



LCIE

Bluetooth Low Energy Template: Release August 20th, 2016

TEST REPORT

N°: 148760-703877

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

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Apparatus under test

↻ Product	QN9080-001-M17
↻ Trade mark	NXP
↻ Manufacturer	NXP Semiconductors
↻ Model under test	QN9080-001-M17
↻ Serial number	P6V700.07
↻ FCC ID	XXMQN9080M17
↻ IC ID	8764A-QN9080M17

Test date

: May 16, 2017 to May 24, 2017

Test location

Fontenay Aux Roses

Composition of document

43 pages

Document issued on

March 23, 2018

Written by :
Armand MAHOUNGOU
Tests operator



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SUMMARY

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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 ℱ	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
6dB Bandwidth ℱ	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA()	<input type="checkbox"/> NP(1)
Duty Cycle ℱ	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Maximum Conducted Output Power ℱ	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Power Spectral Density ℱ	<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 ℱ	<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 ℱ	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA()	<input type="checkbox"/> NP(1)
AC Power Line Conducted Emission ℱ	<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 ℱ	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Receiver Radiated emissions ℱ	<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)

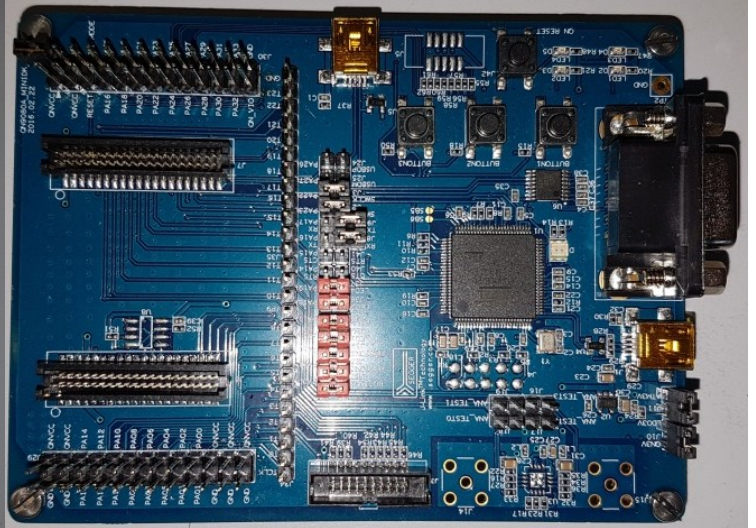
2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):
NXP QN9080-001-M17

Serial Number: P6V700.07



Equipment Under Test



Auxiliary Equipment

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Mother Board	QN9080A_MINIDK_V3	-	-
USB cable	-	-	-
PCB	PCB2482-1	OM15093-1	-
CMW 270	Rohde & Schwarz	1014753	For communication during Blocking receiver



Equipment information:

Bluetooth LE Type:	<input checked="" type="checkbox"/> BLE	<input checked="" type="checkbox"/> v4.0	<input type="checkbox"/> v4.1	<input type="checkbox"/> v4.2
Frequency band:	[2400 – 2483.5] MHz			
Number of Channel:	40			
Spacing channel:	2MHz			
Channel bandwidth:	1MHz			
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:	1			
Receiver chains	1			
Type of equipment:	<input type="checkbox"/> Stand-alone	<input checked="" type="checkbox"/> Plug-in	<input type="checkbox"/> Combined	
Ad-Hoc mode:	<input checked="" type="checkbox"/> Yes		<input type="checkbox"/> No	
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 type="checkbox"/> 0°C	<input checked="" type="checkbox"/> -40°C
	Tnom:	20°C		
	Tmax:	<input type="checkbox"/> 35°C	<input type="checkbox"/> 55°C	<input checked="" type="checkbox"/> 85°C
Type of power source:	<input type="checkbox"/> AC power supply	<input checked="" type="checkbox"/> DC power supply	<input type="checkbox"/> Battery	
Operating voltage range:	Vnom:	<input type="checkbox"/> 120V/60Hz	<input checked="" type="checkbox"/> 3 Vdc	

Antenna Characteristic

Antenna assembly	Gain (dBi)	Frequency Band (MHz)	Impedance(Ω)
1 (PCB Antenna)	-3	2400-2483.5	50



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CHANNEL PLAN

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

DATA RATE

Data Rate (Mbps)	Modulation Type	Worst Case Modulation
1	GFSK	<input checked="" type="checkbox"/>

2.2. RUNNING MODE

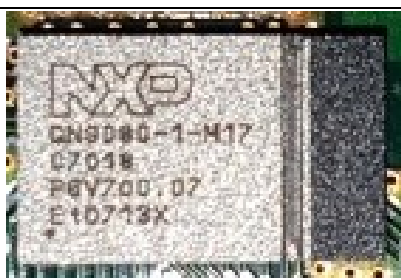
The EUT is set in the following modes during tests:

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

Following commands with the specific test software “QBlue ISP studio” are used to set the product:

- See document:” Software tool for Antenna charac & Certification QN9080M17.pdf” for the instruction.

2.3. EQUIPMENT LABELLING



2.4. EQUIPMENT MODIFICATION

- None Modification:

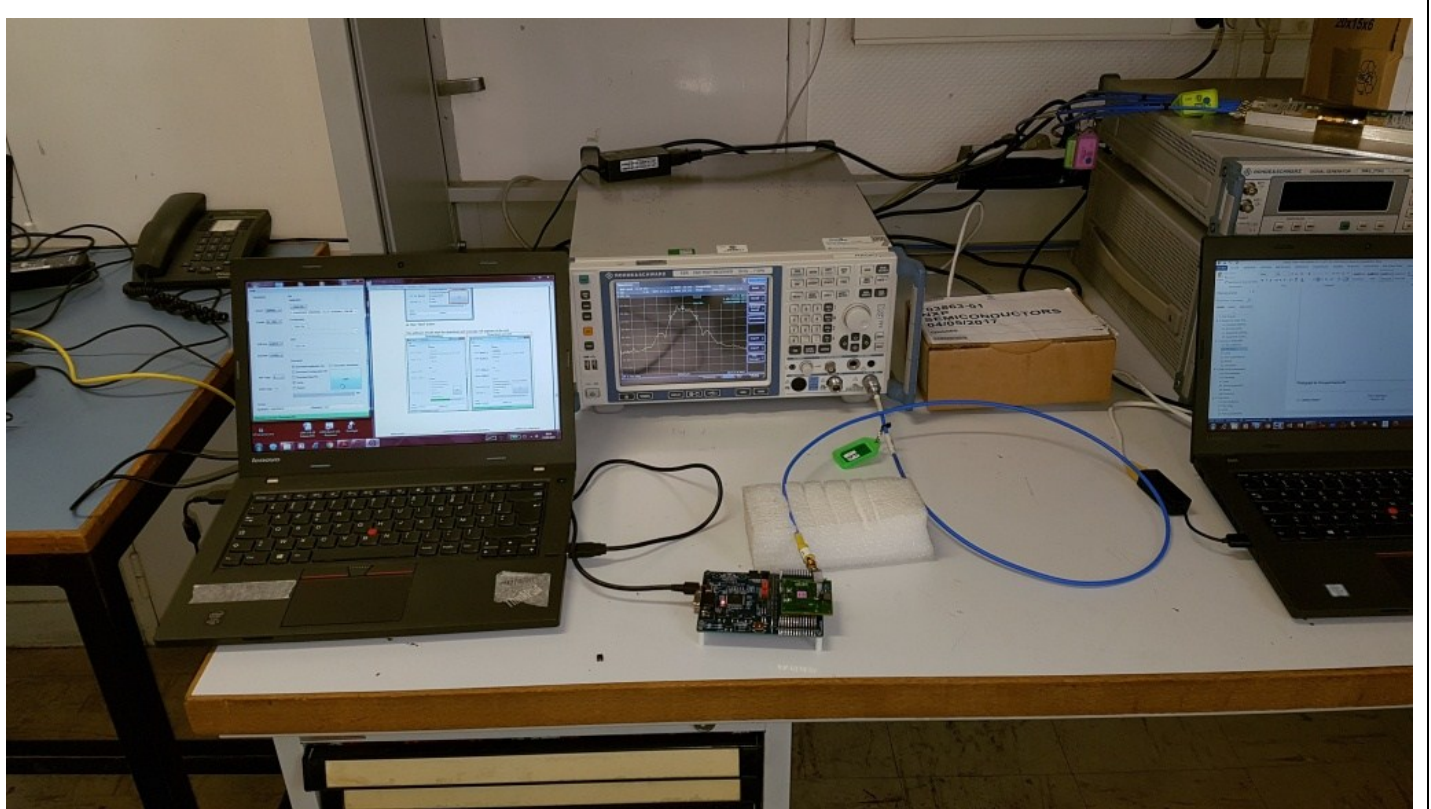
3. OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : May 17, 2017
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 § 6.9.2



Photograph for Occupied bandwidth



3.3. *LIMIT*

None

3.4. TEST EQUIPMENT LIST

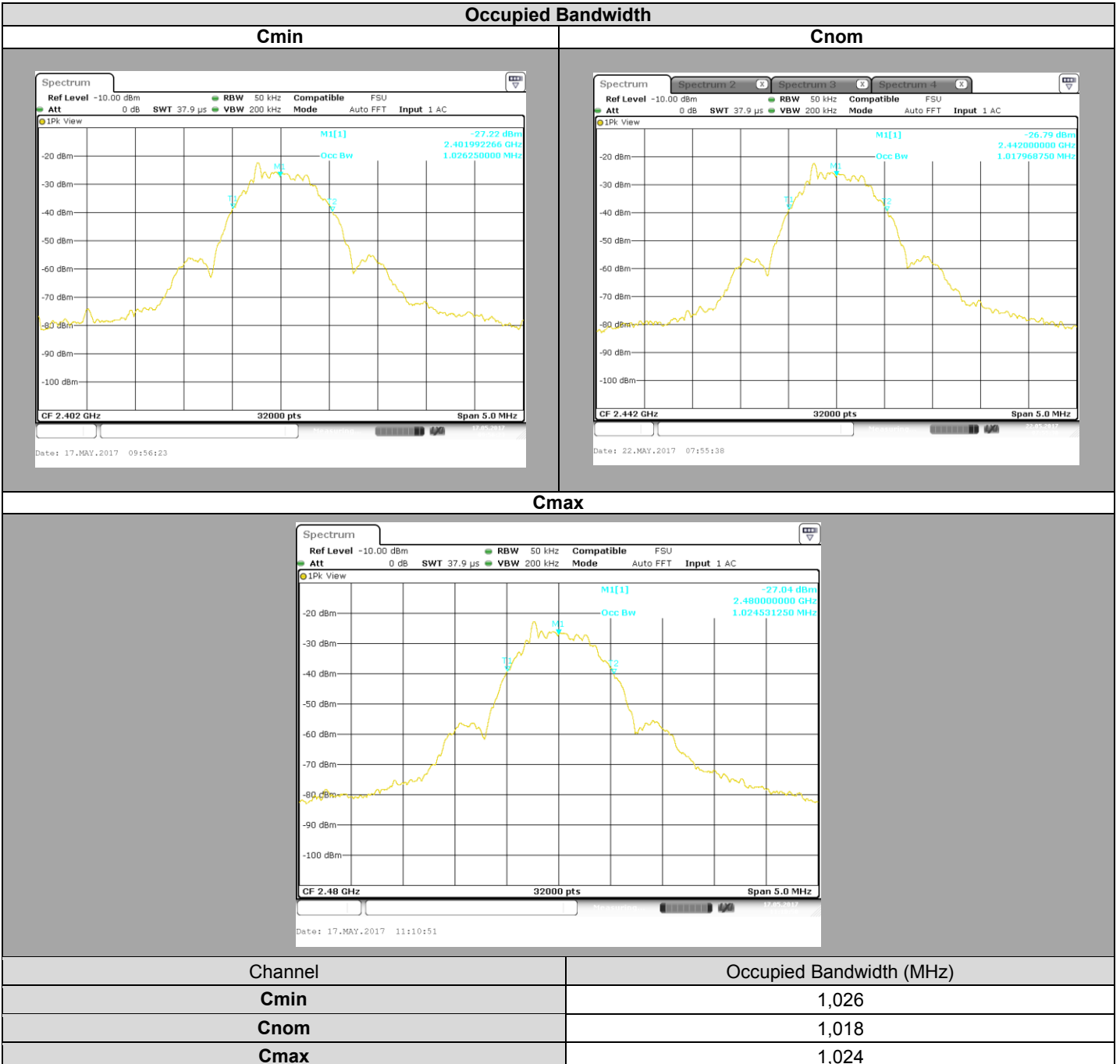
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329676	2016/09	2017/09

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



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3.5. RESULTS



3.6. CONCLUSION

Occupied Channel Bandwidth measurement performed on the sample of the product **NXP QN9080-001-M17**, SN: **P6V700.07**, 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 : May 17, 2017
Ambient temperature : 23 °C
Relative humidity : 45 %

4.2. TEST SETUP

- The Equipment Under Test is installed:

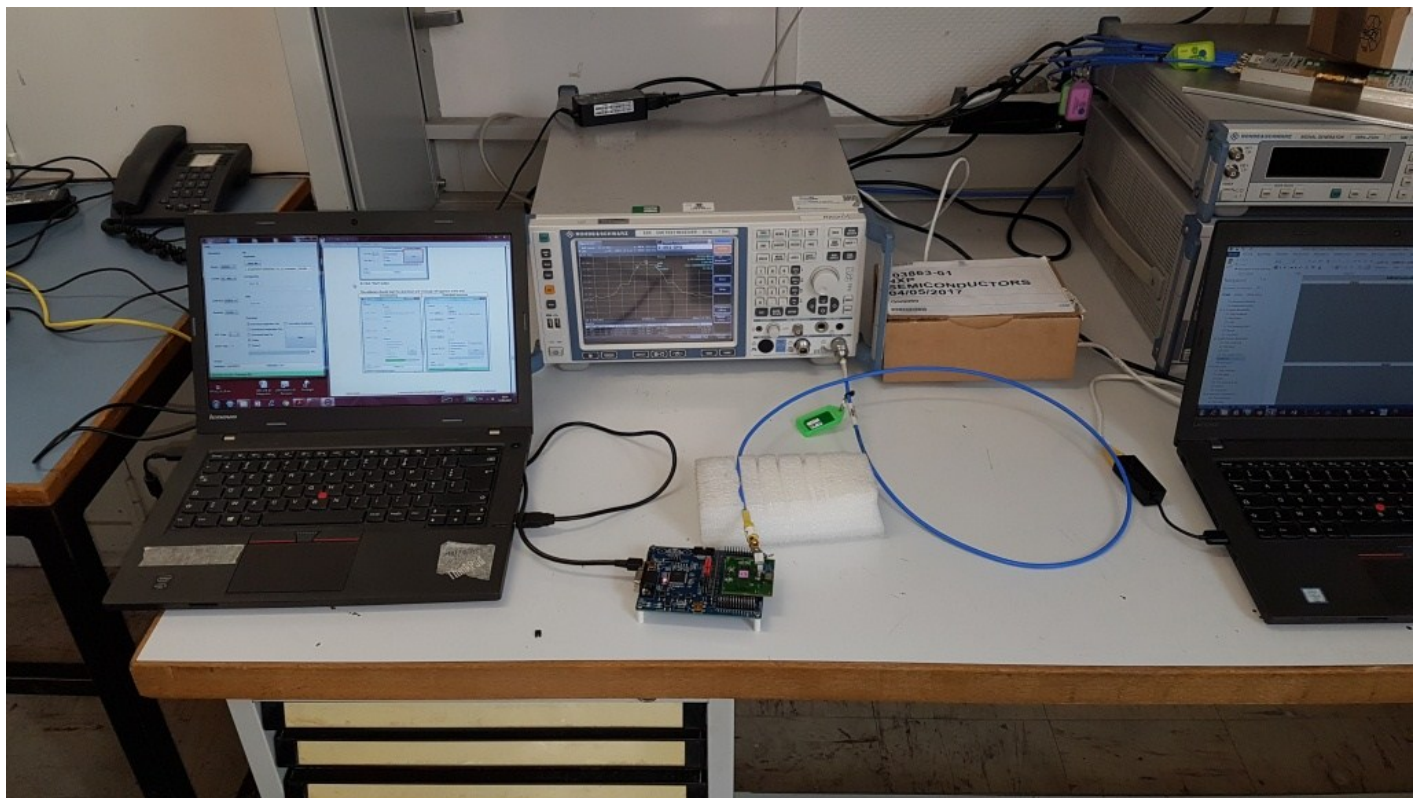
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

- 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

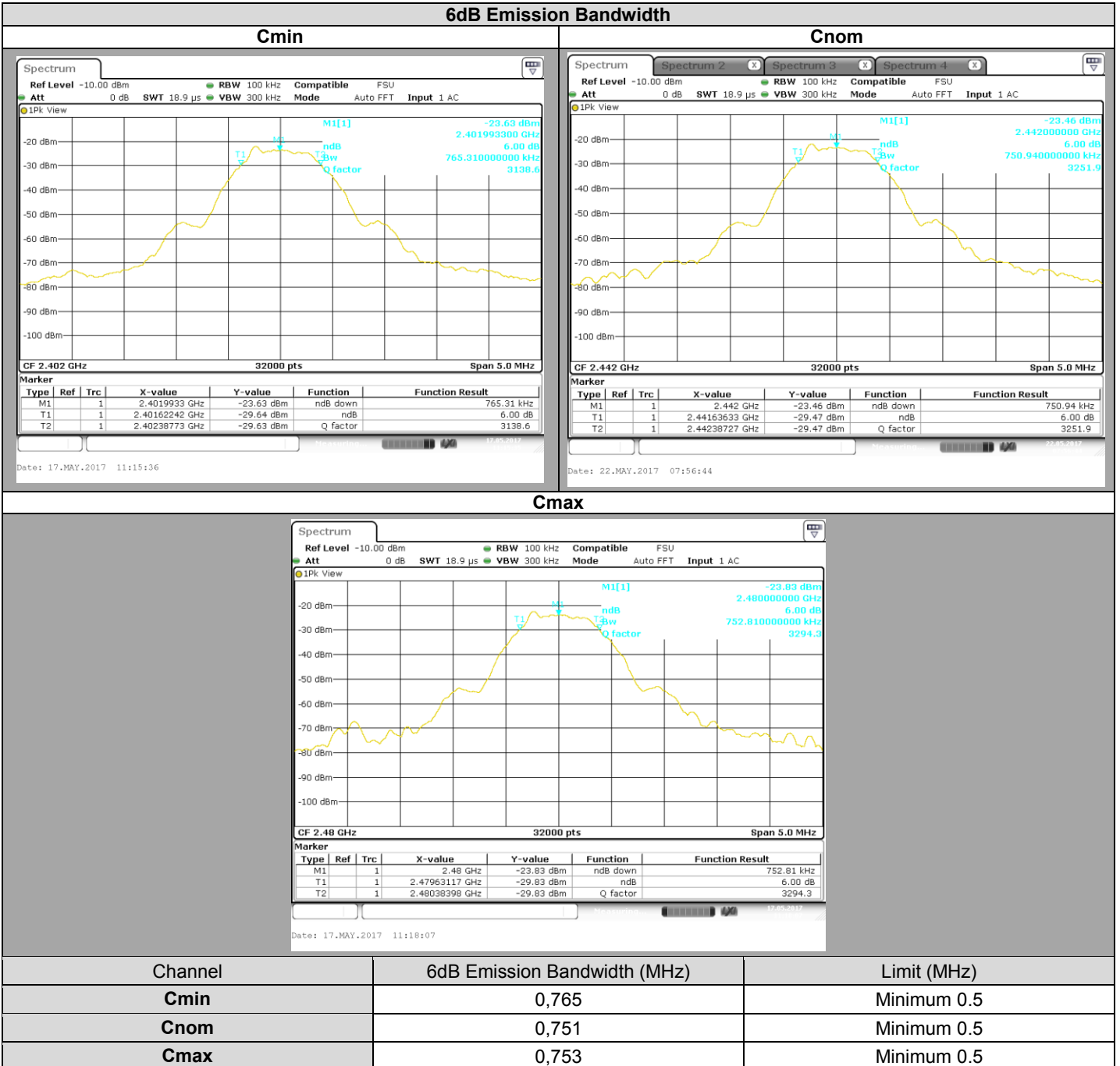
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Téledyne	920-0202-048	A5329676	2016/09	2017/09

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



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4.5. RESULTS



4.6. CONCLUSION

6dB Emission Bandwidth measurement performed on the sample of the product **NXP QN9080-001-M17**, SN: **P6V700.07**, in configuration and description presented in this test report, show levels **compliant to the 47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

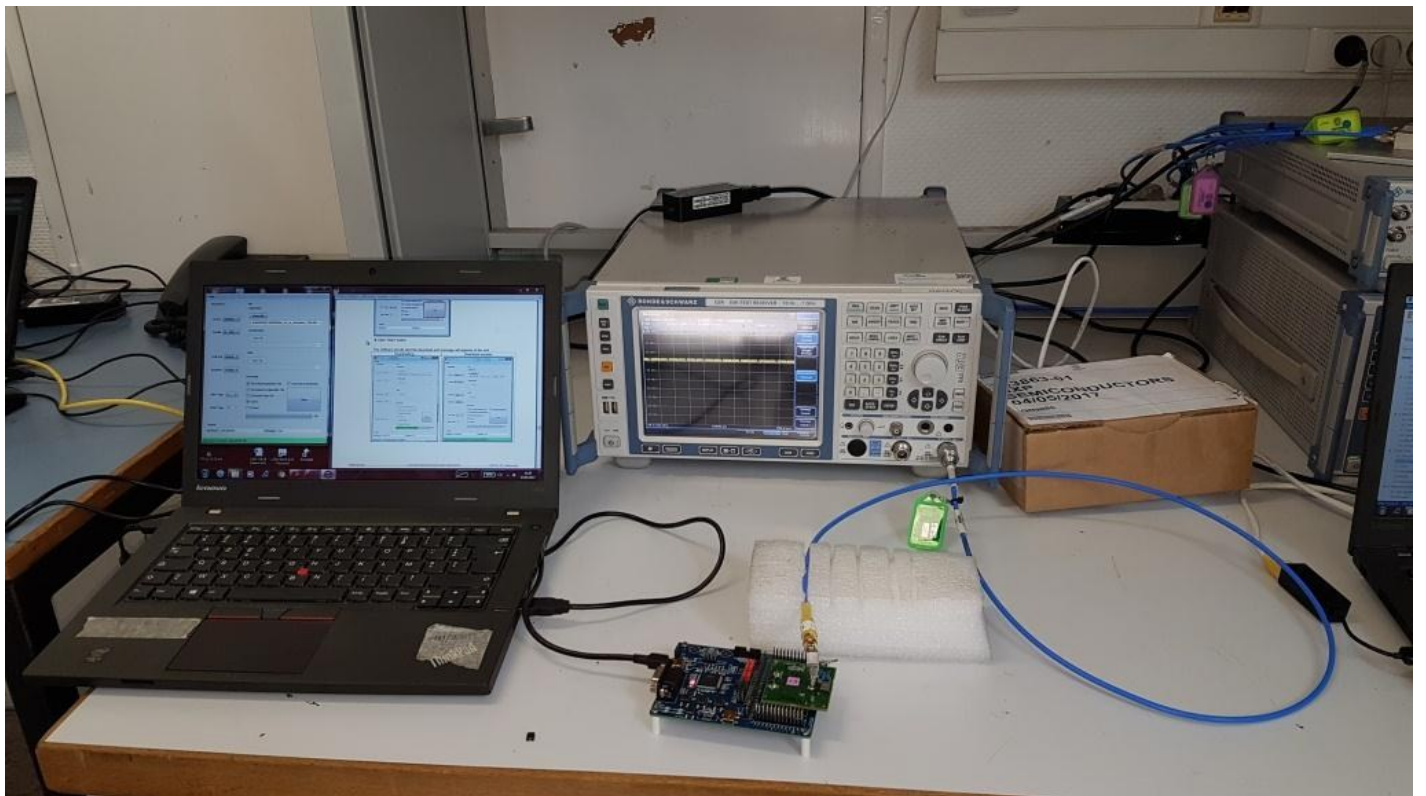
5. DUTY CYCLE

5.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : May 17, 2017
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:
 - KDB 558074 D01 DTS Meas Guidance v04 § 6.0 b)



Photograph for Duty Cycle



5.3. LIMIT

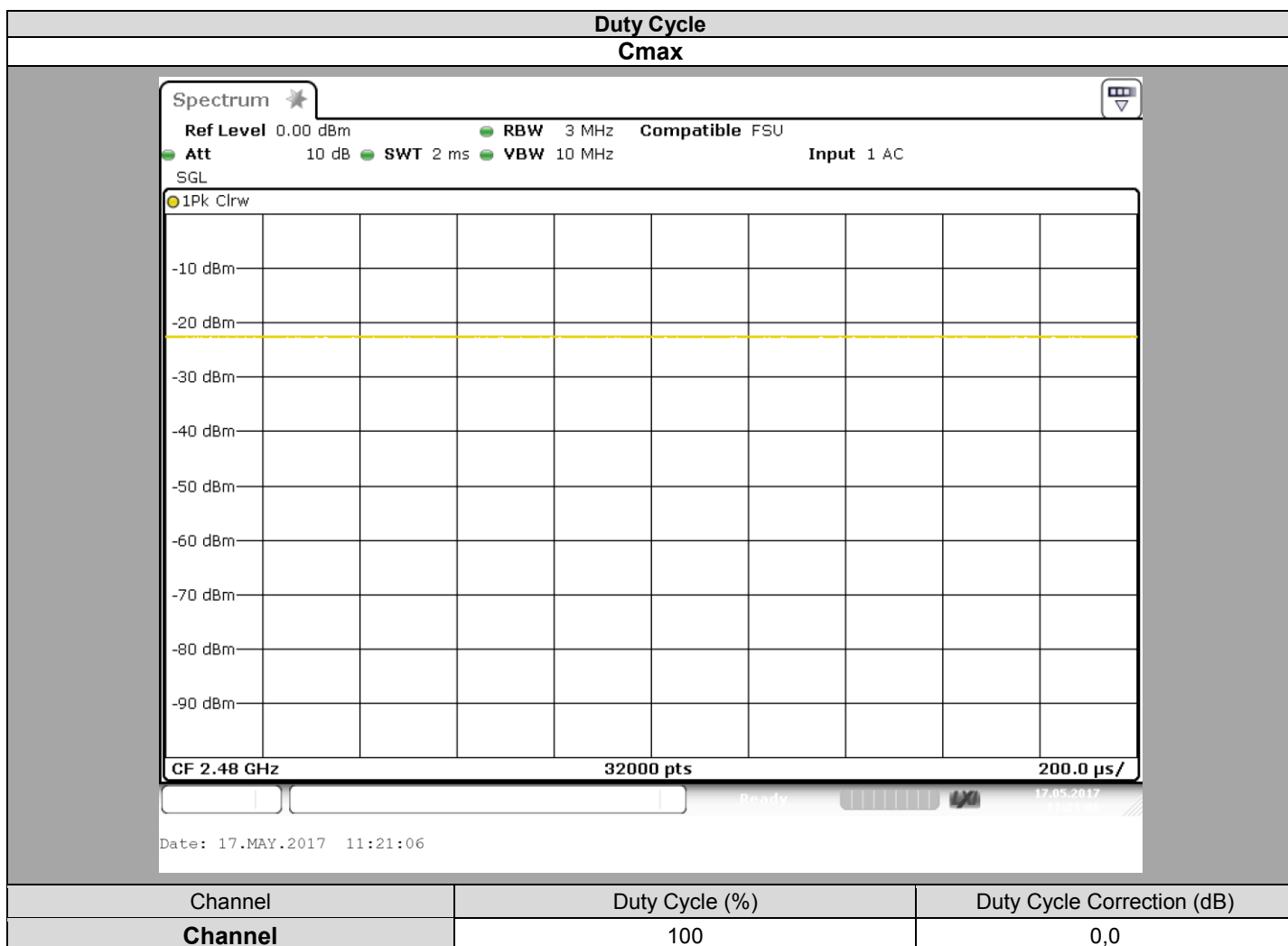
None

5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329676	2016/09	2017/09

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

5.5. RESULTS





5.6. CONCLUSION

Duty Cycle measurement performed on the sample of the product **NXP QN9080-001-M17**, SN: **P6V700.07**, 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 : May 17, 2017
Ambient temperature : 23 °C
Relative humidity : 45 %

6.2. TEST SETUP

- The Equipment Under Test is installed:

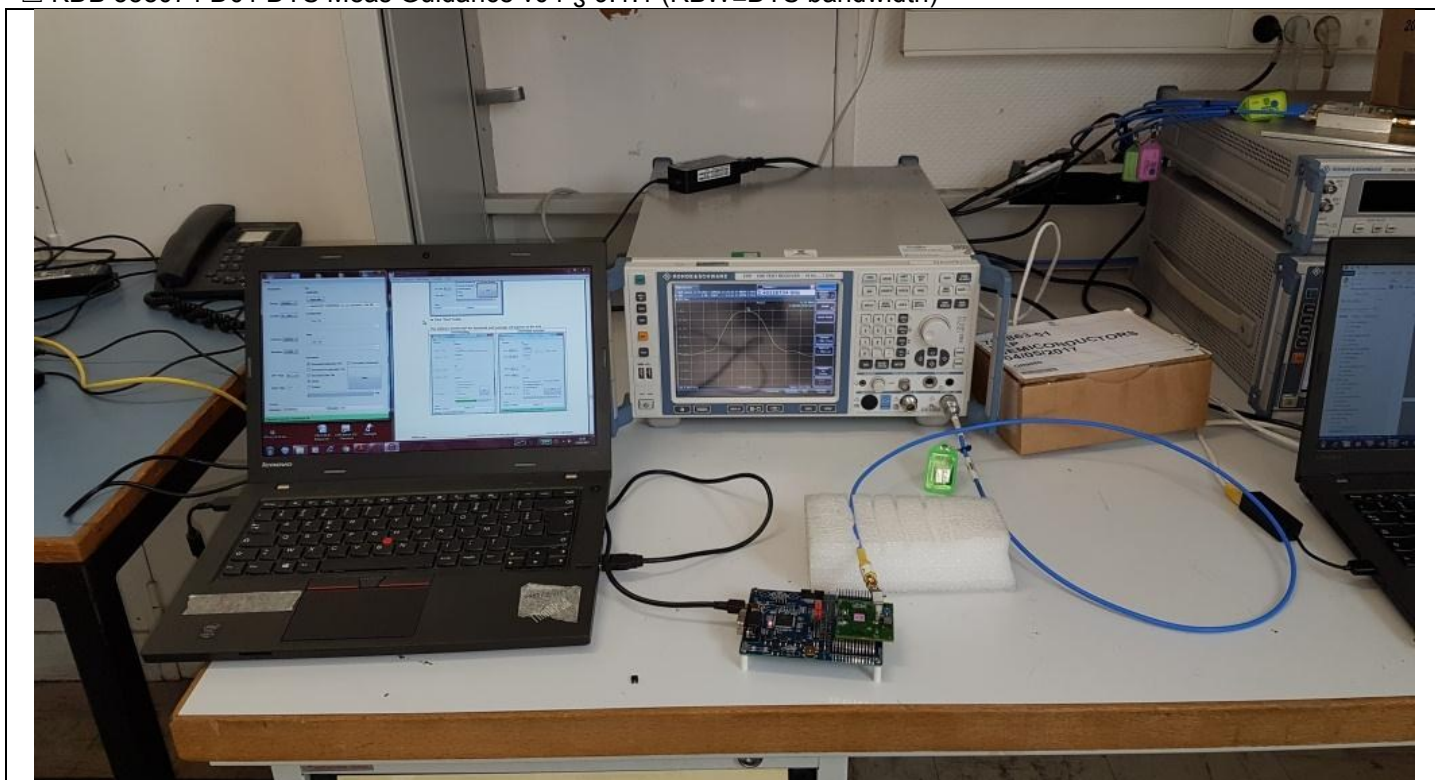
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

- KDB 558074 D01 DTS Meas Guidance v04 § 9.1.1 (RBW≥DTS bandwidth)



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

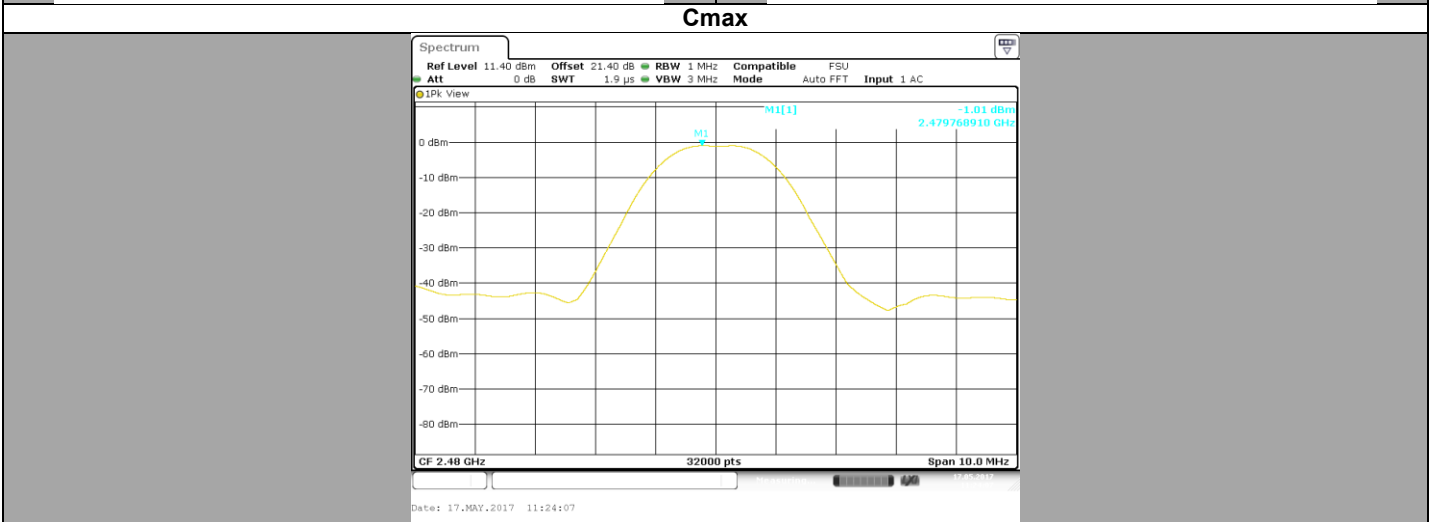
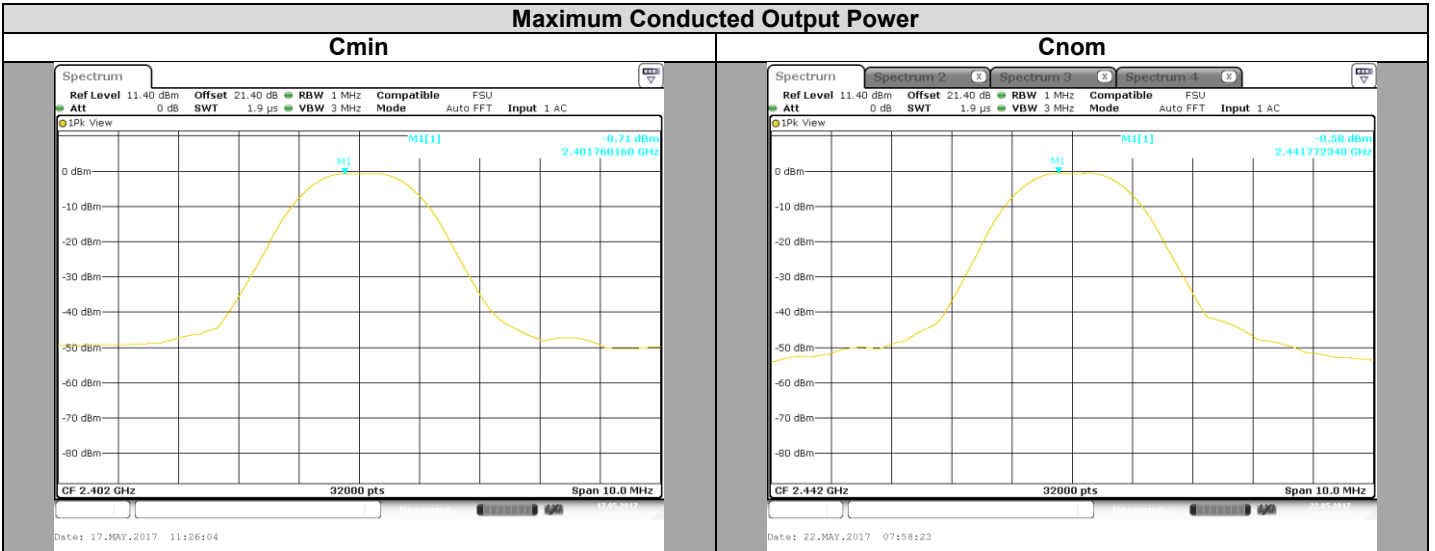
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329676	2016/09	2017/09

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



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6.5. RESULTS



Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Limit (dBm)
Cmin	21,4	-3	-0,71	30
Cnom	21,4	-3	-0,58	30
Cmax	21,4	-3	-1,01	30

6.6. CONCLUSION

Maximum Conducted Output Power measurement performed on the sample of the product **NXP QN9080-001-M17**, SN: **P6V700.07**, 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 : May 17, 2017
Ambient temperature : 23 °C
Relative humidity : 45 %

7.2. TEST SETUP

- The Equipment Under Test is installed:

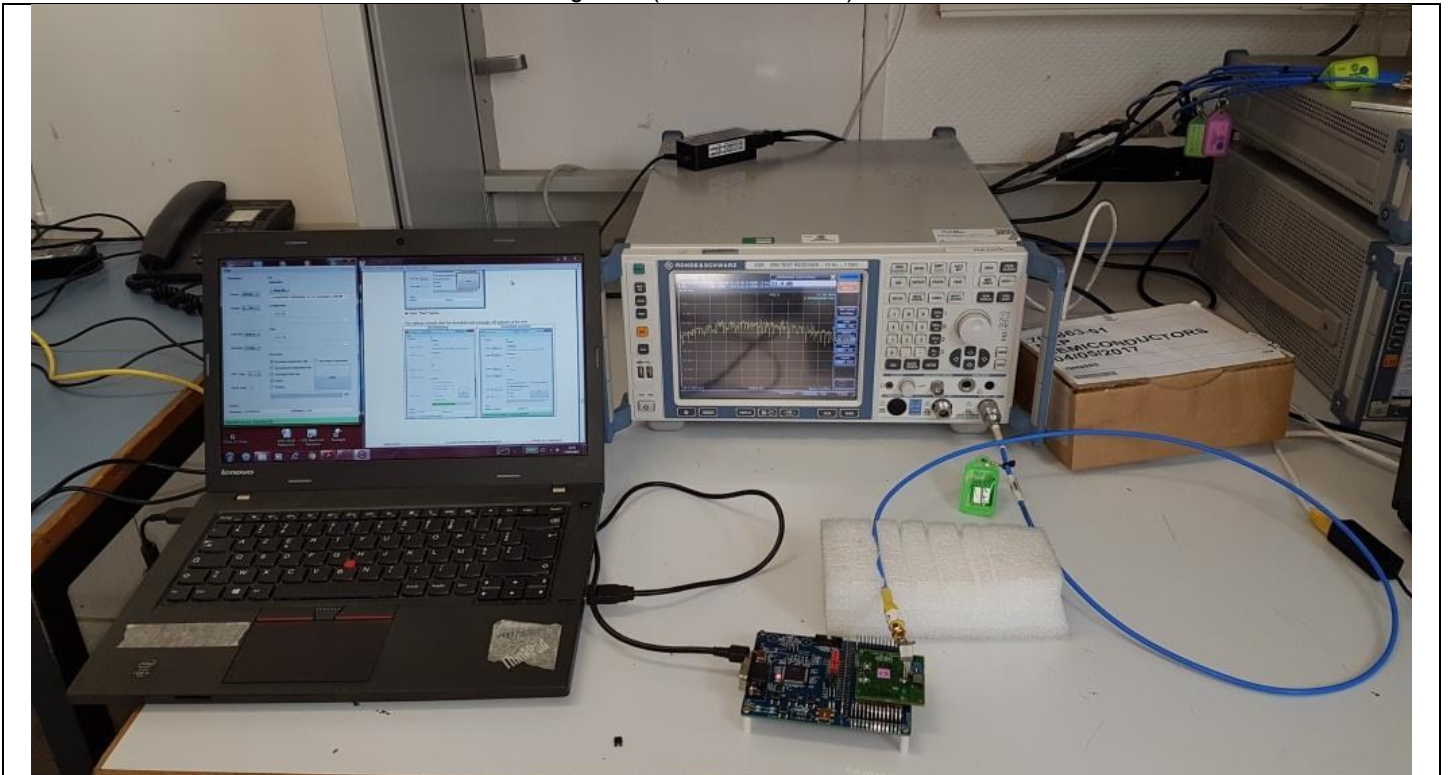
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

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



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

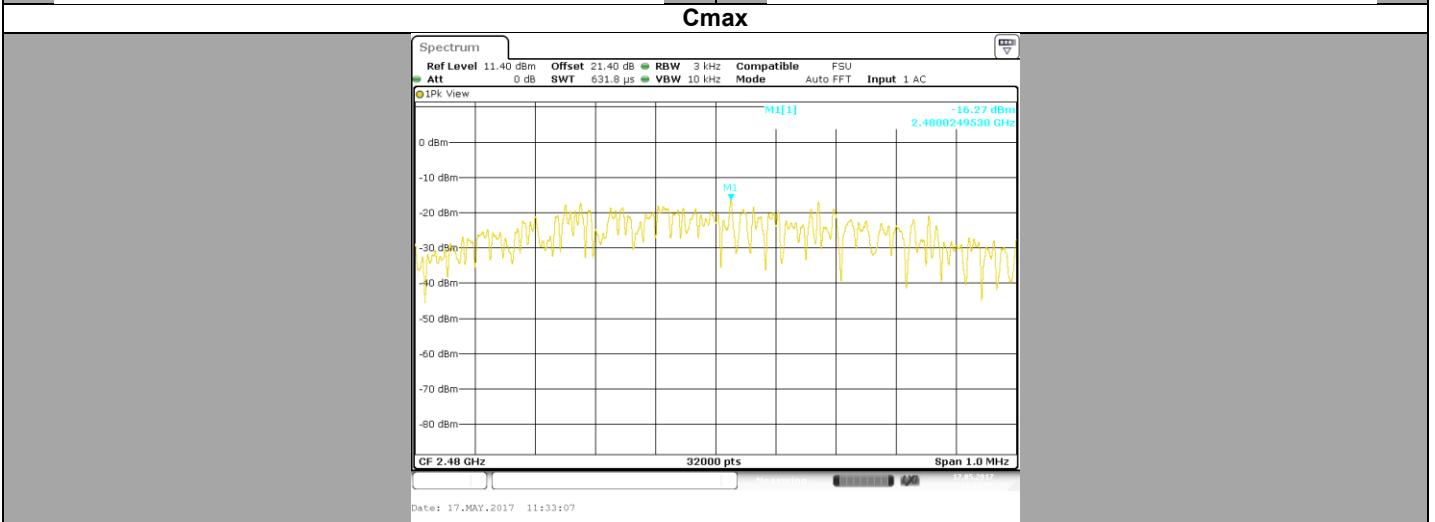
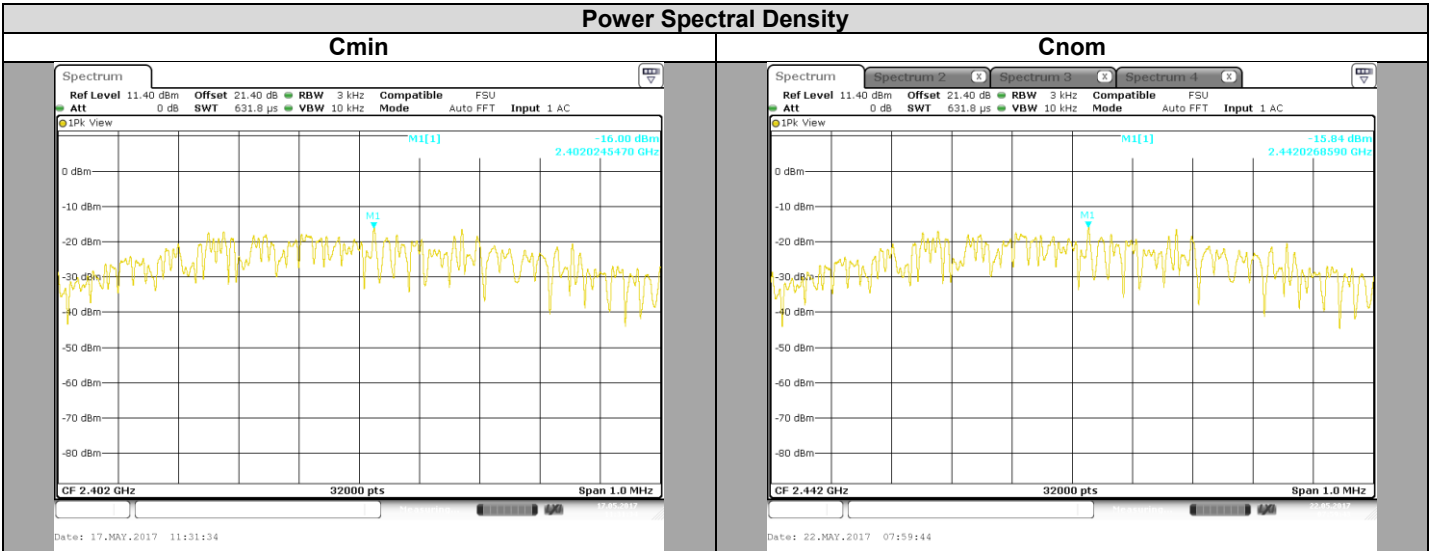
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329676	2016/09	2017/09

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



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7.5. RESULTS



Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
Cmin	21,4	-3	-16,0	8
Cnom	21,4	-3	-15,84	8
Cmax	21,4	-3	-16,27	8

7.6. CONCLUSION

Power Spectral Density measurement performed on the sample of the product **NXP QN9080-001-M17**, SN: **P6V700.07**, 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

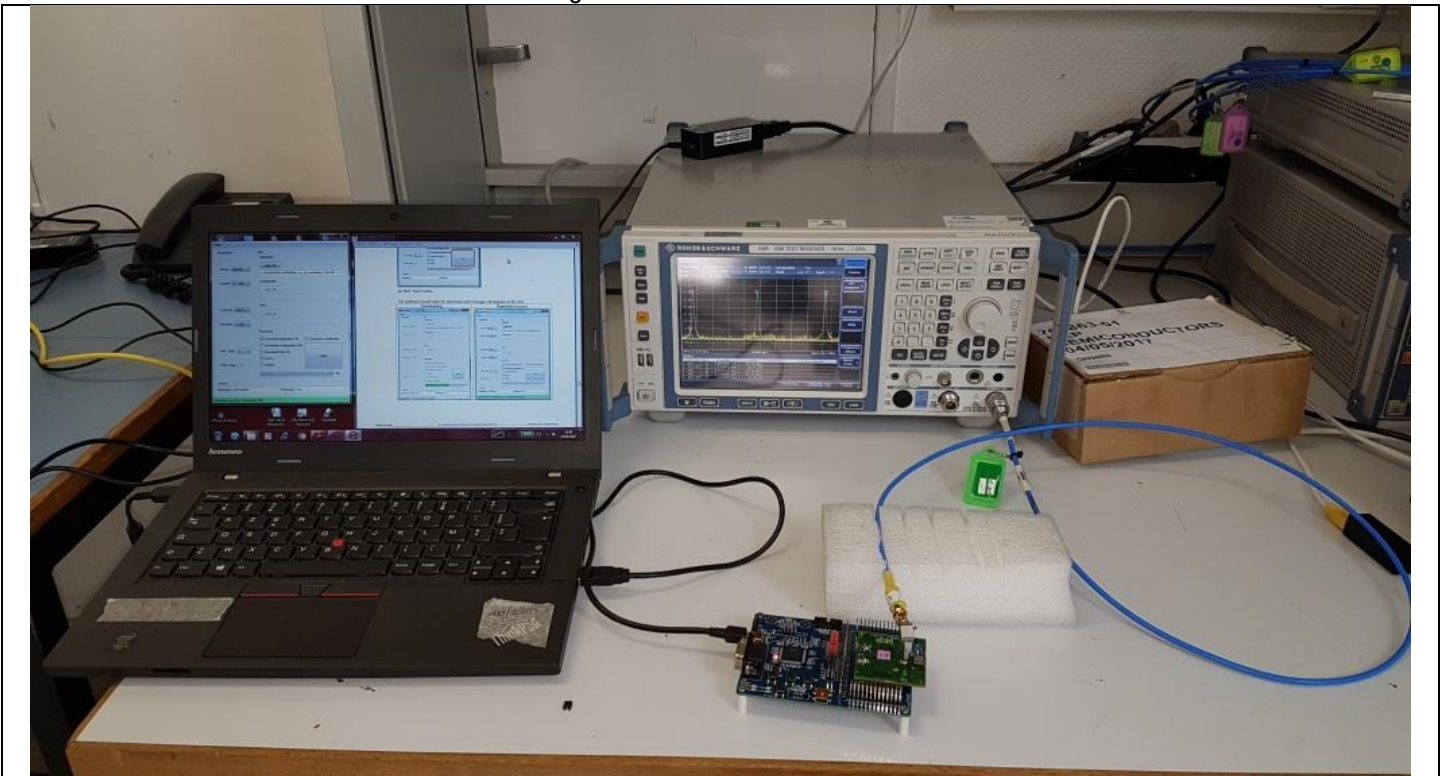
Test performed by : Armand MAHOUNGOU
Date of test : May 17, 2017
Ambient temperature : 23 °C
Relative humidity : 45 %

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:
 - 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 20dB below the Fundamental Radiator Level at the Band Edge Edge “2400MHz & 2483,5MHz”

8.4. TEST EQUIPMENT LIST

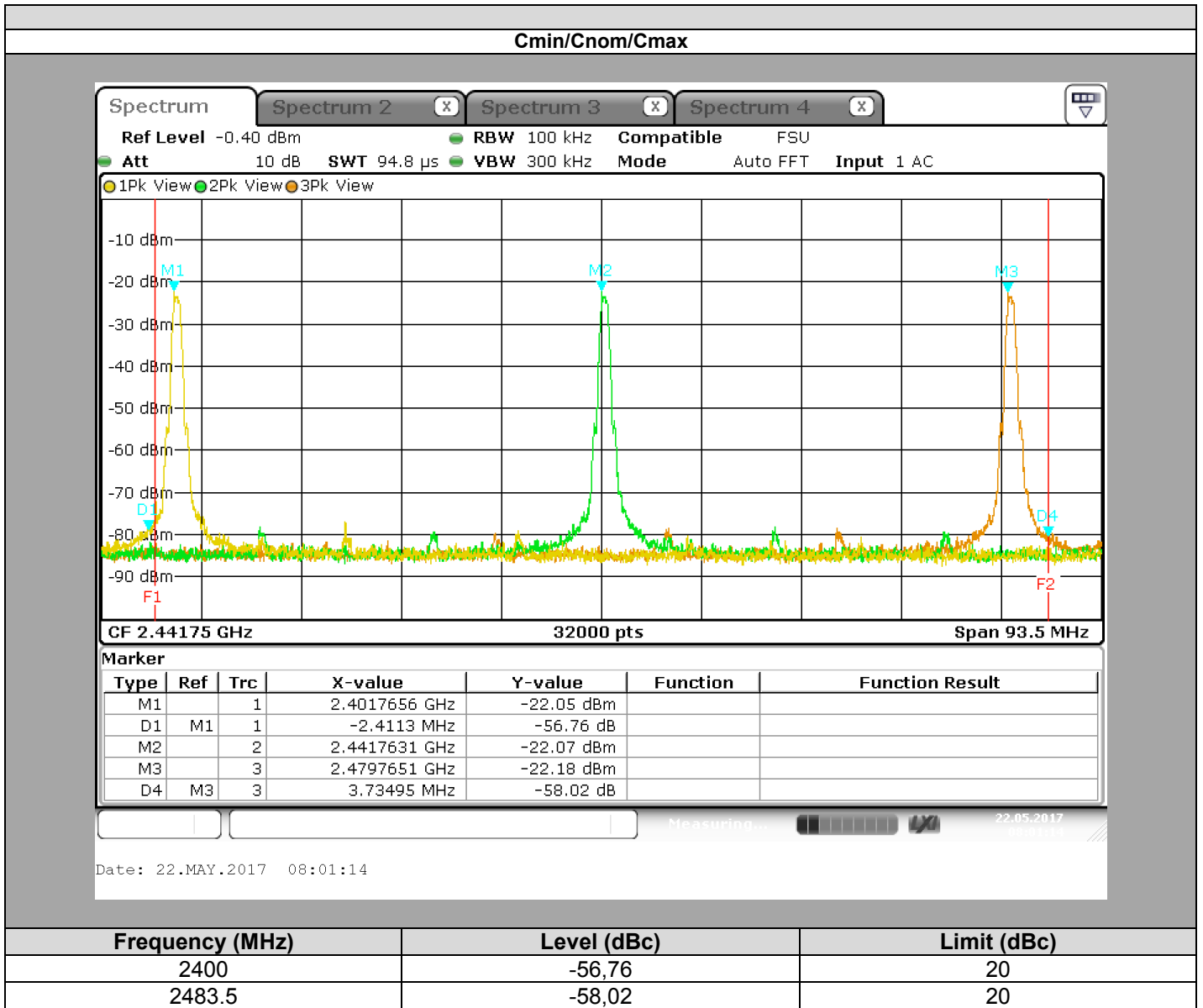
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329676	2016/09	2017/09

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



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8.5. RESULTS



8.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands at the band edge measurement performed on the sample of the product **NXP QN9080-001-M17**, SN: **P6V700.07**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

9. UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS

9.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : May 22, 2017
Ambient temperature : 24 °C
Relative humidity : 44 %

9.2. TEST SETUP

- The Equipment Under Test is installed:

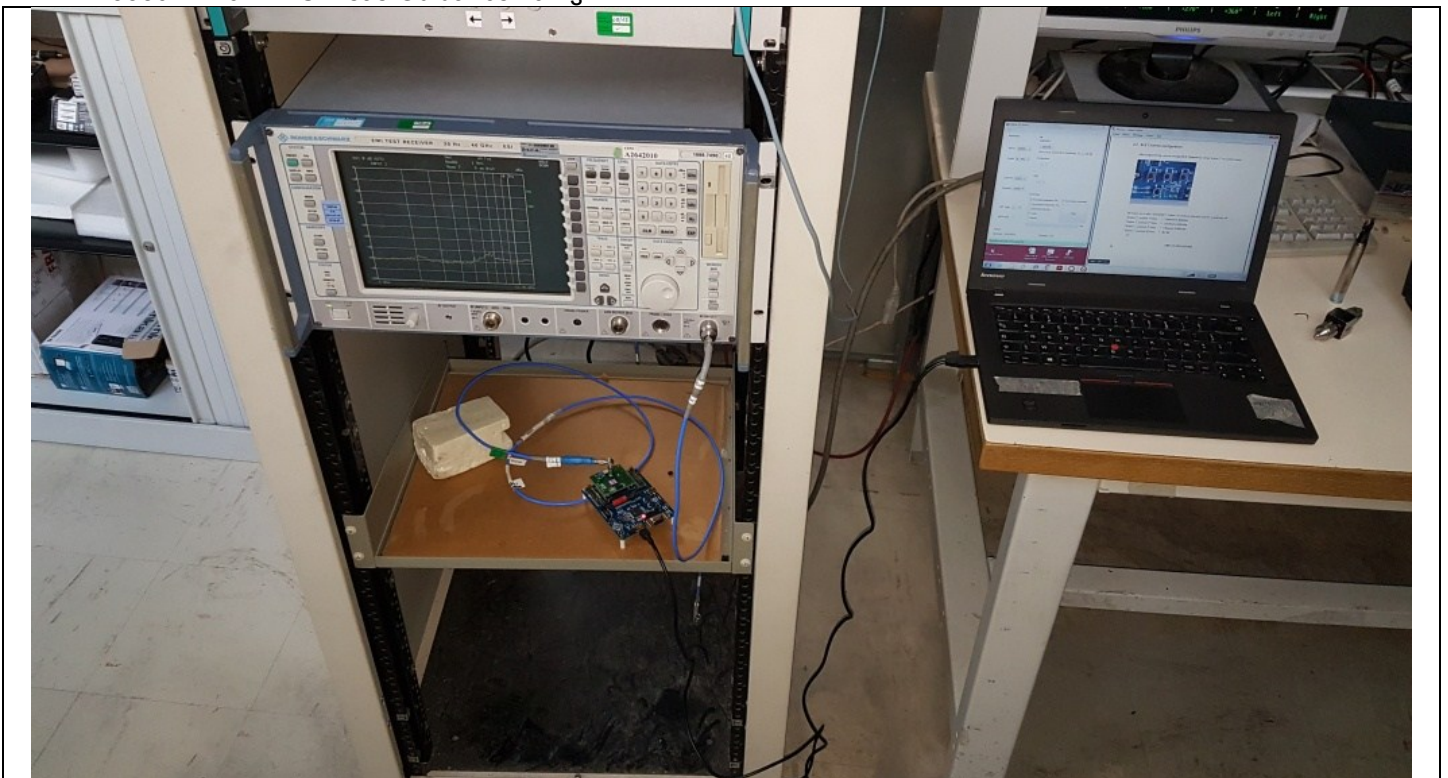
- On a table
- In an anechoic chamber

- 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



9.3. LIMIT

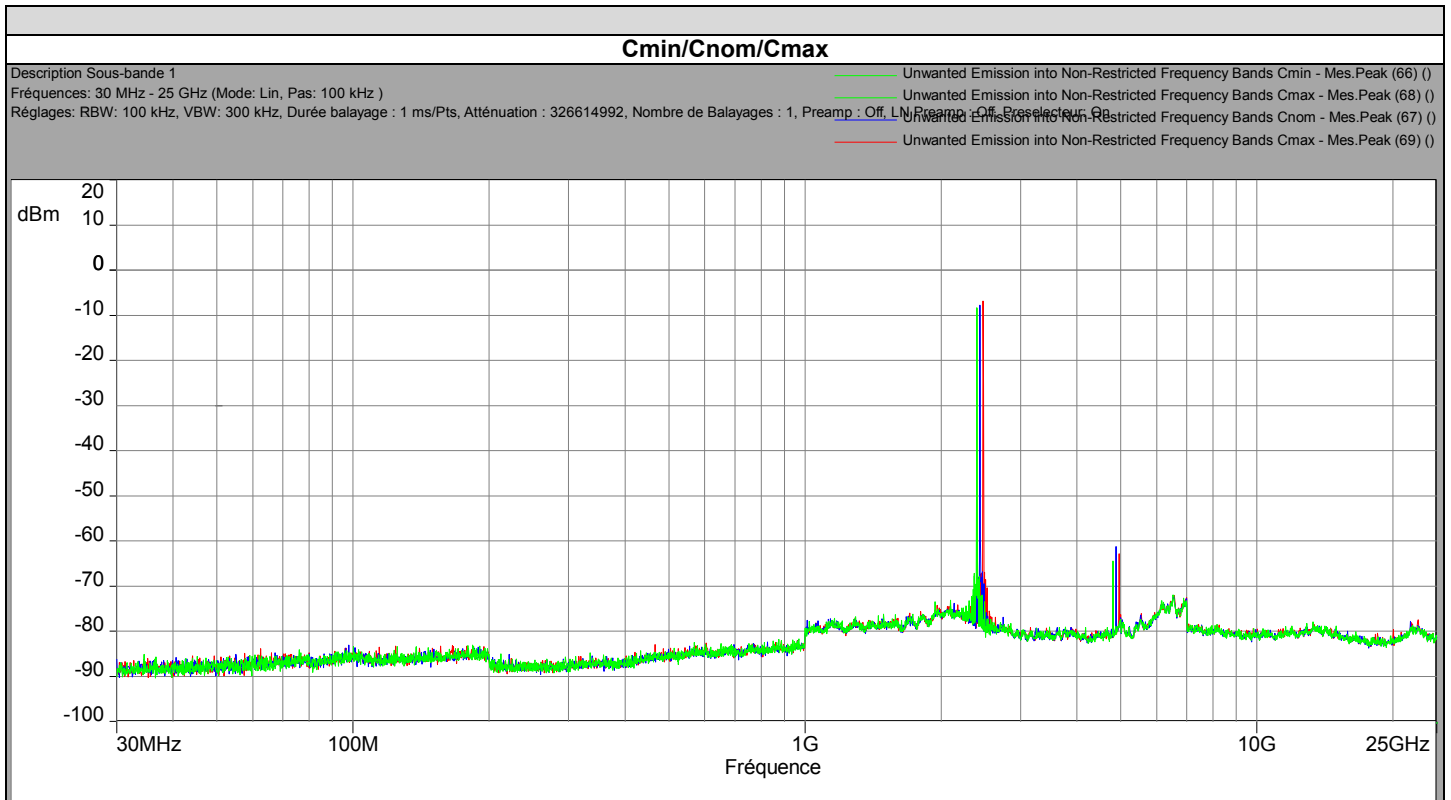
All Spurious Emissions must be at least 20 below the Fundamental Radiator Level

9.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESI40 1088 740K40	A2642010	2016/07	2017/07
cable	Télédyne	084-0555-2MTR	A5329758	2016/10	2017/10
Filter	PASTERNAK	PE8213	A7480048	2015/09	2017/09

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

9.5. RESULTS



Frequency (MHz)	Level (dBm)	Level (dBc)	Limit (dBc)
2402	-8.44		
2369.8	-67.72	59.28	20
2417.8	-69.20	60.76	20
4803.5	-64.55	56.11	20
2442	-7.74		
2407.8	-67.72	59.98	20
2455.8	-68.10	60.36	20
4879.5	-61.24	53.5	20
2480	-6.88		
2447.8	-67.36	60.48	20
2495.8	-67.00	60.12	20
4959	-62.85	55.97	20

9.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands measurement performed on the sample of the product **NXP QN9080-001-M17**, SN: **P6V700.07**, in configuration and description presented in this test report, show levels compliant to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

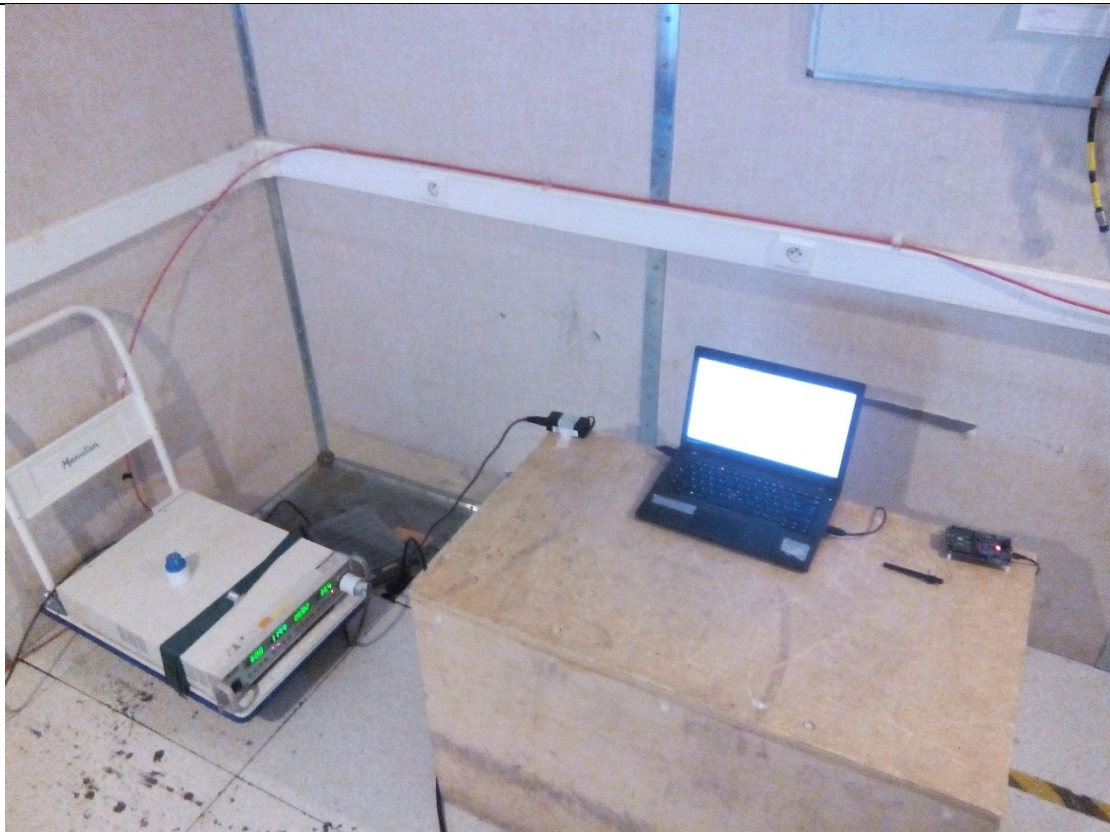
10. AC POWER LINE CONDUCTED EMISSIONS

10.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : May 31, 2017
Ambient temperature : 22 °C
Relative humidity : 44 %

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)



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



10.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESU26	A2642018	2016/10	2017/10
Cable	CABLES & CONNECTIQUES	-	A5329412	2016/06	2017/06
Power Supply	Adaptive power system	FC 210	A7360017	Calibrated with multimeter	Calibrated with multimeter
Multi-meter	ISOTECH	IDM 91E	A1240253	2016/11	2018/11
V LISN	ROHDE & SCHWARZ	ESH3-Z5	C2322003	2016/08	2017/08
pulse limiter	ROHDE & SCHWARZ	ESH3-Z2	A2649005	2016/12	2017/12

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

10.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None Divergence:

10.6. RESULTS

Cmin PCB Antenna Phase

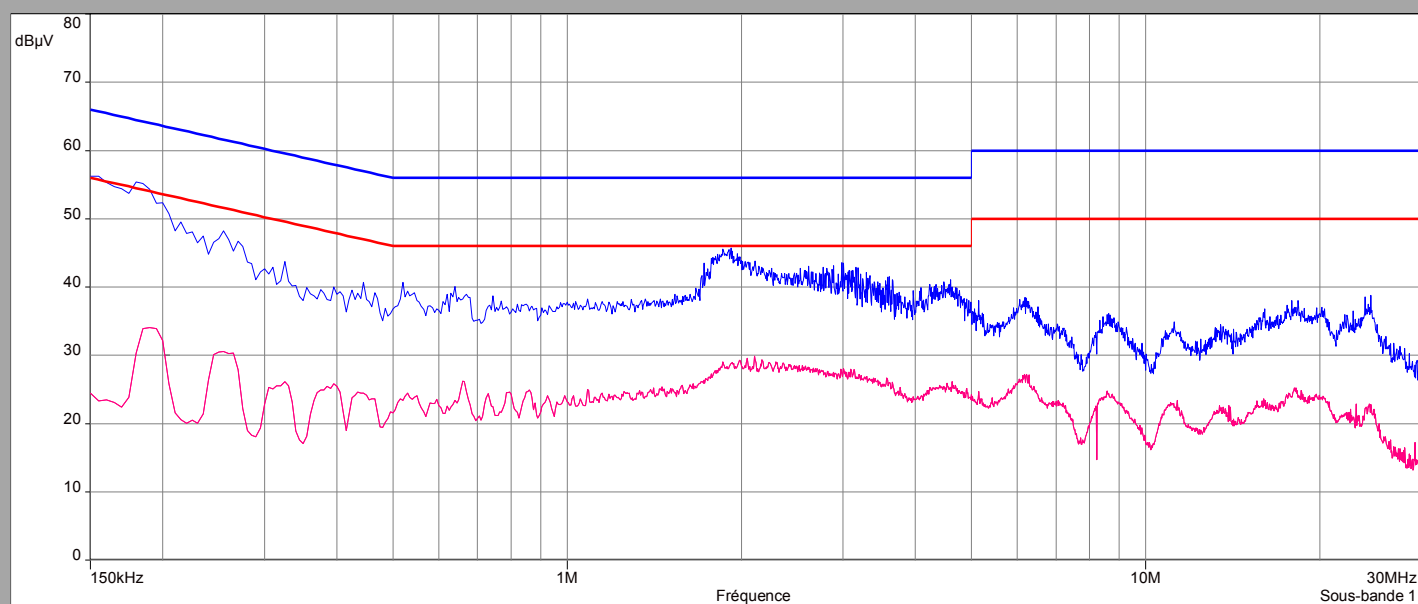
Description Sous-bande 1

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

Réglages: RBW: 9 kHz, VBW: Auto, Durée balayage: 50 ms/Pts, Atténuation: 246648856, Nombre de Balayages: 1, Preamp: Off, LN Preamp: Off, Preselecteur: Off, Mes.Pk (Phase 1)

Ligne:Phase 1

— Civil 55022/EN 55022 Conduit Alim - Classe:B - Moyenne/
 — Civil 55022/EN 55022 Conduit Alim - Classe:B - QCrête/
 — Mes.Pk (Phase 1)
 — Mes.Avg (Phase 1)



Line

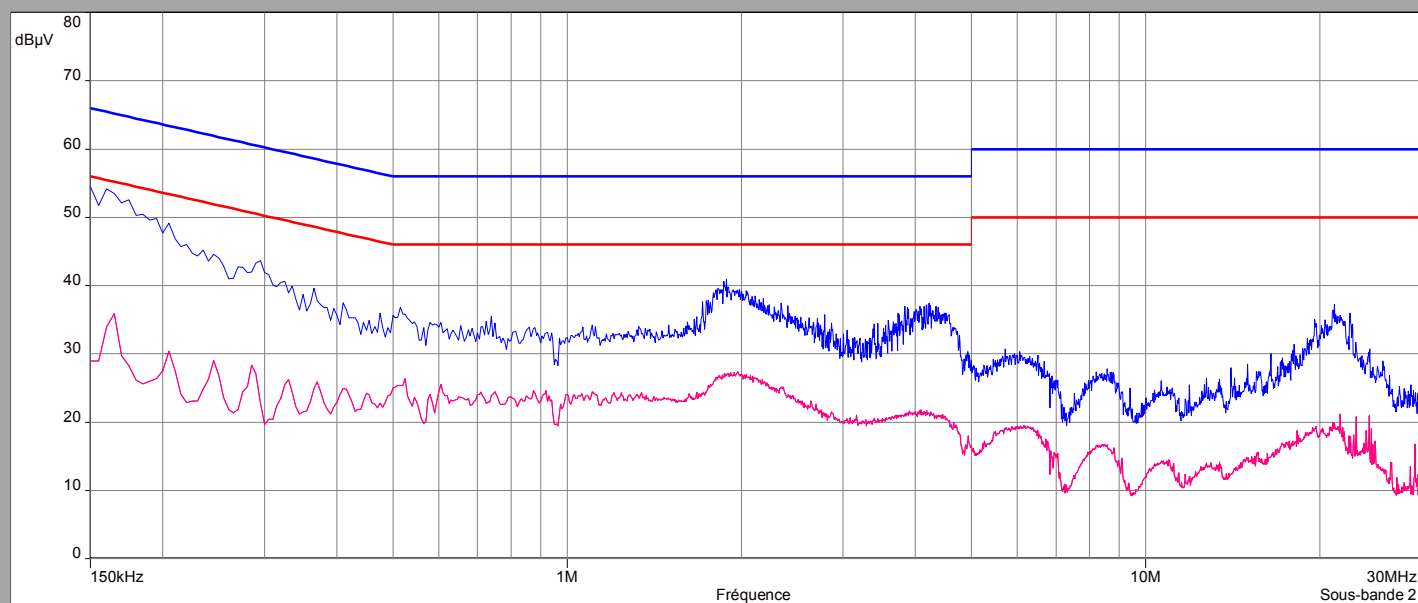
Description Sous-bande 2

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

Réglages: RBW: 9 kHz, VBW: Auto, Durée balayage: 50 ms/Pts, Atténuation: 248690200, Nombre de Balayages: 1, Preamp: Off, LN Preamp: Off, Preselecteur: Off, Mes.Pk (Neutre)

Ligne:Neutre

— Civil 55022/EN 55022 Conduit Alim - Classe:B - Moyenne/
 — Civil 55022/EN 55022 Conduit Alim - 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)	Margin Quasi-Peak Limit (dB μ V)	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Average Limit (dB μ V)
0.18	55.42	-	64.49	9.07	33.88	54.49	20.61
1.92	45.72	-	56	10.28	28.81	46	17.19
4.60	41.05	-	56	14.95	25.26	46	20.74
6.20	38.42	-	60	21.58	26.04	50	23.96
8.63	35.99	-	60	24.01	24.04	50	25.96
24.48	38.8	-	60	21.2	22.49	50	27.51

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 (dB μ V)	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Average Limit (dB μ V)
160	54.19	-	65.46	11.28	35.87	55.21	19.34
295	43.66	-	60.38	16.72	28.39	50.67	22.28
1.88	40.90	-	56.00	15.10	27.03	46.00	18.97
4.22	37.41	-	56.00	18.58	21.37	46.00	24.62
19.58	35.09	-	60	24.91	18.69	50.00	31.30
21.2	37.27	-	60	22.73	18.62	50.00	31.38

10.7. CONCLUSION

Ac Power Line Conducted Emission measurement performed on the sample of the product **NXP QN9080-001-M17**, SN: **P6V700.07**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 & RSS 247 ISSUE 2 limits.

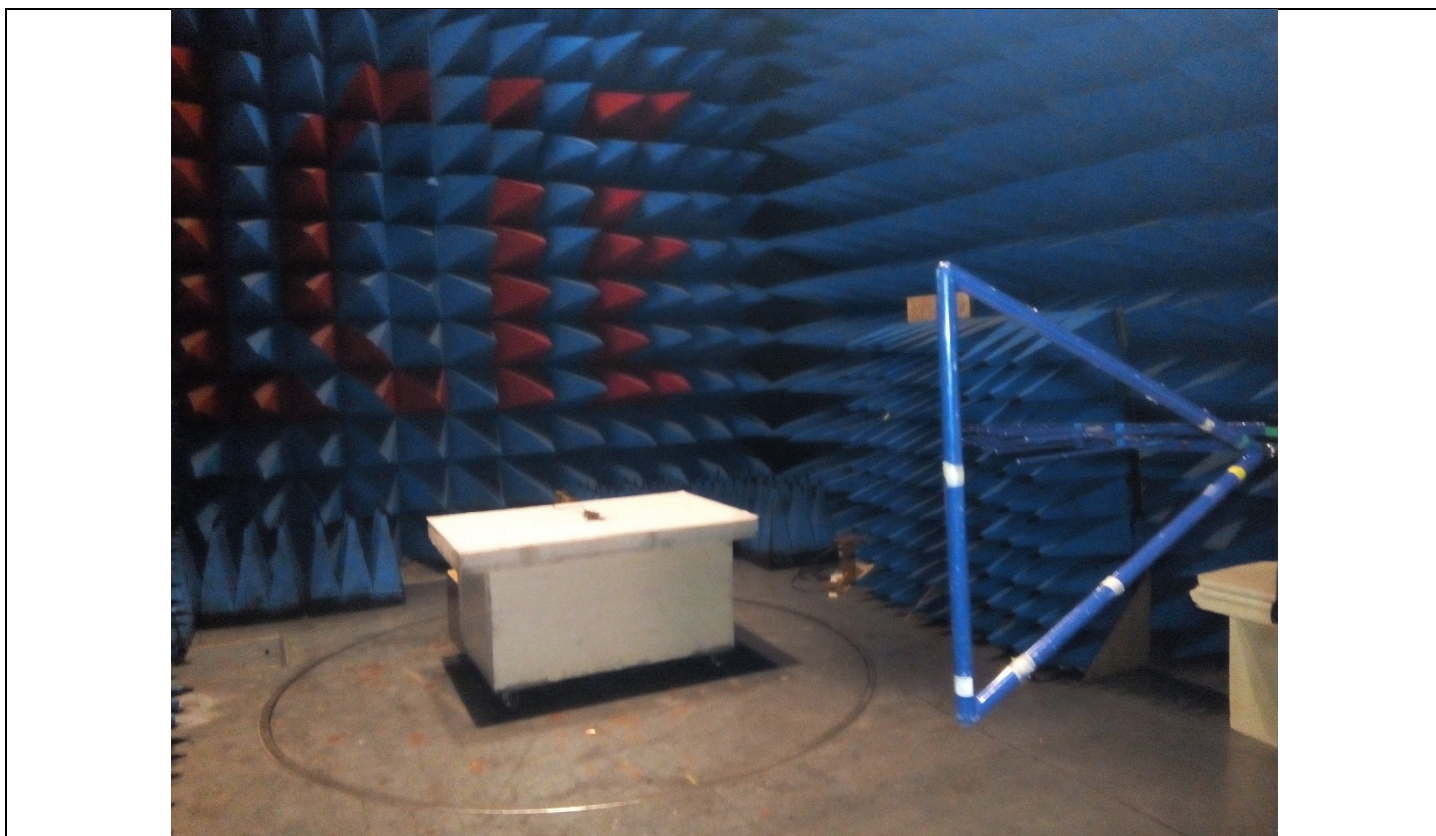
11. UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

11.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : May 22, 2017
Ambient temperature : 22 °C
Relative humidity : 43 %

11.2. TEST SETUP

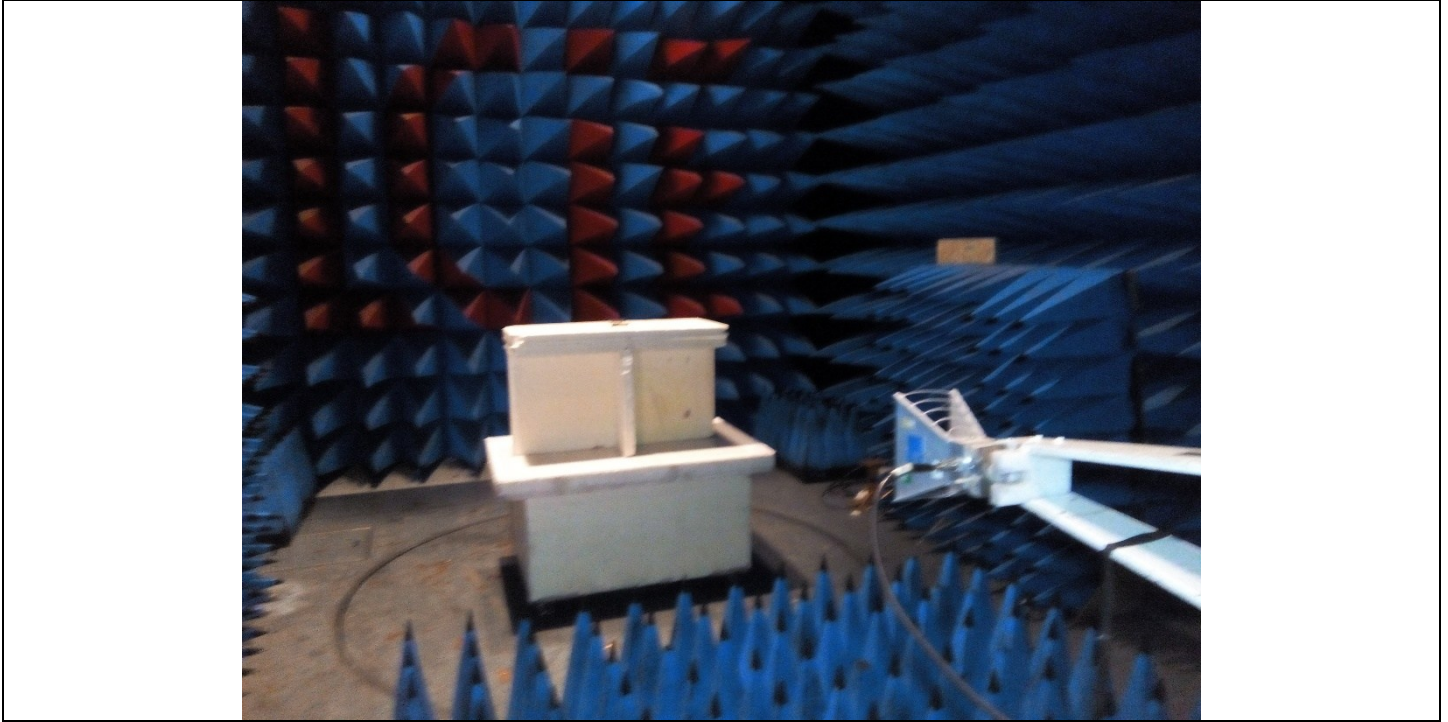
The product has been tested according to ANSI C63.10 (2013). The EUT is placed **ina semi-anechoic chamber**. Distance between measuring antenna and the EUT is **3m**. Test is performed in horizontal (H) and vertical (V) polarization with **logperiodic** antenna below 1GHz and with a horn antenna above 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



L C I E



Photograph for Unwanted Emission in restricted frequency bands

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



LCIE

11.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Preamplifier	LCIE; LCIE	LCIE-ALB-001	A7080073	2016/08	2017/08
Logperiodic antenna	AMPLIFIER RESEARCH	ATR80M6G	C2040149	2016/06	2017/06
Horn antenna	AH SYSTEMS	SAS 571	C2042041	2017/04	2018/04
Horn antenna 18-26,5GHz	PASTERNAK	PE9852/2F-20	C2042049	2015/05	2017/05
Rejector filter 2,4GHz	-	2.45GHz	A7484048	2016/09	2017/09
EMI receiver	ROHDE & SCHWARZ	ESI40 1088 740K40	A2642010	2016/07	2017/07
Measurement RF cable	Télédyne	Cordon 082-5454-1.5mtr	A5329624	2016/08	2018/08
Measurement RF cable	-	082-0404-1MTR	A5329625	2016/08	2018/08
Measurement RF cable	Télédyne	082-0454-3MTR	A5329626	2016/08	2018/08
Semi anechoic chamber	SIEPEL	-	D3044008	2016/06	2017/06
EMI receiver	ROHDE & SCHWARZ	ESU26	A2642018	2016/03	2017/03
RF cable	RADIALL; CDI	30990-7M	A5329711	2016/03	2017/03
Cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA/3.5MC/4000	A5329431	2016/03	2017/03

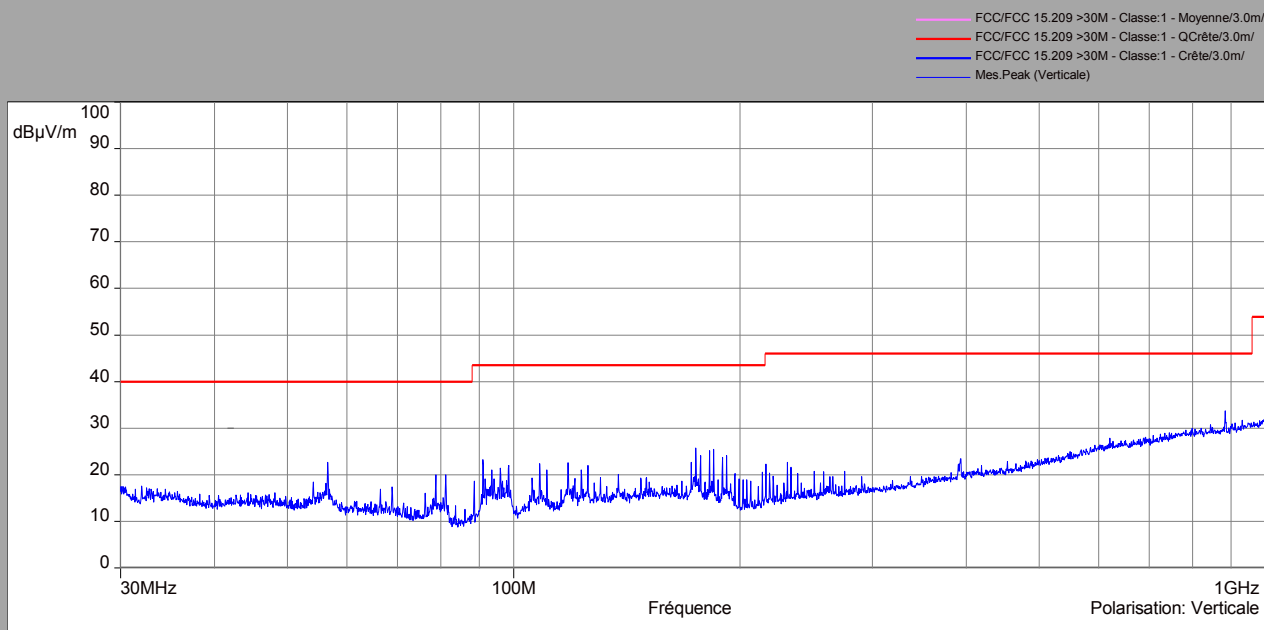
Note: In our quality system, the test equipment calibration due is more & less 2 months

11.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

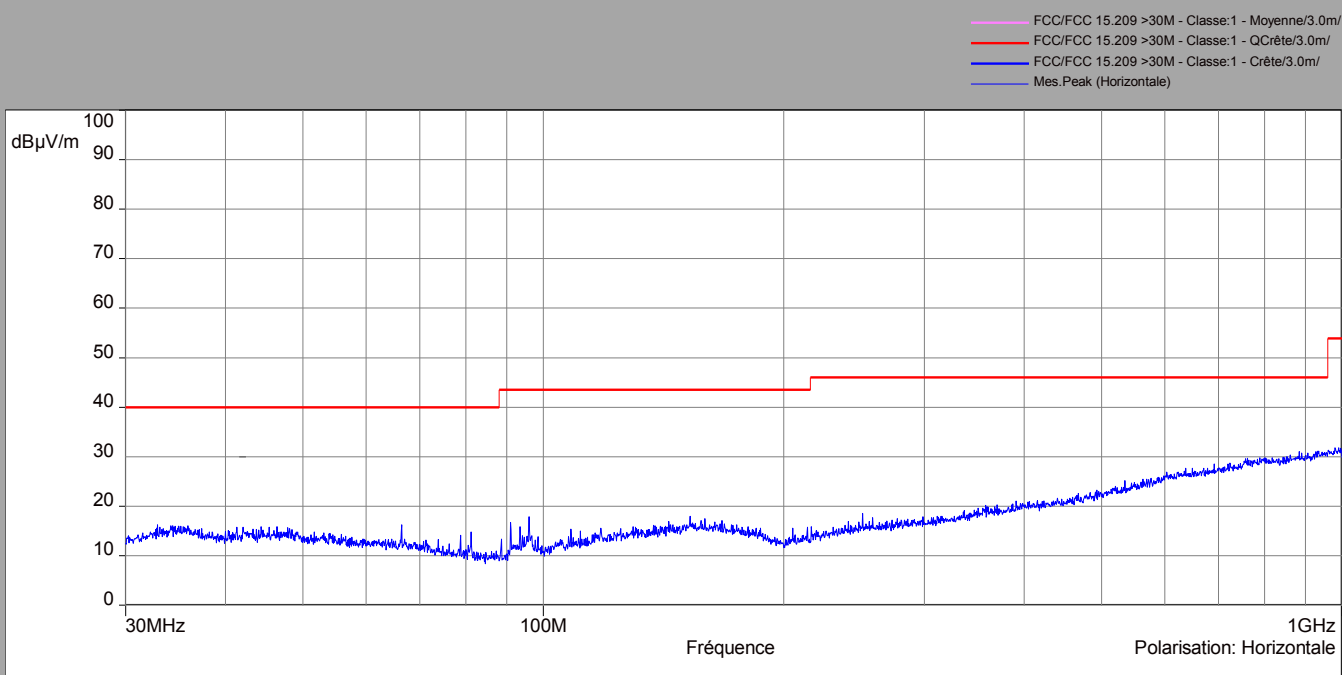
None Divergence:

11.6. RESULTS

Below 1GHz Internal Antenna Channel Vertical Polarization



Horizontal polarization





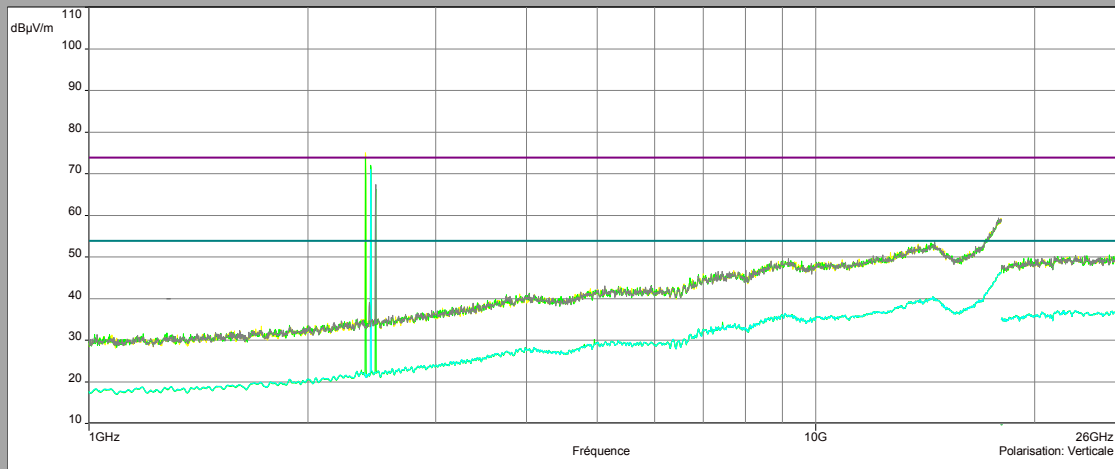
L C I E

Above 1GHz Internal Antenna

Cmin/Cnom/Cmax

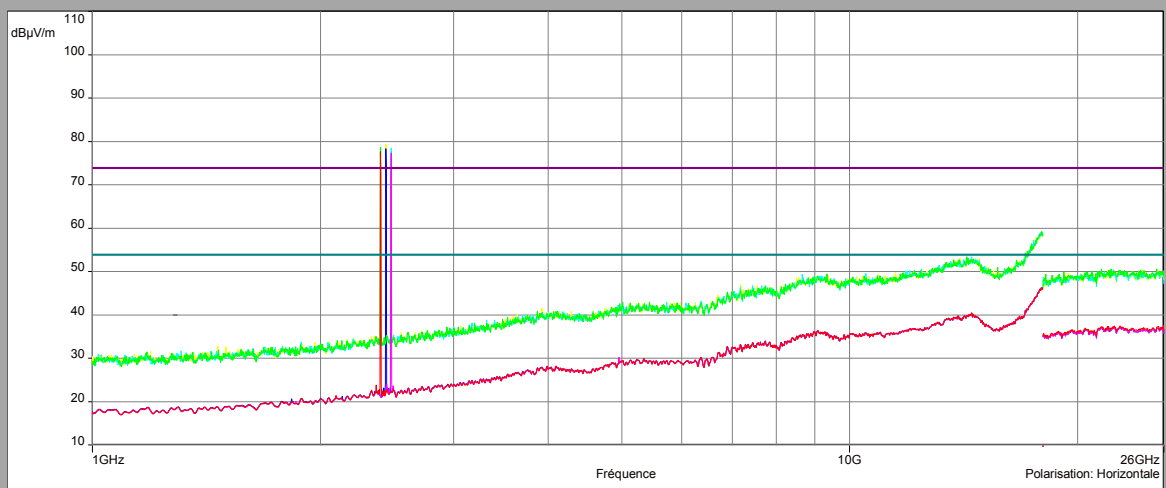
Vertical Polarization

- FCC/FCC 15.209 >30M - Classe:1 - Moyenne/3.0m/
- FCC/FCC 15.209 >30M - Classe:1 - Crête/3.0m/
- Emissions rayonnées classique sans antenne noire Cmax - Mes.Peak (63) (Verticale)
- Emissions rayonnées classique sans antenne noire Cnom - Mes.Avg (62) (Verticale)
- Emissions rayonnées classique sans antenne noire Cmin - Mes.Avg (61) (Verticale)
- Emissions rayonnées classique sans antenne noire Cmax - Mes.Avg (63) (Verticale)
- Emissions rayonnées classique sans antenne noire Cmin - Mes.Peak (61) (Verticale)



Horizontal polarization

- FCC/FCC 15.209 >30M - Classe:1 - Moyenne/3.0m/
- FCC/FCC 15.209 >30M - Classe:1 - Crête/3.0m/
- Emissions rayonnées classique sans antenne noire Cmin - Mes.Avg (61) (Horizontale)
- Emissions rayonnées classique sans antenne noire Cmax - Mes.Avg (63) (Horizontale)
- Emissions rayonnées classique sans antenne noire Cmin - Mes.Peak (61) (Horizontale)
- Emissions rayonnées classique sans antenne noire Cmax - Mes.Peak (63) (Horizontale)
- Emissions rayonnées classique sans antenne noire Cnom - Mes.Avg (62) (Horizontale)
- Emissions rayonnées classique sans antenne noire Cnom - Mes.Peak (62) (Horizontale)



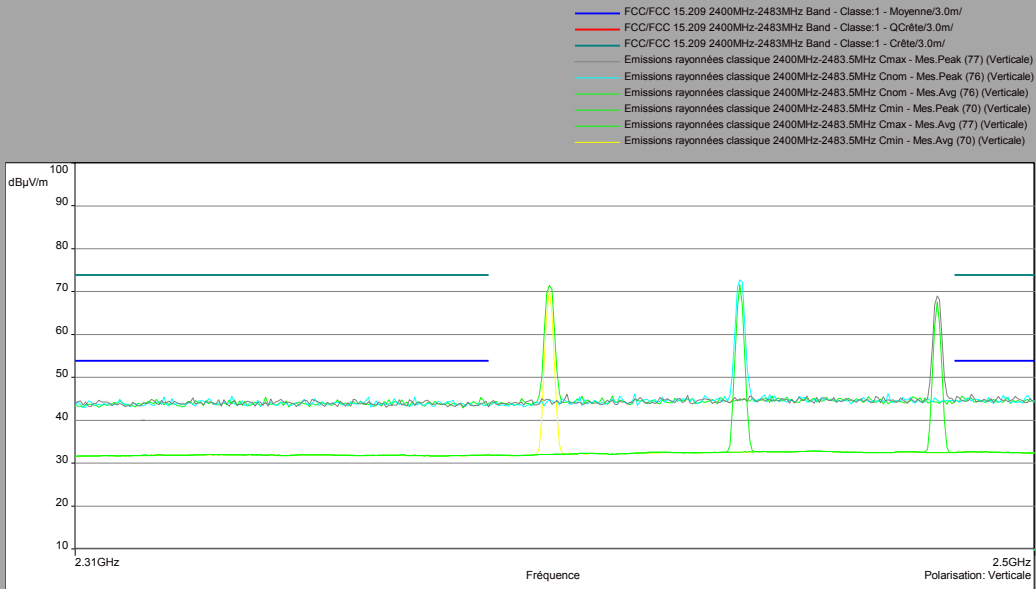


L C I E

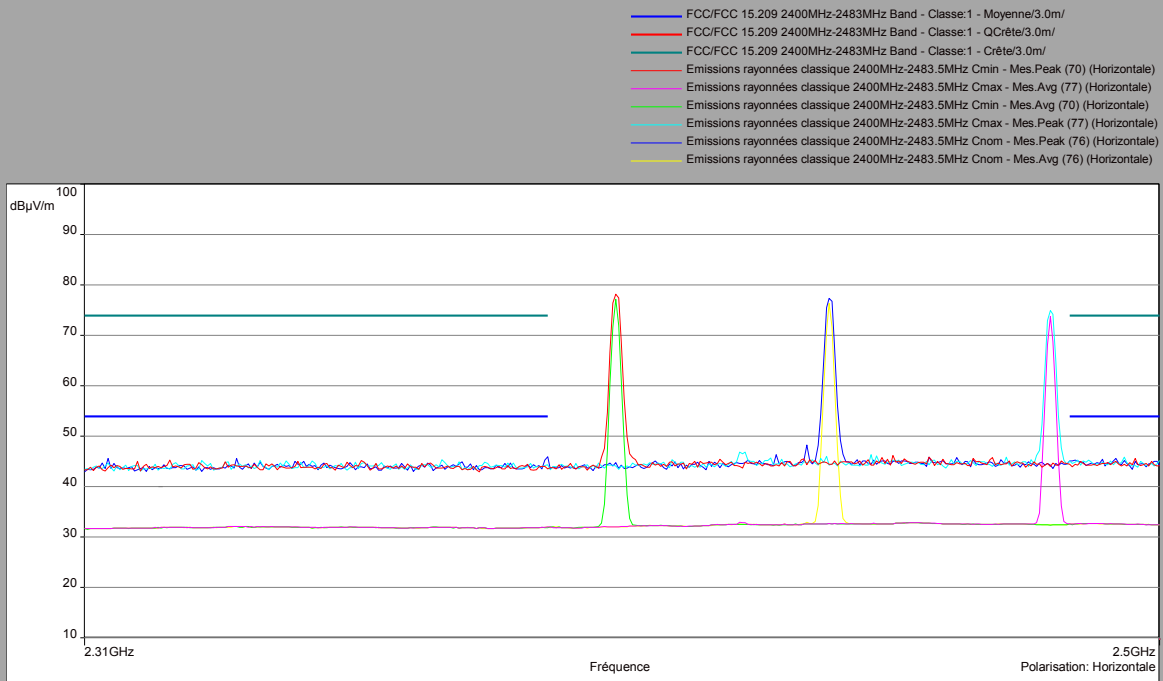
Above 1GHz Zoom 2310MHz-2500MHz Internal Antenna

Cmin/Cnom/Cmax

Vertical Polarization



Horizontal polarization





Below 1GHz					
Polarization	Frequency (MHz)	Peak Level (dBµV/m)	QPeak Level (dBµV/m)	Limit (dBµV/m)	Margin QPeak Level (dBµV/m)
Vertical	56.6	22.70	-	40.00	17.30
Horizontal	66.45	16.21	-	40.00	23.79
Vertical	81.2	20.03	-	40.00	19.97
Vertical	91.05	23.26	-	43.5	20.24
Horizontal	96.00	17.90	-	43.5	25.60
Vertical	108.3	22.42	-	43.5	21.08
Vertical	118.5	22.63	-	43.5	20.87
Vertical	174.75	25.78	-	43.5	17.72
Vertical	231.32	22.72	-	46.00	23.28
Vertical	392.96	23.45	-	46.00	22.55
Vertical	884.00	33.69	-	46.00	12.31

Above 1GHz								
Cmin/Cnom/Cmax								
Polarization	Frequency (MHz)	Duty cycle correction (dB)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Margin Average	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Margin Peak level
Vertical	1581.5	0.00	24.59	53,5	28.91	34.69	73,5	38.81
Vertical	2390	0.00	31.97	53,5	21.53	44.03	73,5	29.47
Vertical	2483.5	0.00	32.45	53,5	21.05	44.28	73,5	29.22
Vertical	9082.5	0.00	36.30	53,5	17.20	49.77	73,5	23.73
Vertical	17835	0.00	45.98	53,5	7.70	58.90	73,5	14.6
Horizontal	2390	0.00	31.97	53,5	21.53	43.52	73,5	29.98
Horizontal	2483.5	0.00	32.55	53,5	20.95	44.41	73,5	29.09
Horizontal	9176.5	0.00	37.05	53,5	16.45	50.49	73,5	23.01
Horizontal	17952.5	0.00	45.90	53,5	7.6	59.78	73,5	13.72

11.7. CONCLUSION

Unwanted Emission in restricted frequency bands measurement performed on the sample of the product **NXP QN9080-001-M17**, SN: **P6V700.07**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 & RSS 247 ISSUE 2 limits.

12. 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