



LCIE

# TEST REPORT

N°: 135376-672302ACR2015-10-07

**Subject**

**Electromagnetic compatibility (EMC) :**  
**Publication CFR 47 Part 15 of 2013 Subpart C - Radio frequency devices - Intentional radiators standards (FCC Part 15.209 & 15.207)**

**Issued to**

BodyCap  
6, Rue de la girafe  
14000 Caen  
FRANCE

**Apparatus under test**

- ↪ Product                                    Activator
- ↪ Trade mark                                BodyCap
- ↪ Manufacturer                             BodyCap
- ↪ Model under test                         Activateur / 04001
- ↪ Serial number                             -

**Test date**

May 7th, 2015 to May 26th, 2015

**Test location**

Fontenay Aux Roses

**Test performed by**

Fostoki MEDJOU DJ & Stéphane CAMBOUE

**Composition of document**

18 pages

**Initial issued on**

August 3rd, 2015

**Modified on**

October 07th, 2015

**Written by :**  
**Fostoki MEDJOU DJ**  
**Tests operator**

**Approved by :**  
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**Technical manager**

	<b>LABORATOIRE CENTRAL DES</b>
	<b>INDUSTRIES ELECTRIQUES</b>
	S.A.S au capital de 15 745 984 €
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## 1. Test Program

### References

- ✓ CFR 47 Part 15 Subpart C - Radio frequency devices - Intentional radiators standards
- ✓ ANSI C63.10 (2009)
- ✓ CISPR 16-4-2

### Emission tests:

Test Description	Main characteristics	Test result - Comments
Measurement of radiated electric field in shielded room (FCC Part 15.209)	<input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
Measurement of radiated electric field in open space (FCC Part 15.209)	<input type="checkbox"/> Class A <input type="checkbox"/> Class B	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL <input checked="" type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
Measurement of conducted disturbance on the AC main power port (FCC Part 15.207)	<input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)

The product is Compliant according to CFR 47 Part 15 of 2013 Subpart C - Radio frequency devices - Intentional radiators standards (FCC Part 15.207 & 15.209).

PASS: EUT complies with standard's requirement

FAIL: EUT does not comply with standard's requirement

NA: Not Applicable

NP: Test Not Performed



## 2. Equipment Description (declared by provider)

### 2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT): Activateur / 04001

Serial Number: -



Equipment Under Test


**Inputs/outputs - Cable:**

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
PowersupplyAC	Input: 100-240V~ 50/60Hz 110mA Output: 5Vdc 1A	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Charger: TCUMINI1A1USBV2 / BB2709

**Auxiliary equipment used during test:**

Type	Reference	Sn	Comments
-	-	-	-
-	-	-	-
-	-	-	-

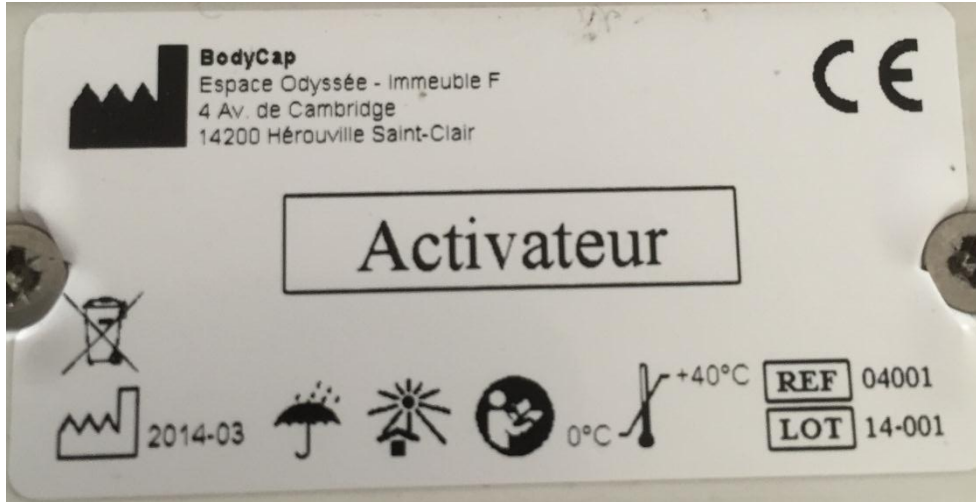
**Equipment information:** (Declared by provider)

Apparatus Description	<p>The device is composed of an ingestible capsule, swallowed by the animal, which uses wireless telemetry to detect and transmit the animal's core body temperature to an external monitor (which is also provided). Transmitter frequency: 50 MHz.</p>  <p>The Activator enables the capsule</p>			
Type of power source:	<input checked="" type="checkbox"/> AC power supply	<input type="checkbox"/> DC power supply	<input type="checkbox"/> Battery (Select Type)	
Test source voltage:	Vmin-Vmax:	<input checked="" type="checkbox"/> 120V -60Hz	<input type="checkbox"/> Vdc	
Operating Modes	Mode 1	Activation - with capsule (which is not in transmission)		
Transmitter frequency	50MHz			



## 2.2. EQUIPMENT LABELLING

ACTIVATOR



CHARGER



## 2.3. EQUIPMENT MODIFICATIONS

- None       Modification:
- Add ferrites on USB cable for radiated electric field (ref:74271132S)



### 3. Measurement of radiated emissions

#### 3.1. ENVIRONMENTAL CONDITIONS

Test performed by : Stéphane CAMBOUE  
Date of test : 2015/05/26  
Ambient temperature : 20°C  
Relative humidity : 38%

#### 3.2. TEST SETUP

##### Specifications:

Frequency	30 – 1000 MHz	RBW 120 kHz
	1-6GHz	RBW 1MHz
Detector	Peak and Quasi-Peak	

Pre characterization in semi anechoic room is performed to define the critical frequencies

##### Operating conditions:

- The Equipment under Test is installed:

- Measure in semi anechoic room
- Measure in open area site

- Measuring distance:

- 3m
- 10m

- Deviation method:

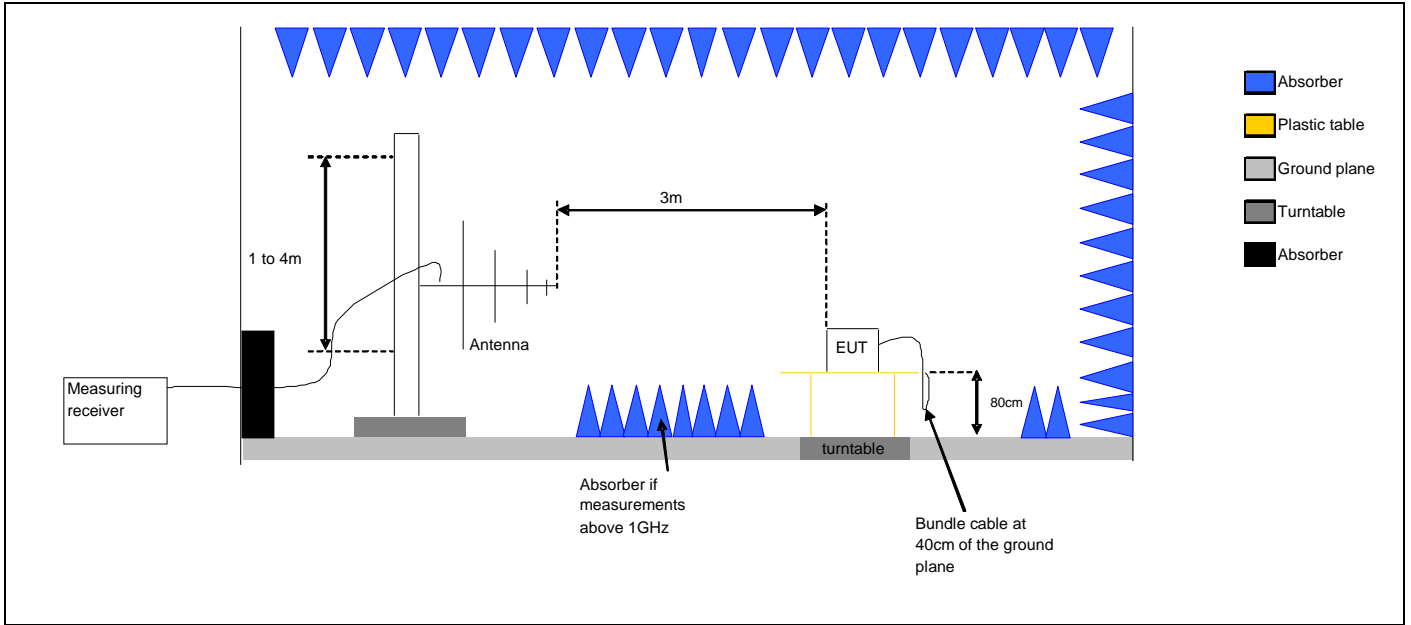
- Yes
- No

-Product installation:

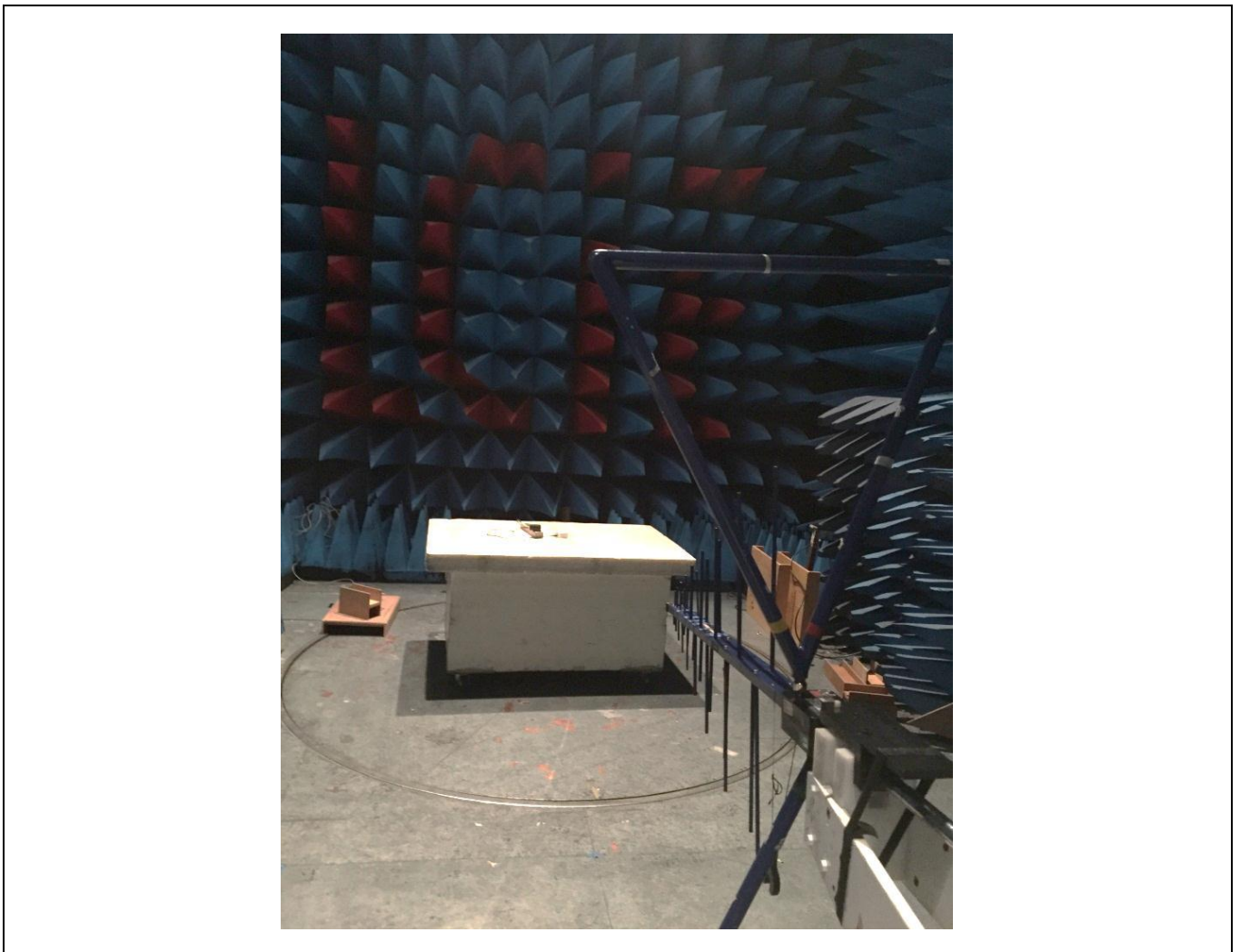
- The EUT was tested as a tabletop equipment and was placed on a non-conducting platform the top of which is 0.8m above the metal ground plane.
- The EUT is at 10cm height from reference plane

##### Operating mode:

- Mode 1



Test Set up for radiated measurement in semi anechoic chamber







Measurement of radiated disturbances.

### 3.3. LIMIT

Frequency Bands/frequencies	dB ( $\mu\text{V}/\text{m}$ ) quasi-peak	dB ( $\mu\text{V}/\text{m}$ ) peak	dB ( $\mu\text{V}/\text{m}$ ) average
30-88MHz	40	-	-
88 – 216MHz	43.5	-	-
216 – 960 MHz	46	-	-
960 – 1000 MHz	53.9	-	-
1000-6000MHz	-	73.9	53.9



### 3.4. TEST EQUIPMENT LIST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi anechoic chamber 11,8x8,1x9,5m	SIEPEL	C01	D3044008	2014/09	2015/09
Bilog antenna	CHASE	CBL6111C	C2040124	2014/09	2015/09
Spectrum analyzer	ROHDE & SCHWARZ	ESIB26	A2642021	2015/01	2016/01
Cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA/3.5MD/4000	A5329374	2014/06	2015/06
Cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA-TDINOX/3.5MD/7000	A5329459	2014/06	2015/06
Cable	-	-	A5329261	2014/06	2015/06



3.5. RESULTS

Diagram N°1  
Horizontal Polarization (30MHz-6GHz)

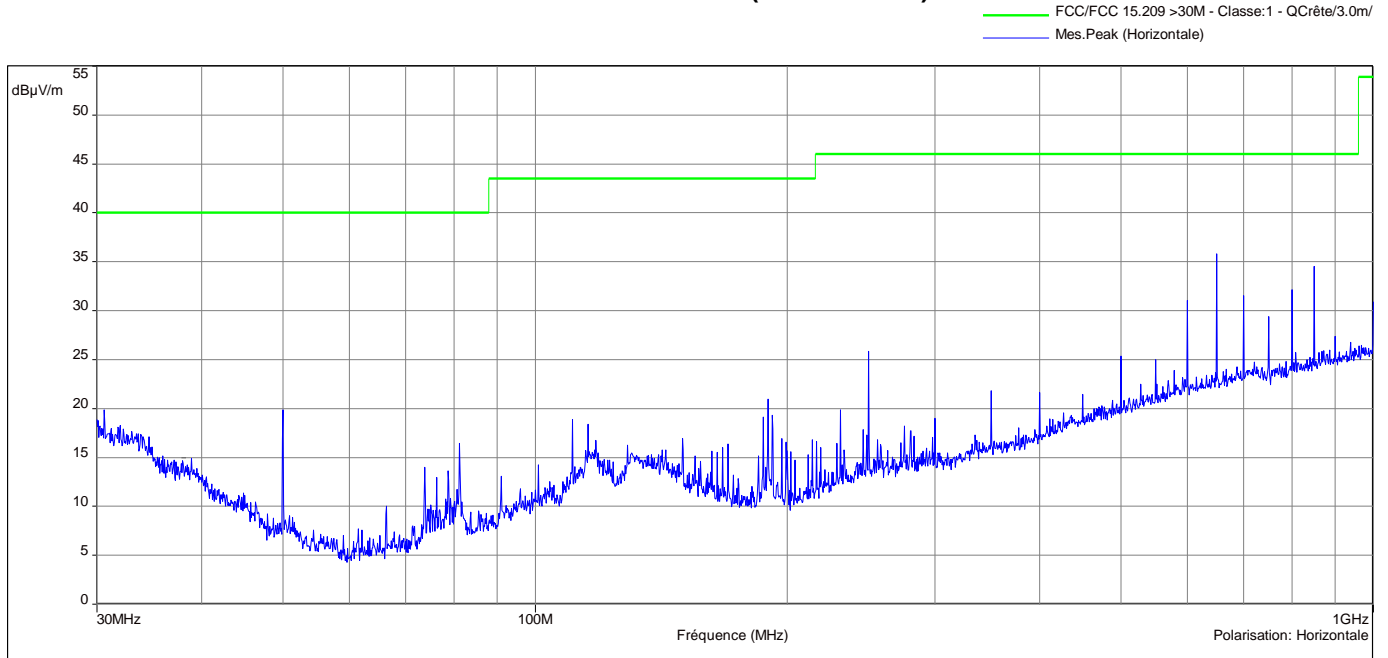
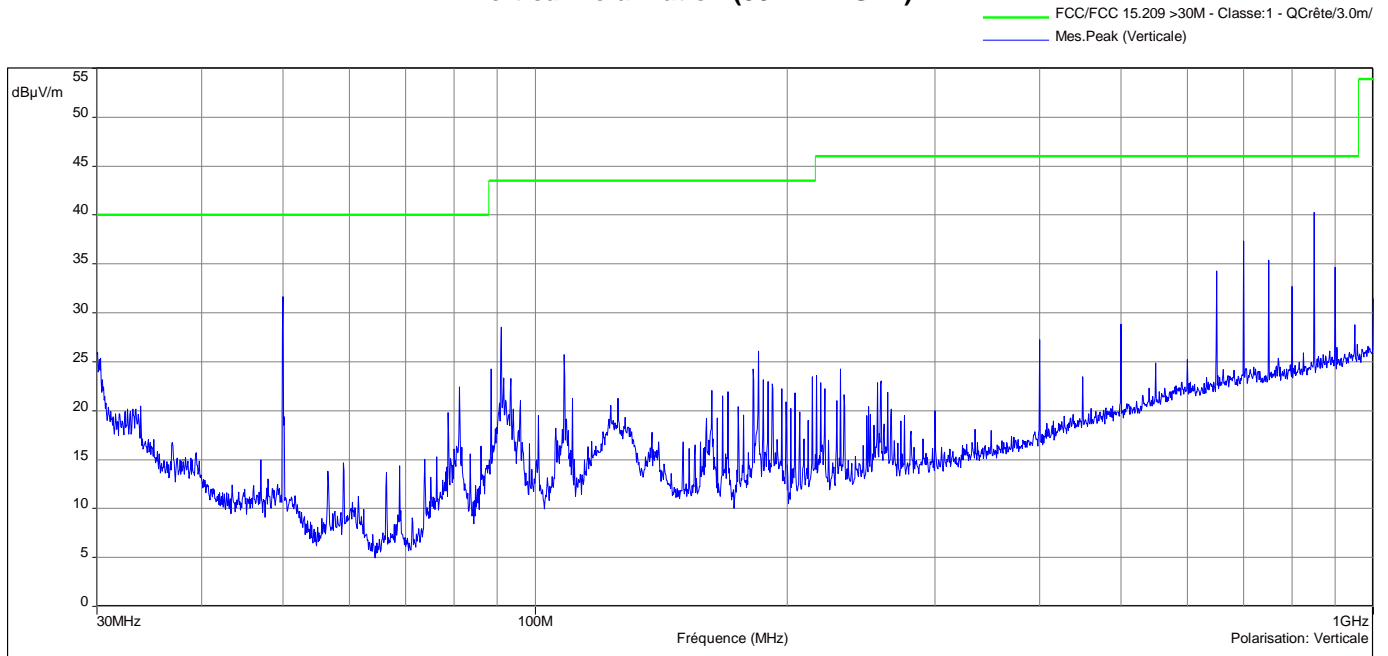


Diagram N°2  
Vertical Polarization (30MHz-1GHz)





Polarisation	Frequency (MHz)	Peak Level (dBµV/m)	QPeak Level (dBµV/m)	Limit (dBµV/m)
V	50	31.66	-	40
V	91.05	28.52	-	43.5
V	669.98	37.35	-	46
V	750.02	35.38	-	46
V	849.980	40.25	-	46
V	1000	31.46	-	53.9

### 3.6. CONCLUSION

Measures of Radiated Emission, performed on the sample of the product **Activeur / 04001**, SN: -, in configuration and description presented in this test report, show levels **conform to** the FCC part 15.209 limits.

## 4. Measurement of conducted disturbance

### 4.1. ENVIRONMENTAL CONDITIONS

Test performed by : Fostoki MEDJOUDJ  
Date of test : 2015/05/07  
Ambient temperature : 20°C  
Relative humidity : 38%

### 4.2. TEST SETUP

#### Specifications:

Frequency 0.15 – 30 MHz RBW 9 kHz  
Detector Peak , Quasi Peak and average

The measurement is performed on power supply with a LISN and telecommunication lines with RSI or current clamp for shielded cables.

#### Operating conditions:

- Deviation method:

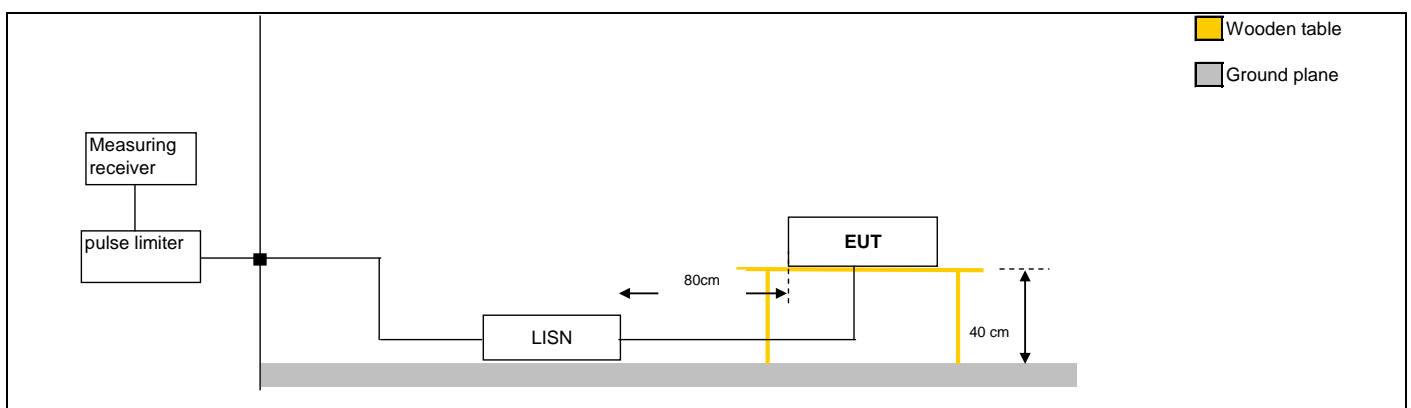
- Yes  
 No

-Product installation:

- The EUT is installed on a wooden table 80 cm above the reference plane, at 80cm of the LISN and at 40cm of the vertical conductive wall  
 The EUT is installed on a wooden table 40 cm above the reference plane, at 80cm of the LISN.  
 The EUT is installed 10 cm above the reference plane, at 80cm of the LISN..

#### Operating mode:

- Mode 1  Mode 2  Mode 3 ...



Test set up of conducted emission on power supply



Test set up of conducted emission on power supply



**4.3. LIMIT**

Frequency Bands/frequencies	dB (µV/m) quasi-peak	dB (µV/m) average
0.15-0.5MHz	66-56	56-46
0.5-5 MHz	56	46
5-30 MHz	60	50

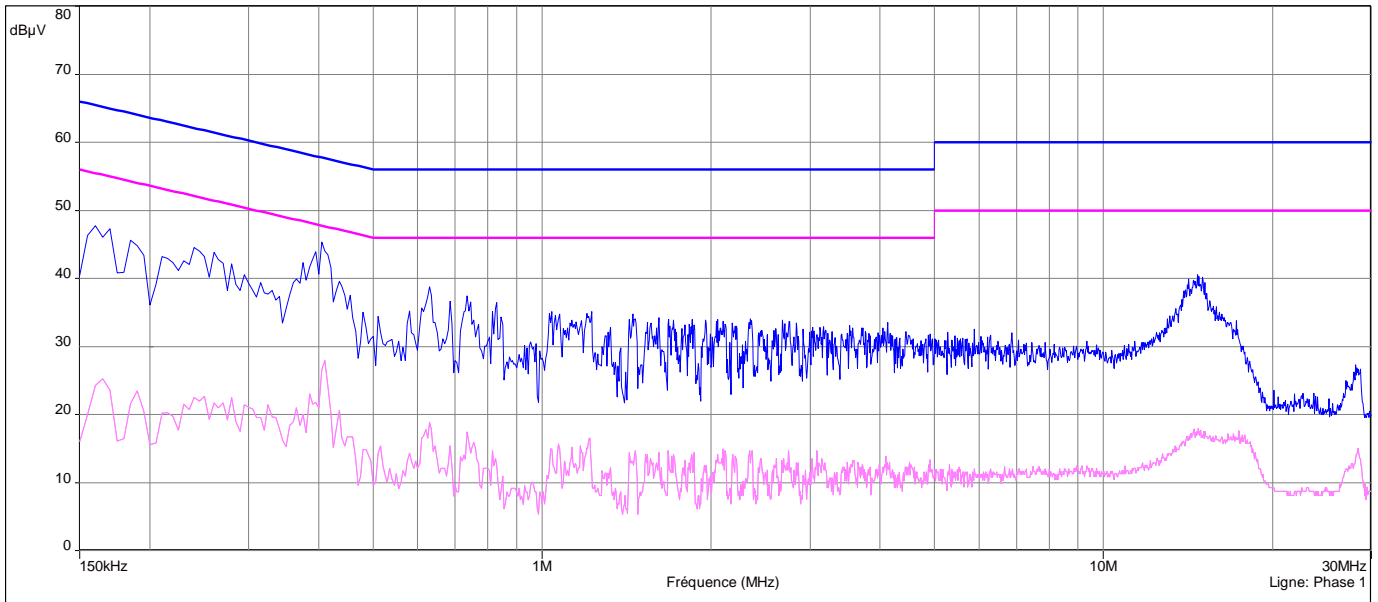
**4.4. TEST EQUIPMENT LIST**

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum analyzer	ROHDE & SCHWARZ	ESIB26	A2642021	2015/01	2016/01
V ISLN	ROHDE & SCHWARZ	ENV216	C2320162	2015/04	2016/04
Semi anechoic chamber 11,8x8,1x9,5m	SIEPEL	C01	D3044008	2014/09	2015/09
Cable	-	-	A5329411	2014/06	2015/06
Cable	-	-	A5329530	2014/06	2015/06

**4.5. RESULTS**

**Diagram N°1**

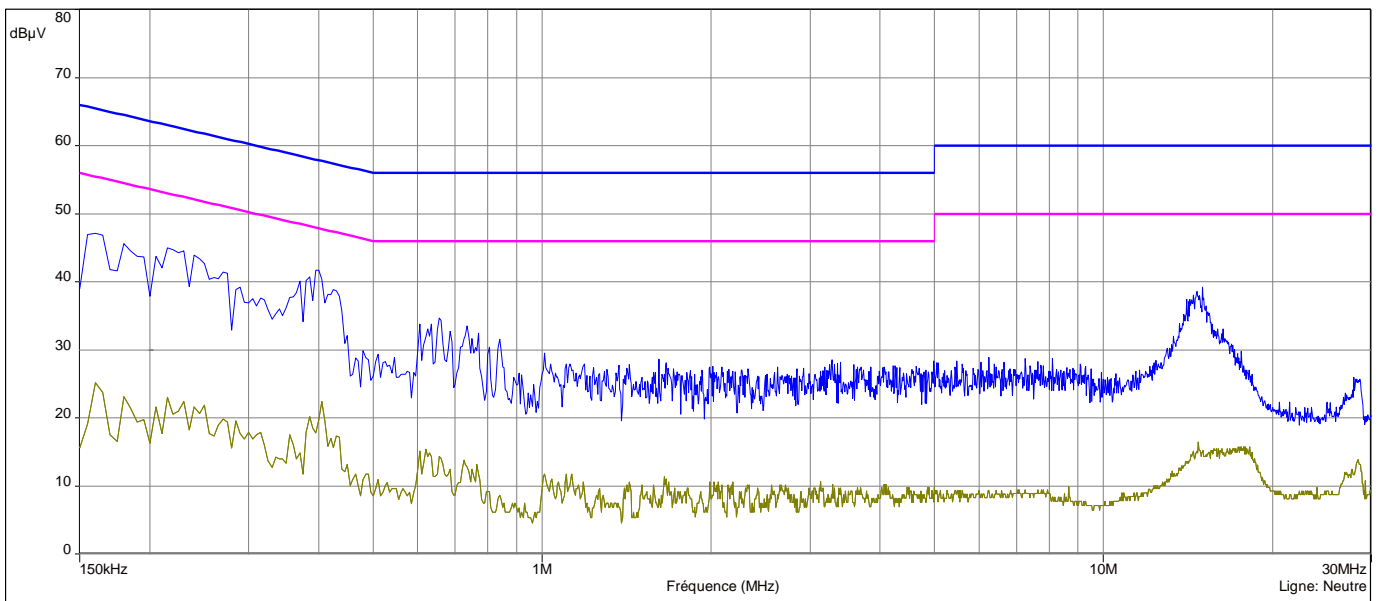
- FCC/FCC 15.207 - Classe:B - Moyenne/
- FCC/FCC 15.207 - Classe:B - QCrête/
- Mes.Peak (Phase 1)
- Mes.Avg (Phase 1)



**Phase**

**Diagram N°2**

- FCC/FCC 15.207 - Classe:B - Moyenne/
- FCC/FCC 15.207 - Classe:B - QCrête/
- Mes.Peak (Neutre)
- Mes.Avg (Neutre)



**Neutral**





**Phase Line**

Frequency (MHz)	Peak Level (dBµV)	Quasi-Peak Level (dBµV)	Quasi-Peak Limit (dBµV)	Average Level (dBµV)	Average Limit (dBµV)
0.418	46.2	-	57.5	27.9	47.5
0.633	38.1	-	56	28.3	46
14.9	40.3	-	60	17.5	50

**Neutral Line**

Frequency (MHz)	Peak Level (dBµV)	Quasi-Peak Level (dBµV)	Quasi-Peak Limit (dBµV)	Average Level (dBµV)	Average Limit (dBµV)
0.418	43.8	-	57.5	22.2	47.5
0.635	34.9	-	56	14.7	46
14.7	39.2	-	60	16.4	50

**4.6. CONCLUSION**

Measures of Conducted Emission, performed on the sample of the product **Activateur / 04001**, SN: -, in configuration and description presented in this test report, show levels **conform to** the FCC part 15.207 limits.



## 5. Uncertainties Chart

Kind of test	Measurement uncertainties (k=2) $\pm x(\text{dB}) / (\text{Hz})$	Limit for uncertainties $\pm y(\text{dB})$
<b>REQUIREMENTS</b>		
RF power conducted	$\pm 0.6\text{dB}$	$\pm 1,5\text{dB}$
Spurious emissions, conducted	$\pm 0.6\text{dB}$	$\pm 3\text{dB}$
Spurious emissions, radiated <ul style="list-style-type: none"> <li>• Frequency &lt; 1000 MHz</li> <li>• Frequency &gt; 1000 MHz</li> </ul>	$\pm 3.9\text{dB}$ $\pm 3.1\text{dB}$	$\pm 6\text{dB}$
Temperature	$\pm 0.5^\circ\text{C}$	$\pm 1^\circ\text{C}$
Humidity	$\pm 2.5 \%$	$\pm 5\%$