

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



LCIE

Rapport d'essai / Test report

N° 89281-R2-E

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DELIVRE A / ISSUED TO

: FESYS
Parc des Ruieres
3, rue Irène Joliot Curie
38320 EYBENS - FRANCE

Objet / Subject

: Essais partiels de compatibilité électromagnétique conformément aux normes
FCC CFR 47 Part 15, Subpart B et C
RSS-210 Issue 8
Electromagnetic compatibility partial tests according to the standards
FCC CFR 47 Part 15, Subpart B and C
RSS-210 Issue 8

Matériel testé / Apparatus under test :

- Produit / Product : **Télécommande de traçabilité / Traceability remote control**
- Marque / Trade mark : **BIOMERIEUX**
- Constructeur / Manufacturer : **FESYS**
- Type / Model : **RUID**
- N° de série / serial number : **000072**
- FCC ID : **YV2-RUID**
- IC : **9309A-RUID**

Date des essais / Test date

: Du 20 au 22 Mars 2012 / From March 20th to 22nd, 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 : Anthony MERLIN

Ce document comporte / Composition of document : 24 pages.

Ecrit par / Written by,
Anthony MERLIN

MOIRANS, LE 26 MARS 2012 / MARCH 26TH, 2012

Approuvé par / Approved by
Jacques LERQUIN

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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



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1. TEST PROGRAM

Standard:

- FCC Part 15, Subpart C 15.247
- ANSI C63.4 (2003)
- RSS-210 Issue 8 – Dec 2010
- RSS-Gen Issue 3 – Dec 2010

EMISSION TEST	LIMITS			RESULTS
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 CFR 47 §15.209 (a) CFR 47 §15.247 (d) RSS-210 §A8.5	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-25GHz* CFR 47 §15.209 (a) CFR 47 §15.247 (d) RSS-210 §A8.5	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
Maximum Peak Output Power CFR 47 §15.247 (b) RSS-210 §A8.4(1)	Limit: 21dBm Conducted or Radiated measurement			PASS
Hopping Channel Separation CFR 47 §15.247 (a) (1) RSS-210 §A8.1(b)	Minimum between: Two-third 20dB Bandwidth or 25kHz Whichever is greater			NP**
Number of Hopping Frequencies CFR 47 §15.247 (a) (1) (iii) RSS-210 §A8.1(d)	At least 15 channels used			NP**
Time of Occupancy (Dwell Time) CFR 47 §15.247 (a) (1) (iii) RSS-210 §A8.1(d)	Maximum 0.4 sec within 31.6sec			NP**
Band Edge Measurement CFR 47 §15.209 (a) CFR 47 §15.247 (d) RSS-210 §A8.5	Limit: -20dBc			NP**
Occupied bandwidth RSS-Gen §4.6.1	No limit			NP**
Receiver Spurious Emission** RSS-Gen §4.10	See RSS-Gen §4.10			NA***

*§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.

**Due to modification, tests not performed, see precedent test results in 200907-5554R-A1-R3-E report.

***Testing covered the receive mode, and receiver spurious emissions are considered to be the same as transmitter.



2. SYSTEM TEST CONFIGURATION

2.1. JUSTIFICATION

The system was configured for testing in a typical fashion (as a customer would normally use it). New power supply adaptor is added to RUID reference with modification of display component. Only worst case configuration is tested to show compliance of new power supply with RUID following standards.

2.2. HARDWARE IDENTIFICATION

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

RUID

Serial number: 000072
FCC ID: YV2-RUID
IC: 9309A-RUID

- **Power supply:**

- AC / DC Adaptor: FRIWO, FW7662M/05, Sn: None, 5VDC/1.1A
- Rating: 100-240VAC
- Frequency: 50-60Hz

During all the tests, EUT is supplied by this power supply.

- **Input/output:**

- 1 x USB port
- 1 x DC input
- 1 x Mini USB (for maintenance only, not tested)

- **Auxiliaries used for testing:**

- 1 x AI3P Traceability, Sn: Proto, used for Bluetooth link

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

- 1 x USB cable (2m)

- **Equipment information:**

- External antenna connector: NO
- Radiated fundamental frequency band: 2400-2483.5MHz
- Antenna type: Integral
- Stand By mode: None
- Normal power source: AC/DC adapter
- Modulation Type: GFSK
- Modulation Technology: FHSS
- Packet Type: DH1, DH2, DH3
- Maximum Antenna Gain: 0dBi

2.3. EUT CONFIGURATION

For RF tests:

Software: testCemDtxBt v1

Following parameters are used during the tests:

- Mode (DH1, DH3, DH5)
- Modulation (GFSK)
- Hopping sequence ON/OFF
- Emitted in continue on frequency (Channel 0, 39, 78)

For Part15B tests:

Software: testCemDtxBt v1

- Bluetooth & Data Matrix (recording data)

A permanent link Bluetooth is performed with auxiliary with a data matrix in loop.



A summary of the worst case emissions found in all test configurations and modes is presented in this test report.

2.4. EQUIPMENT MODIFICATIONS

None

2.5. SPECIAL ACCESSORIES

None

3. CONDUCTED EMISSION DATA

3.1. CLIMATIC CONDITIONS

Date of test : March 20th, 2012
Test performed by : A.MERLIN
Atmospheric pressure : 1003hPa
Relative humidity : 35%
Ambient temperature : 21°C

3.2. 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.

3.3. 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. The cable has been shorted to 1meter length. The EUT is powered trough the LISN (measure).





Conducted emission test setup

3.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Conducted emission comb generator	BARDET	-	A3169049
LISN	RHODE & SCHWARZ	ENV216	C2320123
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019
Thermo-hygrometer	OREGON	BAR916HG-G	B4206011
Transient limiter	RHODE & SCHWARZ	ESH3-Z2	A7122204

3.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

3.6. TEST SEQUENCE AND RESULTS

Measurements are performed on the phase (L1) and neutral (N) of power line voltage.
 Graphs are obtained in PEAK detection.
 Measures are also performed in Quasi-Peak and Average for any strong signal.

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

RESULT: PASS

4. RADIATED EMISSION DATA

4.1. CLIMATIC CONDITIONS

Date of test : March 20th, 2012
Test performed by : A.MERLIN
Atmospheric pressure : 1001hPa
Relative humidity : 37%
Ambient temperature : 22°C

4.2. TEST SETUP

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





Radiated emission test setup



4.3. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Antenna Bi-log	CHASE	CBL6111A	C2040051
Antenna Bi-log	CHASE	CBL6111A	C2040172
Cable N/N	-	-	A5329038
Cable	SUCOFLEX	106G	A5329061
Cable OATS (Mast at 10m)	UTIFLEX	-	A5329188
Cable OATS (Mast at 10m)	UTIFLEX	-	A5329199
Cable N/N	-	-	A5329206
Cable	-	-	A5329545
Semi-Anechoic chamber #3	SIEPEL	-	D3044017
Radiated emission comb generator	BARDET	-	A3169050
Receiver 9kHz - 6GHz	ROHDE & SCHWARZ	FSL6	A2642020
Receiver 20-1000MHz	ROHDE & SCHWARZ	ESVS30	A2642006
Thermo-hygrometer	OREGON	BAR916HG-G	B4206011
Turntable chamber (Cage#3)	ETS Lingren	Model 2165	F2000371
Antenna mast (OATS)	ETS Lindgren	2071-2	F2000392
Turntable controller (Cage#2-3)	ETS Lingren	Model 2066	F2000393
Amplifier 8 GHz	HEROTEK	A1080304A	A7102024
Antenna horn	EMCO	3115	C2042027
Turntable (OATS)	ETS Lindgren	Model 2187	F2000403
Table	MATURO Gmbh	-	F2000437
Semi-Anechoic chamber #1	SIEPEL	-	D3044016
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
Amplifier 8 GHz	HEROTEK	A1080304A	A7102024
Amplifier 8-26GHz	ALDETEC	ALS01452	A7102026
Antenna horn	EMCO	3115	C2042027
Antenna horn 26GHz	SCHWARZBECK	BBHA 9170	C2042028
Cable N/N	-	-	A5329038
Cable	UTIFLEX	-	A5329192
Cable N/N	-	-	A5329206
Semi-Anechoic chamber #1	SIEPEL	-	D3044016
High Pass (4.8-18GHz)	BL Microwave	SH4800-1800	A7484034
Receiver 9kHz - 6GHz	ROHDE & SCHWARZ	FSL6	A2642020
Spectrum Analyzer 9KHz – 26.5GHz	HEWLETT PACKARD	8593E	A4060018
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

**4.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION**

None

4.5. TEST SEQUENCE AND RESULTS**4.5.1. 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 3 axis of EUT. Frequency band investigated is 9kHz to 30MHz.

The pre-characterization results are obtained in PEAK detection: **No frequency observed**

4.5.2. Pre-characterization [30MHz-26GHz]

For frequency band 30MHz to 1GHz, 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 with a log-periodic antenna. The EUT is being rotated on 360° and on 3 axis during the measurement. The pre-characterization graphs are obtained in PEAK detection.

For frequency band 1GHz to 26GHz, a search is performed in the semi-anechoic chamber in order to determine frequencies radiated by the EUT (Measuring distance reduced to 1m and 20cm for frequencies from 12GHz to 26GHz).

See graphs for 30MHz-1GHz:

Polarisation H:	graph Emr#1	Axis X/Y	(see annex 1)
Polarisation V:	graph Emr#2	Axis X/Y	(see annex 1)
Polarisation H:	graph Emr#3	Axis Z	(see annex 1)
Polarisation V:	graph Emr#4	Axis Z	(see annex 1)

4.5.3. 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 §15.109 limits and C §15.209. 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 in following tables.

Frequency (MHz)	QPeak Limit (dBµV/m) @ 30m	Qpeak (dBµV/m)	Qpeak-Limit (Margin dB)	Turntable Angle (deg)	Ant. Pol./ Angle (deg)	Tot Corr (dB)
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No frequency observed

*: Measure have been done at 10m distance and corrected according to requirements of 15.209.e) ($M@30m = M@10m - 19.1dB$)



4.5.4. Characterization on 10 meters open site from 30MHz to 26GHz

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 26GHz.

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	35.439	40.0	35.2	-4.8	35	V	100	15.3	Axis X/Y
2	72.119	40.0	36.2	-3.8	95	V	150	8.0	Axis X/Y
3	160.001	43.5	27.1	-16.4	0	H	400	12.7	Axis X/Y
4	168.295	43.5	33.6	-9.9	260	V	100	12.3	Axis X/Y
5	120.211	43.5	38.2	-5.3	0	V	100	14.7	Axis X/Y
6	215.375	43.5	38.3	-5.2	120	H	350	13.1	Axis X/Y
7	259.935	46.0	36.4	-9.6	140	H	250	15.4	Axis X/Y
8	274.788	46.0	36.2	-9.8	125	H	300	15.7	Axis X/Y
9	311.922	46.0	43.8	-2.2	180	V	100	16.6	Axis X/Y
10	552.959	46.0	43.1	-2.9	310	H	150	22.6	Axis X/Y
11	576.998	46.0	38.6	-7.4	90	H	150	23.1	Axis X/Y
12	601.079	46.0	38.2	-7.8	155	H	400	22.5	Axis X/Y

*: 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 26GHz

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
1	4804	54.0	42.4	-11.6	90	V	120	37.8	/
2	4882	54.0	43.1	-10.9	95	V	110	37.8	/
3	4960	54.0	43.1	-10.9	100	V	120	37.9	/
4	7206	54.0	48.5	-5.5	120	V	100	39.9	/
5	7323	54.0	47.2	-6.8	130	H	120	40.0	/
6	7440	54.0	43.6	-10.4	120	V	110	40.1	/

No	Frequency (GHz)	Limit Peak (dBμV/m)	Measure Peak (dBμV/m)	Margin (Mes-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)	Comments
1	4804	74.0	57.7	-16.3	90	V	120	37.8	/
2	4882	74.0	53.7	-20.3	95	V	110	37.8	/
3	4960	74.0	54.2	-19.8	100	V	120	37.9	/
4	7206	74.0	63.6	-10.4	120	V	100	39.9	/
5	7323	74.0	63.8	-10.2	130	H	120	40.0	/
6	7440	74.0	63.0	-11.0	120	V	110	40.1	/

Note: Measures have been done at 3m distance.

RESULTS: PASS

**4.6. 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.

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

**5. MAXIMUM PEAK OUTPUT POWER****5.1. TEST CONDITIONS**

Date of test : March 22nd, 2012
Test performed by : A.MERLIN
Atmospheric pressure : 1001hPa
Relative humidity : 37%
Ambient temperature : 22°C

5.2. EQUIPMENT CONFIGURATION

Modulation: GFSK
Packet Type: DH5 worst case presented
Hopping sequence: NO

5.3. SETUP*Radiated measurement:*

The product has been tested at a distance of 3 meters from the antenna and using 3MHz RBW and 10MHz VBW. 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 following table. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.

To demonstrate compliance with peak output power requirement of section 15.247 (b), the transmitter's peak output power is calculated using the following equation:

$$E = \frac{\sqrt{30PG}}{d}$$

Where:

- E is the measured maximum fundamental field strength in V/m, utilizing a RBW \geq the 20 dB bandwidth of the emission, VBW > RBW, peak detector function. Follow the procedures in C63.4-1992 with respect to maximizing the emission.
- G is the numeric gain of the transmitting antenna with reference to an isotropic radiator.
- d is the distance in meters from which the field strength was measured.
- P is the power in watts for which you are solving:

$$P = \frac{(Ed)^2}{30G}$$

**5.4. TEST EQUIPMENT LIST**

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Antenna horn	EMCO	3115	C2042027
Cable N/N	-	-	A5329038
Cable	UTIFLEX	-	A5329192
Cable N/N	-	-	A5329206
Semi-Anechoic chamber #1	SIEPEL	-	D3044016
Receiver 9kHz - 6GHz	ROHDE & SCHWARZ	FSL6	A2642020
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

5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

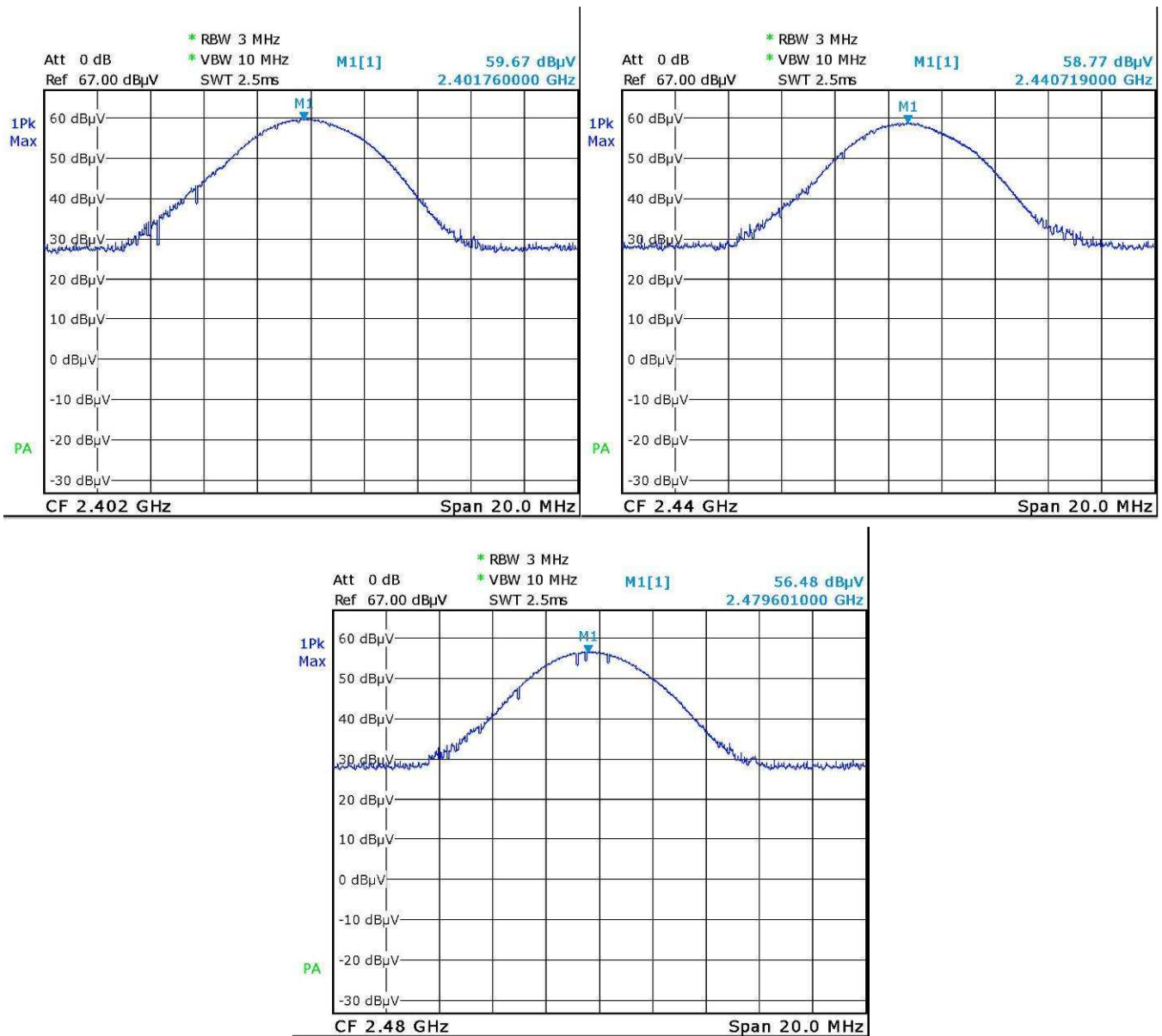
None

5.1. LIMIT

Power limit: 21dBm

5.2. TEST RESULTS

Channel	Channel Frequency (MHz)	Maximum Field (dBμV/m)	Peak Output Power (dBm)	Power Limit (dBm)	FC (dB)	PASS / FAIL
0	2402	91.9	-3.3	21	32.2	P
39	2441	91.0	-4.2	21	32.2	P
78	2480	88.7	-6.5	21	32.2	P





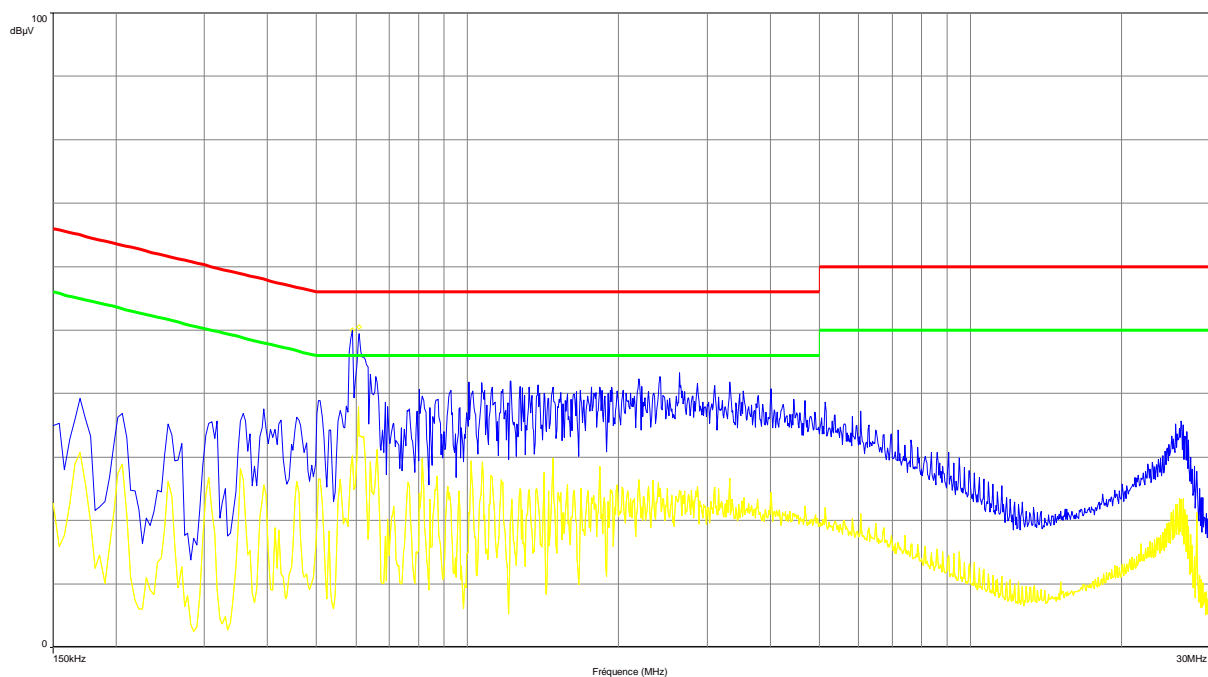
6. ANNEX 1 (GRAPHS)

CONDUCTED EMISSIONS

Graph name :	Emc#1	Test configuration:
Limit :	EN 55022	
Class :	B	

PARAMETERS

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

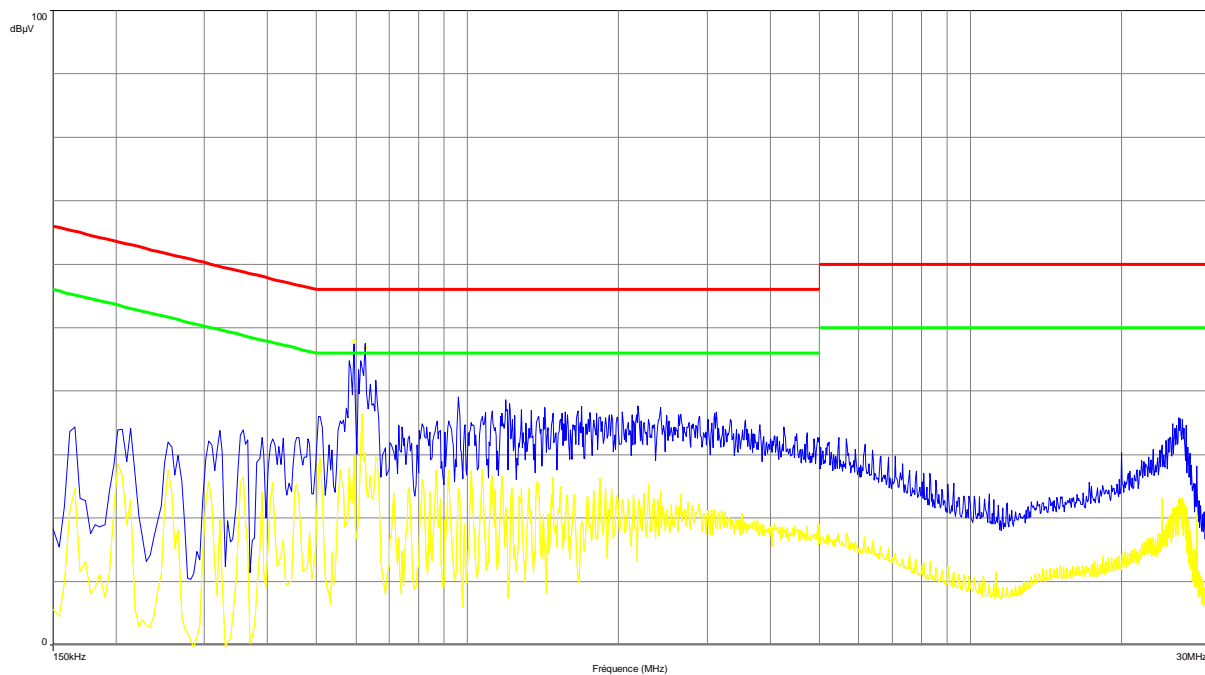


Frequency (MHz)	Avg (dBμV)	Lim Avg (dBμV)	Avg-LimAvg (dBμV)	QPeak (dBμV)	LimQPeak (dBμV)	QPeak-LimQPeak (dBμV)
0.590	25.76	46.00	-20.24	44.52	56.00	-11.48
0.610	37.37	46.00	-8.63	48.90	56.00	-7.10



CONDUCTED EMISSIONS		
Graph name :	Emc#2	Test configuration:
Limit :	EN 55022	
Class :	B	

PARAMETERS		
Voltage / Frequency :	110VAC / 60Hz	Legend: <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; background-color: blue; margin-right: 5px;"></div> Peak Measure </div> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; background-color: yellow; margin-right: 5px;"></div> Average Measure </div> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; background-color: red; margin-right: 5px;"></div> QPeak Limit </div> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; background-color: green; margin-right: 5px;"></div> Average Limit </div>
Line :	Neutral	
RBW :	9kHz	
VBW :	30kHz	
Frequency :	150kHz- 30MHz	



Frequency (MHz)	Avg (dBμV)	Lim Avg (dBμV)	Avg-LimAvg (dBμV)	QPeak (dBμV)	LimQPeak (dBμV)	QPeak-LimQPeak (dBμV)
0.594	24.57	46.00	-21.43	39.86	56.00	-16.14
0.626	26.91	46.00	-19.09	39.11	56.00	-16.89

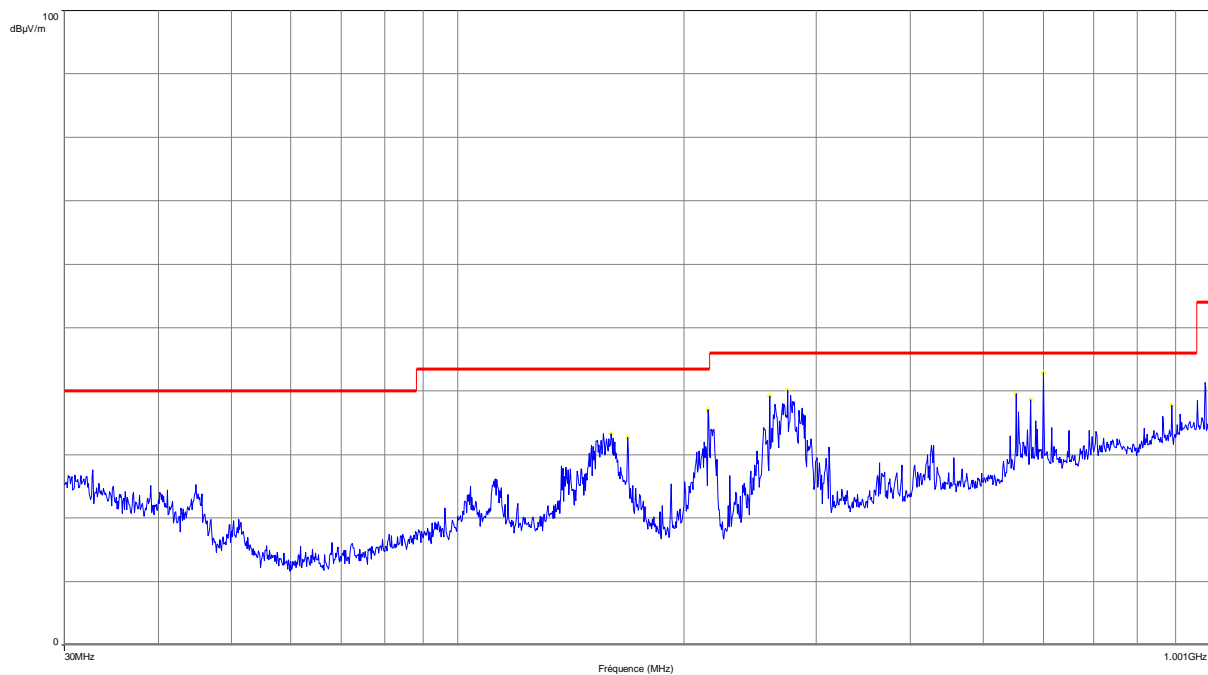


RADIATED EMISSIONS

Graph name :	Emr#1	Test configuration:
Limit :	FCC Part15C	Axis X/Y
Class :	B	

PARAMETERS

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



Frequency (MHz)	Peak (dBµV/m)
160.00	33.35
168.32	32.74
215.40	37.10
259.96	39.23
274.80	40.15
553.00	39.52
577.04	38.59
601.08	42.94
889.60	37.82

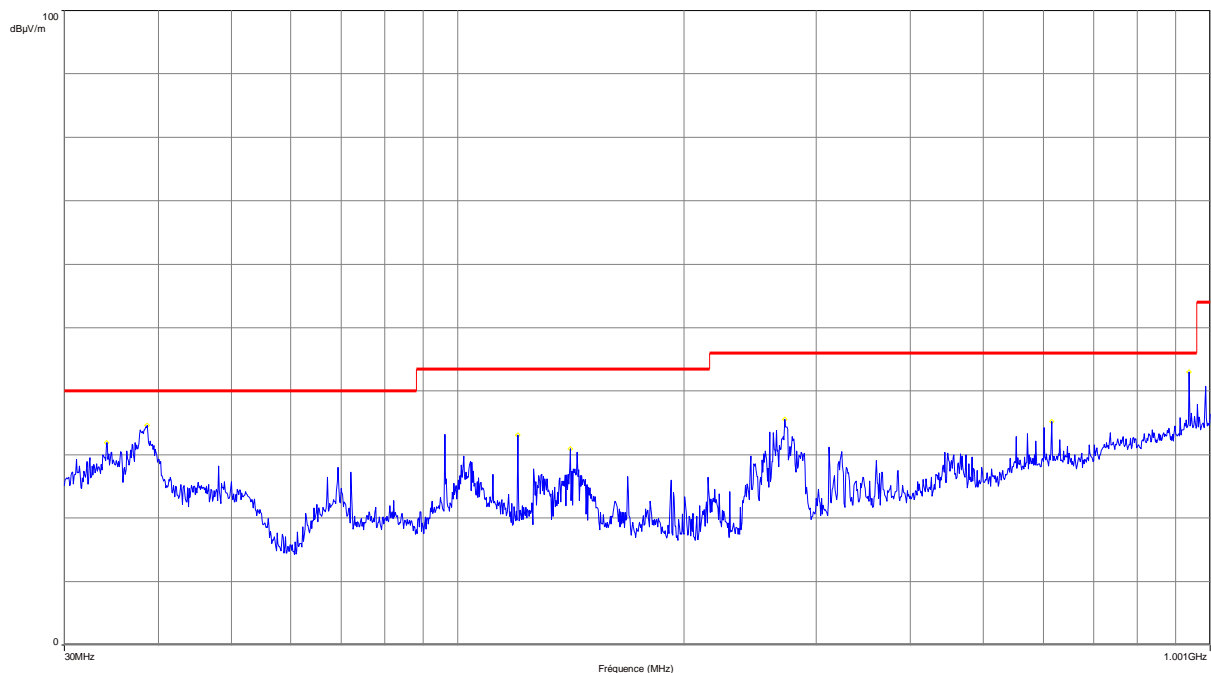


RADIATED EMISSIONS

Graph name :	Emr#2	Test configuration:
Limit :	FCC Part15C	Axis X/Y
Class :	B	

PARAMETERS

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



Frequency (MHz)	Peak (dBµV/m)
34.16	31.92
38.64	34.56
120.24	33.12
141.08	30.94
271.96	35.53
616.44	35.17
937.64	42.97

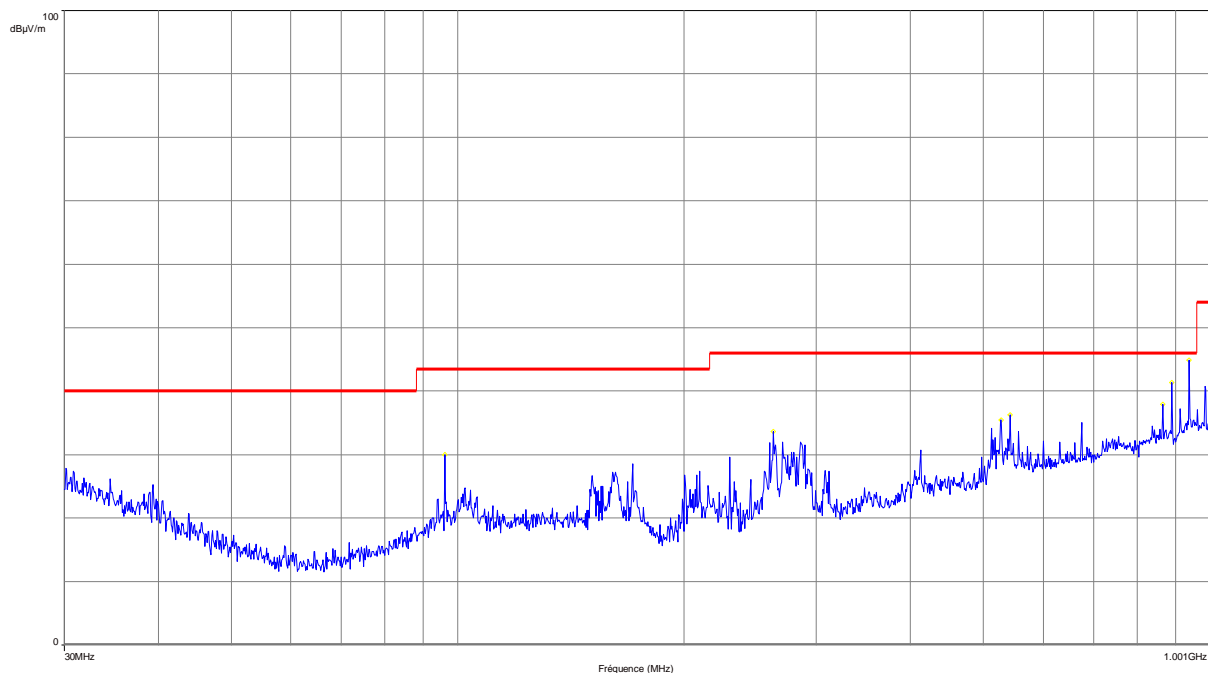


RADIATED EMISSIONS

Graph name :	Emr#3	Test configuration:
Limit :	FCC Part15C	Axis Z
Class :	B	

PARAMETERS

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



Frequency (MHz)	Peak (dBµV/m)
96.16	29.94
262.76	33.67
527.36	35.44
542.16	36.26
865.52	37.97
889.60	41.35
937.64	44.92

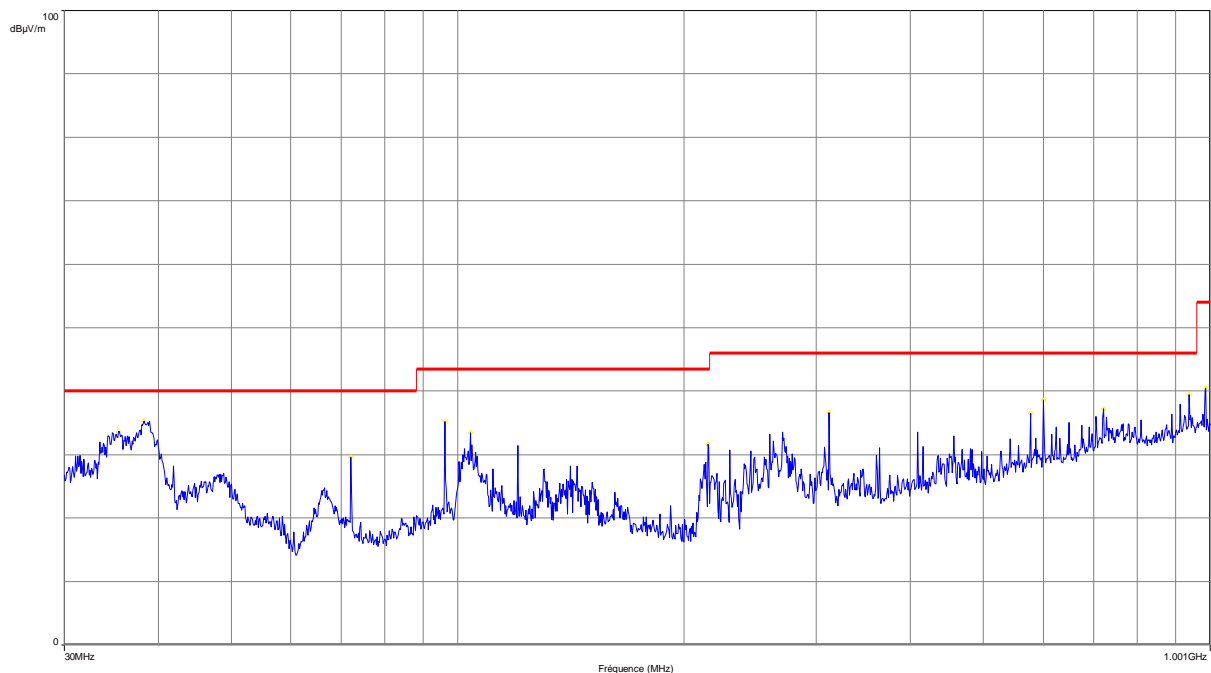


RADIATED EMISSIONS

Graph name :	Emr#4	Test configuration:
Limit :	FCC Part15C	Axis Z
Class :	B	

PARAMETERS

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



Frequency (MHz)	Peak (dBµV/m)
35.44	33.70
38.28	35.26
72.12	29.61
96.20	35.17
104.00	33.41
215.40	31.63
311.92	36.61
577.00	36.52
601.08	38.53
721.28	37.15
937.64	39.45
987.52	40.55



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 <i>Measurement of conducted disturbances in voltage on the power port</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

Les valeurs d'incertitudes calculées du laboratoire étant inférieures aux valeurs d'incertitudes limites établies par la norme, 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 standard. The conformity of the sample is directly established by the applicable limits values.