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The Netherlands
Chamber of Commerce
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FCC RF Exposure Assessment

Product name	: Gateway
Applicant	: Velux A/S
FCC ID	: XSG 832160
IC ID	: 8642A-832160

Test report No. : 160601659 MPE Ver 1.00

Laboratory information

Accreditation

Telefication is designated by the FCC as an Accredited Test Firm for compliance testing of equipment subject to Certification under Parts 15 & 18. The Designation number is: NL0001

The Industry Canada registration number for the 3 meter test chamber of Telefication is: 4173A-1.

Documentation

Telefication complies with the accreditation criteria for test laboratories as laid down in ISO/IEC 17025:2005.

Testing Location

Test Site	Telefication B.V.
Test Site location	Edisonstraat 12a 6902 PK Zevenaar The Netherlands Tel. +31889983600 Fax. +31316583189
Test Site FCC	NL0001

Revision History

Version	Date	Remarks	By
v1.00	15-11-2017	Release version	KR

Table of Contents

1 General Description

1.1 Applicant

Client name:	Velux A/S
Address	Baekgaerdsvej 40
Zip code:	6900, Skjern
Telephone:	+45 3058 1588
E-mail:	j.a.m.thomsen@velux.com
Contact name:	Mr. J.A.M. Thomsen

1.2 Manufacturer

Manufacturer name:	Velux A/S
Address:	Baekgaerdsvej 40
Zip code:	6900, Skjern
Telephone:	+45 3058 1588
E-mail:	j.a.m.thomsen@velux.com
Contact name:	Mr. J.A.M. Thomsen

1.3 Tested Equipment Under Test (EUT)

Product name:	Gateway
Brand name:	VELUX
Product type:	io-homecontrol
FCC ID:	XSG 832160
IC ID:	8642A-832160
Model(s):	BE-RC010-01
Software version:	--
Hardware version:	--
Date of receipt:	18-04-2016
Assessment:	15-11-2017

1.4 MPE Calculation Method

Calculation method of RF Safety Distance:

$$PD = \frac{Pout * G}{4\pi r^2}$$

Where:
PD = Power Density in mW/cm^2
Pout = Output power in mW
G = Gain of antenna
R = Distance between observation point and centre of the radiator in cm

1.5 Product specifications of Equipment Under Test

Tx Frequency range (MHz):	IEEE 802.15.4: 2425 - 2475 Wlan: 2400 – 2483.5
Rx frequency range (MHz):	IEEE 802.15.4: 2425 - 2475 Wlan: 2400 – 2483.5
Maximum output power (mW EIRP):	IEEE 802.15.4: 10 Wlan: 20.5
Antenna type :	PCB Antenna (PIFA)
Antenna gain(dBi):	IEEE 802.15.4: 1 Wlan: 0.36

1.5.1 Output Power Measurement for IEEE 802.15.4

Based on: Telefication test report 1606011659 004 v3.00

Peak method

Technology Std.	Channels	Frequency (MHz)	Data rate	Peak output power (dBm)
IEEE 802.15.4	15	2425	250 kb/s	12.53
	20	2450	250 kb/s	12.53
	25	2475	250 kb/s	12.12
Uncertainty	±1.78 dB			

Note: Peak output power = Measured value + Antenna gain

1.5.2 Output Power Measurement for Wlan

Based on: Telefication test report 161001057 01 Ver 2.00

Duty cycle

Technology Std.	Channel	Frequency (MHz)	Duty cycle (%)
IEEE 802.11b	1	2412	100
	6	2437	100
	11	2462	100
IEEE 802.11g	1	2412	85.7
	6	2437	85.2
	11	2462	85.2
IEEE 802.11n	1	2412	81.8
	6	2437	84.6
	11	2462	80.8

Peak method

Technology Std.	Channel	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
IEEE 802.11b	1	2412	20.47	111.4
	6	2437	20.40	109.6
	11	2462	20.26	106.1
Uncertainty	±0.63 dB			

Average method

Technology Std.	Channel	Frequency (MHz)	Average output power (dBm)	Average output power (mW)
IEEE 802.11g	1	2412	-4.97	0.32
	6	2437	-5.16	0.30
	11	2462	-5.41	0.29
Uncertainty	±0.63 dB			

Average method

Technology Std.	Channel	Frequency (MHz)	Average output power (dBm)	Average output power (mW)
IEEE 802.11n	1	2412	-11.00	0.08
	6	2437	-8.14	0.15
	11	2462	-8.82	0.13
Uncertainty	±0.63 dB			

1.6 Calculation results

Technology Std.	Frequency (MHz)	Power at the Antenna (mW)	Antenna Gain (dBi)	Distance to the Area of Interest (cm)	Power density ($\boldsymbol{mW}$ / $\boldsymbol{cm^2}$)	Limit ($\boldsymbol{mW}$ / $\boldsymbol{cm^2}$)	Result
IEEE 802.15.4	2483.5	12.53	1	20	0.0081	1	Pass
IEEE 802.11b		111.4	0.36	20	0.0631	1	Pass
IEEE 802.11g		0.32	0.36	20	0.0178	1	Pass
IEEE 802.11n		0.15	0.36	20	0.0083	1	Pass

1.7 Conclusions

The MPE value of the Velux A/S Gateway meets the RF exposure limits for General Population / Uncontrolled Exposure FCC Rule Part 1.1310.

Assessment performed by:

Date : 15-11-2017
Name : ing. K.A. Roes
Function : Coordinator Radio Laboratory

Signature :