Accreditation
N°1-1633
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Template : March 5th, 2024

TEST REPORT

N°: **21359071-798084-A (FILE#7740639)** Version: **02**

Subject **Electromagnetic compatibility tests according to the standards:**
FCC CFR 47 Part 15, Subpart B
ANSI C63.4 / ANSI C63.4a
ICES-003

Issued to

JAY ELECTRONIQUE
ZAC La Batie – Rue Champrond
38330 - ST ISMIER
FRANCE

Apparatus under test

Product	**Wireless safety logic signal transmission system**
Trade mark	**CONDUCTIX wampfler**
Manufacturer	**Jay Electronique**
Model under test	**RSEFBox - RSB6A1040060N-1**
Serial number	**231227401**
FCCID	**OQMRSEFBOX**
IC	**3393A-RSEFBOX**

Conclusion See Test Program chapter

Test date	March 05, 2024 to March 22, 2024
Test location	LCIE Grenoble
FCC Test site	FR0008 - 197516 (MOI)
ISED Test site	6500A (MOI)
Sample receipt date	March 05, 2024
Composition of document	23 pages
Document issued on	April 29, 2024

Written by :
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Approved by :
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PUBLICATION HISTORY

Version	Date	Author	Modification
01	April 12, 2024	Jonathan SARTO	Creation of the document
02	April 29, 2024	Jonathan SARTO	Address modification

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) / ANSI C63.4a (2017)**
- ✓ **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 / ICES-003**	**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 @3m**		
	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 30MHz-1GHz **ICES-003**	**Access: Enclosure port of ancillary equipment**			**PASS**
	Frequency	**Quasi-peak @3m**		
	30MHz-88MHz	40.0 dBµV/m		
	88MHz-216MHz	43.5 dBµV/m		
	216MHz-230MHz	46.0 dBµV/m		
	230MHz-960MHz	47.0 dBµV/m		
	Above 960MHz	54.0 dBµV/m		
Radiated emissions 1GHz-14GHz* **FCC §15.109 / ICES-003**	**Access: Enclosure port of ancillary equipment**			**PASS**
	Frequency	**Peak @3m**	**Average @3m**	
	1- 14GHz	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. If this test is covered by the COFRAC accreditation, the declaration of conformity for product standard only are carried out outside the framework of accreditation.
***§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. INFORMATIONS

An internal switch of the antennas allows for sequential transmission on one and then the other, never both simultaneously.
The antennas are connected to the RSEFBox using cables of at least 30 meters, with a minimum attenuation of 4.35 dB
All tests were conducted with this minimal attenuation..

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Ph: +44 (0) 1727 845 750 Email: info@gemcable.co.uk www.gemcable.co.uk

GBC600 Low Loss Coax Cable

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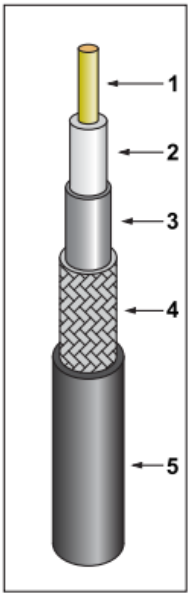


- Jumper Assemblies in Wireless Communications Systems
- Short Antenna Feeder Runs
- Any application (e.g. WLL, GPS, LMR, WLAN, WISP, WiMax, SCADA, Mobile Antennas) requiring an easily routed low loss RF cable

Construction Specifications		
1 Inner Conductor	Bare Copper Clad Aluminium	4.47mm
2 Dielectric	Physical Foam Polyethylene	11.56mm
3 Outer Conductor	Bonded Aluminium Foil	11.71mm
4 Overall Braid	Tinned Copper	12.45mm
5 Jacket	Black Polyethylene	14.99mm

Electrical Specifications	
1 Impedance	50 Ω
2 Capacitance	76.6pF/M (23.4pF/ft)
3 Velocity of Propagation	87%
4 Voltage Withstand	4000 VDC
5 Max Operating Frequency	10.3 GHz

Environmental Specifications	
1 Bending Radius Static	38.1mm (1.50")
2 Bending Radius Repeated	152.4mm (6.0")
3 Weight	200 Kg/Km

LSZH Version Also Available

Frequency (MHz)	150	220	450	900	1500	1800	2000	2500	3000	5800
Attenuation dB/100m	3.2	3.9	5.6	8.2	10.9	12.1	12.8	14.5	16.1	23.8
Avg. Power kW	2.41	1.97	1.35	0.93	0.70	0.63	0.59	0.52	0.47	0.32

Connectors*

N Type Crimp Plug | TNC Crimp Plug | SMA Crimp Plug | N Type Clamp Plug | N Type Clamp Socket

*Only A Selection of Connectors Shown, More Available From Stock

We Manufacture Your Cable Assemblies To Your Spec

Unit C, 156 St. Albans Road, Sandridge, St. Albans, Herts. AL4 9LP

2.2. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES)

Equipment under test (EUT):

Model under test:	**RSEFBox - RSB6A1040060N-1**
Serial Number:	**231227401**

Antenna reference: Solwise **MNT-2409N**

Antenna reference: **Pasternack PE51OM1026**

Antenna reference :: Amphenol CXL2400-3LW/m

Dimensions:	400cm x 230cm x 540cm (Length x Width x Height)
Type:	Table-Top

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	24VDC	-	-

NC: Not communicated by provider

Earth:

Access	Type	Length (m)	Width (m)	Thickness (m)	Under test	Comments
None						

NC: Not communicated by provider

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Supply1	2 Wires in industrial connector	3	No	No	Yes	/
Access1	Industrial connector16C:Power supply - 4 dry Contacts - 4Inputs-2 outputs- RS232-Earth	1.8	No	No	No	/
Access2	2 RF outputs - N connector	/	No	Yes	No	/

NC: Not communicated by provider

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop LENOVO	L460	/	/
Emergency stop	/	/	RS232 access -2 inputs - 2 Light Indicators

NC: Not communicated by provider

2.3. EUT CONFIGURATION

Hardware information			
Highest internal frequency (PLL, Quartz, Clock, Microprocessor…):	**$F_{Highest}$:**	**52**	**MHz**
Firmware (if applicable):	**V. :**	15	
Software (if applicable):	**V. :**	/	

NC: Not communicated by provider

Running mode n°1:

Setup:

EUT is powered by 24VDC and it's in permanent emission.

2.4. EQUIPMENT MODIFICATIONS DURING THE TESTS

None

2.5. 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

2.6. TEST DISTANCE EXTRAPOLATION – FCC/ISED

The field strength is extrapolated to the new measurement distance using formula from FCC Part15.31 (f) and §6.5-6.6 RSS-GEN:

Below 30MHz,

$$FS_{\text{limit}} = FS_{\max} - 40\log\left(\frac{d_{\text{limit}}}{d_{\text{measure}}}\right)$$

Above 30MHz,

$$FS_{\text{limit}} = FS_{\max} - 20\log\left(\frac{d_{\text{limit}}}{d_{\text{measure}}}\right)$$

Where:
FS_{limit} is the calculation of field strength at the limit distance, expressed in dBµV/m
FS_{max} is the measured field strength, expressed in dBµV/m
$d_{measure}$ is the distance of the measurement point from the EUT
d_{limit} is the reference limit distance

2.7. CALIBRATION DATE

The calibration intervals are extended at 12+2 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. TEST CONDITIONS

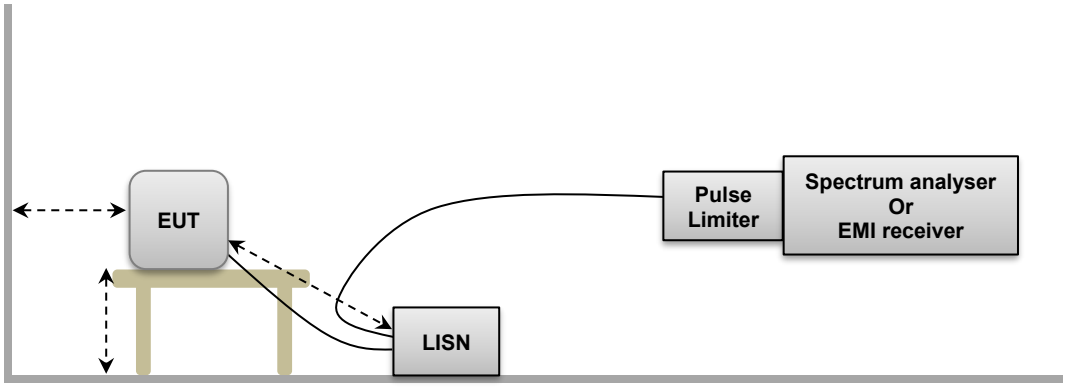
Date of test	:	March 22, 2024
Test performed by	:	Jonathan SARTO
Atmospheric pressure (hPa)	:	994
Relative humidity (%)	:	46
Ambient temperature (°C)	:	23

3.2. TEST SETUP

Test procedure:
ANSI C63.4 & FCC Part 15 subpart B

The EUT and auxiliaries are set 80cm above the ground on the non-conducting table (Table-top equipment) at 80cm from the LISN, the cable has been shorted to 1meter length. The distance between the EUT and the vertical ground plane is 40cm. Measurement is made with a receiver in peak mode. This was followed by a Quasi-Peak, i.e. CISPR measurement for any strong signal. If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary. Interconnecting cables and equipment's were moved to position that maximized emission. The EUT is powered like specified in following table, through a LISN (measure); auxiliaries are powered by another LISN.

Type	Measurement performed:	
☐ AC / ☑ DC (Auxiliary used)	☑ 120VAC/60Hz	☑ 240VAC/50Hz
☐ USB (Laptop auxiliary)	☐ 120VAC/60Hz (Laptop auxiliary)	☐ 240VAC/50Hz (Laptop auxiliary)



Test setup of AC Power Line Conducted Emissions

Photo of AC Power Line Conducted Emissions

3.3. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
BAT EMC	NEXIO	v3.21.0.32	L1000115		
Cable + self	_	_	A5329578	05/22	05/24
EMC comb generator	LCIE SUD EST	_	A3169098		
LISN	ROHDE & SCHWARZ	ENV216	C2320291	07/23	07/24
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	03/23	03/25
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	05/23	05/25
Transient limiter	ROHDE & SCHWARZ	ESH3-Z2	A7122204	08/22	08/24

3.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

3.5. TEST RESULTS – RUNNING MODE N°1

Mains terminals:

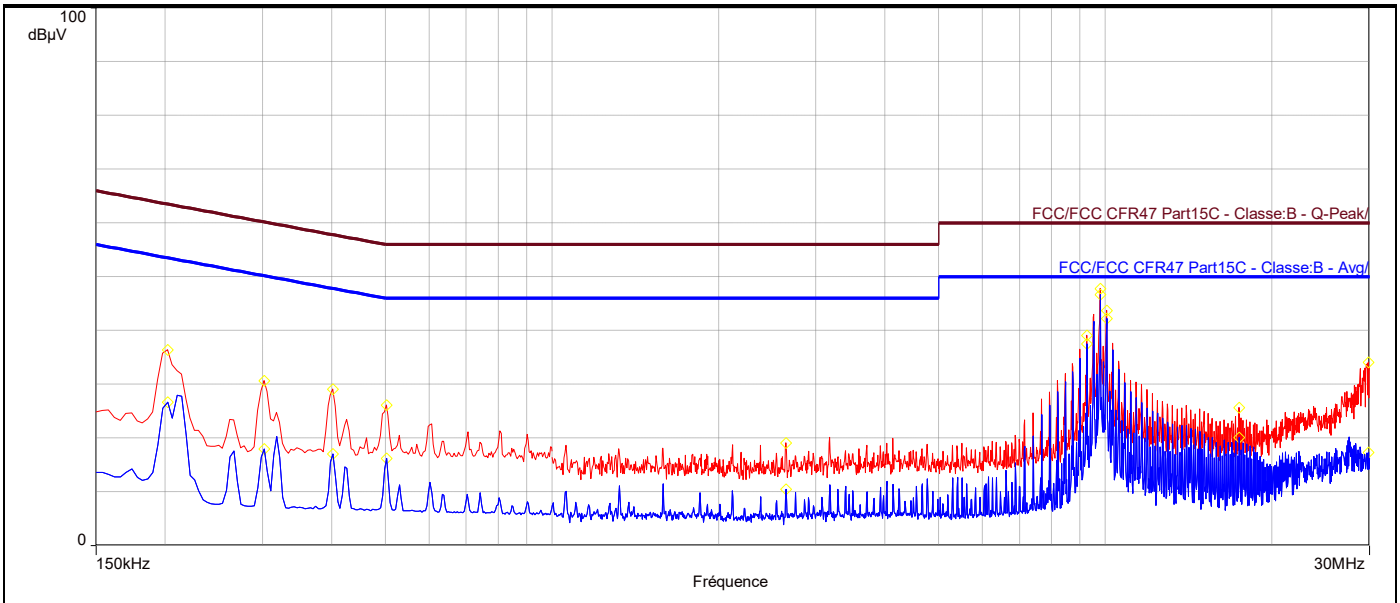
SUPPLY1

Measurements are performed on the phase (L1) and neutral (N) of the power line.

Results: (PEAK detection)

Graph identifier		Line	Comments	
Emc#	1	Phase	120VAC/60Hz	See below
Emc#	2	Neutral	120VAC/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/C	Running mode 1	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	120V/60Hz	**RBW:** 10kHz	**VBW:** 30kHz
Line:	**Phase**	**Trace color & detector:**	PEAK AVG

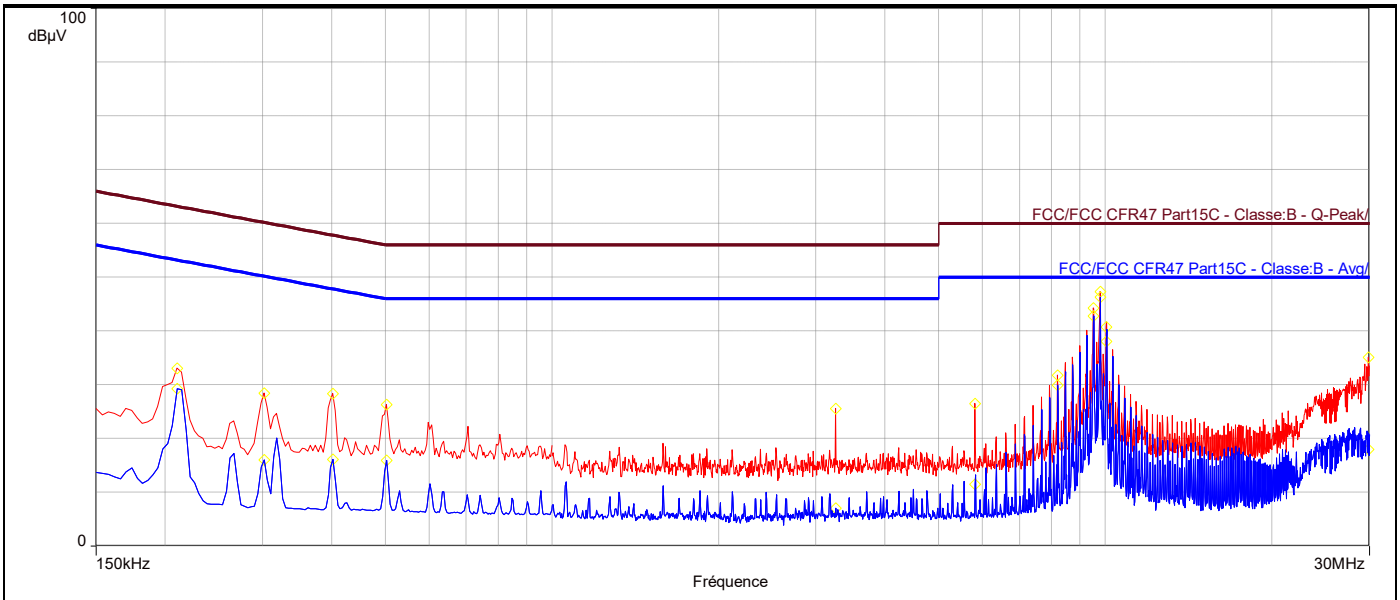


Spurious emissions

Frequency (MHz)	QPeak (dBµV)	Lim.QPeak (dBµV)	QPeak-Lim.QPeak (dB)	CISPR.AVG (dBµV)	Lim.CISPR.AVG (dBµV)	CISPR.AVG-Lim.CISPR.AVG (dB)
0.202	34.1	63.5	**-29.5**	26.6	53.5	**-27.0**
0.302	27.4	60.2	**-32.8**	17.9	50.2	**-32.2**
0.402	25.9	57.8	**-31.9**	17.0	47.8	**-30.8**
0.502	23.7	56.0	**-32.3**	16.2	46.0	**-29.8**
2.648	15.1	56.0	**-40.9**	10.3	46.0	**-35.7**
9.260	37.7	60.0	**-22.3**	37.1	50.0	**-12.9**
9.788	47.0	60.0	**-13.0**	46.6	50.0	**-3.4**

Frequency (MHz)	QPeak (dBµV)	Lim.QPeak (dBµV)	QPeak-Lim.QPeak (dB)	CISPR.AVG (dBµV)	Lim.CISPR.AVG (dBµV)	CISPR.AVG-Lim.CISPR.AVG (dB)
10.052	43.4	60.0	**-16.6**	42.6	50.0	**-7.4**
17.460	21.3	60.0	**-38.7**	18.8	50.0	**-31.2**
29.884	28.1	60.0	**-31.9**	15.9	50.0	**-34.1**

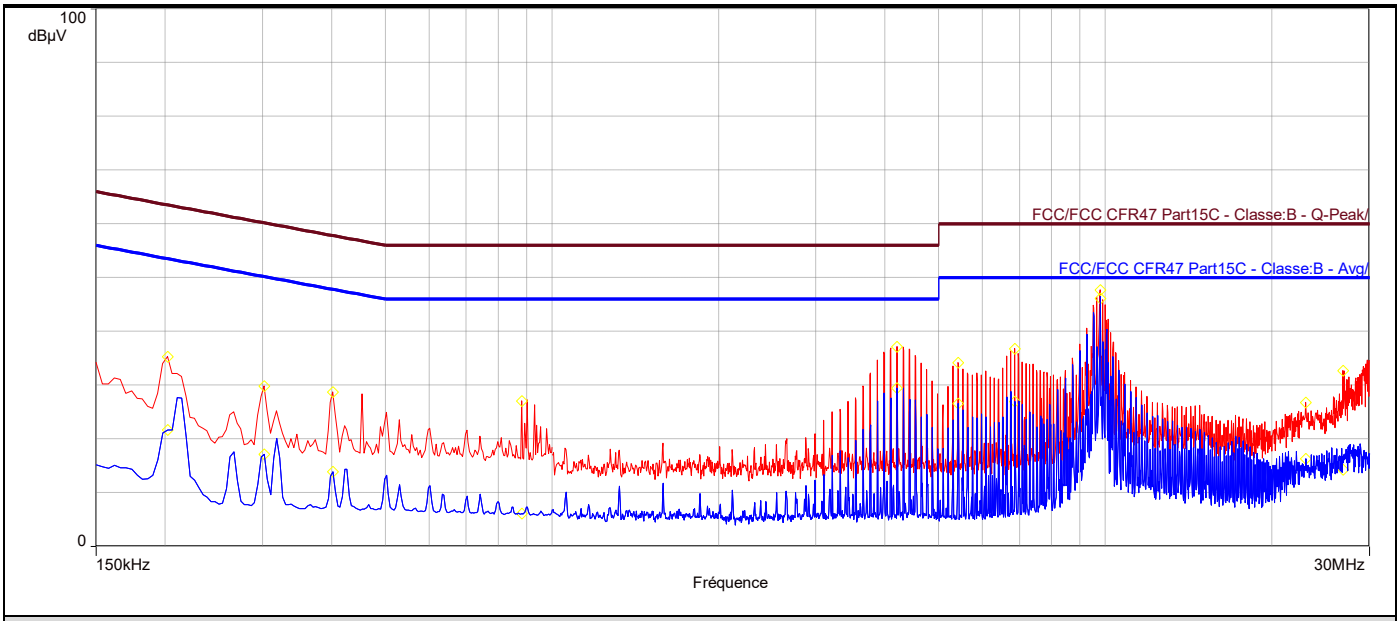
CONDUCTED EMISSIONS			
Graph name:	Emc#2	**Test configuration:**	
Limit:	FCC CFR47 Part15B/C	Running mode 1	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	120V/60Hz	**RBW:** 10kHz	**VBW:** 30kHz
Line:	**Neutral**	**Trace color & detector:**	PEAK AVG



Spurious emissions

Frequency (MHz)	QPeak (dBµV)	Lim.QPeak (dBµV)	QPeak-Lim.QPeak (dB)	CISPR.AVG (dBµV)	Lim.CISPR.AVG (dBµV)	CISPR.AVG-Lim.CISPR.AVG (dB)
0.210	30.6	63.2	**-32.6**	29.1	53.2	**-24.1**
0.302	24.7	60.2	**-35.5**	15.9	50.2	**-34.3**
0.402	24.9	57.8	**-32.9**	16.0	47.8	**-31.8**
0.502	23.3	56.0	**-32.7**	15.6	46.0	**-30.4**
3.256	10.6	56.0	**-45.4**	5.0	46.0	**-41.0**
5.816	14.8	60.0	**-45.2**	11.1	50.0	**-38.9**
8.200	30.5	60.0	**-29.5**	29.9	50.0	**-20.1**
9.520	43.8	60.0	**-16.2**	43.3	50.0	**-6.7**
9.788	46.5	60.0	**-13.5**	46.1	50.0	**-3.9**
10.048	40.0	60.0	**-20.0**	38.5	50.0	**-11.5**
29.868	24.4	60.0	**-35.6**	16.2	50.0	**-33.8**

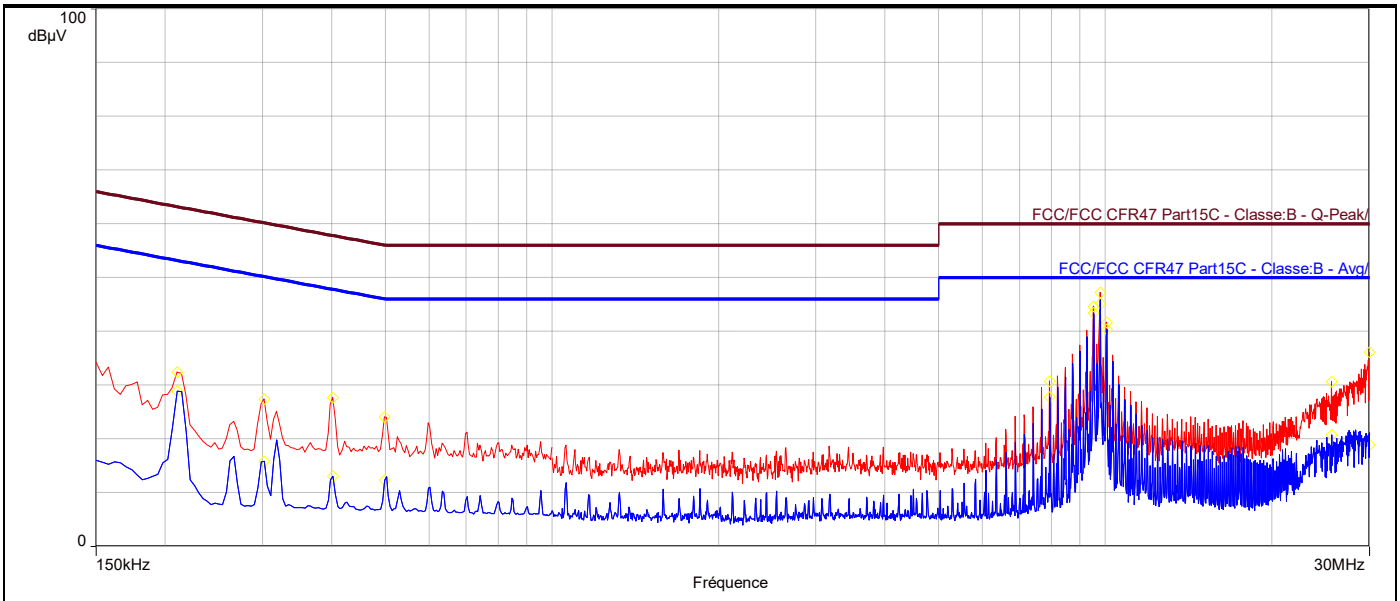
CONDUCTED EMISSIONS					
Graph name:	Emc#3	**Test configuration:**			
Limit:	FCC CFR47 Part15B/C	Running mode 1			
Class:	B				
Frequency range: [150kHz - 30MHz]					
Voltage / Frequency:	240V/50Hz	**RBW:**	10kHz	**VBW:**	30kHz
Line:	**Phase**	**Trace color & detector:**		PEAK AVG	



Spurious emissions

Frequency (MHz)	QPeak (dBµV)	Lim.QPeak (dBµV)	QPeak-Lim.QPeak (dB)	CISPR.AVG (dBµV)	Lim.CISPR.AVG (dBµV)	CISPR.AVG-Lim.CISPR.AVG (dB)
0.202	31.9	63.5	**-31.7**	21.5	53.5	**-32.0**
0.302	26.4	60.2	**-33.8**	16.9	50.2	**-33.3**
0.402	24.8	57.8	**-33.1**	13.8	47.8	**-34.0**
0.882	11.2	56.0	**-44.8**	5.5	46.0	**-40.5**
4.204	10.8	56.0	**-45.2**	5.2	46.0	**-40.8**
5.420	11.6	60.0	**-48.4**	6.1	50.0	**-43.9**
6.856	10.7	60.0	**-49.3**	5.2	50.0	**-44.8**
9.784	46.8	60.0	**-13.2**	46.2	50.0	**-3.8**
23.008	21.1	60.0	**-38.9**	15.5	50.0	**-34.5**
26.868	17.2	60.0	**-42.8**	10.8	50.0	**-39.2**

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



Spurious emissions

Frequency (MHz)	QPeak (dBµV)	Lim.QPeak (dBµV)	QPeak-Lim.QPeak (dB)	CISPR.AVG (dBµV)	Lim.CISPR.AVG (dBµV)	CISPR.AVG-Lim.CISPR.AVG (dB)
0.210	30.2	63.2	**-33.0**	28.8	53.2	**-24.4**
0.302	23.9	60.2	**-36.3**	15.7	50.2	**-34.5**
0.402	23.8	57.8	**-34.1**	13.0	47.8	**-34.8**
0.498	18.8	56.0	**-37.2**	11.9	46.0	**-34.1**
7.936	28.8	60.0	**-31.2**	27.5	50.0	**-22.5**
9.520	44.1	60.0	**-15.9**	43.7	50.0	**-6.3**
9.784	46.4	60.0	**-13.6**	45.8	50.0	**-4.2**
10.052	40.3	60.0	**-19.7**	39.9	50.0	**-10.1**
25.656	26.8	60.0	**-33.2**	21.0	50.0	**-29.0**
29.984	28.7	60.0	**-31.3**	18.6	50.0	**-31.4**

3.6. CONCLUSION

The sample of the equipment **RSEFBox - RSB6A1040060N-1**, Sn : **231227401**, 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

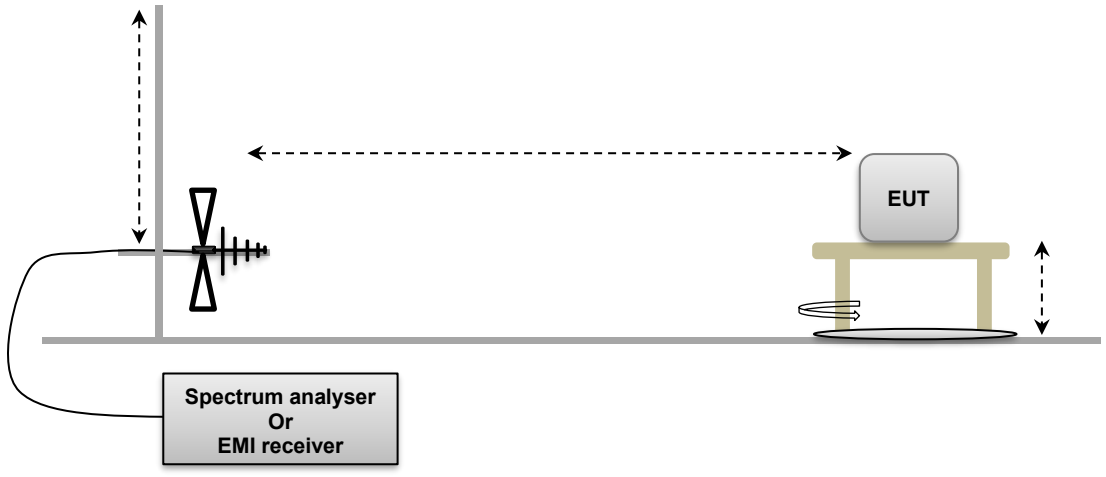
4.1. TEST CONDITIONS

Date of test	:	March 05, 2024
Test performed by	:	Jonathan SARTO
Atmospheric pressure (hPa)	:	989
Relative humidity (%)	:	39
Ambient temperature (°C)	:	23

4.2. TEST SETUP

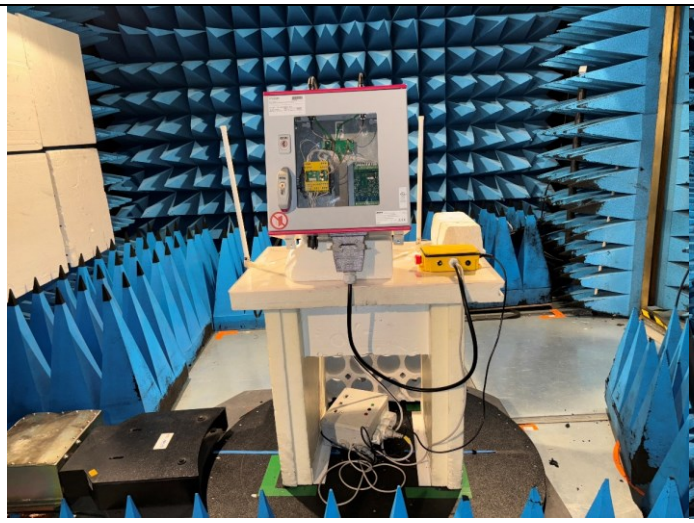
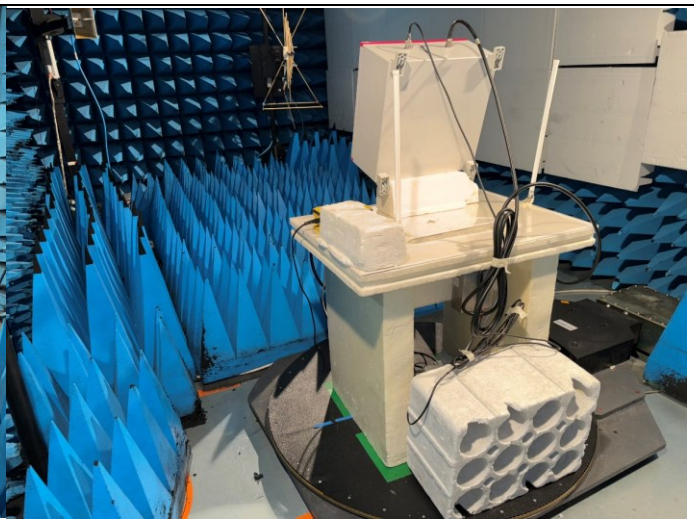
Test procedure:
ANSI C63.4 & FCC Part 15 subpart B

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}.

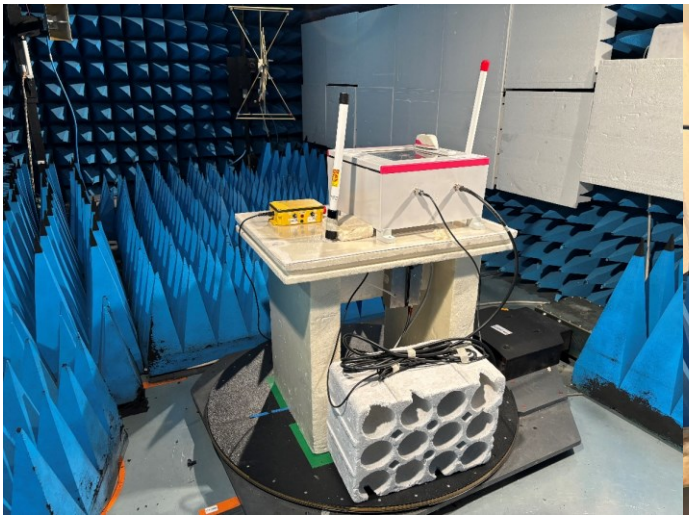
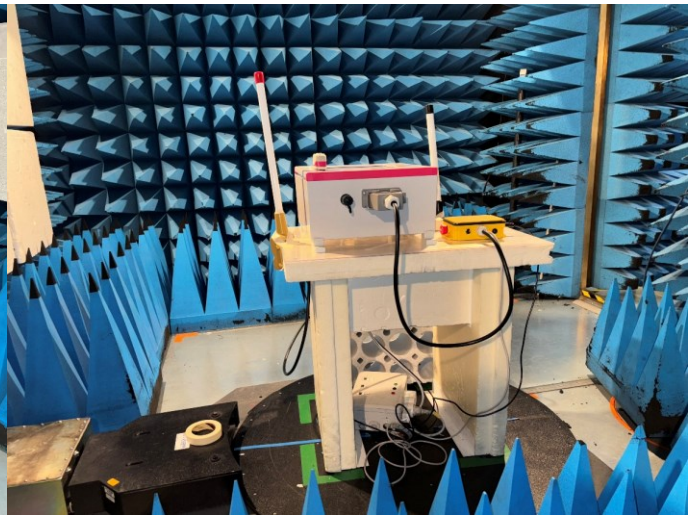


Test setup of Radiated Emission

Same setup is used in semi anechoic chamber during pre-characterization, with a distance of 3m between EUT and antenna.

Axis XY

Axis Z

Photo in anechoic chamber

Axis XY

Axis Z

Photo on OATS

4.3. TEST METHOD

4.3.1. 30MHz –1GHz

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.

Minimal beamwidth of the measurement antenna used: Eaton 94455 / w@10m - 2.6m x 2.6m and Teseq CBL 6111 / w@10m - 14m x 14m

4.3.2. 1GHz – 14GHz:

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: ETS-Lindgren 3115 / w@3m - 2.1m x 2.1m <6GHz / 1.7m x 1.7m <14GHz / 0.9m x 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					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
Amplifier 10MHz - 18GHz	LCIE SUD EST	_	A7102082	05/22	05/24
Antenna Bi-log	AH System	SAS-521-7	C2040180	05/23	05/25
Antenna horn 18GHz	EMCO	3115	C2042027	04/22	04/25
Comb EMR HF	YORK	CGE01	A3169114		
Radiated emission comb generator	BARDET	_	A3169050		
Semi-Anechoic chamber #3 (BF)	SIEPEL	_	D3044017_BF	04/22	04/25
Semi-Anechoic chamber #3 (VSWR)	SIEPEL	_	D3044017_VSWR	04/22	04/25
Table C3	LCIE	_	F2000461		
Turntable chamber (Cage#3)	ETS Lingren	Model 2165	F2000371		
Turntable controller (Cage#3)	ETS Lingren	Model 2090	F2000444		
BAT EMC	NEXIO	v3.21.0.32	L1000115		
Cable 0.75m	-	18GHz	A5329900	08/22	08/24
CONTROLLER	INNCO	CO3000	D3044034		
Filter Matrice	LCIE SUD EST	Combined filters	A7484078	03/23	03/25
SMA Cable 18GHz 0.5m	TELEDYNE	18GHz	A5330060	02/23	06/24
SMA Cable 18GHz 0.5m	TELEDYNE	18GHz	A5330059	02/23	06/24
SMA Cable 18GHz 0.6m	TELEDYNE	18GHz	A5330055	02/23	06/24
SMA Cable 18GHz 3.5m	TELEDYNE	18GHz	A5330058	02/23	06/24
SMA Cable 18GHz 6m	TELEDYNE	18GHz	A5330057	02/23	06/24
Spectrum analyzer	ROHDE & SCHWARZ	FSU 26	A4060058	09/23	09/25
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	05/23	05/25
Antenna Mat (OATS)	ETS Lingren	2071-2	F2000392		
Biconic Antenna	EATON	94455-1	C2040234	05/23	05/25
Cable (OATS)	_	1GHz	A5329623	09/23	09/24
CALCUL_FACTEURS	LCIE SUD EST	V4	L2000035		
Emission Cable	RADIALEX		A5329061	07/23	07/24
Emission Cable	MICRO-COAX	1GHz	A5329656	09/23	09/24
OATS	_	_	F2000409	08/23	08/24
Receiver 20-1000MHz	ROHDE & SCHWARZ	ESVS30	A2642006	05/22	05/24
Table C1/OATS	LCIE	_	F2000445		
Turntable (OATS)	ETS Lingren	Model 2187	F2000403		
Turntable / Mast controller (OATS)	ETS Lingren	Model 2066	F2000372		

4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

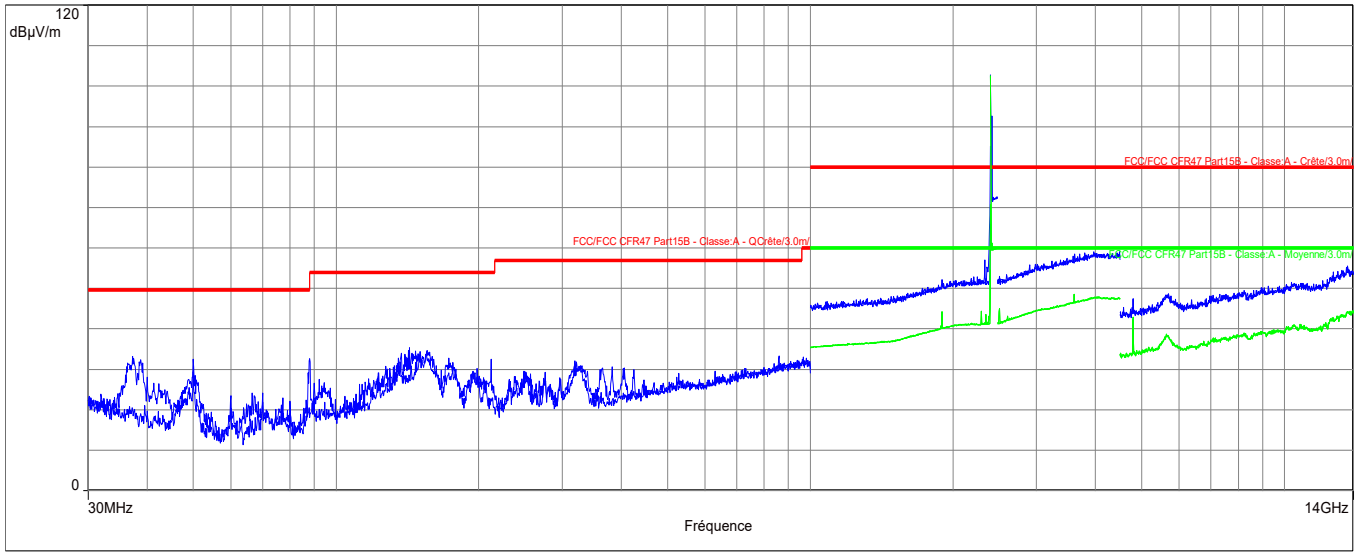
4.6. TEST RESULTS – RUNNING MODE N°1

4.6.1. 30MHz –14GHz

Pre-qualification measurement

Graph identifier	Polarization	EUT position	Comments	
Emr# 1	Horizontal & Vertical	Axis XY	Only worst case graph	See below

RADIATED EMISSIONS		
Graph name:	Emr#1	**Test configuration:**
Limit:	FCC CFR47 Part15B	Running mode 1
Class:	A	
Frequency range: [30MHz - 14GHz]		
Antenna polarization:	H & V	
Azimuth:	0° - 360°	



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	Lim.Q-Peak (dBµV/m)	Polarization	Correction (dB)
142.762	35.3	54.0	Horizontal	23.4
157.410	34.2	54.0	Horizontal	23.1
37.226	33.1	49.6	Vertical	18.0
49.982	32.6	49.6	Vertical	12.0
87.958	32.6	49.6	Vertical	14.4

Frequency (MHz)	Peak (dBµV/m)	Lim.Peak (dBµV/m)	Avg (dBµV/m)	Lim.Avg (dBµV/m)	Polarization	Correction (dB)
2401.879	102.9	80.0	102.6	60.0	Horizontal	35.0
4245.518	58.5	80.0	47.1	60.0	Horizontal	40.7
4804.000	47.3	80.0	42.0	60.0	Horizontal	-19.3
4804.000	47.5	80.0	42.4	60.0	Vertical	-19.3
4241.081	58.7	80.0	47.6	60.0	Vertical	40.7

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)	Transducer Factor (dB)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
35.9660	18.6	QP	V	0	100	14.2	32.8	40.0	**-7.2**
36.3050	18.4	QP	V	0	110	14.1	32.5	40.0	**-7.5**
36.3540	13.5	QP	V	90	110	14.1	27.6	40.0	**-12.4**
43.3375	16.0	QP	V	0	100	13.5	29.5	40.0	**-10.5**
49.9820	16.2	QP	V	350	110	12.1	28.3	40.0	**-11.7**
70.0120	20.4	QP	V	125	120	7.3	27.7	40.0	**-12.3**
86.5000	17.7	QP	V	350	120	11.3	29.0	40.0	**-11.0**
124.5750	23.7	QP	V	0	100	13.6	37.3	43.5	**-6.2**
126.3210	22.2	QP	V	0	120	14.0	36.2	43.5	**-7.3**
146.2840	17.6	QP	V	45	120	18.4	36.0	43.5	**-7.5**
166.5760	16.8	QP	V	0	120	19.3	36.1	43.5	**-7.4**

4.7. CONCLUSION

The sample of the equipment **RSEFBox - RSB6A1040060N-1**, Sn : **231227401**, 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) 150kHz-30MHz *Measurement of conducted disturbances in voltage on the power port (single & three phases)150kHz-30MHz* LISN 50Ω/50µH Capacitive Voltage Probe	 3.3dB 3.7dB	 3.4dB 3.9dB
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*	6.3dB	6.3dB
Mesure du champ électrique rayonné en cage de Faraday anéchoïque de 1GHz à 6GHz *Measurement of radiated electric field in full-anechoic Faraday room From 1GHz à 6GHz*	5.2dB	5.2dB
Mesure du champ électrique rayonné en cage de Faraday anéchoïque de 6GHz à 18GHz *Measurement of radiated electric field in full-anechoic Faraday room From 6GHz to 18GHz*	5.5dB	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.*	6.3dB	6.3dB

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*