TEST REPORT

N°: 173833-769606-A(FILE#2976371) **Version : 02**

Subject	**Radio spectrum matters** **tests according to standards:** **47 CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 5**
Issued to	**IN&MOTION** 10 rue de la Lyre – Cran-Gevrier 74960 – ANNECY FRANCE

Apparatus under test

Product	**Airbag analysis, detection, triggering unit**
Trade mark	**In&motion**
Manufacturer	**In&motion**
Model under test	**In&box V6**
Serial number	**63000001 & 63000005**
FCC ID	**2AS9Y-INEBOX630**
IC	**25034-INEBOX630**

Conclusion	See Test Program chapter
Test date	August 26, 2021 to September 16, 2021
Test location	Moirans
FCC Test site	FR0008 - 197516
ISED Test site	FR0008 - 6500A
Sample receipt date	August 11, 2021
Composition of document	66 pages
Document issued on	November 3, 2021

Written by :
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PUBLICATION HISTORY

Version	Date	Author	Modification
01	October 19, 2021	Majid MOURZAGH	Creation of the document
02	November 3, 2021	Majid MOURZAGH	Correction test site FCC/ISED on page 1 Correction Name and mailing address on page 1

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

References

- **47 CFR Part 15.247**
- **RSS 247 Issue 2**
- **RSS Gen Issue 5**
- **KDB 558074 D01 DTS Meas Guidance v05r02**
- **ANSI C63.10-2013**

Radio requirement:

Clause (47CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 5) Test Description	Test result - Comments
Occupied Bandwidth	☑ PASS ☐ FAIL ☐ NA ☐ NP(1)
6dB Bandwidth	☑ PASS ☐ FAIL ☐ NA() ☐ NP(1)
Duty Cycle	☐ PASS ☐ FAIL ☑ NA ☐ NP(1)
Maximum Conducted Output Power	☑ PASS ☐ FAIL ☐ NA ☐ NP(1)
Power Spectral Density	☑ PASS ☐ FAIL ☐ NA ☐ NP(1)
Conducted Spurious Emission at the Band Edge	☑ PASS ☐ FAIL ☐ NA() ☐ NP(1)
Unwanted Emissions into Non-Restricted Frequency Bands	☑ PASS ☐ FAIL ☐ NA() ☐ NP(1)
AC Power Line Conducted Emission	☑ PASS ☐ FAIL ☐ NA(2) ☐ NP(1)
Unwanted Emissions into Restricted Frequency Bands	☑ PASS ☐ FAIL ☐ NA ☐ NP(1)
Receiver Radiated emissions	☐ PASS ☐ FAIL ☑ NA ☐ NP(1)
This table is a summary of test report, see conclusion of each clause of this test report for detail.	

(1): Limited program
(2): EUT not directly or indirectly connected to the AC Power Public Network

PASS: EUT complies with standard's requirement
FAIL: EUT does not comply with standard's requirement
NA: Not Applicable
NP: Test Not Performed

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

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):
In&motion In&box V6 **Serial Number: 63000001**

Equipment Under Test

Power supply:
During all the tests, EUT is supplied by V_{nom}: 3.7VDC
For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference / Sn	Comments
Supply1	☐ AC ☐ DC ☑ Battery	LiPo 3.7V 2600mAh	Akku Tronics 854166	/

Voltage table used (for Power Line Conducted Emissions):

Type	Measurement performed:	
☑ AC	☑ **120VAC/60Hz**	☑ **240VAC/50Hz**
☑ battery	☑ **+**3.7**VDC**	☐ **-**....**VDC**
☑ USB (used to reload battery)	☑ **+**5VDC**VDC**	☐ **-**....**VDC**

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Cable USB	USBC	0.3	☐	☑	☐	Used to reload battery

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop LENOVO	L460		Used to let RF configuration setting
Switching Adapter INPUT:100-240 50/60Hz 0.3Amax OUTPUT:5V 2A	SOY-0500200EU	-	Used during test:"AC Power Line Conducted Emission"

Equipment information:

Bluetooth LE Type:	☐ **BLE**	☐ **v4.1**	☐ **v4.2**	☑ **v5.2**
Frequency band:	[2400 – 2483.5] MHz			
Spectrum Modulation:	☑ DSSS (Tested like it)			
Number of Channel:	40			
Spacing channel:	2MHz			
Channel bandwidth:	☑ 1MHz		☑ 2MHz	
Antenna Type:	☑ Integral	☐ External	☐ Dedicated	
Antenna connector:	☐ Yes	☐ No	☑ Temporary for test	
Transmit chains:	1			
	Single antenna			
	Gain: 0.5dBi			
Antenna requirements §15.203	Conducted Method (welded connection, according to manufacturer's requirements)			
Type of equipment:	☑ Stand-alone	☐ Plug-in	☐ Combined	
Duty cycle:	☑ Continuous duty	☐ Intermittent duty	☐ 100% duty	
Equipment type:	☑ Production model		☐ Pre-production model	
Operating temperature range:	Tmin:	☑ -20°C	☐ 0°C	☐ °C
	Tnom:	20°C		
	Tmax:	☐ 35°C	☑ 55°C	☐ °C
Type of power source:	☐ AC power supply	☐ DC power supply	☑ Battery	
Operating voltage range:	Vnom:	☐ 230V/50Hz	☑ 3.7Vdc	

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			
Available	**Data Rate (Mbps)**	**Modulation Type**	**Worst Case Modulation**
☑	1	GFSK	☑
☑	2	GFSK	☐

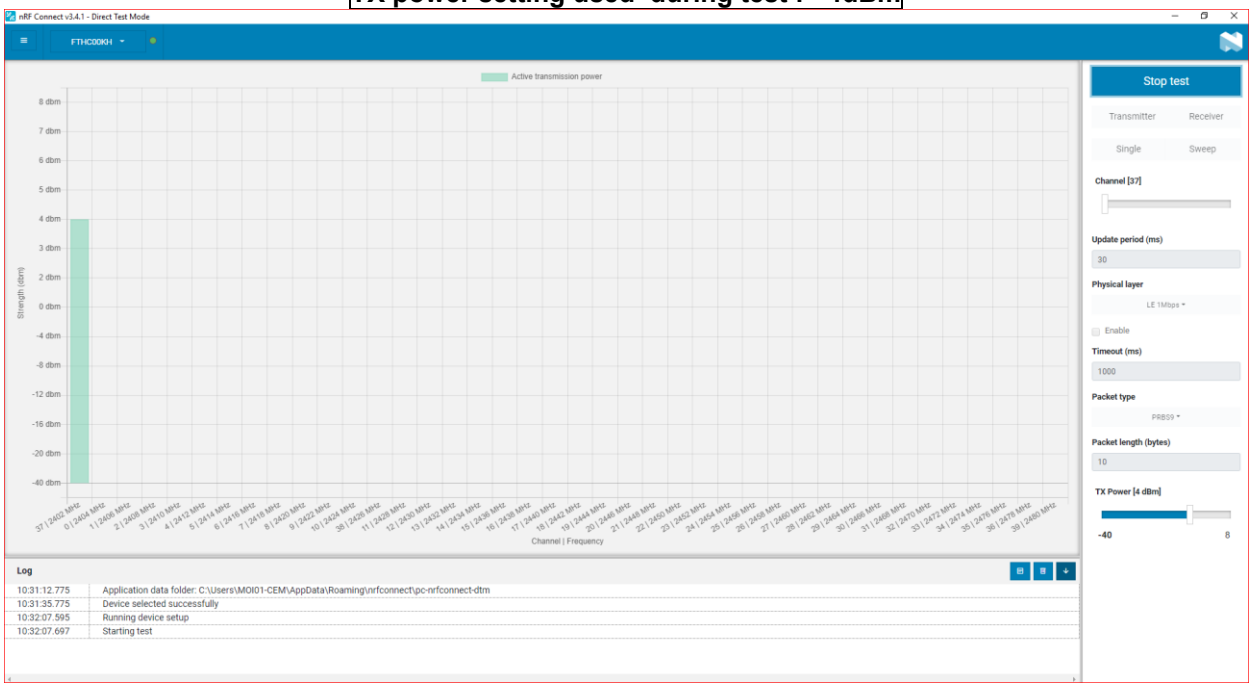
2.2. RUNNING MODE

Test mode	Description of test mode
Test mode 1	Permanent emission with modulation on a fixed channel in the data rate that produced the highest power
Test mode 2	Permanent reception

Test	Running mode	
Occupied Bandwidth	☑ Test mode 1 (1)	☐ Alternative test mode()
6dB Bandwidth	☑ Test mode 1 (1)	☐ Alternative test mode()
Duty Cycle	☑ Test mode 1 (1)	☐ Alternative test mode()
Maximum Conducted Output Power	☑ Test mode 1 (1)	☐ Alternative test mode()
Power Spectral Density	☑ Test mode 1 (1)	☐ Alternative test mode()
Conducted Spurious Emission at the Band Edge	☑ Test mode 1 (1)	☐ Alternative test mode()
Unwanted Emissions into Non-Restricted Frequency Bands	☑ Test mode 1 (1)	☐ Alternative test mode()
AC Power Line Conducted Emission	☑ Test mode 1 (1)	☐ Alternative test mode()
Unwanted Emissions into Restricted Frequency Bands	☑ Test mode 1 (1)	☐ Alternative test mode()

(1): Following commands with the specific test software “nRF Connect” are used to set the product:

TX power setting used during test : +4dBm



Hardware information (declaration of provider)		
Firmware GPS	**V. :**	*SIM33ELA_B06V10*
Firmware Atmel ATSAM4S8CA-ANR, Nordic Semi nRF52810 & Espressif ESP8285	**V. :**	*Tag certif-rf-2021-08-v2, sha1 2c26c9efd36c14af3b06f3fe5d2084a9adce1d29*

2.3. EQUIPMENT LABELLING

None

2.4. EQUIPMENT MODIFICATION

☐ None ☑ Modification: Only debug connectors soldered on PCB without any functional modification

3. OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

Test performed by	: Majid MOURZAGH
Date of test	: August 30, 2021
Ambient temperature	: 23 °C
Relative humidity	: 39 %

3.2. TEST SETUP

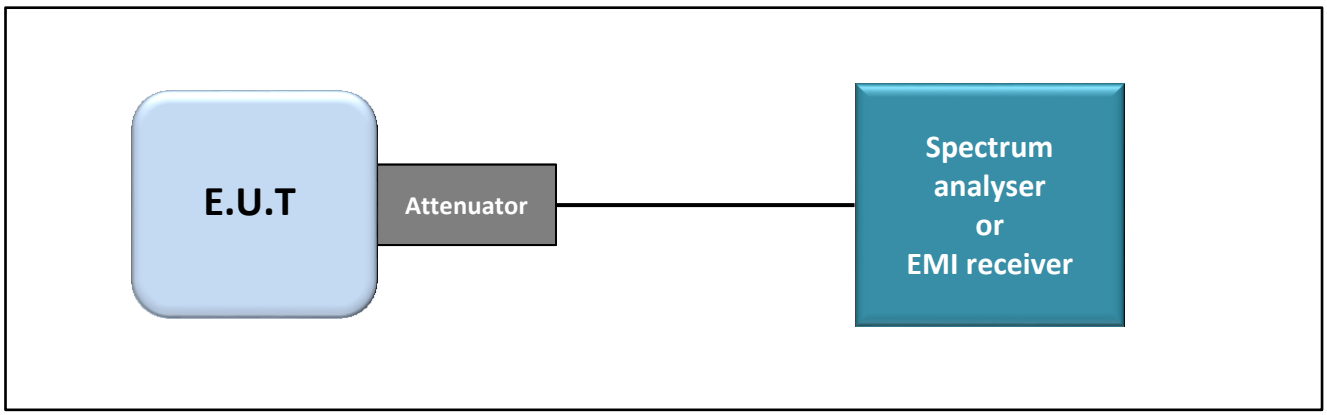
- The Equipment under Test is installed:
☐ On a table
☑ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

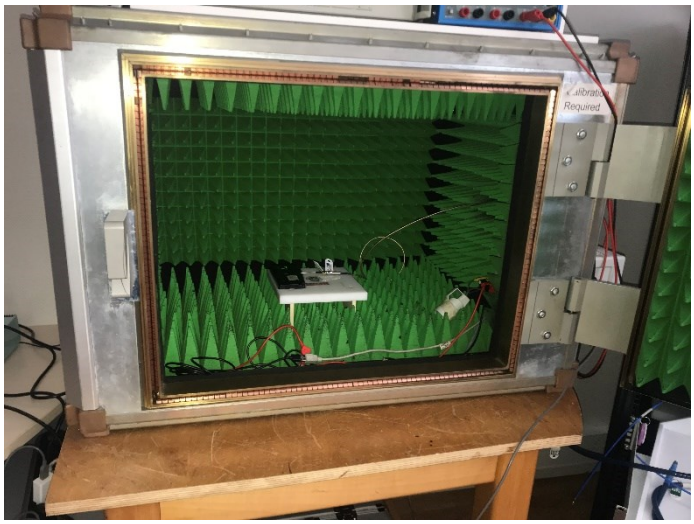
- Test Procedure:
☐ RSS-Gen Issue 5 § 6.7
☑ ANSI C63.10 § 6.9.2

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



Test set up of Occupied Bandwidth




Photograph for Occupied bandwidth

3.3. *LIMIT*

None

3.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
Attenuator 10dB	AEROFLEX	_	A7122269	09/20	03/22
CABLE SMA 1m	RADIALL	18GHz	A5329862	04/21	04/23
Full Anechoic Room	SIEPEL	_	D3044024		
Multimeter - CEM	FLUKE	87	A1240251	03/21	03/23
SMA 1.5m	SUCOFLEX	18GHz	A5329864	04/21	04/22
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	05/19	09/21
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23
SOFT	LCIE SUD EST	LCIE FCC 247 (BLE_ZIGBEE...)	L2000059		

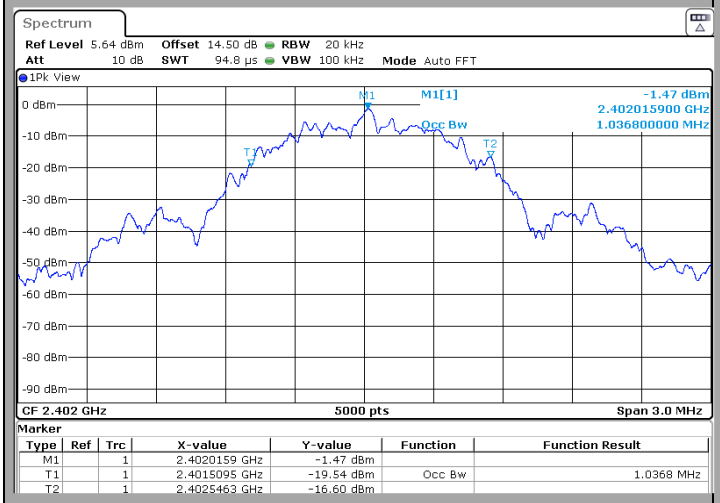
Note: In our quality system, the test equipment calibration due is more & less 2 months

3.5. RESULTS

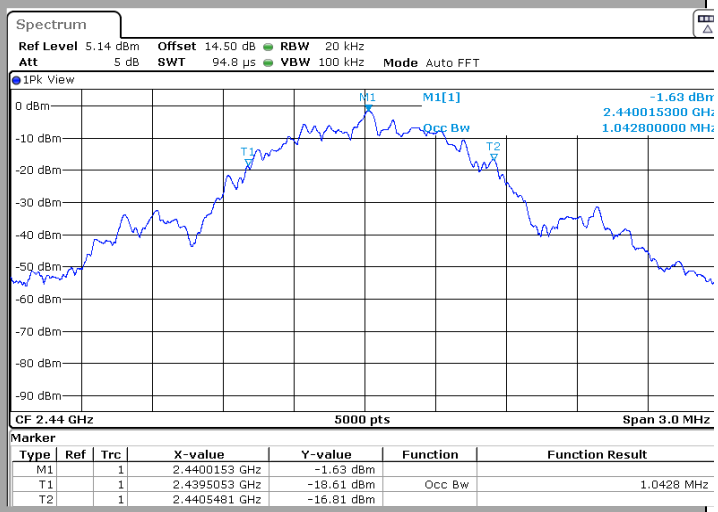
1MBits/s

Occupied Bandwidth

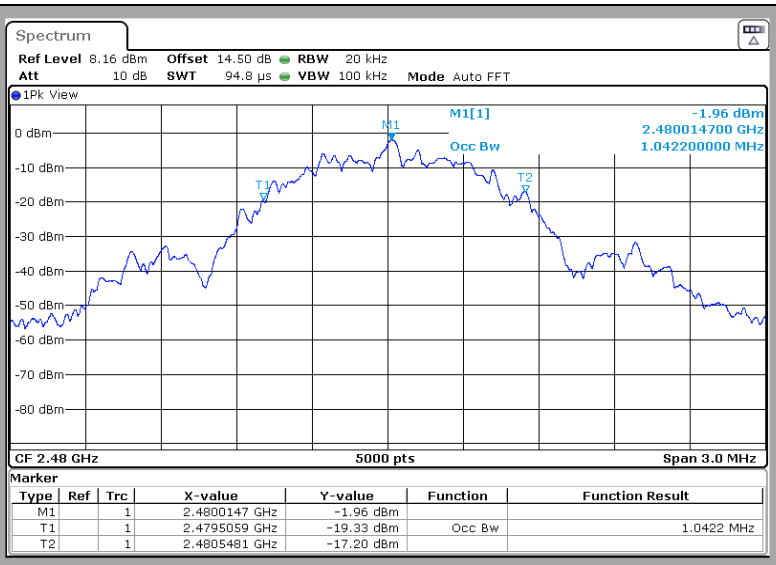
Cmin



Cnom



Cmax

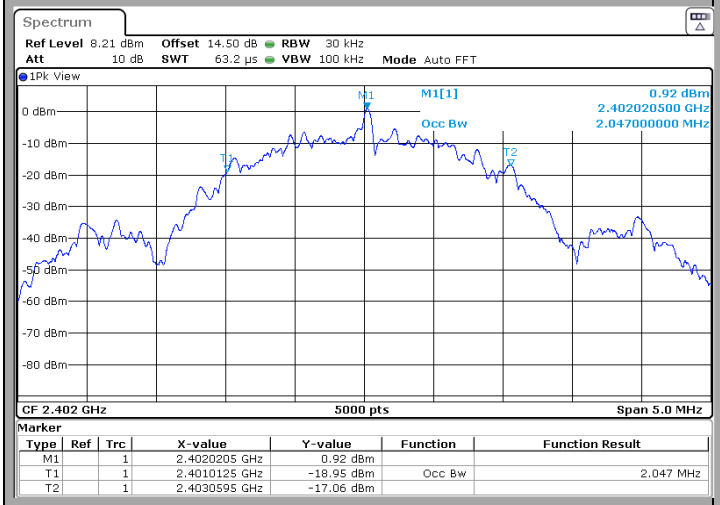


Channel	Occupied Bandwidth (MHz)
Cmin	1.0368
Cnom	1.0428
Cmax	1.0422

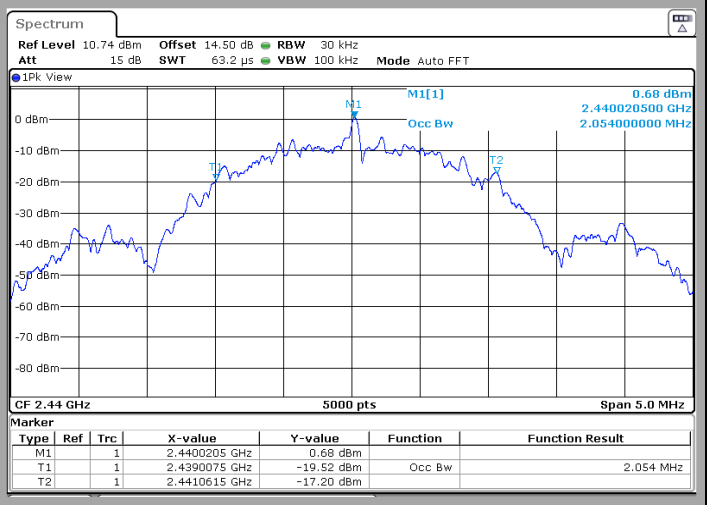
2MBits/s

Occupied Bandwidth

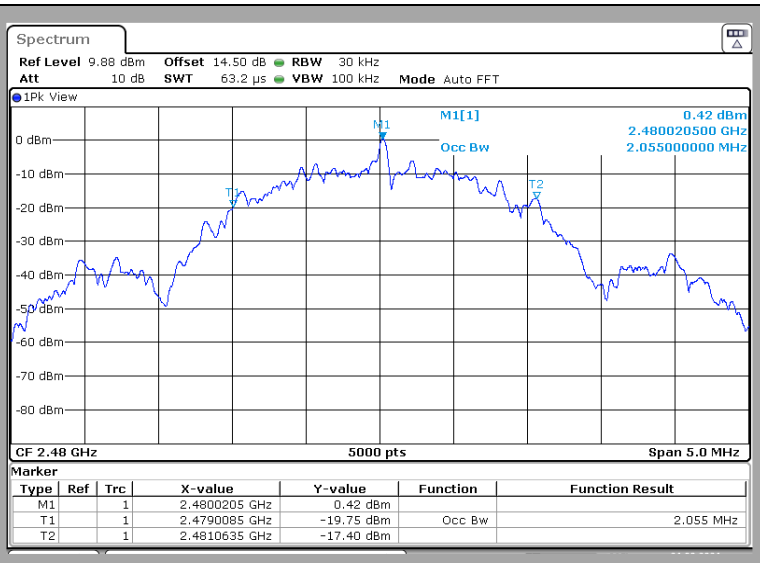
Cmin



Cnom



Cmax



Channel	Occupied Bandwidth (MHz)
Cmin	2.047
Cnom	2.054
Cmax	2.055

3.6. *CONCLUSION*

Occupied Channel Bandwidth measurement performed on the sample of the product **In&motion In&box V6**, SN: **63000001**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS-GEN ISSUE 5** limits.

4. 6DB EMISSION BANDWIDTH

4.1. TEST CONDITIONS

Test performed by	: Majid MOURZAGH
Date of test	: August 30, 2021
Ambient temperature	: 23 °C
Relative humidity	: 39 %

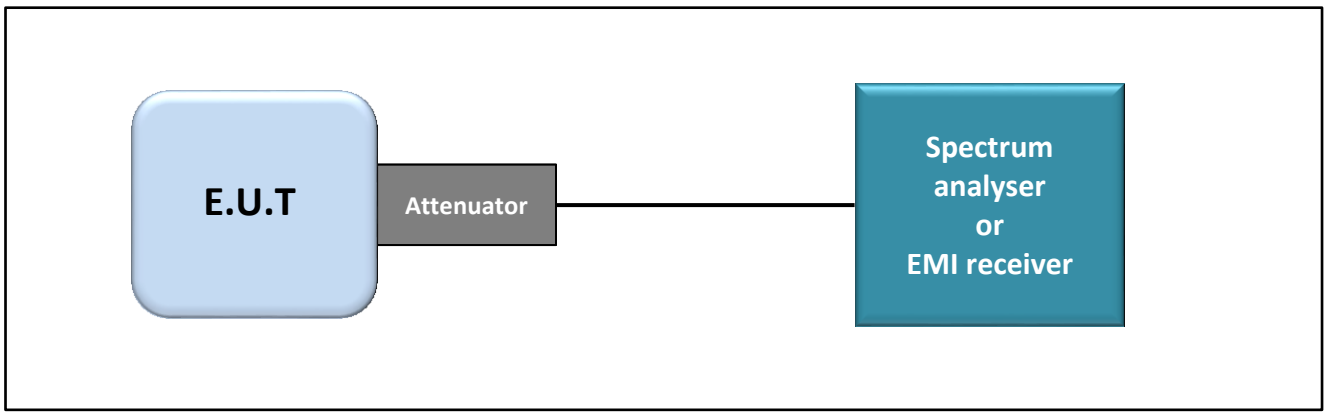
4.2. TEST SETUP

- The Equipment under Test is installed:
☐ On a table
☑ In an anechoic chamber

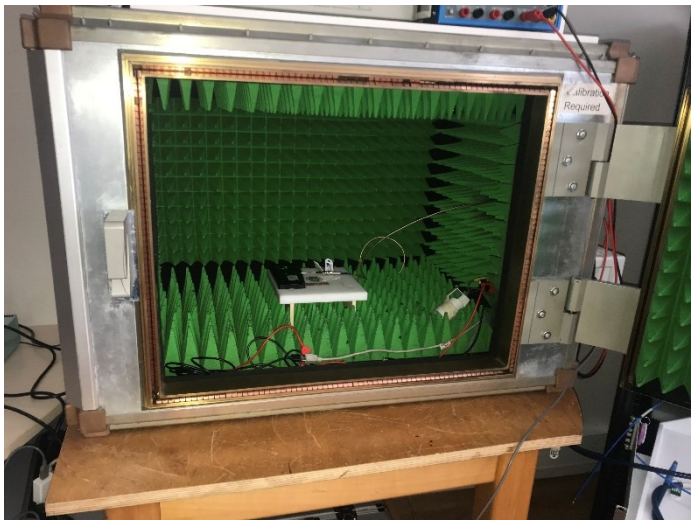
- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ KDB 558074 D01 DTS Meas Guidance v05r02 § 8.2

Measurement Procedure:
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.



Test set up of 6dB Emission Bandwidth



Photograph for 6dB emission bandwidth

4.3. LIMIT

The 6dB bandwidth shall be at least 500kHz

4.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
Attenuator 10dB	AEROFLEX	_	A7122269	09/20	03/22
CABLE SMA 1m	RADIALL	18GHz	A5329862	04/21	04/23
Full Anechoic Room	SIEPEL	_	D3044024		
Multimeter - CEM	FLUKE	87	A1240251	03/21	03/23
SMA 1.5m	SUCOFLEX	18GHz	A5329864	04/21	04/22
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	05/19	09/21
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23
SOFT	LCIE SUD EST	LCIE FCC 247 (BLE_ZIGBEE...)	L2000059		

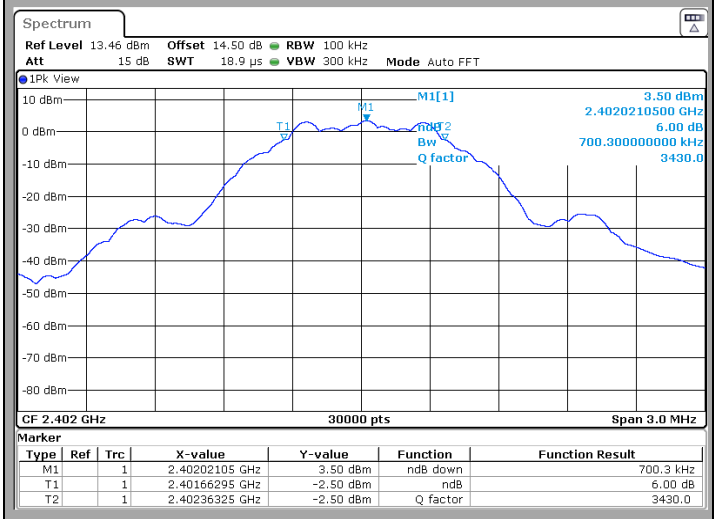
Note: In our quality system, the test equipment calibration due is more & less 2 months

4.5. RESULTS

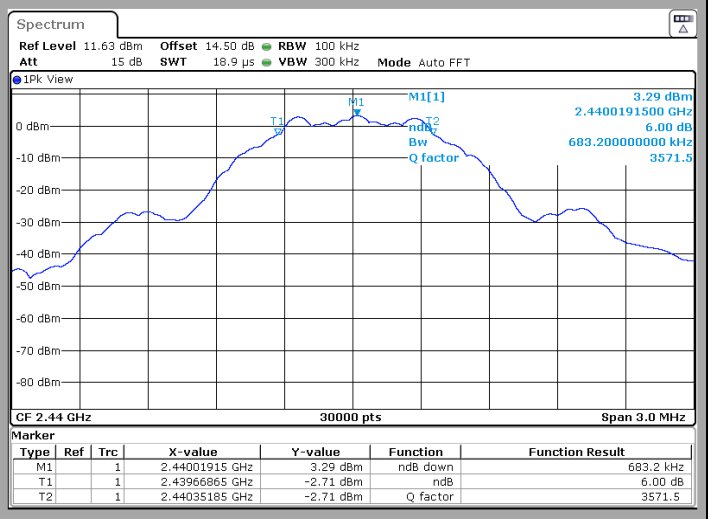
250kBits/s or 1MBits/s (same modulation)

6dB Emission Bandwidth

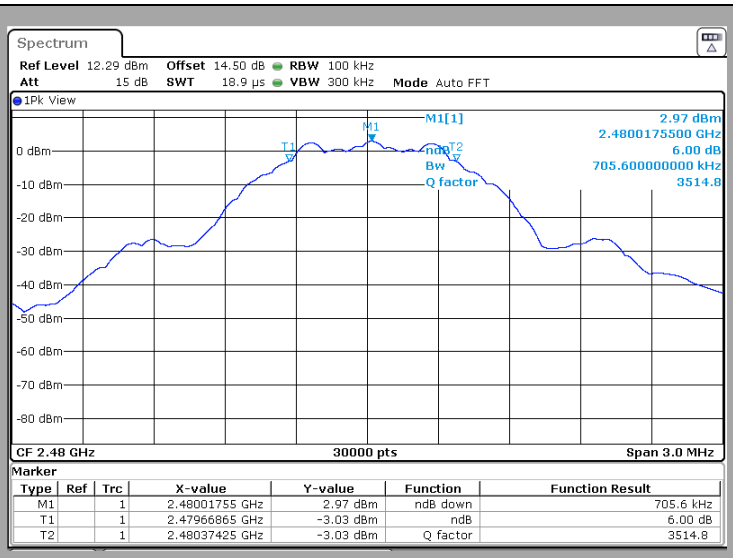
Cmin



Cnom



Cmax

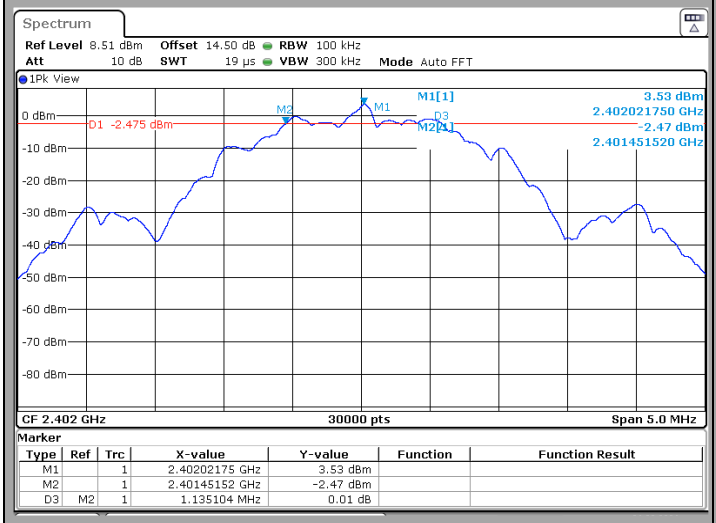


Channel	6dB Emission Bandwidth (MHz)	Limit (MHz)
Cmin	0.7003	Minimum 0.5
Cnom	0.6832	Minimum 0.5
Cmax	0.7056	Minimum 0.5

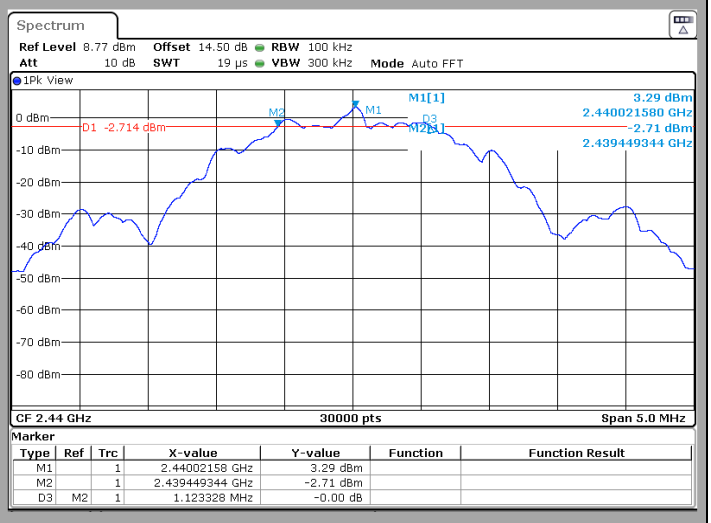
2MBits/s

6dB Emission Bandwidth

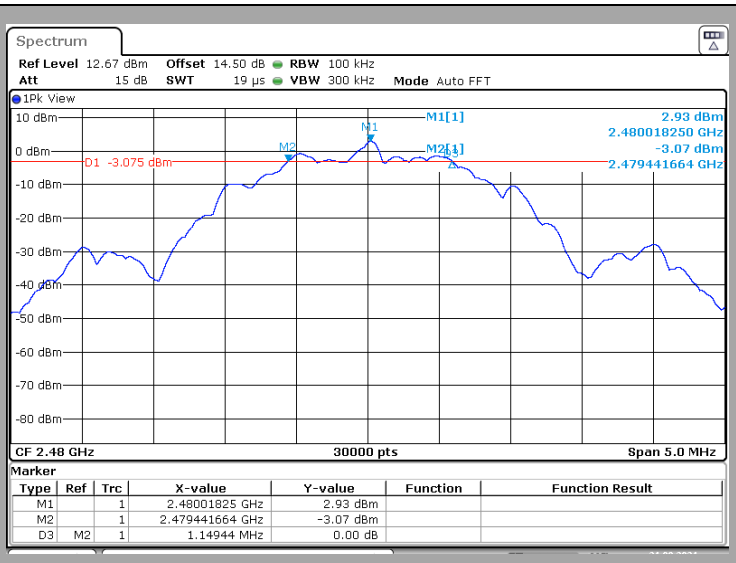
Cmin



Cnom



Cmax



Channel	6dB Emission Bandwidth (MHz)	Limit (MHz)
Cmin	1.1352	Minimum 0.5
Cnom	1.1233	Minimum 0.5
Cmax	1.1494	Minimum 0.5

4.6. CONCLUSION

6dB Emission Bandwidth measurement performed on the sample of the product **In&motion In&box V6**, SN: **63000001**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

5. MAXIMUM CONDUCTED OUTPUT POWER

5.1. TEST CONDITIONS

Test performed by	: Majid MOURZAGH
Date of test	: August 30, 2021
Ambient temperature	: 23 °C
Relative humidity	: 39 %

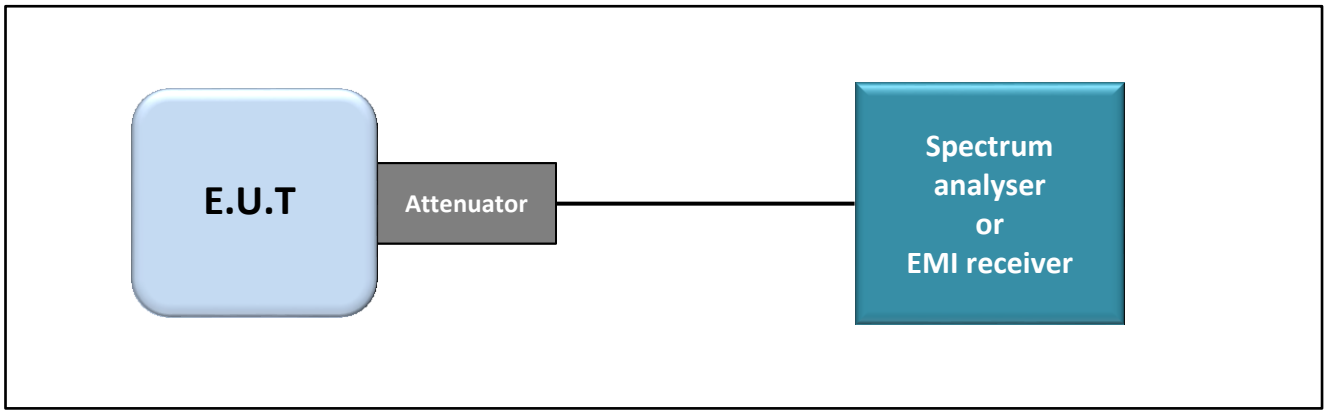
5.2. TEST SETUP

- The Equipment under Test is installed:
☐ On a table
☑ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ KDB 558074 D01 DTS Meas Guidance v05r02 § 8.3.1.1
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.

☐ KDB 558074 D01 DTS Meas Guidance v05r02 § 8.3.1.2
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



Test set up of Maximum Conducted Output Power

Photograph for Maximum Conducted Output Power

5.3. LIMIT

Maximum Conducted Output power:
2400MHz-2483.5MHz: Shall not exceed 30dBm
Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

5.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
Attenuator 10dB	AEROFLEX	_	A7122269	09/20	03/22
CABLE SMA 1m	RADIALL	18GHz	A5329862	04/21	04/23
Full Anechoic Room	SIEPEL	_	D3044024		
Multimeter - CEM	FLUKE	87	A1240251	03/21	03/23
SMA 1.5m	SUCOFLEX	18GHz	A5329864	04/21	04/22
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	05/19	09/21
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23
SOFT	LCIE SUD EST	LCIE FCC 247 (BLE_ZIGBEE...)	L2000059		

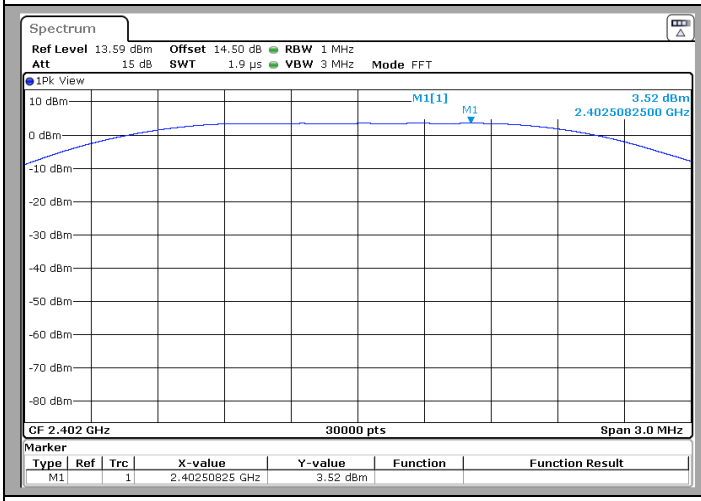
Note: In our quality system, the test equipment calibration due is more & less 2 months

5.5. RESULTS

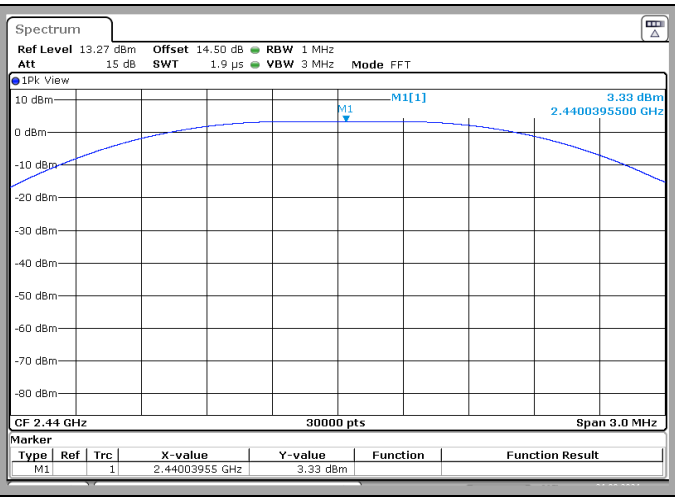
1MBits/s

Maximum Conducted Output Power

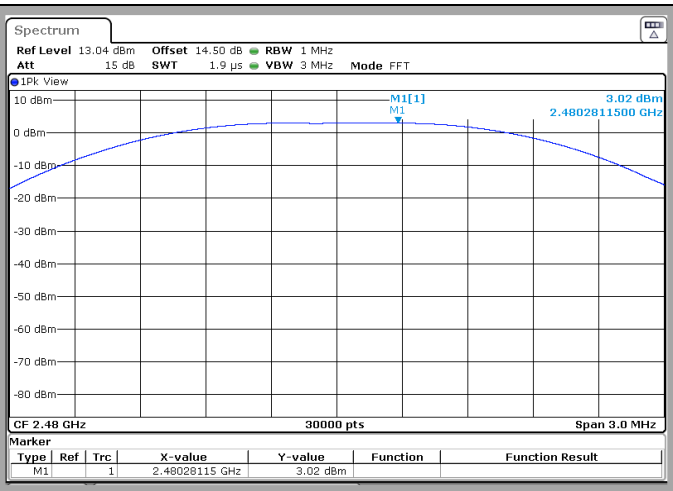
Cmin



Cnom



Cmax

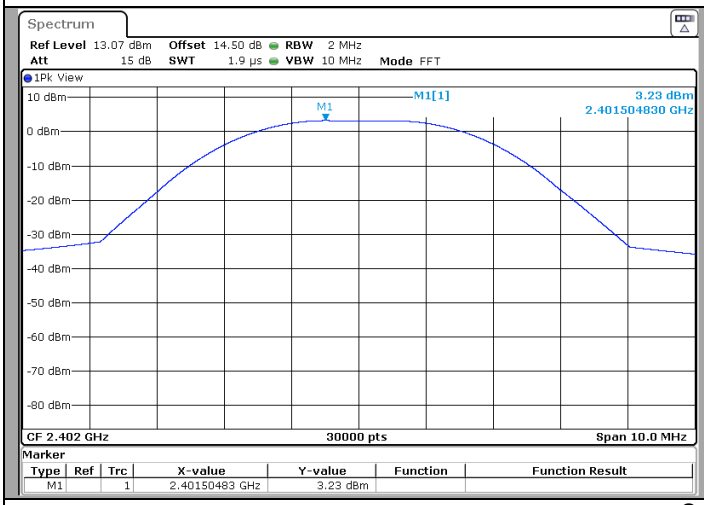


Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Limit (dBm)
Cmin	**14.5**	0.5	3.52	30. Reduced by G-6dBi if Antenna Gain above 6dBi
Cnom	**14.5**	0.5	3.33	30. Reduced by G-6dBi if Antenna Gain above 6dBi
Cmax	**14.5**	0.5	3.02	30. Reduced by G-6dBi if Antenna Gain above 6dBi

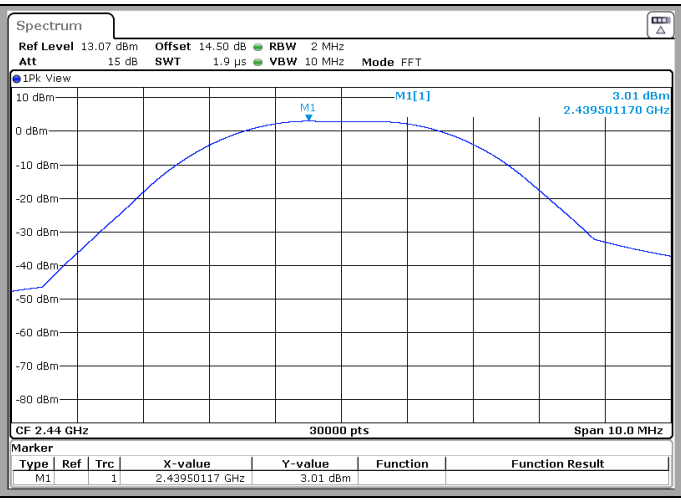
2MBits/s

Maximum Conducted Output Power

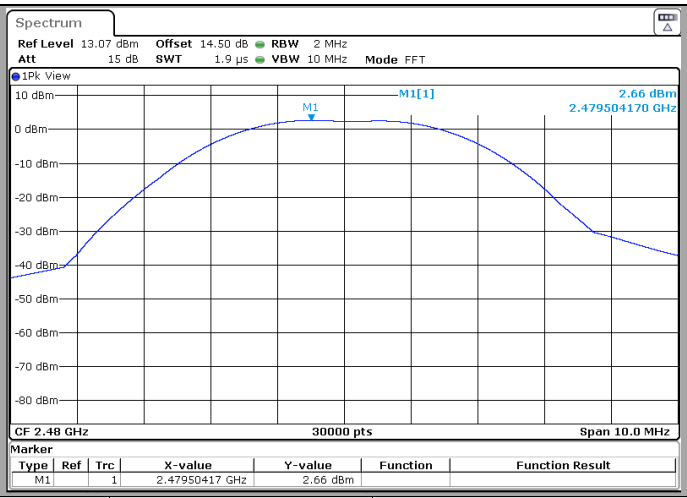
Cmin



Cnom



Cmax



Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Limit (dBm)
Cmin	**14.5**	0.5	3.23	30. Reduced by G-6dBi if Antenna Gain above 6dBi
Cnom	**14.5**	0.5	3.01	30. Reduced by G-6dBi if Antenna Gain above 6dBi
Cmax	**14.5**	0.5	2.66	30. Reduced by G-6dBi if Antenna Gain above 6dBi

5.6. CONCLUSION

Maximum Conducted Output Power measurement performed on the sample of the product **In&motion In&box V6**, SN: **63000001**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

6. POWER SPECTRAL DENSITY

6.1. TEST CONDITIONS

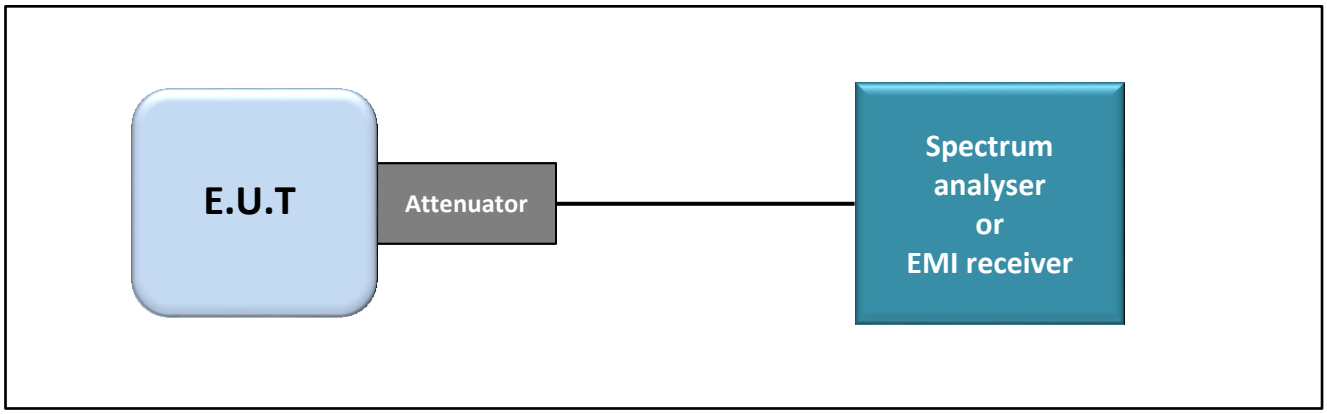
Test performed by	: Majid MOURZAGH
Date of test	: August 30, 2021
Ambient temperature	: 23 °C
Relative humidity	: 39 %

6.2. TEST SETUP

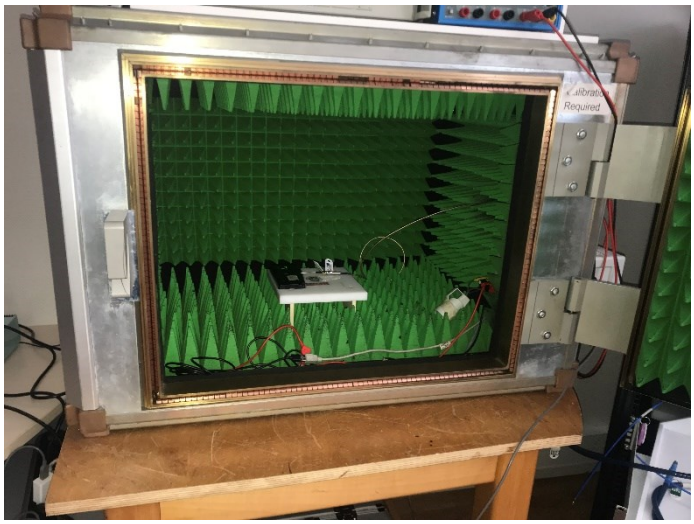
- The Equipment Under Test is installed:
☐ On a table
☑ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ KDB 558074 D01 DTS Meas Guidance v05r02 § 8.4 (Method PKPSD)
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.



Test set up of Power Spectral Density




Photograph for Power Spectral Density

6.3. LIMIT

Power Spectral Density:
2400MHz-2483.5MHz: Shall not exceed 8dBm/3kHz
Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

6.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
Attenuator 10dB	AEROFLEX	_	A7122269	09/20	03/22
CABLE SMA 1m	RADIALL	18GHz	A5329862	04/21	04/23
Full Anechoic Room	SIEPEL	_	D3044024		
Multimeter - CEM	FLUKE	87	A1240251	03/21	03/23
SMA 1.5m	SUCOFLEX	18GHz	A5329864	04/21	04/22
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	05/19	09/21
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23
SOFT	LCIE SUD EST	LCIE FCC 247 (BLE_ZIGBEE...)	L2000059		

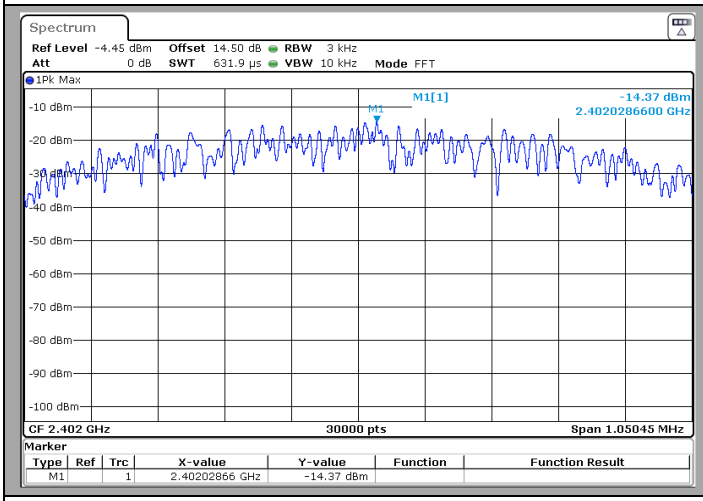
Note: In our quality system, the test equipment calibration due is more & less 2 months

6.5. RESULTS

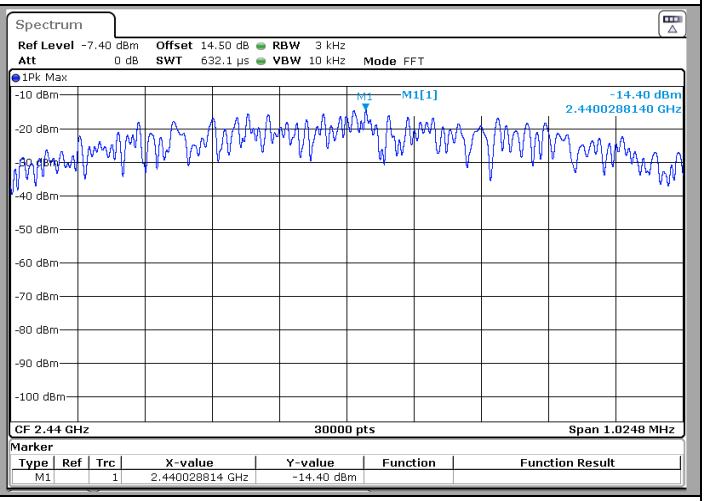
1MBits/s

Power Spectral Density

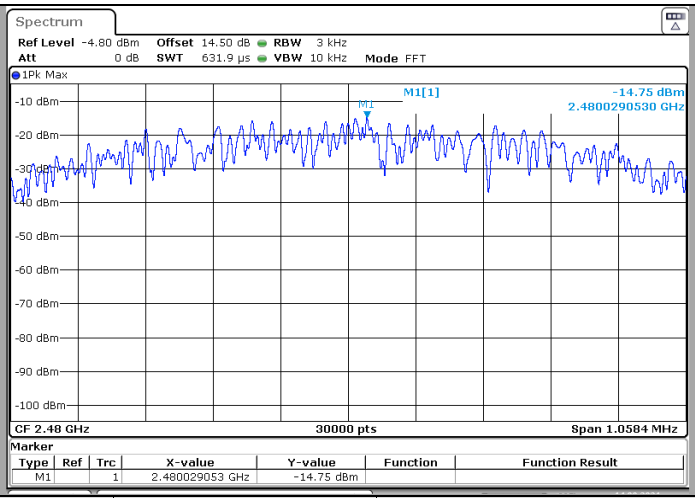
Cmin



Cnom



Cmax

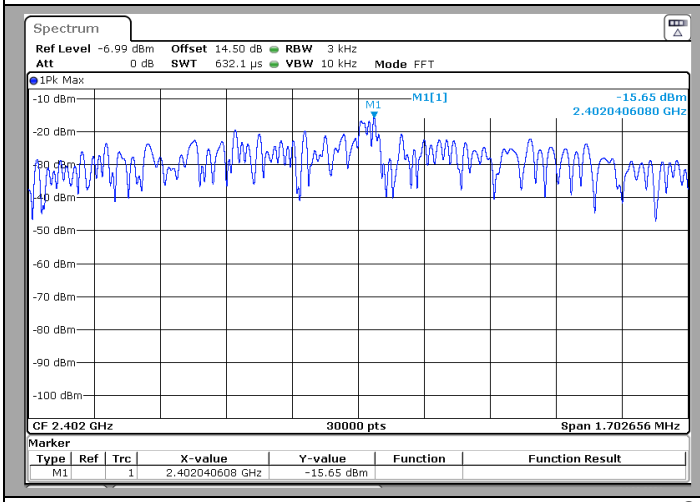


Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
Cmin	**14.5**	0.5	-14.37	8. Reduced by G-6dBi if Antenna Gain above 6dBi
Cnom	**14.5**	0.5	-14.40	8. Reduced by G-6dBi if Antenna Gain above 6dBi
Cmax	**14.5**	0.5	-14.75	8. Reduced by G-6dBi if Antenna Gain above 6dBi

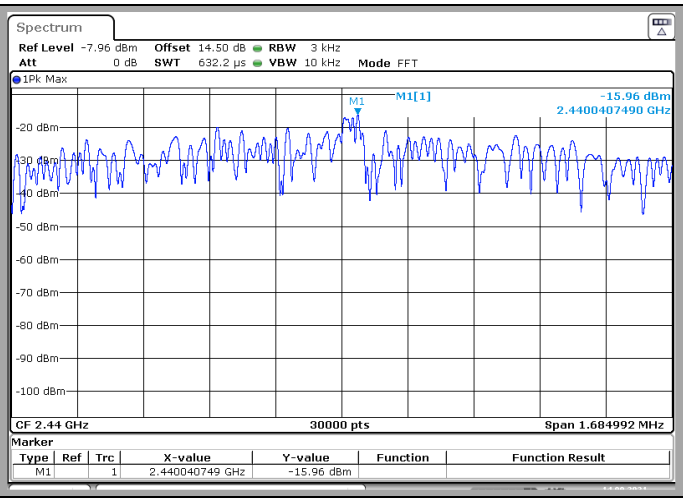
2MBits/s

Power Spectral Density

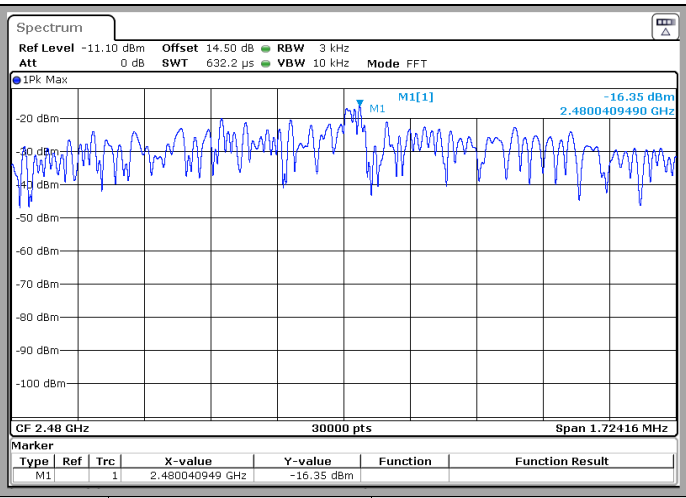
Cmin



Cnom



Cmax



Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
Cmin	**14.5**	0.5	-15.65	8. Reduced by G-6dBi if Antenna Gain above 6dBi
Cnom	**14.5**	0.5	-15.96	8. Reduced by G-6dBi if Antenna Gain above 6dBi
Cmax	**14.5**	0.5	-16.35	8. Reduced by G-6dBi if Antenna Gain above 6dBi

6.6. CONCLUSION

Power Spectral Density measurement performed on the sample of the product **In&motion In&box V6**, SN: **63000001**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

7. UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS AT THE BAND EDGE

7.1. TEST CONDITIONS

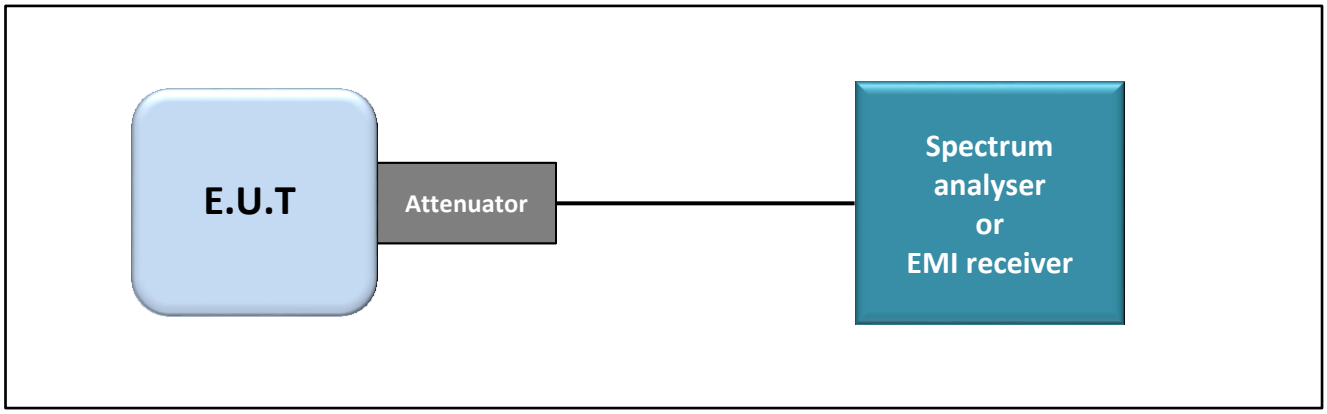
Test performed by	: Majid MOURZAGH
Date of test	: August 30, 2021
Ambient temperature	: 23 °C
Relative humidity	: 39 %

7.2. TEST SETUP

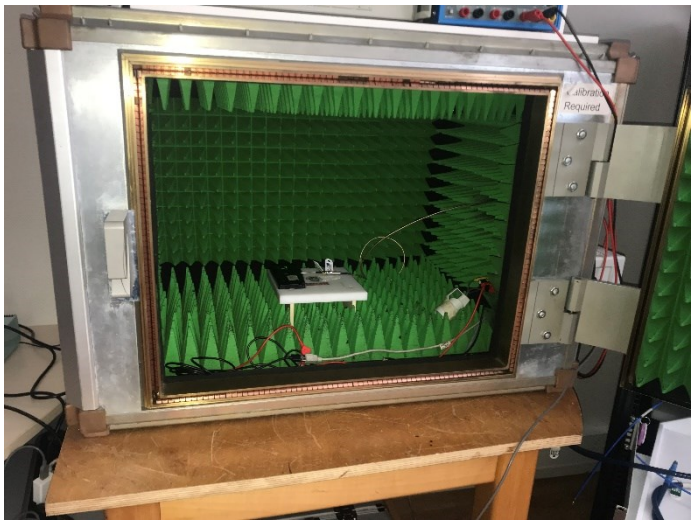
- The Equipment Under Test is installed:
☐ On a table
☑ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ KDB 558074 D01 DTS Meas Guidance v05r02 § 8.5



Test set up of Unwanted Emissions into Non-Restricted Frequency Bands at the Band Edge



Photograph for Unwanted Emission into non-restricted frequency bands at the band edge

7.3. LIMIT

All Spurious Emissions must be at least 20dB below the Fundamental Radiator Level at the Band Edge Edge “2400MHz & 2483,5MHz”

7.4. TEST EQUIPMENT LIST

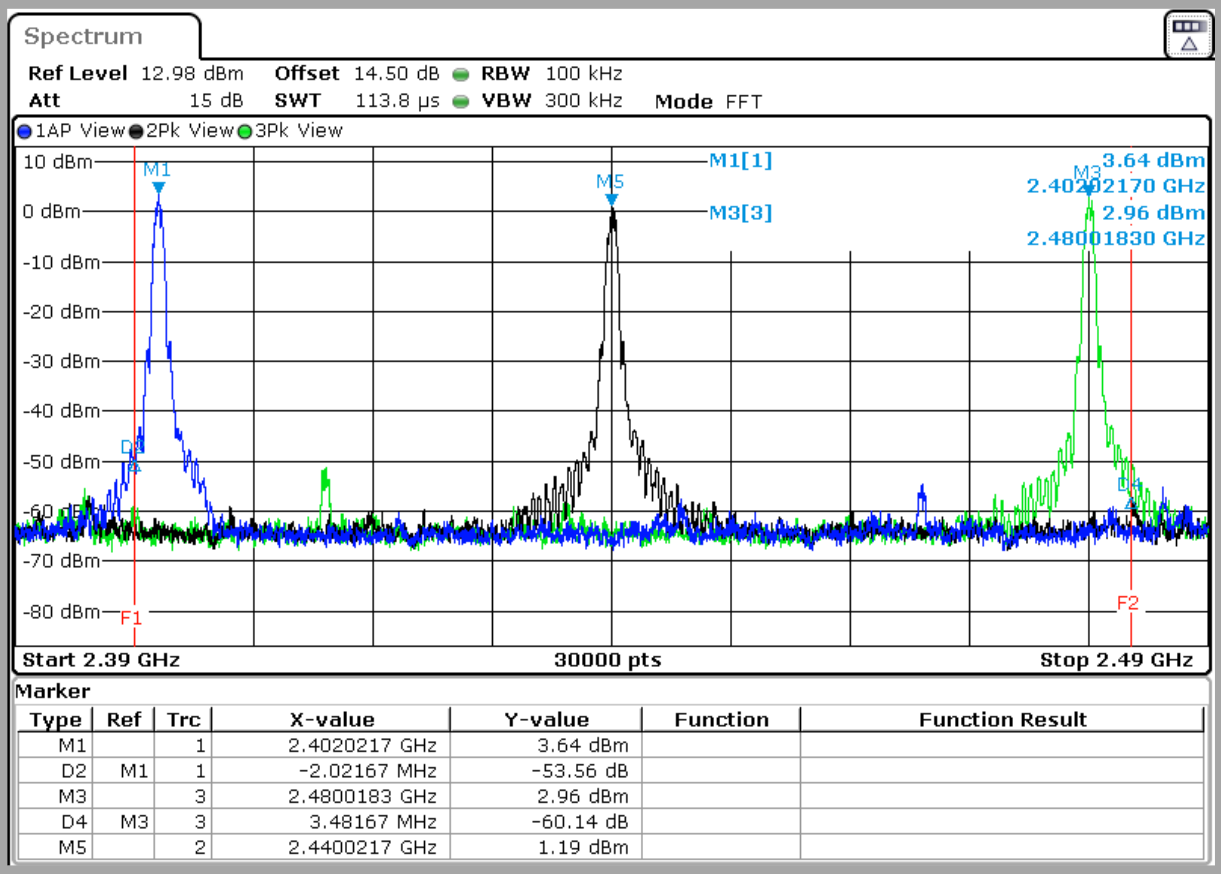
TEST EQUIPMENT USED					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
Attenuator 10dB	AEROFLEX	_	A7122269	09/20	03/22
CABLE SMA 1m	RADIALL	18GHz	A5329862	04/21	04/23
Full Anechoic Room	SIEPEL	_	D3044024		
Multimeter - CEM	FLUKE	87	A1240251	03/21	03/23
SMA 1.5m	SUCOFLEX	18GHz	A5329864	04/21	04/22
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	05/19	09/21
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23
SOFT	LCIE SUD EST	LCIE FCC 247 (BLE_ZIGBEE...)	L2000059		

Note: In our quality system, the test equipment calibration due is more & less 2 months

7.5. RESULTS

1MBits/s

Cmin/Cnom/Cmax



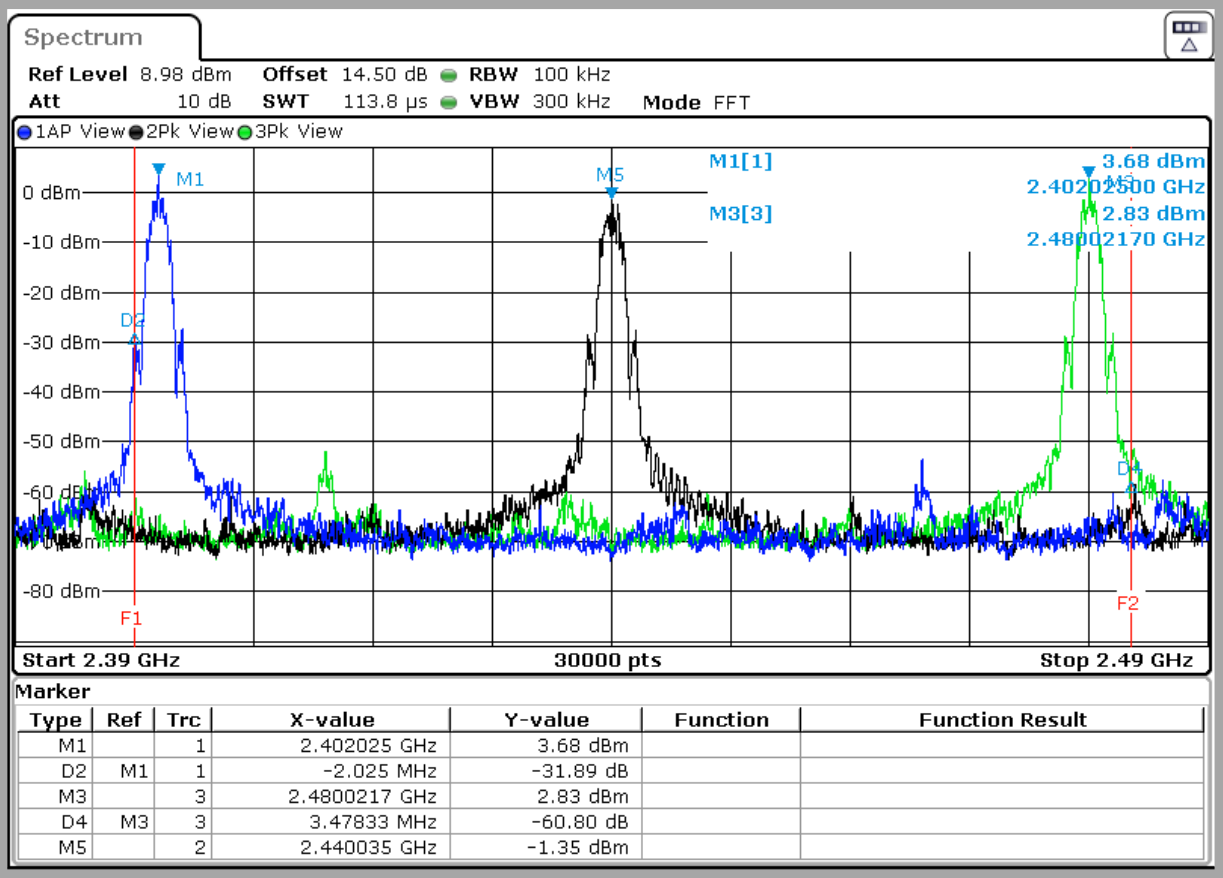
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4020217 GHz	3.64 dBm		
D2	M1	1	-2.02167 MHz	-53.56 dB		
M3		3	2.4800183 GHz	2.96 dBm		
D4	M3	3	3.48167 MHz	-60.14 dB		
M5		2	2.4400217 GHz	1.19 dBm		

Frequency (MHz)	Level (dBc)	Limit (dBc)
2400	**-53.56**	20
2483.5	**-60.14**	20

2MBits/s

Cmin/Cnom/Cmax



Frequency (MHz)	Level (dBc)	Limit (dBc)
2400	**-31.89**	20
2483.5	**-60.80**	20

7.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands at the band edge measurement performed on the sample of the product **In&motion In&box V6**, SN: **63000001**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

8. UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS

8.1. TEST CONDITIONS

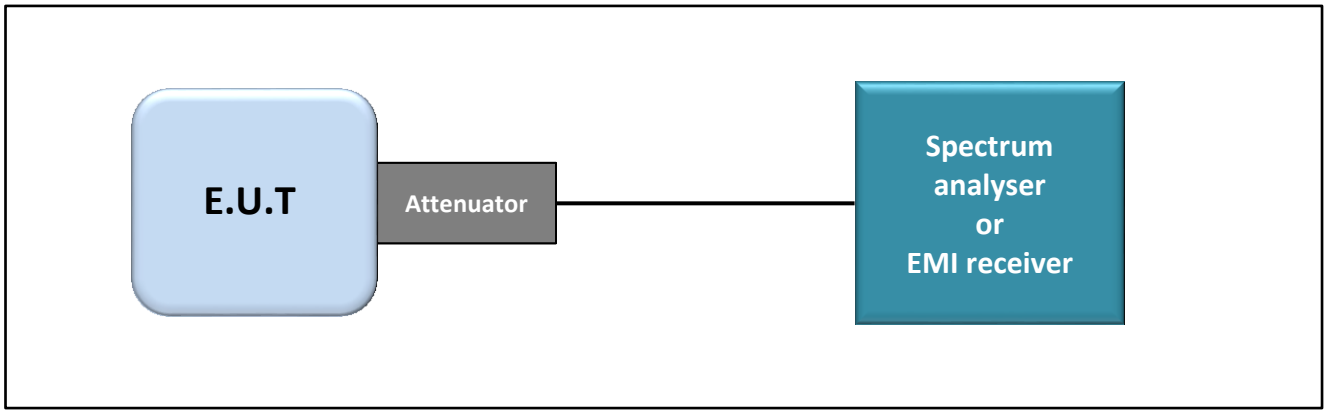
Test performed by	: Majid MOURZAGH
Date of test	: August 31, 2021
Ambient temperature	: 24 °C
Relative humidity	: 42 %

8.2. TEST SETUP

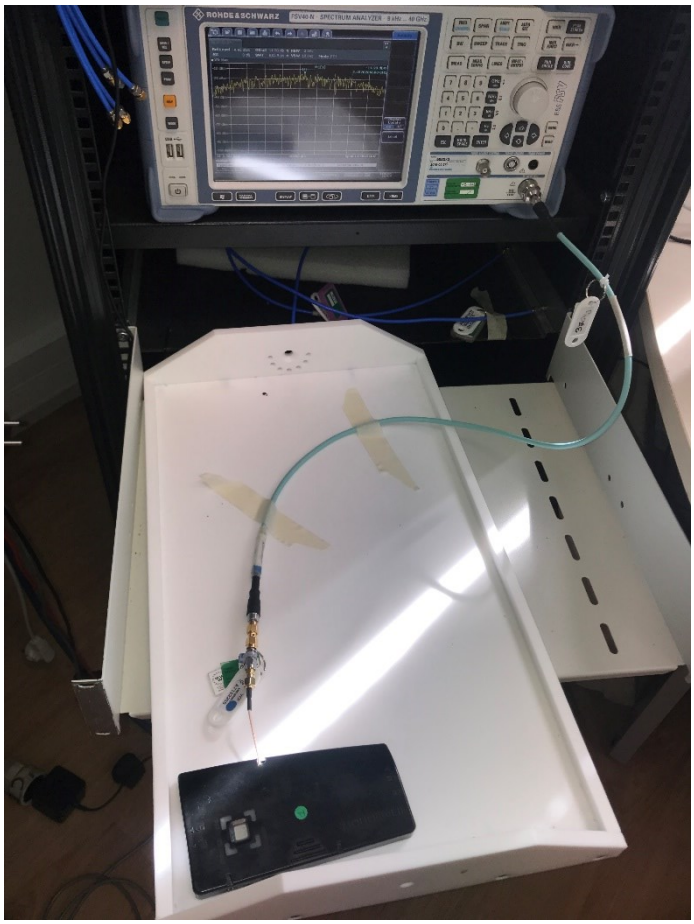
- The Equipment under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ KDB 558074 D01 DTS Meas Guidance v05r02 § 8.5



Test set up of Unwanted Emissions into Non-Restricted Frequency Bands



Photograph for Unwanted Emission into non-restricted frequency bands

8.3. LIMIT

All Spurious Emissions must be at least 20 below the Fundamental Radiator Level

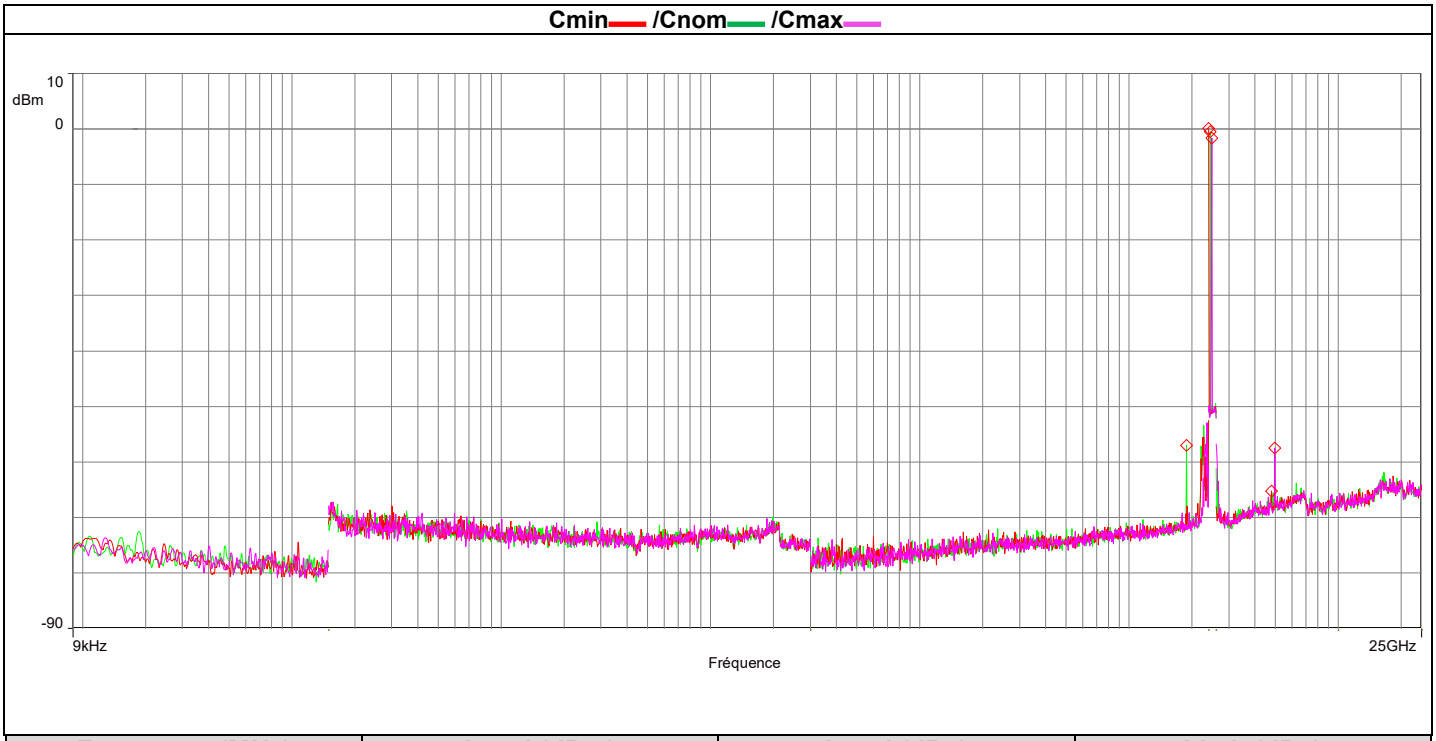
8.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
Attenuator 10dB	AEROFLEX	_	A7122269	09/20	03/22
Multimeter - CEM	FLUKE	87	A1240251	03/21	03/23
Cable Measure	_	36G	A5329604	04/21	04/22
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	05/19	09/21
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23
BAT EMC	NEXIO	v3.19.1.23	L1000115		

Note: In our quality system, the test equipment calibration due is more & less 2 months

8.5. RESULTS

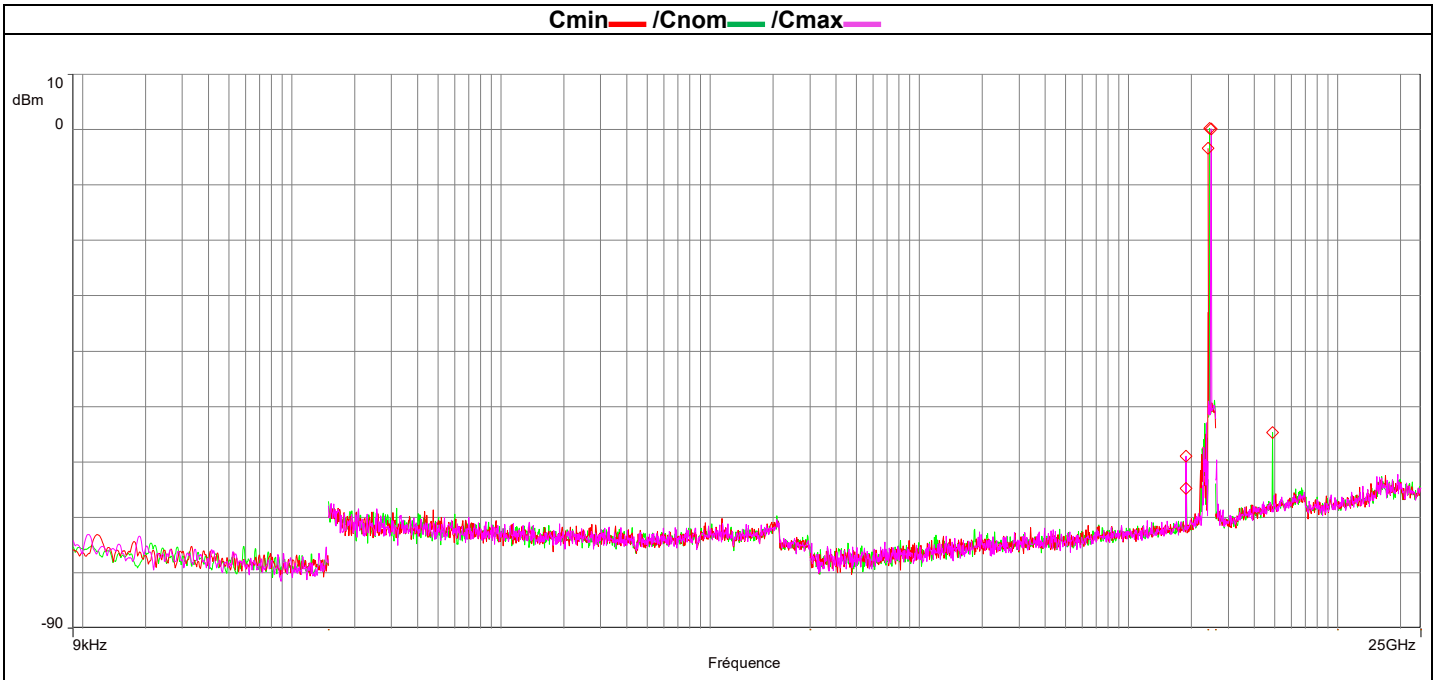
1MBits/s



Frequency (MHz)	Level (dBm)	Level (dBc)	Limit (dBc)
2402.00	0.12		
4804	-65.30	-65.42	20
2440.00	-0.43		
1881*	-57.02	/	**20**
2480.00	-1.61		
4960	-57.55	-55.94	20

*: Due to local cellular signal, not due to EUT

2MBits/s



Frequency (MHz)	Level (dBm)	Level (dBc)	Limit (dBc)
2402.00	-3.37		
1882*	-58.97	-55.60	20
2440.00	0.24		
4880	-54.64	-54.88	20
2480.00	0.13		
1885*	-64.73	-64.86	20

*: Due to local cellular signal, not due to EUT

8.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands measurement performed on the sample of the product **In&motion In&box V6**, SN: **63000001**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

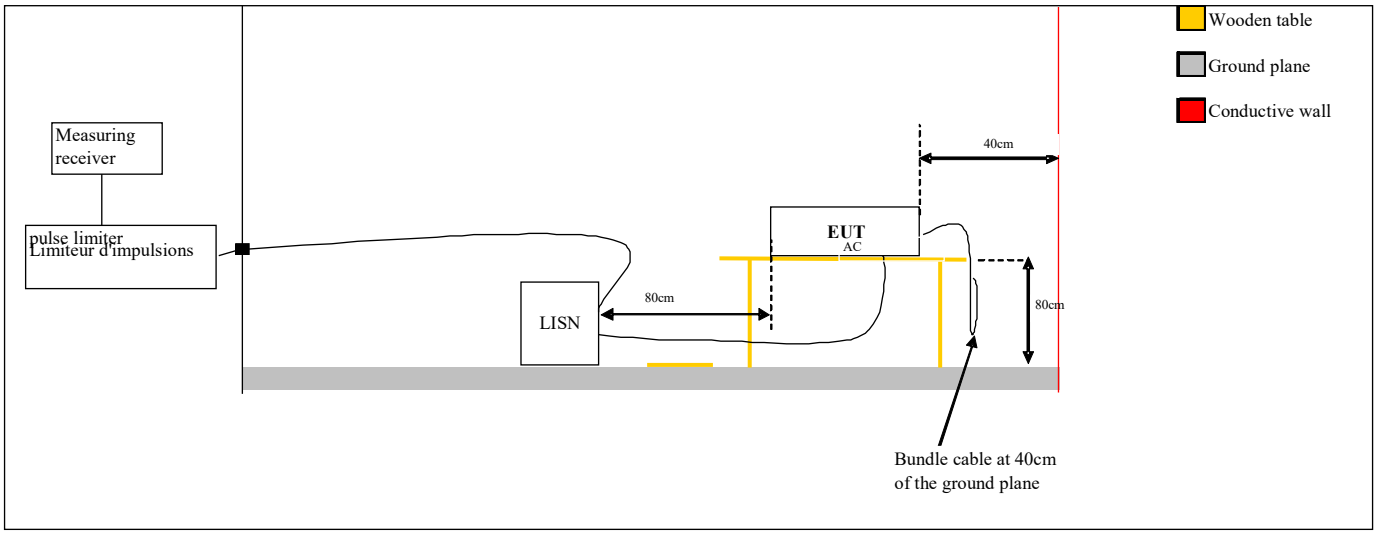
9. AC POWER LINE CONDUCTED EMISSIONS

9.1. TEST CONDITIONS

Test performed by	: Majid MOURZAGH
Date of test	: September 16, 2021
Ambient temperature	: 21 °C
Relative humidity	: 41 %

9.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013) method. The EUT is placed on the ground reference plane, at 80cm from the LISN. The distance between the EUT and the vertical ground plane is 40cm. Auxiliaries are powered by another LISN. The cable has been shorted to 1meter length. The EUT is powered through the LISN. 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. The LISN (measure) is 50Ω / 50µH. Interconnecting cables and equipment's were moved to position that maximized emission.



Photograph for AC Power Line Conducted Emissions (with AC/DC Adapter)




Photograph for AC Power Line Conducted Emissions (with Laptop)

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#	n°1	Phase	120VAC/60Hz *(AC/DC adapter)*	See below
Emc#	n°2	Neutral	120VAC/60Hz *(AC/DC adapter)*	See below
Emc#	n°3	Phase	240VAC/50Hz *(AC/DC adapter)*	See below
Emc#	n°4	Neutral	240VAC/50Hz *(AC/DC adapter)*	See below
Emc#	n°5	Phase	120VAC/60Hz *(With laptop)*	See below
Emc#	n°6	Neutral	120VAC/60Hz *(With laptop)*	See below
Emc#	n°7	Phase	240VAC/50Hz *(With laptop)*	See below
Emc#	n°8	Neutral	240VAC/50Hz *(With laptop)*	See below

9.3. LIMIT

Frequency range	Level	Detector
0,15kHz to 0,5MHz	66dBµV to 56µV*	QPeak
	56dBµV to 46µV*	Average
0,5MHz to 5MHz	56dBµV	QPeak
	46dBµV	Average
5MHz to 30MHz	60BµV	QPeak
	50dBµV	Average

*Decreases with the logarithm of the frequency

9.4. 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	C2320291	08/21	08/22
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	11/20	11/22
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	08/22

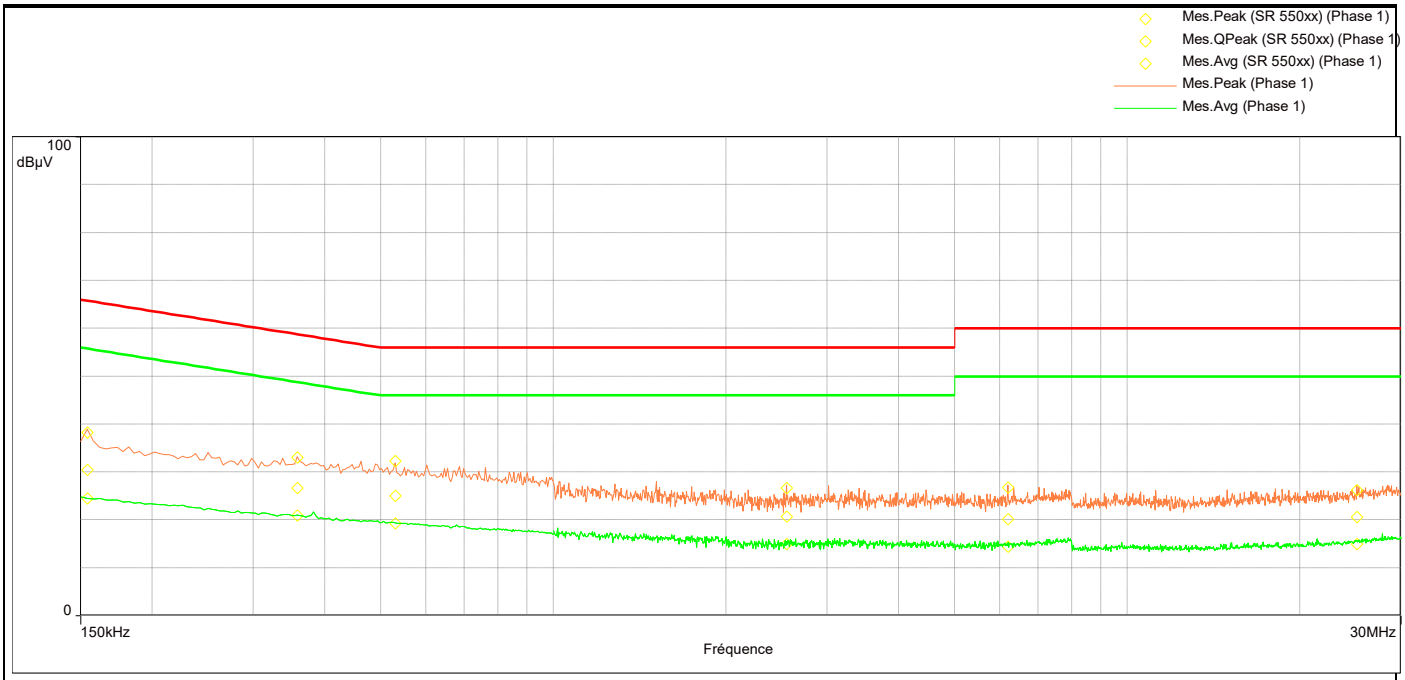
Note: In our quality system, the test equipment calibration due is more & less 2 months

9.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

9.6. RESULTS

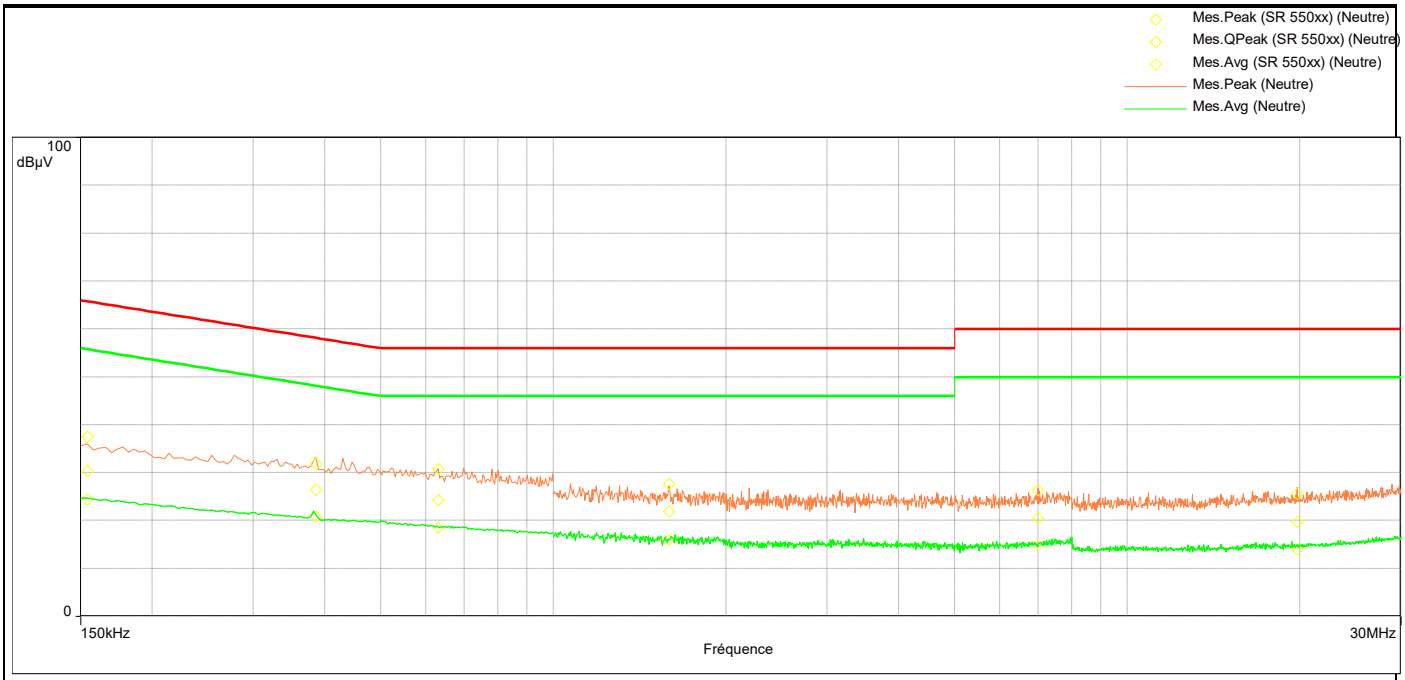
CONDUCTED EMISSIONS			
Graph name:	Emc#1	**Test configuration:**	
Limit:	FCC CFR47 Part15C	120Vac / 60Hz- Line with AC/DC adapter	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	120VAC / 60Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



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)	Line	Correction (dB)
0.154	38.2	30.4	65.8	-35.4	24.5	55.8	-31.3	Phase 1	19.4
0.358	33.0	26.7	58.8	-32.1	20.9	48.8	-27.8	Phase 1	19.5
0.530	32.3	25.0	56.0	-31.0	19.3	46.0	-26.7	Phase 1	19.5
2.548	26.6	20.7	56.0	-35.3	14.9	46.0	-31.1	Phase 1	19.7
6.196	26.8	20.2	60.0	-39.8	14.4	50.0	-35.6	Phase 1	20.0
25.140	26.3	20.6	60.0	-39.4	14.9	50.0	-35.1	Phase 1	21.3

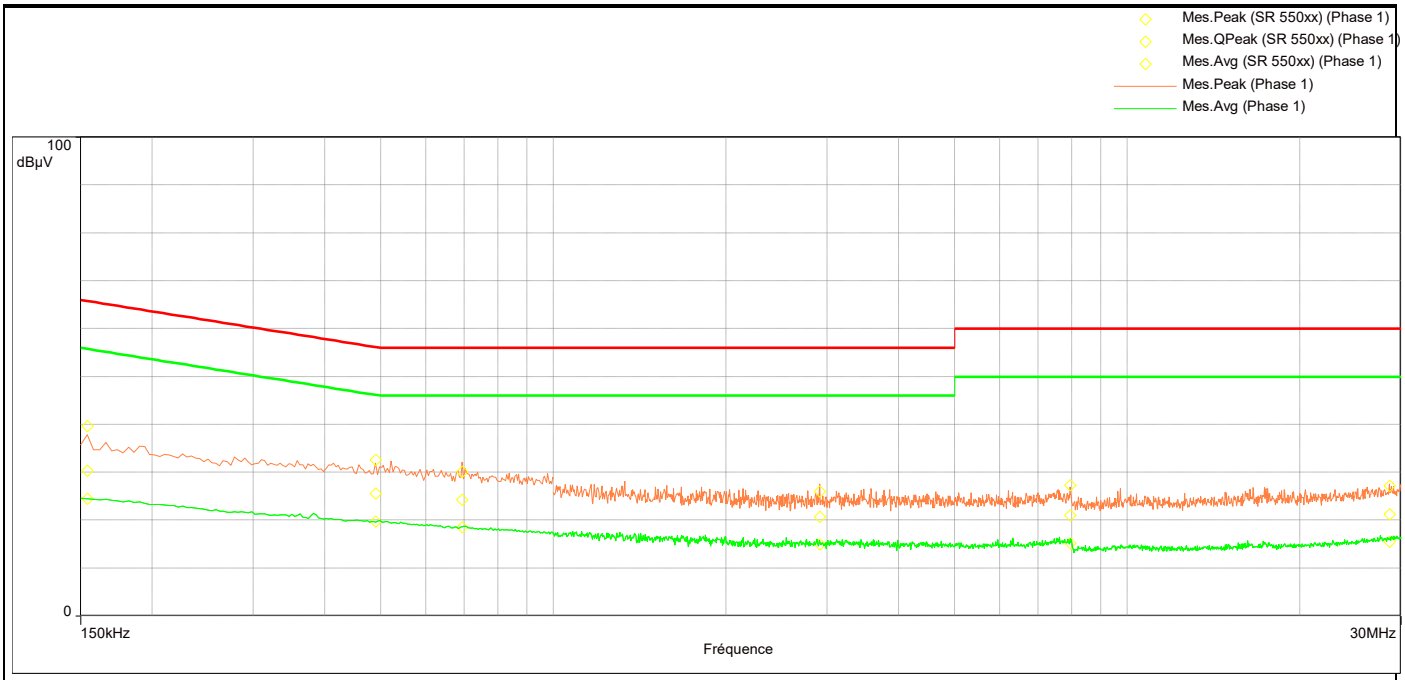
CONDUCTED EMISSIONS			
Graph name:	Emc#2	**Test configuration:**	
Limit:	FCC CFR47 Part15C	120Vac / 60Hz- Neutral with AC/DC adapter	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	120VAC / 60Hz	**RBW :**	10kHz
Line:	Neutral	**VBW :**	30kHz



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)	Line	Correction (dB)
0.154	37.5	30.3	65.8	-35.5	24.4	55.8	-31.4	Neutral	19.4
0.386	31.8	26.4	58.2	-31.8	20.8	48.2	-27.3	Neutral	19.5
0.630	30.8	24.3	56.0	-31.7	18.6	46.0	-27.4	Neutral	19.5
1.592	27.6	21.9	56.0	-34.1	16.1	46.0	-29.9	Neutral	19.6
6.992	26.4	20.5	60.0	-39.5	14.8	50.0	-35.2	Neutral	20.0
19.780	25.6	19.8	60.0	-40.2	14.0	50.0	-36.0	Neutral	21.0

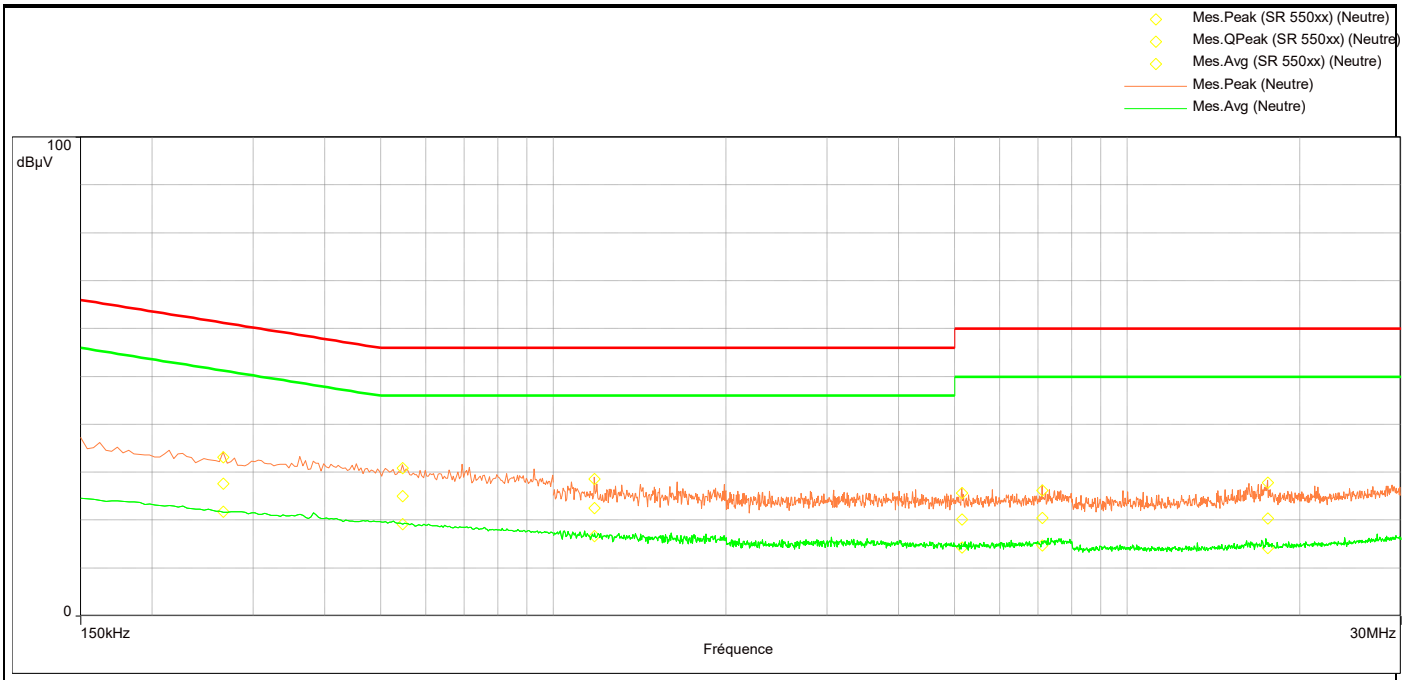
CONDUCTED EMISSIONS			
Graph name:	Emc#3	**Test configuration:**	
Limit:	FCC CFR47 Part15C	240Vac / 50Hz- Line with AC/DC adapter	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	240VAC / 50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



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)	Line	Correction (dB)
0.154	39.6	30.4	65.8	-35.4	24.4	55.8	-31.3	Phase 1	19.4
0.490	32.6	25.5	56.2	-30.6	19.7	46.2	-26.5	Phase 1	19.5
0.694	30.1	24.3	56.0	-31.7	18.5	46.0	-27.5	Phase 1	19.5
2.912	26.0	20.7	56.0	-35.3	15.0	46.0	-31.0	Phase 1	19.7
7.964	27.3	21.0	60.0	-39.0	15.2	50.0	-34.8	Phase 1	20.1
28.632	27.2	21.2	60.0	-38.8	15.6	50.0	-34.4	Phase 1	21.4

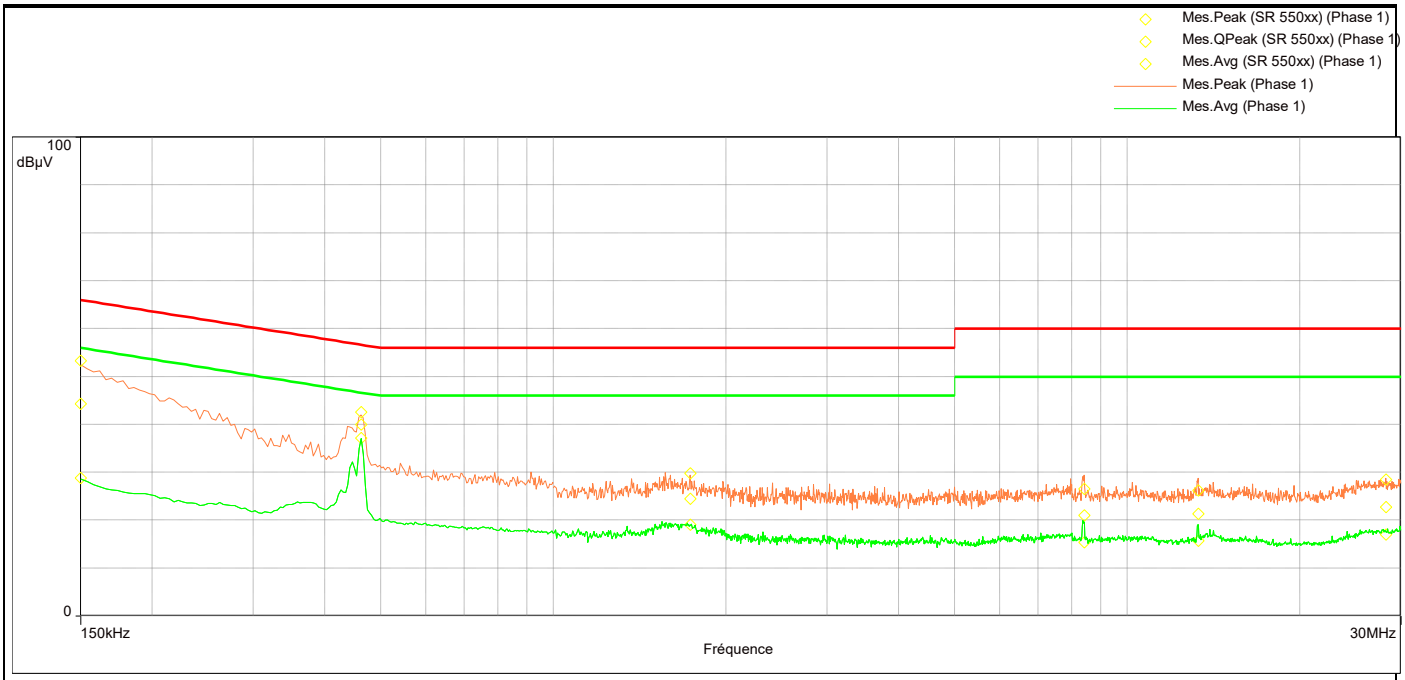
CONDUCTED EMISSIONS			
Graph name:	Emc#4	**Test configuration:**	
Limit:	FCC CFR47 Part15C	240Vac / 50Hz- Neutral with AC/DC adapter	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	240VAC / 50Hz	**RBW :**	10kHz
Line:	Neutral	**VBW :**	30kHz



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)	Line	Correction (dB)
0.266	33.1	27.7	61.2	-33.6	21.8	51.2	-29.4	Neutral	19.4
0.546	30.9	25.0	56.0	-31.0	19.2	46.0	-26.8	Neutral	19.5
1.180	28.6	22.5	56.0	-33.5	16.7	46.0	-29.3	Neutral	19.6
5.148	25.7	20.1	60.0	-39.9	14.3	50.0	-35.7	Neutral	19.9
7.112	26.2	20.5	60.0	-39.5	14.8	50.0	-35.2	Neutral	20.0
17.592	27.9	20.4	60.0	-39.6	14.2	50.0	-35.8	Neutral	20.8

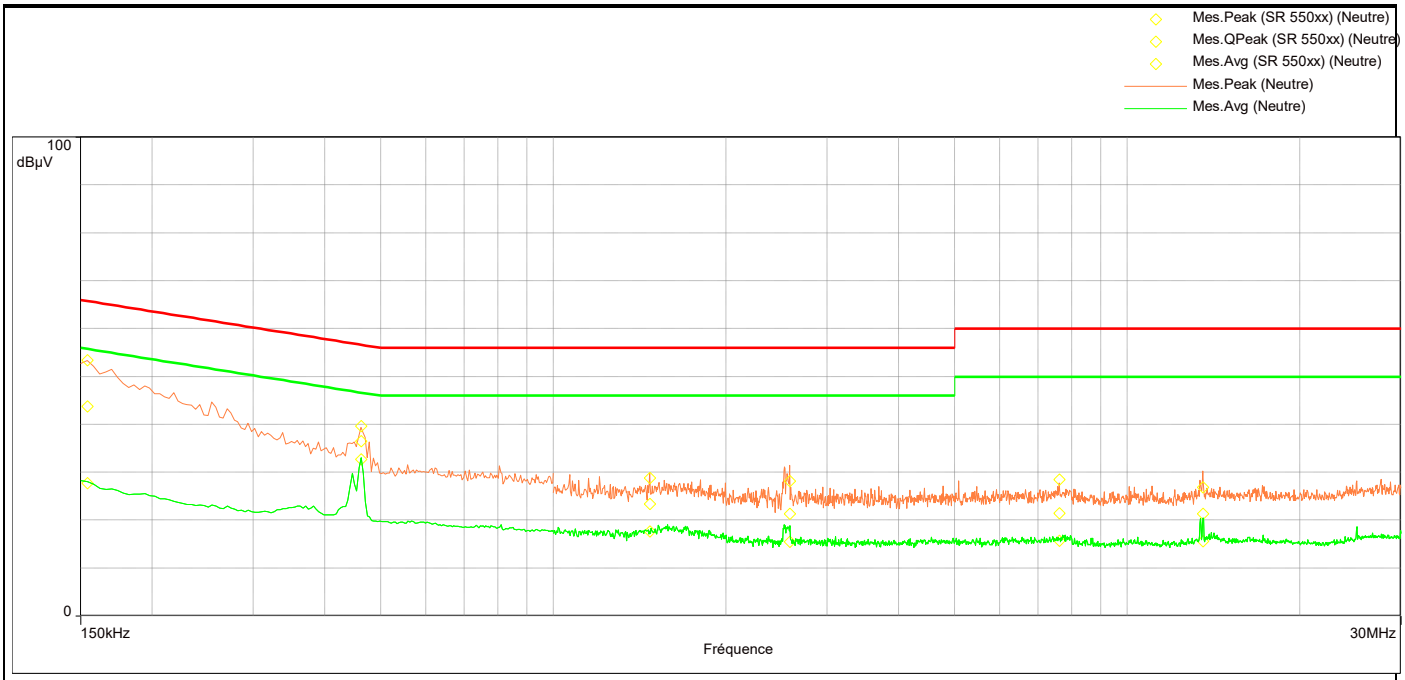
CONDUCTED EMISSIONS			
Graph name:	Emc#5	**Test configuration:**	
Limit:	FCC CFR47 Part15C	120Vac / 60Hz- Line with Laptop	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	120VAC / 60Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



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)	Line	Correction (dB)
0.150	53.3	44.3	66.0	-21.7	28.8	56.0	-27.2	Phase 1	19.4
0.462	42.6	40.0	56.7	-16.7	37.2	46.7	-9.5	Phase 1	19.5
1.732	29.8	24.5	56.0	-31.5	19.1	46.0	-26.9	Phase 1	19.6
8.420	26.6	21.0	60.0	-39.0	15.4	50.0	-34.6	Phase 1	20.2
13.296	26.2	21.3	60.0	-38.7	15.7	50.0	-34.3	Phase 1	20.5
28.244	28.5	22.7	60.0	-37.3	17.0	50.0	-33.0	Phase 1	21.4

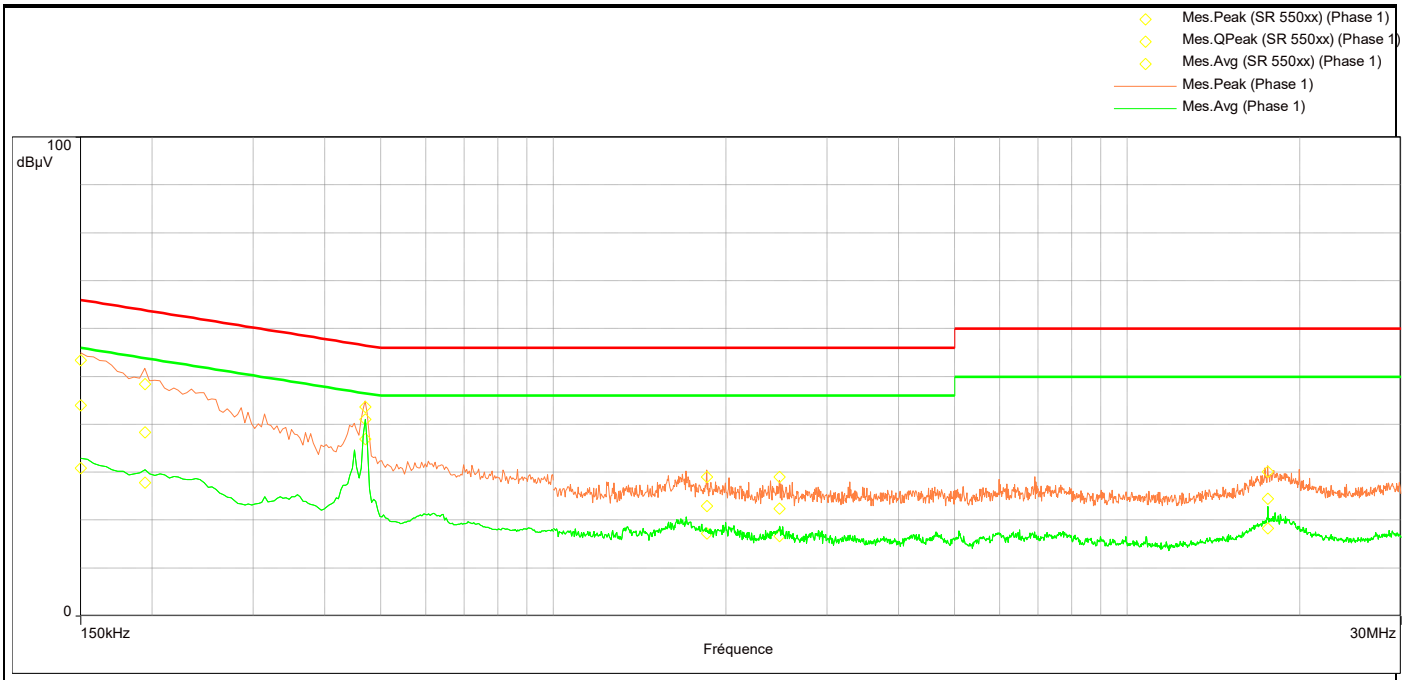
CONDUCTED EMISSIONS			
Graph name:	Emc#6	**Test configuration:**	
Limit:	FCC CFR47 Part15C	120Vac / 60Hz- Neutral with Laptop	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	120VAC / 60Hz	**RBW :**	10kHz
Line:	Neutral	**VBW :**	30kHz



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)	Line	Correction (dB)
0.154	53.4	43.8	65.8	-22.0	27.8	55.8	-28.0	Neutral	19.4
0.462	39.7	36.5	56.7	-20.2	32.7	46.7	-13.9	Neutral	19.5
1.472	28.8	23.4	56.0	-32.6	17.7	46.0	-28.3	Neutral	19.6
2.580	28.1	21.3	56.0	-34.7	15.5	46.0	-30.5	Neutral	19.7
7.612	28.5	21.5	60.0	-38.5	15.7	50.0	-34.3	Neutral	20.1
13.564	26.9	21.4	60.0	-38.6	15.6	50.0	-34.4	Neutral	20.5

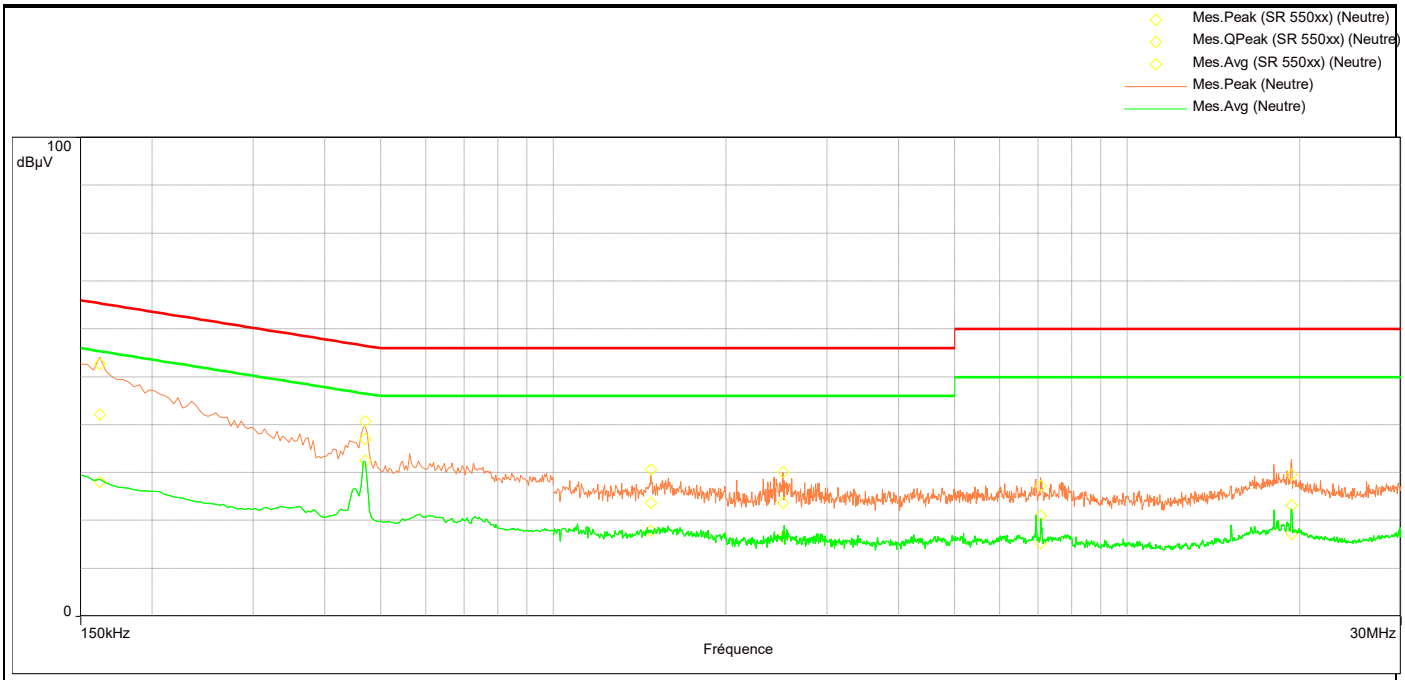
CONDUCTED EMISSIONS			
Graph name:	Emc#7	**Test configuration:**	
Limit:	FCC CFR47 Part15C	240Vac / 50Hz- Line with Laptop	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	240VAC / 50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



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)	Line	Correction (dB)
0.150	53.4	44.0	66.0	-22.0	30.9	56.0	-25.1	Phase 1	19.4
0.194	48.4	38.4	63.9	-25.5	27.9	53.9	-26.0	Phase 1	19.5
0.470	43.6	41.1	56.5	-15.4	36.9	46.5	-9.6	Phase 1	19.5
1.852	29.1	23.0	56.0	-33.0	17.2	46.0	-28.8	Phase 1	19.6
2.476	29.1	22.5	56.0	-33.5	16.7	46.0	-29.3	Phase 1	19.7
17.596	30.2	24.5	60.0	-35.5	18.3	50.0	-31.7	Phase 1	20.8

CONDUCTED EMISSIONS			
Graph name:	Emc#8	**Test configuration:**	
Limit:	FCC CFR47 Part15C	240Vac / 50Hz- Neutral with Laptop	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	240VAC / 50Hz	**RBW :**	10kHz
Line:	Neutral	**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)	Line	Correction (dB)
0.162	52.6	42.2	65.4	-23.2	28.0	55.4	-27.3	Neutral	19.4
0.470	40.8	37.1	56.5	-19.4	32.6	46.5	-14.0	Neutral	19.5
1.480	30.7	23.7	56.0	-32.3	17.9	46.0	-28.1	Neutral	19.6
2.516	30.1	23.8	56.0	-32.2	16.6	46.0	-29.4	Neutral	19.7
7.064	27.2	21.1	60.0	-38.9	15.3	50.0	-34.7	Neutral	20.0
19.364	29.6	23.2	60.0	-36.8	17.2	50.0	-32.8	Neutral	20.9

9.7. CONCLUSION

Ac Power Line Conducted Emission measurement performed on the sample of the product **In&motion In&box V6**, SN: **63000005** in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 & RSS 247 ISSUE 2 limits.

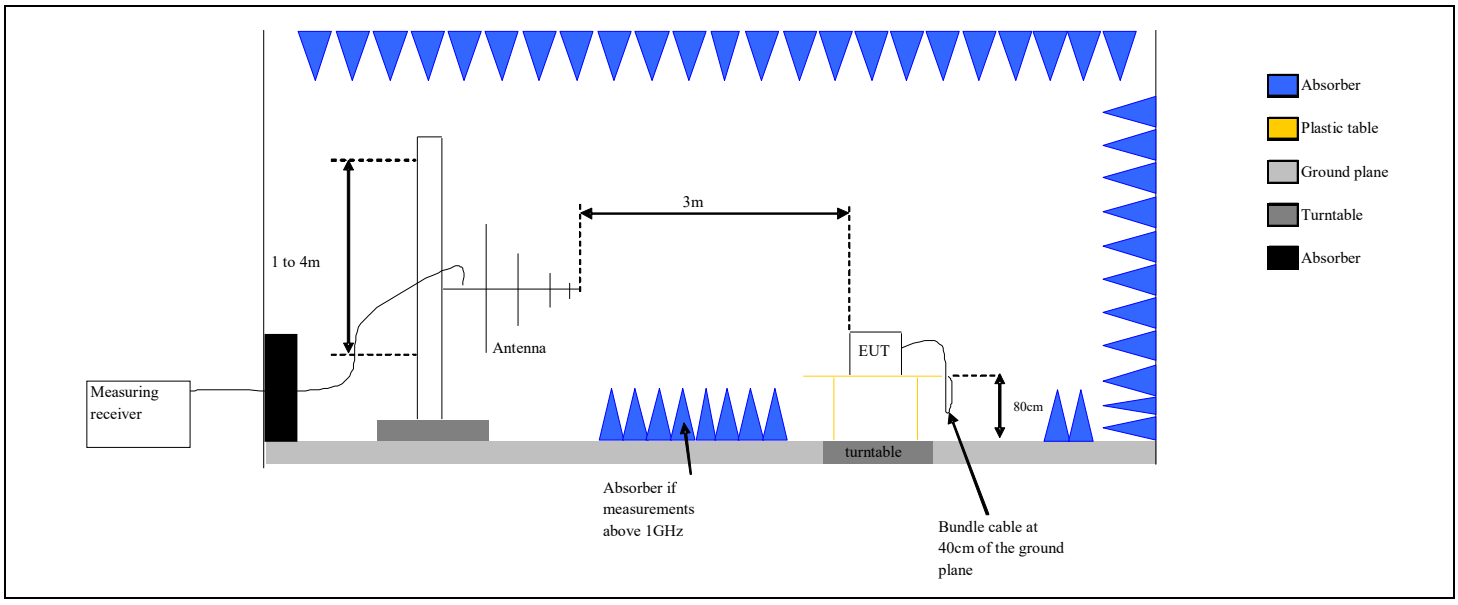
10. UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

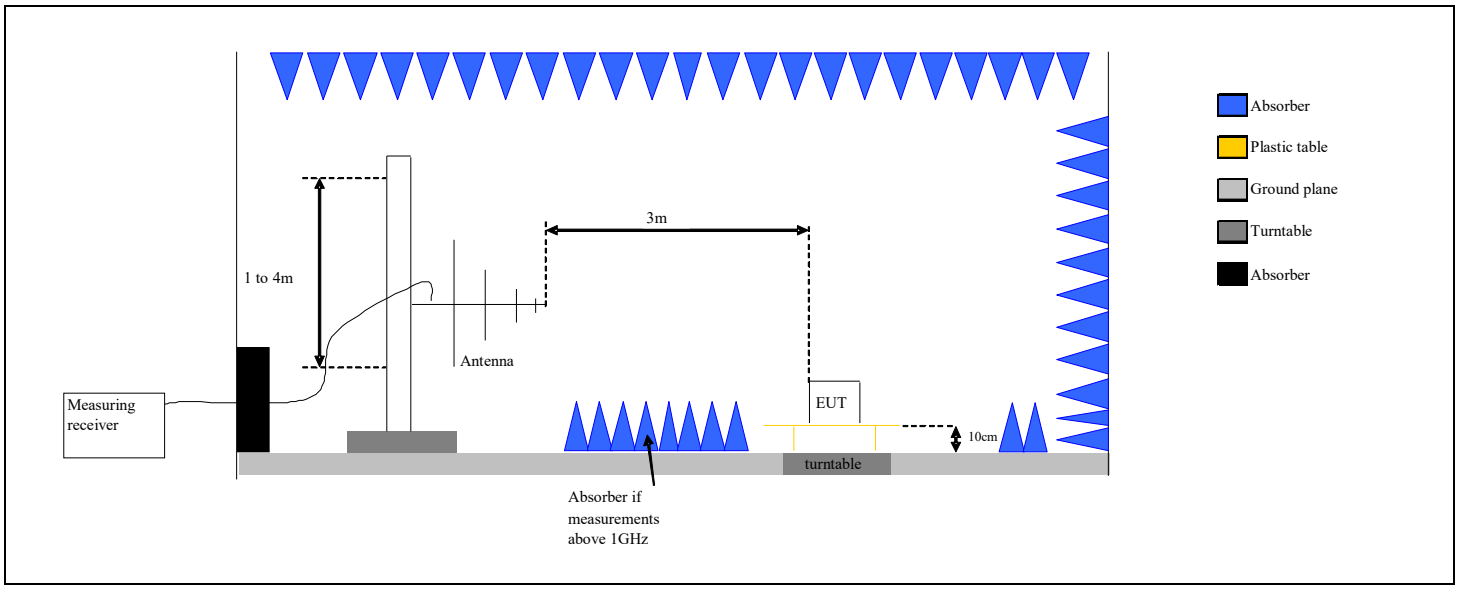
10.1. TEST CONDITIONS

Test performed by	: Majid MOURZAGH
Date of test	: September 3, 2021
Ambient temperature	: 24 °C
Relative humidity	: 41 %

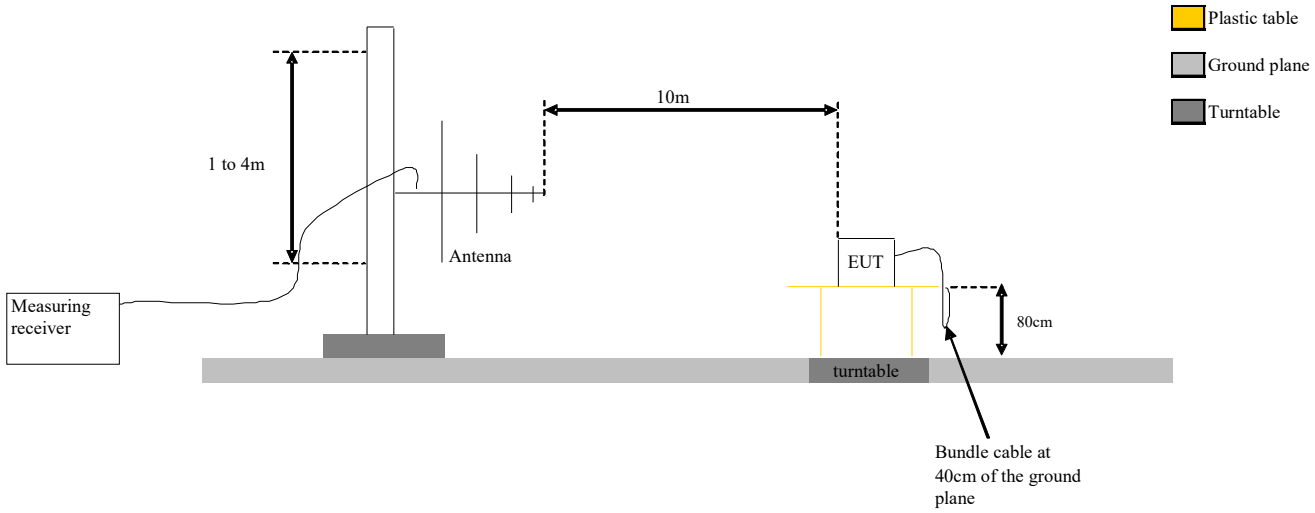
10.2. TEST SETUP

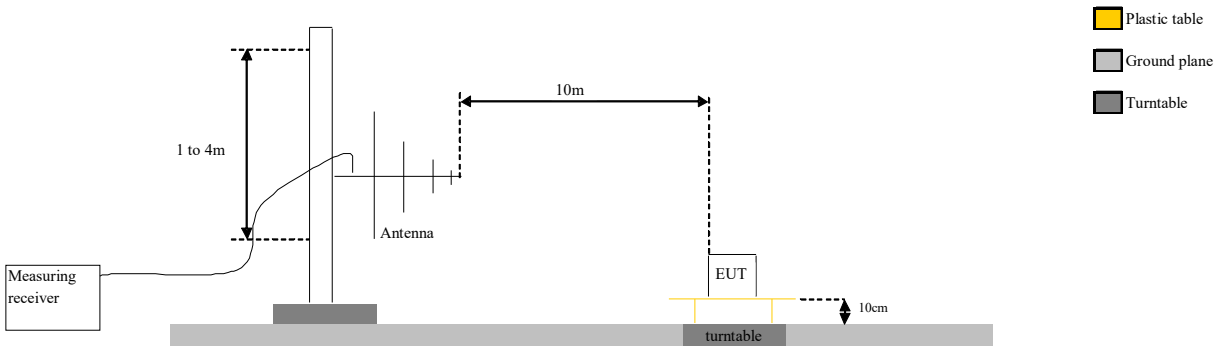
The product has been tested according to ANSI C63.10 (2013) and FCC part15 subpart C.
Test is performed in parallel, perpendicular and ground parallel axis with a loop antenna below 30MHz. Measurement bandwidth was 200Hz below 150kHz and 9kHz between 150kHz & 30MHz. The level has been maximised by the turntable rotation of 360 degrees range on all axis of EUT used in normal configuration. Antenna height was 1m. The EUT is placed **on an open area test site**. Distance between measuring antenna and the EUT is **10m**.
Test is performed in horizontal (H) and vertical (V) polarization with **bilog** between 30MHz & 1GHz and with a horn antenna above 1GHz. Measurement bandwidth was 120kHz below 1GHz and 1MHz above 1GHz. The level has been maximised by the turntable rotation of 360 degrees range on all axis of EUT used in normal configuration. The EUT is place at 1.5m high above 1GHz and at 0.8m high under 1GHz. The EUT is placed **in a full anechoic chamber** above 1GHz and **on an open area test site** from 30MHz to 1GHz. Distance between measuring antenna and the EUT is **3m**.
The height antenna is varied from 1m to 4m from 30MHz to 1GHz and above 1GHz 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.



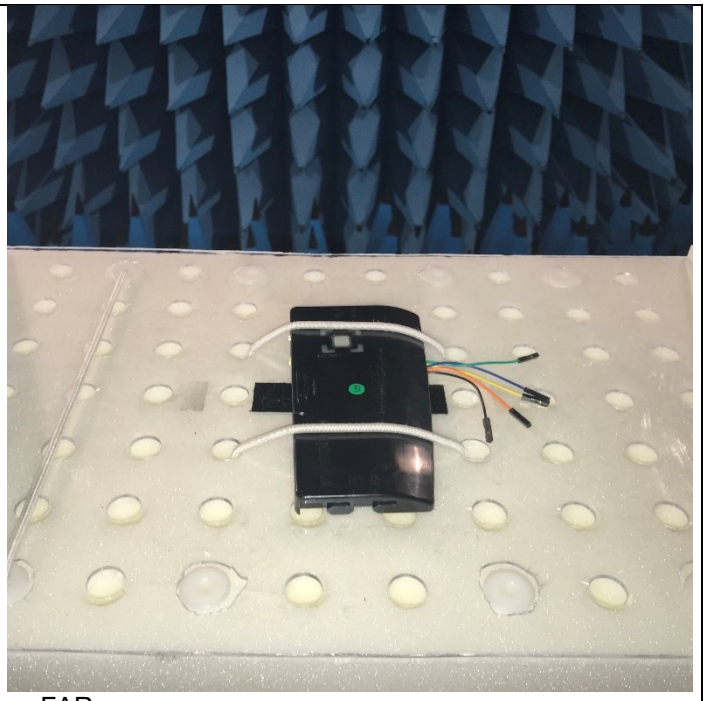


Test set up of Unwanted Emissions in Restricted Frequency Bands in semi anechoic chamber

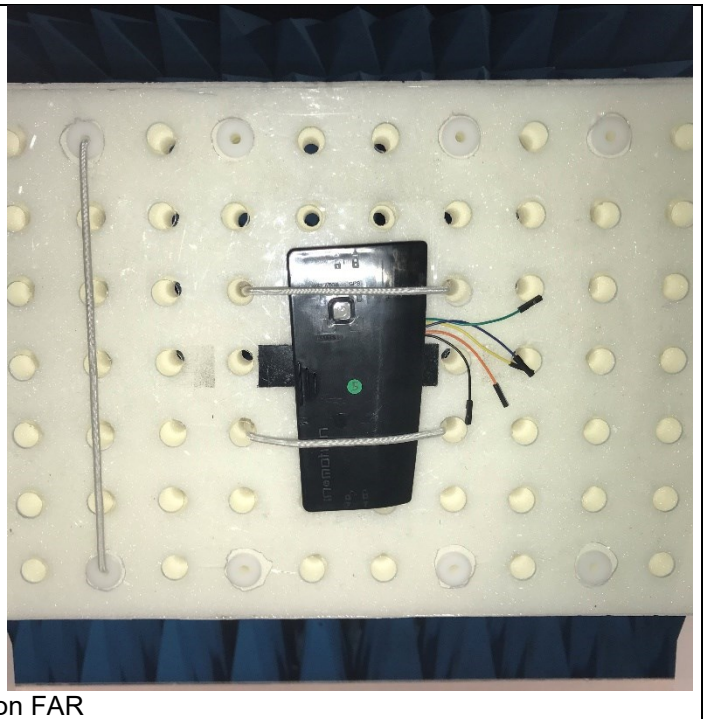




Test Set up for radiated measurement in open area test site

Axis XY on FAR

Axis Z on FAR


Axis XY on OATS


Axis Z on OATS

Photograph for Unwanted Emission in restricted frequency bands

10.3. LIMIT

Measure at 300m		
Frequency range	**Level**	**Detector**
9kHz-490kHz	67.6dBµV/m /F(kHz)	QPeak
Measure at 30m		
Frequency range	**Level**	**Detector**
490kHz-1.705MHz	87.6dBµV/m /F(kHz)	QPeak
1.705MHz-30MHz	29.5dBµV/m	QPeak
Measure at 10m		
Frequency range	**Level**	**Detector**
30MHz to 88MHz	29.5dBµV/m	QPeak
88MHz to 216MHz	33dBµV/m	QPeak
216MHz to 960MHz	35.5BµV/m	QPeak
960MHz to 1000MHz	43.5dBµV/m	QPeak
Above 1000MHz	63.5dBµV/m	Peak
	43.5dBµV/m	Average
Measure at 3m		
Frequency range	**Level**	**Detector**
30MHz to 88MHz	40dBµV/m	QPeak
88MHz to 216MHz	43.5dBµV/m	QPeak
216MHz to 960MHz	46BµV/m	QPeak
960MHz to 1000MHz	54dBµV/m	QPeak
Above 1000MHz	74dBµV/m	Peak
	54dBµV/m	Average

10.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
Amplifier 9kHz - 40GHz	LCIE SUD EST	_	A7102082	06/20	09/21
Antenna Bi-log	CHASE	CBL6111A	C2040172	09/18	09/21
Antenna horn 18GHz	EMCO	3115	C2042029	09/18	09/21
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052	06/19	06/22
BAT EMC	NEXIO	v3.19.1.23	L1000115		
CABLE N 3m	_	-	A5329206	07/20	07/22
Cable SMA 40GHz 40cm	WITHWAVE	W101-SM1-0.4M	A5329979	04/21	04/22
Comb EMR HF	YORK	CGE01	A3169114		
Emission Cable (SMA 1m)	TELEDYNE	26GHz	A5329874	10/20	10/21
Emission Cable (SMA 3.3m)	TELEDYNE	26GHz	A5329875	10/20	10/21
Emission Cable <1GHz (Ampl <-> Cage)	-	18GHz	A5329907	08/20	09/21
Filter Matrice	LCIE SUD EST	Combined filters	A7484078	09/20	09/21
Multimeter - CEM	FLUKE	87	A1240251	03/21	03/23
Rehausse Table C3	LCIE	_	F2000507		
Rehausse Table C3	LCIE	_	F2000511		
Semi-Anechoic chamber #3 (BF)	SIEPEL	_	D3044017_BF	12/19	12/22
Semi-Anechoic chamber #3 (VSWR)	SIEPEL	_	D3044017_VSWR	12/19	12/22
Spare C3 Cable Measure	TELEDYNE	26GHz	A5329681	09/20	09/22
Spectrum analyzer	ROHDE & SCHWARZ	FSU 26	A4060058	09/19	09/21
Table C3	LCIE	_	F2000461		
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23
Turntable chamber (Cage#3)	ETS Lingren	Model 2165	F2000371		
Turntable controller (Cage#3)	ETS Lingren	Model 2090	F2000444		

Note: In our quality system, the test equipment calibration due is more & less 2 months

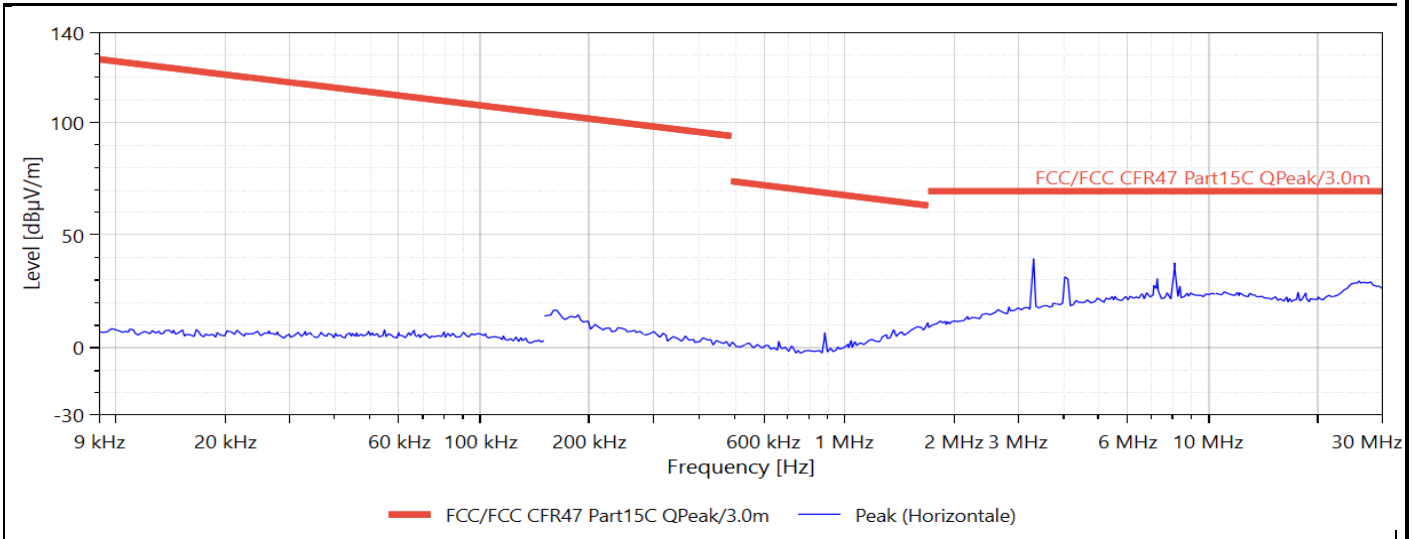
10.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

10.6. RESULTS

Results in the frequency band [0.009-30] MHz: Worst case presented

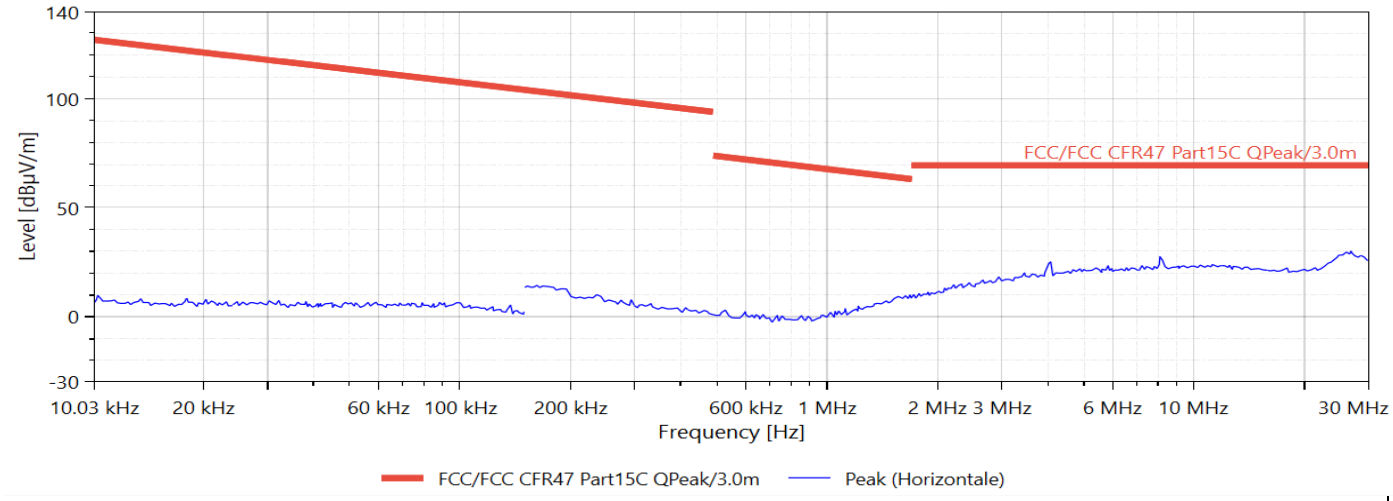
RADIATED EMISSIONS			
Graph name:	Emr#1	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(0°) - Cmin - TX mode - Angle2 = (0°-150°) step 30°	
Class:			
Frequency range: [9kHz - 30MHz]			
Antenna polarization:	0°	**RBW :**	500Hz & 10kHz
Azimuth:	0° - 360°	**VBW :**	2kHz & 30kHz



Spurious emissions

Frequency (MHz)	QPeak Level (dBµV/m)	Polarization	Correction (dB)
No significant frequency observed in 20dB below limit of restricted frequency bands			

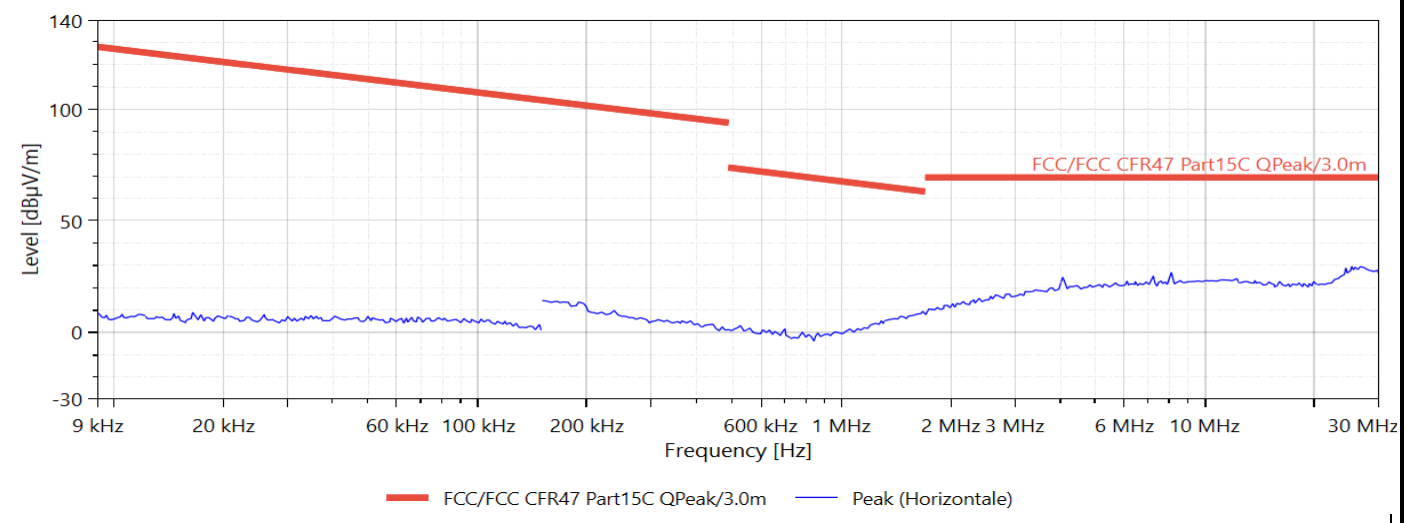
RADIATED EMISSIONS			
Graph name:	Emr#2	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(90°) - Cmin - TX mode - Angle2 = (0°-150°) step 30°	
Class:			
Frequency range: [9kHz - 30MHz]			
Antenna polarization:	90°	**RBW :**	500Hz & 10kHz
Azimuth:	0° - 360°	**VBW :**	2kHz & 30kHz



Spurious emissions

Frequency (MHz)	QPeak Level (dBµV/m)	Polarization	Correction (dB)
No significant frequency observed in 20dB below limit of restricted frequency bands			

RADIATED EMISSIONS			
Graph name:	Emr#3	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(180°) - Cmin - TX mode - Angle2 = (0°-150°) step 30°	
Class:			
Frequency range: [9kHz - 30MHz]			
Antenna polarization:	180°	**RBW :**	500Hz & 10kHz
Azimuth:	0° - 360°	**VBW :**	2kHz & 30kHz

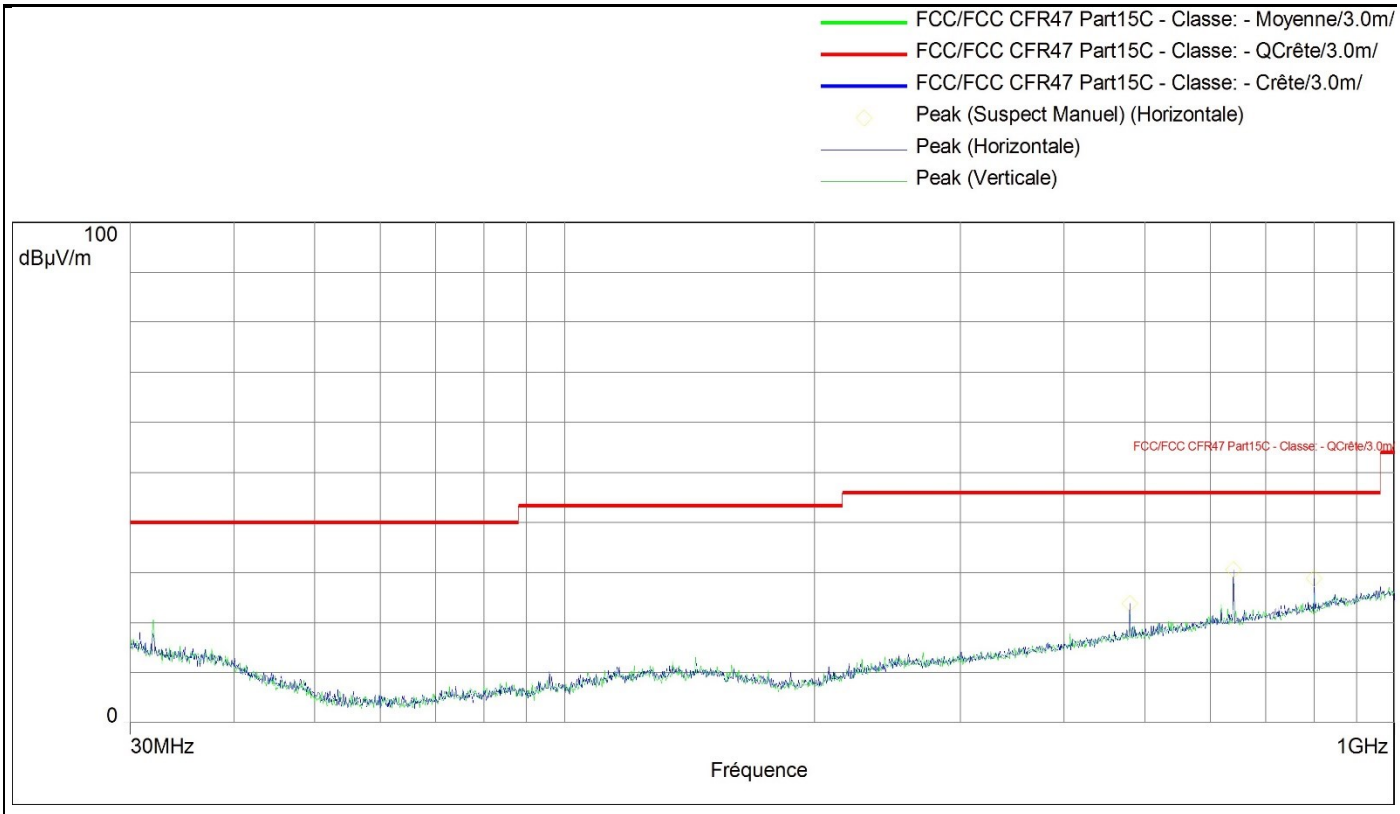


Spurious emissions

Frequency (MHz)	QPeak Level (dBµV/m)	Polarization	Correction (dB)
No significant frequency observed in 20dB below limit of restricted frequency bands			

Results in the frequency band [30-1000] MHz: Worst case presented

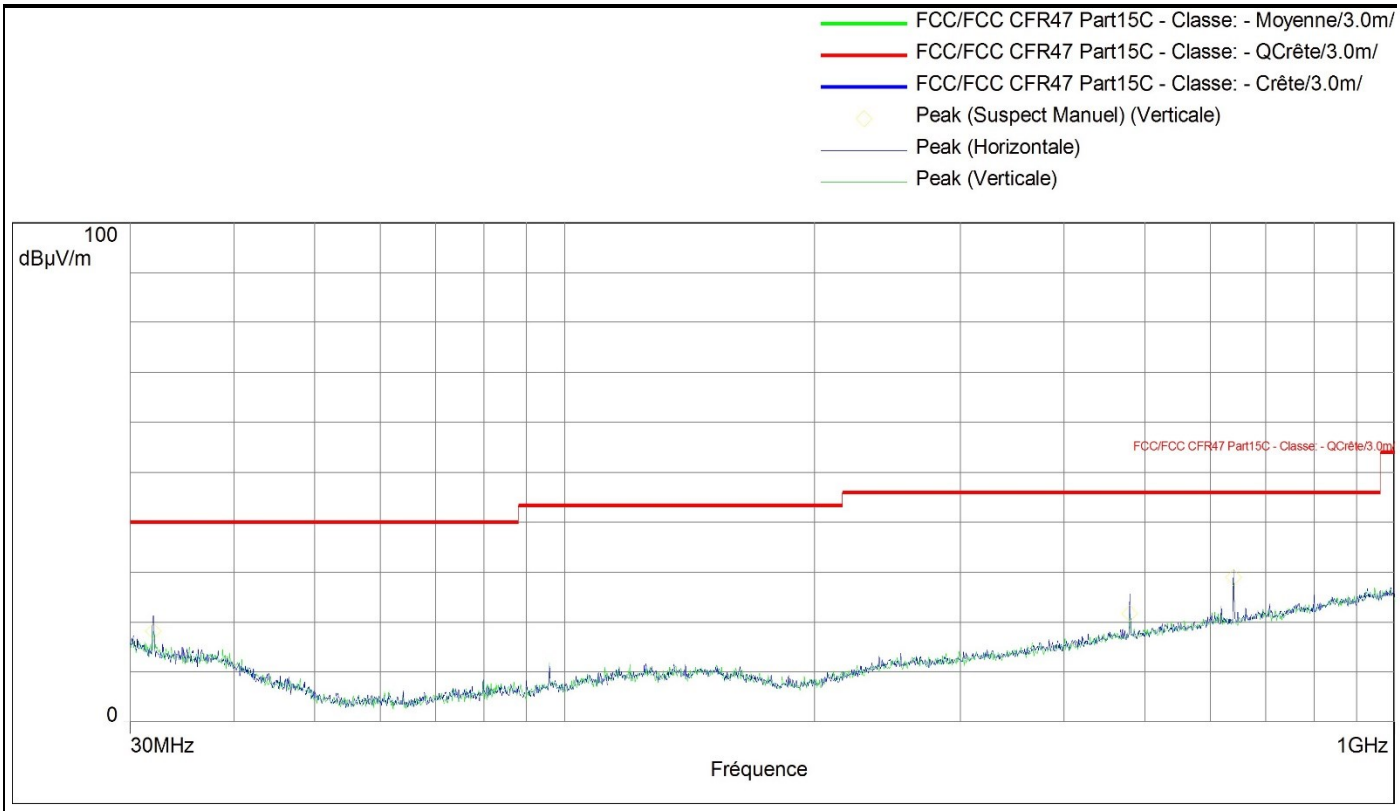
RADIATED EMISSIONS			
Graph name:	Emr#4	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) - Cmin - TX mode - Angle2 = (0°-150°) step 30°	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:		**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	Lim.Peak (dBµV/m)	Margin (dB)	Azimuth	Angle2 (°)	Polarisation	Correction (dB)
479.983	23.73	46	-22.27	126.00	90	Horizontale	-14.48
640.033	30.53	46	-15.47	128.00	90	Horizontale	-11.90
800.0345	28.81	46	-17.19	23.00	90	Horizontale	-9.90

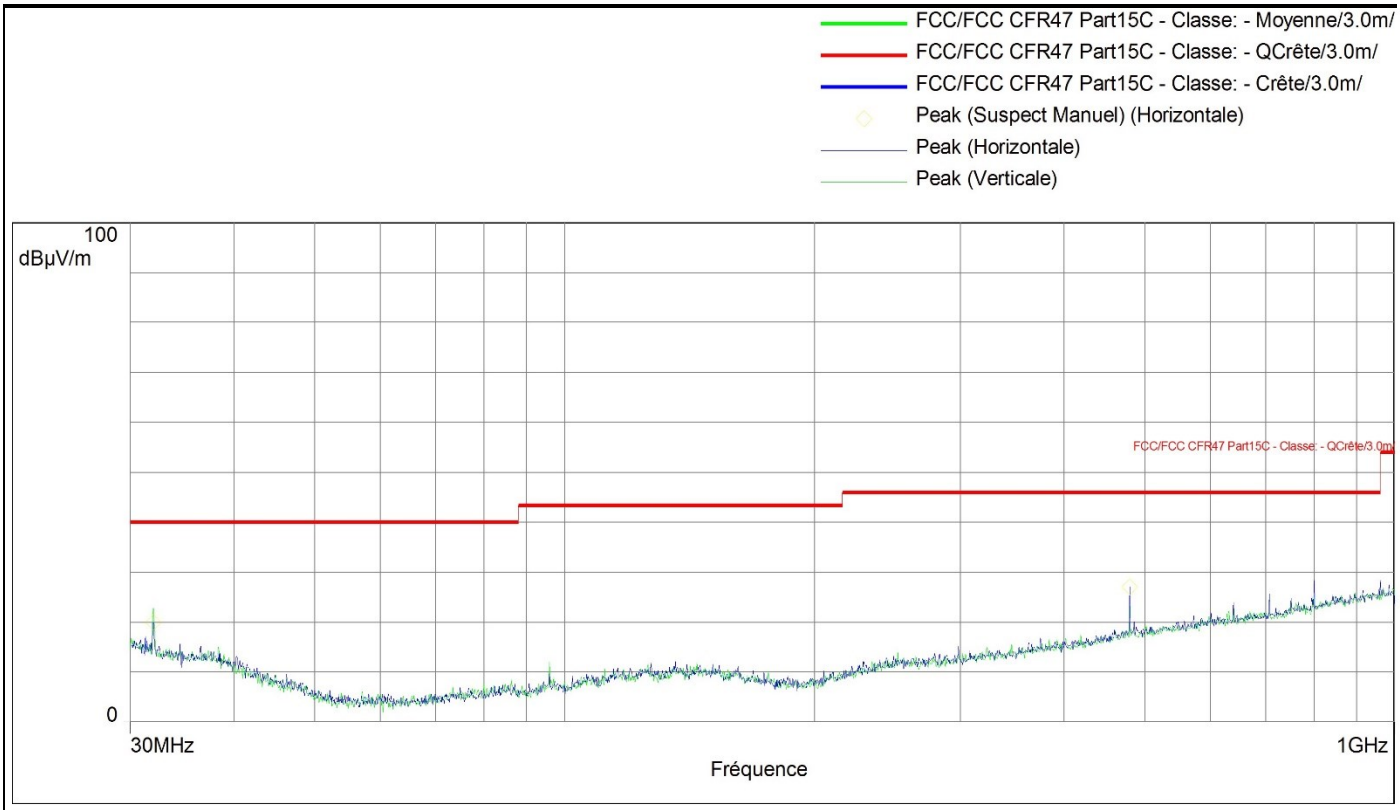
RADIATED EMISSIONS			
Graph name:	Emr#5	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) - Cmid - TX mode - Angle2 = (0°-150°) step 30°	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:		**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	Lim.Peak (dBµV/m)	Margin (dB)	Azimuth	Angle2 (°)	Polarisation	Correction (dB)
31.9885	18.22	40	-21.78	43.00	0	Verticale	-15.59
479.983	21.76	46	-24.24	239.00	0	Verticale	-14.48
640.033	28.97	46	-17.03	197.00	0	Verticale	-11.90

RADIATED EMISSIONS			
Graph name:	Emr#6	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) - Cmax - TX mode - Angle2 = (0°-150°) step 30°	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:		**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	Lim.Peak (dBµV/m)	Margin (dB)	Azimuth	Angle2 (°)	Polarisation	Correction (dB)
31.9885	19.92	40	-20.08	0.00	30	Horizontale	-15.59
479.983	27.09	46	-18.91	43.00	90	Horizontale	-14.48

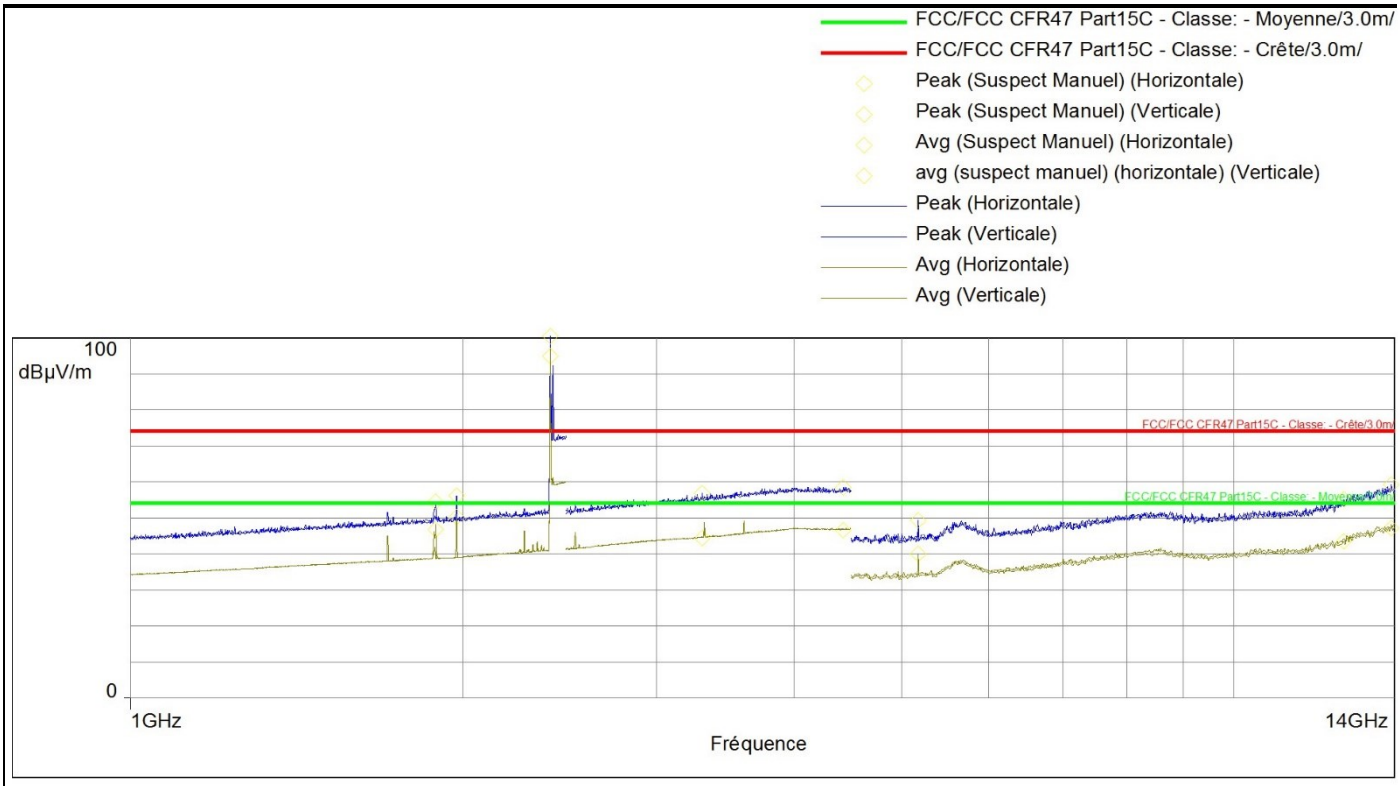
QUALIFICATION (30MHz-1GHz): 10 meters measurement on the Open Area Test Site.
Frequency list has been created with semi-anechoic chamber pre-scan results.
Measurements are performed using a QUASI-PEAK detection.

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)	Remark
No significant frequency observed margin > 15dB										

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

Results in the frequency band [1-25] GHz:

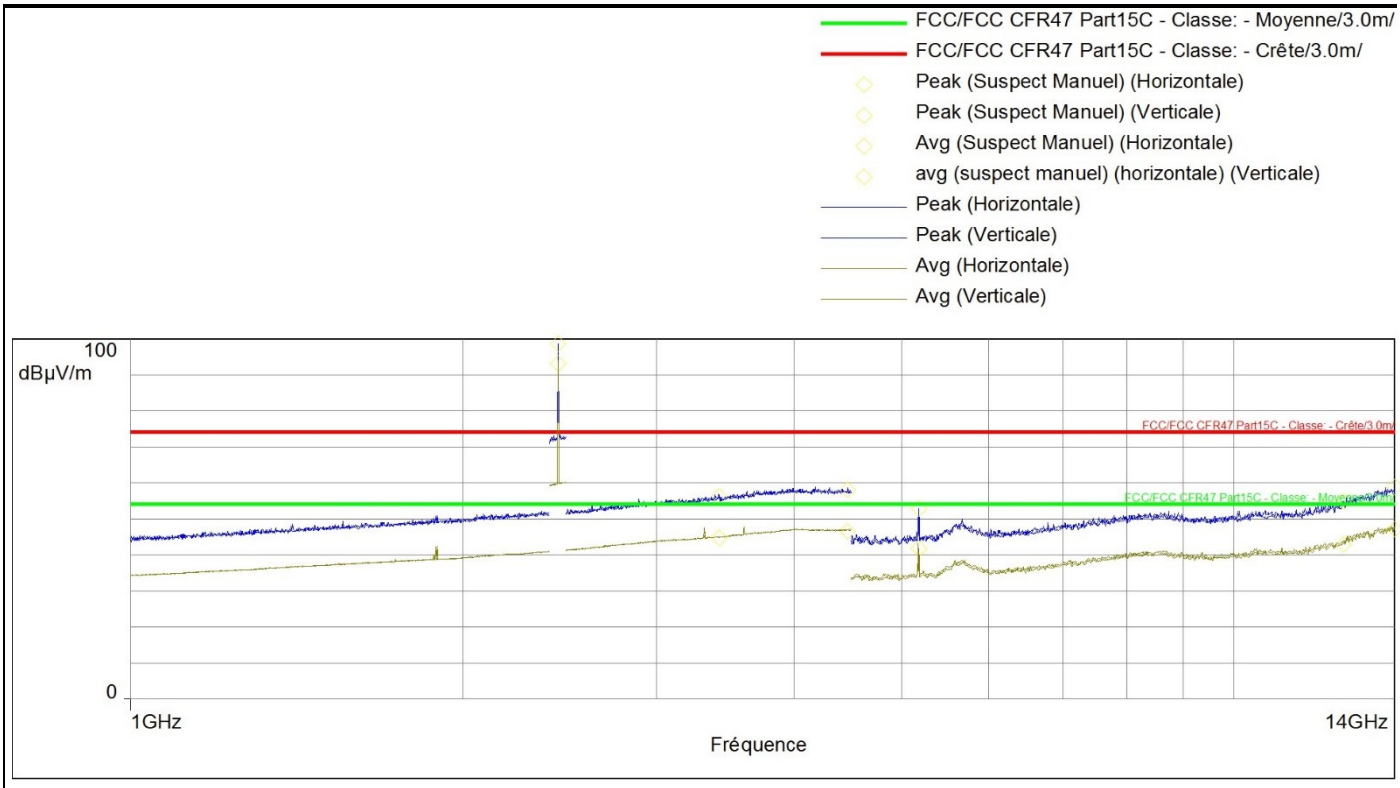
RADIATED EMISSIONS			
Graph name:	Emr#7	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) - CMin - TX mode - Angle2 = (0°-150°) step 30°	
Class:			
Frequency range: [1GHz - 14GHz]			
Antenna polarization:		**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	Lim.Peak (dBµV/m)	Margin Peak (dB)	Avg (dBµV/m)	Lim.Avg (dBµV/m)	Margin Avg (dB)	Azimuth	Angle2 (°)	Polarisation	Correction (dB)
1890.75	54.52	/	/	46.7	/	/	207.00	30	Horizontale	32.73
1974.75	56.16	74.00	-17.84	50.24	54	-3.76	229.00	120	Verticale	33.05
2402.004	100.56	74.00	26.56	94.84	54	40.84	76.00	90	Verticale	34.68
3299.3759	56.77	74.00	-17.23	44.35	54	-9.65	47.00	120	Verticale	37.83
4430.6324	58.52	74.00	-15.48	46.5	54	-7.5	358.00	90	Verticale	39.75
5175.45	49.32	74.00	-24.68	40.02	54	-13.98	158.00	90	Verticale	-22.21
12588.3	55.26	74.00	-18.74	43.59	54	-10.41	184.00	90	Horizontale	-11.99
13895.5	59.24	74.00	-14.76	47.18	54	-6.82	257.00	0	Horizontale	-7.76

RADIATED EMISSIONS			
Graph name:	Emr#8	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) - CMid - TX mode - Angle2 = (0°-150°) step 30°	
Class:			
Frequency range: [1GHz - 14GHz]			
Antenna polarization:		**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz

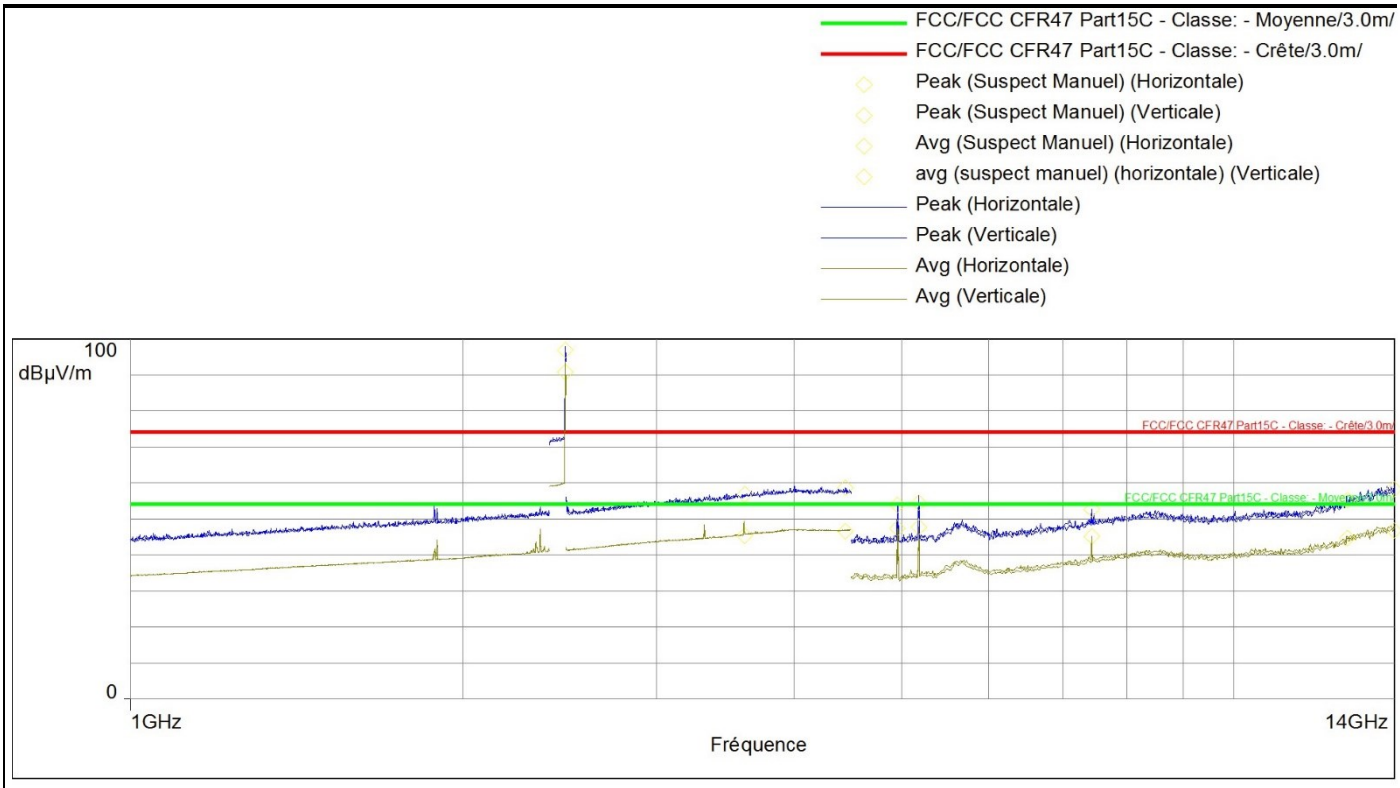


Spurious emissions

Suspect Manuel (6)

Frequency (MHz)	Peak (dBµV/m)	Lim.Peak (dBµV/m)	Margin Peak (dB)	Avg (dBµV/m)	Lim.Avg (dBµV/m)	Margin Avg (dB)	Azimuth	Angle2 (°)	Polarisation	Correction (dB)
2441.75	98.58	/	/	93.02	/	/	68.00	90	Horizontale	34.83
3418.3494	56.21	74	-17.79	44.7	54	-9.3	128.00	90	Horizontale	38.08
4470.1558	57.94	74	-16.06	46.54	54	-7.46	0.00	150	Horizontale	39.75
5184.95	52.96	74	-21.04	41.84	54	-12.16	94.00	90	Horizontale	-22.19
12584.5	54.84	74	-19.16	43.04	54	-10.96	177.00	120	Verticale	-12.02
13991.45	58.84	74	-15.16	47.08	54	-6.92	118.00	0	Verticale	-7.20

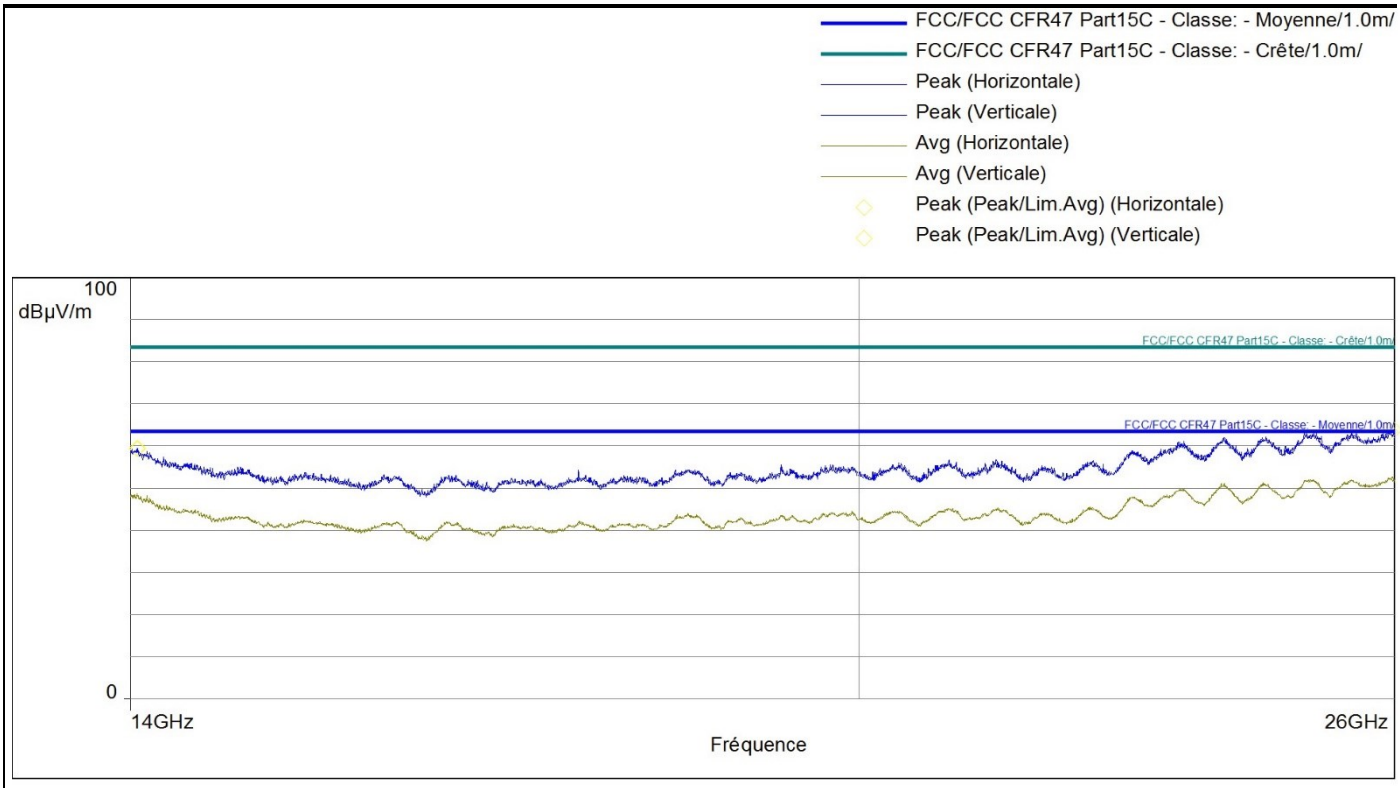
RADIATED EMISSIONS			
Graph name:	Emr#9	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) - CMax - TX mode - Angle2 = (0°-150°) step 30°	
Class:			
Frequency range: [1GHz - 14GHz]			
Antenna polarization:		**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	Lim.Peak (dBµV/m)	Margin Peak (dB)	Avg (dBµV/m)	Lim.Avg (dBµV/m)	Margin Avg (dB)	Azimuth	Angle2 (°)	Polarisation	Correction (dB)
2479.78425	96.84	/	/	90.76	/	/	66.00	90	Horizontale	34.96
3601.4476	56.75	74	-17.25	45.43	54	-8.57	134.00	60	Verticale	38.61
4445.9578	58.6	74	-15.4	46.46	54	-7.54	54.00	0	Verticale	39.75
4958.85	53.88	74	-20.12	47.27	54	-6.73	61.00	90	Horizontale	-22.83
5183.05	54.39	74	-19.61	47.79	54	-6.21	116.00	150	Horizontale	-22.20
7440.25	52.61	74	-21.39	45.07	54	-8.93	351.00	60	Verticale	-17.04
12672.85	55.27	74	-18.73	44.69	54	-9.31	162.00	0	Verticale	-11.49
13977.2	58.3	74	-15.7	46.71	54	-7.29	0.00	30	Verticale	-7.28

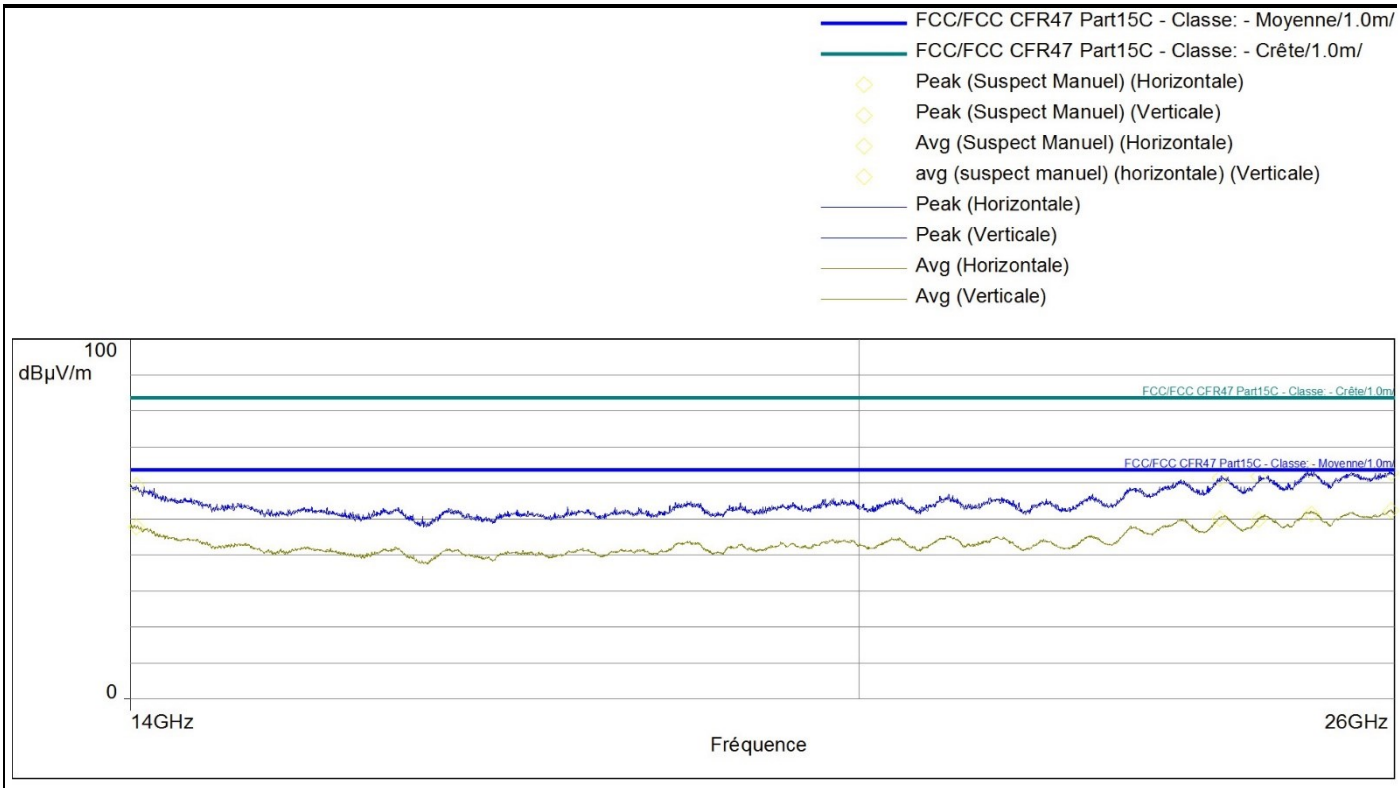
RADIATED EMISSIONS			
Graph name:	Emr#10	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) - CMin - TX mode - Angle2 = (0°-150°) step 30°	
Class:			
Frequency range: [14GHz - 26GHz]			
Antenna polarization:		**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	Lim.Peak (dBµV/m)	Margin Peak (dB)	Avg (dBµV/m)	Lim.Avg (dBµV/m)	Margin Avg (dB)	Azimuth	Angle2 (°)	Polarisation	Correction (dB)
14046	59.43	83.5	-24.07	48.25	63.5	-15.25	0.00	150	Horizontale	6.94
14049	59.41	83.5	-24.09	48.31	63.5	-15.19	145.00	60	Verticale	6.90
25933	63.5	83.5	-20	51.38	63.5	-12.12	287.00	30	Horizontale	17.48
25992	63.84	83.5	-19.66	51.76	63.5	-11.74	324.00	30	Verticale	17.61

RADIATED EMISSIONS			
Graph name:	Emr#11	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) - CMid - TX mode - Angle2 = (0°-150°) step 30°	
Class:			
Frequency range: [14GHz - 26GHz]			
Antenna polarization:		**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz

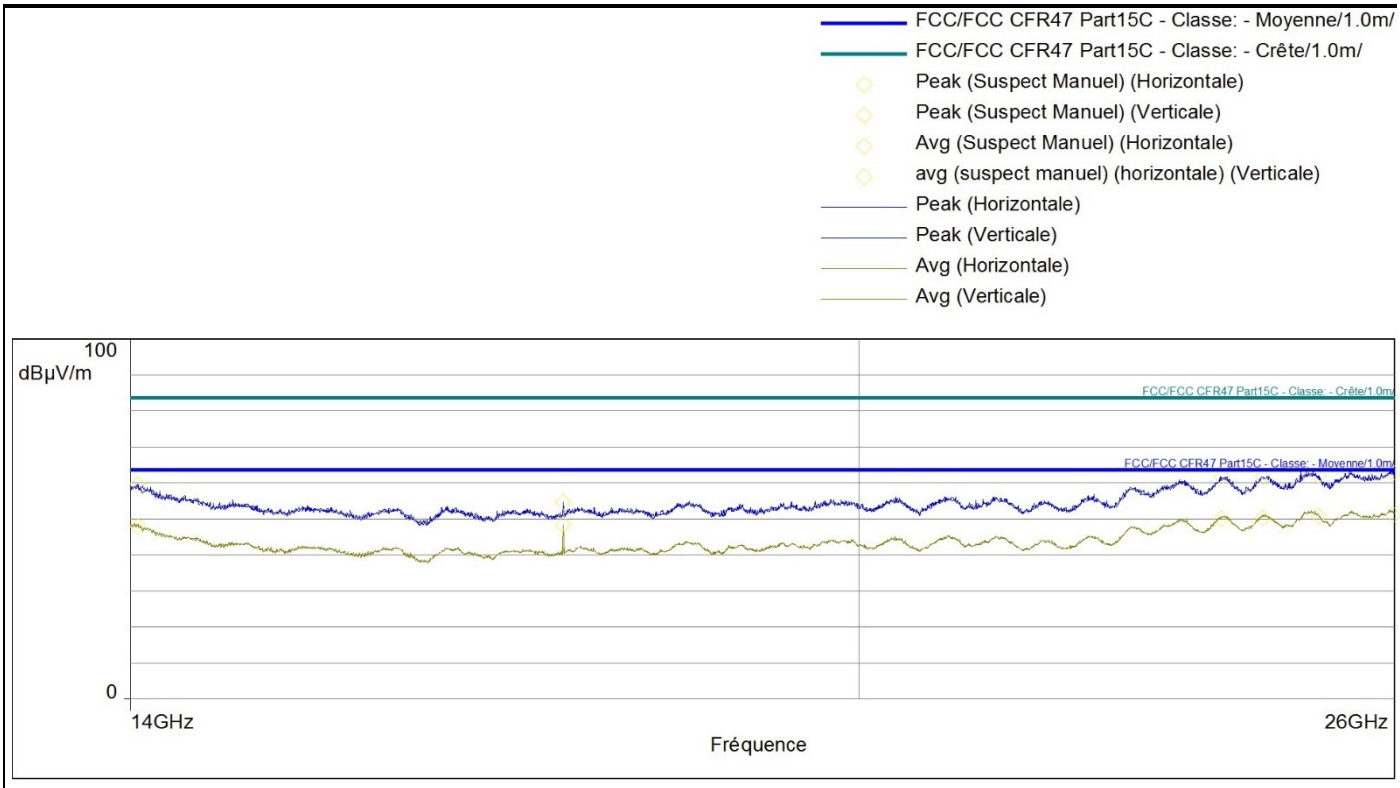


Spurious emissions

Suspect Manuel (5)

Frequency (MHz)	Peak (dBµV/m)	Lim.Peak (dBµV/m)	Margin Peak (dB)	Avg (dBµV/m)	Lim.Avg (dBµV/m)	Margin Avg (dB)	Azimuth	Angle2 (°)	Polarisation	Correction (dB)
14038.5	59.3	83.5	-24.2	47.65	63.5	-15.85	0.00	120	Horizontale	6.97
25950	62.84	83.5	-20.66	52.21	63.5	-11.29	74.00	90	Horizontale	17.52
23865	61.37	83.5	-22.13	50.19	63.5	-13.31	198.00	30	Verticale	13.64
24324	61.89	83.5	-21.61	49.66	63.5	-13.84	283.00	120	Verticale	14.06
24956	63.26	83.5	-20.24	51.23	63.5	-12.27	94.00	60	Verticale	15.00

RADIATED EMISSIONS			
Graph name:	Emr#12	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) - CMax - TX mode - Angle2 = (0°-150°) step 30°	
Class:			
Frequency range: [14GHz - 26GHz]			
Antenna polarization:		**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	Lim.Peak (dBµV/m)	Margin Peak (dB)	Avg (dBµV/m)	Lim.Avg (dBµV/m)	Margin Avg (dB)	Azimuth	Angle2 (°)	Polarisation	Correction (dB)
14048.5	59.54	83.5	-23.96	47.92	63.5	-15.58	345.00	90	Horizontale	6.91
17305	54.58	83.5	-28.92	48.3	63.5	-15.2	115.00	30	Verticale	-0.45
23880	61.75	83.5	-21.75	50.14	63.5	-13.36	248.00	120	Verticale	13.67
24377	61.66	83.5	-21.84	50.34	63.5	-13.16	266.00	30	Verticale	14.08
25049	61.98	83.5	-21.52	50.75	63.5	-12.75	11.00	90	Verticale	15.15
25985	62.84	83.5	-20.66	51.07	63.5	-12.43	201.00	120	Verticale	17.60

10.7. CONCLUSION

Unwanted Emission in restricted frequency bands measurement performed on the sample of the product **In&motion In&box V6**, SN:**63000005** in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 & RSS 247 ISSUE 2 limits.

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**
Measurement of conducted disturbances in voltage on the power port	3.29dB	3.4 dB
Measurement of conducted disturbances in voltage on the telecommunication port.	3.26 dB	5dB
Measurement of discontinuous conducted disturbances in voltage	3.33 dB	3.4 dB
Measurement of conducted disturbances in current	2.67 dB	2.9dB
Spurious emission, radiated (Semi anechoic chamber & open test site)	*5.60 dB*	*6 dB*
Spurious emission, radiated (Full anechoic chamber above 1GHz)	*±3.8 dB*	*±6 dB*
Occupied Channel Bandwidth	*±2.8 %*	*±5 %*
RF power, conducted	*±1.2 dB*	*±1.5 dB*
Power Spectral Density, Conducted	*±1.7 dB*	*±3 dB*
Spurious emission, conducted	*±2.3 dB*	*±3 dB*
Temperature	*±0.75 °C*	*±3 °C*
Supply Voltages	*±1.7 %*	*±3 %*

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.*