



LCIE



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Template : May 28<sup>th</sup>, 2024

# TEST REPORT

N°: 24329407-806666-B(FILE# 9310523-SRA)

Version: 01

**Subject** Electromagnetic compatibility tests according to the standards:  
FCC CFR 47 Part 15, Subpart B  
ANSI C63.4 / ANSI C63.4a  
ICES-003

**Issued to** STMICROELECTRONICS (ROUSSET) SAS  
190 Avenue Celestin Coq  
13106 – ROUSSET  
FRANCE

## Apparatus under test

Product Bluetooth® LE and IEEE 802.15.4 radio module  
Trade mark STMICROELECTRONICS  
Manufacturer STMICROELECTRONICS  
Model under test STM32WBA5MMG  
Serial number None  
FCCID YCP-32WBA5MMG01  
IC 8976A-32WBA5MMG01

**Conclusion** See Test Program chapter

Test date December 02, 2024 to December 03, 2024  
Test location LCIE Grenoble  
FCC Test site FR0008 - 918017 (MOI)  
ISED Test site 6500A (MOI)  
Sample receipt date November 20, 2024  
Composition of document 27 pages  
Document issued on February 26, 2025

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## PUBLICATION HISTORY

Version	Date	Author	Modification
01	February 26, 2025	Akram HAKKARI	Creation of the document

*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 .....	4
2.	EQUIPMENT UNDER TEST: CONFIGURATION (DECLARED BY PROVIDER) .....	5
3.	MEASUREMENT OF CONDUCTED EMISSION .....	9
4.	MEASUREMENT OF RADIATED EMISSION .....	20
5.	UNCERTAINTIES CHART .....	27

## 1. TEST PROGRAM

EMISSION TEST	LIMITS			RESULTS (Comments)
Limits for conducted disturbance 150kHz-30MHz <b>FCC §15.107 / ICES-003</b>	Access: AC power			<b>PASS</b>
	Frequency	Quasi-peak	Average	
	150-500kHz	66 to 56 dBµV	56 to 46 dBµV	
	0.5-5MHz	56 dBµV	46 dBµV	
	5-30MHz	60 dBµV	50 dBµV	
Radiated emissions 30MHz-1GHz <b>FCC §15.109</b>	Access: Enclosure port of ancillary equipment			<b>PASS</b>
	Frequency	Quasi-peak @3m		
	30MHz-88MHz	40.0 dBµV/m		
	88MHz-216MHz	43.5 dBµV/m		
	216MHz-960MHz	46.0 dBµV/m		
Radiated emissions 30MHz-1GHz <b>ICES-003</b>	Access: Enclosure port of ancillary equipment			<b>PASS</b>
	Frequency	Quasi-peak @3m		
	30MHz-88MHz	40.0 dBµV/m		
	88MHz-216MHz	43.5 dBµV/m		
	216MHz-230MHz	46.0 dBµV/m		
	230MHz-960MHz	47.0 dBµV/m		
Radiated emissions 1GHz-14GHz* <b>FCC §15.109 / ICES-003</b>	Access: Enclosure port of ancillary equipment			<b>PASS</b>
	Frequency	Peak @3m	Average @3m	
	1- 14GHz	74.0 dBµV/m	54.0 dBµV/m	

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

Ⓐ: Divergence, the last version is used to make it possible to test the product with the standard which describes the current state of the art and thus to answer as well as possible his environment of final use. If this test is covered by the COFRAC accreditation, the declaration of conformity for product standard only are carried out outside the framework of accreditation.

**\*§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.

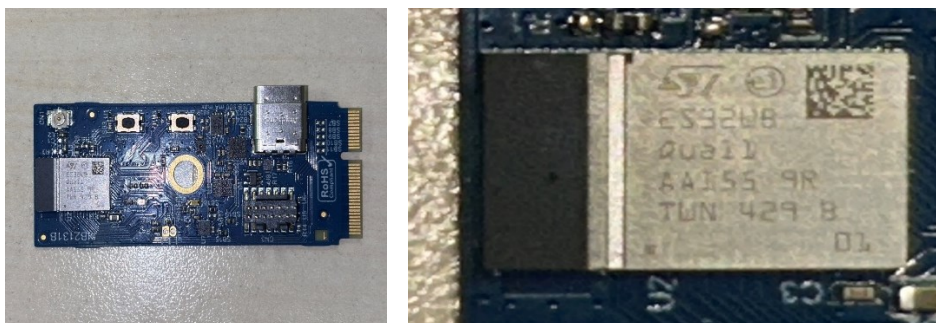
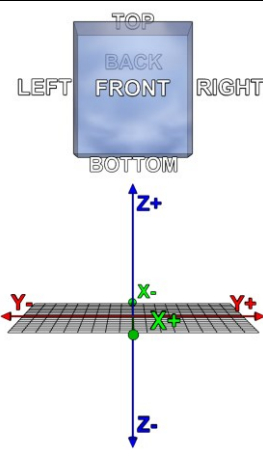
Special condition for intentional radiator:

- For a composite system comprised of a digital device using a clock frequency of 1 GHz as the highest frequency for the digital logic and an intentional radiator operating at 2.4 GHz, the composite is required to be investigated to the upper frequency of 24 GHz (in this case, 10 times the intentional radiator frequency is the higher frequency).
- For a composite system comprised of a digital device using a clock frequency of 2 GHz as the highest frequency for the digital logic and an intentional radiator operating at 913 MHz, the composite is required to be investigated to the upper frequency of 10 GHz (in this case, 5 times the unintentional radiator clock frequency is the higher frequency).

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

### 2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES)

#### Equipment under test (EUT):

Model under test :	STM32WBA5MMG		
Serial Number:	None		
<div></div>		<div></div>	
Dimensions:	8mm x 12mm x 1.372mm (Length x Width x Height)		
Type :	Table-Top		

#### Power supply:

Name	Type	Rating	Reference / Sn	Comments
Supply1	DC	1.71 to 3.6 V	/	Module power supply
Supply2	DC	USB power supply (4 – 5.75V)	/	Switching AC/ Adapter

NC: Not communicated by provider

**Inputs/outputs - Cable:**

Access	Type	Length used (m)	Declared <3m	Shielded	Comments
Supply1	USB C	1.5	No	No	USB only on board and only for power
Supply2	USB C	1.5	No	No	100/240VAC – 5VDC
Access1	JTAG	0.1	No	No	Only for debug

NC: Not communicated by provider

**Auxiliary equipment used during test:**

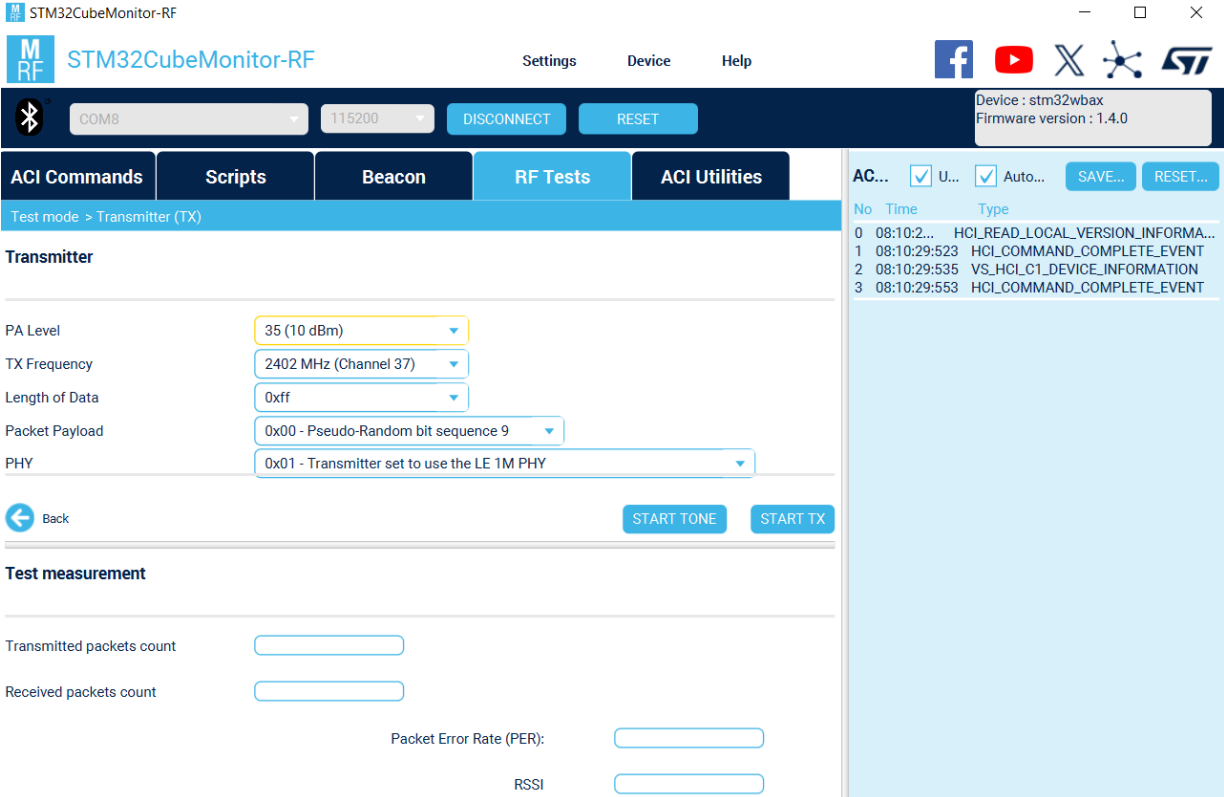
Type	Reference	Sn	Comments
LAPTOP	LENOVO	/	/
Daughter board	STLINK-V3MINE	/	/

NC: Not communicated by provider

## 2.2. EUT CONFIGURATION

Hardware information			
Highest internal frequency (PLL, Quartz, Clock, Microprocessor...):	F <sub>Highest</sub> :	2500	MHz
Firmware (if applicable):	V. :	Device : stm32wbax Firmware version : 1.4.0	
Software (if applicable):	V. :		

NC: Not communicated by provider

Test mode	Description of test mode
Test mode 1	<p>Permanent emission with modulation on a fixed channel in the data rate that produced the highest power. A daughter board with a JTAG connector is used to connect the module to the PC. The module is connected to a daughter board equipped with a JTAG connector. This daughter board is then connected to a PC via a USB-C port to configure the DUT (Device Under Test). The software used to configure the product is STM32CubeMonitor-RF, which allows configuring the module for BLE (Bluetooth Low Energy) and Zigbee. The power used is +10dBm.</p> 

## 2.3. EQUIPMENT MODIFICATIONS DURING THE TESTS

None



## 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

## 2.5. TEST DISTANCE EXTRAPOLATION – FCC/ISED

The field strength is extrapolated to the new measurement distance using formula from FCC Part15.31 (f) and §6.5-6.6 RSS-GEN:

Below 30MHz,

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left( \frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

Above 30MHz,

$$FS_{\text{limit}} = FS_{\text{max}} - 20 \log \left( \frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

Where:

$FS_{\text{limit}}$  is the calculation of field strength at the limit distance, expressed in dBμV/m

$FS_{\text{max}}$  is the measured field strength, expressed in dBμV/m

$d_{\text{measure}}$  is the distance of the measurement point from the EUT

$d_{\text{limit}}$  is the reference limit distance

## 2.6. 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. The symbol -/- replaces the date for equipment checking before test or that have none impact on the test or that have no calibration required by the standard.



### 3. MEASUREMENT OF CONDUCTED EMISSION

#### 3.1. TEST CONDITIONS

Date of test : December 03, 2024  
 Test performed by : Akram HAKKARI  
 Relative humidity (%) : 33  
 Ambient temperature (°C) : 21

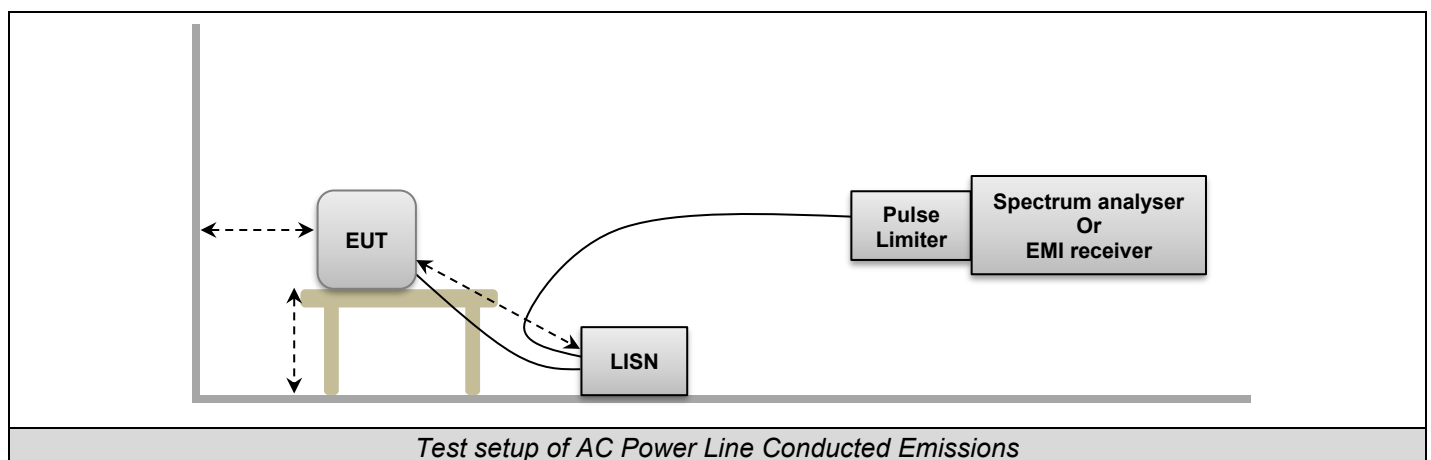
#### 3.2. TEST SETUP

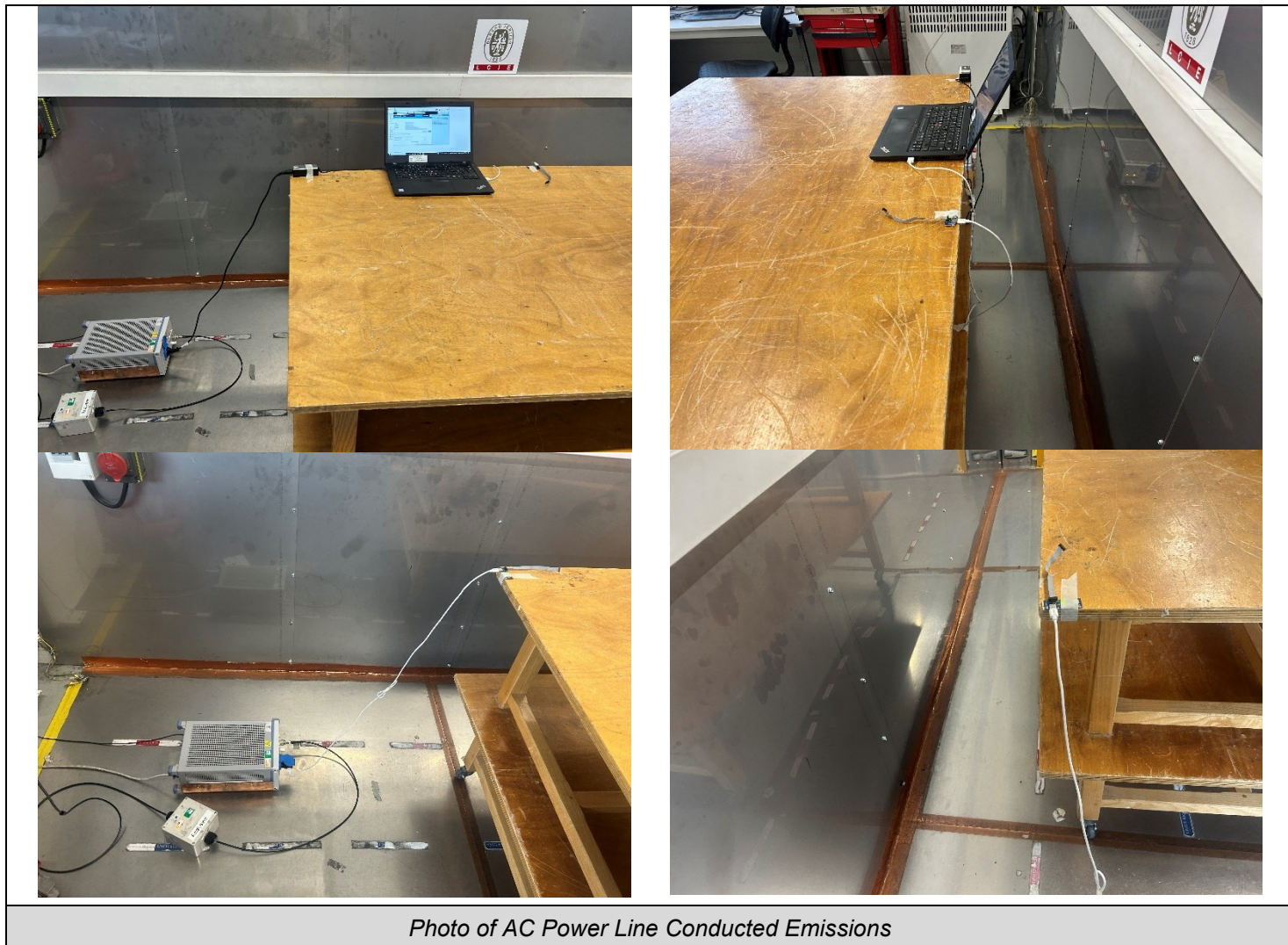
Test procedure:  
 ANSI C63.4 & FCC Part 15 subpart B

The EUT and auxiliaries are set 80cm above the ground on the non-conducting table (Table-top equipment) at 80cm from the LISN, the cable has been shorted to 1meter length. The distance between the EUT and the vertical ground plane is 40cm. Measurement is made with a receiver in peak mode. This was followed by a Quasi-Peak, i.e. CISPR measurement for any strong signal. If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary. Interconnecting cables and equipment were moved to position that maximized emission. The EUT is powered like specified in following table, through a LISN (measure); auxiliaries are powered by another LISN.

Frequency range:	150kHz to 30MHz	
Test:	Pre-Characterization	Qualification
RBW Filter:	10kHz	9kHz
Detector:	Peak & Average	QPeak & Cispr Average
Mode:	Linear Scan	

Type	Measurement performed:	
<input checked="" type="checkbox"/> AC / <input type="checkbox"/> DC (Auxiliary used)	<input checked="" type="checkbox"/> 120VAC/60Hz	<input checked="" type="checkbox"/> 240VAC/50Hz
<input type="checkbox"/> USB (Laptop auxiliary)	<input type="checkbox"/> 120VAC/60Hz (Laptop auxiliary)	<input type="checkbox"/> 240VAC/50Hz (Laptop auxiliary)







### 3.3. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due
BAT EMC	NEXIO	v3.21.0.32	L1000115	-/-	-/-
Cable + self	—	—	A5329578	05/24	05/26
EMC comb generator	LCIE SUD EST	—	A3169098	-/-	-/-
LISN	ROHDE & SCHWARZ	ENV216	C2320291	08/24	08/25
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	03/23	03/25
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	05/23	05/25
Transient limiter	ROHDE & SCHWARZ	ESH3-Z2	A7122204	07/24	07/26

### 3.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

### 3.5. TEST RESULTS – RUNNING MODE N°1

**Mains terminals:**

#### SUPPLY1

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

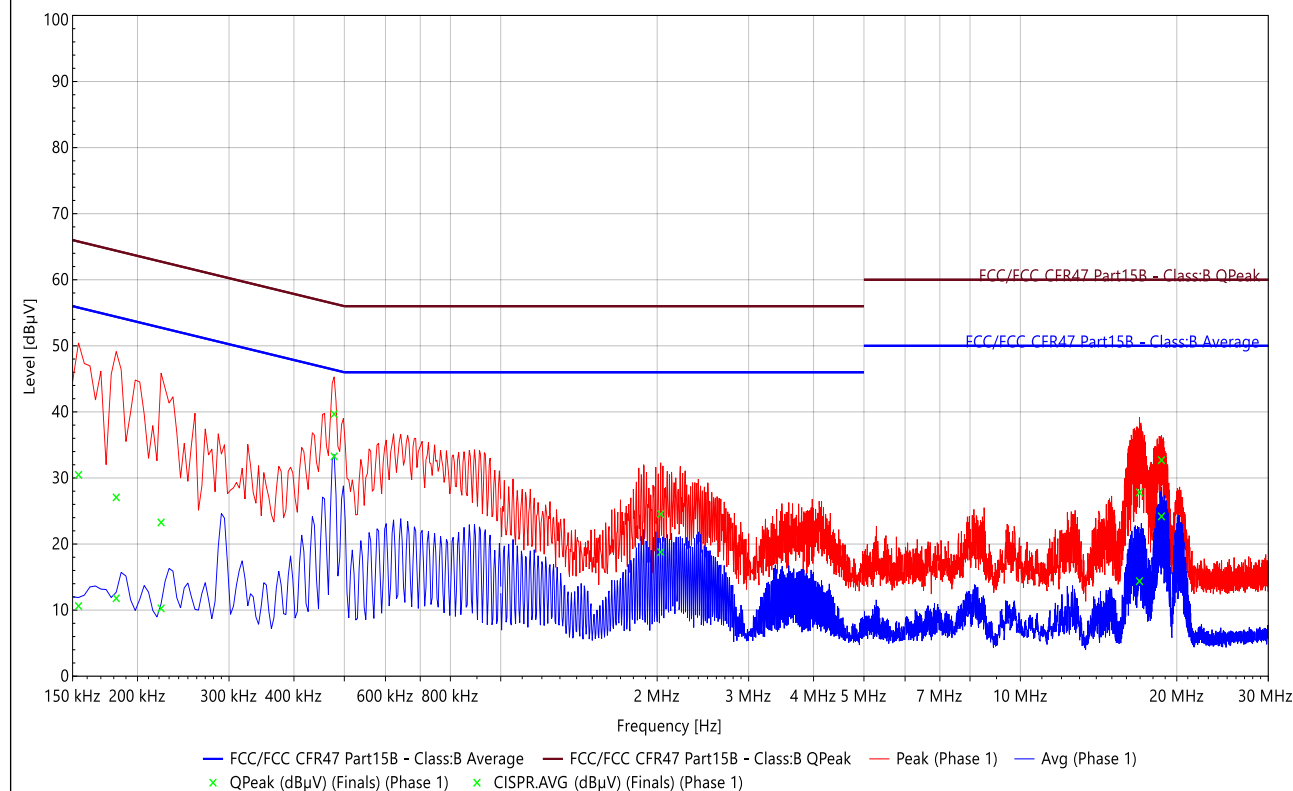
**Results: (PEAK detection)**

Graph identifier	Line	Comments	
Emc# 1	Phase	240VAC/50Hz	See below
Emc# 2	Neutral	240VAC/50Hz	See below
Emc# 3	Phase	120VAC/60Hz	See below
Emc# 4	Neutral	120VAC/60Hz	See below
Emc# 5	Phase	240VAC/50Hz	Laptop is used
Emc# 6	Neutral	240VAC/50Hz	Laptop is used
Emc# 7	Phase	120VAC/60Hz	Laptop is used
Emc# 8	Neutral	120VAC/60Hz	Laptop is used

### Conducted Emissions

**Graph name:** Emc#1  
**Frequency range:** 150 kHz to 30 MHz

#### 240V/50Hz - (RSIL) [150k-30M]Hz - Phase



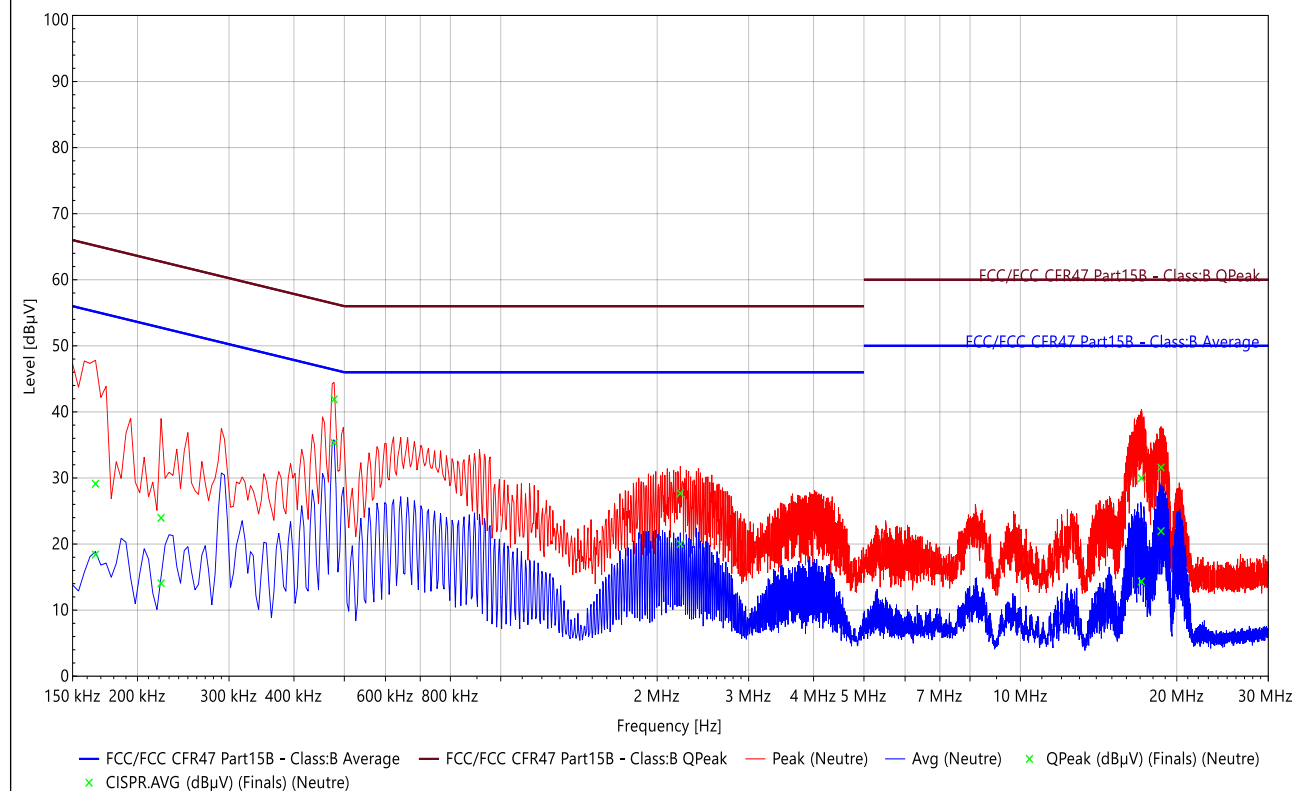
#### Qualification:

Frequency	QP Level (dBμV)	Lim.QP (dBμV)	QP-Lim.QP (dB)	CAVG Level (dBμV)	Lim.CAVG (dBμV)	CAVG-Lim.CAVG (dB)	Meas.Time (s)	Correction (dB)
154.000 kHz	30.47	65.78	-35.31	10.62	55.78	-45.16	0.01	19.43
182.000 kHz	27.06	64.39	-37.33	11.79	54.39	-42.60	0.01	19.45
222.000 kHz	23.27	62.74	-39.47	10.26	52.74	-42.48	0.01	19.43
478.000 kHz	39.67	56.37	-16.70	33.27	46.37	-13.11	0.01	19.46
2.000 ,032 MHz	24.53	56.00	-31.47	18.78	46.00	-27.22	0.01	19.57
16.000 ,952 MHz	27.81	60.00	-32.19	14.38	50.00	-35.62	0.01	20.47
18.000 ,688 MHz	32.69	60.00	-27.31	24.18	50.00	-25.82	0.01	20.56

## Conducted Emissions

**Graph name:** Emc#2  
**Frequency range:** 150 kHz to 30 MHz

### 240V/50Hz- (RSIL) [150k-30M]Hz - Neutre



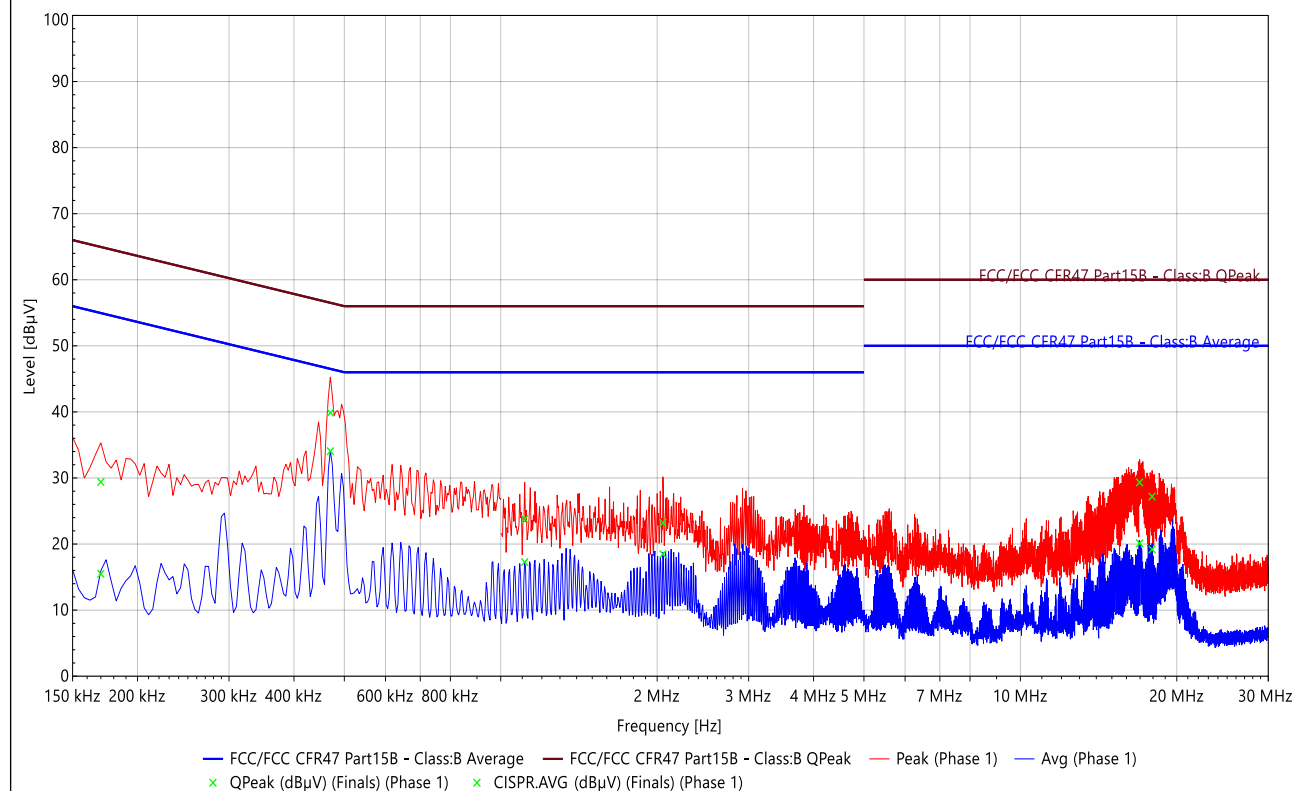
### Qualification:

Frequency	QP Level (dBμV)	Lim.QP (dBμV)	QP-Lim.QP (dB)	CAVG Level (dBμV)	Lim.CAVG (dBμV)	CAVG-Lim.CAVG (dB)	Meas.Time (s)	Correction (dB)
165.000 ,999 kHz	29.12	65.16	-36.03	18.41	55.16	-36.75	0.01	19.44
222.000 kHz	23.95	62.74	-38.79	14.06	52.74	-38.68	0.01	19.44
478.000 kHz	41.90	56.37	-14.47	35.32	46.37	-11.05	0.01	19.46
2.000 ,216 MHz	27.68	56.00	-28.32	20.00	46.00	-26.00	0.01	19.59
17.000 ,092 MHz	29.96	60.00	-30.04	14.33	50.00	-35.67	0.01	20.52
18.000 ,648 MHz	31.59	60.00	-28.41	21.95	50.00	-28.05	0.01	20.61

## Conducted Emissions

**Graph name:** Emc#3  
**Frequency range:** 150 kHz to 30 MHz

### 120V/60Hz- (RSIL) [150k-30M]Hz - Phase



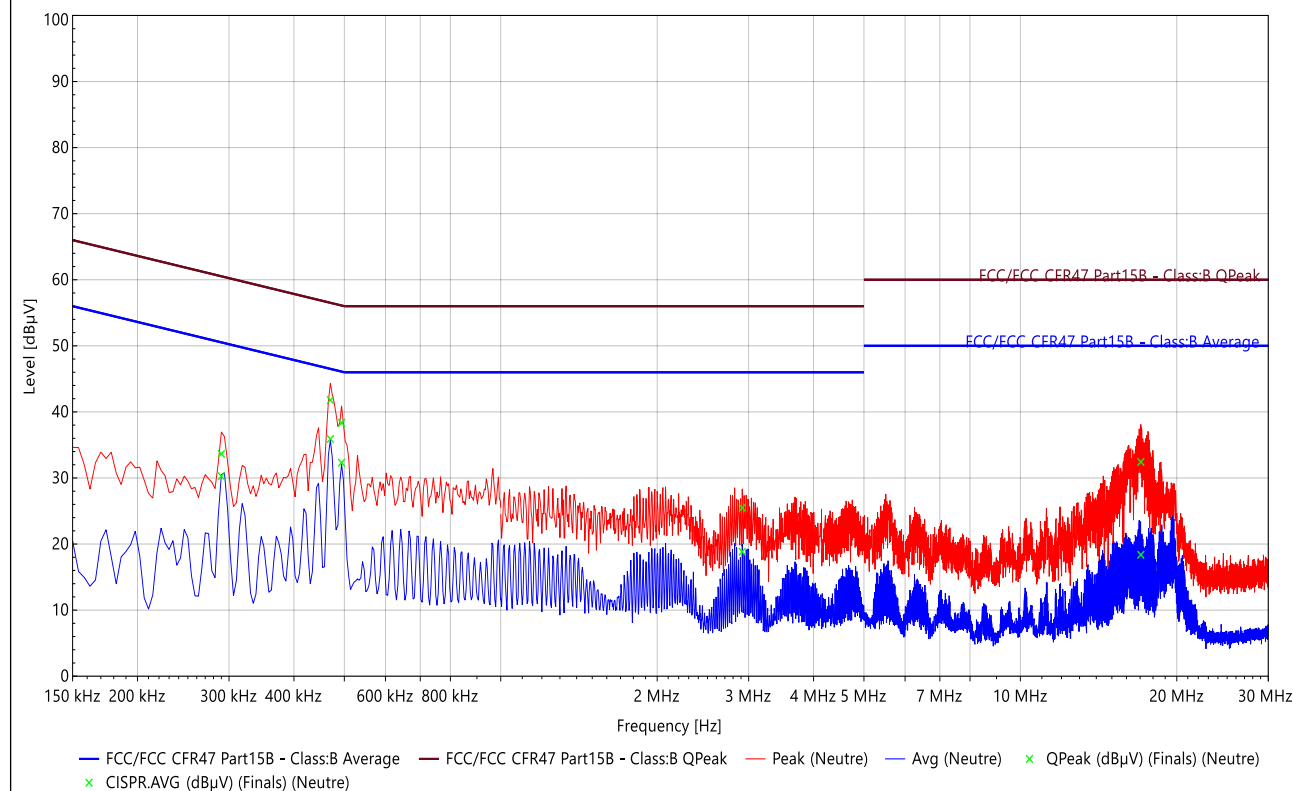
### Qualification:

Frequency	QP Level (dBμV)	Lim.QP (dBμV)	QP-Lim.QP (dB)	CAVG Level (dBμV)	Lim.CAVG (dBμV)	CAVG-Lim.CAVG (dB)	Meas.Time (s)	Correction (dB)
169.000 ,999 kHz	29.39	64.96	-35.58	15.49	54.96	-39.47	0.01	19.42
470.000 kHz	39.88	56.51	-16.64	34.05	46.51	-12.46	0.01	19.45
1.000 ,112 MHz	23.78	56.00	-32.22	17.27	46.00	-28.73	0.01	19.50
2.000 ,052 MHz	23.21	56.00	-32.79	18.47	46.00	-27.53	0.01	19.57
16.000 ,964 MHz	29.32	60.00	-30.68	20.13	50.00	-29.87	0.01	20.47
17.000 ,928 MHz	27.19	60.00	-32.81	19.18	50.00	-30.82	0.01	20.52

### Conducted Emissions

**Graph name:** Emc#4  
**Frequency range:** 150 kHz to 30 MHz

**120V/60Hz - (RSIL) [150k-30M]Hz - Neutre**



#### Qualification:

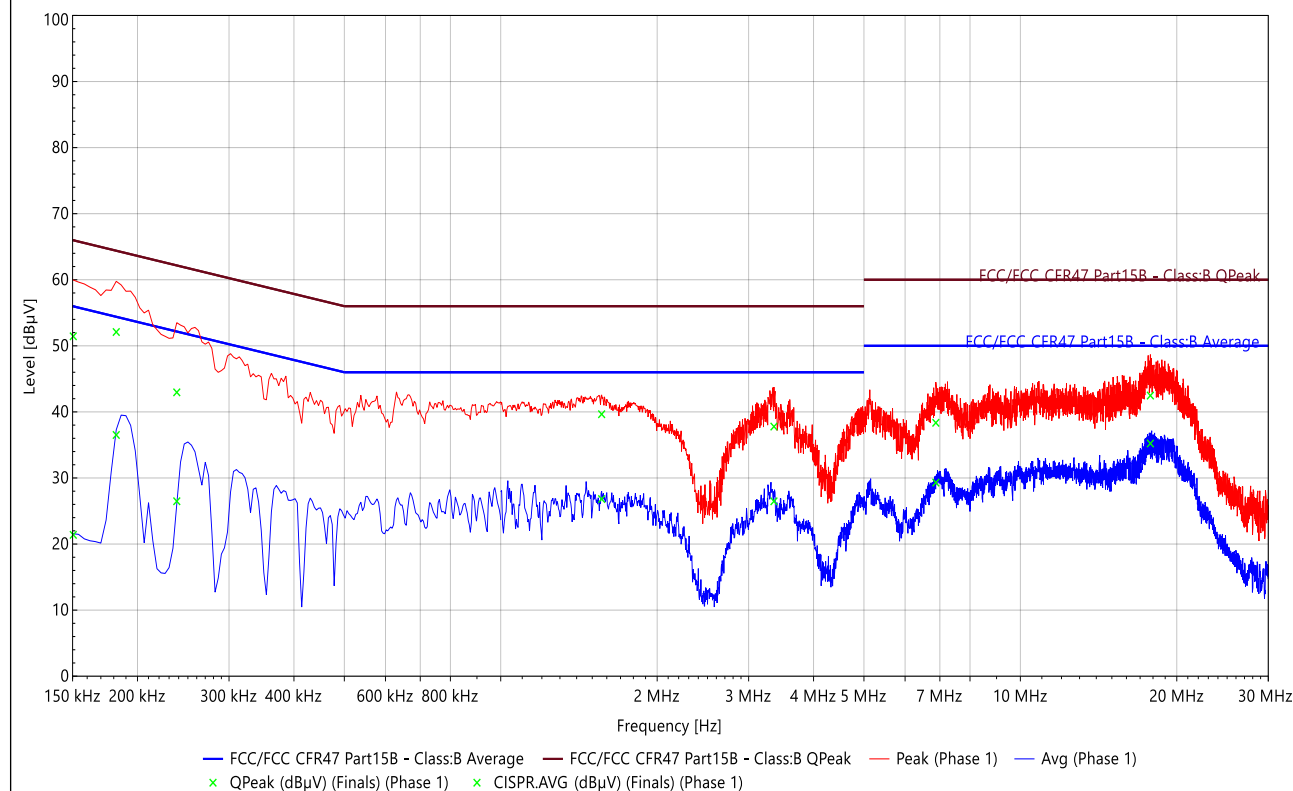
Frequency	QP Level (dBμV)	Lim.QP (dBμV)	QP-Lim.QP (dB)	CAVG Level (dBμV)	Lim.CAVG (dBμV)	CAVG-Lim.CAVG (dB)	Meas.Time (s)	Correction (dB)
290.000 kHz	33.64	60.52	-26.88	30.27	50.52	-20.25	0.01	19.42
470.000 kHz	41.78	56.51	-14.73	35.90	46.51	-10.61	0.01	19.45
494.000 kHz	38.36	56.10	-17.74	32.31	46.10	-13.79	0.01	19.45
2.000 ,916 MHz	25.48	56.00	-30.52	18.84	46.00	-27.16	0.01	19.64
17.000 ,056 MHz	32.42	60.00	-27.58	18.37	50.00	-31.63	0.01	20.52



### Conducted Emissions

**Graph name:** Emc#5  
**Frequency range:** 150 kHz to 30 MHz

#### 240V/50Hz - (RSIL) [150k-30M]Hz - Phase PC



#### Qualification:

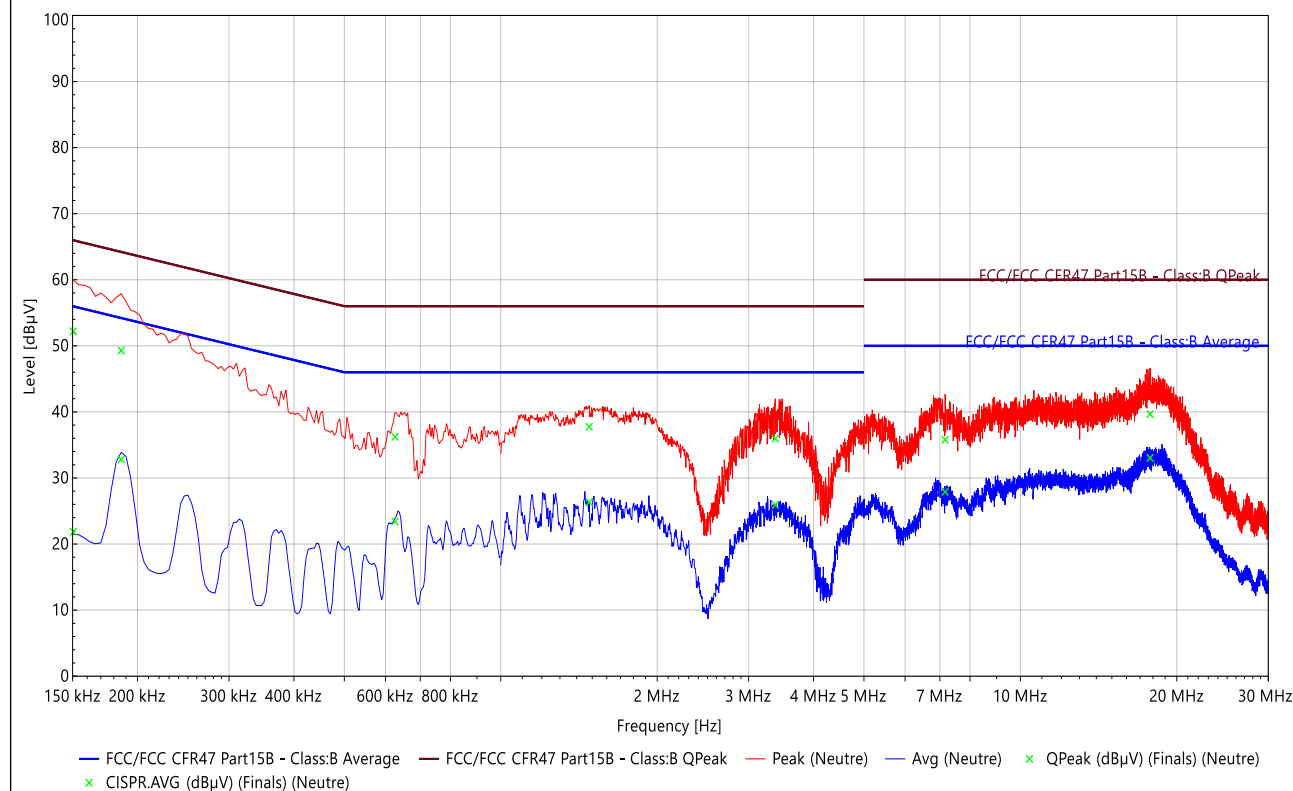
Frequency	QP Level (dBμV)	Lim.QP (dBμV)	QP-Lim.QP (dB)	CAVG Level (dBμV)	Lim.CAVG (dBμV)	CAVG-Lim.CAVG (dB)	Meas.Time (s)	Correction (dB)
150.000 kHz	51.44	66.00	-14.56	21.39	56.00	-34.61	0.01	19.41
182.000 kHz	52.09	64.39	-12.31	36.51	54.39	-17.89	0.01	19.45
238.000 kHz	42.96	62.17	-19.20	26.48	52.17	-25.69	0.01	19.42
1.000 ,564 MHz	39.65	56.00	-16.35	26.81	46.00	-19.19	0.01	19.53
3.000 ,356 MHz	37.78	56.00	-18.22	26.47	46.00	-19.53	0.01	19.67
6.000 ,876 MHz	38.35	60.00	-21.65	29.30	50.00	-20.70	0.01	19.92
17.000 ,792 MHz	42.47	60.00	-17.53	35.22	50.00	-14.78	0.01	20.52



### Conducted Emissions

**Graph name:** Emc#6  
**Frequency range:** 150 kHz to 30 MHz

#### 240V/50Hz- (RSIL) [150k-30M]Hz - Neutre PC



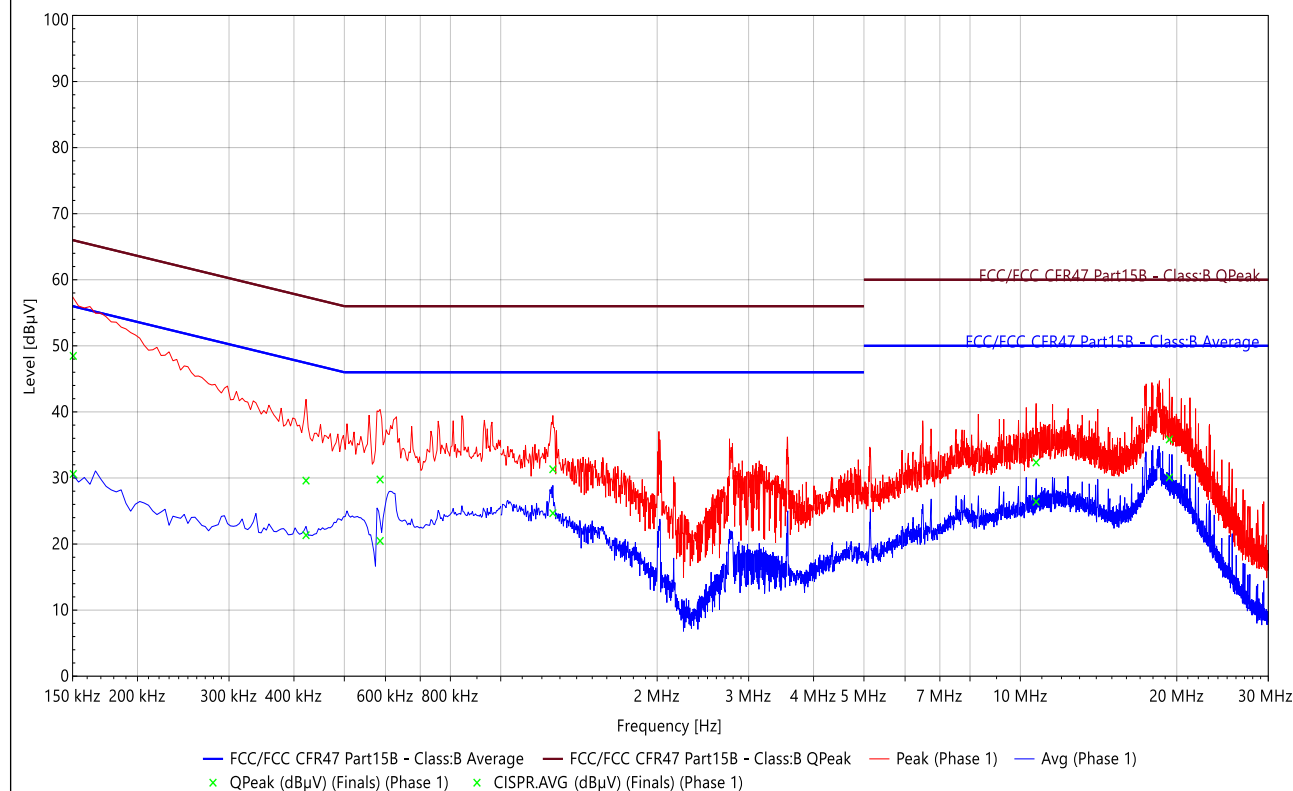
#### Qualification:

Frequency	QP Level (dBμV)	Lim.QP (dBμV)	QP-Lim.QP (dB)	CAVG Level (dBμV)	Lim.CAVG (dBμV)	CAVG-Lim.CAVG (dB)	Meas.Time (s)	Correction (dB)
150.000 kHz	52.18	66.00	-13.82	21.87	56.00	-34.13	0.01	19.42
186.000 kHz	49.29	64.21	-14.92	32.80	54.21	-21.41	0.01	19.46
626.000 kHz	36.23	56.00	-19.77	23.40	46.00	-22.60	0.01	19.47
1.000 ,48 MHz	37.73	56.00	-18.27	26.34	46.00	-19.66	0.01	19.53
3.000 ,376 MHz	35.96	56.00	-20.04	25.92	46.00	-20.08	0.01	19.67
7.000 ,164 MHz	35.78	60.00	-24.22	27.90	50.00	-22.10	0.01	19.95
17.000 ,768 MHz	39.66	60.00	-20.34	33.03	50.00	-16.97	0.01	20.56

### Conducted Emissions

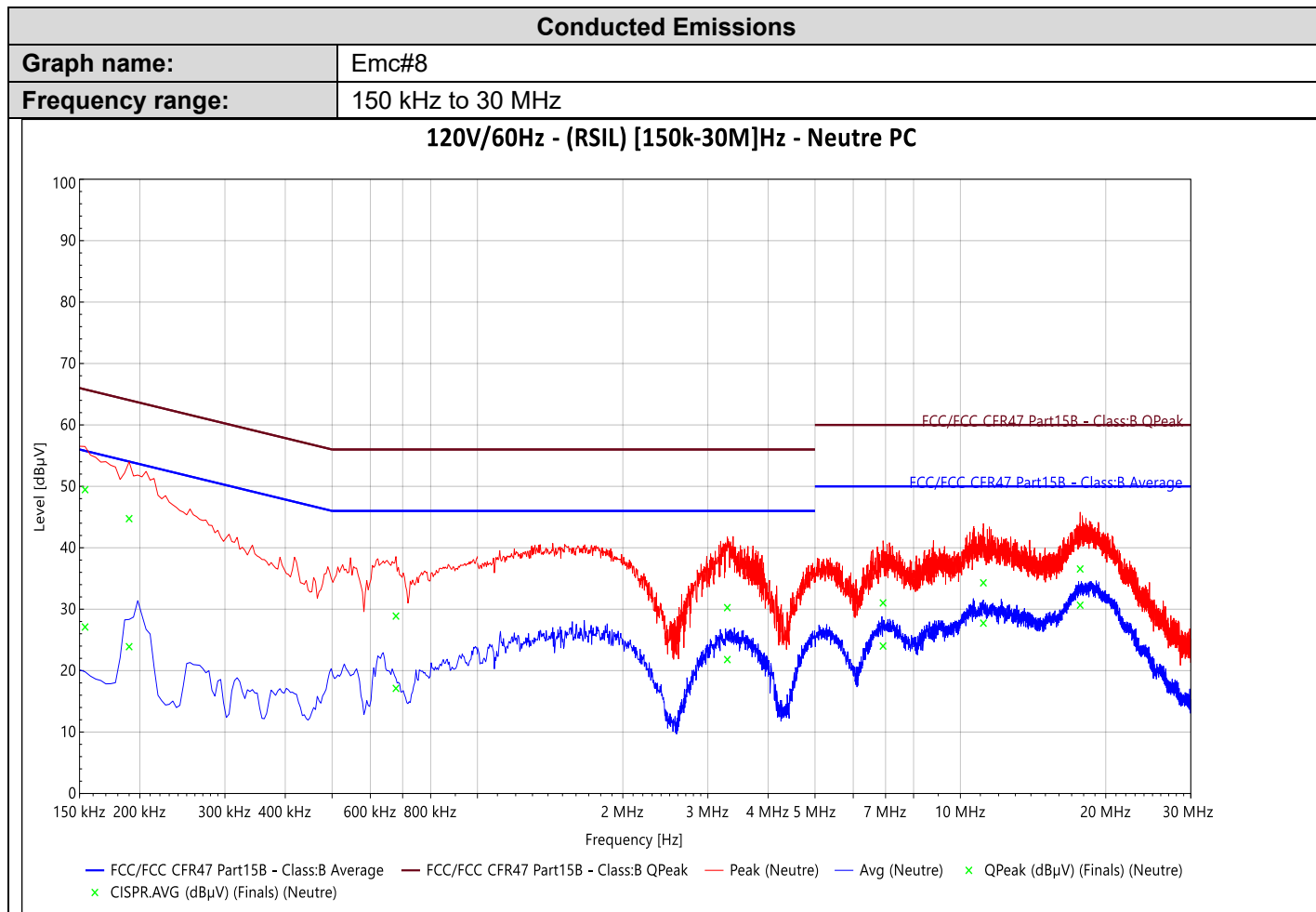
**Graph name:** Emc#7  
**Frequency range:** 150 kHz to 30 MHz

#### 120V/60Hz- (RSIL) [150k-30M]Hz - Phase PC



#### Qualification:

Frequency	QP Level (dBμV)	Lim.QP (dBμV)	QP-Lim.QP (dB)	CAVG Level (dBμV)	Lim.CAVG (dBμV)	CAVG-Lim.CAVG (dB)	Meas.Time (s)	Correction (dB)
150.000 kHz	48.47	66.00	-17.53	30.60	56.00	-25.40	0.01	19.41
422.000 kHz	29.60	57.41	-27.81	21.34	47.41	-26.07	0.01	19.45
586.000 kHz	29.78	56.00	-26.22	20.47	46.00	-25.53	0.01	19.45
1.000 ,26 MHz	31.32	56.00	-24.68	24.67	46.00	-21.33	0.01	19.50
10.000 ,724 MHz	32.35	60.00	-27.65	26.40	50.00	-23.60	0.01	20.14
19.000 ,356 MHz	35.84	60.00	-24.16	30.07	50.00	-19.93	0.01	20.60



#### Qualification:

Frequency	QP Level (dBµV)	Lim.QP (dBµV)	QP-Lim.QP (dB)	CAVG Level (dBµV)	Lim.CAVG (dBµV)	CAVG-Lim.CAVG (dB)	Meas.Time (s)	Correction (dB)
154.000 kHz	49.46	65.78	-16.33	27.10	55.78	-28.69	0.01	19.44
190.000 kHz	44.74	64.04	-19.30	23.90	54.04	-30.14	0.01	19.45
678.000 kHz	28.88	56.00	-27.12	17.11	46.00	-28.89	0.01	19.46
3.000 ,292 MHz	30.25	56.00	-25.75	21.80	46.00	-24.20	0.01	19.67
6.000 ,916 MHz	31.02	60.00	-28.98	24.00	50.00	-26.00	0.01	19.93
11.000 ,16 MHz	34.29	60.00	-25.71	27.73	50.00	-22.27	0.01	20.18
17.000 ,704 MHz	36.56	60.00	-23.44	30.65	50.00	-19.35	0.01	20.56

### 3.6. CONCLUSION

The sample of the equipment **STM32WBA5MMG**, Sn : **None**, tested in the configuration presented in this test report **satisfies** to requirements of the product family standard applied (See §Test Program) for conducted emissions.

## 4. MEASUREMENT OF RADIATED EMISSION

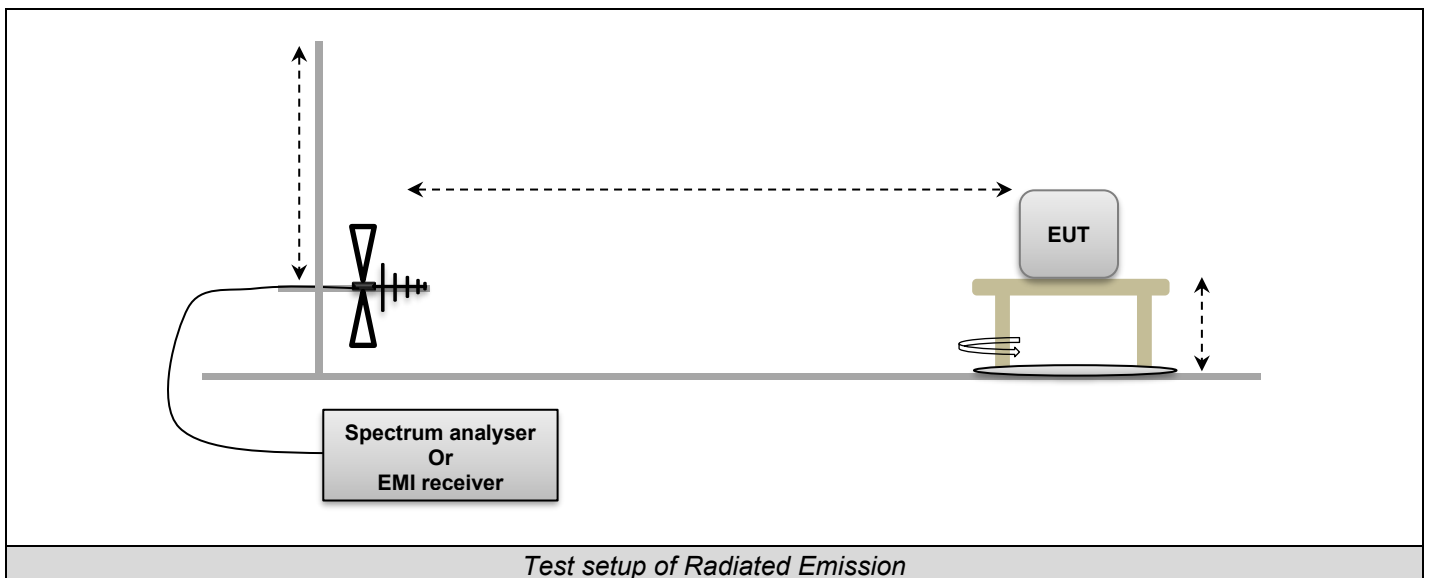
### 4.1. TEST CONDITIONS

Date of test : December 02, 2024  
 Test performed by : Akram HAKKARI  
 Relative humidity (%) : 33  
 Ambient temperature (°C) : 21

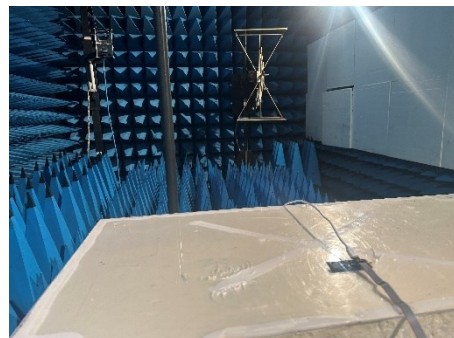
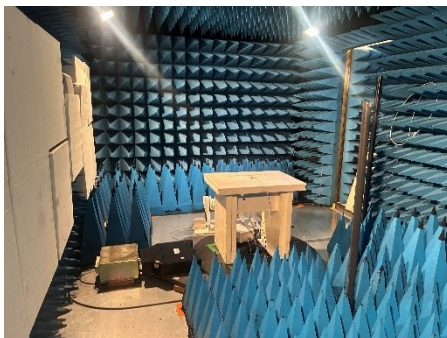
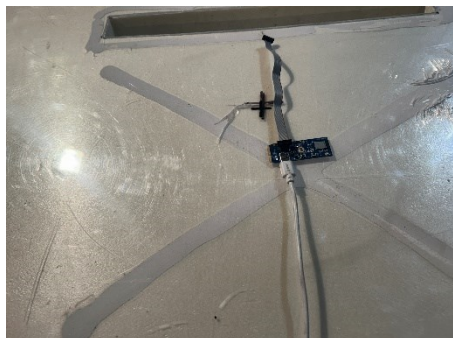
### 4.2. TEST SETUP

Test procedure:  
 ANSI C63.4 & FCC Part 15 subpart B

The EUT and auxiliaries are set 80cm above the ground on the non-conducting table (Table-top equipment).  
 The EUT is powered by  $V_{nom}$ .



Same setup is used in semi anechoic chamber during pre-characterization, with a distance of 3m between EUT and antenna.



*Photo in anechoic chamber*



*Photo on OATS*



#### 4.3. TEST METHOD

During pre-characterization, a pre-scan of all the setup has been performed on all axis of EUT used in normal configuration. The pre-characterization graphs are obtained in PEAK detection, and AVERAGE detection for frequencies above 1GHz. A summary of the worst case emissions found in all test configurations and modes is shown. Spurious or frequency band are measured with qualification method to show compliance with limits.

Following frequency ranges, test setup parameters are different and specified in tables below.

##### 4.3.1. 30MHz –1GHz

Frequency range:	30MHz to 1GHz	
Test:	Pre-Characterization	Qualification
Antenna Polarization:	Horizontal and Vertical	
Antenna Height:	Centered on EUT	Varied by step from 1m to 4m
Antenna Type:	Bi-Log	Bi-Log
Min. Antenna Beamwidth:	Teseq CBL 6111 / w@3m - 4.2m<1GHz	Teseq CBL 6111 / w@10m - 14m<1GHz
RBW Filter:	100kHz	100kHz
Maximization:	Turntable rotation of 360 degrees range	
Test site:	Full Anechoic Chamber	Open Aera Test Site
Distance EUT - Antenna:	3m	10m
Detector:	QPeak	QPeak
Mode:	Linear Scan	

##### 4.3.2. 1GHz – 14GHz:

Frequency range:	1GHz to 6GHz	
Test:	Pre-Characterization	Qualification
Antenna Polarization:	Horizontal and Vertical	
Antenna Height:	Centered on EUT	Centered on EUT
Antenna Type:	Horn	Horn
Min. Antenna Beamwidth:	Teseq CBL 6143 / w@3m - 2.5m>1GHz	Teseq CBL 6143 / w@3m - 2.5m>1GHz
RBW Filter:	1MHz	1MHz
Maximization:	Turntable rotation of 360 degrees range	
Test site:	Full Anechoic Chamber	Full Anechoic Chamber
Distance EUT - Antenna:	3m	3m
Detector:	Peak & Average	Peak & Average
Mode:	Linear Scan	



#### 4.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due
Amplifier 10MHz - 18GHz	LCIE SUD EST	—	A7102082	11/22	03/25
Antenna Bi-log	AH System	SAS-521-7	C2040180	05/23	05/25
Antenna horn 18GHz	EMCO	3115	C2042027	04/22	04/25
BAT EMC	NEXIO	v3.21.0.32	L1000115	-/-	-/-
CABLE	TELEDYNE	R82-0404-0.5M	A5330010	03/22	03/25
Cable 0.75m	-	18GHz	A5329900	08/24	08/26
Cable SMA 40cm	WITHWAVE	W101-SM1-0.4M	A5329979	10/23	10/26
CONTROLLER	INNCO	CO3000	D3044034	-/-	-/-
Emission Cable (SMA 1m)	TELEDYNE	26GHz	A5329874	08/22	08/25
Emission Cable (SMA 3.3m)	TELEDYNE	26GHz	A5329875	08/22	08/25
Filter Matrice	LCIE SUD EST	Combined filters	A7484078	03/23	03/25
Multimeter - CEM	FLUKE	87	A1240251	10/23	10/25
Rehausse Table C3	LCIE	—	F2000511	-/-	-/-
Rehausse Table C3	LCIE	—	F2000507	-/-	-/-
Semi-Anechoic chamber #3 (BF)	SIEPEL	—	D3044017_BF	04/22	04/25
Semi-Anechoic chamber #3 (VSWR)	SIEPEL	—	D3044017_VSWR	04/22	04/25
SMA Cable 18GHz 0.5m	TELEDYNE	18GHz	A5330060	05/24	05/25
SMA Cable 18GHz 0.5m	TELEDYNE	18GHz	A5330059	05/24	05/25
SMA Cable 18GHz 0.6m	TELEDYNE	18GHz	A5330055	05/24	05/25
SMA Cable 18GHz 3.5m	TELEDYNE	18GHz	A5330058	05/24	05/25
SMA Cable 18GHz 6m	TELEDYNE	18GHz	A5330057	05/24	05/25
Spectrum analyzer	ROHDE & SCHWARZ	FSU 26	A4060058	09/23	09/25
Table C3	LCIE	—	F2000461	-/-	-/-
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	05/23	05/25
TILT	INNCO	TILT	D3044033	-/-	-/-
Turntable chamber (Cage#3)	ETS Lingren	Model 2165	F2000371	-/-	-/-
Turntable controller (Cage#3)	ETS Lingren	Model 2090	F2000444	-/-	-/-
Antenna Mat (OATS)	ETS Lingren	2071-2	F2000392	-/-	-/-
Biconic Antenna	EATON	94455-1	C2040234	05/23	05/25
Cable (OATS)	—	1GHz	A5329623	09/24	09/25
Emission Cable	CABELTEL	6GHz	A5329069	02/24	02/25
Emission Cable	MICRO-COAX	1GHz	A5329656	09/24	09/25
Emission Cable	RADIALEX	-/-	A5329061	07/24	07/25
OATS	—	—	F2000409	07/24	07/25
Rehausse Table C1/OATS	LCIE	—	F2000512	-/-	-/-



Table C1/OATS	LCIE	—	F2000445	-/-	-/-
Turntable (OATS)	ETS Lingren	Model 2187	F2000403	-/-	-/-
Turntable / Mast controller (OATS)	ETS Lingren	Model 2066	F2000372	-/-	-/-

#### **4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION**

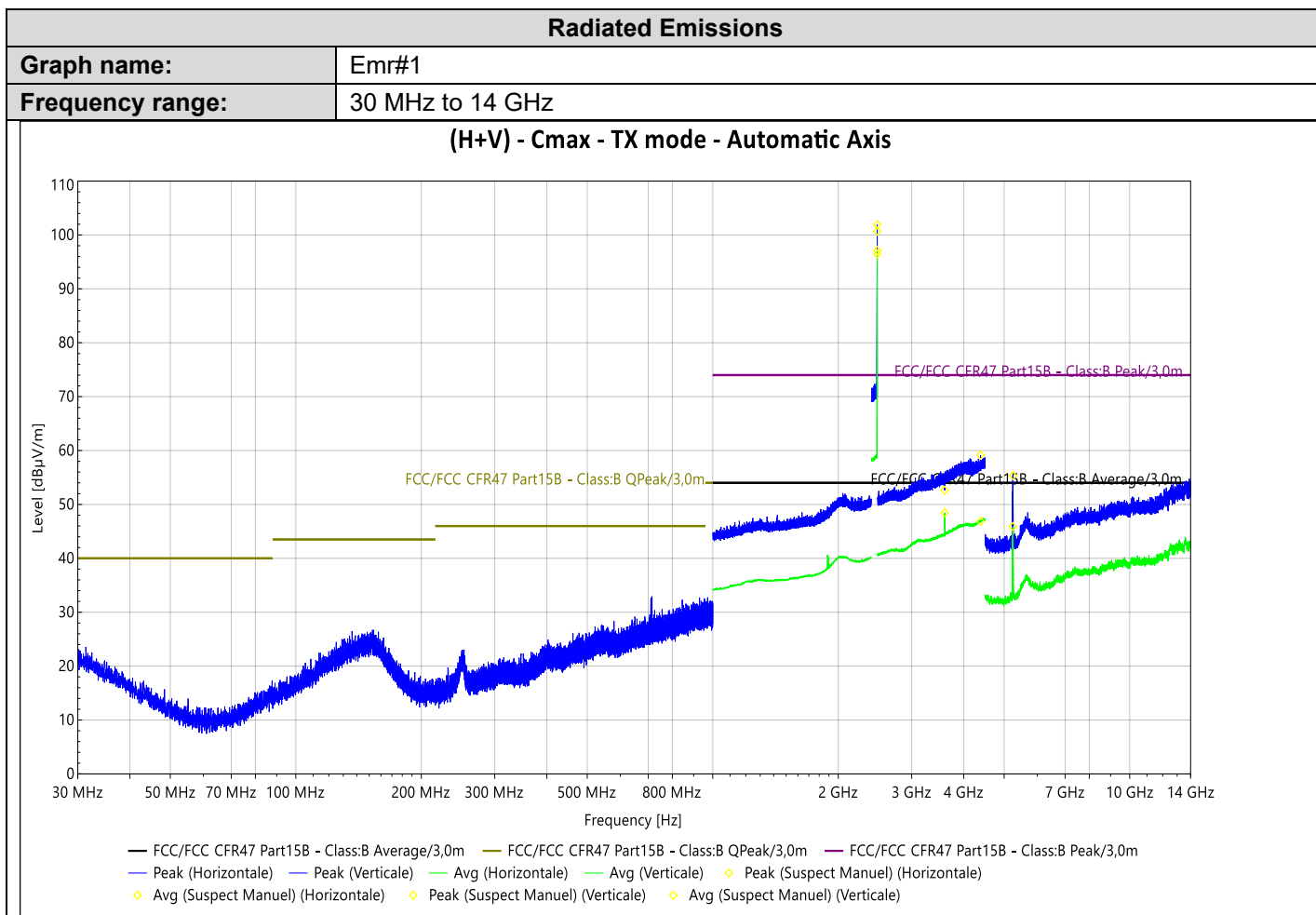
None



#### 4.6. TEST RESULTS – RUNNING MODE N°1

##### 4.6.1. 30MHz –14GHz

Graph identifier	Polarization	Mode	Channel	EUT position	Comments
Emr# 1	H/V	TX	Cmax	Axis XY/Z	See the following results



#### Pre-Characterization:

Frequency	PK Level (dBμV/m)	Lim.PK (dBμV/m)	Avg (dBμV/m)	Lim.Avg (dBμV/m)	Lim.QP (dBμV/m)	Angle (°)	Polar.	Correct. (dB)
2.48028525 GHz*	100.72	74.00	97.10	54.00		156	H	34.57
2.480494 GHz*	101.91	74.00	96.45	54.00		194	H	34.57
5.2467 GHz	55.35	74.00	45.90	54.00		0	H	-20.17
3.599834399 GHz	52.62	74.00	48.46	54.00		167	H	37.65
4.3866727 GHz	59.15	74.00	46.88	54.00		19	V	40.20

\*Carrier frequency



#### 4.7. CONCLUSION

The sample of the equipment **STM32WBA5MMG**, Sn : **None**, tested in the configuration presented in this test report **satisfies** to requirements of the product family standard applied (See §Test Program) for radiated emissions.

## 5. UNCERTAINTIES CHART

Type de mesure / Kind of measurement	Incertitude élargie laboratoire / Wide uncertainty laboratory (k=2) $\pm x$	Incertitude limite du CISPR / CISPR uncertainty limit $\pm y$
Mesure des perturbations conduites en tension sur le réseau d'énergie (monophasé /triphase) 9kHz-150kHz <i>Measurement of conducted disturbances in voltage on the power port ( single &amp; three phases)9kHz-150kHz</i>	3.7dB	3.8dB
Mesure des perturbations conduites en tension sur le réseau d'énergie (monophasé /triphase) 150kHz-30MHz <i>Measurement of conducted disturbances in voltage on the power port ( single &amp; three phases)150kHz-30MHz</i> LISN 50Ω/50μH Capacitive Voltage Probe	3.3dB 3.7dB	3.4dB 3.9dB
Mesure des perturbations conduites en tension sur le réseau de télécommunication <i>Measurement of conducted disturbances in voltage on the telecommunication port.</i> AAN avec aLCL = 55 ... 40 dBc AAN avec aLCL = 65 ... 50 dBc AAN avec aLCL = 75 ... 60 dBc	4.2dB 4.6dB 5.0dB	4.2dB 4.6dB 5.1dB
Mesure des perturbations discontinues conduites en tension <i>Measurement of discontinuous conducted disturbances in voltage</i>	3.4dB	3.4dB
Mesure des perturbations conduites en courant <i>Measurement of conducted disturbances in current</i>	2.9dB	2.9dB
Mesure du champ électrique rayonné en cage de Faraday semi-anéchoïque de 30MHz à 1GHz <i>Measurement of radiated electric field in half-anechoic Faraday room</i> <i>From 30MHz to 1GHz</i>	6.3dB	6.3dB
Mesure du champ électrique rayonné en cage de Faraday anéchoïque de 1GHz à 6GHz <i>Measurement of radiated electric field in full-anechoic Faraday room</i> <i>From 1GHz to 6GHz</i>	5.2dB	5.2dB
Mesure du champ électrique rayonné en cage de Faraday anéchoïque de 6GHz à 18GHz <i>Measurement of radiated electric field in full-anechoic Faraday room</i> <i>From 6GHz to 18GHz</i>	5.5dB	5.5dB
Mesure du champ électrique rayonné sur le site en espace libre de Moirans 30MHz – 1GHz. <i>Measurement of radiated electric field on the Moirans open area test site</i> <i>30MHz – 1GHz.</i>	6.3dB	6.3dB
Mesure du champ électrique rayonné IN SITU de 30 à 1000 MHz <i>IN SITU measurement of radiated electric field from 30 to 1000MHz</i>	A l'étude / Under consideration	5.2dB
Mesure de la puissance perturbatrice <i>Measurement of disturbance power</i>	3.32dB	4.5dB
Mesure des harmoniques de courant <i>Measurement of current harmonics</i>	11.11%	/
Mesure du flicker <i>Flicker measurement</i>	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*