Choose Scandinavian trust

RADIO TEST REPORT – 454338-3APFWL

Type of assessment:

MPE Calculation report

Manufacturer:

Cysca Technologies Inc

Product Marketing Name (PMN):

WS4 - LEVEL SENSOR

Hardware Version Identification Number (HVIN):

WS4-LVL

FCC ID:

2A2IF-WS4LVL

ISED certification number:

IC: 27492-WS4LVL

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: February 7, 2023

Fahar Abdul Sukkoor, EMC/RF Specialist
Prepared by

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.

RSS-102, Section 4

For the purpose of this standard, Industry Canada has adopted the SAR and RF field strength limits established in Health Canada's RF exposure guideline, Safety Code 6:

Table 1.1-2: *Table 4 to RSS-102— RF Field Strength 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	6
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	6

Notes: f = frequency in MHz.

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	902.22 MHz
Antenna type	Omnidirectional antenna- Flexible dipole antenna
Antenna gain	1.2 dBi
Number of antennas	1
Maximum transmitter power	16.93 dBm (conducted)
Prediction distance (declared)	20 cm

1.1.3 MPE calculation

Fundamental transmit (prediction) frequency:	902.22	MHz
Maximum measured conducted peak output power:	16.93	dBm
Cable and/or jumper loss:	0	dB
Maximum peak power at antenna input terminal:	16.93	dBm
Duty cycle:	100	%
Maximum calculated average power at antenna input terminal:	49.31738	mW
Single Antenna gain (typical):	1.2	dBi
Number of antennae:	1	
Total system gain:	1.20	dBi

	FCC limit:		ISED limit:	
MPE limit for uncontrolled exposure at prediction frequency:	**0.601480**	**mW/cm^2**	**0.274029**	**mW/cm^2**
	6.014800	W/m^2	2.740287	W/m^2
MPE limit for controlled exposure at prediction frequency:	**3.007400**	**mW/cm^2**	**1.938887**	**mW/cm^2**
	30.074000	W/m^2	19.388869	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:	**0.012934**	**mW/cm^2**	**0.012934**	**mW/cm^2**
	0.129339	W/m^2	0.129339	W/m^2
Margin of Compliance for **uncontrolled** envirenment:	**16.67**	**dB**	**13.26**	**dB**
with Maximum premitted antenna gain:	17.87	dBi	14.46	dBi
Margin of Compliance for **controlled** envirenment:	**23.66**	**dB**	**21.76**	**dB**
with Maximum permitted antenna gain:	41.79	dBi	39.89	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: 27492-WS4LVL		
Product marketing name (PMN)	Wireless Probe WS4 Level Probe		
Hardware version identification number (HVIN)	WS4-LVL		
Firmware version identification number (FVIN)	N/A		
Host marketing name (HMN)	N/A		
Applicant name	Cysca Technologies Inc		
SAR/RF exposure test laboratory	2040G-5 (3 m semi anechoic chamber - Montréal)		
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:	**902–928**	MHz
	Standard used for evaluation:	**Safety Code 6**	
	Measurement distance:	**0.2**	m
	RF value:	**0.129**	☒ W/m² ☐ V/m ☐ A/m ☐ Measured ☐ Computed ☒ Calculated

End of the test report