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TEST REPORT

N°: 174694-772594

Version : 03

Subject

Radio spectrum matters
tests according to standards:
47 CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 5

Issued to

ABEYE
27 Rue Buffon
21200 - BEAUNE
France

Apparatus under test

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

LEXILENS JCV5S2
LEXILENS
ABEYE
ABLT02
1505131B3B
FCC ID : 2A9XX-ABLT02
IC ID : 30009-ABLT02

Conclusion

See Test Program chapter

Test date

November 3, 2022 to November 22, 2022

Test location

Fontenay Aux Roses & Ecuelles

Test Site

6500A-1 & 6500A-3

Sample receipt date

November 16, 2022

Registration Number

582868

Designation Number

FR0010

Composition of document

50 pages

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November 3, 2022

Document issued on

December 21, 2023

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PUBLICATION HISTORY

Version	Date	Author	Modification
01	December 21, 2023	Julien Palard	Creation of the document
02	October 30, 2023	Laurent DENEUX	Change of address on page 1
03	December 21, 2023	Laurent DENEUX	Added a photo on page 40

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 (R).
- 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 ☐ 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):
LEXILENS ABLT02

Serial Number: 1505131B3B



Equipment Under Test

Power supply:

Name	Type	Rating	Reference / Sn	Comments
Supply1	☐ AC ☒ DC ☐ Battery	5V-DC	OTTERBOX 78-51415	

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
1	UART cable	2	☐	☒	☐	

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop	LENOVO		Use to set the EUT

Equipment information:

Bluetooth LE Type:	☒ BLE	☐ v4.0	☐ v4.1	☒ v4.2	☐ v5.0
Chipset :					
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	
Antenna Requirements §15.203	Conducted Method (welded connection, according to manufacturer's requirements)				
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:	Tnom:	20°C			
Type of power source:	☐ AC power supply		☒ DC power supply		☐ Battery
Operating voltage range:	Vnom:	☐ 120V/60Hz		☒ 5 VDC	
		☐ 240V/50Hz		☐ X VDC	

Antenna Characteristic			
Antenna assembly	Gain (dBi)	Frequency Band (MHz)	Impedance(Ω)
1	0	2400 – 2483.5	50

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



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

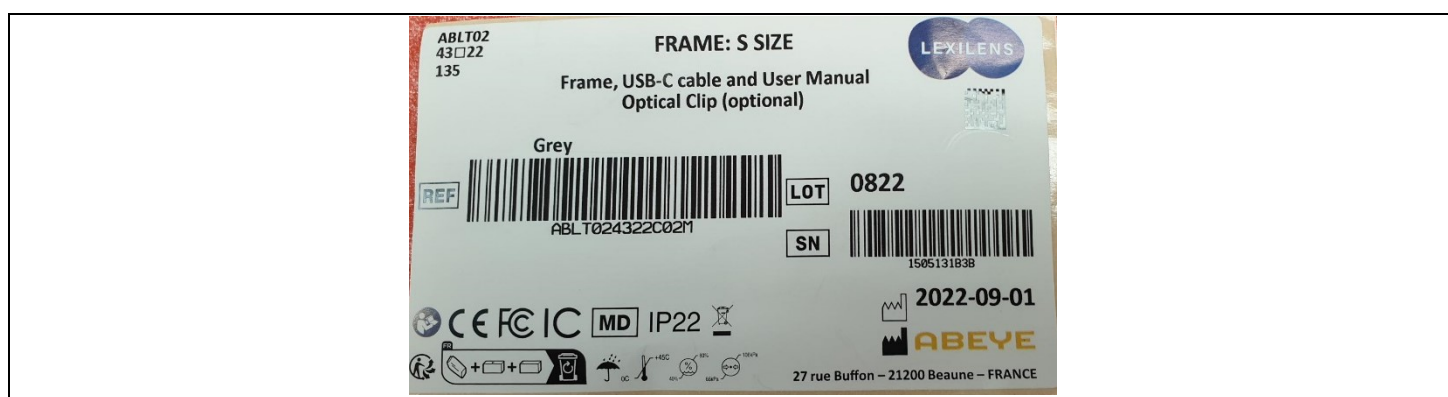
DATA RATE		
Data Rate (Mbps)	Modulation Type	Worst Case Modulation
1	GFSK	☒
2	GFSK	☐

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 mode 2	Permanent reception
Test	Running mode
Occupied Bandwidth	☒ Test mode 1 (1) ☐ Alternative test mode()
6dB Bandwidth	☒ Test mode 1 (1) ☐ Alternative test mode()
Duty Cycle	☒ Test mode 1 (1) ☐ Alternative test mode()
Maximum Conducted Output Power	☒ Test mode 1 (1) ☐ Alternative test mode()
Power Spectral Density	☒ Test mode 1 (1) ☐ Alternative test mode()
Conducted Spurious Emission at the Band Edge	☒ Test mode 1 (1) ☐ Alternative test mode()
Unwanted Emissions into Non-Restricted Frequency Bands	☒ Test mode 1 (1) ☐ Alternative test mode()
AC Power Line Conducted Emission	☒ Test mode 1 (1) ☐ Alternative test mode()
Unwanted Emissions into Restricted Frequency Bands	☒ Test mode 1 (1) ☐ Alternative test mode()

- (1) Following commands with the specific test software "Tera Term Professional V4.52" are used to set the product:
- See document "ADD-ST-053-02_Notice tests RF - Junior Care"(provided by customer) for the command used during test.

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.

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

The 32 dBμV/m value can be mathematically converted to its corresponding level in μV/m.

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

2.1. TEST DISTANCE EXTRAPOLATION – FCC/ISED

The field strength is extrapolated to the new measurement distance using formula from FCC Part15.31 (f) and §6.5-6.6 RSS-GEN:

Below 30MHz,

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

Above 30MHz,

$$FS_{\text{limit}} = FS_{\text{max}} - 20 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

Where:

FS_{limit} is the calculation of field strength at the limit distance, expressed in dBμV/m

FS_{max} is the measured field strength, expressed in dBμV/m

d_{measure} is the distance of the measurement point from the EUT

d_{limit} is the reference limit distance

2.2. 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, 2022
Ambient temperature : 25 °C
Relative humidity : 42 %

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:

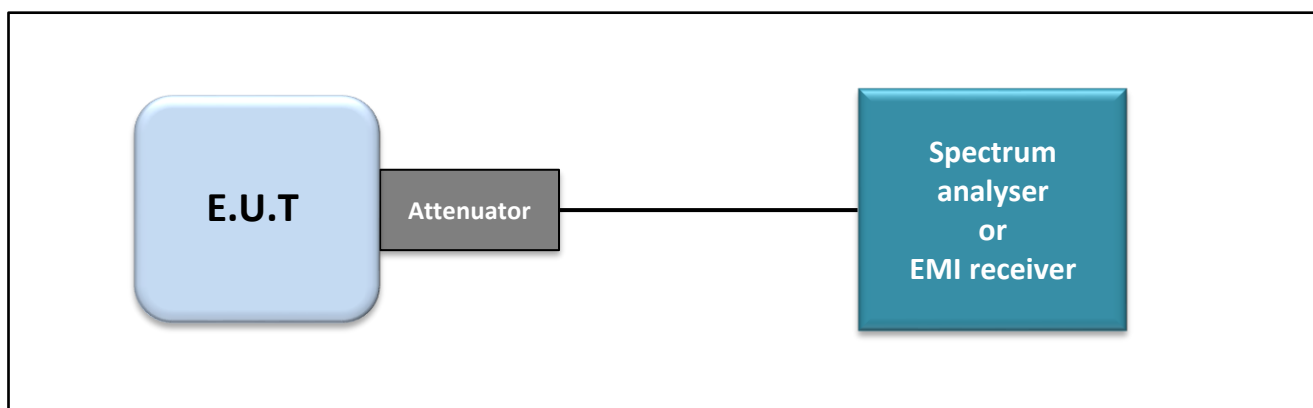
- ☒ Conducted Method
☐ Radiated Method

- Test Procedure:

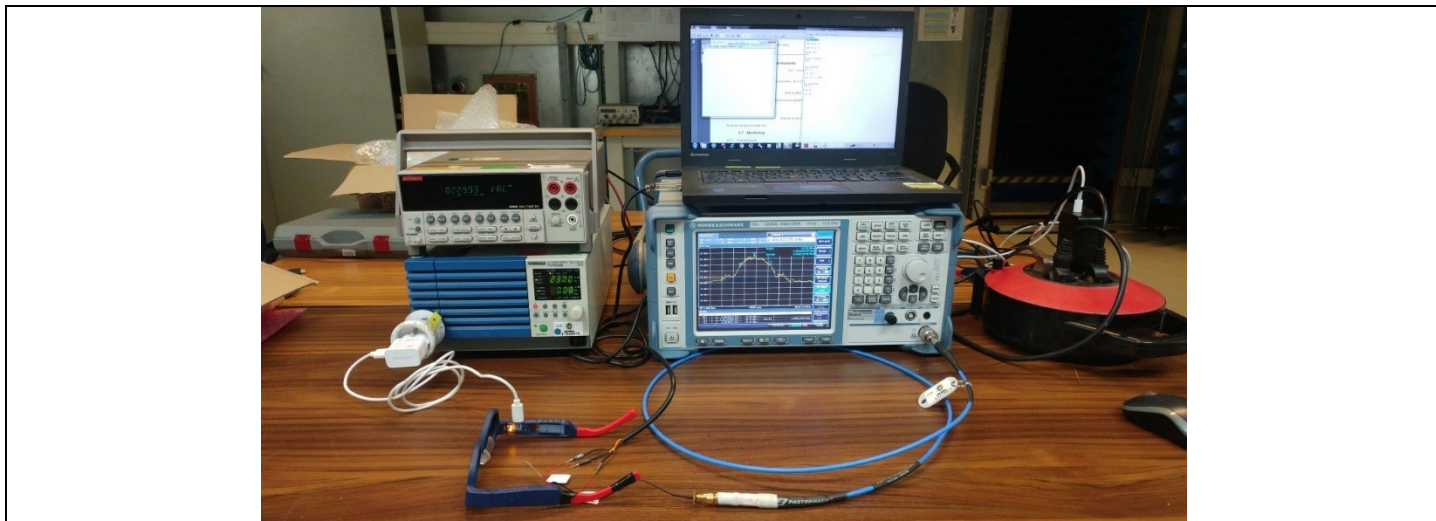
- ☐ RSS-Gen Issue 5 § 6.7
☒ ANSI C63.10 § 6.9.2

Measurement Procedure:

- RBW shall be in the range of 1% to 5% of the anticipated occupied bandwidth
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW
- SPAN = Capture all products of the modulation process
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- OBW 99% function of spectrum analyzer used



Test set up of Occupied Bandwidth



Photograph for Occupied bandwidth

3.3. **LIMIT**

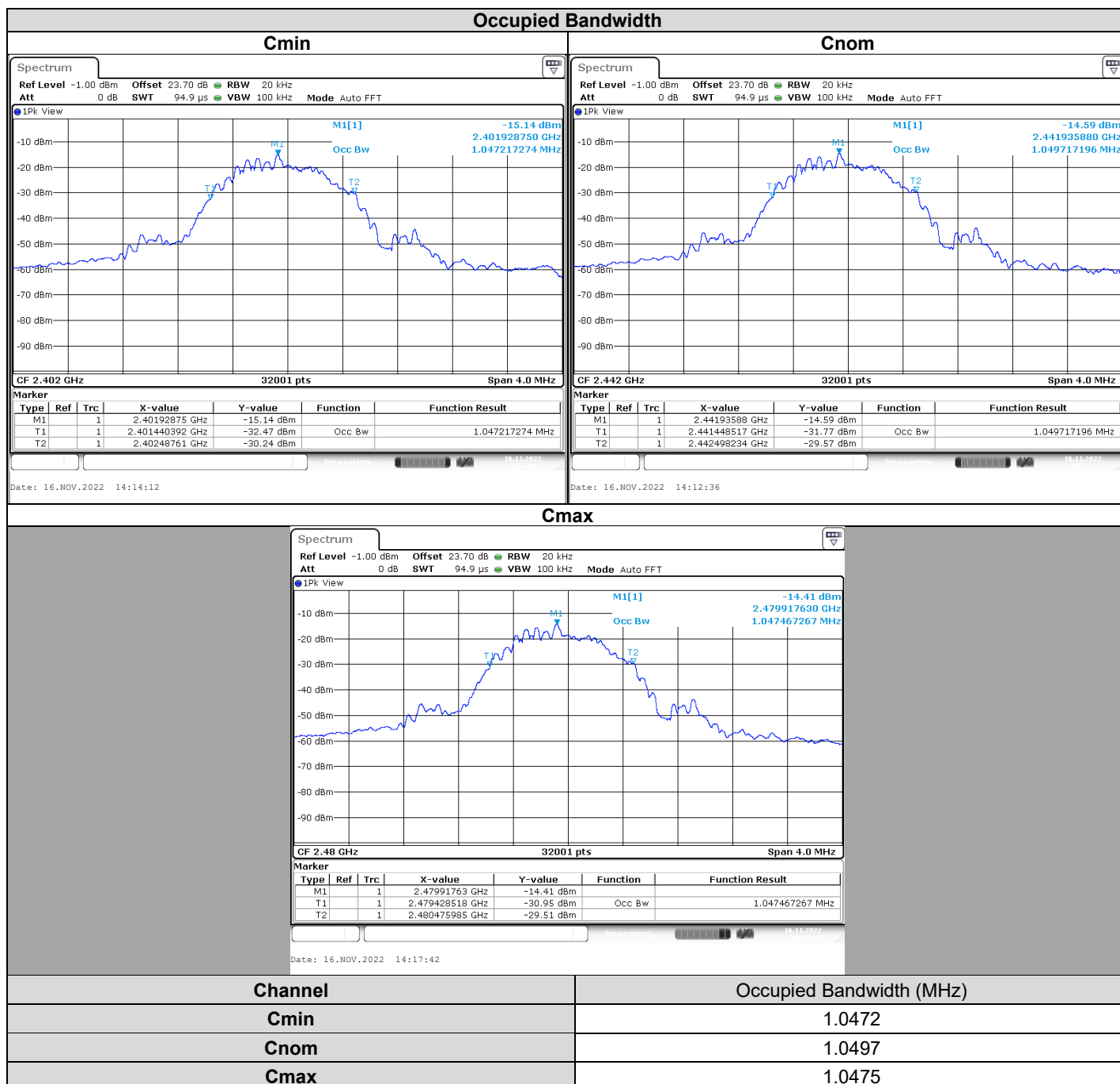
None

3.4. **TEST EQUIPMENT LIST**

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Power supply	KIKUSUI	PCR500M	A7040079	See multimeter	
Multimeter	KEITHLEY	2000	A1242090	2021/03	2023/03
R&S Commander Software	ROHDE & SCHWARZ	Version 1.6.4	-	-	-
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2022/02	2024/02
Cable SONDE 028+ Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329973	2021/09	2023/09

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 **LEXILENS ABLT02**, SN: **1505131B3B**, 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 : November 16, 2022
Ambient temperature : 25 °C
Relative humidity : 42 %

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:

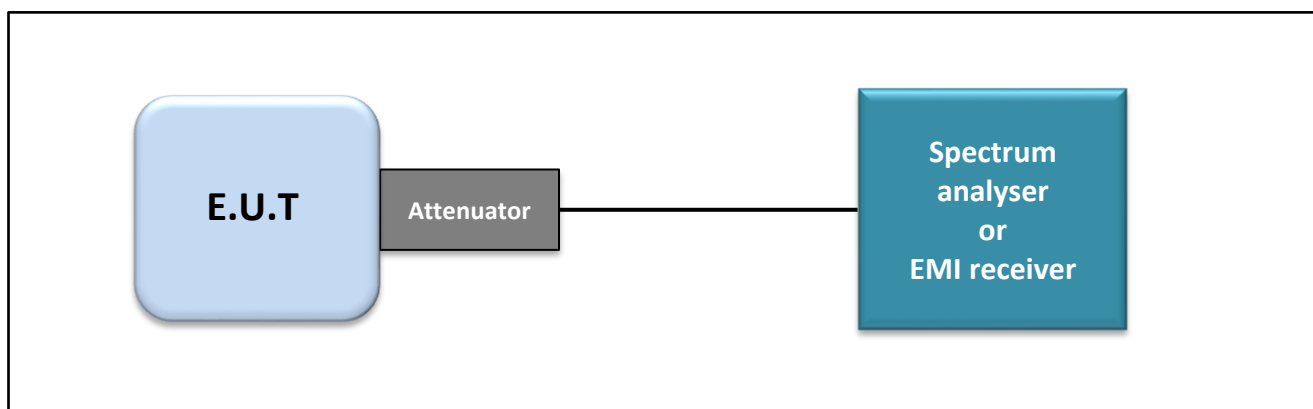
- ☒ Conducted Method
☐ Radiated Method

- Test Procedure:

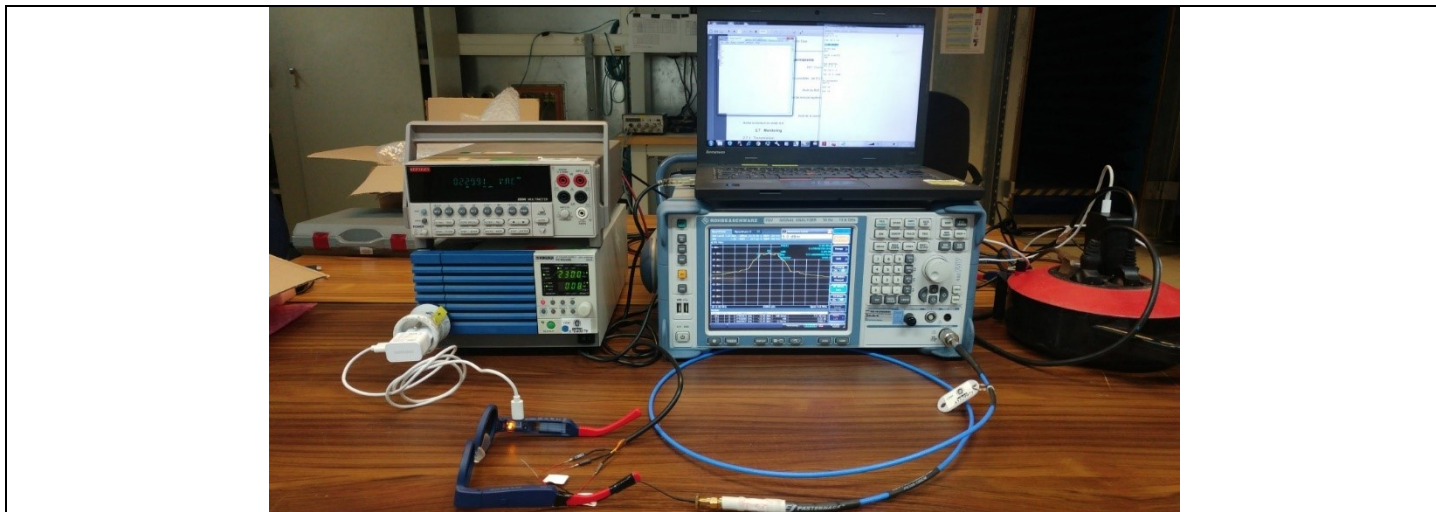
- ☒ ANSI C63.10 § 11.8.1
☐ ANSI C63.10 § 11.8.2

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

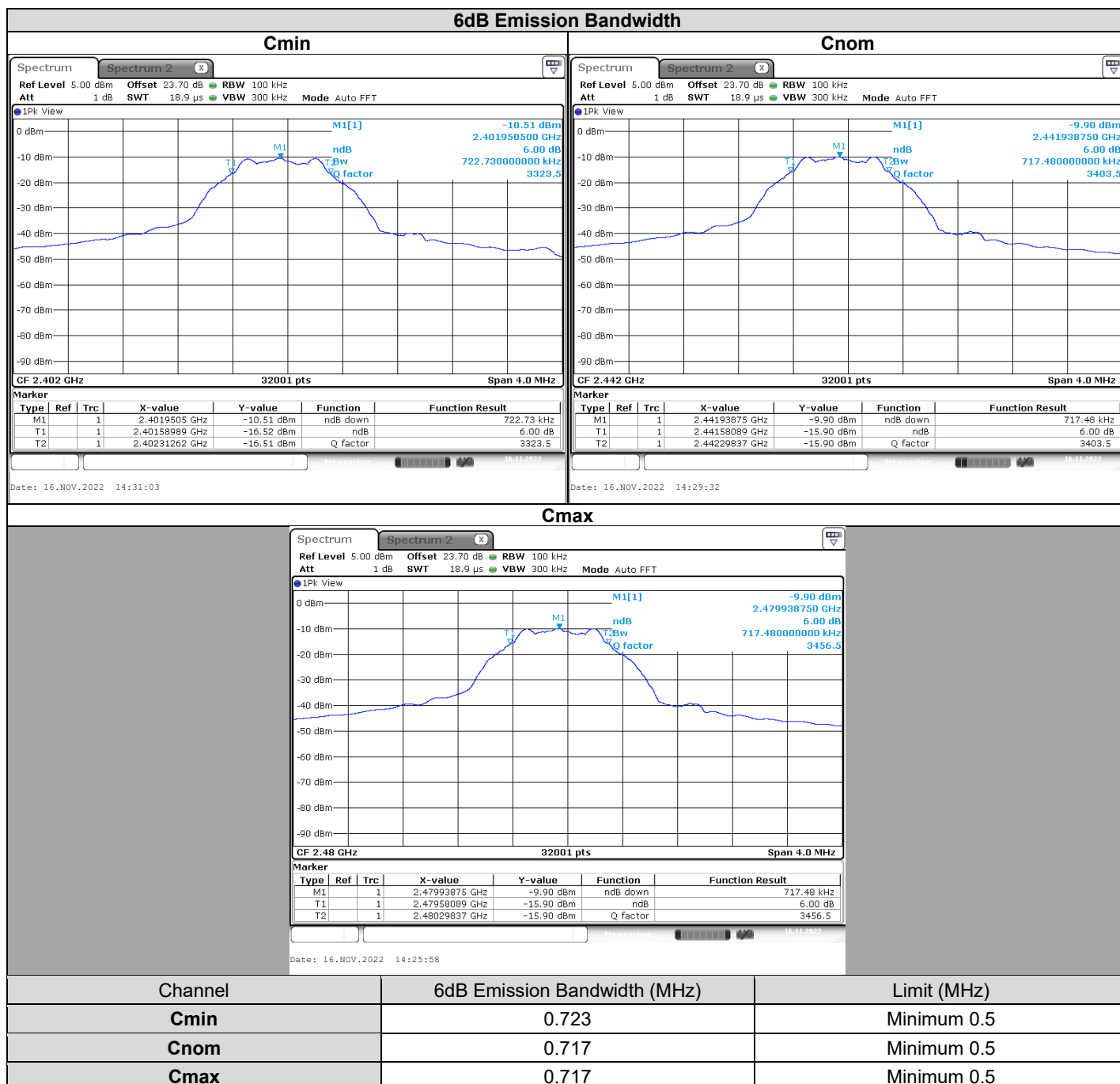
Frequency range	The 6dB bandwidth Limit
2400MHz to 2483.5MHz	$\geq 500\text{kHz}$

4.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Power supply	KIKUSUI	PCR500M	A7040079	See multimeter	
Multimeter	KEITHLEY	2000	A1242090	2021/03	2023/03
R&S Commander Software	ROHDE & SCHWARZ	Version 1.6.4	-	-	-
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2022/02	2024/02
Cable SONDE 028+ Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329973	2021/09	2023/09

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 **LEXILENS ABLT02**, SN: **1505131B3B**, 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 : November 16, 2022
Ambient temperature : 25 °C
Relative humidity : 42 %

5.2. TEST SETUP

- The Equipment under Test is installed:

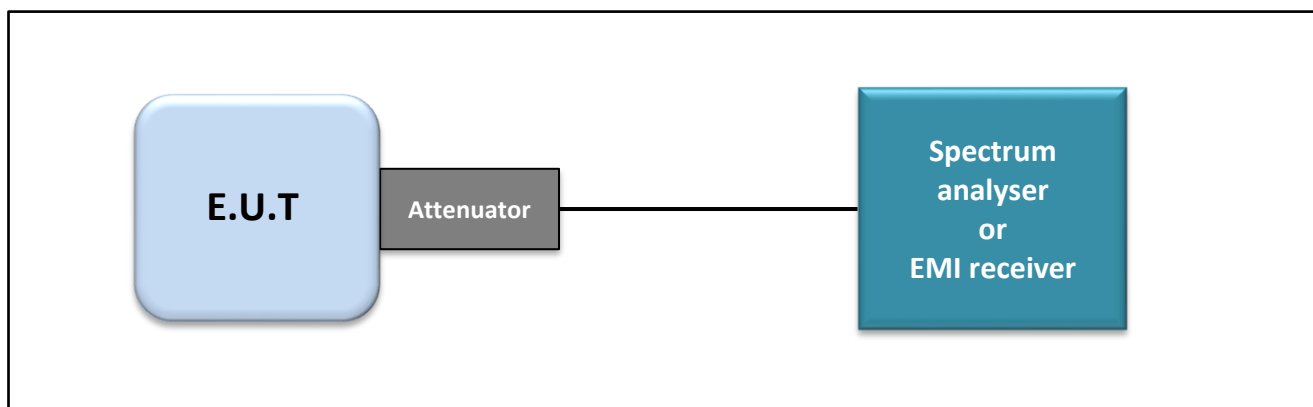
- ☒ On a table
- ☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

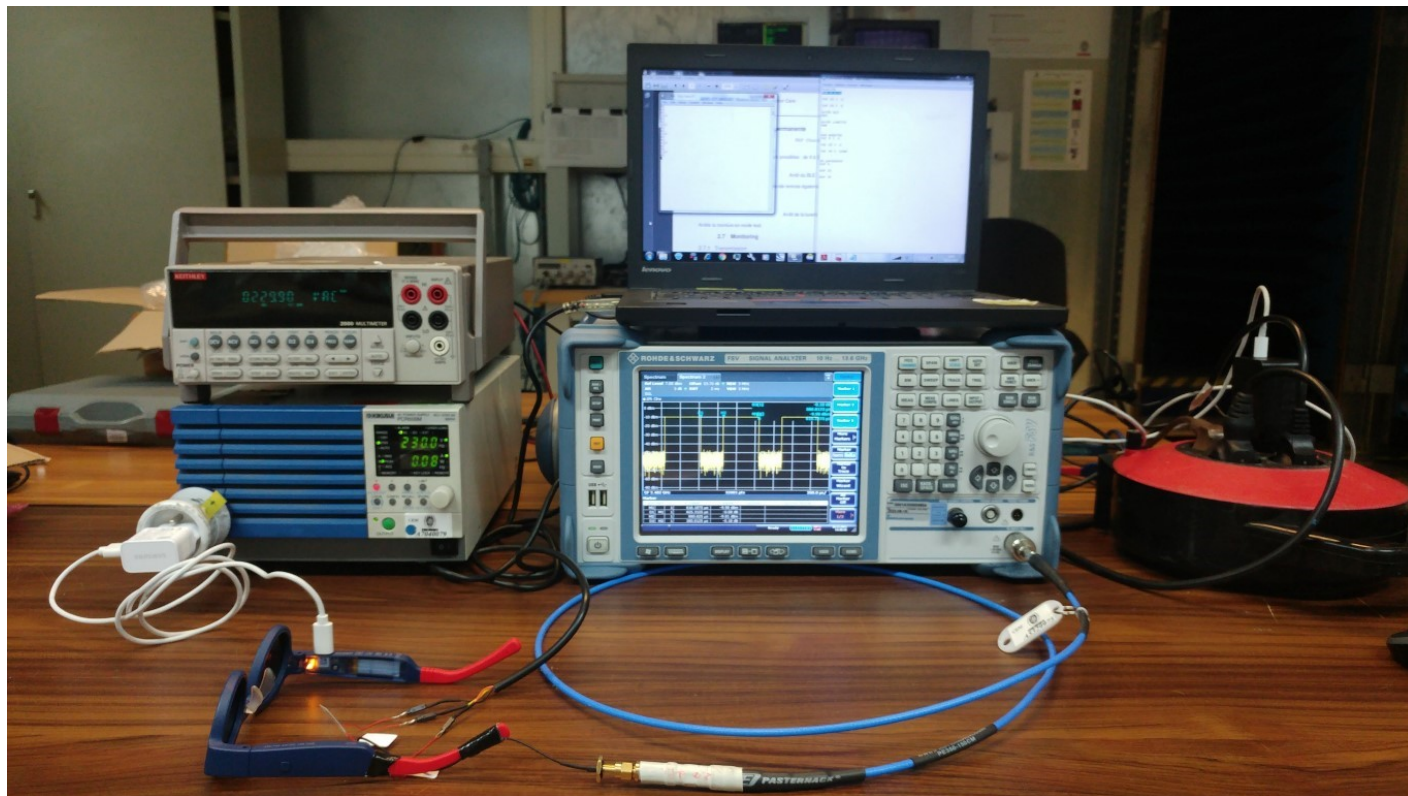
- ☒ Conducted Method
- ☐ Radiated Method

- Test Procedure:

- ☒ ANSI C63.10 § 11.6



Test set up of Duty Cycle



Photograph for Duty Cycle

5.3. LIMIT

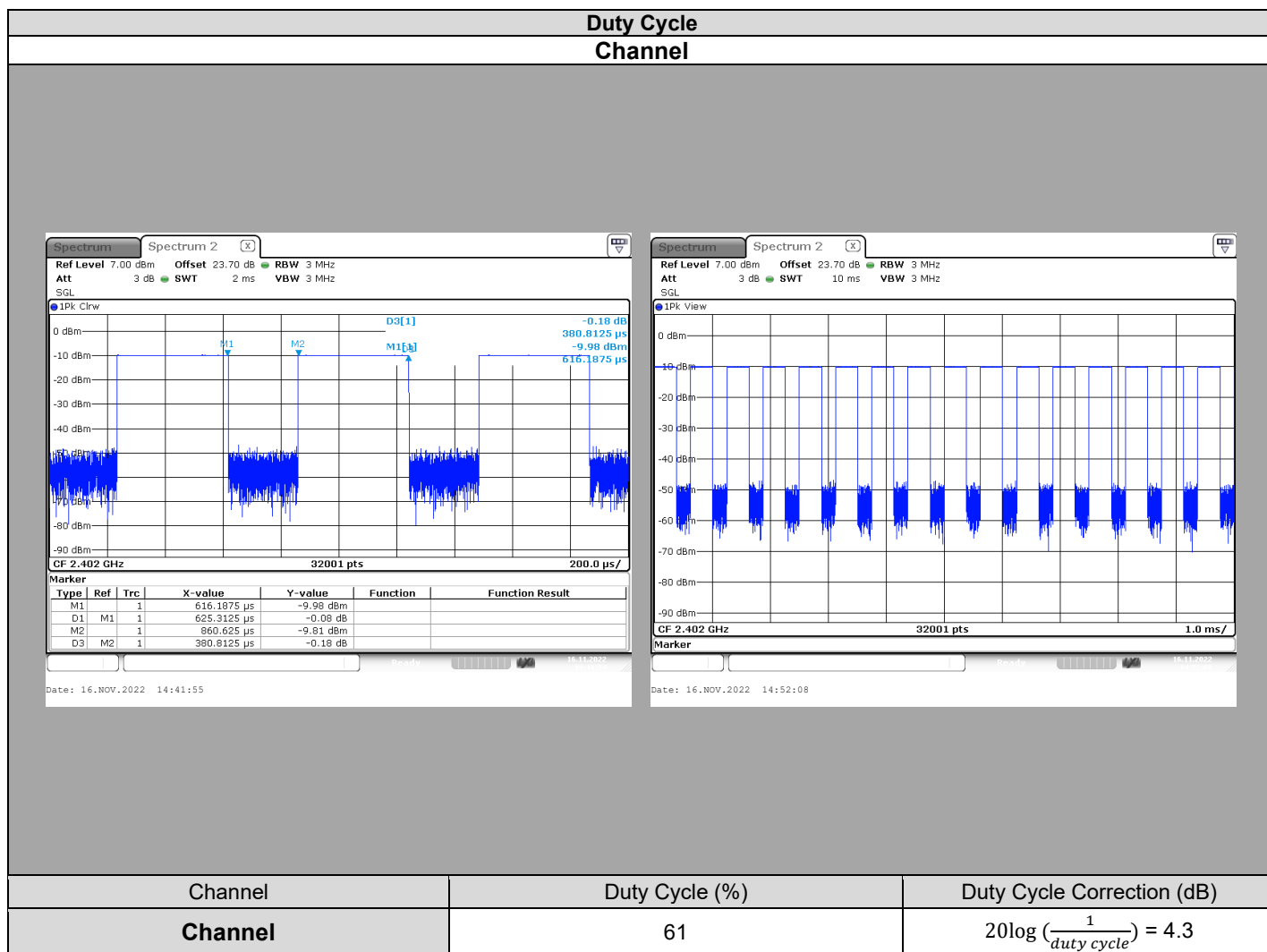
None

5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Power supply	KIKUSUI	PCR500M	A7040079	See multimeter	
Multimeter	KEITHLEY	2000	A1242090	2021/03	2023/03
R&S Commander Software	ROHDE & SCHWARZ	Version 1.6.4	-	-	-
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2022/02	2024/02
Cable SONDE 028+ Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329973	2021/09	2023/09

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

5.5. RESULTS



5.6. CONCLUSION

Duty Cycle measurement performed on the sample of the product **LEXILENS ABLT02**, SN: **1505131B3B**, 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 : November 16, 2022
Ambient temperature : 25 °C
Relative humidity : 42 %

6.2. TEST SETUP

- The Equipment under Test is installed:

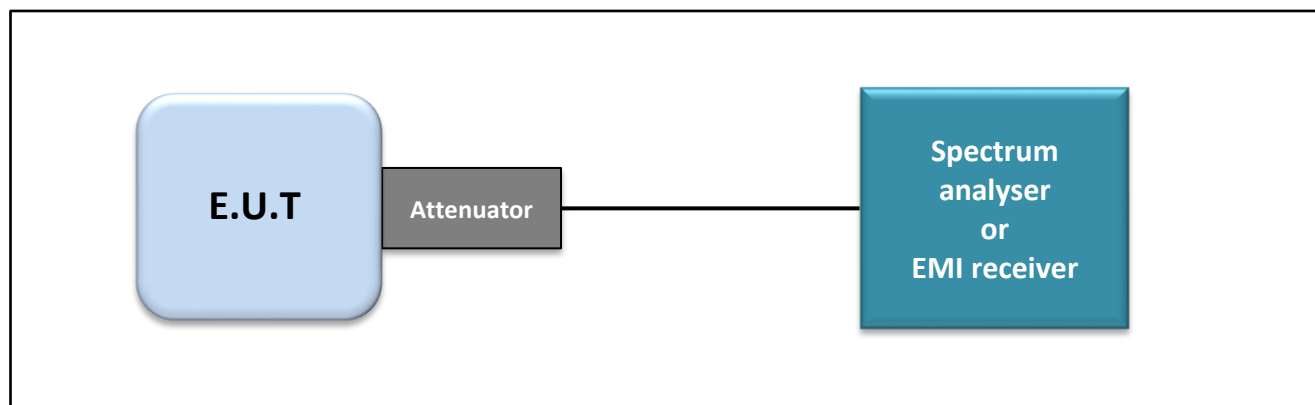
- ☒ On a table
- ☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

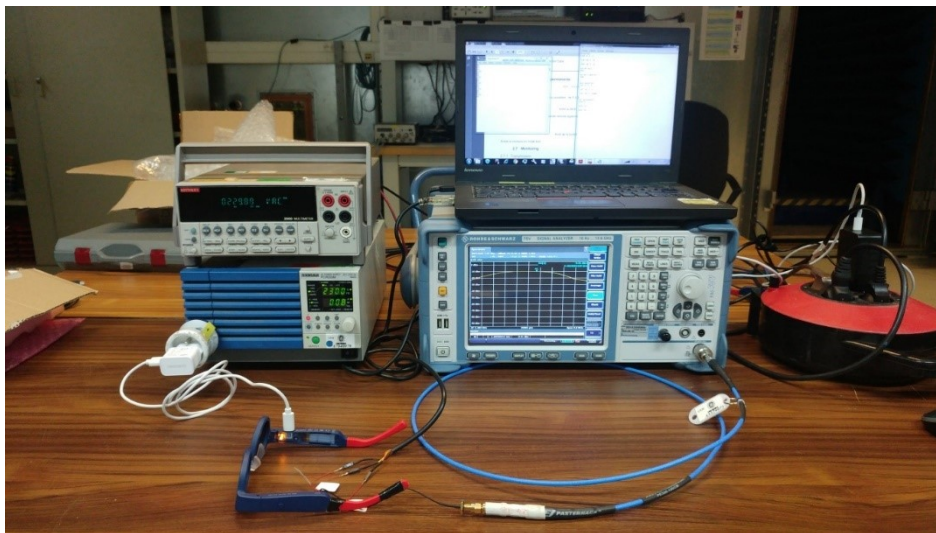
- ☒ Conducted Method
- ☐ Radiated Method

- 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	$\leq 30\text{dBm}^*$

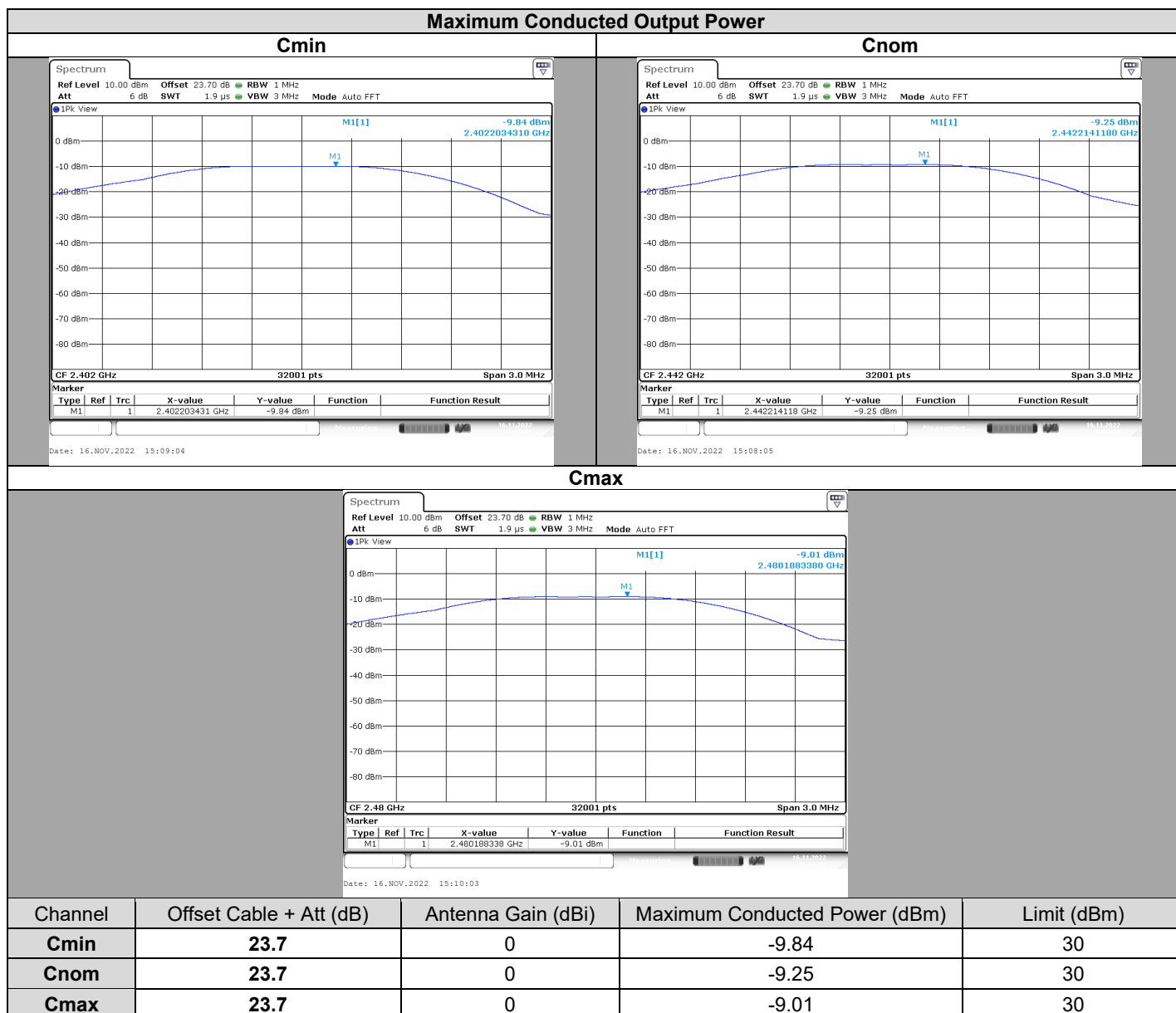
*Remark: Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

6.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Power supply	KIKUSUI	PCR500M	A7040079	See multimeter	
Multimeter	KEITHLEY	2000	A1242090	2021/03	2023/03
R&S Commander Software	ROHDE & SCHWARZ	Version 1.6.4	-	-	-
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2022/02	2024/02
Cable SONDE 028+ Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329973	2021/09	2023/09

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

6.5. RESULTS



6.6. CONCLUSION

Maximum Conducted Output Power measurement performed on the sample of the product **LEXILENS ABLT02**, SN: **1505131B3B**, 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 : November 16, 2022
Ambient temperature : 25 °C
Relative humidity : 42 %

7.2. TEST SETUP

- The Equipment Under Test is installed:

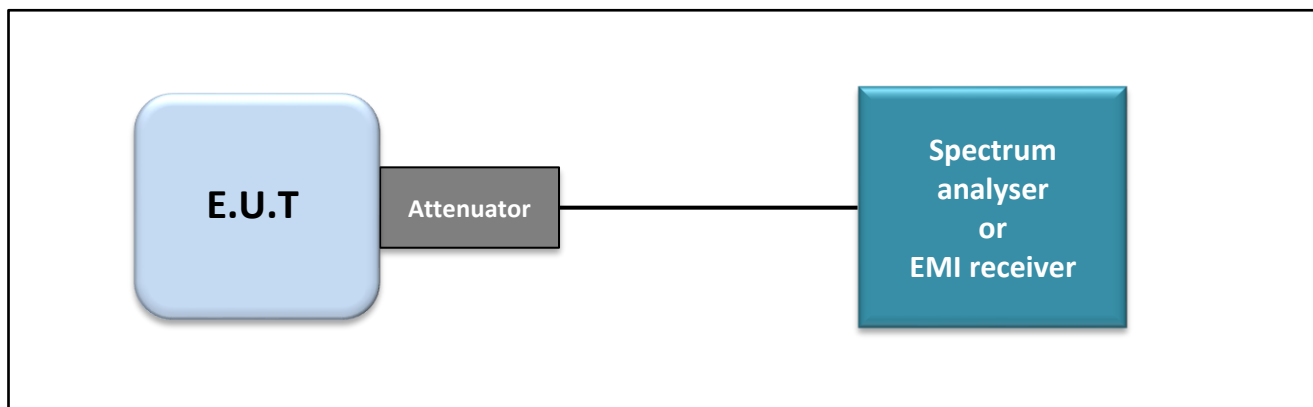
- ☒ On a table
- ☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

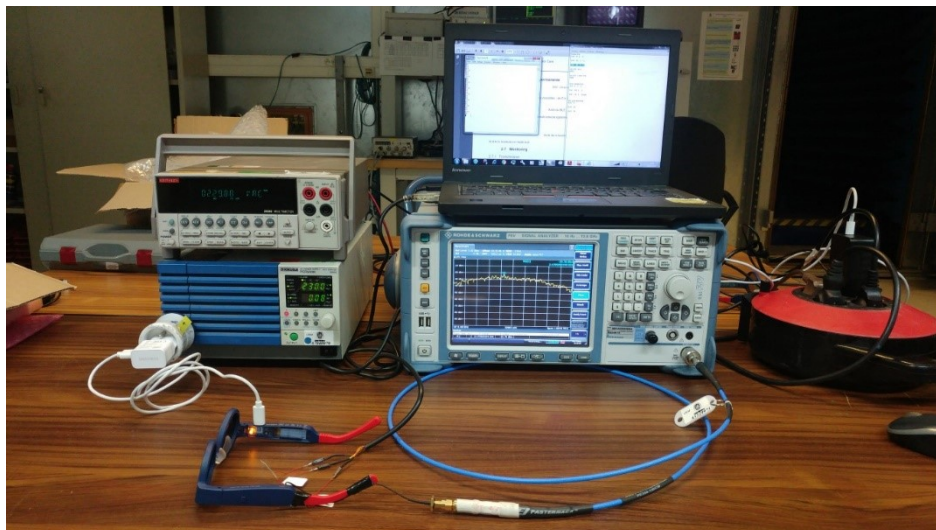
- ☒ Conducted Method
- ☐ Radiated Method

- 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	$\leq 8\text{dBm}/3\text{kHz}^*$

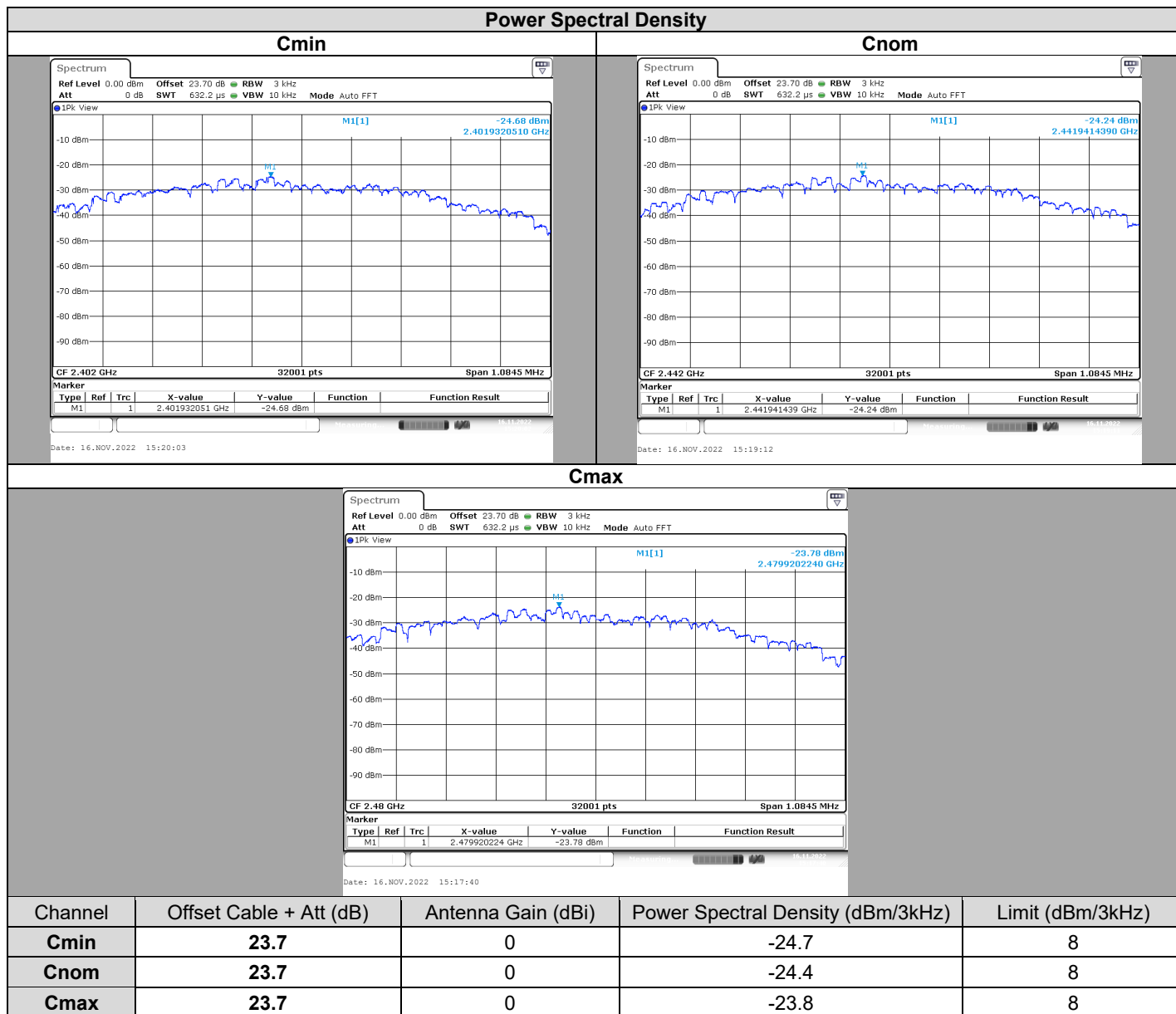
*Remark: Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

7.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Power supply	KIKUSUI	PCR500M	A7040079	See multimeter	
Multimeter	KEITHLEY	2000	A1242090	2021/03	2023/03
R&S Commander Software	ROHDE & SCHWARZ	Version 1.6.4	-	-	-
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2022/02	2024/02
Cable SONDE 028+ Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329973	2021/09	2023/09

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

7.5. RESULTS



7.6. CONCLUSION

Power Spectral Density measurement performed on the sample of the product **LEXILENS ABLT02**, SN: **1505131B3B**, 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 : November 16, 2022
Ambient temperature : 25 °C
Relative humidity : 42 %

8.2. TEST SETUP

- The Equipment Under Test is installed:

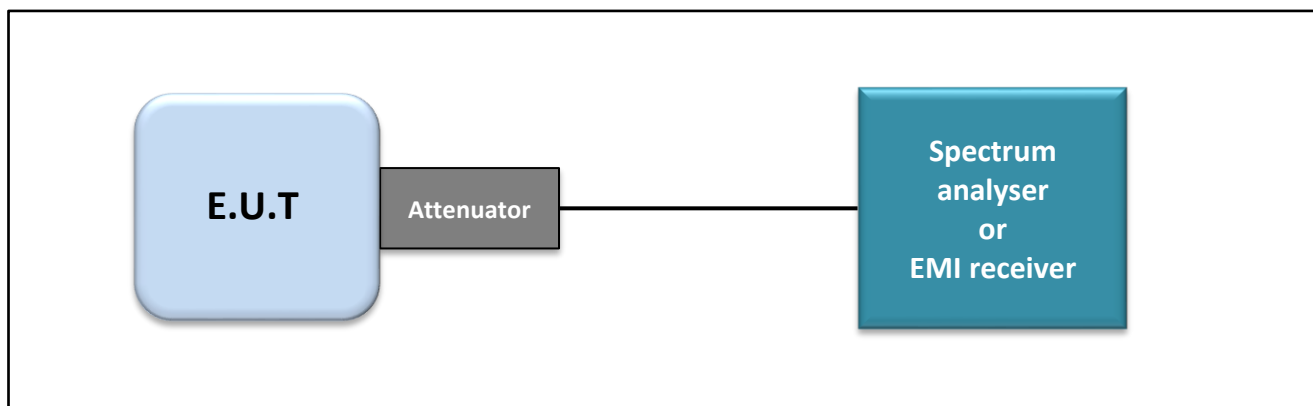
- ☒ On a table
- ☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

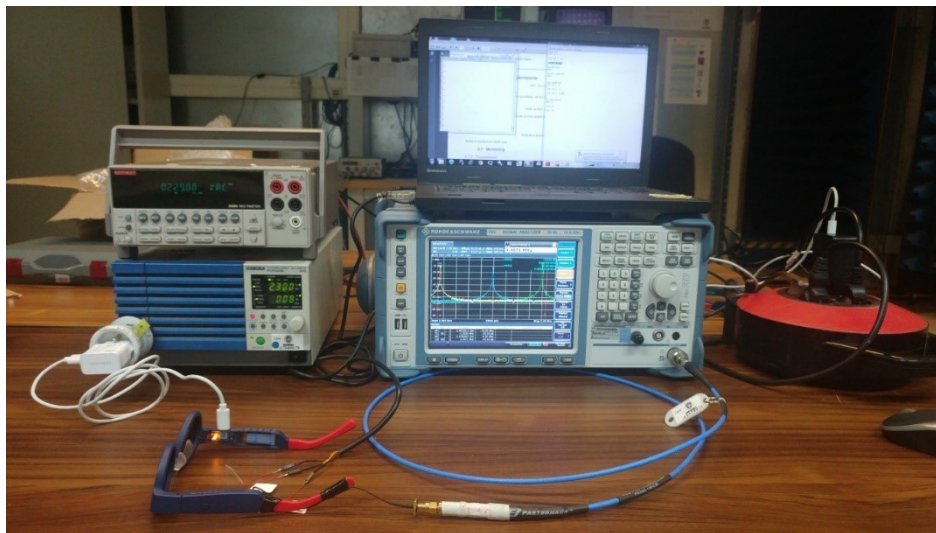
- ☒ Conducted Method
- ☐ Radiated Method

- 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

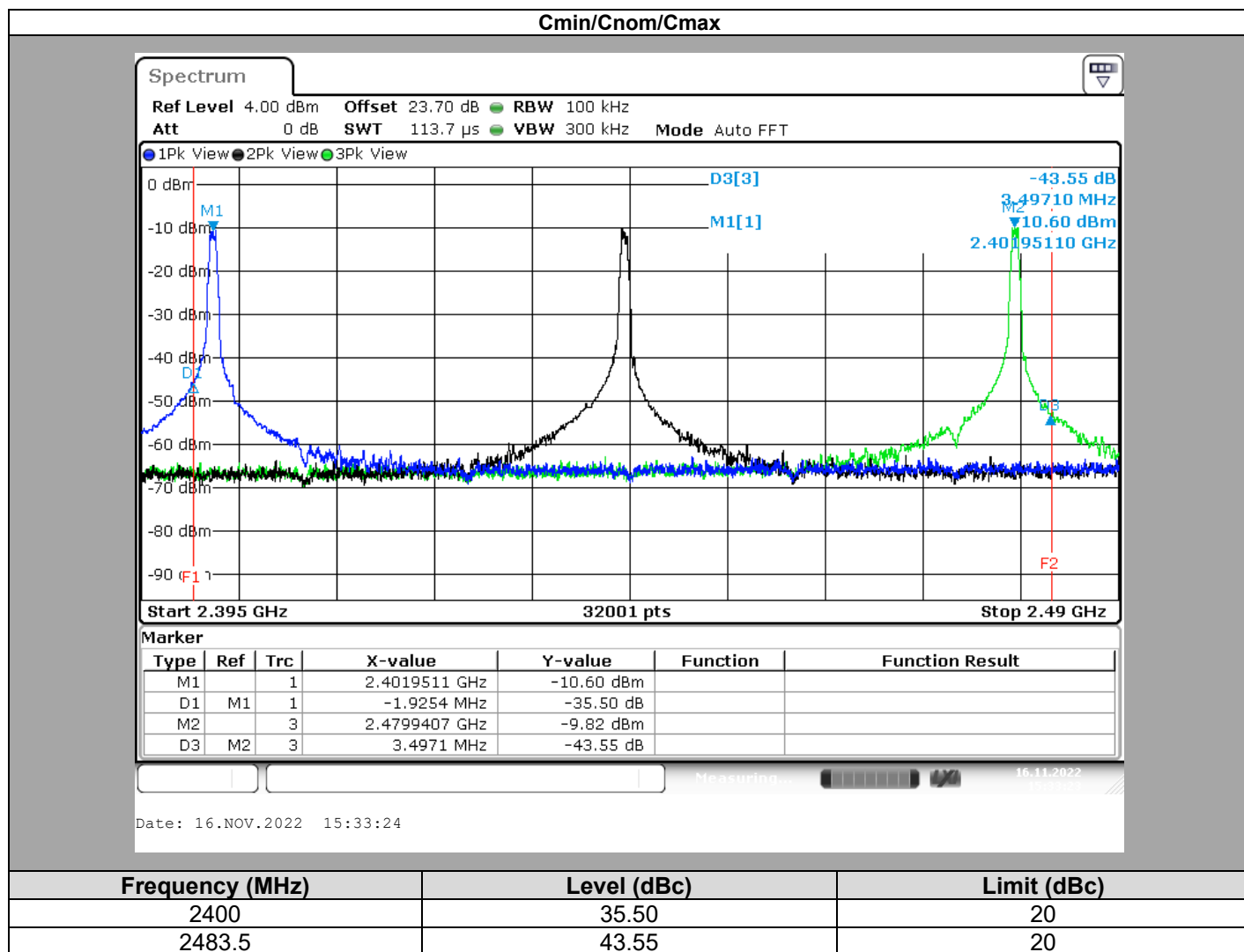
All Spurious Emissions must be at least 20dB (Maximum Conduced Power) below the Fundamental Radiator Level at the Band Edge "2400MHz & 2483,5MHz"

8.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Power supply	KIKUSUI	PCR500M	A7040079	See multimeter	
Multimeter	KEITHLEY	2000	A1242090	2021/03	2023/03
R&S Commander Software	ROHDE & SCHWARZ	Version 1.6.4	-	-	-
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2022/02	2024/02
Cable SONDE 028+ Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329973	2021/09	2023/09

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

8.5. RESULTS



8.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands at the band edge measurement performed on the sample of the product **LEXILENS ABLT02**, SN: **1505131B3B**, 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 : Julien Palard
Date of test : November 22, 2022
Ambient temperature : 25 °C
Relative humidity : 42 %

9.2. TEST SETUP

- The Equipment under Test is installed:

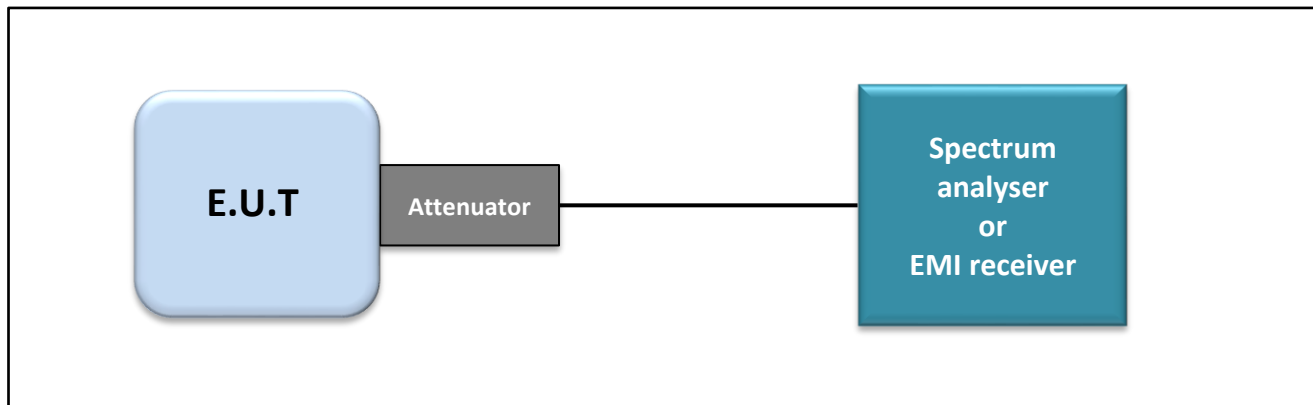
- ☒ On a table
- ☐ In an anechoic chamber

- 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

9.3. LIMIT

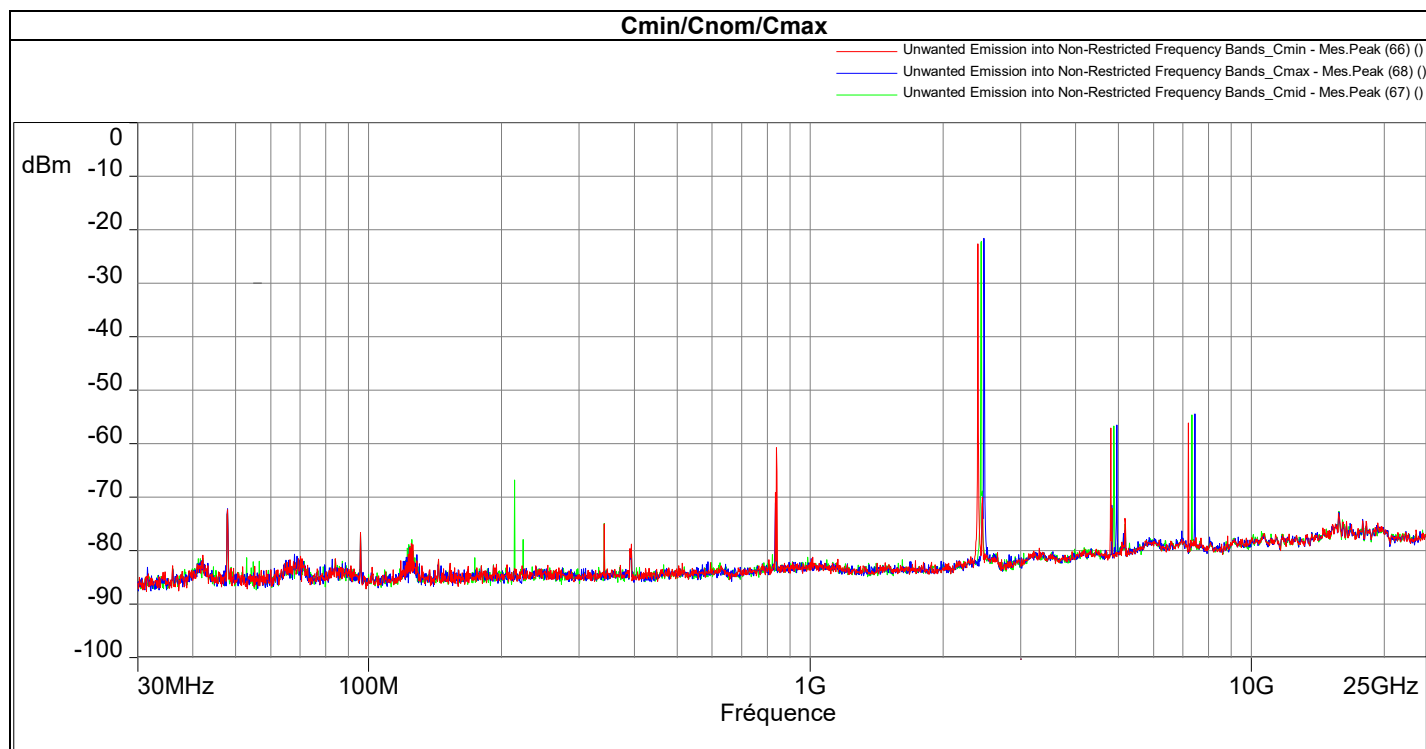
All Spurious Emissions must be at least 20dB (Maximum Conducted Power) below the Fundamental Radiator Level

9.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Power supply	KIKUSUI	PCR500M	A7040079	See multimeter	
Multimeter	KEITHLEY	2000	A1242090	2021/03	2023/03
BAT EMC Software	NEXIO	Version 3,19,1,18	-	-	-
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2022/02	2024/02
Cable S36 chamber	PASTERNAK	PE360-3000CM	A5329872	2022/05	2023/05
Attenuator 3dB Cable Spurious Conducted	-	WA54-3-12	A7122223	2021/09	2023/09
High Pass Filter 2,4GHz	WAINWRIGHT	WHK12-2494	A7484068	2021/08	2023/08

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	-22,6		
47,9	-72,3	49,7	20
95,8	-76,6	54	20
341,8	-75,0	52,4	20
838,9	-60,8	38,2	20
4804	-57,0	34,4	20
7206	-56,2	33,6	20
2442.00	-22,1		
47,9	-73,0	50,9	20
214,1	-66,8	44,7	20
341,8	-74,9	52,8	20
839,2	-70,7	48,6	20
4884	-56,7	34,6	20
7326	-54,6	32,5	20
2480.00	-21,6		
47,9	-72,1	50,5	20
95,8	-76,8	55,2	20
393,4	-79,5	57,9	20
833,8	-71,1	49,5	20
4960	-56,5	34,9	20
7440	-54,4	32,8	20



9.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands measurement performed on the sample of the product **LEXILENS ABLT02**, SN: **1505131B3B**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

10. AC POWER LINE CONDUCTED EMISSIONS

10.1. TEST CONDITIONS

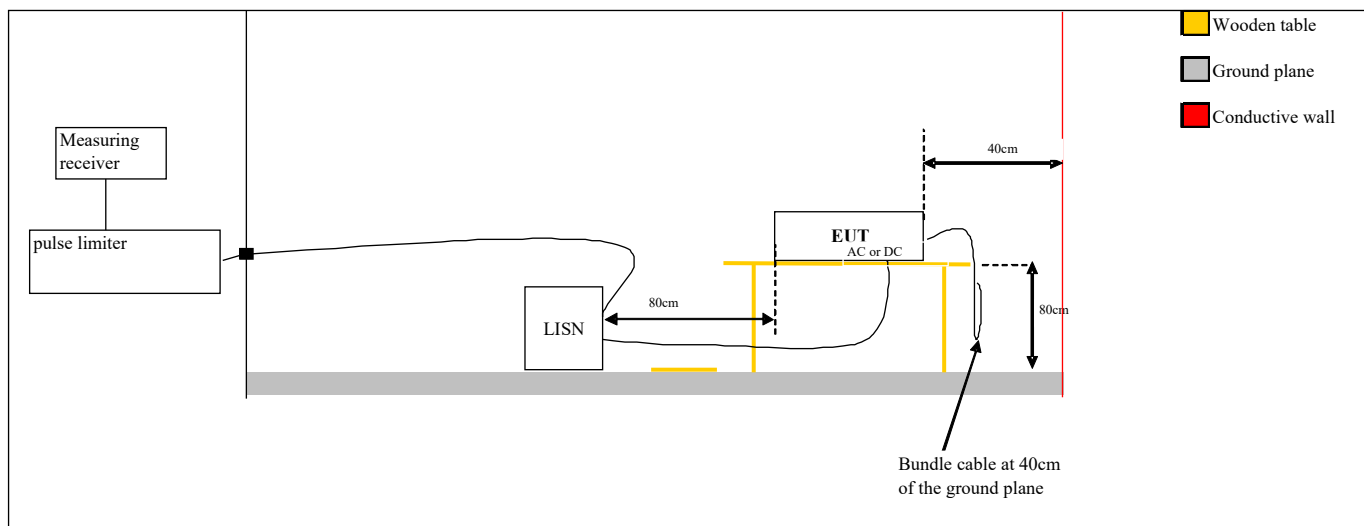
Test performed by : Laurent DENEUX
 Date of test : November 3, 2022
 Ambient temperature : 21 °C
 Relative humidity : 43 %

10.2. TEST SETUP

The product has been tested according to ANSI C63.10 method. The EUT is placed on the ground reference plane, at 80cm from the LISN. The distance between the EUT and the vertical ground plane is 40cm. Auxiliaries are powered by another LISN. The cable has been shorted to 1meter length. The EUT is powered through the LISN. Measurement is made with a receiver in peak mode. This was followed by a Quasi-Peak, i.e. CISPR measurement for any strong signal. If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary. The LISN (measure) is 50 Ω / 50 μ H. Interconnecting cables and equipment's were moved to position that maximized emission.

Voltage table used (for Power Line Conducted Emissions):

Type	Measurement performed:	
☒ AC / ☐ DC (Auxiliary used)	☒ 120VAC/60Hz	☒ 240VAC/50Hz
☐ USB (Laptop auxiliary)	☐ 120VAC/60Hz (Laptop auxiliary)	☐ 240VAC/50Hz(Laptop auxiliary)





Photograph for AC Power Line Conducted Emissions (Front view)



Photograph for AC Power Line Conducted Emissions

10.3. LIMIT

Frequency range	Level	Detector
0,15kHz to 0,5MHz	66dB μ V to 56 μ V*	QPeak
	56dB μ V to 46 μ V*	Average
0,5MHz to 5MHz	56dB μ V	QPeak
	46dB μ V	Average
5MHz to 30MHz	60B μ V	QPeak
	50dB μ V	Average

*Decreases with the logarithm of the frequency

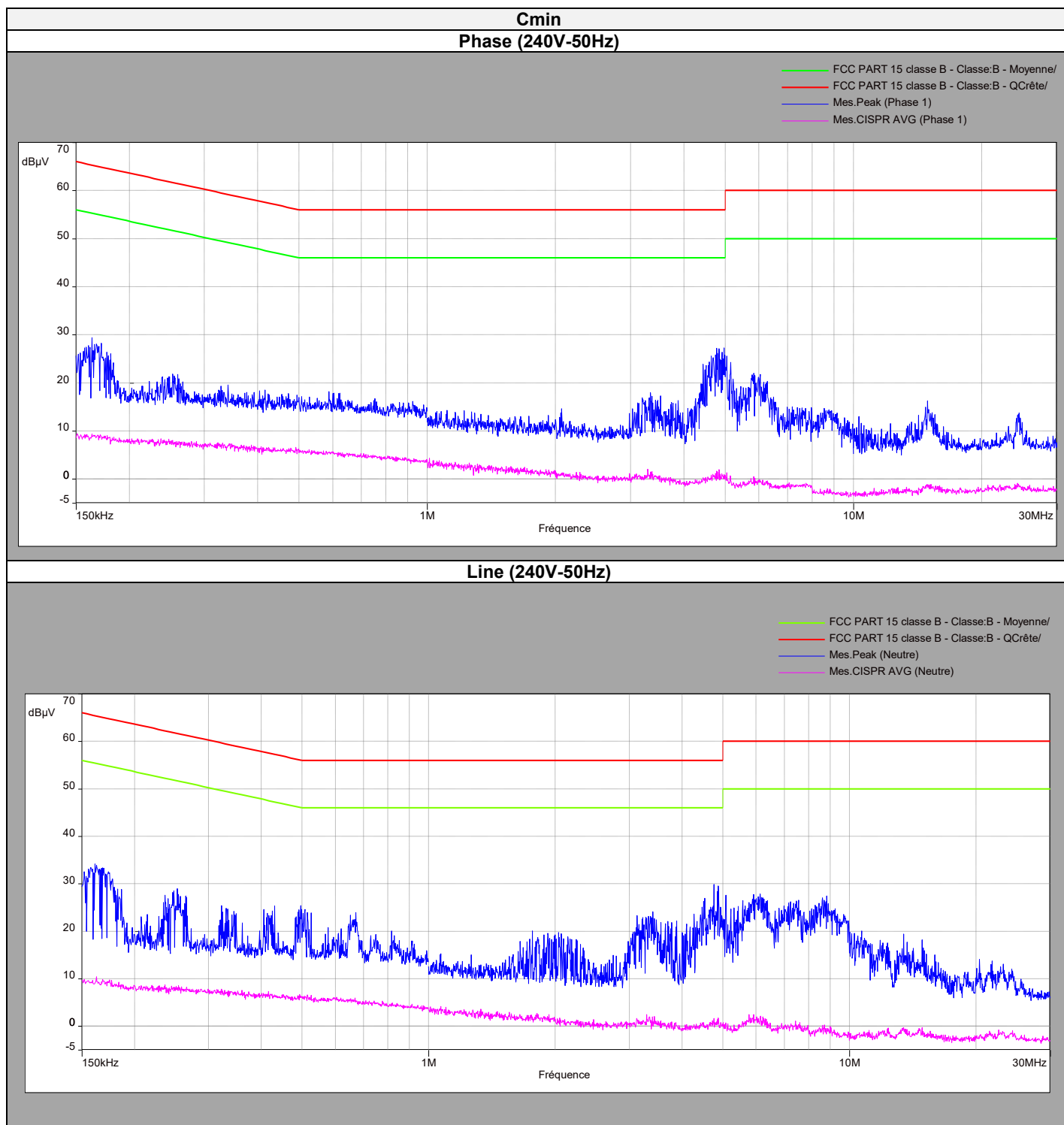
10.4. TEST EQUIPMENT LIST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Receiver	ROHDE & SCHWARZ	ESU	A2642018	2020/10	2022/12
Limiter	ROHDE & SCHWARZ	ESH3-Z2	A2649008	2022/06	2024/06
V ISLN	ROHDE & SCHWARZ	ESH2-Z5	C2322002	2021/11	2022/12
Absorber cable	LCIE	-	A5329589	2021/11	2023/11
Cable	-	-	A5329417	2021/11	2022/11
Power supply	DANA	DSC5000	A7044076	-	-
Software V3.19.1.21	NEXIO	BAT-EMC	-	-	-

10.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒ None ☐ Divergence:

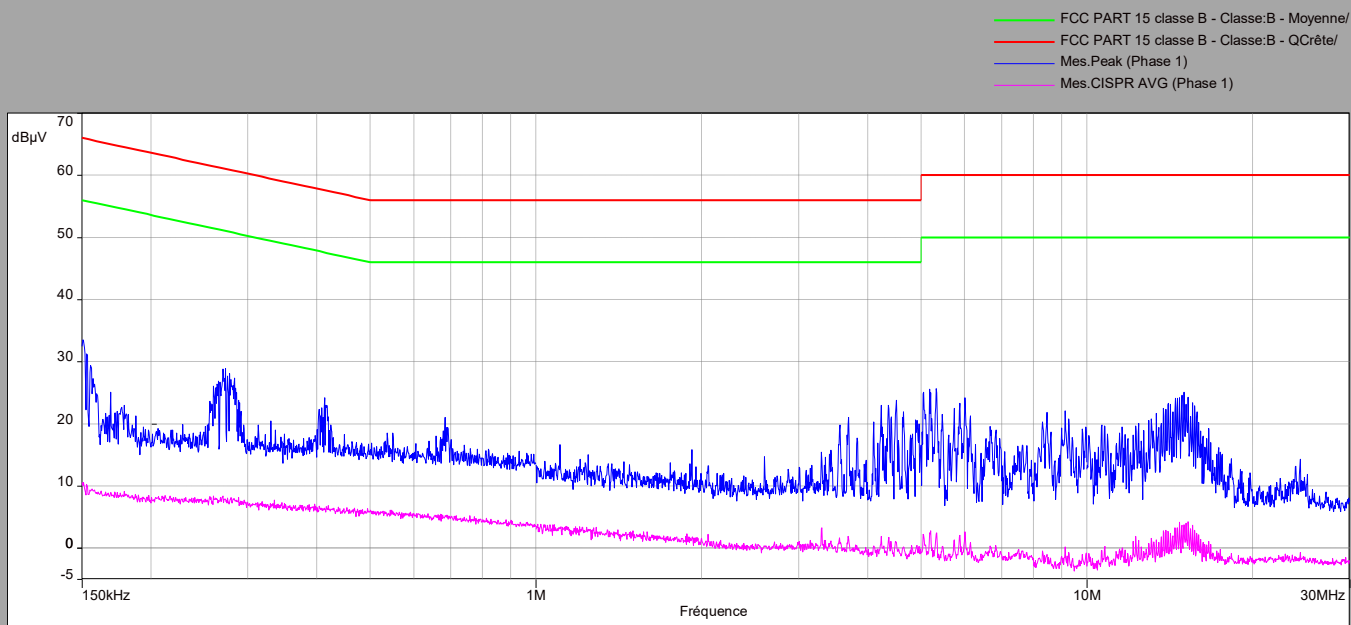
10.6. RESULTS



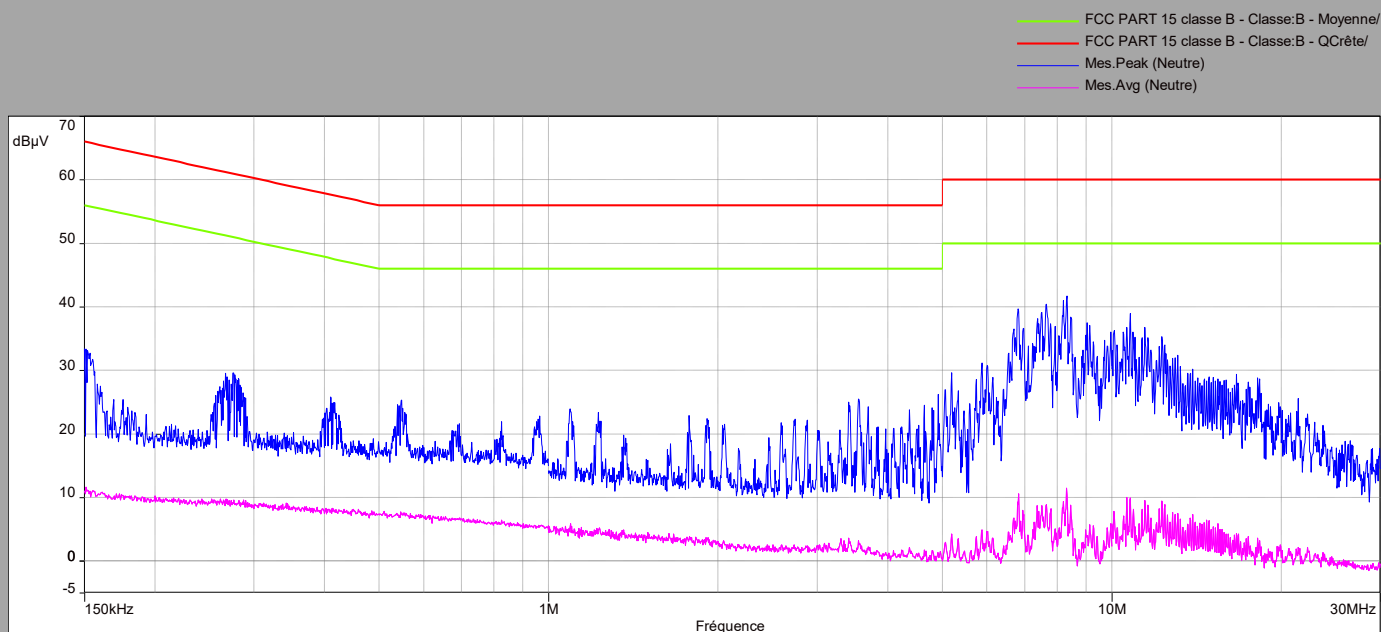
Phase Line							
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin Quasi-Peak (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0,15	25,6	-	66	40,4	8,6	56	47,4
0,6	17,7	-	56	38,3	5,2	46	40,8
3,33	18	-	56	38	2	46	44
4,97	27,3	-	56	28,7	2	46	44
14,9	16,3	-	60	43,7	-1	50	51

Neutral Line							
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin Quasi-Peak (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0,15	32,9	-	66	33,1	9,3	56	46,7
0,507	24,2	-	56	31,8	6,3	46	39,7
3,41	24	-	56	32	1,9	46	44,1
4,88	29,5	-	56	26,5	2	46	44
7,5	26	-	60	34	0	50	50

Cmin
Phase (120V-60Hz)



Line (120V-60Hz)



Phase Line							
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin Quasi-Peak (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0,15	33,5	-	66	32,5	10,1	56	45,9
0,685	21	-	56	35	5	46	41
4,5	22,8	-	56	33,2	3	46	43
5,33	25	-	60	35	2,5	50	47,5
14,73	24,2	-	60	35,8	15	50	35

Neutral Line							
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin Quasi-Peak (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0,15	33,4	-	66	32,6	11	56	45
0,548	25,3	-	56	30,7	7	46	39
3,56	25	-	56	31	3	46	43
6,83	39,5	-	60	20,5	10,5	50	39,5
8,32	41,7	-	60	18,3	11,5	50	38,5

10.7. CONCLUSION

Ac Power Line Conducted Emission measurement performed on the sample of the product **LEXILENS ABLT02**, SN: **1505131B3B**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 & RSS 247 ISSUE 2 limits.

11. UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

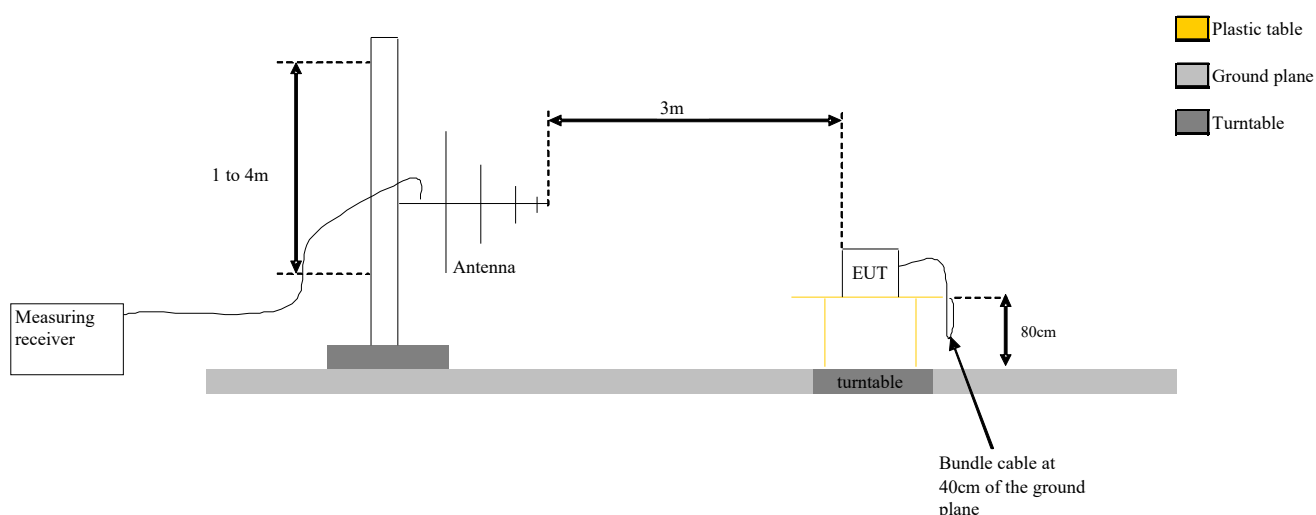
11.1. TEST CONDITIONS

Test performed by : Laurent DENEUX
 Date of test : November 3, 2022 to November 22, 2022
 Ambient temperature : 20 °C
 Relative humidity : 41 %

11.2. 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 :	Open Aera Test Site	Open Aera Test Site	Open Aera Test Site
Distance EUT-Antenna :	3m	3m	3m



Test Set up for radiated measurement in open area test site



Photograph for Unwanted Emission in restricted frequency bands (open area test site)

11.3. 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

11.4. TEST EQUIPMENT LIST

Description	Manufacturer	Model	Identifier	Last Calibration date	Calibration due date
Open test site	LCIE	-	F2000400	2022-02	2023-02
EMI Test Receiver	ROHDE & SCHWARZ	ESU	A2642018	2020-10	2022-12
Cable	-	-	A5329416	2022-02	2023-02
Cable	-	-	A5329368	2021-12	2022-12
Cable	-	-	A5329361	2021-12	2022-12
Loop antenna	R&S	HFH2-Z2	C2040269	2020-09	2022-12
Antenne bilog	CHASE	CBL 6112A	C2040040	2021-04	2022-04
Cable	-	-	A5330032	2022-08	2023-08
Cable	-	-	A5329449	2021-11	2022-11
Software V3.19.1.21	NEXIO	BAT-EMC	-	-	-
BAT EMC Software	NEXIO	Version 3,19,1,18	-	-	-
Full anechoic chamber	SIEPEL	-	D3044019	2019/10	2023/10
Preamplifier	LCIE	LCIE-ALB-001	A7080073	2021/02	2023/02
Logperiodic antenna	ROHDE & SCHWARZ	HL223	C2040174	2021/05	2023/05
Horn antenna	AH SYSTEMS	SAS 571	C2042041	2021/11	2023/11
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2021/12	2023/12
Cable S36 chamber	PASTERNAK	PE360-3000CM	A5329872	2022/02	2023/02
Cable S36 chamber	PASTERNAK	PE360-1000CM	A5329939	2022/02	2023/02
Cable S36 chamber	PASTERNAK	PE360-1500CM	A5329940	2022/02	2023/02
Cable S36 chamber	PASTERNAK	PE360-3000CM	A5329961	2022/02	2023/02
Attenuator 3dB Cable Spurious Conducted	-	WA54-3-12	A7122223	2021/09	2023/09
High Pass Filter 2.4GHz	WAINWRIGHT	WHK12-2494	A7484068	2021/08	2023/08

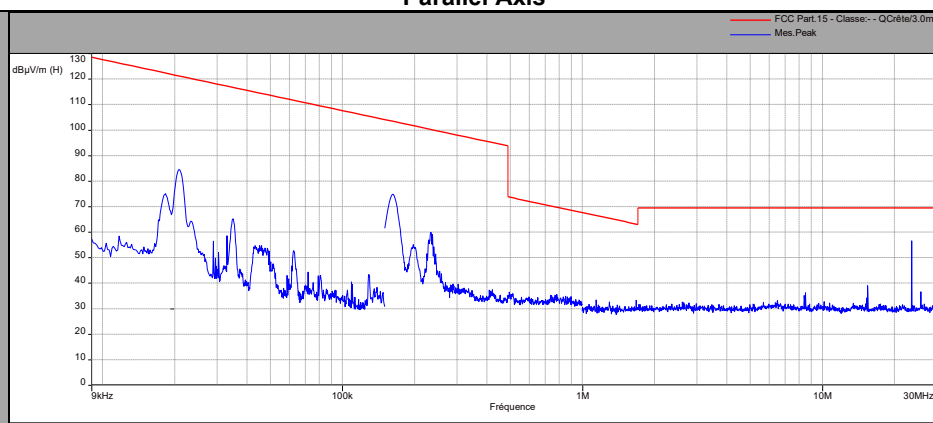
11.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒ None ☐ Divergence:

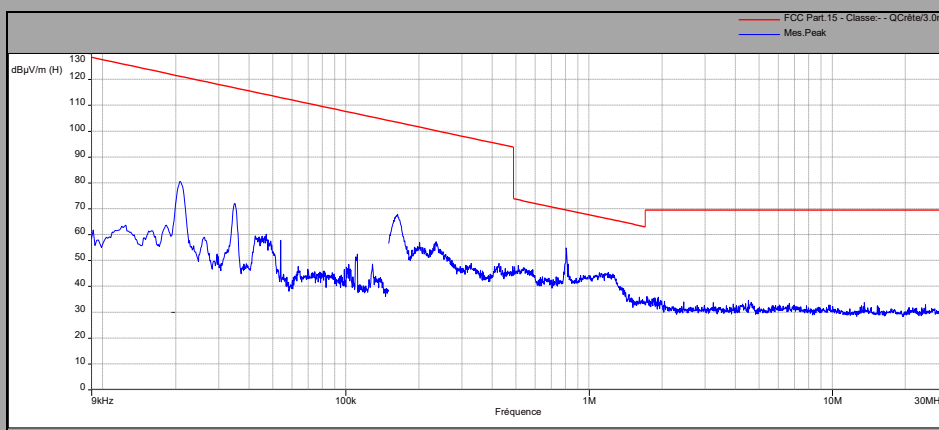
11.6. RESULTS

9kHz to 30MHz

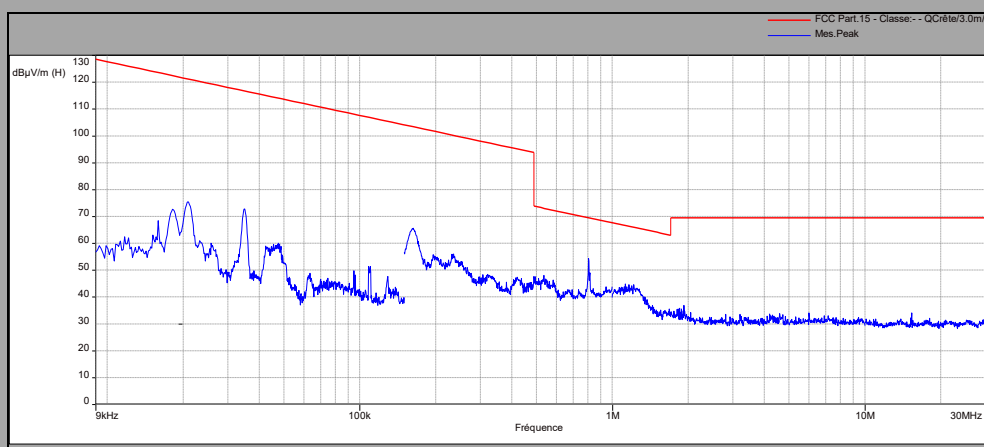
Parallel Axis

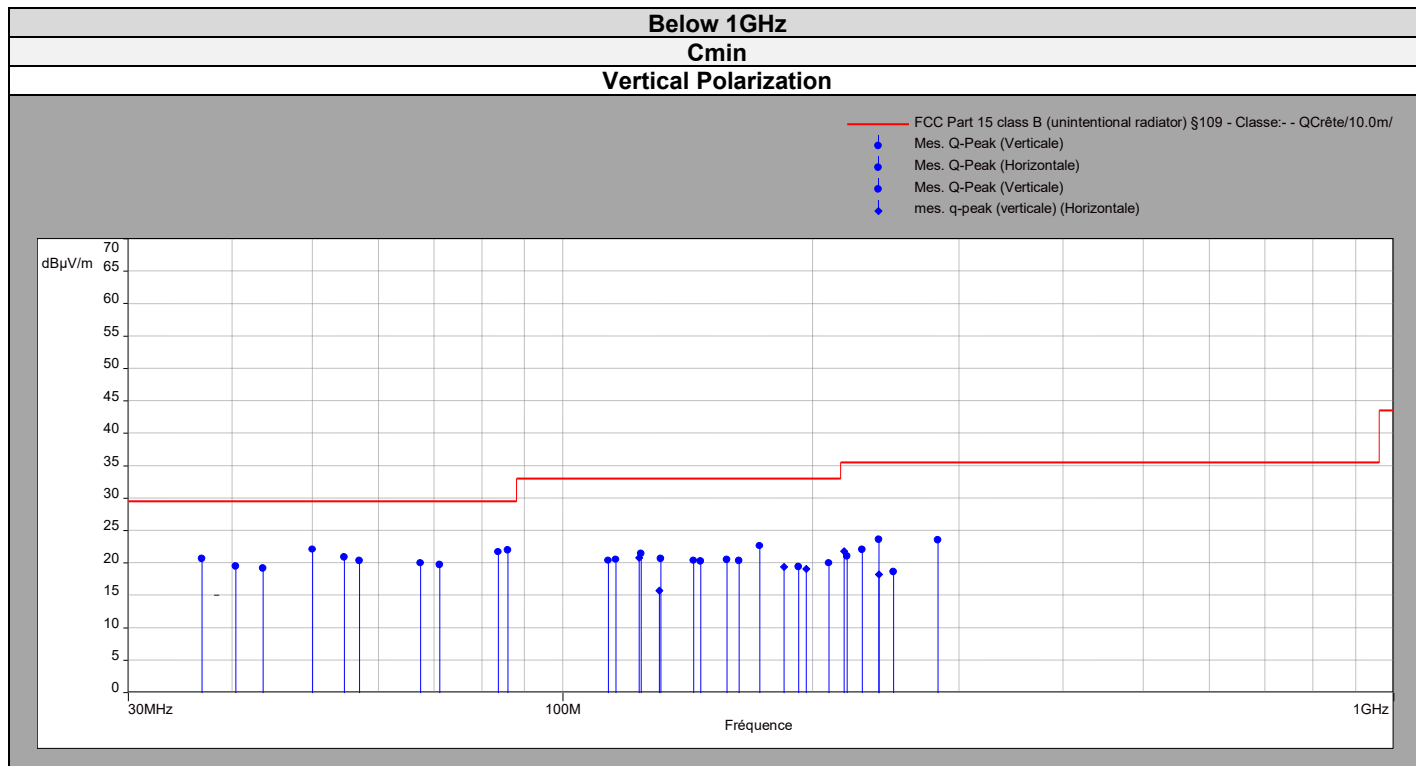


Perpendicular Axis



Ground Parallel Axis



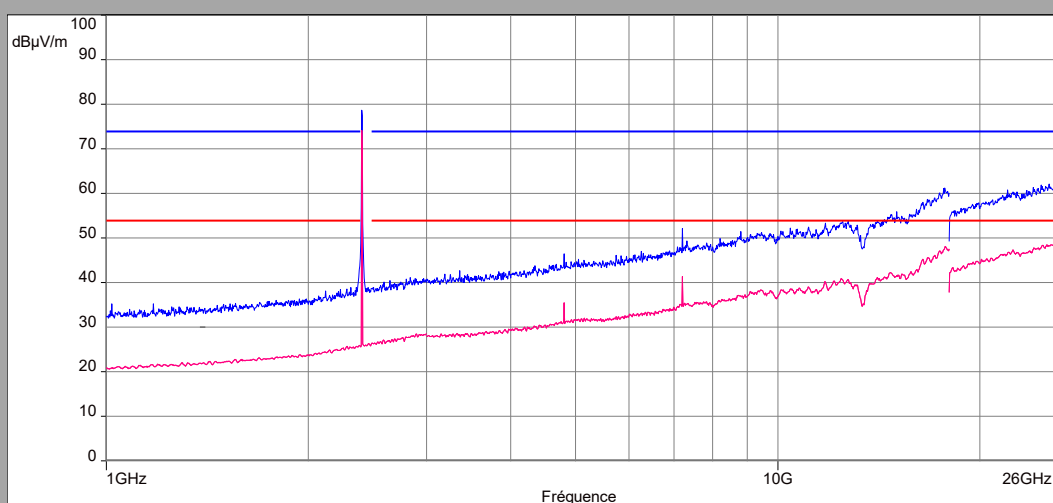


Above 1GHz

Cmin

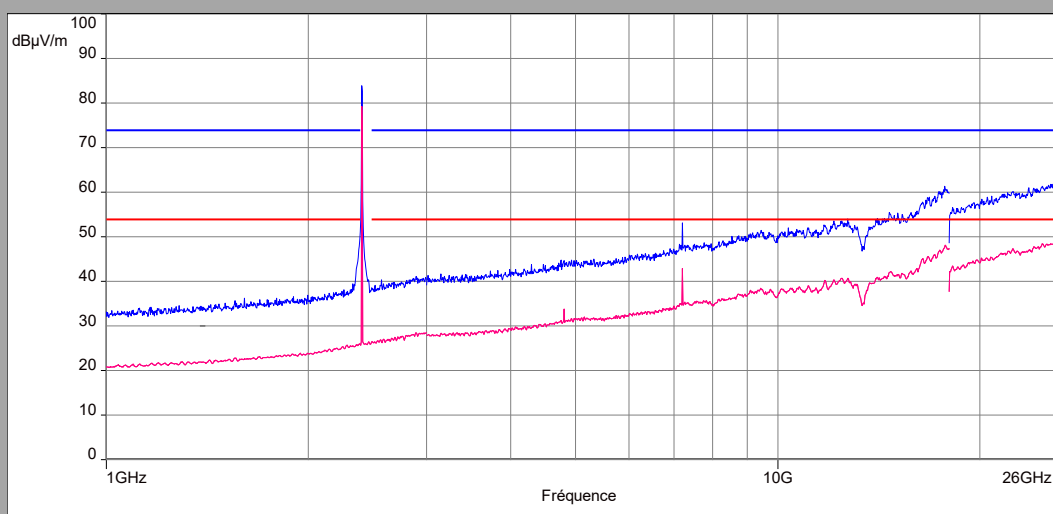
Vertical Polarization

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

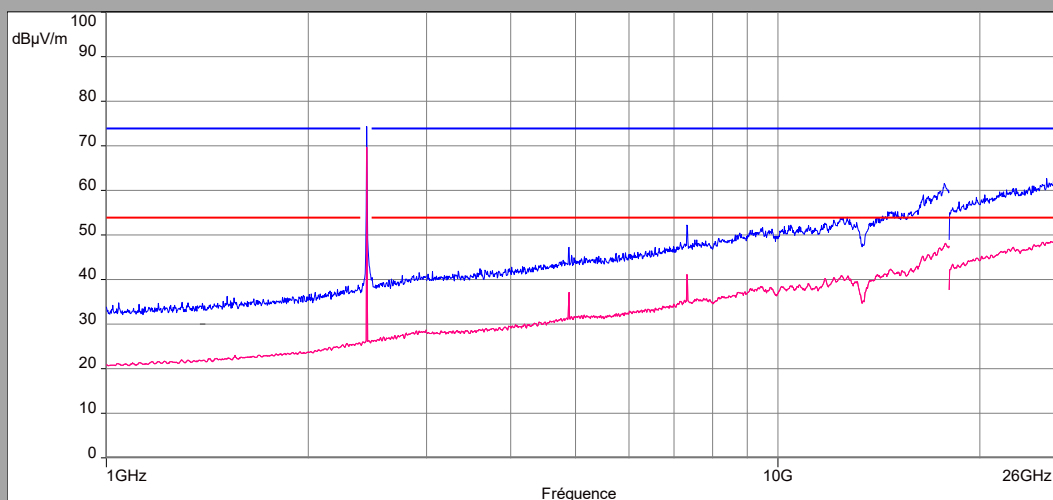


Above 1GHz

Cnom

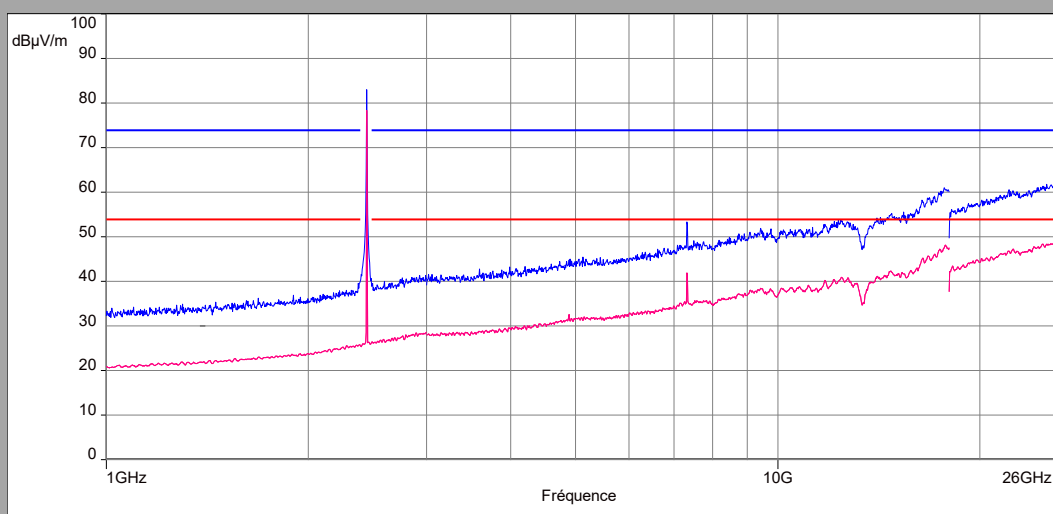
Vertical Polarization

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

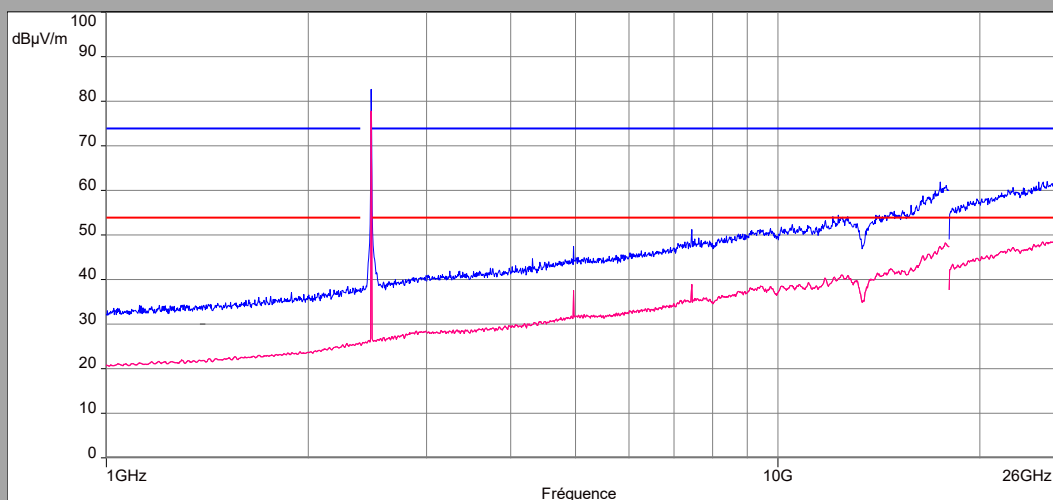


Above 1GHz

Cmax

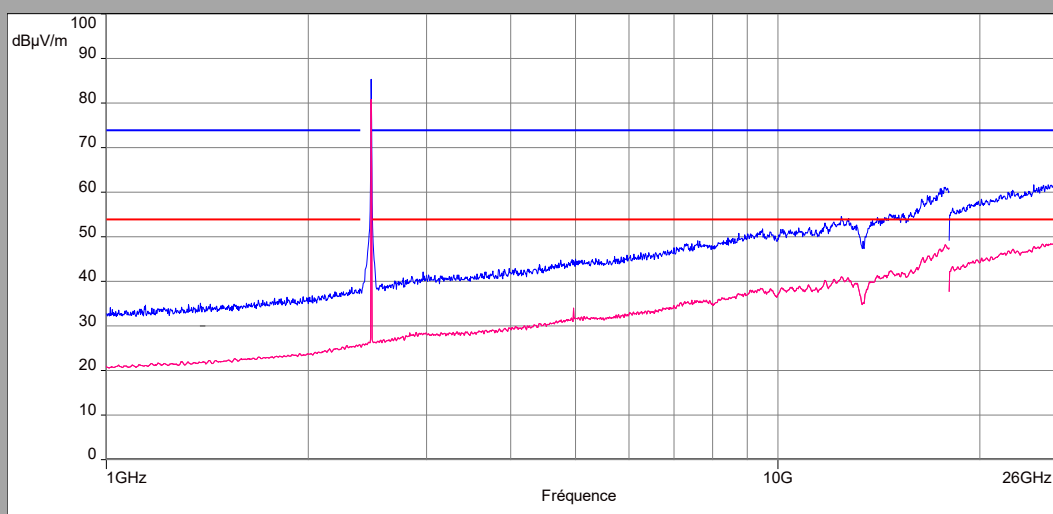
Vertical Polarization

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

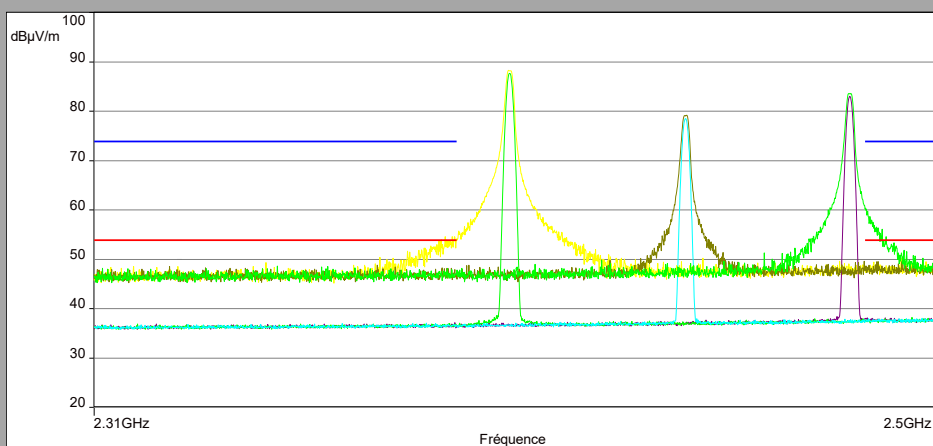


Above 1GHz Zoom 2310MHz-2500MHz

Cmin/Cnom/Cmax

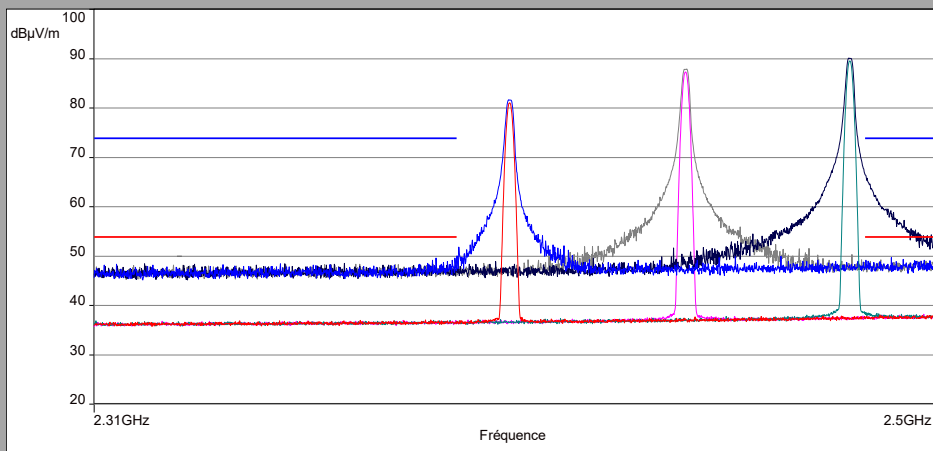
Vertical Polarization

- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
- BLE Cmax / Mode 4.2 / TARGET = 3 - Mes.Peak (236) - Verticale (Verticale)
- BLE Cnom / Mode 4.2 / TARGET = 3 - Mes.Avg (235) - Verticale (Verticale)
- BLE Cnom / Mode 4.2 / TARGET = 3 - Mes.Peak (235) - Verticale (Verticale)
- BLE Cmin / Mode 4.2 / TARGET = 3 - Mes.Avg (234) - Verticale (Verticale)
- BLE Cmax / Mode 4.2 / TARGET = 3 - Mes.Avg (236) - Verticale (Verticale)
- BLE Cmin / Mode 4.2 / TARGET = 3 - Mes.Peak (234) - Verticale (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/
- BLE Cmin / Mode 4.2 / TARGET = 3 - Mes.Avg (234) - Horizontale (Horizontale)
- BLE Cmax / Mode 4.2 / TARGET = 3 - Mes.Avg (236) - Horizontale (Horizontale)
- BLE Cmin / Mode 4.2 / TARGET = 3 - Mes.Peak (234) - Horizontale (Horizontale)
- BLE Cmax / Mode 4.2 / TARGET = 3 - Mes.Peak (236) - Horizontale (Horizontale)
- BLE Cnom / Mode 4.2 / TARGET = 3 - Mes.Avg (235) - Horizontale (Horizontale)
- BLE Cnom / Mode 4.2 / TARGET = 3 - Mes.Peak (235) - Horizontale (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	36.8	-	20.6	29.5	8.9
Vertical	50	-	22.1	29.5	7.4
Vertical	172.73	-	22.67	33	10.33
Vertical	240	-	23.56	35.5	11.94
Horizontal	163.1	-	20.32	33	12.68
Horizontal	282.9	-	23.51	35.5	11.99

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)
Horizontal	2390	35,8	40,1	54	13,9	51,8	74	22,2
Vertical	2390	36,1	40,4	54	13,6	55,7	74	18,3
Horizontale	2483.5	37,7	42	54	12	66,4	74	7,6
Verticale	2483.5	37,3	41,6	54	12,4	60,2	74	13,8
Horizontal	4804	33,8	38,1	54	15,9	44,7	74	29,3
Verticale	4804	35,4	39,7	54	14,3	46,4	74	27,6
Horizontal	4882	32,6	36,9	54	17,1	45	74	29
Verticale	4882	37,2	41,5	54	12,5	47,3	74	26,7
Horizontal	4960	33,9	38,2	54	15,8	45,1	74	28,9
Verticale	4960	37,6	41,9	54	12,1	47,5	74	26,5
Horizontal	7206	42,9	47,2	54	6,8	53,1	74	20,9
Verticale	7206	41,3	45,6	54	8,4	52,1	74	21,9
Horizontal	7326	41,3	45,6	54	8,4	53,3	74	20,7
Verticale	7326	41,1	45,4	54	8,6	52,2	74	21,8
Horizontal	7440	35,8	40,1	54	13,9	48,5	74	25,5
Verticale	7440	38,9	43,2	54	10,8	51,2	74	22,8

11.7. CONCLUSION

Unwanted Emission in restricted frequency bands measurement performed on the sample of the product **LEXILENS ABLT02**, SN: **1505131B3B**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 & RSS 247 ISSUE 2 limits.

12. UNCERTAINTIES CHART

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