

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

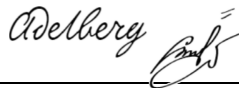
RSS-102 - Declaration of RF Exposure Compliance

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



Signature

Nemko Canada Inc., a testing laboratory, is accredited by ANSI National Accreditation Board (ANAB).
The tests included in this report are within the scope of this accreditation.
The ANAB symbol is an official symbol of the ANSI National Accreditation Board, used under licence.

ANAB File Number: AT-3195 (Ottawa/Almonte); AT-3193 (Pointe-Claire); AT-3194 (Cambridge)



Lab locations

Company name	Nemko Canada Inc.			
Facilities	<i>Ottawa site:</i>	<i>Montréal site:</i>	<i>Cambridge site:</i>	<i>Almonte site:</i>
	303 River Road Ottawa, Ontario Canada K1V 1H2	292 Labrosse Avenue Pointe-Claire, Québec Canada H9R 5L8	1-130 Saltsman Drive Cambridge, Ontario Canada N3E 0B2	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:	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

Nemko Canada Inc. authorizes the applicant to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.

Nemko Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

© Nemko Canada Inc.

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	$0.354 f^{0.5}$	$9.40 \times 10^{-4} f^{0.5}$	$3.33 \times 10^{-4} f$	$616000 / f^{1.2}$
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	$0.158 / f^{0.5}$	$4.21 \times 10^{-4} / f^{0.5}$	$6.67 \times 10^{-5} / f$	$616000 / f^{1.2}$

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/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

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:		
MPE limit for <u>uncontrolled</u> exposure at prediction frequency:	0.288933 mW/cm ²	0.166030 mW/cm ²
	2.889333 W/m ²	1.660295 W/m ²
MPE limit for <u>controlled</u> exposure at prediction frequency:	1.444667 mW/cm ²	1.343819 mW/cm ²
	14.446667 W/m ²	13.438188 W/m ²
Minimum calculated prediction distance for Uncontrolled compliance:	20 cm	20 cm
Typical (declared) Uncontrolled distance:	20 cm	20 cm
ISSED limit:		
Average power density for uncontrolled at prediction frequency:	0.000639 mW/cm ²	0.000639 mW/cm ²
	0.006393 W/m ²	0.006393 W/m ²
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/cm ²	0.000639 mW/cm ²
	0.006393 W/m ²	0.006393 W/m ²
Margin of Compliance for uncontrolled environment:	26.55 dB	24.14 dB
with Maximum premitted antenna gain:	26.55 dBi	24.14 dBi
Margin of Compliance for controlled environment:	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 ☐ Leg ☐ Arm ☐ 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/m ² ☐ V/m ☐ A/m ☐ Measured ☐ Computed ☒ Calculated

End of the test report