Bluetooth Antenna

TEST METHOD

Passive antenna measurement within a 5-meter anechoic antenna chamber equipped with a quad-ridged horn receiver antenna and an EL-AZ positioner with laser positioner
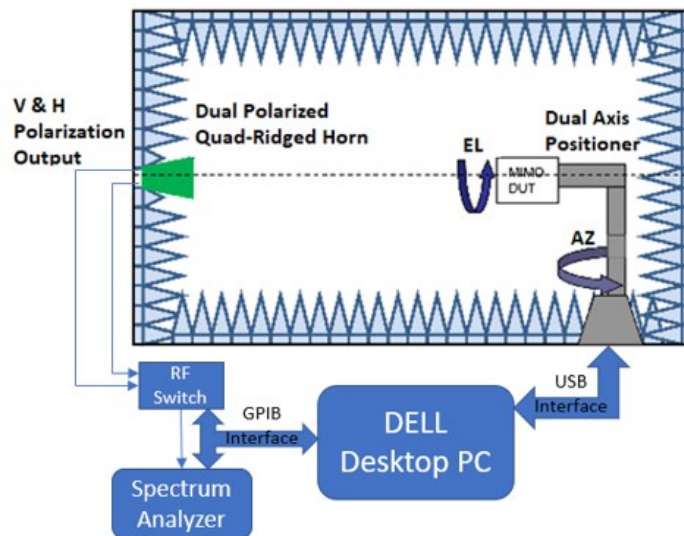
SITE / EQUIPMENT INFORMATION

Lab Name: Field Theory Consulting
Lab Address: 1029 Butterfield Rd, Vernon Hills, IL 60061
Size: 5m
Frequency Measurement Range: 2400 - 2480 MHz

**TEST EQUIPMENT CALIBRATION STATUS**

Equipment	Manufacturer	Model No.	Serial No.	last Cal.	Due Date
Network Analyzer	Anritsu	MS46122B	2135304	8/25/2023	8/24/2024
Quad-Ridge Horn Antenna	ETS-Lindgreen	3164-10	217936	8/25/2023	8/24/2024
3 Meter Anechoic Chamber	Braden Shielding Systems	NA	F70331	NA	NA
RF Cable	ENS Microwave	S160-160-MKS-MKS	3042020	8/25/2023	8/24/2024
RF Cable	ENS Microwave	S160-120-MKS-MKS	12042018	8/25/2023	8/24/2024
RF Cable	ENS Microwave	EMC1-K1K1-72	1GVT4 19002201	8/25/2023	8/24/2024
RF Cable	ENS Microwave	EMC1-K1K1-72	1GVT4 19002202	8/25/2023	8/24/2024
RF Cable	ENS Microwave	EMC1-K1K1-216	1GVT4 19002202 001	8/25/2023	8/24/2024
RF Cable	ENS Microwave	EMC1-K1K1-216	1GVT4 19002202 002	8/25/2023	8/24/2024
DUT Positioner	DE LCC	D6025	NA	NA	NA
RF Switch	Mini-Circuits	RC-1SPDT-A18	1810010005	8/25/2023	8/24/2024

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SETUP PHOTO
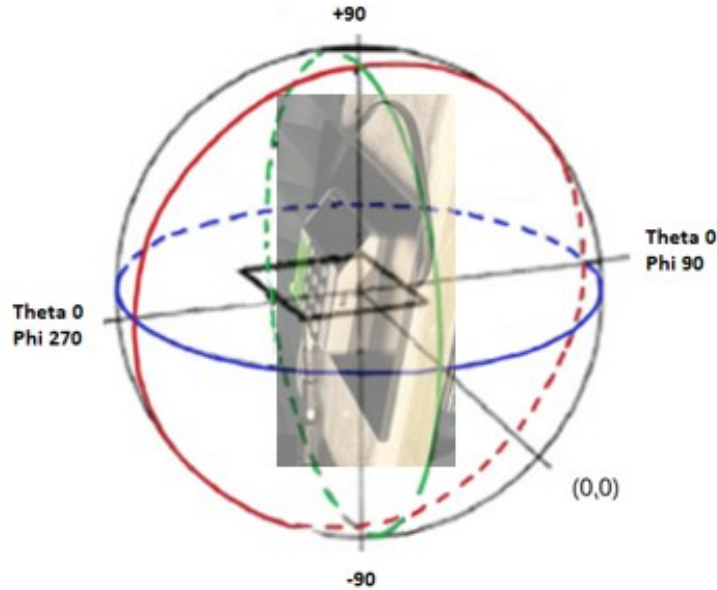
FORMULA AND CALCULATIONS

Gain:

$$G_{AUT} = \frac{[S_{21}{}^2]}{[G_{REF}]}\left(\frac{\lambda}{4\pi d}\right)^{-2}$$

Efficiency:

$$\varepsilon = \frac{\pi}{2NM}\sum_N\sum_M\frac{S_{21}^2(\theta_M,\phi_N)}{P_L G_T}Cos(\phi_N)$$

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RADIO SPECIFICATION

Standard: BLE: 2400 - 2480 MHz

MECHANICAL

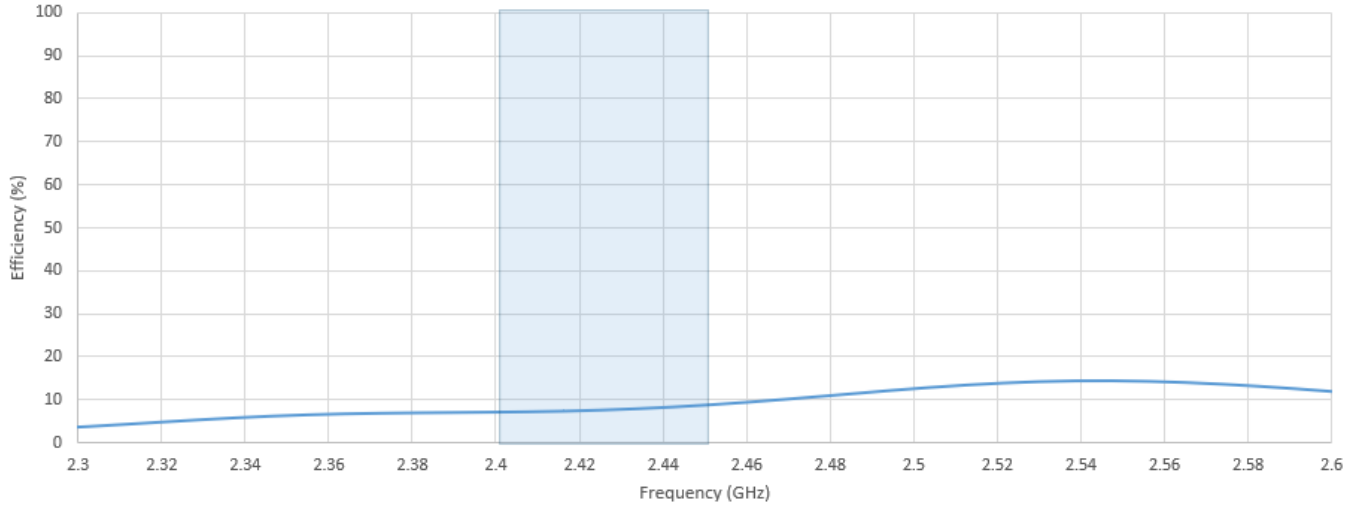Dimensions (mm):

Connector Type:

ENVIRONMENTAL

Storage Temperature:

Compliance:

Parameters			
Frequency (MHz)	2407	2442	2495
Efficiency (%)	7	8	12
Peak Gain (dB)	-5.2	-4.6	-3.7
Impedance (ohms)	50	50	50
VSWR	< 2.5	< 2.5	< 2.5
Polarization	Linear	Linear	Linear
Maximum Input Power (W)	5	5	5

Antenna

Passive Efficiency

1D Plots
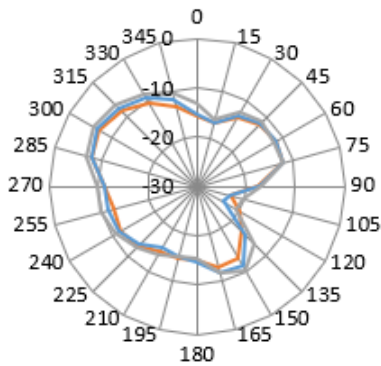
Legend:
- 2407 MHz
- 2442 MHz
- 2495 MHz

Antenna

2D and 3D Patterns

2407	2442	2495
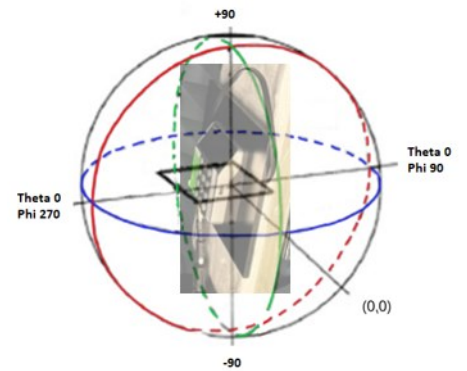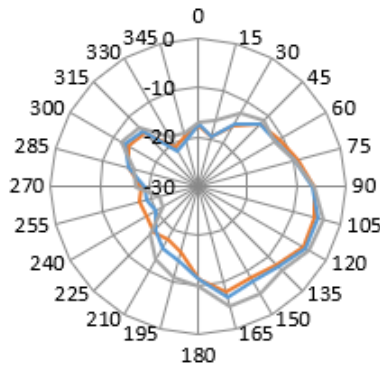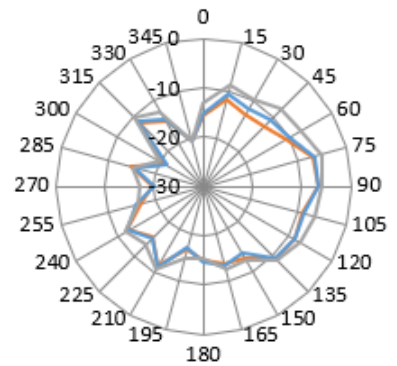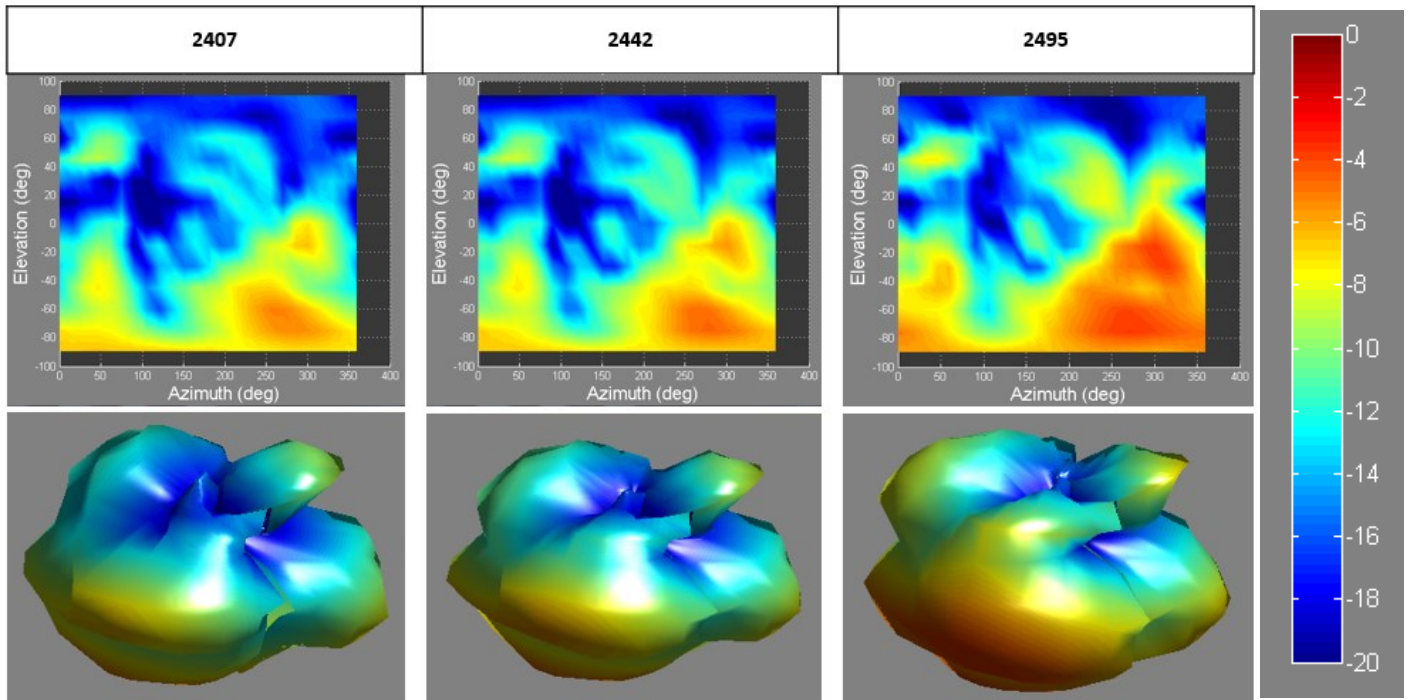
Mechanical Drawing

Antenna