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RADIO TEST REPORT – APFWL

Type of assessment:

MPE Calculation report

Manufacturer:

Otodata Wireless Network Inc.

Hardware Version Identification Number (HVIN):

C028

Product Marketing Name (PMN):

GA3020

Product description:

Bluetooth LE, Home Heat Adapter

FCC ID:

2ADQFBEDHT

IC certification number:

12649A-BEDHT

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 5 Amendment 1, (February 2021)

RSS-102 Annex B - Declaration of RF Exposure Compliance

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 SAR and/or RF field strength limits of RSS-102.

Date of issue: March 10, 2022

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

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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.

RSS-102, Section 2.5.2

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where ƒ is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $0.0131\ f^{0.6834}$ W (adjusted for tune-up tolerance), where ƒ is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

References, definitions and limits, continued

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	2480 MHz
Antenna type	Meander line antenna
Antenna gain	2.14 dBi
Number of antennas	1
Maximum transmitter conducted power	6.19 dBm (4.159 mW)
Prediction distance	20 cm

1.1.3 MPE calculation

Fundamental transmit (prediction) frequency:	2480	MHz		
Maximum measured conducted peak output power:	6.19	dBm		
Cable and/or jumper loss:	0	dB		
Maximum peak power at antenna input terminal:	6.19	dBm		
Tx On time:	1.000	ms		
Tx period time:	1.000	ms		
Average factor:	100	%		
Maximum calculated average power at antenna input terminal:	4.1591061	mW		
Single Antenna gain (typical):	2.14	dBi		
Number of antennae:	1			
Total system gain:	2.14	dBi		
	FCC limit:		**ISED limit:**	
MPE limit for uncontrolled exposure at prediction frequency:	**1.000000**	**mW/cm^2**	**0.546895**	**mW/cm^2**
	10.000000	W/m^2	5.468948	W/m^2
Minimum calculated prediction distance for compliance:	20	cm	20	cm
Typical (declared) distance:	20	cm	20	cm
Average power density at prediction frequency:	**0.001354**	**mW/cm^2**	**0.001354**	**mW/cm^2**
	0.013543	W/m^2	0.013543	W/m^2
Margin of Compliance:	**28.68**	**dB**	**26.06**	**dB**
Maximum allowable antenna gain:	30.82	dBi	28.20	dBi

1.1.4 Verdict

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

1.1.5 RSS-102, Annex A - RF technical brief cover sheet

IC Certification Number	12649A-BEDHT		
Product marketing name (PMN)	GA3020		
Hardware version identification number (HVIN)	C028		
Firmware version identification number (FVIN)	N/A		
Host marketing name (HMN)	N/A		
Applicant company number	12649A		
Applicant name	Otodata Wireless Network Inc.		
SAR/RF exposure test laboratory	2040G-5 (3 m semi anechoic chamber)		
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)		
SAR evaluation	Multiple transmitters: ☐ Yes ☐ No		
	Evaluated against exposure limits:	☐ General Public Use	☐ Controlled Use
	Duty cycle used in evaluation:	N/A	%
	Separation distance:	N/A	mm
	Standard used for evaluation:	N/A	
	SAR value:	N/A	W/kg
	☐ Measured ☐ Computed ☐ Calculated		
Nerve Stimulation Evaluation (SPR-002)	Evaluated against exposure limits:	☐ General Public Use	☐ Controlled Use
	Measurement distance:	N/A	m
	Field Strength:	N/A	☐ V/m (electric) ☐ A/m (magnetic) ☐ Measured ☐ Computed ☐ Calculated
	Exposure condition:	☐ Whole body/Torso/Head ☐ Arm	☐ Leg ☐ Hand/Foot
RF exposure evaluation	Evaluated against exposure limits:	☒ General Public Use	☐ Controlled Use
	Duty cycle used in evaluation:	**100**	%
	Operational frequency:	**2480**	MHz
	Standard used for evaluation:	**Safety Code 6**	
	Measurement distance:	**0.2**	m
	RF value:	**0.014**	☒ W/m² ☐ V/m ☐ A/m ☐ Measured ☐ Computed ☒ Calculated

End of the test report