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TEST REPORT

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Version : 01

Subject

Radio spectrum matters
tests according to standards:
47 CFR Part 15.249 & RSS-210 Issue 10 & RSS-Gen Issue 5

Issued to

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Apparatus under test

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

RF Module
Tractel
TRACTEL
RF 2.4GHz
-
OVL-RF24GHZ
3619A-RF24GHZ

Conclusion

See Test Program chapter
: November 16, 2020 to November 17, 2020

Test date

Test location

Moirans

Test Site

6500A-1 & 6500A-3

Sample receipt date

December 7, 2020

Registration Number

197516

Designation Number

FR0008

Composition of document

38 pages

Document issued on

June 18, 2021

Written by :
Julien Palard
Tests operator



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PUBLICATION HISTORY

Version	Date	Author	Modification
01	June 18, 2021	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

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1. TEST PROGRAM

References

- 47 CFR Part 15.249
- RSS 210 Issue 10
- RSS Gen Issue 5
- ANSI C63.10-2013

Radio requirement:

Clause (47CFR Part 15.249 & RSS-249 Issue 2 & RSS-Gen Issue 5) Test Description	Test result - Comments			
Occupied Bandwidth	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
20dB Emission Bandwidth	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
Field strength of fundamental & Field strength of harmonics	☒ 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	☐ 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

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):

Tractel RF 2.4GHz

Serial Number: -



Equipment Under Test

Power supply:

Name	Type	Rating	Reference / Sn	Comments
Supply1	☐ AC ☐ DC ☒ Battery			

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
1	DC power cable	-	☒	☐	☐	-

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Test jig	Dynafor Carte Afficheur	-	-



Equipment information:

Frequency band:	[2400 – 2483.5] MHz		
Number of Channel:	16		
Spacing channel:	3.8 MHz		
Channel bandwidth:	0.3 MHz		
Antenna Type:	☒ Integral	☐ External	☐ Dedicated
Antenna connector:	☐ Yes	☐ No	☒ Temporary for test
Transmit chains:	☒ 1	☐ 2	
Receiver chains:	☒ 1	☐ 2	
Type of equipment:	☒ Stand-alone	☐ Plug-in	☐ Combined
Equipment arrangement:	☐ Tabletop	☐ Floor-standing	☒ Multiple orientations
Duty cycle:	☒ Continuous duty	☐ Intermittent duty	☐ 100% duty
Equipment type:	☒ Production model		☐ Pre-production model
Operating temperature range:	Tmin:	☒ -20°C	☐ 0°C
	Tnom:	20°C	
	Tmax:	☐ 35°C	☒ 55°C
Type of power source:	☐ AC power supply	☐ DC power supply	☒ Battery
Operating voltage range:	Vnom:	☐ 120V/60Hz	☒ 4.5 VDC

CHANNEL PLAN	
Channel	Frequency (MHz)
Cmin: 0	2432
1	2435.2
2	2438.4
3	2441.6
4	2444.8
5	2448
6	2451.2
Cmid: 7	2454.4
8	2457.6
9	2460.8
10	2464
11	2467.2
12	2470.4
13	2473.6
14	2476.8
Cmax: 15	2480

Antenna Characteristic			
Antenna assembly	Gain (dBi)	Frequency Band (MHz)	Impedance(Ω)
1	1.7	2400-2483.5	50

Modulation Type	Worst Case Modulation
GFSK	☒

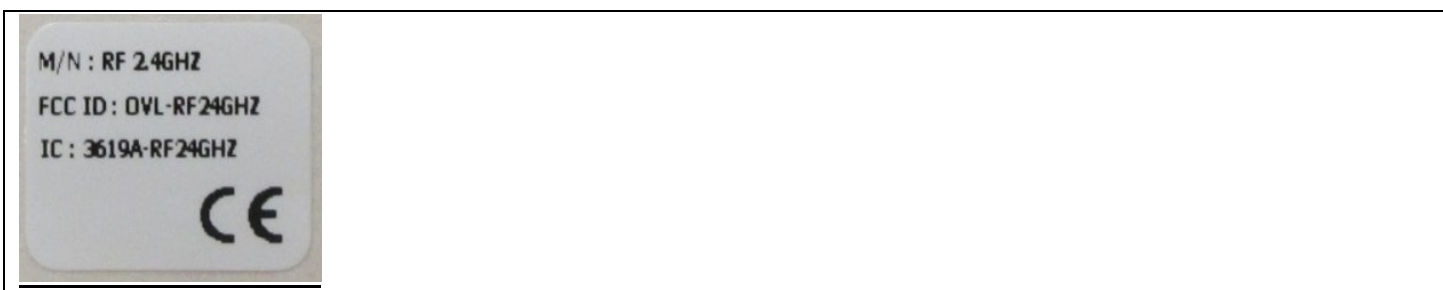
Hardware information		
Software (if applicable):	V. :	-

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()
Field strength of fundamental & Field strength of harmonics	☒ 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 52.5dB μ V 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 dB μ V/m.

$$FS = 52.5 + 7.4 + 1.1 - 29 = 32 \text{ dB}\mu\text{V/m}$$

The 32 dB μ V/m value can be mathematically converted to its corresponding level in μ V/m.

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32\text{dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}.$$

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.

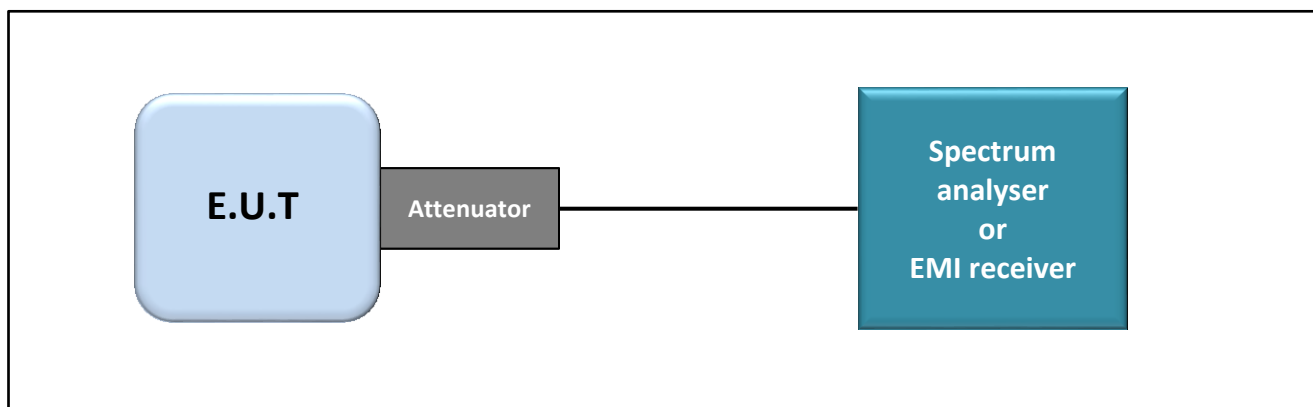
3. OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

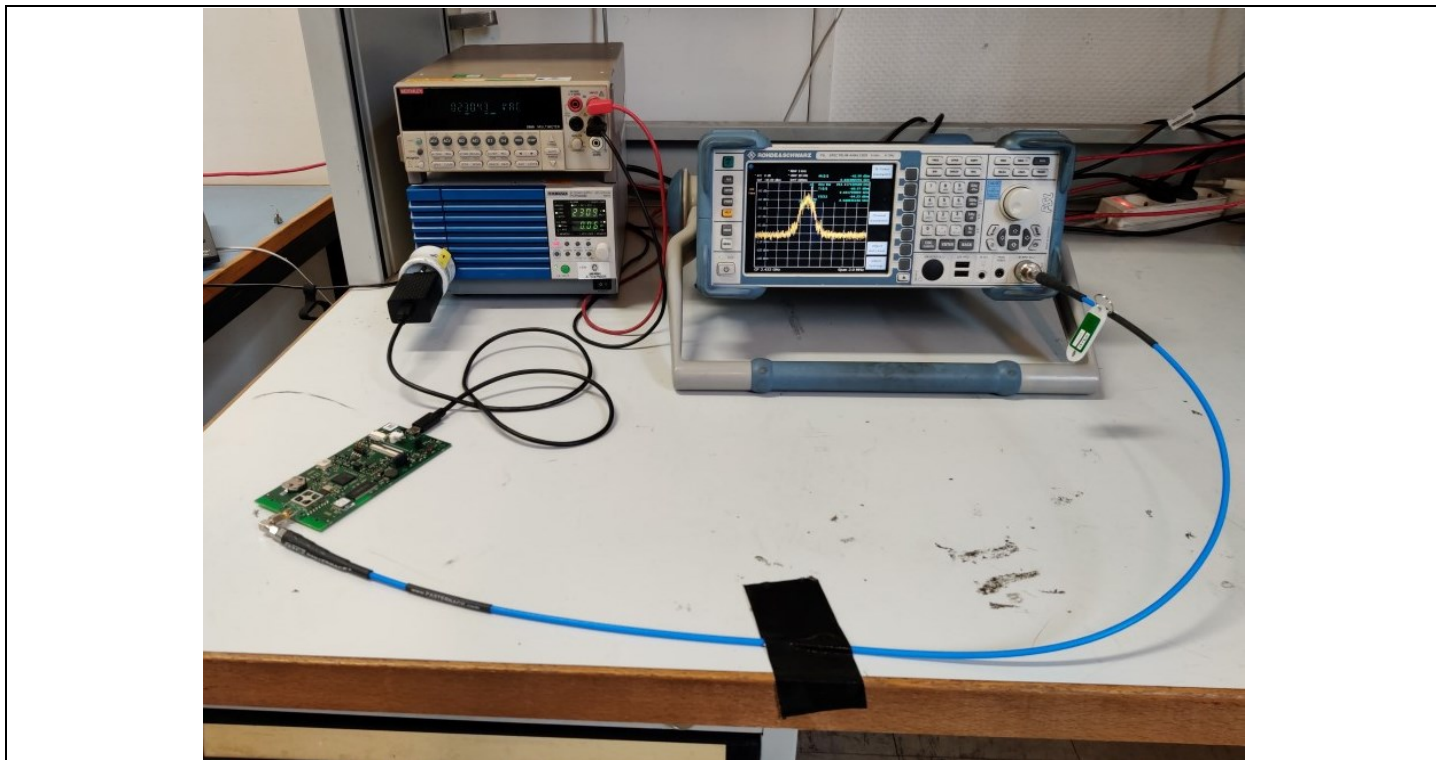
Test performed by : Julien PALARD
Date of test : November 16, 2020
Ambient temperature : 26 °C
Relative humidity : 38 %

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



Test set up of Occupied Bandwidth



Photograph for Occupied bandwidth

3.3. LIMIT

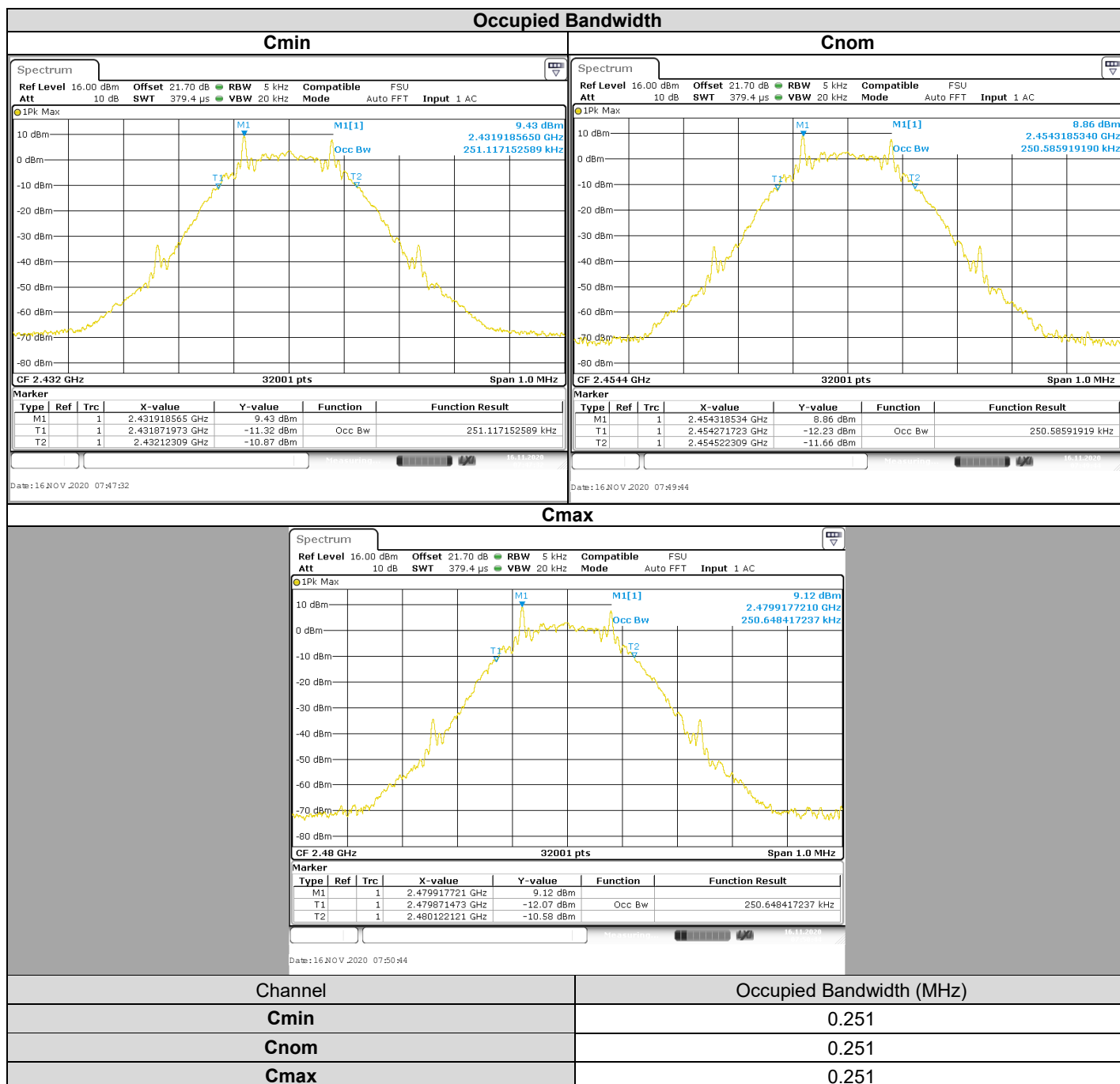
None

3.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Spectrum analyzer	ROHDE & SCHWARZ	FSL6	A4060032	2020/01	2022/01
Cable SONDE 025 + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329970	2020/09	2021/09
Power supply	ROHDE & SCHWARZ	NGSM 32/10	A7040074	Calibrate with multimeter	Calibrate with multimeter
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05

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

3.5. RESULTS



3.6. CONCLUSION

Occupied Channel Bandwidth measurement performed on the sample of the product **Tractel RF 2.4GHz**, SN: -, in configuration and description presented in this test report, show levels **compliant** to the RSS-GEN Issue 5 limits.

4. 20dB EMISSION BANDWIDTH

4.1. TEST CONDITIONS

Test performed by : Julien PALARD
Date of test : November 16, 2020
Ambient temperature : 26 °C
Relative humidity : 38 %

4.2. TEST SETUP

- The Equipment under Test is installed:

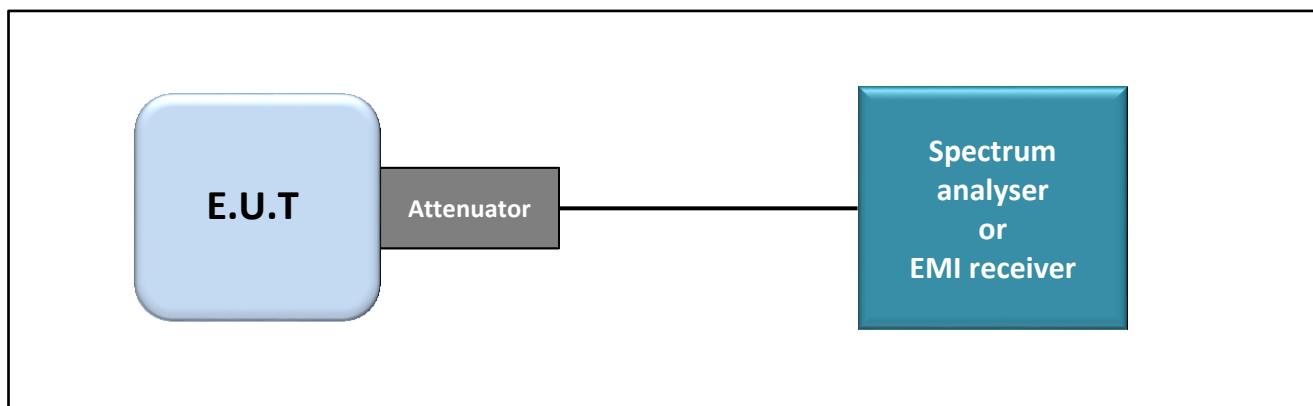
- ☒ On a table
- ☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

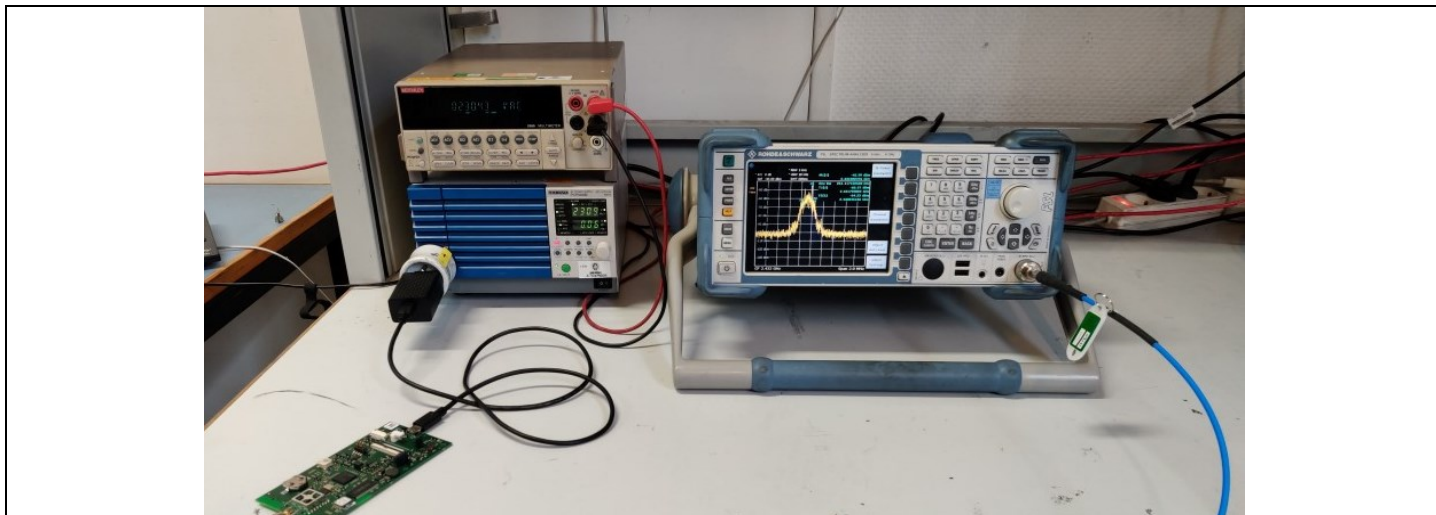
- ☒ Conducted Method
- ☐ Radiated Method

- Test Procedure:

- ☒ ANSI C63.10 § 6.9.2:



Test set up of 6dB Emission Bandwidth



Photograph for 20dB emission bandwidth

4.3. LIMIT

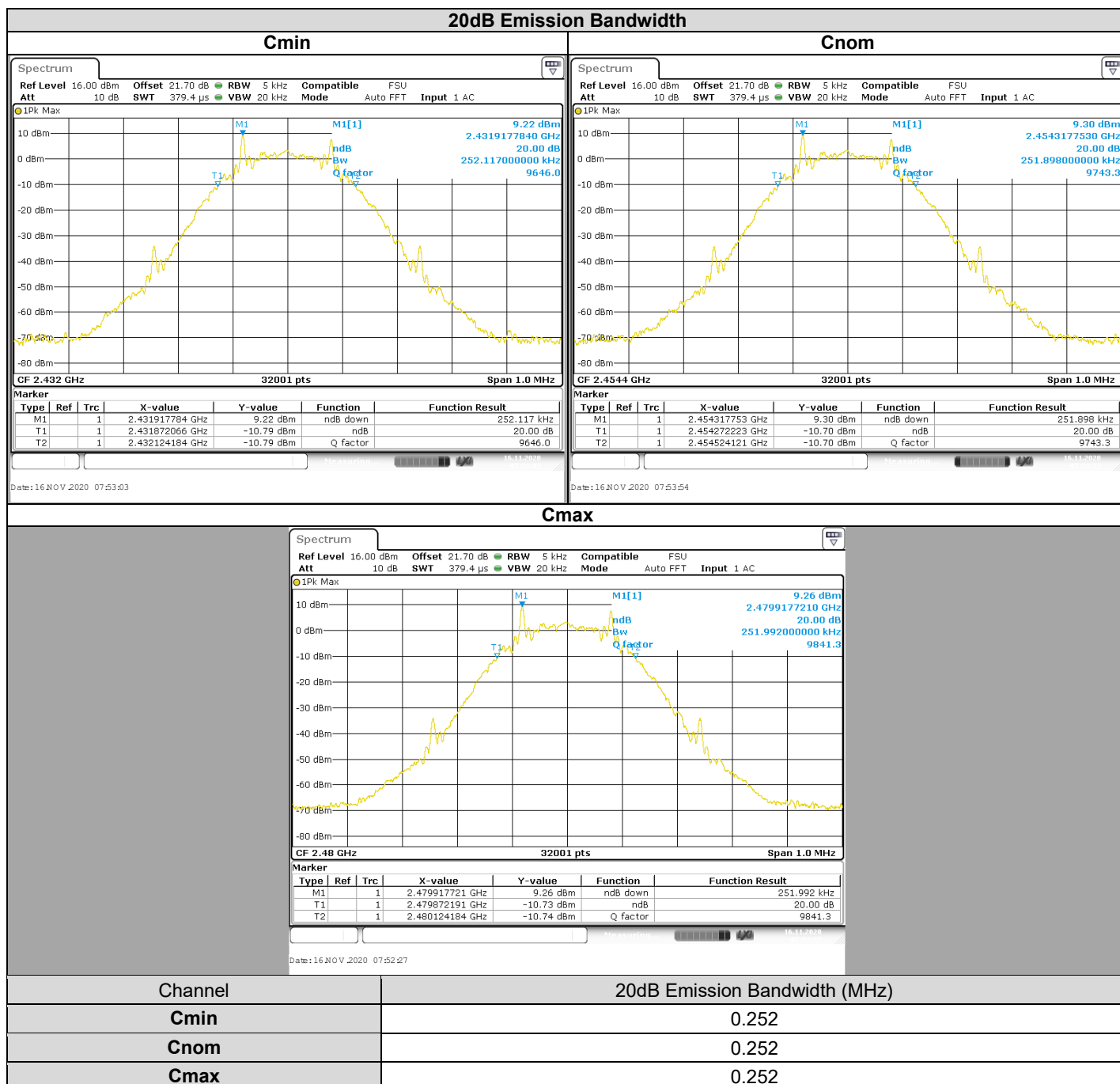
No Limit

4.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Spectrum analyzer	ROHDE & SCHWARZ	FSL6	A4060032	2020/01	2022/01
Cable SONDE 025 + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329970	2020/09	2021/09
Power supply	ROHDE & SCHWARZ	NGSM 32/10	A7040074	Calibrate with multimeter	Calibrate with multimeter
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05

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

4.5. RESULTS



4.6. CONCLUSION

20dB Emission Bandwidth measurement performed on the sample of the product **Tractel RF 2.4GHz**, SN: -, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 210 ISSUE 10** limits.

5. DUTY CYCLE

5.1. TEST CONDITIONS

Test performed by : Julien PALARD
Date of test : November 16, 2020
Ambient temperature : 26°C
Relative humidity : 38%

5.2. TEST SETUP

- The Equipment under Test is installed:

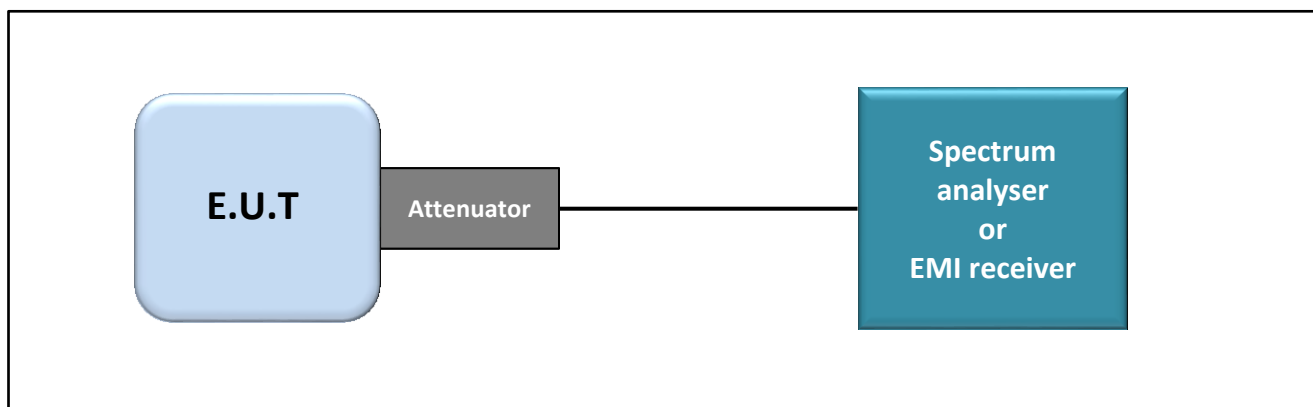
- ☒ On a table
- ☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

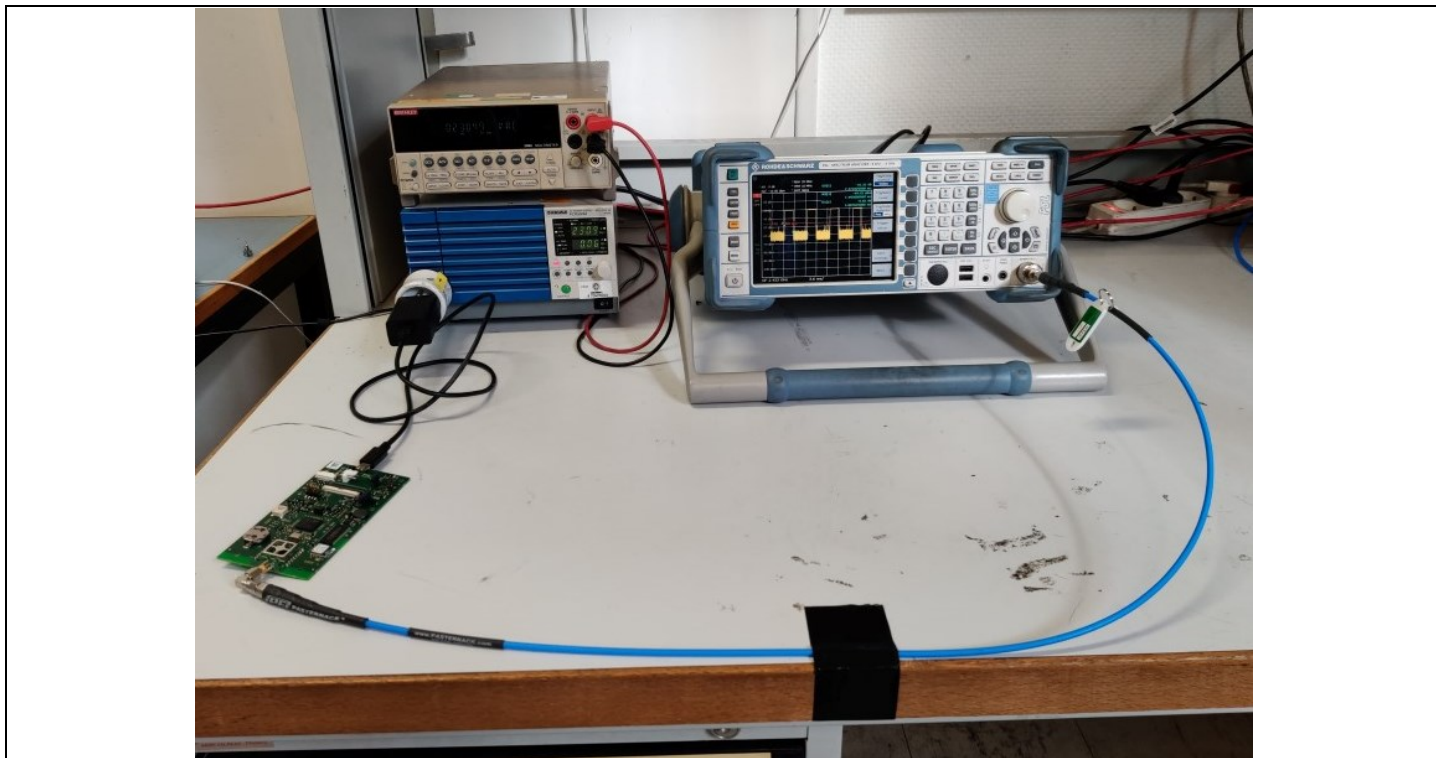
- ☒ Conducted Method
- ☐ Radiated Method

- Test Procedure:

- ☒ ANSI C63.10 § 11.6



Test set up of Duty Cycle



Photograph for Duty Cycle

5.3. LIMIT

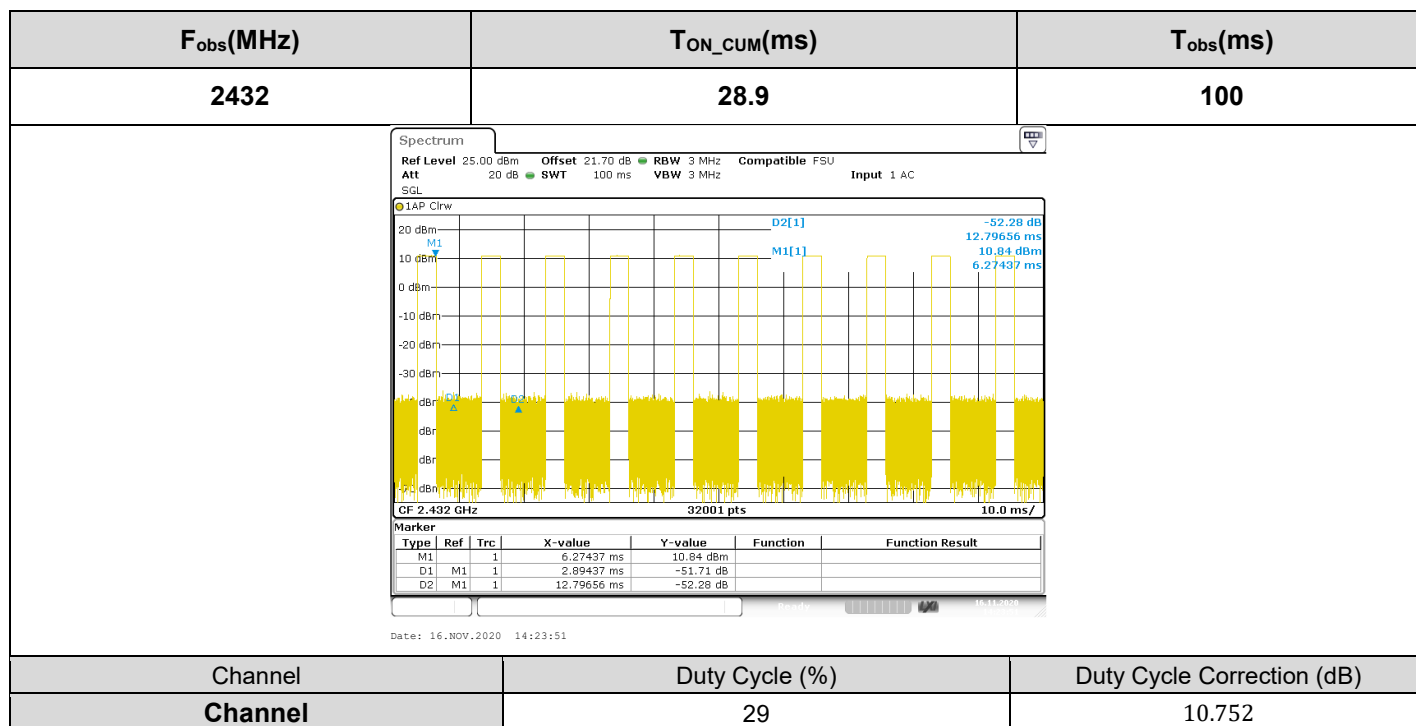
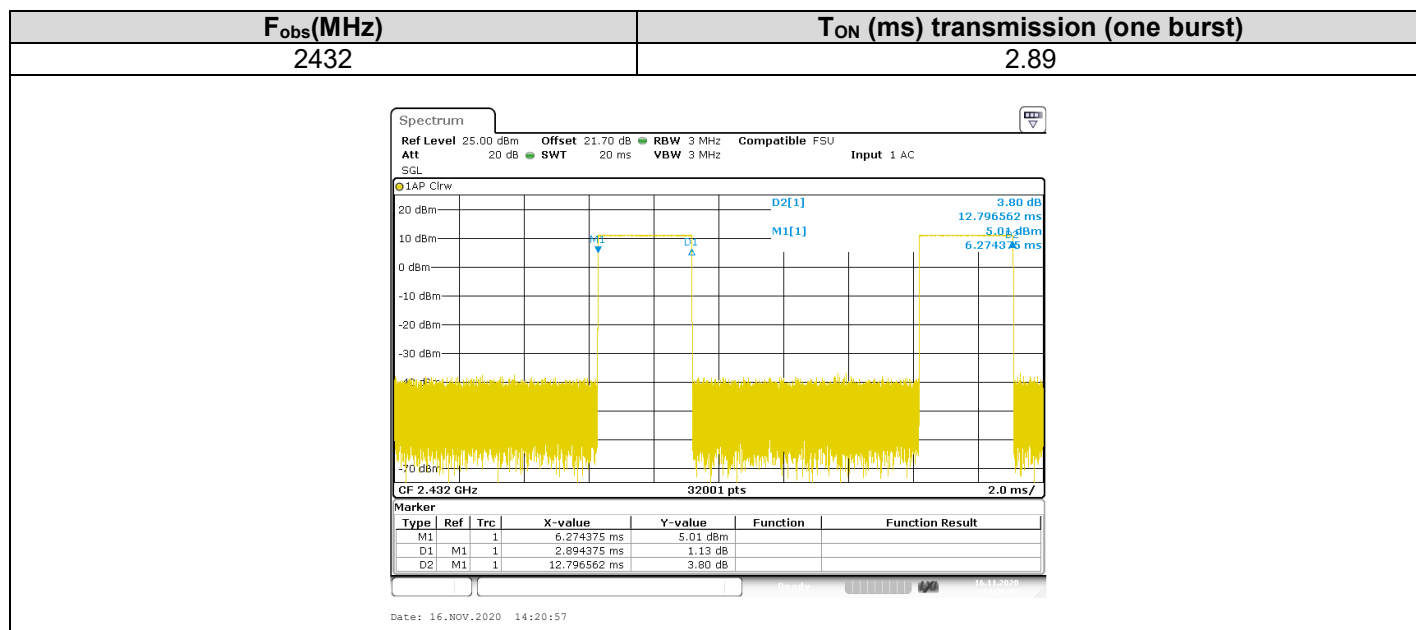
None

5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Spectrum analyzer	ROHDE & SCHWARZ	FSL6	A4060032	2020/01	2022/01
Cable SONDE 025 + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329970	2020/09	2021/09
Power supply	ROHDE & SCHWARZ	NGSM 32/10	A7040074	Calibrate with multimeter	Calibrate with multimeter
Multimeter	KEITHLEY	2000	A1242090	2019/05	2021/05
Climatic chamber	SECASI Technologies	SLT-34	D1024029	Calibrate with thermometer	Calibrate with thermometer
Hygrometer	AOIP	TM360	B4041042	2019/01	2021/01

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

5.5. RESULTS



6. FIELD STRENGTH OF EMISSION & FIELD STRENGTH OF HARMONICS

6.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
 Date of test : November 18, 2020 to November 20, 2020
 Ambient temperature : 24°C & 22°C
 Relative humidity : 46% & 48%

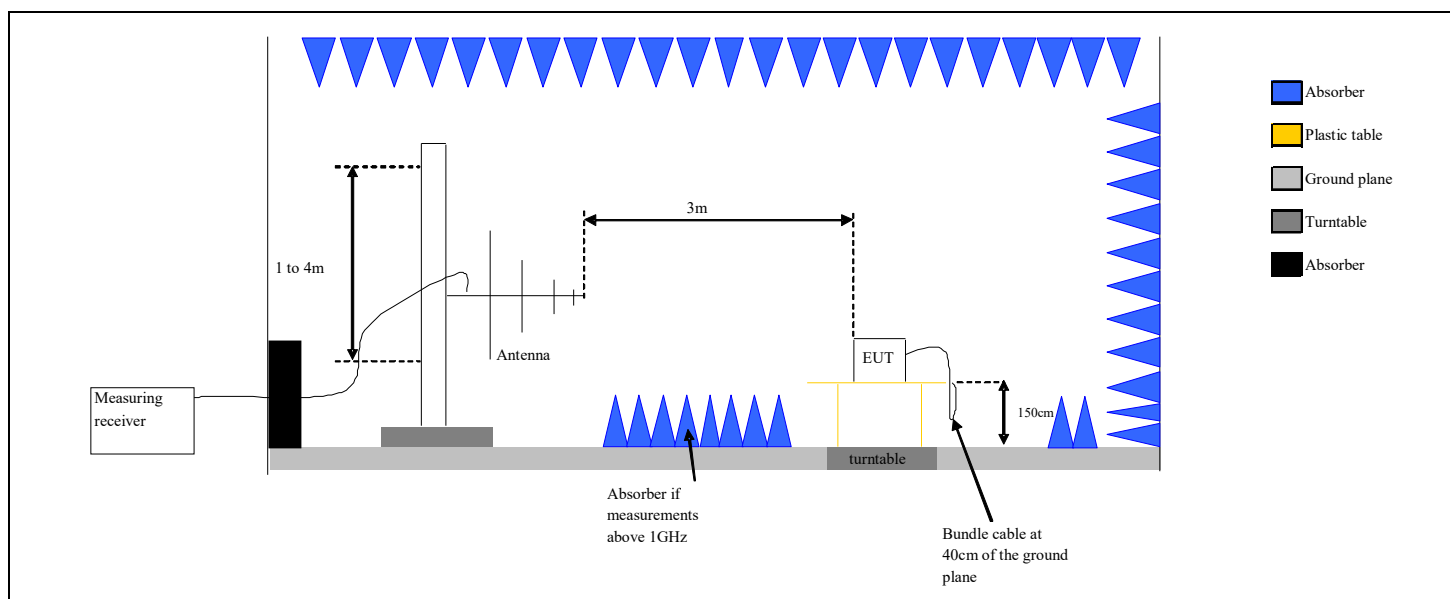
6.2. TEST SETUP

Frequencies above 1GHz:

Test is performed in horizontal (H) and vertical (V) polarization with a horn antenna. Measurement bandwidth was 1MHz. The level has been maximised by the turntable rotation of 360 degrees range on all axis of EUT used in normal configuration. The EUT is place at 1.5m high. The EUT is placed **in a full anechoic chamber**. Distance between measuring antenna and the EUT is **3m**.

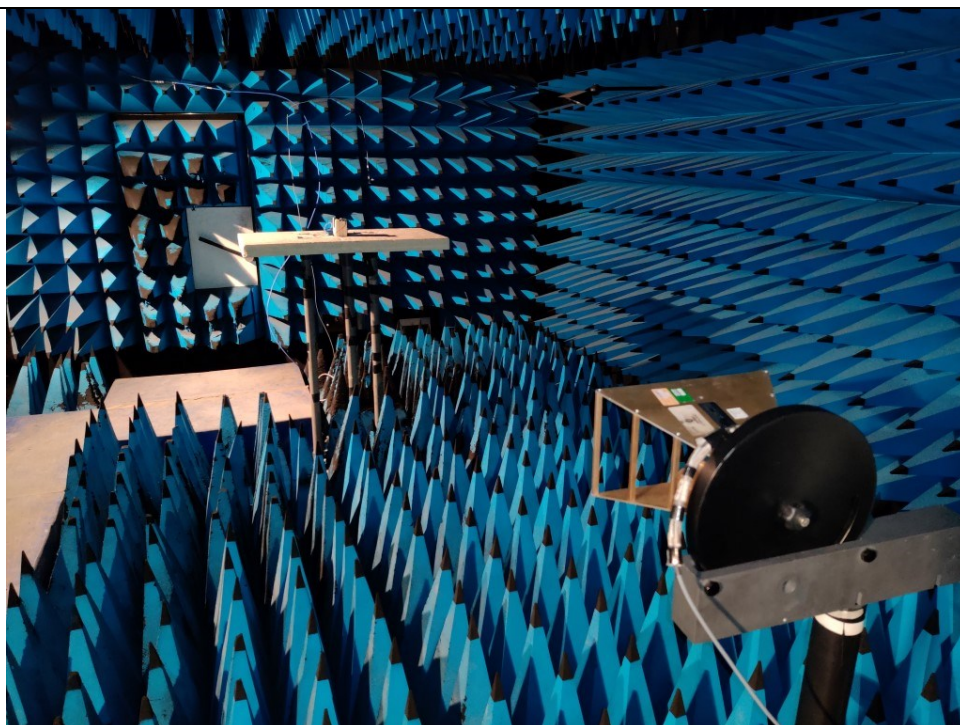
The height antenna is:

- ☐ On mast, varied from 1m to 4m
- ☒ Fixed and centered on the EUT (EUT smaller than the bandwidth of the measurement antenna, ANSI C63.10 §6.6.5).
 EUT is placed on tilt table to perform measurement each 30° on x axis from 0° to 150°.





Photograph for Field strength of fundamental & Field strength of harmonics



Photograph for Field strength of fundamental & Field strength of harmonics



6.3. LIMIT

Field strength of fundamental: 50mV/m (93.98dB μ V/m) at 3m

Field strength of harmonics: 500 μ V/m (53.98dB μ V/m) at 3m

6.4. TEST EQUIPMENT LIST

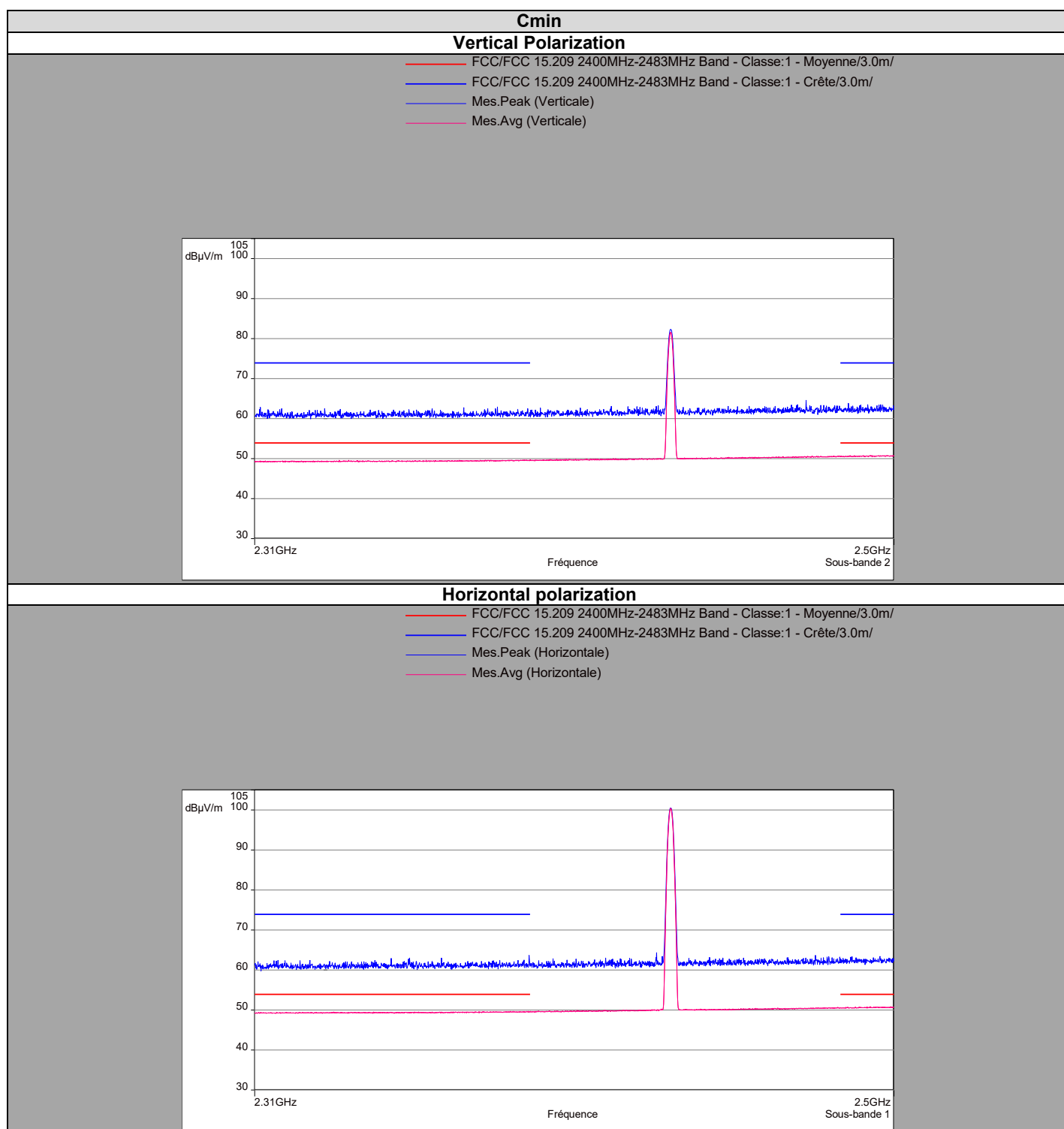
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Full anechoic chamber	SIEPEL	-	D3044019	2019/10	2023/10
Preamplifier	LCIE	LCIE-ALB-001	A7080073	2018/12	2020/12
Horn antenna	AH SYSTEMS	SAS 571	C2042041	2019/11	2021/11
Power meter	HEWLETT PACKARD	437B	A1503001	2019/11	2020/11
Power sensor	HEWLETT PACKARD	8482A	A1509082	2019/11	2020/11
Cable S36 chamber	PASTERNAK	PE360-3000CM	A5329872	2020/01	2021/01
Cable S36 chamber	PASTERNAK	PE360-1000CM	A5329939	2020/01	2021/01
Cable S36 chamber	PASTERNAK	PE360-1500CM	A5329940	2020/01	2021/01

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

6.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒ None ☐ Divergence:

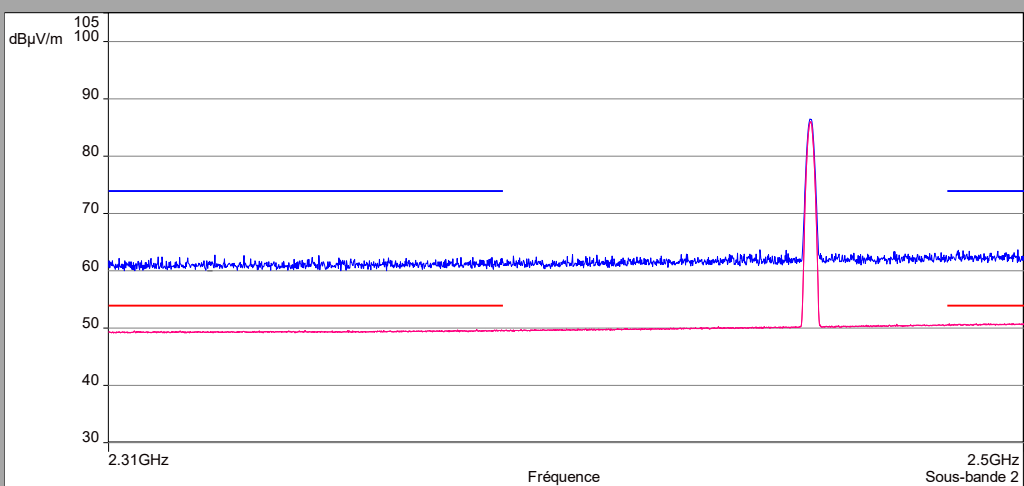
6.6. RESULTS



Cnom

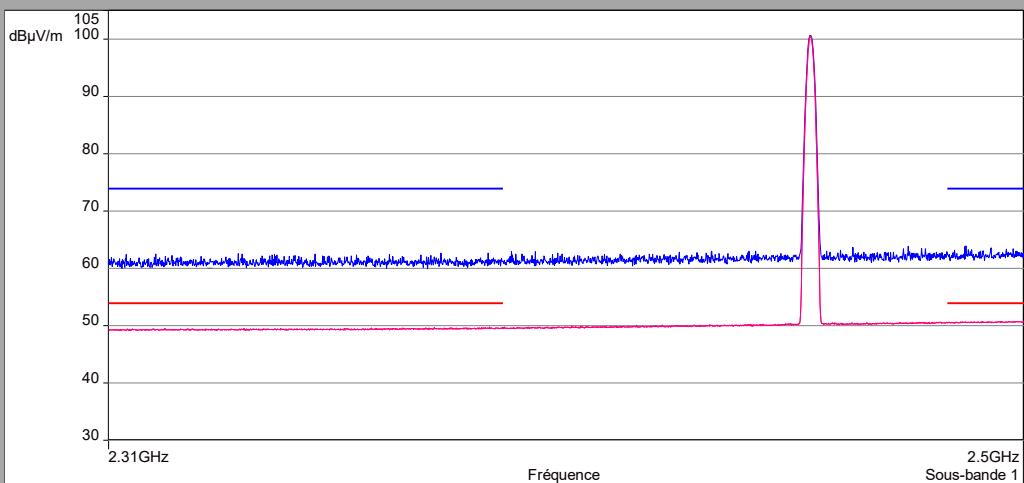
Vertical Polarization

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



Horizontal polarization

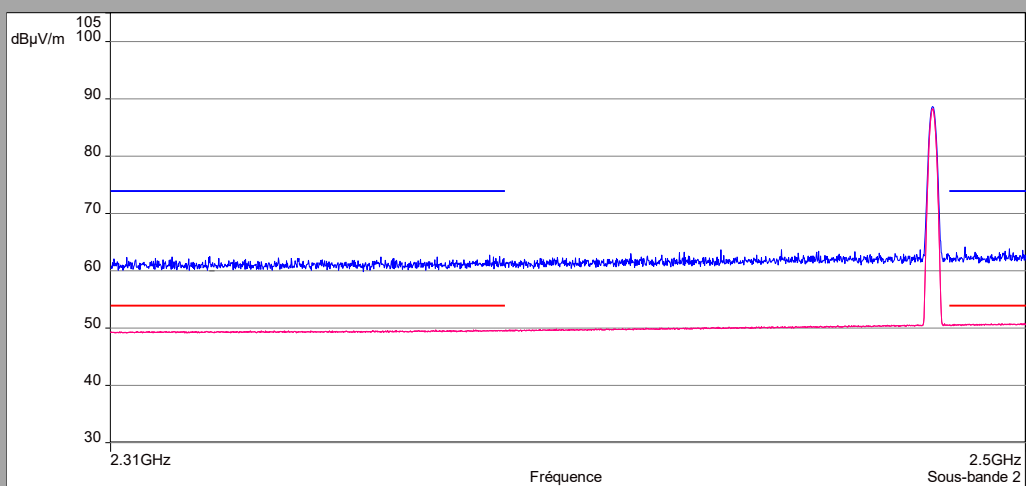
- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
- Mes.Peak (Horizontale)
- Mes.Avg (Horizontale)



Cmax

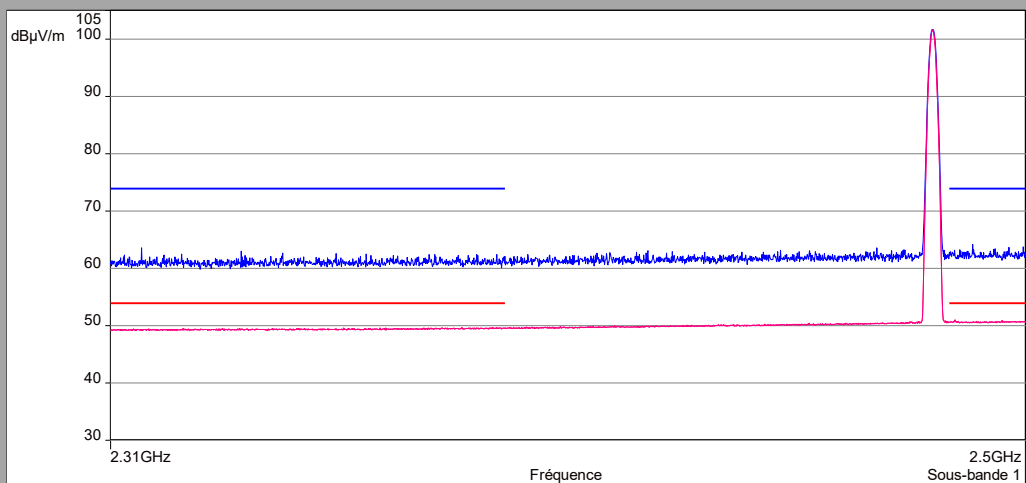
Vertical Polarization

- 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 (Verticale)
- Mes.Avg (Verticale)



Horizontal polarization

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





Cmin				
Polarization	Frequency (MHz)	Peak Level (dBμV/m)	Peak Level – Duty cycle Factor (dBμV/m)	FCC Limit (dBμV/m)
Vertical	2432	82.32	71.57	93.98
Horizontal	2432	100.51	89.76	93.98

Cnom				
Polarization	Frequency (MHz)	Peak Level (dBμV/m)	Peak Level – Duty cycle Factor (dBμV/m)	FCC Limit (dBμV/m)
Vertical	2454.4	86.49	75.74	93.98
Horizontal	2454.4	100.64	89.89	93.98

Cmax				
Polarization	Frequency (MHz)	Peak Level (dBμV/m)	Peak Level – Duty cycle Factor (dBμV/m)	FCC Limit (dBμV/m)
Vertical	2480	88.64	77.89	93.98
Horizontal	2480	101.70	90.95	93.98

6.7. CONCLUSION

Field strength of fundamental & Field strength of harmonics measurement performed on the sample of the product **Tractel RF 2.4GHz**, SN: -, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.249 & RSS 210 Issue 10 limits.

7. UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

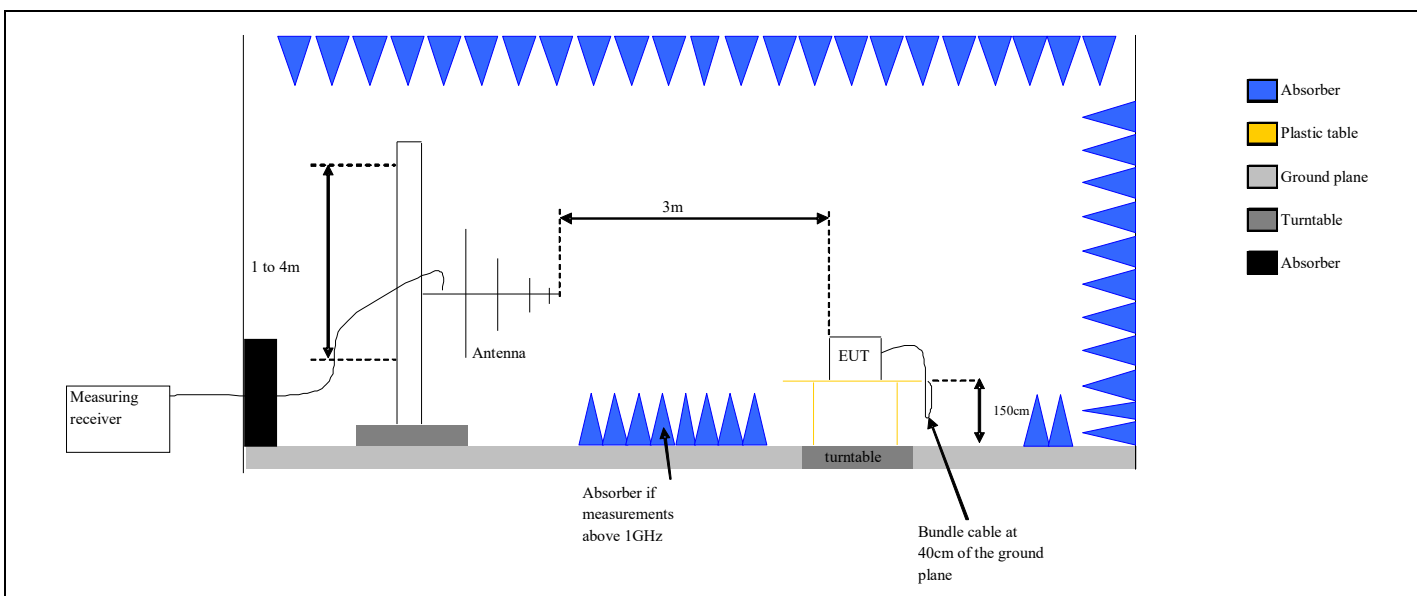
7.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
 Date of test : November 18, 2020 to December 4, 2020
 Ambient temperature : 24°C & 27°C
 Relative humidity : 46% & 49%

7.2. TEST SETUP

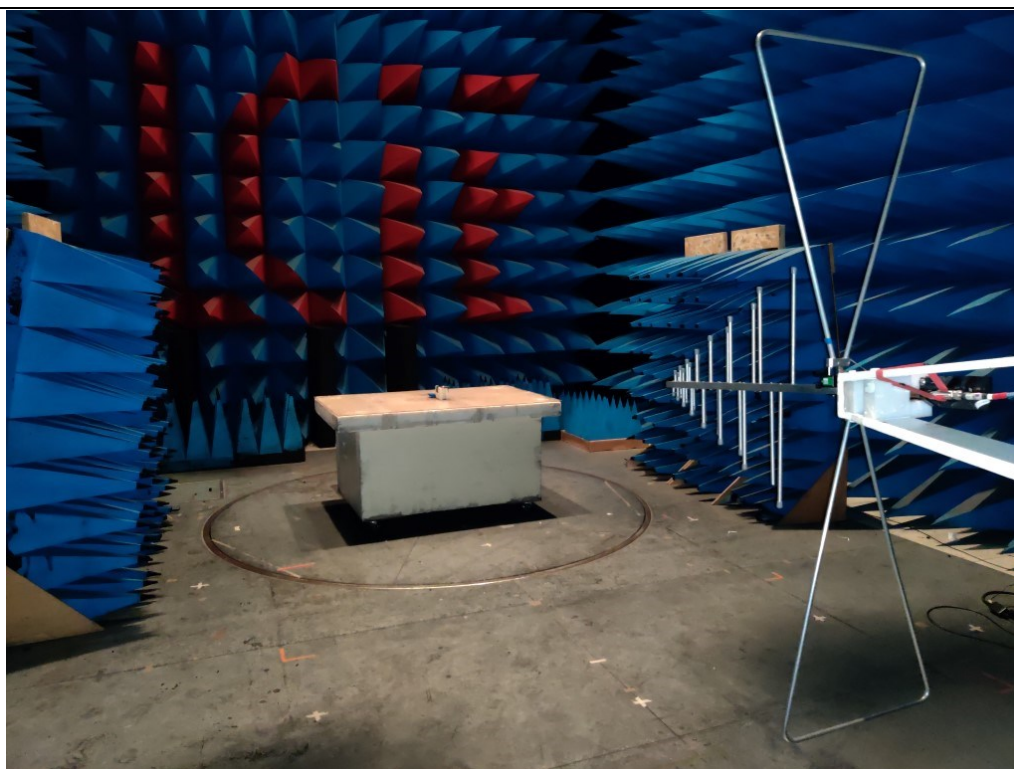
The product has been tested according to ANSI C63.10 and FCC part 15 subpart C:

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	Varied from 1m to 4m
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 :	Semi-Anechoic Chamber	Semi-Anechoic Chamber	Full Anechoic Chamber
Distance EUT-Antenna :	3m	3m	3m





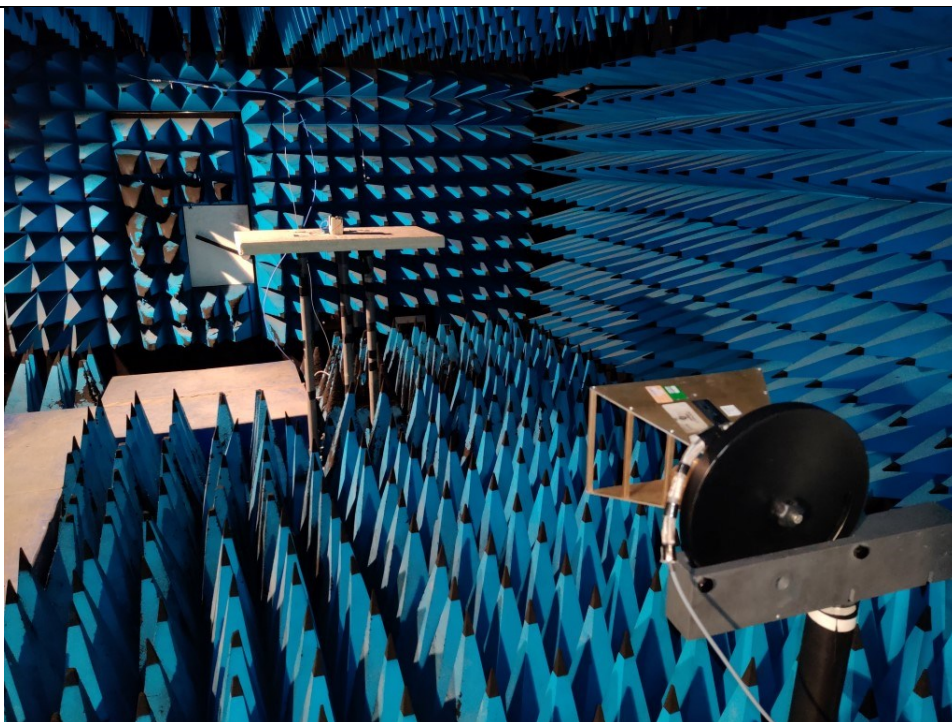
Photograph for Unwanted Emission in restricted frequency bands



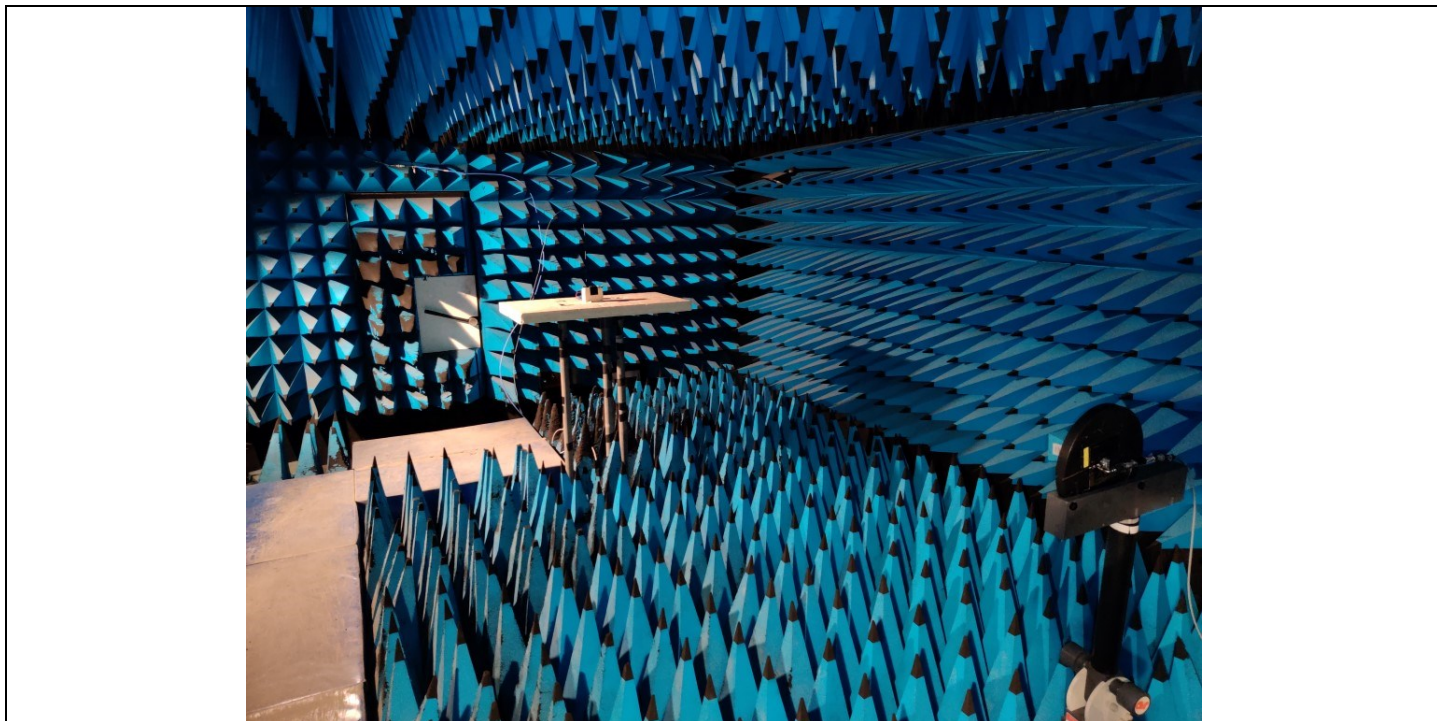
Photograph for Unwanted Emission in restricted frequency bands



Photograph for Unwanted Emission in restricted frequency bands



Photograph for Unwanted Emission in restricted frequency bands



Photograph for Unwanted Emission in restricted frequency bands

7.3. 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



7.4. TEST EQUIPMENT LIST

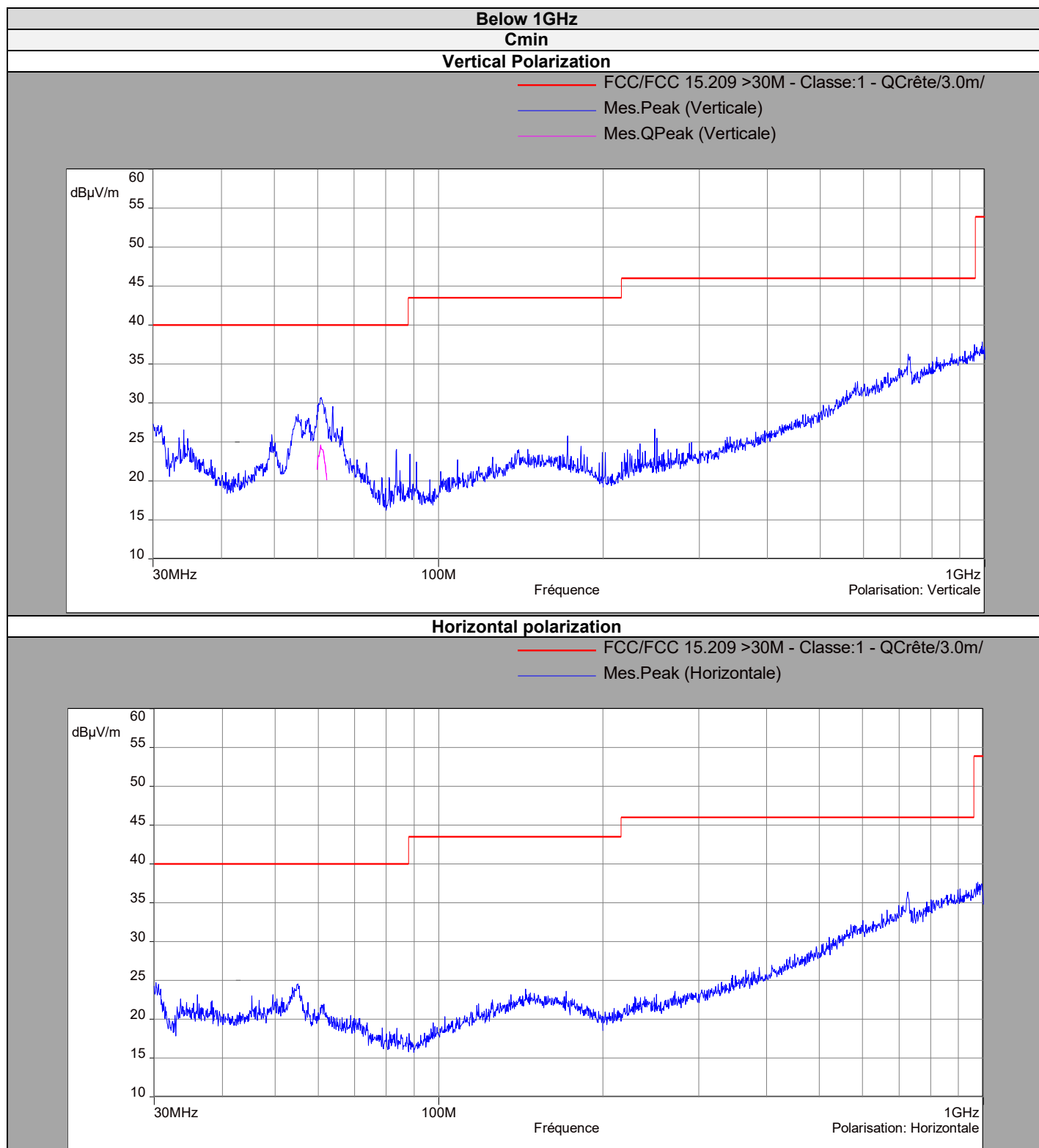
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
SEMI ANECHOIC CHAMBER	SIEPEL	ZONE HOMOGENE	D3044008	2019/12	2020/12
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642026	2019/07	2021/07
loop antenna	SCHWARZBECK	FMZB1513	C2040209	2018/03	2020/07
Bilog antenna	SCHWARZBECK	VULB9160	C2040150	2020/06	2021/06
Cable	-	-	A5329461	2020/01	2021/01
Cable	-	-	A5329947	2020/01	2021/01
Full anechoic 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 (18-26,5GHz)	PASTERNAK	PE9852/2F-20	C2042049	2020/06	2022/06
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2019/05	2021/05
Cable S36 chamber	PASTERNAK	PE360-3000CM	A5329872	2020/01	2021/01
Cable S36 chamber	PASTERNAK	PE360-1000CM	A5329939	2020/01	2021/01
Cable S36 chamber	PASTERNAK	PE360-1500CM	A5329940	2020/01	2021/01
High Pass Filter 2,4GHz	WAINWRIGHT	WHK12-2494	A7484068	2019/07	2021/07
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

7.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒ None ☐ Divergence:

7.6. RESULTS

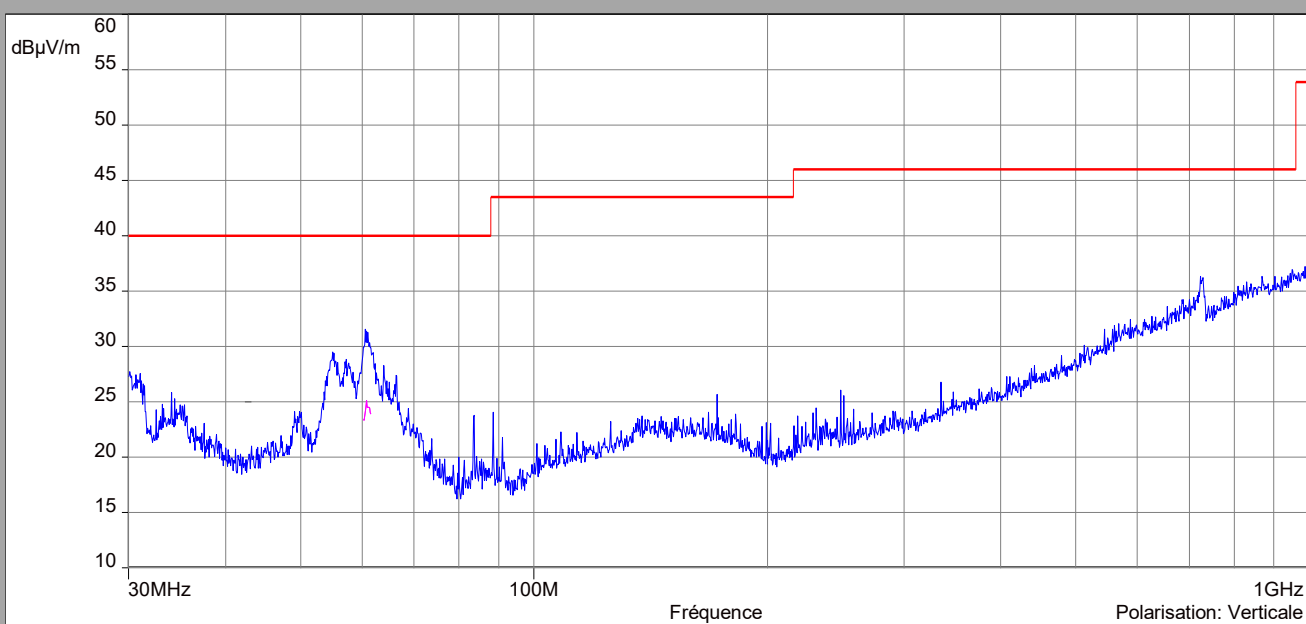


Below 1GHz

Cnom

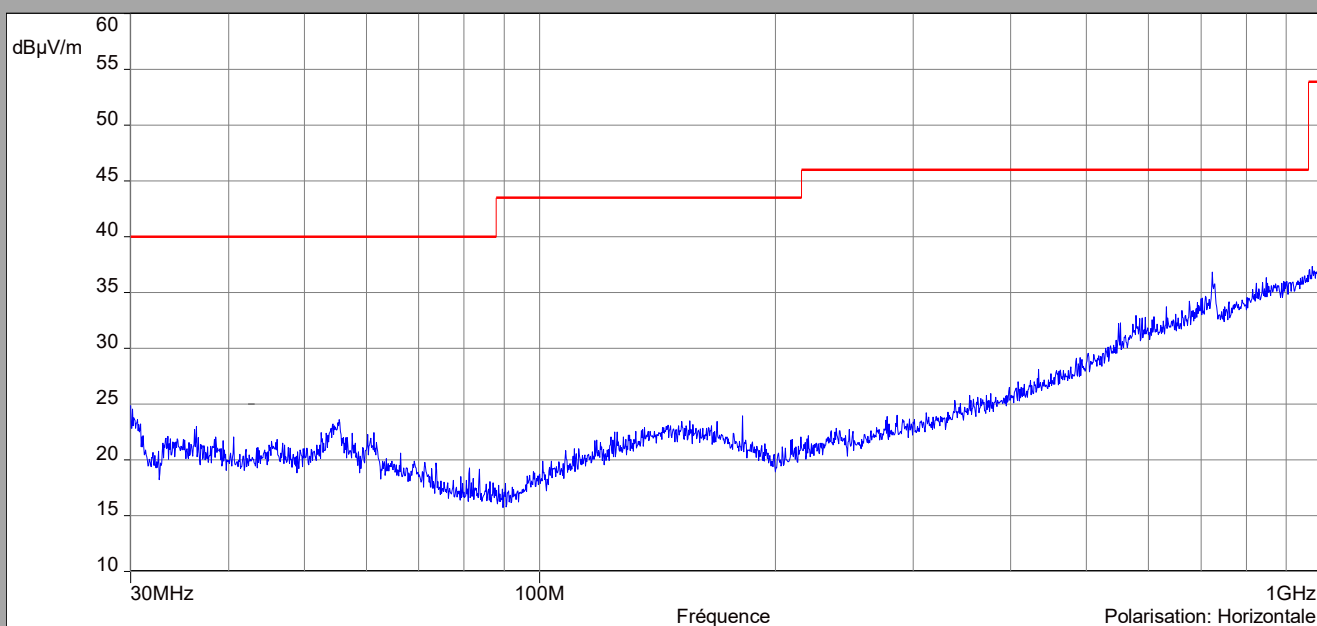
Vertical Polarization

— FCC/FCC 15.209 >30M - Classe:1 - QCrête/3.0m/
— Mes.Peak (Verticale)
— Mes.QPeak (Verticale)



Horizontal polarization

— FCC/FCC 15.209 >30M - Classe:1 - QCrête/3.0m/
— Mes.Peak (Horizontale)

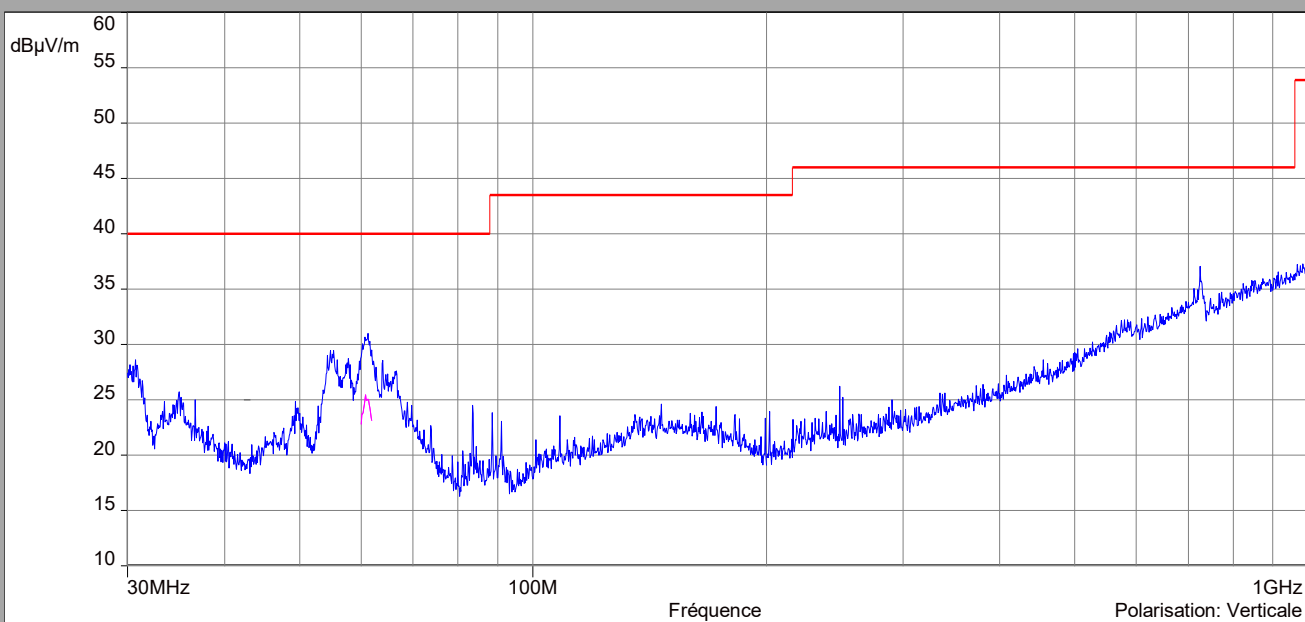


Below 1GHz

Cmax

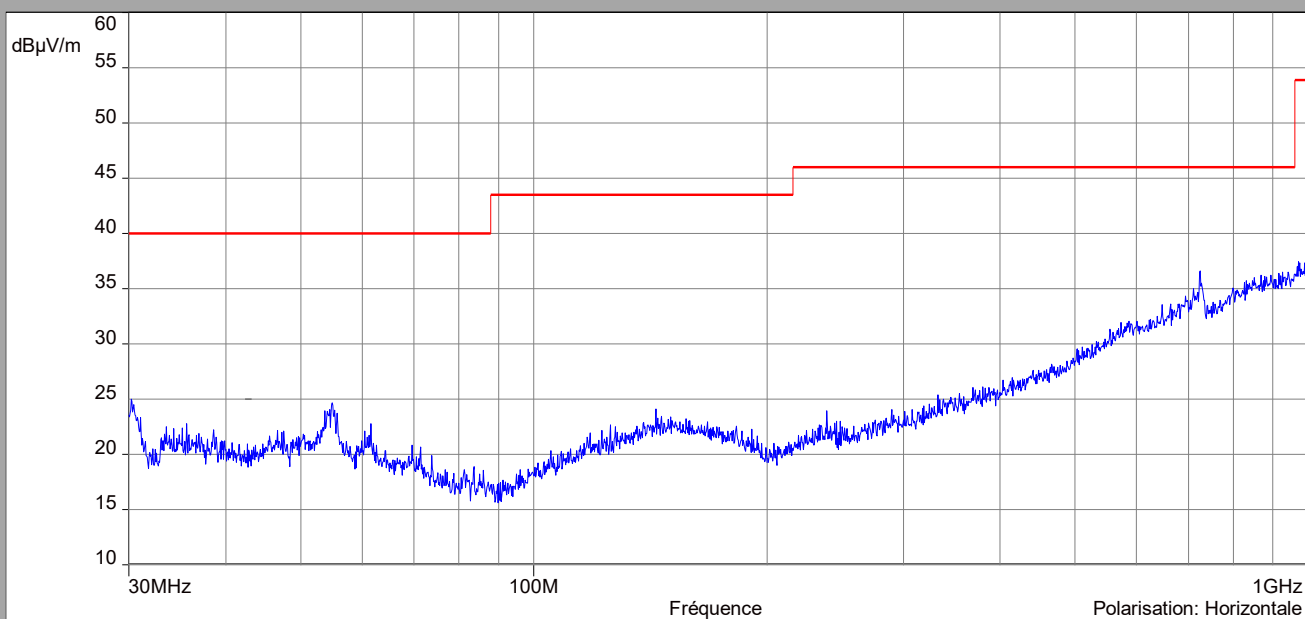
Vertical Polarization

— FCC/FCC 15.209 >30M - Classe:1 - QCrête/3.0m/
— Mes.Peak (Verticale)
— Mes.QPeak (Verticale)



Horizontal polarization

— FCC/FCC 15.209 >30M - Classe:1 - QCrête/3.0m/
— Mes.Peak (Horizontale)

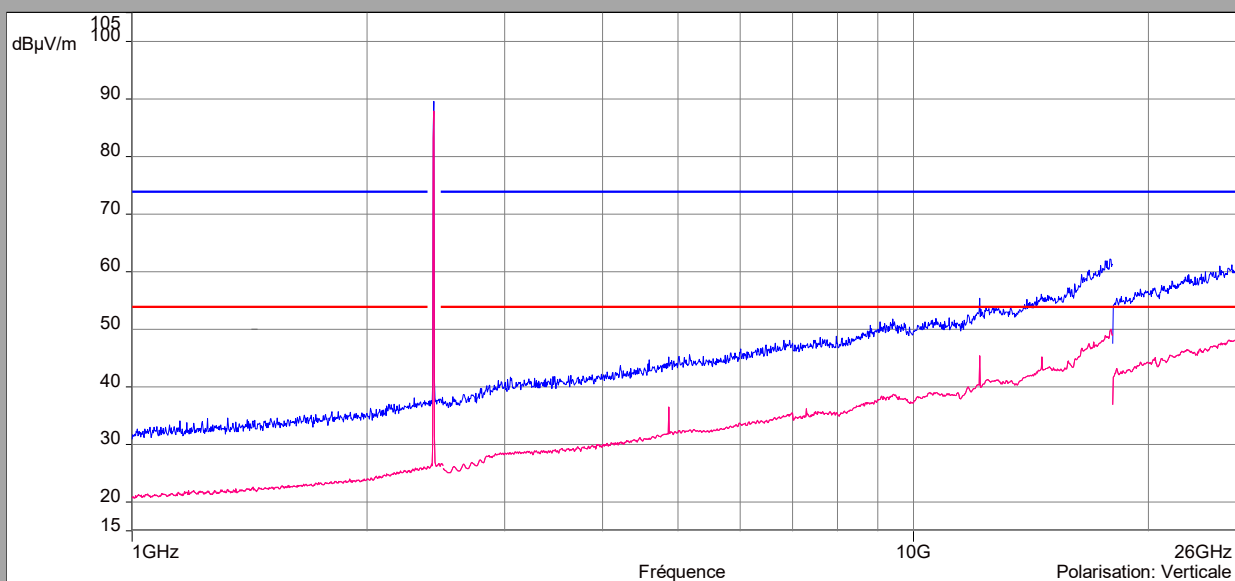


Above 1GHz

Cmin

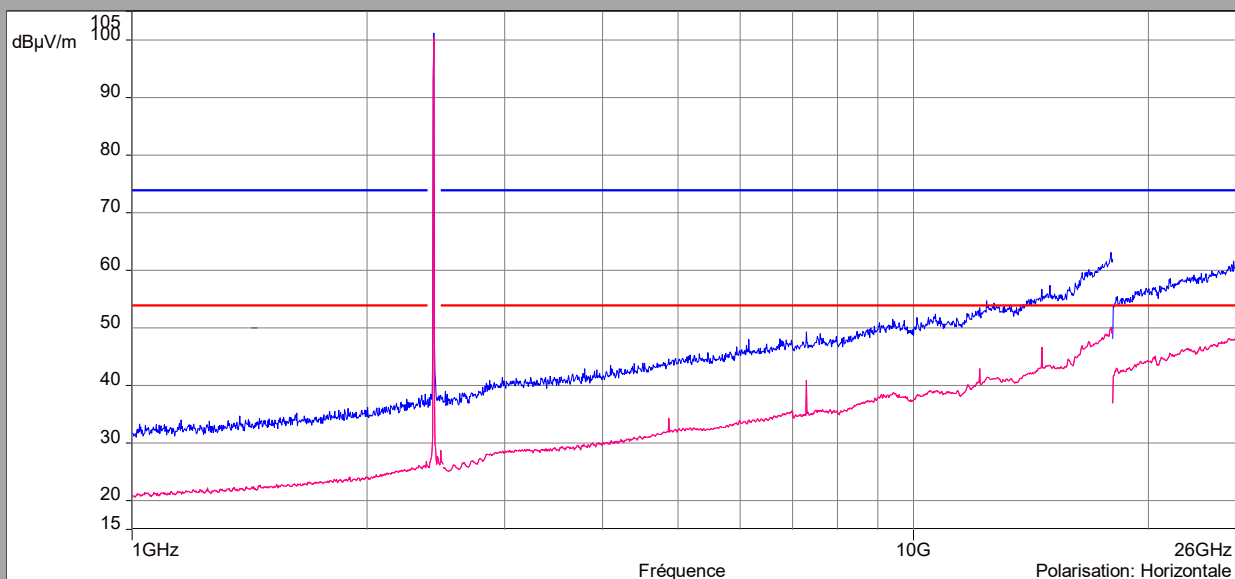
Vertical Polarization

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



Horizontal polarization

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

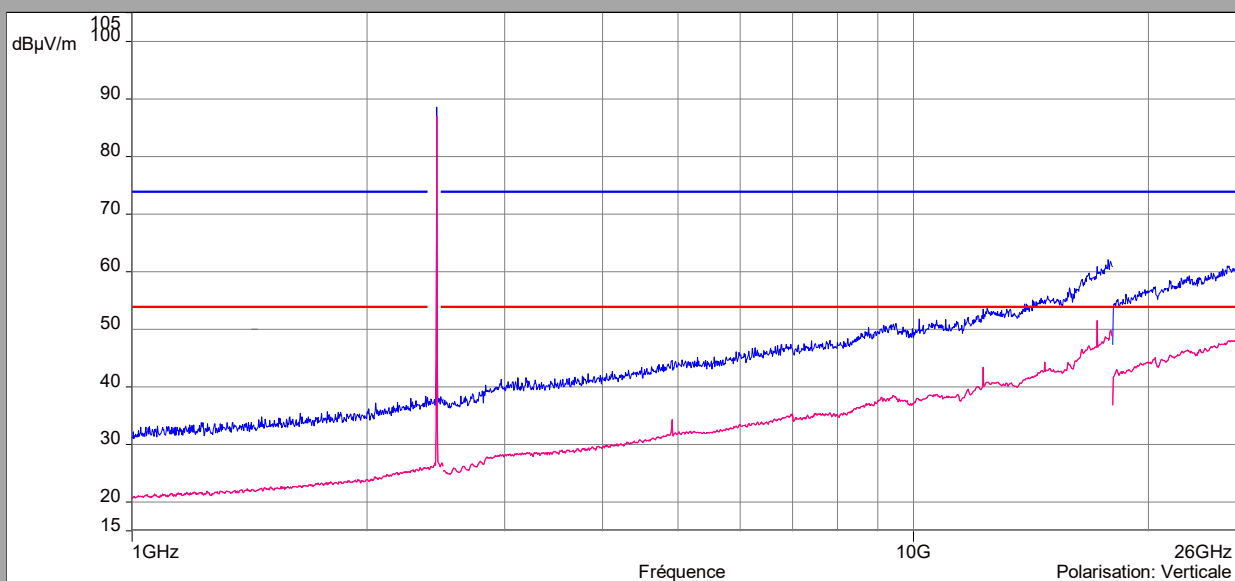


Above 1GHz

Cnom

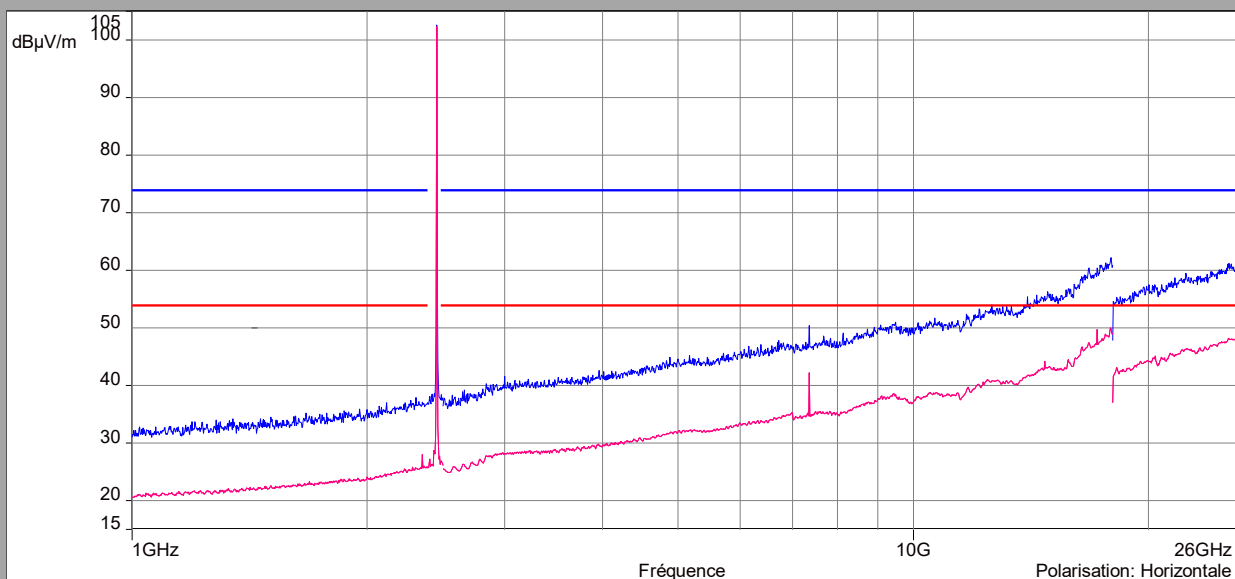
Vertical Polarization

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



Horizontal polarization

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

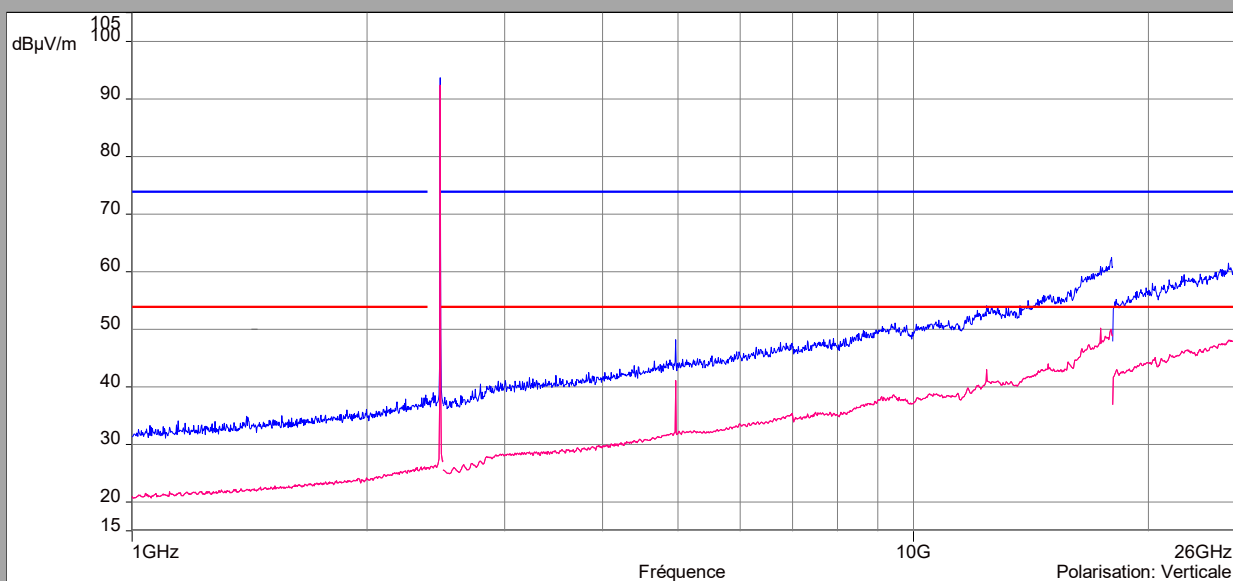


Above 1GHz

Cmax

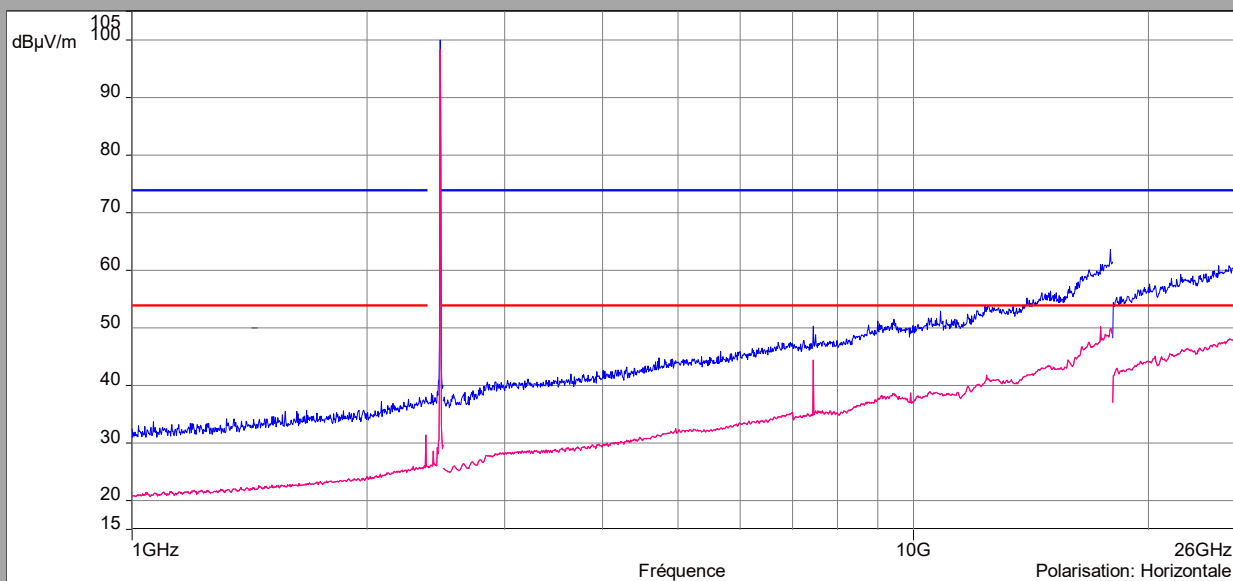
Vertical Polarization

- 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 (Verticale)
- Mes.Avg (Verticale)



Horizontal polarization

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



9kHz to 30MHz				
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					
Polarization	Frequency (MHz)	Peak Level (dBμV/m)	QPeak Level (dBμV/m)	Limit (dBμV/m)	Margin (dBμV/m)
Vertical	61	31.02	25.46	40	14.54
Vertical	725	37.08	-	46	8.92

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)
Vertical	4864	25,698	14,946	54	39,054	34,428	74	39,572
Vertical	4909	23,528	12,776	54	41,224	33,888	74	40,112
Vertical	4959	30,328	19,576	54	34,424	37,478	74	36,522
Horizontal	7295	30,138	19,386	54	34,614	38,538	74	35,462
Horizontal	7363	31,488	20,736	54	33,264	39,698	74	34,302
Horizontal	7439	33,638	22,886	54	31,114	39,538	74	34,462
Vertical	12160	34,648	23,896	54	30,104	44,688	74	29,312
Vertical	12271	32,618	21,866	54	32,134	42,778	74	31,222
Vertical	12399	32,238	21,486	54	32,514	42,558	74	31,442
Horizontal	14592	35,838	25,086	54	28,914	45,988	74	28,012
Horizontal	17180	40,788	30,036	54	23,964	49,638	74	24,362
Horizontal	17359	39,438	28,686	54	25,314	50,268	74	23,732

7.7. CONCLUSION

Unwanted Emission in restricted frequency bands measurement performed on the sample of the product **Tractel RF 2.4GHz**, SN: -, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.249 & RSS 210 Issue 10 limits.

8. UNCERTAINTIES CHART

47 CFR Part 15.209 & 15.207 Kind of test	Wide uncertainty laboratory (k=2) $\pm x(\text{dB}) / (\text{Hz}) / \text{ms}$	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