

Certification Radio test report

According to the standard:

CFR 47 FCC PART 15

RSS GEN – Issue 5

RSS 247 – Issue 2

Equipment under test:

WIRELESS / BATTERYLESS LIMIT SWITCH

FCC ID: Y7HXC MW

IC NUMBER: 7002C-XC MW

Company:

SCHNEIDER ELECTRIC INDUSTRIES

Distribution: Mr CORAZZA

(Company: SCHNEIDER ELECTRIC INDUSTRIES)

Number of pages: 24 with 1 appendix

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			Name and Function	Visa
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Information in italics are declared by the manufacturer/customer and are under his responsibility



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TESTING ACCREDITATIONS N° 1-0826, 1-0827, 1-1925,
1-2069, 1-2070, 1-2206, 1-2376 & 1-6086
LIST OF ACCREDITED SITES AND SCOPE
AVAILABLE ON WWW.COFAC.FR

DESIGNATION OF PRODUCT: **WIRELESS / BATTERYLESS LIMIT SWITCH**

Serial number (S/N):
Conducted Sample 1: FF70235A
Conducted Sample 2: FF70203E
Conducted Sample 3: FF70212C
Conducted Sample 4: FF70217E
Conducted Sample 5: FF702089
Conducted Sample 6: FF70113D
Conducted Sample 7: FF702354

*Radiated Sample 1: FF70235C
Radiated Sample 2: FF702030
Radiated Sample 3: FF702132
Radiated Sample 4: FF702180
Radiated Sample 5: FF702087
Radiated Sample 6: FF701142
Radiated Sample 7: FF702355*

Reference / model (P/N):
Sample 1: XCMW101
Sample 2: XCMW139
Sample 3: XCMW146
Sample 4: XCMW149
Sample 5: XCMW159
Sample 6: XCMW1F0
Sample 7: XCMW1H0

Software version: XCMW_V1.0.HEX

Firmware version: 1.0

MANUFACTURER: SCHNEIDER ELECTRIC INDUSTRIES FRANCE L'ISLE D'ESPAGNAC

COMPANY SUBMITTING THE PRODUCT:

Company: SCHNEIDER ELECTRIC INDUSTRIES FRANCE L'ISLE D'ESPAGNAC

Address: BP 660 –Zone Industrielle L'ISLE D'ESPAGNAC
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Responsible: Mr LAIDET

DATE(S) OF TEST: From 13-Jan-22 to 18-Jan-22

TESTING LOCATION:

EMITECH ANGERS laboratory at JUIGNE SUR LOIRE (49) FRANCE

FCC Accredited under US-EU MRA Designation Number: FR0009

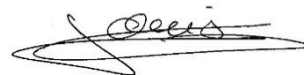
Test Firm Registration Number: 873677

ISED Accredited under CANADA-EU MRA Designation Number: FR0001

Industry Canada Registration Number: 4452A

TESTED BY:

S. LOUIS

VISA:**WRITTEN BY:**

S. LOUIS

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REVISIONS HISTORY

Revision	Date	Modified pages	Modifications
0	19-Jan-22	/	Creation

1. INTRODUCTION

This report presents the results of radio test carried out on the following radio equipment: **Wireless / Batteryless limit switch**, in accordance with normative reference.

The device under test integrates a monofrequency zigbee radio emitter (2405MHz).
5 similar references are already certified (FCCID: Y7HXCW / IC: 7002-XCW).

Due to mechanical differences, 7 supplementary references (XCMW101, XCMW139, XCMW146, XCMW149, XCMW159, XCMW1F0, XCMW1H0) are tested in this report; limited to carrier and harmonics

This report permit to validate a permissive change class 2.

Only power and harmonics measurements are realized on these products (C2PC).

No increase of power was detected by comparison with the initial product (see Emitech report RR051-18-101550-2-A Ed. 0 and RR051-18-101550-3-A Ed. 0).

No significant increase of harmonics level was detected by comparison with the initial product (see Emitech report RR051-18-101550-2-A Ed. 0 and RR051-18-101550-3-A Ed. 0).

The 12 references below are validated without tests and registered as model for Canada.

References	Particularities
XCMW201	Same as XCMW101 but with inverted trames
XCMW202	Same as XCMW102 but with inverted trames
XCMW210	Same as XCMW110 but with inverted trames
XCMW215	Same as XCMW115 but with inverted trames
XCMW216	Same as XCMW116 but with inverted trames
XCMW239	Same as XCMW139 but with inverted trames
XCMW245	Same as XCMW145 but with inverted trames
XCMW246	Same as XCMW146 but with inverted trames
XCMW249	Same as XCMW149 but with inverted trames
XCMW259	Same as XCMW159 but with inverted trames
XCMW2F0	Same as XCMW1F0 but with inverted trames
XCMW2H0	Same as XCMW1H0 but with inverted trames

2. PRODUCT DESCRIPTION

Category of equipment (ISED):	I
Class:	B
Utilization:	Switch
Antenna type and gain:	Whip antenna (3.17dBi)
Operating frequency range:	2405 MHz
Number of channels:	1
Channel spacing:	Not concerned
Modulation:	Zigbee
Power source:	3Vdc

Power level, frequency range and channels characteristics are not user adjustable.
The details pictures of the product and the circuit boards are joined with this file.

3. NORMATIVE REFERENCE

The standards and testing methods related throughout this report are those listed below.
They are applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

CFR 47 FCC Part 15 (2021)	Radio Frequency Devices
ANSI C63.10	2013 Procedures for Compliance Testing of Unlicensed Wireless Devices.
558074 D01 15.247 Meas Guidance v05r02	Guidance for compliance measurements on digital transmission system, frequency hopping spread spectrum system, and hybrid system devices operating under section 15.247 of the FCC rules.
RSP-100	Issue 12, August 2019 Certification of Radio Apparatus
RSS-Gen	Issue 5, April 2018 General Requirements for Compliance of Radio Apparatus
RSS-247	Issue 2, February 2017 Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

4. TEST METHODOLOGY

Radio performance tests procedures given in CFR 47 part 15:

Subpart C – Intentional Radiators

- Paragraph 203: Antenna requirement
- Paragraph 205: Restricted bands of operation
- Paragraph 207: Conducted limits
- Paragraph 209: Radiated emission limits; general requirements
- Paragraph 212: Modular transmitter
- Paragraph 215: Additional provisions to the general radiated emission limitations
- Paragraph 247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz

Radio performance tests procedures given in RSS-Gen:

- Paragraph 2 - General
- Paragraph 3 - Normative publications and related documents
- Paragraph 4 - Labelling requirements
- Paragraph 6 - General administrative and technical requirements
- Paragraph 8 - Licence-exempt Radio Apparatus

Radio performance tests procedures given in RSS-247:

- Paragraph 3 - Certification requirements
- Paragraph 4 - Measurement method
- Paragraph 5 - Standard specifications for frequency hopping systems and digital transmission systems operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz

5. TEST EQUIPMENT CALIBRATION DATES

Emitech Number	Model	Type	Last calibration	Calibration interval (years)	Next calibration due
0	BAT-EMC V3.18.0.26	Software	/	/	/
4088	R&S FSP40	Spectrum Analyzer	04/05/2020	2	04/05/2022
7279	SUCOFLEX SF104 N 1.5m	Cable	11/06/2020	2	11/06/2022
7299	Microtronics BRM50702	Reject band filter	04/09/2019	3	03/09/2022
8535	EMCO 3115	Antenna	28/04/2020	3	28/04/2023
8593	SIDT Cage 2	Anechoic chamber	/	/	/
8704	LUCIX Corp S180265L3201 LNA	Low-noise amplifier	17/08/2021	1	17/08/2022
8750	La Crosse Technology WS-9232	Meteo station	22/09/2020	2	22/09/2022
8775	Fontaine FTN 2515B	Power source	(1)	(1)	(1)
8896	ACQUISYS GPS8	Satellite synchronized frequency standard	/	/	/
8974	STORM MICROWAE k-20cm	cable	09/12/2021	2	09/12/2023
8975	STORM MICROWAE k-20cm	cable	09/12/2021	2	09/12/2023
9398	N-1.5m	cable	11/06/2020	2	11/06/2022
12911	Huber + Suhner N-2m	cable	11/06/2020	2	11/06/2022
14736	MATURO	Turntable and mat controller MCU	/	/	/
14831	Fluke 177	Multimeter	25/02/2020	2	24/02/2022
15812	COMP-POWER PAM-118A	Low-noise amplifier 18GHz	19/07/2021	1	19/07/2022
15882	SUCOFLEX	cable N 5m	26/01/2021	2	26/01/2023

(1) The equipment is not verified; instead, the output voltage is checked before each measurement with the calibrated multimeter.

6. TESTS RESULTS SUMMARY

6.1 CFR 47 part 15 requirements

Test procedure	Description of test	Respected criteria?				Comment
		Yes	No	NAP	NAs	
FCC Part 15.203	ANTENNA REQUIREMENT	X				Note 1
FCC Part 15.205	RESTRICTED BANDS OF OPERATION	X				
FCC Part 15.207	CONDUCTED LIMITS			X		Not operational with AC Power Line
FCC Part 15.209	RADIATED EMISSION LIMITS; general requirements	X				Note 2
FCC Part 15.212	MODULAR TRANSMITTERS			X		
FCC part 15.215	ADDITIONAL PROVISIONS TO THE GENERAL RADIATED EMISSION LIMITATIONS					
	(a) Alternative to general radiated emission limits			X		
	(b) Unwanted emissions outside of §15.247 frequency bands	X				Note 3
	(c) 20 dB bandwidth and band-edge compliance			X		
FCC Part 15.247	OPERATION WITHIN THE BANDS 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz					
	(a) (1) Hopping systems			X		
	(a) (2) Digital modulation techniques	X				Note 4
	(b) Maximum peak output power	X				Note 4
	(c) Operation with directional antenna gains > 6 dBi			X		
	(d) Intentional radiator	X				Note 4
	(e) Peak power spectral density					Note 4
	(f) Hybrid system			X		
	(g) Frequency hopping requirements			X		
	(h) Frequency hopping intelligence			X		
	(i) RF exposure compliance	X				

NAP: Not Applicable

NAs: Not Asked

Note 1: Whip antenna plugged on internal UFL connector.

Note 2: See FCC part 15.247 (d).

Note 3: See FCC part 15.209. Unwanted emissions levels are all below the fundamental emission field strength level.

Note 4: Refer Emitech test report RR051-18-101550-2-A Ed. 0 and RR051-18-101550-3-A Ed. 0.

Only power and harmonics measurements are realized on these products (C2PC).

No significant increase of harmonics level was detected by comparison with the initial product (see Emitech report RR051-18-101550-2-A Ed. 0 and RR051-18-101550-3-A Ed. 0).

6.2 RSS-Gen requirements

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
Paragraph 8	Licence-exempt radio apparatus					
§ 8.1	Measurement Bandwidths and Detector Functions	X				
§ 8.2	Pulsed operation	X				
§ 8.3	Prohibition of amplifiers	X				
§ 8.4	User manual notice	X				see certification documents
§ 8.5	Measurement of licence-exempt devices on-site (in-situ)			X		
§ 8.6	Operating frequency range of devices in master/slave networks	X				
§ 8.7	Radio frequency identification (RFID) devices			X		
§ 8.8	AC power line conducted emissions limits			X		Not operational with AC Power Line
§ 8.9	Transmitter emission limits	X				Permissive change report
§ 8.10	Restricted frequency bands	X				
§ 8.11	Frequency stability			X		

NAp: Not Applicable

NAs: Not Asked

6.3 RSS-247 requirements

Test Procedure RSS-247	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
Paragraph 5	Standard specifications for frequency hopping system and digital transmission systems operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz					
5.1	Frequency hopping systems (FHSS)			X		
5.2	Digital transmission systems	X				Permissive change report Note 1
5.3	Hybrid systems			X		
5.4	Transmitter output power and equivalent isotropically radiated power (e.i.r.p.) requirements	X				
5.5	Unwanted emissions	X				

NAp: Not Applicable

NAs: Not Asked

Note 1: Refer Emitech test report RR051-18-101550-2-A Ed. 0 and RR051-18-101550-3-A Ed. 0.

Only power and harmonics measurements are realized on these products (C2PC).

No significant increase of harmonics level was detected by comparison with the initial product (see Emitech report RR051-18-101550-2-A Ed. 0 and RR051-18-101550-3-A Ed. 0).

7. MEASUREMENT UNCERTAINTY

To declare, or not, the compliance with the specifications, it was not explicitly taken into account of uncertainty associated with the result(s).

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for normal distribution corresponds to a coverage probability of approximately 95%.

Parameter	Emitech Uncertainty
RF power, conducted	$\pm 0.8\text{dB}$
Radiated emission valid to 26 GHz	
9kHz – 30MHz	$\pm 2.7. \text{ dB}$
30MHz – 1GHz	$\pm 5.0 \text{ dB}$
1GHz – 18GHz	$\pm 5.3 \text{ dB}$
18GHz – 40GHz	$\pm 6.1 \text{ dB}$
AC Power Lines conducted emissions	$\pm 3.4 \text{ dB}$
Temperature	$\pm 1 \text{ }^{\circ}\text{C}$
Humidity	$\pm 5 \%$

8. PEAK CONDUCTED OUTPUT POWER**Temperature (°C) :** 19.7 / 20.2**Humidity (%HR):** 40 / 39**Date :** January 17, 2022 and
January 18, 2022**Technician :** S. LOUIS**Standard:** FCC Part 15
RSS-247**Test procedure:**

For FCC Part 15: paragraph 15.247 (b)

For RSS-247: paragraph 5.4

RBW≥DTS bandwidth method of paragraph 11.9.1.1 of ANSI C63.10

Test set up:

First an exploratory radiated measurement was performed.

During this phase the product is oriented in three orthogonal planes.

Then the final measurement is realized with the product on the most critical orientation.

The system is tested in anechoic chamber, the EUT is placed on a rotating table, 1.5 m from a ground plane.

Zero degree azimuths correspond to the front of the device under test.

See photos in appendix 2.

Distance of antenna: 3 meters**Antenna height:** 1.5 meter**Antenna polarization:** vertical and horizontal (only the highest level is recorded)

The measurement of the radiated electro-magnetic field is realized with an analyser and peak detector. The resolution bandwidth is adjusted at 10 MHz and video bandwidth at 10 MHz. (11.9.1.1 of ANSI C63.10)

Finally the radiated electro-magnetic field is converted in dBm with the following formula:

$$\text{EIRP(dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8;$$
where D is the measurement distance in meters and antenna Gain = 3.15 dBi.**Equipment under test operating condition:**

The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate.

Tests are performed with internal antenna

Power source: 3 Vdc by an external power supply

Percentage of voltage variation during the test (%):

± 1

Results:

Radiated Sample N° 1 F = 2405 MHz

	Electro-magnetic field (dBμV/m):	Maximum Peak conducted output power (1)		Limit (W)
		(dBm)	(W)	
Nominal supply voltage:	99.2	0.77	0.001195	1

Polarization of test antenna: Vertical (height: 150 cm)

Position of equipment: 1 (azimuth: 110 degrees)

Radiated Sample N° 2 F = 2405 MHz

	Electro-magnetic field (dBμV/m):	Maximum Peak conducted output power (1)		Limit (W)
		(dBm)	(W)	
Nominal supply voltage:	99.6	1.17	0.001310	1

Polarization of test antenna: Vertical (height: 150 cm)

Position of equipment: 1 (azimuth: 150 degrees)

Radiated Sample N° 3 F = 2405 MHz

	Electro-magnetic field (dBμV/m):	Maximum Peak conducted output power (1)		Limit (W)
		(dBm)	(W)	
Nominal supply voltage:	101.1	2.67	0.001850	1

Polarization of test antenna: Vertical (height: 150 cm)

Position of equipment: 1 (azimuth: 160 degrees)

Radiated Sample N° 4 F = 2405 MHz

	Electro-magnetic field (dBμV/m):	Maximum Peak conducted output power (1)		Limit (W)
		(dBm)	(W)	
Nominal supply voltage:	100.9	2.47	0.001767	1

Polarization of test antenna: Vertical (height: 150 cm)

Position of equipment: 1 (azimuth: 150 degrees)

Radiated Sample N° 5 F = 2405 MHz

	Electro-magnetic field (dBμV/m):	Maximum Peak conducted output power (1)		Limit (W)
		(dBm)	(W)	
Nominal supply voltage:	98.3	-0.12	0.000971	1

Polarization of test antenna: Vertical (height: 150 cm)

Position of equipment: 1 (azimuth: 100 degrees)

Radiated Sample N° 6 F = 2405 MHz

	Electro-magnetic field (dBμV/m):	Maximum Peak conducted output power (1)		Limit (W)
		(dBm)	(W)	
Nominal supply voltage:	100.6	2.17	0.001649	1

Polarization of test antenna: Vertical (height: 150 cm)

Position of equipment: 1 (azimuth: 90 degrees)

Radiated Sample N° 7 F = 2405 MHz

	Electro-magnetic field (dBμV/m):	Maximum Peak conducted output power (1)		Limit (W)
		(dBm)	(W)	
Nominal supply voltage:	99.6	1.17	0.001309	1

Polarization of test antenna: Horizontal (height: 150 cm)

Position of equipment: 2 (azimuth: 90 degrees)

(1) Maximum Peak conducted output power:

 $EIRP(dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance in meters and antenna

Gain = 3.17 dBi (declared by the applicant)

Test conclusion:

RESPECTED STANDARD

9. RADIATED SPURIOUS EMISSIONS**Temperature (°C) :** 19.7 / 20.2**Humidity (%HR):** 40 / 39**Date :** January 17, 2022 and
January 18, 2022**Technician :** S. LOUIS**Standard:** FCC Part 15
RSS-247**Test procedure:**For FCC Part 15: paragraph 15.205, paragraph 15.209, paragraph 15.247 (d)
For RSS-247: paragraph 5.5

Emissions in non-restricted frequency bands method of paragraph 11.11 of ANSI C63.10

Emissions in restricted frequency bands method of paragraph 11.12 of ANSI C63.10

Test set up:

The measure is performed first in conducted then in radiated for measure cabinet spurious.

For cabinet spurious measurement, the antenna is fitted with 50 ohm non-reactive load.

Frequency range: From 2.7GHz to 25GHz (10th harmonic of the highest fundamental frequency - 2405MHz)**Detection mode:** Quasi-peak ($F < 1 \text{ GHz}$)Peak / Average ($F > 1 \text{ GHz}$)**Bandwidth:** 200Hz ($9 \text{ kHz} < F < 150\text{kHz}$)
9 kHz ($150 \text{ kHz} < F < 30\text{MHz}$)
120 kHz ($30 \text{ MHz} < F < 1 \text{ GHz}$)
100 kHz / 1 MHz ($F > 1 \text{ GHz}$)**Distance of antenna:** 3 meters

Conducted Method:

The equipment under test is connected to the measuring equipment via a 50 Ω attenuator.

Bandwidth: 200Hz ($9 \text{ kHz} < F < 150\text{kHz}$)
9 kHz ($150 \text{ kHz} < F < 30\text{MHz}$)
120 kHz ($30 \text{ MHz} < F < 1 \text{ GHz}$)
100 kHz / 1 MHz ($F > 1 \text{ GHz}$)

The spurious are measured in (dBm) and the antenna gain is added (1dBi) in order to determine the E.I.R.P

And the resultant E.I.R.P level is converted to an equivalent electric field strength using the following formula:

$$E = \text{EIRP} - 20\log D + 104.8$$

Where: E = electric field strength in $\text{dB}\mu\text{V/m}$,
EIRP = equivalent isotropic radiated power in dBm,
D = specified measurement distance in meters

Radiated Method:

First an exploratory radiated measurement was performed.

During this phase the product is oriented in three orthogonal planes.

Then the final measurement is realized with the product on the most critical orientation.

The EUT is placed on a rotating table, 1.5 m from a ground plane.

Zero degree azimuths correspond to the front of the device under test.

See photos in appendix 2.

Antenna height: 1.5 meter

Antenna polarization: vertical and horizontal (only the highest level is recorded)

Equipment under test operating condition:

The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate.

Power source: 3 Vdc by an external power supply

Percentage of voltage variation during the test (%): ± 1

Conducted Measurement Results:

Conducted Sample N° 1 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	RBW (kHz)	Field strength Measured (dB μ V/m)	Limits at 3 m (dB μ V/m)	Margin (dB)
4809.3 (1)	P	150	1000	51.5 (2)	74	22.5
7213.6	P	150	100	58.5	81.6	23.1
9618.8	P	150	100	41.2	81.6	40.4

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Conducted Sample N° 2 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	RBW (kHz)	Field strength Measured (dB μ V/m)	Limits at 3 m (dB μ V/m)	Margin (dB)
4811.3 (1)	P	150	1000	51.5 (2)	74	22.5
7213.6	P	150	100	57.7	81.6	23.9
9622.4	P	150	100	41.7	81.6	39.9

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Conducted Sample N° 3 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	RBW (kHz)	Field strength Measured (dB μ V/m)	Limits at 3 m (dB μ V/m)	Margin (dB)
4811.3 (1)	P	150	1000	54.6	74	19.4
4811.3 (1)	Av	150	1000	50.1	54	3.9
7213.6	P	150	100	58.3	81.6	23.3
9618	P	150	100	41.6	81.6	40.0

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Conducted Sample N° 4 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	RBW (kHz)	Field strength Measured (dB μ V/m)	Limits at 3 m (dB μ V/m)	Margin (dB)
4809.3 (1)	P	150	1000	49.9 (2)	74	24.1
7213.6	P	150	100	56.8	81.6	24.8
9622.8	P	150	100	43.3	81.6	38.3

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Conducted Sample N° 5 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	RBW (kHz)	Field strength Measured (dB μ V/m)	Limits at 3 m (dB μ V/m)	Margin (dB)
4811.3 (1)	P	150	1000	57.6	74	16.4
4811.3 (1)	Av	150	1000	53.4	54	0.6
7213.6	P	150	100	57.3	81.6	24.3
9618.0	P	150	100	40.3	81.6	41.3

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Conducted Sample N° 6 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	RBW (kHz)	Field strength Measured (dB μ V/m)	Limits at 3 m (dB μ V/m)	Margin (dB)
4810.0 (1)	P	150	1000	56.4	74	17.6
4810.0 (1)	Av	150	1000	52.2	54	1.8
7213.6	P	150	100	57.8	81.6	23.8
9618.8	P	150	100	40.6	81.6	41

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Conducted Sample N° 7 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	RBW (kHz)	Field strength Measured (dB μ V/m)	Limits at 3 m (dB μ V/m)	Margin (dB)
4809.0 (1)	P	150	1000	50.3 (2)	74	23.7
7213.6	P	150	100	59.4	81.6	22.2
9618.8	P	150	100	44.1	81.6	37.5

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Radiated Measurement Results (cabinet structure):

Radiated Sample N° 1 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	Position	RBW (kHz)	Polarization H: Horizontal V: Vertical	Field strength Measured at 3 m (dB μ V/m)	Limits at 3 m (dB μ V/m)	Margin (dB)
4811 (1)	P	150	2	1000	H	52.7 (2)	74	21.3
7216.4	P	150	1	100	H	56.0	81.6	25.6
9617.6	P	150	1	100	V	52.4	81.6	29.2

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Radiated Sample N° 2 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	Position	RBW (kHz)	Polarization H: Horizontal V: Vertical	Field strength Measured at 3 m (dB μ V/m)	Limits at 3 m (dB μ V/m)	Margin (dB)
4811.0 (1)	P	150	2	1000	H	56.3	74	17.7
4811.0 (1)	Av	150	2	1000	H	52.1	54	1.9
7216.4	P	150	1	100	H	55.9	81.6	25.7
9622.0	P	150	1	100	V	53.0	81.6	28.6

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Radiated Sample N° 3 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	Position	RBW (kHz)	Polarization H: Horizontal V: Vertical	Field strength Measured at 3 m (dB μ V/m)	Limits at 3 m (dB μ V/m)	Margin (dB)
4811.0 (1)	P	150	2	1000	H	52.0 (2)	74	22.0
7216.4	P	150	1	100	H	55.7	81.6	25.9
9622.0	P	150	1	100	V	52.4	81.6	29.2

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Radiated Sample N° 4 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	Position	RBW (kHz)	Polarization H: Horizontal V: Vertical	Field strength Measured at 3 m (dB μ V/m)	Limits at 3 m (dB μ V/m)	Margin (dB)
4809.0 (1)	P	150	2	1000	H	54.7	74	19.3
4809.0 (1)	Av	150	2	1000	H	50.5	54	23.5
7216.8	P	150	1	100	V	55.0	81.6	26.6
9618.0	P	150	1	100	V	52.2	81.6	29.4

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Radiated Sample N° 5 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	Position	RBW (kHz)	Polarization H: Horizontal V: Vertical	Field strength Measured at 3 m (dB μ V/m)	Limits at 3 m (dB μ V/m)	Margin (dB)
4809.0 (1)	P	150	1	1000	H	57.5	74	16.5
4809.0 (1)	Av	150	1	1000	H	53.3	54	0.7
7213.2	P	150	3	100	V	58.4	81.6	23.2
9618.0	P	150	1	100	V	53.7	81.6	27.9

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Radiated Sample N° 6 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	Position	RBW (kHz)	Polarization H: Horizontal V: Vertical	Field strength Measured at 3 m (dB μ V/m)	Limits at 3 m (dB μ V/m)	Margin (dB)
4809.0 (1)	P	150	1	1000	V	52.7 (2)	74	21.3
7216.4	P	150	2	100	H	54.9	81.6	26.7
9617.6	P	150	2	100	H	51.3	81.6	30.3

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dB μ V/m)

Radiated Sample N° 7 (F = 2405 MHz)

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	Position	RBW (kHz)	Polarization H: Horizontal V: Vertical	Field strength Measured at 3 m (dBμV/m)	Limits at 3 m (dBμV/m)	Margin (dB)
4809.0 (1)	P	150	1	1000	V	58.1	74	25.9
4809.0 (1)	Av	150	1	1000	V	53.9	54	0.1
7216.4	P	150	1	100	H	57.0	81.6	24.6
9617.6	P	150	2	100	V	51.4	81.6	30.2

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205

(1) Restricted bands of operation as defined in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dBμV/m)

Applicable limits: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

The highest level recorded in a 100 kHz bandwidth is 101.1 dBμV/m on channel.

So the applicable limit is 80.1 dBμV/m.

In addition, radiated emissions which fall in the restricted band, as defined in section 15.205 (a), must also comply with the radiated emission limits specified in section 15.209 (a) (see section 15.205 (c)).

In addition, radiated emissions which fall in the restricted band, as defined in Table 6 of RSS-Gen, must also comply with the radiated emission limits specified in Table 4 and Table 5 of RSS-Gen.

Test conclusion:

RESPECTED STANDARD

□□□ End of report, 1 appendix to be forwarded □□□

APPENDIX 1: Test equipment list

Peak conducted output power

TYPE	MANUFACTURER	EMITECH NUMBER
Anechoic Chamber	EMITECH	8593
Turntable controller 1060C	MATURO	14736
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Antenna 3115	EMCO	8535
N-1.5M Cable	SUCOFLEX	7279
N-2M Cable	Huber + Suhner	12911
N-5M Cable	SUCOFLEX	15882
Power source FTN 2515B	Fontaine	8775
Multimeter 177	Fluke	14831
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC V3.18.0.26	0000

Radiated spurious emissions

TYPE	MANUFACTURER	EMITECH NUMBER
Anechoic Chamber	EMITECH	8593
Turntable controller 1060C	MATURO	14736
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Antenna 3115	EMCO	8535
Low-noise amplifier PAM-118A	COM-POWER	15812
Low-noise amplifier S180265L3201	LUCIX Corp.	8704
N-1.5M Cable	SUCOFLEX	7279
N-1.5M Cable	SUCOFLEX	9398
N-2M Cable	Huber + Suhner	12911
Cable k-20cm	STORM MICROWAE	8974
Cable k-20cm	STORM MICROWAE	8975
Reject band filter BRM50702	Microtronics	7299
Power source FTN 2515B	Fontaine	8775
Multimeter 177	Fluke	14831
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC V3.18.0.26	0000