



TEST REPORT

Number
Composition of document

RADIO

141724-685531B
20 pages

FCC Registration Number
Industry Canada Number

166175 (FAR)
6230B

Standards

47 CFR Part 15.225 (Limited program)
RSS-210, Issue 8 (Limited program)
RSS-Gen, Issue 4 (Limited program)

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 capacitive screen)
151407313031009301003609
2586D-LANE5000CL
XKB-LANE5000CL

Test date

2016/04/25

Tests performed by

Gilles DE BUYSER

Test site

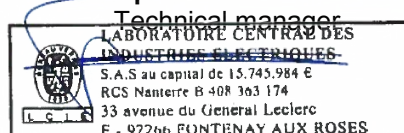
Fontenay aux Roses

Date of issue

2016/07/05

Written by :
Gilles DE BUYSER
Tests operator

Approved by :
Stéphane PHOUDIAH



This document shall not be reproduced, except in full, without the written approval of the LCIE. This document contains results related only to the item tested. It does not imply the conformity of the whole production to the items tested. Unless otherwise specified, the decision of conformity takes into account the uncertainty of measures. This document doesn't anticipate any certification decision.



SUMMARY

- 1. TEST PROGRAM 3
- 2. EQUIPMENT DESCRIPTION..... 4
- 3. AC POWER LINE CONDUCTED EMISSIONS..... 8
- 4. FIELD STRENGTH OUTSIDE OF THE BANDS 13.110-14.010 MHZ 10
- 5. TEST EQUIPMENT LIST 13
- 6. UNCERTAINTIES CHART 14
- 7. ANNEX (GRAPHS) 15



1. TEST PROGRAM

- **References**

Standards:

- 47 CFR Part 15C
- RSS-210 issue 8
- RSS-Gen issue 4
- CISPR 16-4-2
- ANSI C63.10 (2013)

Standard Section	Test Description	TEST RESULT - Comments
RSS-Gen § 6.6	Occupied Bandwidth	NP (limited test program)
CFR 47 § 15.225 (e) RSS-210 § A2.6	Frequency tolerance	NP (limited test program)
CFR 47 § 15.207 RSS-Gen § 8.8	AC Power Line Conducted Emissions	PASS
CFR 47 § 15.225 (a) (b) (c) RSS-210 § A2.6 (a) (b) (c)	Field strength within the band 13.110-14.010 MHz	NP (limited test program)
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 (Limited to 30MHz-1GHz band)
RSS-Gen § 7	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



2. EQUIPMENT DESCRIPTION

2.1. HARDWARE & SOFTWARE IDENTIFICATION

- Equipment under test (EUT):



Front face



Back face

Equipment Under Test

The equipment was equipped with capacitive screen.

The equipment has been tested with the following AC/DC power supply:

- PHIHONG, reference: PSAC30U-120L6



RFID card



Bank card



Power supply AC/DC adapter

Equipment Under Test



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

No auxiliary equipment

Photograph of AE

- **Input/output:**

- Input Power 120V 60Hz

- **Software identification:**

-Software version: - (No information)

- **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

2.2. RUNNING MODE

The EUT is set in the following modes during tests:

- Permanent emission-reception with modulation



2.3. EQUIPEMENT LABELLING



Terminal label



AC/DC power adapter label

2.4. EQUIPMENT MODIFICATIONS

No equipment modification has been necessary during testing.



3. AC POWER LINE CONDUCTED EMISSIONS

3.1. TEST CONDITIONS

Test performed by : Gilles DE BUYSER
Date of test : 2016/04/25
Ambient temperature : 20°C
Relative humidity : 41%

3.2. 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 (Global view)



3.3. RESULTS

Phase Line

Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Average Level (dBμV)	Average Limit (dBμV)
0.16	49.5	-	65.4	27.5	55.4
0.19	47.8	-	64.2	26.4	54.2
0.30	39.2	-	60.1	35.8	50.1
0.32	39.8	-	59.6	35.1	49.6
14.33	31.6	-	60.0	19.6	50.0
23.61	36.2	-	60.0	34.9	50.0

Neutral Line

Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Average Level (dBμV)	Average Limit (dBμV)
0.15	50.8	-	66.0	28.9	56
0.32	38.5	-	59.6	31.5	49.6
13.48	38.0	-	60.0	18.2	50
13.69	39.5	-	60.0	17.8	50
16.12	35.5	-	60.0	27.7	50
27.16	37.1	-	60.0	20.3	50

See annex for graphics

Result: **PASS**

Limit: →

Quasi-Peak

0,15kHz to 0,5MHz: 66dBμV to 56dBμV*

0,5MHz to 5MHz: 56dBμV

5MHz to 30MHz: 60dBμV

Average

0,15kHz to 0,5MHz: 56dBμV to 46dBμV*

0,5MHz to 5MHz: 46dBμV

5MHz to 30MHz: 50dBμV

*Decreases with the logarithm of the frequency



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

4.1. TEST CONDITIONS

Test performed by : Gilles DE BUYSER
Date of test : 2016/04/25
Ambient temperature : 20°C
Relative humidity : 41%

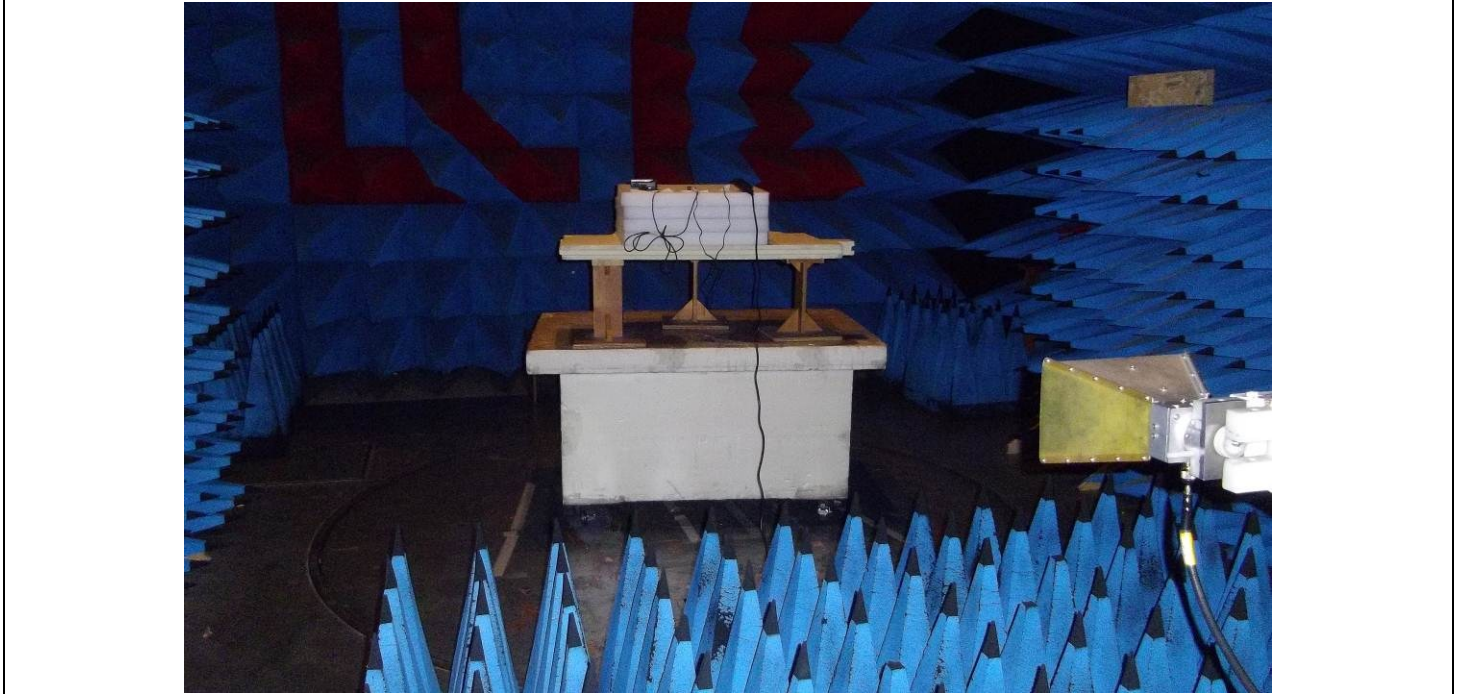
4.2. TEST SETUP

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 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 (between 30 & 1000MHz)



Photograph for Field strength outside of the bands 13.110-14.010 MHz (above 1GHz)



4.3. RESULTS

- Characterization in a semi anechoic chamber (30MHz to 10GHz):

Vertical Polarization

Below 1Ghz

Frequency (MHz)	Peak Level (dB μ V/m)	QPeak Level (dB μ V/m)	QPeak Limit (dB μ V/m)
35.25	15.5	11.0	40
91.05	31.8	29.9	43.5
108.3	28.1	28.0	43.5
184.6	31.9	30.0	43.5

Above 1GHz

No spurious observed

Horizontal Polarization

Below 1GHz

Frequency (MHz)	Peak Level (dB μ V/m)	QPeak Level (dB μ V/m)	QPeak Limit (dB μ V/m)
566.66	31.4	29.3	46
623.42	27.1	23.1	46

Above 1GHz

No spurious observed

See annex for graphics

Result: PASS

Limit: → 30MHz to 88MHz: 100 μ V/m (3m) or 40dB μ V/m (3m) QPeak
 88MHz to 216MHz: 150 μ V/m (3m) or 43,5dB μ V/m (3m) QPeak
 216MHz to 960MHz: 200 μ V/m (3m) or 46dB μ V/m (3m) QPeak
 960MHz to 1000MHz: 500 μ V/m (3m) or 54dB μ V/m (3m) QPeak
 Above 1000MHz: 5012 μ V/m (3m) or 74dB μ V/m Peak
 500 μ V/m (3m) or 54dB μ V/m (3m) Average



5. TEST EQUIPMENT LIST

Field strength outside of the bands 13.110-14.010 MHz					
Apparatus	Trade Mark	Type	Registration number	Calibration date	Calibration due
EMI receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2015/12	2016/12
Cable	CABLES & CONNECTIQUES	2.9MD/CSU440AA/2.9MD/2000	A5329358	2016/02	2017/02
Cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA/3.5MD/4000	A5329374	2015/06	2016/06
Cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA/3.5MC/4000	A5329431	2016/03	2017/03
RF cable	RADIALL; CDI	30990-7M	A5329711	2016/03	2017/03
Preamplifier	BONN Elektronik	BLNA 3018-8F305	A7080053	2016/04	2017/04
Bilog antenna	SCHWARZBECK	VULB 9160	C2040150	2016/03	2017/03
Horn antenna	EMCO	3115	C2042018	2015/05	2016/05
Semi anechoic chamber	SIEPEL	-	D3044008	2014/05	2017/05
AC Power Line Conducted Emissions					
Apparatus	Trade Mark	Type	Registration number	Calibration date	Calibration due
Semi anechoic chamber	SIEPEL	-	D3044008	2014/05	2017/05
EMI receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2015/12	2016/12
Cable	CABLES & CONNECTIQUES		A5329411	2015/06	2016/06
Cable	CABLES & CONNECTIQUES		A5329417	2015/10	2016/10
V LISN	ROHDE & SCHWARZ	ENV216	C2320163	2016/03	2017/03



6. 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 %

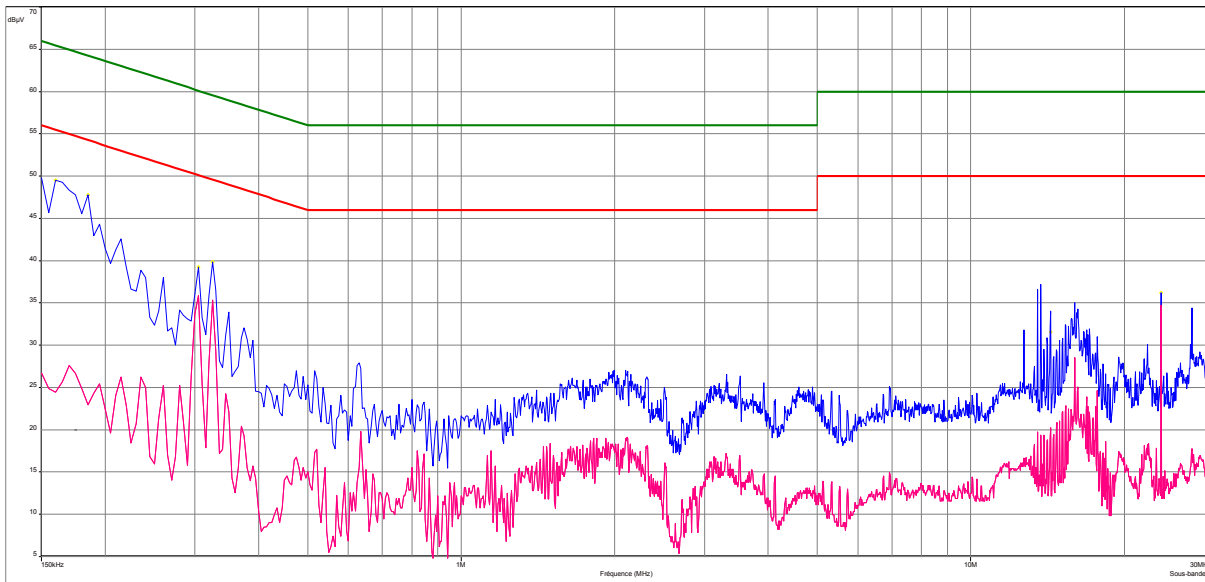


7. ANNEX (GRAPHS)

AC power line conducted emissions
Frequency: F_{nom}
Temperature: T_{nom}
Voltage: V_{nom}
Phase Line

Description Sous-bande 1
Fréquences: 150 kHz - 30 MHz (Mode: Lin, Pas: 5 kHz)
Réglages: RBW: 9 kHz, VBW: Auto, Temps de mesure: 50 ms/Pts, Nombre de Balayages: 1, Preamp: Off, LN Preamp: Off, Préselecteur: On
Ligne: Phase 1

— FCC/FCC 15.207 - Classe B - Moyenne/
— FCC/FCC 15.207 - Classe B - QcRéf/
— Mes Peak (Phase 1)
— Mes Avg (Phase 1)
● Niveau (Suspect Manuel) (Phase 1)

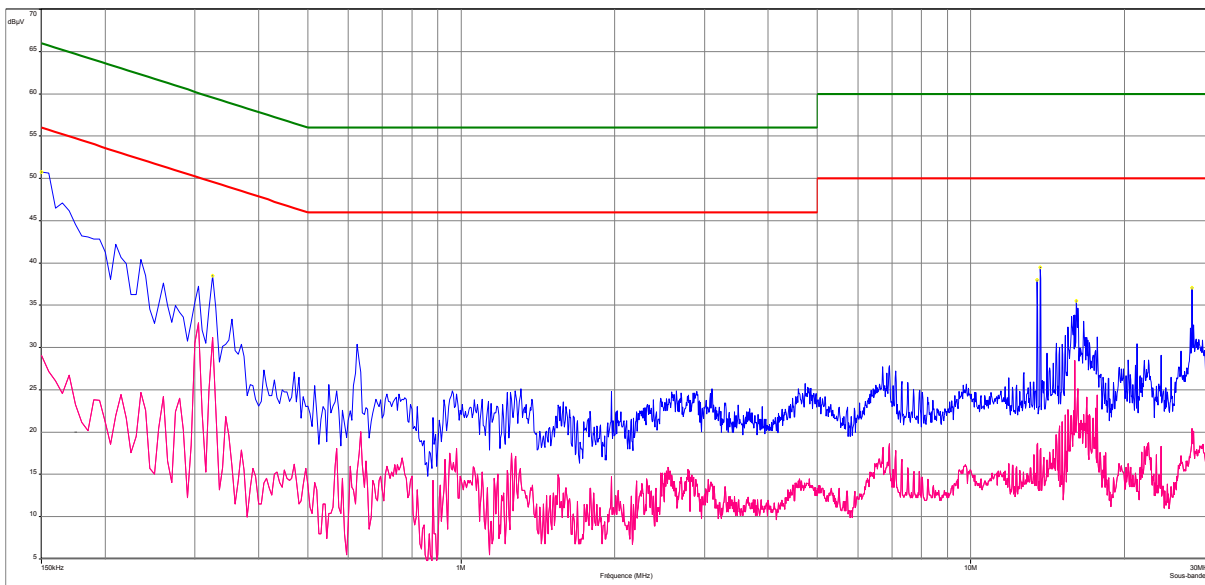




AC power line conducted emissions
Frequency: F_{nom}
Temperature: T_{nom}
Voltage: V_{nom}
Neutral Line

Description Sous-bande 2
Fréquences: 150 kHz - 30 MHz (Mode: Lin, Pas: 5 kHz)
Réglages: RBW: 9 kHz, VBW: Auto, Temps de mesure: 50 ms/Pts, Nombre de Balayages: 1, Preamp: Off, LN Preamp: Off, Préselecteur: On
Ligne: Neutre

— FCC/FCC 15.207 - Classe B - Moyenne/
— FCC/FCC 15.207 - Classe B - QCRéfé/
• Niveau (Suspect Manuel) (Neutre)
— Mes Peak (Neutre)
— Mes Avg (Neutre)



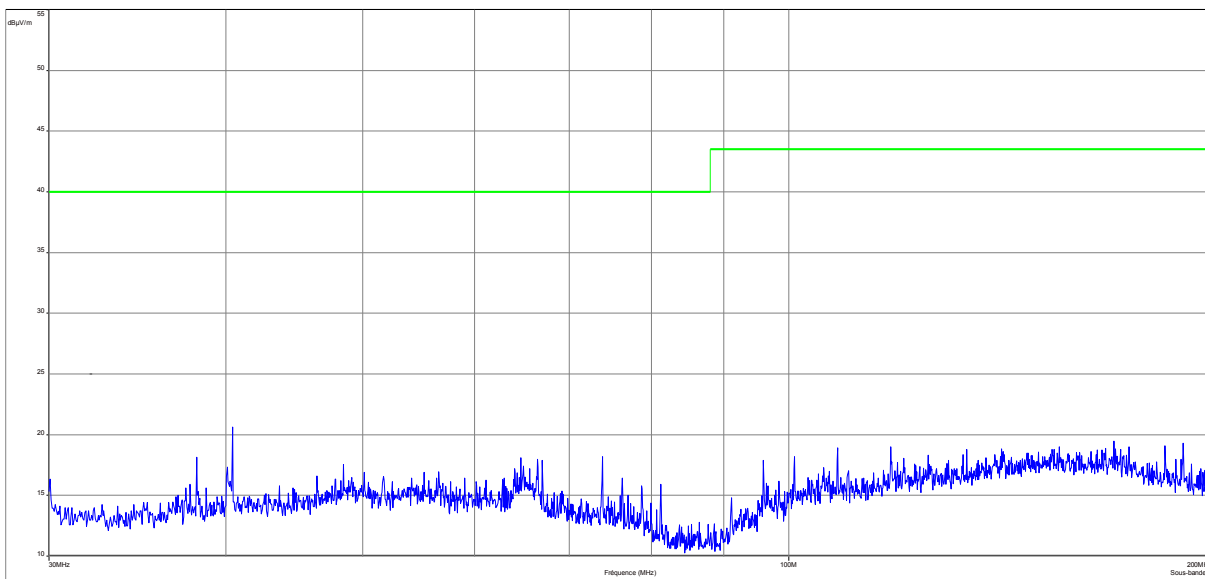


Transmitter Radiated Emissions

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

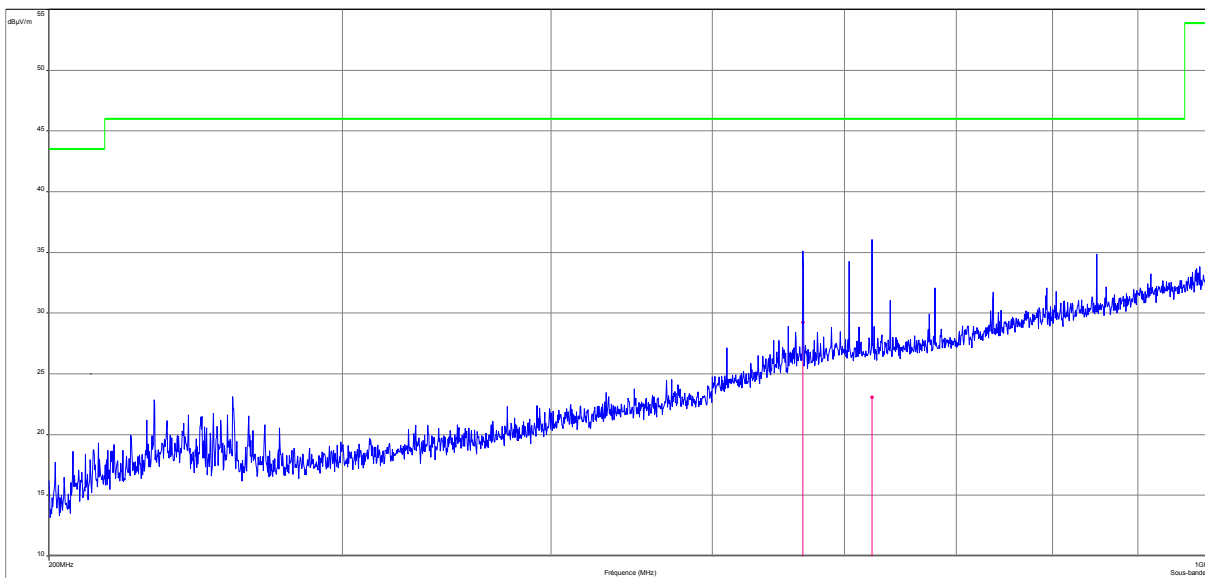
Description Sous-bande 1
Fréquences: 30 MHz - 200 MHz (Mode: Lin, Pas: 50 kHz)
Réglages: RBW: 120 kHz, VBW: Auto, Temps de mesure: 30 ms/Pis, Nombre de Balayages: 1, Preamp: On: 10 dB, LN Preamp: Off, Preselecteur: On
Polarisation: Horizontale
Distance: 3 m

— FCC/FCC 15.209 >30M - Classe:1 - QC4et/3.0m
— Mes. Peak (Horizontale)



Description Sous-bande 2
Fréquences: 200 MHz - 1 GHz (Mode: Lin, Pas: 60 kHz)
Réglages: RBW: 120 kHz, VBW: Auto, Temps de mesure: 30 ms/Pis, Nombre de Balayages: 1, Preamp: On: 10 dB, LN Preamp: Off, Preselecteur: On
Polarisation: Horizontale
Distance: 3 m

— FCC/FCC 15.209 >30M - Classe:1 - QC4et/3.0m
— Mes. Peak (Horizontale)
— Mes. Q-Peak (Horizontale)



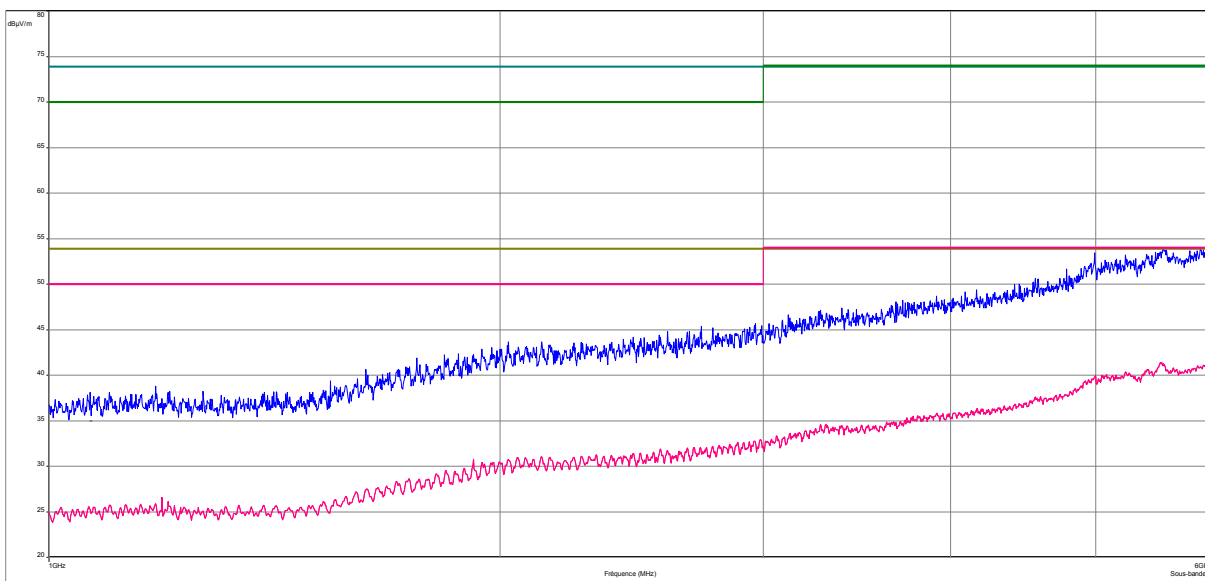
Horizontal Polarization (30-1000MHz)



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

Description Sous-bande 5
Fréquences: 1 GHz - 6 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure: 10 ms/Pts, Nombre de Balayages: 1, Preamp: Off, LN Preamp: Off, Préselecteur: Off
Polarisation: Horizontale
Distance: 3 m

- EN 55022 en dessous du GHz - Classe B - OCrite/0.0mV
- EN 55022 au dessus du GHz - Classe B - Moyenne/0.0mV
- EN 55022 au dessus du GHz - Classe B - Crête/0.0mV
- FCC/FCC 15.209 >30M - Classe 1 - Moyenne/0.0mV
- FCC/FCC 15.209 >30M - Classe 1 - Crête/0.0mV
- Mes Peak (Horizontale)
- Mes Avg (Horizontale)



Horizontal Polarization (1-6GHz)

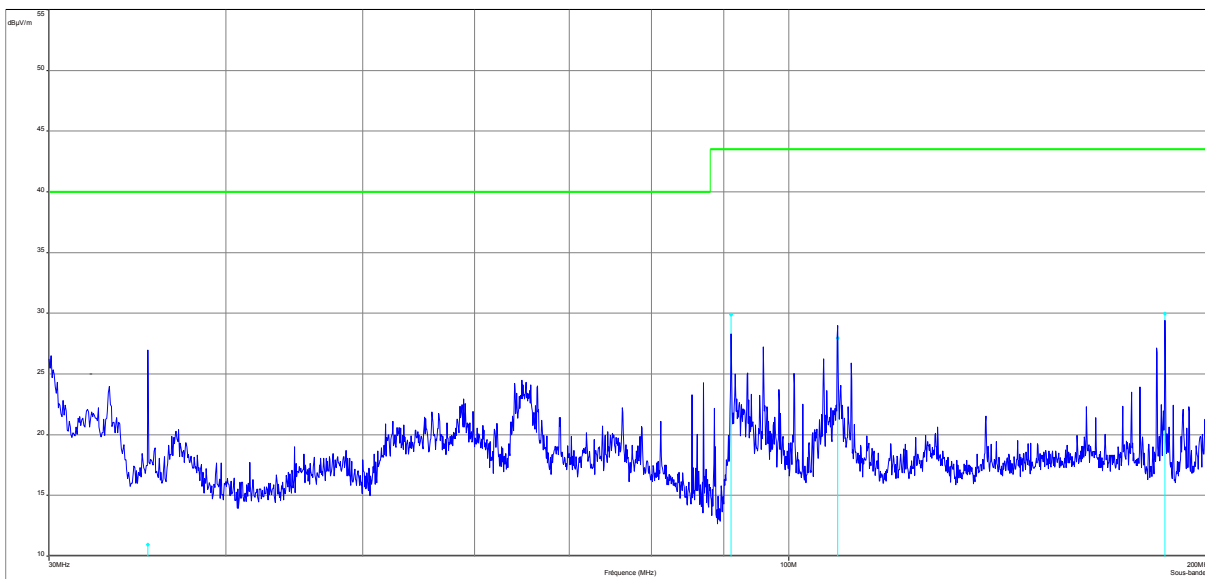


Transmitter Radiated Emissions

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

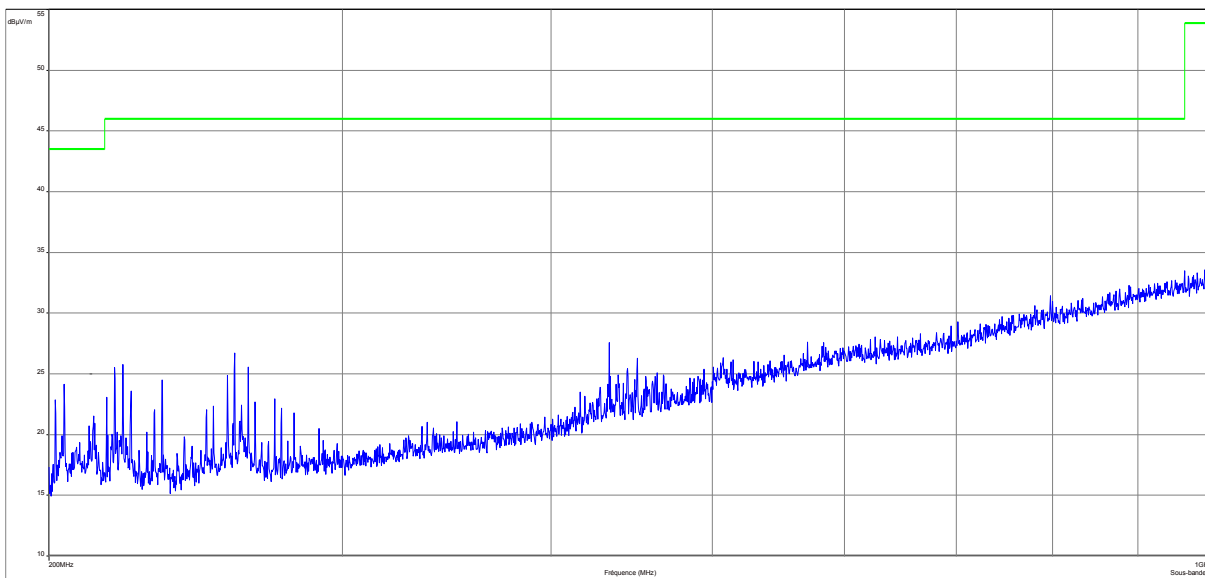
Description Sous-bande 3
Fréquences: 30 MHz - 200 MHz (Mode: Lin, Pas: 50 kHz)
Réglages: RBW: 120 kHz, VBW: Auto, Temps de mesure : 30 ms/Pis, Nombre de Balayages : 1, Preamp : On : 10 dB, LN Preamp : Off, Preselecteur: On
Polarisation: Verticale
Distance: 3 m

— FCC/FCC 15.209 *30M - Classe:1 - QC4et/3.0m
— Mes. Peak (Verticale)
— Mes. Q-Peak (Verticale)



Description Sous-bande 4
Fréquences: 200 MHz - 1 GHz (Mode: Lin, Pas: 60 kHz)
Réglages: RBW: 120 kHz, VBW: Auto, Temps de mesure : 30 ms/Pis, Nombre de Balayages : 1, Preamp : On : 10 dB, LN Preamp : Off, Preselecteur: On
Polarisation: Verticale
Distance: 3 m

— FCC/FCC 15.209 *30M - Classe:1 - QC4et/3.0m
— Mes. Peak (Verticale)



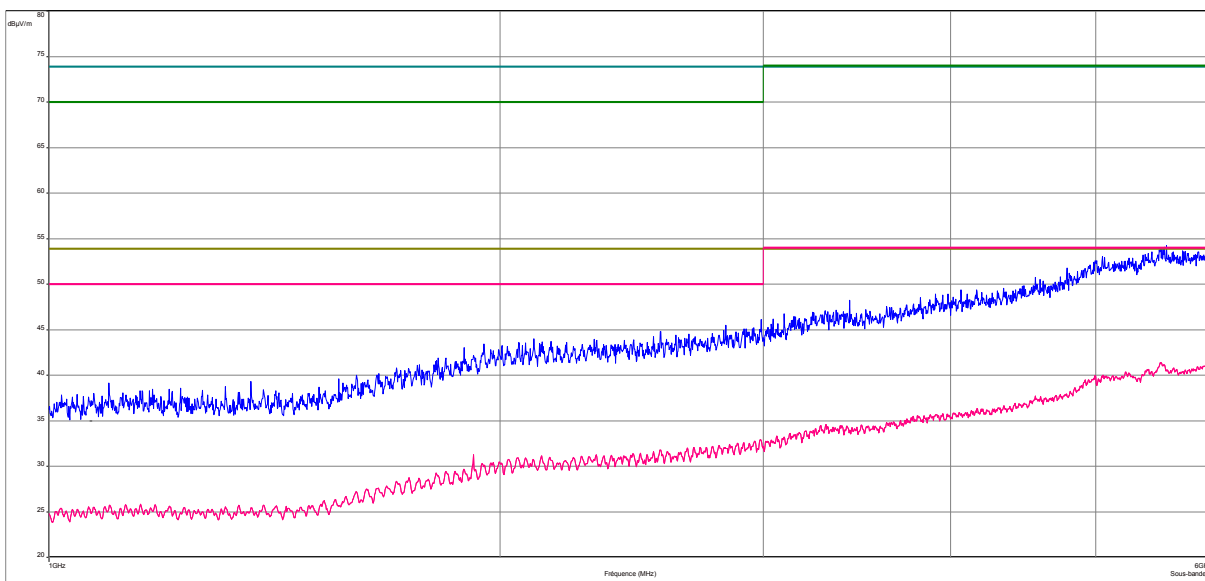
Vertical Polarization (30-1000MHz)



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

Description Sous-bande 6
Fréquences: 1 GHz - 6 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure: 10 ms/Pts, Nombre de Balayages: 1, Preamp: Off, LN Preamp: Off, Préselecteur: Off
Polarisation: Verticale
Distance: 3 m

- EN 55022 en dessous du GHz - Classe B - OCrite/3.0mV
- EN 55022 au dessus du GHz - Classe B - Moyenne/3.0mV
- EN 55022 au dessus du GHz - Classe B - Crête/3.0mV
- FCC/FCC 15.209 >30M - Classe 1 - Moyenne/3.0mV
- FCC/FCC 15.209 >30M - Classe 1 - Crête/3.0mV
- Mes Peak (Verticale)
- Mes Avg (Verticale)



Vertical Polarization (1-6GHz)