Choose Scandinavian trust

RADIO TEST REPORT

Type of assessment:

MPE Calculation report

Manufacturer:

Ericsson AB

Hardware Version Identification Number (HVIN):

AS1619061

Product Marketing Name (PMN):

LPRU 4420 B25B66

Product description:

Remote Radio Unit with LTE, NBIoT, and NR

FCC ID:

TA8AKRC161906-1

ISED certification number:

IC: 287AB-AS1619061

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: April 18, 2024

Andrey Adelberg, Senior 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.

Copyright notification

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	2185 MHz for B66, 1980 MHz for B25.
Antenna gain used for calculations	0 dBi. Antenna gains higher than shown in *Maximum permitted antenna gain* row will require adjustments to the safety distance.
Maximum transmitter total power per port	22.21 dBm (conducted for B66), 22.26 (conducted for B25). – 6.02 dB MIMO factor added
Path loss	2.5 dB
Prediction distance used for calculations	20 cm. Antenna gains higher than shown in *Maximum permitted antenna gain* row will require adjustments to the safety distance.

1.1.3 MPE calculation for B66

Fundamental transmit (prediction) frequency:	2185	MHz		
Maximum measured conducted peak output power:	22.210	dBm		
Cable and/or jumper loss:	2.5	dB		
Maximum peak power at antenna input terminal:	19.710	dBm		
Duty cycle:	100	%		
Maximum calculated average power at antenna input terminal:	93.54056741	mW		
Single Antenna gain (typical):	0	dBi		
Number of antennae:	4			
Total system gain:	6.02	dBi		
	FCC limit:		**ISED limit:**	
MPE limit for uncontrolled exposure at prediction frequency:	**1.000000**	**mW/cm^2**	**0.501553**	**mW/cm^2**
	10.000000	W/m^2	5.015527	W/m^2
MPE limit for controlled exposure at prediction frequency:	**5.000000**	**mW/cm^2**	**3.017324**	**mW/cm^2**
	50.000000	W/m^2	30.173241	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:	**0.074437**	**mW/cm^2**	**0.074437**	**mW/cm^2**
	0.744372	W/m^2	0.744372	W/m^2
Margin of Compliance for **uncontrolled** envirenment:	**11.28**	**dB**	**8.29**	**dB**
with Maximum premitted antenna gain:	17.30	dBi	14.31	dBi
Margin of Compliance for **controlled** envirenment:	**18.27**	**dB**	**16.08**	**dB**
with Maximum permitted antenna gain:	37.98	dBi	35.79	dBi

1.1.1 Verdict for B66

The calculated average power density falls below the limit. Consequently, the product meets the RF Exposure requirements for the minimum calculated distance of 20 cm and an antenna gain of at least 0 dBi. However, if the individual gain of the antenna used in the final product installation exceeds the value specified in the Maximum Permitted Antenna Gain row, adjustments to the safety distance will be necessary.

1.1.1 MPE calculation for B25

Fundamental transmit (prediction) frequency:	1980	MHz
Maximum measured conducted peak output power:	22.260	dBm
Cable and/or jumper loss:	2.5	dB
Maximum peak power at antenna input terminal:	19.760	dBm
Duty cycle:	100	%
Maximum calculated average power at antenna input terminal:	94.62371614	mW
Single Antenna gain (typical):	0	dBi
Number of antennae:	4	
Total system gain:	6.02	dBi

	FCC limit:		ISED limit:	
MPE limit for uncontrolled exposure at prediction frequency:	**1.000000**	**mW/cm^2**	**0.468896**	**mW/cm^2**
	10.000000	W/m^2	4.688960	W/m^2
MPE limit for controlled exposure at prediction frequency:	**5.000000**	**mW/cm^2**	**2.872294**	**mW/cm^2**
	50.000000	W/m^2	28.722937	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:	**0.075299**	**mW/cm^2**	**0.075299**	**mW/cm^2**
	0.752992	W/m^2	0.752992	W/m^2
Margin of Compliance for **uncontrolled** envirenment:	**11.23**	**dB**	**7.94**	**dB**
with Maximum premitted antenna gain:	17.25	dBi	13.96	dBi
Margin of Compliance for **controlled** envirenment:	**18.22**	**dB**	**15.81**	**dB**
with Maximum permitted antenna gain:	37.98	dBi	35.57	dBi

1.1.2 Verdict

The calculated average power density falls below the limit. Consequently, the product meets the RF Exposure requirements for the minimum calculated distance of 20 cm and an antenna gain of at least 0 dBi. However, if the individual gain of the antenna used in the final product installation exceeds the value specified in the Maximum Permitted Antenna Gain row, adjustments to the safety distance will be necessary.

1.1.3 RSS-102, Annex A - RF technical brief cover sheet

ISED certification number	287AB-AS1619061		
Product marketing name (PMN)	LPRU 4420 B25B66		
Hardware version identification number (HVIN)	AS1619061		
Firmware version identification number (FVIN)	CXP2030045/28_R18C294		
Host marketing name (HMN)	N/A		
Applicant name	Ericsson AB		
SAR/RF exposure test laboratory	2040A-4 (3 m semi anechoic chamber - Ottawa)		
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 for Band 25	Evaluated against exposure limits:	☒ General Public Use	☐ Controlled Use
	Duty cycle used in evaluation:	**100**	%
	Operational frequency:	**1980**	MHz
	Standard used for evaluation:	**Safety Code 6**	
	Measurement distance:	**0.2**	m (minimum)
	RF value:	**0.75**	☒ W/m² ☐ V/m ☐ A/m ☐ Measured ☐ Computed ☒ Calculated
RF exposure evaluation for Band 66	Evaluated against exposure limits:	☒ General Public Use	☐ Controlled Use
	Duty cycle used in evaluation:	**100**	%
	Operational frequency:	**2185**	MHz
	Standard used for evaluation:	**Safety Code 6**	
	Measurement distance:	**0.2**	m (minimum)
	RF value:	**0.74**	☒ W/m² ☐ V/m ☐ A/m ☐ Measured ☐ Computed ☒ Calculated

End of the test report