

RADIO TEST REPORT

Report ID

REP142669

Project ID

PRJ0092517

Type of assessment:

MPE Calculation report

Manufacturer:

ORBCOMM License Corp.

Product Marketing Name (PMN):

**Mobile Satellite/Terrestrial Dual Mode
Communication Terminal**

Hardware Version Identification Number (HVIN):

ST8100

FCC IDs:

XGS-ST8100, XPYUBX20VA01

ISED certification numbers:

11881A-ST8100, 8595A-UBX20VA01

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: **February 3, 2026****Andrey Adelberg, Senior 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

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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.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contained in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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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 (LTE)	Transmitter 2 (BLE)	Transmitter 3 (Satellite)
Prediction frequency	1710 MHz	2480 MHz	1643.5 MHz
Antenna type	Inverted F built-in on PCB	Inverted F built-in on PCB	Patch antenna
Antenna gain	3.0 dBi	3.1 dBi	5.0 dBi
Maximum transmitter conducted power	25.3 dBm	7.0 dBm	32.2 dBm
Prediction distance (declared)	20 cm (FCC), 25 cm (ISED)	20 cm (FCC), 25 cm (ISED)	20 cm (FCC), 25 cm (ISED)

Only two transmitters can operate simultaneously: Cellular + BLE or Satellite + BLE

1.1.3 MPE calculations for FCC for LTE + BLE

Band type	Freq., MHz	Conducted power (measured), dBm	Cable loss, dB	Max power at antenna, dBm	Duty cycle, %	Average power (with duty cycle), mW	Ant. gain, dBi	Num. of Ant.	Total system gain, dBi	Nom. Dist., cm	Average power density at Dist., mW/cm ²	MPE limit, mW/cm ²	Exposure ratio	MIN. Dist., cm	Margin of Compliance, dB	Maximum permitted gain, dBi
LTE	1710	25.3	0	25.3	100	338.84	3.00	1	3.00	20	0.135	1.00	0.135	20	8.71	11.71
BLE	2480	7	0	7	100	5.012	3.10	1	3.10	20	0.002	1.00	0.002	20	26.91	30.01
Total exposure ratio for simultaneous operation						0.136538	<1 = Pass									

1.1.4 MPE calculations for FCC for BLE + SAT

Band type	Freq., MHz	Conducted power (measured), dBm	Cable loss, dB	Max power at antenna, dBm	Duty cycle, %	Average power (with duty cycle), mW	Ant. gain, dBi	Num. of Ant.	Total system gain, dBi	Nom. Dist., cm	Average power density at Dist., mW/cm ²	MPE limit, mW/cm ²	Exposure ratio	MIN. Dist., cm	Margin of Compliance, dB	Maximum permitted gain, dBi
BLE	2480	7	0	7	100	5.012	3.10	1	3.10	20	0.002	1.00	0.002	20	26.91	30.01
SAT	1643.5	32.2	0	32.2	60	995.75	5.00	1	5.00	20	0.626	1.00	0.626	20	2.03	7.03
Total exposure ratio for simultaneous operation						0.628479	<1 = Pass									

1.1.1 MPE calculations for ISSED for LTE + BLE

Band type	Freq., MHz	Conducted power (measured), dBm	Cable loss, dB	Max power at antenna, dBm	Duty cycle, %	Average power (with duty cycle), mW	Ant. gain, dBi	Num. of Ant.	Total system gain, dBi	Nom. Dist., cm	Average power density at Dist., mW/cm ²	MPE limit, mW/cm ²	Exposure ratio	MIN. Dist., cm	Margin of Compliance, dB	Maximum permitted gain, dBi
LTE	1710	25.3	0	25.3	100	338.84	3.00	1	3.00	25	0.086	0.42	0.203	20	6.93	9.93
BLE	2480	7	0	7	100	5.012	3.10	1	3.10	25	0.001	0.55	0.002	20	26.23	29.33
Total exposure ratio for simultaneous operation						0.20531	<1 = Pass		Total simultaneous power density			0.87384	W/cm ²			

1.1.2 MPE calculations for ISSED for BLE + SAT

Band type	Freq., MHz	Conducted power (measured), dBm	Cable loss, dB	Max power at antenna, dBm	Duty cycle, %	Average power (with duty cycle), mW	Ant. gain, dBi	Num. of Ant.	Total system gain, dBi	Nom. Dist., cm	Average power density at Dist., mW/cm ²	MPE limit, mW/cm ²	Exposure ratio	MIN. Dist., cm	Margin of Compliance , dB	Maximum permitted gain, dBi
BLE	2480	7	0	7	100	5.012	3.10	1	3.10	25	0.001	0.55	0.002	20	26.23	29.33
SAT	1643.5	32.2	0	32.2	60	995.75	5.00	1	5.00	25	0.401	0.41	0.971	25	0.13	5.13
Total exposure ratio for simultaneous operation					0.97349	<1 = Pass		Total simultaneous power density					4.02226	W/cm ²		
Maximum for the product																

1.1.3 Verdict

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

End of the test report