0827, 1-1925, 1-2069,1-2070, 1-2206, LIST OF ACCREDITED SITES AND SCOP AVALABLE ON WWW.COFRAC.F





Test report issued under the responsibility of:

EMITECH MONTPELLIER laboratory
MRA US-EU Designation Number: FR0006
Canadian CAB Identifier: FR0003

RADIO TEST REPORT

FCC 47 CFR PART 15: June 2023 RSS-210 _ Issue 10, December 2019 / AMD: April 2020

Company STMICROELECTRONICS (Rousset) SAS

Address..... 190 AVENUE CELESTIN COQ

13106 ROUSSET

FRANCE

Test item description. NFC card reader evaluation board

Trade Mark. STMICROELECTRONICS

Manufacturer.....: STMICROELECTRONICS

Model/Type reference...... STEVAL-25R200SA (with Main antenna and NFC tag ST25TV)

Ratings.....: 5 Vdc

Testing Laboratory: EMITECH MONTPELLIER laboratory

Address.....: 145 rue de Massacan

34740 VENDARGUES

FRANCE

Report Reference No...... RR-EVE-22P033-11A

Test procedure. : FCC IC Certification

Diffusion. : Mr. David DAUBOIS

Applicant's name. : STMICROELECTRONICS

Date of issue.....: October 29, 2024

Total number of pages.....: 31
Revision....: 0

Compiled by.....: Morgan PATEY

Approved by (+ signature).....: Olivier AELBRECHT (Technical Manager)

Duplication of this test report is only permitted for an integral photographic facsimile. It includes the number of pages referenced here above. This document is the result of testing a specimen or a sample of the product submitted. It does not imply an assessment of the conformity of the whole manufactured products of the tested sample.



REPORT INDEX: GENERAL INFORMATIONS3 REFERENCE DOCUMENT(S)......4 2. 3.1. EUT Marking plate5 3.2. 3.3. 3.5. 36 3.7. RESULT SUMMARY.......10 4. MEASUREMENT UNCERTAINTY......12 TEST CONDITIONS AND RESULTS13 6.1. 62 6.3. 6.4. 6.5. 6.6.

REVISION HISTORY:							
Revision	Date	Modified pages	Modifications				
0	October 29, 2024	/	Creation				



1. GENERAL INFORMATIONS

This document submits the results of Radio tests performed on the equipment NFC card reader evaluation board STEVAL-25R200SA (with Main antenna and NFC tag ST25TV) (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 Location..... EMITECH MONTPELLIER laboratory y & 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: None Date of receipt of test item: N/A

Date (s) of performance of tests From August 28th to September 01st of 2023

APPLICANT'S GENERAL INFORMATIONS:

Company name STMICROELECTRONICS (Rousset) SAS

Company address. 190 AVENUE CELESTIN COQ

13106 ROUSSET

FRANCE

Responsible.....: Mr. David DAUBOIS

GENERAL REMARKS:

The information in italics is declared by the manufacturer and is under his responsibility. 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.

"(see Enclosure #)" refers to additional information appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report the decimal separator is point.

Possible test case verdicts:

Test case does not apply to the test object.: N/A
Test case not performed......: N/P
Test object does meet the requirement.....: P (Pass)
Test object does not meet the F (Fail)

requirement.:

DEFINITIONS AND ABBREVIATIONS:

E.U.T.	Equipment Under Test	AE	Ancillary Equipment	Pk	Peak detector
RBW	Resolution BandWidth	VBW	Video BandWidth	QP	Quasi-peak detector
OATS	Open Area Test Site	FAR	Full Anechoic Room	Av	Average detector
VP	Vertical Polarization	HP	Horizontal Polarization	RMS	Root Mean Square
RF	Radio Frequency	N.T.R	Nothing To Report	N/C	Not Communicated



2. REFERENCE DOCUMENT(S)

NORMATIVE REFERENCES:

The following referenced documents are necessary for the application of the present test report.

FCC 47 CFR PART 15: June 2023

Code of federal regulations - Title 47 telecommunication - Part 15 - Radio frequency devices

FCC Part 15.225

Operation within the bands 13.553-13.567MHz

RSS-210, Issue 10, December 2019 / AMD: April 2020

Licence-Exempt Radio Apparatus: Category I Equipment

RSS-GEN: Issue 5 April 2018 / AMD 1: 2019 / AMD 2: 2021

General Requirements for Compliance of Radio Apparatus

ANSI C 63.10: 2013

American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

Although the product standard uses obsolete technical standards, the latest versions of standards achievable by the laboratory will be used for testing.

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

Trade Mark. STMICROELECTRONICS

Type of sample.....: Pre-serial

Function(s)...... NFC demo board

Manufacturer name. : STMICROELECTRONICS
Address. : 776 RUE ALBERT CAQUOT

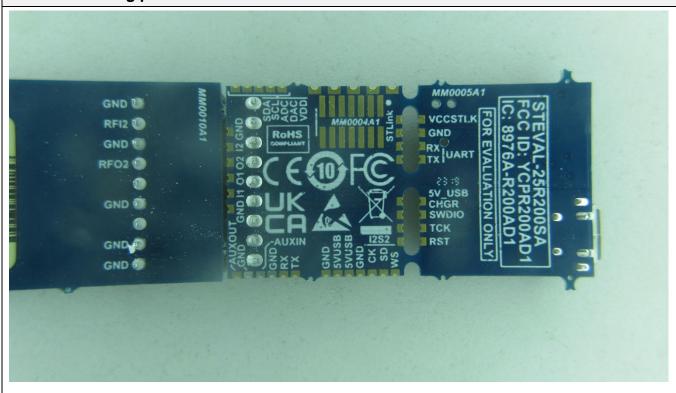
SKY SOPHIA BAT B

06410 BIOT FRANCE

General product information:

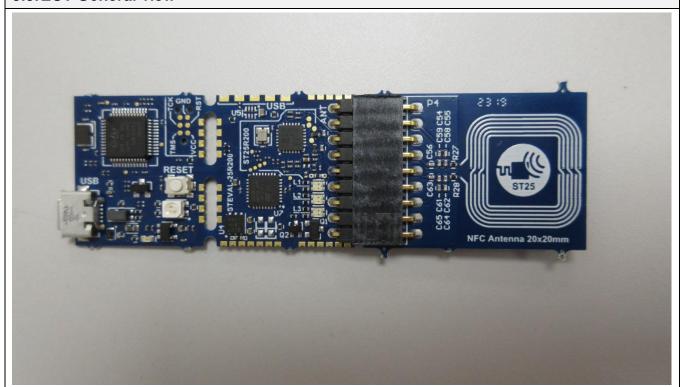
N/A

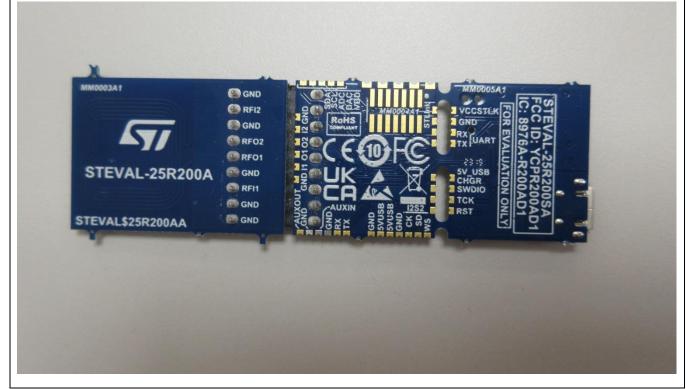
3.2. EUT Marking plate





3.3. EUT General view







3.4. EUT Mechanical and Electrical Design

Power supply range 5 Vdc
Power type 5 Vdc
USB

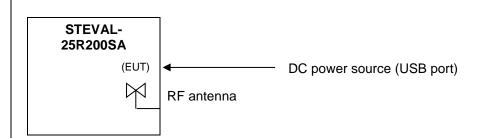
Temperature range (°C). +10 to +40

Ground bounding strap.....: No

Comments:

N/A

3.5. E.U.T. Input/Output ports



Port	NAME	Түре	LENGTH	CABLE TYPE	COMMENTS
0	Main frame	N/E	N/A	РСВ	N/A
1	DC power source	USB	<3m	+/-	5Vdc
2	RF antenna	RF	N/A	N/A	PCB

AC/DC: AC/DC Converter port AC......: Alternative current port DC......: Direct current port I/O: Telecommunication port RF......: Radio frequency port

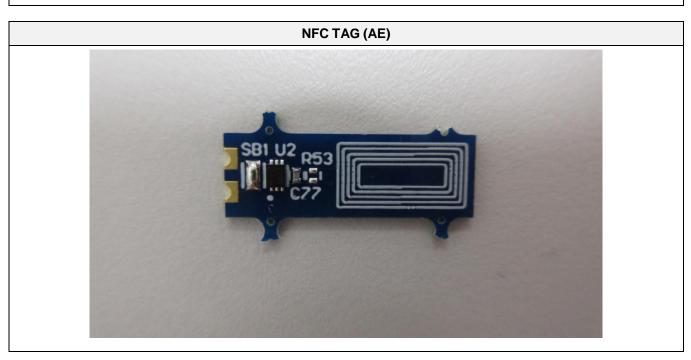
N/E: Non Electrical port



3.6. Supporting Equipment Used During Test

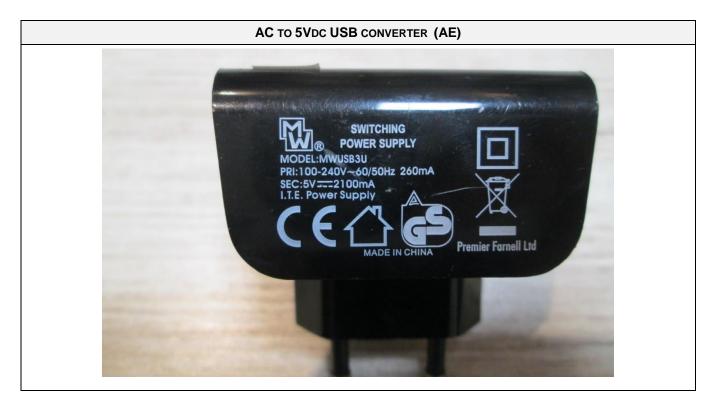
Sample subject to the tests was tested with following equipment.

PRODUCT TYPE	MANUFACTURER	MODEL	N°EMITECH / COMMENTS
NFC TAG	STMICROELECTRONICS	ST25TV	Used to maintain a NFC communications.
Power Bank	Xindao B.V.	P324.25	Used as EUT's power supply for OATS measurements
AC to 5Vdc USB converter	Pro-Power	MWUSB3U	Used as EUT's power supply.









3.7. EUT Radio Specifications

a) GENERAL INFORMATIONS

According to manufacturer's declarations:

EUT type.....: Transceiver

Technology: RFID

Environmental profile: Data transmissions

Temperature range: +10°C to +40°C

Antenna type: PCB

Comments:

N/A

b) Transmitter Parameters (Tx)

Frequency bands...... 13.553 MHz to 13.567 MHz

RF Power.....: Not communicated

 Number of channels / Separation
 1

 Modulation type
 : AM

 Duty cycle
 : 100%

 Tested frequency
 : 13.56 MHz

c) RECEIVER PARAMETERS (RX)

Frequency bands.....: 13.553 MHz to 13.567 MHz



4. RESULT SUMMARY

Labeling requirements Information to user Home-built devices Kits NA 15.23 Special Accessories Inspection by the Commission Measurement standards Test procedure for CPU boards and computer power supplies Frequency range of radiated measurements Measurements Measurement detector functions and bandwidths Transition provisions for compliance with the rules UNINTENTIONAL RADIATORS Exempted device Information to the user Conducted limits Class B Radiated emission limits TV interface devices, including cable system terminal devices TV broadcast receivers Cable ready consumer electronics equipment Program blocking technology requirements of deligital cable ready products INTENTIONAL RADIATORS Intertion And Intertion Inter	TEST DESIGNATION	SEVERITY	VERDICT	COMMENTS
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Converters used with scanning receivers Labeling of digital cable ready products N/A 15.121 15.123			N/A	15.120
			N/A	15.121
INTENTIONAL RADIATORS	Labeling of digital cable ready products		N/A	15.123
	INTENTIONAL RADIATORS			



TEST DESIGNATION	SEVERITY	VERDICT	COMMENTS
Equipment authorization requirement		PASS	15.201 / Transmitter part is subject to Certification procedure
Certified operating frequency range		N/A	15.202
Antenna requirement		PASS	15.203 / Dedicated integral antenna
External radio frequency power amplifiers and antenna modifications		N/A	15.204
Restricted bands of operation		PASS	15.205
Conducted limits		PASS	15.207
Radiated emission limits; general requirements		PASS	15.209
Tunnel radio systems		N/A	15.211
Modular transmitters		N/A	15.212
Cable locating equipment		N/A	15.213
Cordless telephones		N/A	15.214
Additional provisions to the general radiated emission limits		PASS	15.215
Operation within the band 13.110-14.010 MHz.		PASS	15.225
- Field strength in the band 13.553-13.567 MHz		PASS	(a)
 Field strength in the band 13.410-13.553 MHz and 13.567-13.710 MHz 		PASS	(b)
 Field strength in the band 13.110-13.410 MHz and 13.710-14.010 MHz 		PASS	(c)
 Field strength outside the band 13.110-14.010 MHz 		PASS	(d)
- Frequency tolerance of the carrier signal		PASS	(e)
- Radio frequency powered tag		N/A	(f) 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
Radio frequency	± 1 x 10 ⁻⁷	±1 x 10 ⁻⁷
Occuped bandwidth		
RF power	\pm 3.8 %	± 5 %
Supply voltages	± 3 %	± 3 %
Temperature	± 1 °C	± 1°C
Humidity	± 5 %	± 5 %
Conducted emission (FCC)		
(Artificial Mains Network) 150kHz – 30MHz	\pm 3.4 dB	± 3.4 dB
Radiated emission (electric field for FCC standard)		
9kHz – 30MHz	\pm 2.7 dB	/
30MHz – 1GHz	\pm 5.0 dB	/
1GHz – 18GHz	\pm 5.3 dB	/
18GHz – 40GHz	\pm 6.1 dB	/
40GHz – 140GHz	$\pm5.7~\mathrm{dB}$	/

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



6. TEST CONDITIONS AND RESULTS

6.1. AC power-line conducted emissions

Reference standard:	FCC part 15.207
	RSS-Gen
Test method:	ANSI C63.10: 2013

General test setup: EUT is set on an insulating support at 80cm above the horizontal ground reference plane, and at 40cm of the vertical 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
120Vac / 60Hz	150kHz-30MHz	15.207	EMI4578	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	-	

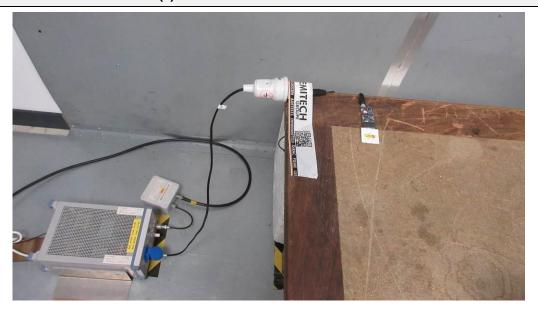
Test method deviation: N/A

Supplementary information: EUT power supply is done trought a "standard power supply" wich meets FCC and RSS requirements.

TEST EQUIPMENT USED						
CATEGORY	BRAND	Түре	IDENTIFIER	CAL. DATE	CAL. DUE	
AC power source	GW Instek	APS-1102	17782	24/06/2023	24/08/2024	
Cable	EMITECH	Current absorber sheath	18366	17/08/2023	17/10/2025	
Cable	C&C	N-3m	14335	14/04/2023	14/06/2025	
LISN	Rohde & Schwarz	ENV216	17925	24/09/2021	24/11/2023	
Multimeter	FLUKE	8808A	10382	17/05/2023	17/07/2024	
Receiver	Rohde & Schwarz	ESI	9704	18/11/2022	18/01/2024	
Software	Nexio	BAT EMC	0000			
Thermohygrometer	Testo	608-H1	7561	19/06/2023	19/08/2024	
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024	



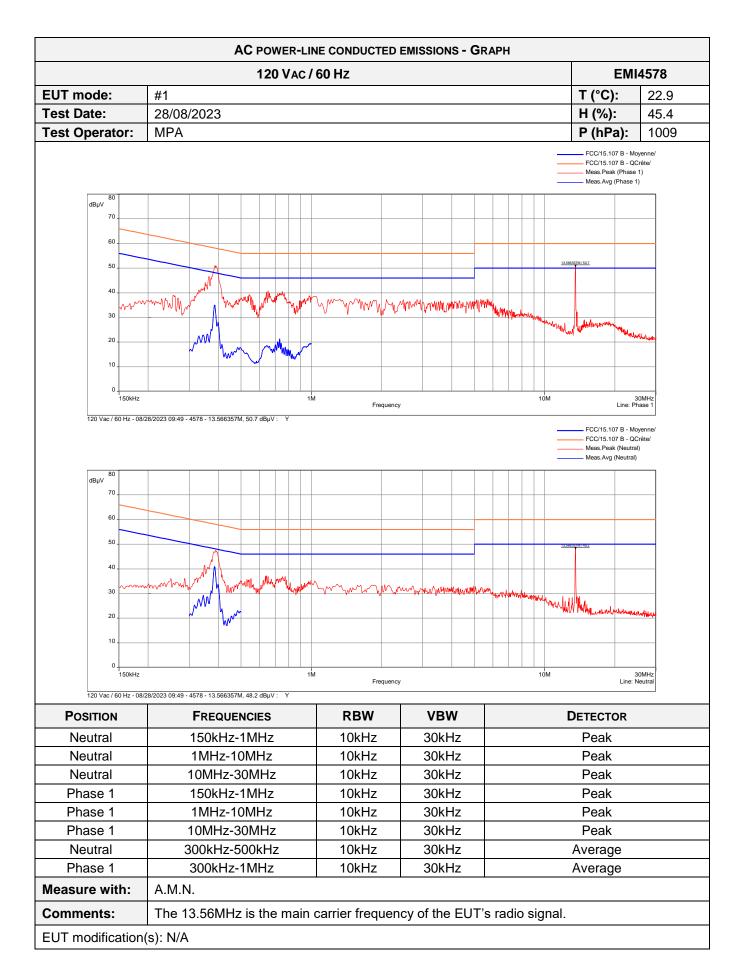




	AC POWER-LINE CONDUCTED EMISSIONS - TABULATED RESULTS							
	12	0 VAC / 60 Hz			EMI4578			
TERMINAL	FREQUENCY (MHz) DETECTOR (Pκ/QP/Av) LEVEL (dBμV) LIMIT (dBμV)							
0.349	Neutral	Avg	29.29	48.98	-19.69			
0.390	Neutral	Avg	41.05	48.06	-7.01			
0.642	Neutral	Peak	37.30	46.00	-8.70			
1.036	Neutral	Peak	35.16	46.00	-10.84			
2.714	Neutral	Peak	33.09	46.00	-12.91			
0.256	Line	Peak	39.06	51.57	-12.51			
0.387	Line	Avg	35.07	48.13	-13.06			
0.652	Line	Avg	18.54	46.00	-27.46			
0.751	Line	Avg	21.33	46.00	-24.67			
0.980	Line	Peak	38.90	46.00	-7.10			
1.036	Line	Peak	38.54	46.00	-7.46			
5.671	Line	Peak	37.55	50.00	-12.45			

Supplementary information: When margin between peak measurements and Average or Qpeak limit(s) is > 6dB, no Average or Qpeak measurements were performed.







6.2. Occupied Bandwidth

Reference standard:	FCC part 15 Radio part 15.205 RSS-Gen
Test method:	ANSI C63.10: 2013

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 CABLE	OBW	SEVERITY	RESULT TAB.	VERDICT
99% Bandwidth	10.910 kHz	<14kHz	EMI4470	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	20.7 °C
Relative Humidity	20 to 75 %	66.6 %
Atmospheric pressure	N/A	1020 hPa
Test method deviation: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED						
CATEGORY	BRAND	Түре	IDENTIFIER	CAL. DATE	CAL. DUE	
Antenna	EMITECH	3.5 cm	4653			
Attenuator	Radiall	R412720124	4391	30/09/2022	30/11/2025	
Cable	MegaPhase	N-3m	14853	20/05/2022	20/07/2024	
Receiver	Rohde & Schwarz	FSW43	14830	10/08/2022	10/11/2024	
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024	
Thermohygrometer	Bioblock Scientific	Météostar	0963	09/06/2021	09/02/2024	



	OCCUPIED BANDWIDTH - GRAPH				
	99% BANDWIDTH	EMI4470			
EUT mode:	Tx mode				
Test Date:	22/10/2024				
Test Operator:	MPA				



EUT modification(s): N/A

Results: The system has an OBW of 10.910 kHz in the 13.553MHz to 13.567MHz band.

EUT modification(s): N/A



6.3. Radiated spurious emissions

Reference standard:	FCC Part 15.225 & RSS-Gen
Test method:	ANSI C63.10: 2013

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. 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 mode / 0°	9kHz-30MHz	§15.209	EMI4688	PASS
Tx mode / 45°	9kHz-30MHz	§15.209	EMI4687	PASS
Tx mode / 90°	9kHz-30MHz	§15.209	EMI4686	PASS
Radiated measurement	30MHz-1GHz	§15.209	EMI4637	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.



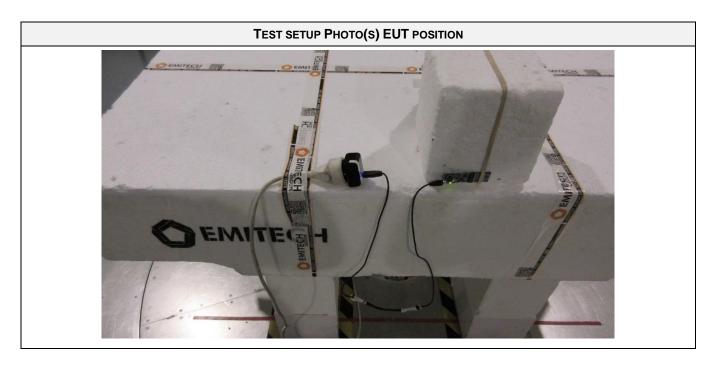
TEST EQUIPMENT USED - 9 KHZ TO 30 MHZ						
CATEGORY	BRAND	ТҮРЕ	IDENTIFIER	CAL. DATE	CAL. DUE	
Antenna	Rohde & Schwarz	HFH2-Z2	5825	16/08/2022	16/10/2024	
Cable	/	N-1m	3625	02/05/2023	02/07/2025	
Cable	Techniwave	N-3.5m	18353	25/01/2022	25/03/2024	
Cable	Techniwave	N-4m	18355	25/01/2022	25/03/2024	
Receiver	Rohde & Schwarz	FSW43	14830	10/08/2022	10/10/2024	
Shielded enclosure	COMTEST	FAR-3m	18014	17/08/2021	17/10/2024	
Software	Nexio	BAT EMC	0000			
Thermohygrometer	Testo	608-H2	12269	07/06/2022	07/08/2024	
Thermohygrometer	Bioblock Scientific	Météostar	0963	09/06/2021	09/02/2024	

BAT-EMC software version: V3.18.0.26

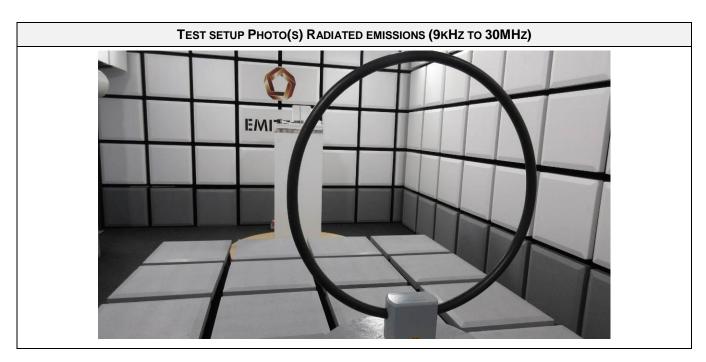
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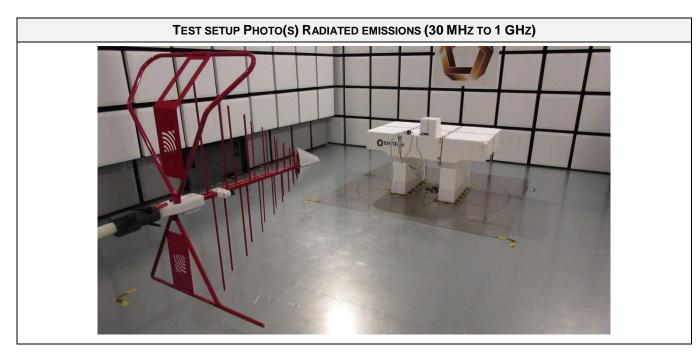
TEST EQUIPMENT USED - 30 MHz TO 1 GHz					
CATEGORY	BRAND	Түре	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	ETS lindgren	3142E	14523	27/01/2022	27/03/2025
Cable	SUCOFLEX	N-3m	14378	17/08/2023	17/10/2025
Cable	SUCOFLEX	N-6,5m	14380	17/08/2023	17/10/2025
Cable	Techniwave	N-8m	18349	17/08/2023	17/10/2025
Receiver	Rohde & Schwarz	ESW26	17791	08/02/2023	08/04/2024
Shielded enclosure	COMTEST	FAR-3m	18014	17/08/2021	17/10/2024
Software	Nexio	BAT EMC	0000		
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024
Thermohygrometer	Testo	608-H2	12269	07/06/2022	07/08/2024

BAT-EMC software version: V3.18.0.26











RADIATED SPURIOUS EMISSIONS – TABULATED RESULTS					
	Tx MODE / 0° EMI4688				
FREQUENCY (MHz) PEAK LEVEL (dBµA/m) AVERAGE/QPEAK QPEAK LIMIT (dBµA/m) AVERAGE/QPEAK QPEAK LIMIT (dBµA/m)					MARGING (dB)
N/A	N/A	N/A	N/A	N/A	N/A
Supplementary information: No spurious emissions were detected.					

RADIATED SPURIOUS EMISSIONS – TABULATED RESULTS						
	Tx mode / 45°					
FREQUENCY (MHz)						
N/A	N/A	N/A	N/A	N/A	N/A	
Supplementary information: No spurious emissions were detected.						

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS							
Tx mode / 90° EMI468					EMI4686		
FREQUENCY (MHz)	POLARIZATION	PEAK LEVEL (dBµA/m)	AVERAGE/QPEAK LEVEL (dBµA/m)	AVERAGE/ QPEAK LIMIT (dBµA/m)	MARGING (dB)		
N/A	N/A	N/A	N/A	N/A	N/A		
Supplementary i	Supplementary information: No spurious emissions were detected.						

	RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS							
	RADIATED MEASUREMENT							
FREQUENCY (MHz)	POLARIZATION	PEAK LEVEL (dBµV/m)	QPEAK LEVEL (dBµV/m)	QPEAK LIMIT (dBµV/m)	MARGING (dB)			
33.492	Vertical	29.68	N/P	40.00	-10.32			
53.475	Vertical	33.47	N/P	40.00	-6.53			
84.774	Vertical	34.68	29.01	40.00	-10.99			
133.405	Vertical	26.79	N/P	43.50	-16.71			
142.621	Vertical	27.42	N/P	43.50	-16.08			
33.460	Horizontal	23.45	N/P	40.00	-16.55			
57.937	Horizontal	27.04	N/P	40.00	-12.96			
80.151	Horizontal	22.96	N/P	40.00	-17.04			
352.568	Horizontal	26.19	N/P	46.00	-19.81			

Supplementary information: when margin between peak measurements and quasi-peak limit(s) is > 6dB, no quasi-peak measurements were performed



	RADIATED	SPURIOUS EMIS	SIONS - GRAPH			
	Tx mode	/ 0°			EMI	4688
EUT mode:	Tx mode				T (°C):	24
Test Date:	29/08/2023				H (%):	44.2
Test Operator:	MPA				P (hPa):	1010
					Part 15 §209 Tx - Moyenne Part 15 §209 Tx - QCrête/3 :	
dBμA/m 70						
60						
50						
40						
30						
20						
10						
0					13.558256M/22	_
-10 Mm	Managary barrange May Marketon W. M.	mmm				
-20	Market to Market	my manhandy and	manufacture special property of the contract property of	and the second second	morning but and the	included an
-30						
-40 9kHz		Frequen	cy		Position: C	0MHz rcular
Position	FREQUENCIES	RBW	VBW		DETECTOR	
Circular	9kHz-150kHz	300Hz	1kHz		Peak	
Circular	150kHz-1MHz	10kHz	30kHz			
Circular		10kHz		Peak		
	1MHz-30MHz	TUKHZ	30kHz		Peak	
Configuration:	N/A					
	Limit indicated on these plo	ts are calculat	ed with 40 dB/de	ecade extrap	olation facto	r and
Comments:	51.5dB conversion factor.			·		
	The 13.56MHz is the main of	carrier frequen	cy of the EUT's	radio signal.		
		•	-	_		



Test Date: 2	Tx MODE / Tx mode 29/08/2023 MPA	/ 45°				4687
Test Date: 2 Test Operator: N	29/08/2023				T (°C).	
Test Operator: Λ dBμA/m 80 70 60					T (°C):	24
dBμA/m 80 70 60	MPA				H (%):	44.2
dBμA/m ₇₀					P (hPa):	1010
dBμA/m ₇₀					Part 15 §209 Tx - Moyenne, Part 15 §209 Tx - QCrête/3	
50						
40						
30						
20						
10						
0					13.558256M/2.43	_
-10	market I market in the second	manner.				
-20	The state of the s	" When the many	man daga man dalah daga gang gang pada sagar na da man)	way man Arran and a second and a	and the second second second	holl-corp.
-30						
9kHz		Frequenc	у		30 Position: Ci	0MHz rcular
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: 5	Limit indicated on these plot 51.5dB conversion factor.				olation facto	r and
UT modification(s)	The 13.56MHz is the main o	amer frequen	by or the EUTS	s radio signal.		



	TX MODE	/ 00°			EMI	4686
		7 90				
EUT mode:	Tx mode				T (°C):	24
Test Date: Test Operator:	29/08/2023 MPA				H (%): P (hPa):	44.2 1010
80 L	, with A				Part 15 §209 Tx - Moyenne Part 15 §209 Tx - QCrête/3	/3.0m/
dBμA/m 70 60 50 40 30 20 10 -10 -20 -30 9kHz	Mary Mary Mary Mary Mary Mary Mary Mary	Frequen	zy	a portage Augustinos de la constante de la con	33 Position: Ci	omHz rcular
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 plo 51.5dB conversion factor. The 13.56MHz is the main of					r and



EUT modification(s): N/A

		RADIATED ME	ASUREMENT			EMI	4637
EUT mode:	Tx mode					T (°C):	22.9
Test Date:	28/08/2023	3				H (%):	45.4
Test Operator:	MPA					P (hPa):	1009
Settings: RBW: 100k Polarization: Vertical Distance: 3 m dBµV/m 70 60 50 40 40	1- 1 GHz (Analyser mode) 30 Hz, VBW: 300kHz, Auto, Atte	enuation: 0 dB, Sweep count 1, Pre	hamp: Off, LN Preamp: On, Prese	All and the second seco		Meas.QPeak (SR 550xx) (V Meas.Peak (Vertical)	ertical)
0 30MH		100					1GHz
		0000 Points enuation: 0 dB, Sweep count 1, Pre	eamp: Off, LN Preamp: On, Prese	elector: Off			
dBμV/m							
60							
50							
40							
							John Market
30	57.9	36931M/27		352.5	6809M/26.2	of the property of the party of	
20 ~~~	Mary Mary Mary Mary Mary Mary Mary Mary	~ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	Lighting of the public of the	was and was the same the same of the same	(Nosellana)		
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0		The state of the s					
0 - 30MH.		100		су		Polarization: Hori	1GHz zontal
Radiated measurement Position	rent / Configuration 5 - 4637	QUENCIES	M Frequen	VBW		Polarization: Hori	1GHz zontal
Radiated measurement Position Vertical	rnt / Configuration 5 - 4637 FREG 30MI	QUENCIES Hz-1GHz	RBW 100kHz	VBW 300kHz		Polarization: Hori Peak	1GHz zontal
Position Vertical Horizontal	FREG 30MI	QUENCIES	M Frequen	VBW		Polarization: Hori	1GHz zontal
Radiated measurement Position Vertical	rnt / Configuration 5 - 4637 FREG 30MI	QUENCIES Hz-1GHz	RBW 100kHz	VBW 300kHz		Polarization: Hori Peak	1GHz zontal
Position Vertical Horizontal	FREG 30MI 30MI N/A	QUENCIES Hz-1GHz	RBW 100kHz 100kHz	VBW 300kHz		Polarization: Hori Peak	1GHz contal



6.4. Field strength in the band 13.553-13.567MHz

Reference standard:	FCC Part 15.225 a) & RSS-210	
Test method:	ANSI C63.10: 2013	

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.

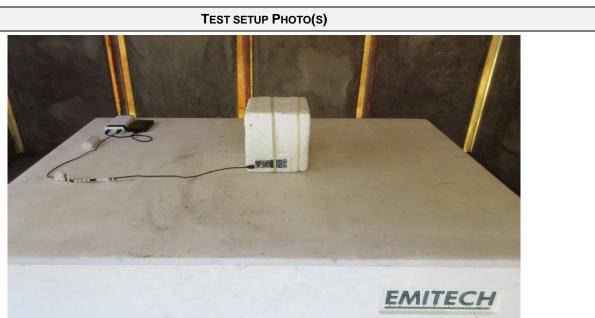
TEST CASE	EUT MODE	SEVERITY	RESULT TAB.	VERDICT
Field strength	Tx mode	15848µV/m at 30m	EMI4400	PASS

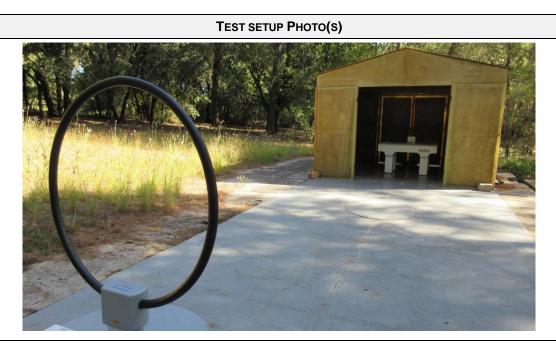
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST				
Ambient Temperature	15 to 35 °C	22.6 °C				
Relative Humidity	20 to 75 %	56.6 %				
Atmospheric pressure	N/A	1017 hPa				
Test method deviation: N/A						

Supplementary information: Only maximum level is recorded

TEST EQUIPMENT USED							
CATEGORY	BRAND	Түре	IDENTIFIER	CAL. DATE	CAL. DUE		
Antenna	Rohde & Schwarz	HFH2-Z2	5825	16/08/2022	16/10/2024		
Cable	Huber + Suhner	N-10m	8472	16/08/2023	16/10/2025		
Open area test site	EMITECH	Salinelles	3482	21/08/2021	21/10/2024		
Receiver	Rohde & Schwarz	ESHS10	3371	04/05/2023	04/07/2024		
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024		
Thermohygrometer	Bioblock Scientific	Météostar	0963	09/06/2021	09/02/2024		







	EMI4400					
Frequency (MHz)	Polarization (°)	Level at 10m (dBµA/m)	Limit at 10m (dBµA/m)	Limit at 30m (μV/m)		
13.56	0	-9.04	51.58	15848		
13.56	45	-7.84	51.58	15848		
13.56	90	-5.34	51.58	15848		
Comments:	Maximun level at 10 m is -5.34 dBμA/m for a limit at 51.58 dBμA/m. Using an extrapolation factor of 40 dB/dec and a conversion factor of -51.5 dB, level at 30m is 27.08 dBμV/m for a limit at 84 dBμV/m.					

EUT MODIFICATIONS	OPERATOR	TEST DATE	RESULT TAB.
N/A	MPA	31/08/2023	EMI4400



6.5. Field strength outside the band 13.110-14.010MHz

Reference standard:	FCC Part 15.225 b) c) & d) RSS-210			
Test method: ANSI C63.10: 2013				
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
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
Below 13.110MHz	§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: N/A			

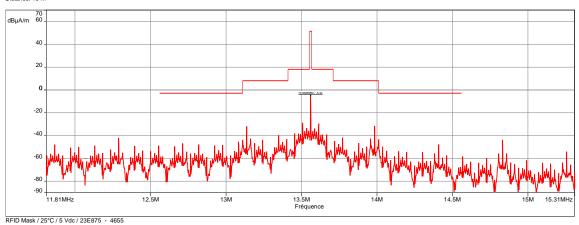
TEST EQUIPMENT USED					
CATEGORY	BRAND	ТҮРЕ	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	EMITECH	3.5 cm	4653		
Attenuator	Radiall	R412720124	4391	30/09/2022	30/11/2025
Cable	MegaPhase	N-3m	14853	20/05/2022	20/07/2024
Receiver	Rohde & Schwarz	FPL1007	17908	02/11/2022	02/01/2024
Software	Nexio	BAT EMC	0000		
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024
Thermohygrometer	Bioblock Scientific	Météostar	0963	09/06/2021	09/02/2024

FCC/15.225 - Classe:Tx - QCrête/10.0m/



	FIELD STRENGTH IN THE BAND 13.110-14.010MHz AND OUTSIDE – GRAPH				
FIELD STRENGTH IN THE BAND 13.110-14.010MHZ AND OUTSIDE EMI4581					
EUT mode:	EUT mode: Tx mode 1				
Test Date:	01/09/2023	H (%):	56.6		
Test Operator:	MPA	P (hPa):	1017		

Description Sous-bande 1
Fréquences:11.81 MHz - 15.31 MHz (Mode analyseur) 8000 Points
Réglages: RBW: 30014; VBW: 1kHz, Auto, Atténuation : Auto, Nombre de Balayages : 1, Preamp : Off, LN Preamp : Off, Preselecteur: Off
Position:Circulative
Distance: 10 m



Position	FREQUENCIES	RBW	VBW	DETECTOR
Circular	11.81MHz-15.31MHz	300Hz	1kHz	Peak

Configuration:

Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and **Comments:** 51.5dB conversion factor.

EUT modification(s): N/A



6.6. Measurement of Frequency Stability

Reference standard:	FCC 47 CRF Part 15.225 e) RSS-210
Test method :	ANSI C63.10: 2013

General test setup: The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

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

TEST CASE	EUT MODE	SEVERITY	RESULT TAB.	VERDICT
Frequency stability	Tx mode	+/-0.01%	EMI4500	PASS

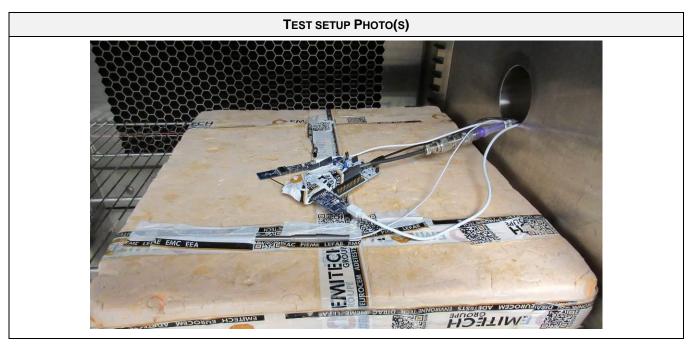
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST	
Ambient Temperature	15 to 35 °C	22.6 °C	
Relative Humidity	20 to 75 %	56.6 %	
Atmospheric pressure	N/A	1017 hPa	

Test method deviation: Due to EUT's operating temperature range, measurement was performed at +10°C and +40°C.

Supplementary information: N/A

TEST EQUIPMENT USED					
CATEGORY	BRAND	Түре	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	EMITECH	3.5 cm	4653		
Attenuator	Radiall	R412720124	4391	30/09/2022	30/11/2025
Cable	MegaPhase	N-3m	14853	20/05/2022	20/07/2024
Climatic enclosure	CLIMATS	EXCAL 7714-HA	14261	01/09/2022	01/11/2023
Receiver	Rohde & Schwarz	FPL1007	17908	02/11/2022	02/01/2024
Software	Nexio	BAT EMC	0000		
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024
Thermohygrometer	Bioblock Scientific	Météostar	0963	09/06/2021	09/02/2024





FREQUENCY STABILITY / CARD - TABULATED RESULTS					EMI4500
Test Case	Limit (%)				
Normal conditions	+25	5	13.5606154	-	
Extremes conditions	0	5	13.5606454	+0.00022	+/- 0.01%
	+60	5	13.5605475	-0.00050	

EUT MODIFICATIONS	OPERATOR	TEST DATE	RESULT TAB.
N/A	MPA	01/09/2023	EMI4500

OOO End of test report OOO