TEST REPORT

N°: 172996-766532-A(FILE#2598443) **Version: 03**

Subject	**Electromagnetic compatibility tests according to the standards:** **FCC CFR 47 Part 15, Subpart B** **ANSI C63.4 (2014)** **ICES-003 (2020)**
Issued to	**Wattsense** 39 Chemin du Moulin Carron 69570 Dardilly
Apparatus under test	
Product	**Box**
Trade mark	Wattsense
Manufacturer	Wattsense
Family range	-
Model under test	V1.3.3
Serial number	3a4c7c31b0c3403f
FCCID	2A2KQ–WSGW1
Conclusion	See Test Program chapter
Test date	September 23, 2020 to May 28, 2021
Test location	LCIE Grenoble
FCC Test site	FR0008
ISED Test site	FR0008 - 6500A
Sample receipt date	September 23, 2020
Composition of document	23 pages
Document issued on	May 18, 2022

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PUBLICATION HISTORY

Version	Date	Author	Modification
01	June 11, 2021	Nathalie BUGANZA	Creation of the document
02	February 9, 2022	Nathalie BUGANZA	Adding FCCID
03	May 18, 2022	Nathalie BUGANZA	Adding comments p7 Lora setting p19 to indicate frequency from Lora modular.

Each new edition of this test report replaces and cancels the previous edition. The control of the old editions of report is under responsibility of client.

SUMMARY

1. TEST PROGRAM

1.1. FCC PART15B / ICES-003

Standard:

- ✓ **FCC Part 15, Subpart B (Digital Devices)**
- ✓ **ANSI C63.4 (2014)**
- ✓ **ICES-003 (2020)**

1.1.1. Requirements for disturbance emissions – Class B

EMISSION TEST	LIMITS			RESULTS (Comments)
Limits for conducted disturbance 150kHz-30MHz **FCC §15.107**	**Access: AC power**			**PASS**
	Frequency	**Quasi-peak**	**Average**	
	150-500kHz	66 to 56 dBµV	56 to 46 dBµV	
	0.5-5MHz	56 dBµV	46 dBµV	
	5-30MHz	60 dBµV	50 dBµV	
Radiated emissions 30MHz-1GHz **FCC §15.109**	**Access: Enclosure port of ancillary equipment**			**PASS**
	Frequency	**Quasi-peak @10m**		
	30MHz-88MHz	40.0 dBµV/m		
	88MHz-216MHz	43.5 dBµV/m		
	216MHz-960MHz	46.0 dBµV/m		
	Above 960MHz	54.0 dBµV/m		
Radiated emissions 1GHz- 10GHz* **FCC §15.109**	**Access: Enclosure port of ancillary equipment**			**PASS**
	Frequency	**Peak @3m**	**Average @3m**	
	1- 10GHz	74.0 dBµV/m	54.0 dBµV/m	

NA: Not Applicable / NP: Not Performed, not requested by the customer (It cannot be taken into account for the declaration of conformity)
D: Divergence, the last version is used to make it possible to test the product with the standard which describes the current state of the art and thus to answer as well as possible his environment of final use.
***§15.33:** The highest internal source of a testing device is defined like more the highest frequency generated or used in the testing device or on which the testing device works or agrees.
- If the highest frequency of the internal sources of the testing device is lower than 108 MHz, measurement must be only performed until 1GHz.
- If the highest frequency of the internal sources of the testing device ranges between 108 MHz and 500 MHz, measurement must be only performed until 2GHz.
- If the highest frequency of the internal sources of the testing device ranges between 500 MHz and 1 GHz, measurement must be only performed until 5GHz.

If the highest frequency of the internal sources of the testing device is above 1 GHz, measurement must be only performed until 5 times the highest frequency or 40 GHz, while taking smallest of both.
Special condition for intentional radiator:

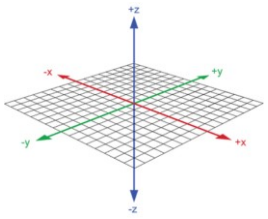
- For a composite system comprised of a digital device using a clock frequency of 1 GHz as the highest frequency for the digital logic and an intentional radiator operating at 2.4 GHz, the composite is required to be investigated to the upper frequency of 24 GHz (in this case, 10 times the intentional radiator frequency is the higher frequency).

- For a composite system comprised of a digital device using a clock frequency of 2 GHz as the highest frequency for the digital logic and an intentional radiator operating at 913 MHz, the composite is required to be investigated to the upper frequency of 10 GHz (in this case, 5 times the unintentional radiator clock frequency is the higher frequency).

2. EQUIPMENT UNDER TEST: CONFIGURATION (DECLARED BY PROVIDER)

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES)

Equipment under test (EUT):

Model under test :	V1.3.3
Serial Number:	3a4c7c31b0c3403f
	
Dimensions:	23cm x 10cm x 7cm (Length x Width x Height)

Power supply:
During all the tests, EUT is supplied by V_{nom}: **24VDC**
For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference / Sn	Comments
Supply1	DC	12-24V	-	-

NC: Not communicated by provider

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Supply1	2 wires	5	☑	☐	☑	-
Access1	Ethernet	5	☐	☐	☑	-
Access2	KNX	5	☐	☑	☑	-
Access3	M-Bus	5	☐	☑	☑	-
Access4	X-Bus	5	☐	☑	☑	-
Access5	RS485	5	☐	☑	☑	-
Access6	USB	5	☑	☑	☑	-

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Power Supply	AFX9660SB	A7042292	-
GLS 230 auxiliary Power supply	-	-	-
RVL470	-	-	-
ISMA-B-8I	-	-	
Ewattch Ambiance	-	-	-
Wago PFC200	-	-	-
Itron UltraMax	-	-	-
KNX-20E-640 Power Supply	-	-	-
Schneider MGU3.534.12	-	-	-
Echelon U60	-	-	-

NC: Not communicated by provider

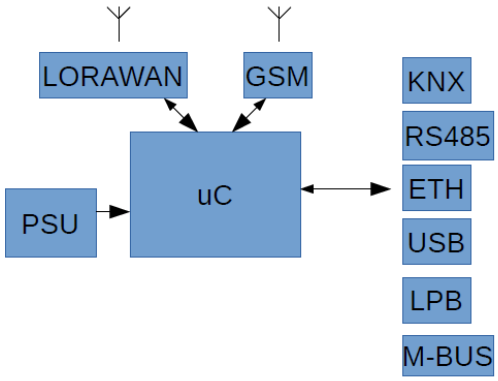
2.2. EUT CONFIGURATION

Hardware information			
Highest internal frequency (PLL, Quartz, Clock, Microprocessor…):	**$F_{Highest}$:**	**1800**	**MHz**
Firmware (if applicable):	**V. :**	**3.x**	
Software (if applicable):	**V. :**	**3.x**	
Time necessary for the EUT to be exercised and to respond:	**Dwell:**	**2**	**s**

NC: Not communicated by provider

Running mode n°1:

Setup:



Checking the functions on the laptop

Note: North America region setting is set to Lora modular.

2.3. EQUIPMENT MODIFICATIONS DURING THE TESTS

None

2.4. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follow:

FS = RA + AF + CF – AG

Where *FS = Field Strength*
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Factor
AG = Amplifier Gain

2.5. CALIBRATION DATE

The calibration intervals are extended at 12+1 months. This extended interval is based on the fact that there is sufficient calibration data to statistically establish a trend or based on experience of use of the test equipment to assure good measurement results for a longer period

3. MEASUREMENT OF CONDUCTED EMISSION

3.1. ENVIRONMENTAL CONDITIONS

Date of test	:	May 28, 2021
Test performed by	:	Loïc BOURET
Atmospheric pressure (hPa)	:	993
Relative humidity (%)	:	36
Ambient temperature (°C)	:	22

3.2. TEST SETUP

Mains terminals

The EUT and auxiliaries are set 80cm above the ground on the non-conducting table (Table-top equipment).
The EUT is powered by V_{nom}.
The EUT is powered through a LISN (measure). Auxiliaries are powered by another LISN.

Test setup

3.3. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
BAT EMC	NEXIO	v3.19.1.23	L1000115		
Cable + self	_	_	A5329578	04/21	04/22
EMC comb generator	LCIE SUD EST	_	A3169098		
LISN	ROHDE & SCHWARZ	ENV216	C2320123	09/20	09/21
LISN	ROHDE & SCHWARZ	ENV216	C2320291	06/20	06/21
Spectrum Analyzer 9kHz - 30MHz	ROHDE & SCHWARZ	ESHS10	A2642028	01/20	01/22
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23
Transient limiter	ROHDE & SCHWARZ	ESH3-Z2	A7122204	08/20	08/21
Load 50Ω - N	AEROFLEX	_	A7152067	07/20	07/21

3.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

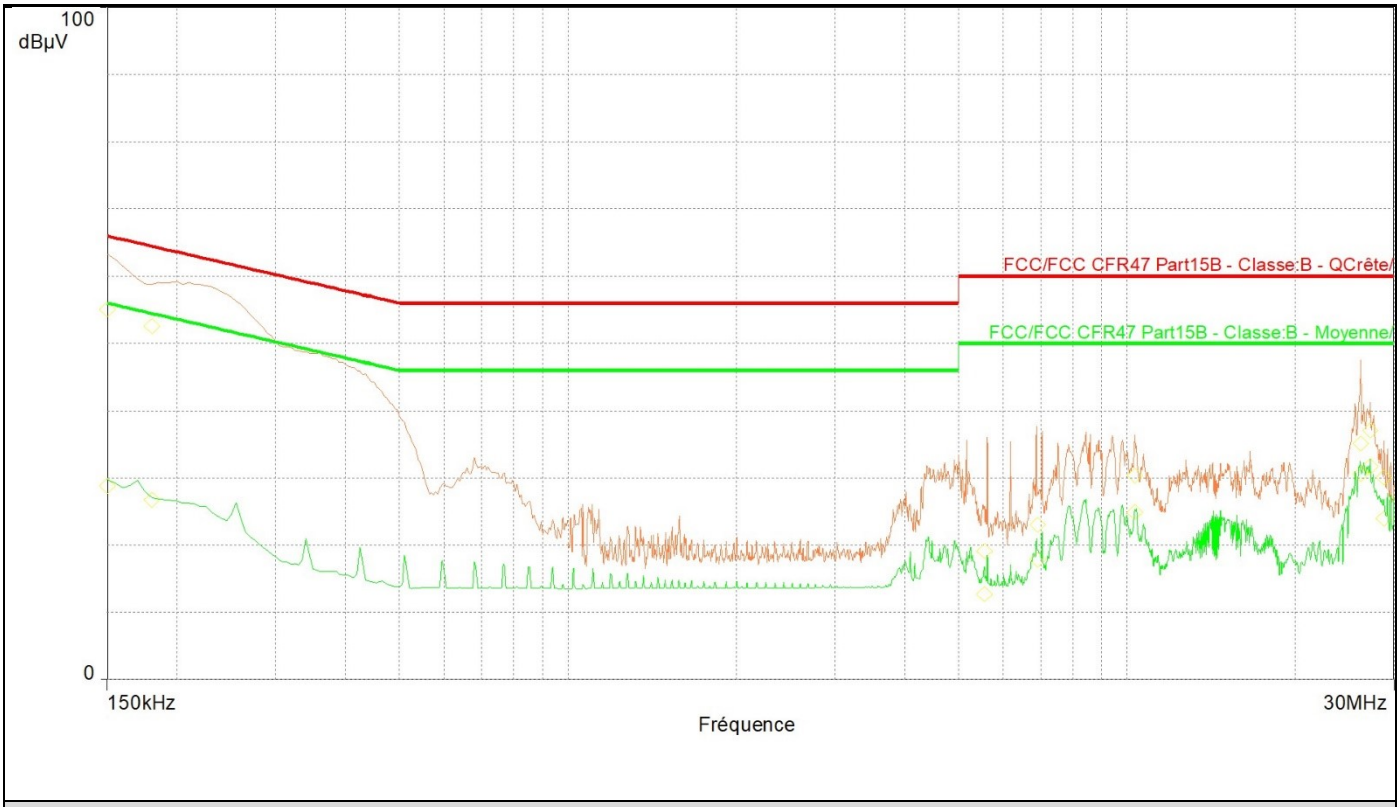
3.5. TEST RESULTS – RUNNING MODE N°1

Mains terminals:

Supply1
Measurements are performed on the phase (L1) and neutral (N) of the power line.
Results: (PEAK detection)

Graph identifier		Line	Comments	
Emc#	1	Phase	110VAC/60Hz	See below
Emc#	2	Neutral	110VAC /60Hz	See below
Emc#	3	Phase	240VAC/50Hz	See below
Emc#	4	Neutral	240VAC/50Hz	See below

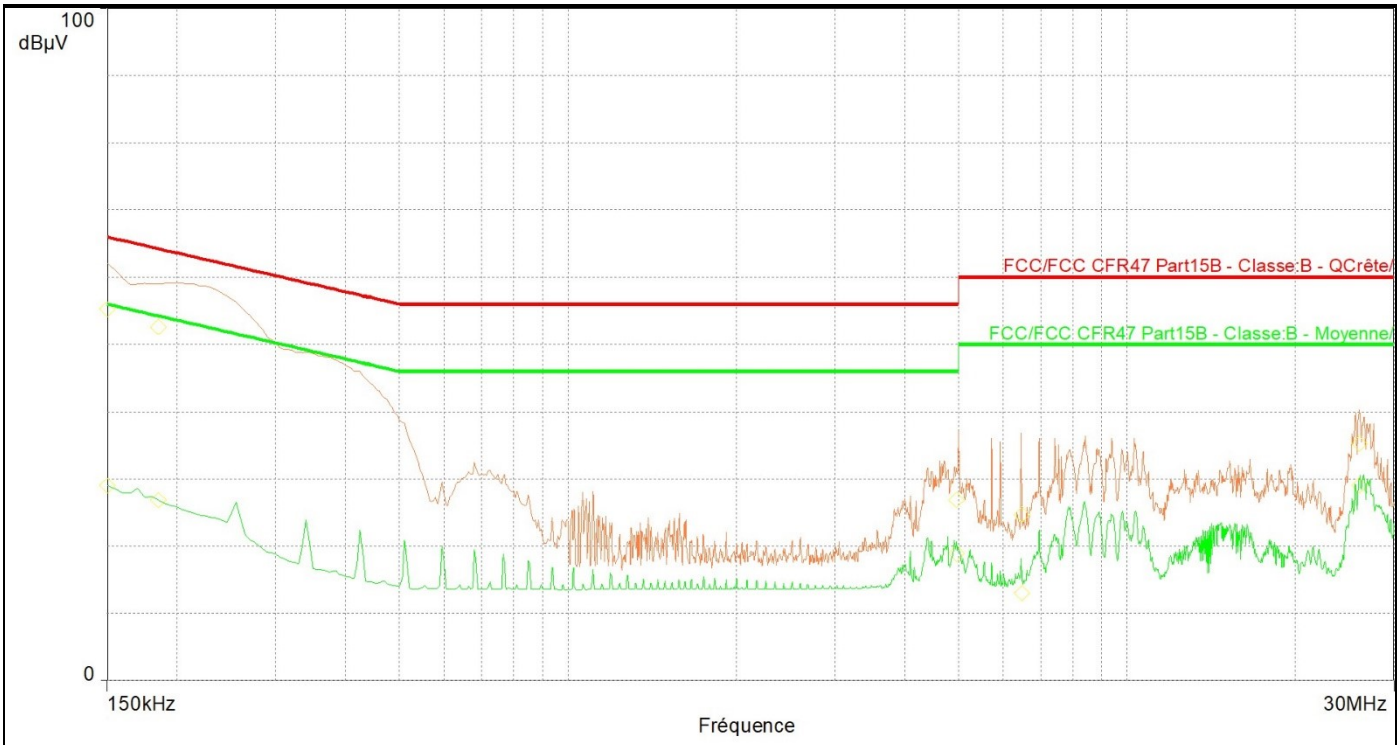
CONDUCTED EMISSIONS			
Graph name:	Emc#1	**Test configuration:**	
Limit:	FCC CFR47 Part15B	1	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	110V 60Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



Spurious emissions

Frequency (MHz)	Mes.QPeak (dBµV)	LimQP (dBµV)	Mes.QPeak-LimQP (dB)	Mes.Avg (dBµV)	LimAvg (dBµV)	Mes.Avg-LimAvg (dB)	Line	Correction (dB)
0.150	55.1	66.0	-10.9	28.9	56.0	-27.1	Phase 1	19.4
0.180	52.6	64.5	-11.9	26.8	54.5	-27.7	Phase 1	19.5
5.564	19.1	60.0	-40.9	12.7	50.0	-37.3	Phase 1	19.9
6.920	23.1	60.0	-36.9	17.9	50.0	-32.1	Phase 1	20.0
10.320	30.3	60.0	-29.7	24.9	50.0	-25.1	Phase 1	20.2
26.180	35.1	60.0	-24.9	30.6	50.0	-19.4	Phase 1	21.2
27.200	37.1	60.0	-22.9	31.7	50.0	-18.3	Phase 1	21.2
28.796	30.0	60.0	-30.0	23.9	50.0	-26.1	Phase 1	21.3

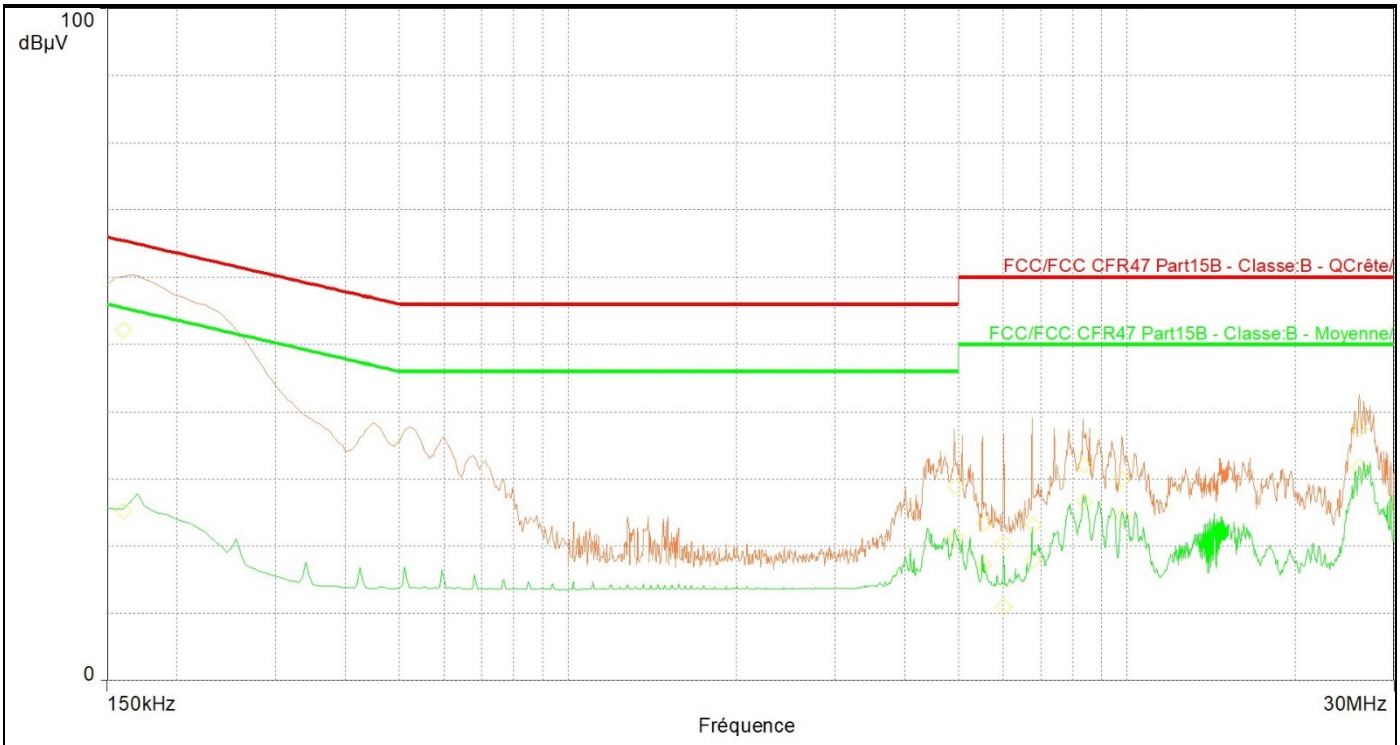
CONDUCTED EMISSIONS			
Graph name:	Emc#2	**Test configuration:**	
Limit:	FCC CFR47 Part15B	1	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	110V 60Hz	**RBW :**	10kHz
Line:	Neutral	**VBW :**	30kHz



Spurious emissions

Frequency (MHz)	Mes.QPeak (dBµV)	LimQP (dBµV)	Mes.QPeak-LimQP (dB)	Mes.Avg (dBµV)	LimAvg (dBµV)	Mes.Avg-LimAvg (dB)	Line	Correction (dB)
0.150	55.3	66.0	-10.7	29.0	56.0	-27.0	Neutral	19.4
0.185	52.6	64.3	-11.6	26.9	54.3	-27.4	Neutral	19.5
4.956	26.8	56.0	-29.2	18.9	46.0	-27.1	Neutral	19.8
6.476	24.7	60.0	-35.3	13.0	50.0	-37.0	Neutral	20.0
25.996	35.2	60.0	-24.8	29.0	50.0	-21.0	Neutral	21.2

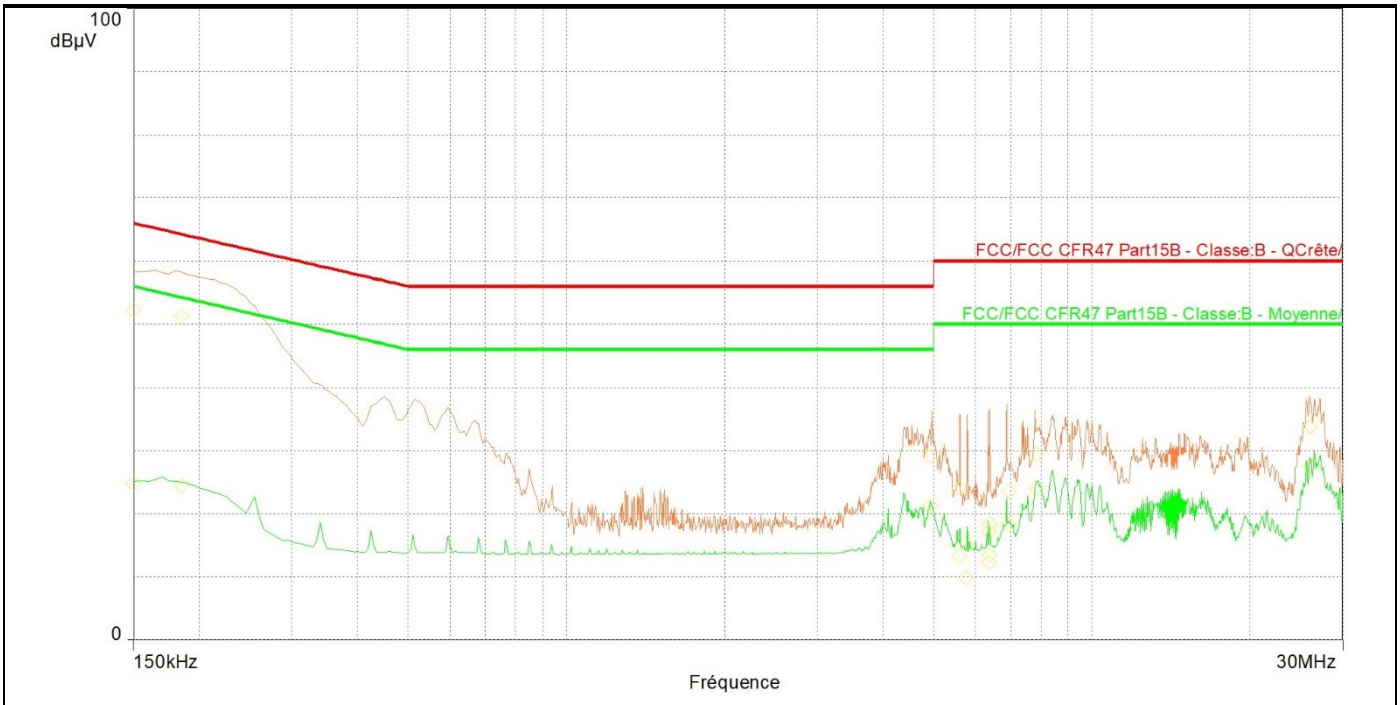
CONDUCTED EMISSIONS			
Graph name:	Emc#3	**Test configuration:**	
Limit:	FCC CFR47 Part15B	1	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	240V 50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



Spurious emissions

Frequency (MHz)	Mes.QPeak (dBµV)	LimQP (dBµV)	Mes.QPeak-LimQP (dB)	Mes.Avg (dBµV)	LimAvg (dBµV)	Mes.Avg-LimAvg (dB)	Line	Correction (dB)
0.160	52.2	65.5	-13.3	25.2	55.5	-30.3	Phase 1	19.5
4.932	28.8	56.0	-27.2	21.5	46.0	-24.5	Phase 1	19.8
5.544	23.4	60.0	-36.6	17.2	50.0	-32.8	Phase 1	19.9
6.012	20.5	60.0	-39.5	10.9	50.0	-39.1	Phase 1	19.9
6.796	23.1	60.0	-36.9	18.0	50.0	-32.0	Phase 1	20.0
8.388	32.0	60.0	-28.0	26.7	50.0	-23.3	Phase 1	20.1
9.796	30.0	60.0	-30.0	24.5	50.0	-25.5	Phase 1	20.2
25.992	37.5	60.0	-22.5	31.7	50.0	-18.3	Phase 1	21.2

CONDUCTED EMISSIONS			
Graph name:	Emc#4	**Test configuration:**	
Limit:	FCC CFR47 Part15B	1	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	240V 50Hz	**RBW :**	10kHz
Line:	Neutral	**VBW :**	30kHz



Spurious emissions

Frequency (MHz)	Mes.QPeak (dBµV)	LimQP (dBµV)	Mes.QPeak-LimQP (dB)	Mes.Avg (dBµV)	LimAvg (dBµV)	Mes.Avg-LimAvg (dB)	Line	Correction (dB)
0.150	52.2	66.0	-13.8	24.8	56.0	-31.2	Neutral	19.4
0.185	51.3	64.3	-12.9	24.4	54.3	-29.8	Neutral	19.5
4.928	29.2	56.0	-26.8	21.3	46.0	-24.7	Neutral	19.8
5.584	24.0	60.0	-36.0	13.3	50.0	-36.7	Neutral	19.9
6.364	17.2	60.0	-42.8	12.3	50.0	-37.7	Neutral	20.0
6.388	18.4	60.0	-41.6	13.4	50.0	-36.6	Neutral	20.0
6.932	23.5	60.0	-36.5	18.4	50.0	-31.6	Neutral	20.0
7.844	29.4	60.0	-30.6	24.1	50.0	-25.9	Neutral	20.1
26.000	33.8	60.0	-26.2	27.6	50.0	-22.4	Neutral	21.2

3.6. CONCLUSION

The sample of the equipment V1.3.3, Sn : **3a4c7c31b0c3403f**, tested in the configuration presented in this test report **satisfies** to requirements of the product family standard applied (See §Test Program) for conducted emissions.

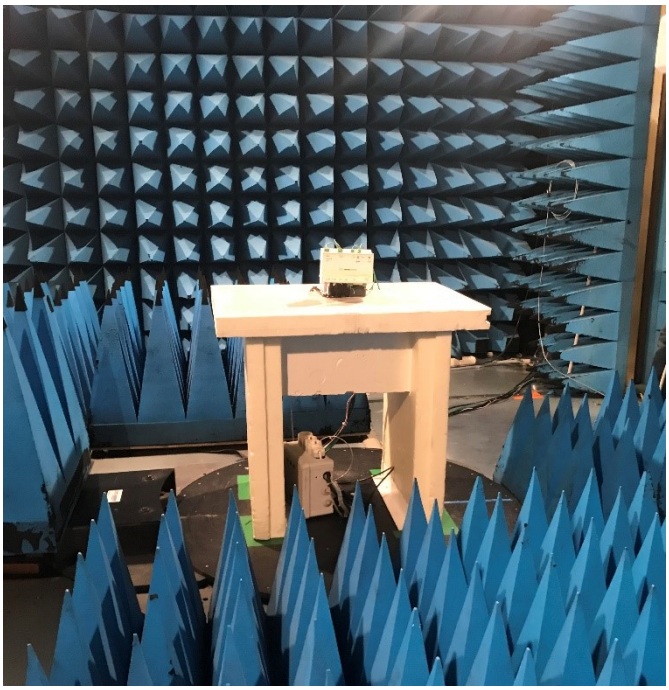
4. MEASUREMENT OF RADIATED EMISSION

4.1. ENVIRONMENTAL CONDITIONS

Date of test	:	September 23, 2020	May 28, 2021
Test performed by	:	Majid MOURZAGH	Loïc BOURET
Atmospheric pressure (hPa)	:	989	993
Relative humidity (%)	:	45	36
Ambient temperature (°C)	:	24	22

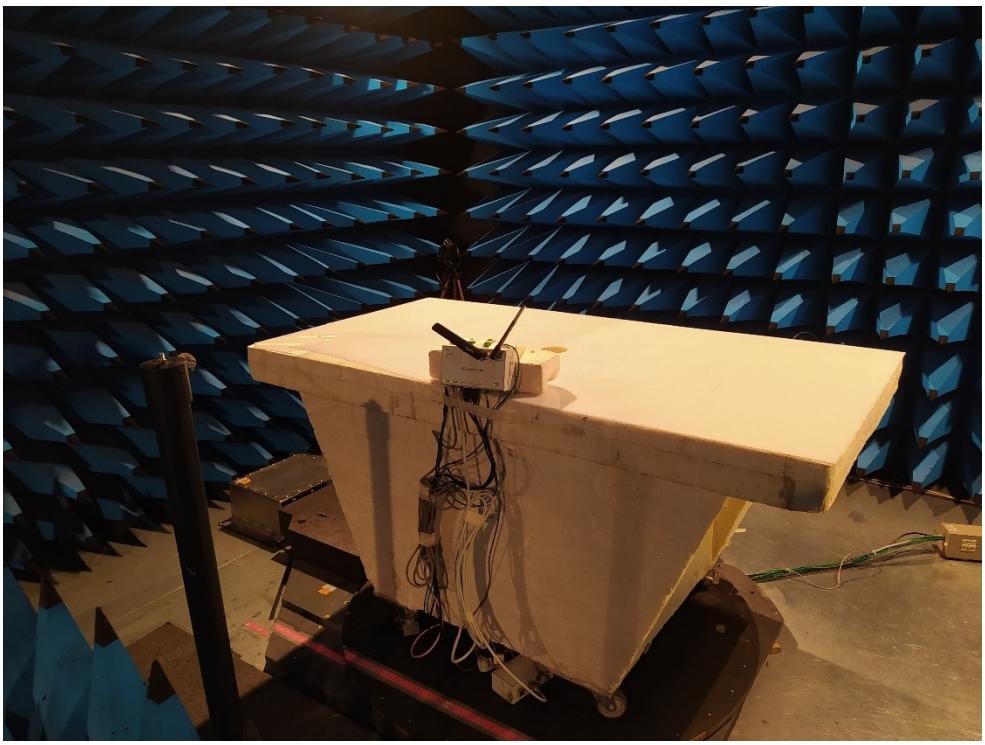
4.2. TEST SETUP

The EUT and auxiliaries are set 80cm above the ground on the non-conducting table (Table-top equipment).
The EUT is powered by V_{nom}.



Test setup in anechoic chamber – Frequency <1GHz (23/09/2020)

Test setup on OATS (23/09/2020)



Test setup in anechoic chamber – Frequency >1GHz (28/05/2021)

4.3. TEST METHOD

4.3.1. 30MHz –1GHz (23/09/2020):

Pre-qualification measurement

A pre-scan of all the setup has been performed in a 3 meters semi-anechoic chamber. Test is performed with antenna centered on EUT in horizontal (H) and vertical (V) polarization, continuous linear turntable azimuth search was performed with 360 degrees range. Measurements are performed on all axis of EUT used in normal configuration. The pre-characterization graphs are obtained in PEAK detection.

Qualification

The installation of EUT is identical than for pre-qualification measurements on an Open Area Test Site with a 10 meters distance between EUT and antenna. In this case, it corrected according to requirements of 15.209.e), M@3m = M@10m+10.5dB. Test is performed in horizontal (H) and vertical (V) polarization and the height antenna is varied from 1m to 4m. Continuous linear turntable azimuth search was performed with 360 degrees range. Measurements are performed on all axis of EUT used in normal configuration. A summary of the worst case emissions found in all test configurations and modes is shown.

4.3.2. 1GHz – 10GHz (28/05/2021):

Pre-qualification measurement

A pre-scan of all the setup has been performed in a 3 meters full anechoic chamber. Test is performed with antenna centered on EUT in horizontal (H) and vertical (V) polarization, continuous linear turntable azimuth search was performed with 360 degrees range. Measurements are performed on all axis of EUT used in normal configuration. The pre-characterization graphs are obtained in PEAK and AVERAGE detection.

Qualification

The installation of EUT is identical for pre-characterization measurements. Test is performed in horizontal (H) and vertical (V) polarization and the height antenna is fixed and centered on the EUT, EUT smaller than the beamwidth of the measurement antenna.

Minimal beamwidth of the measurement antenna used: ETS3115 / w@3m=2.1m<14GHz / w@3m=0.9m<18GHz

Continuous linear turntable azimuth search was performed with 360 degrees range. Measurements are performed on all axis of EUT used in normal configuration. A summary of the worst case emissions found in all test configurations and modes is shown.

4.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED (23/09/2020)					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
Amplifier 9kHz - 40GHz	LCIE SUD EST	_	A7102082	06/20	06/21
BAT EMC	NEXIO	v3.19.1.23	L1000115	-	-
Emission Cable (SMA 1m)	TELEDYNE	26GHz	A5329874	01/19	09/20
Emission Cable (SMA 3.3m)	TELEDYNE	26GHz	A5329875	01/19	09/20
Emission Cable (SMA 30cm)	TELEDYNE	26GHz	A5329873	01/19	09/20
Emission Cable <1GHz (Ampl <-> Cage)	-	18GHz	A5329562	08/20	08/21
Emission Cable <1GHz (Ampl <-> Cage)	-	18GHz	A5329907	08/20	08/21
Semi-Anechoic chamber #3 (BF)	SIEPEL	_	D3044017_BF	12/19	12/22
Table C3	LCIE	_	F2000461		
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	10/18	10/20
Turntable chamber (Cage#3)	ETS Lingren	Model 2165	F2000371	-	-
Turntable controller (Cage#3)	ETS Lingren	Model 2090	F2000444	-	-
Spectrum analyzer	ROHDE & SCHWARZ	FSU 26	A4060058	09/19	09/21
Antenna Mat (OATS)	ETS Lingren	2071-2	F2000392		
Cable (OATS)	_	1GHz	A5329623	05/20	05/21
Antenna Bi-log	CHASE	CBL6111A	C2040051	06/19	06/21
Biconic Antenna	EATON	94455-1	C2040234	03/19	03/21
CALCUL_FACTEURS	LCIE SUD EST	V4	L2000035		-
Emission Cable	SUCOFLEX	6GHz	A5329061	06/20	06/21
Emission Cable	MICRO-COAX	1GHz	A5329656	08/20	08/21
OATS	_	_	F2000409	04/20	04/21
Receiver 20-1000MHz	ROHDE & SCHWARZ	ESVS30	A2642006	03/20	03/22
Table C1/OATS	LCIE	_	F2000445	-	-

TEST EQUIPMENT USED (28/05/2021)					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
Amplifier 100kHz - 18GHz	LCIE SUD EST	_	A7085027	11/20	11/21
Antenna horn 18GHz	AINFO	LB	C2042078	04/21	04/23
BAT EMC	NEXIO	v3.19.1.23	L1000115		
Cable 0.75m	SUCOFLEX	18GHz	A5329919	11/20	11/21
Cable 2.2m N	SUCOFLEX	SF118A/2x1 1N/2.2M	A5329990	11/20	11/21
Cable 5m	SUCOFLEX	18GHz	A5329918	11/20	11/21
Diameter 1.2m / Height 2.25m	LCIE	VSWR 1GHz - 18GHz	D3044015_VSWR	06/19	06/22
HF Radiated emission comb generator	LCIE SUD EST	_	A3169088		
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	11/20	11/22
Semi-Anechoic chamber #2	SIEPEL	_	D3044015	06/19	06/22
Spectrum Analyzer 9kHz - 6GHz	ROHDE & SCHWARZ	FSL6	A4060049	04/20	04/22
Table C2/OATS	LCIE	_	F2000438		
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23
Turntable chamber (Cage#2)	ETS Lingren	Model 2165	F2000404		
Turntable controller (Cage#2)	ETS Lingren	Model 2066	F2000393		

4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

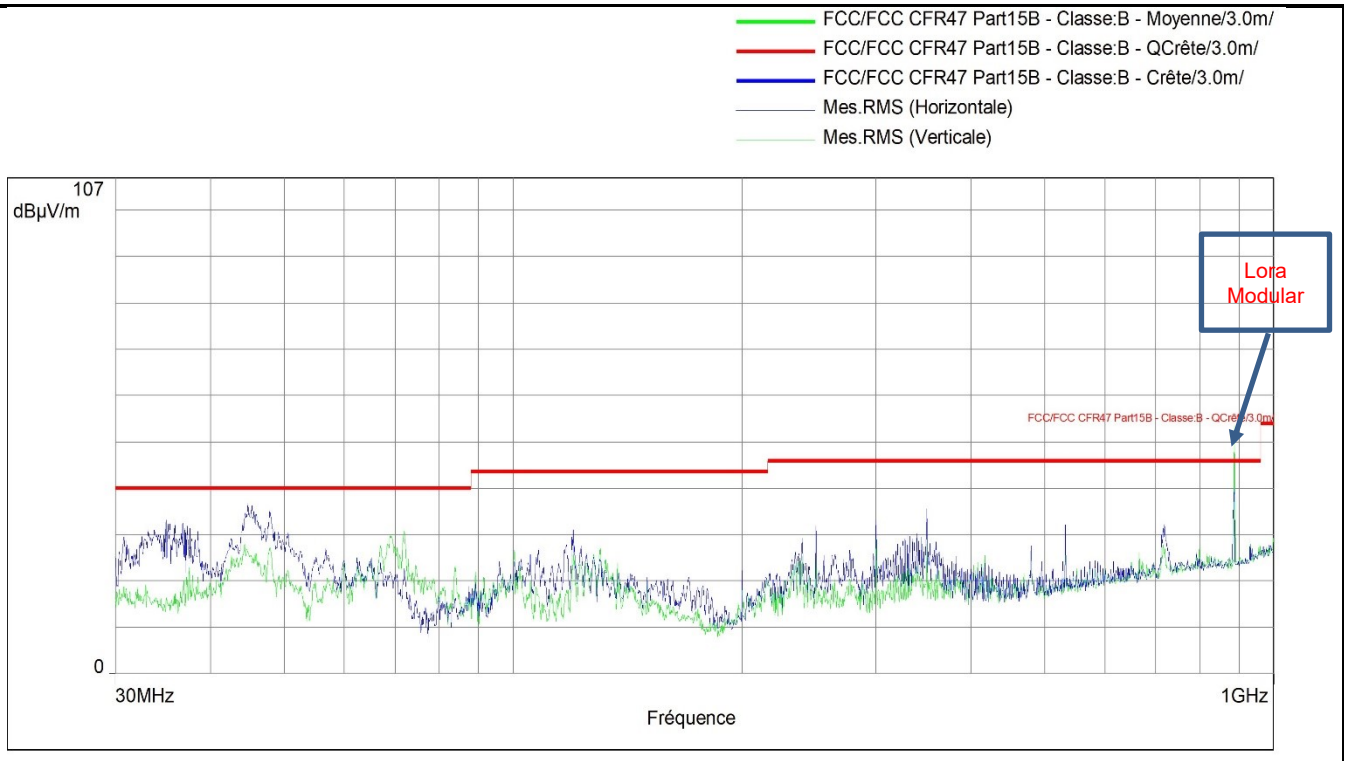
4.6. TEST RESULTS – RUNNING MODE N°1

4.6.1. 30MHz –1GHz

Pre-qualification measurement

Graph identifier	Polarization	EUT position	Comments
Emr# 1	Vertical/ Horizontal	Axis XY	See below

RADIATED EMISSIONS			
Graph name:	Emr#1	**Test configuration:**	
Limit:	FCC CFR47 Part15B	1	
Class:	B		
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Vertical/Horizontal	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



Spurious emissions

Frequency (MHz)	Peak Level (dBµV/m)	Polarization	Correction (dB)
119.974	33.3	Horizontal	-19.1
122.362	30.0	Horizontal	-19.0
127.636	28.2	Horizontal	-18.6
300.000	34.7	Horizontal	-19.0
349.974	33.8	Horizontal	-18.1
44.784	30.2	Vertical	-19.7
47.941	27.2	Vertical	-20.8
69.232	27.8	Vertical	-26.4
532.002	33.4	Vertical	-14.6

Qualification

The frequency list is created from the results obtained during the pre-qualification.
Measurements are performed using a QUASI-PEAK detection.

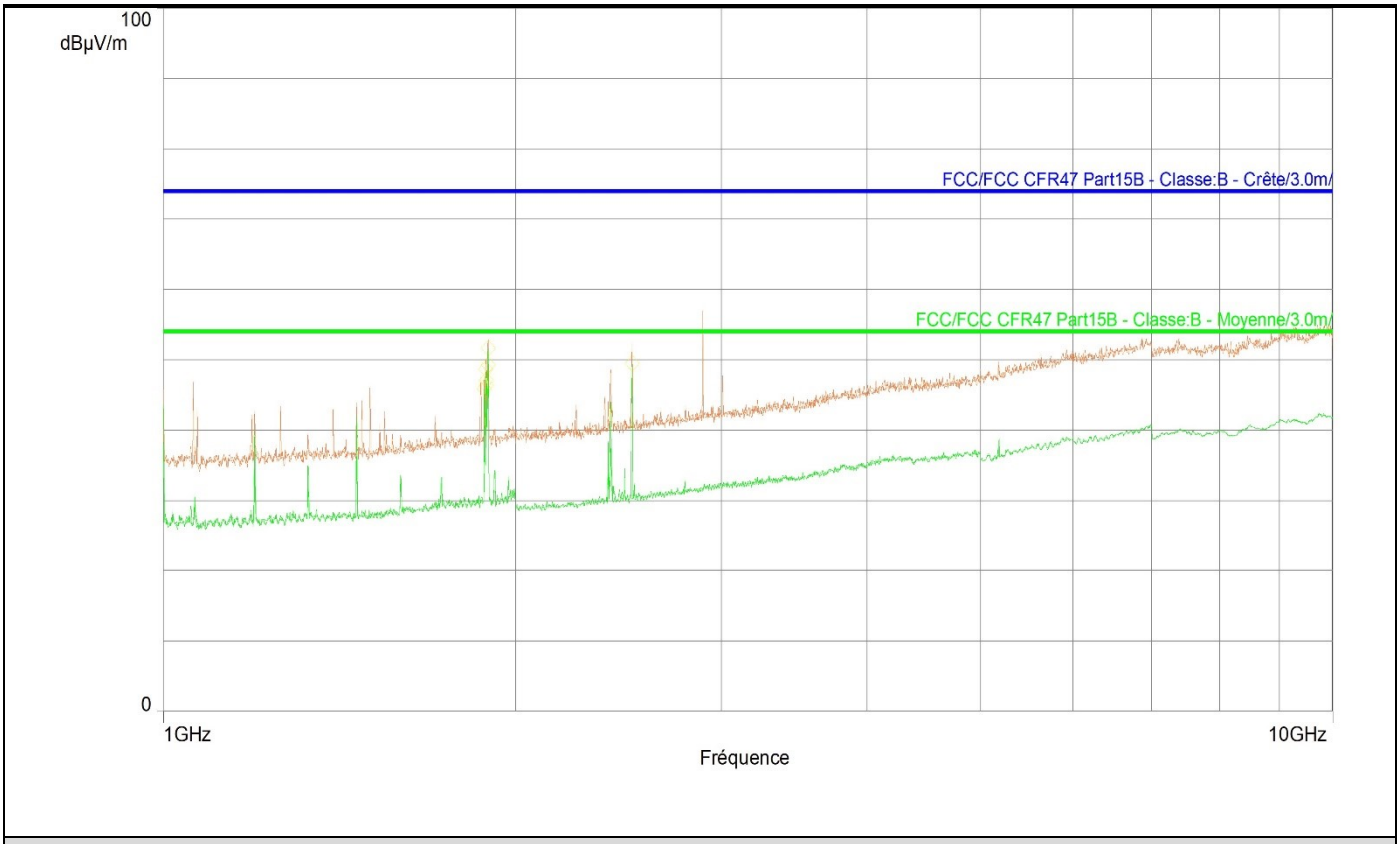
Test Frequency (MHz)	Meter Reading dB(µV)	Detector (Pk/QP/Av)	Polarity (V/H)	Azimuth (Degrees)	Antenna Height (cm)	Gain/Loss Factor (dB)	Transducer Factor (dB)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
44,800	15,0	QP	V	0	110	-	11,9	26,9	40,0	**-13,1**
47,900	15,2	QP	V	0	110	-	10,5	25,7	40,0	**-14,3**
69,200	14,9	QP	V	180	110	-	7,6	22,5	40,0	**-17,5**
120,000	8,2	QP	V	270	110	-	14,2	22,4	43,5	**-21,1**
122,300	5,1	QP	V	250	115	-	14,3	19,4	43,5	**-24,1**
127,600	4,9	QP	V	270	110	-	14,3	19,2	43,5	**-24,3**
200,000	6,1	QP	V	90	110	-	11,9	18,0	43,5	**-25,5**
300,000	12,2	QP	H	90	240	-	17,2	29,4	46	**-16,6**
350,000	8,2	QP	H	90	260	-	18,9	27,1	46	**-18,9**
532	3,1	QP	V	180	110	-	24,3	27,4	46	**-18,6**
763	1,2	QP	V	180	120	-	29,2	30,4	46	**-15,6**

4.6.2. 1GHz - 10GHz

Pre-qualification measurement

Graph identifier	Polarization	EUT position	Comments	
Emr# 2	Vertical/ Horizontal	Axis XY		See below

RADIATED EMISSIONS			
Graph name:	Emr#2	**Test configuration:**	
Limit:	FCC CFR47 Part15B	1	
Class:	B		
Frequency range: [1GHz - 10GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Average (dBµV/m)	Lim.Average (dBµV/m)	Average-Lim.Average (dB)	Polarization	Correction (dB)
1887.125	48.7	54.0	-5.3	Horizontal	2.2
1888.875	47.1	54.0	-6.9	Horizontal	2.2
1895.625	51.7	54.0	-2.3	Horizontal	2.1
2516.375	49.5	54.0	-4.5	Horizontal	4.2
1888.625	46.4	54.0	-7.6	Vertical	2.2
1895.250	49.3	54.0	-4.7	Vertical	2.1

Qualification

The frequency list is created from the results obtained during the pre-qualification.
Measurements are performed using a PEAK and AVERAGE detection.

Test Frequency (MHz)	Meter Reading dB(µV)	Detector (Pk/QP/Av)	Polarity (V/H)	Azimuth (Degrees)	Antenna Height (cm)	Gain/Loss Factor (dB)	Transducer Factor (dB)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1888.875	40,7	QP	V	0	100	-	2.2	42,9	54.0	**-11,1**
1813	46,13	QP	V	180	100	-	2.1	48,23	54.0	**-5,77**
2516.375	29,93	QP	H	270	100	-	2.2	32,13	54.0	**-21,87**
1888.625	34,7	QP	H	270	100	-	2.1	36,8	54.0	**-17,2**
1895.250	33,78	QP	H	90	100	-	4.2	37,98	54.0	**-16,02**

4.7. CONCLUSION

The sample of the equipment V1.3.3, Sn : **3a4c7c31b0c3403f**, tested in the configuration presented in this test report **satisfies** to requirements of the product family standard applied (See §Test Program) for radiated emissions.

5. UNCERTAINTIES CHART

Type de mesure / Kind of measurement	Incertitude élargie laboratoire / Wide uncertainty laboratory (k=2) ±x	Incertitude limite du CISPR / CISPR uncertainty limit ±y
Mesure des perturbations conduites en tension sur le réseau d'énergie (monophasé /triphasé) 10kHz-150kHz *Measurement of conducted disturbances in voltage on the power port (single & three phases)10kHz-150kHz*	3.27dB	3.8dB
Mesure des perturbations conduites en tension sur le réseau d'énergie (monophasé /triphasé) 150kHz-30MHz *Measurement of conducted disturbances in voltage on the power port (single & three phases)150kHz-30MHz*	3.29dB	3.4dB
Mesure des perturbations conduites en tension sur le réseau de télécommunication *Measurement of conducted disturbances in voltage on the telecommunication port.*	3.26dB	5dB
Mesure des perturbations discontinues conduites en tension *Measurement of discontinuous conducted disturbances in voltage*	3.33dB	3.4dB
Mesure des perturbations conduites en courant *Measurement of conducted disturbances in current*	2.67dB	2.9dB
Mesure du champ électrique rayonné en cage de Faraday semi-anéchoïque de 30MHz à 1GHz *Measurement of radiated electric field in half-anechoic Faraday room From 30MHz to 1GHz*	5.06dB	5.3dB
Mesure du champ électrique rayonné en cage de Faraday semi-anéchoïque de 1GHz à 6GHz *Measurement of radiated electric field in half-anechoic Faraday room From 1GHz à 6GHz*	5.18dB	5.2dB
Mesure du champ électrique rayonné en cage de Faraday semi-anéchoïque de 6GHz à 18GHz *Measurement of radiated electric field in half-anechoic Faraday room From 6GHz to 18GHz*	5.21dB	5.5dB
Mesure du champ électrique rayonné sur le site en espace libre de Moirans 30MHz – 1GHz. *Measurement of radiated electric field on the Moirans open area test site 30MHz – 1GHz.*	5.2dB	6.3dB
Mesure du champ électrique rayonné IN SITU de 30 à 1000 MHz *IN SITU measurement of radiated electric field from 30 to 1000MHz*	A l'étude / Under consideration	5.2dB
Mesure de la puissance perturbatrice *Measurement of disturbance power*	3.32dB	4.5dB
Mesure des harmoniques de courant *Measurement of current harmonics*	11.11%	/
Mesure du flicker *Flicker measurement*	9.26%	/

Les valeurs d'incertitudes calculées du laboratoire étant inférieures aux valeurs d'incertitudes limites établies par le CISPR, la conformité de l'échantillon est établie directement par les niveaux limites applicables. Ce tableau regroupe l'ensemble des incertitudes maximales pour les essais réalisables dans le laboratoire, qu'ils aient été ou non réalisés dans le cadre du présent rapport / *The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the CISPR. The conformity of the sample is directly established by the applicable limits values. This table includes all uncertainties maximum feasible for testing in the laboratory, whether or not made in this report*

Note - L'incertitude de mesure instrumentale est déterminée selon la CISPR 16-4-2. / *The instrumentation measurement uncertainty is determined according to CISPR16-4-2*