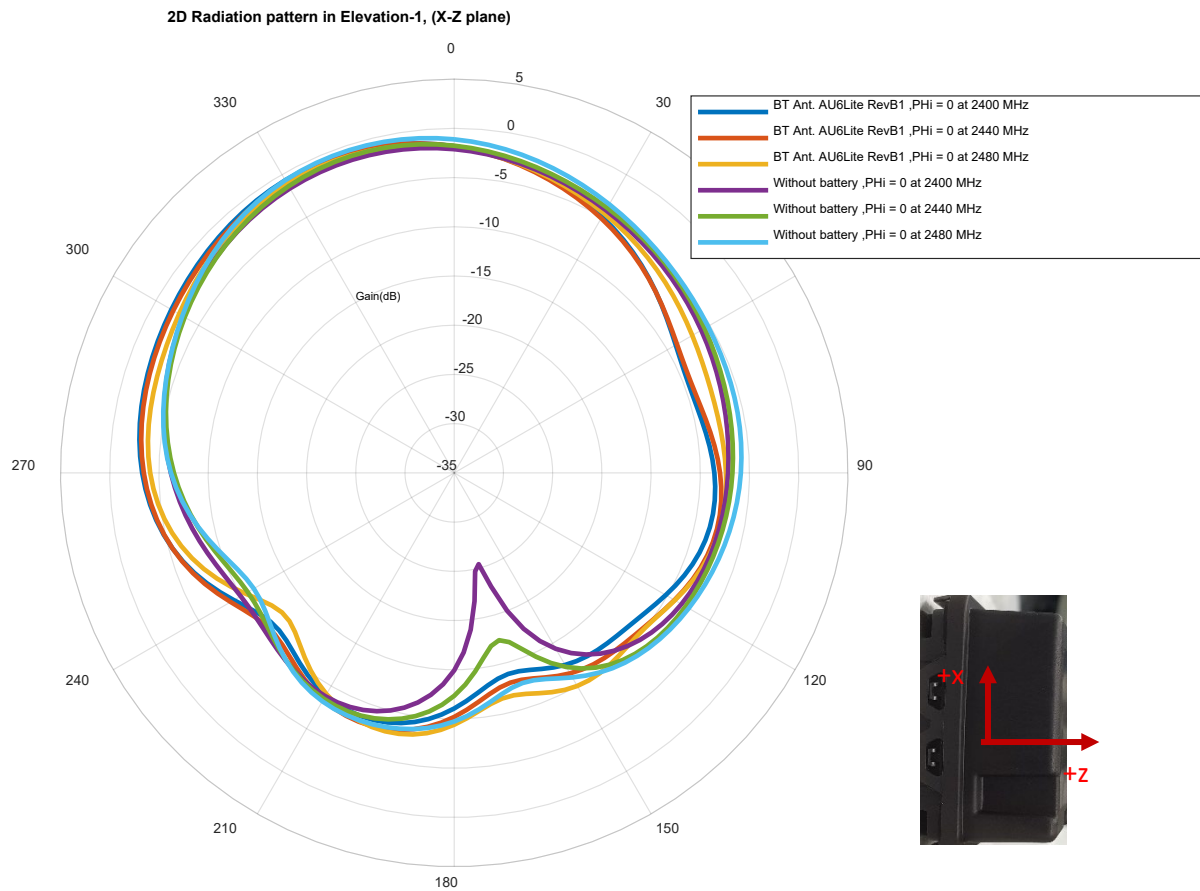


Figure 7 - BLE antenna radiation pattern, X-Z plane

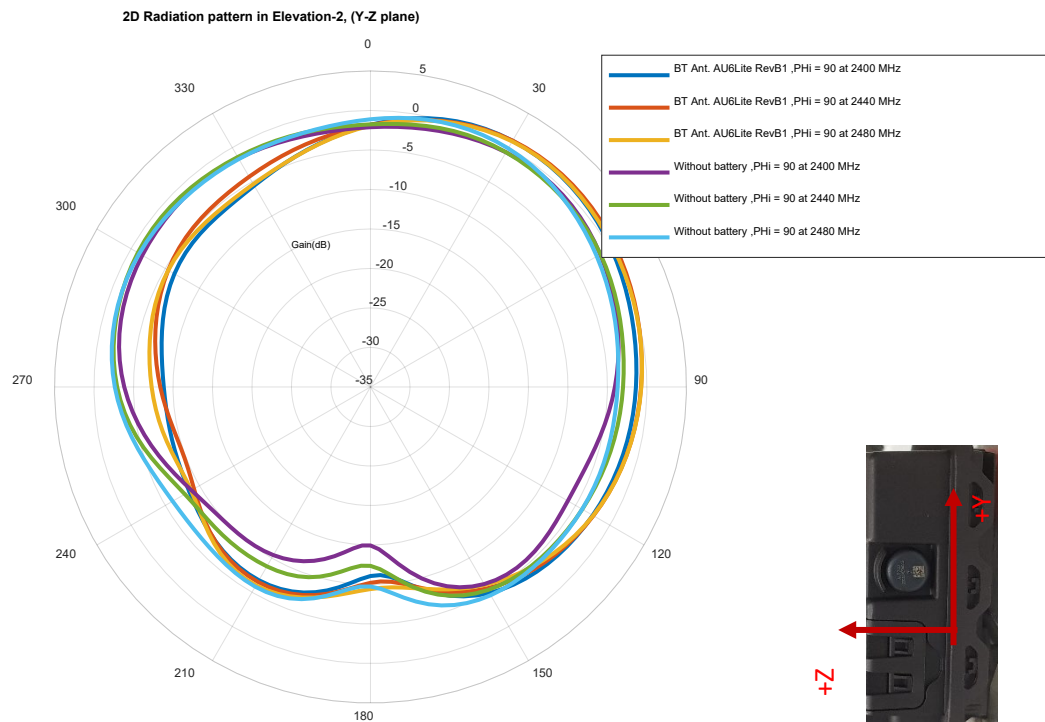


Figure 8 - BLE antenna radiation pattern, Y-Z plane

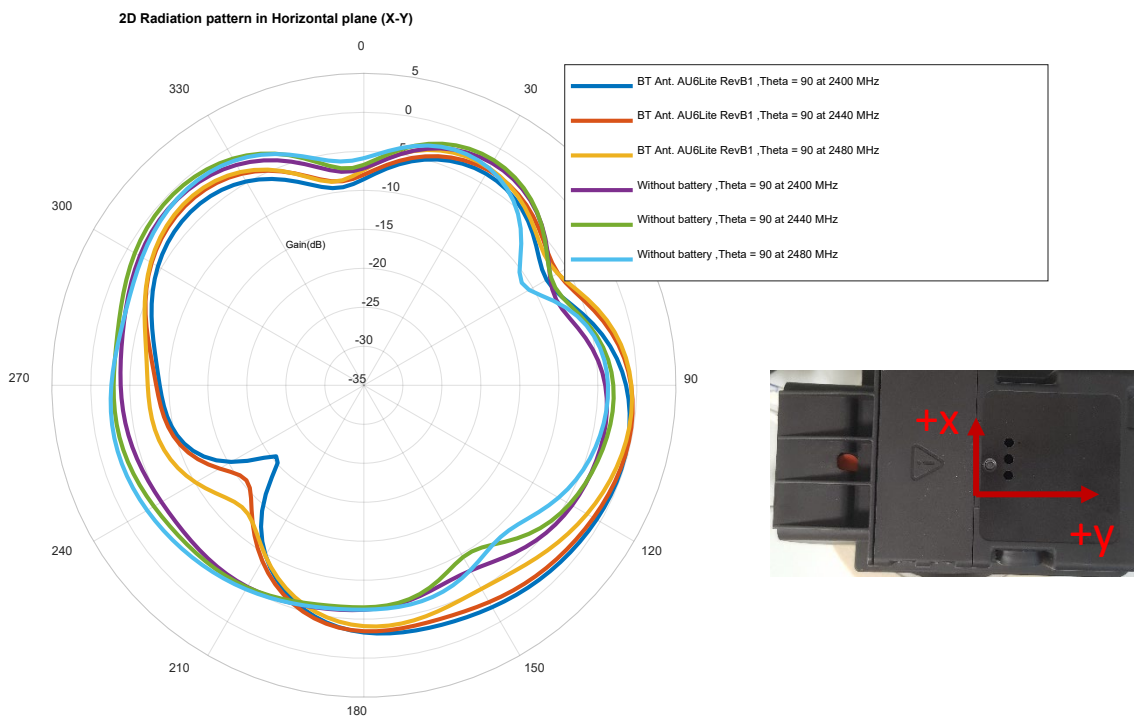


Figure 9 - BLE antenna radiation pattern, X-Y plane

2.2 GNSS

2.2.1 Specifications

Table 5 - GNSS antenna specifications

Antenna	1034-323-01
Standard	GNSS (B1, L1, E1 & G1)
Frequency	1559 – 1610 MHz
Max gain	0.1 dBi
Efficiency	-6.1 dB / 25%
Impedance	50Ω
Polarization	Linear

2.2.2 Max gain

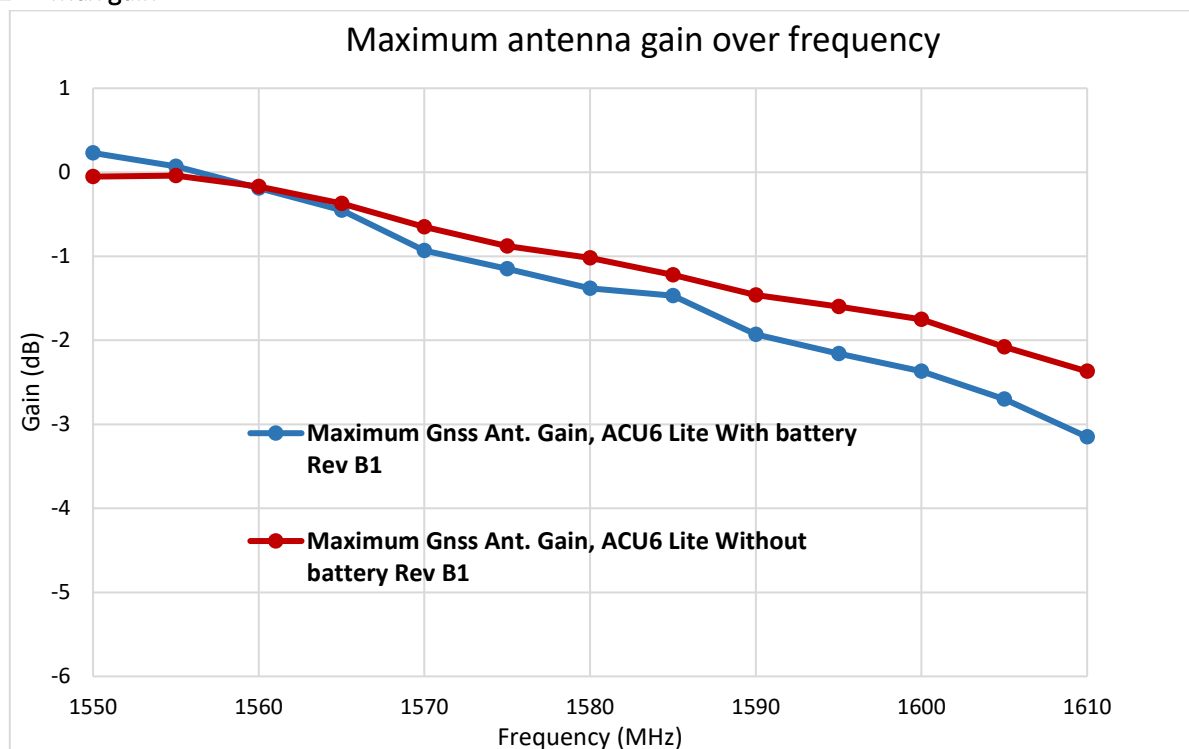


Figure 10 - GNSS antenna max gain

2.2.3 Efficiency

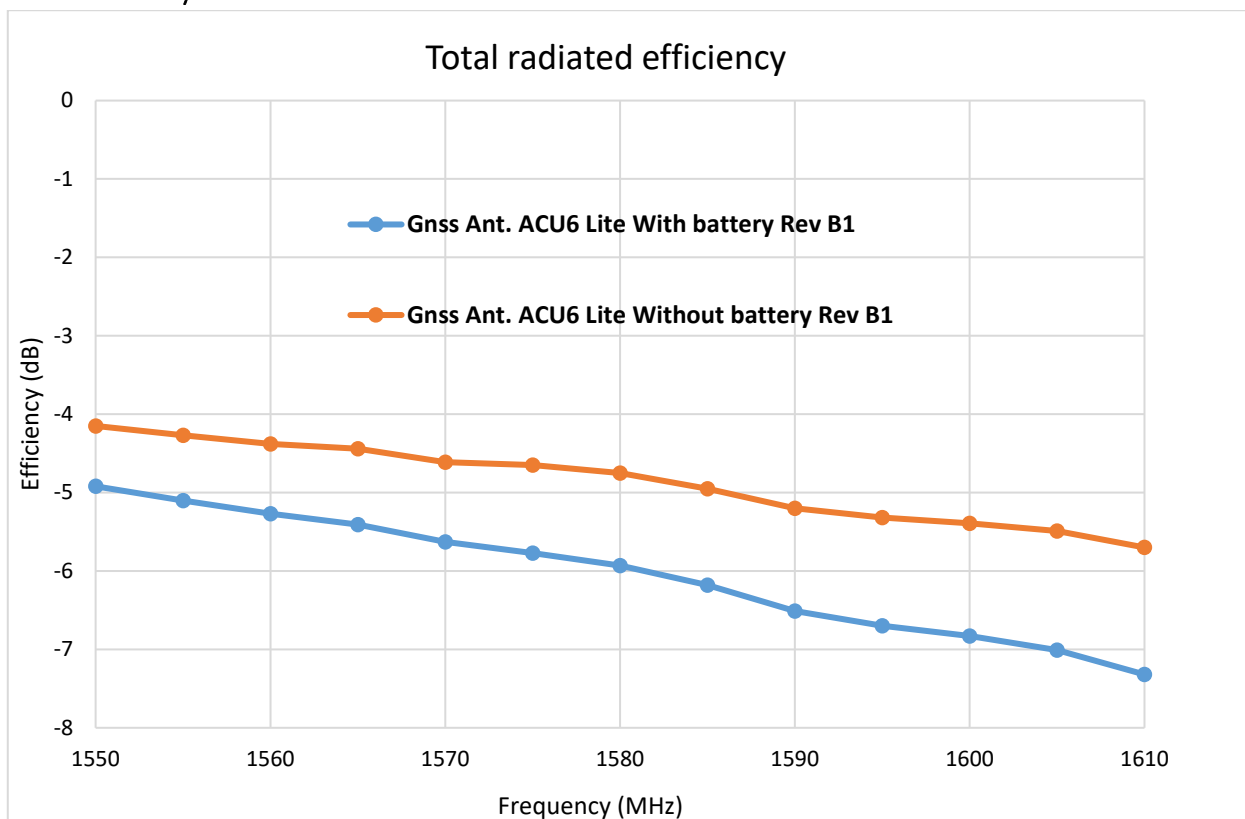


Figure 11 - GNSS antenna efficiency

2.2.4 Return Loss/VSWR

Table 6 - GNSS antenna VSWR

GNSS antenna VSWR			
Frequency [MHz]	1550	1575	1610
With back-up battery	1.6	1.9	2.8
Without back-up battery	1.9	2.2	2.8

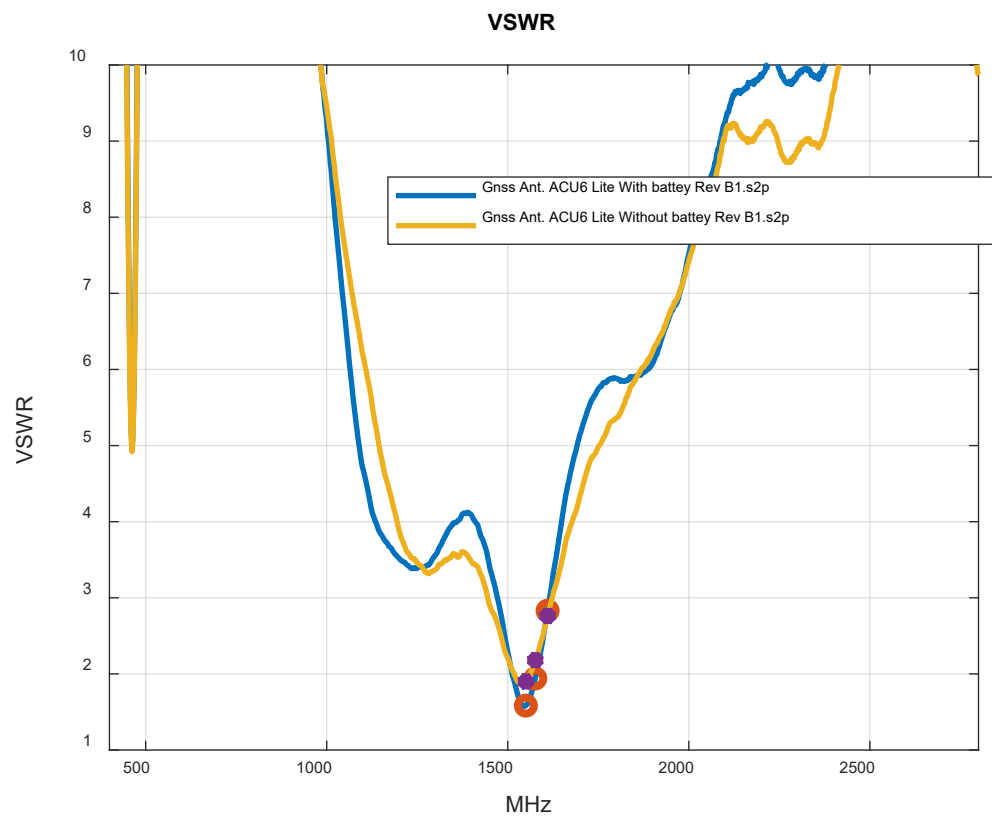


Figure 12 - GNSS antenna VSWR

2.2.5 Radiation pattern

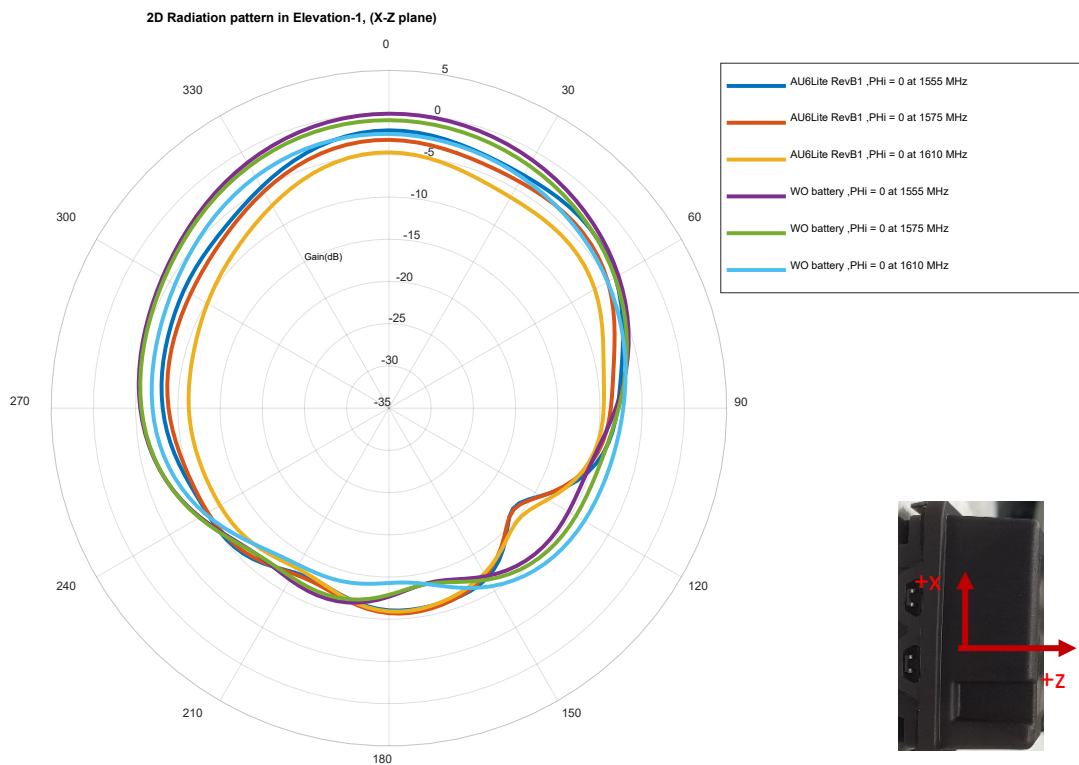


Figure 13 - GNSS antenna radiation pattern, X-Z plane

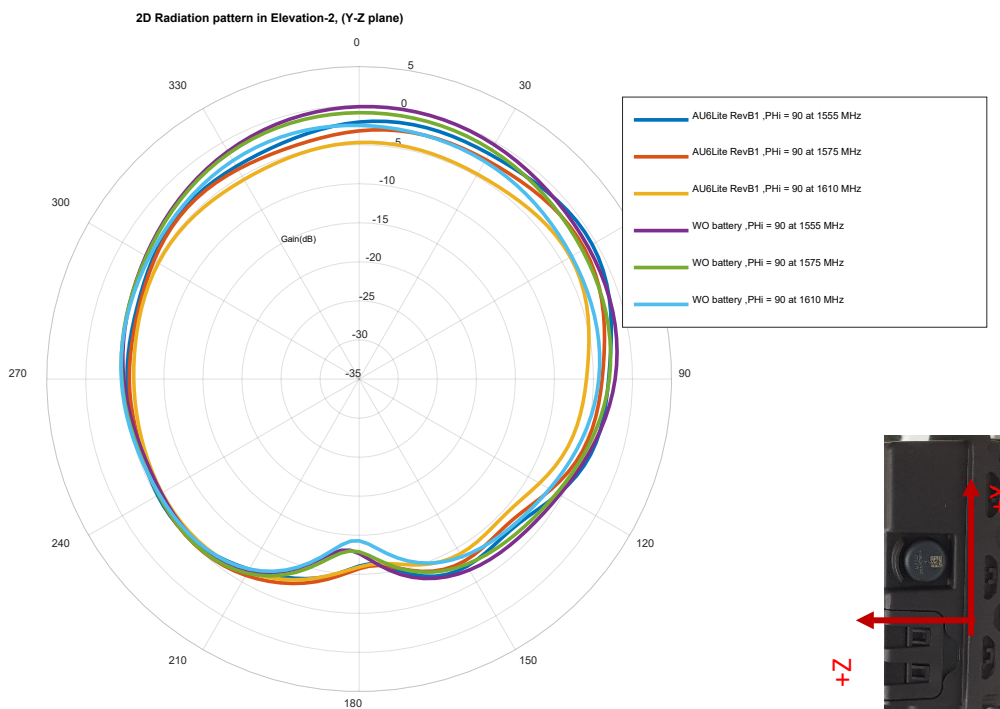


Figure 14 - GNSS antenna radiation pattern, Y-Z plane

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