Choose Scandinavian trust

RADIO TEST REPORT – APFWL

Type of assessment:

MPE Calculation report

Manufacturer:

Bosch Security Systems LLC

Product Marketing Name (PMN):

RADION B812 Transceiver

Hardware Version Identification Number (HVIN):

B812

FCC ID:

FCC ID: T3X-B812

ISED certification number:

IC: 1249A-B812

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 15, 2023

RSS-102 - Declaration of RF Exposure Compliance

ATTESTATION: I attest that, Annex A and the Technical Brief information was prepared by me and is correct; that the device evaluation was performed or supervised by me; that applicable measurement and evaluation methodologies have been followed; and that the device meets the SAR, APD and/or IPD limits of RSS-102.

Date of issue: April 4, 2025

Andrey Adelberg, Senior EMC/RF Specialist

Prepared by

Adelberg

Signature

Lab locations

Company name	Nemko Canada Inc.			
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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.

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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.

References, definitions and limits, continued

RSS-102, Section 5.3.2

The electric and magnetic field strength reference levels, power density reference levels, and associated reference period for devices employed by the general public (uncontrolled environment) and controlled-use devices (controlled environment) are specified in table below. Note that the power density limits specified in these tables apply to whole body exposure conditions.

Table 1.1-2: *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 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	$616000 / f^{1.2}$
15000–30000	$0.354 f^{0.5}$	$9.40\times10\text{-}4 f^{0.5}$	$3.33\times10^{-4} f$	$616000 / f^{1.2}$
Limits for 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	$616000 / f^{1.2}$
15000–30000	$0.158 / f^{0.5}$	$4.21\times10^{-4} / f^{0.5}$	$6.67\times10^{-5} / f$	$616000 / f^{1.2}$

Notes: f = frequency in MHz.

The above table refers to Health Canada's Safety Code 6 for relevant notes and additional information.

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	433.4 MHz
Antenna gain	3.53 dBd
Number of antennas	2 (1 transmit at a time)
Maximum field strength	100.3 dBµV/m (or 5.07 dBm)
Prediction distance (declared)	20 cm

1.1.3 MPE calculation

Fundamental transmit (prediction) frequency:	433.4	MHz
Maximum EIRP:	5.07	dBm
Cable and/or jumper loss:	0	dB
Maximum peak power at antenna input terminal:	5.07	dBm
Duty cycle:	100	%
Maximum calculated average power at antenna input terminal:	3.21	mW
Single Antenna gain for calculation (3.53 dBd - considered in EIRP):	0	dBi
Number of Tx antennae (at a time):	1	
Total system gain:	0.00	dBi

	FCC limit:		ISED limit:	
MPE limit for uncontrolled exposure at prediction frequency:	**0.288933**	**mW/cm²**	**0.166030**	**mW/cm²**
	2.889333	W/m²	1.660295	W/m²
MPE limit for controlled exposure at prediction frequency:	**1.444667**	**mW/cm²**	**1.343819**	**mW/cm²**
	14.446667	W/m²	13.438188	W/m²
Minimum calculated prediction distance for Uncontrolled compliance:	20	cm	20	cm
Typical (declared) Uncontrolled distance:	20	cm	20	cm
Average power density for uncontrolled at prediction frequency:	**0.000639**	**mW/cm²**	**0.000639**	**mW/cm²**
	0.006393	W/m²	0.006393	W/m²
Minimum calculated prediction distance for Controlled compliance:	20	cm	20	cm
Typical (declared) Controlled distance:	20	cm	20	cm
Average power density for controlled at prediction frequency:	**0.000639**	**mW/cm²**	**0.000639**	**mW/cm²**
	0.006393	W/m²	0.006393	W/m²
Margin of Compliance for **uncontrolled** envirenment:	**26.55**	**dB**	**24.14**	**dB**
with Maximum premitted antenna gain:	26.55	dBi	24.14	dBi
Margin of Compliance for **controlled** envirenment:	**33.54**	**dB**	**33.23**	**dB**
with Maximum permitted antenna gain:	38.61	dBi	38.30	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

ISED certification number	IC: 1249A-B812		
Product marketing name (PMN)	RADION B812 Transceiver		
Hardware version identification number (HVIN)	B812		
Firmware version identification number (FVIN)	N/A		
Host marketing name (HMN)	N/A		
Applicant name	Bosch Security Systems LLC		
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)		
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:	**433.4**	MHz
	Standard used for evaluation:	**Safety Code 6**	
	Measurement distance:	**0.2**	m
	RF value:	**0.0063**	☒ W/m² ☐ V/m ☐ A/m ☐ Measured ☐ Computed ☒ Calculated

End of the test report