RR-21-E382-SCH-3-A Ed. 0

# Certification Radio test report

**According to the standard:**

CFR 47 FCC PART 15

RSS GEN – Issue 5
RSS 247 – Issue 2

**Equipment under test:**

***XZBWR2STT24***

***Wireless transmitter***

**FCC ID: *Y7HXZBWR***
**IC NUMBER: *7002C-XZBWR***

**Company:**
**Schneider Electric Industries France L'Isle d'Espagnac**

**Distribution:** Mr LAIDET **(Company:** Schneider Electric Industries France L'Isle d'Espagnac)

**Number of pages:** 25 with 1 appendix

| Ed. | Date | Modified Page(s) | Technical Verification and Quality Approval<br>Name and Function | Visa |
|---|---|---|---|---|
| 0 | 11-Oct-21 | Creation | S. LOUIS, Radio Technician | |

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S51 RTY 000 INT 00015 [01]

| | |
|---|---|
| **DESIGNATION OF PRODUCT:** | **XZBWR2STT24** |
| **Serial number (S/N):** | 210201846 |
| **Reference / model (P/N):** | XZBWR2STT24 |
| **Software 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 - ZI No.3 L'ISLE D'ESPAGNAC France 16340 |
| ***Responsible:*** | Mr LAIDET |
| **DATES OF TEST:** | 14-Sep-21 |
| **TESTING LOCATION:** | EMITECH ANGERS laboratory at JUIGNE SUR LOIRE (49) FRANCE<br><br>FCC Accredited under US-EU MRA Designation Number: FR0009<br>Test Firm Registration Number: 873677<br><br>ISED Accredited under CANADA-EU MRA Designation Number: FR0001<br>Industry Canada Registration Number: 4452A |

**TESTED BY:** T. LEDRESSEUR **VISA:** 

**WRITTEN BY:** T. LEDRESSEUR

# CONTENTS



# REVISIONS HISTORY

| Revision | Date | Modified pages | Modifications |
|---|---|---|---|
| 0 | **22-Sep-21** | / | Creation |

## 1. INTRODUCTION

This report presents the results of radio test carried out on the following radio equipment: **XZBWR2STT24**, in accordance with normative reference.

The product integrates a Zigbee function

## 2. PRODUCT DESCRIPTION

| | |
|---|---|
| Category of equipment (ISED): | I |
| Class: | B |
| Utilization: | Wireless transmitter |
| Antenna type and gain: | 0 dBi / integral PCB antenna |
| Operating frequency range: | 2405 MHz |
| Number of channels: | 1 |
| Channel spacing: | Not concerned |
| Modulation: | OQPSK |
| Power source: | 24Vdc |

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<br>Procedures for ComplianceTesting of Unlicensed Wireless Devices. |
| 558074 D01 DTS v05 r02 | 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<br>Certification of Radio Apparatus |
| RSS-Gen | Issue 5, April 2018<br>General Requirements for Compliance of Radio Apparatus |
| RSS-247 | Issue 2, February 2017<br>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 | / | / | / |
| 1406 | EMCO 6502 | Loop antenna | 13/04/2021 | 1 | 13/04/2022 |
| 4087 | Filtek LP03/1000-7GH | Low Pass Filter | 25/02/2020 | 3 | 24/02/2023 |
| 4088 | R&S FSP40 | Spectrum Analyzer | 04/05/2020 | 2 | 04/05/2022 |
| 7124 | A.H. Systems SAS-572 | Antenna | 05/01/2019 | 3 | 04/01/2022 |
| 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 |
| 8511 | HP 8447D | Low-noise amplifier | 26/01/2021 | 1 | 26/01/2022 |
| 8526 | Schwarzbeck VHBB 9124 | Biconical antenna | 22/08/2021 | 3 | 21/08/2024 |
| 8535 | EMCO 3115 | Antenna | 28/04/2020 | 3 | 28/04/2023 |
| 8543 | Schwarzbeck UHALP 9108A | Log periodic antenna | 05/08/2021 | 3 | 04/08/2024 |
| 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 | 14/11/2019 | 2 | 13/11/2021 |
| 8975 | STORM MICROWAE k-20cm | cable | 14/11/2019 | 2 | 13/11/2021 |
| 12590 | LUCIX Corp S005180M3201 | Low-noise amplifier | 26/07/2021 | 1 | 26/07/2022 |
| 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 |
| 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 15requirements

| 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 | | |
| 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 | | | | |
| | (b) Maximum peak output power | X | | | | Note 4 |
| | (c) Operation with directional antenna gains > 6 dBi | | | X | | |
| | (d) Intentional radiator | X | | | | |
| | (e) Peak power spectral density | X | | | | |
| | (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: Integral antenna.

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: Conducted measurement is not possible (integral antenna), so we used the radiated method.

## 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 | | |
| § 8.9 | Transmitter emission limits | X | | | | |
| § 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 | | | | |
| 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

## 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 | ± 0.75dB |
| Radiated emission valid to 26 GHz<br>F < 62.5 MHz:<br>62.5 MHz < F < 1 GHz:<br>1 GHz < F < 26 GHz: | <br>± 5.14 dB<br>± 5.13 dB<br>± 5.16 dB |
| AC Power Lines conducted emissions | ± 3.38 dB |
| Temperature | ± 1 °C |
| Humidity | ± 5 % |

## *8.* OCCUPIED BANDWIDTH

**Temperature (°C) :** 23 **Humidity (%HR):** 45 **Date :** September 14, 2021
**Technician** : T. LEDRESSEUR

**Standard:** FCC Part 15
RSS-247

**Test procedure:**
Method of paragraphs 11.8 of ANSI C63.10 (6dB Measurement)
Method of paragraphs 6.9.3 of ANSI C63.10 (99% Measurement)

**Test set up:**

Radiated test

Test realized in near field.

Setting:

| **Measure** | **6dB** | **99%** |
|---|---|---|
| **Center frequency** | The centre frequency of the channel under test | |
| **Detector** | Peak | |
| **Span** | 2 to 5 times the OBW | 1.5 to 5 times the OBW |
| **RBW** | 100kHz | 1% to 5% of the OBW |
| **VBW** | 300kHz | 3 x RBW |
| **Trace** | Max hold | |
| **Sweep** | Auto | |

**Test operating condition of the equipment:**

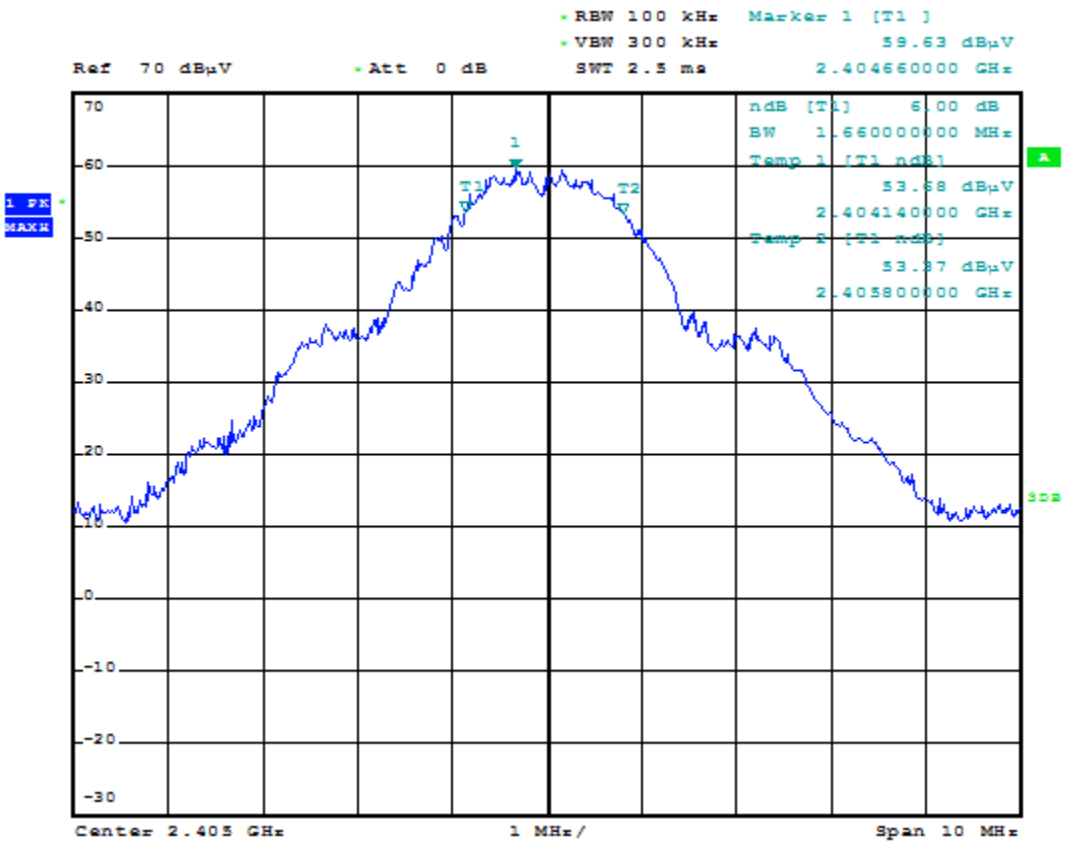
The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate.

Power source: 24 Vdc by an external power supply
Percentage of voltage variation during the test (%): ± 1

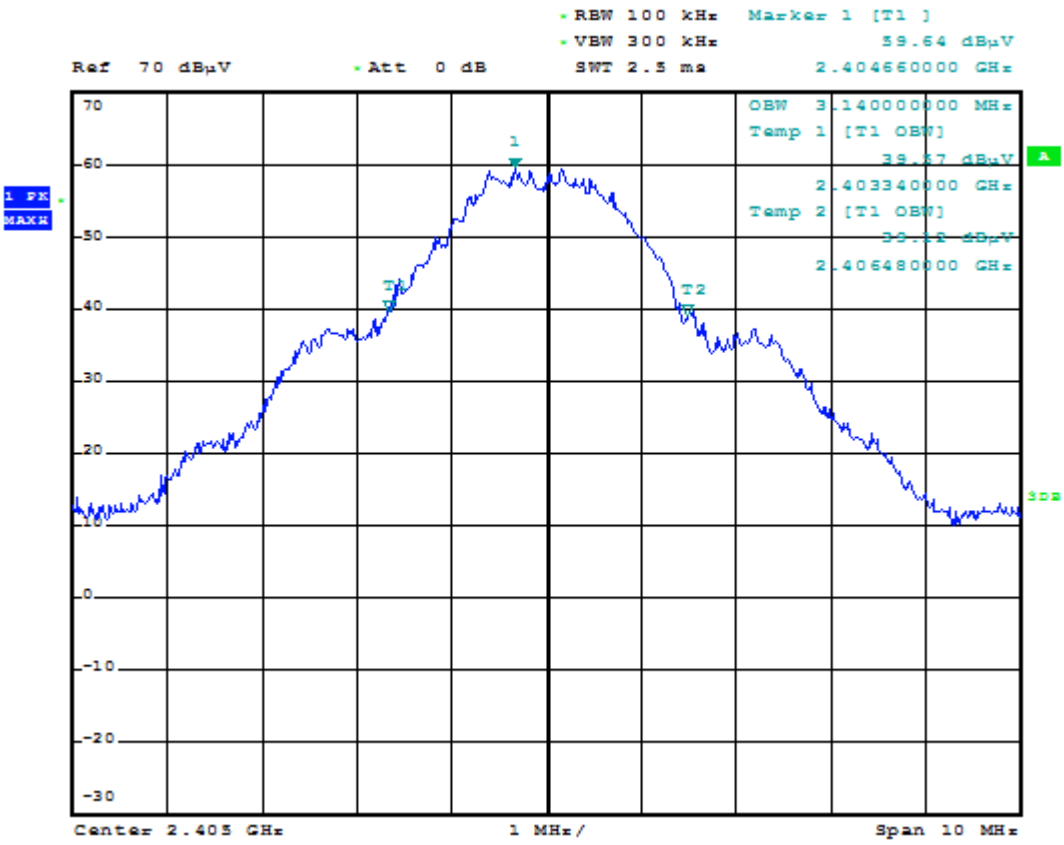
**Results:**

Sample N° 1

6dB bandwidth



99% bandwidth




Measure realized for reporting only

**Test conclusion:**

RESPECTED STANDARD

## 9. BAND EDGE

**Temperature (°C) :** 23 **Humidity (%HR):** 45 **Date :** September 14, 2021
**Technician** : T. LEDRESSEUR

**Standard:** FCC Part 15
RSS-247

**Test procedure:**
DTS:
Method of paragraph 11.13.2 of ANSI C63.10

**Test set up:**

Test realized in near field. All field strength measurements are correlated with the radiated maximum peak output power

**Test operating condition of the equipment:**

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: 24 Vdc by an external power supply
Percentage of voltage variation during the test (%): ± 1

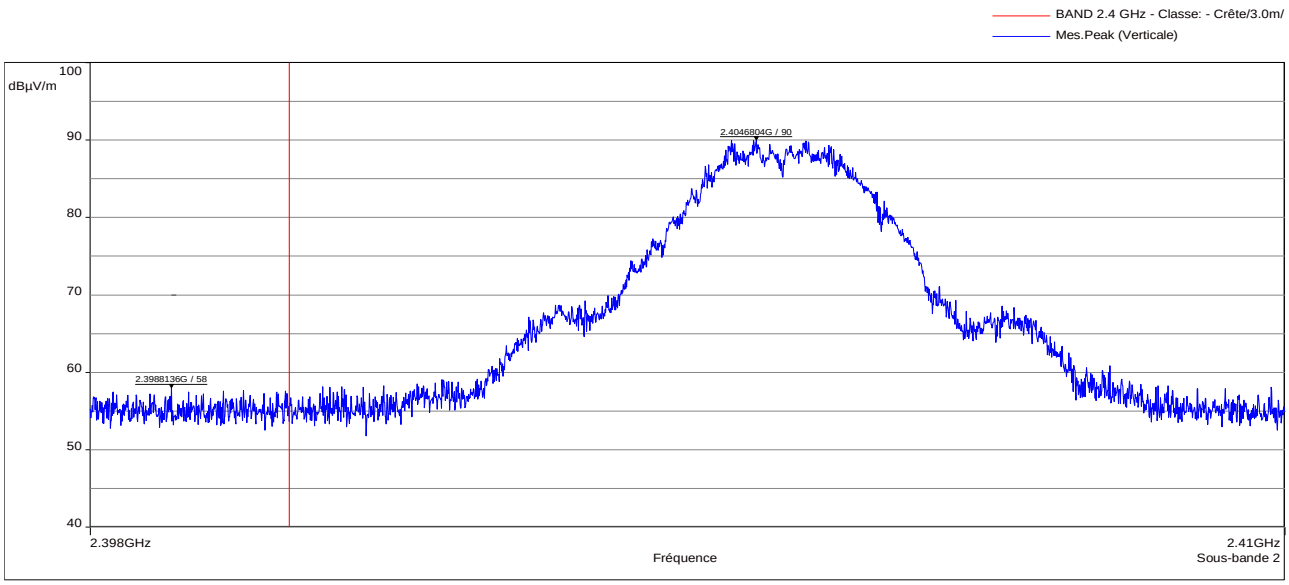
**Results:**

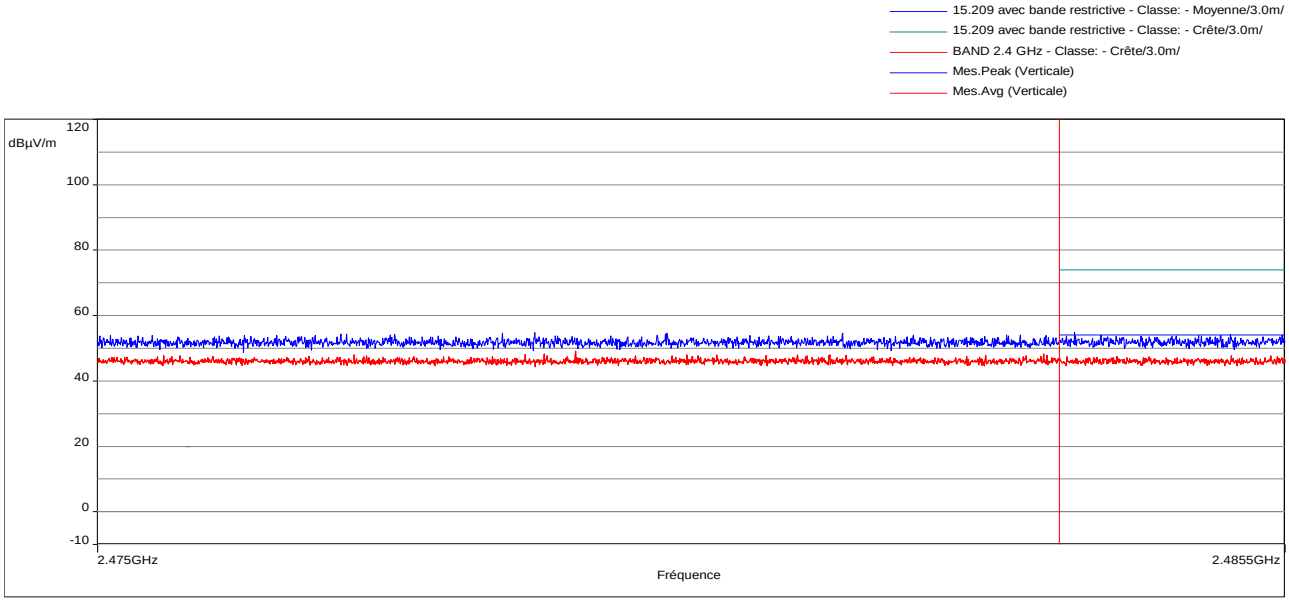
Lower Band Edge: From 2398 MHz to 2400 MHz
Upper Band Edge: From 2483.5 MHz to 2485.5 MHz

Sample N° 1

| Fundamental frequency (MHz) | Field Strength Level of fundamental (dBµV/m) | Detector (Peak or Average) | Frequency of maximum Band-edges Emission (MHz) | Delta Marker (dB) (1) | Calculated Max Out-of-Band Emission Level (dBµV/m) | Limit | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 2405 | 90 | Peak | 2398.8136 | 32 | / | -20 dBc | 12 |
| 2405 | 90 | Peak | 2483.6375 | 35.11 | 54.89 | 74 dBµV/m | 19.11 |
| 2405 | 90 | Average | 2485.025 | 42.259 | 47.741 | 54 dBµV/m | 6.259 |

(1) Marker-Delta method




**Test conclusion:**

RESPECTED STANDARD

## *10.* PEAK CONDUCTED OUTPUT POWER

**Temperature (°C) :** 23 **Humidity (%HR):** 45 **Date :** September 14, 2021
**Technician** : T. LEDRESSEUR

**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 these two normal positions

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 (in anechoic room)

**Antenna height:** 1.5 meter (in anechoic room)

**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 3 MHz and video bandwidth at 10 MHz.

Finally the radiated electro-magnetic field is converted in dBm with the following formula:
EIRP(dBm) = E (dBµV/m) + 20log(D) - 104.8; where D is the measurement distance in meters and antenna Gain = 0 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.

Power source: 24 Vdc by an external power supply
Percentage of voltage variation during the test (%): ± 1

**Results:**

Sample N° 1

| | Electro-magnetic field (dBµV/m): | Maximum Peak conducted output power (1) | | Limit |
|---|---|---|---|---|
| | | (dBm) | (W) | (W) |
| **Nominal supply voltage:** | 93.9 | -1.33 | 0.00074 | 1 |

Polarization of test antenna: Vertical (height: 150 cm)
Position of equipment: 1 (azimuth: 255 degrees)

Maximum Peak conducted output power:
EIRP(dBm) = E (dBµV/m) + 20log(D) - 104.8; where D is the measurement distance in meters and antenna Gain = 0 dBi.

**Test conclusion:**

RESPECTED STANDARD

## *11.* RADIATED SPURIOUS EMISSIONS

**Temperature (°C) :** 23 **Humidity (%HR):** 45 **Date :** September 14, 2021
**Technician** : T. LEDRESSEUR

**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:**

First an exploratory radiated measurement was performed. During this phase the product is oriented in these two normal positions
Then the final measurement is realized with the product on the most critical orientation.

The measure is realized on open area test site under 1 GHz and in anechoic chamber above 1 GHz.

When the system is tested in an open area test site (OATS), the EUT is placed on a rotating table, 0.8m from a ground plane.
When 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.

**Frequency range:** From 9 kHz to 10$^{th}$ harmonic of the highest fundamental frequency (2405 MHz)

**Detection mode:** Quasi-peak (F < 1 GHz) Peak / Average (F > 1 GHz)

**Bandwidth:** 200Hz (9 kHz < F < 150kHz)
9 kHz (150 kHz < F < 30MHz)
120 kHz (30 MHz < F < 1 GHz)
100 kHz / 1 MHz (F > 1 GHz)

**Distance of antenna:** 10 meters (in open area test site) / 3 meters (in anechoic room)

**Antenna height:** 1 to 4 meters (in open area test site) / 1.5 meter (in anechoic room)

**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: 24 Vdc by an external power supply
Percentage of voltage variation during the test (%): ± 1

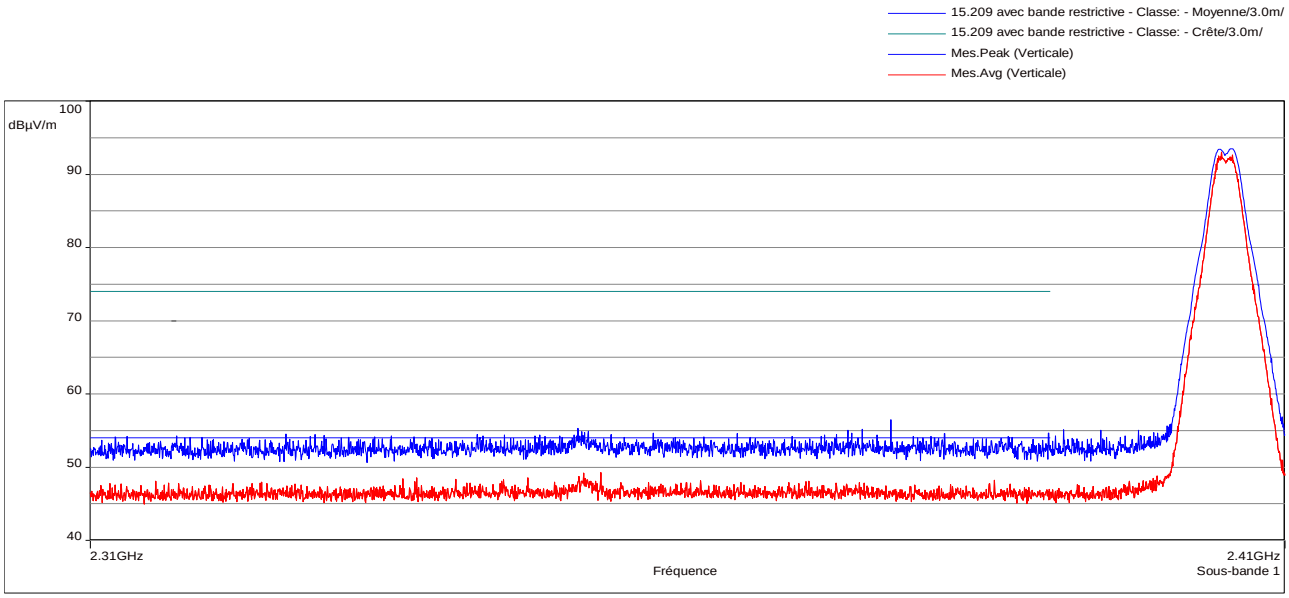
**Results:**

Sample N° 1

| Frequencies (MHz) | Detector P QP Av | Antenna height (cm) | Azimuth (degree) | RBW (kHz) | Polarization H: Horizontal V: Vertical | Field strength Measured at 3m (dBµV/m) | Limits at 3 m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 2350.29 (1) | P | 150 | 255 | 1000 | V | 55.33 | 74 | 18.67 |
| 2350.79 (1) | Av | 150 | 255 | 1000 | V | 49.16 | 54 | 4.84 |
| 4810 (1) | P | 150 | 120 | 1000 | H | 45.69 (2) | 54 | 8.31 |
| 7215 | P | 150 | 0 | 100 | V | 45.2 (3) | 70 | 24.8 |
| 9620 | P | 150 | 0 | 100 | V | 46.77 (3) | 70 | 23.23 |

P= Peak, QP=Quasi-peak, Av=Average
(1) Restricted bands of operation in 15.205 and in Table 6 of RSS-Gen
(2) The peak level is lower than the average limit (54 dBµV/m)
(3) Noise floor

**Band edge worst case measurement (band 2.31GHz to 2.39GHz)**




**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 90 dBµV/m.
So the applicable limit is 70 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

## *12.* PEAK CONDUCTED POWER SPECTRAL DENSITY

**Temperature (°C) :** 23 **Humidity (%HR):** 45 **Date :** September 14, 2021
**Technician** : T. LEDRESSEUR

**Standard:** FCC Part 15
RSS-247

**Test procedure:**
For FCC Part 15: paragraph 15.247 (e), paragraph 15.247 (f)
For RSS-247: paragraph 5.2
PKPSD (Peak PSD) method of paragraph 11.10.2 of ANSI C63.10

**Test set up:**

First an exploratory radiated measurement was performed. During this phase the product is oriented in these two normal positions

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 (in anechoic room)

**Antenna height:** 1.5 meter (in anechoic room)

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

The measurement of the radiated electro-magnetic field is realized with an analyser.

Then the peak marker function is used.

Finally the radiated electro-magnetic field is converted in dBm with the following formula:
EIRP(dBm) = E (dBµV/m) + 20log(D) - 104.8; where D is the measurement distance in meters and antenna Gain = 0 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.

Power source: 24 Vdc by an external power supply
Percentage of voltage variation during the test (%): ± 1

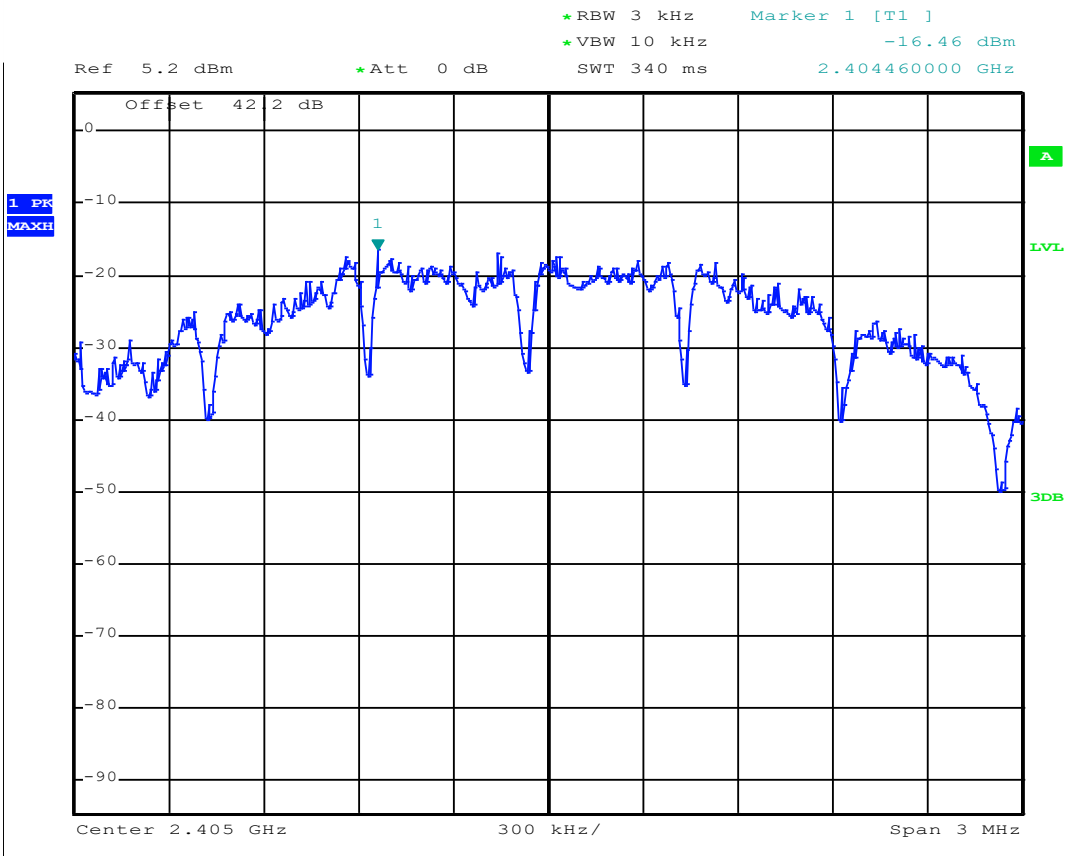
**Results:**

Sample N° 1

| | Electro-magnetic field (dBµV/m): | Maximum Peak conducted power density (dBm / 3 kHz) | Limit (dBm / 3 kHz) |
|---|---|---|---|
| **Nominal supply voltage:** | 78.8 | -16.46 | 8 |

Polarization of test antenna: Vertical (height: 150 cm)
Position of equipment: 1 (azimuth: 255 degrees)

Maximum Peak conducted power density:
EIRP(dBm / 3 kHz) = E (dBµV/m / 3 kHz) + 20log(D) - 104.8; where D is the measurement distance in meters and antenna Gain = 0 dBi.




**Test conclusion:**

RESPECTED STANDARD

**□□□ End of report, (1) appendix to be forwarded □□□**

# APPENDIX 1: Test equipment list

## Occupied bandwidth

| 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 | RS Commander | - |

## Band edge

| 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 |

**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 |
| Loop antenna 6502 | EMCO | 1406 |
| Biconical antenna VHBB 9124 | Schwarzbeck | 8526 |
| Log periodic antenna UHALP 9108A | Schwarzbeck | 8543 |
| Antenna 3115 | EMCO | 8535 |
| Antenna SAS-572 | A.H Systems | 7124 |
| Low-noise amplifier 8447D | Hewlett Packard | 8511 |
| Low-noise amplifier S005180M3201 | LUCIX Corp. | 12590 |
| Low-noise amplifier S180265L3201 | LUCIX Corp. | 8704 |
| N-1.5M Cable | SUCOFLEX | 7279 |
| N-2M Cable | Huber + Suhner | 12911 |
| N-5M Cable | SUCOFLEX | 15882 |
| Cable k-20cm | STORM MICROWAE | 8974 |
| Cable k-20cm | STORM MICROWAE | 8975 |
| Low pass filter LP03/1000-7GH | Filtek | 4087 |
| 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 |

**Peak conducted power spectral density**

| 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 |