TEST REPORT

N°: 140156-681881-A (FILE#871076-A2) **Version : 01**

Subject	**Electromagnetic compatibility tests according to the standards:** **FCC CFR 47 Part 15, Subpart C** **RSS-210 Issue 9**
Issued to	**INGENICO** 9 Avenue de la Gare CP - Ville FRANCE
Apparatus under test	
↳ Product	POC2TV
↳ Trade mark	**INGENICO**
↳ Manufacturer	**INGENICO**
↳ Model under test	**FIT111CL**
↳ Serial number	**15336UN00000015**
↳ FCCID	**XKB-FIT111CL**
↳ IC	**2586D-FIT111CL**
Conclusion	See Test Program chapter §1
Test date	October 27, 2015 to December 14, 2015
Test location	MOIRANS
IC Test site	6500A-1 & 6500A-3
Composition of document	26 pages
Document issued on	January 9, 2017

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PUBLICATION HISTORY

Version	Date	Author	Modification
01	January 9, 2017	Jonathan PAUC	Creation of the document

SUMMARY

1. TEST PROGRAM

Standard:

- **FCC Part 15, Subpart C**
- **ANSI C63.10 (2013)**
- **RSS-210 Issue 9**
- **RSS-Gen Issue 4**

EMISSION TEST	LIMITS			RESULTS (Comments)
Limits for conducted disturbance at mains ports 150kHz-30MHz *CFR 47 §15.207*	**Frequency**	**Quasi-peak value (dBµV)**	**Average value (dBµV)**	☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
	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 §15.225* *RSS-Gen §4.9*	**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** ☐ **FAIL** ☐ **NA** ☐ **NP**
Radiated emissions 30MHz-25GHz* *CFR 47 §15.209 (a)* *CFR 47 §15.225* *RSS-Gen §4.9* ***Highest frequency :<108MHz (Declaration of provider)***	**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** ☐ **FAIL** ☐ **NA** ☐ **NP**
Fundamental field strength limit *CFR 47 §15.225* *RSS-210 §B.6*	**Operation within the band 13.110-14.010 MHz**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Fundamental frequency tolerance *CFR 47 §15.225* *RSS-210 §B.6*	**Operation within the band 13.110-14.010 MHz**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Band edge compliance *CFR 47 §15.225* *RSS-210 §B.6*	**Operation within the band 13.110-14.010 MHz**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Occupied bandwidth *RSS-Gen §4.6.1*	**No limit**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Receiver Spurious Emission** *RSS-Gen §4.10*	**See RSS-Gen §4.10**			☐ **PASS** ☐ **FAIL** ☑ **NA** ☐ **NP**

***§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.

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

2. SYSTEM TEST CONFIGURATION

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):

FIT111CL **Serial Number:** 15336UN00000015

Power supply:
During all the tests, EUT is supplied by V_{nom}: 5VDC (USB Port) & 120V / 60Hz Main power supply IBM Laptop (Thinkpad)

For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference / Sn	Comments
Supply1	☐ AC ☑ DC ☐ Battery	5VDC	-	-

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Supply1	USB with ferrite 28B0735-000 / LAIRD (2ways)	1.15	☑	☑	☑	-
Access1	RS232	1.0	☑	☐	☐	-
Access2	Wake up	0.2	☑	☐	☐	-

Auxiliary equipment used during test:

Type	Reference	Sn
Contactless Card	-	-
IBM Laptop	Thinkpad	-
IBM Laptop power supply	IBMP 90W 20V	11S922P1103Z1ZACP5BE0EV Rev02

Equipment information:

Frequency band:	☑ [13.553–13.567]MHz	☐ [125]kHz	☐ [-] MHz	
RF mode:	☐ Transmitter	☑ Transceiver	☐ Receiver	☐ Standby
Type:	☑ RFID	☐ EAS	☐ Other:	
Channelized system:	☑ No	☐ Yes, channel spacing: kHz		
Equipment intended for use as a	☑ Fixed	☐ Mobile	☐ Portable	
Type of equipment:	☑ Stand-alone	☐ Plug-in	☐ Combined	
Antenna Type:	☐ External		☑ Internal	
Antenna connector:	☐ Permanent external	☐ Permanent internal	☑ None	☐ Temporary (only for tests)
Antenna Gain:	0dBi			
Duty cycle:	☐ Continuous duty	☐ Intermittent duty	☑ Continuous operation	
Equipment type:	☐ Production model		☑ Prototype	
Type of power source:	☐ AC power supply	☑ DC power supply	☐ Battery	
Test source voltage:	Vmin:	☐ 207V/50Hz	☑ 4.75 VDC	
	Vnom:	☐ 230V/50Hz	☑ 5.00 VDC	
	Vmax	☐ 253V/50Hz	☑ 5.25 VDC	
Temperature range:	Tmin:	☑ -30°C	☐ 0°C	☐ °C
	Tnom:	20°C		
	Tmax:	☐ 35°C	☑ 50°C	☐ °C

2.2. EUT CONFIGURATION

A continuous reading process is performed between EUT and Contact less Card through RFID Protocol.

Hardware information		
Software (if applicable):	**V. :**	8200362104

2.3. EQUIPMENT MODIFICATIONS

☑ None ☐ Modification:

2.4. 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.

2.5. CALIBRATION DATE

The calibration intervals are extended at 12+2 months. This extended interval is based on the fact that there is sufficient calibration data to statistically establish a trend or based on experience of use of the test equipment to assure good measurement results for a longer period

3. CONDUCTED EMISSION DATA

3.1. ENVIRONMENTAL CONDITIONS

Date of test	:	November 11, 2016
Test performed by	:	Nicolas BILLAUD
Atmospheric pressure (hPa)	:	990
Relative humidity (%)	:	31
Ambient temperature (°C)	:	21

3.2. TEST SETUP

Mains terminals

The EUT and auxiliaries are set:

☑ 80cm above the ground on the non-conducting table (Table-top equipment)

☐ 10cm above the ground on isolating support (Floor standing equipment)

The distance between the EUT and the LISN is 80cm. The EUT is 40cm away for the vertical ground plane.

The EUT is powered by V_{nom}.(120V 60Hz)

The EUT is powered through a LISN (measure). Auxiliaries are powered by another LISN.

3.3. TEST METHOD

The product has been tested according to ANSI C63.10 and FCC Part 15 subpart C. The product has been tested with 120V/60Hz power line voltage and compared to the FCC Part 15 limits. Measurement bandwidth was 9kHz from 150kHz to 30MHz. 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.
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.

3.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + self	-	-	A5329585	04/16	04/17
EMC comb generator	LCIE SUD EST	-	A3169098	-	-
LISN tri-phase ESH2-Z5	RHODE & SCHWARZ	33852.19.53	C2320062	04/16	04/17
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	08/16	08/17
BAT EMC	NEXIO	v3.9.0.10	L1000115	-	-
Thermo-hygrometer (PM2)	OREGON	BAR916HG-G	B4206022	08/16	08/17
Transient limiter	RHODE & SCHWARZ	ESH3-Z2	A7122204	01/16	01/17

3.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

3.6. TEST RESULTS

Mains terminals:

Supply1
Measurements are performed on the phase (L1) and neutral (N) of the power line.
Results: (PEAK detection)

Graph identifier		Line	Comments	
Emc#	1	Phase	-	See annex 1
Emc#	2	Neutral	-	See annex 1

3.7. CONCLUSION

The sample of the equipment FIT111CL, Sn: 15336UN00000015, tested in the configuration presented in this test report *satisfies* to requirements of class B limits of the standard FCC Part 15 Subpart C, for conducted emissions.

4. RADIATED EMISSION DATA (15.209)

4.1. ENVIRONMENTAL CONDITIONS

Date of test	:	November 8, 2016
Test performed by	:	Gaëtan DESCHAMPS
Atmospheric pressure (hPa)	:	990
Relative humidity (%)	:	34
Ambient temperature (°C)	:	21

4.2. 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:
☑ 80cm above the ground on the non-conducting table (Table-top equipment) - Below 1GHz
☐ 150cm above the ground on the non-conducting table (Table-top equipment) - Above 1GHz
☐ 10cm above the ground on isolating support (Floor standing equipment)
The EUT is powered by V_{nom}.

4.3. TEST METHOD

The product has been tested according to ANSI C63.10, FCC Part 15 Subpart C.
Pre-characterisation measurement: (9kHz – 1GHz)
A pre-scan of all the setup has been performed in a 3 meters semi-anechoic chamber for frequency from 30MHz to 1GHz. Test is performed in horizontal (H) and vertical (V) polarization, the loop antenna was rotated during the test for maximized the emission measurement. Continuous linear turntable azimuth search was performed with 360 degrees range. Measurement performed on all axis of EUT used in normal configuration.

Characterization on 10 meters open site from 9kHz to 1GHz:
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 limits. Measurement bandwidth was 9kHz below 30MHz and 120kHz from 30 MHz to 1GHz. Test is performed in horizontal (H) and vertical (V) polarization, the loop antenna was rotated during the test for maximized the emission measurement. The height antenna is varied from 1m to 4m. Continuous linear turntable azimuth search was performed with 360 degrees range. Measurement performed on all axis of EUT used in normal configuration. A summary of the worst case emissions found in all test configurations and modes is shown.
Frequency list has been created with anechoic chamber pre-scan results.

4.4. TEST EQUIPMENT LIST

OATS					
DESCRIPTION	**MANUFACTURER**	**MODEL**	**N° LCIE**	**Cal_Date**	**Cal_Due**
Antenna Bi-log	CHASE	CBL6111A	C2040051	06/16	06/18
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052	11/15	11/17
Cable	SUCOFLEX	106G	A5329061	02/16	02/17
Cable	-	-	A5329190	01/16	01/17
Cable (OATS)	-	-	A5329623	01/16	01/17
Radiated emission comb generator	BARDET	-	A3169050	-	-
OATS	-	-	F2000409	08/16	08/17
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	08/16	08/17
BAT EMC	NEXIO	v3.9.0.10	L1000115	-	-
Turntable / Mast controller (OATS)	ETS Lindgren	Model 2066	F2000372	-	-
Antenna mast (OATS)	ETS Lindgren	2071-2	F2000392	-	-
Turntable (OATS)	ETS Lindgren	Model 2187	F2000403	-	-
Table	LCIE	-	F2000445	-	-

ANECHOIC CHAMBER					
DESCRIPTION	**MANUFACTURER**	**MODEL**	**N° LCIE**	**Cal_Date**	**Cal_Due**
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052	11/15	11/17
Antenna Bi-log	CHASE	CBL6111A	C2040172	06/16	06/18
Cable	UTIFLEX	-	A5329188	12/16	12/17
Cable Measure @3m	-	-	A5329206	04/16	04/17
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	08/16	08/17
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	10/16	10/17
Thermo-hygrometer	OREGON	BAR916	B4206011	10/16	10/17
Turntable chamber (Cage#3)	ETS Lingren	Model 2165	F2000371	-	-
Table	LCIE	-	F2000461	-	-
Turntable controller (Cage#3)	ETS Lingren	Model 2090	F2000444	-	-

4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

4.6. TEST RESULTS

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

See graph for 9kHz-30MHz band:

Graph identifier		Polarization	EUT position	Comments	
Emr#	1	0°& 90°	Axis XY		See annex 1

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

See graphs for 30MHz-1GHz:

Graph identifier		Polarization	EUT position	Comments	
Emr#	2	Vertical & Horizontal	Axis XY		See annex 1

4.6.3. Characterization on 10 meters open site below 30 MHz

Worst case final data result:

Frequency list has been created with semi-anechoic chamber pre-scan results.
Measurements are performed using a QUASI-PEAK detection.

No	Frequency (MHz)	QPeak Limit (dBµV/m) @ 30m	Qpeak (dBµV/m) @ 30m	Margin (Mes-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. Factor (dB)	Comments
1	13.560	84	16.7	**-67.3**	120	V	100	35.2	/
2	27.120	29.5	22.7	**-6.8**	88	V	180	41.9	/

Note: 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 following chapter of this test report for band edge measurements.

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

Worst case final data result:
Frequency list has been created with semi-anechoic chamber pre-scan results.
Measurements are performed using a QUASI-PEAK detection.

Test Frequency (MHz)	Meter Reading dB(µV)	Detector (Pk/QP/Av)	Polarity (V/H)	Azimuth (Degrees)	Antenna Height (cm)	Transducer Factor (dB)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
40.680	23.8	QP	V	0	100	14.3	38.1	40.0	**-1.9**
54.240	30.9	QP	V	300	100	8.4	39.3	40.0	**-0.7**
67.800	29.5	QP	V	335	100	7.7	37.2	40.0	**-2.8**
81.360	22.6	QP	V	60	130	8.9	31.5	40.0	**-8.5**
169.336	24.0	QP	H	360	400	11.8	35.8	43.5	**-7.7**
217.720	25.7	QP	H	347	360	12.9	38.6	46.0	**-7.4**
362.866	18.7	QP	V	290	100	18.5	37.2	46.0	**-8.8**
411.240	15.7	QP	V	202	288	19.9	35.6	46.0	**-10.4**
459.632	16.7	QP	V	180	28	21.1	37.8	46.0	**-8.2**
508.000	12.7	QP	H	360	400	22.2	34.9	46.0	**-11.1**
749.925	12.6	QP	V	236	286	26.7	39.3	46.0	**-6.7**
846.660	12.7	QP	V	200	210	28.2	40.9	46.0	**-5.1**
999.000	8.2	QP	V	250	0	31.0	39.2	54.0	**-14.8**

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

4.7. CONCLUSION

The sample of the equipment FIT111CL, Sn: 15336UN00000015, tested in the configuration presented in this test report satisfies to requirements of class B limits of the standard FCC Part 15 Subpart C, for radiated emissions.

5. FUNDAMENTAL FREQUENCY TOLERANCE (15.225E)

5.1. ENVIRONMENTAL CONDITIONS

Date of test	:	December 14, 2016
Test performed by	:	Jonathan PAUC
Atmospheric pressure (hPa)	:	990
Relative humidity (%)	:	31
Ambient temperature (°C)	:	21

5.2. TEST SETUP

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.

5.3. TEST METHOD

The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency when the temperature is varied from -20°C to +50°C at the nominal power voltage and the primary power voltage is varied from 85% to 115% of the rated supply voltage at 20°C.

5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Multimeter - CEM	FLUKE	87	A1240251	06/16	06/17
Climatic chamber	BIA CLIMATIC	CL 6-25	D1024032	-	-
Thermometer (radio)	FLUKE	52 II	B4043150	-	-
Power Supply	Power supply DC	TDK	A7044055	-	-
Cable 40GHz 2m coudé	-	-	AA5329720	05/16	05/17
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060051	11/16	11/17
Antenna Loop	LCIE	_	_	-	-

5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

5.6. TEST RESULTS

Temperature / Voltage	-30°C	-20°C	20°C	+50°C
5.0 VDC				
Carrier level (dBc)	1.10	0.25	**REF (dB)**	-0.40
Frequency Drift (MHz)	-0.000052	-0.000118	**REF (MHz)**	0.000032
4.5 VDC				
Carrier level (dBc)	0.10	0.25	-0.15	-0.40
Frequency Drift (MHz)	-0.000056	-0.000106	-0.000073	0.000032
5.5 VDC				
Carrier level (dBc)	0.10	0.26	-0.15	-0.40
Frequency Drift (MHz)	-0.000066	-0.000118	-0.000052	0.000032

Frequency drift measured is -**118Hz** when the temperature is varied from -30°C to +50°C and voltage is varied.

5.7. CONCLUSION

The sample of the equipment FIT111CL, Sn: 15336UN00000015, tested in the configuration presented in this test report satisfies to requirements of the standard FCC Part 15 Subpart C, for fundamental frequency tolerance.

6. BAND-EDGE COMPLIANCE §15.209

6.1. ENVIRONMENTAL CONDITIONS

Date of test	:	December 14, 2016
Test performed by	:	Jonathan PAUC
Atmospheric pressure (hPa)	:	990
Relative humidity (%)	:	31
Ambient temperature (°C)	:	21

6.2. TEST SETUP

For measurement, the power level calibration of the spectrum analyzer is related to the field strength measured in chapter radiated emission data.

6.3. TEST METHOD

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.

Frequency band 13.553-13.567MHz
Following plots show radiated emission level in the frequency band 13.55.-13.567MHz with a RBW of 1kHz. The graphs are obtained with a measuring receiver.

6.4. TEST EQUIPMENT LIST

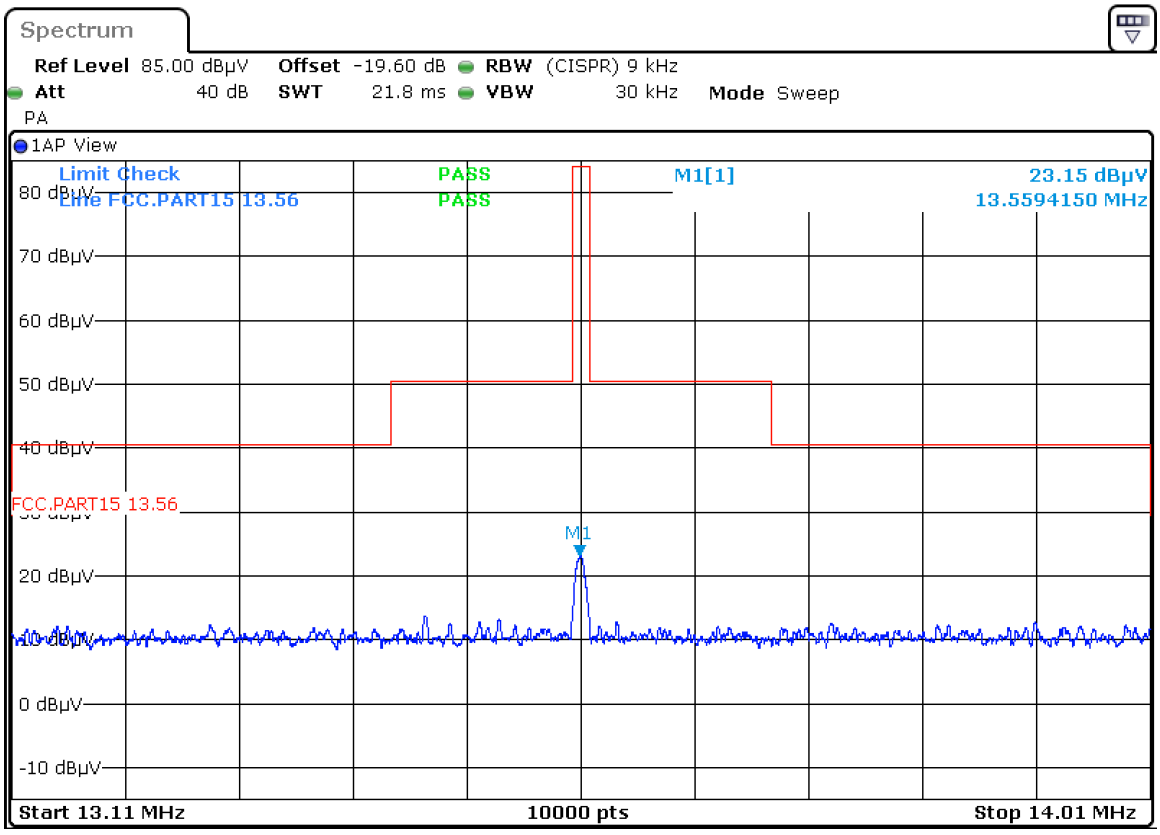
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Climatic chamber	BIA CLIMATIC	CL 6-25	D1024032	-	-
Thermometer (radio)	FLUKE	52 II	B4043150	-	-
Power Supply	Power supply DC	TDK	A7044055	-	-
Cable 40GHz 2m	-	-	AA5329720	05/16	05/17
Loop Antenna	LCIE	-	-	-	-
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060051	11/16	11/17

6.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

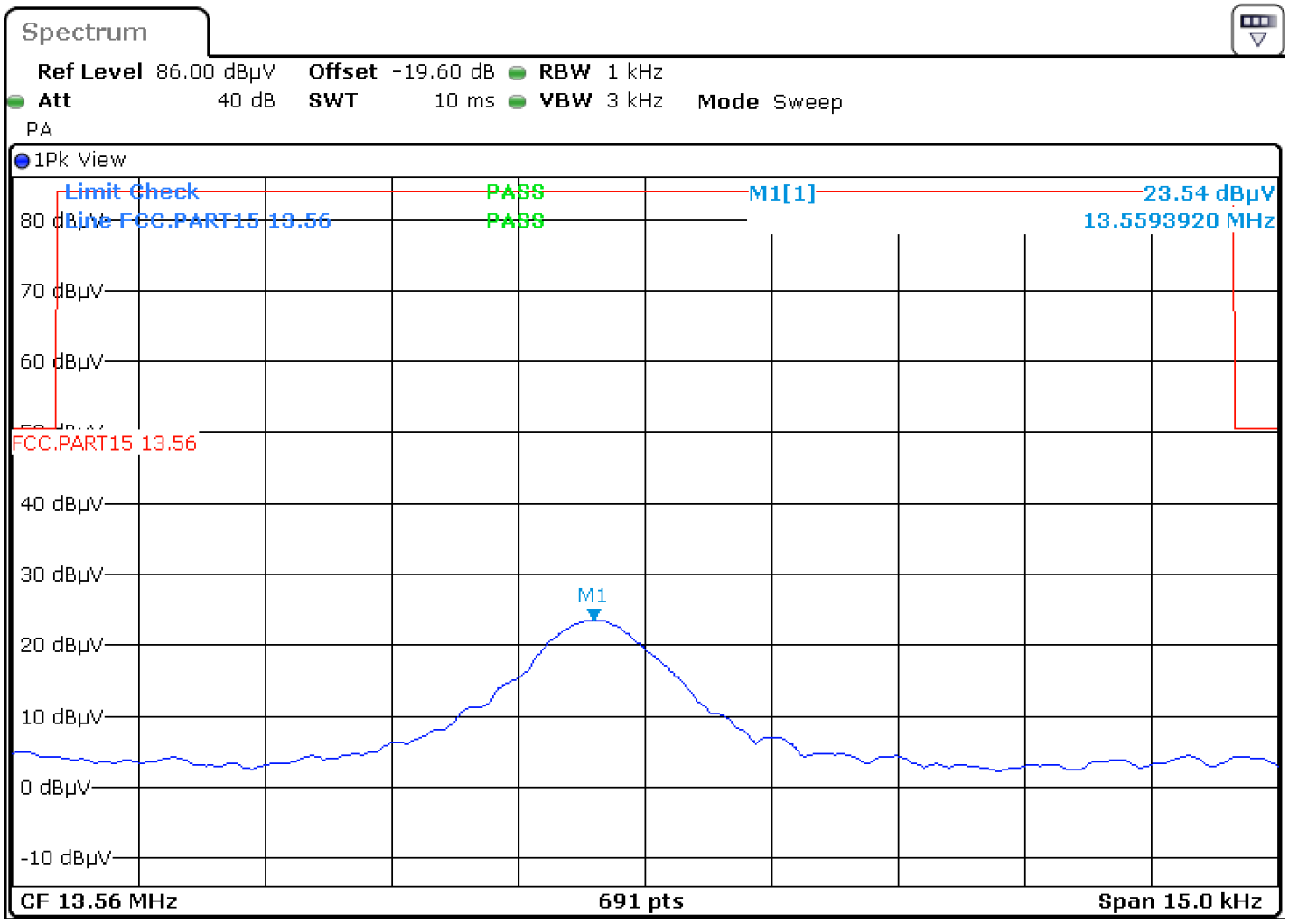
☑ None ☐ Divergence:

6.6. TEST RESULTS

Frequency band 13.110-14.010MHz



Frequency band 13.553-13.567MHz



6.7. CONCLUSION

The sample of the equipment FIT111CL, Sn: 15336UN00000015, tested in the configuration presented in this test report satisfies to requirements of the standard FCC Part 15 Subpart C, for band-edge compliance.

7. OCCUPIED BANDWIDTH

7.1. ENVIRONMENTAL CONDITIONS

Date of test	:	December 14, 2016
Test performed by	:	Jonathan PAUC
Atmospheric pressure (hPa)	:	990
Relative humidity (%)	:	31
Ambient temperature (°C)	:	21

7.1. SETUP

☐ ***Conducted measurement:***
The EUT is turned ON and connected to measurement instrument; the center frequency of the spectrum analyzer is set to the fundamental frequency. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.
Offset: Attenuator+cable 10.3dB

☑ ***Radiated measurement:***
The EUT is turned ON and connected to measurement instrument; the center frequency of the spectrum analyzer is set to the fundamental frequency. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.

Measurement Procedure:
1. RBW used in the range of 1% to 5% of the anticipated emission bandwidth
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = Max Hold.
5. Sweep = Auto couple.
6. Allow the trace to stabilize.
7. OBW 99% function of spectrum analyzer used

7.2. TEST EQUIPMENT LIST

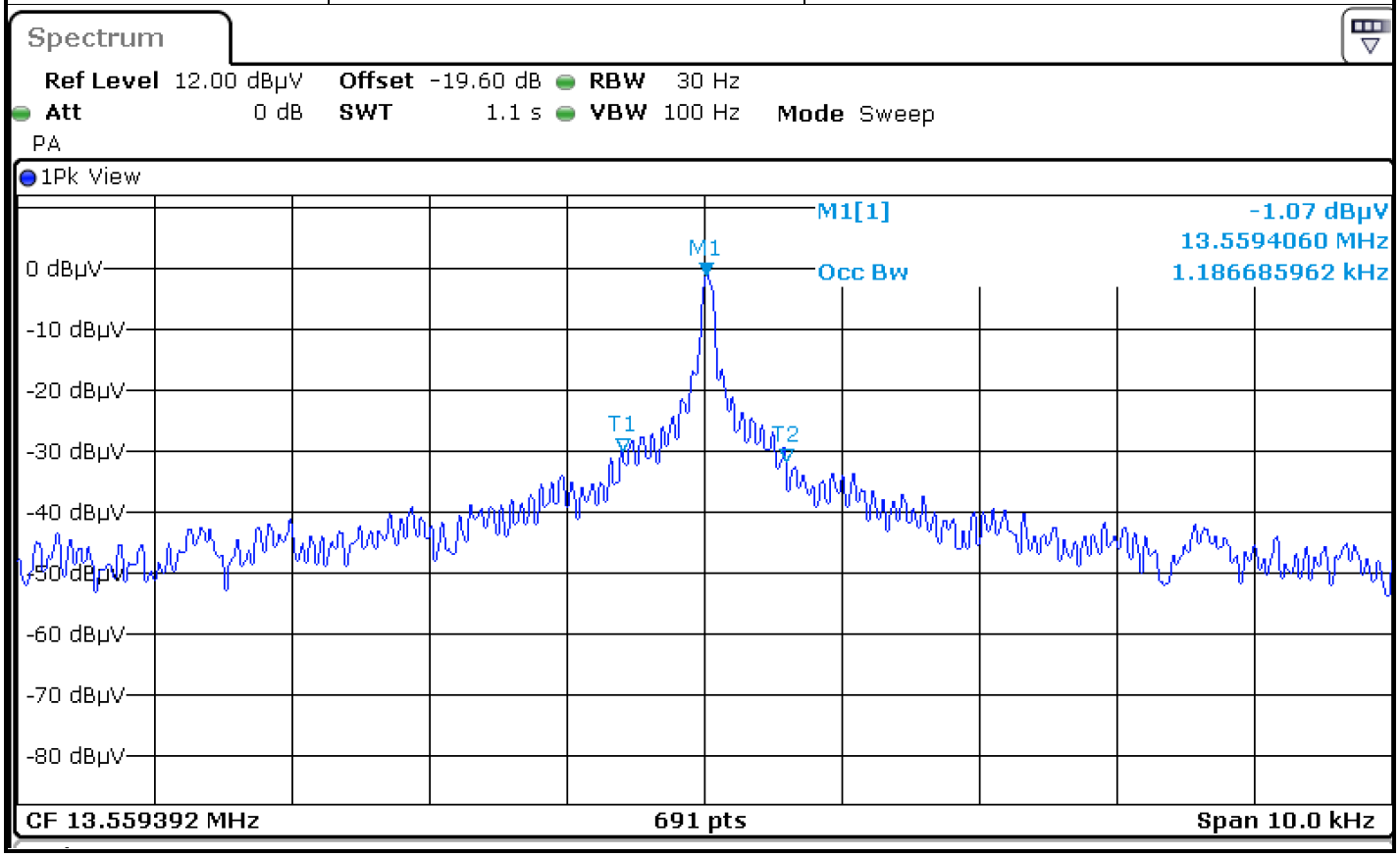
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Climatic chamber	BIA CLIMATIC	CL 6-25	D1024032	-	-
Thermometer (radio)	FLUKE	52 II	B4043150	-	-
Power Supply	Power supply DC	TDK	A7044055	-	-
Cable 40GHz 2m coudé	-	-	AA5329720	05/16	05/17
Loop Antenna	LCIE	-	-	-	-
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060051	11/16	11/17

7.3. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

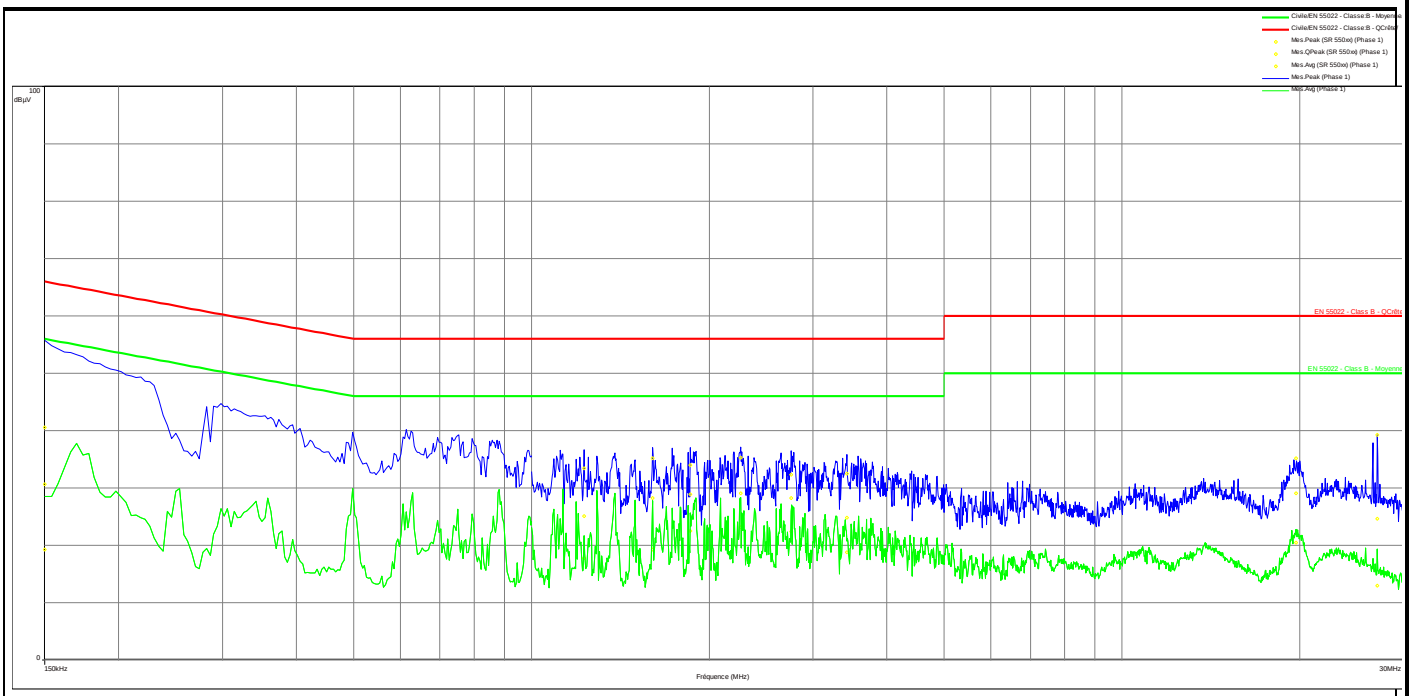
7.4. TEST SEQUENCE AND RESULTS

Channel	Channel Frequency (MHz)	99% Occupied Bandwidth (kHz)
Nom	13.56	**1.18**



8. ANNEX 1 (GRAPHS)

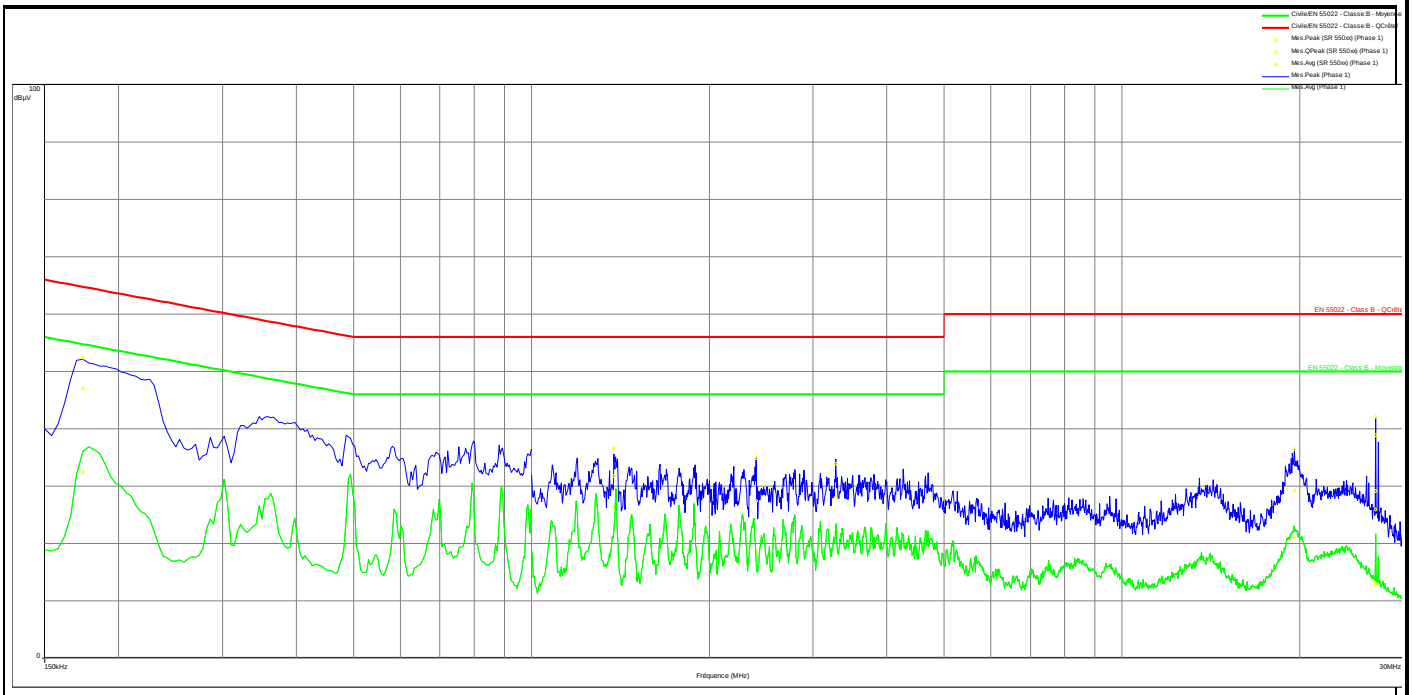
CONDUCTED EMISSIONS			
Graph name:	Emc#1	**Test configuration:**	
Limit:	EN 55022	L - 120V60Hz	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	120VAC / 60Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



Spurious emissions

Frequency (MHz)	Mes.Peak (dBµV)	Mes.QPeak (dBµV)	LimQP (dBµV)	Mes.QPeak-LimQP (dB)	Mes.Avg (dBµV)	LimAvg (dBµV)	Mes.Avg-LimAvg (dB)	Line
0.150	40.6	30.6	66.0	-35.4	19.3	56.0	-36.7	Phase 1
1.228	33.4	25.1	56.0	-30.9	17.8	46.0	-28.2	Phase 1
1.604	35.2	28.2	56.0	-27.8	19.3	46.0	-26.7	Phase 1
1.860	34.0	28.9	56.0	-27.1	22.5	46.0	-23.5	Phase 1
2.264	35.3	29.1	56.0	-26.9	23.2	46.0	-22.8	Phase 1
2.756	32.4	28.2	56.0	-27.8	22.4	46.0	-23.6	Phase 1
3.420	32.5	24.9	56.0	-31.1	18.8	46.0	-27.2	Phase 1
19.724	35.2	29.0	60.0	-31.0	20.5	50.0	-29.5	Phase 1
27.076	39.3	24.6	60.0	-35.4	12.9	50.0	-37.1	Phase 1

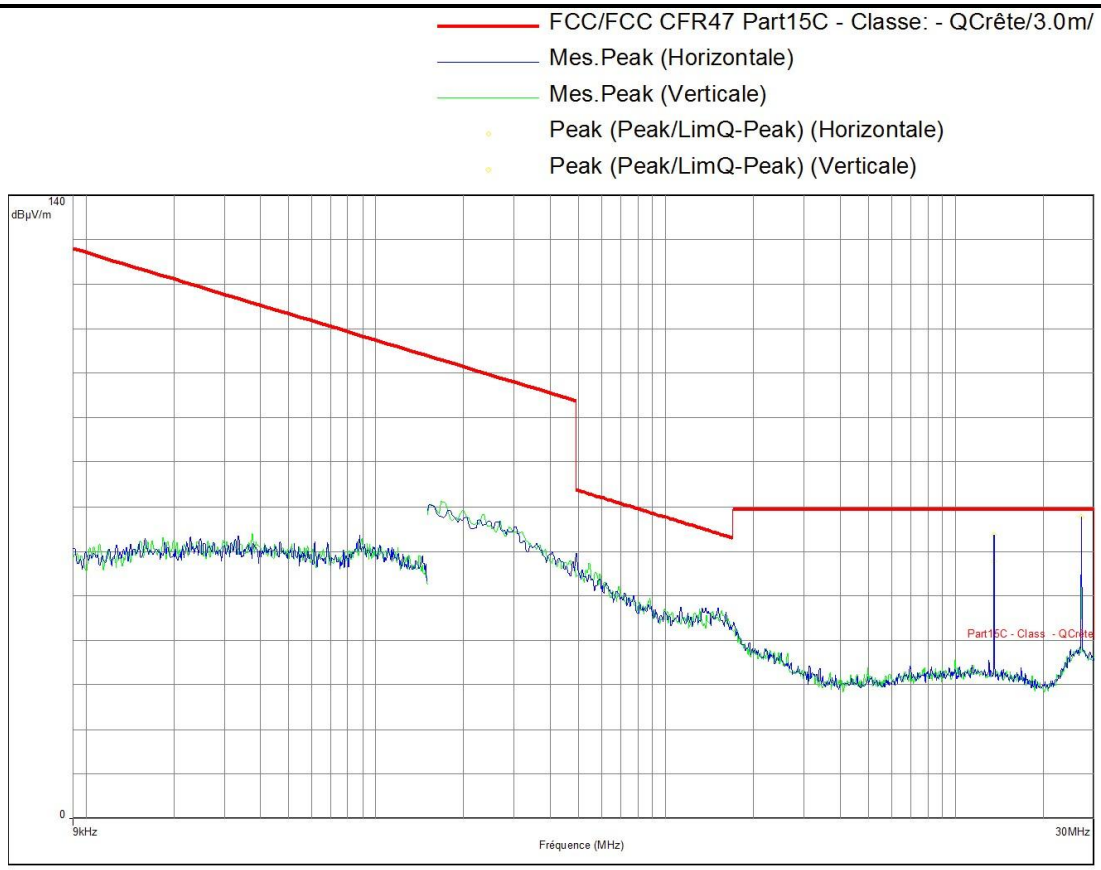
CONDUCTED EMISSIONS			
Graph name:	Emc#2	**Test configuration:**	
Limit:	EN 55022	N - 120V60Hz	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	120VAC / 60Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



Spurious emissions

Frequency (MHz)	Mes.Peak (dBµV)	Mes.QPeak (dBµV)	LimQP (dBµV)	Mes.QPeak-LimQP (dB)	Mes.Avg (dBµV)	LimAvg (dBµV)	Mes.Avg-LimAvg (dB)	Line
0.174	52.4	47.0	64.8	-17.8	32.5	54.8	-22.2	Phase 1
1.380	36.6	31.8	56.0	-24.2	26.4	46.0	-19.6	Phase 1
2.400	35.0	27.4	56.0	-28.6	18.6	46.0	-27.4	Phase 1
3.276	33.9	28.1	56.0	-27.9	22.0	46.0	-24.0	Phase 1
19.592	36.5	29.3	60.0	-30.7	21.1	50.0	-28.9	Phase 1
26.904	42.1	29.2	60.0	-30.8	13.1	50.0	-36.9	Phase 1
26.912	38.9	26.0	60.0	-34.0	12.8	50.0	-37.2	Phase 1

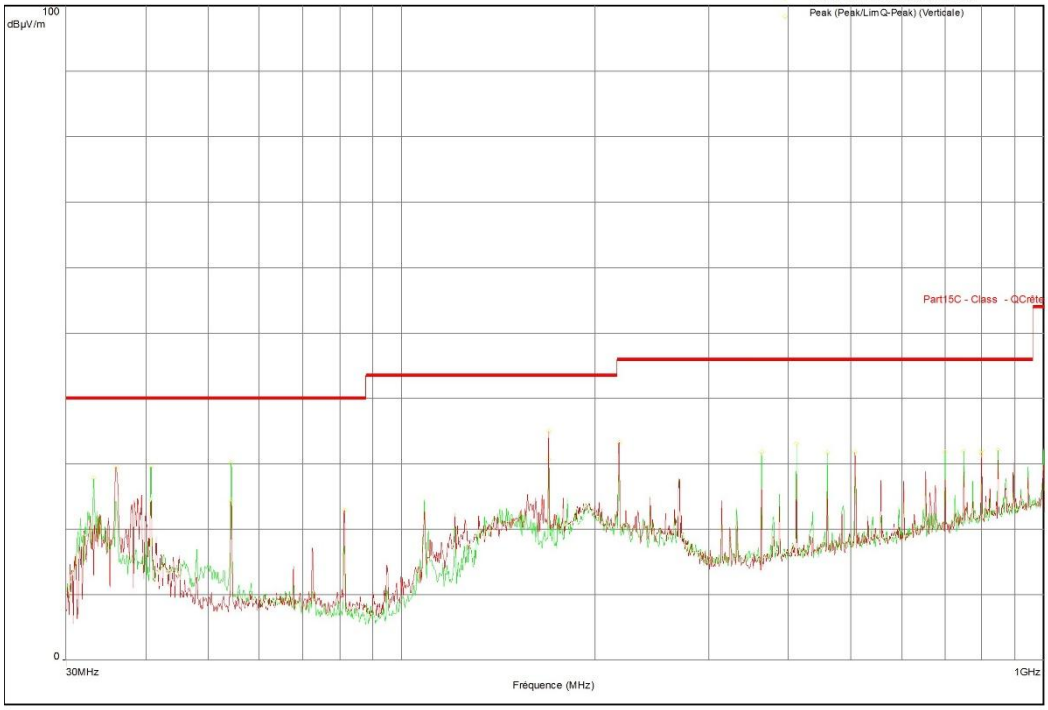
RADIATED EMISSIONS		
Graph name:	Emr#1	**Test configuration:**
Limit:	FCC CFR47 Part15C	(0°/90°)
Class:		
Frequency range: [9kHz - 30MHz]		
Antenna polarization:	Horizontal	**RBW :** 100kHz
Azimuth:	0° - 360°	**VBW :** 300kHz



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	LimQP (dBµV/m)	Peak-LimQP (dB)	Polarization
13.562	63.7	69.5	-5.8	Horizontal
27.119	67.6	69.5	-1.9	Horizontal
13.562	57.7	69.5	-11.8	Vertical

RADIATED EMISSIONS		
Graph name:	Emr#2	**Test configuration:**
Limit:	FCC CFR47 Part15C	(H+V)
Class:		
Frequency range: [30MHz - 1GHz]		
Antenna polarization:	Horizontal & Vertical	**RBW :** 100kHz
Azimuth:	0° - 360°	**VBW :** 300kHz



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	LimQP (dBµV/m)	Peak-LimQP (dB)	Polarization
217.720	33.3	46.0	-12.7	Horizontal
508.000	31.8	46.0	-14.2	Horizontal
798.320	32.1	46.0	-13.9	Horizontal
33.145	27.8	40.0	-12.2	Vertical
40.676	29.5	40.0	-10.5	Vertical
54.259	30.1	40.0	-9.9	Vertical
169.366	30.6	43.5	-12.9	Vertical
362.880	31.8	46.0	-14.2	Vertical
411.280	33.0	46.0	-13.0	Vertical

Frequency (MHz)	Peak (dBµV/m)	LimQP (dBµV/m)	Peak-LimQP (dB)	Polarization
459.600	31.6	46.0	-14.4	Vertical
701.560	31.8	46.0	-14.2	Vertical
749.960	31.9	46.0	-14.1	Vertical
798.320	31.6	46.0	-14.4	Vertical
846.720	32.0	46.0	-14.0	Vertical

Frequency (MHz)	Peak Level (dBµV/m)	Polarization
35.899	29.5	Horizontal
54.259	24.2	Horizontal
81.357	22.8	Horizontal
169.366	35.0	Horizontal

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 *Measurement of conducted disturbances in voltage on the power port*	3.51 dB	3.6 dB
Mesure des perturbations conduites en tension sur le réseau de télécommunication *Measurement of conducted disturbances in voltage on the telecommunication port.*	3.26 dB	A l'étude / Under consid.
Mesure des perturbations discontinues conduites en tension *Measurement of discontinuous conducted disturbances in voltage*	3.45 dB	3.6 dB
Mesure des perturbations conduites en courant *Measurement of conducted disturbances in current*	3.09 dB	A l'étude / Under consid.
Mesure du champ électrique rayonné sur le site en espace libre de Moirans *Measurement of radiated electric field on the Moirans open area test site*	5.20 dB	6.3 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.*