

**RF Exposure Report  
(mobile devices)  
47 CFR 2.1091  
RSS-102 Issue 6**

**Report No.:** WIRS135492 – FCC & ISED RF Exposure

**Test Model:** Communication Unit

**Received Date:** 05/29/2025

**Test Date(s):** 06/19/2025 – 06/20/2025, 06/25/2025 – 06/27/2025, 07/07/2025

**Issued Date:** 07/23/2025

**Applicant:** Bloodhound Tracking Systems

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## 1. Certificate of Conformity

**Product:** Bloodhound Tracking Device

**Brand:** Bloodhound Tracking Device

**Test Model:** Communication Unit

**Sample Status:** Production

**Applicant:** Bloodhound Tracking Device

**Test Date(s):** 06/19/2025 – 06/20/2025, 06/25/2025 – 06/27/2025, 07/07/2025

**Standard:** 47 CFR FCC Part 2.1091 and FCC Part 1.1310  
RSS-102 Issue 6

A handwritten signature in black ink, appearing to read "Chin Ming Lui".

Chin Ming Lui  
Senior Wireless Test Engineer

**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 Part 22 Subpart H and Part 24 Subpart E and Part 27 Subpart L of the FCC Rules under normal use and maintenance.

## Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	July 23, 2025	Initial Issue.
1	July 29, 2025	Updated Section 1: "EUT General Info". Updated Section 3.3: "RF Exposure Calculation" for Iridium Radio (both FCC and ISED).

## 1. EUT General info

Bloodhound Tracking Device: BTD CU Plus  
Manufacturer: Bloodhound Tracking Device  
Part Number: 100602

- Cellular Radio:
  - Manufacturer: Trasna Cellular S.p.A.
  - P/N: SARA-R510M8Sv1
  - FCC ID: XPYUBX19KM01
  - LTE-M Bands Enabled
  - Integrated GNSS receiver
    - Constellations enabled: (GPS)
- LoRa Radio:
  - P/N: SX1262IMLRT
    - Manufacturer: Semtech
    - Chipset Design
    - Frequency Hopping: Not Implemented
    - FHSS: Not Implemented
    - Spectrum Access: Duty Cycle (1%)
    - Maximum Output Power: 14 dBm
    - Bandwidth: 500 kHz
    - Spreading Factor: 10
    - Coding Rate: 4/5
    - NA Band: 902 to 915MHz (Unit is parked at 902.5MHz)
- Satcom Radio:
  - Manufacturer: Iridium Satellite LLC
  - P/N: SBDN9603
  - FCC ID: Q639603N
  - Data: SBD Messages
- Simultaneous Transmitter Configuration:
  - LTE-M and Iridium radios are never powered at the same time and will not transmit simultaneously
  - LTE-M and LoRa are both enabled concurrently and can transmit at the same time.
  - During an Iridium SBD message session, LoRa transmission is disabled. LoRa and Iridium do not transmit simultaneously; however, LoRa can still receive packets while Iridium is active.

**Note:** The information in this section is leveraged from the Operational Description supplied by Bloodhound Tracking Device.

## 2. RF Exposure Limits

In this document, we evaluate the RF Exposure to human body due the intentional transmission from the transmitter (EUT). The limits for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 and RSS-102 issue 6 were followed.

### 2.1 FCC ID

**FCC ID:** 2BP2A-BTDCUP

**IC:** 34083-BTDCUP

### 2.2 FCC Limits

According to FCC 1.1310 Table 1: 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)

Table 1 to § 1.1310(e)(1) – LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (minutes)
<b>(A) Limits For Occupational / Control Exposures</b>				
0.3 – 3.0	614	1.63	*100	6
3.0 – 30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300 - 1500	...	...	F/300	6
1500 - 100,000	...	...	5	6
<b>(B) Limits For General Population / Uncontrolled Exposure</b>				
0.3 – 1.34	614	1.63	*100	30
1.34 – 30	824/f	2.19/f	*180/f <sup>2</sup>	30
30 – 300	27.5	0.073	0.2	30
300 - 1500	...	...	F/1500	30
1500 - 100,000	...	...	1.0	30

F = Frequency in MHz

\* = plane wave equivalent density

## 2.3 ISED Limits

According to RSS-102, ISED has adopted the SAR and RF field strength limits established in Health Canada's RF exposure guideline, Safety Code 6.

**Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)**

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m <sup>2</sup> )	Reference Period (minutes)
0.003-10	83	90	-	Instantaneous*
0.1-10	-	0.73/ $f$	-	6**
1.1-10	87/ $f$ <sup>0.5</sup>	-	-	6**
10-20	27.46	0.0728	-2	6
20-48	58.07/ $f$ <sup>0.25</sup>	0.1540/ $f$ <sup>0.25</sup>	8.944/ $f$ <sup>0.5</sup>	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 $f$ <sup>0.3417</sup>	0.008335 $f$ <sup>0.3417</sup>	0.02619 $f$ <sup>0.6834</sup>	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ $f$ <sup>1.2</sup>
150000-300000	0.158 $f$ <sup>0.5</sup>	4.21 x 10-4 $f$ <sup>0.5</sup>	6.67 x 10 <sup>-5</sup> $f$	616000/ $f$ <sup>1.2</sup>

Note:  $f$  is frequency in MHz.  
 \* Based on nerve stimulation (NS).  
 \*\* Based on specific absorption rate (SAR).

### 3 Test Results (Mobile Configuration)

#### 3.1 Classification

Radio is installed inside a mobile host device. The antenna of the product, under normal use condition, is at least 20 cm away from the body of the user and accessible to the end user. Warning statement to the user for keeping at least 20 cm or more separation distance with the antenna should be included in user's manual.

#### 3.2 Maximum RF Power

**LoRa Radio:**

Modulation	Frequency Range (MHz)	Max. RF output power <sup>1</sup> (dBm)	Max. Antenna Gain <sup>2</sup> (dBi)	Max. EIRP <sup>3</sup> (dBm)	Max. EIRP (mWatts)
LoRa	902 – 928	13.14	-1.7	11.44	13.93

<sup>1</sup>**Note:** Measured max. conducted output power obtained from test report WIRS135492-FCC 15.247

<sup>2</sup>**Note:** LoRa Antenna peak gain obtained from "Antenna Report for CU Antennas" provided by Bloodhound Tracking Devices. Antenna specification sheet is attached in Appendix A.

<sup>3</sup>**Note:** Max. EIRP (dBm) = Max RF Output Power (dBm) + Max Antenna Gain (dBi)

**Cellular Radio:**

<b>Band</b>	<b>Frequency Range (MHz)</b>	<b>Max. RF output Power<sup>1</sup> (W)</b>	<b>Max. RF output Power with Tune Up<sup>2</sup> (dBm)</b>	<b>Max. Antenna Gain<sup>3</sup> (dBi)</b>	<b>Max EIRP<sup>4</sup> (dBm)</b>	<b>Max EIRP (mWatts)</b>
LTE CAT-M1 B2	1850 – 1910	0.1976	25	5.48	30.48	1116.9
LTE CAT-M1 B4	1710 – 1755	0.2128	25	5.48	30.48	1116.9
LTE CAT-M1 B5	824 – 849	0.2027	25	0.81	25.81	381.07
LTE CAT-M1 B12	699 – 716	0.1995	25	0.81	25.81	381.07
LTE CAT-M1 B13	777 – 787	0.2065	25	0.81	25.81	381.07
LTE CAT-M1 B26	814 – 849	0.1883	25	0.81	25.81	381.07

<sup>1</sup>**Note:** Maximum conducted output power for LTE CAT-M1 leveraged from u-blox AG Grant (FCC ID: XPYUBX19KM01).

<sup>2</sup>**Note:** Maximum conducted output power with tune-up tolerance leveraged from “RF Exposure and Maximum ERP/EIRP Assessment For SARA-R510M8S” (FCC ID: XPYUBX19KM01, IC: 8595A-UBX19KM01, Assessment Reference: MDE\_UBLOX\_1905\_MPE\_01\_rev03) test report by 7layers

<sup>3</sup>**Note:** Cellular Antenna peak gain obtained from “Antenna Report for CU Antennas” provided by Bloodhound Tracking Devices. Antenna specification sheet is attached in Appendix A.

<sup>4</sup>**Note:** Max. EIRP (dBm) = Max RF Output Power with Tune Up (dBm) + Max Antenna Gain (dBi)

**Iridium Radio:**

<b>Modulation</b>	<b>Frequency Range (MHz)</b>	<b>Max. RF output power<sup>1</sup> (dBW)</b>	<b>Max. Antenna Gain<sup>2</sup> (dBi)</b>	<b>Max. EIRP<sup>3</sup> (dBW)</b>	<b>Max. EIRP (mWatts)</b>
Iridium	1616 – 1626.5	2.61	3.4	6.01	3990.2

<sup>1</sup>**Note:** Max. Conducted Output Power leveraged from “FCC and Industry Canada Testing of the Iridium Communications Inc. 9603N” (FCC ID: Q639603N, IC: 4629A-9603N, Document 75926443 Report 05 Issue 2) Test Report by TÜV SÜD

<sup>2</sup>**Note:** Peak gain obtained from “DP254 Ceramic Patch Antenna” by Unictron Technologies Corp. Antenna specification sheet is attached in Appendix A.

<sup>3</sup>**Note:** Max. EIRP (dBW) = Max RF Output Power (dBW) + Max Antenna Gain (dBi)

### 3.3 RF Exposure Calculation

#### FCC limits

Calculations for this report are based on highest power for each radio channel or band

#### LoRa Radio:

Evaluation of 20cm distance:

Modulation	Frequency Range (MHz)	Max. EIRP <sup>1</sup> (dBm)	Max. EIRP (mW)	Power Density (mW/cm <sup>2</sup> ) @20 cm	FCC Limit (mW/cm <sup>2</sup> )	Results
LoRa	902 – 928	11.44	13.93	0.0028	1.0	Complies

<sup>1</sup>**Note:** Max. EIRP (dBm) = Max RF Output Power (dBm) + Max Antenna Gain (dBi)

#### Cellular Radio:

Evaluation of 20cm distance:

Band	Frequency Range (MHz)	Max. EIRP <sup>1</sup> (dBm)	Max. EIRP <sup>1</sup> (mW)	Power Density (mW/cm <sup>2</sup> ) @20 cm	FCC Limit (mW/cm <sup>2</sup> )	Results
LTE CAT-M1 B2	1850 – 1910	30.48	1116.9	0.2222	1.0	Complies
LTE CAT-M1 B4	1710 – 1755	30.48	1116.9	0.2222	1.0	Complies
LTE CAT-M1 B5	824 – 849	25.81	381.07	0.0758	0.549	Complies
LTE CAT-M1 B12	699 – 716	25.81	381.07	0.0758	0.466	Complies
LTE CAT-M1 B13	777 – 787	25.81	381.07	0.0758	0.518	Complies
LTE CAT-M1 B26	814 – 849	25.81	381.07	0.0758	0.543	Complies

<sup>1</sup>**Note:** Max. EIRP (dBm) = Max RF Output Power with Tune Up (dBm) + Max Antenna Gain (dBi)

### Iridium Radio:

Evaluation of 20cm distance:

Modulation	Frequency Range (MHz)	Max. EIRP <sup>1</sup> (dBW)	Max. EIRP (mW)	Power Density (mW/cm <sup>2</sup> ) @20 cm	FCC Limit (mW/cm <sup>2</sup> )	Results
Iridium	1616 – 1626.5	6.01	3990.2	0.7938	1.0	Complies

<sup>1</sup>**Note:** Max. EIRP (dBW) = Max RF Output Power (dBW) + Max Antenna Gain (dBi)

The Iridium radio is not capable of simultaneous transmission with either LoRa or Cellular radio.

### LoRa + Cellular Radios Simultaneous Transmission:

Worst-case scenario: LoRa and LTE CAT-M1 B4 transmitting simultaneously.

Power Density of Simultaneous Transmitting Radios =  $0.0028 \text{ mW/cm}^2 + 0.2222 \text{ mW/cm}^2 = 0.225 \text{ mW/cm}^2$ , which complies with the worst-case FCC limit of  $0.466 \text{ mW/cm}^2$ .

## ISED Limits

Calculations for this report are based on highest power for each radio channel or band

### LoRa Radio:

Evaluation of 20cm distance:

Modulation	Frequency Range (MHz)	Max. EIRP <sup>1</sup> (dBm)	Max. EIRP (mW)	Power Density (W/m <sup>2</sup> ) @20 cm	RSS Limit (W/m <sup>2</sup> )	Results
LoRa	902 – 928	11.44	13.93	0.028	2.74	Complies

<sup>1</sup>Note: Max. EIRP (dBm) = Max RF Output Power (dBm) + Max Antenna Gain (dBi)

### Cellular Radio:

Evaluation of 20cm distance:

Technology	Frequency Range (MHz)	Max. EIRP <sup>1</sup> (dBm)	Max. EIRP (mW)	Power Density (W/m <sup>2</sup> ) @20 cm	RSS Limit (W/m <sup>2</sup> )	Results
LTE CAT-M1 B2	1850 – 1910	30.48	1116.9	2.222	4.476	Complies
LTE CAT-M1 B4	1710 – 1755	30.48	1116.9	2.222	4.242	Complies
LTE CAT-M1 B5	824 – 849	25.81	381.07	0.758	2.576	Complies
LTE CAT-M1 B12	699 – 716	25.81	381.07	0.758	2.302	Complies
LTE CAT-M1 B13	777 – 787	25.81	381.07	0.758	2.474	Complies
LTE CAT-M1 B26	814 – 849	25.81	381.07	0.758	2.554	Complies

<sup>1</sup>Note: Max. EIRP (dBm) = Max RF Output Power with Tune Up (dBm) + Max Antenna Gain (dBi)

### Iridium Radio:

Evaluation of 28cm distance:

Modulation	Frequency Range (MHz)	Max. EIRP <sup>1</sup> (dBW)	Max. EIRP (mW)	Power Density (W/m <sup>2</sup> ) @28 cm	RSS Limit (W/m <sup>2</sup> )	Results
Iridium	1616 – 1626.5	6.01	3990.2	4.05	4.081	Complies

<sup>1</sup>**Note:** Max. EIRP (dBW) = Max RF Output Power (dBW) + Max Antenna Gain (dBi)

The Iridium radio of the EUT complies with RF Exposure requirements at 28cm away from the body of the user. The Iridium radio is not capable of simultaneous transmission with either LoRa or Cellular radio.

### LoRa + Cellular Radios Simultaneous Transmission:

Worst-case scenario: LoRa and LTE CAT-M1 B4 transmitting simultaneously.

Power Density of Simultaneous Transmitting Radios =  $0.028 \text{ W/m}^2 + 2.222 \text{ W/m}^2 = 2.25 \text{ W/m}^2$ , which complies with the worst-case RSS limit of  $2.302 \text{ W/m}^2$ .

### Power Density Calculation

$$P_d = (P_{out} * G) / (4 * \pi * R^2)$$

Where:

$P_d$  = Power density in  $\text{W/m}^2$

$P_{out}$  = Output power from the antenna in watts (W)

$G$  = Gain of the antenna in linear scale

$R$  = Distance between observation point and center of the radiator in meters (m)

## 4 Conclusion

This device is compliant with RF Exposure requirements of the limits for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 and RSS-102 Issue 6 for General Public (Uncontrolled Environment).

The LoRa and Cellular radios comply to both the FCC and ISED limits at 20cm away from the body of the user. Worst-case scenario of LoRa and LTE CAT-M1 B4 simultaneous transmission comply with both FCC and ISED MPE limits.

The Iridium radio complies to the FCC limit at 20cm away from the body of the user and complies to the ISED limit at 28cm away from the user.

The LoRa and Cellular radios are capable of simultaneous transmission.

The Iridium radio is not capable of simultaneous transmission with either LoRa or Cellular radio.

In conclusion, the EUT, under normal use condition, must be at least 28 cm away from the body of the user and accessible to the end user. Warning statement to the user for keeping at least 28 cm or more separation distance with the antenna should be included in user's manual.

## Appendix A

### Antenna Information:



BTD CU Antenna  
Report\_16Jul2025.pdf



Iridium Patch  
Antenna (Dual Pin).pdf

### Operational Description:



OP BTD CU Plus PN  
100602.pdf