



LCIE



Accreditation
N°1-0312
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TEST REPORT

N°: 174694 - 772593

Version : 03

Subject

Electromagnetic compatibility (EMC):
47 CFR Part 15.107 & Part 15.109
Subpart B of 2021
ANSI C63.4 of 2014
ICES-003 issue 7 of 2020 (RU)

Issued to

ABEYE
27 Rue Buffon
21200 - BEAUNE
FRANCE

Apparatus under test

↳ Product	LEXILENS JCV5S2
↳ Trade mark	LEXILENS
↳ Manufacturer	ABEYE
↳ Model under test	ABLTO2
↳ Serial number	1505131B3B
↳ FCC ID	2A9XX-ABLTO2
↳ IC ID	30009-ABLTO2

Test date

Test Site
Registration Number
Designation Number

November 3, 2022

6500A-1 & 6500A-3

582868

FR0010

Test location

LCIE, Fontenay Aux Roses & Ecouelles

Test performed by

Laurent Deneux

Composition of document

28 pages

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February 15, 2023

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December 21, 2023

Written by :

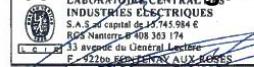
Laurent Deneux

Tests operator

Approved by :

Julien Bouthaud

Technical manager



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PUBLICATION HISTORY

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.

Version	Date	Author	Modification
01	February 15, 2023	Laurent DENEUX	Creation of the document
02	October 30, 2023	Laurent DENEUX	Change of address on page 1
03	December 21, 2023	Laurent DENEUX	Addition of the test location, registration number and the test site on page 1

Date of receipt of test item:
October 27, 2022



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SUMMARY

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1. Test Program

References

- ✓ CFR 47 Part 15 Subpart B - Radio frequency devices - Unintentional radiators 2021
- ✓ ICES -003 issue 7 of 2020
- ✓ ANSI 63.4 of 2014

Emission tests:

Test Description	Main characteristics	Test result - Comments
Measurement of radiated electric field in shielded room 15.109 (a), (b) & (c)	<input type="checkbox"/> Class A <input type="checkbox"/> Class B	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input checked="" type="checkbox"/> NP (Limited Program)
Measurement of radiated electric field in open space	<input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
Measurement of conducted disturbance on the AC main power port 15.107 (a) (c) (d)	<input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA (1) <input type="checkbox"/> NP (Limited Program)

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

The product is compliant according to CFR 47 Part 15 Subpart B - Radio frequency devices - Unintentional radiators & ICES -003 standards.

PASS: EUT complies with standard's requirement

FAIL: EUT does not comply with standard's requirement

NA: Not Applicable

NP: Test Not Performed



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2. Equipment Description (declared by provider)

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT): ABLT02

Serial Number: 1505131B3B



Equipment Under Test



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Inputs/outputs - Cable:

Access	Inputs / Outputs	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Data	Input	USB	2		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Power supply	OTTERBOX 78-51415	-	No tested

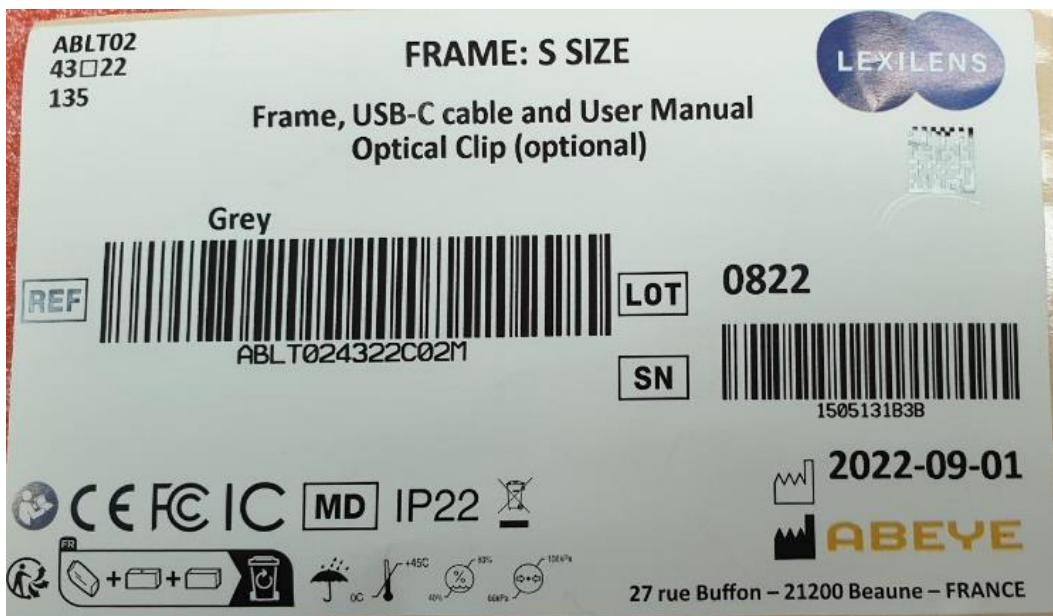
Equipment information: (Declared by provider)

Apparatus Description	Junior care glasses			
Type of power source:	<input checked="" type="checkbox"/> AC power supply	<input type="checkbox"/> DC power supply	<input type="checkbox"/> Battery (Select Type)	
Test source voltage:	Vmin-Vmax:	<input checked="" type="checkbox"/> 240 - 120 V / 50 - 60 Hz	<input type="checkbox"/> 5 VDc	
Operating Modes	Mode 1	paired and powered at 240V-50Hz		
	Mode 2	paired and powered at 120V-60Hz		
	Mode 3	-		
	Mode 4	-		
Highest internal frequency (PLL, Quartz, Clock, Microprocessor...):	F _{Highest} :		NC	MHz



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2.2. EQUIPMENT LABELLING



Equipment Labelling

2.3. EQUIPMENT MODIFICATIONS

None Modification:

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2.4. 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.

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

2.5. 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 dB μ V/m

FS_{max} is the measured field strength, expressed in dB μ V/m

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

d_{limit} is the reference limit distance



3. Measurement of radiated emissions

3.1. ENVIRONMENTAL CONDITIONS

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

3.2. TEST SETUP

Specifications:

Frequency	30 – 1000 MHz	RBW 120 kHz
	1-18GHz	RBW 1MHz
Detector	Peak and Quasi-Peak	

Pre characterization in semi anechoic room is performed to define the critical frequencies

Operating conditions:

- The Equipment under Test is installed:

Measure in semi anechoic room
 Measure in open area site

- Measuring distance:

3m
 10m

- Deviation method:

Yes
 No

-Product installation:

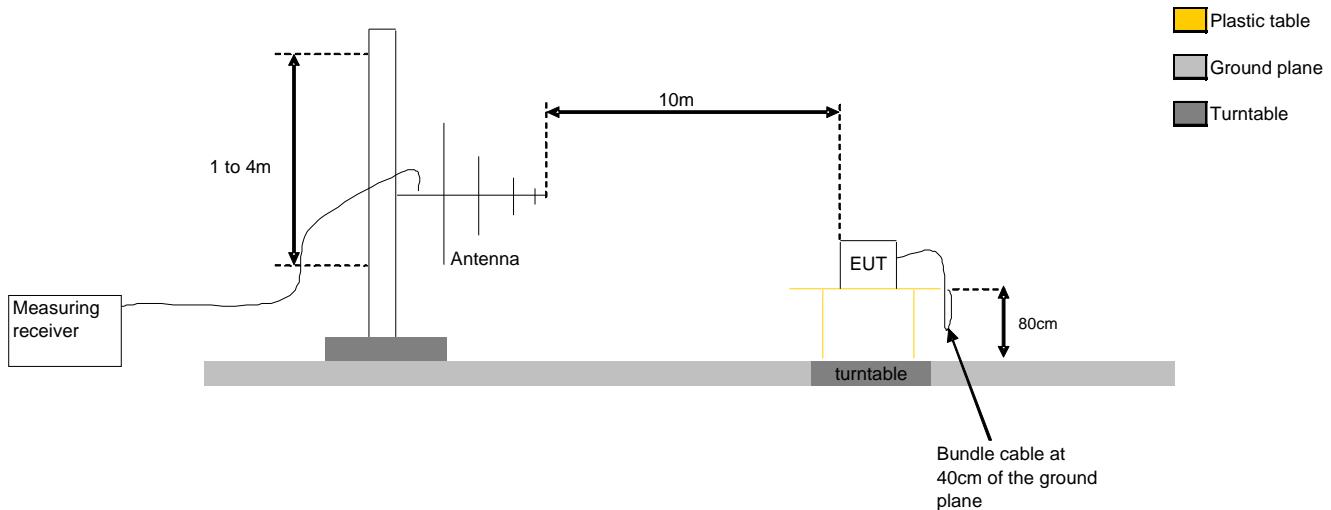
The EUT was tested as a tabletop equipment and was placed on a non-conducting platform the top of which is 0.8m above the metal ground plane.
 The EUT is at 10cm height from reference plane

Operating mode:

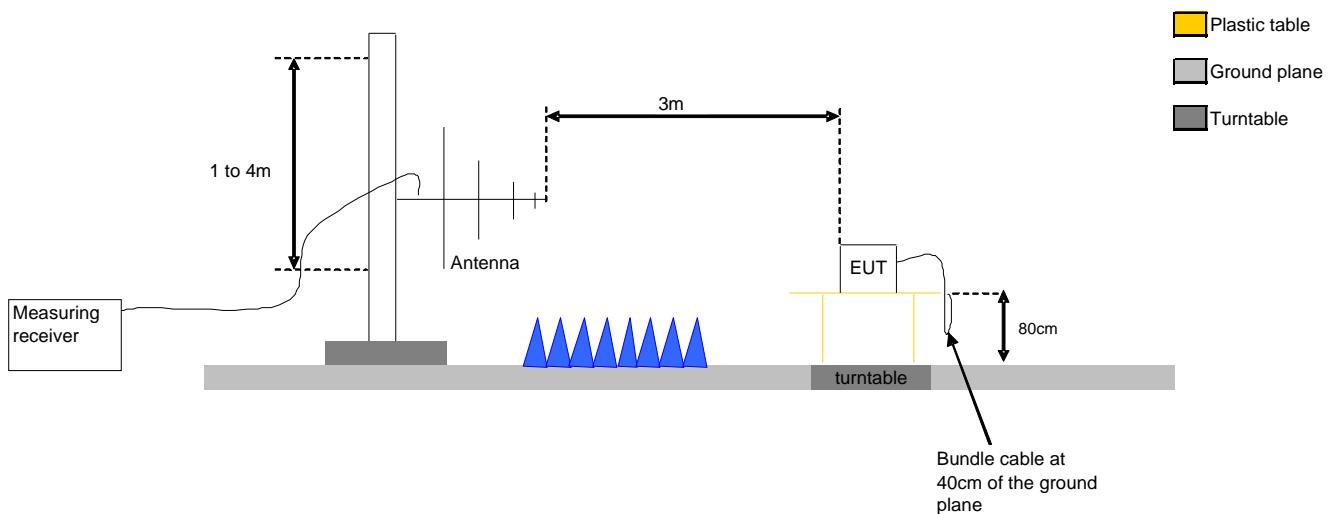
Mode 1 Mode 2 Mode 3 ...



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Test Set up for radiated measurement in open area test site below 1GHz



Test Set up for radiated measurement in open area test site above 1GHz

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Measurement of radiated disturbances.

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Measurement of radiated disturbances.

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3.3. LIMIT FOR FCC

Class A in open area test site

Frequency Bands/frequencies	dB (µV/m) quasi-peak	dB (µV/m) peak	dB (µV/m) average	Distance
30-88MHz	39.5	-	-	10m
88 – 216MHz	43.9	-	-	10m
216 – 960 MHz	46.9	-	-	10m
960 – 1000 MHz	50	-	-	10m
1000-6000MHz	-	80	60	3m

Class B in open area test site

Frequency Bands/frequencies	dB (µV/m) quasi-peak	dB (µV/m) peak	dB (µV/m) average	Distance
30-88MHz	30	-	-	10m
88 – 216MHz	33.5	-	-	10m
216 – 960 MHz	36	-	-	10m
960 – 1000 MHz	43.9	-	-	10m
1000-6000MHz	-	74	54	3m



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3.4. LIMIT FOR IECS 003

Class A in open area test site

Frequency Bands/frequencies	dB (μ V/m) quasi-peak	dB (μ V/m) peak	dB (μ V/m) average	Distance
30-88MHz	40	-	-	10m
88 – 216MHz	43.5	-	-	10m
216 – 230 MHz	46.4	-	-	10m
230 – 960 MHz	47	-	-	10m
960 – 1000 MHz	49.5	-	-	10m
1000-6000MHz	-	80	60	3m

Class B in open area test site

Frequency Bands/frequencies	dB (μ V/m) quasi-peak	dB (μ V/m) peak	dB (μ V/m) average	Distance
30-88MHz	30	-	-	10m
88 – 216MHz	33.1	-	-	10m
216 – 230 MHz	35.6	-	-	10m
230 – 960 MHz	37	-	-	10m
960 – 1000 MHz	43.5	-	-	10m
1000-6000MHz	-	74	54	3m

3.5. TEST EQUIPMENT LIST

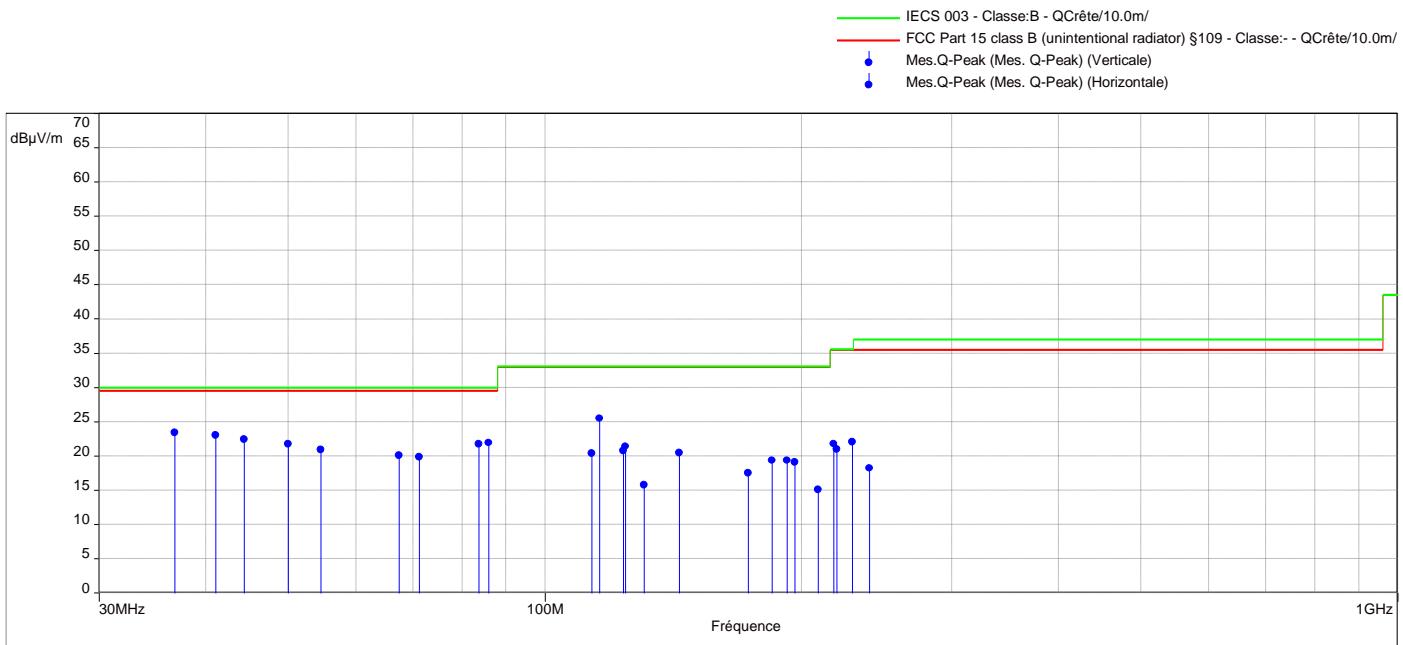
Description	Manufacturer	Model	Identifier	Last Calibration date	Calibration due date
Open test site	LCIE	-	F2000400	2022-02	2023-02
EMI Test Receiver	ROHDE & SCHWARZ	ESU	A2642018	2020-10	2022-12
Cable			A5329368	2021-12	2022-12
Preamplifier	BONN	BLNA 3018-8F305	A7080053	2021-11	2023-11
Horn antenna	EMCO	3115	C2042016	2020-04	2023-04
Cable	-	-	A5329542	2021-11	2022-11
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	-	-	-



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3.6. RESULTS

Diagram N°1
Quasi peak measurement
Vertical & horizontal Polarization (30MHz-1GHz)



	Frequency (MHz)	level (dBμV/m)	limit FCC class B	Margin Fcc Part class B	IECS003 class B	Margin IECS003 class B
Vertical	36.8	23.4	29.5	6.1	30	6.6
Vertical	44.4	22.4	29.5	7.1	30	7.6
Vertical	85.9	21.9	29.5	7.6	30	8.1
Vertical	229.2	22	35.5	13.5	35.1	13.1
Horizontal	115.9	25.5	33	7.5	33.1	7.6
Horizontal	218.1	21.8	35.5	13.7	35.1	13.3

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Diagram N°2
Peak measurement
Vertical & horizontal Polarization (1GHz-18GHz)

— FCC Part 15 (intentional radiator) §209 - Classe:- - Crête/3.0m/
● Mes.Peak (Mes. peak) (Verticale)
● Mes.Peak (Mes. peak) (Horizontale)

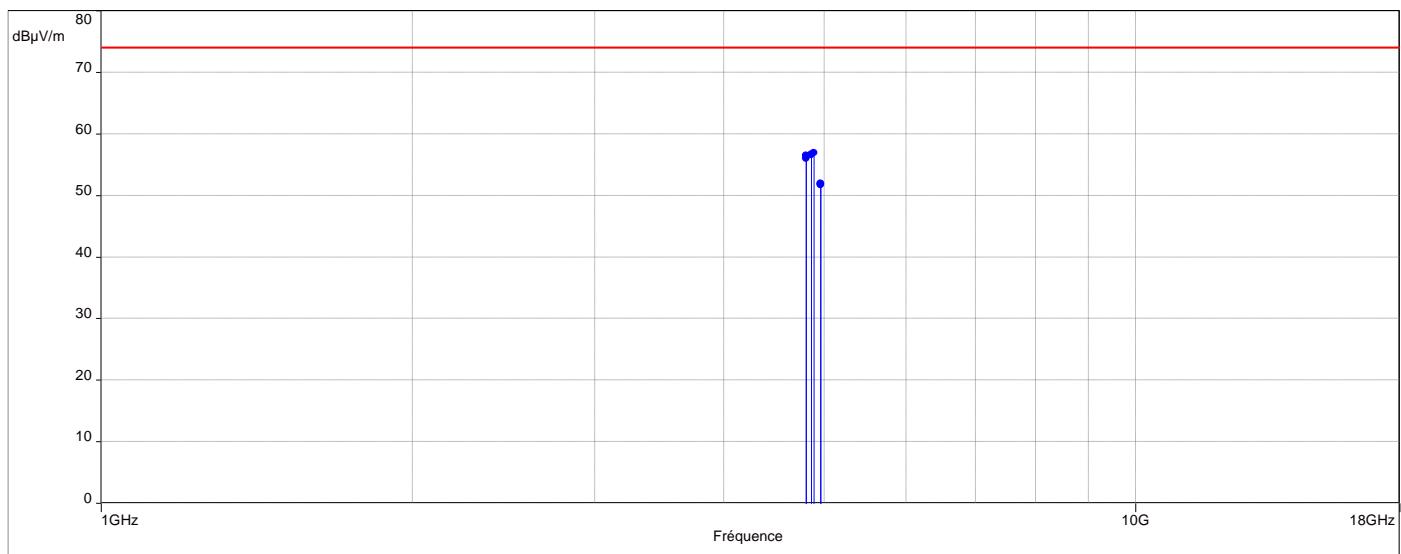
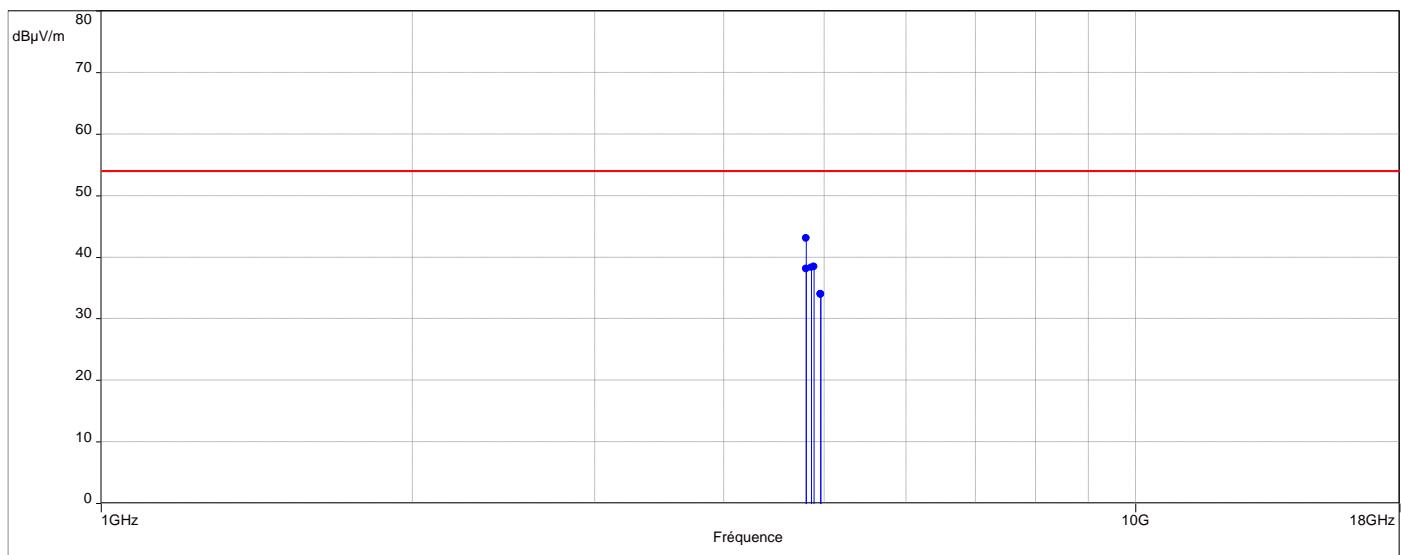


Diagram N°3
Average value
Vertical & horizontal Polarization (1GHz-18GHz)

— FCC Part 15 (intentional radiator) §209 - Classe:- - Moyenne/3.0m/
● Mes.Avg (Mes. Avg) (Verticale)
● Mes.Avg (Mes. Avg) (Horizontale)



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	Frequency (MHz)	level peak (dB μ V/m)	level average (dB μ V/m)	limit peak FCC Part.15	Margin peak FCC Part .15	limit average FCC Part.15	Margin Average FCC Part.15
Vertical	4803.4	56.01	38.08	63.5	7.49	43.5	5.42
Vertica	4884.1	56.94	38.49	63.5	6.56	43.5	5.01
Vertica	4960	51.95	33.99	63.5	11.55	43.5	9.51
Horizontal	4803.9	56.51	43.09	63.5	6.99	43.5	0.41
Horizontal	4861	56.61	38.38	63.5	6.89	43.5	5.12
Horizontal	4959.86	51.76	33.99	63.5	11.74	43.5	9.51

3.7. CONCLUSION

Measures of Radiated Emission, performed on the sample of the product ABLT02, SN: 1505131B3B, in configuration and description presented in this test report, show levels conform to the FCC part 15 & ICES -003 limits.



4. Measurement of conducted disturbance

4.1. ENVIRONMENTAL CONDITIONS

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

4.2. TEST SETUP

Specifications:

Frequency 0.15 – 30 MHz RBW 9 kHz
Detector Peak , Quasi Peak and average

The measurement is performed on power supply with a LISN and telecommunication lines with RSI or current clamp for shielded cables.

Operating conditions:

- Deviation method:

Yes
 No

-Product installation:

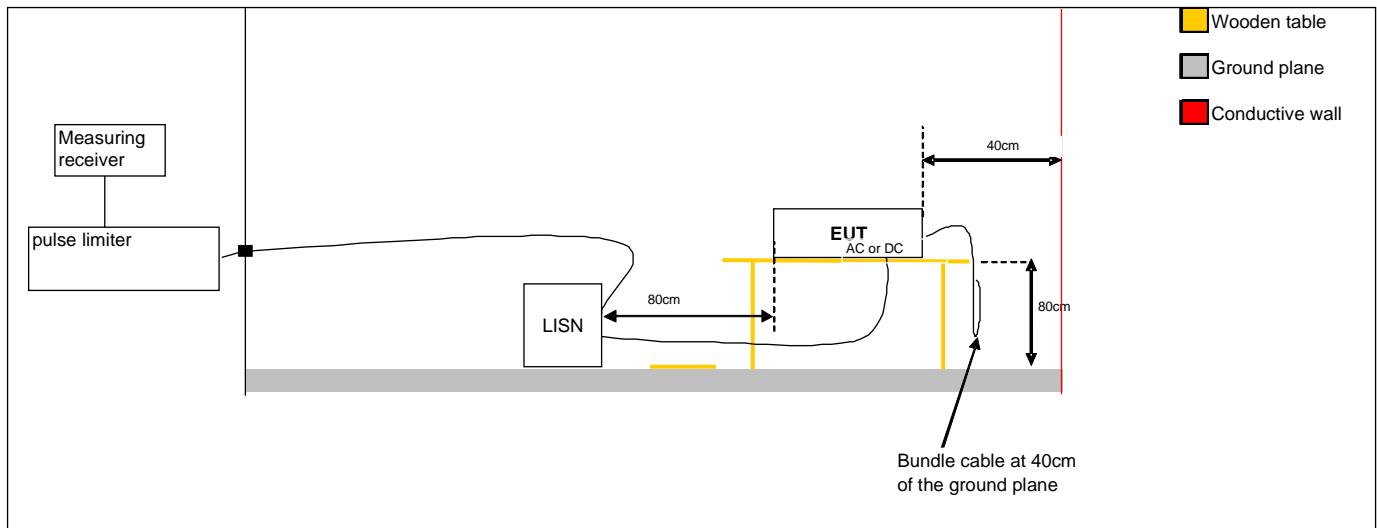
The EUT is installed on a wooden table 80 cm above the reference plane, at 80cm of the LISN and at 40cm of the vertical conductive wall
 The EUT is installed on a wooden table 40 cm above the reference plane, at 80cm of the LISN.
 The EUT is installed 10 cm above the reference plane, at 80cm of the LISN.

Operating mode:

Mode 1 Mode 2 Mode 3 ...



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Test set up of conducted emission on power supply



Test set up of conducted emission on power supply

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Test set up of conducted emission on power supply

4.3. LIMIT

Power supply Class A

Frequency Bands/frequencies	dB (µV/m) quasi-peak	dB (µV/m) average
0.15-0.5MHz	79	66
0.5-30 MHz	73	60

Power supply Class B

Frequency Bands/frequencies	dB (µV/m) quasi-peak	dB (µV/m) average
0.15-0.5MHz	66-56	56-46
0.5-5 MHz	56	46
5-30 MHz	60	50

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4.4. 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	-	-	-

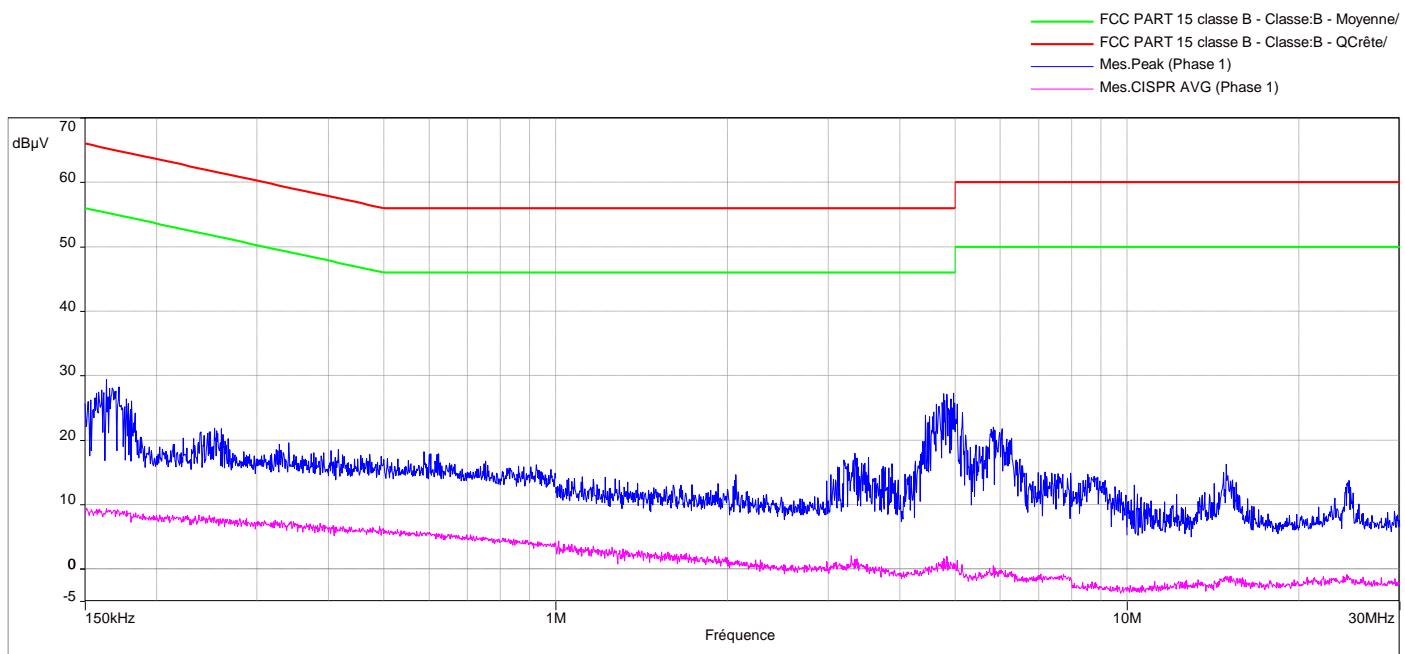


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4.5. RESULTS

Diagram N°1

Phase 240V/50Hz



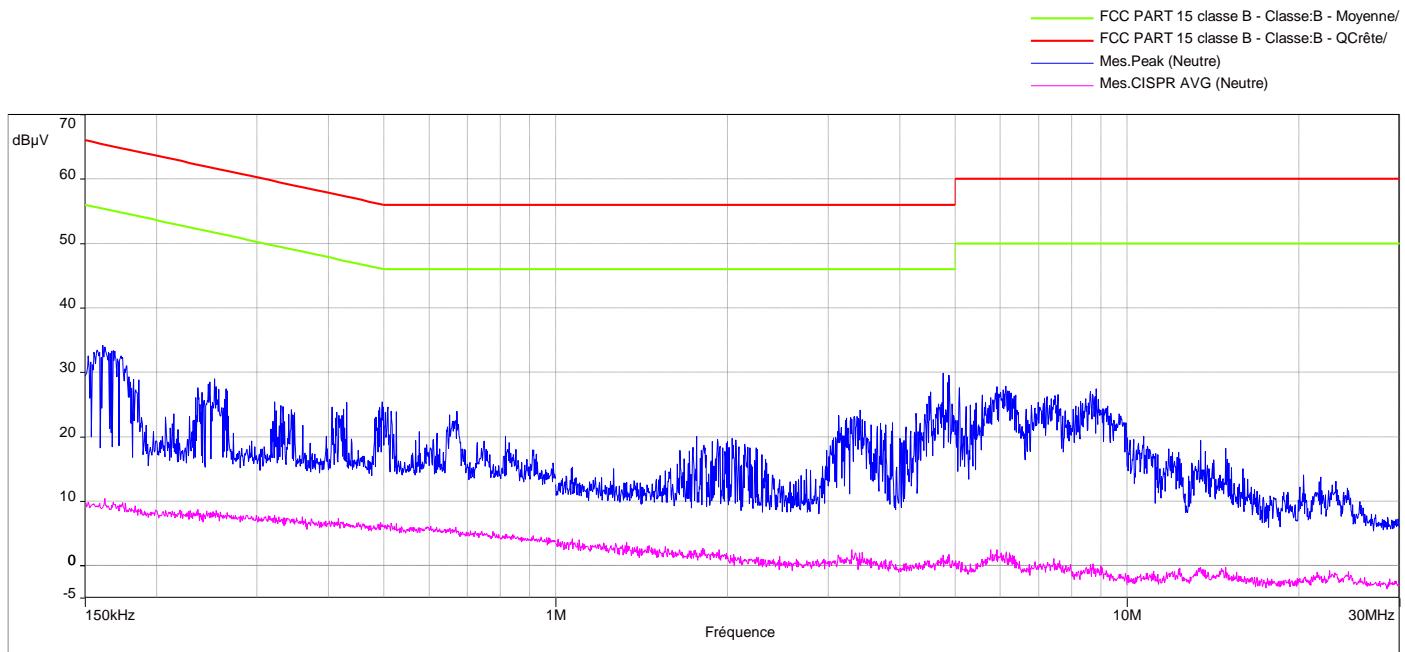
Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Margin peak/Quasi Peak (dB)	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Avg/Avg (dB)
0.15	25.6	-	66	40.4	8.6	56	47.4
0.6	17.7	-	56	38.3	5.2	46	40.8
3.33	18	-	56	38	2	46	44
4.97	27.3	-	56	28.7	2	46	44
14.9	16.3	-	60	43.7	-1	50	51



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Diagram N°2

Neutral 240V/50Hz



Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Margin peak/Quasi Peak (dB)	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Avg/Avg (dB)
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

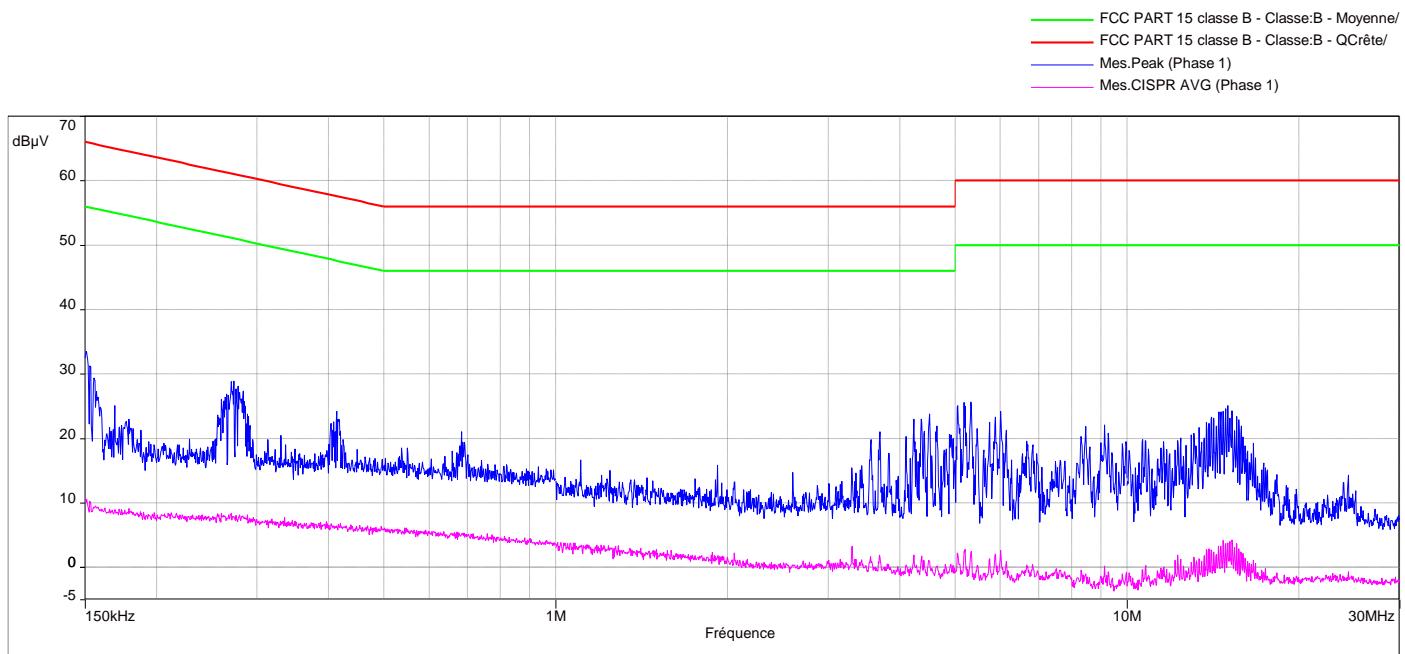
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Diagram N°3

Phase 120/60Hz



Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Margin peak/Quasi Peak (dB)	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Avg/Avg (dB)
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

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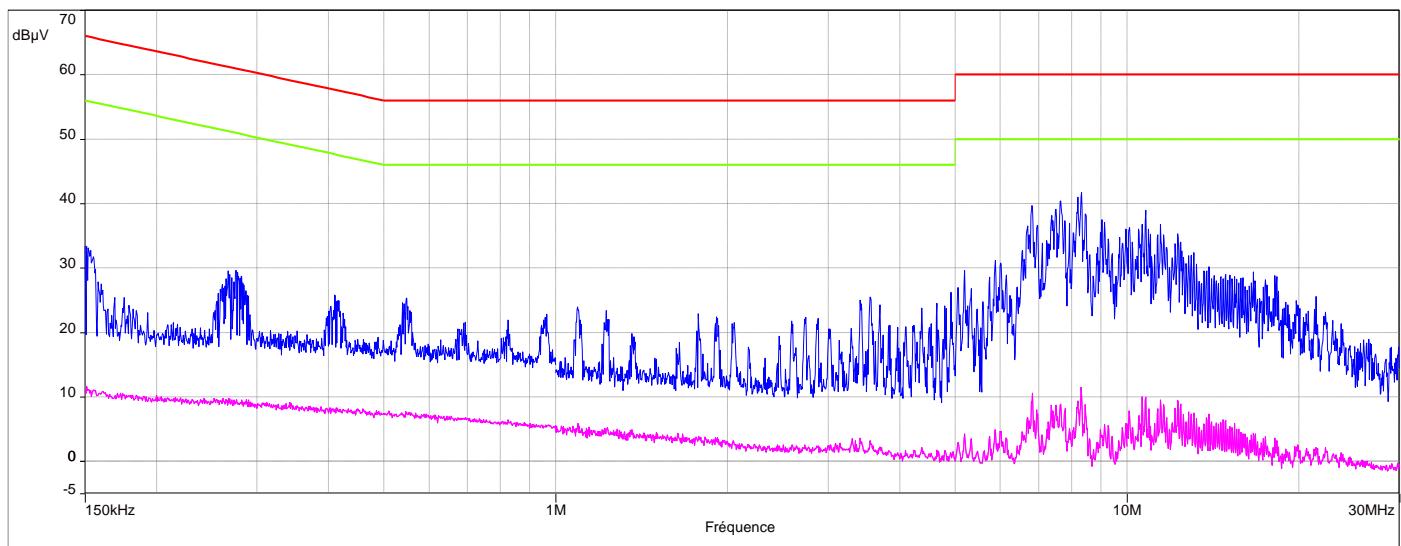


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Diagram N°4

Neutral 120/60Hz

— FCC PART 15 classe B - Classe:B - Moyenne/
— FCC PART 15 classe B - Classe:B - QCréte/
— Mes.Peak (Neutre)
— Mes.Avg (Neutre)



Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
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

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4.6. CONCLUSION

Measures of Conducted Emission, performed on the sample of the product ABLT02, SN: 1505131B3B, in configuration and description presented in this test report, show levels conform to the FCC part 15 & ICES -003 limits.



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5. Uncertainties Chart

Kind of measurement	Wide uncertainty laboratory (k=2) $\pm x$ (dB)	CISPR uncertainty limit $\pm y$ (dB)
Measurement of conducted disturbances in voltage on the AC power port (9 kHz – 150 kHz)	3.68	3.8
Measurement of conducted disturbances in voltage on the AC power port (150 kHz – 30 MHz)	3.22	3.4
Measurement of conducted disturbances in Capacitive voltage (150 kHz – 30 MHz)	3.69	3.9
Measurement of conducted disturbances in voltage AAN avec aLCL = 55 ... 40 dBc	4.15	4.2
Measurement of conducted disturbances in voltage AAN avec aLCL = 65 ... 50 dBc	4.54	4.59
Measurement of conducted disturbances in voltage AAN avec aLCL = 75 ... 60 dBc	4.97	5.03
Measurement of conducted disturbances in current (current clamp)	2.9	2.9
Measurement of disturbance power	4.31	4.5
Measurement of radiated magnetic field from 10kHz to 30MHz in SAC	4.48	/
Measurement of radiated electric field from 30 to 1000MHz in horizontal position on OATS & SAC	5.79	6.3
Measurement of radiated electric field from 30 to 1000MHz in vertical position on OATS & SAC at 3m	6.3	6.3
Measurement of radiated electric field from 6 to 18GHz	5.36	5.5
Measurement of radiated electric field from 30 to 1000MHz in horizontal position in OATS at 10m	5.7	6.3
Measurement of radiated electric field from 30 to 1000MHz in vertical position in OATS at 10m	5.61	6.3
Measurement of radiated electric field from 1 to 6 GHz	4.98	5.2
Measurement of radiated magnetic field from 10kHz to 30MHz on the OATS (Ecuelles)	4.48	/
Measurement of current harmonics	11.11%	/
Measurement of Flicker	9.26%	/
Immunity to radiated. radio-frequency. electromagnetic field in SAC C01 (80MHz-1GHz)	2.26	/
Immunity to radiated. radio-frequency. electromagnetic field in SAC C01 (1-6GHz)	2.42	/
Immunity to radiated. radio-frequency. electromagnetic field in SAC V01 (80MHz-1GHz)	2.5	/
Immunity to radiated. radio-frequency. electromagnetic field in SAC V01 (1-6GHz)	2.64	/
Immunity to radiated. radio-frequency. electromagnetic field in SAC V05 (80MHz-1GHz)	2.27	/
Immunity to radiated. radio-frequency. electromagnetic field in SAC V05 (1-6GHz)	2.64	/

End of test report

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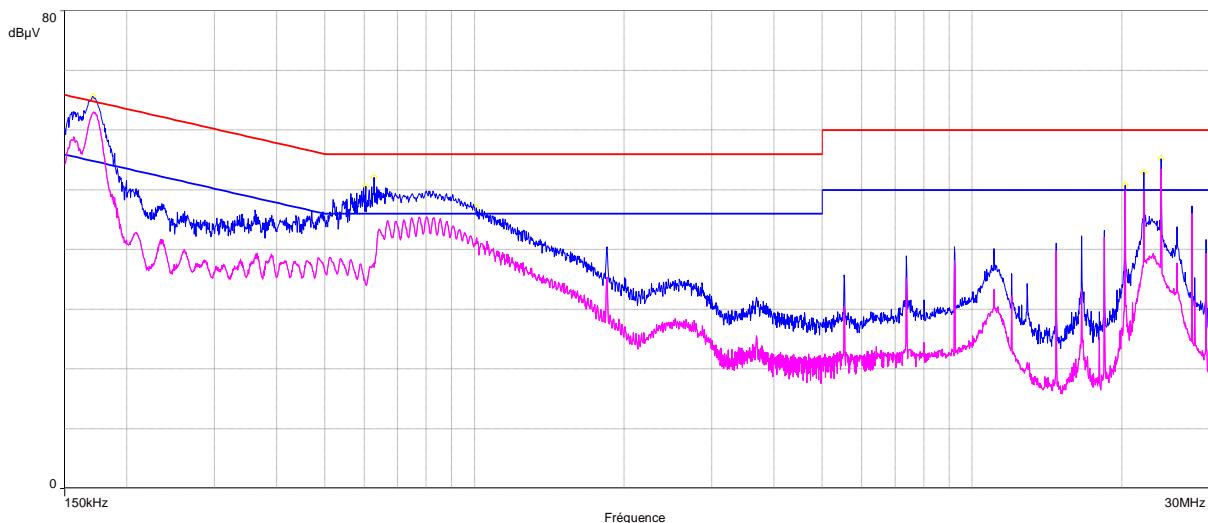
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AUTO CONTROL

1. Measurement of radiated emissions

Polarity antenna	Frequency MHz	Level measured dB μ V/m
Vertical	65	39.9
Vertical	115	48.6
Vertical	515	48.8
Vertical	900	40.5

2. Measurement of conducted disturbance



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