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RADIO TEST REPORT – 454155-2APFWL

Type of assessment:

MPE Exemption report

Applicant:

Redline Communications Inc.

Product:

Outdoor Wireless TCP/IP Transport

Model:

RDL-3211 XC

FCC ID:

QC8-RDL3211XC

Specifications:

- ◆ FCC 47 CFR Part 1 Subpart I, §§1.1307, 1.1310
- ◆ FCC 47 CFR Part 2 Subpart J, §2.1091
- ◆ KDB 447498 D01 General RF Exposure Guidance v06

Date of issue: **March 29, 2022**

Fahar Abdul Sukkoor, EMC/RF Specialist

Prepared by

Signature

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SCC File Number: 15064 (Ottawa/Almonte); 151100 (Montreal); 151097 (Cambridge)

FCC MPE exemption; Date: May 2021

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Lab locations

Company name	Nemko Canada Inc.			
Facilities	<i>Ottawa site:</i> 303 River Road Ottawa, Ontario Canada K1V 1H2	<i>Montréal site:</i> 292 Labrosse Avenue Pointe-Claire, Québec Canada H9R 5L8	<i>Cambridge site:</i> 1-130 Saltsman Drive Cambridge, Ontario Canada N3E 0B2	<i>Almonte site:</i> 1500 Peter Robinson Road West Carleton, Ontario Canada K0A 1L0
	Tel: +1 613 737 9680 Fax: +1 613 737 9691	Tel: +1 514 694 2684 Fax: +1 514 694 3528	Tel: +1 519 650 4811	Tel: +1 613 256-9117
Test site identifier	Organization	Ottawa/Almonte	Montreal	Cambridge
	FCC: ISED:	CA2040 2040A-4	CA2041 2040G-5	CA0101 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.

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Table of Contents

Table of Contents	3
Section 1 Evaluation summary	4
1.1 MPE exemption for simultaneous transmission	4

Section 1 Evaluation summary

1.1 MPE exemption for simultaneous transmission

1.1.1 References, definitions and limits

FCC §2.1091(c)

- (1) Mobile devices that operate in the Commercial Mobile Radio Services pursuant to part 20 of this chapter; the Cellular Radiotelephone Service pursuant to part 22 of this chapter; the Personal Communications Services pursuant to part 24 of this chapter; the Satellite Communications Services pursuant to part 25 of this chapter; the Miscellaneous Wireless Communications Services pursuant to part 27 of this chapter; the Upper Microwave Flexible Use Service pursuant to part 30 of this chapter; the Maritime Services (ship earth station devices only) pursuant to part 80 of this chapter; the Specialized Mobile Radio Service, and the 3650 MHz Wireless Broadband Service pursuant to part 90 of this chapter; the 76-81 GHz Band Radar Service pursuant to part 95 of this chapter; and the Citizens Broadband Radio Service pursuant to part 96 of this chapter are subject to routine environmental evaluation for RF exposure prior to equipment authorization or use if:
 - (i) They operate at frequencies of 1.5 GHz or below and their effective radiated power (ERP) is 1.5 watts or more, or
 - (ii) They operate at frequencies above 1.5 GHz and their ERP is 3 watts or more.
- (2) Unlicensed personal communications service devices, unlicensed millimeter-wave devices, and unlicensed NII devices authorized under §§15.255(f), 15.257(g), 15.319(i), and 15.407(f) of this chapter are also subject to routine environmental evaluation for RF exposure prior to equipment authorization or use if their ERP is 3 watts or more or if they meet the definition of a portable device as specified in §2.1093(b) requiring evaluation under the provisions of that section.
- (3) All other mobile and unlicensed transmitting devices are categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use, except as specified in §§1.1307(c) and 1.1307(d) of this chapter.

1.1.2 EUT technical information

	Transmitter 1 (UNII-1)	Transmitter 2 (2.4 GHz BLE)
Operational frequency	5200 MHz	2444 MHz
Antenna type	Dual Polarization Antenna	Dipole Antenna
Antenna gain	25 dBi	2.14 dBi
Number of antennas	2	1
Maximum transmitter conducted power	21.81 dBm (151.71 mW)	19.56 dBm (90.37 mW)
Maximum EIRP	46.11 dBm (40.83 W)	21.7 dBm (147.91 mW)

1.1.1 MPE exemption calculation

	Transmitter 1	Transmitter 2
Fundamental transmit (prediction) frequency:	5200 MHz	2444 MHz
Maximum measured conducted peak output power:	21.81 dBm	19.56 dBm
Cable and/or jumper loss:	0.7 dB	0 dB
Maximum peak power at antenna input terminal:	21.11 dBm	19.56 dBm
Tx On time:	0.950 ms	1.000 ms
Tx period time:	1.000 ms	1.000 ms
Average factor:	95 %	100 %
Maximum calculated average power at antenna input terminal:	122.666 mW	90.3649 mW
Single Antenna gain (typical):	25 dBi	2.14 dBi
Number of antennae:	1	1
Total system gain:	25.00 dBi	2.14 dBi
MPE limit for uncontrolled exposure at prediction frequency:	1.000000 mW/cm ² 10.00 W/m ²	1.000000 mW/cm ² 10.00 W/m ²
Minimum calculated prediction distance for compliance:	56 cm	20 cm
Typical (declared) distance:	100 cm	100 cm
Average power density at prediction frequency:	0.308684 mW/cm ² 3.086837 W/m ²	0.001177 mW/cm ² 0.011770 W/m ²
Combined MPE compliance:		
Margin of Compliance:	5.10 dB	29.29 dB
Maximum allowable antenna gain:	30.10 dBi	31.43 dBi
Average power density to MPE limit ratio:	0.309	0.001
Total sum of ratios:	0.310	
Maximum allowed sum of ratios:	1	

1.1.2 Verdict

The calculation of EIRP is below the exemption limit; therefore, the product is passing the RF Exposure exemption requirements.

End of the test report