

HEADQUARTERS: 914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230 • PHONE (410) 354-3300 • FAX (410) 354-3313

4/22/2025

Maztech Industries 1641 Reynolds Ave. Irvine, CA 92614 USA

Dear Craig Cronin,

Enclosed is the EMC test report for testing of the Maztech Industries, X4-LRF tested to the requirements of FCC Part 2.1093

Thank you for using the services of Eurofins E&E North America. If you have any questions regarding these results or if MET can be of further service to you, please do feel free to contact me.

Sincerely,

Mancy Labucque

Nancy LaBrecque Documentation Department Eurofins Electrical and Electronic Testing NA, Inc.

Reference: WIRA134602_MPE_R3



Certificates and reports shall not be reproduced except in full, without the written permission of Eurofins E&E North America While use of the A2LA logo in this report reflects MET accreditation under these programs, the report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government. This letter of transmittal is not a part of the attached report.

Eurofins MET Laboratories Inc. (Eurofins E&E North America) is part of the Eurofins Electrical & Electronics (E&E) global compliance network.



Maztech Industries X4-LRF

RF Exposure Report

RF Exposure Criteria Test Report Using Maximum Permissible Exposure (MPE) Calculations

for the

Maztech Industries X4-LRF

Tested under

FCC Part 2.1093

Report: WIRA134602_MPE_R3

4/22/2025

Bryan Taylor, Wireless Team Lead Electromagnetic Compatibility Lab

Mancy Labucque

Nancy LaBrecque Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules Part 15.247 under normal use and maintenance.

Matthew Hinojosa EMC Manager, Austin Electromagnetic Compatibility Lab

eurofins

Maztech Industries X4-LRF

RF Exposure Report

Report Status Sheet

Revision	Report Date	Reason for Revision
0	2/12/2025	Initial Issue.
1	2/13/2025	Customer requested changes
2	3/24/2025	Additional customer requested changes. Updated report to reflect a portable device and show SAR exemption for the BLE transmitter
3	4/22/2025	Updated Antenna Gain



RF Exposure Report

Table of Contents

1.0 1	Requirements Summary	8
2.0 1	Equipment Configuration	9
2	2.1 Overview	9
2	2.2 Test Site	10
2	2.3 References	10
2	2.4 Description of Test Sample	11
2	2.5 Modifications	11
	2.5.1 Modifications to EUT	11
	2.5.2 Modifications to Test Standard	11
2	2.6 Disposition of EUT	11
3.0	Transmitter Requirements	12



RF Exposure Report

List of Tables

Table 1. Summary of Test Results	8
Table 2. EUT Summary Table	9
Table 3. References.	

eurofins

Maztech Industries X4-LRF

List of Terms and Abbreviations

AC	Alternating Current		
ACF	Antenna Correction Factor		
Cal	Calibration		
d	Measurement Distance		
dB	Decibels		
dBµA	Decibels above one microamp		
dBµV	Decibels above one microvolt		
dBµA/m	Decibels above one microamp per meter		
dBµV/m	Decibels above one microvolt per meter		
DC	Direct Current		
Е	Electric Field		
DSL	Digital Subscriber Line		
ESD	Electrostatic Discharge		
EUT	Equipment Under Test		
f	Frequency		
CISPR Comite International Special des Perturbations Radioelectrique (International Special Committee on Radio Interference)			
GRP	Ground Reference Plane		
Н	Magnetic Field		
НСР	Horizontal Coupling Plane		
Hz	Hertz		
IEC	International Electrotechnical Commission		
kHz	kiloHertz		
kPa	kiloPascal		
kV	kilovolt		
LISN	Line Impedance Stabilization Network		
MHz	MegaHertz		
μΗ	microHenry		
μΓ	microFarad		
μs	microseconds		
PRF	Pulse Repetition Frequency		
RF	Radio Frequency		
RMS	Root-Mean-Square		
V/m	Volts per meter		
VCP	Vertical Coupling Plane		



RF Exposure Report

1.0 Requirements Summary

E&E

Page Number	Test Name	Result
12	FCC Part 2.1093 Limits (For General Public Exposure)	Compliant

 Table 1. Summary of Test Results



2.0 Equipment Configuration

2.1 Overview

Eurofins METLabs was contracted by Maztech Industries to perform testing on the X4-LRF, under Maztech Industries's purchase order number 1MAZ1911.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Maztech Industries X4-LRF.

Product Name:	X4 Laser Rangefinder (X4-LRF)		
Model Number:	X4-LRF		
FCCID:	2BKWD-LRF01		
	Primary Power: 1.5	-4.2VDC	
	Antonno Coinly	BLE: 2.15dBi	
	Antenna Galli :	UWB:4.16dBi	
EUT Specifications	EUT Frequency	BLE: 2402MHz – 2480MHz	
EOT specifications.	Ranges:	UWB: 3.1GHz – 6GHz	
	Maximum	BLE: 0dBm	
	Conducted Output Power:	UWB: -13.0dBm	
Analysis:	The results obtained relate only to the item(s) tested		
	Temperature: 15-35	5° C	
Environmental 1 est	Relative Humidity: 30-60%		
Conditions:	Barometric Pressure: 860-1060 mbar		
Type of Filing:	Original		
Evaluated by:	Bryan Taylor		
Report Date(s):	4/22/2025		

The results obtained relate only to the item(s) tested.

 Table 2. EUT Summary Table

¹ The antenna gain information was provided by Maztech Industries at the time of testing.



Maztech Industries X4-LRF

RF Exposure Report

2.2 Test Site

All testing was performed at Eurofins E&E North America, Austin, TX. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

2.3 References

FCC Part 2.1093	Radiofrequency radiation exposure evaluation: portable devices.
	Table 3. References



RF Exposure Report

2.4 Description of Test Sample

Determines distances to items that are pointed to. It has wireless interfaces to communicate with accessories: UWB (3.1 GHz-5.8 GHz) and to communicate with smartphone for a command/control app: BLE 5.0 (2.4 GHz).

2.5 Modifications

2.5.1 Modifications to EUT

No modifications were made to the EUT.

2.5.2 Modifications to Test Standard

E&E

No modifications were made to the test standard.

2.6 Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Maztech Industries upon completion of testing.



3.0 Maximum Permissible Exposure Results

3.1 FCC SAR Exemption Thresholds

The FCC SAR exemption threshold limits from KDB447498D04 v01 are shown below.



where

 $x = -\log_{10}\left(\frac{60}{ERP_{20}\,\mathrm{cm}\sqrt{f}}\right)$

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

					Di	stance	(mm)				
		5	10	15	20	25	30	35	40	45	50
R	300	39	65	88	110	129	148	166	184	201	217
HW	450	22	44	67	89	112	135	158	180	203	226
y ()	835	9	25	44	66	90	116	145	175	207	240
enc	1900	3	12	26	44	66	92	122	157	195	236
nbə	2450	3	10	22	38	59	83	111	143	179	219
Fn	3600	2	8	18	32	49	71	96	125	158	195
	5800	1	6	14	25	40	58	80	106	136	169

3.1 FCC Blanket 1mW Exemption Criteria

Per the FCCs KDB 447498D04v01, transmitters that meet the 1mW blanket exemption power level are exempt from the RF exposure criteria.

B.1 General This appendix provides the exemption criteria and summarizes relevant parameters and usage considerations based on descriptions in FCC 19-126.
B.2 Blanket 1 mW Blanket Exemption
The 1 mW Blanket Exemption of § 1.1307(b)(3)(i)(A) applies for single fixed, mobile, and
portable RF sources with available maximum time-averaged power of no more than 1 mW.
regardless of separation distance.
The 1 mW blanket exemption applies at separation distances less than 0.5 cm, including where
there is no separation. This exemption shall not be used in conjunction with other exemption
criteria other than those for multiple RE sources in paragraph $(1, 1, 307(b)(3)(i))(A)$
The 1 mW exemption is independent of service type and covers the full range of 100 kHz to
100 GHz, but it shall not be used in conjunction with other exemption criteries or in devices with
higher news transmitters operating in the same time averaging pariod. Exposure from such
inghet-power transmitters operating in the same time-averaging period. Exposure from such
higher-power transmitters would invalidate the underlying assumption that exposure from the
lower-power transmitter is the only contributor to SAR in the relevant volume of tissue.

KDB 447498D01 Blanket Exemption for Transmitters Outputting Less than 1mW



Maztech Industries X4-LRF

RF Exposure Report

Test Procedure:

For the Ultra-Wideband transmitter, the maximum radiated power was compared to the 1mW blanket exemption limit. For the BLE transmitter the maximum conducted power was added to the antenna gain and the resultant EIRP was compared to the SAR exemption limit at 2402MHz and a separation distance of 5mm.

Test Results:

The X4 Laser Rangefinder (X4-LRF) was **compliant** with FCC Part 2.1093. The EIRP from the BLE transmitter was less than the power threshold limit for SAR based exemption with a separation distance of 5mm. Additionally, the Ultra-Wideband transmitter onboard met the 1mW blanket exemption criteria from KDB447498 D04.



RF Exposure Report

Test Data:

Maximum Output					
Power	Antenna	EIRP			
(dBm)	Gain (dBi)	(dBm)	EIRP (mW)	Pth	Result
0	2.15	2.15	1.6406	3,0000	exempt

SAR Power Threshold Data for the BLE Transmitter at 2402MHz

E&E

EIRP (Including Tune- Up Tolerance) (dBm)	EIRP (mW)
-13	0.0501187234

The worst case output power including tune-up tolerance was converted to mW and compared to the 1mW Exemption Criteria.

1mW Exemption for the Ultra-Wideband Transmitter

Test Engineer(s):	Bryan Taylor

Test Date(s): 1/27/2025



Maztech Industries X4-LRF

Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Asset #	Description	Manufacturer	Model	Last Cal Date	Cal Due Date
1A1250	Receiver	Rohde & Schwarz	ESW44	04/08/2024	04/08/2025
1A1234	FSV Signal Analyzer	Rohde & Schwarz	FSV 40	1/23/2023	02/23/2025
1A1176	Active Loop Antenna (9KHz-30MHz)	ETS-Lindgren	6502	8/22/2024	8/22/2026
1A1147	Bi-Log Antenna	Suno Sciences Corp	JB3	04/06/2023	04/06/2025
1A1047	Horn Antenna (1GHz – 18GHz)	ETS - Lindgren	3117	06/26/2024	06/26/2025
1A1161	Horn Antenna (18GHz – 40GHz)	ETS Lindgren	3116C	08/01/2024	08/01/2026
1A1088	Preamplifier	Rohde & Schwarz	TS-PR1	See Note	
1A1044	Generator	Com-Power	CG-520	See Note	
1A1073	Multi Device Controller	ETS	2090	See Note	
1A1074	System Controller	Panasonic	WV-CU101	See Note	
1A1080	Multi-Device	ETS	2090	See Note	
1A1180	Preamplifier	Miteq	AMF-7D- 01001800-22- 10P	See Note	

Table 4. Test Equipment List

Note:

Functionally tested equipment is verified using calibrated instrumentation at the time of testing.

End of Report