TEST REPORT

N°: 168177-753591-B **Version : 01**

Subject	**Radio spectrum matters tests according to standards: 47 CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 5**
Issued to	**MICROPORT CRM** Parc d'Affaires NOVEOS - 4 avenue Réaumur 92143-Clamart France
Apparatus under test	
Product	SPIDER VIEW
Trade mark	**MicroPort CRM**
Manufacturer	**MicroPort CRM s.r.l**
Model under test	**SPIDERVIEW**
Serial number	**-**
FCC ID	**YSGLA456**
IC	**10270A-LA456**
Conclusion	See Test Program chapter
Test date	June 29, 2020 to June 30, 2020
Test location	Fontenay Aux Roses
Test Site	6230B-1
Sample receipt date	June 26, 2020
Composition of document	45 pages
Document issued on	January 20, 2022

Written by :
Julien Palard
Tests operator

Approved by :
Arnaud FAYFE
Technical manager

PUBLICATION HISTORY

Version	Date	Author	Modification
01	January 20, 2022	Julien Palard	Creation of the document

Each new edition of this test report replaces and cancels the previous edition. The control of the old editions of report is under responsibility of client.

SUMMARY

1. TEST PROGRAM

References

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

Radio requirement:

Clause (47CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 5) Test Description	Test result - Comments
Occupied Bandwidth	☑ PASS ☐ FAIL ☐ NA ☐ NP(1)
6dB Bandwidth	☑ PASS ☐ FAIL ☐ NA() ☐ NP(1)
Duty Cycle	☑ PASS ☐ FAIL ☐ NA ☐ NP(1)
Maximum Conducted Output Power	☑ PASS ☐ FAIL ☐ NA ☐ NP(1)
Power Spectral Density	☑ PASS ☐ FAIL ☐ NA ☐ NP(1)
Conducted Spurious Emission at the Band Edge	☑ PASS ☐ FAIL ☐ NA() ☐ NP(1)
Unwanted Emissions into Non-Restricted Frequency Bands	☑ PASS ☐ FAIL ☐ NA() ☐ NP(1)
AC Power Line Conducted Emission	☐ PASS ☐ FAIL ☑ NA(2) ☐ NP(1)
Unwanted Emissions into Restricted Frequency Bands	☑ PASS ☐ FAIL ☐ NA ☐ NP(1)
Receiver Radiated emissions	☑ PASS(3) ☐ FAIL ☐ NA ☐ NP(1)
This table is a summary of test report, see conclusion of each clause of this test report for detail.	

(1): Limited program
(2): EUT not directly or indirectly connected to the AC Power Public Network
(3)Testing covered the receive mode, and receiver spurious emissions are considered to be the same as transmitter.

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):
MicroPort CRM SPIDERVIEW **Serial Number: -**

Equipment Under Test

Equipment Under Test

Power supply:

Name	Type	Rating	Reference / Sn	Comments
Supply1	☐ AC ☐ DC ☑ Battery	1.5Vdc	-	-

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
-	-	-	☐	☐	☐	-

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
-	-	-	-

Equipment information:

Bluetooth LE Type:	☑ **BLE**	☐ **v4.0**	☐ **v4.1**	☑ **v4.2**
Frequency band:	[2400 – 2483.5] MHz			
Number of Channel:	40			
Spacing channel:	2MHz			
Channel bandwidth:	1MHz			
Antenna Type:	☑ Integral	☐ External	☐ Dedicated	
Antenna connector:	☐ Yes	☐ No	☑ Temporary for test	
Transmit chains:	1			
	Single antenna			
Receiver chains	1			
Type of equipment:	☑ Stand-alone	☐ Plug-in	☐ Combined	
Equipment arrangement:	☐ Tabletop	☐ Floor-standing	☑ Multiple orientations	
Ad-Hoc mode:	☐ Yes	☑ No		
Duty cycle:	☐ Continuous duty	☐ Intermittent duty	☑ 100% duty	
Equipment type:	☑ Production model	☐ Pre-production model		
Operating temperature range:	Tmin:	☐ -20°C	☑ 0°C	☐ X°C
	Tnom:	20°C		
	Tmax:	☐ 35°C	☐ 55°C	☑ 40°C
Type of power source:	☐ AC power supply	☐ DC power supply	☑ Battery	
Operating voltage range:	Vnom:	☐ 120V/60Hz	☑ 1.5 VDC	
		☐ 240V/50Hz	☐ X VDC	

Antenna Characteristic			
Antenna assembly	**Gain (dBi)**	**Frequency Band (MHz)**	**Impedance(Ω)**
1	2.6	2400-2483.5	50

Hardware information		
Firmware (if applicable):	**V. :**	**V4.00P**

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	☑

2.2. RUNNING MODE

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

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

2.3. EQUIPMENT LABELLING

2.4. EQUIPMENT MODIFICATION

☑ None ☐ Modification:

2.5. *FIELD STRENGTH CALCULATION*

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follow:

FS = RA + AF + CF – AG

Where FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Factor
AG = Amplifier Gain

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

2.6. *CALIBRATION DATE*

The calibration intervals are extended at 12+2 months. This extended interval is based on the fact that there is sufficient calibration data to statistically establish a trend or based on experience of use of the test equipment to assure good measurement results for a longer period.

3. OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

Test performed by	: Julien PALARD
Date of test	: June 29, 2020
Ambient temperature	: 23 °C
Relative humidity	: 38 %

3.2. TEST SETUP

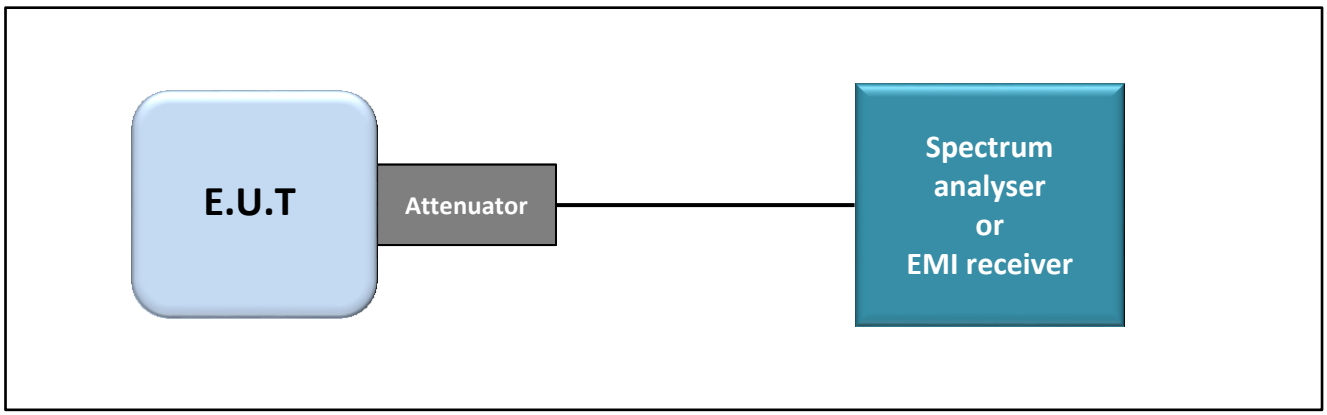
- The Equipment under Test is installed:
☑ On a table
☐ In an anechoic chamber

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

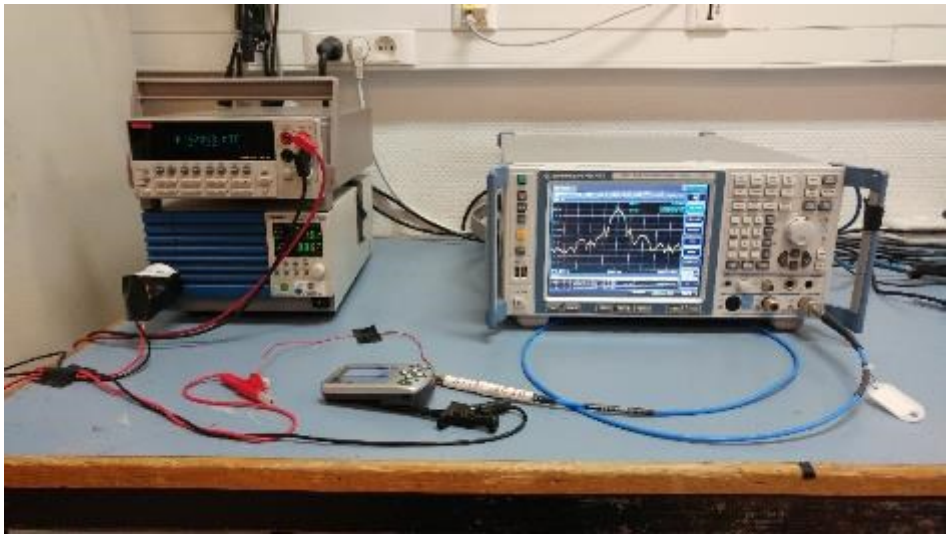
- Test Procedure:
☐ RSS-Gen Issue 5 § 6.7
☑ ANSI C63.10 § 6.9.2

Measurement Procedure:

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



Test set up of Occupied Bandwidth



Photograph for Occupied bandwidth

3.3. *LIMIT*

None

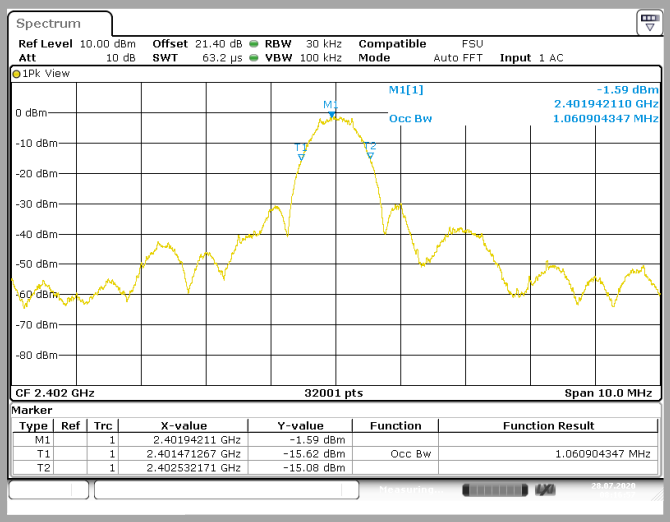
3.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Cable SONDE A1503027+ Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329972	2019/07	2020/07
Power supply	KIKUSUI	PCR500M	A7040079	Calibrate with multimeter	Calibrate with multimeter
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Hygrometer	AOIP	TM360	B4041042	2019/01	2021/01

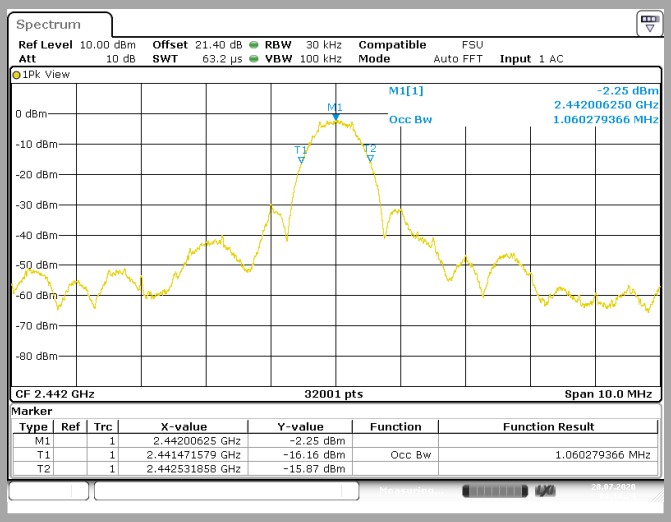
3.5. RESULTS

Occupied Bandwidth

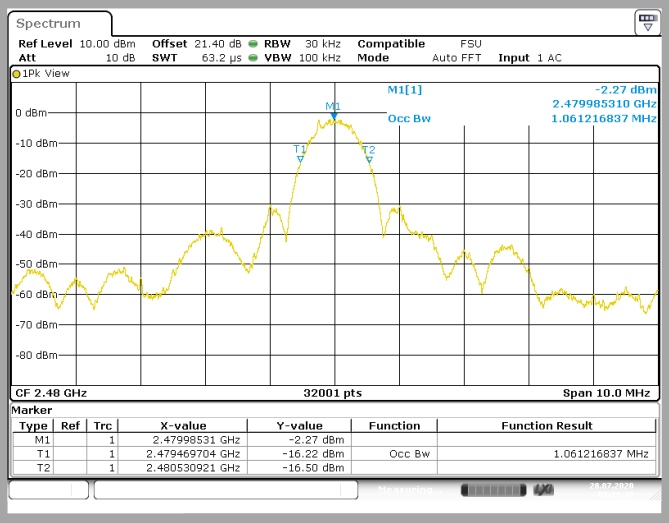
Cmin



Cnom



Cmax



Channel	Occupied Bandwidth (MHz)
Cmin	1.061
Cnom	1.060
Cmax	1.061

3.6. *CONCLUSION*

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

4. 6DB EMISSION BANDWIDTH

4.1. TEST CONDITIONS

Test performed by	: Julien PALARD
Date of test	: June 29, 2020
Ambient temperature	: 23 °C
Relative humidity	: 38 %

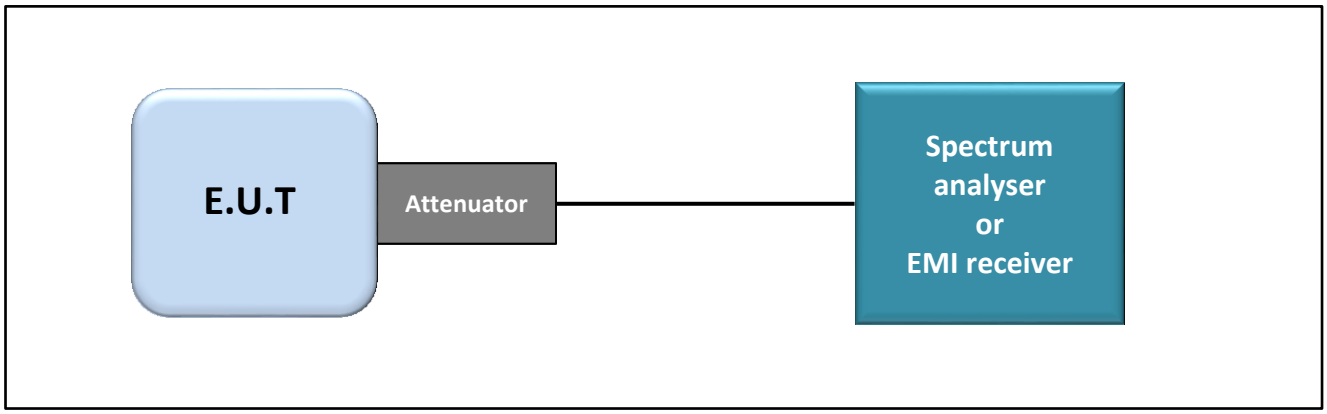
4.2. TEST SETUP

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

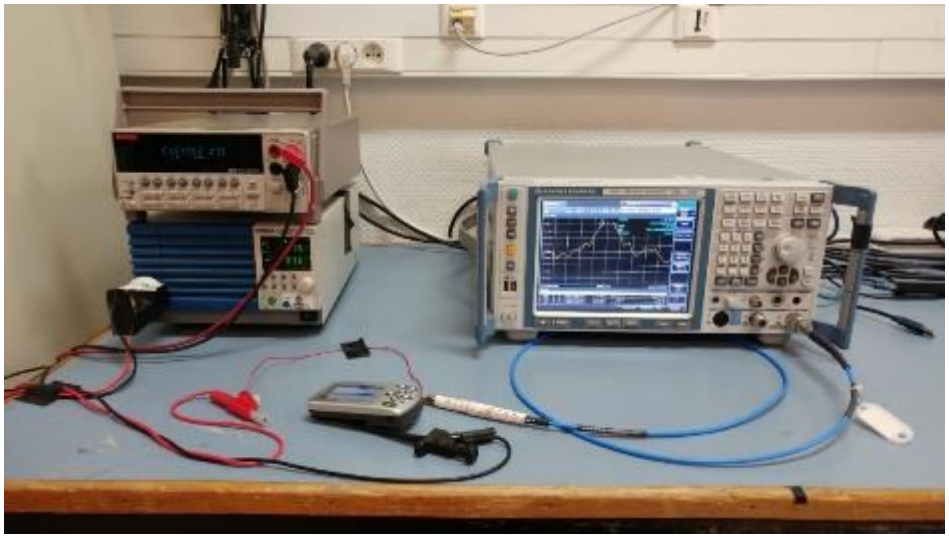
- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ ANSI C63.10 § 11.8.1
☐ ANSI C63.10 § 11.8.2

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



Test set up of 6dB Emission Bandwidth



Photograph for 6dB emission bandwidth

4.3. LIMIT

Frequency range	The 6dB bandwidth Limit
2400MHz to 2483.5MHz	≥500kHz

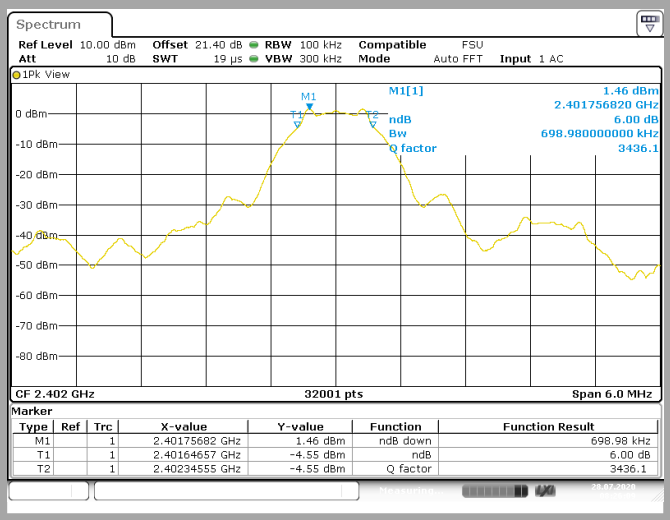
4.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Cable SONDE A1503027+ Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329972	2019/07	2020/07
Power supply	KIKUSUI	PCR500M	A7040079	Calibrate with multimeter	Calibrate with multimeter
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Hygrometer	AOIP	TM360	B4041042	2019/01	2021/01

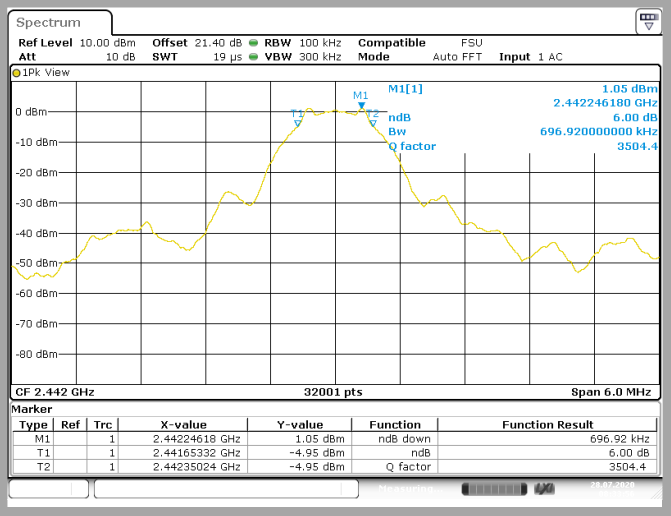
4.5. RESULTS

6dB Emission Bandwidth

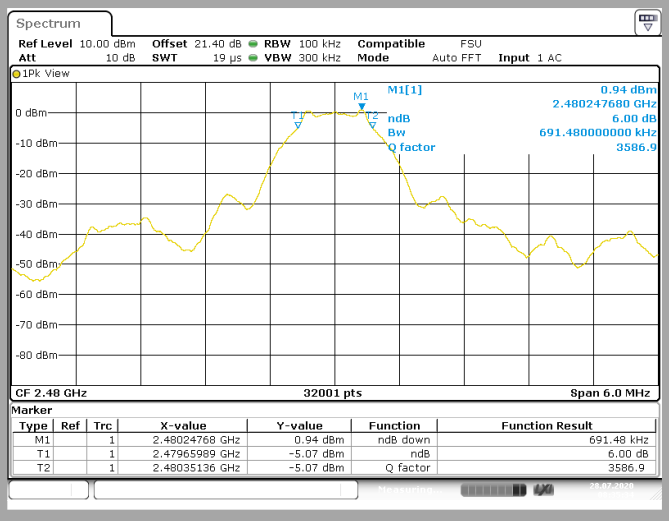
Cmin



Cnom



Cmax



Channel	6dB Emission Bandwidth (MHz)	Limit (MHz)
Cmin	0.699	Minimum 0.5
Cnom	0.697	Minimum 0.5
Cmax	0.691	Minimum 0.5

4.6. CONCLUSION

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

5. DUTY CYCLE

5.1. TEST CONDITIONS

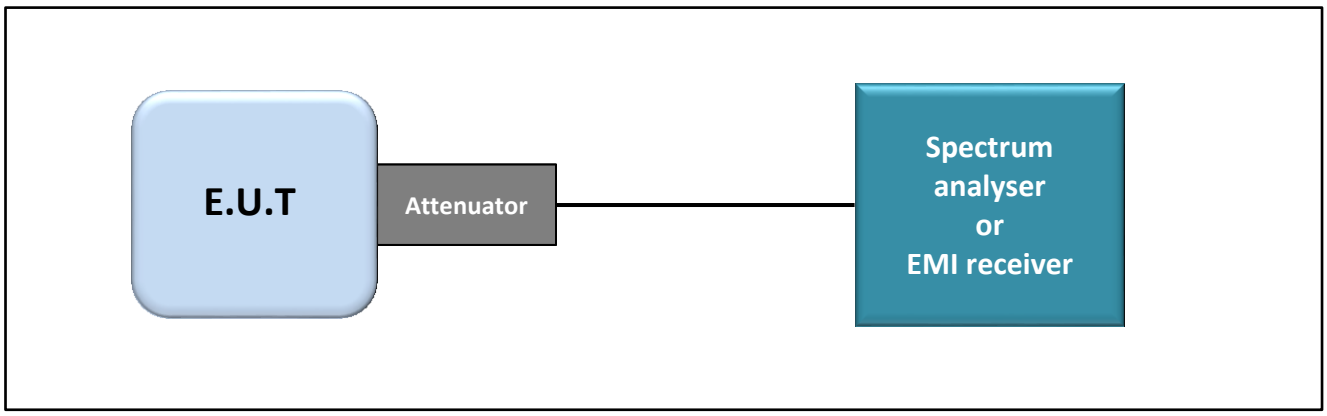
Test performed by	: Julien PALARD
Date of test	: June 29, 2020
Ambient temperature	: 23 °C
Relative humidity	: 38 %

5.2. TEST SETUP

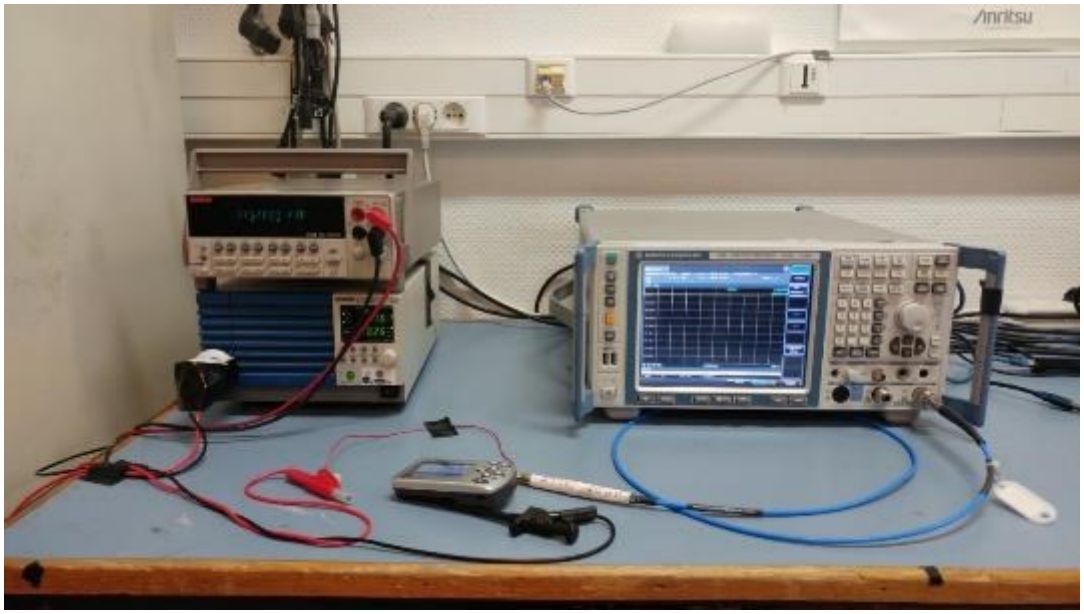
- The Equipment under Test is installed:
☑ On a table
☐ In an anechoic chamber

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

- Test Procedure:
☑ ANSI C63.10 § 11.6



Test set up of Duty Cycle



Photograph for Duty Cycle

5.3. LIMIT

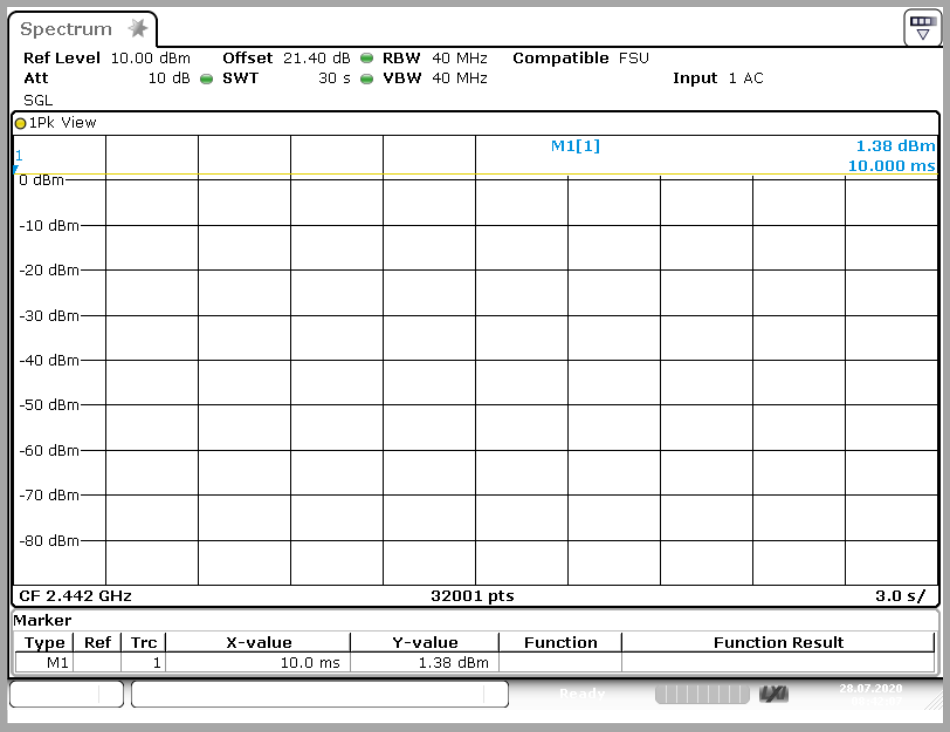
None

5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Cable SONDE A1503027+ Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329972	2019/07	2020/07
Power supply	KIKUSUI	PCR500M	A7040079	Calibrate with multimeter	Calibrate with multimeter
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Hygrometer	AOIP	TM360	B4041042	2019/01	2021/01

5.5. RESULTS

Duty Cycle
Cnom



Channel	Duty Cycle (%)	Duty Cycle Correction (dB)
Channel	100	$20\log(\frac{1}{duty\ cycle}) = 0$

5.6. CONCLUSION

Duty Cycle measurement performed on the sample of the product **MicroPort CRM SPIDERVIEW**, SN: **-**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

6. MAXIMUM CONDUCTED OUTPUT POWER

6.1. TEST CONDITIONS

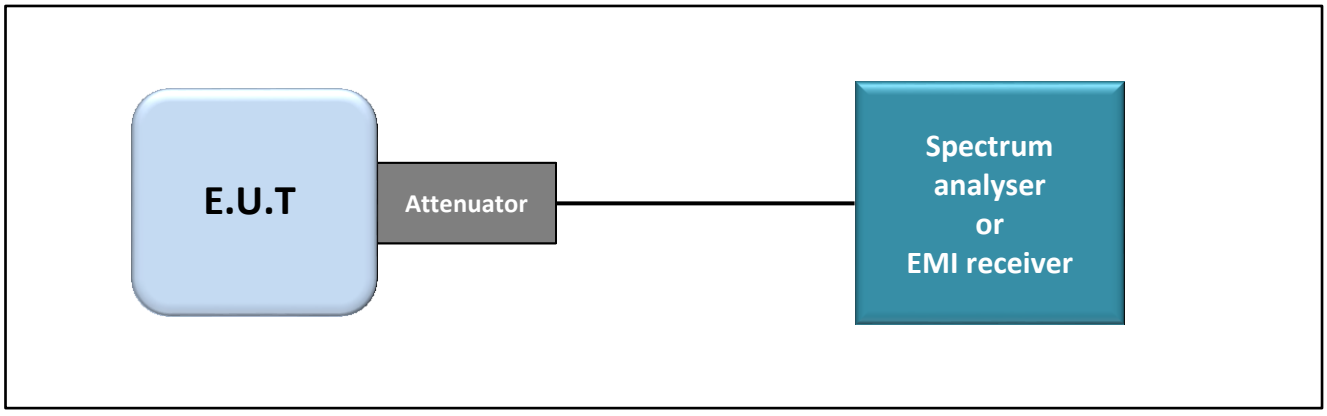
Test performed by	: Julien PALARD
Date of test	: June 29, 2020
Ambient temperature	: 23 °C
Relative humidity	: 38 %

6.2. TEST SETUP

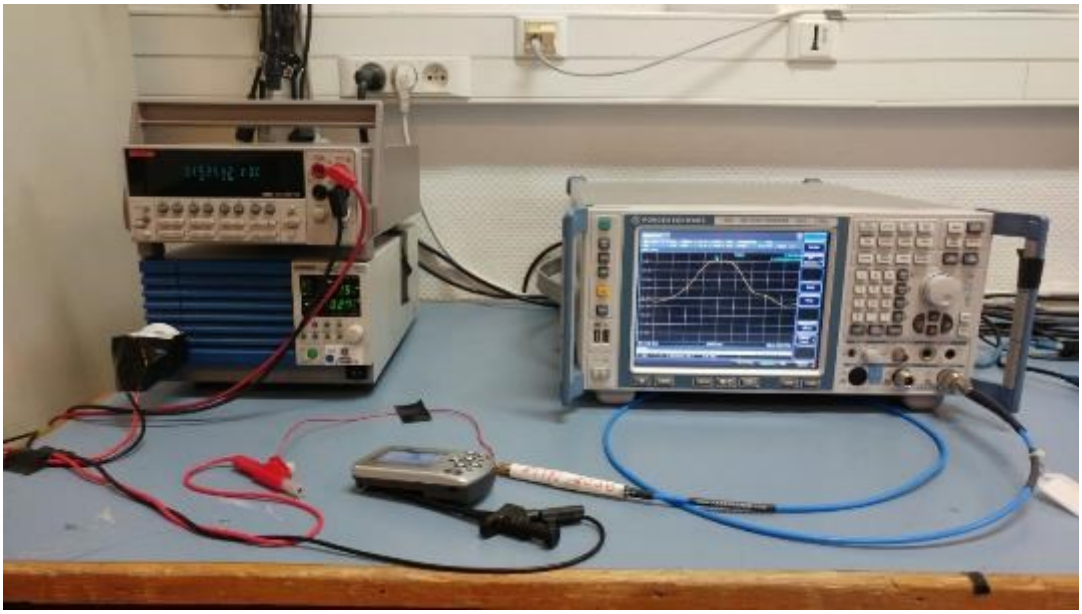
- The Equipment under Test is installed:
☑ On a table
☐ In an anechoic chamber

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

- Test Procedure:
☑ ANSI C63.10 § 11.9.1.1
☐ ANSI C63.10 § 11.9.1.2
☐ ANSI C63.10 § 11.9.2.2.2 (Method AVGSA-1)
☐ ANSI C63.10 § 11.9.2.2.4 (Method AVGSA-2)



Test set up of Maximum Conducted Output Power



Photograph for Maximum Conducted Output Power

6.3. LIMIT

Frequency range	Maximum Conducted Output Power
2400MHz to 2483.5MHz	≤30dBm*

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

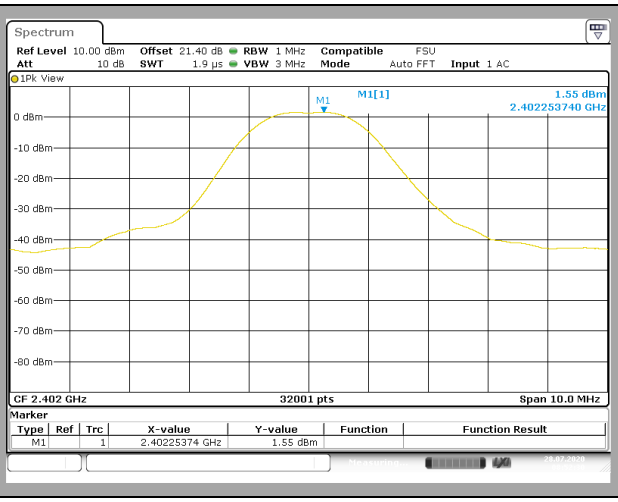
6.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Cable SONDE A1503027+ Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329972	2019/07	2020/07
Power supply	KIKUSUI	PCR500M	A7040079	Calibrate with multimeter	Calibrate with multimeter
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Hygrometer	AOIP	TM360	B4041042	2019/01	2021/01

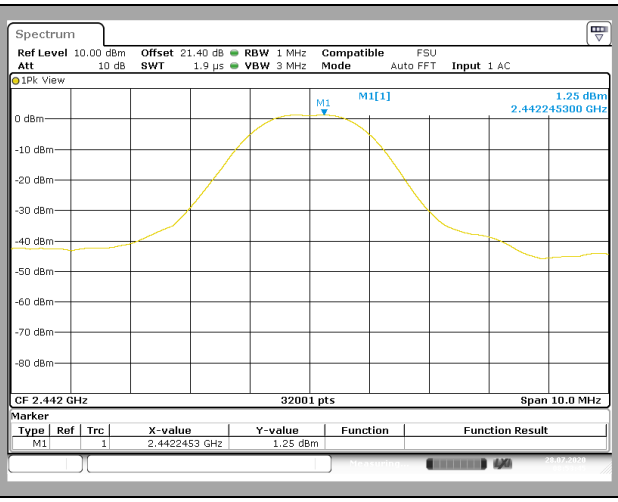
6.5. RESULTS

Maximum Conducted Output Power

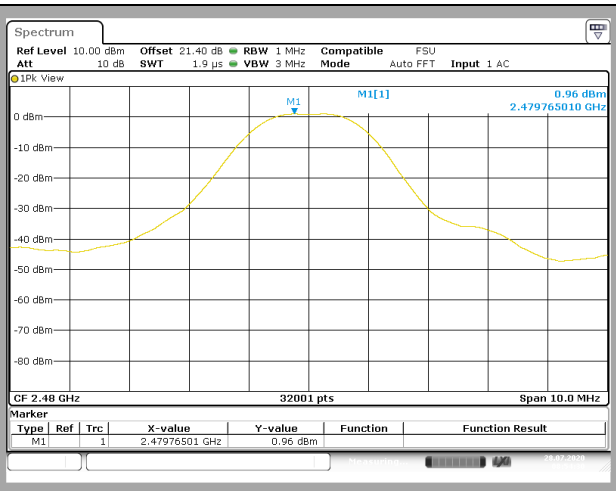
Cmin



Cnom



Cmax



Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Limit (dBm)
Cmin	**21.4**	2.6	1.55	30
Cnom	**21.4**	2.6	1.25	30
Cmax	**21.4**	2.6	0.96	30

6.6. CONCLUSION

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

7. POWER SPECTRAL DENSITY

7.1. TEST CONDITIONS

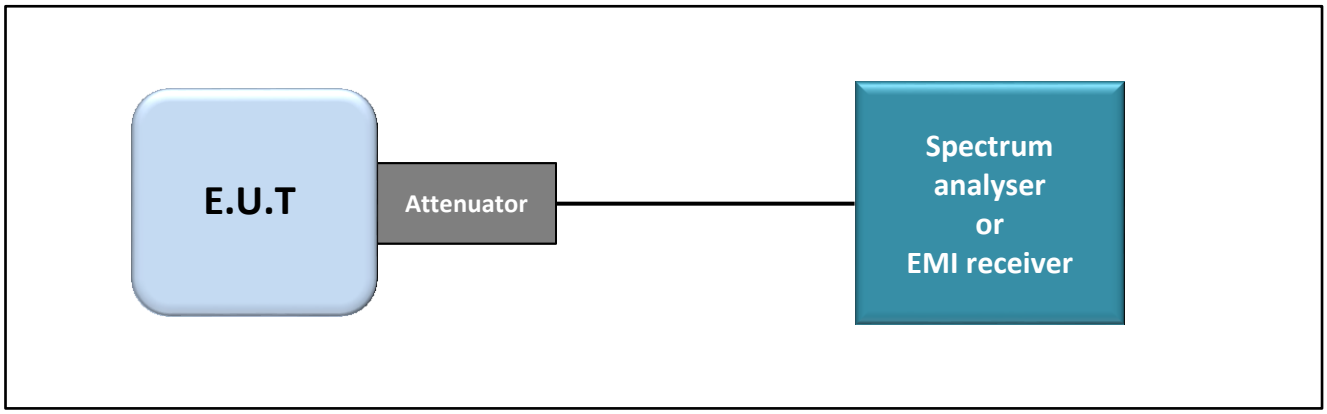
Test performed by	: Julien PALARD
Date of test	: June 29, 2020
Ambient temperature	: 23 °C
Relative humidity	: 38 %

7.2. TEST SETUP

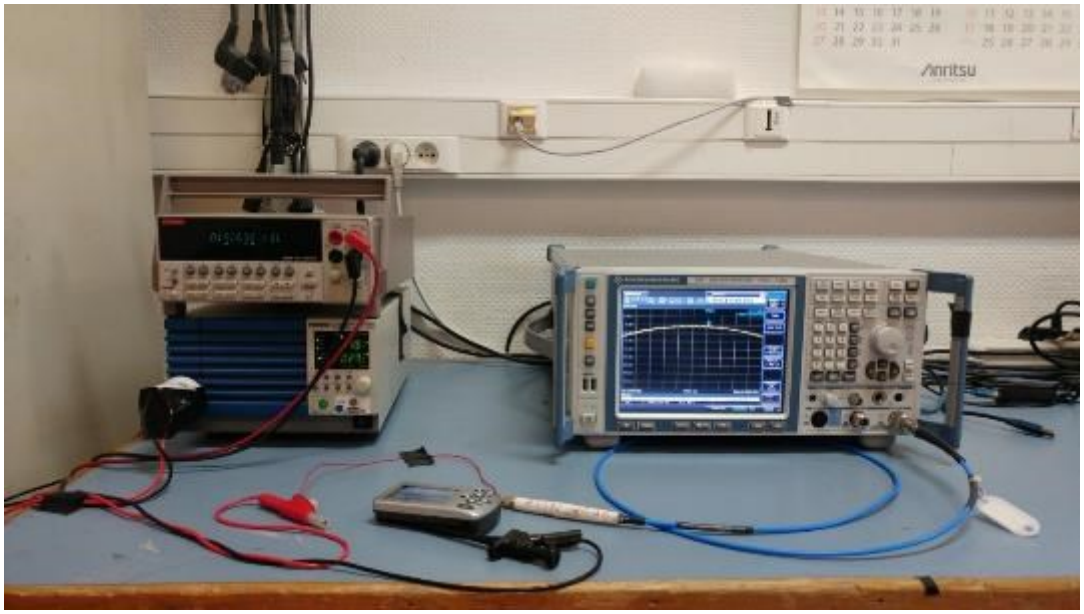
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

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

- Test Procedure:
☑ ANSI C63.10 § 11.10.2 (Method PKPSD)
☐ ANSI C63.10 § 11.10.3 (Method AVGPSD-1)



Test set up of Power Spectral Density



Photograph for Power Spectral Density

7.3. LIMIT

Frequency range	Power Spectral Density
2400MHz to 2483.5MHz	≤8dBm/3kHz*

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

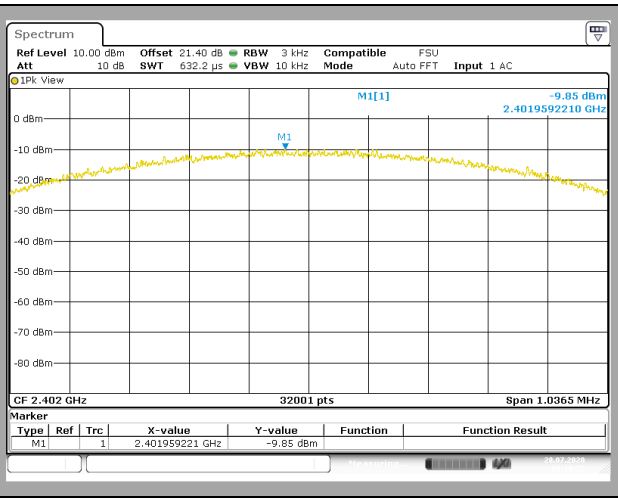
7.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Cable SONDE A1503027+ Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329972	2019/07	2020/07
Power supply	KIKUSUI	PCR500M	A7040079	Calibrate with multimeter	Calibrate with multimeter
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Hygrometer	AOIP	TM360	B4041042	2019/01	2021/01

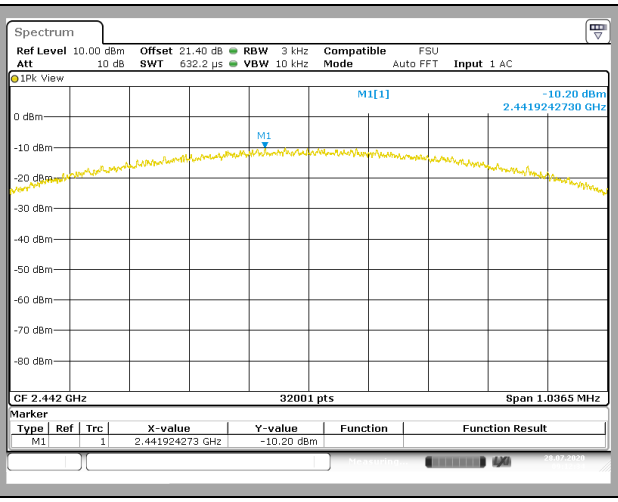
7.5. RESULTS

Power Spectral Density

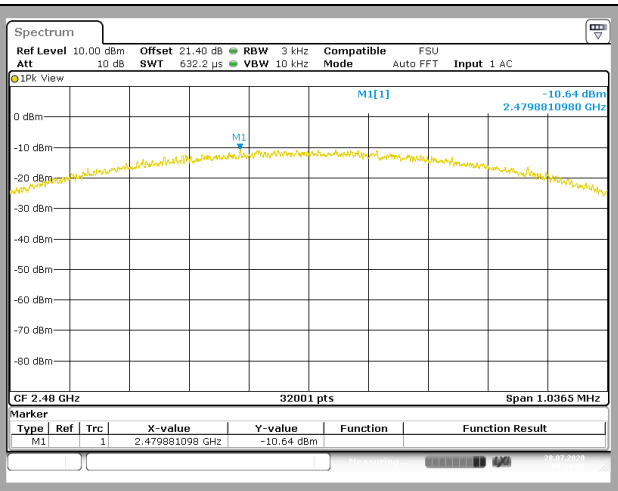
Cmin



Cnom



Cmax



Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
Cmin	**21.4**	2.6	-9.85	8
Cnom	**21.4**	2.6	-10.20	8
Cmax	**21.4**	2.6	-10.64	8

7.6. CONCLUSION

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

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

8.1. TEST CONDITIONS

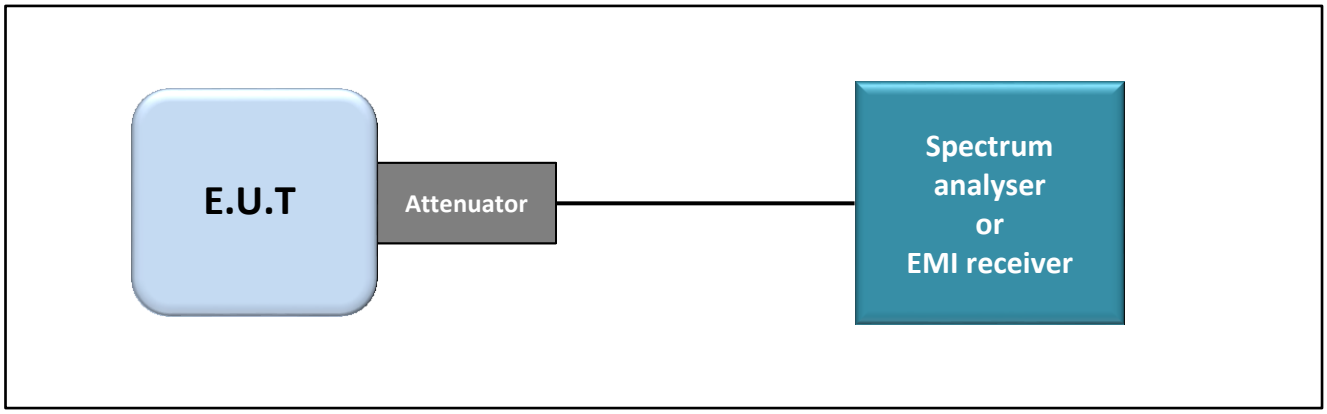
Test performed by	: Julien PALARD
Date of test	: June 29, 2020
Ambient temperature	: 23 °C
Relative humidity	: 38 %

8.2. TEST SETUP

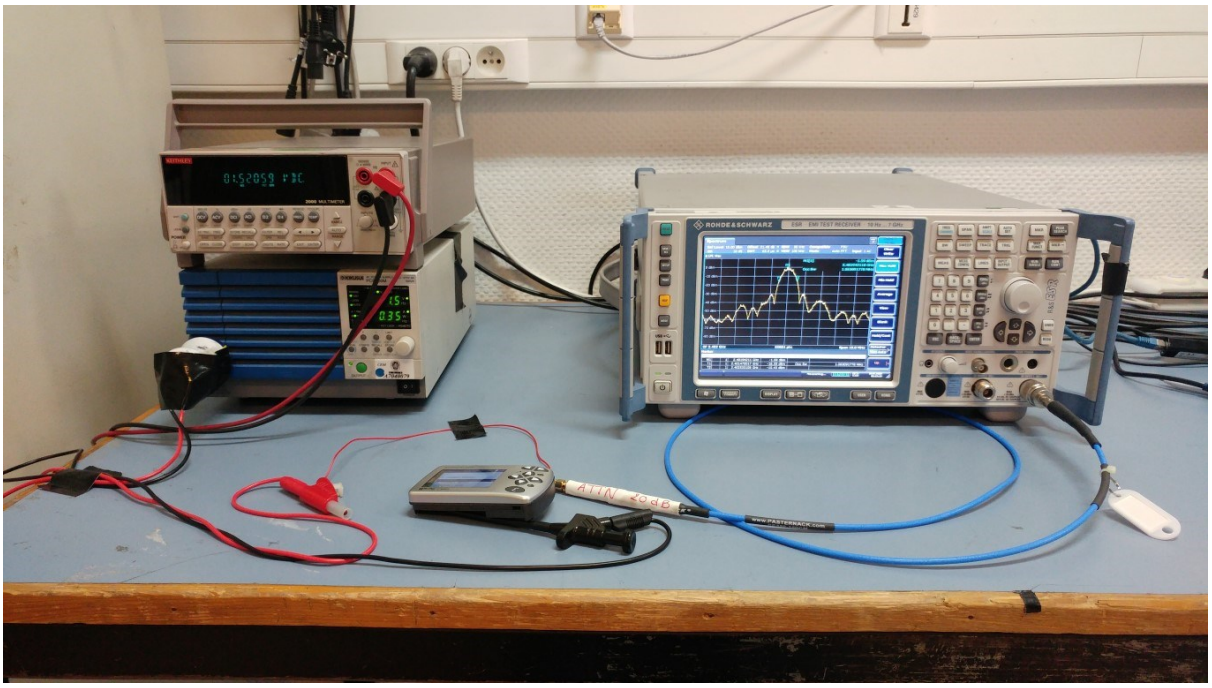
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

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

- Test Procedure:
☑ ANSI C63.10 § 11.11



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



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

8.3. LIMIT

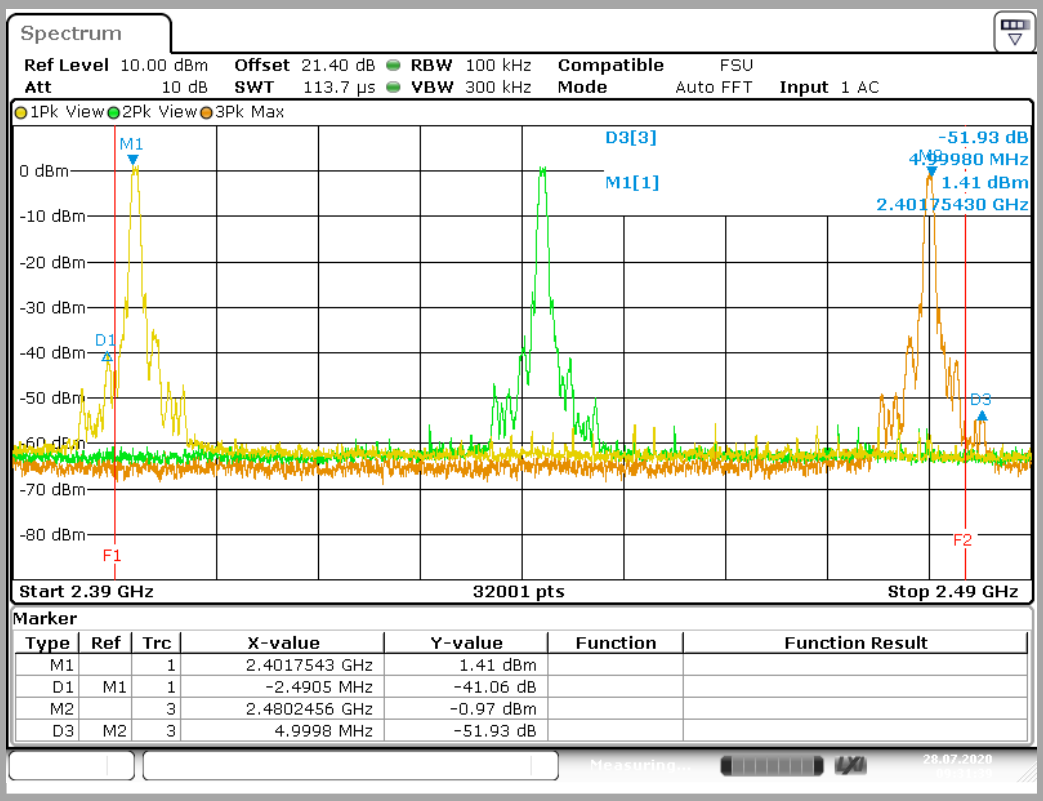
All Spurious Emissions must be at least 20dB (Maximum Conduted Power) below the Fundamental Radiator Level at the Band Edge “2400MHz & 2483,5MHz”

8.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Cable SONDE A1503027+ Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329972	2019/07	2020/07
Power supply	KIKUSUI	PCR500M	A7040079	Calibrate with multimeter	Calibrate with multimeter
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Hygrometer	AOIP	TM360	B4041042	2019/01	2021/01

8.5. RESULTS

Cmin/Cnom/Cmax



Frequency (MHz)	Level (dBc)	Limit (dBc)
2400	41.06	20
2483.5	51.93	20

8.6. CONCLUSION

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

9. UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS

9.1. TEST CONDITIONS

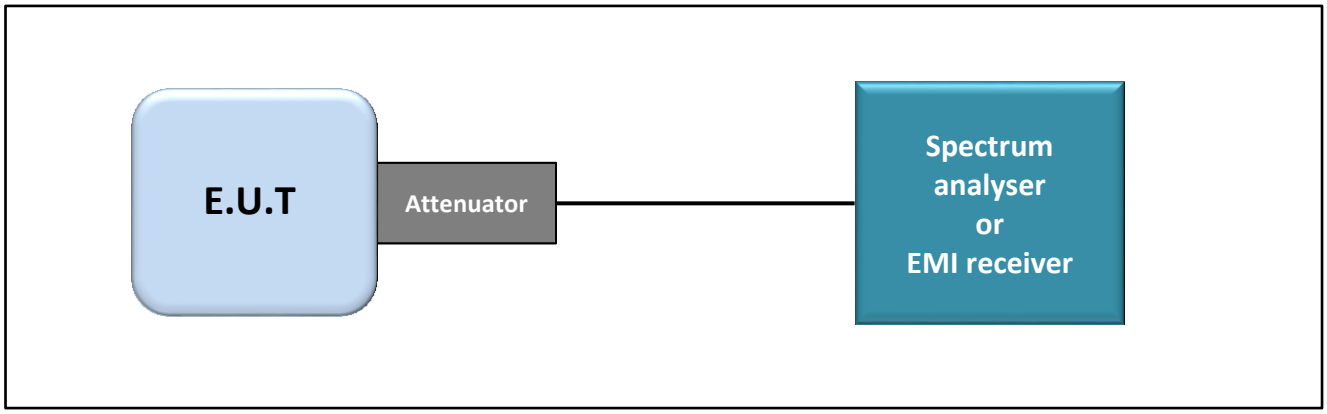
Test performed by	: Armand MAHOUNGOU
Date of test	: June 30, 2020
Ambient temperature	: 28°C
Relative humidity	: 45%

9.2. TEST SETUP

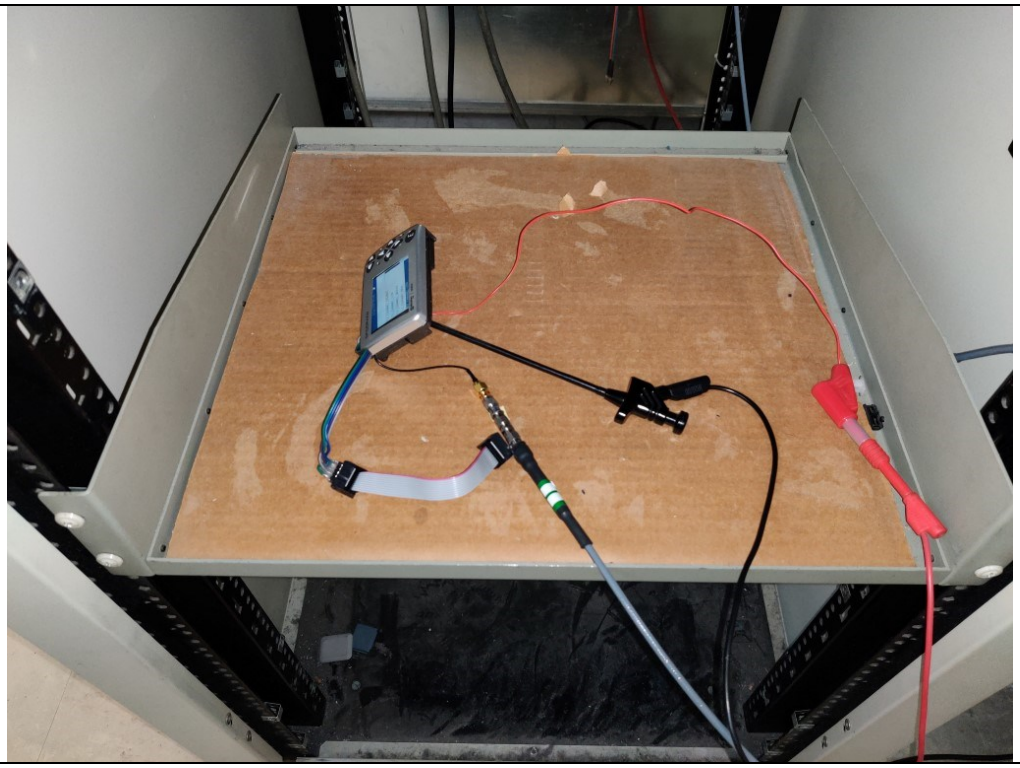
- The Equipment under Test is installed:
☑ On a table
☐ In an anechoic chamber

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

- Test Procedure:
☑ ANSI C63.10 § 11.11



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



Photograph for Unwanted Emission into non-restricted frequency bands

Photograph for Unwanted Emission into non-restricted frequency bands

9.3. LIMIT

All Spurious Emissions must be at least 20dB (Maximum Conduted Power) below the Fundamental Radiator Level

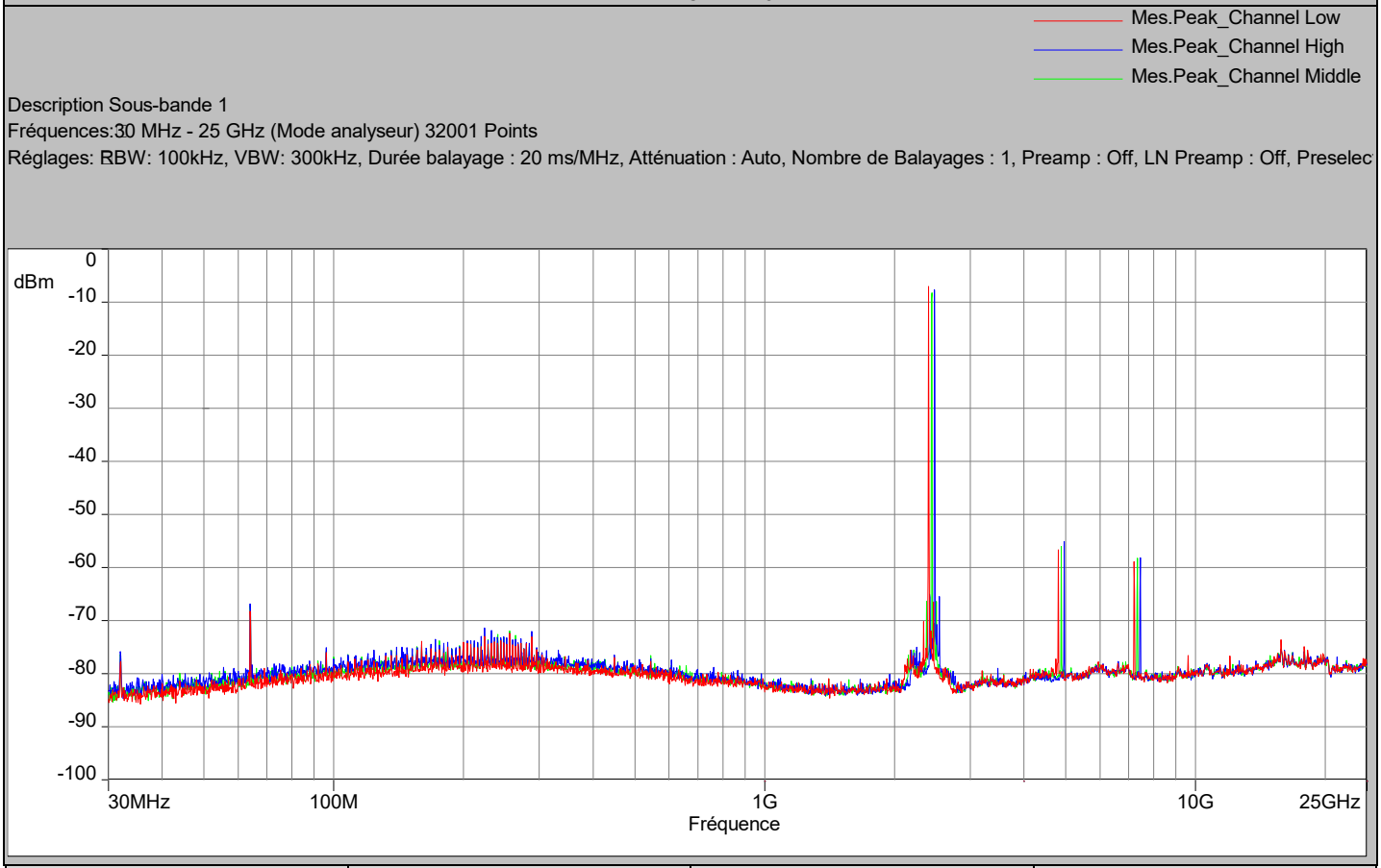
9.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2019/05	2021/05
Cable Conducted S36 chamber	TELEDYNE	084-0555-2MTR	A5329758	2020/02	2021/02
Attenuator 3dB Cable Spurious Conducted	-	WA54-3-12	A7122223	2020/02	2021/02
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Power supply	ROHDE & SCHWARZ	NGSM 32/10	A7040074	See multimeter	See multimeter

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

9.5. RESULTS

Cmin/Cnom/Cmax



Frequency (MHz)	Level (dBm)	Level (dBc)	Limit (dBc)
2402.00	-7.07		
4803	-56.61	49.54	20
7206	-58.86	51.79	20
2442.00	-8.21		
4883	-56.04	47.83	20
7325	-58.22	50.01	20
2480.00	-7.96		
4960	-55.06	47.1	20
7441	-58.14	50.18	20

9.6. *CONCLUSION*

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

10. UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

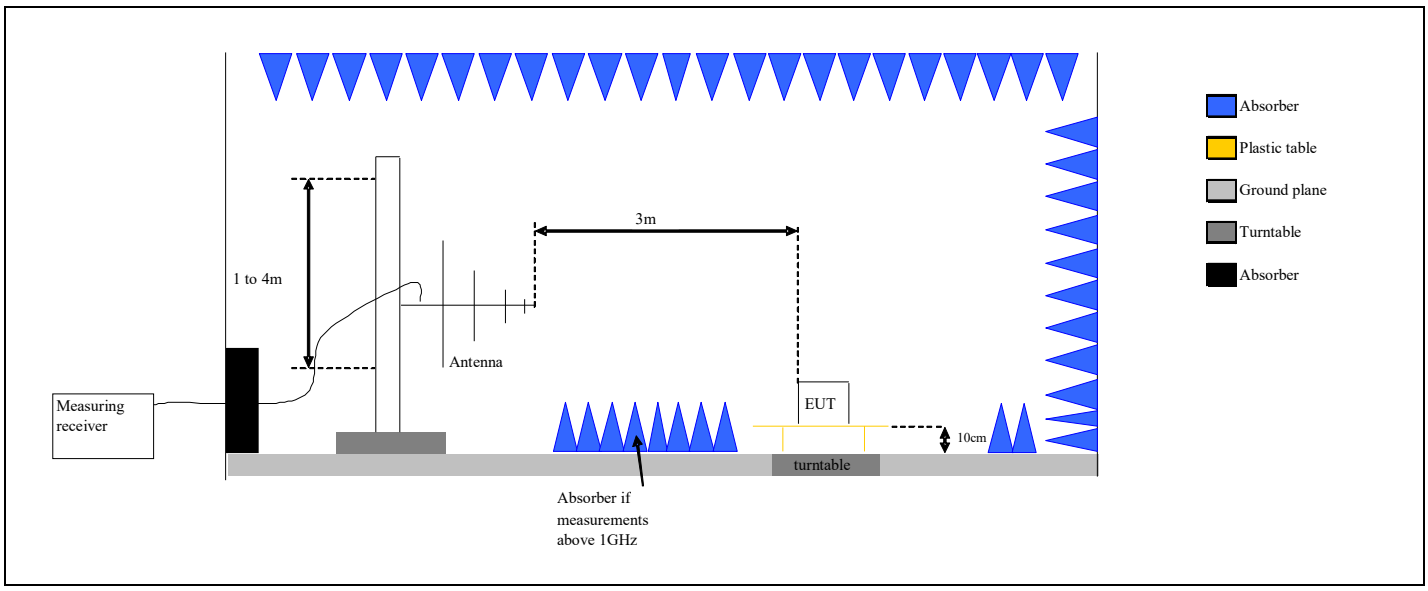
10.1. TEST CONDITIONS

Test performed by	: Armand MAHOUNGOU & Laurent DENEUX
Date of test	: June 30, 2020
Ambient temperature	: 23 to 28°C
Relative humidity	: 45%

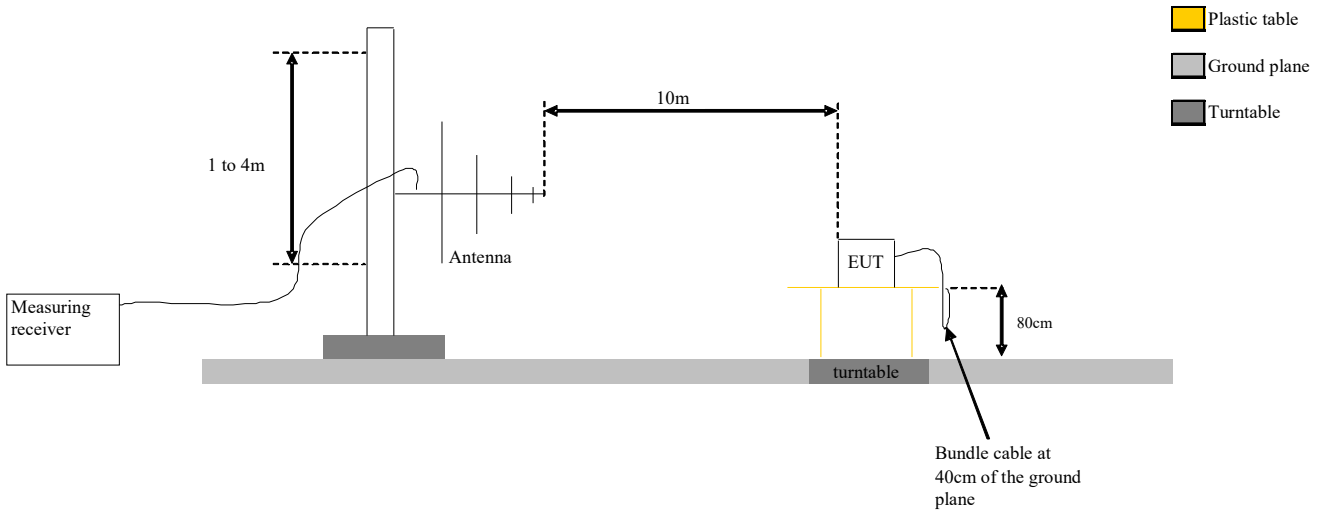
10.2. TEST SETUP

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

Frequency range :	**Below 30MHz**	**From 30MHz to 1GHz**	**Above 1GHz**
Antenna Polarization :	Parallel, Perpendicular And Ground parallel	Horizontal And Vertical	Horizontal And Vertical
Antenna Height :	1m	Varied from 1m to 4m	Centered on EUT (§6.6.5 ANSI C63-10)
Antenna Type :	Loop	Bi-Log	Horn
RBW Filter :	200Hz below 150kHz 9kHz above 150kHz	120kHz	1MHz
Maximization :	Turntable rotation of 360 degrees range		
EUT height :	0.8m		1.5m
Test site :	Open Aera Test Site	Open Aera Test Site	Full Anechoic Chamber
Distance EUT-Antenna :	3m	10m	3m



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

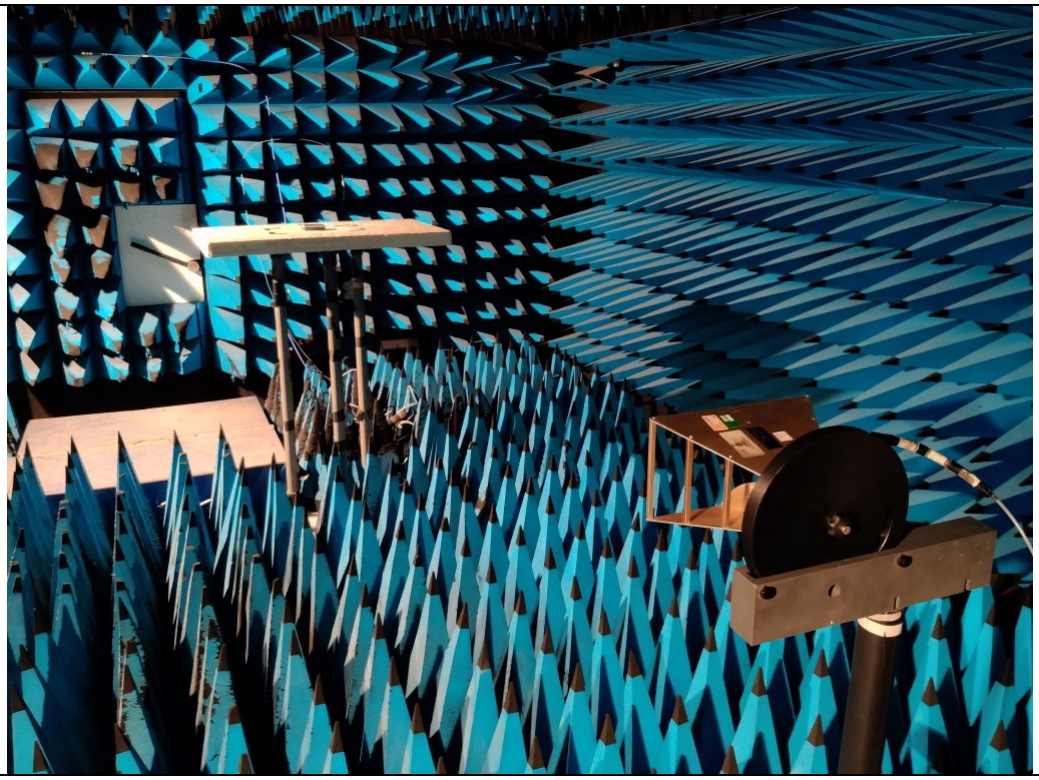


Test Set up for radiated measurement in open area test site

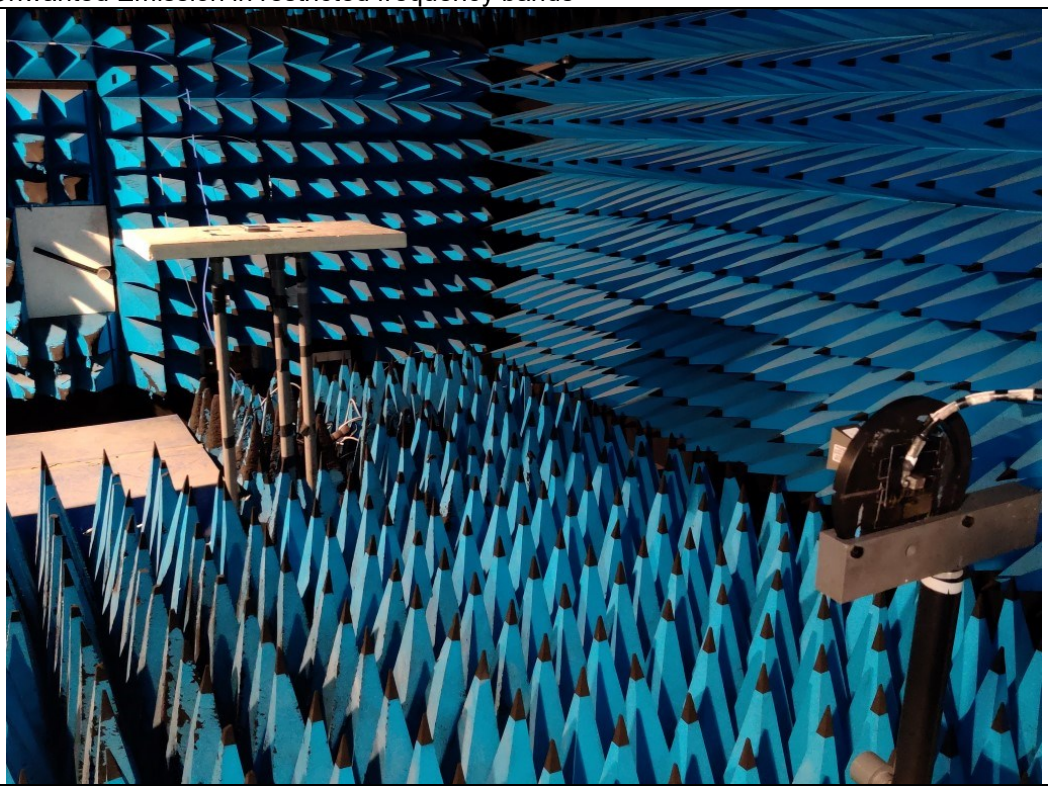
Photograph for Unwanted Emission in restricted frequency bands

Photograph for Unwanted Emission in restricted frequency bands

Photograph for Unwanted Emission in restricted frequency bands



Photograph for Unwanted Emission in restricted frequency bands



Photograph for Unwanted Emission in restricted frequency bands

10.3. LIMIT

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

10.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Full anachoic chamber	SIEPEL	-	D3044019	2019/10	2023/10
Preamplifier	LCIE	LCIE-ALB-001	A7080073	2018/12	2020/12
Horn antenna	AH SYSTEMS	SAS 571	C2042041	2019/11	2021/11
Horn antenna	-	-	C2042026	2020/05	2021/05
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2019/05	2021/05
Cable S36 chamber	PASTERNACK	PE360-3000CM	A5329872	2020/01	2021/01
Cable S36 chamber	PASTERNACK	PE360-1000CM	A5329939	2020/01	2021/01
Cable S36 chamber	PASTERNACK	PE360-1500CM	A5329940	2020/01	2021/01
Open test site	LCIE	-	F2000400	2019-06	2020-06
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2018-10	2020-10
Cable	-	-	A5329442	2019-12	2020-12
Bilog antenna	CHASE	CBL 6112A	C2040040	2020-05	2021-05
Cable	-	-	A5329449	2019-12	2020-12
Cable	-	-	A5329876	2019-12	2020-12
Cable	-	-	A5329368	2019-12	2020-12
Cable			A5329361	2019-11	2020-11
Cable	-	-	A5329418	2020-05	2021-05
loop antenna	SCHWARZBECK	FMZB1513	C2040209	2018-03	2020-07
High Pass Filter 2,4GHz	WAINWRIGHT	WHK12-2494	A7484068	2019/07	2021/07

Note: In our quality system, the test equipment calibration due is more & less 3 months

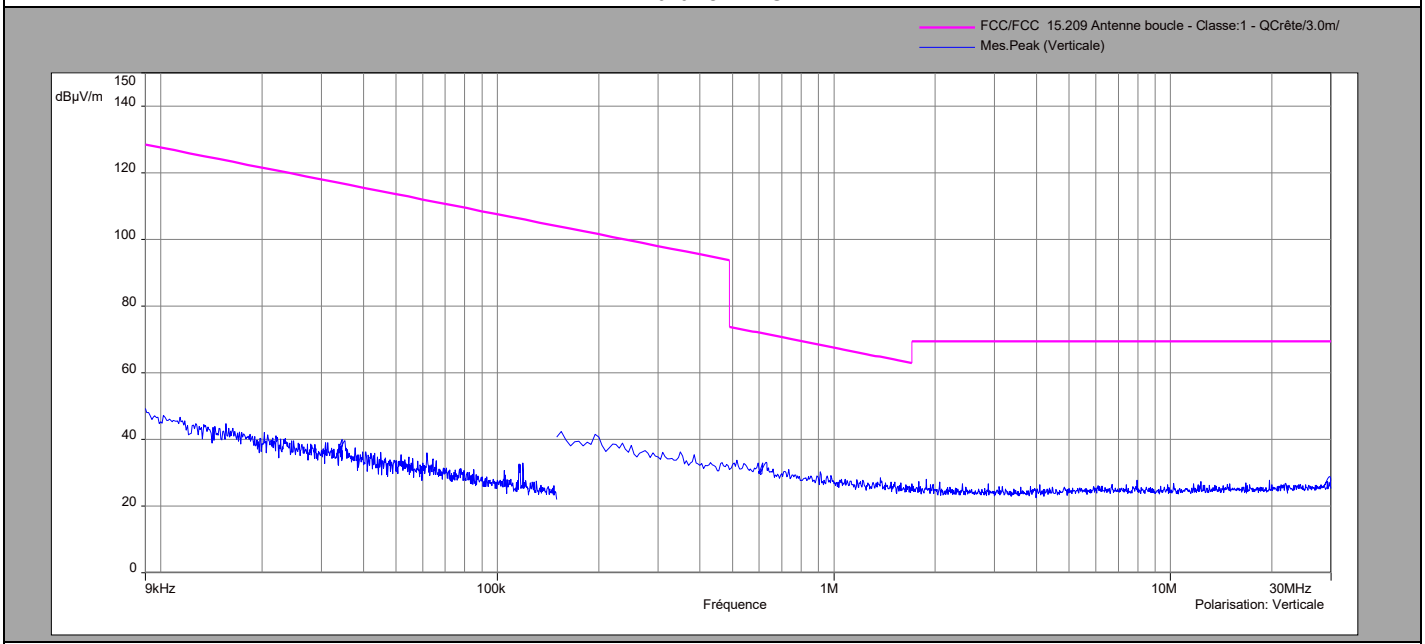
10.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

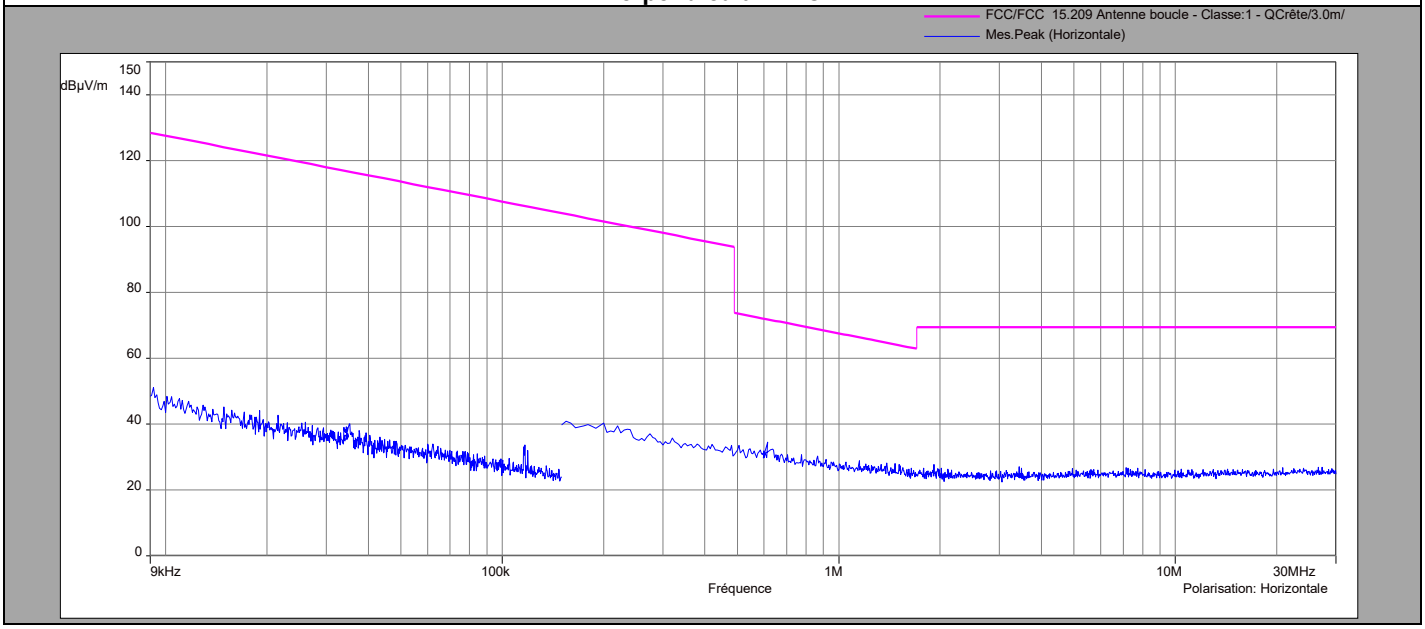
10.6. RESULTS

9kHz to 30MHz

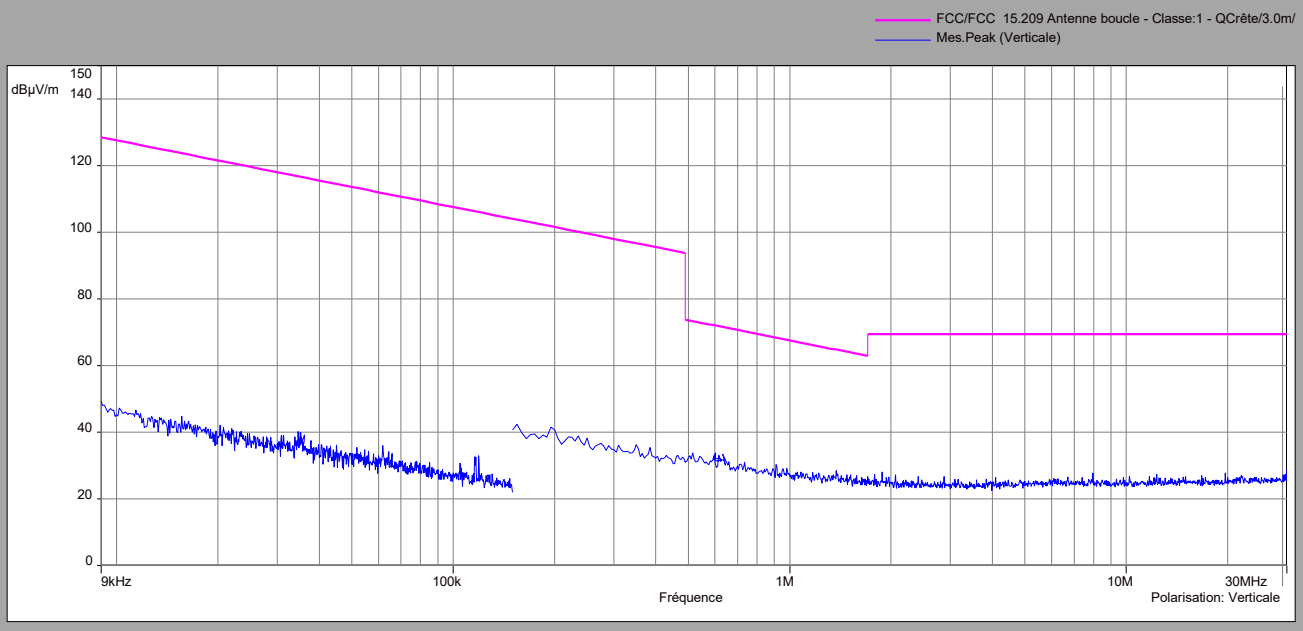
Parallel Axis



Perpendicular Axis



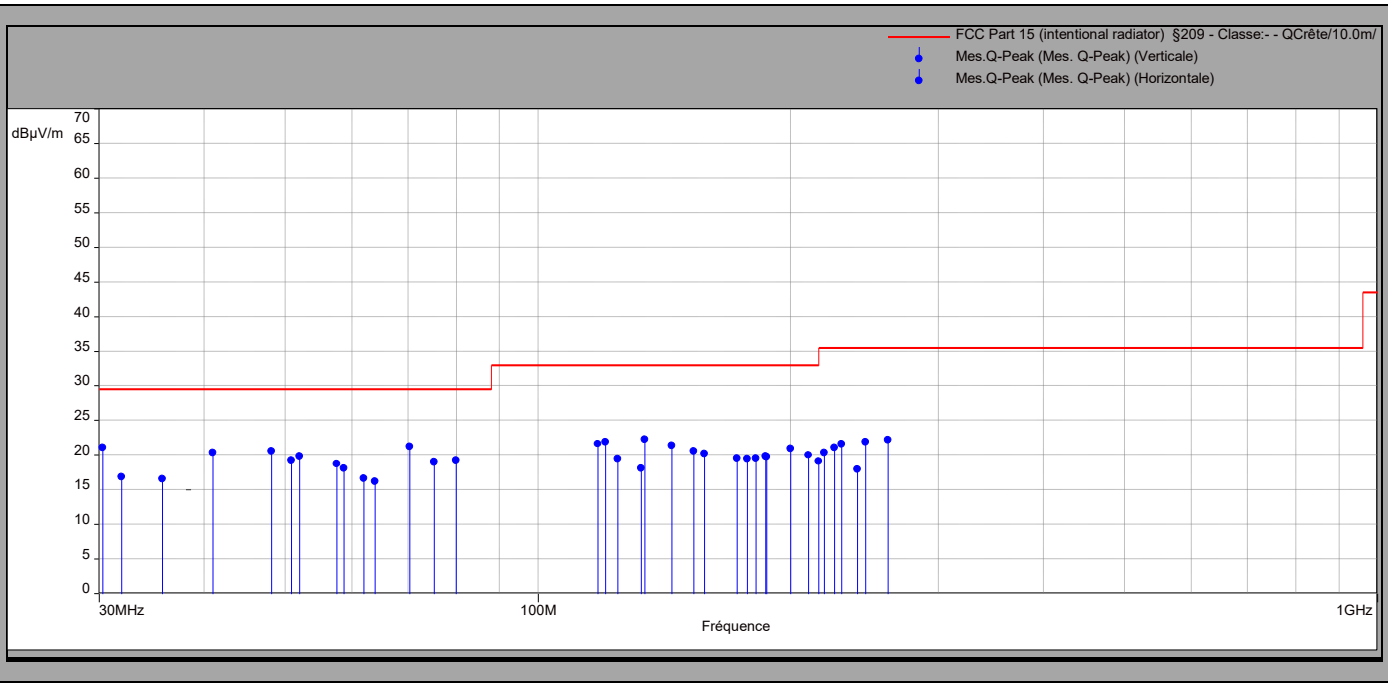
Ground Parallel Axis



Below 1GHz

Cmin/Cnom/Cmax

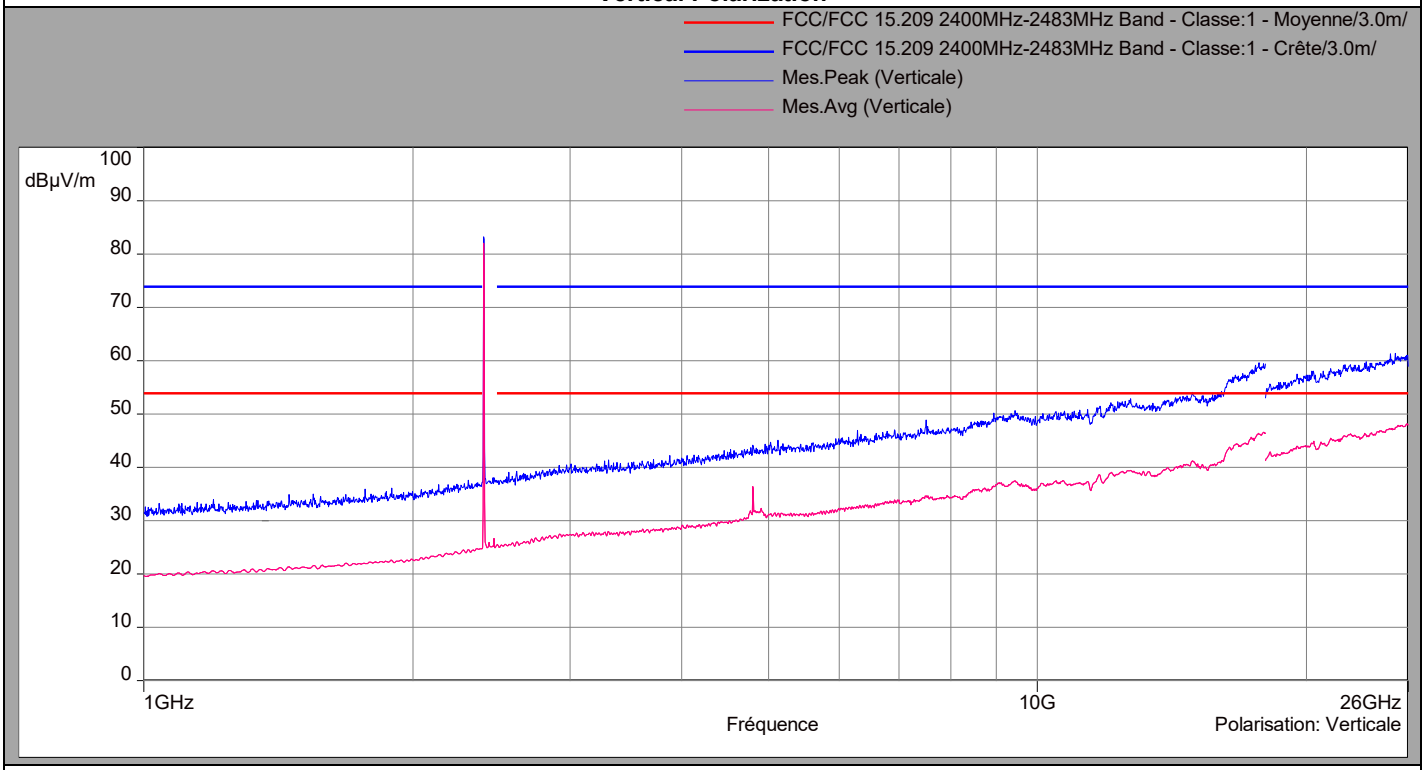
Vertical & horizontal Polarization



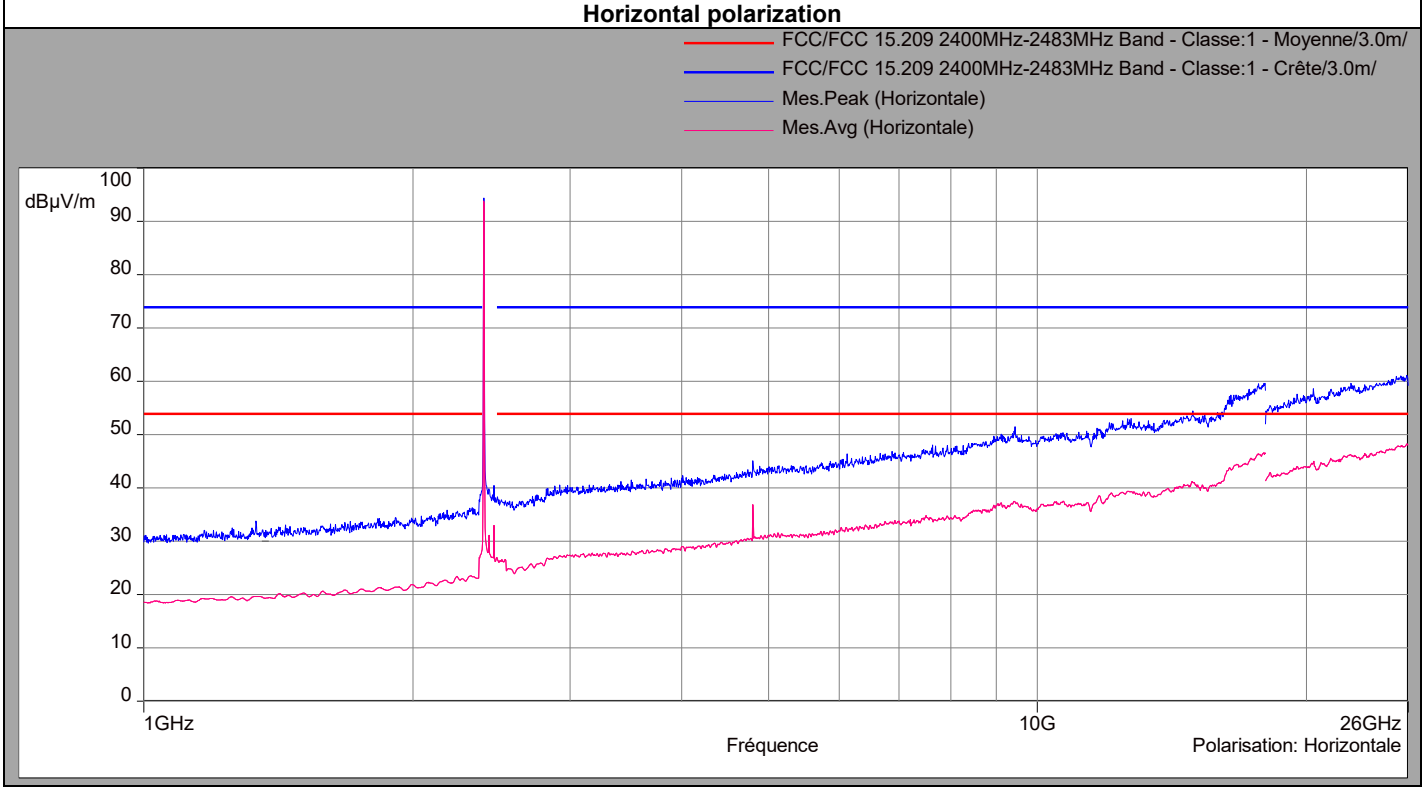
Above 1GHz

Cmin

Vertical Polarization



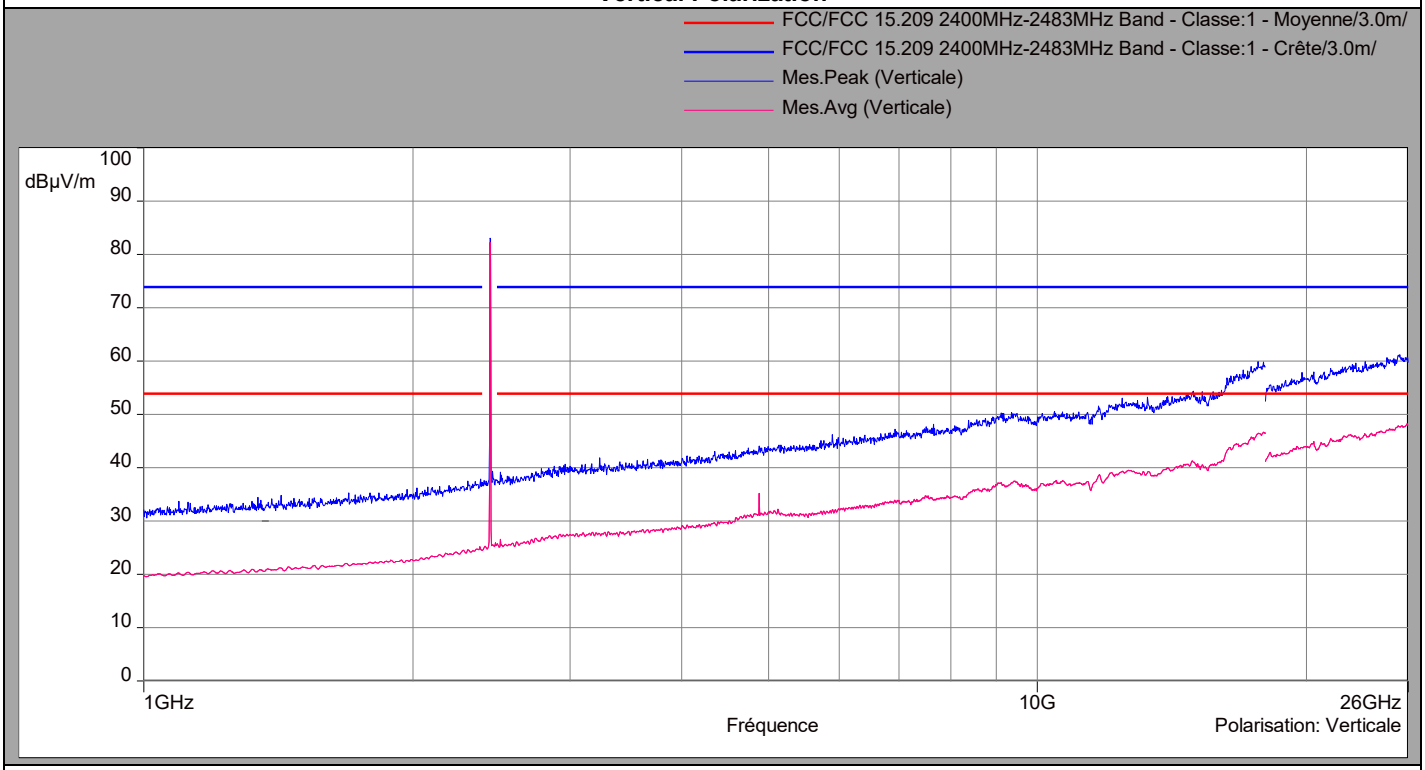
Horizontal polarization



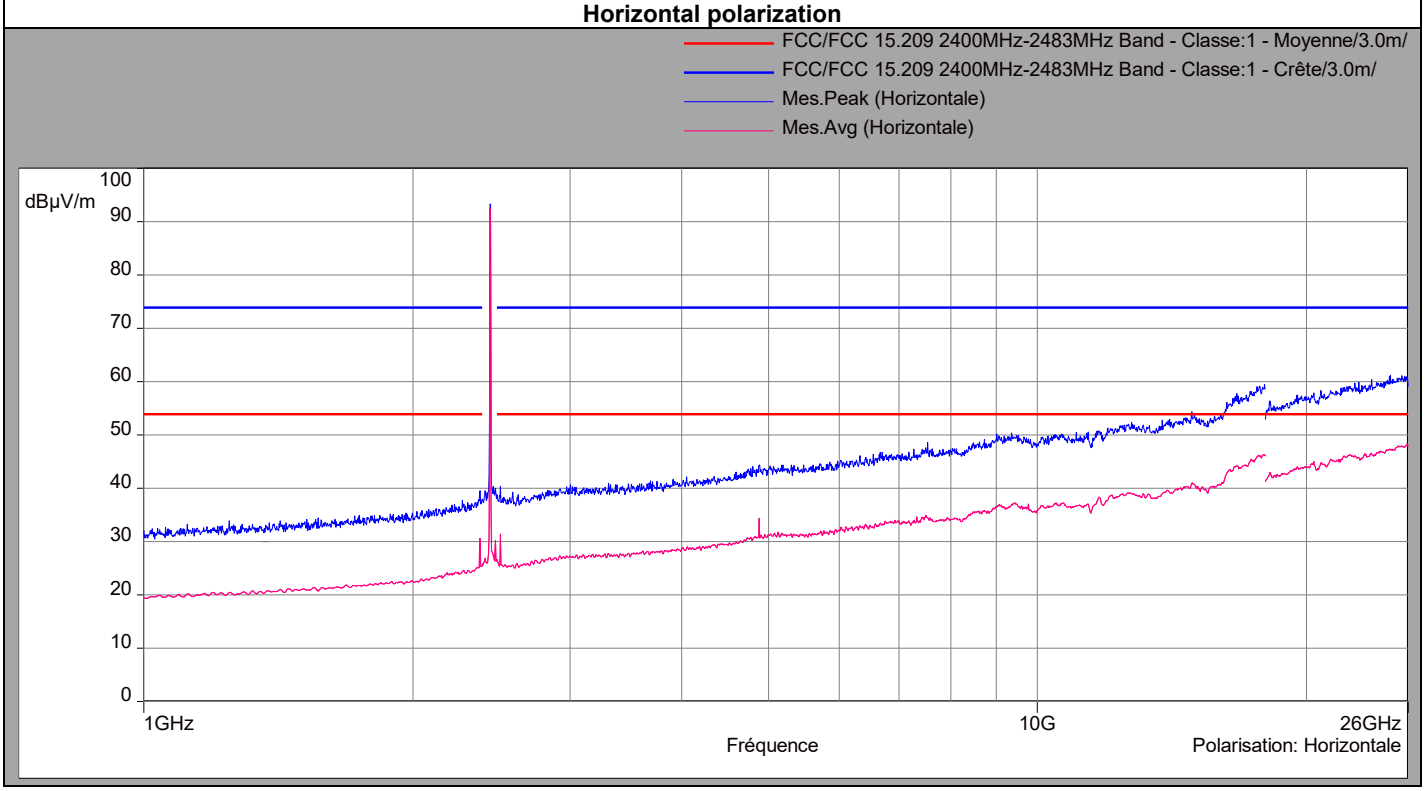
Above 1GHz

Cnom

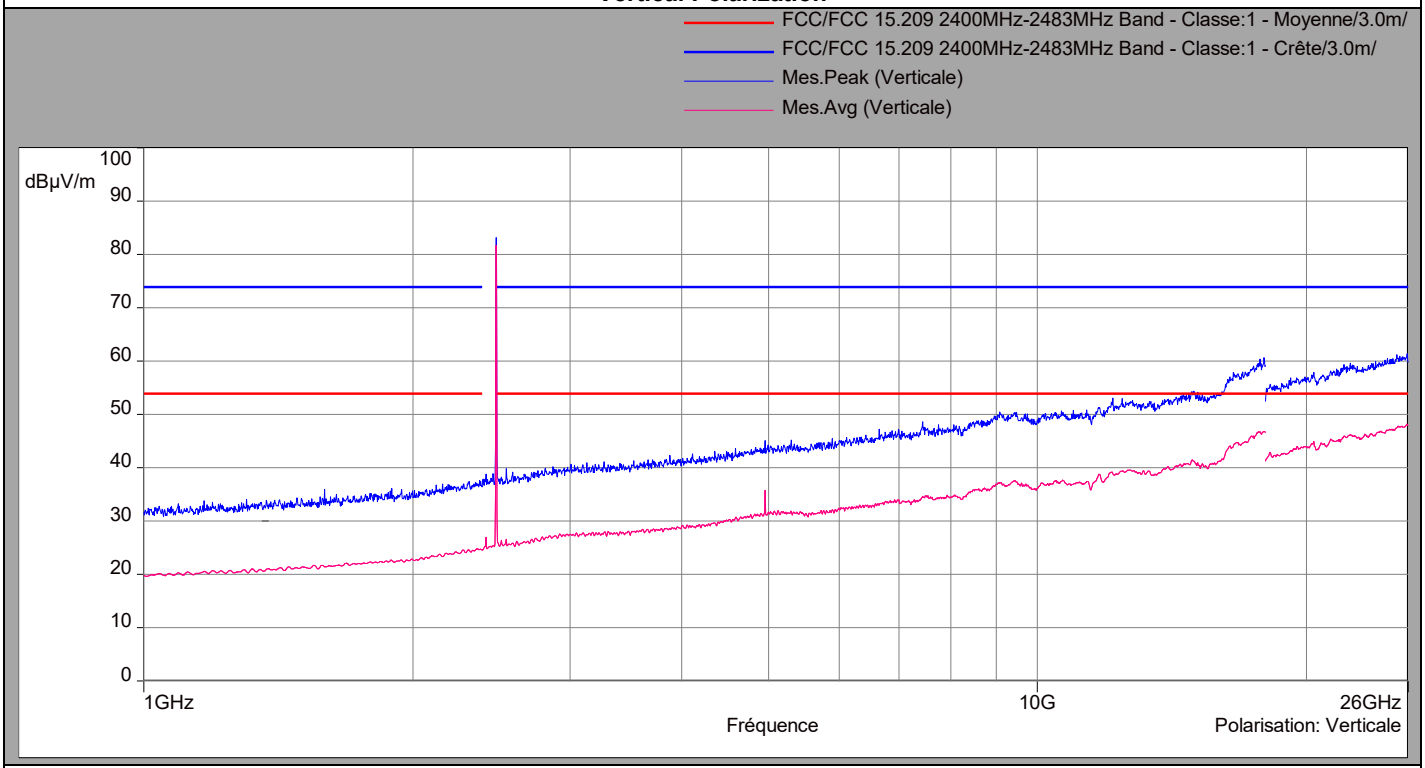
Vertical Polarization



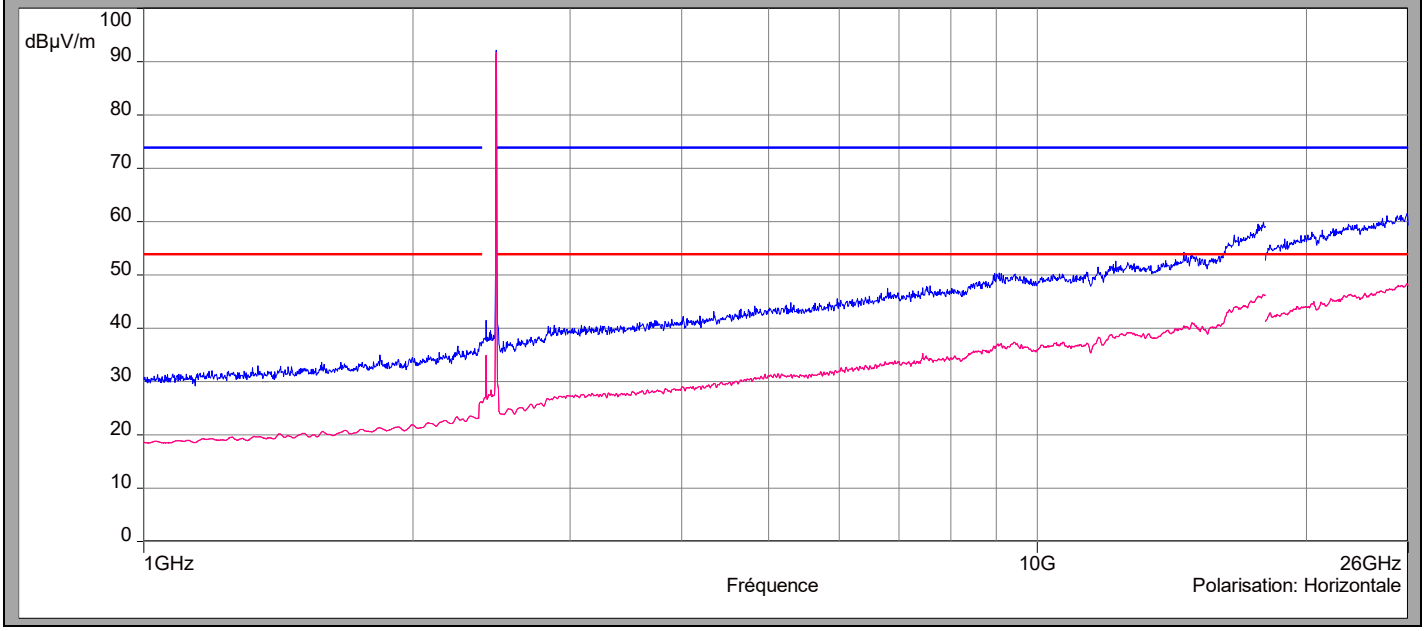
Horizontal polarization



Above 1GHz
Cmax
Vertical Polarization



Horizontal polarization



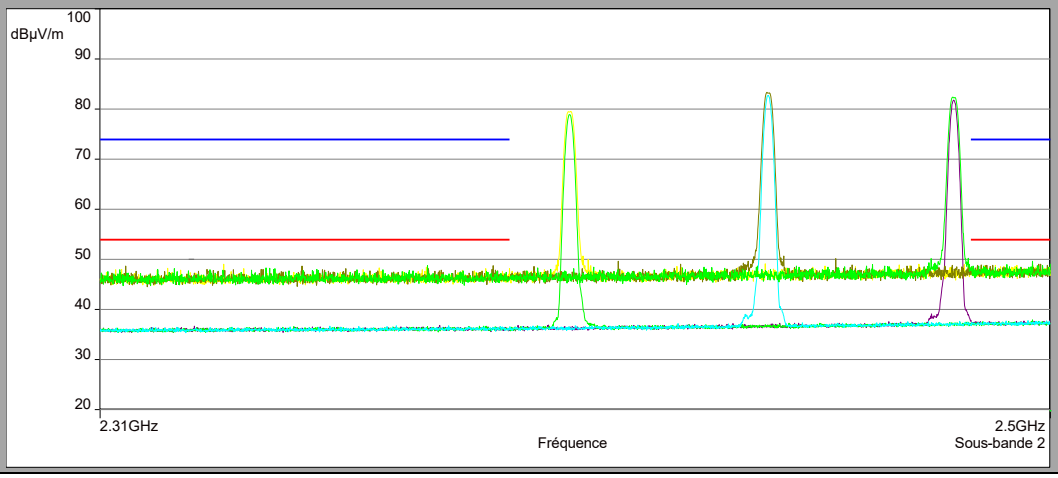
Above 1GHz Zoom 2310MHz-2500MHz

Cmin/Cnom/Cmax

Vertical Polarization

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

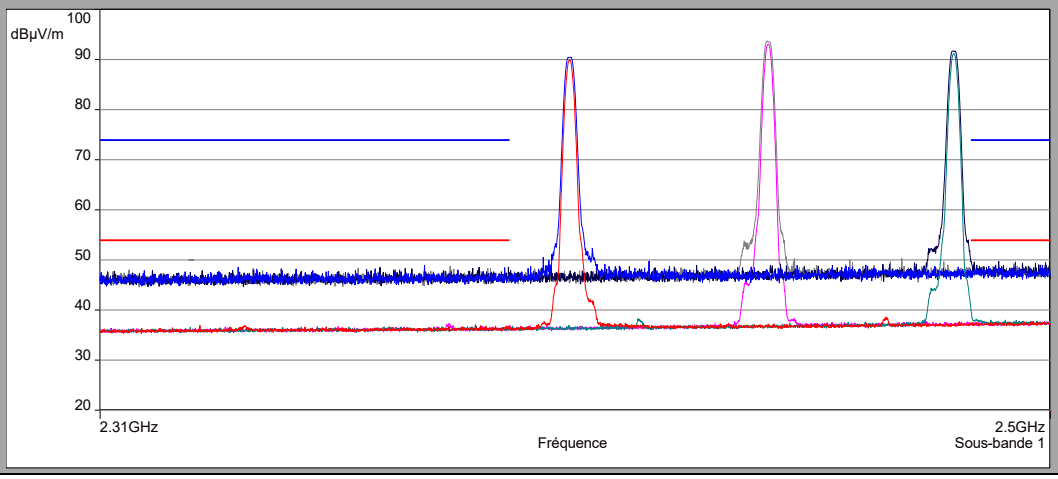
Description Sous-bande 2
Fréquences:2.31 GHz - 2.5 GHz (Mode analyseur) 32001 Points
Réglages: RBW: 1MHz, VBW: 3MHz, Durée balayage : 20 ms/MHz, Atténuation : 0 dB, Nombre de Balayages : 1, Preamp : On: 10 dB, LN Preamp : Off, Preselec
Polarisation:Verticale
Distance: 3 m



Horizontal polarization

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

Description Sous-bande 1
Fréquences:2.31 GHz - 2.5 GHz (Mode analyseur) 32001 Points
Réglages: RBW: 1MHz, VBW: 3MHz, Durée balayage : 20 ms/MHz, Atténuation : 0 dB, Nombre de Balayages : 1, Preamp : On: 10 dB, LN Preamp : Off, Preselec
Polarisation:Horizontale
Distance: 3 m



9kHz to 30MHz Cmin/Cnom/Cmax				
Polarization	**Frequency (MHz)**	**Peak Level (dBµV/m)**	**QPeak Level (dBµV/m)**	**Limit (dBµV/m)**
all emissions were greater than 20 dB below the limit				

Below 1GHz Cmin/Cnom/Cmax					
Polarization	**Frequency (MHz)**	**Peak Level (dBµV/m)**	**QPeak Level (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dBµV/m)**
Vertical	30.3	-	21.05	29.5	8.45
Vertical	120.4	-	21.88	33	11.12
Vertical	134	-	22.25	33	10.75
Vertical	144.4	-	21.38	33	11.62
Vertical	245.4	-	21.84	35.5	13.66
Horizontal	120.4	-	21.88	33	11.12
Horizontal	229.9	-	21.56	35.5	13.94

Above 1GHz Cmin/Cnom/Cmax								
Polarization	**Frequency (MHz)**	**Average Level (dBµV/m)**	**Average Level + Duty Cycle Factor (dBµV/m)**	**Average Limit (dBµV/m)**	**Average Margin Level (dBµV/m)**	**Peak Level (dBµV/m)**	**Peak Limit (dBµV/m)**	**Peak Margin Level (dBµV/m)**
Horizontale	2390	35,73	35,73	54	18,27	45,78	74	28,22
Verticale	2390	35,61	35,61	54	18,39	47,11	74	26,89
Horizontale	2483.5	39,67	39,67	54	14,33	48,69	74	25,31
Verticale	2483.5	37,04	37,04	54	18,27	46,95	74	27,05
Horizontale	4806	36,88	36,88	54	17,12	45,14	74	28,86
Verticale	4882	35,20	35,20	54	18,80	44,06	74	29,94
Verticale	4958	35,74	35,74	54	18,26	45,08	74	28,92

10.7. CONCLUSION

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

11. 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 (Ecuelles)	4,88	6.3
Measurement of radiated electric field from 1 to 18GHz on the Ecuelles site	5.16	/
Measurement of radiated electric field from 30 to 1000MHz in vertical position on the OATS (Ecuelles)	4,99	6.3
Measurement of radiated electric field from 30 to 1000MHz in horizontal position in SAC C01	5,08	6.3
Measurement of radiated electric field from 30 to 1000MHz in vertical position in SAC C01	5,16	6.3
Measurement of radiated electric field from 30 to 1000MHz in horizontal position in SAC V01	5,08	6.3
Measurement of radiated electric field from 30 to 1000MHz in vertical position in SAC V01	5,15	6.3
Measurement of radiated electric field from 1 to 6 GHz C01	5,1	5.2
Measurement of radiated electric field from 1 to 6 GHz V01	4,85	5.2
Measurement of radiated magnetic field from 10kHz to 30MHz on the OATS (Ecuelles)	4,48	/

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