



LCIE

RFID 13,56MHz Template: Release October 10th, 2016

TEST REPORT

N°: 156043-722836

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
11 Boulevard Gallieni
92130 - ISSY-LES-MOULINEAUX CEDEX France
FRANCE

Apparatus under test

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

Access Control Terminal with biometric identification
IDEMIA
IDEMIA Identity & Security France
MPH-AC004A
1818SMP0000168
ZBW-MPHAC004A
11472A-MPHAC004A

Test date

: June 14, 2018 to June 25, 2018

Test location

Fontenay Aux Roses & Ecuelles

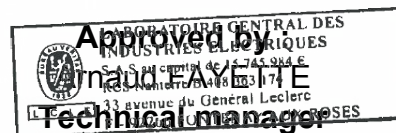
Composition of document

42 pages

Document issued on

June 29, 2018

Written by :
Mathieu CERISIER
Tests operator



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PUBLICATION HISTORY

Version	Date	Author	Modification
01	June 28, 2018	Mathieu CERISIER	Creation of the document



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 P	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
AC Power Line Conducted Emission P	☒ PASS	☐ FAIL	☐ NA(2)	☐ NP(1)
Frequency Tolerance P	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
Field strength within the band 13.110-14.010MHz P	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
Field strength outside of the bands 13.110-14.010 MHz P	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
Receiver Radiated Emissions P	☐ 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-AC004A

Serial Number: 1818SMP0000168



Equipment Under Test

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
POE	COMMET model : CNGE1IP RJ45	2	☐	☒	☒	100-240V~ 50/60Hz
AC/DC Power supply	FRIWO model : FW7362/12	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

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:	☒ -20°C	☐ 0°C
	Tnom:	20°C	
	Tmax:	☐ 35°C	☐ 50°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	☒ 27,6Vdc
Operating voltage range POE:	Vmin:	☐ 102V/60Hz	☒ 42,5Vdc
	Vnom:	☐ 120V/60Hz	☒ 48Vdc
	Vmax:	☐ 138V/60Hz	☒ 57Vdc

Modulation Type

ASK 10% / ASK 100%

2.2. EQUIPMENT LABELLING



2.3. EQUIPMENT MODIFICATION

☒ None ☐ Modification:

3. OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

Test performed by : Mathieu CERISIER
Date of test : June 21, 2018
Ambient temperature : 24 °C
Relative humidity : 42 %

3.2. TEST SETUP

- The Equipment Under Test is installed:

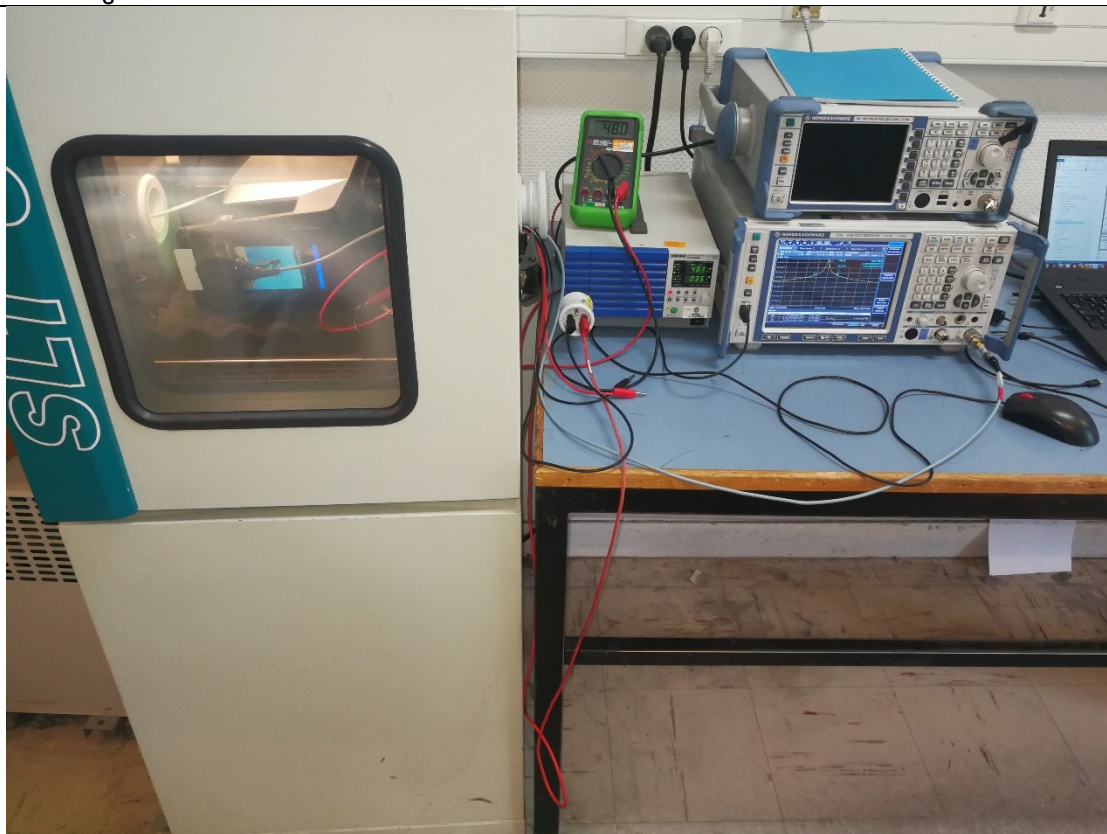
- ☐ On a table
- ☒ In a climatic chamber
- ☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- ☐ Conducted Method
- ☒ Text Fixture
- ☐ Radiated Method

- Test Procedure:

- ☒ RSS-Gen Issue 5 § 6.7



Photograph for Occupied bandwidth

3.1. LIMIT

None

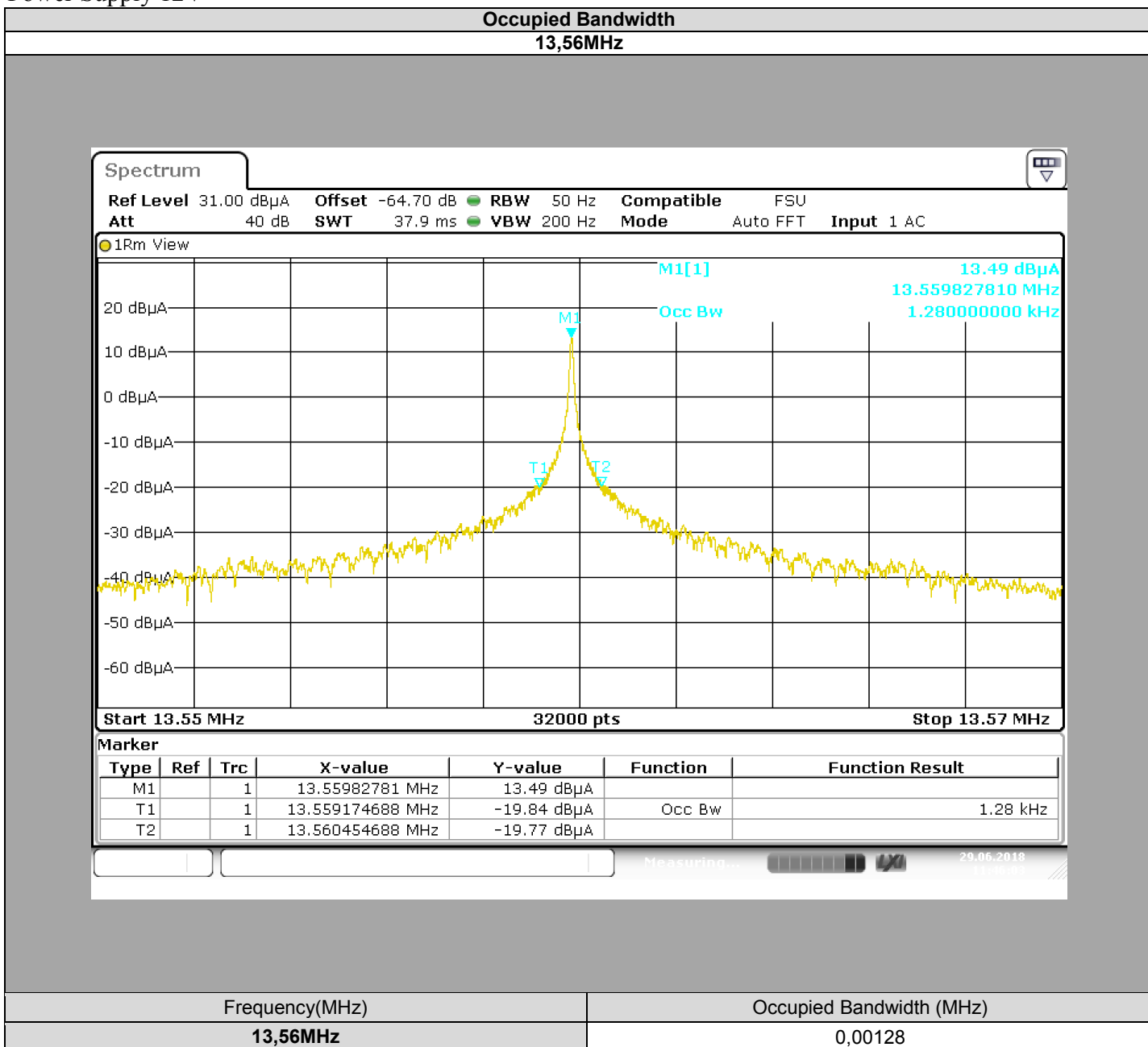
3.2. TEST EQUIPMENT LIST

Description	Constructor	Model	N°	Cal. Date	Cal. Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2018/09
Multimeter	ISO-TECH	-	A1240269	2016/11	2018/11
Hygrometer	AOIP	TM360	B4041042	2018/06	2019/12
13,56MHz Test fixture Antenna	-	-	A5329422	Calibrated with EMI receiver	
Power supply	KIKUSUI	PCR500M	A7049006	Calibrated with multimeter	
Climatic chamber	SECASI Technologies	SLT-34	D1024029	Calibrated with Hygrometer	

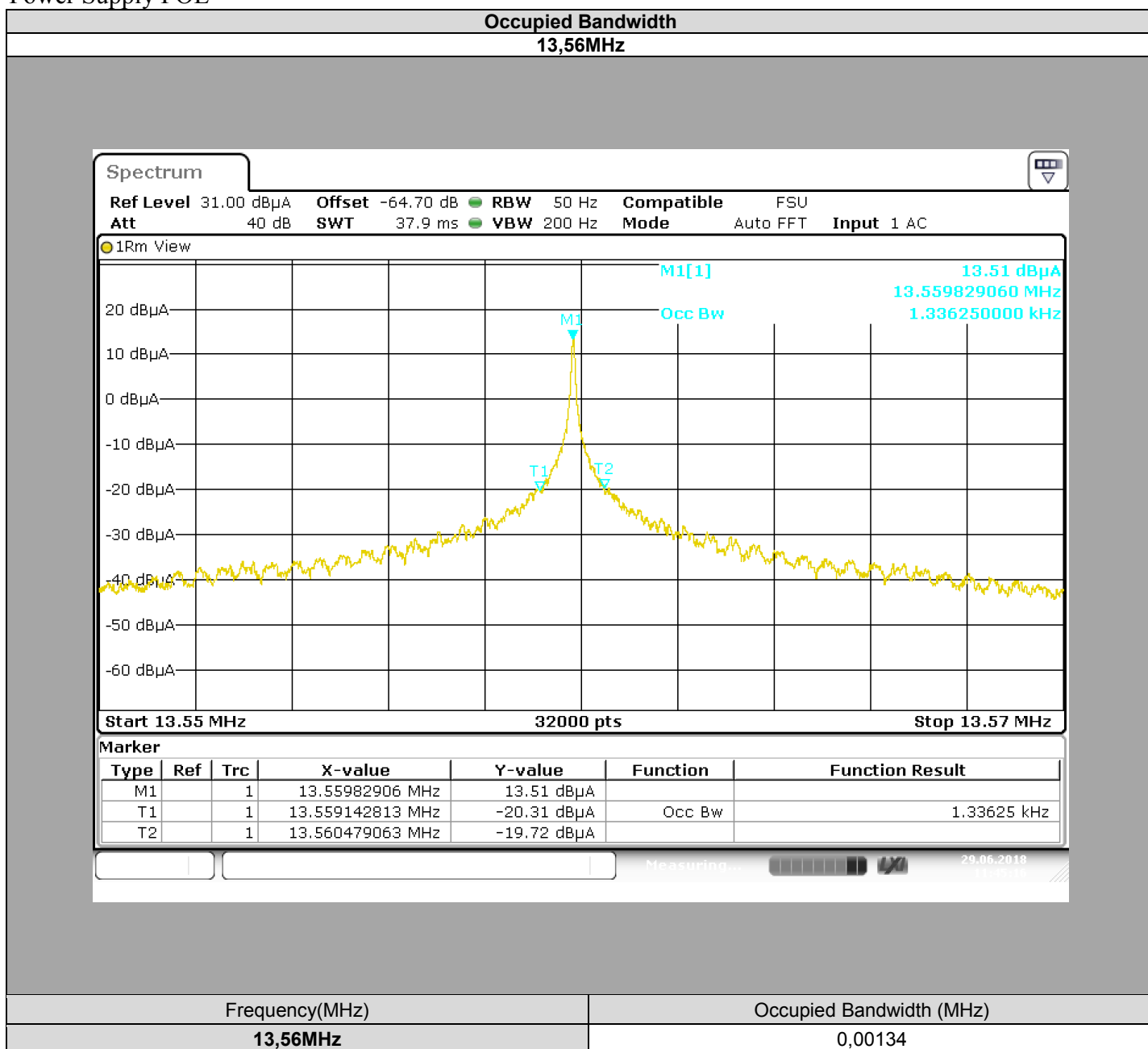
Note: In our quality system, the test equipment calibration due is more & less 2 months

3.3. RESULTS

Power Supply 12V



Power Supply POE



3.1. CONCLUSION

Occupied Channel Bandwidth measurement performed on the sample of the product **IDEMIA MPH-AC004A**, SN: **1818SMP0000168**, 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 : Mathieu CERISIER
Date of test : June 21, 2018
Ambient temperature : 24 °C
Relative humidity : 42 %

4.2. TEST SETUP

- The Equipment Under Test is installed:

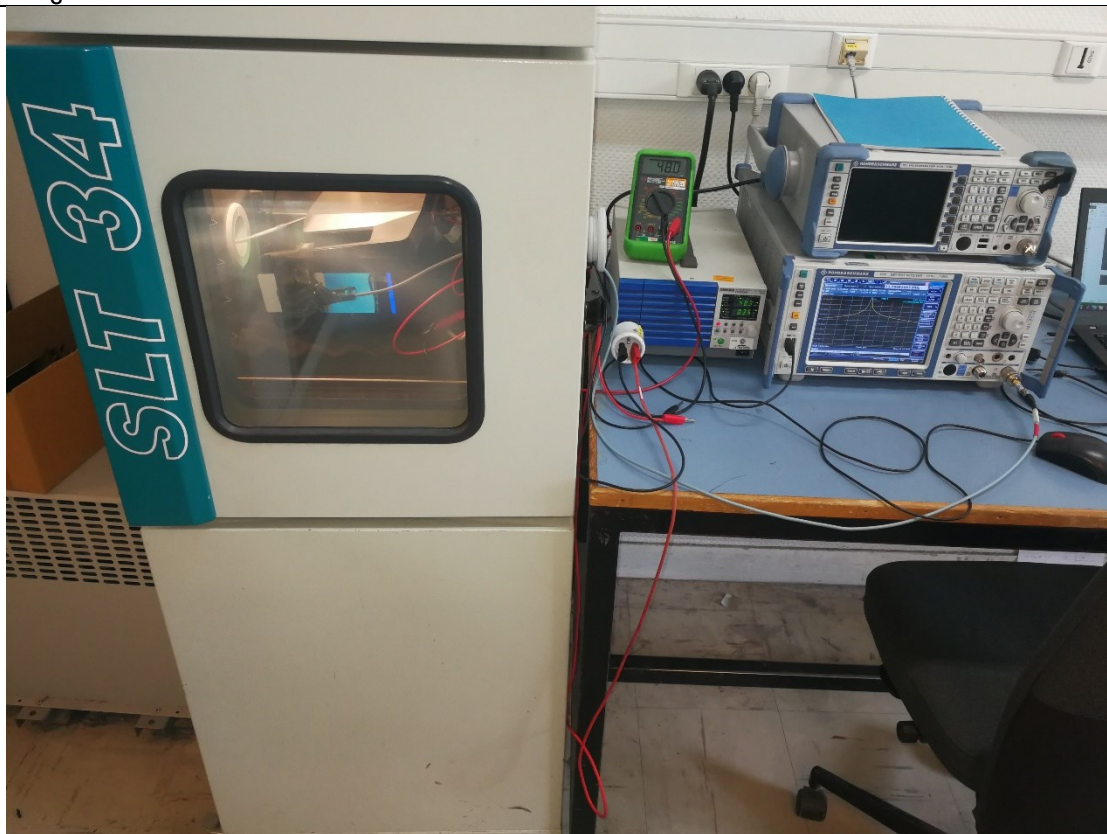
- ☐ On a table
- ☒ In a climatic chamber
- ☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- ☐ Conducted Method
- ☒ Text Fixture
- ☐ Radiated Method

- Test Procedure:

- ☒ ANSI C63.10 § 6.8



Photograph for Frequency Tolerance

4.3. LIMIT

±0.01% (± 100ppm)

4.4. TEST EQUIPMENT LIST

Description	Constructor	Model	N°	Cal. Date	Cal. Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2018/09
Multimeter	ISO-TECH	-	A1240269	2016/11	2018/11
Hygrometer	AOIP	TM360	B4041042	2018/06	2019/12
13,56MHz Test fixture Antenna	-	-	A5329422	Calibrated with EMI receiver	
Power supply	KIKUSUI	PCR500M	A7049006	Calibrated with multimeter	
Climatic chamber	SECASI Technologies	SLT-34	D1024029	Calibrated with Hygrometer	

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

4.5. RESULTS

Power Supply POE

Frequency	13,56									
EUT ACTIVATION	Start up									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)		13,55988	13,5599	13,5599	13,55989	13,55985	13,55985	13,55981	13,5599	13,55989
Frequency Drift (%)	-100,0000	-0,0009	-0,0007	-0,0007	-0,0008	-0,0011	-0,0011	-0,0014	-0,0007	-0,0008
EUT ACTIVATION	2min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)		13,55989	13,55991	13,5599	13,55987	13,55984	13,55984	13,55981	13,5599	13,5599
Frequency Drift (%)	-100,0000	-0,0008	-0,0007	-0,0007	-0,0010	-0,0012	-0,0012	-0,0014	-0,0007	-0,0007
EUT ACTIVATION	5min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)		13,55989	13,5599	13,55989	13,55987	13,55984	13,55982	13,55981	13,5599	13,5599
Frequency Drift (%)	-100,0000	-0,0008	-0,0007	-0,0008	-0,0010	-0,0012	-0,0013	-0,0014	-0,0007	-0,0007
EUT ACTIVATION	10min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)		13,55989	13,55991	13,55989	13,55986	13,55984	13,55982	13,55981	13,55989	13,55989
Frequency Drift (%)	-100,0000	-0,0008	-0,0007	-0,0008	-0,0010	-0,0012	-0,0013	-0,0014	-0,0008	-0,0008
Voltage	Vnom									
Temperature	Tnom									
Frequency (MHz)	13,5599			13,55988			13,55984			
Frequency Drift (%)	-0,0007			-0,0009			-0,0012			



Power Supply 12V

Frequency	13,56									
EUT ACTIVATION	Start up									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)		13,55988	13,55991	13,55991	13,55987	13,55986	13,55984	13,55982	13,55981	13,5598
Frequency Drift (%)	-100,0000	-0,0009	-0,0007	-0,0007	-0,0010	-0,0010	-0,0012	-0,0013	-0,0014	-0,0015
EUT ACTIVATION	2min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)		13,55988	13,55991	13,5599	13,55987	13,55984	13,55982	13,55981	13,5598	13,5598
Frequency Drift (%)	-100,0000	-0,0009	-0,0007	-0,0007	-0,0010	-0,0012	-0,0013	-0,0014	-0,0015	-0,0015
EUT ACTIVATION	5min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)		13,55989	13,55991	13,5599	13,55987	13,55984	13,55982	13,55981	13,5598	13,5598
Frequency Drift (%)	-100,0000	-0,0008	-0,0007	-0,0007	-0,0010	-0,0012	-0,0013	-0,0014	-0,0015	-0,0015
EUT ACTIVATION	10min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)		13,55989	13,55991	13,5599	13,55986	13,55984	13,55982	13,55981	13,5598	13,5598
Frequency Drift (%)	-100,0000	-0,0008	-0,0007	-0,0007	-0,0010	-0,0012	-0,0013	-0,0014	-0,0015	-0,0015
Voltage	Vnom									
Temperature	Tnom									
Frequency (MHz)	13,5599			13,55987			13,55982			
Frequency Drift (%)	-0,0007			-0,0010			-0,0013			

4.6. CONCLUSION

Frequency tolerance measurement performed on the sample of the product **IDEMIA MPH-AC004A**, SN: **1818SMP0000168**, 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 : June 14, 2018
Ambient temperature : 21°C
Relative humidity : 52 %

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 $50\Omega / 50\mu\text{H}$. Interconnecting cables and equipment's were moved to position that maximized emission.



Photograph for AC Power Line Conducted Emissions (Front view) with DC power supply



Photograph for AC Power Line Conducted Emissions (Rear view) with DC power supply



Photograph for AC Power Line Conducted Emissions (Front view) with POE



Photograph for AC Power Line Conducted Emissions (Rear view) with POE



5.3. LIMIT

Quasi-Peak

0,15kHz to 0,5MHz: 66dB μ V to 56dB μ V*

0,5MHz to 5MHz: 56dB μ V

5MHz to 30MHz: 60dB μ V

Average

0,15kHz to 0,5MHz: 56dB μ V to 46dB μ V*

0,5MHz to 5MHz: 46dB μ V

5MHz to 30MHz: 50dB μ V

*Decreases with the logarithm of the frequency

5.4. TEST EQUIPMENT LIST

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Receiver	RHODE & SCHWARZ	ESIB26	A2642021	2016/12	2018/12
V ISLN	ROHDE & SCHWARZ	ESH2-Z5	C2322001	2017/08	2018/08
Pulse limiter	ROHDE & SCHWARZ	ESH3-Z2	A2649008	2018/03	2019/03
Cable	-	-	A5329417	2017/10	2018/10
Cable	-	-	A5329589	2017/08	2018/08
Reference ground plan 2 x 3m	L.C.I.E.	-	-	-	-

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

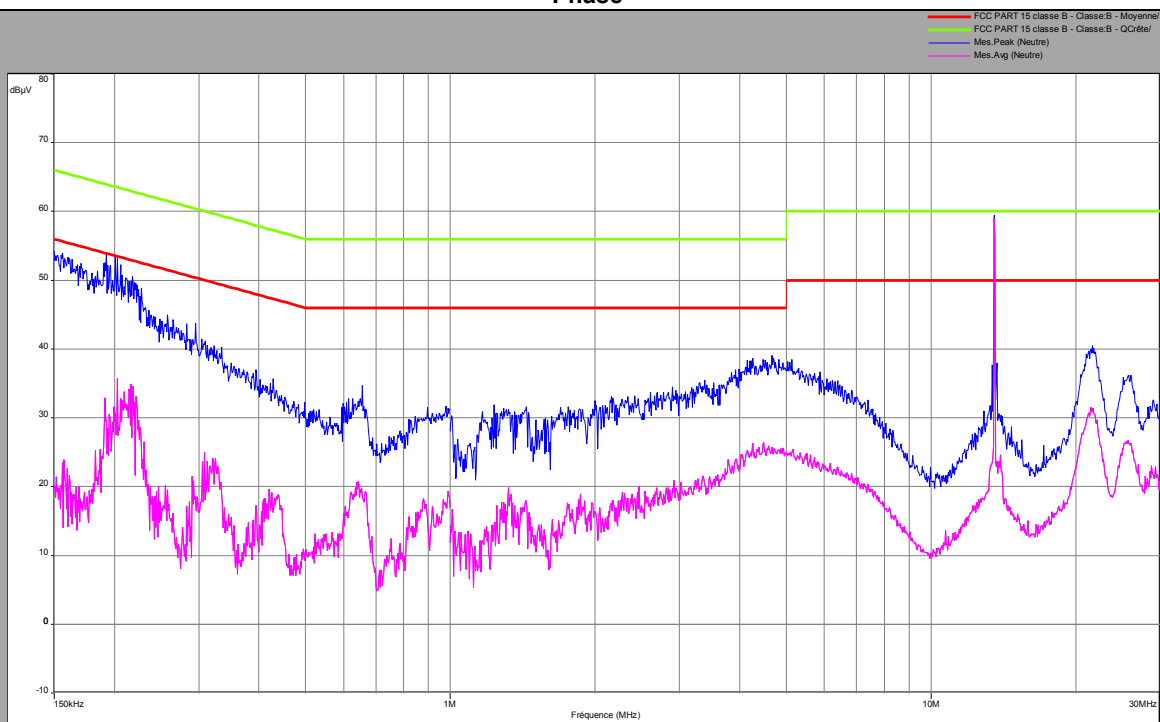
5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒ None

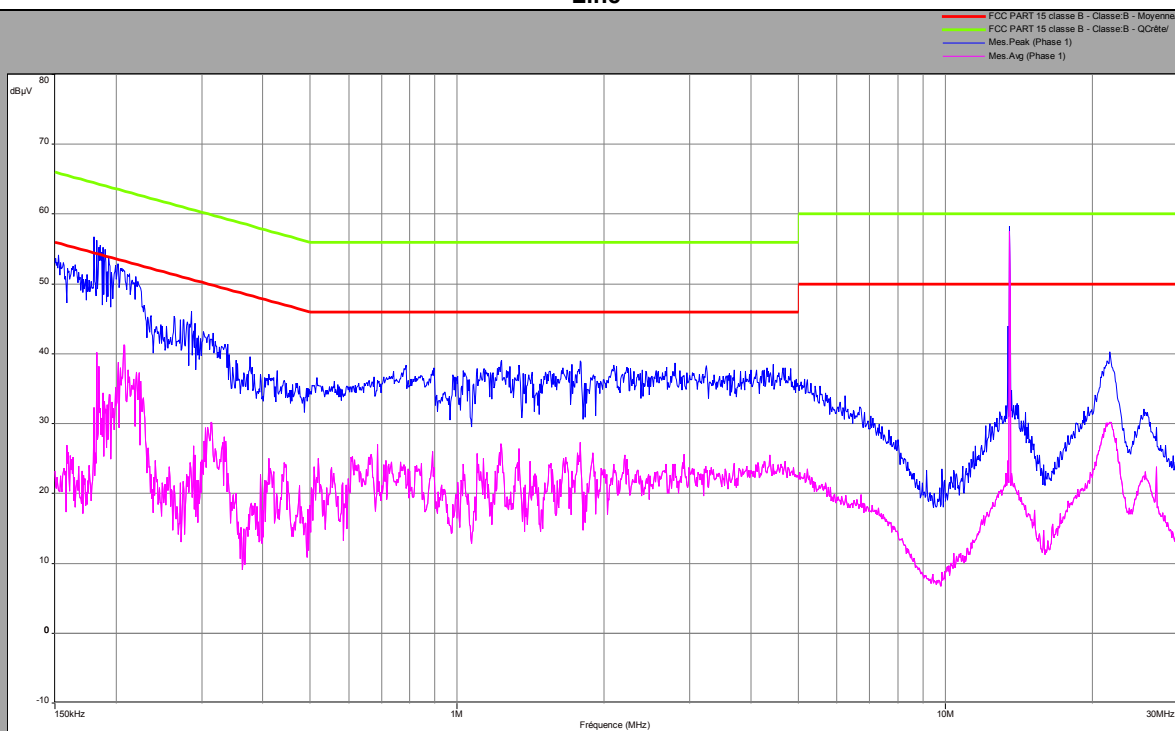
☐ Divergence:

5.6. RESULTS

AC Power Line Conducted Emission Mode DC power supply with antenna Phase



Line

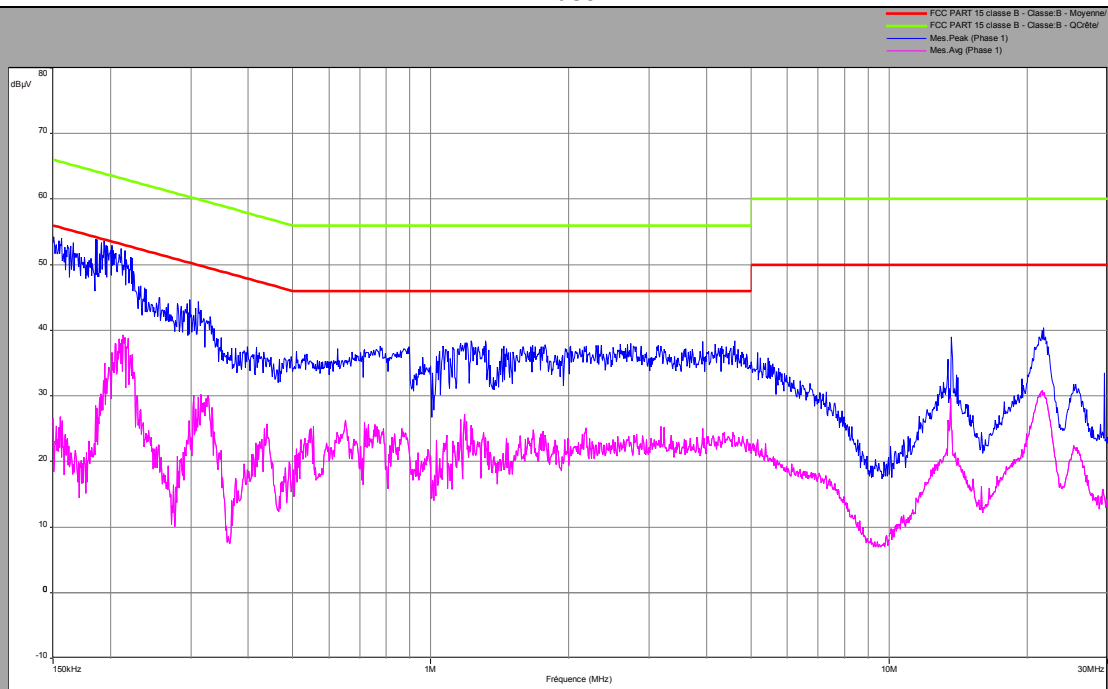


Phase Line							
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin Quasi-Peak (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0,203	53,2	-	63,4	10,2	35,7	53,4	17,7
0,656	34,7	-	56	21,3	20,6	46	25,4
4,67	39	-	56	17	24	46	22
13,56	59,2	-	60	0,8	59	50	-9
21,64	40,5	-	60	19,5	30,3	50	19,7

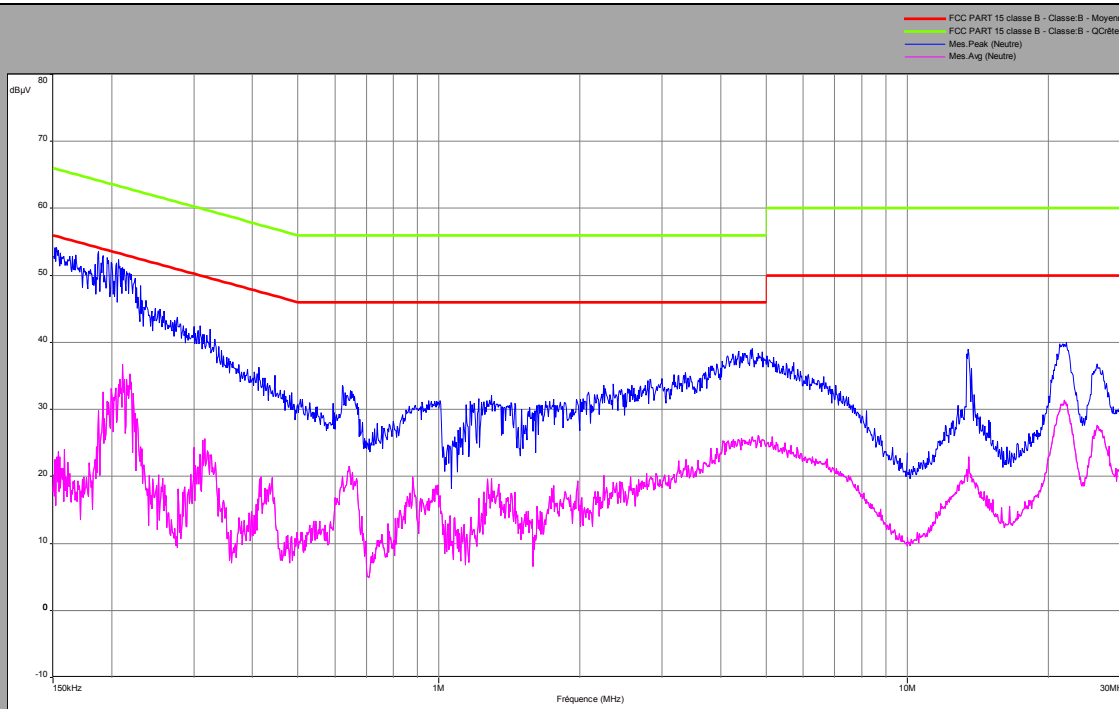
Neutral Line							
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin Quasi-Peak (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0,182	52,3	-	64,3	12	40,2	54,3	14,1
0,314	42,1	-	59,8	17,7	30	49,8	19,8
1,228	38,8	-	56	17,2	27,1	46	18,9
13,56	58,2	-	60	1,8	58	50	-8
21,74	40,2	-	60	19,8	30	50	20

**AC Power Line Conducted Emission
Mode POWER SUPPLY without antenna**

Phase



Line

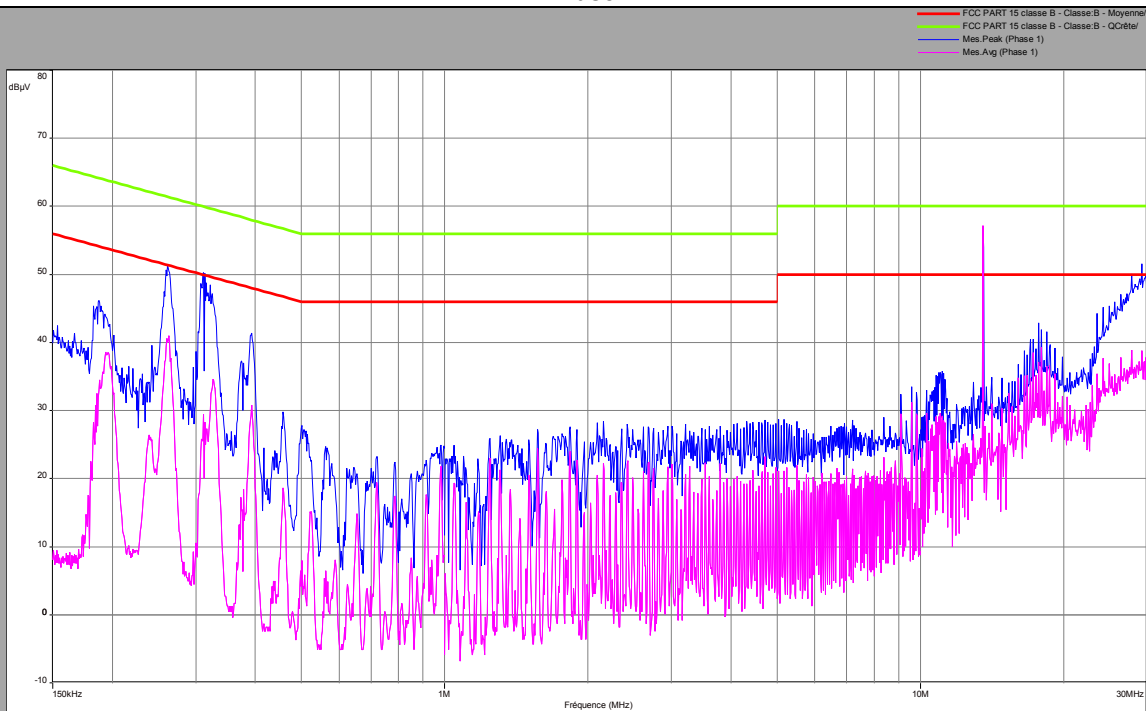


Phase Line							
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin Quasi-Peak (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0,211	52,4	-	63	10,6	39,3	53	13,7
0,311	44,3	-	59,8	15,5	31	30,2	-0,8
1,226	38,4	-	56	17,6	26,4	46	19,6
13,69	39	-	60	21	29,3	50	20,7
21,74	40	-	60	20	30,3	50	19,7

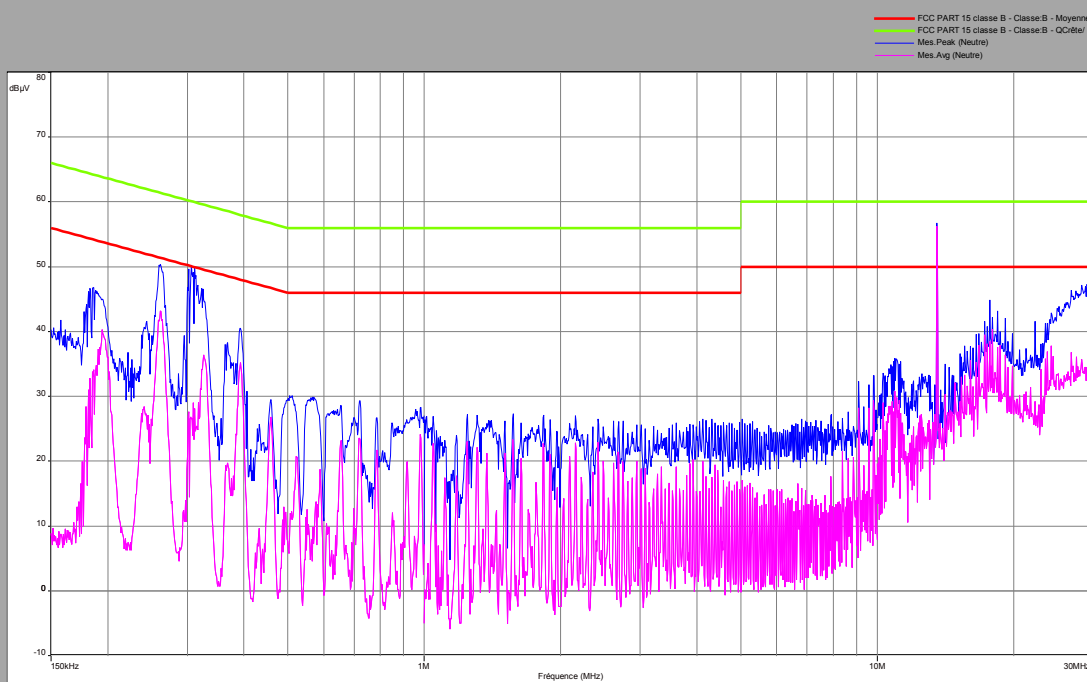
Neutral Line							
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin Quasi-Peak (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0,211	51,2	-	63,2	12	36,7	53,2	16,5
0,644	31,2	-	56	24,8	21,5	46	24,5
4,81	38,4	-	56	17,6	26	46	20
13,54	38,3	-	60	21,7	23	50	27
21,53	39,4	-	60	20,6	30,2	50	19,8

AC Power Line Conducted Emission Mode POE with antenna

Phase



Line

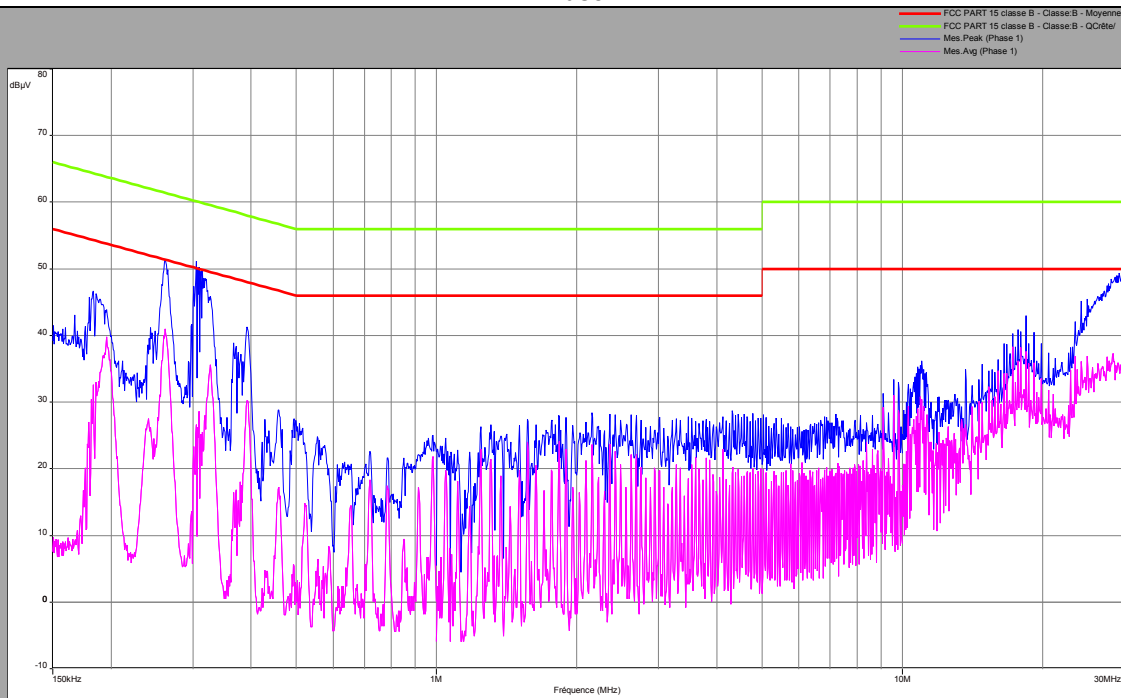


Phase Line							
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin Quasi-Peak (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0,261	51,3	-	61,4	10,1	41	51,4	10,4
0,393	41,3	-	58	16,7	30,8	48	17,2
1,572	26,7	-	56	29,3	22	46	24
13,56	57,1	-	60	2,9	57	50	-7
17,74	42,8	-	60	17,2	37,2	50	12,8

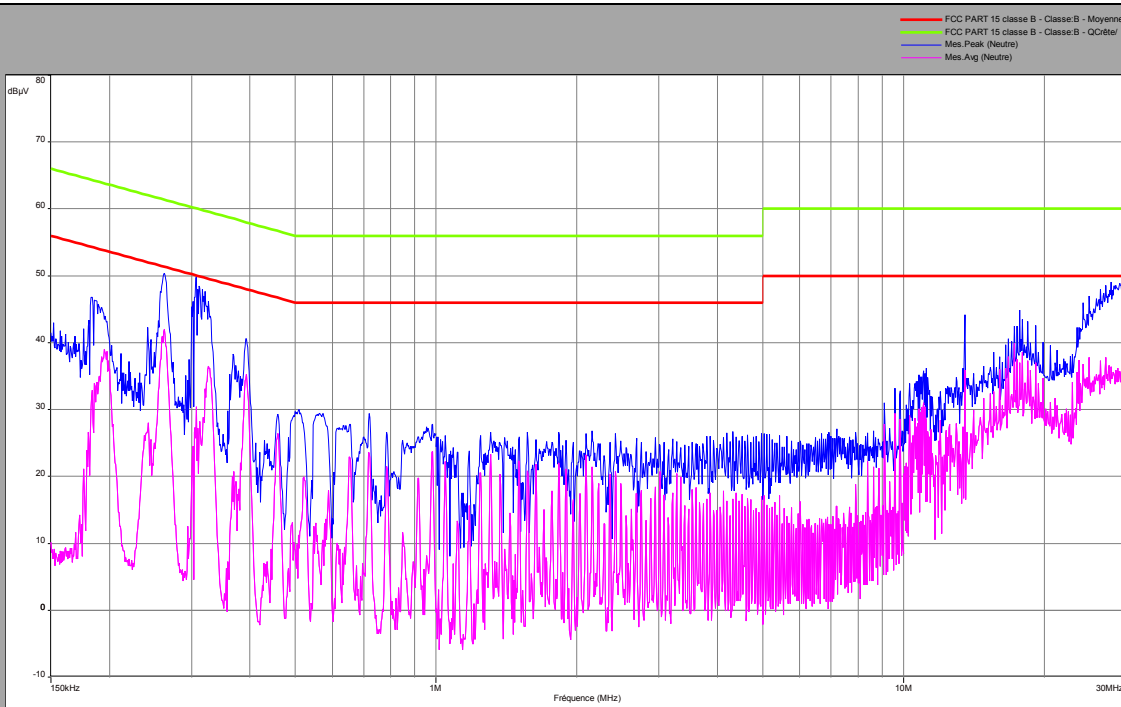
Neutral Line							
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin Quasi-Peak (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0,262	50	-	61,4	11,4	43	51,4	8,4
0,393	40,5	-	58	17,5	35,3	48	12,7
1,244	27,2	-	56	28,8	23	46	23
13,56	56,7	-	60	3,3	56,3	50	-6,3
17,74	49,3	-	60	10,7	38,4	50	11,6

AC Power Line Conducted Emission Mode POE 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)
0,261	51,5	-	61,4	9,9	41	51,4	10,4
0,392	41,2	-	58	16,8	30,2	48	17,8
1,572	27	-	56	29	22,7	46	23,3
11	32,2	-	60	27,8	30,4	50	19,6
18,46	43	-	60	17	35,5	50	14,5

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)
0,262	49,6	-	61,4	11,8	42	51,4	9,4
0,393	40,3	-	58	17,7	35,3	48	12,7
1,244	26,6	-	56	29,4	23,3	46	22,7
13,56	44,2	-	60	15,8	35,9	50	14,1
17,74	44,9	-	60	15,1	37	50	13

5.7. CONCLUSION

Ac Power Line Conducted Emission measurement performed on the sample of the product **IDEMIA MPH-AC004A**, SN: **1818SMP0000168**, 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 : June 14, 2018 to June 19, 2018
Ambient temperature : 19 °C to 20 °C
Relative humidity : 47 to 51 %

6.2. 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 and perpendicular 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.

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.



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



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

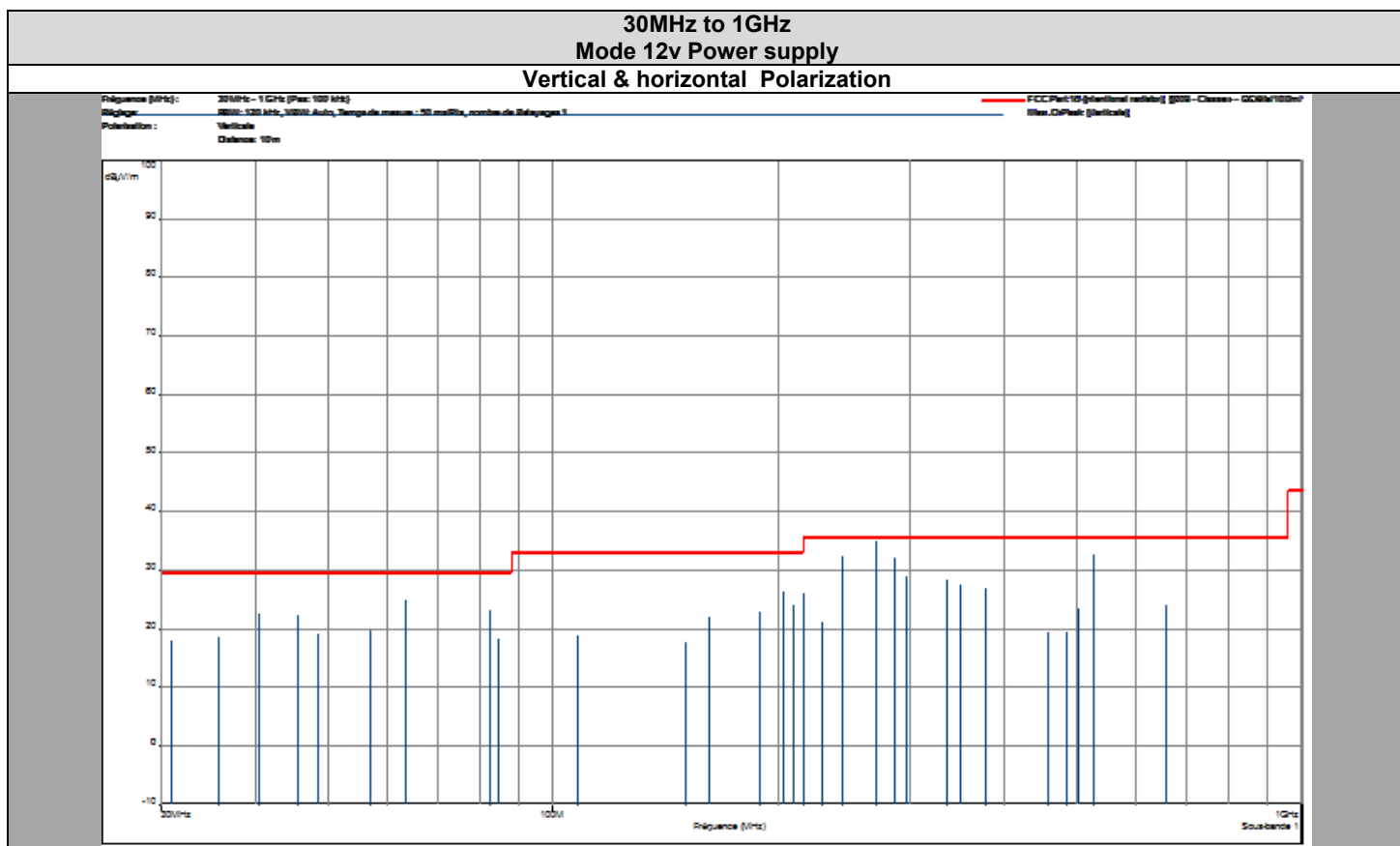
Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Open test site	LCIE	-	F2000400	2017-06	2018-06
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2016-12	2018-12
Bilog antenna	CHASE	CBL 6112A	C2040040	2018-04	2019-04
Dipole	ROHDE & SCHWARZ	HUF-Z1	C2040011	2018-04	2019-04
Générateur / Signal Generator	ROHDE & SCHWARZ	SMY02	A5442014	2016-05	2018-05
Logperiodic antenna	ROHDE & SCHWARZ	HL 023 A2	C2040001	2018-04	2019-04
loop antenna	RHODE & SCHWARZ	HFH2-Z2	C2040007	2017-12	2020-12
Cable	-	-	A5329442	2017-09	2018-09
Cable	-	-	A5329362	2017-12	2018-12
Cable	-	-	A5329449	2017-09	2018-09
Cable	-	-	A5329380	2017-06	2018-06
cable	-	-	A5329444	2017-09	2018-09

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:

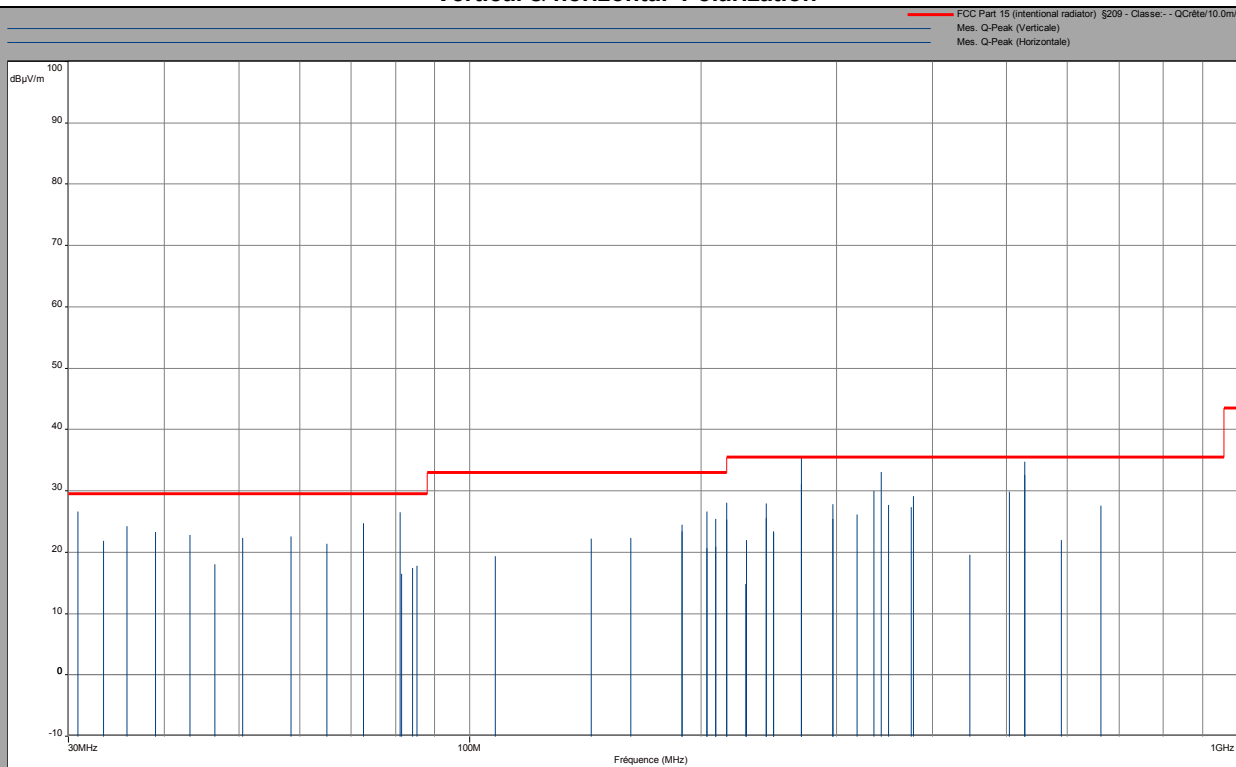
6.6. RESULTS

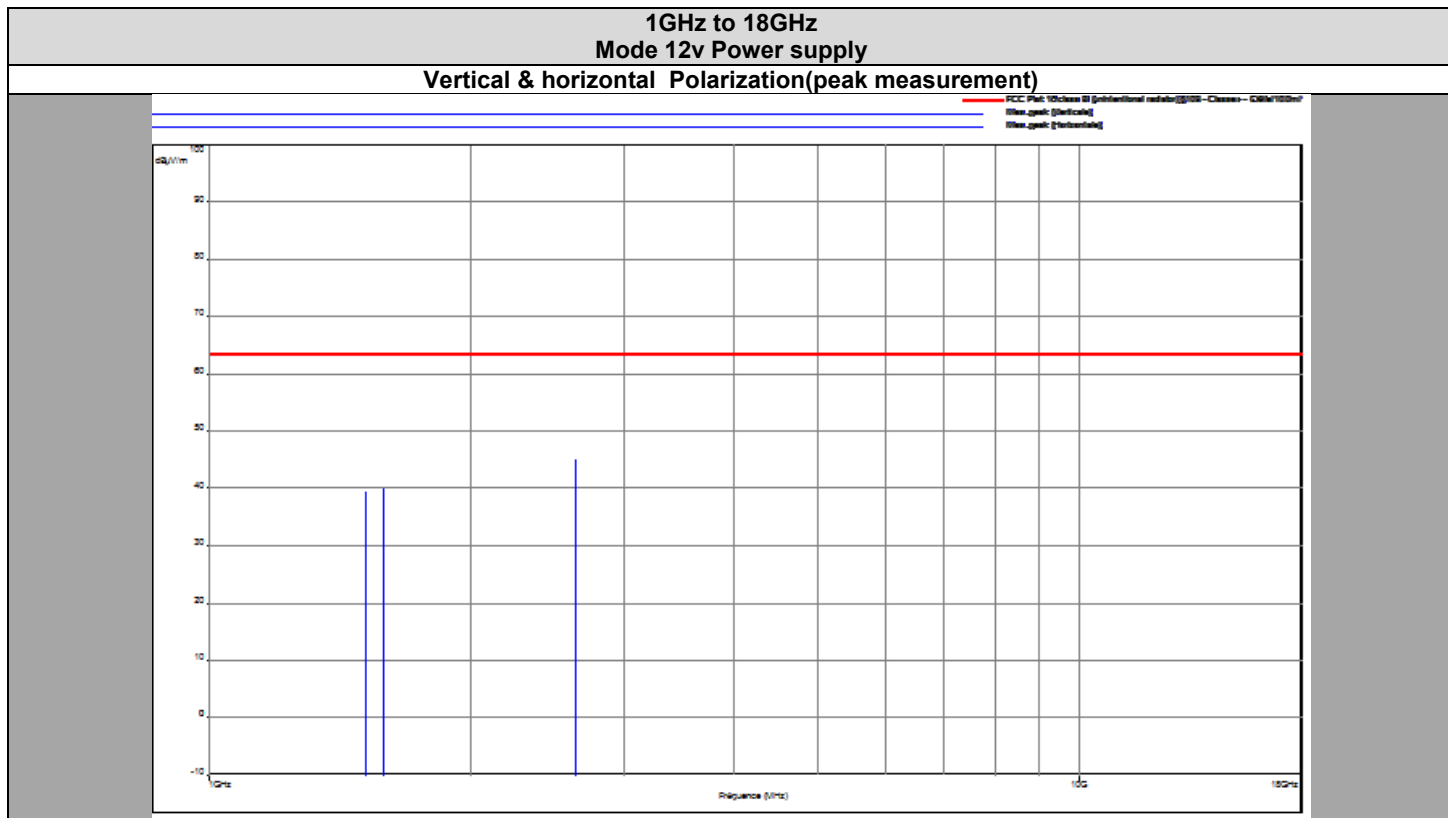


30MHz to 1GHz

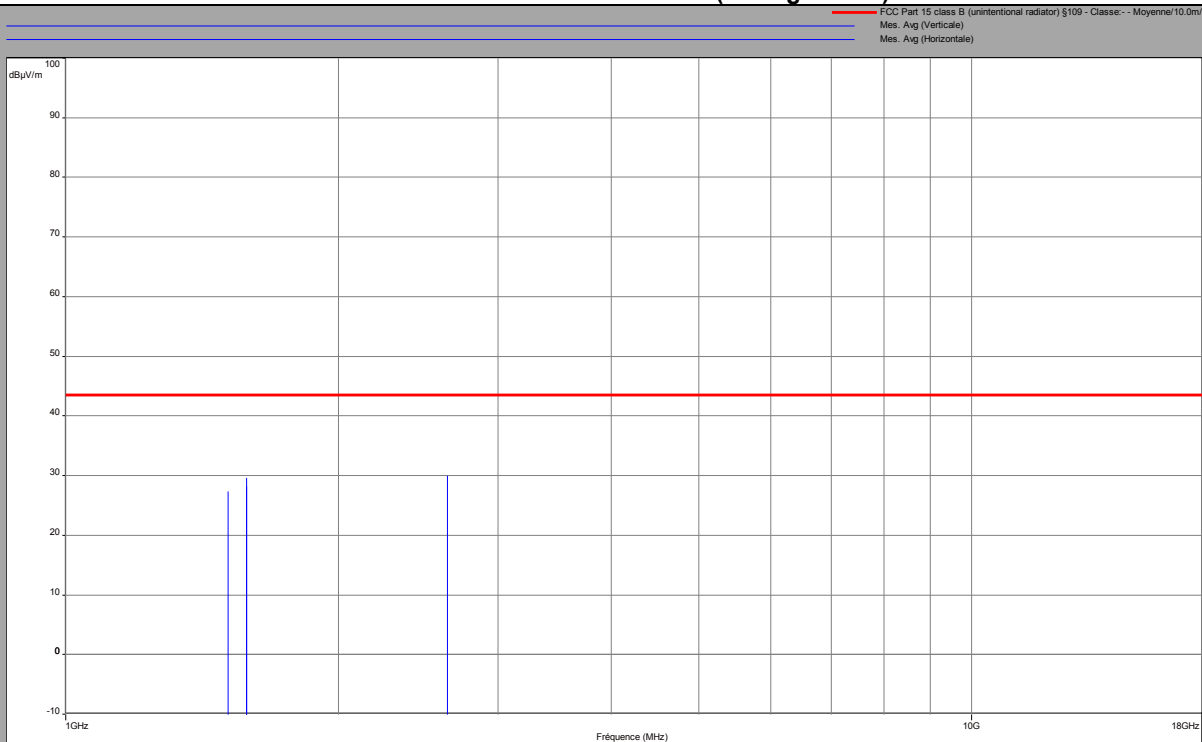
Mode POE

Vertical & horizontal Polarization





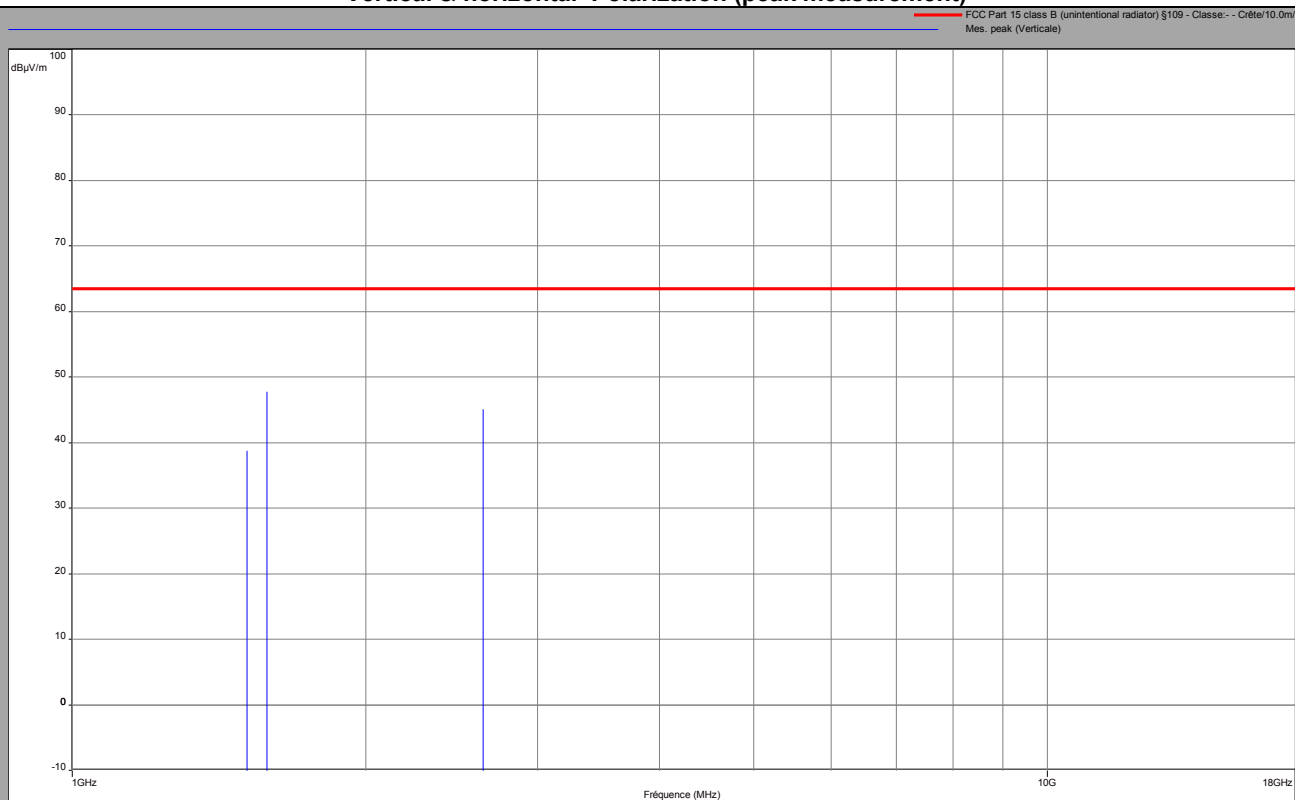
1GHz to 18GHz
Mode 12v Power supply
Vertical & horizontal Polarization (average value)



1GHz to 18GHz

Mode POE

Vertical & horizontal Polarization (peak measurement)

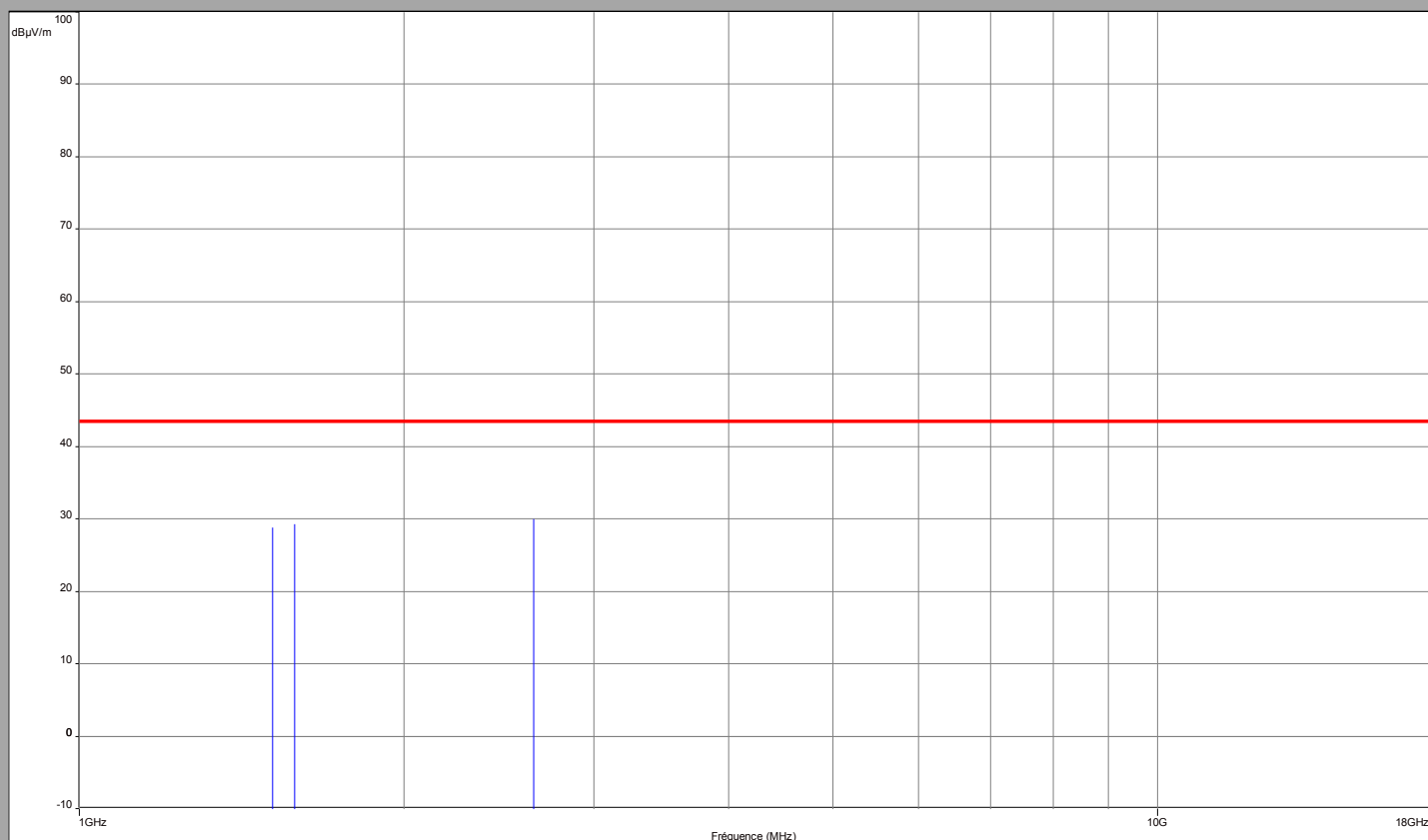


1GHz to 18GHz

Mode POE

Vertical & horizontal Polarization (average value)

FCC Part 15 class B (unintentional radiator) §109 - Classe: - Moyenne/10.0m/
Mes. Avg (Verticale)



Mode 12V-DC power supply

Frequency (MHz)	Polarity	level (dB μ V/m)	limit FCC class B	Margin
63.4	Vertical	24.97	29.5	4.53
243	Vertical	32.47	35.5	3.03
270	Vertical	35.22	35.5	0.28
285.3	Vertical	32.03	35.5	3.47
343.1	Horizontal	32.48	35.5	3.02
528	Horizontal	34.5	35.5	1

Mode POE

Frequency (MHz)	Polarity	level (dB μ V/m)	limit FCC class B	Margin
30.9	Vertical	26.72	29.5	2.78
203.4	Vertical	26.71	33	6.29
270	Vertical	35.5	35.5	0
335.9	Vertical	30.01	35.5	5.49
343.1	Horizontal	33.15	35.5	2.35
528	Horizontal	34.77	35.5	0.73

6.7. CONCLUSION

Field strength outside of the bands 13.110-14.010 MHz measurement performed on the sample of the product **IDEMIA MPH-AC004A**, SN: **1818SMP0000168**, 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 : June 15, 2018 to January 19, 2016
Ambient temperature : 19 °C
Relative humidity : 51 %

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 and perpendicular 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

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Open test site	LCIE	-	F2000400	2017-06	2018-06
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2016-12	2018-12
loop antenna	RHODE & SCHWARZ	HFH2-Z2	C2040007	2017-12	2020-12
Cable	-	-	A5329449	2017-09	2018-09
Cable	-	-	A5329380	2017-06	2018-06
cable	-	-	A5329444	2017-09	2018-09

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

Mode DC power supply

Parallel Axis			
Frequency (MHz)	Peak Level (dB μ V/m) (3m)	QPeak Level (dB μ V/m) (3m)	Limit (dB μ V/m) (3m)
Below 13.110	-	32	69.5
13.110 to 13.410	-	31	80.5
13.410 to 13.553	-	35.8	90.5
13.553 to 13.567	-	66.5	124
13.567 to 13.710	-	34	90.5
13.710 to 14.010	-	31	80.5
Above 14.010	-	29	69.5

Perpendicular Axis			
Frequency (MHz)	Peak Level (dB μ V/m) (3m)	QPeak Level (dB μ V/m) (3m)	Limit (dB μ V/m) (3m)
Below 13.110	-	32.8	69.5
13.110 to 13.410	-	30	80.5
13.410 to 13.553	-	35.6	90.5
13.553 to 13.567	-	61	124
13.567 to 13.710	-	36.4	90.5
13.710 to 14.010	-	33	80.5
Above 14.010	-	29	69.5

Mode POE

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	-	30	80.5
13.410 to 13.553	-	34.3	90.5
13.553 to 13.567	-	67	124
13.567 to 13.710	-	32	90.5
13.710 to 14.010	-	30	80.5
Above 14.010	-	29	69.5

Perpendicular 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	-	34	80.5
13.410 to 13.553	-	34	90.5
13.553 to 13.567	-	61.3	124
13.567 to 13.710	-	35.8	90.5
13.710 to 14.010	-	34	80.5
Above 14.010	-	31.7	69.5

7.7. CONCLUSION

Field strength within the band 13.110-14.010MHz measurement performed on the sample of the product **IDEMIA MPH-AC004A**, SN: **1818SMP0000168**, 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) $\pm x(\text{dB}) / (\text{Hz}) / \text{ms}$	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