

RF Exposure Evaluation Report

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Testing laboratory:	Verkotan Oy Elektroniikkatie 17 90590 Oulu Finland	Client:	Redtail Telematics Ltd. Plextek Building London Road Great Chesterford Essex, CB10 1NY United Kingdom
Tested device:	Vehicle location tracker		
Related reports:	-		
Testing has been carried out in accordance with:	47CFR §2.1093 Radiofrequency Radiation Exposure Evaluation: Portable Devices FCC published RF exposure KDB procedures; 447498 D04 Interim General RF Exposure Guidance v01		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document		

Date and signatures: 28.03.2025

Laboratory Manager

Miia Nurkkala

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1. EVALUATION SUMMARY

1.1 Test Details

Device under Test (DUT):

Product:	VLU6M4SP
Manufacturer:	Redtail Telematics Ltd.
Model:	EW
Hardware Version:	EP3
FCC ID:	2AXBF-VLU6M4SP
Mobile/Portable device:	Mobile
FCC Test Firm Designation Number:	FI0005
Document ID:	FCC_RF Exposure Evaluation_VLU6M4SP_ID7501_28032025
Document History:	Initial version

1.2 Evaluation Results

1.2.1 Standalone Exposure

The device conforms to the requirements of the standards when the maximum ERP is less than or equal to the Test Exclusion Threshold Limit.

Mode of Operation	Maximum ERP [mW]	Separation Distance [mm]	MPE-Based Exemption threshold [mW]	Evaluation Result
BLE	0.33	300	1728	PASS
VHF	30.48	300	344.7	PASS

1.2.2 Simultaneous Transmission Exposure

Highest Simultaneous Transmission SAR	$\sum \text{ERP}_j / \text{ERP}_{\text{th},j}$	Limit	Evaluation Result
BLE + VHF	0.0882	1	PASS

2. DESCRIPTION OF THE DEVICE UNDER TEST (DUT)

The DUT, VLU6M4SP, is used for vehicle location tracking and it is mounted behind the dashboard of the vehicle. The DUT is a self-powered VHF radio based around a single transceiver, a PA and a receiver RF front end. The device has two internal power sources, a 3V and a 6V non-rechargeable battery packs.

A Bluetooth Low Energy radio is used to communicate with a separate key fob used to detect the presence of an authorised driver. The VHF radio unit has 3 modes of operation; normal run, activated and speed up mode. They all transmit with duty cycle from which the speed up mode is having highest operation duty cycle: it has Tx on for 100ms every 2 seconds.

Exposure Environment	General population, uncontrolled
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2.1 Supported Frequency Bands and Operational Modes

TX Frequency bands	Modes of Operation	Transmitter Frequency Range [MHz]	Maximum Specified Output Power [dBm]
	BLE	2402 – 2480	-2.7
	VHF	173 – 173	30

3. TEST EXCLUSIONS

FCC MPE-based Exemption thresholds in 447498 D04 Interim General RF Exposure Guidance v01 are shown in a table below.

TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES
SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source Frequency			Minimum Distance			Threshold ERP
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	$1,920 R^2$
1.34	–	30	35.6 m	–	1.6 m	$3,450 R^2/f^2$
30	–	300	1.6 m	–	159 mm	$3.83 R^2$
300	–	1,500	159 mm	–	31.8 mm	$0.0128 R^2 f$
1,500	–	100,000	31.8 mm	–	0.5 mm	$19.2 R^2$
Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.						

According to Table B.1 in 447498 D04 Interim General RF Exposure Guidance v01, FCC MPE-based Exemption threshold can be calculated according to formulas:

300-1500 MHz: $0.0128 * R^2 * f$
 1500-100 000 MHz: $19.2 R^2$

where:

R = Separation distance (m)

f = Frequency (MHz)

Modes of Operation	Frequency [MHz]	Separation Distance [mm]	P_{th} [mW]
BLE	2402	300	1728
VHF	173	300	344.7

4. RESULTS

4.1 Standalone Exposure

Modes of Operation	Frequency [MHz]	Distance, R [mm]	Maximum Input Power to Antenna, P [dBm]	Time Averaging Factor	Time-Averaged Input Power to Antenna, P [mW]	Time-Averaged Input Power to Antenna, P [dBm]	Power Gain of Antenna, G [dBi]	Time-Averaged ERP [dBm]	Time-Averaged ERP [mW]	P _{th} [mW]
BLE	2402	300	-2.7	1	0.54	-2.7	0	-4.85	0.33	1728
VHF	173	300	30	0.05	50	16.99	0	14.84	30.48	344.7

The ERP of the DUT is below the test exclusion threshold.

4.2 Simultaneous Transmission Analysis

The simultaneous transmission compliance is determined by sum of the ratios that can be transmitting simultaneously using formula C.1 from 447498 D04 Interim General RF Exposure Guidance v01.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1 \quad (C.1)$$

where

ERP_j = the available maximum time-averaged power or the ERP, whichever is greater, of fixed, mobile, or portable RF source j.

ERP_{th,j} = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least λ/2π, according to the applicable § 1.1307(b)(3)(i)(C) Table 1 formula at the location in question.

Following simultaneous transmission combinations are supported:

- BLE + VHF

Modes of Operation	ERP _j / ERP _{th,j}
BLE	0.00019
VHF	0.088
Maximum Simultaneous Compliance Ratio	0.0882

The sum of simultaneously transmitting radios is below 1 thus the results are **PASS**.