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Bluetooth Low Energy Template: Release October 11th, 2019

TEST REPORT

N°: 165235-746928

Version : 01

Subject

Radio spectrum matters
tests according to standards:
47 CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 5 [P](#)

Issued to

MICROPORT CRM
Parc d'Affaires NOVEOS -4 avenue Réaumur
92143 - Clamart
FRANCE

Apparatus under test

- ↪ Product
- ↪ Trade mark
- ↪ Manufacturer
- ↪ Model under test
- ↪ Serial number
- ↪ FCC ID
- ↪ IC

Holter SAS
MicroPort CRM | SORIN
MICROPORT S.r.l
SPIDER SAS
SW1512013A
YSGLA800
10270A-LA800

Conclusion

See Test Program chapter

Test date

January 15, 2020 to February 10, 2020

Test location

Fontenay Aux Roses & Ecuelles

Test Site

6230B-1

Sample receipt date

January 15, 2020

Composition of document

41 pages

Document issued on

May 13, 2020

Written by :
Armand MAHOUNGOU
Tests operator

Approved by :
Arnaud FAYETTE



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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

Version	Date	Author	Modification
01	May 13, 2020	Armand MAHOUNGOU	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

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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 ↗	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP(1)
6dB Bandwidth ↗	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA() <input type="checkbox"/> NP(1)
Duty Cycle ↗	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP(1)
Maximum Conducted Output Power ↗	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP(1)
Power Spectral Density ↗	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP(1)
Conducted Spurious Emission at the Band Edge ↗	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA() <input type="checkbox"/> NP(1)
Unwanted Emissions into Non-Restricted Frequency Bands ↗	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA() <input type="checkbox"/> NP(1)
AC Power Line Conducted Emission ↗	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL <input checked="" type="checkbox"/> NA(2) <input type="checkbox"/> NP(1)
Unwanted Emissions into Restricted Frequency Bands ↗	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP(1)
Receiver Radiated emissions ↗	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP(1)
This table is a summary of test report, see conclusion of each clause of this test report for detail.	

(1): Limited program

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

PASS: EUT complies with standard's requirement

FAIL: EUT does not comply with standard's requirement

NA: Not Applicable

NP: Test Not Performed

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

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):

MicroPort CRM | SORIN SPIDER SAS

Serial Number: SW1512013A



Equipment Under Test

Power supply:

During all the tests, EUT is supplied by V_{nom} : 1.5VDC



Equipment information:

Bluetooth LE Type:	<input checked="" type="checkbox"/> BLE	<input type="checkbox"/> v4.0	<input type="checkbox"/> v4.1	<input checked="" 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 checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Temporary for test	
Transmit chains:	1 Single antenna			
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	
Duty cycle:	<input type="checkbox"/> Continuous duty	<input type="checkbox"/> Intermittent duty	<input checked="" 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"/> 40°C
Type of power source:	<input type="checkbox"/> AC power supply	<input type="checkbox"/> DC power supply	<input checked="" type="checkbox"/> Battery	
Operating voltage range:	Vnom:	<input type="checkbox"/> 120V/60Hz	<input checked="" type="checkbox"/> 1.5 Vdc	
		<input type="checkbox"/> 240V/50Hz	<input type="checkbox"/> X Vdc	

Antenna Characteristic			
Antenna assembly	Gain (dBi)	Frequency Band (MHz)	Impedance(Ω)
1	3.92	2400-2483.5	50

Hardware information		
Software (if applicable):	V. :	Not provided by customer



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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

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	<input checked="" type="checkbox"/> Test mode 1	<input type="checkbox"/> Alternative test mode()
6dB Bandwidth	<input checked="" type="checkbox"/> Test mode 1	<input type="checkbox"/> Alternative test mode()
Duty Cycle	<input checked="" type="checkbox"/> Test mode 1	<input type="checkbox"/> Alternative test mode()
Maximum Conducted Output Power	<input checked="" type="checkbox"/> Test mode 1	<input type="checkbox"/> Alternative test mode()
Power Spectral Density	<input checked="" type="checkbox"/> Test mode 1	<input type="checkbox"/> Alternative test mode()
Conducted Spurious Emission at the Band Edge	<input checked="" type="checkbox"/> Test mode 1	<input type="checkbox"/> Alternative test mode()
Unwanted Emissions into Non-Restricted Frequency Bands	<input checked="" type="checkbox"/> Test mode 1	<input type="checkbox"/> Alternative test mode()
Unwanted Emissions into Restricted Frequency Bands	<input checked="" type="checkbox"/> Test mode 1	<input type="checkbox"/> Alternative test mode()

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 : January 20, 2020
Ambient temperature : 26°C
Relative humidity : 48%

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:

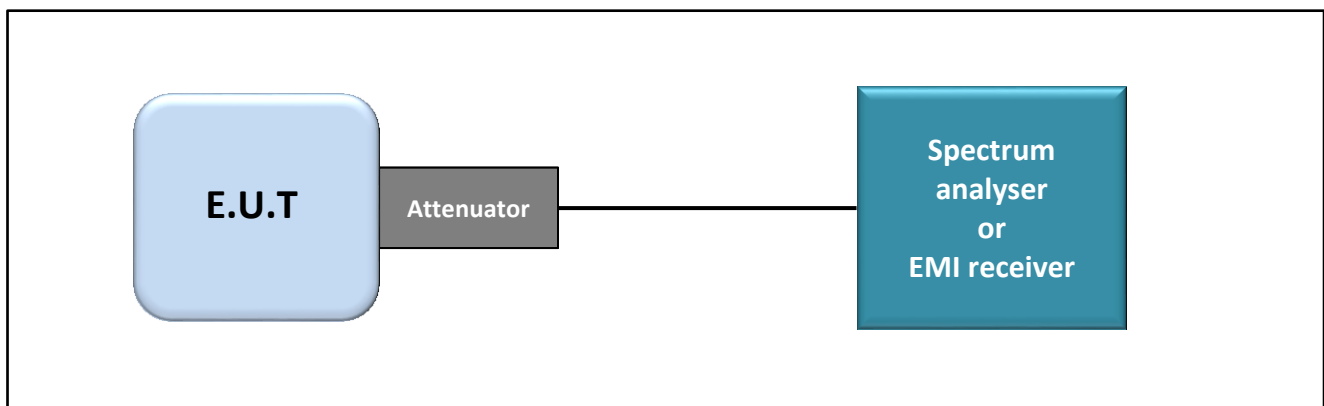
- Conducted Method
- Radiated Method

- Test Procedure:

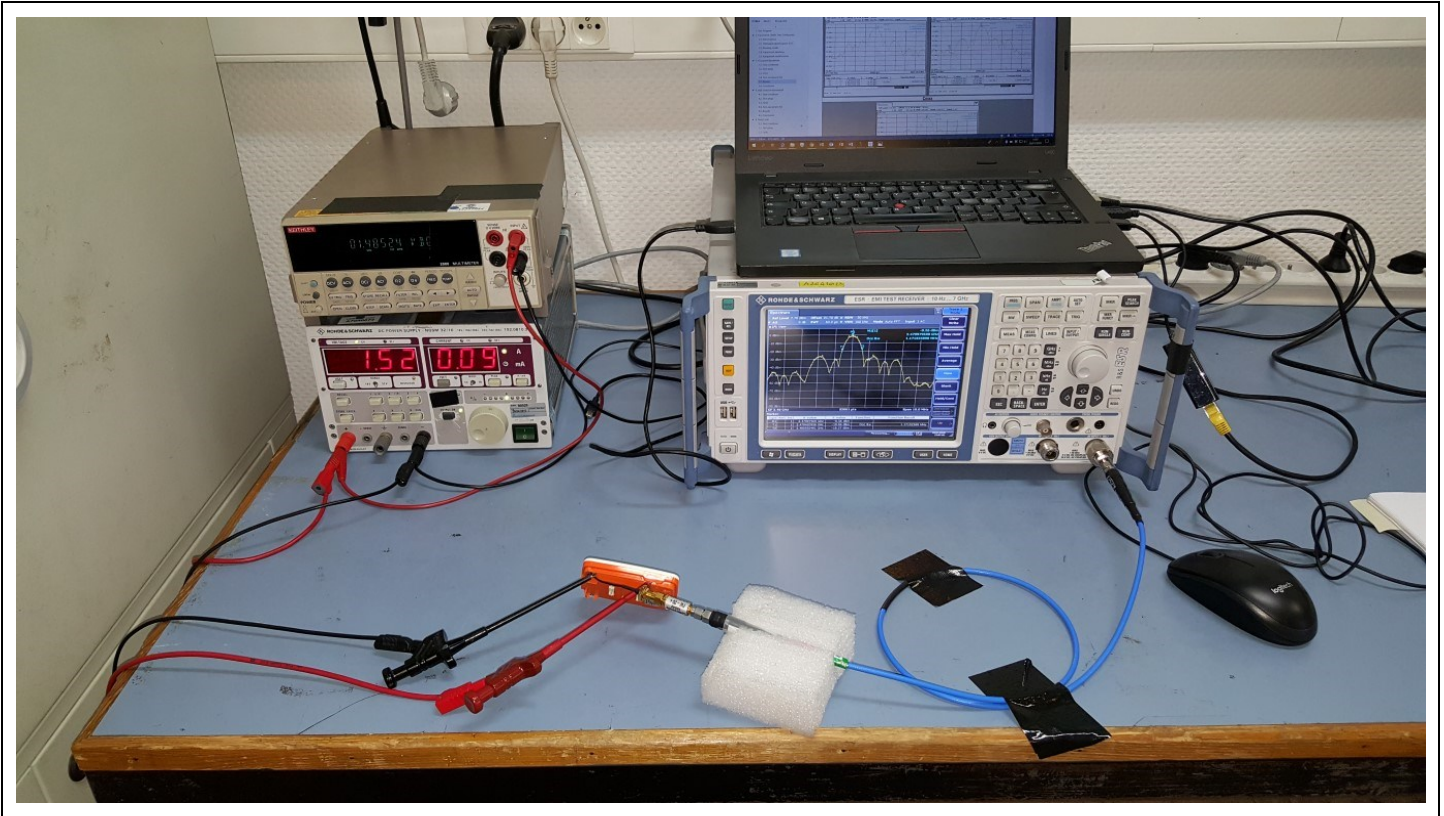
- RSS-Gen Issue 5 § 6.7
- ANSI C63.10 § 6.9.2

Measurement Procedure:

- a) RBW shall be in the range of 1% to 5% of the anticipated occupied bandwidth
- b) Set the video bandwidth (VBW) $\geq 3 \times$ 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

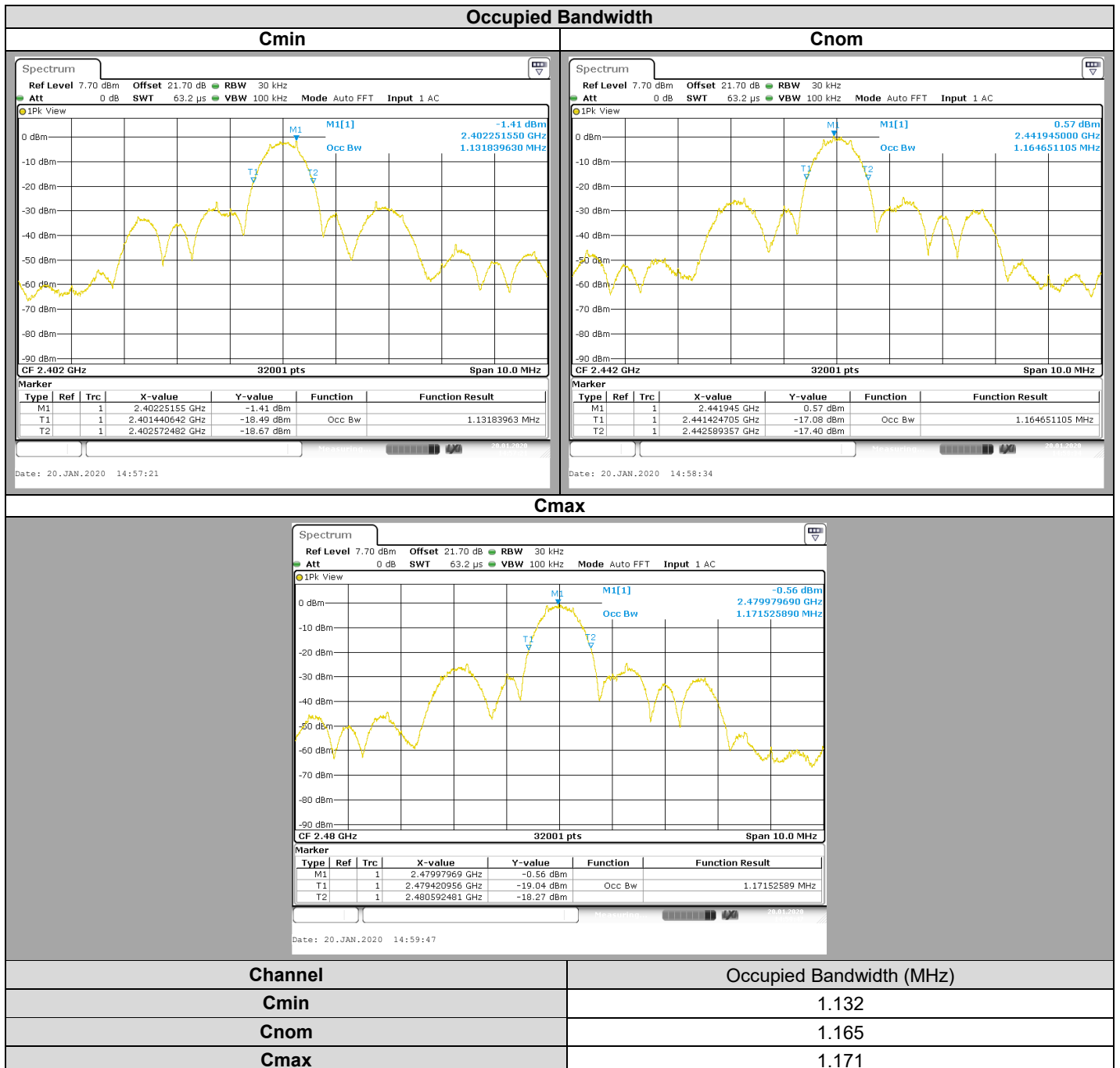
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Cable + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329770	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Programmable DC power supply	ROHDE & SCHWARZ	NGSM32/10	A7040074	See multimeter	See multimeter

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 **MicroPort CRM | SORIN SPIDER SAS**, SN: **SW1512013A**, 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 : Armand MAHOUNGOU
Date of test : January 20, 2020
Ambient temperature : 26°C
Relative humidity : 48%

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:

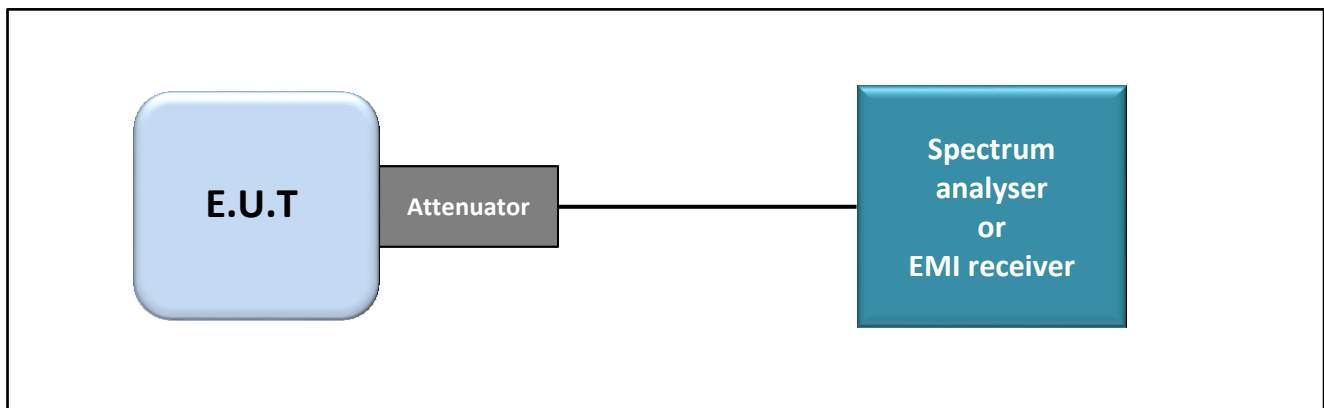
- Conducted Method
- Radiated Method

- Test Procedure:

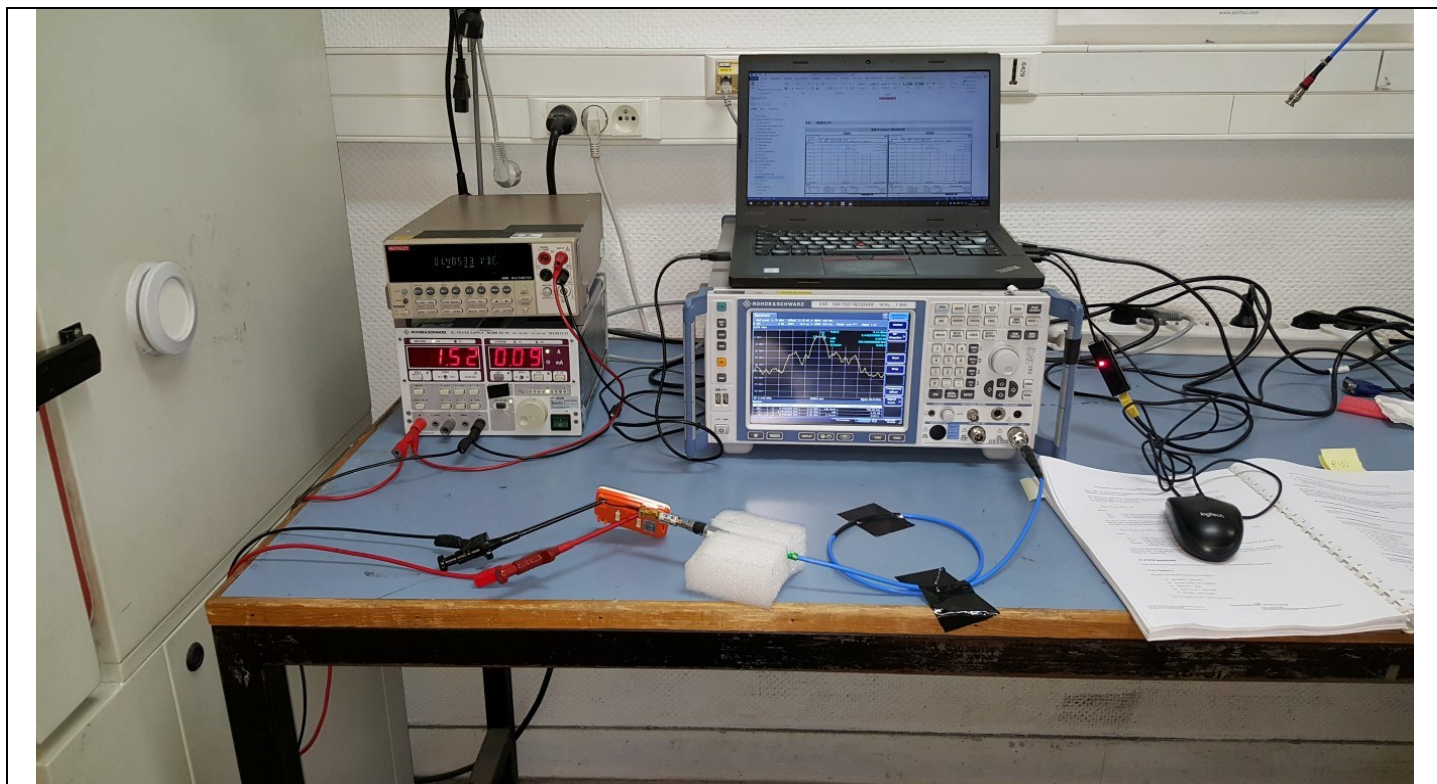
- ANSI C63.10 § 11.8.1
- ANSI C63.10 § 11.8.2

Measurement Procedure:

1. Set resolution bandwidth (RBW) = 100kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ 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

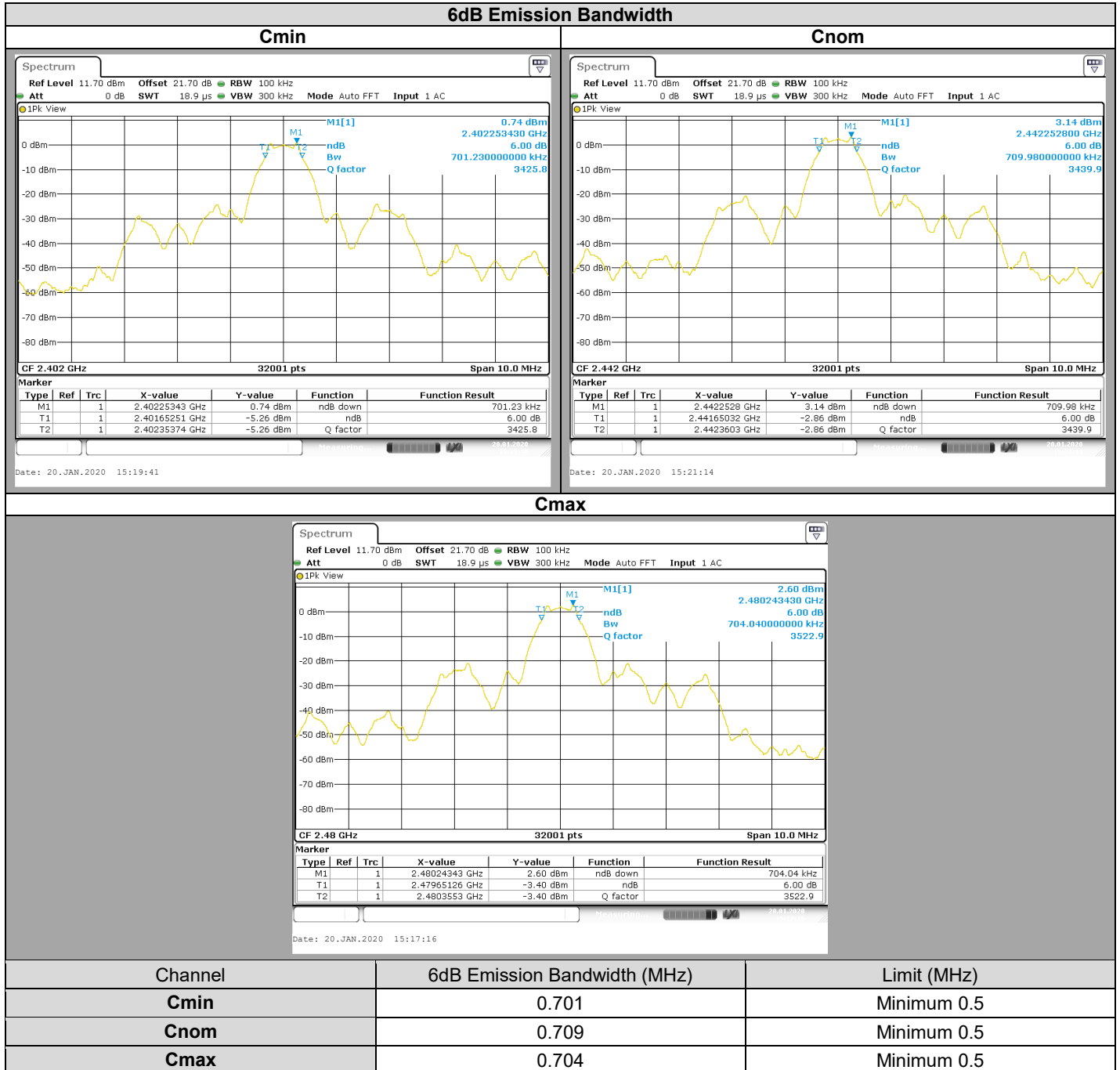
Frequency range	The 6dB bandwidth Limit
2400MHz to 2483.5MHz	≥ 500kHz

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 + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329770	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Programmable DC power supply	ROHDE & SCHWARZ	NGSM32/10	A7040074	See multimeter	See multimeter

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

4.5. RESULTS



4.6. CONCLUSION

6dB Emission Bandwidth measurement performed on the sample of the product **MicroPort CRM | SORIN SPIDER SAS**, SN: **SW1512013A**, 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 : January 20, 2020
Ambient temperature : 26°C
Relative humidity : 48%

5.2. TEST SETUP

- The Equipment under Test is installed:

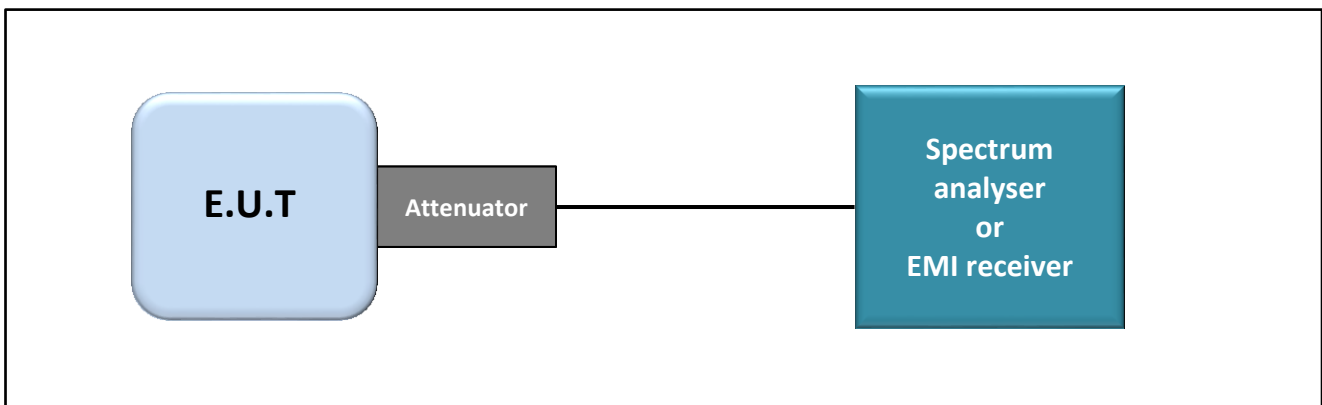
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

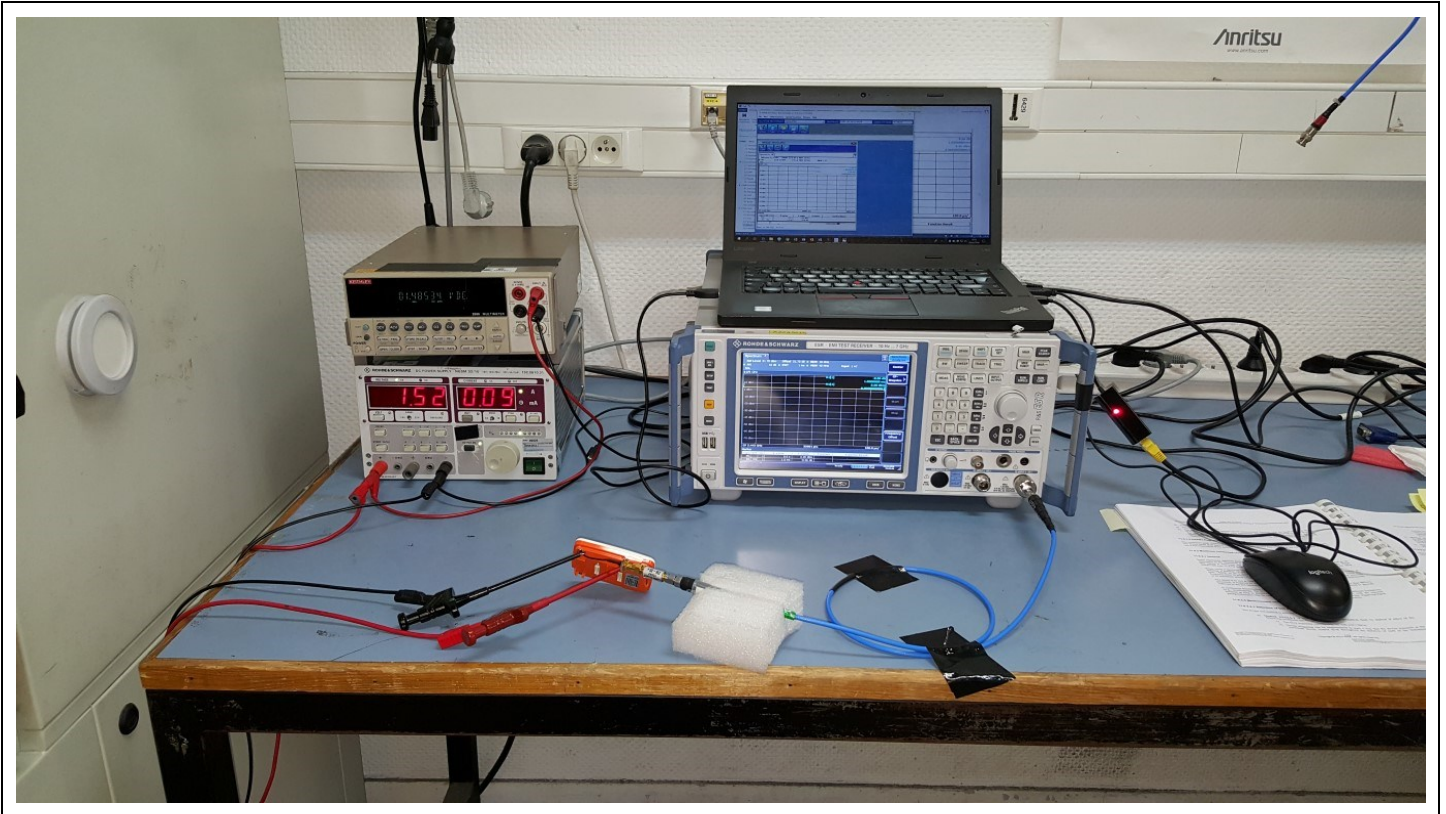
- ANSI C63.10 § 11.6



Test set up of Duty Cycle



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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 + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329770	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Programmable DC power supply	ROHDE & SCHWARZ	NGSM32/10	A7040074	See multimeter	See multimeter

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

6. MAXIMUM CONDUCTED OUTPUT POWER

6.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : January 20, 2020
Ambient temperature : 26°C
Relative humidity : 48%

6.2. TEST SETUP

- The Equipment under Test is installed:

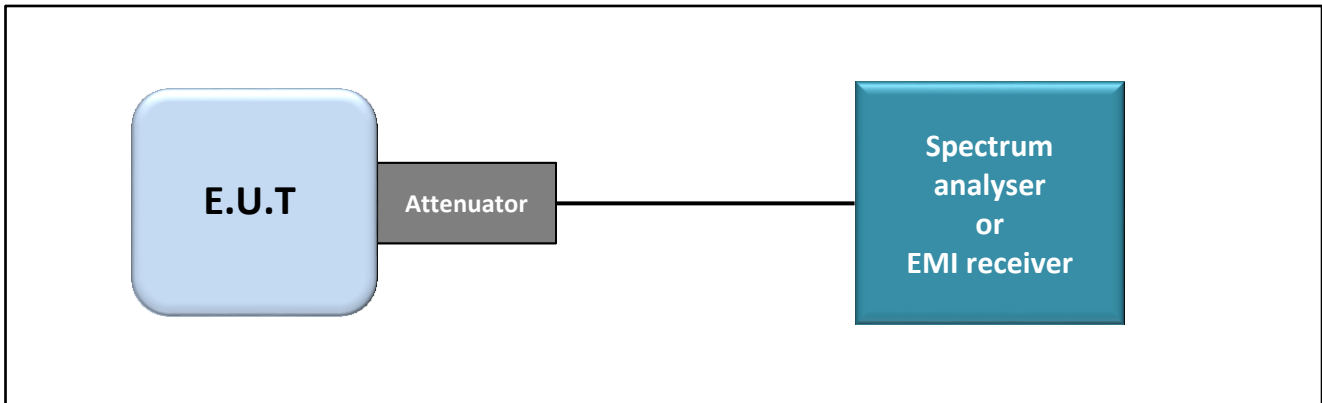
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

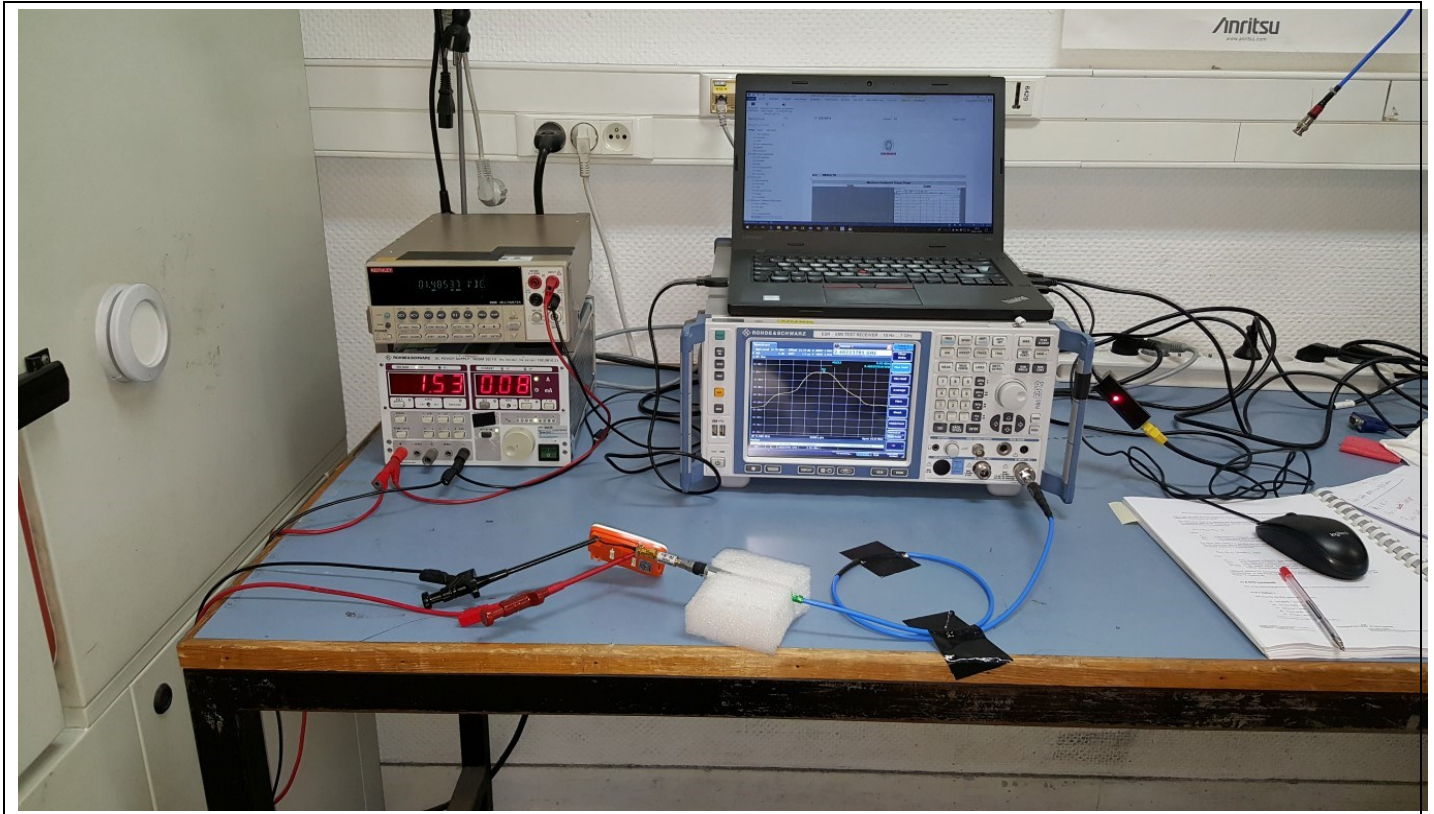
- Conducted Method
- Radiated Method

- 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

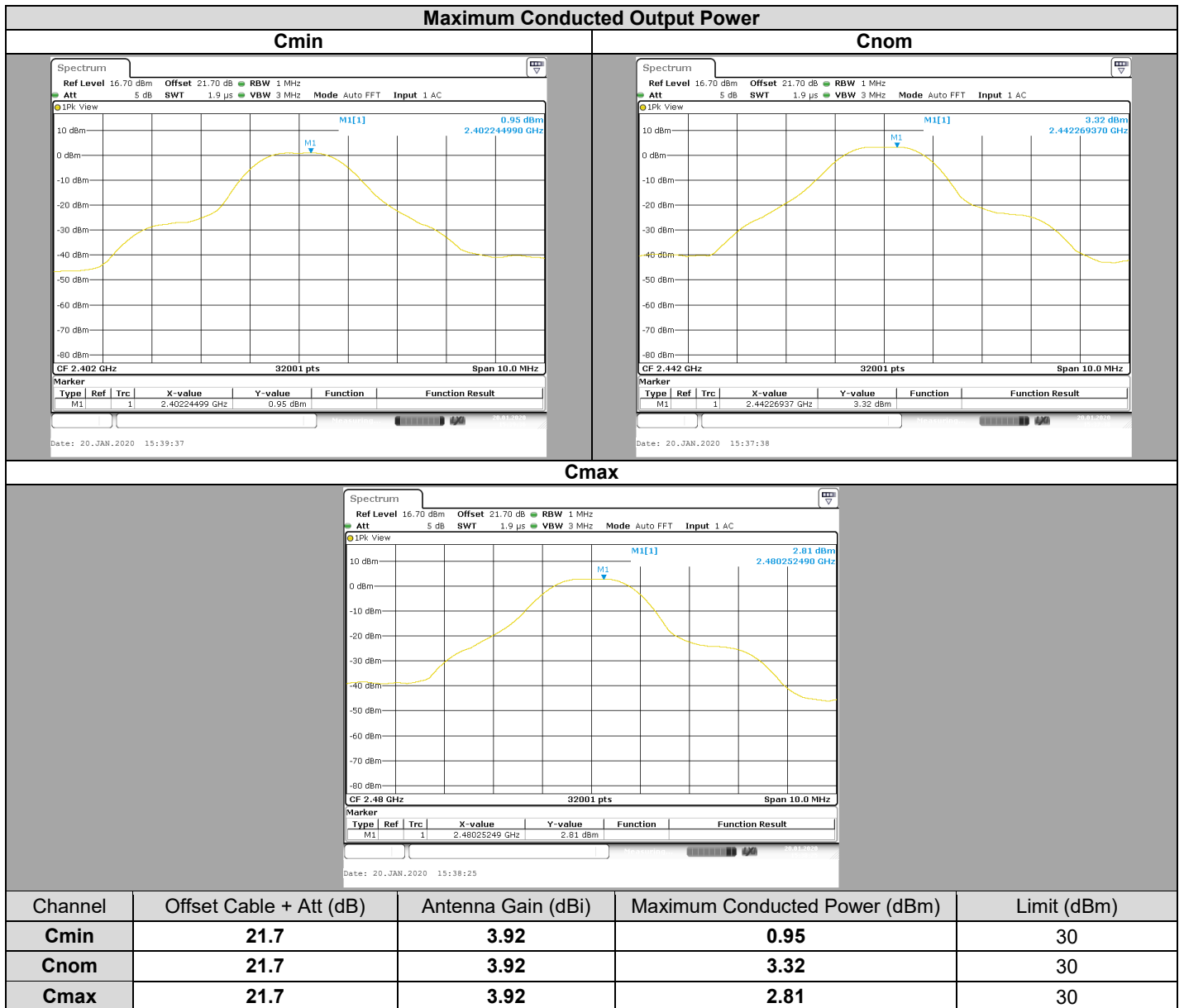
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Cable + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329770	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Programmable DC power supply	ROHDE & SCHWARZ	NGSM32/10	A7040074	See multimeter	See multimeter

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



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6.5. RESULTS



6.6. CONCLUSION

Maximum Conducted Output Power measurement performed on the sample of the product **MicroPort CRM | SORIN SPIDER SAS**, SN: **SW1512013A**, 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 : January 20, 2020
Ambient temperature : 26°C
Relative humidity : 48%

7.2. TEST SETUP

- The Equipment Under Test is installed:

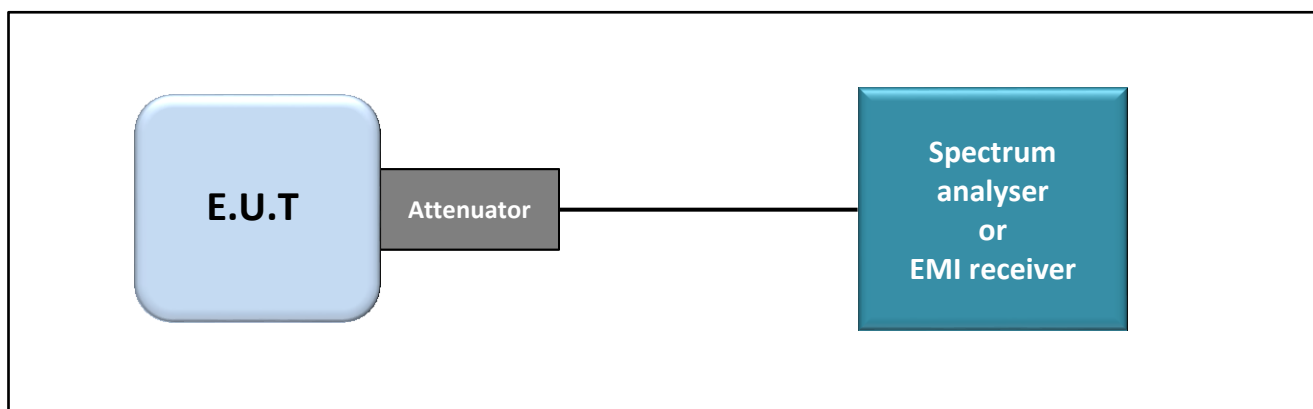
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

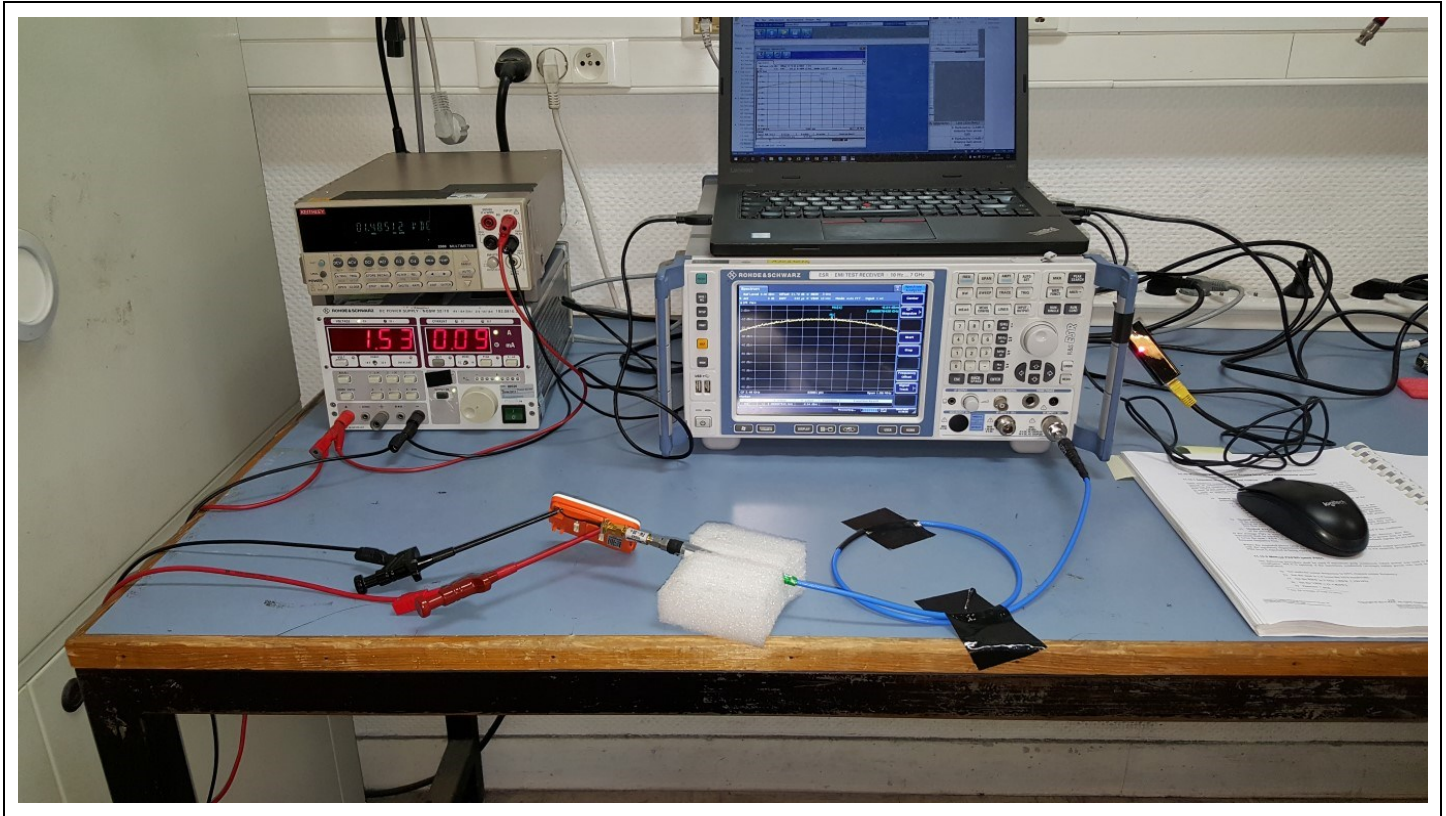
- Conducted Method
- Radiated Method

- Test Procedure:

- ANSI C63.10 § 11.10.2 (Method PKPSD)
- ANSI C63.10 § 11.10.3 (Method AVGPS-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	$\leq 8\text{dBm}/3\text{kHz}^*$

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

7.4. TEST EQUIPMENT LIST

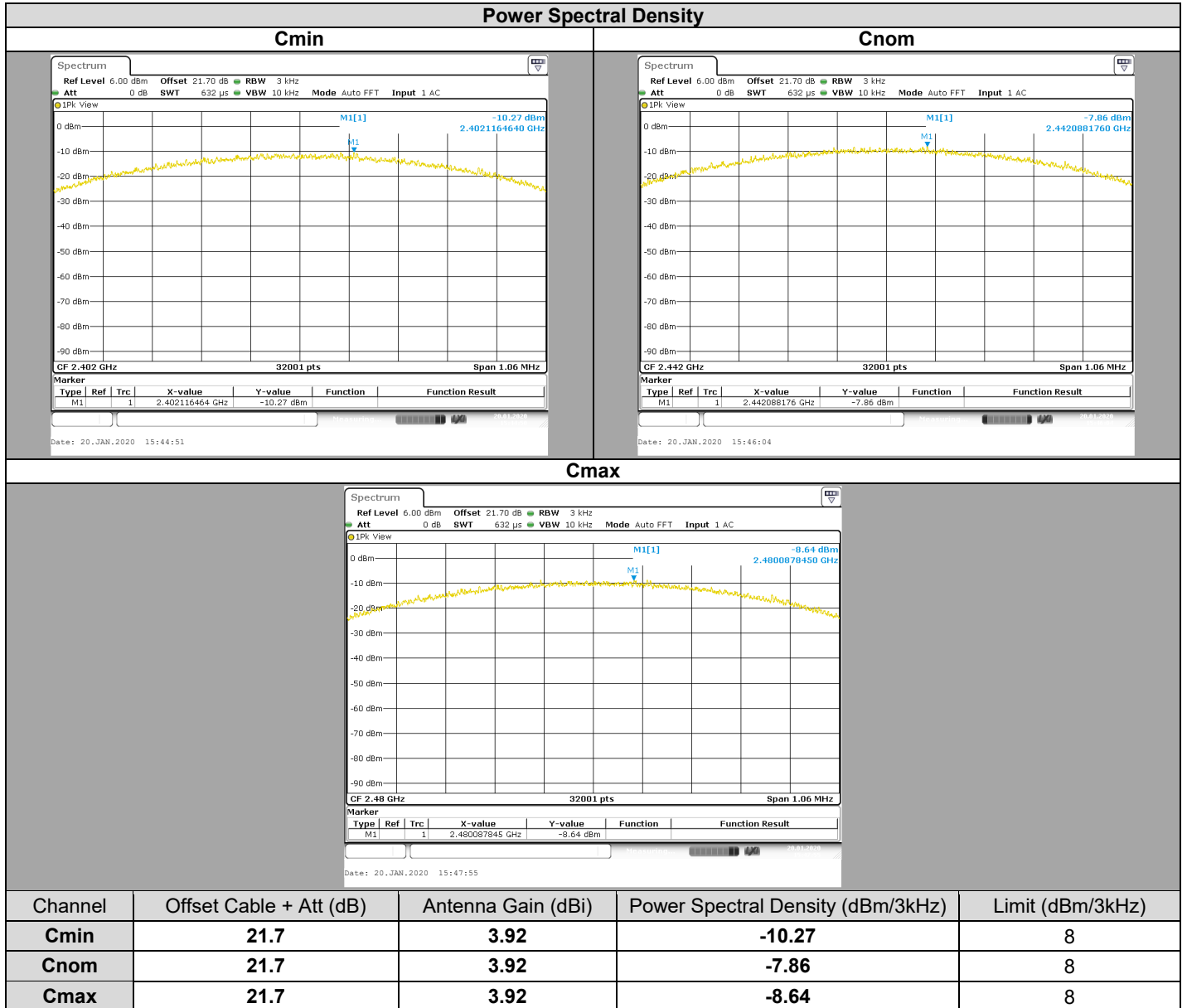
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Cable + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329770	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Programmable DC power supply	ROHDE & SCHWARZ	NGSM32/10	A7040074	See multimeter	See multimeter

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



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7.5. RESULTS



7.6. CONCLUSION

Power Spectral Density measurement performed on the sample of the product **MicroPort CRM | SORIN SPIDER SAS**, SN: **SW1512013A**, 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 : January 20, 2020
Ambient temperature : 26°C
Relative humidity : 48%

8.2. TEST SETUP

- The Equipment Under Test is installed:

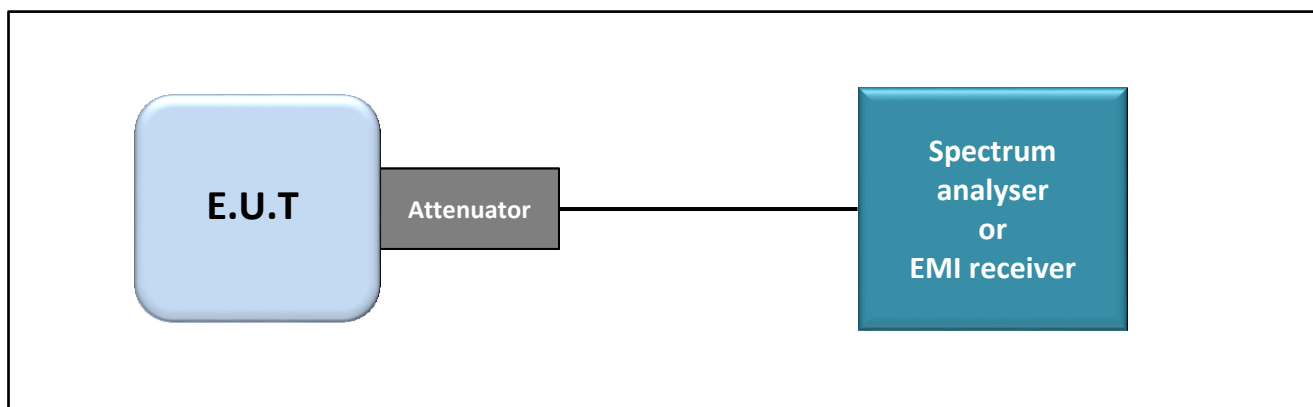
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

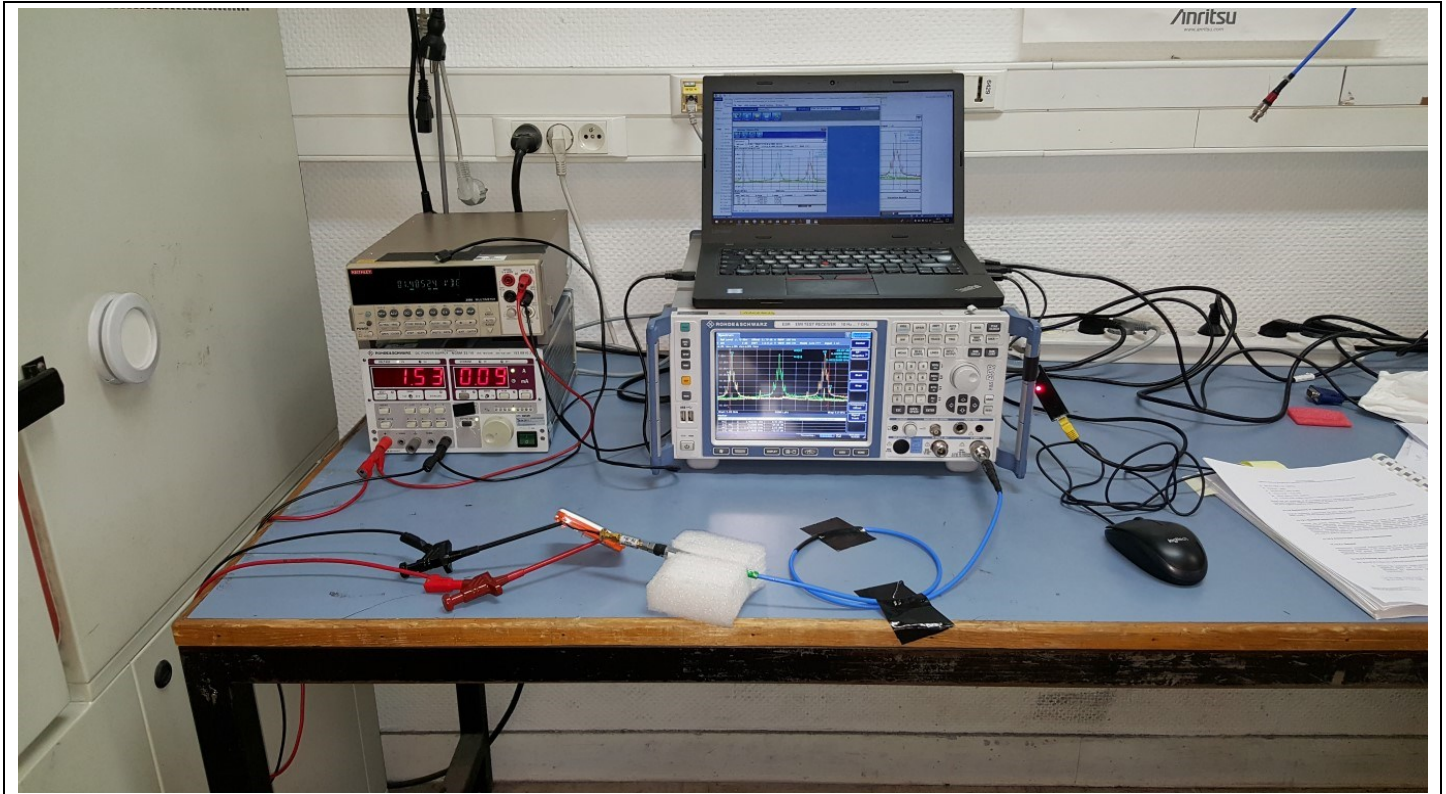
- Conducted Method
- Radiated Method

- 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 Conduced Power) below the Fundamental Radiator Level at the Band Edge “2400MHz & 2483,5MHz”

8.4. TEST EQUIPMENT LIST

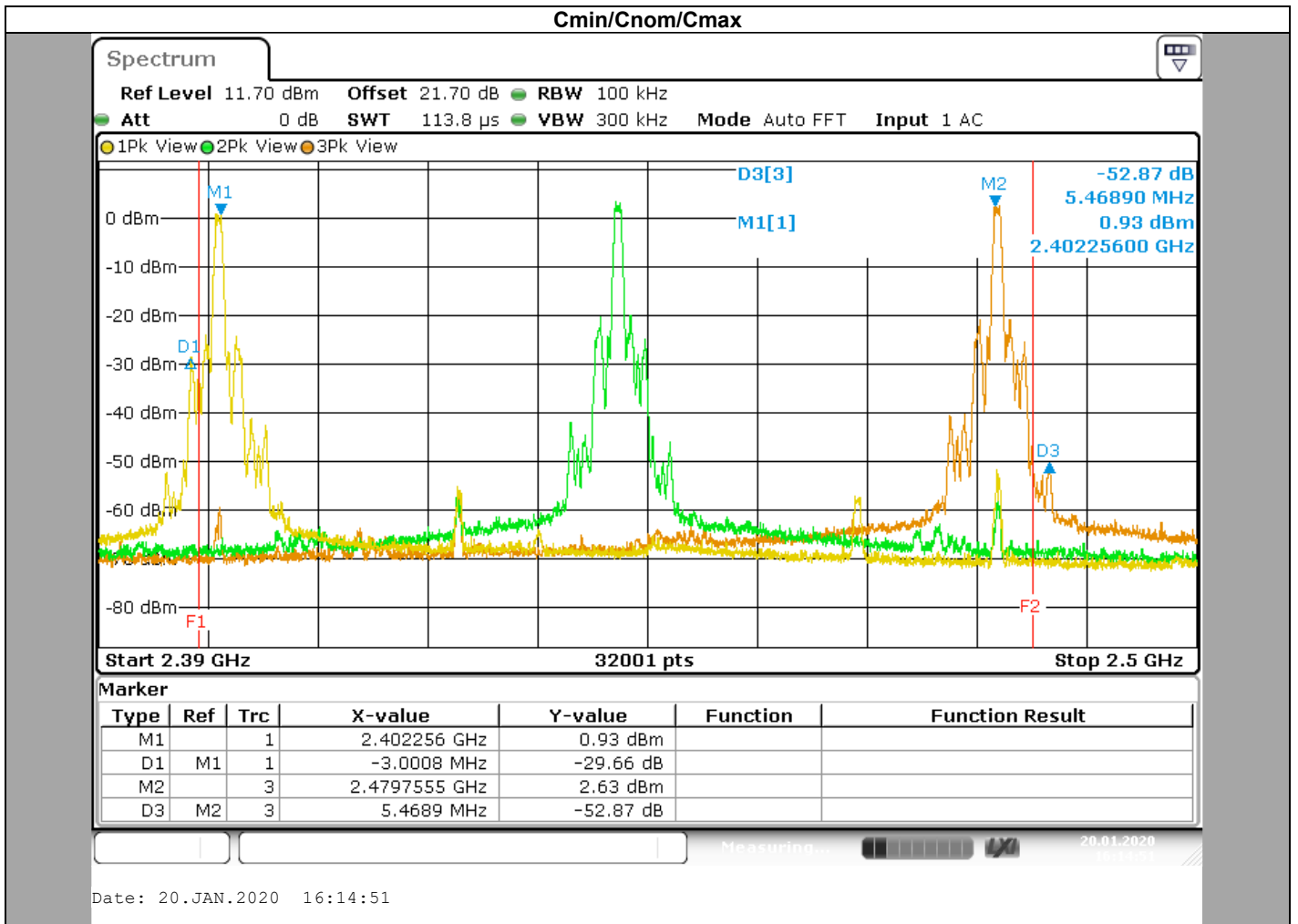
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Cable + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329770	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Programmable DC power supply	ROHDE & SCHWARZ	NGSM32/10	A7040074	See multimeter	See multimeter

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



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8.5. RESULTS



Frequency (MHz)	Level (dBc)	Limit (dBc)
2400	29.66	20
2483.5	52.87	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 | SORIN SPIDER SAS**, SN: **SW1512013A**, 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 : January 20, 2020
Ambient temperature : 26°C
Relative humidity : 48%

9.2. TEST SETUP

- The Equipment under Test is installed:

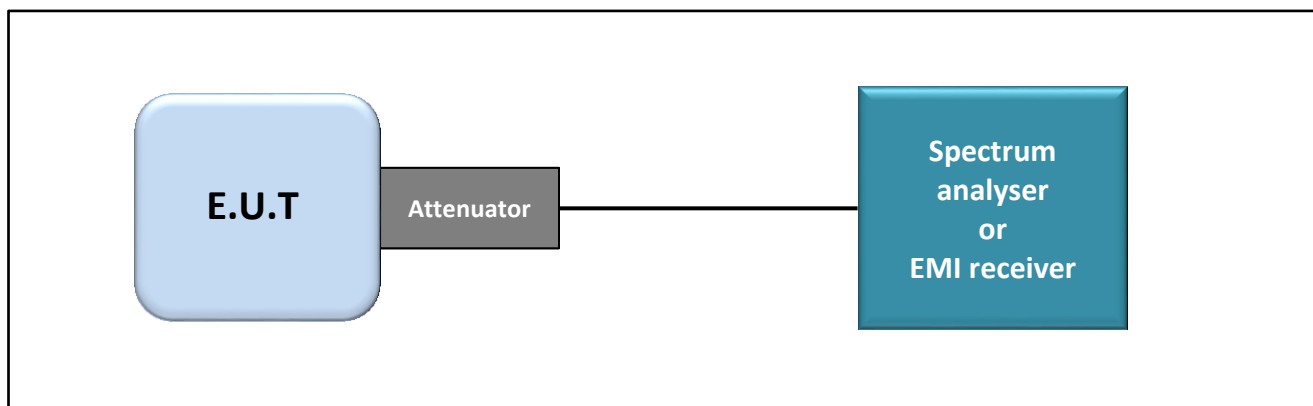
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

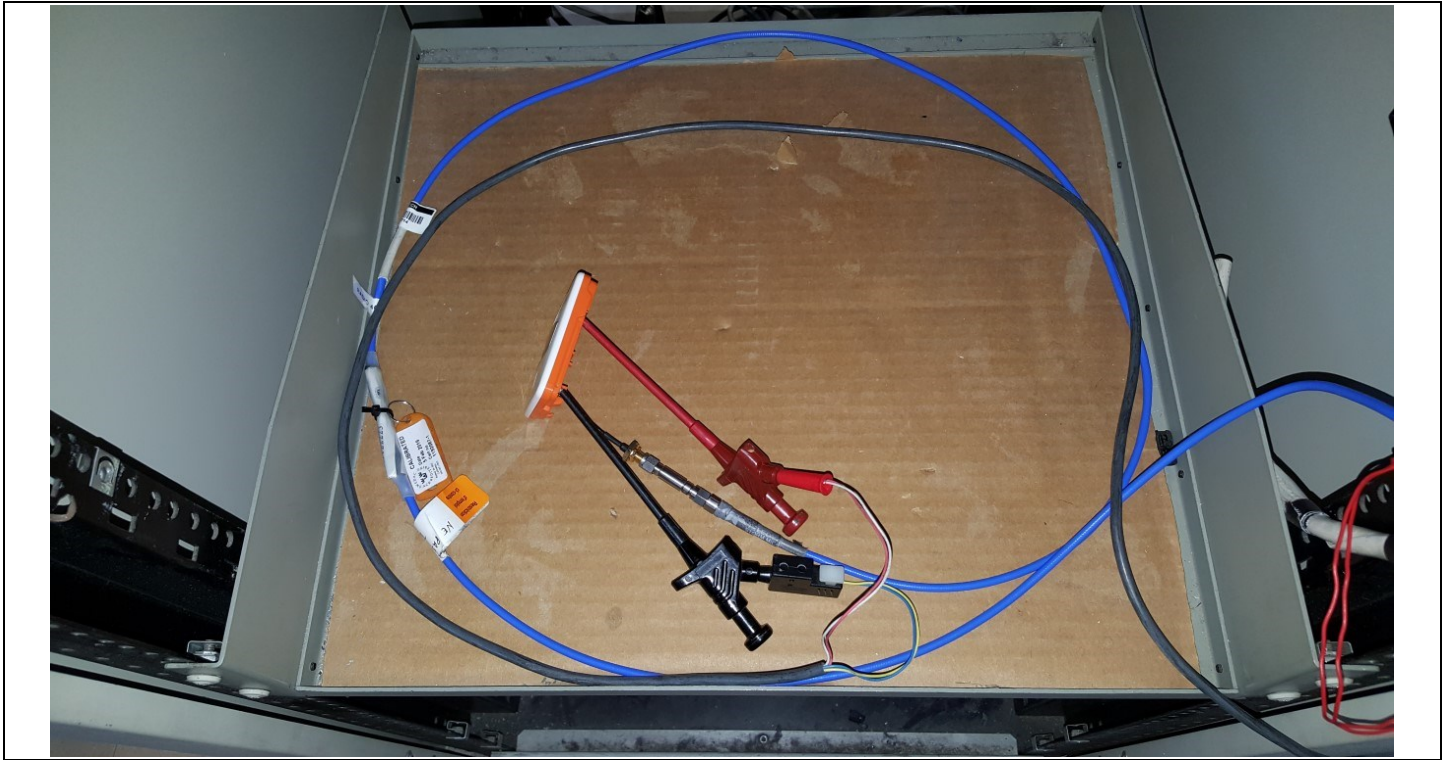
- Conducted Method
- Radiated Method

- Test Procedure:

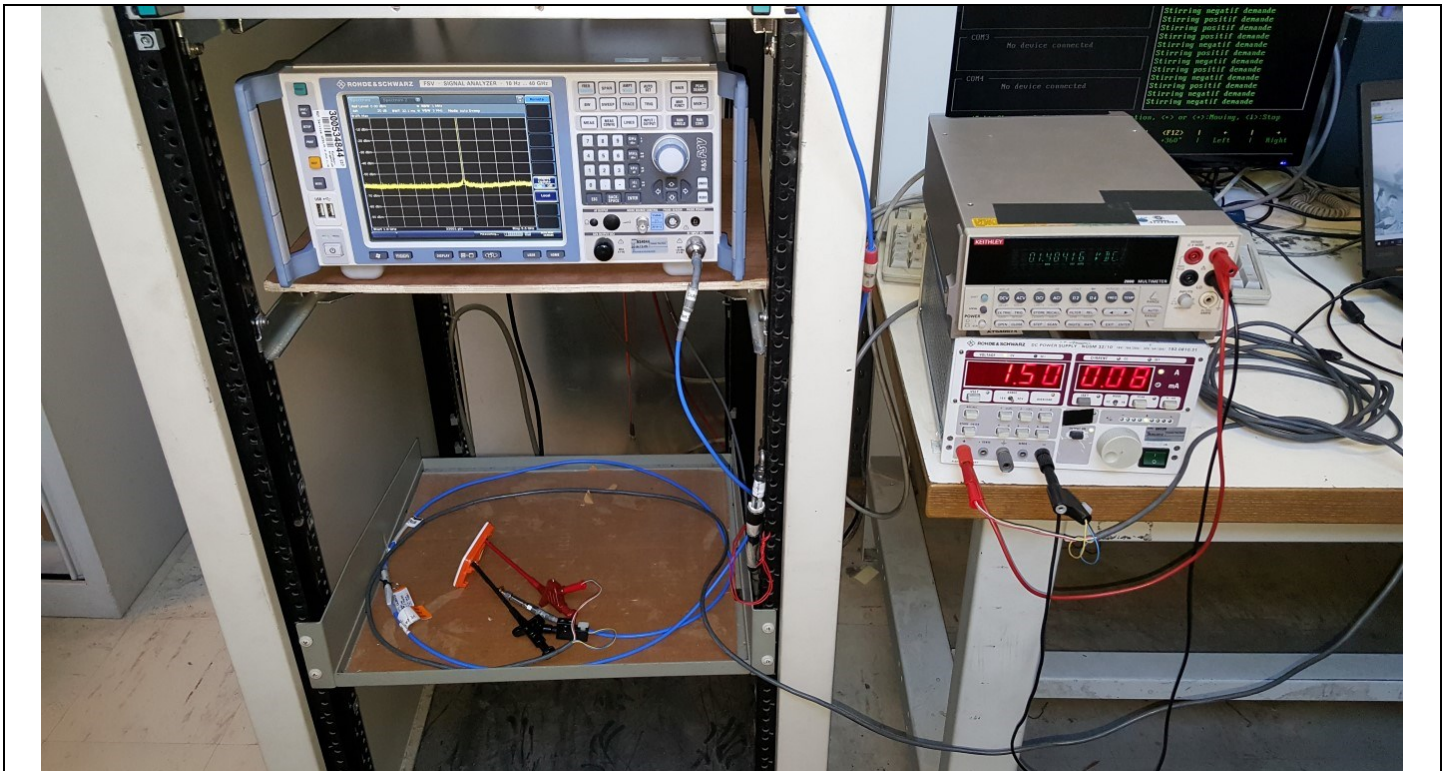
- ANSI C63.10 § 11.11



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

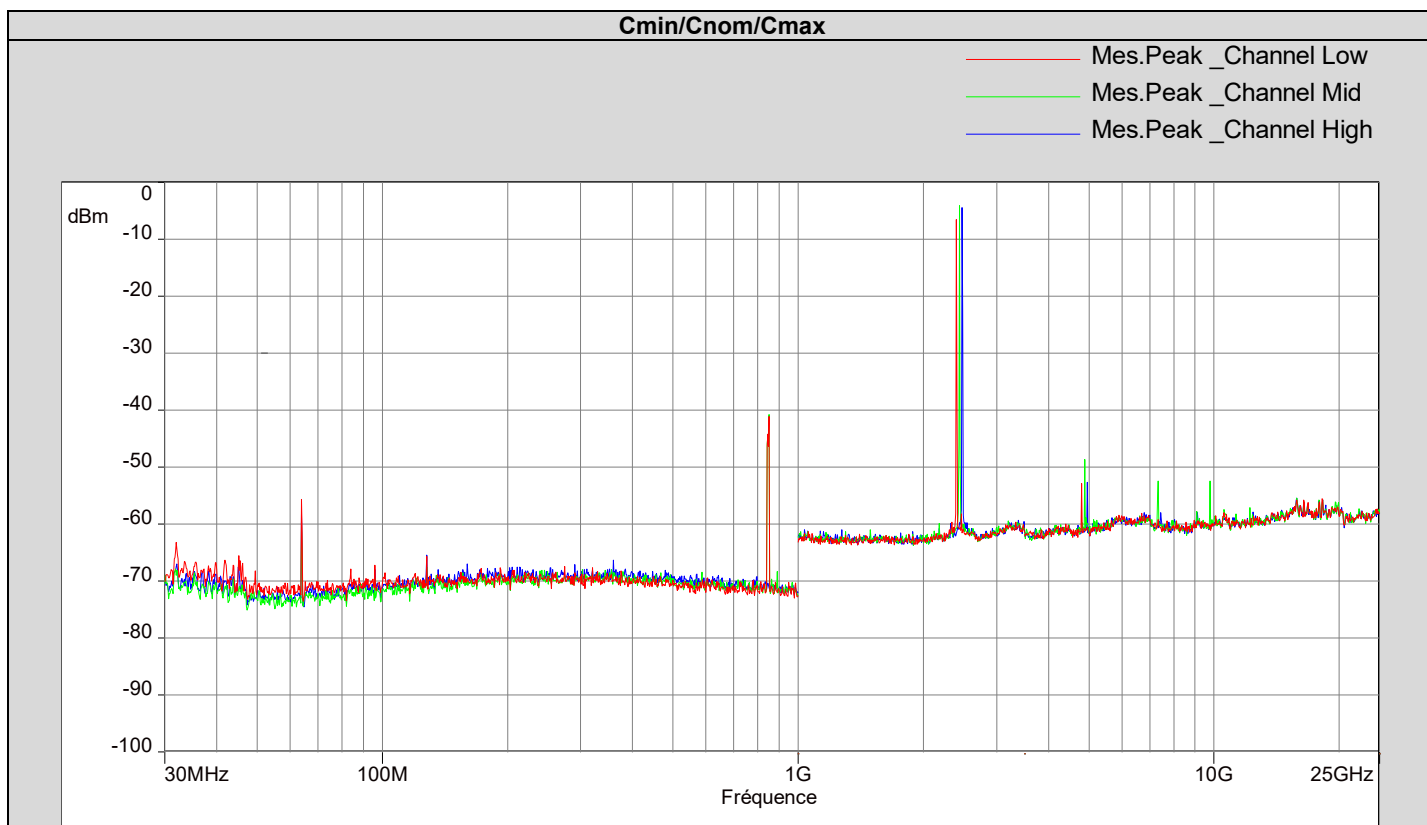
All Spurious Emissions must be at least 20dB (Maximum Conducted Power) below the Fundamental Radiator Level

9.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2019/05	2021/05
Cable Conducted S36 chamber	TELEDYNE	084-0555-2MTR	A5329758	2019/02	2020/02
Attenuator 3dB Cable Spurious Conducted	-	WA54-3-12	A7122223	2019/02	2020/02

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)
2402.00	-6.55		
4804	-52.87	46,32	20
2442.00	-4.09		
4884	-48.67	44,58	20
7327	-52.42	48,33	20
9768	-52.45	48,36	20
2480.00	-4.43		
4960	-52.66	48,23	20
7439	-58.02	53,59	20

9.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands measurement performed on the sample of the product **MicroPort CRM | SORIN SPIDER SAS**, SN: **SW1512013A**, 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

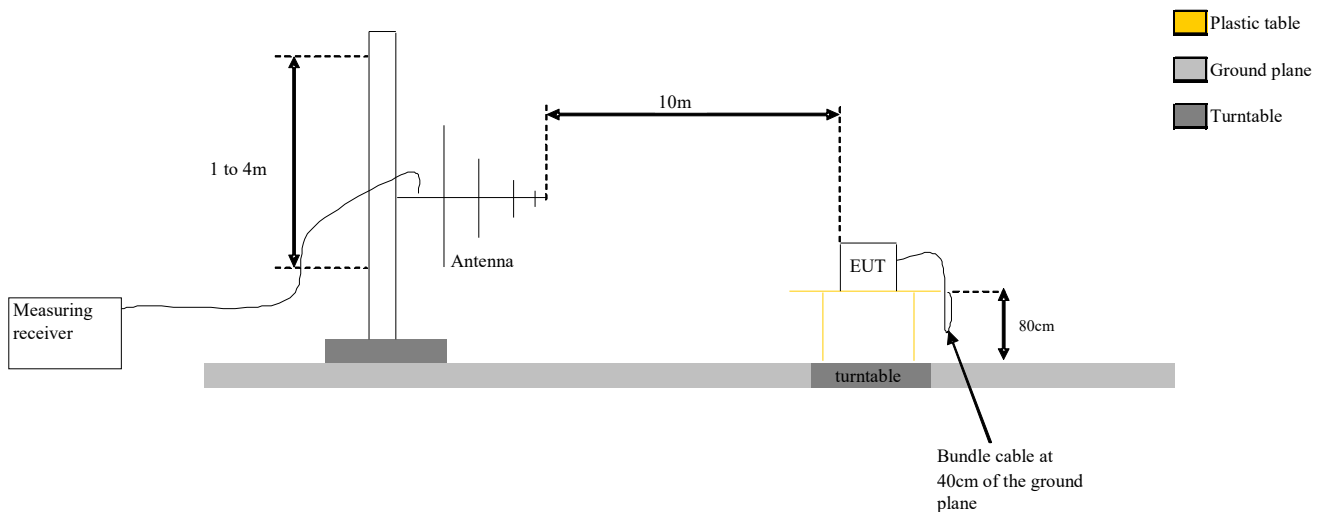
Test performed by : Laurent DENEUX
 Date of test : January 15, 2020
 Ambient temperature : 21 °C
 Relative humidity : 49 %

10.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013) and FCC part15 subpart C.

Test is performed in parallel, perpendicular and ground parallel axis with a loop antenna below 30MHz. Measurement bandwidth was 200Hz below 150kHz and 9kHz between 150kHz & 30MHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height was 1m. The EUT is placed on an open area test site. Distance between measuring antenna and the EUT is 3m.

Test is performed in horizontal (H) and vertical (V) polarization with bilog between 30MHz & 1GHz and with a horn antenna above 1GHz. Measurement bandwidth was 120kHz below 1GHz and 1MHz above 1GHz. The level has been maximised by the turntable rotation of 360 degrees range on 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. The EUT is placed on an open area test site above 1GHz and on an open area test site from 30MHz to 1GHz. Distance between measuring antenna and the EUT is 10m.



Test Set up for radiated measurement in open area test site



Photograph for Unwanted Emission in restricted frequency bands



L C I E



Photograph for Unwanted Emission in restricted frequency bands

10.3. LIMIT

Measure at 300m		
Frequency range	Level	Detector
9kHz-490kHz	67.6dB μ V/m /F(kHz)	QPeak
Measure at 30m		
Frequency range	Level	Detector
490kHz-1.705MHz	87.6dB μ V/m /F(kHz)	QPeak
1.705MHz-30MHz	29.5dB μ V/m	QPeak
Measure at 10m		
Frequency range	Level	Detector
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	63.5dB μ V/m	Peak
	43.5dB μ V/m	Average



Measure at 3m		
Frequency range	Level	Detector
30MHz to 88MHz	40dB μ V/m	QPeak
88MHz to 216MHz	43.5dB μ V/m	QPeak
216MHz to 960MHz	46B μ V/m	QPeak
960MHz to 1000MHz	54dB μ V/m	QPeak
Above 1000MHz	74dB μ V/m	Peak
	54dB μ V/m	Average

10.4. TEST EQUIPMENT LIST

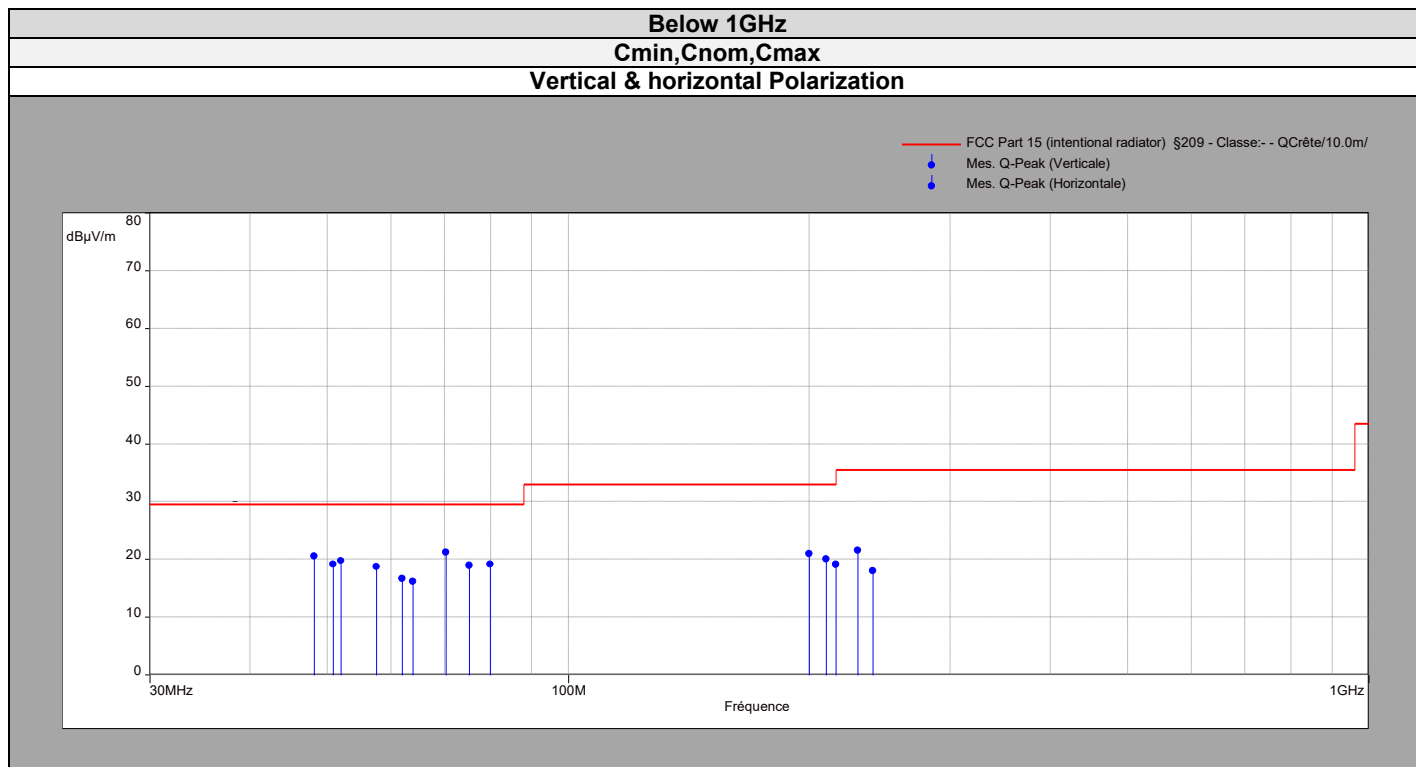
Test equipment used					
Description	Manufacturer	Model	Identifier	Last Calibration date	Calibration due date
Open test site	LCIE	-	F2000400	2019-06	2020-06
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2018-10	2020-10
Cable	-	-	A5329444	2019-12	2020-12
Bilog antenna	CHASE	CBL 6112A	C2040040	2019-04	2020-04
Cable	-	-	A5329442	2019-129	2020-12
Cable	-	-	A5329876	2019-12	2020-12
Cable	-	-	A5329542	2019-08	2020-08
Preamplifier	HEWLETT PACKARD	8449B	A4069002	2018-04	2020-04
Horn	EMCO	3115	C2042016	2019-06	2020-06
loop antenna	RHODE & SCHWARZ	HFH2-Z2	C2040007	2018-11	2020-11
Cable	-	-	A5329416	2019-12	2020-12

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





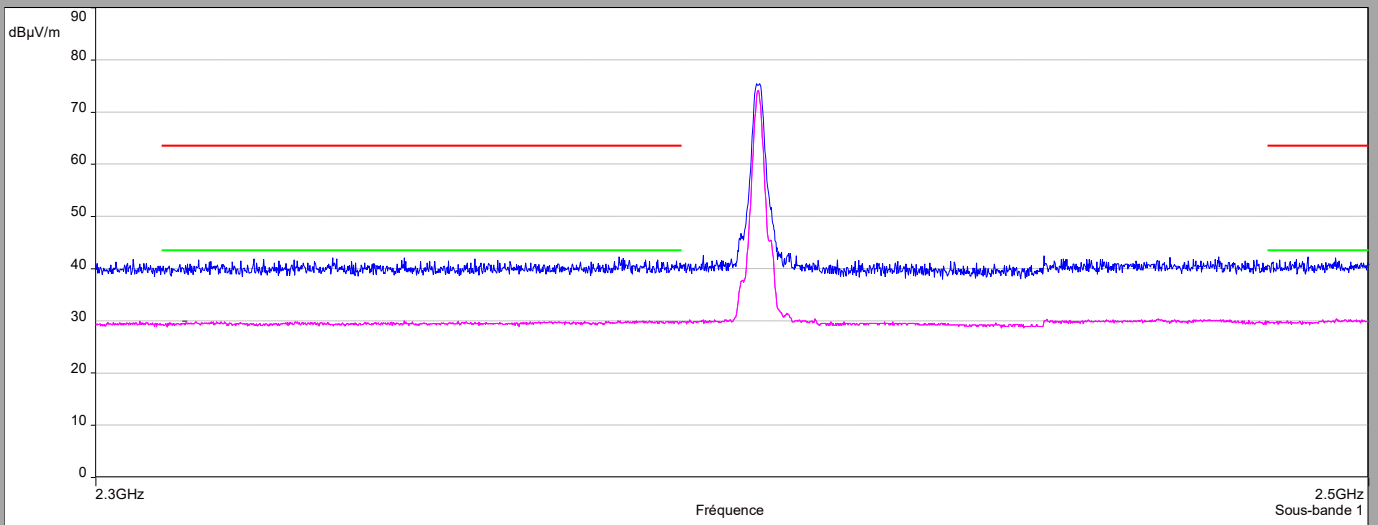
L C I E

Above 1GHz Zoom 2310MHz-2500MHz

Cmin

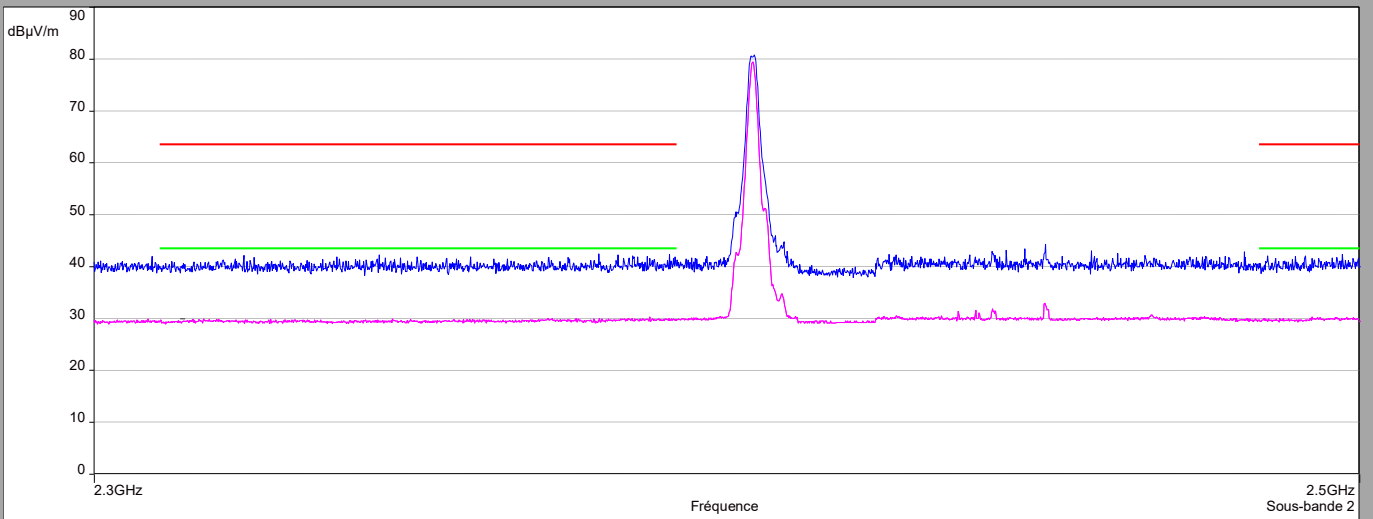
Vertical Polarization

- Part 15 retriected bands (intentional radiator) WIFI §209 - Classe:- - Moyenne/10.0m/
- Part 15 retriected bands (intentional radiator) WIFI §209 - Classe:- - Crête/10.0m/
- Mes.Peak (Verticale)
- Mes.Avg (Verticale)



Horizontal polarization

- Part 15 retriected bands (intentional radiator) WIFI §209 - Classe:- - Moyenne/10.0m/
- Part 15 retriected bands (intentional radiator) WIFI §209 - Classe:- - Crête/10.0m/
- Mes.Peak (Horizontale)
- Mes.Avg (Horizontale)





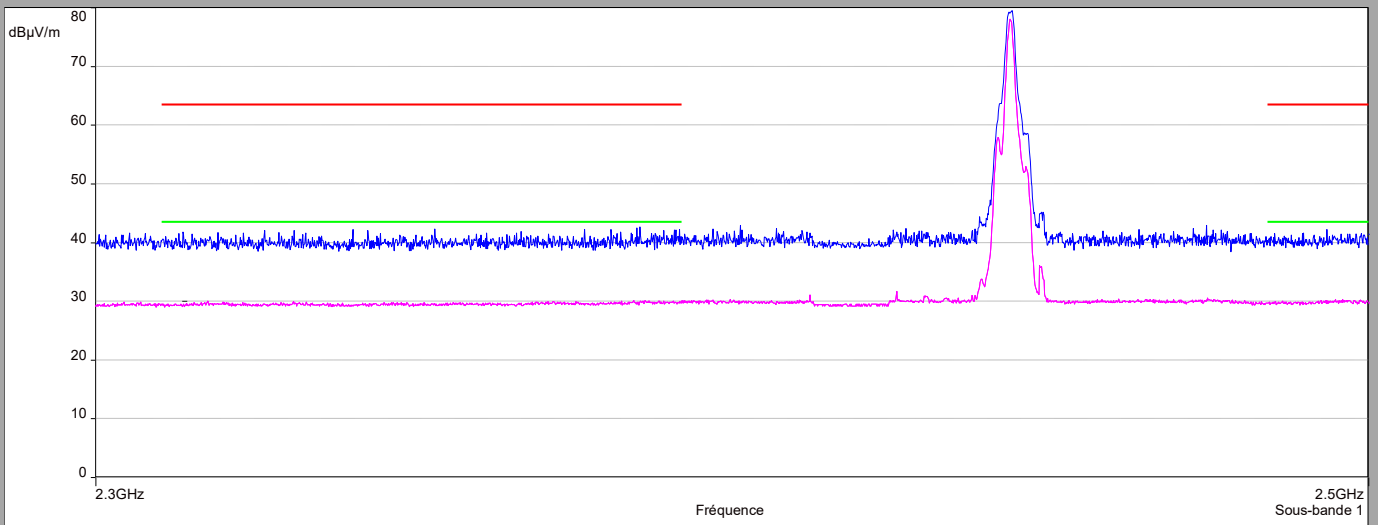
L C I E

Above 1GHz Zoom 2310MHz-2500MHz

Cnom

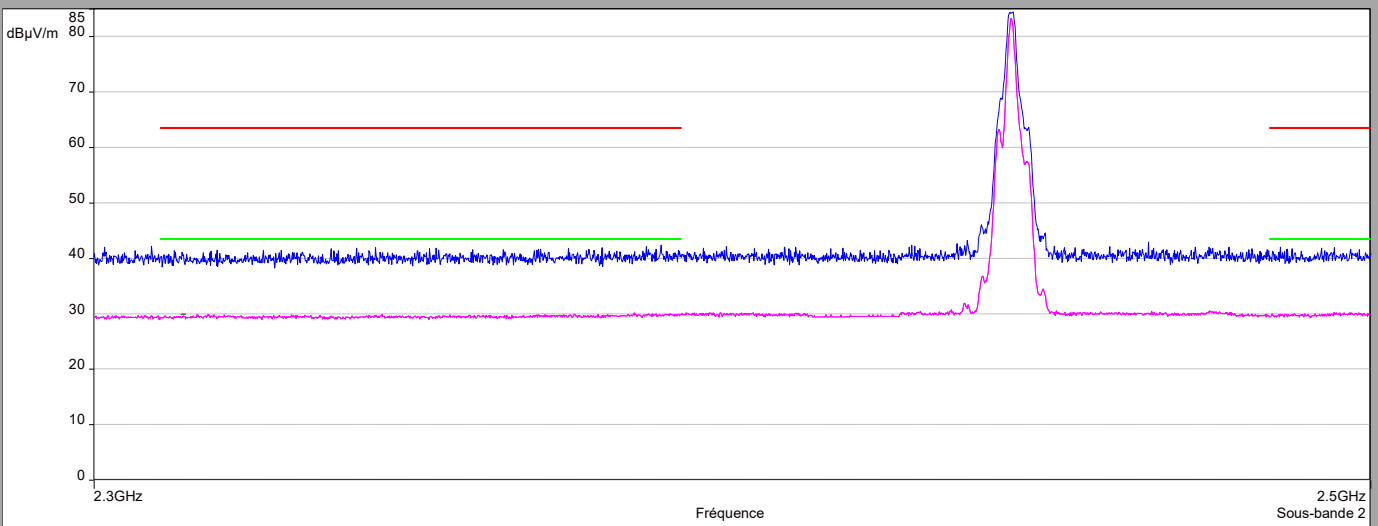
Vertical Polarization

- Part 15 recricded bands (intentional radiator) WIFI §209 - Classe:- - Moyenne/10.0m/
- Part 15 recricded bands (intentional radiator) WIFI §209 - Classe:- - Crête/10.0m/
- Mes.Peak (Verticale)
- Mes.Avg (Verticale)



Horizontal polarization

- Part 15 recricded bands (intentional radiator) WIFI §209 - Classe:- - Moyenne/10.0m/
- Part 15 recricded bands (intentional radiator) WIFI §209 - Classe:- - Crête/10.0m/
- Mes.Peak (Horizontale)
- Mes.Avg (Horizontale)





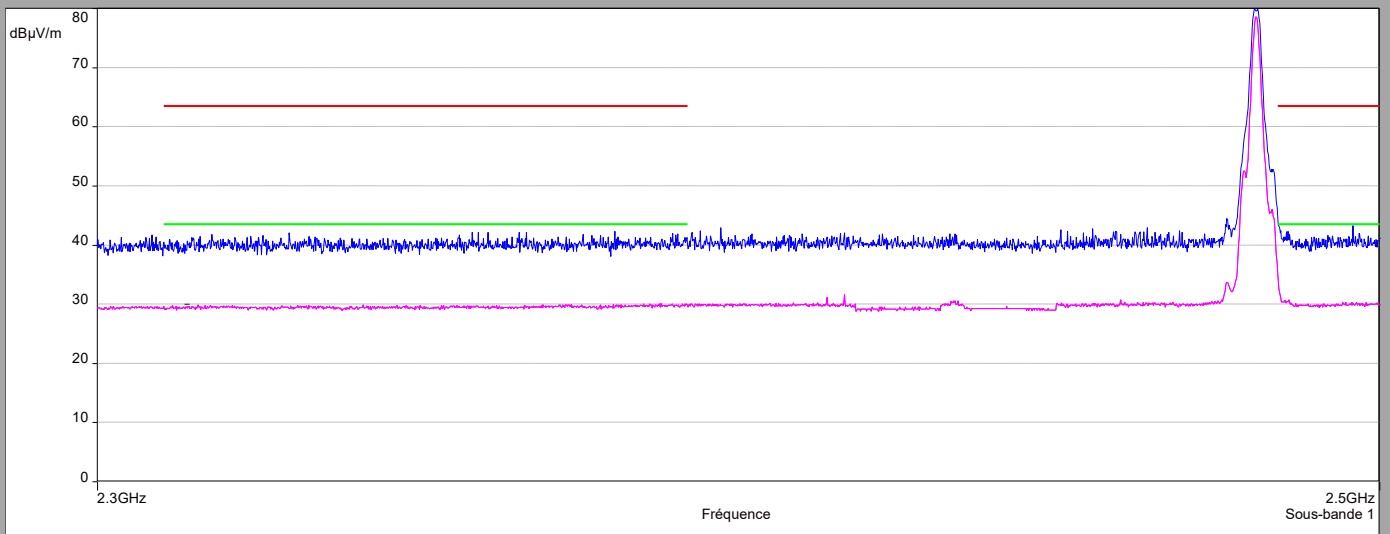
L C I E

Above 1GHz Zoom 2310MHz-2500MHz

Cmax

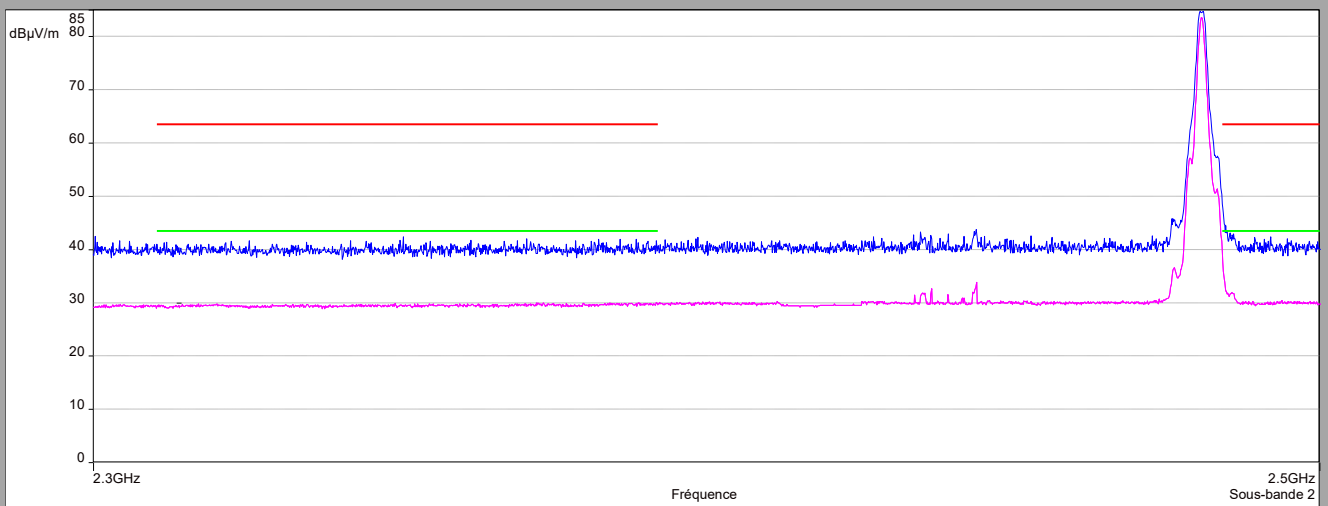
Vertical Polarization

- Part 15 restricted bands (intentional radiator) WIFI §209 - Classe:- - Moyenne/10.0m/
- Part 15 restricted bands (intentional radiator) WIFI §209 - Classe:- - Crête/10.0m/
- Mes.Peak (Verticale)
- Mes.Avg (Verticale)



Horizontal polarization

- Part 15 restricted bands (intentional radiator) WIFI §209 - Classe:- - Moyenne/10.0m/
- Part 15 restricted bands (intentional radiator) WIFI §209 - Classe:- - Crête/10.0m/
- Mes.Peak (Horizontale)
- Mes.Avg (Horizontale)





L C I E

9kHz to 30MHz				
Polarization	Frequency (MHz)	Peak Level (dB μ V/m)	QPeak Level (dB μ V/m)	Limit (dB μ V/m)
all emissions were greater than 20 dB below the limit				

Below 1GHz					
Polarization	Frequency (MHz)	Peak Level (dB μ V/m)	QPeak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB μ V/m)
Vertical	48.1	-	20.5	29.5	9
Vertical	50.8	-	19.2	29.5	10.3
Vertical	52	-	19.8	29.5	9.7
Vertical	57.6	-	18.8	29.5	10.7
Vertical	62	-	16.6	29.5	1.9
Vertical	63.9	-	16.2	29.5	13.3
Vertical	70.3	-	21.2	29.5	8.3
Vertical	79.9	-	19.2	29.5	10.3
Horizontal	200	-	21	33	12
Horizontal	210	-	20	33	13
Vertical	216	-	19.1	33	13.9
Horizontal	229.9	-	21.6	35.5	13.9
Vertical	240	-	18	35.5	17.5

Above 1GHz								
Cmin								
Polarization	Frequency (MHz)	Average Level (dB μ V/m)	Average Level + Duty Cycle Factor (dB μ V/m)	Average Limit (dB μ V/m)	Average Margin Level (dB μ V/m)	Peak Level (dB μ V/m)	Peak Limit (dB μ V/m)	Peak Margin Level (dB μ V/m)
Horizontal	2390	29.7	29.7	44	14.3	41.7	64	22.7
Vertical	2390	29.6	29.6	44	14.4	41.8	64	22.2
Horizontal	2483.5	29.8	29.8	44	14.2	41.2	64	22.8
Vertical	2483.5	29.4	29.4	44	14.6	42	64	22

Above 1GHz								
Cnom								
Polarization	Frequency (MHz)	Average Level (dB μ V/m)	Average Level + Duty Cycle Factor (dB μ V/m)	Average Limit (dB μ V/m)	Average Margin Level (dB μ V/m)	Peak Level (dB μ V/m)	Peak Limit (dB μ V/m)	Peak Margin Level (dB μ V/m)
Horizontal	2390	29.7	29.7	44	14.3	41.3	64	22.7
Vertical	2390	29.9	29.9	44	14.1	42.3	64	21.7
Horizontal	2483.5	29.8	29.8	44	14.2	42	64	22
Vertical	2483.5	29.9	29.9	44	14.1	41.5	64	22.5



Above 1GHz								
Cmax								
Polarization	Frequency (MHz)	Average Level (dB μ V/m)	Average Level + Duty Cycle Factor (dB μ V/m)	Average Limit (dB μ V/m)	Average Margin Level (dB μ V/m)	Peak Level (dB μ V/m)	Peak Limit (dB μ V/m)	Peak Margin Level (dB μ V/m)
Horizontal	2390	30	30	44	14	41.6	64	22.4
Vertical	2390	30	30	44	14	41.3	64	22.7
Horizontal	2483.5	39.6	39.6	44	4.4	48.5	64	15.5
Vertical	2483.5	35	35	44	9	44.5	64	19.5

10.7. CONCLUSION

Unwanted Emission in restricted frequency bands measurement performed on the sample of the product **MicroPort CRM | SORIN SPIDER SAS**, SN: **SW1512013A**, 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) $\pm x(\text{dB}) / (\text{Hz}) /$ 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