Choose Scandinavian trust

RADIO TEST REPORT – 447842-1APFWL

Type of assessment:

MPE Calculation report

Applicant:

Redline Communications

Product:

LTE Base Station – Band 41

Model:

Ellipse 4G HP Band 41

FCC ID:

QC8-B41

Specifications:

- 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

Date of issue: September 13, 2021

Andrey Adelberg, Senior EMC/RF Specialist

Prepared by

Adelberg

Signature

Lab locations

Company name	Nemko Canada Inc.			
Facilities	***Ottawa site:*** **303 River Road** **Ottawa, Ontario** **Canada** **K1V 1H2** **Tel: +1 613 737 9680** **Fax: +1 613 737 9691**	*Montréal site:* 292 Labrosse Avenue Pointe-Claire, Québec Canada H9R 5L8 Tel: +1 514 694 2684 Fax: +1 514 694 3528	*Cambridge site:* 1-130 Saltsman Drive Cambridge, Ontario Canada N3E 0B2 Tel: +1 519 650 4811	*Almonte site:* 1500 Peter Robinson Road West Carleton, Ontario Canada K0A 1L0 Tel: +1 613 256-9117

Test site identifier	**Organization**	**Ottawa/Almonte**	**Montreal**	**Cambridge**
	FCC:	CA2040	CA2041	CA0101
	ISED:	2040A-4	2040G-5	24676
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.

Copyright notification

Table of Contents

Section 1 Evaluation summary

1.1 MPE calculation for standalone transmission

1.1.1 References, definitions and limits

FCC §2.1091(d)

(2) (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.

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

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

where: S = power density (mW/cm^2 or W/m^2)
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

Prediction frequency	2685 MHz
Antenna type	Sectoral
Antenna gain	16 dBi
Number of antennas	2
Maximum transmitter conducted power	39.29 dBm (8492 mW)
Prediction distance	235 cm

1.1.3 MPE calculation

Fundamental transmit (prediction) frequency:	2685	MHz
Maximum measured conducted peak output power:	39.29	dBm
Cable and/or jumper loss:	0	dB
Maximum peak power at antenna input terminal:	39.29	dBm
Tx On time:	1.000	ms
Tx period time:	1.000	ms
Average factor:	100	%
Maximum calculated average power at antenna input terminal:	8491.8048	mW
Single Antenna gain (typical):	16	dBi
Number of antennae:	2	
Total system gain:	19.01	dBi
MPE limit for uncontrolled exposure at prediction frequency:	**1.000000**	**mW/cm^2**
	10.000000	W/m^2
Minimum calculated prediction distance for compliance:	232	cm
Typical (declared) distance:	235	cm
Average power density at prediction frequency:	**0.974281**	**mW/cm^2**
	9.742814	W/m^2
Margin of Compliance:	**0.11**	**dB**
Maximum allowable antenna gain:	19.12	dBi

1.1.4 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