



TEST REPORT

Number
Composition of document

RADIO

138293-679011
23 pages

FCC Registration Number
Industry Canada Number

166175 (FAR)
6230B

Standards

47 CFR Part 15.225
RSS-210, Issue 8
RSS-Gen, Issue 4

Issued to

INGENICO
28/32 Boulevard de Grenelle
75015 PARIS
FRANCE

Apparatus under test

Trade mark
Manufacturer
Type
Serial number
IC
FCC ID

Payment terminal
INGENICO
INGENICO
Lane/5000 CL/Eth (with resistive screen)
151967323031006501004737
2586D-LANE5000CL
XKB-LANE5000CL

Test date

2015/10/28 to 2015/10/30

Tests performed by

Armand MAHOUNGOU

Test site

Fontenay aux Roses

Date of issue

2016/03/29

Written by :
Armand MAHOUNGOU
Tests operator

Approved by :
Stéphane PHOUDIAH



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1. TEST PROGRAM

- References**

Standards:

- 47 CFR Part 15C
- RSS-210
- RSS-Gen
- CISPR 16-4-2
- ANSI C63.10 (2013)

Standard Section	Test Description	TEST RESULT - Comments
RSS-Gen § 6.6	Occupied Bandwidth	N.P (Limited program: Note)
CFR 47 § 15.225 (e) RSS-210 § A2.6	Frequency tolerance	N.P (Limited program: Note)
CFR 47 § 15.207 RSS-Gen § 8.8	AC Power Line Conducted Emissions	N.P (Limited program: Note)
CFR 47 § 15.225 (a) (b) (c) RSS-210 § A2.6 (a) (b) (c)	Field strength within the band 13.110-14.010 MHz	PASS
CFR 47 § 15.209 (a) CFR 47 § 15.225 (d) RSS-210 § A2.6 (d)	Field strength outside of the bands 13.110-14.010 MHz	PASS
RSS-Gen § 7.1.2	Receiver Radiated emissions	NA (Transceiver equipment. Include in Field strength test)

PASS: EUT complies with standard's requirement

FAIL: EUT does not comply with standard's requirement

NA: Not Applicable

NP: Test Not Performed

Note: This EUT described in this report is a variant of the tested version described in test report n° 138293-679000. The only difference is the screen which is a resistive screen. As other parts and radio parts are strictly the same for both versions, only "Field Strength outside the band" has been performed for this resistive screen version. For other radio tests not performed here, results of test report n° 138293-679000 are applicable.



EQUIPMENT DESCRIPTION

1.1. HARDWARE & SOFTWARE IDENTIFICATION

- Equipment under test (EUT):



Front face

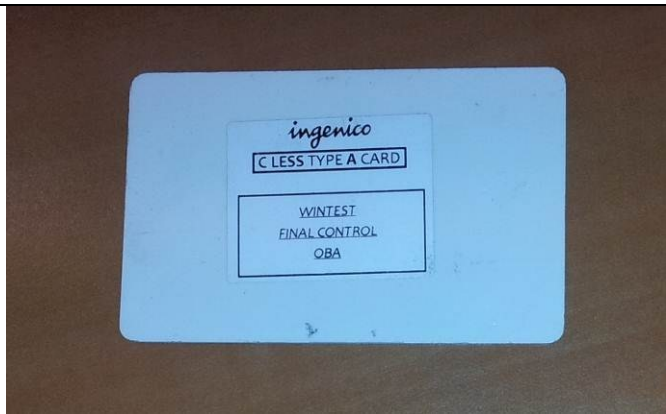


Back face

Equipment Under Test

The equipment was equipped with resistive screen.

The equipment has been tested with the following AC/DC power supply:
- PHIHONG, reference: PSC16A-080L6IN-R



RFID card



Bank card



Equipment Under Test



- **Auxiliary equipment (AE) used for testing:**

No auxiliary equipment

Photograph of AE

- **Input/output:**

- Input Power

- **Software identification:**

-Software version: Unknown

- **Equipment information:**

- External antenna connector: No
- Frequency band allocated: 13.553MHz to 13.567MHz
- Frequency band used: 13.56MHz
- Modulation: ASK 100%
- Number of channel: 1
- Antenna type: Integral
- Stand By mode: No
- Type of power source: External power supply
- Power supply: Vmin : 108 V
Vnom: 120 V
Vmax :132 V
- Temperature range: Tmin: -30°C (IC) -20°C (FCC)
Tnom: 20°C
Tmax: +50°C

1.2. RUNNING MODE

The EUT is set in the following modes during tests:

- Permanent emission-reception with modulation



1.3. EQUIPEMENT LABELLING



1.4. EQUIPMENT MODIFICATIONS

No equipment modification has been necessary during testing.



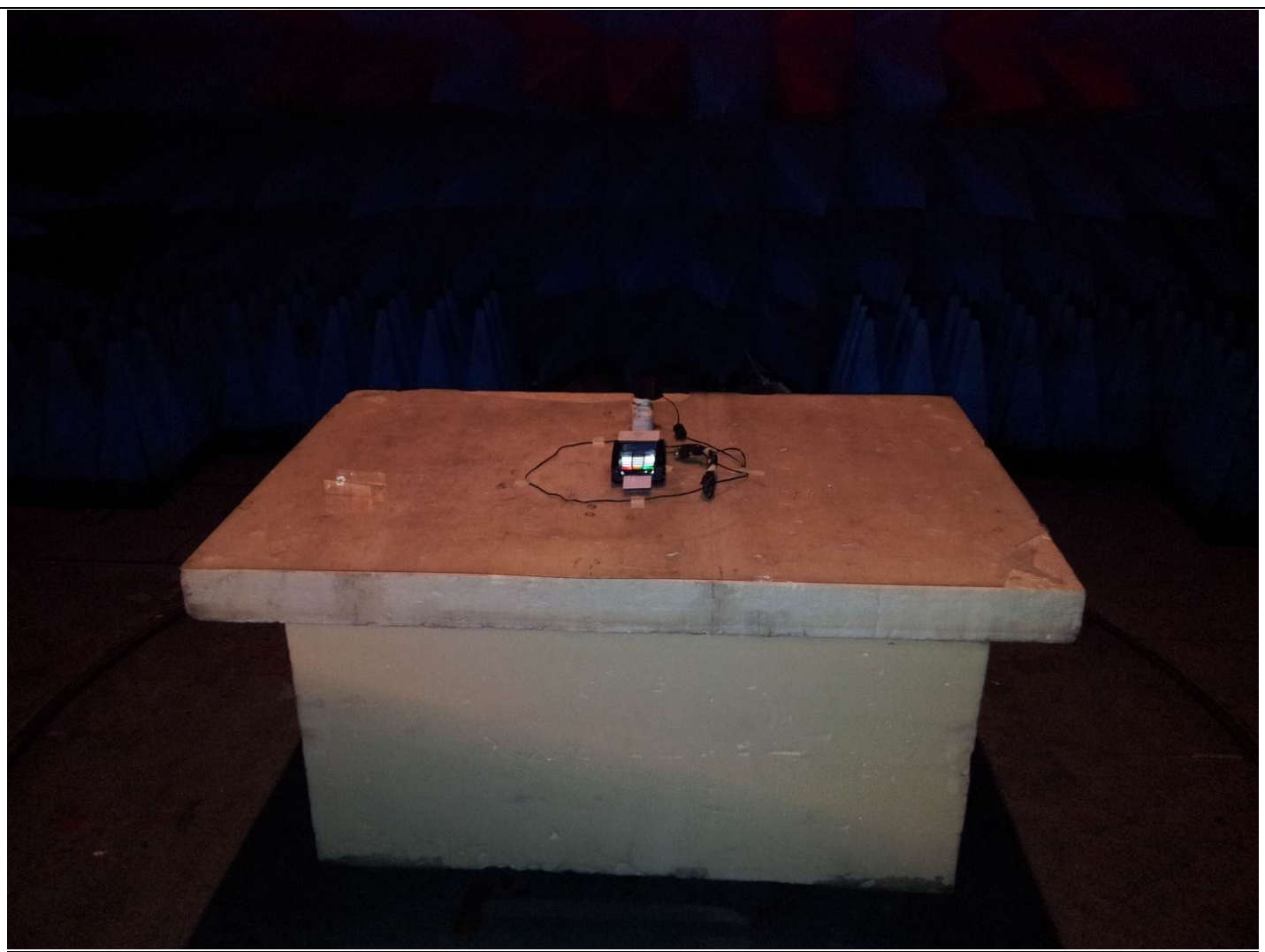
2. FIELD STRENGTH WITHIN THE BAND 13.110-14.010MHZ

2.1. TEST CONDITIONS

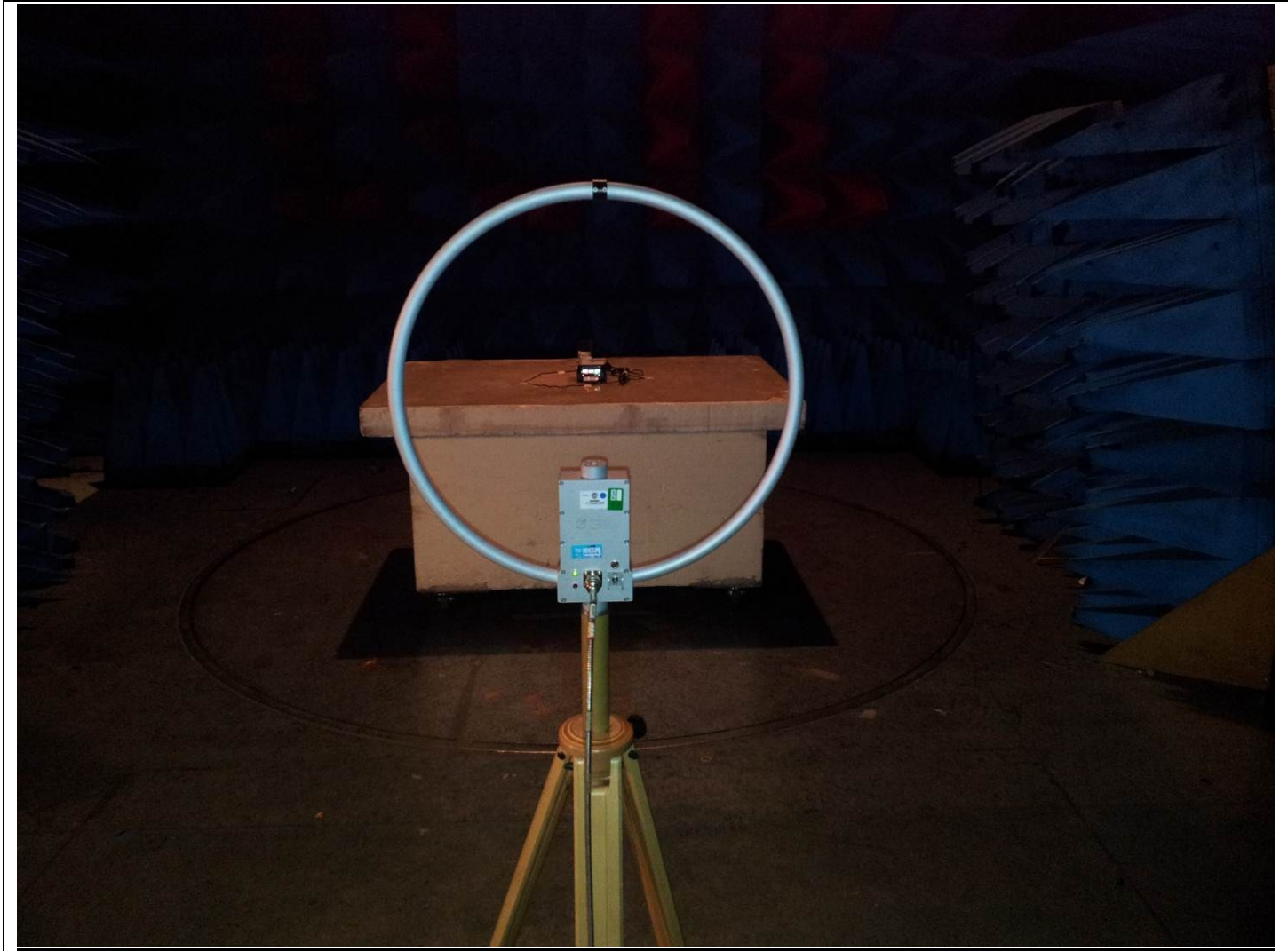
Test performed by : Armand MAHOUNGOU
Date of test : 2015/10/29
Ambient temperature : 21°C
Relative humidity : 44%

2.2. TEST SETUP

The product has been tested according to ANSI C63.10-(2013). The EUT is placed in a semi-anechoic chamber. Distance between measuring antenna and the EUT is 3m. Test is performed in parrallel and perpendicular axis with a loop antenna. Measurement bandwidth was 9kHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height was 1m.



Photograph for Field strength within the band 13.110-14.010MHz



Photograph for Field strength within the band 13.110-14.010MHz



2.3. RESULTS

- Characterization in a semi anechoic chamber:**

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	26.26	-	69.5
13.110 to 13.410	24.68	-	80.5
13.410 to 13.553	25.37	-	90.5
13.553 to 13.567	35.88	-	124
13.567 to 13.710	25.06	-	90.5
13.710 to 14.010	24.40	-	80.5
Above 14.010	25.08	-	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	28.12	-	69.5
13.110 to 13.410	27.85	-	80.5
13.410 to 13.553	27.98	-	90.5
13.553 to 13.567	48.54	-	124
13.567 to 13.710	28.14	-	90.5
13.710 to 14.010	30.14	-	80.5
Above 14.010	28.17	-	69.5

See annex for graphics

Result: PASS

Limit: → Below 13.110MHz: 69.5dB μ V/m (3m) or 29.5dB μ V/m (30m)
 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: 69.5dB μ V/m (3m) or 29.5dB μ V/m (30m)



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

3.1. TEST CONDITIONS

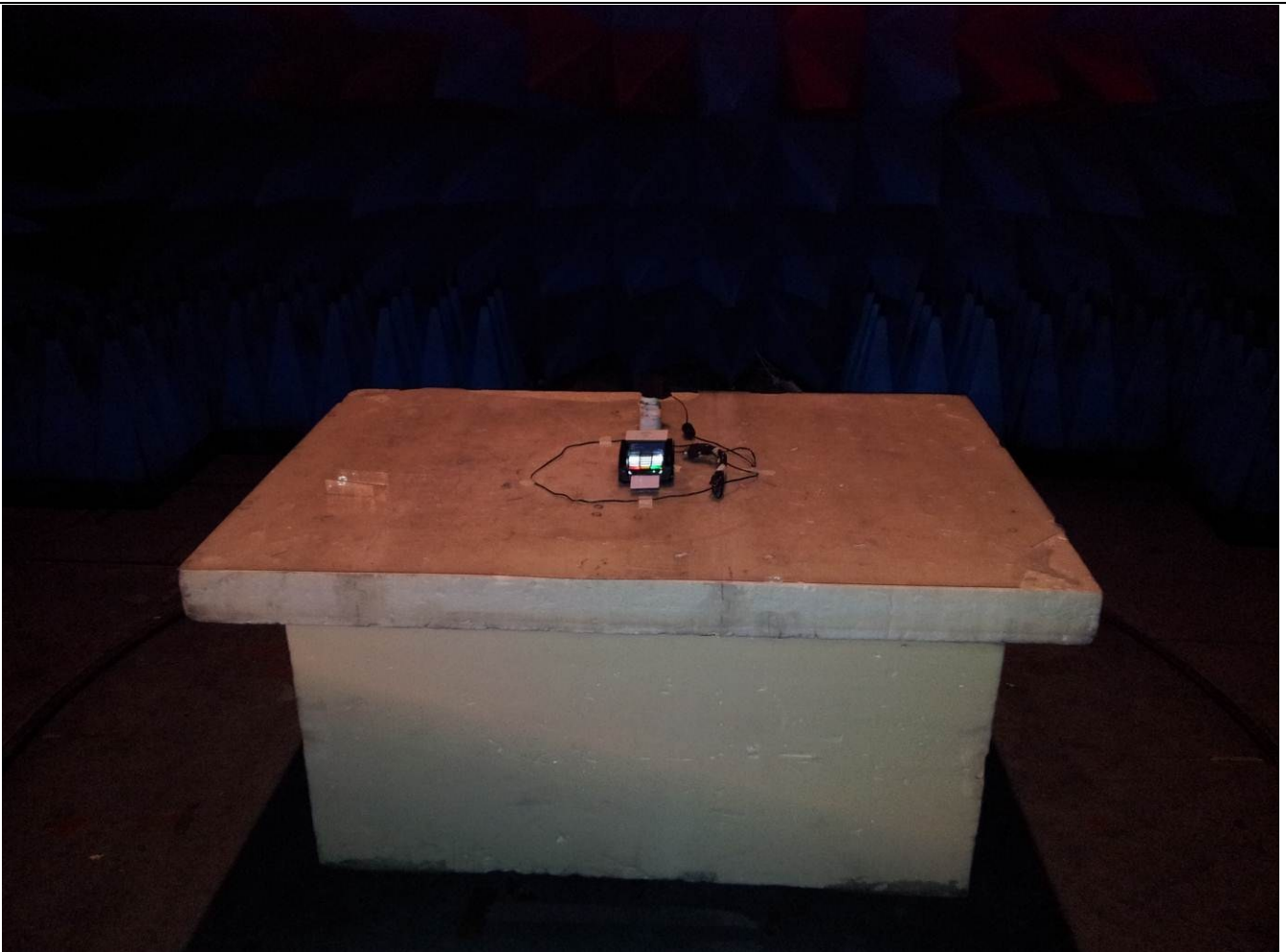
Test performed by : Armand MAHOUNGOU
Date of test : 2015/10/29
Ambient temperature : 22°C
Relative humidity : 44%

3.2. TEST SETUP

The product has been tested according to ANSI C63.10-(2013). The EUT is placed in a semi-anechoic chamber. 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.

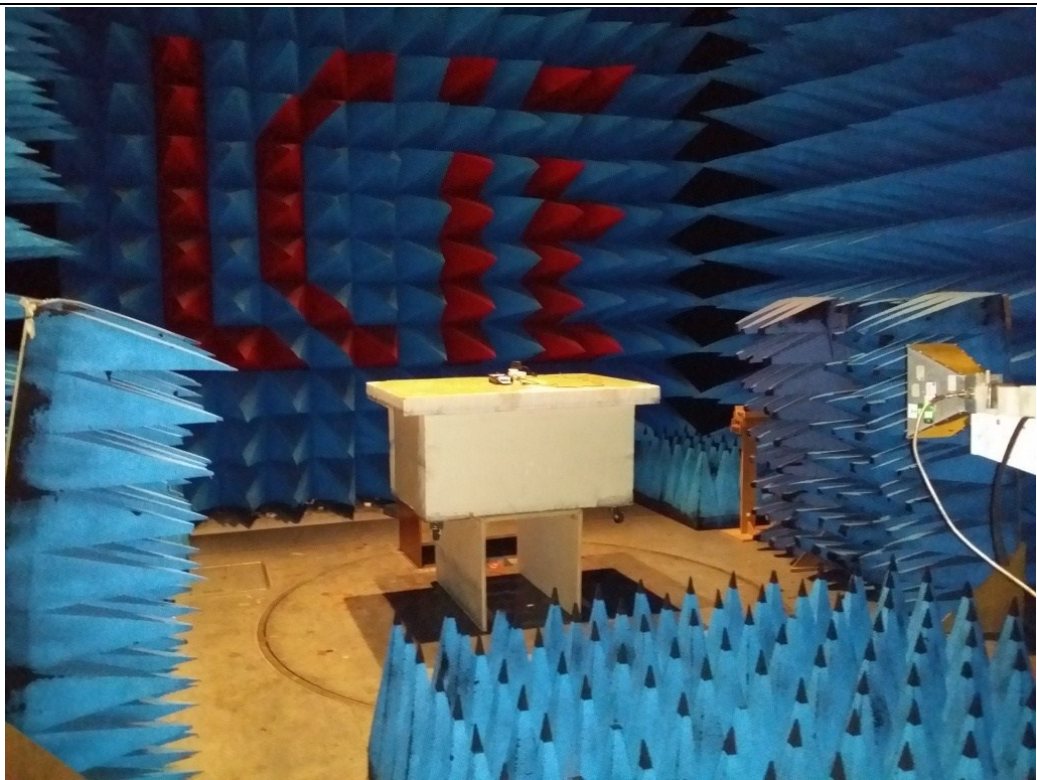
Test is performed in horizontal (H) and vertical (V) polarization with bilog antenna between 30MHz & 1GHz and with a horn antenna above 1GHz. Measurement bandwidth was 120kHz below 1GHz and 1MHz above 1GHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height search was performed from 1 to 4m.



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



3.3. RESULTS

- Characterization in a semi anechoic chamber (9kHz to 10GHz):**

Vertical Polarization

Below 1GHz

Frequency (MHz)	Peak Level (dBµV/m)	QPeak Level (dBµV/m)	Limit (dBµV/m)
0.242	46.27	-	119.82
0.452	44.95	-	114.52
0.726	41.08	-	110.42
13.51	49.54	-	69.5
22.15	28.36	-	69.5
29.53	31.90	-	69.5

Above 1GHz

Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)
1335.76	27.41	54	39.85	74
1883.26	30.42	54	45.71	74

Horizontal Polarization

Below 1GHz

Frequency (MHz)	Peak Level (dBµV/m)	QPeak Level (dBµV/m)	Limit (dBµV/m)
0.242	46.84	-	119.82
0.48.3	45.06	-	113.91
0.726	42.97	-	110.42
13.72	35.88	-	69.5

Above 1GHz

Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)
1439.86	29.62	54	39.63	74

See annex for graphics

Result: PASS

Limit: → 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: 100µV/m (3m) or 40dBµV/m (3m) QPeak
 88MHz to 216MHz: 150µV/m (3m) or 43,5dBµV/m (3m) QPeak
 216MHz to 960MHz: 200µV/m (3m) or 46dBµV/m (3m) QPeak
 960MHz to 1000MHz: 500µV/m (3m) or 54dBµV/m (3m) QPeak
 Above 1000MHz: 5012µV/m (3m) or 74dBµV/m Peak
 500µV/m (3m) or 54dBµV/m (3m) Average



4. TEST EQUIPMENT LIST

Field strength outside of the bands 13.110-14.010 MHz					
Apparatus	Trade Mark	Type	Registration number	Calibration date	Calibration due
Semi anechoic chamber	SIEPEL	-	D3044008	2015/09	2016/09
EMI receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2015/01	2016/01
Bilog antenna	CHASE	CBL6111C	C2040124	2015/09	2016/09
Cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA/3.5MD/4000	A5329374	2015/06	2016/06
Cable	CABLES & CONNECTIQUES	2.9MD/CSU440AA-TDINOX/2.9MD/12000	A5329426	2015/07	2016/07
Horn antenna	EMCO	3115	C2042018	2015/05	2016/05
Cable	CABLES & CONNECTIQUES	2.9MD/CSU440AA/2.9MD/2000	A5329358	2014/12	2015/12
Preamplifier	BONN Elektronik	BLNA 3018-8F305	A7080053	2015/03	2016/03
Field strength within the band 13.110-14.010MHz					
Apparatus	Trade Mark	Type	Registration number	Calibration date	Calibration due
Semi anechoic chamber	SIEPEL	-	D3044008	2015/09	2016/09
EMI receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2015/01	2016/01
Loop antenna	SCHWARZBECK	FMZB 1513	C2040209	2015/09	2016/09
Cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA/3.5MD/4000	A5329374	2015/06	2016/06
Cable	CABLES & CONNECTIQUES	2.9MD/CSU440AA-TDINOX/2.9MD/12000	A5329426	2015/07	2016/07
AC Power Line Conducted Emissions					
Apparatus	Trade Mark	Type	Registration number	Calibration date	Calibration due
Semi anechoic chamber	SIEPEL	-	D3044008	2015/09	2016/09
EMI receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2015/01	2016/01
Cable	CABLES & CONNECTIQUES	-	A5329411	2015/06	2016/06
Cable	CABLES & CONNECTIQUES	-	A5329413	2015/06	2016/06
V LISN	ROHDE & SCHWARZ	ENV216	C2320163	2015/02	2016/02



5. UNCERTAINTIES CHART

Kind of test	Measurement uncertainties (k=2) $\pm x(\text{dB}) / (\text{Hz})$	Limit for uncertainties $\pm y(\text{dB})$
TRANSMITTER REQUIREMENTS		
Radio frequency	$\pm 2 \cdot 10^{-8}$ Hz	$\pm 1 \cdot 10^{-7}$ Hz
RF Conducted power	± 0.6 dB	± 1.5 dB
Spurious emissions <ul style="list-style-type: none"> • Frequency < 1000 MHz • Frequency > 1000 MHz 	± 3.9 dB ± 3.1 dB	± 6 dB
Spurious in conduction	± 1.6 dB	± 3 dB
Temperature	$\pm 0.5^\circ\text{C}$	$\pm 1^\circ\text{C}$
Humidity	± 2.5 %	± 10 %



6. ANNEX (GRAPHS)

Transmitter Radiated Emissions

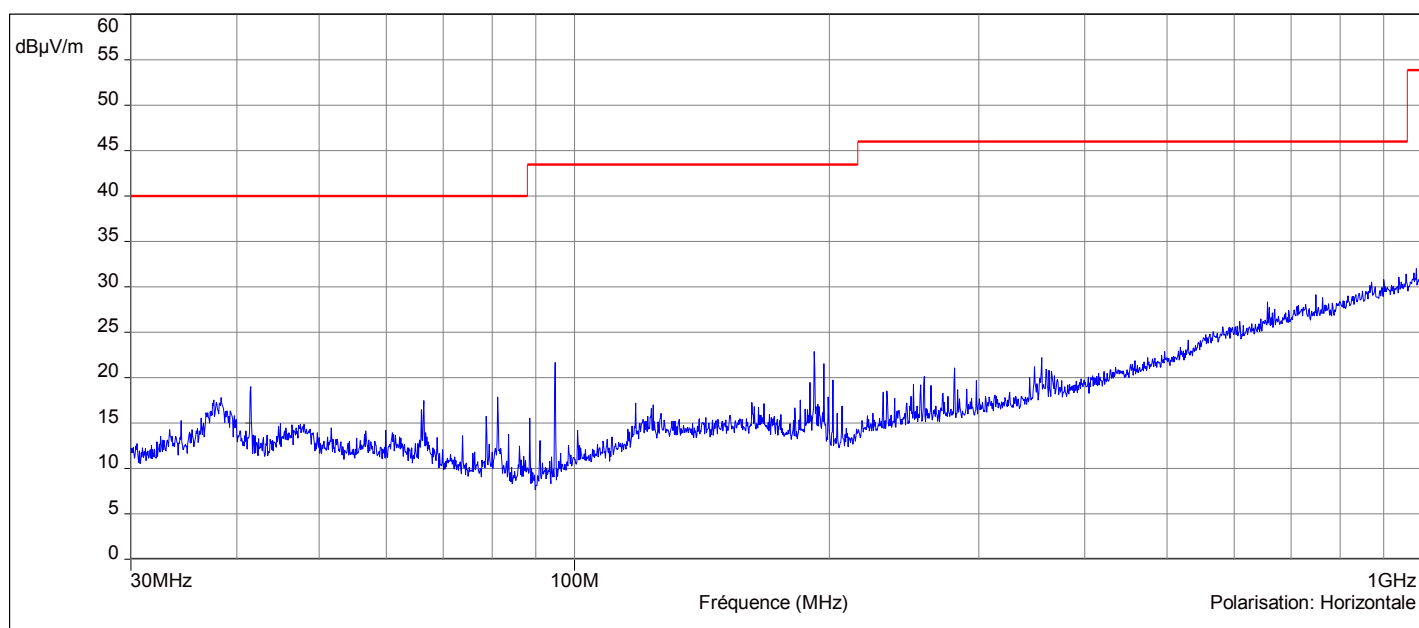
Frequency: F_{nom}

Temperature: T_{nom}

Voltage: V_{nom}

Horizontal polarisation

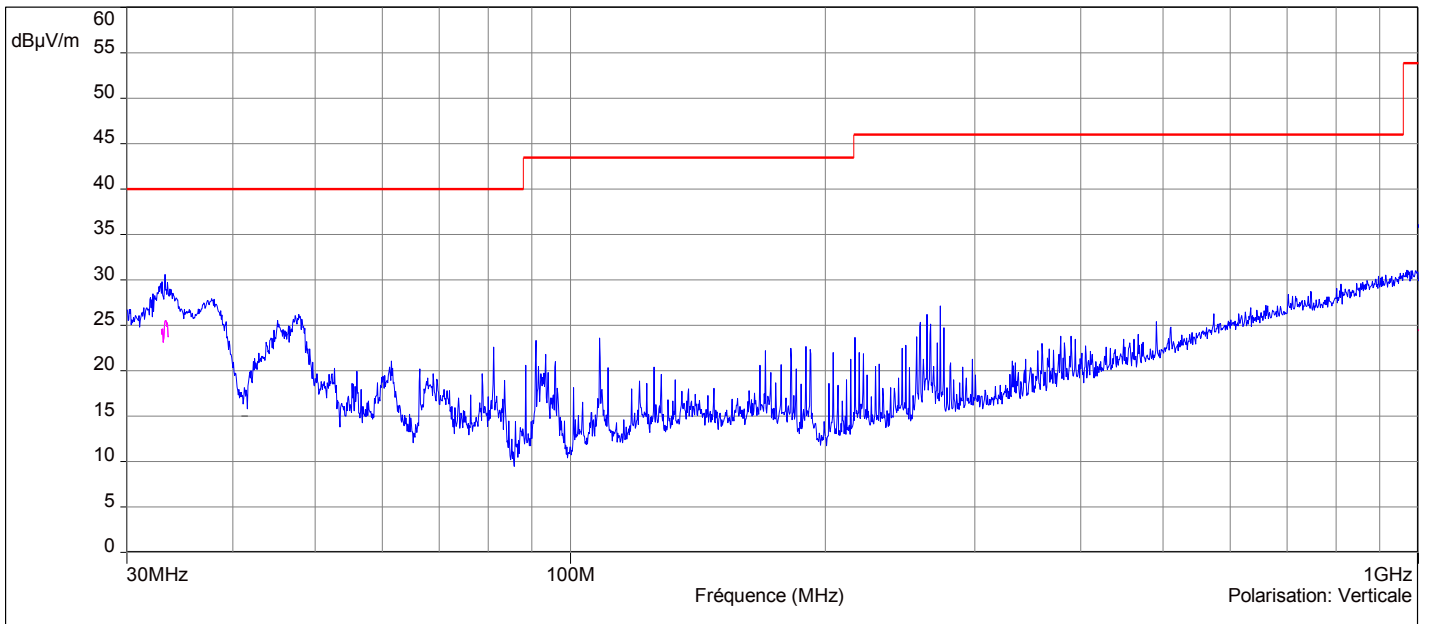
- FCC/FCC 15.109 - Classe: - Moyenne/3.0m/
- FCC/FCC 15.109 - Classe: - QCrête/3.0m/
- FCC/FCC 15.109 - Classe: - Crête/3.0m/
- Mes.Peak (Horizontale)
- Mes.Avg (Horizontale)





Transmitter Radiated Emissions
Frequency: F_{nom}
Temperature: T_{nom}
Voltage: V_{nom}
Vertical polarisation

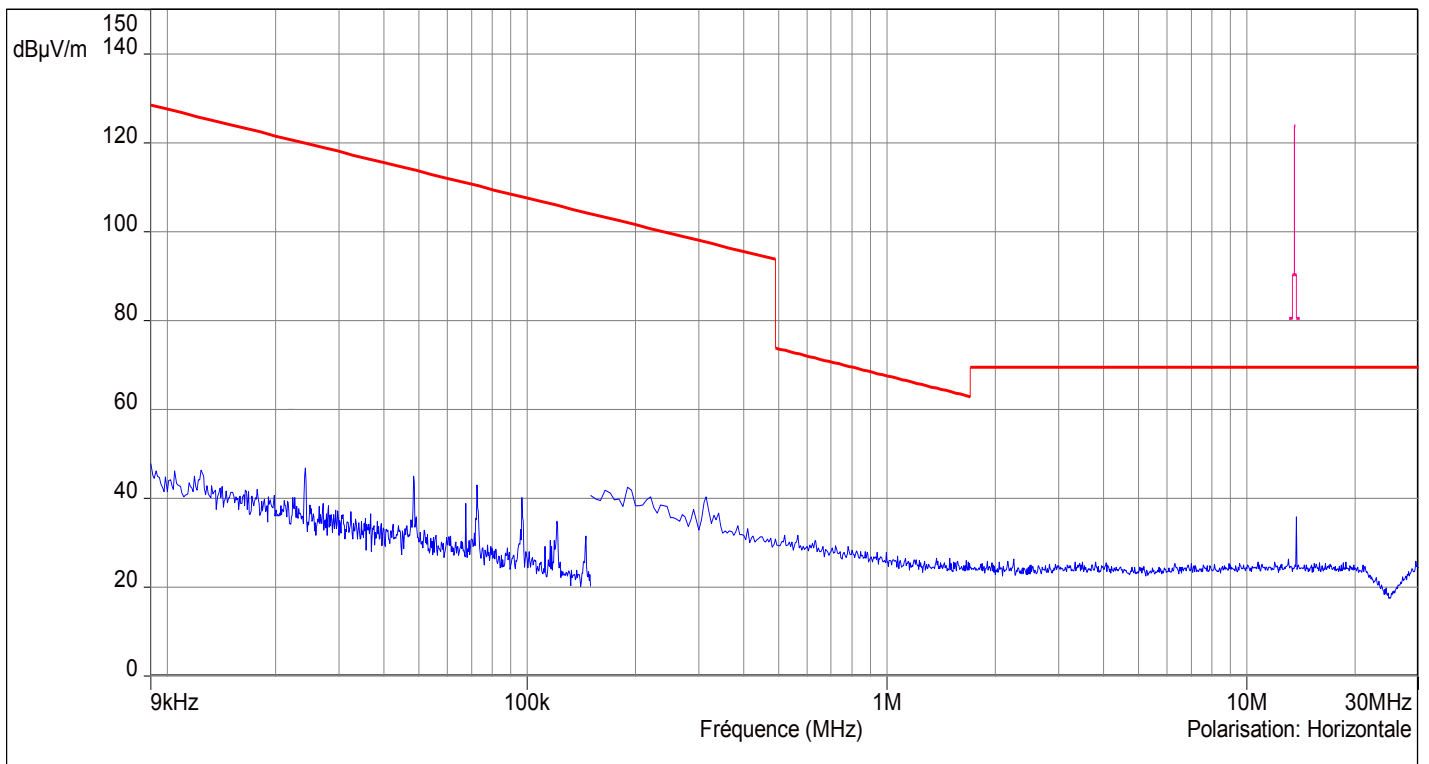
- FCC/FCC 15.109 - Classe: - Moyenne/3.0m/
- FCC/FCC 15.109 - Classe: - QCrête/3.0m/
- FCC/FCC 15.109 - Classe: - Crête/3.0m/
- Mes.Peak (Verticale)
- Mes.QPeak (Verticale)
- Mes.Avg (Verticale)





Transmitter Radiated Emissions
Frequency: F_{nom}
Temperature: T_{nom}
Voltage: V_{nom}
Parallel polarisation

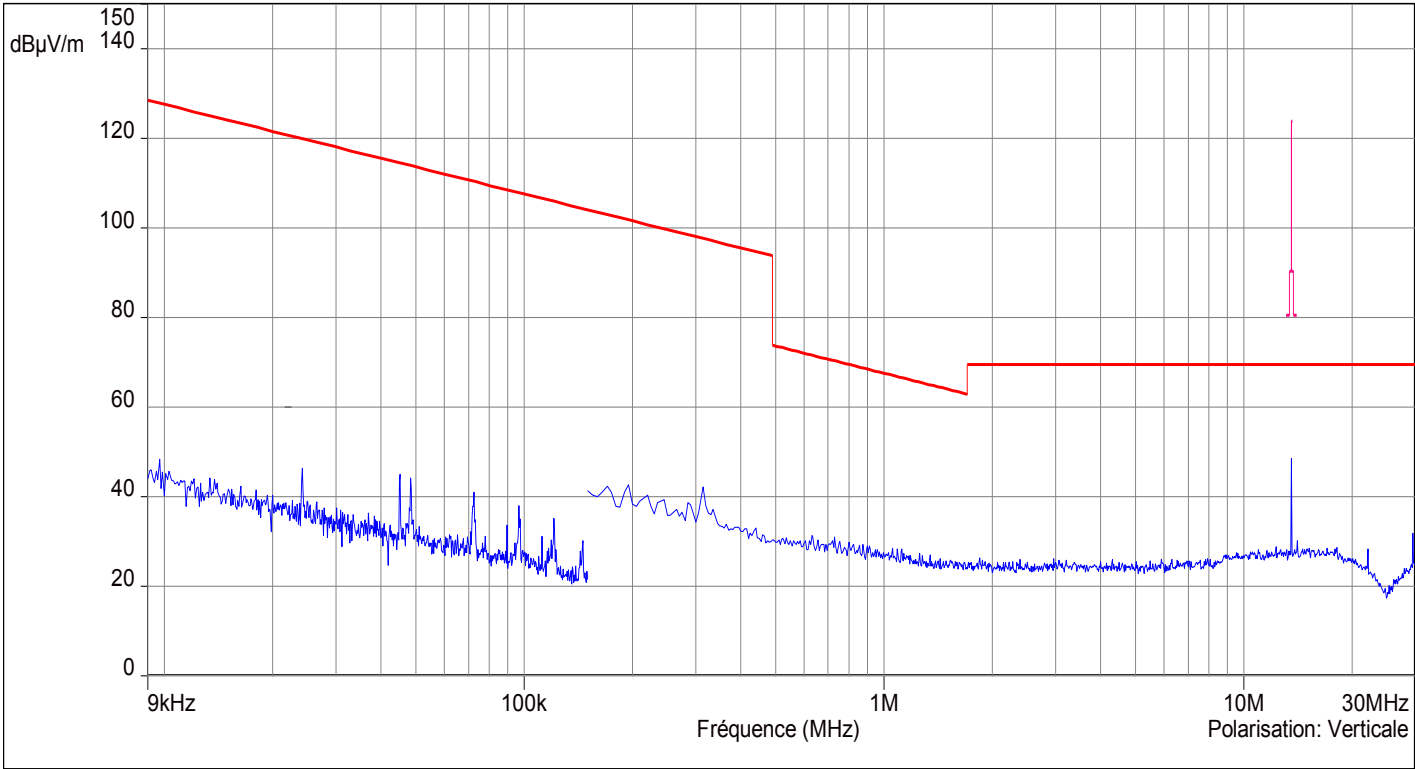
- FCC/FCC 15.225 - Classe:1 - QCrête/3.0m/
- FCC/FCC 15.209 Antenne boucle - Classe:1 - QCrête/3.0m/
- Mes.Peak (Horizontale)





Transmitter Radiated Emissions
Frequency: F_{nom}
Temperature: T_{nom}
Voltage: V_{nom}
Perpendicular polarisation

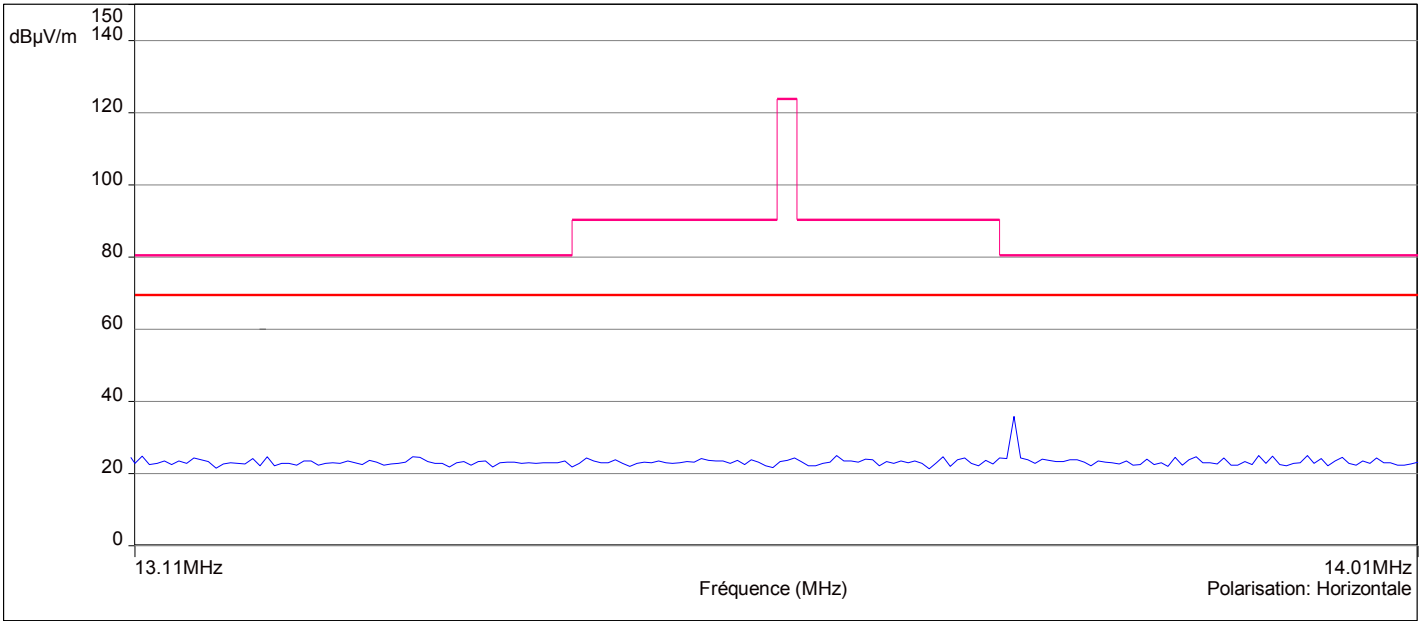
- FCC/FCC 15.225 - Classe:1 - QCrête/3.0m/
- FCC/FCC 15.209 Antenne boucle - Classe:1 - QCrête/3.0m/
- Mes.Peak (Verticale)





Transmitter Radiated Emissions
Frequency: F_{nom}
Temperature: T_{nom}
Voltage: V_{nom}
Parallel polarisation

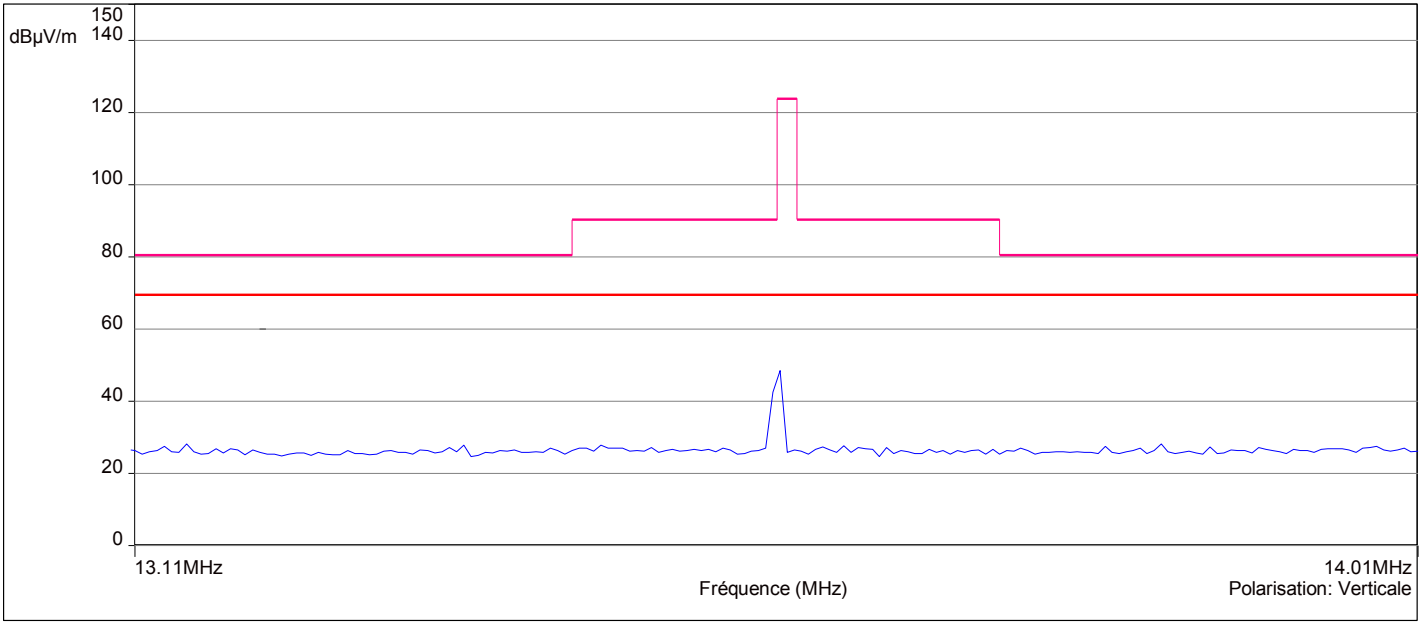
- FCC/FCC 15.225 - Classe:1 - QCrête/3.0m/
- FCC/FCC 15.209 Antenne boucle - Classe:1 - QCrête/3.0m/
- Mes.Peak (Horizontale)





Transmitter Radiated Emissions
Frequency: F_{nom}
Temperature: T_{nom}
Voltage: V_{nom}
Perpendicular polarisation

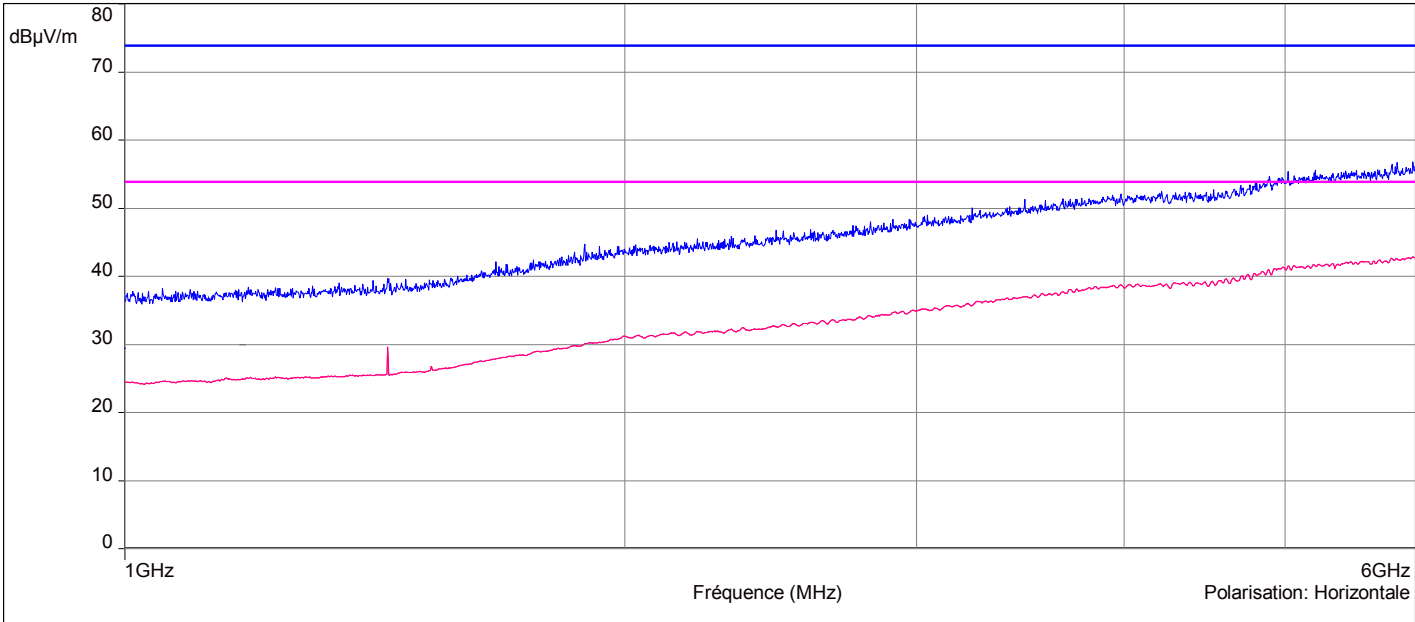
- FCC/FCC 15.225 - Classe:1 - QCrête/3.0m/
- FCC/FCC 15.209 Antenne boucle - Classe:1 - QCrête/3.0m/
- Mes.Peak (Verticale)





Transmitter Radiated Emissions
Frequency: F_{nom}
Temperature: T_{nom}
Voltage: V_{nom}
Horizontal polarisation

- FCC/FCC 15.109 - Classe: - Moyenne/3.0m/
- FCC/FCC 15.109 - Classe: - QCrête/3.0m/
- FCC/FCC 15.109 - Classe: - Crête/3.0m/
- Mes.Peak (Horizontale)
- Mes.Avg (Horizontale)





Transmitter Radiated Emissions
Frequency: F_{nom}
Temperature: T_{nom}
Voltage: V_{nom}
Verticale polarisation

- FCC/FCC 15.109 - Classe: - Moyenne/3.0m/
- FCC/FCC 15.109 - Classe: - QCrête/3.0m/
- FCC/FCC 15.109 - Classe: - Crête/3.0m/
- Mes.Peak (Verticale)
- Mes.QPeak (Verticale)
- Mes.Avg (Verticale)

