# Rapport d'essai / *Test report*

**N°** 200803-4369CR-R1-E **JDE :** 83738

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**DELIVRE A / *ISSUED TO*** : **AMESYS**
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**Objet / *Subject*** : Essais de compatibilité électromagnétique conformément aux normes FCC CFR 47 Part 15, Subpart B et C.
*Electromagnetic compatibility tests according to the standards FCC CFR 47 Part 15, Subpart B and Subpart C*

**Matériel testé / *Apparatus under test*** :

- Produit / *Product* : **Coupleur RFID/ *RFID coupler***
- Marque / *Trade mark* : **AMESYS**
- Constructeur / *Manufacturer* : **AMESYS**
- Type / *Model* : **Stella Compact Flash SCF303**
- N°de série / *serial number* * : **A115400003-000001**
- FCC ID : **WRUSCF303BTREADER**

* : information donnée par le client / *information given by the customer*

**Date des essais / *Test date*** : Du 17 au 18 Juillet 2008 / *From July 17th to 18th, 2008*

**Lieu d'essai / *Test location*** : **LCIE**
170 rue de Chatagnon
Z.I Centr'alp
38430 MOIRANS - France

**Test réalisé par / Test p*erformed by*** : Anthony MERLIN / Laurent CHAPUS

**Ce document comporte /*Composition of document :*** 24 pages.

MOIRANS, LE 17 NOVEMBRE 2008 / *NOVEMBER 17TH, 2008*

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## SUMMARY

## 1. TEST PROGRAM

**Standard : FCC CFR 47, PART 15, Subpart C**
ANSI C63-4 (2003).
Requirements for intentional radiator. Chapter 15.225 (Operation within the band 13.110-14.010MHz)

**Standard : FCC CFR 47, PART 15, Subpart B**
ANSI C63-4 (2003).
Requirements for unintentional radiator. Class B computer peripheral.

- Radiated emissions from 9kHz to 1GHz
- Conducted emissions from 150kHz to 30MHz

**General conclusion:**
**Measures performed on the sample of the product Stella Compact Flash SCF303, SN: A115400003-000001, in configuration and description presented in this test report, show compliance levels with FCC CFR 47, Part 15 B and Part 15 C.**

# 2. SYSTEM TEST CONFIGURATION

## *2.1. JUSTIFICATION*

The system was configured for testing in a typical fashion (as a customer would normally use it).

## *2.2. HARDWARE IDENTIFICATION*

- **Equipment under test (EUT):**

**Stella Compact Flash SCF303** **Serial number: A115400003-000001**
**FCC ID: WRUSCF303BTREADER**

The **Stella Compact Flash SCF303** is powered with the battery **PSION TEKLOGIX model: WA3006 (3.7V)**.

- **Input/output:**

- 1xCompact Flash interface

- **Auxiliaries used for testing:**

- 1xInterface Card (between the EUT and the PDA used during the test).
- 1xPDA, PSION TEKLOGIX model Work About Pro WA9007-G1 (s/n: 1050773)
- 2xBatteries, PSION TEKLOGIX model WA3006 (s/n: WA7AC7036179 and WA7AC34535)

- **I/O cables used for testing:**

- None

## *2.3. EQUIPMENT MODIFICATIONS*

None

## *2.4. EUT EXERCISE SOFTWARE*

The EUT exercise program used during radiated testing was WinCE_CscScr.

## *2.5. EUT CONFIGURATION*

The system was configured for testing in a permanent emitted mode.

## *2.6. SPECIAL ACCESSORIES*

-1xBattery Charger PSION TEKLOGIX model WA4102-G1, s/n: 8272P000998.

# 3. RADIATED EMISSION DATA

## *3.1. CLIMATIC CONDITIONS*

Date of test : July 17th, 2008
Test performed by : A.MERLIN / L.CHAPUS
Atmospheric pressure : 990mb
Relative humidity : 43%
Ambient temperature : 23°C

## *3.2. TEST SETUP*

The installation of EUT is identical for pre-characterization measurement in a 3 meters full anechoic chamber and for measures on a 10 meters Open site.

Power supply: Battery (Fully charged) – Worst case
The EUT is placed on a non-conducting table of 80cm height.

*Radiated emission test setup*

## *3.3. TEST SEQUENCE AND RESULTS*

### 3.3.1. Pre-characterization at 3 meters [9kHz-30MHz]

A pre-scan of all the setup has been performed in a 3 meters full anechoic chamber.
The distance between EUT and antenna is 3 meters. For Pre-characterization, the loop antenna position was rotated during the test for maximized the emission measurement.
Frequency band investigated is 9kHz to 30MHz.
For Pre-characterization, two test configurations are performed to search the worst case:

Battery mode, the EUT is used with the PDA in battery mode
Charger mode, the EUT is used with the PDA during the battery-charging

The worst case is the Battery mode; the results correspond to this mode.

The pre-characterization graphs are obtained in PEAK detection.

**See graphs for 9kHz-30MHz band:**
**Stella Compact Flash SCF303** **graph#1** (See annex 1)

### 3.3.2. Pre-characterization at 3 meters [30MHz-1GHz]

A pre-scan of all the setup has been performed in a 3 meters full anechoic chamber.
The distance between EUT and antenna is 3 meters. Test is performed in horizontal (H) and vertical (V) polarization with a log-periodic antenna TESEQ CBL6144. The EUT is being rotated on 360° during the measurement. Th e pre-characterization graphs are obtained in PEAK detection.
For Pre-characterization, two test configurations are performed to search the worst case:

Battery mode, the EUT is used with the PDA in battery mode
Charger mode, the EUT is used with the PDA during the battery-charging

The worst case is the Battery mode; the results correspond to this mode.

**See graphs for 30MHz-1GHz:**
**Stella Compact Flash SCF303**
H polarization **graph#2** (See annex 1)
V polarization **graph#3** (See annex 1)

### 3.3.3. Characterization on 10 meters open site below 30 MHz

The product has been tested according to ANSI C63.4 (2003), FCC part 15 subpart C. Radiated Emissions were measured on an open area test site. A description of the facility is on file with the FCC.
The product has been tested at a distance of **10 meters** from the antenna and compared to the FCC part 15 subpart C §15.225 limits in the frequency range 13.553MHz 13.567MHz. Measurement bandwidth was 9kHz.
Antenna height was 1m for both horizontal and vertical polarization.
Antenna was rotated around its vertical axis.
Continuous linear turntable azimuth search was performed with 360 degrees range.
3 axis measurements were performed for the equipment. (Vertical axis is the worst case)
A summary of the worst case emissions found in all test configurations and modes is shown on clauses 3.2.

| Frequency (MHz) | QPeak Limit (dBµV/m) @ 30m | QPeak (dBµV/m) | QPeak-Limit (Margin dB) | Turntable Angle (deg) | Angle (deg) | Axis EUT | Tot Corr (dB) |
|---|---|---|---|---|---|---|---|
| 13.56 *[1] | 84.0 | 32.6 | **-51.4** | 120° | 0° | V | 37.9 |
| 27.12 | 29.5 | | **NT** | | | | 39.7 |

NT: Not Traceable
*[1]: Measure have been done at 10m distance and corrected according to requirements of 15.209.e) (M@30m = M@10m-19.1dB)

**Limits Sub clause §15.225**

| Frequency (MHz) | Field strength (µV/m) | Measurement distance (m) |
|---|---|---|
| 13.553-13.567 | 15 848<br>84 dBµV/m | 30 |
| 13.410-13.553<br>13.567-13.710 | 334<br>50.5 dBµV/m | 30 |
| 13.110-13.410<br>13.710-14.010 | 106<br>40.5 dBµV/m | 30 |

See chapter 5 of this test report for band edge measurements.

### 3.3.4. Characterization on 10 meters open site from 30MHz to 1GHz

The product has been tested according to ANSI C63.4 (2003), FCC part 15 subpart C. Radiated Emissions were measured on an open area test site. A description of the facility is on file with the FCC.

The product has been tested at a distance of **10 meters** from the antenna and compared to the FCC part 15 subpart C §15.209 limits. Measurement bandwidth was 120kHz from 30 MHz to 1GHz.
Antenna height search was performed from 1m to 4m for both horizontal and vertical polarization. Continuous linear turntable azimuth search was performed with 360 degrees range.
3 axis measurements were performed for the equipment. (Vertical axis is the worst case)
A summary of the worst case emissions found in all test configurations and modes is shown on clause 3.2.

| No | Frequency (MHz) | QPeak Limit (dBµV/m) | Qpeak * (dBµV/m) | Qpeak-Limit (Margin, dB) | Angle (deg) | Pol | Hgt (cm) | Tot Corr (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 40.68 | 40.0 | 36.8 | **-3.2** | 140 | V | 140 | 12.3 | |
| 2 | 54.219 | 40.0 | 36.3 | **-3.7** | 310 | V | 280 | 12.2 | |
| 3 | 67.788 | 40.0 | 30.0 | **-10.0** | 320 | V | 230 | 10.4 | |
| 4 | 81.277 | 40.0 | 24.3 | **-15.7** | 300 | V | 360 | 8.6 | |
| 5 | 108.572 | 43.5 | 22.0 | **-21.5** | 320 | V | 100 | 15.2 | |
| 6 | 298.316 | 46.0 | 38.0 | **-8.0** | 155 | V | 130 | 17.7 | |
| 7 | 325.422 | 46.0 | 39.5 | **-6.5** | 210 | V | 130 | 18.1 | |
| 8 | 935.645 | 46.0 | 32.1 | **-13.9** | 180 | V | 100 | 29.6 | |

*: Measure have been done at 10m distance and corrected according to requirements of 15.209.e)
(M@3m = M@10m+10.5dB)

**RESULTS: PASS**

### *3.4. FIELD STRENGTH CALCULATION*

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follow:

FS = RA + AF + CF – AG

Where FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Factor
AG = Amplifier Gain

Assume a receiver reading of 52.5dBµV is obtained. The antenna factor of 7.4 and a cable factor of 1.1 are added. The amplifier gain of 29dB is subtracted, giving a field strength of 32 dBµV/m.
FS = 52.5 + 7.4 + 1.1 – 29 = 32 dBµV/m
The 32 dBµV/m value can be mathematically converted to its corresponding level in µV/m.
Level in µV/m = Common Antilogarithm [(32dBµV/m)/20] = 39.8 µV/m.

# 4. CONDUCTED EMISSION DATA

## *4.1. CLIMATIC CONDITIONS*

Date of test : April 18th, 2008
Test performed by : Laurent CHAPUS / Anthony MERLIN
Atmospheric pressure : 970mb
Relative humidity : 35%
Ambient temperature : 20°C

## *4.2. SETUP FOR CONDUCTED EMISSIONS MEASUREMENT*

The product has been tested according to ANSI C63.4-(2003) and FCC Part 15 subpart C.

The product has been tested with 110V/60Hz power line voltage and compared to the FCC Part 15 subpart C §15.207 limits. Measurement bandwidth was 9kHz from 150 kHz to 30 MHz.

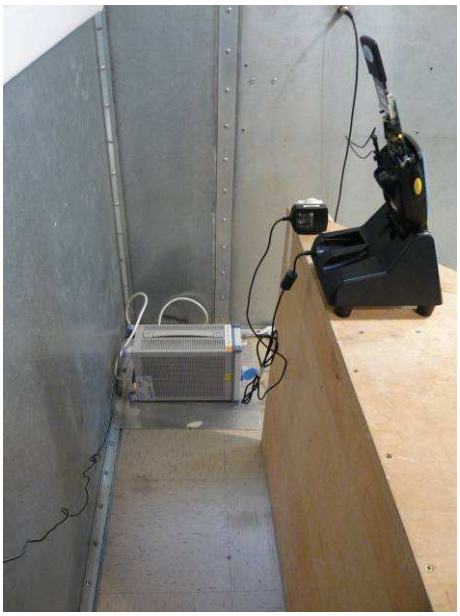
Measurement is made with a Rohde & Schwarz ESU8 receiver in peak mode. This was followed by a Quasi-Peak, i.e. CISPR measurement for any strong signal. If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary. The LISN (measure) is 50Ω / 50µH.

The Peak data are shown on plots in annex 1. Quasi-Peak and Average measurements are detailed in a table with frequencies and levels measured.

Interconnecting cables and equipment's were moved to position that maximized emission. A summary of the worst case emissions found in all test configurations and modes is shown on the following page.

### *4.3. TEST SETUP*

The EUT is placed on a table at 0.8m height. The cable has been shorted to 1meter length. The EUT is powered trough the LISN (measure).



### *4.4. TEST SEQUENCE AND RESULTS*

Measurements are performed on the phase (L1) and neutral (N) of power lines of the battery charger.
A measurement is also performed with a 50Ω dummy load replacing the transmitter antenna in order to demonstrate that some 13.56MHz may be cross-coupled to AC line connection.
Graphs are obtained in PEAK detection.
Measures are also performed in Quasi-Peak and Average for any strong signal.

**SCF303:**

| | | |
|---|---|---|
| Measure on L1: | graph Emc#1 | (see annex 1) |
| Measure on N: | graph Emc#2 | (see annex 1) |

**Dummy load (50Ω) replacing the antenna:**

| | | |
|---|---|---|
| Measure on L1: | graph Emc#3 | (see annex 1) |
| Measure on N: | graph Emc#4 | (see annex 1) |

**RESULT: PASS**

## 5. FUNDAMENTAL FREQUENCY TOLERANCE (15.225E)

The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency when the temperature is varied from -20℃ to +50℃ at the no minal power voltage and the primary power voltage is varied from 85% to 115% of the rated supply voltage at 20℃.

### *5.1. Temperature and voltage fluctuation*

The Frequency Stability test is not performing while device was powered via AC line because the product is powered by the PDA which is supplied by the charger; the worst case is if the PDA voltage is varied. Moreover, the normal using of the product is not during the battery charging.

Temperature has been set at +20℃, –20℃ and +50℃.
Voltage: Battery (Fully charged)
Frequency of carrier: 13.56 MHz
Upper limit: 13.561356 MHz
Lower limit: 13.558644 MHz

| **Temperature**<br>**Voltage** | **-20℃** | **20℃** | **+50℃** |
|---|---|---|---|
| Mains voltage: Battery | | | |
| Frequency drift (MHz) | -0.000053 | **REF** | -0.000012 |
| Carrier level (dB) | -0.8 | **REF** | -0.5 |

Frequency drift measured is **53Hz** when the temperature is varied from -20℃ to +50℃.

**RESULTS: PASS**

# 6. BAND-EDGE COMPLIANCE §15.209

## *6.1. CLIMATIC CONDITIONS*

Date of test : July 17th, 2008
Test performed by : A.MERLIN / L.CHAPUS
Atmospheric pressure : 990mb
Relative humidity : 43%
Ambient temperature : 23°C

## *6.2. EQUIPMENT CONFIGURATION*

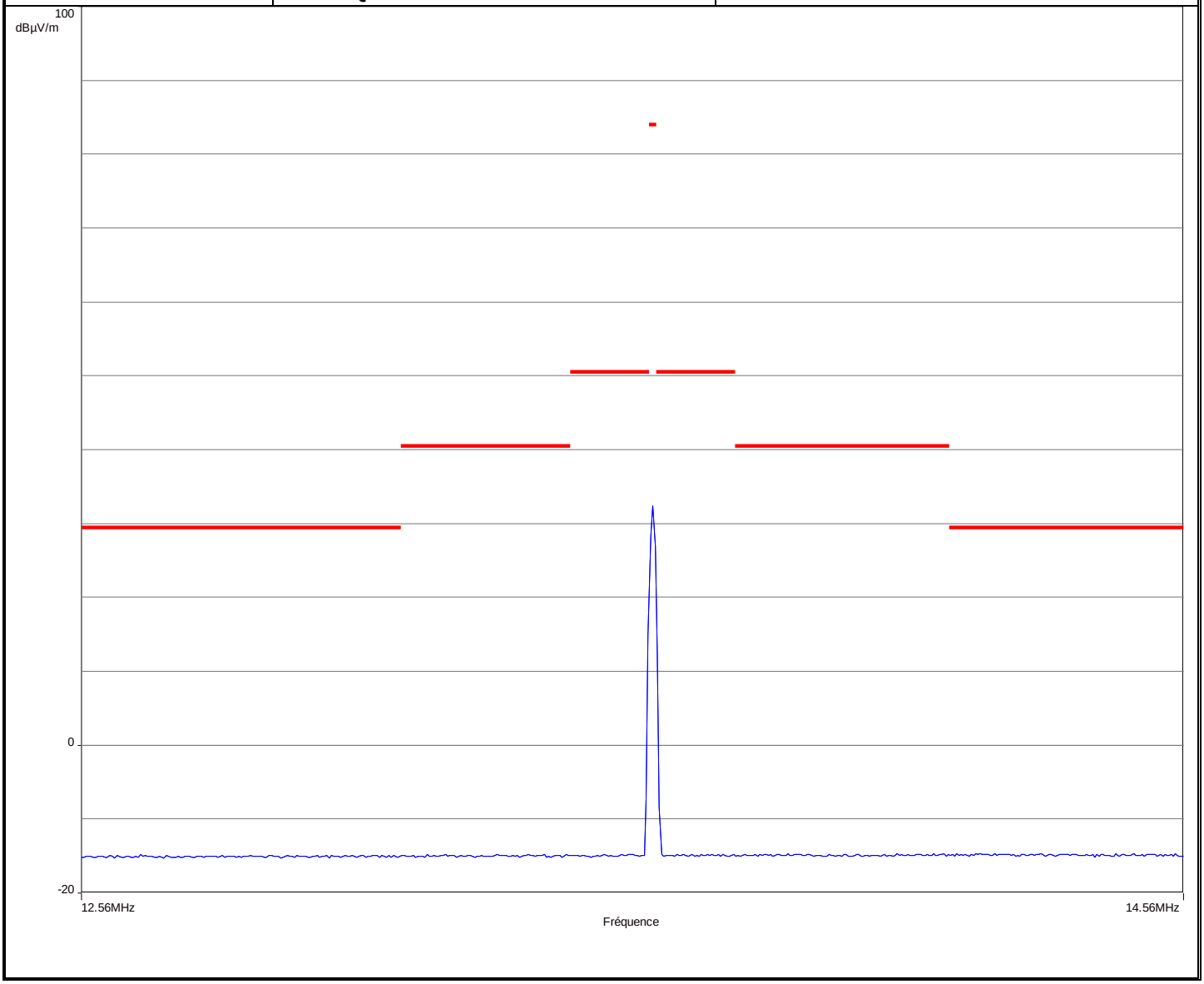
The system was configured for testing in a permanent emitted mode with normal modulation.

## *6.3. Frequency band 13.110-14.010MHz*

Following plots show radiated emission level in the frequency band 13.110-14.010MHz with a RBW of 9kHz and a quasi-peak detector.
The graphs are obtained with a measuring receiver ESU8.
**See Graph EMR#1**

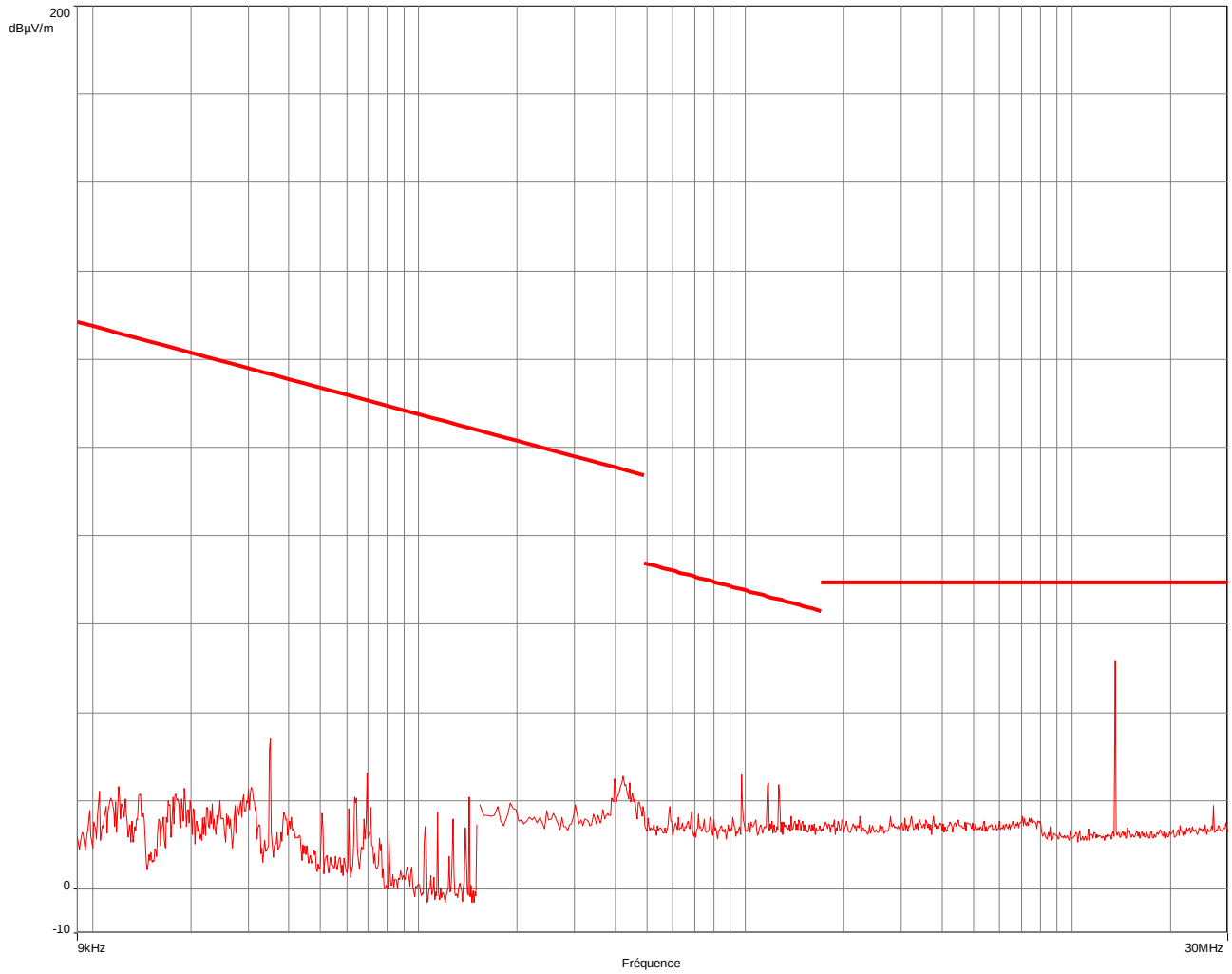
**RESULTS: PASS**

| RADIATED EMISSIONS | | **Test configuration:** |
|---|---|---|
| Graph name: | **Emr#1** | |
| Voltage | **Battery** | |
| RBW / Detector | **9kHz / Quasi-Peak** | |



## 7. ANNEX 1 (GRAPHS)

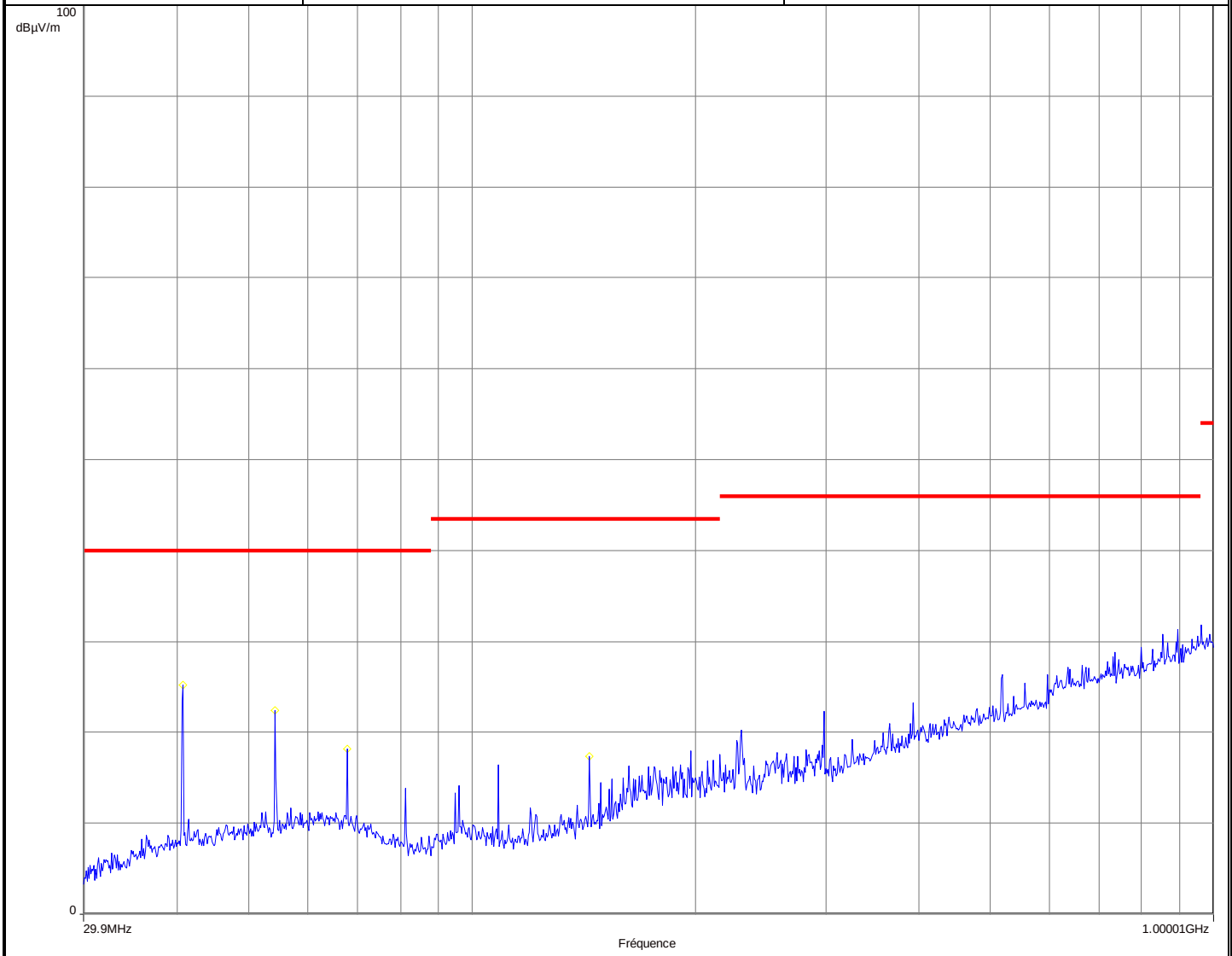
| RADIATED EMISSIONS (Pre-characterization at 3meters) | | **Test configuration:** |
|---|---|---|
| Graph name: | **graph#1** | |
| Antenna polarization | **Parallel** | |
| Frequency band | **9kHz-30MHz** | |
| Azimuth: | **90°** | |
| RBW / VBW : | **9kHz / 30kHz** | |




| Frequency (MHz) | Peak (dBµV/m) |
|---|---|
| 13.56* | 51.1 |

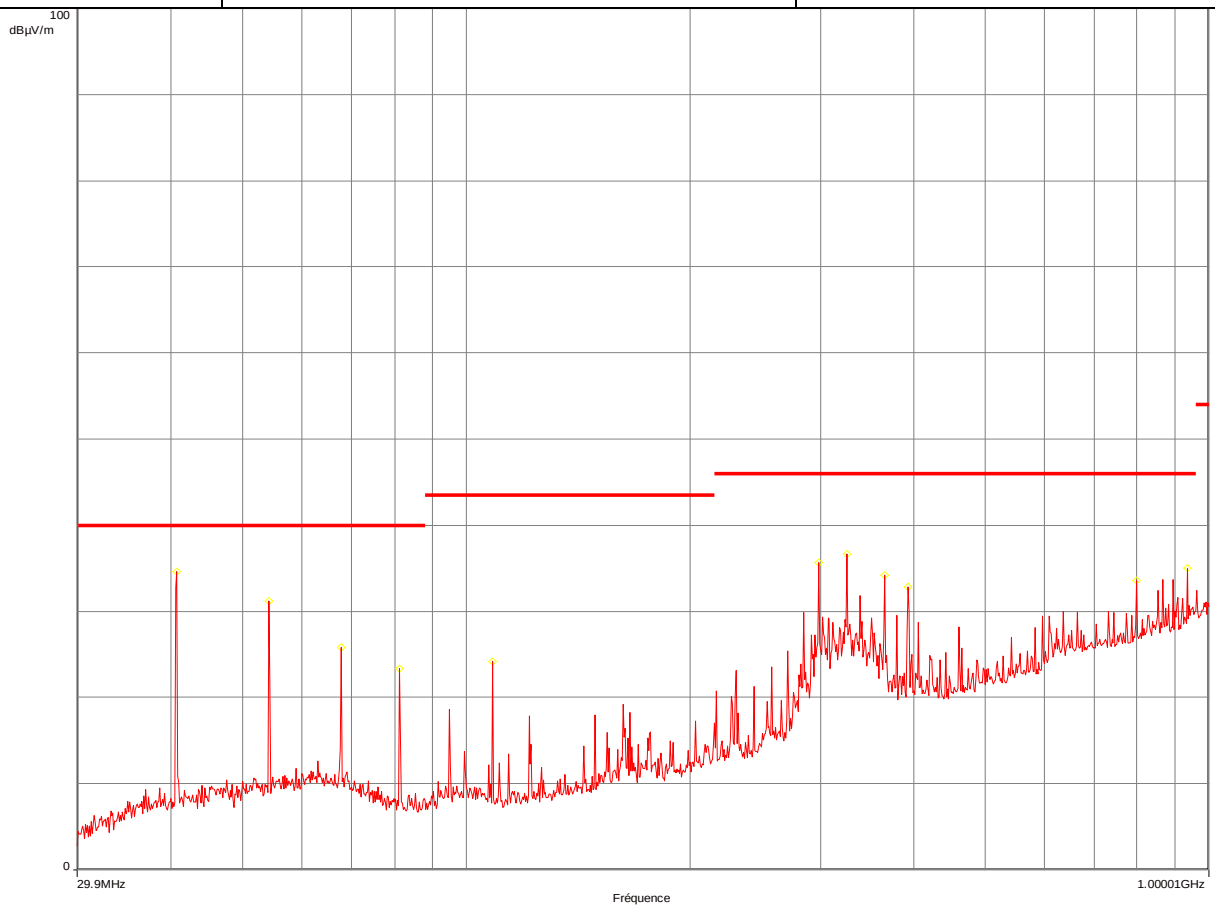
*Marker is carrier frequency (13.56MHz)

| RADIATED EMISSIONS (3meters pre-scan) | | **Test configuration:** |
|---|---|---|
| Graph name: | **graph#2** | |
| Antenna polarisation | **Horizontal** | |
| Frequency band | **30MHz – 1GHz** | |
| Azimuth: | **From 0°to 360°(Max-hold measurement)** | |
| RBW / VBW : | **120kHz / 300kHz** | |




| Frequency (MHz) | Peak (dBµV/m) |
|---|---|
| 40.7 | 25.22 |
| 54.26 | 22.42 |
| 67.82 | 18.16 |
| 143.78 | 17.39 |

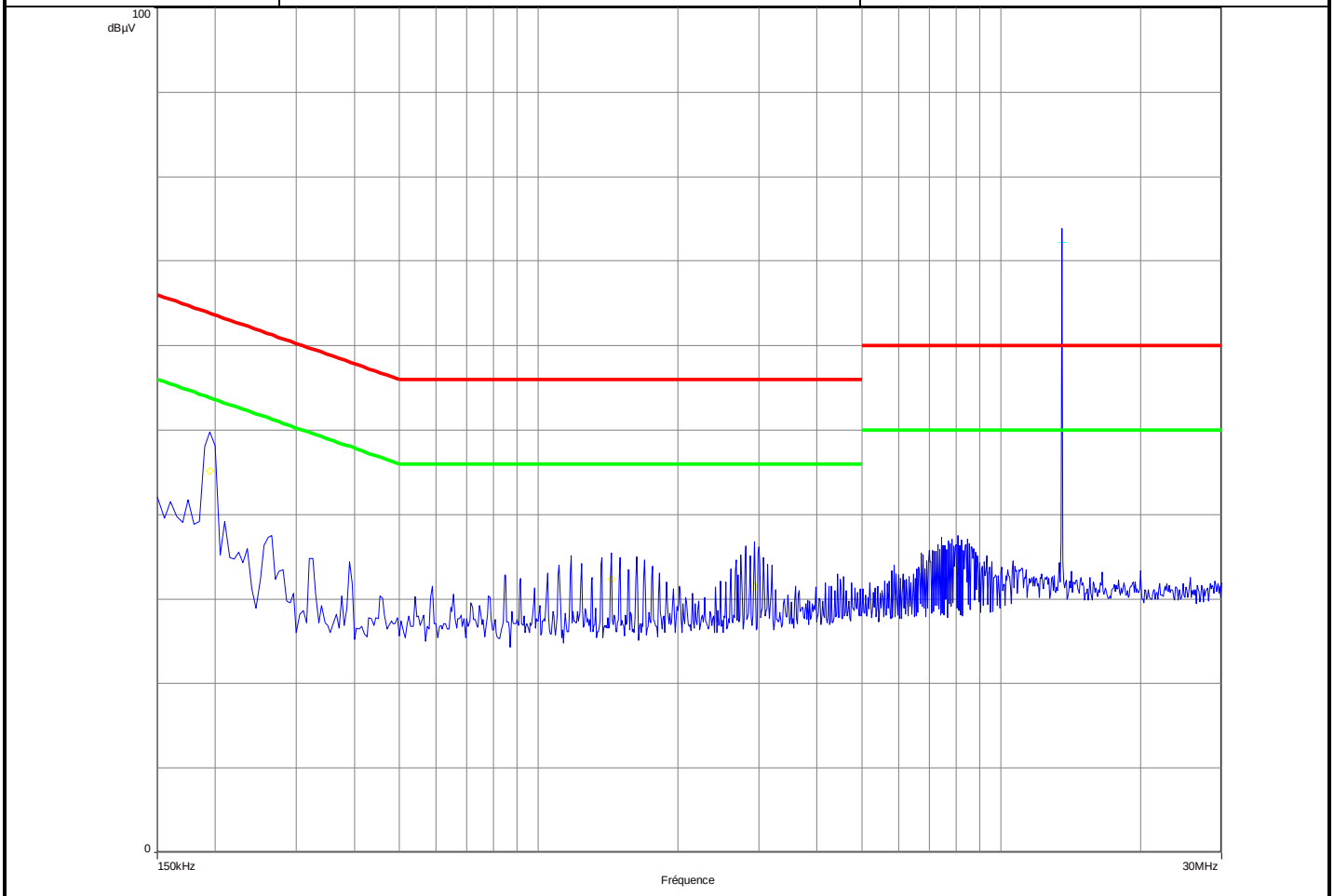
| RADIATED EMISSIONS (3meters pre-scan) | | **Test configuration:** |
|---|---|---|
| Graph name: | **graph#3** | |
| Antenna polarisation | **Vertical** | |
| Frequency band | **30MHz – 1GHz** | |
| Azimuth: | **From 0°to 360°(Max-hold measurement)** | |
| RBW / VBW : | **120kHz / 300kHz** | |




| Frequency (MHz) | Peak (dBµV/m) |
|---|---|
| 40.7 | 34.59 |
| 54.26 | 31.19 |
| 67.82 | 25.78 |
| 81.38 | 23.32 |
| 108.5 | 24.21 |
| 298.34 | 35.68 |
| 325.46 | 36.67 |
| 366.08 | 34.25 |
| 393.26 | 32.88 |
| 800 | 33.56 |
| 935.6 | 35.02 |

| CONDUCTED EMISSIONS | |
|---|---|
| Graph name: | **Emc#1** |
| Voltage / Frequency | **110Vac/60Hz** |
| Line/Port | **Phase L1** |
| RBW / VBW : | **9kHz / 30kHz** |

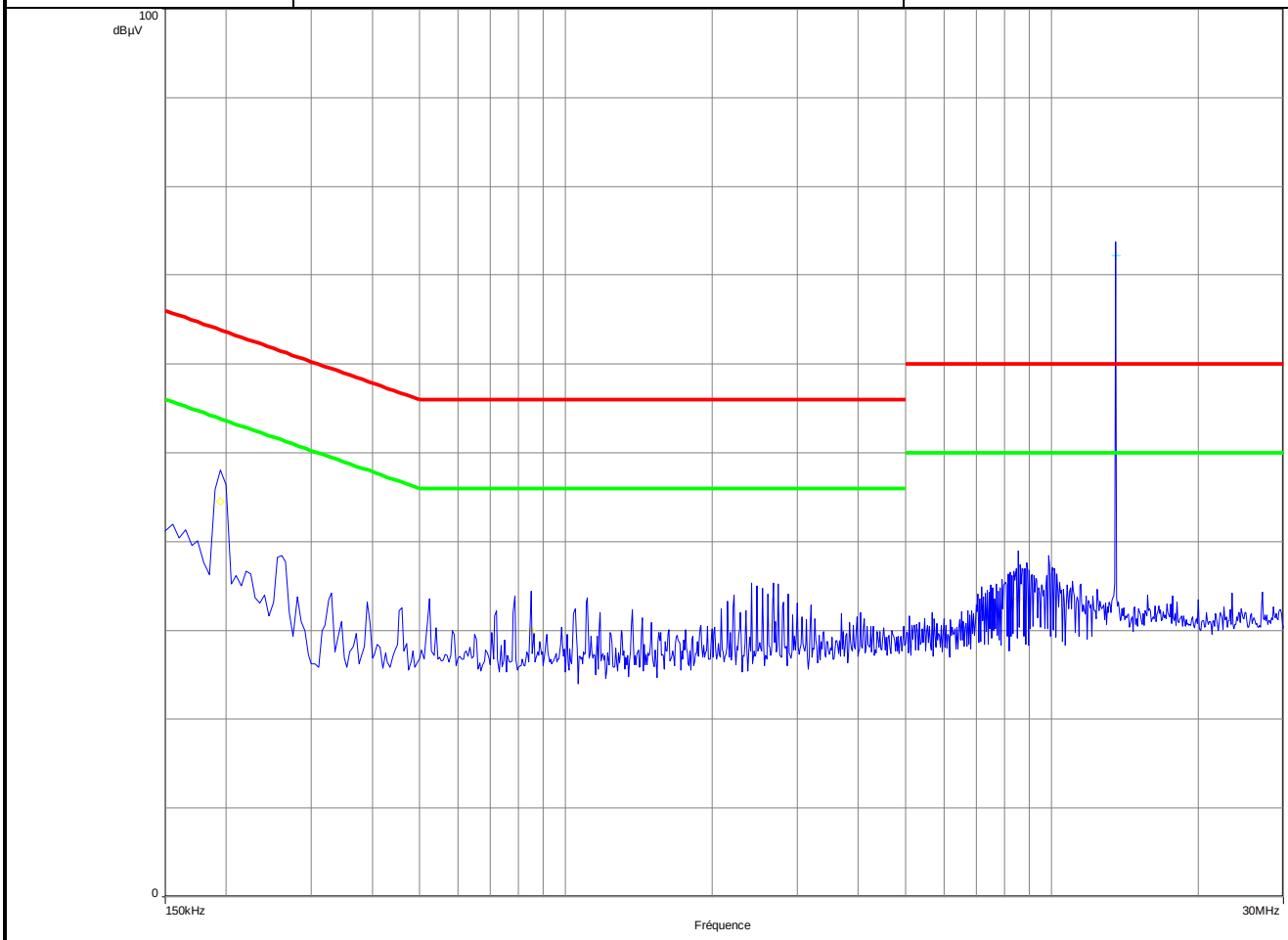
**Test configuration:**




| Frequency (MHz) | QPeak (dBµV) | LimQPeak (dBµV) | QPeak-LimQPeak (dBµV) | Avg (dBµV) | Lim Avg (dBµV) | Avg-LimAvg (dBµV) |
|---|---|---|---|---|---|---|
| 0.195 | 45.15 | 63.82 | **-18.67** | 37.95 | 53.82 | **-15.87** |
| 1.435 | 32.35 | 56 | **-23.65** | 28.55 | 46 | **-17.45** |
| 2.935 | 31.49 | 56 | **-24.51** | 28.79 | 46 | **-17.21** |
| 8.085 | 33.4 | 60 | **-26.6** | 30.9 | 50 | **-19.1** |
| 13.56* | 72.21 | 60 | **12.21** | 71.81 | 50 | **21.81** |

*: Carrier frequency (see measurement with dummy load replacing the RF antenna)

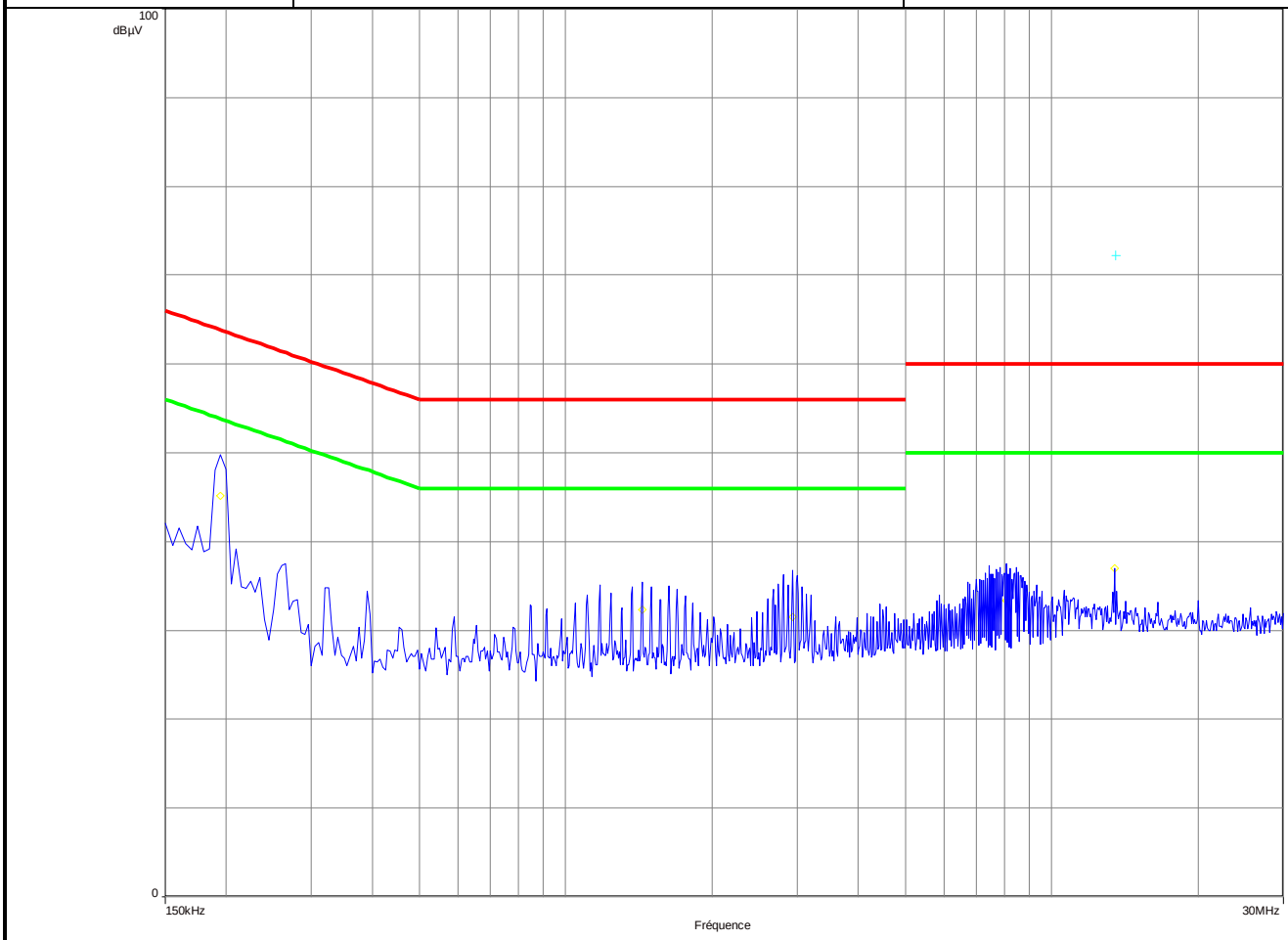
| CONDUCTED EMISSIONS | | **Test configuration:** |
|---|---|---|
| Graph name: | **Emc#2** | |
| Voltage / Frequency | **110Vac/60Hz** | |
| Line/Port | **Neutre N** | |
| RBW / VBW : | **9kHz / 30kHz** | |




| Frequency (MHz) | QPeak (dBµV) | LimQPeak (dBµV) | QPeak-LimQPeak (dBµV) | Avg (dBµV) | Lim Avg (dBµV) | Avg-LimAvg (dBµV) |
|---|---|---|---|---|---|---|
| 0.195 | 44.55 | 63.82 | **-19.27** | 38.65 | 53.82 | **-15.17** |
| 0.85 | 30.01 | 56 | **-25.99** | 26.31 | 46 | **-19.69** |
| 2.675 | 30.58 | 56 | **-25.42** | 26.88 | 46 | **-19.12** |
| 8.545 | 33.62 | 60 | **-26.38** | 31.92 | 50 | **-18.08** |
| 13.56* | 72.21 | 60 | **12.21** | 71.81 | 50 | **21.81** |

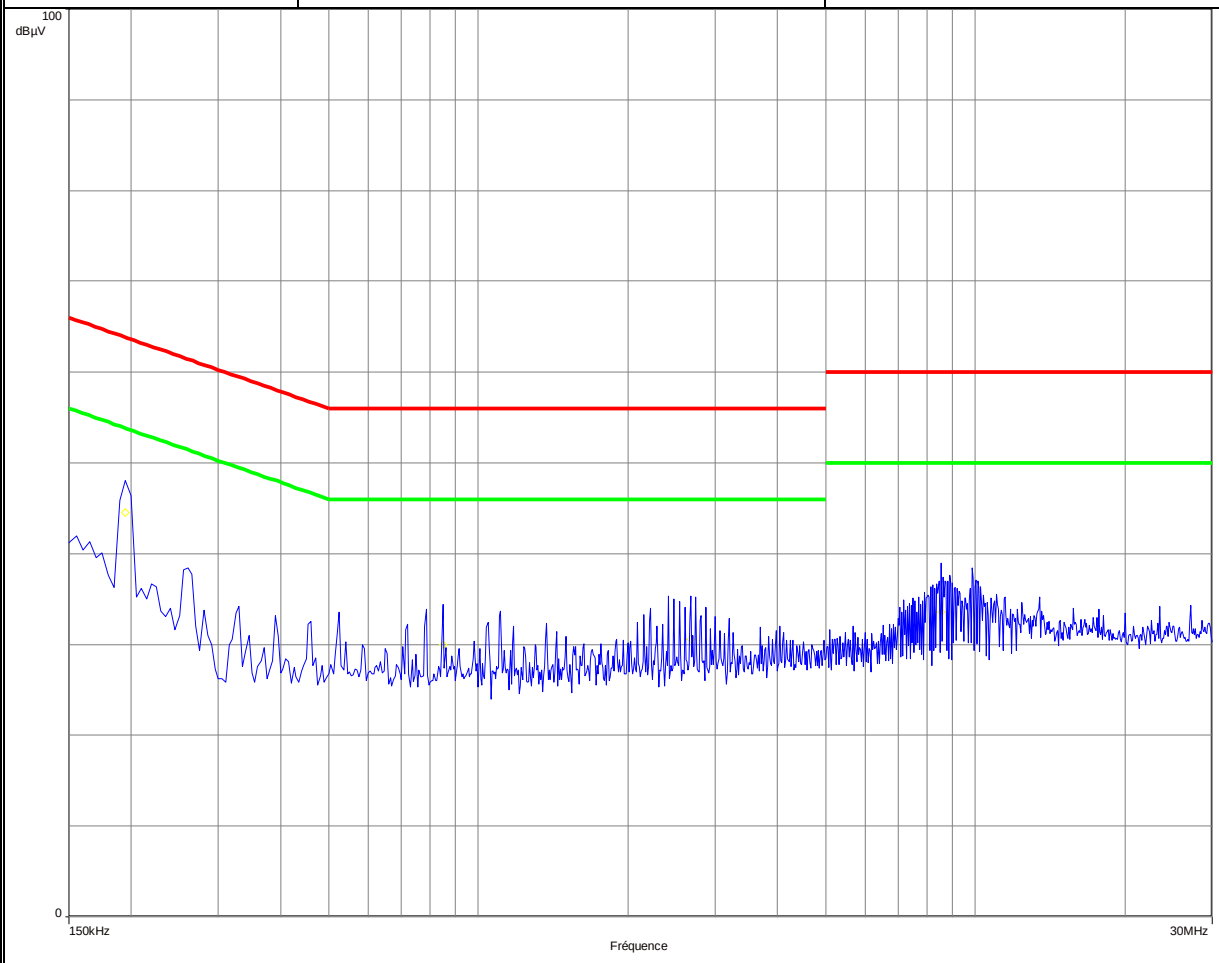
*: Carrier frequency (see measurement with dummy load replacing the RF antenna)

| CONDUCTED EMISSIONS | | **Test configuration:** **measurement with dummy load replacing the RF antenna** |
|---|---|---|
| Graph name: | **Emc#3** | |
| Voltage / Frequency | **110Vac/60Hz** | |
| Line/Port | **Phase L1** | |
| RBW / VBW : | **9kHz / 30kHz** | |




| Frequency (MHz) | QPeak (dBµV) | LimQPeak (dBµV) | QPeak-LimQPeak (dBµV) | Avg (dBµV) | Lim Avg (dBµV) | Avg-LimAvg (dBµV) |
|---|---|---|---|---|---|---|
| 0.195 | 45.15 | 63.82 | **-18.67** | 37.95 | 53.82 | **-15.87** |
| 1.435 | 32.35 | 56 | **-23.65** | 28.55 | 46 | **-17.45** |
| 2.935 | 31.49 | 56 | **-24.51** | 28.79 | 46 | **-17.21** |
| 8.085 | 33.4 | 60 | **-26.6** | 30.9 | 50 | **-19.1** |
| 13.56 | 32.5 | 60 | **-27.5** | 30.7 | 50 | **-19.3** |

| **CONDUCTED EMISSIONS** | | **Test configuration:** |
|---|---|---|
| Graph name: | **Emc#4** | **measurement with dummy load replacing the RF antenna** |
| Voltage / Frequency | **110Vac/60Hz** | |
| Line/Port | **Neutre N** | |
| RBW / VBW : | **9kHz / 30kHz** | |




| Frequency (MHz) | QPeak (dBµV) | LimQPeak (dBµV) | QPeak-LimQPeak (dBµV) | Avg (dBµV) | Lim Avg (dBµV) | Avg-LimAvg (dBµV) |
|---|---|---|---|---|---|---|
| 0.195 | 44.55 | 63.82 | **-19.27** | 38.65 | 53.82 | **-15.17** |
| 0.85 | 30.01 | 56 | **-25.99** | 26.31 | 46 | **-19.69** |
| 2.675 | 30.58 | 56 | **-25.42** | 26.88 | 46 | **-19.12** |
| 8.545 | 33.62 | 60 | **-26.38** | 31.92 | 50 | **-18.08** |
| 13.56 | 30.4 | 60 | **-29.6** | 28.5 | 50 | **-21.5** |

## 8. TEST EQUIPMENT LIST

| | N°LCIE | TYPE | COMPANY | REF | SN |
|---|---|---|---|---|---|
| ***RADIATED EMISSION MEASUREMENT (SEMI-ANECHOIC CHAMBER #1)*** | | | | | |
| | A5329032VO | Absorption clamp | LUTHI | MDS21 | 2826 |
| | A5329044VO | Absorption clamp | RHODE ET SCHWARZ | 85024A | 194.0100.50 |
| | A7102024VO | Amplifier 8 GHz | HEROTEK | A1080304A | 222033 |
| | A7102019VO | Amplifier 9 KHz – 1300 MHz | HEWLETT PACKARD | 8447F Opt 64 | 3113A06394 |
| | A7105006VO | Amplifier 9 KHz – 1300 MHz | HEWLETT PACKARD | 8447D Opt 64 | |
| X | C2040145VO | Antenna Bi-Log XWing | TESEQ | CBL6144 | 25903 |
| | C2042027VO | Antenna horn | EMCO | 3115 | 6382 |
| | C2042028VO | Antenna horn 26GHz | SCHWARZBECK | BBHA 9170 | BBHA9170232 |
| X | C2040052VO | Antenna Loop | ELECTRO-METRICS | EM-6879 | 690234 |
| X | F2000407 | Antenna mast | MATURO Gmbh | AM 4.0 | /037/1270308 |
| X | A5329189VO | Cable EMI (s-Anechoic chamber) | | | |
| | A5329192VO | Cable Radiat EMI | | | |
| X | A5329198VO | Cable Radiat EMI | | | |
| X | A2642019VO | Measurement Receiver 20Hz – 8GHz | ROHDE & SCHWARZ | ESU8 | 100131 |
| X | D3044016VO | Semi-Anechoic chamber #1 | SIEPEL | | |
| | A4060033VO | Spectrum Analyzer 9KHz – 12.8GHz | HEWLETT PACKARD | 8596E | 3409u00537 |
| | A4060018VO | Spectrum Analyzer 9KHz – 26.5GHz | HEWLETT PACKARD | 8593E | 3409u00537 |
| | A4060016VO | Spectrum analyzer 9kHz –1.8GHz | HEWLETT PACKARD | 8591E | 3536A00384 |
| | A4049060VO | Adapter quasi-peak | HEWLETT PACKARD | HP85650A | |
| | A4060028VO | Spectrum analyzer display | HEWLETT PACKARD | HP85662A | |
| | A4060029VO | Spectrum analyzer | HEWLETT PACKARD | HP8568B | |
| | A4060030VO | Pre-selector RF | HEWLETT PACKARD | HP85685A | |
| X | F2000406 | Turntable chamber | MATURO Gmbh | TT 2.0 SI | /053/1270308 |
| X | F2000408 | Turntable controller chamber | MATURO Gmbh | Multiple Control Unit | MCU/060/1270308 |
| X | A3169050VO | Radiated emission comb generator | BARDET | | PR17B |
| | | | | | |
| ***RADIATED EMISSION MEASUREMENT (OPEN AREA TEST SITE)*** | | | | | |
| | A5329032VO | Absorption clamp | LUTHI | MDS21 | 2826 |
| | A5329044VO | Absorption clamp | RHODE ET SCHWARZ | 85024A | 194.0100.50 |
| X | A4049059VO | Adapter quasi-peak | HEWLETT PACKARD | HP85650A | 2811A01134 |
| | A7102024VO | Amplifier 8 GHz | HEROTEK | A1080304A | 222033 |
| | A7102026VO | Amplifier 8-26GHz | ALDETEC | ALS01452 | 1 |
| | A7102019VO | Amplifier 9 KHz – 1300 MHz | HEWLETT PACKARD | 8447F Opt 64 | 3113A06394 |
| X | C2040050VO | Antenna biconic | EMCO | 3104C | 9401-4636 |
| | C2040051VO | Antenna Bi-log | CHASE | CBL6111A | 1628 |
| | C2042027VO | Antenna horn | EMCO | 3115 | 6382 |
| | C2042028VO | Antenna horn 26GHz | SCHWARZBECK | BBHA 9170 | BBHA9170232 |
| X | C2040056VO | Antenna log-periodic | EMCO | 3146 | 2178 |
| X | C2040052VO | Antenna Loop | ELECTRO-METRICS | EM-6879 | 690234 |
| | F2000288VO | Antenna mast | EMCO | 1050 | |
| | C2040057VO | Antenna monopole | AH SYSTEM | SAS-551 | 181 |
| X | A5329048VO | Cable EMR OATS | SUCOFLEX | 106G | 553 |
| | A5329075VO | Cable OATS | UTIFLEX | | |
| X | A5329188VO | Cable OATS (Mast at 10m) | UTIFLEX | | |
| | A5329076VO | Cable OATS (Mast at 3m) | UTIFLEX | | |
| | A5329196VO | Cable OATS (Turntable) | UTIFLEX | | |
| | A2640011VO | Measurement receiver 9kHz–30MHz | ROHDE ET SCHWARZ | ESH3 | 972079/117 |
| X | A2642019 | Measurement Receiver 20Hz – 8GHz | ROHDE & SCHWARZ | ESU8 | 100131 |
| X | A4060027VO | Pre-selector RF | HEWLETT PACKARD | HP85685A | 2837A00784 |
| X | A3169050VO | Radiated emission comb generator | BARDET | | PR17B |
| X | A4060017VO | Spectrum analyzer | HEWLETT PACKARD | HP8568B | 2732A04155 |
| | A4060018VO | Spectrum Analyzer 9KHz – 26.5GHz | HEWLETT PACKARD | 8593E | 3409u00537 |
| | A4060016VO | Spectrum analyzer 9kHz –1.8GHz | HEWLETT PACKARD | 8591E | 3536A00384 |
| X | A4060019VO | Spectrum analyzer display | HEWLETT PACKARD | HP85662A | 2816A16603 |
| X | F2000403VO | Turntable | ETS LINDGREN | Model 2187 | |
| X | F2000286VO | Turntable / Antenna mast controller | ETS LINDGREN | Model 2066 | |
| | | | | | |
| ***CONDUCTED MEASUREMENT EMISSION*** | | | | | |
| X | A5329061VO | Cable Conduct. EMI | | | |
| X | A5329060VO | Cable Conduct. EMI | | | |
| X | A3169049VO | Conducted emission comb generator | BARDET | | CGPR12 |

| | N°LCIE | TYPE | COMPANY | REF | SN |
|---|---|---|---|---|---|
| | A4040050VO | Clickmeter | SCHAFFNER | DIA1512D | 22338 |
| | A5329037VO | Current injection probe | SCHAFFNER | CIP8213 | 52 |
| | A1290017VO | Current probe | SCHAFFNER | CSP9160 | 1097 |
| | A5329036VO | Direct Injection Module 100 Ohms | LCIE | MID01-100 ohms | |
| | A5329042VO | Ferrite Tube | LUTHI | FTC 101 | 4485 |
| | A1092042VO | Ferrite Tube | LUTHI | FTC101 | 4763 |
| | C2320059VO | LISN | EMCO | 3810/2SH | 9511/1182 |
| | C2320068VO | LISN | EMCO | 3825/2 | 9309/2122 |
| | C2320061VO | LISN | TELEMETER ELECTRONIC | NNB-2/16Z | 98010 |
| | C2320062VO | LISN tri-phase ESH2-Z5 | RHODE ET SCHWARZ | 33852.19.53 | 841223/008 |
| | C2320063VO | LISN tri-phase ESH2-Z5 | RHODE ET SCHWARZ | 33852.19.53 | 841223/007 |
| X | C2320123VO | LISN | RHODE ET SCHWARZ | ENV216 | 100037 |
| | A2640011VO | Measurement receiver 9kHz–30MHz | ROHDE ET SCHWARZ | ESH3 | 972079/117 |
| X | A2642019VO | Measurement Receiver 20Hz – 8GHz | ROHDE & SCHWARZ | ESU8 | 100131 |
| | C2320067VO | ISN 2 x 2 wires | RHODE ET SCHWARZ | ENY22 | 836727/015 |
| | C2320066VO | ISN 4 wires | RHODE ET SCHWARZ | ENY41 | 838119/023 |
| | C2320124VO | ISN 4 wires | TESEQ | T400A | 24873 |
| | D3044016VO | Semi-Anechoic chamber #1 | SIEPEL | | |
| | D3044017VO | Semi-Anechoic chamber #2 | SIEPEL | | |
| | D3044015VO | Semi-Anechoic chamber #3 | SIEPEL | | |
| X | D3044010VO | Faraday Cage | RAY PROOF | | 4854 |
| X | A4049061VO | Transient limiter | HEWLETT PACKARD | 11947A | 3107A01596 |
| | A4089117VO | Voltage probe | LCIE | | |
| | | | | | |
| ***MISCALLENOUS (CONTROL EQUIPMENT)*** | | | | | |
| | A6440068VO | Data Logger | AGILENT | 34970A | US37043935 |
| | A2120003VO | Programable PSU, HAR/FLK | HEWLETT PACKARD | 6842A | 3531A00109 |
| | A6440068VO | Data Logger Board | AGILENT | 34901A | MY41037442 |
| X | D1022117VO | Climatic chamber | BIA CLIMATIC | CL 6-25 | 200 105 6 |
| | A7043037VO | Power supply DC 30V 10A | ELC | AL924 | 95/00600 |
| | A1240170VO | Multimeter | Fluke | 87 | 75250745 |
| | A1240171VO | Multimeter | FLUKE | 189 | 89770115 |
| | A4024018VO | Oscilloscope 500 MHz | Hewlett Packard | 54542C | US36040602 |
| | A4024019VO | Oscilloscope | Hewlett Packard | 54720A | 7426600 |
| X | B4204052VO | Thermo-hygrometer | HUGER | | |
| | A7043036VO | Power supply DC 300W / 150V-6A | SODILEC | 7SDLIN/GB AUTO 300 | 493711 |
| | A4083040VO | Oscilloscope 100 MHz 500Ms/s | Tektronix | TDS30-25 | H712103 |
| | | | | | |

## 9. UNCERTAINTIES CHART

| **Type de mesure / *Kind of measurement*** | **Incertitude élargie laboratoire / *Wide uncertainty laboratory* (k=2) ± x** | **Incertitude limite du CISPR / *CISPR uncertainty limit* ± y** |
|---|---|---|
| Mesure des perturbations conduites en tension sur le réseau d'énergie<br>*Measurement of conducted disturbances in voltage on the power port* | 3.57 dB | 3.6 dB |
| Mesure des perturbations conduites en tension sur le réseau de télécommunication<br>*Measurement of conducted disturbances in voltage on the telecommunication port.* | 3.28 dB | A l'étude /<br>Under consid. |
| Mesure des perturbations discontinues conduites en tension<br>*Measurement of discontinuous conducted disturbances in voltage* | 3.47 dB | 3.6 dB |
| Mesure des perturbations conduites en courant<br>*Measurement of conducted disturbances in current* | 2.90 dB | A l'étude /<br>Under consid. |
| Mesure du champ électrique rayonné sur le site en espace libre de Voiron<br>*Measurement of radiated electric field on the Voiron open area test site* | 5.07 dB | 5.2 dB |