

# RADIO RF EXPOSURE TEST REPORT

Type of assessment:

## MPE Calculation report

Manufacturer:

Trilliant Networks Inc.

Hardware Version Identification Number (HVIN):

CL-R0368A-1.4, CL-R0368B-1.2

Product Marketing Name (PMN):

OSDI-4000-1x (x depends on  
firmware)

Product description:

Open Smart Device Interface Module

FCC identifier:

FCC ID: TMB-OSDI4W1

ISED certification number:

IC: 6028A-OSD14W1

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 18, 2025

Andrey Adelberg, Senior EMC/RF Specialist

Prepared by



Signature

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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><br>303 River Road<br>Ottawa, Ontario<br>Canada<br>K1V 1H2<br><br>Tel: +1 613 737 9680<br>Fax: +1 613 737 9691 | <i>Montréal site:</i><br>292 Labrosse Avenue<br>Pointe-Claire, Québec<br>Canada<br>H9R 5L8<br><br>Tel: +1 514 694 2684<br>Fax: +1 514 694 3528 | <i>Cambridge site:</i><br>1-130 Saltsman Drive<br>Cambridge, Ontario<br>Canada<br>N3E 0B2<br><br>Tel: +1 519 650 4811 | <i>Almonte site:</i><br>1500 Peter Robinson Road<br>West Carleton, Ontario<br>Canada<br>K0A 1L0<br><br>Tel: +1 613 256-9117 |
|                      |                                                                                                                                   |                                                                                                                                                |                                                                                                                       |                                                                                                                             |
|                      |                                                                                                                                   |                                                                                                                                                |                                                                                                                       |                                                                                                                             |
| Test site identifier | <b>Organization</b>                                                                                                               | <b>Ottawa/Almonte</b>                                                                                                                          | <b>Montreal</b>                                                                                                       | <b>Cambridge</b>                                                                                                            |
|                      | FCC:                                                                                                                              | CA2040                                                                                                                                         | CA2041                                                                                                                | CA0101                                                                                                                      |
|                      | ISED:                                                                                                                             | 2040A-4                                                                                                                                        | 2040G-5                                                                                                               | 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.

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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<br>(MHz)                                        | Electric field strength<br>(V/m) | Magnetic field strength<br>(A/m) | Power density<br>(mW/cm <sup>2</sup> ) | Averaging time<br>(minutes) |
|-----------------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------------|-----------------------------|
| <b>(i) Limits for Occupational/Controlled Exposure</b>          |                                  |                                  |                                        |                             |
| 0.3–3.0                                                         | 614                              | 1.63                             | *(100)                                 | ≤6                          |
| 3.0–30                                                          | 1842 / f                         | 4.89 / f                         | *(900 / f <sup>2</sup> )               | <6                          |
| 30–300                                                          | 61.4                             | 0.163                            | 1.0                                    | <6                          |
| 300–1500                                                        |                                  |                                  | f / 300                                | <6                          |
| 1500–100000                                                     |                                  |                                  | 5                                      | <6                          |
| <b>(ii) Limits for General Population/Uncontrolled Exposure</b> |                                  |                                  |                                        |                             |
| 0.3–1.34                                                        | 614                              | 1.63                             | *(100)                                 | <30                         |
| 1.34–30                                                         | 824 / f                          | 2.19 / f                         | *(180 / f <sup>2</sup> )               | <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<br>(MHz)                   | Electric field strength<br>(V/m rms) | Magnetic field strength<br>(A/m rms) | Power density<br>(W/m <sup>2</sup> ) | Reference Period<br>(minutes) |
|--------------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------------------------------|
| <b>Limits for Controlled Environment</b>   |                                      |                                      |                                      |                               |
| 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 $f^{0.5}$                      | 9.40×10 <sup>-4</sup> $f^{0.5}$      | 3.33×10 <sup>-4</sup> $f$            | 616000 / $f^{1.2}$            |
| <b>Limits for Uncontrolled Environment</b> |                                      |                                      |                                      |                               |
| 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 / $f^{0.5}$                    | 4.21×10 <sup>-4</sup> / $f^{0.5}$    | 6.67×10 <sup>-5</sup> / $f$          | 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<sup>2</sup> or W/m<sup>2</sup>)  
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           | 2405 MHz              |
| Antenna type                   | Dipole                |
| Antenna gain                   | 3.5 dBi               |
| Number of antennas             | 1                     |
| Maximum transmitter power      | 25.85 dBm (conducted) |
| Prediction distance (declared) | 20 cm                 |

## 1.1.3 MPE calculation

|                                                                     |                             |                             |
|---------------------------------------------------------------------|-----------------------------|-----------------------------|
| Fundamental transmit (prediction) frequency:                        | 2405 MHz                    |                             |
| Maximum measured conducted peak output power:                       | 25.85 dBm                   |                             |
| Cable and/or jumper loss:                                           | 0 dB                        |                             |
| Maximum peak power at antenna input terminal:                       | 25.85 dBm                   |                             |
| Duty cycle:                                                         | 100 %                       |                             |
| Maximum calculated average power at antenna input terminal:         | 384.591782 mW               |                             |
| Single Antenna gain (typical):                                      | 3.5 dBi                     |                             |
| Number of antennae:                                                 | 1                           |                             |
| Total system gain:                                                  | 3.50 dBi                    |                             |
| <b>FCC limit:</b>                                                   |                             | <b>ISED limit:</b>          |
| MPE limit for <u>uncontrolled</u> exposure at prediction frequency: | 1.000000 mW/cm <sup>2</sup> | 0.535537 mW/cm <sup>2</sup> |
|                                                                     | 10.000000 W/m <sup>2</sup>  | 5.355371 W/m <sup>2</sup>   |
| MPE limit for <u>controlled</u> exposure at prediction frequency:   | 5.000000 mW/cm <sup>2</sup> | 3.165584 mW/cm <sup>2</sup> |
|                                                                     | 50.000000 W/m <sup>2</sup>  | 31.655836 W/m <sup>2</sup>  |
| Minimum calculated prediction distance for compliance (controlled): | 20 cm                       | 20 cm                       |
| Typical (declared) distance:                                        | 20 cm                       | 20 cm                       |
| Average power density at prediction frequency:                      | 0.171289 mW/cm <sup>2</sup> | 0.171289 mW/cm <sup>2</sup> |
|                                                                     | 1.712893 W/m <sup>2</sup>   | 1.712893 W/m <sup>2</sup>   |
| Margin of Compliance for <b>controlled</b> environment:             | 14.65 dB                    | 12.67 dB                    |
| with Maximum permitted antenna gain:                                | 44.00 dBi                   | 42.02 dBi                   |

## 1.1.4 Verdict

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

End of the test report