RFID 13,56MHz Template: Release October 25th, 2018

TEST REPORT

N°: 158180-729320 **Version : 01**

Subject	**Radio spectrum matters tests according to standards: 47 CFR Part 15.225 & RSS 210 Issue 9 & RSS-Gen Issue 5**
Issued to	**IDEMIA Identity & Security France 2, place Samuel De Champlain 92400 COURBEVOIE FRANCE**

Apparatus under test

Product	**Access Control Terminal**
Trade mark	**IDEMIA**
Manufacturer	**IDEMIA Identity & Security France**
Model under test	**MPH-AC005A**
Serial number	**-**
FCC ID	**ZBW-MPHAC005A**
IC ID	**11472A-MPHAC005A**

Test date	: January 22, 2019 to February 1, 2019
Test location	Fontenay Aux Roses
Test Site	6230B-1
Composition of document	48 pages
Document issued on	June 6, 2019

Written by :
Armand MAHOUNGOU
Tests operator

Approved by :
Arnaud FAYETTE
Technical manager

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	April 25th,2019	Laurent DENEUX	Creation of the document

Date of receipt of test item
January 22th ,2019

SUMMARY

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1. TEST PROGRAM

References

- **47 CFR Part 15.225**
- **RSS 210 Issue 9**
- **RSS Gen Issue 5**
- **ANSI C63.10-2013**

Radio requirement:

Clause (47CFR Part 15.225 & RSS-210 Issue 9 & RSS-Gen Issue 5) Test Description	Test result - Comments			
Occupied Bandwidth	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
AC Power Line Conducted Emission	☑ PASS	☐ FAIL	☐ NA(2)	☐ NP(1)
Frequency Tolerance	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Field strength within the band 13.110-14.010MHz	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Field strength outside of the bands 13.110-14.010 MHz	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Receiver Radiated Emissions	☐ PASS (3)	☐ 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
(3)Testing covered the receive mode, and receiver spurious emissions are considered to be the same as transmitter.

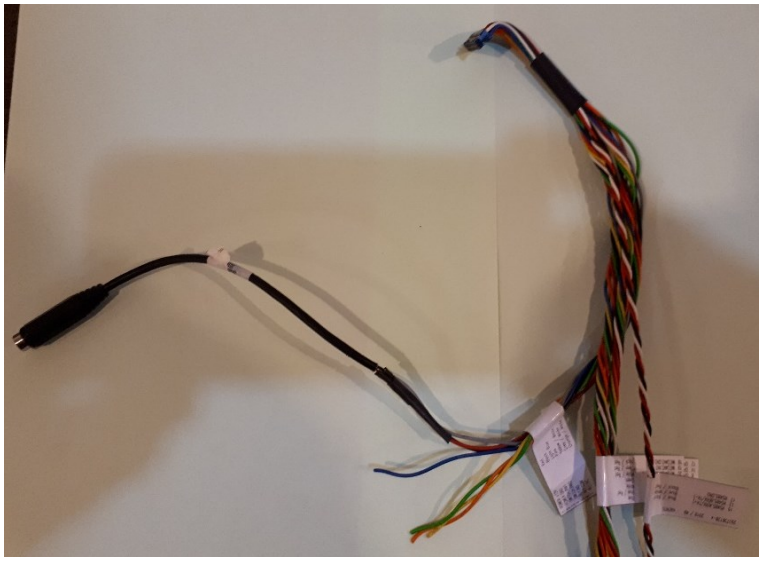
PASS: EUT complies with standard's requirement
FAIL: EUT does not comply with standard's requirement
NA: Not Applicable
NP: Test Not Performed

2. EQUIPMENT UNDER TEST: CONFIGURATION (DECLARED BY PROVIDER)

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):
IDEMIA MPH-AC005A **Serial Number: -**



Equipment Under Test

Equipment Under Test

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
POE	ZyXel model : PoE12-HP	2	☐	☑	☑	100-240V~ 50/60Hz
AC/DC Power supply	CINCON model : TRG36A12	1.8	☐	☐	☑	Input:100-240V~50-60Hz Output: 12Vdc 2.5A
DC Power supply	12Vdc	1.8	☐	☐	☑	-
Ethernet	RJ45	10	☐	☑	☑	Between POE and EUT when powered through POE or Between EUT and Laptop when powered through DC power supply.

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
LapTop	LENOVO L460	-	Not under test / just to send ping command
POE	ZyXel model : PoE12-HP	-	Not under test
AC/DC Power supply	CINCON model : TRG36A12	-	Not under test

Equipment information:

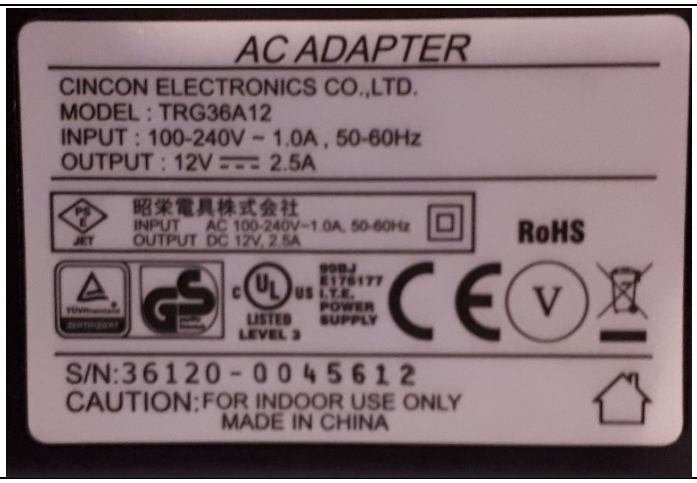
Type:	☐ **RFID**			
Frequency band:	[13.553 to 13.567] MHz			
Number of Channel:	1			
Antenna Type:	☑ Integral	☐ External	☐ Dedicated	
Transmit chains:	1			
Receiver chains	1			
Type of equipment:	☑ Stand-alone	☐ Plug-in	☐ Combined	
Equipment type:	☑ Production model	☐ Pre-production model		
Operating temperature range:	Tmin:	☑ -30°C IC ☑ -20°C FCC	☐ 0°C	☐ X°C
	Tnom:	20°C		
	Tmax:	☐ 35°C	☑ 50°C	☐ X°C
Type of power source:	☐ AC power supply	☑ DC power supply	☐ Battery	
Operating voltage range: DC	Vmin:	☐ 102V/60Hz	☑ 9Vdc	
	Vnom:	☐ 120V/60Hz	☑ 12Vdc	
	Vmax:	☐ 138V/60Hz	☑ 27Vdc	
Operating voltage range: POE	Vmin:	☐ 102V/60Hz	☑ 42,5Vdc	
	Vnom:	☐ 120V/60Hz	☑ 48Vdc	
	Vmax:	☐ 138V/60Hz	☑ 57Vdc	

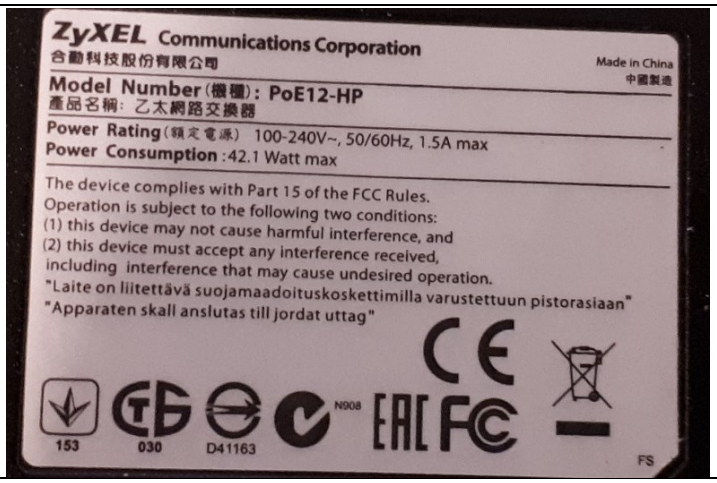
Antenna Characteristic			
Antenna assembly	**Gain (dBi)**	**Frequency Band (MHz)**	**Impedance(Ω)**
1	-	-	50

2.2. RUNNING MODE

The EUT is set in the following modes during tests:
- Permanent emission-reception with modulation at the highest power

2.3. EQUIPMENT LABELLING





2.4. EQUIPMENT MODIFICATION

☑ None ☐ Modification:

3. OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

Test performed by	: Armand MAHOUNGOU
Date of test	: February 1, 2019
Ambient temperature	: 27°C
Relative humidity	: 45%

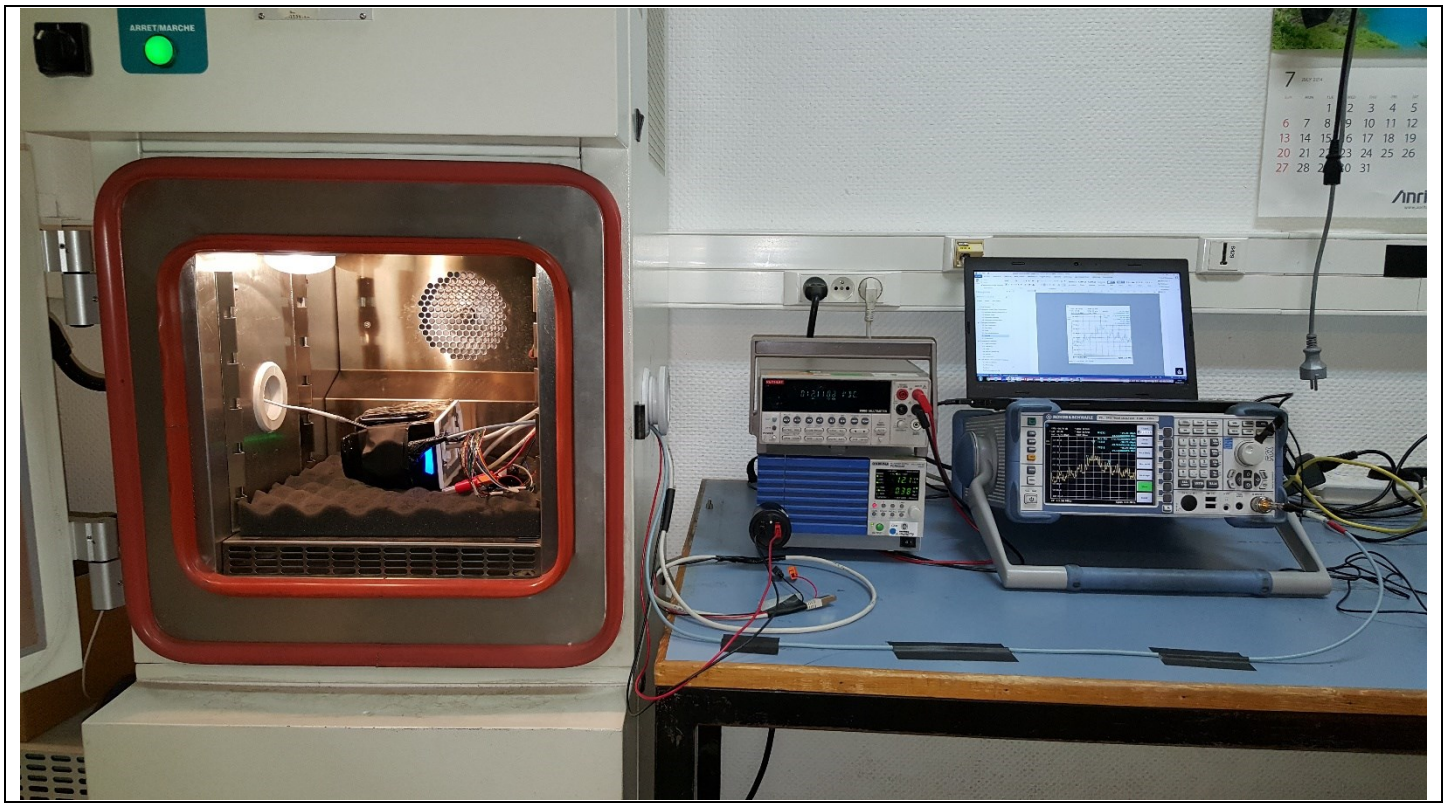
3.2. TEST SETUP

- The Equipment Under Test is installed:
☐ On a table
☑ In a climatic chamber
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☐ Conducted Method
☑ Radiated Method

- Test Procedure:
☑ RSS-Gen Issue 5 § 6.7

Photograph for Occupied bandwidth **(POE Mode)**



Photograph for Occupied bandwidth **(DC Mode)**

3.3. *LIMIT*

None

3.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Climatic chamber	SECASI	SLT34	D1024029	See Hygrometer	See Hygrometer
Hygrometer	AOIP	TM360	B4041042	2018/06	2019/12
Spectrum analyzer	ROHDE & SCHWARZ	FSL6	A4060032	2017/10	2019/10
Multimeter	KEITHLEY	2000	A1242090	2017/05	2019/05
Power supply	KIKUSUI	PCR500M	A7040079	See Multimeter	See Multimeter
Attenuator 20dB	-	WA54-3-12	A7122225	2018/11	2019/11
13,56MHz Test fixture Antenna	-	-	A5329422	See Spectrum analyzer	See Spectrum analyzer

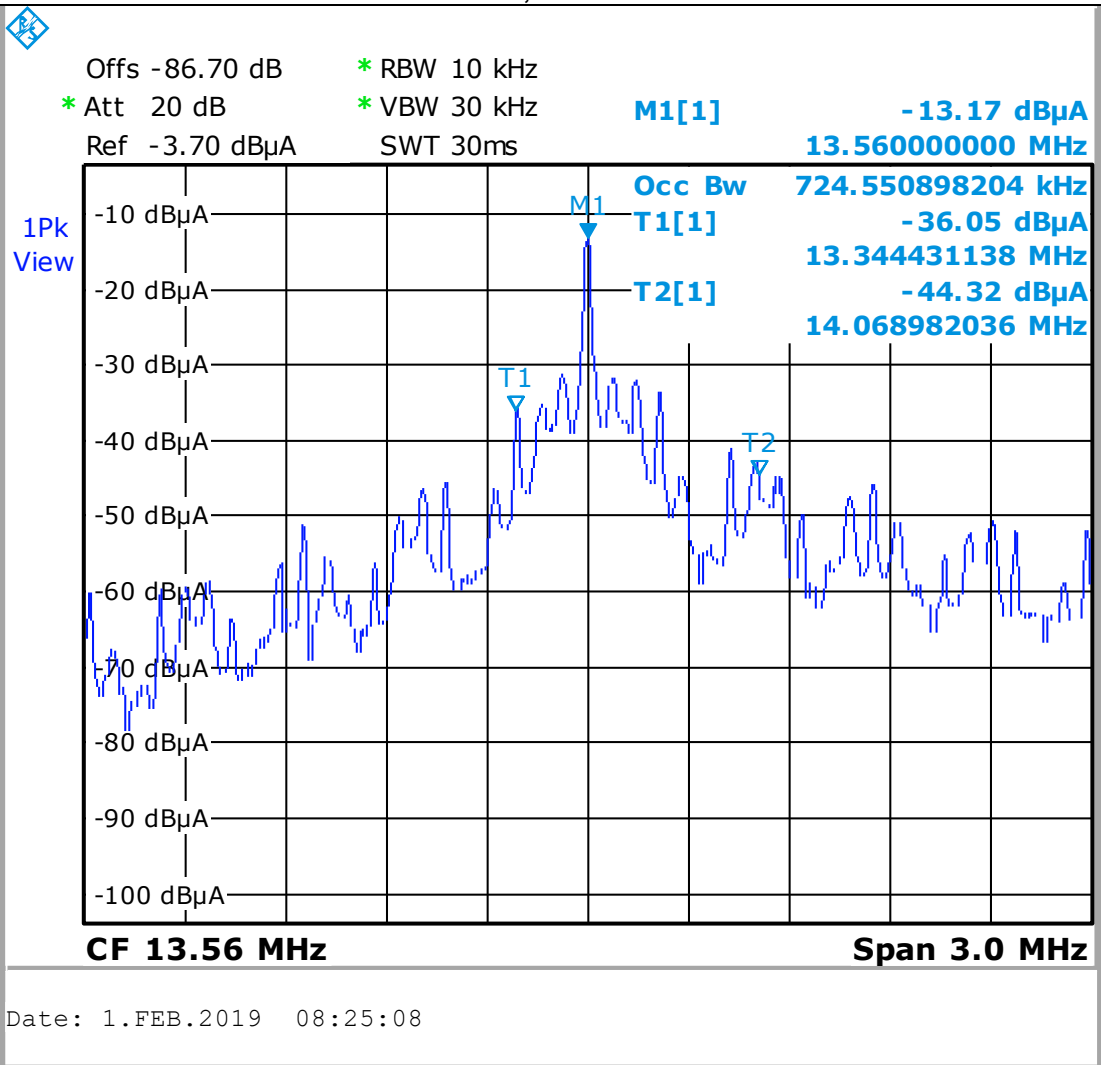
Note: In our quality system, the test equipment calibration due is more & less 2 months

3.5. *DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION*

☑ None ☐ Divergence:

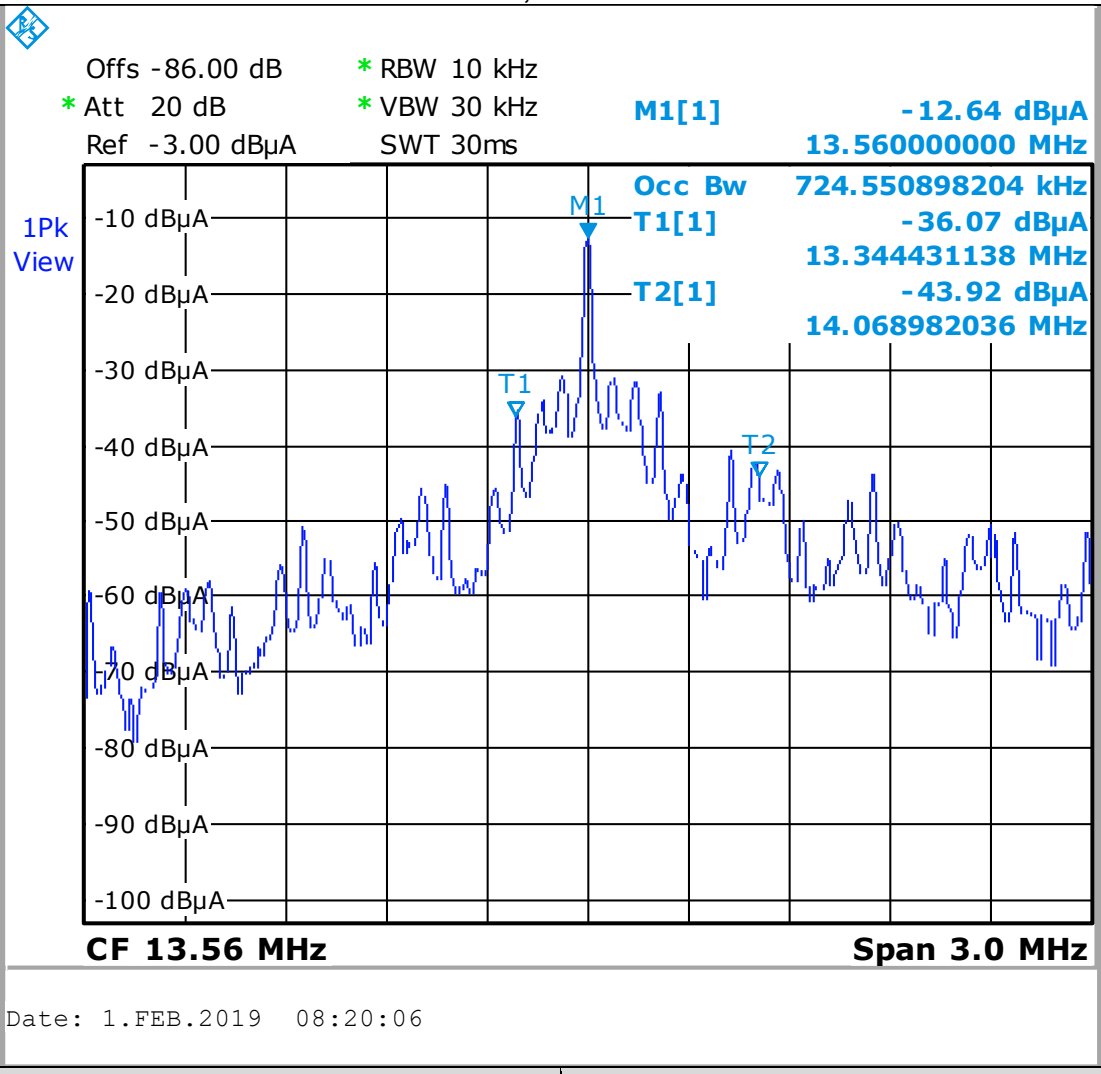
3.6. RESULTS

Occupied Bandwidth	
POE Mode	
13,56MHz	



Frequency(MHz)	Occupied Bandwidth (MHz)
13,56MHz	0,724

Occupied Bandwidth
DC Mode
13,56MHz



Frequency(MHz)	Occupied Bandwidth (MHz)
13,56MHz	0,724

3.1. CONCLUSION

Occupied Channel Bandwidth measurement performed on the sample of the product **IDEMIA MPH-AC005A**, SN: **-**, in configuration and description presented in this test report, show levels **compliant** to the **RSS-GEN ISSUE 5** limits.

4. FREQUENCY TOLERANCE

4.1. TEST CONDITIONS

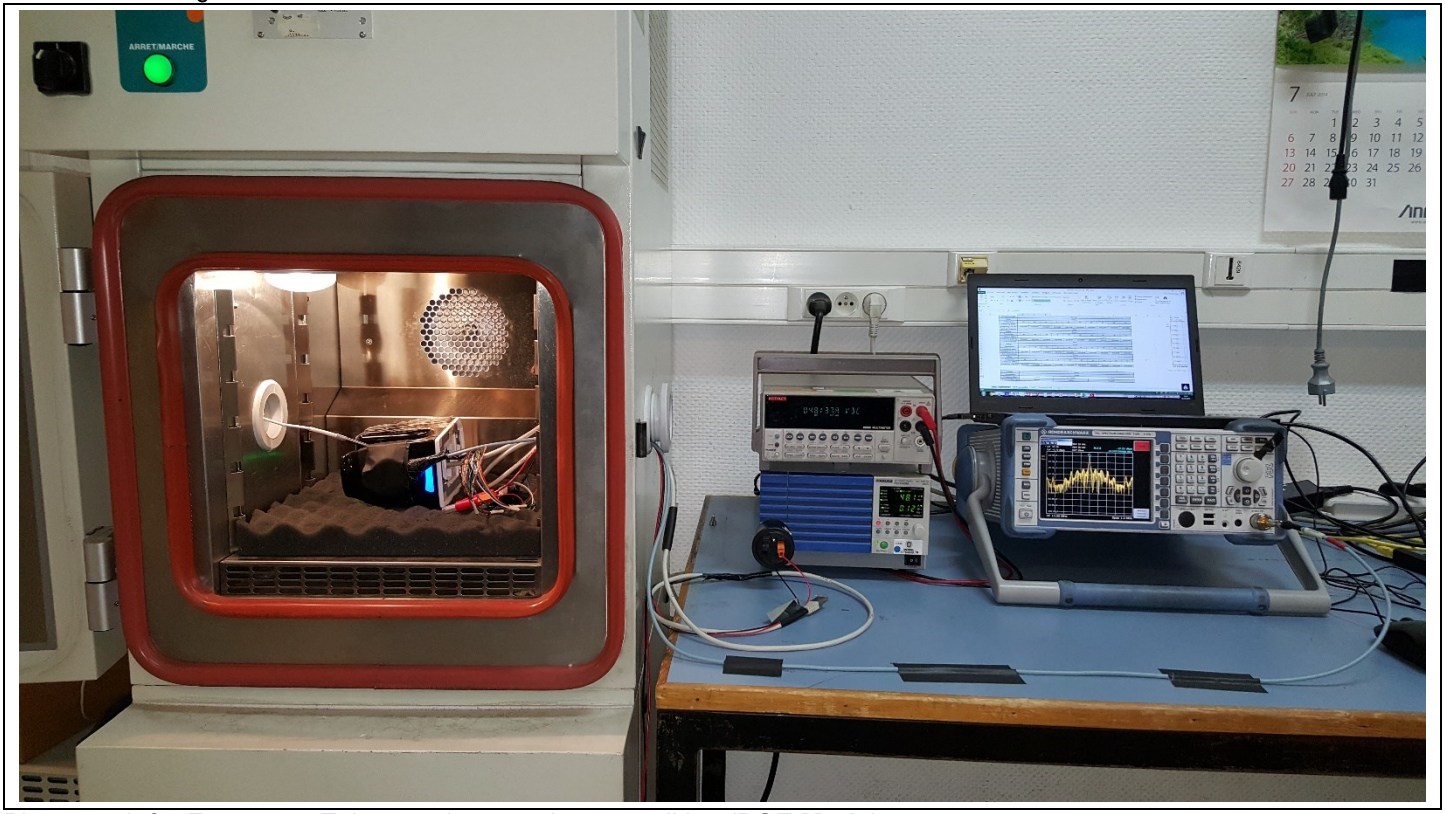
Test performed by	: Armand MAHOUNGOU
Date of test	: February 1, 2019
Ambient temperature	: 27°C
Relative humidity	: 45%

4.2. TEST SETUP

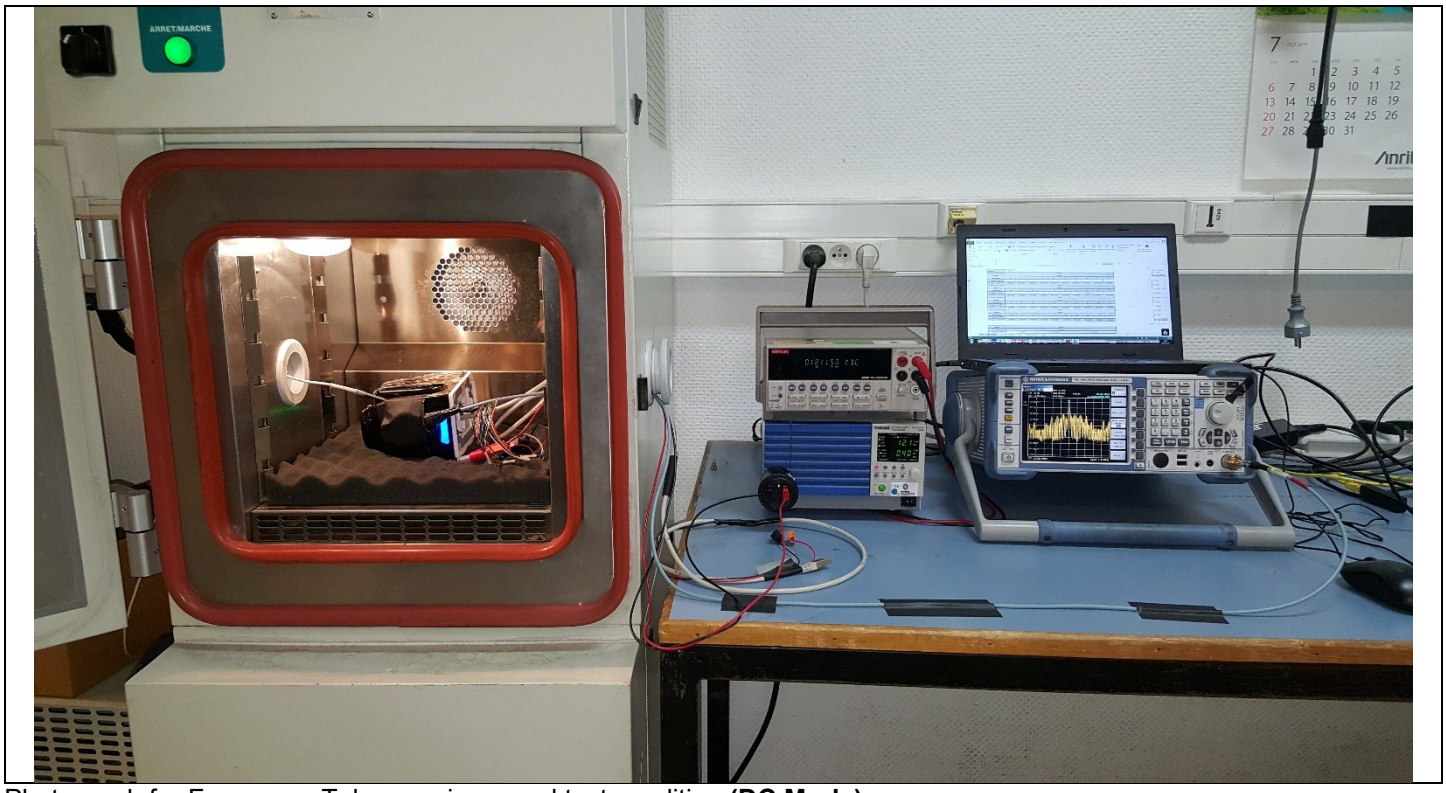
- The Equipment Under Test is installed:
☐ On a table
☑ In a climatic chamber
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☐ Conducted Method
☑ Radiated Method

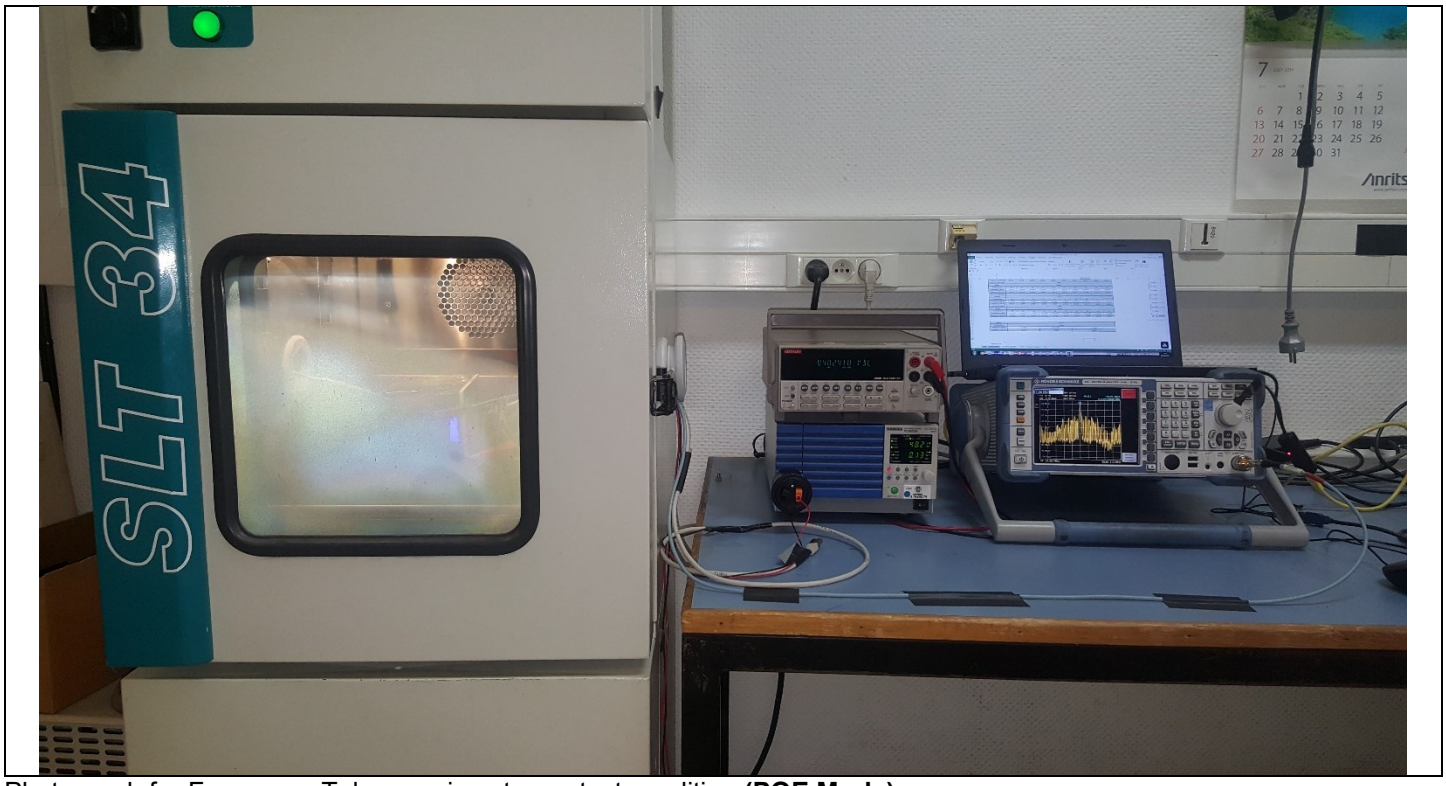
- Test Procedure:
☑ ANSI C63.10 § 6.8



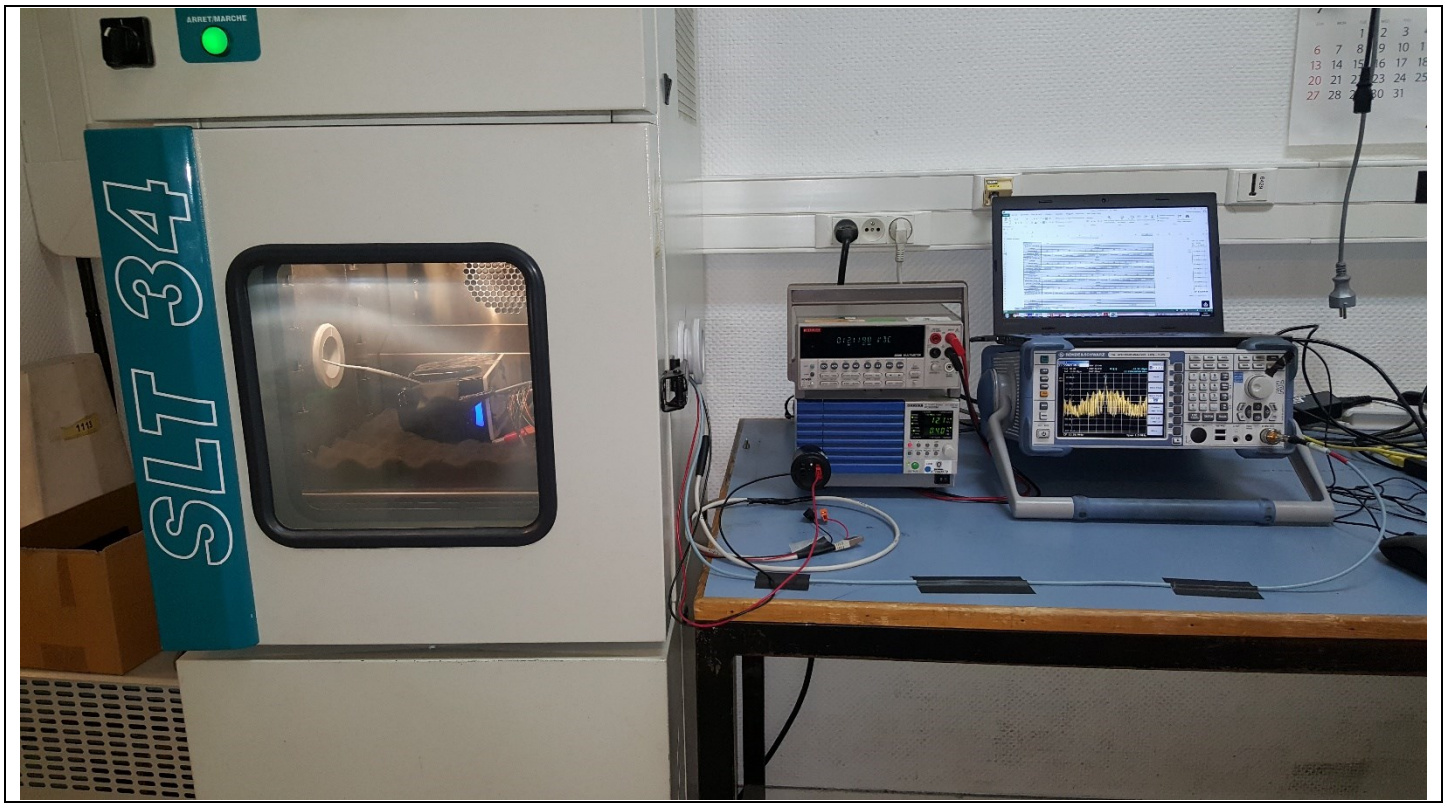
Photograph for Frequency Tolerance in normal test condition **(POE Mode)**



Photograph for Frequency Tolerance in normal test condition **(DC Mode)**



Photograph for Frequency Tolerance in extreme test condition **(POE Mode)**



Photograph for Frequency Tolerance in extreme test condition **(DC Mode)**

4.3. LIMIT

±0.01% (± 100ppm)

4.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Climatic chamber	SECASI	SLT34	D1024029	See Hygrometer	See Hygrometer
Hygrometer	AOIP	TM360	B4041042	2018/06	2019/12
Spectrum analyzer	ROHDE & SCHWARZ	FSL6	A4060032	2017/10	2019/10
Multimeter	KEITHLEY	2000	A1242090	2017/05	2019/05
Power supply	KIKUSUI	PCR500M	A7040079	See Multimeter	See Multimeter
Attenuator 20dB	-	WA54-3-12	A7122225	2018/11	2019/11
13,56MHz Test fixture Antenna	-	-	A5329422	See Spectrum analyzer	See Spectrum analyzer

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

4.5. *DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION*

☑ None ☐ Divergence:

4.6. RESULTS

For the POE Mode

Frequency	13,56									
EUT ACTIVATION	Start up									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,559725	13,559725	13,559875	13,559875	13,559875	13,559875	13,559575	13,559775	13,560025	13,559775
Frequency Drift (%)	-0,0020	-0,0020	-0,0009	-0,0009	-0,0009	-0,0009	-0,0031	-0,0017	0,0002	-0,0017
EUT ACTIVATION	2min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,559825	13,559775	13,559825	13,559875	13,559875	13,559725	13,559775	13,56032	13,559775	13,559725
Frequency Drift (%)	-0,0013	-0,0017	-0,0013	-0,0009	-0,0009	-0,0020	-0,0017	0,0024	-0,0017	-0,0020
EUT ACTIVATION	5min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,559775	13,559775	13,559875	13,559825	13,559925	13,559825	13,559725	13,559825	13,559875	13,559675
Frequency Drift (%)	-0,0017	-0,0017	-0,0009	-0,0013	-0,0006	-0,0013	-0,0020	-0,0013	-0,0009	-0,0024
EUT ACTIVATION	10min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,559725	13,559775	13,559875	13,559875	13,559625	13,559875	13,559775	13,559825	13,559825	13,559775
Frequency Drift (%)	-0,0020	-0,0017	-0,0009	-0,0009	-0,0028	-0,0009	-0,0017	-0,0013	-0,0013	-0,0017

Voltage	Vnom		
Temperature	Tnom		
Frequency (MHz)	13,55975	13,559688	13,55975
Frequency Drift (%)	-0,0018	-0,0023	-0,0018

For the DC Mode

Frequency	13,56									
EUT ACTIVATION	Start up									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,559875	13,559875	13,559875	13,559825	13,559875	13,559725	13,559775	13,559775	13,55975	13,559775
Frequency Drift (%)	-0,0009	-0,0009	-0,0009	-0,0013	-0,0009	-0,0020	-0,0017	-0,0017	-0,0018	-0,0017
EUT ACTIVATION	2min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,559775	13,559775	13,559875	13,559875	13,559775	13,559775	13,559775	13,559875	13,55975	13,559725
Frequency Drift (%)	-0,0017	-0,0017	-0,0009	-0,0009	-0,0017	-0,0017	-0,0017	-0,0009	-0,0018	-0,0020
EUT ACTIVATION	5min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,559725	13,559875	13,559875	13,559825	13,559875	13,559825	13,559775	13,559775	13,559725	13,559675
Frequency Drift (%)	-0,0020	-0,0009	-0,0009	-0,0013	-0,0009	-0,0013	-0,0017	-0,0017	-0,0020	-0,0024
EUT ACTIVATION	10min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,559725	13,559775	13,559775	13,559825	13,559875	13,559825	13,559775	13,559875	13,559725	13,559825
Frequency Drift (%)	-0,0020	-0,0017	-0,0017	-0,0013	-0,0009	-0,0013	-0,0017	-0,0009	-0,0020	-0,0013

Voltage	Vnom		
Temperature	Tnom		
Frequency (MHz)	13,55985	13,55975	13,55965
Frequency Drift (%)	-0,0011	-0,0018	-0,0026

4.7. CONCLUSION

Frequency tolerance measurement performed on the sample of the product **IDEMIA MPH-AC005A**, SN: **-**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.225 & RSS 210 ISSUE 9 limits.

5. AC POWER LINE CONDUCTED EMISSIONS

5.1. TEST CONDITIONS

Test performed by	: Laurent DENEUX
Date of test	: January 25, 2019
Ambient temperature	: 21 °C
Relative humidity	: 50 %

5.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013) 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 50Ω / 50µH. Interconnecting cables and equipment's were moved to position that maximized emission.

Photograph for Power Line Conducted Emissions **(DC Mode)**

Photograph for Power Line Conducted Emissions **(DC Mode)**

Photograph for Power Line Conducted Emissions **(POE Mode)**

Photograph for Power Line Conducted Emissions (POE power supply)

5.3. LIMIT

Quasi-Peak
0,15kHz to 0,5MHz: 66dBµV to 56dBµV*
0,5MHz to 5MHz: 56dBµV
5MHz to 30MHz: 60dBµV

Average
0,15kHz to 0,5MHz: 56dBµV to 46dBµV*
0,5MHz to 5MHz: 46dBµV
5MHz to 30MHz: 50dBµV

*Decreases with the logarithm of the frequency

5.4. 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	08/2018	08/2019
limiter	ROHDE & SCHWARZ	ESH3-Z2	A2649008	03/2018	03/2019
Cable	-	-	A5329417	09/2018	09/2019
Cable	-	-	A5329589	09/2018	09/2019
Ground plane	LCIE	-	-	-	-

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

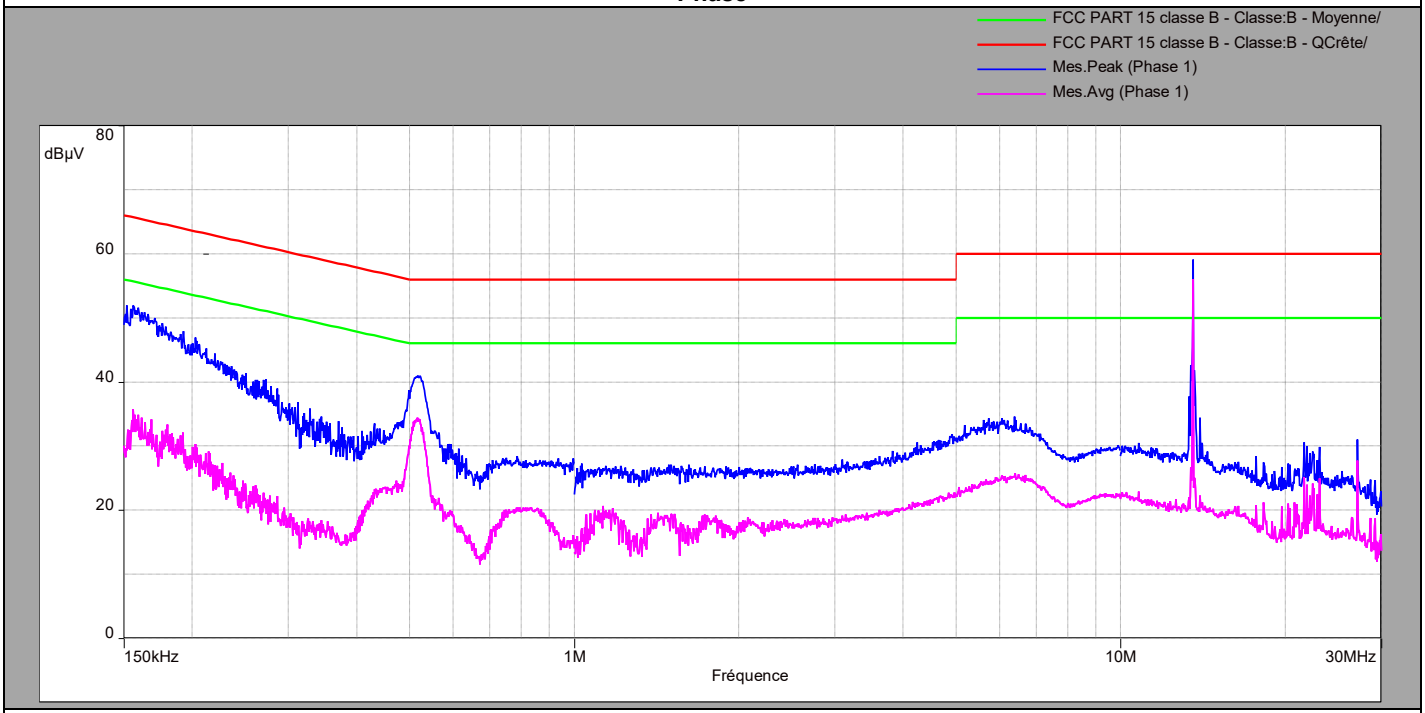
5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

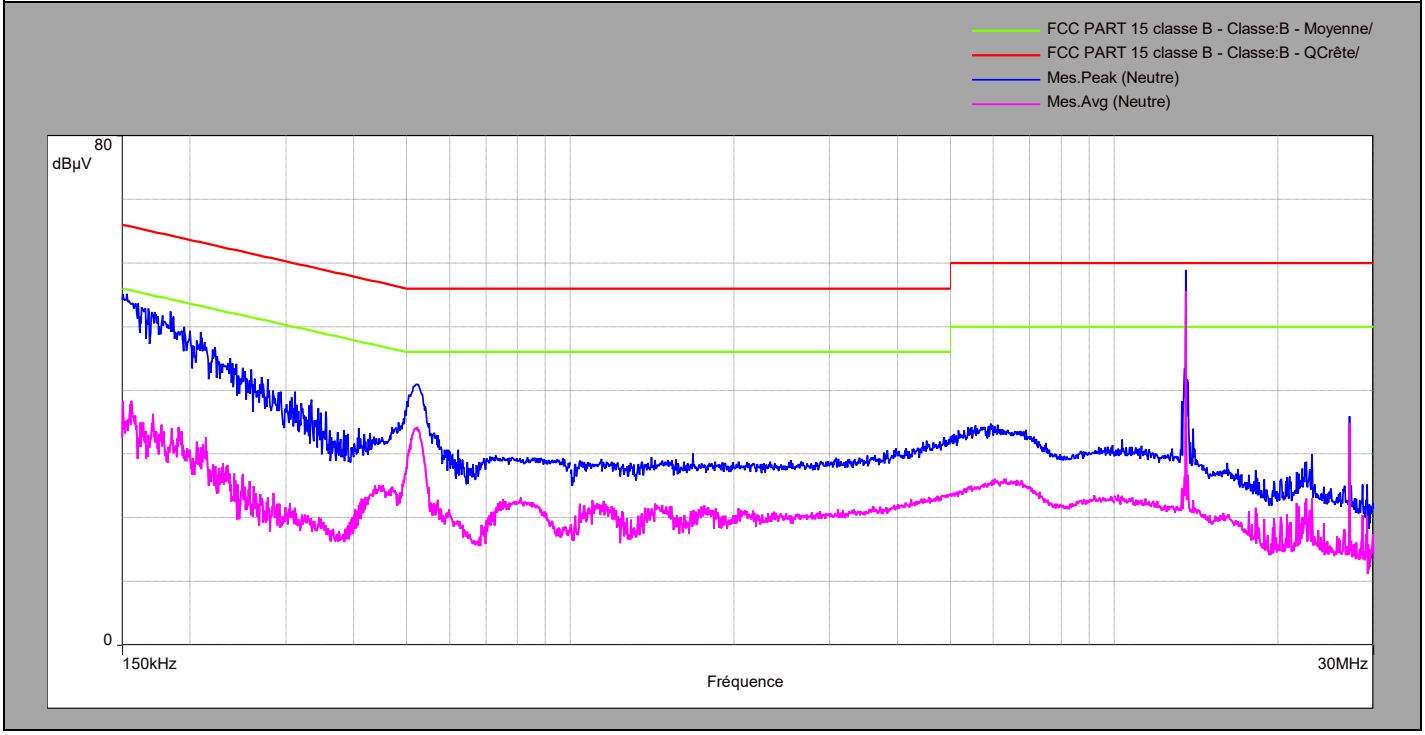
5.6. RESULTS

120V-60Hz AC Power Line Conducted Emission (DC power supply)
With antenna

Phase



Line

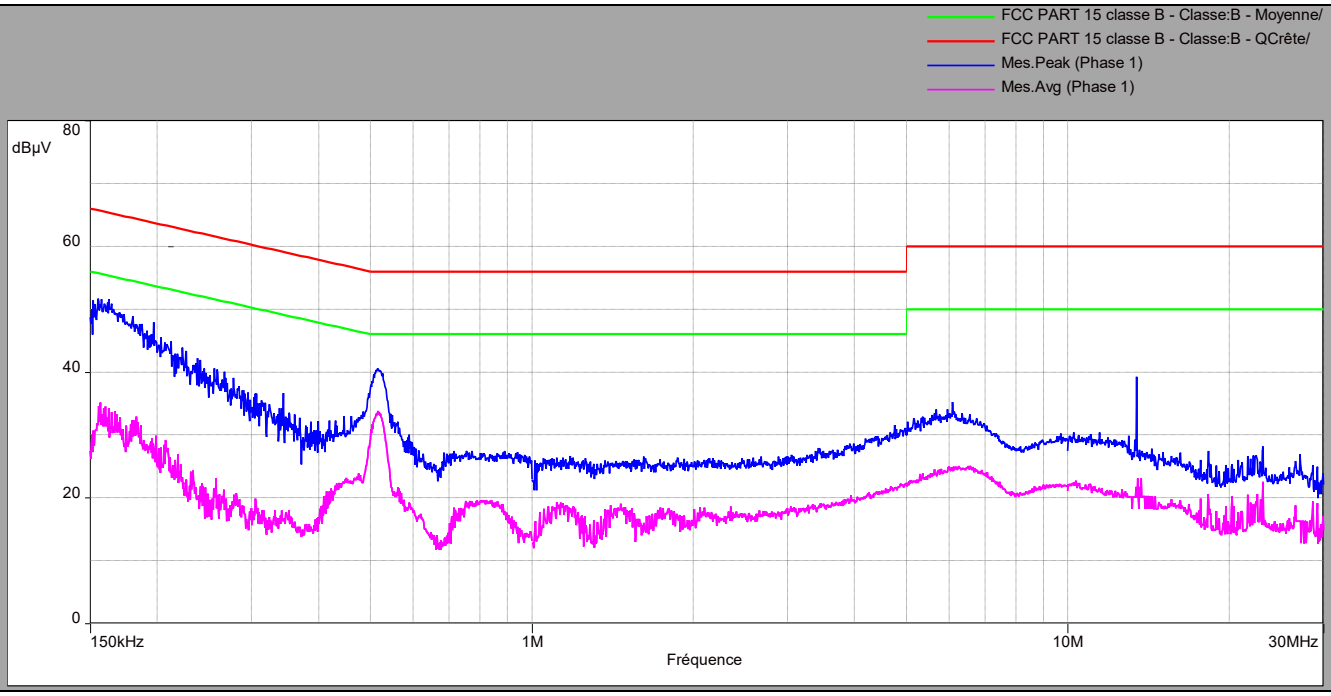


Phase Line							
Frequency (MHz)	**Peak Level (dBµV)**	**Quasi-Peak Level (dBµV)**	**Quasi-Peak/Peak Limit (dBµV)**	**Margin Quasi-Peak (dBµV)**	**Average Level (dBµV)**	**Average Limit (dBµV)**	**Margin Average (dBµV)**
0,156	51,7	-	65,7	14	35	55,7	20,7
0,516	40,7	-	56	15,3	34,2	46	11,8
6,07	34,4	-	60	25,6	25,4	50	24,6
13,56	59	-	60	1	56	50	-6
27,12	31	-	60	29	25	50	25

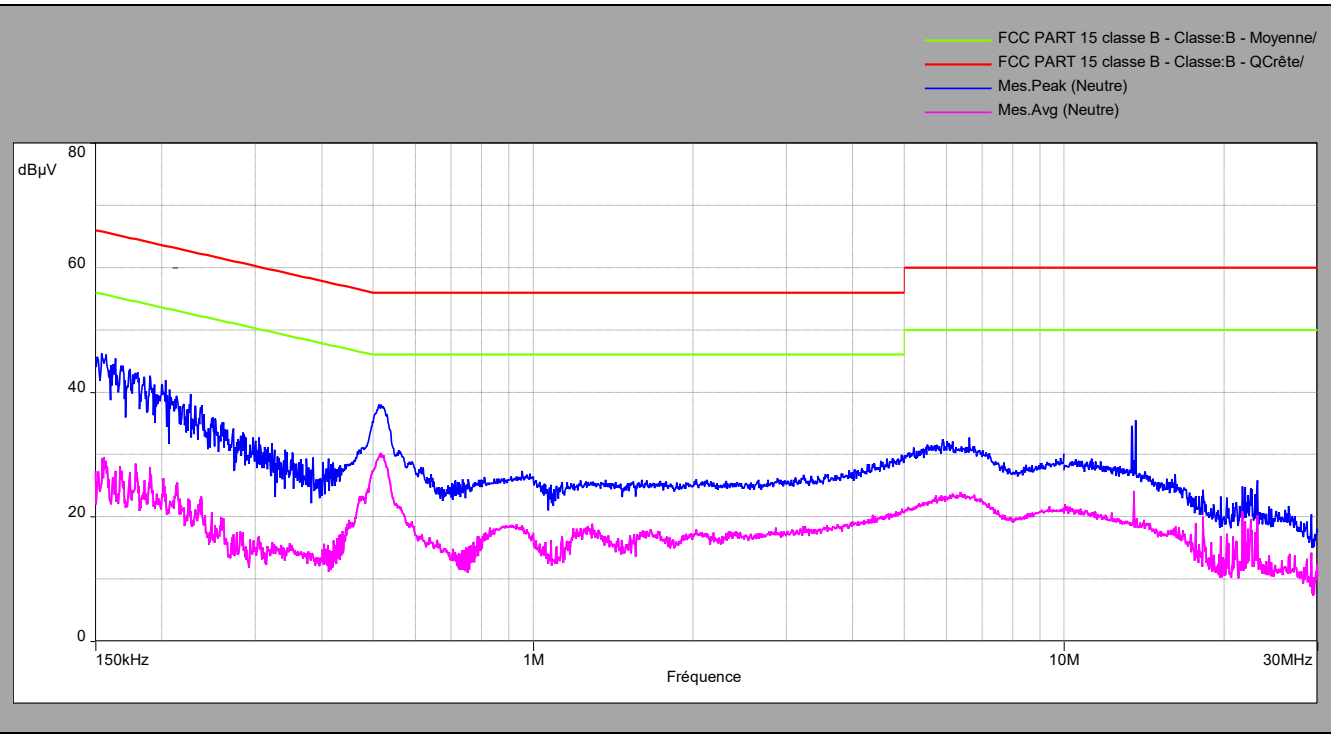
Neutral Line							
Frequency (MHz)	**Peak Level (dBµV)**	**Quasi-Peak Level (dBµV)**	**Quasi-Peak/Peak Limit (dBµV)**	**Margin Quasi-Peak (dBµV)**	**Average Level (dBµV)**	**Average Limit (dBµV)**	**Margin Average (dBµV)**
0,156	55,2	-	65,7	10,5	38,4	55,7	17,3
0,523	40,7	-	56	15,3	34,3	46	11,7
5,93	34,7	-	60	25,3	25,4	50	24,6
13,56	58,9	-	60	1,1	55,5	50	-5,5
27,12	36	-	60	24	34,8	50	15,2

120V-60Hz AC Power Line Conducted Emission (DC power supply)
Without antenna

Phase



Line

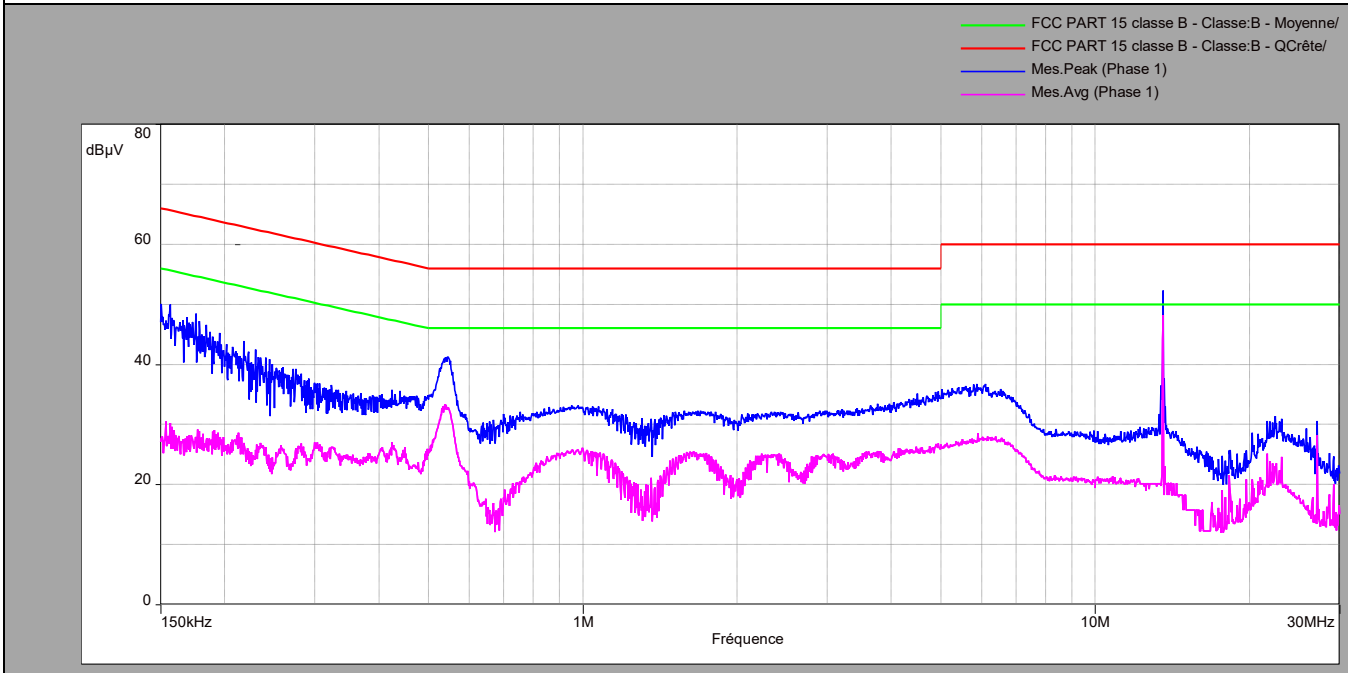


Phase Line							
Frequency (MHz)	**Peak Level (dBµV)**	**Quasi-Peak Level (dBµV)**	**Quasi-Peak/Peak Limit (dBµV)**	**Margin Quasi-Peak (dBµV)**	**Average Level (dBµV)**	**Average Limit (dBµV)**	**Margin Average (dBµV)**
0,156	51,3	-	65,7	14,4	34,5	55,7	21,2
0,515	40,2	-	56	15,8	33	46	13
6,088	35,2	-	60	24,8	24,2	50	25,8
13,43	37,3	-	60	22,7	23	50	27
23,12	28,2	-	60	31,8	22	50	28

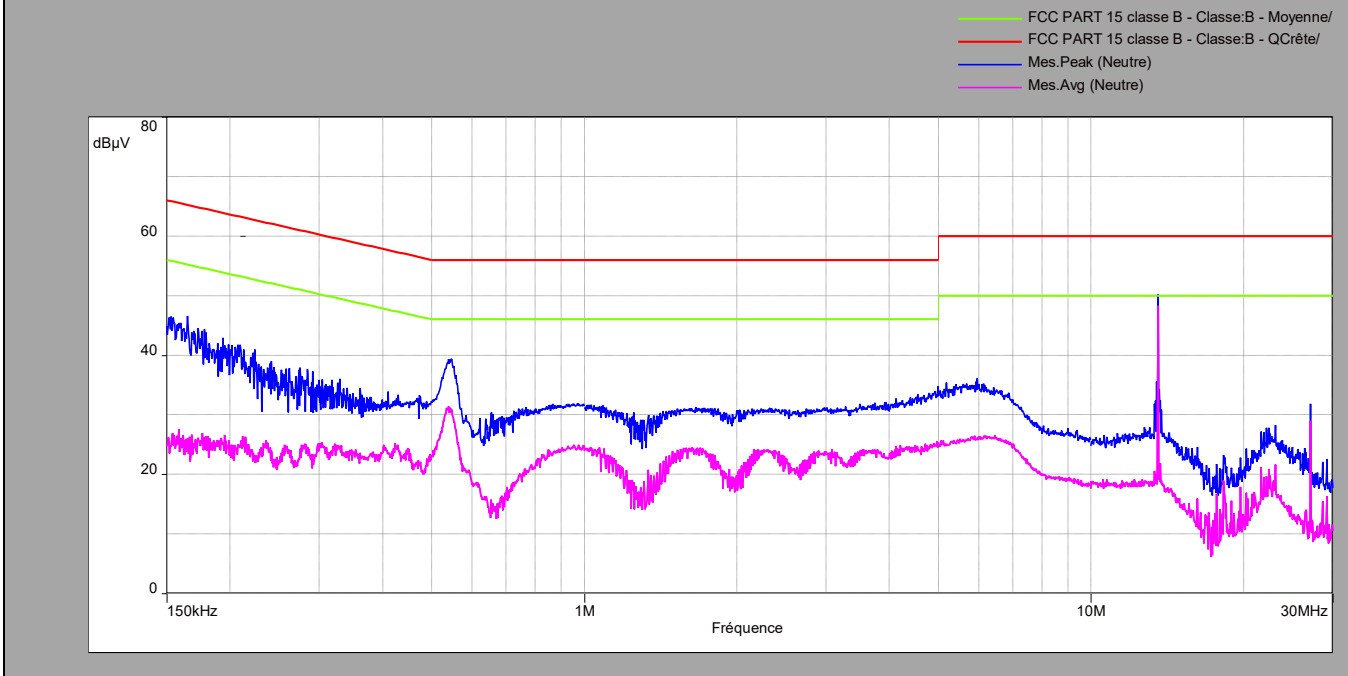
Neutral Line							
Frequency (MHz)	**Peak Level (dBµV)**	**Quasi-Peak Level (dBµV)**	**Quasi-Peak/Peak Limit (dBµV)**	**Margin Quasi-Peak (dBµV)**	**Average Level (dBµV)**	**Average Limit (dBµV)**	**Margin Average (dBµV)**
0,156	45,4	-	65,7	20,3	29	55,7	26,7
0,516	37,8	-	56	18,2	30	46	16
5,93	32	-	60	28	23	50	27
13,62	35,5	-	60	24,5	24,2	50	25,8
21,66	24	-	60	36	16,3	50	33,7

240V-50Hz AC Power Line Conducted Emission (DC power supply)
With antenna

Phase



Line

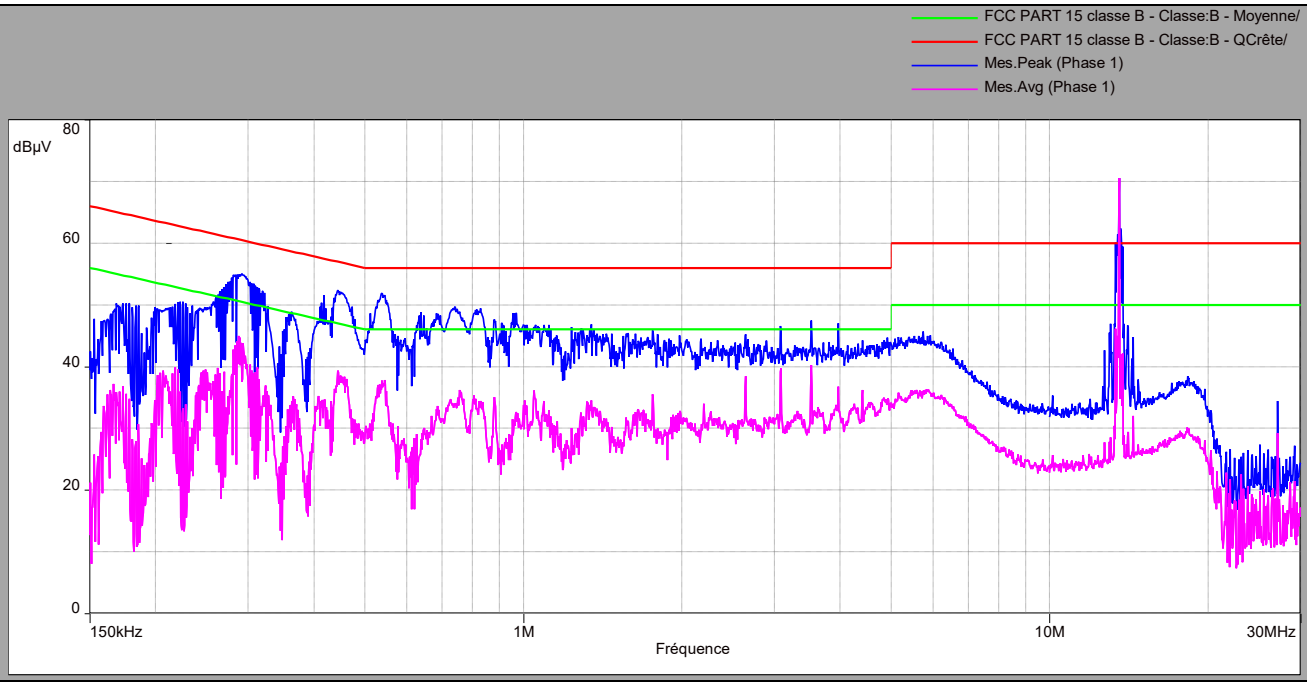


Phase Line							
Frequency (MHz)	**Peak Level (dBµV)**	**Quasi-Peak Level (dBµV)**	**Quasi-Peak Limit (dBµV)**	**Margin Quasi-Peak (dBµV)**	**Average Level (dBµV)**	**Average Limit (dBµV)**	**Margin Average (dBµV)**
0,156	46,5	-	65,7	19,2	26	55,7	29,7
0,542	39	-	56	17	31,2	46	14,8
5,96	36	-	60	24	26	50	24
13,56	49,8	-	60	10,2	47,7	50	2,3
27,12	30,6	-	60	29,4	29	50	21

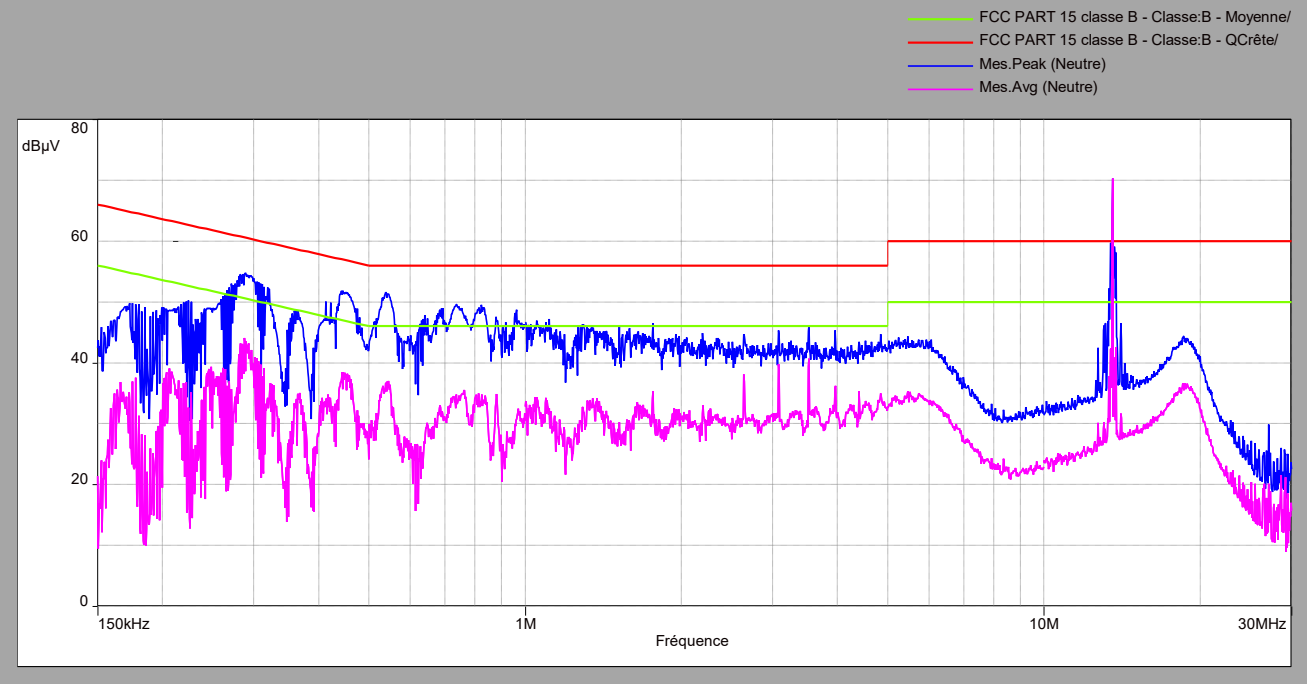
Neutral Line							
Frequency (MHz)	**Peak Level (dBµV)**	**Quasi-Peak Level (dBµV)**	**Quasi-Peak Limit (dBµV)**	**Margin Quasi-Peak (dBµV)**	**Average Level (dBµV)**	**Average Limit (dBµV)**	**Margin Average (dBµV)**
0,156	50	-	65,7	15,7	39,5	55,7	16,2
0,523	41	-	56	15	33	46	13
5,91	36,2	-	60	23,8	28,5	50	21,5
13,56	52,3	-	60	7,7	48,2	50	1,8
27,12	30,6	-	60	29,4	27,5	50	22,5

120V-60Hz AC Power Line Conducted Emission (POE power supply)
With antenna

Phase



Line

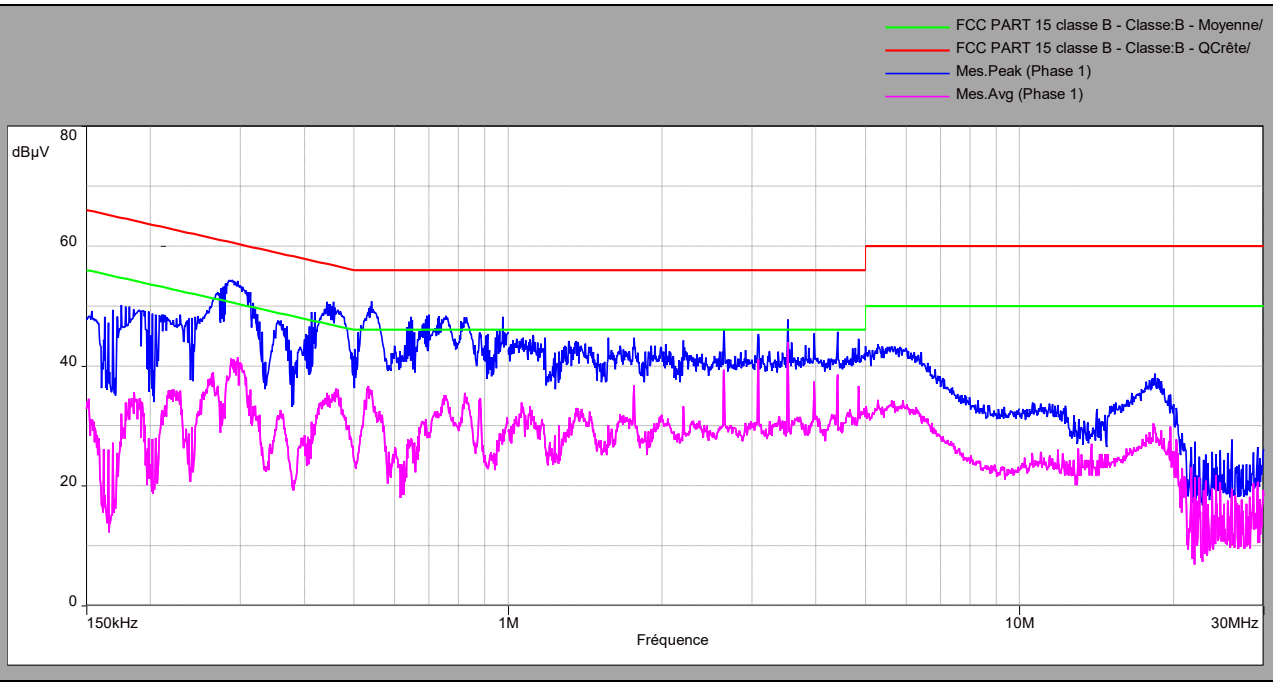


Phase Line							
Frequency (MHz)	**Peak Level (dBµV)**	**Quasi-Peak Level (dBµV)**	**Quasi-Peak Limit (dBµV)**	**Margin Quasi-Peak (dBµV)**	**Average Level (dBµV)**	**Average Limit (dBµV)**	**Margin Average (dBµV)**
0,281	55	-	60,7	5,7	44,7	50,7	6
0,829	49,2	-	56	6,8	34	46	12
3,52	47,5	-	56	8,5	40,2	46	5,8
13,53	70,5	-	60	-10,5	70,4	50	-20,4
27,12	34,4	-	60	25,6	29,3	50	20,7

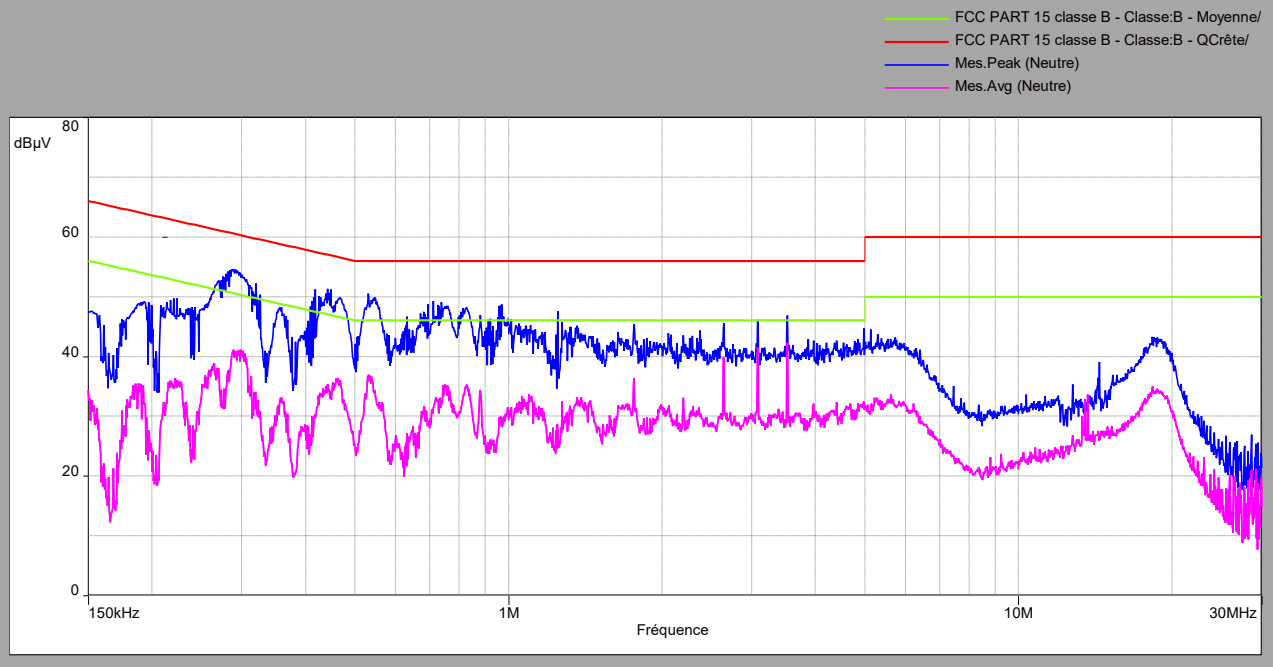
Neutral Line							
Frequency (MHz)	**Peak Level (dBµV)**	**Quasi-Peak Level (dBµV)**	**Quasi-Peak Limit (dBµV)**	**Margin Quasi-Peak (dBµV)**	**Average Level (dBµV)**	**Average Limit (dBµV)**	**Margin Average (dBµV)**
0,281	54,4	-	60,7	6,3	43,5	50,7	7,2
0,74	49,5	-	56	6,5	35,5	46	10,5
3,52	46	-	56	10	42,2	46	3,8
13,53	70,4	-	60	-10,4	70,1	50	-20,1
18,608	44,3	-	60	15,7	35	50	15

120V-60Hz AC Power Line Conducted Emission (POE power supply)
Without antenna

Phase



Line

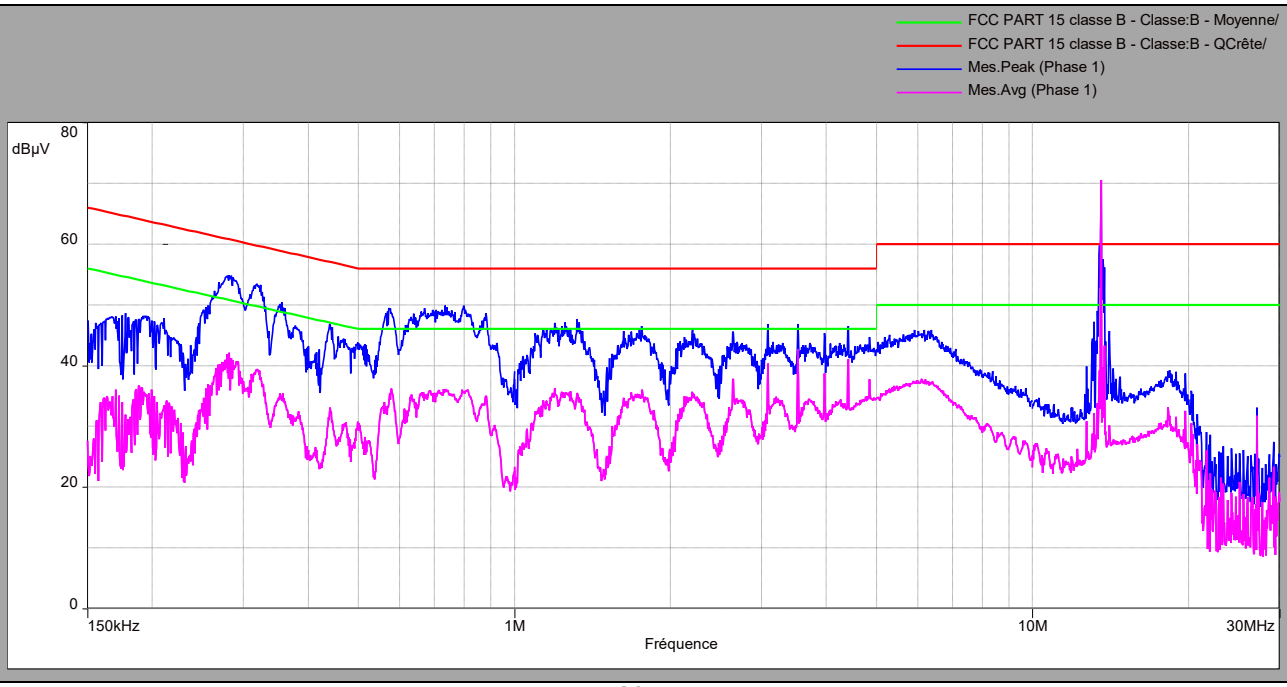


Phase Line							
Frequency (MHz)	**Peak Level (dBµV)**	**Quasi-Peak Level (dBµV)**	**Quasi-Peak Limit (dBµV)**	**Margin Quasi-Peak (dBµV)**	**Average Level (dBµV)**	**Average Limit (dBµV)**	**Margin Average (dBµV)**
0,289	54,4	-	60,7	6,3	41	50,7	9,7
0,824	47,7	-	56	8,3	35,4	46	10,6
3,52	47,7	-	56	8,3	43,5	46	2,5
5,86	43	-	60	17	32,7	50	17,3
18,24	37,7	-	60	22,3	30,23	50	19,77

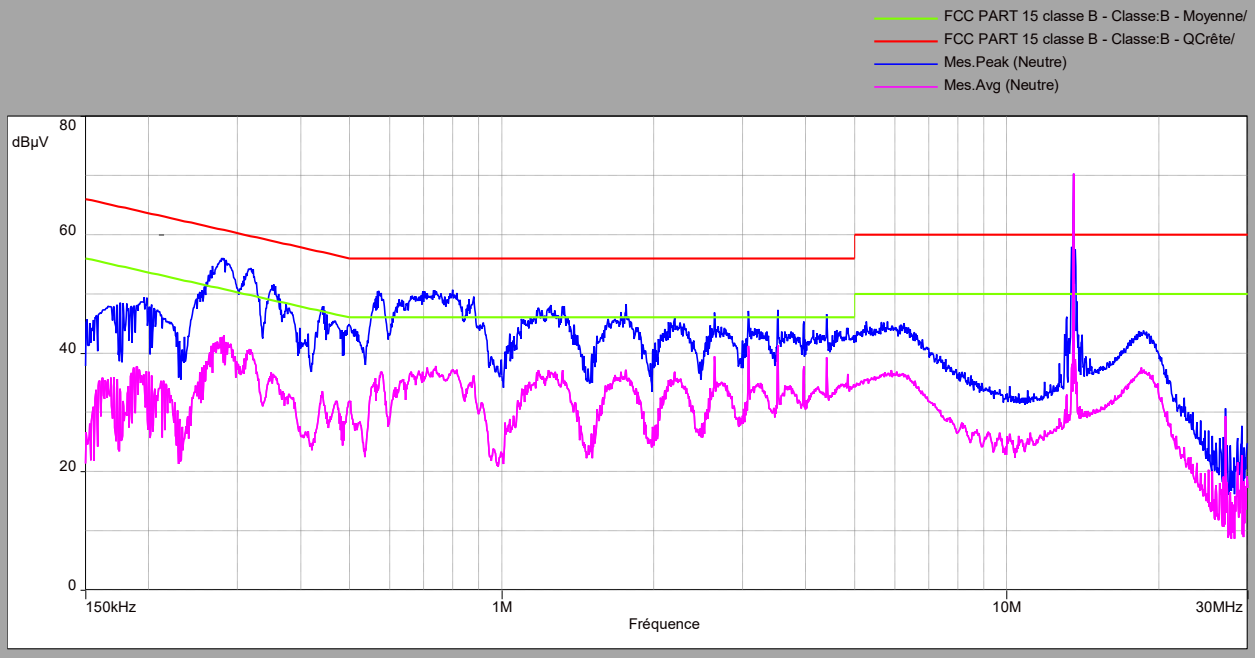
Neutral Line							
Frequency (MHz)	**Peak Level (dBµV)**	**Quasi-Peak Level (dBµV)**	**Quasi-Peak Limit (dBµV)**	**Margin Quasi-Peak (dBµV)**	**Average Level (dBµV)**	**Average Limit (dBµV)**	**Margin Average (dBµV)**
0,281	54,4	-	60,7	6,3	40,8	50,7	9,9
0,531	50,5	-	56	5,5	37	46	9
3,52	46,6	-	56	9,4	40,9	46	5,1
5,13	44,5	-	60	15,5	30,6	50	19,4
18,68	43,15	-	60	16,85	33,75	50	16,25

240V-50Hz AC Power Line Conducted Emission (POE power supply)
With antenna

Phase



Line

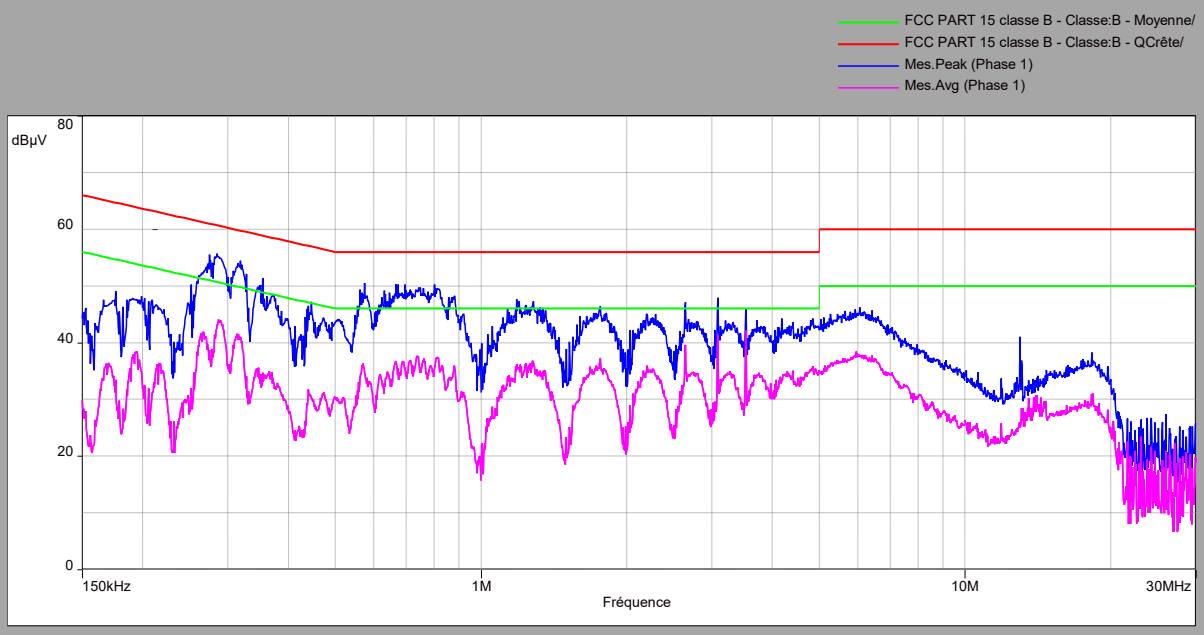


Phase Line							
Frequency (MHz)	**Peak Level (dBµV)**	**Quasi-Peak Level (dBµV)**	**Quasi-Peak Limit (dBµV)**	**Margin Quasi-Peak (dBµV)**	**Average Level (dBµV)**	**Average Limit (dBµV)**	**Margin Average (dBµV)**
0,281	54,8	-	60,7	5,9	42,1	50,7	8,6
0,8	49,8	-	56	6,2	36	46	10
3,52	46,2	-	56	9,8	42,8	46	3,2
13,56	70,5	-	60	-10,5	70	50	-20
27,12	33,2	-	60	26,8	31,7	50	18,3

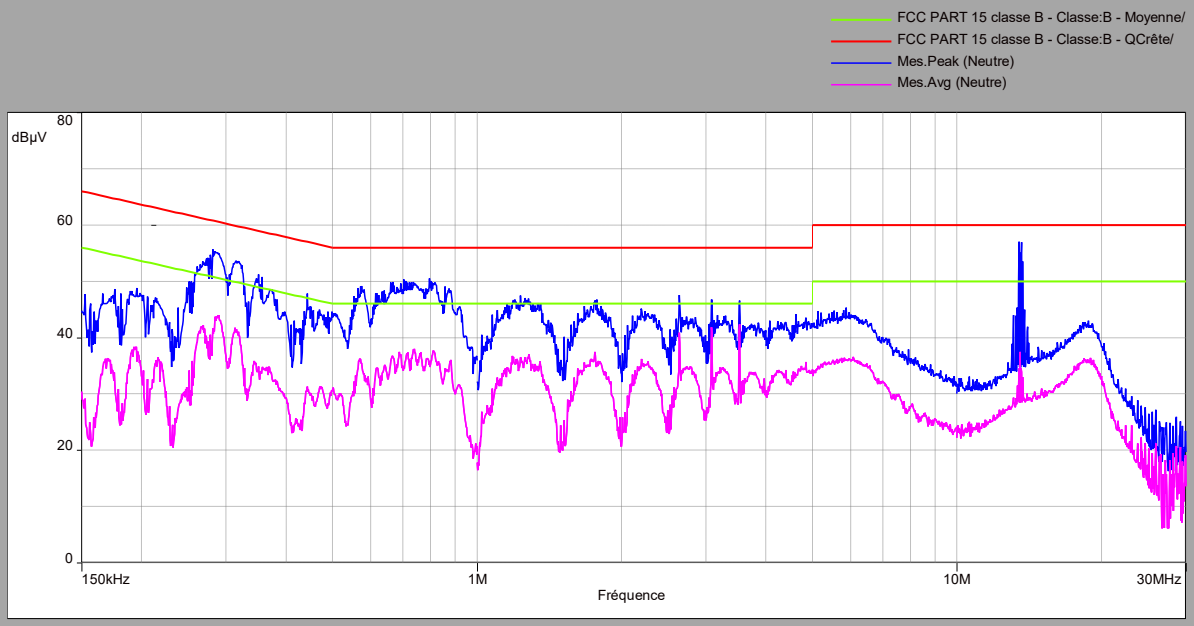
Neutral Line							
Frequency (MHz)	**Peak Level (dBµV)**	**Quasi-Peak Level (dBµV)**	**Quasi-Peak Limit (dBµV)**	**Margin Quasi-Peak (dBµV)**	**Average Level (dBµV)**	**Average Limit (dBµV)**	**Margin Average (dBµV)**
0,281	56	-	60,7	4,7	43	50,7	7,7
0,8	50,6	-	56	5,4	37,3	46	8,7
3,08	47,2	-	56	8,8	41,18	46	4,82
13,56	70,3	-	60	-10,3	70	50	-20
27,12	30,6	-	60	29,4	29,3	50	20,7

240V-50Hz AC Power Line Conducted Emission (POE power supply)
Without antenna

Phase



Line



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)**
0,281	55,1	-	60,7	5,6	44	50,7	6,7
0,8	49,5	-	56	6,5	37,3	46	8,7
3,08	47,8	-	56	8,2	41,4	46	4,6
6,43	45,6	-	60	14,4	37,7	50	12,3
13	41	-	60	19	28	50	22

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)**
0,281	55,8	-	60,7	4,9	43,5	50,7	7,2
0,8	50,5	-	56	5,5	37,4	46	8,6
2,64	47,5	-	56	8,5	40,8	46	5,2
13,53	55	-	60	5	37,5	50	12,5
18,79	43	-	60	17	36	50	14

5.7. CONCLUSION

Ac Power Line Conducted Emission measurement performed on the sample of the product **IDEMIA MPH-AC005A**, SN: **-**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.225 & RSS Gen ISSUE 5 limits.

6. FIELD STRENGTH OUTSIDE OF THE BANDS 13.110-14.010 MHZ

6.1. TEST CONDITIONS

Test performed by	: Laurent DENEUX
Date of test	: January 22, 2019 to January 28, 2016
Ambient temperature	: 19 to 21 °C
Relative humidity	: 47 to 50 %

6.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013).
Test is performed in parallel, perpendicular and ground parallel axis with a loop antenna below 30MHz. Measurement bandwidth was 200Hz below 150kHz and 9kHz between 150kHz & 30MHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height was 1m. 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** between 30MHz & 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. The EUT is placed **on an open area test site** above 1GHz and **on an open area test site** from 30MHz to 1GHz. Distance between measuring antenna and the EUT is **10m**.

Photograph for Field strength outside of the bands 13.110-14.010 MHz

Photograph for Field strength outside of the bands 13.110-14.010 MHz

6.3. LIMIT

Limit at 3m:
9kHz to 0,490MHz: 2400/F(kHz)µV/m (300m) or 20log(2400/F(kHz))dBµV/m (3m) QPeak
0,490MHz to 1.705MHz: 240000/F(kHz)µV/m (30m) or 20log(240000/F(kHz))dBµV/m (3m) QPeak
1.705MHz to 30MHz: 30µV/m (30m) or dBµV/m (3m) QPeak
30MHz to 88MHz: 40dBµV/m QPeak
88MHz to 216MHz: 43,5dBµV/m QPeak
216MHz to 960MHz: 46dBµV/m QPeak
960MHz to 1000MHz: 54dBµV/m QPeak
Above 1000MHz: 74dBµV/m Peak
54dBµV/m Average

Limit at 10m:
30MHz to 88MHz: 29.5dBµV/m QPeak
88MHz to 216MHz: 33dBµV/m QPeak
216MHz to 960MHz: 35.5dBµV/m QPeak
960MHz to 1000MHz: 43.5dBµV/m QPeak
Above 1000MHz: 63.5BµV/m Peak
43.5BµV/m Average

6.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Open test site	LCIE	-	F2000400	2018-06	2019-06
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2018-10	2020-10
Bilog antenna	CHASE	CBL 6112A	C2040040	2018-04	2019-04
loop antenna	RHODE & SCHWARZ	HFH2-Z2	C2040007	2018-11	2020-11
Horn antenna	EMCO	3115	C2042016	2018-04	2019-04
Preamplifier	HEWLETT PACKARD	8449B	A4069002	2018-04	2020-04
Cable	-	-	A5329442	2018-09	2019-09
Cable	-	-	A5329444	2018-09	2019-09
Cable	-	-	A5329876	2018-11	2019-11
Cable			A5326368	2018-12	2019-12
Cable	-	-	A5329416	2018-12	2019-12

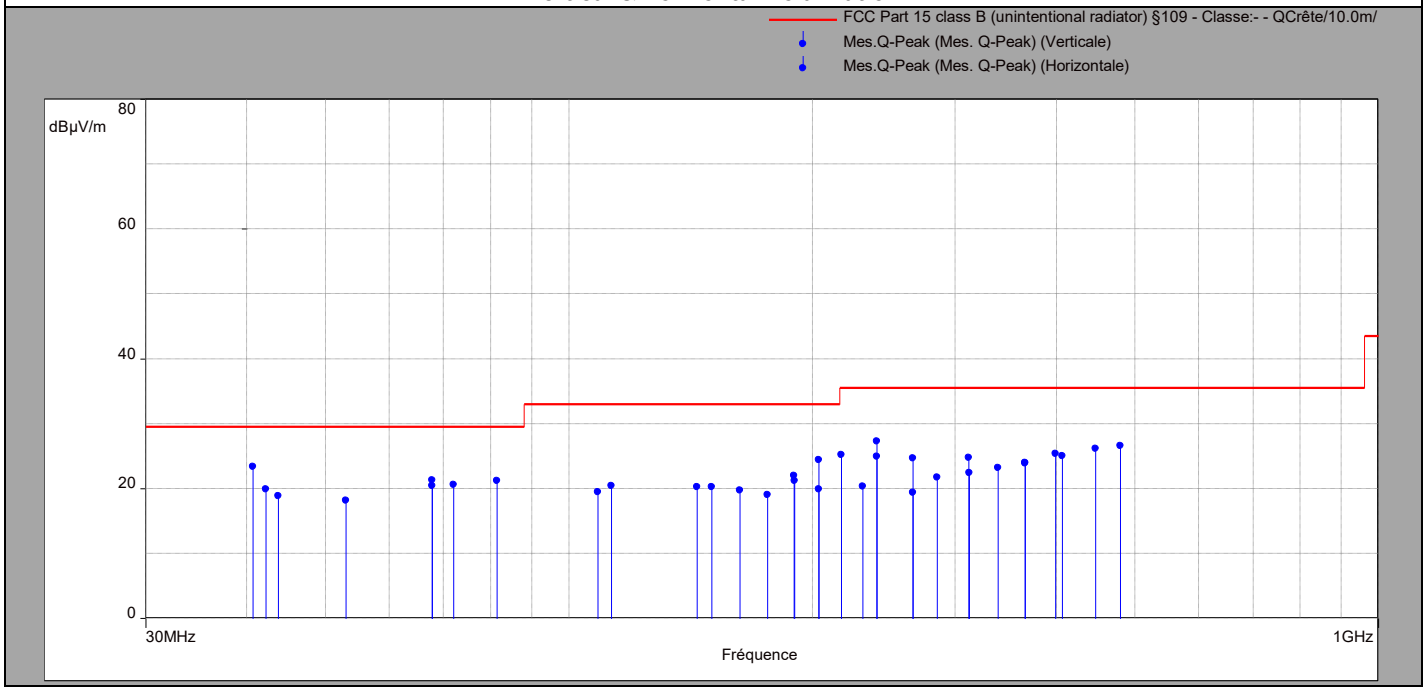
Note: In our quality system, the test equipment calibration due is more & less 2 months

6.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

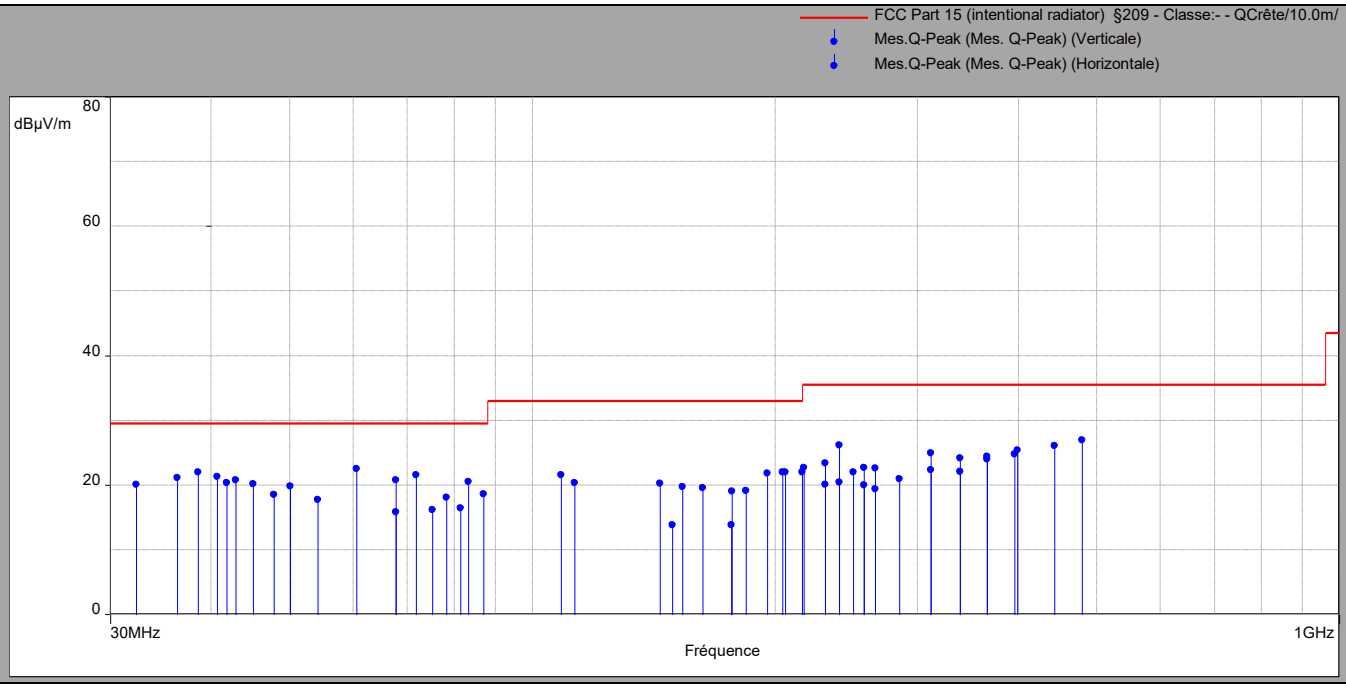
6.6. RESULTS

30MHz to 1GHz
DC mode
Vertical & horizontal Polarization



30MHz to 1GHz
POE mode

Vertical &horizontal Polarization



DC mode

9kHz to 30MHz					
Polarization	**Frequency (MHz)**	**Peak Level (dBµV/m)**	**QPeak Level (dBµV/m)**	**Limit (dBµV/m)**	**Margin QPeak (dBµV/m)**
all emissions were greater than 20 dB below the limit					

30MHz to 1GHz					
Polarization	**Frequency (MHz)**	**Peak Level (dBµV/m)**	**QPeak Level (dBµV/m)**	**Limit (dBµV/m)**	**Margin QPeak (dBµV/m)**
Vertical	40,7	-	23,37	29,5	6,13
Vertical	67,8	-	21,32	29,5	8,18
Vertical	72	-	20,58	29,5	8,92
Vertical	81,4	-	21,24	29,5	8,26
Vertical	203,4	-	24,38	33	8,62
Vertical	240	-	27,27	35,5	8,23

Above 1GHz								
Polarization	**Frequency (MHz)**	**Duty cycle correction (dB)**	**Average Level (dBµV/m)**	**Average Limit (dBµV/m)**	**Margin Average (dBµV/m)**	**Peak Level (dBµV/m)**	**Peak Limit (dBµV/m)**	**Margin Peak (dBµV/m)**
all emissions were greater than 20 dB below the limit								

POE mode

9kHz to 30MHz					
Polarization	**Frequency (MHz)**	**Peak Level (dBµV/m)**	**QPeak Level (dBµV/m)**	**Limit (dBµV/m)**	**Margin QPeak (dBµV/m)**
all emissions were greater than 20 dB below the limit					

30MHz to 1GHz					
Polarization	**Frequency (MHz)**	**Peak Level (dBµV/m)**	**QPeak Level (dBµV/m)**	**Limit (dBµV/m)**	**Margin QPeak (dBµV/m)**
Vertical	40,7	-	21,25	29,5	8,25
Vertical	42,9	-	20,73	29,5	8,77
Vertical	60,6	-	22,51	29,5	6,99
Vertical	67,7	-	20,76	29,5	8,74
Vertical	71,8	-	21,53	29,5	7,97
Vertical	240	-	26,15	35,5	9,35

Above 1GHz								
Polarization	**Frequency (MHz)**	**Duty cycle correction (dB)**	**Average Level (dBµV/m)**	**Average Limit (dBµV/m)**	**Margin Average (dBµV/m)**	**Peak Level (dBµV/m)**	**Peak Limit (dBµV/m)**	**Margin Peak (dBµV/m)**
all emissions were greater than 20 dB below the limit								

6.7. CONCLUSION

Field strength outside of the bands 13.110-14.010 MHz measurement performed on the sample of the product **IDEMIA MPH-AC005A**, SN: **-**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.225 & RSS-Gen ISSUE 5 limits.

7. FIELD STRENGTH WITHIN THE BAND 13.110-14.010MHz

7.1. TEST CONDITIONS

Test performed by	: Laurent DENEUX
Date of test	: January 28, 2019
Ambient temperature	: 11 °C
Relative humidity	: 47 %

7.2. 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 parallel, perpendicular and ground parallel axis with a loop antenna below 30MHz. Measurement bandwidth was 200Hz below 150kHz and 9kHz between 150kHz & 30MHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height was 1m.
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 0.8m.

Photograph for Field strength within the band 13.110-14.010MHz

7.3. LIMIT

Limit:

Below 13.110MHz:	30µV/m (30m) or 69.5dBµV/m (3m) QPeak
13.110MHz to 13.410MHz:	106µV/m (30m) or 80.5dBµV/m (3m)
13.410MHz to 13.553MHz:	334µV/m (30m) or 90.5dBµV/m (3m)
13.553MHz to 13.567MHz:	15848µV/m (30m) or 124dBµV/m (3m)
13.567MHz to 13.710MHz:	334µV/m (30m) or 90.5dBµV/m (3m)
13.710MHz to 14.010MHz:	106µV/m (30m) or 80.5dBµV/m (3m)
Above 14.010MHz:	30µV/m (30m) or 69.5dBµV/m (3m) QPeak

7.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Open test site	LCIE	-	F2000400	2018-06	2019-06
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2018-10	2020-10
loop antenna	RHODE & SCHWARZ	HFH2-Z2	C2040007	2018-11	2020-11
Cable	-	-	A5329442	2018-09	2019-09
Cable	-	-	A5329444	2018-09	2019-09
Cable	-	-	A5329416	2018-12	2019-12

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

DC mode

Parallel Axis			
Frequency (MHz)	**Peak Level (dBµV/m) (3m)**	**QPeak Level (dBµV/m) (3m)**	**Limit (dBµV/m) (3m)**
Below 13.110	-	32.2	69.5
13.110 to 13.410	-	32	80.5
13.410 to 13.553	-	36.5	90.5
13.553 to 13.567	-	61.5	124
13.567 to 13.710	-	36.9	90.5
13.710 to 14.010	-	33.5	80.5
Above 14.010	-	30.2	69.5

Ground Parallel Axis			
Frequency (MHz)	**Peak Level (dBµV/m) (3m)**	**QPeak Level (dBµV/m) (3m)**	**Limit (dBµV/m) (3m)**
Below 13.110	-	32	69.5
13.110 to 13.410	-	31.5	80.5
13.410 to 13.553	-	33.5	90.5
13.553 to 13.567	-	61.1	124
13.567 to 13.710	-	36.1	90.5
13.710 to 14.010	-	32.5	80.5
Above 14.010	-	30.1	69.5

Perpendicular Axis			
Frequency (MHz)	**Peak Level (dBµV/m) (3m)**	**QPeak Level (dBµV/m) (3m)**	**Limit (dBµV/m) (3m)**
Below 13.110	-	32.9	69.5
13.110 to 13.410	-	33.8	80.5
13.410 to 13.553	-	37.5	90.5
13.553 to 13.567	-	57	124
13.567 to 13.710	-	36.1	90.5
13.710 to 14.010	-	32.9	80.5
Above 14.010	-	29	69.5

POE mode

Parallel Axis			
Frequency (MHz)	**Peak Level (dBµV/m) (3m)**	**QPeak Level (dBµV/m) (3m)**	**Limit (dBµV/m) (3m)**
Below 13.110	-	31	69.5
13.110 to 13.410	-	33	80.5
13.410 to 13.553	-	36.7	90.5
13.553 to 13.567	-	60	124
13.567 to 13.710	-	37	90.5
13.710 to 14.010	-	34.3	80.5
Above 14.010	-	32	69.5

Ground Parallel Axis			
Frequency (MHz)	**Peak Level (dBµV/m) (3m)**	**QPeak Level (dBµV/m) (3m)**	**Limit (dBµV/m) (3m)**
Below 13.110	-	27	69.5
13.110 to 13.410	-	29.7	80.5
13.410 to 13.553	-	31.6	90.5
13.553 to 13.567	-	43	124
13.567 to 13.710	-	31.7	90.5
13.710 to 14.010	-	29.7	80.5
Above 14.010	-	27.3	69.5

Perpendicular Axis			
Frequency (MHz)	**Peak Level (dBµV/m) (3m)**	**QPeak Level (dBµV/m) (3m)**	**Limit (dBµV/m) (3m)**
Below 13.110	-	31	69.5
13.110 to 13.410	-	32.5	80.5
13.410 to 13.553	-	37.3	90.5
13.553 to 13.567	-	54	124
13.567 to 13.710	-	35	90.5
13.710 to 14.010	-	33	80.5
Above 14.010	-	31	69.5

7.7. CONCLUSION

Field strength within the band 13.110-14.010MHz measurement performed on the sample of the product **IDEMIA MPH-AC005A**, SN: **-**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.225 & RSS 210 ISSUE 9 limits.

8. UNCERTAINTIES CHART

47 CFR Part 15.209 & 15.207 Kind of test	Wide uncertainty laboratory (k=2) ±x(dB) / (Hz)/ 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