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RADIO TEST REPORT

Report ID

REP122138

Project ID

PRJ0089134

Type of assessment:

MPE Calculation report

Manufacturer:

Geotab Inc.

Product Marketing Name (PMN):

Telematics Device

Hardware Version Identification Number (HVIN):

GDSBA1

FCC identifier:

FCC ID: 2AV57GDSBA1

ISED certification number:

IC: 11140A-GDSBA1

Specification:

- ◆ FCC 47 CFR Part 1 Subpart I, §1.1307, §1.1310
- ◆ FCC 47 CFR Part 2 Subpart J, §2.1091
- ◆ FCC KDB 447498 D01 General RF Exposure Guidance v06
- ◆ ISED Canada RSS-102 Issue 6 (December 2023)

RSS-102 Annex A

ATTESTATION: I attest that the information provided in Annex A is correct; that the Technical Brief was prepared and the information contained therein is correct; that the device evaluation was performed or supervised by me; that applicable measurement methods and evaluation methodologies have been followed; and that the device meets the applicable RF exposure limits set forth in RSS-102.

Date of issue: December 3, 2025

Alvin Liu, EMC/RF Specialist

Prepared by

Signature

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ANAB File Number: AT-3195 (Ottawa); AT-3193 (Pointe-Claire); AT-3194 (Cambridge)



Lab locations

Company name	Nemko Canada Inc.
Facilities	Ottawa site: 303 River Road, Ottawa, ON, Canada, K1V 1H2 Tel: +1 613 737 9680 Test site registration number: CA2040 Montréal site: 292 Labrosse Avenue, Pointe-Claire, QC, Canada, H9R 5L8 Tel: +1 514 694 2684 Test site registration number: CA2041 Cambridge site: 1-130 Saltsman Drive, Cambridge, ON, Canada, N3E 0B2 Tel: +1 519 650 4811 Test site registration number: CA0101
Website	www.nemko.com

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

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Section 1 Evaluation summary

1.1 MPE calculation for simultaneous transmission

1.1.1 References, definitions and limits

FCC §2.1091(d)

- (2) For operations within the frequency range of 300 kHz and 6 GHz (inclusive), the limits for maximum permissible exposure (MPE), derived from whole-body SAR limits and listed in Table 1 in paragraph (e)(1) of this section, may be used instead of whole-body SAR limits as set forth in paragraphs (a) through (c) of this section to evaluate the environmental impact of human exposure to RF radiation as specified in §1.1307(b) of this part, except for portable devices as defined in §2.1093 of this chapter as these evaluations shall be performed according to the SAR provisions in §2.1093.

Table 1.1-1: 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 ²)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3–3.0	614	1.63	*(100)	≤6
3.0–30	1842 / f	4.89 / f	*(900 / f ²)	<6
30–300	61.4	0.163	1.0	<6
300–1500	–	–	f / 300	<6
1500–100000	–	–	5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	<30
1.34–30	824 / f	2.19 / f	*(180 / f ²)	<30
30–300	27.5	0.073	0.2	<30
300–1500	–	–	f / 1500	<30
1500–100000	–	–	1.0	<30

Notes: f = frequency in MHz, * = Plane-wave equivalent power density.

References, definitions and limits, continued

RSS-102, Section 5.1

Through this standard, ISED adopts Health Canada's RF exposure guideline entitled Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz (Safety Code 6) and its Notice: Localized human exposure limits for radiofrequency fields in the range of 6 GHz to 300 GHz.

Table 1.1-2: Table 7&8 to RSS-102 — RF Field Strength and power density Limits

Frequency range (MHz)	Electric field strength (V/m rms)	Magnetic field strength (A/m rms)	Power density (W/m ²)	Reference Period (minutes)
Limits for controlled-use devices (controlled environment)				
10–20	61.4	0.163	10	6
20–48	129.8 / $f^{0.25}$	0.3444 / $f^{0.25}$	44.72 / $f^{0.5}$	6
48–100	49.33	0.1309	6.455	6
100–6000	15.60 $f^{0.25}$	0.04138 $f^{0.25}$	0.6455 $f^{0.5}$	6
6000–15000	137	0.364	50	6
15000–150000	137	0.364	50	616000 / $f^{1.2}$
150000–300000	0.354 $f^{0.5}$	9.40 × 10 ⁻⁴ $f^{0.5}$	3.33 × 10 ⁻⁴ f	616000 / $f^{1.2}$
Limits for r devices used by the general public (uncontrolled environment)				
10–20	27.46	0.0728	2	6
20–48	58.07 / $f^{0.25}$	0.1540 / $f^{0.25}$	8.944 / $f^{0.5}$	6
48–300	22.06	0.05852	1.291	6
300–6000	3.142 $f^{0.3417}$	0.008335 $f^{0.3417}$	0.02619 $f^{0.6834}$	6
6000–15000	61.4	0.163	10	6
15000–150000	61.4	0.163	10	616000 / $f^{1.2}$
150000–300000	0.158 $f^{0.5}$	4.21 × 10 ⁻⁴ $f^{0.5}$	6.67 × 10 ⁻⁵ f	616000 / $f^{1.2}$

Notes: f = frequency in MHz

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (mW/cm² or W/m²)
P = power input to the antenna (mW or W)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (cm or m)

1.1.2 EUT technical information

	Transmitter 1 (WiFi)	Transmitter 2 (BLE)	Transmitter 3 (LTE)
Prediction frequency	2442 MHz	2402 MHz	777 MHz
Antenna type	LDS Antenna	LDS Antenna	LDS Antenna
Antenna gain	2.8 dBi	2.8 dBi	2.3 dBi
Maximum transmitter conducted power	14.7 dBm	5.3 dBm	23.2 dBm
Prediction distance (declared)	20 cm	20 cm	20 cm

Note: WiFi and BLE can not be in simultaneous transmitting mode, so MPE calculation for simultaneous transmission was performed at two scenarios: WiFi<E and BLE<E.

1.1.3 MPE calculation

	Transmitter 1	Transmitter 3	
Fundamental transmit (prediction) frequency:	2442 MHz	777 MHz	
Maximum measured conducted peak output power:	14.7 dBm	23.2 dBm	
Cable and/or jumper loss:	0 dB	0 dB	
Maximum peak power at antenna input terminal:	14.7 dBm	23.2 dBm	
Duty cycle:	100 %	100 %	
Maximum calculated average power at antenna input terminal:	29.5121 mW	208.93 mW	
Single Antenna gain (typical):	2.8 dBi	2.3 dBi	
Number of antennae:	1	1	
Total system gain:	2.80 dBi	2.30 dBi	
MPE limit for <u>uncontrolled</u> exposure at prediction frequency:	ISED limit 0.54115 mW/cm ² FCC limit 1.00000 mW/cm ²	ISED limit 0.24743 mW/cm ² FCC limit 0.51800 mW/cm ²	
MPE limit for <u>controlled</u> exposure at prediction frequency:	5.411540 W/m ² 3.18984 mW/cm ² 31.89841 W/m ²	2.474282 W/m ² 1.79931 mW/cm ² 17.99313 W/m ²	5.18000 W/m ² 2.59000 mW/cm ² 25.90000 W/m ²
Minimum calculated prediction distance for compliance:	20 cm	20 cm	20 cm
Typical (declared) distance:	20 cm	20 cm	20 cm
Average power density at prediction frequency:	0.011187 mW/cm ² 0.111874 W/m ²	0.011187 mW/cm ² 0.111874 W/m ²	0.070588 mW/cm ² 0.705879 W/m ²
MPE compliance for simultaneous operation:			
Margin of Compliance for <u>controlled</u> environment:	24.55 dB	26.50 dB	14.06 dB
with Maximum permitted antenna gain:	27.35 dBi	29.30 dBi	16.36 dBi
Margin of Compliance for <u>uncontrolled</u> environment:	16.85 dB	19.51 dB	5.45 dB
with Maximum permitted antenna gain:	19.65 dBi	19.51 dBi	7.75 dBi
Average power density to MPE limit ratio (<u>uncontrolled</u>):	0.021	0.011	0.285
Average power density to MPE limit ratio (<u>controlled</u>):	0.004	0.002	0.039
Total sum of ratios for FCC (uncontrolled):	0.147 <1	Total sum of ratios for FCC (controlled):	0.029 <1
Total sum of ratios for ISED (uncontrolled):	0.306 <1	Total sum of ratios for ISED (controlled):	0.043 <1
Maximum allowed sum of ratios:	1		
			Total RF value for ISED 0.8178 W/m ²
	Transmitter 2	Transmitter 3	
Fundamental transmit (prediction) frequency:	2402 MHz	777 MHz	
Maximum measured conducted peak output power:	5.3 dBm	23.2 dBm	
Cable and/or jumper loss:	0 dB	0 dB	
Maximum peak power at antenna input terminal:	5.3 dBm	23.2 dBm	
Duty cycle:	100 %	100 %	
Maximum calculated average power at antenna input terminal:	3.3884416 mW	208.93 mW	
Single Antenna gain (typical):	2.8 dBi	2.3 dBi	
Number of antennae:	1	1	
Total system gain:	2.80 dBi	2.30 dBi	
MPE limit for <u>uncontrolled</u> exposure at prediction frequency:	ISED limit 0.53508 mW/cm ² FCC limit 1.00000 mW/cm ²	ISED limit 0.24743 mW/cm ² FCC limit 0.51800 mW/cm ²	
MPE limit for <u>controlled</u> exposure at prediction frequency:	5.350805 W/m ² 3.16361 mW/cm ² 31.63609 W/m ²	2.474282 W/m ² 1.79931 mW/cm ² 17.99313 W/m ²	5.18000 W/m ² 2.59000 mW/cm ² 25.90000 W/m ²
Minimum calculated prediction distance for compliance:	20 cm	20 cm	20 cm
Typical (declared) distance:	20 cm	20 cm	20 cm
Average power density at prediction frequency:	0.001284 mW/cm ² 0.012845 W/m ²	0.001284 mW/cm ² 0.012845 W/m ²	0.070588 mW/cm ² 0.705879 W/m ²
MPE compliance for simultaneous operation:			
Margin of Compliance for <u>controlled</u> environment:	33.91 dB	35.90 dB	14.06 dB
with Maximum permitted antenna gain:	36.71 dBi	38.70 dBi	16.36 dBi
Margin of Compliance for <u>uncontrolled</u> environment:	26.20 dB	28.91 dB	5.45 dB
with Maximum permitted antenna gain:	29.00 dBi	28.91 dBi	7.75 dBi
Average power density to MPE limit ratio (<u>uncontrolled</u>):	0.002	0.001	0.285
Average power density to MPE limit ratio (<u>controlled</u>):	0.000	0.000	0.039
Total sum of ratios for FCC (uncontrolled):	0.138 <1	Total sum of ratios for FCC (controlled):	0.028 <1
Total sum of ratios for ISED (uncontrolled):	0.288 <1	Total sum of ratios for ISED (controlled):	0.040 <1
Maximum allowed sum of ratios:	1		
			Total RF value for ISED 0.7187 W/m ²

1.1.4 Verdict

The calculation is below the limit; therefore, the product is passing the RF Exposure requirements for the declared distance.

1.2 RSS-102, Annex A – RF technical brief cover sheet

ISED certification number	IC: 11140A-GDSBA1
Product marketing name (PMN)	Telematics Device
Hardware version identification number (HVIN)	GDSBA1
Firmware version identification number (FVIN)	N/A
Host marketing name (HMN)	N/A
Applicant name	Geotab Inc.
SAR/RF exposure test laboratory	24676 (3 m semi anechoic chamber - Cambridge)
Type of evaluation	☐ SAR Evaluation: Device Used in the Vicinity of the Human Head ☐ SAR Evaluation: Body-Worn Device and Body-Supported Device ☐ SAR Evaluation: Limb-Worn Device ☒ RF Exposure Evaluation ☐ Nerve Stimulation Exposure Evaluation (SPR-002)
Multiple transmitters:	☒ Yes ☐ No
RF exposure evaluation	Evaluated against exposure limits: ☒ General Public Use ☐ Controlled Use
	Duty cycle used in evaluation: 100 %
	Operational frequency: 2442 MHz and 777 MHz
	Standard used for evaluation: Safety Code 6
	Measurement distance: 0.2 m
	RF value: 0.818 ☒ W/m ² ☐ V/m ☐ A/m ☐ Measured ☐ Computed ☒ Calculated
RF exposure evaluation	Evaluated against exposure limits: ☒ General Public Use ☐ Controlled Use
	Duty cycle used in evaluation: 100 %
	Operational frequency: 2402 MHz and 777 MHz
	Standard used for evaluation: Safety Code 6
	Measurement distance: 0.2 m
	RF value: 0.719 ☒ W/m ² ☐ V/m ☐ A/m ☐ Measured ☐ Computed ☒ Calculated

End of the test report