Test report issued under the responsibility of:
EMITECH MONTPELLIER laboratory
MRA US-EU Designation Number: FR0006
IC Assigned Code: FR0003

RADIO TEST REPORT

RSS-210
FCC part 15.225

Company ..... :	**STMICROELECTRONICS SAS**
Address..... :	190 AVENUE CELESTIN COQ 13106 ROUSSET FRANCE

Test item description. ..... :	**NFC card reader evaluation board based on ST25R3916 integrated circuit**
Trade Mark. ..... :	STMICROELECTRONICS SAS
Manufacturer. ..... :	STMICROELECTRONICS (ROUSSET) SAS
Model/Type reference..... :	ST25R3916-DISCO
FCC ID. ..... :	YCPR3916DB1
IC. ..... :	8976A-R3916DB1
Ratings..... :	5Vdc +/-10%

Testing Laboratory ..... :	**EMITECH MONTPELLIER laboratory**
Address..... :	145 rue de Massacan 34740 VENDARGUES FRANCE

Report Reference No. ..... :	**R412-18-105699-4A**
Test procedure. ..... :	FCC IC Certification
Diffusion. ..... :	Mr ROMAN
Applicant's name. ..... :	STMICROELECTRONICS SAS
Date of issue. ..... :	11/12/2019
Total number of pages..... :	60
Revision. ..... :	0
Modified page(s). ..... :	Creation
Compiled by. ..... :	Morgan PATEY
Approved by (+ signature). ..... :	David MONTAULON (Technical Manager)

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REPORT INDEX:

1. GENERAL INFORMATIONS

This document submits the results of Radio tests performed on the equipment **ST25R3916 Discovery Kit** (denominated hereafter E.U.T.: equipment under test) according to document(s) listed in §2 of this test report.

TESTING PROCEDURE AND TESTING LOCATION:	
Testing Laboratory	EMITECH MONTPELLIER laboratory & Open Area Test Site in SALINELLES (30)
Address	145 rue de Massacan 34740 VENDARGUES FRANCE
Test procedure	FCC IC Certification
Tested by	Morgan PATEY
Test supervisor	David MONTAULON
Date of receipt of test item	N/A
Date (s) of performance of tests	April, from 15th to September 11th of 2019

APPLICANT'S GENERAL INFORMATIONS:	
Company name	STMICROELECTRONICS SAS
Company address	190 Avenue Celestin Coq 13106 Rousset FRANCE
Person(s) present during the tests	Mr. ROMAN
Responsible	Mr. FIDELIS

GENERAL REMARKS:

The test results presented in this report relate only to the object tested.
The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

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Throughout this report the decimal separator is point.

POSSIBLE TEST CASE VERDICTS:	
Test case does not apply to the test object.	N/A
Information not communicated.	N/C
Test case not performed	N/P
Test object does meet the requirement.	P (Pass)
Test object does not meet the requirement.	F (Fail)
Test object was not subjected to all tests.	I (Inconclusive)

DEFINITIONS AND ABBREVIATIONS:

E.U.T.	Equipement under test	AE	Ancillary equipment
RBW	Resolution bandwidth	VBW	Video bandwidth
OATS	Open area test site	FAR	Full anechoic room
RF	Radio frequency	NTR	Nothing to report
SRD	Short Range Device	GPS	Global Positioning System

2. REFERENCE DOCUMENT(S)

NORMATIVE REFERENCES:
The following referenced documents are necessary for the application of the present test report. **FCC part 15, 2018** Code of federal regulations. Title 47- Telecommunication Chapter 1- Federal Communication Commission. Part 15- Radio frequency devices Subpart B- Unintentional Radiators. Limits and methods of measurement of radio disturbance. Characteristic of information technology equipment. **FCC part 15.225** Operation within the bands 13.553-13.567MHz **RSS-210, Issue 9, August 2016, Amendment November 2017** Licence-Exempt Radio Apparatus: Category I Equipment **RSS/CNR-Gen, Issue 5, March 2019, Amendment 1** General Requirements for Compliance of Radio Apparatus **ANSI C 63.10:2013** American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices **ANSI C 63.4:2014** American National Standard for Methods of measurement of Radio-Noise from low-voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
INFORMATIVE REFERENCES:
The following referenced documents are not necessary for the application of the present test report but they assist the user with regard to a particular subject area.

3. EQUIPMENT TECHNICAL DESCRIPTION

3.1. Test Conditions

Test item description.	:	NFC card reader evaluation board based on ST25R3916 integrated circuit
Model/Type reference.	:	ST25R3916-DISCO
Trade Mark.	:	STMICROELECTRONICS SAS
FCC ID.	:	YCPR3916DB1
IC.	:	8976A-R3916DB1
Serial number (S/N).	:	PRODV1.0.1
Part number (P/N).	:	Not communicated
Software version.	:	Not communicated
Firmware version.	:	ST25R3916/disco v1.0.1
Type of sample.	:	Pre-serial
Function(s).	:	NFC card reader evaluation board based on ST25R3916 integrated circuit. Additionally, the device also supports card emulation and peer-to-peer modes. This equipment is for use by developers for evalution purposes only and must not be incorporated into any other device or system
Manufacturer name.	:	STMICROELECTRONICS SAS
Address.	:	190 Avenue Celestin Coq 13106 Rousset FRANCE

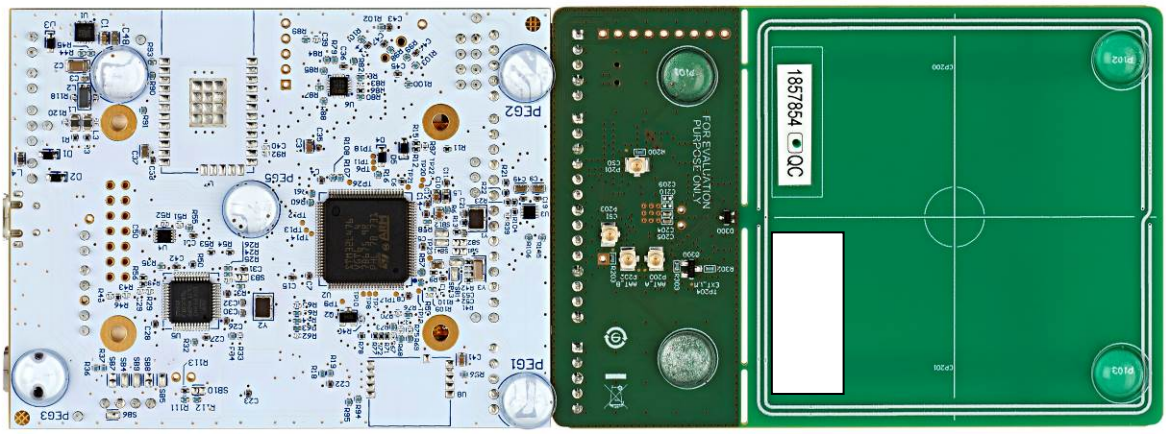
General product information:

N/A

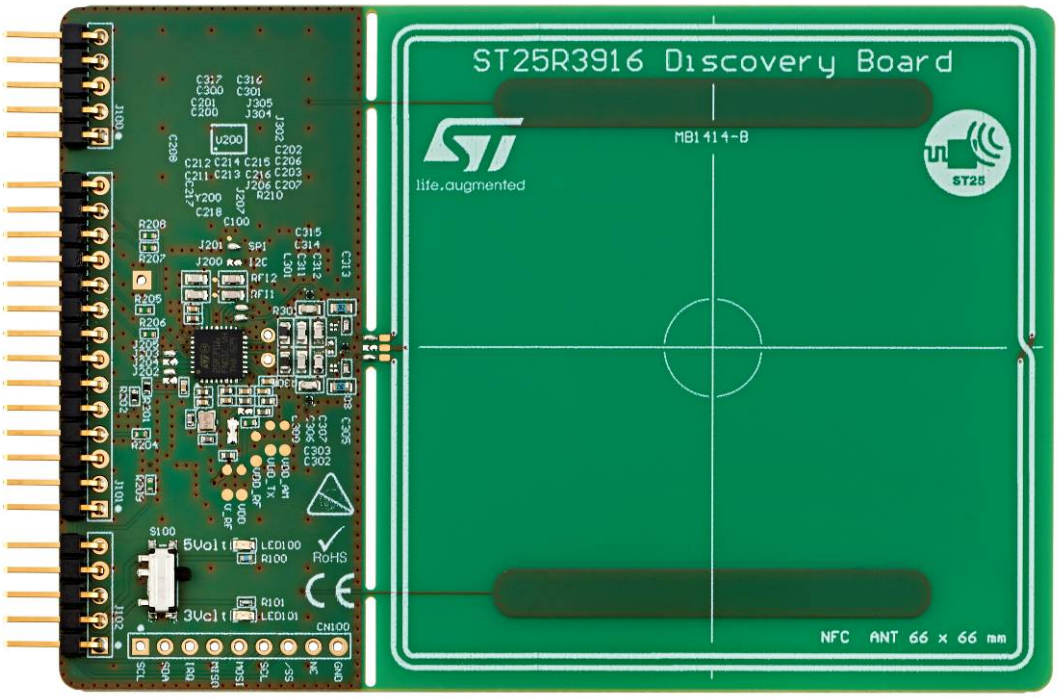
3.2. EUT general view

3.3. EUT top view

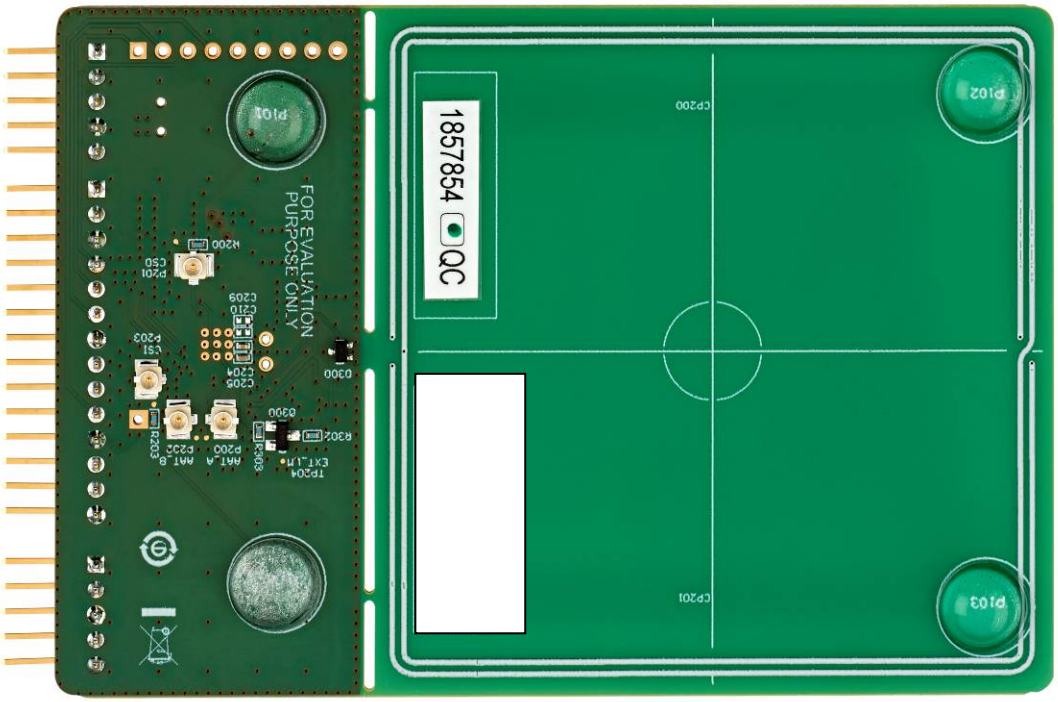
3.4. EUT bottom view



3.5. EUT Radio part top view

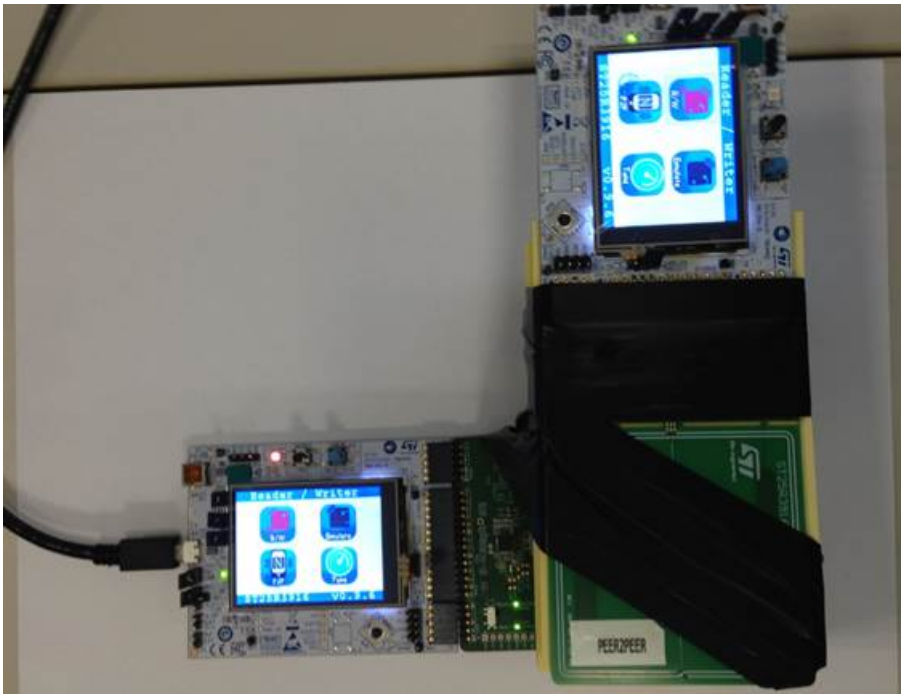


3.6. EUT Radio part bottom view



3.7. EUT (Tag mode)

3.8. EUT (Card emul or P2P mode)



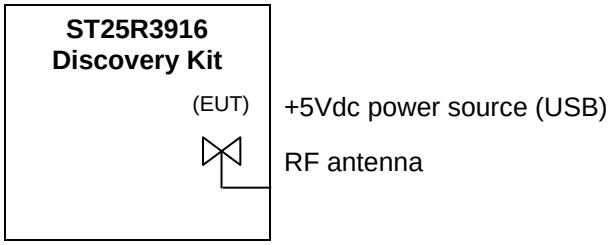
3.9. EUT Mechanical and Electrical Design

Power supply. ..... : 5 Vdc
Power supply range. ..... : +/-10%
Power type. ..... : USB
Power (mW). ..... : 2
Nominal current (mA). ..... : 200mA
Dimensions (L x W x H) (m). ..... : Not communicated
Weight (kg). ..... : 0.2
Temperature range (°C). ..... : -20 to +55°C
Ground bounding strap. ..... : No

Comments:

N/A

3.10. EUT Input/Output ports



PORT	NAME	TYPE	LENGHT	CABLE TYPE	COMMENTS
0	Main frame	N/E	N/A	N/A	PCB
1	DC power source	DC	<3m	N/A	5Vdc
2	RF antenna	RF	N/A	N/A	13.56MHz

AC/DC : AC/DC Converter port
I/O..... : Input or Output port
N/E ..... : Non Electrical port
AC ..... : Alternative current port
TP ..... : Telecommunication port
DC ..... : Discontinuous current port
RF..... : Radio frequency port

3.11. EUT Radio Specifications

a) GENERAL INFORMATIONS

According to manufacturer's declarations :

EUT type..... : Transceiver
Technology..... : SRD - RFID HF 13.56MHz
Environmental profile..... : Data transmissions
Temperature range..... : Category I (General) (-20°C to +55°C)
Antenna type ..... : Integral
Antenna Gain..... : N/A

Comments:

N/A

b) TRANSMITTER PARAMITTERS (TX)

Frequency bands..... : N/A
RF Power..... : 1.7W
Number of channels / Separation..... : 1
Modulation type ..... : AM
Duty cycle ..... : N/A
Tested frequency..... : 13.56MHz

c) RECEIVER PARAMETERS (RX)

Frequency bands..... : N/A
Category/Class ..... : Not communicated
Bandwidth..... : N/A

4. RESULT SUMMARY

TEST DESIGNATION	SEVERITY	VERDICT	COMMENTS
GENERAL			
Labeling requirements		N/P	See certification documents
Information to user		N/P	See certification documents
Home-built devices		N/A	
Kits		N/A	
Special Accessories		N/P	See certification documents
Inspection by the Commission		N/A	
Measurement standards		PASS	
Test procedure for CPU boards and computer power supplies		N/A	
Frequency range of radiated measurements		PASS	
Measurement detector functions and bandwidths		PASS	
Transition provisions for compliance with the rules		N/P	See certification documents
UNINTENTIONAL RADIATORS			
Equipment authorization			
- Verification		N/A	
- Declaration of Conformity		N/A	
CPU boards and power supplies used in personal computers		N/A	
Exempted device		N/A	
Information to the user		N/P	See certification documents
Conducted limits		PASS	
Radiated emission limits	Class B	PASS	
Antenna power conduction limits for receivers		N/A	
Power line carrier systems		N/A	
TV interface devices, including cable system terminal devices		N/A	
TV broadcast receivers		N/A	
Cable ready consumer electronics equipment		N/A	
Program blocking technology requirements for TV receivers		N/A	
Scanning receivers and frequency converters used with scanning receivers		N/A	
Labeling of digital cable ready products		N/A	
INTENTIONAL RADIATORS			

TEST DESIGNATION	SEVERITY	VERDICT	COMMENTS
Equipment authorization requirement		PASS	Transmitter part is subject to Certification procedure
Certified operating frequency range		N/A	
Antenna requirement		PASS	Dedicated integral antenna
External radio frequency power amplifiers and antenna modifications		N/A	
Restricted bands of operation		PASS	
Conducted limits	Class B	PASS	
Radiated emission limits; general requirements	Class B	PASS	
Tunnel radio systems		N/A	
Modular transmitters		N/A	
Cable locating equipment		N/A	
Cordless telephones		N/A	
Additional provisions to the general radiated emission limits		PASS	
Operation within the band 13.110-14.010 MHz.		PASS	
- **Field strength in the band 13.553-13.567 MHz**		PASS	
- **Field strength in the band 13.410-13.553 MHz and 13.567-13.710 MHz**		PASS	
- **Field strength in the band 13.110-13.410 MHz and 13.710-14.010 MHz**		PASS	
- **Field strength outside the band 13.110-14.010 MHz**		PASS	
- **Frequency tolerance of the carrier signal**		PASS	
- **Radio frequency powered tag**		N/A	EUT is an RFID reader

Sample subject to the test complies with the requirements of the reference document(s) listed in §2 of this test report and, where applicable, with deviation(s) specified in this document.

To declare, or not, the compliance with the specifications, it was not explicitly taken account of uncertainty associated with the results.

Opinion(s) and interpretation(s): N/A

5. MEASUREMENT UNCERTAINTY

PARAMETER	MAXIMAL EMITECH UNCERTAINTY	MINIMAL STANDARD UNCERTAINTY
Conducted emission		
(Artificial Mains Network) 150kHz – 30MHz	± 3.4 dB	± 3.4 dB
Radio frequency	± 1 x 10^{-7}	±1 x 10^{-7}
RF power, conducted		
RF power	± 0.8dB	± 1 dB
Power spectral density	± 2.3dB	± 3 dB
Occupied bandwidth		
RF power	± 1.2 %	± 5 %
Conducted emission (spurious)		
f ≤ 1 GHz	± 0.8 dB	± 3 dB
1 GHz - 12.75 GHz	± 1.6 dB	
Radiated emission (PAR / PIRE / RNE)		
f ≤ 62.5 MHz	± 5.1 dB	± 6 dB
62.5 MHz - 1 GHz	± 5.1 dB	± 6 dB
1 GHz - 18 GHz	± 5.2 dB	± 6 dB
18 GHz – 26 GHz	± 5.1 dB	± 6 dB
26 GHz – 40 GHz	± 5.4 dB	± 6 dB
PIRE and power spectral density with diode	± 5.4 dB	± 6 dB
Radiated emission (magnetic field)		
9kHz – 30MHz	± 2.7 dB	± 6 dB
Supply voltages	± 3 %	± 3 %
Temperature	± 1 °C	± 1°C
Humidity	± 5 %	± 5 %
Time / Duty cycle	± 4.4 %	± 5 %
Radiated emission (electric field for FCC standard)		
9kHz – 30MHz	± 2.7 dB	/
30MHz – 1GHz	± 5.2 dB	/
1GHz – 18GHz	± 5.3 dB	/
18GHz – 26GHz	± 5.5 dB	/
26GHz – 40GHz	± 5.5 dB	/

For the calcul of expanded uncertainty, the confidence interval is 95 % (k=2).

6. TEST CONDITIONS AND RESULTS

6.1. Conducted voltage emission (measurement)

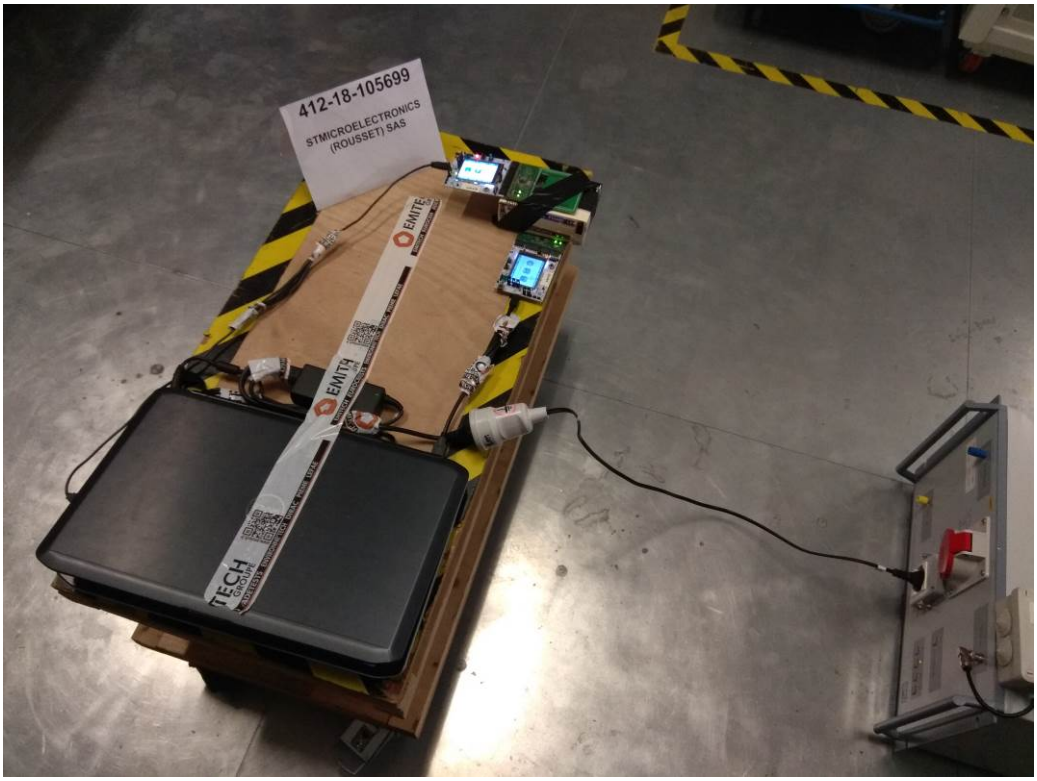
Reference standard:	FCC part 15.107, 15.207 and RSS-Gen
Test method:	ANSI C63.4: 2014
General test setup: Test is done inside a shielded room. EUT is set on an insulating support at 80cm above the ground reference plane. All power was connected to the system through Artificial Mains Network (AMN). The AMN is placed at 80cm from the boundary of the EUT and bonded to a ground reference plane.	

TESTED CABLE	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
115Vac/60Hz power supply / Reader mode	150kHz-30MHz	Class B	EMI4331	**PASS**
115Vac/60Hz power supply / Card emulation mode	150kHz-30MHz	Class B	EMI4345	**PASS**
115Vac/60Hz power supply / P2P mode	150kHz-30MHz	Class B	EMI4373	**PASS**

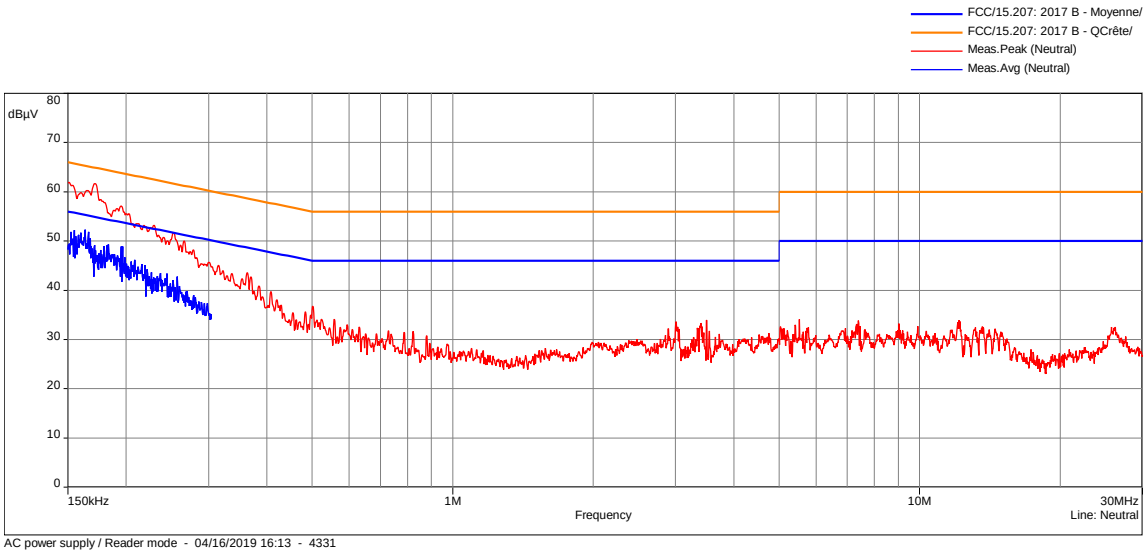
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	*See Graph(es)*
Relative Humidity	30 to 60 %	*See Graph(es)*
Atmospheric pressure	N/A	*See Graph(es)*
Test method deviation: N/A		
Supplementary information: EUT power supply is done trought a “standard power supply” wich meets FCC and RSS requirements.		

TEST EQUIPMENT USED					
CATEGORY	**BRAND**	**TYPE**	**IDENTIFIER**	**CAL. DATE**	**CAL. DUE**
AC power source	KIKUSUI	PCR2000L	0800	12/06/2018	12/08/2019
Cable	MICRO-COAX	N-3m	10536	12/10/2017	12/12/2019
Cable	EMITECH	Current absorber sheath	10653	19/10/2018	19/12/2020
Cable	SUCOFLEX	N-3m	14378	19/01/2017	19/09/2019
LISN	PMM	L2-16	1209	08/02/2018	08/04/2020
PE choke	EMITECH	CISPR 16-2-1 : 2008	10071		
Receiver	Rohde & Schwarz	ESI	9704	15/02/2019	15/04/2020
Shielded enclosure	COMTEST	SAC 3m	14494	14/02/2017	14/04/2020
Software	Nexio		0000		
Surges Suppressor	Hewlett Packard	11947A	0238	11/09/2017	11/11/2019
Thermohygrometer	Bioblock Scientific	Météostar	0963	25/01/2019	25/03/2021
Thermohygrometer	Testo	608-H2	12269	27/11/2017	27/01/2020

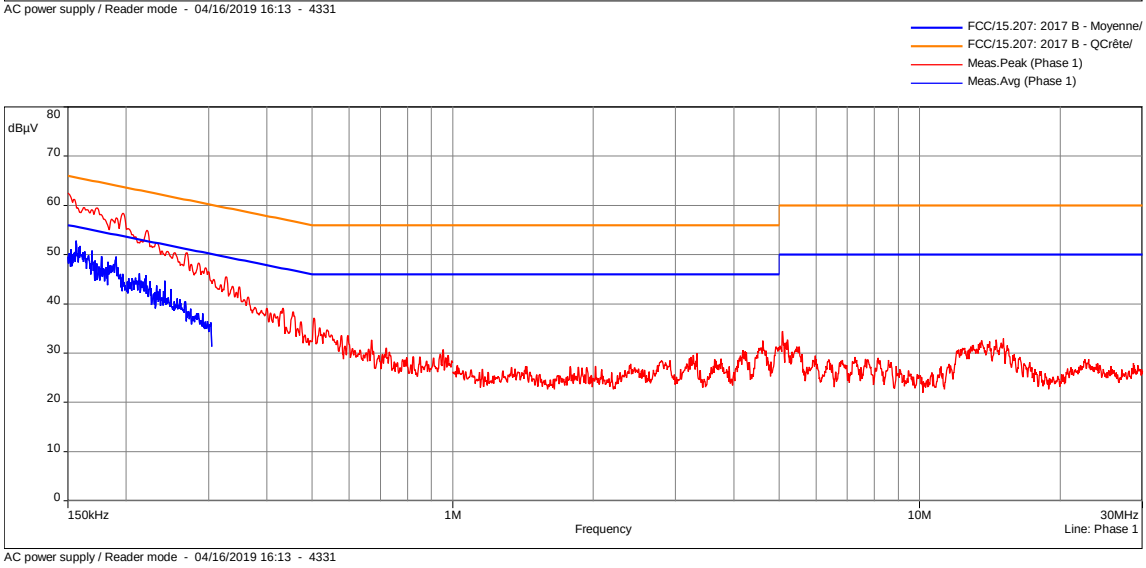
Blank cells = Permanent validity

TEST SETUP PHOTO(S) – POWER SUPPLY USED FOR CONDUCTED MEASUREMENT


CONDUCTED EMISSION (MEASUREMENT) - GRAPH			
AC POWER SUPPLY / READER MODE		EMI4331	
EUT mode:	#1	**T (°C):**	19.9
Test Date:	16/04/2019 16:13:21	**H (%):**	51.9
Test Operator:	MPA	**P (hPa):**	1002



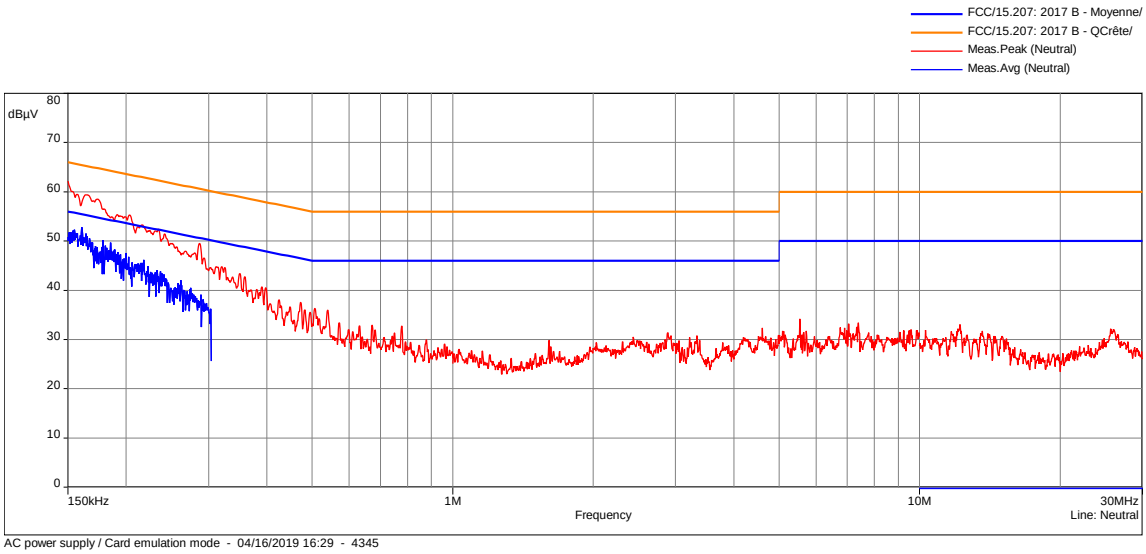
AC power supply / Reader mode - 04/16/2019 16:13 - 4331



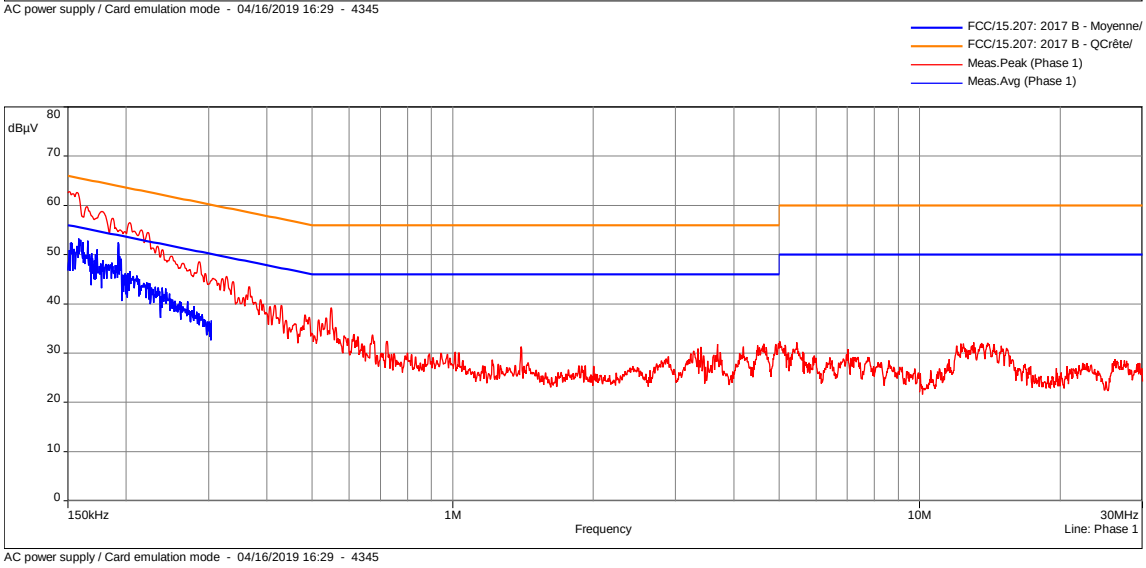
AC power supply / Reader mode - 04/16/2019 16:13 - 4331

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Neutral	150kHz-1MHz	10kHz	30kHz	Peak/Avg
Neutral	1MHz-10MHz	10kHz	30kHz	Peak
Neutral	10MHz-30MHz	10kHz	30kHz	Peak
Phase 1	150kHz-1MHz	10kHz	30kHz	Peak/Avg
Phase 1	1MHz-10MHz	10kHz	30kHz	Peak
Phase 1	10MHz-30MHz	10kHz	30kHz	Peak
Measure with:	A.M.N.			
Comments:				
EUT modification(s): N/A				

CONDUCTED EMISSION (MEASUREMENT) - GRAPH			
AC POWER SUPPLY / CARD EMULATION MODE		EMI4345	
EUT mode:	#1	**T (°C):**	19.9
Test Date:	16/04/2019 16:29:57	**H (%):**	51.9
Test Operator:	MPA	**P (hPa):**	1002



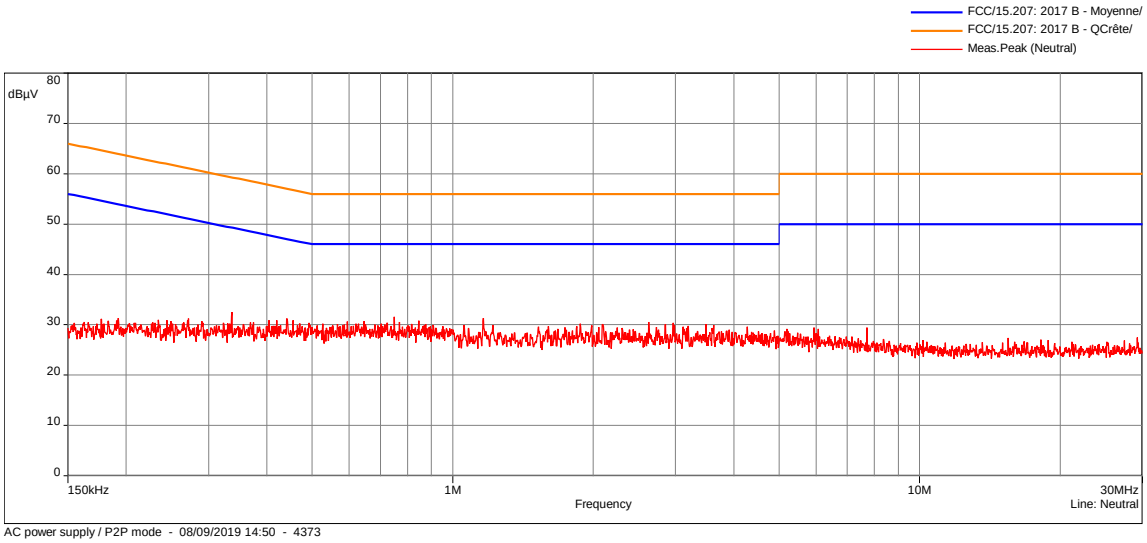
AC power supply / Card emulation mode - 04/16/2019 16:29 - 4345



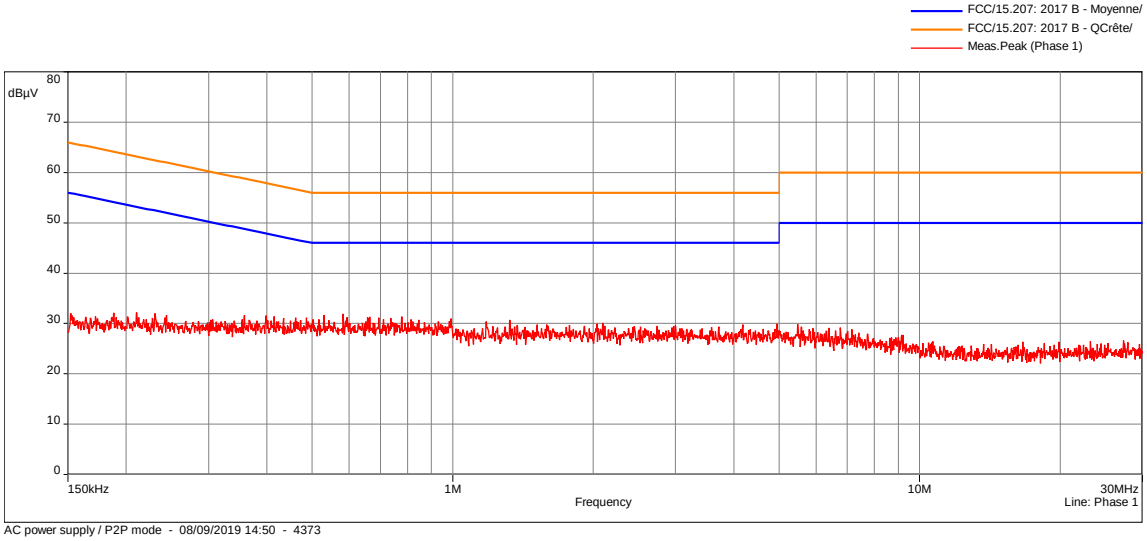
AC power supply / Card emulation mode - 04/16/2019 16:29 - 4345

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Neutral	150kHz-1MHz	10kHz	30kHz	Peak/Avg
Neutral	1MHz-10MHz	10kHz	30kHz	Peak
Neutral	10MHz-30MHz	10kHz	30kHz	Peak
Phase 1	150kHz-1MHz	10kHz	30kHz	Peak/Avg
Phase 1	1MHz-10MHz	10kHz	30kHz	Peak
Phase 1	10MHz-30MHz	10kHz	30kHz	Peak
Measure with:	A.M.N.			
Comments:				
EUT modification(s): N/A				

CONDUCTED EMISSION (MEASUREMENT) - GRAPH			
AC POWER SUPPLY / P2P MODE		EMI4373	
EUT mode:	#1	**T (°C):**	19.9
Test Date:	09/08/2019 14:50:09	**H (%):**	51.9
Test Operator:	MPA	**P (hPa):**	1002



AC power supply / P2P mode - 08/09/2019 14:50 - 4373



AC power supply / P2P mode - 08/09/2019 14:50 - 4373

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Neutral	150kHz-1MHz	10kHz	30kHz	Peak
Neutral	1MHz-10MHz	10kHz	30kHz	Peak
Neutral	10MHz-30MHz	10kHz	30kHz	Peak
Phase 1	150kHz-1MHz	10kHz	30kHz	Peak
Phase 1	1MHz-10MHz	10kHz	30kHz	Peak
Phase 1	10MHz-30MHz	10kHz	30kHz	Peak
Measure with:	A.M.N.			
Comments:				

EUT modification(s): N/A

6.2. Occupied Bandwidth

Reference standard:	FCC part 15 Radio part 15.225 & RSS-210
Test method:	FCC part 15.225 & RSS-210
Test description: The occupied bandwidth (OBW) is the Frequency Range in which 99 % of the total mean power of a given emission falls. The residual part of the total power being denoted as β, which, in cases of symmetrical spectra, splits up into β/2 on each side of the spectrum. Unless otherwise specified, β/2 is taken as 0,5 %. The maximum occupied bandwidth includes all associated side bands above the appropriate emissions level and the frequency error or drift under extreme test conditions. EUT is connected to the measuring receiver via 50Ω attenuator(s).	

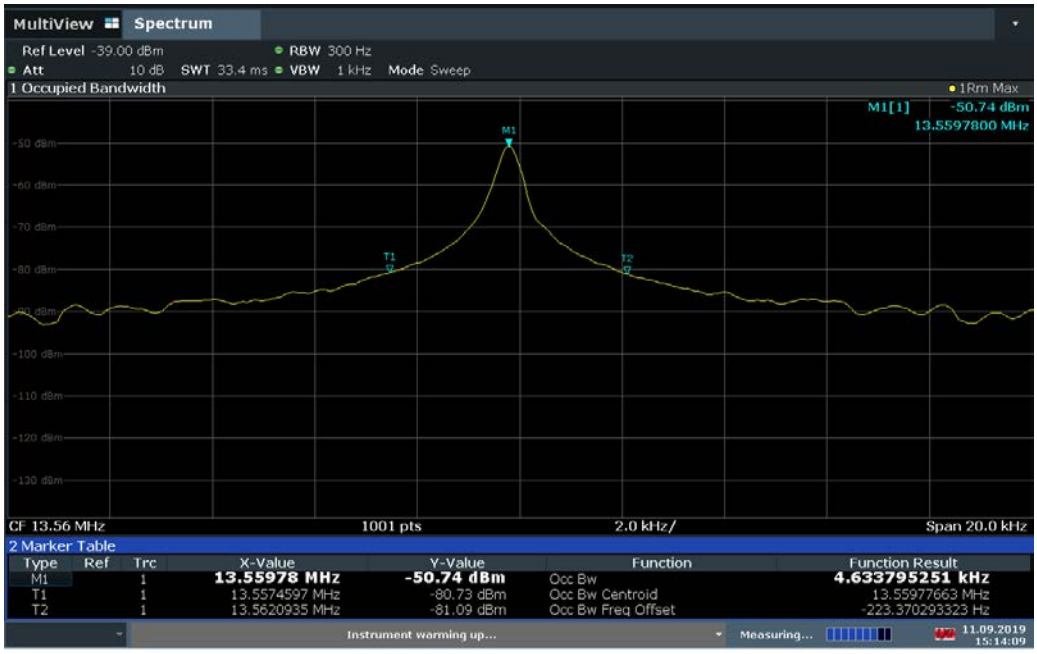
TESTED PARAMETER	OBW	SEVERITY	RESULT TAB.	VERDICT
99% Bandwidth	7.7944 kHz	<14kHz	EMI5993	**PASS**

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	21.3°C
Relative Humidity	20 to 75 %	39.4 %
Atmospheric pressure	N/A	1015 hPa
Test method deviation: N/A		
Supplementary information: Test is done in the worst observed configuration: Reader mode + P2P mode at the same time.		

TEST EQUIPMENT USED					
CATEGORY	**BRAND**	**TYPE**	**IDENTIFIER**	**CAL. DATE**	**CAL. DUE**
AC power source	KIKUSUI	PCR4000L	3074	24/07/2019	24/09/2020
Antenna	Emitech	3.5 cm	4653		
Cable	MICRO-COAX	N-3m	10537	05/07/2019	05/07/2021
Multimeter	FLUKE	8808A	12446	19/07/2019	19/09/2020
Spectrum analyzer	Rohde & Schwarz	FSW43	14830	28/12/2018	28/02/2020
Thermohygrometer	Bioblock Scientific	Météostar	0963	25/01/2019	25/03/2021
Thermohygrometer	Testo	608-H2	12268	27/11/2017	27/01/2020

Blank cells = Permanent validity

OCCUPIED BANDWIDTH - GRAPH		
99% BANDWIDTH		EMI5993
EUT mode:	D-M3	
Test Date:	11/09/2019	
Test Operator:	MPA	



15:14:10 11.09.2019

Results:	The system has an OBW of 4.633 kHz

EUT modification(s): N/A

6.3. Radiated spurious emissions

Reference standard:	FCC part 15 Radio part 15.225 & CNR-Gen
Test method:	FCC part 15.109, 15.209, 15.205, 15.215, CNR-Gen

General test setup: For f <30MHz, EUT is set on an insulating support at 80cm above the ground reference plane.

Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter in a semi-anechoic chamber. The EUT was rotated 360°in order to maximize radiated levels. Test antenna was oriented in 3 axes (0°, 45° and 90°).

Final measurements (quasi-peak) were then performed in a 10-meter Open Area Test Site that complies to CISPR 16 in the same measurement conditions.

For f > 30MHz, EUT is set on an insulating support at 80cm above the ground reference plane (150cm for f >1GHz).

Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities.

Final measurements (quasi-peak or average) were then performed in a semi-anechoic chamber or Open Area Test Site that complies to CISPR 16. The EUT was rotated 360° about its azimuth and adjusting the receive antenna height from 1 to 4 m.

All frequencies were investigated, where applicable.

For portable equipements a research of maximum level is done on the 3 axes. Only the highest levels are recorded.

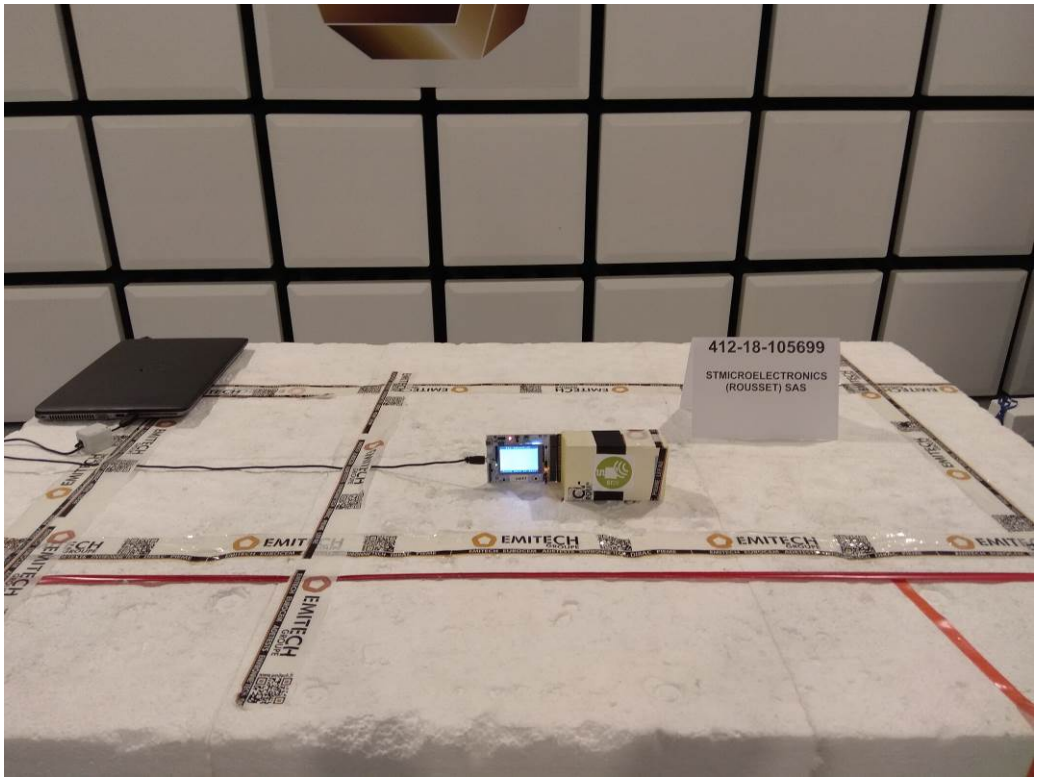
TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
TX / 0° / Card emulation mode / Position 1	9kHz-30MHz	15.209	EMI4272	**PASS**
TX / 45° / Card emulation mode / Position 1	9kHz-30MHz	15.209	EMI4273	**PASS**
TX / 90° / Card emulation mode / Position 1	9kHz-30MHz	15.209	EMI4274	**PASS**
TX / 0° / Card emulation mode / Position 2	9kHz-30MHz	15.209	EMI4275	**PASS**
TX / 45° / Card emulation mode / Position 2	9kHz-30MHz	15.209	EMI4276	**PASS**
TX / 90° / Card emulation mode / Position 2	9kHz-30MHz	15.209	EMI4277	**PASS**
TX / 0° / P2P mode / Position 1	9kHz-30MHz	15.209	EMI4278	**PASS**
TX / 45° / P2P mode / Position 1	9kHz-30MHz	15.209	EMI4279	**PASS**
TX / 90° / P2P mode / Position 1	9kHz-30MHz	15.209	EMI4280	**PASS**
TX / 0° / P2P mode / Position 2	9kHz-30MHz	15.209	EMI4281	**PASS**
TX / 45° / P2P mode / Position 2	9kHz-30MHz	15.209	EMI4282	**PASS**
TX / 90° / P2P mode / Position 2	9kHz-30MHz	15.209	EMI4283	**PASS**
TX / 0° / Mode reader / Position 1	9kHz-30MHz	15.209	EMI4284	**PASS**
TX / 45° / Mode reader / Position 1	9kHz-30MHz	15.209	EMI4285	**PASS**
TX / 90° / Mode reader / Position 1	9kHz-30MHz	15.209	EMI4286	**PASS**
TX / 0° / Mode reader / Position 2	9kHz-30MHz	15.209	EMI4287	**PASS**
TX / 45° / Mode reader / Position 2	9kHz-30MHz	15.209	EMI4288	**PASS**
TX / 90° / Mode reader / Position 2	9kHz-30MHz	15.209	EMI4289	**PASS**
TX / 0° / Mode reader / Position 3	9kHz-30MHz	15.209	EMI4290	**PASS**
TX / 45° / Mode reader / Position 3	9kHz-30MHz	15.209	EMI4291	**PASS**
TX / 90° / Mode reader / Position 3	9kHz-30MHz	15.209	EMI4292	**PASS**
Tx mode / Mode reader / Position 1	30MHz-1GHz	15.209	EMI4223	**PASS**

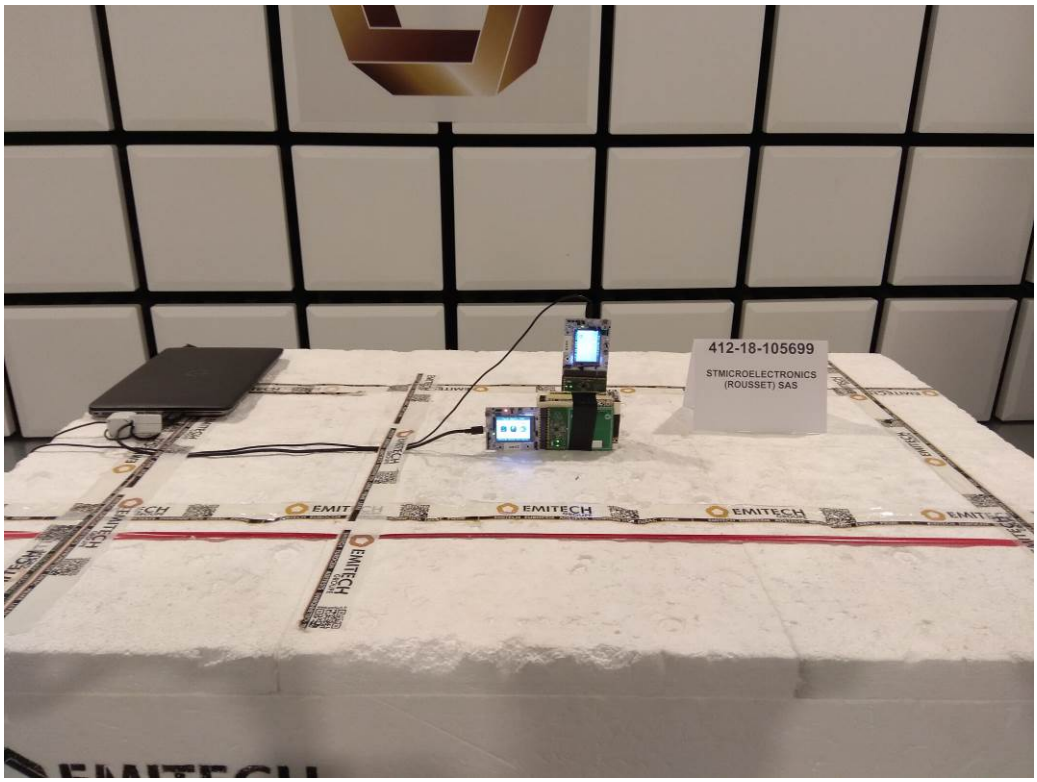
TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Tx mode / Mode reader / Position 2	30MHz-1GHz	15.209	EMI4224	**PASS**
Tx mode / Mode reader / Position 3	30MHz-1GHz	15.209	EMI4225	**PASS**
Tx mode / Card emulation mode / Position 1	30MHz-1GHz	15.209	EMI4227	**PASS**
Tx mode / Card emulation mode / Position 2	30MHz-1GHz	15.209	EMI4228	**PASS**
Tx mode / P2P mode / Position 1	30MHz-1GHz	15.209	EMI4229	**PASS**
Tx mode / P2P mode / Position 2	30MHz-1GHz	15.209	EMI4230	**PASS**

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	*See Graph(es)*
Relative Humidity	20 to 75 %	*See Graph(es)*
Atmospheric pressure	N/A	*See Graph(es)*
Test method deviation: N/A		
Supplementary information: From 9 kHz to 30MHz: limit indicated on the curves is calculated with 40 dB/decade extrapolation factor and 51.5 dB conversion factor. From 30MHz to 1GHz Quasi peak limit provided is the limit given in §15.209.		

TEST EQUIPMENT USED					
CATEGORY	**BRAND**	**TYPE**	**IDENTIFIER**	**CAL. DATE**	**CAL. DUE**
AC power source	CHROMA	61603	12532	24/04/2018	24/06/2019
Antenna	Rohde & Schwarz	HFH2-Z2	5825	20/09/2017	20/11/2019
Antenna	Electro Metrics	BIA-30HF	0824	13/06/2018	13/08/2021
Antenna	Rohde & Schwarz	HL223	3126	13/06/2018	13/08/2021
Cable	SUCOFLEX	N-3m	14378	19/07/2017	19/09/2019
Cable	SUCOFLEX	N-6,5m	14380	19/07/2017	19/09/2019
Cable	TechniWAVE	N-0.23m	14891	23/02/2018	23/04/2020
Cable	TechniWAVE	N-0.23m	14899	23/02/2018	23/04/2020
Cable	MegaPhase	N-8m	15813	12/11/2018	12/01/2021
Receiver	Agilent Technologies	E4440A	5824	18/04/2018	18/06/2020
Shielded enclosure	COMTEST	SAC 3m	14494	14/02/2017	14/04/2020
Software	Nexio		0000		
Thermohygrometer	Bioblock Scientific	Météostar	0963	25/01/2019	25/03/2021
Thermohygrometer	Testo	608-H2	12269	27/11/2017	27/01/2020
Turntable	Maturo	NCD	14657		

Blank cells = Permanent validity

TEST SETUP PHOTO(S) RADIATED EMISSIONS POSITION / READER MODE


TEST SETUP PHOTO(S) RADIATED EMISSIONS POSITION / CARD EMULATION & P2P MODE


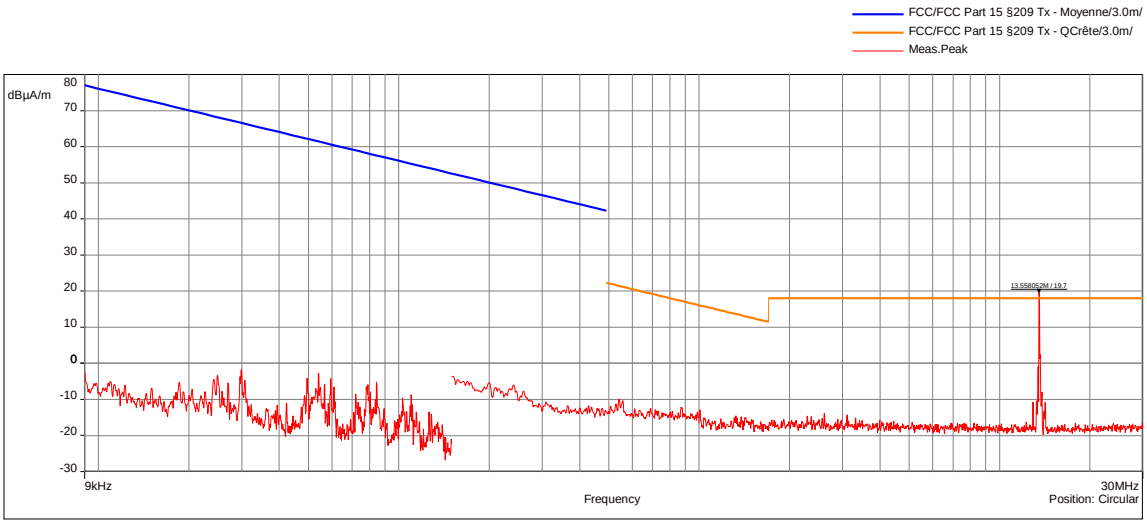
TEST SETUP PHOTO(S) RADIATED EMISSIONS (30MHZ-200MHZ)


TEST SETUP PHOTO(S) RADIATED EMISSIONS (200MHZ-1GHZ)


TEST SETUP PHOTO(S) RADIATED EMISSION(F<30MHZ, PRE MEASUREMENT)

TEST SETUP PHOTO(S) RADIATED EMISSION(F<30MHZ, FINAL MEASUREMENT)

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 0° / CARD EMULATION MODE / POSITION 1		EMI4272	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:05:04	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002

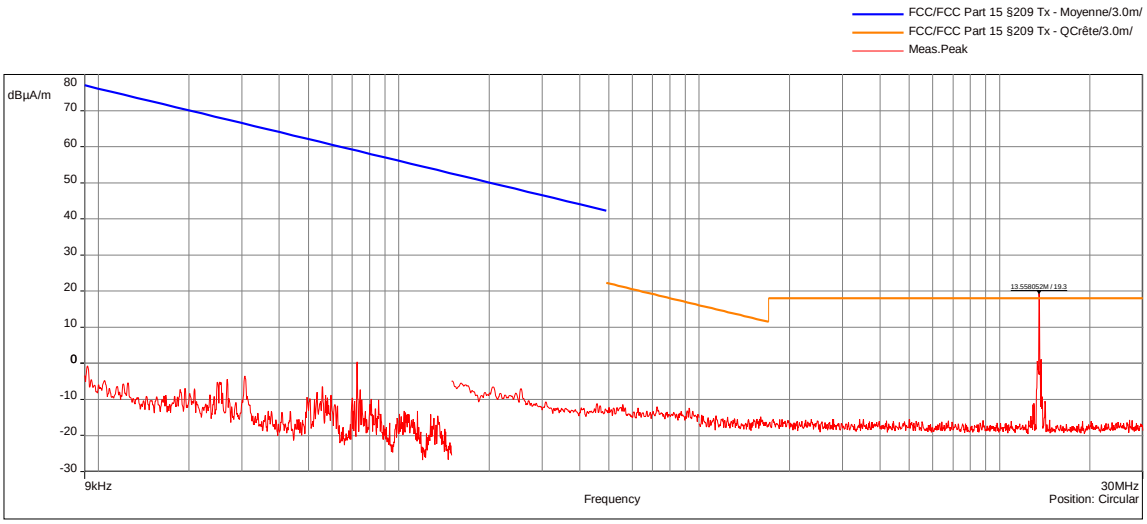


POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak

Configuration:	N/A
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency
EUT modification(s): N/A	

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

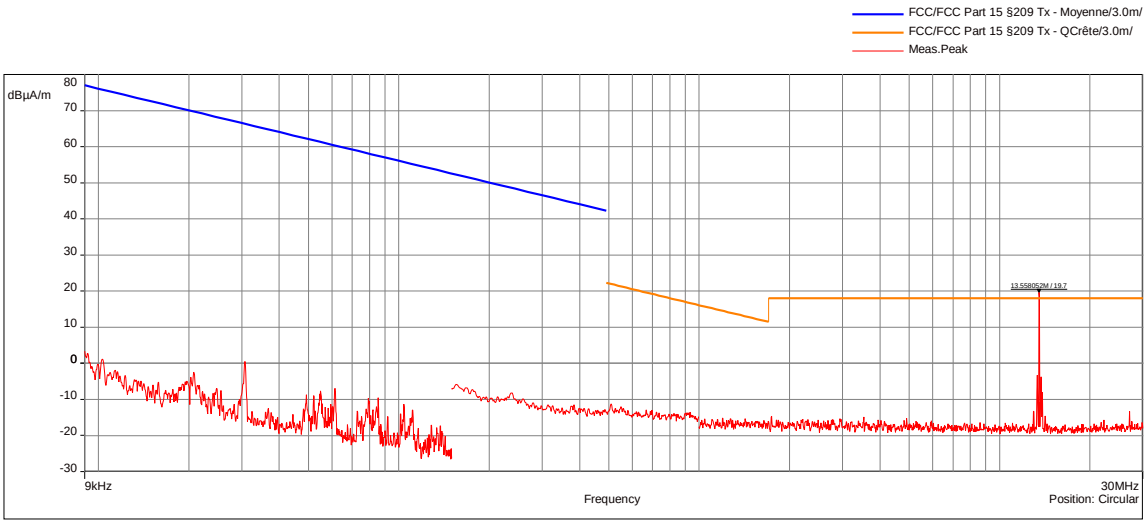
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 45° / CARD EMULATION MODE / POSITION 1		EMI4273	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:08:00	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 90° / CARD EMULATION MODE / POSITION 1		EMI4274	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:11:30	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002

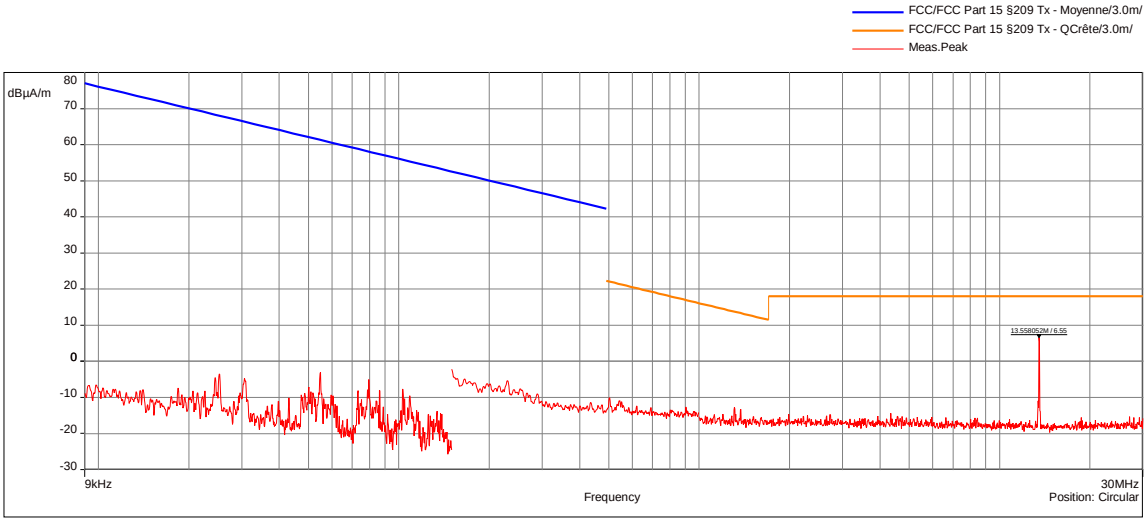


POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak

Configuration:	N/A
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency
EUT modification(s): N/A	

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

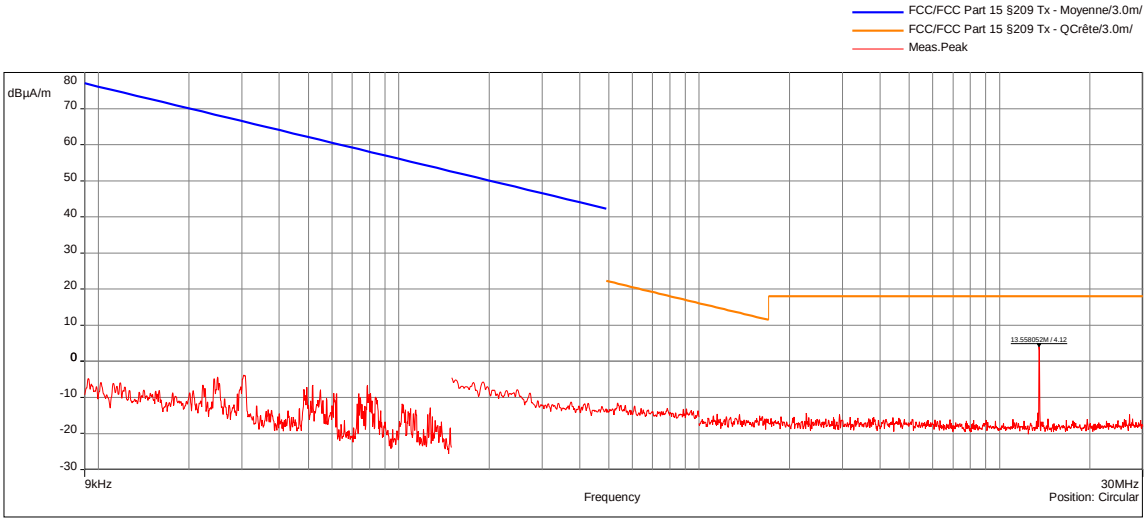
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 0° / CARD EMULATION MODE / POSITION 2		EMI4275	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:14:40	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 45° / CARD EMULATION MODE / POSITION 2		EMI4276	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:19:25	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002

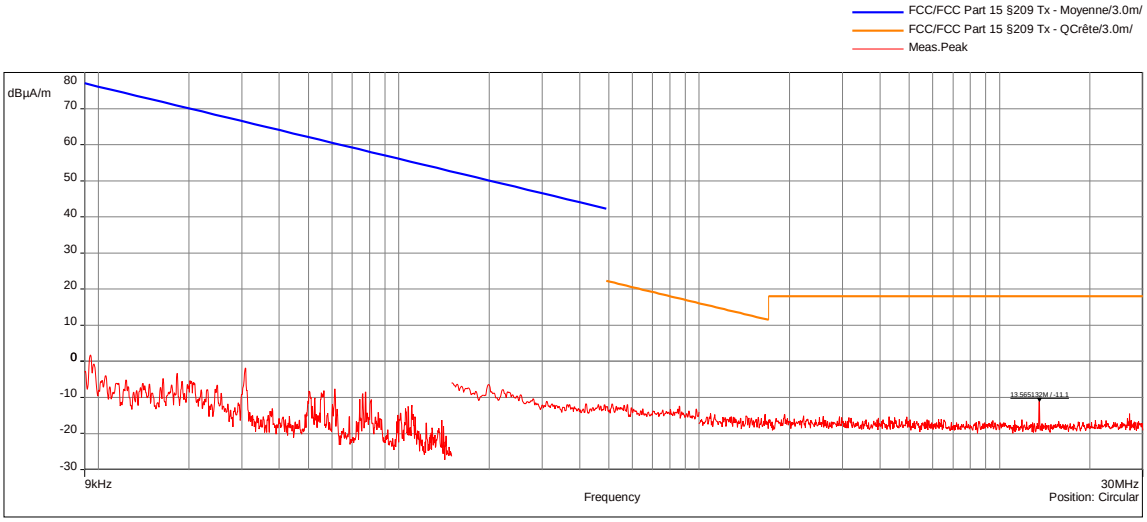


POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak

Configuration:	N/A
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency
EUT modification(s): N/A	

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

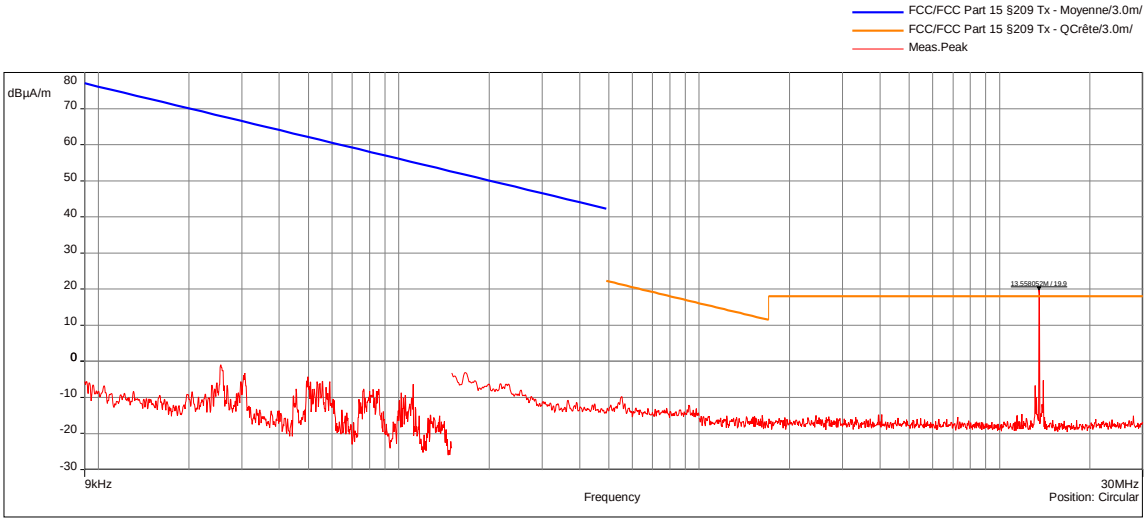
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 90° / CARD EMULATION MODE / POSITION 2		EMI4277	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:22:39	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

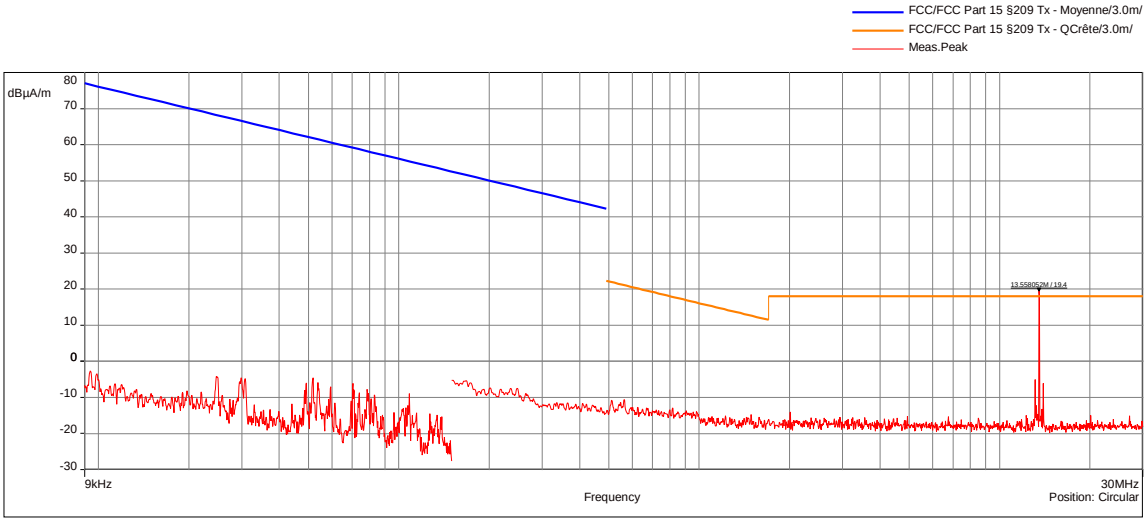
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 0° / P2P MODE / POSITION 1		EMI4278	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:26:53	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

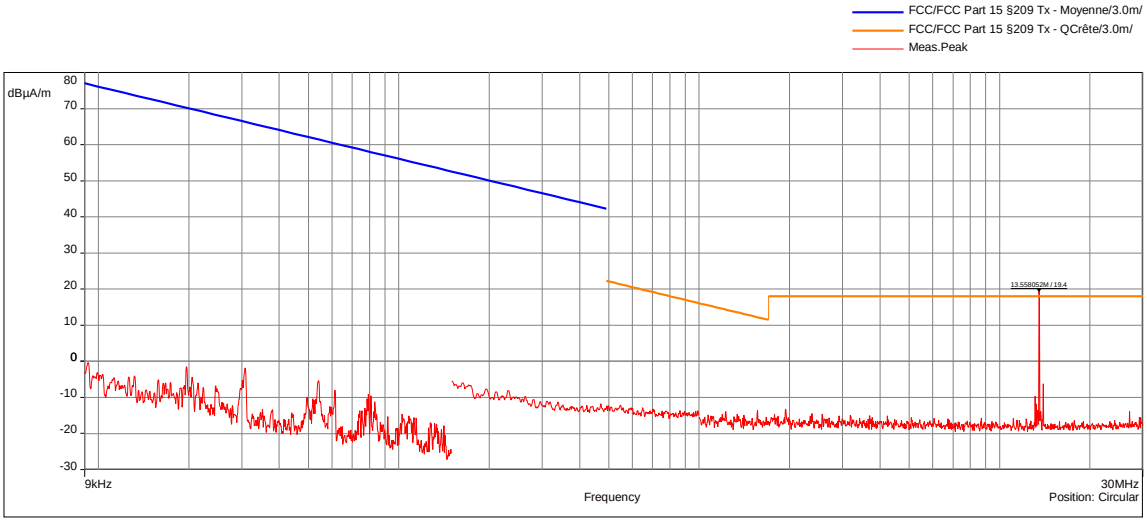
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 45° / P2P MODE / POSITION 1		EMI4279	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:34:03	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 90° / P2P MODE / POSITION 1		EMI4280	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:36:09	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002

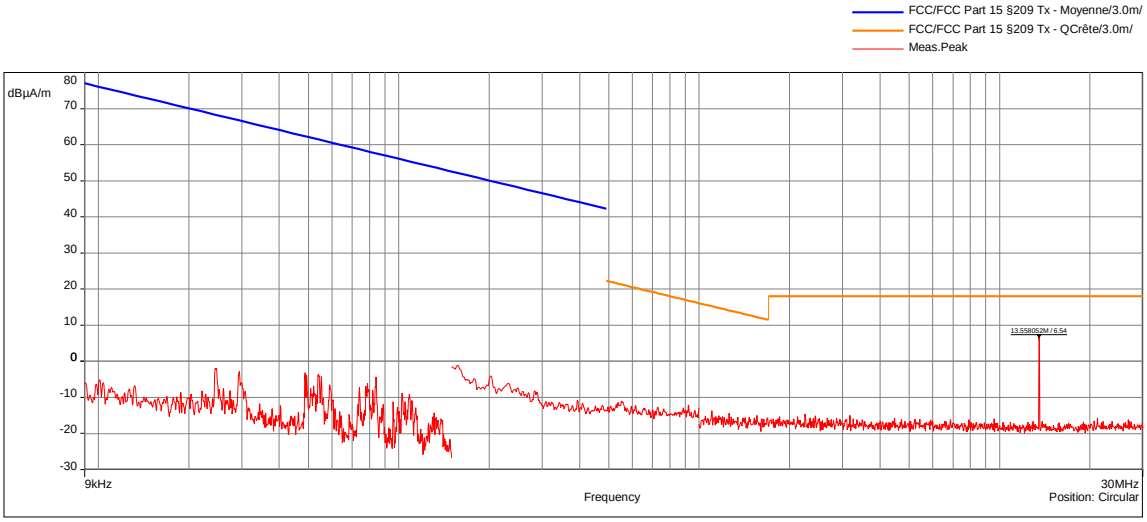


POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak

Configuration:	N/A
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency
EUT modification(s): N/A	

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

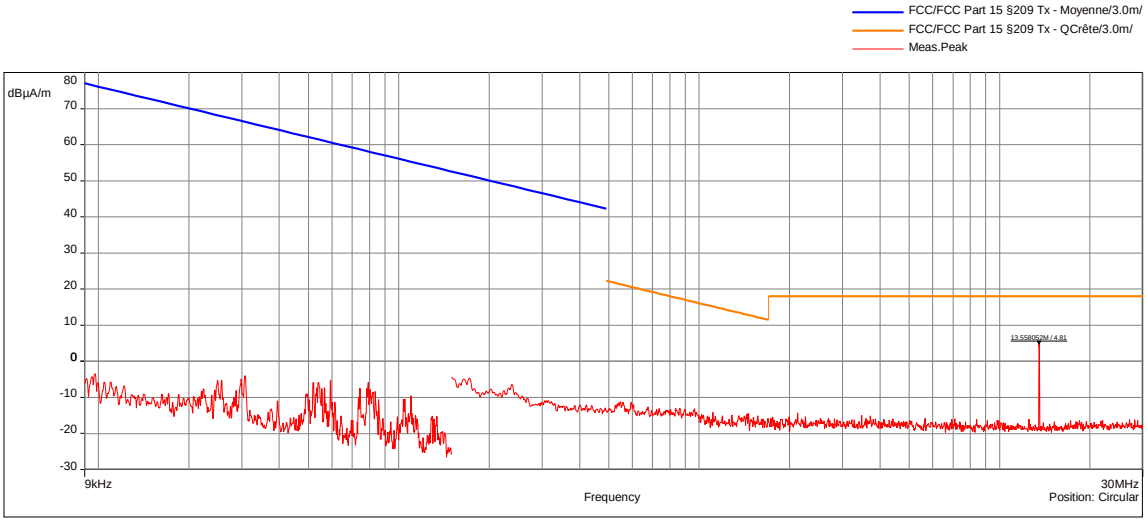
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 0° / P2P MODE / POSITION 2		EMI4281	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:39:33	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

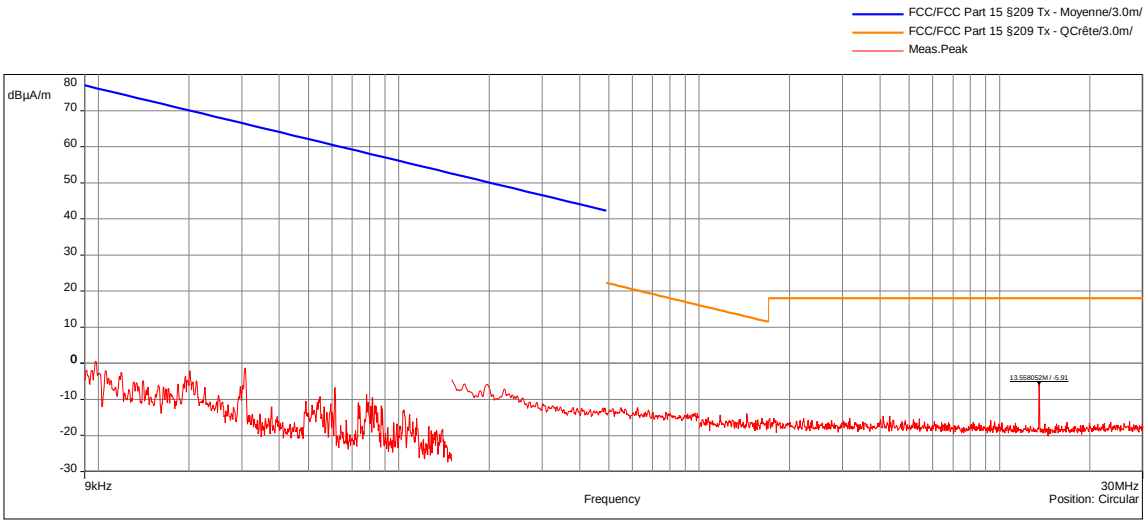
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 45° / P2P MODE / POSITION 2		EMI4282	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:46:22	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

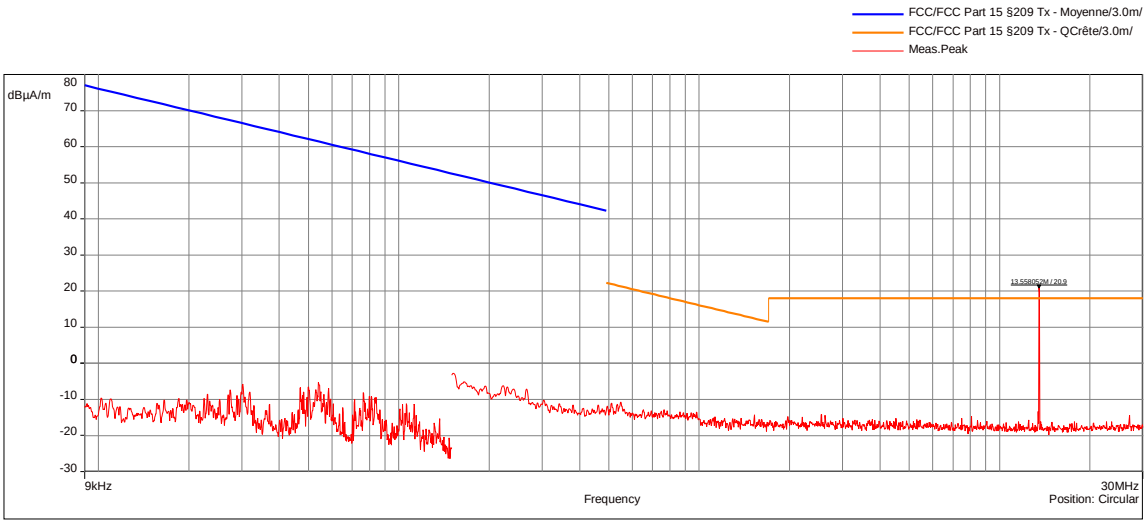
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 90° / P2P MODE / POSITION 2		EMI4283	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:49:05	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

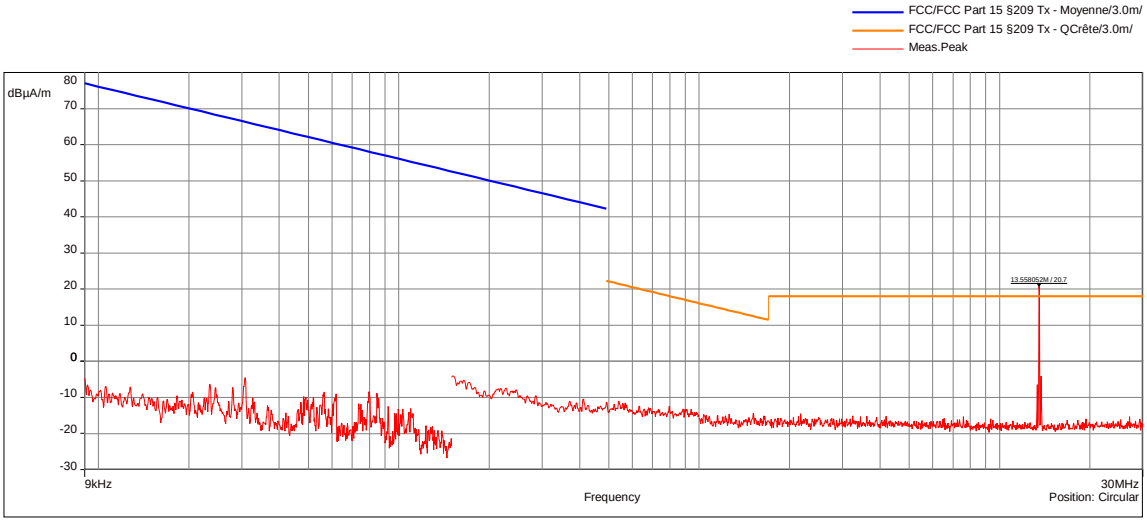
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 0° / MODE READER / POSITION 1		EMI4284	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:53:02	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

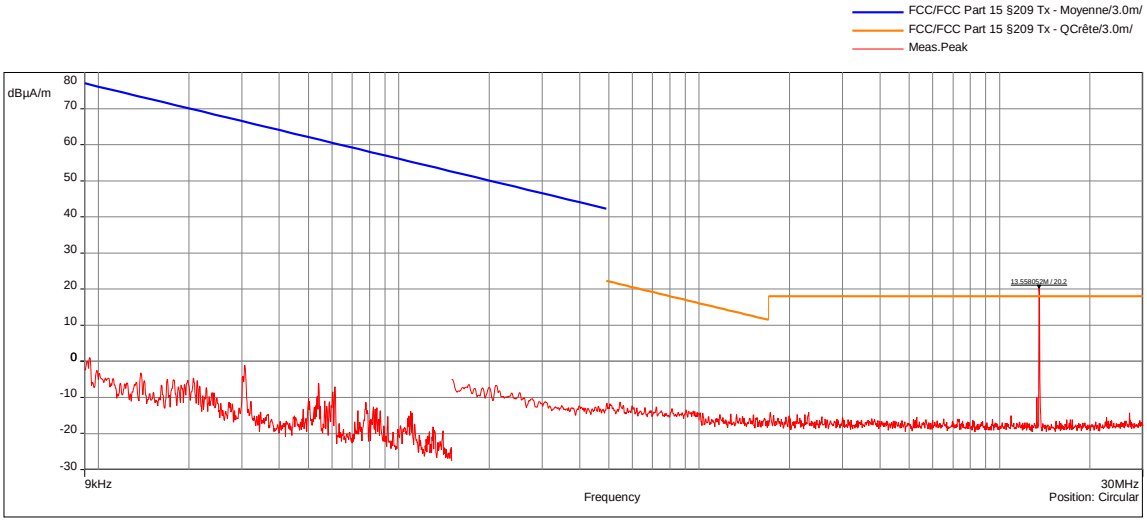
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 45° / MODE READER / POSITION 1		EMI4285	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 14:57:37	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

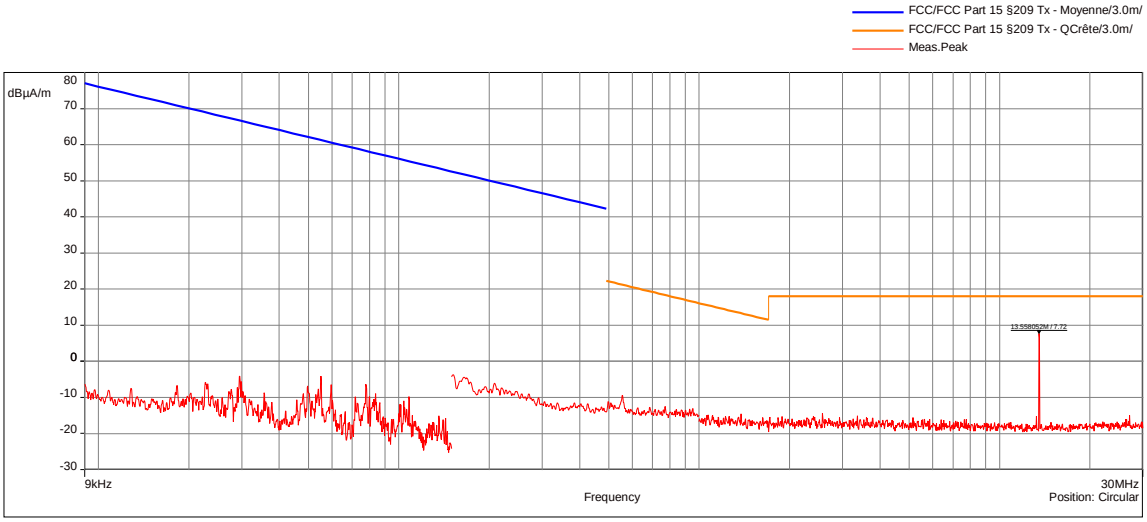
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 90° / MODE READER / POSITION 1		EMI4286	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 15:01:31	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

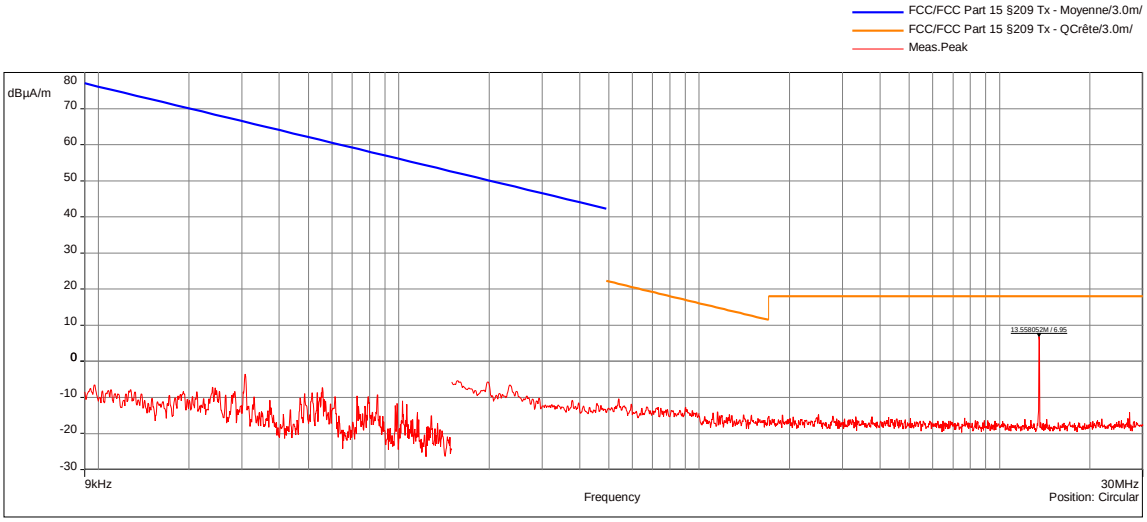
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 0° / MODE READER / POSITION 2		EMI4287	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 15:18:58	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 45° / MODE READER / POSITION 2		EMI4288	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 15:22:28	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002

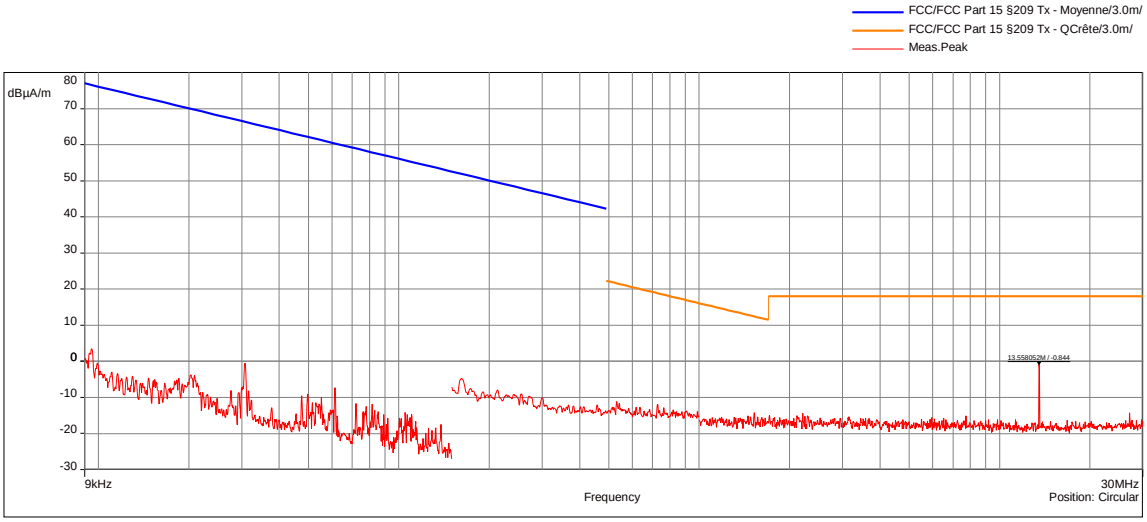


POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak

Configuration:	N/A
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency
EUT modification(s): N/A	

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

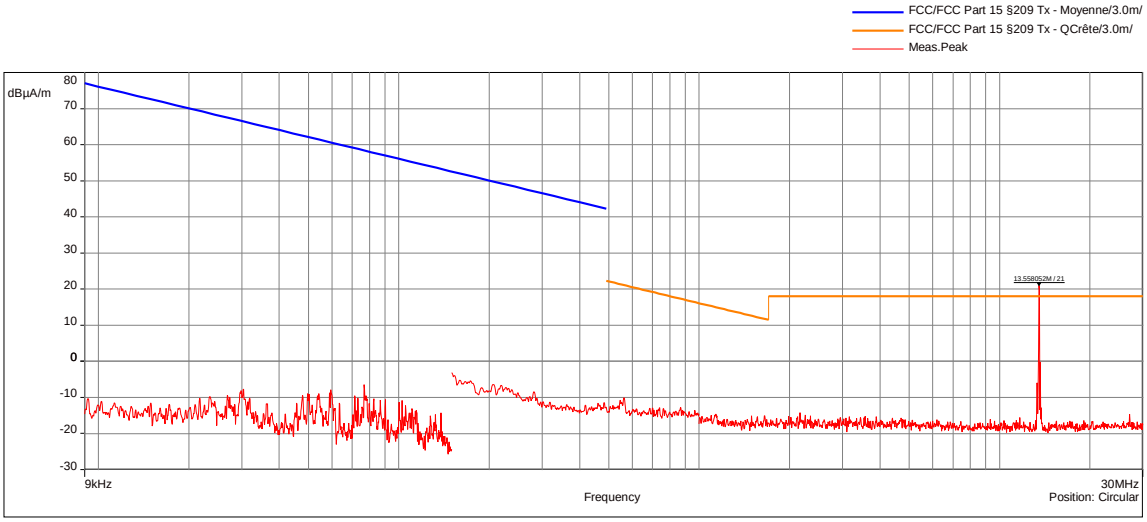
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 90° / MODE READER / POSITION 2		EMI4289	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 15:25:26	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

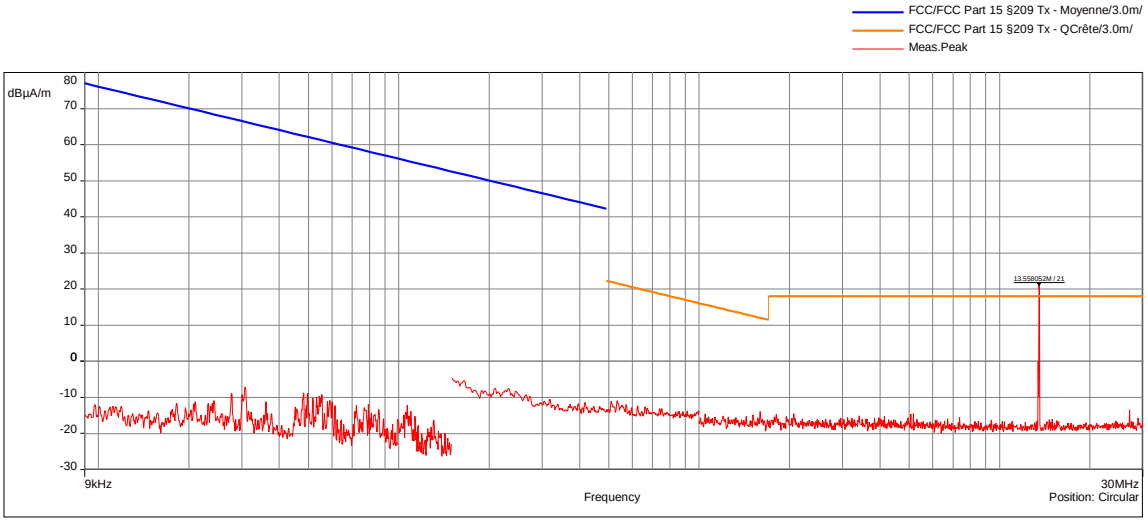
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 0° / MODE READER / POSITION 3		EMI4290	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 15:30:24	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 45° / MODE READER / POSITION 3		EMI4291	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 15:33:40	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002

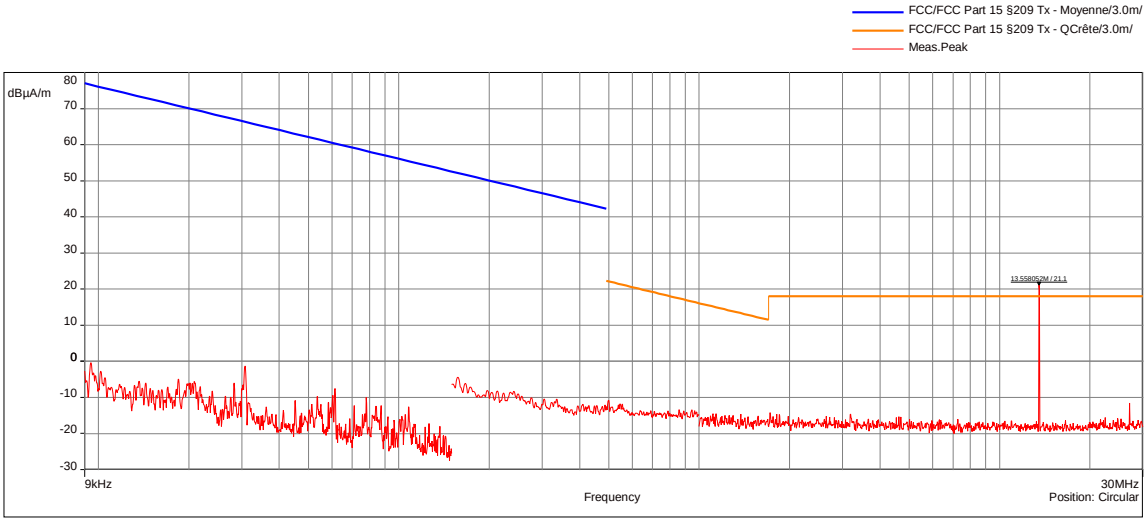


POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak

Configuration:	N/A
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency
EUT modification(s): N/A	

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

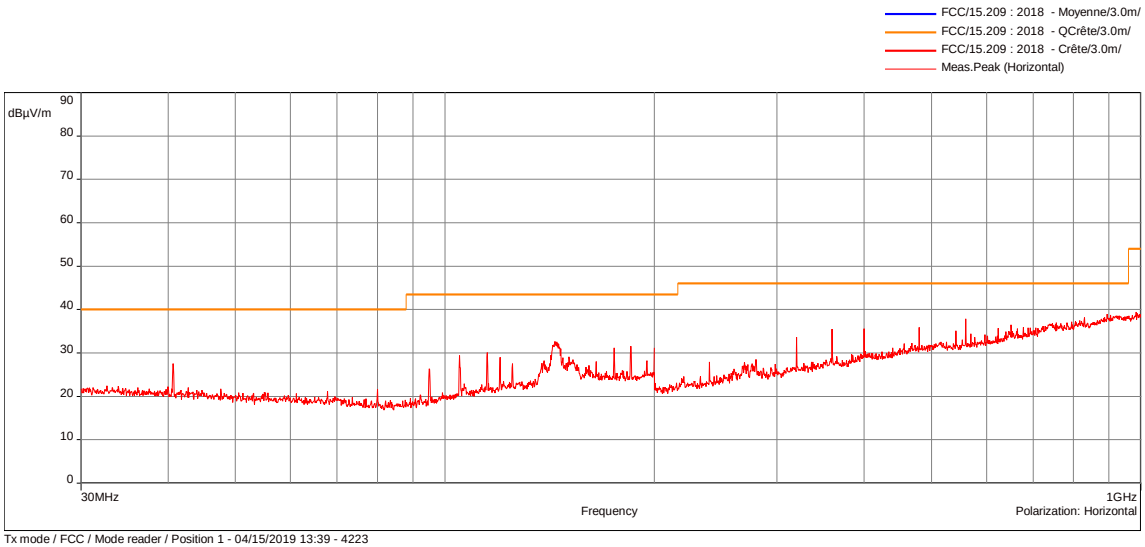
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
TX / 90° / MODE READER / POSITION 3		EMI4292	
EUT mode:	D-M2	**T (°C):**	19.1
Test Date:	16/04/2019 15:36:31	**H (%):**	47
Test Operator:	MPA	**P (hPa):**	1002



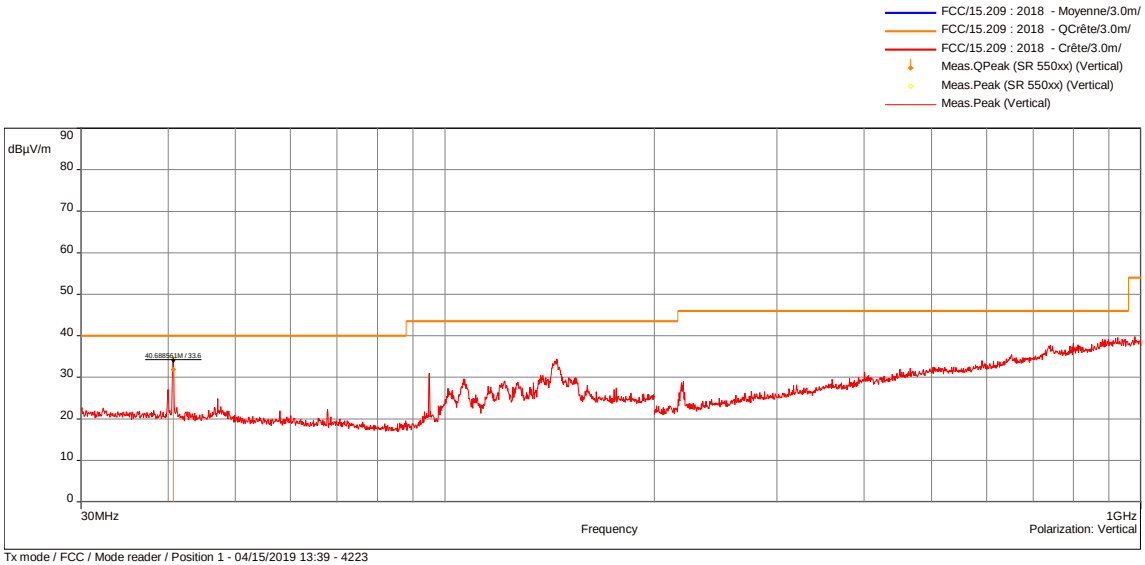
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. 13.56MHz : Util frequency			
EUT modification(s): N/A				

No spurious emissions were detected.
Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
TX MODE / MODE READER / POSITION 1		EMI4223	
EUT mode:	D-M2	**T (°C):**	19.8
Test Date:	15/04/2019 13:39:23	**H (%):**	29.8
Test Operator:	MPA	**P (hPa):**	1012



Tx mode / FCC / Mode reader / Position 1 - 04/15/2019 13:39 - 4223

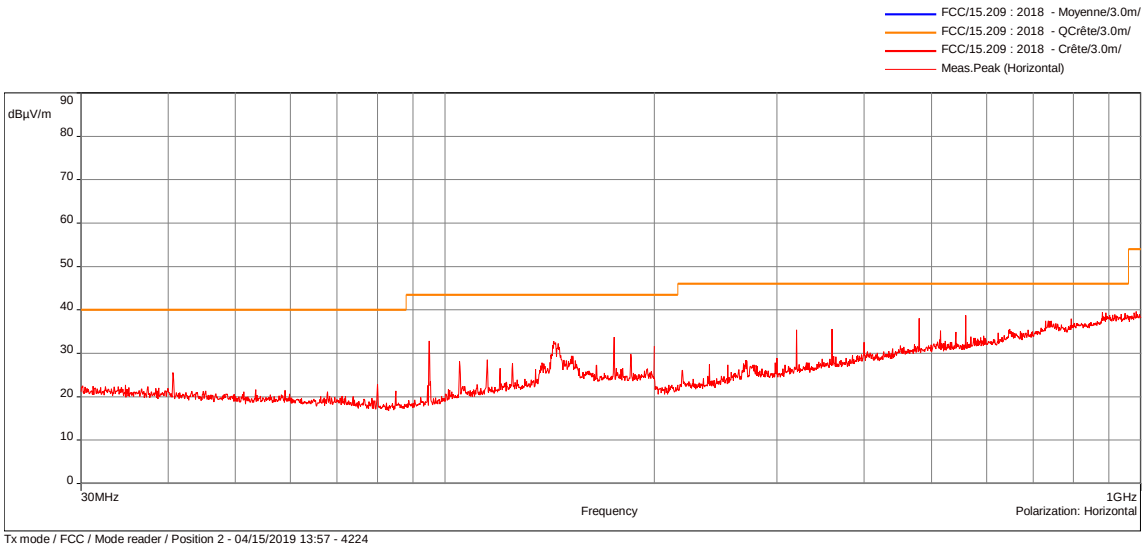


Tx mode / FCC / Mode reader / Position 1 - 04/15/2019 13:39 - 4223

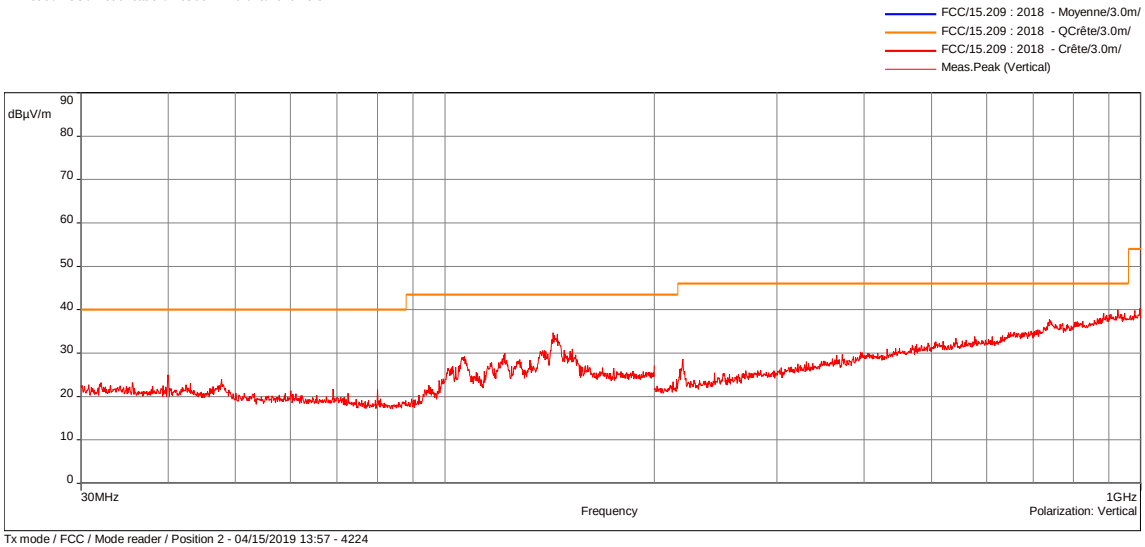
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	30MHz-200MHz	100kHz	300kHz	Peak
Vertical	200MHz-1GHz	100kHz	300kHz	Peak
Horizontal	200MHz-1GHz	100kHz	300kHz	Peak
Configuration:				
Comments:	N/A			
EUT modification(s): N/A				

FREQUENCY (MHZ)	POLARISATION	PEAK (DBµV/M)	QP (DBµV/M)	QP LIMIT (DBµV/M)	MARGIN (DB)
40.68856062	Vertical	34.59	31.93	40	-8.07

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
TX MODE / MODE READER / POSITION 2		EMI4224	
EUT mode:	D-M2	**T (°C):**	19.8
Test Date:	15/04/2019 13:57:49	**H (%):**	29.8
Test Operator:	MPA	**P (hPa):**	1012



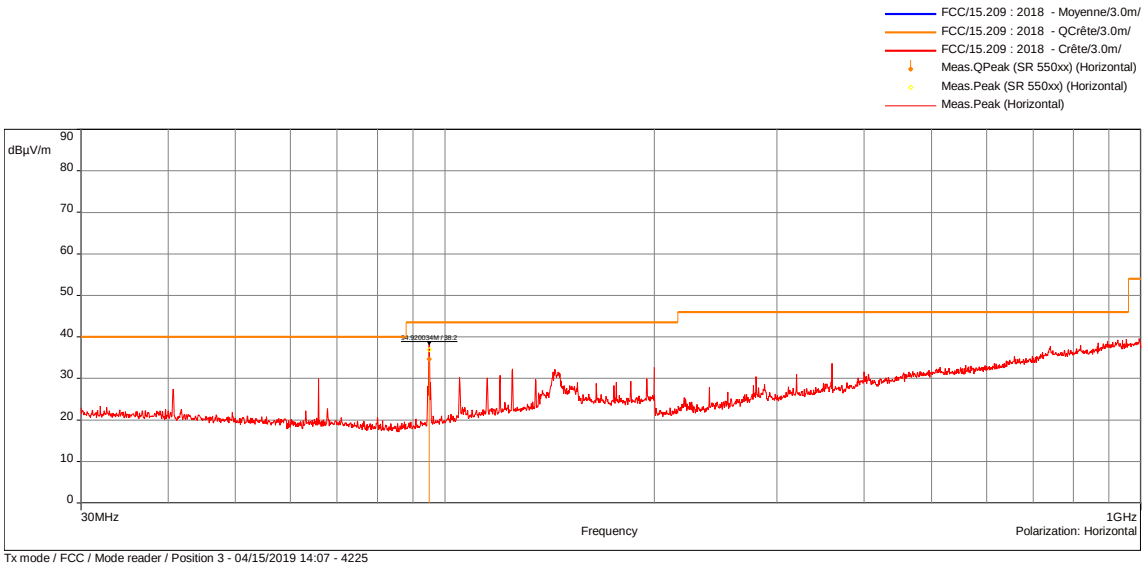
Tx mode / FCC / Mode reader / Position 2 - 04/15/2019 13:57 - 4224



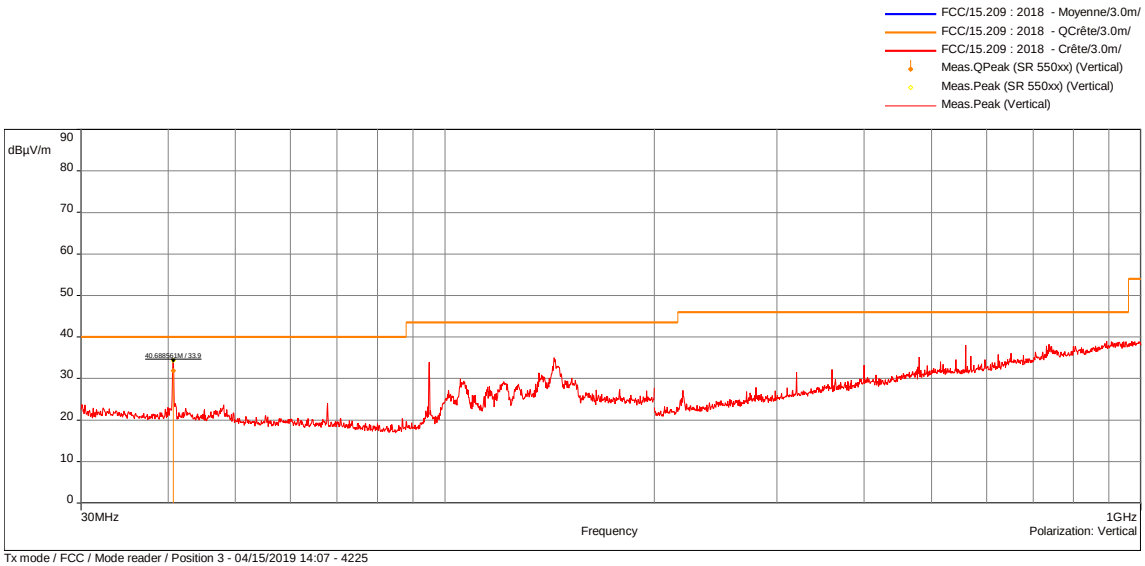
Tx mode / FCC / Mode reader / Position 2 - 04/15/2019 13:57 - 4224

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	200MHz-1GHz	100kHz	300kHz	Peak
Vertical	200MHz-1GHz	100kHz	300kHz	Peak
Configuration:				
Comments:	N/A			
EUT modification(s): N/A				

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
TX MODE / MODE READER / POSITION 3		EMI4225	
EUT mode:	D-M2	**T (°C):**	19.8
Test Date:	15/04/2019 14:07:20	**H (%):**	29.8
Test Operator:	MPA	**P (hPa):**	1012



Tx mode / FCC / Mode reader / Position 3 - 04/15/2019 14:07 - 4225

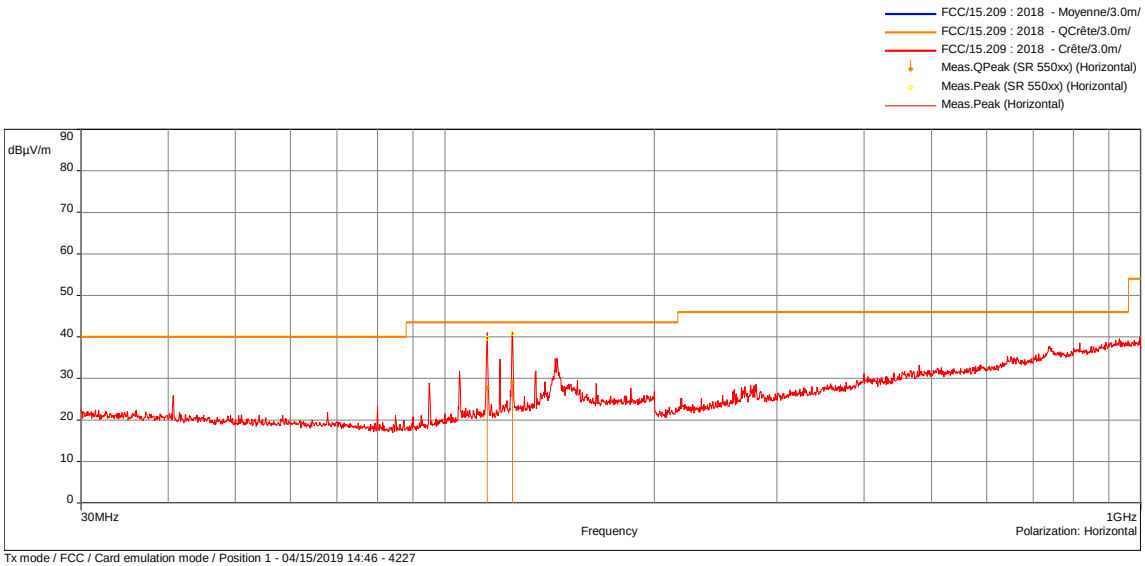


Tx mode / FCC / Mode reader / Position 3 - 04/15/2019 14:07 - 4225

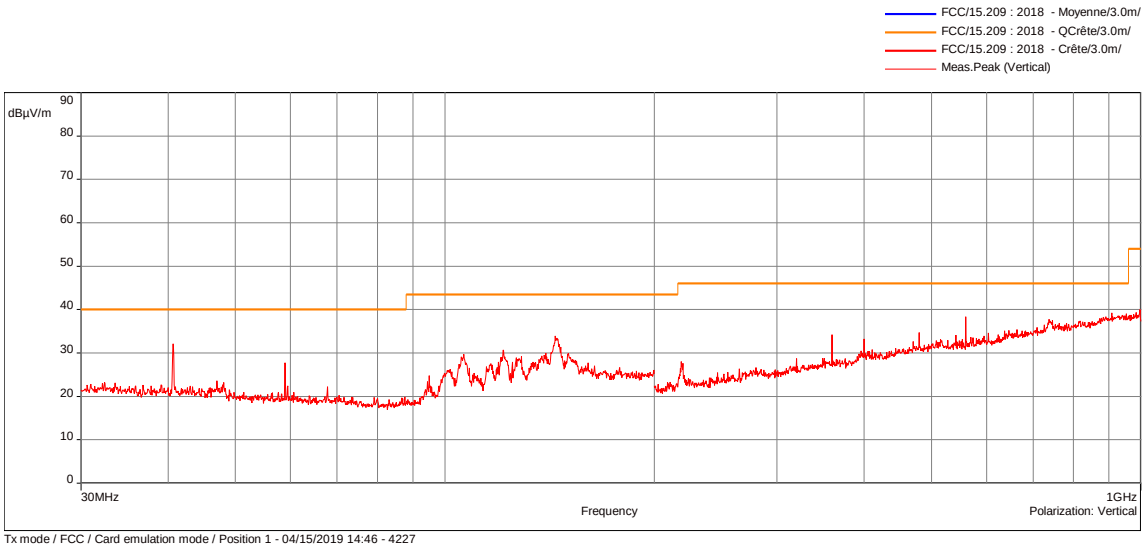
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	30MHz-200MHz	100kHz	300kHz	Peak
Vertical	200MHz-1GHz	100kHz	300kHz	Peak
Horizontal	200MHz-1GHz	100kHz	300kHz	Peak
Configuration:				
Comments:	N/A			
EUT modification(s): N/A				

FREQUENCY (MHZ)	POLARISATION	PEAK (DBµV/M)	QP (DBµV/M)	QP LIMIT (DBµV/M)	MARGIN (DB)
40.68856062	Vertical	34.32	31.86	40	-8.14
94.92003418	Horizontal	36.93	34.65	43.5	-8.85

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
TX MODE / CARD EMULATION MODE / POSITION 1		EMI4227	
EUT mode:	D-M2	**T (°C):**	19.8
Test Date:	15/04/2019 14:46:42	**H (%):**	29.8
Test Operator:	MPA	**P (hPa):**	1012



Tx mode / FCC / Card emulation mode / Position 1 - 04/15/2019 14:46 - 4227

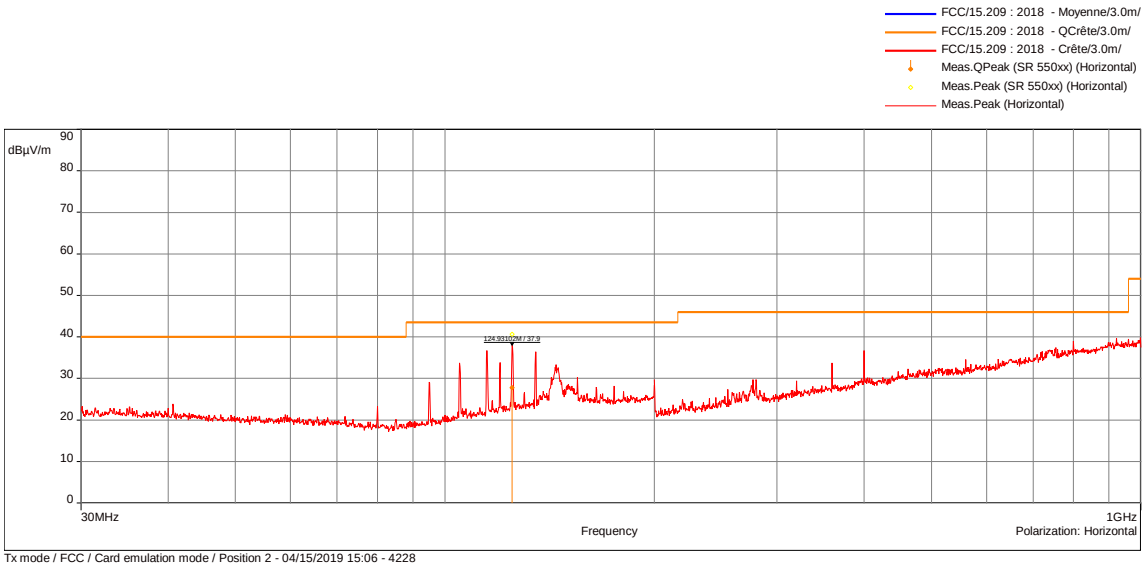


Tx mode / FCC / Card emulation mode / Position 1 - 04/15/2019 14:46 - 4227

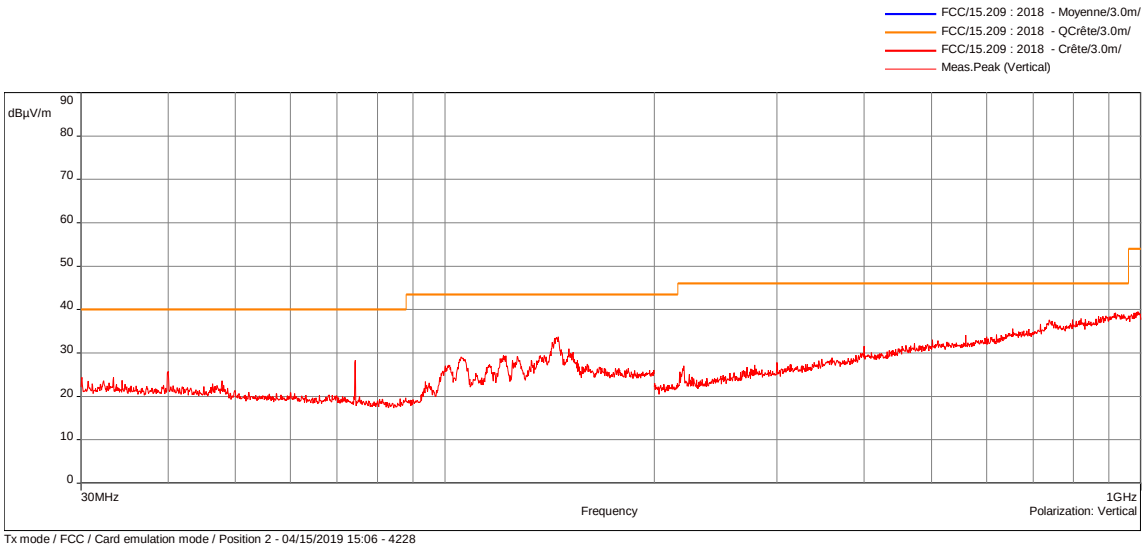
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	30MHz-200MHz	100kHz	300kHz	Peak
Vertical	200MHz-1GHz	100kHz	300kHz	Peak
Horizontal	200MHz-1GHz	100kHz	300kHz	Peak
Configuration:				
Comments:	N/A			
EUT modification(s): N/A				

FREQUENCY (MHZ)	POLARISATION	PEAK (DBµV/M)	QP (DBµV/M)	QP LIMIT (DBµV/M)	MARGIN (DB)
115.0518862	Horizontal	39.71	27.74	43.5	-15.76
124.9725308	Horizontal	40.8	29.03	43.5	-14.47

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
TX MODE / CARD EMULATION MODE / POSITION 2		EMI4228	
EUT mode:	D-M2	**T (°C):**	19.8
Test Date:	15/04/2019 15:06:25	**H (%):**	29.8
Test Operator:	MPA	**P (hPa):**	1012



Tx mode / FCC / Card emulation mode / Position 2 - 04/15/2019 15:06 - 4228

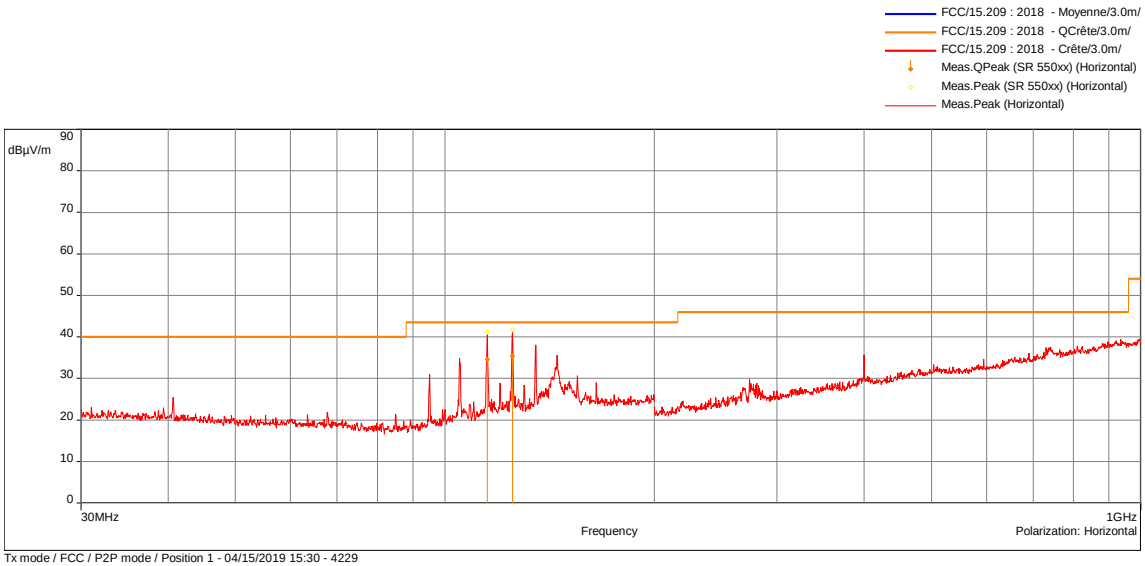


Tx mode / FCC / Card emulation mode / Position 2 - 04/15/2019 15:06 - 4228

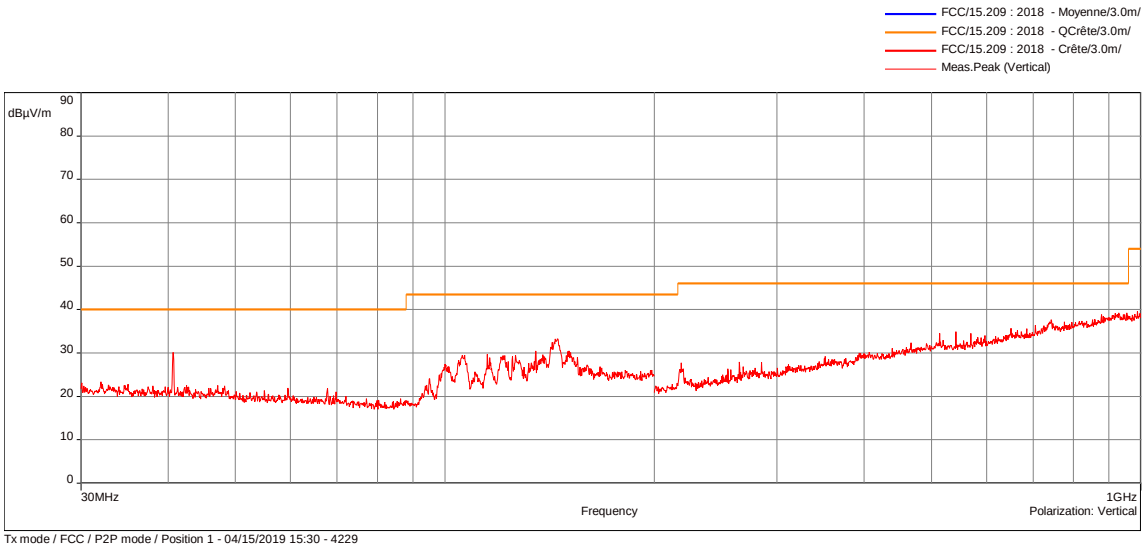
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	200MHz-1GHz	100kHz	300kHz	Peak
Vertical	200MHz-1GHz	100kHz	300kHz	Peak
Configuration:				
Comments:	N/A			
EUT modification(s): N/A				

FREQUENCY (MHZ)	POLARISATION	PEAK (DBµV/M)	QP (DBµV/M)	QP LIMIT (DBµV/M)	MARGIN (DB)
124.9102674	Horizontal	40.62	27.81	43.5	-15.69

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
TX MODE / P2P MODE / POSITION 1		EMI4229	
EUT mode:	D-M2	**T (°C):**	19.8
Test Date:	15/04/2019 15:30:18	**H (%):**	29.8
Test Operator:	MPA	**P (hPa):**	1012



Tx mode / FCC / P2P mode / Position 1 - 04/15/2019 15:30 - 4229

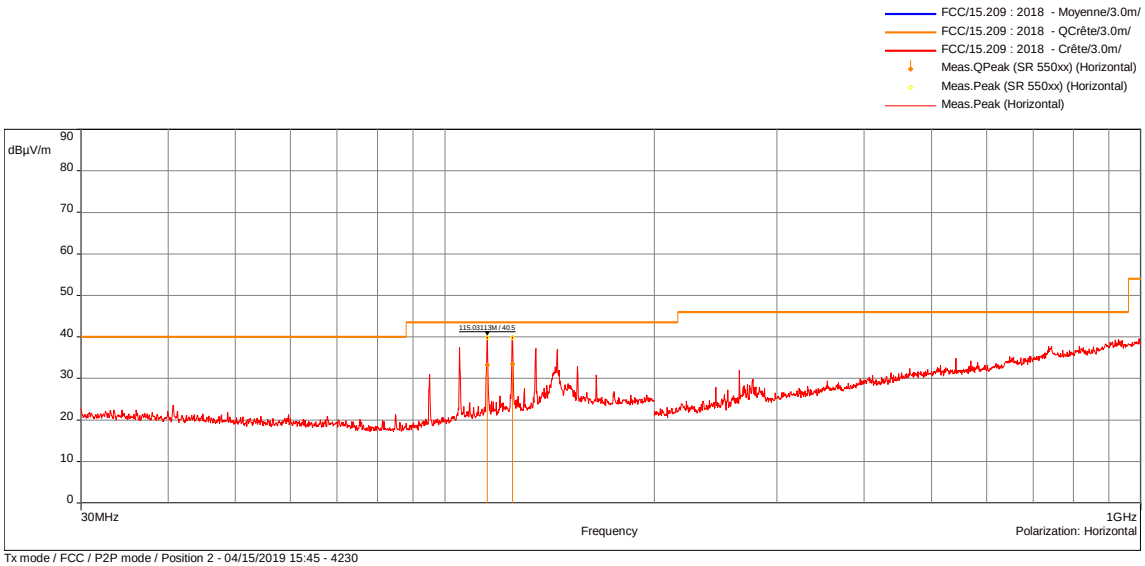


Tx mode / FCC / P2P mode / Position 1 - 04/15/2019 15:30 - 4229

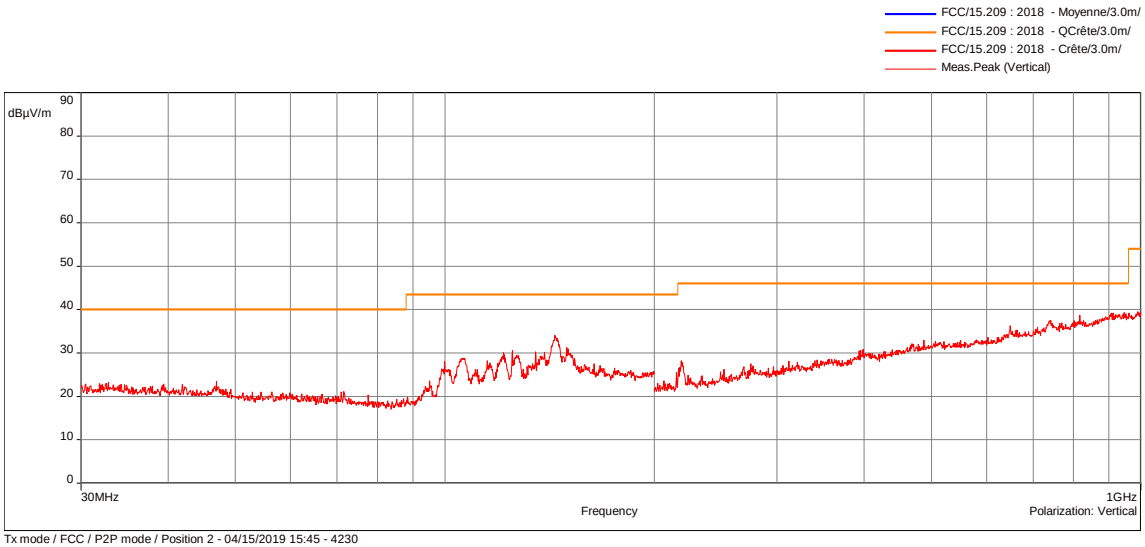
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	200MHz-1GHz	100kHz	300kHz	Peak
Vertical	200MHz-1GHz	100kHz	300kHz	Peak
Configuration:				
Comments:	N/A			
EUT modification(s): N/A				

FREQUENCY (MHZ)	POLARISATION	PEAK (DBµV/M)	QP (DBµV/M)	QP LIMIT (DBµV/M)	MARGIN (DB)
115.0103772	Horizontal	41.28	34.53	43.5	-8.97
124.9725308	Horizontal	41.81	35.39	43.5	-8.11

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
TX MODE / P2P MODE / POSITION 2		EMI4230	
EUT mode:	D-M2	**T (°C):**	19.8
Test Date:	15/04/2019 15:45:28	**H (%):**	29.8
Test Operator:	MPA	**P (hPa):**	1012



Tx mode / FCC / P2P mode / Position 2 - 04/15/2019 15:45 - 4230



Tx mode / FCC / P2P mode / Position 2 - 04/15/2019 15:45 - 4230

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	30MHz-200MHz	100kHz	300kHz	Peak
Vertical	200MHz-1GHz	100kHz	300kHz	Peak
Horizontal	200MHz-1GHz	100kHz	300kHz	Peak
Configuration:				
Comments:	N/A			
EUT modification(s): N/A				

FREQUENCY (MHZ)	POLARISATION	PEAK (DBµV/M)	QP (DBµV/M)	QP LIMIT (DBµV/M)	MARGIN (DB)
115.0311317	Horizontal	39.77	33.27	43.5	-10.23
124.9932853	Horizontal	39.78	33.4	43.5	-10.1

6.4. Field strength in the band 13.553-13.567MHz

Reference standard:	FCC part 15 Radio part 15.225 a) & RSS-210
Test method:	FCC part 15 Radio part 15.225 a) & RSS-210
General test setup: EUT is set on an insulating support at 80cm. Measurements were then performed in a 10-meter Open Area Test Site that complies to CISPR 16. The EUT was rotated 360° in order to maximize radiated levels. Test antenna was oriented in 3 axes (0°, 45° and 90°). For portable equipements a research of maximum level is done on the 3 axes. Only the highest levels are recorded.	

TEST CASE	EUT MODE	SEVERITY	RESULT TAB.	VERDICT
Tx mode	Permanent emission mode	15848µV/m at 30m	-	**PASS**

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	N/A
Relative Humidity	20 to 75 %	N/A
Atmospheric pressure	N/A	N/A
Test method deviation: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	Rohde & Schwarz	HFH2-Z2	5825	20/09/2017	20/11/2019
Antenna mast	INNCO	MA4000-EP-O	10261		
Cable	Huber + Suhner	N-20m	8385	11/10/2017	11/12/2019
Mast controller	Heinrich Deisel	HD100	4036		
Open area test site	EMITECH	Salinelles	3482	10/10/2017	10/12/2020
Receiver	Rohde & Schwarz	ESHS10	3371	20/09/2018	20/11/2019
Turntable	Heinrich Deisel	D4420	4038		

Blank cells = Permanent validity

FIELD STRENGTH - TABULATED RESULTS – READER MODE				
Frequency (MHz)	**Polarization (°)**	**Level at 10m (dBµA/m)**	**Limit at 10m (dBµA/m)**	**Limit at 30m (µV/m)**
13.56	0	5.36	51.58	15848
13.56	45	7.86	51.58	15848
13.56	90	9.86	51.58	15848

Maximun level at 10m is 9.86dBµA/m for a limit at 51.58 dBµA/m.
Using an extrapolation factor of 40dB/dec and a conversion factor of -51.5dB, level at 30m is 42.28 dBµV/m for a limit at 84 dBµV/m.

FIELD STRENGTH - TABULATED RESULTS – CARD EMULATION MODE				
Frequency (MHz)	**Polarization (°)**	**Level at 10m (dBµA/m)**	**Limit at 10m (dBµA/m)**	**Limit at 30m (µV/m)**
13.56	0	7.16	51.58	15848
13.56	45	10.36	51.58	15848
13.56	90	11.86	51.58	15848

Maximun level at 10m is 11.86dBµA/m for a limit at 51.58 dBµA/m.
Using an extrapolation factor of 40dB/dec and a conversion factor of -51.5dB, level at 30m is 44.28 dBµV/m for a limit at 84 dBµV/m.

FIELD STRENGTH - TABULATED RESULTS – P2P MODE				
Frequency (MHz)	**Polarization (°)**	**Level at 10m (dBµA/m)**	**Limit at 10m (dBµA/m)**	**Limit at 30m (µV/m)**
13.56	0	5.86	51.58	15848
13.56	45	8.76	51.58	15848
13.56	90	10.56	51.58	15848

Maximun level at 10m is 10.56dBµA/m for a limit at 51.58 dBµA/m.
Using an extrapolation factor of 40dB/dec and a conversion factor of -51.5dB, level at 30m is 42.98 dBµV/m for a limit at 84 dBµV/m.

TEST SETUP PHOTO(S)


6.5. Field strength outside the band 13.110-14.010MHz

Reference standard:	FCC part 15 Radio part 15.225 b) c) & d) & RSS-210
Test method:	FCC part 15 Radio part 15.225 a) c) & d) & RSS-210
General test setup: EUT is set inside the climatic enclosure. Carrier level are correlated with the maximum carrier level measured in normal conditions.	

FREQUENCY BAND	SEVERITY	RESULT TAB.	VERDICT
Below 13.110MHz	§15.209	See graphic & §6.3 of this report	**PASS**
13.110-13.410MHz	106µV/m at 30m	See graphic	**PASS**
13.410-13.553MHz	334µV/m at 30m	See graphic	**PASS**
13.553-13.567MHz	15,848µV/m at 30m	See graphic & §6.4 of this report	**PASS**
13.567-13.710MHz	334µV/m at 30m	See graphic	**PASS**
13.710-14.010MHz	106µV/m at 30m	See graphic	**PASS**
Above 14.010MHz	§15.209	See graphic & §6.3 of this report	**PASS**

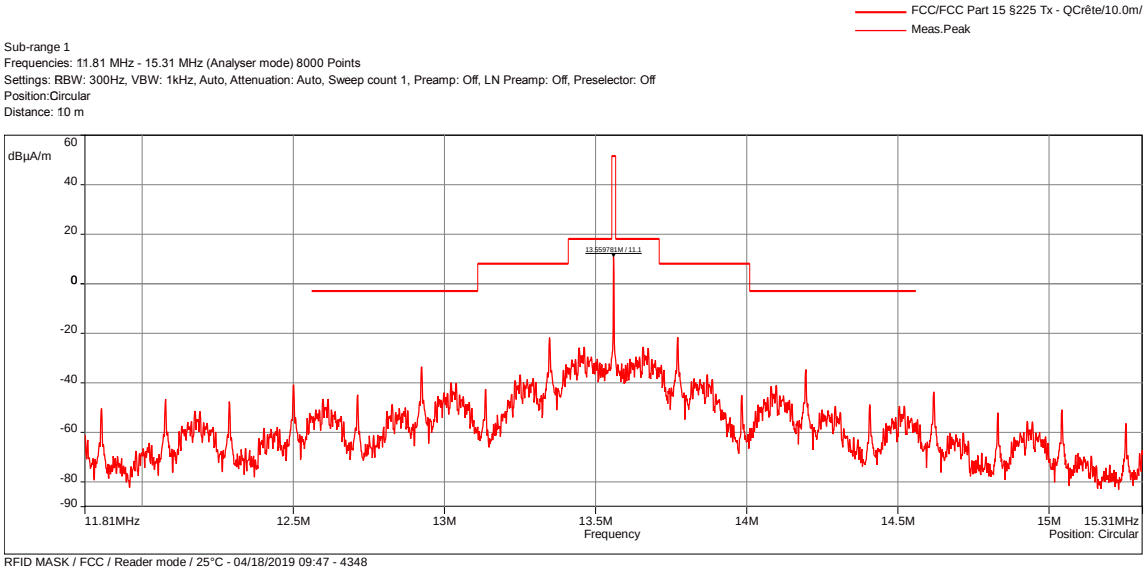
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	*See Graph(es)*
Relative Humidity	20 to 75 %	*See Graph(es)*
Atmospheric pressure	N/A	*See Graph(es)*
Test method deviation: N/A		
Supplementary information: Test is done in the worst observed configuration: Reader mode + P2P mode at the same time.		

TEST EQUIPMENT USED

CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
AC power source	KIKUSUI	PCR4000L	3074	12/06/2018	12/08/2019
Antenna	Emitech	3.5 cm	4653		
Cable	MICRO-COAX	N-3m	10535	06/04/2017	06/06/2019
Multimeter	FLUKE	8808A	12446	24/04/2018	24/06/2019
Spectrum analyzer	Rohde & Schwarz	FSW43	14830	28/12/2018	28/02/2020
Thermohygrometer	Bioblock Scientific	Météostar	0963	25/01/2019	25/03/2021
Thermohygrometer	Testo	608-H2	12268	27/11/2017	27/01/2020

Blank cells = Permanent validity

FIELD STRENGTH IN THE BAND 13.110-14.010MHZ AND OUTSIDE - GRAPH			
FIELD STRENGTH IN THE BAND 13.110-14.010MHZ AND OUTSIDE		EMI4348	
EUT mode:	D-M2	**T (°C):**	22.1
Test Date:	18/04/2019 09:47:27	**H (%):**	45.3
Test Operator:	MPA	**P (hPa):**	1010



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	11.81MHz-15.31MHz	300Hz	1kHz	Peak max hold
Configuration:	N/A			
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor.			

EUT modification(s): N/A

6.6. Measurement of Frequency Stability

Reference standard:	FCC part 15 Radio part 15.225 e) & RSS-210
Test method :	FCC part 15 Radio part 15.225 e), ANSI C63.10:2013 and RSS Gen

General test setup: The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

EUT is set inside the climatic enclosure. Carrier level are correlated with the maximum carrier level measured in normal conditions.

A digital temperature probe is set near the equipement in order to ensure a temperature stabilisation.

Measurement are made according to ANSI C63.10:2013 §6.8.1, only extremes tests values are shown in final results.

TEST CASE	EUT MODE	SEVERITY	RESULT TAB.	VERDICT
Tx mode	Tx mode	+/-0.01%	-	**PASS**

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	N/A
Relative Humidity	20 to 75 %	N/A
Atmospheric pressure	N/A	N/A
Test method deviation: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED

CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
AC power source	KIKUSUI	PCR4000L	3074	12/06/2018	12/08/2019
Antenna	Emitech	3.5 cm	4653		
Cable	MICRO-COAX	N-3m	10535	06/04/2017	06/06/2019
Climatic enclosure	CLIMATS	EXCAL 7714-HA	14261	26/04/2018	26/06/2019
Digital thermometer	GHM Greisinger	GMH 3710	12968	11/02/2019	11/04/2020
Multimeter	FLUKE	8808A	12446	24/04/2018	24/06/2019
Spectrum analyzer	Rohde & Schwarz	FSW43	14830	28/12/2018	28/02/2020
Thermohygrometer	Bioblock Scientific	Météostar	0963	25/01/2019	25/03/2021
Thermohygrometer	Testo	608-H2	12268	27/11/2017	27/01/2020
Thermometer contactless	GHM Greisinger	GMH 3710	12968	11/02/2019	11/04/2020

Blank cells = Permanent validity

EFFECTIVE RADIATED POWER - TABULATED RESULTS				
Test Case (Temperature variation)	**Temperature (°C)**	**Power supply (Vdc)**	**Frequency (MHz)**	**Frequency error (%)**
Normal conditions	25	5	13.560268	-
Extremes tests conditions	-30	5	13.5602425	0.00179
	+55	5	13.5602025	0.00149

TEST SETUP PHOTO(S)

End of test report