Accreditation
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TEST REPORT

N°: 145658-697108 **Version : 01**

Subject	**Electromagnetic compatibility (EMC) :** **Publication CFR 47 PART 15 Subpart C (15.209 & 15.207)**
Issued to	SAGEMCOM BROADBAND SAS 250 Route de l'Empereur 92848 RUEIL MALMAISON FRANCE
Apparatus under test	
Product	WIFI Home router
Trade mark	OPTIMUM
Manufacturer	SAGEMCOM BROADBAND SAS
Model under test	FAST 5260CV (& FAST 5260)
Serial number	253536653
FCC ID	VW3FAST5260CV (& VW3FAST5260)
Test date	December 14, 2016
Test location	LCIE, Ecuelles
Test performed by	**Laurent Deneux**
Composition of document	23 pages
Initial issue	December 20, 2016

Written by :
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Tests operator

Approved by :
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PUBLICATION HISTORY

Version	Date	Author	Modification
01	December 16, 2016	**Laurent Deneux**	Creation of the document

SUMMARY

1. Test Program

References

- ✓ **CFR 47 Part 15 Subpart C**
- ✓ **ANSI 63.10 of 2013**

Emission tests:

Test Description	Main characteristics	Test result - Comments
Measurement of radiated electric field in shielded room 15.209	☐ **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 15.207	☐ **Class A** ☑ **Class B**	☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP (Limited Program)**

The product is compliant according to CFR 47 Part 15 Subpart C 15.209 & 15.207

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)

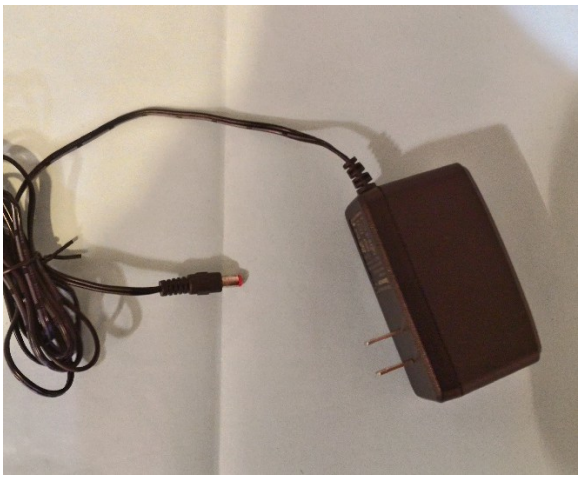
2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT): FAST 5260CV (& FAST 5260)

Serial Number: 253536653

WIFI home router

WIFI home router



Power supply model LPL-D030120250ZL
Manufacturer DOKOCOM

Equipment Under Test

Note: All these tests have been performed on the worst model FAST 5260CV model equipped with 2 usb ports. Due to the similarity between FAST 5260CV and FAST 5260 (the only difference is that FAST 5260 is equipped with only 1 usb port), all results recorded in this test report are applicable for both models FAST 5260 CV & FAST 5260.

Inputs/outputs - Cable:

Access	Type	Length used (m)	Shielded	Under test	Comments
Power supply AC up	-	1	☐	☑	
WAN	Ethernet	10	☑	☑	Cat. 5e UTP

Supporting Equipment Used During Test:

Product	Trade mark	model	Comments
Power supply	SAGEMCOM	LPL-D030120250ZL	12V-DC

Auxiliary equipment (AE) used for testing:

Product	Trade mark	model	Comments
Computer	LENOVO	R61	No subject to the test

Equipment information: (Declared by provider)

Apparatus Description	WIFI home router			
Type of power source:	☑ AC power supply	☐ DC power supply	☐ Battery (Li-ion)	
Test source voltage:	Vmin-Vmax:	☑ 120V -60Hz	☐ 7.4Vdc	
Operating Modes	Mode 1	The EUT is set in the following modes during tests: - power supply LPL-D030120250ZL - Permanent emission with modulation on a fixed channel in the data rate that produced the highest power (802.11g and 802.11ac) - link between WIFI home router and computer on the cable Ethernet (continuous ping)		
	Mode 2	-		
	Mode 3	-		
	Mode 4	-		

2.2. EQUIPMENT LABELLING

WIFI HOME ROUTER

POWER SUPPLY

2.3. EQUIPMENT MODIFICATIONS

☑ None ☐ Modification:

3. Measurement of radiated emissions

3.1. ENVIRONMENTAL CONDITIONS

Test performed by	: **Laurent Deneux**
Date of test	: December 14, 2016
Ambient temperature	: 18°C
Relative humidity	: 47%

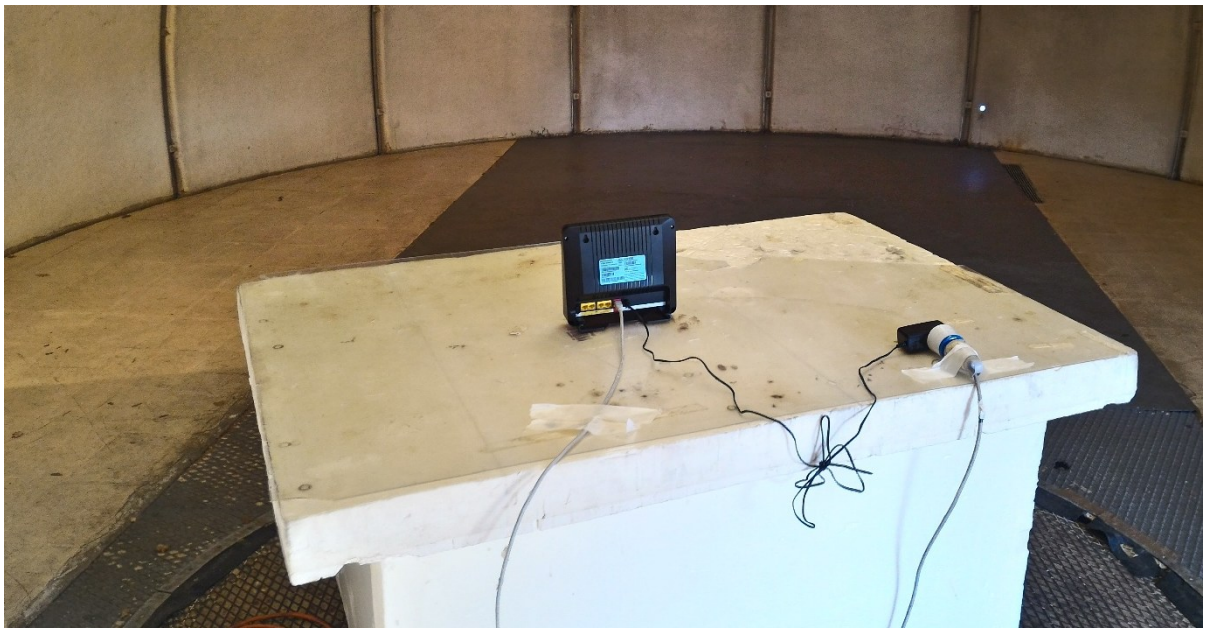
3.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013). The EUT is placed **on an open area test site**. Distance between measuring antenna and the EUT is **3m**. Test is performed in horizontal (H) and vertical (V) polarization with **bilog** antenna below 1GHz and with a horn antenna above 1GHz. Measurement bandwidth was 120kHz below 1GHz and 1MHz above 1GHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height search was performed from 1 to 4m. The EUT is place at 1.5m high above 1GHz and at 0.8m high under 1GHz.

Operating mode:

☑ Mode 1 ☐ Mode 2 ☐ Mode 3

Measurement of radiated disturbances below 1GHz



Measurement of radiated disturbances below 1GHz

Measurement of radiated disturbances above 1GHz

3.3. LIMIT

☐ at 10m Class A

Frequency Bands/frequencies	dB (µV/m) quasi-peak	dB (µV/m) peak	dB (µV/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 (µV/m) quasi-peak	dB (µV/m) peak	dB (µV/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

Apparatus	Trade Mark	Type	Registration number	**Cal. Date**	**Cal. Due**
Open test site	LCIE	-	F2000400	2016-05	2017-05
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2015-12	2016-12
Preamplifier	HELWETT PACKARD	8449B	A7080071	2016-01	2017-01
Bilog antenna	CHASE	CBL 6112A	C2040040	2016-01	2017-01
Horn	ETS	3115	C2042023	2016-01	2017-01
Cable	-	-	A5329542	2016-03	2017-03
Cable	-	-	A5329449	2016-10	2017-10
Cable	-	-	A5329368	2016-05	2017-05
Cable	-	-	A5329444	2016-10	2017-10

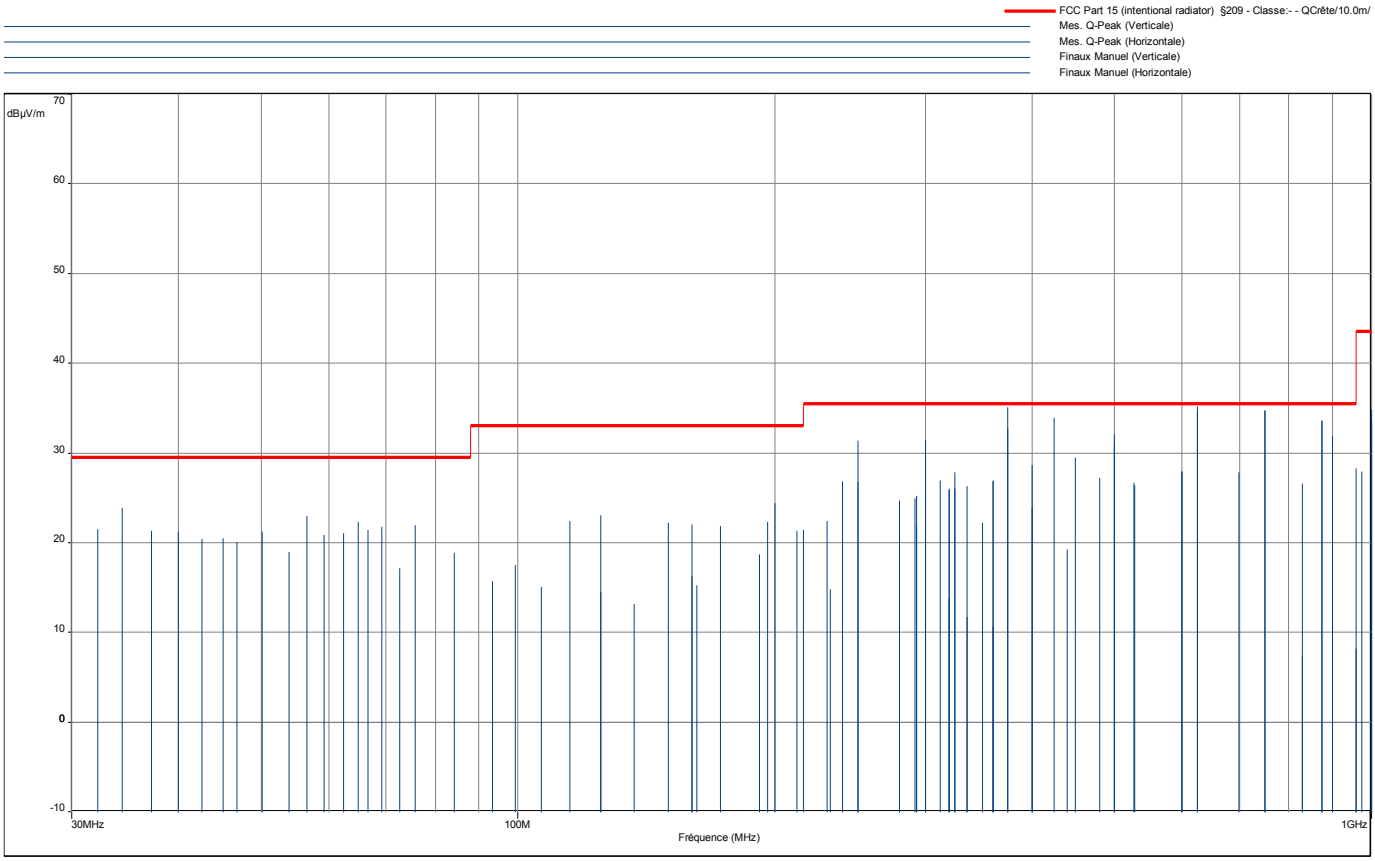
3.5. RESULTS

Diagram N°1

FCC Part.15 class B (30 to 1000MHz)

SAGEMCOM
WIFI HOME ROUTER
TYPE : FAST 5260CV

Quasi peak measurement



The radiated measurements were performed in both vertical and horizontal polarization.
The worst case has been recorded after maximization levels

Worst frequencies for radiated emissions

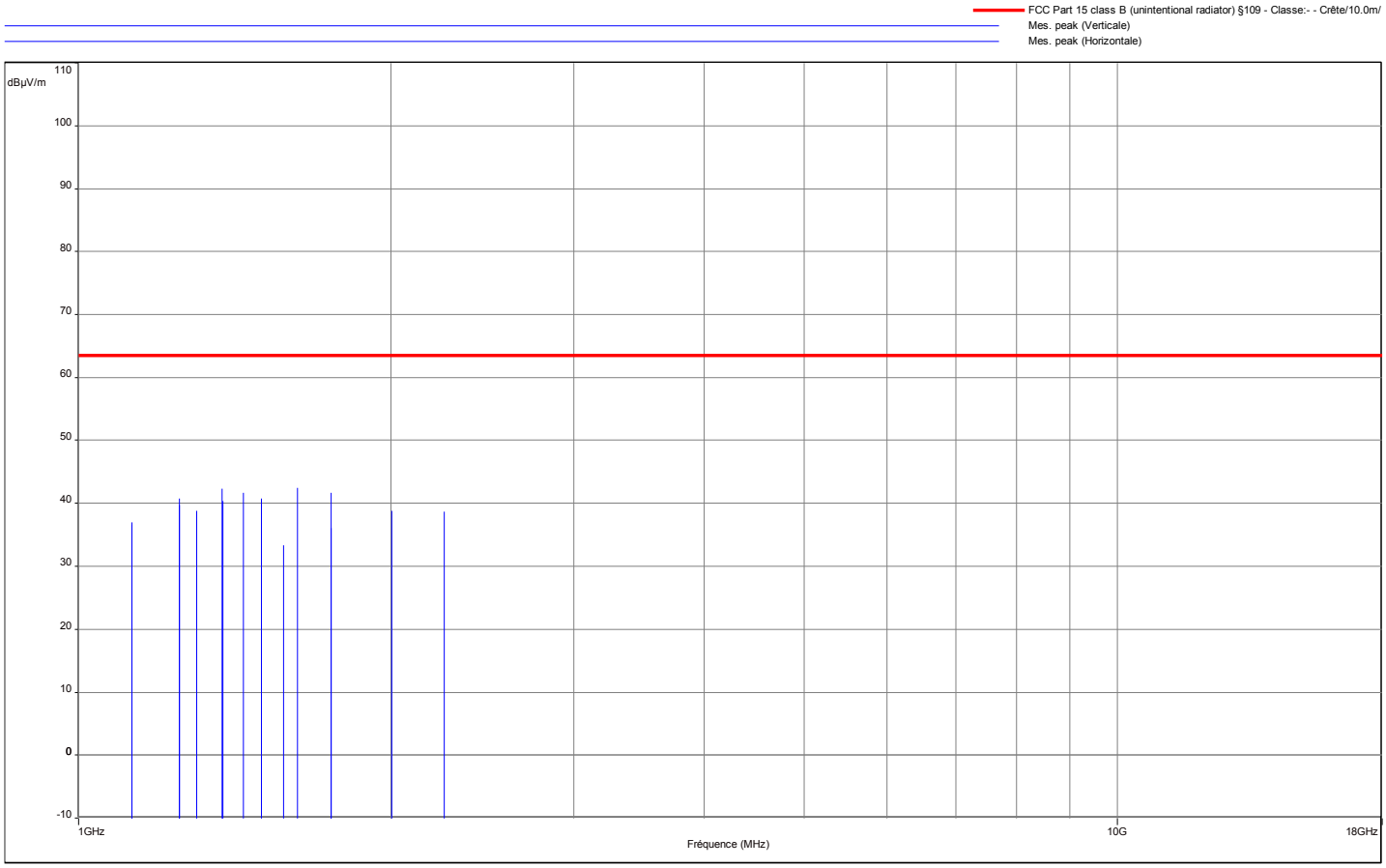
Frequency (MHz)	Peak Level dBµV/m)	Limit	Margin
375	35.12	35.5	0.38
425	33.98	35.5	1.52
625	35.21	35.5	0.29
750	34.77	35.5	0.73
875	33.69	35.5	1.81

Diagram N°2

FCC Part.15 class B (1 to 18GHz)

SAGEMCOM
WIFI HOME ROUTER
TYPE : FAST 5260CV

Peak measurement



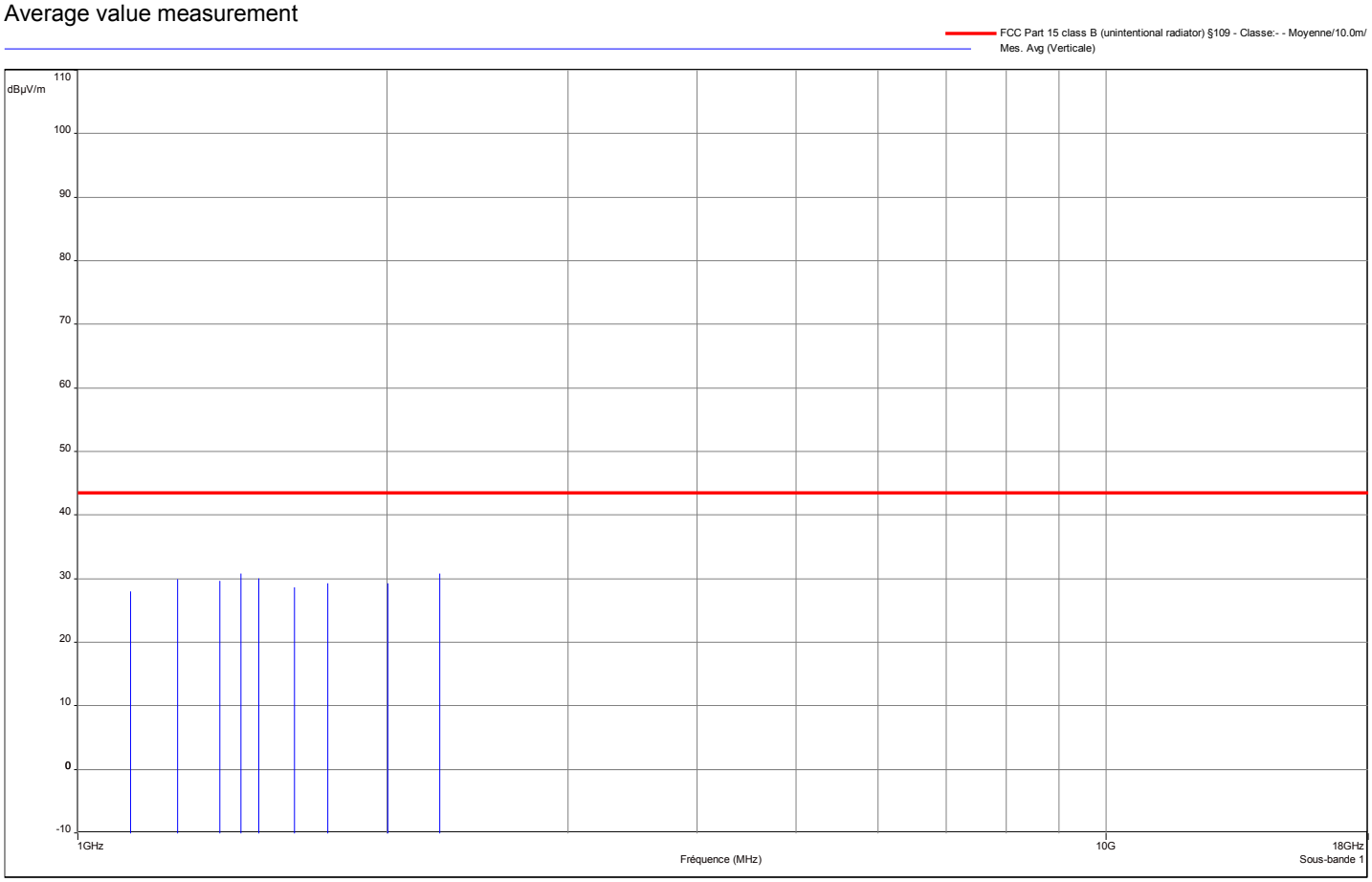
The radiated measurements were performed in both vertical and horizontal polarization.
The worst case has been recorded after maximization levels

Diagram N°3

FCC Part.15 class B (1 to 18GHz)

SAGEMCOM
WIFI HOME ROUTER
TYPE : FAST 5260CV

Average value measurement



The radiated measurements were performed in both vertical and horizontal polarization.
The worst case has been recorded after maximization levels

3.6. CONCLUSION

Measures of Radiated Emission, performed on the sample of the product FAST 5260CV (& FAST 5260), SN: 253536653, in configuration and description presented in this test report, show levels conform to the FCC part 15.209 limits.

4. Measurement of conducted disturbance

4.1. ENVIRONMENTAL CONDITIONS

Test performed by	: **Laurent Deneux**
Date of test	: December 14, 2016
Ambient temperature	: 21°C
Relative humidity	: 47%

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:

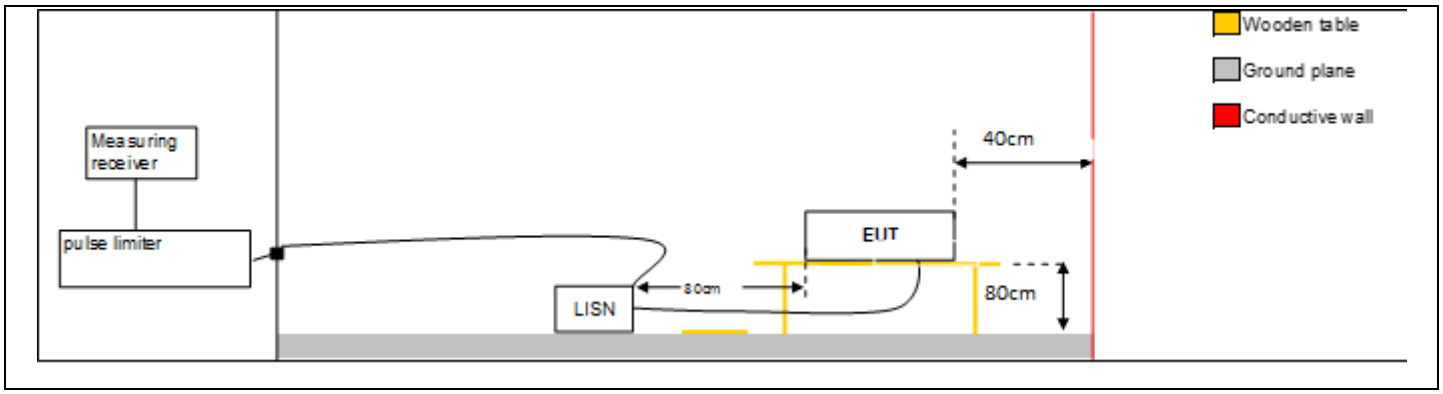
☑ The EUT is installed on a wooden table 80 cm above the reference plane, at 80cm of the LISN and at 40cm of the vertical conductive wall

☐ 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 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

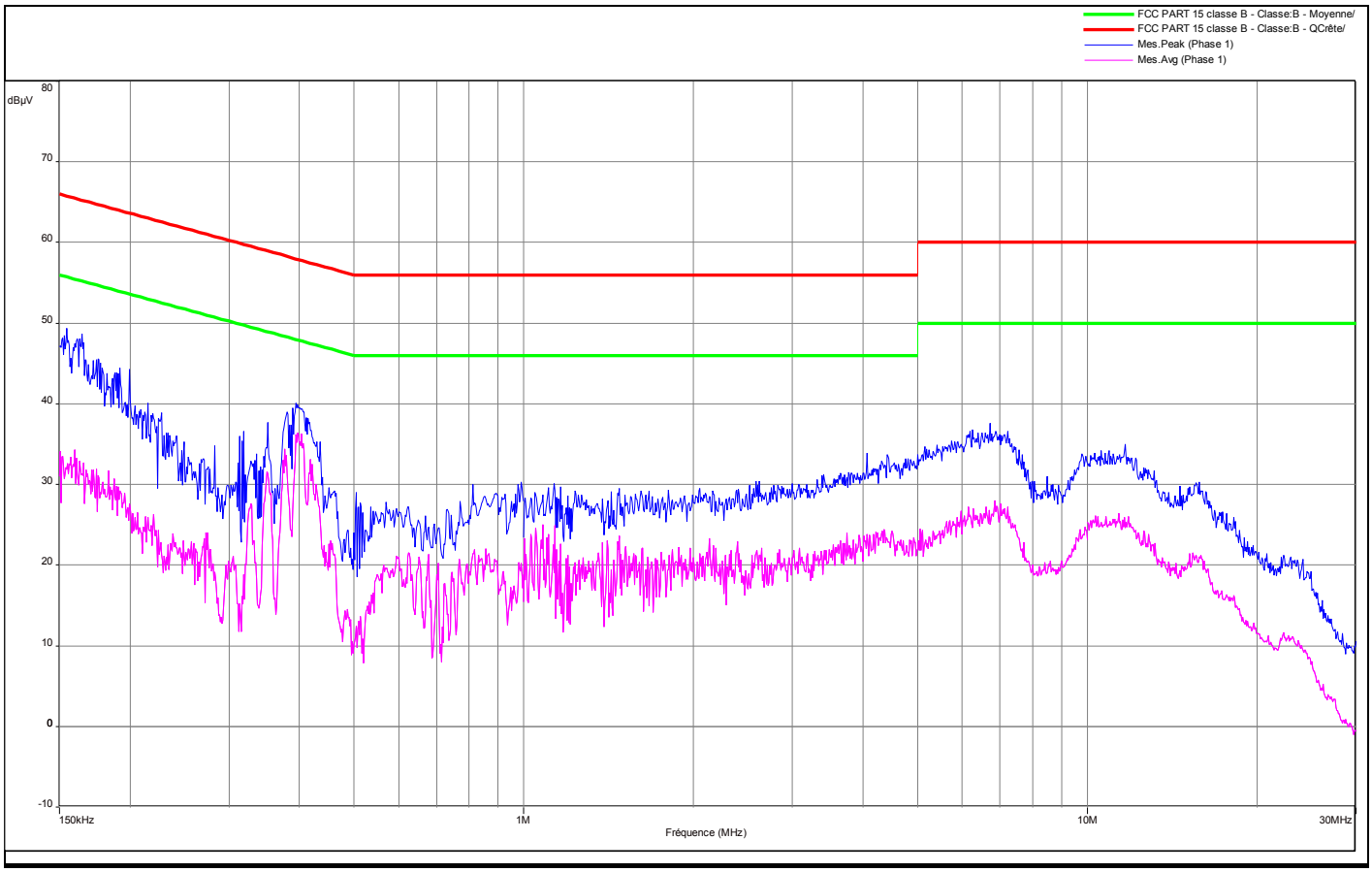
4.4. TEST EQUIPMENT LIST

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2015-12	2016-12
V ISLN	ROHDE & SCHWARZ	ESH2-Z5	C2322001	2016-05	2017-05
Pulse limiter	ROHDE & SCHWARZ	ESH3-Z2	A2649008	2016-03	2017-03
Cable	-	-	A5329417	2016-10	2017-10
Cable	-	-	A5329589	2016-10	2017-10
Ground plane	LCIE	-	-	-	-

4.5. RESULTS

Diagram N°1

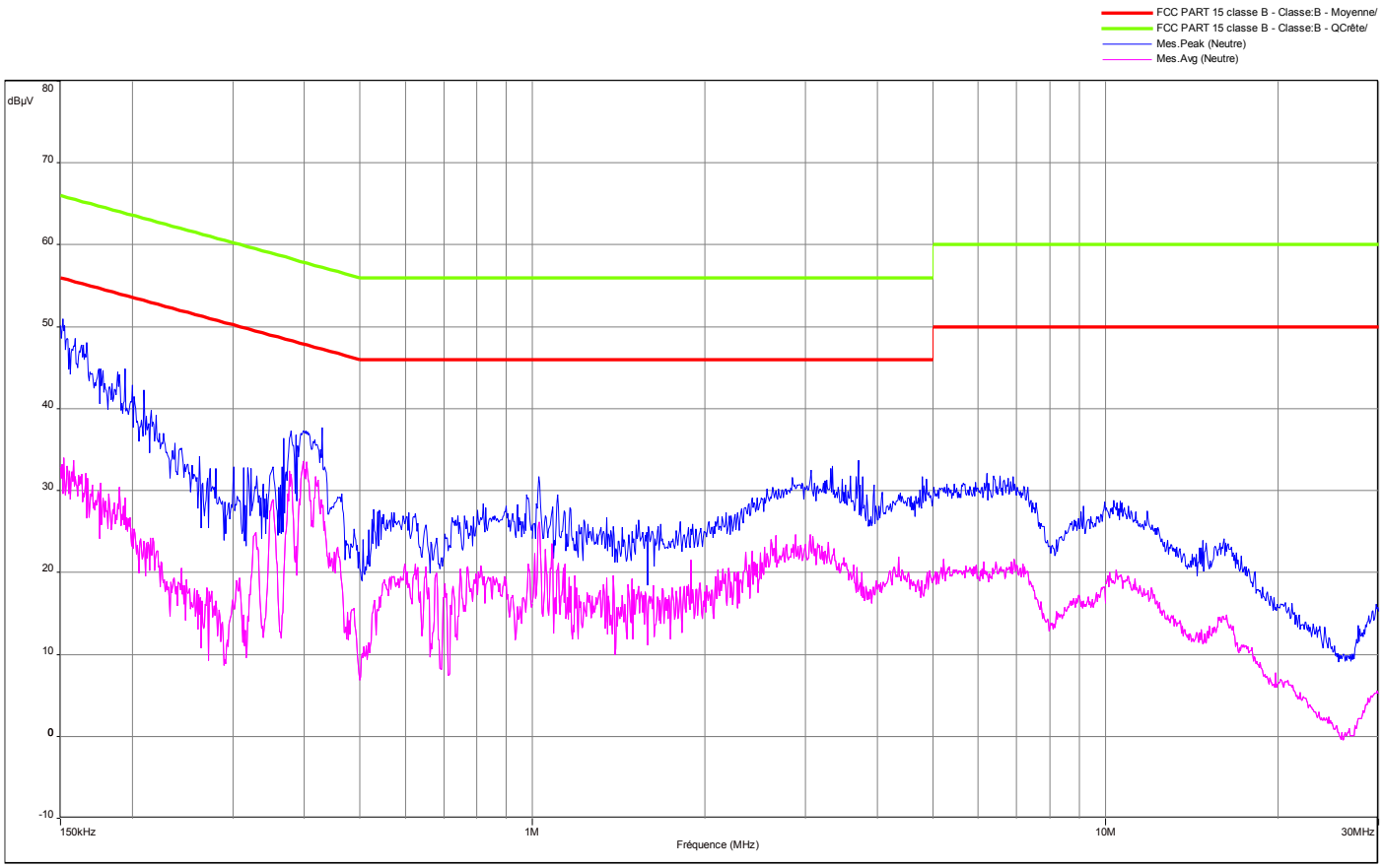
Phase



Phase Line							
Frequency (MHz)	Peak Level (dBµV)	Quasi-Peak Level (dBµV)	Quasi-Peak Limit (dBµV)	Margin Quasi-peak limit	Average Level (dBµV)	Average Limit (dBµV)	Margin Average Limit
154	47,5	-	65,7	18,2	34,4	55,7	21,3
396	39,5	-	58	18,5	36,5	48	11,5
4066	33,8	-	56	22,2	21,3	46	24,7
6,73	37,6	-	60	22,4	26,7	50	23,3
11694	35	-	60	25	25	50	25

Diagram N°2

Neutral



Neutral Line							
Frequency (MHz)	Peak Level (dBµV)	Quasi-Peak Level (dBµV)	Quasi-Peak Limit (dBµV)	Margin Quasi-peak limit	Average Level (dBµV)	Average Limit (dBµV)	Margin Average Limit
151	55	-	65,8	10,8	34	55,8	21,8
401	37	-	57,8	20,8	33,5	47,8	14,3
1026	31,7	-	56	24,3	26	46	20
3066	32,5	-	56	23,5	24,5	46	21,5
10606	28,8	-	60	31,2	19,2	50	30,8

4.6. CONCLUSION

Measures of Conducted Emission, performed on the sample of the product FAST 5260CV (& FAST 5260), SN: 253536653, in configuration and description presented in this test report, show levels conform to the FCC part 15.207 limit.

5. Uncertainties Chart

Kind of measurement	Wide uncertainty laboratory (k=2) ±x(dB)	CISPR uncertainty limit ±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