TEST REPORT

N°: 156606-724476-A (File#1004136-A1) **Version : 01**

Subject	**Electromagnetic compatibility and Radio spectrum Matters (ERM) tests according to standards: FCC CFR 47 Part 15, Subpart C RSS-247 Issue 2.0**
Issued to	**INGENICO** 9 Avenue de la gare, Rovaltain TGV 26958 - VALENCE FRANCE
Apparatus under test	
↳ Product	Bluetooth Low Energy printer
↳ Trade mark	**INGENICO**
↳ Manufacturer	**INGENICO**
↳ Model under test	**AXIUM PRINTER CL/BT**
↳ Serial number	**18200731407111020290975 5 (DTM conducted sample)** **18200731407111020290978 6 (DTM radiated sample)** **18200731407111020290977 3 (EMC sample)**
↳ FCCID	**XKB-AXIPRTBT**
↳ IC	**2586D-AXIPRTBT**
Conclusion	See Test Program chapter §1
Test date	November 16, 2018 to November 22, 2018
Test location	MOIRANS
IC Test site	6500A-1 & 6500A-3
Composition of document	57 pages
Document issued on	November 19, 2018

Written by :
Jonathan PAUC
Tests operator

Approved by :
Anthony MERLIN
Technical manager

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES
LCIE SUD-EST
ZI Centr'Alp
170, Rue de Chatagnon
38430 MOIRANS
Tél. Int. 04 76 07 36 36
Fax 04 76 35 90 88

This document shall not be reproduced, except in full, without the written approval of the LCIE. This document contains results related only to the items 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 measurement. This document doesn't anticipate any certification decision.

PUBLICATION HISTORY

Version	Date	Author	Modification
01	November 19, 2018	Jonathan PAUC	Creation of the document

SUMMARY

1. TEST PROGRAM

Standard:

- **FCC Part 15, Subpart C 15.247**
- **ANSI C63.10 (2013)**
- **RSS-247 Issue 2.0**
- **RSS-Gen Issue 5**
- **558074 D01 DTS Measurement Guidance v05**

EMISSION TEST	LIMITS			RESULTS
Limits for conducted disturbance at mains ports 150kHz-30MHz	**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 §15.247 (d)* *RSS-247 §5.5*	**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** ☐ **FAIL** ☐ **NA** ☐ **NP**
Radiated emissions 30MHz-25GHz* *CFR 47 §15.209 (a)* *CFR 47 §15.247 (d)* *RSS-247 §5.5* ***Highest frequency : 64MHz*** ***(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**
Bandwidth 6dB *CFR 47* §15.247 (a) (2) *RSS-247 §5.2*	**At least 500kHz**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Power spectral Density *CFR 47 §15.247 (e)* *RSS-247 §5.2*	**Limit: 8dBm/3kHz**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Maximum Peak Output Power *CFR 47 §15.247 (b)* *RSS-247 §5.4*	**Limit: 30dBm** Conducted or Radiated measurement			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Band Edge Measurement *CFR 47 §15.209 (a)* *CFR 47 §15.247 (d)* *RSS-247 §5.5*	**Limit: -20dBc or** **Radiated emissions limits in restricted bands**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Occupied bandwidth *RSS-Gen §6.7*	**No limit**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Receiver Spurious Emission** *RSS-Gen §7.3*	**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**

***§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):

AXIUM PRINTER CL/BT **Serial Number:** **182007314071110202909773**
182007314071110202909786
182007314071110202909755

Photography of EUT

Power supply:
During all the tests, EUT is supplied by V_{nom}: 240V / 50Hz – (Radiated Emission & Conducted Emission)
120V/60Hz (Conducted Emission)
For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference / Sn	Comments
Supply1	☐ AC ☐ DC ☑ Battery	3.6Vdc / 2.25Ah / 8.1A Wh	F26402298	Configuration 3
Supply2	☐ AC ☑ DC ☐ Battery	100-240V (50-60Hz) => 5Vdc	PSM10R-050	Configuration 1
Supply3	☐ AC ☑ DC ☐ Battery	100-240V (50-60Hz) => 5Vdc	PSAF10E-050Q	Configuration 2

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Supply 3	USB Type C	2	☑	☑	☑	Ref : 296243055

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop	Lenovo L450	PF0D29NW	

Equipment information:

Bluetooth LE Type:	☑ **BLE**	☐ **v4.0**	☐ **v4.1**	☐ **v4.2**
	☑ **v5.0**			
Frequency band:	[2400 – 2483.5] MHz			
Spectrum Modulation:	☑ DSSS (Tested like it)			
Number of Channel:	40			
Spacing channel:	2MHz			
Channel bandwidth:	1MHz			
Antenna Type:	☑ Integral	☐ External	☐ Dedicated	
Antenna connector:	☐ Yes	☐ No	☑ Temporary for test	
Transmit chains:	1			
	Single antenna			
	Gain: 0dBi			
Beam forming gain:	No			
Receiver chains	1			
Type of equipment:	☑ Stand-alone	☐ Plug-in	☐ Combined	
Ad-Hoc mode:	☑ Yes	☑ No		
Adaptivity mode:	☐ Yes (Load Based)	☐ Off mode	☑ No	
	Clear Channel Assessment Time:		Xµs	
Duty cycle:	☑ Continuous duty	☐ Intermittent duty	☐ 100% duty	
Equipment type:	☑ Production model	☐ Pre-production model		
Operating temperature range:	Tmin:	☐ -20°C	☐ 0°C	☑ -10°C
	Tnom:	20°C		
	Tmax:	☐ 35°C	☐ 55°C	☑ 45°C
Type of power source:	☐ AC power supply	☑ DC power supply	☐ Battery	
Operating voltage range:	Vnom:	☐ 230V/50Hz	☑ 5Vdc	
Geo-location capability:	☐ Yes (The geographical location determined by the equipment is not accessible to the end user as defined in section 4.3.2.12.2 of ETSI EN 300 328 V2.1.1 standard)	☑ No		
Minimum performance criteria for Receiver blocking test:	☑ PER less than or equal to 10%	☐ Alternative performance criteria (4)		

CHANNEL PLAN			
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
Cmin: 0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
Cmid : **19**	2440	**Cmax: 39**	2480

DATA RATE		
Data Rate (Mbps)	**Modulation Type**	**Worst Case Modulation**
1	GFSK	☑

2.2. EUT CONFIGURATION

2.2.1. Configuration

✓ EMC Test mode =>Three Configurations:
- (Configuration 1 – Powered by Power Supply PSM10R-050 with battery charging)
- (Configuration 2 – Powered by Power Supply PSAF10E-050Q with battery charging)
- (Configuration 3 – Powered by Battery charging only)

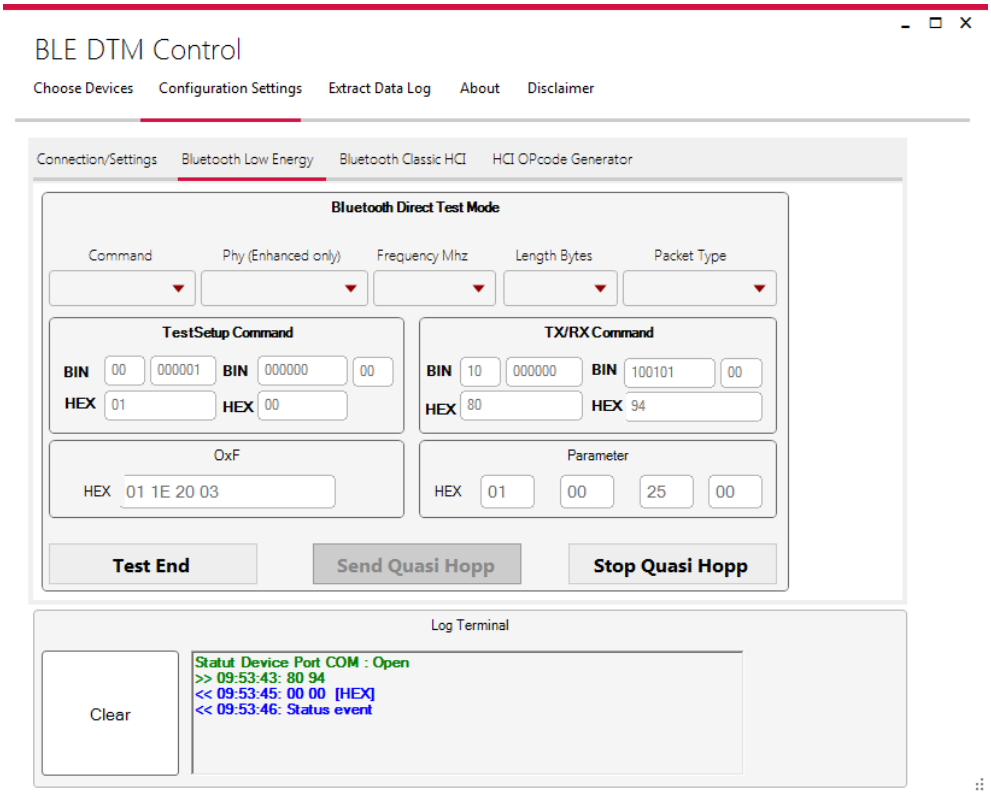
✓ DTM Test mode => Connected to a laptop through USB-C cable (Configuration 4)

During tests, worst cases configurations are presented.

2.2.2. Testing Mode :

1/ BLE Testing Mode (DTM Mode) :

The EUT is set in the following modes during tests with simulator / software (BLE DTM Control V1.0)
- Permanent emission with modulation on a fixed channel in the data rate that produced the highest power
All tests are performed at Cmin, Cmid and Cmax.



2/ EMC Testing Mode

- Switch the Printer to << Auto Test >> mode, pressing the Power button and advance paper.
- When released the printer prints a ticket every second, BLE ON

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 20, 2018
Test performed by	:	Jonathan PAUC
Atmospheric pressure (hPa)	:	990
Relative humidity (%)	:	34
Ambient temperature (°C)	:	22

3.2. TEST SETUP

Mains terminals

The EUT and auxiliaries are set:

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

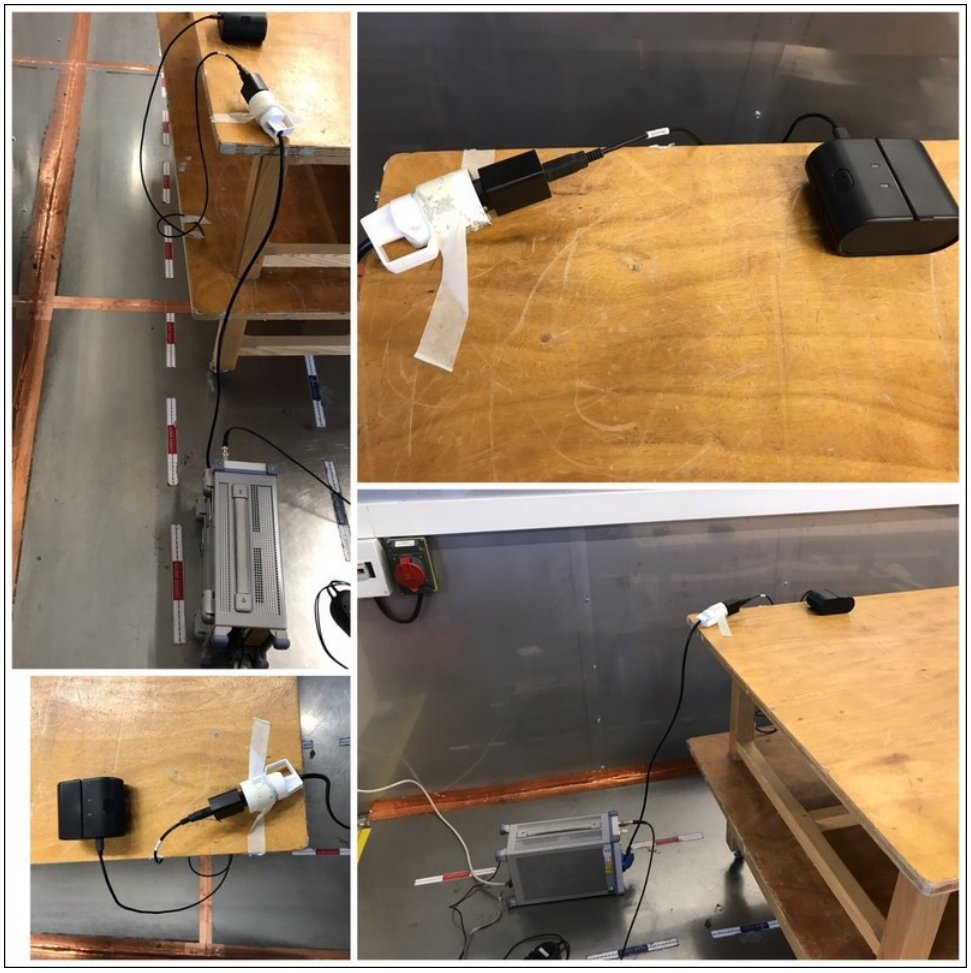
☐ 10cm above the ground on isolating support (Floor standing equipment)

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}.

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

Test setup – Configuration 1



Test setup – Configuration 2

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	-	-	A5329578	10/18	10/19
LISN	RHODE & SCHWARZ	ENV216	C2320291	12/17	12/18
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	12/17	12/18
Transient limiter	RHODE & SCHWARZ	ESH3-Z2	A7122204	02/18	02/19

Note: In our quality system, the test equipment calibration due is more & less 2 months

3.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

3.6. TEST RESULTS

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

Measure on L1:	(240V/50Hz)	graph **Emc#1**	(Configuration 1)	(see annex 1)
Measure on N:	(240V/50Hz)	graph **Emc#2**	(Configuration 1)	(see annex 1)
Measure on L1:	(120V/60Hz)	graph **Emc#3**	(Configuration 1)	(see annex 1)
Measure on N:	(120V/60Hz)	graph **Emc#4**	(Configuration 1)	(see annex 1)
Measure on L1:	(240V/50Hz)	graph **Emc#5**	(Configuration 2)	(see annex 1)
Measure on N:	(240V/50Hz)	graph **Emc#6**	(Configuration 2)	(see annex 1)
Measure on L1:	(120V/60Hz)	graph **Emc#7**	(Configuration 2)	(see annex 1)
Measure on N:	(120V/60Hz)	graph **Emc#8**	(Configuration 2)	(see annex 1)

3.7. CONCLUSION

Conducted emission data measurement performed on the sample of the product AXIUM PRINTER CL/BT, SN: 18200731407111020290977 3, in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

4. RADIATED EMISSION DATA

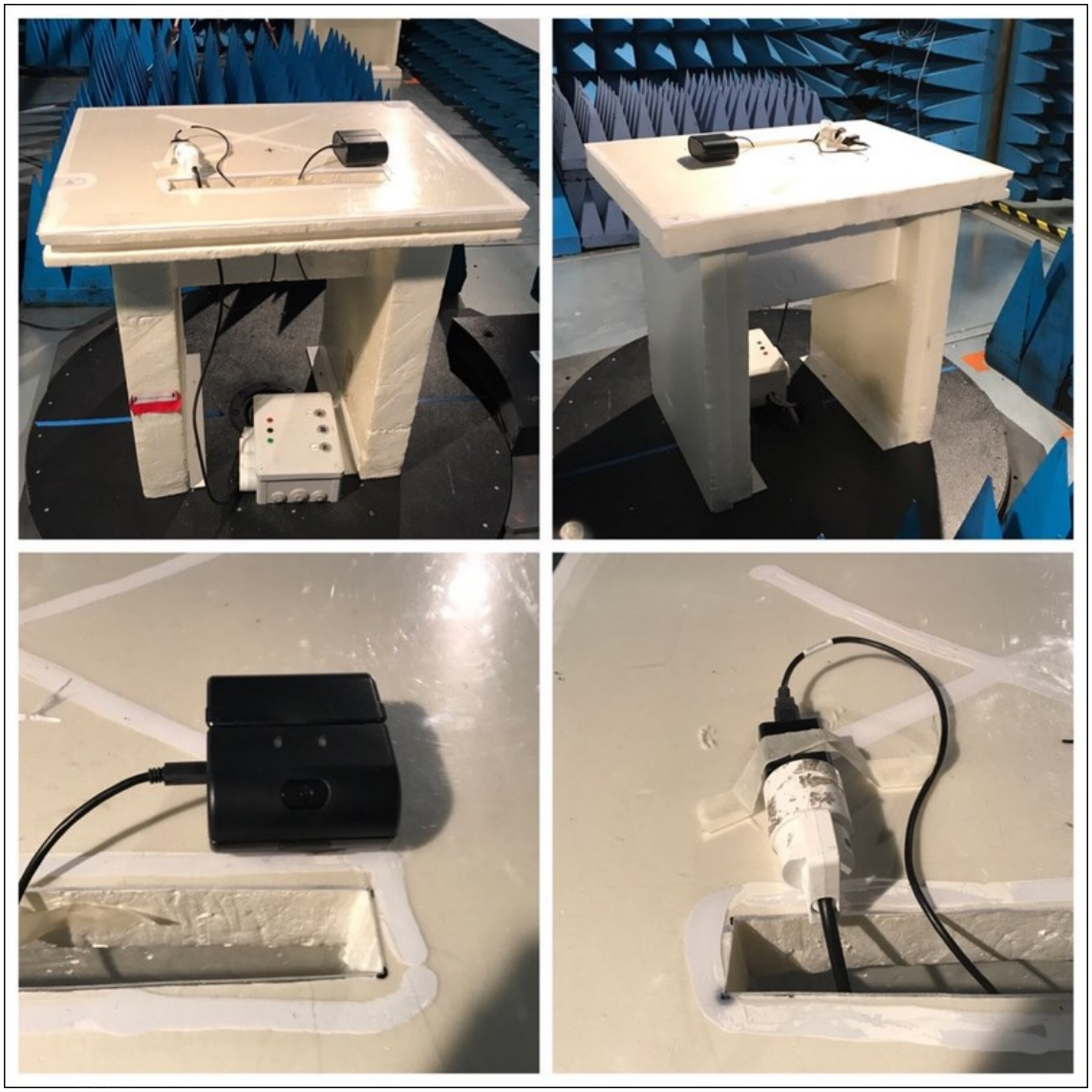
4.1. ENVIRONMENTAL CONDITIONS

Date of test	:	November 20, 2018	November 22, 2018
Test performed by	:	Jonathan PAUC	Jonathan PAUC
Atmospheric pressure (hPa)	:	990	994
Relative humidity (%)	:	31	25
Ambient temperature (°C)	:	21	21

4.2. TEST SETUP

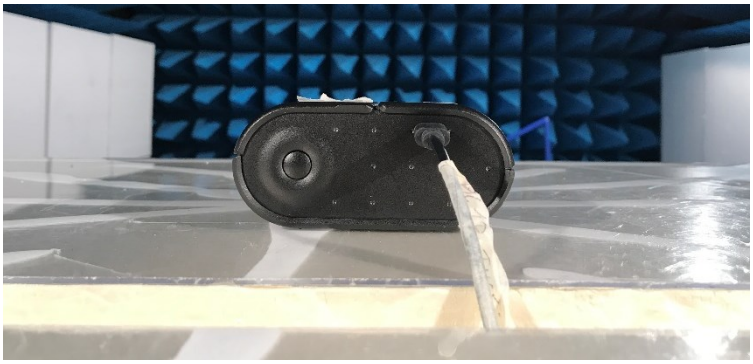
The installation of EUT is identical for pre-characterization measures in a 3 meters semi- anechoic chamber and for measures on the 10 meters Open site.
The EUT and auxiliaries are set:
☑ 80cm above the ground on the non-conducting table (Table-top equipment) - Below 1GHz
☑ 150cm above the ground on 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}.

Test setup in anechoic chamber – Charging mode Cfg1 (<1Ghz) – EMC test setup



Test setup in anechoic chamber – Charging mode Cfg2(<1GHz) – EMC test setup

Test setup in anechoic chamber – Battery mode Cfg3(<1GHz) – EMC test setup



Test setup in anechoic chamber – Test setup (>1Ghz) -Configuration 4 DTM Test Mode

Test setup in OATS – Charging mode Cfg1 (<1Ghz) – EMC test setup

Test setup in OATS – Charging mode Cfg2(<1GHz) – EMC test setup

4.3. TEST METHOD

The product has been tested according to ANSI C63.10, FCC part 15 subpart C.

Pre-characterisation measurement: (9kHz – 12.75GHz)
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 to maximize 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.
The pre-characterization graphs are obtained in PEAK detection and PEAK/AVERAGE from 1GHz to 12.75GHz.

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 to maximize 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.

Characterization on 3 meters full anechoic chamber from 1GHz to 12.75GHz:
The product has been tested at a distance of **3 meters** from the antenna and compared to the FCC part 15 subpart C limits. Measurement bandwidth was 1MHz from 1GHz to 12.75GHz.
Test is performed in horizontal (H) and vertical (V) polarization. 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.

The height antenna is
☑ On mast, varied from 1m to 4m
☐ Fixed and centered on the EUT (EUT smaller than the beamwidth of the measurement antenna, ANSI C63.10 §6.6.5)

Frequency list has been created with anechoic chamber pre-scan results.

4.4. TEST EQUIPMENT LIST

ANECHOIC CHAMBER					
DESCRIPTION	**MANUFACTURER**	**MODEL**	**N° LCIE**	**CAL_DATE**	**CAL_DUE**
Amplifier 9kHz - 40GHz	LCIE SUD EST	_	A7102082	10/18	10/19
Antenna Bi-log	CHASE	CBL6111A	C2040072	09/18	09/20
Antenna horn 18GHz	EMCO	3115	C2042029	09/18	09/20
Cable Measure @3m 18GHz	-	18GHz	A5329038	12/17	12/18
Cable Measure @3m 18GHz	-	18GHz	A5329657	06/18	06/19
Cable Measure @3m	-	1GHz	A5329206	06/18	06/19
Cable Measure @1m	STORMFLEX	26GHz	A5329680	12/17	12/18
Cable Measure Analyzer-Amplifier SMA	STORMFLEX	26GHz	A5329681	12/17	12/18
Cable Measure @1m	STORMFLEX	26GHz	A5329682	12/17	12/18
Semi-Anechoic chamber #3	SIEPEL	-	D3044017	03/16	03/19
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	12/17	12/18
BAT EMC	NEXIO	v3.9.0.10	L1000115	-	-
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	10/18	10/20
Turntable chamber (Cage#3)	ETS Lingren	Model 2165	F2000371	-	-
Table C3	LCIE	-	F2000461	-	-
Rehausse Table C3	LCIE	-	F2000511	-	-
Turntable controller (Cage#3)	ETS Lingren	Model 2090	F2000444	-	-

OATS					
DESCRIPTION	**MANUFACTURER**	**MODEL**	**N° LCIE**	**CAL_DATE**	**CAL_DUE**
Antenna Bi-log	CHASE	CBL6111A	C2040051	01/19	01/20
Emission Cable	SUCOFLEX	6GHz	A5329061	03/19	03/20
Cable (OATS)	-	1GHz	A5329623	03/19	03/20
Radiated emission comb generator	BARDET	-	A3169050	-	-
OATS	-	-	F2000409	10/19	10/20
Receiver 20-1000MHz	ROHDE & SCHWARZ	ESVS30	A2642006	12/19	12/21
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 C1/OATS	LCIE	-	F2000445	-	-

Note: In our quality system, the test equipment calibration due is more & less 2 months

4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

4.6. TEST RESULTS

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

See graphs for 30MHz-1GHz:

Graph identifier	Polarization	Mode	EUT position	Channel	Configuration	Comments
Emr# 1	H & V	TX	Axis XY	/	Configuration 1	See annex 1
Emr# 2	H & V	TX	Axis XY	/	Configuration 2	See annex 1
Emr# 3	H & V	TX	Axis XY	/	Configuration 3	See annex 1

4.6.2. Pre-characterization at 3 meters [1GHz-12.75GHz]

See graphs for 1GHz-12.75GHz:

Graph identifier	Polarization	Mode	EUT position	Channel	Configuration	Comments
Emr# 4	H & V	TX (DTM test mode)	Axis XY	Cmin	Configuration 4	See annex 1
Emr# 5	H & V	TX (DTM test mode)	Axis XY	Cmid	Configuration 4	See annex 1
Emr# 6	H & V	TX (DTM test mode)	Axis XY	Cmax	Configuration 4	See annex 1

4.6.3. 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)	Remark
38.456	15.0	QP	V	85	100	17.0	32.0	40.0	**-8.0**	cfg1
56.590	21.1	QP	V	0	110	8.3	29.4	40.0	**-10.6**	cfg1
389.789	19.4	QP	V	93	254	19.5	38.9	46.0	**-7.1**	cfg1
38.185	17.0	QP	V	95	125	17.1	34.1	40.0	**-5.9**	cfg2
57.300	21.7	QP	V	12	140	8.1	29.8	40.0	**-10.2**	cfg2
62.180	24.7	QP	V	145	100	7.8	32.5	40.0	**-7.5**	cfg2
401.900	20.0	QP	H	231	250	19.9	39.9	46.0	**-6.1**	cfg2
437.330	20.2	QP	H	201	250	20.8	41.0	46.0	**-5.0**	cfg2

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

4.6.4. Characterization on 3meters anechoic chamber from 1GHz to 12.75GHz

Worst case final data result:
The frequency list is created from the results obtained during the pre-characterization in anechoic chamber.
Measurements are performed using a PEAK and AVERAGE detection.

Configuration 1 – BLE Cmin Channel

Frequency (MHz)	Mes.Avg (dBµV/m)	Limite (dBµV/m)	Mes.-Lim. (dB)	Correction (dB)
4803.585	32.1	54.0	-21.9	-24.1
7205.078	48.3	54.0	-5.7	-19.9
9607.881	39.0	54.0	-15.0	-18.8
2209.945	27.6	54.0	-26.4	-31.0
2295.704	27.2	54.0	-26.8	-30.8
2352.061	27.1	54.0	-26.9	-30.8
4803.650	33.1	54.0	-20.9	-24.1
7205.356	45.1	54.0	-8.9	-19.9
9607.825	37.7	54.0	-16.3	-18.8

Frequency (MHz)	Mes.Peak (dBµV/m)	Limite (dBµV/m)	Mes.-Lim. (dB)	Correction (dB)
4803.585	45.9	74.0	-28.1	-24.1
7205.078	58.0	74.0	-16.0	-19.9
9607.881	48.1	74.0	-25.9	-18.8
2209.945	39.5	74.0	-34.5	-31.0
2295.704	41.0	74.0	-33.0	-30.8
2352.061	40.5	74.0	-33.5	-30.8
4803.650	45.2	74.0	-28.8	-24.1
7205.356	55.6	74.0	-18.4	-19.9
9607.825	49.0	74.0	-25.0	-18.8

Note: Measures have been done at 3m distance.

Configuration 1 – BLE Cmid Channel

Frequency (MHz)	Mes Peak (dBµV/m)	Limit Pk (dBµV/m)	Peak-LimM (dB)	Angle (°)	Pos	Correction (dB)	Comments
4048.15	46	74	-28	315	H	-25.7	Mes Peak < Avg Limit
5261.4	47	74	-27	161	V	-23.2	Mes Peak < Avg Limit
7319.29103	57	74	-17	193	H	-19.8	/

Frequency (MHz)	Mes.Avg (dBµV/m)	Limit Avg (dBµV/m)	Avg-LimM (dB)	Angle (°)	Pos	Correction (dB)	Comments
7319.29103	47.6	54	-6.45	193	H	-19.8	Mes Peak < Avg Limit

Note: Measures have been done at 3m distance.

Configuration 3 – BLE Cmax Channel

Frequency (MHz)	Mes Peak (dBµV/m)	Limit Pk (dBµV/m)	Peak-LimM (dB)	Angle (°)	Pos	Correction (dB)	Comments
5768.25	47.8	74	-26.2	175	H	-22.7	Mes Peak < Avg Limit
7439.22	57.91	74	-16.09	104	V	-19.6	/

Frequency (MHz)	Mes.Avg (dBµV/m)	Limit Avg (dBµV/m)	Avg-LimM (dB)	Angle (°)	Pos	Correction (dB)	Comments
7439.22	46.69	54	-7.31	104	V	-19.6	/

Note: Measures have been done at 3m distance.

4.7. CONCLUSION

Radiated emission data measurement performed on the sample of the product AXIUM PRINTER CL/BT, SN:18200731407111020290977 3 & 18200731407111020290978 6, in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

5. BANDWIDTH (15.247)

5.1. TEST CONDITIONS

Date of test	:	November 19, 2018
Test performed by	:	Jonathan PAUC
Atmospheric pressure (hPa)	:	990
Relative humidity (%)	:	27
Ambient temperature (°C)	:	19

5.2. 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 placed in an anechoic chamber; 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, a delta marker is used to measure the frequency difference as the emission bandwidth.

Measurement Procedure: §8.1 Option 1 (DTS Measurement Guidance)
1. Set resolution bandwidth (RBW) = 100kHz.
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. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. Compare the resultant bandwidth with the RBW setting of the analyzer.

5.3. TEST EQUIPMENT LIST

CONDUCTED TEST SETUP					
DESCRIPTION	**MANUFACTURER**	**MODEL**	**N° LCIE**	**CAL_DATE**	**CAL_DUE**
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	10 /18	10/20
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	12/17	12/18
Cable Measure Analyzer-Amplifier SMA	STORMFLEX	26GHz	A5329681	12/17	12/18
Attenuator 10dB	AEROFLEX	-	A7122268	06/17	06/19

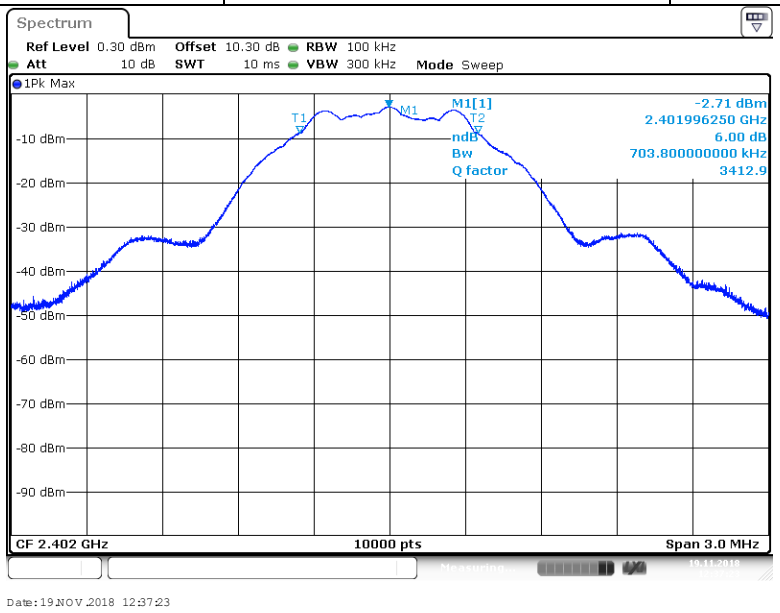
Note: In our quality system, the test equipment calibration due is more & less 2 months

5.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

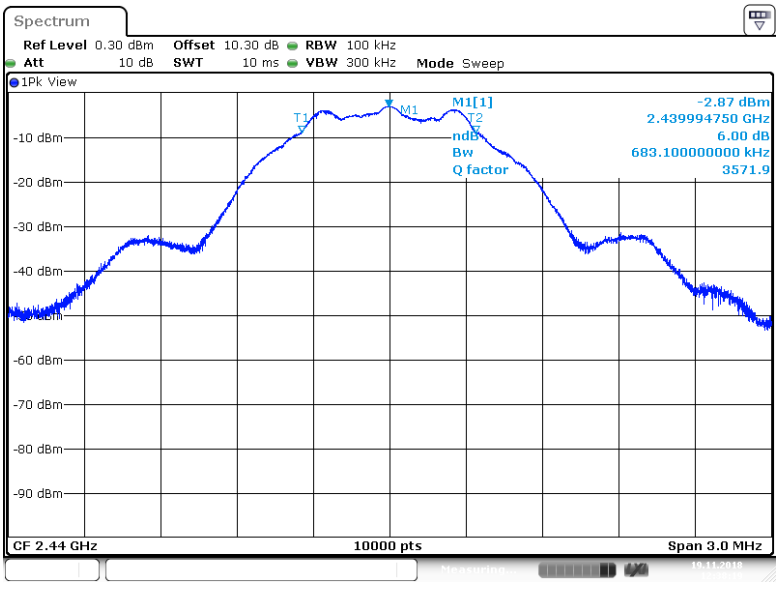
☑ None ☐ Divergence:

5.5. TEST SEQUENCE AND RESULTS

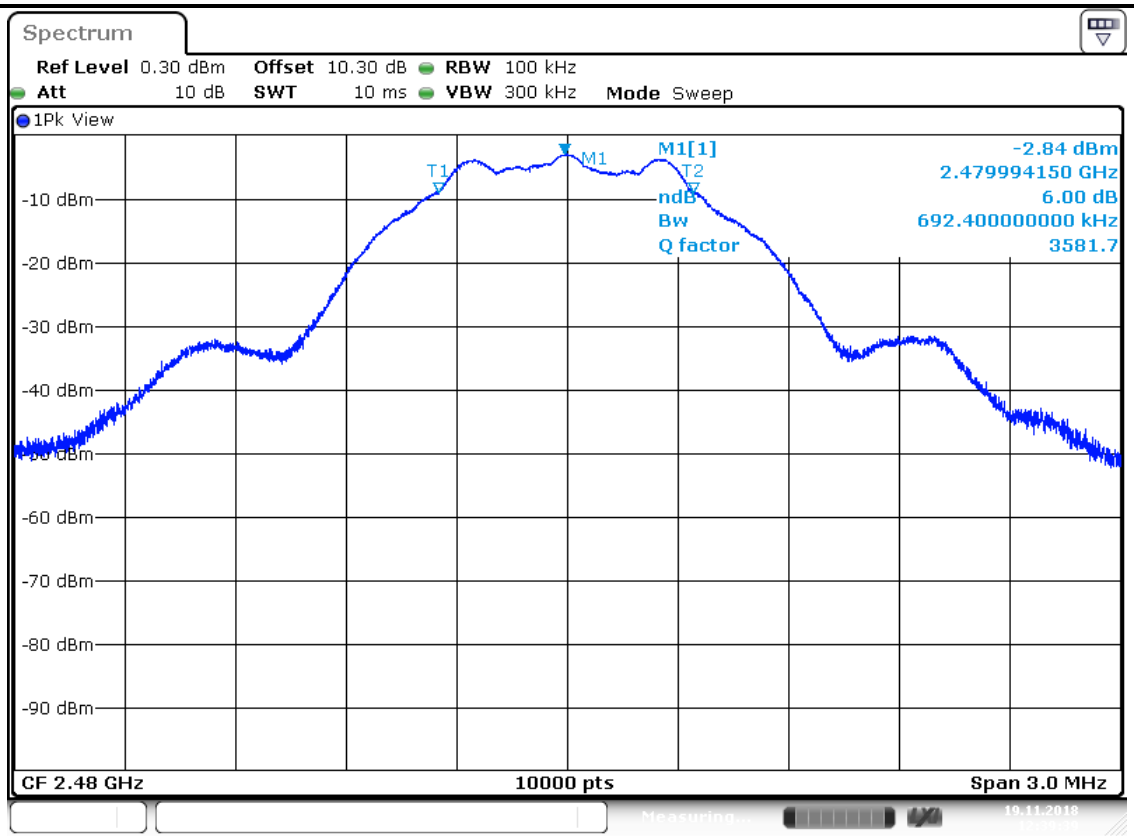
Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Bandwidth Limit (MHz)
Cmin	2402	**703.8**	**>0.5**
Cmid	2440	**683.1**	**>0.5**
Cmax	2480	**692.4**	**>0.5**



Cmin



Cmid



Cmax

5.6. CONCLUSION

Bandwidth measurement performed on the sample of the product AXIUM PRINTER CL/BT, SN: 18200731407111020290975 5, in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

6. MAXIMUM PEAK OUTPUT POWER (15.247)

6.1. TEST CONDITIONS

Date of test	:	November 19, 2018
Test performed by	:	Jonathan PAUC
Atmospheric pressure (hPa)	:	990
Relative humidity (%)	:	27
Ambient temperature (°C)	:	19

6.2. 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.
Offset: Attenuator+cable 10.3dB

☐ ***Radiated measurement:***
The EUT is placed in an anechoic chamber; the center frequency of the spectrum analyzer is set to the fundamental frequency.
The product has been tested at a distance of 3 meters from the antenna. 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.
- 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:

$$P = \frac{(E\,d)^2}{30G}$$

Maximum peak conducted output power

One of the following procedures may be used to determine the maximum peak conducted output power of a DTS EUT.

- ☑ ***RBW ≥ DTS bandwidth*** ***§9.1.1 (DTS Measurement Guidance)***

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

a) Set the RBW ≥ DTS bandwidth.
b) Set VBW ≥ 3 x RBW.
c) Set span ≥ 3 x RBW
d) Sweep time = auto couple.
e) Detector = peak.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

- ☐ ***Integrated band power method***

This procedure may be used when the maximum available RBW of the measurement instrument is less than the DTS bandwidth.

a) Set the RBW = 1 MHz.
b) Set the VBW ≥ 3 x RBW
c) Set the span ≥ 1.5 x DTS bandwidth.
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges

6.3. TEST EQUIPMENT LIST

CONDUCTED TEST SETUP					
DESCRIPTION	**MANUFACTURER**	**MODEL**	**N° LCIE**	**CAL_DATE**	**CAL_DUE**
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	10 /18	10/20
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	12/17	12/18
Cable Measure Analyzer-Amplifier SMA	STORMFLEX	26GHz	A5329681	12/17	12/18
Attenuator 10dB	AEROFLEX	-	A7122268	06/17	06/19

Note: In our quality system, the test equipment calibration due is more & less 2 months

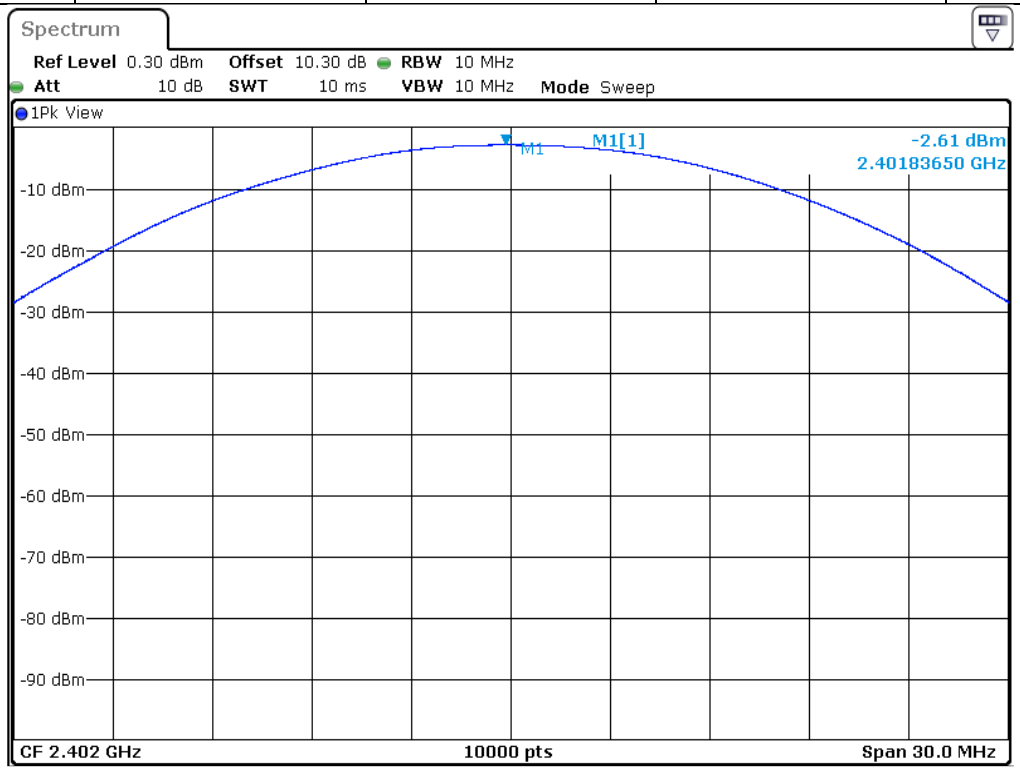
6.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

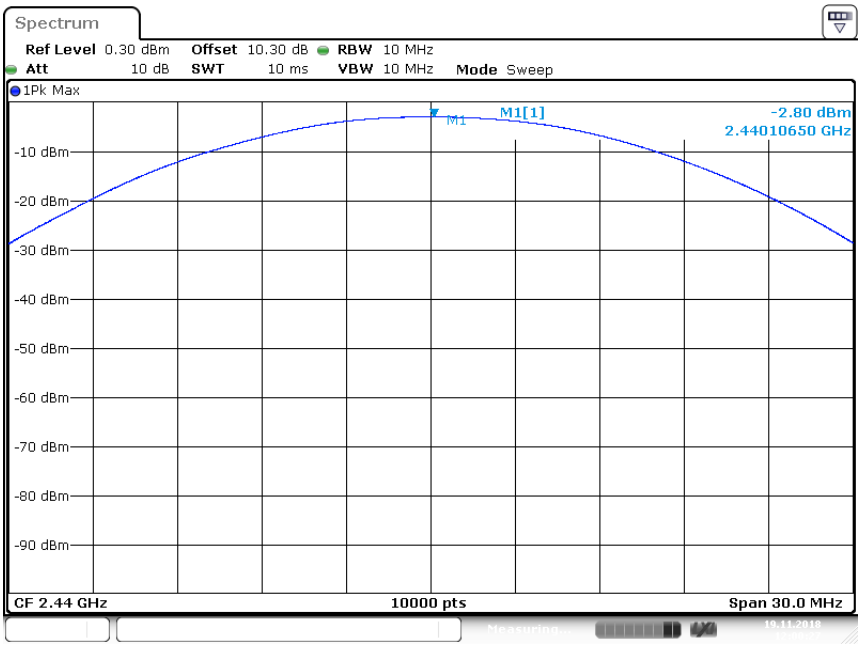
6.5. TEST SEQUENCE AND RESULTS

Modulation:

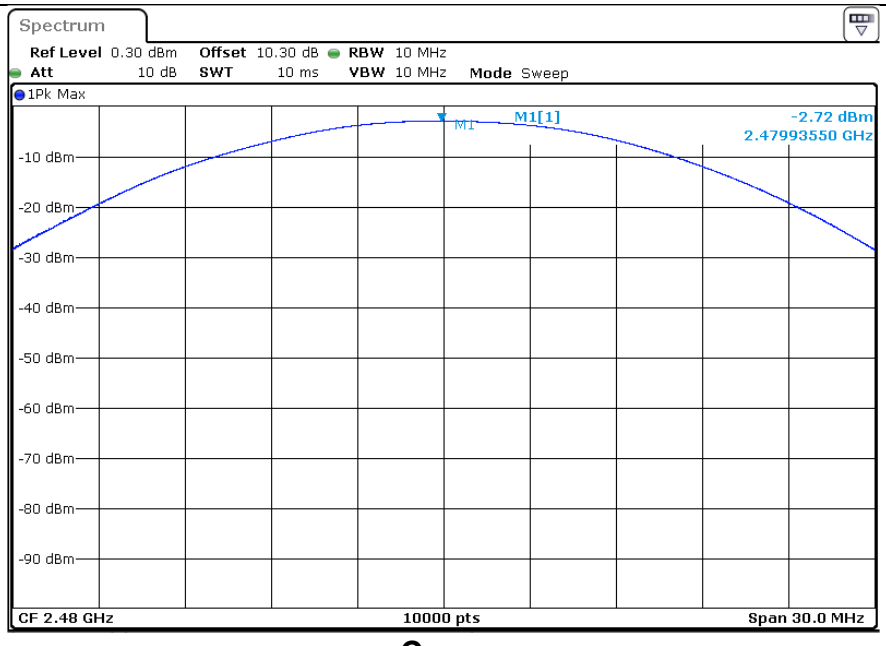
Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	Power Limit (dBm)	FC (dB)
Cmin	2402	**-2.6**	30.0	10.3
Cmid	2440	**-2.8**	30.0	10.3
Cmax	2480	**-2.7**	30.0	10.3



Cmin



Cmid



Cmax

6.1. CONCLUSION

Maximum Peak Output Power measurement performed on the sample of the product AXIUM PRINTER CL/BT, SN:18200731407111020290975 5 , in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

7. POWER SPECTRAL DENSITY (15.247)

7.1. TEST CONDITIONS

Date of test	:	November 19, 2018
Test performed by	:	Jonathan PAUC
Atmospheric pressure (hPa)	:	990
Relative humidity (%)	:	27
Ambient temperature (°C)	:	19

7.2. 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.
Offset: Attenuator+cable 10.3dB

☐ ***Radiated measurement:***
The EUT is placed in an anechoic chamber; the center frequency of the spectrum analyzer is set to the fundamental frequency.
The product has been tested at a distance of 3 meters from the antenna. 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.
- 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:

$$P = \frac{(E\,d)^2}{30G}$$

Measurement Procedure PKPSD: §10.2 (DTS Measurement Guidance)
a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to: 3 kHz.
d) Set the VBW ≥ 3 x RBW.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

7.3. TEST EQUIPMENT LIST

CONDUCTED TEST SETUP					
DESCRIPTION	**MANUFACTURER**	**MODEL**	**N° LCIE**	**CAL_DATE**	**CAL_DUE**
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	10 /18	10/20
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	12/17	12/18
Cable Measure Analyzer-Amplifier SMA	STORMFLEX	26GHz	A5329681	12/17	12/18
Attenuator 10dB	AEROFLEX	-	A7122268	06/17	06/19

Note: In our quality system, the test equipment calibration due is more & less 2 months

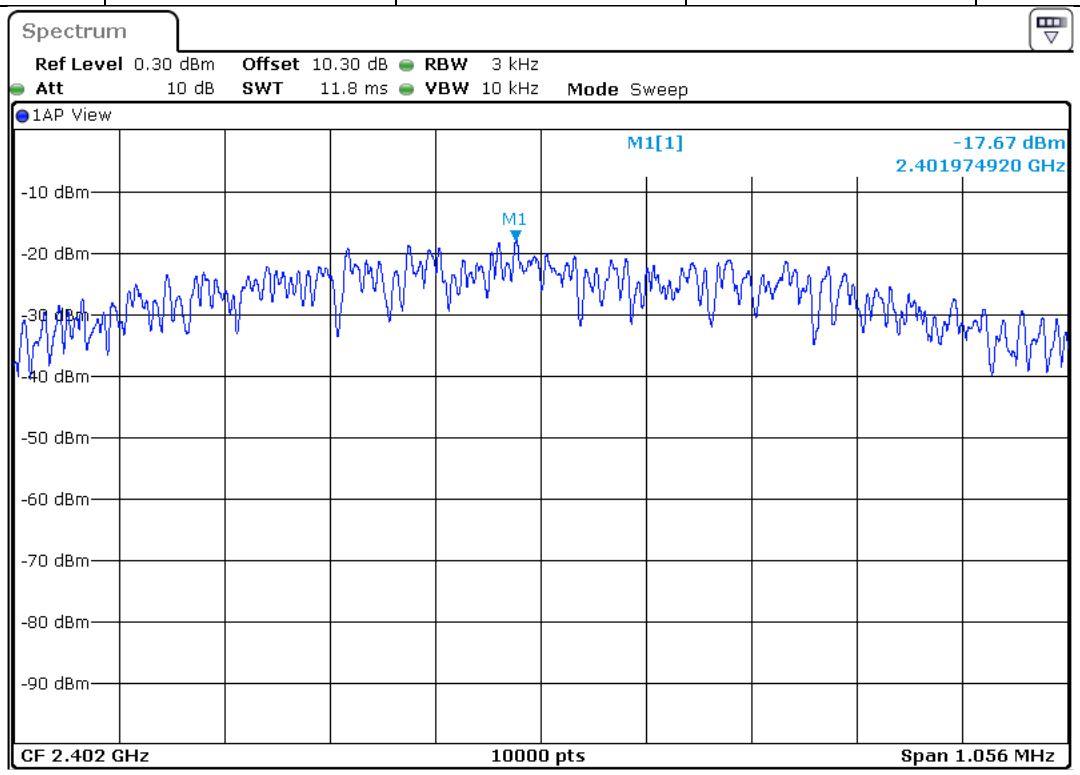
7.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

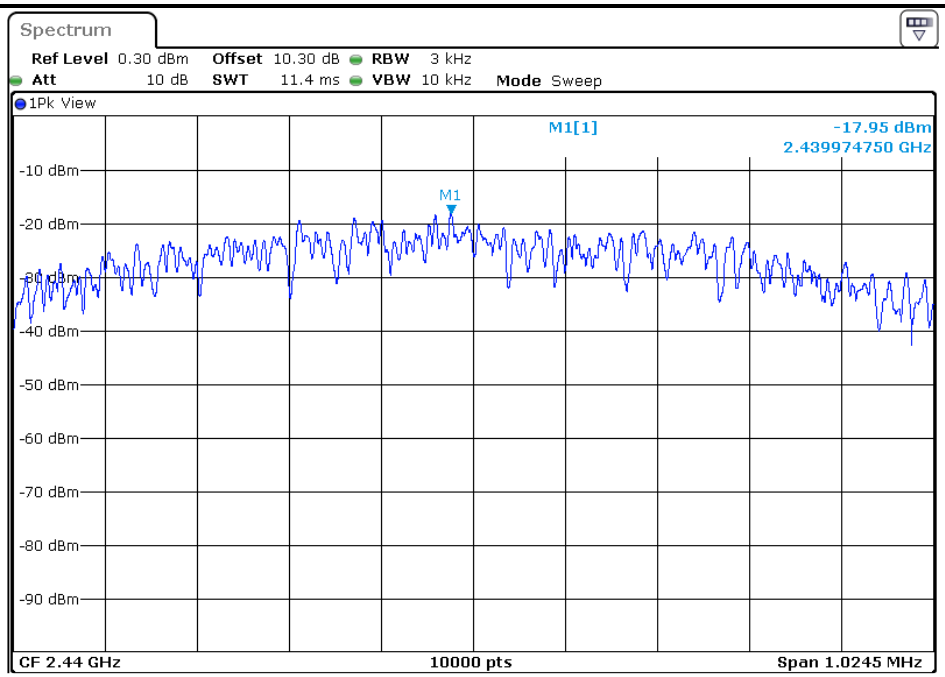
7.5. TEST SEQUENCE AND RESULTS

Modulation:

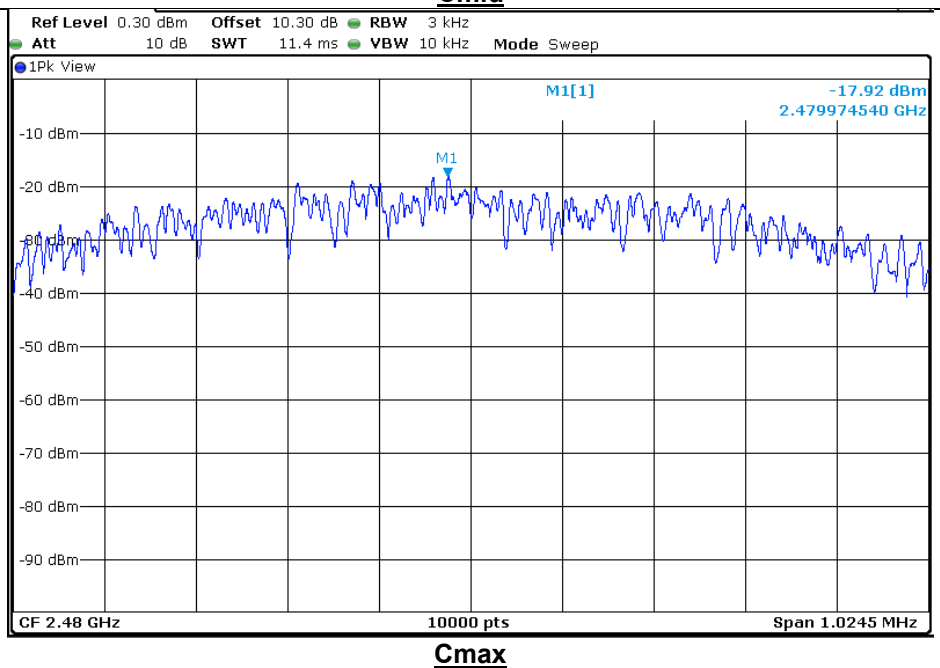
Channel	Channel Frequency (MHz)	Power Spectral Density (dBm)	PSD Limit (dBm)	FC (dB)
Cmin	2402	**-17.7**	8.0	10.3
Cmid	2440	**-17.9**	8.0	10.3
Cmax	2480	**-17.9**	8.0	10.3



Cmin



Cmid



Cmax

7.1. CONCLUSION

Power Spectral Density measurement performed on the sample of the product AXIUM PRINTER CL/BT, SN: 18200731407111020290975 5 , in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

8. BAND EDGE MEASUREMENT (15.247)

8.1. TEST CONDITIONS

Date of test	:	November 19, 2018
Test performed by	:	Jonathan PAUC
Atmospheric pressure (hPa)	:	990
Relative humidity (%)	:	27
Ambient temperature (°C)	:	19

8.2. LIMIT

RF antenna conducted test: § 11 (DTS Measurement Guidance)
Set RBW = 100 kHz, Video bandwidth (VBW) > RBW, scan up through 10th harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.
For -20dBc limit, lowest power output level is considered, worst case.

Radiated emission test: § 12 (DTS Measurement Guidance)
Applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. For measurements above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See results in Radiated emissions section before.

8.3. SETUP

The EUT is placed in an anechoic chamber; levels have been corrected to be in compliant with Peak Output Power measurement. The EUT is turn ON; the graphs of the restrict frequency band are recorded with a display line indicating the highest level and other the 20dB offset below to show compliance with 15.247 (d) and 15.205. The emissions in restricted bands are compared to 15.209 limits.
RBW: 100kHz
VBW: 300kHz

8.4. TEST EQUIPMENT LIST

CONDUCTED TEST SETUP					
DESCRIPTION	**MANUFACTURER**	**MODEL**	**N° LCIE**	**CAL_DATE**	**CAL_DUE**
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	10 /18	10/20
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	12/17	12/18
Cable Measure Analyzer-Amplifier SMA	STORMFLEX	26GHz	A5329681	12/17	12/18
Attenuator 10dB	AEROFLEX	-	A7122268	06/17	06/19

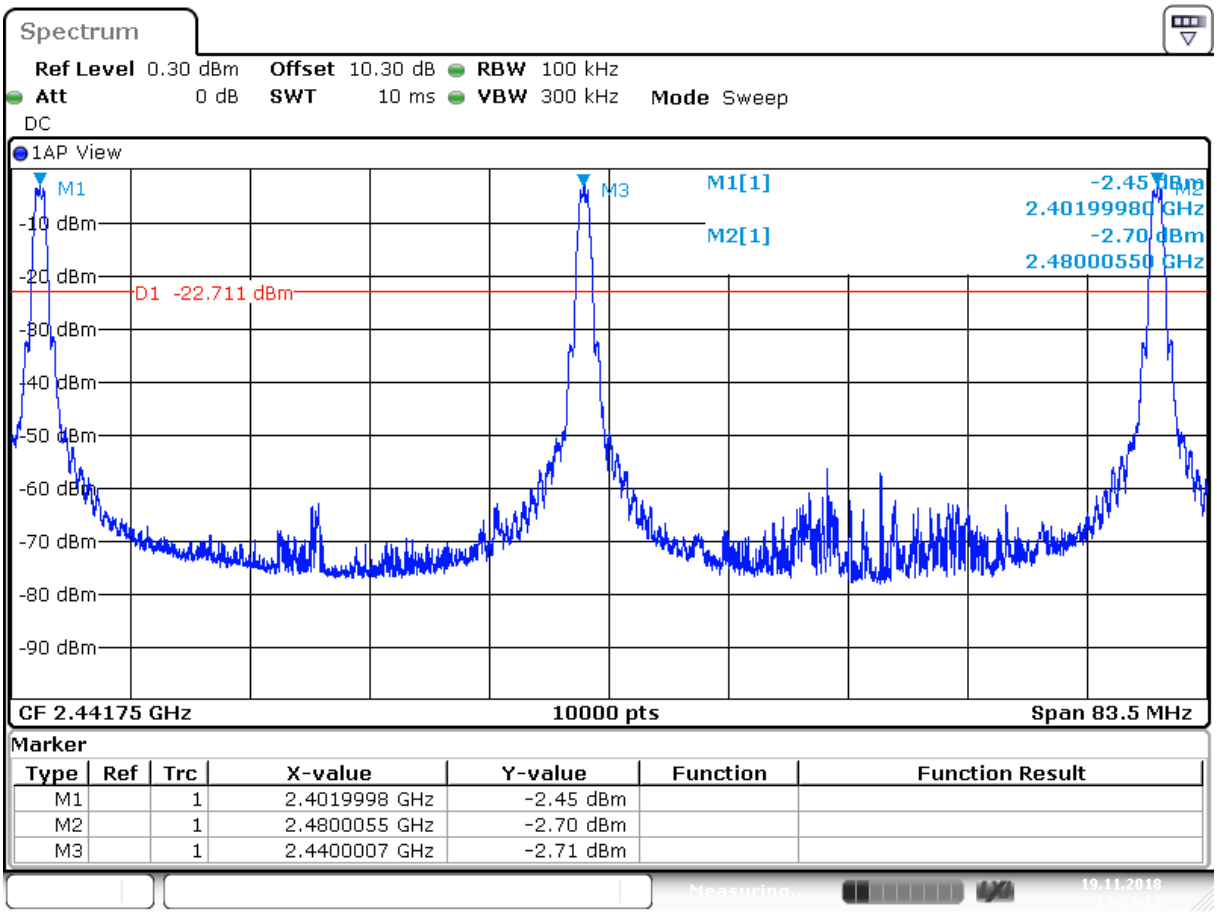
Note: In our quality system, the test equipment calibration due is more & less 2 months

8.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

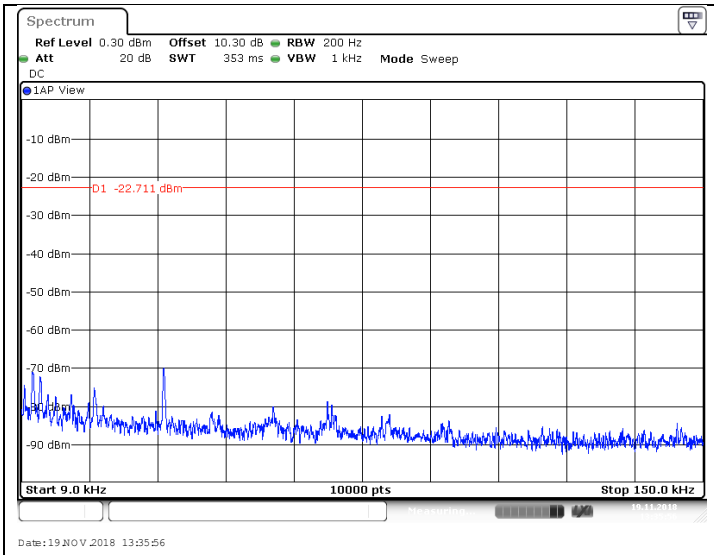
☑ None ☐ Divergence:

8.6. TEST SEQUENCE AND RESULTS

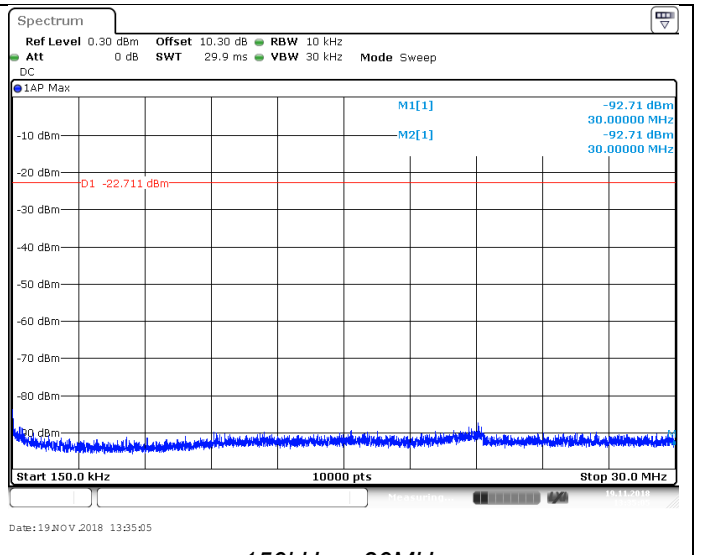
Offset: Attenuator+cable 10.3dB
GRAPH / MODULATION.



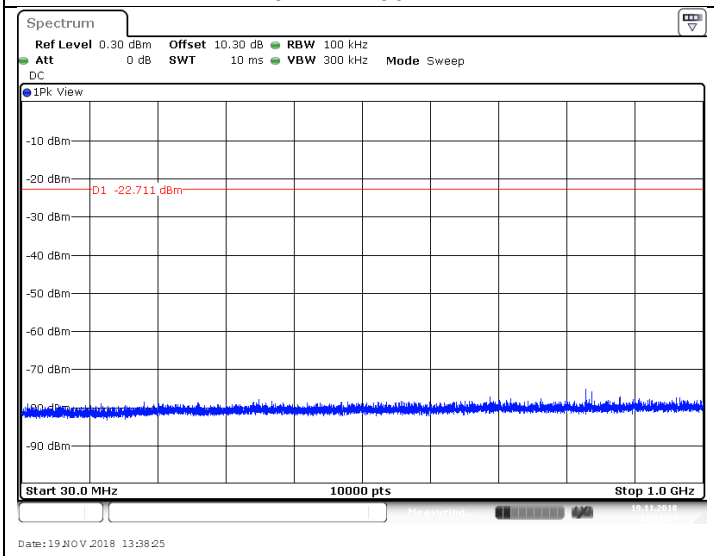
Date: 19.NOV.2018 13:24:12



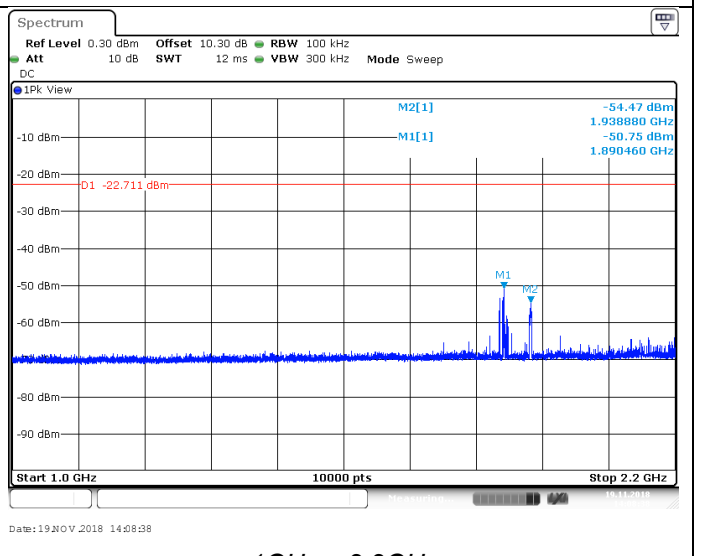
9kHz – 150kHz



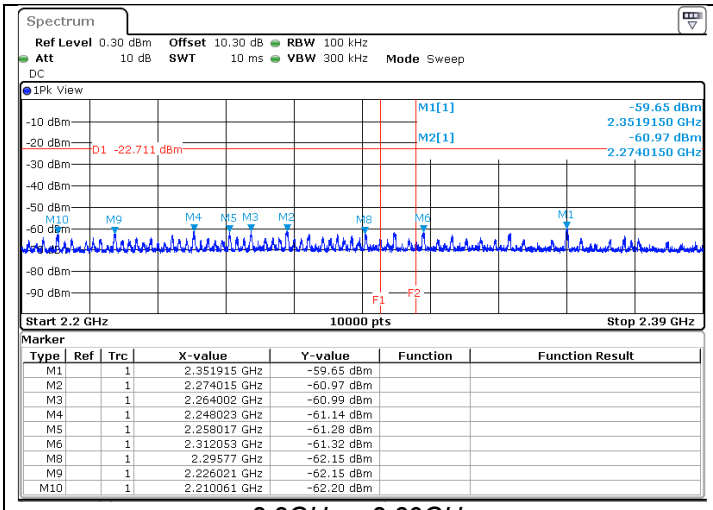
150kHz – 30MHz



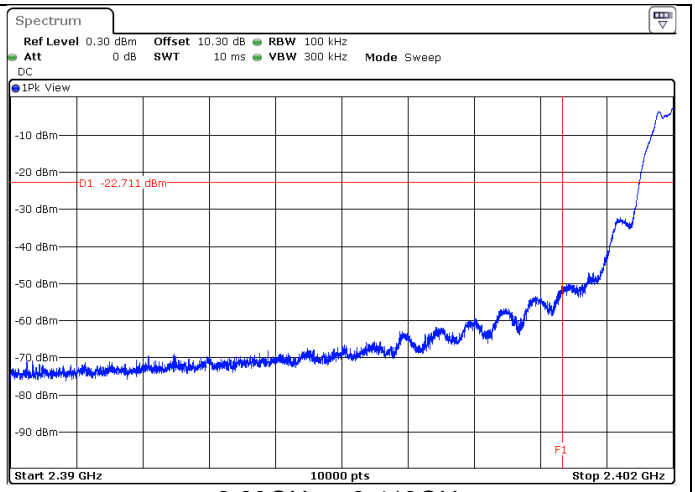
30MHz – 1GHz



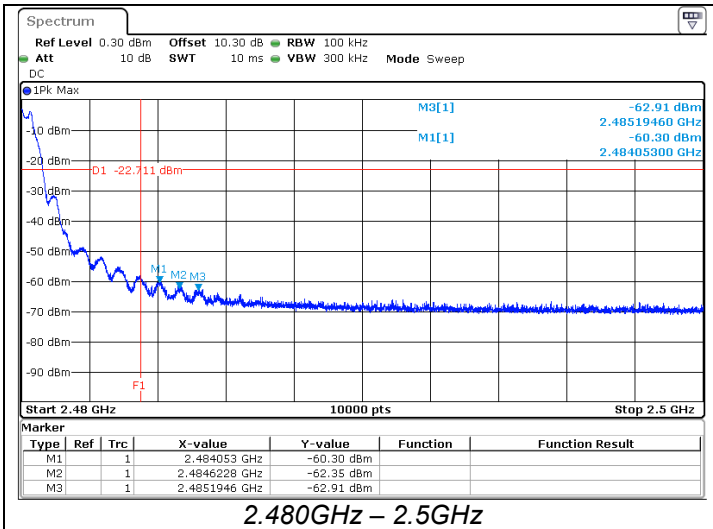
1GHz – 2.2GHz



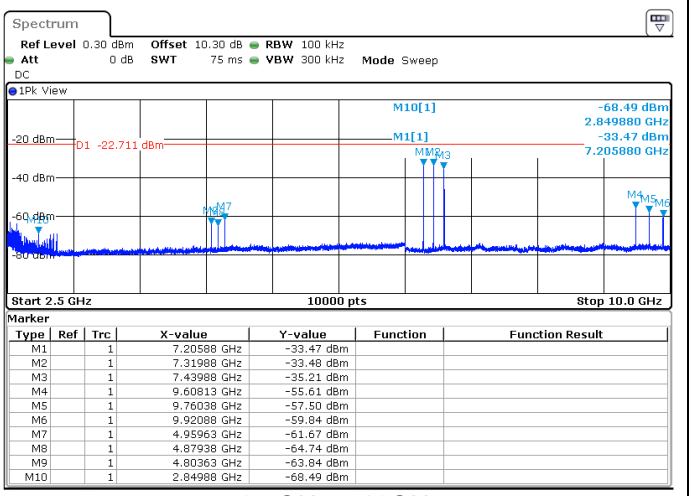
2.2GHz – 2.39GHz



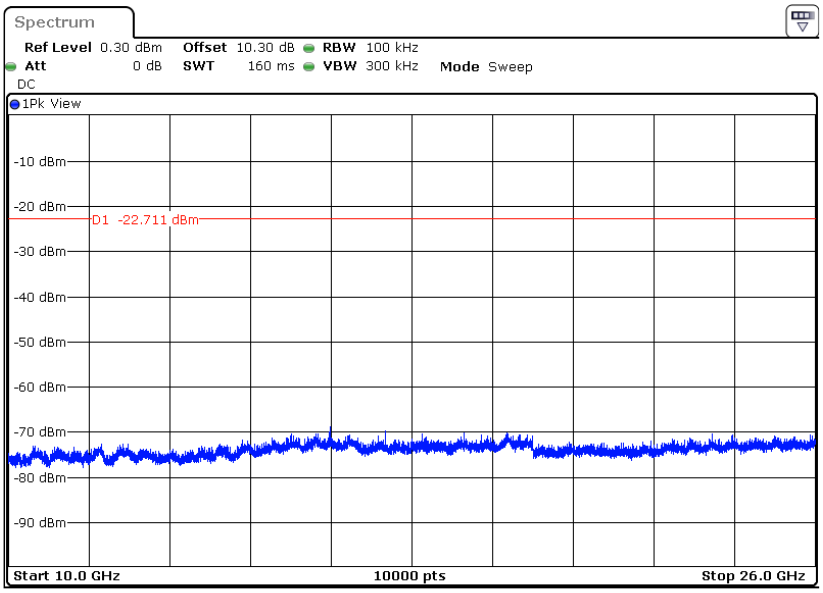
2.39GHz – 2.412GHz



2.480GHz – 2.5GHz



2.5GHz – 10GHz



10GHz – 26GHz

8.7. CONCLUSION

Band Edge Measurement performed on the sample of the product AXIUM PRINTER CL/BT, SN: 18200731407111020290975 5 , in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

9. OCCUPIED BANDWIDTH

9.1. TEST CONDITIONS

Date of test	:	February 5, 2019
Test performed by	:	Jonathan PAUC
Atmospheric pressure (hPa)	:	994
Relative humidity (%)	:	31
Ambient temperature (°C)	:	20

9.2. 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:

a) RBW shall be in the range of 1% to 5% of the anticipated occupied bandwidth
b) Set the video bandwidth (VBW) ≥ 3 x RBW
c) SPAN = Capture all products of the modulation process
d) Detector = Peak.
e) Trace mode = max hold.
f) Sweep = auto couple.
g) Allow the trace to stabilize.
h) OBW 99% function of spectrum analyzer used

9.3. TEST EQUIPMENT LIST

CONDUCTED TEST SETUP					
DESCRIPTION	**MANUFACTURER**	**MODEL**	**N° LCIE**	**CAL_DATE**	**CAL_DUE**
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	10 /18	10/20
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	12/17	12/18
Cable Measure Analyzer-Amplifier SMA	STORMFLEX	26GHz	A5329681	12/17	12/18
Attenuator 10dB	AEROFLEX	-	A7122268	06/17	06/19

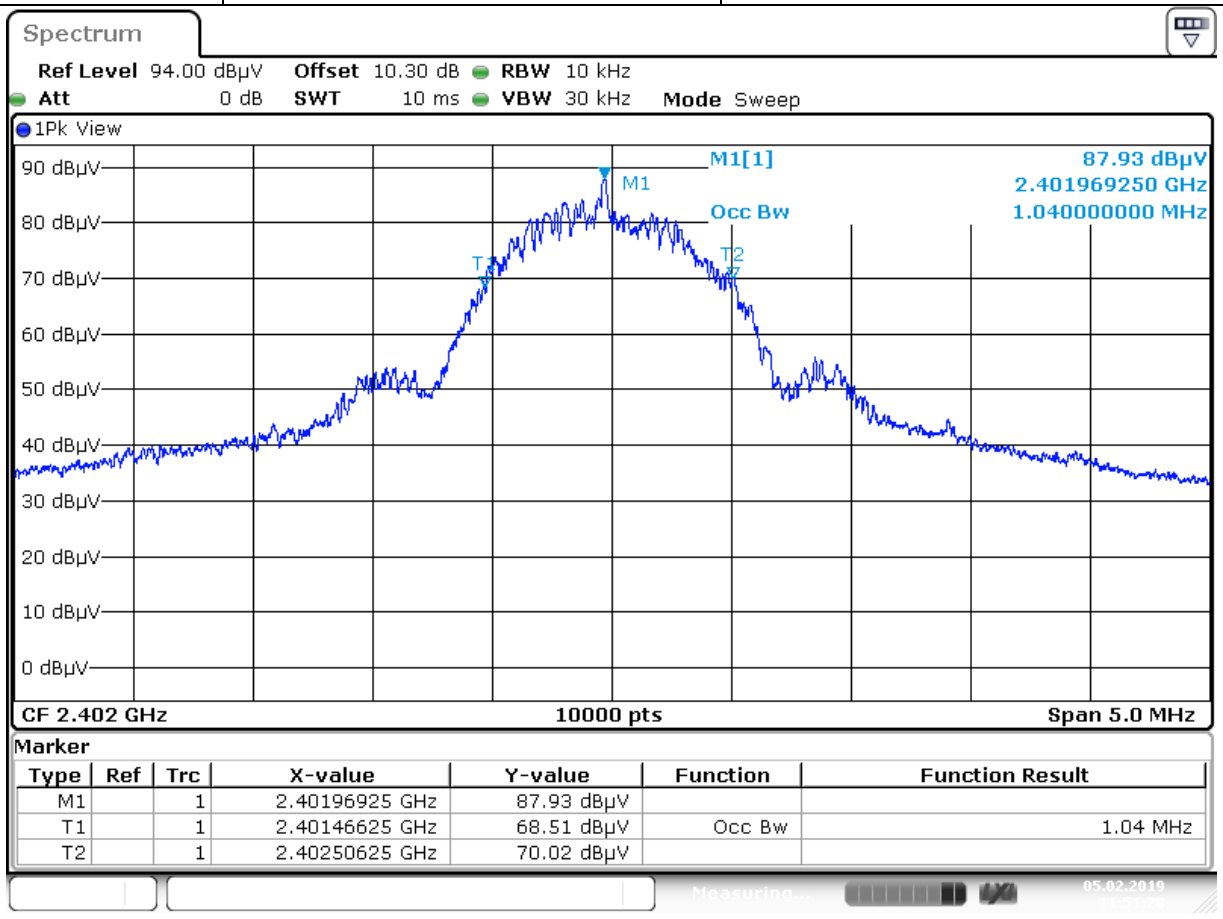
Note: In our quality system, the test equipment calibration due is more & less 2 months

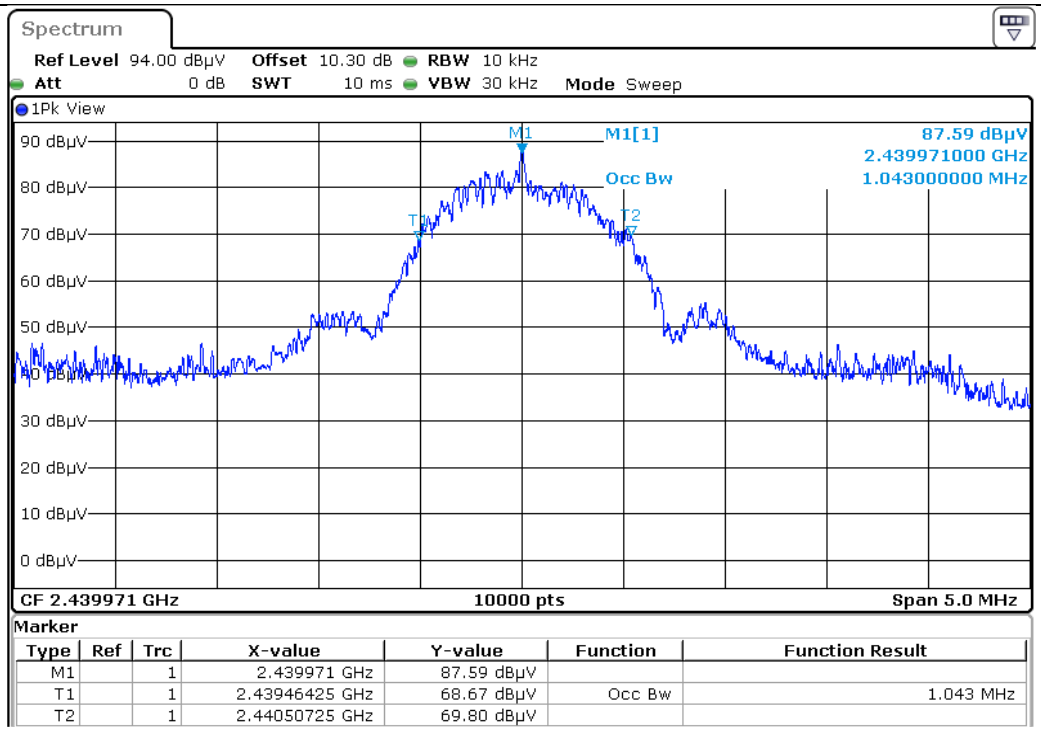
9.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

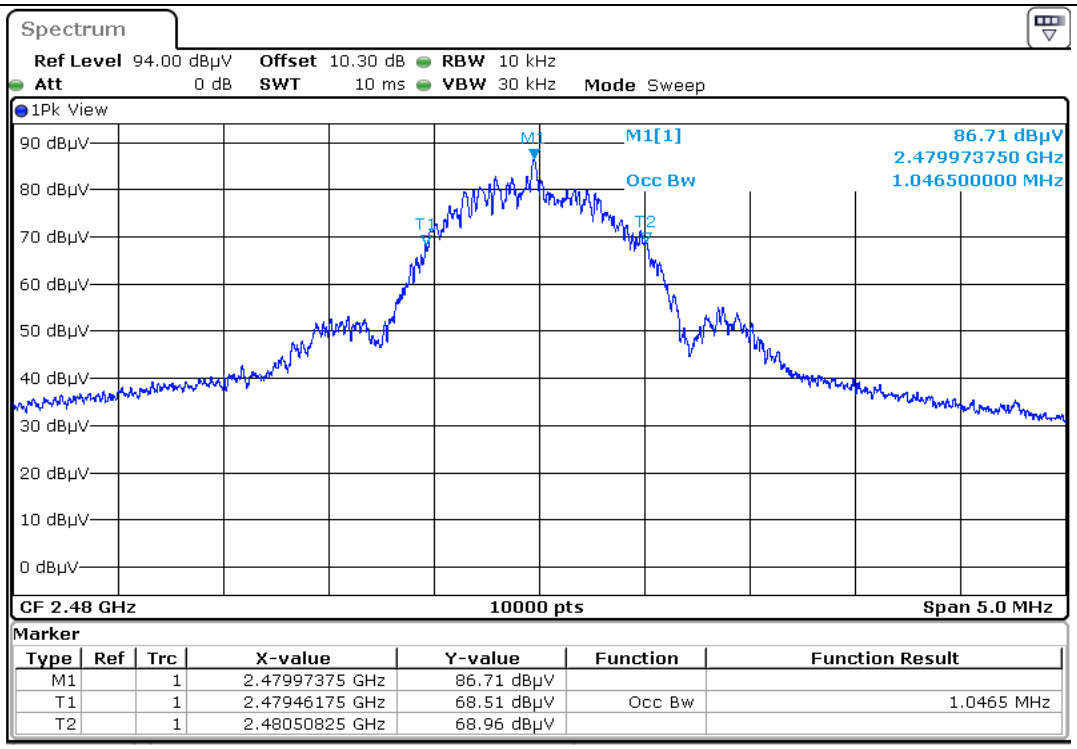
9.5. TEST SEQUENCE AND RESULTS

Channel	Channel Frequency (MHz)	99% Occupied Bandwidth (MHz)
Cmin	2402	**1.040**
Cmid	2440	**1.043**
Cmax	2480	**1.046**




Spectrum
Ref Level 94.00 dBµV Offset 10.30 dB RBW 10 kHz
Att 0 dB SWT 10 ms VBW 30 kHz Mode Sweep
1Pk View
M1[1] 87.59 dBµV
2.439971000 GHz
Occ Bw 1.043000000 MHz
90 dBµV
80 dBµV
70 dBµV
60 dBµV
50 dBµV
40 dBµV
30 dBµV
20 dBµV
10 dBµV
0 dBµV
CF 2.439971 GHz
10000 pts
Span 5.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.439971 GHz 87.59 dBµV
T1 1 2.43946425 GHz 68.67 dBµV Occ Bw 1.043 MHz
T2 1 2.44050725 GHz 69.80 dBµV

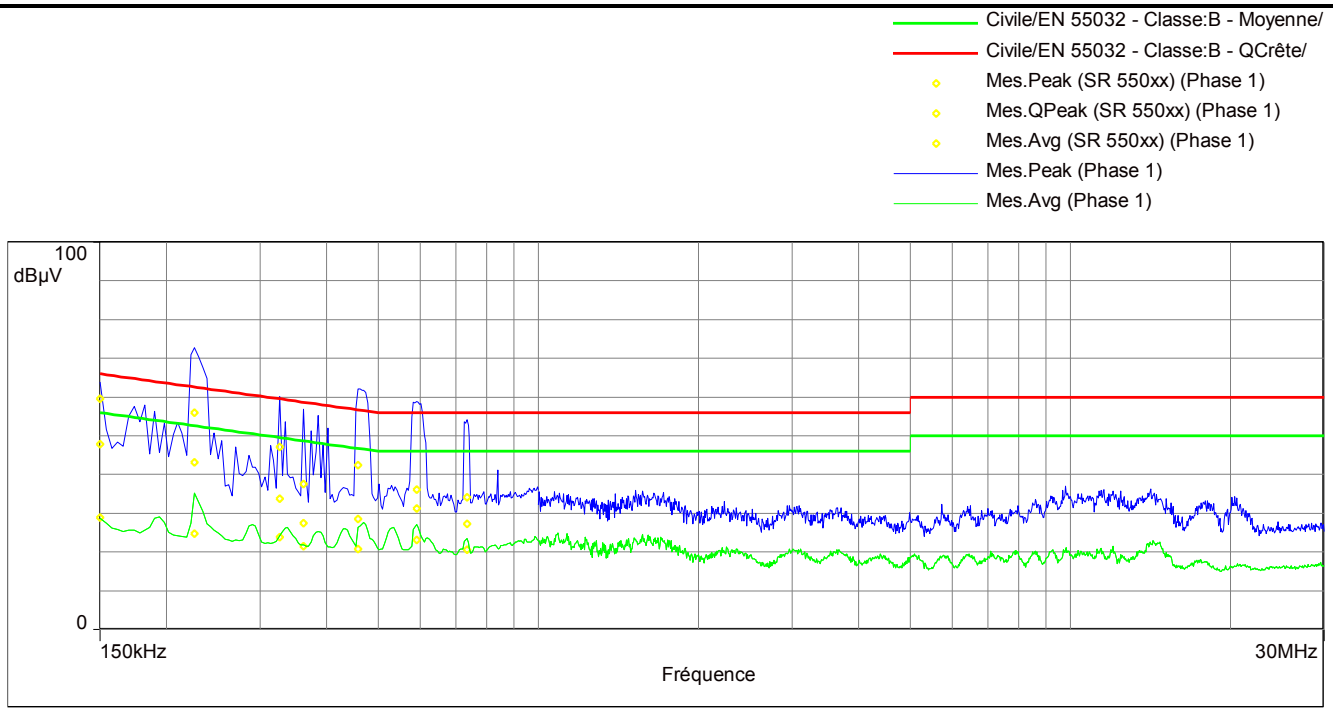
Cmid


Spectrum
Ref Level 94.00 dBµV Offset 10.30 dB RBW 10 kHz
Att 0 dB SWT 10 ms VBW 30 kHz Mode Sweep
1Pk View
M1[1] 86.71 dBµV
2.479973750 GHz
Occ Bw 1.046500000 MHz
90 dBµV
80 dBµV
70 dBµV
60 dBµV
50 dBµV
40 dBµV
30 dBµV
20 dBµV
10 dBµV
0 dBµV
CF 2.48 GHz
10000 pts
Span 5.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.47997375 GHz 86.71 dBµV
T1 1 2.47946175 GHz 68.51 dBµV Occ Bw 1.0465 MHz
T2 1 2.48050825 GHz 68.96 dBµV

Cmax

10. ANNEX 1 (GRAPHS)

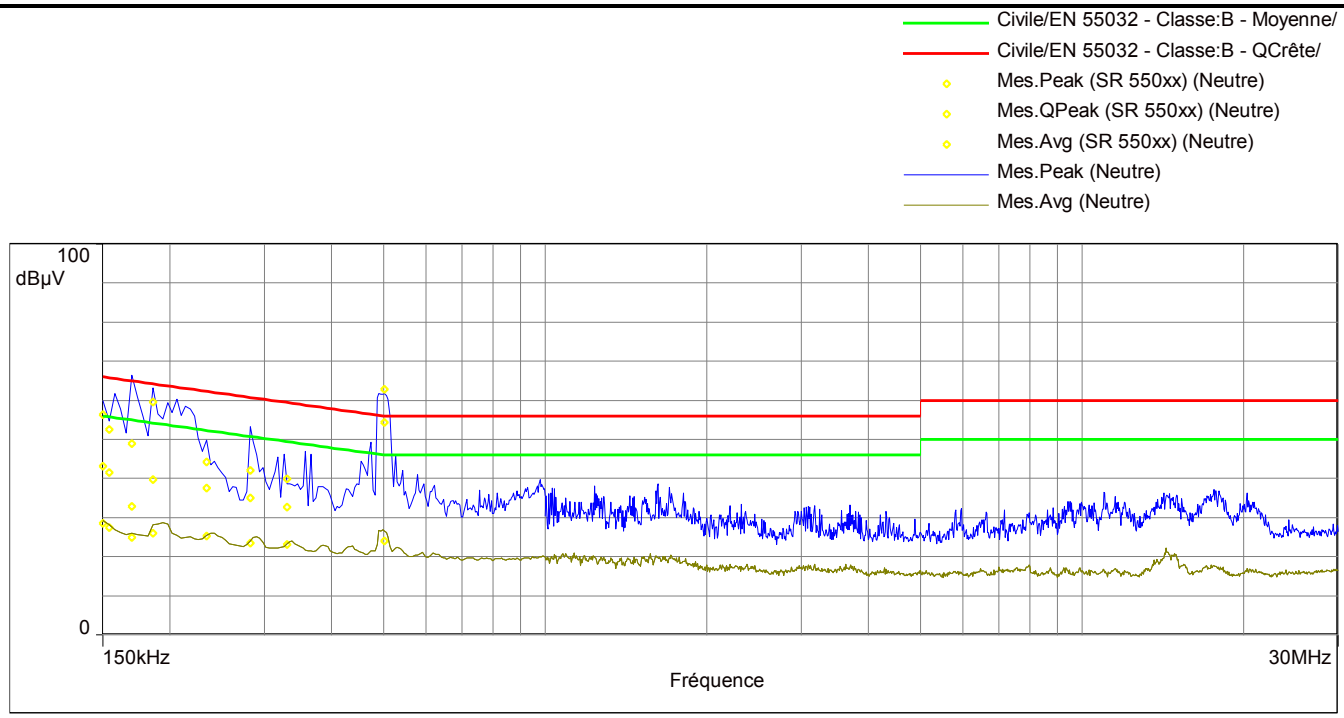
CONDUCTED EMISSIONS			
Graph name:	Emc#1	**Test configuration:**	
Limit:	EN 55032	P (RSIL) 240V 50Hz (PSM10R-050)	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	230VAC / 50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



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	Correction (dB)
0.150	59.6	47.8	66.0	-18.2	29.0	56.0	-27.0	Phase 1	19.4
0.226	56.0	43.2	62.6	-19.4	24.7	52.6	-27.9	Phase 1	19.5
0.326	47.2	33.7	59.6	-25.8	23.9	49.6	-25.7	Phase 1	19.5
0.362	37.6	27.5	58.7	-31.2	21.4	48.7	-27.3	Phase 1	19.5
0.458	42.5	28.6	56.7	-28.1	20.8	46.7	-25.9	Phase 1	19.5
0.590	36.2	31.2	56.0	-24.8	23.1	46.0	-22.9	Phase 1	19.5
0.734	34.1	27.3	56.0	-28.7	20.6	46.0	-25.4	Phase 1	19.5

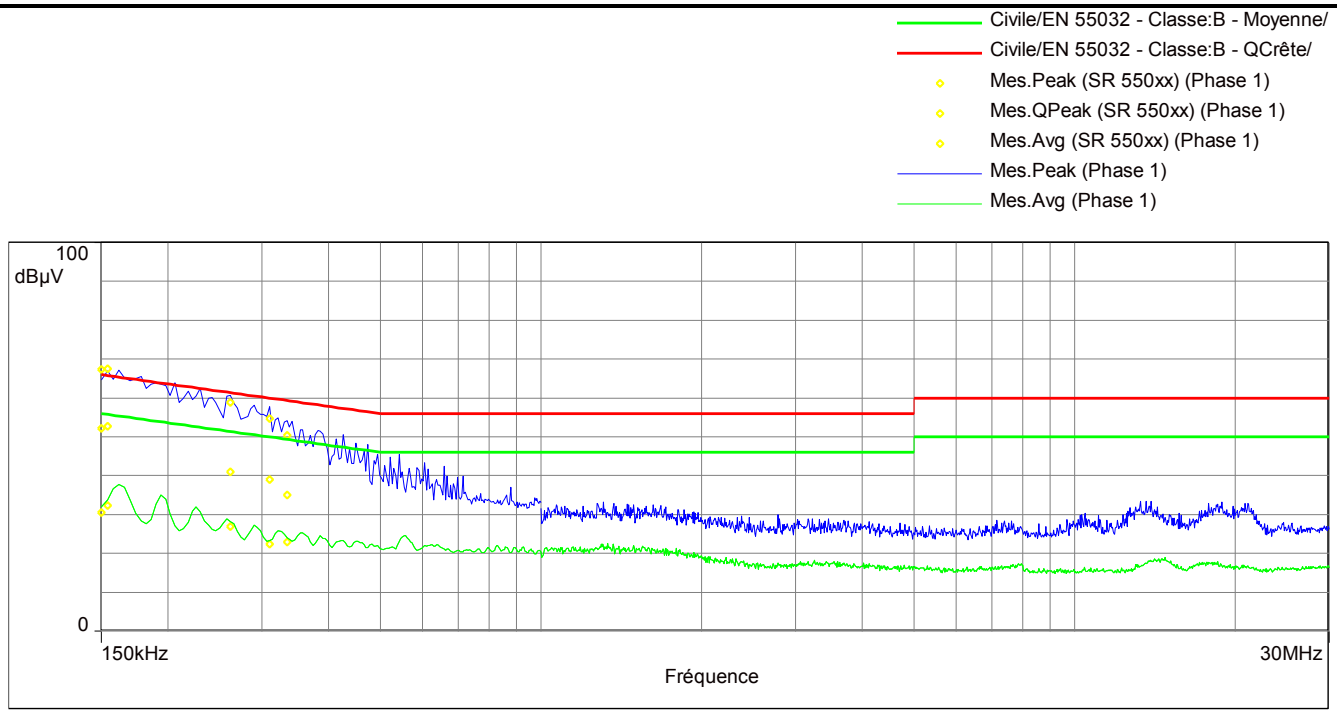
CONDUCTED EMISSIONS			
Graph name:	Emc#2	**Test configuration:**	
Limit:	EN 55032	N (RSIL) 240V 50Hz (PSM10R-050)	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	230VAC / 50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



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	Correction (dB)
0.150	56.4	43.2	66.0	-22.8	28.6	56.0	-27.4	Neutre	19.4
0.154	52.5	41.6	65.8	-24.2	27.5	55.8	-28.3	Neutre	19.4
0.170	49.0	32.9	65.0	-32.0	25.0	55.0	-30.0	Neutre	19.4
0.186	59.6	39.7	64.2	-24.5	26.0	54.2	-28.3	Neutre	19.5
0.234	44.2	37.5	62.3	-24.8	25.2	52.3	-27.1	Neutre	19.5
0.282	42.1	35.0	60.8	-25.8	23.5	50.8	-27.3	Neutre	19.4
0.330	39.9	32.7	59.4	-26.7	23.2	49.4	-26.3	Neutre	19.4
0.502	62.8	54.3	56.0	-1.7	24.1	46.0	-21.9	Neutre	19.5

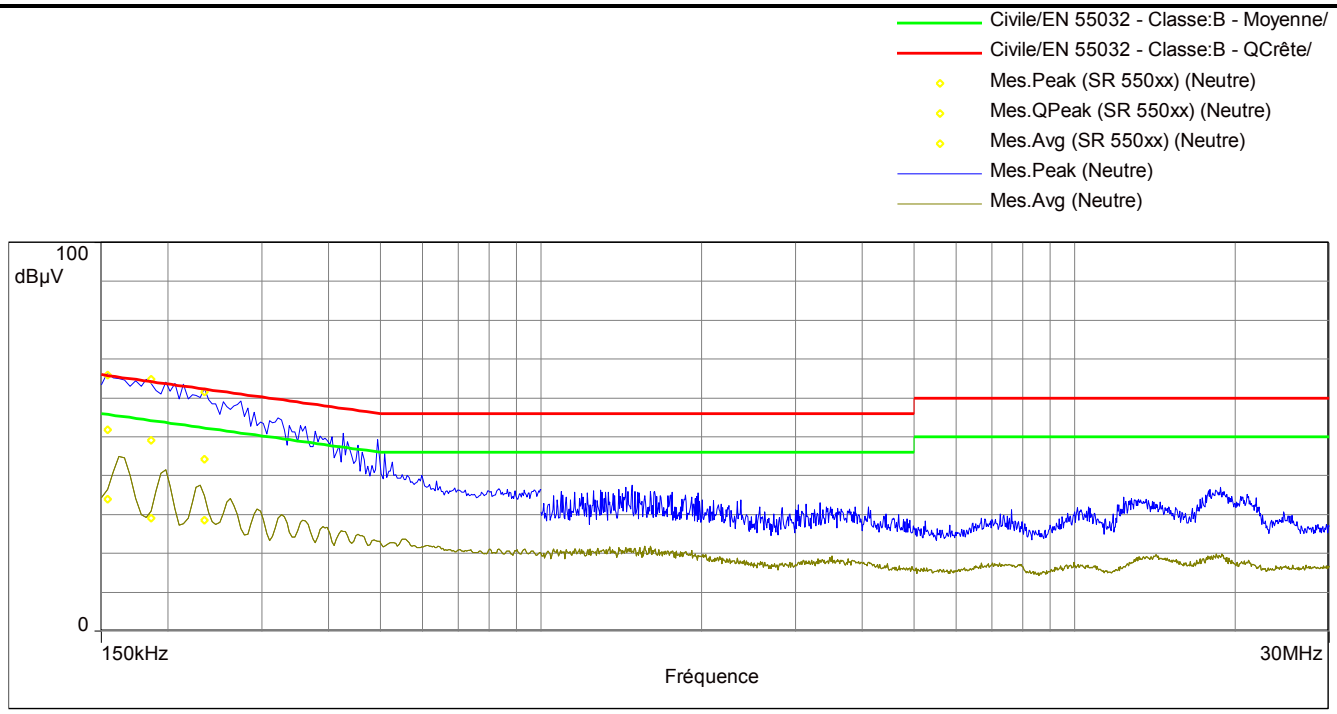
CONDUCTED EMISSIONS			
Graph name:	Emc#3	**Test configuration:**	
Limit:	EN 55032	P (RSIL) 120V 60Hz (PSM10R-050)	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	230VAC / 50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



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	Correction (dB)
0.150	67.3	52.2	66.0	-13.8	30.5	56.0	-25.5	Phase 1	19.4
0.154	67.6	52.8	65.8	-13.0	32.4	55.8	-23.4	Phase 1	19.4
0.262	58.9	40.9	61.4	-20.4	26.9	51.4	-24.5	Phase 1	19.4
0.310	54.8	38.9	60.0	-21.0	22.5	50.0	-27.5	Phase 1	19.5
0.334	50.4	35.0	59.4	-24.4	22.9	49.4	-26.5	Phase 1	19.4

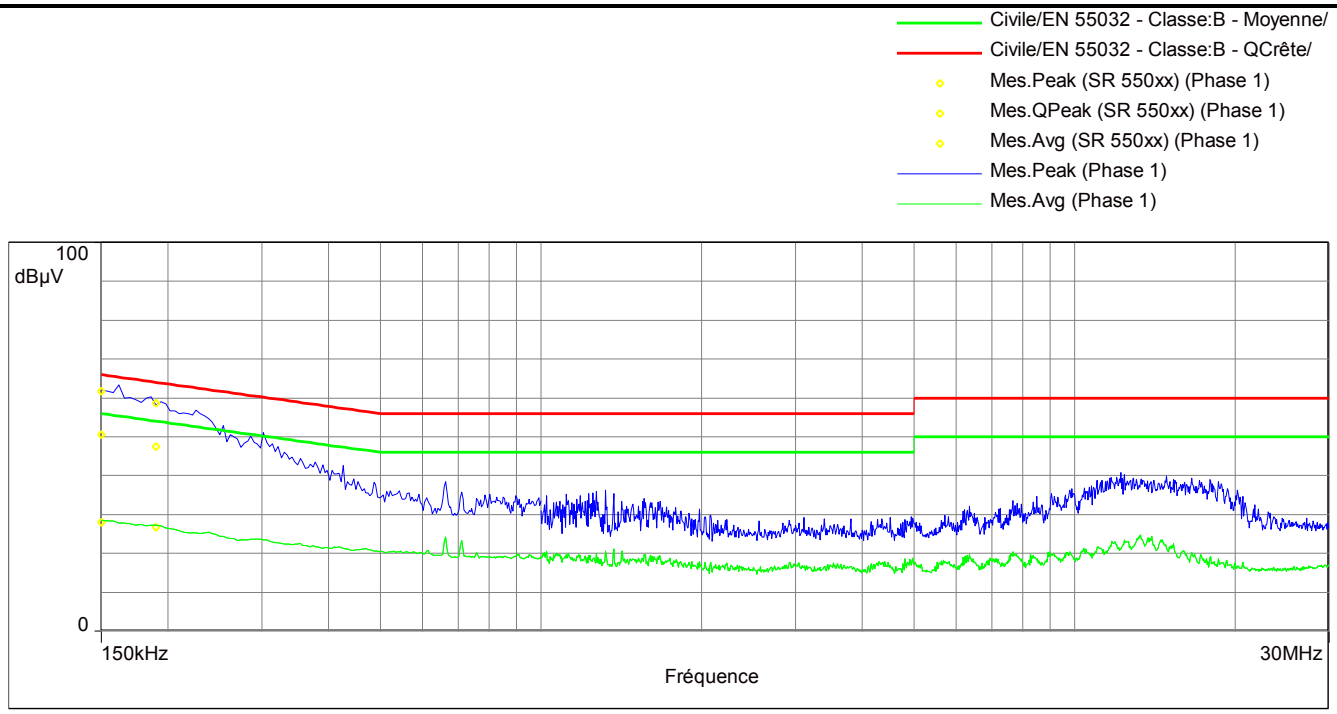
CONDUCTED EMISSIONS			
Graph name:	Emc#4	**Test configuration:**	
Limit:	EN 55032	N (RSIL) 120V 60Hz (PSM10R-050)	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	230VAC / 50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



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	Correction (dB)
0.154	65.8	51.8	65.8	-14.0	34.0	55.8	-21.8	Neutre	19.4
0.186	64.9	49.0	64.2	-15.2	29.0	54.2	-25.2	Neutre	19.5
0.234	61.6	44.2	62.3	-18.1	28.6	52.3	-23.7	Neutre	19.5

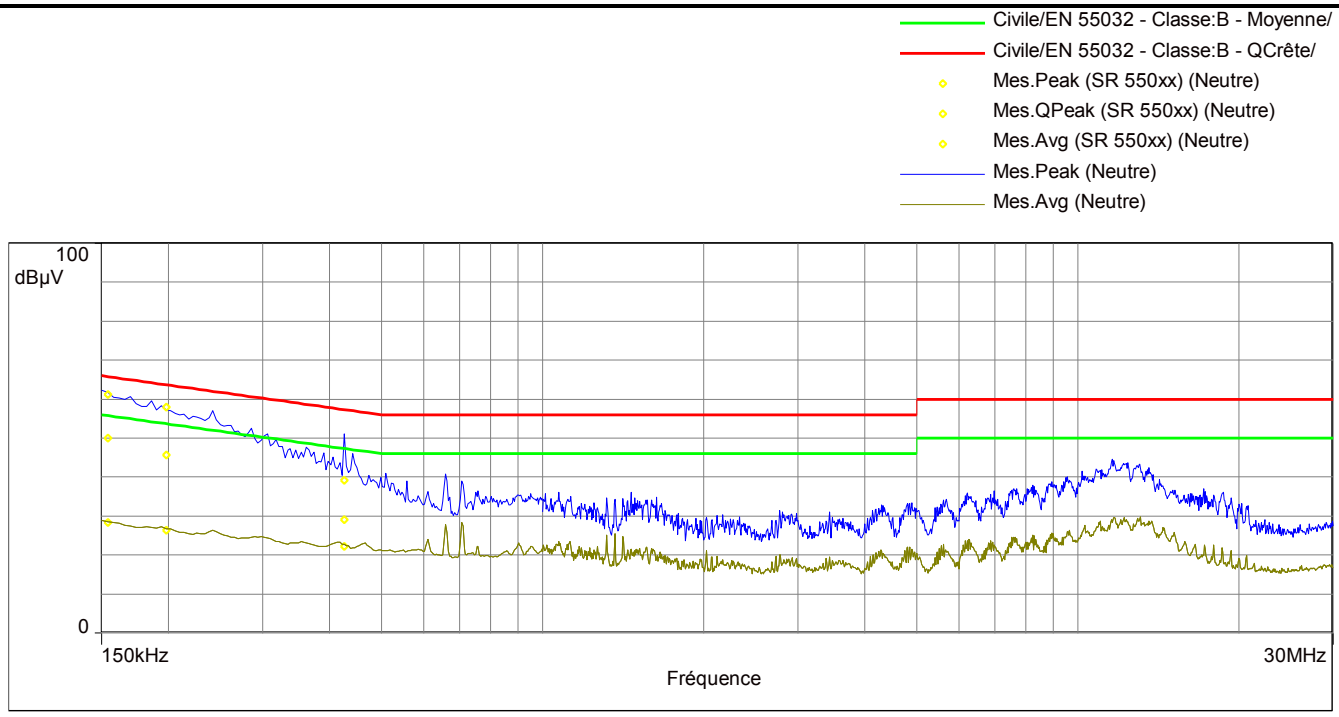
CONDUCTED EMISSIONS			
Graph name:	Emc#5	**Test configuration:**	
Limit:	EN 55032	P (RSIL) 240V 50Hz (PSAF10E-050Q)	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	230VAC / 50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



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	Correction (dB)
0.150	61.7	50.5	66.0	-15.5	28.0	56.0	-28.0	Phase 1	19.4
0.190	58.7	47.6	64.0	-16.5	26.7	54.0	-27.3	Phase 1	19.5

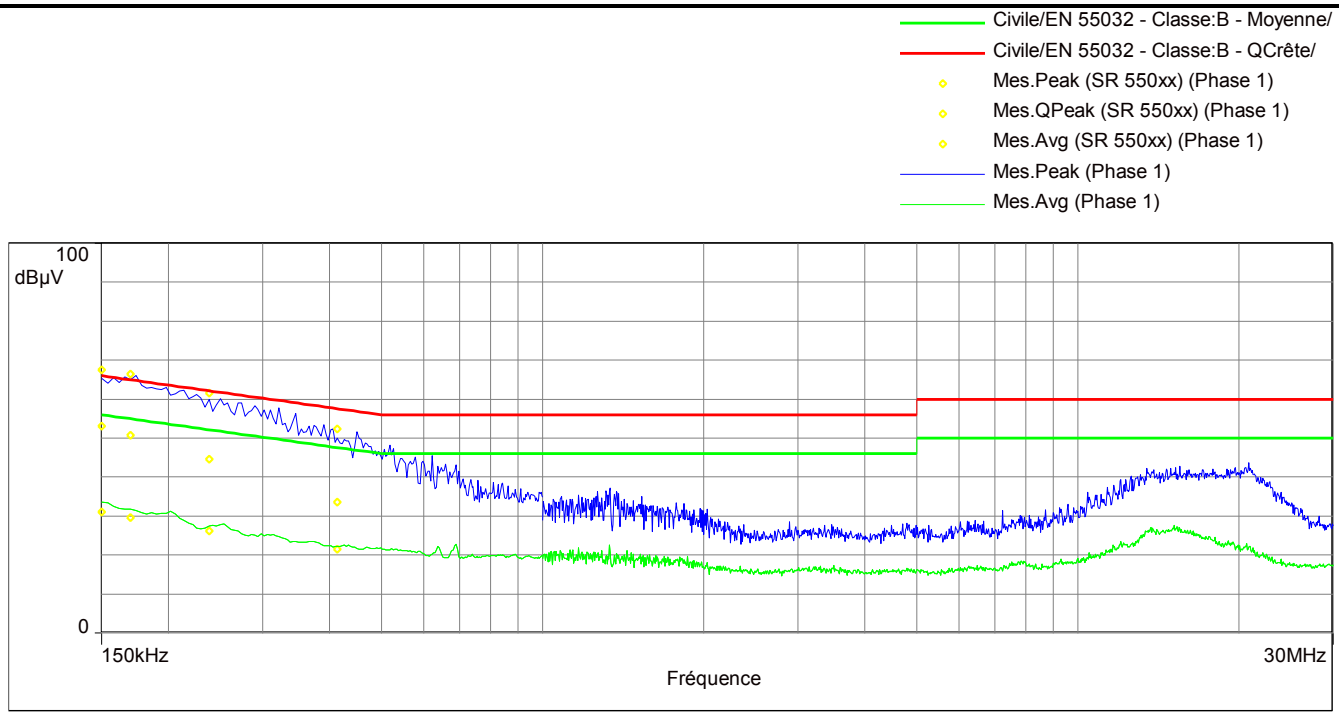
CONDUCTED EMISSIONS			
Graph name:	Emc#6	**Test configuration:**	
Limit:	EN 55032	N (RSIL) 240V 50Hz (PSAF10E-050Q)	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	230VAC / 50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



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	Correction (dB)
0.154	61.2	50.0	65.8	-15.7	28.3	55.8	-27.5	Neutre	19.4
0.198	58.0	45.7	63.7	-18.0	26.4	53.7	-27.3	Neutre	19.6
0.426	39.3	29.1	57.3	-28.2	22.2	47.3	-25.2	Neutre	19.5

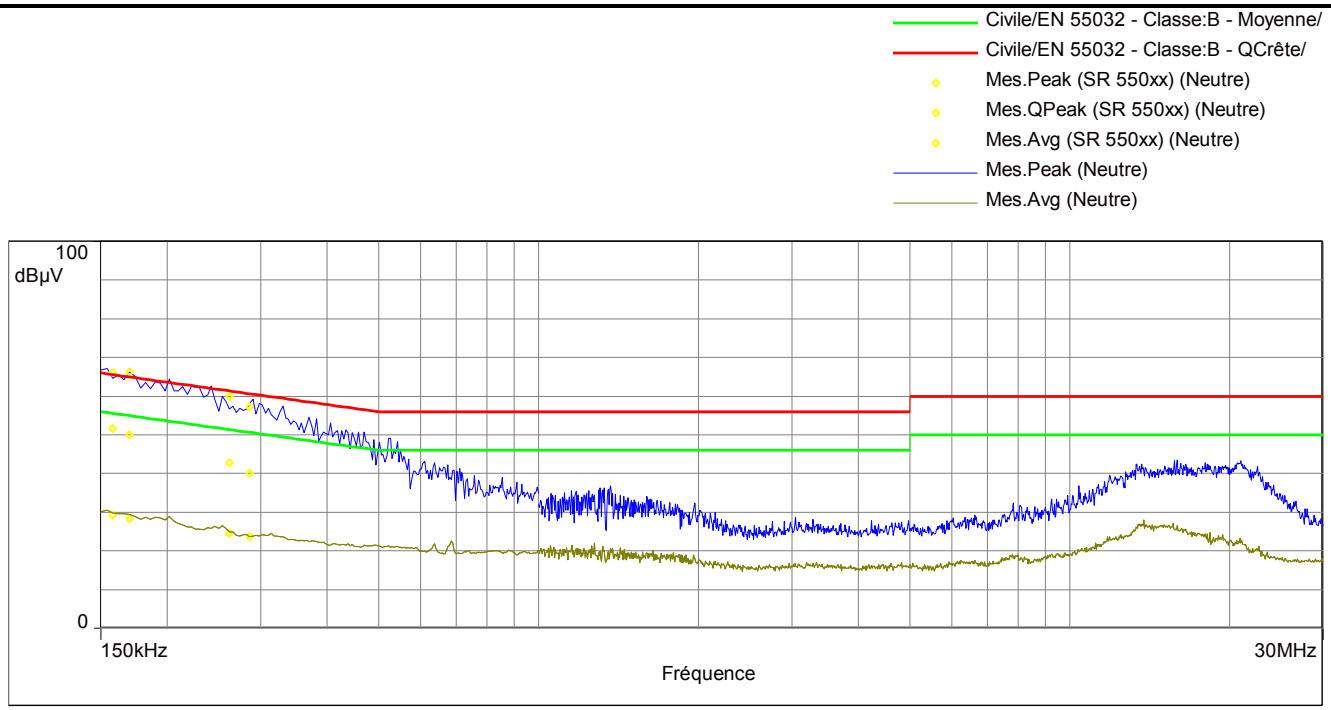
CONDUCTED EMISSIONS			
Graph name:	Emc#7	**Test configuration:**	
Limit:	EN 55032	P (RSIL) 120V 60Hz (PSAF10E-050Q)	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	230VAC / 50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



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	Correction (dB)
0.150	67.5	53.1	66.0	-12.9	31.1	56.0	-24.9	Phase 1	19.4
0.170	66.4	50.8	65.0	-14.1	29.7	55.0	-25.3	Phase 1	19.4
0.238	61.6	44.7	62.2	-17.5	26.2	52.2	-26.0	Phase 1	19.5
0.414	52.3	33.6	57.6	-23.9	21.5	47.6	-26.1	Phase 1	19.4

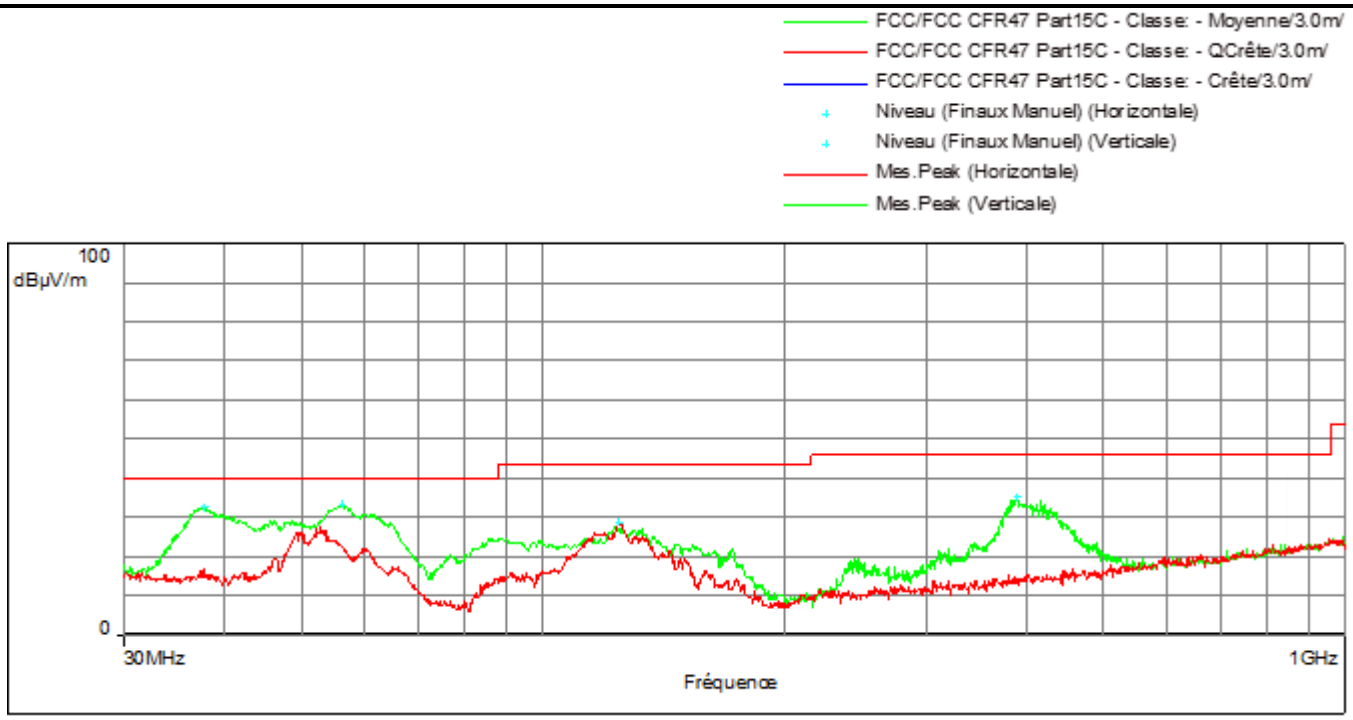
CONDUCTED EMISSIONS			
Graph name:	Emc#8	**Test configuration:**	
Limit:	EN 55032	N (RSIL) 120V 60Hz (PSAF10E-050Q)	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	230VAC / 50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



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	Correction (dB)
0.158	66.1	51.7	65.6	-13.9	29.2	55.6	-26.3	Neutre	19.4
0.170	66.2	50.0	65.0	-15.0	28.4	55.0	-26.6	Neutre	19.4
0.262	60.0	42.7	61.4	-18.7	24.6	51.4	-26.8	Neutre	19.4
0.286	57.2	40.1	60.6	-20.6	23.6	50.6	-27.1	Neutre	19.4

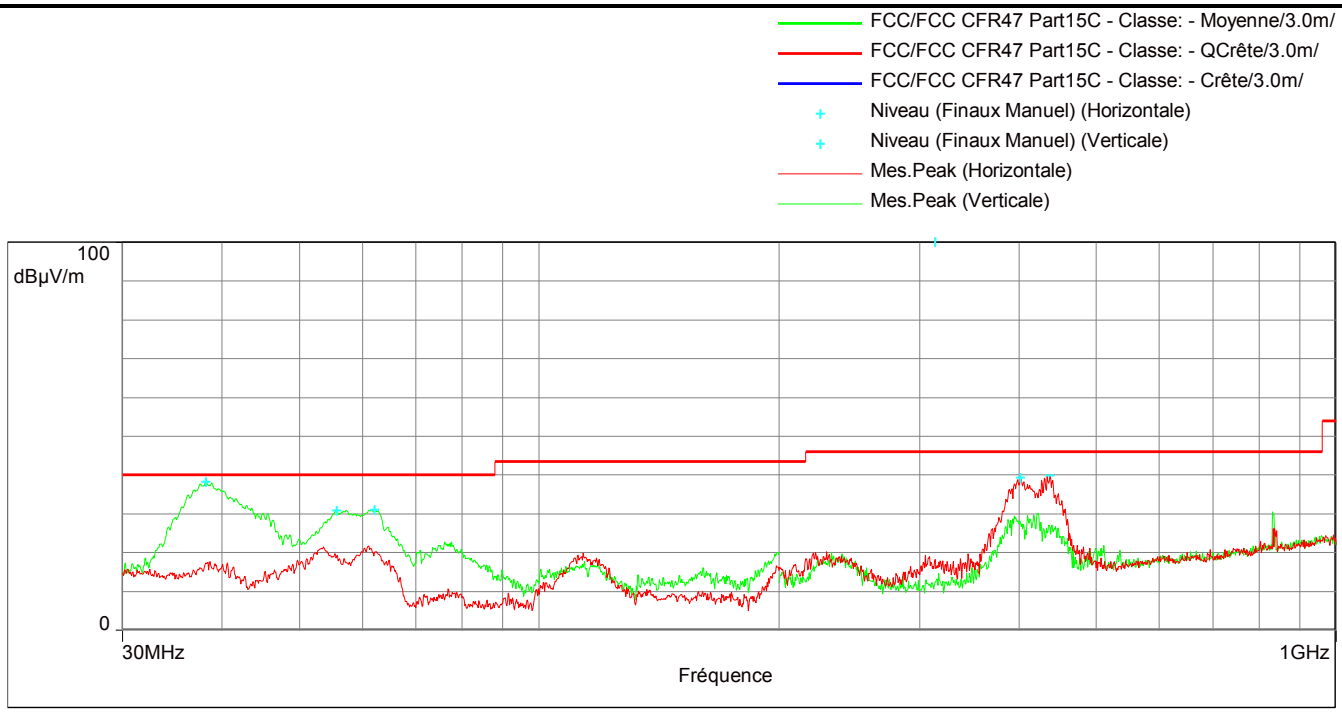
RADIATED EMISSIONS			
Graph name:	Emr#1	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) - Configuration 1 - PSM10R-050 <1GHz	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



Spurious emissions

Frequency (MHz)	Peak Level (dBµV/m)	Polarization
124.656	29.0	Horizontal
37.888	32.6	Vertical
56.180	33.4	Vertical
389.680	35.2	Vertical

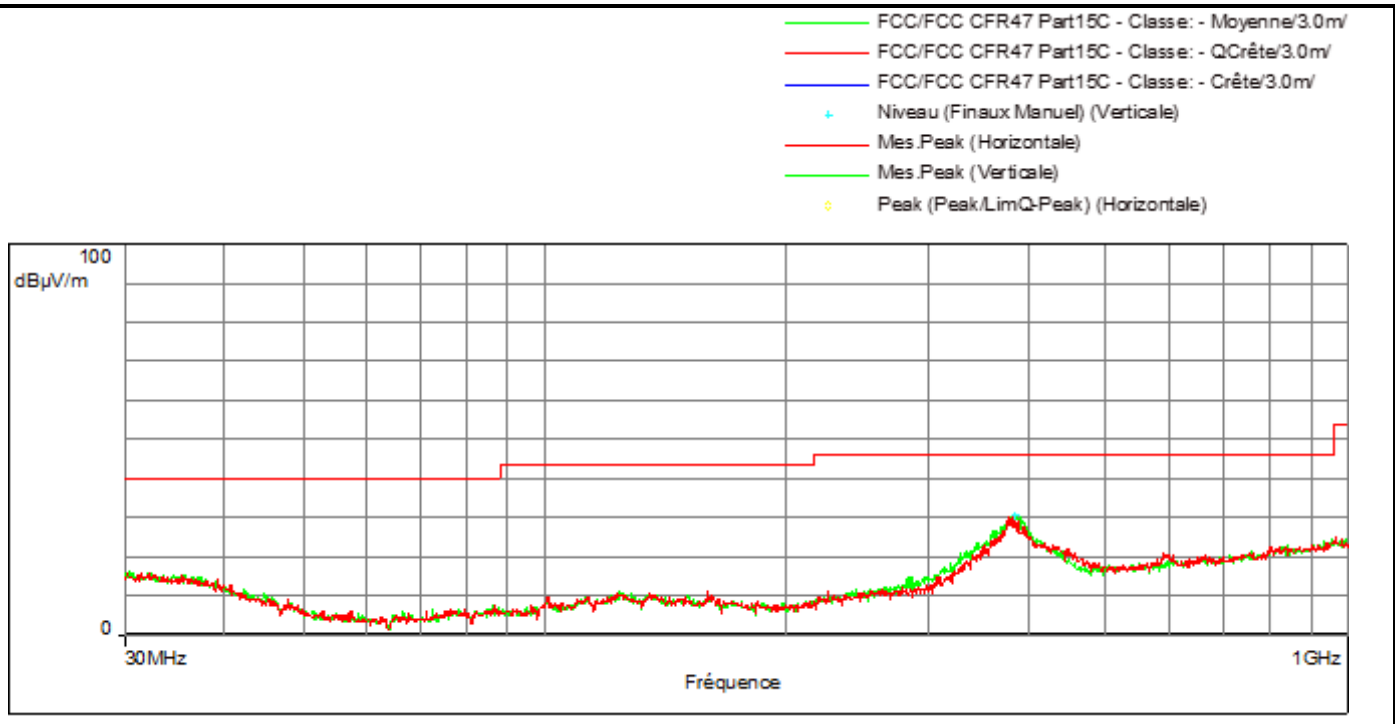
RADIATED EMISSIONS			
Graph name:	Emr#2	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) - Configuration 2 - PSAF10E-050Q <1GHz	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



Spurious emissions

Frequency (MHz)	Peak Level (dBµV/m)	Polarization
401.720	39.3	Horizontal
437.280	39.8	Horizontal
38.177	38.4	Vertical
55.653	30.8	Vertical
62.181	31.1	Vertical

RADIATED EMISSIONS			
Graph name:	Emr#3	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) - Configuration 3 - Battery <1GHz	
Class:			
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz

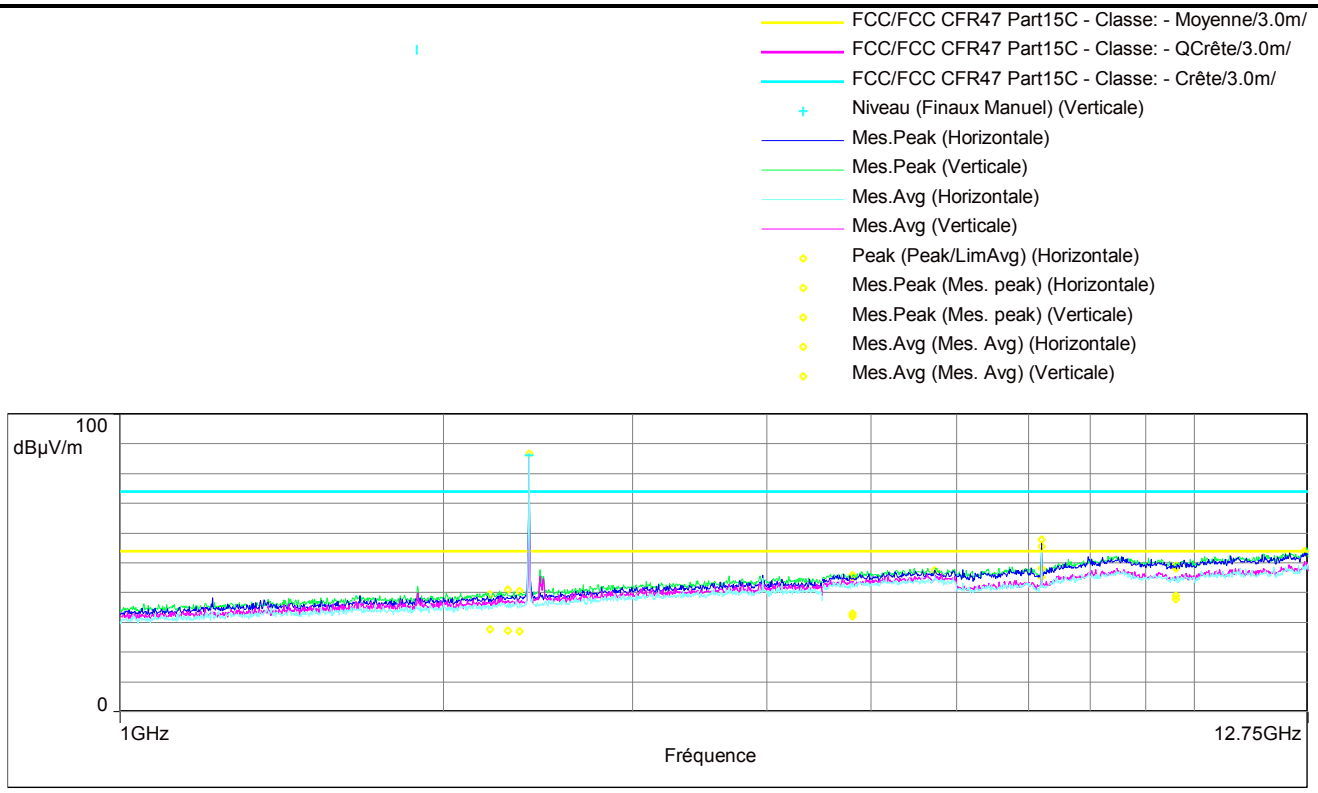


Spurious emissions

Frequency (MHz)	Peak Level (dBµV/m)	Polarization
384.800	30.5	Vertical

Frequency (MHz)	Peak (dBµV/m)	LimQP (dBµV/m)	Peak-LimQP (dB)	Polarization	Correction (dB)
883.320	43.6	46.0	-2.4	Horizontal	-11.3

RADIATED EMISSIONS			
Graph name:	Emr#4	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) – Configuration 4– BLE Cmin [1-12.75]GHz - DTM test mode	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz

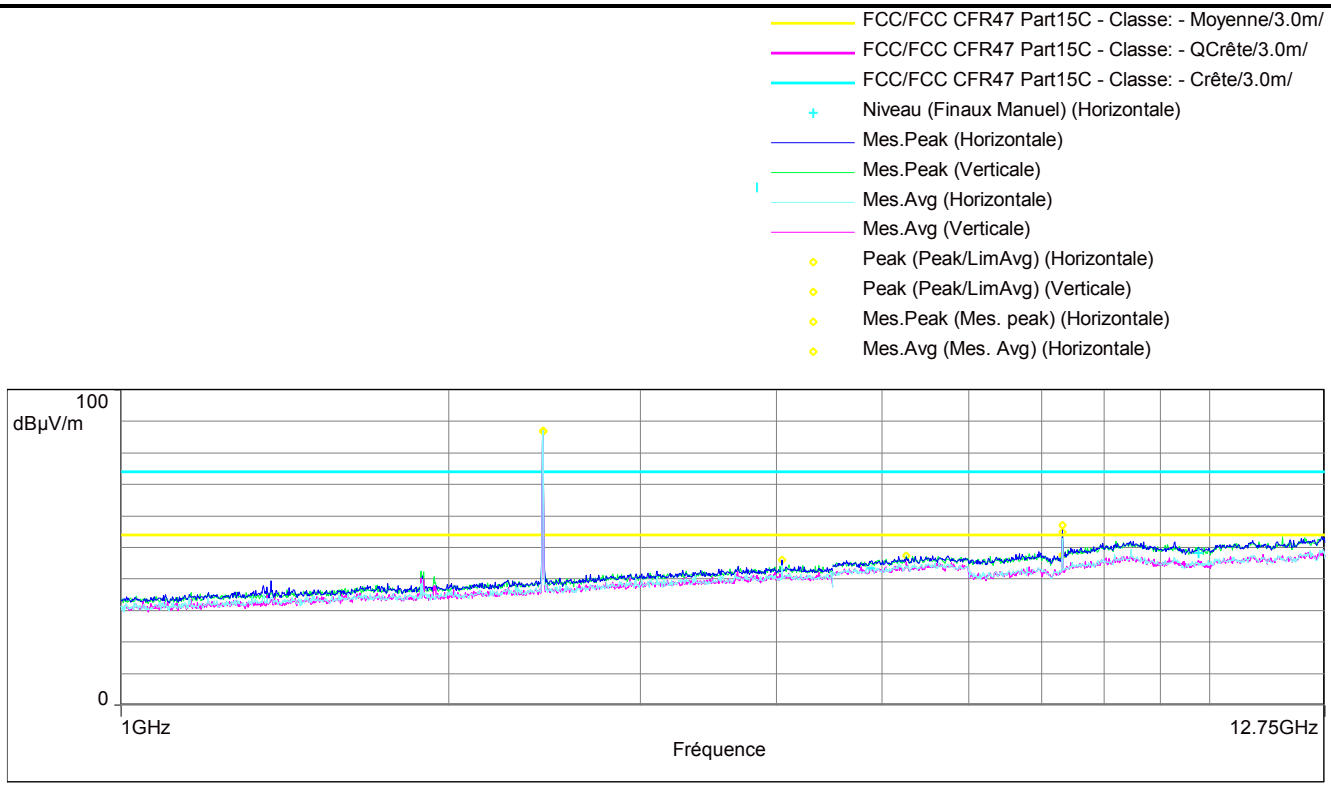


Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	Limit Pk (dBµV/m)	Peak-LimM (dB)	Angle (°)	Position	Correction (dB)
2209.94506	39.5	74	-34.5	302	H	-31.0
2295.70388	41.0	74	-33.0	229	H	-30.8
2352.061286	40.5	74	-33.5	203	H	-30.8
4803.65	45.2	74	-28.8	359	H	-24.1
4803.584982	45.9	74	-28.1	44	V	-24.1
7205.07755	58.0	74	-16.1	194	H	-19.9
7205.3559	55.7	74	-18.4	106	V	-19.9
9607.825	49.0	74	-25.0	87	H	-18.8
9607.881109	48.1	74	-25.9	80	V	-18.8

Frequency (MHz)	Mes.Avg (dBµV/m)	Limit Avg (dBµV/m)	Avg-LimM (dB)	Angle (°)	Position	Correction (dB)
2209.94506	27.6	54	-26.4	302	H	-31.0
2295.70388	27.2	54	-26.8	229	H	-30.8
2352.061286	27.1	54	-26.9	203	H	-30.8
4803.65	33.1	54	-20.9	359	H	-24.1
4803.584982	32.1	54	-21.9	44	V	-24.1
7205.07755	48.3	54	-5.7	194	H	-19.9
7205.3559	45.1	54	-8.9	106	V	-19.9
9607.825	37.7	54	-16.3	87	H	-18.8
9607.881109	39.0	54	-15.0	80	V	-18.8

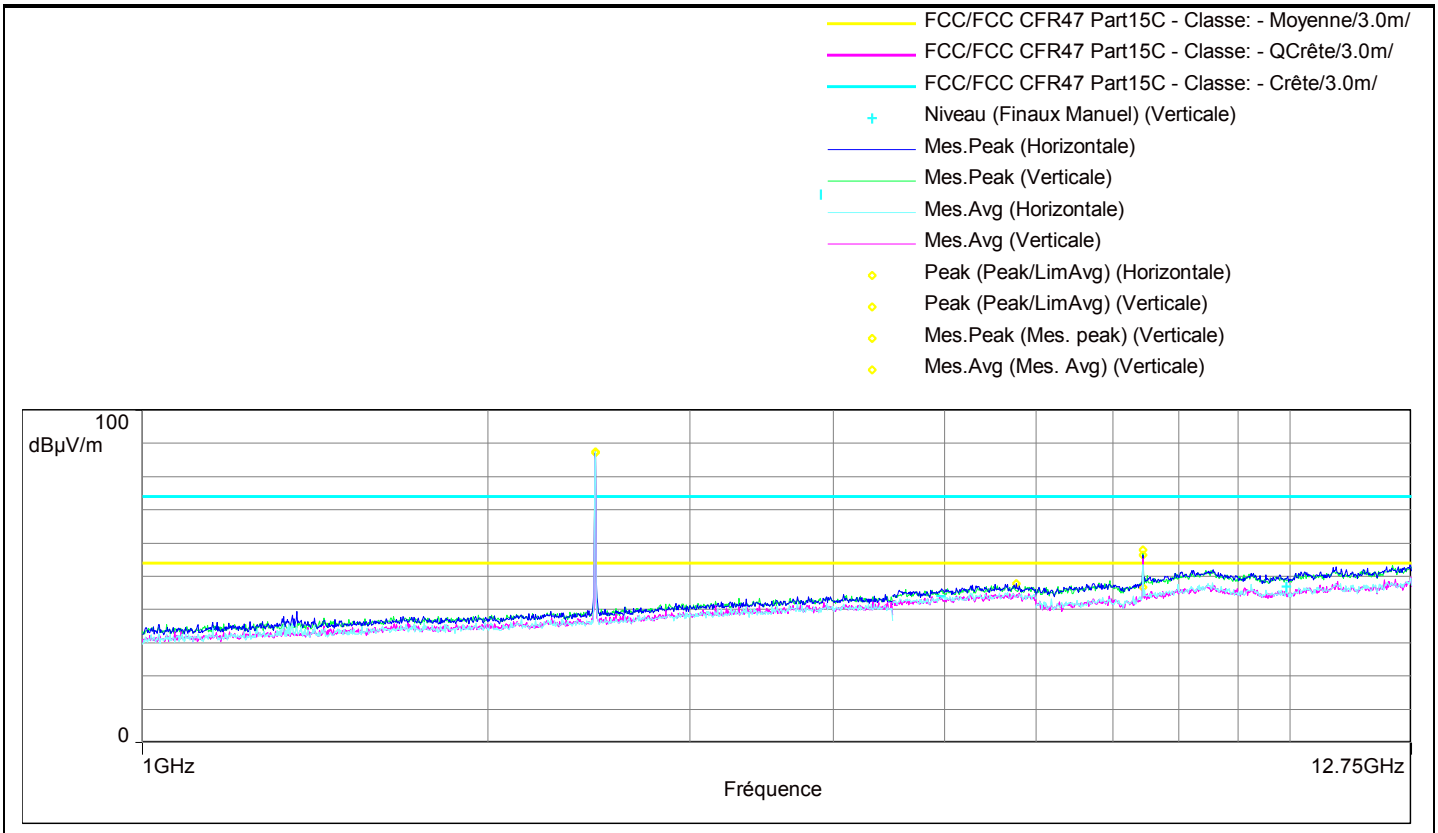
RADIATED EMISSIONS			
Graph name:	Emr#5	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) – Configuration 4 – BLE Cmid [1-12.75]GHz - - DTM test mode	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	Limit Pk (dBµV/m)	Peak-LimM (dB)	Angle (°)	Position	Correction (dB)
2439.9	87.1	54	33.1	195	H	-30.7
2440.25	86.9	54	32.9	30	V	-30.7
4048.15	46.1	54	-7.9	315	H	-25.7
5261.4	47.4	54	-6.7	161	V	-23.2
7319.29103	57.0	74	-17.0	193	H	-19.75

RADIATED EMISSIONS			
Graph name:	Emr#6	**Test configuration:**	
Limit:	FCC CFR47 Part15C	(H+V) – Configuration 4 – BLE Cmax [1-12.75]GHz - DTM test mode	
Class:			
Frequency range: [1GHz - 12.75GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	Limit Pk (dBµV/m)	Peak-LimM (dB)	Angle (°)	Position	Correction (dB)
2479.8	87.24	54	33.24	29	V	-30.6
2479.8	87.41	54	33.41	167	H	-30.6
5768.25	47.8	54	-6.2	175	H	-22.7
7439.22	57.91	74	-16.09	104	V	-19.6

12. 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.*