TEST REPORT

N°: 138624-679240-A **Version : 02**

Subject	**Electromagnetic compatibility tests according to the standards:** **FCC CFR 47 Part 15, Subpart C** **RSS-247 Issue 1.0**
Issued to	**GROUPE SEB** 112 Chemin du Moulin Carron 69130 – ECULLY FRANCE
Apparatus under test	
Product	Module Bluetooth Low Energy / Bluetooth Low Energy Module
Trade mark	**GROUPE SEB**
Manufacturer	**GROUPE SEB**
Model under test	**PE177-C**
FCC ID	**2AGS8-PE177C**
IC	**20937-PE177C**
Serial number	**RADIO 2 & CEM 2**
Conclusion	See page 4
Test date	November 25h, 2015 to November 27th, 2015
Test location	MOIRANS
IC Test site	6500A-1 & 6500A-3
Composition of document	69 pages
Document issued on	May 20, 2016

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PUBLICATION HISTORY

Version	Date	Author	Modification
01	January 4th, 2016	Jonathan PAUC	Creation of the document
02	May 20, 2016	Jonathan PAUC	Modification of address

SUMMARY

1. TEST PROGRAM

Standard:

- **FCC Part 15, Subpart C 15.247**
- **ANSI C63.10 (2013)**
- **RSS-247 Issue 1.0 – May 2015**
- **RSS-Gen Issue 4 – Nov 2014**
- **558074 D01 DTS Measurement Guidance v03r03**

EMISSION TEST	LIMITS			RESULTS
Limits for conducted disturbance at mains ports 150kHz-30MHz	**Frequency**	**Quasi-peak value (dBµV)**	**Average value (dBµV)**	☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
	150-500kHz	66 to 56	56 to 46	
	0.5-5MHz	56	46	
	5-30MHz	60	50	
Radiated emissions 9kHz-30MHz *CFR 47 §15.209 (a)* *CFR 47 §15.247 (d)* *RSS-247 §5.5*	**Measure at 300m** 9kHz-490kHz : 67.6dBµV/m /F(kHz) **Measure at 30m** 490kHz-1.705MHz : 87.6dBµV/m /F(kHz) 1.705MHz-30MHz : 29.5 dBµV/m			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Radiated emissions 30MHz-25GHz* *CFR 47 §15.209 (a)* *CFR 47 §15.247 (d)* *RSS-247 §5.5* ***Highest frequency : 32MHz*** ***(Declaration of provider)***	**Measure at 3m** 30MHz-88MHz : 40 dBµV/m 88MHz-216MHz : 43.5 dBµV/m 216MHz-960MHz : 46.0 dBµV/m Above 960MHz : 54.0 dBµV/m			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Bandwidth 6dB *CFR 47 §*15.247 (a) (2) *RSS-247 §5.2.1*	**At least 500kHz**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Power spectral Density *CFR 47 §15.247 (e)* *RSS-247 §5.2.2*	**Limit: 8dBm/3kHz**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Maximum Peak Output Power *CFR 47 §*15.247 (b) *RSS-247 §5.4.4*	**Limit: 30dBm** Conducted or Radiated measurement			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Band Edge Measurement *CFR 47 §15.209 (a)* *CFR 47 §15.247 (d)* *RSS-247 §5.5*	**Limit: -20dBc or** **Radiated emissions limits in restricted bands**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Occupied bandwidth *RSS-Gen §4.6.1*	**No limit**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Receiver Spurious Emission** *RSS-Gen §4.10*	**See RSS-Gen §4.10**			☐ **PASS** ☐ **FAIL** ☑ **NA** ☐ **NP**

***§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.

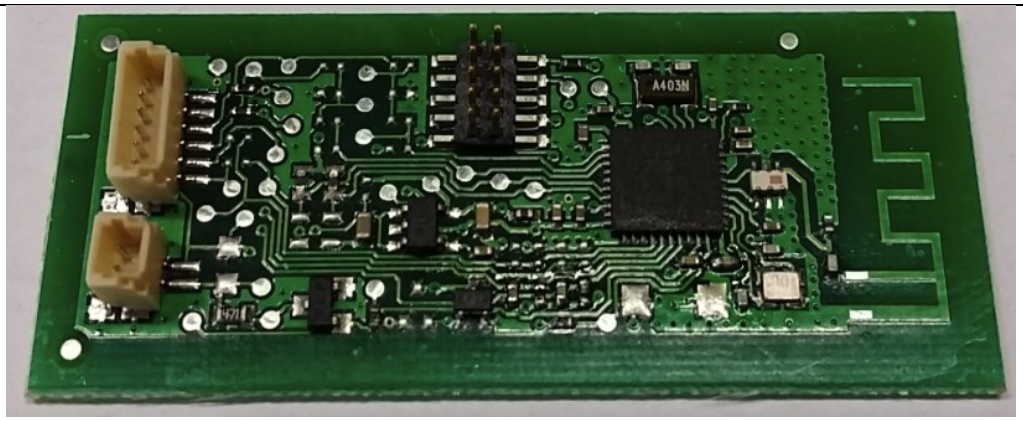
If the highest frequency of the internal sources of the testing device is above 1 GHz, measurement must be only performed until 5 times the highest frequency or 40 GHz, while taking smallest of both.

2. SYSTEM TEST CONFIGURATION

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):

PE177-C **Serial Number: RADIO 2 & CEM 2**



Photography of EUT

Power supply:
During all the tests, EUT is supplied by V_{nom}: 5VDC
For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference / Sn	Comments
Supply1	☐ AC ☑ DC ☐ Battery	5 Vdc	/	/

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Supply1	Power supply and serial communication	1m	☑	☐	☑	
Access1	LED Output	1m	☑	☐	☑	

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Linear power supply	TTI PL320	A7040FDXFF059	/
Smartphone	SAMSUNG S3 – GT-I9515	RF8F50DXF2F	/

Equipment information:

Bluetooth LE Type:	☑ **BLE**	☑ **v4.0**	☐ **v4.1**	☐ **v4.2**
Frequency band:	[2400 – 2483.5] MHz			
Spectrum Modulation:	☑ DSSS (Tested like it)			
Number of Channel:	40			
Spacing channel:	2MHz			
Channel bandwidth:	1MHz			
Antenna Type:	☑ Integral	☐ External	☐ Dedicated	
Antenna connector:	☐ Yes	☑ No	☐ Temporary for test	
Transmit chains:	☑ 1			
	Single antenna			
	Gain 1: 2dBi	Gain 2: XdBi		
Beam forming gain:	No			
Receiver chains	1			
Type of equipment:	☐ Stand-alone	☑ Plug-in	☐ Combined	
Ad-Hoc mode:	☑ Yes	☐ No		
Adaptivity mode:	☐ Yes (Load Based)	☐ Off mode	☑ No	
	Clear Channel Assessment Time:		/	
Duty cycle:	☑ Continuous duty	☐ Intermittent duty	☐ 100% duty	
Equipment type:	☑ Production model	☐ Pre-production model		
Operating temperature range:	Tmin:	☑ -20°C	☐ 0°C	☐ X°C
	Tnom:	20°C		
	Tmax:	☐ 35°C	☐ 55°C	☑ 80°C
Type of power source:	☐ AC power supply	☑ DC power supply	☐ Battery	
Operating voltage range:	Vnom:	☐ 230V/50Hz	☑ 5Vdc	

CHANNEL PLAN			
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
Cmin: 0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
Cmid: 19	2440	**Cmax: 39**	2480

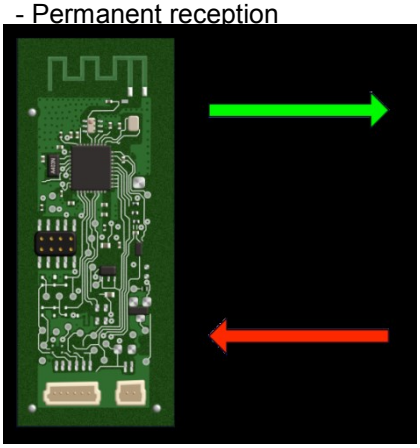
DATA RATE		
Data Rate (Mbps)	**Modulation Type**	**Worst Case Modulation**
1	GFSK	☑

2.2. EUT CONFIGURATION

The EUT is set in the following modes during tests:

TX/RX Mode:

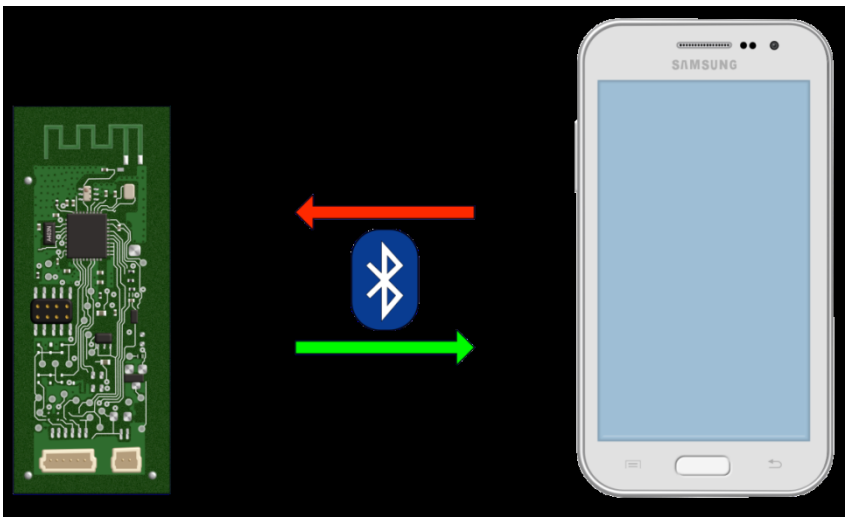
- Permanent emission with modulation on a fixed channel in the data rate that produced the highest power
- Permanent reception



EUT sample Firmware : HostTestRelease_PTMMode_1_4_0
EUT sample Serial number : RADIO 2

Functional Mode :

A continuous communication is performed between
EUT and Smartphone (Master Control Panel V3.4.1)



EUT sample Firmware: PE177C_CoffeeConnect_v1_1_20151124
EUT sample Serial number: CEM 2

2.3. EQUIPMENT MODIFICATIONS

☑ None ☐ Modification:

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

Assume a receiver reading of 52.5dBµV is obtained. The antenna factor of 7.4 and a cable factor of 1.1 are added. The amplifier gain of 29dB is subtracted, giving a field strength of 32 dBµV/m.
FS = 52.5 + 7.4 + 1.1 – 29 = 32 dBµV/m
The 32 dBµV/m value can be mathematically converted to its corresponding level in µV/m.
Level in µV/m = Common Antilogarithm [(32dBµV/m)/20] = 39.8 µV/m.

2.5. 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. CONDUCTED EMISSION DATA

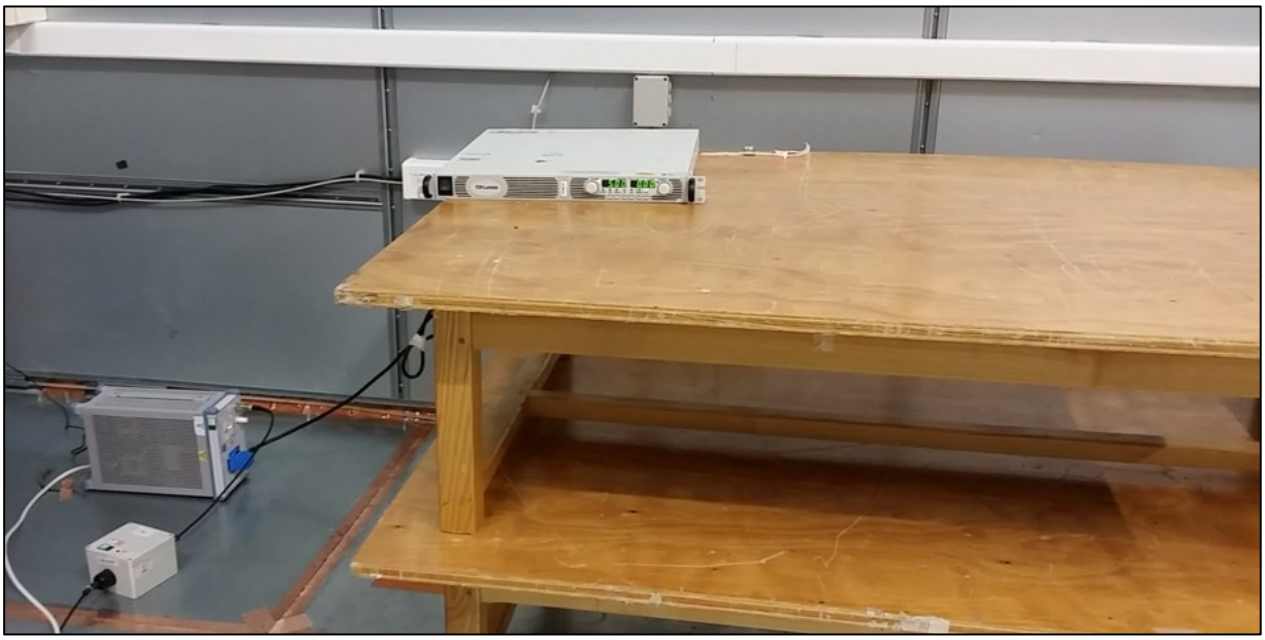
3.1. ENVIRONMENTAL CONDITIONS

Date of test	: December 22nd,2015
Test performed by	:J.PAUC
Atmospheric pressure (hPa)	:990
Relative humidity (%)	:31
Ambient temperature (°C)	:21

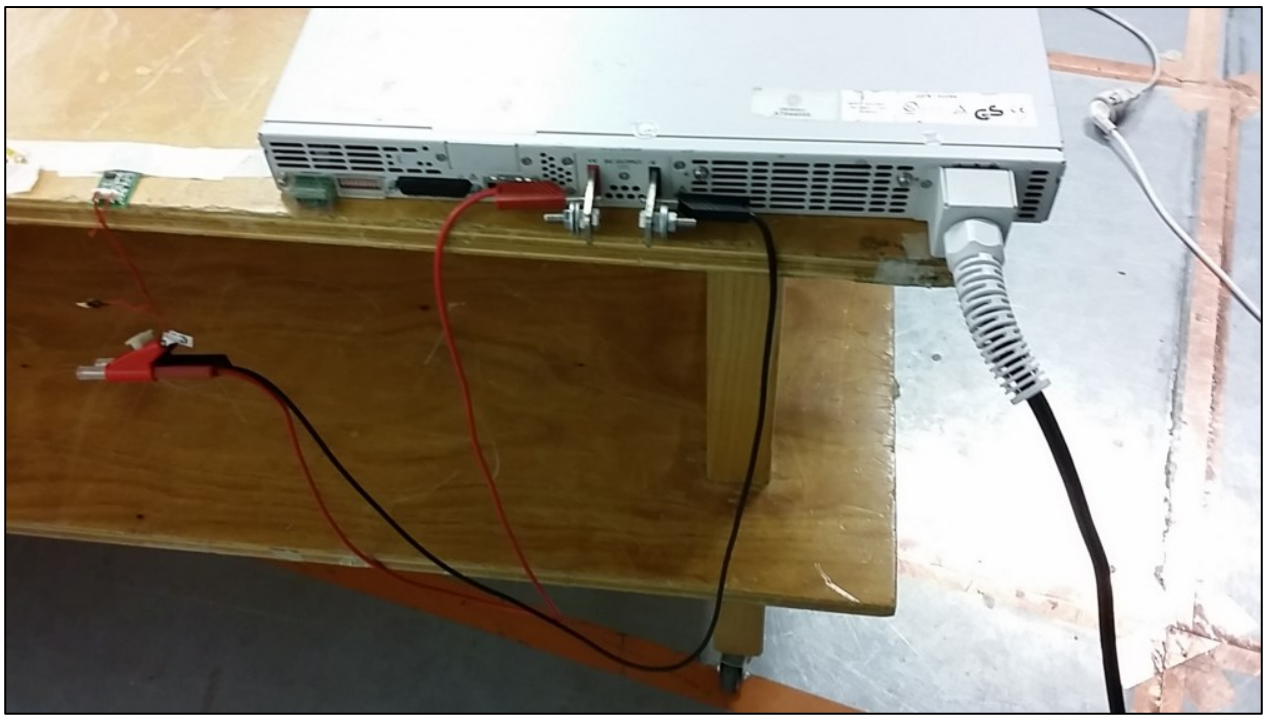
3.2. TEST SETUP

Mains terminals
The EUT and auxiliaries are set:
☑ 80cm above the ground on the non-conducting table (Table-top equipment)
☐ 10cm above the ground on isolating support (Floor standing equipment)
The distance between the EUT and the LISN is 80cm. The EUT is 40cm away for the vertical ground plane.

The EUT is powered by V_{nom}.
The EUT is powered through a LISN (measure). Auxiliaries are powered by another LISN.
EUT is set in functional mode see §2.2



Test setup



Test setup

3.3. TEST METHOD

The product has been tested according to ANSI C63.10 and FCC Part 15 subpart C. The product has been tested with 120V/60Hz power line voltage and compared to the FCC Part 15 limits. Measurement bandwidth was 9kHz from 150kHz to 30MHz. 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. The LISN (measure) is 50Ω / 50µH. The Peak data are shown on plots in annex 1. Quasi-Peak and Average measurements are detailed in a table with frequencies and levels measured. Interconnecting cables and equipment's were moved to position that maximized emission. A summary of the worst case emissions found in all test configurations and modes is shown on the following page.
Measurements are performed on the phase (L1) and neutral (N) of power line voltage. Graphs are obtained in PEAK detection. Measures are also performed in Quasi-Peak and Average for any strong signal.

3.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + self	-	-	A5329578	07/15	07/16
LISN	RHODE & SCHWARZ	ENV216	C2320123	02/15	02/16
LISN	RHODE & SCHWARZ	ENV216	C2320291	11/15	11/16
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	04/15	04/16
Thermo-hygrometer (PM2)	OREGON	BAR916HG-G	B4206011	09/15	09/16
Transient limiter	HEWLETT PACKARD	11947A	A4049061	02/15	02/16
Linear Power supply	TDK-LAMBDA	GEN30-50	A7044055	-	-

3.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

3.6. TEST RESULTS

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

Measure on L1: graph **Emc#1** (see annex 1)
Measure on N: graph **Emc#2** (see annex 1)

3.7. ONCLUSION

Conducted emission data measurement performed on the sample of the product PE177-C, SN: CEM 2in configuration and description presented in this test report, show levels above the FCC CFR 47 Part 15 and RSS-247 limits.

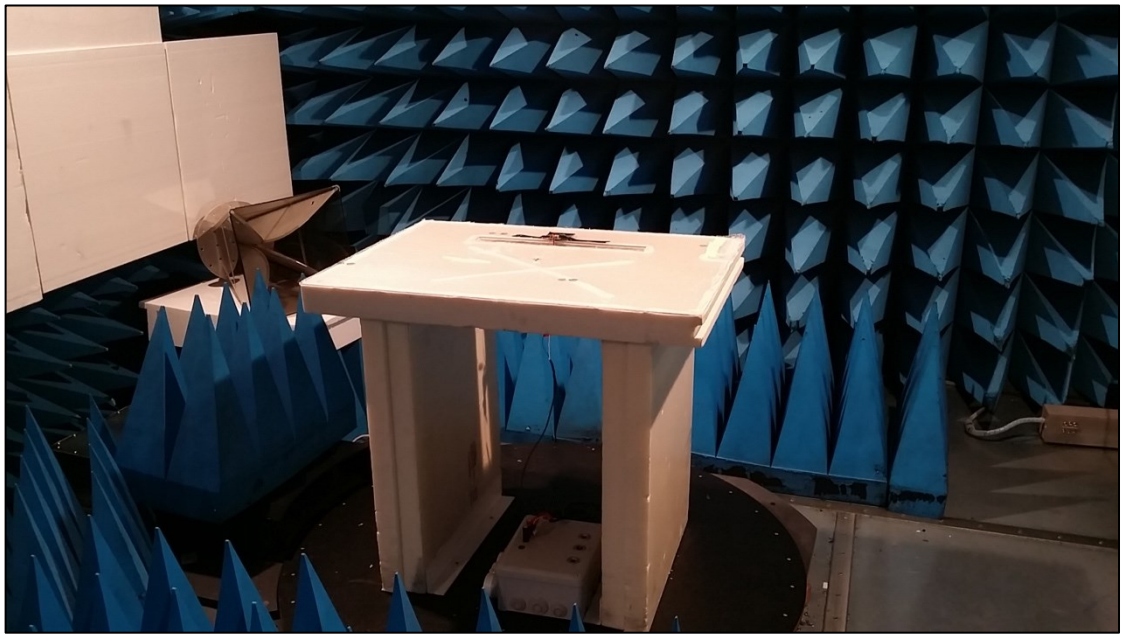
4. RADIATED EMISSION DATA

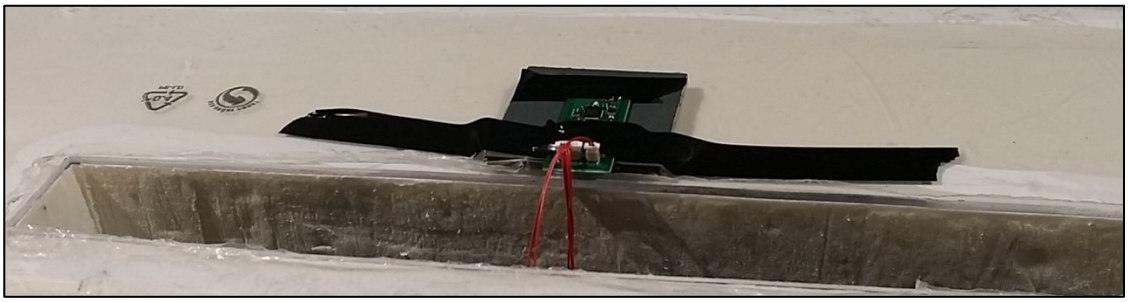
4.1. ENVIRONMENTAL CONDITIONS

Date of test :November 27th,2015
Test performed by :J.PAUC
Atmospheric pressure (hPa) :1001
Relative humidity (%) :23
Ambient temperature (°C) :23

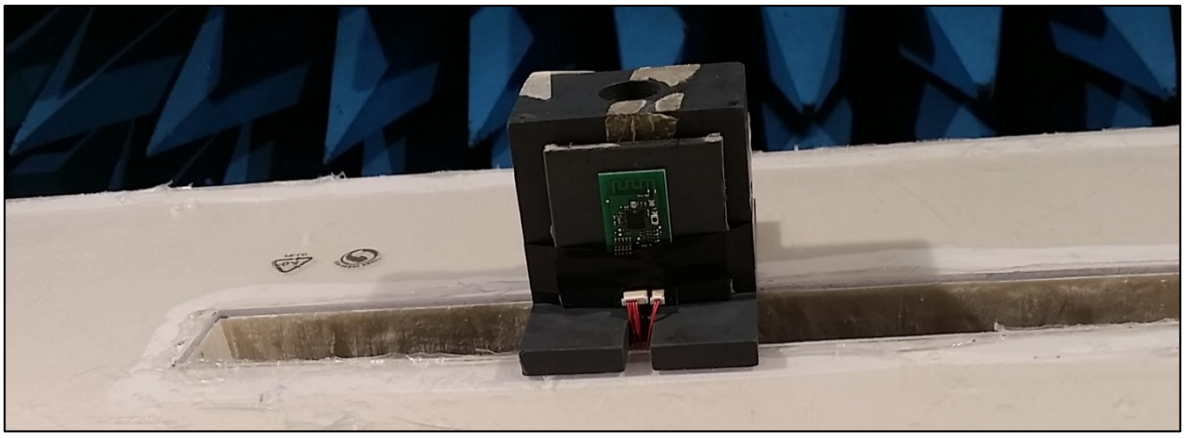
4.2. TEST SETUP

The installation of EUT is identical for pre-characterization measures in a 3 meters semi- anechoic chamber and for measures on the 10 meters Open site.
The EUT and auxiliaries are set:
☑ 80cm above the ground on the non-conducting table (Table-top equipment) - Below 1GHz
☑ 150cm above the ground on the non-conducting table (Table-top equipment) - Above 1GHz
☐ 10cm above the ground on isolating support (Floor standing equipment)
The EUT is powered by V_{nom}.

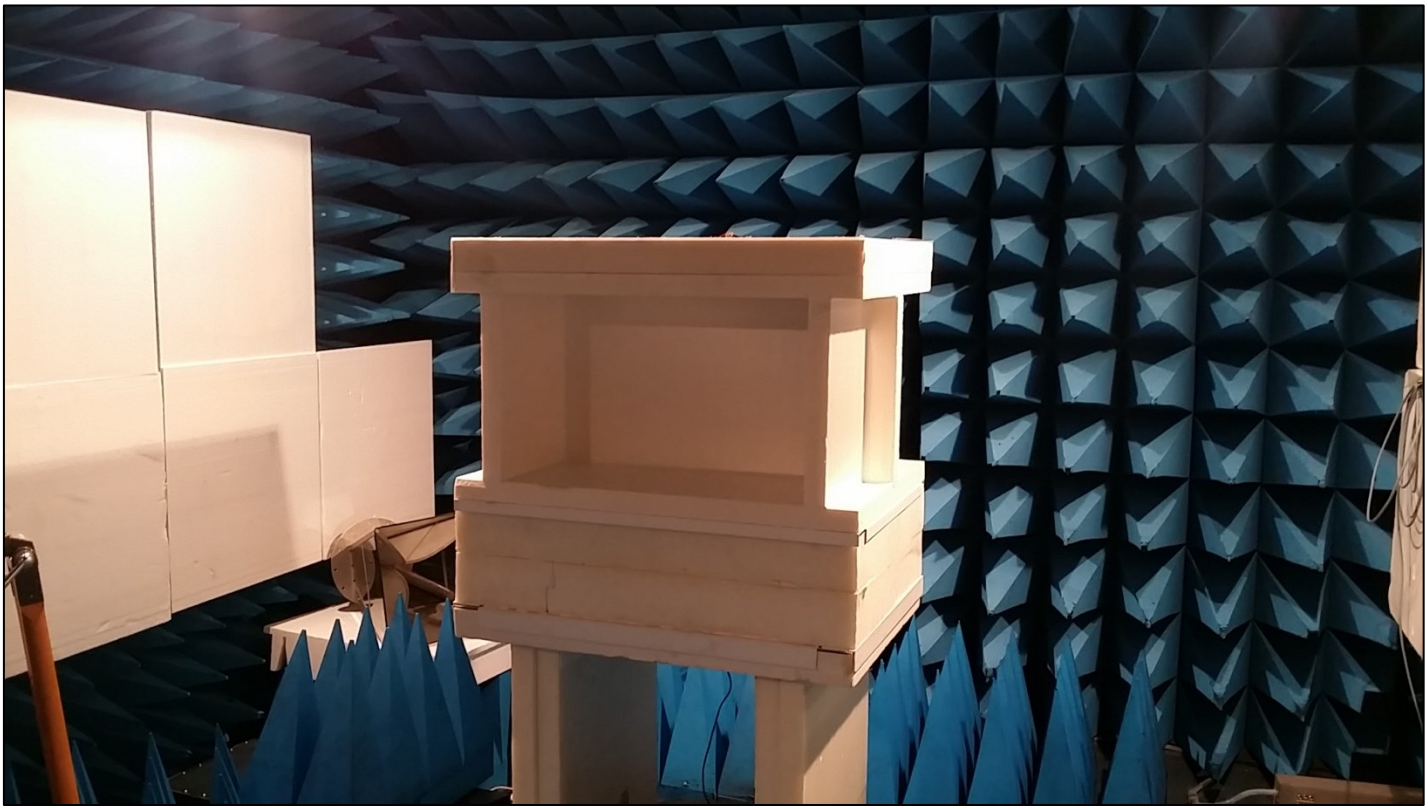




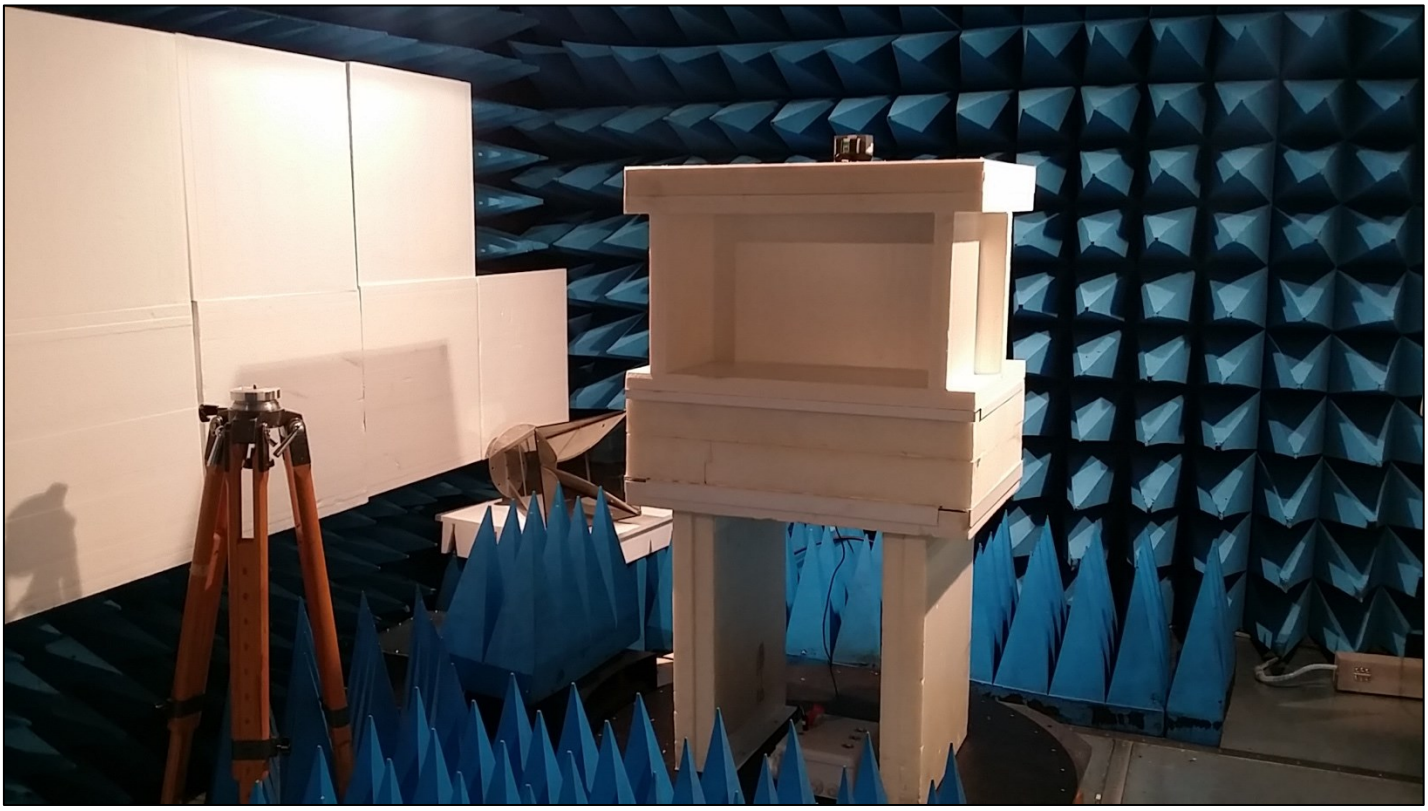
Test setup in anechoic chamber – XY Pos (30MHz – 1GHz)

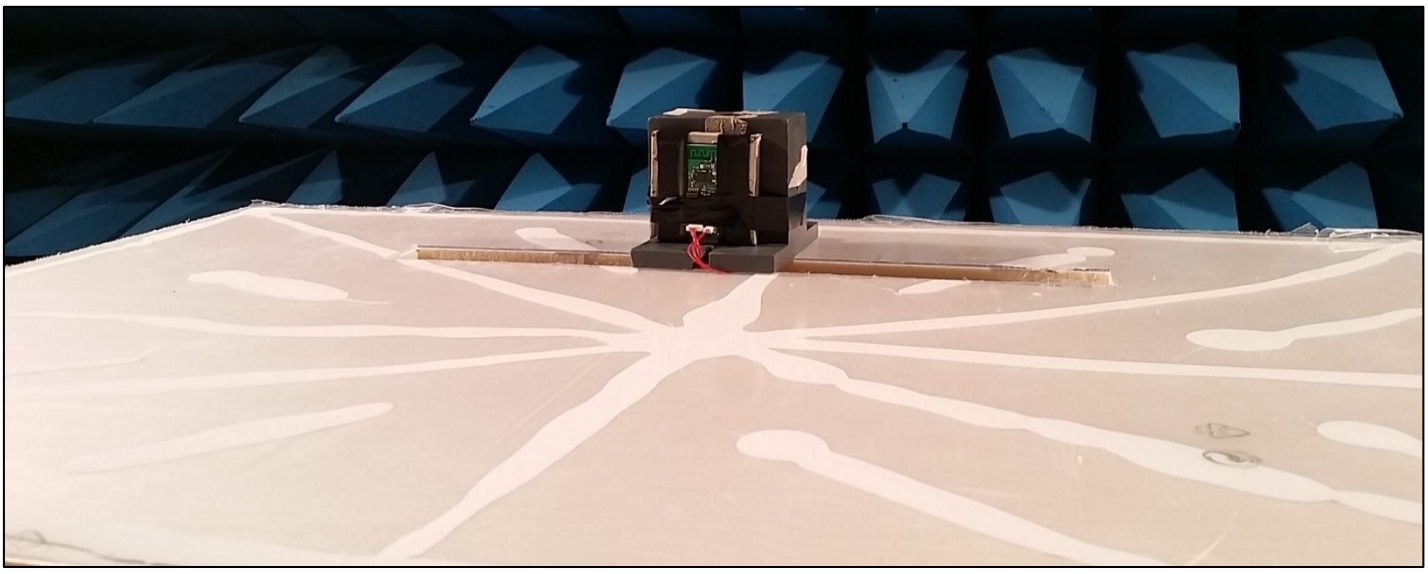


Test setup in anechoic chamber – Z Pos (30MHz – 1GHz)



Test setup in anechoic chamber – XY Pos (>1GHz)





Test setup in anechoic chamber – Z Pos (>1GHz)

4.3. TEST METHOD

The product has been tested according to ANSI C63.10, FCC part 15 subpart C.

Pre-characterisation measurement: (30MHz – 12.75GHz)
A pre-scan of all the setup has been performed in a 3 meters semi-anechoic chamber for frequency from 30MHz to 1GHz. Test is performed in horizontal (H) and vertical (V) polarization, the loop antenna was rotated during the test to maximize the emission measurement. Continuous linear turntable azimuth search was performed with 360 degrees range. Measurement performed on all axis of EUT used in normal configuration.
The pre-characterization graphs are obtained in PEAK detection and PEAK/AVERAGE from 1GHz to 12.75GHz.

Characterization on 10 meters open site from 30MHz to 1GHz:
Radiated Emissions were measured on an open area test site. A description of the facility is on file with the FCC. The product has been tested at a distance of **10 meters** from the antenna and compared to the FCC part 15 subpart C limits. Measurement bandwidth was 9kHz below 30MHz and 120kHz from 30 MHz to 1GHz. Test is performed in horizontal (H) and vertical (V) polarization, the loop antenna was rotated during the test to maximize the emission measurement. The height antenna is varied from 1m to 4m. Continuous linear turntable azimuth search was performed with 360 degrees range. Measurement 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.
Frequency list has been created with anechoic chamber pre-scan results.

Characterization on 3 meters full anechoic chamber from 1GHz to 12.75GHz:
The product has been tested at a distance of **3 meters** from the antenna and compared to the FCC part 15 subpart C limits. Measurement bandwidth was 1MHz from 1GHz to 12.75GHz.
Test is performed in horizontal (H) and vertical (V) polarization. Continuous linear turntable azimuth search was performed with 360 degrees range. Measurement 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.The height antenna is
☐ On mast, varied from 1m to 4m
☑ Fixed and centered on the EUT (EUT smaller than the beamwidth of the measurement antenna, ANSI C63.10 §6.6.5)
Frequency list has been created with anechoic chamber pre-scan results.

4.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Amplifier 1-13GHz	LCIE SUD EST	-	A7102067	10/14	11/15*
Antenna Bi-log	CHASE	CBL6111A	C2040172	06/15	06/17
Antenna horn	EMCO	3115	C2042027	11/15	11/16
Cable Measure @3m 18GHz	-	-	A5329038	08/15	11/16
Cable Measure @3m	-	-	A5329206	04/15	04/16
Semi-Anechoic chamber #3	SIEPEL	-	D3044017	-	-
Radiated emission comb generator	BARDET	-	A3169050	-	-
HF Radiated emission comb generator	LCIE SUD EST	-	A3169088	-	-
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060051	11/15	11/16
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	04/15	04/16
Thermo-hygrometer (PM2)	OREGON	BAR916HG-G	B4206011	09/15	09/16
Turntable chamber (Cage#3)	ETS Lingren	Model 2165	F2000371	-	-
Turntable controller (Cage#3)	ETS Lingren	Model 2090	F2000444	-	-

4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

4.6. TEST RESULTS

4.6.1. Pre-characterization at 3 meters [30MHz-1GHz]

See graphs for 30MHz-1GHz:

Graph identifier		Polarization	Mode	EUT position	Channel	Comments
Emr#	1	H & V	TX	Axis XY	Min	See annex 1
Emr#	2	H & V	TX	Axis XY	Max	See annex 1
Emr#	3	H & V	TX	Axis Z	Min	See annex 1
Emr#	4	H & V	TX	Axis Z	Max	See annex 1
Emr#	5	H & V	RX	Axis XY	Min	See annex 1
Emr#	6	H & V	RX	Axis XY	Max	See annex 1
Emr#	7	H & V	RX	Axis Z	Min	See annex 1
Emr#	8	H & V	RX	Axis Z	Max	See annex 1
Emr#	9	H & V	Functional	Axis XY	/	See annex 1
Emr#	10	H & V	Functional	Axis Z	/	See annex 1

4.6.2. Pre-characterization at 3 meters [1GHz-12.75GHz]

See graphs for 1GHz-12.75GHz:

Graph identifier		Polarization	Mode	EUT position	Channel	Comments
Emr#	11	H	TX	Axis XY	Min	See annex 1
Emr#	12	V	TX	Axis XY	Min	See annex 1
Emr#	13	H	TX	Axis XY	Max	See annex 1
Emr#	14	V	TX	Axis XY	Max	See annex 1
Emr#	15	H	TX	Axis Z	Min	See annex 1
Emr#	16	V	TX	Axis Z	Min	See annex 1
Emr#	17	H	TX	Axis Z	Max	See annex 1
Emr#	18	V	TX	Axis Z	Max	See annex 1
Emr#	19	H	RX	Axis XY	Min	See annex 1
Emr#	20	V	RX	Axis XY	Min	See annex 1
Emr#	21	H	RX	Axis XY	Max	See annex 1
Emr#	22	V	RX	Axis XY	Max	See annex 1
Emr#	23	H	RX	Axis Z	Min	See annex 1
Emr#	24	V	RX	Axis Z	Min	See annex 1
Emr#	25	H	RX	Axis Z	Max	See annex 1
Emr#	26	V	RX	Axis Z	Max	See annex 1
Emr#	27	H	Functional	Axis Z	/	See annex 1
Emr#	28	V	Functional	Axis Z	/	See annex 1
Emr#	29	H	Functional	Axis XY	/	See annex 1
Emr#	30	V	Functional	Axis XY	/	See annex 1

4.6.3. Characterization on 10 meters open site from 30MHz to 1GHz

Worst case final data result:
Frequency list has been created with semi-anechoic chamber pre-scan results.
Measurements are performed using a QUASI-PEAK detection.

No	Frequency (MHz)	Limit Quasi-Peak (dBµV/m)	Measure Quasi-Peak (dBµV/m)	Margin (Mes-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. Factor (dB)	Comments
No significative frequency observed									

Note: Measure have been done at 10m distance and corrected according to requirements of 15.209.e) (M@3m = M@10m+10.5dB)

4.6.4. Characterization on 3meters anechoic chamber from 1GHz to 12.75GHz

Worst case final data result:
The frequency list is created from the results obtained during the pre-characterization in anechoic chamber.
Measurements are performed using a PEAK and AVERAGE detection.

Restricted Band (See §												
No	Frequency (MHz)	Limit Peak (dBµV/m)	Measure Peak (dBµV/m)	Margin Peak (dB)	Limit Average (dBµV/m)	Measure Average (dBµV/m)	Margin Average (dB)	Angle Table (°)	Pol. Ant.	Ht. Ant. (cm)	FC (dB)	Remark
1	2369.777	74.0	54.1	**-19.9**	54.0	34.3	**-19.7**	48	V	150	12.3	/
2	2484.507	74.0	51.7	**-22.3**	54.0	28.8	**-25.2**	225	H	150	13.8	/
3	2485.287	74.0	50.3	**-23.7**	54.0	34.8	**-19.2**	225	H	150	13.8	/
4	2485.820	74.0	54.5	**-19.5**	54.0	35.8	**-18.2**	220	V	150	13.8	/
5	2486.538	74.0	56.8	**-17.2**	54.0	36.8	**-17.2**	210	V	150	13.8	/

Note: Measures have been done at 3m distance.

4.7. CONCLUSION

Radiated emission data measurement performed on the sample of the product PE177-C, SN: RADIO 2 & CEM 2 in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

5. BANDWIDTH (15.247)

5.1. TEST CONDITIONS

Date of test :November 25th , 2015
Test performed by :J.PAUC
Atmospheric pressure (hPa) :1001
Relative humidity (%) :27
Ambient temperature (°C) :21

5.2. SETUP

☑ ***Conducted measurement:***
The EUT is turned ON and connected to measurement instrument; the center frequency of the spectrum analyzer is set to the fundamental frequency. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.
Offset: Attenuator+cable 10.3dB

☐ ***Radiated measurement:***
The EUT is placed in an anechoic chamber; the center frequency of the spectrum analyzer is set to the fundamental frequency. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete, a delta marker is used to measure the frequency difference as the emission bandwidth.

Measurement Procedure: §8.1 Option 1 (DTS Measurement Guidance)
1. Set resolution bandwidth (RBW) = 100kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. Compare the resultant bandwidth with the RBW setting of the analyzer.

5.3. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	01/15	01/16
Cable	-		A5329705	12/14	12/15
Attenuator 10dB	AEROFLEX		A7122268	02/15	02/16
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	04/15	04/16

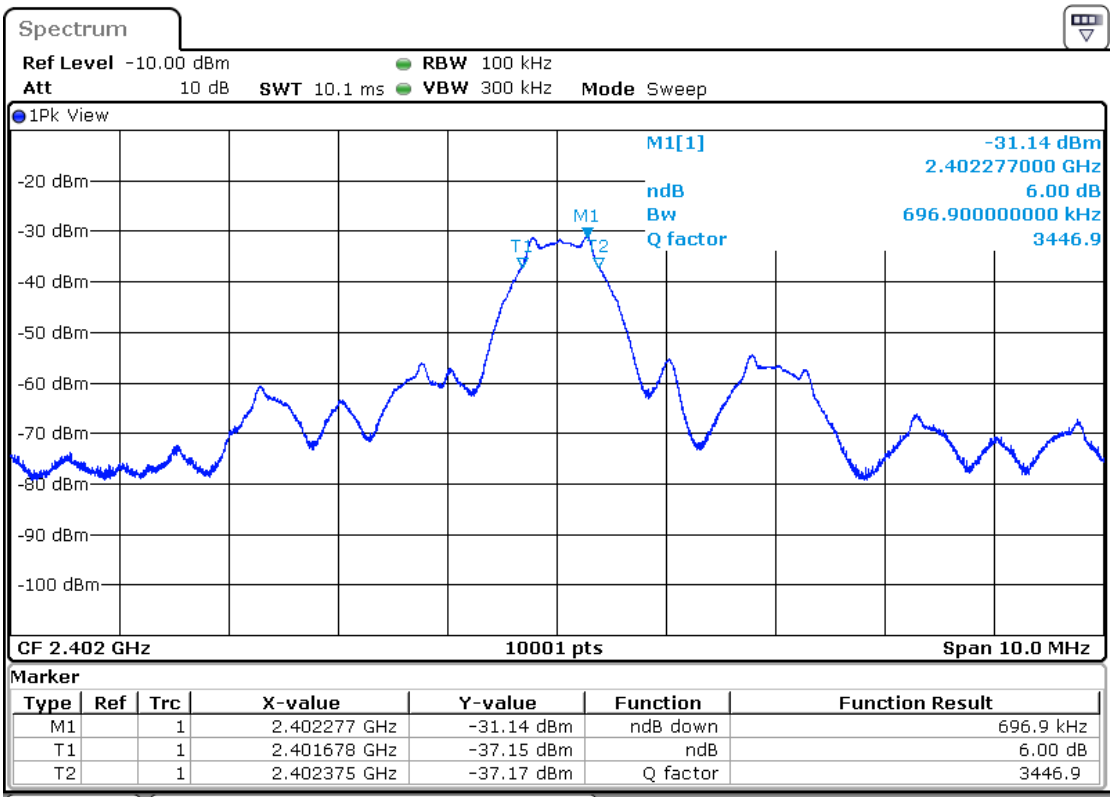
5.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

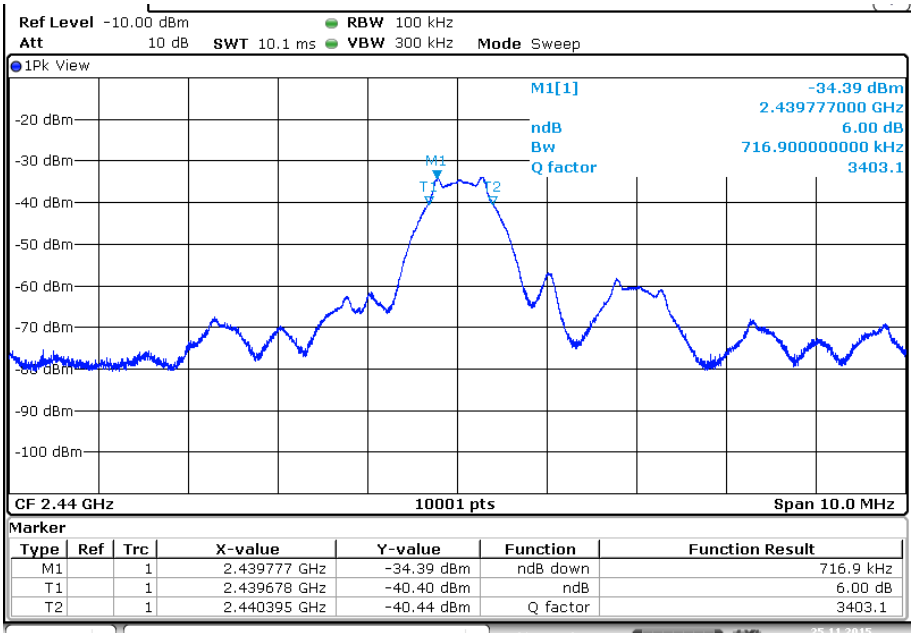
5.5. TEST SEQUENCE AND RESULTS

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Bandwidth Limit (MHz)
Cmin	2402	**0.697**	**>0.5**
Cmid	2440	**0.717**	**>0.5**
Cmax	2480	**0.681**	**>0.5**

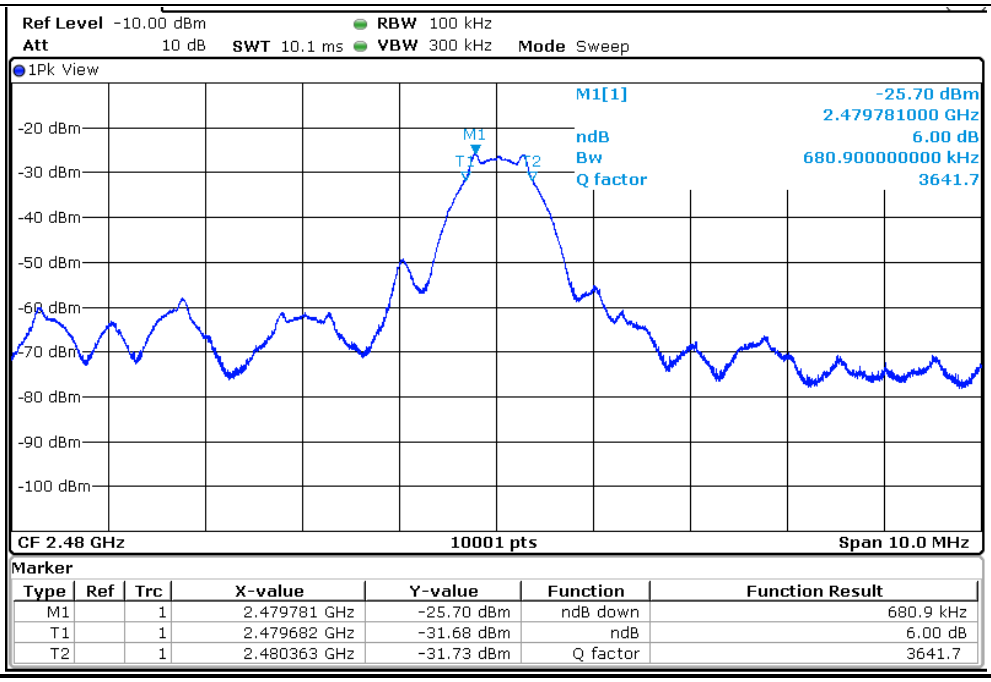
Cmin



Cmid



Cmax



5.6. CONCLUSION

Bandwidth measurement performed on the sample of the product PE177-C, SN: RADIO 2, in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

6. MAXIMUM PEAK OUTPUT POWER (15.247)

6.1. TEST CONDITIONS

Date of test :November 25th , 2015
Test performed by :J.PAUC
Atmospheric pressure (hPa) :1001
Relative humidity (%) :27
Ambient temperature (°C) :21

6.2. SETUP

☑ ***Conducted measurement:***
The EUT is turned ON and connected to measurement instrument; the center frequency of the spectrum analyzer is set to the fundamental frequency.
Offset: Attenuator+cable 10dB

☐ ***Radiated measurement:***
The EUT is placed in an anechoic chamber; the center frequency of the spectrum analyzer is set to the fundamental frequency.
The product has been tested at a distance of 3 meters from the antenna. Continuous linear turntable azimuth search was performed with 360 degrees range. Measurement performed on 3 axis of EUT. A summary of the worst case emissions found in all test configurations and modes is shown on following table. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.
To demonstrate compliance with peak output power requirement of section 15.247 (b), the transmitter's peak output power is calculated using the following equation:

$$E = \frac{\sqrt{30PG}}{d}$$

Where:
- E is the measured maximum fundamental field strength in V/m.
- G is the numeric gain of the transmitting antenna with reference to an isotropic radiator.
- d is the distance in meters from which the field strength was measured.
- P is the power in watts for which you are solving:

$$P = \frac{(Ed)^2}{30G}$$

Maximum peak conducted output power

One of the following procedures may be used to determine the maximum peak conducted output power of a DTS EUT.

- ☑ ***RBW ≥ DTS bandwidth §9.1.1 (DTS Measurement Guidance)***

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

a) Set the RBW ≥ DTS bandwidth.
b) Set VBW ≥ 3 x RBW.
c) Set span ≥ 3 x RBW
d) Sweep time = auto couple.
e) Detector = peak.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

- ☐ ***Integrated band power method***

This procedure may be used when the maximum available RBW of the measurement instrument is less than the DTS bandwidth.

a) Set the RBW = 1 MHz.
b) Set the VBW ≥ 3 x RBW
c) Set the span ≥ 1.5 x DTS bandwidth.
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges

6.3. TEST EQUIPMENT LIST

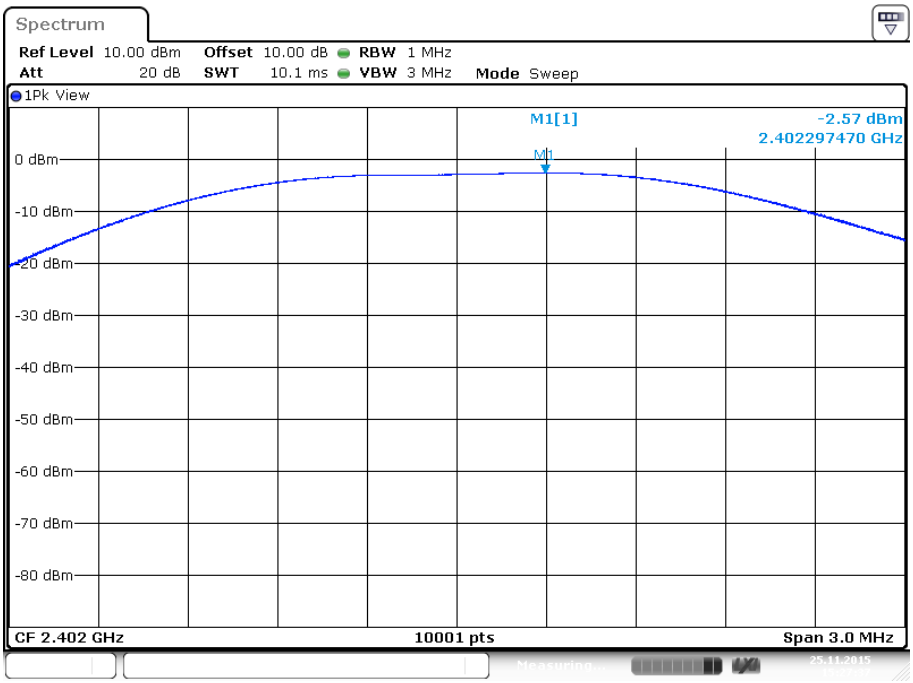
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	01/15	01/16
Cable	-		A5329705	12/14	12/15
Attenuator 10dB	AEROFLEX		A7122268	02/15	02/16
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	04/15	04/16

6.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

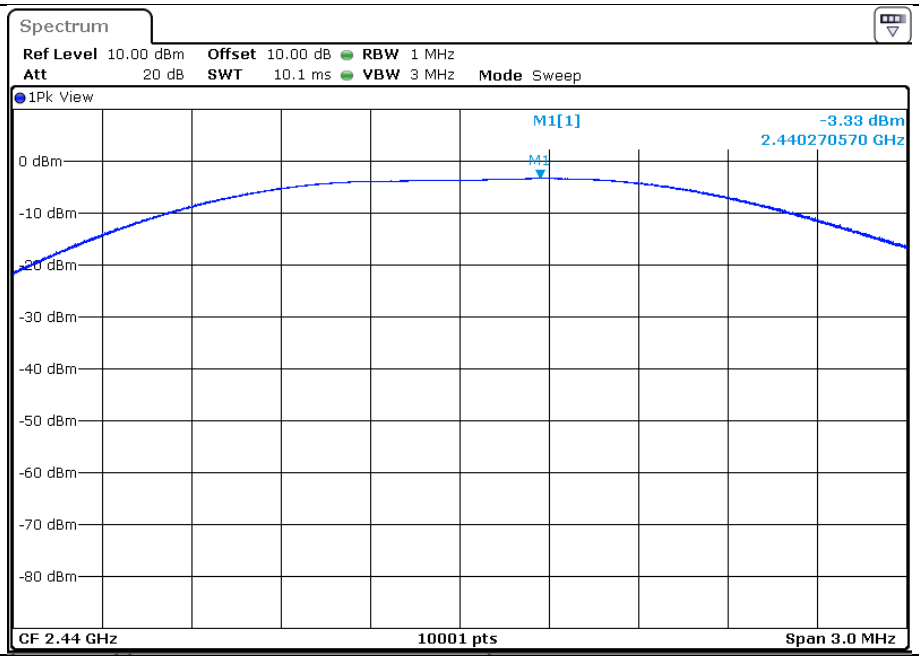
☑ None ☐ Divergence:

6.5. TEST SEQUENCE AND RESULTS

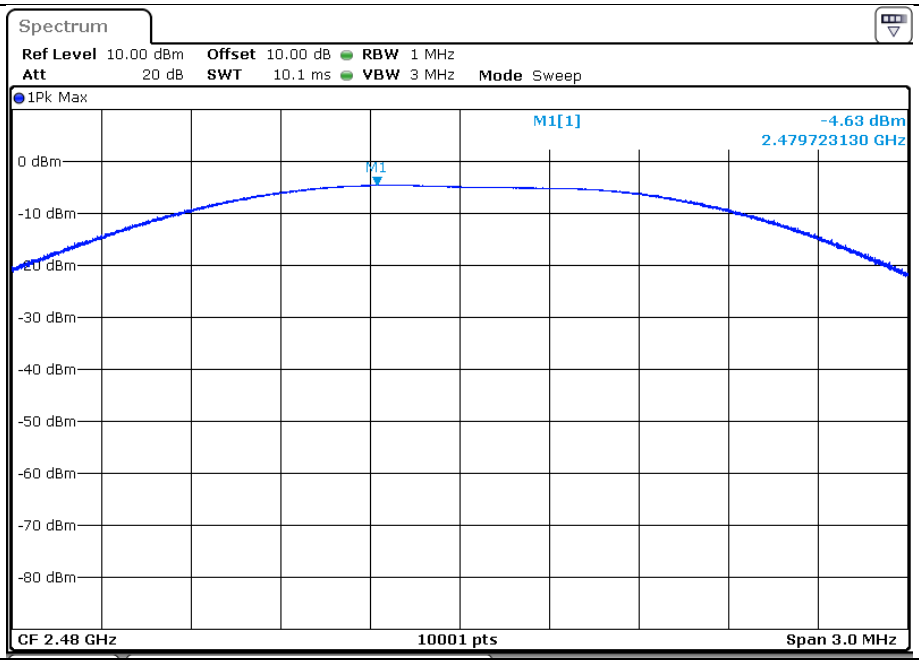
Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	Power Limit (dBm)	Margin (dB)
Cmin	2402	**-2.6**	30.0	-27.4
Cmid	2440	**-3.3**	30.0	-26.7
Cmax	2480	**-4.6**	30.0	-25.4



Cmin



Cmid



Cmax

6.6. CONCLUSION

Maximum Peak Output Power measurement performed on the sample of the product PE177-C, SN: RADIO 2, in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

7. POWER SPECTRAL DENSITY (15.247)

7.1. TEST CONDITIONS

Date of test	:November 25th , 2015
Test performed by	:J.PAUC
Atmospheric pressure (hPa)	:1001
Relative humidity (%)	:27
Ambient temperature (°C)	:21

7.2. SETUP

☑ ***Conducted measurement:***
The EUT is turned ON and connected to measurement instrument; the center frequency of the spectrum analyzer is set to the fundamental frequency.
Offset: Attenuator+cable 10dB

☐ ***Radiated measurement:***
The EUT is placed in an anechoic chamber; the center frequency of the spectrum analyzer is set to the fundamental frequency.
The product has been tested at a distance of 3 meters from the antenna. Continuous linear turntable azimuth search was performed with 360 degrees range. Measurement performed on 3 axis of EUT. A summary of the worst case emissions found in all test configurations and modes is shown on following table. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.
To demonstrate compliance with peak output power requirement of section 15.247 (b), the transmitter's peak output power is calculated using the following equation:

$$E = \frac{\sqrt{30PG}}{d}$$

Where:
- E is the measured maximum fundamental field strength in V/m.
- G is the numeric gain of the transmitting antenna with reference to an isotropic radiator.
- d is the distance in meters from which the field strength was measured.
- P is the power in watts for which you are solving:

$$P = \frac{(Ed)^2}{30G}$$

Measurement Procedure PKPSD: §10.2 (DTS Measurement Guidance)
a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to: 3 kHz.
d) Set the VBW ≥ 3 x RBW.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

7.3. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	01/15	01/16
Cable	-		A5329705	12/14	12/15
Attenuator 10dB	AEROFLEX		A7122268	02/15	02/16
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	04/15	04/16

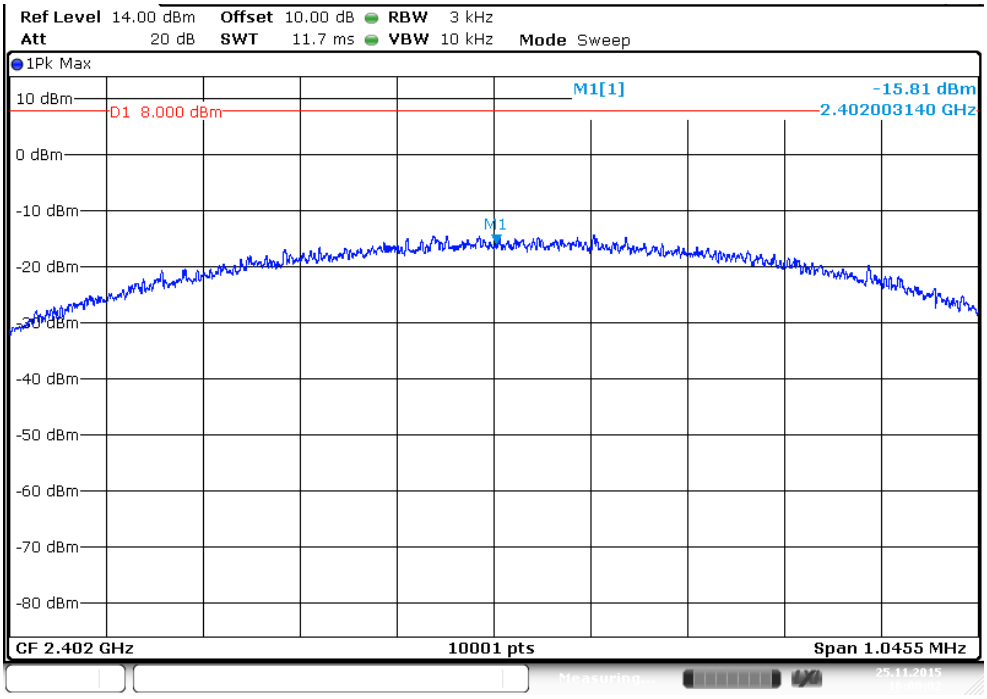
7.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

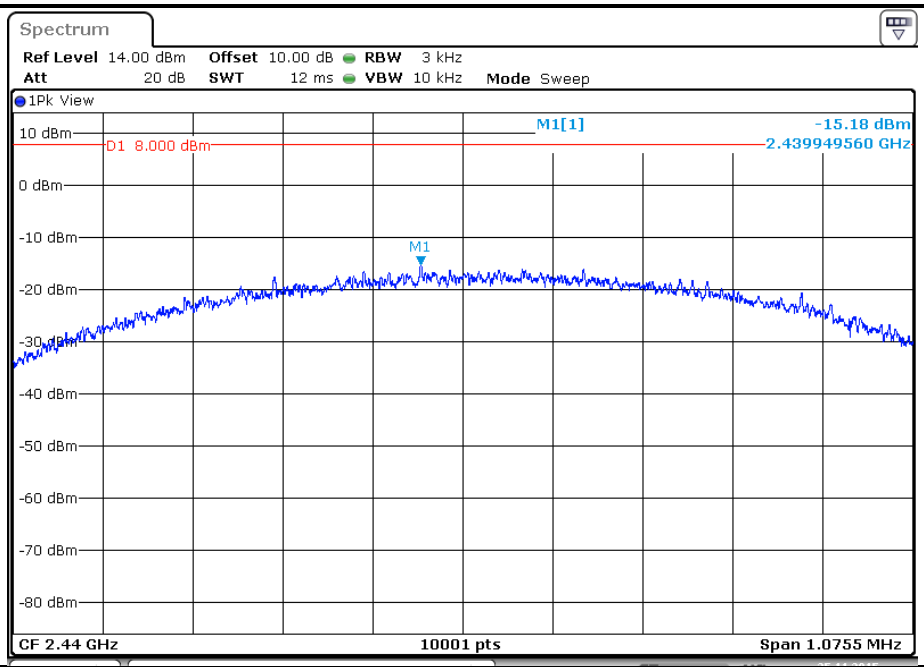
7.5. TEST SEQUENCE AND RESULTS

Modulation:

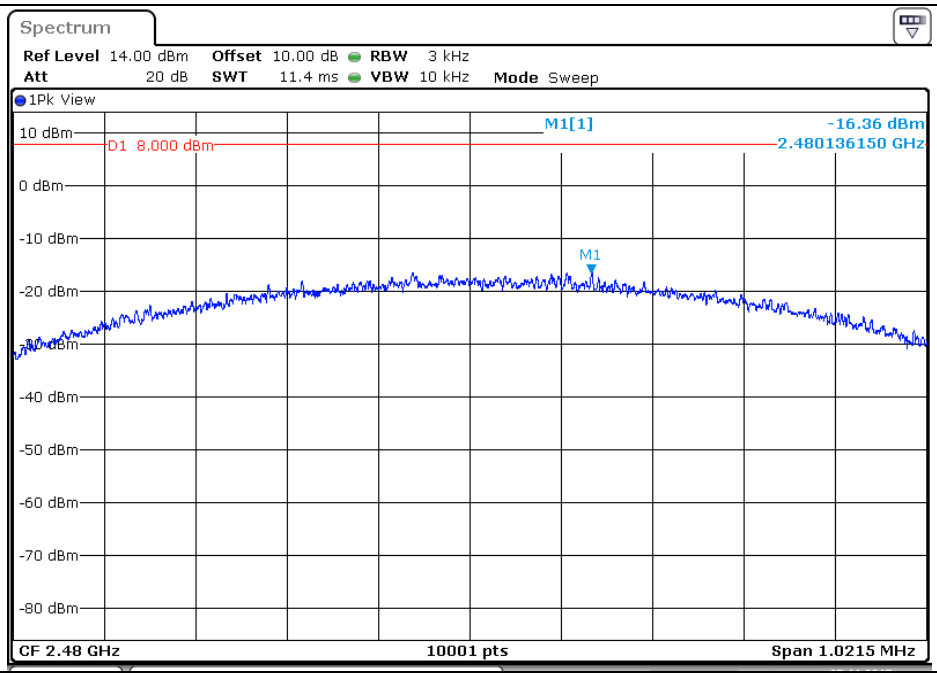
Channel	Channel Frequency (MHz)	Power Spectral Density (dBm)	PSD Limit (dBm)
Cmin	2402	**-15.8**	8.0
Cmid	2440	**-15.2**	8.0
Cmax	2480	**-16.4**	8.0



Cmin



Cmid



Cmax

7.6. CONCLUSION

Power Spectral Density measurement performed on the sample of the product PE177-C, SN: RADIO 2, in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

8. BAND EDGE MEASUREMENT (15.247)

8.1. TEST CONDITIONS

Date of test	:November 25th , 2015	:
Test performed by	:J.PAUC	:
Atmospheric pressure (hPa)	:1001	:
Relative humidity (%)	:27	:
Ambient temperature (°C)	:21	:

8.2. LIMIT

RF antenna conducted test: § 11 (DTS Measurement Guidance)
Set RBW = 100 kHz, Video bandwidth (VBW) > RBW, scan up through 10th harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB. *For -20dBc limit, lowest power output level is considered, worst case.*

Radiated emission test: § 12 (DTS Measurement Guidance)
Applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. For measurements above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See results in Radiated emissions section before.

8.3. SETUP

The EUT is placed in an anechoic chamber; levels have been corrected to be in compliant with Peak Output Power measurement. The EUT is turn ON; the graphs of the restrict frequency band are recorded with a display line indicating the highest level and other the 20dB offset below to show compliance with 15.247 (d) and 15.205. The emissions in restricted bands are compared to 15.209 limits.
RBW: 100kHz
VBW: 300kHz

8.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	01/15	01/16
Cable	-		A5329705	12/14	12/15
Attenuator 10dB	AEROFLEX		A7122268	02/15	02/16
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	04/15	04/16

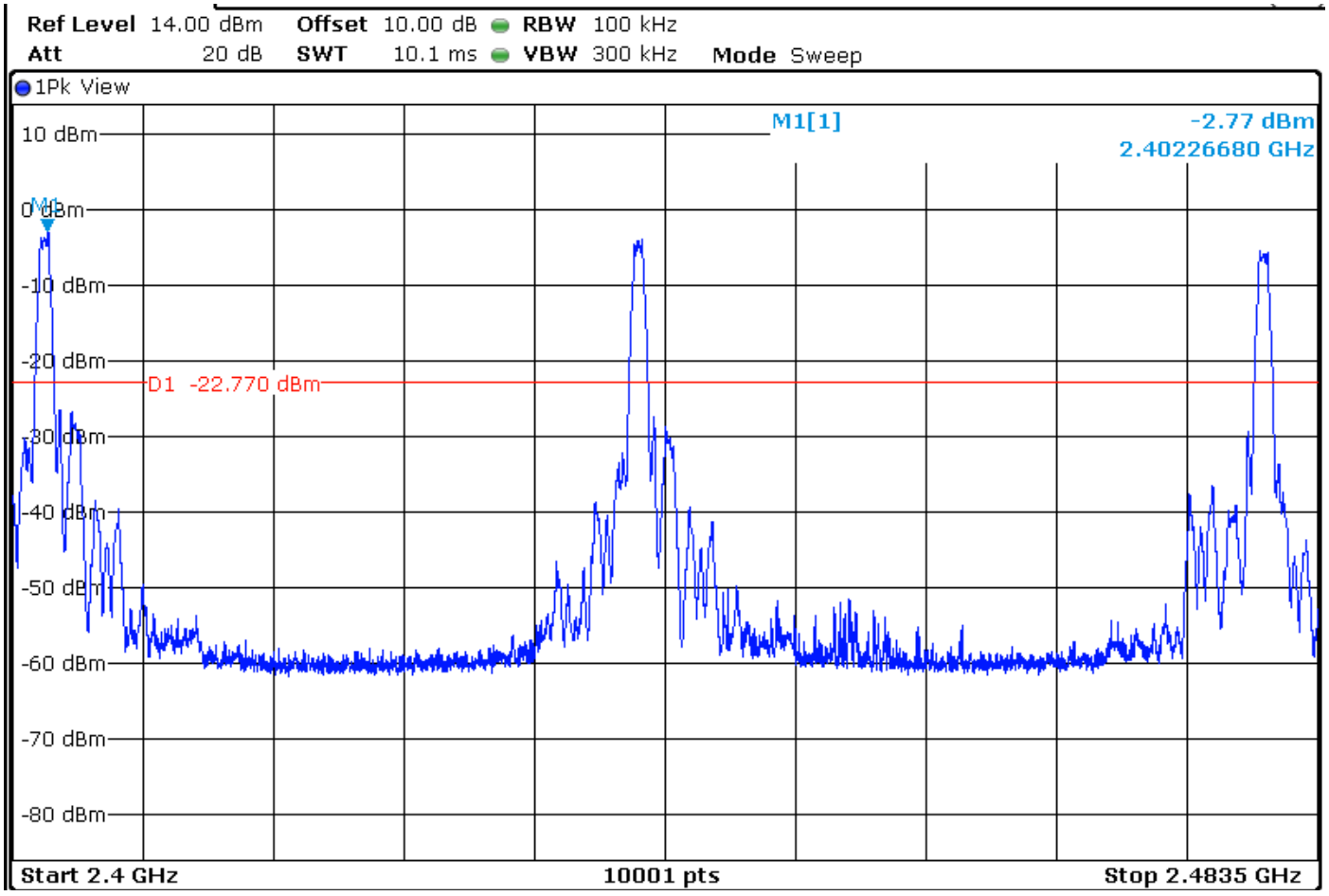
8.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

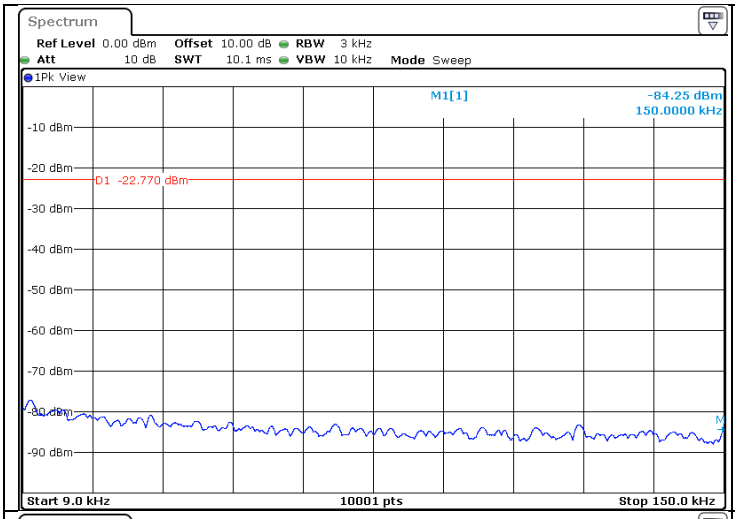
8.6. TEST SEQUENCE AND RESULTS

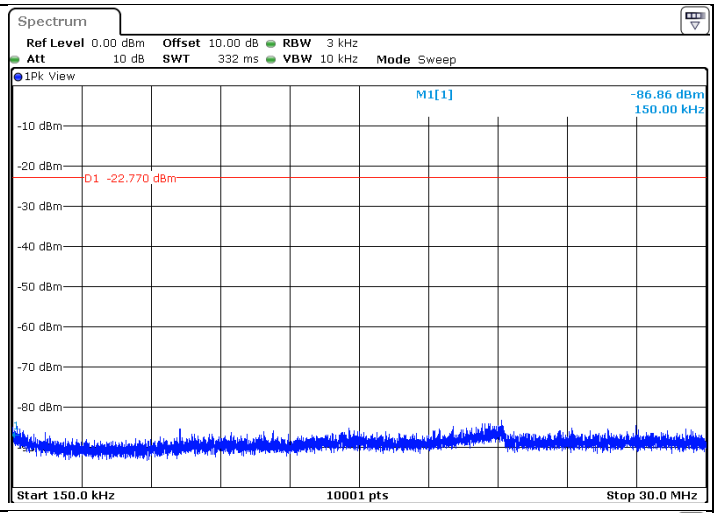
Offset: Attenuator+cable 10dB

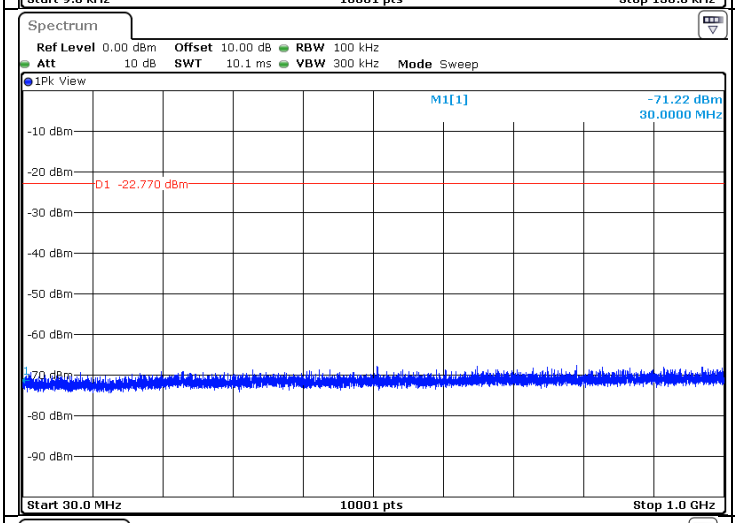
GRAPH / MODULATION.

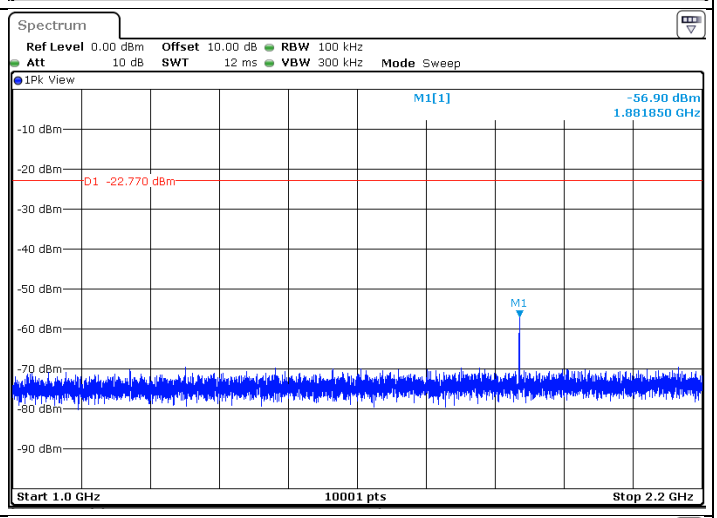


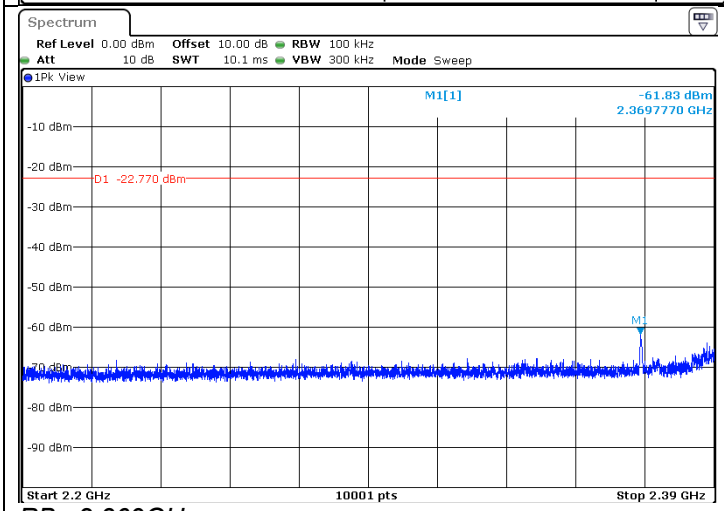
-20dBc limit used **Worst case: Cmin , limit at -22.77dBm**



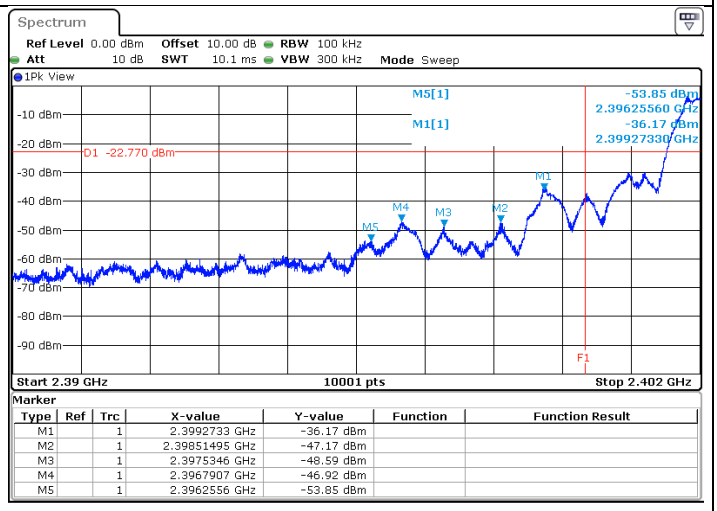






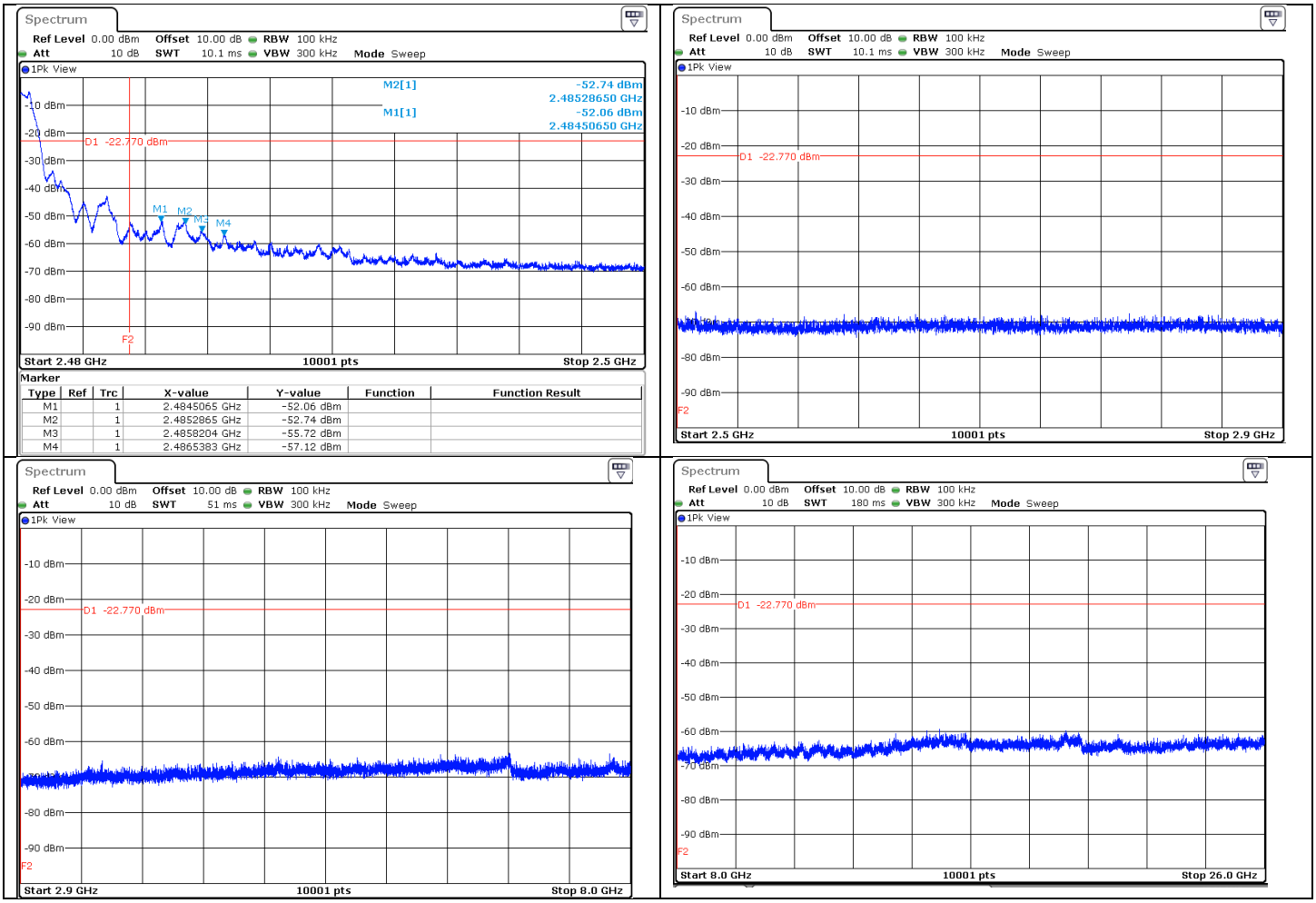


RB : 2.369GHz



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.3992733 GHz	-36.17 dBm		
M2		1	2.39851495 GHz	-47.17 dBm		
M3		1	2.3975346 GHz	-48.59 dBm		
M4		1	2.3967907 GHz	-46.92 dBm		
M5		1	2.3962556 GHz	-53.85 dBm		



8.7. CONCLUSION

Band Edge Measurement performed on the sample of the product PE177-C, SN: RADIO 2, in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

9. OCCUPIED BANDWIDTH

9.1. TEST CONDITIONS

Date of test	:November 25th , 2015	:November 26th , 2015
Test performed by	:J.PAUC	:J.PAUC
Atmospheric pressure (hPa)	:1001	:1001
Relative humidity (%)	:27	:26
Ambient temperature (°C)	:21	:22

9.2. SETUP

☑ ***Conducted measurement:***
The EUT is turned ON and connected to measurement instrument; the center frequency of the spectrum analyzer is set to the fundamental frequency. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.
Offset: Attenuator+cable : 10dB

☐ ***Radiated measurement:***
The EUT is turned ON and connected to measurement instrument; the center frequency of the spectrum analyzer is set to the fundamental frequency. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.

Measurement Procedure:

a) RBW shall be in the range of 1% to 5% of the anticipated occupied bandwidth
b) Set the video bandwidth (VBW) ≥ 3 x RBW
c) SPAN = Capture all products of the modulation process
d) Detector = Peak.
e) Trace mode = max hold.
f) Sweep = auto couple.
g) Allow the trace to stabilize.
h) OBW 99% function of spectrum analyzer used

9.3. TEST EQUIPMENT LIST

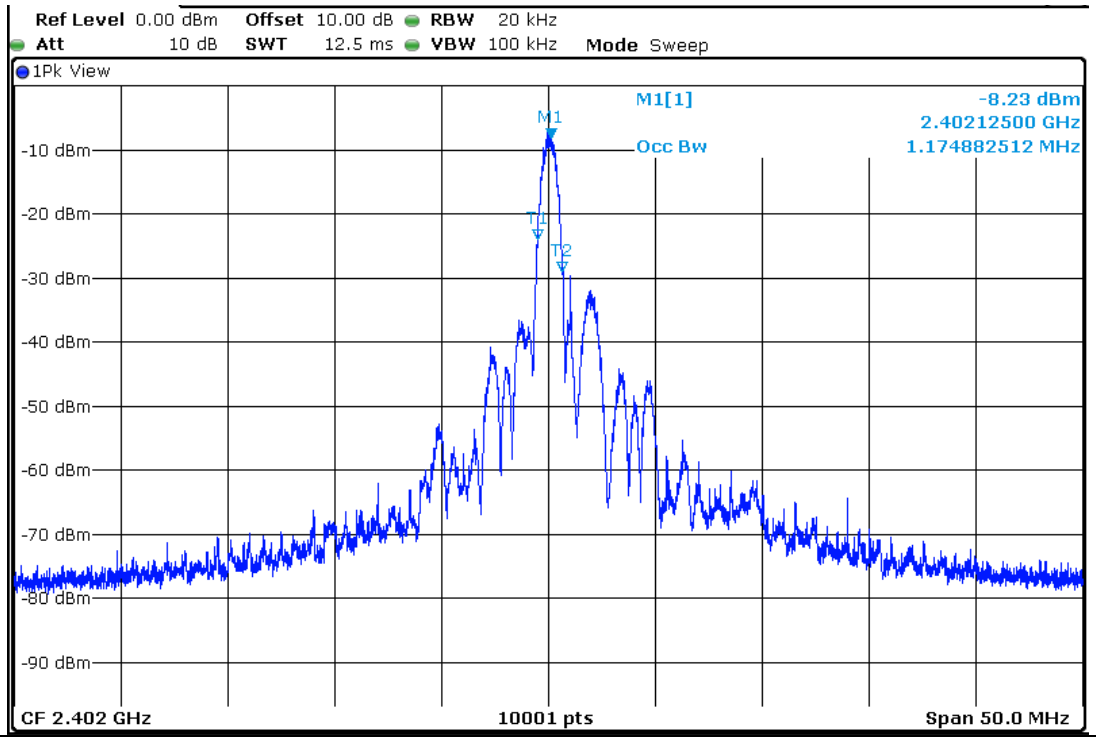
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	01/15	01/16
Cable	-		A5329705	12/14	12/15
Attenuator 10dB	AEROFLEX		A7122268	02/15	02/16
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	04/15	04/16

9.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

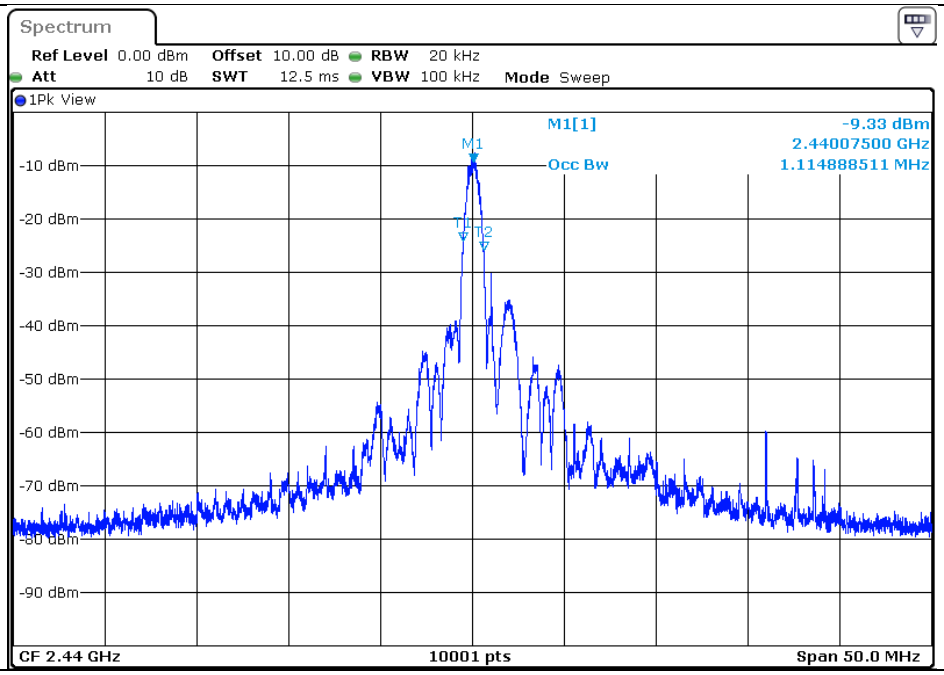
☑ None ☐ Divergence:

9.5. TEST SEQUENCE AND RESULTS

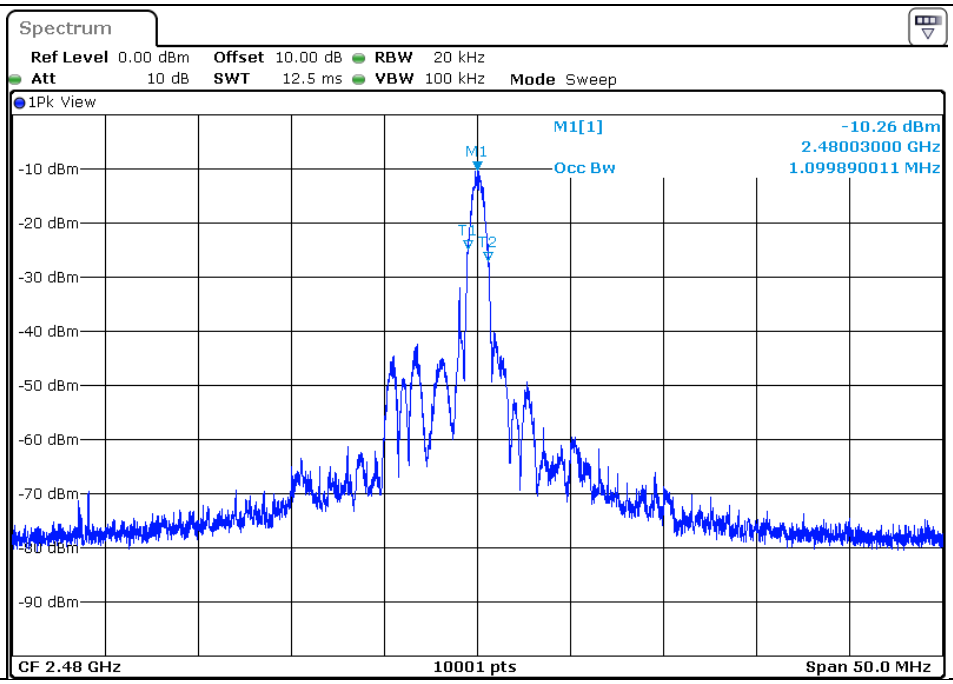
Channel	Channel Frequency (MHz)	99% Occupied Bandwidth (MHz)
Cmin	2402	**1.174**
Cmid	2440	**1.115**
Cmax	2480	**1.099**



Cmin


Spectrum
Ref Level 0.00 dBm Offset 10.00 dB RBW 20 kHz
Att 10 dB SWT 12.5 ms VBW 100 kHz Mode Sweep
1Pk View
M1[1] -9.33 dBm
2.44007500 GHz
Occ Bw 1.114888511 MHz
M1
T1
T2
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.44 GHz
10001 pts
Span 50.0 MHz

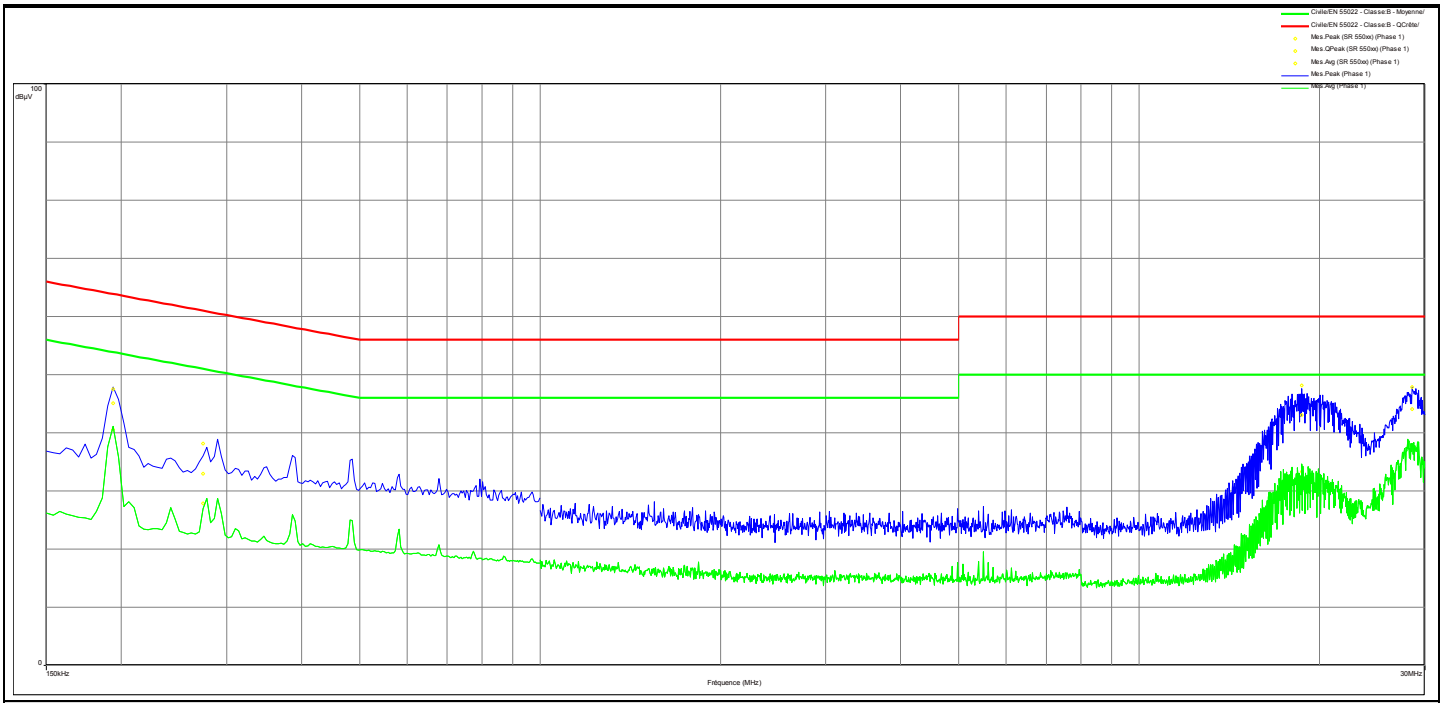
Cmid


Spectrum
Ref Level 0.00 dBm Offset 10.00 dB RBW 20 kHz
Att 10 dB SWT 12.5 ms VBW 100 kHz Mode Sweep
1Pk View
M1[1] -10.26 dBm
2.48003000 GHz
Occ Bw 1.099890011 MHz
M1
T1
T2
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.48 GHz
10001 pts
Span 50.0 MHz

Cmax

10. ANNEX 1 (GRAPHS)

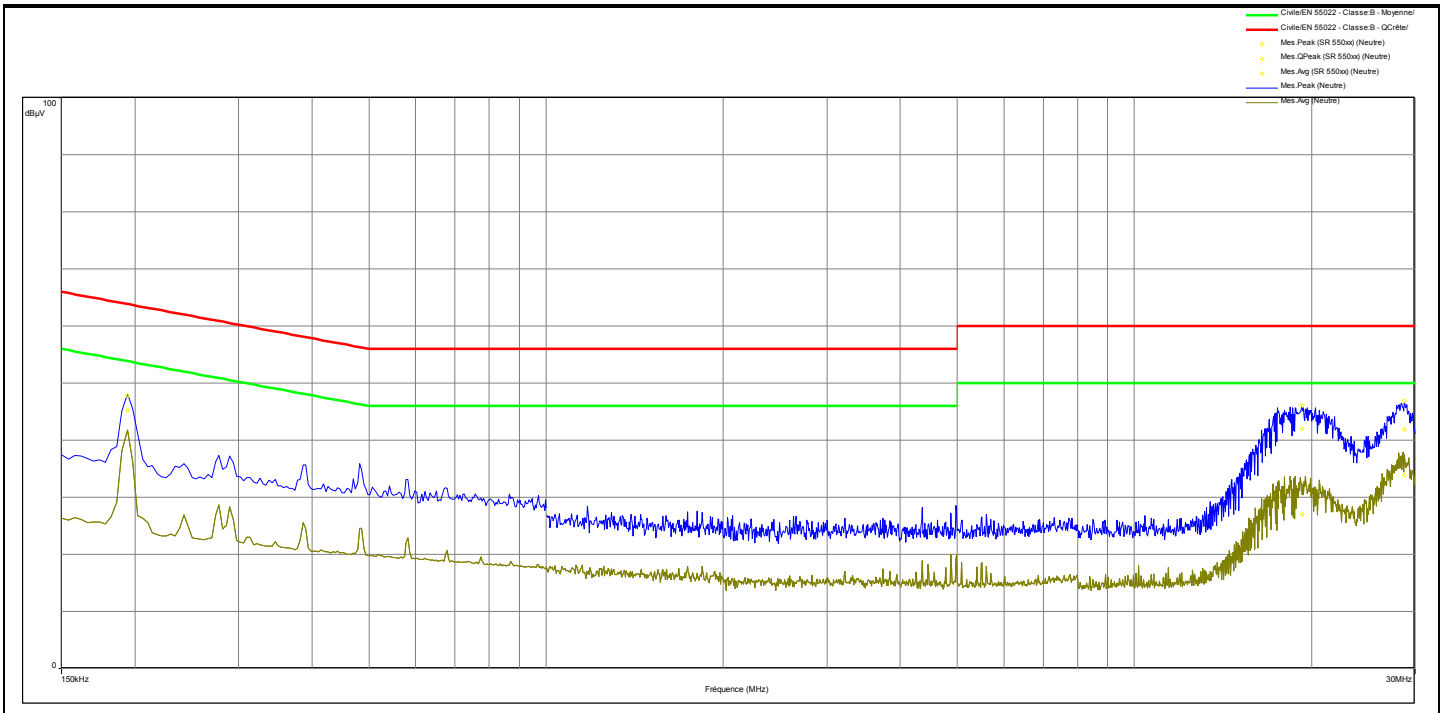
CONDUCTED EMISSIONS			
Graph name:	Emc#1	**Test configuration:**	
Limit:	EN 55022	Phase - 110V 60Hz	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	110VAC / 60Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



Spurious emissions

Frequency (MHz)	Mes.Peak (dBµV)	Mes.QPeak (dBµV)	LimQP (dBµV)	Mes.QPeak-LimQP (dB)	Mes.Avg (dBµV)	LimAvg (dBµV)	Mes.Avg-LimAvg (dB)
0.195	47.5	45.08	63.86	-18.78	40.52	53.86	-13.35
0.275	38.13	32.93	60.52	-27.59	27.85	50.52	-22.67
18.671	48.19	43.07	60	-16.93	33.36	50	-16.64
28.531	47.89	44.12	60	-15.88	37.67	50	-12.33

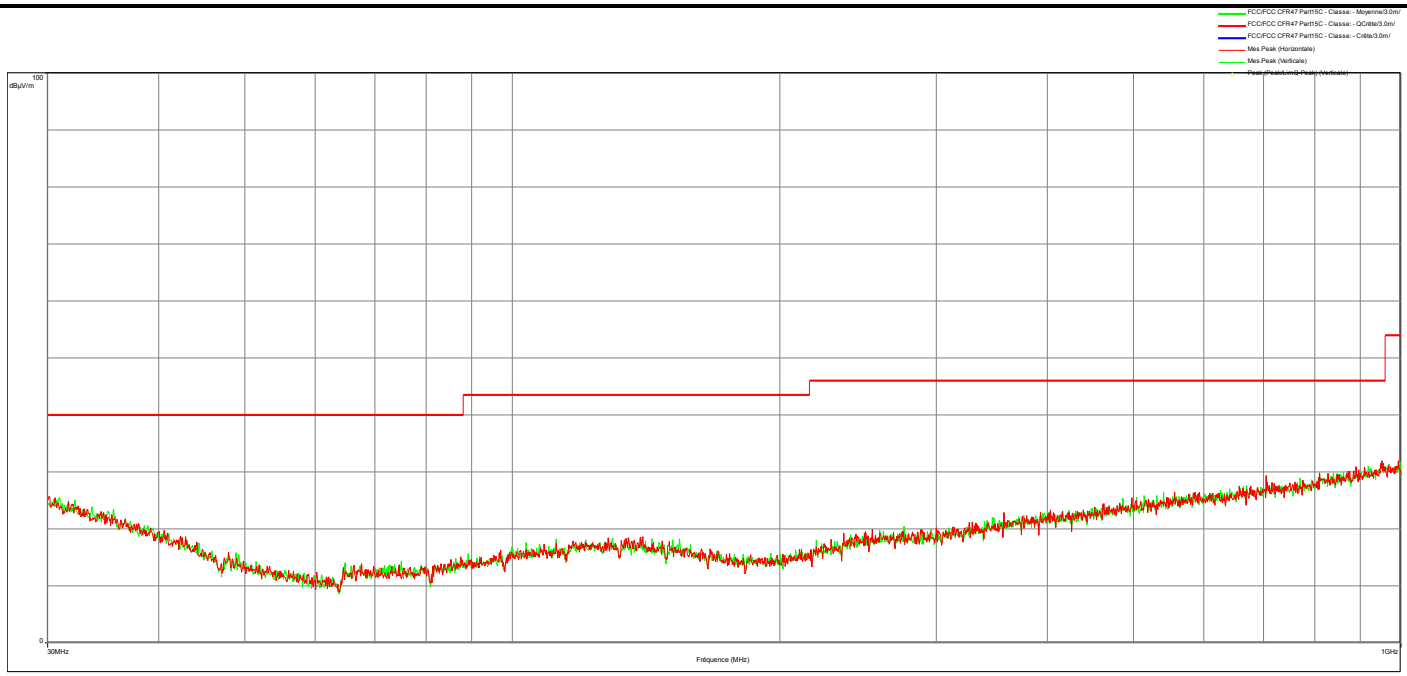
CONDUCTED EMISSIONS			
Graph name:	Emc#2	**Test configuration:**	
Limit:	EN 55022	Neutral - 110V 60Hz	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	110VAC / 60Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



Spurious emissions

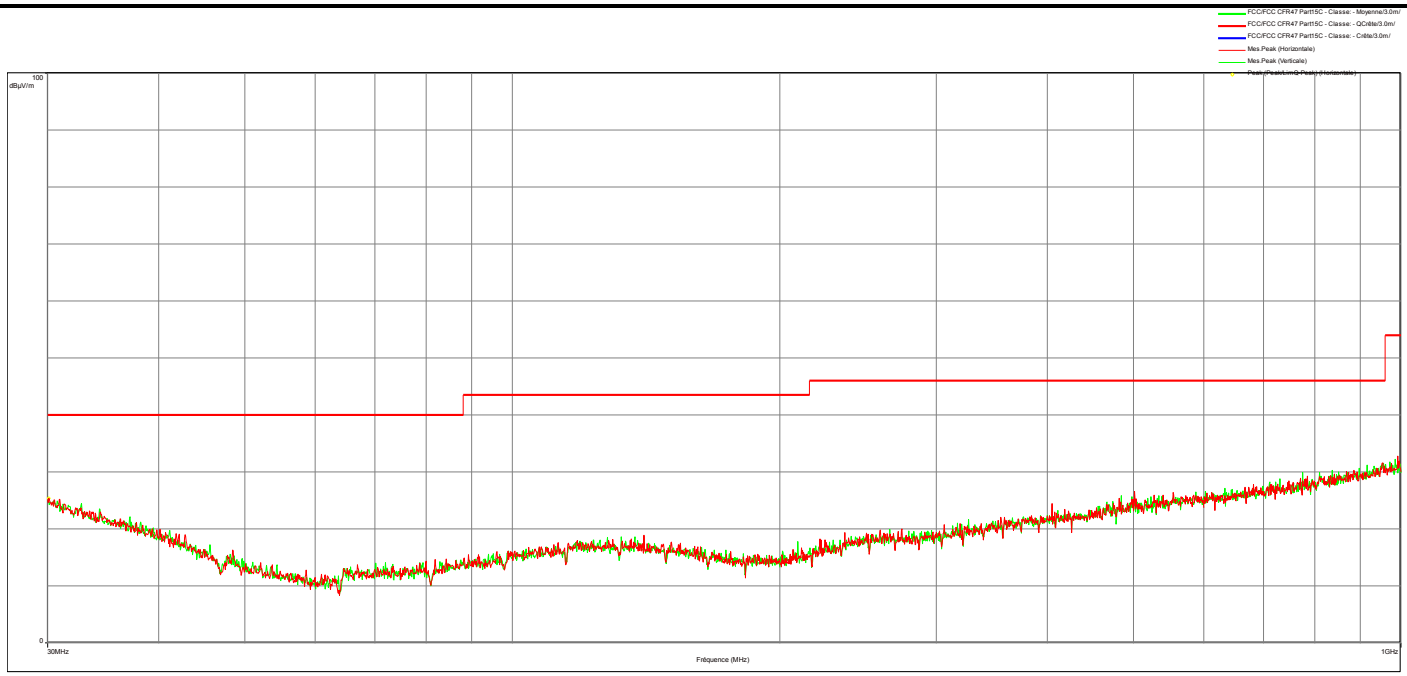
Frequency (MHz)	Mes.Peak (dBµV)	Mes.QPeak (dBµV)	LimQP (dBµV)	Mes.QPeak-LimQP (dB)	Mes.Avg (dBµV)	LimAvg (dBµV)	Mes.Avg-LimAvg (dB)
0.195	47.73	45.26	63.86	-18.6	41.14	53.86	-12.72
19.277	46.15	41.95	60	-18.05	26.96	50	-23.04
28.768	46.94	41.89	60	-18.11	33.84	50	-16.16

RADIATED EMISSIONS			
Graph name:	Emr#1	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Emr1 - Pos XY TX Cmin	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



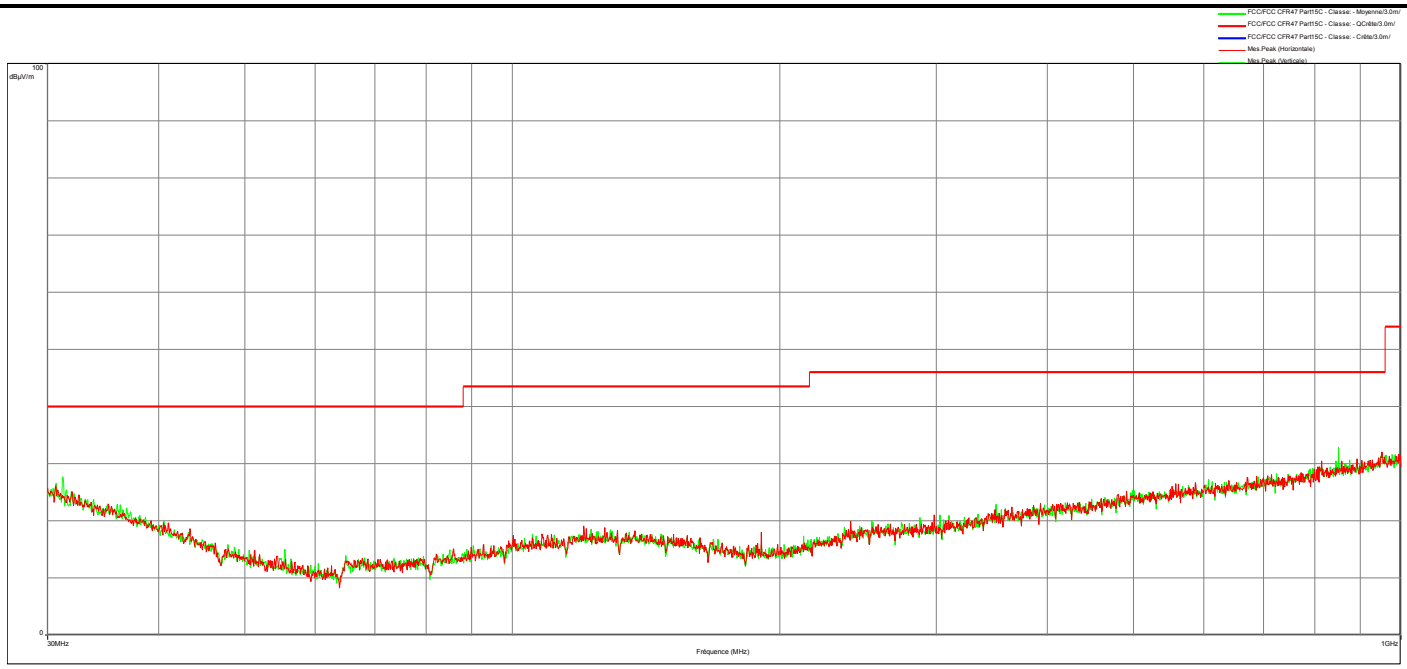
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#2	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Emr2 - Pos XY TX Cmax	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



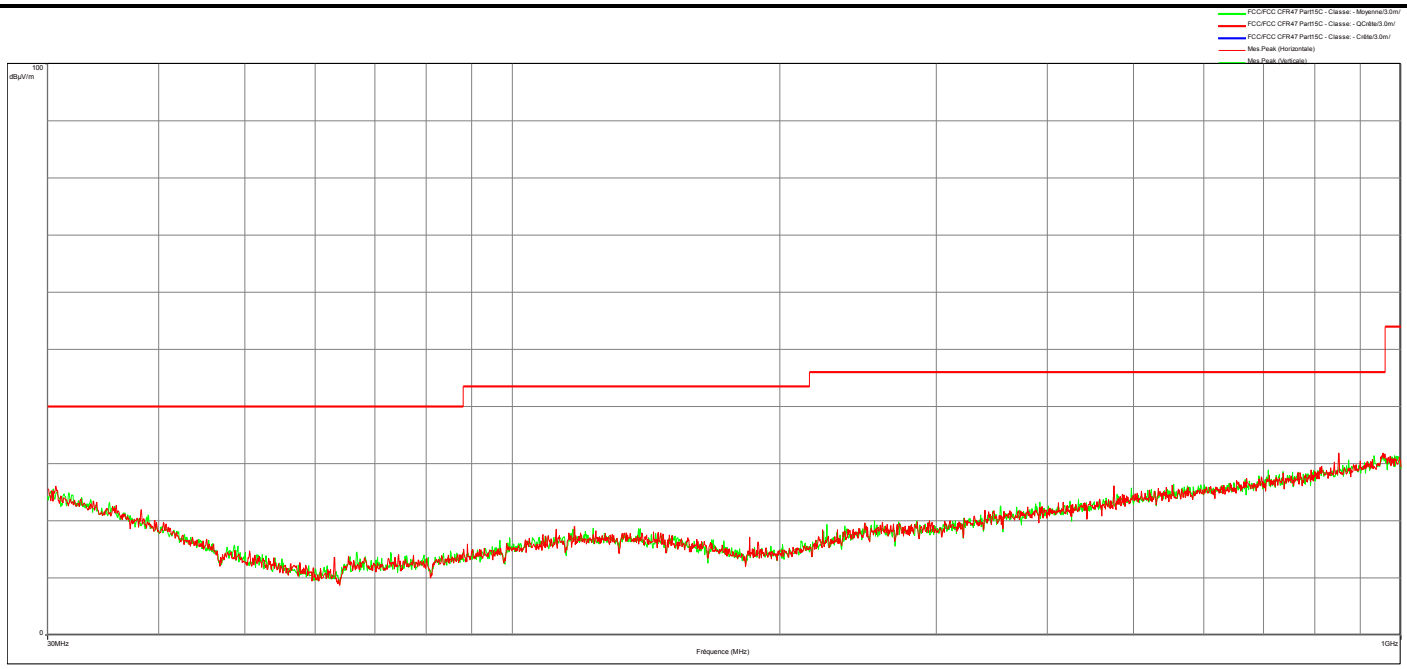
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#3	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Emr3 - Pos Z TX Cmin	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



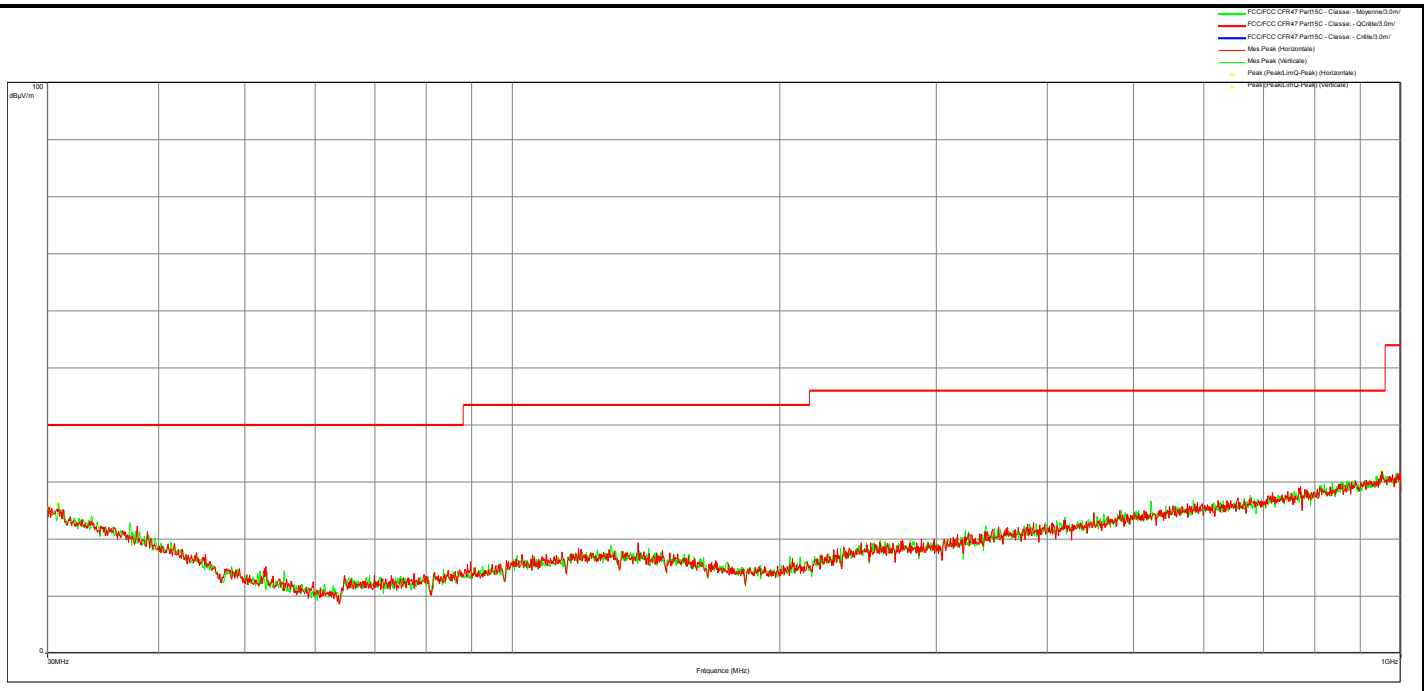
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#4	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Emr4 - Pos Z TX Cmax	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



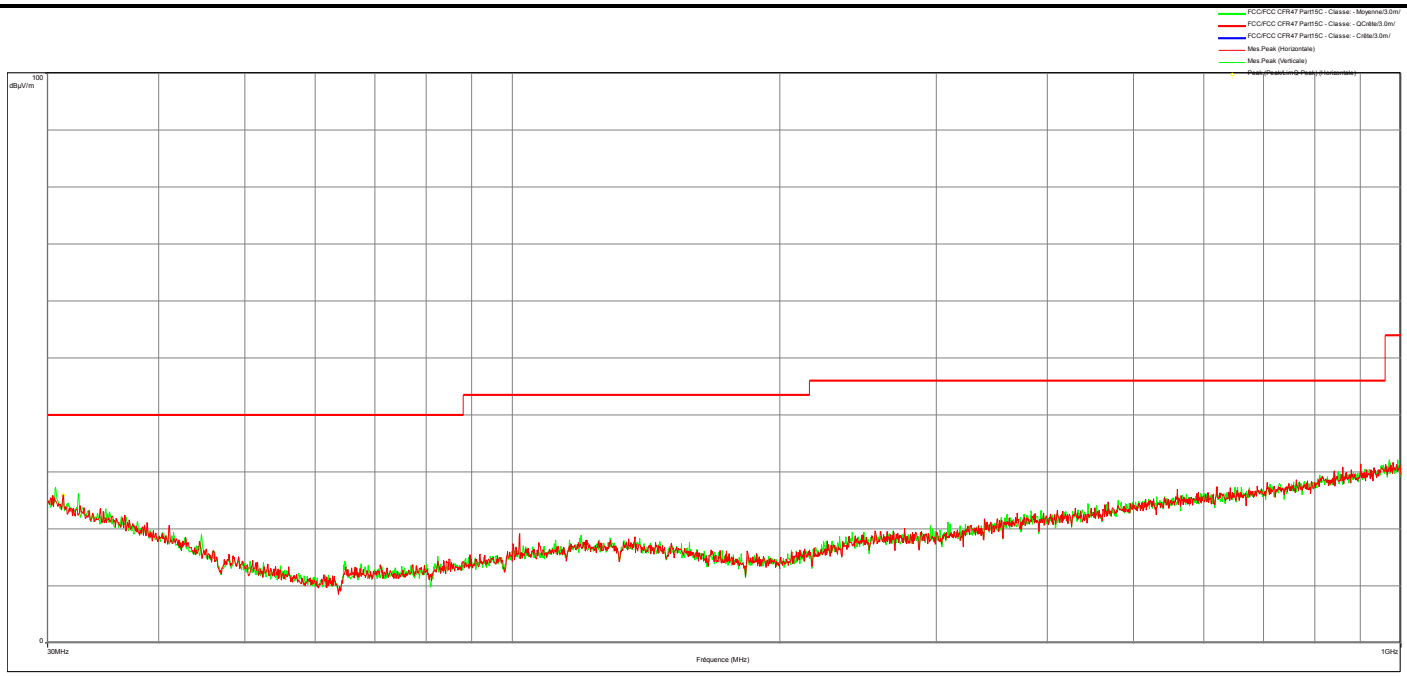
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#5	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Emr5 - Pos XY RX Cmin	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



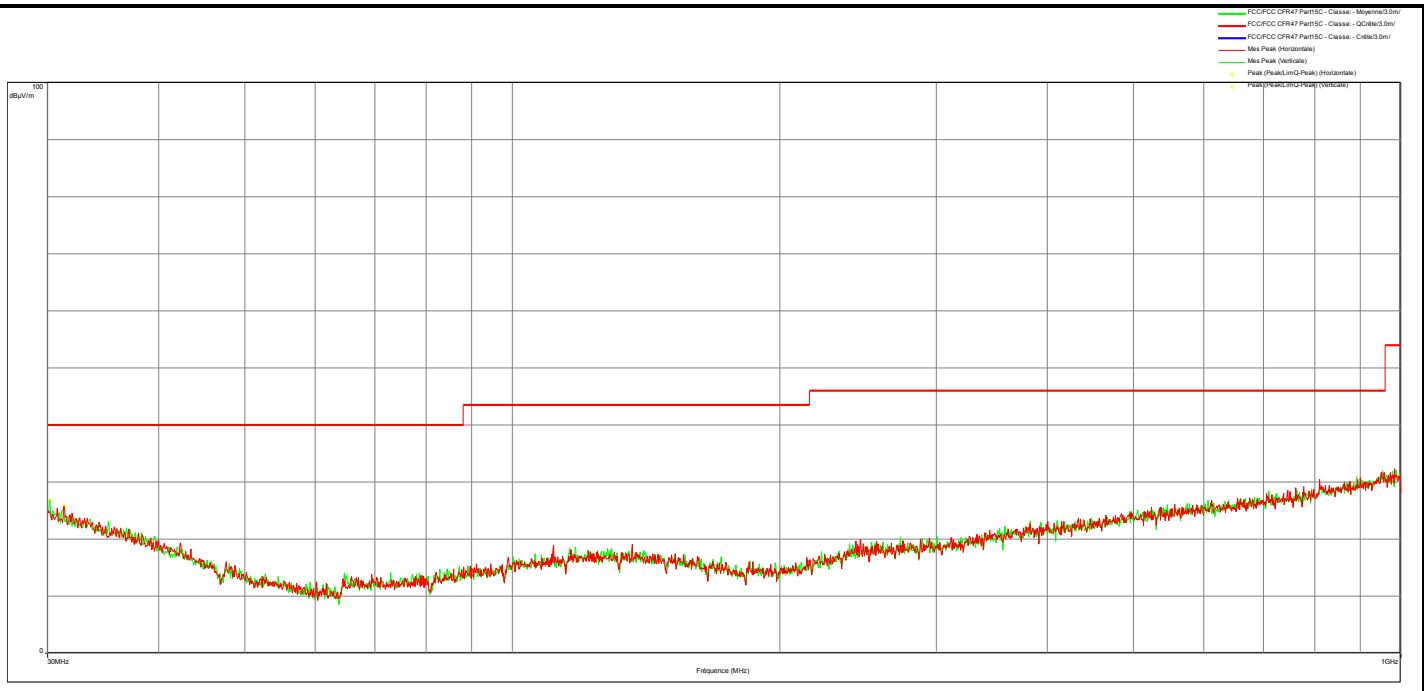
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#6	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Emr6 - Pos XY RX Cmax	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



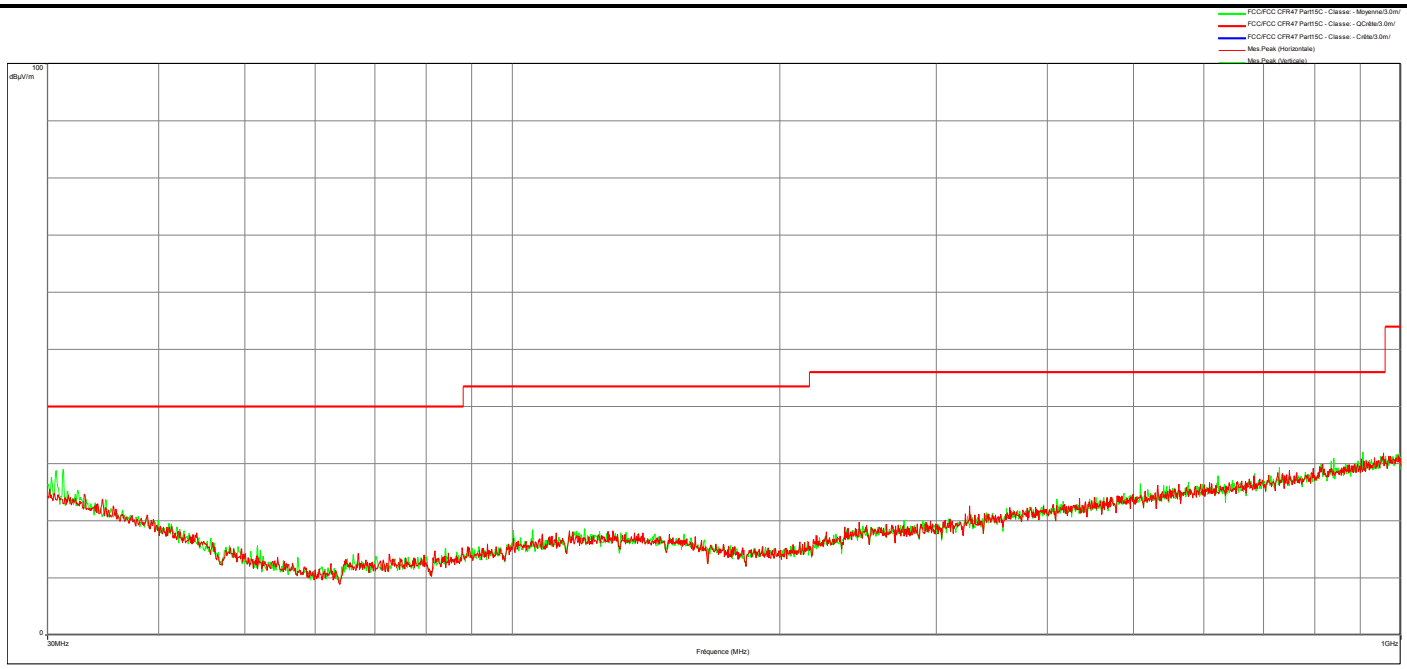
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#7	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Emr7 - Pos Z RX Cmin	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



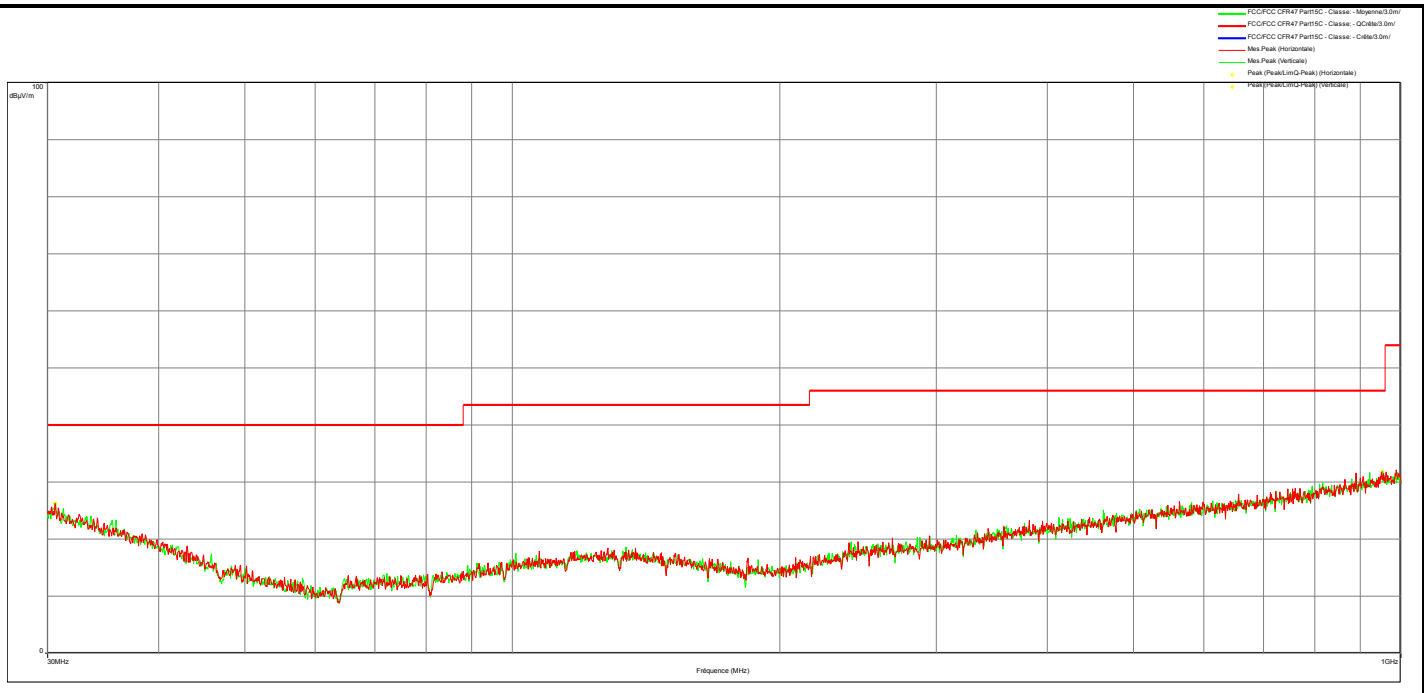
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#8	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Emr8 - Pos Z RX Cmax	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



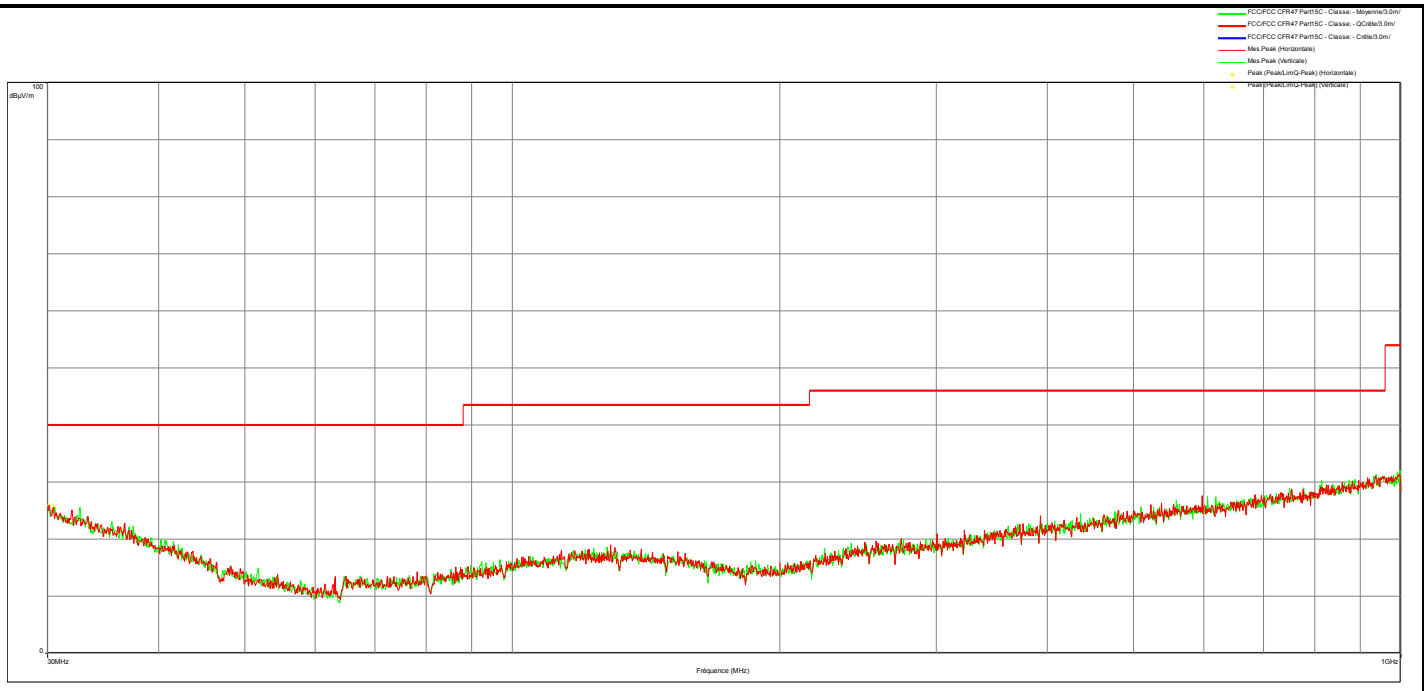
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#9	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Emr9 - Pos XY Fonctional mode	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



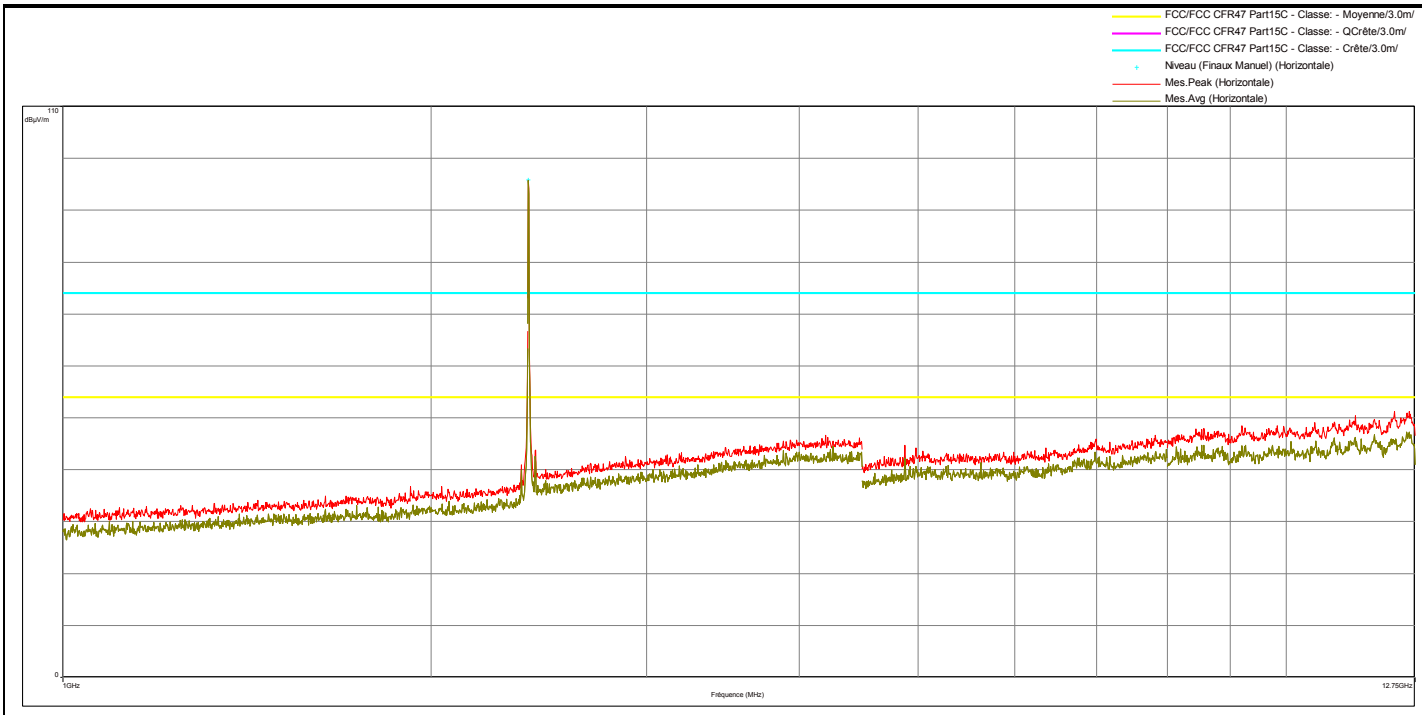
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#10	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Emr10 - Pos Z - Fonctional mode	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



Spurious emissions

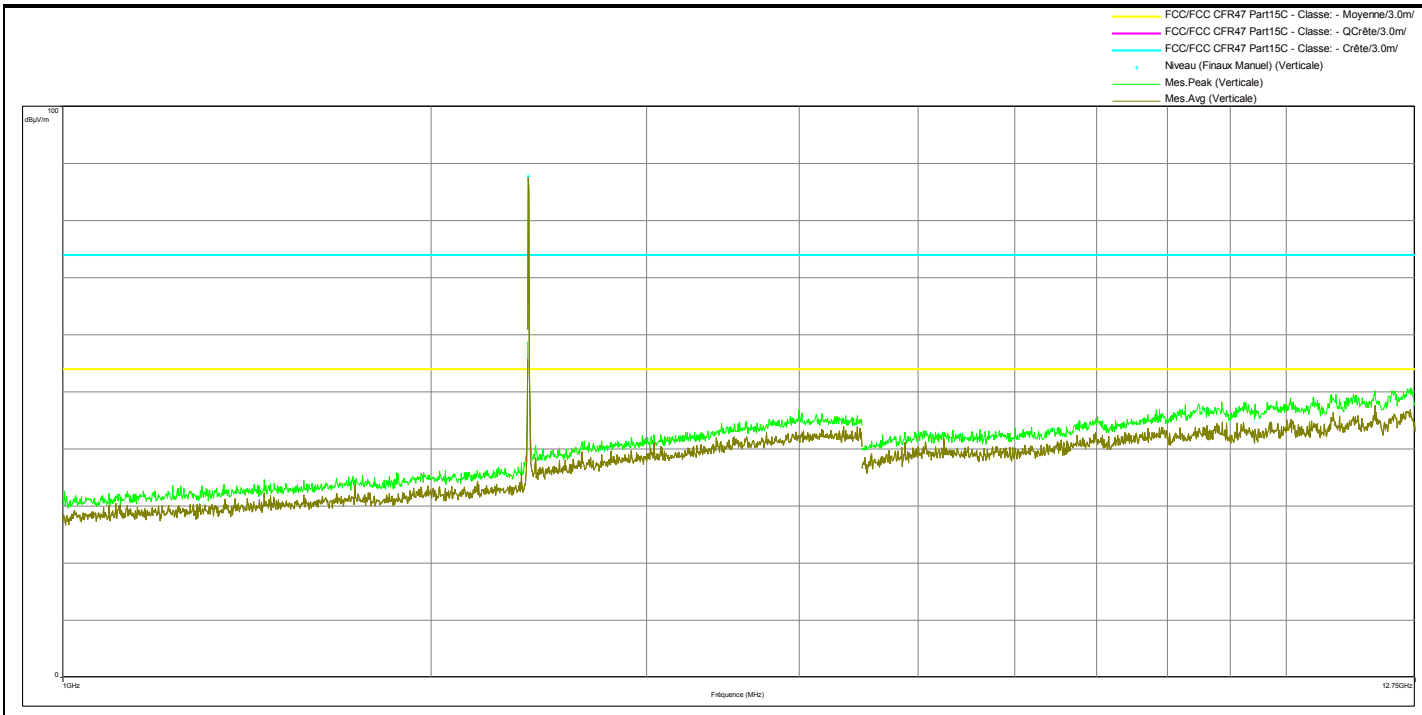
RADIATED EMISSIONS			
Graph name:	Emr#11	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H) - Axis XY - TX Cmin	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Horizontal	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak Level (dBµV/m)	Angle (°)	Commentaires
2402.31	95.86	290	Horizontale

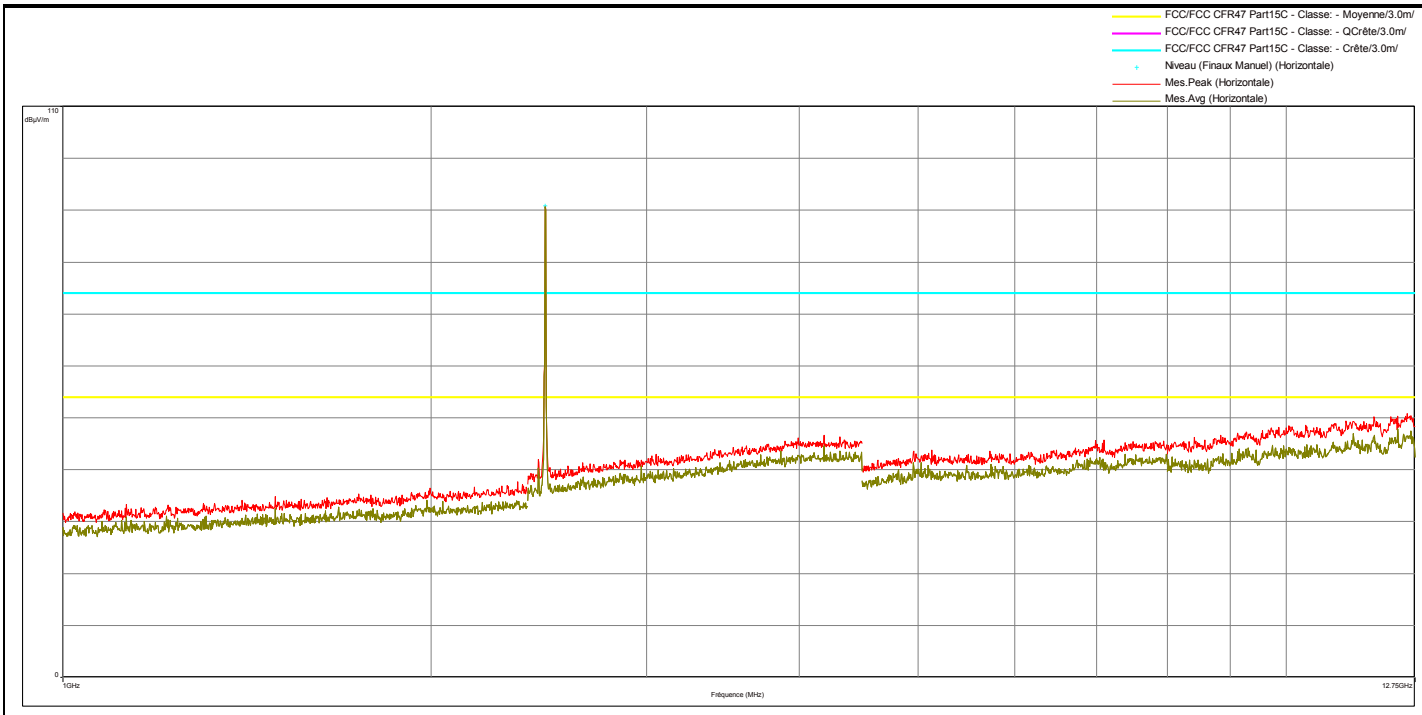
RADIATED EMISSIONS			
Graph name:	Emr#12	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(V) - Axis XY - TX Cmin	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak Level (dBµV/m)	Angle (°)	Commentaires
2402.31	87.79	205	Verticale

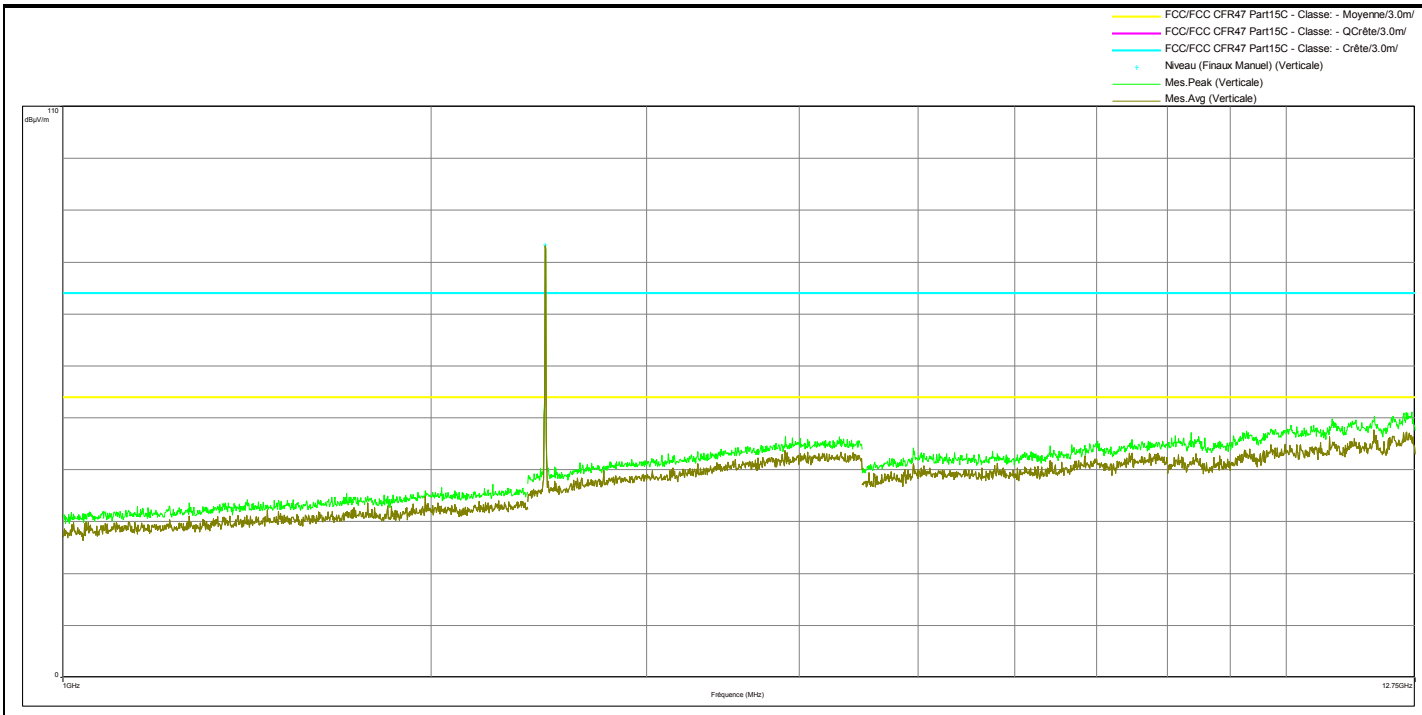
RADIATED EMISSIONS			
Graph name:	Emr#13	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H) - Axis XY - TX Cmax	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Horizontal	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak Level (dBµV/m)	Angle (°)	Commentaires
2479.8	90.83	313	Horizontale

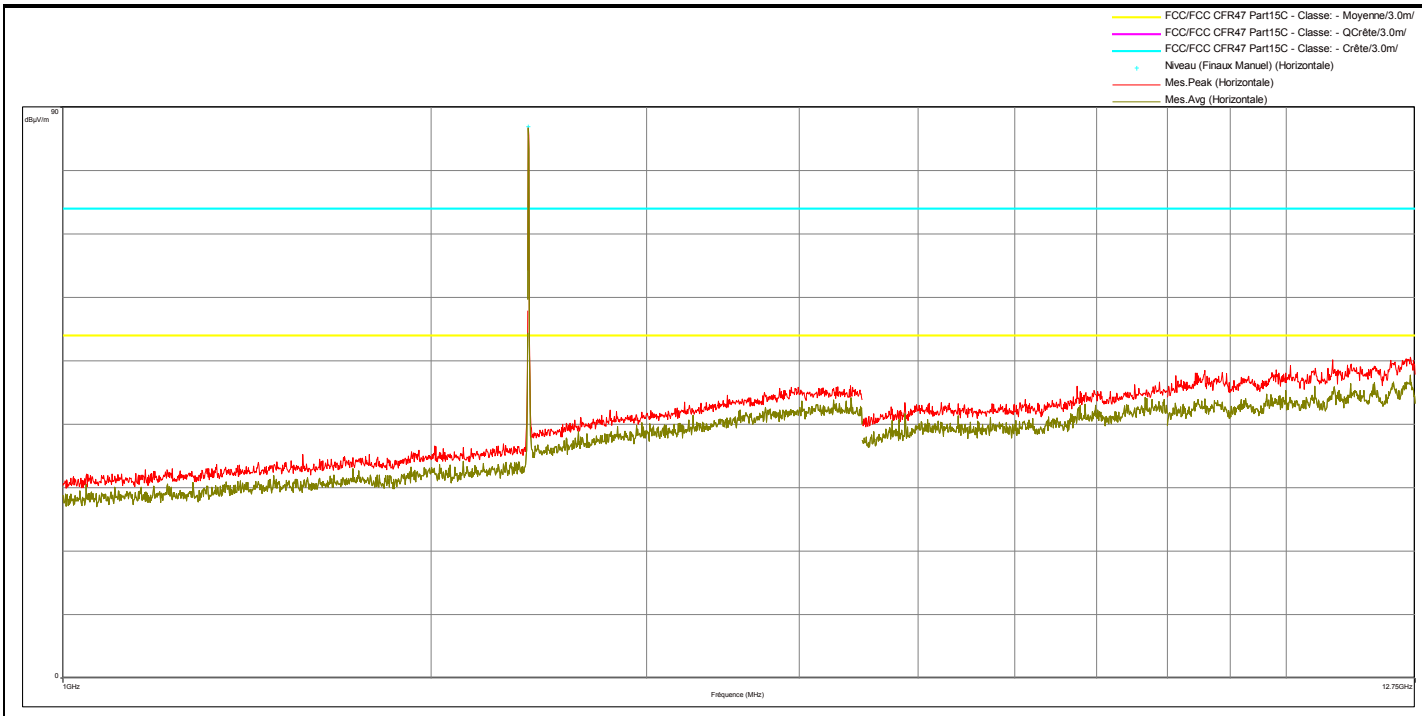
RADIATED EMISSIONS			
Graph name:	Emr#14	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(V) - Axis XY - TX Cmax	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak Level (dBµV/m)	Angle (°)	Commentaires
2479.8	83.36	153	Verticale

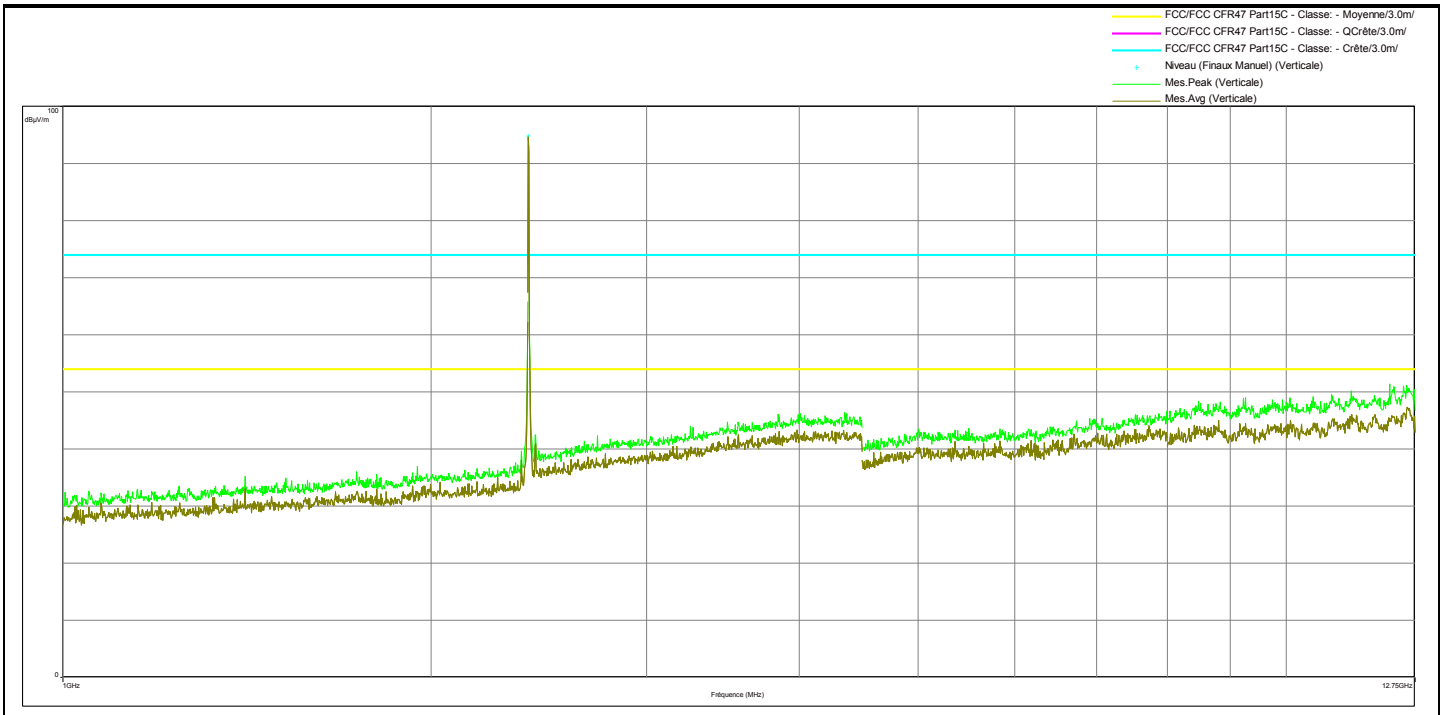
RADIATED EMISSIONS			
Graph name:	Emr#15	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H) - Axis Z - TX Cmin	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Horizontal	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak Level (dBµV/m)	Angle (°)	Commentaires
2402.31	86.94	161	Horizontale

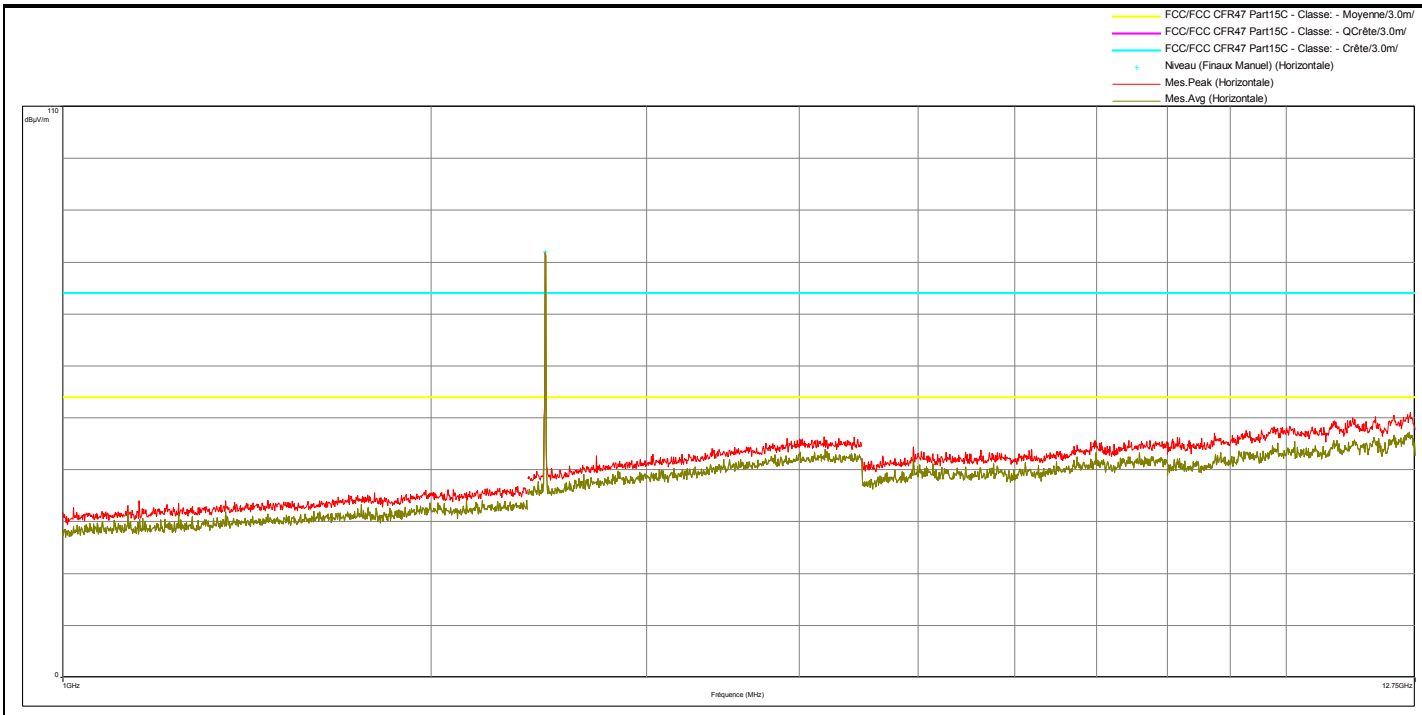
RADIATED EMISSIONS			
Graph name:	Emr#16	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(V) - Axis Z - TX Cmin	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak Level (dBµV/m)	Angle (°)	Commentaires
2402.31	94.78	160	Verticale

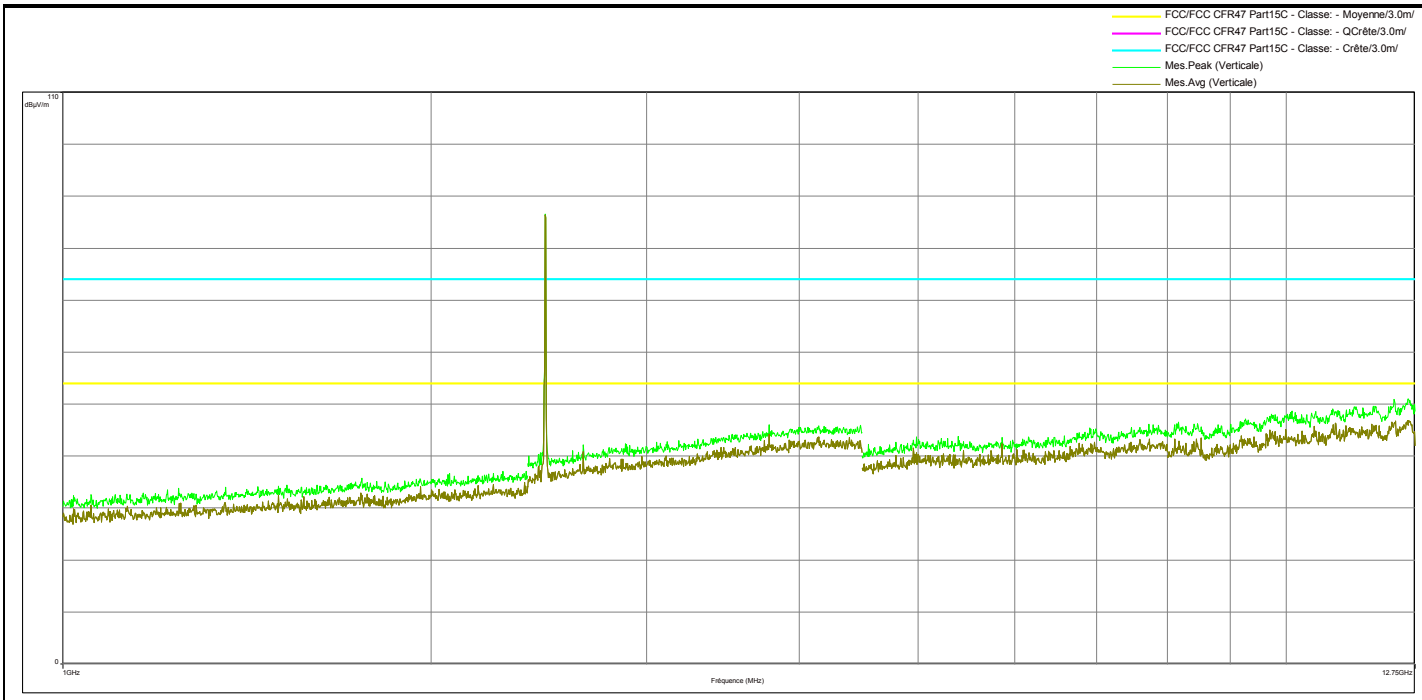
RADIATED EMISSIONS			
Graph name:	Emr#17	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H) - Axis Z - TX Cmax	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Horizontal	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

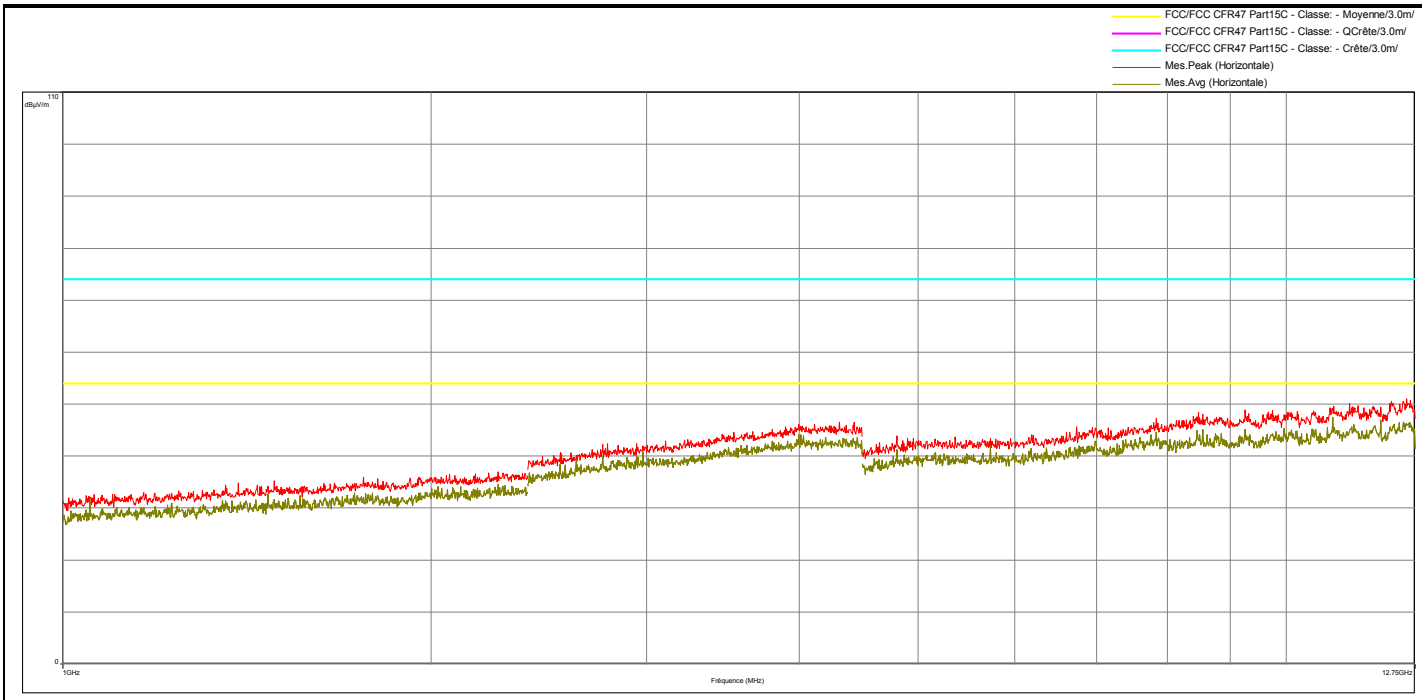
Frequency (MHz)	Peak Level (dBµV/m)	Angle (°)	Commentaires
2479.8	82.01	135	Horizontale

RADIATED EMISSIONS			
Graph name:	Emr#18	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(V) - Axis Z - TX Cmax	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



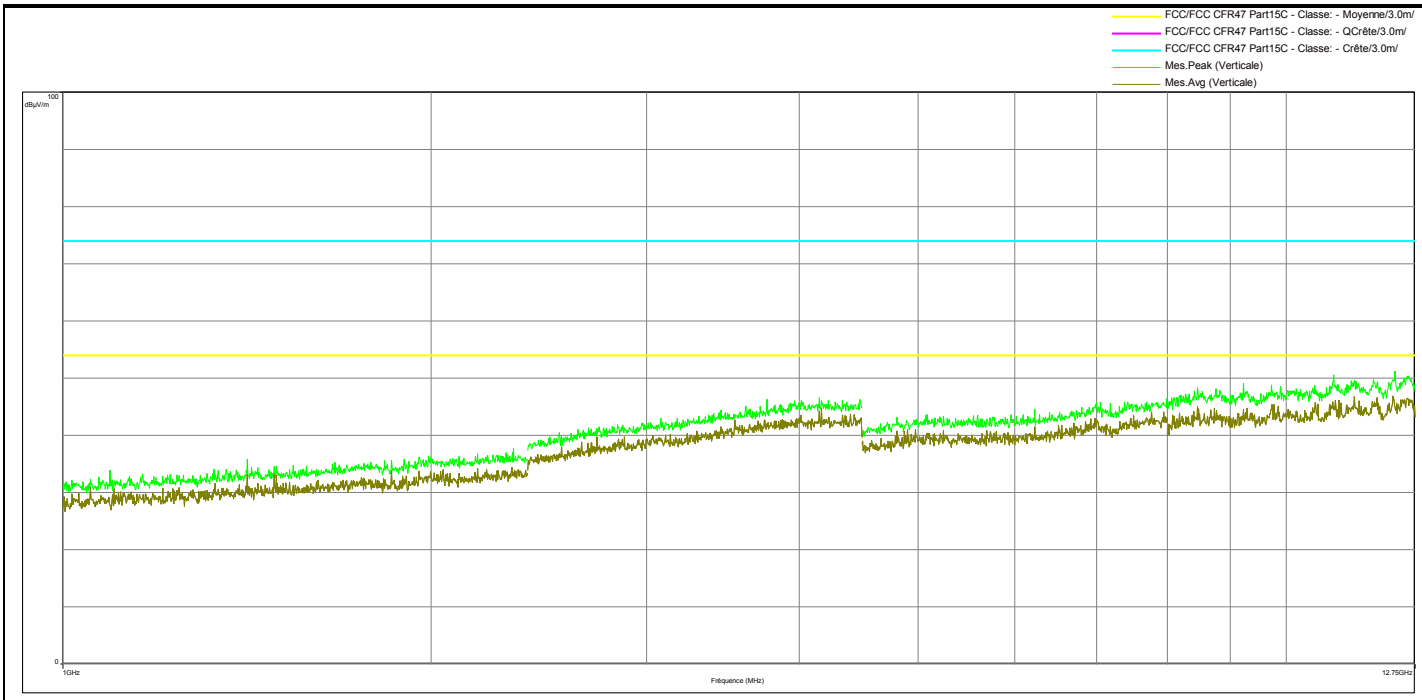
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#19	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H) - Axis XY - RX Cmin	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Horizontal	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



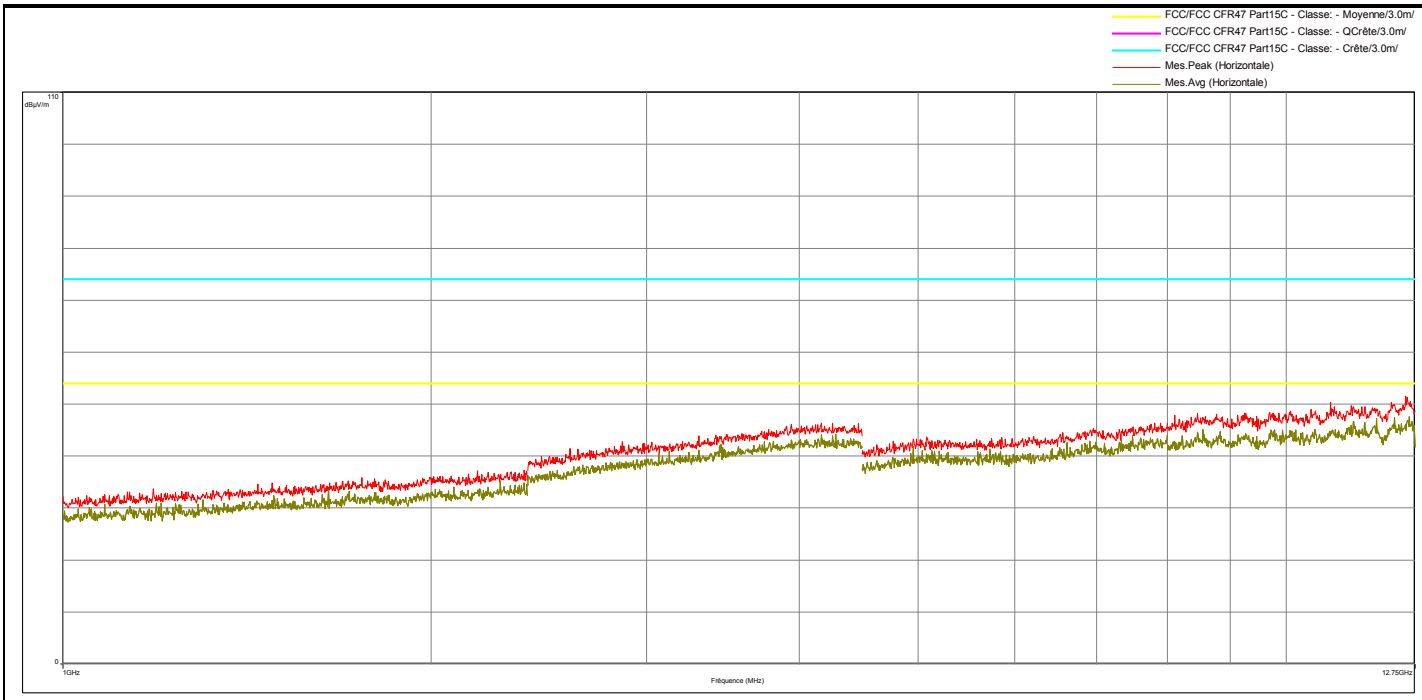
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#20	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(V) - Axis XY - RX Cmin	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



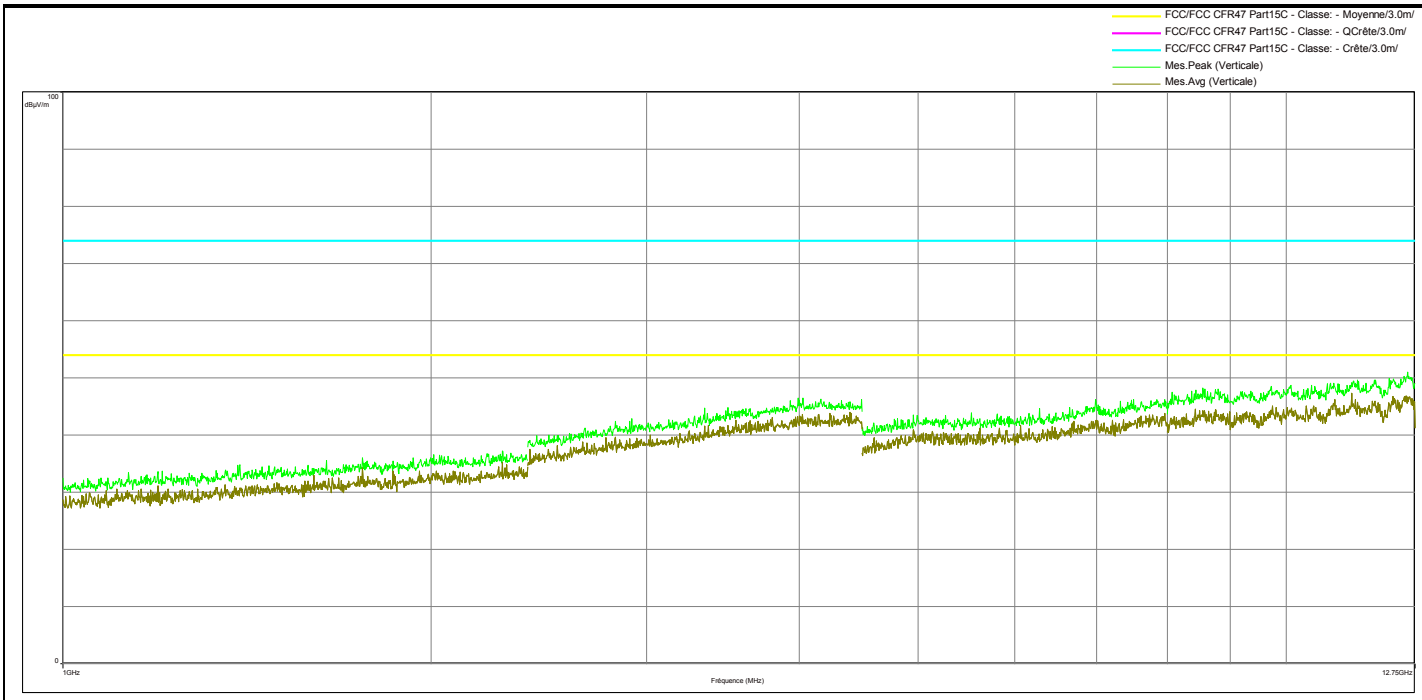
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#21	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H) - Axis XY - RX Cmax	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Horizontal	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



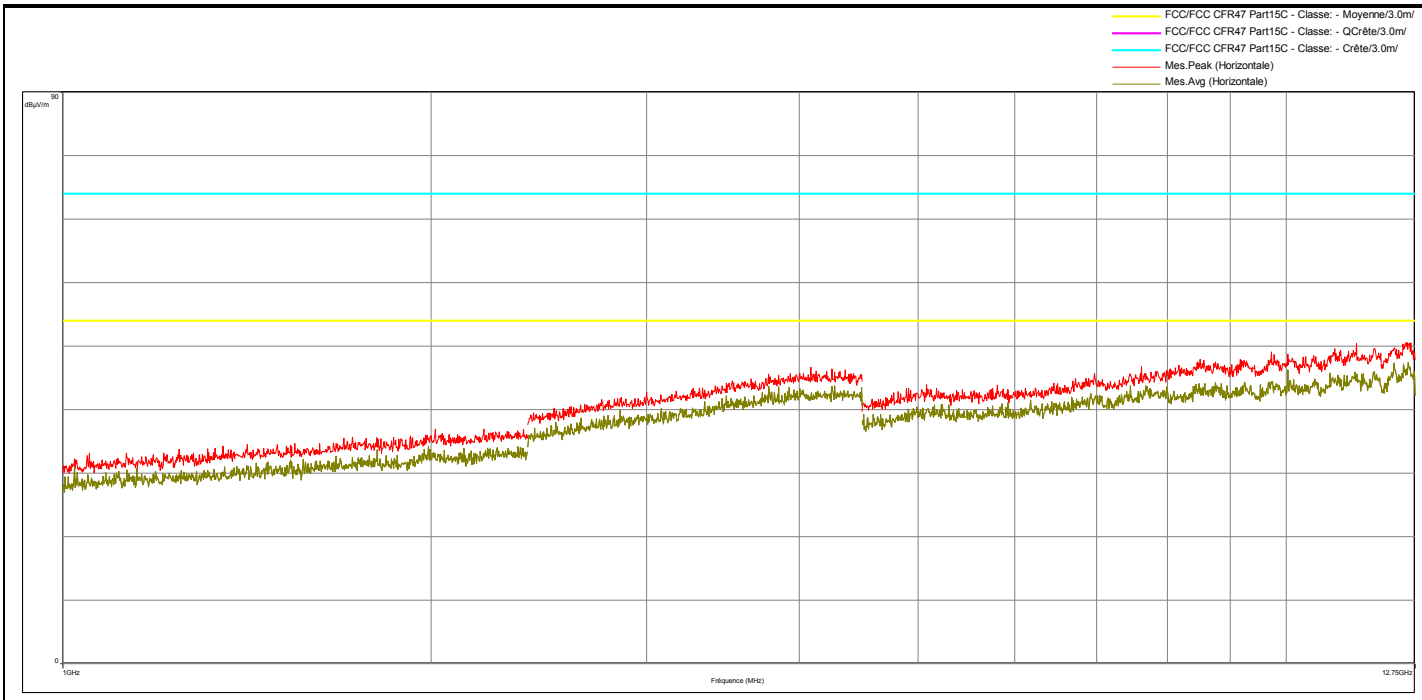
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#22	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(V) - Axis XY - RX Cmax	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



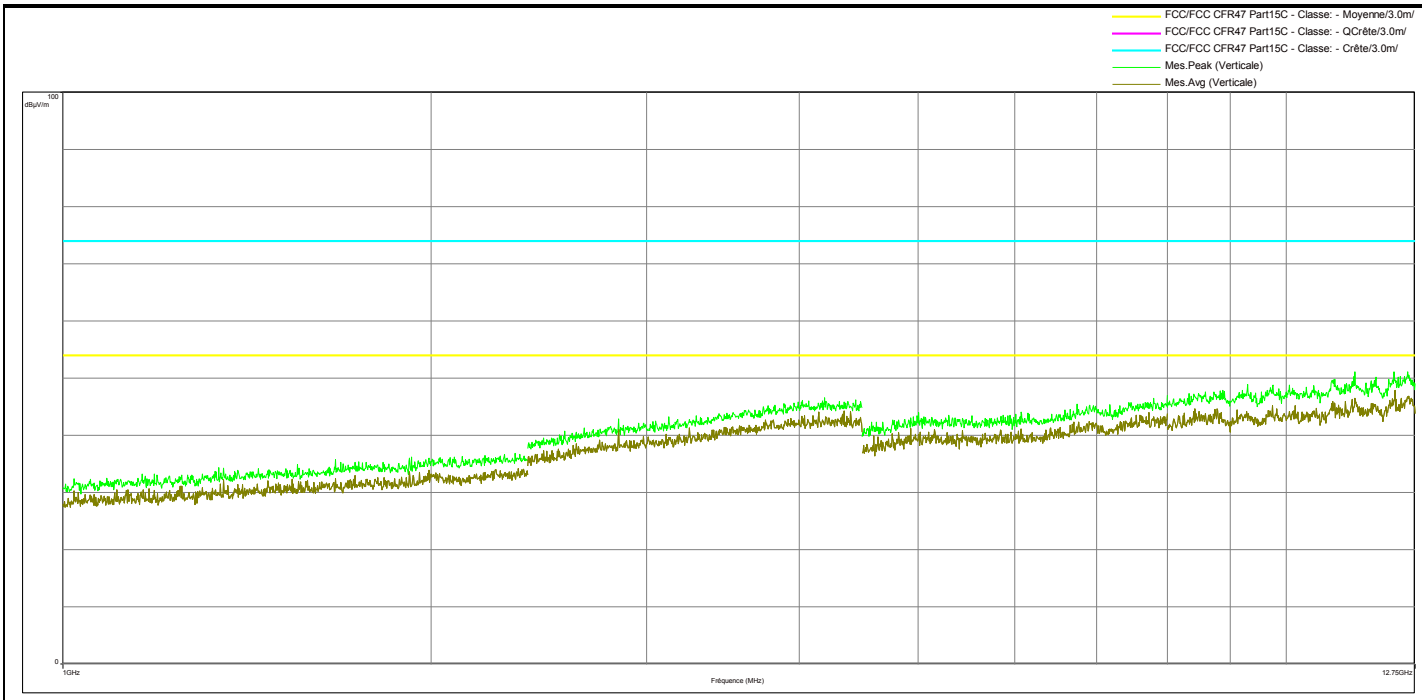
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#23	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H) - Axis Z - RX Cmin	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Horizontal	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



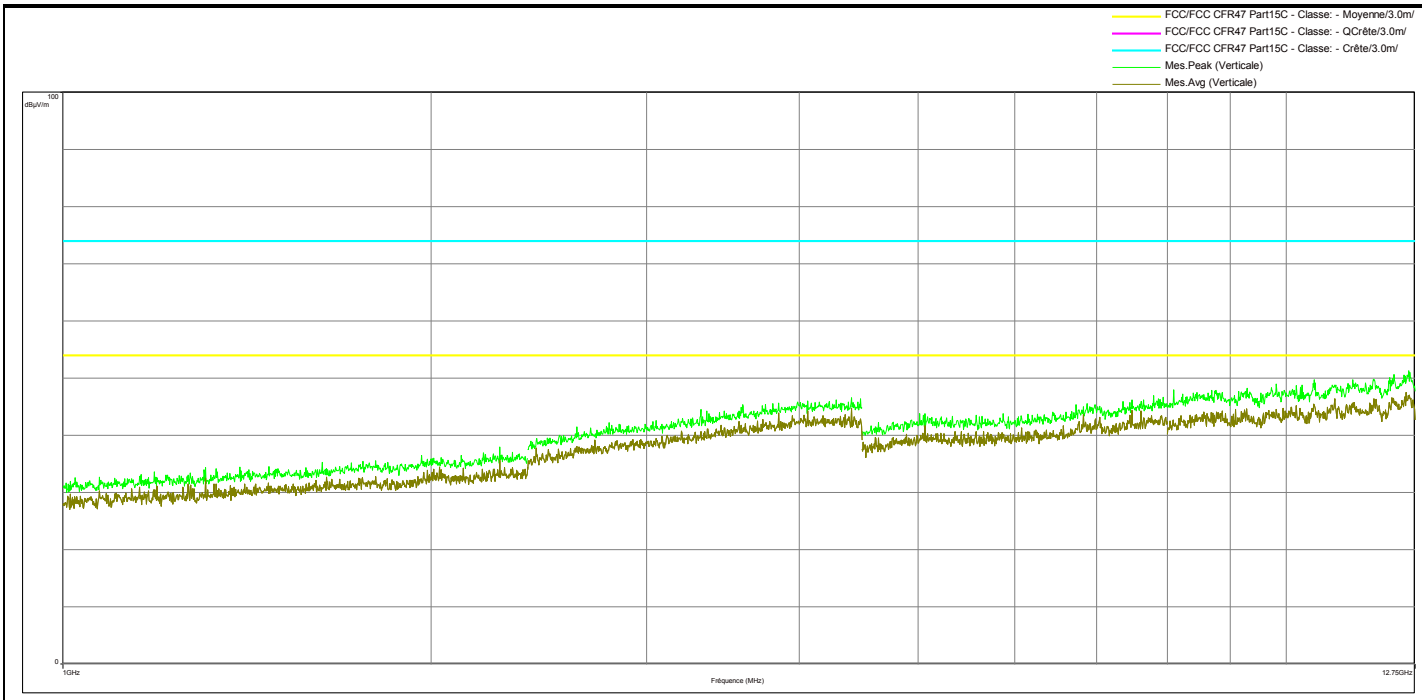
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#24	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(V) - Axis Z - RX Cmin	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



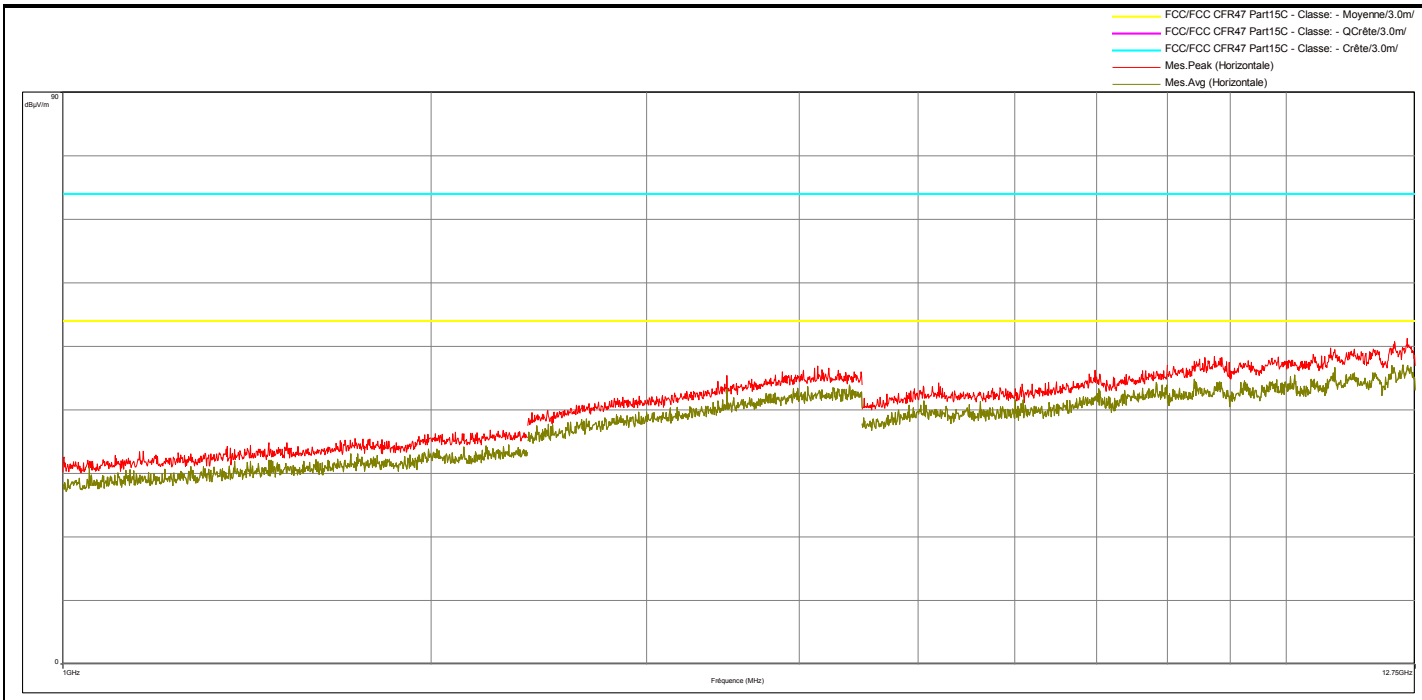
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#25	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(V) - Axis Z - RX Cmax	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



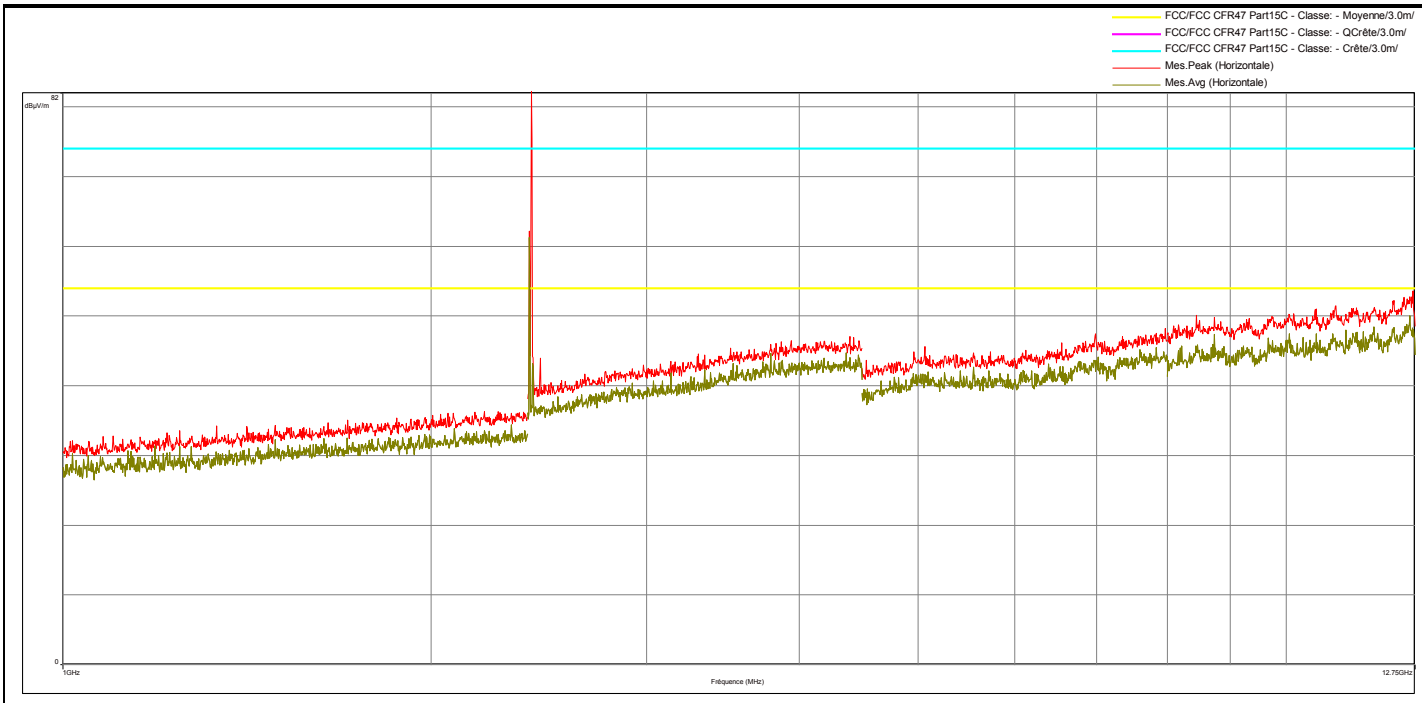
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#26	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H) - Axis Z - RX Cmax	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	HorizontaL	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



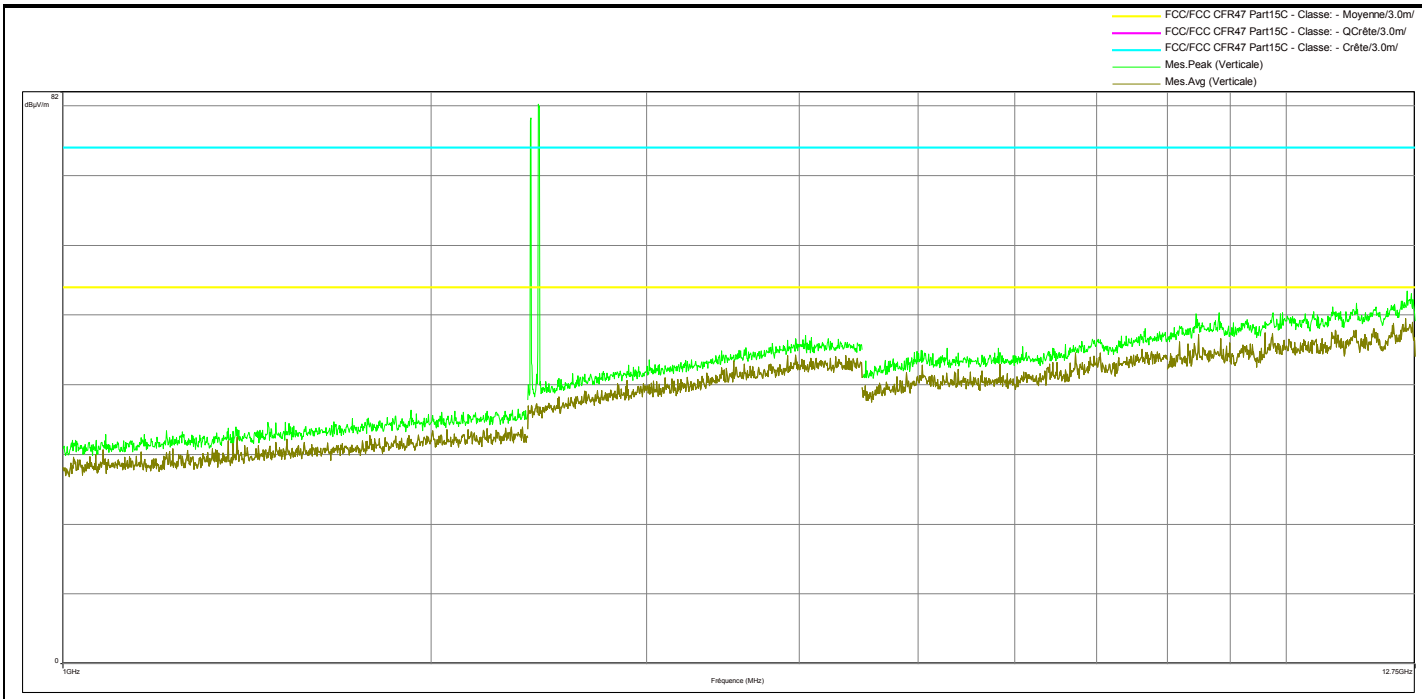
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#27	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H) - Axis Z - Default Running mode	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Horizontal	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



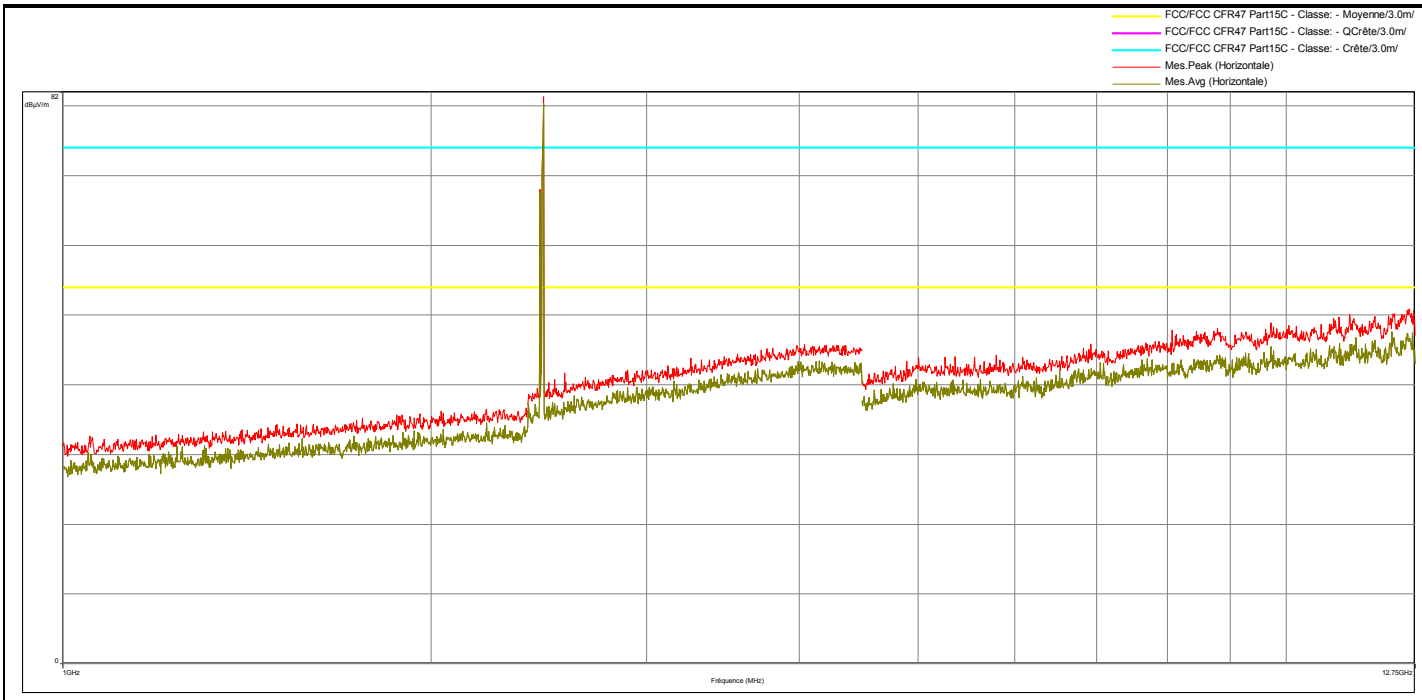
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#28	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(V) - Axis Z - Default Running mode	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



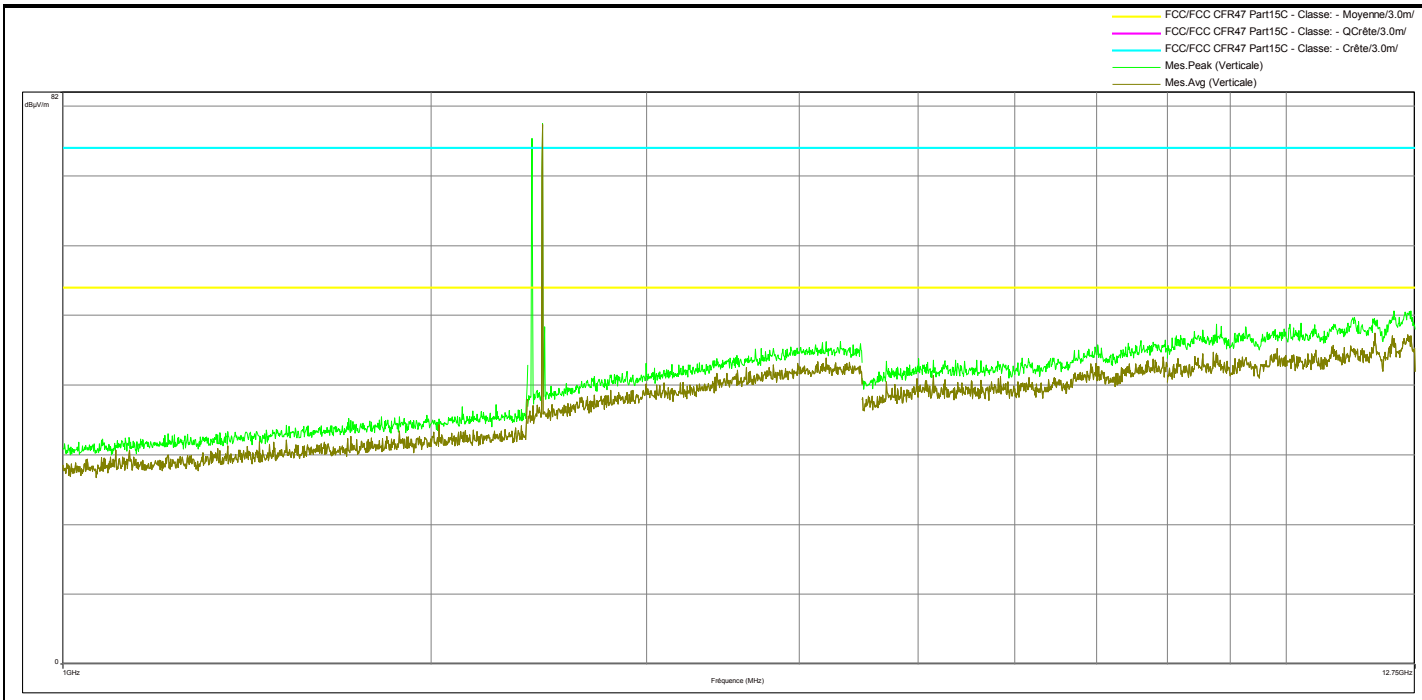
Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#29	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H) - Axis XY - Default Running mode	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Horizontal	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

RADIATED EMISSIONS			
Graph name:	Emr#30	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(V) - Axis XY - Default Running mode	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

11. 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 *Measurement of conducted disturbances in voltage on the power port*	3.57 dB	3.6 dB
Mesure des perturbations conduites en tension sur le réseau de télécommunication *Measurement of conducted disturbances in voltage on the telecommunication port.*	3.28 dB	A l'étude / Under consid.
Mesure des perturbations discontinues conduites en tension *Measurement of discontinuous conducted disturbances in voltage*	3.47 dB	3.6 dB
Mesure des perturbations conduites en courant *Measurement of conducted disturbances in current*	2.90 dB	A l'étude / Under consid.
Mesure du champ électrique rayonné sur le site en espace libre de Moirans *Measurement of radiated electric field on the Moirans open area test site*	5.07 dB	5.2 dB

Les valeurs d'incertitudes calculées du laboratoire étant inférieures aux valeurs d'incertitudes limites établies par la norme, la conformité de l'échantillon est établie directement par les niveaux limites applicables. / *The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the standard. The conformity of the sample is directly established by the applicable limits values.*