

RADIO TEST REPORT

Type of assessment:

MPE Calculation report

Applicant:

Dell Inc.

Product:

5G NR Remote Radio Unit 4TX 4RX 40W-per-TX

Model:

RR4T4RA

FCC ID:

E2K-DRU77440

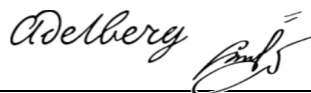
Specifications:

- ◆ 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

Date of issue: November 22, 2024

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Prepared by



Signature

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SCC File Number: 15064 (Ottawa/Almonte); 151100 (Montreal); 151097 (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	292 Labrosse Avenue	1-130 Saltsman Drive	1500 Peter Robinson Road
	Ottawa, Ontario	Pointe-Claire, Québec	Cambridge, Ontario	West Carleton, Ontario
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	Fax: +1 613 737 9691	Fax: +1 514 694 3528		
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.

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	3980 MHz
Antenna type	External
Antenna gain	Antenna is not provided, and the RF exposure is addressed at the time of licensing. 12.93 dBi sample antenna was used for calculation of safety distance
Number of antennas	4
Maximum transmitter conducted power	40 W per port
Prediction distance	5 m

1.1.3 MPE calculation

Fundamental transmit (prediction) frequency:	3980 MHz
Maximum measured conducted peak output power:	46.02 dBm
Cable and/or jumper loss:	0 dB
Maximum peak power at antenna input terminal:	46.02059991 dBm
Tx On time:	1.000 ms
Tx period time:	1.000 ms
Average factor:	100 %
Maximum calculated average power at antenna input terminal:	40000 mW
Single Antenna gain (typical):	12.93 dBi
Number of antennae:	4
Total system gain:	18.95 dBi
MPE limit for uncontrolled exposure at prediction frequency:	1.000000 mW/cm ²
	10.000000 W/m ²
Minimum calculated prediction distance for compliance:	500 cm
Typical (declared) distance:	500 cm
Average power density at prediction frequency:	0.999931 mW/cm ²
	9.999312 W/m ²
Margin of Compliance:	0.00 dB
Maximum allowable antenna gain:	18.95 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