TEST REPORT

N°: 156105-723027-A(FILE#1000493) **Version : 02**

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	**TAGSYS SAS** 286 Avenue de Pastré 13400 - AUBAGNE FRANCE
Apparatus under test	
↳ Product	**Power Node V2**
↳ Trade mark	**TAGSYS SA**
↳ Manufacturer	**TAGSYS RFID**
↳ Model under test	**Power Node V2**
↳ Serial number	**16577-A0**
↳ FCCID	**QHKPNV2CLUSTER**
Conclusion	See Test Program chapter
Test date	February 26, 2019 to February 27, 2019
Test location	MOIRANS
IC Test site	6500A-1 & 6500A-3
Composition of document	43 pages
Document issued on	February 26, 2019

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PUBLICATION HISTORY

Version	Date	Author	Modification
01	February 26, 2019	Gaetan DESCHAMPS	Creation of the document
02	March 19, 2019	Gaetan DESCHAMPS	Adding: - In §2.2: Channel plan

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**

EMISSION TEST	LIMITS			RESULTS (Comments)
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-10GHz* *CFR 47 §15.209 (a)* *CFR 47 §15.247 (d)* *RSS-247 §5.5* ***Highest frequency : 1500MHz*** ***(Declaration of provider)***	**Measure at 3m** 30MHz-88MHz : 40 dBµV/m 88MHz-216MHz : 43.5 dBµV/m 216MHz-960MHz : 46.0 dBµV/m 960MHz-1GHz : 54.0 dBµV/m 1GHz – 25GHz: 54.0 dBµV/m (AV) 74.0 dBµV/m (PK)			☑ **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**
Hopping Channel Separation *CFR 47 §15.247 (a) (1)* *RSS-247 §5.1*	**FHSS shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Number of Hopping Frequencies *CFR 47 §15.247 (a) (1) (iii)* *RSS-247 §5.1*	**At least 50 channels used**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Time of Occupancy (Dwell Time) *CFR 47 §15.247 (a) (1) (iii)* *RSS-247 §5.1*	**Maximum 0.4 sec within 20sec**			☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP**
Band Edge Measurement *CFR 47 §15.209 (a)* *CFR 47 §15.247 (d)* *RSS-247 §5.5*	**Limit: -20dBc**			☑ **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.

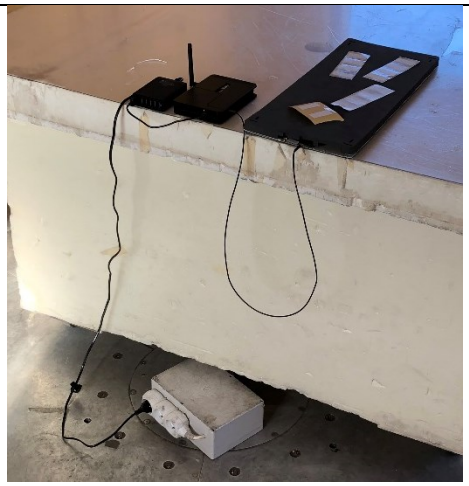
If the highest frequency of the internal sources of the testing device is above 1 GHz, measurement must be only performed until 5 times the highest frequency or 40 GHz, while taking smallest of both.

****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):
Power Node V2
Serial Number: 16577-A0



Photography of EUT

Power supply:
During all the tests, EUT is supplied by V_{nom}: 3.7VdC
For measurement with different voltage, it will be presented in test method.

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Internal	Battery	-	☐	☐	☑	
Supply	USB to µUSB (5VDC)	0.2	☐	☑	☑	-
Access	Input/Output(RFID antenna) x 8	0.5	☑	☑	☑	Only 1 linked with antenna
Access	Jack	-	☐	☐	☐	Not used
Access	SMA (Receiver antenna)	-	☑	☑	☐	2.45 GHz not tested in this report

Voltage table used:

Type	Measurement performed:	
☐ AC	☐ **110VAC/60Hz**	☐ **240VAC/50Hz**
☐ DC	☐ **+....VDC**	☐ **-....VDC**
☑ USB (Laptop auxiliary)	☑ **110VAC/60Hz (Power Port 6)**	☑ **240VAC/50Hz (Power Port 6)**

Inputs/outputs – Power supply:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Access1	AC/USB	1.5	☐	☐	☑	
Access2	USB	0.2	☐	☑	☑	-
Access3	USB	-	☐	☑	☐	Not linked
Access4	USB	-	☐	☑	☐	Not linked
Access5	USB	-	☐	☑	☐	Not linked
Access6	USB	-	☐	☑	☐	Not linked
Access7	USB	-	☐	☑	☐	Not linked

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Hot Spot V2	-	16540-A0	-
Laptop	Dell latitude	-	-

Equipment information:

Frequency band:	[902 – 928]* MHz		
Spectrum Modulation:	☑ FHSS		
Number of Channel:	See the following table.		
Spacing channel:	500kHz		
Channel bandwidth:	500kHz		
Antenna Type:	☑ Integral	☐ External	☐ Dedicated
Antenna connector:	☐ Yes	☑ No	☐ Temporary for test
Transmit chains:	☑ 1		
	Single antenna		
	Gain 1: 2dBi*		
Beam forming gain:	No		
Receiver chains	1		
Type of equipment:	☐ Stand-alone	☑ Plug-in	☐ Combined
Ad-Hoc mode:	☐ Yes	☑ No	
Dwell time:	800µs		
Duty cycle:	☑ Continuous duty	☐ Intermittent duty	☐ 100% duty
Equipment type:	☑ Production model	☐ Pre-production model	
Operating temperature range:	Tmin:	☑ -20°C	☐ 0°C	☐ X°C
	Tnom:	20°C		
	Tmax:	☐ 35°C	☑ 55°C	☐ X°C
Type of power source:	☑ AC power supply	☐ DC power supply	☑ Battery (internal)
Operating voltage range:	Vnom:	☑ 230V/50Hz	☑ 3.7Vdc (internal battery)

*See the Antenna information in§2.3

2.2. EUT CONFIGURATION

Following commands with the specific test software "" is used to set the product:

- Permanent emission with modulation in Hopping mode.

Channel plan:

Channel	Channel Frequency (MHz)
Cmin:	**902.75**
-	903.25
-	903.75
-	904.25
-	904.75
-	905.25
-	905.75
-	906.25
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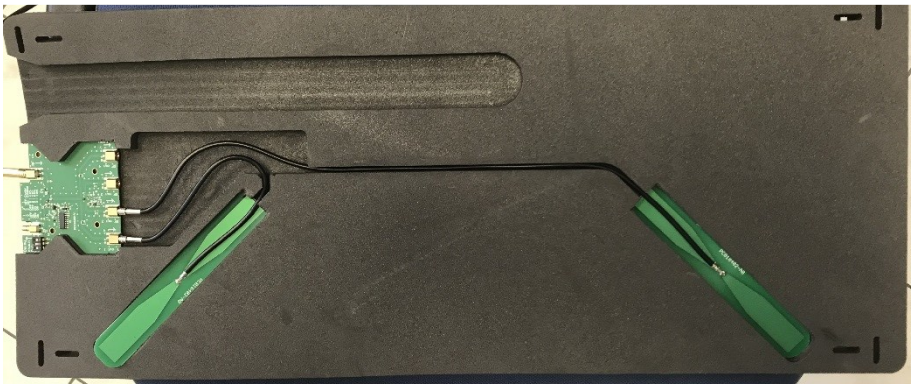
-	912.25
-	912.75
-	913.25
-	913.75
-	914.25
-	914.75

Cmid	915.25
-	915.75
-	916.25
-	916.75
-	917.25
-	917.75
-	918.25
-	918.75
-	919.25
-	919.75
-	920.25
-	920.75
-	921.25
-	921.75
-	922.25
-	922.75
-	923.25
-	923.75
-	924.25
-	924.75
-	925.25
-	925.75
-	926.25
-	926.75
Cmax	**927.25**

2.3. ANTENNA INFORMATION

Antenna configuration:

Cluster Antenna (2 Dipoles, see the following photograph)
Part Number: DDP16381



2.4. EQUIPMENT MODIFICATIONS

☑ None ☐ Modification:

2.5. 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.

2.6. CALIBRATION DATE

The calibration intervals are extended at 12+1 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

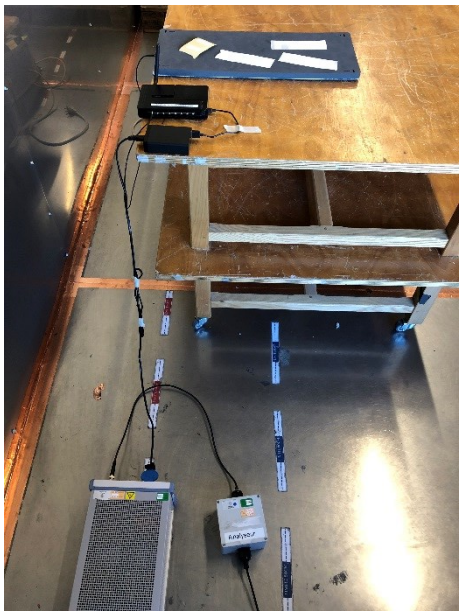
Date of test	:	February 27, 2019
Test performed by	:	Gaëtan DESCHAMPS
Atmospheric pressure (hPa)	:	1020
Relative humidity (%)	:	33
Ambient temperature (°C)	:	23

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

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 a voltage sets (see the table voltage in §2.2) 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 (for example). 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
EMC comb generator	LCIE SUD EST	-	A3169098	-	-
LISN	RHODE & SCHWARZ	ENV216	C2320291	02/19	02/20
Receiver 9kHz - 30MHz	ROHDE & SCHWARZ	ESHS10	A2642028	11/18	11/19
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	08/18	08/20
Transient limiter	RHODE & SCHWARZ	ESH3-Z2	A7122204	02/18	02/19

3.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

3.6. TEST RESULTS

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

Graph identifier		Line	Comments	
Emc#	1	Phase	110VAC/60Hz	See Annex
Emc#	2	Neutral	110VAC/60Hz	See Annex
Emc#	3	Phase	240VAC/50Hz	See Annex
Emc#	4	Neutral	240VAC/50Hz	See Annex

3.7. CONCLUSION

Conducted emission data measurement performed on the sample of the product **Power Node V2**, SN: 16577-A0, 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

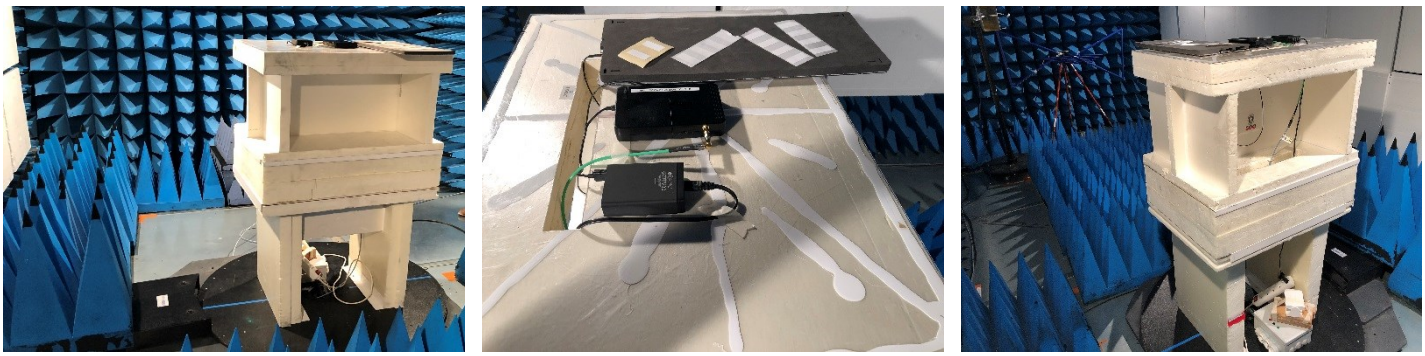
4.1. ENVIRONMENTAL CONDITIONS

Date of test	:	February 26, 2019
Test performed by	:	Gaëtan DESCHAMPS
Atmospheric pressure (hPa)	:	1080
Relative humidity (%)	:	32
Ambient temperature (°C)	:	23

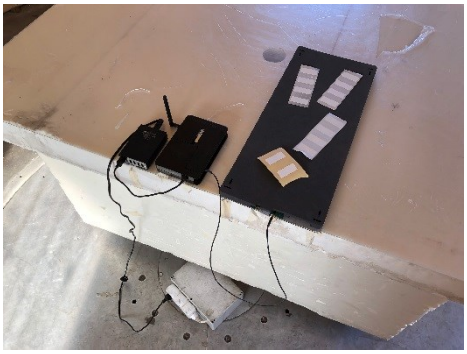
4.2. TEST SETUP

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 <1GHz (pre-characterization)



Test setup in anechoic chamber >1GHz (pre-characterization and characterization)


Test setup in OATS (characterization):



Test setup in Chamber C1 (characterization):

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 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.

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 8GHz:
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 10GHz.
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

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	C2040051	01/18	03/19
Antenna Bi-log	CHASE	CBL6111A	C2040172	09/18	09/20
Antenna horn 18GHz	EMCO	3115	C2042029	09/18	09/20
Emission Cable	SUCOFLEX	6GHz	A5329061	03/18	03/19
Emission Cable C3	-	6GHz	A5329069	11/18	11/19
Cable (OATS)	-	1GHz	A5329623	03/18	03/19
Cable SMA Emission C3	-	6GHz	A5329637	02/18	05/19
Cable SMA 30cm coudé	TELEDYNE	26GHz	A5329873	01/19	01/20
Cable SMA 1m	TELEDYNE	26GHz	A5329874	01/19	01/20
Cable SMA 3.3m	TELEDYNE	26GHz	A5329875	01/19	01/20
Semi-Anechoic chamber #3	SIEPEL	-	D3044017	03/16	03/19
Radiated emission comb generator	BARDET	-	A3169050	-	-
HF Radiated emission comb generator	LCIE SUD EST	-	A3169088	-	-
High Pass (1-15GHz)	WAINRIGHT	WHKX 1.03/15G-10SS	A7484035	05/17	05/19
OATS	-	-	F2000409	02/19	02/20
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	12/17	03/19
Spectrum analyzer	ROHDE & SCHWARZ	FSU 26	A4060058	06/18	06/19
BAT EMC	NEXIO	v3.17.0.10	L1000115	-	-
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	08/18	08/20
Turntable chamber (Cage#3)	ETS Lingren	Model 2165	F2000371	-	-
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	MATURO Gmbh	-	F2000437	-	-
Table C3	LCIE	-	F2000461	-	-
Rehausse Table C3	LCIE	-	F2000511	-	-
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 [30MHz-1GHz]

See graphs for 30MHz-1GHz:

Graph identifier	Polarization	Mode	EUT position	Channel	Comments
Emr# 1	H/V	TX	Axis XY	Hopping mode	See annex 1

4.6.2. Pre-characterization at 3 meters [1GHz-8GHz]

See graphs for 1GHz-8GHz:

Graph identifier	Polarization	Mode	EUT position	Channel	Comments
Emr# 2	H/V	TX	Axis XY	Hopping mode	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)	Gain/Loss Factor (dB)	Transducer Factor (dB)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
37.837	21.0	QP	V	0	100	-	17.3	38.3	40.0	-1.7	Performed in OATS
832.950*	6.0	QP	V	0	400	-	15.6	21.6	46.0	-24.4	Performed in cage1 (due to OATS noise)
837.780*	6.7	QP	V	0	400	-	15.6	22.3	46.0	-23.7	Performed in cage1 (due to OATS noise)
839.760*	29.2	QP	V	100	250	-	15.6	44.8	46.0	-1.2	Performed in cage1 (due to OATS noise)
841.350*	18.7	QP	H	360	180	-	15.6	34.3	46.0	-11.7	Performed in cage1 (due to OATS noise)
928.381*	29.1	QP	H	360	120	-	15.6	44.7	46.0	-1.3	Performed in cage1 (due to OATS noise)
931.701*	24.9	QP	H	360	100	-	15.6	40.5	46.0	-5.5	Performed in cage1 (due to OATS noise)

*Characterization measured at 3m.

4.6.4. Characterization on 3meters anechoic chamber from 1GHz to 8GHz

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.

Test Frequency (MHz)	Meter Reading dB(µV)	Detector (Pk/QP/Av)	Polarity (V/H)	Azimuth (Degrees)	Antenna Height (cm)	Gain/Loss Factor (dB)	Transducer Factor (dB)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
4884.450	86.6	Pk	V		150	-	-25.6	61.0	74.0	**-13.0**	
4884.450	55.6	Av	V		150	-	-25.6	30.0	54.0	**-24.0**	
4935.150	89.3	Pk	V		150	-	-25.5	63.8	74.0	**-10.2**	
4935.150	56.3	Av	V		150	-	-25.5	30.8	54.0	**-23.2**	
5991.750	79.1	Pk	V		150	-	-24.5	54.6	74.0	**-19.4**	
5991.750	76.6	Av	V		150	-	-24.5	52.1	54.0	**-1.9**	

Note: Measures have been done at 3m distance.

4.7. CONCLUSION

Radiated emission data measurement performed on the sample of the product **Power Node V2**, SN: **16577-A0**, in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

5. MAXIMUM PEAK OUTPUT POWER (15.247)

5.1. ENVIRONMENTAL CONDITIONS

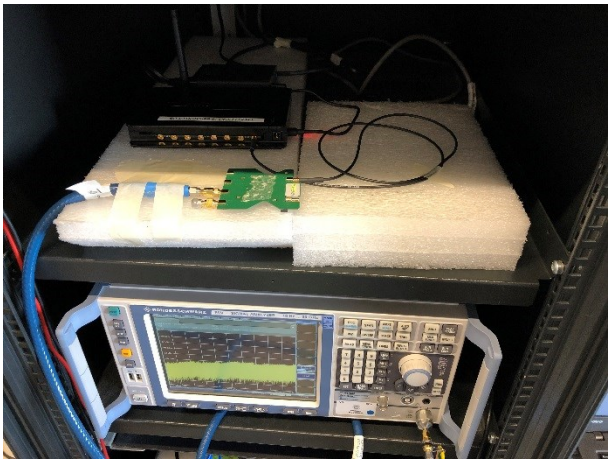
Date of test	:	February 27, 2019
Test performed by	:	Gaëtan DESCHAMPS
Atmospheric pressure (hPa)	:	1020
Relative humidity (%)	:	33
Ambient temperature (°C)	:	23

5.2. EQUIPMENT CONFIGURATION

Packet type: Random 05
Hopping sequence: ☑ ON ☐ OFF

5.3. TEST 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 and using 500kHz RBW and 2MHz VBW.
The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.



☐ ***Radiated measurement:***
The product has been tested at a distance of 3 meters from the antenna and using 500kHz RBW and 2MHz 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 ≥ 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:

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

5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Attenuator 10dB	AEROFLEX	-	A7122269	12/17	12/19
Cable SMA	-	18GHz	A5329863	11/18	11/19
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	12/17	03/19
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	08/18	08/20
Attenuator 10dB	TECHNIWAVE	-	A7122273	06/18	06/20

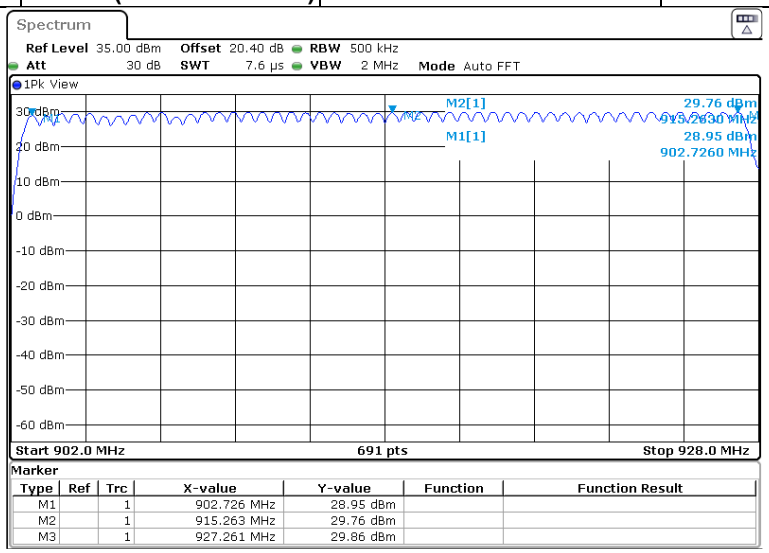
5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

5.6. TEST RESULTS

Packet type: Random
Hopping sequence: ☑ ON ☐ OFF

Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	Power Limit (dBm)
Cmin	**902.75 (see marker M2)**	**28.95**	**30**
Cmid	**915.25 (see marker M3)**	**29.76**	**30**
Cmax	**927.25 (see marker M4)**	**29.86**	**30**



Worst case sees in Marker M3 at 29.86dBm

5.7. CONCLUSION

Maximum Peak Output Power measurement performed on the sample of the product **Power Node V2**, SN: **16577-A0**, in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

6. CARRIER FREQUENCY SEPARATION (15.247)

6.1. ENVIRONMENTAL CONDITIONS

Date of test	:	February 27, 2019
Test performed by	:	Gaëtan DESCHAMPS
Atmospheric pressure (hPa)	:	1020
Relative humidity (%)	:	33
Ambient temperature (°C)	:	23

6.2. LIMIT

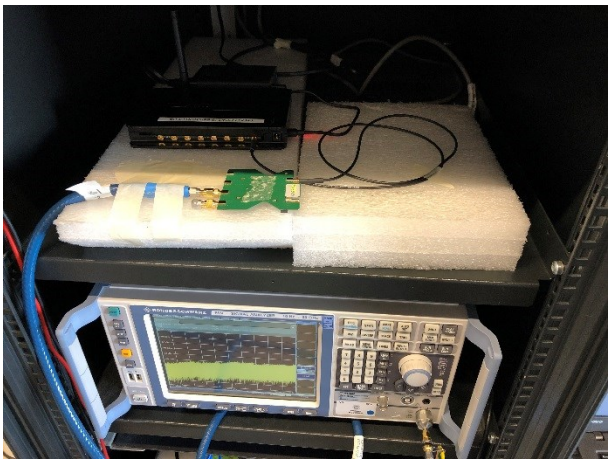
For frequency hopping system, hopping channel carrier frequencies must be separated by a minimum of 25kHz or the 20dB bandwidth of hopping channel, whichever is greater.
For frequency hopping system operating in the 902-928MHz with 20dB bandwidth of hopping channel is equal or greater than 250kHz:

- System shall use at least 25 channels
- Average time of occupancy on any frequency shall not greater than 0.4s within 10s period

The maximum allowed 20dB bandwidth of hopping channel is 500kHz.

6.3. EQUIPMENT CONFIGURATION

Packet type: Random 05
Hopping sequence: ☑ ON ☐ OFF



6.4. SETUP – OBW (20DB BANDWIDTH)

The occupied bandwidth is measured as the width of the spectral envelope of the modulated signal, at an amplitude level reduced from a reference value by a specified ratio (or in decibels, a specified number of dB down from the reference value).
Setting:

- The spectrum analyzer center frequency is set to the nominal EUT channel center frequency.
- RBW shall be in the range of 1 % to 5% of the OBW
- Span < 5 X OBW
- ndBdown set at 20dB.

6.5. SETUP – ADJACENT CHANNEL SEPARATION

The EUT is placed in an anechoic chamber; levels have been corrected to be in compliant with the Peak Output Power measured. The EUT is turn ON and using the MaxHold function, the separation of two adjacent channels is recorded. A delta marker is used to measure the frequency difference.
Setting:

- Span: Wide enough to capture the peaks of two adjacent channels.
- RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
- Video bandwidth (VBW) ≥ RBW.
- Sweep: Auto.
- Detector function: Peak.
- Trace: Max hold.
- Allow the trace to stabilize.

Use the marker-delta function to determine the separation between the peaks of the adjacent channels.
Compliance of an EUT with the appropriate regulatory limit shall be determined. A plot of the data shall be included in the test report.

6.6. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Attenuator 10dB	AEROFLEX	-	A7122269	12/17	12/19
Cable SMA	-	18GHz	A5329863	11/18	11/19
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	12/17	03/19
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	08/18	08/20
Attenuator 10dB	TECHNIWAVE	-	A7122273	06/18	06/20

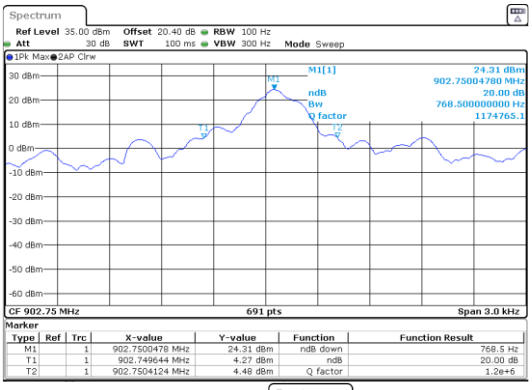
6.7. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

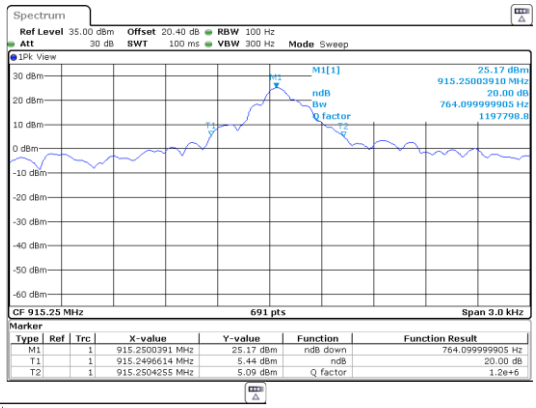
☑ None ☐ Divergence:

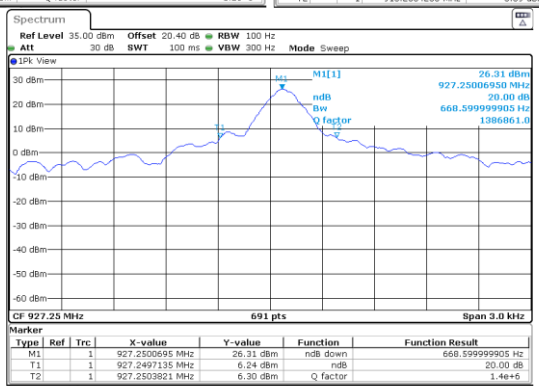
6.8. TEST SEQUENCE AND RESULTS

Packet type: Random 05
Hopping sequence: ☑ ON ☐ OFF

6.8.1. 20dB Bandwidth:

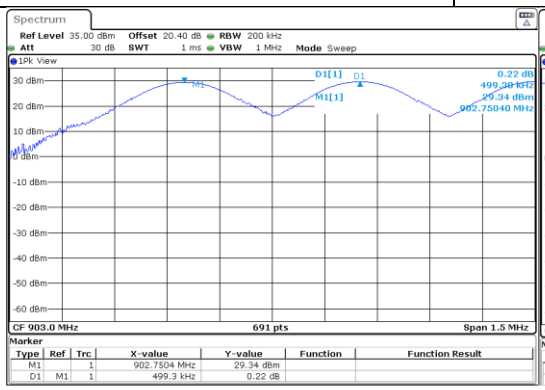


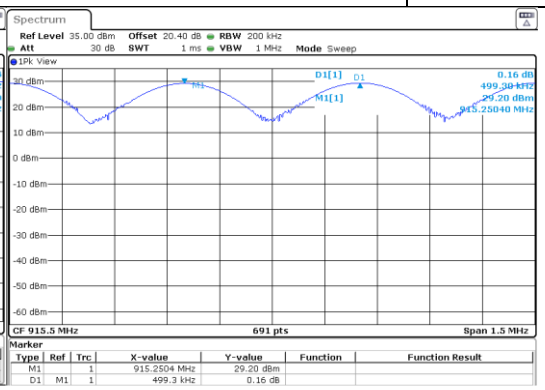


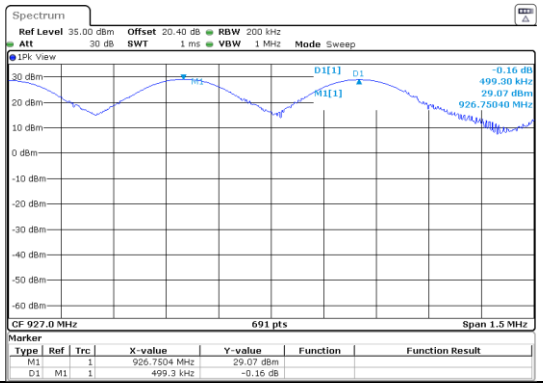


6.8.2. Adjacent frequency separation

Minimum channel spacing frequency measured (MHz)	Maximum 20dB Bandwidth (kHz)	Minimum Limit (kHz)
0.499	0.768	250







6.9. CONCLUSION

Hopping Channel Separation measurement performed on the sample of the product **Power Node V2**, SN: **16577-A0**, in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

7. NUMBER OF HOPPING FREQUENCIES (15.247)

7.1. ENVIRONMENTAL CONDITIONS

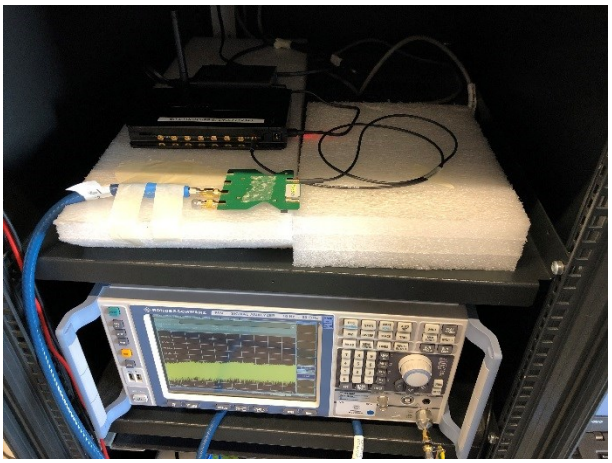
Date of test	:	February 27, 2019
Test performed by	:	Gaëtan DESCHAMPS
Atmospheric pressure (hPa)	:	1020
Relative humidity (%)	:	33
Ambient temperature (°C)	:	23

7.2. LIMIT

For frequency hopping system operating in the 902-928MHz, at least 50 channels frequencies must be used.

7.3. EQUIPMENT CONFIGURATION

Packet type: Random 05
Hopping sequence: ☑ ON ☐ OFF



7.4. SETUP

The EUT is placed in an anechoic chamber. The EUT is turn ON and using the MaxHold function and a delta marker the number of frequencies used for this FHSS system is recorded, see following graphs.

Setting:

- Span: The frequency band of operation.
- RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
- VBW ≥ RBW.
- Sweep: Auto.
- Detector function: Peak.
- Trace: Max hold.
- Allow the trace to stabilize.

7.5. TEST EQUIPMENT LIST

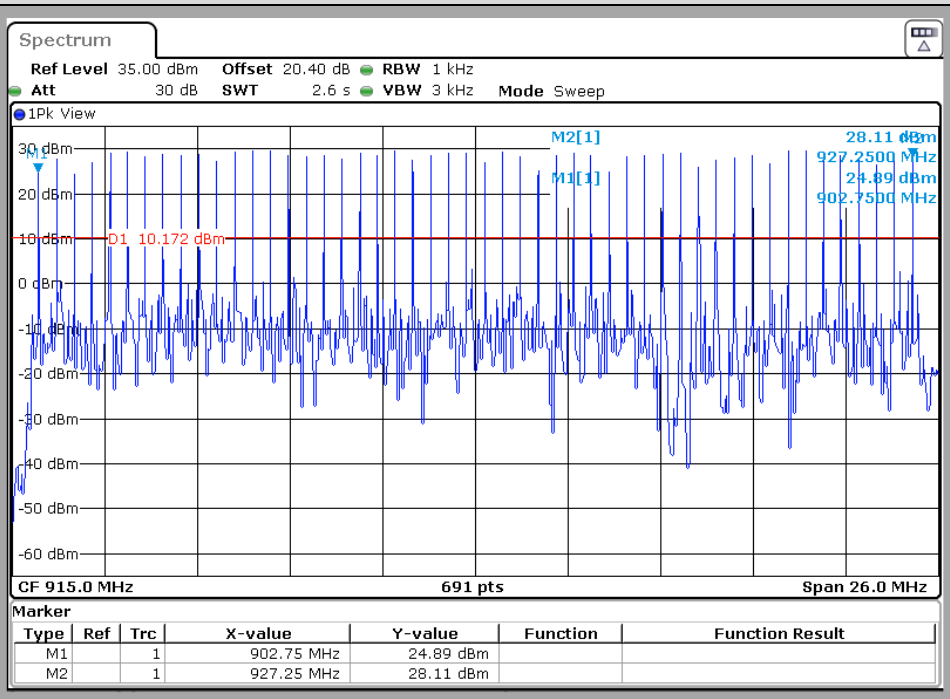
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Attenuator 10dB	AEROFLEX	-	A7122269	12/17	12/19
Cable SMA	-	18GHz	A5329863	11/18	11/19
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	12/17	03/19
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	08/18	08/20
Attenuator 10dB	TECHNIWAVE	-	A7122273	06/18	06/20

7.6. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

7.7. TEST SEQUENCE AND RESULTS

Channel Table



Hopping Sequence	50	Channels

7.8. CONCLUSION

Number of hopping frequencies measurement performed on the sample of the product **Power Node V2**, SN: **16577-A0**, in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

8. TIME OF OCCUPANCY (DWELL TIME) (15.247)

8.1. ENVIRONMENTAL CONDITIONS

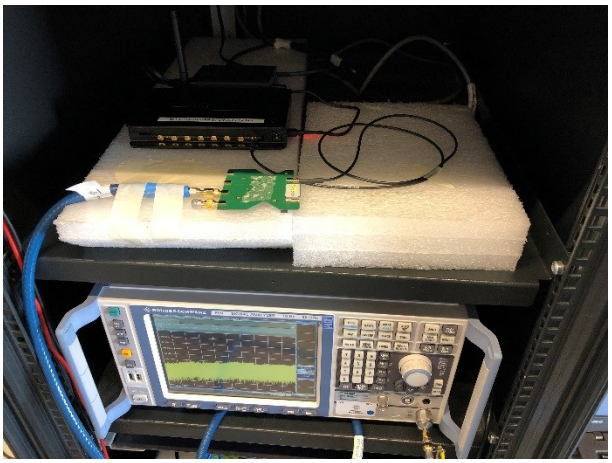
Date of test	:	February 27, 2019
Test performed by	:	Gaëtan DESCHAMPS
Atmospheric pressure (hPa)	:	1020
Relative humidity (%)	:	33
Ambient temperature (°C)	:	23

8.2. LIMIT

The average time of occupancy on any channel shall not be greater than 0.4 seconds within period of 20 seconds

8.3. EQUIPMENT CONFIGURATION

Packet type: Random 05
Hopping sequence: ☑ ON ☐ OFF



8.4. 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.

☐ ***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:
Dwell Time is measured and calculated using the zero SPAN mode on a channel frequency and a SWEEP with an adapter value to measure the number of transmission within a period and the time of transmission
RBW: 100kHz
VBW: 300kHz

8.5. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Attenuator 10dB	AEROFLEX	-	A7122269	12/17	12/19
Cable SMA	-	18GHz	A5329863	11/18	11/19
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	12/17	03/19
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	08/18	08/20
Attenuator 10dB	TECHNIWAVE	-	A7122273	06/18	06/20

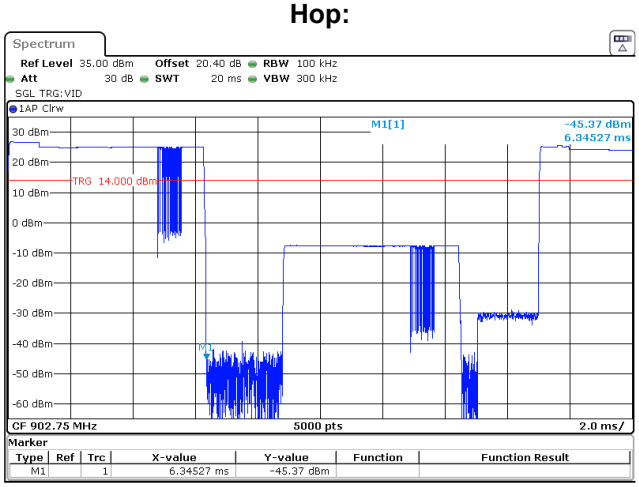
8.6. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

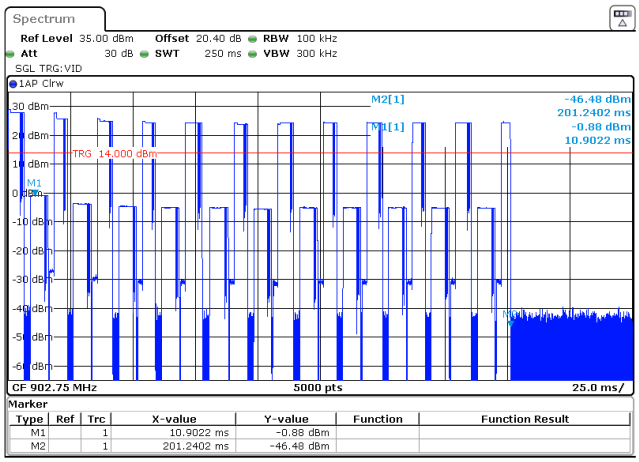
8.7. TEST SEQUENCE AND RESULTS

Frequency range table	Number of transmission in the period at 20s	Length of transmission time (ms)	Result (ms)	Limit (ms)
Channel observed : Cmin	2	76.14324	152.28648	400

Hop:



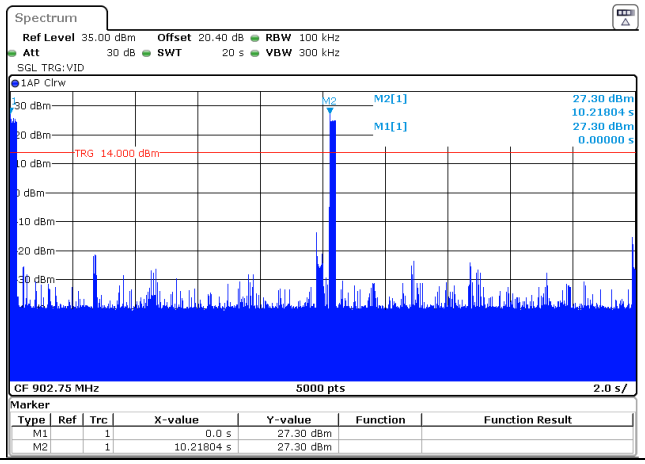
Burst:



*Cross coupling (see Marker M1) not applicable

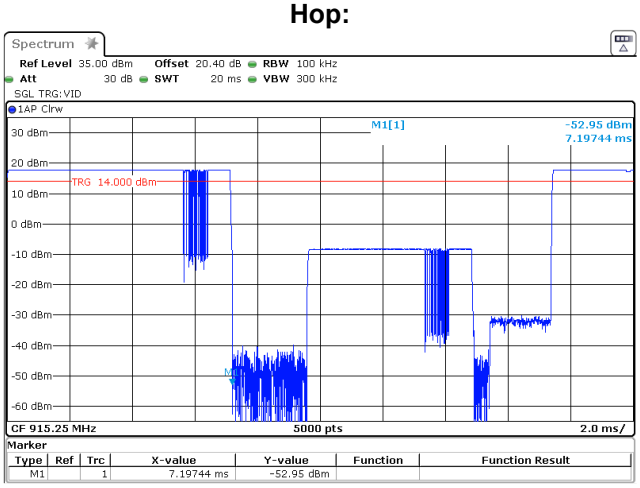
Hop period (in ms & worst case presented) **6.34527** **Number of Hop in the Burst** **12**

Number of transmission:

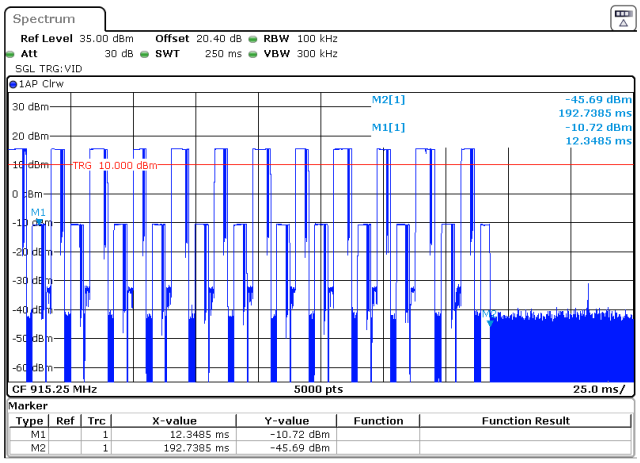


Frequency range table	Number of transmission in the period at 20s	Length of transmission time (ms)	Result (ms)	Limit (ms)
Channel observed : Cmid	2	86.36928	172.73856	400

Hop:



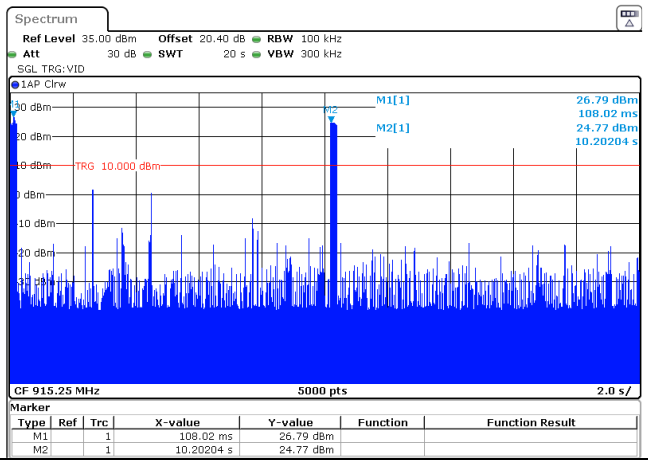
Burst:



*Cross coupling (see Marker M1) not applicable

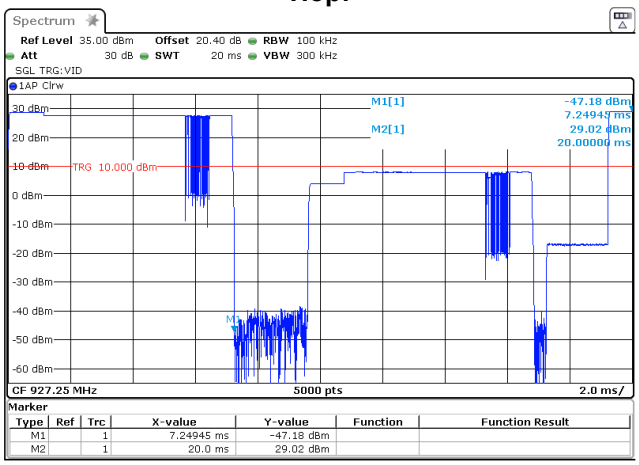
Hop period (in ms & worst case presented) **7.19744** **Number of Hop in the Burst** **12**

Number of transmission:

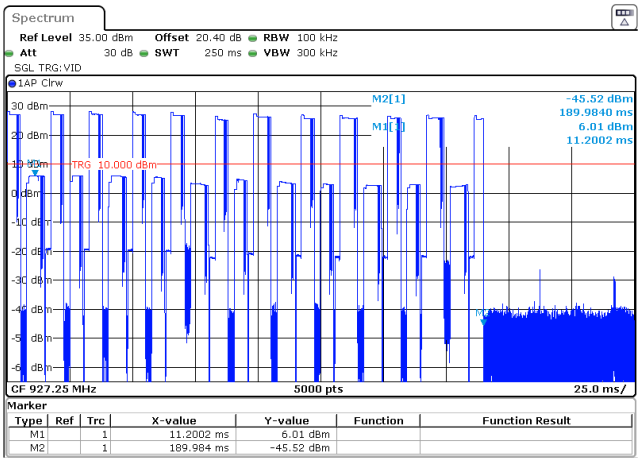


Frequency range table	Number of transmission in the period at 20s	Length of transmission time (ms)	Result (ms)	Limit (ms)
Channel observed : Cmax	2	86.9934	173.9868	400

Hop:



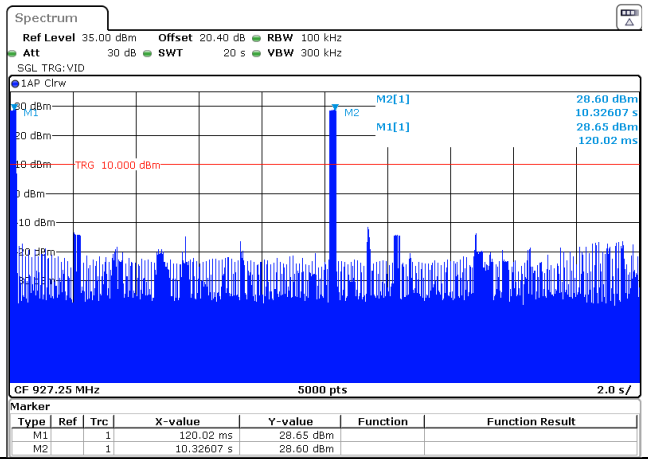
Burst:



***Cross coupling (see Marker M1) not applicable**

Hop period (in ms & worst case presented) **7.24945** **Number of Hop in the Burst** **12**

Number of transmission:



8.8. CONCLUSION

Time of occupancy measurement performed on the sample of the product **Power Node V2**, SN: **16577-A0**, in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

9. BAND EDGE MEASUREMENT (15.247)

9.1. ENVIRONMENTAL CONDITIONS

Date of test	:	February 27, 2019
Test performed by	:	Gaëtan DESCHAMPS
Atmospheric pressure (hPa)	:	1020
Relative humidity (%)	:	33
Ambient temperature (°C)	:	23

9.2. LIMIT

RF antenna conducted test:
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:
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.

9.3. EQUIPMENT CONFIGURATION

Packet type: Random 05
Hopping sequence: ☑ ON ☐ OFF

9.4. 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

9.5. TEST EQUIPMENT LIST

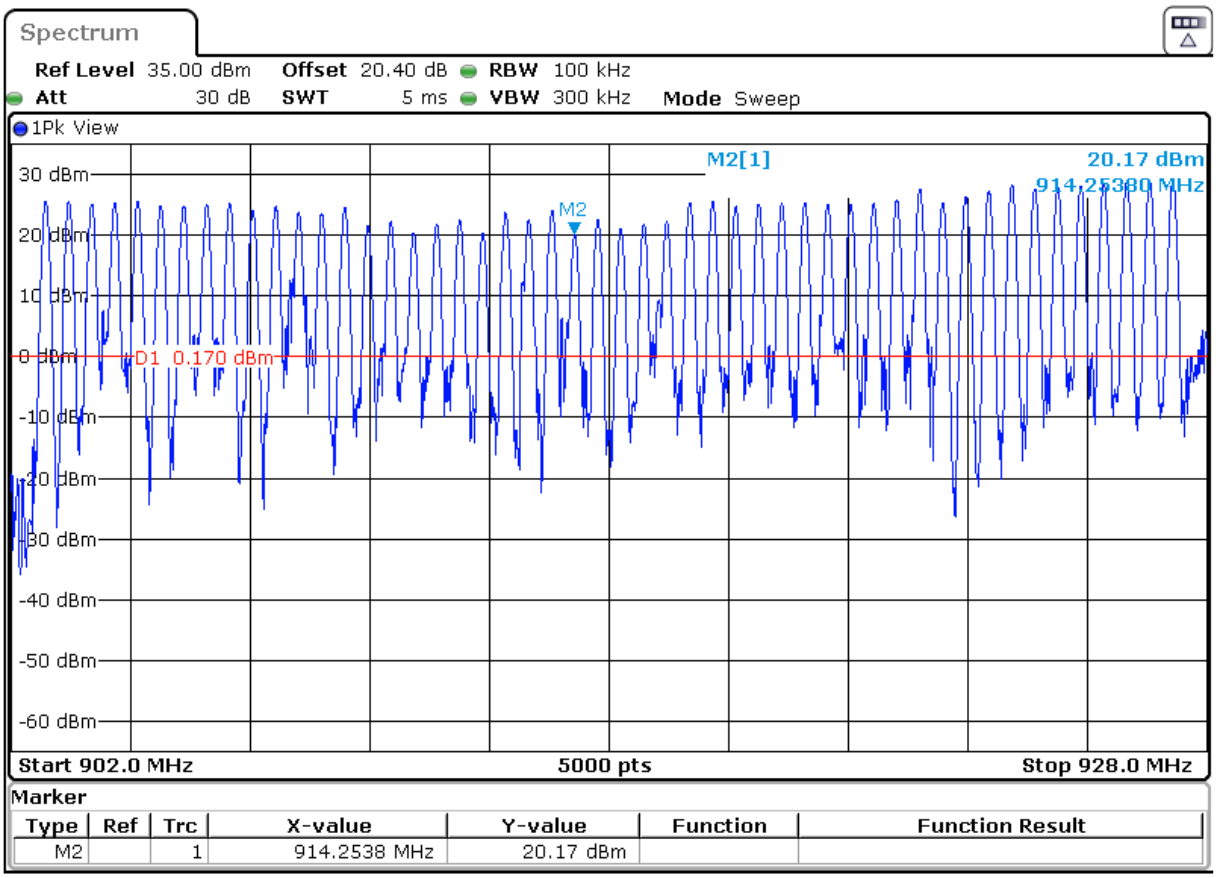
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Attenuator 10dB	AEROFLEX	-	A7122269	12/17	12/19
Cable SMA	-	18GHz	A5329863	11/18	11/19
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060050	12/17	03/19
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	08/18	08/20
Attenuator 10dB	TECHNIWAVE	-	A7122273	06/18	06/20

9.6. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

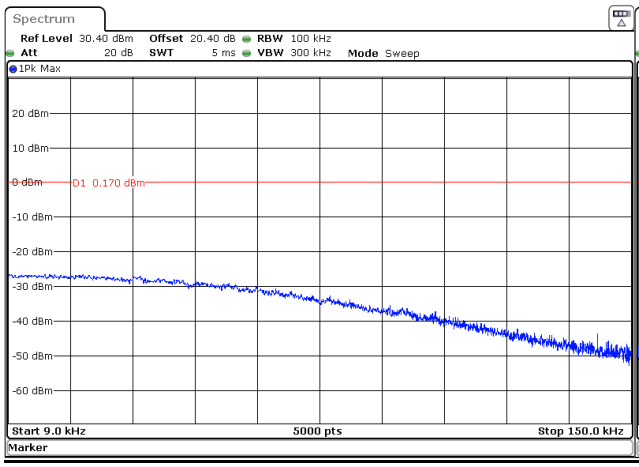
9.7. TEST SEQUENCE AND RESULTS

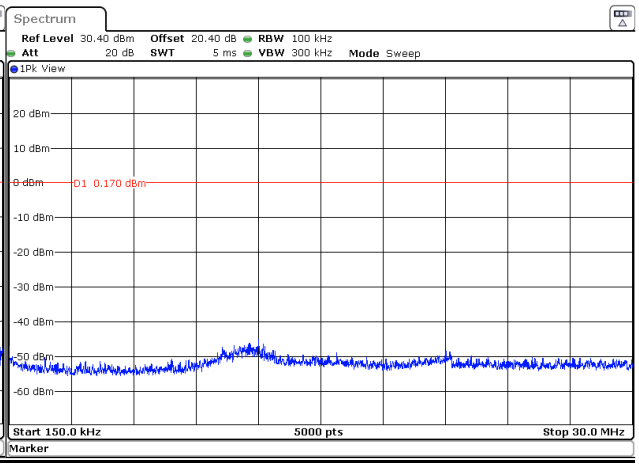
GRAPH / MODULATION.

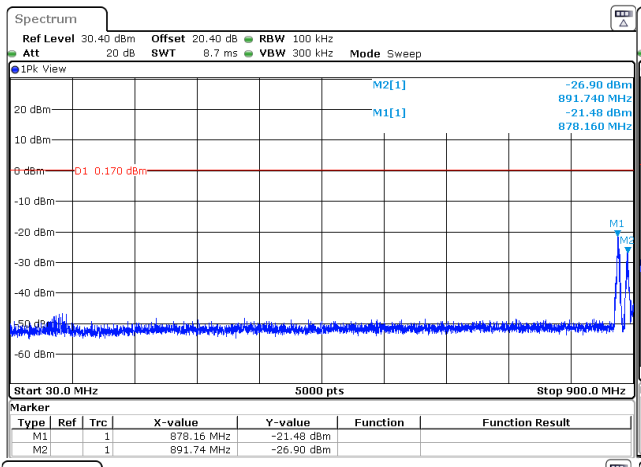


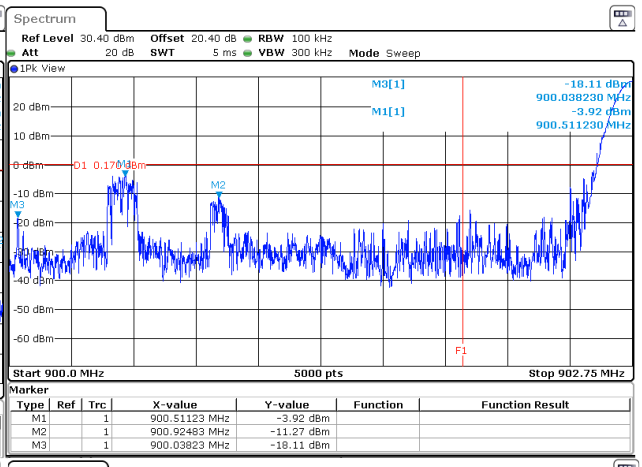
Worst case: Display line at 0.17dBm (see above Marker M2)

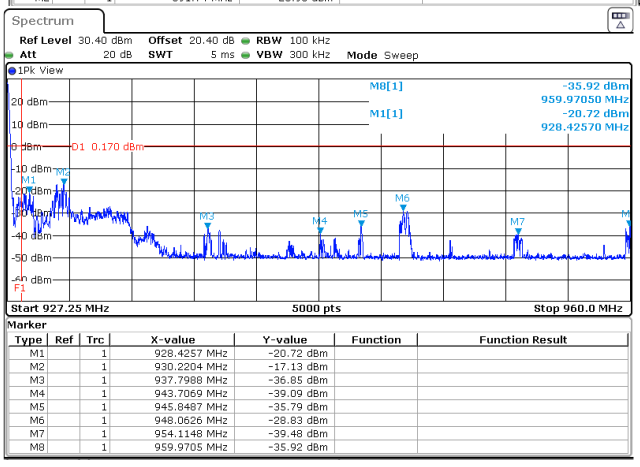
Results:

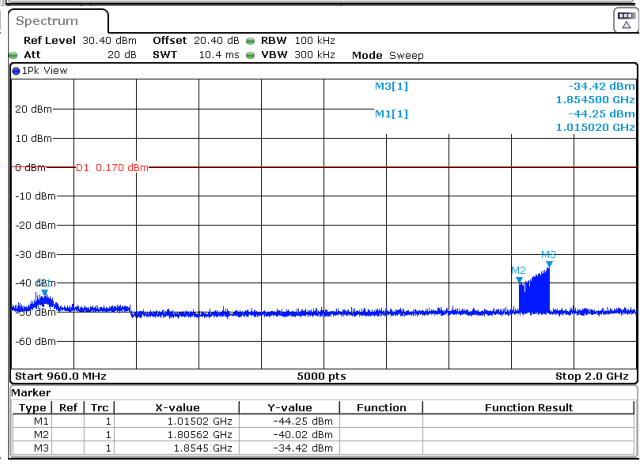

Spectrum
Ref Level 30.40 dBm Offset 20.40 dB RBW 100 kHz
Att 20 dB SWT 5 ms VBW 300 kHz Mode Sweep
1Pk Max
D1 0.170 dBm
Start 9.0 kHz 5000 pts Stop 150.0 kHz
Marker

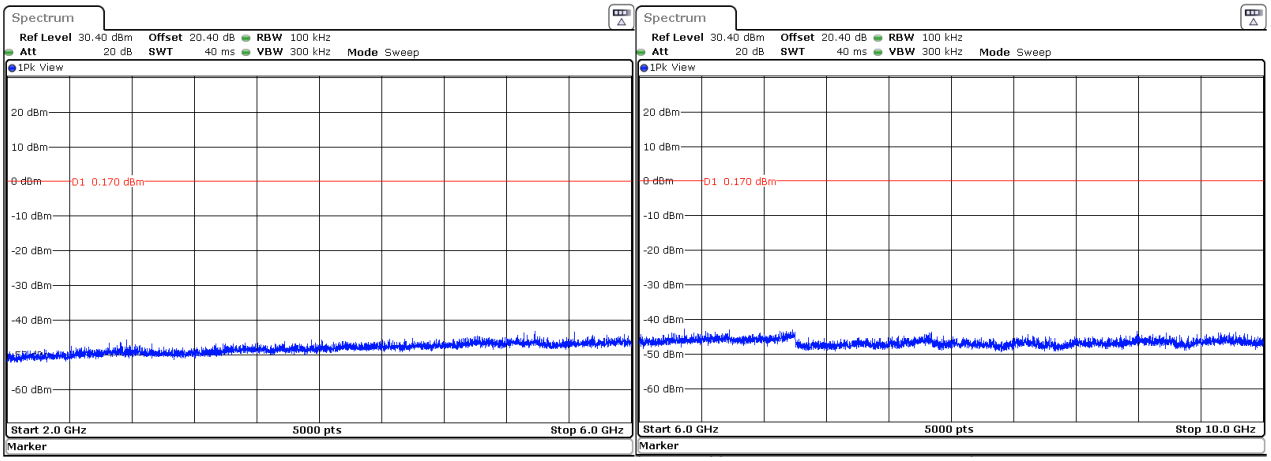

Spectrum
Ref Level 30.40 dBm Offset 20.40 dB RBW 100 kHz
Att 20 dB SWT 5 ms VBW 300 kHz Mode Sweep
1Pk View
D1 0.170 dBm
Start 150.0 kHz 5000 pts Stop 30.0 MHz
Marker


Spectrum
Ref Level 30.40 dBm Offset 20.40 dB RBW 100 kHz
Att 20 dB SWT 8.7 ms VBW 300 kHz Mode Sweep
1Pk View
M2[1] -26.90 dBm 891.740 MHz
M1[1] -21.48 dBm 878.160 MHz
D1 0.170 dBm
Start 30.0 MHz 5000 pts Stop 900.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 878.16 MHz -21.48 dBm
M2 1 891.74 MHz -26.90 dBm


Spectrum
Ref Level 30.40 dBm Offset 20.40 dB RBW 100 kHz
Att 20 dB SWT 5 ms VBW 300 kHz Mode Sweep
1Pk View
M3[1] -18.11 dBm 900.038230 MHz
M1[1] -3.92 dBm 900.511230 MHz
D1 0.170 dBm
Start 900.0 MHz 5000 pts Stop 902.75 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 900.51123 MHz -3.92 dBm
M2 1 900.92483 MHz -11.27 dBm
M3 1 900.03823 MHz -18.11 dBm


Spectrum
Ref Level 30.40 dBm Offset 20.40 dB RBW 100 kHz
Att 20 dB SWT 5 ms VBW 300 kHz Mode Sweep
1Pk View
M8[1] -35.92 dBm 959.97050 MHz
M1[1] -20.72 dBm 928.42570 MHz
D1 0.170 dBm
Start 927.25 MHz 5000 pts Stop 960.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 928.4257 MHz -20.72 dBm
M2 1 930.2204 MHz -17.13 dBm
M3 1 937.7988 MHz -36.85 dBm
M4 1 943.7069 MHz -39.09 dBm
M5 1 945.8487 MHz -35.79 dBm
M6 1 948.0626 MHz -28.83 dBm
M7 1 954.1148 MHz -39.48 dBm
M8 1 959.9705 MHz -35.92 dBm


Spectrum
Ref Level 30.40 dBm Offset 20.40 dB RBW 100 kHz
Att 20 dB SWT 10.4 ms VBW 300 kHz Mode Sweep
1Pk View
M3[1] -34.42 dBm 1.854500 GHz
M1[1] -44.25 dBm 1.015020 GHz
D1 0.170 dBm
Start 960.0 MHz 5000 pts Stop 2.0 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 1.01502 GHz -44.25 dBm
M2 1 1.80562 GHz -40.02 dBm
M3 1 1.8545 GHz -34.42 dBm



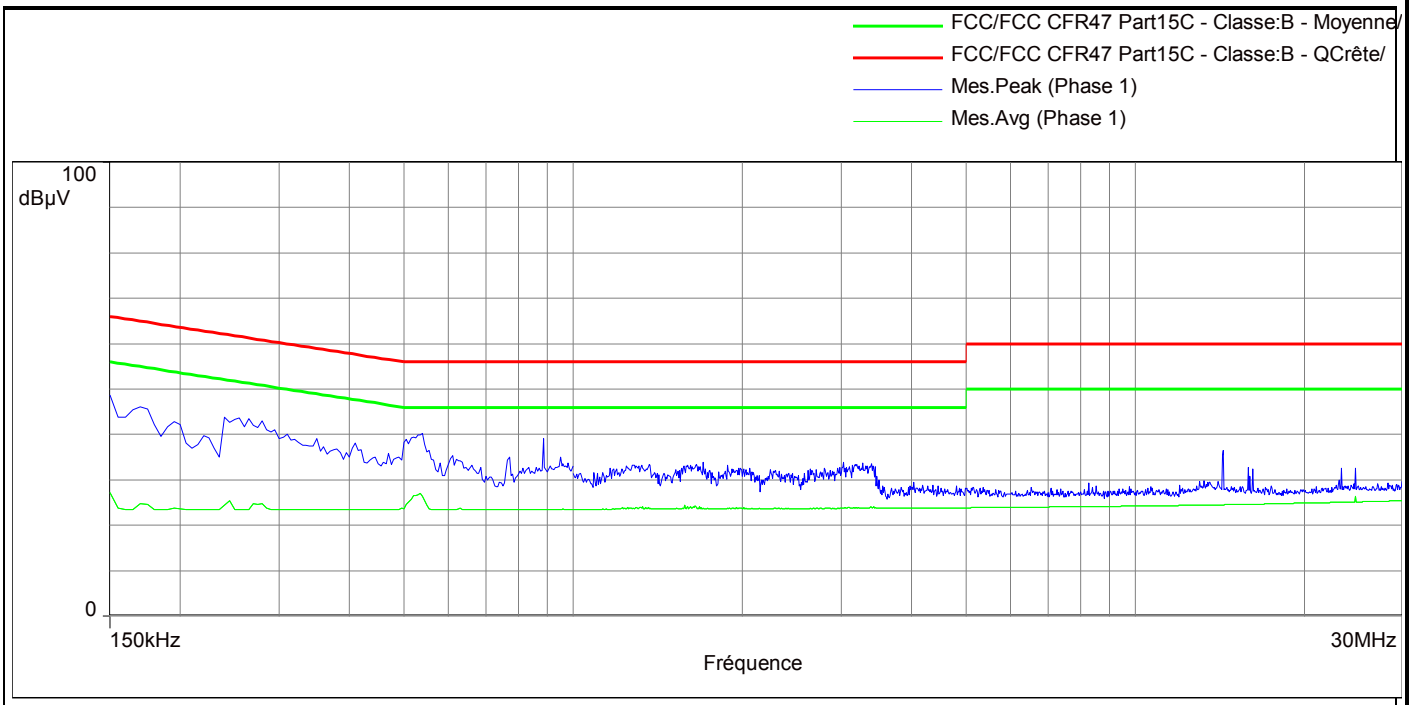
Results worst case: see "Radiated Emission Data" in §4.6

9.8. CONCLUSION

Band edge measurement performed on the sample of the product **Power Node V2**, SN: **16577-A0**, in configuration and description presented in this test report, show levels below the FCC CFR 47 Part 15 and RSS-247 limits.

10. ANNEX 1 (GRAPHS)

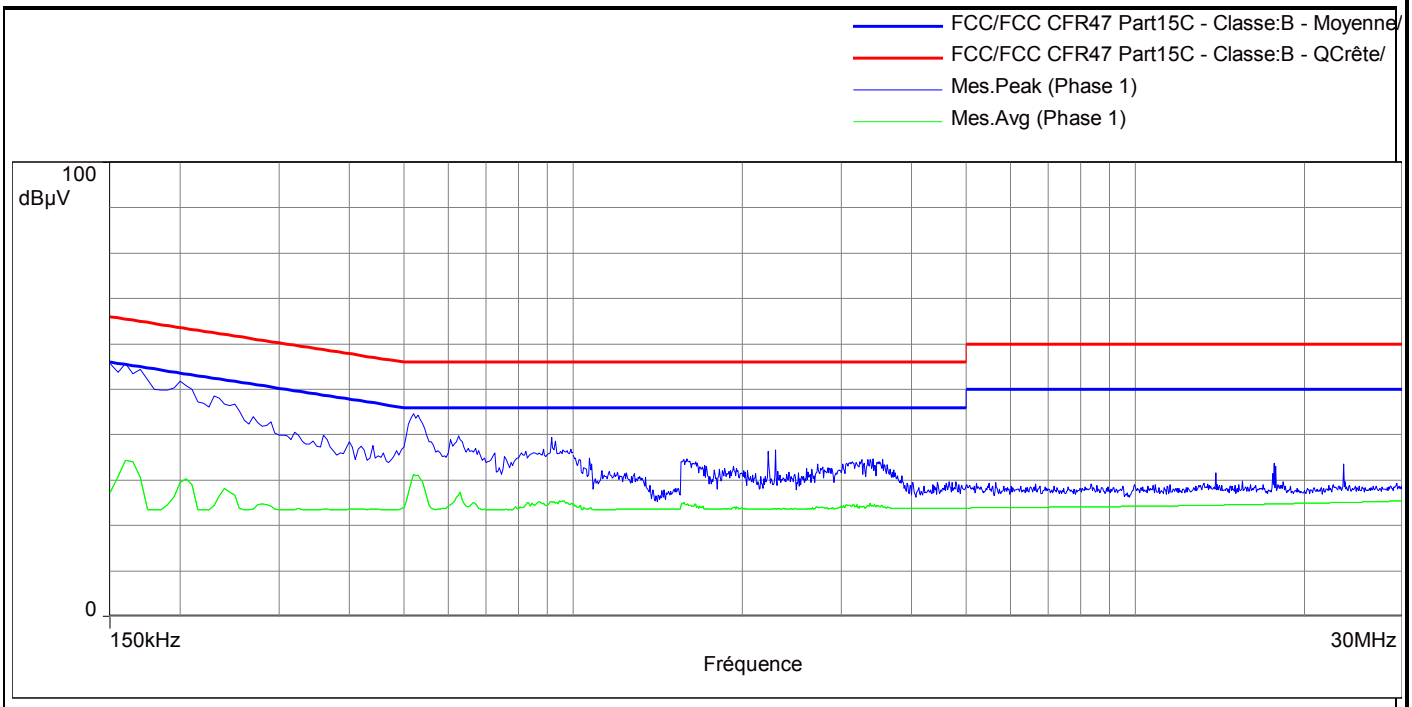
CONDUCTED EMISSIONS			
Graph name:	Emc#1	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Phase (PN)	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	110VAC / 60Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



Spurious emissions

Frequency (MHz)	Peak (dBµV)	LimM (dBµV)	Peak-LimM (dB)	Line	Correction (dB)
0.150	48.8	56.0	-7.2	Phase 1	19.4
0.885	39.1	46.0	-6.9	Phase 1	19.5
14.340	36.5	50.0	-13.5	Phase 1	20.5

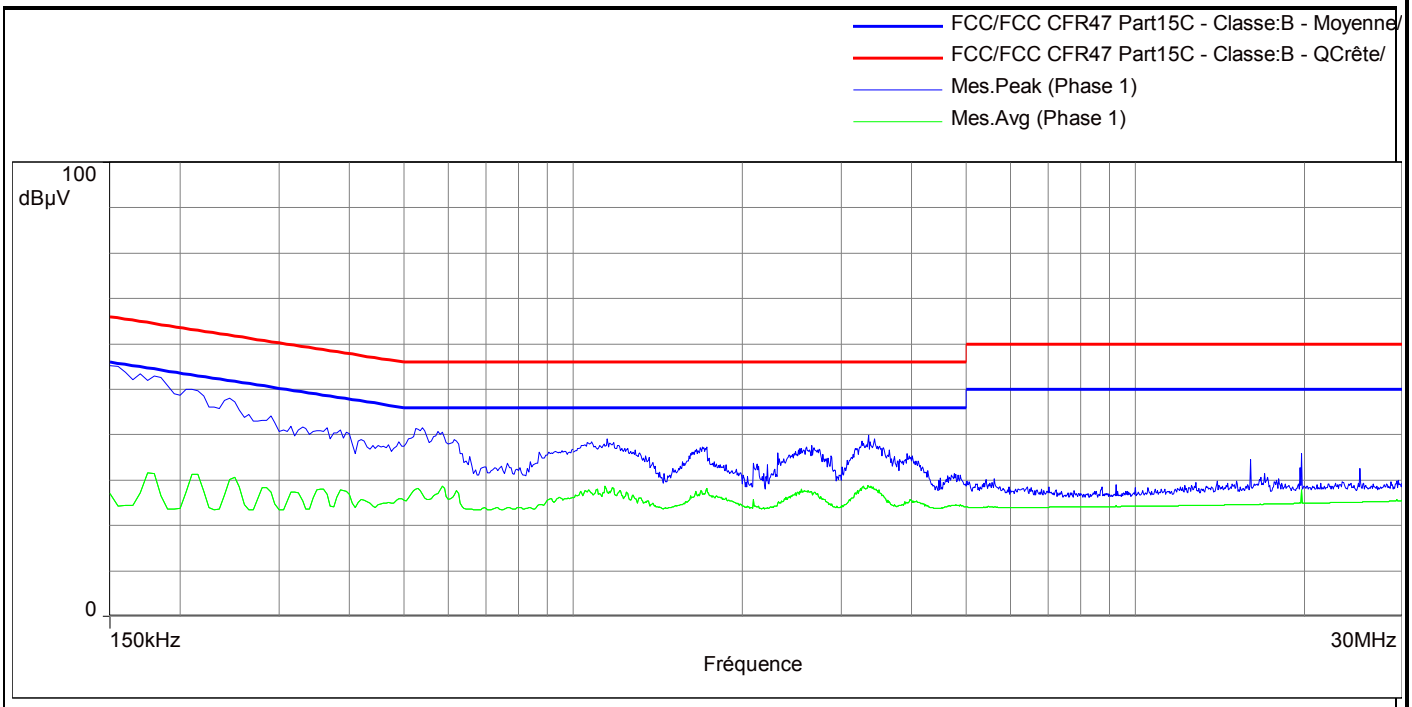
CONDUCTED EMISSIONS			
Graph name:	Emc#2	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Neutral (PN)	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	110VAC / 60Hz	**RBW :**	10kHz
Line:	Neutral	**VBW :**	30kHz



Spurious emissions

Frequency (MHz)	Peak (dBµV)	LimM (dBµV)	Peak-LimM (dB)	Line	Correction (dB)
0.150	55.7	56.0	-0.3	Phase 1	19.4
0.520	44.7	46.0	-1.3	Phase 1	19.5
1.000	35.5	46.0	-10.5	Phase 1	19.5
2.290	36.6	46.0	-9.4	Phase 1	19.6

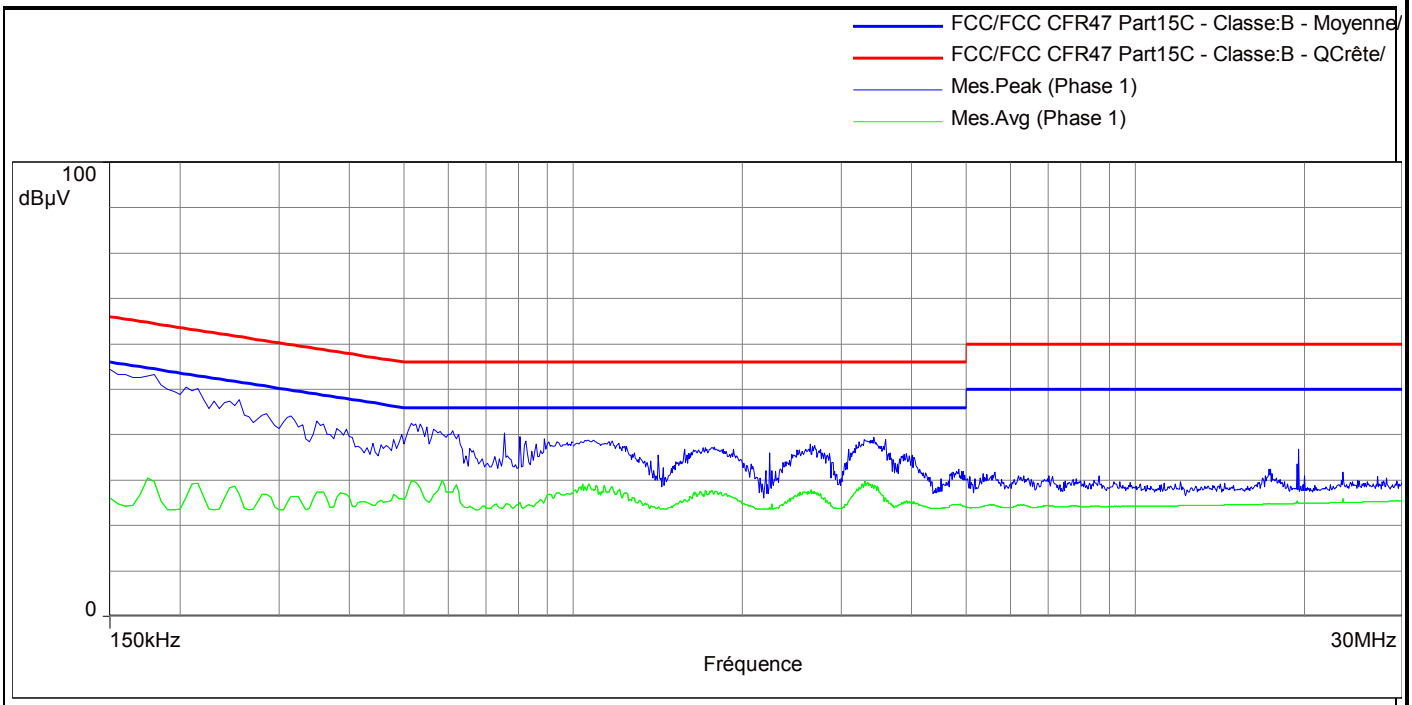
CONDUCTED EMISSIONS			
Graph name:	Emc#3	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Phase (PN)	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	240VAC / 50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



Spurious emissions

Frequency (MHz)	Peak (dBµV)	LimM (dBµV)	Peak-LimM (dB)	Line	Correction (dB)
0.150	55.3	56.0	-0.7	Phase 1	19.4
1.150	39.0	46.0	-7.0	Phase 1	19.5
3.355	40.0	46.0	-6.0	Phase 1	19.7
19.750	35.9	50.0	-14.1	Phase 1	20.9

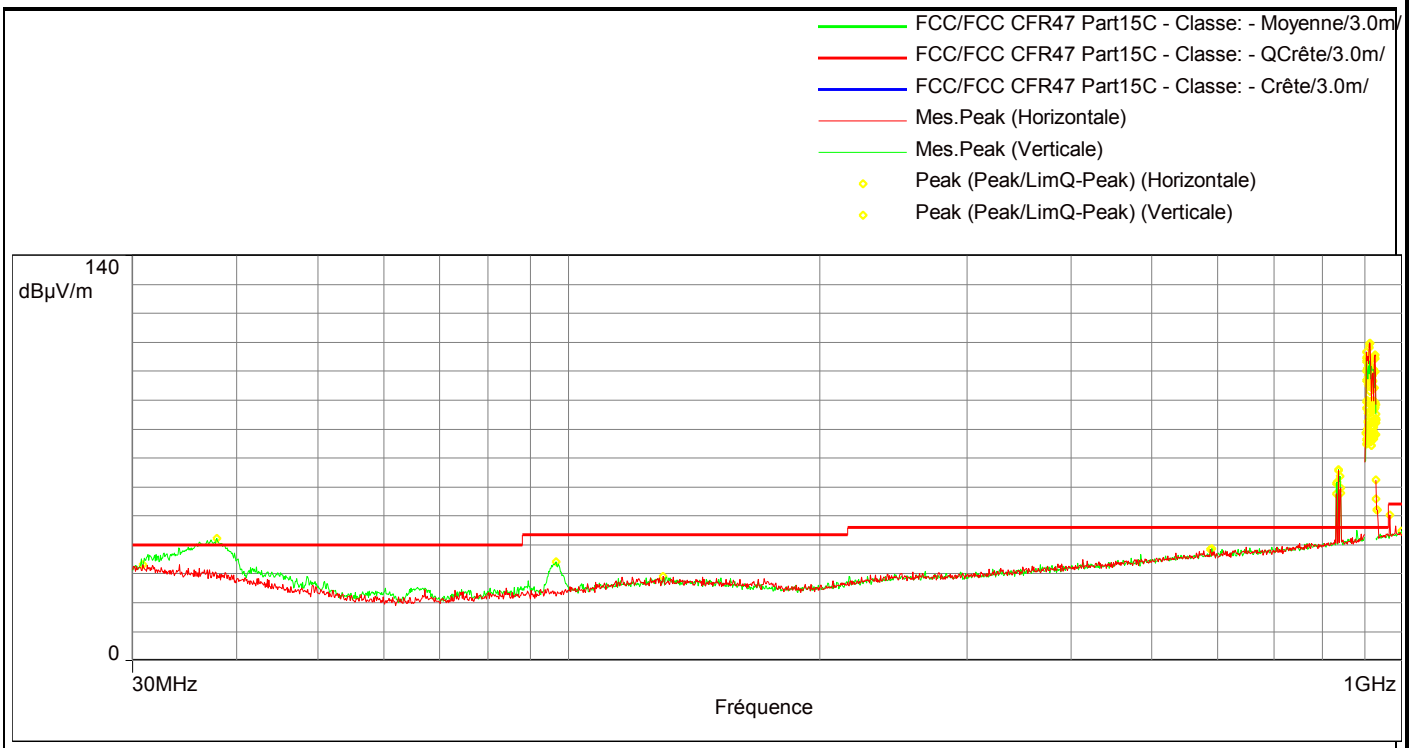
CONDUCTED EMISSIONS			
Graph name:	Emc#4	**Test configuration:**	
Limit:	FCC CFR47 Part15C	Neutral (PN)	
Class:	B		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	240VAC / 50Hz	**RBW :**	10kHz
Line:	Neutral	**VBW :**	30kHz



Spurious emissions

Frequency (MHz)	Peak (dBµV)	LimM (dBµV)	Peak-LimM (dB)	Line	Correction (dB)
0.150	54.4	56.0	-1.6	Phase 1	19.4
1.060	38.8	46.0	-7.2	Phase 1	19.5
2.640	37.9	46.0	-8.1	Phase 1	19.7
3.425	39.4	46.0	-6.6	Phase 1	19.8
19.495	36.8	50.0	-13.2	Phase 1	20.9

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



Spurious emissions

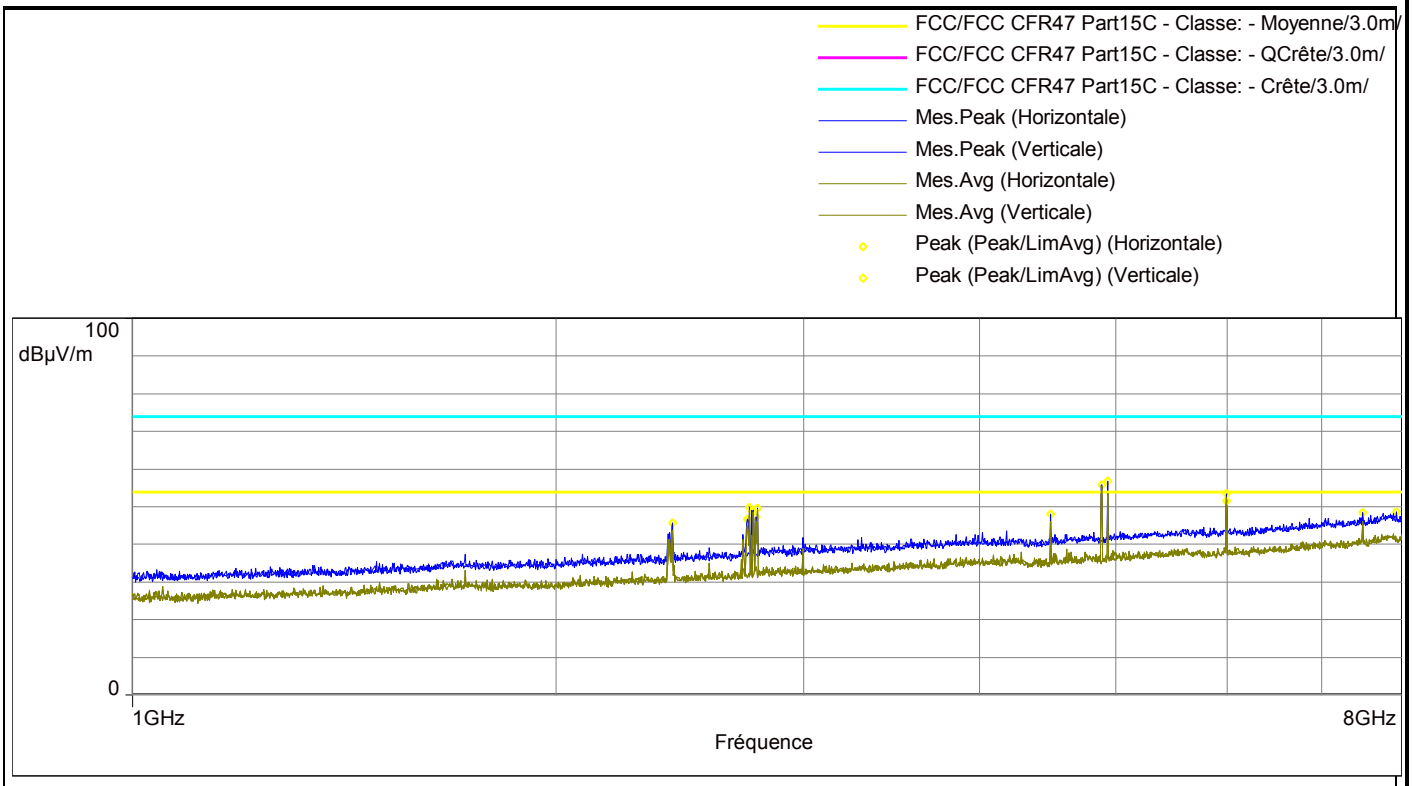
Frequency (MHz)	Peak (dBµV/m)	LimQP (dBµV/m)	Peak-LimQP (dB)	Polarization	Correction (dB)
30.867	33.2	40.0	-6.8	Horizontal	22.0
129.620	29.2	43.5	-14.4	Horizontal	15.6
587.600	38.5	46.0	-7.5	Horizontal	24.5
832.560	57.6	46.0	11.6	Horizontal	27.9
837.420	65.8	46.0	19.8	Horizontal	28.0
841.350	59.7	46.0	13.7	Horizontal	28.0
902.758*	78.5	46.0	32.5	Horizontal	28.8
903.716*	87.3	46.0	41.3	Horizontal	28.8
903.735*	89.4	46.0	43.4	Horizontal	28.8
903.914*	76.4	46.0	30.4	Horizontal	28.8
904.248*	106.6	46.0	60.6	Horizontal	28.8
904.284*	103.4	46.0	57.4	Horizontal	28.8
904.752*	96.9	46.0	50.9	Horizontal	28.8
905.242*	90.0	46.0	44.0	Horizontal	28.8
905.746*	103.7	46.0	57.7	Horizontal	28.8
907.249*	97.9	46.0	51.9	Horizontal	28.8
907.577*	75.6	46.0	29.6	Horizontal	28.8
907.750*	105.2	46.0	59.2	Horizontal	28.8
908.114*	75.9	46.0	29.9	Horizontal	28.8
908.235*	82.4	46.0	36.4	Horizontal	28.9
909.747*	102.6	46.0	56.6	Horizontal	28.9

Frequency (MHz)	Peak (dBµV/m)	LimQP (dBµV/m)	Peak-LimQP (dB)	Polarization	Correction (dB)
910.237*	82.6	46.0	36.6	Horizontal	28.9
910.475*	86.0	46.0	40.0	Horizontal	28.9
910.749*	109.6	46.0	63.6	Horizontal	28.9
911.250*	108.2	46.0	62.2	Horizontal	28.9
912.256*	78.8	46.0	32.8	Horizontal	28.9
912.751*	109.6	46.0	63.6	Horizontal	28.9
913.748*	104.1	46.0	58.1	Horizontal	29.0
914.249*	101.2	46.0	55.2	Horizontal	29.0
914.742*	82.1	46.0	36.1	Horizontal	29.0
915.756*	75.5	46.0	29.5	Horizontal	29.0
916.108*	78.0	46.0	32.0	Horizontal	29.0
916.243*	89.6	46.0	43.6	Horizontal	29.0
916.758*	89.5	46.0	43.5	Horizontal	29.0
917.262*	78.7	46.0	32.7	Horizontal	29.0
917.632*	74.4	46.0	28.4	Horizontal	29.0
918.262*	97.1	46.0	51.1	Horizontal	29.0
918.757*	76.6	46.0	30.6	Horizontal	29.1
919.253*	98.8	46.0	52.8	Horizontal	29.1
920.258*	93.9	46.0	47.9	Horizontal	29.1
920.754*	99.3	46.0	53.3	Horizontal	29.1
921.252*	96.6	46.0	50.6	Horizontal	29.1
922.744*	89.7	46.0	43.7	Horizontal	29.1
923.212*	76.6	46.0	30.6	Horizontal	29.1
923.251*	79.2	46.0	33.2	Horizontal	29.2
924.254*	105.0	46.0	59.0	Horizontal	29.2
924.758*	78.0	46.0	32.0	Horizontal	29.2
925.052*	87.0	46.0	41.0	Horizontal	29.2
925.256*	104.4	46.0	58.4	Horizontal	29.2
925.547*	87.5	46.0	41.5	Horizontal	29.2
925.749*	105.6	46.0	59.6	Horizontal	29.2
926.256*	89.1	46.0	43.1	Horizontal	29.2
926.757*	82.6	46.0	36.6	Horizontal	29.2
927.258*	88.5	46.0	42.5	Horizontal	29.2
927.846*	78.1	46.0	32.1	Horizontal	29.2
927.866*	83.2	46.0	37.2	Horizontal	29.2
927.885*	82.2	46.0	36.2	Horizontal	29.2
927.910*	83.1	46.0	37.1	Horizontal	29.2
927.955*	83.8	46.0	37.8	Horizontal	29.2
928.072	56.0	46.0	10.0	Horizontal	29.2
928.382	62.3	46.0	16.3	Horizontal	29.2
929.865	52.1	46.0	6.1	Horizontal	29.3
931.701	52.1	46.0	6.1	Horizontal	29.3
964.605	50.4	54.0	-3.6	Horizontal	29.9
37.837	42.1	40.0	2.1	Vertical	19.2
96.555	34.1	43.5	-9.4	Vertical	12.8
590.120	38.7	46.0	-7.3	Vertical	24.5
832.560	61.1	46.0	15.1	Vertical	27.9
832.950	61.6	46.0	15.6	Vertical	27.9
837.780	66.1	46.0	20.1	Vertical	28.0
839.760	63.6	46.0	17.6	Vertical	28.0
841.440	57.8	46.0	11.8	Vertical	28.0
903.769*	74.8	46.0	28.8	Vertical	28.8
904.248*	104.6	46.0	58.6	Vertical	28.8
904.749*	100.2	46.0	54.2	Vertical	28.8
905.748*	79.9	46.0	33.9	Vertical	28.8
906.252*	100.9	46.0	54.9	Vertical	28.8
906.754*	96.7	46.0	50.7	Vertical	28.8
907.255*	85.8	46.0	39.8	Vertical	28.8
907.748*	95.8	46.0	49.8	Vertical	28.8
907.988*	76.8	46.0	30.8	Vertical	28.8
908.014*	77.9	46.0	31.9	Vertical	28.8
908.081*	82.7	46.0	36.7	Vertical	28.8

Frequency (MHz)	Peak (dBµV/m)	LimQP (dBµV/m)	Peak-LimQP (dB)	Polarization	Correction (dB)
908.254*	97.3	46.0	51.3	Vertical	28.9
908.582*	81.1	46.0	35.1	Vertical	28.9
908.747*	95.1	46.0	49.1	Vertical	28.9
909.752*	101.9	46.0	55.9	Vertical	28.9
910.242*	96.3	46.0	50.3	Vertical	28.9
910.749*	99.2	46.0	53.2	Vertical	28.9
912.250*	100.8	46.0	54.8	Vertical	28.9
912.751*	103.5	46.0	57.5	Vertical	28.9
913.255*	93.0	46.0	47.0	Vertical	29.0
913.745*	85.4	46.0	39.4	Vertical	29.0
915.246*	88.7	46.0	42.7	Vertical	29.0
915.753*	97.3	46.0	51.3	Vertical	29.0
916.251*	77.6	46.0	31.6	Vertical	29.0
917.254*	101.6	46.0	55.6	Vertical	29.0
917.382*	89.0	46.0	43.0	Vertical	29.0
917.424*	89.1	46.0	43.1	Vertical	29.0
917.755*	100.4	46.0	54.4	Vertical	29.0
918.250*	98.4	46.0	52.4	Vertical	29.0
918.385*	86.4	46.0	40.4	Vertical	29.0
918.469*	80.9	46.0	34.9	Vertical	29.0
918.754*	98.6	46.0	52.6	Vertical	29.1
919.160*	80.9	46.0	34.9	Vertical	29.1
919.247*	86.2	46.0	40.2	Vertical	29.1
919.768*	82.9	46.0	36.9	Vertical	29.1
920.247*	100.3	46.0	54.3	Vertical	29.1
920.745*	89.6	46.0	43.6	Vertical	29.1
921.050*	77.0	46.0	31.0	Vertical	29.1
921.249*	100.4	46.0	54.4	Vertical	29.1
921.398*	80.8	46.0	34.8	Vertical	29.1
921.417*	80.6	46.0	34.6	Vertical	29.1
922.260*	77.0	46.0	31.0	Vertical	29.1
922.758*	86.6	46.0	40.6	Vertical	29.1
923.251*	100.5	46.0	54.5	Vertical	29.2
923.750*	94.2	46.0	48.2	Vertical	29.2
924.766*	82.2	46.0	36.2	Vertical	29.2
925.248*	99.9	46.0	53.9	Vertical	29.2
927.255*	85.2	46.0	39.2	Vertical	29.2
995.421	44.8	54.0	-9.2	Vertical	30.5

*Carrier frequency

RADIATED EMISSIONS			
Graph name:	Emr#2	**Test configuration:**	
Limit:	FCC CFR47 Part15C	PN (H+V) - Configuration 1 [1-8]GHz	
Class:			
Frequency range: [1GHz - 8GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	LimM (dBµV/m)	Peak-LimM (dB)	Polarization	Correction (dB)
2733.900	46.6	54.0	-7.4	Horizontal	-30.1
2737.050	46.5	54.0	-7.5	Horizontal	-30.1
2744.400	49.8	54.0	-4.2	Horizontal	-30.1
2755.250	49.0	54.0	-5.0	Horizontal	-30.0
2760.850	49.0	54.0	-5.0	Horizontal	-30.0
2774.500	47.2	54.0	-6.8	Horizontal	-29.9
2780.450	49.7	54.0	-4.3	Horizontal	-29.8
5991.750	51.6	54.0	-2.4	Horizontal	-23.8
7911.600	48.7	54.0	-5.3	Horizontal	-18.8
2419.250	45.7	54.0	-8.3	Vertical	-31.4
4494.050	48.0	54.0	-6.0	Vertical	-26.6
4884.450	55.9	54.0	1.9	Vertical	-25.5
4935.150	56.9	54.0	2.9	Vertical	-25.4
5991.750	53.6	54.0	-0.4	Vertical	-23.8
7490.000	48.4	54.0	-5.6	Vertical	-20.4

11. 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.*