This test report cancels and replaces RR-EVE-23B292-7A Ed.0

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
RSS-247_Issue 3
RSS-Gen Issue 5
ANSI C 63.10: 2013

Company ..... :	**ENLESS WIRELESS**
Address..... :	45 TER AVENUE DE VERDUN 33520 BRUGES FRANCE

Test item description. ..... :	**LoRa wireless repeater**
Trade Mark. ..... :	ENLESS WIRELESS
Manufacturer. ..... :	ENLESS WIRELESS
Model/Type reference..... :	600501532 / RX REPEATER 600-501
FCC ID..... :	2BEZP600501
IC. ..... :	32107-600501
Ratings..... :	7.5 Vdc to 24 Vdc

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

Report Reference No..... :	**RR-EVE-23B292-7A**
Test procedure. ..... :	FCC IC Certification
Diffusion..... :	Mr PETIT
Applicant's name. ..... :	ENLESS WIRELESS
Date of issue..... :	August 23, 2024
Total number of pages..... :	51
Revision. ..... :	1 (see revision history on page 2)
Compiled by..... :	Morgan PATEY
Approved by (+ signature). ..... :	Olivier HEYER (Deputy Laboratory Manager)

REPORT INDEX:

REVISION HISTORY:

Revision	Date	Modified pages	Modifications
0	August 8, 2024	/	Creation
1	August 23, 2024	37 to 39	6dB Bandwidth measurement was performed with an RBW = 100kHZ according to ANSI C63.10: 2013. instead of RBW = 20kHz as previously.
		40 to 42	RF output power measurement was performed in conducted instead of radiated as previously.
		50 to 51	Occupied Bandwidth measurement was performed with an RBW = 100kHZ according to ANSI C63.10: 2013. instead of RBW = 20kHz as previously.

1. GENERAL INFORMATIONS

This document submits the results of Radio tests performed on the equipment **Proprietary LoRa Signal Repeater RX REPEATER 600-501** (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
Address	145 rue de Massacan 34740 VENDARGUES FRANCE
Test procedure.	FCC IC Certification
Tested by	Morgan PATEY + Olivier AELBRECHT + Richard BURELLE
Test supervisor	None
Date of receipt of test item	N/A
Date (s) of performance of tests	From November 22nd of 2023 to February 09th of 2024 and August the 22nd of 2024

APPLICANT'S GENERAL INFORMATIONS:

Company name	ENLESS WIRELESS
Company address.	45 TER AVENUE DE VERDUN 33520 BRUGES FRANCE
Person(s) present during the tests.	No representative for company attended the tests.
Responsible.	Mr PETIT

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 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
FSOATS	Free Space 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
SAC	Semi Anechoic Chamber				

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: October 2023
Code of federal regulations – Title 47 telecommunication - Part 15 - Radio frequency devices

FCC 47 CFR Part 15.247
Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

RSS-247_Issue 3: August 2023
Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence Exempt Local Area Network (LE-LAN) Devices

RSS-Gen Issue 5: April 2018 / AMD1: 2019 / AMD2: 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

Test item description.	:	LoRa wireless repeater
Model/Type reference.	:	600501532 / RX REPEATER 600-501
Trade Mark.	:	ENLESS WIRELESS
Serial number (S/N).	:	Not communicated
Part number (P/N).	:	Not communicated
Software version.	:	*Not communicated*
Firmware version.	:	*Not communicated*
Type of sample.	:	Standard equipment
Function(s).	:	Not communicated
Manufacturer name.	:	ENLESS WIRELESS
Address.	:	45 TER AVENUE DE VERDUN 33520 BRUGES FRANCE

General product information:

N/A

3.2. E.U.T. Marking plate

No marking plate during the tests

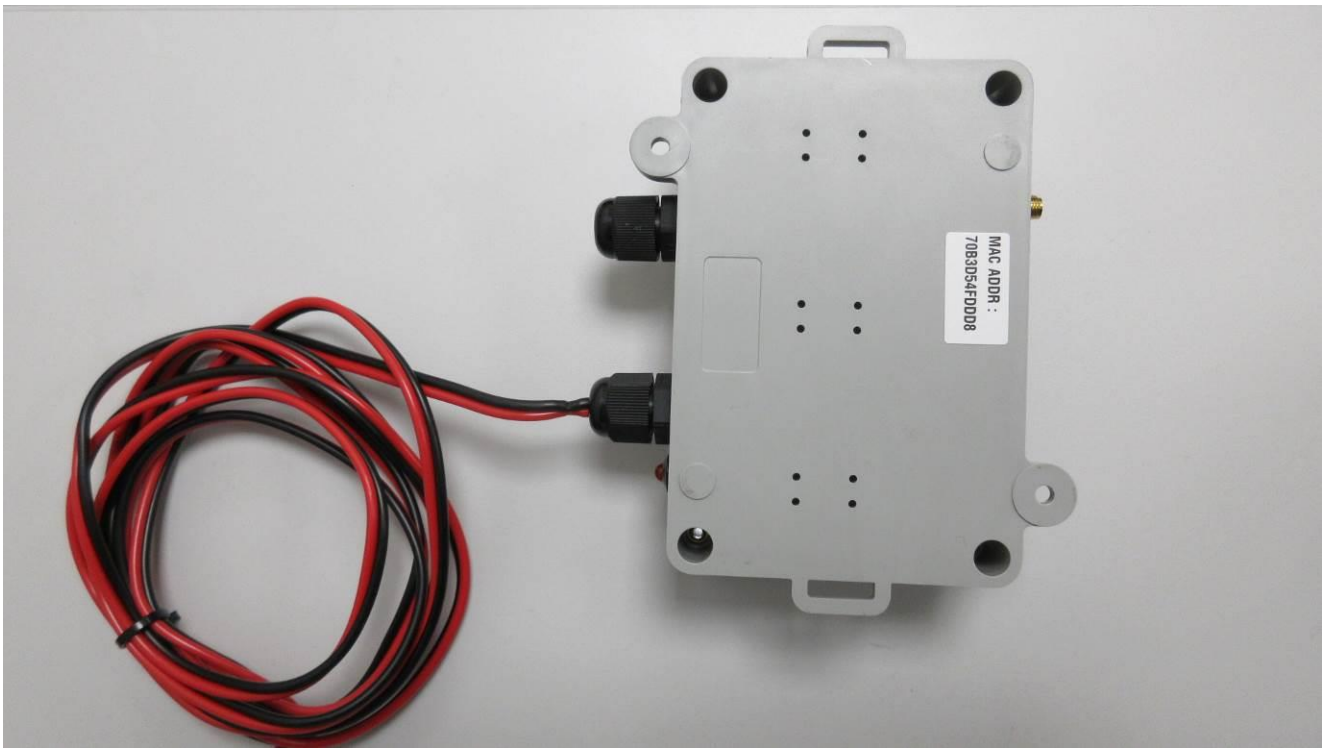
3.3. E.U.T. Modification(s)

No modifications

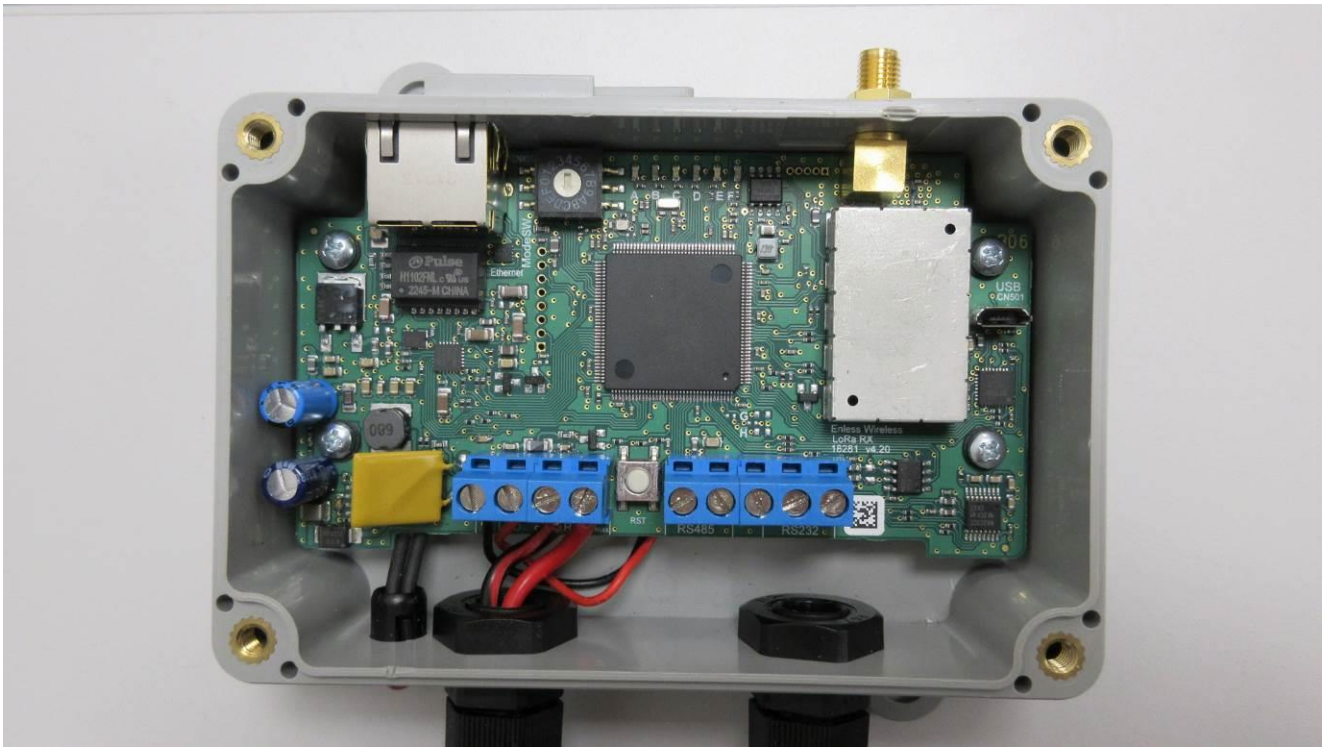
3.4. E.U.T. General view

3.5. E.U.T. Front view

3.6. E.U.T. Back view



3.7. E.U.T. Internal view & Electronic board



3.8. E.U.T. 0541-915 antenna

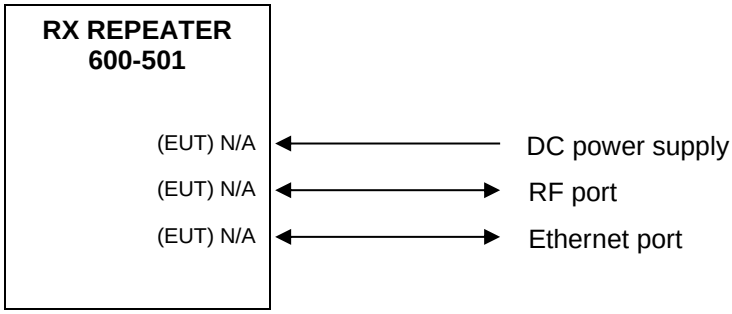
3.9. E.U.T. 0138 antenna

3.10. E.U.T. Mechanical and Electrical Design

Power supply. ..... : *12 VDC*
Power supply range. ..... : *7.5 Vdc to 24 Vdc*
Power type. ..... : *DC*
Power (W). ..... : *Not communicated*
Nominal current (A). ..... : *Not communicated*
Dimensions (L x W x H) (m). ..... : *0.118 x 0.079 x 0.048*
Weight (kg). ..... : *0.450*
Temperature range (°C). ..... : *-25 to +55*
Ground bounding strap. ..... : *No*

Comments:
N/A

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



PORT	NAME	TYPE	LENGTH	CABLE TYPE	COMMENTS
0	Main frame	N/E	N/A	Plastic	N/A
1	DC power supply	DC	N/A	N/A	12Vdc
2	RF port	I/O	N/A	N/A	900MHz
3	Ethernet port	I/O	N/A	N/A	N/A

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 ..... : Direct current port
RF..... : Radio frequency port

3.12. Supporting Equipment Used During Test

Sample subject to the tests was tested with following equipment.

PRODUCT TYPE	MANUFACTURER	MODEL	N°EMITECH / COMMENTS
AC/DC block Laptop	STONTRONICS DELL	No:6A-151DT12A Latitude 5510	Used to powered EUT during tests Used as Ethernet load

AC/DC BLOCK (AE)

3.13. EUT Radio Specifications

a) GENERAL INFORMATIONS

According to manufacturer's declarations :

EUT type..... : *Transceiver*
Technology ..... : *LoRa*
Environmental profile..... : *Data transmissions*
Temperature range..... : *-25°C to +55°C*
Antenna type ..... : *¼ wave antennas*
Antenna Gain..... : *2.1dBi for 0541-915 antenna and 2.19dBi for 0138 antenna*

Comments:

N/A

b) TRANSMITTER PARAMETERS (TX)

Frequency bands..... : *902 MHz to 928 MHz*
RF Power..... : *N/C*
Number of channels / Separation..... : *Not communicated*
Modulation type ..... : *Not communicated*
Duty cycle ..... : *Not communicated*
Tested frequency..... : *904.0 MHz*

c) RECEIVER PARAMETERS (RX)

Frequency bands..... : *902 MHz to 928 MHz*
Category/Class ..... : *Not communicated*
Bandwidth..... : *Not communicated*

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	15.105 / See certification documents
Conducted limits	Class B	PASS	15.107
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	**Class B**	**PASS**	**15.207**
Radiated emission limits; general requirements	**Class B**	**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 902-928MHz, 2400-2483.5MHz and 5725-5850MHz			**15.247**
- **Frequency hopping and digitally modulated**		-	**a)**
- Frequency hopping system		**N/A**	**a) (1) / DSSS mode**
- Digital modulation system		**PASS**	**a) (2)**
- **Maximum peak conducted output power**		**-**	**b)**
- For hopping system in the 2400-2483.5 MHz and 5725-5850 MHz bands		**N/A**	**b) (1)**
- For hopping system in the 902-928MHz band		**N/A**	**b) (2) / DSSS mode**
- For system using digital modulation in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands		**PASS**	**b) (3)**
- **Operation with directional antenna gains > 6 dBi**		**N/A**	**c)**
- **Out-of-band emissions**		**PASS**	**d)**
- **Power spectral density conducted**		**PASS**	**e)**
- **Hybrid system**		**N/A**	**f)**
- **Frequency hopping additional requirements**		**N/A**	**g)**
- **Frequency hopping intelligence**		**N/A**	**h)**
- **RF exposure compliance**		**PASS**	**i)**

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}
RF power, conducted		
RF power	± 0.8dB	± 1 dB
Power spectral density	± 2.3dB	± 3 dB
Occuped bandwidth		
RF power	± 3.8 %	± 5 %
Conducted emission (spurious)		
f ≤ 1 GHz	± 0.8 dB	± 3 dB
1 GHz - 12.75 GHz	± 1.6 dB	
Radiated emission (ERP / EIRP)		
f ≤ 62.5 MHz	± 5.7 dB	± 6 dB
62.5 MHz - 1 GHz	± 5.8 dB	± 6 dB
1 GHz - 18 GHz	± 5.6 dB	± 6 dB
18 GHz – 40 GHz	± 5.6 dB	± 6 dB
Radiated emission (magnetic field)		
9kHz – 30MHz	± 3.4 dB	± 6 dB
Supply voltages	± 3 %	± 3 %
Temperature	± 1 °C	± 1°C
Humidity	± 5 %	± 5 %
Time / Duty cycle	± 4.4 %	± 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. Conducted limits

Reference standard:	CFR 47 FCC Part 15.207 RSS-Gen
Test method:	ANSI C63.13: 2013
General test setup: EUT is set on an insulating support at 40cm from 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. All tested telecommunications lines (if applicable) were connected to an Asymmetric Artificial Network (AAN) and conducted voltage measurements on telecommunications lines were made at the output of the AAN. Where an AAN was not appropriate or available, measurements were made using a Capacitive Voltage Probe and/or a Current probe. Additionnal ground terminals (if any) are connected to earth terminal of the AMN.	

TESTED CABLE	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Power supply 120Vac/60Hz / 600-501	150kHz-30MHz	Class B	EMI4981	**PASS**

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	*See Graph(s)*
Relative Humidity	30 to 60 %	*See Graph(s)*
Atmospheric pressure	N/A	*See Graph(s)*
Test method deviation: N/A		
Supplementary information: N/A		

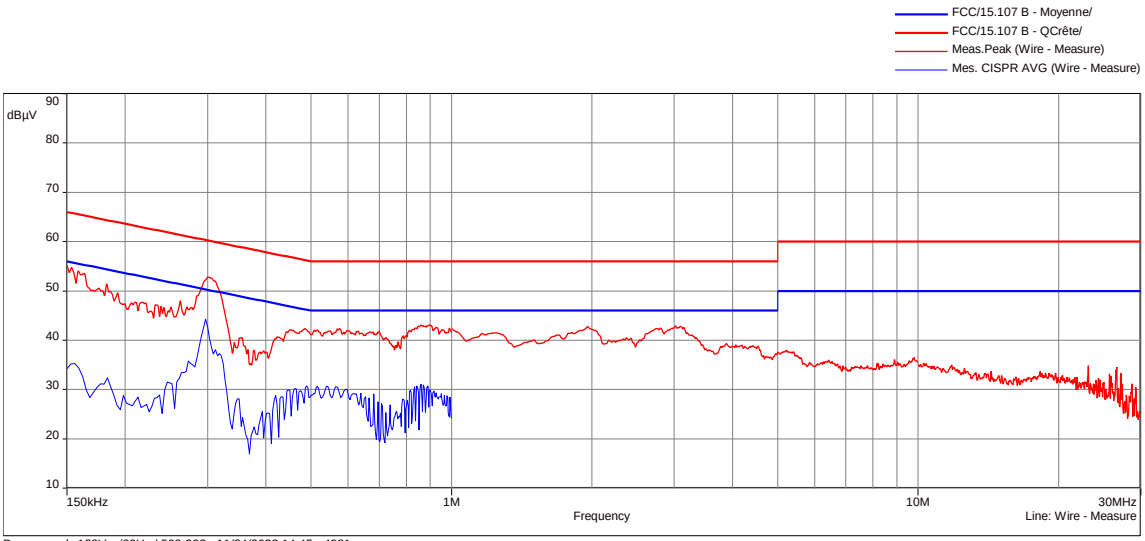
TEST EQUIPMENT USED					
CATEGORY	**BRAND**	**TYPE**	**IDENTIFIER**	**CAL. DATE**	**CAL. DUE**
Cable	EMITECH	Current absorber sheath	18366	17/08/2023	17/10/2025
Cable	C&C	N-3m	14335	14/04/2023	14/06/2025
Ground plane	EMITECH	Test area	11569		
LISN	Rohde & Schwarz	ENV216	17925	25/09/2021	25/01/2024
PE choke	EMITECH	CISPR 16-2-1 : 2014 AMD1:2017	18782		
Receiver	Rohde & Schwarz	ESI	9704	18/11/2022	18/01/2024
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

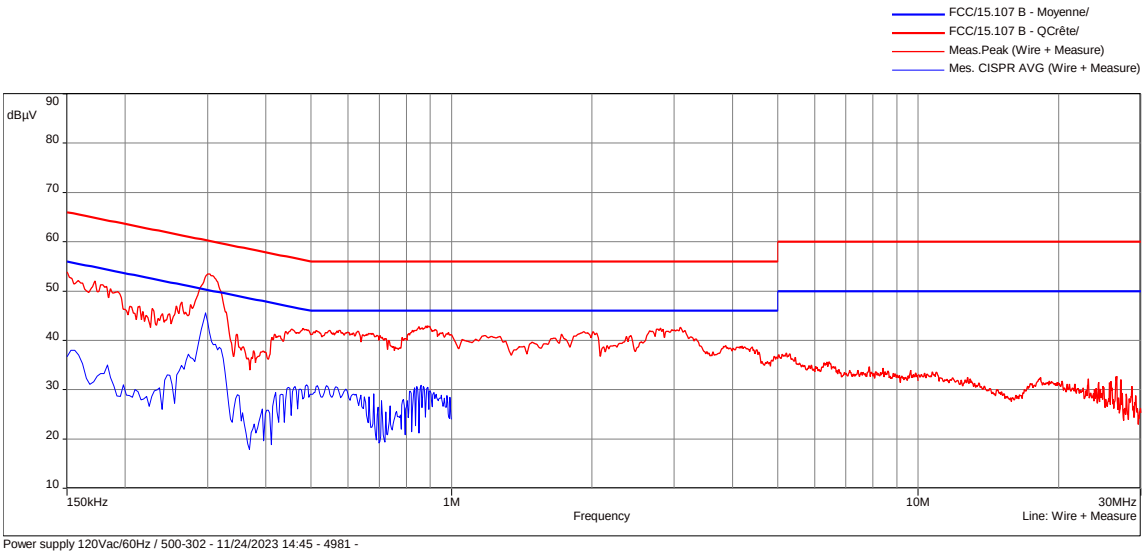
TEST SETUP PHOTO(S) - POWER SUPPLY 120VAC/60HZ


CONDUCTED LIMITS – TABULATED RESULTS								
POWER SUPPLY 120VAC/60HZ / 600-501							EMI4981	
FREQUENCY (MHZ)	TERMINAL	PEAK LEVEL (DBµV)	QPEAK LEVEL (DBµV)	QPEAK LIMIT (DBµV)	QPEAK MARGIN (DB)	AVERAGE LEVEL (DBµV)	AVERAGE LIMIT (DBµV)	AVERAGE MARGIN (DB)
0.150	Wire -	55.08	N/P	66.00	-10.92	38.78	56.00	-17.22
0.159	Wire -	54.08	N/P	65.54	-11.46	35.31	55.54	-20.23
0.182	Wire -	51.45	N/P	64.38	-12.93	31.60	54.38	-22.78
0.262	Wire -	47.98	N/P	61.35	-13.37	40.28	51.35	-11.07
0.302	Wire -	52.80	N/P	60.20	-7.40	29.76	50.20	-20.44
0.862	Wire -	43.09	N/P	56.00	-12.91	29.22	46.00	-16.78
0.150	Wire +	53.88	N/P	66.00	-12.12	35.01	56.00	-20.99
0.172	Wire +	52.06	N/P	64.86	-12.80	31.01	54.86	-23.85
0.186	Wire +	50.46	N/P	64.22	-13.76	32.95	54.22	-21.27
0.264	Wire +	47.73	N/P	61.30	-13.57	44.01	51.30	-7.29
0.302	Wire +	53.50	N/P	60.20	-6.70	29.71	50.20	-20.49
0.889	Wire +	42.95	N/P	56.00	-13.05	29.82	46.00	-16.18
COMMENT:	When margin between peak measurements and Average/Qpeak limit(s) is > 6dB, no Average/Qpeak measurements were performed.							

CONDUCTED LIMITS - GRAPH			
POWER SUPPLY 120VAC/60HZ / 600-501		EMI4981	
EUT mode:	#1	**T (°C):**	24.0
Test Date:	24/11/2023	**H (%):**	32.6
Test Operator:	MPA	**P (hPa):**	1012



Power supply 120Vac/60Hz / 500-302 - 11/24/2023 14:45 - 4981 -



Power supply 120Vac/60Hz / 500-302 - 11/24/2023 14:45 - 4981 -

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Wire- port	150kHz-1MHz	10kHz	30kHz	Peak
Wire- port	1MHz-10MHz	10kHz	30kHz	Peak
Wire- port	10MHz-30MHz	10kHz	30kHz	Peak
Wire+ port	150kHz-1MHz	10kHz	30kHz	Peak
Wire+ port	1MHz-10MHz	10kHz	30kHz	Peak
Wire+ port	10MHz-30MHz	10kHz	30kHz	Peak
Wire- port	150kHz-1MHz	9kHz	30kHz	Average
Wire+ port	150kHz-1MHz	9kHz	30kHz	Average
Measure with:	A.M.N.			
Comments:	N/A			
EUT modification(s): N/A				

6.2. Radiated emission limits

Reference standard:	FCC 47 CFR Part 15.247; 15.209; 15.205, 15.109 RSS-247; RSS-Gen
Test method:	ANSI C63.10: 2013

Test description: : 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
Radiated measurement / 9 kHz to 30 MHz / 600-501 / 0°	9kHz-30MHz	15.209	EMI4996	**PASS**
Radiated measurement / 9 kHz to 30 MHz / 600-501 / 45°	9kHz-30MHz	15.209	EMI4997	**PASS**
Radiated measurement / 9 kHz to 30 MHz / 600-501 / 90°	9kHz-30MHz	15.209	EMI4998	**PASS**
Radiated measurement / 30 MHz to 1 GHz / 600-501 / 0541-915 antenna	30MHz-1GHz	15.209	EMI4507	**PASS**
Radiated measurement / 30 MHz to 1 GHz / 600-501 / 0138 antenna	30MHz-1GHz	15.209	EMI4508	**PASS**
Radiated measurement / 1 GHz to 10 GHz / 600-501 / 0541-915 antenna	1GHz-10GHz	15.209	EMI4518	**PASS**
Radiated measurement / 1 GHz to 10 GHz / 600-501 / 0138 antenna	1GHz-10GHz	15.209	EMI4519	**PASS**
Radiated measurement / 30 MHz to 1 GHz / 600-501 / 0541-915 antenna	30MHz-1GHz	15.109	EMI4792	**PASS**
Radiated measurement / 30 MHz to 1 GHz / 600-501 / 0138 antenna	30MHz-1GHz	15.109	EMI4793	**PASS**
Radiated measurement / 1 GHz to 12.75 GHz / 600-501 / 0541-915 antenna	1GHz-12.75GHz	15.109	EMI4782	**PASS**
Radiated measurement / 1 GHz to 12.75 GHz / 600-501 / 0138 antenna	1GHz-12.75GHz	15.109	EMI4783	**PASS**

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	*See Graph(s)*
Relative Humidity	20 to 75 %	*See Graph(s)*
Atmospheric pressure	N/A	*See Graph(s)*

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.

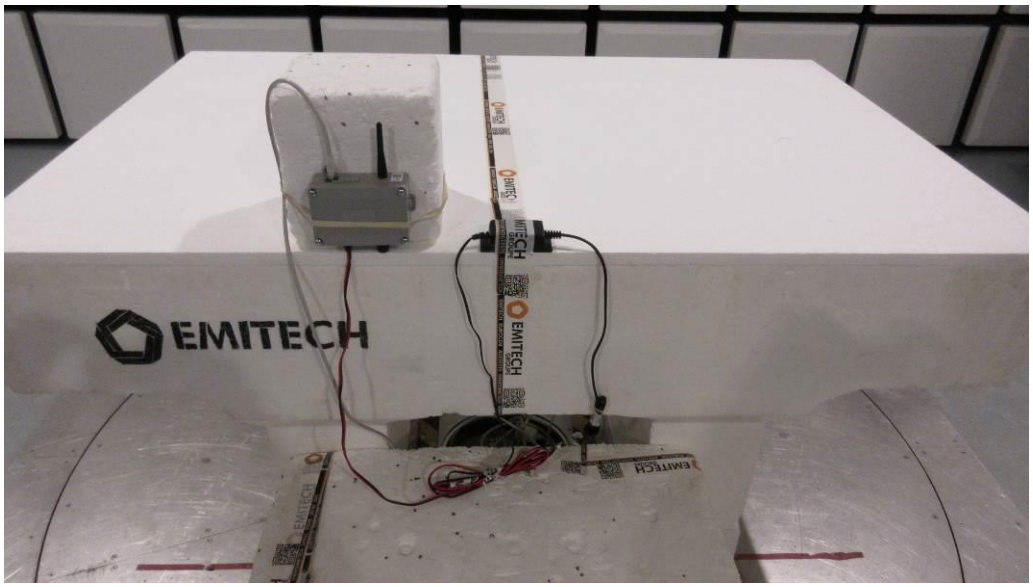
Above 1GHz average limit in restricted bands §15.205 is 54dBµV/m. Otherwise, the limit is 20dB under carrier emission level at 3m without averaging.

TEST EQUIPMENT USED

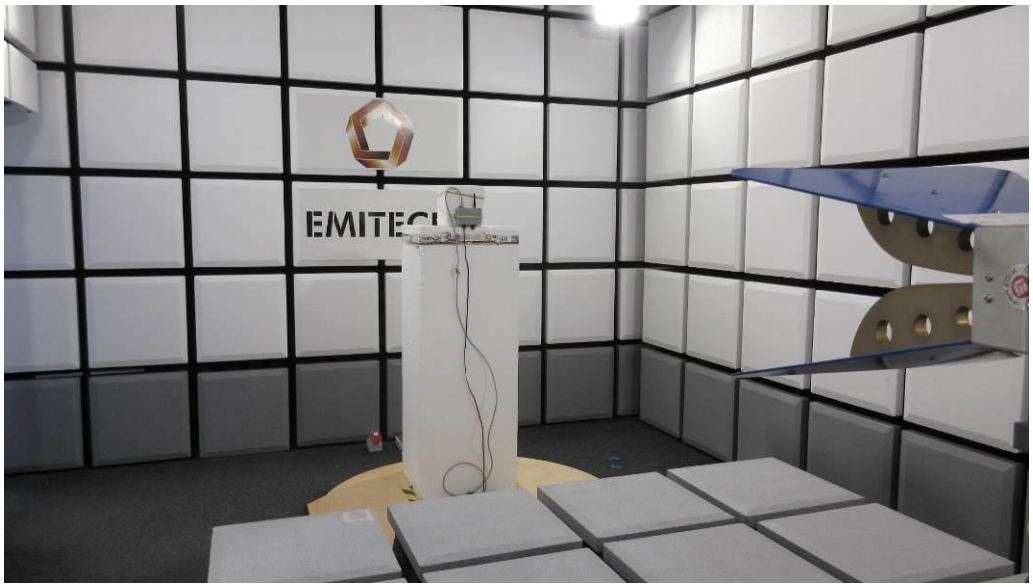
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	Rohde & Schwarz	HFH2-Z2	5825	16/08/2022	16/10/2024
Antenna	ETS lindgren	3142E	14523	27/01/2022	27/03/2025
Antenna	AARONIA	Powerlog 70180	15306	04/01/2023	04/03/2026
Cable	/	N-1m	3625	02/05/2023	02/07/2025
Cable	Techniwave	N-3.5m	18353	17/08/2023	17/10/2025
Cable	Techniwave	N-4m	18355	17/08/2023	17/10/2025
Cable	Techniwave	N-1.5m	18341	17/08/2023	17/10/2025
Cable	Techniwave	N-1.5m	18342	25/01/2022	25/03/2024
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
Filter	Micro-Tronics	HPM18865	12843	24/08/2021	24/10/2024
Preamplifier	IMPULSE	CA118-546ACN	9169	15/06/2023	15/08/2024
Receiver	Rohde & Schwarz	ESW26	17791	08/02/2023	08/04/2024
Receiver	Rohde & Schwarz	FSW43	14830	10/08/2022	10/10/2024
Shielded enclosure	COMTEST	FAR-3m	18014	17/08/2021	17/10/2024
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) - RADIATED MEASUREMENT / POSITION



TEST SETUP PHOTO(S) - RADIATED MEASUREMENT / 30 MHZ TO 1 GHZ


TEST SETUP PHOTO(S) - RADIATED MEASUREMENT / 1 GHZ TO 12.75 GHZ


RADIATED EMISSION LIMITS – TABULATED RESULTS								
RADIATED MEASUREMENT / 9 KHZ TO 30 MHZ / 600-501 / 0°							EMI4996	
FREQUENCY (MHZ)	POLARIZATION	PEAK LEVEL (DBµA/M)	AVERAGE LEVEL (DBµA/M)	AVERAGE LIMIT (DBµA/M)	AVERAGE MARGIN (DB)	QPEAK LEVEL (DBµA/M)	QPEAK LIMIT (DBµA/M)	QPEAK MARGIN (DB)
0.978	0°	-18.86	N/A	N/A	N/A	N/P	16.30	-35.16
0.986	0°	-18.98	N/A	N/A	N/A	N/P	16.23	-35.21
1.264	0°	-19.08	N/A	N/A	N/A	N/P	14.07	-33.15
1.484	0°	-19.16	N/A	N/A	N/A	N/P	12.67	-31.83
1.653	0°	-19.09	N/A	N/A	N/A	N/P	11.74	-30.83
1.705	0°	-19.42	N/A	N/A	N/A	N/P	11.47	-30.89
COMMENT:		When margin between peak measurements and Average/Qpeak limit(s) is > 6dB, no Average/Qpeak measurements were performed. No spurious were detected.						

RADIATED EMISSION LIMITS – TABULATED RESULTS								
RADIATED MEASUREMENT / 9 KHZ TO 30 MHZ / 600-501 / 45°							EMI4997	
FREQUENCY (MHZ)	POLARIZATION	PEAK LEVEL (DBµA/M)	AVERAGE LEVEL (DBµA/M)	AVERAGE LIMIT (DBµA/M)	AVERAGE MARGIN (DB)	QPEAK LEVEL (DBµA/M)	QPEAK LIMIT (DBµA/M)	QPEAK MARGIN (DB)
1.374	45°	-19.17	N/A	N/A	N/A	N/P	13.34	-32.51
1.455	45°	-19.01	N/A	N/A	N/A	N/P	12.85	-31.86
1.525	45°	-18.57	N/A	N/A	N/A	N/P	12.44	-31.01
1.667	45°	-20.13	N/A	N/A	N/A	N/P	11.67	-31.80
6.168	45°	-14.09	N/A	N/A	N/A	N/P	18.04	-32.13
6.316	45°	-14.40	N/A	N/A	N/A	N/P	18.04	-32.44
COMMENT:		When margin between peak measurements and Average/Qpeak limit(s) is > 6dB, no Average/Qpeak measurements were performed. No spurious were detected.						

RADIATED EMISSION LIMITS – TABULATED RESULTS								
RADIATED MEASUREMENT / 9 KHZ TO 30 MHZ / 600-501 / 90°							EMI4998	
FREQUENCY (MHZ)	POLARIZATION	PEAK LEVEL (DBµV)	AVERAGE LEVEL (DBµV)	AVERAGE LIMIT (DBµV)	AVERAGE MARGIN (DB)	QPEAK LEVEL (DBµV)	QPEAK LIMIT (DBµV)	QPEAK MARGIN (DB)
4.269	90°	-11.12	N/A	N/A	N/A	N/P	18.04	-29.16
5.551	90°	-10.23	N/A	N/A	N/A	N/P	18.04	-28.27
6.052	90°	-10.36	N/A	N/A	N/A	N/P	18.04	-28.40
6.180	90°	-11.15	N/A	N/A	N/A	N/P	18.04	-29.19
6.279	90°	-11.27	N/A	N/A	N/A	N/P	18.04	-29.31
6.308	90°	-10.56	N/A	N/A	N/A	N/P	18.04	-28.60
COMMENT:		When margin between peak measurements and Average/Qpeak limit(s) is > 6dB, no Average/Qpeak measurements were performed. No spurious were detected.						

RADIATED EMISSION LIMITS – TABULATED RESULTS					
RADIATED MEASUREMENT / 30 MHZ TO 1 GHZ / 600-501 / 0541-915 ANTENNA					EMI4507
FREQUENCY (MHZ)	POLARIZATION	PEAK LEVEL (DBµV/M)	QPEAK LEVEL (DBµV/M)	QPEAK LIMIT (DBµV/M)	QPEAK MARGIN (DB)
250.00	Vertical	36.04	N/P	46	-9.96
400.00	Vertical	37.03	N/P	46	-8.97
450.02	Vertical	37.60	N/P	89	-51.40
660.00	Vertical	36.00	N/P	89	-53.00
795.91	Vertical	43.57	N/P	89	-45.43
872.09	Vertical	41.96	N/P	89	-47.04
250.00	Horizontal	34.42	N/P	46	-11.58
299.99	Horizontal	36.77	N/P	46	-9.23
450.02	Horizontal	35.90	N/P	89	-53.10
660.00	Horizontal	36.33	N/P	89	-52.67
726.03	Horizontal	38.11	N/P	89	-50.89
803.37	Horizontal	42.91	N/P	89	-46.09
COMMENT:	When margin between peak measurements and Qpeak limit(s) is > 6dB, no Qpeak measurements were performed.				

RADIATED EMISSION LIMITS – TABULATED RESULTS					
RADIATED MEASUREMENT / 30 MHZ TO 1 GHZ / 600-501 / 0138 ANTENNA					EMI4508
FREQUENCY (MHZ)	POLARIZATION	PEAK LEVEL (DBµV/M)	QPEAK LEVEL (DBµV/M)	QPEAK LIMIT (DBµV/M)	QPEAK MARGIN (DB)
250.00	Vertical	35.98	N/P	46	-10.02
299.99	Vertical	36.17	N/P	46	-9.83
350.01	Vertical	36.35	N/P	89	-52.65
660.04	Vertical	36.63	N/P	89	-52.37
811.59	Vertical	36.41	N/P	89	-52.59
858.02	Vertical	35.95	N/P	89	-53.05
196.75	Horizontal	31.84	N/P	89	-57.16
299.99	Horizontal	39.64	N/P	46	-6.36
349.98	Horizontal	34.90	N/P	89	-54.10
449.99	Horizontal	33.65	N/P	89	-55.35
726.03	Horizontal	36.69	N/P	89	-52.31
795.91	Horizontal	35.61	N/P	89	-53.39
COMMENT:	When margin between peak measurements and Qpeak limit(s) is > 6dB, no Qpeak measurements were performed.				

RADIATED EMISSION LIMITS – TABULATED RESULTS							
RADIATED MEASUREMENT / 1 GHZ TO 10 GHZ / 600-501 / 0541-915 ANTENNA						EMI4518	
FREQUENCY (MHZ)	POLARIZATION	PEAK LEVEL (DBµV/M)	PEAK LIMIT (DBµV/M)	PEAK MARGIN (DB)	AVERAGE LEVEL (DBµV/M)	AVERAGE LIMIT (DBµV/M)	AVERAGE MARGIN (DB)
1807.63	Vertical	70.15	89	-18.85	N/P	61.44	-7.56
8132.44	Vertical	47.92	74	-26.08	N/P	54	-6.08
8875.26	Vertical	48.15	89	-40.85	N/P	69	-20.85
9078.07	Vertical	47.95	74	-26.05	N/P	54	-6.05
9509.48	Vertical	48.50	89	-40.50	N/P	69	-20.50
9832.59	Vertical	48.11	89	-40.89	N/P	69	-20.89
1808.23	Horizontal	61.60	89	-27.40	N/P	69	-7.40
7980.33	Horizontal	48.33	89	-40.67	N/P	69	-20.67
8508.65	Horizontal	48.90	89	-40.10	N/P	69	-20.10
8648.15	Horizontal	47.93	89	-41.07	N/P	69	-21.07
9038.17	Horizontal	47.88	74	-26.12	N/P	54	-6.12
9439.88	Horizontal	48.19	74	-25.81	N/P	54	-5.81
COMMENT:		When margin between peak measurements and average limit is > 6dB, no average measurements were performed.					

RADIATED EMISSION LIMITS – TABULATED RESULTS							
RADIATED MEASUREMENT / 1 GHZ TO 10 GHZ / 600-501 / 0138 ANTENNA						EMI4519	
FREQUENCY (MHZ)	POLARIZATION	PEAK LEVEL (DBµV/M)	PEAK LIMIT (DBµV/M)	PEAK MARGIN (DB)	AVERAGE LEVEL (DBµV/M)	AVERAGE LIMIT (DBµV/M)	AVERAGE MARGIN (DB)
1002.10	Vertical	39.71	74	-34.29	N/P	54	-14.29
1807.93	Vertical	47.10	89	-41.90	N/P	69	-21.90
2566.35	Vertical	41.14	89	-47.86	N/P	69	-27.86
7249.21	Vertical	47.65	89	-41.35	N/P	69	-21.35
7771.53	Vertical	47.90	89	-41.10	N/P	69	-21.10
9733.89	Vertical	48.52	89	-40.48	N/P	69	-20.48
1807.93	Horizontal	46.77	89	-42.23	N/P	69	-22.23
5274.84	Horizontal	44.99	89	-44.01	N/P	69	-24.01
8135.14	Horizontal	48.40	74	-25.60	N/P	54	-5.60
9388.28	Horizontal	49.12	74	-24.88	N/P	54	-4.88
9823.29	Horizontal	48.63	89	-40.37	N/P	69	-20.37
9923.80	Horizontal	48.34	89	-40.66	N/P	69	-20.66
COMMENT:		When margin between peak measurements and average limit is > 6dB, no average measurements were performed.					

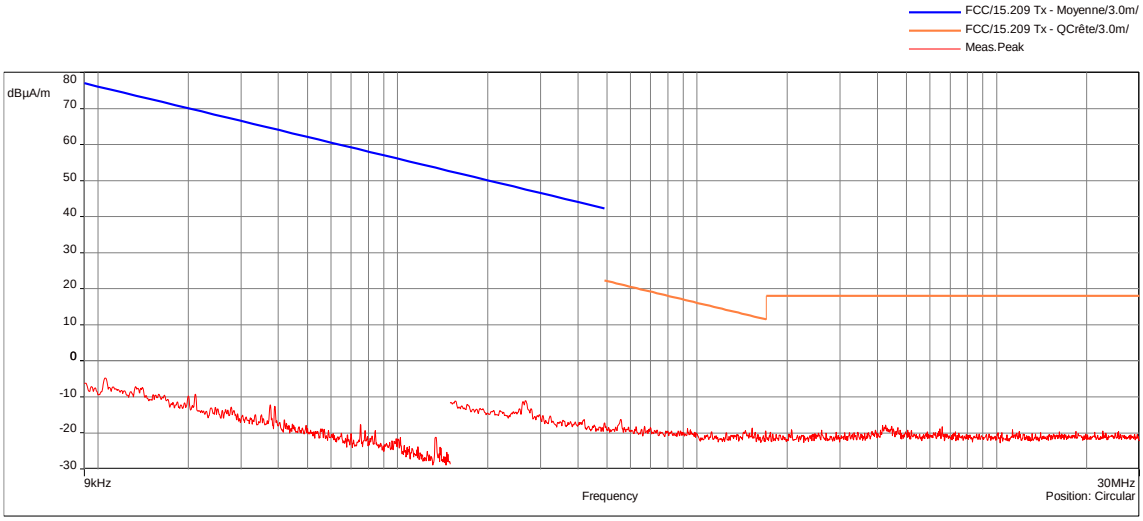
RADIATED EMISSION LIMITS – TABULATED RESULTS					
RADIATED MEASUREMENT / 30 MHZ TO 1 GHZ / 600-501 / 0541-915 ANTENNA					EMI4792
FREQUENCY (MHZ)	POLARIZATION	PEAK LEVEL (DBµV/M)	QPEAK LEVEL (DBµV/M)	QPEAK LIMIT (DBµV/M)	QPEAK MARGIN (DB)
124.97	Vertical	35.32	N/P	43.5	-8.18
400.00	Vertical	33.36	N/P	46	-12.64
660.00	Vertical	35.39	N/P	46	-10.61
726.00	Vertical	34.54	N/P	46	-11.46
791.99	Vertical	35.51	N/P	46	-10.49
924.01	Vertical	34.50	N/P	46	-11.50
249.97	Horizontal	31.62	N/P	46	-14.38
594.01	Horizontal	30.88	N/P	46	-15.12
660.00	Horizontal	32.10	N/P	46	-13.90
726.00	Horizontal	35.56	N/P	46	-10.44
791.99	Horizontal	31.03	N/P	46	-14.97
924.01	Horizontal	33.77	N/P	46	-12.23
COMMENT:	When margin between peak measurements and Qpeak limit(s) is > 6dB, no Qpeak measurements were performed.				

RADIATED EMISSION LIMITS – TABULATED RESULTS					
RADIATED MEASUREMENT / 30 MHZ TO 1 GHZ / 600-501 / 0138 ANTENNA					EMI4793
FREQUENCY (MHZ)	POLARIZATION	PEAK LEVEL (DBµV/M)	QPEAK LEVEL (DBµV/M)	QPEAK LIMIT (DBµV/M)	QPEAK MARGIN (DB)
299.99	Vertical	36.40	N/P	46	-9.60
449.99	Vertical	36.65	N/P	46	-9.35
726.03	Vertical	35.47	N/P	46	-10.53
792.03	Vertical	37.37	N/P	46	-8.63
858.02	Vertical	38.03	N/P	46	-7.97
924.01	Vertical	44.45	43.28	46	-2.72
299.99	Horizontal	36.27	N/P	46	-9.73
350.01	Horizontal	34.88	N/P	46	-11.12
400.00	Horizontal	35.74	N/P	46	-10.26
792.03	Horizontal	38.15	N/P	46	-7.85
858.05	Horizontal	38.38	N/P	46	-7.62
924.01	Horizontal	44.58	43.96	46	-2.04
COMMENT:	When margin between peak measurements and Qpeak limit(s) is > 6dB, no Qpeak measurements were performed.				

RADIATED EMISSION LIMITS – TABULATED RESULTS							
RADIATED MEASUREMENT / 1 GHZ TO 12.75 GHZ / 600-501 / 0541-915 ANTENNA						EMI4782	
FREQUENCY (MHZ)	POLARIZATION	PEAK LEVEL (DBµV/M)	PEAK LIMIT (DBµV/M)	PEAK MARGIN (DB)	AVERAGE LEVEL (DBµV/M)	AVERAGE LIMIT (DBµV/M)	AVERAGE MARGIN (DB)
3335.59	Vertical	41.76	74	-32.24	N/P	54	-12.24
4504.36	Vertical	42.43	74	-31.57	N/P	54	-11.57
5503.14	Vertical	44.55	74	-29.45	N/P	54	-9.45
7952.71	Vertical	47.68	74	-26.32	N/P	54	-6.32
8516.73	Vertical	48.01	74	-25.99	N/P	54	-5.99
8643.63	Vertical	48.31	74	-25.69	N/P	54	-5.69
4679.44	Horizontal	42.88	74	-31.12	N/P	54	-11.12
5521.16	Horizontal	43.92	74	-30.08	N/P	54	-10.08
5772.23	Horizontal	44.14	74	-29.86	N/P	54	-9.86
6285.72	Horizontal	44.27	74	-29.73	N/P	54	-9.73
6660.16	Horizontal	44.94	74	-29.06	N/P	54	-9.06
9446.96	Horizontal	48.80	74	-25.20	N/P	54	-5.20
COMMENT:		When margin between peak measurements and average limit is > 6dB, no average measurements were performed.					

RADIATED EMISSION LIMITS – TABULATED RESULTS							
RADIATED MEASUREMENT / 1 GHZ TO 12.75 GHZ / 600-501 / 0138 ANTENNA						EMI4783	
FREQUENCY (MHZ)	POLARIZATION	PEAK LEVEL (DBµV/M)	PEAK LIMIT (DBµV/M)	PEAK MARGIN (DB)	AVERAGE LEVEL (DBµV/M)	AVERAGE LIMIT (DBµV/M)	AVERAGE MARGIN (DB)
8852.79	Vertical	47.31	74	-26.69	N/P	54	-6.69
9280.89	Vertical	47.41	74	-26.59	N/P	54	-6.59
9324.37	Vertical	47.42	74	-26.58	N/P	54	-6.58
9383.90	Vertical	48.00	74	-26.00	N/P	54	-6.00
9475.56	Vertical	47.84	74	-26.16	N/P	54	-6.16
9616.95	Vertical	47.30	74	-26.70	N/P	54	-6.70
7908.06	Horizontal	47.58	74	-26.42	N/P	54	-6.42
7986.78	Horizontal	47.69	74	-26.31	N/P	54	-6.31
8714.52	Horizontal	47.27	74	-26.73	N/P	54	-6.73
8950.71	Horizontal	48.11	74	-25.89	N/P	54	-5.89
9409.36	Horizontal	47.66	74	-26.34	N/P	54	-6.34
9750.13	Horizontal	47.14	74	-26.86	N/P	54	-6.86
COMMENT:		When margin between peak measurements and average limit is > 6dB, no average measurements were performed.					

RADIATED EMISSION LIMITS - GRAPH			
RADIATED MEASUREMENT / 9 KHZ TO 30 MHZ / 600-501 / 0°		EMI4996	
EUT mode:	Tx mode	**T (°C):**	20.2
Test Date:	10/01/2024	**H (%):**	32.1
Test Operator:	MPA	**P (hPa):**	1020

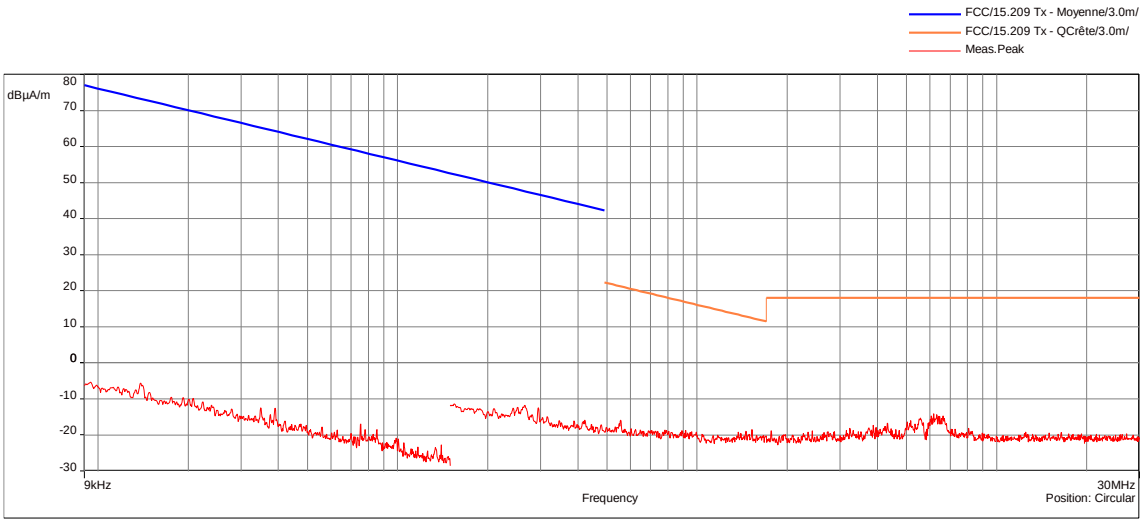


POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak

Configuration:	N/A
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. No spurious emissions were detected.

EUT modification(s): N/A

RADIATED EMISSION LIMITS - GRAPH			
RADIATED MEASUREMENT / 9 KHZ TO 30 MHZ / 600-501 / 45°		EMI4997	
EUT mode:	Tx mode	**T (°C):**	20.2
Test Date:	10/01/2024	**H (%):**	32.1
Test Operator:	MPA	**P (hPa):**	1020

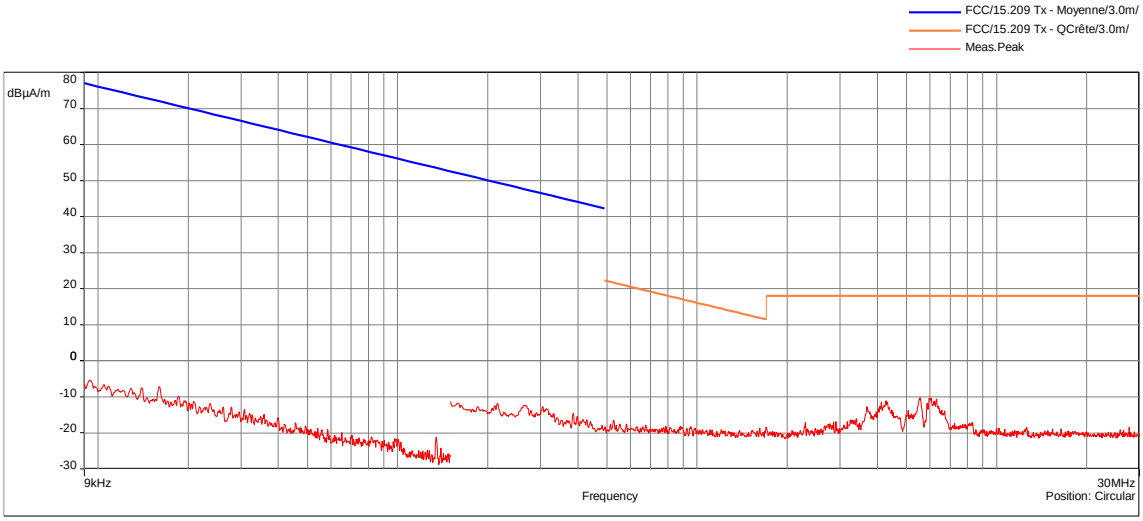


POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-30MHz	10kHz	30kHz	Peak

Configuration:	N/A
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. No spurious emissions were detected.

EUT modification(s): N/A

RADIATED EMISSION LIMITS - GRAPH			
RADIATED MEASUREMENT / 9 KHZ TO 30 MHZ / 600-501 / 90°		EMI4998	
EUT mode:	Tx mode	**T (°C):**	20.2
Test Date:	10/01/2024	**H (%):**	32.1
Test Operator:	MPA	**P (hPa):**	1020



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

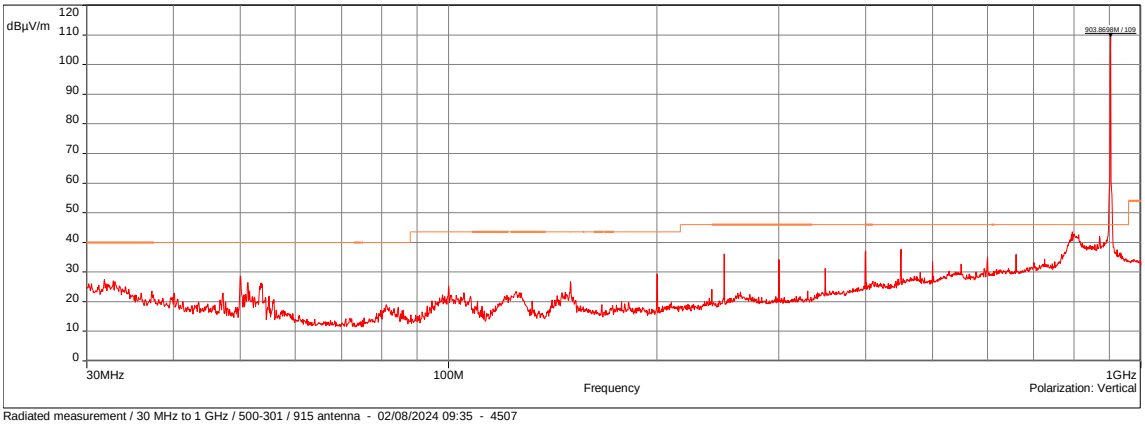
Configuration:	N/A
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor. No spurious emissions were detected.

EUT modification(s): N/A

RADIATED EMISSION LIMITS - GRAPH			
RADIATED MEASUREMENT / 30 MHZ TO 1 GHZ / 600-501 / 0541-915 ANTENNA		EMI4507	
EUT mode:	Tx mode	**T (°C):**	20.8
Test Date:	08/02/2024	**H (%):**	48.1
Test Operator:	MPA	**P (hPa):**	1009

FCC/15.209 - QCrête/3.0m/
FCC/15.205: 2018 restricted bands + 15.209 - QCrête/3.0m/
Meas.Peak (Vertical)

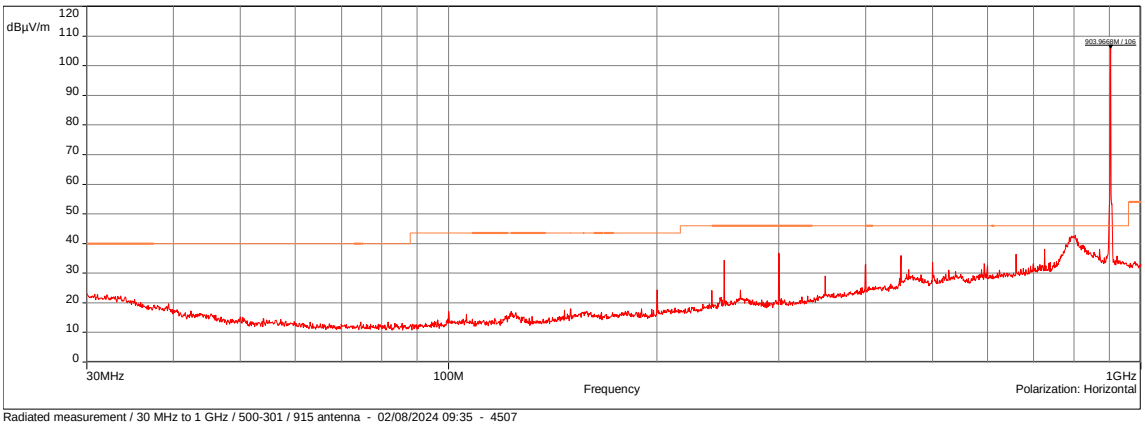
Sub-range 1
Frequencies: 30 MHz - 1 GHz (Analyser mode) 30000 Points
Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: Auto, Sweep count 1, Preamp: Off, LN Preamp: On, Preselector: Off
Polarization:Vertical
Distance: 3 m



Radiated measurement / 30 MHz to 1 GHz / 500-301 / 915 antenna - 02/08/2024 09:35 - 4507

FCC/15.209 - QCrête/3.0m/
FCC/15.205: 2018 restricted bands + 15.209 - QCrête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 30 MHz - 1 GHz (Analyser mode) 30000 Points
Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: Auto, Sweep count 1, Preamp: Off, LN Preamp: On, Preselector: Off
Polarization:Horizontal
Distance: 3 m



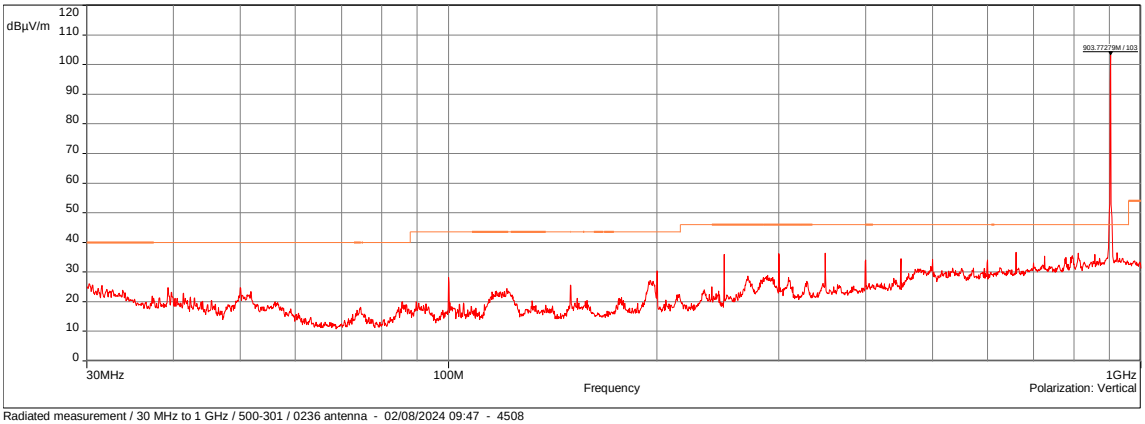
Radiated measurement / 30 MHz to 1 GHz / 500-301 / 915 antenna - 02/08/2024 09:35 - 4507

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 EMISSION LIMITS - GRAPH			
RADIATED MEASUREMENT / 30 MHZ TO 1 GHZ / 600-501 / 0138 ANTENNA		EMI4508	
EUT mode:	Tx mode	**T (°C):**	20.8
Test Date:	08/02/2024	**H (%):**	48.1
Test Operator:	MPA	**P (hPa):**	1009

FCC/15.209 - QCrête/3.0m/
FCC/15.205: 2018 restricted bands + 15.209 - QCrête/3.0m/
Meas.Peak (Vertical)

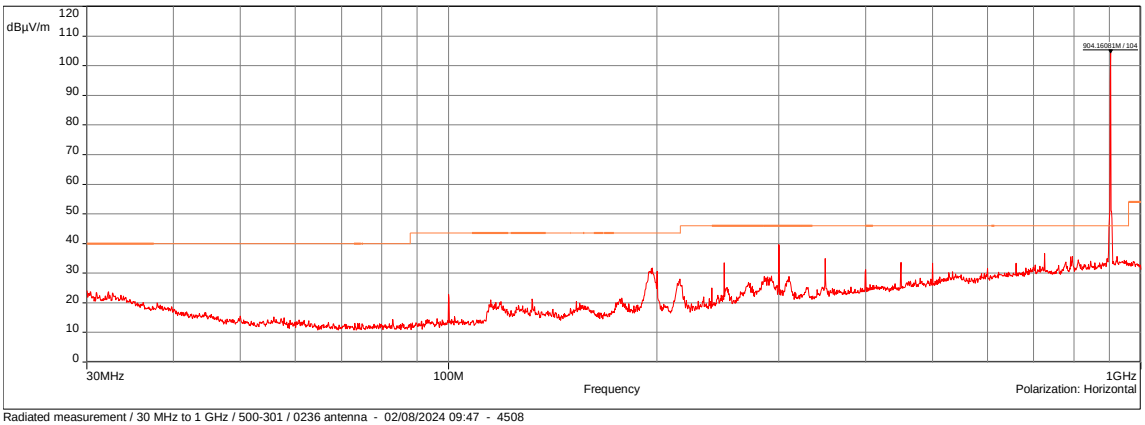
Sub-range 1
Frequencies: 30 MHz - 1 GHz (Analyser mode) 30000 Points
Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: Auto, Sweep count 1, Preamp: Off, LN Preamp: On, Preselector: Off
Polarization:Vertical
Distance: 3 m



Radiated measurement / 30 MHz to 1 GHz / 500-301 / 0236 antenna - 02/08/2024 09:47 - 4508

FCC/15.209 - QCrête/3.0m/
FCC/15.205: 2018 restricted bands + 15.209 - QCrête/3.0m/
Meas.Peak (Horizontal)

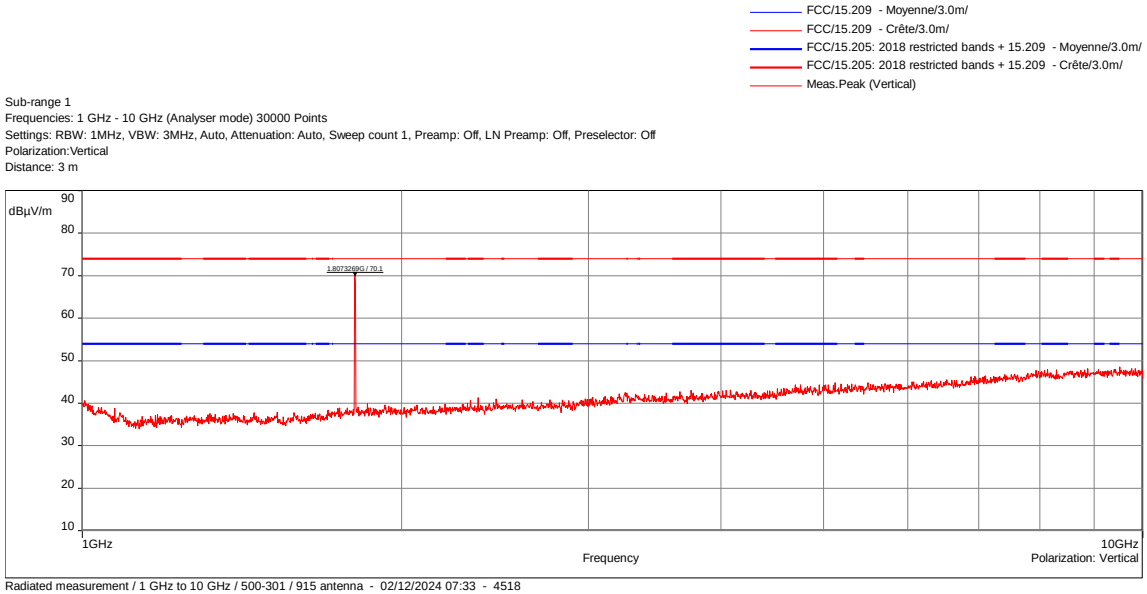
Sub-range 2
Frequencies: 30 MHz - 1 GHz (Analyser mode) 30000 Points
Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: Auto, Sweep count 1, Preamp: Off, LN Preamp: On, Preselector: Off
Polarization:Horizontal
Distance: 3 m



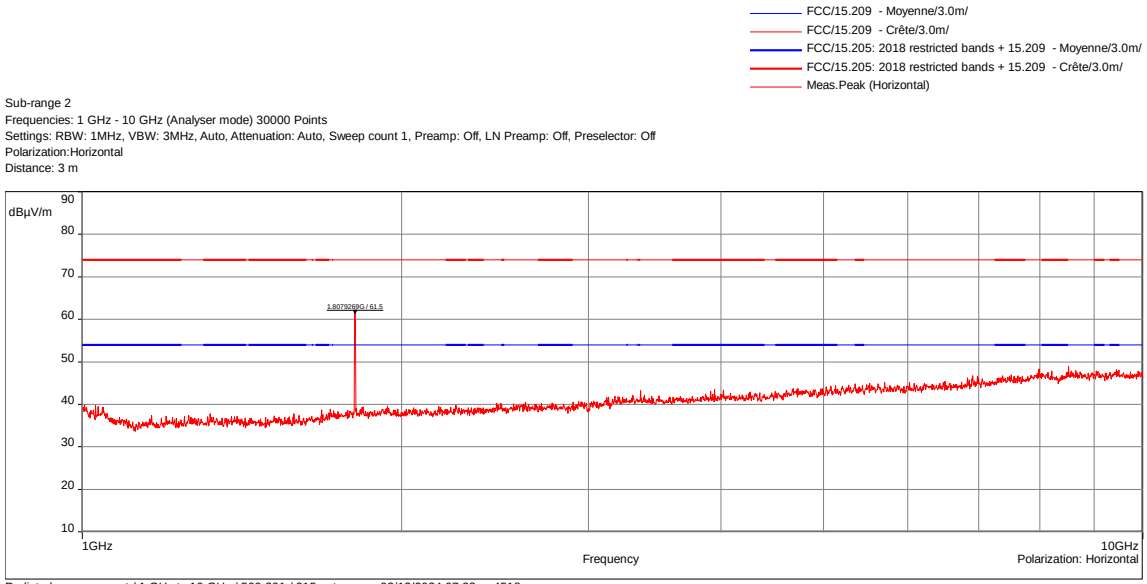
Radiated measurement / 30 MHz to 1 GHz / 500-301 / 0236 antenna - 02/08/2024 09:47 - 4508

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 EMISSION LIMITS - GRAPH			
RADIATED MEASUREMENT / 1 GHZ TO 10 GHZ / 600-501 / 0541-915 ANTENNA		EMI4518	
EUT mode:	Tx mode	**T (°C):**	20.8
Test Date:	08/02/2024	**H (%):**	48.1
Test Operator:	MPA	**P (hPa):**	1009



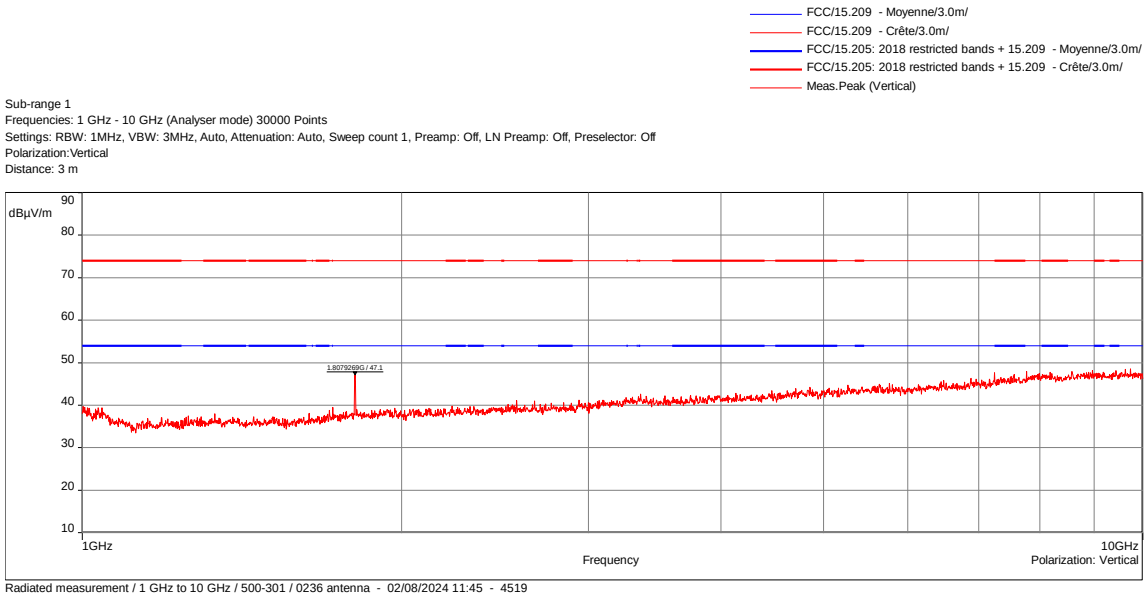
Radiated measurement / 1 GHz to 10 GHz / 500-301 / 915 antenna - 02/12/2024 07:33 - 4518



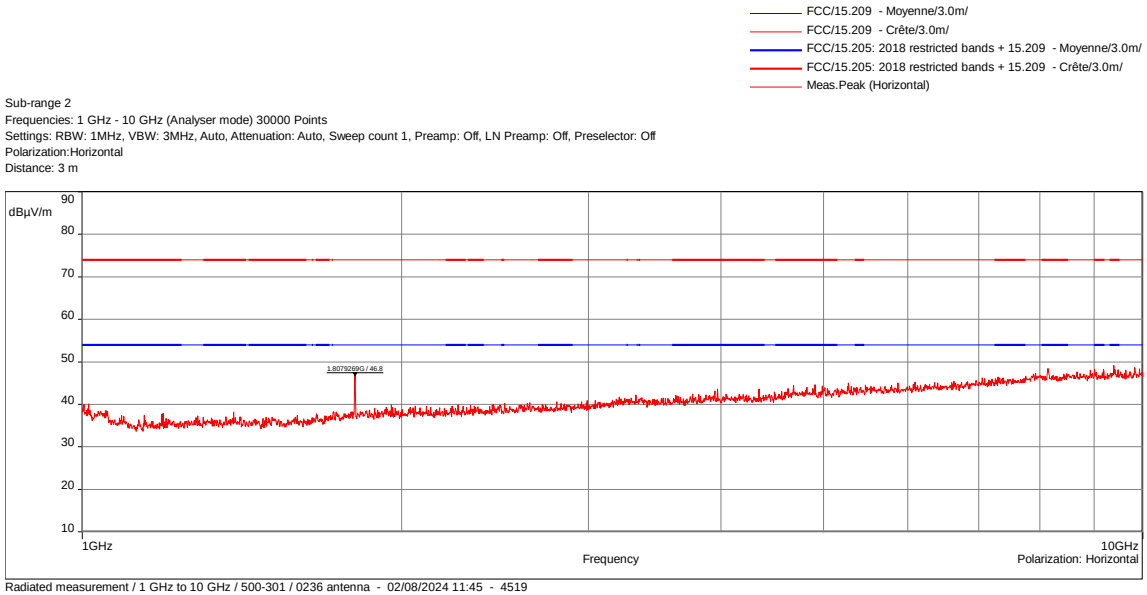
Radiated measurement / 1 GHz to 10 GHz / 500-301 / 915 antenna - 02/12/2024 07:33 - 4518

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-10GHz	1MHz	3MHz	Peak / Average
Horizontal	1GHz-10GHz	1MHz	3MHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

RADIATED EMISSION LIMITS - GRAPH			
RADIATED MEASUREMENT / 1 GHZ TO 10 GHZ / 600-501 / 0138 ANTENNA		EMI4519	
EUT mode:	Tx mode	**T (°C):**	20.8
Test Date:	08/02/2024	**H (%):**	48.1
Test Operator:	MPA	**P (hPa):**	1009



Radiated measurement / 1 GHz to 10 GHz / 500-301 / 0236 antenna - 02/08/2024 11:45 - 4519



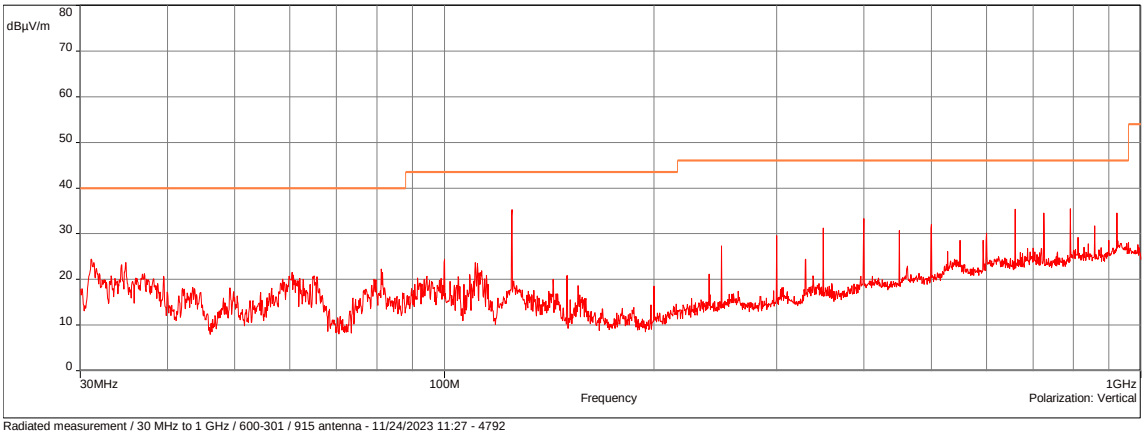
Radiated measurement / 1 GHz to 10 GHz / 500-301 / 0236 antenna - 02/08/2024 11:45 - 4519

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-10GHz	1MHz	3MHz	Peak
Horizontal	1GHz-10GHz	1MHz	3MHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

RADIATED EMISSION LIMITS - GRAPH			
RADIATED MEASUREMENT / 30 MHZ TO 1 GHZ / 600-501 / 0541-915 ANTENNA		EMI4792	
EUT mode:	Rx mode	**T (°C):**	15.8
Test Date:	24/11/2023	**H (%):**	37.3
Test Operator:	MPA	**P (hPa):**	1024

FCC/15.109 B - QCrête/3.0m/
Meas.Peak (Vertical)

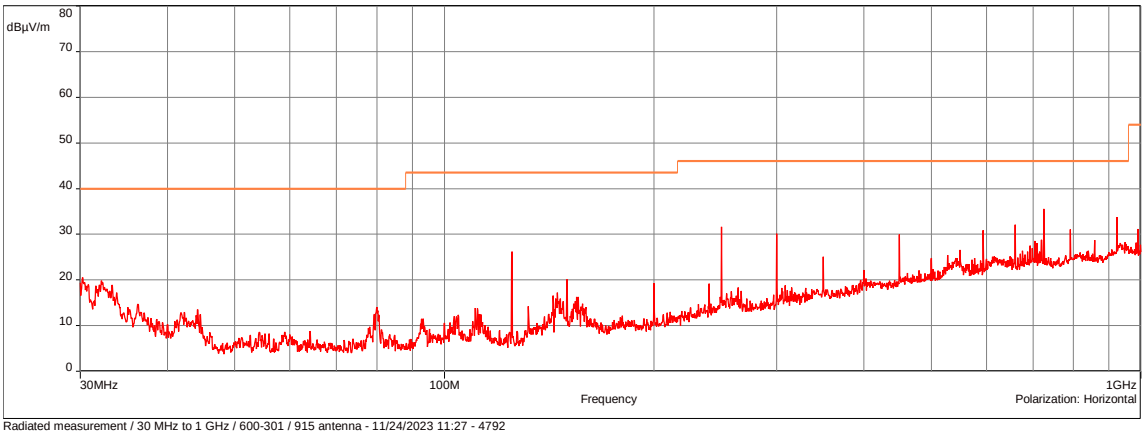
Sub-range 1
Frequencies: 30 MHz - 1 GHz (Analyser mode) 30000 Points
Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: Auto, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



Radiated measurement / 30 MHz to 1 GHz / 600-301 / 915 antenna - 11/24/2023 11:27 - 4792

FCC/15.109 B - QCrête/3.0m/
Meas.Peak (Horizontal)

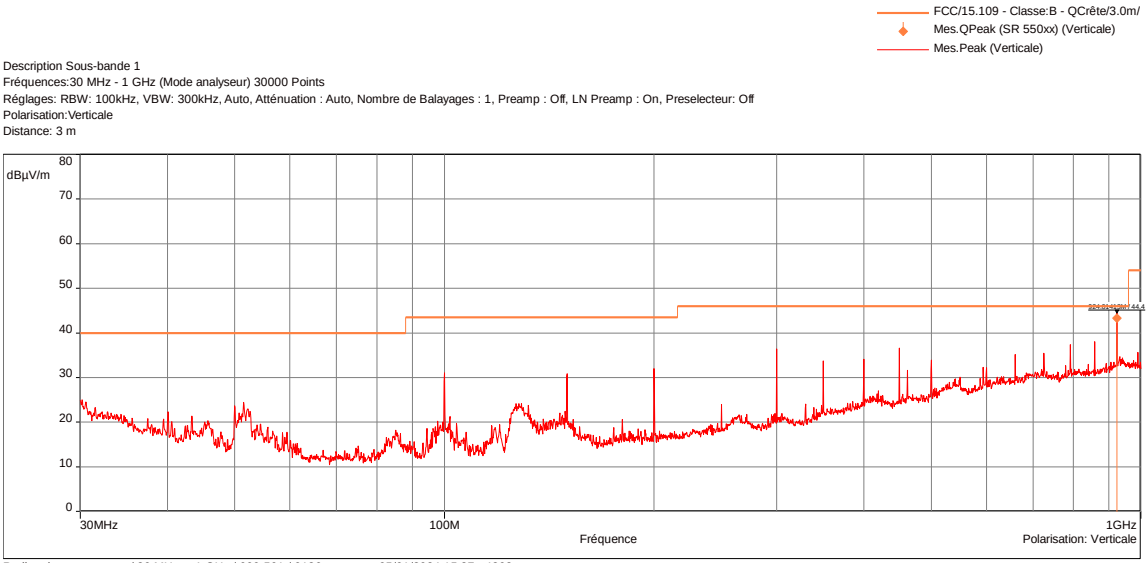
Sub-range 2
Frequencies: 30 MHz - 1 GHz (Analyser mode) 30000 Points
Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: Auto, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



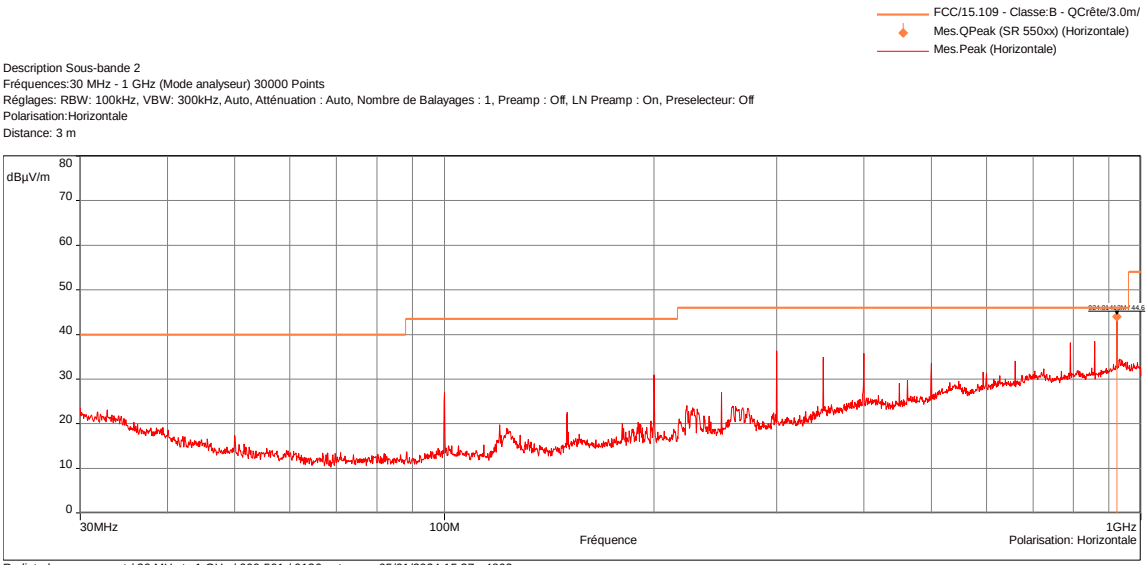
Radiated measurement / 30 MHz to 1 GHz / 600-301 / 915 antenna - 11/24/2023 11:27 - 4792

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 EMISSION LIMITS - GRAPH			
RADIATED MEASUREMENT / 30 MHZ TO 1 GHZ / 600-501 / 0138 ANTENNA		EMI4793	
EUT mode:	Rx mode	**T (°C):**	15.8
Test Date:	24/11/2023	**H (%):**	37.3
Test Operator:	MPA	**P (hPa):**	1024



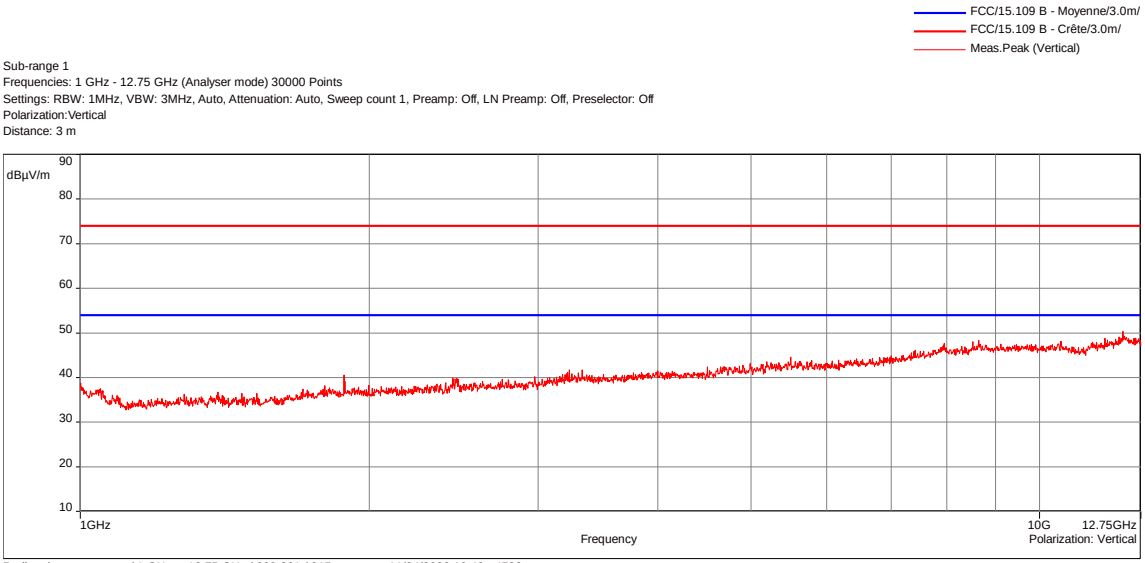
Radiated measurement / 30 MHz to 1 GHz / 600-501 / 0136 antenna - 05/01/2024 15:37 - 4863



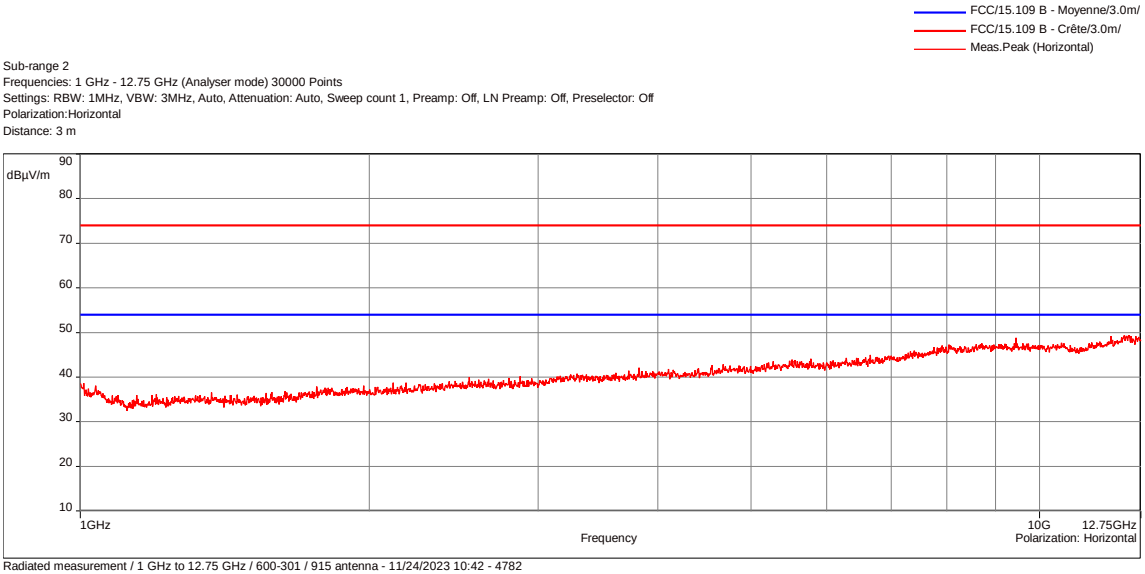
Radiated measurement / 30 MHz to 1 GHz / 600-501 / 0136 antenna - 05/01/2024 15:37 - 4863

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 EMISSION LIMITS - GRAPH			
RADIATED MEASUREMENT / 1 GHZ TO 12.75 GHZ / 600-501 / 0541-915 ANTENNA		EMI4782	
EUT mode:	Rx mode	**T (°C):**	15.8
Test Date:	24/11/2023	**H (%):**	37.3
Test Operator:	MPA	**P (hPa):**	1024



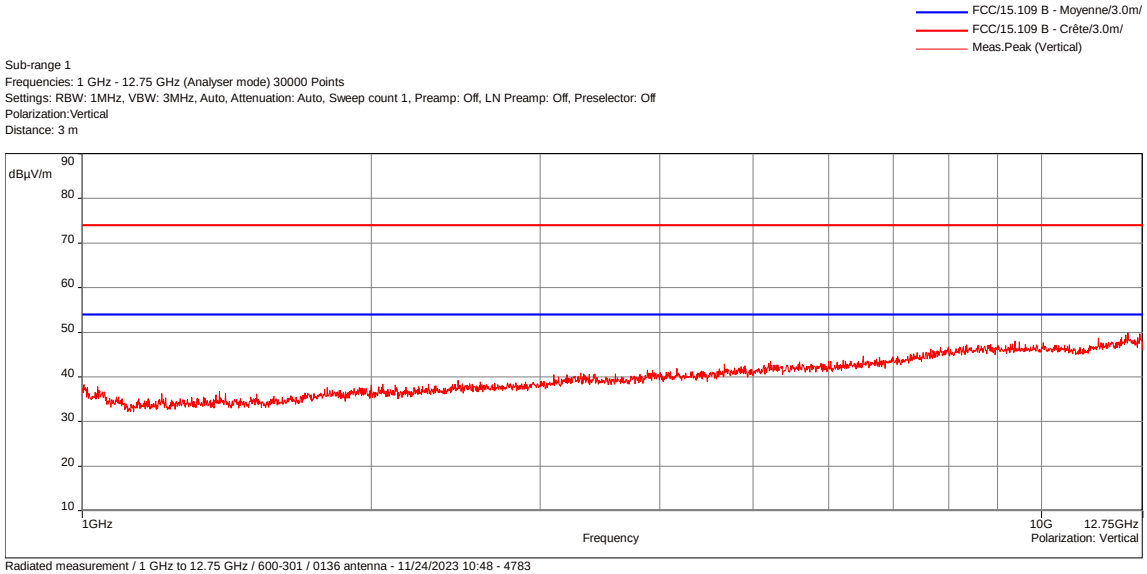
Radiated measurement / 1 GHz to 12.75 GHz / 600-301 / 915 antenna - 11/24/2023 10:42 - 4782



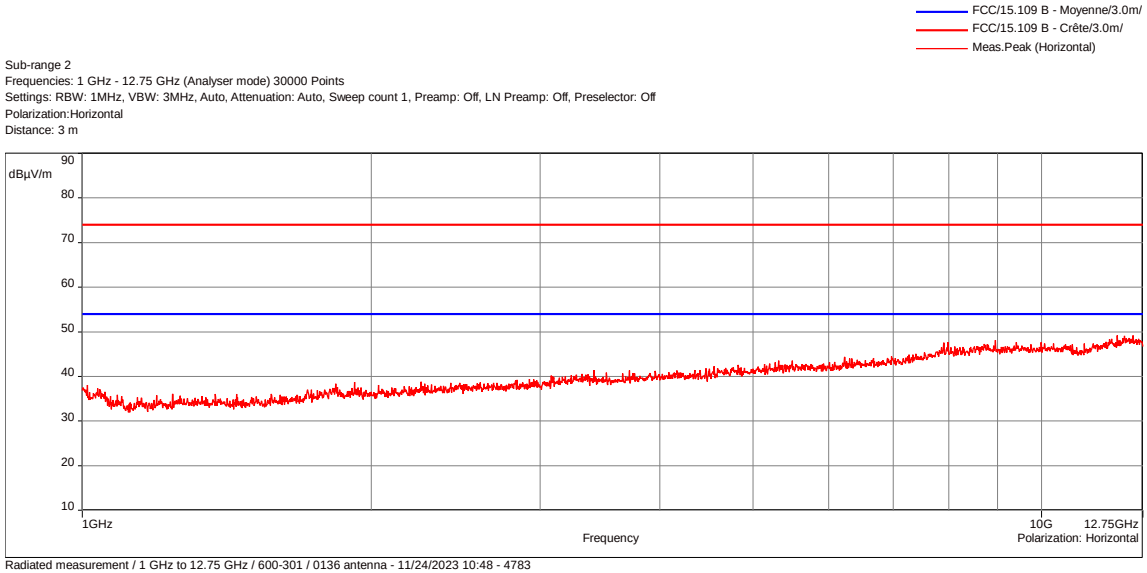
Radiated measurement / 1 GHz to 12.75 GHz / 600-301 / 915 antenna - 11/24/2023 10:42 - 4782

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-12.75GHz	1MHz	3MHz	Peak
Horizontal	1GHz-12.75GHz	1MHz	3MHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

RADIATED EMISSION LIMITS - GRAPH			
RADIATED MEASUREMENT / 1 GHZ TO 12.75 GHZ / 600-501 / 0138 ANTENNA		EMI4783	
EUT mode:	Rx mode	**T (°C):**	15.8
Test Date:	24/11/2023	**H (%):**	37.3
Test Operator:	MPA	**P (hPa):**	1024



Radiated measurement / 1 GHz to 12.75 GHz / 600-301 / 0136 antenna - 11/24/2023 10:48 - 4783



Radiated measurement / 1 GHz to 12.75 GHz / 600-301 / 0136 antenna - 11/24/2023 10:48 - 4783

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-12.75GHz	1MHz	3MHz	Peak
Horizontal	1GHz-12.75GHz	1MHz	3MHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

6.3. 6dB bandwidth

Reference standard:	FCC 47 CFR Part 15.247 RSS 247
Test method:	ANSI C63.10: 2013
Test description: (2) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.	

TESTED PARAMETER	RESULT	SEVERITY	RESULT TAB.	VERDICT
6 dB Bandwidth	636.997 kHz	≥ 500 kHz	EMI5236	**PASS**

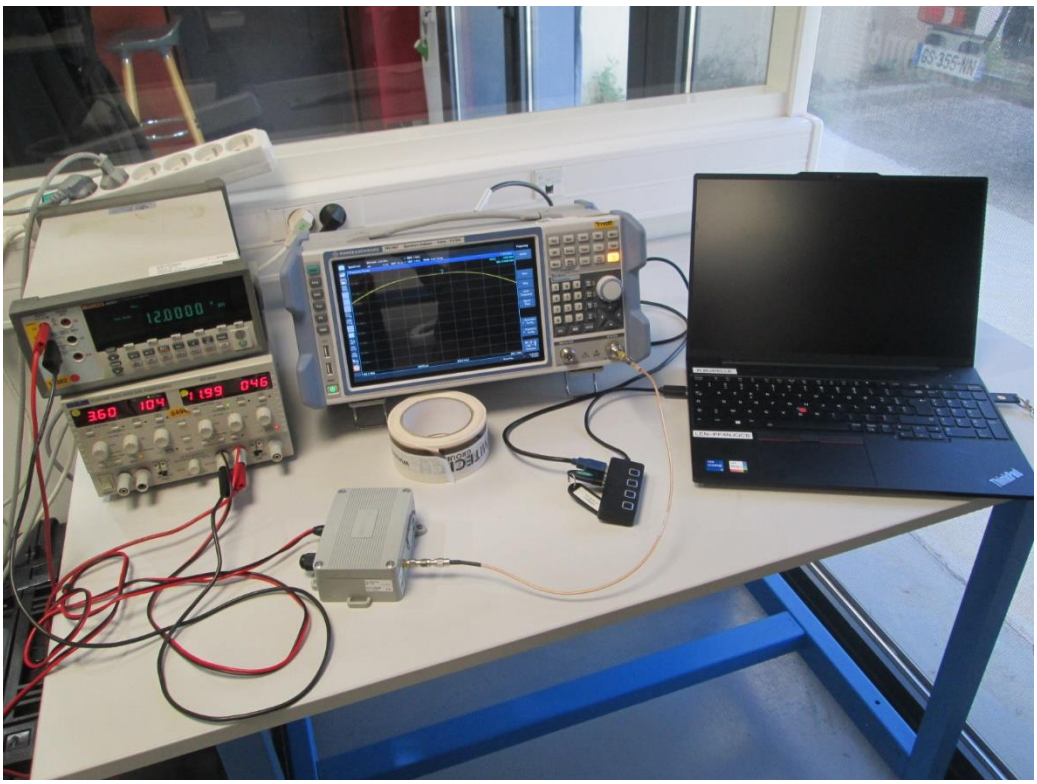
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	*See Graph(es)*
Relative Humidity	20 to 75 %	*See Graph(es)*
Atmospheric pressure	N/A	*See Graph(es)*
TEST METHOD DEVIATION: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED

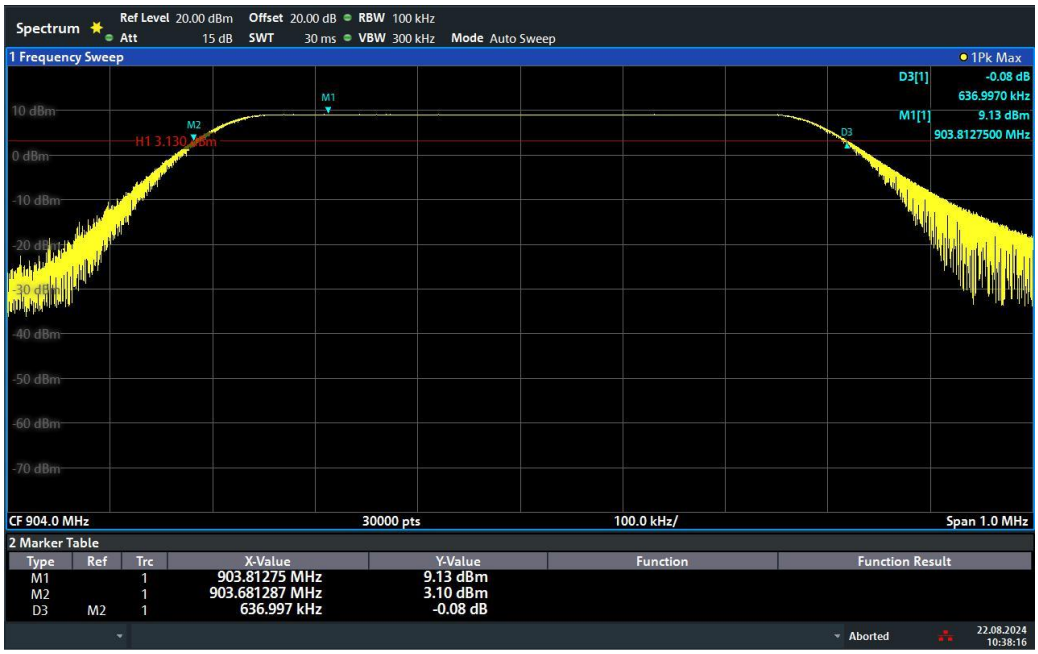
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Attenuator	Techniwave	TWSMA-20dB-18G-SMA	14679	07/03/2023	07/05/2026
Cable	Radiall	SMA-0,5m	16558	16/08/2023	16/10/2025
Power supply	TTI	PL303QMD	8496		
Spectrum analyzer	Rohde & Schwarz	FPL1007	17908	04/12/2023	04/02/2025
Thermohygrometer	Bioblock Scientific	Météostar		25/09/2023	25/11/2025
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024
Multimeter	FLUKE	8808A	10382	11/07/2024	11/09/2025

BAT-EMC software version: V3.18.0.26 Blank cells = Permanent validity

TEST SETUP PHOTO(S) - EUT POSITION


TEST SETUP PHOTO(S)


6dB BANDWIDTH - GRAPH			
6dB BANDWIDTH		EMI5236	
EUT mode:	Tx mode	**T (°C):**	24.7
Test Date:	22/08/2024	**H (%):**	42.6
Test Operator:	OAT + RBU	**P (hPa):**	1006



10:38:17 22.08.2024

Results:	The 6dB bandwidth is 636.997 kHz

EUT modification(s): N/A

6.4. Peak conducted output power

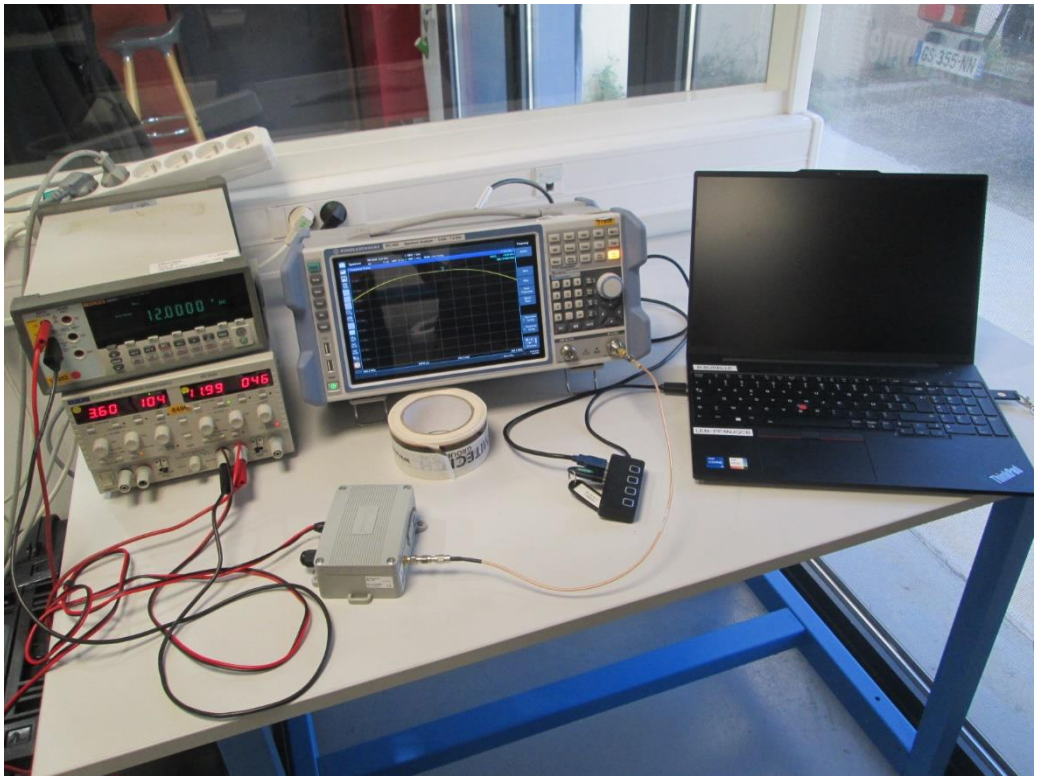
Reference standard:	FCC Part 15.247 and RSS 247
Test method:	ANSI C63.10: 2013
General test setup: b) (3) For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.	

TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
RF output power / 600-501	902.5MHz-905.5MHz	1W (30 dBm)	EMI4562	**PASS**

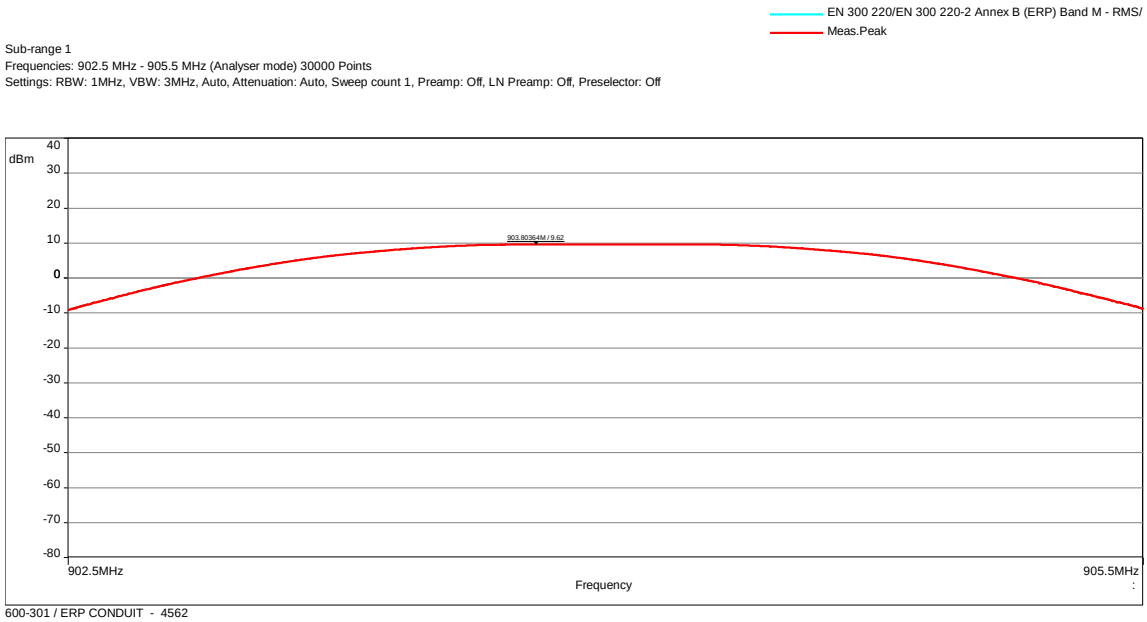
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	*See Graph(s)*
Relative Humidity	20 to 75 %	*See Graph(s)*
Atmospheric pressure	N/A	*See Graph(s)*
Test method deviation: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	**BRAND**	**TYPE**	**IDENTIFIER**	**CAL. DATE**	**CAL. DUE**
Software	Nexio	BAT EMC	0000		
Attenuator	Techniwave	TWSMA-20dB-18G-SMA	14679	07/03/2023	07/05/2026
Cable	Radiall	SMA-0,5m	16558	16/08/2023	16/10/2025
Power supply	TTI	PL303QMD	8496		
Spectrum analyzer	Rohde & Schwarz	FPL1007	17908	04/12/2023	04/02/2025
Thermohygrometer	Bioblock Scientific	Météostar	0963	25/09/2023	25/11/2025
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024
Multimeter	FLUKE	8808A	10382	11/07/2024	11/09/2025

BAT-EMC software version: V3.18.0.26 Blank cells = Permanent validity

TEST SETUP PHOTO(S)


EFFECTIVE RADIATED POWER - GRAPH			
RF OUTPUT POWER / 600-501		EMI4562	
EUT mode:	EUT TX MODE	**T (°C):**	24.8
Test Date:	22/08/2024 17:08:15	**H (%):**	42.1
Test Operator:	OAT + RBU	**P (hPa):**	1006



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Conducted	902.5MHz-905.5MHz	1MHz	3MHz	Peak
Configuration:				
Comments:	/			
EUT modification(s): N/A				

CONDUCTED POWER - TABULATED RESULTS		
RF OUTPUT POWER / 600-501		EMI4562
Frequency (MHz)	**Level (dBm)**	**Limit (dBm)**
904.0	9.62	30

6.5. Band-edge compliance

Reference standard:	FCC 47 CFR Part 15.247 RSS 247
Test method:	ANSI C63.10: 2013
Test description: d) In any 100 kHz bandwidth outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Only the highest levels are recorded.	

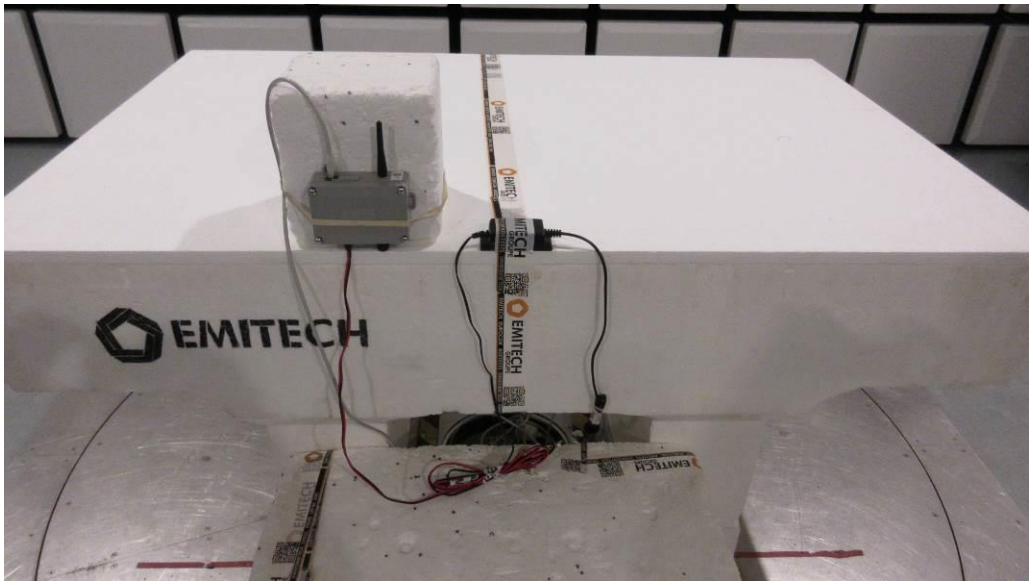
TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Band edge / 600-501	876MHz-954MHz	20 dBc and §15.209	EMI4861	**PASS**

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: Measurements are done in radiated on the worst case configuration.		

TEST EQUIPMENT USED

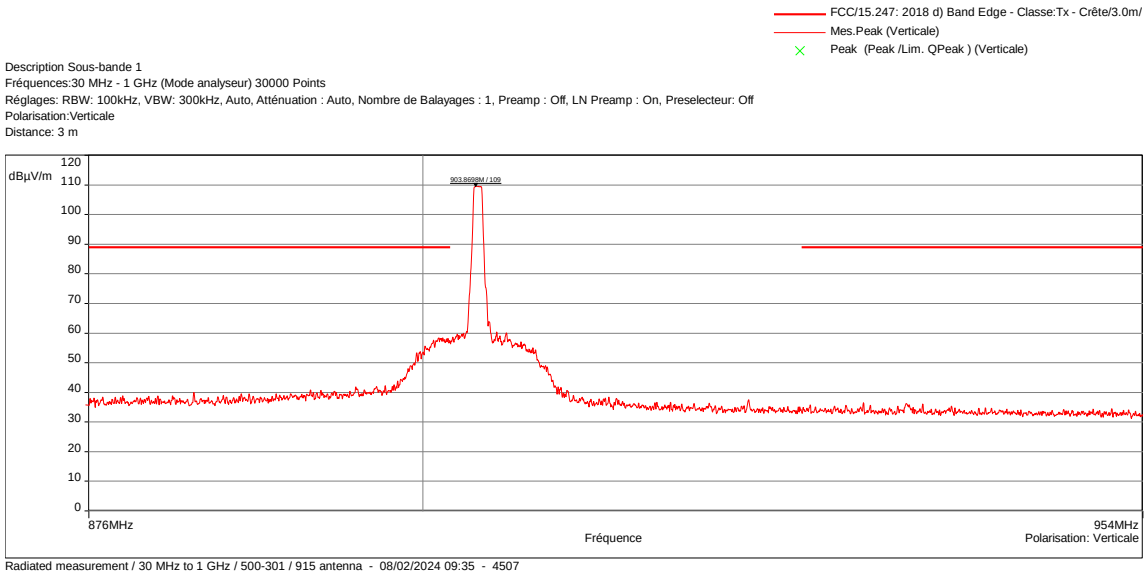
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	ETS lindgren	3142E	14523	27/01/2022	27/03/2025
Cable	Techniwave	N-8m	18349	17/08/2023	17/10/2025
Cable	SUCOFLEX	N-6,5m	14380	17/08/2023	17/10/2025
Cable	SUCOFLEX	N-3m	14378	17/08/2023	17/10/2025
Receiver	Rohde & Schwarz	ESW26	17791	08/02/2023	08/04/2024
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) – POSITION


TEST SETUP PHOTO(S)


BAND-EDGE COMPLIANCE - GRAPH			
BAND EDGE / 600-501		**EMI4861**	
EUT mode:	Tx mode	**T (°C):**	20.8
Test Date:	08/02/2024	**H (%):**	48.1
Test Operator:	MPA	**P (hPa):**	1009



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	876MHz-954MHz	100kHz	300kHz	Peak
Configuration:	N/A			
Comments:	No out of band emissions detected.			
EUT modification(s): N/A				

6.6. Power Spectral Density

Reference standard:	FCC 15.247, 15.209 and RSS 247
Test method:	ANSI C63.10: 2013
Test description: e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. Only the highest levels are recorded.	

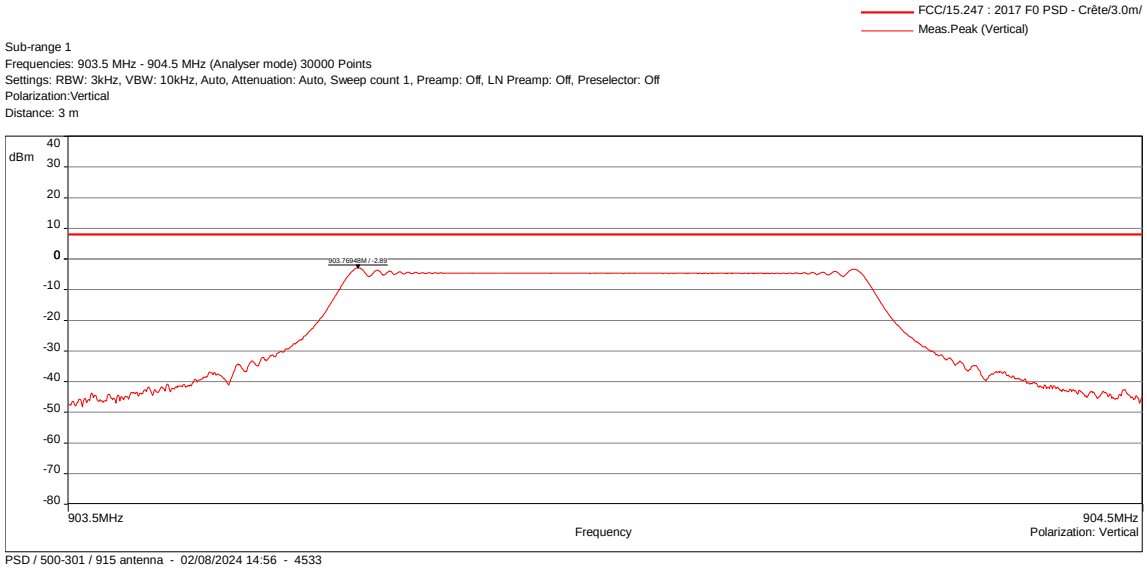
TESTED CONFIGURATION	RESULT	SEVERITY	RESULT TAB.	VERDICT
PSD / 600-501	902.5MHz- 903.5MHz	8 dBm / 3 kHz	EMI5250	**PASS**

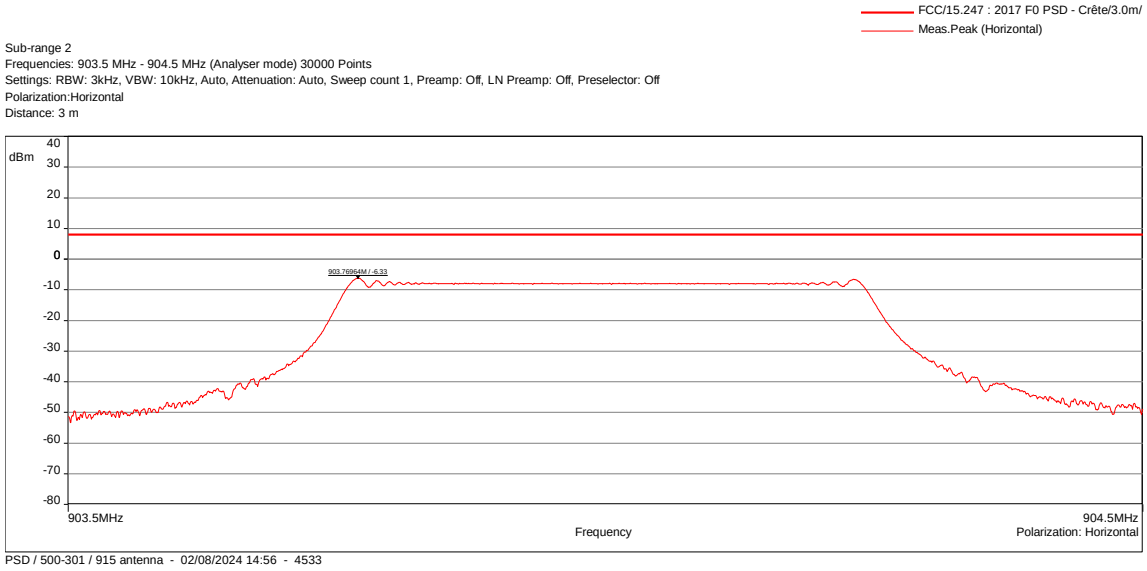
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	*See Graph(es)*
Relative Humidity	20 to 75 %	*See Graph(es)*
Atmospheric pressure	N/A	*See Graph(es)*
TEST METHOD DEVIATION: N/A		
Supplementary information: Measurements are done in radiated on the worst case configuration.		

TEST EQUIPMENT USED					
CATEGORY	**BRAND**	**TYPE**	**IDENTIFIER**	**CAL. DATE**	**CAL. DUE**
Antenna	ETS lindgren	3143B	17930	12/08/2021	12/10/2024
Attenuator	EMITECH	SUB.V4-H	18112	10/03/2023	10/05/2024
Attenuator	EMITECH	SUB.V4-V	18111	10/03/2023	10/05/2024
Cable	/	N-1m	3625	02/05/2023	02/07/2025
Cable	Techniwave	N-3.5m	18353	17/08/2023	17/10/2025
Cable	Techniwave	N-4m	18355	17/08/2023	17/10/2025
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	25/09/2023	25/11/2025

BAT-EMC software version: V3.18.0.26 Blank cells = Permanent validity

POWER SPECTRAL DENSITY - GRAPH			
PSD / 600-501		**EMI5250**	
EUT mode:	Tx mode	**T (°C):**	20.8
Test Date:	08/02/2024	**H (%):**	48.1
Test Operator:	MPA	**P (hPa):**	1009





POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	902.5MHz-903.5MHz	3kHz	10kHz	Peak
Horizontal	902.5MHz-903.5MHz	3kHz	10kHz	Peak

Configuration:	N/A
Comments:	N/A

EUT modification(s): N/A

FREQUENCY (MHZ)	POLARIZATION	LEVEL (DBM / 3 KHZ)	LIMIT (DBM / 3 KHZ)
904	Vertical	-2.89	8
904	Horizontal	-6.33	8

6.7. Measurement of frequency stability

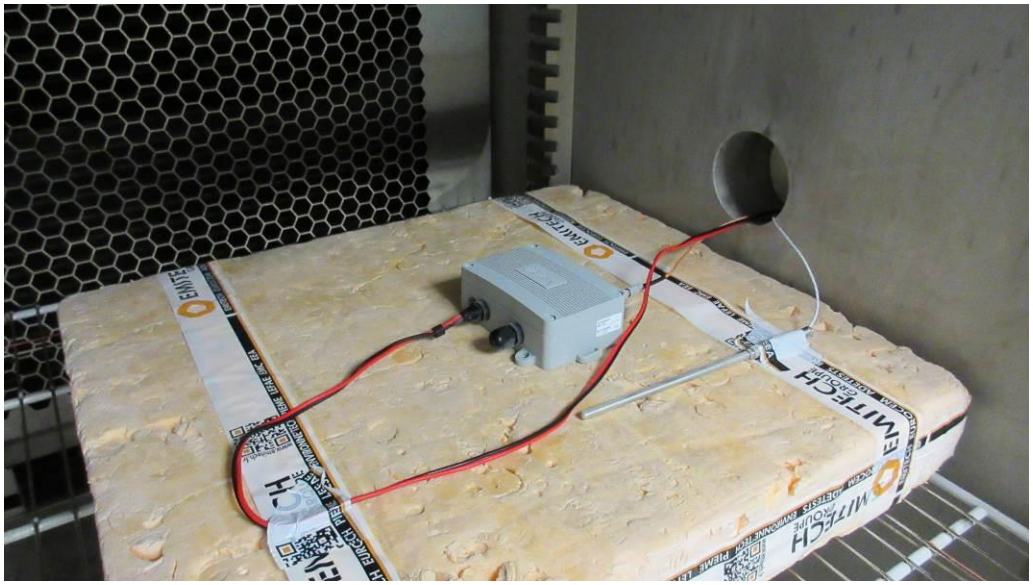
Reference standard:	FCC Part 15.215 and RSS 247
Test method:	ANSI C63.10: 2013
General test setup: The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that 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.	

TEST CASE	EUT MODE	SEVERITY	RESULT TAB.	VERDICT
904 MHz	Tx mode	Within 902MHz to 928MHz	EMI6410	**PASS**

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	21.0 °C
Relative Humidity	20 to 75 %	48.3 %
Atmospheric pressure	N/A	989 hPa
Test method deviation: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	**BRAND**	**TYPE**	**IDENTIFIER**	**CAL. DATE**	**CAL. DUE**
Cable	C&C	N-3m	14332	28/04/2023	28/06/2025
Climatic enclosure	CLIMATS	EXCAL 7714-HA	14261	21/10/2022	21/06/2024
Multimeter	Agilent Technologies	U1252A	6138	29/06/2023	29/08/2024
Power supply	TTI	PL303QMD	8496		
Receiver	Rohde & Schwarz	FPL1007	17908	03/11/2022	03/07/2024
Thermohygrometer	Bioblock Scientific	Météostar	0963	09/06/2021	09/02/2024
Thermohygrometer	Testo	608-H1	7562	11/06/2021	11/02/2024
Thermometer contactless	GHM Greisinger	GMH 3710	12968	28/02/2023	28/04/2025

BAT-EMC software version: V3.18.0.26 Blank cells = Permanent validity

TEST SETUP PHOTO(S)


MEASUREMENT OF FREQUENCY STABILITY - TABULATED RESULTS					
904 MHz					EMI6410
Test case	**Temperature (°C)**	**Power supply (Vdc)**	**Frequency (MHz)**	**Frequency error (kHz)**	**Limit**
Normal conditions	+25	12	904.000942	-	Within 902MHz to 928MHz
Extrem voltage conditions	+25	7.5	904.001092	+ 0.150	
		24	904.000768	- 0.174	
Extrem temperature conditions	-25	12	904.000733	- 0.209	
	+55		903.999955	- 0.997	

6.8. Occupied Bandwidth

Reference standard:	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).	

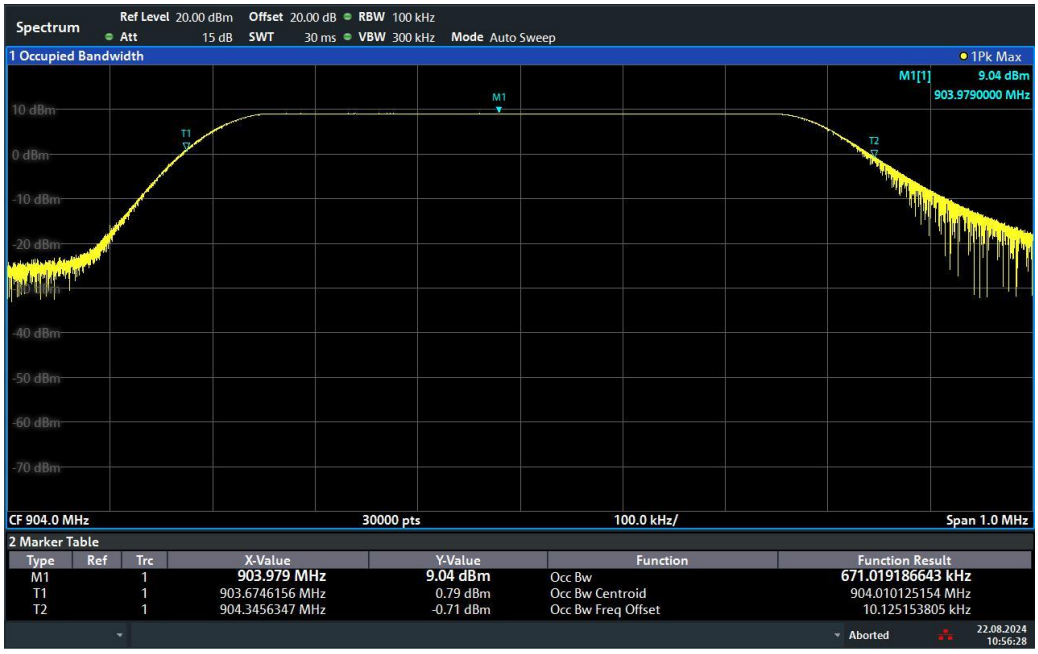
TESTED CABLE	FREQUENCY	SEVERITY	RESULT TAB.	VERDICT
99% Bandwidth	904.0 MHz	Within the 902MHz-928MHz band	EMI4470	**PASS**

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	24.7 °C
Relative Humidity	20 to 75 %	42.6 %
Atmospheric pressure	N/A	1006 hPa
Test method deviation: N/A		
Supplementary information: Measurements are done on the worst case configuration.		

TEST EQUIPMENT USED					
CATEGORY	**BRAND**	**TYPE**	**IDENTIFIER**	**CAL. DATE**	**CAL. DUE**
Attenuator	Techniwave	TWSMA-20dB-18G-SMA	14679	07/03/2023	07/05/2026
Cable	Radiall	SMA-0,5m	16558	16/08/2023	16/10/2025
Power supply	TTI	PL303QMD	8496		
Spectrum analyzer	Rohde & Schwarz	FPL1007	17908	04/12/2023	04/02/2025
Thermohygrometer	Bioblock Scientific	Météostar	0963	25/09/2023	25/11/2025
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024
Multimeter	FLUKE	8808A	10382	11/07/2024	11/09/2025

Blank cells = Permanent validity

OCCUPIED BANDWIDTH - GRAPH		
99% BANDWIDTH		EMI4470
EUT mode:	Tx mode	
Test Date:	22/08/2024	
Test Operator:	OAT + RBU	



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EUT modification(s): N/A

Results:	The system has an OBW of 671.019 kHz

EUT modification(s): N/A

End of test report