

**ELEMENT WASHINGTON DC LLC**

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<http://www.element.com>**RF EXPOSURE EVALUATION  
Maximum Permissible Exposure (MPE)****Applicant Name:**

PALIoT Solutions LLC

13 Clark Street

Shortsville, NY 14548

**Date of Testing:**

3/4/2025 - 3/5/2025

**Test Report Issue Date:**

4/28/2025

**Test Site/Location:**

Element lab., Columbia, MD, USA

**Test Report Serial No.:**

1M2503030020-03-R1.2BOFL

**FCC ID:****2BOFL80030198560151****APPLICANT:****PALIoT Solutions LLC****EUT Type:**

Integrated Module (PIM)

**FCC Classification:**

Digital Transmission System (DTS)

**FCC Rule Part:**

FCC Part 1 (§1.1310) and Part 2 (§2.1091)

**Test Procedure(s):**

KDB 447498 D01 v06

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in FCC KDB 447498 D01. Test results reported herein relate only to the item(s) tested.

This revised Test Report (S/N: 1M2503030020-03-R1.2BOFL) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

**RJ Ortanez**  
**Executive Vice President**



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V 11.2 9/11/2024

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## 1.0 RF EXPOSURE EVALUATION – MAXIMUM PERMISSIBLE EXPOSURE (MPE)

### 1.1 Introduction

This document is prepared to show compliance with the RF Exposure requirements as required in §1.1310 of the FCC Rules.

The limit for Maximum Permissible Exposure (MPE), specified in FCC §1.1310, is listed in Table 1-1. According to FCC §1.1310: the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b).

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (Minutes)
(A) Limits For Occupational / Control Exposures (f = frequency)				
30-300	61.4	0.163	1.0	6
300-1500	...	...	f/300	6
1500-100,000	...	...	5.0	6
(B) Limits For General Population / Uncontrolled Exposure (f = frequency)				
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

**Table 1-1. Limits for Maximum Permissible Exposure (MPE)**

### 1.2 EUT Description

The **PALIoT Integrated Module (PIM)** with **FCC ID: 2BOFL80030198560151** is an asset tracker containing a BLE transmitter.

The PALIoT device was fixtured for measurement with each antenna terminated with a semi-rigid coaxial cable and SMA female connector. The fixture was then mounted onto a wooden block provided by ACD for antenna tuning and optimization. The BLE antenna gain is affected by objects placed in the near-field. Thus, as the device will be placed onto wooden pallets, the antenna radiation patterns were characterized both in free space and in close proximity to a pallet-representative wooden block. The LTE antenna is optimized for best performance with the Wooden block. Matching network utilizing series capacitor (3.0pF) and series inductor (5.1nH) was used for the LTE antenna. Physical battery is used for antenna tuning optimization and measurement.

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### 1.3 Procedure

The procedure used to determine the RF power density was based upon a calculation for determining compliance with the MPE requirements.

The power generated by each transmitter used in this product was initially measured by a power meter or spectrum analyzer and the powers were recorded. Through use of the Friis transmission formula and knowledge of the maximum antenna gain to be used, the power density level is calculated at a distance of 20cm.

#### Friis Transmission Formula

Friis transmission formula:  $P_d = (P_{out} * G) / (4\pi r^2)$

Where,

$P_d$  = Power Density (mW/cm<sup>2</sup>)

$\pi$  = 3.1416

$P_{out}$  = output power to antenna (mW)

$r$  = distance between observation point and center of the radiator (cm)

$G$  = gain of antenna in linear scale

#### Calculated MPE

The power density limit for General Population/Uncontrolled Exposure at each frequency is determined based on the information in Table 1-1.

There is no co-location between the electric fields of any two transmitters therefore following power densities are calculated for each individual transmitter by frequency at 20cm spacing:

Technology	Band	Frequency [MHz]	Max Power [dBm]	Max Power [mW]	Distance [cm]	Max Gain [dBi]	FCC Power Density [mW/cm <sup>2</sup> ]	FCC PD Limit [mW/cm <sup>2</sup> ]	FCC Percentage MPE Used (%)	Result
BTLE (With wooden)	-	2402	6.00	3.98	20	2.88	0.002	1.000	0.15	PASS
BTLE (Without wooden)	-	2402	6.00	3.98	20	1.55	0.001	1.000	0.11	PASS

**Table 1-2. Calculated MPE Data**

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## 2.0 CONCLUSION

The device meets the mobile RF exposure limit at a 20cm separation distance as specified in §2.1091 of the FCC Rules. An appropriate RF exposure compliance statement will be placed in the user's manual.

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