



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: March 2024
RSS-210, Issue 10: December 2019 / AMD: April 2020
(Partial Tests)

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.....: X-NUCLEO-NFC09A1
FCC ID.....: YCPNFC09A1
IC: 8976A-NFC09A1
Ratings.....: 5 Vdc

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

Report Reference No......: **RR-EVE-24C933-2A**
Test procedure: FCC IC Verification
Diffusion.....: Mr DAUBOIS
Applicant's name: STMICROELECTRONICS
Date of issue.....: September 17, 2024
Total number of pages.....: 29
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.*

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REVISION HISTORY:			
Revision	Date	Modified pages	Modifications
0	September 17, 2024	/	Creation

1. GENERAL INFORMATIONS

This document submits the results of Radio tests performed on the equipment **X-NUCLEO-NFC09A1** (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 & 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..... : May the 30 th of 2024					
APPLICANT'S GENERAL INFORMATIONS:					
Company name : STMICROELECTRONICS (Rousset) SAS					
Company address. : 190 AVENUE CELESTIN COQ 13106 ROUSSET FRANCE					
Person(s) present during the tests. : No representative for company attended the tests.					
Responsible..... : Mr DAUBOIS					
GENERAL REMARKS:					
<p>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.</p> <p>"(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.</p>					
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 requirement.. : F (Fail)					
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: March 2024

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

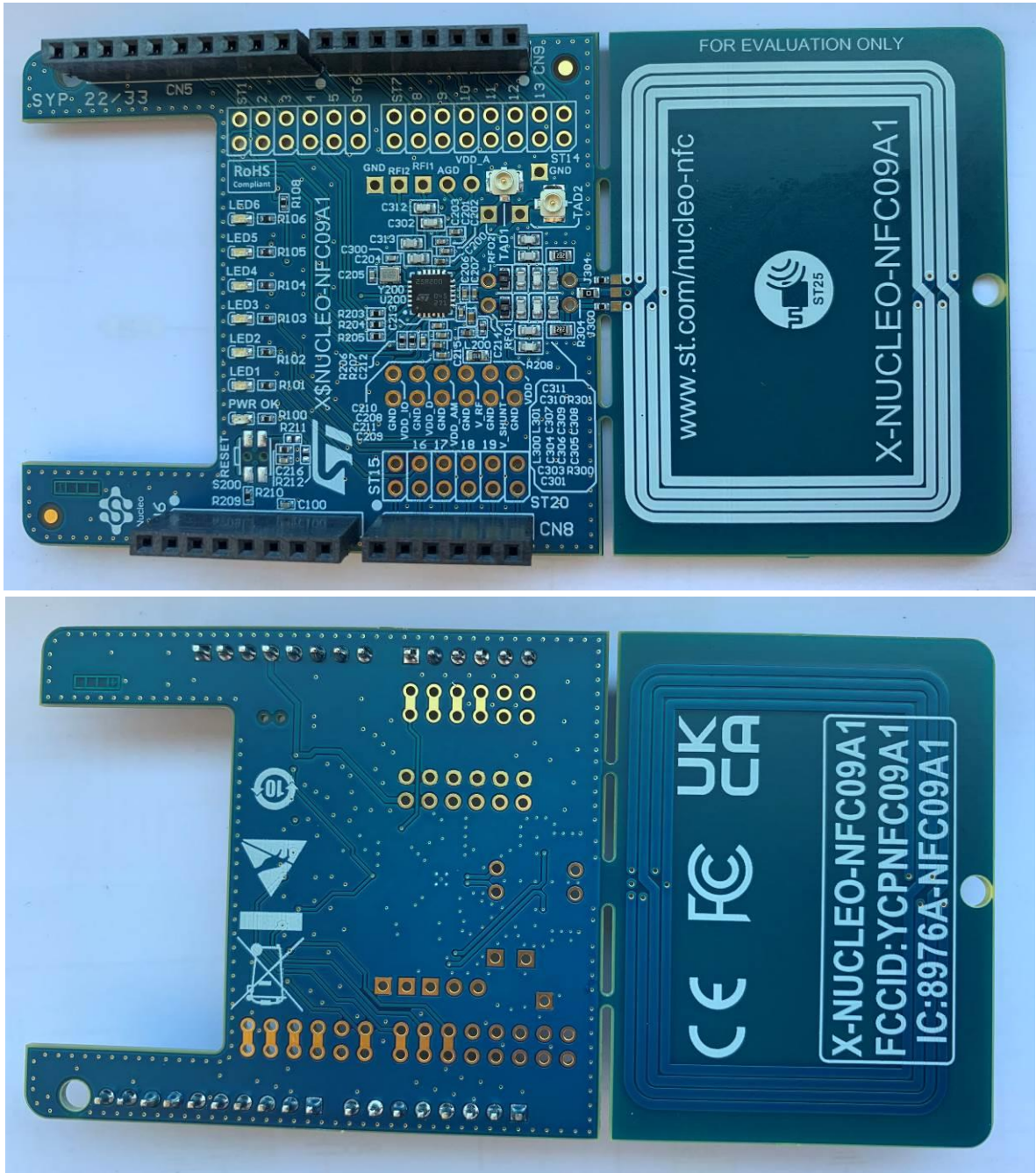
American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

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.

3.3. EUT General view



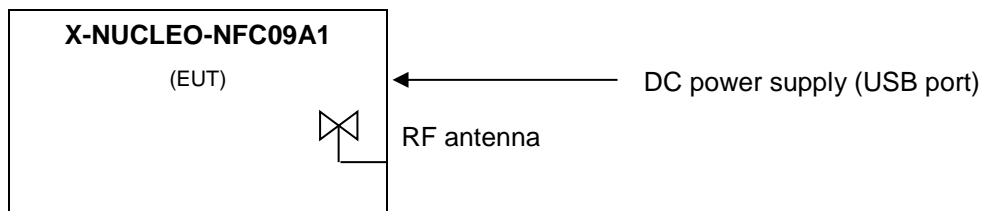
3.4. EUT Mechanical and Electrical Design

Power supply..... : 5 Vdc
 Power supply range..... : 5 Vdc
 Power type..... : USB
 Power (W)..... : 1.7
 Nominal current (A). : *Not communicated*
 Dimensions (L x W x H) (m). : 0.104 x 0.054 x 0.007
 Weight (kg). : 0.01
 Temperature range (°C). : 0 to +60
 Ground bounding strap..... : No

Comments:

N/A

3.5. EUT Input/Output ports



PORT	NAME	TYPE	LENGTH	CABLE TYPE	COMMENTS
0	Main frame	N/E	N/A	N/A	PCB
1	DC power source	USB	N/A	N/A	5Vdc
2	RF antenna	RF	N/A	N/A	13.56 MHz PCB printed

AC/DC : AC/DC Converter port

AC..... : Alternative current port

DC : Direct current port

I/O..... : Input or Output port

TP : Telecommunication port

RF..... : Radio frequency port

N/E : Non Electrical port

3.6. Supporting Equipment Used During Test

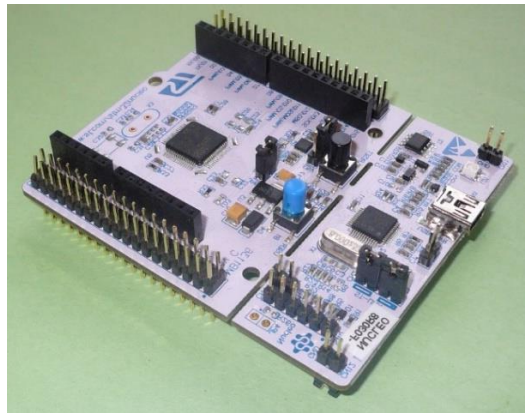
Sample subject to the tests was tested with following equipment.

PRODUCT TYPE	MANUFACTURER	MODEL	N°EMITECH / COMMENTS
NFC TAG	STMICROELECTRONICS	ST25TV02KC	Used to initiate NFC communications.
Nucleo demo board	STMICROELECTRONICS	Not communicated	Used to powered the EUT and set it in test mode.
Power Bank	Xindao B.V.	P324.25	Provide the 5Vdc to the demo board.

NFC TAG (AE)



NUCLEO DEMO BOARD (AE)



POWER BANK (AE)



3.7. EUT Radio Specifications

a) GENERAL INFORMATIONS	
According to manufacturer's declarations :	
EUT type.....	: <i>Transceiver</i>
Technology	: <i>RFID</i>
Environmental profile	: <i>Data transmissions</i>
Temperature range	: <i>0°C to +60°C</i>
Antenna type	: <i>PCB</i>
Antenna Gain.....	: <i>Not communicated</i>
Comments:	
<i>N/A</i>	
b) TRANSMITTER PARAMETERS (Tx)	
Frequency bands.....	: <i>13.553 MHz to 13.567 MHz</i>
RF Power.....	: <i>1.7 W</i>
Number of channels / Separation	: <i>1</i>
Modulation type	: <i>AM</i>
Duty cycle	: <i>100%</i>
Tested frequency.....	: <i>13.56 MHz</i>
c) RECEIVER PARAMETERS (Rx)	
Frequency bands.....	: <i>13.553 MHz to 13.567 MHz</i>

4. RESULT SUMMARY

TEST DESIGNATION	SEVERITY	VERDICT	COMMENTS
GENERAL			
Labeling requirements		N/P	15.19 / See certification documents
Information to user		N/P	15.21 / See certification documents
Home-built devices		N/A	15.23
Kits		N/A	15.25
Special Accessories		N/P	15.27 / See certification documents
Inspection by the Commission		N/A	15.29
Measurement standards		PASS	15.31
Test procedure for CPU boards and computer power supplies		N/A	15.32
Frequency range of radiated measurements		PASS	15.33
Measurement detector functions and bandwidths		PASS	15.35
Transition provisions for compliance with the rules		N/P	15.37 / See certification documents
UNINTENTIONAL RADIATORS			
Equipment authorization			15.101
- Verification		N/A	
- Declaration of Conformity		N/A	
CPU boards and power supplies used in personal computers		N/A	15.102
Exempted device		N/A	15.103
Information to the user		N/P	See certification documents
Conducted limits	Class B	N/P	15.107 Customer's request
Radiated emission limits	Class B	PASS	15.109
Antenna power conduction limits for receivers		N/A	15.111
Power line carrier systems		N/A	15.113
TV interface devices, including cable system terminal devices		N/A	15.115
TV broadcast receivers		N/A	15.117
Cable ready consumer electronics equipment		N/A	15.118
Program blocking technology requirements for TV receivers		N/A	15.120
Scanning receivers and frequency converters used with scanning receivers		N/A	15.121
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		N/P	15.207 Customer's request
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		N/P	Customer's request
- Field strength in the band 13.110-13.410 MHz and 13.710-14.010 MHz		N/P	Customer's request
- Field strength outside the band 13.110-14.010 MHz		N/P	Customer's request
- Frequency tolerance of the carrier signal		N/P	Customer's request
- 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
Radio frequency	$\pm 1 \times 10^{-7}$	$\pm 1 \times 10^{-7}$
Radiated emission (magnetic field) 9kHz – 30MHz	± 3.4 dB	± 6 dB
Supply voltages	± 3 %	± 3 %
Temperature	± 1 °C	± 1 °C
Humidity	± 5 %	± 5 %
Conducted emission (FCC) (Artificial Mains Network) 150kHz – 30MHz	± 3.4 dB	± 3.4 dB
Radiated emission (electric field for FCC standard) 9kHz – 30MHz	± 2.7 dB	/
30MHz – 1GHz	± 5.0 dB	/
1GHz – 18GHz	± 5.3 dB	/
18GHz – 40GHz	± 6.1 dB	/
40GHz – 140GHz	± 5.7 dB	/

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

6. TEST CONDITIONS AND RESULTS

6.1. Radiated spurious emissions

Reference standard:	FCC Part 15.225, 15.209 RSS-210, RSS-Gen
Test method:	ANSI C63.10: 2013
<p>General test setup: For $f < 30\text{MHz}$, EUT is set on an insulating support at 80cm above the ground reference plane.</p> <p>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°).</p> <p>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.</p> <p>For $f > 30\text{MHz}$, EUT is set on an insulating support at 80cm above the ground reference plane (150cm for $f > 1\text{GHz}$).</p> <p>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.</p> <p>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.</p> <p>All frequencies were investigated, where applicable.</p> <p>For portable equipments a research of maximum level is done on the 3 axes. Only the highest levels are recorded.</p>	

TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Radiated measurement / 9 kHz to 30 MHz / 0° / X-NUCLEO-NFC09A1	9kHz-30MHz	15.209	EMI4488	PASS
Radiated measurement / 9 kHz to 30 MHz / 45° / X-NUCLEO-NFC09A1	9kHz-30MHz	15.209	EMI4594	PASS
Radiated measurement / 9 kHz to 30 MHz / 90° / X-NUCLEO-NFC09A1	9kHz-30MHz	15.209	EMI4595	PASS
Radiated measurement / 9 kHz to 30 MHz / 0° / X-NUCLEO-NFC09A1 (old version)	9kHz-30MHz	15.209	EMI4596	PASS
Radiated measurement / 9 kHz to 30 MHz / 45° / X-NUCLEO-NFC09A1 (old version)	9kHz-30MHz	15.209	EMI4597	PASS
Radiated measurement / 9 kHz to 30 MHz / 90° / X-NUCLEO-NFC09A1 (old version)	9kHz-30MHz	15.209	EMI4598	PASS
Radiated measurement / 30 MHz to 1 GHz / X-NUCLEO-NFC09A1	30MHz-1GHz	15.209	EMI4498	PASS
Radiated measurement / 30 MHz to 1 GHz / X-NUCLEO-NFC09A1 (old version)	30MHz-1GHz	15.209	EMI4553	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	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	Rohde & Schwarz	HFH2-Z2	5825	16/08/2022	16/10/2024
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	14/02/2023	14/10/2024
Shielded enclosure	COMTEST	SAC 3m	14494	08/08/2023	08/10/2026
Software	Nexio	BAT EMC	0000		
Thermohygrometer	Testo	608-H2	12269	07/06/2022	07/08/2024
Thermohygrometer	Bioblock Scientific	Météostar	0963	25/09/2023	25/11/2025

BAT-EMC software version: V3.18.0.26

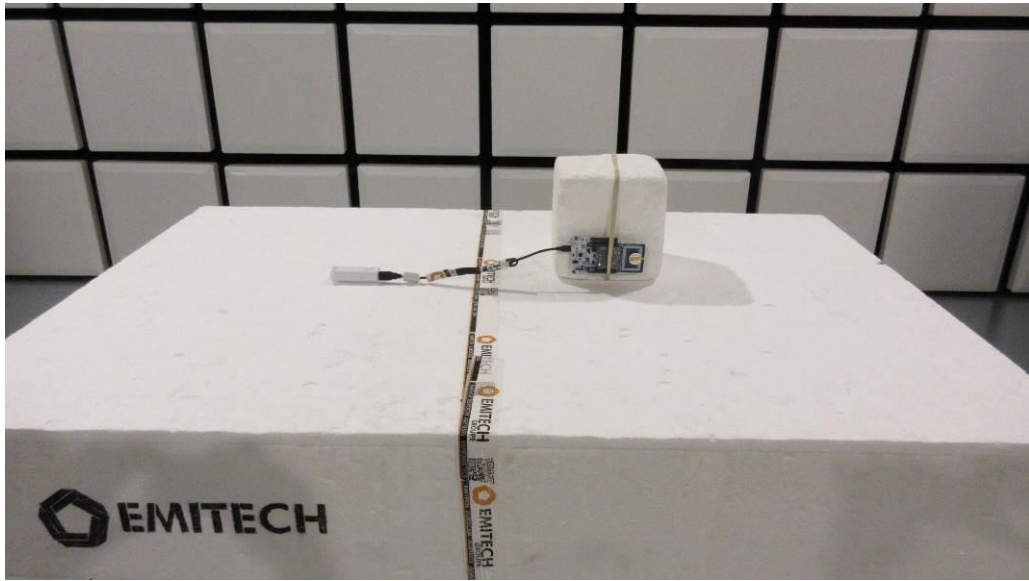
Blank cells = Permanent validity

TEST EQUIPMENT USED – 30 MHZ TO 1 GHZ					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	ETS lindgren	3142E	14523	27/01/2022	27/03/2025
Attenuator	EMITECH	SUB.V3-H	14848	13/03/2023	13/11/2024
Attenuator	EMITECH	SUB.V3-V	14847	13/03/2023	13/11/2024
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
Converter		2.15	9988		
Receiver	Rohde & Schwarz	ESW26	17791	14/02/2023	14/10/2024
Shielded enclosure	COMTEST	SAC 3m	14494	08/08/2023	08/10/2026
Software	Nexio	BAT EMC	0000		
Thermohygrometer	Testo	608-H2	12269	07/06/2022	07/08/2024
Thermohygrometer	Bioblock Scientific	Météostar	0963	25/09/2023	25/11/2025

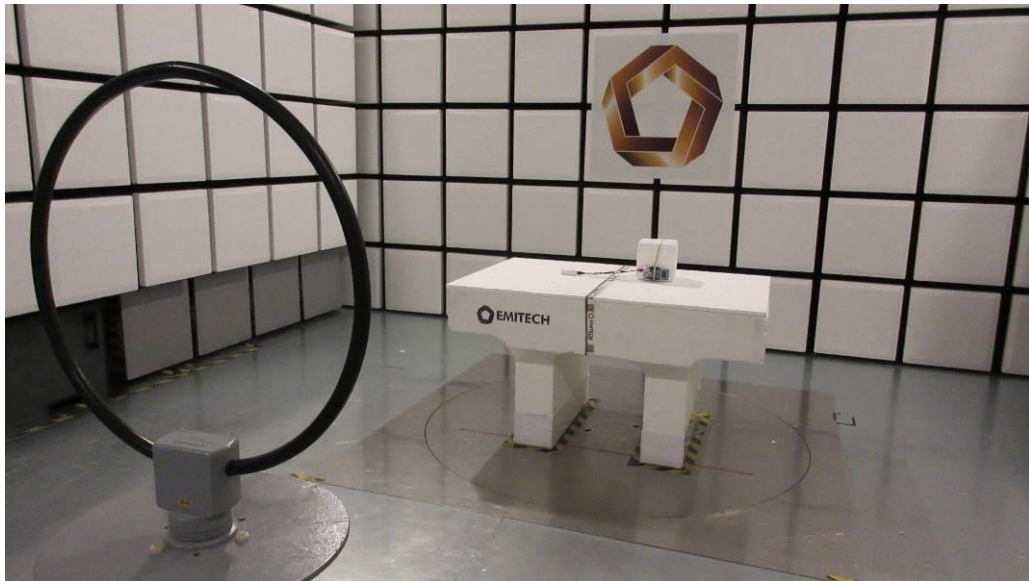
BAT-EMC software version: V3.18.0.26

Blank cells = Permanent validity

TEST SETUP PHOTO(S) EUT POSITION



TEST SETUP PHOTO(S) RADIATED EMISSION (9 KHZ TO 30 MHZ)



TEST SETUP PHOTO(S) RADIATED EMISSIONS (30 MHz TO 1 GHz)



RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS					
RADIATED MEASUREMENT / 9 KHZ TO 30 MHZ / 0° / X-NUCLEO-NFC09A1					EMI4488
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 information: No spurious emissions were detected.					

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS					
RADIATED MEASUREMENT / 9 KHZ TO 30 MHZ / 45° / X-NUCLEO-NFC09A1					EMI4594
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 information: No spurious emissions were detected.					

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS					
RADIATED MEASUREMENT / 9 KHZ TO 30 MHZ / 90° / X-NUCLEO-NFC09A1					EMI4595
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 information: No spurious emissions were detected.					

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS					
RADIATED MEASUREMENT / 9 KHZ TO 30 MHZ / 0° / X-NUCLEO-NFC09A1 (OLD VERSION)					EMI4596
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 information: No spurious emissions were detected.					

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS					
RADIATED MEASUREMENT / 9 KHZ TO 30 MHZ / 45° / X-NUCLEO-NFC09A1 (OLD VERSION)					EMI4597
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 information: No spurious emissions were detected.					

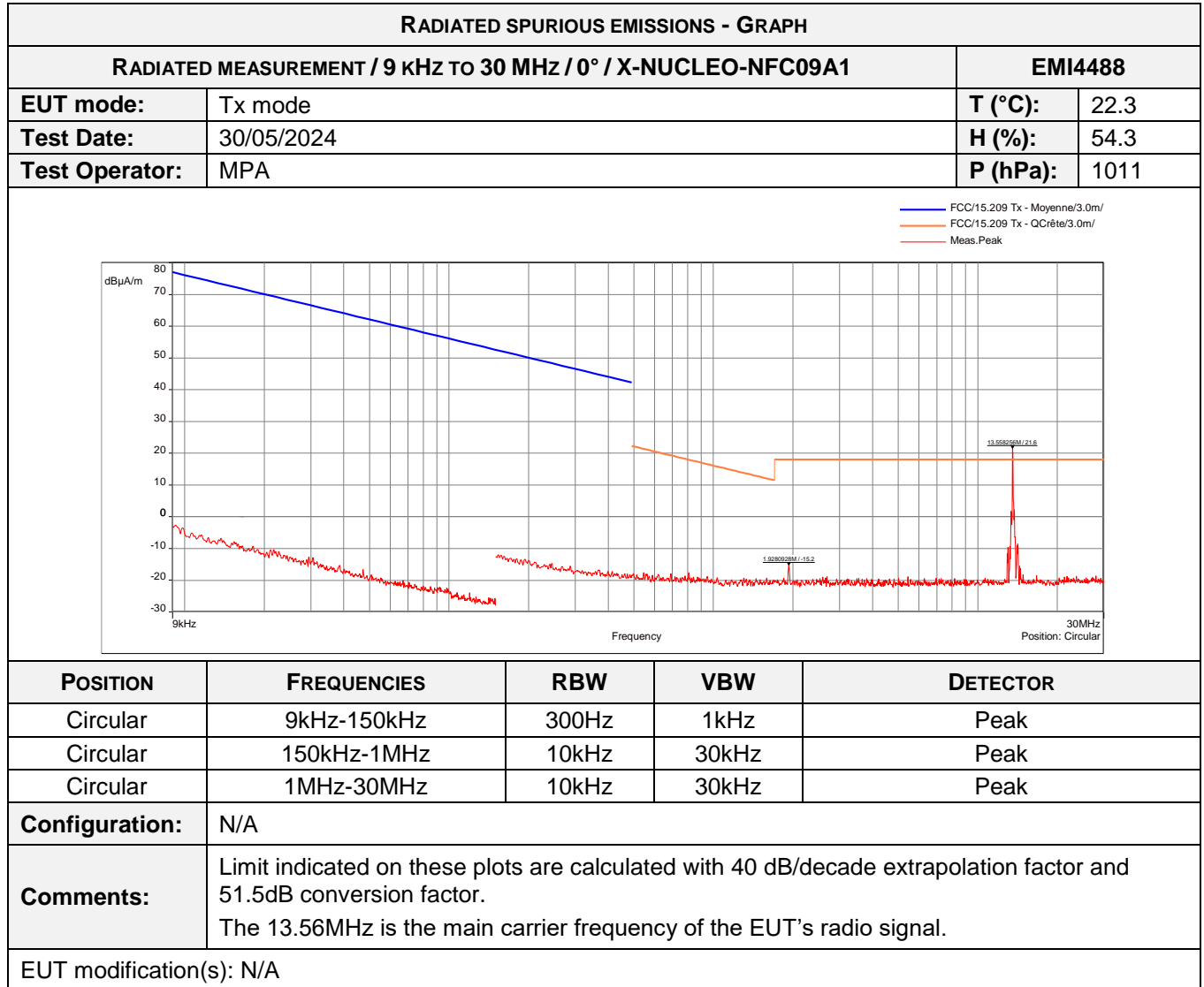
RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS					
RADIATED MEASUREMENT / 9 KHZ TO 30 MHZ / 90° / X-NUCLEO-NFC09A1 (OLD VERSION)					EMI4598
FREQUENCY (MHZ)	POLARIZATION	PEAK LEVEL (dBμA/m)	AVERAGE/QPEAK LEVEL (dBμA/m)	AVERAGE/QPEAK LIMIT (dBμA/m)	MARGING (dB)
N/A	N/A	N/A	N/A	N/A	N/A
Supplementary information: No spurious emissions were detected.					

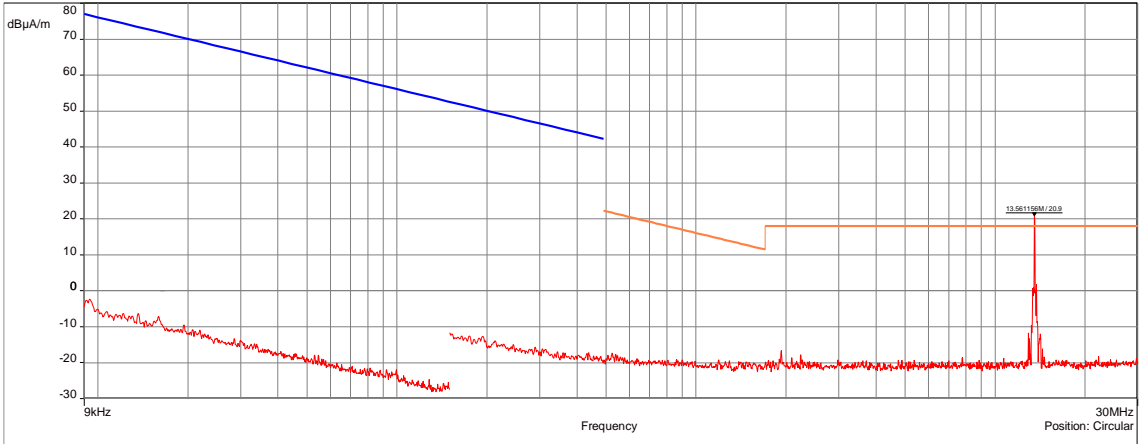
RADIATED SPURIOUS EMISSIONS – TABULATED RESULTS					
RADIATED MEASUREMENT / 30 MHz TO 1 GHz / X-NUCLEO-NFC09A1					EMI4498
FREQUENCY (MHz)	POLARIZATION	PEAK LEVEL (dB μ V/m)	QPEAK LEVEL (dB μ V/m)	QPEAK LIMIT (dB μ V/m)	MARGINING (dB)
40.67	Vertical	22.1	N/P	40	-17.9
176.28	Horizontal	30.1	N/P	43.5	-13.4
203.41	Horizontal	32.6	N/P	43.5	-10.9
266.36	Horizontal	31.8	N/P	46	-14.2
287.96	Horizontal	31.3	N/P	46	-14.7
678.01	Horizontal	38.2	N/P	46	-7.8
735.47	Horizontal	36.8	N/P	46	-9.2

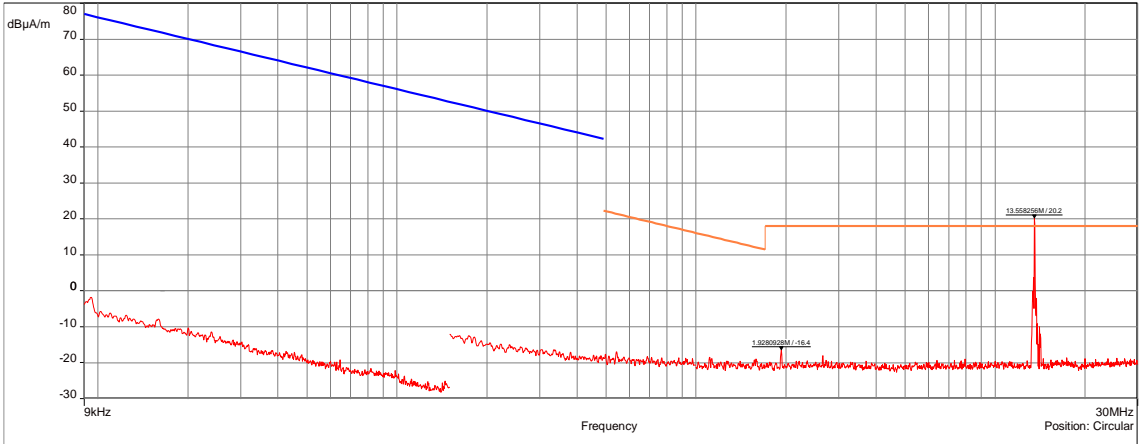
Supplementary information: when margin between peak measurements and quasi-peak limit(s) is > 6dB, no quasi-peak measurements were performed

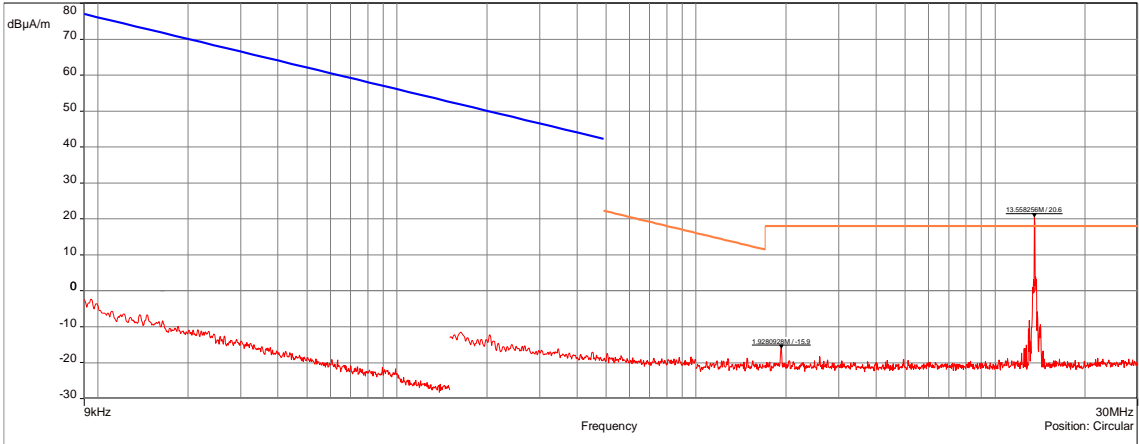
RADIATED SPURIOUS EMISSIONS – TABULATED RESULTS					
RADIATED MEASUREMENT / 30 MHz TO 1 GHz / X-NUCLEO-NFC09A1 (OLD VERSION)					EMI4553
FREQUENCY (MHz)	POLARIZATION	PEAK LEVEL (dB μ V/m)	QPEAK LEVEL (dB μ V/m)	QPEAK LIMIT (dB μ V/m)	MARGINING (dB)
674.16	Horizontal	35.6	N/P	46	-10.4
676.20	Horizontal	36.2	N/P	46	-9.8
685.35	Horizontal	37.5	N/P	46	-8.5
709.60	Horizontal	35.2	N/P	46	-10.8
726.16	Horizontal	35.3	N/P	46	-10.7
729.13	Horizontal	35.4	N/P	46	-10.6

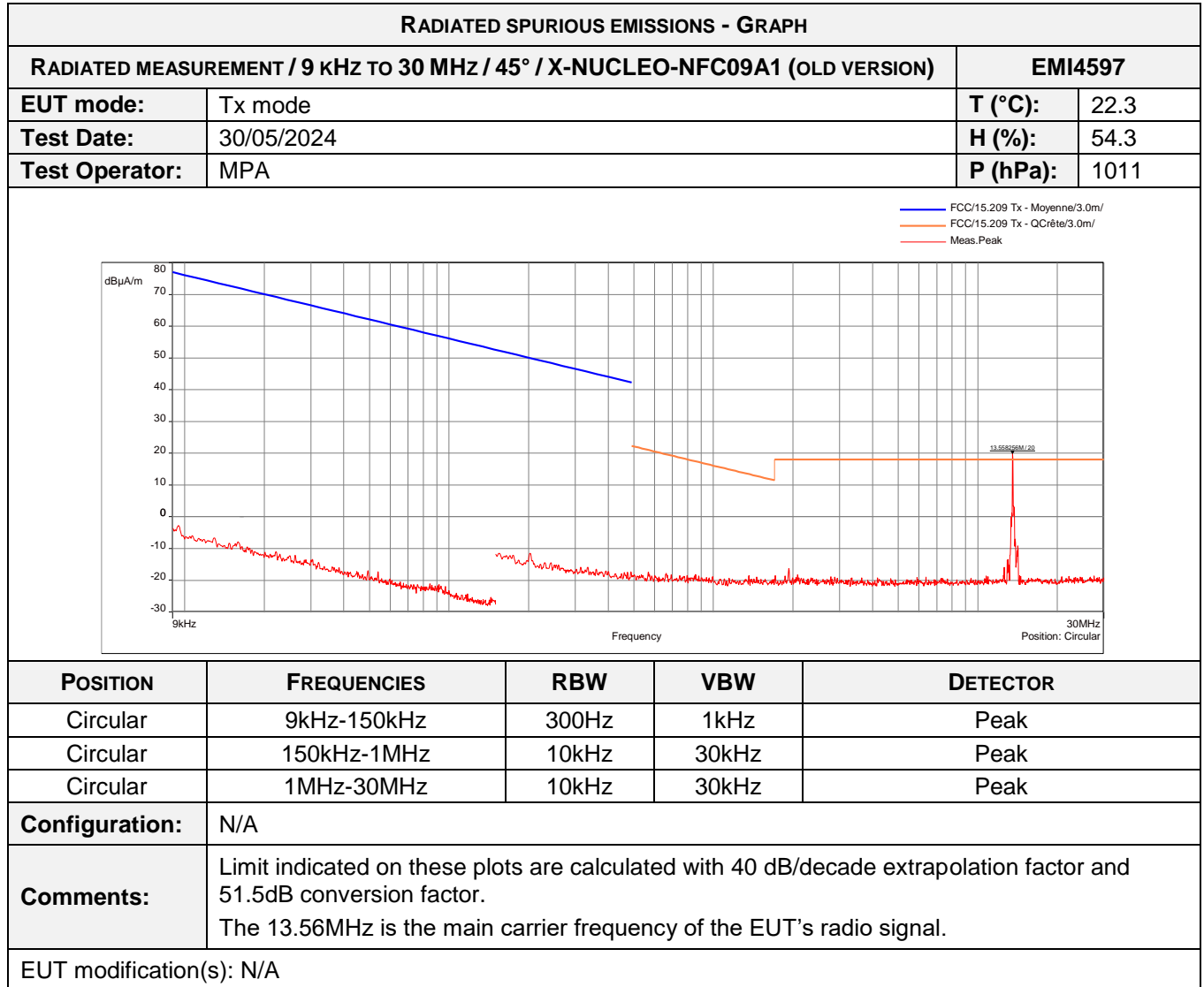
Supplementary information: when margin between peak measurements and quasi-peak limit(s) is > 6dB, no quasi-peak measurements were performed

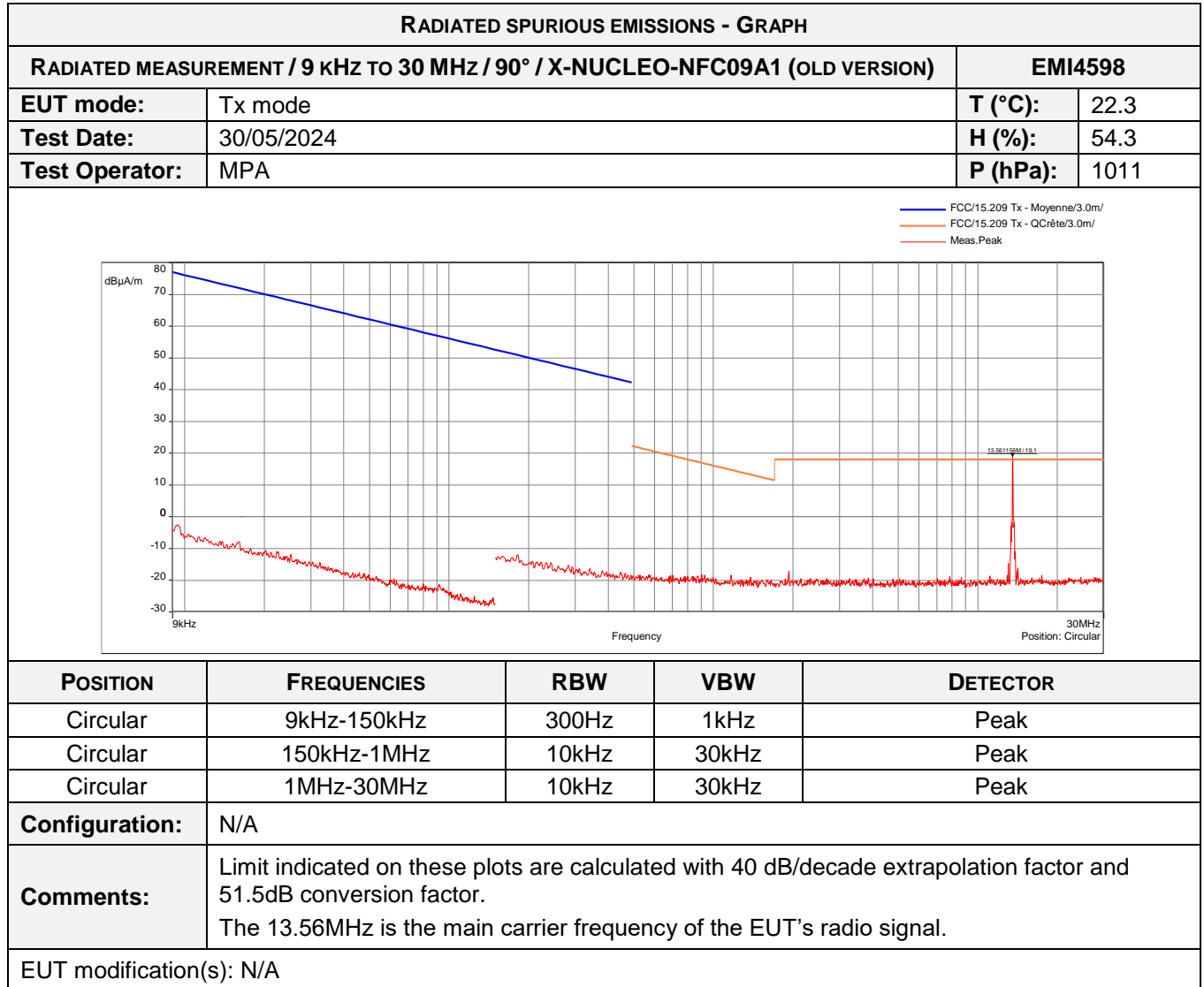


RADIATED SPURIOUS EMISSIONS - GRAPH				
RADIATED MEASUREMENT / 9 kHz TO 30 MHz / 45° / X-NUCLEO-NFC09A1			EMI4594	
EUT mode:	Tx mode		T (°C):	22.3
Test Date:	30/05/2024		H (%):	54.3
Test Operator:	MPA		P (hPa):	1011
<div style="text-align: right;"> <p> — FCC/15.209 Tx - Moyenne/3.0m/ — FCC/15.209 Tx - QCrête/3.0m/ — Meas. Peak </p> </div> 				
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. The 13.56MHz is the main carrier frequency of the EUT's radio signal.			
EUT modification(s): N/A				

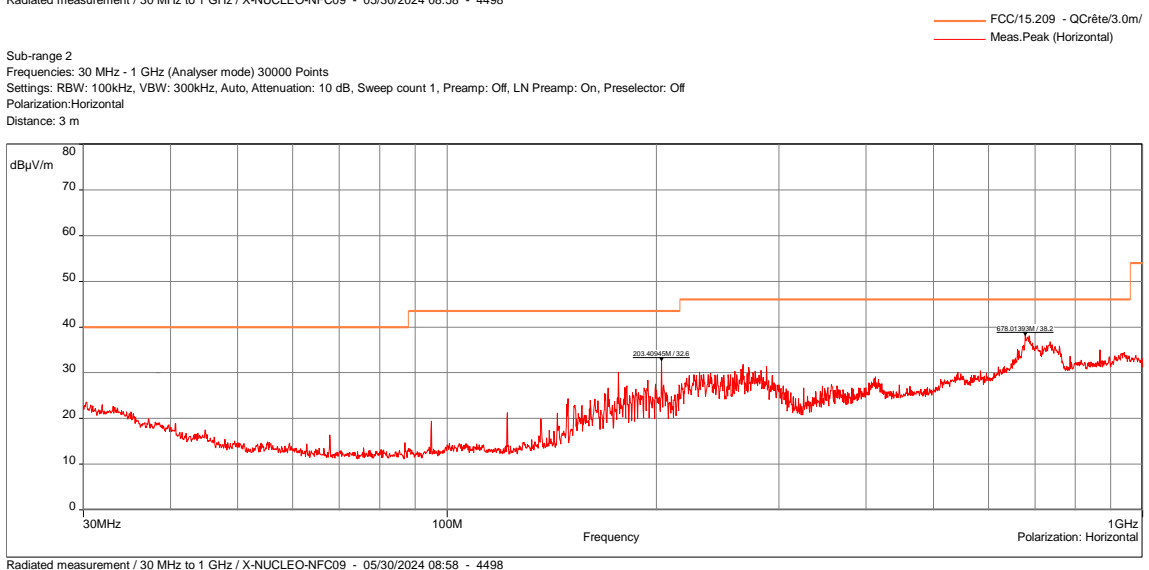
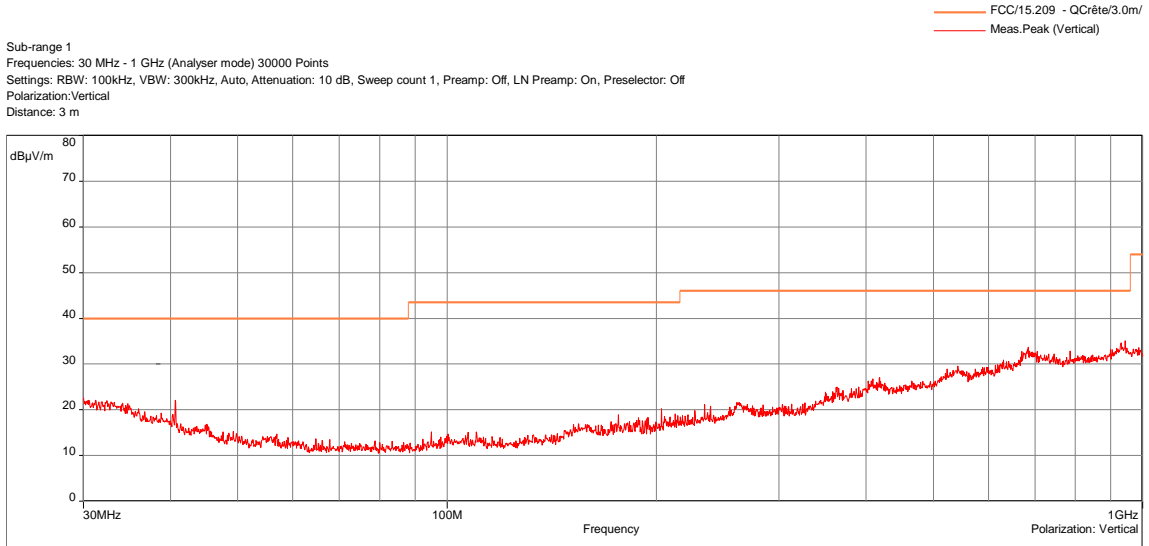
RADIATED SPURIOUS EMISSIONS - GRAPH				
RADIATED MEASUREMENT / 9 kHz TO 30 MHz / 90° / X-NUCLEO-NFC09A1			EMI4595	
EUT mode:	Tx mode		T (°C):	22.3
Test Date:	30/05/2024		H (%):	54.3
Test Operator:	MPA		P (hPa):	1011
<div style="text-align: right; font-size: small;"> — FCC/15.209 Tx - Moyenne/3.0m/ — FCC/15.209 Tx - QCrête/3.0m/ — Meas.Peak </div> 				
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. The 13.56MHz is the main carrier frequency of the EUT's radio signal.			
EUT modification(s): N/A				

RADIATED SPURIOUS EMISSIONS - GRAPH					
RADIATED MEASUREMENT / 9 kHz TO 30 MHz / 0° / X-NUCLEO-NFC09A1 (OLD VERSION)				EMI4596	
EUT mode:	Tx mode			T (°C):	22.3
Test Date:	30/05/2024			H (%):	54.3
Test Operator:	MPA			P (hPa):	1011
					
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. The 13.56MHz is the main carrier frequency of the EUT's radio signal.				
EUT modification(s): N/A					



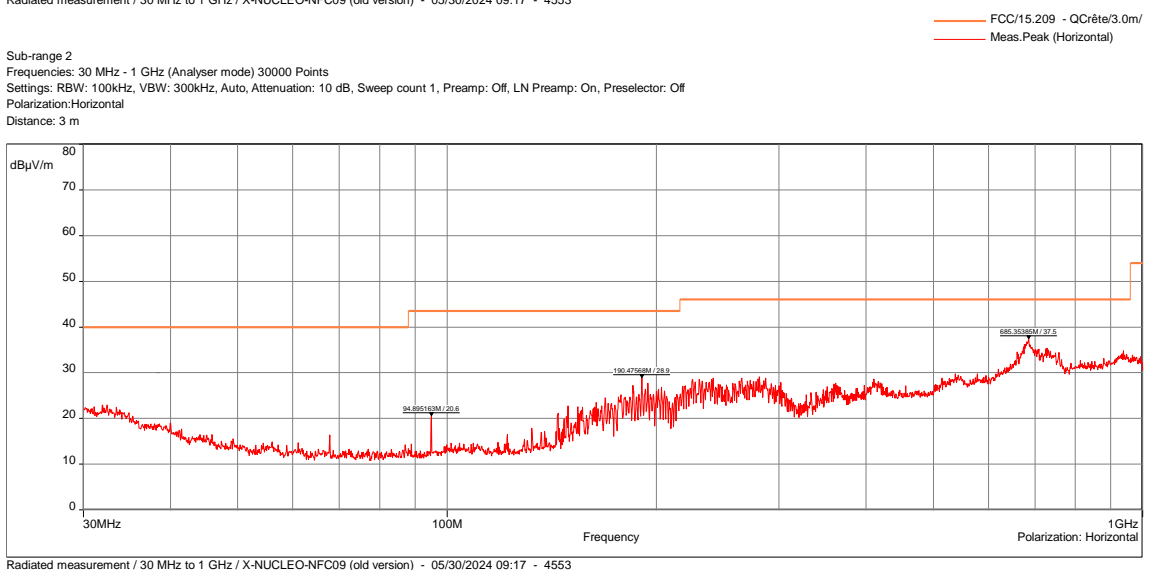
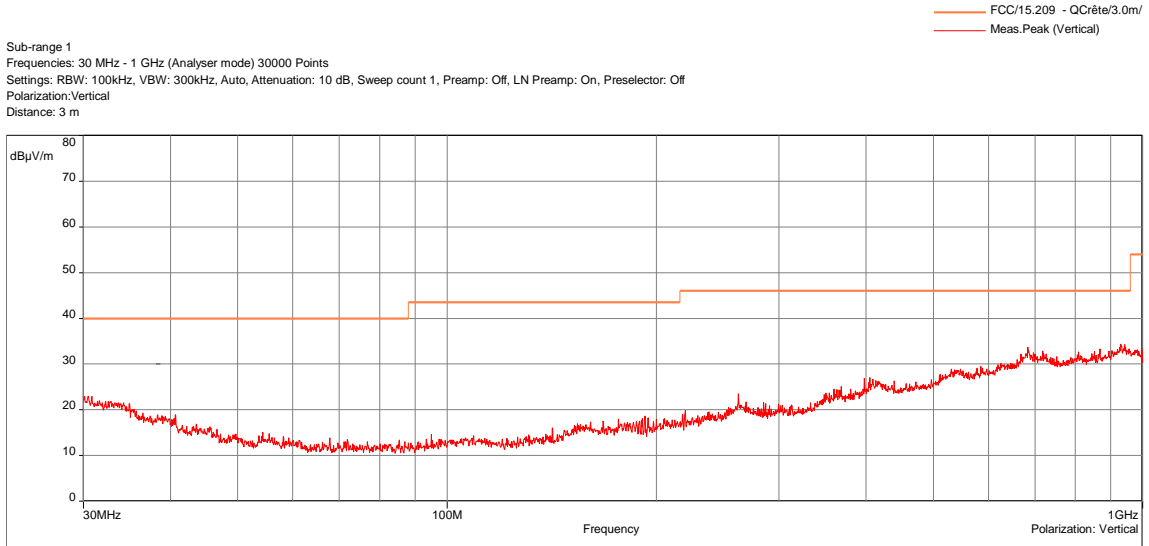


RADIATED SPURIOUS EMISSIONS - GRAPH			
RADIATED MEASUREMENT / 30 MHz TO 1 GHz / X-NUCLEO-NFC09A1			EMI4498
EUT mode:	Tx mode	T (°C):	22.3
Test Date:	30/05/2024	H (%):	54.3
Test Operator:	MPA	P (hPa):	1011



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

RADIATED SPURIOUS EMISSIONS - GRAPH			
RADIATED MEASUREMENT / 30 MHz TO 1 GHz / X-NUCLEO-NFC09A1 (OLD VERSION)			EMI4553
EUT mode:	Tx mode		T (°C): 22.3
Test Date:	30/05/2024		H (%): 54.3
Test Operator:	MPA		P (hPa): 1011



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

6.2. Field strength in the band 13.553-13.567MHz

Reference standard:	FCC Part 15.225 a) RSS-210
Test method:	ANSI C63.10: 2013
<p>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.</p> <p>The EUT was rotated 360° in order to maximize radiated levels. Test antenna was oriented in 3 axes (0°, 45° and 90°).</p> <p>For portable equipments a research of maximum level is done on the 3 axes. Only the highest levels are recorded.</p>	

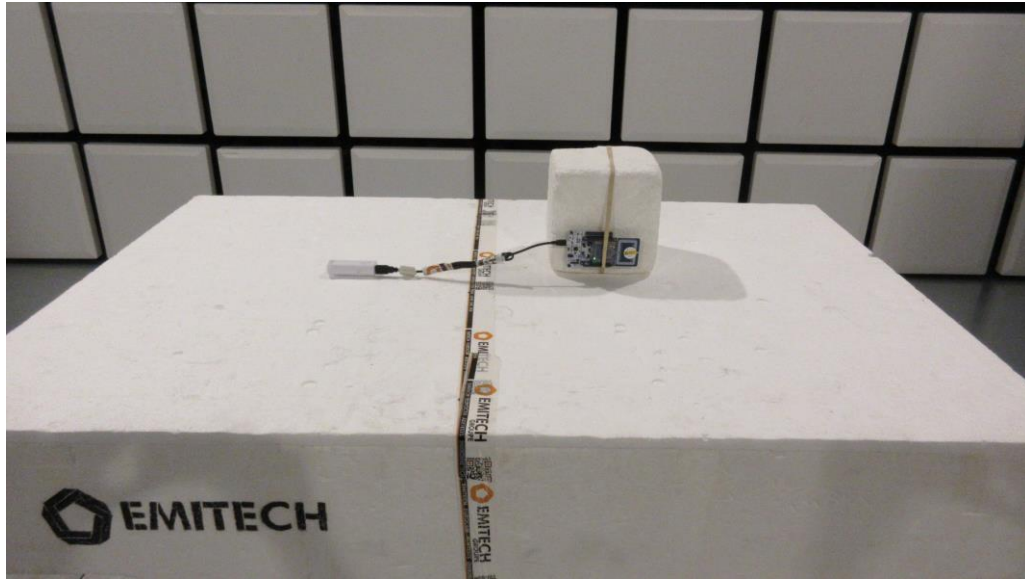
TEST CASE	EUT MODE	SEVERITY	RESULT TAB.	VERDICT
Field strength	Tx mode	15848µV/m at 30m	EMI4400	PASS
Field strength (old version)	Tx mode	15848µV/m at 30m	EMI4401	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	22.3 °C
Relative Humidity	20 to 75 %	54.3 %
Atmospheric pressure	N/A	1011 hPa
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	16/08/2022	16/10/2024
Cable	Huber + Suhner	N-20m	8385	16/08/2023	16/08/2025
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	12269	07/06/2022	07/08/2024
Turntable	Heinrich Deisel	D4420	4038		

Blank cells = Permanent validity

TEST SETUP PHOTO(S)



TEST SETUP PHOTO(S)



FIELD STRENGTH - TABULATED RESULTS				EMI4400
Frequency (MHz)	Polarization (°)	Level at 10m (dBµA/m)	Limit at 10m (dBµA/m)	Limit at 30m (µV/m)
13.56	0	-0.44	51.58	15848
13.56	45	1.36	51.58	15848
13.56	90	4.16	51.58	15848
Comments:	Maximun level at 10 m is 4.16 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 36.58 dBµV/m for a limit at 84 dBµV/m.			

FIELD STRENGTH (OLD VERSION) - TABULATED RESULTS				EMI4401
Frequency (MHz)	Polarization (°)	Level at 10m (dBµA/m)	Limit at 10m (dBµA/m)	Limit at 30m (µV/m)
13.56	0	-1.44	51.58	15848
13.56	45	0.36	51.58	15848
13.56	90	3.16	51.58	15848
Comments:	Maximun level at 10 m is 3.16 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 35.58 dBµV/m for a limit at 84 dBµV/m.			

EUT MODIFICATIONS	OPERATOR	TEST DATE	RESULT TAB.
N/A	MPA	30/05/2024	EMI4400
N/A	MPA	30/05/2024	EMI4401

End of test report