

AUT Report

Prepared for: HerdDogg, Inc.

Address: 612 Seward Street,
Seward, NE 68434

Product: HerdDogg Welfare Tag

Test Report No: R20240524-00-A1 **Rev Number:** B

Approved by:


Fox Lane,
EMC Test Engineer

DATE: April 14, 2025

Total Pages: 18

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REVISION PAGE

Rev. No.	Date	Description
0	5 December 2024	Issued by FLane Prepared by FLane
A	14 February 2025	Included further information on test methodology – FL
B	11 April 2025	Added Antenna Gain Plots – FL



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1.0 SUMMARY OF TEST RESULTS

Antenna Gain Measurements were reported for 2.4GHz band.

2.0 EUT DESCRIPTION

2.1 EQUIPMENT UNDER TEST

Summary and Operating Condition:

EUT	HerdDogg Welfare Tag
FCC ID	2BF8K1129
EUT Received	16 September 2024
EUT Tested	16 September 2024- 17 September 2023
Serial No.	001 (Radiated Measurements) (Lab Assigned SN) 003 (Conducted Measurements) (Lab Assigned SN)
Operating Band	2400 – 2483.5 MHz
Device Type	☒ GMSK ☐ GFSK ☐ BT ☐ BT EDR 2MB ☐ BT EDR 3MB ☐ 802.11x
Power Supply / Voltage	3VDC Internal Battery
Antenna Gain (dBi)	+2.763dBi , PCB Antenna

NOTE: For more detailed features description, please refer to the manufacturer's specifications or user's manual.

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3.0 LABORATORY AND GENERAL TEST DESCRIPTION

3.1 LABORATORY DESCRIPTION

All testing was performed at the following Facility:

The Nebraska Center for Excellence in Electronics (NCEE Labs)
4740 Discovery Drive
Lincoln, NE 68521

A2LA Certificate Number: 1953.01
FCC Accredited Test Site Designation No: US1060
Industry Canada Test Site Registration No: 4294A
NCC CAB Identification No: US0177

Environmental conditions varied slightly throughout the tests:

Relative humidity of $35 \pm 4\%$
Temperature of $22 \pm 3^\circ$ Celsius



3.2 TEST PERSONNEL

No.	PERSONNEL	TITLE	ROLE
1	Fox Lane	Test Engineer	Testing and report

Notes:

All personnel are permanent staff members of NCEE Labs. No testing or review was sub-contracted or performed by sub-contracted personnel.

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3.3 TEST EQUIPMENT

DESCRIPTION AND MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CALIBRATION DATE	CALIBRATION DUE DATE
Keysight MXE Signal Analyzer (26.5GHz)	N9038A	MY56400083	July 17, 2024	July 18, 2026
Keysight EXA Signal Analyzer	N9010A	MY56070862	July 18, 2023	July 17, 2025
EMCO Horn Antenna	3117	29616	June 12, 2024	June 12, 2025
ETS – Lindgren- VSWR on 10m Chamber	10m Semi-anechoic chamber- VSWR	4740 Discovery Drive	May 15, 2024	May 15, 2027
NCEE Labs-NSA on 10m Chamber*	10m Semi-anechoic chamber-NSA	NCEE-001	May 22, 2024	May 22, 2026
RF Cables (3m Ant. to Control room Bulkhead)	MFR-57500	1E3874	June 5, 2023	June 5, 2025
RF Cable (antenna to 10m chamber bulkhead)*	FSCM 64639	01E3872	June 5, 2023	June 5, 2025
RF Cable (10m chamber bulkhead to control room bulkhead)*	FSCM 64639	01E3874	June 5, 2023	June 5, 2025
RF Cable (control room bulkhead to test receiver)*	FSCM 64639	01F1206	June 5, 2023	June 5, 2025
N connector bulkhead (10m chamber)*	PE9128	NCEEBH1	June 5, 2023	June 5, 2025
N connector bulkhead (control room)*	PE9128	NCEEBH2	June 5, 2023	June 5, 2025
TDK Emissions Lab Software	V11.25	700307	NA	NA

*Internal Characterization

Notes:

All equipment is owned by NCEE Labs and stored permanently at NCEE Labs facilities.

3.4 GENERAL TEST PROCEDURE AND SETUP FOR RADIO MEASUREMENTS

Measurement type presented in this report (Please see the checked box below):

Conducted ☒

The conducted measurements were performed by connecting the output of the transmitter directly into a spectrum analyzer using an impedance matched cable and connector soldered to the EUT in place of the antenna. The information regarding resolution bandwidth, video bandwidth, span and the detector used can be found in the graphs provided in Appendix C. All the radio measurements were performed using the sections from ANSI C63.10, details about the section used can be found in the spectrum analyzer titles on the graph.

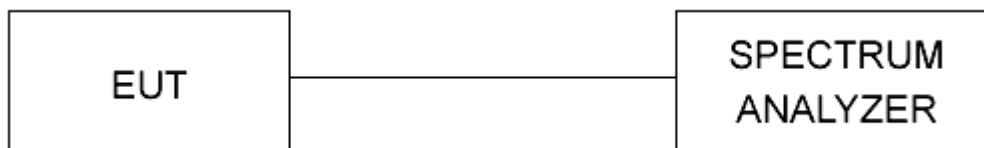


Figure 1 - Bandwidth Measurements Test Setup

Radiated ☒

All the radiated measurements were taken at a distance of 3m from the EUT. The information regarding resolution bandwidth, video bandwidth, span and the detector used can be found in the graphs provided in Appendix C. All the radio measurements were performed using the sections from ANSI C63.10, details about the section used can be found in the spectrum analyzer titles on the graph.

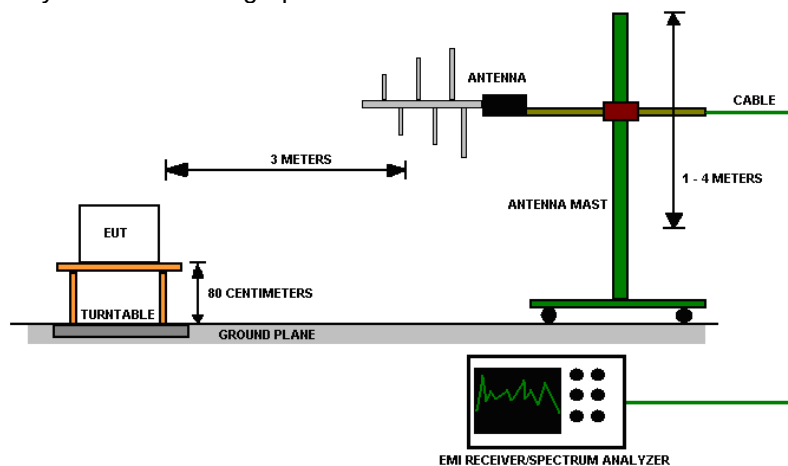


Figure 2 - Radiated Emissions Test Setup

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4.0 RESULTS

4.1 ANTENNA GAIN

Test procedures:

The device's conducted power was measured then the same measurement was repeated on a radiated sample at 3m test distance and converted to E.I.R.P.

Test setup:

Details can be found in section 2.1 of this report.

EUT operating conditions:

Details can be found in section 2.1 and 2.2 of this report.

Test results:

Antenna Gain:

Radiated Average Power (EIRP) – Conducted Average Power = Antenna gain
 $10.48\text{dBm} - 7.717\text{dBm} = \mathbf{+2.763\text{dBi}}$

Comments:

NA

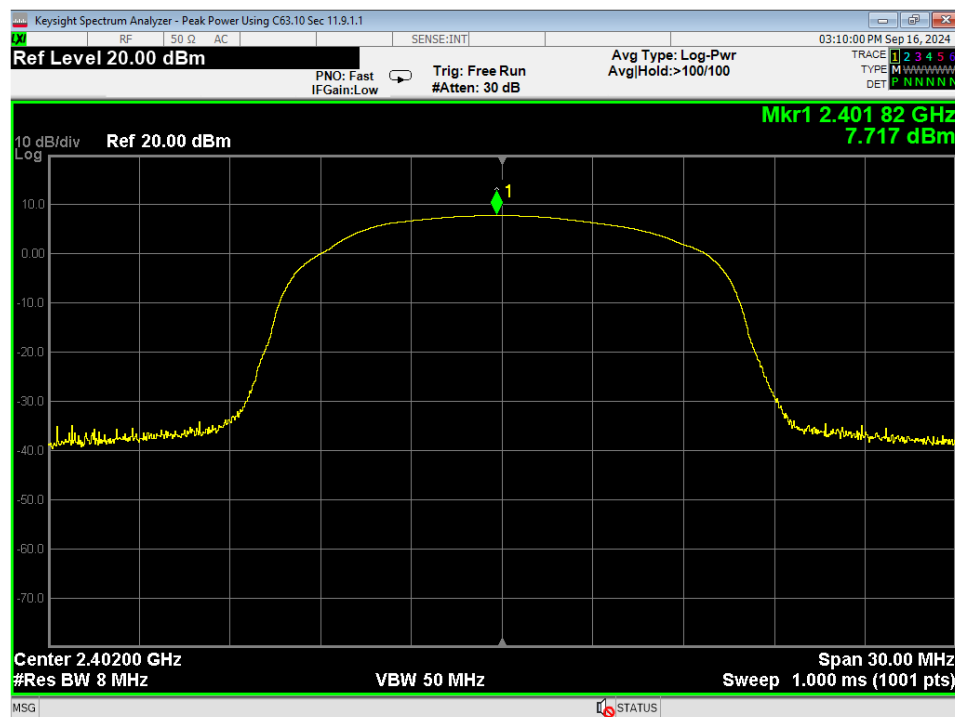


Figure 3 – Conducted Peak Power Measurement, GMSK 2MB

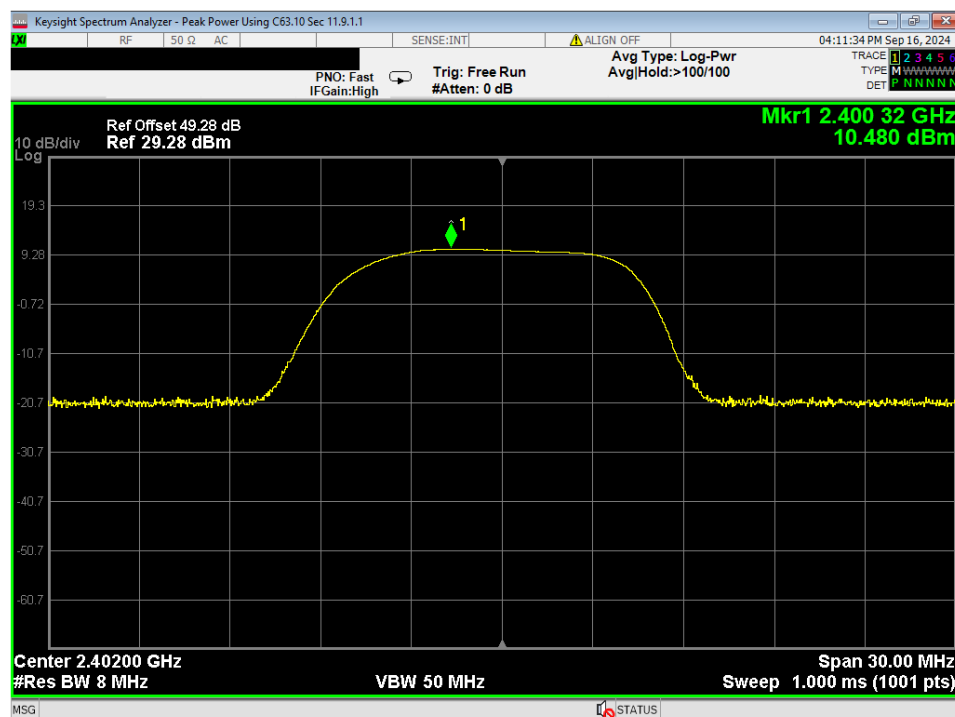


Figure 4 – Radiated Peak Power Measurement, GMSK 2MB

Measurement corrections/EIRP conversions are included in reference offset.

Tower Height 412.0cm

EUT Angle 210.0 degrees

Polarity: Horizontal

4.2 ANTENNA PLOTS

Test procedures:

The device was set to transmit and was measured while rotating on automated turn table. see Antenna Gain section for peak values.

Test setup:

Device was set 1.5m high and measurements were performed at 3m test distance.

EUT operating conditions:

Details can be found in section 2.1 of this report.

Test results:

Comments:

NA

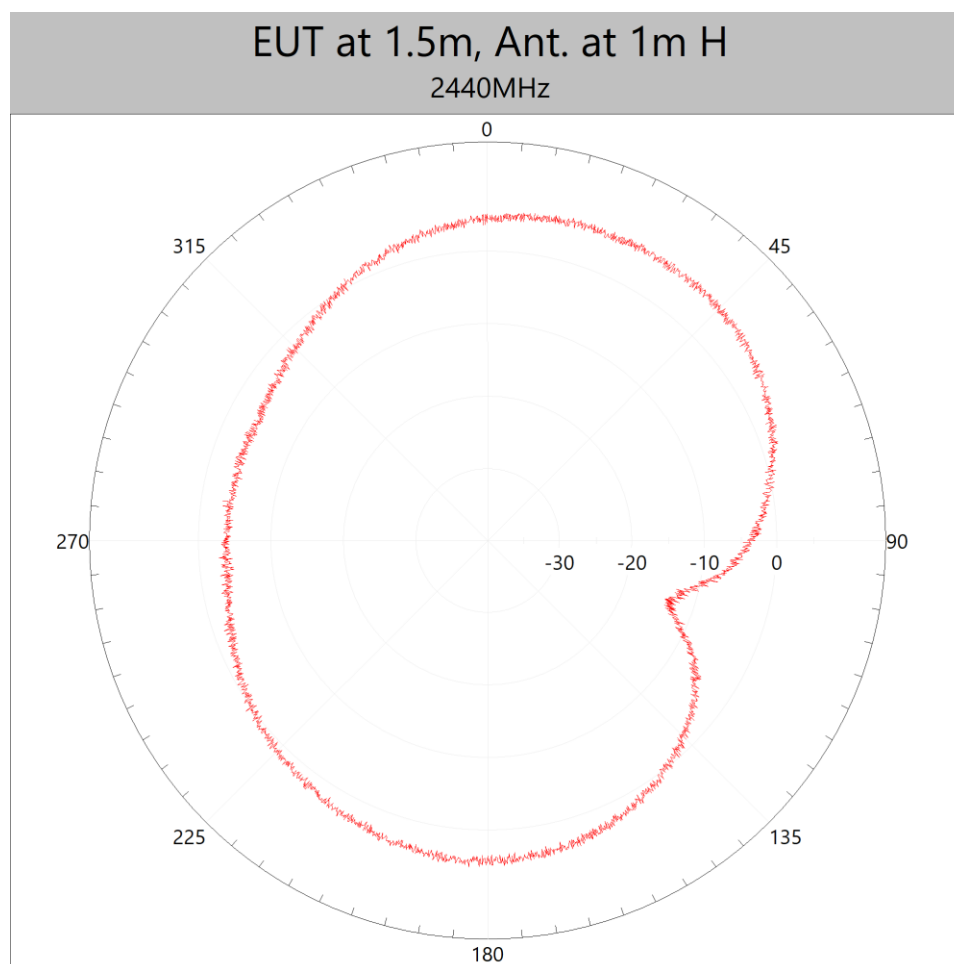


Figure 5 – Antenna Pattern, 1m Rx antenna height, Horizontal polarity

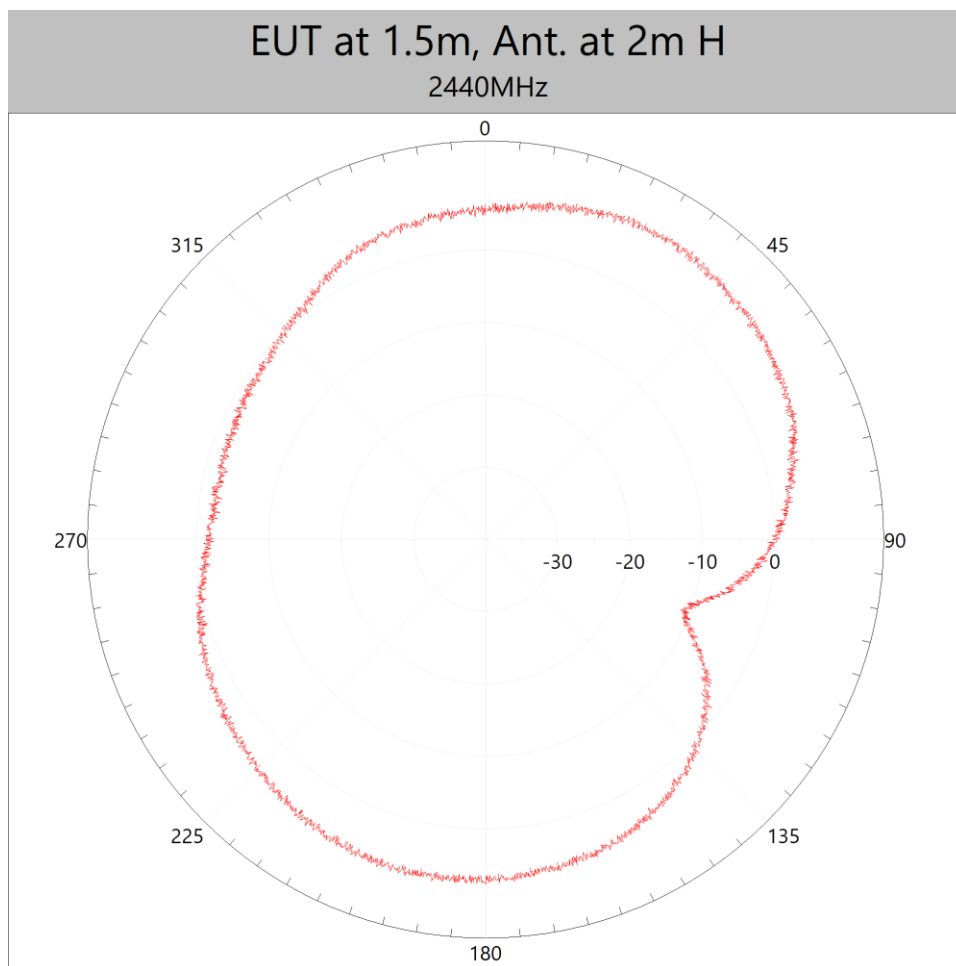


Figure 6 – Antenna Pattern, 2m Rx antenna height, Horizontal polarity

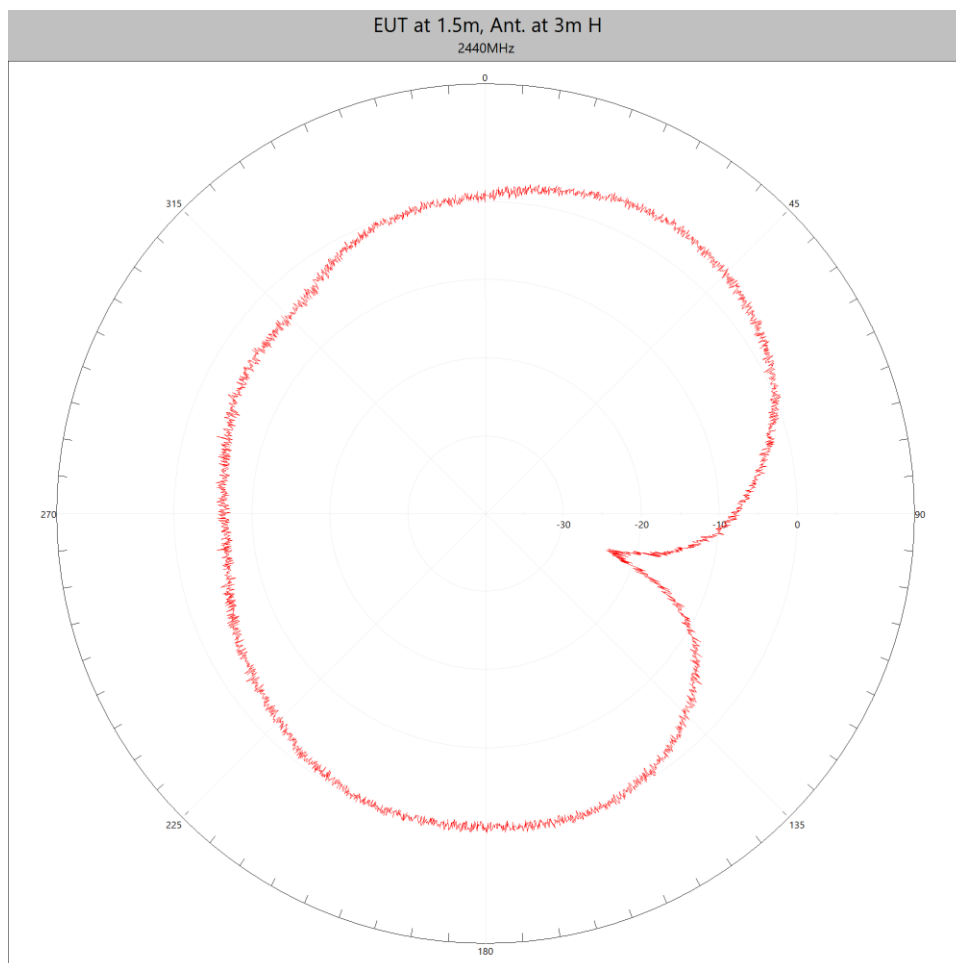


Figure 7 – Antenna Pattern, 3m Rx antenna height, Horizontal polarity

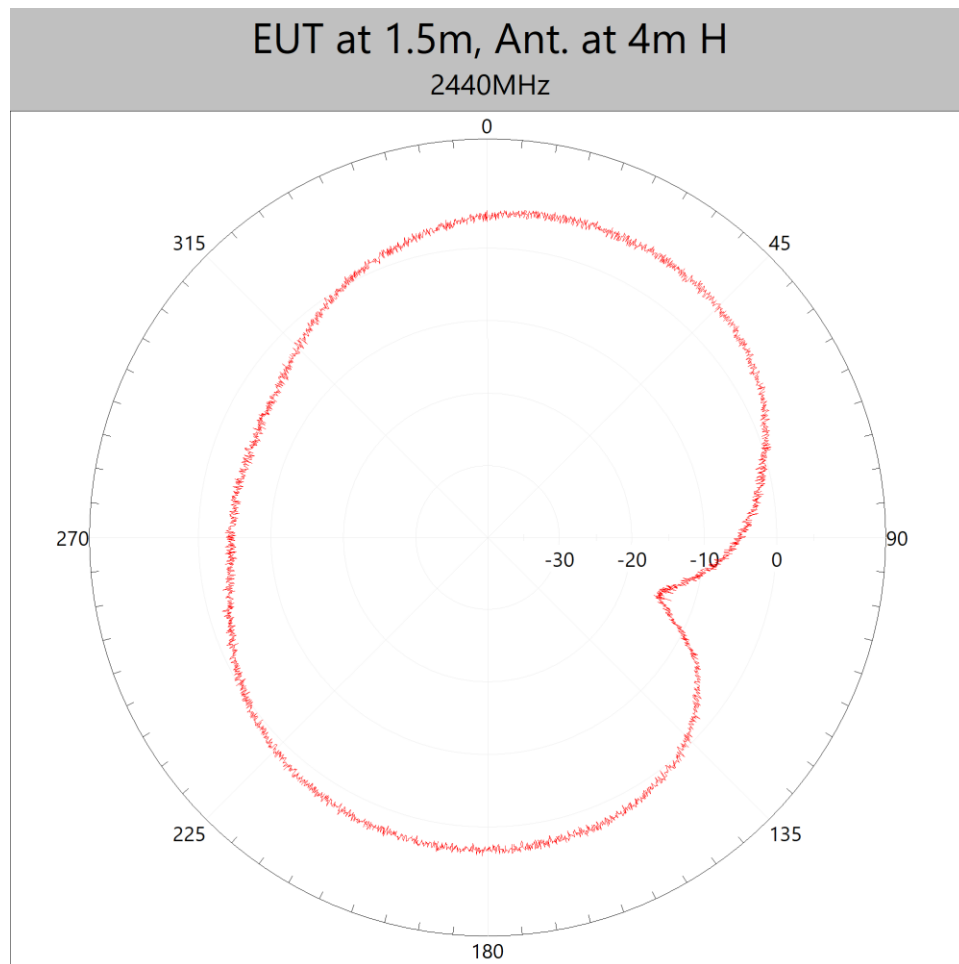


Figure 8 – Antenna Pattern, 4m Rx antenna height, Horizontal polarity

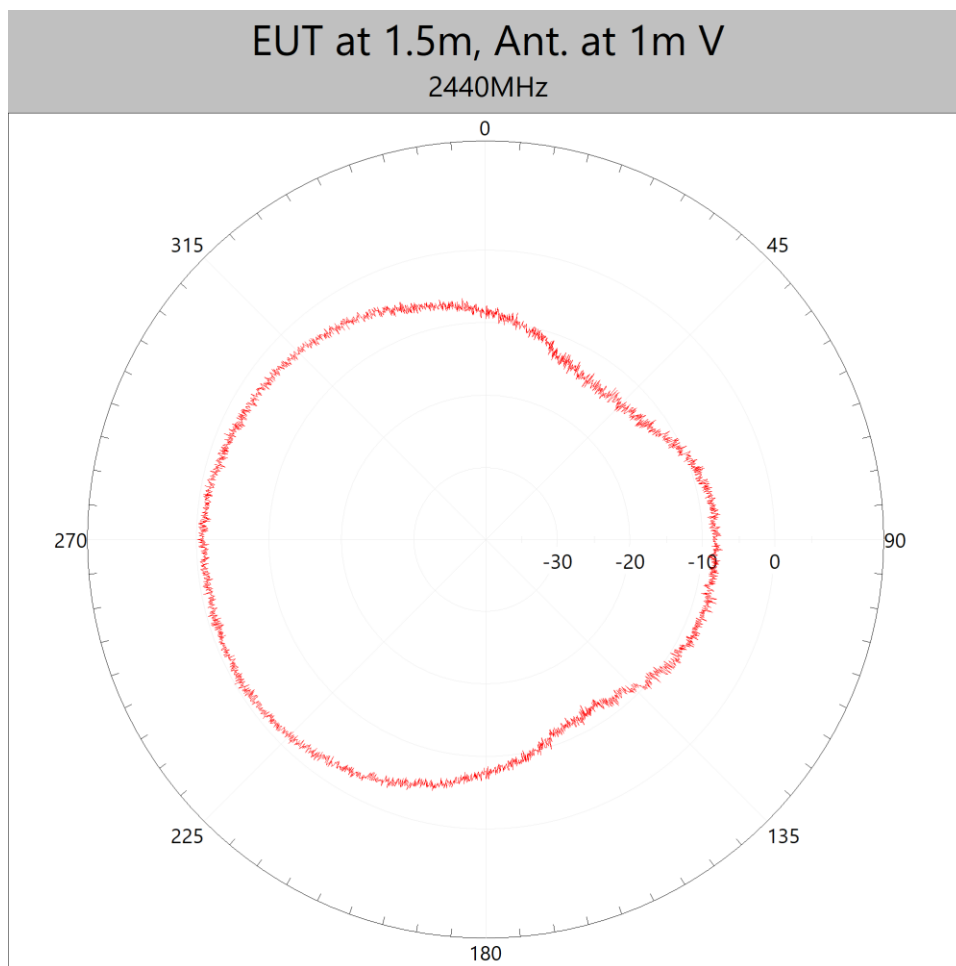


Figure 9 – Antenna Pattern, 1m Rx antenna height, Vertical polarity

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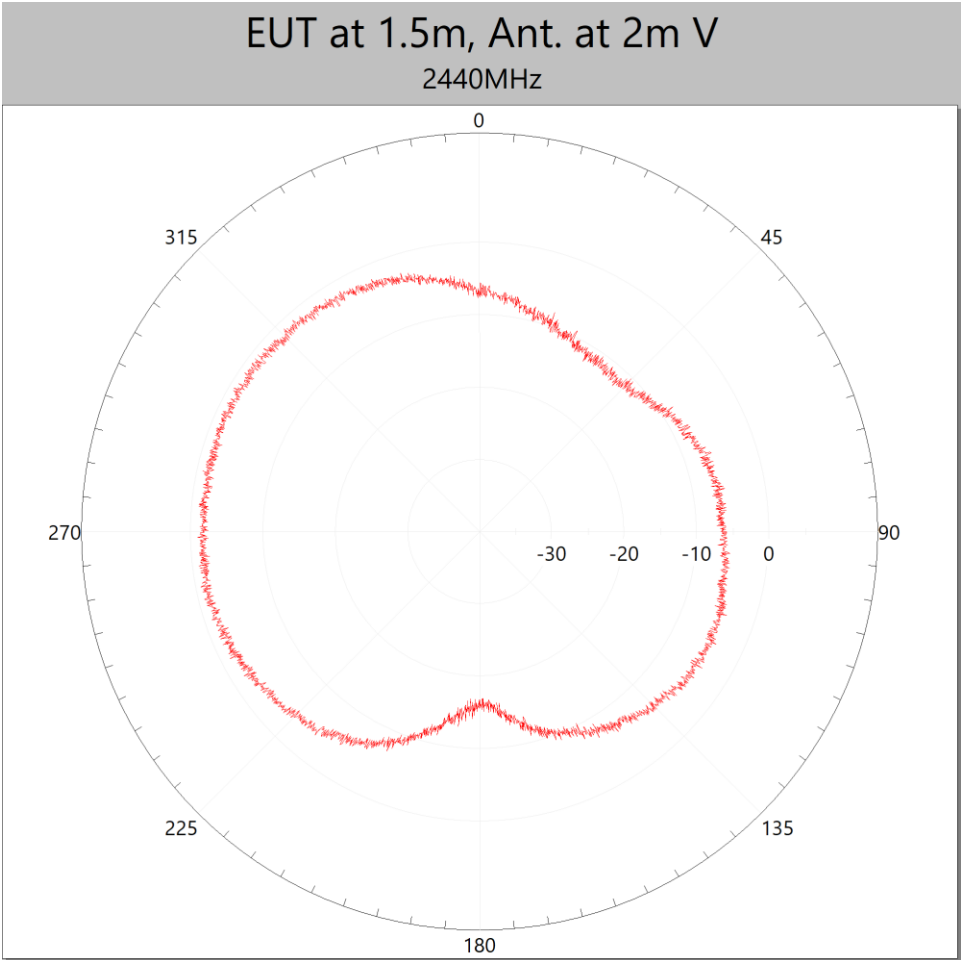


Figure 10 – Antenna Pattern, 2m Rx antenna height, Vertical polarity

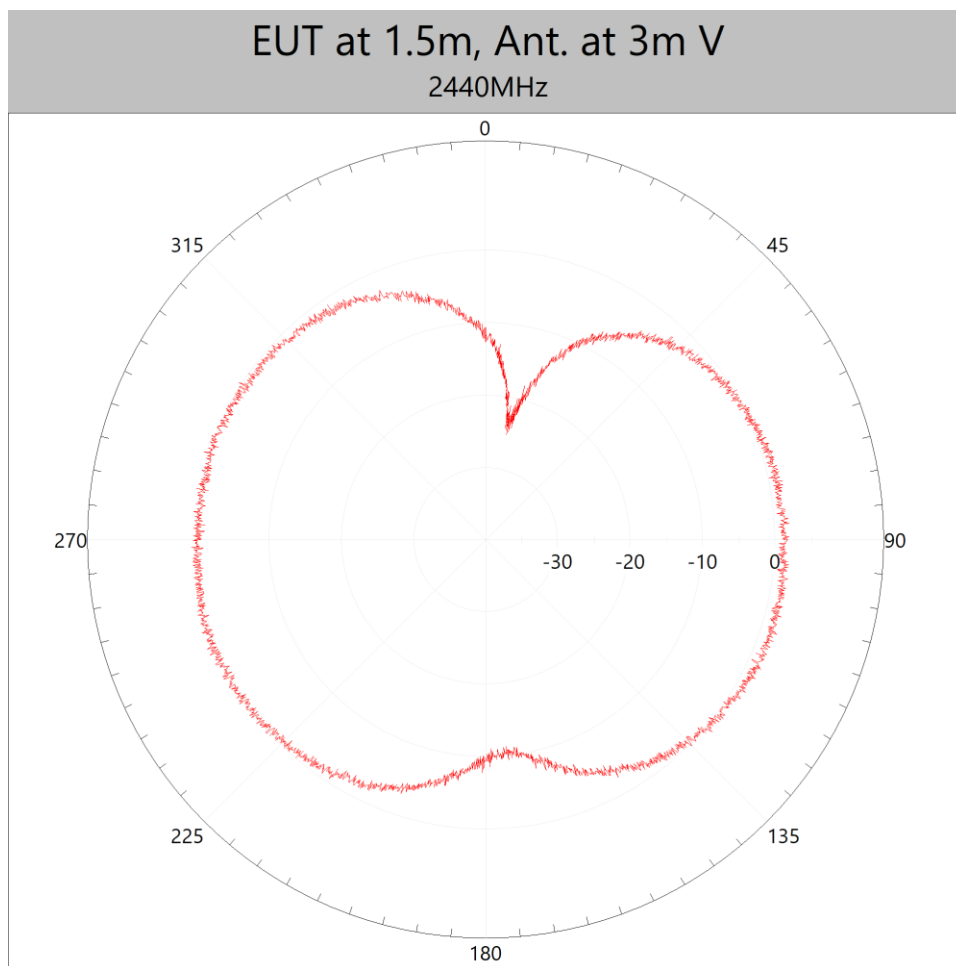


Figure 11 – Antenna Pattern, 3m Rx antenna height, Vertical polarity

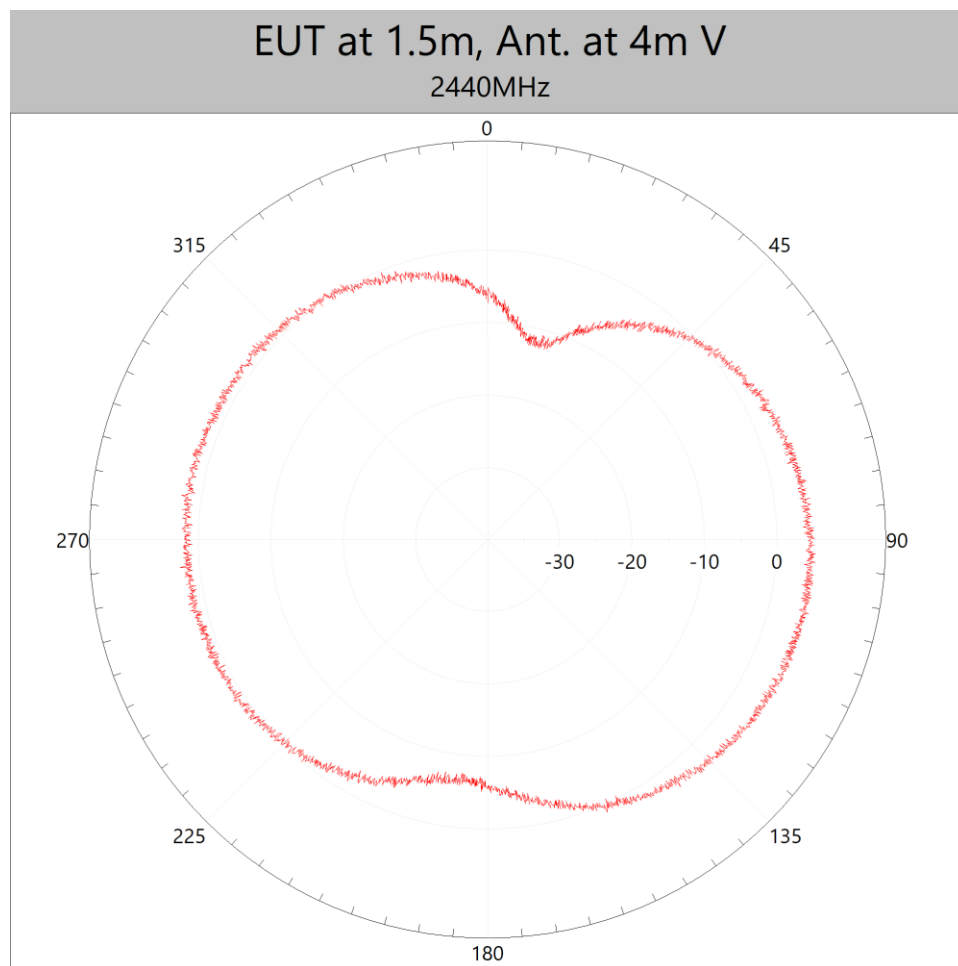


Figure 12 – Antenna Pattern, 4m Rx antenna height, Vertical polarity



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