



LCIE

Bluetooth Classic Template: Release October 03rd, 2016

TEST REPORT

N°: 145064-694081B

Version : 01

Subject

Radio spectrum matters
tests according to standards:
47 CFR Part 15.247 [P](#)

Issued to

SAGEMCOM BROADBAND SAS
250 Route de l' Empereur
92500 – RUEIL MALMAISON
FRANCE

Apparatus under test

[P](#) Product **DGCI384 UHD AIt US**
[P](#) Trade mark **SAGEMCOM**
[P](#) Manufacturer **SAGEMCOM**
[P](#) Model under test **TheBox (253697282)**
[P](#) Serial number **616400107098**
[P](#) FCC ID **VW3DGCI384**

Test date

: November 10, 2016 to November 22, 2016

Test location

Fontenay Aux Roses & Ecuelles

Composition of document

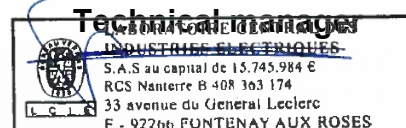
88 pages

Document issued on

January 9, 2017

Written by :
Arnaud FAYETTE
Tests operator

Approved by :
Stéphane PHOUDIAH



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LCIE

Laboratoire Central des Industries Electriques
Une société de Bureau Veritas

33, Av du Général Leclerc
92266 Fontenay Aux Roses
FRANCE

Tél : +33 1 40 95 60 60
contact@lcie.fr
www.lcie.fr



PUBLICATION HISTORY

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01	January 6, 2017	Arnaud FAYETTE	Creation of the document



SUMMARY

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1. TEST PROGRAM

References

- 47 CFR Part 15.247
- ANSI C63.10-2013
- FCC DA 00-705

Radio requirement:

Clause (47CFR Part 15.247) Test Description	Test result - Comments			
Occupied Bandwidth P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
20dB Bandwidth P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Number of Hopping Frequency P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Carrier Frequency Separation P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Time of Occupancy P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Duty Cycle P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Maximum Conducted Output Power P	<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 P	<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 P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA()	<input type="checkbox"/> NP(1)
AC Power Line Conducted Emission P	<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 P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Receiver Radiated emissions P	<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

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

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):
SAGEMCOM TheBox (253697282)

Serial Number: 616400107098



Equipment Under Test



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Equipment Under Test

Inputs/outputs - Cable:

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

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop	-	-	Use to set the EUT
CBT Bluetooth Tester	A4120005	-	-
Horn antenna	C2042051	-	-
Power supply°1	NBS60C120500M2	16366C25200017	P/N:191363252-xx
Power supply°2	LPL-C060120500ZS	1637215590020	P/N:191363559-XX
Power supply°3	MSA-Z5000IS12.0-60A-P	H16386E6950010	P/N:191363695-XX
Power supply°4	A15-060P1A	16413K72800092	P/N:191363728



Equipment information:

Bluetooth Classic Type:	<input type="checkbox"/> v1.2	<input type="checkbox"/> v2.0	<input type="checkbox"/> v2.1+EDR	<input type="checkbox"/> v3.0+HS
	<input type="checkbox"/> v4.0	<input checked="" type="checkbox"/> v4.1		<input type="checkbox"/> v4.2
Frequency band:	[2400 – 2483.5] MHz			
Spectrum Modulation:	<input checked="" type="checkbox"/> FHSS			
Number of Channel:	Maximum:	79	Minimum:	20
Spacing channel:	1MHz			
Channel bandwidth:	1MHz			
Antenna Type:	<input checked="" type="checkbox"/> Integral	<input type="checkbox"/> External	<input type="checkbox"/> Dedicated	
Antenna connector:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Temporary for test	
Transmit chains:	1			
	Single antenna			
Beam forming gain:	No			
Receiver chains:	1			
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	
Dwell time:	400ms			
Duty cycle:	<input checked="" type="checkbox"/> Continuous duty	<input type="checkbox"/> Intermittent duty	<input type="checkbox"/> 100% duty	
Equipment type:	<input checked="" type="checkbox"/> Production model		<input type="checkbox"/> Pre-production model	
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 type="checkbox"/> 55°C	<input checked="" type="checkbox"/> 45°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)
1	2.6	2400-2483.5	50



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CHANNEL PLAN

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Cmin: 0	2402	27	2429	54	2456
1	2403	28	2430	55	2457
2	2404	29	2431	56	2458
3	2405	30	2432	57	2459
4	2406	31	2433	58	2460
5	2407	32	2434	59	2461
6	2408	33	2435	60	2462
7	2409	34	2436	61	2463
8	2410	35	2437	62	2464
9	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	Cmax: 78	2480
25	2427	52	2454		
26	2428	53	2455		

DATA RATE

Available for EUT	Modulation type	Max. Data Rate (Mbps)	Packet type	Worst Case Modulation
<input checked="" type="checkbox"/>	GFSK	1	1-DM1	<input type="checkbox"/>
	GFSK	1	1-DH1	<input type="checkbox"/>
	GFSK	1	1-DM3	<input type="checkbox"/>
	GFSK	1	1-DH3	<input type="checkbox"/>
	GFSK	1	1-DM5	<input type="checkbox"/>
	GFSK	1	1-DH5	<input checked="" type="checkbox"/>
<input type="checkbox"/>	GFSK	1	AUX1	<input type="checkbox"/>
<input checked="" type="checkbox"/>	$\pi/4$ DQPSK	2	2-DH1	<input type="checkbox"/>
	$\pi/4$ DQPSK	2	2-DH3	<input type="checkbox"/>
	$\pi/4$ DQPSK	2	2-DH5	<input checked="" type="checkbox"/>
	8DPSK	3	3-DH1	<input type="checkbox"/>
	8DPSK	3	3-DH3	<input type="checkbox"/>
	8DPSK	3	3-DH5	<input checked="" 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 emission with modulation & hopping in the data rate that produced the highest power
- Permanent reception

Following commands with the specific test software "TERATERM" are used to set the product:

- See document "BT command The Box.docx" for the command used during test

2.3. EQUIPMENT LABELLING



Power supply n° 1



Power supply n° 2



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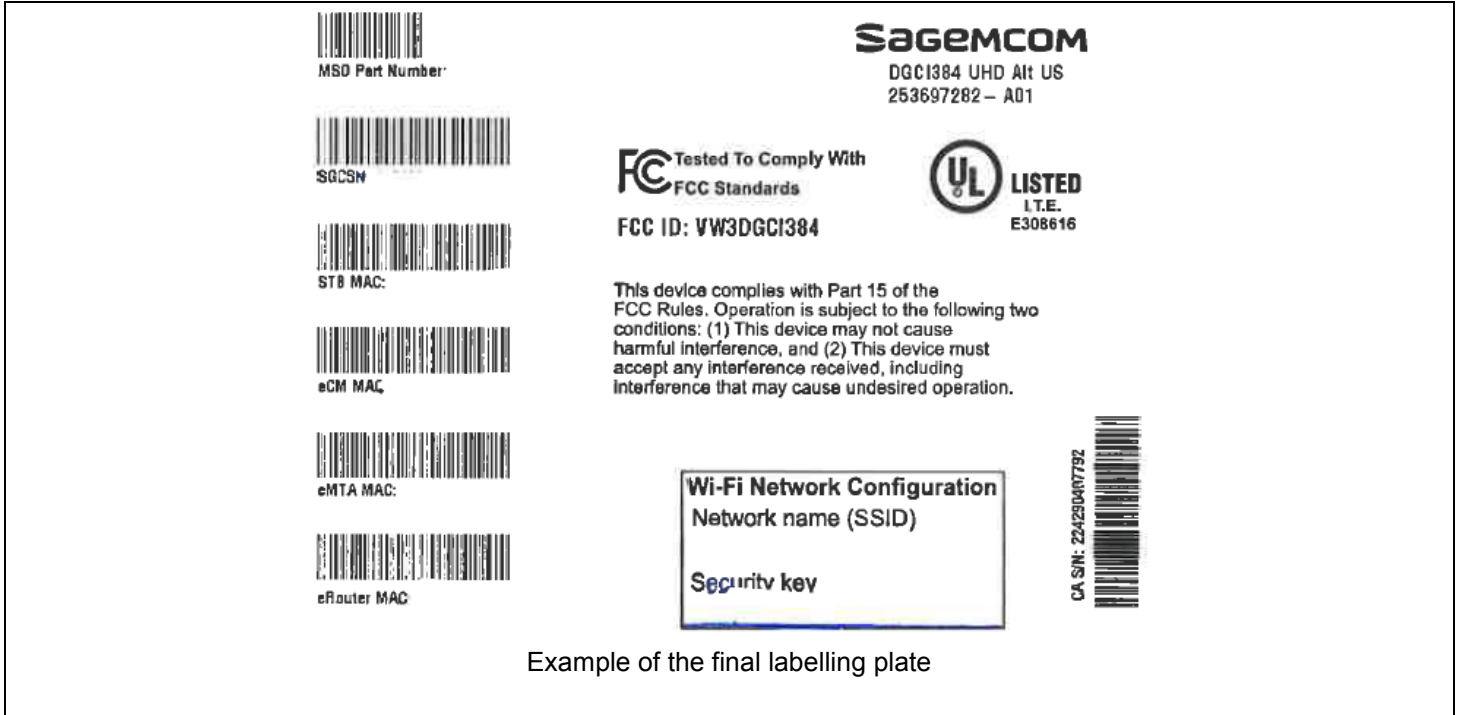
Power supply n° 3



Power supply n° 4



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Example of the final labelling plate

2.4. EQUIPMENT MODIFICATION

- None
- Modification:

3. OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

Test performed by : Arnaud FAYETTE
Date of test : November 14, 2016
Ambient temperature : 23 °C
Relative humidity : 45 %

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 § 6.9.3



Photograph for Occupied bandwidth



3.1. LIMIT

No Limit

3.2. TEST EQUIPMENT LIST

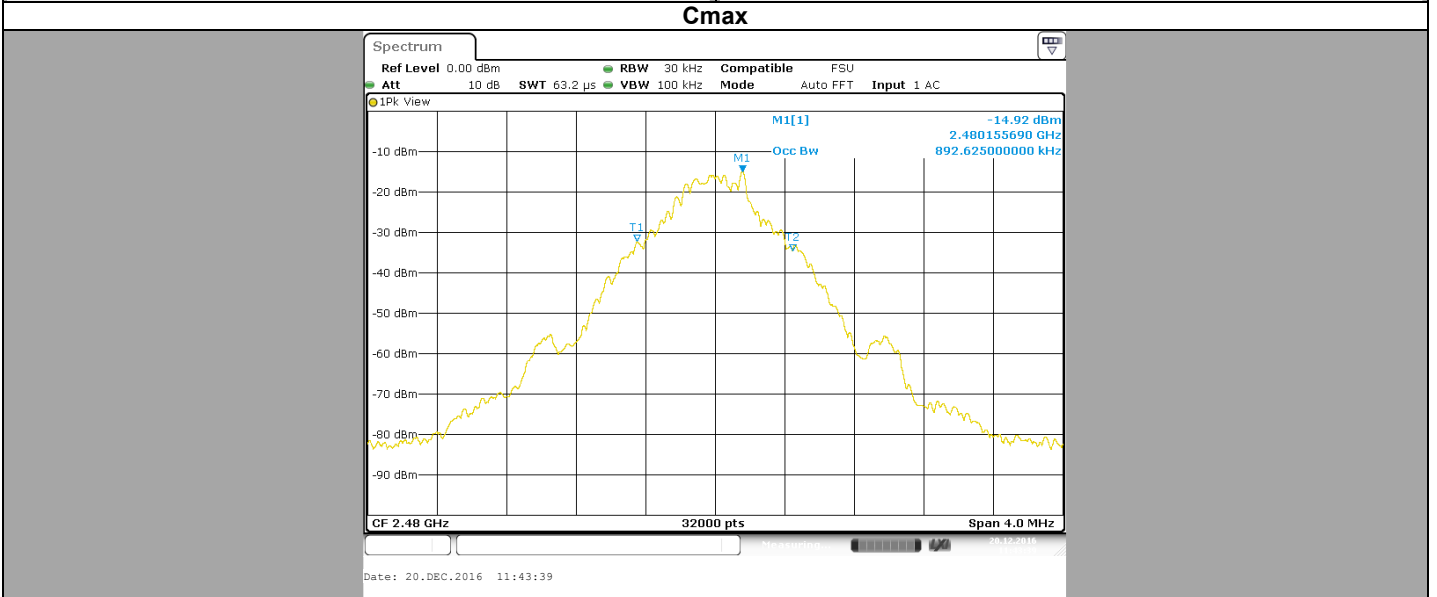
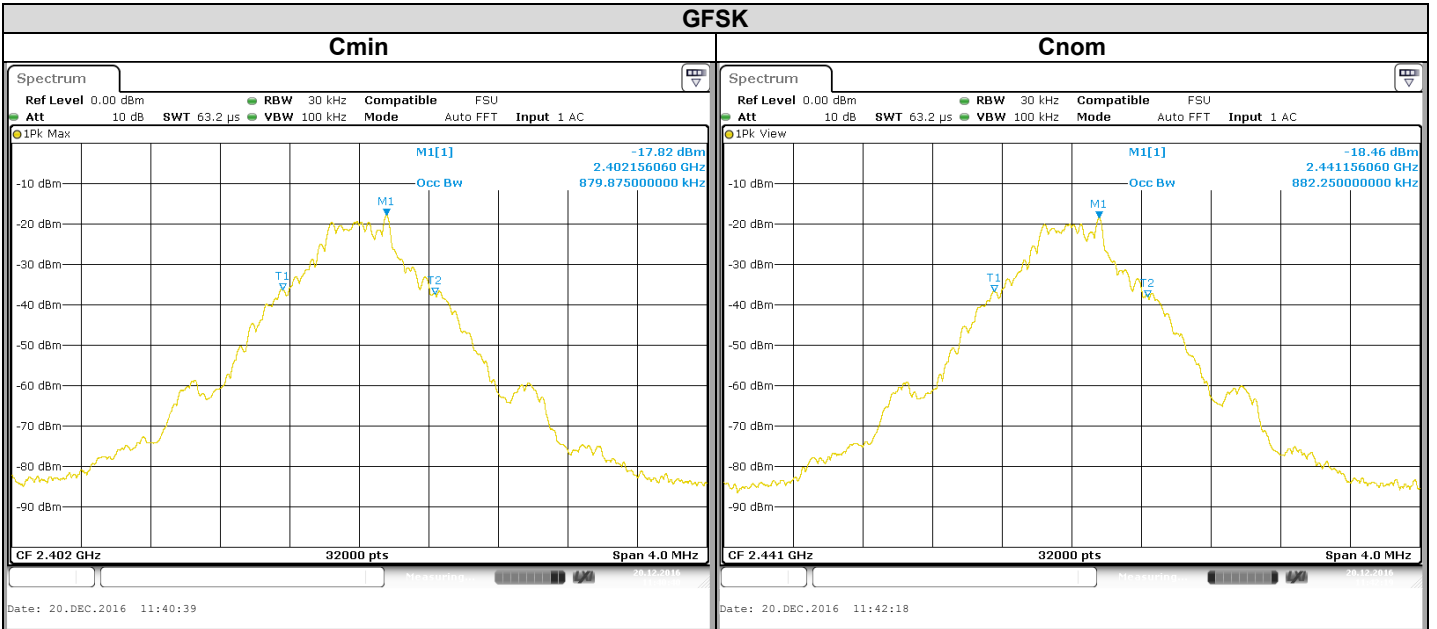
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
Multi-meter	KEITHLEY	2000	A1241084	2016/05	2018/05
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7049006	Verified with calibrated multimeter	Verified with calibrated multimeter
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329674	2016/09	2017/09

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



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3.3. RESULTS



Channel	Occupied Bandwidth (MHz)
Cmin	0,880
Cnom	0,882
Cmax	0,893

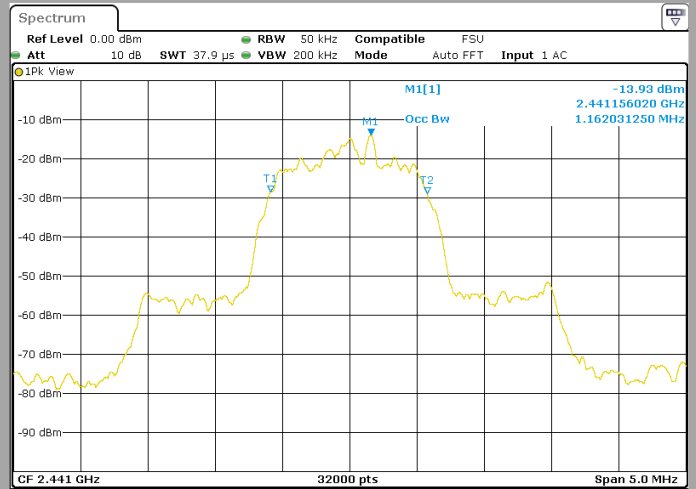
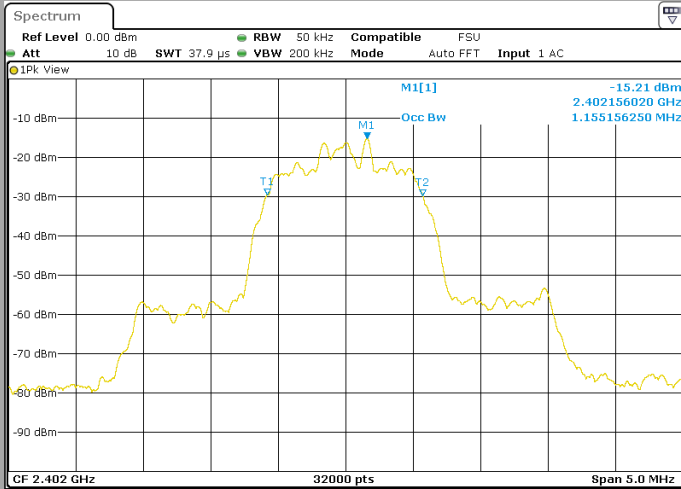


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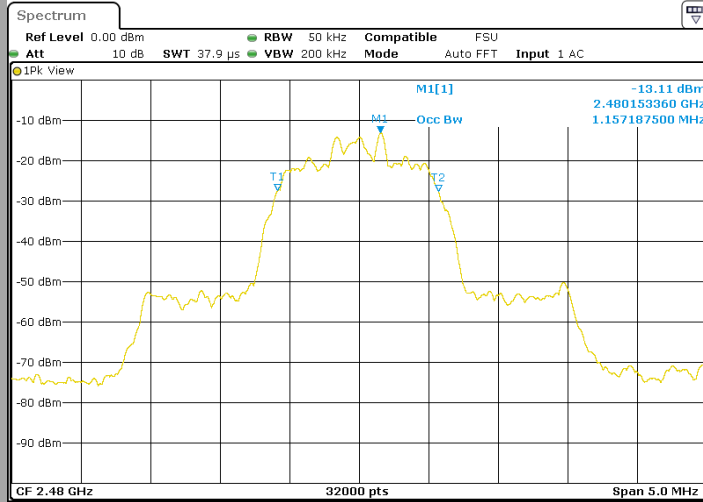
$\pi/4$ DQPSK

Cmin

Cnom



Cmax



Channel

Occupied Bandwidth (MHz)

Cmin

1,16

Cnom

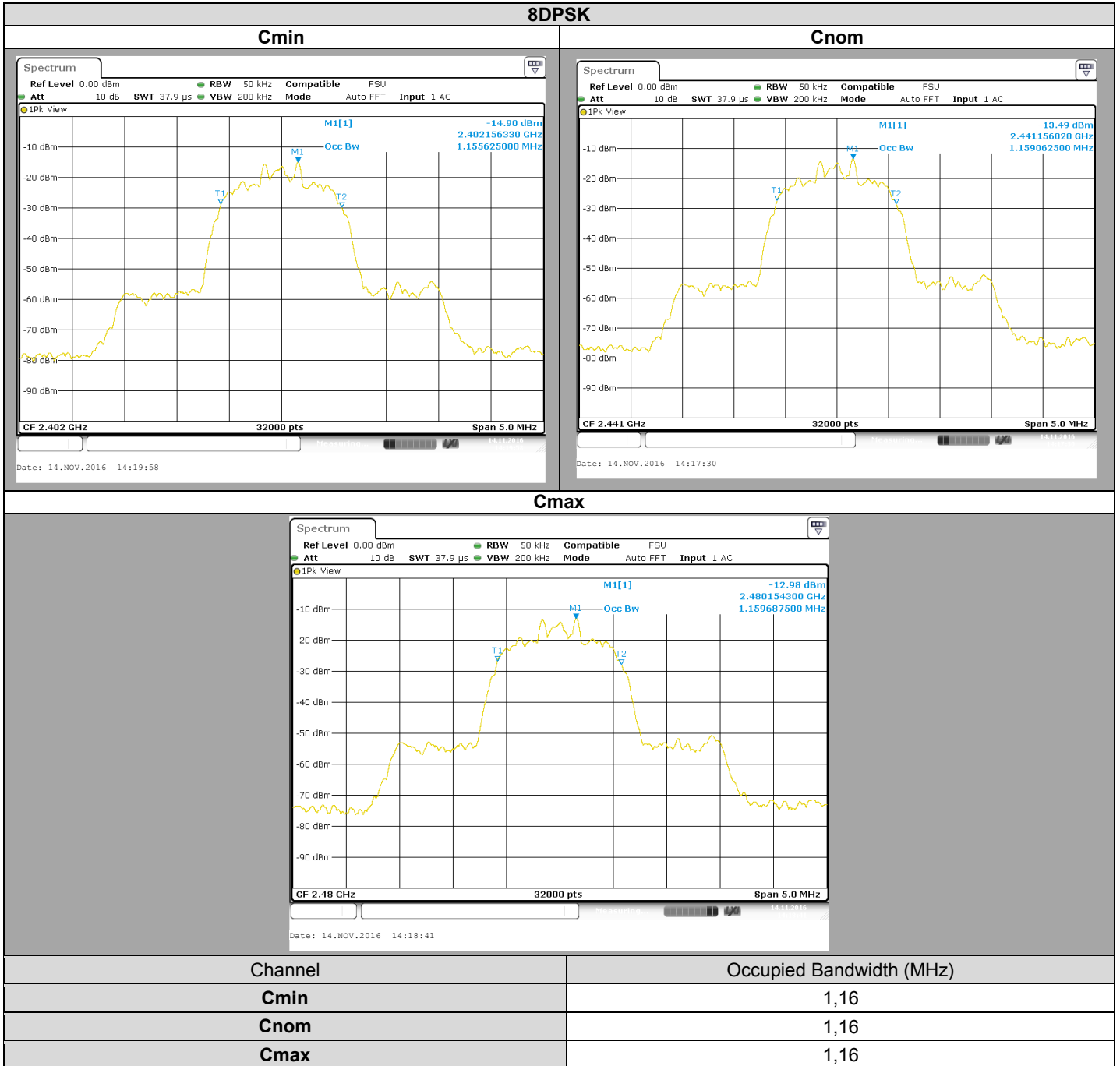
1,16

Cmax

1,16



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3.4. CONCLUSION

Occupied Bandwidth measurement performed on the sample of the product **SAGEMCOM TheBox (253697282)**, SN: **616400107098**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247** limits.

4. 20dB EMISSION BANDWIDTH

4.1. TEST CONDITIONS

Test performed by : Arnaud FAYETTE
Date of test : November 14, 2016
Ambient temperature : 24 °C
Relative humidity : 45 %

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:
 - FCC DA 00-705 (20dB Bandwidth)
 - ANSI C63.10 § 6.9.2



Photograph for 20dB emission bandwidth



4.3. LIMIT

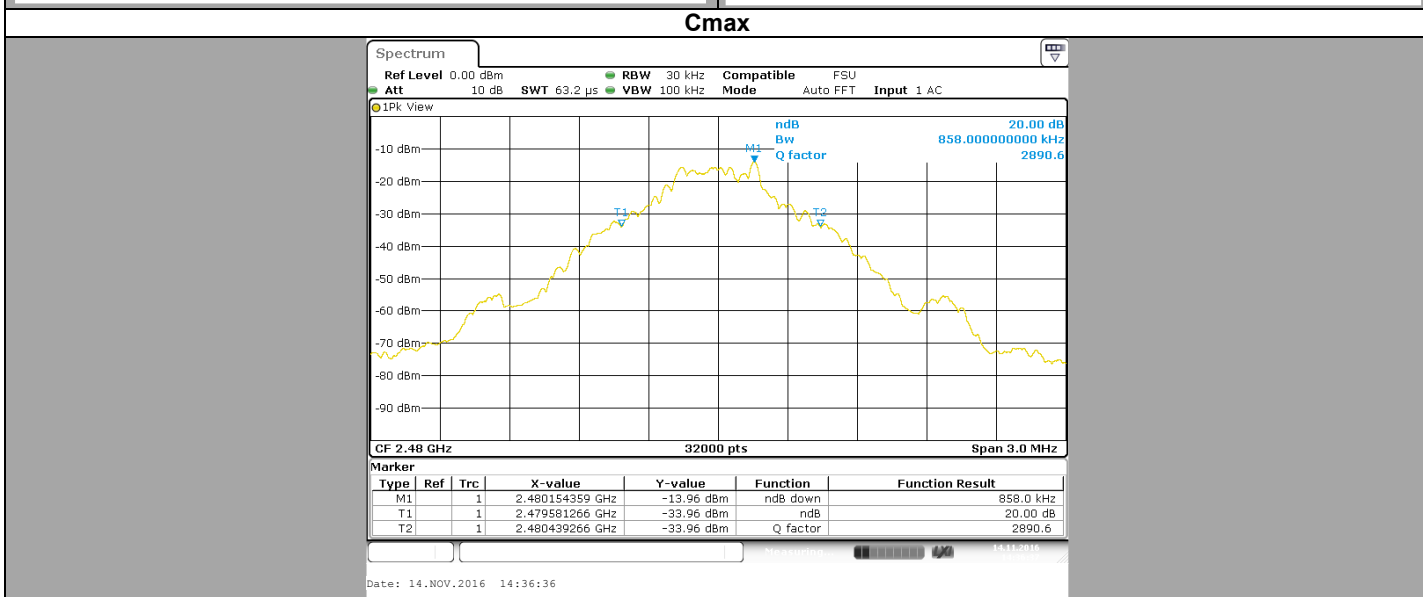
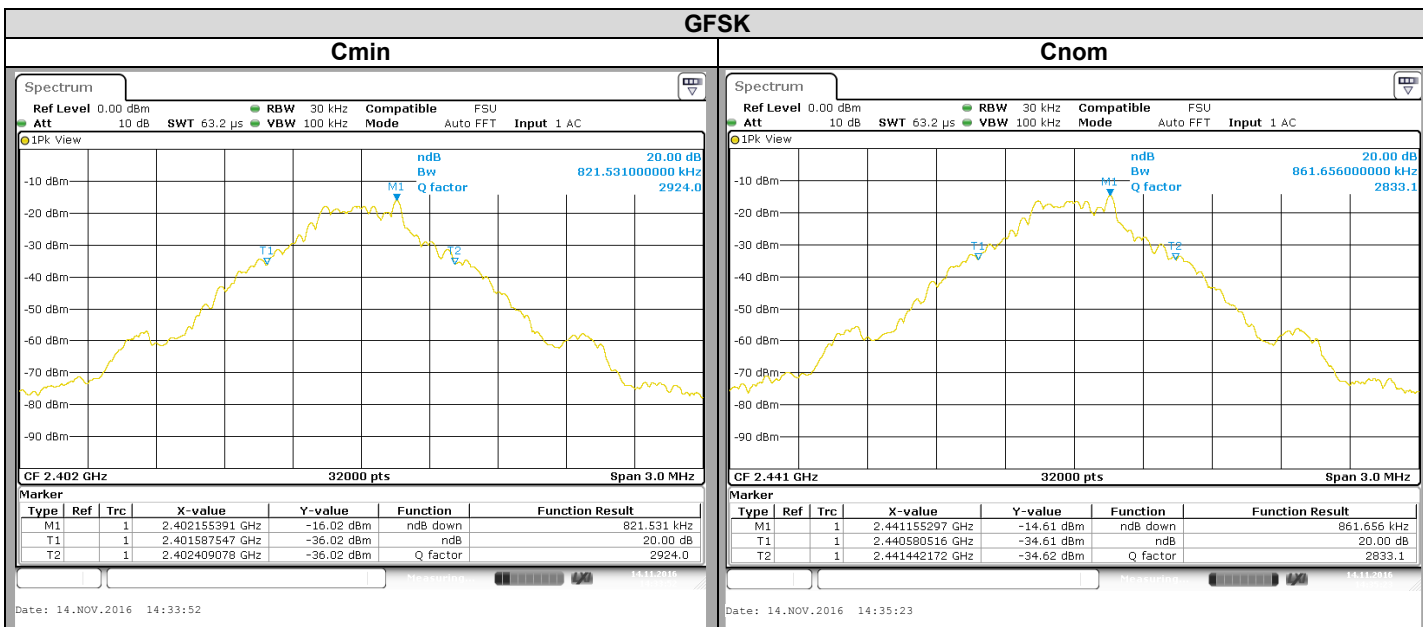
No Limit

4.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
Multi-meter	KEITHLEY	2000	A1241084	2016/05	2018/05
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7049006	Verified with calibrated multimeter	Verified with calibrated multimeter
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329674	2016/09	2017/09

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

4.5. RESULTS

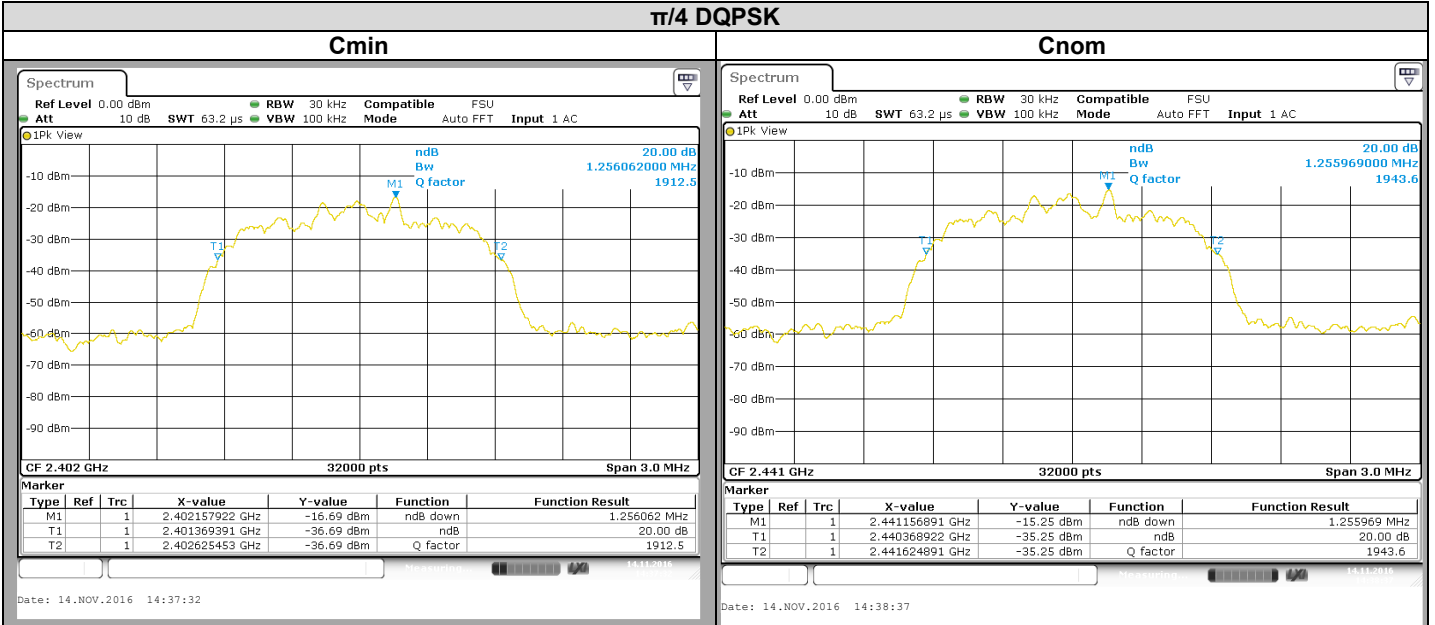


Channel	20dB Bandwidth (MHz)
Cmin	0,821
Cnom	0,861
Cmax	0,858

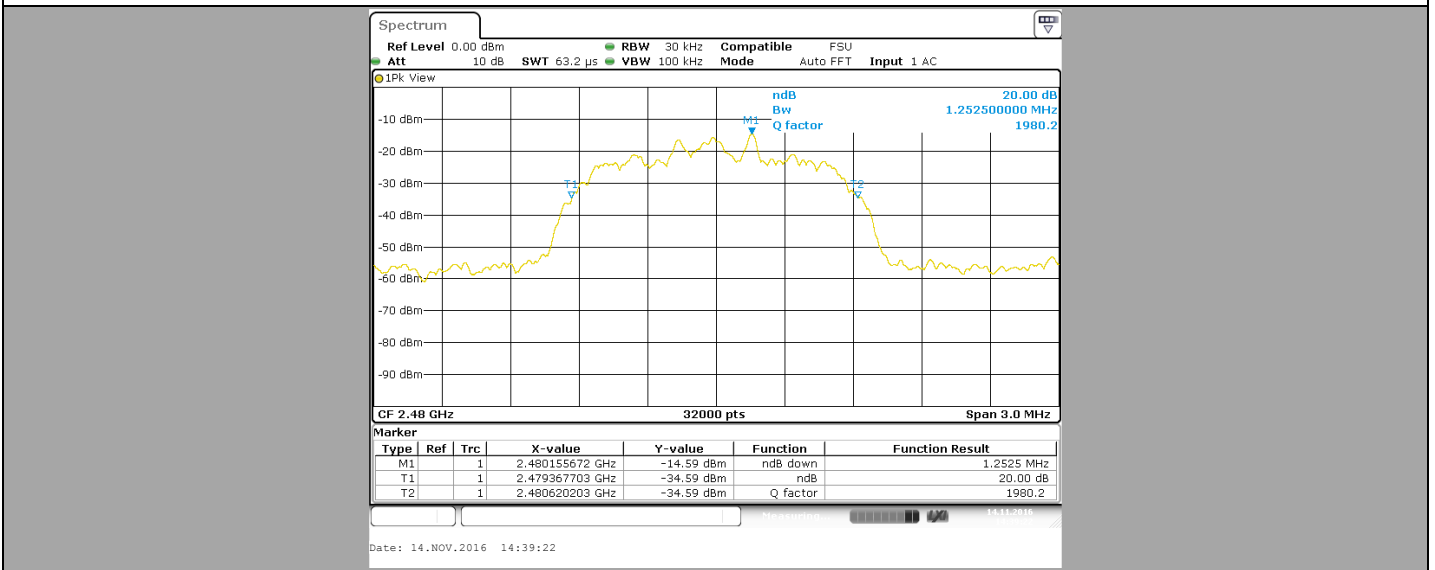


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$\pi/4$ DQPSK



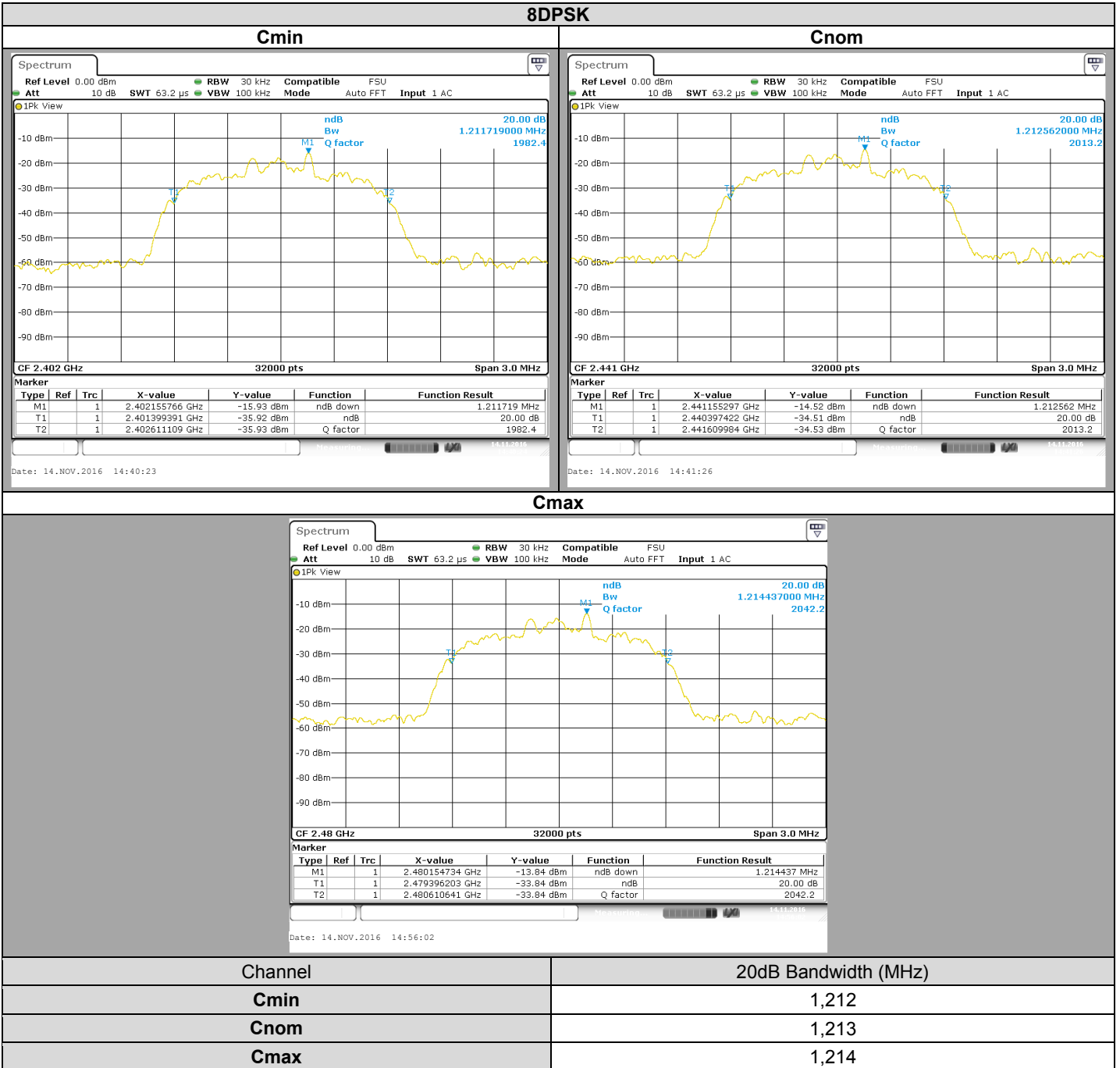
Cmax



Channel	20dB Bandwidth (MHz)
Cmin	1,256
Cnom	1,256
Cmax	1,252



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4.6. CONCLUSION

20dB Emission Bandwidth measurement performed on the sample of the product **SAGEMCOM TheBox (253697282)**, SN: **616400107098**, in configuration and description presented in this test report, show levels compliant to the **47 CFR PART 15.247** limits.

5. NUMBER OF HOPPING FREQUENCY

5.1. TEST CONDITIONS

Test performed by : Arnaud FAYETTE
Date of test : November 14, 2016
Ambient temperature : 23 °C
Relative humidity : 45 %

5.2. TEST SETUP

- The Equipment Under Test is installed:

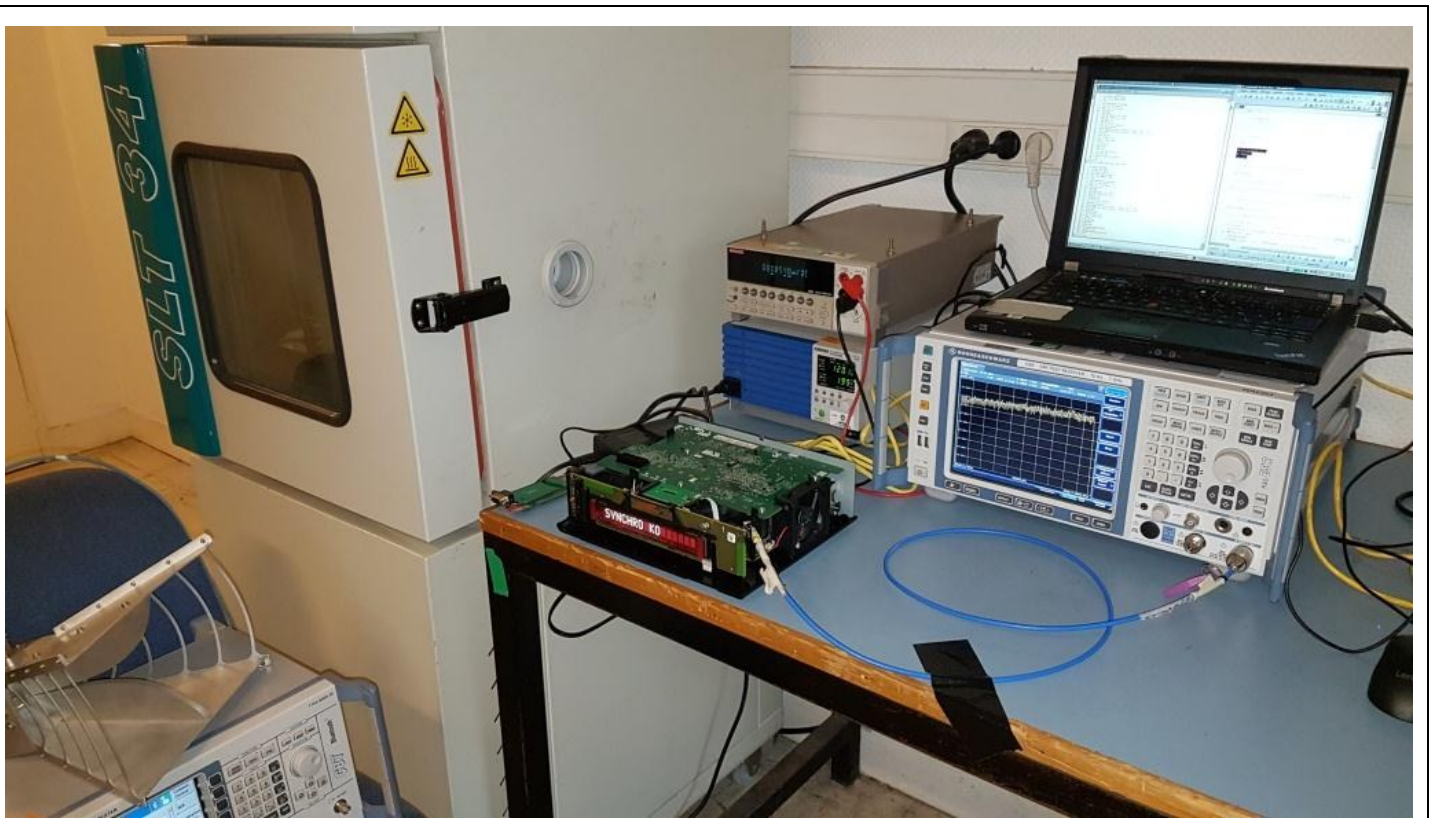
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

- FCC DA 00-705 (Number of Hopping Frequencies)
- ANSI C63.10 § 7.8.3



Photograph for Number of Frequency Hopping



5.3. LIMIT

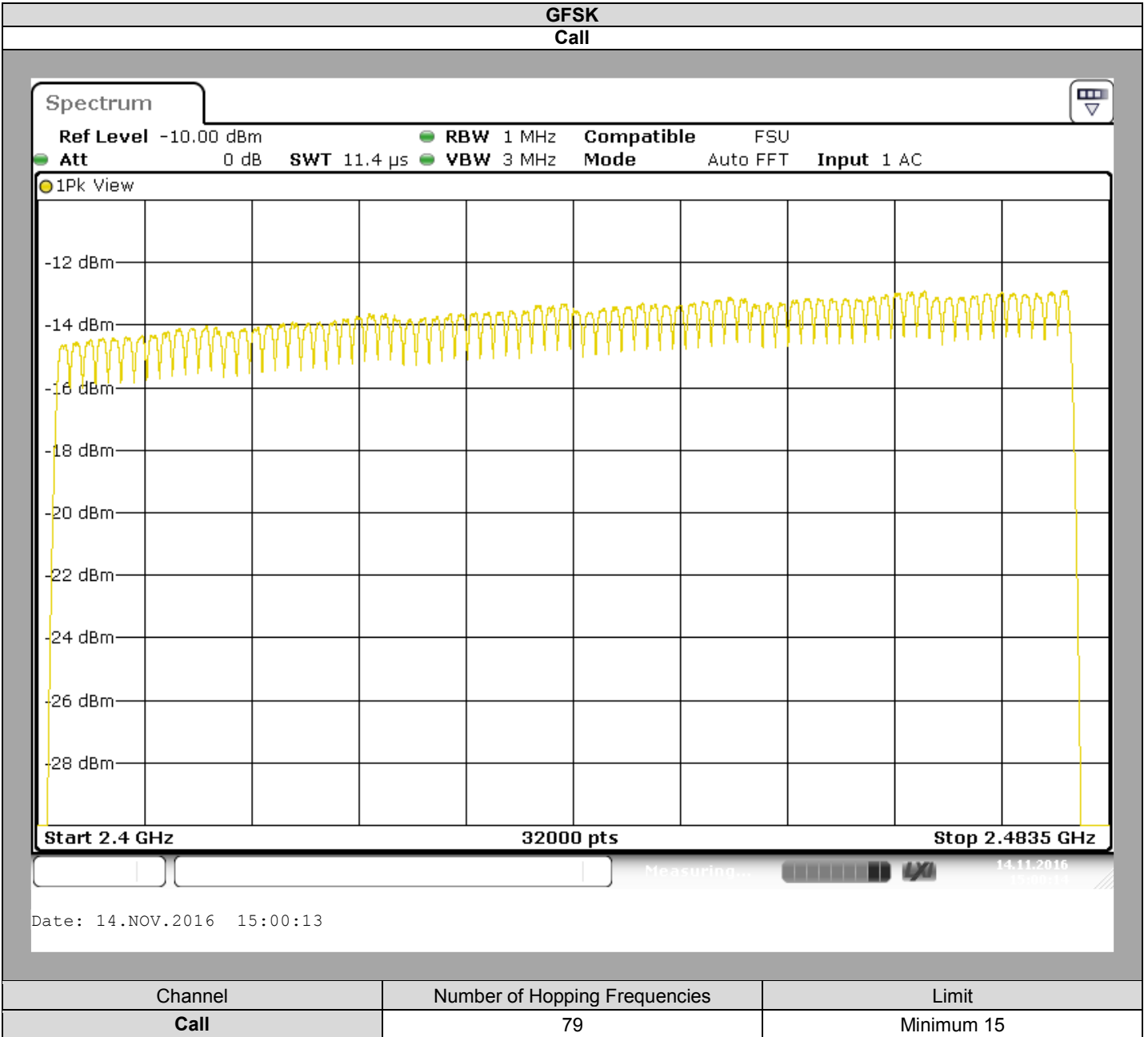
Number of Hopping Frequencies shall be at least 15 channels

5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
Multi-meter	KEITHLEY	2000	A1241084	2016/05	2018/05
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7049006	Verified with calibrated multimeter	Verified with calibrated multimeter
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329674	2016/09	2017/09

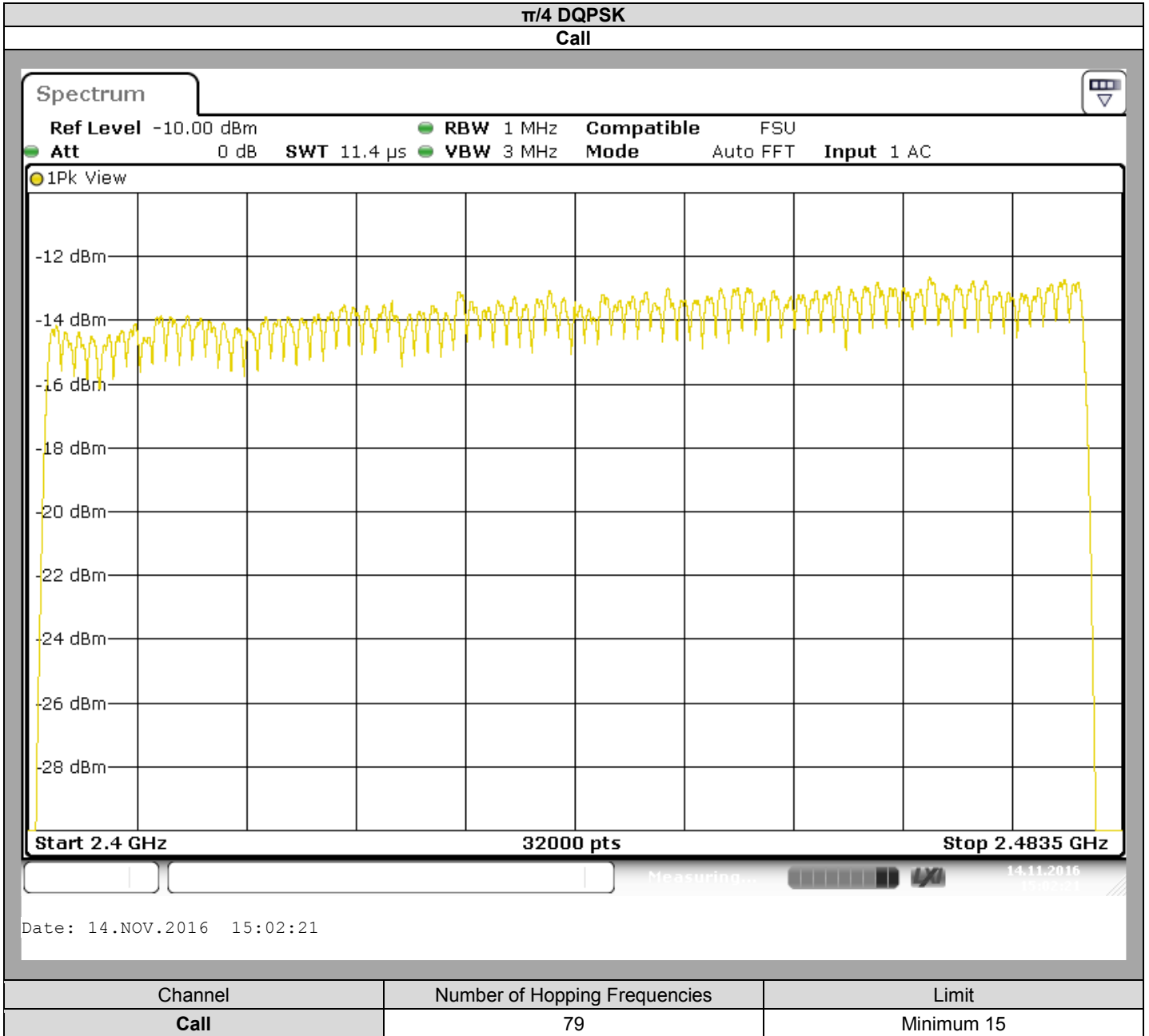
Note: In our quality system, the test equipment calibration due is more & less 2 months

5.5. RESULTS



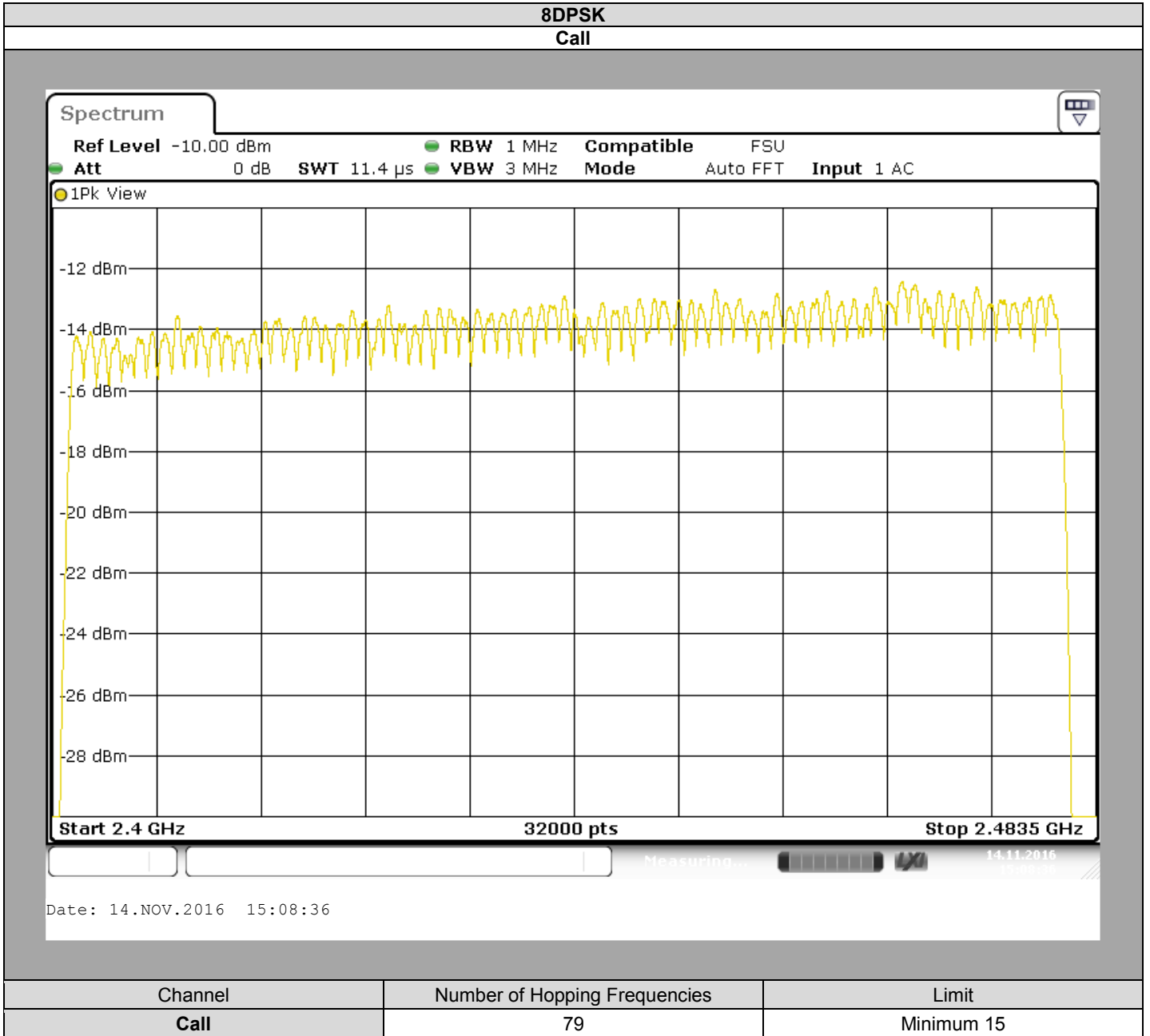


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5.6. CONCLUSION

Number of Frequency Hopping measurement performed on the sample of the product **SAGEMCOM TheBox (253697282)**, SN: **616400107098**, in configuration and description presented in this test report, show levels compliant to the **47 CFR PART 15.247** limits.

6. CARRIER FREQUENCY SEPARATION

6.1. TEST CONDITIONS

Test performed by : Arnaud FAYETTE
Date of test : November 14, 2016
Ambient temperature : 23 °C
Relative humidity : 45 %

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:

- FCC DA 00-705 (Carrier Frequency Separation)
- ANSI C63.10 § 7.8.2



Photograph for Carrier Frequency Separation



6.3. LIMIT

Carrier Frequency Separation shall be at least two-thirds of the 20dB Bandwidth

6.4. TEST EQUIPMENT LIST

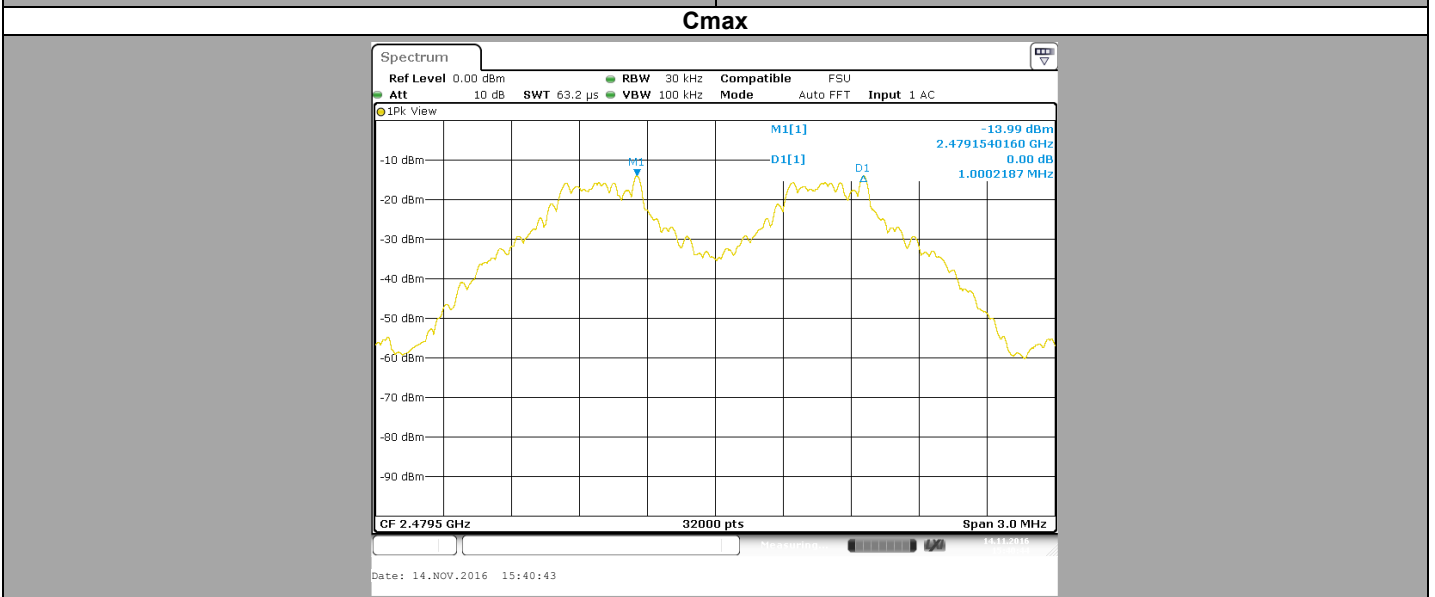
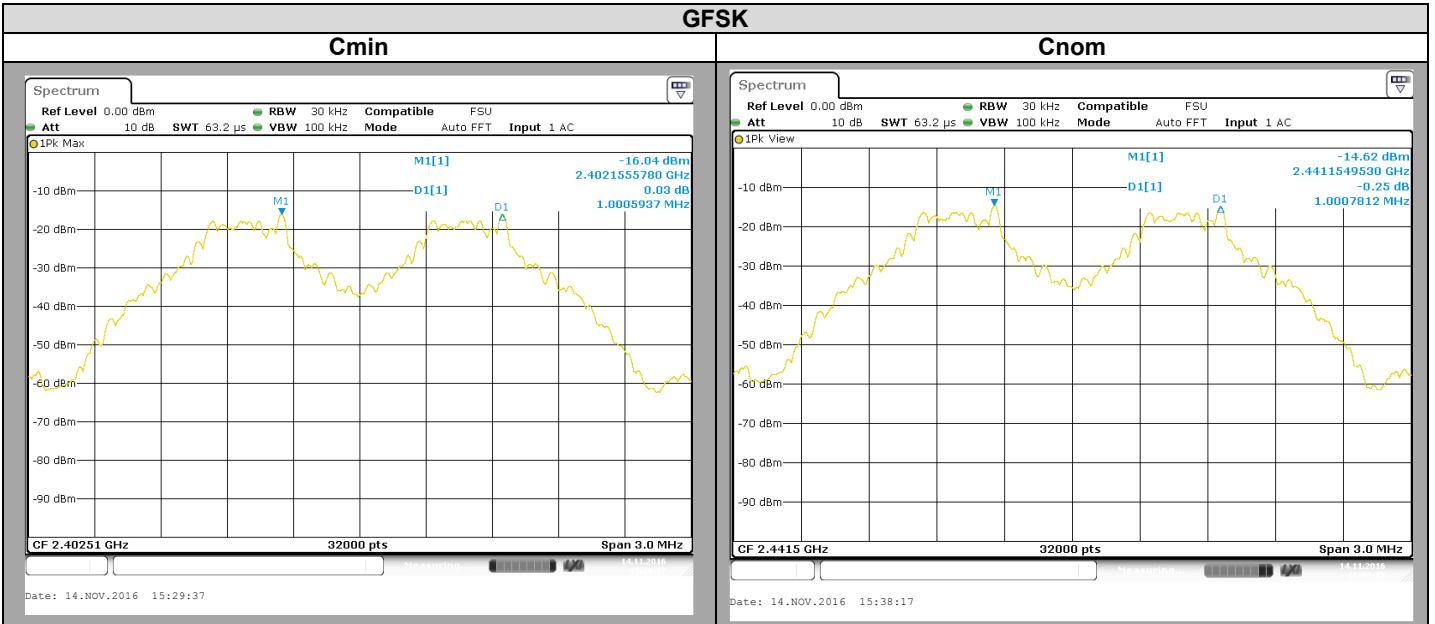
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
Multi-meter	KEITHLEY	2000	A1241084	2016/05	2018/05
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7049006	Verified with calibrated multimeter	Verified with calibrated multimeter
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329674	2016/09	2017/09

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



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6.5. RESULTS

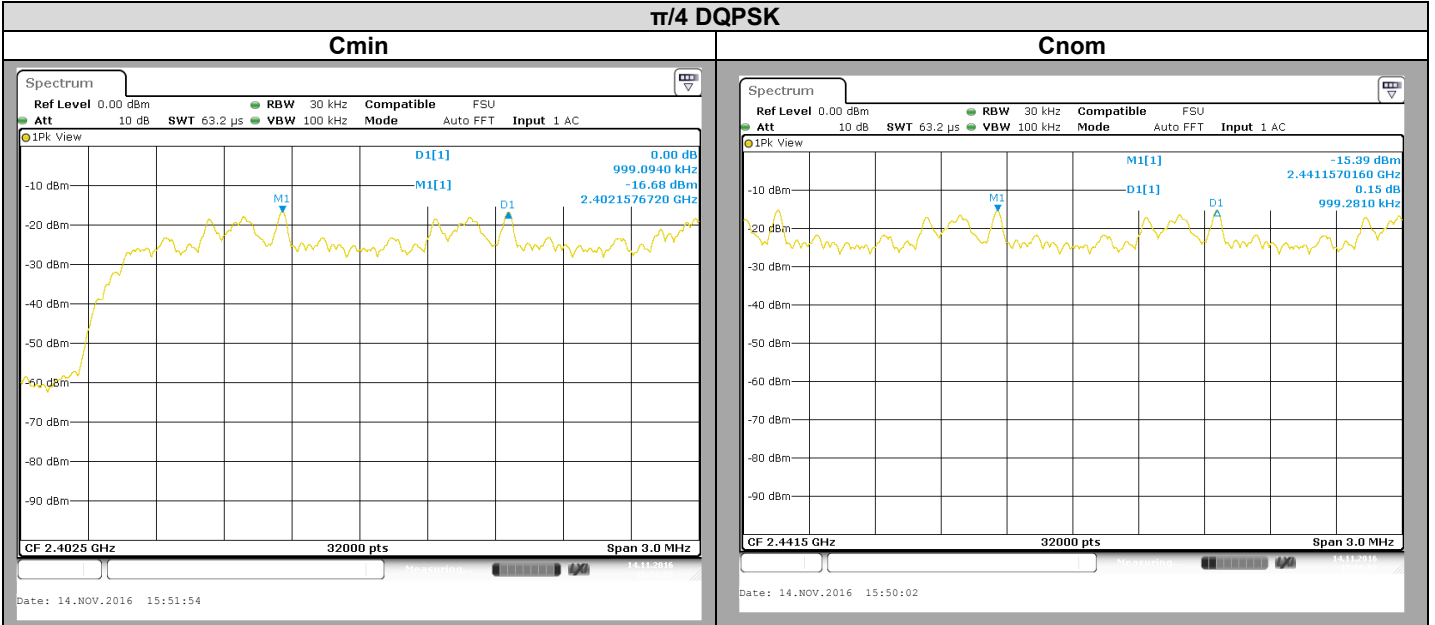


Channel	Carrier Frequency Separation (MHz)	Limit (MHz)
Cmin	1,00	Minimum 2/3 of 20dB Emission Bandwidth
Cnom	1,00	Minimum 2/3 of 20dB Emission Bandwidth
Cmax	1,00	Minimum 2/3 of 20dB Emission Bandwidth

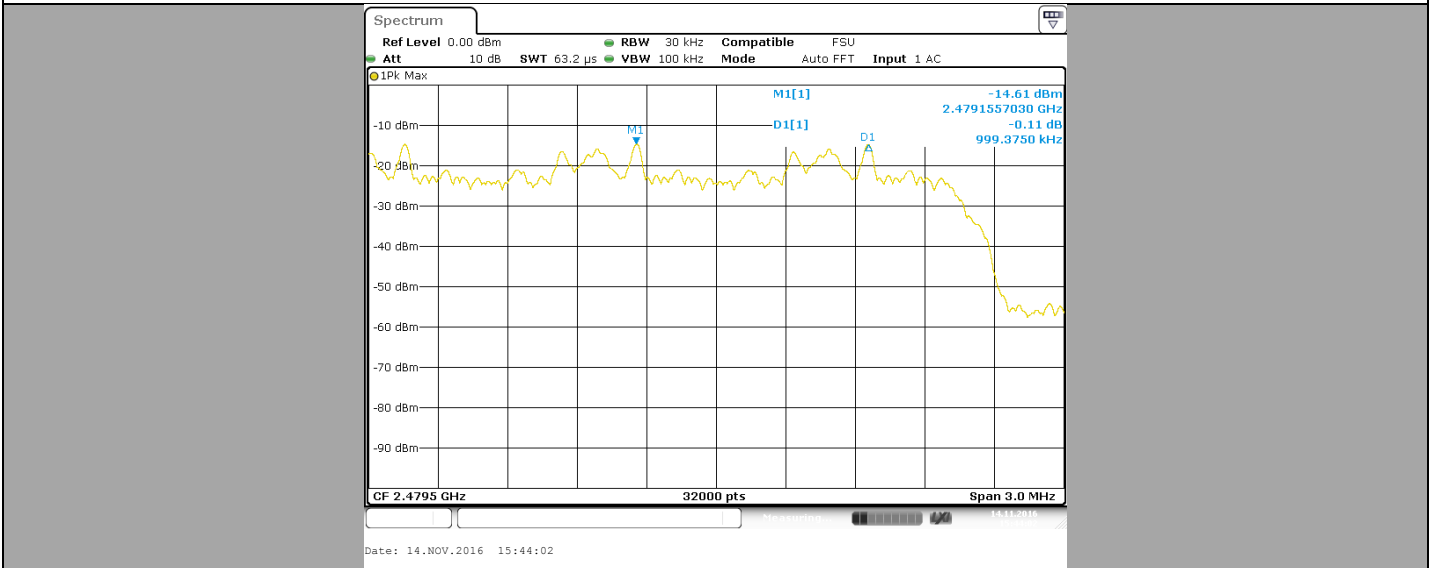


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$\pi/4$ DQPSK



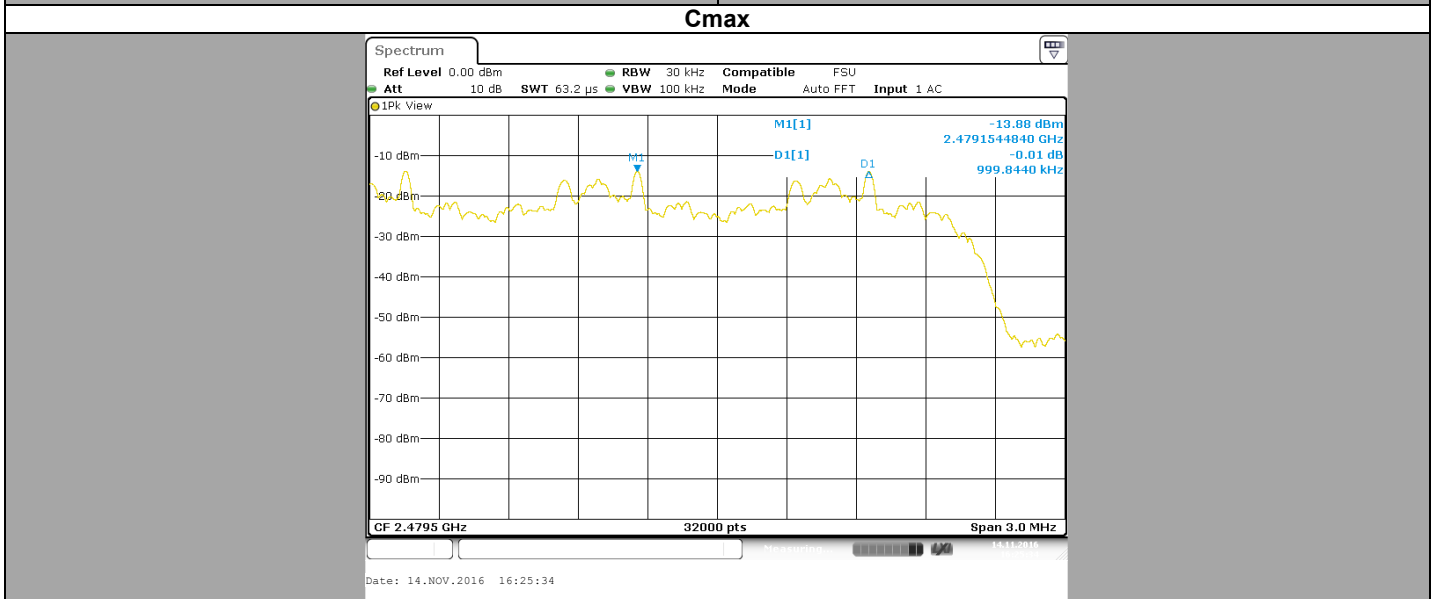
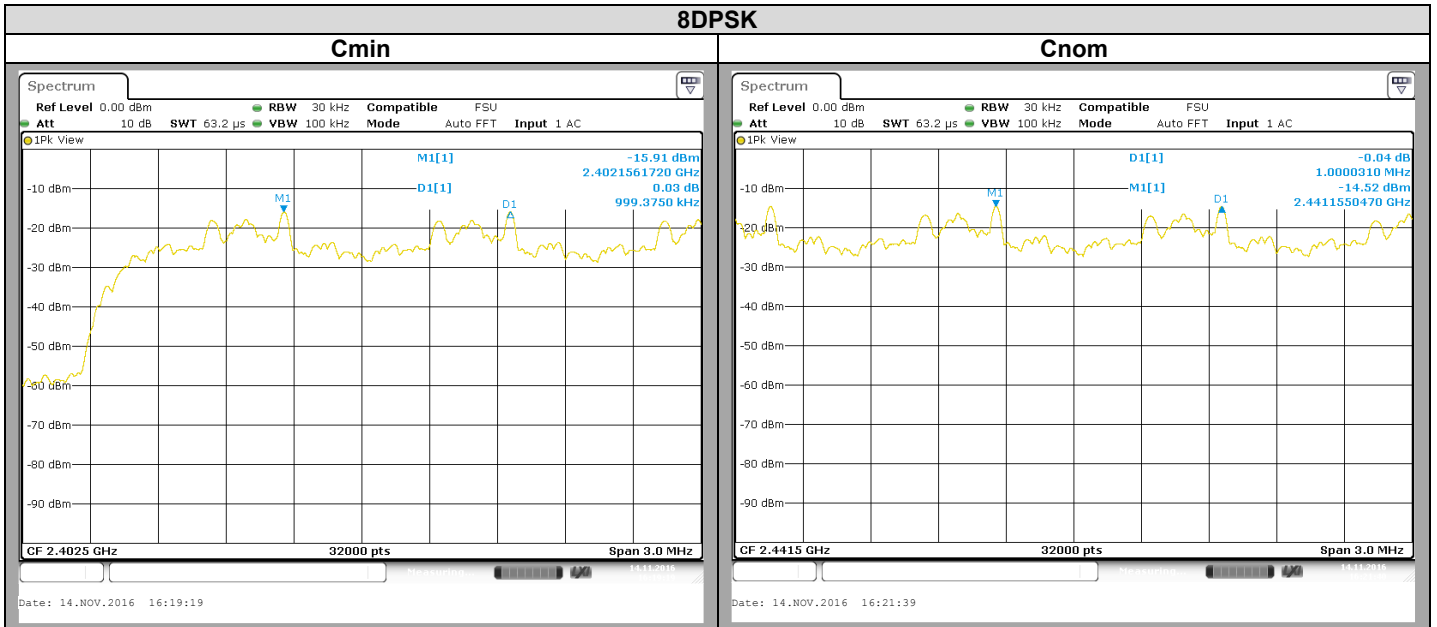
Cmax



Channel	Carrier Frequency Separation (MHz)	Limit (MHz)
Cmin	1,00	Minimum 2/3 of 20dB Emission Bandwidth
Cnom	1,00	Minimum 2/3 of 20dB Emission Bandwidth
Cmax	1,00	Minimum 2/3 of 20dB Emission Bandwidth



L C I E



Channel	Carrier Frequency Separation (MHz)	Limit (MHz)
Cmin	1,00	Minimum 2/3 of 20dB Emission Bandwidth
Cnom	1,00	Minimum 2/3 of 20dB Emission Bandwidth
Cmax	1,00	Minimum 2/3 of 20dB Emission Bandwidth

6.6. CONCLUSION

Carrier Frequency Separation measurement performed on the sample of the product **SAGEMCOM TheBox (253697282)**, SN: **616400107098**, in configuration and description presented in this test report, show levels compliant to the **47 CFR PART 15.247** limits.

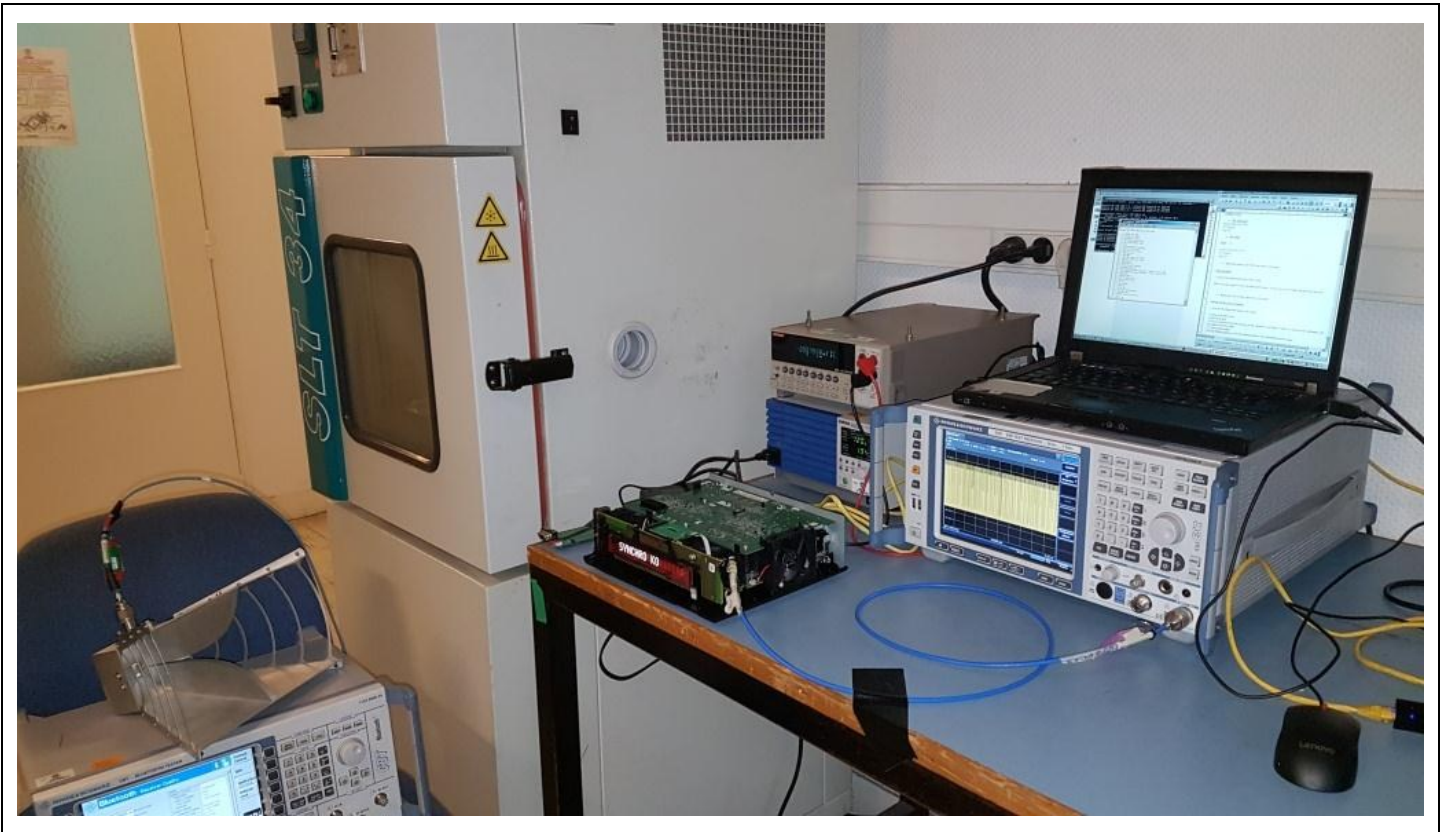
7. TIME OF OCCUPANCY

7.1. TEST CONDITIONS

Test performed by : Arnaud FAYETTE
Date of test : November 14, 2016
Ambient temperature : 23 °C
Relative humidity : 45 %

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:
 - FCC DA 00-705 (Time of Occupancy)
 - ANSI C63.10 § 7.8.4



Photograph for Time of Occupancy



7.3. LIMIT

The Time of Occupancy shall not exceed 0.4s within any period of 0.4s multiplied by the number of hopping channels employed

7.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
Multi-meter	KEITHLEY	2000	A1241084	2016/05	2018/05
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7049006	Verified with calibrated multimeter	Verified with calibrated multimeter
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329674	2016/09	2017/09

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

7.5. RESULTS

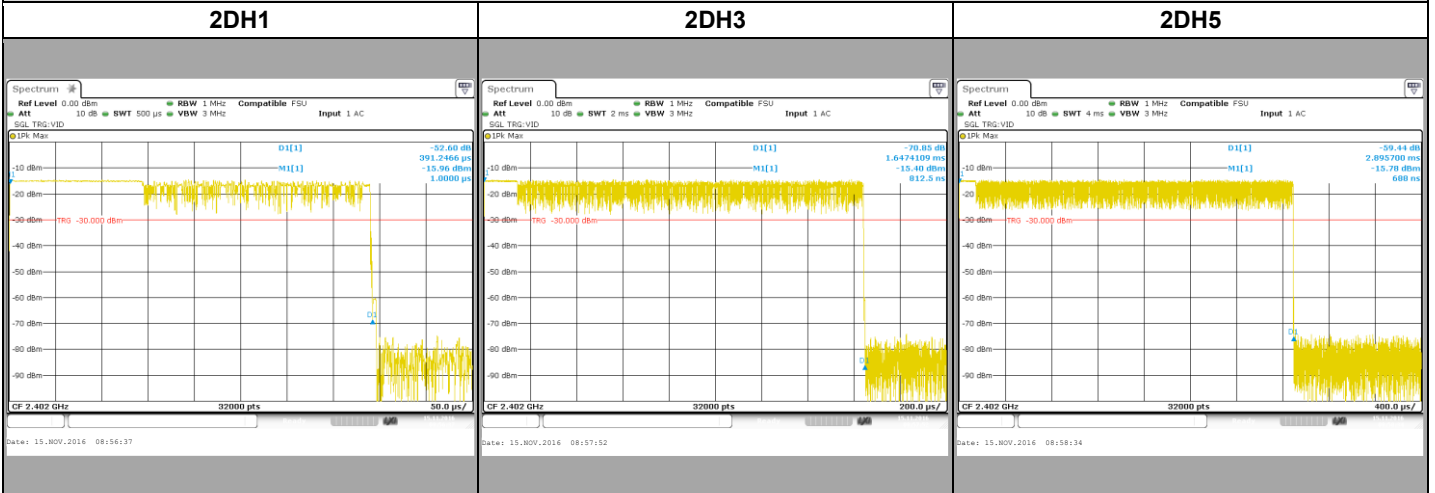




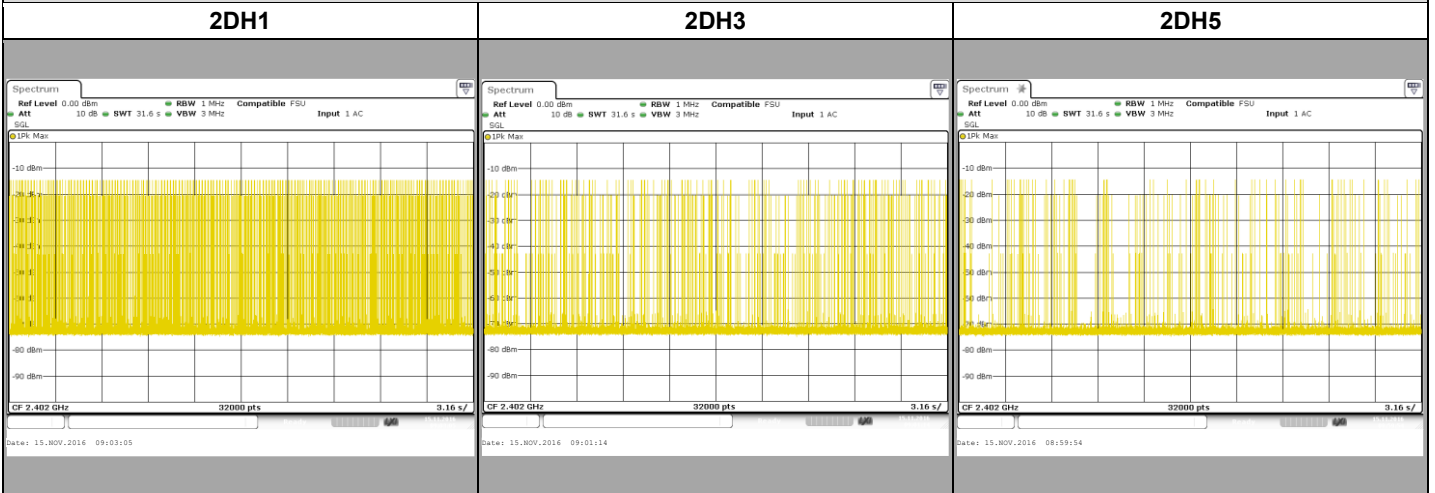
L C I E

Burst Length

$\pi/4$ DQPSK



Time of Occupancy



Packet Type	Burst Length (ms)	Number of Hopping during Time of Occupancy	Time of Occupancy (ms)	Limit of Time of Occupancy (ms)
2DH1	0,391	330	129,03	400
2DH3	1,647	160	263,52	400
2DH5	2,896	62	179,552	400



L C I E



7.6. CONCLUSION

Time of Occupancy measurement performed on the sample of the product **SAGEMCOM TheBox (253697282)**, SN: **616400107098**, in configuration and description presented in this test report, show levels compliant to the **47 CFR PART 15.247** limits.

8. DUTY CYCLE

8.1. TEST CONDITIONS

Test performed by : Arnaud FAYETTE
Date of test : November 15, 2016
Ambient temperature : 23 °C
Relative humidity : 45 %

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:
 - ANSI C63.10 § 11.6



Photograph for Duty Cycle

8.3. LIMIT

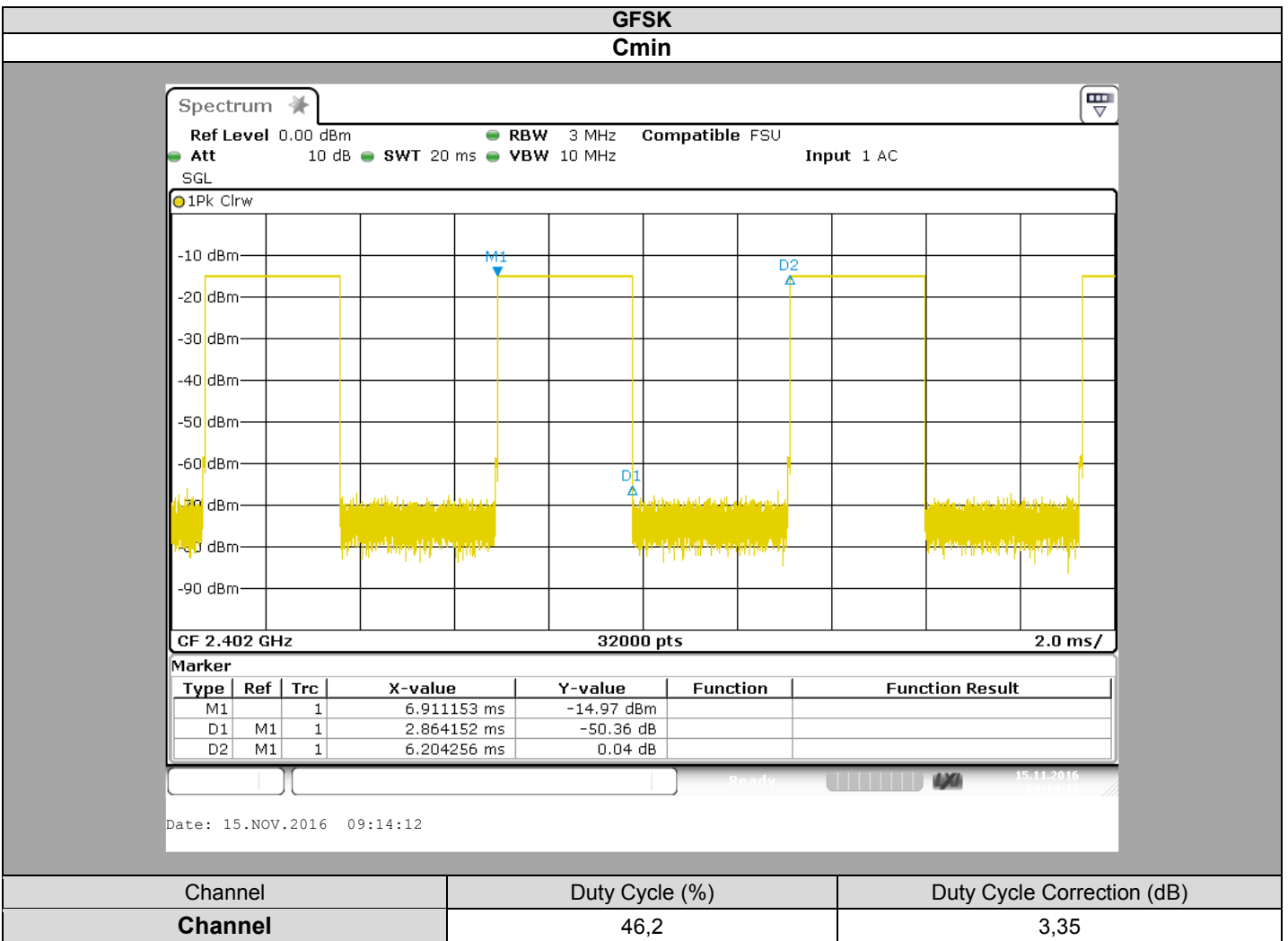
None

8.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
Multi-meter	KEITHLEY	2000	A1241084	2016/05	2018/05
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7049006	Verified with calibrated multimeter	Verified with calibrated multimeter
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329674	2016/09	2017/09

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

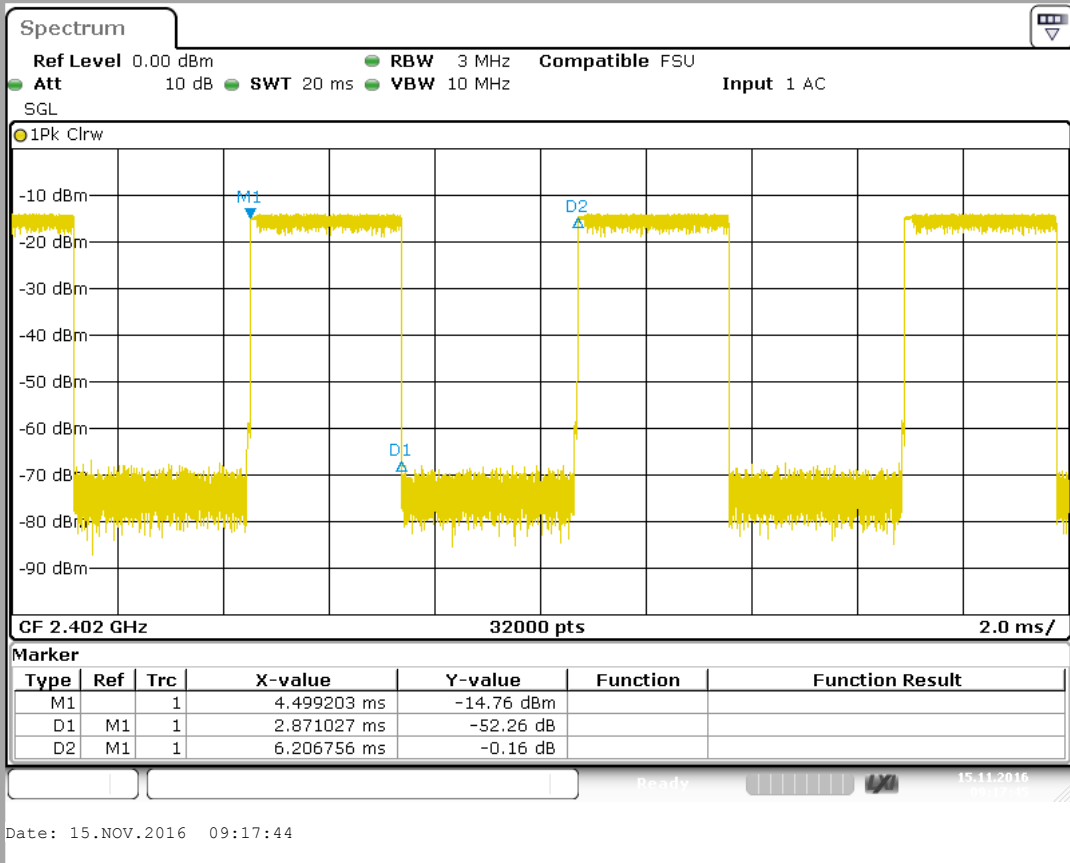
8.5. RESULTS





L C I E

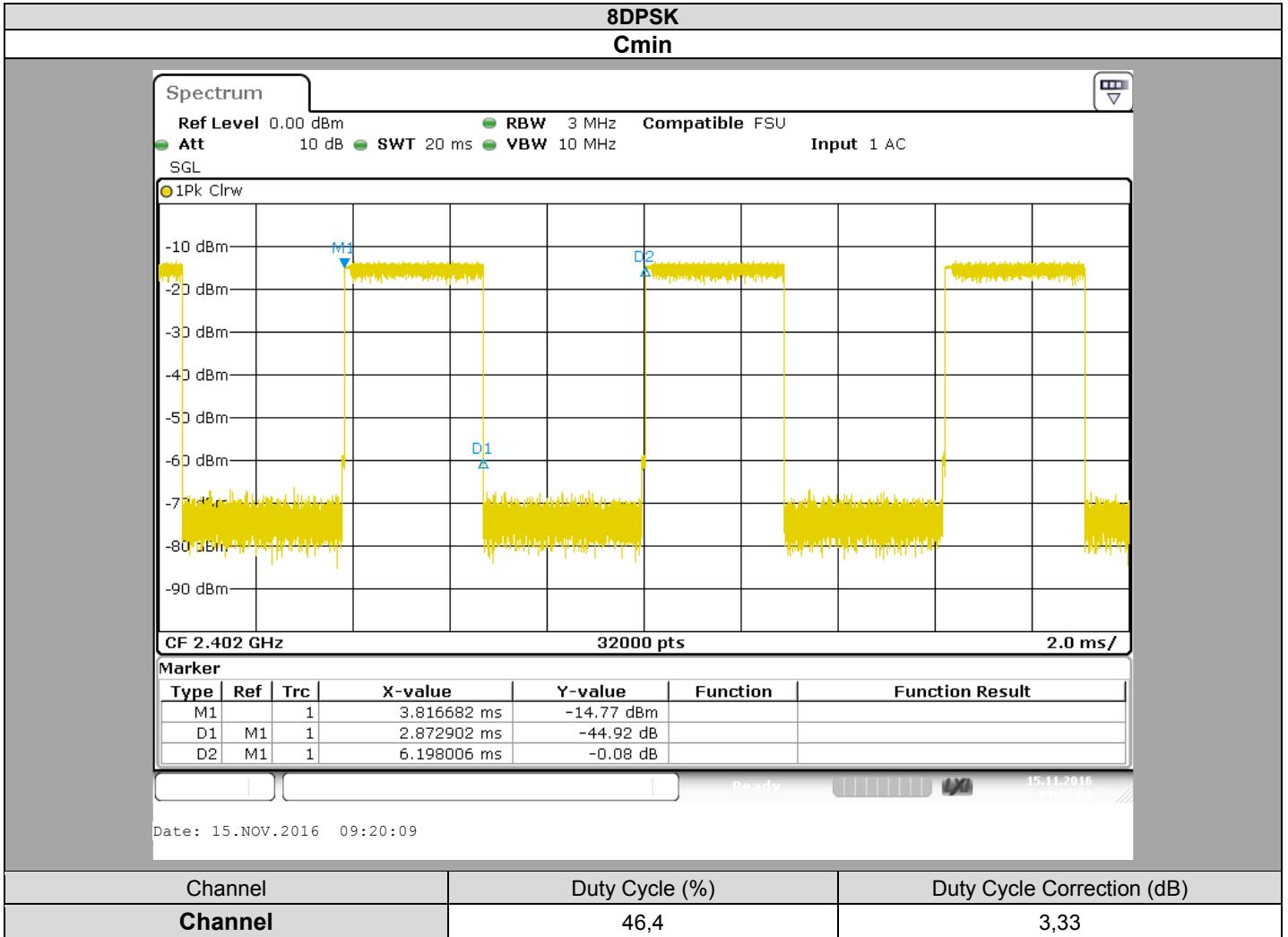
**$\pi/4$ DQPSK
Cmin**



Channel	Duty Cycle (%)	Duty Cycle Correction (dB)
Channel	46,2	3,35



L C I E



8.6. CONCLUSION

Duty Cycle measurement performed on the sample of the product **SAGEMCOM TheBox (253697282)**, SN: **616400107098**, in configuration and description presented in this test report, show levels **compliant to the 47 CFR PART 15.247** limits.

9. MAXIMUM CONDUCTED OUTPUT POWER

9.1. TEST CONDITIONS

Test performed by : Arnaud FAYETTE
Date of test : November 15, 2016
Ambient temperature : 23 °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:

- FCC DA 00-705 (Peak Output Power)
- ANSI C63.10 § 7.8.5



Photograph for Maximum Conducted Output Power



9.3. LIMIT

Maximum Conducted Output power:
Shall not exceed 21dBm
Limits are reduced by G-6dBi if Antenna Gain above 6dBi

9.4. TEST EQUIPMENT LIST

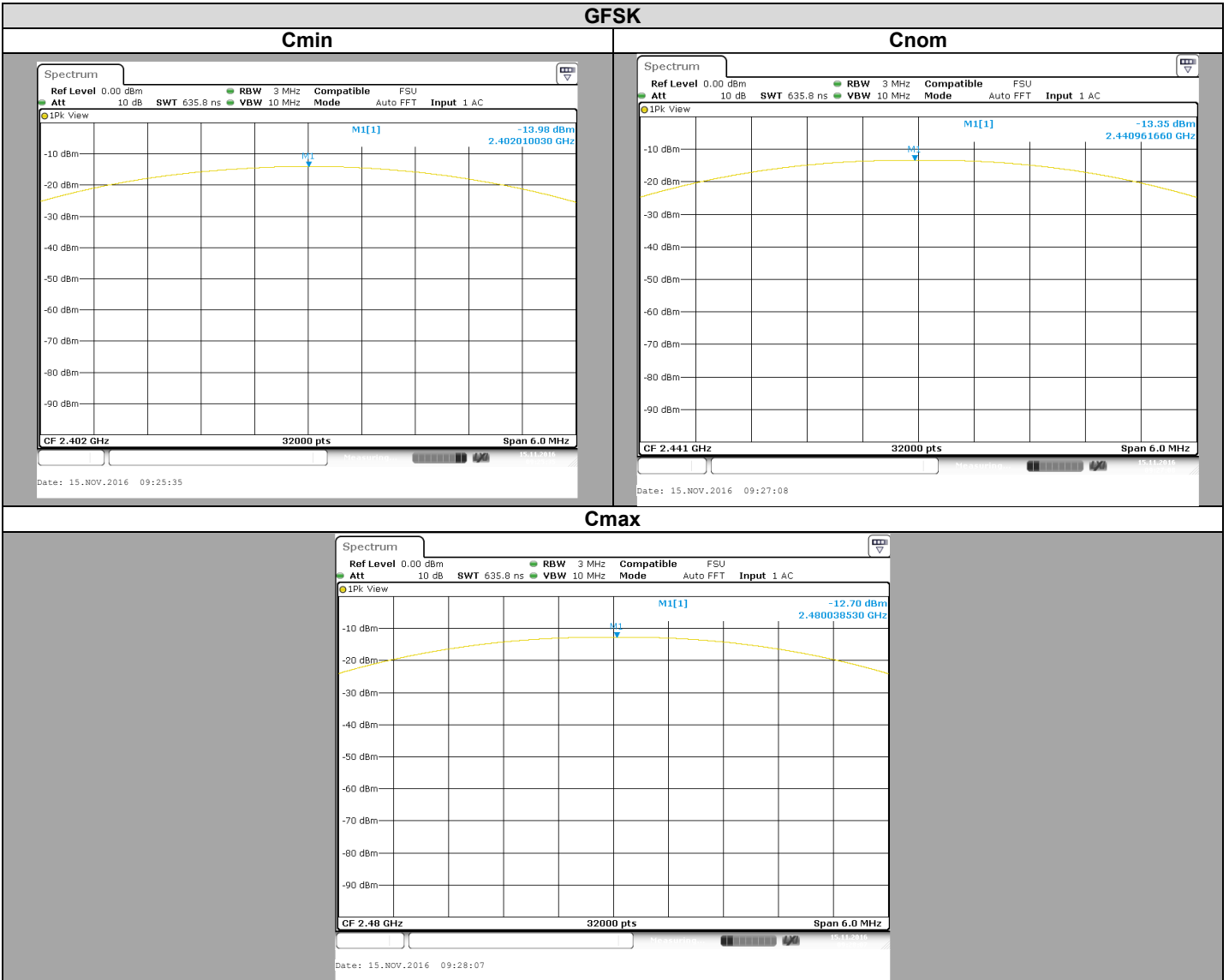
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
Multi-meter	KEITHLEY	2000	A1241084	2016/05	2018/05
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7049006	Verified with calibrated multimeter	Verified with calibrated multimeter
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329674	2016/09	2017/09

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



L C I E

9.5. RESULTS



Channel	Maximum Conducted Power without offset (dBm)	Offset Cable + Att (dB)	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Limit (dBm)
Cmin	-13,98	21,4	2.6	7,42	21dBm. Reduced by G-6dBi if Antenna Gain above 6dBi
Cnom	-13,35	21,4	2.6	8,05	21dBm. Reduced by G-6dBi if Antenna Gain above 6dBi
Cmax	-12,70	21,4	2.6	8,7	21dBm. Reduced by G-6dBi if Antenna Gain above 6dBi

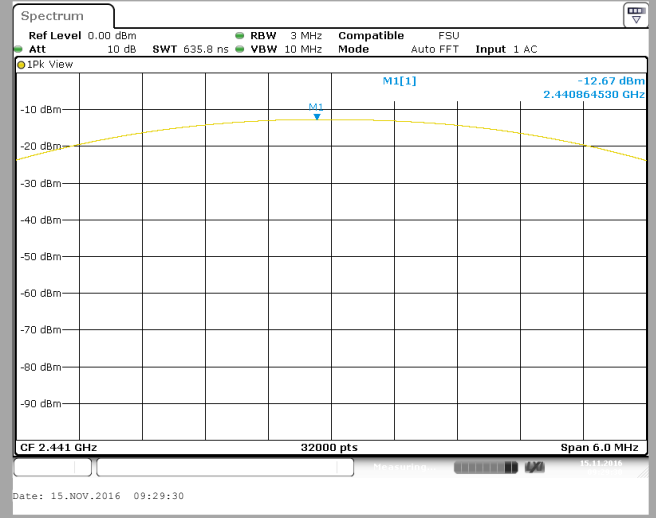
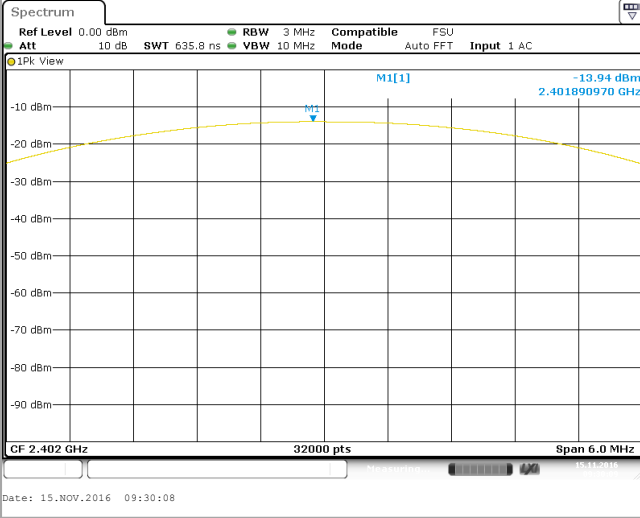


L C I E

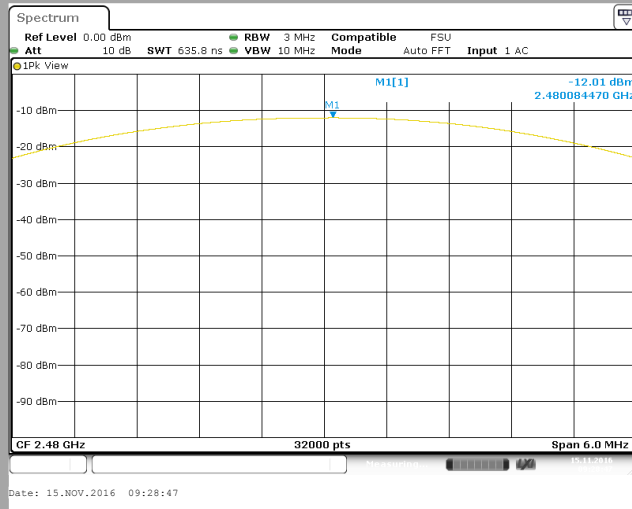
$\pi/4$ DQPSK

Cmin

Cnom



Cmax



Channel	Maximum Conducted Power without offset (dBm)	Offset Cable + Att (dB)	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Limit (dBm)
Cmin	-13,94	21,4	2.6	7,46	21dBm. Reduced by G-6dBi if Antenna Gain above 6dBi
Cnom	-12,67	21,4	2.6	8,73	21dBm. Reduced by G-6dBi if Antenna Gain above 6dBi
Cmax	-12,01	21,4	2.6	9,39	21dBm. Reduced by G-6dBi if Antenna Gain above 6dBi

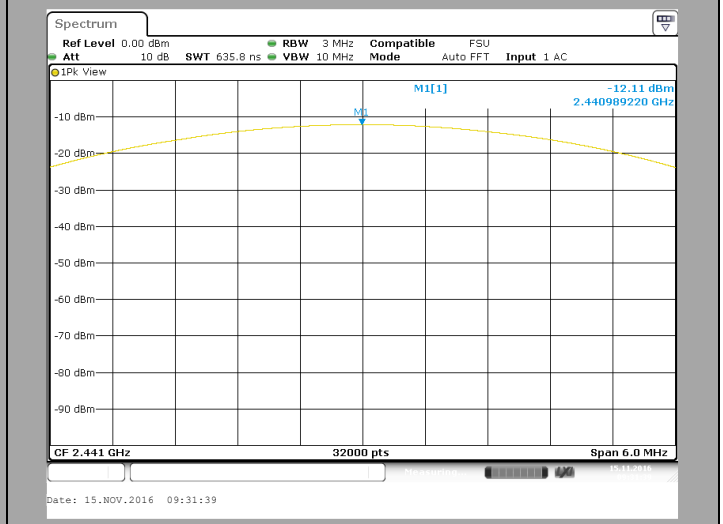
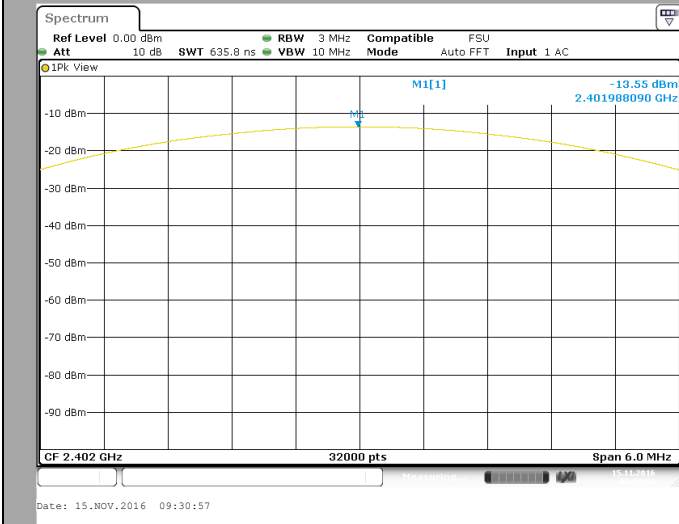


L C I E

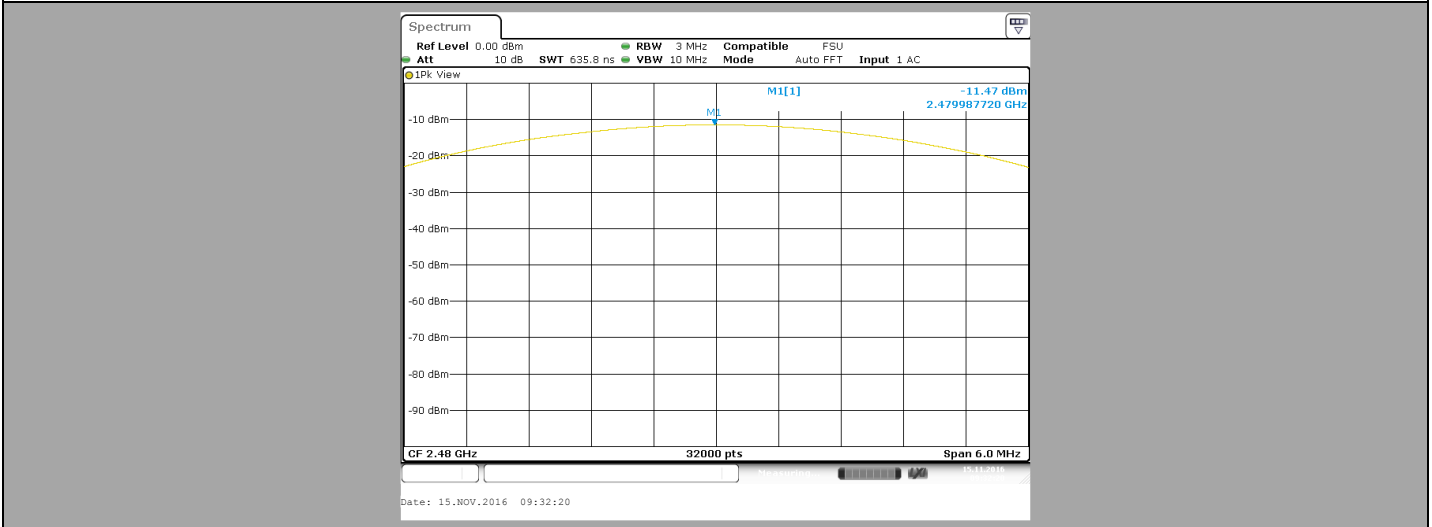
8DPSK

Cmin

Cnom



Cmax



Channel	Maximum Conducted Power without offset (dBm)	Offset Cable + Att (dB)	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Limit (dBm)
Cmin	-13,55	21,4	2.6	7,85	21dBm. Reduced by G-6dBi if Antenna Gain above 6dBi
Cnom	-12,11	21,4	2.6	9,29	21dBm. Reduced by G-6dBi if Antenna Gain above 6dBi
Cmax	-11,47	21,4	2.6	9,93	21dBm. Reduced by G-6dBi if Antenna Gain above 6dBi

9.6. CONCLUSION

Maximum Conducted Output Power measurement performed on the sample of the product **SAGEMCOM TheBox (253697282)**, SN: **616400107098**, in configuration and description presented in this test report, show levels compliant to the 47 CFR PART 15.247 limits.

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

10.1. TEST CONDITIONS

Test performed by : Arnaud FAYETTE
Date of test : November 15, 2016
Ambient temperature : 23 °C
Relative humidity : 45 %

10.2. TEST SETUP

- The Equipment Under Test is installed:

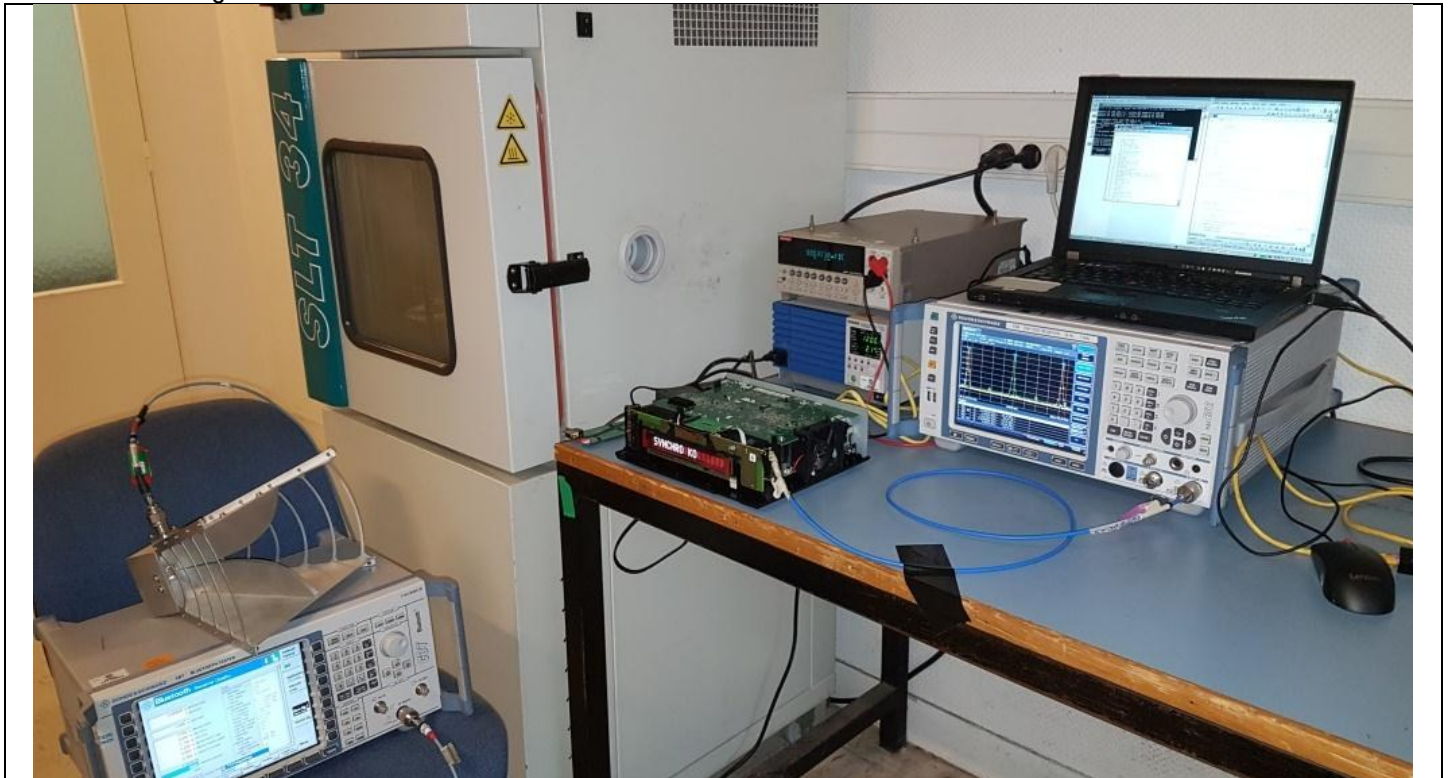
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

- FCC DA 00-705 (Band-edge Compliance of RF Conducted Emissions)
- ANSI C63.10 § 7.8.6



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



10.3. LIMIT

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

10.4. TEST EQUIPMENT LIST

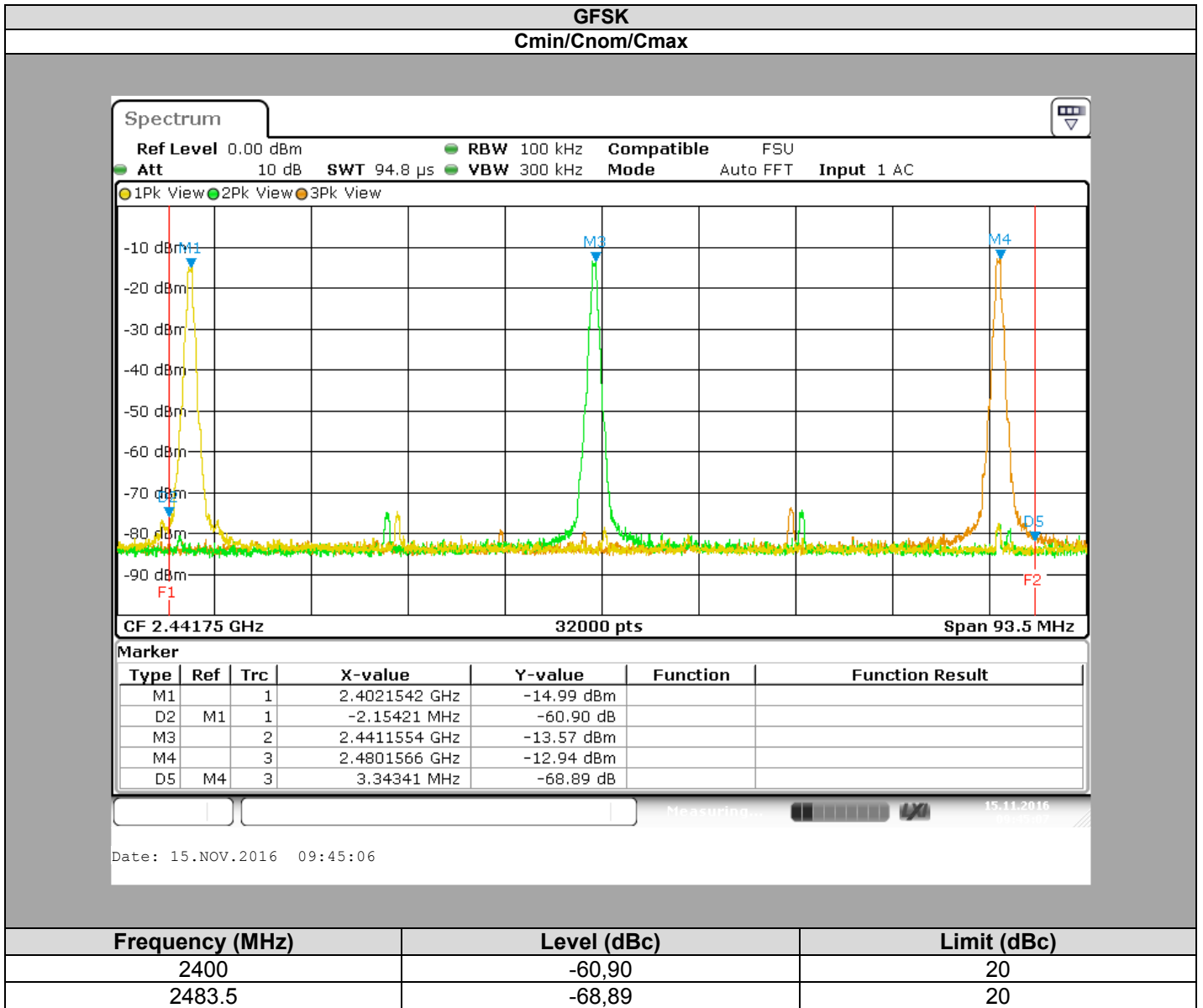
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
Multi-meter	KEITHLEY	2000	A1241084	2016/05	2018/05
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7049006	Verified with calibrated multimeter	Verified with calibrated multimeter
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329674	2016/09	2017/09

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



L C I E

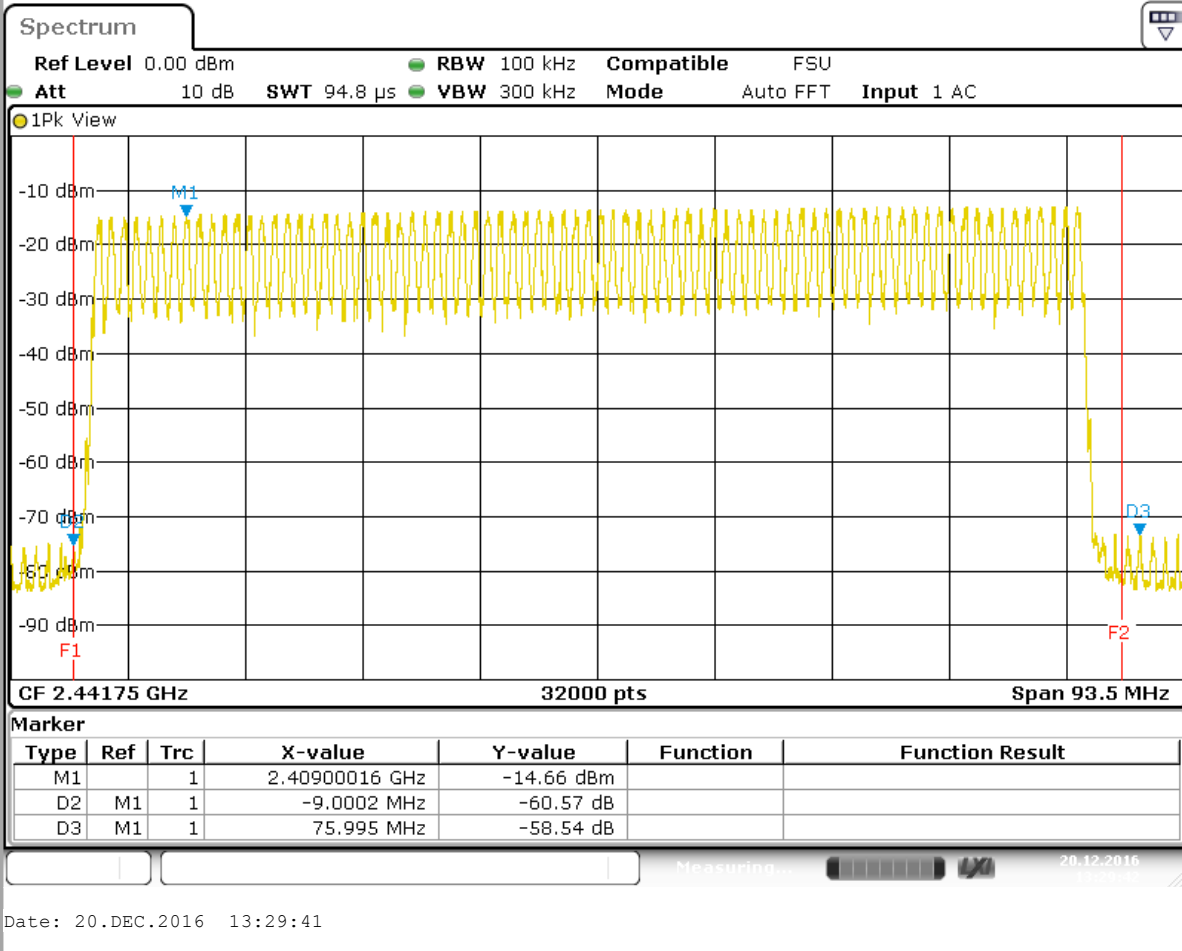
10.5. RESULTS





L C I E

**GFSK
Call**

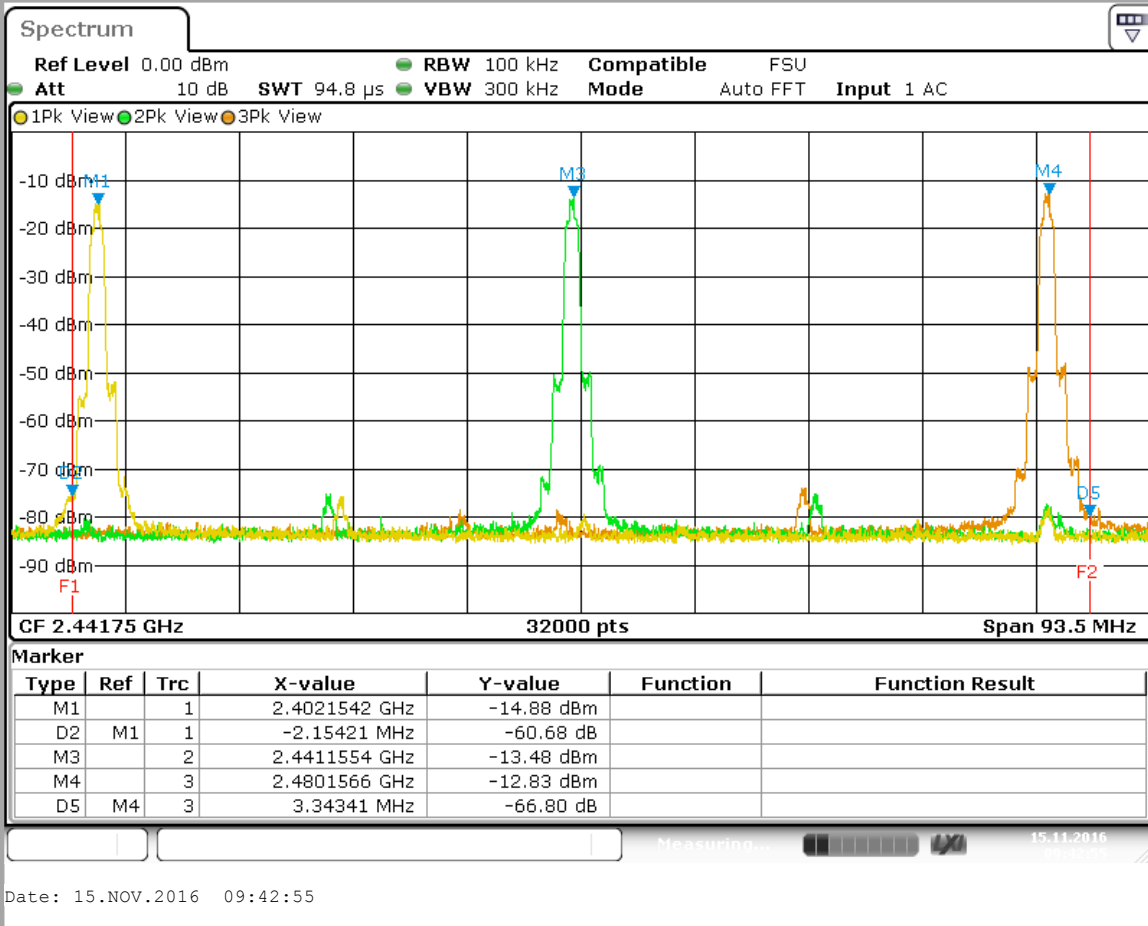


Frequency (MHz)	Level (dBc)	Limit (dBc)
2400	-60,57	20
2483.5	-58,54	20



L C I E

π/4 DQPSK
Cmin/Cnom/Cmax

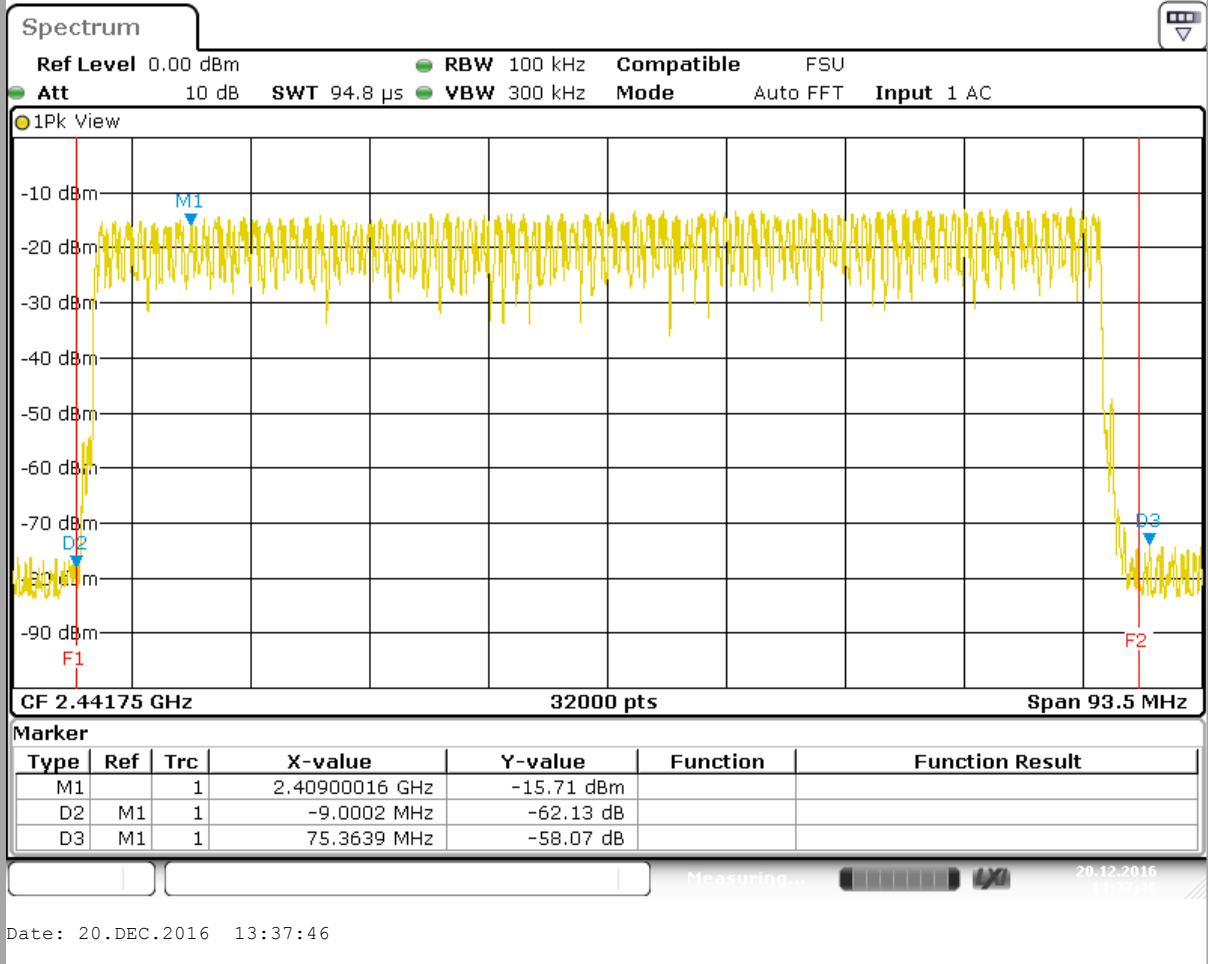


Frequency (MHz)	Level (dBc)	Limit (dBc)
2400	-60,68	20
2483.5	-66,80	20



L C I E

π/4 DQPSK
Call



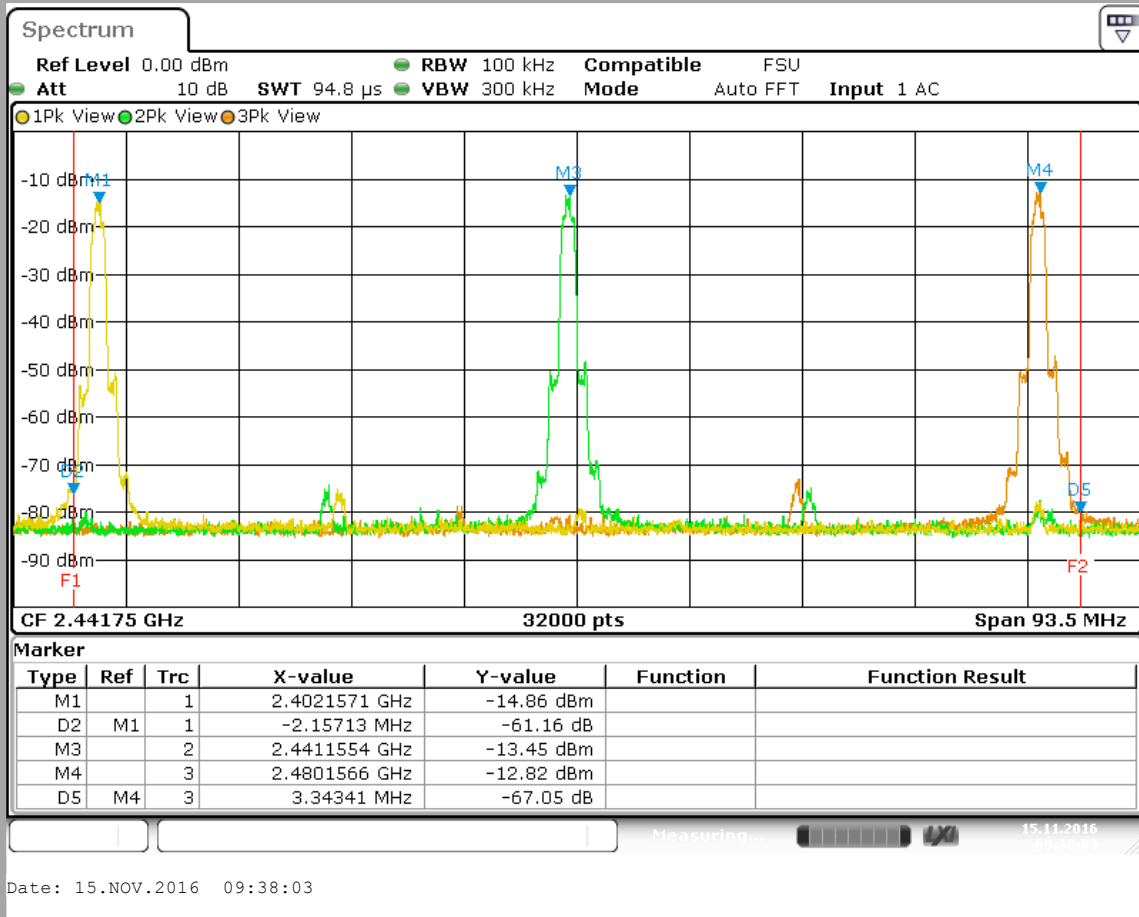
Frequency (MHz)	Level (dBc)	Limit (dBc)
2400	-62,13	20
2483.5	-58,07	20



L C I E

8DPSK

Cmin/Cnom/Cmax



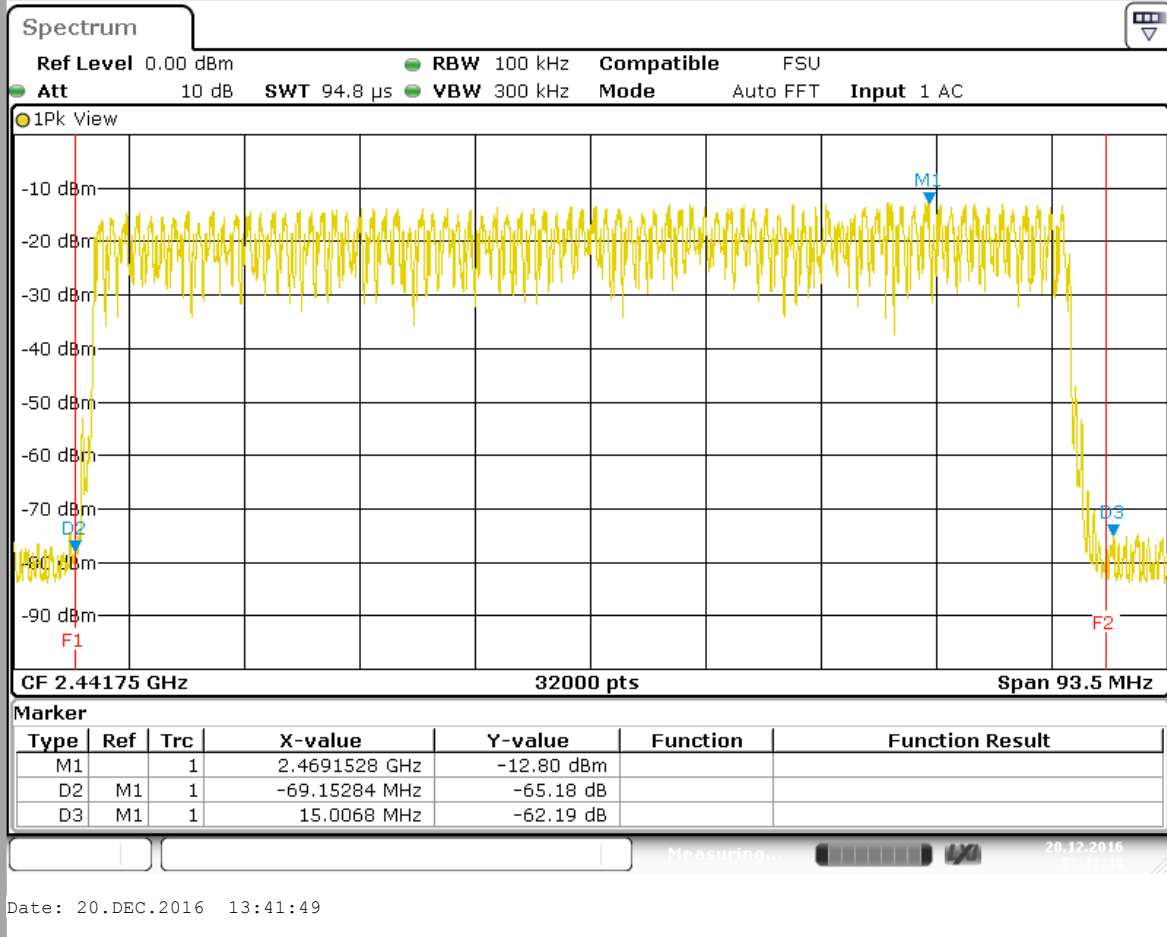
Frequency (MHz)	Level (dBc)	Limit (dBc)
2400	-61,16	20
2483.5	-67,05	20



L C I E

8DPSK

Call



Frequency (MHz)	Level (dBc)	Limit (dBc)
2400	-65,18	20
2483.5	-62,19	20

10.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands at the band edge measurement performed on the sample of the product **SAGEMCOM TheBox (253697282)**, SN: **616400107098**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247** limits.

11. UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS

11.1. TEST CONDITIONS

Test performed by : Mathieu CERISIER
Date of test : November 10, 2016
Ambient temperature : 24 °C
Relative humidity : 41 %

11.2. 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:

- FCC DA 00-705 (Spurious RF Conducted Emissions)
- ANSI C63.10 § 7.8.8



Photograph for Unwanted Emission into non-restricted frequency bands



11.3. LIMIT

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

11.4. TEST EQUIPMENT LIST

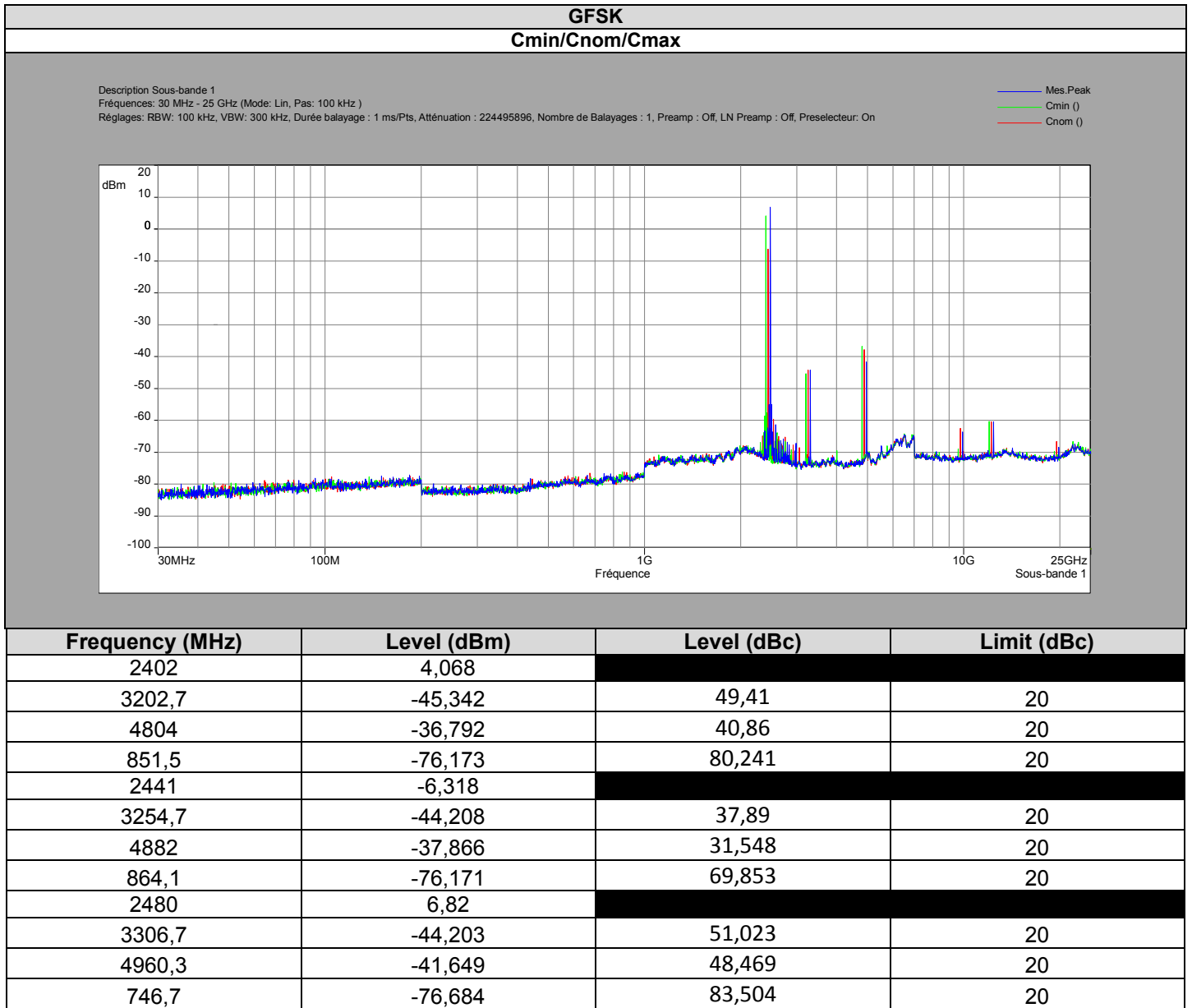
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESI40 1088 740K40	A2642010	2016/07	2017/07
Measurement RF cable	Télédynne	Cordon 082-5454-1.5mtr	A5329624	2016/08	2018/08
Rejector filter 2,4GHz	-	2.45GHz	A7484048	2016/08	2018/08
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7040079	2016/06	2018/06

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



L C I E

11.5. RESULTS





L C I E

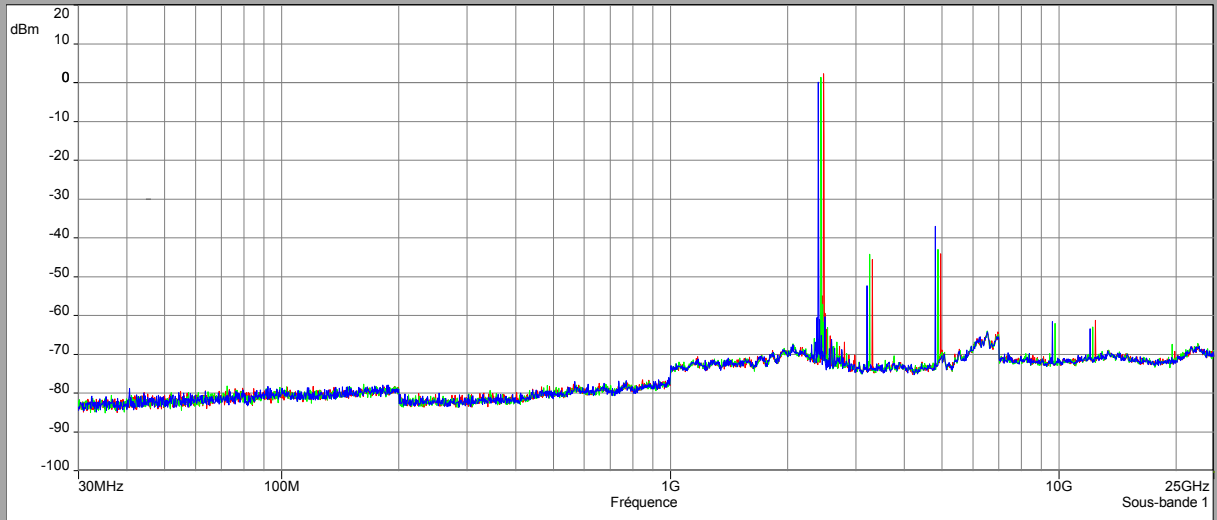
$\pi/4$ DQPSK
Cmin/Cnom/Cmax

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 : 271328272, Nombre de Balayages : 1, Preamp : Off, LN Preamp : Off, Preselecteur: On

Mes.Peak
Cnom ()
Cmax ()

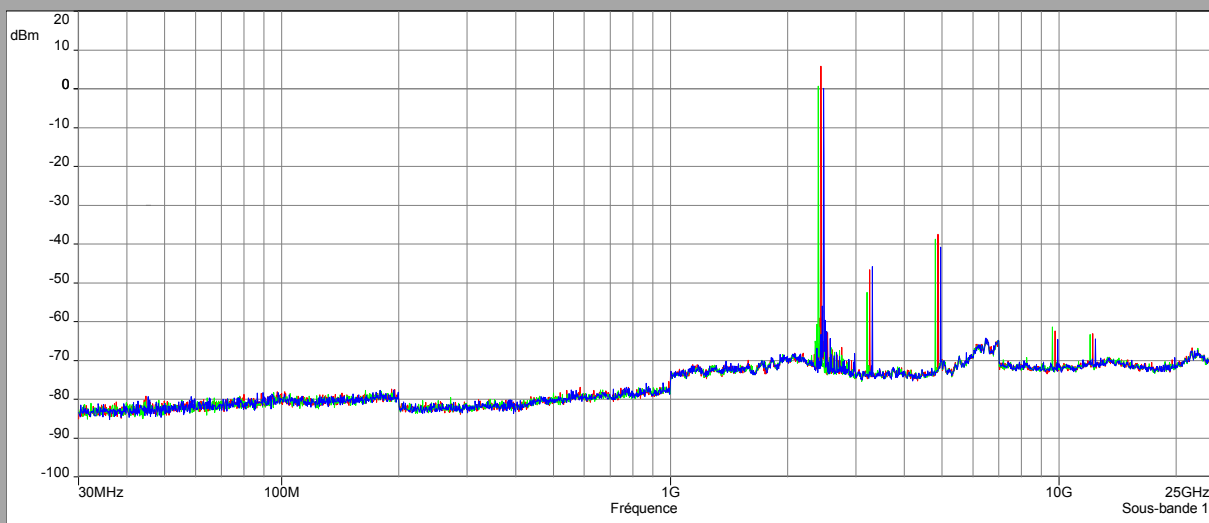


Frequency (MHz)	Level (dBm)	Level (dBc)	Limit (dBc)
2402	0,172		
3202,6	-52,367	52,539	20
4804	-37,03	37,202	20
768,7	-76,804	76,976	20
2441	1,435		
3254,7	-44,208	45,643	20
4882	-42,908	44,343	20
883,3	-76,907	78,342	20
2480	2,342		
3306,7	-45,577	47,919	20
4960	-44,059	46,401	20
848,1	-76,544	78,886	20

8DPSK
Cmin/Cnom/Cmax

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 : 231941328, Nombre de Balayages : 1, Preamp : Off, LN Preamp : Off, Preselecteur: On

Mes.Peak
Cmin ()
Cnom ()



Frequency (MHz)	Level (dBm)	Level (dBc)	Limit (dBc)
2402	0,644		
3206,6	-52,495	53,139	20
4804	-38,746	39,39	20
870,2	-76,91	77,554	20
2441	5,877		
3254,7	-44,586	50,463	20
4882,3	-37,496	43,373	20
780,6	-76,926	82,803	20
2480	0,18		
3306,7	-45,826	46,006	20
4960	-40,775	40,955	20
866	-75,92	76,1	20

11.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands measurement performed on the sample of the product **SAGEMCOM TheBox (253697282)**, SN: **616400107098**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247** limits.

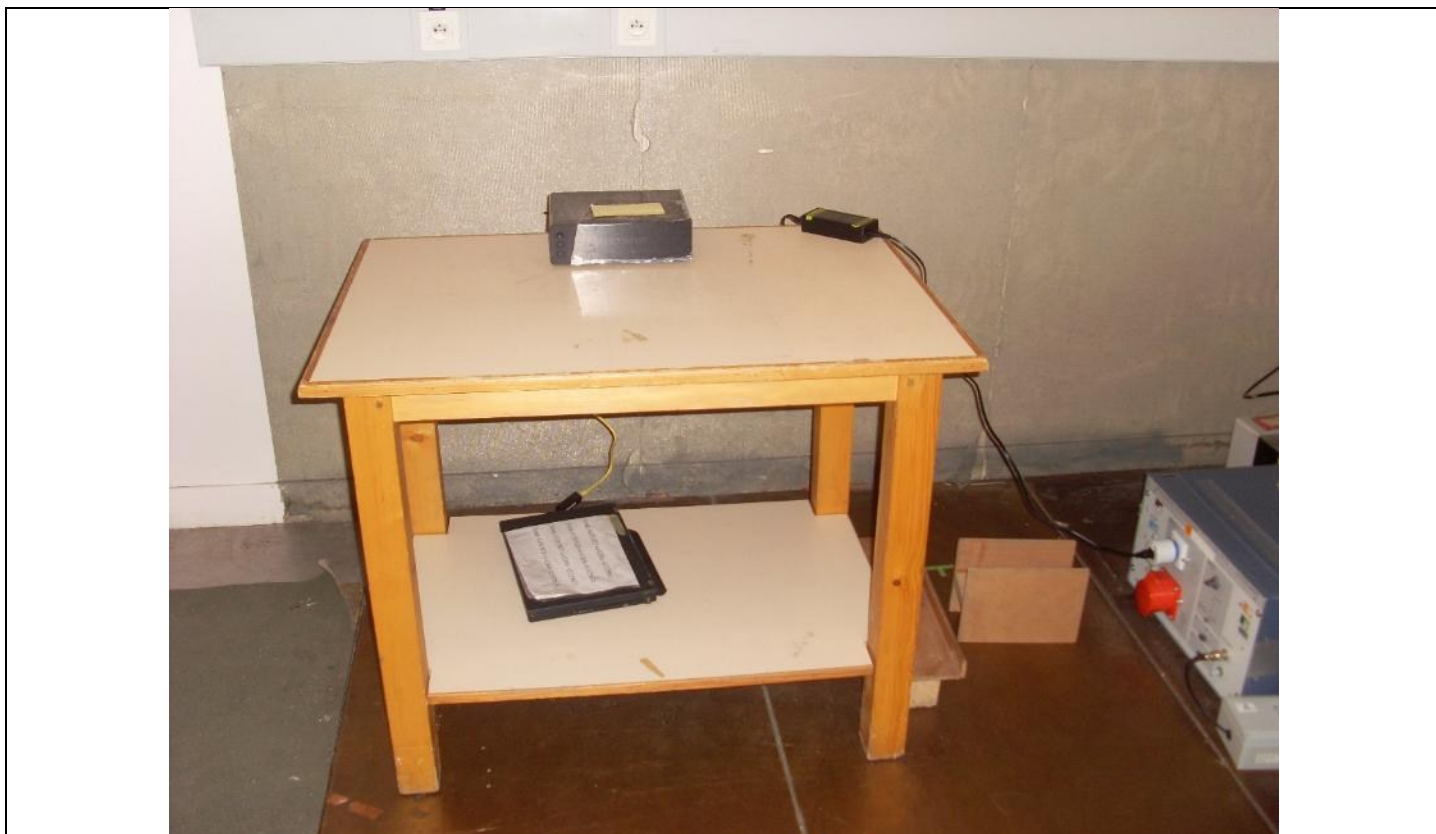
12. AC POWER LINE CONDUCTED EMISSIONS

12.1. TEST CONDITIONS

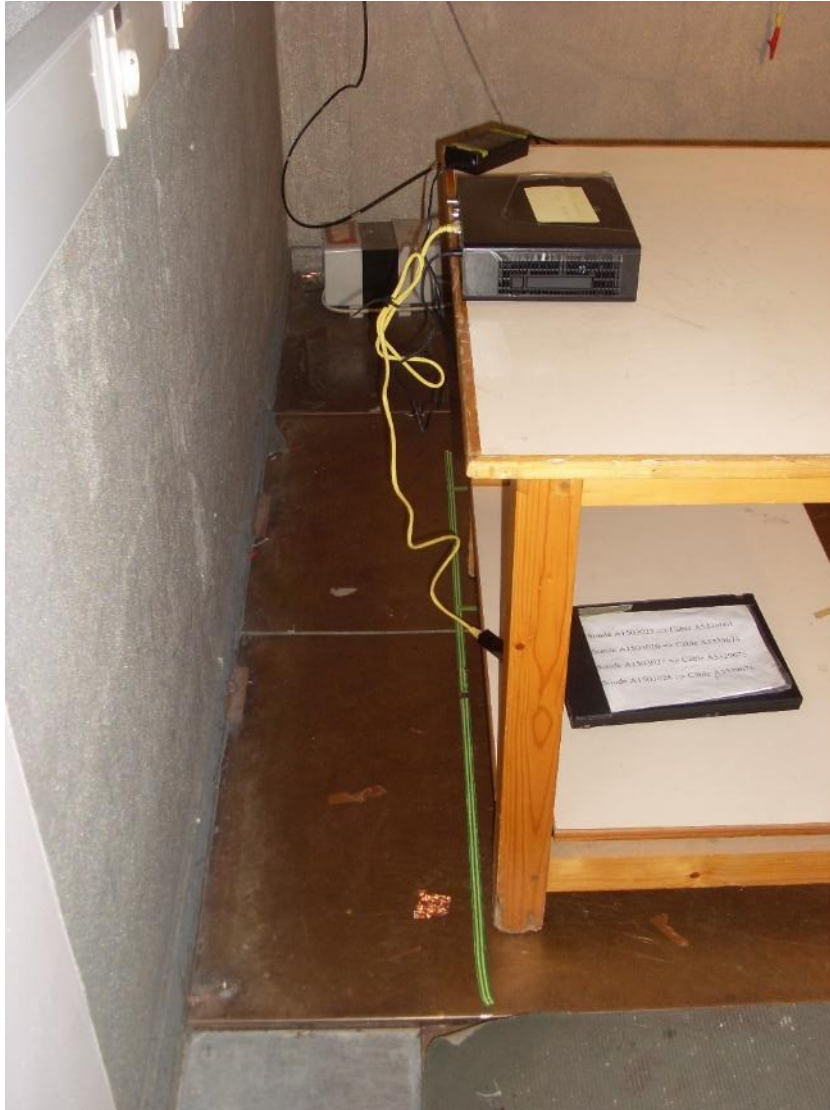
Test performed by : Laurent DENEUX
Date of test : November 21, 2016
Ambient temperature : Temperature 21°C
Relative humidity : Humidity 53%

12.2. 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)



Photograph for AC Power Line Conducted Emissions (Rear view)

12.3. 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

12.4. TEST EQUIPMENT LIST

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2015-12	2016-12
V ISLN	ROHDE & SCHWARZ	ESH2-Z5	C2322001	2016-05	2017-05
Pulse limiter	ROHDE & SCHWARZ	ESH3-Z2	A2649008	2016-03	2017-03
Cable	-	-	A5329417	2016-10	2017-10
Cable	-	-	A5329589	2016-10	2017-10
Ground plane	LCIE	-	-	-	-

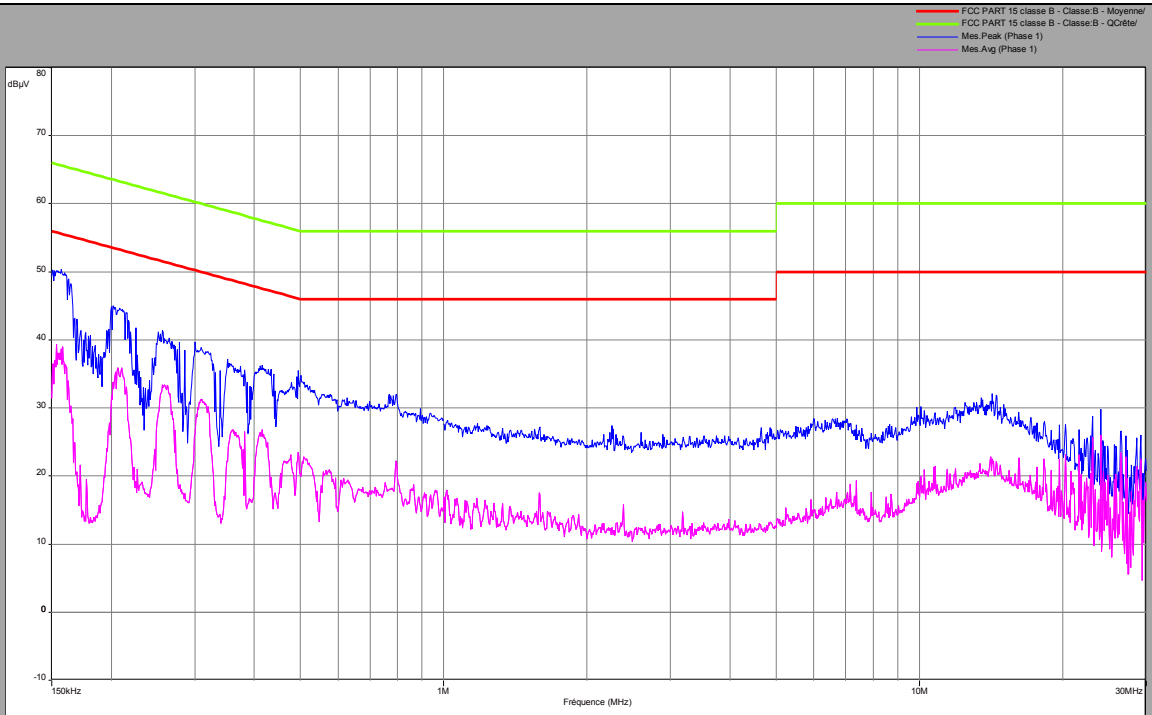
Note: In our quality system, the test equipment calibration due is more & less 2 months

12.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

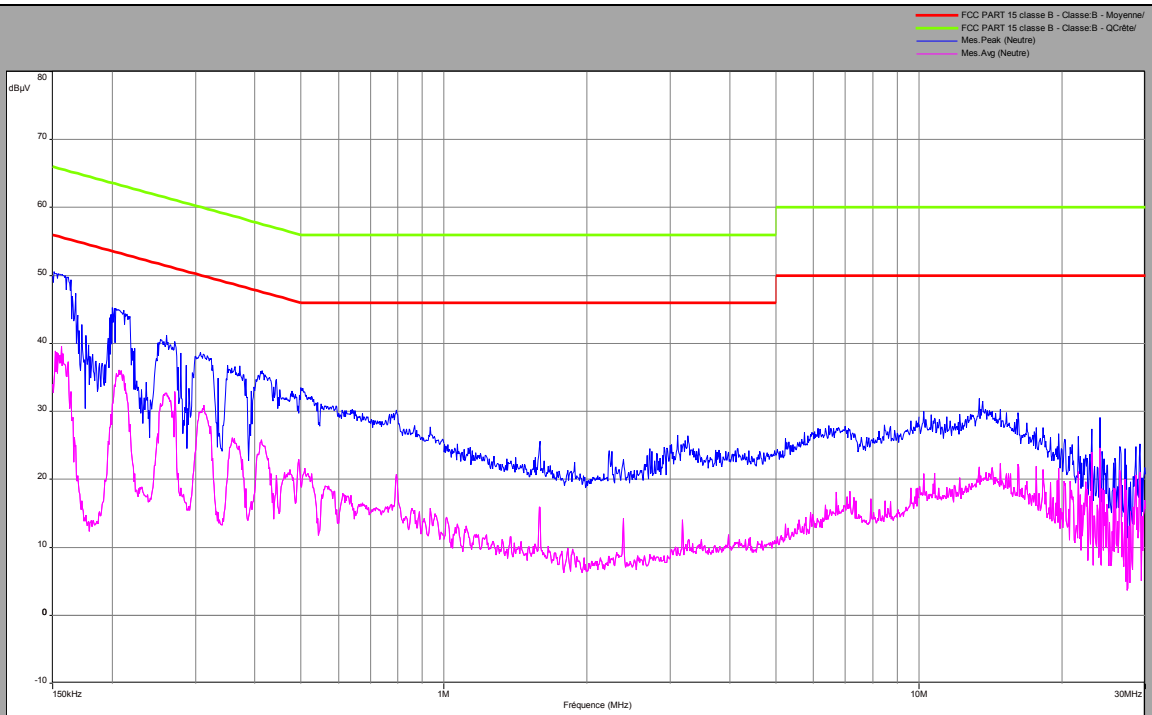
None Divergence:

12.6. RESULTS

Channel Phase



Line





Phase Line							
Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Margin Quasi-peak limit	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Average Limit
0,157	50,4	-	65,6	15,2	39,4	55,6	16,2
0,31	38,9	-	60	21,1	31,2	50	18,8
1,588	27	-	56	29	17,5	46	28,5
14,152	31	-	60	29	22,8	50	27,2
24	29,3	-	60	30,7	26	50	24

Neutral Line							
Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Margin Quasi-peak limit	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Average Limit
0,154	50,3	-	65,8	15,5	50	55,8	5,8
0,315	37,8	-	59,8	22	33	49,8	16,8
1,592	25,6	-	56	30,4	15,8	46	30,2
13,39	32	-	60	28	21,8	50	28,2
24	29,2	-	60	30,8	24,5	50	25,5

12.7. CONCLUSION

Ac Power Line Conducted Emission measurement performed on the sample of the product **SAGEMCOM TheBox (253697282)**, SN: **616400107098**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 limits.

13. UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

13.1. TEST CONDITIONS

Test performed by : Laurent DENEUX
Date of test : November 21, 2016 to November 22, 2016
Ambient temperature : Temperature 19°C
Relative humidity : Humidity 46%

13.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013). 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** 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 Emission in restricted frequency bands



Photograph for Unwanted Emission in restricted frequency bands



Photograph for Unwanted Emission in restricted frequency bands



13.3. LIMIT

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

13.4. TEST EQUIPMENT LIST

Apparatus	Trade Mark	Type	Registration number	Cal. Date	Cal. Due
Open test site	LCIE	-	F2000400	2016-05	2017-05
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2015-12	2016-12
Preamplifier	HELWETT PACKARD	8449B	A7080071	2016-01	2017-01
Bilog antenna	CHASE	CBL 6112A	C2040040	2016-01	2017-01
Horn	ETS	3115	C2042023	2016-01	2017-01
Cable	-	-	A5329542	2016-03	2017-03
Cable	-	-	A5329449	2016-10	2017-10
Cable	-	-	A5329368	2016-05	2017-05
Cable	-	-	A5329444	2016-10	2017-10

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

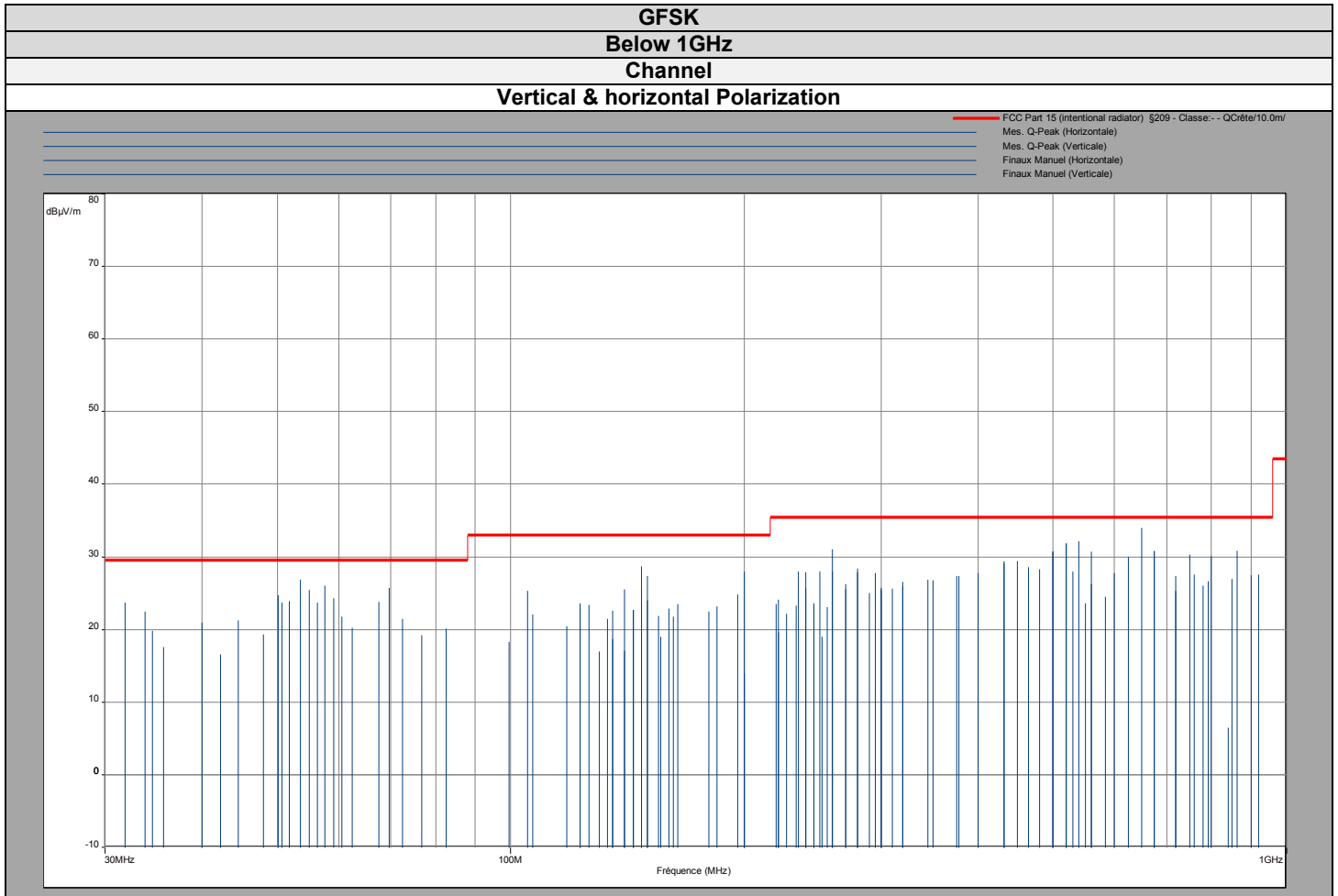
13.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None Divergence:



L C I E

13.6. RESULTS





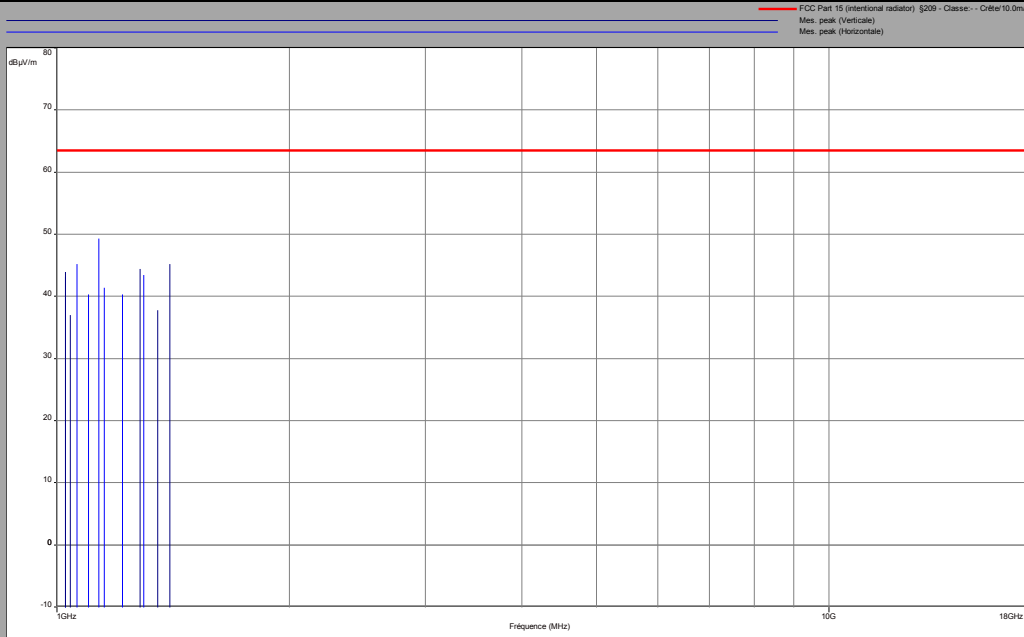
L C I E

GFSK

Above 1GHz

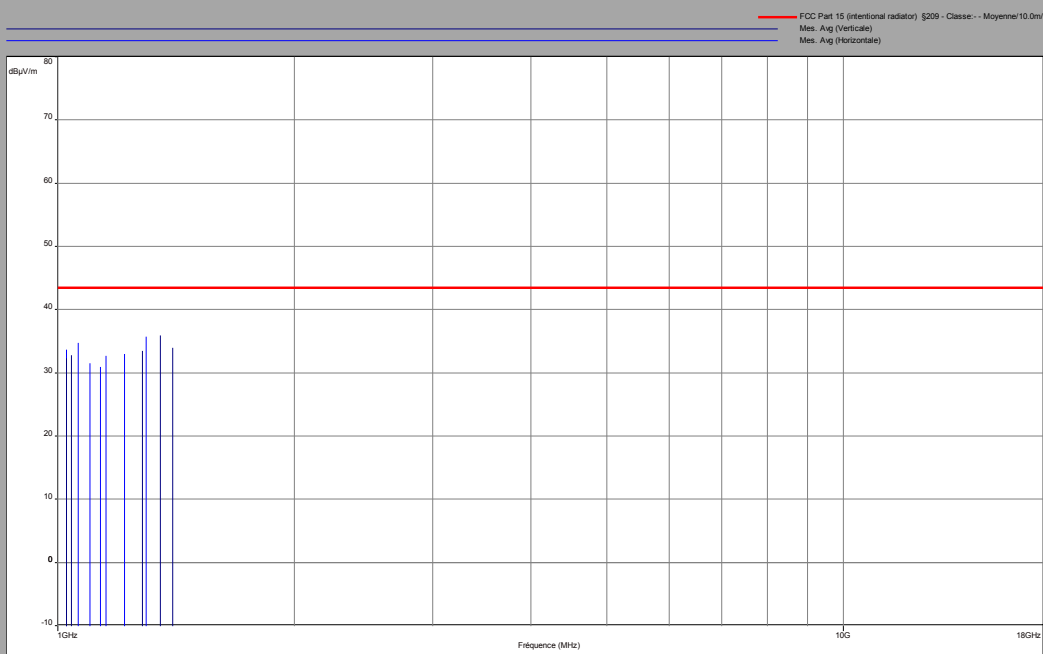
Cmin/Cnom/Cmax

Vertical & horizontal Polarization (peak measurement)



No interference has been observed between 18GHz and 26GHz

Vertical & horizontal Polarization (average value)



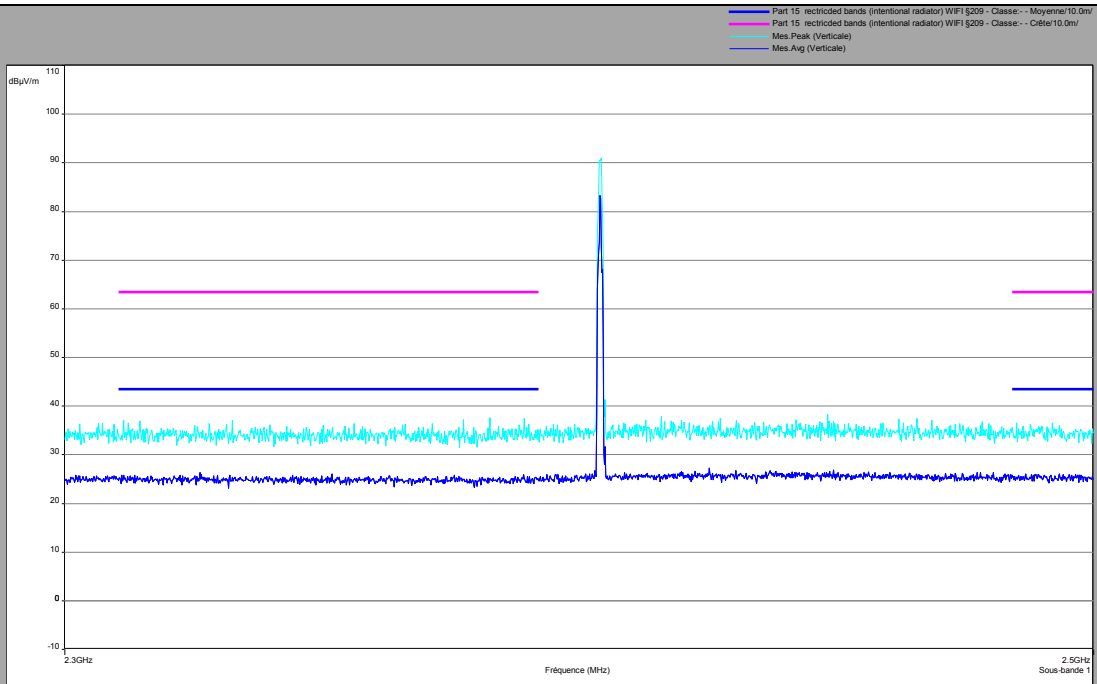
No interference has been observed between 18GHz and 26GHz

GFSK

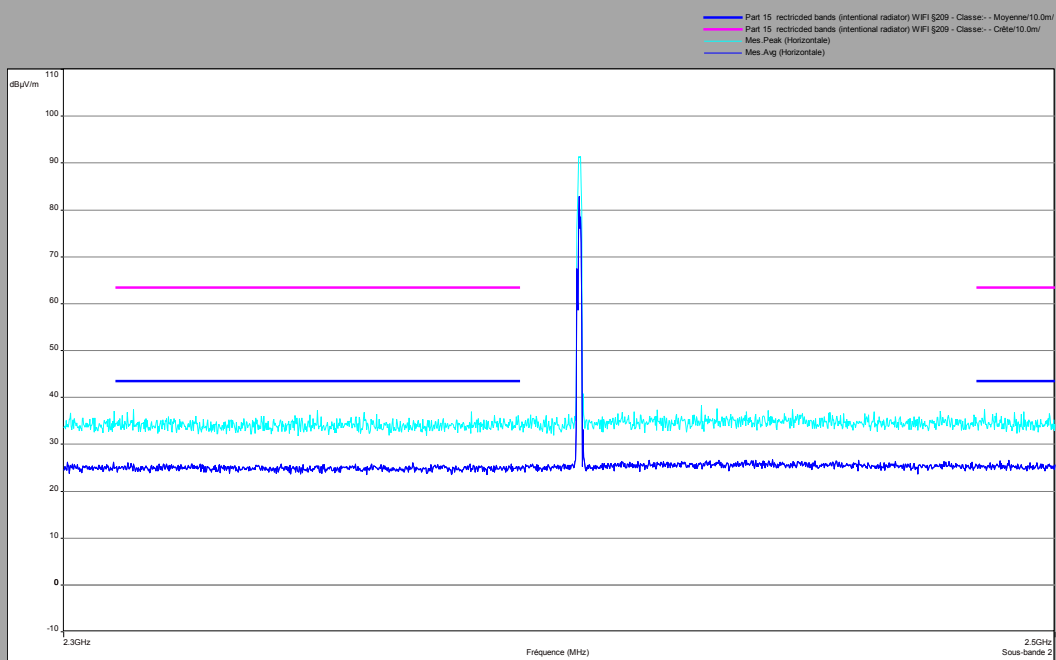
Above 1GHz Zoom 2310MHz-2500MHz

Cmin

Vertical Polarization



Horizontal polarization

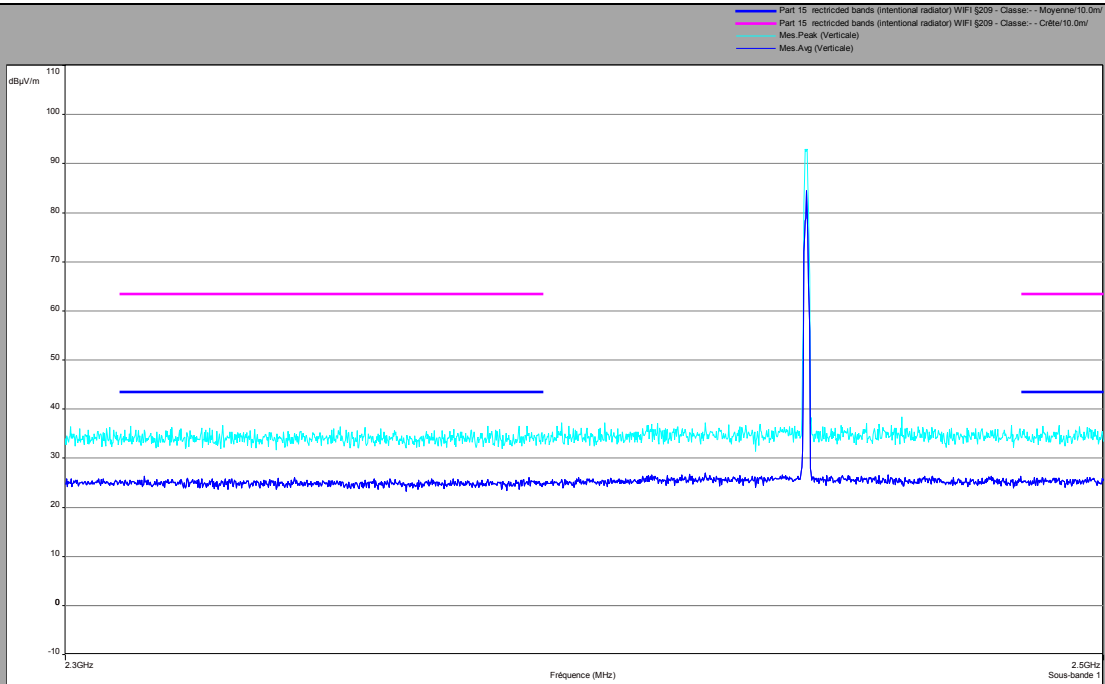


GFSK

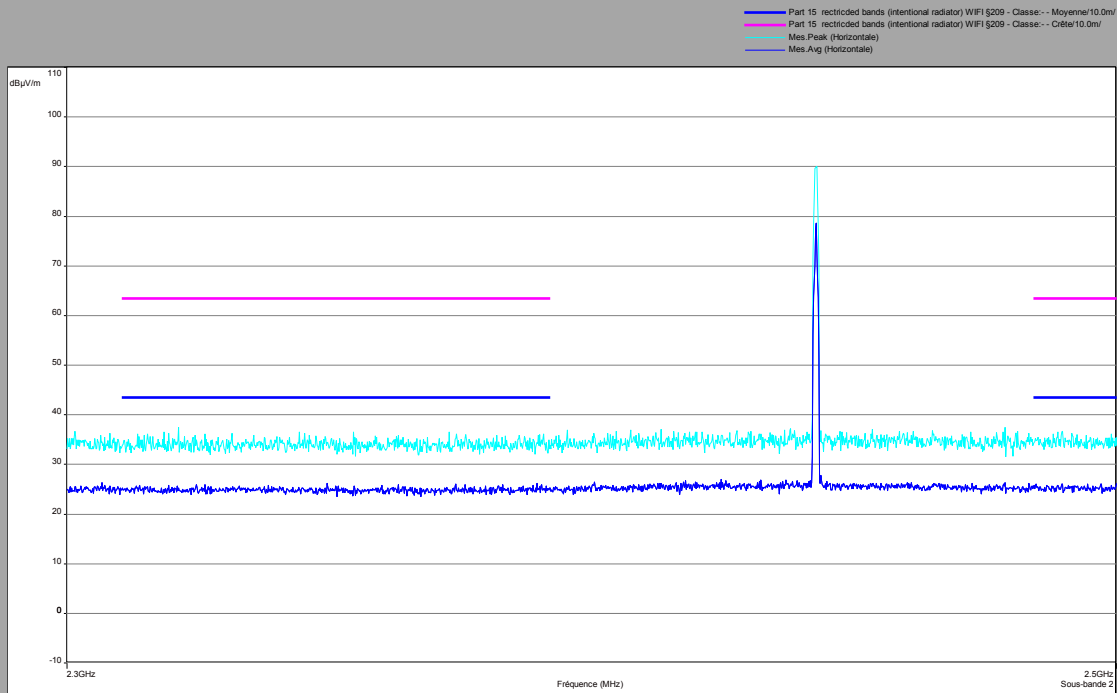
Above 1GHz Zoom 2310MHz-2500MHz

Cnom

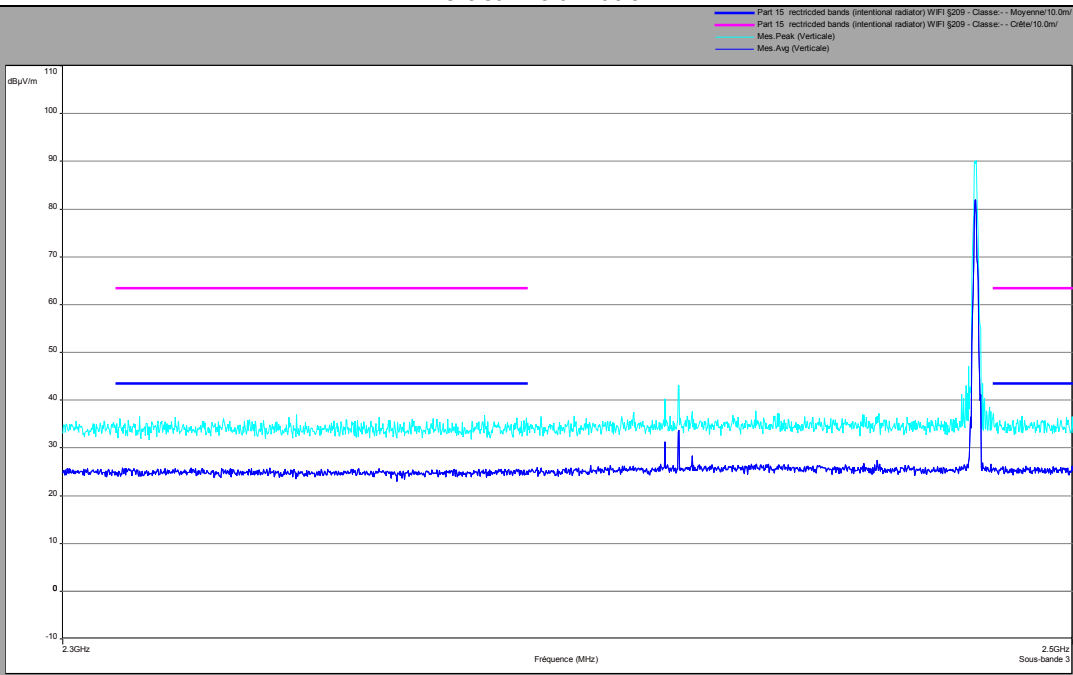
Vertical Polarization



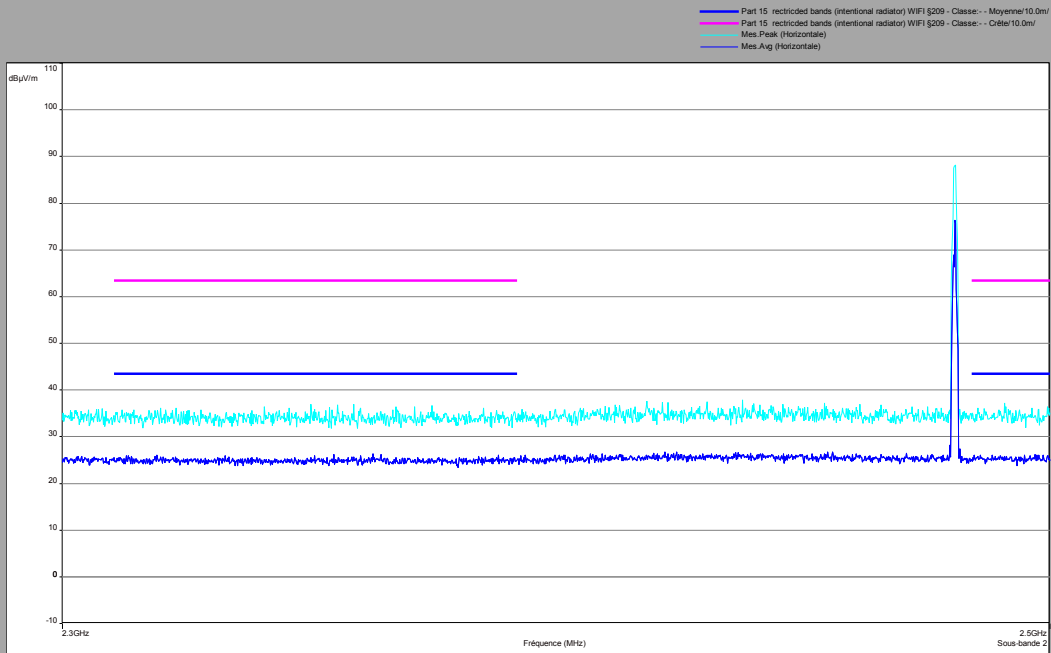
Horizontal polarization



GFSK
Above 1GHz Zoom 2310MHz-2500MHz
/Cmax
Vertical Polarization



Horizontal polarization





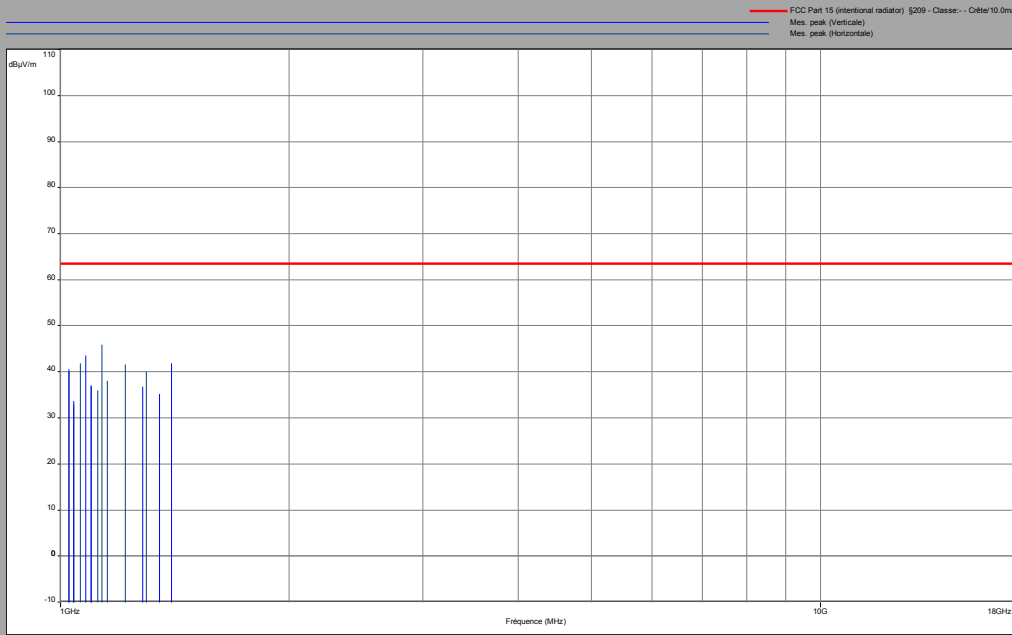
L C I E

$\pi/4$ DQPSK

Above 1GHz

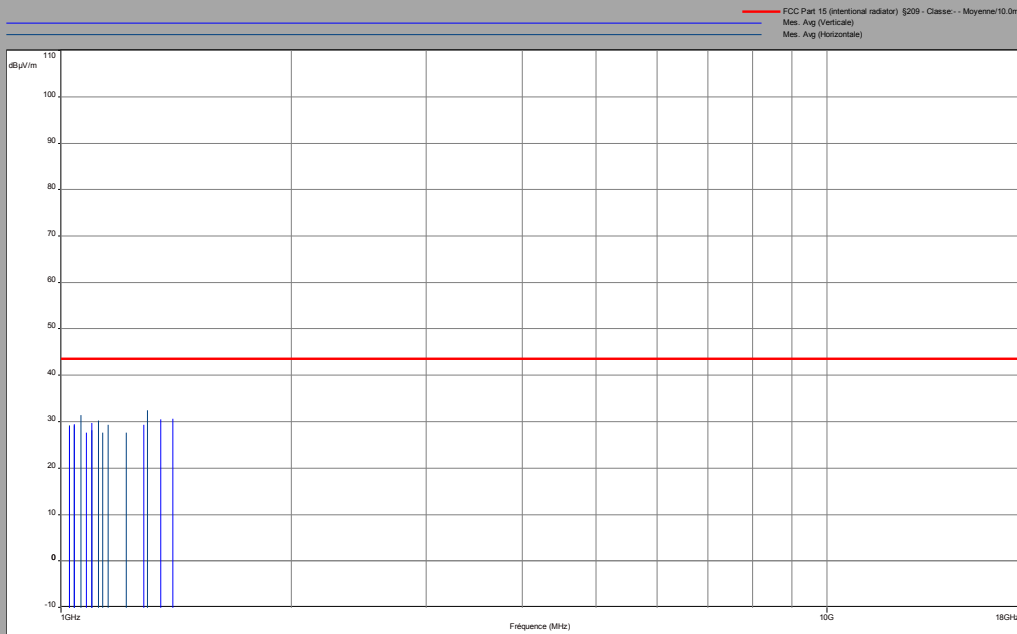
Cmin/Cnom/Cmax

Vertical & horizontal Polarization (peak measurement)



No interference has been observed between 18GHz and 26.5GHz

Vertical & horizontal Polarization (average value)



No interference has been observed between 18GHz and 26.5GHz



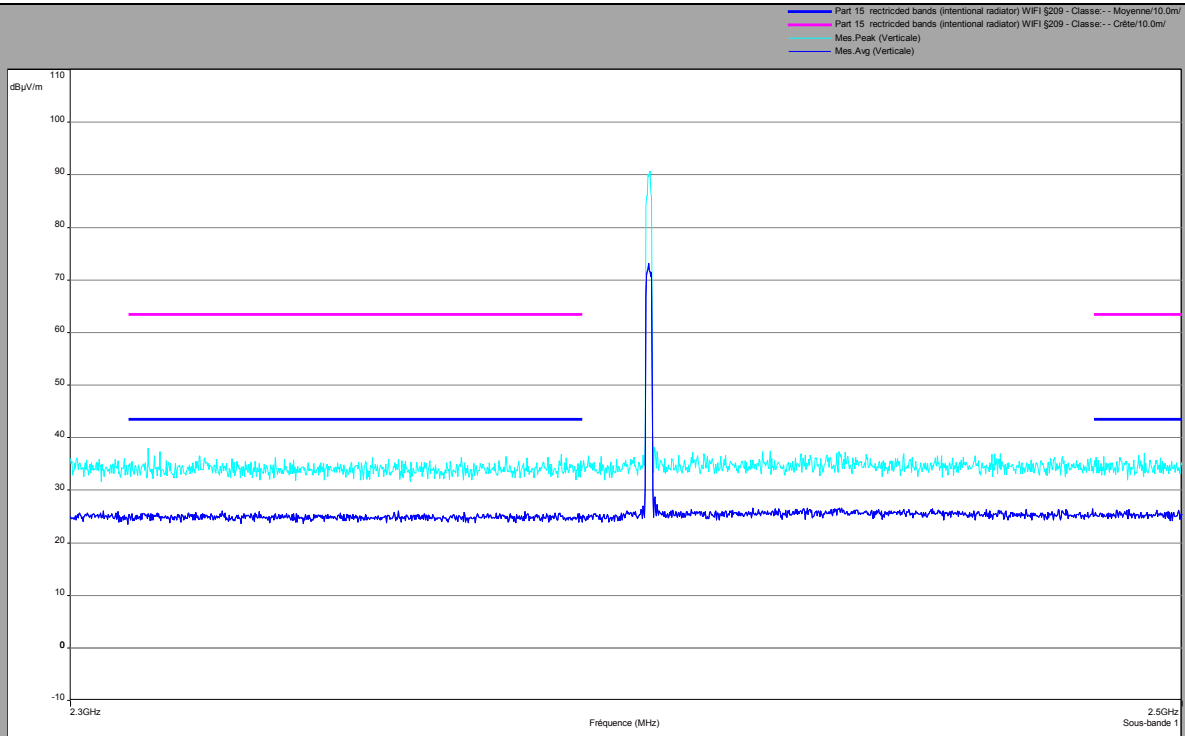
L C I E

$\pi/4$ DQPSK

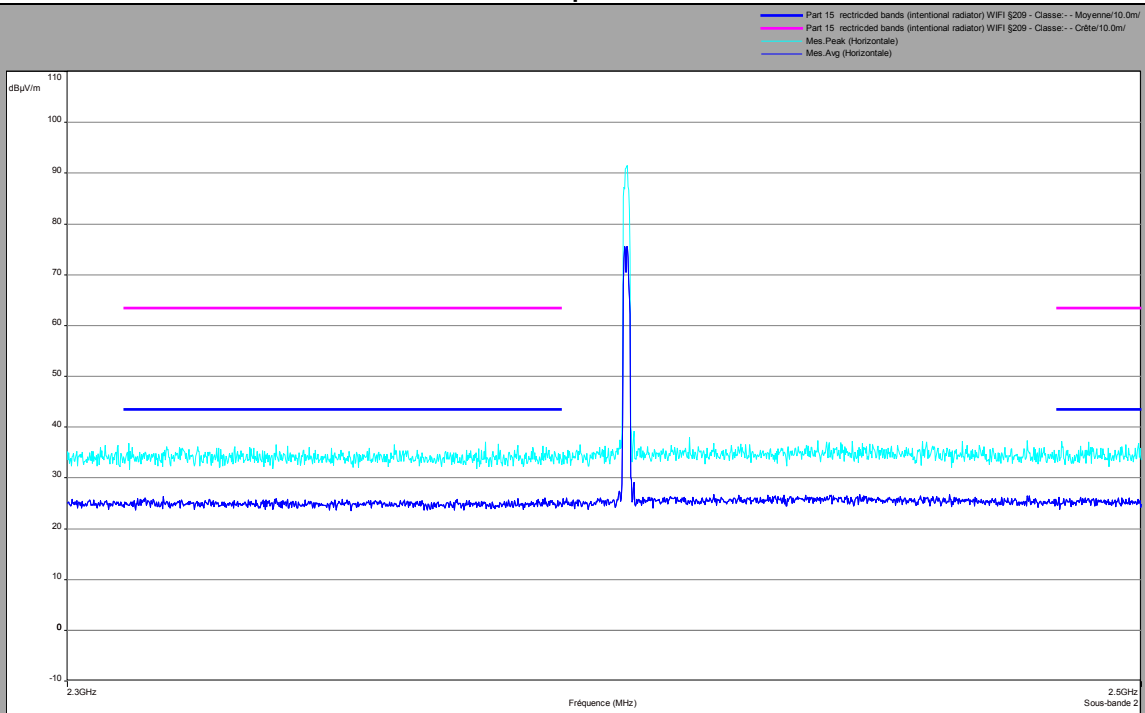
Above 1GHz Zoom 2310MHz-2500MHz

Cmin

Vertical Polarization



Horizontal polarization

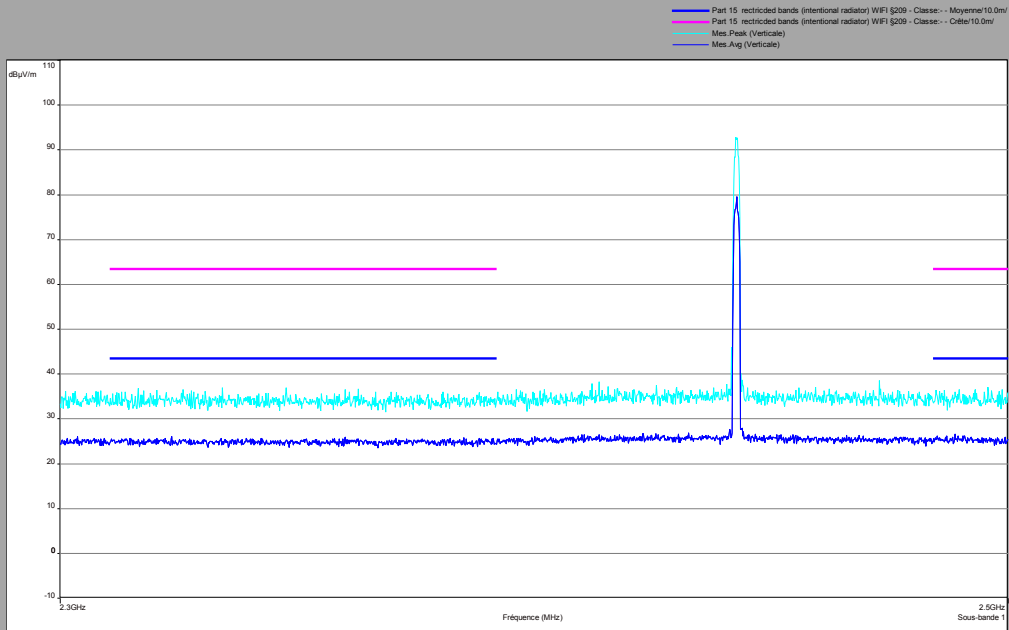


$\pi/4$ DQPSK

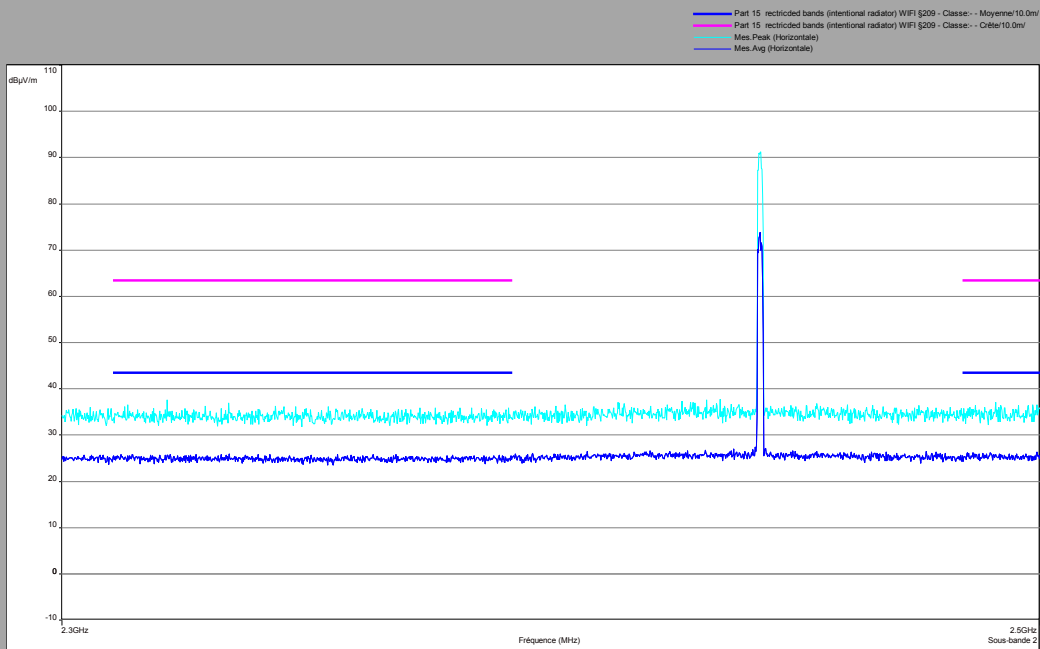
Above 1GHz Zoom 2310MHz-2500MHz

Cnom

Vertical Polarization



Horizontal polarization





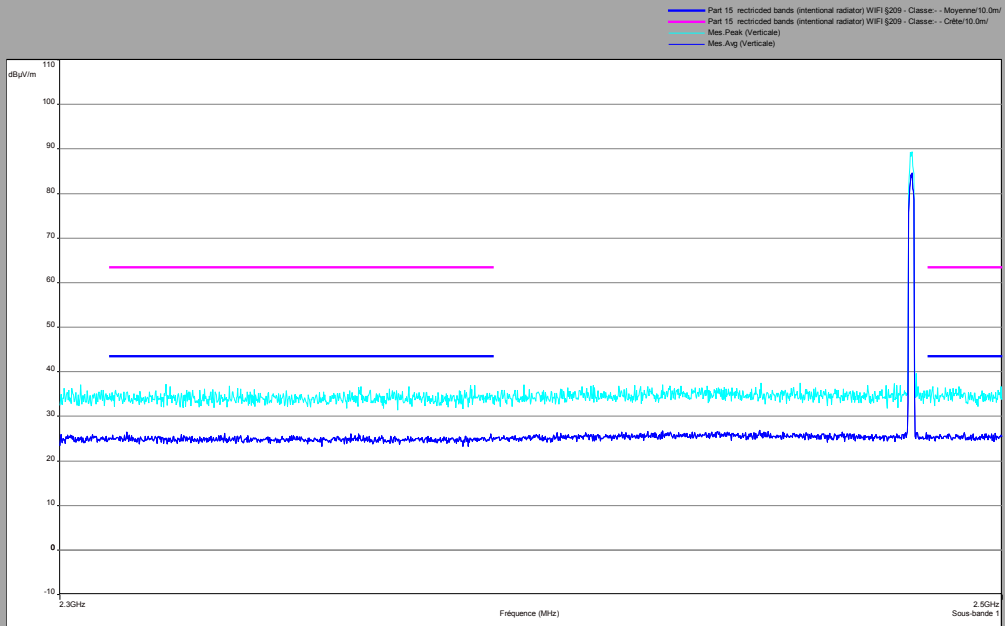
L C I E

$\pi/4$ DQPSK

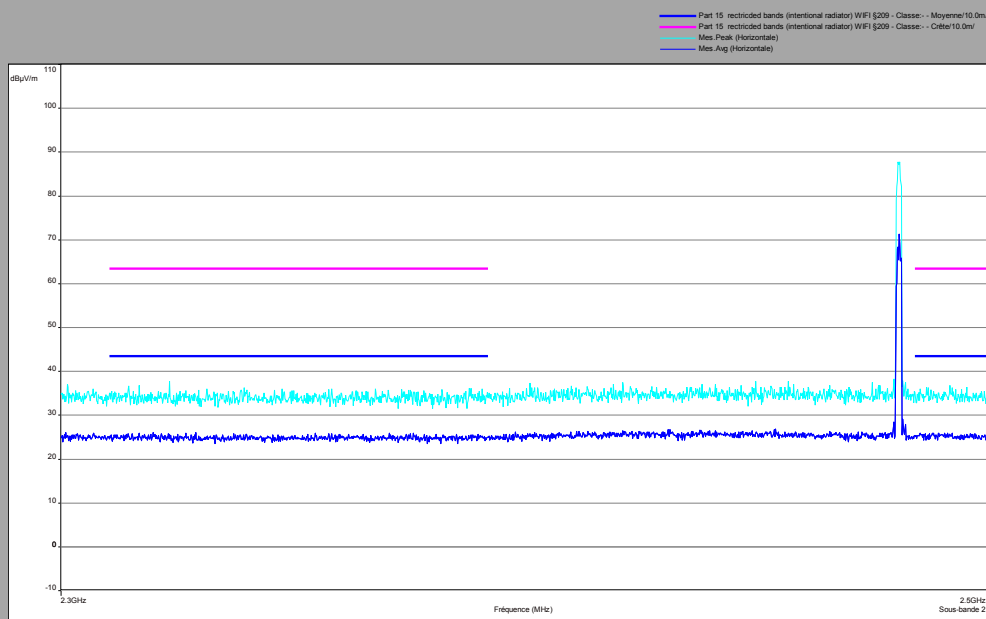
Above 1GHz Zoom 2310MHz-2500MHz

Cmax

Vertical Polarization



Horizontal polarization





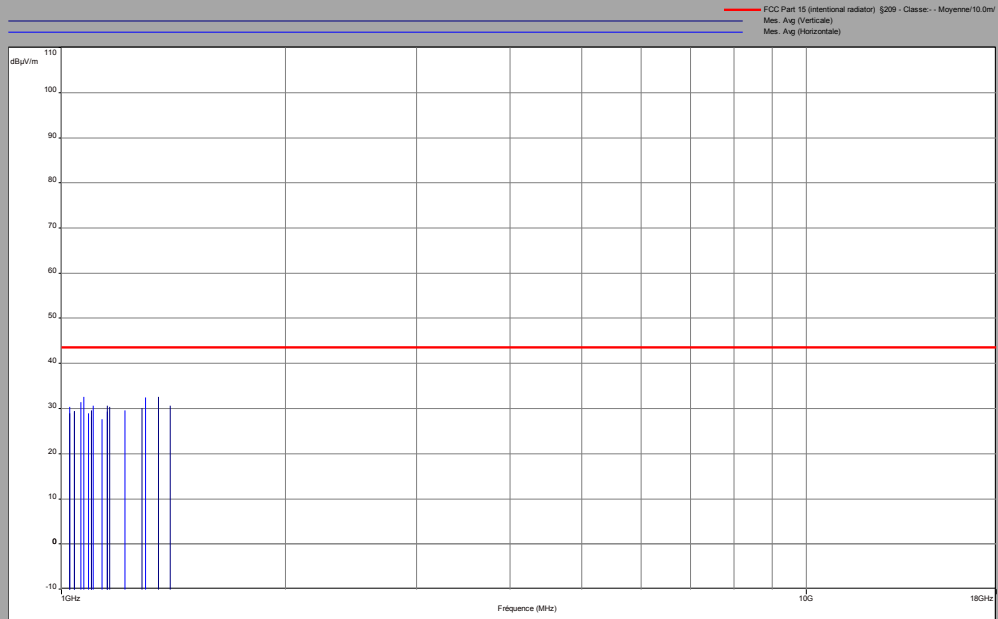
L C I E

8DPSK

Above 1GHz

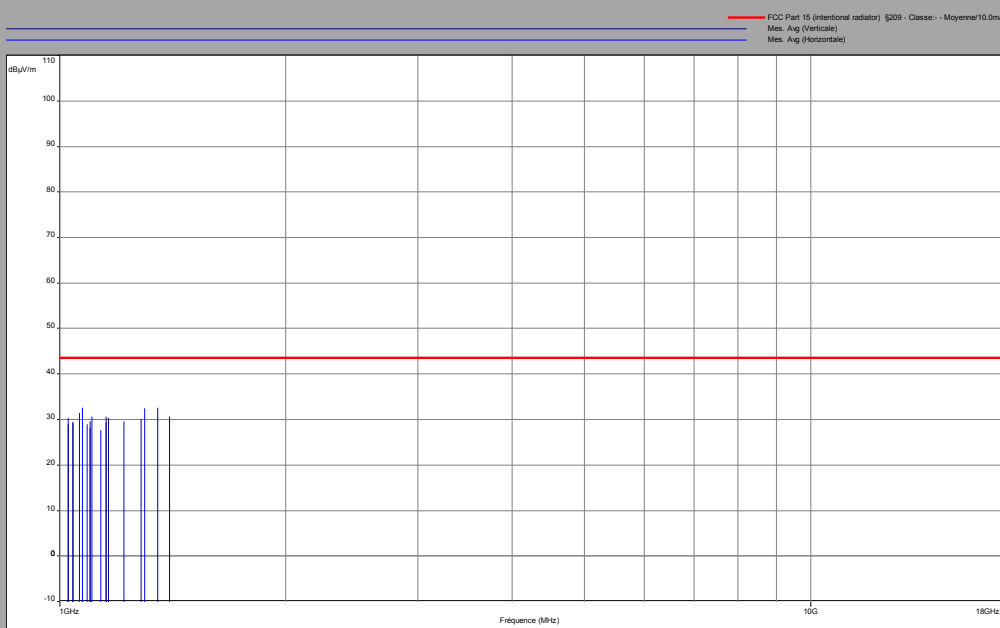
Cmin/Cnom/Cmax

Vertical & horizontal Polarization (peak measurement)



No interference has been observed between 18GHz and 26.5GHz

Vertical & horizontal Polarization (average value)



No interference has been observed between 18GHz and 26.5GHz



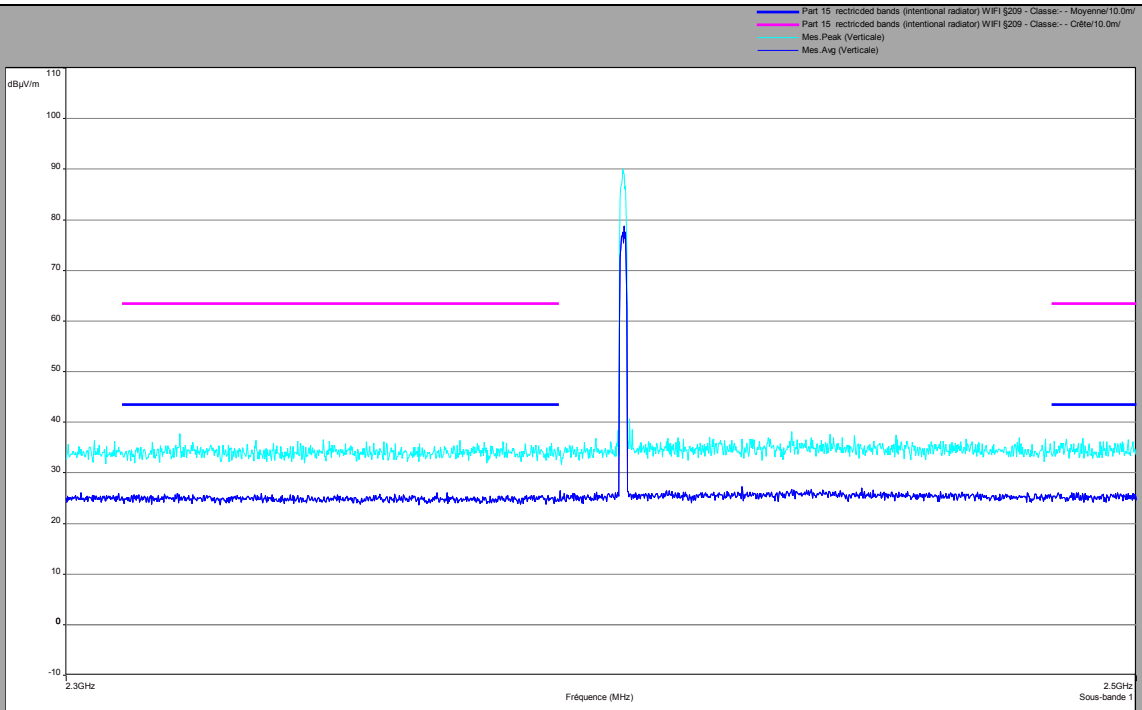
L C I E

8DPSK

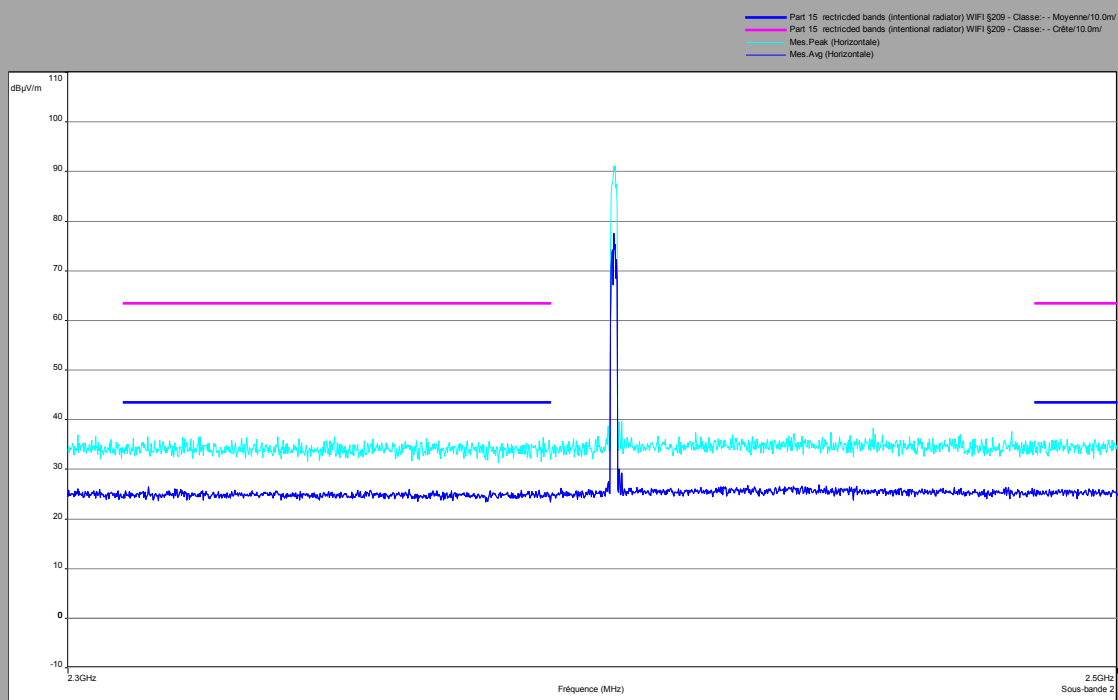
Above 1GHz Zoom 2310MHz-2500MHz

Cmin/Cnom/Cmax

Vertical Polarization



Horizontal polarization





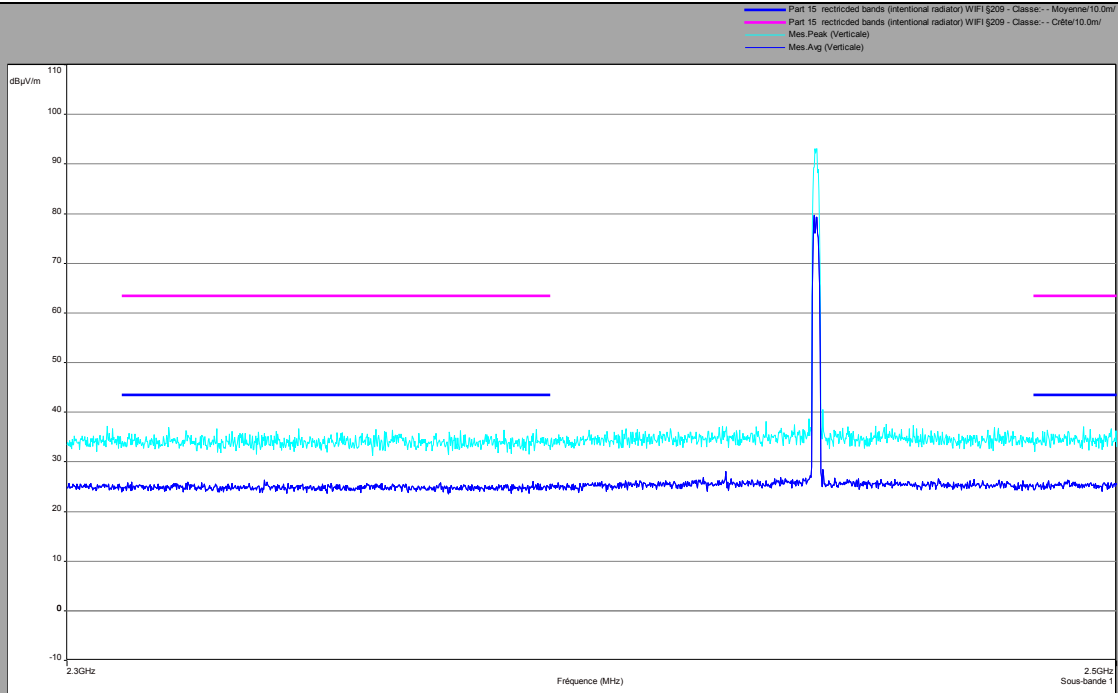
L C I E

8DPSK

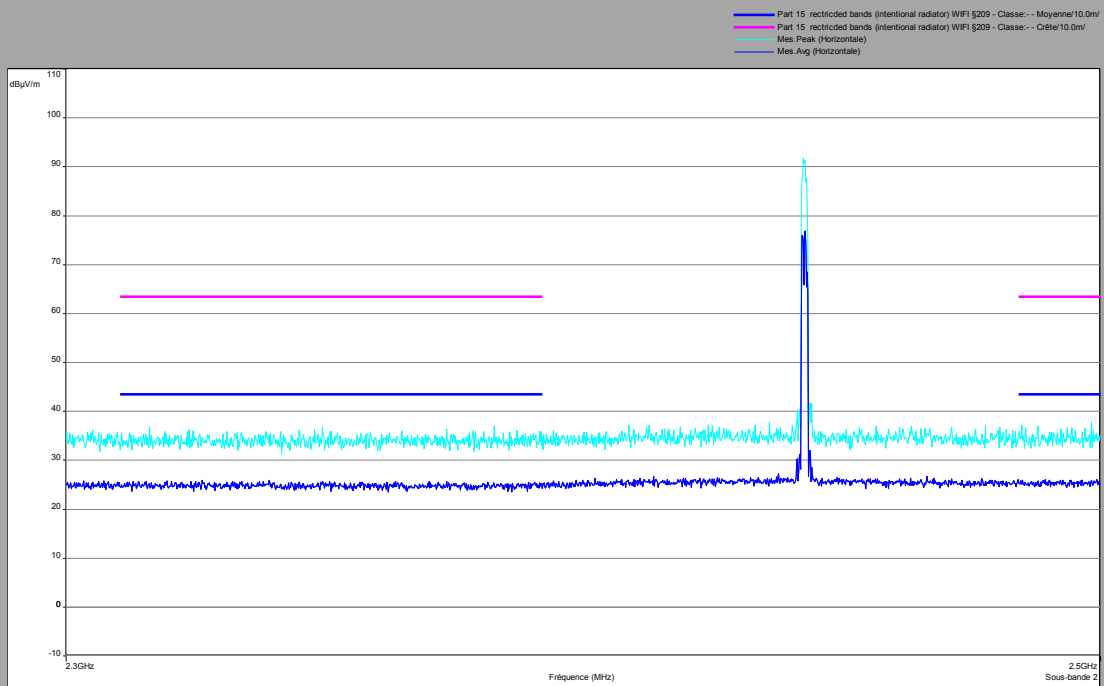
Above 1GHz Zoom 2310MHz-2500MHz

Cnom

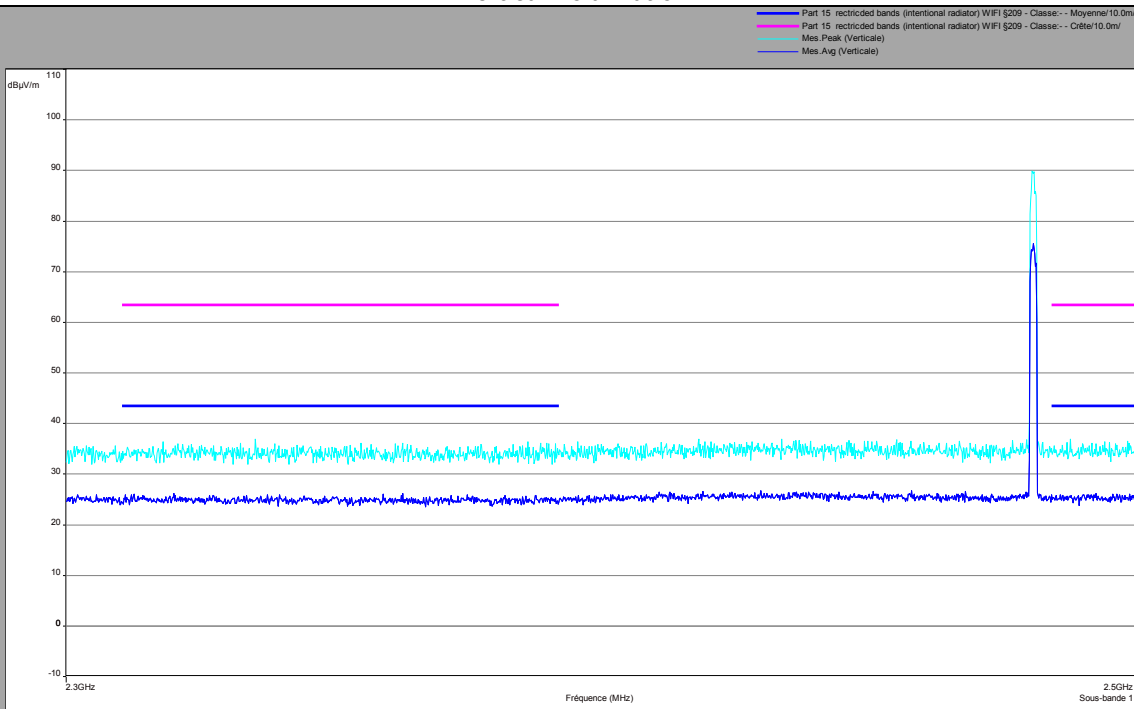
Vertical Polarization



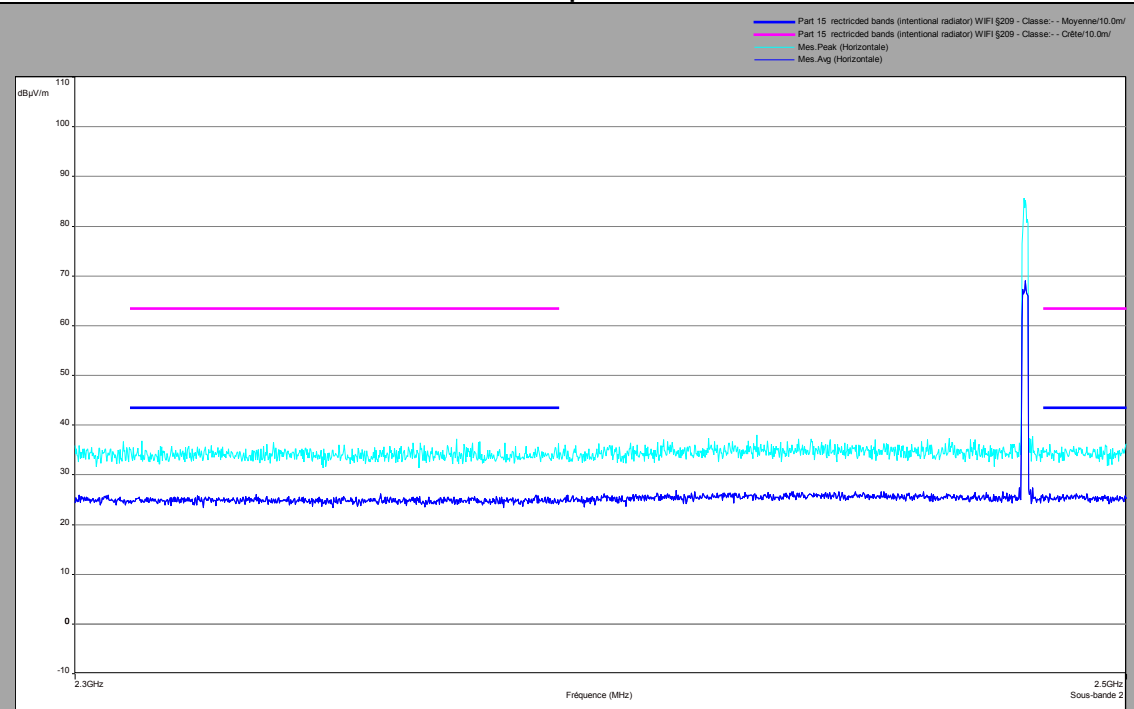
Horizontal polarization



8DPSK
Above 1GHz Zoom 2310MHz-2500MHz
Cmax
Vertical Polarization



Horizontal polarization





L C I E

Below 1 GHz

Polarisation	Frequency (MHz)	level Quasi peak (dB μ V/m)	limit FCC	Margin
vertical	31.8	23.72	29.5	5.78
vertical	33.8	22.55	29.5	6.95
vertical	34.5	19.91	29.5	9.59
vertical	35.7	17.62	29.5	11.88
vertical	40	20.97	29.5	8.53
vertical	42.3	16.63	29.5	12.87
vertical	44.5	21.25	29.5	8.25
vertical	48	19.31	29.5	10.19
vertical	50.1	24.72	29.5	4.78
vertical	50.7	23.72	29.5	5.78
vertical	51.8	23.96	29.5	5.54
vertical	53.6	26.85	29.5	2.65
vertical	55	25.5	29.5	4
vertical	56.3	23.73	29.5	5.77
vertical	57.6	26.08	29.5	3.42
vertical	59.1	24.31	29.5	5.19
vertical	60.6	21.76	29.5	7.74
vertical	62.5	20.3	29.5	9.2
vertical	67.6	23.82	29.5	5.68
vertical	69.7	25.82	29.5	3.68
vertical	72.6	21.53	29.5	7.97
vertical	76.8	19.26	29.5	10.24
vertical	82.6	20.22	29.5	9.28
vertical	99.4	18.35	33	14.65
vertical	105	25.35	33	7.65
vertical	106.7	22.16	33	10.84
vertical	118.2	20.43	33	12.57
vertical	122.9	23.67	33	9.33
vertical	126	23.38	33	9.62
vertical	130	17.02	33	15.98
vertical	133.3	21.46	33	11.54
vertical	135.2	18.71	33	14.29
vertical	140	25.62	33	7.38
vertical	144	22.71	33	10.29
vertical	147.5	28.71	33	4.29
vertical	150	27.4	33	5.6
vertical	156	19.03	33	13.97



L C I E

Polarisation	Frequency (MHz)	level Quasi peak (dB μ V/m)	limit FCC	Margin
vertical	160	22.9	33	10.1
vertical	162	21.79	33	11.21
vertical	164	23.49	33	9.51
vertical	180	22.48	33	10.52
vertical	184.3	23.18	33	9.82
vertical	196	24.91	33	8.09
vertical	200	28.05	33	4.95
vertical	221.2	24.18	35.5	11.32
vertical	233.5	23.31	35.5	12.19
vertical	240	25.73	35.5	9.77
vertical	245.8	23.67	35.5	11.83
vertical	252	19.03	35.5	16.47
vertical	256	23.13	35.5	12.37
vertical	260	27.97	35.5	7.53
vertical	270	26.33	35.5	9.17
vertical	280	28.4	35.5	7.1
vertical	290	25.07	35.5	10.43
vertical	295	27.85	35.5	7.65
vertical	300	25.75	35.5	9.75
vertical	310	25.63	35.5	9.87
vertical	320	26.02	35.5	9.48
vertical	350	26.81	35.5	8.69
vertical	378	27.4	35.5	8.1
vertical	400	27.85	35.5	7.65
vertical	432	29.12	35.5	6.38
vertical	450	29.41	35.5	6.09
vertical	464.7	28.62	35.5	6.88
vertical	480	28.3	35.5	7.2
vertical	500	30.81	35.5	4.69
vertical	520	31.87	35.5	3.63
vertical	530	27.97	35.5	7.53
vertical	540	32.17	35.5	3.33
vertical	560	30.81	35.5	4.69
vertical	583.6	24.58	35.5	10.92
vertical	600	27.85	35.5	7.65
vertical	650	34	35.5	1.5
vertical	675	30.75	35.5	4.75



L C I E

Polarisation	Frequency (MHz)	level Quasi peak (dB μ V/m)	limit FCC	Margin
vertical	720	27.42	35.5	8.08
vertical	750	30.36	35.5	5.14
vertical	760	27.6	35.5	7.9
vertical	792	26.65	35.5	8.85
vertical	800	30.18	35.5	5.32
vertical	850	27.01	35.5	8.49
vertical	864	30.87	35.5	4.63



L C I E

Polarisation	Frequency (MHz)	level Quasi peak (dB μ V/m)	limit FCC	Margin
Horizontal	122.9	23.01	33	9.99
Horizontal	135.2	22.63	33	10.37
Horizontal	140	17.13	33	15.87
Horizontal	144	22.67	33	10.33
Horizontal	147.5	25.82	33	7.18
Horizontal	150	24	33	9
Horizontal	155	21.95	33	11.05
Horizontal	200	13.99	33	19.01
Horizontal	220	23.58	35.5	11.92
Horizontal	221.2	19.67	35.5	15.83
Horizontal	226.8	22.22	35.5	13.28
Horizontal	235	27.97	35.5	7.53
Horizontal	240	27.91	35.5	7.59
Horizontal	245.8	23.24	35.5	12.26
Horizontal	250	27.97	35.5	7.53
Horizontal	260	31.03	35.5	4.47
Horizontal	270	25.59	35.5	9.91
Horizontal	280	27.91	35.5	7.59
Horizontal	300	25.47	35.5	10.03
Horizontal	320	26.64	35.5	8.86
Horizontal	345	26.91	35.5	8.59
Horizontal	375.2	27.39	35.5	8.11
Horizontal	432	29.45	35.5	6.05
Horizontal	500	30.75	35.5	4.75
Horizontal	520	31.92	35.5	3.58
Horizontal	550	23.64	35.5	11.86
Horizontal	560	26.32	35.5	9.18
Horizontal	625	30.04	35.5	5.46
Horizontal	675	30.92	35.5	4.58
Horizontal	720	25.34	35.5	10.16
Horizontal	780	26.03	35.5	9.47
Horizontal	900	27.46	35.5	8.04
Horizontal	920	27.6	35.5	7.9



L C I E

GFSK								
Above 1GHz								
Cmin/Cnom/Cmax								
Polarization	Frequency (MHz)	Duty cycle correction (dB)	Average Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin Average Limit	Peak Level (dB μ V/m)	Peak Limit (dB μ V/m)	Margin Peak Limit
Vertical	1026	3,35	32,35	43,5	11,15	43,89	63,5	19,61
Vertical	1040	3,35	32,77	43,5	10,73	36,97	63,5	26,53
Vertical	1282	3,35	33,52	43,5	9,98	44,47	63,5	19,03
Vertical	1350	3,35	35,97	43,5	7,53	37,75	63,5	25,75
Vertical	1400	3,35	34	43,5	9,5	45,21	63,5	18,29
Vertical	2390	3,35	29,35	43,5	14,15	40,9	63,5	22,6
Vertical	2483,5	3,35	29,65	43,5	13,85	39,9	63,5	23,6
Horizontal	1026	3,35	33,71	43,5	9,79	43,13	63,5	20,37
Horizontal	1062	3,35	34,79	43,5	8,71	45,24	63,5	18,26
Horizontal	1098	3,35	31,52	43,5	11,98	40,32	63,5	23,18
Horizontal	1134	3,35	30,98	43,5	12,52	49,28	63,5	14,22
Horizontal	1152	3,35	32,71	43,5	10,79	41,38	63,5	22,12
Horizontal	1216	3,35	32,98	43,5	10,52	40,32	63,5	23,18
Horizontal	1296	3,35	35,77	43,5	7,73	43,42	63,5	20,08
Horizontal	2390	3,35	29,6	43,5	13,9	40,6	63,5	22,9
Horizontal	2483,5	3,35	29,35	43,5	14,15	41	63,5	22,5



L C I E

$\pi/4$ DQPSK								
Above 1GHz								
Cmin/Cnom/Cmax								
Polarization	Frequency (MHz)	Duty cycle correction (dB)	Average Level (dBμV/m)	Average Limit (dBμV/m)	Margin Average Limit	Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Margin Peak Limit
Vertical	1026	3,35	32,35	43,5	11,15	43,89	63,5	19,61
Vertical	1040	3,35	32,77	43,5	10,73	36,97	63,5	26,53
Vertical	1080	3,35	30,98	43,5	12,52	46,93	63,5	16,57
Vertical	1098	3,35	33,11	43,5	10,39	40,36	63,5	23,14
Vertical	1282	3,35	32,65	43,5	10,85	40,07	63,5	23,43
Vertical	1350	3,35	33,87	43,5	9,63	38,52	63,5	24,98
Vertical	1400	3,35	34	43,5	9,5	45,21	63,5	18,29
Vertical	2390	3,35	32,85	43,5	10,65	40,8	63,5	22,7
Vertical	2483,5	3,35	32,05	43,5	11,45	40,65	63,5	22,85
Horizontal	1026	3,35	32,57	43,5	10,93	43,38	63,5	20,12
Horizontal	1040	3,35	34,79	43,5	8,71	36,23	63,5	27,27
Horizontal	1062	3,35	31,52	43,5	11,98	45,24	63,5	18,26
Horizontal	1098	3,35	33,61	43,5	9,89	40,32	63,5	23,18
Horizontal	1120	3,35	30,98	43,5	12,52	39,37	63,5	24,13
Horizontal	1134	3,35	32,71	43,5	10,79	49,28	63,5	14,22
Horizontal	1152	3,35	30,99	43,5	12,51	41,38	63,5	22,12
Horizontal	1216	3,35	35,77	43,5	7,73	44,97	63,5	18,53
Horizontal	1296	3,35	32,57	43,5	10,93	43,42	63,5	20,08
Horizontal	2390	3,35	32,95	43,5	10,55	39,65	63,5	23,85
Horizontal	2483,5	3,35	31,7	43,5	11,8	40,6	63,5	22,9



L C I E

8DPSK								
Above 1GHz								
Cmin/Cnom/Cmax								
Polarization	Frequency (MHz)	Duty cycle correction (dB)	Average Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin Average Limit	Peak Level (dB μ V/m)	Peak Limit (dB μ V/m)	Margin Peak Limit
Vertical	1026	3,33	32,35	43,5	11,15	43,89	63,5	19,61
Vertical	1040	3,33	32,77	43,5	10,73	36,97	63,5	26,53
Vertical	1098	3,33	33,02	43,5	10,48	38,97	63,5	24,53
Vertical	1152	3,33	34	43,5	9,5	37,37	63,5	26,13
Vertical	1160	3,33	33,75	43,5	9,75	46,06	63,5	17,44
Vertical	1282	3,33	33,52	43,5	9,98	44,47	63,5	19,03
Vertical	1350	3,33	35,97	43,5	7,53	37,75	63,5	25,75
Vertical	1400	3,33	34	43,5	9,5	45,21	63,5	18,29
Vertical	2390	3,33	33,43	43,5	10,07	42,83	63,5	20,67
Horizontal	2483,5	3,33	32,85	43,5	10,65	43,53	63,5	19,97
Horizontal	1026	3,33	33,71	43,5	9,79	43,13	63,5	20,37
Horizontal	1040	3,33	32,58	43,5	10,92	43,24	63,5	20,26
Horizontal	1062	3,33	34,79	43,5	8,71	45,24	63,5	18,26
Horizontal	1072	3,33	35,91	43,5	7,59	44,05	63,5	19,45
Horizontal	1088	3,33	32,36	43,5	11,14	41,33	63,5	22,17
Horizontal	1098	3,33	31,52	43,5	11,98	40,32	63,5	23,18
Horizontal	1104	3,33	34,03	43,5	9,47	44,79	63,5	18,71
Horizontal	1134	3,33	30,98	43,5	12,52	49,28	63,5	14,22
Horizontal	1152	3,33	32,71	43,5	10,79	41,38	63,5	22,12
Horizontal	1216	3,33	32,98	43,5	10,52	40,32	63,5	23,18
Horizontal	1296	3,33	35,77	43,5	7,73	43,42	63,5	20,08
Horizontal	2390	3,33	32,8	43,6	10,8	43,03	63,6	20,57
Horizontal	2483,5	3,33	32,9	43,7	10,8	43	63,7	20,7

13.7. CONCLUSION

Unwanted Emission in restricted frequency bands measurement performed on the sample of the product **SAGEMCOM TheBox (253697282)**, SN: **616400107098**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 limits.

14. UNCERTAINTIES CHART

47 CFR Part 15.209 & 15.207 Kind of test	Wide uncertainty laboratory (k=2) ±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 (Ecuellas)	4,88	6.3
Measurement of radiated electric field from 1 to 18GHz on the Ecuellas site	5.16	/
Measurement of radiated electric field from 30 to 1000MHz in vertical position on the OATS (Ecuellas)	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 (Ecuellas)	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