EMITECH GROUPE

RR-21-C774-EVO-1-A Ed. 0

Certification Radio test report

According to the standard:

CFR 47 FCC PART 15

RSS GEN – Issue 5
RSS 210 - Issue 10

Equipment under test:
MODULE RFID 13.56 MHz

FCC ID: *ZFX0011*
IC NUMBER: *9609A-0011*

Company:

EVOLIS

Distribution: Mrs BEAUDUSSEAU **(Company:** EVOLIS**)**

Number of pages: 25 with 1 appendixes

Ed.	Date	Modified Page(s)	Technical Verification and Quality Approval Name and Function / Visa
0	10-Aug-21	Creation	M. DUMESNIL, Radio Laboratory Manager

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

S51 RTY 000 INT 00014 [01]

DESIGNATION OF PRODUCT:	***MODULE RFID 13.56 MHz***
Serial number (S/N):	*N/A*
Reference / model (P/N):	*CP 013463*
Software version:	*Macro Excel*
MANUFACTURER:	*EVOLIS*

COMPANY SUBMITTING THE PRODUCT:

Company:	EVOLIS
Address:	14, avenue de la Fontaine ZI ANGERS BEAUCOUZE 49070 BEAUCOUZE - FRANCE
Responsible:	Mr Serge
DATES OF TEST:	From 7-Jul-21 to 8-Jul-21
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:	T. LEDRESSEUR **VISA:**
WRITTEN BY:	T. LEDRESSEUR

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REVISIONS HISTORY

Revision	Date	Modified pages	Modifications
0	**9-Jul-21**	/	Creation

1. INTRODUCTION

This report presents the results of radio test carried out on the following radio equipment: ***MODULE RFID 13.56 MHz***, in accordance with normative reference.

2. PRODUCT DESCRIPTION

Category of equipment (ISED):	I
Class:	B
Utilization:	Radio module destined to be used only by EVOLIS
Antenna type and gain:	0 dBi / dedicated antenna
Operating frequency range:	From 13.110 MHz to 14.010 MHz
Number of channels:	1
Channel spacing:	Not concerned
Modulation:	ASK
Power source:	The workbench is powered at 120Vac by AC/DC Adapter,

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 ComplianceTesting of Unlicensed Wireless Devices.
RSP-100	Issue 12, August 2019 Certification of Radio Apparatus
RSS-Gen	Issue 5, April 2018 General Requirements for Compliance of Radio Apparatus
RSS-210	Issue 10, December 2019 Licence-Exempt Radio Apparatus: Category I equipment.

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 225: Operation within the band 13.110-14.010 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-210:

- Paragraph 5 – RSS-Gen compliance
- Paragraph 7 - Technical specifications
- Annex B - Devices Operating in Frequency Bands for Any Application
  - Annex B.6 Band 13.110-14.010 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
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
8508	California instruments 1251RP	Power source	(1)	(1)	(1)
8511	HP 8447D	Low-noise amplifier	26/01/2021	1	26/01/2022
8526	Schwarzbeck VHBB 9124	Biconical antenna	17/08/2018	3	16/08/2021
8528	Schwarzbeck VHA 9103	Biconical antenna	09/03/2019	3	08/03/2022
8543	Schwarzbeck UHALP 9108A	Log periodic antenna	17/08/2018	3	16/08/2021
8590	RG214 N-5m	Cable	25/02/2020	2	24/02/2022
8593	SIDT Cage 2	Anechoic chamber	/	/	/
8707	R&S ESI7	Test receiver	29/08/2020	1	29/08/2021
8719	Thurbly Thandar Instruments 1600	LISN	26/02/2020	2	25/02/2022
8732	Emitech	OATS	03/07/2019	3	02/07/2022
8749	La Crosse Technology WS-9232	Meteo station	22/09/2020	2	22/09/2022
8750	La Crosse Technology WS-9232	Meteo station	22/09/2020	2	22/09/2022
8775	Fontaine FTN 2515B	Power source	(1)	(1)	(1)
8855	EMITECH	Turntable and mat controller	/	/	/
8864	Champ libre Juigné. V3.5	Software	/	/	/
8896	ACQUISYS GPS8	Satellite synchronized frequency standard	/	/	/
10523	EMITECH	Absorber sheath current	27/05/2020	2	27/05/2022
10788	Emitech	Outside room Hors cage	/	/	/
11535	R&S EZ-25	High pass filter	22/03/2019	3	21/03/2022
12911	Huber + Suhner N-2m	cable	11/06/2020	2	11/06/2022
14716	GMH 3710	Precision Termometer -30°C/+100°C	10/02/2021	1	10/02/2022
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
16059	CLIMATS EXCAL² 1411-TA	Climatic chamber	30/11/2020	2	30/11/2022

(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				
FCC Part 15.209	RADIATED EMISSION LIMITS; general requirements	X				Note 2
FCC Part 15.212	MODULAR TRANSMITTERS	X				Note 3
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 §15.225 frequency bands	X				Note 4
	(c) 20 dB bandwidth and band-edge compliance	X				
FCC Part 15.225	OPERATION WITHIN THE BAND 13.110-14.010 MHZ					
	(a) Field strength within the band 13.553-13.567 MHz	X				
	(b) Field strength within the bands 13.410-13.553 MHz and 13.567-13.710 MHz	X				
	(c) Field strength within the bands 13.110-13.410 MHz and 13.710-14.010 MHz	X				
	(d) Field strength outside the band 13.110-14.010 MHz	X				
	(e) Carrier frequency tolerance	X				
	(f) Powered tags			X		

NAp: Not Applicable NAs: Not Asked

Note 1: Radio module

Note 2: See FCC part 15.225 (d).

Note 3: Limited modular transmitter.
The host devices of the certified modules shall be properly labeled to identify the module(s) within.

Note 4: See FCC part 15.209. Unwanted emissions levels are all below the fundamental emission field strength level.

6.2 RSS-Gen requirements

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
Paragraph 2	General	X				
Paragraph 3	Normative publications and related documents	X				
Paragraph 4	Labelling requirements	X				
Paragraph 6	General administrative and technical requirements	X				
§ 6.7	Occupied bandwidth (or 99% emission bandwidth) and x dB bandwidth	X				
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-210 requirements

Test Procedure RSS-210	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
Paragraph 5	RSS-Gen compliance	X				
Paragraph 7	Technical Specifications					
7.1	Emission Falling Within Restricted Frequency Bands	X				
7.2	General Field Strength Limits	X				
7.3	Transmitters with wanted and unwanted emissions that are within the general field strength limits	X				
7.4	Cordless Telephones			X		
Annex B	Device Operating in Frequency Bands for Any Application					
Annex B.6	Band 13.110-14.010 MHz					
(a) i	Field strength within the band 13.553-13.567 MHz	X				
(a) ii	Field strength within the bands 13.410-13.553 MHz and 13.67-13.710 MHz	X				
(a) iii	Field strength within the bands 13.110-13.410 MHz and 13.710-14.010 MHz	X				
(a) iv	Field strength outside the band 13.110-14.010 MHz	X				
(b)	Carrier frequency stability	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 F < 62.5 MHz: 62.5 MHz < F < 1 GHz: 1 GHz < F < 26 GHz:	 ± 5.14 dB ± 5.13 dB ± 5.16 dB
AC Power Lines conducted emissions	± 3.38 dB
Temperature	± 1 °C
Humidity	± 5 %

8. AC CONDUCTED EMISSIONS

Temperature (°C) : 22 **Humidity (%HR):** 36 **Date :** July 7, 2021

Technician : T. LEDRESSEUR

Standard: FCC Part 15
RSS-Gen

Test procedure:
For FCC Part 15: § 15.207
For RSS-Gen: § 8.8
Method of § 6.2 of ANSI C63.10

Software used: BAT-EMC V3.18.0.26

Test set up:

The EUT is isolated and placed on a wooden table, 0.8 m over an horizontal reference plane and 0.4 m from a vertical reference plane. It is powered by an artificial main network placed on the ground reference plane.
The equipment is powered with the AC power operating voltage of 120 V / 60 Hz.

See photos in appendix 2

Frequency range: 150 kHz - 30 MHz

Detection mode: Peak / Quasi-peak / Average

Bandwidth: 10 kHz / 9 kHz

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.

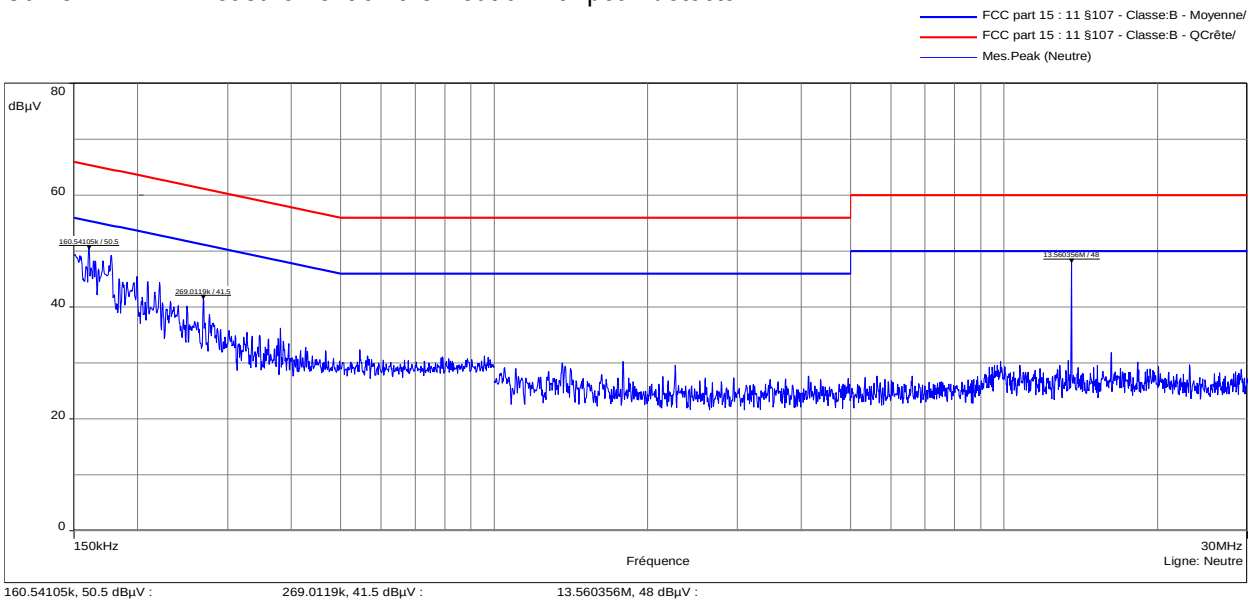
Results:

Sample N° 1:

Measurement on the mains power supply:

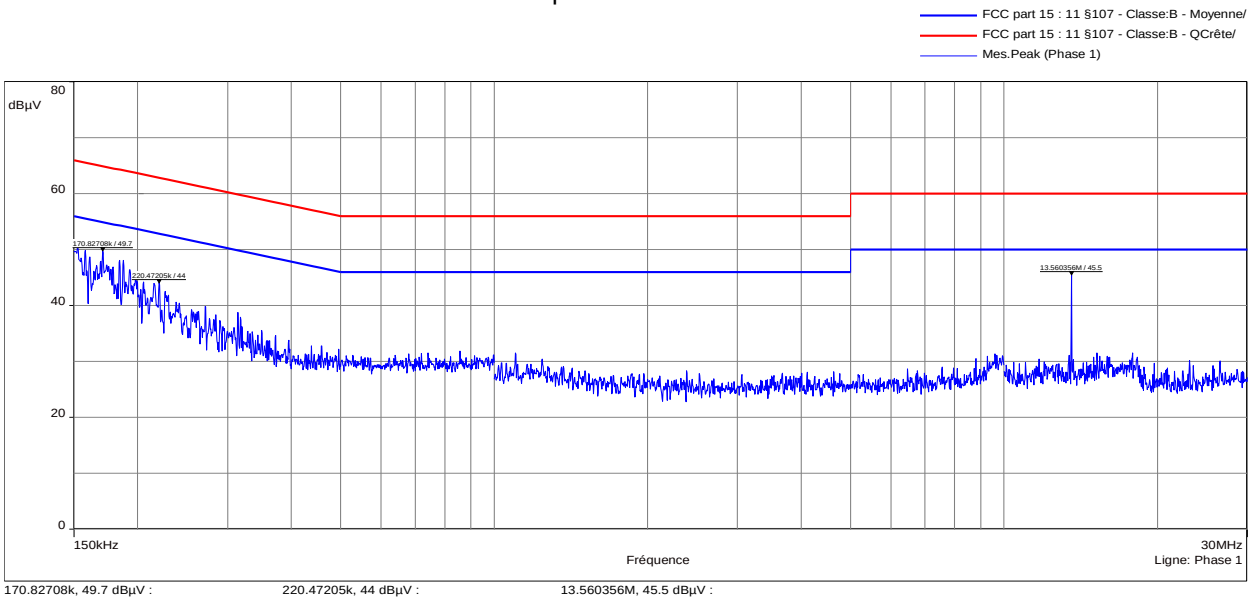
The measurement is first realized with peak detector.

Curve N° 1: measurement on the Neutral with peak detector



160.54105k, 50.5 dBµV : 269.0119k, 41.5 dBµV : 13.560356M, 48 dBµV :

Curve N° 2: measurement on the Line with peak detector



170.82708k, 49.7 dBµV : 220.47205k, 44 dBµV : 13.560356M, 45.5 dBµV :

There are no frequencies at 6 dB below the Quasi-peak and average limit.

Test conclusion:

RESPECTED STANDARD

9. OCCUPIED BANDWIDTH

Temperature (°C) : 23 **Humidity (%HR):** 40 **Date :** July 8, 2021
Technician : T. LEDRESSEUR

Standard: FCC Part 15
RSS-210

Test procedure:
Method of § 6.9.3 of ANSI C63.10 (99% Measurement)
Method of § 6.9.2 of ANSI C63.10 (20dB Measurement)

Test set up:

Radiated test

Test realized in near field.

Setting:

Measure	**99%**	**20dB**
Center frequency	The centre frequency of the channel under test	
Detector	Peak	
Span	1.5 to 5 times the OBW	2 to 5 times the OBW
RBW	1% to 5% of the OBW	1% to 5% of the OBW
VBW	3 x RBW	3 x RBW
Trace	Max hold	
Sweep	Auto	

Because of the modulation, some parameters (RBW) are not respected.

Test operating condition of the equipment:

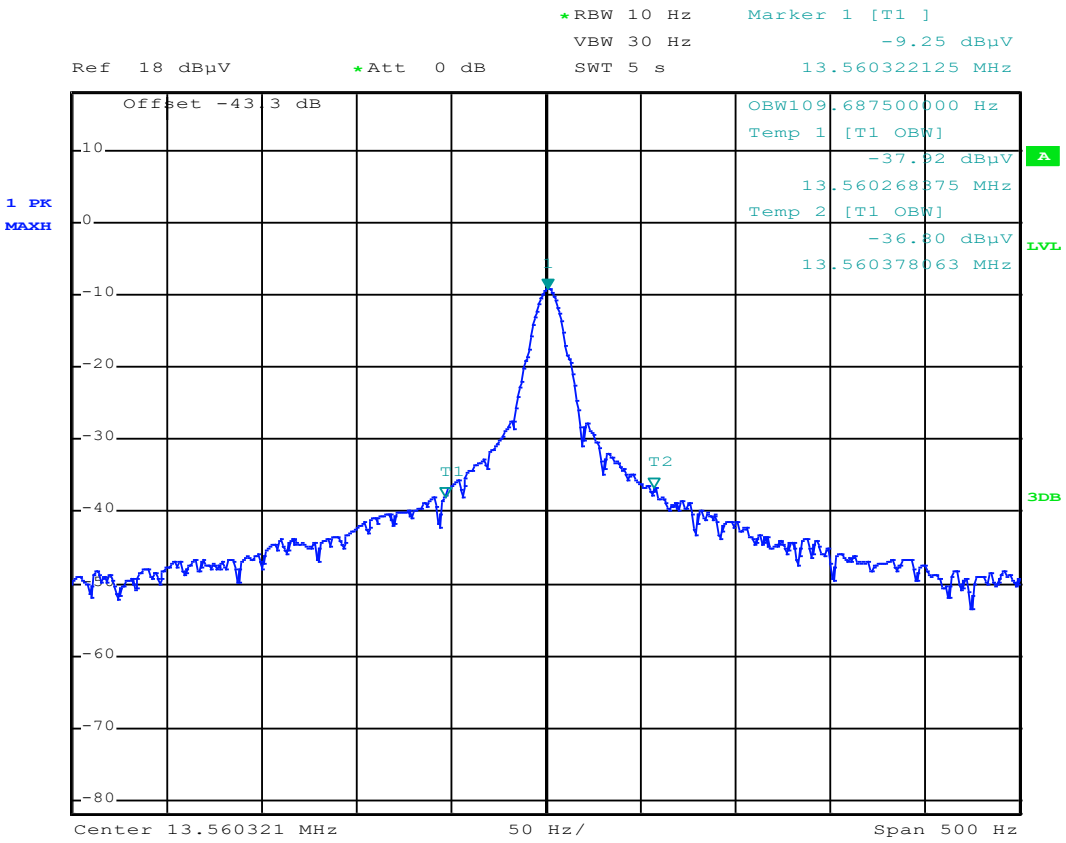
The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate.

Power source: 120 Vac by an external power supply
Percentage of voltage variation during the test (%): ± 1

Results:

Sample N° 1

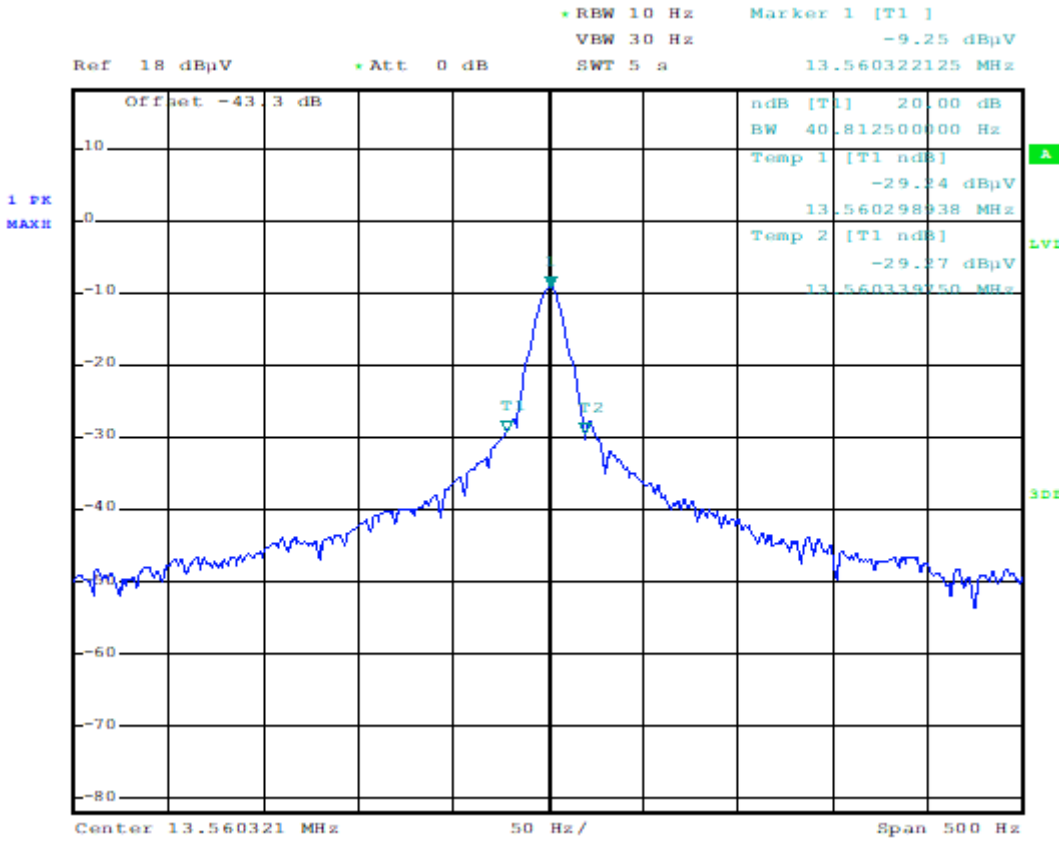
99% bandwidth



Limit:

Measure realized for reporting only

20dB bandwidth



Limit:

Measure realized for reporting only

Test conclusion:

RESPECTED STANDARD

10. BAND EDGE

Temperature (°C) : 23 **Humidity (%HR):** 40 **Date :** July 8, 2021

Technician : T. LEDRESSEUR

Standard: FCC Part 15

Test procedure:

For FCC Part 15: § 15.215
Method of § 6.10.6 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: 120 Vac by an external power supply
Percentage of voltage variation during the test (%): ± 1

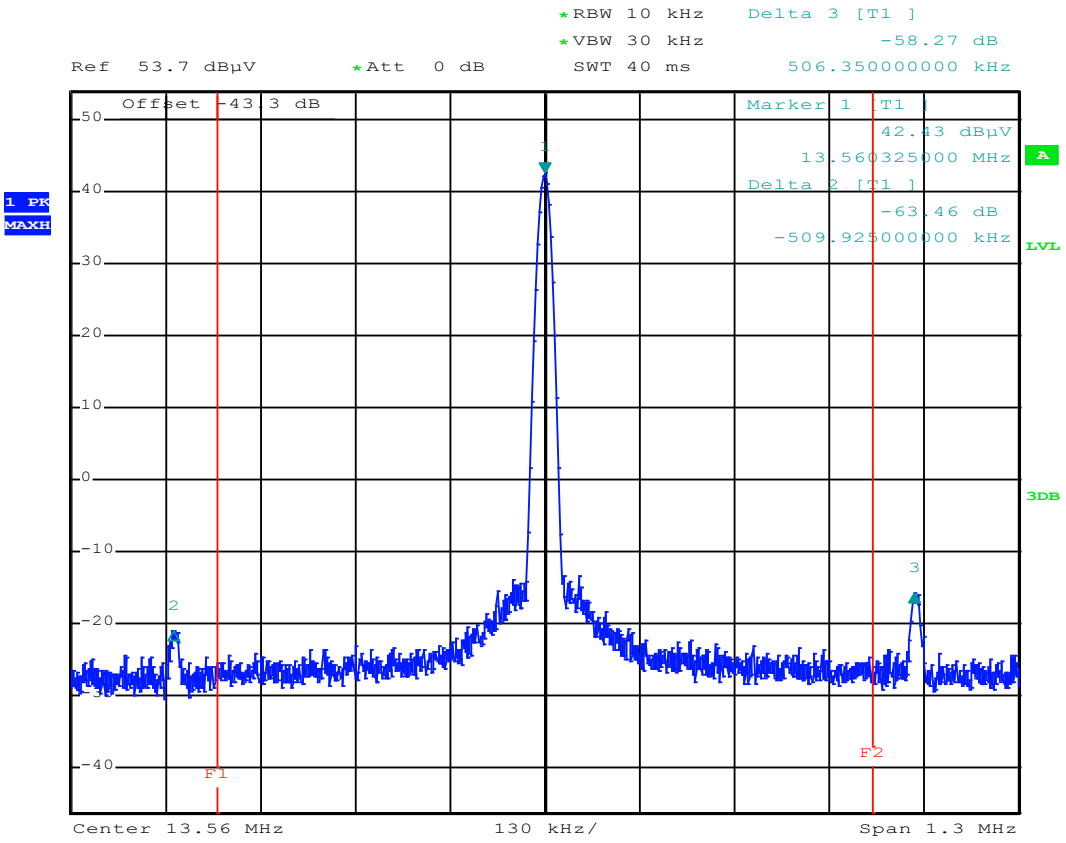
Results:

Lower Band Edge: From 12.910 MHz to 13.110 MHz
Upper Band Edge: From 14.010 MHz to 14.210 MHz

Sample N° 1:

Fundamental frequency (MHz)	Field Strength Level of fundamental (dBµV/m) at 10m	Detector (Peak or Average)	Frequency of maximum Band-edges Emission (MHz)	Delta Marker (dB) (1)	Limit (dBc)	Margin (dB)
13.56	42.36	Peak	13.050	-63.46	-20	43.46
13.56	42.36	Peak	14.066	-58.27	-20	38.27

(1) Marker-Delta method



Test conclusion:

RESPECTED STANDARD

11. OPERATION WITHIN THE BAND 13.110 – 14.010 MHZ

Temperature (°C) : 23 **Humidity (%HR):** 40 **Date :** July 8, 2021
Technician : T. LEDRESSEUR

Standard: FCC Part 15
RSS-210

Test procedure:
For FCC Part 15: § 15.209, § 15.225 (a), (b), (c), (e)
For RSS-210: § Annex B.6 (a), (b), (c)

Method of § 6.3 of ANSI C63.10
Method of § 6.4 of ANSI C63.10
Method of § 6.8 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 an open area test site (OATS). The EUT is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

See photos in appendix 2

The frequency stability measure is realized in near-field with the product in a climatic chamber.

Detection mode: Quasi-peak (F < 1 GHz)

Bandwidth: 9 kHz (150 kHz < F < 30MHz)

Distance of antenna: 10 meters

Antenna height: 1 meter

Antenna polarization: oriented in the vertical plane. The lowest point of the loop is 1m above ground level.

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

Results:

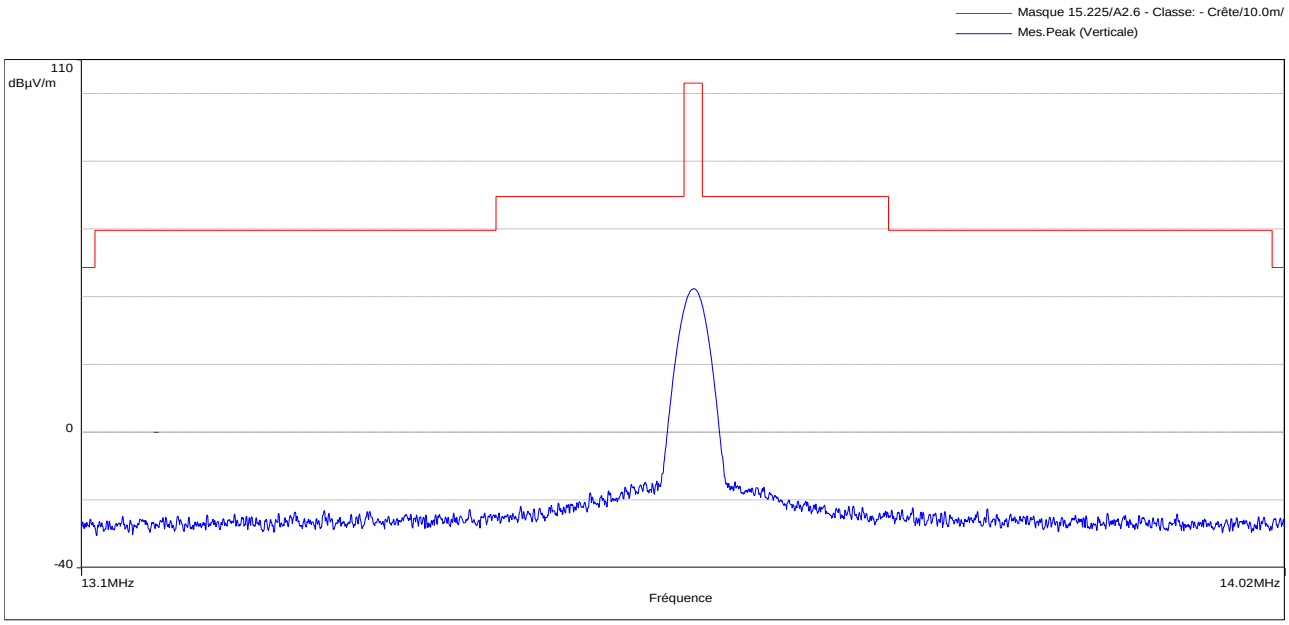
Sample N° 1:

Carrier field strength

	Field strength (dBµV/m) at frequency: 13.56 MHz
Normal test conditions measure at 10 m	42.36
Normal test conditions correlated at 30 m	23.28
Limits at 30m (dBµV/m)	84
Margin (dB)	60.72

Polarization of test antenna: perpendicular at the equipment at 0 degree.
Position of equipment: Position 3,see photos in Test setup document (azimuth: 77°)

Field strength within the band 13.110-14.010 MHz



Frequency stability

Results for temperature variation

Realized with a power source at 120 Vac – 60 Hz through a variac

Temperature (°C)	Mesure at startup		Measure at 2 min		Measure at 5 min		Measure at 10 min		Drift limit (kHz)
	Frequency measured (MHz)	Frequency drift (kHz)	Frequency measured (MHz)	Frequency drift (kHz)	Frequency measured (MHz)	Frequency drift (kHz)	Frequency measured (MHz)	Frequency drift (kHz)	
50	13.560240	0.000240	13.560237	0.000237	13.560238	0.000238	13.560238	0.000238	± 1.356 (a)
40	13.560251	0.000251	13.560246	0.000246	13.560248	0.000248	13.560248	0.000248	
30	13.560283	0.000283	13.560275	0.000275	13.560275	0.000275	13.560275	0.000275	
20	13.560322	0.000322	13.560312	0.000312	13.560312	0.000312	13.560312	0.000312	
10	13.560357	0.000357	13.560352	0.000352	13.560352	0.000352	13.560352	0.000352	
0	13.560369	0.000369	13.560369	0.000369	13.560369	0.000369	13.560369	0.000369	
-10	13.560354	0.000354	13.560359	0.000359	13.560359	0.000359	13.560359	0.000359	
-20	13.560306	0.000306	13.560318	0.000318	13.560318	0.000318	13.560318	0.000318	

(a) ±0.01% of the operating frequency

Results for power supply variation

Realized at +20 °C

Power supply (Vac)	Frequency measured (MHz)	Frequency drift (kHz)	Drift limit (kHz)
102	13.560288	0.000288	± 1.356 (b)
120	13.560312	0.000312	
138	13.560286	0.000286	

(b) ±0.01% of the operating frequency

Test conclusion:

RESPECTED STANDARD

12. FIELD STRENGTH OUTSIDE THE BAND 13.110-14.01 MHZ

Temperature (°C) : 22 **Humidity (%HR):** 36 **Date :** July 7, 2021
Technician : T. LEDRESSEUR

Standard: FCC Part 15

Standard: FCC Part 15
RSS-210

Test procedure:
For FCC Part 15: § 15.209, § 15.225 (d)
For RSS-210: § Annex B.6 (d)

Method of § 6.3 of ANSI C63.10
Method of § 6.4 of ANSI C63.10
Method of § 6.5 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 measure is realized on open area test site under 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 1000 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)
1 MHz (F > 1 GHz)

Distance of antenna: 10 meters (in open area test site)

Antenna height: 1 to 4 meters (in open area test site)

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

Results:

Sample N° 1:

Below 30 MHz

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	RBW (kHz)	Polarization (Parallel Perpendicular)	Field strength Measured at 10 m (dBµV/m)	Field strength Computed at 30 m (dBµV/m)	Limits (dBµV/m)	Margin (dB)
27.12	QP	100	9	Perpendicular	3.49	-15.59	29.5	45.09

Above 30 MHz

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	RBW (kHz)	Polarization H: Horizontal V: Vertical	Field strength Measured at 10 m (dBµV/m)	Field strength Computed at 3 m (dBµV/m)	Limits (dBµV/m)	Margin (dB)
40.68	QP	105	120	V	15.37	25.77	40	14.23
67.8	QP	100	120	V	14.29	24.69	40	15.31
81.36	QP	100	120	V	12.86	23.26	40	16.74
108.48	QP	130	120	V	16.33	26.73	43.5	16.77
135.6	QP	200	120	V	27.04	37.44	43.5	6.06
162.72	QP	120	120	V	31.89	42.29	43.5	1.21
189.84	QP	125	120	V	32.77	43.17	43.5	0.33
216.96	QP	305	120	H	31.1	41.5	46	4.5
244.08	QP	315	120	H	32.63	43.03	46	2.97
271.2	QP	375	120	H	30.97	41.37	46	4.63
298.32	QP	342	120	H	25.78	36.18	46	9.82

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

(1) Restricted bands of operation in 15.205 and in Table 6 of RSS-Gen

Applicable limits: for 9 kHz ≤ F ≤ 490 kHz : 2400/F(kHz) at 300 meters
for 490 kHz < F ≤ 1.705 MHz : 24000/F(kHz) at 30 meters
for 1.705 MHz < F ≤ 30 MHz : 29.5 dBµV/m at 30 meters
for 30 MHz < F ≤ 88 MHz : 40 dBµV/m at 3 meters
for 88 MHz < F ≤ 216 MHz : 43.5 dBµV/m at 3 meters
for 216 MHz < F ≤ 960 MHz : 46 dBµV/m at 3 meters
Above 960 MHz : 54 dBµV/m at 3 meters

Note: any spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.

Test conclusion:

RESPECTED STANDARD

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

APPENDIX 1: Test equipment list

AC Conducted emissions

TYPE	MANUFACTURER	EMITECH NUMBER
Outside room Hors cage	Emitech	10788
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
LISN 1600	Thurbly Thandar Instruments	8719
High-pass filter EZ-25	Rohde & Schwarz	11535
Absorber sheath current	Emitech	10523
Cable N-5m RG214	GYL Technologies	8590
Power source 1251RP	California instruments	8508
Multimeter 177	Fluke	14831
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC V3.17.0.25	0000

Occupied bandwidth

TYPE	MANUFACTURER	EMITECH NUMBER
Outside room Hors cage	Emitech	10788
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Power source FTN 2515B	Fontaine	8775
Multimeter 177	Fluke	14831
Meteo station WS-9232	La Crosse Technology	8750
Software	GPIBShot V2.4	-

Band edge

TYPE	MANUFACTURER	EMITECH NUMBER
Outside room Hors cage	Emitech	10788
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Power source FTN 2515B	Fontaine	8775
Multimeter 177	Fluke	14831
Meteo station WS-9232	La Crosse Technology	8750
Software	GPIBShot V2.4	-

Operation within the band 13.110 – 14.010 MHz

TYPE	MANUFACTURER	EMITECH NUMBER
Open test site	EMITECH	8732
Turntable and mat controller	EMITECH	8855
Anechoic Chamber	EMITECH	8593
Turntable controller 1060C	MATURO	14736
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESI7	Rohde & Schwarz	8707
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Loop antenna 6502	EMCO	1406
Climats EXCAL² 1411-TA	CLIMATS	16059
Precision thermometer GMH 3710	GHM Greisinger	14716
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	8749
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC V3.17.0.25	0000

Field strength outside the band 13.110-14.010 MHz

TYPE	MANUFACTURER	EMITECH NUMBER
Open test site	EMITECH	8732
Turntable and mat controller	EMITECH	8855
Anechoic Chamber	EMITECH	8593
Turntable controller 1060C	MATURO	14736
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESI7	Rohde & Schwarz	8707
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Loop antenna 6502	EMCO	1406
Biconical antenna VHBB 9124	Schwarzbeck	8526
Biconical antenna VHA 9103	Schwarzbeck	8528
Log periodic antenna UHALP 9108A	Schwarzbeck	8543
Low-noise amplifier 8447D	Hewlett Packard	8511
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	8749
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC V3.17.0.25	0000
Software	Champ libre Juigné. V3.5	8864