



LCIE

RFID 13,56MHz Template: Release October 14th, 2019

TEST REPORT

N°: 163963-743759

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 VisionPass Series
Trade mark IDEMIA
Manufacturer IDEMIA Identity & Security France
Model under test MPH-AC006A
Serial number 1940SMA0000015
FCC ID ZBW-MPHAC006A
IC 11472A-MPHAC006A

Conclusion

See Test Program chapter

Test date

: October 11, 2019 to October 16, 2019

Test location

Fontenay Aux Roses & Ecuelles

Test Site

6230B-1

Sample receipt date

October 14, 2019

Composition of document

40 pages

Document issued on

December 19, 2019

Written by :
Julien Palard
Tests operator



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PUBLICATION HISTORY

Version	Date	Author	Modification
01	12/12/2019	Julien Palard	Creation of the document

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.



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	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
AC Power Line Conducted Emission P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA(2)	<input type="checkbox"/> NP(1)
Frequency Tolerance P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Field strength within the band 13.110-14.010MHz P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Field strength outside of the bands 13.110-14.010 MHz P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Receiver Radiated Emissions P	<input checked="" type="checkbox"/> PASS (3)	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> 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

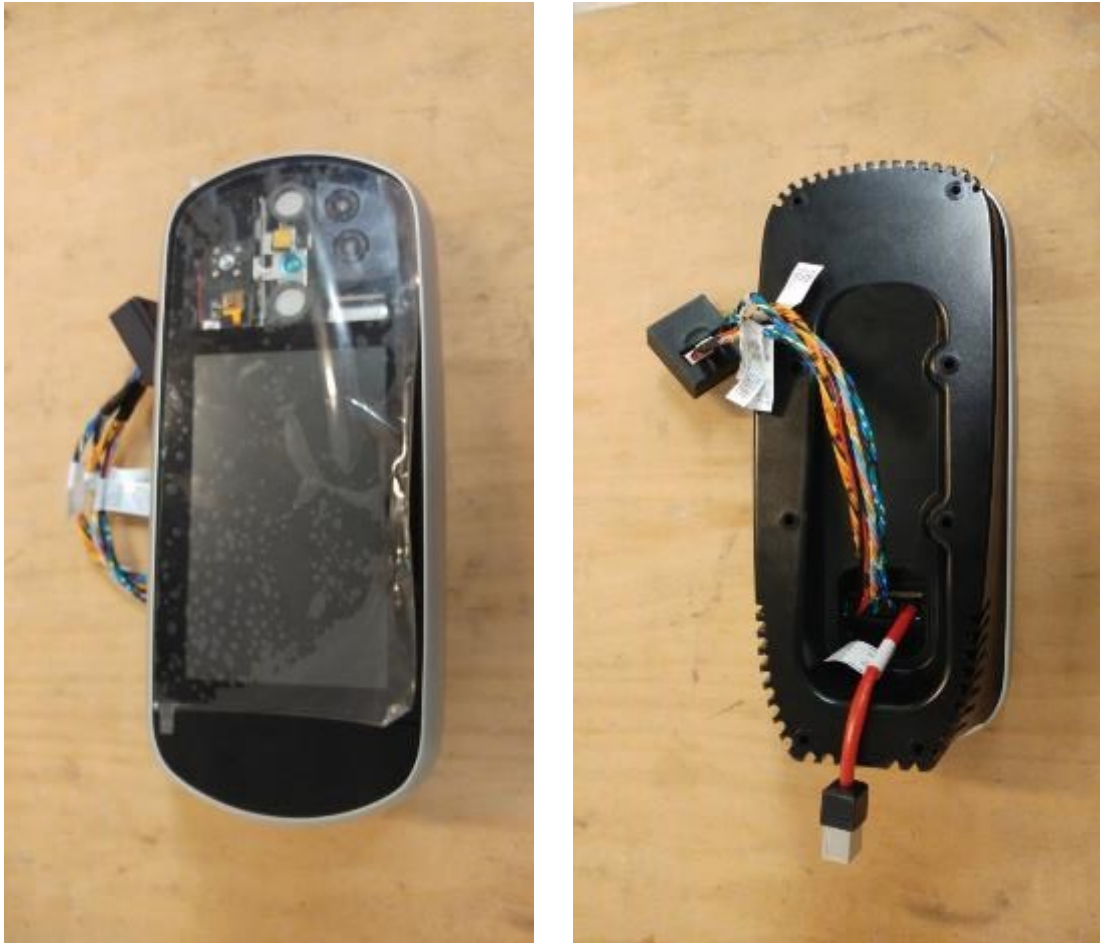
NP: Test Not Performed

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

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):
IDEMIA MPH-AC006A

Serial Number: 1940SMA0000015



Equipment Under Test



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Equipment Under Test

Power supply:

During all the tests, EUT is supplied by V_{nom} : 12VDC provided by representative AC/DC adapter
 For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference / Sn	Comments
Supply1	<input checked="" type="checkbox"/> AC <input type="checkbox"/> DC <input type="checkbox"/> Battery	Input: 100-240Vac 50-60Hz 700mA Output: 12Vdc 2,5A	FW7362/12	Not sold with the product. Representative of what will be used to connect the product to the U.S. public power supply

Voltage table used (for Power Line Conducted Emissions):

Type	Measurement performed:	
<input checked="" type="checkbox"/> AC	<input checked="" type="checkbox"/> 120VAC/60Hz	<input checked="" type="checkbox"/> 240VAC/50Hz
<input type="checkbox"/> DC	<input type="checkbox"/> +12VDC	<input type="checkbox"/> -....VDC
<input type="checkbox"/> Battery	<input type="checkbox"/> +3.6VDC	<input type="checkbox"/> -....VDC
<input type="checkbox"/> USB (Laptop auxiliary)	<input type="checkbox"/> 120VAC/60Hz (Laptop auxiliary)	<input type="checkbox"/> 240VAC/50Hz(Laptop auxiliary)

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
1	Ethernet	10	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop	L460	-	LENOVO
AC/DC power supply	FW7362/12	-	Not sold with the product. Representative of what will be used to connect the product to the U.S. public power supply



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Equipment information:

Type:	<input checked="" type="checkbox"/> RFID		
Frequency band:	[13.553 to 13.567] MHz		
Number of Channel:	1		
Antenna Type:	<input checked="" type="checkbox"/> Integral	<input type="checkbox"/> External	<input type="checkbox"/> Dedicated
Transmit chains:	1		
Receiver chains:	1		
Type of equipment:	<input checked="" type="checkbox"/> Stand-alone	<input type="checkbox"/> Plug-in	<input type="checkbox"/> Combined
Equipment type:	<input checked="" type="checkbox"/> Production model		<input type="checkbox"/> Pre-production model
Operating temperature range:	Tmin:	<input checked="" type="checkbox"/> -30°C IC <input type="checkbox"/> -20°C FCC	<input type="checkbox"/> 0°C <input type="checkbox"/> X°C
	Tnom:	20°C	
	Tmax:	<input type="checkbox"/> 35°C	<input type="checkbox"/> 50°C <input checked="" type="checkbox"/> 55°C
Type of power source:	<input checked="" type="checkbox"/> AC power supply	<input checked="" type="checkbox"/> DC power supply	<input type="checkbox"/> Battery
Operating voltage range:	Vmin:	<input checked="" type="checkbox"/> 102V/60Hz	<input checked="" type="checkbox"/> 10.8Vdc
	Vnom:	<input checked="" type="checkbox"/> 120V/60Hz	<input checked="" type="checkbox"/> 12Vdc
	Vmax:	<input checked="" type="checkbox"/> 138V/60Hz	<input checked="" type="checkbox"/> 27.6Vdc

Antenna Characteristic			
Antenna assembly	Gain (dBi)	Frequency Band (MHz)	Impedance(Ω)
1	-	13.553-13.567	50

Modulation Type
ASK 10% ASK 100%

Hardware information		
Software (if applicable):	V. :	Not provided by customer

2.2. RUNNING MODE

Test mode	Description of test mode
Test mode 1	Permanent emission with modulation on a fixed channel in the data rate that produced the highest power
Test mode 2	Permanent reception

Test	Running mode	
Occupied Bandwidth	<input checked="" type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Frequency Tolerance	<input checked="" type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
AC Power Line Conducted Emission	<input checked="" type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Field strength within the band 13.110-14.010MHz	<input checked="" type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Field strength outside of the bands 13.110-14.010 MHz	<input checked="" type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Receiver Radiated Emissions	<input checked="" type="checkbox"/> Test mode 2 (1)	<input type="checkbox"/> Alternative test mode()

2.3. EQUIPMENT LABELLING



2.4. EQUIPMENT MODIFICATION

None Modification:

- For Field strength outside of the bands 13.110 – 14.010 MHz the RFID wires were separated into 2 groups :



3. OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

Test performed by : Julien Palard
Date of test : October 15, 2019
Ambient temperature : 23 °C
Relative humidity : 49 %

3.2. TEST SETUP

- The Equipment Under Test is installed:

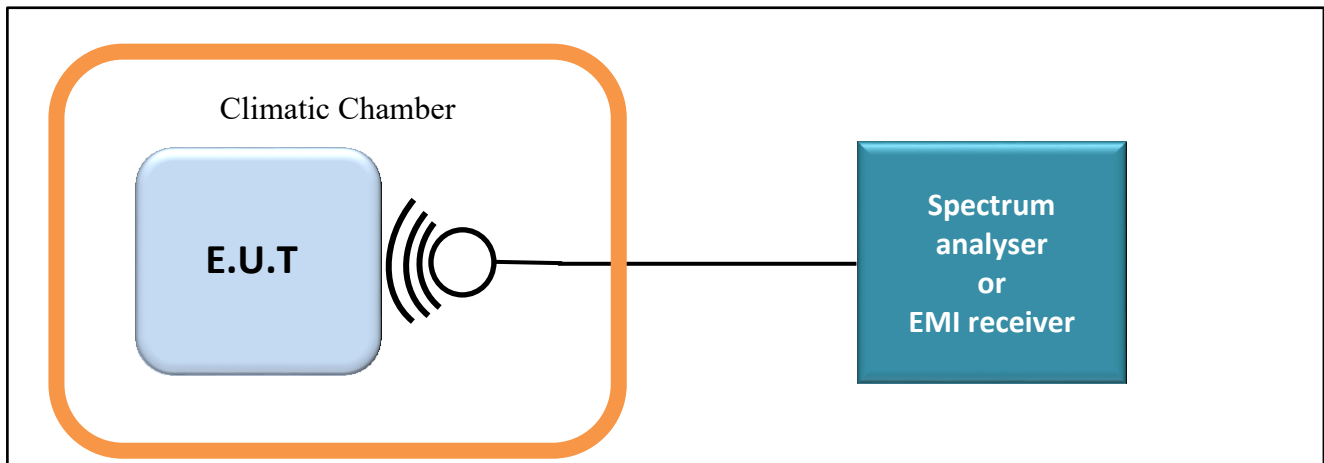
- On a table
- In a climatic chamber
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

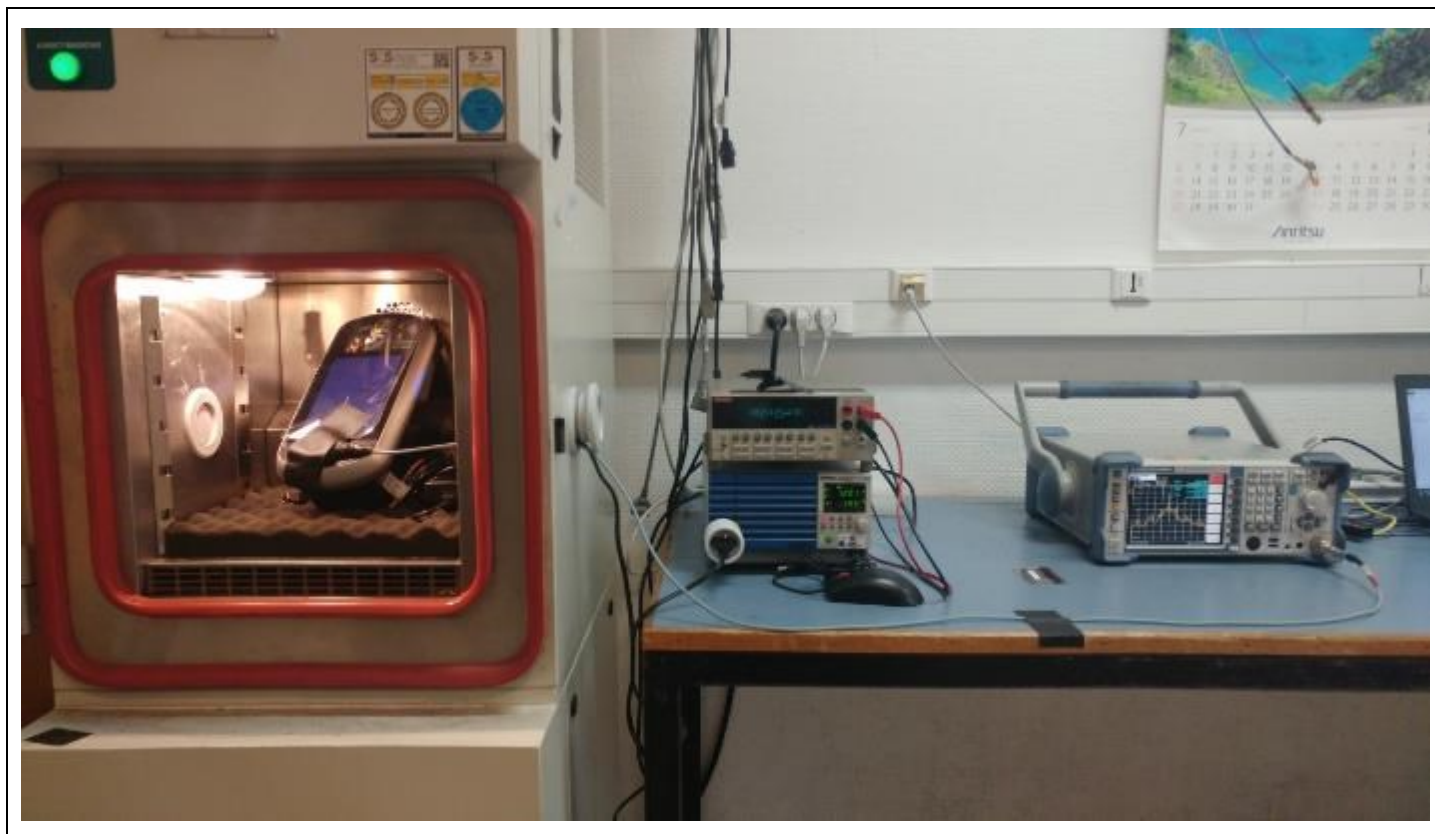
- Conducted Method
- Radiated Method

- Test Procedure:

- RSS-Gen Issue 5 § 6.7



Test set up of Occupied Bandwidth



Photograph for Occupied bandwidth

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	A1241084	2018/12	2020/12
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	Cal with Spectrum analyzer	

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

4. FREQUENCY TOLERANCE

4.1. TEST CONDITIONS

Test performed by : Julien Palard
Date of test : October 15, 2019
Ambient temperature : 23 °C
Relative humidity : 49 %

4.2. TEST SETUP

- The Equipment Under Test is installed:

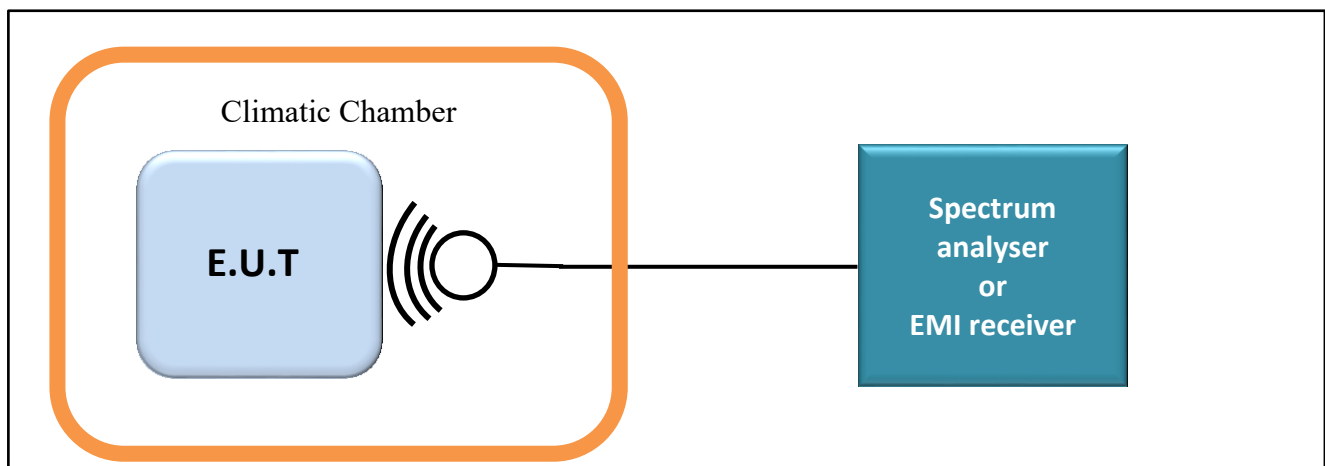
- On a table
- In a climatic chamber
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

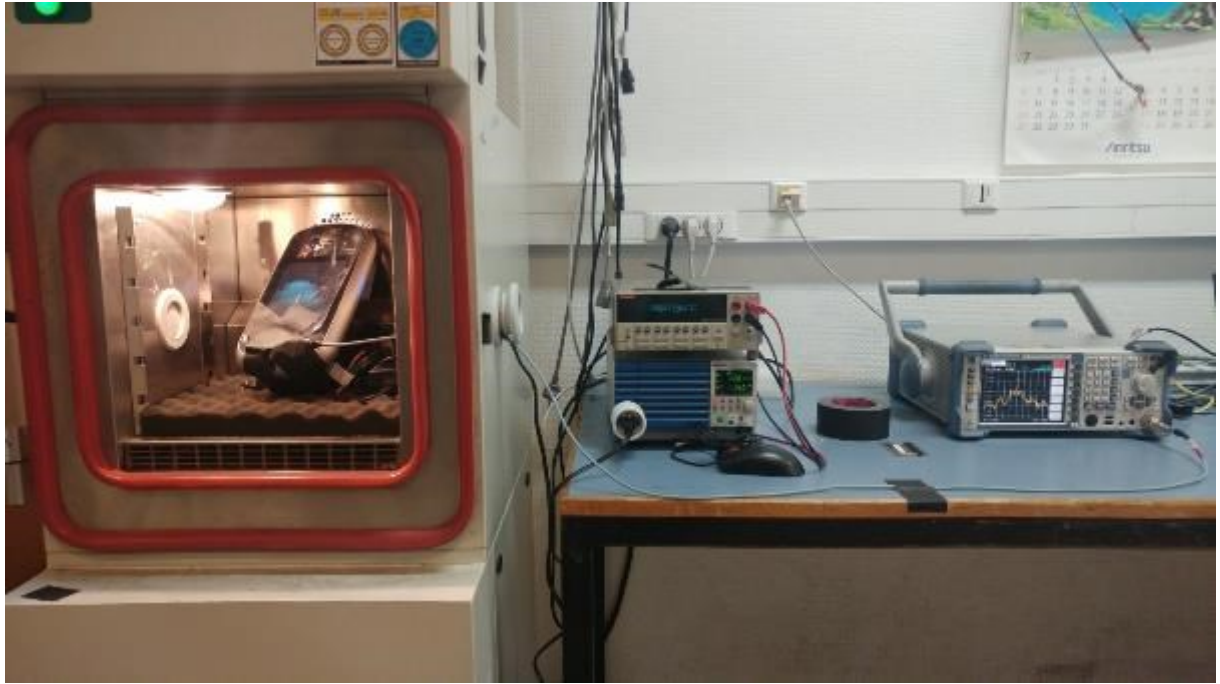
- ANSI C63.10 § 6.8



Test set up of Occupied Bandwidth



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Photograph for Frequency Tolerance in normal test conditions



Photograph for Frequency Tolerance in extreme test conditions

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	A1241084	2018/12	2020/12
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	Cal with Spectrum analyzer	

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



4.5. RESULTS

Frequency	13,56									
EUT ACTIVATION	Start up									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,559725	13,559775	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
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	13,559875	13,559775	13,55975	13,559775	13,559725
Frequency Drift (%)	-0,0013	-0,0017	-0,0013	-0,0009	-0,0009	-0,0009	-0,0017	-0,0018	-0,0017	-0,0020
EUT ACTIVATION	5min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,559755	13,559775	13,559875	13,559875	13,559925	13,559875	13,55975	13,559875	13,55975	13,559725
Frequency Drift (%)	-0,0018	-0,0017	-0,0009	-0,0009	-0,0006	-0,0009	-0,0018	-0,0009	-0,0018	-0,0020
EUT ACTIVATION	10min									
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

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

4.6. CONCLUSION

Frequency tolerance measurement performed on the sample of the product **IDEMIA MPH-AC006A**, SN: **1940SMA0000015**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.225 & RSS 210 ISSUE 9 limits.

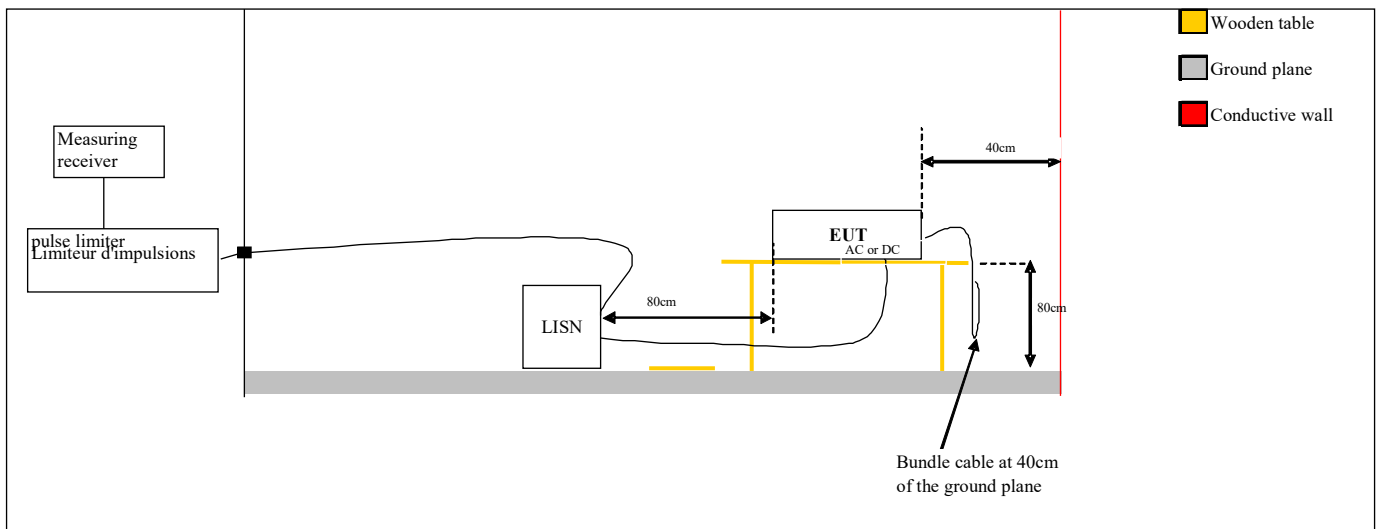
5. AC POWER LINE CONDUCTED EMISSIONS

5.1. TEST CONDITIONS

Test performed by : Laurent DENEUX
 Date of test : October 11, 2019
 Ambient temperature : 21 °C
 Relative humidity : 47 %

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)



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Photograph for AC Power Line Conducted Emissions (Rear view)

5.3. LIMIT

Frequency range	Level	Detector
0,15kHz to 0,5MHz	66dB μ V to 56 μ V*	QPeak
	56dB μ V to 46 μ V*	Average
0,5MHz to 5MHz	56dB μ V	QPeak
	46dB μ V	Average
5MHz to 30MHz	60B μ V	QPeak
	50dB μ V	Average

*Decreases with the logarithm of the frequency

5.4. TEST EQUIPMENT LIST

Test equipment used					
Description	Manufacturer	Model	Identifier	Last Calibration date	Calibration due date
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	03/2019	03/2020
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:



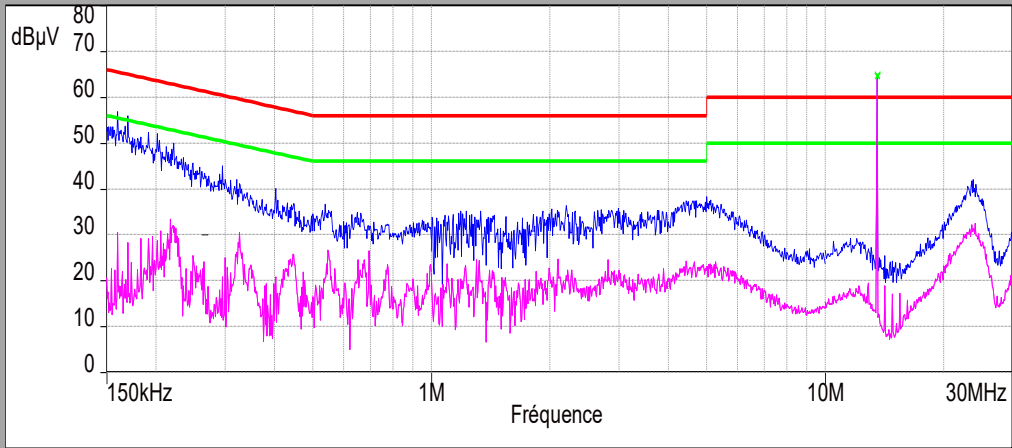
L C I E

5.6. RESULTS

AC Power Line Conducted Emission (240V-50Hz) With antenna RFID

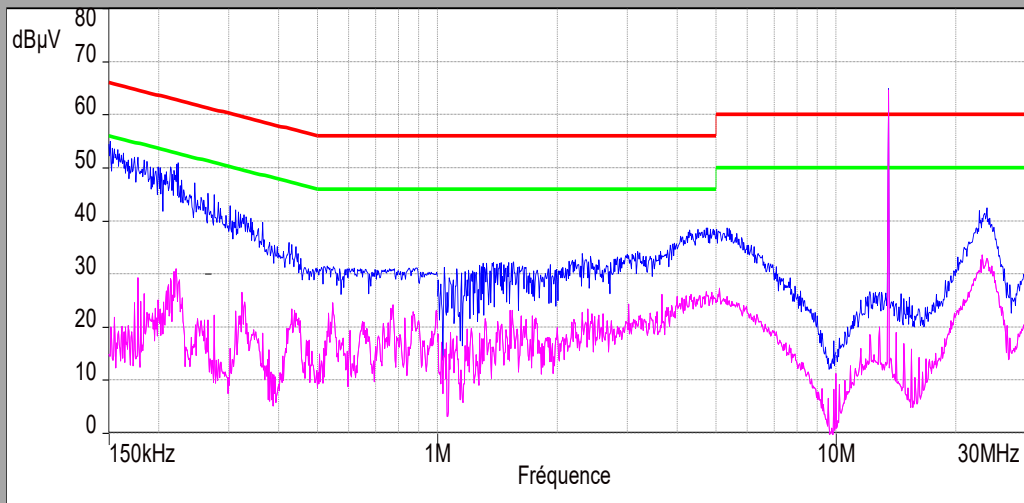
Phase

- FCC PART 15 classe B - Classe:B - Moyenne/
- FCC PART 15 classe B - Classe:B - QCrête/
- Mes.Peak (Phase 1)
- Mes.Avg (Phase 1)
- x Mes.Peak (Finaux 55022) (Phase 1)
- x Mes.QPeak (Finaux 55022) (Phase 1)
- x Mes.Avg (Finaux 55022) (Phase 1)



Line

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





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Phase Line							
Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Margin peak/Quasi Peak (dB)	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Avg/Avg (dB)
0.16	56.8	-	65.6	8.8	30.5	55.6	25.1
0.553	36.6	-	56	19.4	26.6	46	19.4
4.67	37.3	-	56	18.7	24	46	22
13.56	64.7	-	60	-4.7	64.5	50	-14.5
23.6	41.7	-	60	18.3	32.1	50	17.9

Neutral Line							
Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Margin peak/Quasi Peak (dB)	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Avg/Avg (dB)
0.222	50.7	-	62.7	12	30.1	52.7	22.6
0.547	30.7	-	56	25.3	24.5	46	21.5
4.76	38.6	-	56	17.4	24.2	46	21.8
13.56	64.8	-	60	-4.8	64.6	50	-14.6
24	42.4	-	60	17.6	33	50	17

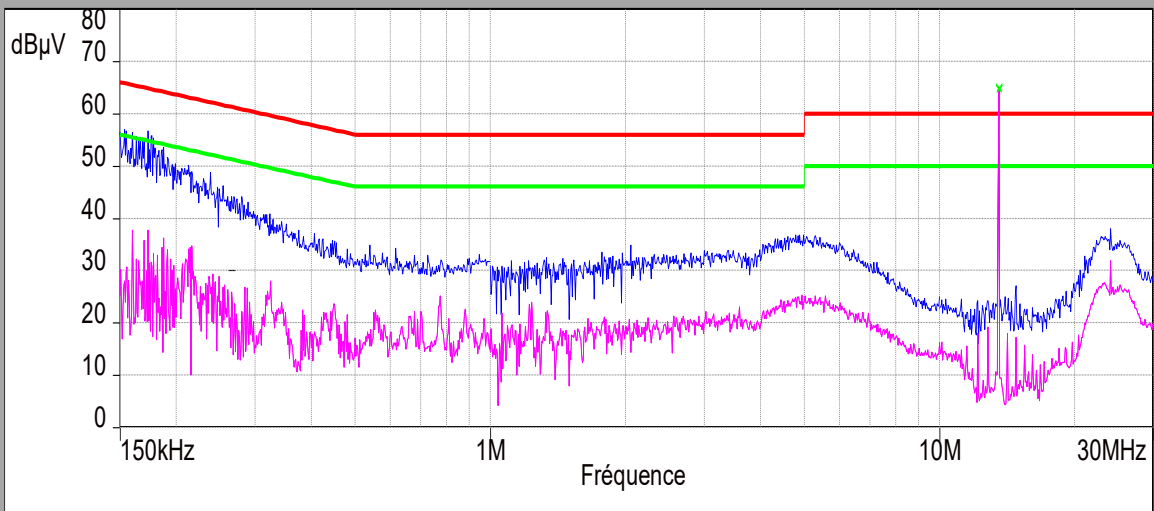


L C I E

AC Power Line Conducted Emission (120V-60Hz) With antenna RFID

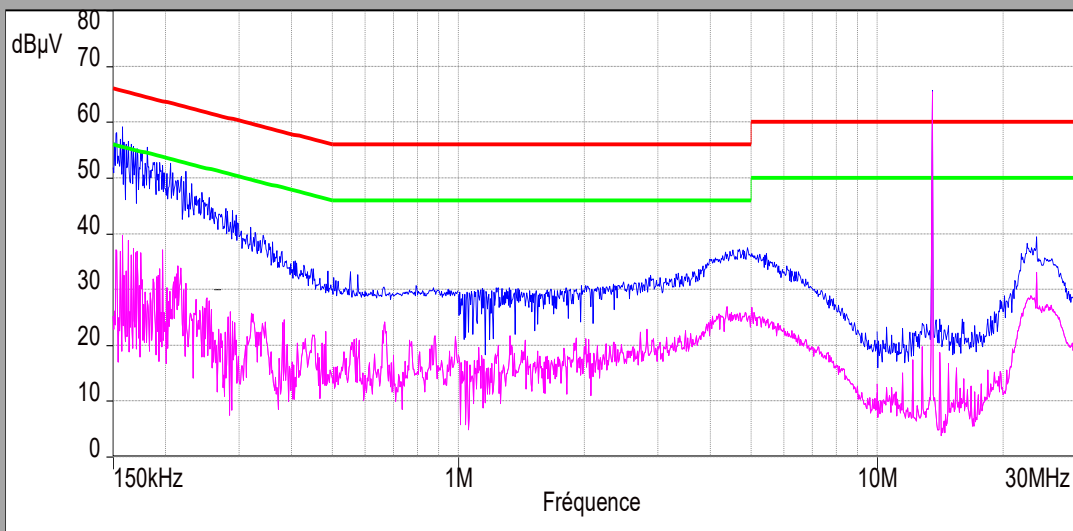
Phase

- FCC PART 15 classe B - Classe:B - Moyenne/
- FCC PART 15 classe B - Classe:B - QCrête/
- Mes.Peak (Phase 1)
- Mes.Avg (Phase 1)
- × Mes.Peak (Finaux 55022) (Phase 1)
- × Mes.QPeak (Finaux 55022) (Phase 1)
- × Mes.Avg (Finaux 55022) (Phase 1)



Line

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





L C I E

Phase Line							
Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Margin peak/Quasi Peak (dB)	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Avg/Avg (dB)
0.159	56.4	-	65.6	9.2	37.6	55.6	18
0.553	34.6	-	56	21.4	18.9	46	27.1
4.85	36.6	-	56	19.4	25	46	21
13.56	65	-	60	-5	64.7	50	-14.7
24	38	-	60	22	31.5	50	18.5

Neutral Line							
Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Margin peak/Quasi Peak (dB)	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Avg/Avg (dB)
0.158	59.2	-	65.6	6.4	39.7	55.6	15.9
0.553	33	-	56	23	20	46	26
4.91	37.5	-	56	18.5	24.3	46	21.7
13.56	65.8	-	60	-5.8	65.4	50	-15.4
24	39.5	-	60	20.5	32.5	50	17.5

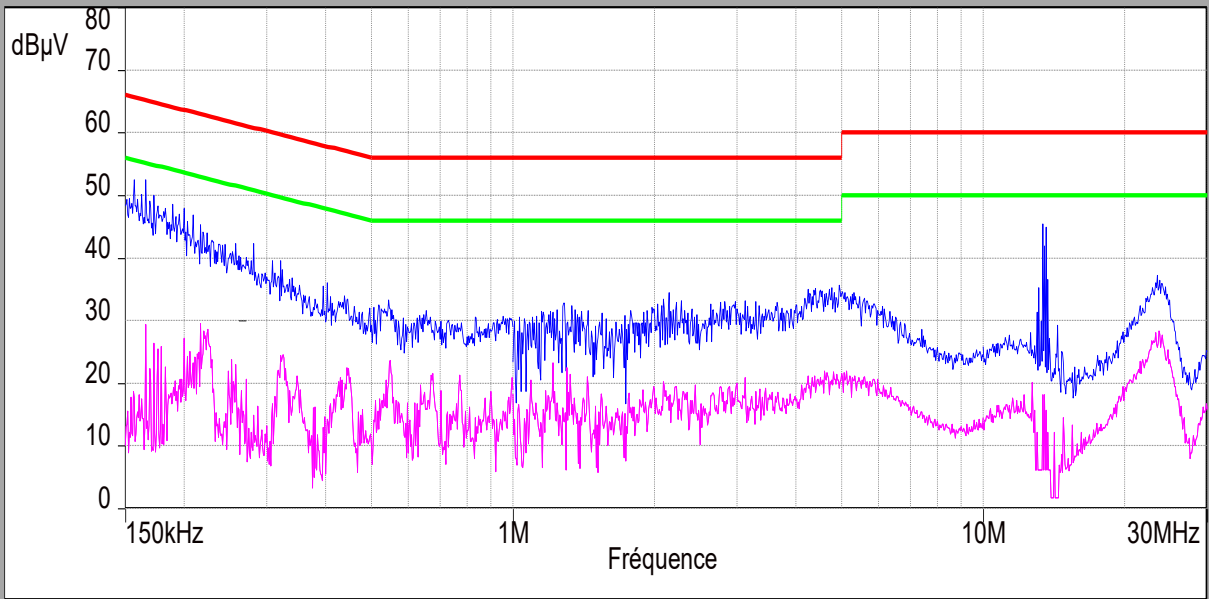


L C I E

AC Power Line Conducted Emission (240V-50Hz) Without antenna RFID

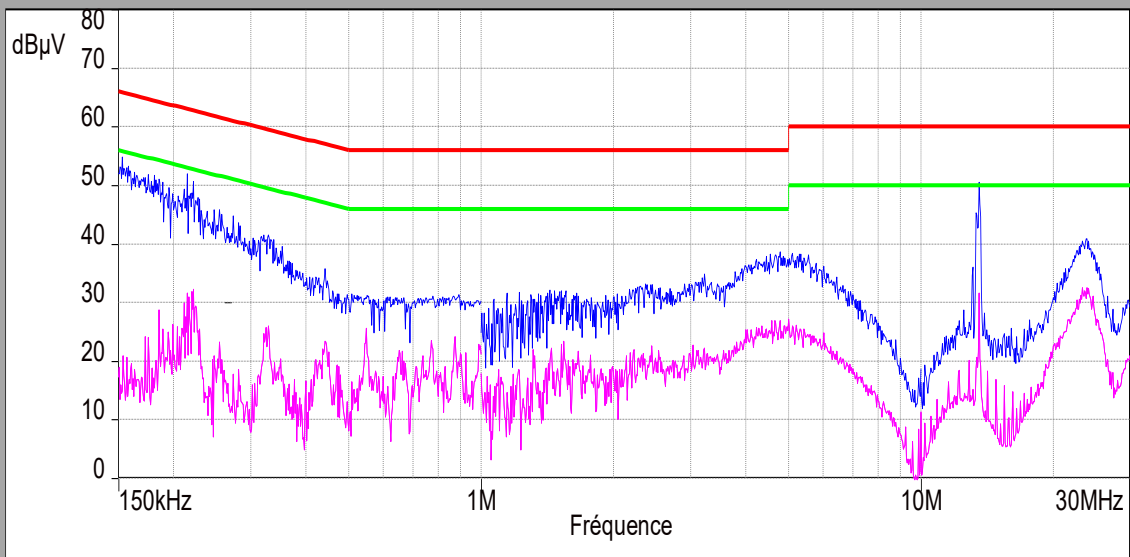
Phase

- FCC PART 15 classe B - Classe:B - Moyenne/
- FCC PART 15 classe B - Classe:B - QCrête/
- Mes.Peak (Phase 1)
- Mes.Avg (Phase 1)



Line

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





L C I E

Phase Line							
Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Margin peak/Quasi Peak (dB)	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Avg/Avg (dB)
0.222	52.5	-	62.7	10.2	29.5	52.7	23.2
0.547	29.9	-	56	26.1	23.6	46	22.4
4.25	35	-	56	21	21.1	46	24.9
13.56	45.2	-	60	14.8	18.2	50	31.8
24	35.3	-	60	24.7	28.3	50	21.7

Neutral Line							
Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Margin peak/Quasi Peak (dB)	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Avg/Avg (dB)
0.222	52	-	62.7	10.7	32.2	52.7	20.5
1.3	31	-	56	25	15	46	31
4.78	38.6	-	56	17.4	26.5	46	19.5
13.56	50.5	-	60	9.5	31	50	19
24	40.8	-	60	19.2	32.5	50	17.5

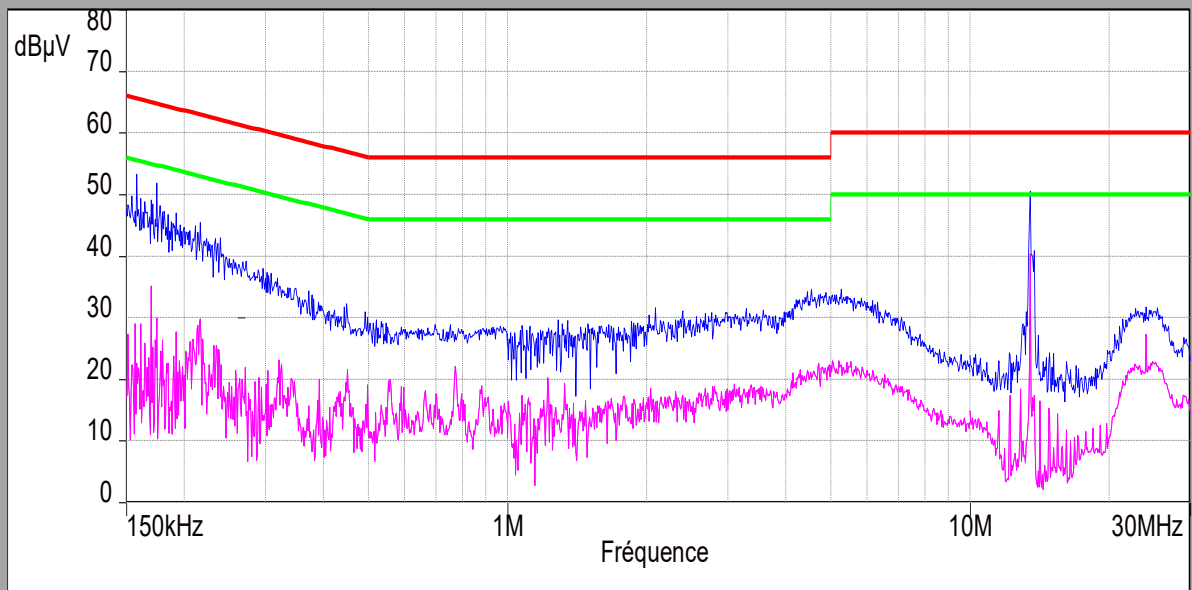


L C I E

AC Power Line Conducted Emission (120V-60Hz) Without antenna RFID

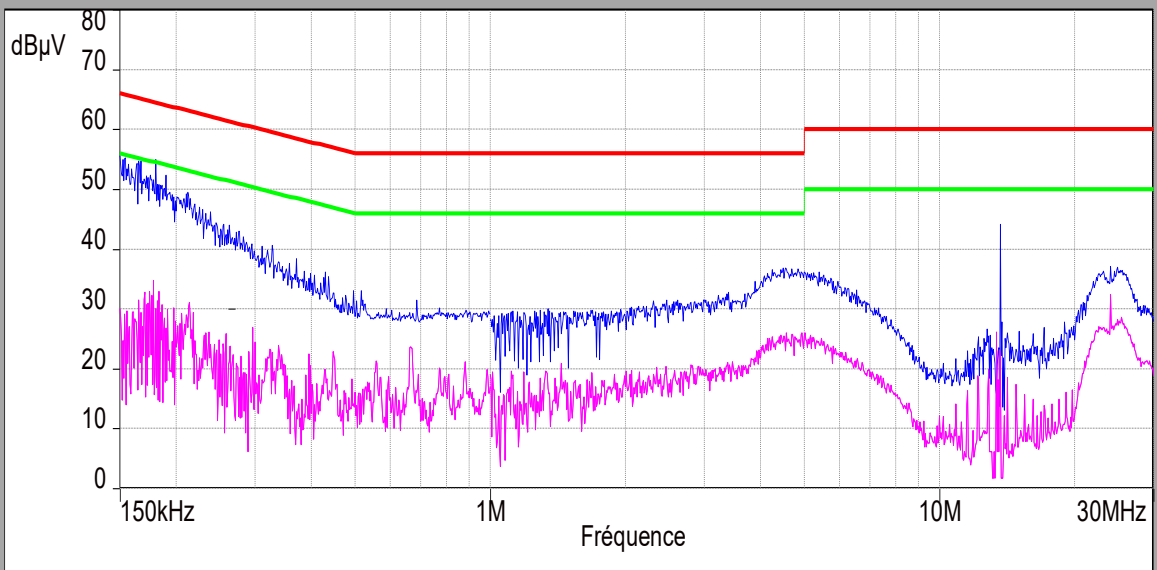
Phase

- FCC PART 15 classe B - Classe:B - Moyenne/
- FCC PART 15 classe B - Classe:B - QCrête/
- Mes.Peak (Phase 1)
- Mes.Avg (Phase 1)



Line

- FCC PART 15 classe B - Classe:B - Moyenne/
- FCC PART 15 classe B - Classe:B - QCrête/
- Mes.Peak (Phase 1)
- Mes.Avg (Phase 1)





L C I E

Phase Line							
Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Margin peak/Quasi Peak (dB)	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Avg/Avg (dB)
0.159	51.8	-	65.6	13.8	35.7	55.6	19.9
0.558	25.8	-	56	30.2	20	46	26
4.98	33.6	-	56	22.4	20.6	46	25.4
13.56	40.5	-	60	19.5	30.3	50	19.7
24	31.7	-	60	28.3	27.3	50	22.7

Neutral Line							
Frequency (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Margin peak/Quasi Peak (dB)	Average Level (dB μ V)	Average Limit (dB μ V)	Margin Avg/Avg (dB)
0.18	55	-	64.4	9.4	34.7	54.4	19.7
0.686	31.4	-	56	24.6	16	46	30
4.66	35	-	56	21	24.5	46	21.5
13.7	54	-	60	6	26.2	50	23.8
24	37	-	60	23	32.3	50	17.7

5.7. CONCLUSION

Ac Power Line Conducted Emission measurement performed on the sample of the product **IDEMIA MPH-AC006A**, SN: **1940SMA0000015**, 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

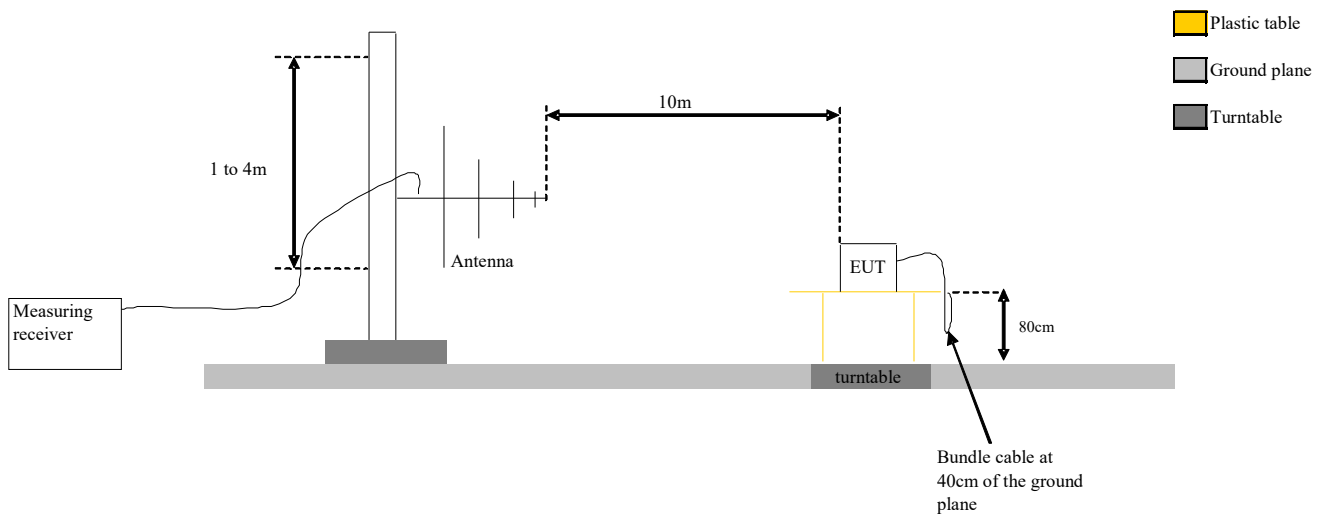
Test performed by : Laurent DENEUX
 Date of test : October 11, 2019 to October 14, 2019
 Ambient temperature : 19 °C
 Relative humidity : 49 %

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**.



Test Set up for radiated measurement in open area test site



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



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6.3. LIMIT

Measure at 300m		
Frequency range	Level	Detector
9kHz-490kHz	67.6dB μ V/m /F(kHz)	QPeak
Measure at 30m		
Frequency range	Level	Detector
490kHz-1.705MHz	87.6dB μ V/m /F(kHz)	QPeak
1.705MHz-30MHz	29.5dB μ V/m	QPeak
Measure at 10m		
Frequency range	Level	Detector
30MHz to 88MHz	29.5dB μ V/m	QPeak
88MHz to 216MHz	33dB μ V/m	QPeak
216MHz to 960MHz	35.5B μ V/m	QPeak
960MHz to 1000MHz	43.5dB μ V/m	QPeak
Above 1000MHz	63.5dB μ V/m	Peak
	43.5dB μ V/m	Average
Measure at 3m		
Frequency range	Level	Detector
30MHz to 88MHz	40dB μ V/m	QPeak
88MHz to 216MHz	43.5dB μ V/m	QPeak
216MHz to 960MHz	46B μ V/m	QPeak
960MHz to 1000MHz	54dB μ V/m	QPeak
Above 1000MHz	74dB μ V/m	Peak
	54dB μ V/m	Average



6.4. 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
Bilog antenna	CHASE	CBL 6112A	C2040040	2019-04	2020-04
Cable	-	-	A5329442	2018-09	2019-09
Cable	-	-	A5329444	2018-09	2019-09
Cable	-	-	A5329876	2018-11	2019-11
loop antenna	RHODE & SCHWARZ	HFH2-Z2	C2040007	2018-11	2020-11
Cable	-	-	A5329442	2018-09	2019-09
Cable	-	-	A5329416	2018-12	2019-12
Preamplifier	HEWLETT PACKARD	8449B	A4069002	2018-04	2020-04
Horn	EMCO	3115	C2042016	2019-06	2020-06
Signal Generator	ROHDE & SCHWARZ	SMY02	A5442013	2018-07	2020-07

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

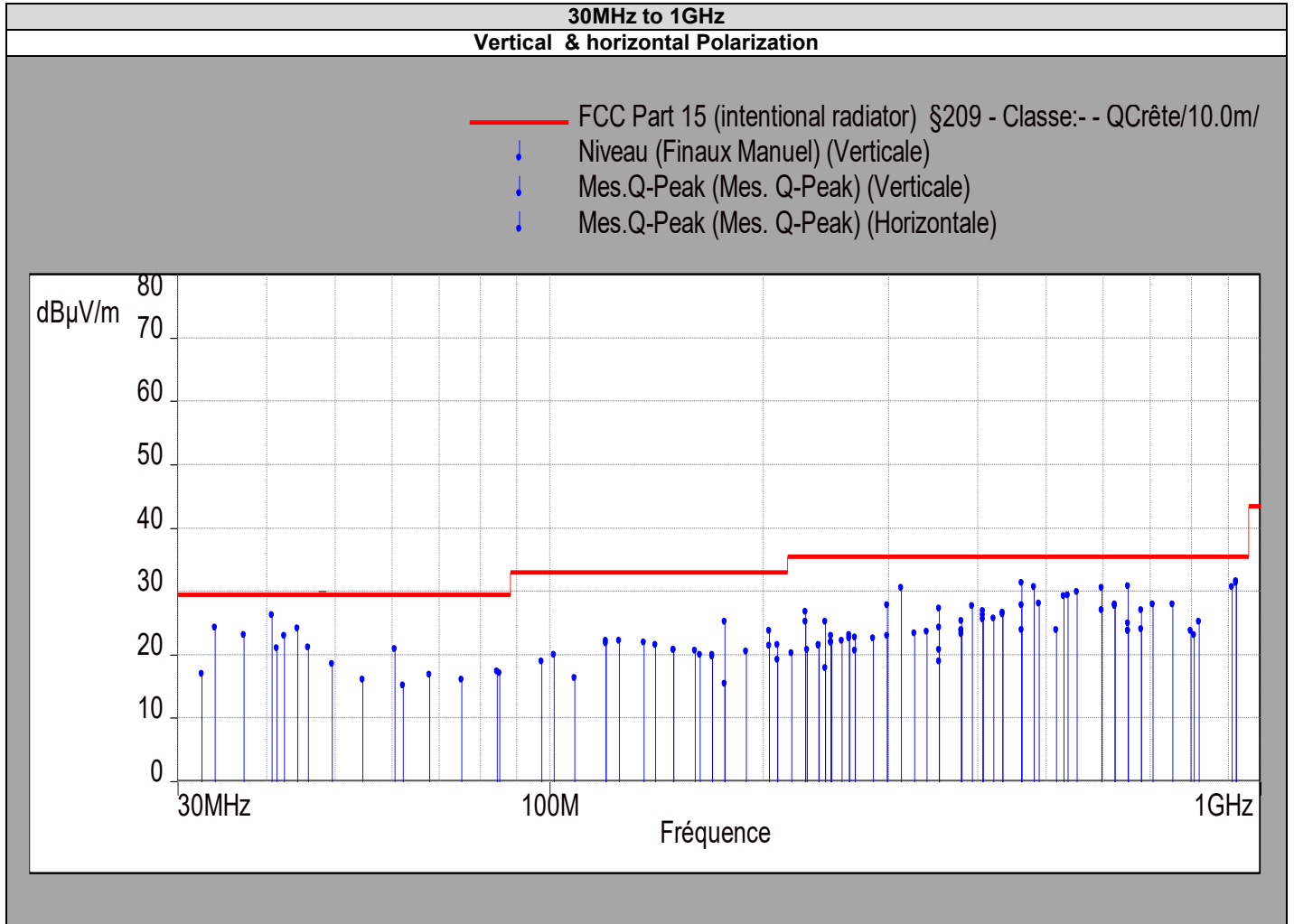
6.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None Divergence:



L C I E

6.6. RESULTS



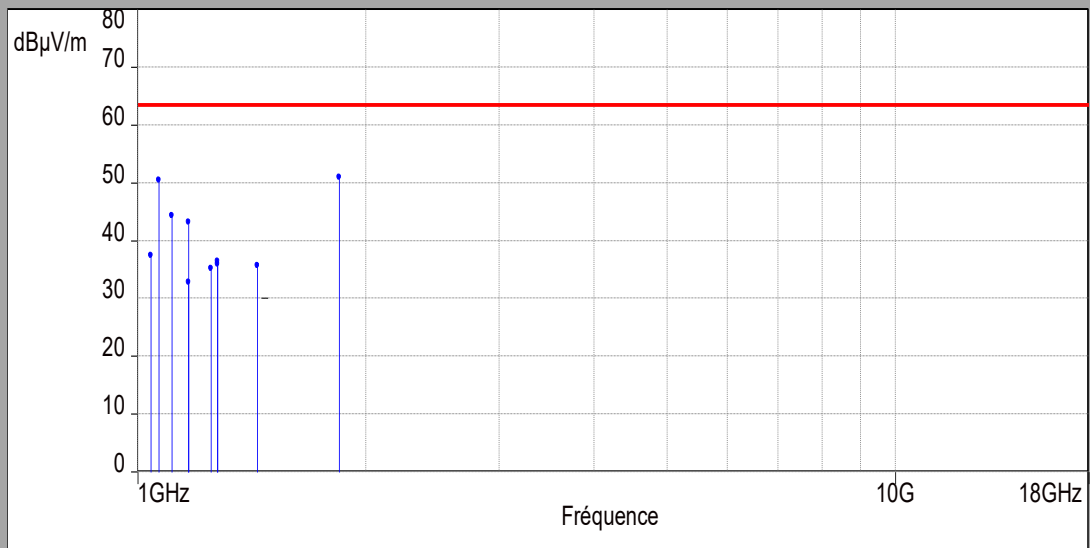


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Above 1GHz

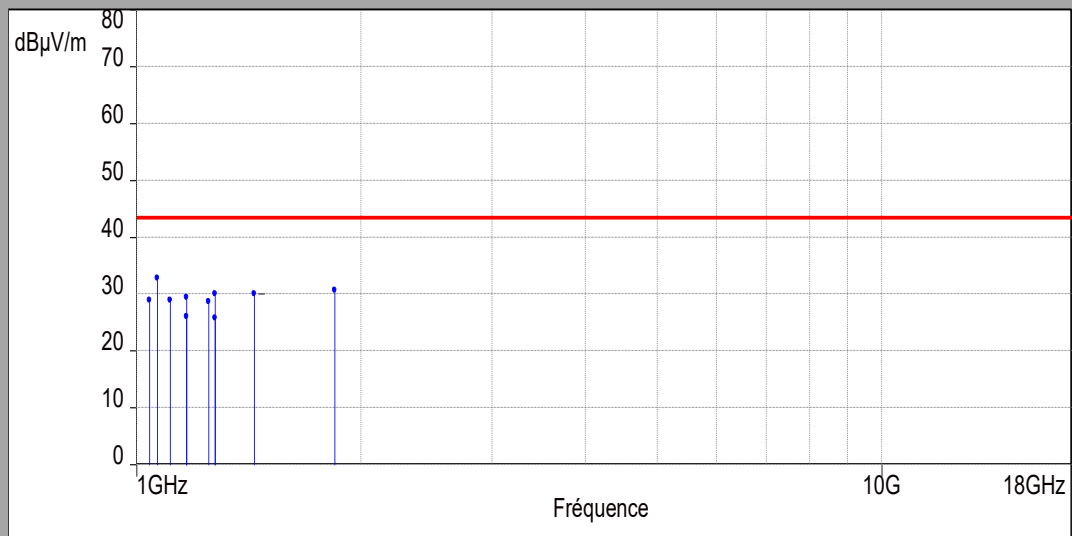
Vertical & horizontal Polarization Peak measurement

- FCC Part 15 (intentional radiator) §209 - Classe:- - Crête/10.0m/
- ↓ Mes. peak (Verticale)
- ↓ Mes. peak (Horizontale)



Vertical & horizontal Polarization Average value

- FCC Part 15 (intentional radiator) §209 - Classe:- - Moyenne/10.0m/
- ↓ Mes. Avg (Verticale)
- ↓ Mes. Avg (Horizontale)





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

30MHz to 1GHz					
Polarization	Frequency (MHz)	Peak Level (dB μ V/m)	QPeak Level (dB μ V/m)	Limit (dB μ V/m)	Margin QPeak (dB μ V/m)
Vertical	40.7	-	26.25	29.5	3.25
Vertical	60.6	-	20.83	29.5	8.67
Vertical	228.9	-	26.77	35.5	8.73
Vertical	461.1	-	31.3	35.5	4.2
Vertical	651	-	30.79	35.5	4.71
Horizontal	924	-	31.61	35.5	3.89

Above 1GHz								
Polarization	Frequency (MHz)	Duty cycle correction (dB)	Average Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin Average (dB μ V/m)	Peak Level (dB μ V/m)	Peak Limit (dB μ V/m)	Margin Peak (dB μ V/m)
Vertical	1039.5	37.47	28.97	43.5	14.53	37.47	63.5	26.03
Vertical	1066.5	50.42	32.78	43.5	10.72	50.42	63.5	13.08
Vertical	1166.4	43.17	26.04	43.5	17.46	43.17	63.5	20.33
Vertical	1274.9	36.48	30.07	43.5	13.43	36.48	63.5	27.02
Vertical	1438.2	35.74	30.04	43.5	13.46	35.74	63.5	27.76

6.7. CONCLUSION

Field strength outside of the bands 13.110-14.010 MHz measurement performed on the sample of the product **IDEMIA MPH-AC006A**, SN: **1940SMA0000015**, 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

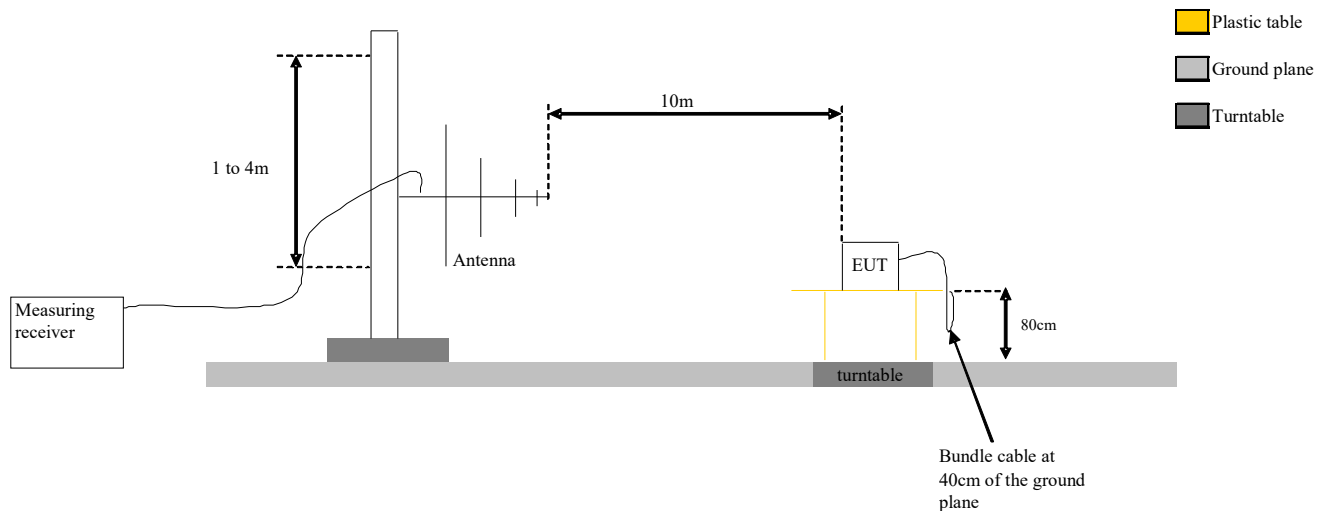
Test performed by : Laurent DENEUX
 Date of test : October 14, 2019
 Ambient temperature : 17 °C
 Relative humidity : 53 %

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 placed at 0.8m.



Test Set up for radiated measurement in open area test site



Photograph for Field strength within the band 13.110-14.010MHz



7.3. LIMIT

Limit:

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

7.4. 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
loop antenna	RHODE & SCHWARZ	HFH2-Z2	C2040007	2018-11	2020-11
Cable	-	-	A5329442	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

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	-	31	69.5
13.110 to 13.410	-	35.4	80.5
13.410 to 13.553	-	40.5	90.5
13.553 to 13.567	-	63	124
13.567 to 13.710	-	39.5	90.5
13.710 to 14.010	-	34.9	80.5
Above 14.010	-	30.2	69.5

Ground 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	-	28.4	69.5
13.110 to 13.410	-	30.5	80.5
13.410 to 13.553	-	36.7	90.5
13.553 to 13.567	-	55.7	124
13.567 to 13.710	-	37.4	90.5
13.710 to 14.010	-	31.2	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	-	32.1	69.5
13.110 to 13.410	-	34.9	80.5
13.410 to 13.553	-	39.8	90.5
13.553 to 13.567	-	59.4	124
13.567 to 13.710	-	38.7	90.5
13.710 to 14.010	-	34.2	80.5
Above 14.010	-	30.7	69.5

7.7. CONCLUSION

Field strength within the band 13.110-14.010MHz measurement performed on the sample of the product **IDEMIA MPH-AC006A**, SN: **1940SMA0000015**, 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 (Ecuellas)	4,88	6.3
Measurement of radiated electric field from 1 to 18GHz on the Ecuellas site	5.16	/
Measurement of radiated electric field from 30 to 1000MHz in vertical position on the OATS (Ecuellas)	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 (Ecuellas)	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