



## **Antenna Characterization Test Data**

**Report No.: MAZT01-A2 Rev A**

**Company:** Maztech Industries

**Model No.:** X4-LRF-2K

## Table of Contents

|    |                         |    |
|----|-------------------------|----|
| 1. | TECHNICAL DETAILS ..... | 3  |
| 2. | TEST SETUP .....        | 4  |
| 3. | TEST METHOD.....        | 6  |
| 4. | EQUIPMENT DETAILS.....  | 7  |
| 5. | Results.....            | 8  |
|    | BLE- 2402 MHz .....     | 8  |
|    | BLE- 2440 MHz .....     | 9  |
|    | BLE- 2480 MHz .....     | 10 |
| 6. | PHOTOGRAPHS .....       | 11 |

## 1. TECHNICAL DETAILS

| Details                          | Description                                                               |
|----------------------------------|---------------------------------------------------------------------------|
| Purpose:                         | Characterize the BLE Antenna emissions of Maztech Industries X4-LRF-2K    |
| Applicant:                       | Maztech Industries<br>1641 Reynolds Ave<br>Irvine, California 92614 USA   |
| Manufacturer:                    | Maztech Industries                                                        |
| Laboratory performing the tests: | MiCOM Labs, Inc.<br>575 Boulder Court<br>Pleasanton California 94566, USA |
| Test report reference number:    | MAZT01-A2                                                                 |
| Date EUT received:               | 28 <sup>th</sup> March 2025                                               |
| Dates of test (from - to):       | 2 <sup>nd</sup> April 2025                                                |
| No of Units Tested:              | 1                                                                         |
| Model(s):                        | X4-LRF-2K                                                                 |
| Location for use:                | Outdoors                                                                  |

## 2. TEST SETUP

The chamber uses spherical measurement system. Figure 1. shows the typical setup of the chamber. In addition to the pictured Theta axis rotation, the EUT will have to be rotated about the Z-axis (Phi rotation) in order to perform the full spherical scans. The EUT is placed on a turn table typically rotating 360 degrees (Azimuth). A receiving antenna, typically a horn antenna or patch antenna with dual polarization, is placed on a boom that moves from zero to 180 degrees (Elevation).

The EUT antenna transmits radio waves which are picked up by the horn antenna for the receiving instrumentation. Measurements are recorded continuously at several angles of Elevation (theta = 0 to 180) and Azimuth (Phi = 0 to 360) to provide a 2D or 3D view of the antenna radiation pattern.

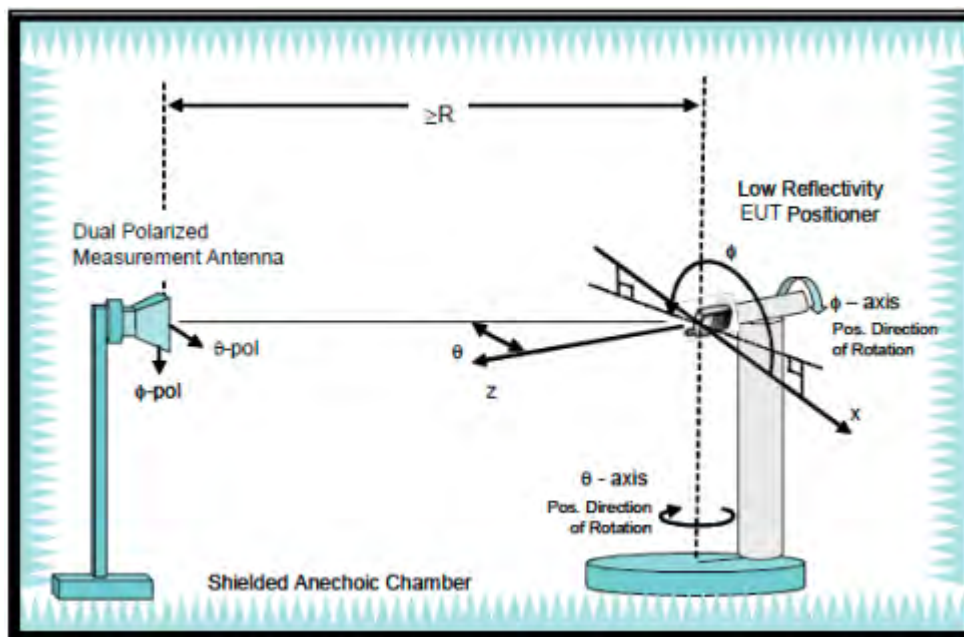


Fig 1. Test Setup

#### Test Equipment Utilized

| Asset# | Description                                              | Manufacturer | Model#                   | Serial#    | Calibration Due Date |
|--------|----------------------------------------------------------|--------------|--------------------------|------------|----------------------|
| 294    | Antenna Measurement Chamber                              | ETS Lindgren | AMS-8500                 | 008        | Not Required         |
| 369    | Quad Ridge Horn Antenna                                  | ETS-Lindgren | ETS 3164-08              | 00123798   | 12 Jan 2026          |
| 479    | Sleeve Dipole Antenna                                    | MVG          | SD2450-265               | SD2450-265 | 20 May 2025          |
| 444    | SMA Cable Assembly                                       | ETS-Lindgren | RFC-NMS-100-SMS-256 IN   | 001        | Cal when used        |
| 499    | ENA Series Network Analyzer 100 kHz to 8.5 GHz           | Agilent      | E5071C                   | MY46100409 | 11 Feb 2026          |
| 510    | Barometer/Thermometer                                    | Digi Sense   | 68000-49                 | 170871375  | 4 Jan 2026           |
| 900    | Test Software for 2D and 3D antenna pattern measurement. | ETS Lindgren | EMQuest V1.08 Build 3151 | 900        | Not Required         |

### **3. TEST METHOD**

The method is used to measure the antenna 2D or 3D gain of EUT in OTA anechoic chamber. Equipment Under Test (EUT) is placed at the center of the platform. EUT was rotated and data was recorded, step rotation 15° on both axis.

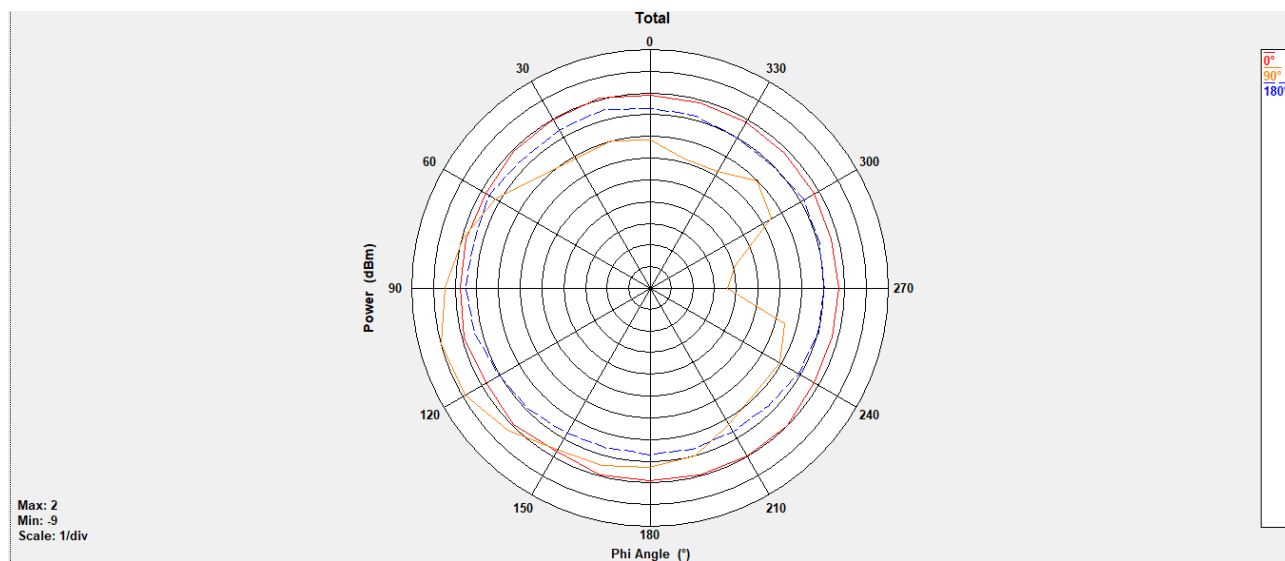
#### 4. EQUIPMENT DETAILS

| Type (EUT/<br>Support) | Equipment Description | Mfr                | Model No. | Serial No. |
|------------------------|-----------------------|--------------------|-----------|------------|
| EUT                    | Laser Rangefinder     | Maztech Industries | X4-LRF-2K | LRF000117  |

## 5. RESULTS

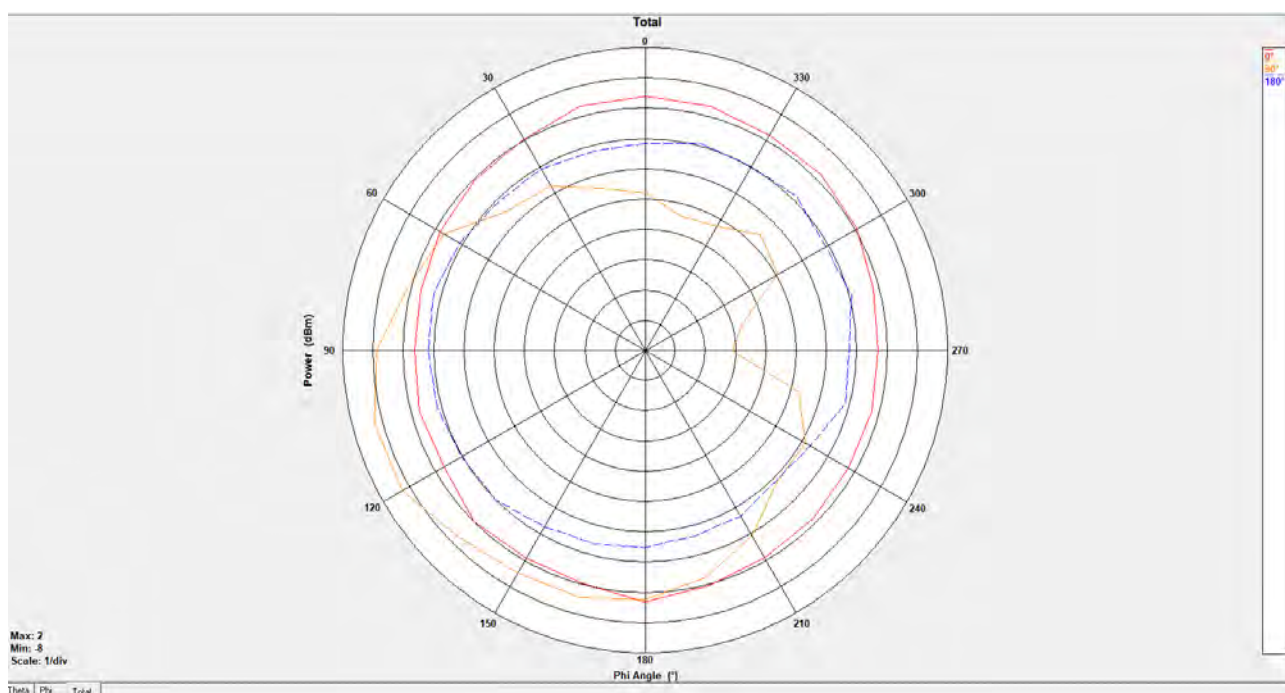
### BLE- 2402 MHz

|                      |          |
|----------------------|----------|
| Tot. Rad. Pwr. (dBm) | -1.16669 |
| Peak EIRP (dBm)      | 1.60568  |
| Directivity (dBi)    | 2.77237  |
| Efficiency (dB)      | -1.16669 |
| Efficiency (%)       | 76.4418  |
| Gain (dBi)           | 1.60568  |



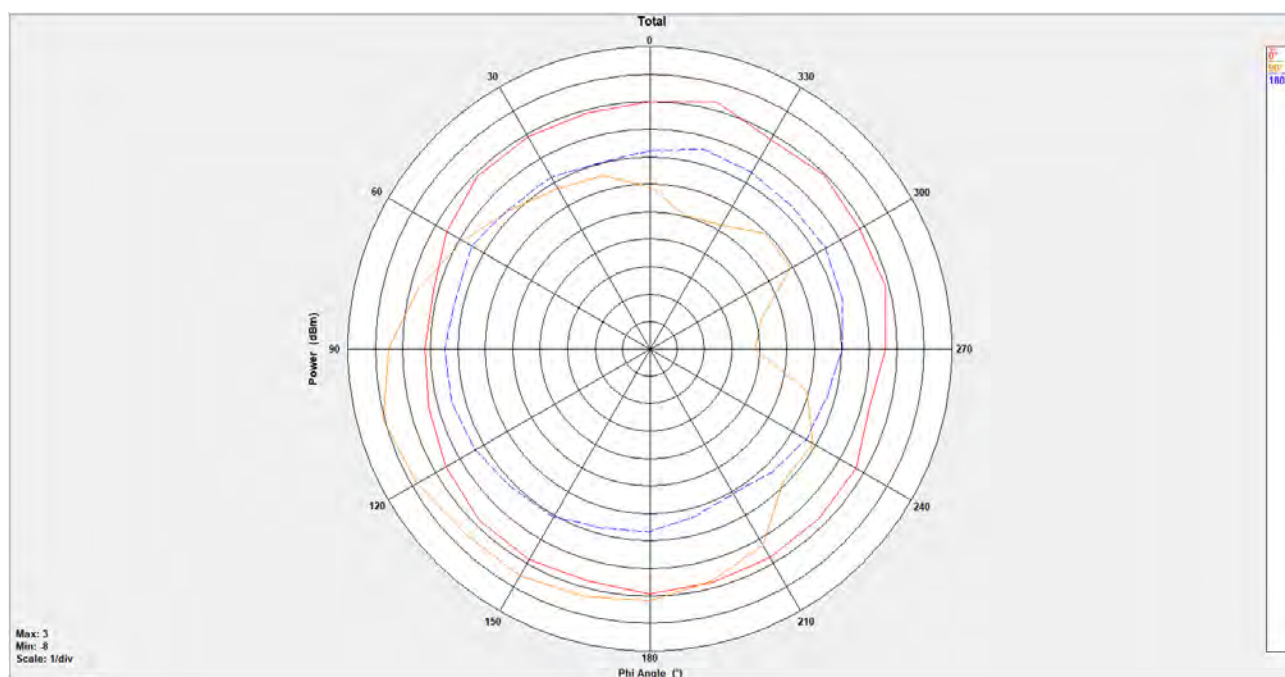
## BLE- 2440 MHz

|                      |           |
|----------------------|-----------|
| Tot. Rad. Pwr. (dBm) | -0.905766 |
| Peak EIRP (dBm)      | 1.77305   |
| Directivity (dBi)    | 2.67881   |
| Efficiency (dB)      | -0.905766 |
| Efficiency (%)       | 81.1752   |
| Gain (dBi)           | 1.77305   |

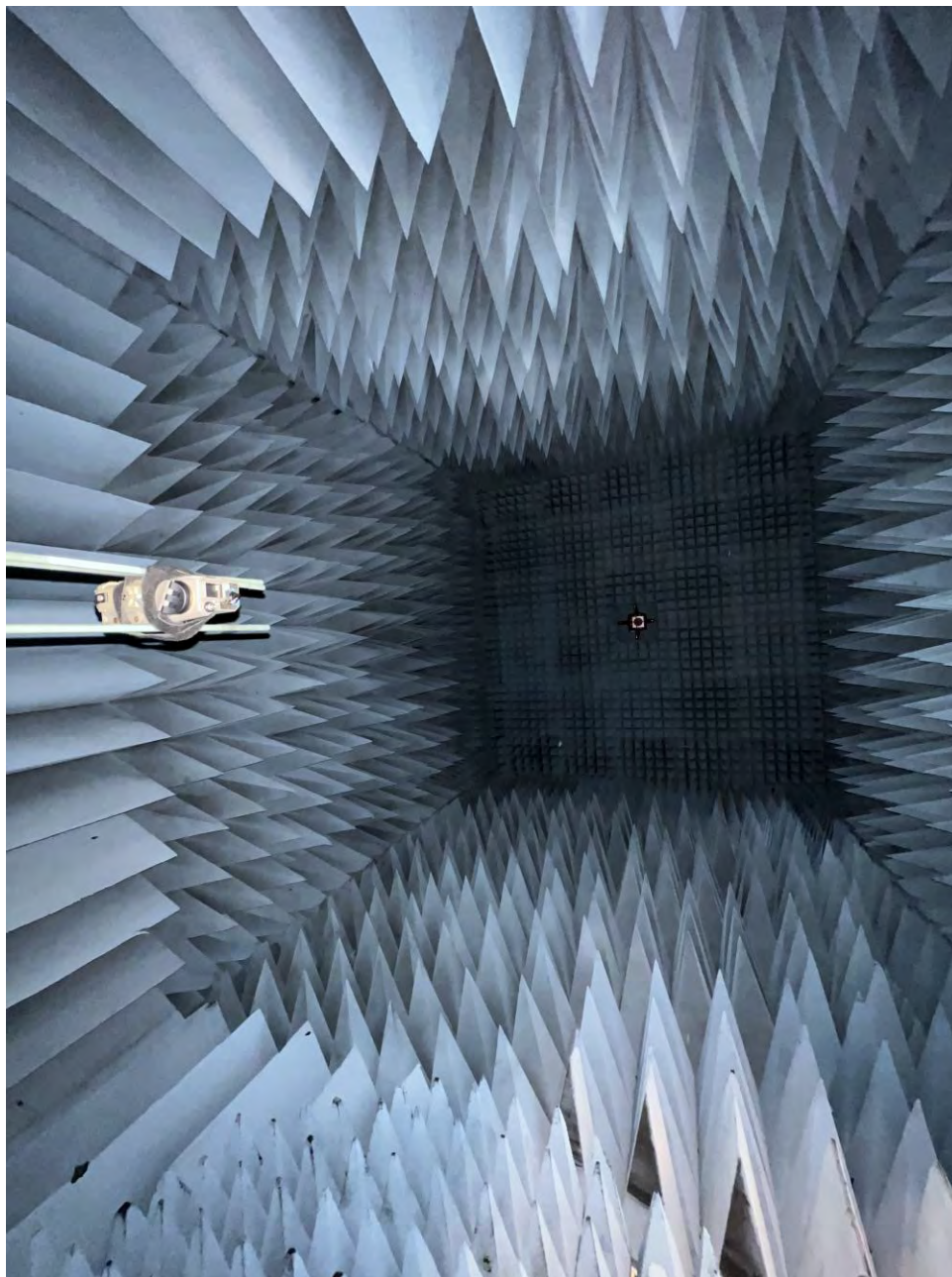


### BLE- 2480 MHz

|                      |           |
|----------------------|-----------|
| Tot. Rad. Pwr. (dBm) | -0.254269 |
| Peak EIRP (dBm)      | 2.15318   |
| Directivity (dBi)    | 2.40745   |
| Efficiency (dB)      | -0.254269 |
| Efficiency (%)       | 94.3133   |
| Gain (dBi)           | 2.15318   |



## 6. PHOTOGRAPHS





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