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TEST REPORT

N°: 159450-732210-A (FILE#1014399) **Version : 02**

Subject	**Electromagnetic compatibility tests according to the standards:** **FCC CFR 47 Part 15, Subpart B.** **ANSI C63.4 (2014)** **ICES-003 (2016)**
Issued to	**STMicroelectronics SAS** 190 Avenue Celestin Coq 13106 – ROUSSET FRANCE
Apparatus under test	
↳ Product	Electronic Evaluation Board
↳ Trade mark	**ST**
↳ Manufacturer	**STMicroelectronics SAS**
↳ Family range	**STM32MP157C-EV1 / STM32MP157A-EV1**
↳ Model under test	**STM32MP157C-EV1**
↳ Serial number	**118**
↳ FCCID	**YCP-MB1263-000**
Conclusion	See Test Program chapter
Test date	December 20, 2018 and February 25, 2019
Test location	MOIRANS
Sample receipt date	October 19, 2018 and February 25, 2019
Composition of document	25 pages
Document issued on	March 6, 2019

Written by :
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Approved by :
Anthony MERLIN
Technical manager

PUBLICATION HISTORY

Version	Date	Author	Modification
01	March 6, 2019	Nathalie BUGANZA	Creation of the document
02	March 11, 2019	Nathalie BUGANZA	Adding of FCCID

Each new edition of this test report replaces and cancels the previous edition. The control of the old editions of report is under responsibility of client.

SUMMARY

1. TEST PROGRAM

1.1. REQUIREMENTS FOR DISTURBANCE EMISSIONS

Standard:

- ✓ **FCC Part 15, Subpart B (Digital Devices)**
- ✓ **ANSI C63.4 (2014)**
- ✓ **ICES-003 (2016)**

EMISSION TEST	LIMITS			RESULTS (Comments)
Limits for conducted disturbance at mains ports 150kHz-30MHz	**Frequency**	**Quasi-peak value**	**Average value**	**PASS**
	0.15-0.5MHz	79 dBµV	66 dBµV	
	0.5-30MHz	73 dBµV	60 dBµV	
Radiated emissions 30MHz-1GHz	**Frequency**	**Quasi-peak value @3m**		**PASS**
	30MHz-88MHz	49.5 dBµV/m		
	88MHz-216MHz	53.9 dBµV/m		
	216MHz-960MHz	56.9 dBµV/m		
	Above 960MHz	60.0 dBµV/m		
Radiated emissions 1GHz-6GHz*	**Frequency**	**Peak value @3m**	**Average value @3m**	**PASS**
	1GHz-6GHz	80.0 dBµV/m	60.0 dBµV/m	

NP: Not Performed / NA: Not Applicable / NR: Not Requested by the customer (It cannot be taken into account for the declaration of conformity)

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

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

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

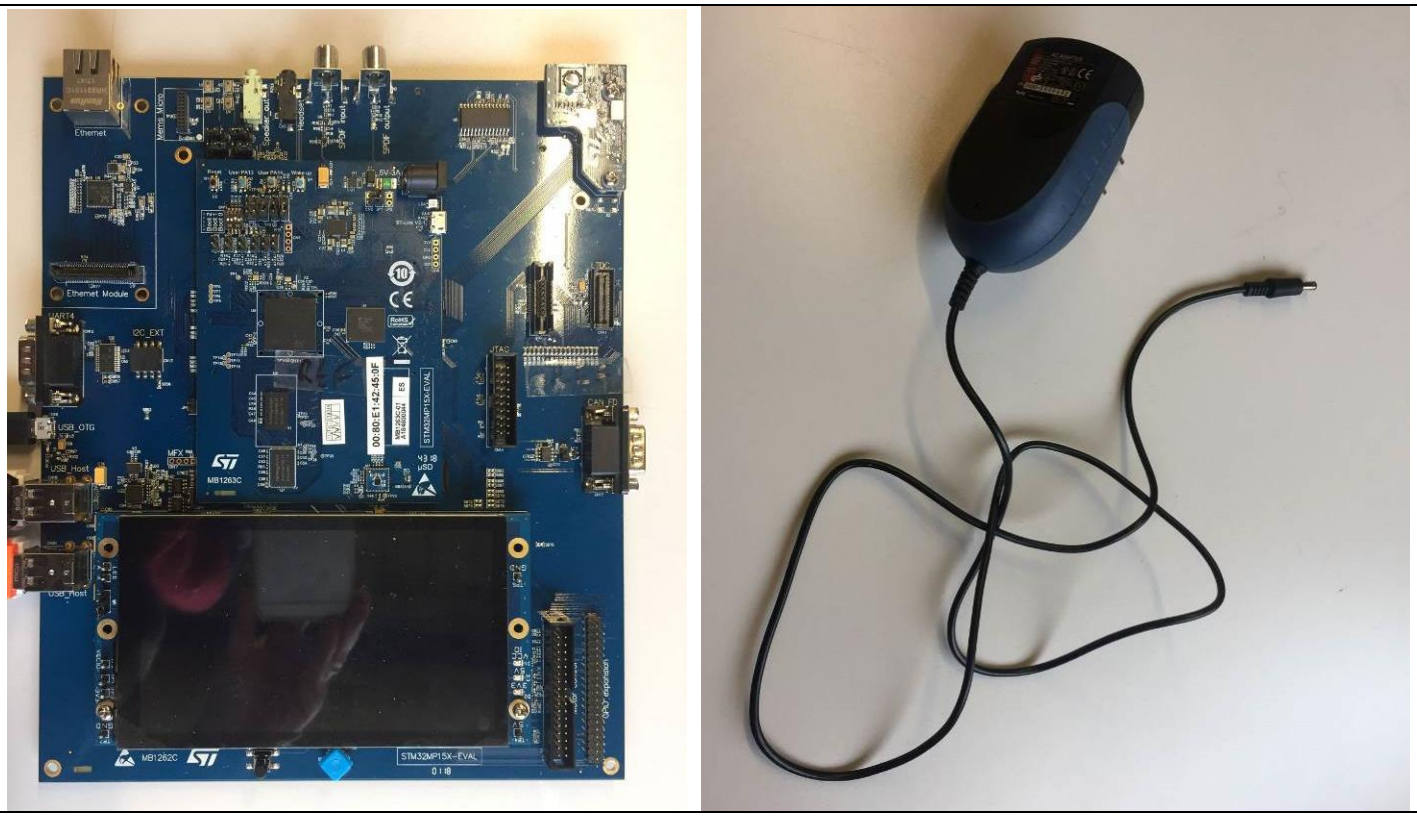
2. EQUIPMENT UNDER TEST: CONFIGURATION (DECLARED BY PROVIDER)

2.1. INFORMATIONS

The STM32MP157C-EV1 and STM32MP157A-EV1 Evaluation boards are high-end development platforms for STM32MP157 microprocessor devices.
Version C supports encryption (Advanced Encryption Standard, Data Encryption Standard and Triple Data Encryption Standard): it is this version, the most constraining, which has been submitted to the EMC tests
All tests describe in this report have been performed on STM32MP157C-EV1

2.2. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):
STM32MP157C-EV1 **Serial Number: 118**



Equipment Under Test

Power supply:
During all the tests, EUT is supplied by V_{nom}: 120 VAC or/and 240 VAC
For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference / Sn	Comments
Supply	☑ AC ☐ DC ☐ Battery	100-240V 50-60Hz	CINCON ELECTRONICS CO. LTD Model: TRG30R050V	-

Voltage table used:

Type	Measurement performed:	
☑ AC	☑ **120VAC/60Hz**	☑ **240VAC/50Hz**
☐ DC	☐ **+….VDC**	☐ **-….VDC**
☐ USB (Laptop auxiliary)	☐ **120VAC/60Hz (Laptop auxiliary)**	☐ **240VAC/50Hz(Laptop auxiliary)**

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Supply	AC Port	/	☐	☐	☑	Wall plug
ETHERNET	Communication Port	10	☐	☑	☑	RJ45
CAN	Communication Port	1	☐	☑	☑	SubD9
Headset	I/O Port	1	☑	☐	☑	Jack
Speaker OUT	I/O Port	1	☑	☐	☑	Jack
USB_OTG	I/O Port	0.2	☑	☐	☑	USB
USB HOST	I/O Port	/	☑	☐	☑	USB
USB HOST	I/O Port	/	☑	☐	☑	USB
USB HOST	I/O Port	1	☑	☑	☑	USB
USB HOST	I/O Port	1	☑	☑	☑	USB
UART	I/O Port	10	☐	☑	☐	Maintenance port
SPDIF Input	I/O Port	1	☐	☐	☑	
SPDIF Output	I/O Port	1	☐	☐	☑	

Auxiliary equipment used during test:

Type	FCC Id	Reference	Sn	Comments
Laptop	ACER	-	-	Laptop
USB Key (x 3)	-	-	-	USB Key (x 3)
Headphone	-	-	-	Headphone

2.3. EUT CONFIGURATION – RUNNING MODE

Hardware information			
Highest internal frequency (PLL, Quartz, Clock, Microprocessor…):	**$F_{Highest}$:**	**650**	**MHz**
Firmware (if applicable):	**V. :**	***/***	
Software (if applicable): For conducted emission test	**V. :**	ST OpenSTLinux - Weston - (A Yocto Project Based Distro) 2.4+openstlinux-4.14-rocko-mp1-18-11-02 stm32mp1 ttyS3	
Software (if applicable): For radiated emission test	**V. :**	ST OpenSTLinux - Weston - (A Yocto Project Based Distro) 2.4+openstlinux-4.19-rocko-mp1-19-02-20 stm32mp1 ttyS3	

Access	Configuration:	
Ethernet	**Process**	Ethernet ping : DUT response to ping is recorded
	Auxiliary for test	Auxiliary PC pings the DUT every ~500ms
	Performance criteria	/
CAN	**Process**	CAN data transmission status shown and recorded
	Auxiliary for test	/
	Performance criteria	/
USB Host	**Process**	USB Host tests : File transfer on two keys, mouse and keyboard -> no error reported at Kernel
	Auxiliary for test	2 USB keys + mouse + keyboard
	Performance criteria	
AUDIO/VIDEO/USB OTG	**Process**	Audio/Video file on a USB key is displayed on DSI display and Headset jack
	Auxiliary for test	/
	Performance criteria	
CAMERA	**Process**	Real time camera capture displayed on DSI
	Auxiliary for test	/
	Performance criteria	

2.4. EQUIPMENT MODIFICATIONS

☑ None ☐ Modification:

2.5. SPECIAL ACCESSORIES

None

2.6. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follow:

FS = RA + AF + CF – AG

Where FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Factor
AG = Amplifier Gain

Assume a receiver reading of 52.5dBµV is obtained. The antenna factor of 7.4 and a cable factor of 1.1 is added. The amplifier gain of 29dB is subtracted, giving 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.

2.7. CALIBRATION DATE

The calibration intervals are extended at 12+/-1 or 24+/-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. MEASUREMENT OF CONDUCTED EMISSION

3.1. ENVIRONMENTAL CONDITIONS

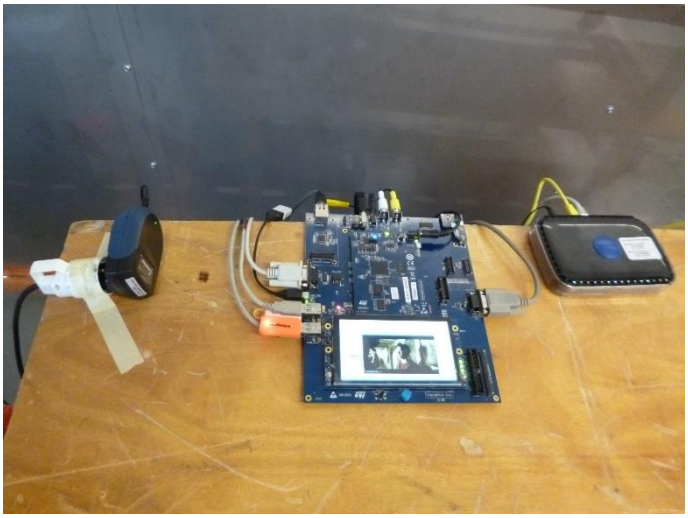
Date of test	:	December 20, 2018
Test performed by	:	Nicolas BILLAUD
Atmospheric pressure (hPa)	:	995
Relative humidity (%)	:	35
Ambient temperature (°C)	:	23

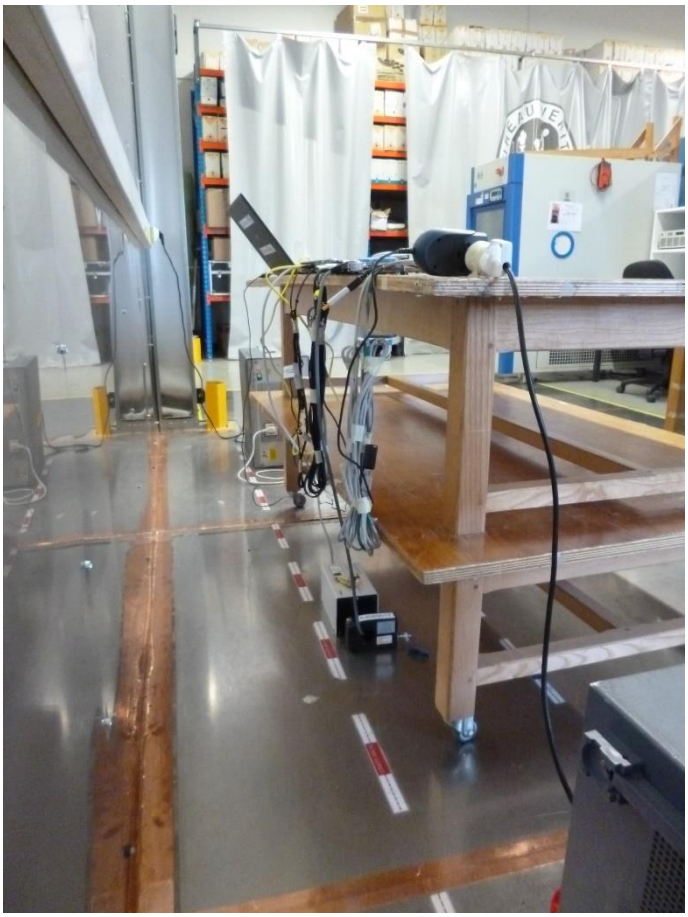
3.2. TEST SETUP

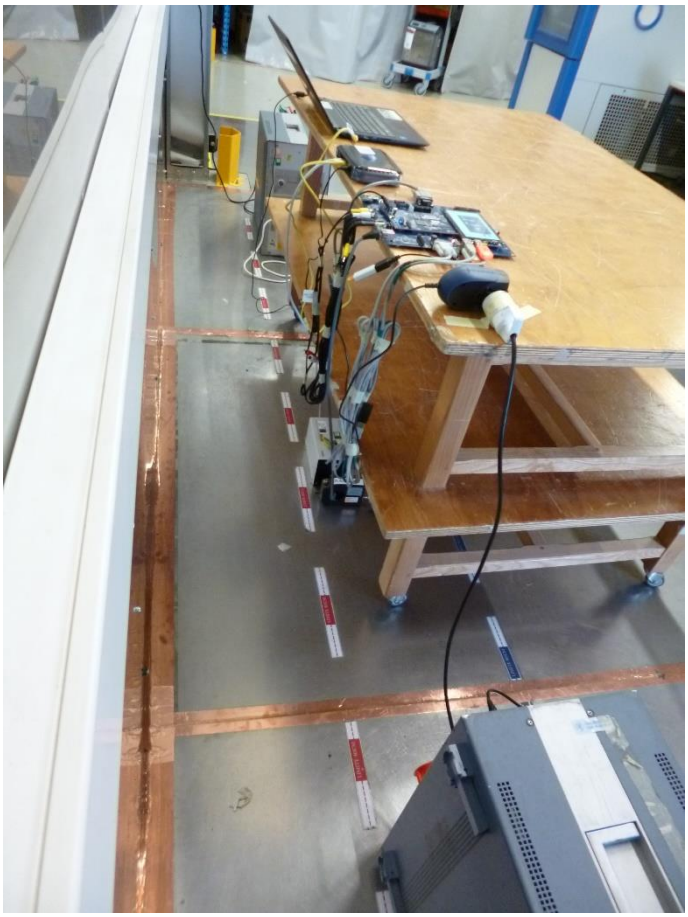
Mains terminals

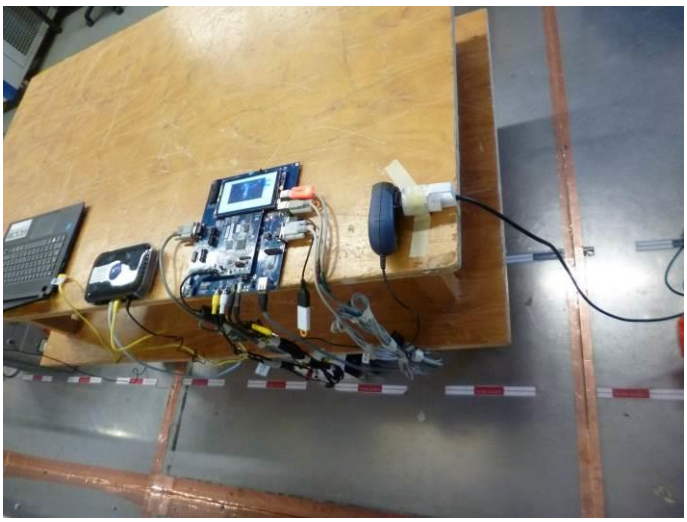
The EUT and auxiliaries are set:
☑ 80cm above the ground on the non-conducting table (Table-top equipment)
☐ 10cm above the ground on isolating support (Floor standing equipment)
The distance between the EUT and the LISN is 80cm. The EUT is 40cm away for the vertical ground plane.

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 C63.4 and FCC Part 15 subpart B. The product has been tested with a voltage sets (see the table voltage in §2.2) and compared to the FCC Part 15 subpart B. 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
EMC comb generator	LCIE SUD EST	-	A3169098	-	-
Coupling Decoupling Network	TESEQ	CDN T8	C2320140	03/18	03/20
LISN tri-phase ESH2-Z5	RHODE & SCHWARZ	33852.19.53	C2320063	09/18	09/19
LISN tri-phase ESH2-Z5	RHODE & SCHWARZ	33852.19.53	C2320062	11/18	11/19
Load 50Ω	-	-	A7152052	02/18	02/19
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	12/17	12/19
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

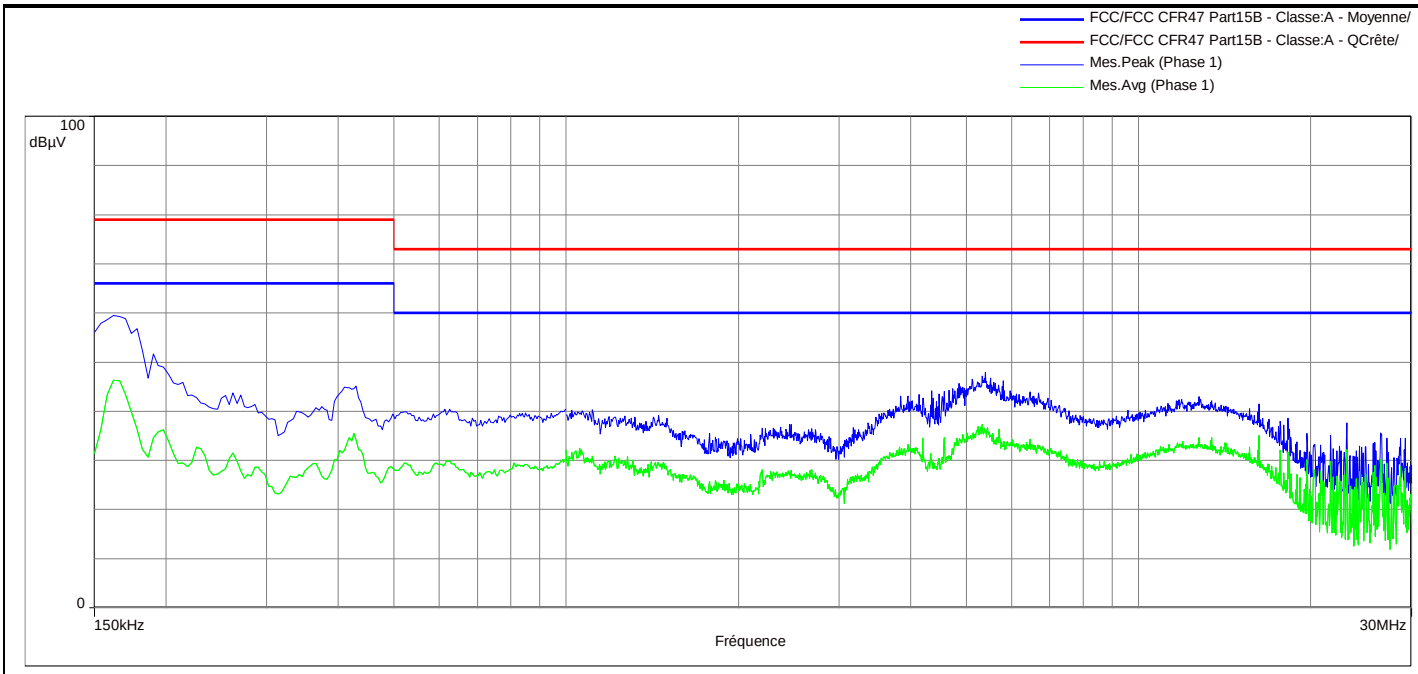
AC tests Results:

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

Results: (PEAK detection)

Graph identifier	Line	Comments	
Emc# 1	Phase	120VAC/60Hz	See below
Emc# 2	Neutral	120VAC/60Hz	See below
Emc# 3	Phase	240VAC/50Hz	See below
Emc# 4	Neutral	240VAC/50Hz	See below

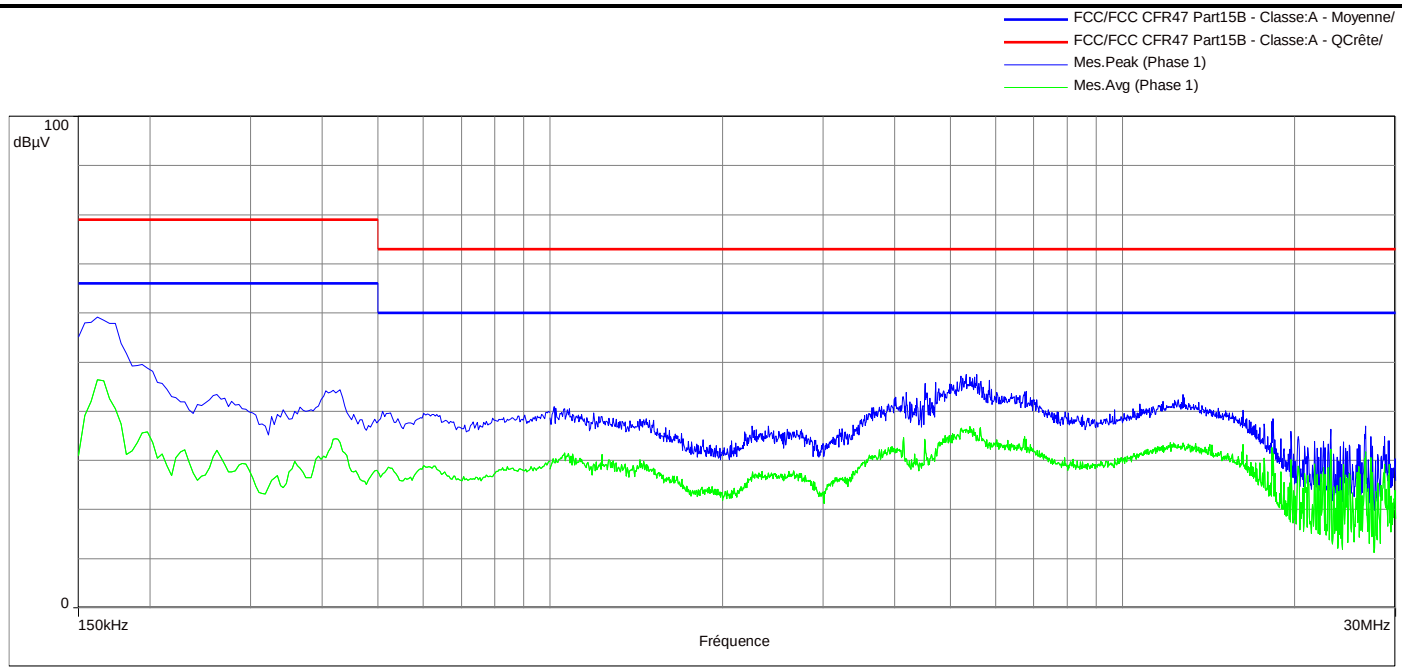
CONDUCTED EMISSIONS			
Graph name:	Emc#1	**Test configuration:**	
Limit:	FCC CFR47 Part15B	120V60Hz L ESU8	
Class:	A		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	120VAC / 60Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



Spurious emissions

Frequency (MHz)	Mes.Peak (dBµV)	Mes.QPeak (dBµV)	LimQP (dBµV)	Mes.QPeak-LimQP (dB)	Mes.Avg (dBµV)	LimAvg (dBµV)	Mes.Avg-LimAvg (dB)	Line	Correction (dB)
0.162	59.8	55.4	79.0	-23.6	46.1	66.0	-19.9	Phase 1	10.0
0.430	45.2	41.1	79.0	-37.9	33.8	66.0	-32.2	Phase 1	10.1
1.112	40.4	36.3	73.0	-36.7	29.6	60.0	-30.4	Phase 1	10.2
5.400	47.8	42.0	73.0	-31.0	35.5	60.0	-24.5	Phase 1	10.6
19.708	36.5	33.7	73.0	-39.3	29.3	60.0	-30.7	Phase 1	12.3
21.664	36.4	34.0	73.0	-39.0	29.7	60.0	-30.3	Phase 1	12.5
23.128	38.6	36.2	73.0	-36.8	32.1	60.0	-27.9	Phase 1	12.7
26.488	36.6	34.8	73.0	-38.2	30.6	60.0	-29.4	Phase 1	13.1
26.548	36.3	34.2	73.0	-38.8	29.9	60.0	-30.1	Phase 1	13.1
26.608	37.2	35.1	73.0	-37.9	30.9	60.0	-29.1	Phase 1	13.1

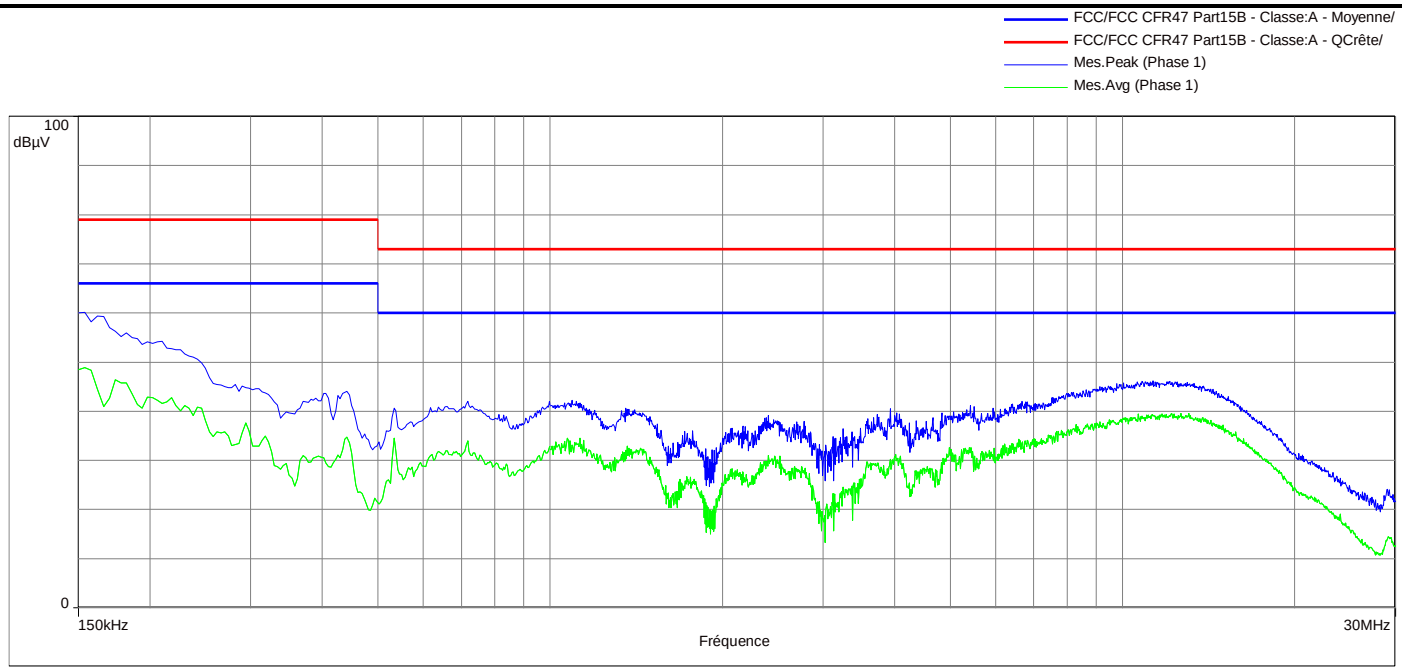
CONDUCTED EMISSIONS			
Graph name:	Emc#2	**Test configuration:**	
Limit:	FCC CFR47 Part15B	120V60Hz N ESU8	
Class:	A		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	120VAC / 60Hz	**RBW :**	10kHz
Line:	Neutral	**VBW :**	30kHz



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)
0.162	59.8	55.4	79.0	-23.6	45.9	66.0	-20.1	Neutral	10.0
1.016	40.5	37.0	73.0	-36.0	30.0	60.0	-30.0	Neutral	10.2
5.336	47.7	42.1	73.0	-30.9	35.6	60.0	-24.4	Neutral	10.6
19.708	37.2	34.3	73.0	-38.7	29.6	60.0	-30.4	Neutral	12.3
23.128	38.7	36.7	73.0	-36.3	32.4	60.0	-27.6	Neutral	12.7
26.488	36.9	35.1	73.0	-37.9	30.9	60.0	-29.1	Neutral	13.1
26.608	37.4	35.5	73.0	-37.5	31.0	60.0	-29.0	Neutral	13.1

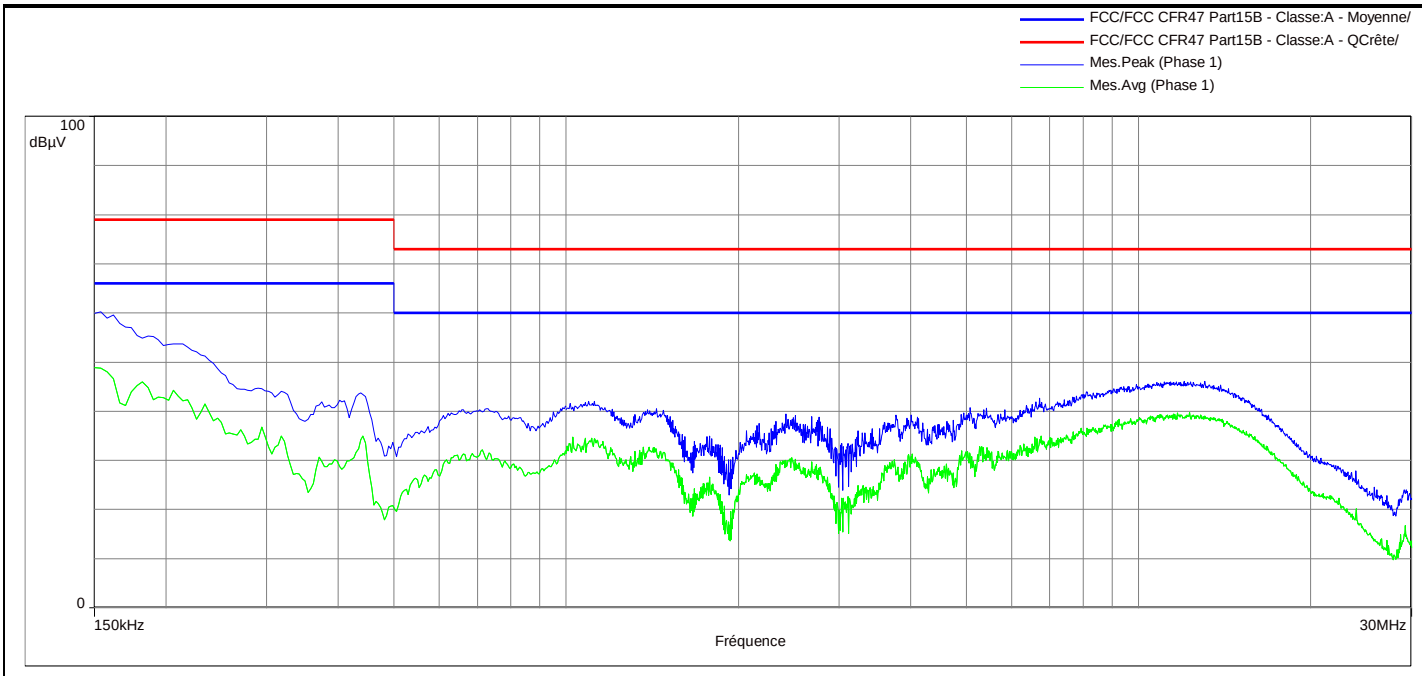
CONDUCTED EMISSIONS			
Graph name:	Emc#3	**Test configuration:**	
Limit:	FCC CFR47 Part15B	240V50Hz L ESU8	
Class:	A		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	240VAC / 50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



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	60.4	58.7	79.0	-20.3	48.4	66.0	-17.6	Phase 1	10.0
0.534	36.9	33.6	73.0	-39.4	25.5	60.0	-34.5	Phase 1	10.1
0.718	40.8	38.7	73.0	-34.3	31.2	60.0	-28.8	Phase 1	10.1
1.072	42.6	40.4	73.0	-32.6	33.2	60.0	-26.8	Phase 1	10.2
1.364	41.2	38.4	73.0	-34.6	31.5	60.0	-28.5	Phase 1	10.2
2.404	40.4	35.8	73.0	-37.2	29.9	60.0	-30.1	Phase 1	10.3
12.168	46.6	43.4	73.0	-29.6	38.6	60.0	-21.4	Phase 1	11.3

CONDUCTED EMISSIONS			
Graph name:	Emc#4	**Test configuration:**	
Limit:	FCC CFR47 Part15B	240V50Hz N ESU8	
Class:	A		
Frequency range: [150kHz - 30MHz]			
Voltage / Frequency:	240VAC / 50Hz	**RBW :**	10kHz
Line:	Neutral	**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	60.4	58.5	79.0	-20.5	48.7	66.0	-17.3	Neutral	10.0
0.998	41.3	38.9	73.0	-34.1	31.4	60.0	-28.6	Neutral	10.2
1.120	42.8	40.4	73.0	-32.6	33.2	60.0	-26.8	Neutral	10.2
2.424	39.9	35.5	73.0	-37.5	29.7	60.0	-30.3	Neutral	10.3
3.424	36.4	30.9	73.0	-42.1	22.2	60.0	-37.8	Neutral	10.4
5.076	40.7	36.3	73.0	-36.7	28.6	60.0	-31.4	Neutral	10.6
12.020	46.2	43.0	73.0	-30.0	38.3	60.0	-21.7	Neutral	11.3

3.7. CONCLUSION

The sample of the equipment **STM32MP157C-EV1**, Sn: **118**, tested in the configuration presented in this test report **satisfies** to requirements of class A limits of the standard FCC Part15B and ICES-003, for conducted emissions.

4. MEASUREMENT OF RADIATED EMISSION (30MHZ-6GHZ)

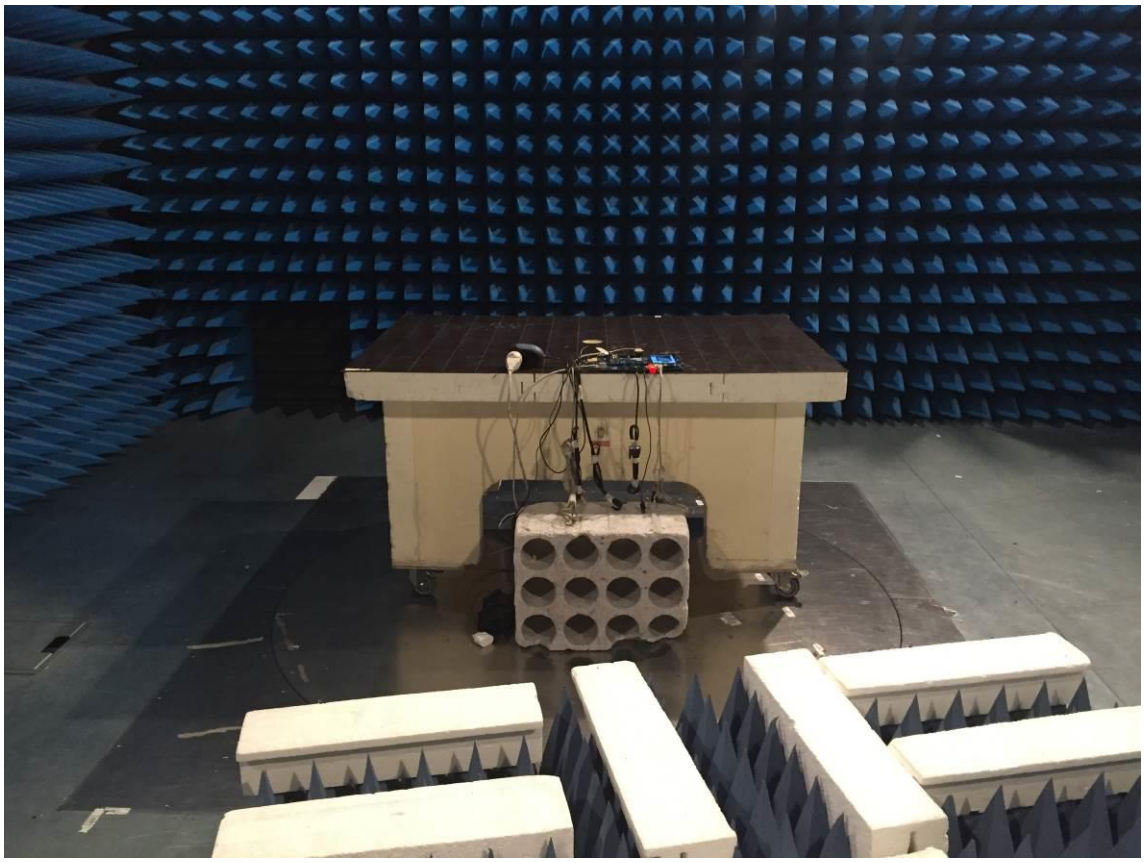
4.1. ENVIRONMENTAL CONDITIONS

Date of test	:	February 25, 2019
Test performed by	:	Majid MOURZAGH
Atmospheric pressure (hPa)	:	1010
Relative humidity (%)	:	32
Ambient temperature (°C)	:	23

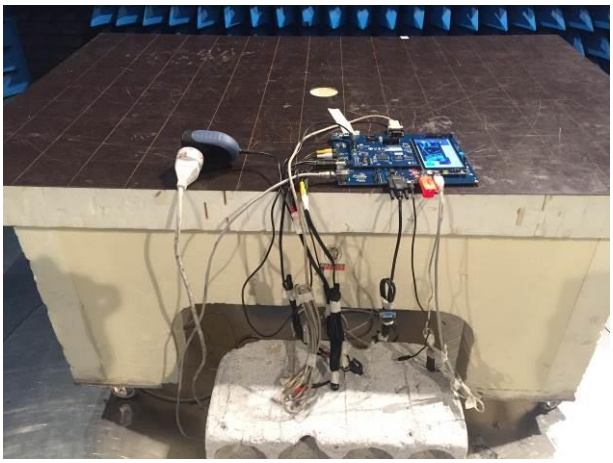
4.2. TEST SETUP

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)
☐ 10cm above the ground on isolating support (Floor standing equipment)
The EUT is powered by V_{nom}.

Test setup on OATS



Test setup in anechoic chamber



4.3. TEST METHOD

The product has been tested according to ANSI C63.4, FCC part 15 subpart B.

Pre-characterisation measurement: (30MHz –6GHz)
A pre-scan of all the setup has been performed in a 3 meters semi-anechoic chamber for frequency from 30MHz to 6GHz. Test is performed in horizontal (H) and vertical (V) polarization during the test for maximized the emission measurement. Continuous linear turntable azimuth search was performed with 360 degrees range. Measurement performed on all axis of EUT used in normal configuration.
The pre-characterization graphs are obtained in PEAK detection and PEAK/AVERAGE from 1GHz to 6GHz.

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

Characterization on 3 meters full anechoic chamber from 1GHz to 6GHz:
The product has been tested at a distance of **3 meters** from the antenna and compared to the FCC part 15 subpart B limits. Measurement bandwidth was 1MHz from 1GHz to 6GHz.
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)
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 20MHz – 6 GHz	LCIE	-	A7085025	11/18	11/19
Cable	-	6GHz	A5329191	06/18	06/19
Emission Cable	MICRO-COAX	18GHz	A5329657	06/18	06/19
Emission Cable	MICRO-COAX	18GHz	A5329658	03/18	03/19
Semi-Anechoic chamber #1	SIEPEL	-	D3044016	09/18	09/19
Radiated emission comb generator	BARDET	-	A3169050	-	-
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	12/17	12/19
Spectrum analyzer	ROHDE & SCHWARZ	FSV 30	A4060051	03/18	03/19
BAT EMC	NEXIO	v3.17.0.10	L1000115	-	-
Thermo-hygrometer (C1)	OREGON	WMR 80	B4206013	06/18	06/20
Turntable chamber (Cage#1)	MATURO Gmbh	TT 2.0 SI	F2000406	-	-
Antenna mast (Cage#1)	MATURO Gmbh	AM 4.0	F2000407	-	-
Turntable controller (Cage#1)	MATURO Gmbh	Control Unit	F2000408	-	-
Table C1/OATS	MATURO Gmbh	-	F2000437	-	-

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Antenna Bi-log	CHASE	CBL6111A	C2040051	01/18	02/19
Emission Cable	SUCOFLEX	6GHz	A5329061	03/18	03/19
Cable (OATS)	-	1GHz	A5329623	03/18	03/19
OATS	-	-	F2000409	02/19	02/20
Facteur OATS 30M-1GHz	LCIE	V3	L2000035	-	-
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	08/18	08/20
Turntable / Mast controller (OATS)	ETS Lindgren	Model 2066	F2000372	-	-
Antenna mast (OATS)	ETS Lindgren	2071-2	F2000392	-	-
Turntable (OATS)	ETS Lindgren	Model 2187	F2000403	-	-

4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

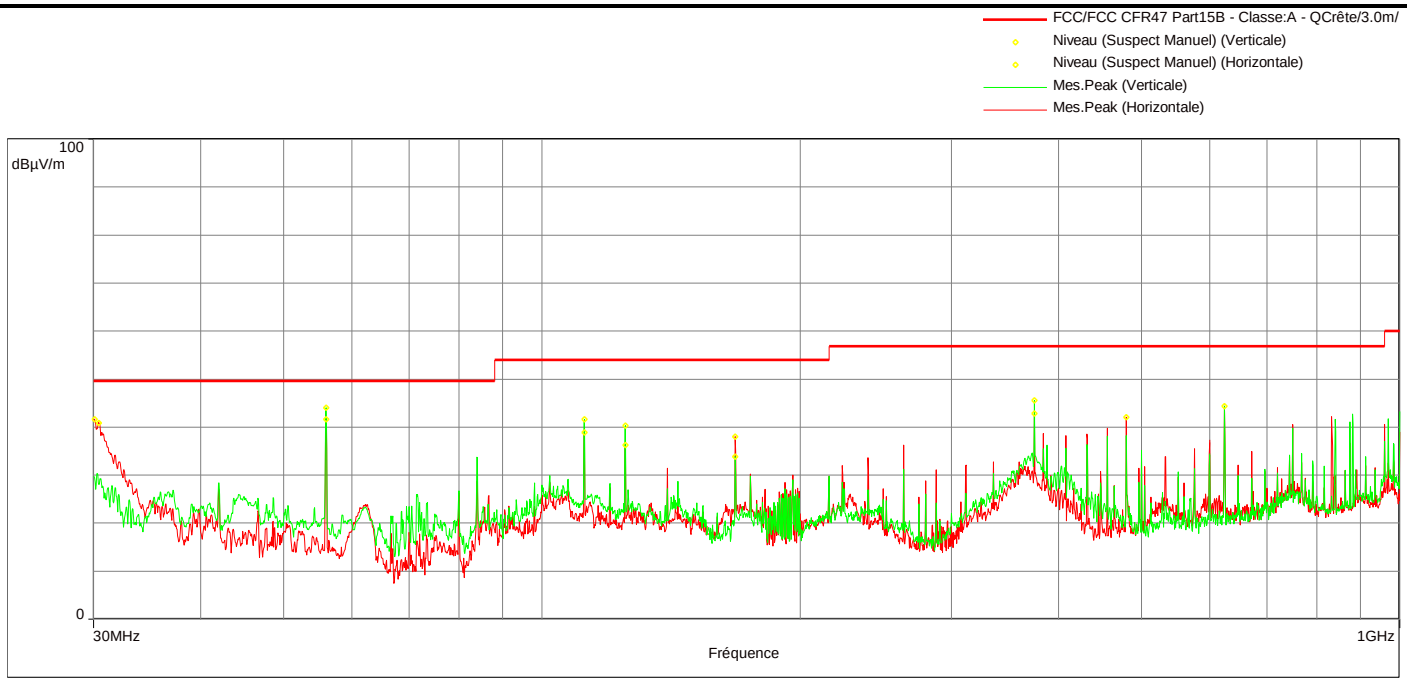
4.6. TEST RESULTS

Pre-characterisation measurement (30MHz-1GHz): pre-scan measurement at 3m (PEAK detection)

See graphs:

Graph identifier		Polarization	EUT position	Comments	
Emr#	1	Vertical/ Horizontal	Axis XY	240VAC/50Hz	See below

RADIATED EMISSIONS			
Graph name:	Emr#1	**Test configuration:**	
Limit:	FCC CFR47 Part15B	(H+V) -Configuration n°1 FCC <1GHz	
Class:	A		
Frequency range: [30MHz - 1GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



Spurious emissions

Frequency (MHz)	Peak Level (dBµV/m)	Hauteur (m)	Polarization
55.993	44.1	1.6	Vertical
111.991	41.7	1.6	Vertical
124.996	40.3	1.6	Vertical
168.006	33.8	1.6	Vertical
375.000	45.6	1.6	Vertical
30.068	41.6	1.6	Horizontal
30.425	40.9	1.6	Horizontal
55.993	41.7	1.6	Horizontal

Frequency (MHz)	Peak Level (dBµV/m)	Hauteur (m)	Polarization
111.991	38.9	1.6	Horizontal
124.996	36.2	1.6	Horizontal
168.006	38.0	1.6	Horizontal
375.000	42.9	1.6	Horizontal
480.000	42.0	1.6	Horizontal
624.960	44.4	1.6	Horizontal

QUALIFICATION (30MHz-1GHz): 10 meters measurement on the Open Area Test Site.
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)
30.100	24.0	QP	V	0	100	-	23.0	47.0	49.6	**-2.6**
30.400	23.5	QP	V	90	100	-	22.7	46.2	49.6	**-3.4**
56.000	36.5	QP	V	60	130	-	8.4	44.9	49.6	**-4.7**
112.000	28.5	QP	H	0	235	-	13.7	42.2	54.0	**-11.8**
125.000	28.0	QP	V	0	130	-	14.5	42.5	54.0	**-11.5**
168.000	30.6	QP	V	0	100	-	12.5	43.1	54.0	**-10.9**
375.000	31.5	QP	V	180	110	-	19.1	50.6	56.9	**-6.3**
480.000	26.5	QP	V	0	100	-	22.0	48.5	56.9	**-8.4**
625.000	28.9	QP	H	125	240	-	25.0	53.9	56.9	**-3.0**

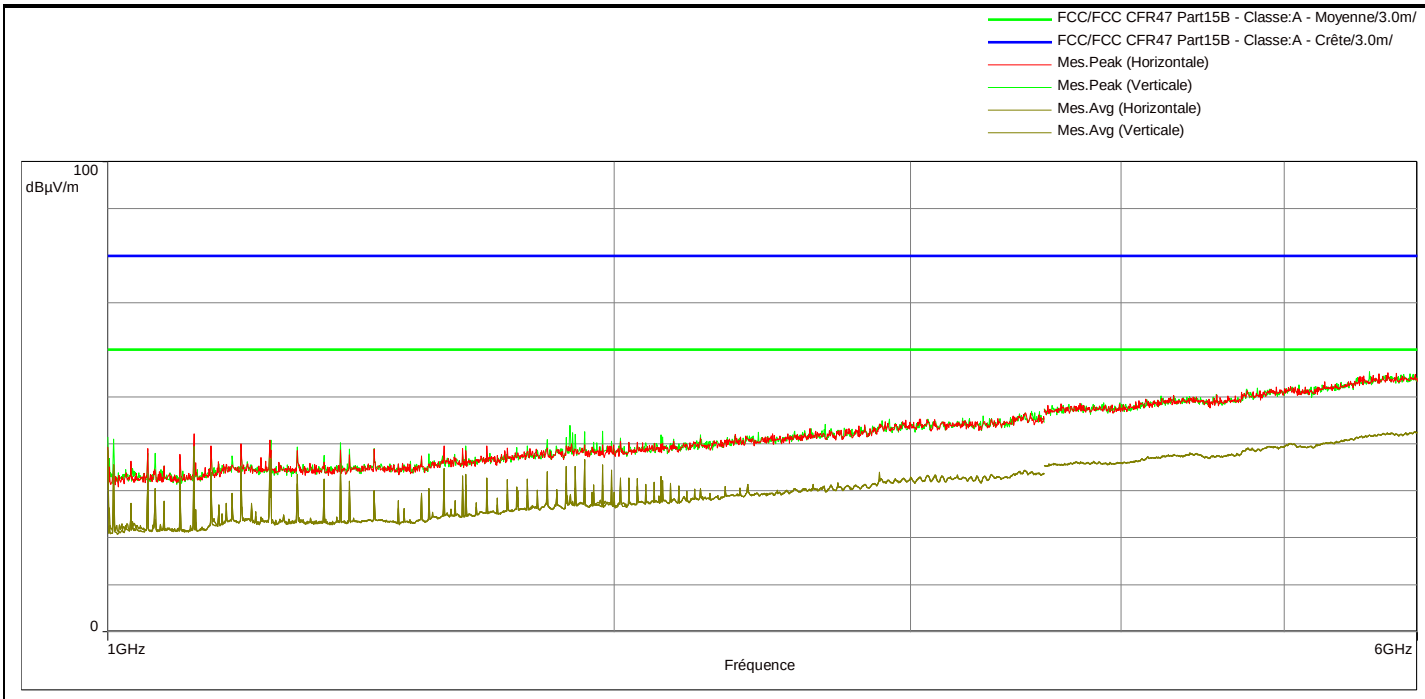
Note: Measure have been done at 10m distance and corrected according to requirements of 15.209.e) (M@3m = M@10m+10.5dB)

Pre-characterisation measurement (1GHz-6GHz): pre-scan measurement at 3m (PEAK and AVERAGE detection, graph examples)

See graphs:

Graph identifier	Polarization	EUT position	Comments	
Emr# 2	Vertical/ Horizontal	Axis XY	240VAC/50Hz	See below

RADIATED EMISSIONS			
Graph name:	Emr#2	**Test configuration:**	
Limit:	FCC CFR47 Part15B	(H+V) - Configuration 1 [1-6]GHz -FCC	
Class:	A		
Frequency range: [1GHz - 6GHz]			
Antenna polarization:	Horizontal & Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Frequency (MHz)	Peak (dBµV/m)	LimM (dBµV/m)	Peak-LimM (dB)	Hauteur (m)	Polarization	Correction (dB)
1125.000	42.1	60.0	-17.9	1.3	Horizontal	1.6
3509.500	46.6	60.0	-13.4	1.3	Horizontal	14.1
5764.000	55.1	60.0	-4.9	1.3	Horizontal	20.6
3539.000	47.0	60.0	-13.0	1.3	Vertical	13.9
5618.500	55.3	60.0	-4.7	1.3	Vertical	20.0

QUALIFICATION (1GHz-6GHz): 3 meters measurement in full anechoic chamber. 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)
Not performed : Margin > -15dB										

4.7. CONCLUSION

The sample of the equipment **STM32MP157C-EV1**, Sn: **118**, tested in the configuration presented in this test report **satisfies** to requirements of class A limits of the standard FCC Part15B and ICES-003, for radiated emissions.

5. 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 (monophasé /triphasé) 10kHz-150kHz *Measurement of conducted disturbances in voltage on the power port (single & three phases)10kHz-150kHz*	3.27dB	3.8dB
Mesure des perturbations conduites en tension sur le réseau d'énergie (monophasé /triphasé) 150kHz-30MHz *Measurement of conducted disturbances in voltage on the power port (single & three phases)150kHz-30MHz*	3.29dB	3.4dB
Mesure des perturbations conduites en tension sur le réseau de télécommunication *Measurement of conducted disturbances in voltage on the telecommunication port.*	3.26dB	5dB
Mesure des perturbations discontinues conduites en tension *Measurement of discontinuous conducted disturbances in voltage*	3.33dB	3.4dB
Mesure des perturbations conduites en courant *Measurement of conducted disturbances in current*	2.67dB	2.9dB
Mesure du champ électrique rayonné en cage de Faraday semi-anéchoïque de 30MHz à 1GHz *Measurement of radiated electric field in half-anechoic Faraday room From 30MHz to 1GHz*	5.06dB	5.3dB
Mesure du champ électrique rayonné en cage de Faraday semi-anéchoïque de 1GHz à 6GHz *Measurement of radiated electric field in half-anechoic Faraday room From 1GHz à 6GHz*	5.18dB	5.2dB
Mesure du champ électrique rayonné en cage de Faraday semi-anéchoïque de 6GHz à 18GHz *Measurement of radiated electric field in half-anechoic Faraday room From 6GHz to 18GHz*	5.21dB	5.5dB
Mesure du champ électrique rayonné sur le site en espace libre de Moirans 30MHz – 1GHz. *Measurement of radiated electric field on the Moirans open area test site 30MHz – 1GHz.*	5.2dB	6.3dB
Mesure du champ électrique rayonné IN SITU de 30 à 1000 MHz *IN SITU measurement of radiated electric field from 30 to 1000MHz*	A l'étude / Under consideration	5.2dB
Mesure de la puissance perturbatrice *Measurement of disturbance power*	3.32dB	4.5dB
Mesure des harmoniques de courant *Measurement of current harmonics*	11.11%	/
Mesure du flicker *Flicker measurement*	9.26%	/

Les valeurs d'incertitudes calculées du laboratoire étant inférieures aux valeurs d'incertitudes limites établies par le CISPR, la conformité de l'échantillon est établie directement par les niveaux limites applicables. Ce tableau regroupe l'ensemble des incertitudes maximales pour les essais réalisables dans le laboratoire, qu'ils aient été ou non réalisés dans le cadre du présent rapport / *The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the CISPR. The conformity of the sample is directly established by the applicable limits values. This table includes all uncertainties maximum feasible for testing in the laboratory, whether or not made in this report*

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