

LCIE
Etablissement de Moirans
ZI Centr'alp
170, rue de Chatagnon
38430 Moirans
RCS Grenoble 408 363 174
Tél. : +33 4 76 07 36 36
Fax : +33 4 76 55 90 88



Rapport d'essai / Test report

N° 351728-R2-E

JDE : 111847

DELIVRE A / ISSUED TO : **INGENICO**
1, Rue Claude Chappe
BP 348
07503 GUILHERAND-GRANGES - France

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 C*

Matériel testé / Apparatus under test :

- . Produit / Product : Lecteur de carte bancaire / Bank payment terminal
- . Marque / Trade mark : **INGENICO**
- . Constructeur / Manufacturer : **INGENICO**
- . Type / Model : **ICT250-01T1099C**
- . N° de série / serial number : **11059CT70625904**
- . FCC ID : **XKB-ICT250**

Date des essais / Test date : Du 20 au 23 Janvier 2012 / January 20th to 23th, 2012

Lieu d'essai / Test location : **LCIE SUD-EST**
ZI Centr'Alp – 170 rue de Chatagnon
38430 MOIRANS - France

Test réalisé par / Test performed by : Nathalie GAGNAIRE & Anthony MERLIN

Ce document comporte / Composition of document : 27 pages.

Ecrit par / Written by,
Nathalie GAGNAIRE & Anthony MERLIN

MOIRANS, LE 26 JANVIER 2012 / JANUARY 26TH, 2012

Approuvé par / Approved by
Jacques LORQUIN
**LABORATOIRE CENTRAL DES
APPAREILS ELECTRIQUES
LCIE SUD-EST
ZI Centr'Alp
170, Rue de Chatagnon
38430 MOIRANS
Tél. 04 76 07 36 36
Fax 04 76 55 90 88**

La reproduction de ce document n'est autorisée que sous sa forme intégrale. Toute reproduction partielle, ou utilisation de résultats dans un texte d'accompagnement en vue de leur diffusion doit recevoir un accord préalable et formel du LCIE. Ce document résulte d'essais effectués sur un spécimen, un échantillon ou une éprouvette. Il ne préjuge pas de la conformité de l'ensemble des produits fabriqués à l'objet essayé. Sauf indication contraire, la décision de conformité prend en compte l'incertitude de mesures. Il ne préjuge en aucun cas d'une décision de certification.
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 item tested. Unless otherwise specified, the decision of conformity takes into account the uncertainty of measures. This document does not anticipate any certification decision.

LCIE
33, av du Général Leclerc
BP 8
92266 Fontenay-aux-Roses cedex
France

Tél : +33 1 40 95 60 60
Fax : +33 1 40 95 86 56
contact@lcie.fr
www.lcie.fr

Société par Actions Simplifiée
au capital de 15 745 984 €
RCS Nanterre B 408 363 174
www.lcie.com



SUMMARY

1. TEST PROGRAM.....	3
2. SYSTEM TEST CONFIGURATION	4
3. RADIATED EMISSION DATA.....	6
4. FUNDAMENTAL FREQUENCY TOLERANCE (15.225E).....	12
5. BAND-EDGE COMPLIANCE §15.209	13
6. CONDUCTED EMISSION DATA	15
7. UNCERTAINTIES CHART.....	18
8. ANNEX 1 (GRAPH)	19



1. TEST PROGRAM

Standard: - FCC Part 15, Subpart B (Digital Devices)
 - ANSI C63.4 (2003)

EMISSION TEST	LIMITS			RESULTS (Comments)
Limits for conducted disturbance at mains ports 150kHz-30MHz	Frequency	Quasi-peak value (dBµV)	Average value (dBµV)	PASS
	150-500kHz	66 to 56	56 to 46	
	0.5-5MHz	56	46	
	5-30MHz	60	50	
Radiated emissions 30MHz-12.5GHz	Measure at 3m 30MHz-88MHz : 40 dBµV/m 88MHz-216MHz : 43.5 dBµV/m 216MHz-960MHz : 46.0 dBµV/m Above 960MHz : 54.0 dBµV/m			PASS

Standard: - FCC Part 15, Subpart C
 - ANSI C63.4 (2003)

EMISSION TEST	LIMITS			RESULTS (Comments)
Limits for conducted disturbance at mains ports 150kHz-30MHz	Frequency	Quasi-peak value (dBµV)	Average value (dBµV)	PASS
	150-500kHz	66 to 56	56 to 46	
	0.5-5MHz	56	46	
	5-30MHz	60	50	
Radiated emissions 9kHz-30MHz	Measure at 300m 9kHz-490kHz : 67.6dBµV/m /F(kHz) Measure at 30m 490kHz-1.705MHz : 87.6dBµV/m /F(kHz) 1.705MHz-30MHz : 29.5 dBµV/m			PASS
Radiated emissions 30MHz-12.5GHz*	Measure at 3m 30MHz-88MHz : 40 dBµV/m 88MHz-216MHz : 43.5 dBµV/m 216MHz-960MHz : 46.0 dBµV/m Above 960MHz : 54.0 dBµV/m			PASS
Fundamental frequency tolerance	Operation within the band 13.110-14.010 MHz §15.225			PASS
Bandedge compliance	Operation within the band 13.110-14.010 MHz §15.225			PASS

*§15.33: The highest internal source of a testing device is defined like more the highest frequency generated or used in the testing device or on which the testing device works or agrees.

- If the highest frequency of the internal sources of the testing device is lower than 108 MHz, measurement must be only performed until 1GHz.
- If the highest frequency of the internal sources of the testing device ranges between 108 MHz and 500 MHz, measurement must be only performed until 2GHz.
- If the highest frequency of the internal sources of the testing device ranges between 500 MHz and 1 GHz, measurement must be only performed until 5GHz.

If the highest frequency of the internal sources of the testing device is above 1 GHz, measurement must be only performed until 5 times the highest frequency or 40 GHz, while taking smallest of both.



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):**

ICT250-01T1099C

Serial number: 11059CT70625904

MagicBox: 2961105416

FCC ID: XKB-ICT250

- **Power supply:**

- AC / DC Adaptor: PHIHONG Model N°: PSM24W-080 Sn/4
- Rating: 100-240V
- Output : 8V DC 3A
- Frequency: 50-60Hz

- **Inputs/outputs:**

- 1x DC power input (8Vdc)
- 1x Serial link (RS232C can't be longer than 3m)
- 1x Ethernet line (may be longer than 3m)
- 1x Dial-up Modem line IN (may be longer than 3m)
- 1 x USB host, not used and without cable
- 1 x USB slave, not used and without cable
- 2 x SAMs
- 1 x CAM0
- 1 x MicroSD

- **Cables:**

- 1x Magic Box extension cord with I/O connectors, spiraled: 1m
- 1x AC power cord, 2 wires, unshielded: 2m
- 1x DC power supply cable (fixed on mains power unit), unshielded: 1.75m
- 1x Ethernet cable, Cat 5e, unshielded: 2m
- 1x RS232 Com cable, RJ11, unshielded, 1.5m
- 1x Line In cable, RJ11, unshielded, 1.5m

- **Auxiliaries equipment used during test:**

- 1x Smartcard (Bank credit card) Sn: none
- 2x SAM cards Sn: none
- 1 x Contactless card RFID reader Sn: None
- 1x Laptop PC TOSHIBA SATELITE S1410-704 (PS141E-04YCM-3V) Sn: 13594938G
with its power supply unit (PA3201U-1ACA SEB100P2-15.0)
- 1x TELTON Telephone line simulator TLS-5B-01 Sn: 014184



2.3. EUT CONFIGURATION

Configuration 1	Configuration 2
<p>The EUT is connected to a laptop PC with its Ethernet link. (Ping function activated). The inboard software (TEST CEM) performed the followings tests and activates the followings functions:</p> <ul style="list-style-type: none">- Printer ON,- Modem is online- Smartcards reading: MicroSD, CAM0, SAM1 and 2 (power ON and reading)- Backlight and display are ON.	<p>The EUT is connected to a laptop PC with its Ethernet link. (Ping function activated). The inboard software (TEST CEM) performed the followings tests and activates the followings functions:</p> <ul style="list-style-type: none">- Printer ON,- Contact less is activated- Smartcards reading: MicroSD, CAM0, SAM1 and 2 (power ON and reading)- Backlight and display are ON.

2.4. EQUIPMENT MODIFICATIONS

None

2.5. SPECIAL ACCESSORIES

None

3. RADIATED EMISSION DATA

3.1. CLIMATIC CONDITIONS

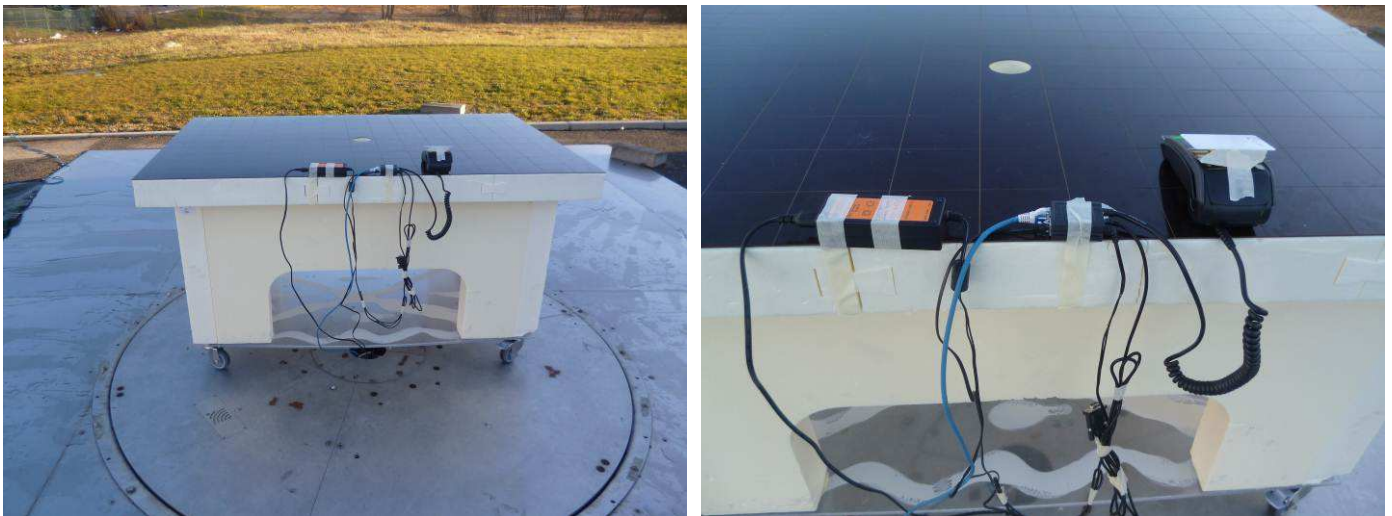
Date of test	: January 20 th , 2012	January 23 th , 2012
Test performed by	: N. GAGNAIRE	N.GAGNAIRE
Atmospheric pressure	: 995HPa	1000HPa
Relative humidity	: 30%	30%
Ambient temperature	: 21°C	21°C

3.2. TEST SETUP

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

The EUT and auxiliaries are set on the non-conducting table of 80 cm height.

The EUT is powered by 230Vac/50Hz (EUT and auxiliaries)



Radiated emission test setup



3.1. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Adapter quasi-peak	HEWLETT PACKARD	HP85650A	A4049059
Amplifier 0.1MHz – 1300 MHz	HEWLETT PACKARD	8447D	A7085008
Amplifier 8-26GHz	ALDETEC	ALS01452	A7102026
Antenna Bi-Log XWing	TESEQ	CBL6144	C2040145
Antenna horn	EMCO	3115	C2042027
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052
Cable	UTIFLEX	-	A5329189
Cable	UTIFLEX	-	A5329191
Cable	UTIFLEX	-	A5329189
Cable	UTIFLEX	-	A5329559
Semi-Anechoic chamber #1	SIEPEL	-	D3044016
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019
Spectrum analyzer	HEWLETT PACKARD	HP8568B	A4060017
Spectrum analyzer display	HEWLETT PACKARD	HP85662A	A4060019
Turntable chamber (Cage#1)	MATURO Gmbh	TT 2.0 SI	F2000406
Antenna mast (Cage#1)	MATURO Gmbh	AM 4.0	F2000407
Turntable controller (Cage#1)	MATURO Gmbh	Control Unit	F2000408
Antenna Bi-log	CHASE	CBL6111A	C2040051
Cable	-	-	A5329557
Cable OATS (Mast at 10m)	UTIFLEX	-	A5329188
Cable OATS (Mast at 10m)	UTIFLEX	-	A5329199
Radiated emission comb generator	BARDET	-	A3169050
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019
Thermo-hygrometer	OREGON	BAR916HG-G	B4206011
Turntable / Mast controller (OATS)	ETS Lindgren	Model 2066	F2000372
Antenna mast (OATS)	ETS Lindgren	2071-2	F2000392
Turntable (OATS)	ETS Lindgren	Model 2187	F2000403

3.2. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None



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 semi anechoic chamber. The distance between EUT and antenna is 3 meters. For Pre-characterization, the loop antenna was rotated during the test for maximized the emission measurement. Measurement performed on 4 axis of EUT. Frequency band investigated is 9kHz to 30MHz.

The pre-characterization graphs are obtained in PEAK detection.

See graph for 9kHz-30MHz band:

Emr#1

(See annex 1)

3.3.2. Pre-characterization [30MHz-12.5GHz]

A pre-scan of all the setup has been performed in a 3 meters semi-anechoic chamber. The distance between EUT and antenna is 3 meters. Test is performed in horizontal (H) and vertical (V) polarization. During the measurement, the EUT is rotated on a 360° range.

The pre-characterization graphs are obtained in PEAK detection.

For frequency band 1GHz to 12.5GHz, a search is performed in the semi-anechoic chamber in order to determine frequencies radiated by the EUT (Measuring distance reduced to 1m).

See graphs for 30MHz-1GHz:

V polarization
H polarization
V polarization
H polarization

Configuration n°1
Configuration n°1
Configuration n°2
Configuration n°2

Emr#2
Emr#3
Emr#4
Emr#5

(See annex 1)
(See annex 1)
(See annex 1)
(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. Measurement performed on 3 axis of EUT. 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)	Ant. Pol./ Angle (deg)	Tot Corr (dB)
13.56* ¹	84.0	41.2	-42.8	90	0	35.3
27.12* ¹	29.5	24.1	-5.4	75	90	39.2

*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 84 dBµV/m	30
13.410-13.553 13.567-13.710	334 50.5 dBµV/m	30
13.110-13.410 13.710-14.010	106 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 12.5GHz

The product has been tested at a distance of **10 meters** from the antenna and compared to the FCC part 15 subpart B §15.109 limits and C §15.209 limits. Measurement bandwidth was 120kHz from 30 MHz to 1GHz and 1MHz from 1GHz to 12.5GHz.

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. Measurement performed on 3 axis of EUT.

A summary of the worst case emissions found in all test configurations and modes is shown on clause 3.2

Worst case final data result:

No	Frequency (MHz)	QPeak Limit (dBµV/m)	Qpeak * (dBµV/m)	Qpeak-Limit (Margin, dB)	Angle (deg)	Pol	Hgt (cm)	Tot Corr (dB)	Comments
1	39.467	40.0	36.6	-3.4	70	V	100	13.7	
2	45.569	40.0	39.6	-0.4	0	V	100	11.0	
3	47.034	40.0	38.9	-1.1	0	V	150	10.3	
4	47.798	40.0	39.8	-0.2	0	V	150	9.8	
5	54.153	40.0	35.3	-4.7	0	V	100	7.9	
6	108.772	43.5	34.3	-9.2	45	V	100	12.9	
7	168.766	43.5	28.4	-15.1	61	V	100	12.1	
8	242.828	46.0	41.8	-4.2	0	V	150	14.8	
9	266.634	46.0	38.0	-8.0	340	V	100	15.5	
10	387.081	46.0	41.7	-4.3	138	V	100	18.9	

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

Frequency band 1GHz to 12.5GHz

Measurements are performed using a PEAK and Average detection. (RBW = 1MHz)

No	Frequency (GHz)	Limit Average (dBµV/m)	Measure Average (dBµV/m)	Margin (Mes-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)	Comments
No Significant Frequency observed									

Note: Measures have been done at 3m distance.

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 52.5dB μ V 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 dB μ V/m.

$$FS = 52.5 + 7.4 + 1.1 - 29 = 32 \text{ dB}\mu\text{V/m}$$

The 32 dB μ V/m value can be mathematically converted to its corresponding level in μ V/m.

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32\text{dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}.$$



4. FUNDAMENTAL FREQUENCY TOLERANCE (15.225E)

4.1. TEST CONDITIONS

Date of test : January 25th, 2012
 Test performed by : A.MERLIN

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

4.2. Temperature and voltage fluctuation

Temperature has been set at +20°C, -20°C and +50°C.
 Voltage is varied from 93.5VAC to 126VAC
 Frequency of carrier: 13.56 MHz
 Upper limit: 13.561356 MHz
 Lower limit: 13.558644 MHz
 The equipment (RF box) is set in a climatic chamber. Measure is performed on one channel of RF module.

Temperature	-20°C	20°C	+50°C
Voltage			
Mains voltage: 110V/60Hz			
Frequency Drift (MHz)	+ 0.000511	REF	+ 0.000473
Carrier level (dBc)	- 0.3	REF	- 1.2
Mains voltage: 93,5V/60Hz			
Frequency Drift (MHz)	+ 0.000511	+ 0.000000	+ 0.000471
Carrier level (dBc)	- 0.3	+ 0.0	- 1.3
Mains voltage: 126V/60Hz			
Frequency Drift (MHz)	+ 0.000511	+ 0.000000	+ 0.000471
Carrier level (dBc)	- 0.3	+ 0.0	- 1.2

Frequency drift measured is **511Hz** when the temperature is varied from -20°C to +50°C and voltage is varied from 110V/60Hz $\pm 15\%$.

4.1. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052
Cable	UTIFLEX	-	A5329184
Climatic chamber	BIA CLIMATIC	CL 6-25	D1022117
Power supply DC 100V	HEWLETT PACKARD	6634B	A704282
Receiver 9kHz - 6GHz	ROHDE & SCHWARZ	FSL6	A2642020

4.2. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

**5. BAND-EDGE COMPLIANCE §15.209****5.1. CLIMATIC CONDITIONS**

Date of test : January 26th, 2012
Test performed by : A.MERLIN
Atmospheric pressure : 991mb
Relative humidity : 40%
Ambient temperature : 21°C

5.2. EQUIPMENT CONFIGURATION

See § 2.3.

5.1. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052
Cable	UTIFLEX	-	A5329184
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019

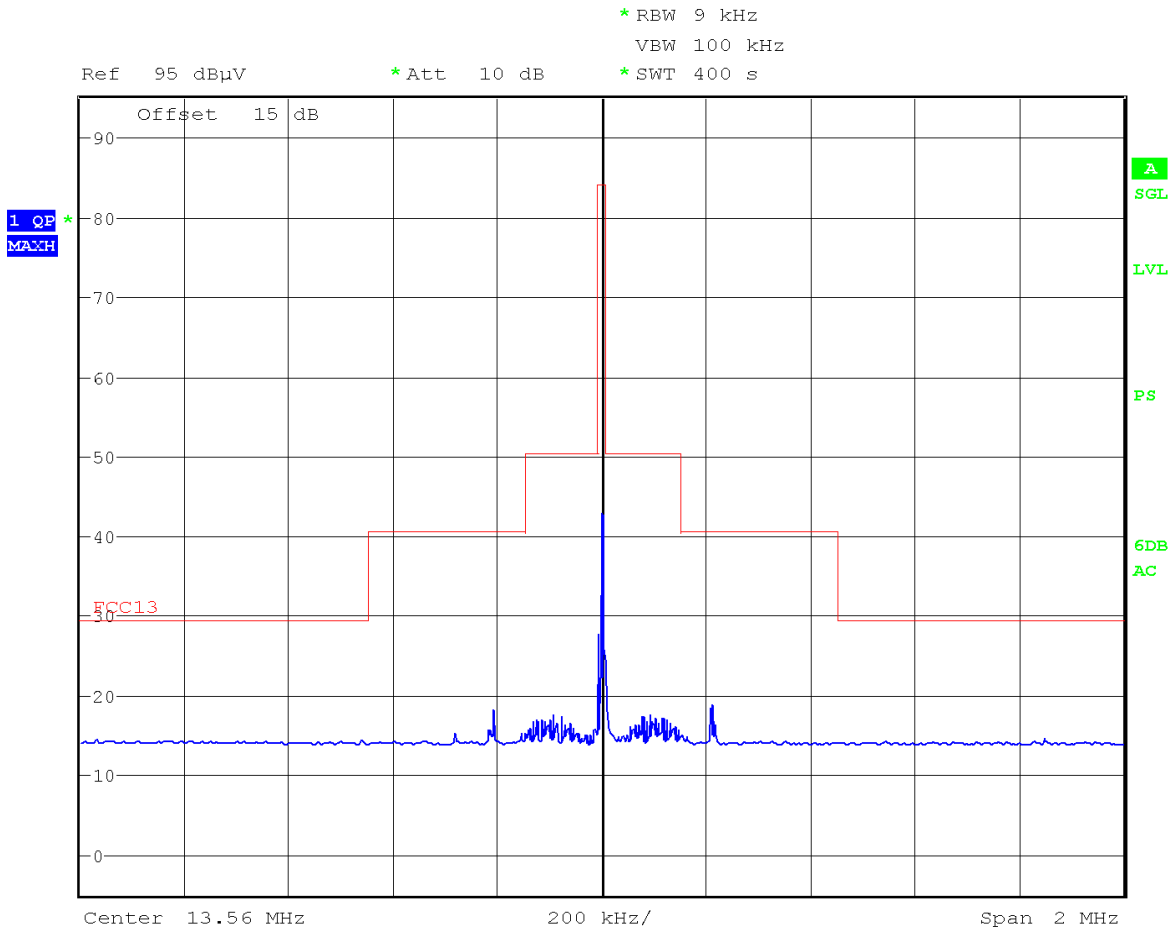
5.2. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None



5.3. 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.



**6. CONDUCTED EMISSION DATA****6.1. CLIMATIC CONDITIONS**

Date of test : January 20th, 2012
Test performed by : Nathalie GAGNAIRE
Atmospheric pressure : 1000mb
Relative humidity : 30%
Ambient temperature : 21°C

6.2. SETUP FOR CONDUCTED EMISSIONS MEASUREMENT

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

The product has been tested with 120V/60Hz power line voltage and compared to the FCC Part 15 subpart B §15.107 and 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.

6.1. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Conducted emission comb generator	BARDET	-	A3169049
LISN tri-phase ESH2-Z5	RHODE & SCHWARZ	33852.19.53	C2320063
LISN	RHODE & SCHWARZ	ENV216	C2320123
Cable	-	-	A5329197
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019
Thermo-hygrometer	OREGON	BAR916HG-G	B4206011
Transient limiter	ROHDE & SCHWARZ	ESH3-Z2	A4049204

6.2. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

6.3. TEST SETUP

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 trough the LISN (measure).



Conducted emission test setup

**6.4. TEST SEQUENCE AND RESULTS**

Measurements are performed on the phase (L1) and neutral (N) of power line voltage.
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.

Configuration 1:

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

Configuration 2:

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

RESULT: PASS



7. 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 (triphase) <i>Measurement of conducted disturbances in voltage on the power port (three phases)</i>	3.6 dB	3.6 dB
Mesure des perturbations conduites en tension sur le réseau d'énergie (monophasé) <i>Measurement of conducted disturbances in voltage on the power port (single line)</i>	3.57 dB	3.6 dB
Mesure des perturbations conduites en tension sur le réseau de télécommunication <i>Measurement of conducted disturbances in voltage on the telecommunication port.</i>	3.28 dB	A l'étude / Under consid.
Mesure des perturbations discontinues conduites en tension <i>Measurement of discontinuous conducted disturbances in voltage</i>	3.47 dB	3.6 dB
Mesure des perturbations conduites en courant <i>Measurement of conducted disturbances in current</i>	2.90 dB	A l'étude / Under consid.
Mesure du champ électrique rayonné sur le site en espace libre de Moirans <i>Measurement of radiated electric field on the Moirans open area test site</i>	5.07 dB	5.2 dB
Mesure du champ électrique rayonné IN SITU de 30 à 1000 MHz <i>IN SITU measurement of radiated electric field from 30 to 1000MHz</i>	A l'étude / Under consideration	5.2 dB
Mesure de la puissance perturbatrice / <i>Measurement of disturbance power</i>	3.37 dB	4.5 dB
Mesure des harmoniques de courant / <i>Measurement of current harmonics</i>	11.11%	/
Mesure du flicker / <i>Flicker measurement</i>	9.26%	/

Les valeurs d'incertitudes calculées du laboratoire étant inférieures aux valeurs d'incertitudes limites établies par le CISPR, la conformité de l'échantillon est établie directement par les niveaux limites applicables. / *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.*

Note - L'incertitude de mesure instrumentale est déterminée selon la CISPR 16-4-2. / *The instrumentation measurement uncertainty is determined according to CISPR16-4-2*



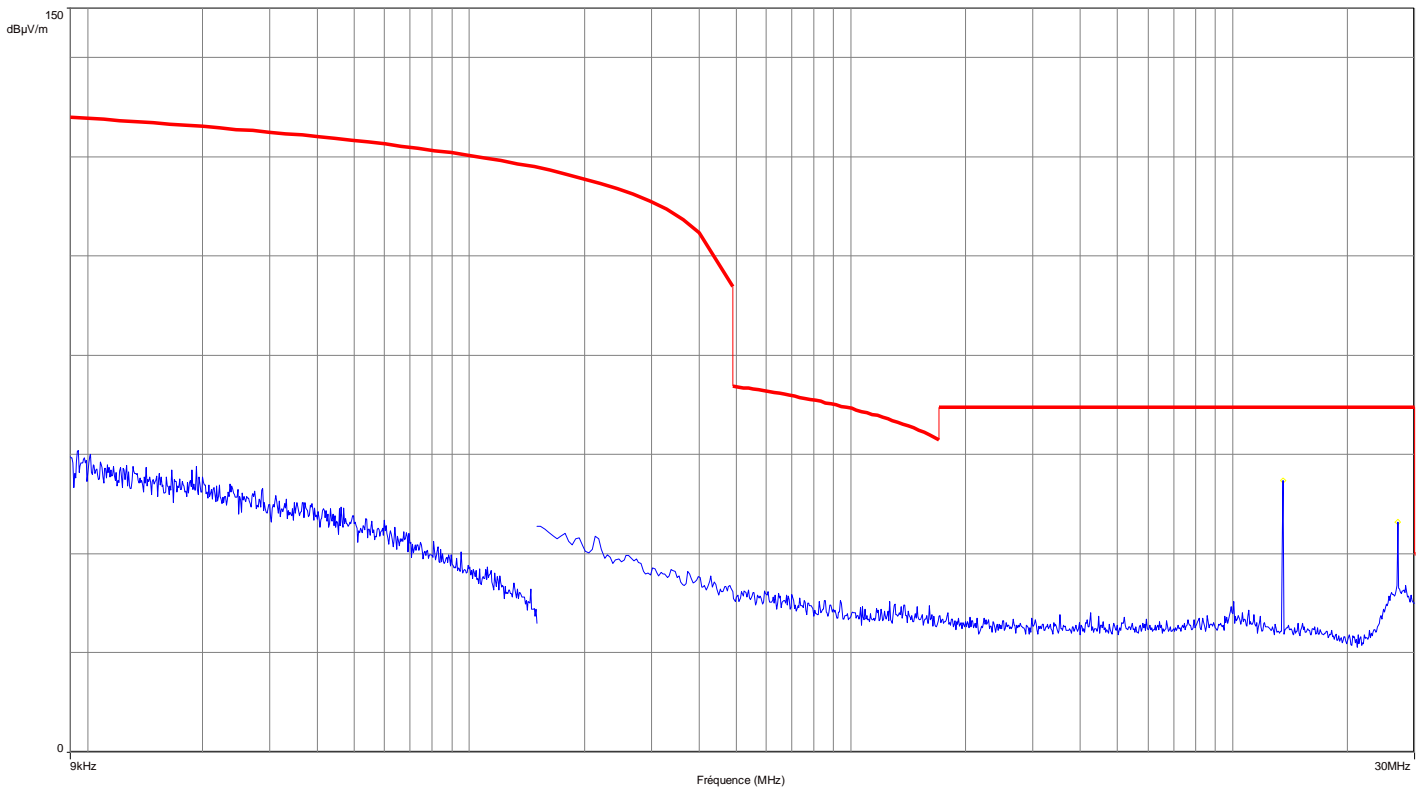
8. ANNEX 1 (GRAPH)

RADIATED EMISSIONS

Graph name :	Emr#1	Test configuration:
Limit :	FCC Part15B	Worst case - ITC250 V2
Class :	B	

PARAMETERS

Antenna polarization:	Parallel	Legend:
Azimuth :	0° - 360°	█ Peak Measure
RBW :	100Hz - 9kHz	█ QPeak Limit@3m
VBW :	300kHz	
Frequency :	9kHz-30MHz	



Freq (MHz)	Peak Level (dBµV/m)
* 13.542	54.67
27.118	46.47

*Carrier Frequency

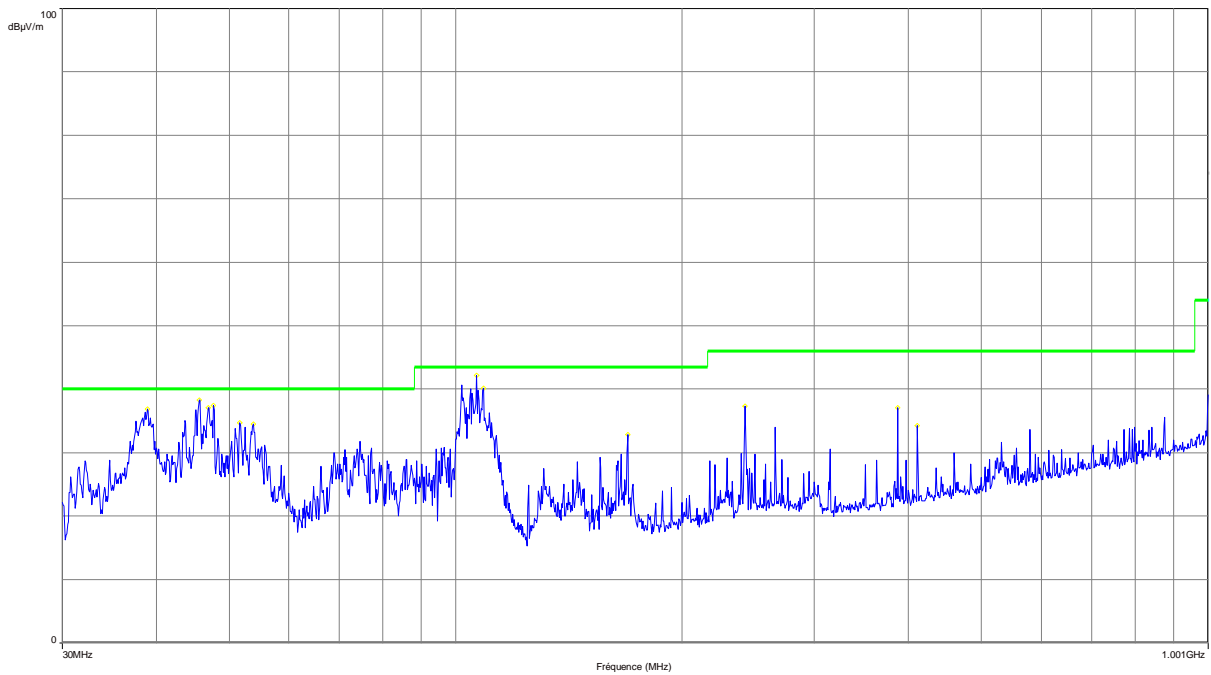


RADIATED EMISSIONS

Graph name :	Emr#2	Test configuration:
Limit :	FCC Part15B	V - ITC250 V2 - Modem
Class :	B	

PARAMETERS

Antenna polarization:	Verticale	Legend:
Azimuth :	0° - 360°	█ Peak Measure
RBW :	100kHz	█ QPeak Limit@3m
VBW :	300kHz	
Frequency :	30MHz- 1.001GHz	



Freq (MHz)	Peak Level (dBµV/m)
38.88	36.86
45.6	38.3
46.92	37.09
47.68	37.49
51.68	34.77
53.8	34.48
106.64	42.14
108.76	40.21
169.24	32.8
242.76	37.29
387	37.07
411.16	34.2

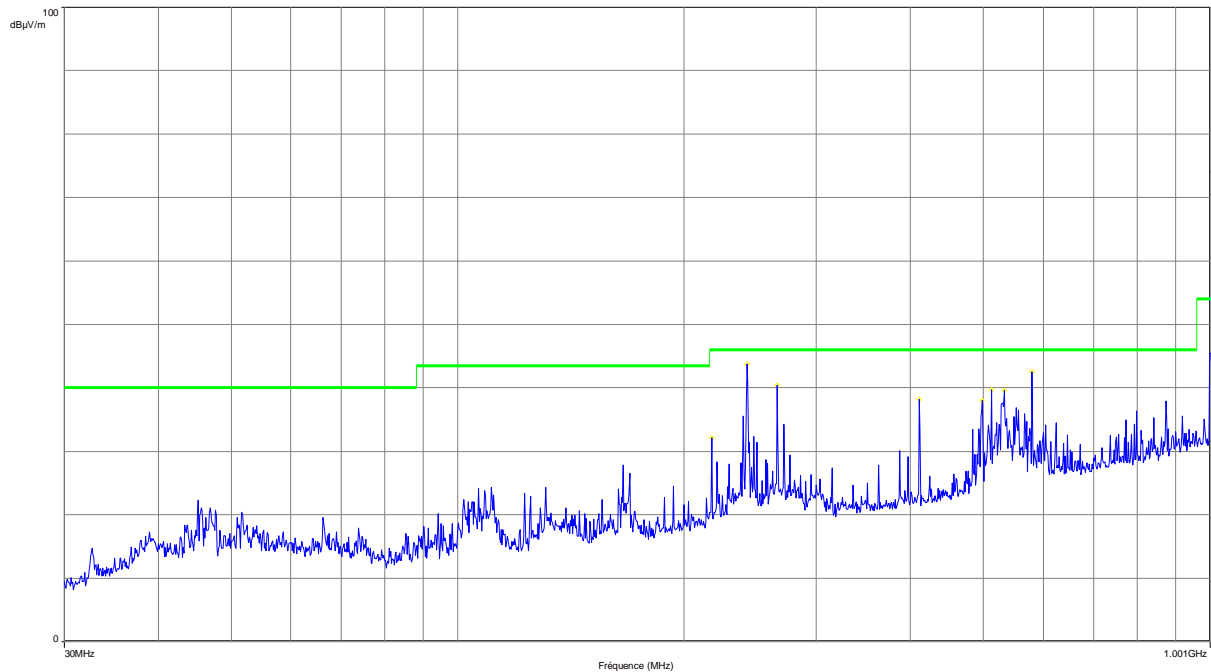


RADIATED EMISSIONS

Graph name :	Emr#3	Test configuration:
Limit :	FCC Part15B	H - ITC250 V2 - Modem
Class :	B	

PARAMETERS

Antenna polarization:	Horizontale	Legend:
Azimuth :	0°- 360°	█ Peak Measure
RBW :	100kHz	█ QPeak Limit@3m
VBW :	300kHz	
Frequency :	30MHz- 1.001GHz	

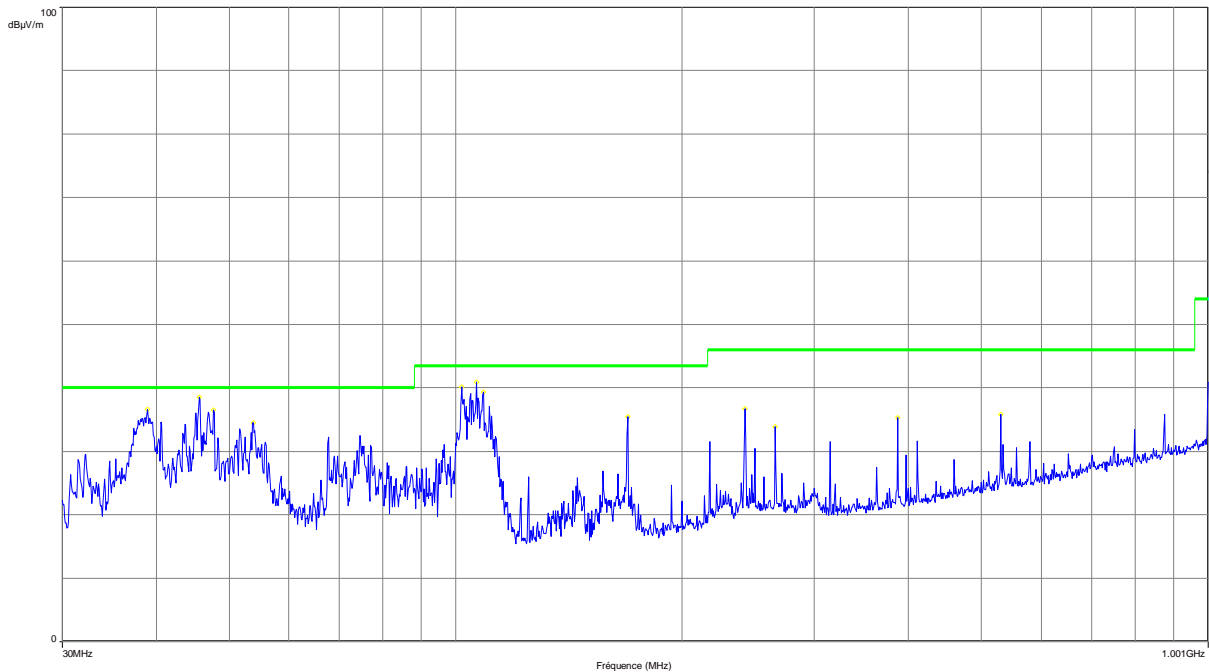


Freq (MHz)	Peak Level (dBµV/m)
217.6	32.07
242.76	43.69
266.04	40.45
411.12	38.2
497.88	38.03
512.16	39.64
533.16	39.58
580.48	42.51



RADIATED EMISSIONS		
Graph name :	Emr#4	Test configuration:
Limit :	FCC Part15B	V - ITC250 V2 - Cless
Class :	B	

PARAMETERS		
Antenna polarization:	Verticale	Legend:
Azimuth :	0° - 360°	█ Peak Measure
RBW :	100kHz	█ QPeak Limit@3m
VBW :	300kHz	
Frequency :	30MHz- 1.001GHz	



Freq (MHz)	Peak Level (dBµV/m)
38.92	36.58
45.64	38.5
47.68	36.49
53.8	34.48
101.8	40.18
106.6	40.84
108.8	39.31
169.24	35.4
242.72	36.79
266.04	33.85
387	35.27
530.6	35.84



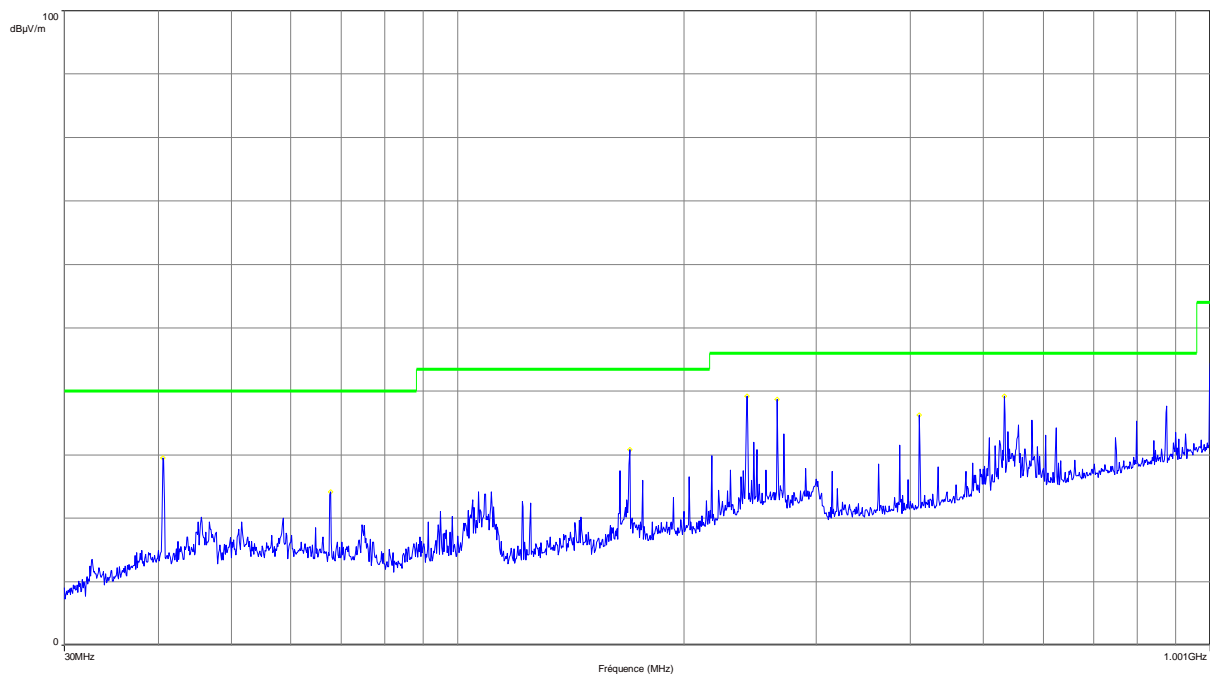
Operator :
Date : 20/01/2012 14:59:38

RADIATED EMISSIONS

Graph name :	Emr#5	Test configuration:
Limit :	FCC Part15B	H - ITC250 V2 - Cless
Class :	B	

PARAMETERS

Antenna polarization:	Horizontale	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	100kHz	QPeak Limit@3m
VBW :	300kHz	
Frequency :	30MHz- 1.001GHz	

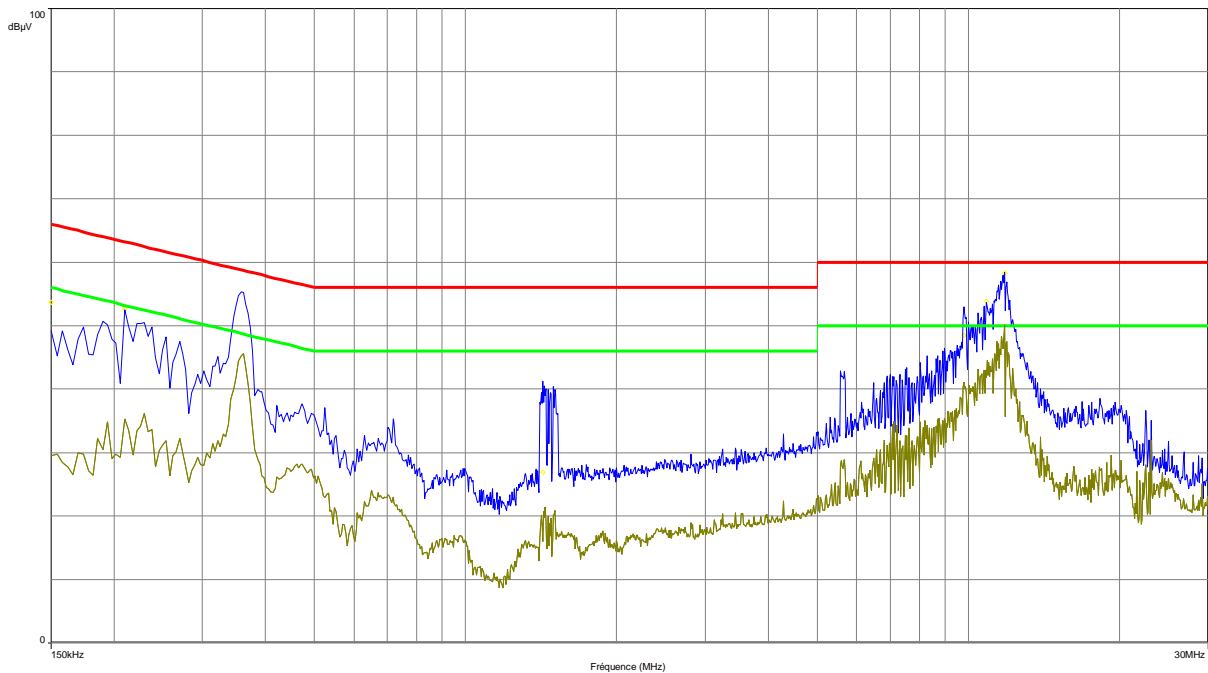


Freq (MHz)	Peak Level (dBµV/m)
40.6	29.49
67.72	24.15
169.2	30.8
242.76	39.19
266.04	38.75
411.16	36.3
533.36	39.19



CONDUCTED EMISSIONS		
Graph name :	Emc#1	Test configuration:
Limit :	EN 55022	ITC250 - L1 - 110V 60Hz Modem
Class :	B	

PARAMETERS			
Voltage / Frequency :	110VAC / 60Hz	Legend:	
Line :	Phase1	Peak Measure	Average Measure
RBW :	9kHz	QPeak Limit	Average Limit
VBW :	30kHz		
Frequency :	150kHz- 30MHz		

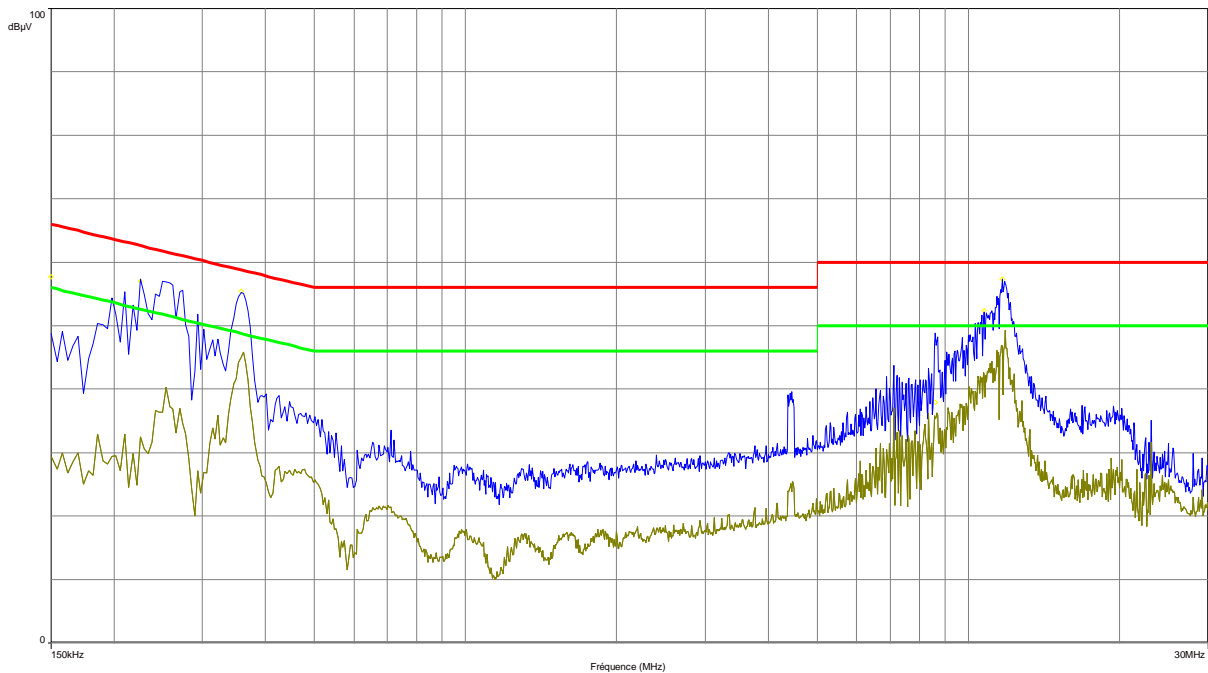


Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.15	46.19	48.77	-2.58	48.39	58.77	-10.39
0.21	34.42	53.21	-18.79	49.11	63.21	-14.1
1.426	14.37	46	-31.63	23.18	56	-32.82
9.794	34.58	50	-15.42	41.63	60	-18.37
10.882	39.45	50	-10.55	46.96	60	-13.04
11.822	39.7	50	-10.3	53.17	60	-6.83



CONDUCTED EMISSIONS		
Graph name :	Emc#2	Test configuration:
Limit :	EN 55022	ITC250 - N - 110V 60Hz Modem
Class :	B	

PARAMETERS			
Voltage / Frequency :	110VAC / 60Hz	Legend:	
Line :	Phase1	Peak Measure	Average Measure
RBW :	9kHz	QPeak Limit	Average Limit
VBW :	30kHz		
Frequency :	150kHz- 30MHz		

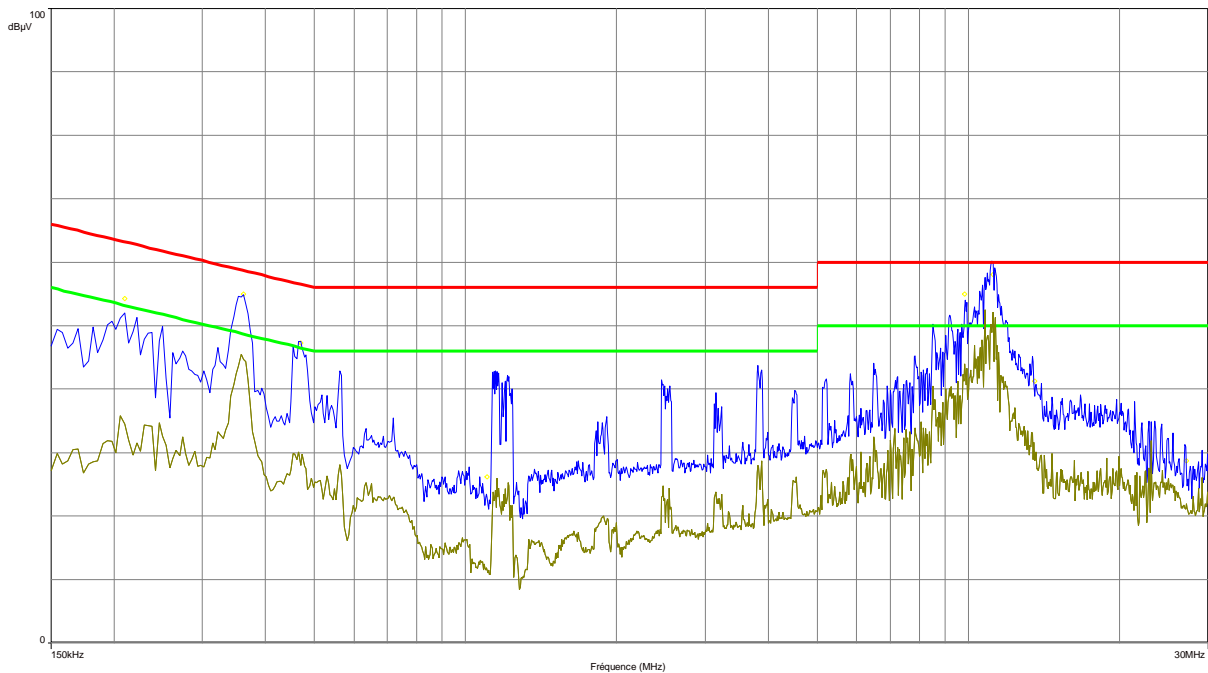


Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.15	48.5	51.63	-3.12	51.28	61.63	-10.34
0.226	31.72	52.6	-20.88	48.03	62.6	-14.56
0.358	44.95	48.77	-3.82	53.27	58.77	-5.51
8.602	26.25	50	-23.75	32.73	60	-27.27
10.746	39.41	50	-10.59	46.16	60	-13.84
11.686	38.24	50	-11.76	52.13	60	-7.87



CONDUCTED EMISSIONS		
Graph name :	Emc#3	Test configuration:
Limit :	EN 55022	ITC250 - L1 - 110V 60Hz Cless
Class :	B	

PARAMETERS			
Voltage / Frequency :	110VAC / 60Hz	Legend:	
Line :	Phase1	█ Peak Measure	█ Average Measure
RBW :	9kHz	█ QPeak Limit	█ Average Limit
VBW :	30kHz		
Frequency :	150kHz- 30MHz		



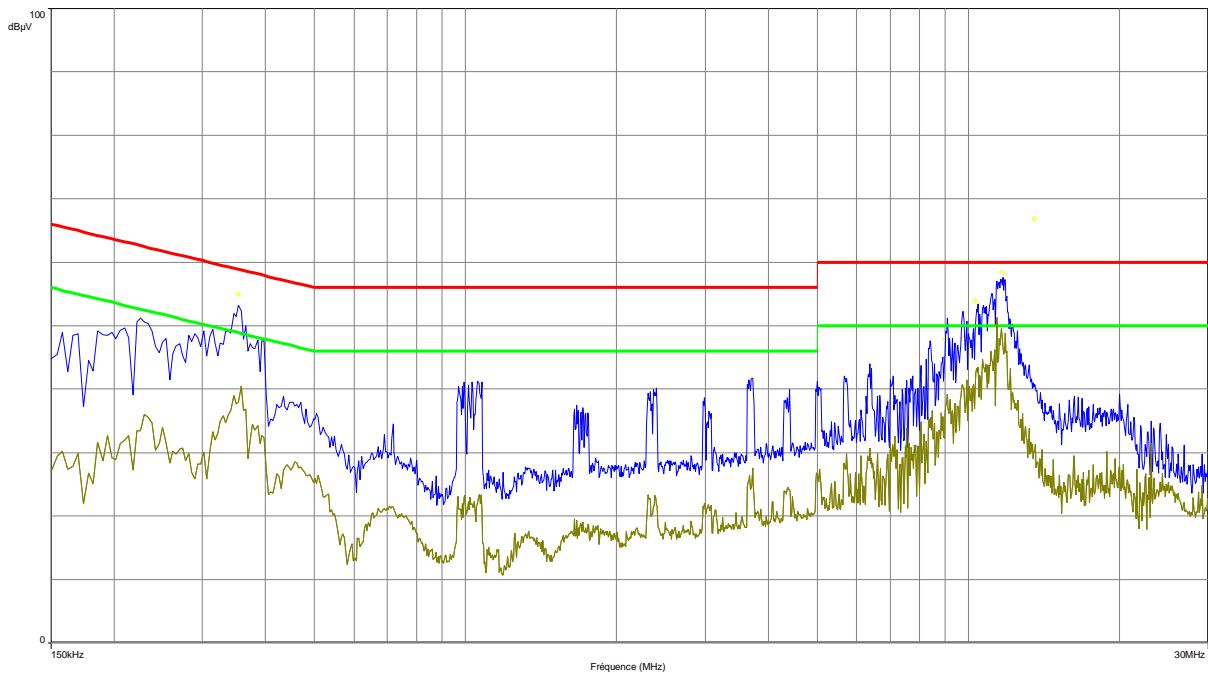
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.21	33.29	53.21	-19.91	48.86	63.21	-14.34
0.362	41.02	48.68	-7.66	53.15	58.68	-5.53
0.47	28.3	46.51	-18.21	41.89	56.51	-14.62
1.106	12.92	46	-33.08	20.78	56	-35.22
9.838	39.09	50	-10.91	47.09	60	-12.91
11.21	42.09	50	-7.91	53.75	60	-6.25
13.558*	24.04	50	-25.96	51.25	60	-8.75
27.158	21.86	50	-28.14	25.54	60	-34.46

* Carrier Frequency



CONDUCTED EMISSIONS		
Graph name :	Emc#4	Test configuration:
Limit :	EN 55022	ITC250 - N - 110V 60Hz Cless
Class :	B	

PARAMETERS			
Voltage / Frequency :	110VAC / 60Hz	Legend:	
Line :	Phase1	Peak Measure	Average Measure
RBW :	9kHz	QPeak Limit	Average Limit
VBW :	30kHz		
Frequency :	150kHz- 30MHz		



Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.226	32.89	52.6	-19.71	47.05	62.6	-15.54
0.354	43.46	48.87	-5.41	52.64	58.87	-6.23
9.006	33.19	50	-16.81	43.36	60	-16.64
9.774	33.91	50	-16.09	40.82	60	-19.18
10.366	39.81	50	-10.19	47.17	60	-12.83
11.69	39.03	50	-10.97	52.76	60	-7.24
13.562*	38.41	50	-11.59	38.85	60	-21.15
27.162	19.47	50	-30.53	27.17	60	-32.83

* Carrier Frequency