



LCIE

WIFI 2,4GHz Template: Release October 10th, 2016

TEST REPORT

N°: 149480-706239

Version : 01

Subject

Radio spectrum matters
tests according to standards:
47 CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 4

Issued to

VELUX America Inc. 1418 Evans Pond Road, Greenwood, SC 29649, USA	VELUX Canada Inc 2740 Sherwood Heights, Drive, Oakville, Ontario L6J7V5, CANADA
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Apparatus under test

- ↳ Product
- ↳ Trade mark
- ↳ Manufacturer
- ↳ Model under test
- ↳ Serial number
- ↳ FCC ID
- ↳ IC ID
- ↳ Industry Canada Number

VELUX ACTIVE Indoor Climate Control

VELUX ACTIVE with NETATMO

VELUX A/S

NXG01S

-

XSG-831591

8642A-831591

6230B(FAR) & 6230B-1(Euelles)

Test date

: July 24, 2017 to October 16, 2017

Test location

Fontenay Aux Roses

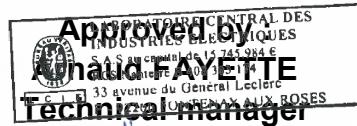
Composition of document

69 pages

Document issued on

January 22, 2018

Written by :
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Tests operator



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PUBLICATION HISTORY

Version	Date	Author	Modification
01	October 16, 2017	Armand MAHOUNGOU	Creation of the document



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1. TEST PROGRAM

References

- 47 CFR Part 15.247
- RSS 247 Issue 2
- RSS Gen Issue 4
- KDB 558074 D01 DTS Meas Guidance v04
- ANSI C63.10-2013

Radio requirement:

Clause (47CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 4) Test Description	Test result - Comments			
Occupied Bandwidth	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
6dB Bandwidth	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA()	<input type="checkbox"/> NP(1)
Duty Cycle	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Maximum Conducted Output Power	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Power Spectral Density	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Conducted Spurious Emission at the Band Edge	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA()	<input type="checkbox"/> NP(1)
Unwanted Emissions into Non-Restricted Frequency Bands	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA()	<input type="checkbox"/> NP(1)
AC Power Line Conducted Emission	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA(2)	<input type="checkbox"/> NP(1)
Unwanted Emissions into Restricted Frequency Bands	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Receiver Radiated emissions	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> 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



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

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):

VELUX ACTIVE with NETATMO NXG01S

Serial Number: -



Equipment Under Test

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Power supply	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop	-	-	-
Isolation transformer	-	-	-



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Equipment information:

Type:	WIFI			
Frequency band:	2400MHz-2483.5MHz			
Standard:	<input checked="" type="checkbox"/> 802.11b	<input checked="" type="checkbox"/> 802.11g	<input checked="" type="checkbox"/> 802.11n HT20	<input type="checkbox"/> 802.11n HT40
Spectrum Modulation:	<input checked="" type="checkbox"/> DSSS <input checked="" type="checkbox"/> OFDM			
Number of Channel:	11			
Spacing channel:	5MHz			
Channel bandwidth:	<input checked="" type="checkbox"/> 20MHz		<input type="checkbox"/> 40MHz	
Antenna Type:	<input checked="" type="checkbox"/> Integral	<input type="checkbox"/> External	<input type="checkbox"/> Dedicated	
Antenna connector:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Temporary for test	
Transmit chains:	<input checked="" type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Beam forming gain:	<input type="checkbox"/> Yes: XdB		<input checked="" type="checkbox"/> No	
Receiver chains	<input checked="" type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Type of equipment:	<input checked="" type="checkbox"/> Stand-alone	<input type="checkbox"/> Plug-in	<input type="checkbox"/> Combined	
Ad-Hoc mode:	<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No	
Duty cycle:	<input checked="" type="checkbox"/> Continuous duty	<input type="checkbox"/> Intermittent duty	<input type="checkbox"/> 100% duty	
Operating temperature range:	Tmin:	<input type="checkbox"/> -20°C	<input checked="" type="checkbox"/> 0°C	<input type="checkbox"/> X°C
	Tnom:	20°C		
	Tmax:	<input type="checkbox"/> 35°C	<input checked="" type="checkbox"/> 55°C	<input type="checkbox"/> X°C
Type of power source:	<input checked="" type="checkbox"/> AC power supply	<input type="checkbox"/> DC power supply	<input type="checkbox"/> Battery	
Operating voltage range:	Vnom:	<input checked="" type="checkbox"/> 120V/60Hz	<input type="checkbox"/> X Vdc	

Antenna Characteristic

Antenna assembly	Gain (dBi)	Frequency Band (MHz)	Impedance(Ω)
Accumulated	5.56	2412	50



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CHANNEL PLAN	
802.11b / 802.11g / 802.11n HT20	
Channel	Frequency (MHz)
Cmin: 1	2412
2	2417
3	2422
4	2427
5	2432
Cmid: 6	2437
7	2442
8	2447
9	2452
10	2457
Cmax: 11	2462



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DATA RATE

802.11b

Data Rate (Mbps)	Modulation Type	Modulation Worst Case
1	DBPSK	<input type="checkbox"/>
2	DQPSK	<input type="checkbox"/>
5.5	DQPSK	<input checked="" type="checkbox"/>
11	CCK	<input type="checkbox"/>

DATA RATE

802.11g

Data Rate (Mbps)	Modulation Type	Modulation Worst Case
6	BPSK	<input checked="" type="checkbox"/>
9	BPSK	<input type="checkbox"/>
12	QPSK	<input type="checkbox"/>
18	QPSK	<input type="checkbox"/>
24	16-QAM	<input type="checkbox"/>
36	16-QAM	<input type="checkbox"/>
48	64-QAM	<input type="checkbox"/>
54	64-QAM	<input type="checkbox"/>



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DATA RATE 802.11n HT20							
Available for EUT	MCS Index	Spatial streams	Modulation	Data Rate (Mbps)		(GI = 400ns)	Worst Case Modulation
				(GI = 800ns)	(GI = 400ns)		
<input checked="" type="checkbox"/>	0	1	BPSK	6.5	7.2	-	<input checked="" type="checkbox"/>
	1	1	QPSK	13	14.4	-	<input type="checkbox"/>
	2	1	QPSK	19.5	21.7	-	<input type="checkbox"/>
	3	1	16-QAM	26	28.9	-	<input type="checkbox"/>
	4	1	16-QAM	39	43.3	-	<input type="checkbox"/>
	5	1	64-QAM	52	57.8	-	<input type="checkbox"/>
	6	1	64-QAM	58.5	65	-	<input type="checkbox"/>
	7	1	64-QAM	65	72.2	-	<input type="checkbox"/>
	32	1	BPSK	-	-	-	<input type="checkbox"/>
<input type="checkbox"/>	8	2	BPSK	13	14.4	-	<input type="checkbox"/>
	9	2	QPSK	26	28.9	-	<input type="checkbox"/>
	10	2	QPSK	39	43.3	-	<input type="checkbox"/>
	11	2	16-QAM	52	57.8	-	<input type="checkbox"/>
	12	2	16-QAM	78	86.7	-	<input type="checkbox"/>
	13	2	64-QAM	104	115.6	-	<input type="checkbox"/>
	14	2	64-QAM	117	130.3	-	<input type="checkbox"/>
	15	2	64-QAM	130	144.4	-	<input type="checkbox"/>
	33	2	16-QAM	39	43.3	-	<input type="checkbox"/>
	34	2	64-QAM	52	57.8	-	<input type="checkbox"/>
	35	2	64-QAM	65	72.2	-	<input type="checkbox"/>
	36	2	16-QAM	58.5	65	-	<input type="checkbox"/>
	37	2	64-QAM	78	86.7	-	<input type="checkbox"/>
	38	2	64-QAM	97.5	108.3	-	<input type="checkbox"/>
	16	3	BPSK	19.5	21.7	-	<input type="checkbox"/>
	17	3	QPSK	39	43.3	-	<input type="checkbox"/>
<input type="checkbox"/>	18	3	QPSK	58.5	65	-	<input type="checkbox"/>
	19	3	16-QAM	78	86.7	-	<input type="checkbox"/>
	20	3	16-QAM	117	130	-	<input type="checkbox"/>
	21	3	64-QAM	156	173.3	-	<input type="checkbox"/>
	22	3	64-QAM	175.5	195	-	<input type="checkbox"/>
	23	3	64-QAM	195	216.7	-	<input type="checkbox"/>
	39	3	16-QAM	52	57.8	-	<input type="checkbox"/>
	40	3	16-QAM	65	72.2	-	<input type="checkbox"/>
	41	3	64-QAM	65	72.2	-	<input type="checkbox"/>
	42	3	64-QAM	78	86.7	-	<input type="checkbox"/>
	43	3	64-QAM	91	101.1	-	<input type="checkbox"/>
	44	3	64-QAM	91	101.1	-	<input type="checkbox"/>
	45	3	64-QAM	104	115.6	-	<input type="checkbox"/>
	46	3	16-QAM	78	86.7	-	<input type="checkbox"/>
<input type="checkbox"/>	47	3	16-QAM	97.5	108.3	-	<input type="checkbox"/>
	48	3	64-QAM	97.5	108.3	-	<input type="checkbox"/>
	49	3	64-QAM	117	130	-	<input type="checkbox"/>
	50	3	64-QAM	136.5	151.7	-	<input type="checkbox"/>
	51	3	64-QAM	136.5	151.7	-	<input type="checkbox"/>
	52	3	64-QAM	156	173.3	-	<input type="checkbox"/>
	24	4	BPSK	26	28.9	-	<input type="checkbox"/>
	25	4	QPSK	52	57.8	-	<input type="checkbox"/>
	26	4	QPSK	78	86.7	-	<input type="checkbox"/>
	27	4	16-QAM	104	115.6	-	<input type="checkbox"/>
	28	4	16-QAM	156	173.3	-	<input type="checkbox"/>
	29	4	64-QAM	208	231.1	-	<input type="checkbox"/>
	30	4	64-QAM	234	260	-	<input type="checkbox"/>
	31	4	64-QAM	260	288.9	-	<input type="checkbox"/>
<input type="checkbox"/>	53	4	16-QAM	65	72.2	-	<input type="checkbox"/>
	54	4	16-QAM	78	86.7	-	<input type="checkbox"/>
	55	4	16-QAM	91	101.1	-	<input type="checkbox"/>
	56	4	64-QAM	78	86.7	-	<input type="checkbox"/>
	57	4	64-QAM	91	101.1	-	<input type="checkbox"/>
	58	4	64-QAM	104	115.6	-	<input type="checkbox"/>
	59	4	64-QAM	117	130	-	<input type="checkbox"/>
	60	4	64-QAM	104	115.6	-	<input type="checkbox"/>
	61	4	64-QAM	117	130	-	<input type="checkbox"/>
	62	4	64-QAM	130	144.4	-	<input type="checkbox"/>
	63	4	64-QAM	130	144.4	-	<input type="checkbox"/>
	64	4	64-QAM	143	158.9	-	<input type="checkbox"/>
	65	4	16-QAM	97.5	108.3	-	<input type="checkbox"/>
	66	4	16-QAM	117	130	-	<input type="checkbox"/>
	67	4	16-QAM	136.5	151.7	-	<input type="checkbox"/>
	68	4	64-QAM	117	130	-	<input type="checkbox"/>
	69	4	64-QAM	136.5	151.7	-	<input type="checkbox"/>
	70	4	64-QAM	156	173.3	-	<input type="checkbox"/>
	71	4	64-QAM	175.5	195	-	<input type="checkbox"/>
	72	4	64-QAM	156	173.3	-	<input type="checkbox"/>
	73	4	64-QAM	175.5	195	-	<input type="checkbox"/>
	74	4	64-QAM	195	216.7	-	<input type="checkbox"/>
	75	4	64-QAM	195	216.7	-	<input type="checkbox"/>
	76	4	64-QAM	214.5	238.3	-	<input type="checkbox"/>



2.2. RUNNING MODE

The EUT is set in the following modes during tests:

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

2.3. EQUIPMENT LABELLING



2.4. EQUIPMENT MODIFICATION

None

Modification:



3. OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : August 1, 2017
Ambient temperature : 26 °C
Relative humidity : 44 %

3.2. TEST SETUP

- The Equipment Under Test is installed:

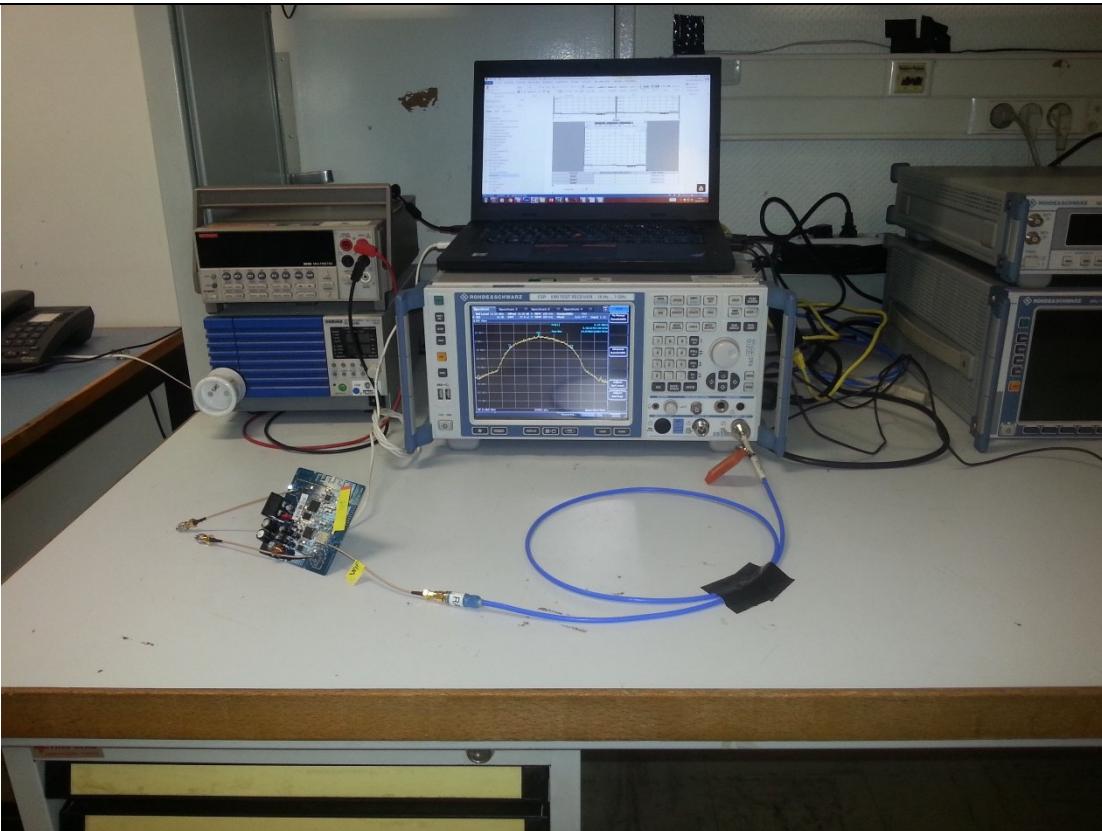
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

- RSS-Gen Issue 4 § 6.6
- ANSI C63.10 § 6.9.2



Photograph for Occupied bandwidth



3.1. LIMIT

None

3.2. TEST EQUIPMENT LIST

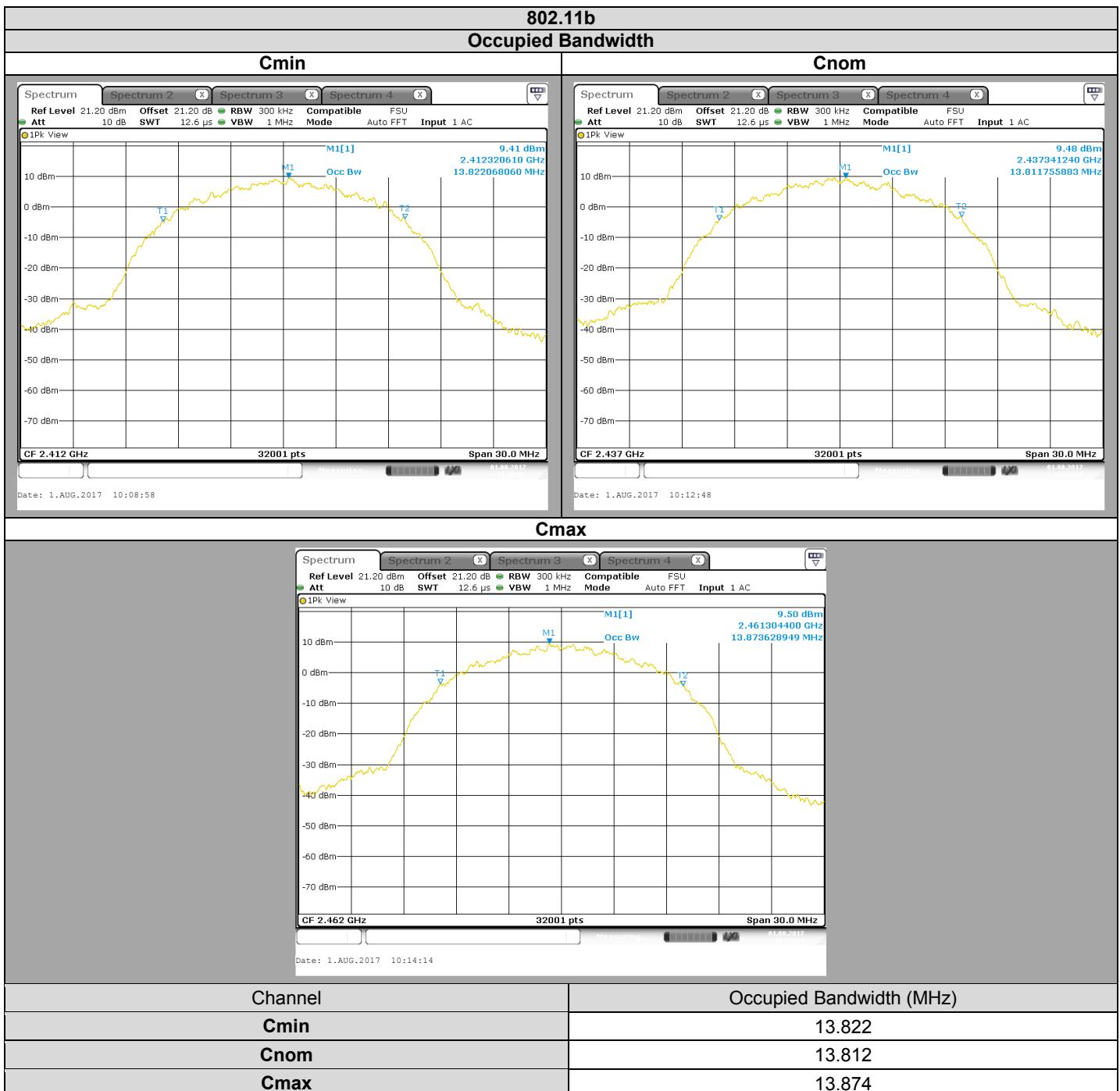
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2018/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329675	2016/09	2017/09
Load 50 ohms	TELEGARTNER		A7150103	2016/12	2017/12
Load 50 ohms	TELEGARTNER		A7150104	2016/12	2017/12

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



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3.3. RESULTS



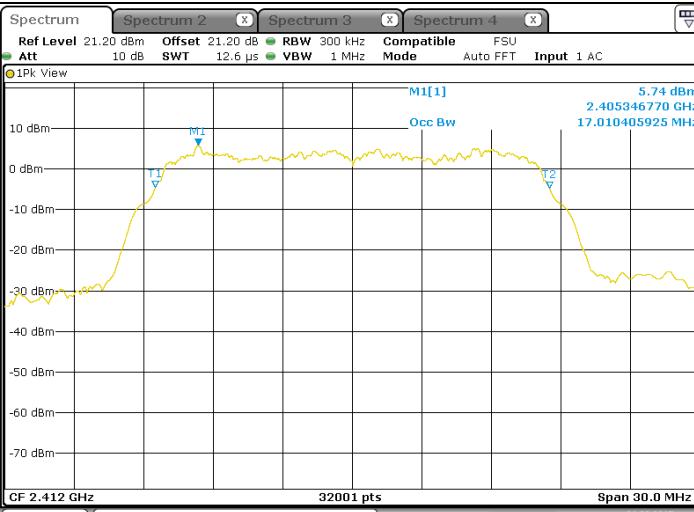


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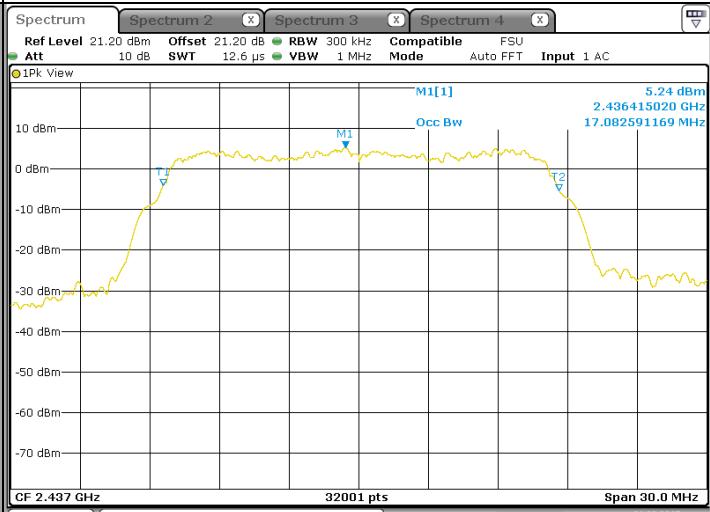
802.11g

Occupied Bandwidth

Cmin



Cnom



Cmax



Channel

Occupied Bandwidth (MHz)

Cmin

17.010

Cnom

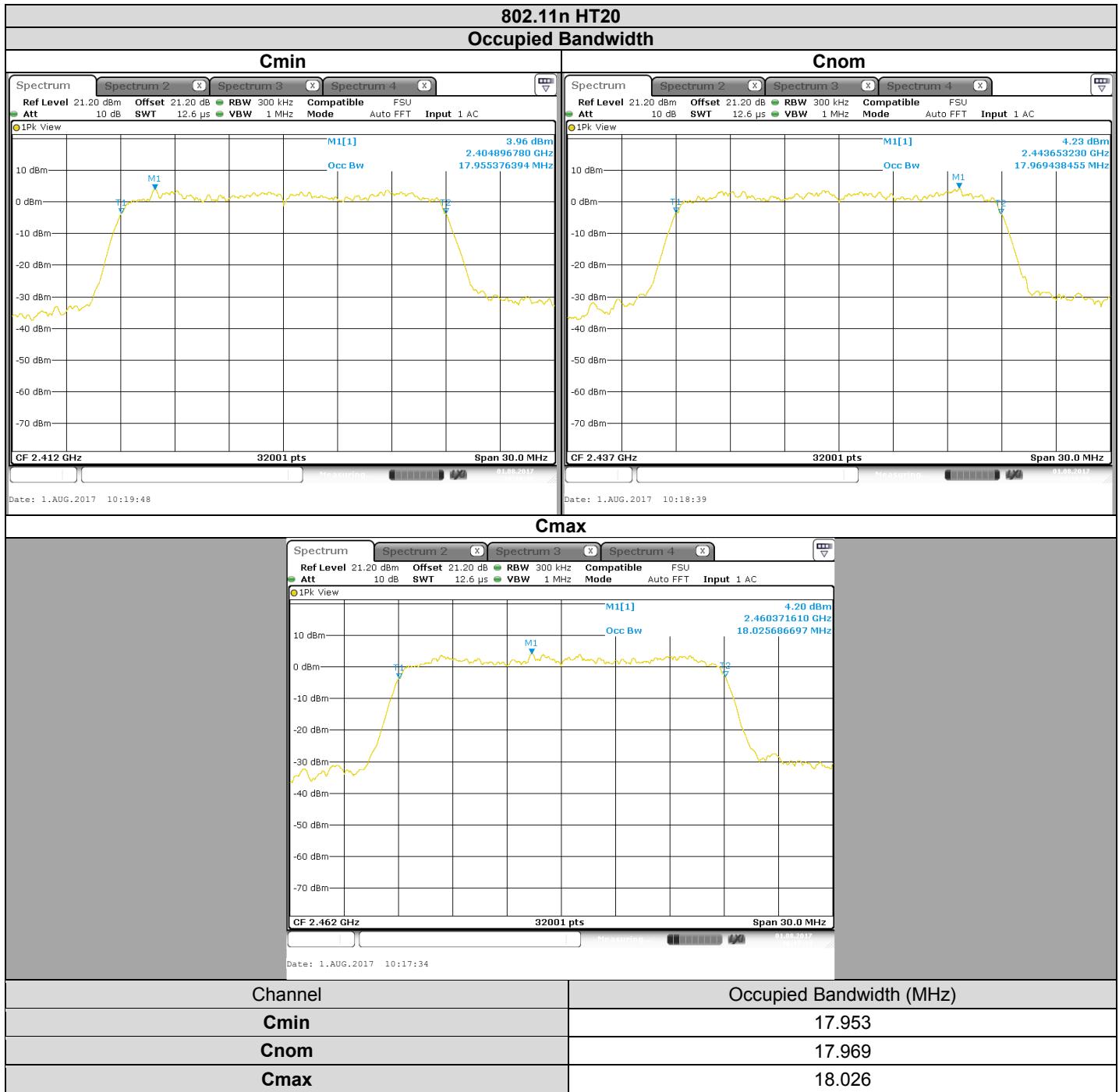
17.082

Cmax

17.156



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3.1. CONCLUSION

Occupied Channel Bandwidth measurement performed on the sample of the product **VELUX ACTIVE** with **NETATMO NXG01S**, SN: -, in configuration and description presented in this test report, show levels compliant to the **47 CFR PART 15.247 & RSS-GEN ISSUE 4** limits.



4. 6dB EMISSION BANDWIDTH

4.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : August 1, 2017
Ambient temperature : 26 °C
Relative humidity : 44 %

4.2. TEST SETUP

- The Equipment Under Test is installed:

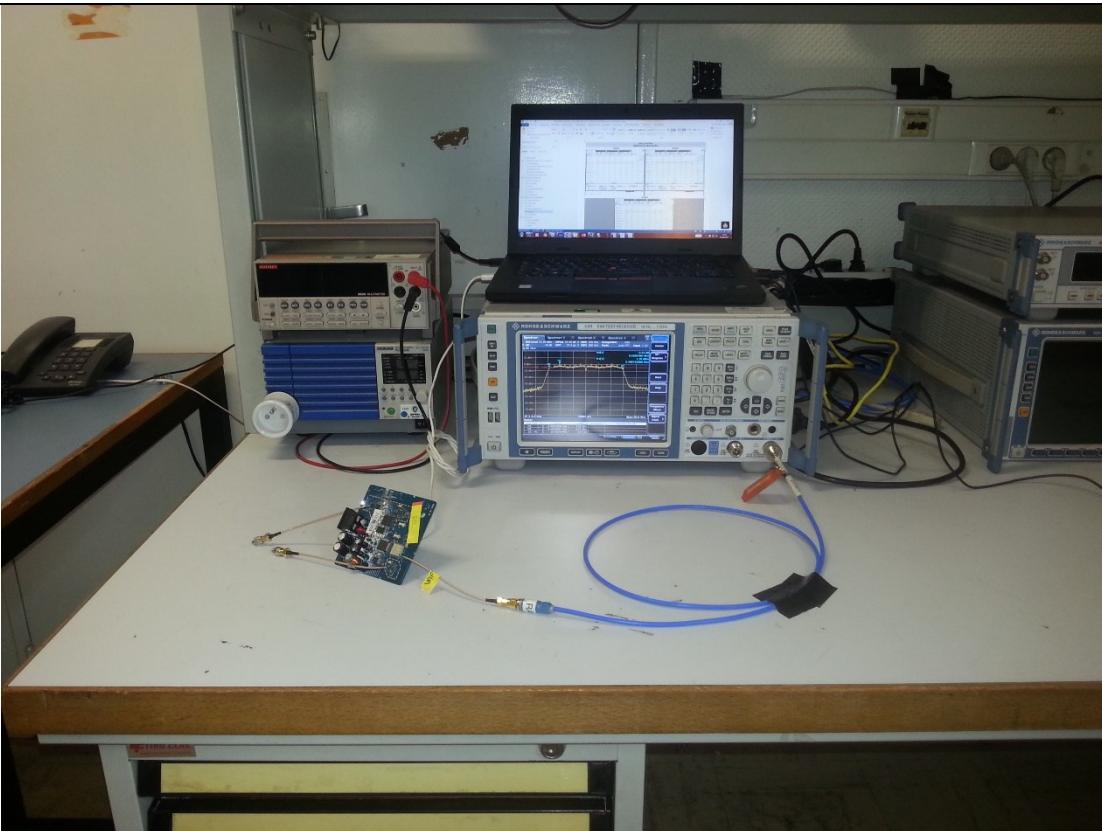
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

- KDB 558074 D01 DTS Meas Guidance v04 § 8.1
- KDB 558074 D01 DTS Meas Guidance v04 § 8.2



Photograph for 6dB emission bandwidth



4.3. LIMIT

The 6dB bandwidth shall be at least 500kHz

4.4. TEST EQUIPMENT LIST

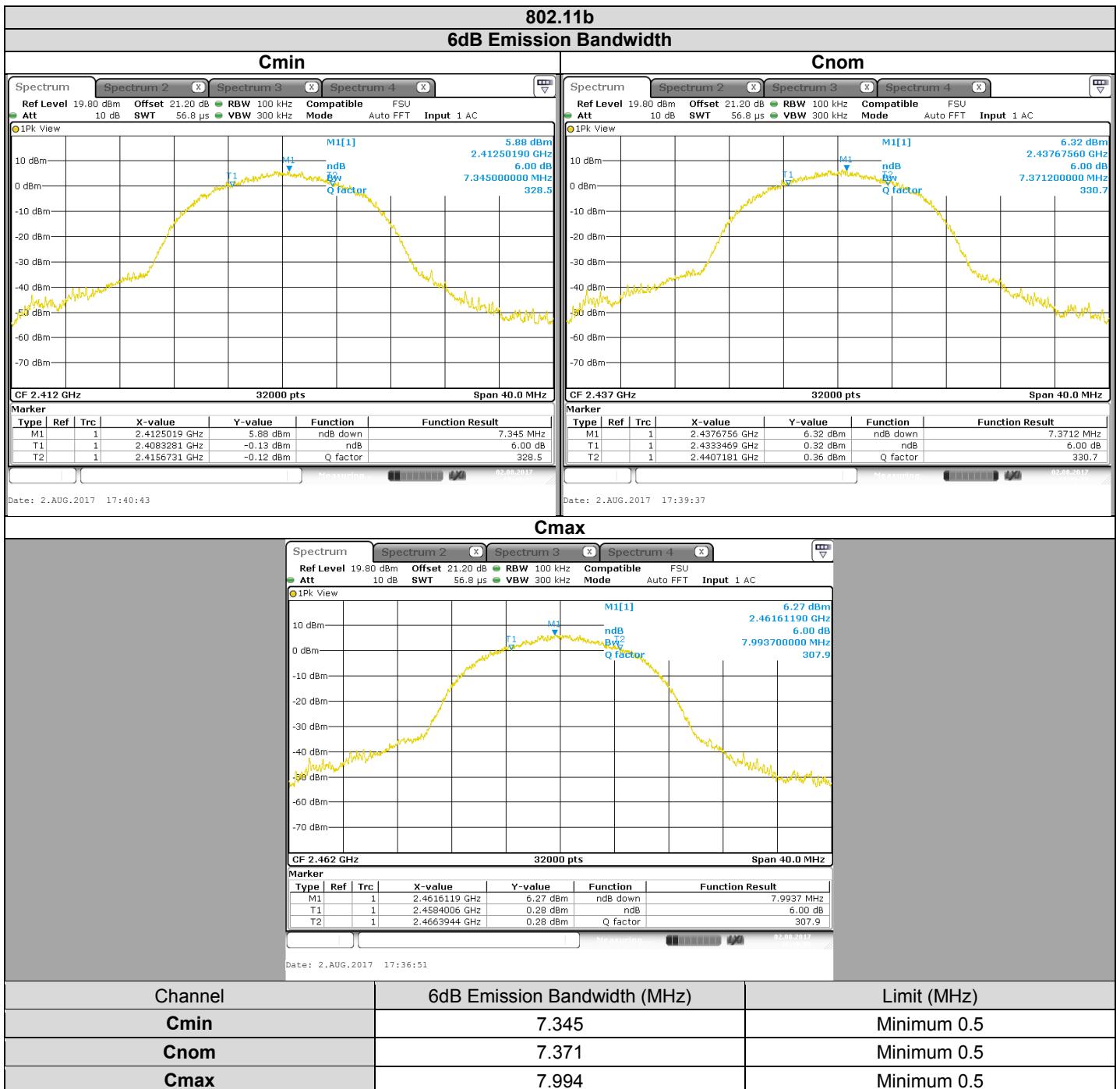
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2018/09
RF cable & 20 dB attenuator	Télédynne	920-0202-048	A5329675	2016/09	2017/09
Load 50 ohms	TELEGARTNER		A7150103	2016/12	2017/12
Load 50 ohms	TELEGARTNER		A7150104	2016/12	2017/12

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



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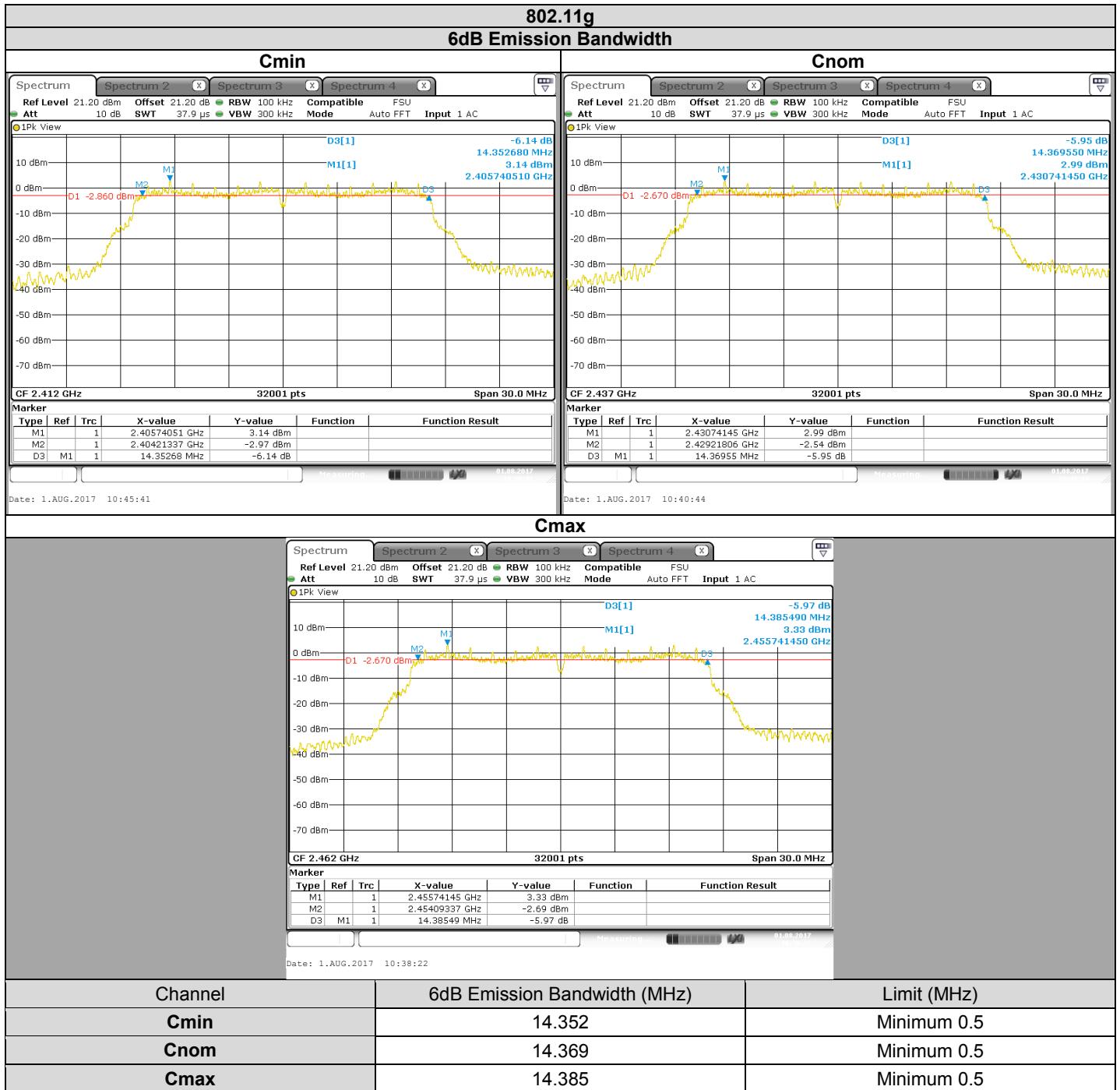
4.5. RESULTS





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TEST REPORT





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TEST REPORT

TEST REPORT
Version : 01





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4.6. CONCLUSION

6dB Emission Bandwidth measurement performed on the sample of the product **VELUX ACTIVE** with **NETATMO NXG01S**, SN: -, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.



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5. DUTY CYCLE

5.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : August 1, 2017
Ambient temperature : 26 °C
Relative humidity : 44 %

5.2. TEST SETUP

- The Equipment Under Test is installed:

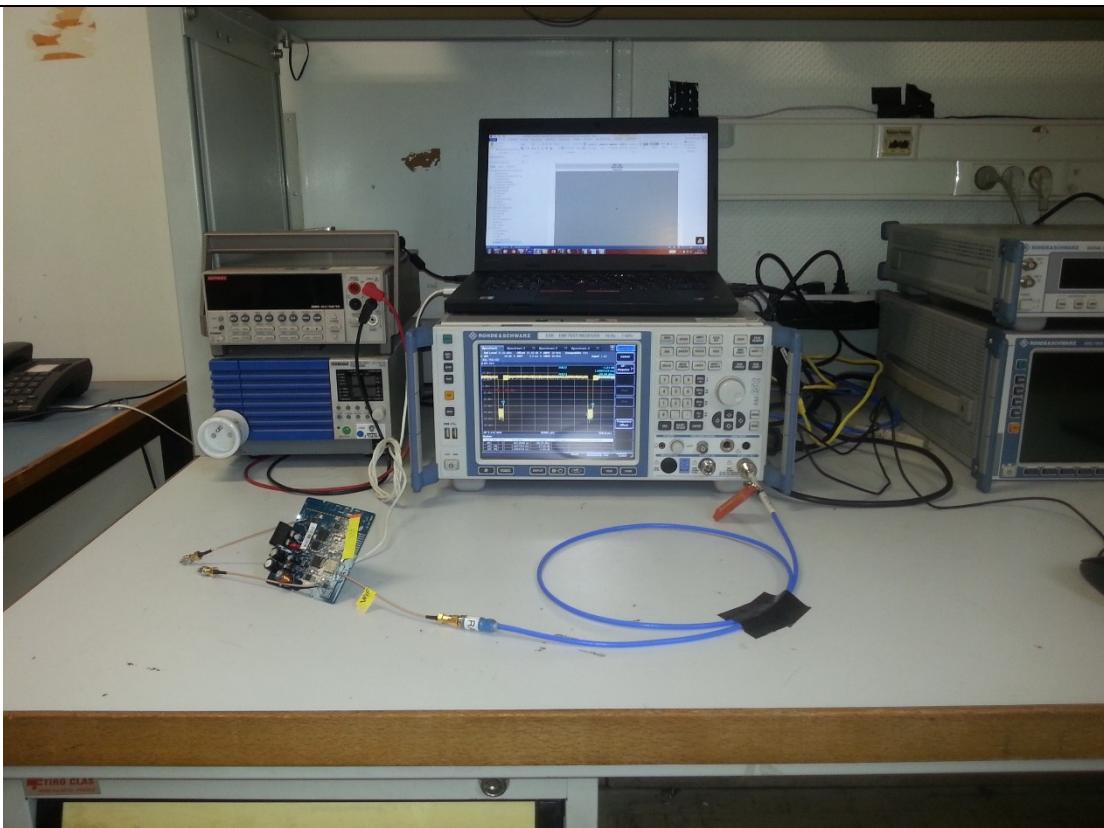
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

- KDB 558074 D01 DTS Meas Guidance v04 § 6.0 b)



Photograph for Duty Cycle



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5.3. LIMIT

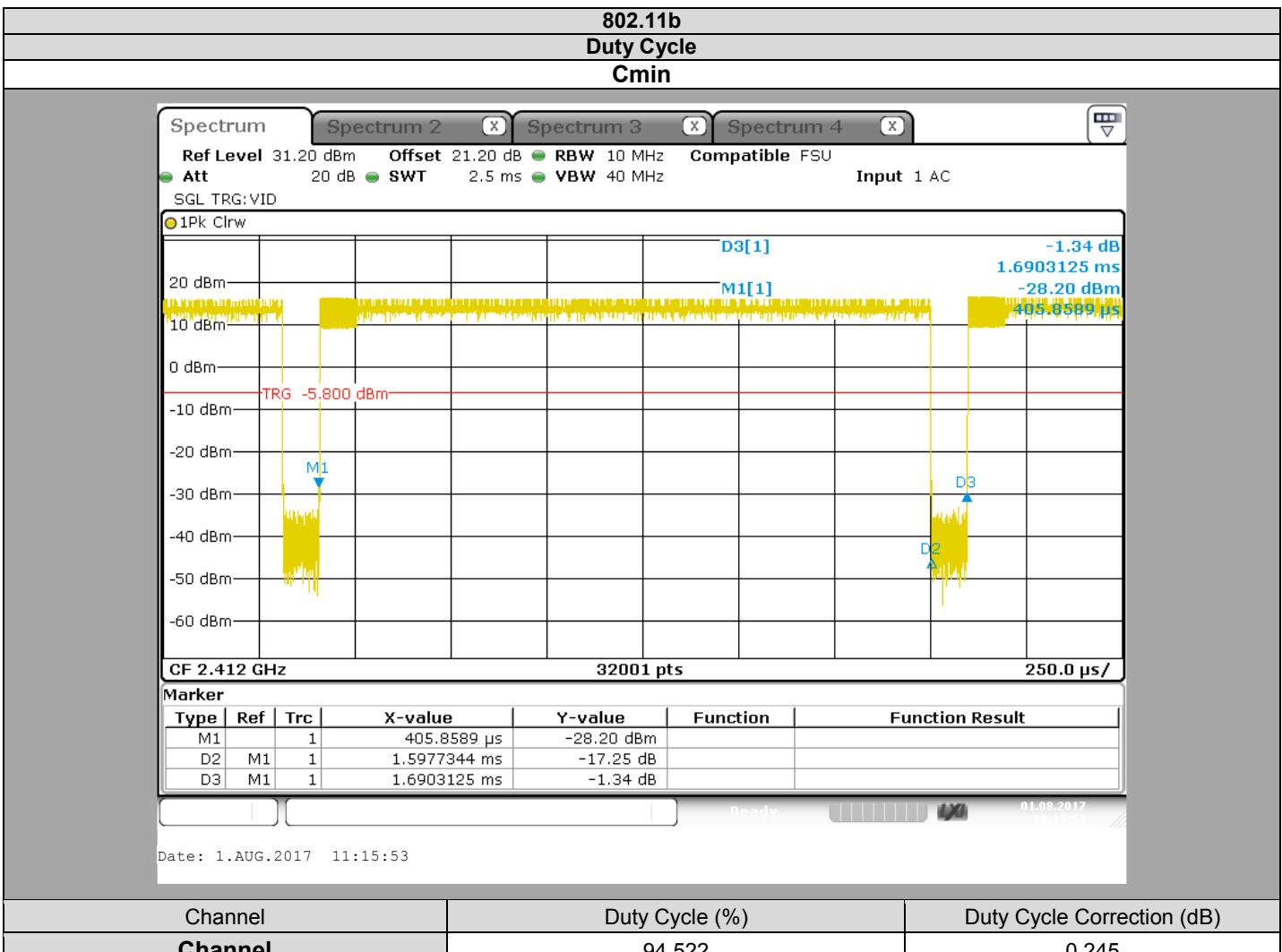
None

5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2018/09
RF cable & 20 dB attenuator	Télédynne	920-0202-048	A5329675	2016/09	2017/09
Load 50 ohms	TELEGARTNER		A7150103	2016/12	2017/12
Load 50 ohms	TELEGARTNER		A7150104	2016/12	2017/12

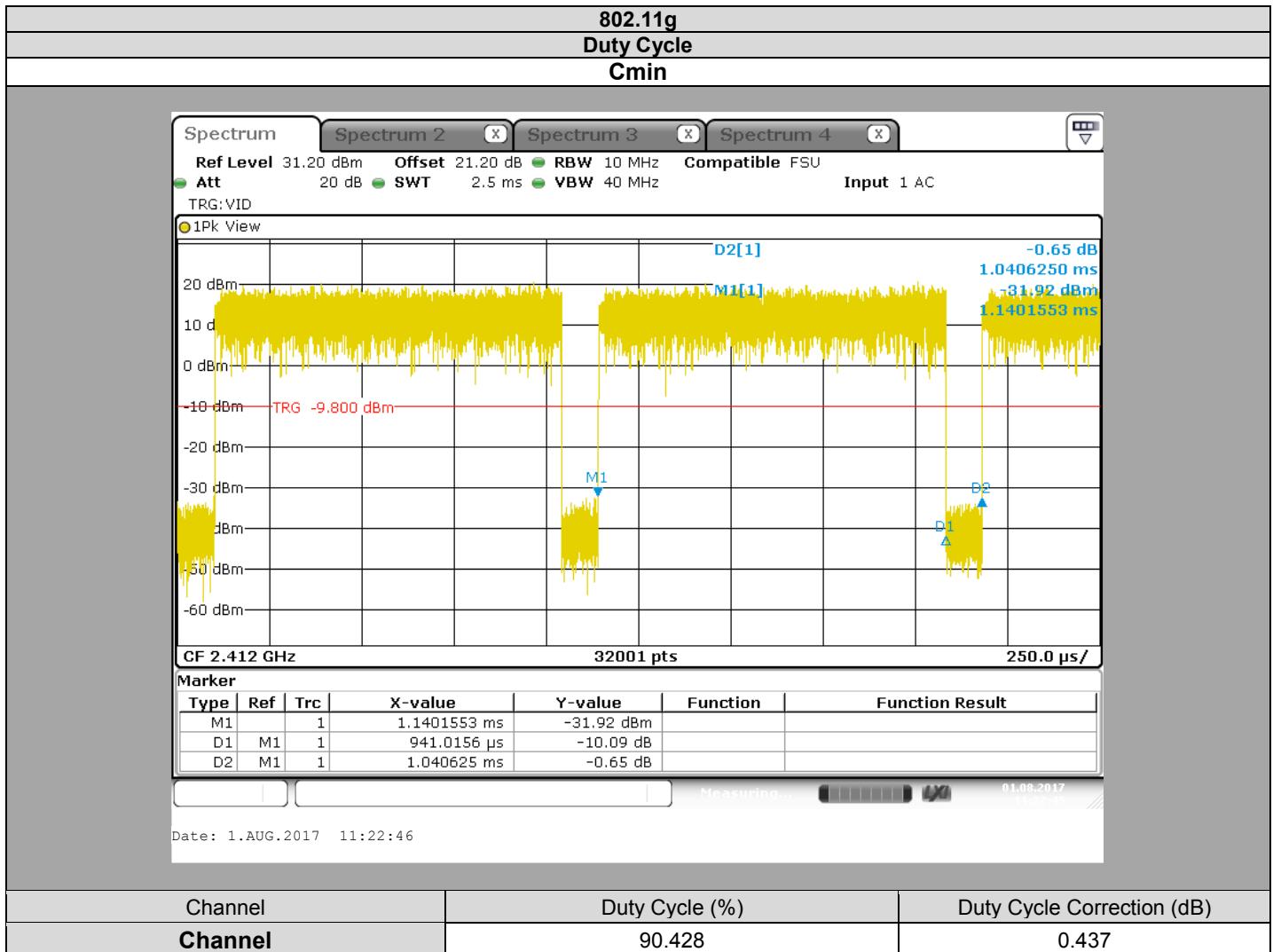
Note: In our quality system, the test equipment calibration due is more & less 2 months

5.5. RESULTS



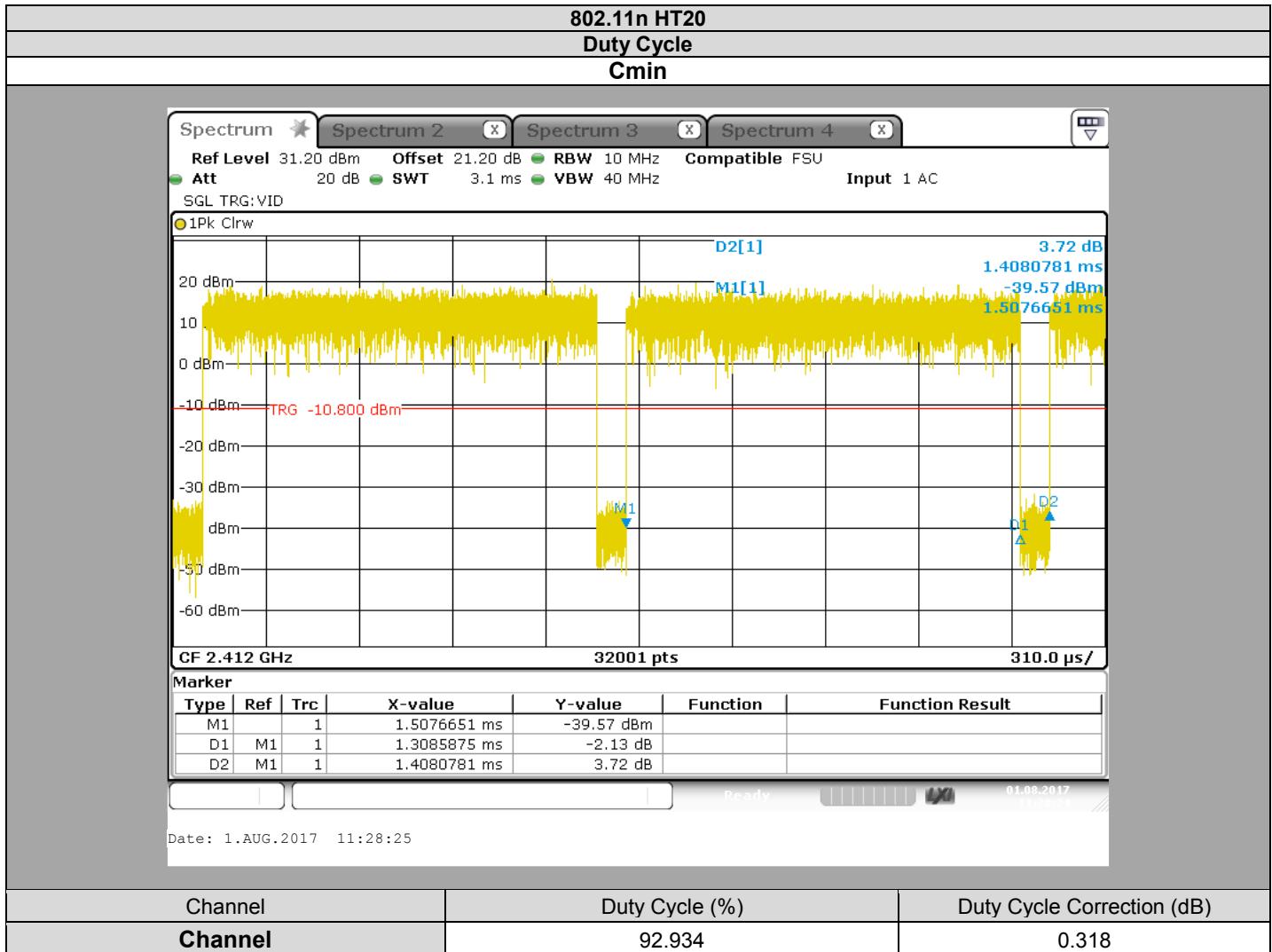


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5.6. CONCLUSION

Duty Cycle measurement performed on the sample of the product **VELUX ACTIVE** with **NETATMO NXG01S**, SN: -, 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. MAXIMUM CONDUCTED OUTPUT POWER

6.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : August 1, 2017
Ambient temperature : 26 °C
Relative humidity : 44 %

6.2. TEST SETUP

- The Equipment Under Test is installed:

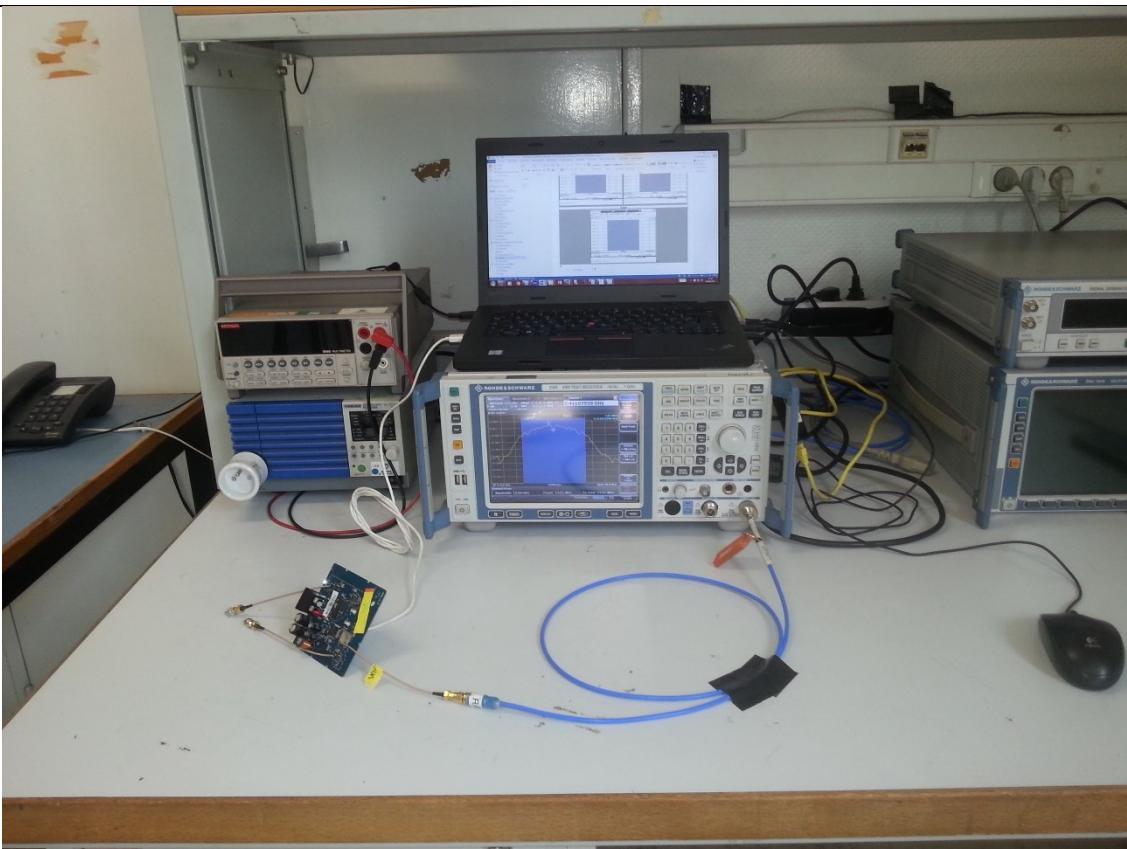
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

- KDB 558074 D01 DTS Meas Guidance v04 § 9.2.2.2 (Method AVGSA-1)
- KDB 558074 D01 DTS Meas Guidance v04 § 9.2.2.4 (Method AVGSA-2)



Photograph for Maximum Conducted Output Power



6.3. LIMIT

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

6.4. TEST EQUIPMENT LIST

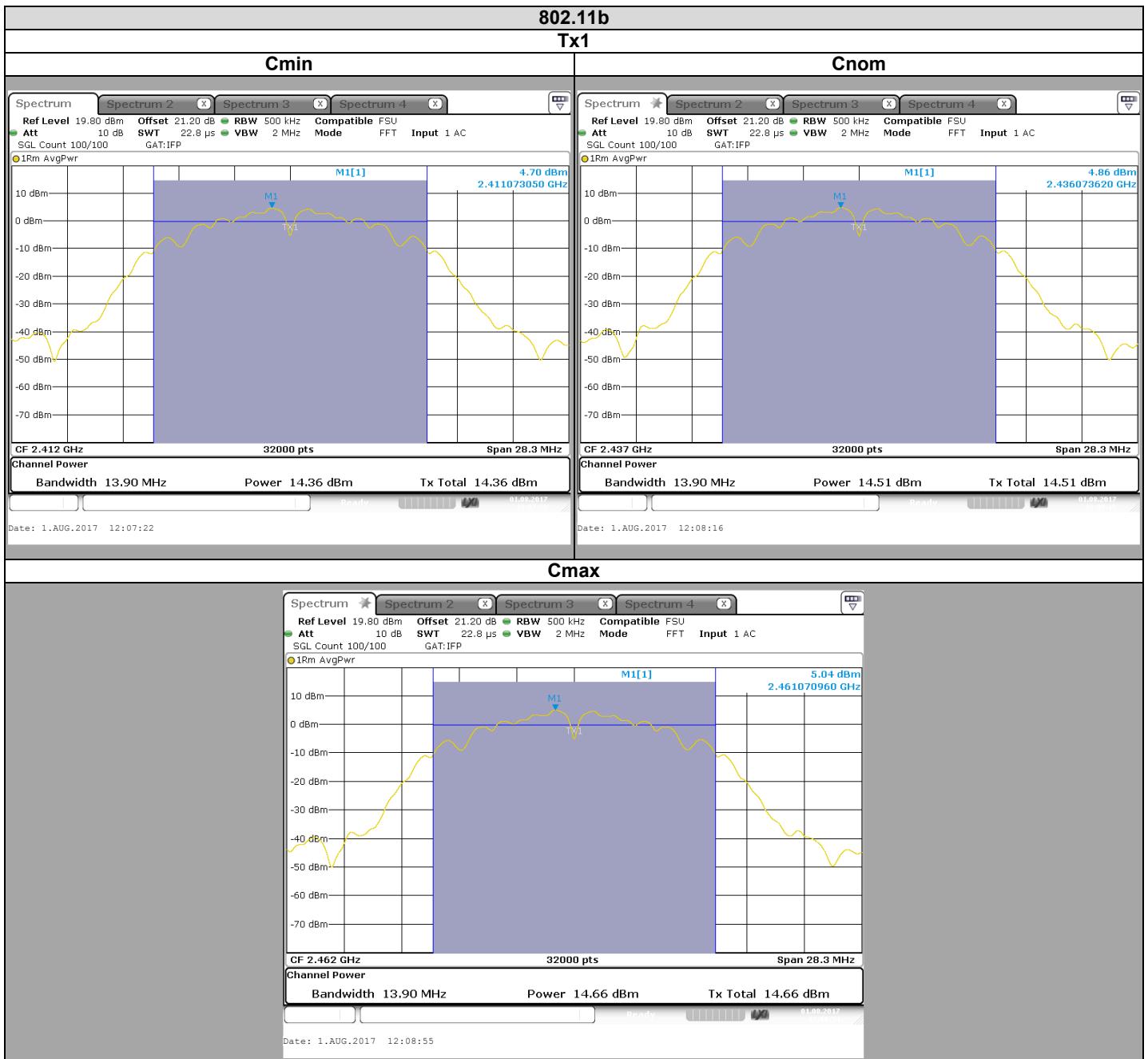
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2018/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329675	2016/09	2017/09
Load 50 ohms	TELEGARTNER		A7150103	2016/12	2017/12
Load 50 ohms	TELEGARTNER		A7150104	2016/12	2017/12

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



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6.5. RESULTS



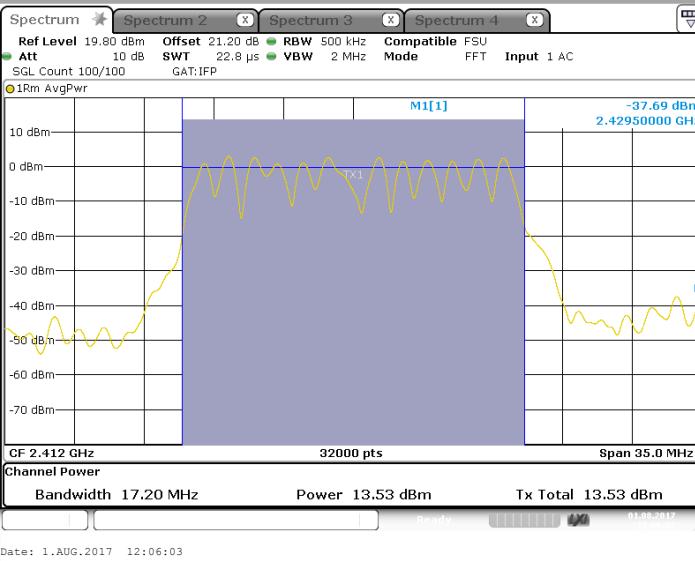


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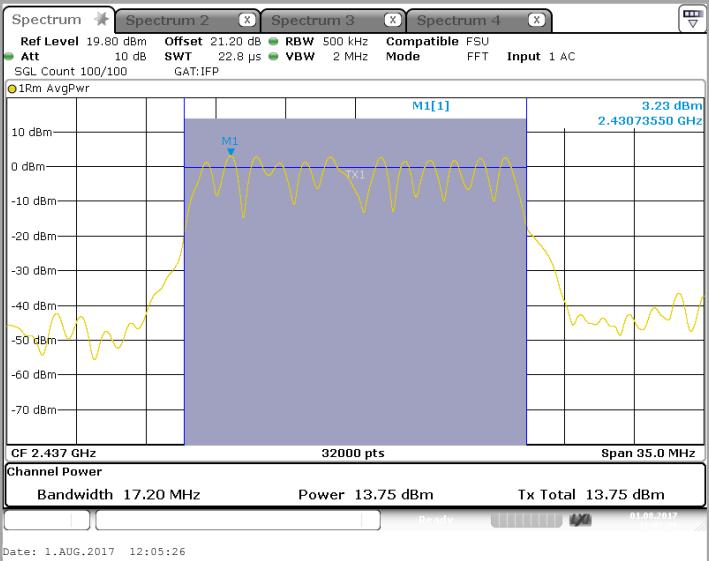
802.11g

Tx1

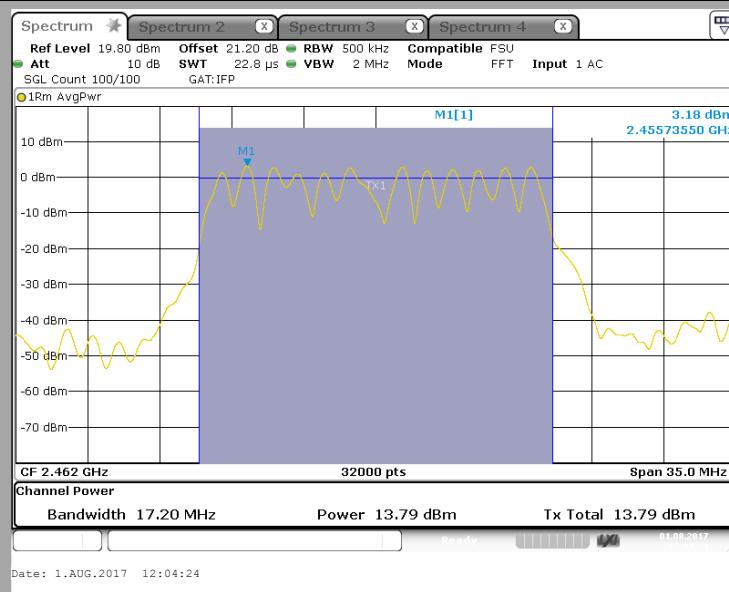
Cmin



Cnom



Cmax



TEST REPORT

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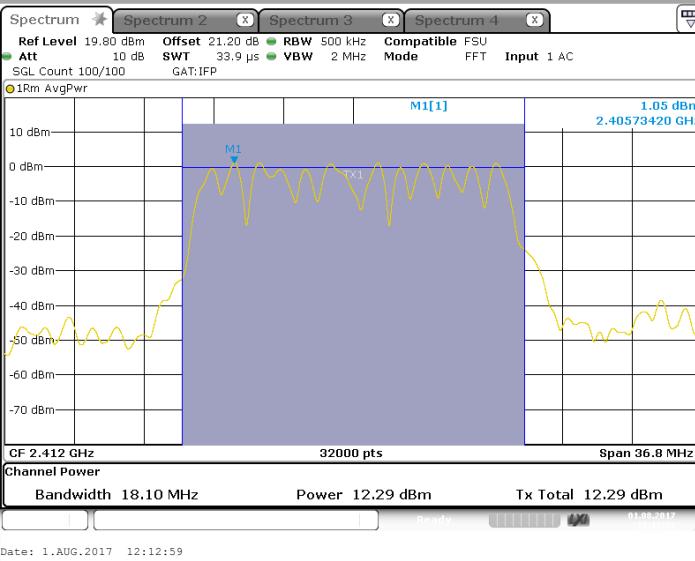


L C I E

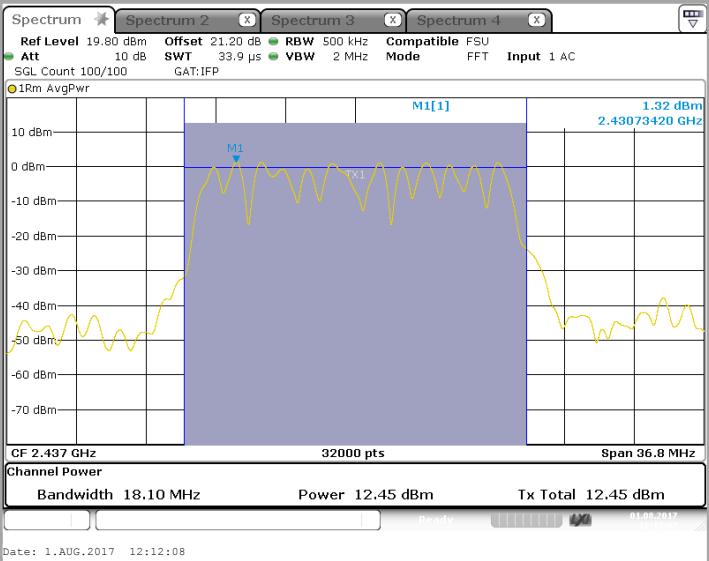
802.11n HT20

Tx1

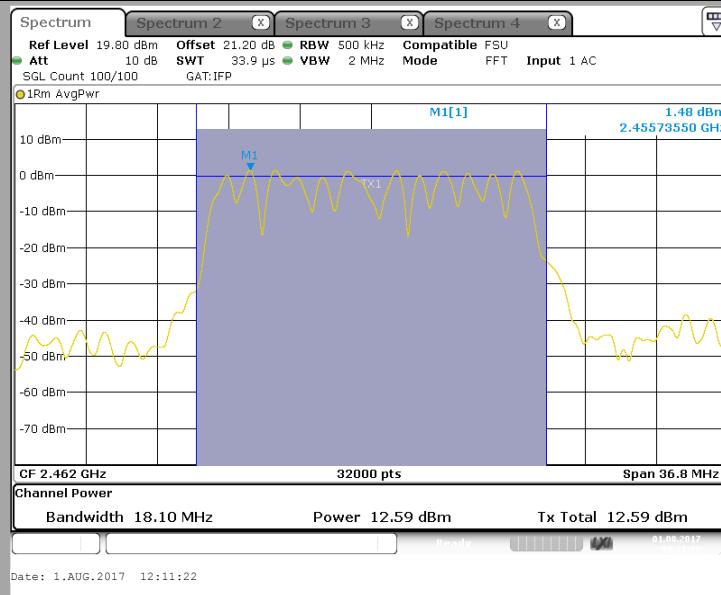
Cmin



Cnom



Cmax



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L C I E

Spectrum Analyzer Offset:
Cable Loss=1.20dB + Attenuator= 20dB

802.11b				
Channel	Tx1 (dBm)	Overall Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Limit (dBm)
Cmin	14.36	5.56	14.36	30
Cnom	14.51	5.56	14.51	30
Cmax	14.66	5.56	14.66	30

802.11g				
Channel	Tx1 (dBm)	Overall Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Limit (dBm)
Cmin	13.53	5.56	13.53	30
Cnom	13.75	5.56	13.75	30
Cmax	13.79	5.56	13.79	30

802.11n HT20				
Channel	Tx1 (dBm)	Overall Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Limit (dBm)
Cmin	12.29	5.56	12.29	30
Cnom	12.45	5.56	12.45	30
Cmax	12.59	5.56	12.29	30

6.6. CONCLUSION

Maximum Conducted Output Power measurement performed on the sample of the product **VELUX ACTIVE** with **NETATMO NXG01S**, SN: -, 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. POWER SPECTRAL DENSITY

7.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : August 1, 2017
Ambient temperature : 26 °C
Relative humidity : 44 %

7.2. TEST SETUP

- The Equipment Under Test is installed:

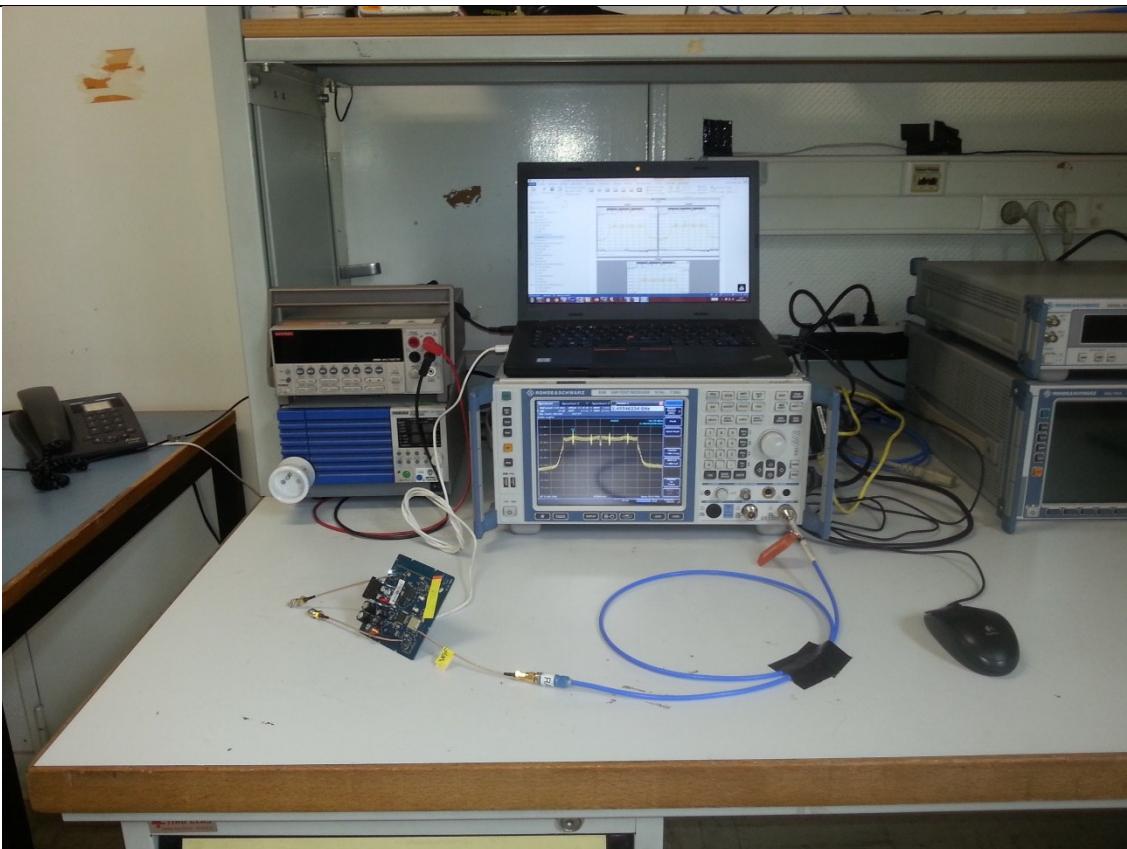
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

- KDB 558074 D01 DTS Meas Guidance v04 § 10.2 (Method PKPSD)
- KDB 558074 D01 DTS Meas Guidance v04 § 10.3 (Method AVGPSD-1)



Photograph for Power Spectral Density



7.3. LIMIT

Power Spectral Density:

2400MHz-2483.5MHz: Shall not exceed 8dBm/3kHz

Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

7.4. TEST EQUIPMENT LIST

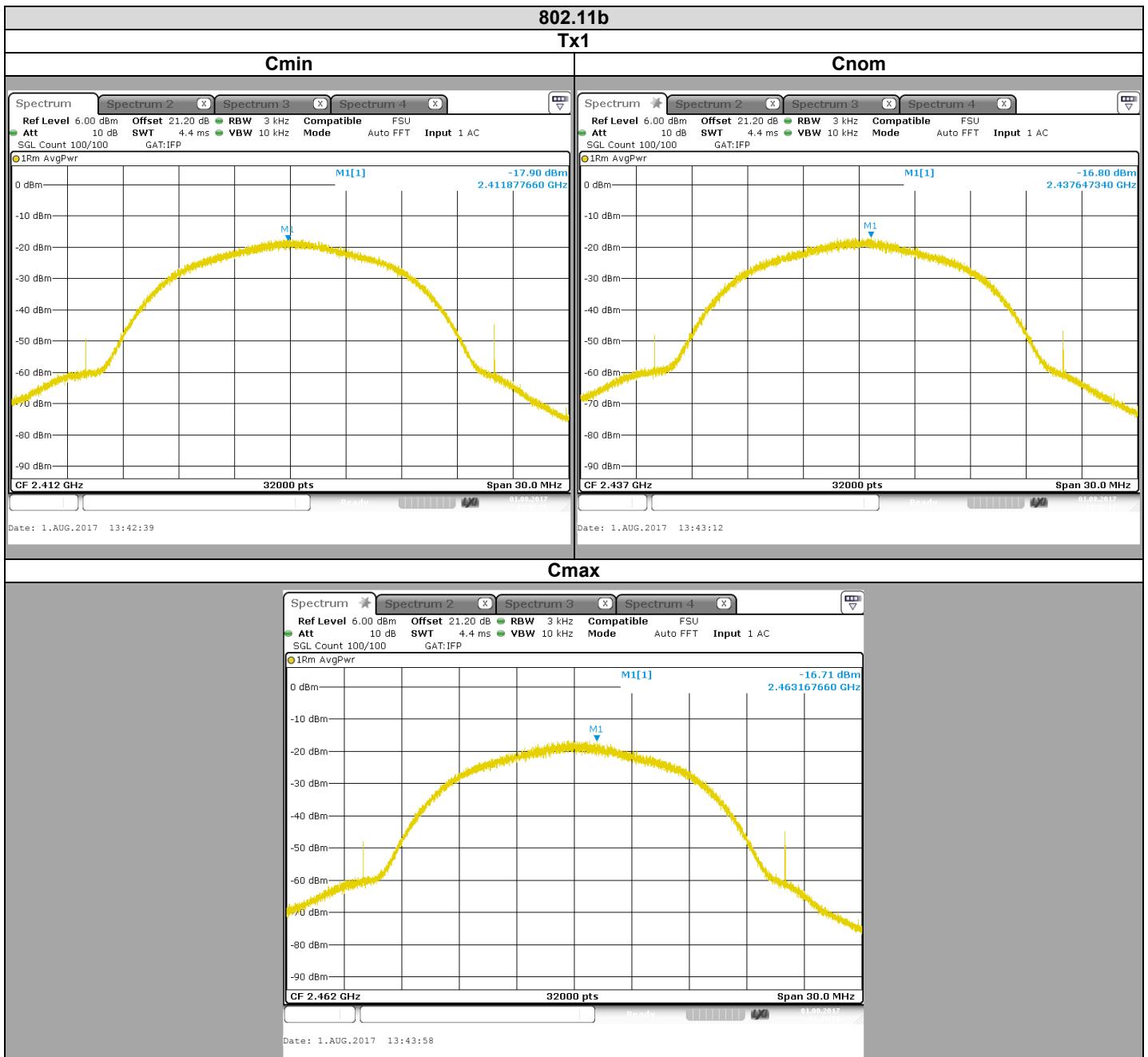
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2018/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329675	2016/09	2017/09
Load 50 ohms	TELEGARTNER		A7150103	2016/12	2017/12
Load 50 ohms	TELEGARTNER		A7150104	2016/12	2017/12

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



L C I E

7.5. RESULTS



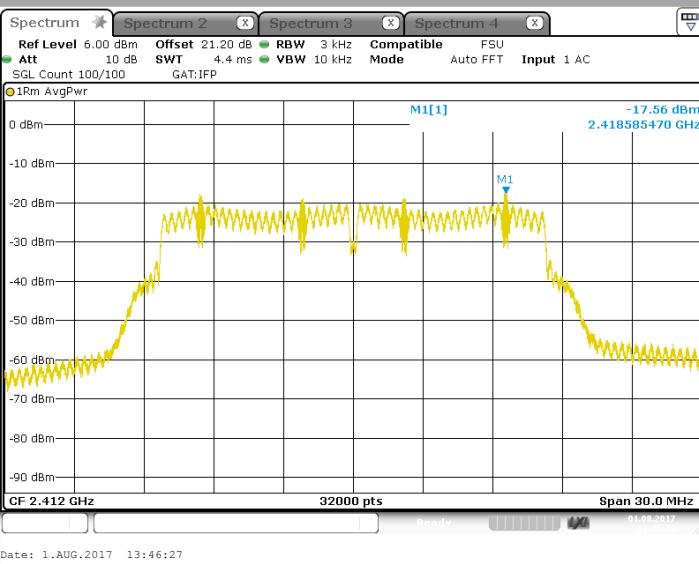


L C I E

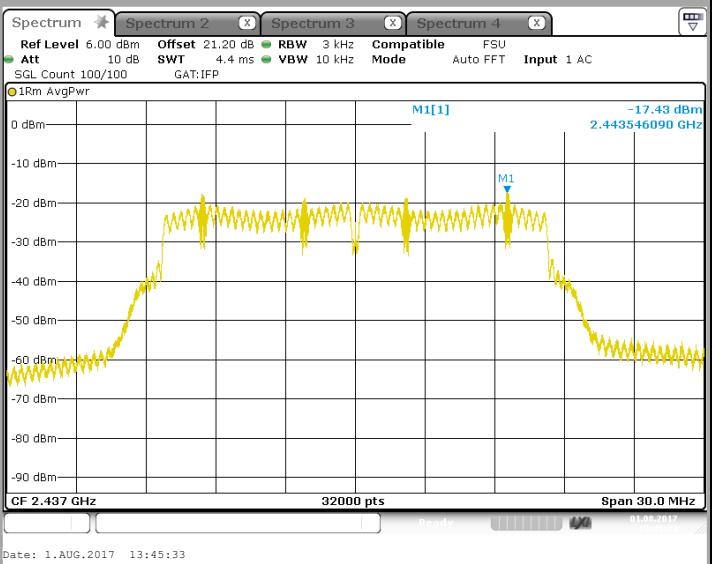
802.11g

Tx1

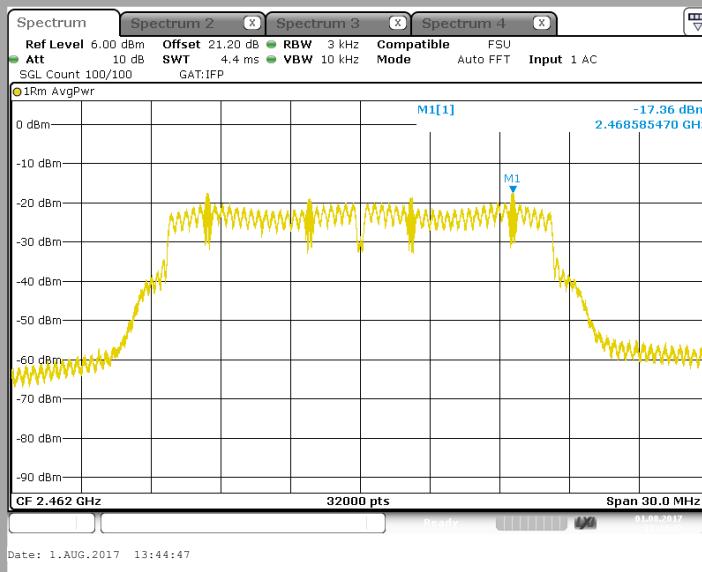
Cmin



Cnom



Cmax



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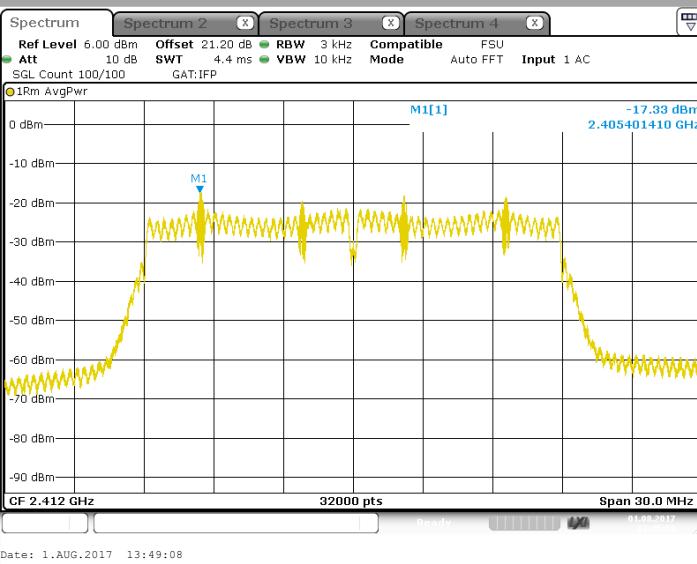


L C I E

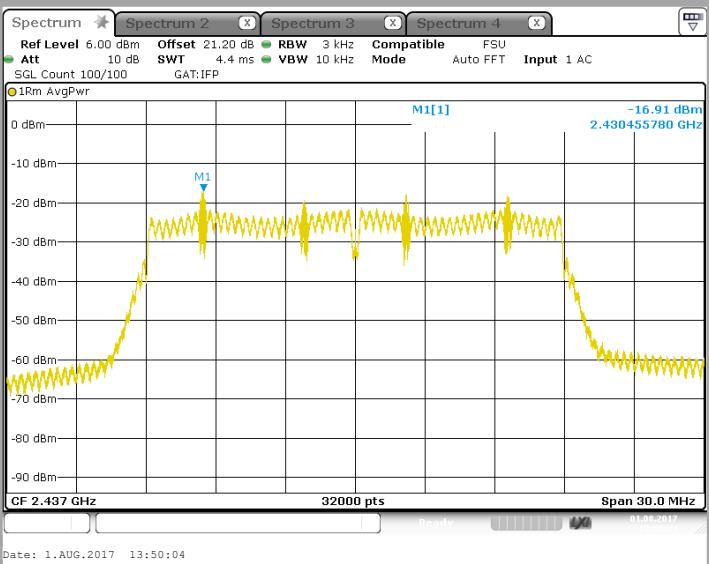
802.11n HT20

Tx1

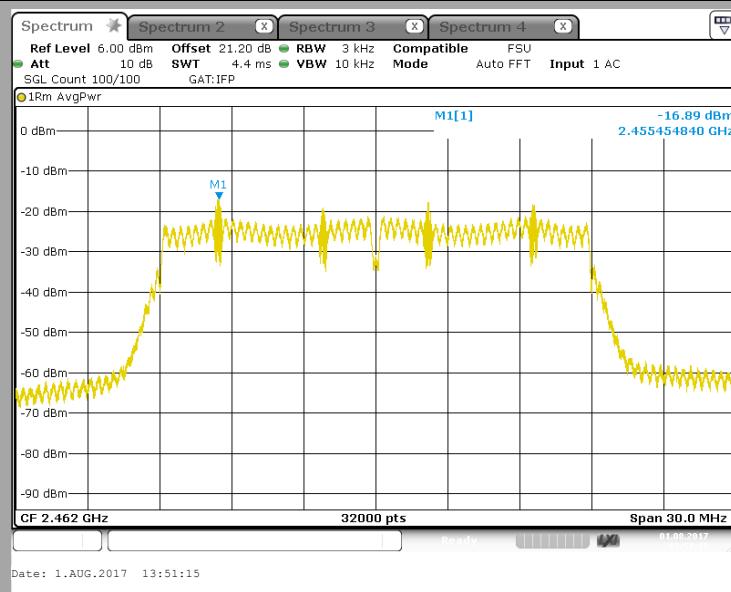
Cmin



Cnom



Cmax



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L C I E

Spectrum Analyzer Offset:

Cable Loss=1.2dB + Attenuator= 20dB

802.11b				
Channel	Tx1 (dBm/3kHz)	Overall Antenna Gain (dBi)	Power Spectral Density (dBm)	Limit (dBm/3kHz)
Cmin	-17.90	5.56	-17.90	8
Cnom	-16.80	5.56	-16.80	8
Cmax	-16.71	5.56	-16.71	8

802.11g				
Channel	Tx1 (dBm/3kHz)	Overall Antenna Gain (dBi)	Power Spectral Density (dBm)	Limit (dBm/3kHz)
Cmin	-17.56	5.56	-17.56	8
Cnom	-17.43	5.56	-17.43	8
Cmax	-17.36	5.56	-17.36	8

802.11nHT20				
Channel	Tx1 (dBm/3kHz)	Overall Antenna Gain (dBi)	Power Spectral Density (dBm)	Limit (dBm/3kHz)
Cmin	-17.33	5.56	-17.33	8
Cnom	-16.91	5.56	-16.91	8
Cmax	-16.89	5.56	-16.89	8

7.6. CONCLUSION

Power Spectral Density measurement performed on the sample of the product **VELUX ACTIVE** with **NETATMO NXG01S**, SN: -, 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 AT THE BAND EDGE

8.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : August 1, 2017
Ambient temperature : 26 °C
Relative humidity : 44 %

8.2. TEST SETUP

- The Equipment Under Test is installed:

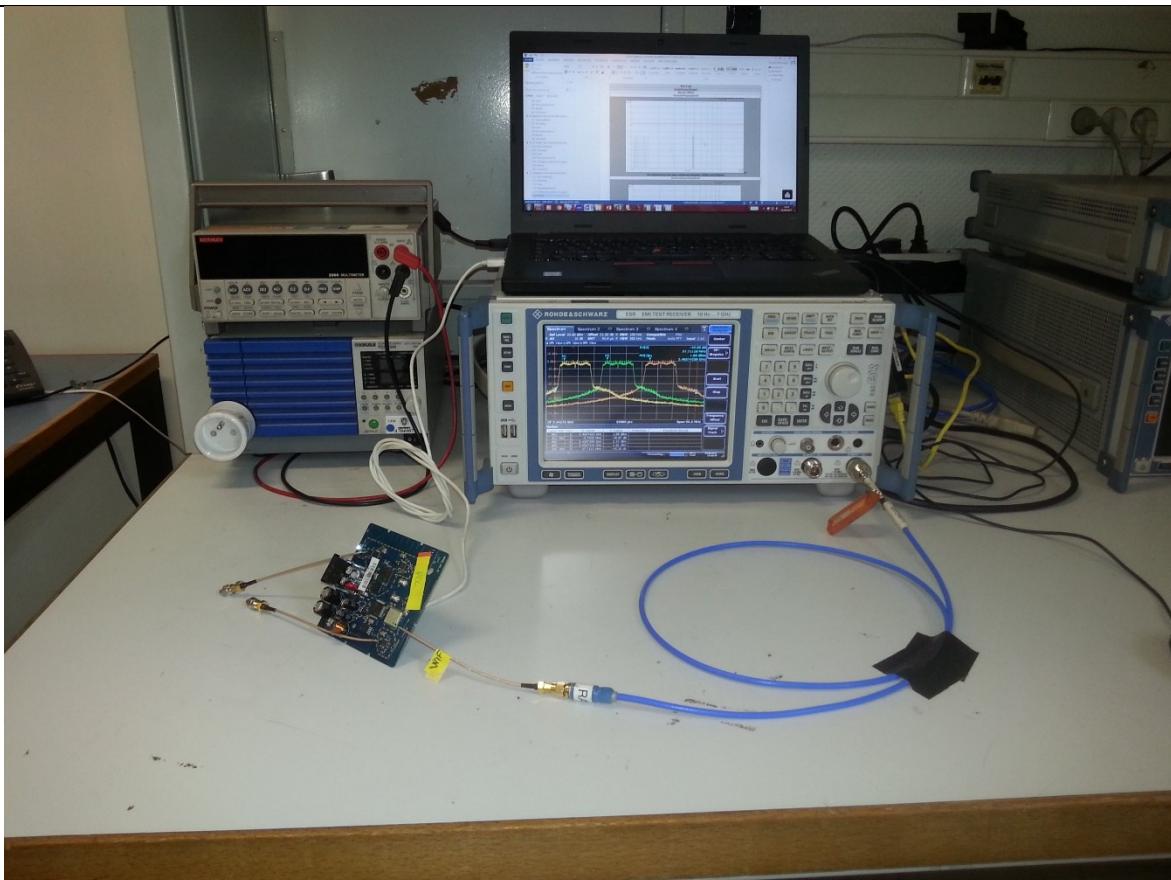
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

- KDB 558074 D01 DTS Meas Guidance v04 § 11



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



8.3. LIMIT

All Spurious Emissions must be at least 30dB (Average Conducted Power) below the Fundamental Radiator Level at the Band Edge Edge "2400MHz & 2483,5MHz"

8.4. TEST EQUIPMENT LIST

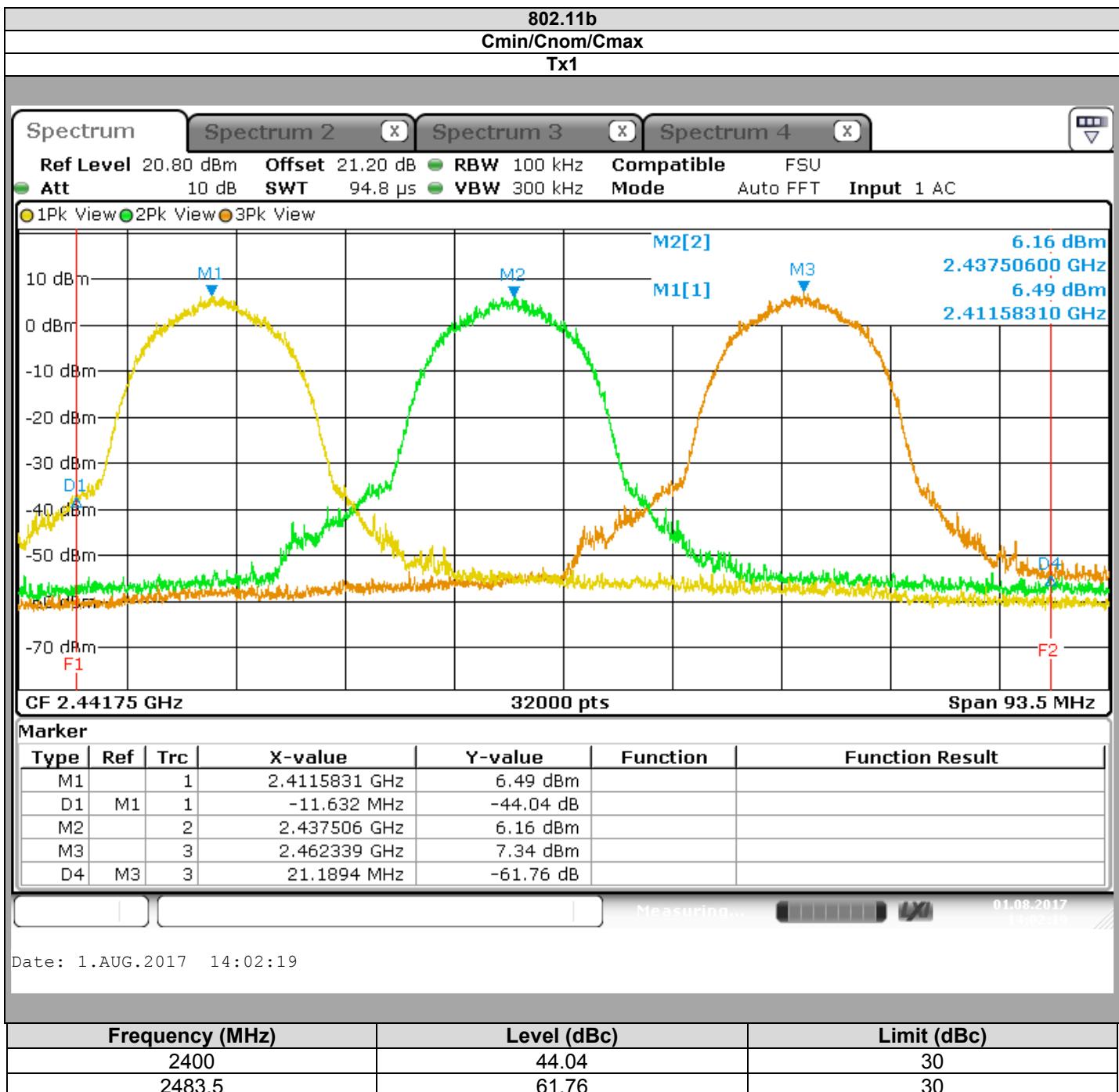
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2018/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329675	2016/09	2017/09
Load 50 ohms	TELEGARTNER		A7150103	2016/12	2017/12
Load 50 ohms	TELEGARTNER		A7150104	2016/12	2017/12

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



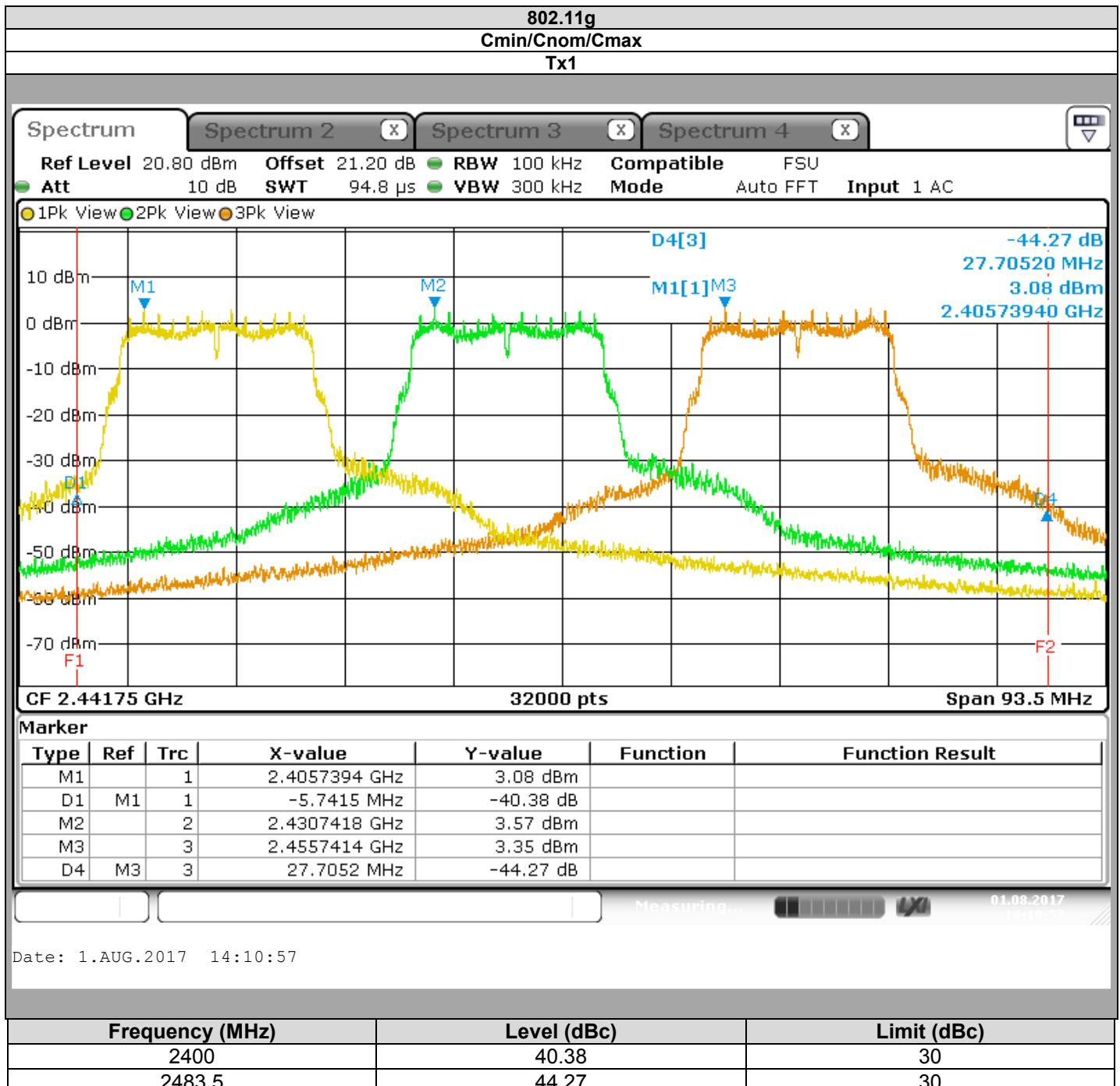
L C I E

8.5. RESULTS



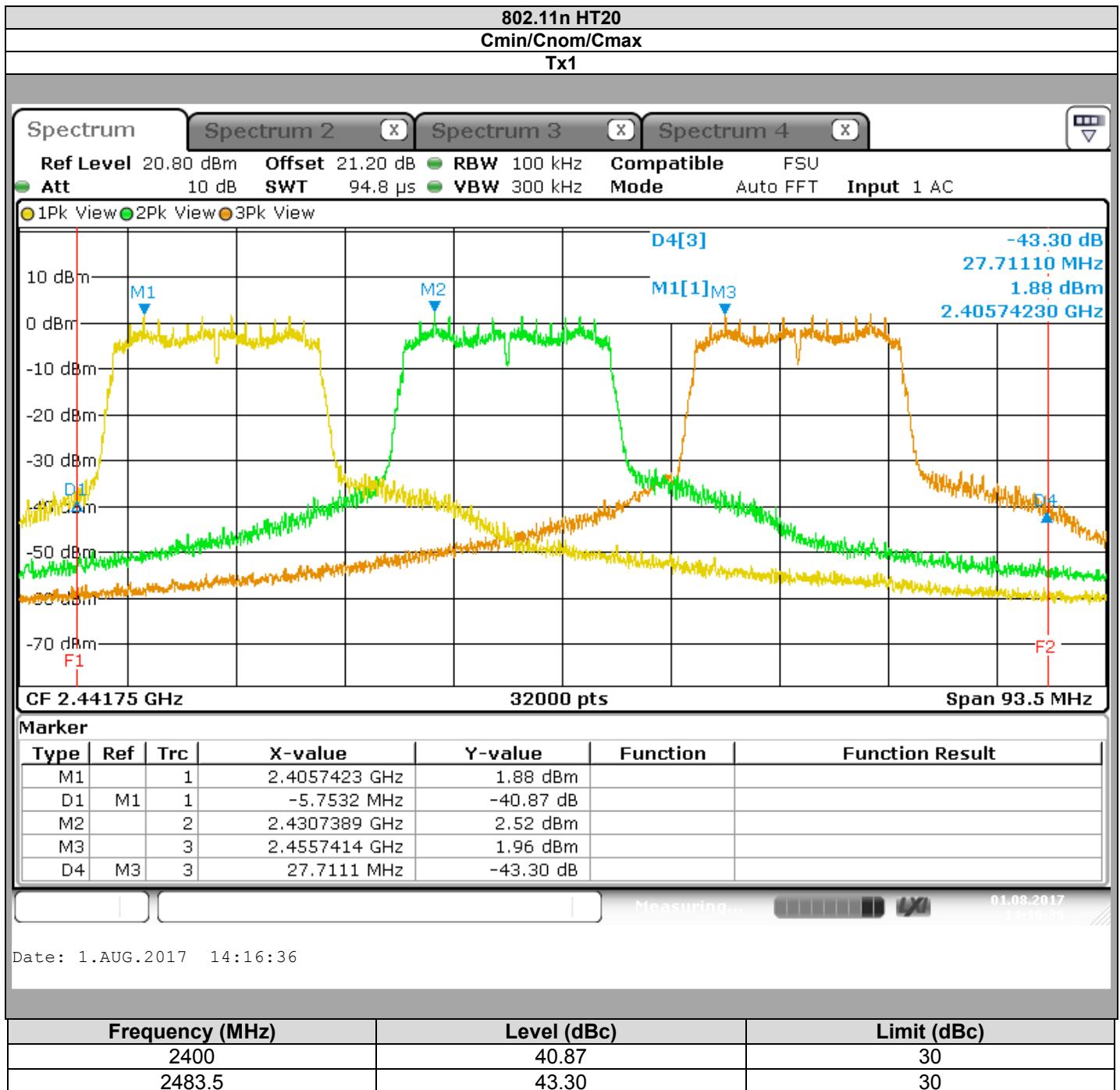


L C I E





L C I E



8.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands at the band edge measurement performed on the sample of the product **VELUX ACTIVE** with **NETATMO NXG01S**, SN: -, in configuration and description presented in this test report, show levels compliant to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.



L C I E

9. UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS

9.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : August 2, 2017
Ambient temperature : 25 °C
Relative humidity : 45 %

9.2. TEST SETUP

- The Equipment Under Test is installed:

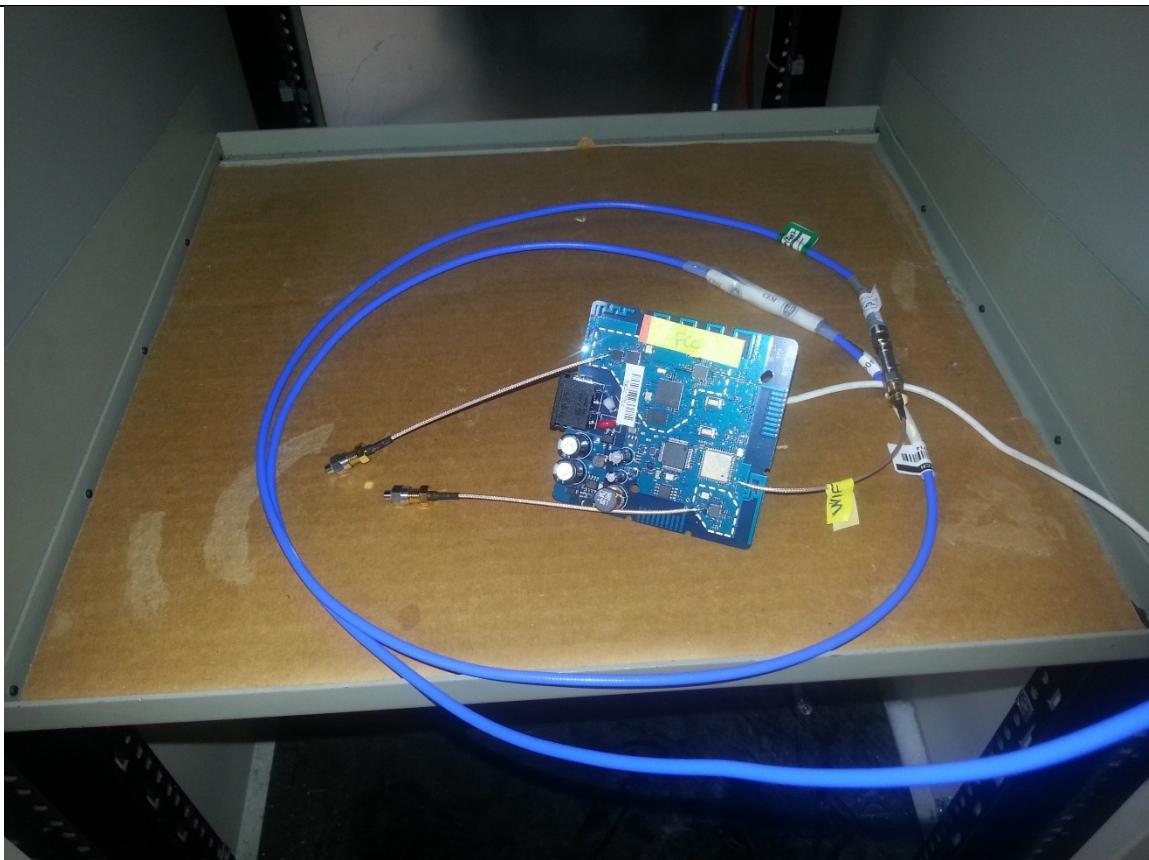
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

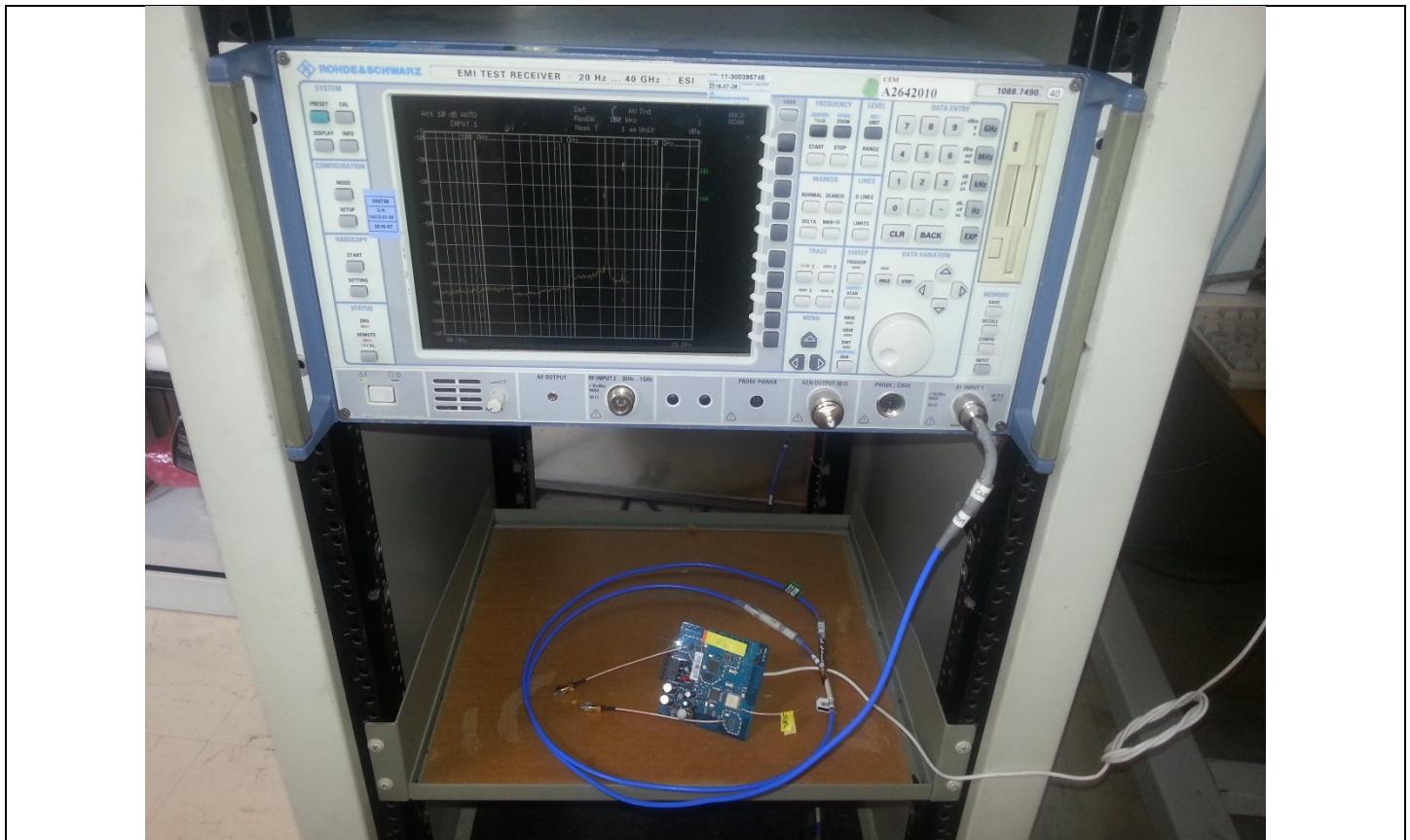
- KDB 558074 D01 DTS Meas Guidance v04 § 11



Photograph for Unwanted Emission into non-restricted frequency bands



LCIE



Photograph for Unwanted Emission into non-restricted frequency bands

9.3. LIMIT

All Spurious Emissions must be at least 30dB (Average Conducted Power) below the Fundamental Radiator Level

9.4. TEST EQUIPMENT LIST

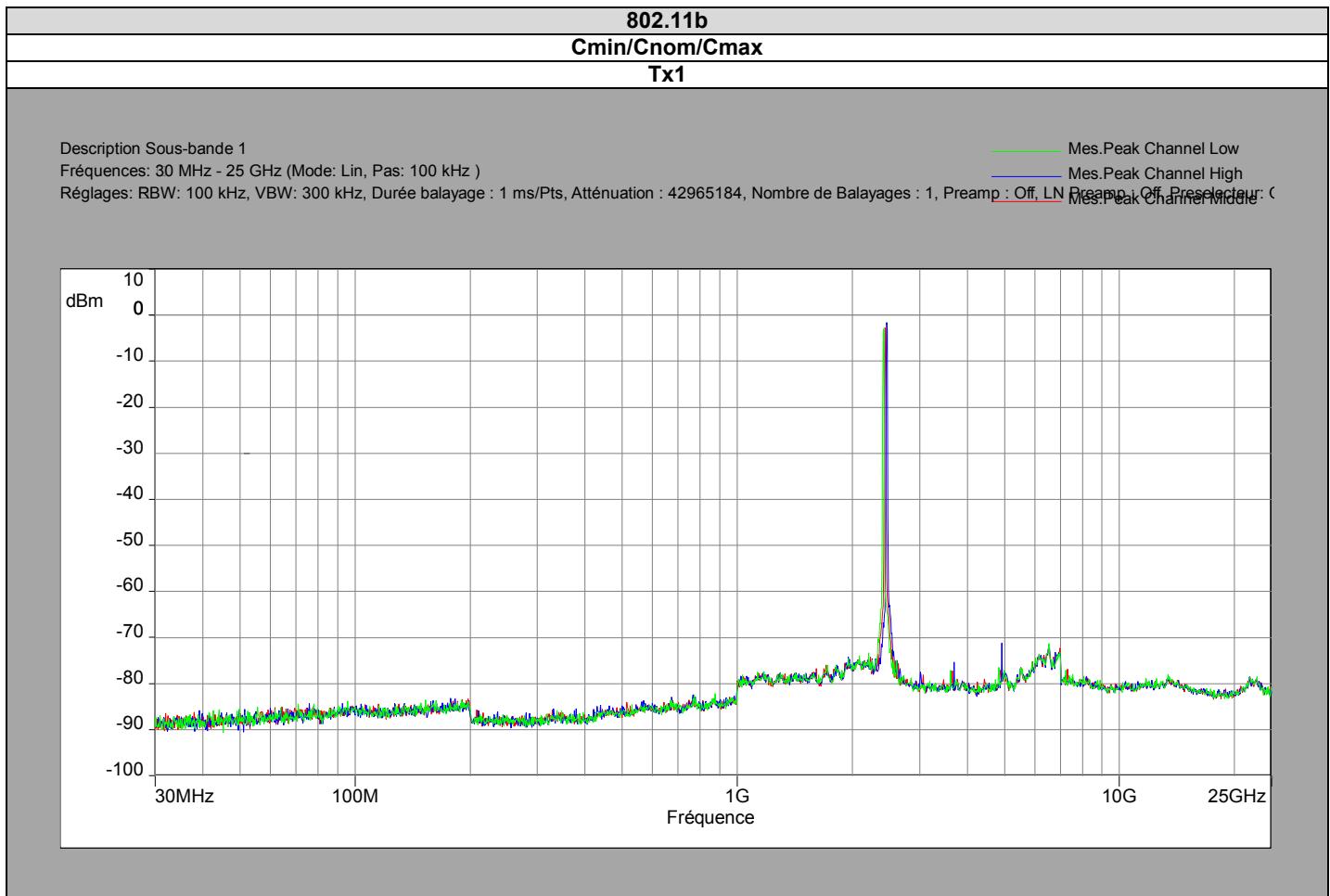
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESI40 1088 740K40	A2642010	2017/07	2018/07
Cable	Télédynne	084-0555-2MTR	A5329758	2016/10	2017/10
Attenuator 3dB	WEINSCHEL	WA54-3-12	A7122223	2016/10	2017/10
High pass filter 2,4GHz	Wainwright	WHKX12-2494-2900-18000-80ST	A7484068	2017/03	2018/03
Load 50 ohms	TELEGARTNER		A7150103	2016/12	2017/12
Load 50 ohms	TELEGARTNER		A7150104	2016/12	2017/12

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



L C I E

9.5. RESULTS





L C I E

802.11g

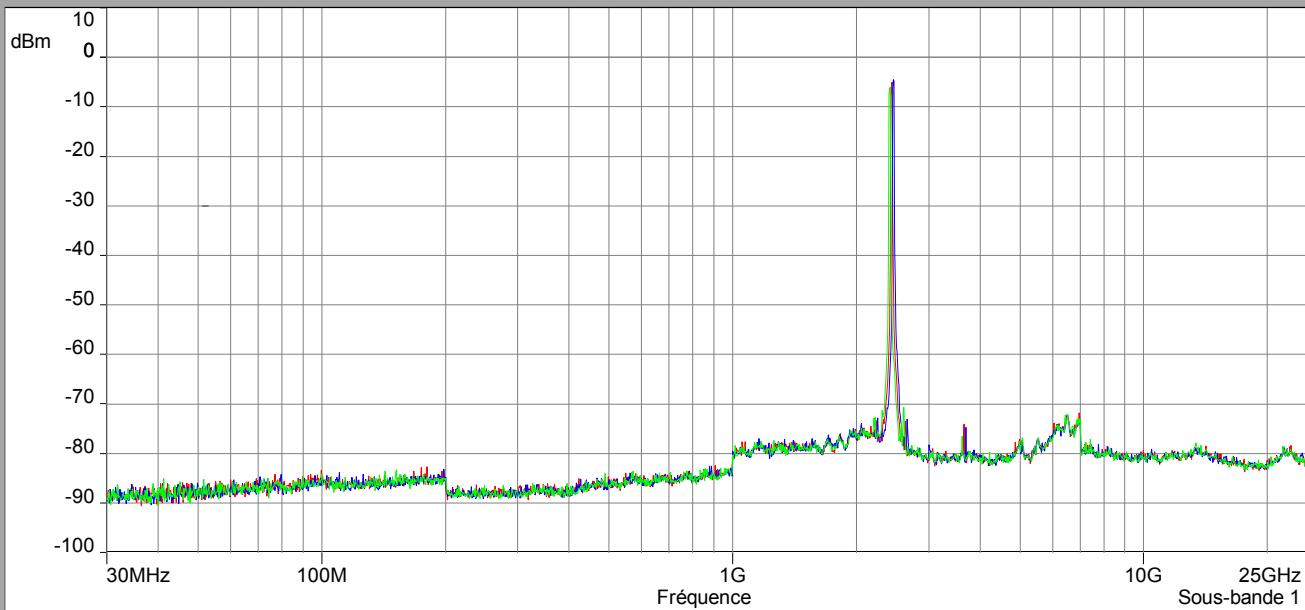
Cmin/Cnom/Cmax

Tx1

Description Sous-bande 1

Fréquences: 30 MHz - 25 GHz (Mode: Lin, Pas: 100 kHz)

Réglages: RBW: 100 kHz, VBW: 300 kHz, Durée balayage : 1 ms/Pts, Atténuation : 45700936, Nombre de Balayages : 1, Preamp : Off, LN Preamp : Off, Préselecteur : Off, Mes.Pk Chnl Modul : Off





L C I E

802.11n HT20

Cmin/Cnom/Cmax

Tx1

Description Sous-bande 1

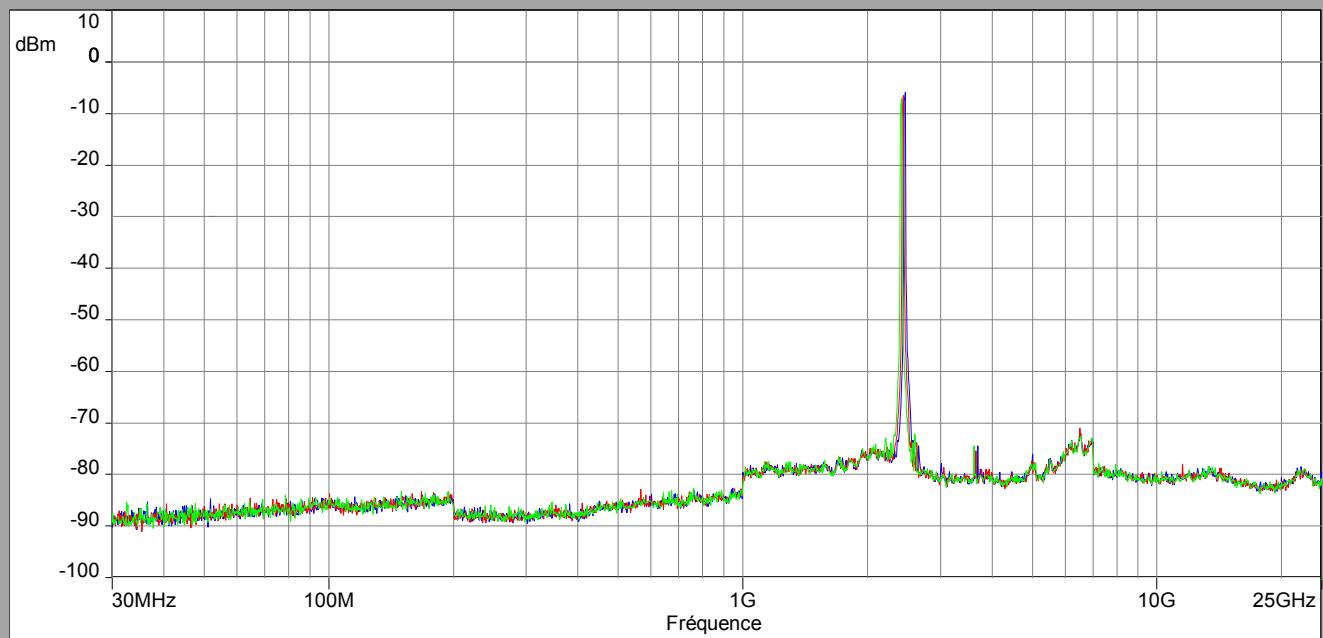
Fréquences: 30 MHz - 25 GHz (Mode: Lin, Pas: 100 kHz)

Réglages: RBW: 100 kHz, VBW: 300 kHz, Durée balayage : 1 ms/Pts, Atténuation : 217824048, Nombre de Balayages : 1, Preamp : Off, LN Preamp: Off, Préselecteur:

Mes. Peak Channel Low

Mes. Peak Channel Middle

Mes. Peak Channel High





L C I E

802.11b

Frequency (MHz)	Level (dBm)	Level (dBc)	Limit (dBc)
2412	-2.96		
4829.5	-76.44	73.48	30
2437	-2.71		
4869.2	-77.07	74.11	30
2462	-1.67		
4924	-71.18	69.51	30

802.11g

Frequency (MHz)	Level (dBm)	Level (dBc)	Limit (dBc)
2412	-6.02		
4826	-76.47	70.45	30
2437	-5.03		
4876	-74.09	69.06	30
2462	-4.58		
4925	-74.71	70.13	30

802.11n HT20

Frequency (MHz)	Level (dBm)	Level (dBc)	Limit (dBc)
2412	-7.13		
4826	-74.45	67.33	30
2437	-6.51		
4876	-75.46	68.95	30
2462	-5.88		
4925	-74.47	68.59	30

9.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands measurement performed on the sample of the product **VELUX ACTIVE** with **NETATMO NXG01S**, SN: -, 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. AC POWER LINE CONDUCTED EMISSIONS

10.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : July 25, 2017
Ambient temperature : 27 °C
Relative humidity : 48 %

10.2. 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 $50\Omega / 50\mu\text{H}$. Interconnecting cables and equipment's were moved to position that maximized emission.



Photograph for AC Power Line Conducted Emissions (Front view)



L C I E



Photograph for AC Power Line Conducted Emissions (Rear view)

10.3. LIMIT

Quasi-Peak

0,15kHz to 0,5MHz: 66dB μ V to 56dB μ V*

0,5MHz to 5MHz: 56dB μ V

5MHz to 30MHz: 60dB μ V

Average

0,15kHz to 0,5MHz: 56dB μ V to 46dB μ V*

0,5MHz to 5MHz: 46dB μ V

5MHz to 30MHz: 50dB μ V

*Decreases with the logarithm of the frequency



LCIE

10.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Semi anechoic chamber	SIEPEL	-	D3044008	2017/06	2018/06
V LISN	ROHDE & SCHWARZ	ESH3-Z5	C2322003	2016/08	2017/08
pulse limiter	ROHDE & SCHWARZ	ESH3-Z2	A2649004	2017/03	2018/03
Cable	-		A5329531	2017/02	2018/02

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:



L C I E

10.6. RESULTS

802.11b

Cmin

Phase

Description Sous-bande 1

Fréquences: 150 kHz - 30 MHz (Mode: Lin, Pas: 5 kHz)

Régistres: RBW: 9 kHz, VBW: Auto, Durée balayage : 50 ms/Pts, Atténuation : 160667760, Nombre de Balayages : 1, Preamp : Off, LN Preamp: Off, Préselecteur: On

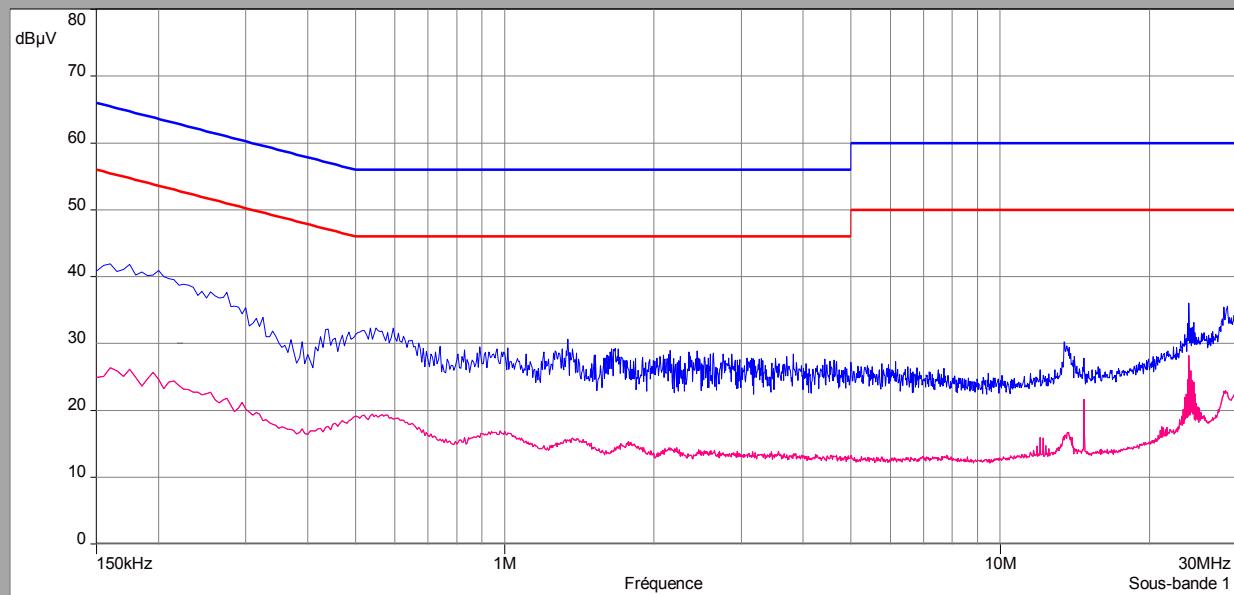
Ligne:Phase 1

FCC/FCC 15.107 - Classe:B - Moyenne/

FCC/FCC 15.107 - Classe:B - QCrête/

Mes.Pk (Phase 1)

Mes.Avg (Phase 1)



Line

Description Sous-bande 2

Fréquences: 150 kHz - 30 MHz (Mode: Lin, Pas: 5 kHz)

Régistres: RBW: 9 kHz, VBW: Auto, Durée balayage : 50 ms/Pts, Atténuation : 160642672, Nombre de Balayages : 1, Preamp : Off, LN Preamp: Off, Préselecteur: On

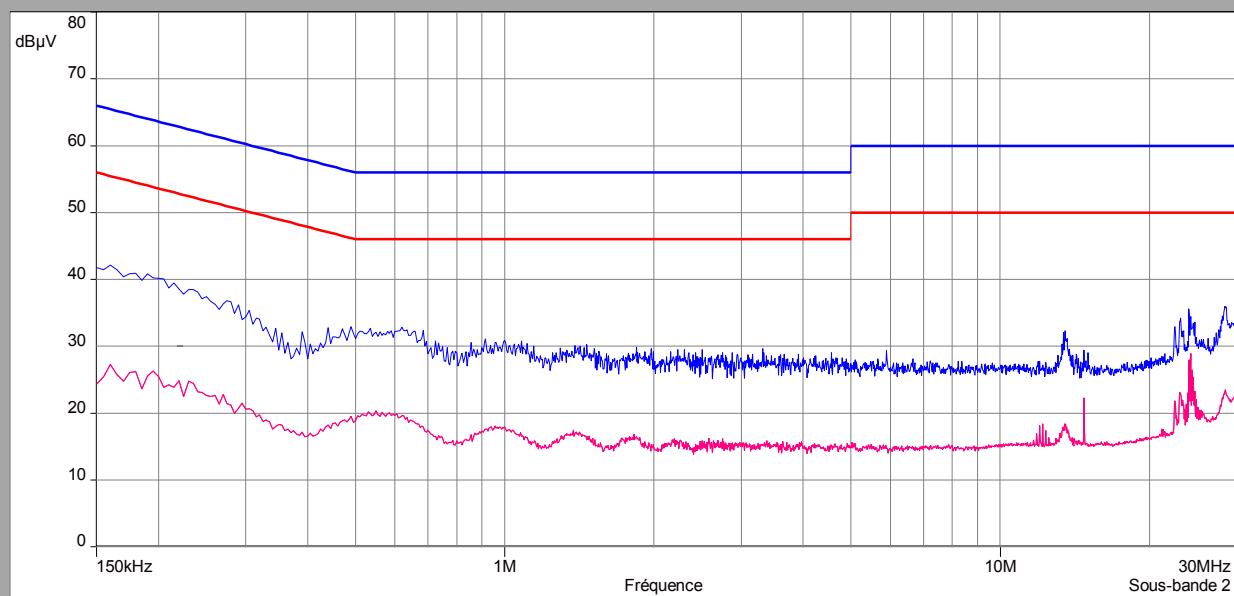
Ligne:Neutre

FCC/FCC 15.107 - Classe:B - Moyenne/

FCC/FCC 15.107 - Classe:B - QCrête/

Mes.Pk (Neutre)

Mes.Avg (Neutre)





L C I E

Phase Line							
Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Peak Margin (dB μ V/m)	Average Level (dB μ V)	Average Limit (dB μ V)	Average Margin (dB μ V/m)
14.74	32.31	-	60	27.69	22.25	50	27.75
24.00	35.59	-	60	24.41	28.89	50	21.11
28.46	35.94	-	60	24.06	23.48	50	26.52

Neutral Line							
Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Peak Margin (dB μ V/m)	Average Level (dB μ V)	Average Limit (dB μ V)	Average Margin (dB μ V/m)
14.74	30.24	-	60	29.76	21.61	50	28.39
24.00	36.06	-	60	23.94	28.18	50	21.82
28.46	35.56	-	60	24.44	22.91	50	27.09

10.7. CONCLUSION

Ac Power Line Conducted Emission measurement performed on the sample of the product **VELUX ACTIVE** with **NETATMO NXG01S**, SN: -, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 & RSS 247 ISSUE 2 limits.



L C I E

11. UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

11.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : July 24, 2017 to July 25, 2017
Ambient temperature : 25 °C & 26 °C
Relative humidity : 46 % & 48 %

11.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013). The EUT is placed in a semi-anechoic chamber. Distance between measuring antenna and the EUT is 3m. Test is performed in horizontal (H) and vertical (V) polarization with biolog antenna below 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 the 3 axis of EUT. Antenna height search was performed from 1 to 4m. The EUT is place at 1.5m high above 1GHz and at 0.8m high under 1GHz.



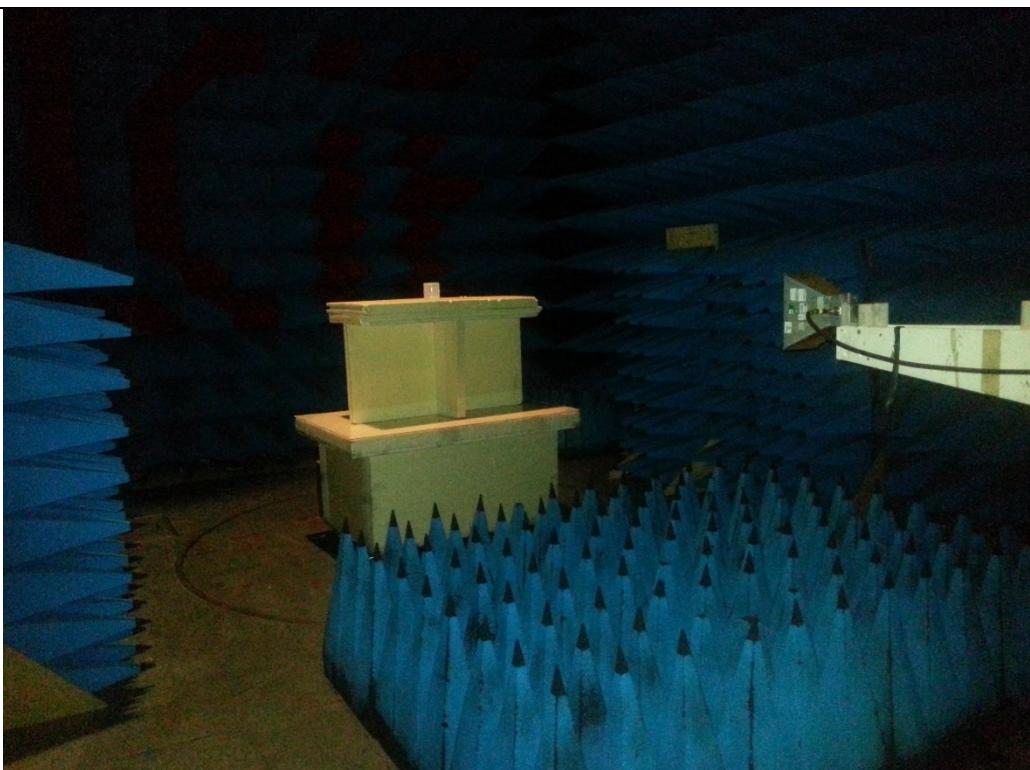
Photograph for Unwanted Emissions



L C I E



Photograph for Unwanted Emissions



Photograph for Unwanted Emissions



L C I E

11.3. LIMIT

Limit at 3m:

30MHz to 88MHz: 40dB μ V/m QPeak
88MHz to 216MHz: 43,5dB μ V/m QPeak
216MHz to 960MHz: 46dB μ V/m QPeak
960MHz to 1000MHz: 54dB μ V/m QPeak
Above 1000MHz: 74dB μ V/m Peak
54dB μ V/m Average

Limit at 10m:

30MHz to 88MHz: 29.5dB μ V/m QPeak
88MHz to 216MHz: 33dB μ V/m QPeak
216MHz to 960MHz: 35.5dB μ V/m QPeak
960MHz to 1000MHz: 43.5dB μ V/m QPeak
Above 1000MHz: 63.5B μ V/m Peak
43.5B μ V/m Average

11.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Semi anechoic chamber	SIEPEL	-	D3044008	2017/06	2018/06
EMI receiver	ROHDE & SCHWARZ	ESU26	A2642018	2016/10	2017/10
Bilog antenna	SCHWARZBECK	VULB 9160	C2040150	2017/03	2018/03
High pass filter 2,4GHz	Wainwright	WHKX12-2494-2900-18000-80ST	A7484068	2017/03	2018/03
RF cable	RADIALL; CDI	30990-7M	A5329711	2017/03	2018/03
Cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA/3.5MC/4000	A5329431	2017/03	2018/03
Horn antenna	A-INFOMW	LB-10180-NF	C2042018	2017/03	2018/03
Cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA/3.5MD/1500	A5329364	2016/11	2017/11
Preamplifier	BONN Elektronik	BLNA 3018-8F305	A7080053	2017/04	2018/04

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

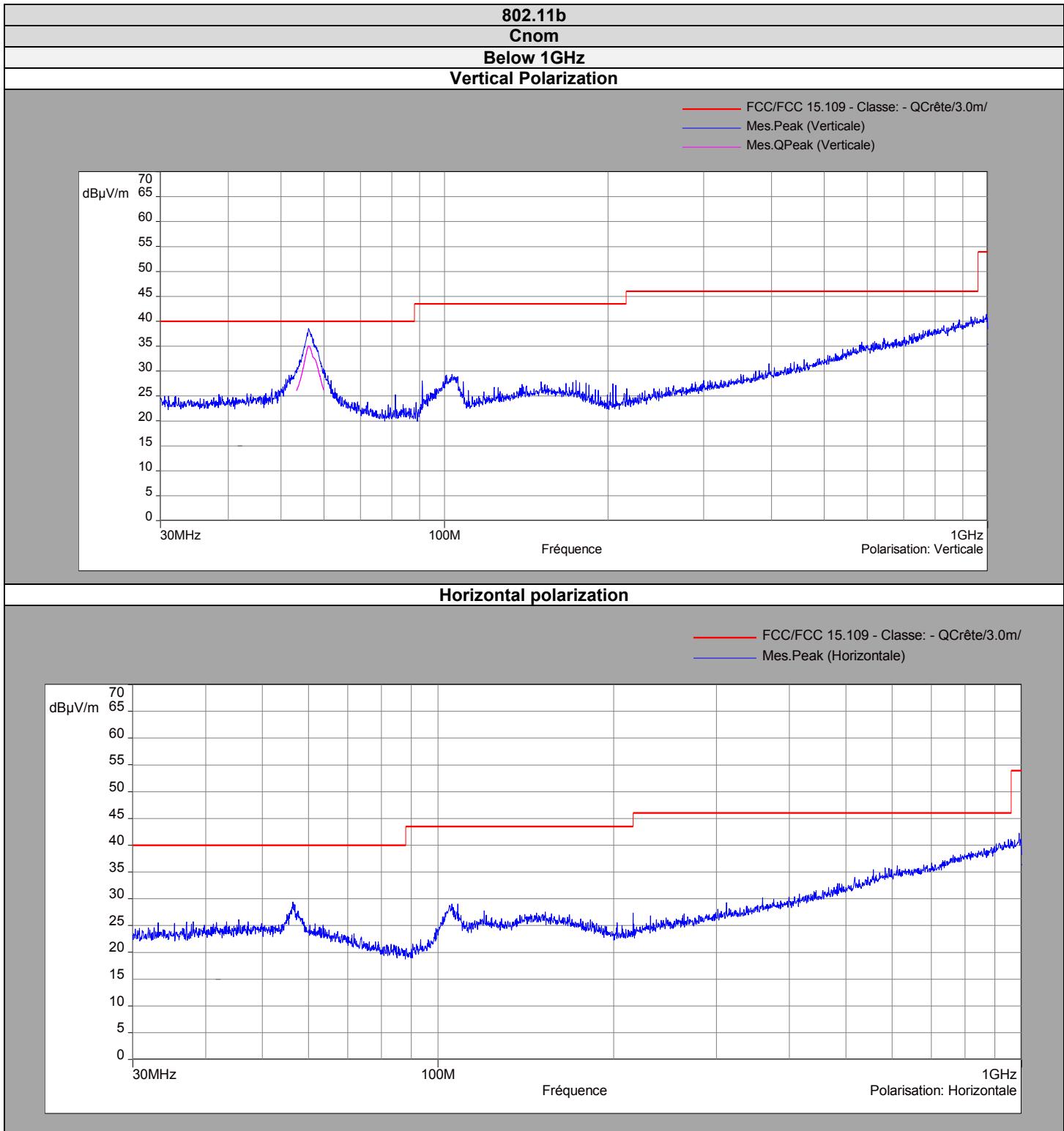
11.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

 None Divergence:



L C I E

11.6. RESULTS





L C I E

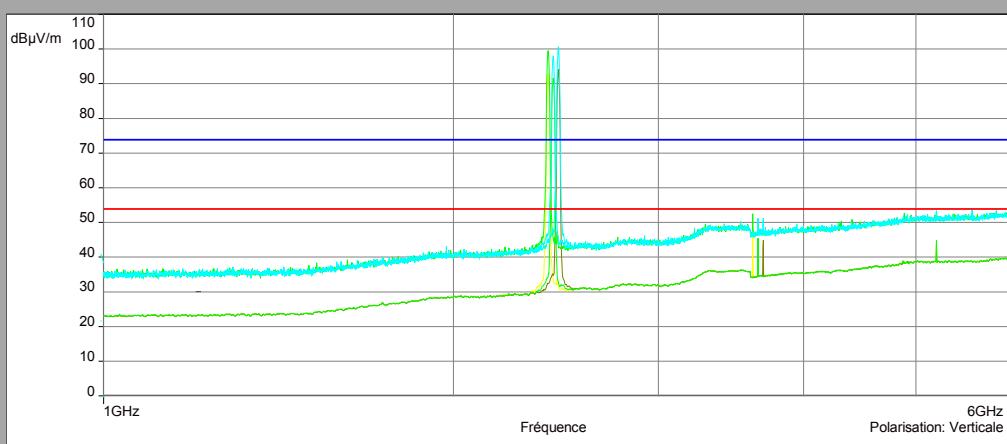
802.11b

Cmin/Cnom/Cmax

Above 1GHz

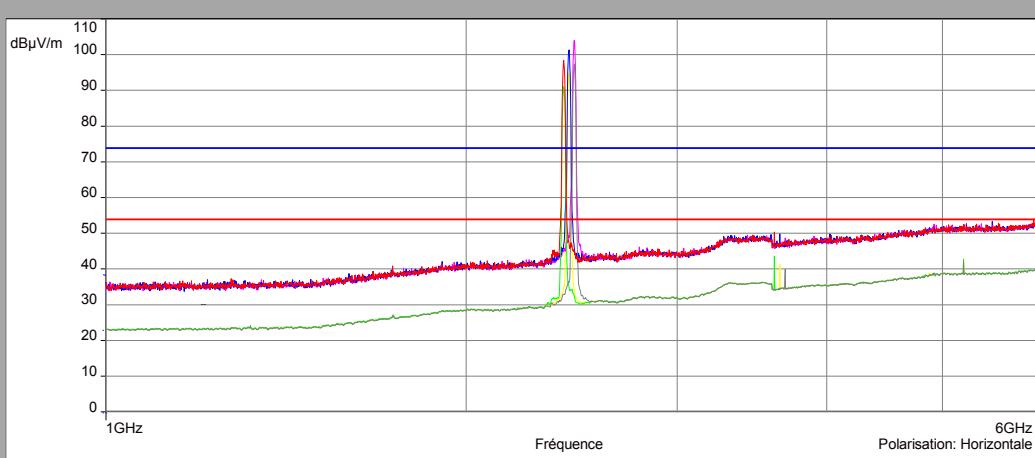
Vertical Polarization

- FCC/FCC 15.109 - Classe: - Moyenne/3.0m/
- FCC/FCC 15.109 - Classe: - Crête/3.0m/
- Mes.QPeak Channel Middle (Verticale)
- Mes.Peak Channel Middle (Verticale)
- Mes.Peak Channel High (Verticale)
- Mes.Avg Channel Middle (Verticale)
- Mes.Peak Channel Low (Verticale)
- Mes.Avg Channel High (Verticale)
- Mes.Avg Channel Low (Verticale)



Horizontal polarization

- FCC/FCC 15.109 - Classe: - Moyenne/3.0m/
- FCC/FCC 15.109 - Classe: - Crête/3.0m/
- Mes.Peak Channel Low (Horizontale)
- Mes.Avg Channel High (Horizontale)
- Mes.Avg Channel Low (Horizontale)
- Mes.Peak Channel Middle (Horizontale)
- Mes.Peak Channel High (Horizontale)
- Mes.Avg Channel Middle (Horizontale)





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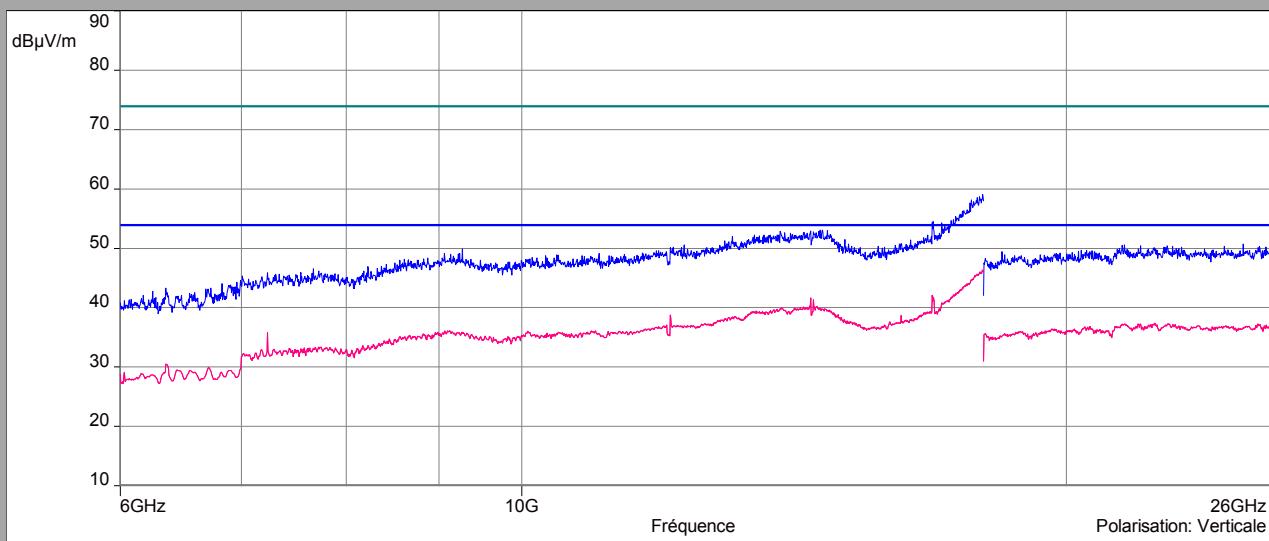
802.11b

Cmin/Cnom/Cmax

Above 1GHz

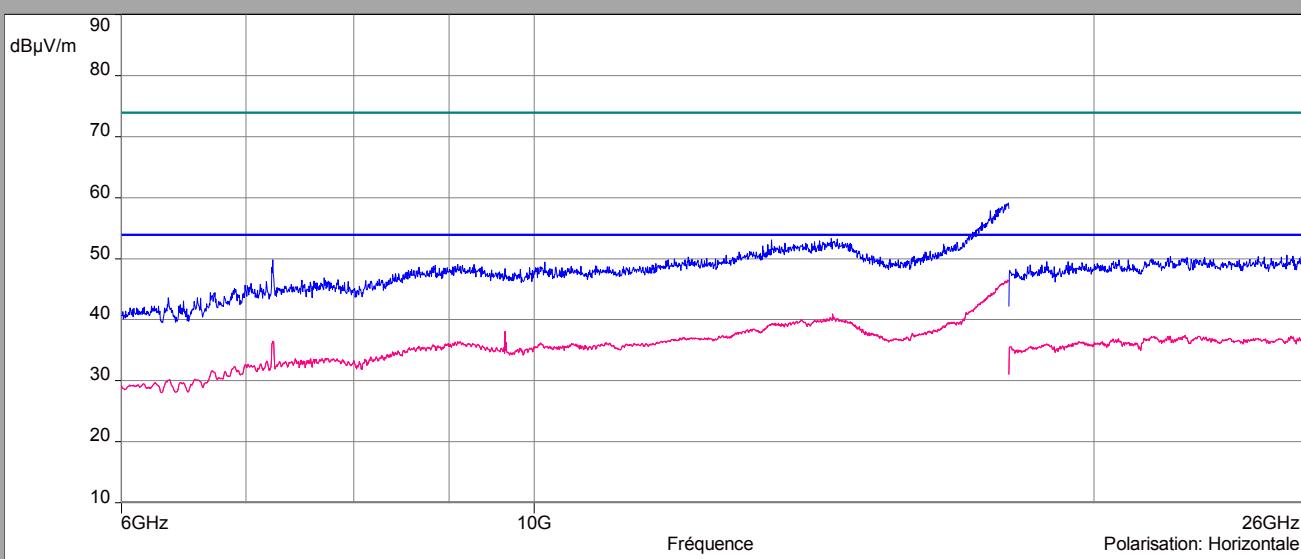
Vertical Polarization

— FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
— FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
— Mes.Peak (Verticale)
— Mes.Avg (Verticale)



Horizontal polarization

— FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
— FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
— Mes.Peak (Horizontale)
— Mes.Avg (Horizontale)





L C I E

802.11b

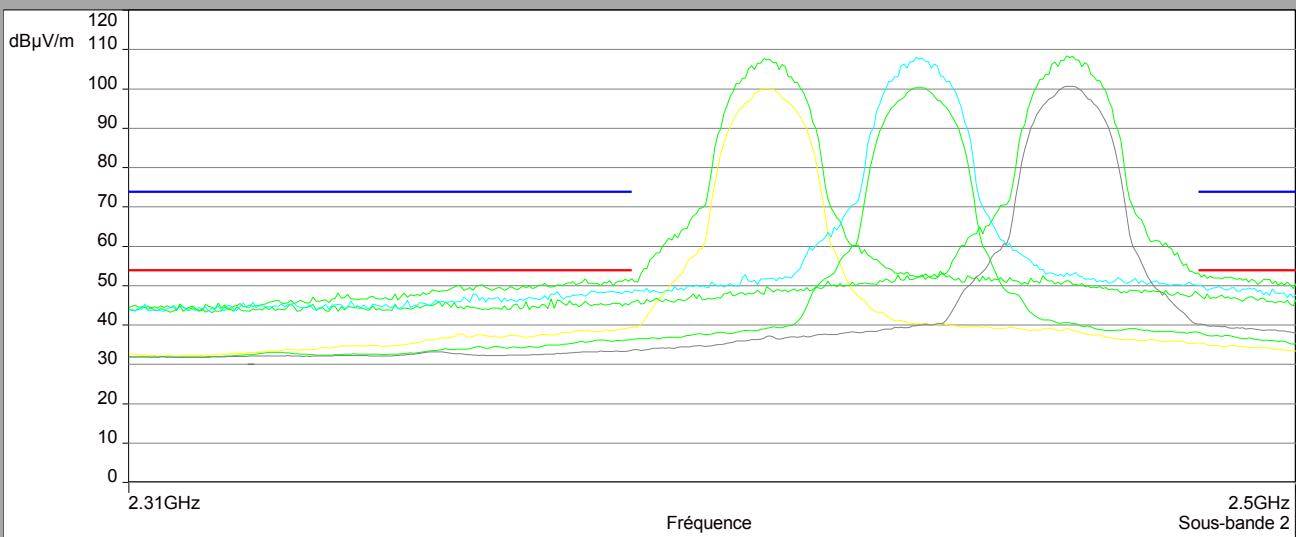
Cmin/Cnom/Cmax

Zoom 2310MHz-2500MHz

Vertical Polarization

Description Sous-bande 2
Fréquences: 2.31 GHz - 2.5 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Durée balayage : 50 ms/Pts, Atténuation : 182191856, Nombre de Balayages : 1, Preamp : On: 20 dB, LN Preamp : Off, Préselecteur: Off
Polarisation: Verticale
Distance: 3 m

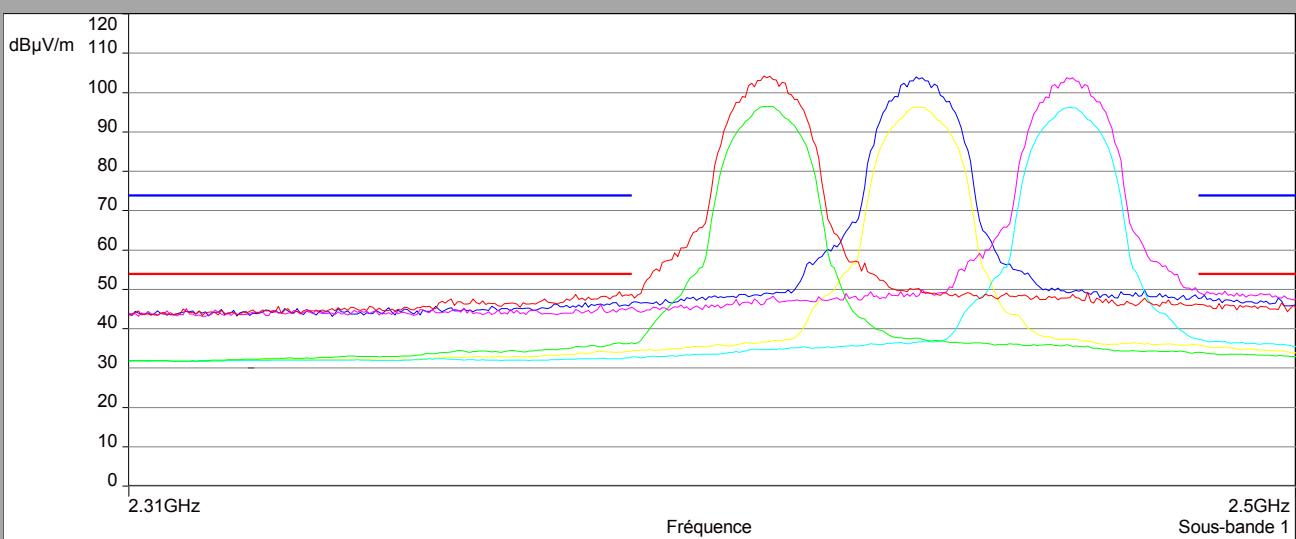
FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
Mes.Avg Channel High (Verticale)
Mes.Preselected Off (Verticale)
Mes.Peak Channel Middle (Verticale)
Mes.Avg Channel Middle (Verticale)
Mes.Peak Channel Low (Verticale)
Mes.Avg Channel Low (Verticale)



Horizontal polarization

Description Sous-bande 1
Fréquences: 2.31 GHz - 2.5 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Durée balayage : 50 ms/Pts, Atténuation : 182191920, Nombre de Balayages : 1, Preamp : On: 20 dB, LN Preamp : Off, Préselecteur: Off
Polarisation: Horizontale
Distance: 3 m

FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
Mes.Peak Channel Low (Horizontale)
Mes.Peak Channel High (Horizontale)
Mes.Avg Channel Low (Horizontale)
Mes.Avg Channel High (Horizontale)
Mes.Peak Channel Middle (Horizontale)
Mes.Avg Channel Middle (Horizontale)



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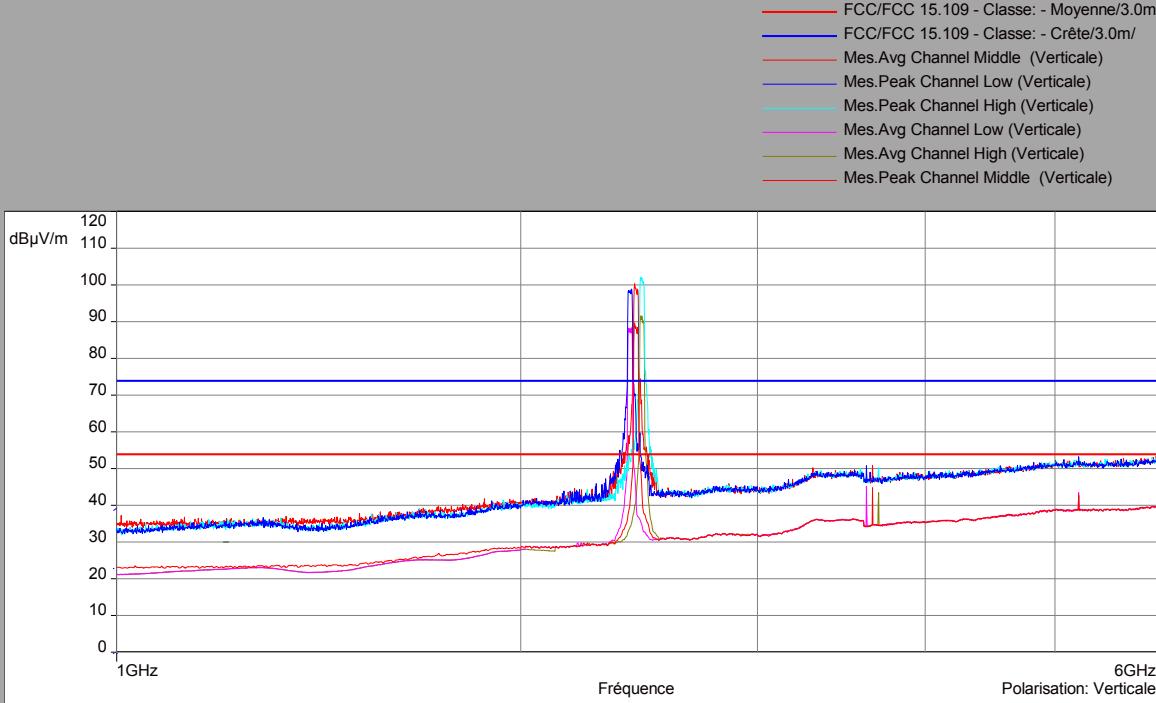
L C I E

802.11g

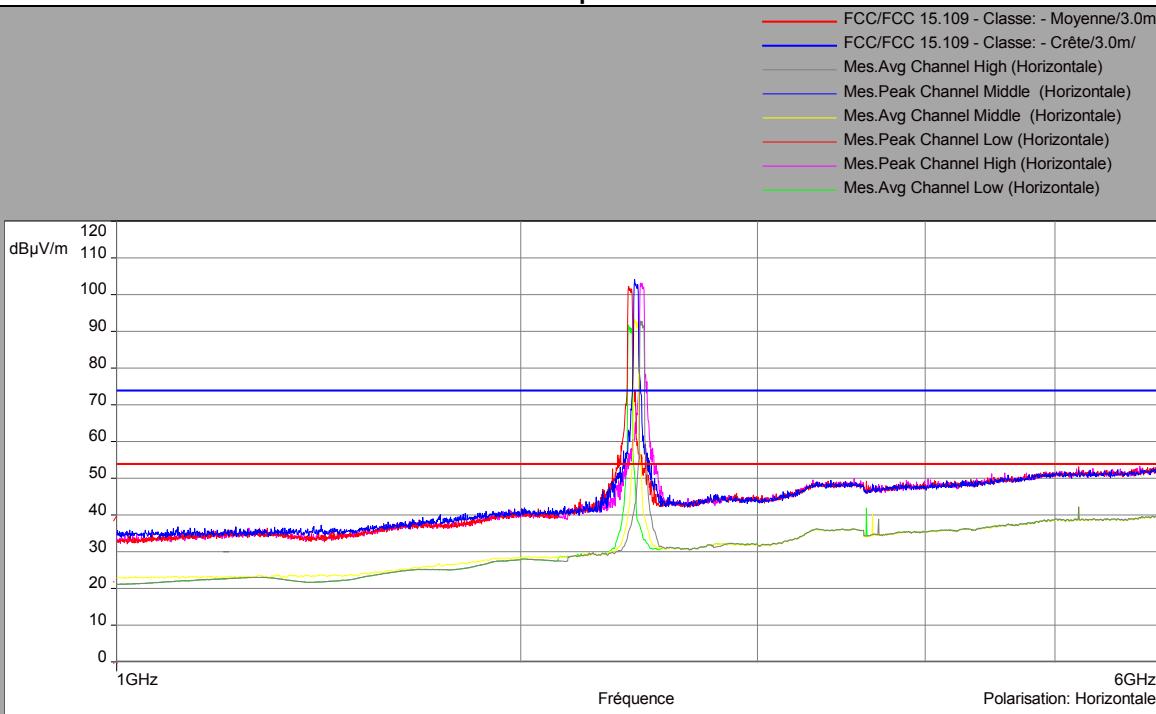
Cmin/Cnom/Cmax

Above 1GHz

Vertical Polarization



Horizontal polarization





L C I E

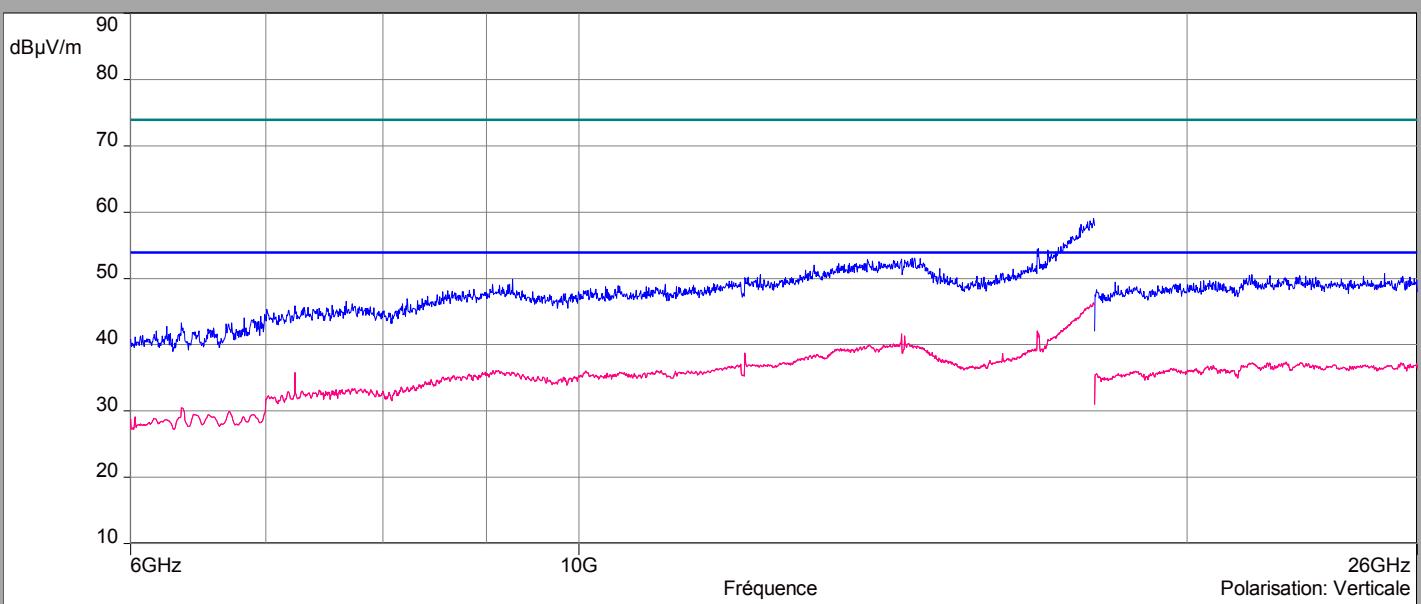
802.11b

Cmin/Cnom/Cmax

Above 1GHz

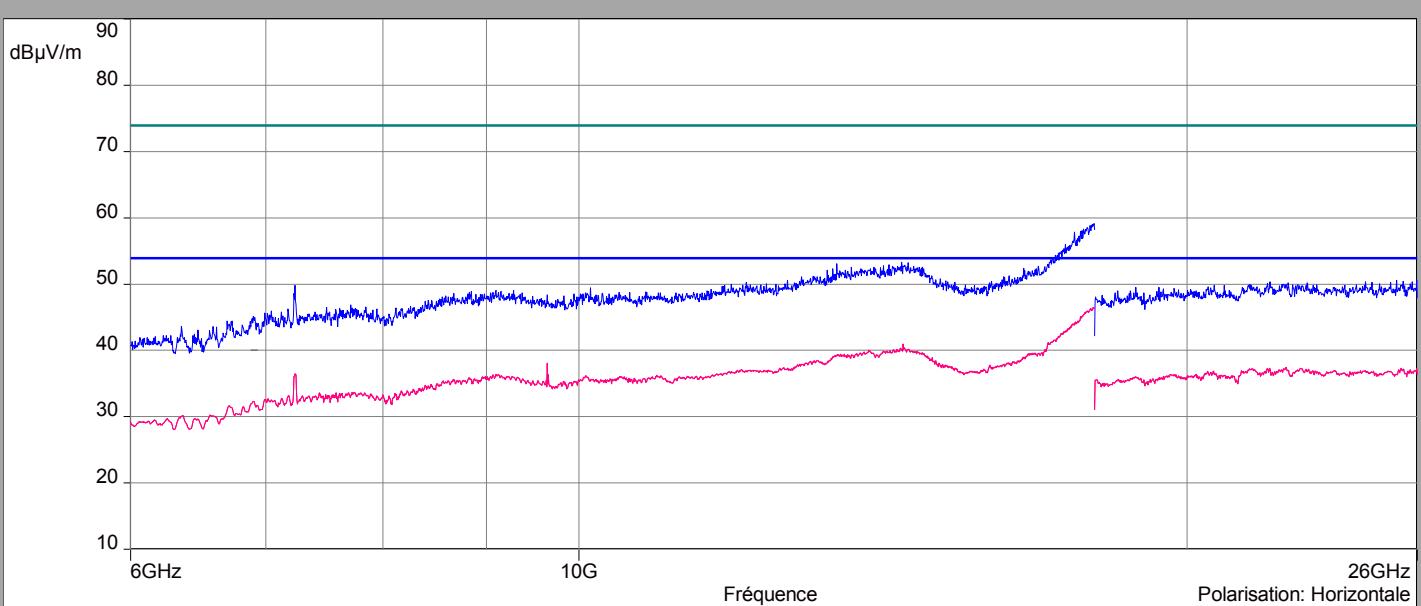
Vertical Polarization

FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
Mes.Peak (Verticale)
Mes.Avg (Verticale)



Horizontal polarization

FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
Mes.Peak (Horizontale)
Mes.Avg (Horizontale)





L C I E

802.11g**Cmin/Cnom/Cmax****Zoom 2310MHz-2500MHz****Vertical Polarization**

Description Sous-bande 2

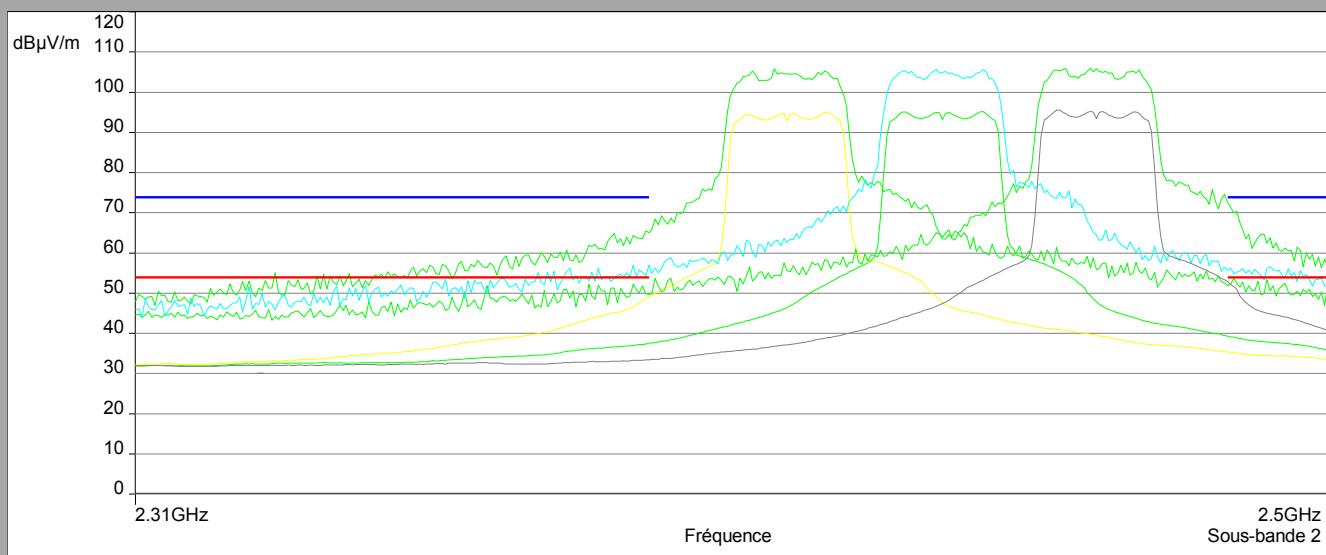
Fréquences: 2.31 GHz - 2.5 GHz (Mode: Lin, Pas: 500 kHz)

Réglages: RBW: 1 MHz, VBW: Auto, Durée balayage : 50 ms/Pts, Atténuation : 43941424, Nombre de Balayages : 1, Preamp : On: 20 dB, LN Preamp : Off, Préselecteur: Off

Polarisation: Verticale

Distance: 3 m

- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
- Mes.Avg Channel High (Verticale)
- Mes.Peak Channel Middle (Verticale)
- Mes.Avg Channel Middle (Verticale)
- Mes.Peak Channel Low (Verticale)
- Mes.Peak Channel High (Verticale)
- Mes.Avg Channel Low (Verticale)

**Horizontal polarization**

Description Sous-bande 1

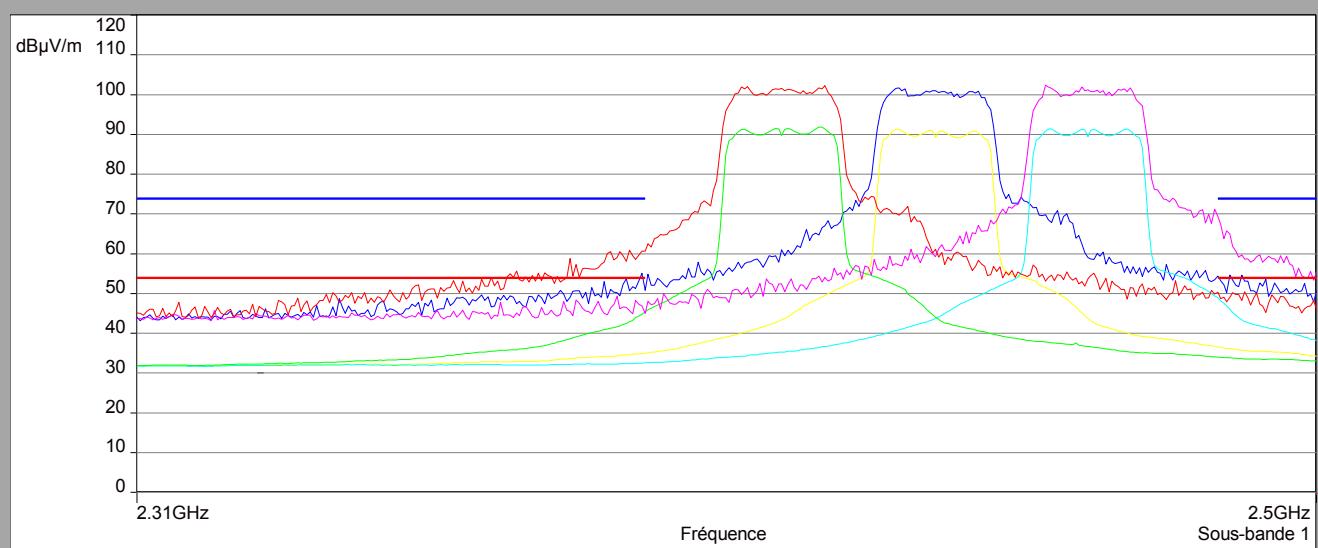
Fréquences: 2.31 GHz - 2.5 GHz (Mode: Lin, Pas: 500 kHz)

Réglages: RBW: 1 MHz, VBW: Auto, Durée balayage : 50 ms/Pts, Atténuation : 43941456, Nombre de Balayages : 1, Preamp : On: 20 dB, LN Preamp : Off, Préselecteur: Off

Polarisation: Horizontale

Distance: 3 m

- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
- Mes.Avg Channel Low (Horizontale)
- Mes.Peak Channel High (Horizontale)
- Mes.Avg Channel Low (Horizontale)
- Mes.Avg Channel High (Horizontale)
- Mes.Peak Channel Middle (Horizontale)
- Mes.Avg Channel Middle (Horizontale)

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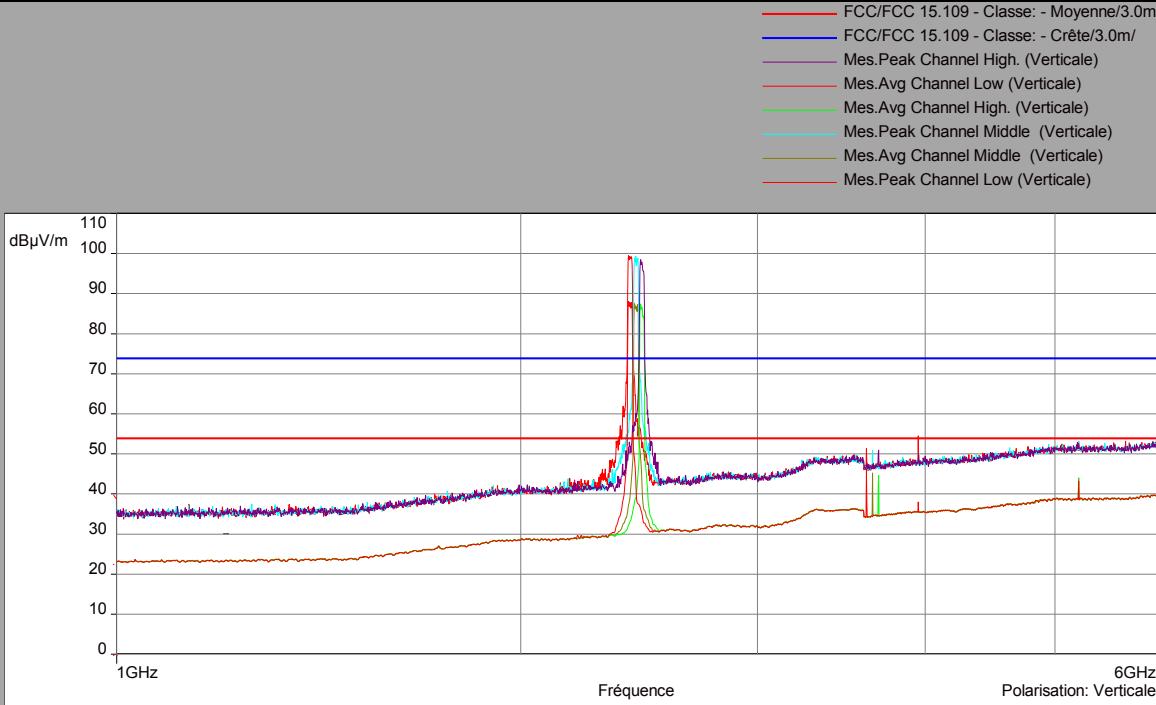
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802.11n HT20

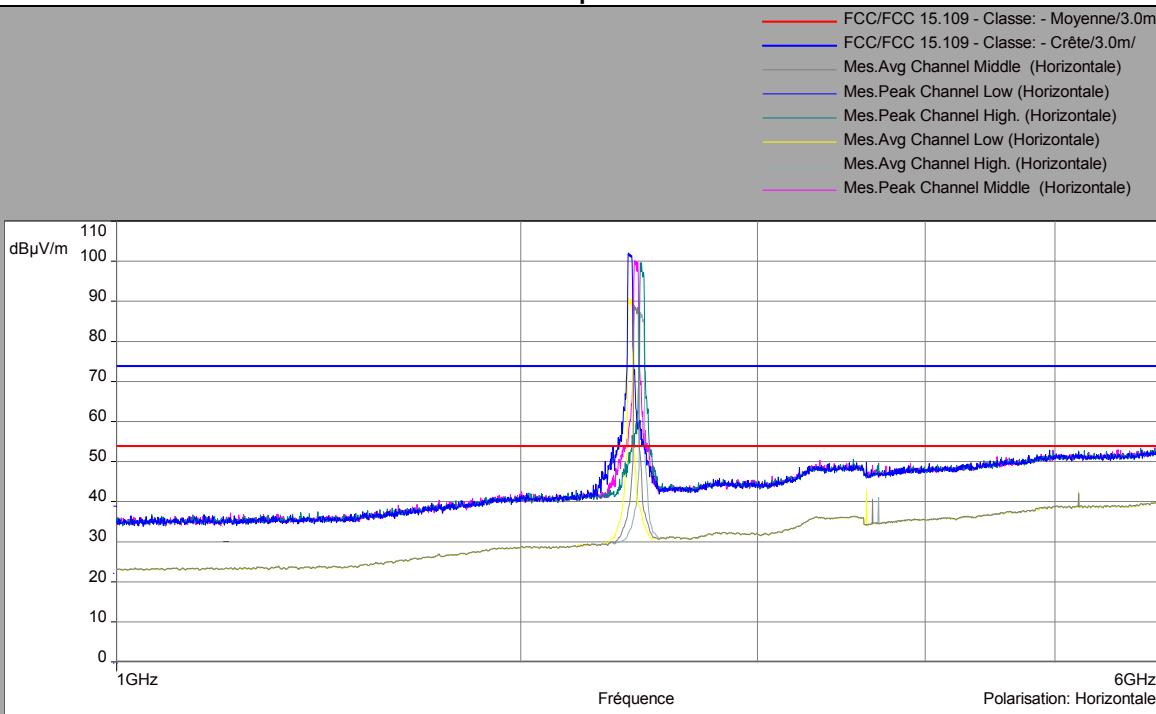
Cmin/Cnom/Cmax

Above 1GHz

Vertical Polarization



Horizontal polarization





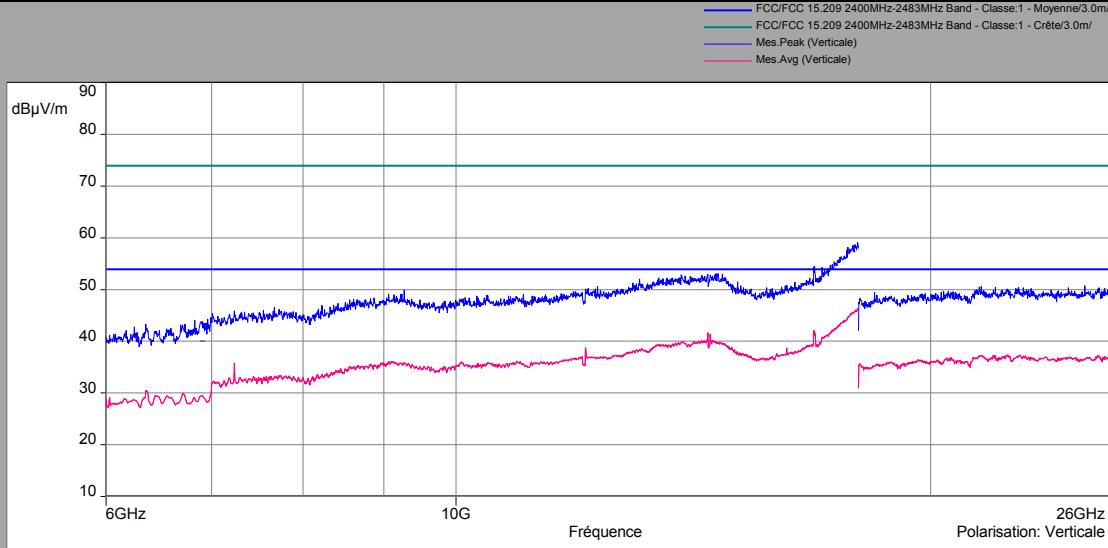
L C I E

802.11n HT20

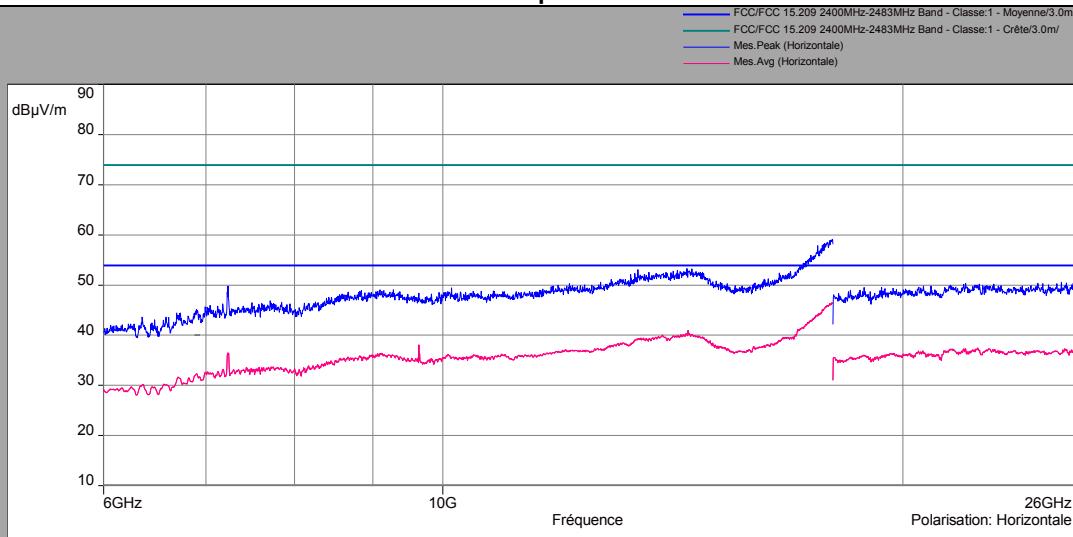
Cmin/Cnom/Cmax

Above 1GHz

Vertical Polarization



Horizontal polarization





L C I E

802.11n HT20**Cmin/Cnom/Cmax****Zoom 2310MHz-2500MHz****Vertical Polarization**

Description Sous-bande 2

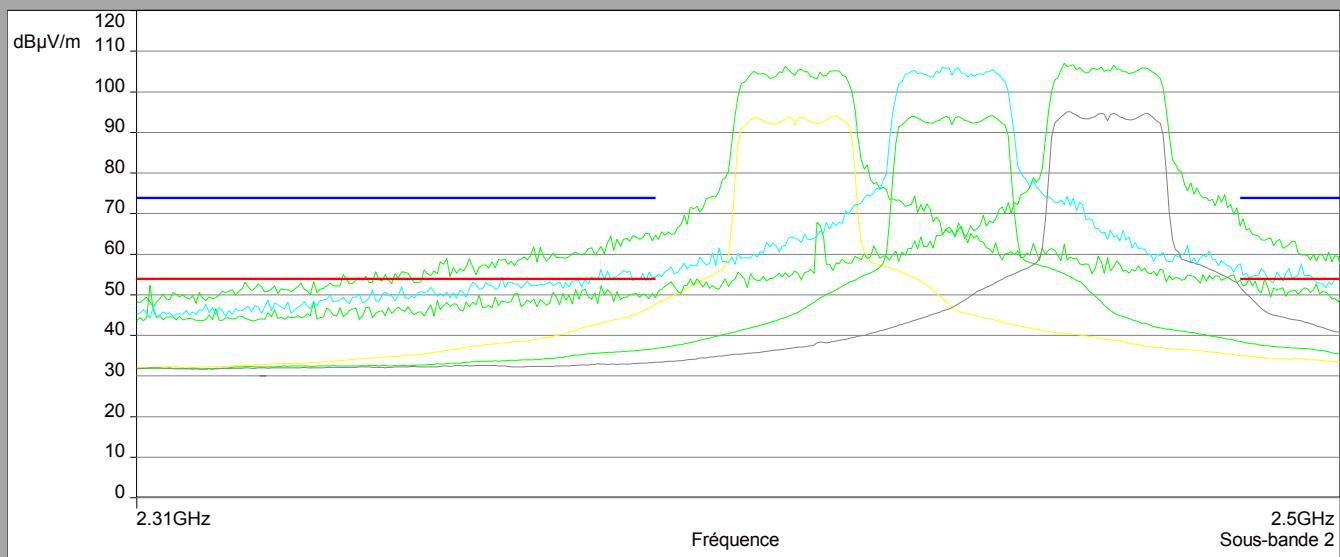
Fréquences: 2.31 GHz - 2.5 GHz (Mode: Lin, Pas: 500 kHz)

Réglaages: RBW: 1 MHz, VBW: Auto, Durée balayage : 50 ms/Pts, Atténuation : 178114400, Nombre de Balayages : 1, Preamp : On: 20 dB, LN Preamp : Off, Préselecteur: Off

Polarisation: Verticale

Distance: 3 m

- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
- Mes.Avg Channel High (Verticale)
- Mes.Peak Channel Middle (Verticale)
- Mes.Avg Channel Middle (Verticale)
- Mes.Peak Channel Low (Verticale)
- Mes.Peak Channel High (Verticale)
- Mes.Avg Channel Low (Verticale)

**Horizontal polarization**

Description Sous-bande 1

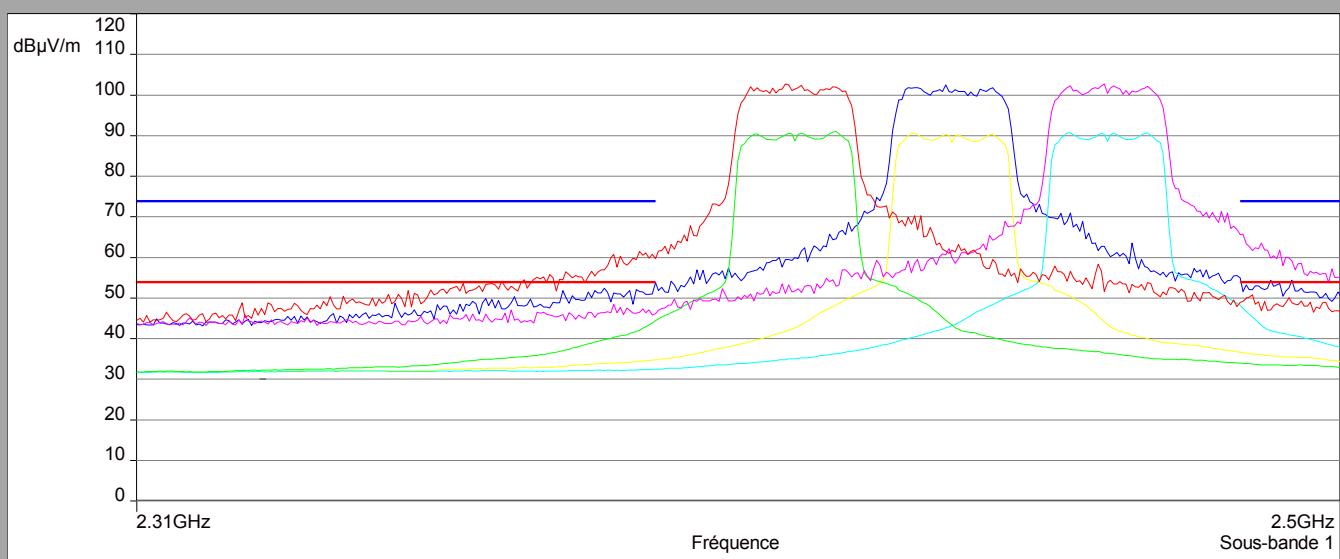
Fréquences: 2.31 GHz - 2.5 GHz (Mode: Lin, Pas: 500 kHz)

Réglaages: RBW: 1 MHz, VBW: Auto, Durée balayage : 50 ms/Pts, Atténuation : 178114848, Nombre de Balayages : 1, Preamp : On: 20 dB, LN Preamp : Off, Préselecteur: Off

Polarisation: Horizontale

Distance: 3 m

- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
- Mes.Peak Channel Low (Horizontale)
- Mes.Peak Channel High (Horizontale)
- Mes.Avg Channel Low (Horizontale)
- Mes.Avg Channel High (Horizontale)
- Mes.Peak Channel Middle (Horizontale)
- Mes.Avg Channel Middle (Horizontale)

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802.11b					
Cnom					
Below 1GHz					
Polarization	Frequency (MHz)	Peak Level (dB μ V/m)	QPeak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB μ V/m)
Horizontal	56.4	29.41	-	40	10.59
Vertical	56.2	38.55	35.02	40	4.98
Horizontal	108	29.07	-	43.5	14.43

802.11b								
Cmin/Cnom/Cmax								
Above 1GHz								
Polarization	Frequency (MHz)	Duty cycle correction (dB)	Average Level (dB μ V/m)	Average Limit (dB μ V/m)	Average Margin (dB μ V/m)	Peak Level (dB μ V/m)	Peak Limit (dB μ V/m)	Peak Margin (dB μ V/m)
Horizontal	1972	0,245	28,99	54	25,00	43,08	74	30,92
Vertical	2390	0,245	39,60	54	14,39	51,71	74	22,29
Vertical	2483,5	0,245	40,50	54	13,49	53,23	74	20,77
Horizontal	3618	0,245	47,20	54	6,79	52,42	74	21,58
Vertical	3655	0,245	45,63	54	8,36	51,11	74	22,89
Vertical	3695	0,245	45,07	54	8,92	51,18	74	22,82
Vertical	5206	0,245	45,06	54	8,93	53,40	74	20,6

802.11g								
Cmin/Cnom/Cmax								
Above 1GHz								
Polarization	Frequency (MHz)	Duty cycle correction (dB)	Average Level (dB μ V/m)	Average Limit (dB μ V/m)	Average Margin (dB μ V/m)	Peak Level (dB μ V/m)	Peak Limit (dB μ V/m)	Peak Margin (dB μ V/m)
Vertical	2153,5	0,437	30,27	54	23,73	43,86	74	30,14
Vertical	2275,5	0,437	30,14	54	23,86	45,89	74	28,11
Horizontal	2313	0,437	30,95	54	23,05	47,24	74	26,76
Vertical	2390	0,437	40,49	54	13,51	68,31	74	5,69
Vertical	2483,5	0,437	52,65	54	1,35	72,48	74	1,52
Vertical	3618	0,437	45,60	54	8,40	50,84	74	23,16
Vertical	3655	0,437	45,17	54	8,83	50,91	74	23,09
Horizontal	3693	0,437	43,92	54	10,08	50,28	74	23,72
Vertical	5206	0,437	44,25	54	9,75	53,24	74	20,76



L C I E

802.11n HT20								
Cmin/Cnom/Cmax								
Above 1GHz								
Polarization	Frequency (MHz)	Duty cycle correction (dB)	Average Level (dB μ V/m)	Average Limit (dB μ V/m)	Average Margin (dB μ V/m)	Peak Level (dB μ V/m)	Peak Limit (dB μ V/m)	Peak Margin (dB μ V/m)
Vertical	2174	0,318	30,10	54	23,90	43,90	74	30,1
Vertical	2300	0,318	29,92	54	24,08	46,16	74	27,84
Vertical	2390	0,318	48,07	54	5,93	64,69	74	9,31
Vertical	2483,5	0,318	52,25	54	1,75	66,95	74	7,05
Vertical	3618	0,318	46,68	54	7,32	51,34	74	22,66
Vertical	3655	0,318	45,64	54	8,36	50,80	74	23,2
Vertical	3693	0,318	45,11	54	8,89	50,92	74	23,08
Vertical	3954,5	0,318	38,48	54	15,52	54,74	74	19,26
Vertical	5206	0,318	44,45	54	9,55	53,20	74	20,8

11.7. CONCLUSION

Unwanted emissions measurement performed on the sample of the product **VELUX ACTIVE** with **NETATMO NXG01S**, SN: -, in configuration and description presented in this test report, show levels compliant to the 47 CFR PART 15.247 & RSS 247 ISSUE 2 limits.



L C I E

12. UNCERTAINTIES CHART

47 CFR Part 15.209 & 15.207 Kind of test	Wide uncertainty (k=2) $\pm x$ (dB) / (Hz)/ ms	Uncertainty limit
Measurement of conducted disturbances in voltage on the AC power port (9 kHz – 150 kHz)	2,67	3.8
Measurement of conducted disturbances in voltage on the AC power port (150 kHz – 30 MHz)	2,67	3.4
Measurement of conducted disturbances in voltage on the telecommunication port. (AAN)	3,67	5.0
Measurement of conducted disturbances in current (current clamp)	2,73	2.9
Measurement of disturbance power	2,67	4.5
Measurement of radiated magnetic field from 10kHz to 30MHz in SAC V01	4,48	/
Measurement of radiated magnetic field from 10kHz to 30MHz in SAC C01	4,48	/
Measurement of radiated electric field from 30 to 1000MHz in horizontal position on the OATS (Ecuelles)	4,88	6.3
Measurement of radiated electric field from 1 to 18GHz on the Ecuelles site	5.16	/
Measurement of radiated electric field from 30 to 1000MHz in vertical position on the OATS (Ecuelles)	4,99	6.3
Measurement of radiated electric field from 30 to 1000MHz in horizontal position in SAC C01	5,08	6.3
Measurement of radiated electric field from 30 to 1000MHz in vertical position in SAC C01	5,16	6.3
Measurement of radiated electric field from 30 to 1000MHz in horizontal position in SAC V01	5,08	6.3
Measurement of radiated electric field from 30 to 1000MHz in vertical position in SAC V01	5,15	6.3
Measurement of radiated electric field from 1 to 6 GHz C01	5,1	5.2
Measurement of radiated electric field from 1 to 6 GHz V01	4,85	5.2
Measurement of radiated magnetic field from 10kHz to 30MHz on the OATS (Ecuelles)	4,48	/

The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the CISPR. The conformity of the sample is directly established by the applicable limits values. This table includes all uncertainties maximum feasible for testing in the laboratory, whether or not made in this report.