Choose Scandinavian trust

Assessment Report

REP001909-3R2ARFWL

Type of assessment:

MPE Calculation report

Manufacturer:

JTECH An HME Company

Model:

LWEXT

Product description:

LinkWear Range Extender

PMN:

LWRP00100

FCC ID:

WDC-JLWEXT

IC certification number:

7752A-JLWEXT

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: September 18, 2023

James Cunningham, EMC/WL Manager

Prepared by

Signature

Lab locations=

Company name	Nemko USA Inc.
Address	2210 Faraday Ave, Suite 150
City	Carlsbad
State	California
Postal code	92008
Country	USA
Telephone	+1 760 444 3500
Website	www.nemko.com
FCC Site Number	Test Firm Registration Number: 392943 Designation Number: US5058
ISED Test Site	2040B-3

Prepared by	James Cunningham, EMC/WL Manager
Date	September 18, 2023
Signature	

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 contain in this report are within Nemko USA's ISO/IEC 17025 accreditation.

Copyright notification

Table of Contents

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 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 ƒ 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 ƒ 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.

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	2440 MHz
Antenna type	Integrated
Antenna gain	2.10 dBi (worst case measured antenna gain)
Number of antennas	1
Maximum transmitter conducted power	18.32 dBm (67.92 mW)
Prediction distance	20 cm

Note: Conducted power taken from worst case EIRP measurement in Nemko report REP001909-1R3TRFWL.
Antenna gain taken from worst case gain measurement in Nemko report REP001909-3TRFWL.

1.1.3 MPE calculation

Fundamental transmit (prediction) frequency:	2440	MHz
Maximum measured conducted peak output power:	18.32	dBm
Cable and/or jumper loss:	0	dB
Maximum peak power at antenna input terminal:	18.32	dBm
Tx On time:	1.000	ms
Tx period time:	1.000	ms
Average factor:	100	%
Maximum calculated average power at antenna input terminal:	67.92	mW
Single Antenna gain (typical):	2.1	dBi
Number of antennae:	1	
Total system gain:	2.10	dBi

	FCC limit:		ISED limit:	
MPE limit for uncontrolled exposure at prediction frequency:	**1.000000**	**mW/cm^2**	**0.540851**	**mW/cm^2**
	10.000000	W/m^2	5.408511	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:	**0.021914**	**mW/cm^2**	**0.021914**	**mW/cm^2**
	0.219144	W/m^2	0.219144	W/m^2
Margin of Compliance:	**16.59**	**dB**	**13.92**	**dB**
Maximum allowable antenna gain:	18.69	dBi	16.02	dBi

1.1.4 Verdict

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