Test report

Customer:

Nielsen Lab, d.o.o.

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EMC test report

180645-AU01+W03

The Nielsen Company

BLE module 2.4 GHz

Motion Detector

EMV TESTHAUS

ilac-MRA

DAkkS Deutsche Akkreditierungsstelle D-PL-12155-01-00

EMV **TESTHAUS** GmbH

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Accreditation:

FCC test firm accreditation expiration date: 2021-05-30
MRA US-EU, FCC designation number: DE0010
BnetzA-CAB-02/21-02/5 Valid until 2023-11-26

Recognized on March 14th, 2019 by the
Department of Innovation, Science and Economic Development (ISED) Canada
as a wireless testing laboratory
CAB identifier: DE0011

Location of Testing:

EMV **TESTHAUS** GmbH
Gustav-Hertz-Straße 35
94315 Straubing

The technical accuracy is guaranteed through the quality management of the EMV **TESTHAUS** GmbH.

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1 Test regulations

Standard	*Title*
IEEE C95.3-2002 (R2008) Approved December 11, 2002 Reaffirmed June 12, 2008	IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz–300 GHz
OET Bulletin 65, 65A, 65B Edition 97-01, August 1997	Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields
Part 1, Subpart I, Section 1.1310	Radiofrequency radiation exposure limits
Part 1, Subpart 2, Section 2.1091	Radiofrequency radiation exposure evaluation: mobile devices.
Part 1, Subpart 2, Section 2.1093	Radiofrequency radiation exposure evaluation: portable device
KDB 447498 D01 v06	Mobile and portable devices RF Exposure procedures and equipment authorisation policies, October 23, 2015.
ANSI C95.1: 2005	IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz

2 Summary of test results

Standard	*Result*	*Remark*
Part 1, Subpart 2, Section 2.1093	Passed	---

Straubing, September 2, 2019

Konrad Graßl
Head of radio department
EMV **TESTHAUS** GmbH

Christian Kiermeier
Technical executive
EMV **TESTHAUS** GmbH

3 Equipment under test (EUT)

Product type:	BLE module 2.4 GHz
Model Name:	Motion detector
Manufacturer:	The Nielsen Company
Serial number:	prototype
FCC ID:	2ASUZ003
Application frequency band:	2400 MHz – 2483.5 MHz
Number of RF channels:	40
Antenna model:	Johanson 2450AT18B100
Antenna gain:	0.5 dBi
Antenna types:	PCB antenna ☐ detachable ☒ not detachable
Power supply:	DC supply nominal voltage: 3.3 V
Type of device:	☐ Body-supported device ☒ Body-worn (or body-mount) radio ☒ Limb-Worn device ☐ other
Separation distance:	☒ ≤ 20 cm ☐ > 20 cm
Evaluated against exposure limits:	☐ General public use ☐ Controlled use
Simultaneous transmissions:	No

4 Photographs of EUT

See document 180645-AU01+W01 Annex C.

5 Test results

This clause gives details about the test results as collected on page 5.

5.1 FCC

5.1.1 Evaluation for separation distance ≤ 20 cm, except WPT

Reference: Part 1, Subpart 2, Section 2.1093

Basic standard: n/a

Performed by:	Konrad Graßl	Date of test:	August 20, 2019
Result:	☒ Limits kept	☐ Limits not kept	

5.1.1.1 Data of equipment under test (EUT)

Note: The data for the RF technology 1 is taken out of the Test report 180634-AU01+W01 of the test laboratory EMV Testhaus GmbH.

RF technology :

Application:	Bluetooth low energy
Operation frequency range:	2400 MHz – 2483.5 MHz
Antenna manufacturer:	Johanson Technology
Antenna part number:	2450AT18B100
Antenna connector:	none
Antenna type:	internal (chip antenna)
	not detachable
Antenna gain:	0.5 dBi
Maximum conducted output power:	-0.35 dBm at 2402.08 MHz
Tune-up tolerance:	1 dB

5.1.1.2 Requirements and limits for separation distance ≤ 20 cm

This estimation follows the general guidelines for RF Exposure according to KDB 447498.

As noted in §2.103(b) For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

According §2.1093 (d)(i)(2): The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

5.1.1.3 Results

RF technology:

Information related to Exposure:

Separation distance: 1 mm

Exposure tier: general public

Power averaging over time: Not applied

Separation distance (mm)	*Channel Frequency (MHz)*	*rated power + tolerance (dBm)*	*rated power + tolerance (mW)*	*1-g SAR*	*Limit 1-g SAR*	*Fraction of limit (%)*
1	2402.08	0.65	1.16	0.36	3.0	12.0

Table 1: Result of calculation of exposure to the body

Separation distance (mm)	*Channel Frequency (MHz)*	*rated power + tolerance (dBm)*	*rated power + tolerance (mW)*	*10-g SAR*	*Limit 10-g SAR*	*Fraction of limit (%)*
1	2402.08	0.65	1.16	0.36	7.5	4.8

Table 2: Result of calculation of exposure to the limbs

6 Revision history

Revision	*Date*	*Issued by*	*Description of modifications*
0	2019-09-02	Konrad Graßl	First edition