

# RADIO TEST REPORT – 466496-1APFWL

Type of assessment:

**MPE Exemption report**

Manufacturer:

**Maximus Systems (4458664 Canada Inc)**

Hardware Version Identification Number (HVIN):

**7000-0052**

Product Marketing Name (PMN):

**Electronic Sow Feeding Module**

HVIN/Model variant(s):

**7000-0048 and 7000-0049**

FCC ID:

**2A7II-RFID3P**

ISED certification number:

**IC: 28688-RFID3P**

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, Issue 5, Supplementary Procedure SPR-002, Issue 1

Declaration of RF exposure compliance for exemption from routine evaluation limits

## RSS-102 Annex C - Attestation:

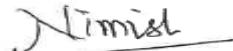
I attest that the radiocommunication apparatus meets the exemption from the routine evaluation limits in Section 2.5 of RSS-102 standard; that the Technical Brief was prepared, and the information contained therein is correct; that the device evaluation was performed or supervised by me; that applicable 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: September 28, 2022

Nimish Kapoor, EMC/RF Specialist

Prepared by

Signature



Nemko Canada Inc., a testing laboratory, is accredited by the Standards Council of Canada.  
The tests included in this report are within the scope of this accreditation.  
The SCC Accreditation Symbol is an official symbol of the Standards Council of Canada, used under licence.

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

FCC and RSS-102 Annex C – MPE Exemption; Date: May 2021

[www.nemko.com](http://www.nemko.com)



---

**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	<b>Organization</b> FCC: ISED:	<b>Ottawa/Almonte</b> CA2040 2040A-4	<b>Montreal</b> CA2041 2040G-5	<b>Cambridge</b> CA0101 24676
Website	<a href="http://www.nemko.com">www.nemko.com</a>			

---

**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.

## Table of Contents

<b>Table of Contents .....</b>	<b>3</b>
<b>Section 1      Evaluation summary .....</b>	<b>4</b>
1.1    MPE exemption for standalone transmission .....	4
<b>Section 2      RSS-102 Nerve Stimulation.....</b>	<b>6</b>
2.1    Test specifications .....	6
2.2    Test methods.....	6
2.3    RSS-102 Nerve Stimulation test results.....	6
2.4    Test equipment list .....	6
2.5    Nerve Stimulation 3 kHz – 10 MHz .....	7
<b>Section 3      EUT setup photos.....</b>	<b>11</b>

## Section 1 Evaluation summary

---

### 1.1 MPE exemption for standalone 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.

##### 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 f 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 f 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.

#### 1.1.2 EUT technical information

---

Operational frequency	0.12825 MHz
Antenna type	Coil
Antenna gain	0 dBi
Number of antennas	1
Maximum transmitter conducted power	N/A
Maximum EIRP	20.25 dBm (115.48 dB $\mu$ V/m @ 3 m)

1.1.3 MPE exemption calculation

---

Fundamental transmit (prediction) frequency:	0.12825	MHz
Maximum measured conducted peak output power:	20.25	dBm
Cable and/or jumper loss:	0	dB
Maximum peak power at antenna input terminal:	20.25	dBm
Tx On time:	1.000	ms
Tx period time:	1.000	ms
Average factor:	100	%
Maximum calculated average power at antenna input terminal:	105.925	mW
Single Antenna gain (typical):	0	dBi
Number of antennae:	1	
Total system gain:	0.00	dBi
<b>MPE exemption limit:</b>	<b>1.000000</b>	<b>W</b>
<b>ISED limit</b>		<b>FCC limit</b>
<b>Average EIRP at prediction frequency:</b>	<b>105.925</b>	<b>mW</b>
	0.106	W
		105.925
		0.106
<b>Margin of Compliance:</b>	<b>9.75</b>	<b>dB</b>
		11.51

1.1.4 Verdict

---

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

## Section 2 RSS-102 Nerve Stimulation

---

### 2.1 Test specifications

---

RSS 102, Issue 5	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
SPR-002, Issue 1	Supplementary Procedure for Assessing Compliance with RSS-102 Nerve Stimulation Exposure Limits

### 2.2 Test methods

---

RSS 102, Issue 5	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
SPR-002, Issue 1	Supplementary Procedure for Assessing Compliance with RSS-102 Nerve Stimulation Exposure Limits

### 2.3 RSS-102 Nerve Stimulation test results

---

**Table 2.3-1: FCC general requirements results**

Part	Test description	Verdict
	Nerve Stimulation - Instantaneous	Pass

Notes: EUT is an AC powered device.

Type of evaluation	Nerve Stimulation Exposure Evaluation (SPR-002)		
	Evaluated against exposure limits:	<input checked="" type="checkbox"/> General Public Use	<input type="checkbox"/> Controlled Use
Nerve Stimulation Evaluation (SPR-002)	Measurement distance:	0.2 m	
	Field Strength:	12.713 <input checked="" type="checkbox"/> V/m (electric) <input type="checkbox"/> A/m (magnetic)	<input checked="" type="checkbox"/> Measured <input type="checkbox"/> Computed <input type="checkbox"/> Calculated
	Field Strength:	3.654 <input type="checkbox"/> V/m (electric) <input checked="" type="checkbox"/> A/m (magnetic)	<input checked="" type="checkbox"/> Measured <input type="checkbox"/> Computed <input type="checkbox"/> Calculated
	Exposure condition:	<input checked="" type="checkbox"/> Whole body/Torso/Head <input type="checkbox"/> Leg	<input type="checkbox"/> Arm <input type="checkbox"/> Hand/Foot

### 2.4 Test equipment list

---

**Table 2.4-1: Equipment list**

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
Isotropic probe	Narda	EHP200-TS	FA003103	2 years	July 14, 2023

## 2.5 Nerve Stimulation 3 kHz – 10 MHz

### 2.5.1 Definitions and limits

This evaluation of the instantaneous requirements for Radio Frequency (RF) field strengths (reference levels) based on the effects of internal electric fields was done in accordance with SPR-002, Issue 1. The limits for Uncontrolled Environment are found in RSS 102, Issue 5, Table 4 (Instantaneous).

**Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)**

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m <sup>2</sup> )	Reference Period (minutes)
0.003-10 <sup>21</sup>	83	90	-	Instantaneous <sup>a</sup>
0.1-10	-	0.73/ <i>f</i>	-	6 <sup>“</sup>
1.1-10	87/ <i>f</i> <sup>0.5</sup>	-	-	6 <sup>“</sup>
10-20	27.46	0.0728	-2	6
20-48	58.07/ <i>f</i> <sup>0.25</sup>	0.1540/ <i>f</i> <sup>0.25</sup>	8.944/ <i>f</i> <sup>0.5</sup>	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 <i>f</i> <sup>0.3417</sup>	0.008335 <i>f</i> <sup>0.3417</sup>	0.02619 <i>f</i> <sup>0.6634</sup>	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> <sup>1.2</sup>
150000-300000	0.158 <i>f</i> <sup>0.5</sup>	4.21 × 10 <sup>-4</sup> <i>f</i> <sup>0.5</sup>	6.67 × 10 <sup>-6</sup> <i>f</i>	616000/ <i>f</i> <sup>1.2</sup>

Note: *f* is frequency in MHz.

<sup>a</sup> Based on nerve stimulation (NS).

<sup>“</sup> Based on specific absorption rate (SAR).

Exposure Condition	Relaxation Factor	Electric Field (V/m r.m.s.)	Magnetic Field (A/m r.m.s.)
<b>Whole Body / Torso / Head</b>	1.0	83	90
<b>Leg</b>	1.5	124.5	135
<b>Arm</b>	2.5	207.5	225
<b>Hand/Foot</b>	5.0	415	450

**Note:** The values of the electric field and the magnetic field in Table 2 are for indication purposes only and do not supersede the levels specified in RSS-102.

*SPR-002 Limb Exposure Limit Relaxation*

No relaxation was applied to the measurements.

## 2.5.2 Test date

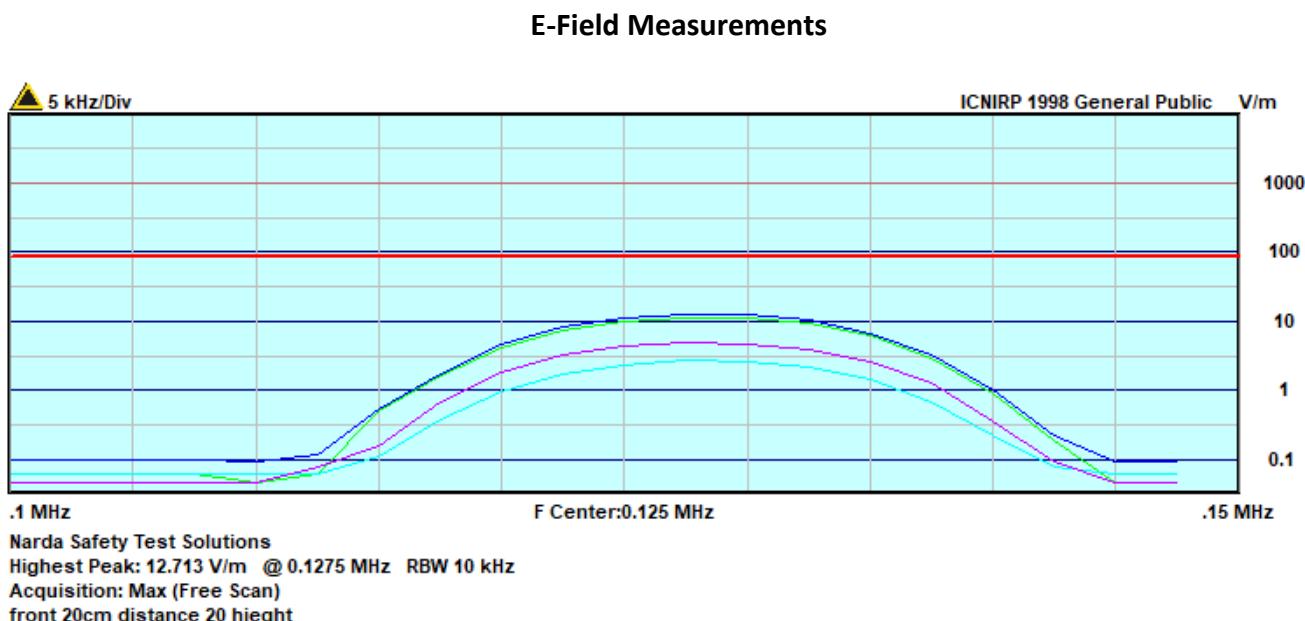
Start date

September 20, 2022

## 2.5.3 Observations, settings and special notes

The testing was performed as per SPR-002, Issue 1.

- a) The measurement probe is set a fixed separation distance of 20 cm
- b) The instantaneous E-Field is assessed over the average 180 cm human body height, measuring 5 points in 40 cm intervals, starting 20 cm above the ground. The maximum field was measured at 20 cm height and is used as reference for calculations.
- c) The instantaneous H-Field is assessed by measuring 8 points in an evenly spaced rectangular pattern measuring 60 cm tall by 30 cm wide. The maximum field was measured at 20 cm height and is used as reference for calculations.
- d) The X, Y, and Z axis are measured simultaneously, and summed by the measurement probe software
- e) The maximum emission level is measured using an appropriate resolution bandwidth.

**2.5.3 Test data**


*Figure 1 – E-Field scan on 0.12825 MHz, H3E modulation, transmitter emission - 20 cm separation distance*

*Table 2 - Instantaneous E-Field measurements over 180 cm height*

Frequency, MHz	Measurement distance cm	Measurement Height cm	Measured Electric Field Strength V/m (r.m.s) instantaneous	RSS-102 Limit Electric Field Strength V/m (r.m.s) instantaneous	Margin, dB
0.12825	20	20	12.71	83.00	70.29

Notes: Limit taken from RSS 210, Issue 5, Table 4 for Uncontrolled Exposure, Maximum E-Field emission measured at 20 cm

## H-Field Measurements

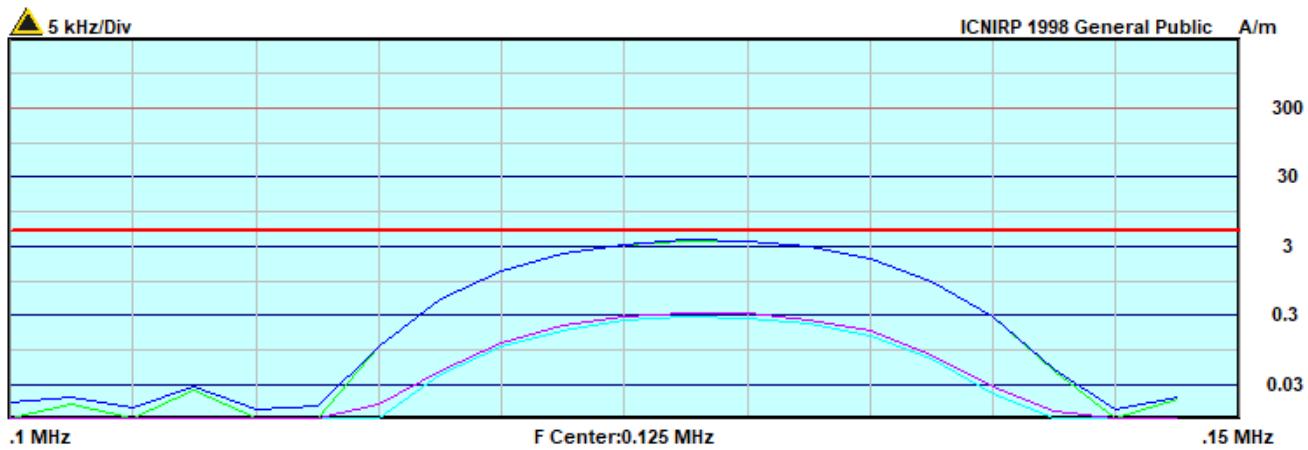


Figure 2 - Zoom scan on 0.12825 MHz transmitter emission, H3E modulation - 20 cm separation distance

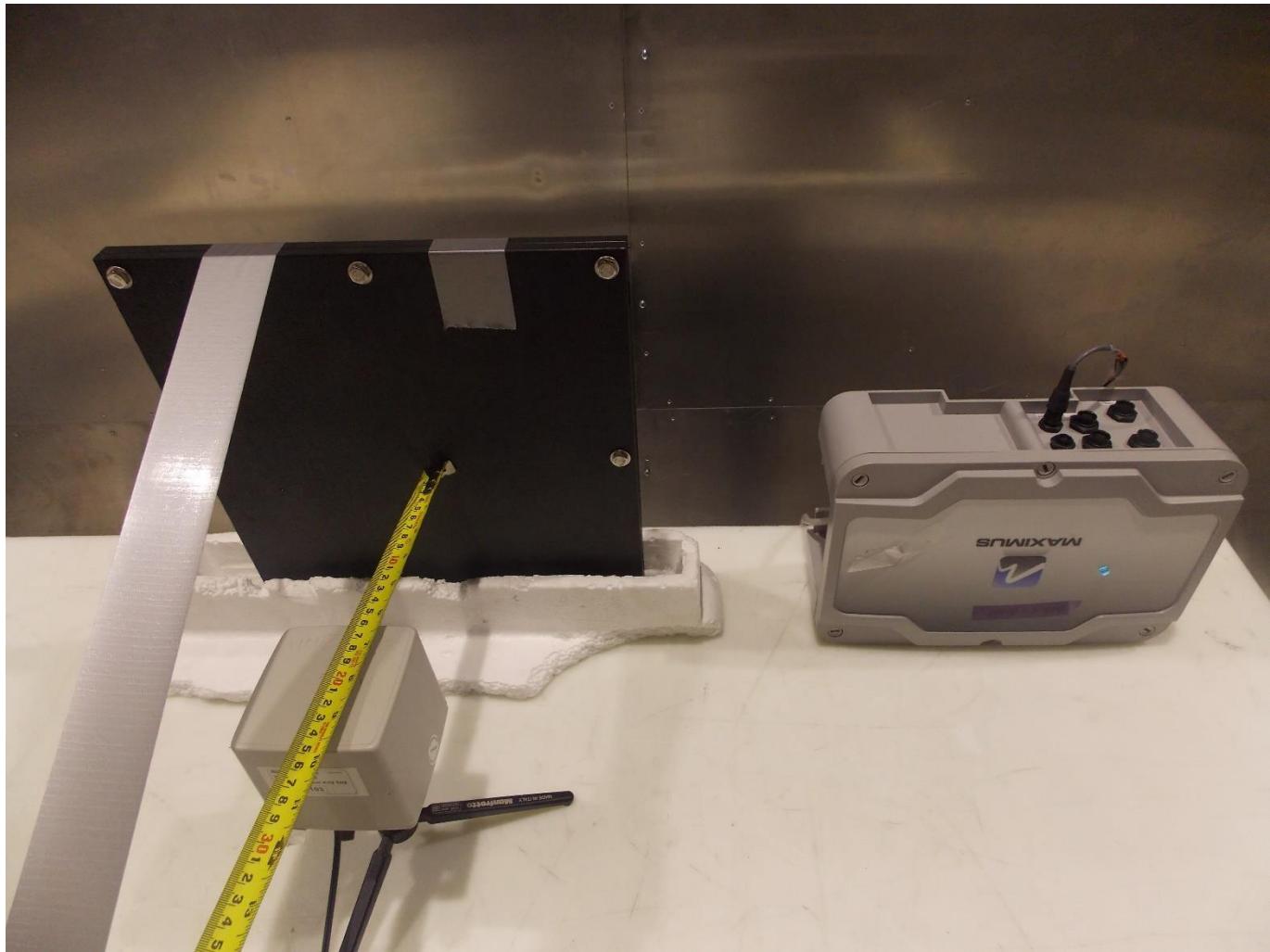
Table 3 - Maximum instantaneous H-Field

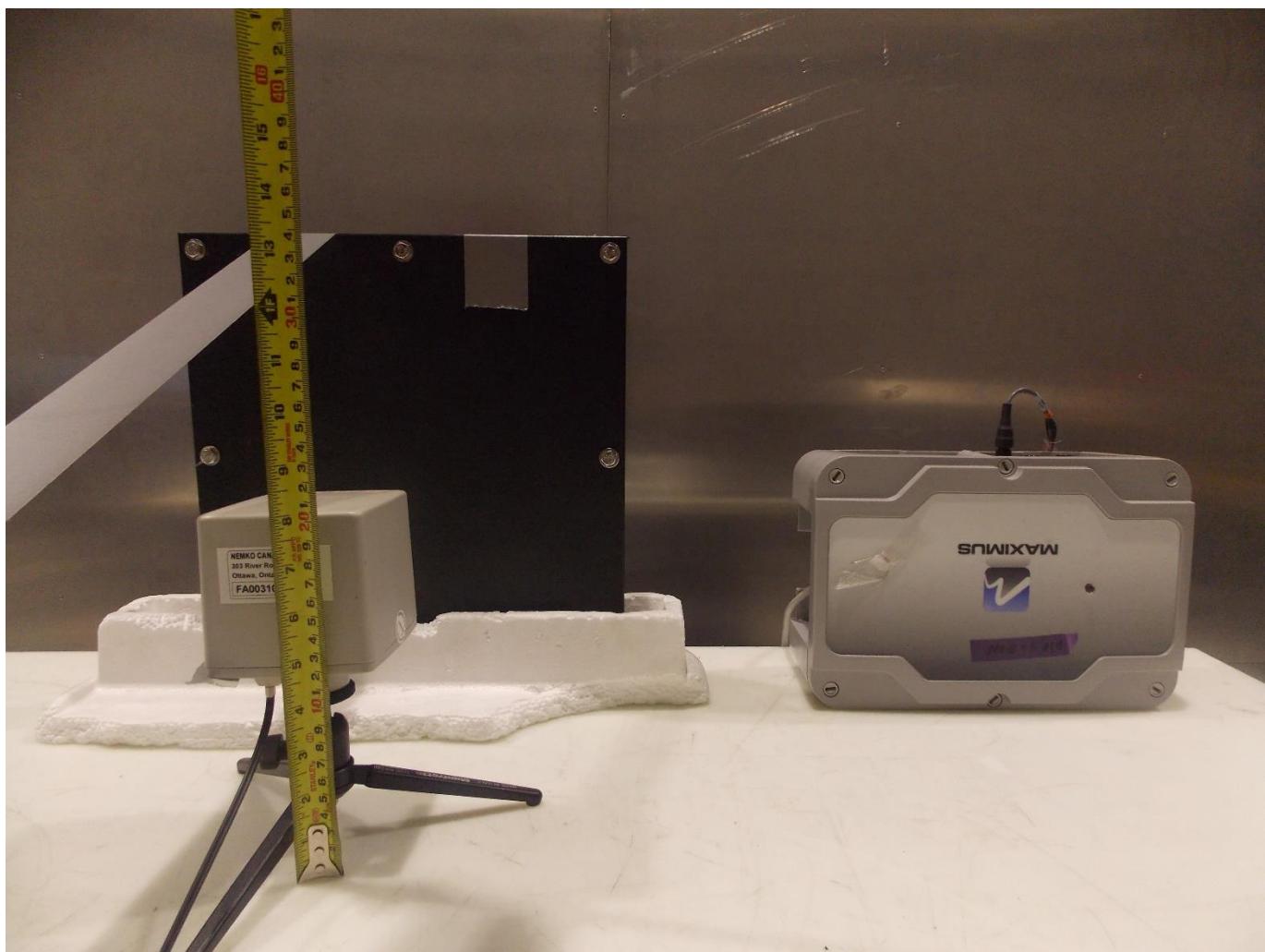
Frequency, MHz	Antenna Position referencing EUT	Measurement distance cm	Measurement Height cm	Measured Magnetic Field Strength A/m (r.m.s) instantaneous	RSS-102 Limit Magnetic Field Strength A/m (r.m.s) instantaneous	Margin, dB
0.12825	center	20	20	3.65	90.00	86.35

Notes: Limit taken from RSS 210, Issue 5, Table 4 for Uncontrolled Exposure.

## Section 3 EUT setup photos

---





End of the test report