



LCIE



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TEST REPORT

N°: 167005 - 750426

Version : 01

Subject

Electromagnetic compatibility (EMC) :
Publication CFR 47 PART 15 of 2013 & ICES-003 of 2016

Issued to

SAGEMCOM BROADBAND
250 Route de l'Empereur
92500- RUEIL MALMAISON
FRANCE

Apparatus under test

Product Set Top Box
Trade mark SAGEMCOM
Manufacturer SAGEMCOM
Model under test DCIW384 UHD Alt US V4
Serial number 195005290000050

Test date

May 4, 2020 to May 6, 2020

Test location

LCIE, Ecuelles

Test performed by

Laurent Deneux

Composition of document

27 pages

Document issued on

May 28, 2020

Written by :
Laurent Deneux
Tests operator

Approved by :
Arnaud Fayette
Technical manager



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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

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	May 28 th ,2020	Laurent DENEUX	Creation of the document

Date of receipt of test item:
May 6th, 2020



SUMMARY

1.	TEST PROGRAM.....	4
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1. Test Program

References

- ✓ CFR 47 Part 15 Subpart B - Radio frequency devices - Unintentional radiators October 2013
- ✓ ICES -003 of 2016
- ✓ 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)	☐ Class A ☐ Class B	☐ PASS ☐ FAIL ☒ NA ☐ NP (Limited Program)
Measurement of radiated electric field in open space	☐ Class A ☒ Class B	☒ PASS ☐ FAIL ☐ NA ☐ NP (Limited Program)
Measurement of conducted disturbance on the AC main power port 15.107 (a) (c) (d)	☐ Class A ☒ Class B	☒ PASS ☐ FAIL ☐ NA (1) ☐ 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 October 2013 & ICES -003 of 2016 standards.

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 Description (declared by provider)

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT): DCIW384 UHD Alt US V4

Serial Number: 195005290000050

Inputs/outputs - Cable:

Access	Inputs / Outputs	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Main power supply	Input	L1-N	1		☐	☒	

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Power supply n° 1	MSG-V2500NR120-030E0-US	191600803-xx	MOSO
Power supply n° 2	NBS30G120250VU	191600824-xx	NETBIT
Power supply n° 3	ADS-36FLJ-12 12030EPCU-L	191600811-xx	SHENZHEN HONOR ELECTRONIC

Equipment information: (Declared by provider)

Apparatus Description	Set Top Box			
Type of power source:	☒ AC power supply	☐ DC power supply	☐ Battery (Select Type)	
Test source voltage:	Vmin-Vmax:	☒ 120 - V / 60 - Hz	☐ Vnom VDc	
Operating Modes	Mode 1	All parties are active with power supply n°1		
	Mode 2	All parties are active with power supply n°2		
	Mode 3	All parties are active with power supply n°3		
	Mode 4	-		

2.2. EQUIPMENT LABELLING

Code barre type 128 MSO Part Number: XXXXX Code barre type 128 12 Digits SGCSN: 123456789012 Code barre type 128 STB MAC: XXXXXXXXXXXXX Code barre type 128 Wi-Fi 5 GHz MAC: XXXXXXXXXXXXX	 DCIW384 UHD Alt US V4 253866952-ind FC Tested To Comply With FCC Standards FCC ID: VW3DCIW384-V4 This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.  5 Ghz 2.4 Ghz HPF CA SN: XXXXXXXXXXXX Code barre type 128
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Equipment Labelling

2.3. EQUIPMENT MODIFICATIONS

☒ None
 ☐ Modification:



3. Measurement of radiated emissions

3.1. ENVIRONMENTAL CONDITIONS

Test performed by : **Laurent Deneux**
Date of test : May 4th to 6th, 2020
Ambient temperature : 21°C
Relative humidity : 46%

3.2. TEST SETUP

Specifications:

Frequency	30 – 1000 MHz	RBW 120 kHz
	1-18GHz	RBW 1MHz
Detector	Peak and quasi-peak measurement and average value	

e 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

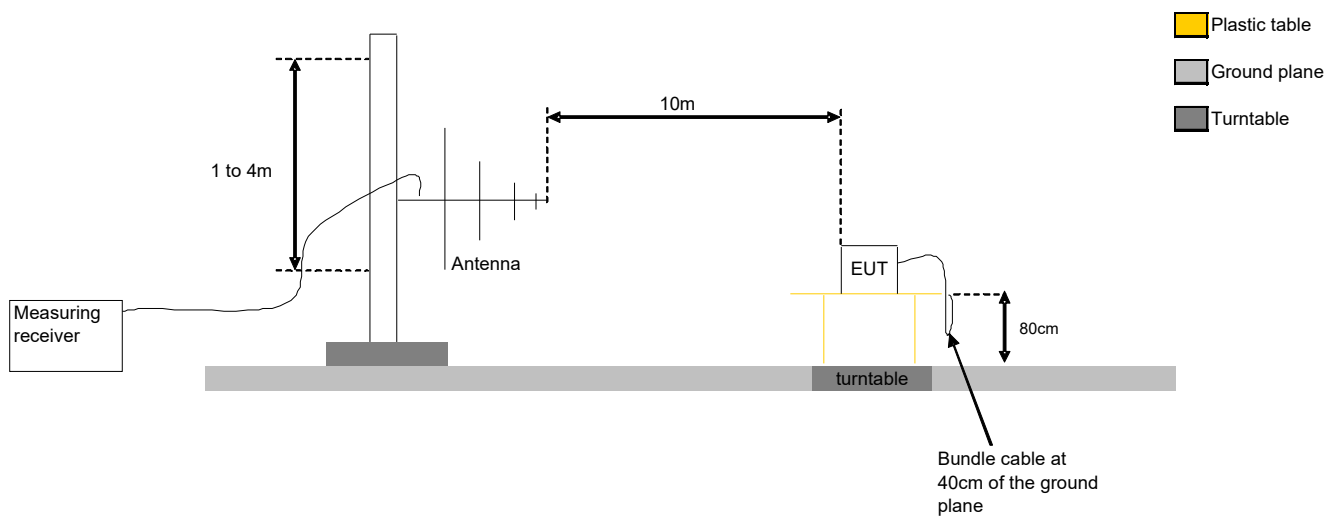
-Product installation:

☒ 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.

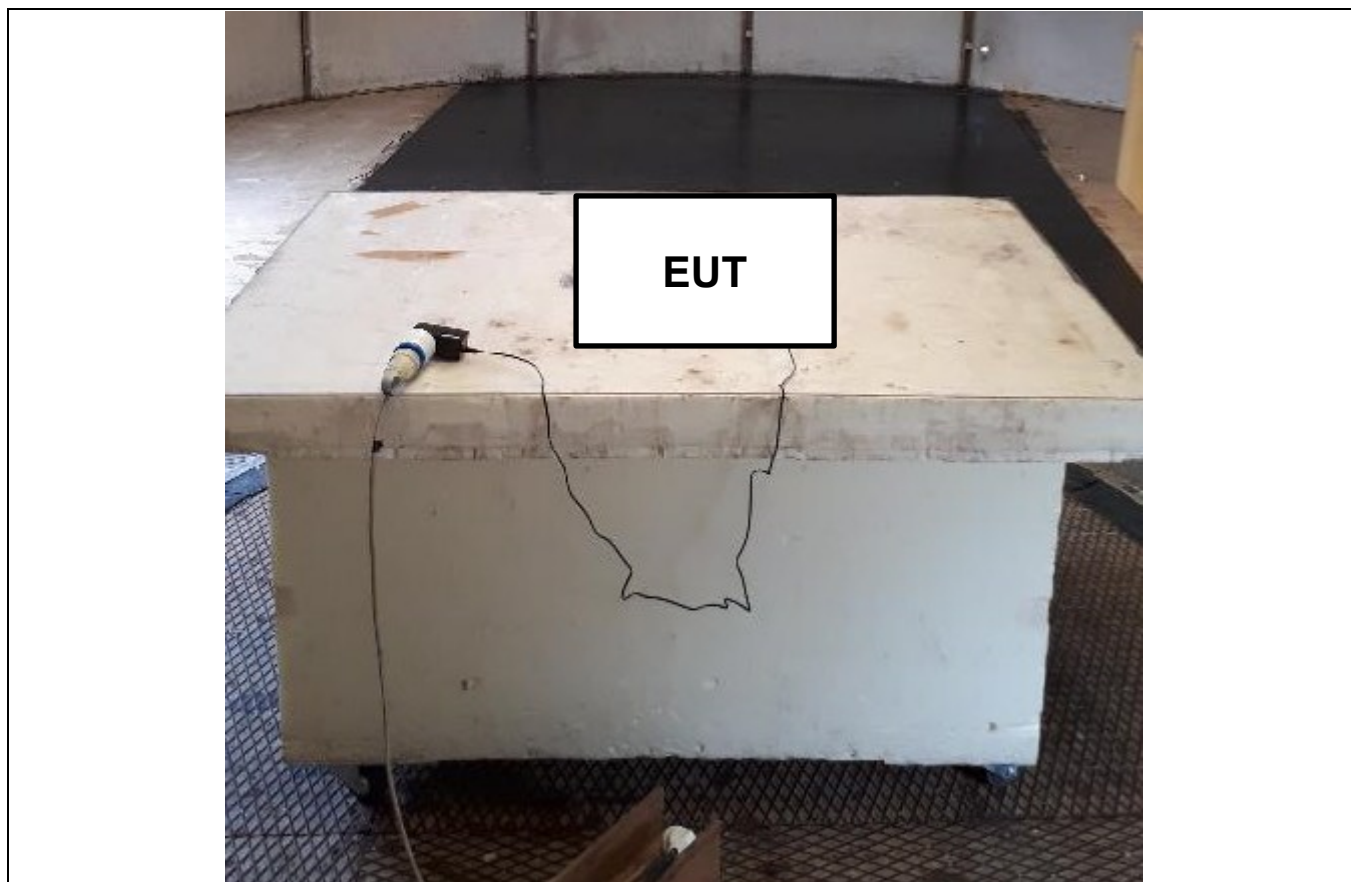
☐ The EUT is at 10cm height from reference plane

Operating mode:

☒ Mode 1 ☒ Mode 2 ☒ Mode 3 ...



Test Set up for radiated measurement in open area test site



Measurement of radiated disturbances.

3.3. LIMIT

☐ at 10m Class A

Frequency Bands/frequencies	dB ($\mu\text{V/m}$) quasi-peak	dB ($\mu\text{V/m}$) peak	dB ($\mu\text{V/m}$) average
30-88MHz	39.5	-	-
88 – 216MHz	43.9	-	-
216 – 960 MHz	46.9	-	-
960 – 1000 MHz	50	-	-
1000-6000MHz	-	70	50

☒ at 10m Class B

Frequency Bands/frequencies	dB ($\mu\text{V/m}$) quasi-peak	dB ($\mu\text{V/m}$) peak	dB ($\mu\text{V/m}$) average
30-88MHz	29.5	-	-
88 – 216MHz	33	-	-
216 – 960 MHz	35.5	-	-
960 – 1000 MHz	43.5	-	-
1000-6000MHz	-	63.5	43.5



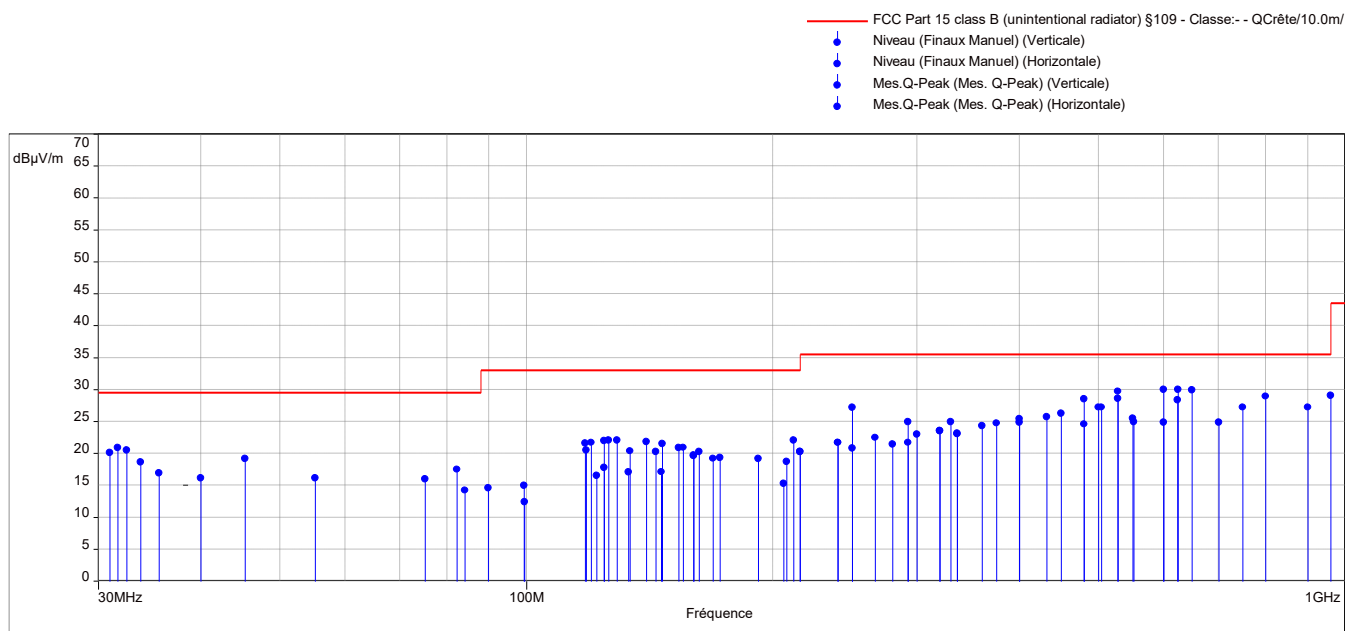
3.4. TEST EQUIPMENT LIST

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	-	-	A5329449	2019-12	2020-12
Cable	-	-	A5329876	2019-12	2020-12
Cable	-	-	A5329542	2019-08	2020-08
Cable	-	-	A5329368	2019-12	2020-12
Preamplifier	HEWLETT PACKARD	8449B	A4069002	2018-04	2020-04
Horn	EMCO	3115	C2042016	2019-06	2020-06

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

3.5. RESULTS

Diagram N°1
Mode 1
Quasi peak Measurement
Vertical & horizontal Polarization (30MHz-1000MHz)

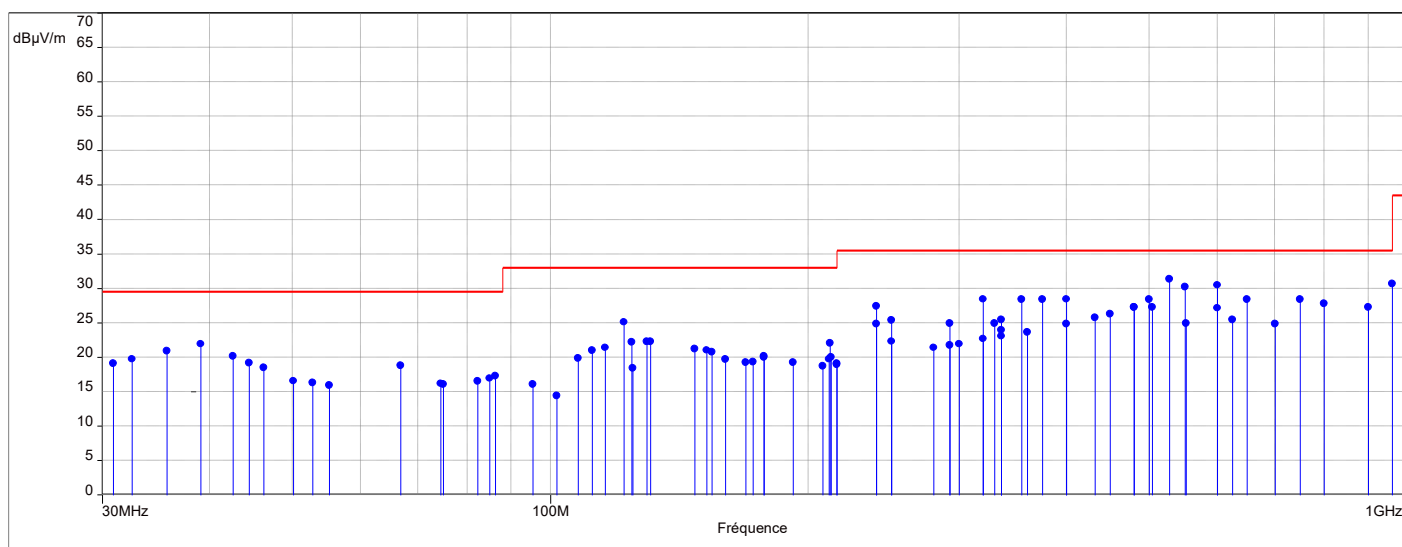


	Frequency (MHz)	level (dBµV/m)	limit FCC class B	Margin Fcc Part class B
Vertical	31.7	20.87	29.5	8.63
Horizontal	118	21.6	33	11.4
Vertical	528	29.75	35.5	5.75
Horizontal	600	29.97	35.5	5.53
Vertical	650	29.9	35.5	5.6
Vertical	960	29.08	35.5	6.42

No significant spurious has been observed above 1GHz

Diagram N°2
Mode 2
Quasi peak Measurement
Vertical & horizontal Polarization (30MHz-1000MHz)

— FCC Part 15 class B (unintentional radiator) §109 - Classe: - - QCrête/10.0m/
 • Finaux Manuel (Verticale)
 • Mes.Q-Peak (Mes. Q-Peak) (Verticale)
 • Mes.Q-Peak (Mes. Q-Peak) (Horizontale)



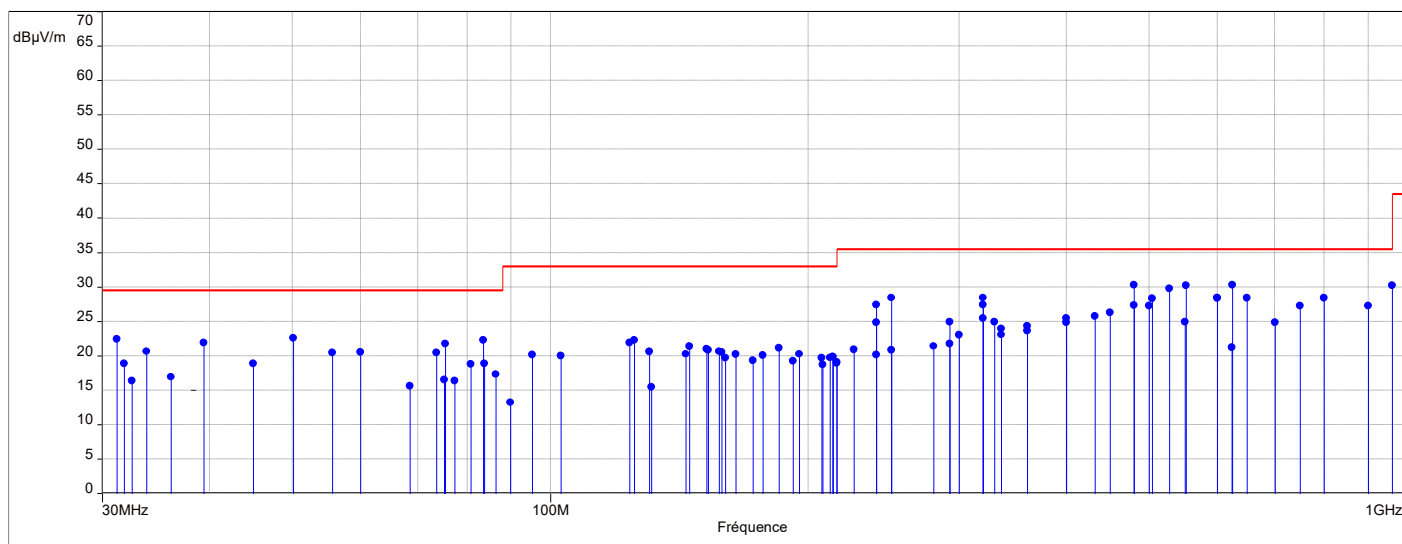
	Frequency (MHz)	level (dBµV/m)	limit FCC class B	Margin Fcc Part class B
Vertical	39.1	21.95	29.5	7.55
Horizontal	121.9	25.12	33	7.88
Vertical	528	31.3	35.5	4.2
Vertical	550	30.24	35.5	5.26
Horizontal	600	30.51	35.5	4.99
Vertical	960	30.69	35.5	4.81

No significant spurious has been observed above 1GHz



Diagram N°3
Mode 3
Quasi peak Measurement
Vertical & horizontal Polarization (30MHz-1000MHz)

— FCC Part 15 class B (unintentional radiator) §109 - Classe:- - QCrête/10.0m/
 • Finaux Manuel (Verticale)
 • Mes.Q-Peak (Mes. Q-Peak) (Verticale)
 • Mes.Q-Peak (Mes. Q-Peak) (Horizontale)



	Frequency (MHz)	level (dBµV/m)	limit FCC class B	Margin Fcc Part class B
Vertical	50.1	22.55	29.5	6.95
Vertical	83.5	22.26	29.5	7.24
Vertical	250	28.42	35.5	7.08
Vertical	480	30.29	35.5	5.21
Vertical	552	30.24	35.5	5.26
Vertical	625	30.29	35.5	5.21

No significant spurious has been observed above 1GHz

3.6. CONCLUSION

Measures of Radiated Emission, performed on the sample of the product DCIW384 UHD Alt US V4, SN: 195005290000050, 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 : May 5, 2020
Ambient temperature : 20°C
Relative humidity : 48%

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:

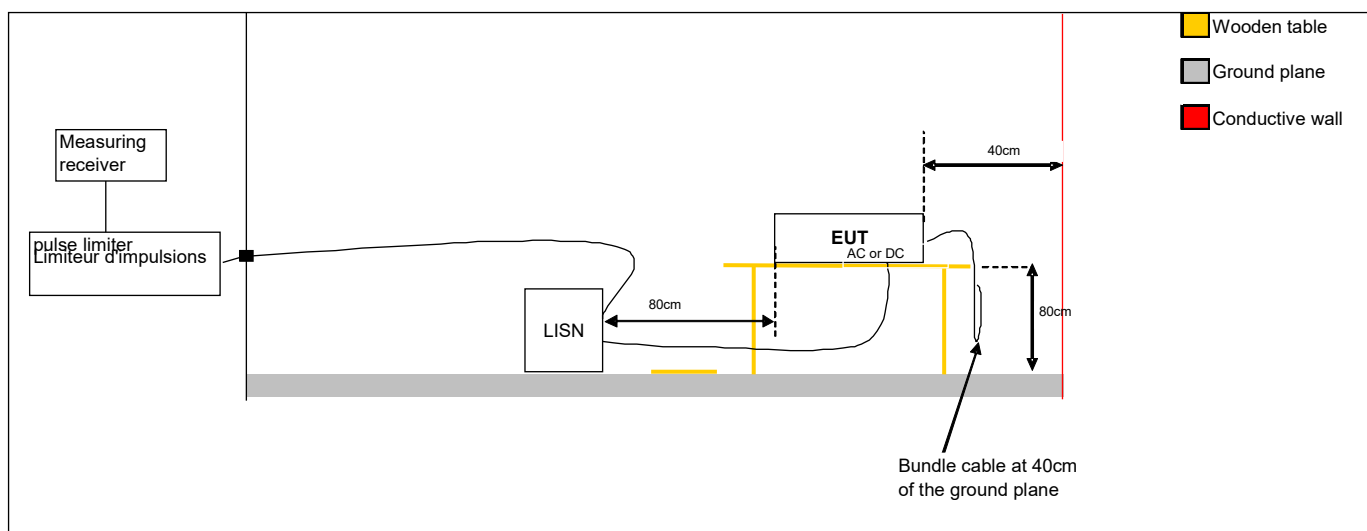
☒ The EUT is installed on a wooden table 80 cm above the reference plane, at 80cm of the LISN and at 40cm of the vertical conductive wall

☐ The EUT is installed on a wooden table 40 cm above the reference plane, at 80cm of the LISN.

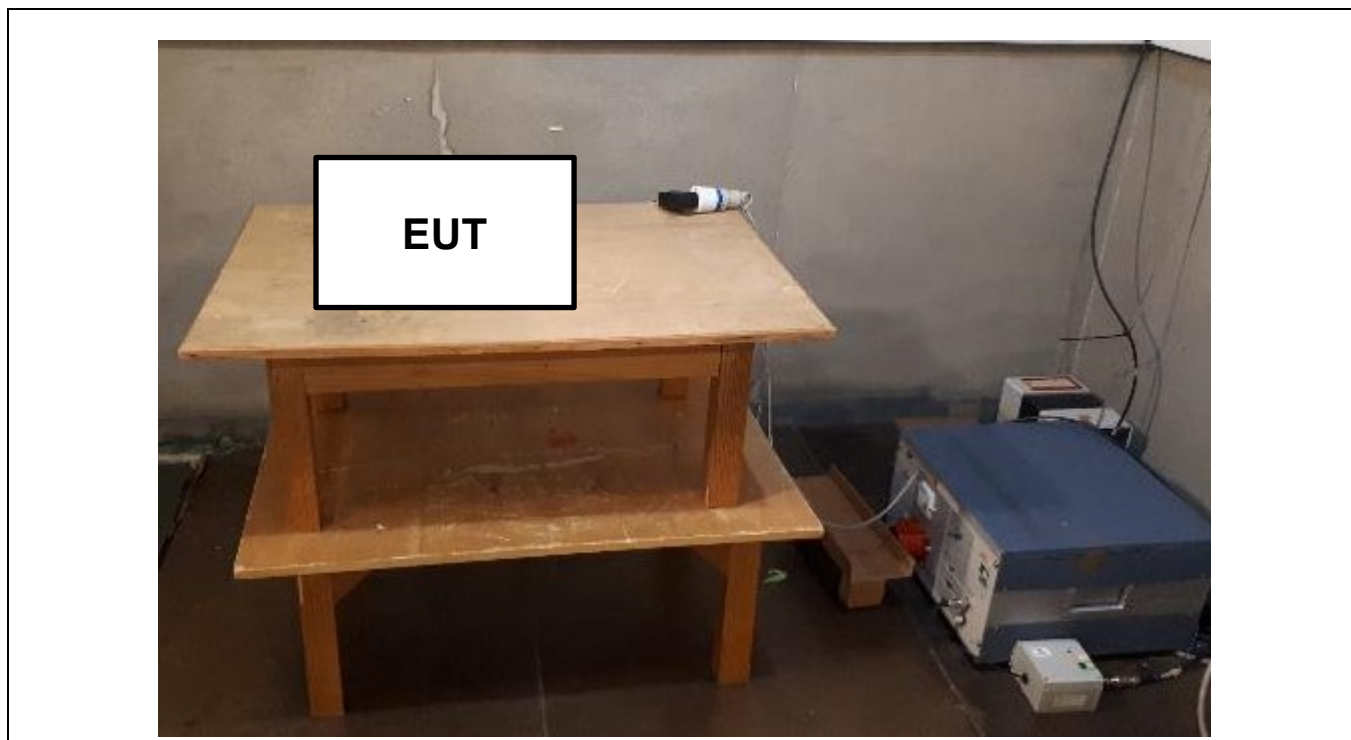
☐ The EUT is installed 10 cm above the reference plane, at 80cm of the LISN..

Operating mode:

☒ Mode 1 ☒ Mode 2 ☒ Mode 3 ...



Test set up of conducted emission on power supply



Test set up of conducted emission on power supply



Test set up of conducted emission on power supply

4.3. LIMIT

☒ Power supply Class B

Frequency Bands/frequencies	dB ($\mu\text{V/m}$) quasi-peak	dB ($\mu\text{V/m}$) average
0.15-0.5MHz	66-56	56-46
0.5-5 MHz	56	46
5-30 MHz	60	50



4.4. TEST EQUIPMENT LIST

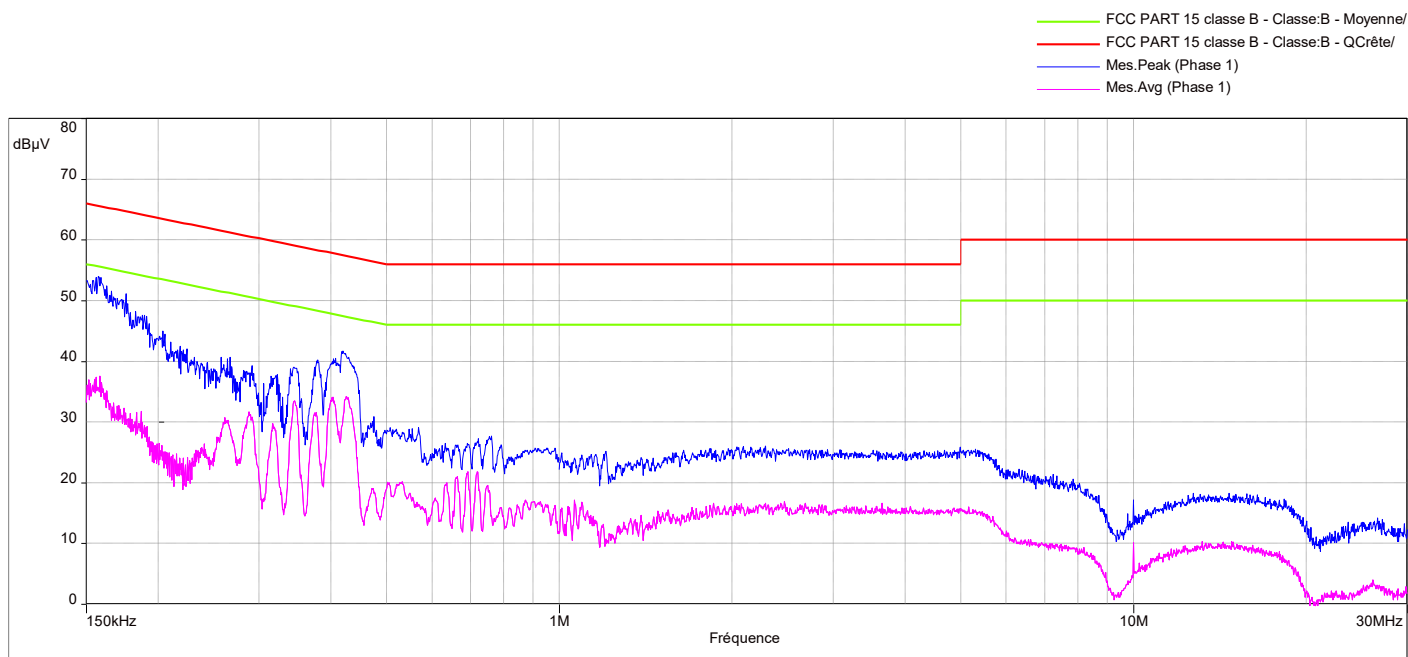
Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	10/2018	10/2020
V ISLN	ROHDE & SCHWARZ	ESH2-Z5	C2322001	08/2019	08/2020
Pulse limiter	R&S	ESH3-Z2	A2649008	03/2019	03/2020
Cable	-	-	A5329417	12/2018	12/2020
Cable	-	-	A5329589	10/2019	10/2020
Ground plane	LCIE	-	-	-	-

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

4.5. RESULTS

Diagram N°1 Mode 1

Phase 120/60Hz

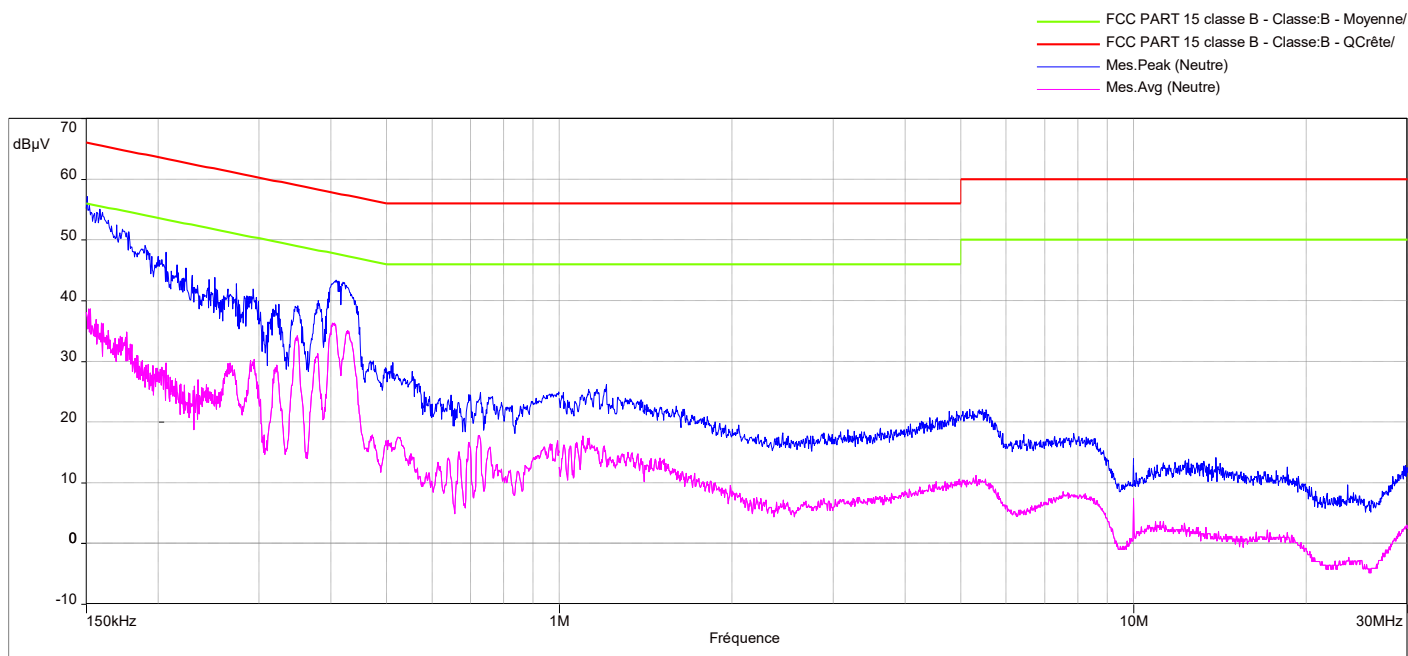


Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.156	53.8	-	66	12.2	37.4	56	18.6
0.421	41.4	-	57.5	16.1	34.2	47.5	13.3
0.719	26.5	-	56	29.5	21.8	46	24.2
2.28	26	-	56	30	15.2	46	30.8
5.38	25.2	-	60	34.8	15	50	35



**Diagram N°2
Mode 1**

Neutral 120/60Hz

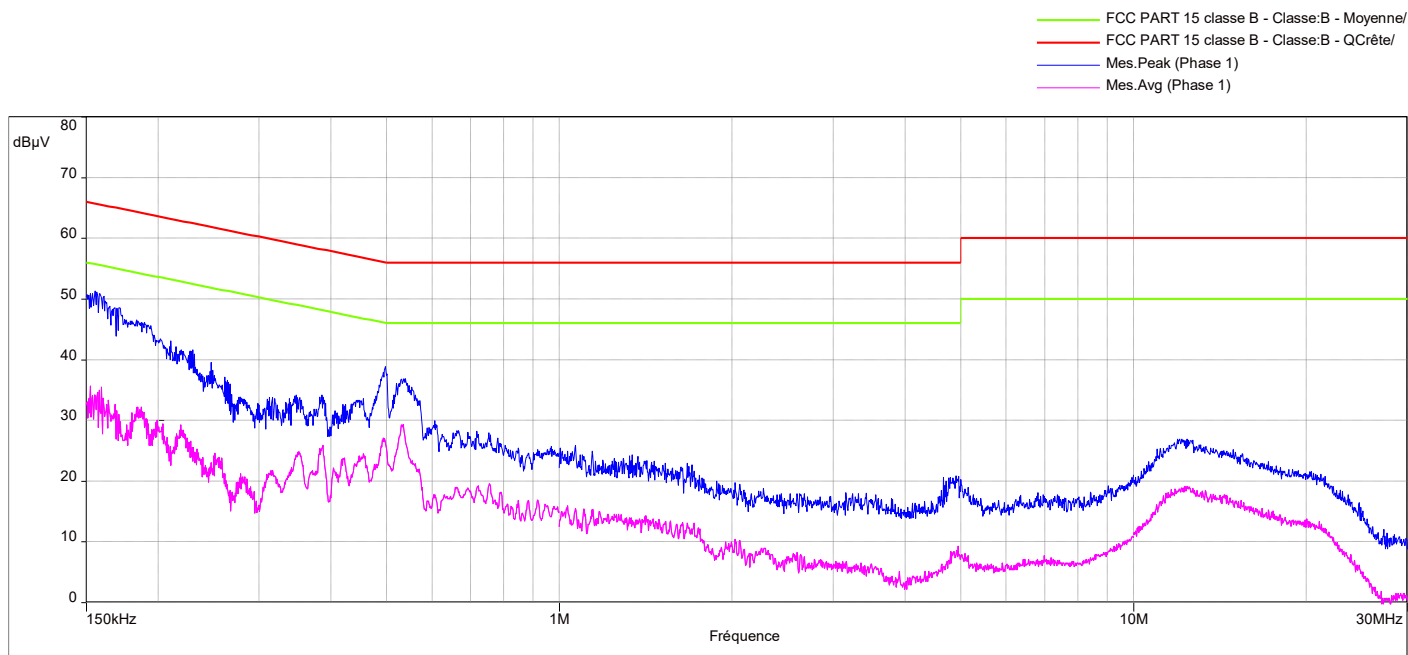


Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.15	55.2	-	66	10.8	38	56	18
0.406	43	-	57.7	14.7	36.2	47.7	11.5
0.993	24.6	-	56	31.4	16.8	46	29.2
5.18	22.1	-	60	37.9	9.9	50	40.1
13.71	12.7	-	60	47.3	2	50	48



Diagram N°3 Mode 2

Phase 120/60Hz

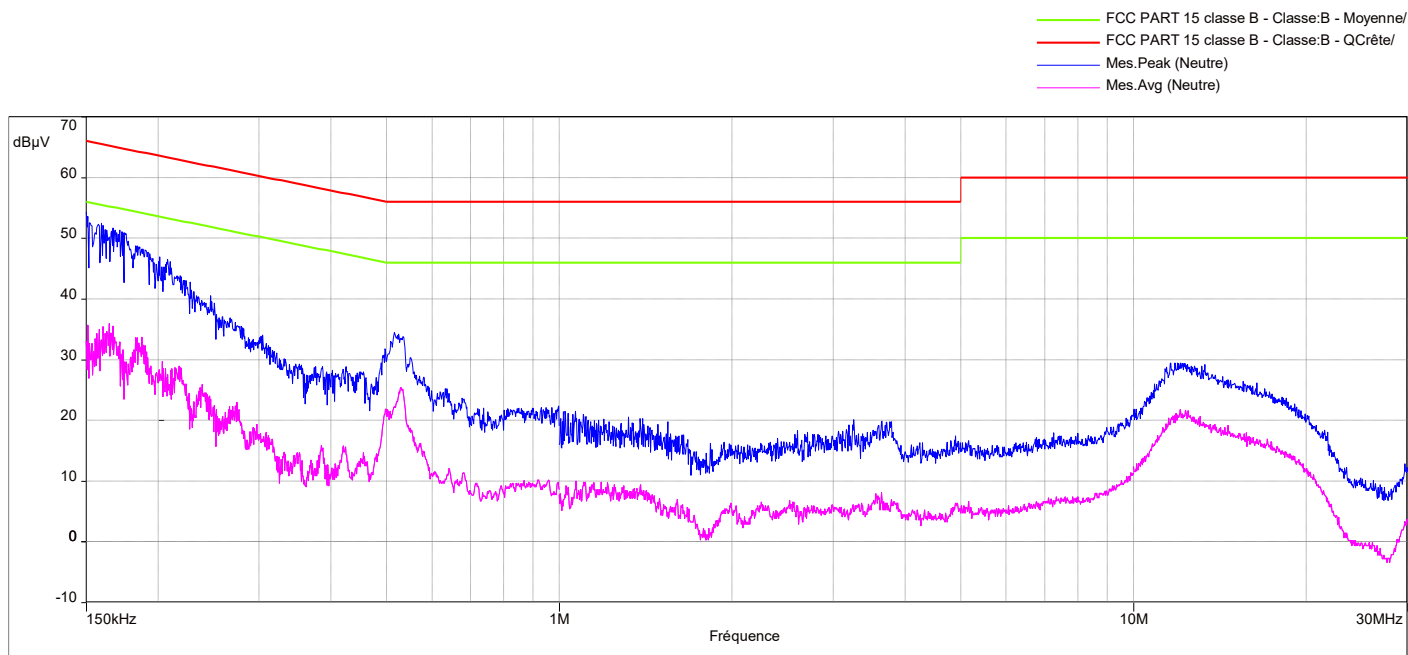


Frequency (MHz)	Peak Level (dBµV)	Quasi-Peak Level (dBµV)	Quasi-Peak Limit (dBµV)	Margin peak/Quasi Peak (dB)	Average Level (dBµV)	Average Limit (dBµV)	Margin Avg/Avg (dB)
0.164	51.4	-	65.5	14.1	34	55.5	21.5
0.532	36	-	56	20	29	46	17
1.066	25.8	-	56	30.2	15.5	46	30.5
4.96	19.9	-	56	36.1	9.2	46	36.8
11.92	27	-	60	33	18	50	32



Diagram N°4 Mode 2

Neutral 120/60Hz

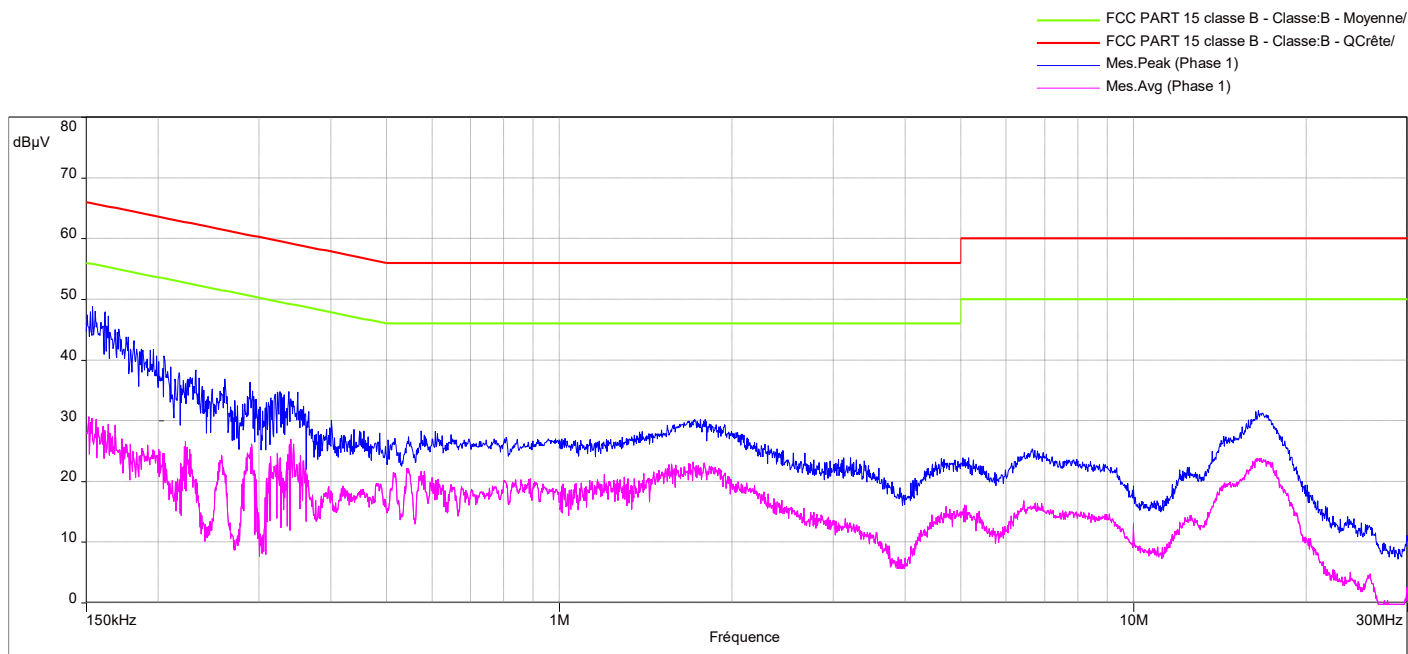


Frequency (MHz)	Peak Level (dBµV)	Quasi-Peak Level (dBµV)	Quasi-Peak Limit (dBµV)	Margin peak/Quasi Peak (dB)	Average Level (dBµV)	Average Limit (dBµV)	Margin Avg/Avg (dB)
0.164	50.2	-	65.5	15.3	36	55.5	19.5
0.531	34.5	-	56	21.5	25.3	46	20.7
1.38	19.9	-	56	36.1	9.4	46	36.6
3.48	20	-	56	36	7.9	46	38.1
11.9	28	-	60	32	20.8	50	29.2



**Diagram N°5
Mode 3**

Phase 120/60Hz

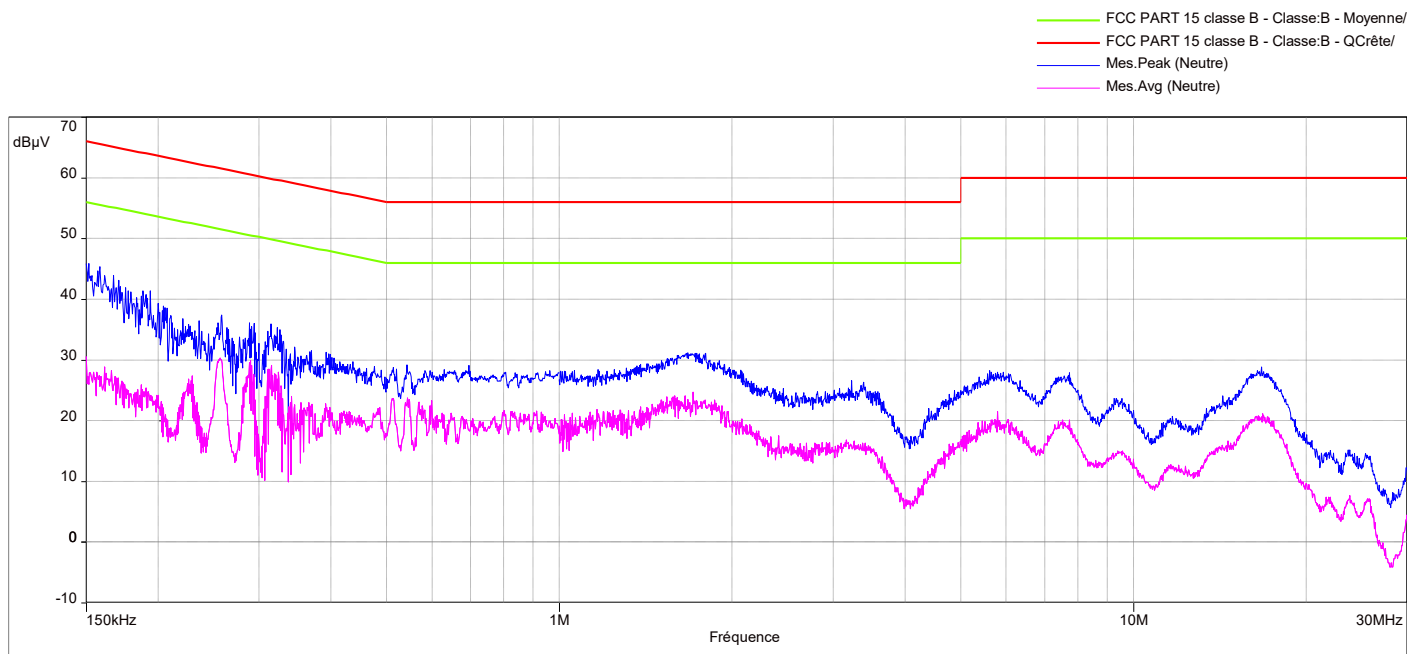


Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.15	44.7	-	66	21.3	28	56	28
0.327	34.7	-	59.5	24.8	23.8	49.5	25.7
1.71	29.3	-	56	26.7	23.2	46	22.8
6.8	23.5	-	60	36.5	15.5	50	34.5
16.46	31.6	-	60	28.4	23.2	50	26.8



Diagram N°6 Mode 3

Neutral 120/60Hz



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	45.8	-	66	20.2	30.5	56	25.5
0.258	37.5	-	61.5	24	30	51.5	21.5
1.7	30	-	56	26	24.6	46	21.4
7.48	27	-	56	29	19.8	46	26.2
16.7	28.9	-	60	31.1	20	50	30

4.6. CONCLUSION

Measures of Conducted Emission, performed on the sample of the product DCIW384 UHD Alt US V4, SN: 195005290000050, in configuration and description presented in this test report, show levels conform to the FCC part 15 & ICES -003 limits.



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)	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	/

End of test report

AUTO CONTROL

1. Measurement of radiated emissions

Polarity antenna	Frequency MHz	Level measured dB μ V/m
Vertical	65	38.9
Vertical	115	48.4
Vertical	515	47.2
Vertical	900	39.8

2. Measurement of conducted disturbance

