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
FCC 47 CFR PART 18
RSS-Gen, Issue 4
RSS-247, Issue 2

Company ..... :	**SUBLIMED**
Address..... :	9 RUE DU ROCHER DE LORZIER 38430 MOIRANS FRANCE

Test item description. ..... :	**Nerve stimulator**
Trade Mark. ..... :	actiTENS
Manufacturer..... :	SUBLIMED
Model/Type reference..... :	B8 / actiTENS
FCC ID..... :	2BALKSBM
Ratings..... :	100-240Vac/50-60Hz

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

Report Reference No..... :	**RR-EVE-22P427-1A**
Test procedure. ..... :	FCC IC Certification
Diffusion..... :	Mrs JOUVIE Camille
Applicant's name. ..... :	SUBLIMED
Date of issue..... :	June 15, 2023
Total number of pages..... :	97
Revision..... :	0
Compiled by..... :	Alexis TOUZET
Approved by (+ signature). ..... :	Olivier HEYER (Laboratory Manager)

Certain services reported in this document are not covered by the accreditation. They are identified by the symbol (*)

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:

1. GENERAL INFORMATIONS 3
2. REFERENCE DOCUMENT(S) 4
3. EQUIPMENT TECHNICAL DESCRIPTION 5
3.1. TEST CONDITIONS 5
3.2. E.U.T. MARKING PLATE 5
3.3. CHARGER MARKING PLATE 6
3.4. E.U.T. MODIFICATION(S) 6
3.5. E.U.T. GENERAL VIEW 7
3.6. E.U.T. INTERNAL VIEW 7
3.7. E.U.T. MECHANICAL AND ELECTRICAL DESIGN 8
3.8. E.U.T. INPUT/OUTPUT PORTS 8
3.9. SUPPORTING EQUIPMENT USED DURING TEST 9
3.10. EUT RADIO SPECIFICATIONS 11
4. RESULT SUMMARY 12
5. MEASUREMENT UNCERTAINTY 13
6. TEST CONDITIONS AND RESULTS 14
6.1. CONDUCTED EMISSION (MEASUREMENT) 14
6.2. 6DB BANDWIDTH 18
6.3. OCCUPIED BANDWIDTH 23
6.4. MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER 28
6.5. BAND-EDGE COMPLIANCE 43
6.6. POWER SPECTRAL DENSITY 49
6.7. RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ 62
6.8. RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ 74
6.9. FREQUENCY ERROR (*) 96

REVISION HISTORY:

Revision	Date	Modified pages	Modifications
0	June 15, 2023	/	Creation

1. GENERAL INFORMATIONS

This document submits the results of Radio tests performed on the equipment **Nerve stimulator actiTENS SBM1AA100** (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 ..... :	Alexis TOUZET
Test supervisor ..... :	None
Date of receipt of test item ..... :	N/A
Date (s) of performance of tests ..... :	From February 15th to 17th of 2022

APPLICANT'S GENERAL INFORMATIONS:	
Company name ..... :	SUBLIMED
Company address. ..... :	9 RUE DU ROCHER DE LORZIER 38430 MOIRANS FRANCE
Person(s) present during the tests. ..... :	No representative for company attended the tests.
Responsible. ..... :	Mrs JOUVIE Camille Mr CHAMBON Bertrand

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: 2017
Code of federal regulations – Title 47 telecommunication
Part 15- Radio frequency devices

FCC 47 CFR PART 18 : 2020
Code of federal regulations Title 47- Telecommunication
Chapter 1- Federal Communication Commission
Part 18- Industrial, scientific and medical equipment Limits and methods of measurement of radio disturbance

RSS-Gen, Issue 4, November 2014
General Requirements for Compliance of Radio Apparatus

FCC part 15.247
Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850MHz. (frequency hopping and digitally modulated)

RSS-247 _ Issue 2, February 2017
Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

ANSI C63.10: 2013
American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

ANSI C63.4: 2014
American National Standard for Methods of measurement of Radio-Noise from low-voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

ICES-001 / NMB-001 ed5 : 2020 and ICES-Gen / NMB-Gen : 2018
Industry Canada
Spectrum Management and Telecommunications Policy
Interference Causing Equipment Standard,
Industrial, scientific and medical equipment (ISM)

KDB 447498 D01
General RF Exposure Guidance V06

KDB 558074 D01 DTS v03r03
Guidance for Performing Compliance on Digital Transmission Systems Operating under §15.247

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

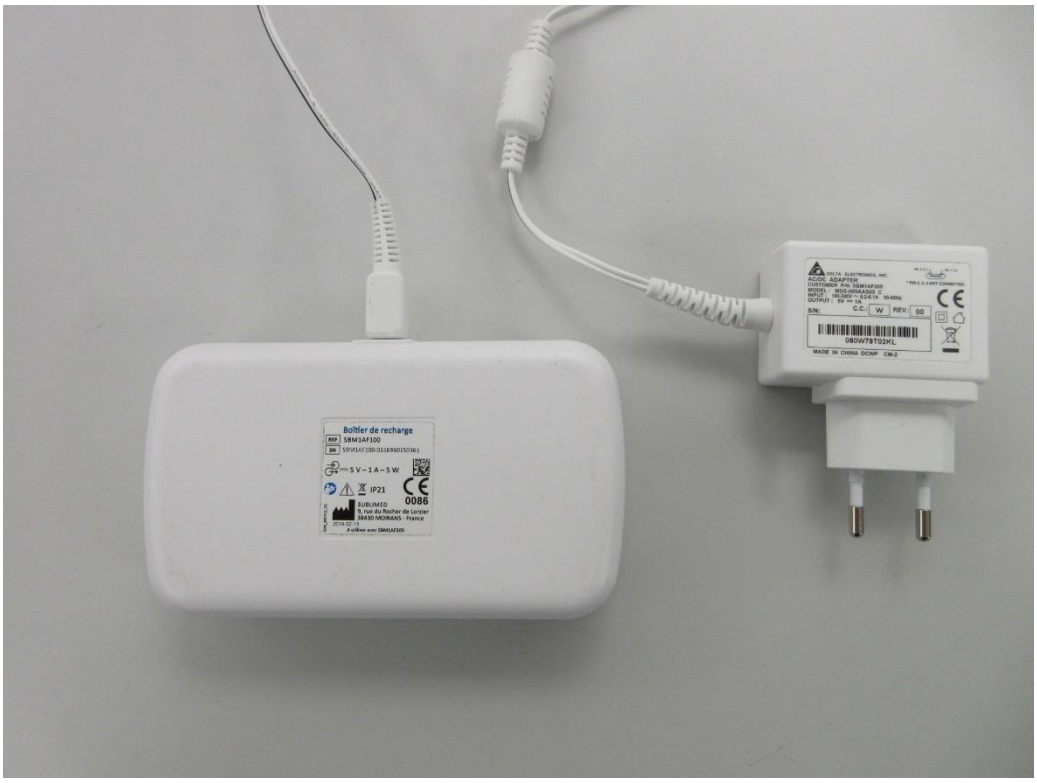
Test item description. ..... :	*Nerve stimulator*
Model/Type reference..... :	*B8 / actiTENS*
FCC ID..... :	*2BALKSBM*
Trade Mark. ..... :	actiTENS
Serial number (S/N)..... :	*0007594030698*
Part number (P/N). ..... :	*759403*
Software version..... :	*2.0*
Firmware version. ..... :	*7.3*
Type of sample. ..... :	*Standard equipment*
Function(s)..... :	*Transcutaneous electrical nerve stimulator*
Manufacturer name. ..... :	SUBLIMED
Address. ..... :	137 ruede Mayoussard 38430 Moirans FRANCE

General product information:

N/A

3.2. E.U.T. Marking plate

3.3. Charger Marking plate



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

None

3.5. E.U.T. General view

3.6. E.U.T. Internal view

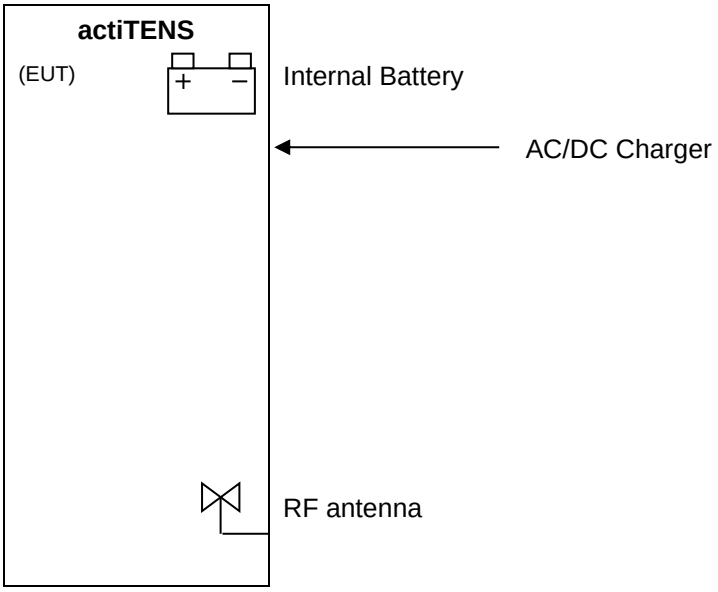
3.7. E.U.T. Mechanical and Electrical Design

Power supply. ..... : *120Vac/60Hz and 230Vac/50Hz*
Power supply range. ..... : *100-240Vac/50-60Hz*
Power type. ..... : *Single phase without earth*
Power (W). ..... : *5*
Nominal current (A). ..... : *0.2*
Dimensions (L x W x H) (mm). ..... : *108 x 53.5 x 18*
Weight (kg). ..... : *115g*
Temperature range (°C). ..... : *-25 to +85*
Ground bounding strap. ..... : *No*

Comments:

N/A

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



Port	Name	Type	Length	Cable Type	Comments
0	Main frame	N/E	N/A	Plastic	-
1	Battery	DC	N/A	N/A	Not communicated
2	AC/DC Charger	AC/DC	N/A	2P	120Vac/60Hz to 5Vdc
3	RF antenna	RF	N/A	N/A	WiFi 2.4GHz

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

3.9. Supporting Equipment Used During Test

Sample subject to the tests was tested with following equipment.

PRODUCT TYPE	MANUFACTURER	MODEL	N°EMITECH / COMMENTS
Laptop	DELL	Latitude 5580	Set test mode
UART to USB	N/A	N/A	

LAPTOP (AE)

UART (AE)

3.10. EUT Radio Specifications

a) GENERAL INFORMATIONS	
According to manufacturer's declarations :	
EUT type..... :	*Transmitter*
Technology ..... :	*Bluetooth Low Energy (BLE)*
Environmental profile..... :	*Data transmission*
Temperature range..... :	*-25°C to +85°C*
Antenna type ..... :	*Integral*
Antenna Gain..... :	*0.5 dBi*
Comments:	
N/A	

b) TRANSMITTER PARAMETERS (TX)	
Frequency bands..... :	*2400MHz to 2483.5MHz*
RF Power..... :	*Not communicated*
Number of channels / Separation..... :	*40 / 2MHz*
Modulation type ..... :	*GFSK*
Duty cycle ..... :	*Continuous*
Tested frequency..... :	*2402MHz (Low channel)* *2426MHz (Mid channel)* *2480MHz (High channel)*

c) RECEIVER PARAMETERS (RX)	
Frequency bands..... :	*2400MHz to 2483.5MHz*
Category/Class ..... :	*Not communicated*
Bandwidth..... :	*Not communicated*

4. RESULT SUMMARY

TEST DESIGNATION	SEVERITY	VERDICT	BASIC STANDARDS / COMMENTS
SUBPART A - GENERAL			
Labeling requirements		**PASS**	**15.19 / See certification documents**
Information to user		**PASS**	**15.21 / See certification documents**
Measurement standards		**PASS**	**15.31**
Frequency range of radiated measurements		**PASS**	**15.33**
Measurement detector functions and bandwidths		**PASS**	**15.35**
SUBPART B – UNINTENTIONAL RADIATORS			
Information to the user		**PASS**	**15.105 / See certification documents**
Conducted limits	**Class B**	**PASS**	**15.107**
Radiated emission limits	**Class B**	**PASS**	**15.109**
SUBPART C –INTENTIONAL RADIATORS			
Equipment authorization requirement		**PASS**	**15.201 / Transmitter part is subject to Certification procedure**
Antenna requirement		**PASS**	**15.203 / Dedicated and glued antenna**
Restricted bands of operation		**PASS**	**15.204**
Conducted limits	**Class B**	**PASS**	**15.207**
Radiated emission limits; general requirements	**Class B**	**PASS**	**15.209**
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)
- 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)
- 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.

TEST(S) PERFORMED	MODIFICATION(S)
FCC part 15.247 subclause d)	N/A
FCC part 15.247	N/A
FCC part 15.109, 15.209, 15.205, 15.215	N/A
FCC part 15 Radio part 15.215	N/A
ANSI C63.4: 2014	N/A
ANSI C63.10: 2013	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 %
Radiated emission (PIRE)		
62.5 MHz - 1 GHz	± 5.8 dB	± 6 dB
1 GHz - 18 GHz	± 5.6 dB	± 6 dB
Radiated emission (magnetic field)		
9kHz – 30MHz	± 3.4 dB	± 6 dB
RF level for a given BER	± 0.8 dB	± 1.5 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 emission (measurement)

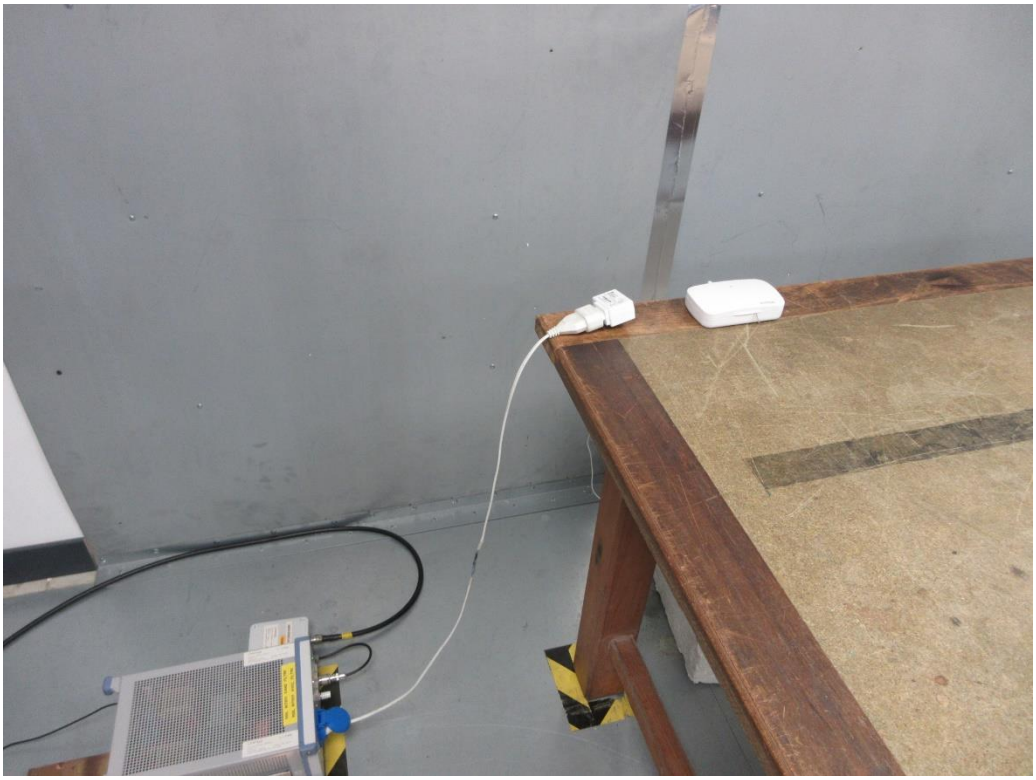
Reference standard:	FCC part 15.107, 15.207, FCC part 18 and RSS-Gen
Test method:	ANSI C63.4: 2014
General test setup: EUT is set on an insulating support at 40cm from the vertical ground reference plane. All power was connected to the system through Artificial Mains Network (AMN). The AMN is placed at 80cm from the boundary of the EUT and bonded to a ground reference plane. 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
Conducted measurement / Wifi all channels / 120Vac/60Hz	150kHz-30MHz	15.207	EMI4481	**PASS**
Conducted measurement / Rx mode / 120Vac/60Hz	150kHz-30MHz	15.107	EMI4614	**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	26/01/2022	26/03/2024
Cable	C&C	N-3m	14334	18/03/2021	18/05/2023
LISN	Rohde & Schwarz	ENV216	17925	24/09/2021	24/11/2023
Receiver	Rohde & Schwarz	ESI	9704	18/11/2022	18/01/2024
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024
Thermohygrometer	Bioblock Scientific	Météostar	0963	07/06/2021	07/08/2023

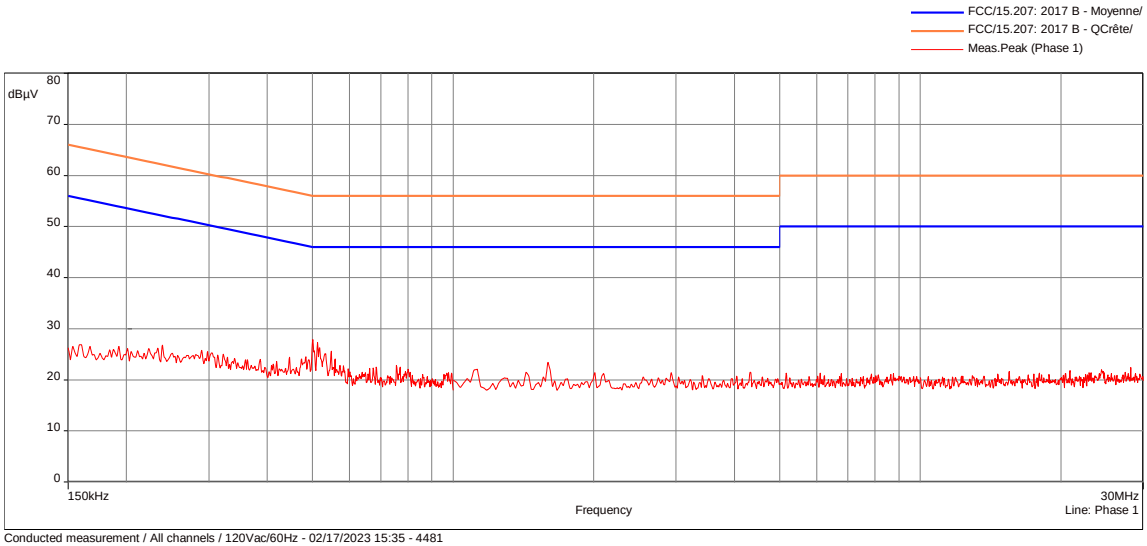
BAT-EMC software version: V3.18.0.26 Blank cells = Permanent validity

TEST SETUP PHOTO(S)


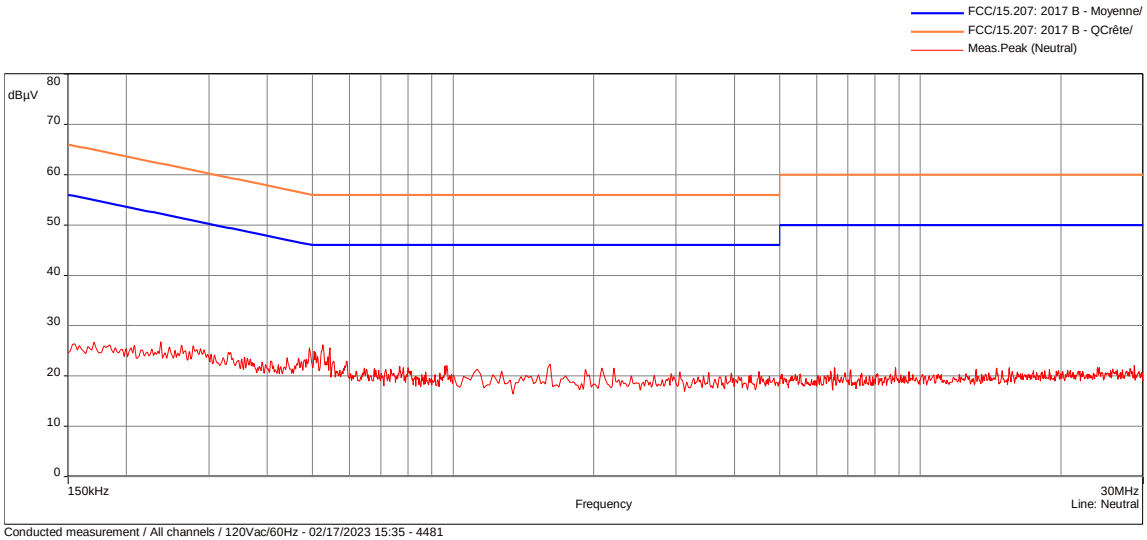
CONDUCTED EMISSION (MEASUREMENT) - TABULATED RESULTS						
CONDUCTED MEASUREMENT / ALL CHANNELS / 120VAC/60HZ						EMI4481
Terminal	Test Frequency (MHz)	Detector (Pk/QP/Av)	Gain/Loss Factor (dB)	Level dB (µV)	Limit dB (µV)	Margin (dB)
/	/	/	/	/	/	/
Supplementary information: No Spurious emission detected.						

CONDUCTED EMISSION (MEASUREMENT) - TABULATED RESULTS						
CONDUCTED MEASUREMENT / RX MODE / 120VAC/60HZ						EMI4614
Terminal	Test Frequency (MHz)	Detector (Pk/QP/Av)	Gain/Loss Factor (dB)	Level dB (µV)	Limit dB (µV)	Margin (dB)
/	/	/	/	/	/	/
Supplementary information: No Spurious emission detected.						

CONDUCTED EMISSION (MEASUREMENT) - GRAPH			
CONDUCTED MEASUREMENT / ALL CHANNELS / 120VAC/60HZ		EMI4481	
EUT mode:	Tx mode	**T (°C):**	23.7
Test Date:	17/02/2023	**H (%):**	35.5
Test Operator:	ATO	**P (hPa):**	1009



Conducted measurement / All channels / 120Vac/60Hz - 02/17/2023 15:35 - 4481

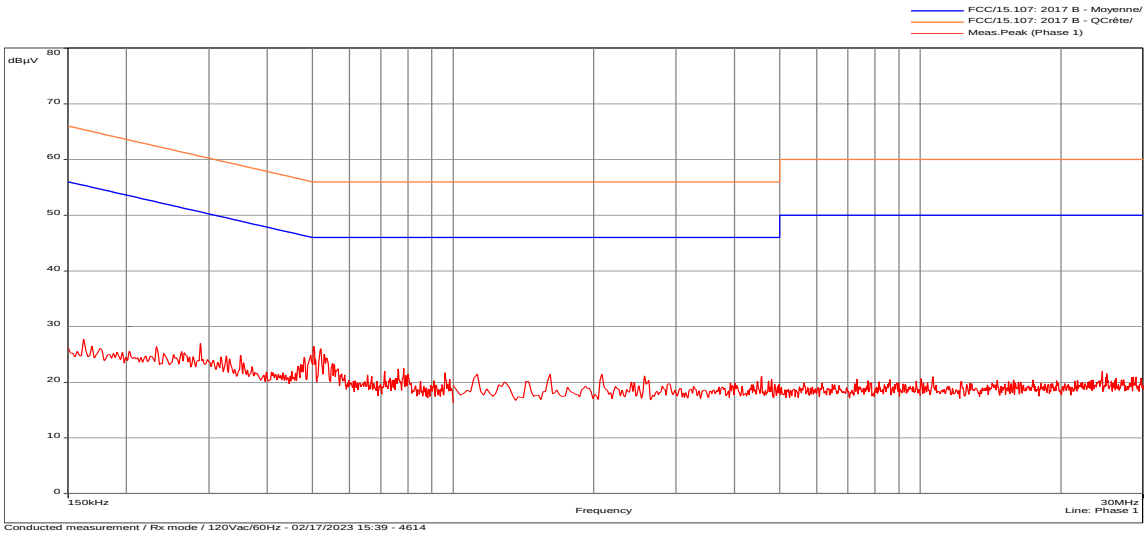


Conducted measurement / All channels / 120Vac/60Hz - 02/17/2023 15:35 - 4481

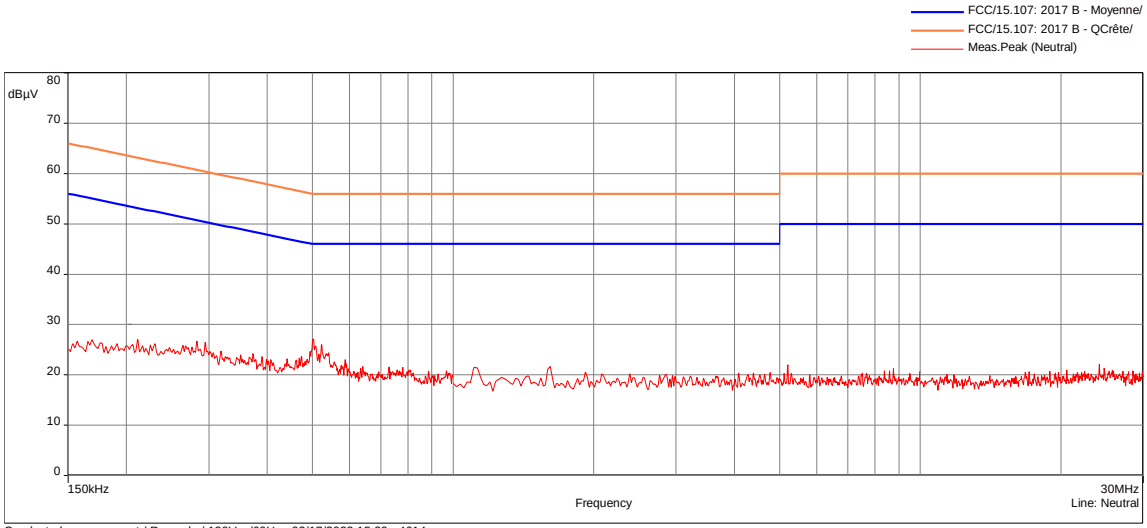
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Neutral	150kHz-1MHz	10kHz	30kHz	Peak
Neutral	1MHz-10MHz	10kHz	30kHz	Peak
Neutral	10MHz-30MHz	10kHz	30kHz	Peak
Line	150kHz-1MHz	10kHz	30kHz	Peak
Line	1MHz-10MHz	10kHz	30kHz	Peak
Line	10MHz-30MHz	10kHz	30kHz	Peak
Measure with:	A.M.N.			
Comments:	N/A			

EUT modification(s): N/A

CONDUCTED EMISSION (MEASUREMENT) - GRAPH			
CONDUCTED MEASUREMENT / RX MODE / 120VAC/60HZ		EMI4614	
EUT mode:	Tx mode	**T (°C):**	23.7
Test Date:	17/02/2023	**H (%):**	35.5
Test Operator:	ATO	**P (hPa):**	1009



Conducted measurement / Rx mode / 120Vac/60Hz - 02/17/2023 15:39 - 4614



Conducted measurement / Rx mode / 120Vac/60Hz - 02/17/2023 15:39 - 4614

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

EUT modification(s): N/A

6.2. 6dB bandwidth

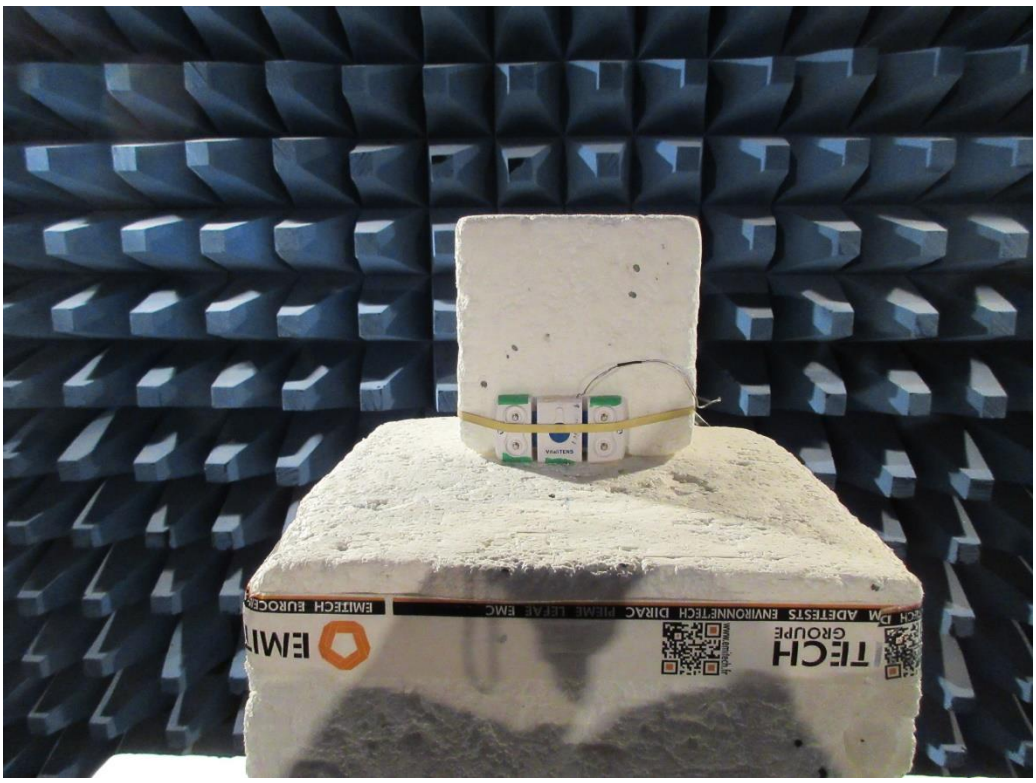
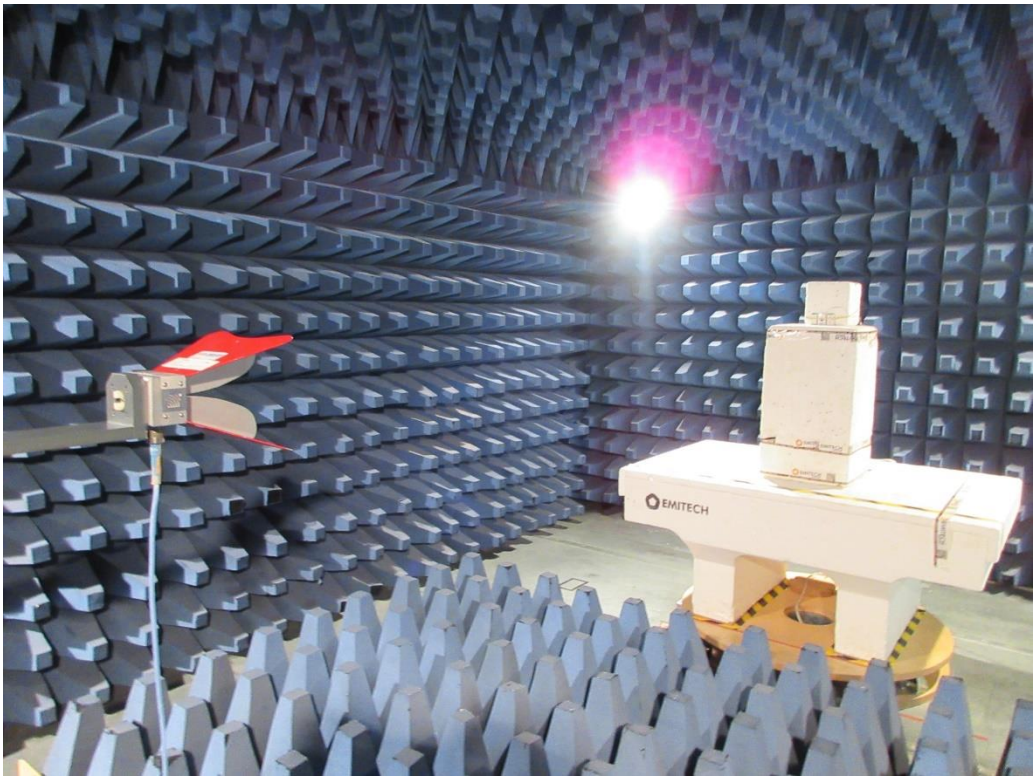
Reference standard:	FCC part 15 Radio part 15.247 and RSS-247
Test method:	FCC part 15.247 and RSS-247
Test description: a) (2): Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz. EUT is connected to the measuring receiver via 50Ω attenuator(s). Tests are done in max-hold mode in order to capture all channels.	

TEST CASE AND CONDITIONS	SEVERITY	RESULT TAB.	VERDICT
Low Channel	>500kHz	EMI4633	**PASS**
Mid Channel	>500kHz	EMI4634	**PASS**
High Channel	>500kHz	EMI4635	**PASS**

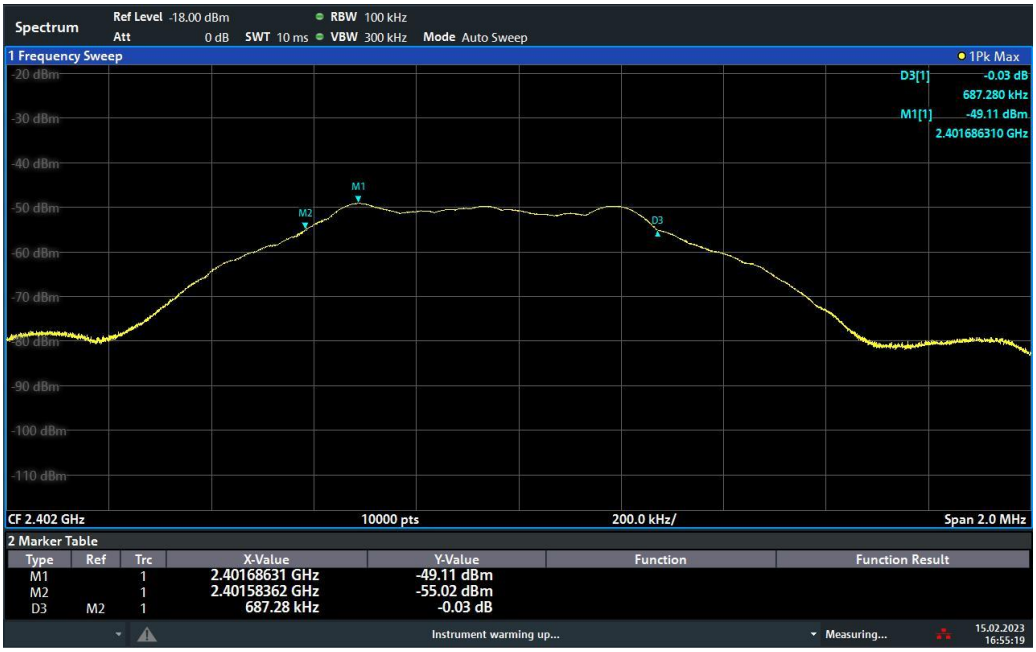
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	24.2 °C
Relative Humidity	20 to 75 %	35.4 %
Atmospheric pressure	N/A	1002 hPa
Test method deviation: N/A		
Supplementary information:		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	ETS-Lindgren	3117	5456	09/09/2022	09/11/2025
Cable	SUCOFLEX	N-3m	14378	23/08/2021	23/10/2023
Cable	SUCOFLEX	N-5,5m	14381	23/08/2021	23/10/2023
Receiver	Rohde & Schwarz	FPL1003	16027	16/11/2021	16/07/2023
Shielded enclosure	RAY PROOF	C.V2	1423	04/10/2019	04/06/2023
Thermohygrometer	Testo	608-H1	7562	09/06/2021	09/08/2023
Thermohygrometer	Bioblock Scientific	Météostar	0963	07/06/2021	07/08/2023

Blank cells = Permanent validity

TEST SETUP PHOTO(S)



6dB Bandwidth - Graph	
Low Channel	EMI4633
EUT mode:	Modulated
Test Date:	16/02/2023
Test Operator:	ATO

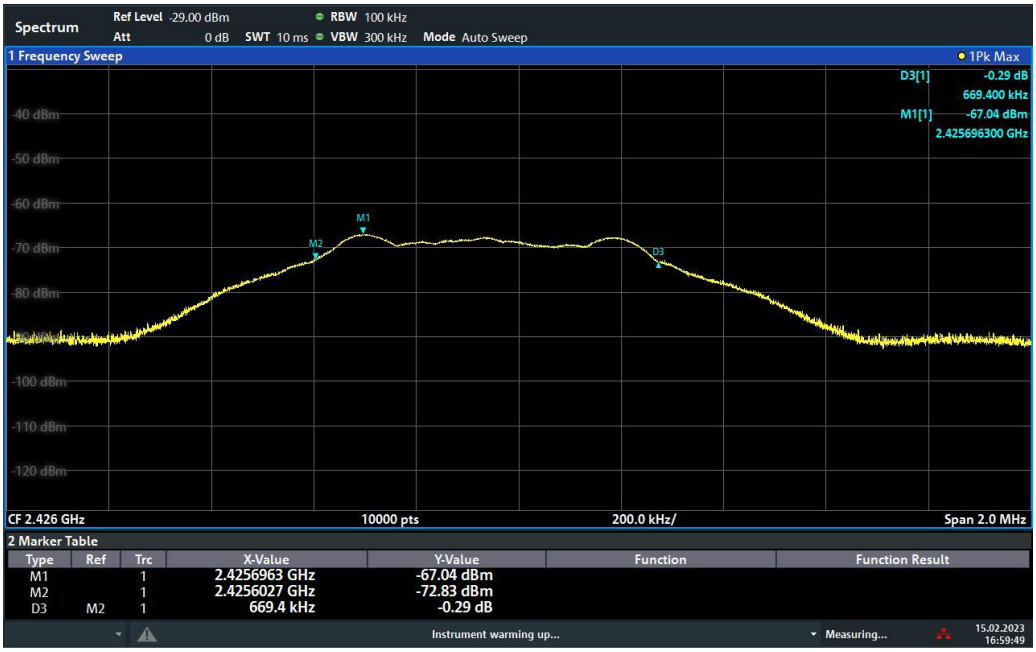


16:55:20 15.02.2023

EUT modification(s): N/A

6dB Bandwith - Tabulated Results			
Low channel			
Frequency	**RBW**	**6 dB Bandwith**	**Limit**
2402 MHz	100kHz	687.28 kHz	>500kHz

6dB Bandwidth - Graph	
Mid Channel	EMI4634
EUT mode:	Modulated
Test Date:	16/02/2023
Test Operator:	ATO

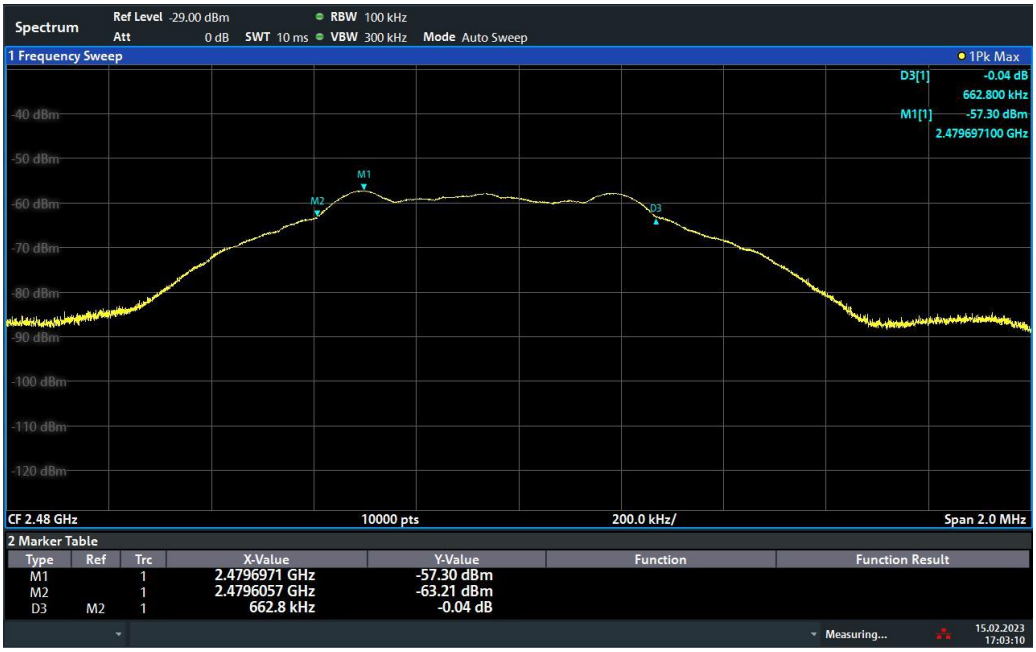


16:59:49 15.02.2023

EUT modification(s): N/A

6dB Bandwith - Tabulated Results			
Low channel			
Frequency	**RBW**	**6 dB Bandwith**	**Limit**
2426 MHz	100kHz	669.40 kHz	>500kHz

6dB Bandwidth - Graph	
High Channel	EMI4635
EUT mode:	Modulated
Test Date:	16/02/2023
Test Operator:	ATO



17:03:11 15.02.2023

EUT modification(s): N/A

6dB Bandwith - Tabulated Results			
Low channel			
Frequency	**RBW**	**6 dB Bandwith**	**Limit**
2480 MHz	100kHz	662.80 kHz	>500kHz

6.3. Occupied bandwidth

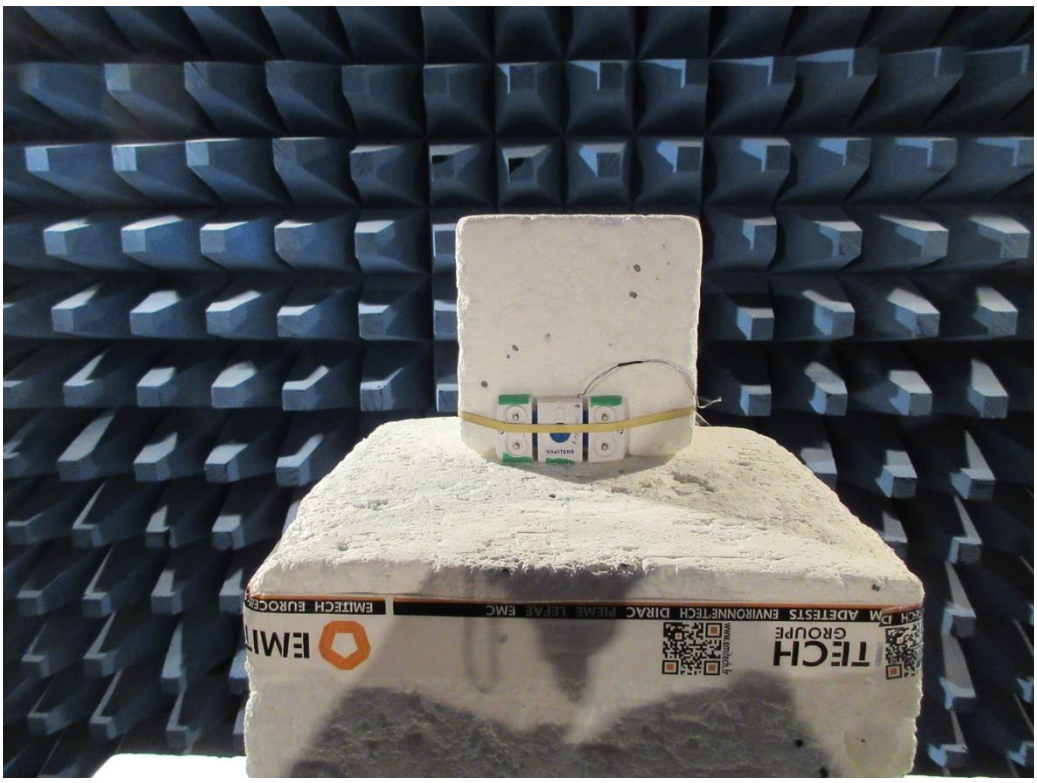
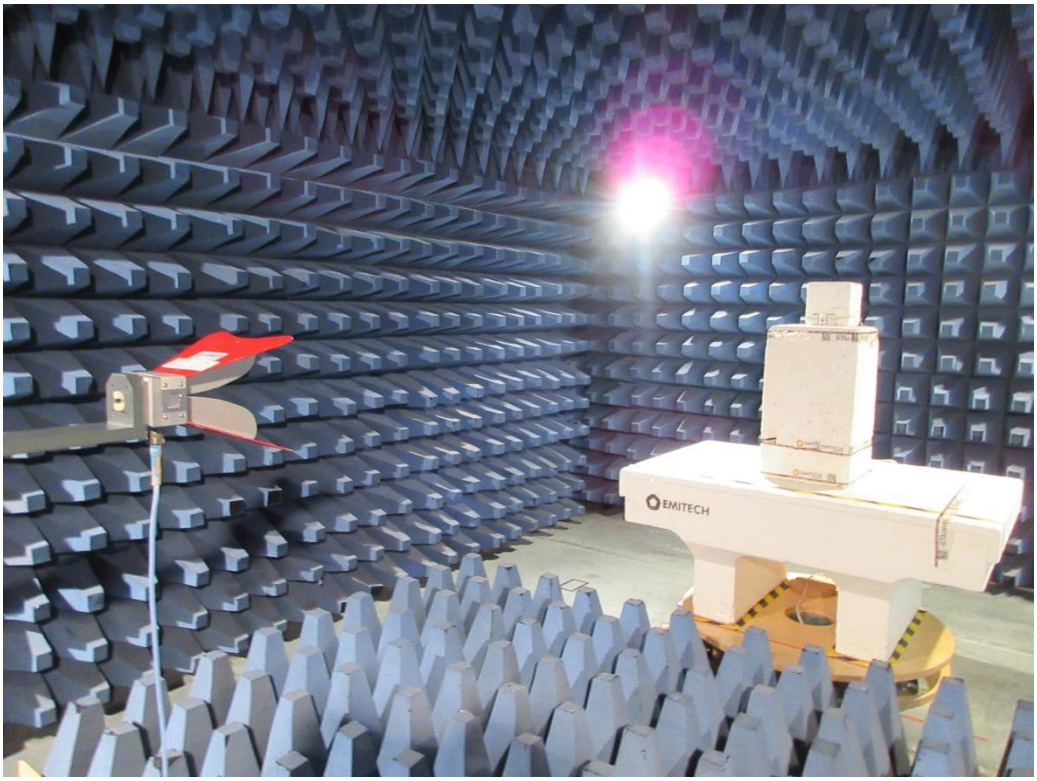
Reference standard:	FCC part 15 Radio part 15.247 and RSS-247
Test method:	FCC part 15.247 and RSS-247
Test description: The occupied bandwidth (OBW) is the Frequency Range in which 99 % of the total mean power of a given emission falls. The residual part of the total power being denoted as β, which, 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.	

TEST CASE AND CONDITIONS	SEVERITY	RESULT TAB.	VERDICT
Low Channel	>500kHz	EMI4471	**PASS**
Mid Channel	>500kHz	EMI4631	**PASS**
High Channel	>500kHz	EMI4632	**PASS**

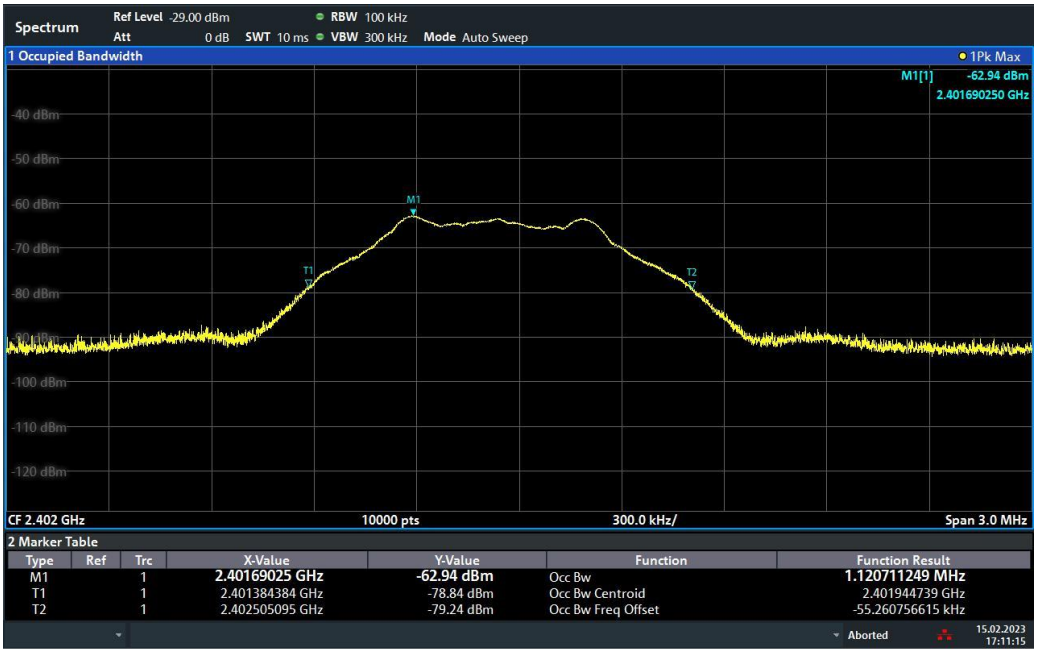
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	24.2 °C
Relative Humidity	20 to 75 %	35.4 %
Atmospheric pressure	N/A	1002 hPa
Test method deviation: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	ETS-Lindgren	3117	5456	09/09/2022	09/11/2025
Cable	SUCOFLEX	N-3m	14378	23/08/2021	23/10/2023
Cable	SUCOFLEX	N-5,5m	14381	23/08/2021	23/10/2023
Receiver	Rohde & Schwarz	FPL1003	16027	16/11/2021	16/07/2023
Shielded enclosure	RAY PROOF	C.V2	1423	04/10/2019	04/06/2023
Thermohygrometer	Testo	608-H1	7562	09/06/2021	09/08/2023
Thermohygrometer	Bioblock Scientific	Météostar	0963	07/06/2021	07/08/2023

Blank cells = Permanent validity

TEST SETUP PHOTO(S)



MODULATION BANDWIDTH - GRAPH	
OBW / LOW CHANNEL	EMI4471
EUT mode:	Modulated
Test Date:	16/02/2023
Test Operator:	ATO



17:11:16 15.02.2023

EUT modification(s): N/A

OCCUPIED BANDWIDTH - TABULATED RESULTS			
HIGH CHANNEL			
Frequency	**RBW**	**OBW 99%**	**Limit**
2402 MHz	100 kHz	1.120 MHz	> 500kHz

MODULATION BANDWIDTH - GRAPH	
OBW / MID CHANNEL	EMI4631
EUT mode:	Modulated
Test Date:	16/02/2022
Test Operator:	ATO

17:13:42 15.02.2023

EUT modification(s): N/A

OCCUPIED BANDWIDTH - TABULATED RESULTS			
HIGH CHANNEL			
Frequency	**RBW**	**OBW 99%**	**Limit**
2426 MHz	100 kHz	1.048 MHz	> 500kHz

MODULATION BANDWIDTH - GRAPH	
OBW / HIGH CHANNEL	EMI4632
EUT mode:	Modulated
Test Date:	16/02/2022
Test Operator:	ATO

17:14:50 15.02.2023

EUT modification(s): N/A

OCCUPIED BANDWIDTH - TABULATED RESULTS			
HIGH CHANNEL			
Frequency	**RBW**	**OBW 99%**	**Limit**
2480 MHz	100 kHz	1.046 MHz	> 500kHz

6.4. Maximum effective isotropic radiated power

a) Normal Tests Conditions

Reference standard:	FCC part 15 Radio part 15.247 and RSS-247
Test method:	FCC part 15.247 and RSS-247

Test description: EUT is set on an insulating support at 150cm above the ground reference plane.

Measurement are done on a normalized test site by the substitution method.

The test antenna is oriented in the two polarizations (vertical and horizontal), and the product is rotated at 360° in the horizontal plane (See photo(s) for initial position of the EUT(0°)). If applicable the test antenna was raised and lowered through the specified range of height until a maximum signal level is detected.

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

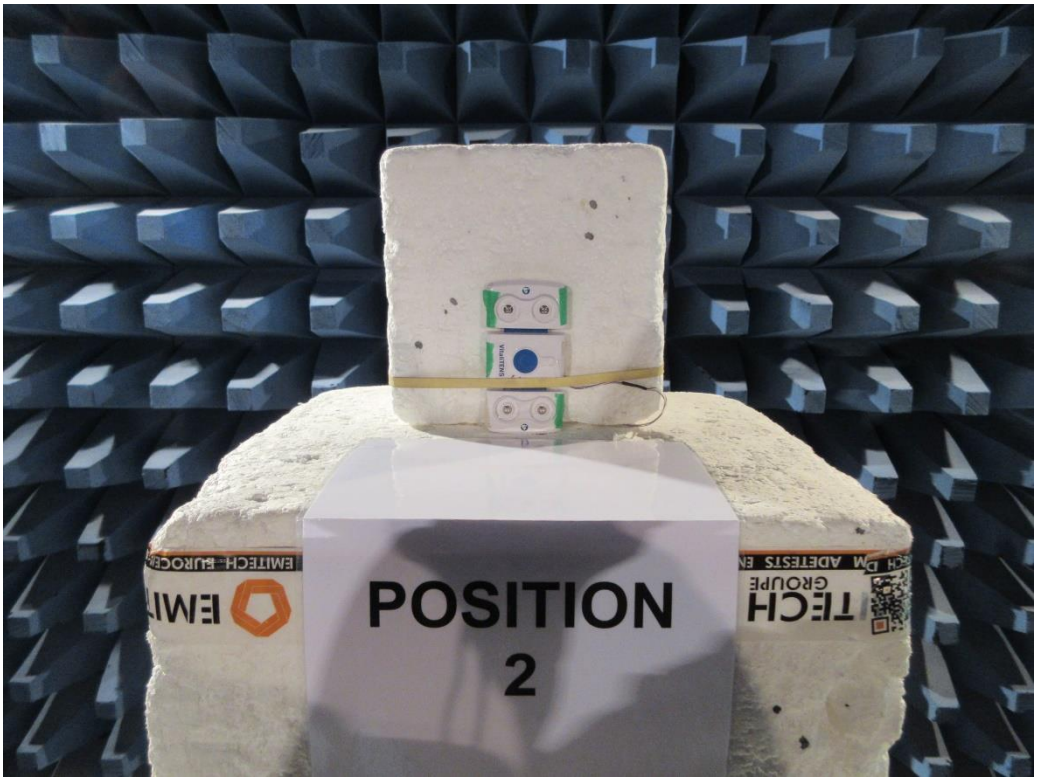
Test Case	Parameter	Severity	Result Tab.	Verdict
RF output power / Low channel (2402MHz) / Position 1	2.3995GHz-2.4045GHz	30dBm	EMI4589	**PASS**
RF output power / Low channel (2402MHz) / Position 2	2.3995GHz-2.4045GHz	30dBm	EMI4590	**PASS**
RF output power / Low channel (2402MHz) / Position 3 (Charging)	2.3995GHz-2.4045GHz	30dBm	EMI4588	**PASS**
RF output power / Mid channel (2426MHz) / Position 1	2.4235GHz-2.4285GHz	30dBm	EMI4591	**PASS**
RF output power / Mid channel (2426MHz) / Position 2	2.4235GHz-2.4285GHz	30dBm	EMI4592	**PASS**
RF output power / Mid channel (2426MHz) / Position 3 (Charging)	2.4235GHz-2.4285GHz	30dBm	EMI4593	**PASS**
RF output power / High channel (2480MHz) / Position 1	2.4775GHz-2.4825GHz	30dBm	EMI4596	**PASS**
RF output power / High channel (2480MHz) / Position 2	2.4775GHz-2.4825GHz	30dBm	EMI4595	**PASS**
RF output power / High channel (2480MHz) / Position 3 (Charging)	2.4775GHz-2.4825GHz	30dBm	EMI4594	**PASS**

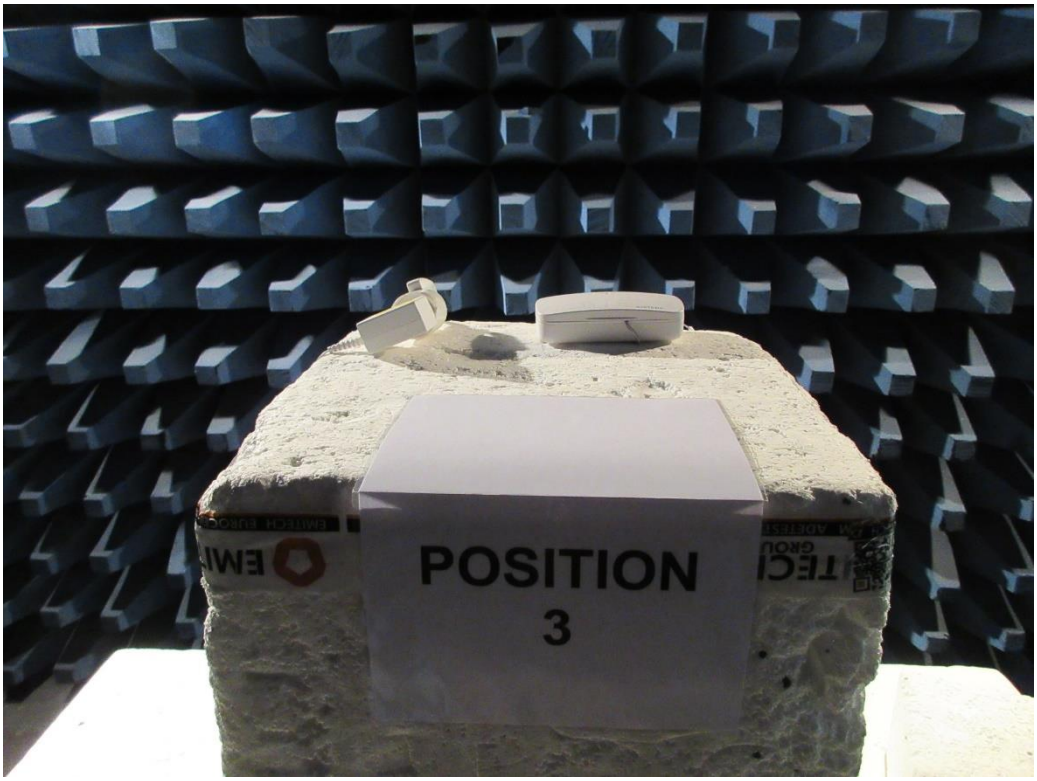
Laboratory parameters:	Required prior to the test	During the test
Ambient Temperature	15 to 35 °C	25.1 °C
Relative Humidity	20 to 75 %	35.7 %
Atmospheric pressure	N/A	1009 hPa
Test method deviation: N/A		
Supplementary information: N/A		

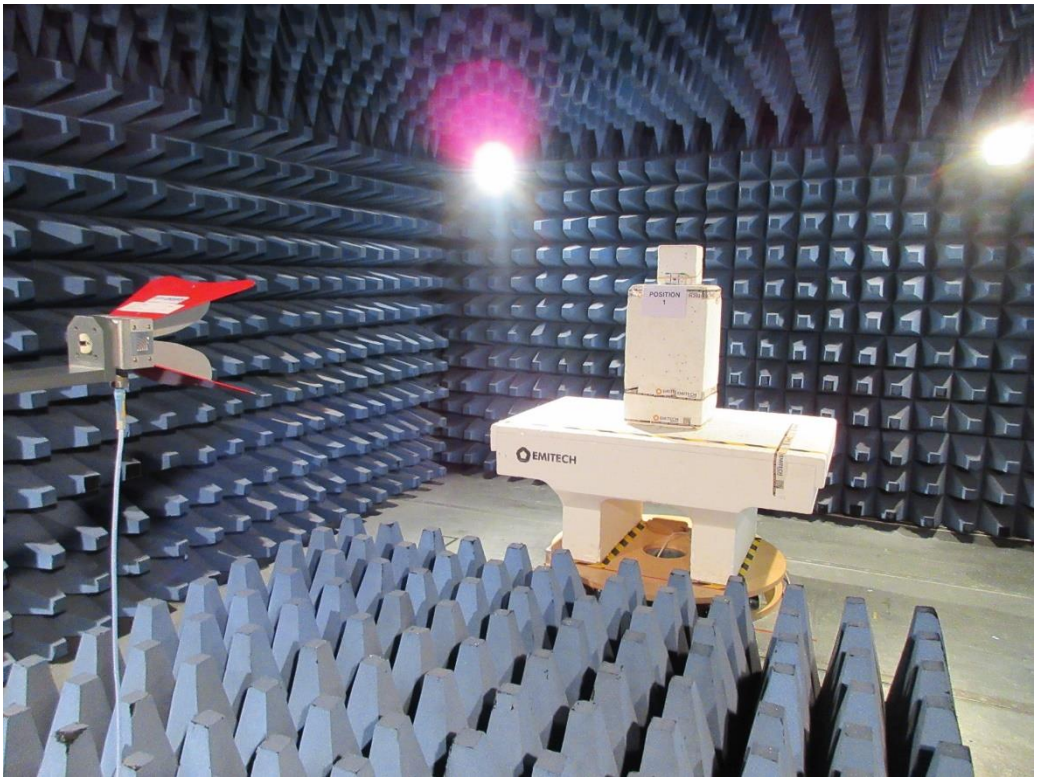
TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	ETS-Lindgren	3117	5456	09/09/2022	09/11/2025
Attenuator	EMITECH	SUB.V2-H	14495	05/01/2022	05/03/2023
Attenuator	EMITECH	SUB.V2-V	14496	05/01/2022	05/03/2023
Cable	SUCOFLEX	N-3m	14378	23/08/2021	23/10/2023
Cable	SUCOFLEX	N-5,5m	14381	23/08/2021	23/10/2023
Receiver	Agilent Technologies	E4440A	5824	02/11/2020	02/07/2023
Shielded enclosure	RAY PROOF	C.V2	1423	04/10/2019	04/06/2023
Software	Nexio	BAT EMC	0000		
Thermohygrometer	Testo	608-H1	7562	09/06/2021	09/08/2023
Thermohygrometer	Bioblock Scientific	Météostar	0963	07/06/2021	07/08/2023

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

TEST SETUP PHOTO(S) – POSITION 1

TEST SETUP PHOTO(S) – POSITION 2


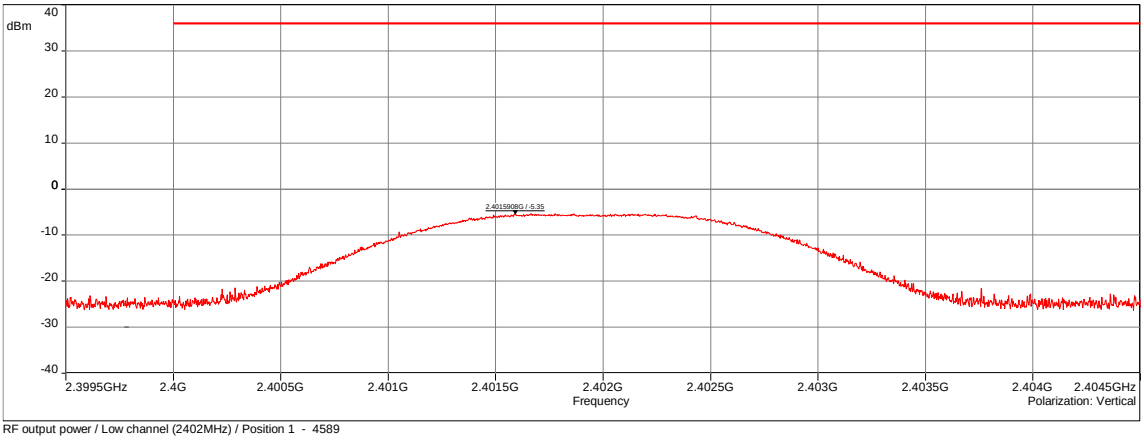
TEST SETUP PHOTO(S) – POSITION 3


TEST SETUP PHOTO(S)


MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - GRAPH			
RF OUTPUT POWER / LOW CHANNEL (2402MHz) / POSITION 1		EMI4589	
EUT mode:	Unmodulated	**T (°C):**	24.2
Test Date:	16/02/2023	**H (%):**	35.4
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Vertical)

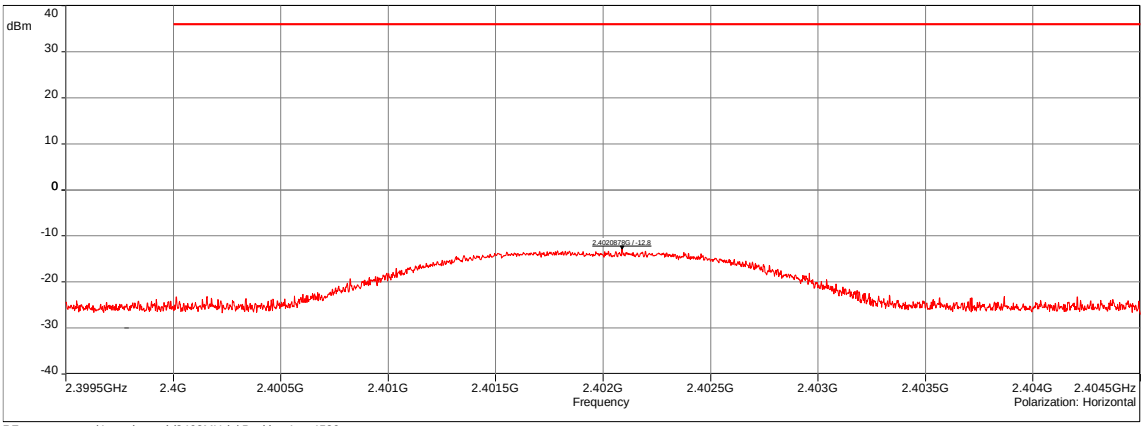
Sub-range 1
Frequencies: 2.3995 GHz - 2.4045 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



RF output power / Low channel (2402MHz) / Position 1 - 4589

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.3995 GHz - 2.4045 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



RF output power / Low channel (2402MHz) / Position 1 - 4589

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.3995GHz-2.4045GHz	1MHz	3MHz	Peak
Horizontal	2.3995GHz-2.4045GHz	1MHz	3MHz	Peak
Configuration:	N/A			
Comments:	N/A			

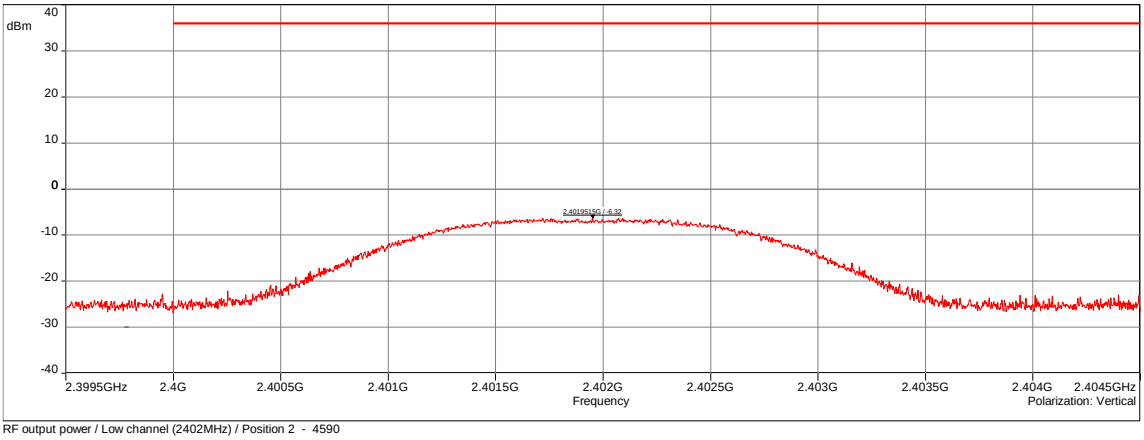
EUT modification(s): N/A

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
RF OUTPUT POWER / LOW CHANNEL (2402MHz) / POSITION 1			EMI4589
Frequency (MHz)	**Polarization**	**Level (dBm)**	**Limit (dBm)**
2402MHz	Vertical	-5.35	30.00
2402MHz	Horizontal	-12.8	30.00

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - GRAPH			
RF OUTPUT POWER / LOW CHANNEL (2402MHz) / POSITION 2		EMI4590	
EUT mode:	Unmodulated	**T (°C):**	24.2
Test Date:	16/02/2023	**H (%):**	35.4
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Vertical)

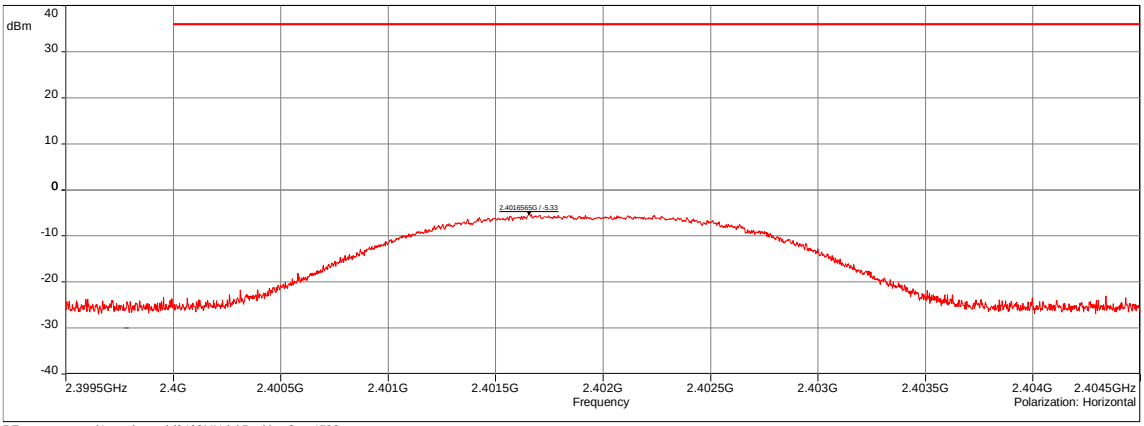
Sub-range 1
Frequencies: 2.3995 GHz - 2.4045 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



RF output power / Low channel (2402MHz) / Position 2 - 4590

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.3995 GHz - 2.4045 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



RF output power / Low channel (2402MHz) / Position 2 - 4590

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.3995GHz-2.4045GHz	1MHz	3MHz	Peak
Horizontal	2.3995GHz-2.4045GHz	1MHz	3MHz	Peak
Configuration:	N/A			
Comments:	N/A			

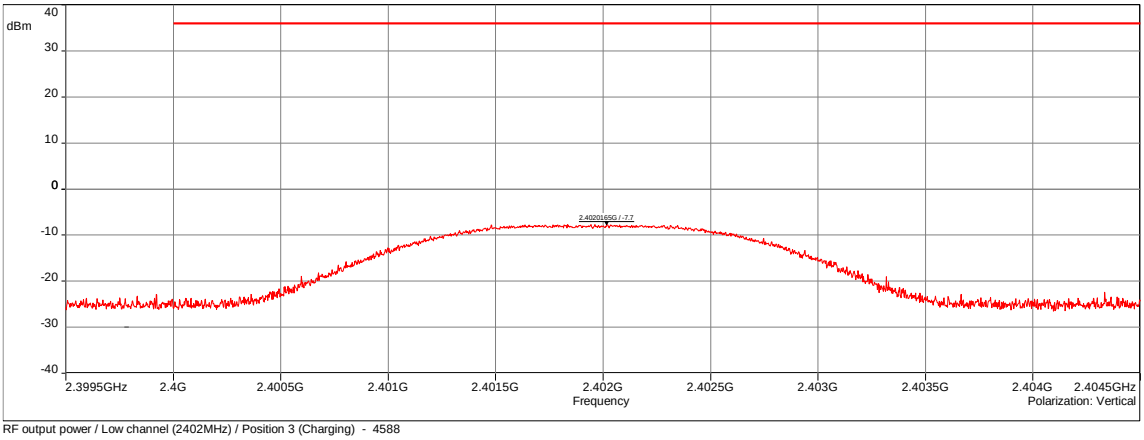
EUT modification(s): N/A

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
RF OUTPUT POWER / LOW CHANNEL (2402MHz) / POSITION 2			EMI4590
Frequency (MHz)	**Polarization**	**Level (dBm)**	**Limit (dBm)**
2402	Vertical	-6.32	30.00
2402	Horizontal	-5.33	30.00

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - GRAPH			
RF OUTPUT POWER / LOW CHANNEL (2402MHZ) / POSITION 3 (CHARGING)		EMI4588	
EUT mode:	Unmodulated	**T (°C):**	24.2
Test Date:	16/02/2023	**H (%):**	35.4
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Vertical)

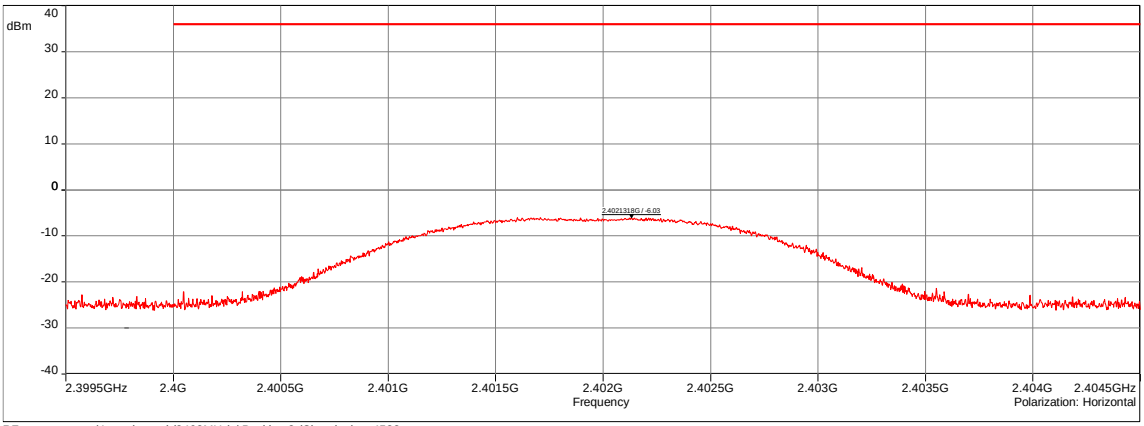
Sub-range 1
Frequencies: 2.3995 GHz - 2.4045 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



RF output power / Low channel (2402MHz) / Position 3 (Charging) - 4588

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.3995 GHz - 2.4045 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



RF output power / Low channel (2402MHz) / Position 3 (Charging) - 4588

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.3995GHz-2.4045GHz	1MHz	3MHz	Peak
Horizontal	2.3995GHz-2.4045GHz	1MHz	3MHz	Peak
Configuration:	N/A			
Comments:	N/A			

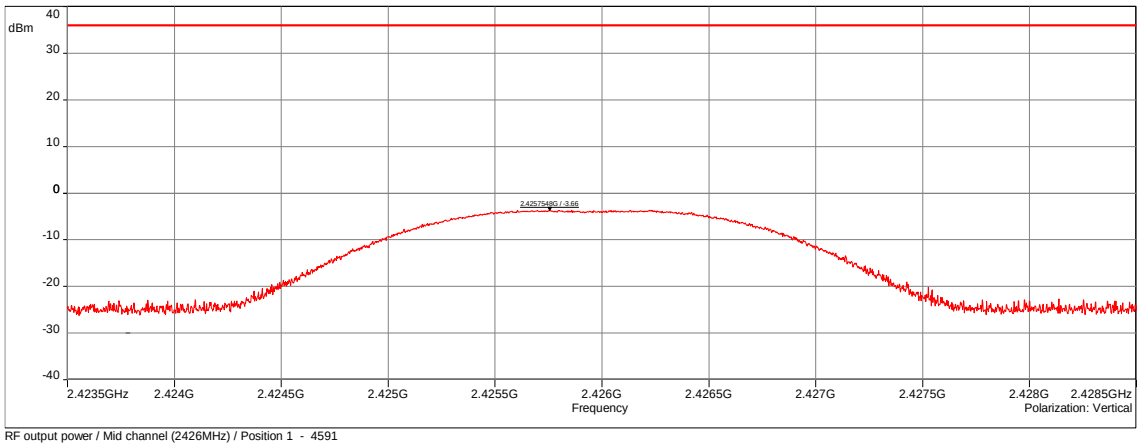
EUT modification(s): N/A

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
RF OUTPUT POWER / LOW CHANNEL (2402MHZ) / POSITION 3 (CHARGING)			EMI4588
Frequency (MHz)	**Polarization**	**Level (dBm)**	**Limit (dBm)**
2402	Vertical	-7.70	30.00
2402	Horizontal	-6.03	30.00

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - GRAPH			
RF OUTPUT POWER / MID CHANNEL (2426MHZ) / POSITION 1		EMI4591	
EUT mode:	Unmodulated	**T (°C):**	24.2
Test Date:	17/02/2023	**H (%):**	35.4
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Vertical)

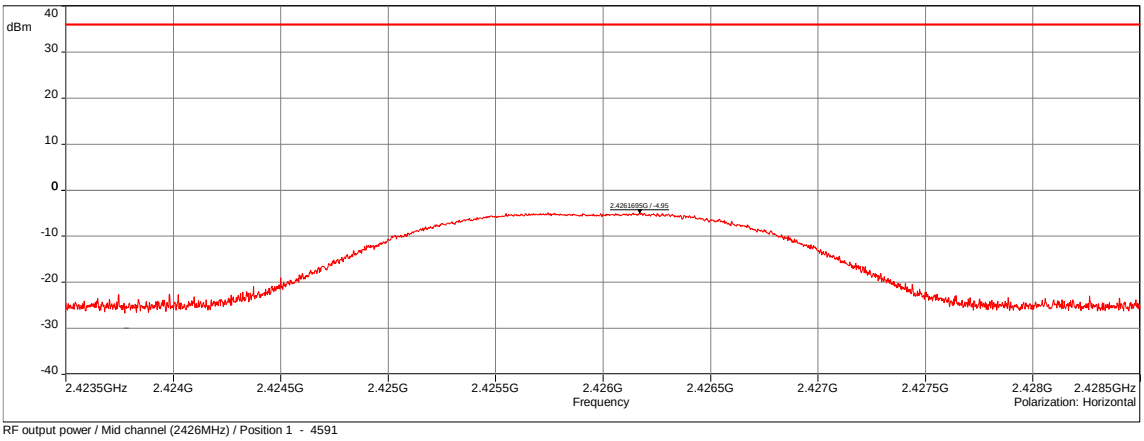
Sub-range 1
Frequencies: 2.4235 GHz - 2.4285 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



RF output power / Mid channel (2426MHz) / Position 1 - 4591

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.4235 GHz - 2.4285 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



RF output power / Mid channel (2426MHz) / Position 1 - 4591

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.4235GHz-2.4285GHz	1MHz	3MHz	Peak
Horizontal	2.4235GHz-2.4285GHz	1MHz	3MHz	Peak
Configuration:	N/A			
Comments:	N/A			

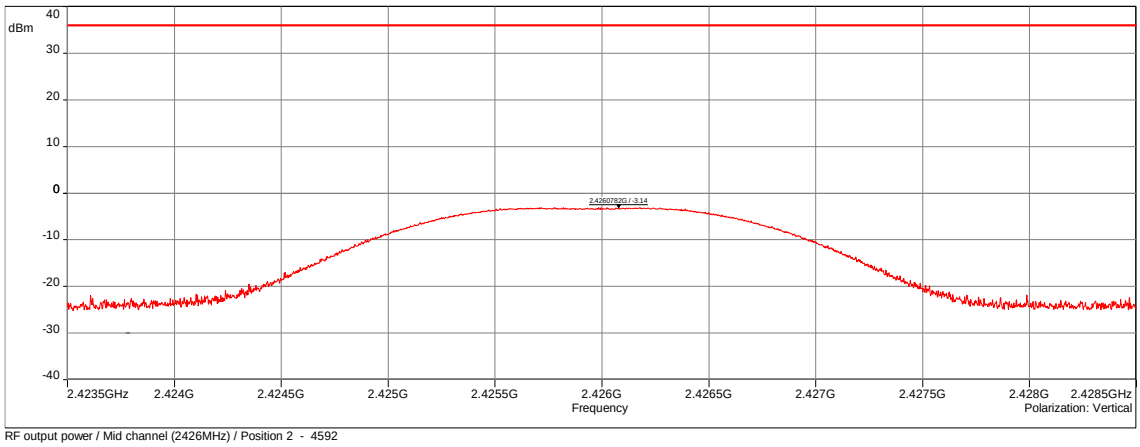
EUT modification(s): N/A

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
RF OUTPUT POWER / MID CHANNEL (2426MHZ) / POSITION 1			EMI4591
Frequency (MHz)	**Polarization**	**Level (dBm)**	**Limit (dBm)**
2426	Vertical	-3.66	30.00
2426	Horizontal	-4.95	30.00

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - GRAPH			
RF OUTPUT POWER / MID CHANNEL (2426MHZ) / POSITION 2		EMI4592	
EUT mode:	Unmodulated	**T (°C):**	24.2
Test Date:	17/02/2023	**H (%):**	35.4
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Vertical)

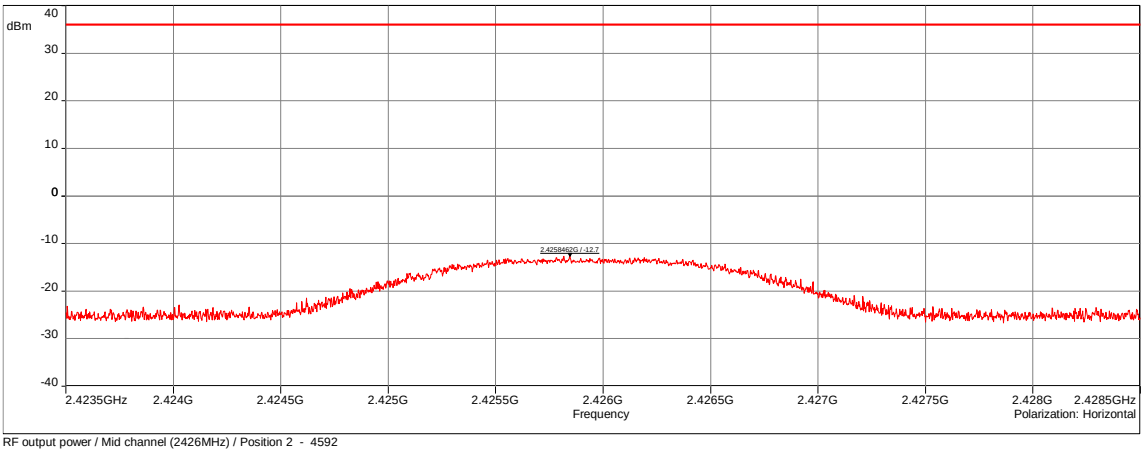
Sub-range 1
Frequencies: 2.4235 GHz - 2.4285 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



RF output power / Mid channel (2426MHz) / Position 2 - 4592

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.4235 GHz - 2.4285 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



RF output power / Mid channel (2426MHz) / Position 2 - 4592

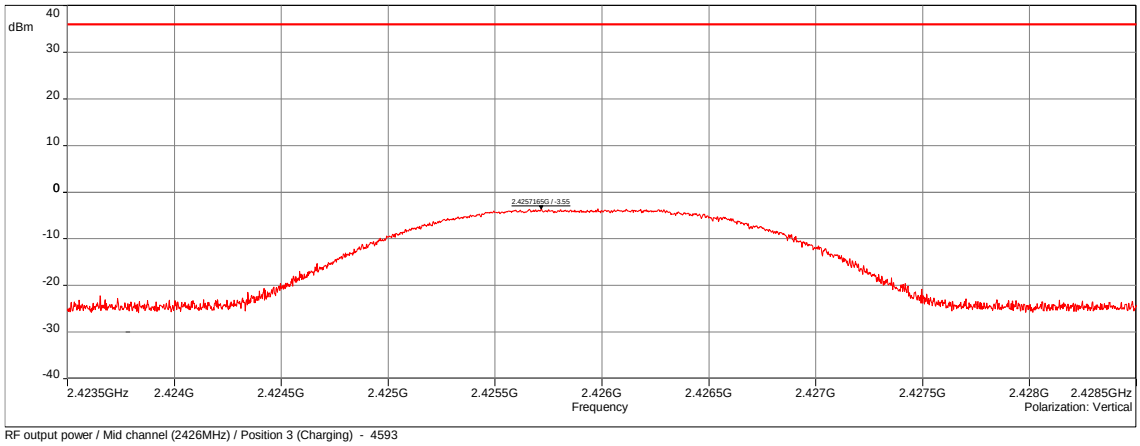
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.4235GHz-2.4285GHz	1MHz	3MHz	Peak
Horizontal	2.4235GHz-2.4285GHz	1MHz	3MHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
RF OUTPUT POWER / MID CHANNEL (2426MHZ) / POSITION 2			EMI4592
Frequency (MHz)	**Polarization**	**Level (dBm)**	**Limit (dBm)**
2426	Vertical	-3.14	30.00
2426	Horizontal	-12.7	30.00

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - GRAPH			
RF OUTPUT POWER / MID CHANNEL (2426MHZ) / POSITION 3 (CHARGING)		EMI4593	
EUT mode:	Unmodulated	**T (°C):**	24.2
Test Date:	17/02/2023	**H (%):**	35.4
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Vertical)

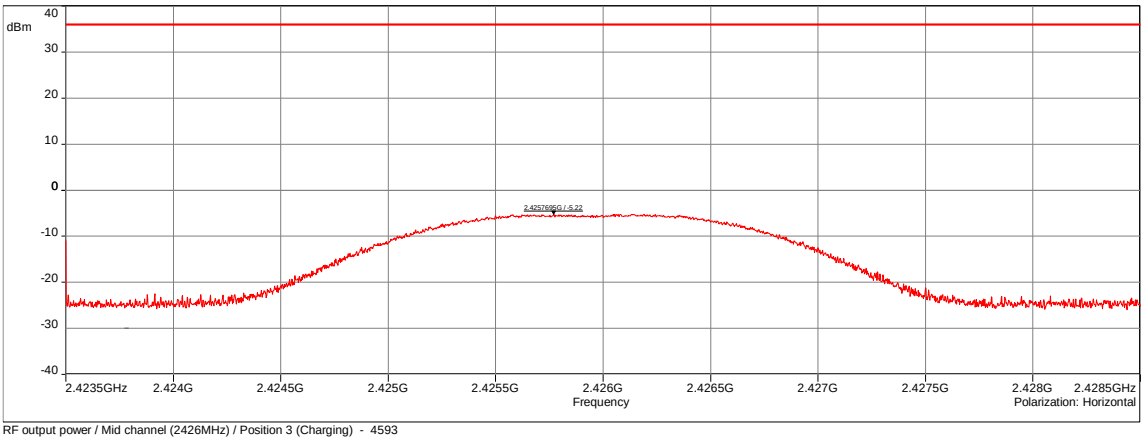
Sub-range 1
Frequencies: 2.4235 GHz - 2.4285 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



RF output power / Mid channel (2426MHz) / Position 3 (Charging) - 4593

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.4235 GHz - 2.4285 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



RF output power / Mid channel (2426MHz) / Position 3 (Charging) - 4593

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.4235GHz-2.4285GHz	1MHz	3MHz	Peak
Horizontal	2.4235GHz-2.4285GHz	1MHz	3MHz	Peak
Configuration:	N/A			
Comments:	N/A			

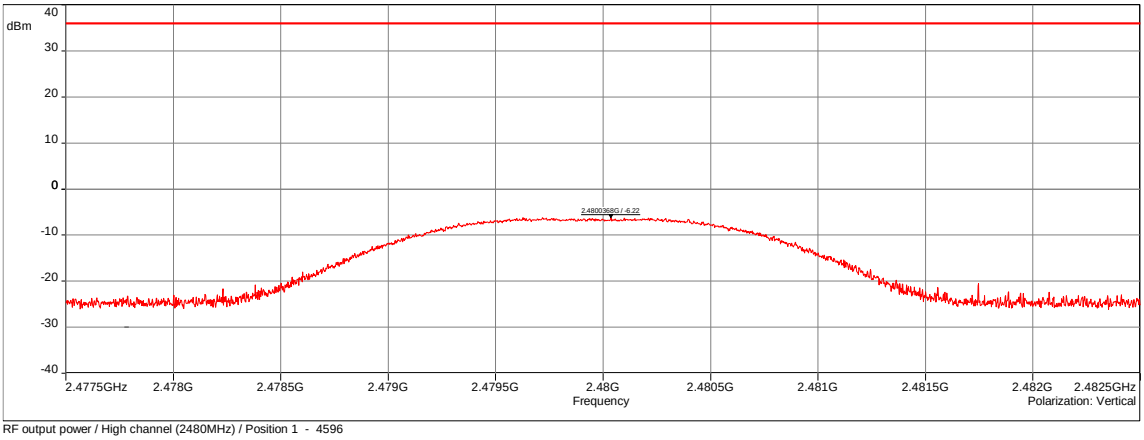
EUT modification(s): N/A

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
RF OUTPUT POWER / MID CHANNEL (2426MHZ) / POSITION 3 (CHARGING)			EMI4593
Frequency (MHz)	**Polarization**	**Level (dBm)**	**Limit (dBm)**
2426	Vertical	-3.55	30.00
2426	Horizontal	-5.22	30.00

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - GRAPH			
RF OUTPUT POWER / HIGH CHANNEL (2480MHz) / POSITION 1		EMI4596	
EUT mode:	Unmodulated	**T (°C):**	24.2
Test Date:	17/02/2023	**H (%):**	35.4
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Vertical)

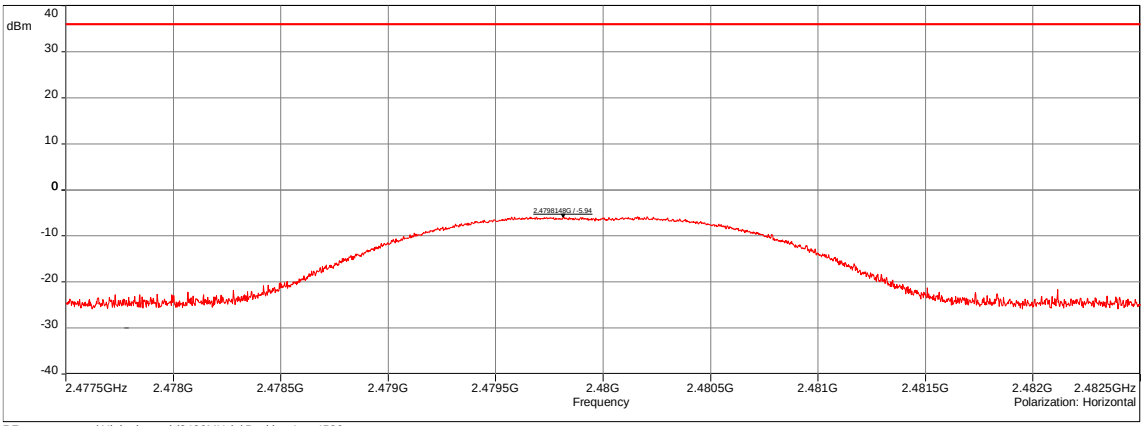
Sub-range 1
Frequencies: 2.4775 GHz - 2.4825 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



RF output power / High channel (2480MHz) / Position 1 - 4596

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.4775 GHz - 2.4825 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



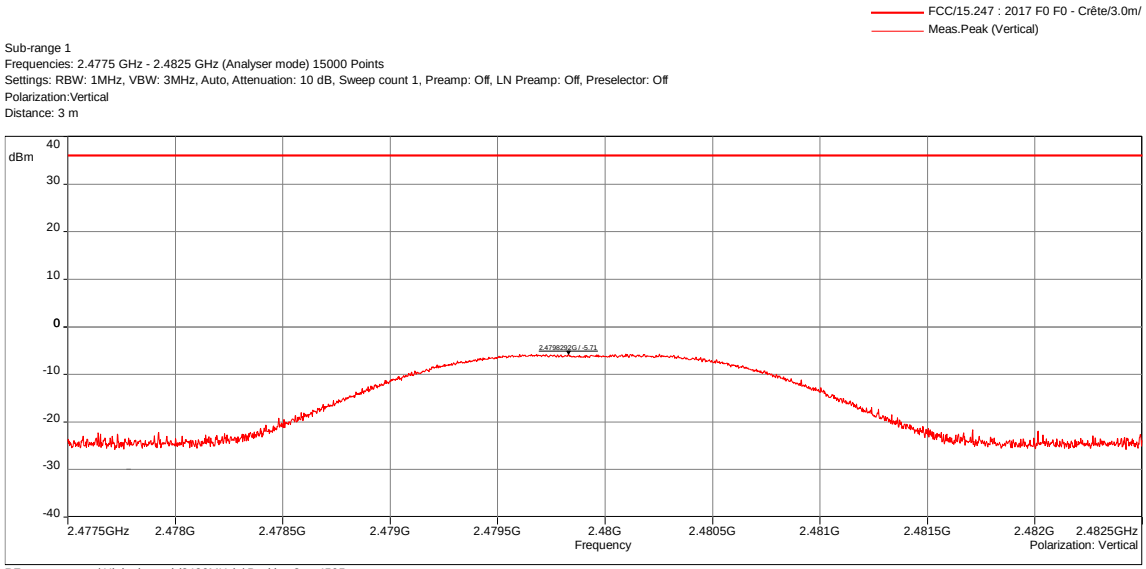
RF output power / High channel (2480MHz) / Position 1 - 4596

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.4775GHz-2.4825GHz	1MHz	3MHz	Peak
Horizontal	2.4775GHz-2.4825GHz	1MHz	3MHz	Peak
Configuration:	N/A			
Comments:	N/A			

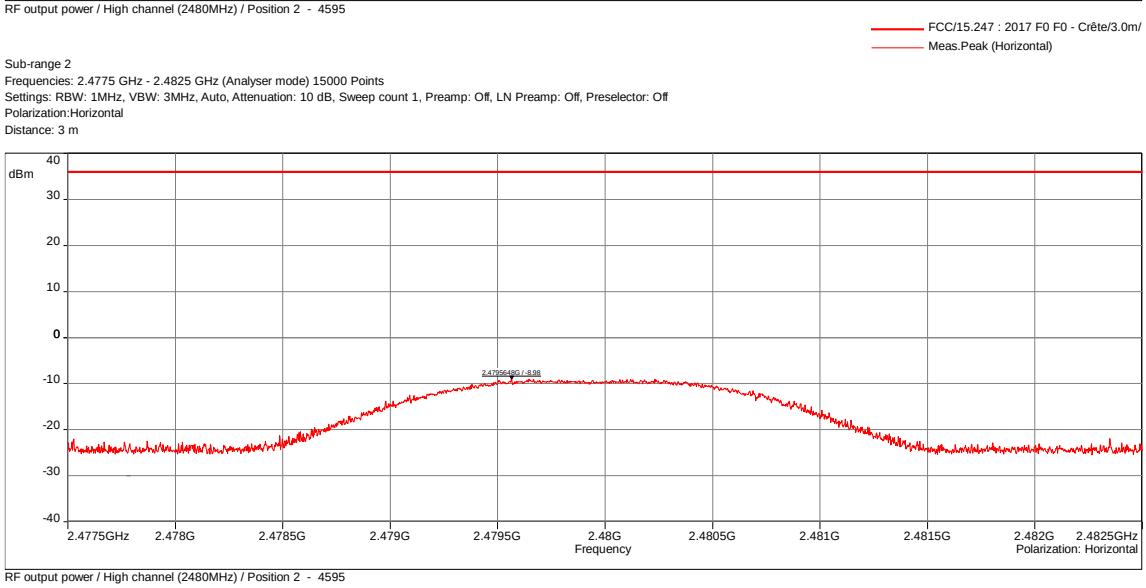
EUT modification(s): N/A

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
RF OUTPUT POWER / HIGH CHANNEL (2480MHz) / POSITION 1			EMI4596
Frequency (MHz)	**Polarization**	**Level (dBm)**	**Limit (dBm)**
2480	Vertical	-6.22	30.00
2480	Horizontal	-5.94	30.00

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
RF OUTPUT POWER / HIGH CHANNEL (2480MHZ) / POSITION 2		EMI4595	
EUT mode:	Unmodulated	**T (°C):**	24.2
Test Date:	17/02/2023	**H (%):**	35.4
Test Operator:	ATO	**P (hPa):**	1002



RF output power / High channel (2480MHz) / Position 2 - 4595



RF output power / High channel (2480MHz) / Position 2 - 4595

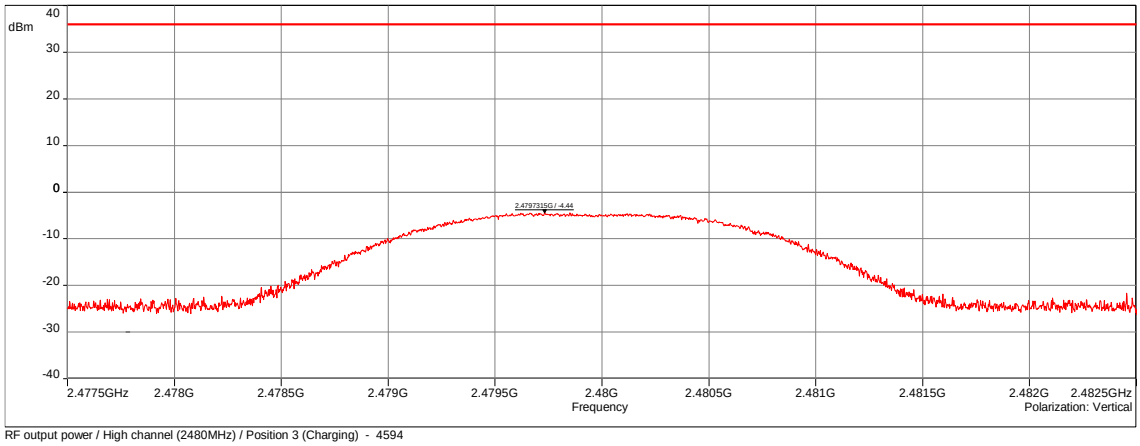
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.4775GHz-2.4825GHz	1MHz	3MHz	Peak
Horizontal	2.4775GHz-2.4825GHz	1MHz	3MHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
RF OUTPUT POWER / HIGH CHANNEL (2480MHZ) / POSITION 2			EMI4595
Frequency (MHz)	**Polarization**	**Level (dBm)**	**Limit (dBm)**
2480	Vertical	-5.71	30.00
2480	Vertical	-8.98	30.00

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - GRAPH			
RF OUTPUT POWER / HIGH CHANNEL (2480MHZ) / POSITION 3 (CHARGING)		EMI4594	
EUT mode:	Unmodulated	**T (°C):**	24.2
Test Date:	17/02/2023	**H (%):**	35.4
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Vertical)

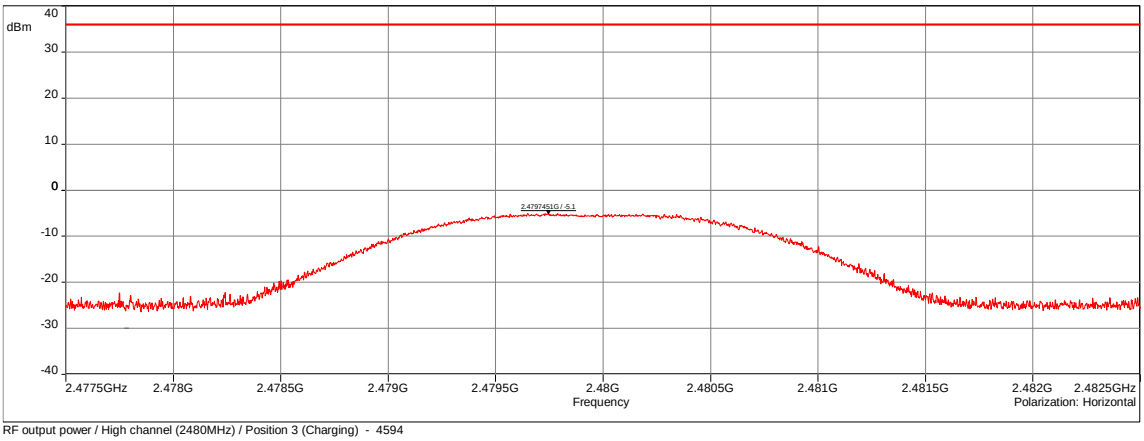
Sub-range 1
Frequencies: 2.4775 GHz - 2.4825 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



RF output power / High channel (2480MHz) / Position 3 (Charging) - 4594

FCC/15.247 : 2017 F0 F0 - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.4775 GHz - 2.4825 GHz (Analyser mode) 15000 Points
Settings: RBW: 1MHz, VBW: 3MHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



RF output power / High channel (2480MHz) / Position 3 (Charging) - 4594

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.4775GHz-2.4825GHz	1MHz	3MHz	Peak
Horizontal	2.4775GHz-2.4825GHz	1MHz	3MHz	Peak
Configuration:	N/A			
Comments:	N/A			

EUT modification(s): N/A

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
RF OUTPUT POWER / HIGH CHANNEL (2480MHZ) / POSITION 3 (CHARGING)			EMI4594
Frequency (MHz)	**Polarization**	**Level (dBm)**	**Limit (dBm)**
2480	Vertical	-4.44	30.00
2480	Horizontal	-5.10	30.00

b) Extremes Tests Conditions (*)

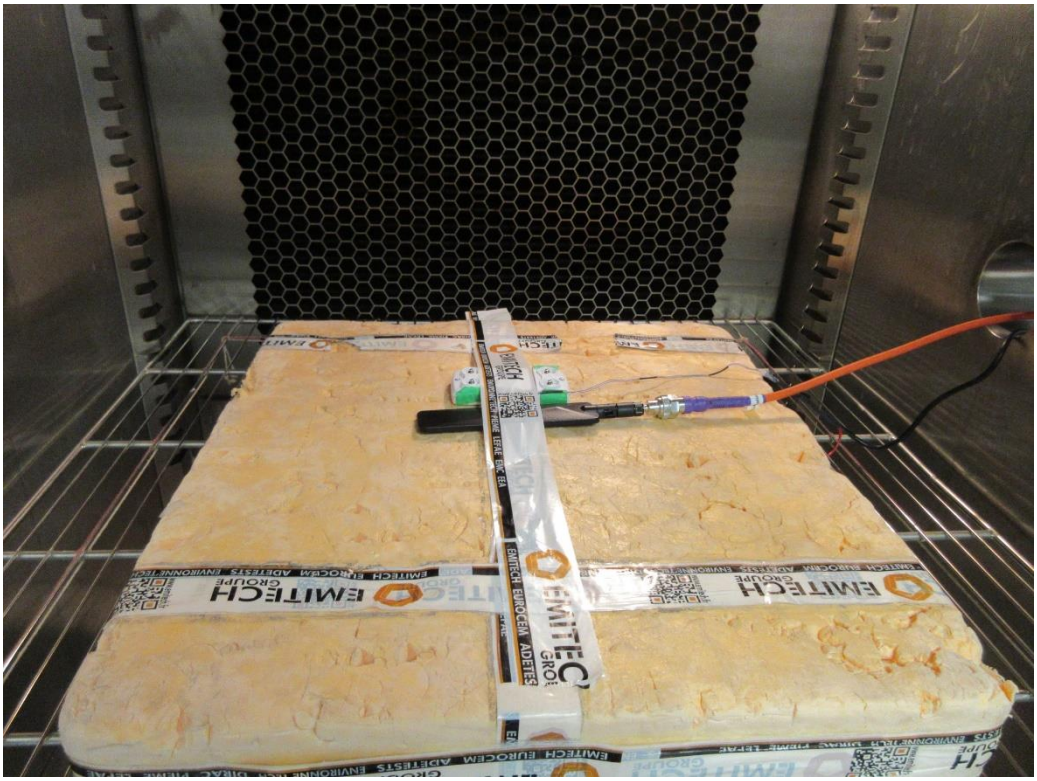
Reference standard:	FCC part 15 Radio part 15.247 and RSS-247
Test method:	FCC part 15.247 and RSS-247
General test setup: EUT is set inside the climatic enclosure. EIRP measurements are repeated in extreme test conditions with the power levels correlated with the maximum effective radiated power measured in normal conditions.	

Test Case	Parameter	Severity	Result Tab.	Verdict
Low channel / 25°C	Unmodulated	30dBm	EMI4473	**PASS**
Mid channel / 25°C	Unmodulated	30dBm	EMI4636	**PASS**
High channel / 25°C	Unmodulated	30dBm	EMI4637	**PASS**
Low channel / 10°C	Unmodulated	30dBm	EMI4638	**PASS**
Mid channel / 10°C	Unmodulated	30dBm	EMI4639	**PASS**
High channel / 10°C	Unmodulated	30dBm	EMI4640	**PASS**
Low channel / 40°C	Unmodulated	30dBm	EMI4641	**PASS**
Mid channel / 40°C	Unmodulated	30dBm	EMI4642	**PASS**
High channel / 40°C	Unmodulated	30dBm	EMI4643	**PASS**

Laboratory parameters:	Required prior to the test	During the test
Ambient Temperature	15 to 35 °C	25.1 °C
Relative Humidity	20 to 75 %	35.7 %
Atmospheric pressure	N/A	1009 hPa
Test method deviation: N/A		
Supplementary information: Extrêmes tests conditions are not made under COFRAC accréditation.		

Test equipment used					
Category	**Brand**	**Type**	**Identifier**	**Cal. Date**	**Cal. Due**
Attenuator	Radiall	R412710124	17328	22/06/2020	22/08/2023
Cable	MegaPhase	TM18-N1N1-118	12841	04/10/2022	04/12/2024
Climatic enclosure	CLIMATS	EXCAL 7714-HA	14261	01/09/2022	01/11/2023
Spectrum analyzer	Rohde & Schwarz	FPL1007	17908	02/11/2022	02/01/2024
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024
Thermohygrometer	Bioblock Scientific	Météostar	0963	07/06/2021	07/08/2023

Blank cells = Permanent validity

TEST SETUP PHOTO(S) – CLIMATIC ENCLOSURE


MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS				
TEST CONDITION	FREQUENCY	EIRP	LIMIT	RESULT TAB.
Low channel / 25°C	2402MHz	-5.35dBm	30dBm	EMI4473
Mid channel / 25°C	2426MHz	-3.14dBm	30dBm	EMI4636
High channel / 25°C	2480MHz	-5.94dBm	30dBm	EMI4637
Low channel / 10°C	2402MHz	-5.59dBm	30dBm	EMI4638
Mid channel / 10°C	2426MHz	-3.25dBm	30dBm	EMI4639
High channel / 10°C	2480MHz	-5.12dBm	30dBm	EMI4640
Low channel / 40°C	2402MHz	-4.78dBm	30dBm	EMI4641
Mid channel / 40°C	2426MHz	-2.64dBm	30dBm	EMI4642
High channel / 40°C	2480MHz	-5.53dBm	30dBm	EMI4643

6.5. Band-edge compliance

Reference standard:	FCC part 15 Radio part 15.247 and RSS-247
Test method:	FCC part 15.247 subclause d) and RSS-247

Test description:

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.

EUT is connected to the measuring receiver via 50Ω attenuator(s).Only the highest levels are recorded.

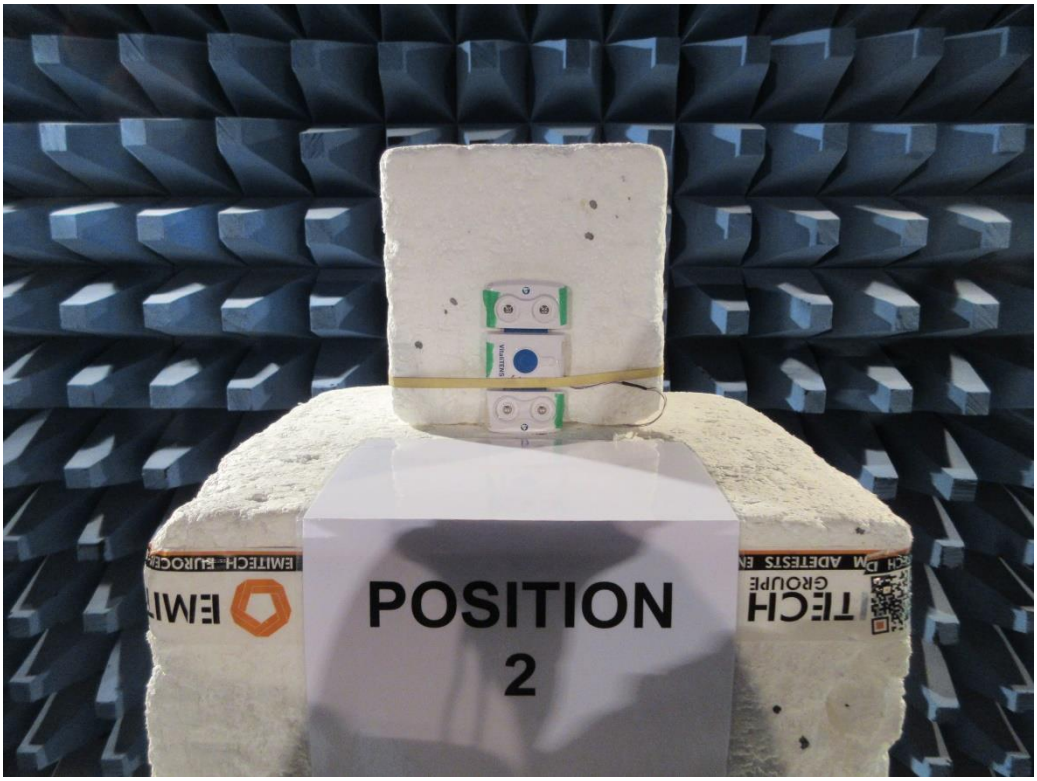
TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Band-edge / All Positions / Low channel (2402MHz)	2.38GHz-2.5035GHz	>20dBc	EMI4626	**PASS**
Band-edge / All Positions / Mid channel (2426MHz)	2.38GHz-2.5035GHz	>20dBc	EMI4627	**PASS**
Band-edge / All Positions / High channel (2480MHz)	2.38GHz-2.5035GHz	>20dBc	EMI4628	**PASS**

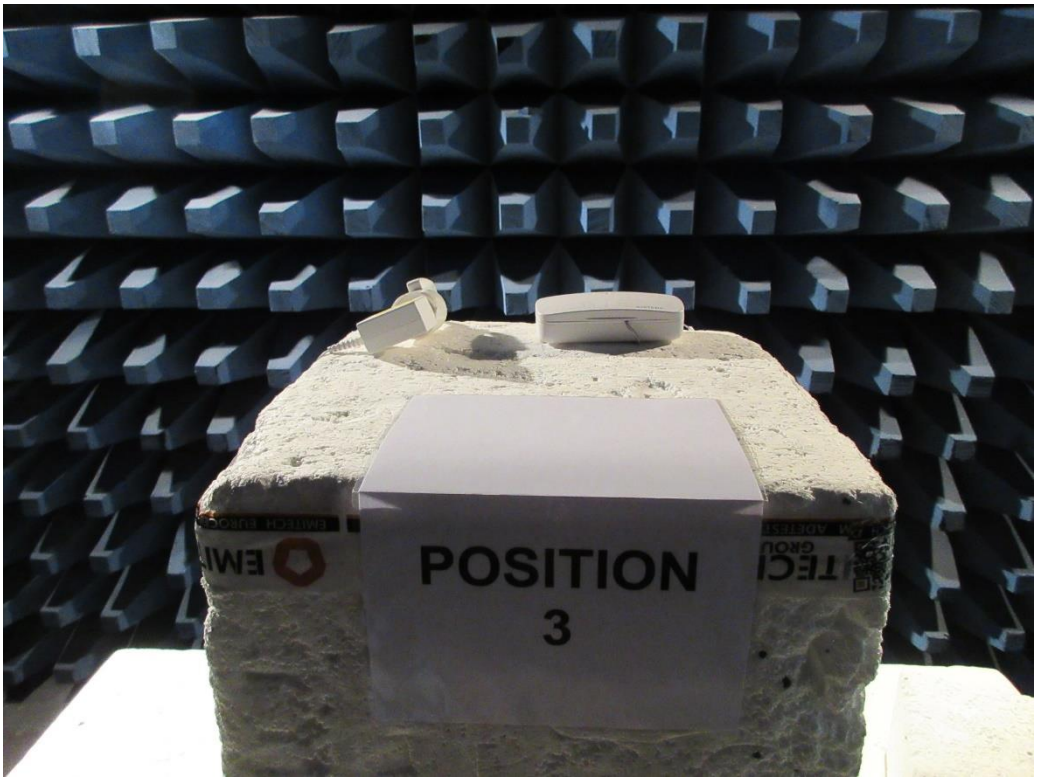
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	*See Graph(es)*
Relative Humidity	20 to 75 %	*See Graph(es)*
Atmospheric pressure	N/A	*See Graph(es)*
Test method deviation: N/A		
Supplementary information: N/A		

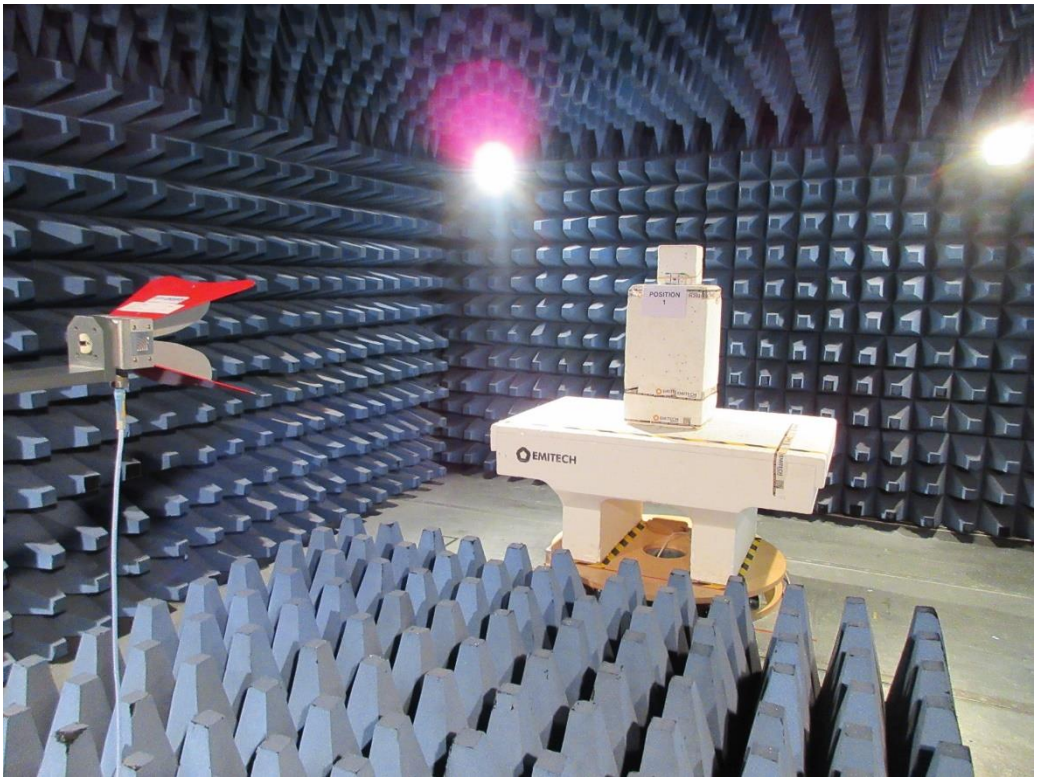
TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	ETS-Lindgren	3117	5456	09/09/2022	09/11/2025
Attenuator	EMITECH	SUB.V2-H	14495	05/01/2022	05/03/2023
Attenuator	EMITECH	SUB.V2-V	14496	05/01/2022	05/03/2023
Cable	SUCOFLEX	N-3m	14378	23/08/2021	23/10/2023
Cable	SUCOFLEX	N-5,5m	14381	23/08/2021	23/10/2023
Receiver	Agilent Technologies	E4440A	5824	02/11/2020	02/07/2023
Shielded enclosure	RAY PROOF	C.V2	1423	04/10/2019	04/06/2023
Software	Nexio	BAT EMC	0000		
Thermohygrometer	Testo	608-H1	7562	09/06/2021	09/08/2023
Thermohygrometer	Bioblock Scientific	Météostar	0963	07/06/2021	07/08/2023

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

TEST SETUP PHOTO(S) – POSITION 1

TEST SETUP PHOTO(S) – POSITION 2


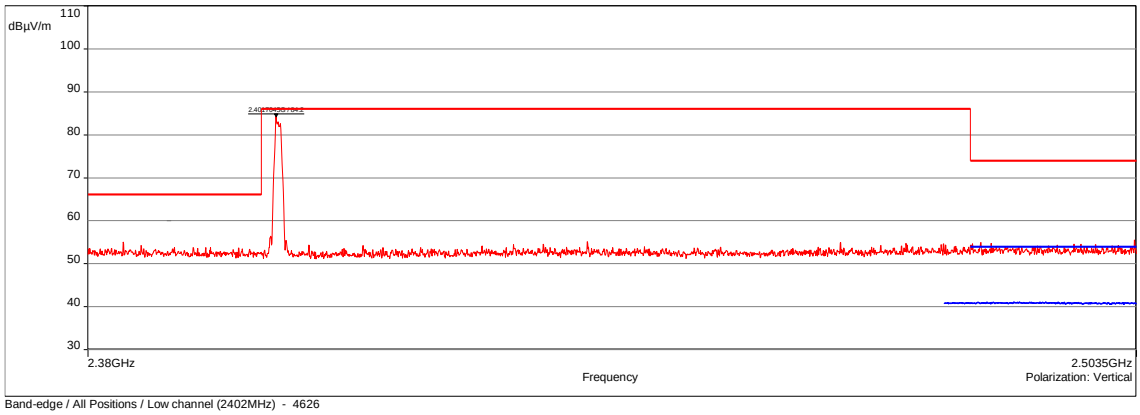
TEST SETUP PHOTO(S) – POSITION 3


TEST SETUP PHOTO(S)


BAND EDGE - GRAPH			
BAND-EDGE / ALL POSITIONS / LOW CHANNEL (2402MHZ)		EMI4626	
EUT mode:	Modulated	**T (°C):**	18.2
Test Date:	16/02/2023	**H (%):**	41.3
Test Operator:	ATO	**P (hPa):**	1006

FCC/15.247: 2018 d) Band Edeg 2.4-2.483.5GHz BEdge Low BLE - Moyenne/3.0m/
FCC/15.247: 2018 d) Band Edeg 2.4-2.483.5GHz BEdge Low BLE - Crête/3.0m/
Meas.Peak (Vertical)
Meas.Avg (Vertical)

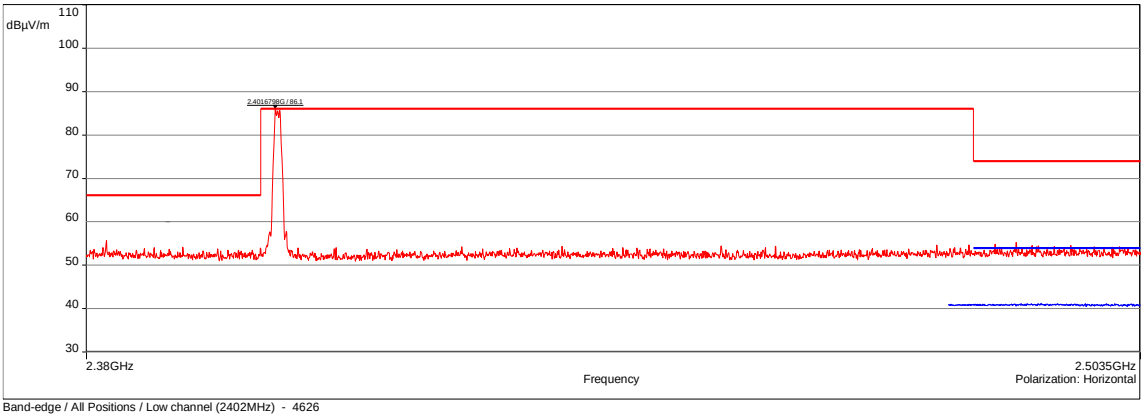
Sub-range 1
Frequencies: 2.38 GHz - 2.5035 GHz (Analyser mode) 15000 Points
Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



Band-edge / All Positions / Low channel (2402MHz) - 4626

FCC/15.247: 2018 d) Band Edeg 2.4-2.483.5GHz BEdge Low BLE - Moyenne/3.0m/
FCC/15.247: 2018 d) Band Edeg 2.4-2.483.5GHz BEdge Low BLE - Crête/3.0m/
Meas.Peak (Horizontal)
Meas.Avg (Horizontal)

Sub-range 2
Frequencies: 2.38 GHz - 2.5035 GHz (Analyser mode) 15000 Points
Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



Band-edge / All Positions / Low channel (2402MHz) - 4626

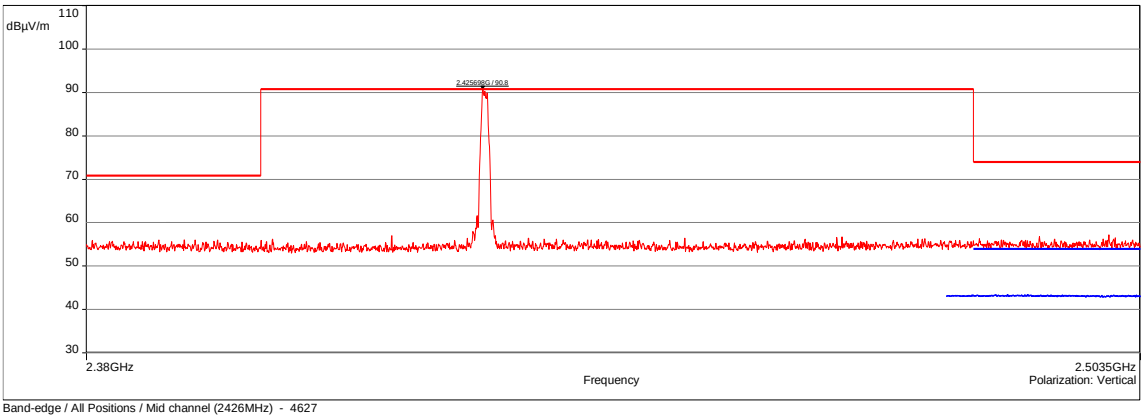
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.38GHz-2.5035GHz	100kHz	300kHz	Peak, Avg
Horizontal	2.38GHz-2.5035GHz	100kHz	300kHz	Peak, Avg
Configuration:	N/A			
Comments:	No out of band emissions detected.			

EUT modification(s): N/A

BAND EDGE - GRAPH			
BAND-EDGE / ALL POSITIONS / MID CHANNEL (2426MHZ)		EMI4627	
EUT mode:	Modulated	**T (°C):**	18.2
Test Date:	16/02/2023	**H (%):**	41.3
Test Operator:	ATO	**P (hPa):**	1006

FCC/15.247: 2018 d) Band Edeg 2.4-2.483.5GHz BEdge Mid BLE - Moyenne/3.0m/
FCC/15.247: 2018 d) Band Edeg 2.4-2.483.5GHz BEdge Mid BLE - Crête/3.0m/
Meas.Peak (Vertical)
Meas.Avg (Vertical)

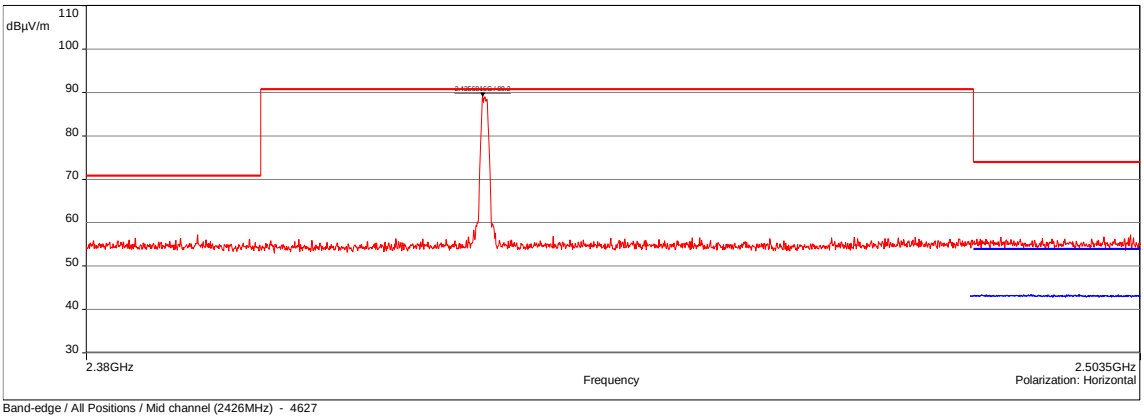
Sub-range 1
Frequencies: 2.38 GHz - 2.5035 GHz (Analyser mode) 15000 Points
Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



Band-edge / All Positions / Mid channel (2426MHz) - 4627

FCC/15.247: 2018 d) Band Edeg 2.4-2.483.5GHz BEdge Mid BLE - Moyenne/3.0m/
FCC/15.247: 2018 d) Band Edeg 2.4-2.483.5GHz BEdge Mid BLE - Crête/3.0m/
Meas.Peak (Horizontal)
Meas.Avg (Horizontal)

Sub-range 2
Frequencies: 2.38 GHz - 2.5035 GHz (Analyser mode) 15000 Points
Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m

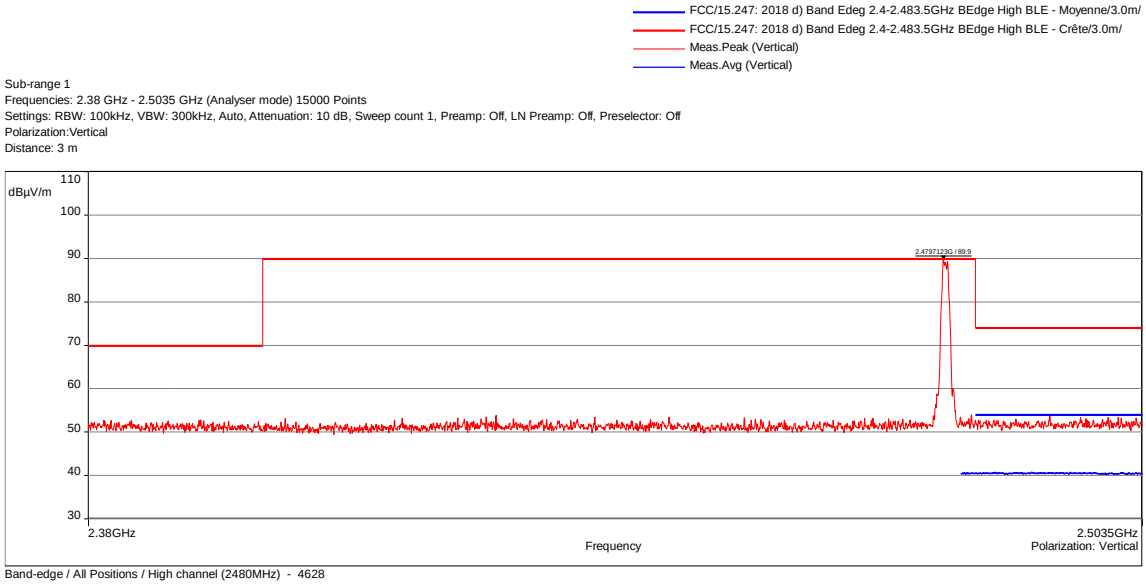


Band-edge / All Positions / Mid channel (2426MHz) - 4627

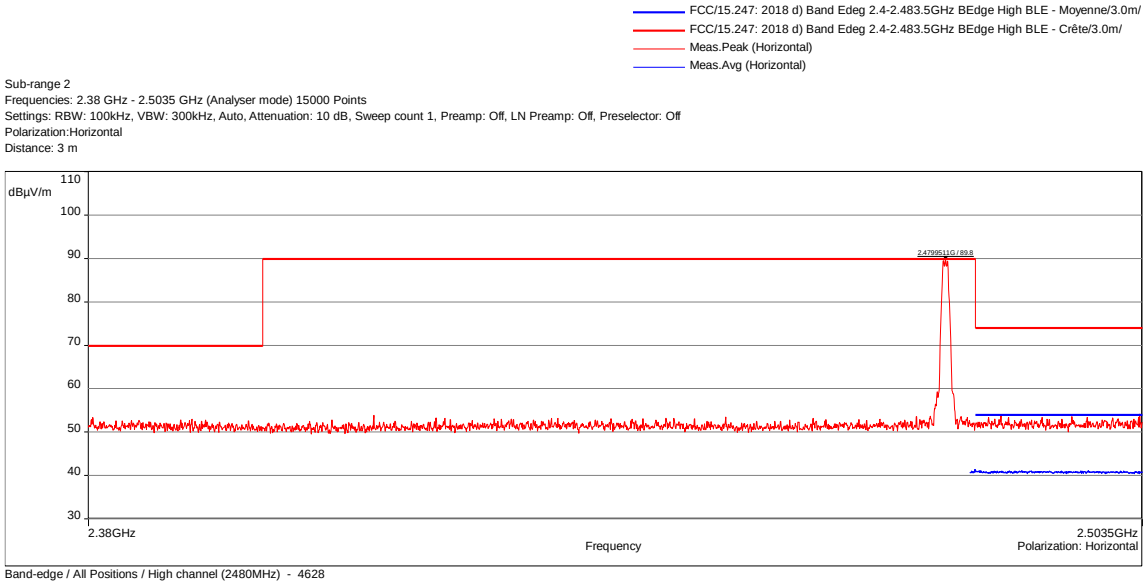
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.38GHz-2.5035GHz	100kHz	300kHz	Peak, Avg
Horizontal	2.38GHz-2.5035GHz	100kHz	300kHz	Peak, Avg
Configuration:	N/A			
Comments:	No out of band emissions detected.			

EUT modification(s): N/A

BAND EDGE - GRAPH			
BAND-EDGE / ALL POSITIONS / HIGH CHANNEL (2480MHz)		EMI4628	
EUT mode:	Tx mode	**T (°C):**	18.2
Test Date:	16/02/2023	**H (%):**	41.3
Test Operator:	ATO	**P (hPa):**	1006



Band-edge / All Positions / High channel (2480MHz) - 4628



Band-edge / All Positions / High channel (2480MHz) - 4628

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.38GHz-2.5035GHz	100kHz	300kHz	Peak, Avg
Horizontal	2.38GHz-2.5035GHz	100kHz	300kHz	Peak, Avg
Configuration:	N/A			
Comments:	No out of band emissions detected.			

EUT modification(s): N/A

6.6. Power spectral density

Reference standard:	FCC part 15 Radio part 15.247 and RSS-247
Test method:	FCC part 15.247 and RSS-247

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. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

EUT is connected to the measuring receiver via 50Ω attenuator(s).Only the highest levels are recorded.

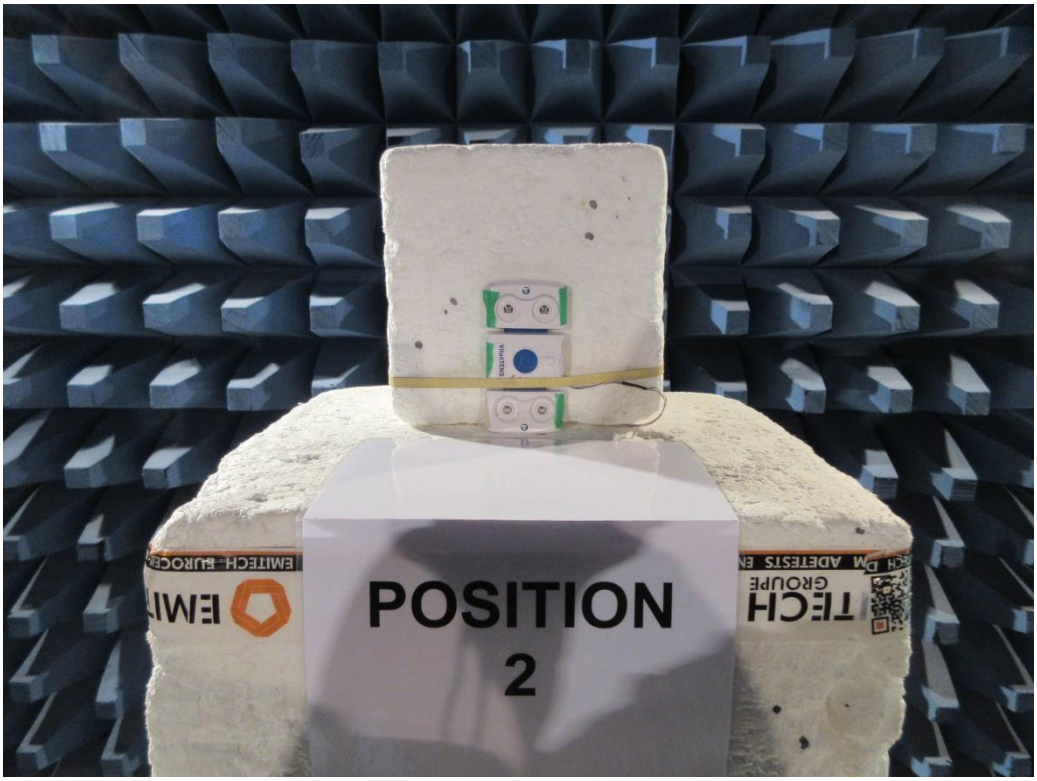
TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
PSD / Low channel (2402 MHz) / Position 1	2.401GHz-2.403GHz	8dBm/3kHz	EMI4616	**PASS**
PSD / Low channel (2402 MHz) / Position 2	2.401GHz-2.403GHz	8dBm/3kHz	EMI4617	**PASS**
PSD / Low channel (2402 MHz) / Position 3 (Charging)	2.401GHz-2.403GHz	8dBm/3kHz	EMI4618	**PASS**
PSD / Mid channel (2426 MHz) / Position 1	2.425GHz-2.427GHz	8dBm/3kHz	EMI4619	**PASS**
PSD / Mid channel (2426 MHz) / Position 2	2.425GHz-2.427GHz	8dBm/3kHz	EMI4620	**PASS**
PSD / Mid channel (2426 MHz) / Position 3 (Charging)	2.425GHz-2.427GHz	8dBm/3kHz	EMI4621	**PASS**
PSD / High channel (2480 MHz) / Position 1	2.479GHz-2.481GHz	8dBm/3kHz	EMI4622	**PASS**
PSD / High channel (2480 MHz) / Position 2	2.479GHz-2.481GHz	8dBm/3kHz	EMI4623	**PASS**
PSD / High channel (2480 MHz) / Position 3 (Charging)	2.479GHz-2.481GHz	8dBm/3kHz	EMI4624	**PASS**

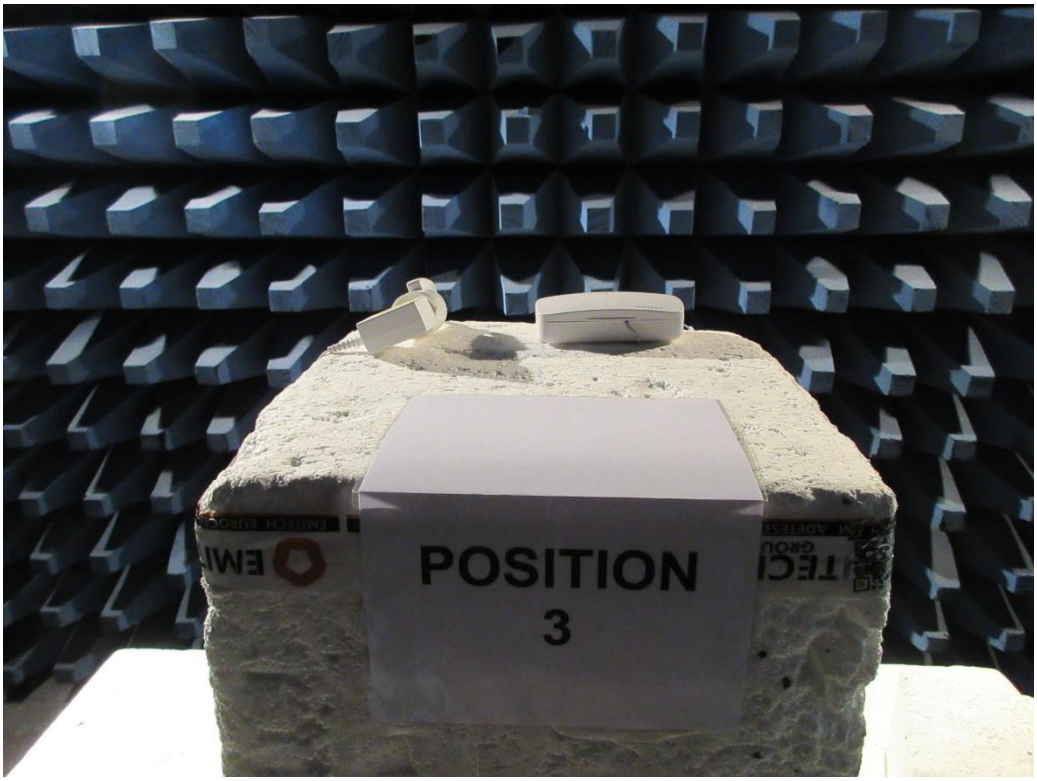
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	*See Graph(s)*
Relative Humidity	20 to 75 %	*See Graph(s)*
Atmospheric pressure	N/A	*See Graph(s)*
Test method deviation: N/A		
Supplementary information: N/A		

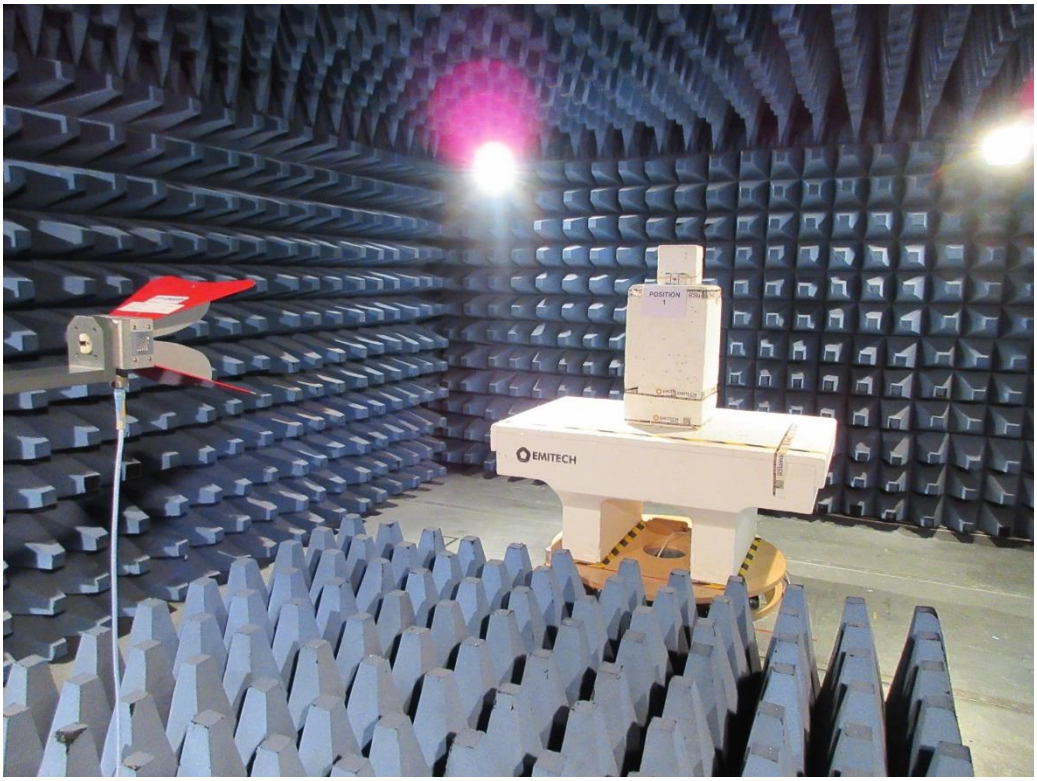
TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	ETS-Lindgren	3117	5456	09/09/2022	09/11/2025
Attenuator	EMITECH	SUB.V2-H	14495	05/01/2022	05/03/2023
Attenuator	EMITECH	SUB.V2-V	14496	05/01/2022	05/03/2023
Cable	SUCOFLEX	N-3m	14378	23/08/2021	23/10/2023
Cable	SUCOFLEX	N-5,5m	14381	23/08/2021	23/10/2023
Receiver	Agilent Technologies	E4440A	5824	02/11/2020	02/07/2023
Shielded enclosure	RAY PROOF	C.V2	1423	04/10/2019	04/06/2023
Software	Nexio	BAT EMC	0000		
Thermohygrometer	Testo	608-H1	7562	09/06/2021	09/08/2023
Thermohygrometer	Bioblock Scientific	Météostar	0963	07/06/2021	07/08/2023

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

TEST SETUP PHOTO(S) – POSITION 1

TEST SETUP PHOTO(S) – POSITION 2


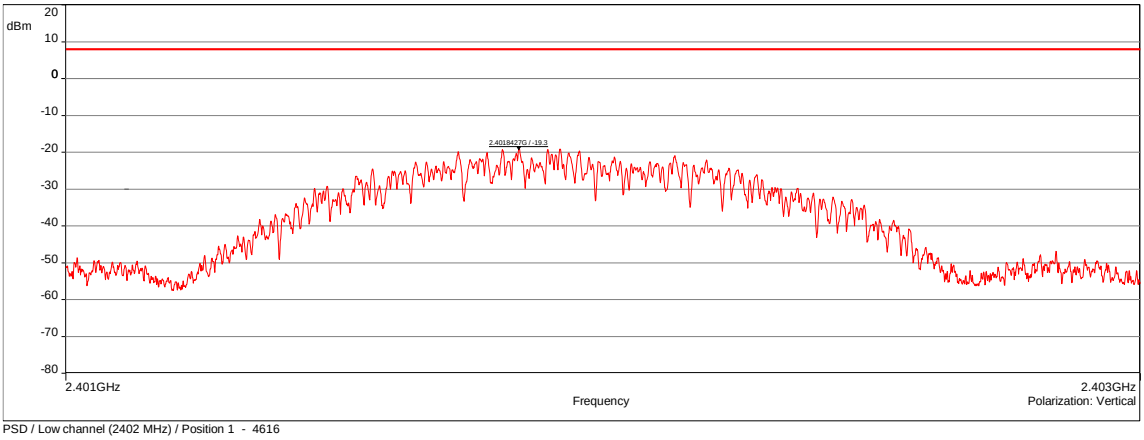
TEST SETUP PHOTO(S) – POSITION 3


TEST SETUP PHOTO(S)


POWER SPECTRAL DENSITY - GRAPH			
PSD / LOW CHANNEL (2402 MHz) / POSITION 1		EMI4616	
EUT mode:	Modulated	**T (°C):**	24.2
Test Date:	15/02/2023	**H (%):**	34.5
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Vertical)

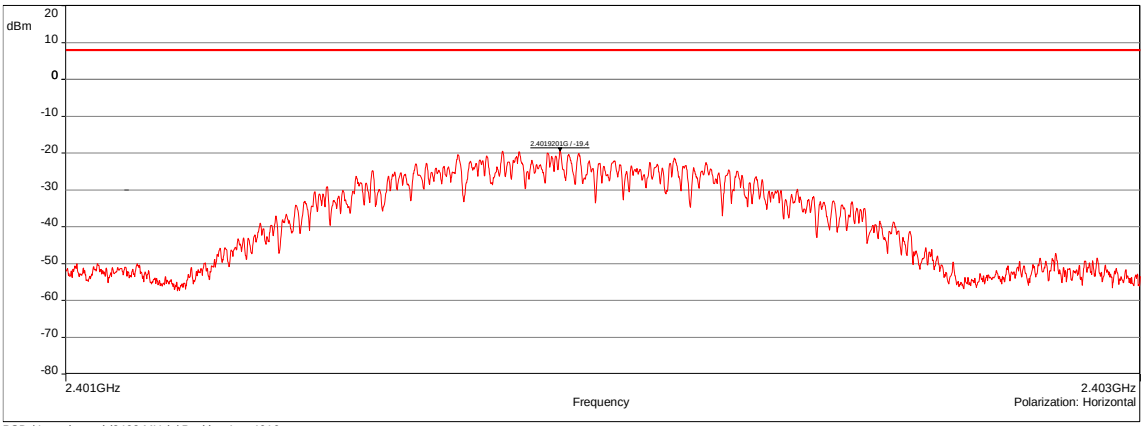
Sub-range 1
Frequencies: 2.401 GHz - 2.403 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



PSD / Low channel (2402 MHz) / Position 1 - 4616

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.401 GHz - 2.403 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



PSD / Low channel (2402 MHz) / Position 1 - 4616

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.401GHz-2.403GHz	3kHz	9kHz	Peak
Horizontal	2.401GHz-2.403GHz	3kHz	9kHz	Peak
Configuration:	N/A			
Comments:	N/A			

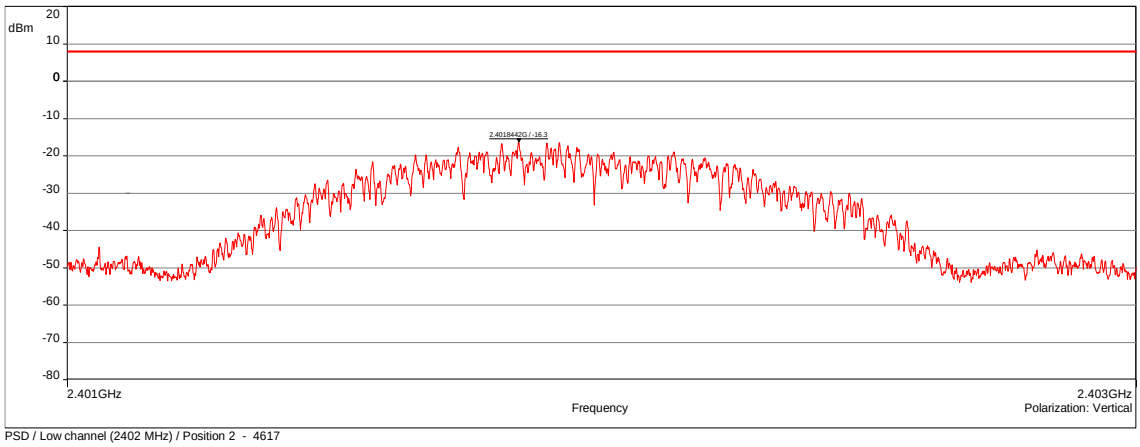
EUT modification(s): N/A

POWER SPECTRAL DENSITY - TABULATED RESULTS			
PSD / LOW CHANNEL (2402 MHz) / POSITION 1			EMI4616
Frequency (MHz)	**Polarization**	**Level (dBm/3kHz)**	**Limit (dBm/3kHz)**
2402	Vertical	-19.3	8.00
2402	Horizontal	-19.4	8.00

POWER SPECTRAL DENSITY - GRAPH			
PSD / LOW CHANNEL (2402 MHz) / POSITION 2		EMI4617	
EUT mode:	Modulated	**T (°C):**	24.2
Test Date:	15/02/2023	**H (%):**	34.5
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Vertical)

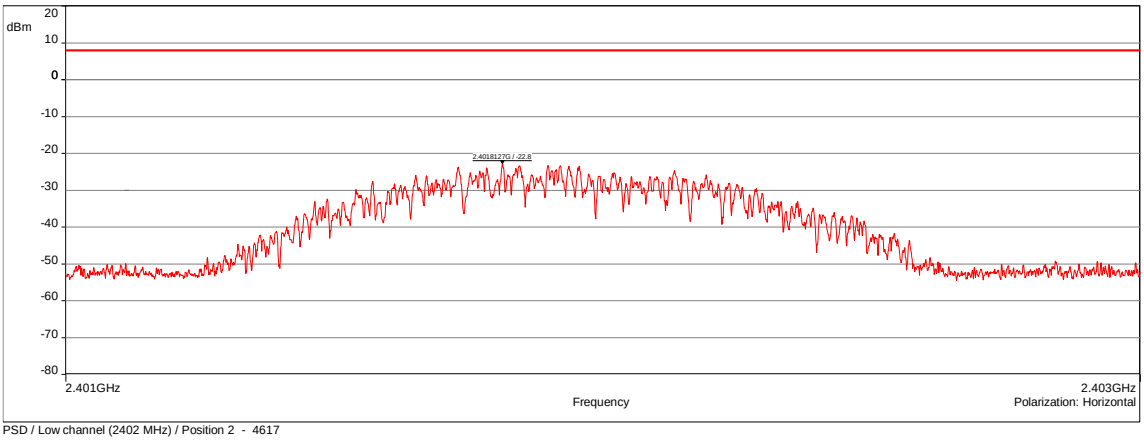
Sub-range 1
Frequencies: 2.401 GHz - 2.403 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



PSD / Low channel (2402 MHz) / Position 2 - 4617

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.401 GHz - 2.403 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



PSD / Low channel (2402 MHz) / Position 2 - 4617

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.401GHz-2.403GHz	3kHz	9kHz	Peak
Horizontal	2.401GHz-2.403GHz	3kHz	9kHz	Peak
Configuration:	N/A			
Comments:	N/A			

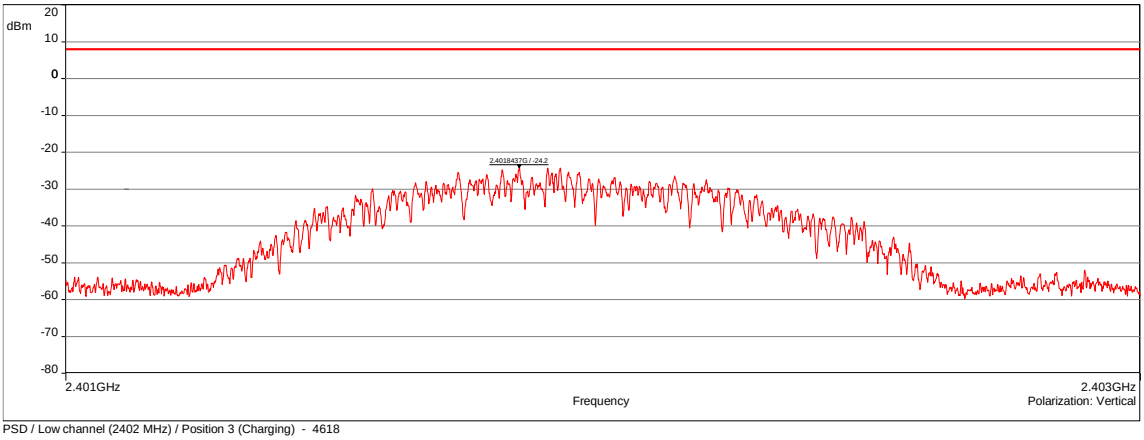
EUT modification(s): N/A

POWER SPECTRAL DENSITY - TABULATED RESULTS			
PSD / LOW CHANNEL (2402 MHz) / POSITION 2			EMI4617
Frequency (MHz)	**Polarization**	**Level (dBm/3kHz)**	**Limit (dBm/3kHz)**
2402	Vertical	-16.3	8.00
2402	Horizontal	-22.8	8.00

POWER SPECTRAL DENSITY - GRAPH			
PSD / LOW CHANNEL (2402 MHz) / POSITION 3 (CHARGING)		EMI4618	
EUT mode:	Modulated	**T (°C):**	24.2
Test Date:	15/02/2023	**H (%):**	34.5
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Vertical)

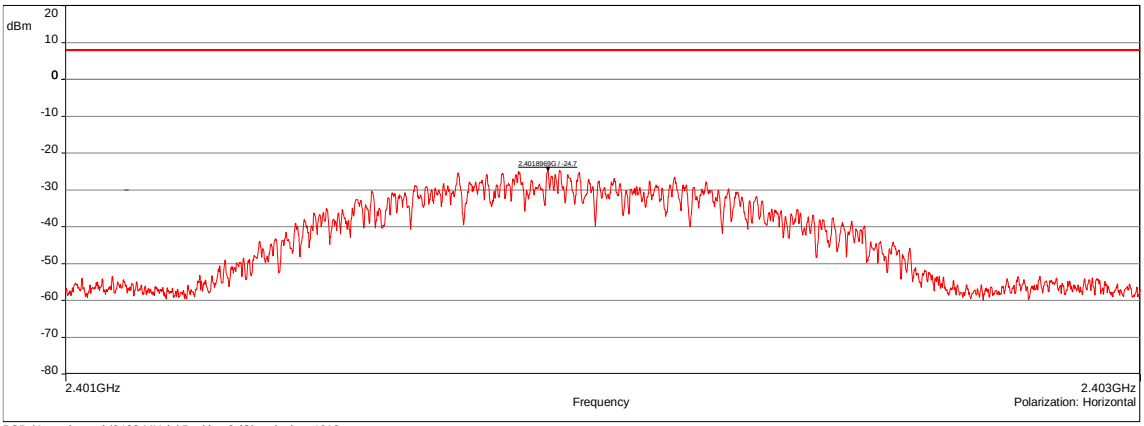
Sub-range 1
Frequencies: 2.401 GHz - 2.403 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



PSD / Low channel (2402 MHz) / Position 3 (Charging) - 4618

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.401 GHz - 2.403 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



PSD / Low channel (2402 MHz) / Position 3 (Charging) - 4618

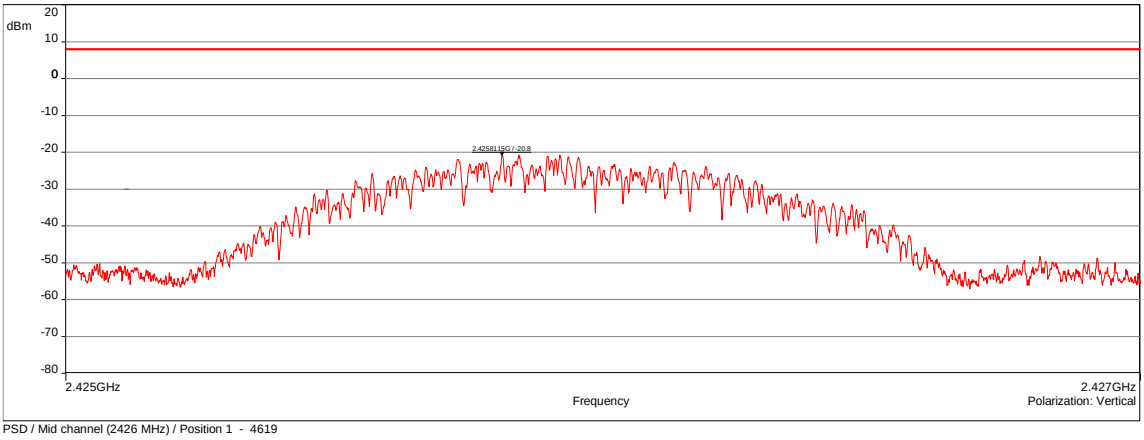
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.401GHz-2.403GHz	3kHz	9kHz	Peak
Horizontal	2.401GHz-2.403GHz	3kHz	9kHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

POWER SPECTRAL DENSITY - TABULATED RESULTS			
PSD / LOW CHANNEL (2402 MHz) / POSITION 3 (CHARGING)			EMI4618
Frequency (MHz)	**Polarization**	**Level (dBm/3kHz)**	**Limit (dBm/3kHz)**
2402	Vertical	-24.2	8.00
2402	Horizontal	-24.7	8.00

POWER SPECTRAL DENSITY - GRAPH			
PSD / MID CHANNEL (2426 MHz) / POSITION 1		EMI4619	
EUT mode:	Modulated	**T (°C):**	24.2
Test Date:	15/02/2023	**H (%):**	34.5
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Vertical)

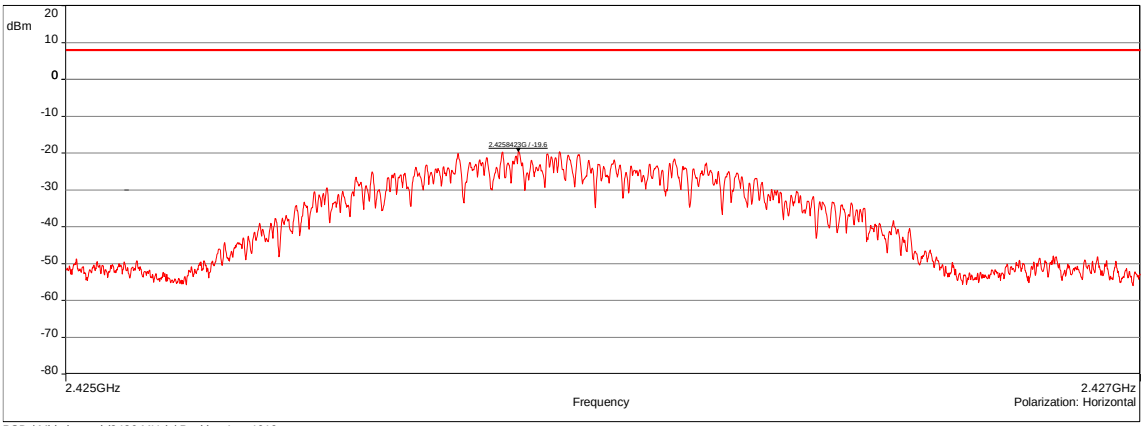
Sub-range 1
Frequencies: 2.425 GHz - 2.427 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



PSD / Mid channel (2426 MHz) / Position 1 - 4619

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.425 GHz - 2.427 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



PSD / Mid channel (2426 MHz) / Position 1 - 4619

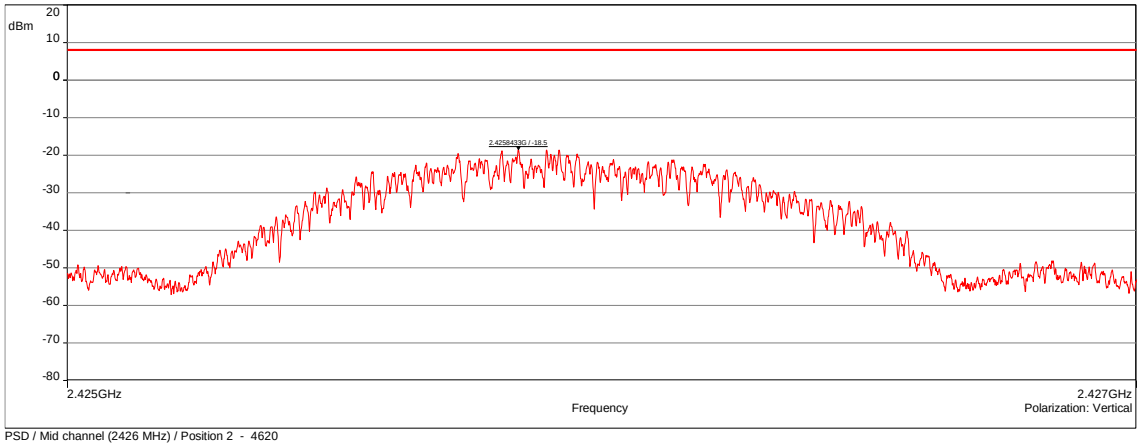
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.425GHz-2.427GHz	3kHz	9kHz	Peak
Horizontal	2.425GHz-2.427GHz	3kHz	9kHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

POWER SPECTRAL DENSITY - TABULATED RESULTS			
PSD / MID CHANNEL (2426 MHz) / POSITION 1			EMI4619
Frequency (MHz)	**Polarization**	**Level (dBm/3kHz)**	**Limit (dBm/3kHz)**
2426	Vertical	-20.8	8.00
2426	Horizontal	-19.6	8.00

POWER SPECTRAL DENSITY - GRAPH			
PSD / MID CHANNEL (2426 MHz) / POSITION 2		EMI4620	
EUT mode:	Modulated	**T (°C):**	24.2
Test Date:	15/02/2023	**H (%):**	34.5
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Vertical)

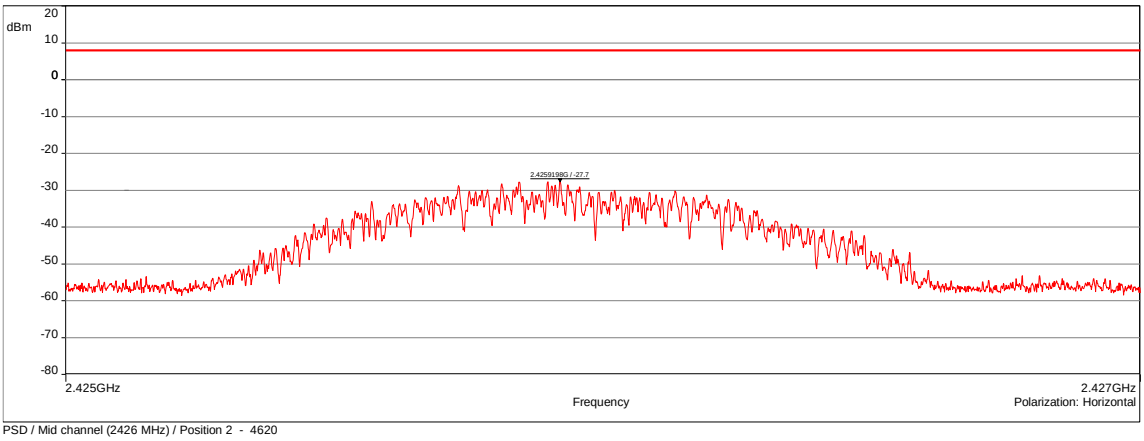
Sub-range 1
Frequencies: 2.425 GHz - 2.427 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



PSD / Mid channel (2426 MHz) / Position 2 - 4620

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.425 GHz - 2.427 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



PSD / Mid channel (2426 MHz) / Position 2 - 4620

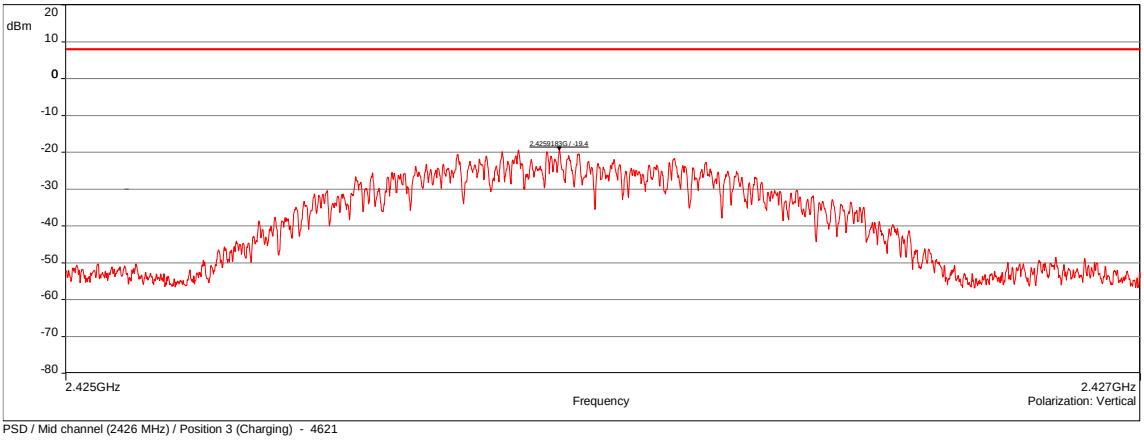
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.425GHz-2.427GHz	3kHz	9kHz	Peak
Horizontal	2.425GHz-2.427GHz	3kHz	9kHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

POWER SPECTRAL DENSITY - TABULATED RESULTS			
PSD / MID CHANNEL (2426 MHz) / POSITION 2			EMI4620
Frequency (MHz)	**Polarization**	**Level (dBm/3kHz)**	**Limit (dBm/3kHz)**
2426	Vertical	-18.5	8.00
2426	Horizontal	-27.7	

POWER SPECTRAL DENSITY - GRAPH			
PSD / MID CHANNEL (2426 MHZ) / POSITION 3 (CHARGING)		EMI4621	
EUT mode:	Modulated	**T (°C):**	24.2
Test Date:	15/02/2023	**H (%):**	34.5
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Vertical)

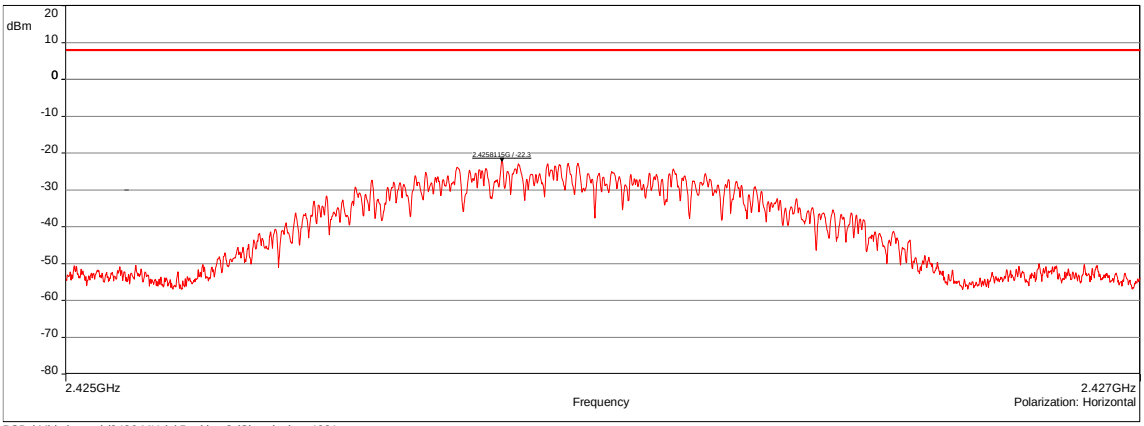
Sub-range 1
Frequencies: 2.425 GHz - 2.427 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



PSD / Mid channel (2426 MHz) / Position 3 (Charging) - 4621

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.425 GHz - 2.427 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



PSD / Mid channel (2426 MHz) / Position 3 (Charging) - 4621

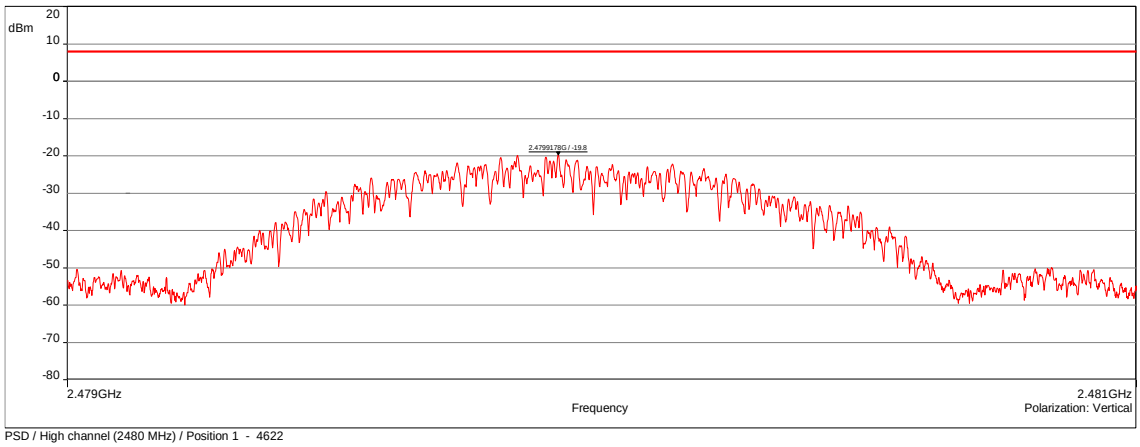
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.425GHz-2.427GHz	3kHz	9kHz	Peak
Horizontal	2.425GHz-2.427GHz	3kHz	9kHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

POWER SPECTRAL DENSITY - TABULATED RESULTS			
PSD / MID CHANNEL (2426 MHZ) / POSITION 3 (CHARGING)			EMI4621
Frequency (MHz)	**Polarization**	**Level (dBm/3kHz)**	**Limit (dBm/3kHz)**
2426	Vertical	-19.4	8.00
2426	Horizontal	-22.3	8.00

POWER SPECTRAL DENSITY - GRAPH			
PSD / HIGH CHANNEL (2480 MHz) / POSITION 1		EMI4622	
EUT mode:	Modulated	**T (°C):**	24.2
Test Date:	15/02/2023	**H (%):**	34.5
Test Operator:	ATO	**P (hPa):**	1002

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Vertical)

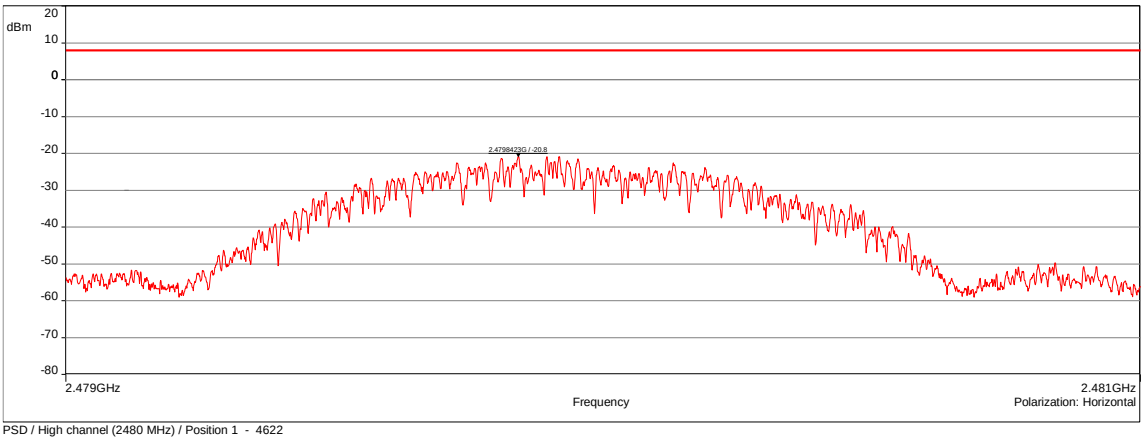
Sub-range 1
Frequencies: 2.479 GHz - 2.481 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Vertical
Distance: 3 m



PSD / High channel (2480 MHz) / Position 1 - 4622

FCC/15.247: 2020 e) Tx - Crête/3.0m/
Meas.Peak (Horizontal)

Sub-range 2
Frequencies: 2.479 GHz - 2.481 GHz (Analyser mode) 15000 Points
Settings: RBW: 3kHz, VBW: 9kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization:Horizontal
Distance: 3 m



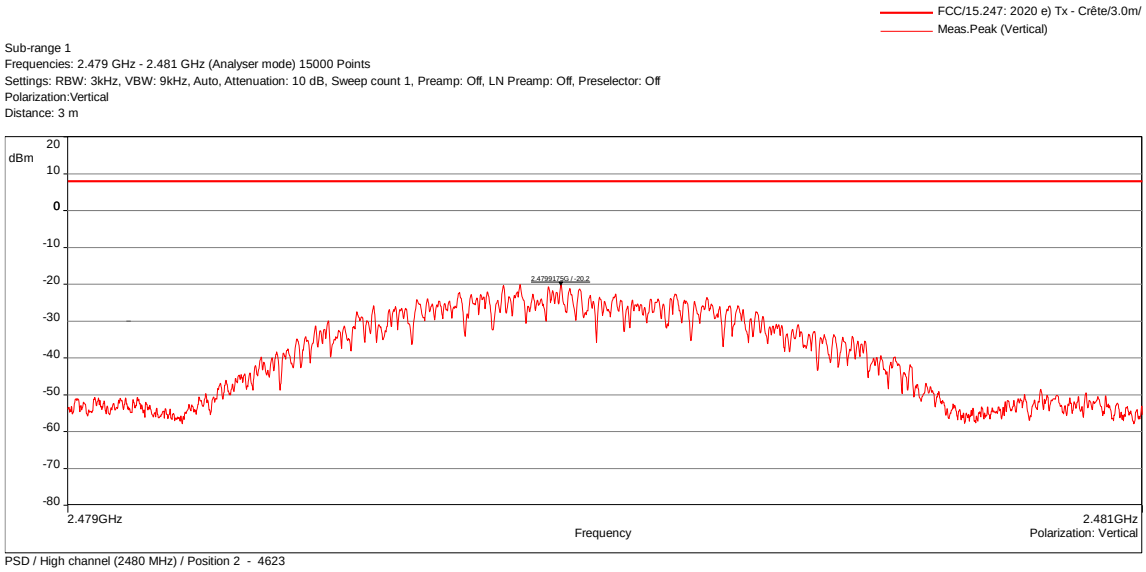
PSD / High channel (2480 MHz) / Position 1 - 4622

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.479GHz-2.481GHz	3kHz	9kHz	Peak
Horizontal	2.479GHz-2.481GHz	3kHz	9kHz	Peak
Configuration:	N/A			
Comments:	N/A			

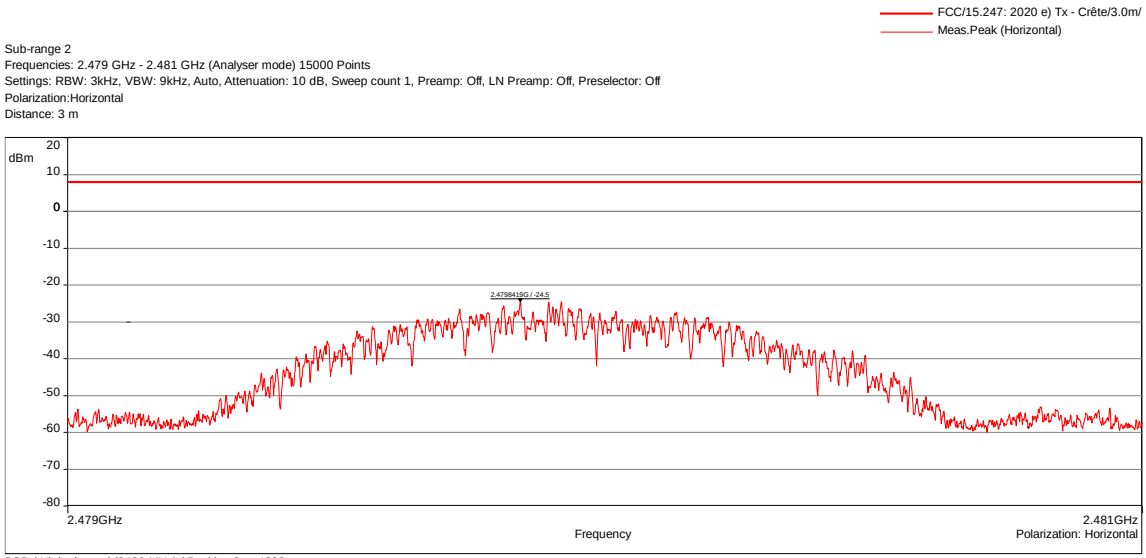
EUT modification(s): N/A

POWER SPECTRAL DENSITY - TABULATED RESULTS			
PSD / HIGH CHANNEL (2480 MHz) / POSITION 1			EMI4622
Frequency (MHz)	**Polarization**	**Level (dBm/3kHz)**	**Limit (dBm/3kHz)**
2480	Vertical	-19.8	8.00
2480	Horizontal	-20.8	8.00

POWER SPECTRAL DENSITY - GRAPH			
PSD / HIGH CHANNEL (2480 MHz) / POSITION 2		EMI4623	
EUT mode:	Modulated	**T (°C):**	24.2
Test Date:	15/02/2023	**H (%):**	34.5
Test Operator:	ATO	**P (hPa):**	1002



PSD / High channel (2480 MHz) / Position 2 - 4623

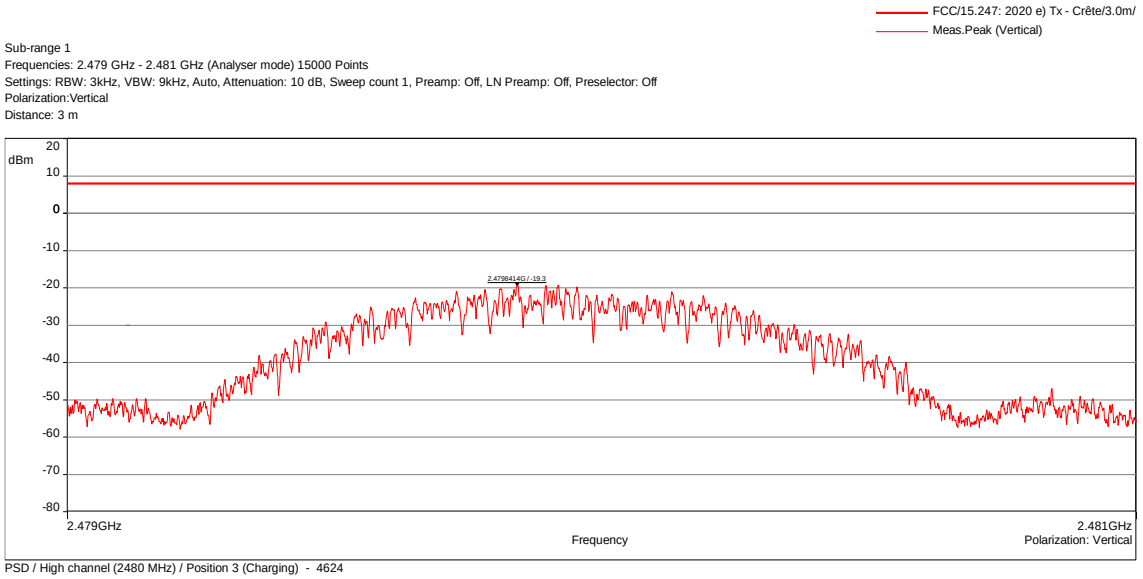


PSD / High channel (2480 MHz) / Position 2 - 4623

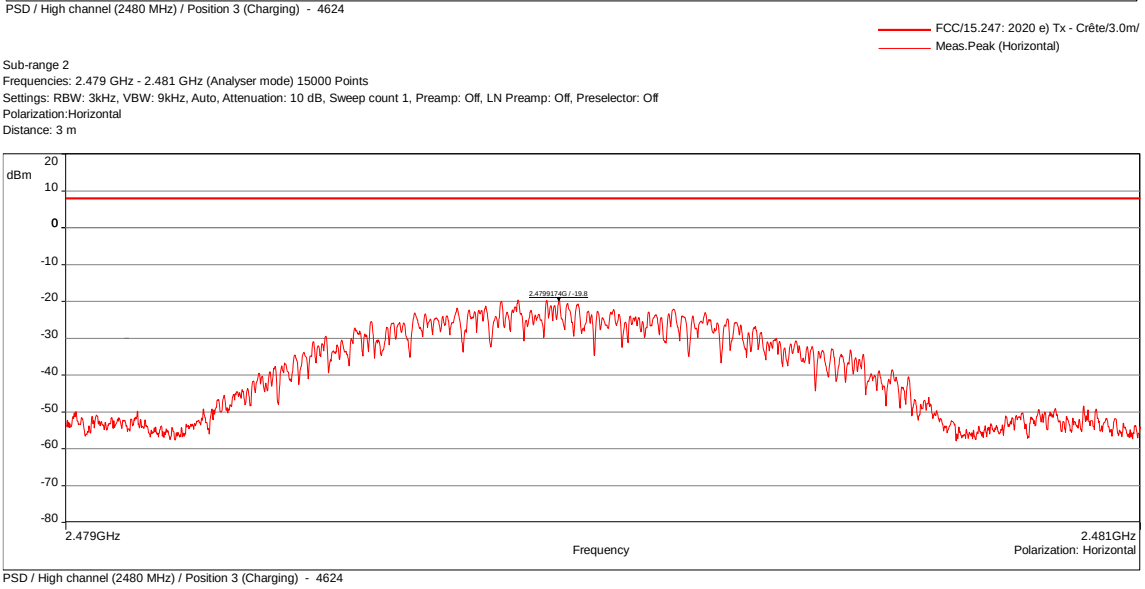
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.479GHz-2.481GHz	3kHz	9kHz	Peak
Horizontal	2.479GHz-2.481GHz	3kHz	9kHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

POWER SPECTRAL DENSITY - TABULATED RESULTS			
PSD / HIGH CHANNEL (2480 MHz) / POSITION 2			EMI4623
Frequency (MHz)	**Polarization**	**Level (dBm/3kHz)**	**Limit (dBm/3kHz)**
2480	Vertical	-20.2	8.00
2480	Horizontal	-24.5	8.00

POWER SPECTRAL DENSITY - GRAPH			
PSD / HIGH CHANNEL (2480 MHz) / POSITION 3 (CHARGING)		EMI4624	
EUT mode:	Tx mode	**T (°C):**	24.2
Test Date:	15/02/2023	**H (%):**	34.5
Test Operator:	ATO	**P (hPa):**	1002



PSD / High channel (2480 MHz) / Position 3 (Charging) - 4624



PSD / High channel (2480 MHz) / Position 3 (Charging) - 4624

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	2.479GHz-2.481GHz	3kHz	9kHz	Peak
Horizontal	2.479GHz-2.481GHz	3kHz	9kHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

POWER SPECTRAL DENSITY - TABULATED RESULTS			
PSD / HIGH CHANNEL (2480 MHz) / POSITION 3 (CHARGING)			EMI4624
Frequency (MHz)	**Polarization**	**Level (dBm/3kHz)**	**Limit (dBm/3kHz)**
2480	Vertical	-19.3	8.00
2480	Horizontal	-19.8	8.00

6.7. Radiated spurious emissions at frequencies <30MHz

Reference standard:	FCC 47 CFR PART 15.109 & 15.209: 2020 FCC 47 CFR PART 18 and RSS-Gen
Test method:	ANSI C63.4: 2014 ANSI C63.10: 2013

Test description: : Spurious domain emission limits are limits on emissions at frequencies other than those of the carrier and sidebands associated with normal test modulation**.**

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 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.

All frequencies were investigated, where applicable.

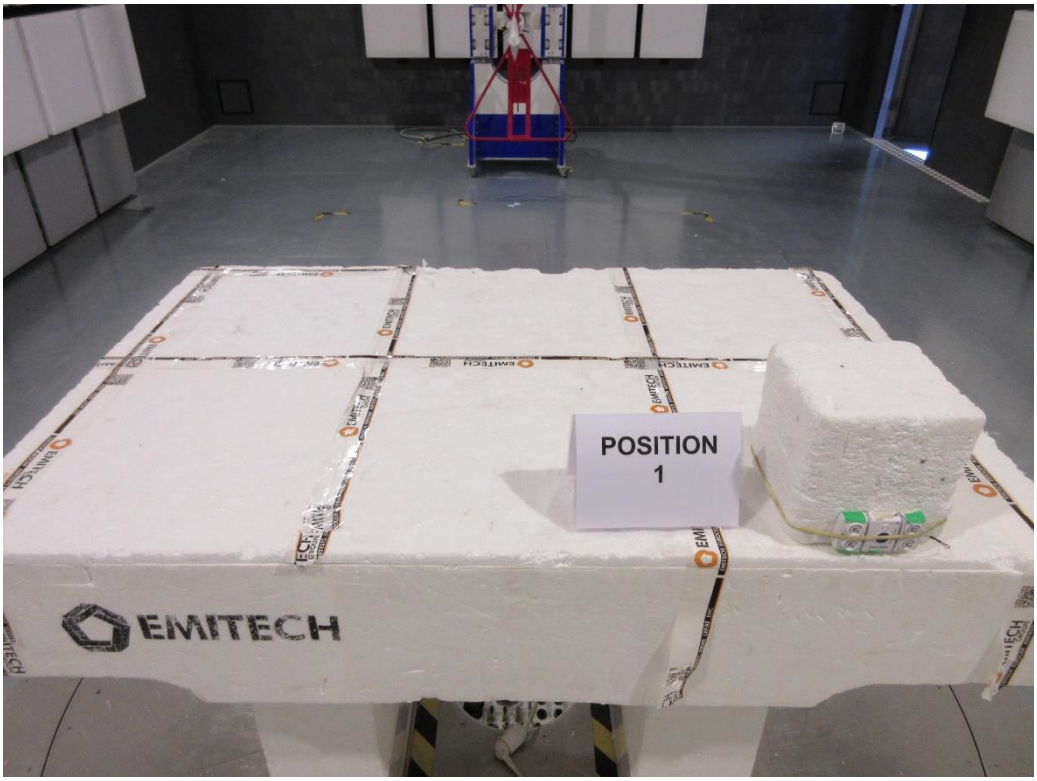
TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Radiated measurement / Rx mode / All Positions / 0°	9kHz-30MHz	15.109	EMI4608	**PASS**
Radiated measurement / Rx mode / All Positions / 45°	9kHz-30MHz	15.109	EMI4609	**PASS**
Radiated measurement / Rx mode / All Positions / 90°	9kHz-30MHz	15.109	EMI4610	**PASS**
Radiated measurement / All channels / All Positions / 0°	9kHz-30MHz	15.209	EMI4611	**PASS**
Radiated measurement / All channels / All Positions / 45°	9kHz-30MHz	15.209	EMI4612	**PASS**
Radiated measurement / All channels / All Positions / 90°	9kHz-30MHz	15.209	EMI4613	**PASS**

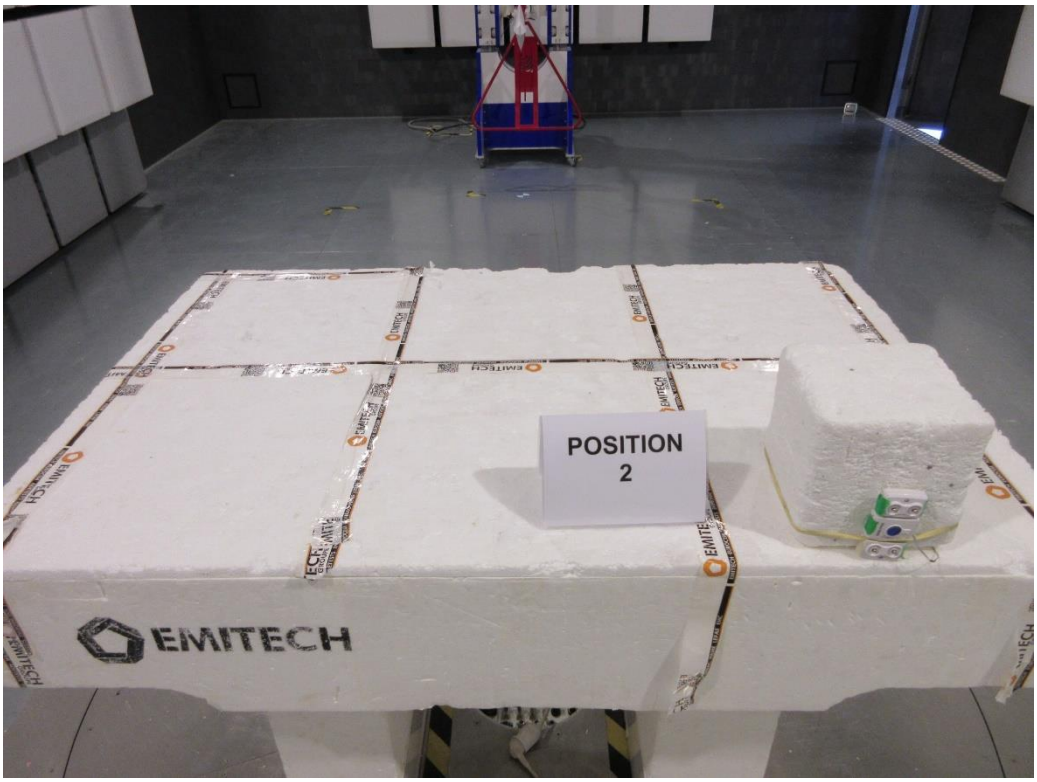
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	*See Graph(s)*
Relative Humidity	20 to 75 %	*See Graph(s)*
Atmospheric pressure	N/A	*See Graph(s)*
Test method deviation: N/A		
Supplementary information: N/A		

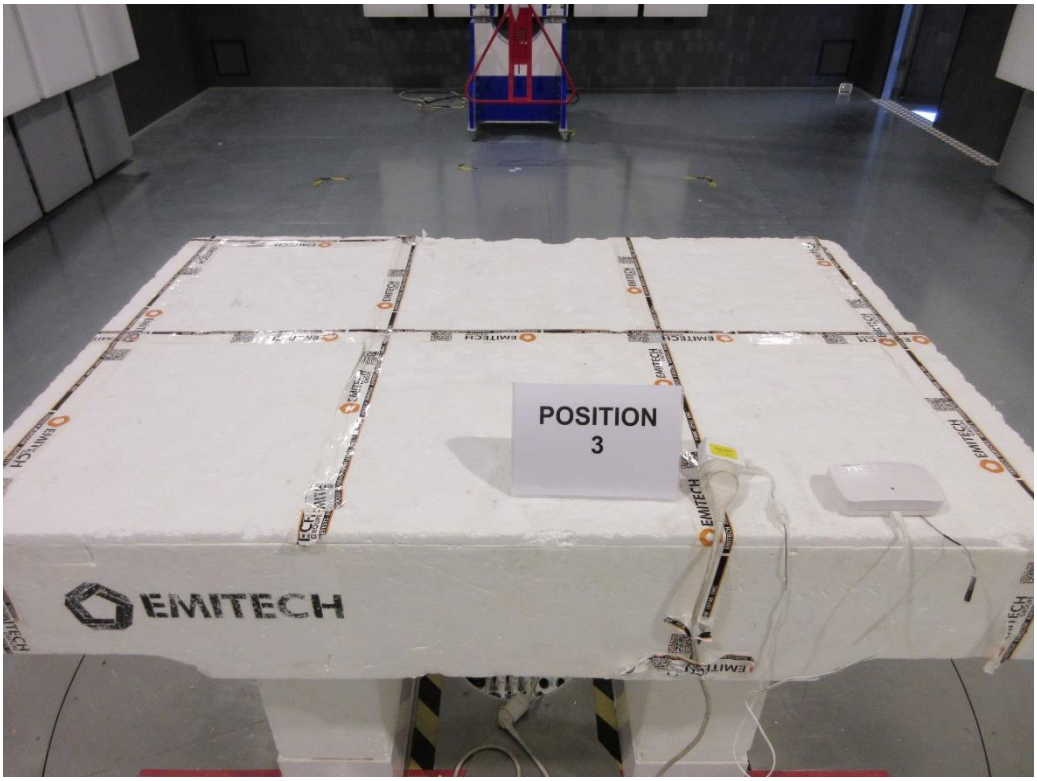
TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	Rohde & Schwarz	HFH2-Z2	5825	16/08/2022	16/10/2024
Cable	MegaPhase	N-3m	14852	18/03/2021	18/05/2023
Cable	SUCOFLEX	N-6,5m	14380	23/08/2021	23/10/2023
Cable	Techniwave	N-8m	18349	25/01/2022	25/03/2024
Receiver	Rohde & Schwarz	ESW26	17791	13/02/2023	13/04/2024
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	07/06/2021	07/08/2023

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

TEST SETUP PHOTO(S) - RADIATED MEASUREMENT

TEST SETUP PHOTO(S) – POSITION 1


TEST SETUP PHOTO(S) – POSITION 2


TEST SETUP PHOTO(S) – POSITION 3


RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH						
RADIATED MEASUREMENT / RX MODE / ALL POSITIONS / 0°						EMI4608
Test Frequency (MHz)	Polarization	Detector (Pk/QP/Av)	Gain/Loss Factor (dB)	Level dB (µV)	Limit dB (µV)	Margin (dB)
/	/	/	/	/	/	/
Supplementary information: Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported						

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH						
RADIATED MEASUREMENT / RX MODE / ALL POSITIONS / 45°						EMI4609
Test Frequency (MHz)	Polarization	Detector (Pk/QP/Av)	Gain/Loss Factor (dB)	Level dB (µV)	Limit dB (µV)	Margin (dB)
/	/	/	/	/	/	/
Supplementary information: Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported						

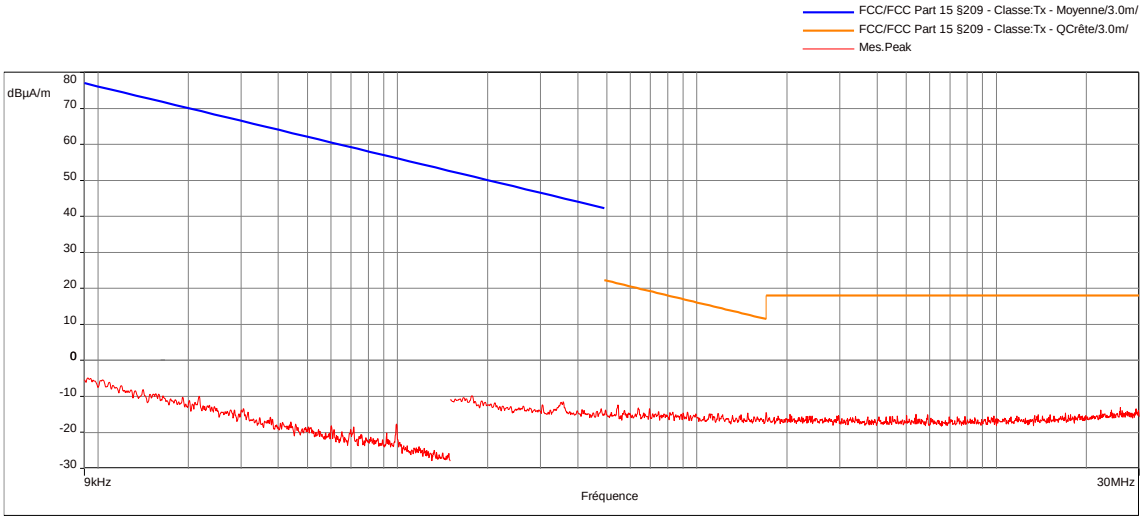
RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH						
RADIATED MEASUREMENT / RX MODE / ALL POSITIONS / 90°						EMI4610
Test Frequency (MHz)	Polarization	Detector (Pk/QP/Av)	Gain/Loss Factor (dB)	Level dB (µV)	Limit dB (µV)	Margin (dB)
/	/	/	/	/	/	/
Supplementary information: Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported						

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH						
RADIATED MEASUREMENT / ALL CHANNELS / ALL POSITIONS / 0°						EMI4611
Test Frequency (MHz)	Polarization	Detector (Pk/QP/Av)	Gain/Loss Factor (dB)	Level dB (µV)	Limit dB (µV)	Margin (dB)
/	/	/	/	/	/	/
Supplementary information: Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported						

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH						
RADIATED MEASUREMENT / ALL CHANNELS / ALL POSITIONS / 45°						EMI4612
Test Frequency (MHz)	Polarization	Detector (Pk/QP/Av)	Gain/Loss Factor (dB)	Level dB (µV)	Limit dB (µV)	Margin (dB)
/	/	/	/	/	/	/
Supplementary information: Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported						

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH						
RADIATED MEASUREMENT / ALL CHANNELS / ALL POSITIONS / 90°						EMI4613
Test Frequency (MHz)	Polarization	Detector (Pk/QP/Av)	Gain/Loss Factor (dB)	Level dB (µV)	Limit dB (µV)	Margin (dB)
/	/	/	/	/	/	/
Supplementary information: Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported						

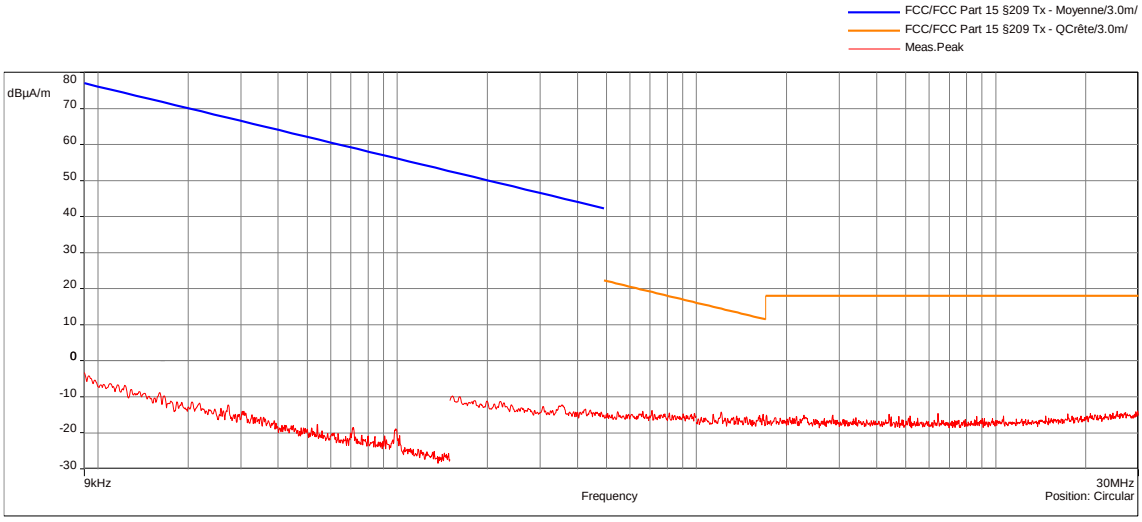
RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
RADIATED MEASUREMENT / RX MODE / ALL POSITIONS / 0°		EMI4608	
EUT mode:	Tx mode	**T (°C):**	22.3
Test Date:	17/02/2023	**H (%):**	37.6
Test Operator:	ATO	**P (hPa):**	1009



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

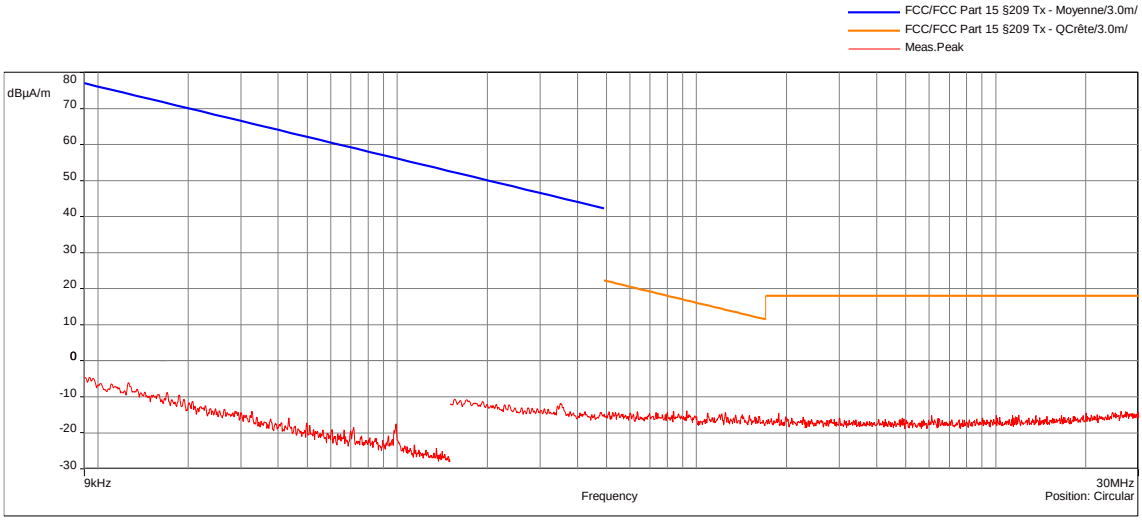
RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
RADIATED MEASUREMENT / RX MODE / ALL POSITIONS / 45°		EMI4609	
EUT mode:	Tx mode	**T (°C):**	22.3
Test Date:	17/02/2023	**H (%):**	37.6
Test Operator:	ATO	**P (hPa):**	1009



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

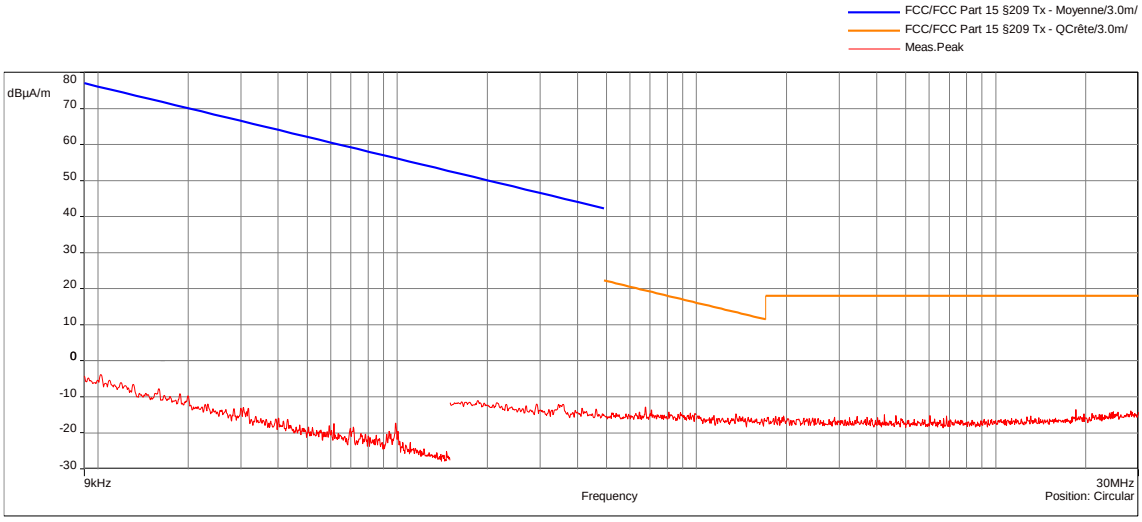
RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
RADIATED MEASUREMENT / RX MODE / ALL POSITIONS / 90°		EMI4610	
EUT mode:	Tx mode	**T (°C):**	22.3
Test Date:	17/02/2023	**H (%):**	37.6
Test Operator:	ATO	**P (hPa):**	1009



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

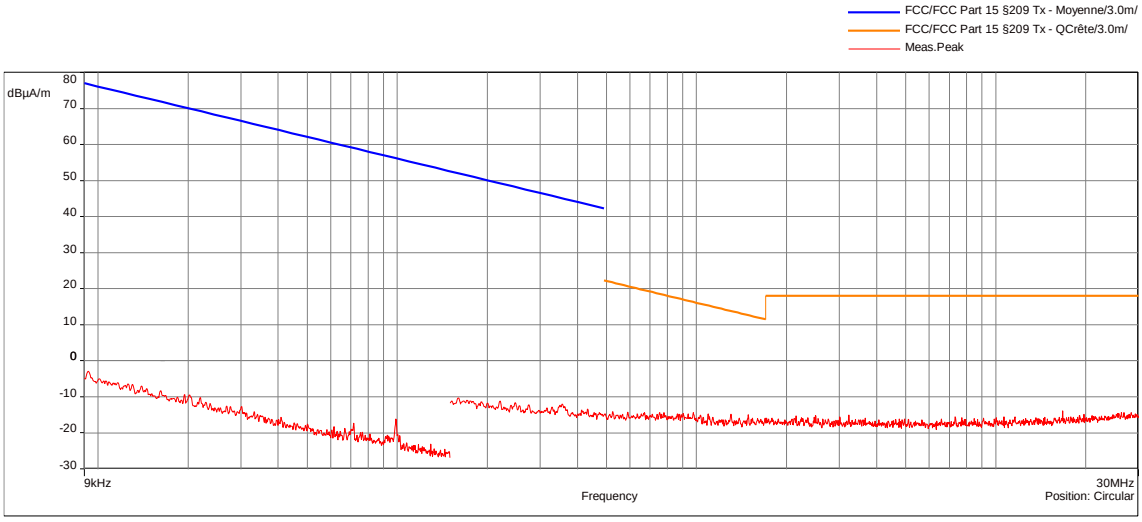
RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
RADIATED MEASUREMENT / ALL CHANNELS / ALL POSITIONS / 0°		EMI4611	
EUT mode:	Tx mode	**T (°C):**	22.3
Test Date:	17/02/2023	**H (%):**	37.6
Test Operator:	ATO	**P (hPa):**	1009



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

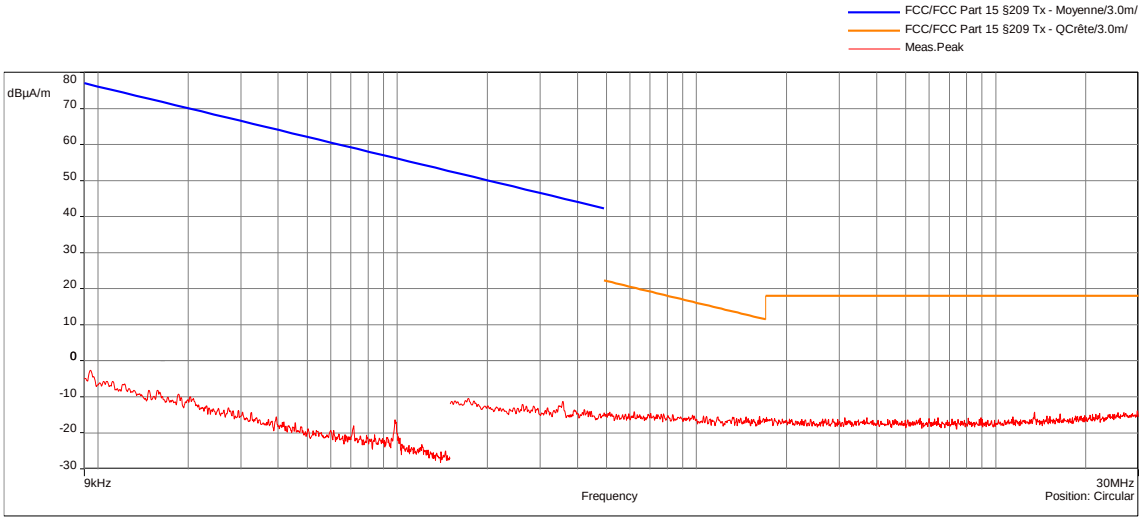
RADIATED SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
RADIATED MEASUREMENT / ALL CHANNELS / ALL POSITIONS / 45°		EMI4612	
EUT mode:	Tx mode	**T (°C):**	22.3
Test Date:	17/02/2023	**H (%):**	37.6
Test Operator:	ATO	**P (hPa):**	1009



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 SPURIOUS EMISSIONS AT FREQUENCIES <30MHZ - GRAPH			
RADIATED MEASUREMENT / ALL CHANNELS / ALL POSITIONS / 90°		EMI4613	
EUT mode:	Tx mode	**T (°C):**	22.3
Test Date:	17/02/2023	**H (%):**	37.6
Test Operator:	ATO	**P (hPa):**	1009



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

6.8. Radiated spurious emissions at frequencies >30MHz

Reference standard:	FCC 47 CFR PART 15.109 & 15.209: 2020 FCC 47 CFR PART 18 and RSS-Gen
Test method:	ANSI C63.4: 2014 ANSI C63.10: 2013

General test setup: EUT is set on an insulating support at 150cm above the ground reference plane.

Measurement are done on a normalized test site by the substitution method.

The test antenna is oriented in the two polarizations (vertical and horizontal), and the product is rotated at 360° in the horizontal plane (See photo(s) for initial position of the EUT(0°)). If applicable the test antenna was raised and lowered through the specified range of height until a maximum signal level is detected.

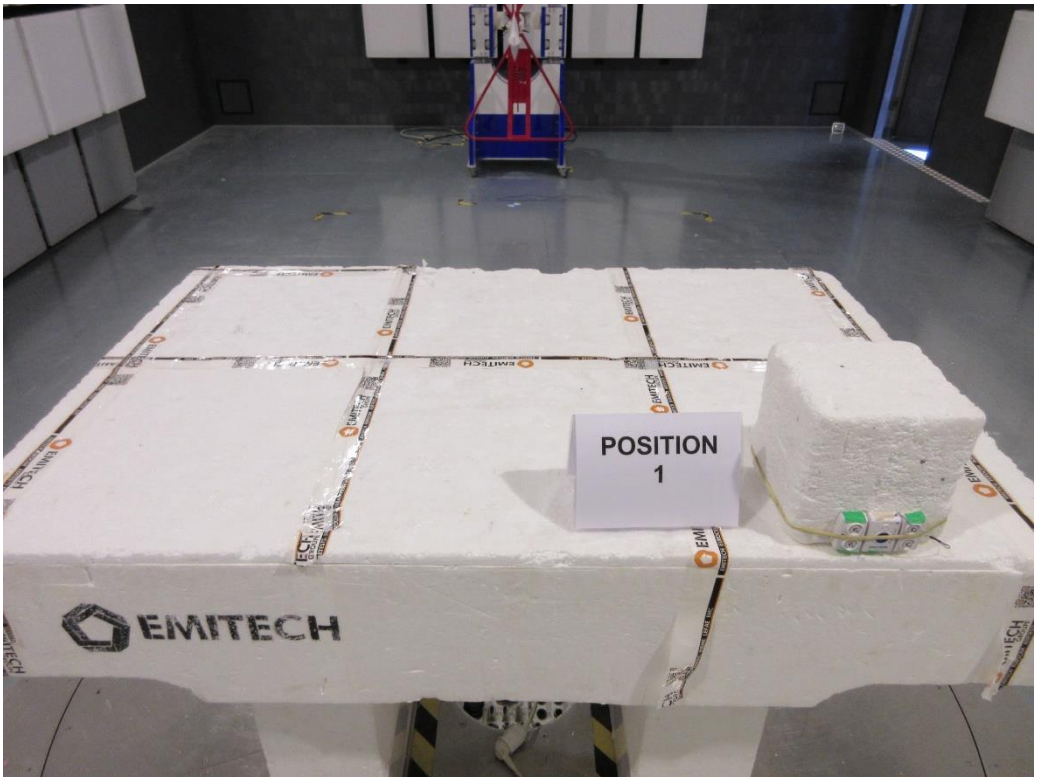
For portable equipments a research of maximum level is done on the 3 axes. Only the highest levels are recorded.

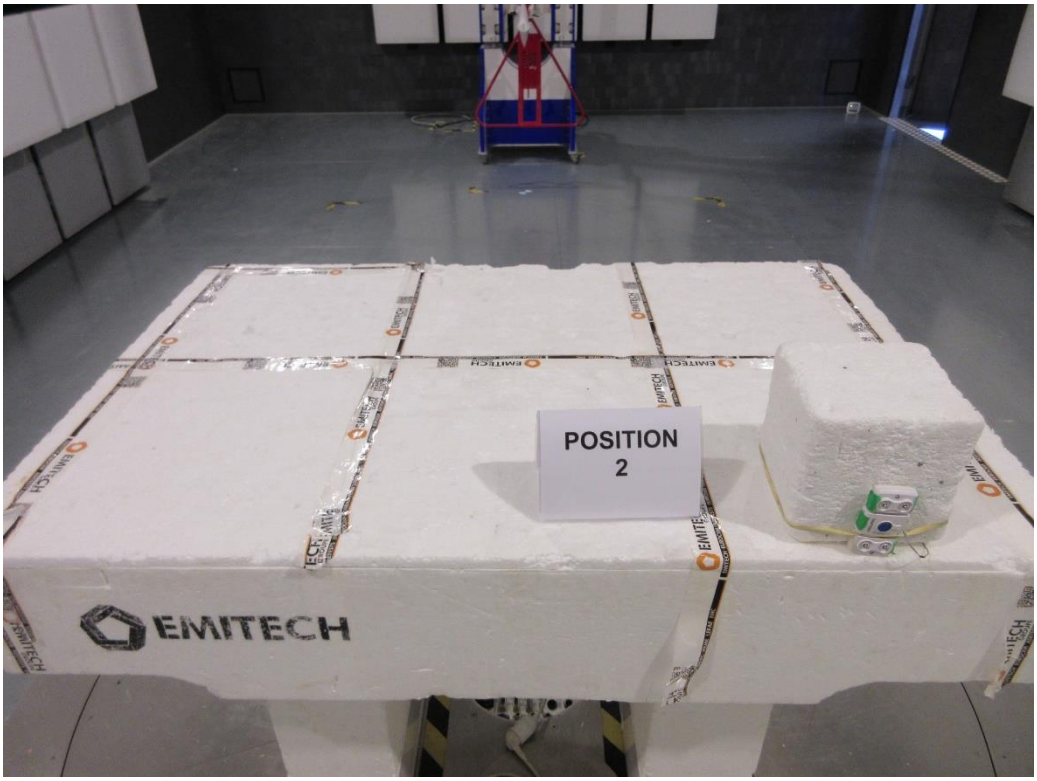
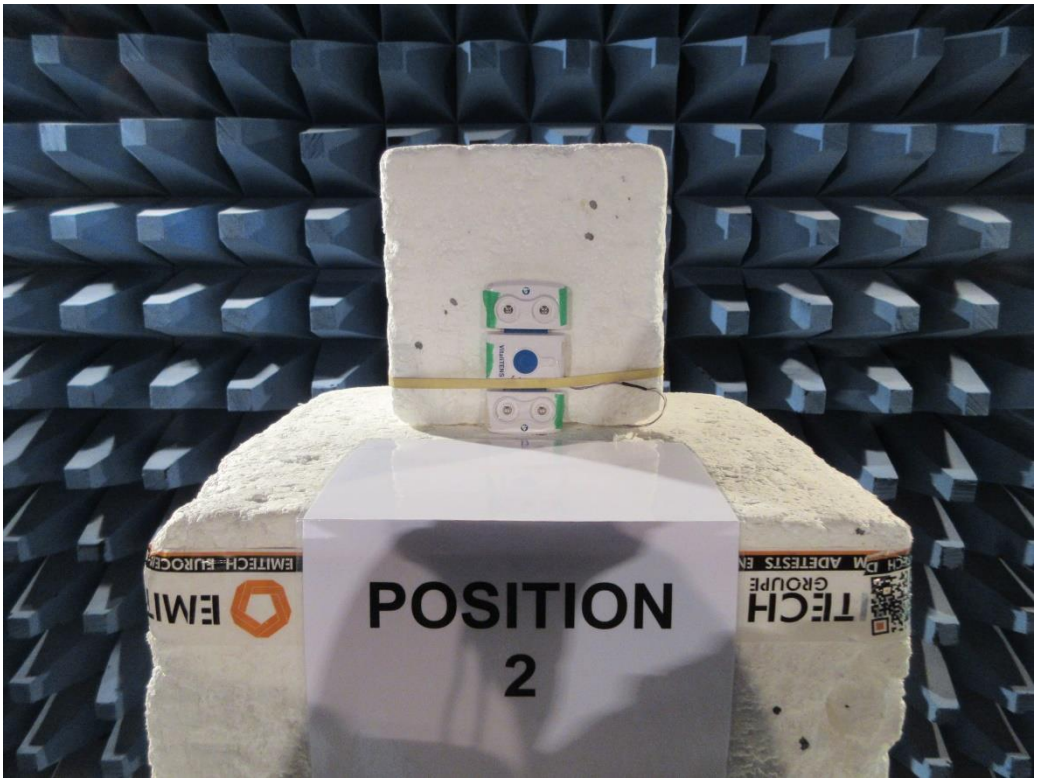
TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Radiated measurement / All Positions / Low channel (2402MHz) / For freq <1GHz	30MHz-1GHz	15.209	EMI4602	**PASS**
Radiated measurement / All Positions / Mid channel (2426MHz) / For freq <1GHz	30MHz-1GHz	15.209	EMI4603	**PASS**
Radiated measurement / All Positions / High channel (2480MHz) / For freq <1GHz	30MHz-1GHz	15.209	EMI4604	**PASS**
Radiated measurement / Rx mode / All Positions / For freq <1GHz	30MHz-1GHz	15.109	EMI4606	**PASS**
Radiated measurement / Low channel (2402MHz) / All Positions / For freq >1GHz	1GHz-18GHz	15.209	EMI4586	**PASS**
Radiated measurement / Mid channel (2426MHz) / All Positions / For freq >1GHz	1GHz-18GHz	15.209	EMI4585	**PASS**
Radiated measurement / High channel (2480MHz) / All Positions / For freq >1GHz	1GHz-18GHz	15.209	EMI4584	**PASS**
Radiated measurement / Rx mode / All Positions / For freq >1GHz	1GHz-18GHz	15.109	EMI4582	**PASS**
Radiated measurement / All Positions / Low channel (2402MHz) / 18GHz to 26.5GHz	18GHz-26.5GHz	15.209	EMI4600	**PASS**
Radiated measurement / All Positions / Mid channel (2426MHz) / 18GHz to 26.5GHz	18GHz-26.5GHz	15.209	EMI4599	**PASS**
Radiated measurement / All Positions / High channel (2480MHz) / 18GHz to 26.5GHz	18GHz-26.5GHz	15.209	EMI4598	**PASS**
Radiated measurement / Rx mode / All Positions / 18GHz to 26.5GHz	18GHz-26.5GHz	15.109	EMI4629	**PASS**

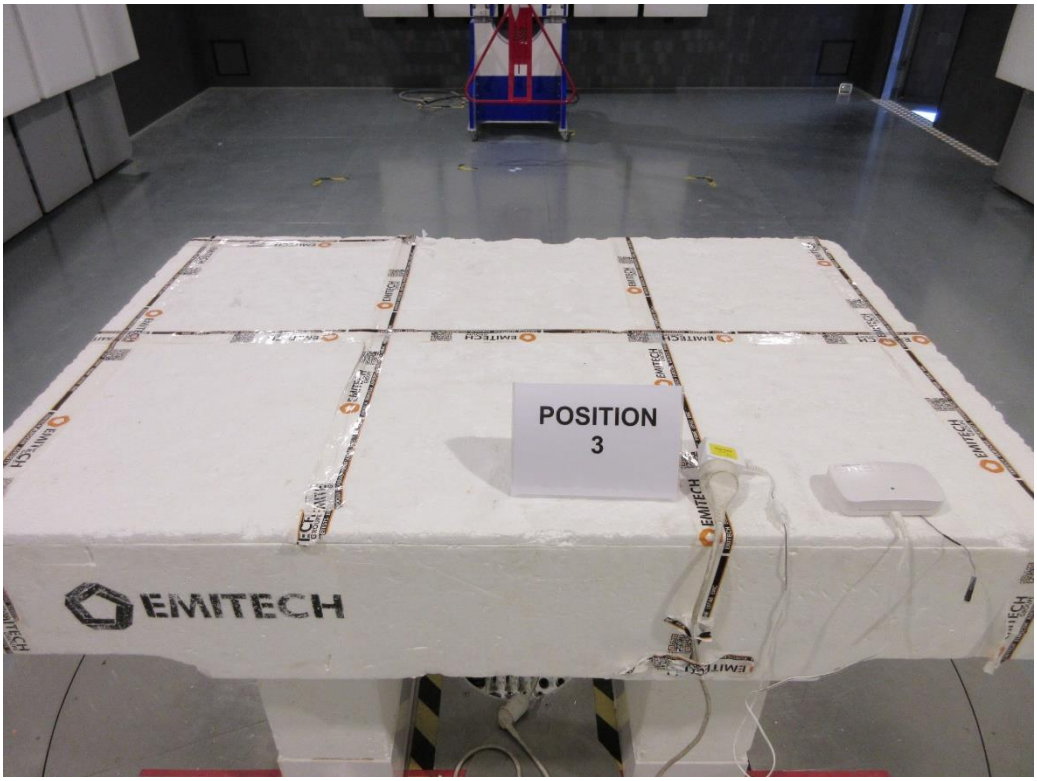
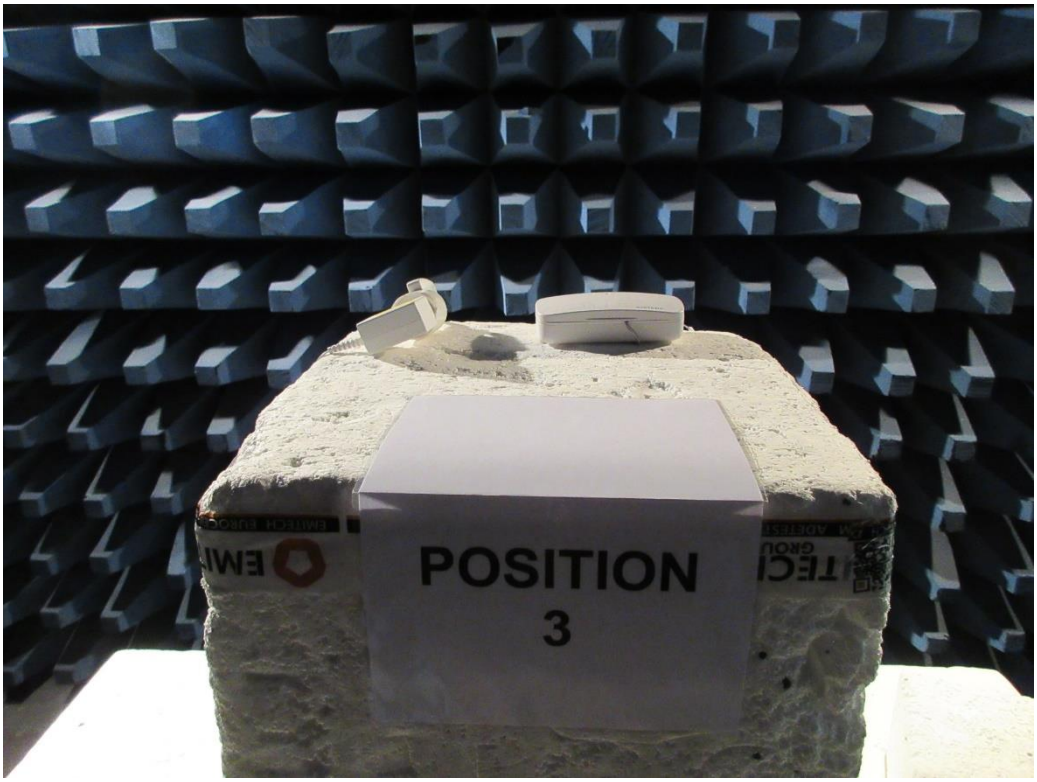
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	*See Graph(s)*
Relative Humidity	20 to 75 %	*See Graph(s)*
Atmospheric pressure	N/A	*See Graph(s)*
Test method deviation: N/A		
Supplementary information: From 30MHz to 1GHz Quasi peak limit provided is 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	ETS-Lindgren	3117	5456	09/09/2022	09/11/2025
Antenna	ETS lindgren	3142E	14523	27/01/2022	27/03/2025
Antenna	ETS lindgren	3160-09	14690	07/01/2022	07/03/2025
Cable	JYE BAO	K30K30-5003-40G1	14887	25/06/2019	25/08/2023
Cable	Huber + Suhner	K-5m	14460	19/01/2022	19/03/2024
Cable	cables and connectors	N-1.5m	4203	27/01/2021	27/03/2023
Cable	SUCOFLEX	N-3m	14378	23/08/2021	23/10/2023
Cable	SUCOFLEX	N-3m	14379	23/08/2021	23/10/2023
Cable	MegaPhase	N-3m	14852	18/03/2021	18/05/2023
Cable	SUCOFLEX	N-5,5m	14381	23/08/2021	23/10/2023
Cable	SUCOFLEX	N-6,5m	14380	23/08/2021	23/10/2023
Cable	Techniwave	N-8m	18349	25/01/2022	25/03/2024
Filter	Micro-Tronics	HPM 15162	10273	26/11/2021	26/01/2025
Filter	Micro-Tronics	HPM18865	12843	24/08/2021	24/10/2024
Filter	Wainwright Instruments	WRCGV 2402/2480-2380/2500-40/10EE-200W	9771	15/03/2022	15/05/2025
Preamplifier	Wright Technologie	ASL40-B3015	14851	28/01/2022	28/03/2023
Preamplifier	IMPULSE	CA118-546ACN	9169	26/04/2022	26/06/2023
Receiver	Agilent Technologies	E4440A	5824	02/11/2020	02/07/2023
Receiver	Rohde & Schwarz	ESW26	17791	13/02/2023	13/04/2024
Shielded enclosure	RAY PROOF	C.V2	1423	04/10/2019	04/06/2023
Shielded enclosure	COMTEST	FAR-3m	18014	17/08/2021	17/10/2024
Software	Nexio	BAT EMC	0000		
Thermohygrometer	Testo	608-H1	7562	09/06/2021	09/08/2023
Thermohygrometer	Testo	608-H2	12269	07/06/2022	07/08/2024
Thermohygrometer	Bioblock Scientific	Météostar	0963	07/06/2021	07/08/2023

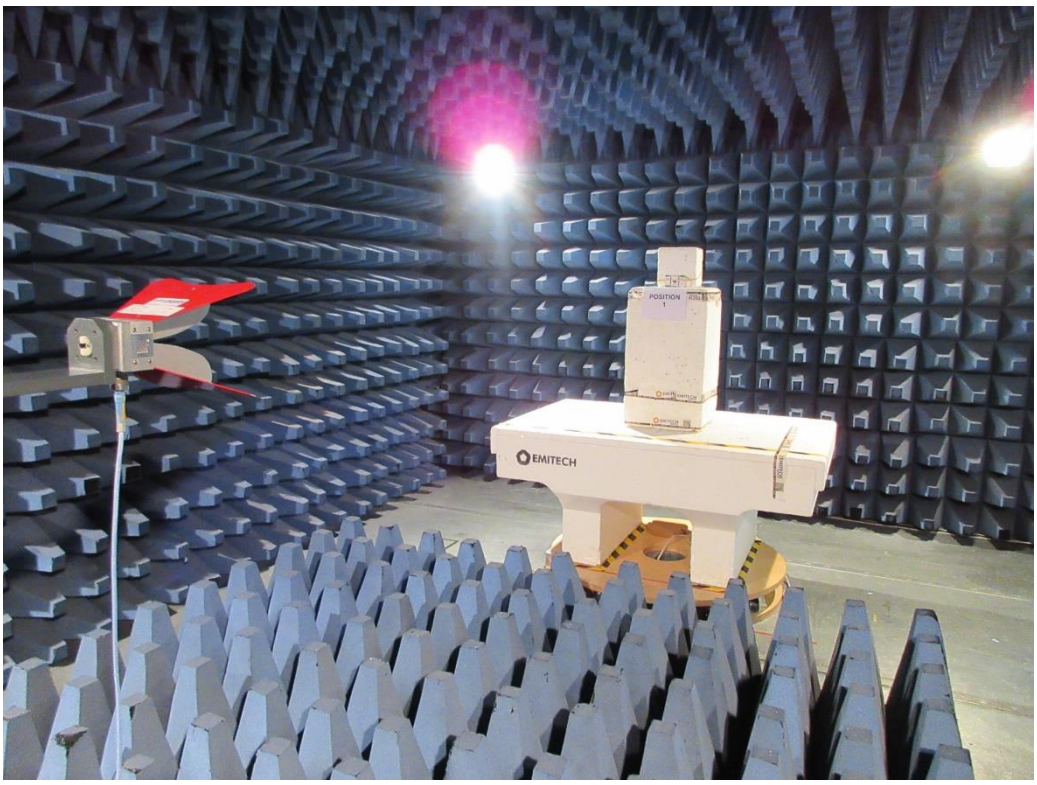
BAT-EMC software version: V3.18.0.26 Blank cells = Permanent validity

TEST SETUP PHOTO(S) – POSITION 1


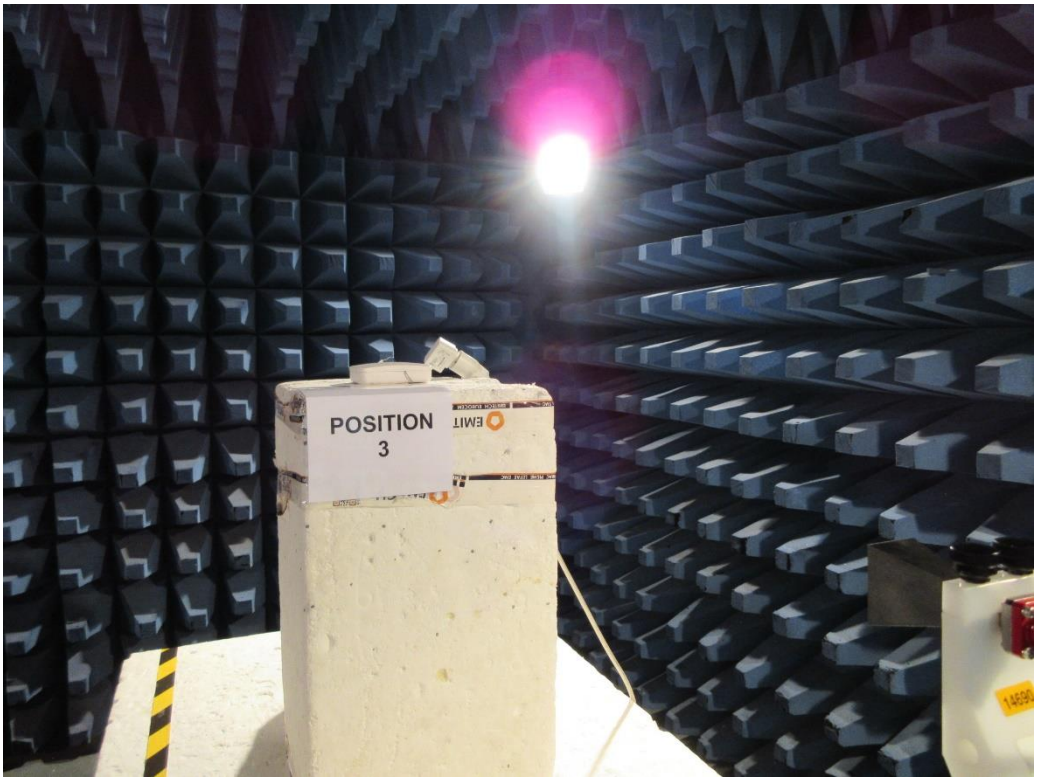
TEST SETUP PHOTO(S) – POSITION 2
 

TEST SETUP PHOTO(S) – POSITION 3
 

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

TEST SETUP PHOTO(S) – RADIATED MEASUREMENT – 1GHZ TO 18GHZ


TEST SETUP PHOTO(S) - RADIATED MEASUREMENT – 18GHZ TO 26.5GHZ



RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - TABULATED RESULTS								
RADIATED MEASUREMENT / ALL POSITIONS / LOW CHANNEL (2402MHZ) / FOR FREQ <1GHZ								EMI4602
Test Freq. (MHz)	Detector (Pk/QP/ Av)	Ant. position	Azimuth (°)	Ant. Height (cm)	Cor. Factor (dB)	Level dB (µV/m)	Limit dB (µV/m)	Margin (dB)
39.60	QP	V	0	100	19.87	29.71	40.00	-10.29
42.99	QP	V	0	100	18.28	31.80	40.00	-8.20
55.93	Pk	V	/	/	15.69	27.13	40.00	-12.87
79.37	Pk	V	/	/	14.38	30.39	40.00	-9.61
192.01	QP	V	0	100	17.28	35.33	43.50	-8.17
506.51	Pk	V	/	/	28.43	33.06	46.00	-12.94
39.86	Pk	H	/	/	19.75	25.41	40.00	-14.59
57.19	Pk	H	/	/	15.69	24.66	40.00	-15.34
191.96	Pk	H	/	/	17.28	24.04	43.50	-19.46

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - TABULATED RESULTS								
RADIATED MEASUREMENT / ALL POSITIONS / MID CHANNEL (2426MHZ) / FOR FREQ <1GHZ								EMI4603
Test Freq. (MHz)	Detector (Pk/QP/ Av)	Ant. position	Azimuth (°)	Ant. Height (cm)	Cor. Factor (dB)	Level dB (µV/m)	Limit dB (µV/m)	Margin (dB)
38.22	QP	V	0	100	20.53	29.28	40.00	-10.72
42.60	QP	V	0	100	18.46	32.09	40.00	-7.91
60.87	Pk	V	/	/	15.10	29.62	40.00	-10.38
80.08	Pk	V	/	/	14.41	30.53	40.00	-9.47
191.99	Pk	V	/	/	17.28	30.41	43.50	-13.09
215.98	Pk	V	/	/	18.73	32.85	43.50	-10.65
535.35	Pk	V	/	/	30.47	35.43	46.00	-10.57
37.98	Pk	H	/	/	20.65	26.46	40.00	-13.54
42.19	Pk	H	/	/	18.64	27.70	40.00	-12.3
385.45	Pk	H	/	/	25.42	30.04	46.00	-15.96

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - TABULATED RESULTS								
RADIATED MEASUREMENT / ALL POSITIONS / HIGH CHANNEL (2480MHZ) / FOR FREQ <1GHZ								EMI4604
Test Freq. (MHz)	Detector (Pk/QP/ Av)	Ant. position	Azimuth (°)	Ant. Height (cm)	Cor. Factor (dB)	Level dB (µV/m)	Limit dB (µV/m)	Margin (dB)
38.22	QP	V	0	100	20.53	29.09	40.00	-10.91
42.57	QP	V	0	100	18.47	32.32	40.00	-7.68
72.09	Pk	V	/	/	14.51	28.12	40.00	-11.88
124.12	Pk	V	/	/	15.02	31.31	46.00	-14.69
164.28	Pk	V	/	/	17.34	32.21	43.50	-11.29
216.01	Pk	V	/	/	18.73	34.05	43.50	-9.45
532.47	Pk	V	/	/	30.19	35.48	46.00	-10.52
38.05	Pk	H	/	/	20.62	25.38	40.00	-14.62
42.44	Pk	H	/	/	18.52	25.82	40.00	-14.18

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - TABULATED RESULTS								
RADIATED MEASUREMENT / RX MODE / ALL POSITIONS / FOR FREQ <1GHZ								EMI4606
Test Freq. (MHz)	Detector (Pk/QP/ Av)	Ant. position	Azimuth (°)	Ant. Height (cm)	Cor. Factor (dB)	Level dB (µV/m)	Limit dB (µV/m)	Margin (dB)
38.19	QP	V	0	100	20.55	29.45	40.00	-10.55
42.54	QP	V	0	100	18.48	32.22	40.00	-7.78
168.00	Pk	V	/	/	17.13	37.06	43.50	-6.44

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - TABULATED RESULTS								
RADIATED MEASUREMENT / LOW CHANNEL (2402MHZ) / ALL POSITIONS / FOR FREQ >1GHZ								EMI4586
Test Freq. (MHz)	Detector (Pk/QP/ Av)	Ant. position	Azimuth (°)	Ant. Height (cm)	Cor. Factor (dB)	Level dB (µV/m)	Limit dB (µV/m)	Margin (dB)
4804.12	Av	V	/	/	-1.37	44.49	54.00	-9.51
4804.12	Av	H	/	/	-1.37	43.62	54.00	-10.38
7204.28	Av	H	/	/	3.42	47.82	54.00	-6.18

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - TABULATED RESULTS								
RADIATED MEASUREMENT / MID CHANNEL (2426MHZ) / ALL POSITIONS / FOR FREQ >1GHZ								EMI4585
Test Freq. (MHz)	Detector (Pk/QP/ Av)	Ant. position	Azimuth (°)	Ant. Height (cm)	Cor. Factor (dB)	Level dB (µV/m)	Limit dB (µV/m)	Margin (dB)
4851.12	Av	V	/	/	-1.55	43.90	54.00	-10.1
4851.12	Av	H	/	/	-1.55	42.91	54.00	-11.09
7278.28	Av	H	/	/	3.48	47.63	54.00	-6.37

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - TABULATED RESULTS								
RADIATED MEASUREMENT / HIGH CHANNEL (2480MHZ) / ALL POSITIONS / FOR FREQ >1GHZ								EMI4584
Test Freq. (MHz)	Detector (Pk/QP/ Av)	Ant. position	Azimuth (°)	Ant. Height (cm)	Cor. Factor (dB)	Level dB (µV/m)	Limit dB (µV/m)	Margin (dB)
4959.13	Av	V	/	/	-1.47	43.70	54.00	-10.3
4959.13	Av	H	/	/	-1.47	39.65	54.00	-14.35
7439.29	Av	H	/	/	3.67	48.66	54.00	-5.34

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - TABULATED RESULTS								
RADIATED MEASUREMENT / RX MODE / ALL POSITIONS / FOR FREQ >1GHZ								EMI4582
Test Freq. (MHz)	Detector (Pk/QP/ Av)	Ant. position	Azimuth (°)	Ant. Height (cm)	Cor. Factor (dB)	Level dB (µV/m)	Limit dB (µV/m)	Margin (dB)
/	/	/	/	/	/	/	/	/
Supplementary information: Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.								

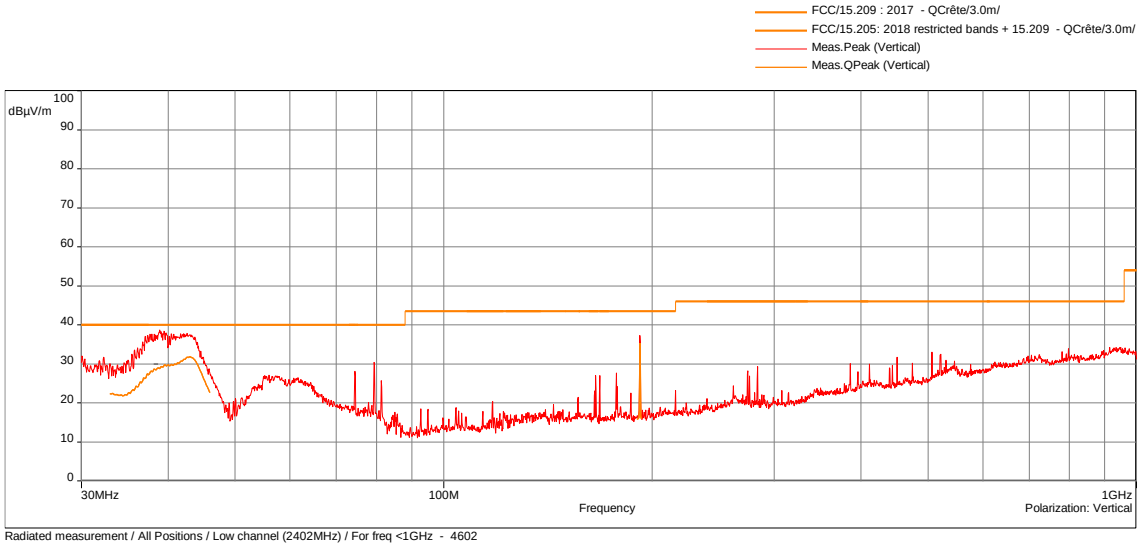
RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - TABULATED RESULTS								
RADIATED MEASUREMENT / ALL POSITIONS / LOW CHANNEL (2402MHZ) / 18GHZ TO 26.5GHZ								EMI4600
Test Freq. (MHz)	Detector (Pk/QP/ Av)	Ant. position	Azimuth (°)	Ant. Height (cm)	Cor. Factor (dB)	Level dB (µV/m)	Limit dB (µV/m)	Margin (dB)
/	/	/	/	/	/	/	/	/
Supplementary information: Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.								

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - TABULATED RESULTS								
RADIATED MEASUREMENT / ALL POSITIONS / MID CHANNEL (2426MHZ) / 18GHZ TO 26.5GHZ								EMI4599
Test Freq. (MHz)	Detector (Pk/QP/ Av)	Ant. position	Azimuth (°)	Ant. Height (cm)	Cor. Factor (dB)	Level dB (µV/m)	Limit dB (µV/m)	Margin (dB)
/	/	/	/	/	/	/	/	/
Supplementary information: Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.								

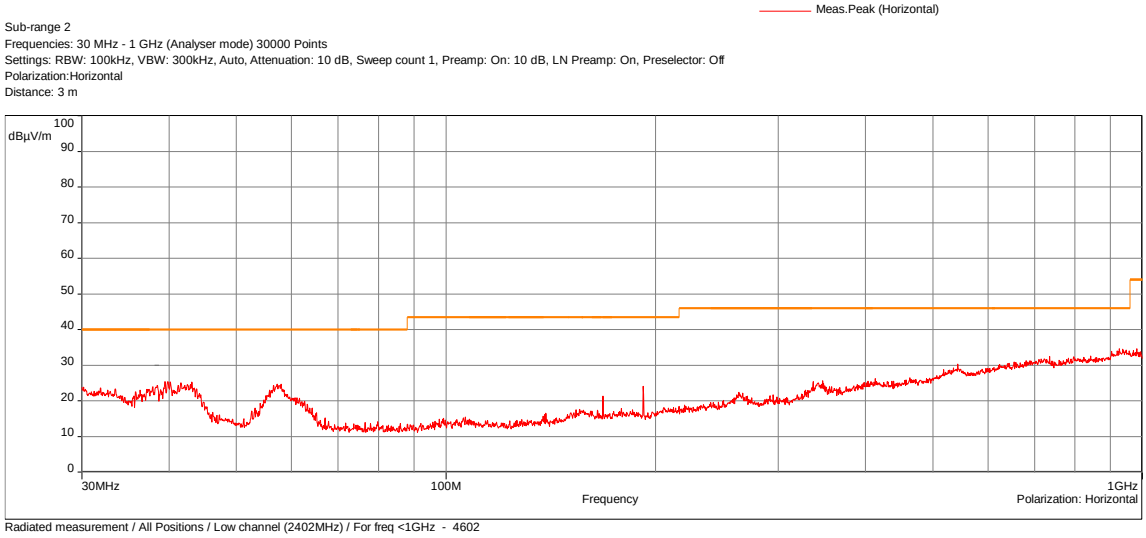
RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - TABULATED RESULTS								
RADIATED MEASUREMENT / ALL POSITIONS / HIGH CHANNEL (2480MHZ) / 18GHZ TO 26.5GHZ								EMI4598
Test Freq. (MHz)	Detector (Pk/QP/ Av)	Ant. position	Azimuth (°)	Ant. Height (cm)	Cor. Factor (dB)	Level dB (µV/m)	Limit dB (µV/m)	Margin (dB)
/	/	/	/	/	/	/	/	/
Supplementary information: Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.								

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - TABULATED RESULTS								
RADIATED MEASUREMENT / RX MODE / ALL POSITIONS / 18GHZ TO 26.5GHZ								EMI4629
Test Freq. (MHz)	Detector (Pk/QP/ Av)	Ant. position	Azimuth (°)	Ant. Height (cm)	Cor. Factor (dB)	Level dB (µV/m)	Limit dB (µV/m)	Margin (dB)
/	/	/	/	/	/	/	/	/
Supplementary information: Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.								

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
RADIATED MEASUREMENT / ALL POSITIONS / LOW CHANNEL (2402MHZ) / FOR FREQ <1GHZ		EMI4602	
EUT mode:	Modulated	**T (°C):**	22.3
Test Date:	17/02/2023	**H (%):**	38.9
Test Operator:	ATO	**P (hPa):**	1009



Radiated measurement / All Positions / Low channel (2402MHz) / For freq <1GHz - 4602

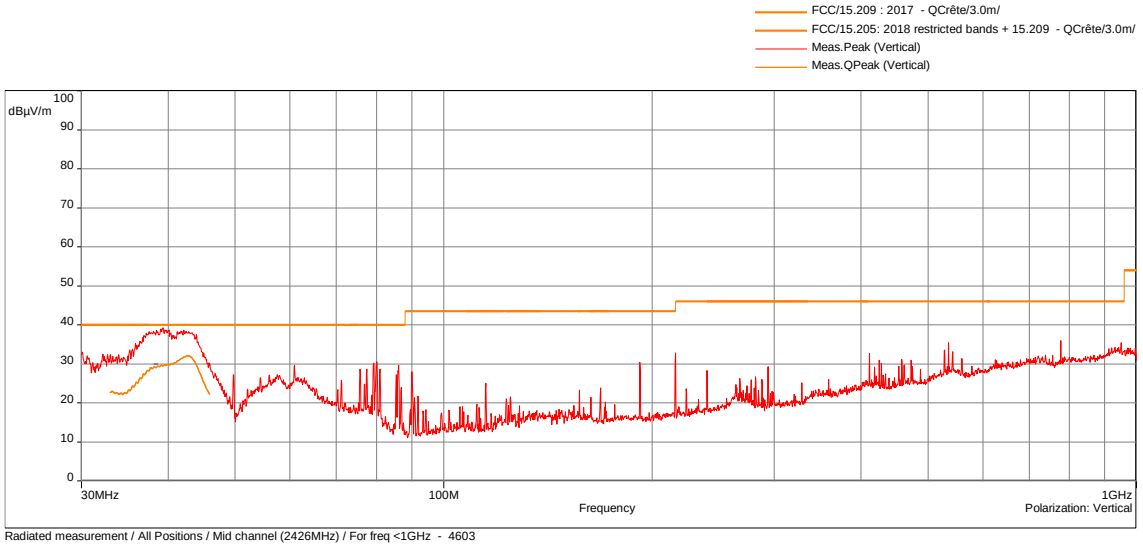


Radiated measurement / All Positions / Low channel (2402MHz) / For freq <1GHz - 4602

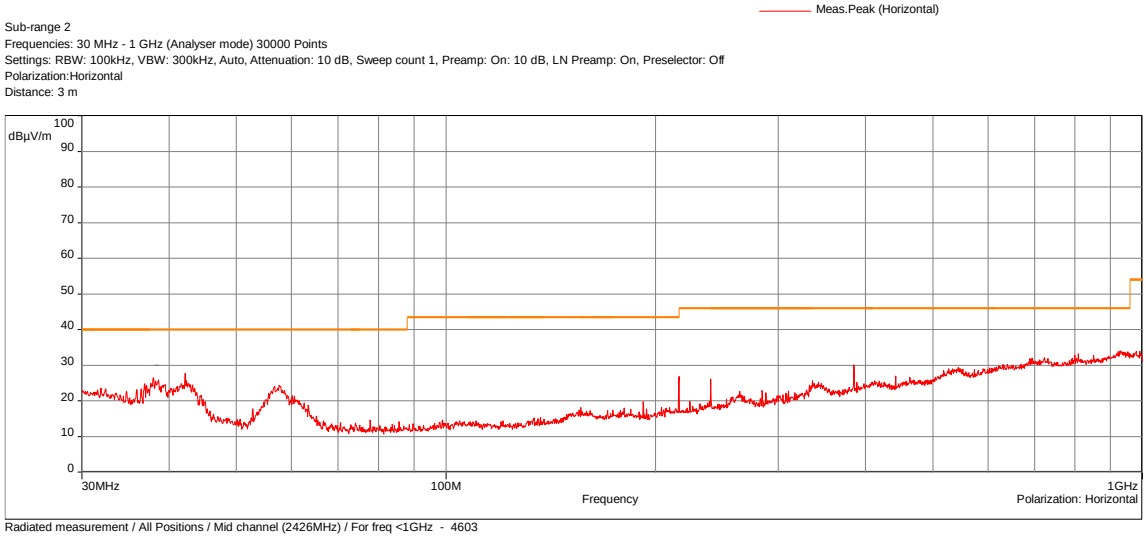
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-1GHz	100kHz	300kHz	Peak
Horizontal	30MHz-1GHz	100kHz	300kHz	Peak
Vertical	33MHz-46MHz	120kHz	-	QPeak
Vertical	190MHz-193MHz	120kHz	-	QPeak
Configuration:	N/A			
Comments:	N/A			

EUT modification(s): N/A

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
RADIATED MEASUREMENT / ALL POSITIONS / MID CHANNEL (2426MHZ) / FOR FREQ <1GHZ		EMI4603	
EUT mode:	Modulated	**T (°C):**	22.3
Test Date:	17/02/2023	**H (%):**	38.9
Test Operator:	ATO	**P (hPa):**	1009



Radiated measurement / All Positions / Mid channel (2426MHz) / For freq <1GHz - 4603

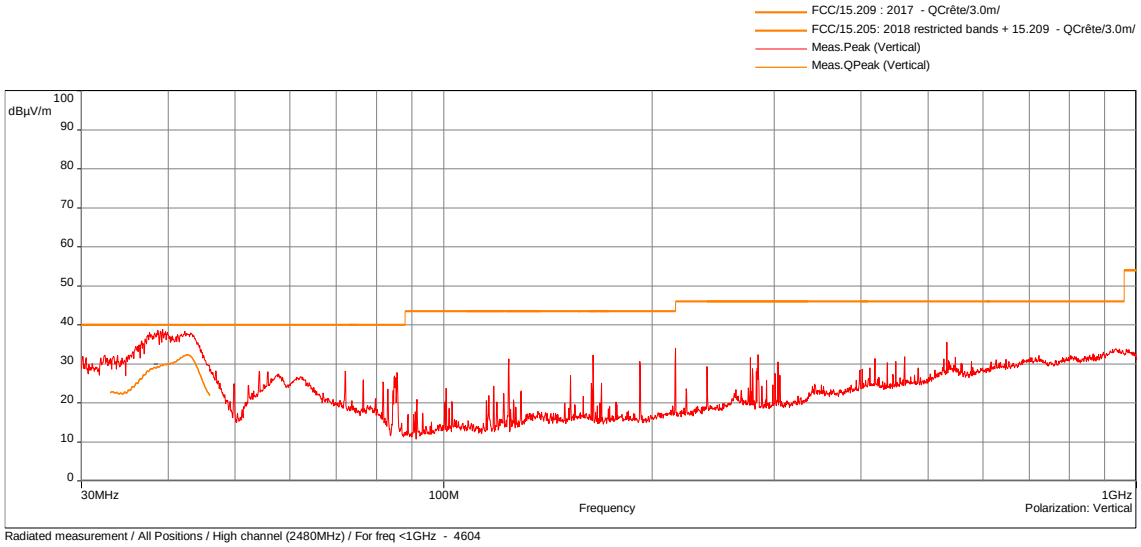


Radiated measurement / All Positions / Mid channel (2426MHz) / For freq <1GHz - 4603

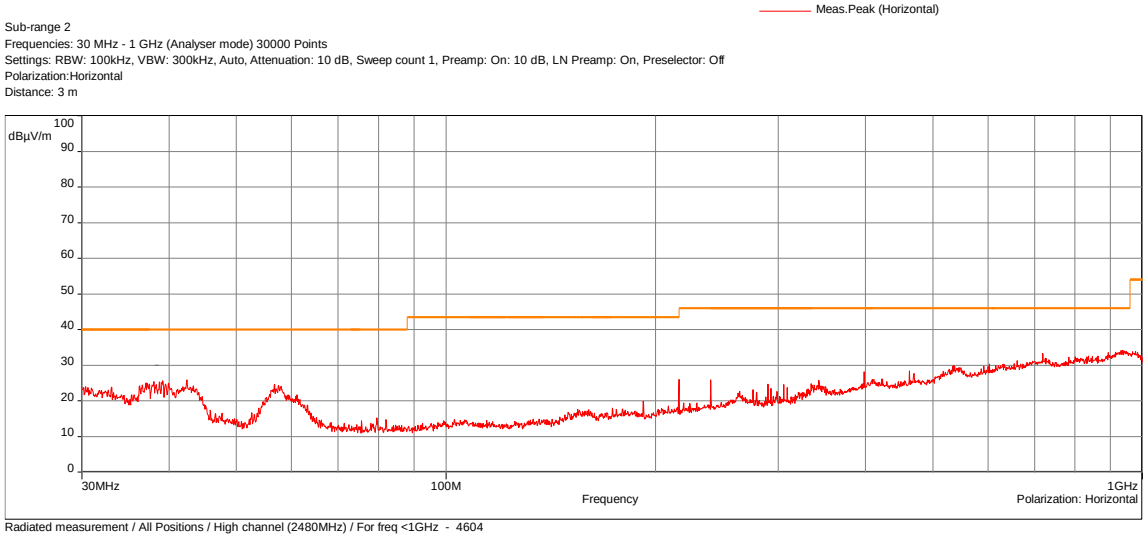
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-1GHz	100kHz	300kHz	Peak
Horizontal	30MHz-1GHz	100kHz	300kHz	Peak
Vertical	33MHz-46MHz	120kHz	-	QPeak
Configuration:	N/A			
Comments:	N/A			

EUT modification(s): N/A

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
RADIATED MEASUREMENT / ALL POSITIONS / HIGH CHANNEL (2480MHZ) / FOR FREQ <1GHZ		EMI4604	
EUT mode:	Modulated	**T (°C):**	22.3
Test Date:	17/02/2023	**H (%):**	38.9
Test Operator:	ATO	**P (hPa):**	1009



Radiated measurement / All Positions / High channel (2480MHz) / For freq <1GHz - 4604

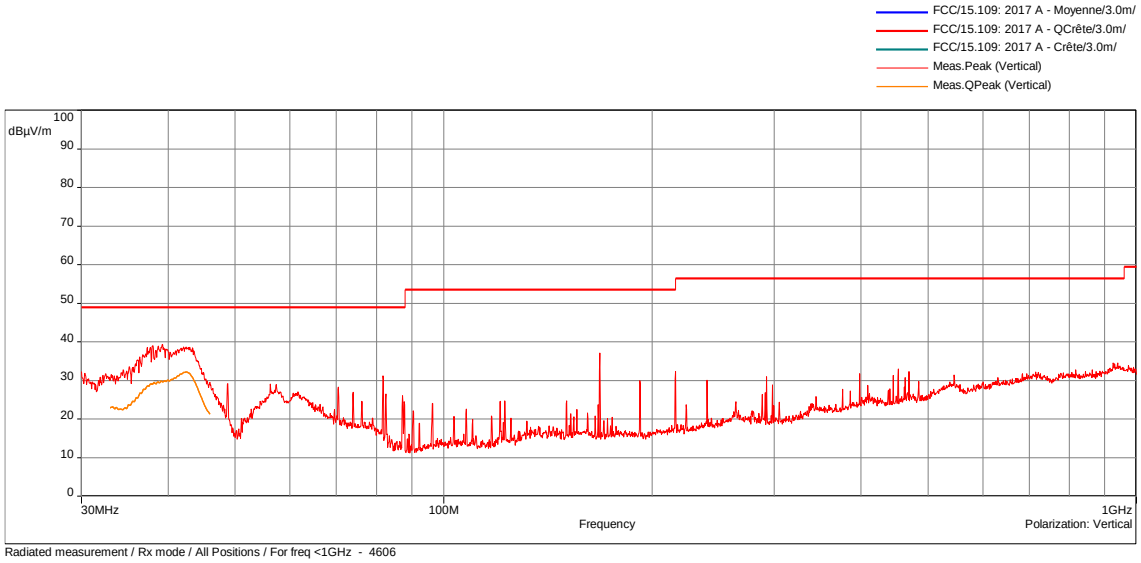


Radiated measurement / All Positions / High channel (2480MHz) / For freq <1GHz - 4604

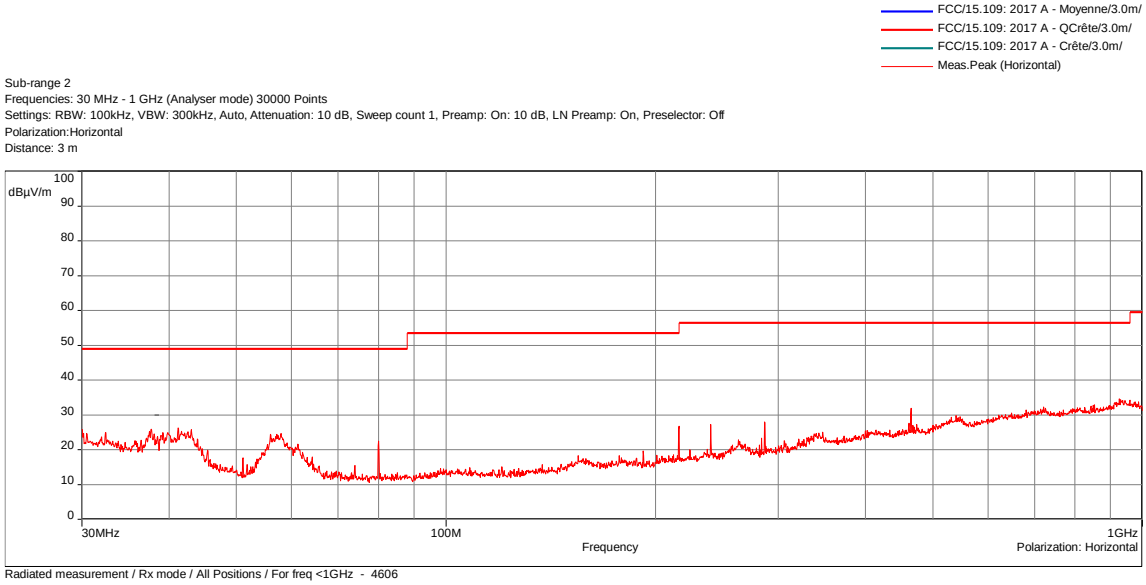
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-1GHz	100kHz	300kHz	Peak
Horizontal	30MHz-1GHz	100kHz	300kHz	Peak
Vertical	33MHz-46MHz	120kHz	-	QPeak
Configuration:	N/A			
Comments:	N/A			

EUT modification(s): N/A

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
RADIATED MEASUREMENT / RX MODE / ALL POSITIONS / FOR FREQ <1GHZ		EMI4606	
EUT mode:	Modulated	**T (°C):**	22.3
Test Date:	17/02/2023	**H (%):**	38.9
Test Operator:	ATO	**P (hPa):**	1009



Radiated measurement / Rx mode / All Positions / For freq <1GHz - 4606



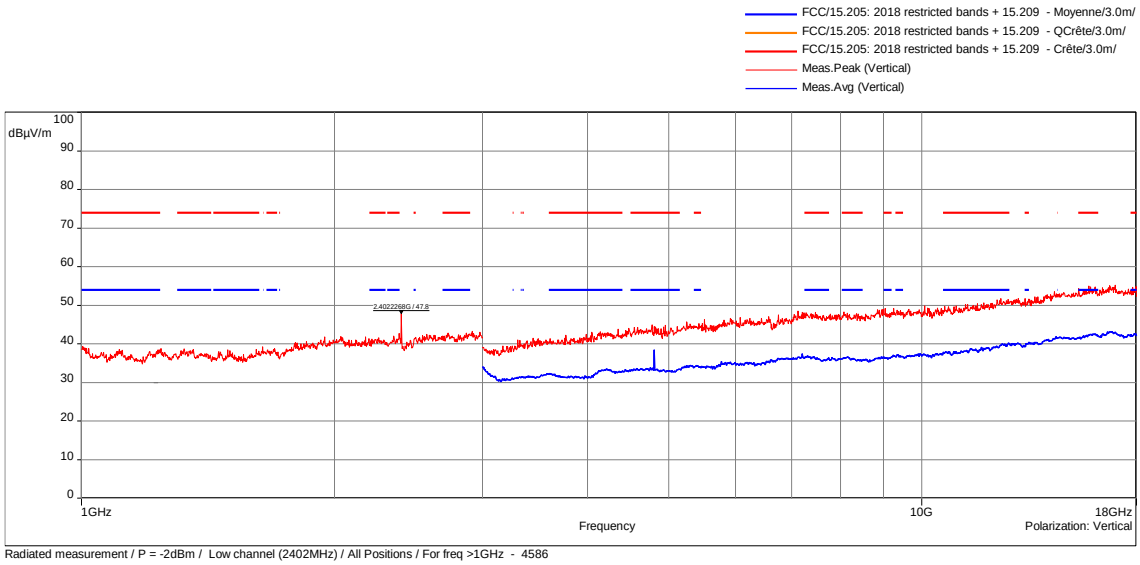
Sub-range 2
Frequencies: 30 MHz - 1 GHz (Analyser mode) 30000 Points
Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: On: 10 dB, LN Preamp: On, Preselector: Off
Polarization:Horizontal
Distance: 3 m

Radiated measurement / Rx mode / All Positions / For freq <1GHz - 4606

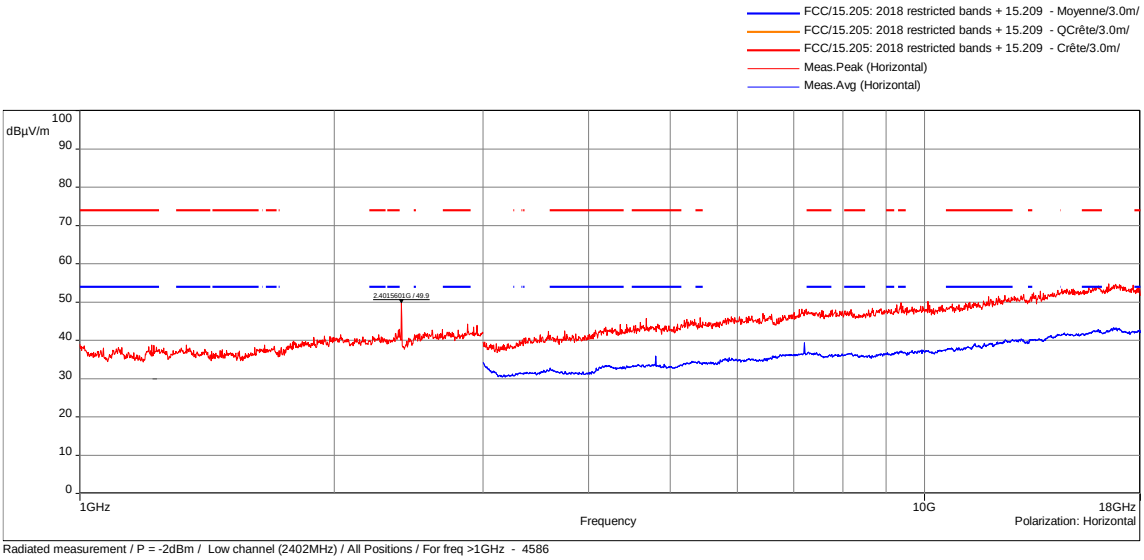
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-1GHz	100kHz	300kHz	Peak
Horizontal	30MHz-1GHz	100kHz	300kHz	Peak
Vertical	33MHz-46MHz	120kHz	-	QPeak
Configuration:	N/A			
Comments:	N/A			

EUT modification(s): N/A

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
RADIATED MEASUREMENT / LOW CHANNEL (2402MHZ) / ALL POSITIONS / FOR FREQ >1GHZ		EMI4586	
EUT mode:	Modulated	**T (°C):**	20.2
Test Date:	16/02/2023	**H (%):**	37.6
Test Operator:	ATO	**P (hPa):**	1006



Radiated measurement / P = -2dBm / Low channel (2402MHz) / All Positions / For freq >1GHz - 4586



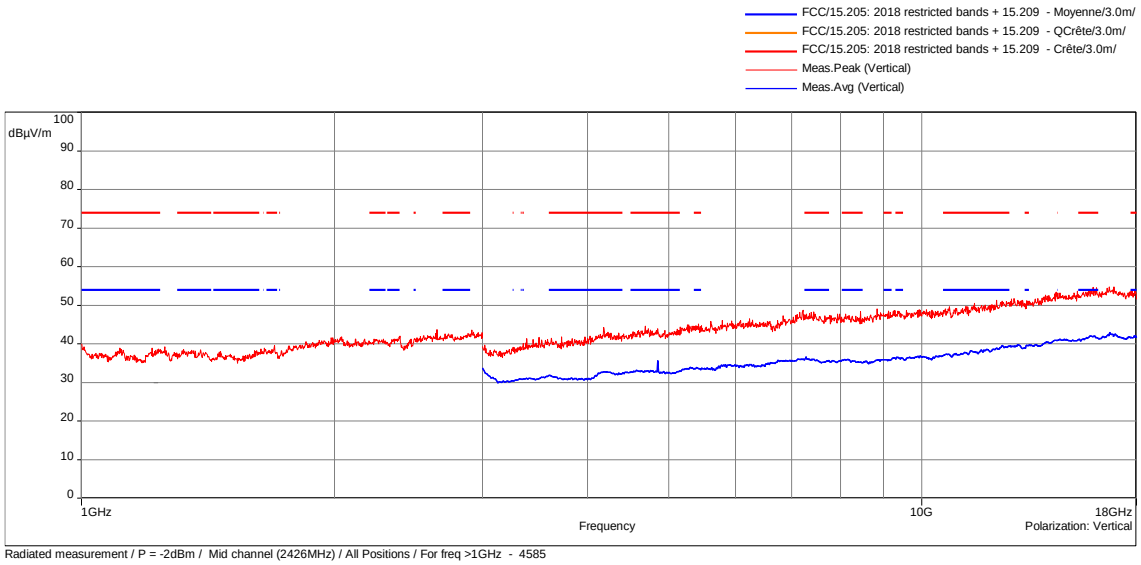
Radiated measurement / P = -2dBm / Low channel (2402MHz) / All Positions / For freq >1GHz - 4586

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-3GHz	1MHz	3MHz	Peak
Horizontal	1GHz-3GHz	1MHz	3MHz	Peak
Vertical	3GHz-18GHz	1MHz	3MHz	Peak, Avg
Horizontal	3GHz-18GHz	1MHz	3MHz	Peak, Avg

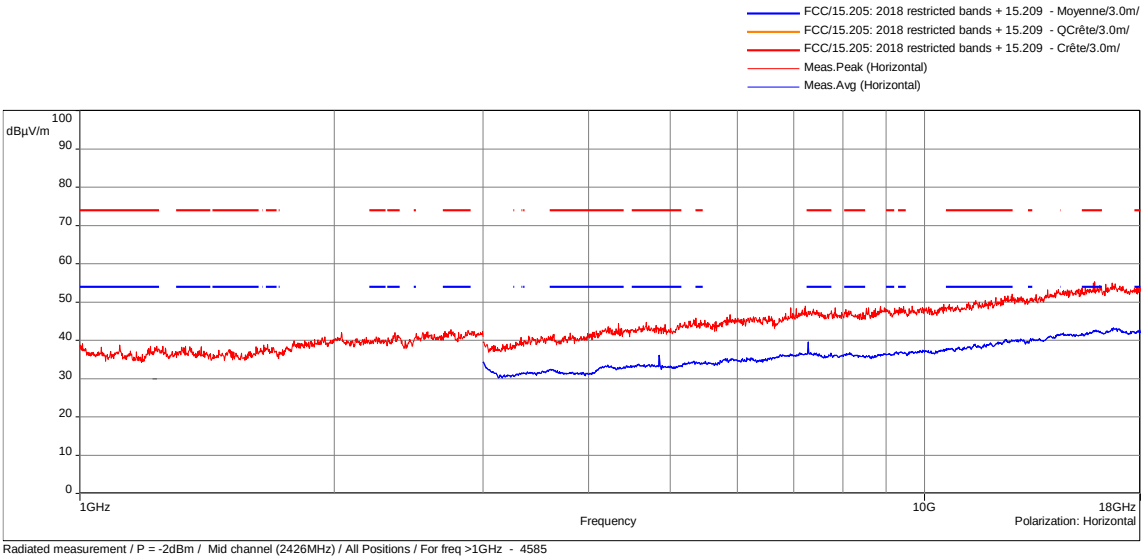
Configuration:	N/A
Comments:	Frequencies from 2400MHz to 2483.5MHz are the operating frequencies. No spurious emissions were detected.

EUT modification(s): N/A

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
RADIATED MEASUREMENT / MID CHANNEL (2426MHZ) / ALL POSITIONS / FOR FREQ >1GHZ		EMI4585	
EUT mode:	Modulated	**T (°C):**	20.2
Test Date:	16/02/2023	**H (%):**	37.6
Test Operator:	ATO	**P (hPa):**	1006



Radiated measurement / P = -2dBm / Mid channel (2426MHz) / All Positions / For freq >1GHz - 4585



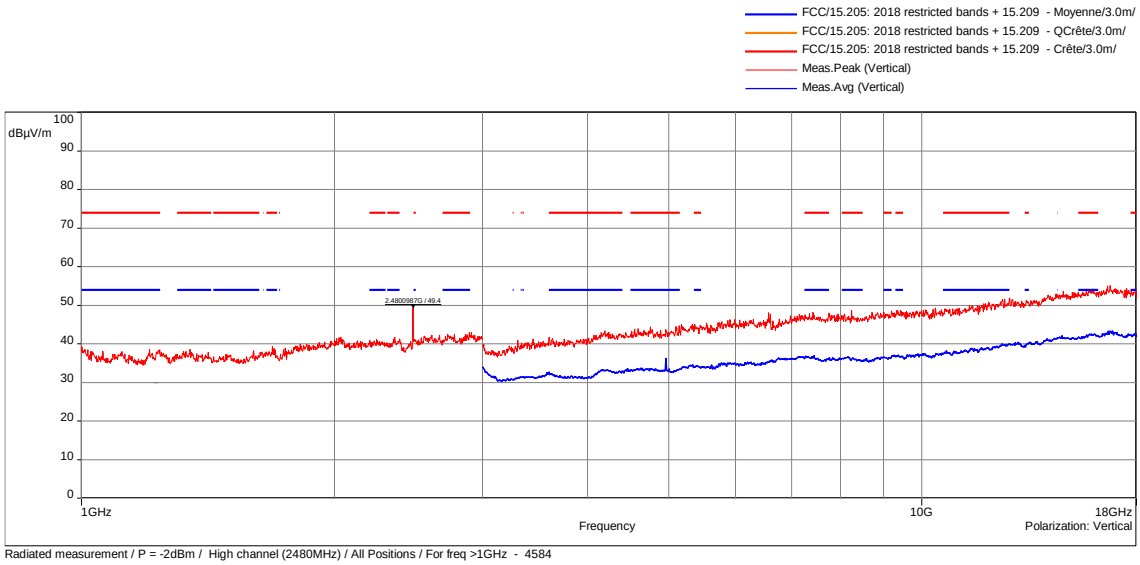
Radiated measurement / P = -2dBm / Mid channel (2426MHz) / All Positions / For freq >1GHz - 4585

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-3GHz	1MHz	3MHz	Peak
Horizontal	1GHz-3GHz	1MHz	3MHz	Peak
Vertical	3GHz-18GHz	1MHz	3MHz	Peak, Avg
Horizontal	3GHz-18GHz	1MHz	3MHz	Peak, Avg

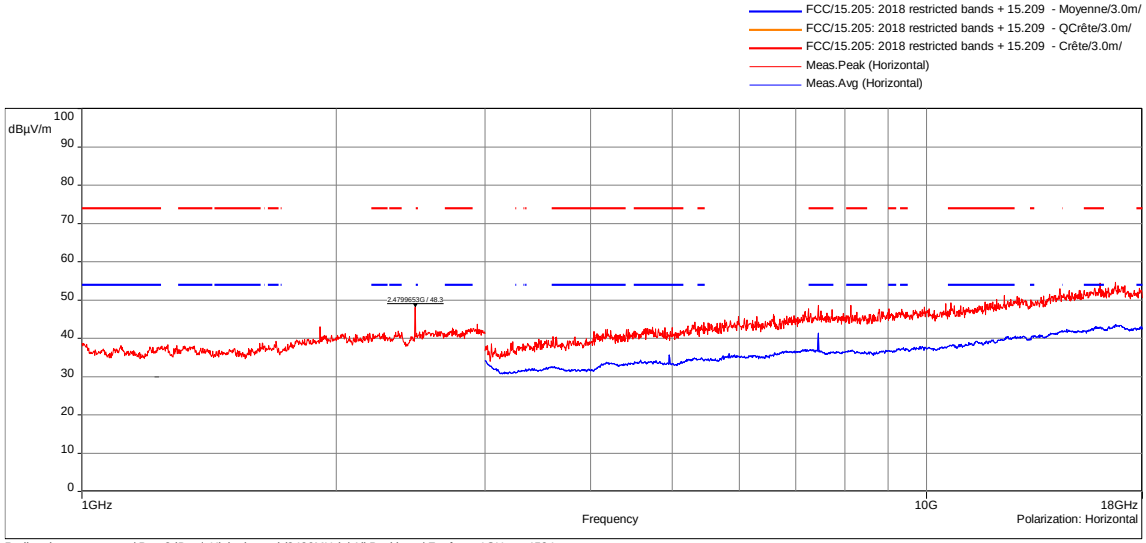
Configuration:	N/A
Comments:	Frequencies from 2400MHz to 2483.5MHz are the operating frequencies. No spurious emissions were detected.

EUT modification(s): N/A

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
RADIATED MEASUREMENT / HIGH CHANNEL (2480MHZ) / ALL POSITIONS / FOR FREQ >1GHZ		EMI4584	
EUT mode:	Modulated	**T (°C):**	20.2
Test Date:	16/02/2023	**H (%):**	37.6
Test Operator:	ATO	**P (hPa):**	1006



Radiated measurement / P = -2dBm / High channel (2480MHz) / All Positions / For freq >1GHz - 4584



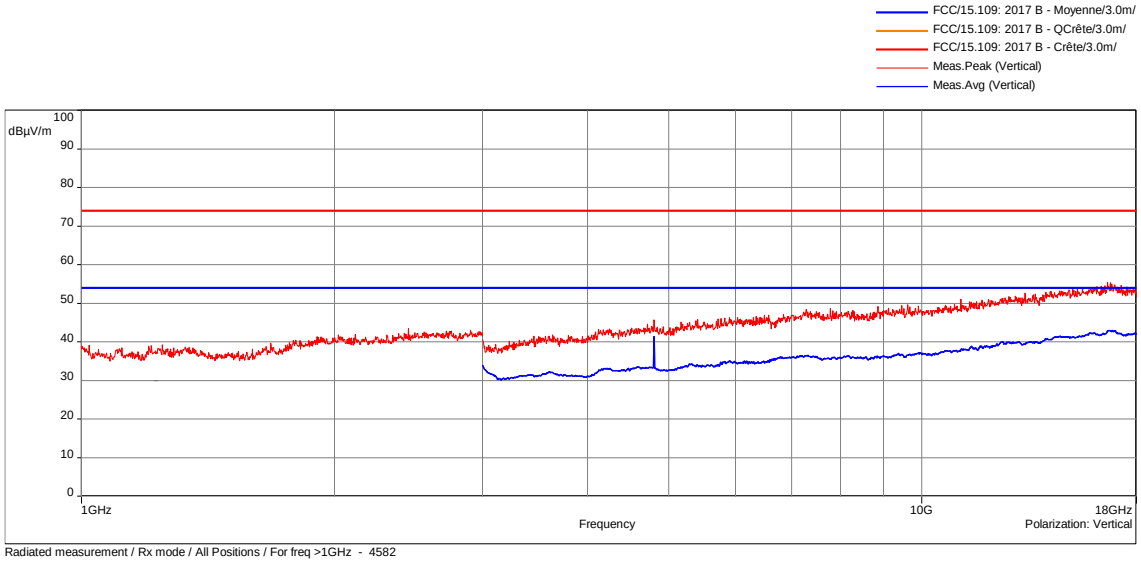
Radiated measurement / P = -2dBm / High channel (2480MHz) / All Positions / For freq >1GHz - 4584

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-3GHz	1MHz	3MHz	Peak
Horizontal	1GHz-3GHz	1MHz	3MHz	Peak
Vertical	3GHz-18GHz	1MHz	3MHz	Peak, Avg
Horizontal	3GHz-18GHz	1MHz	3MHz	Peak, Avg

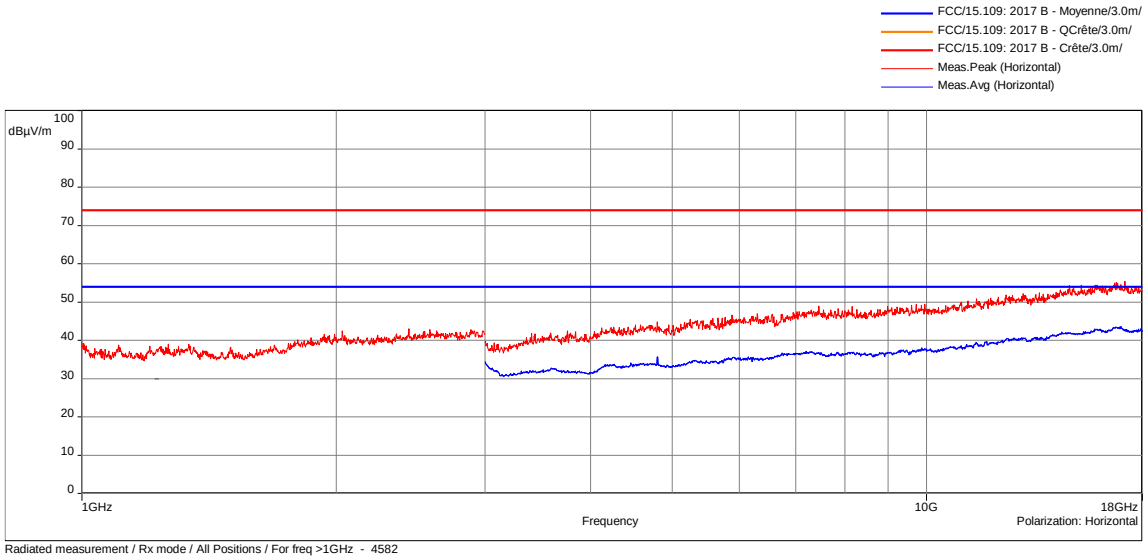
Configuration:	N/A
Comments:	Frequencies from 2400MHz to 2483.5MHz are the operating frequencies. No spurious emissions were detected.

EUT modification(s): N/A

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
RADIATED MEASUREMENT / RX MODE / ALL POSITIONS / FOR FREQ >1GHZ		EMI4582	
EUT mode:	Modulated	**T (°C):**	20.2
Test Date:	16/02/2023	**H (%):**	37.6
Test Operator:	ATO	**P (hPa):**	1006



Radiated measurement / Rx mode / All Positions / For freq >1GHz - 4582

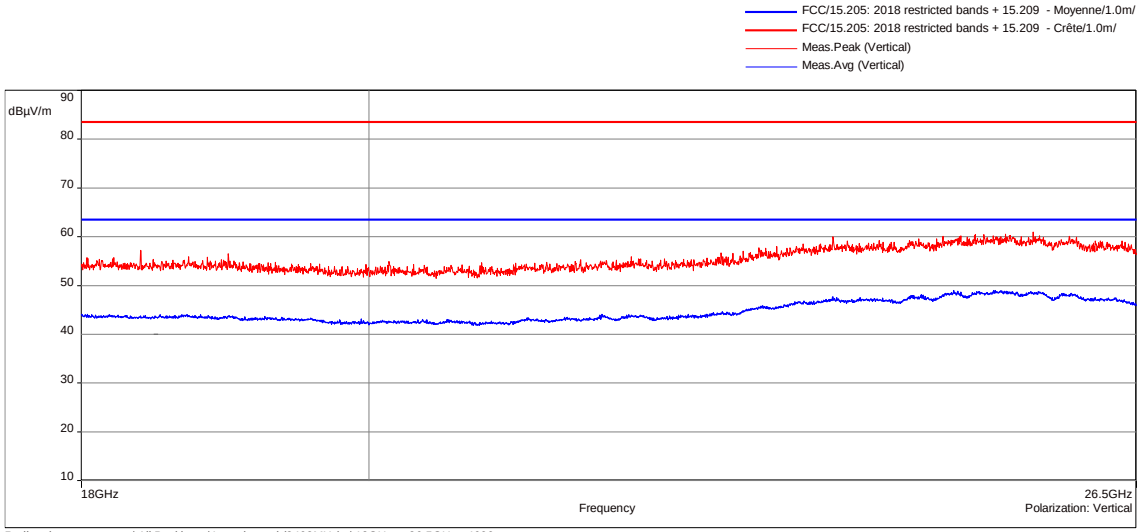


Radiated measurement / Rx mode / All Positions / For freq >1GHz - 4582

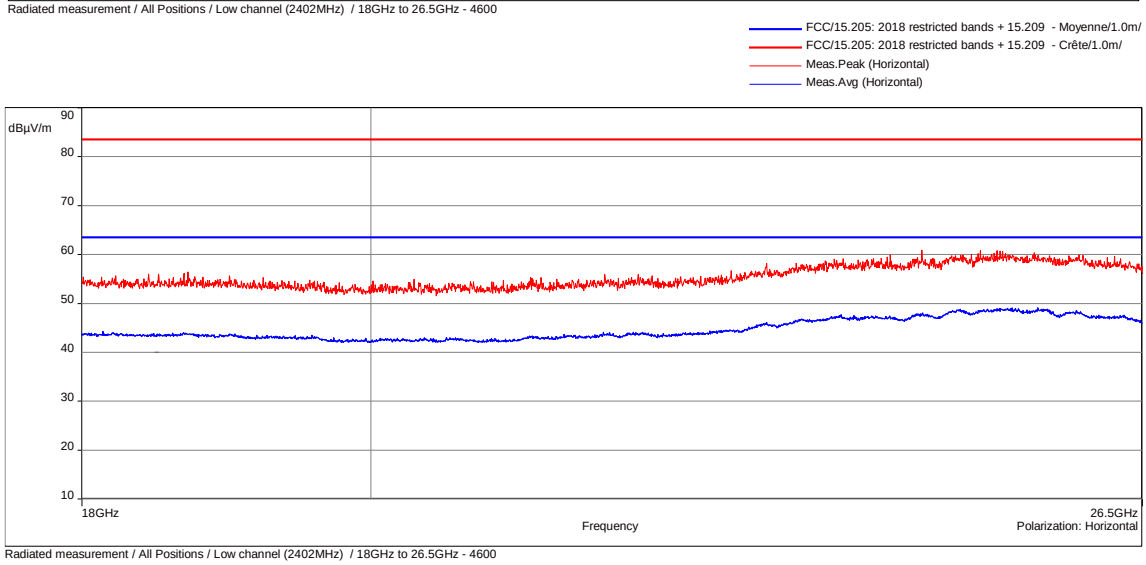
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-3GHz	1MHz	3MHz	Peak
Horizontal	1GHz-3GHz	1MHz	3MHz	Peak
Vertical	3GHz-18GHz	1MHz	3MHz	Peak, Avg
Horizontal	3GHz-18GHz	1MHz	3MHz	Peak, Avg
Configuration:	N/A			
Comments:	Frequencies from 2400MHz to 2483.5MHz are the operating frequencies.			

EUT modification(s): N/A

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
RADIATED MEASUREMENT / ALL POSITIONS / LOW CHANNEL (2402MHZ) / 18GHZ TO 26.5GHZ		EMI4600	
EUT mode:	Modulated	**T (°C):**	19.7
Test Date:	17/02/2023	**H (%):**	33.7
Test Operator:	ATO	**P (hPa):**	1009



Radiated measurement / All Positions / Low channel (2402MHz) / 18GHz to 26.5GHz - 4600

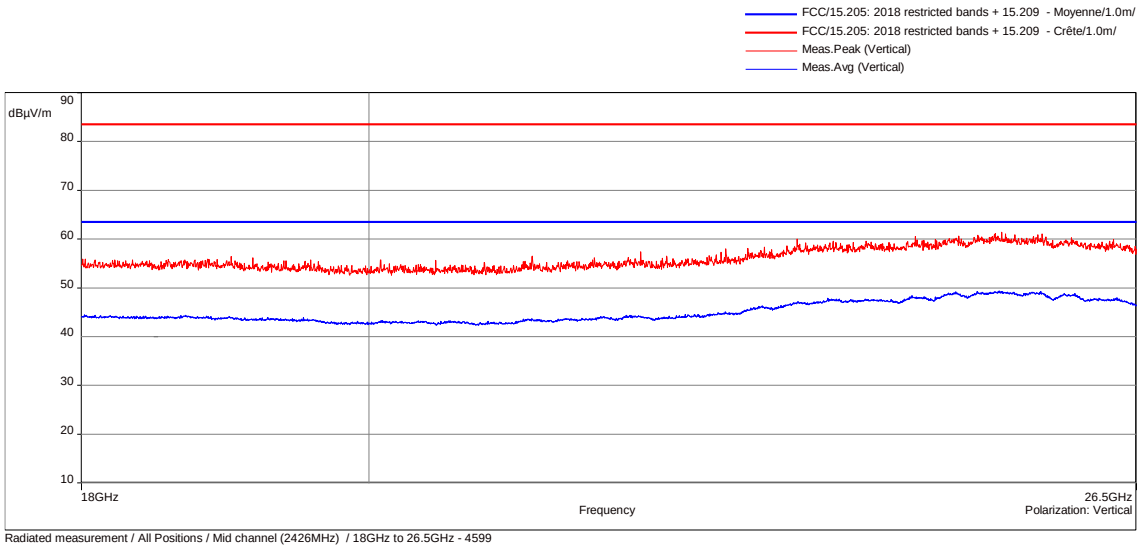


Radiated measurement / All Positions / Low channel (2402MHz) / 18GHz to 26.5GHz - 4600

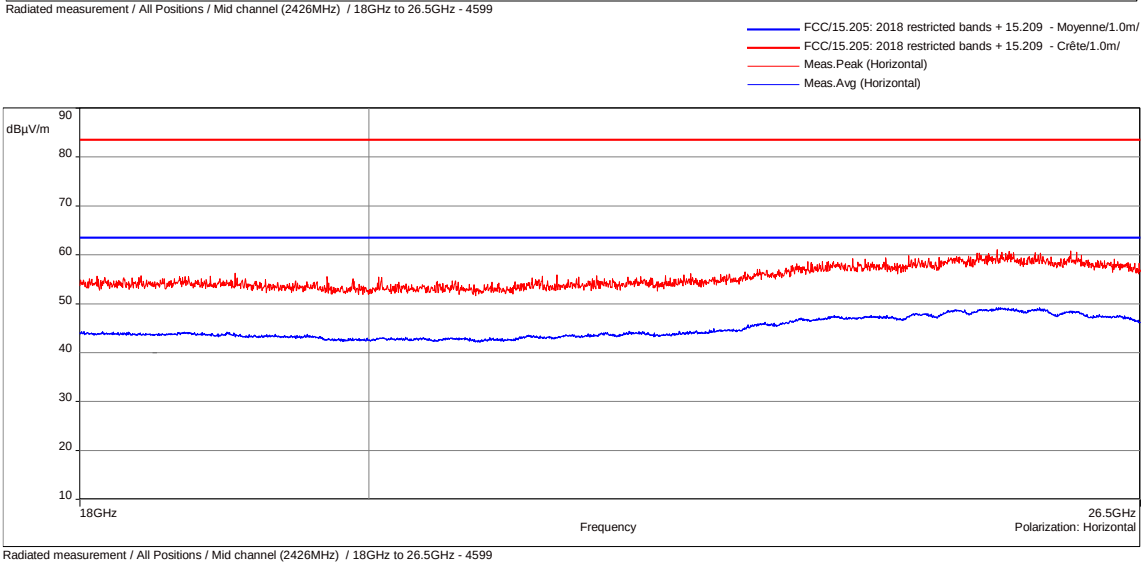
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	18GHz-26.5GHz	1MHz	3MHz	Peak, Avg
Horizontal	18GHz-26.5GHz	1MHz	3MHz	Peak, Avg
Configuration:	N/A			
Comments:	N/A			

EUT modification(s): N/A

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
RADIATED MEASUREMENT / ALL POSITIONS / MID CHANNEL (2426MHZ) / 18GHZ TO 26.5GHZ		EMI4599	
EUT mode:	Modulated	**T (°C):**	19.7
Test Date:	17/02/2023	**H (%):**	33.7
Test Operator:	ATO	**P (hPa):**	1009



Radiated measurement / All Positions / Mid channel (2426MHz) / 18GHz to 26.5GHz - 4599

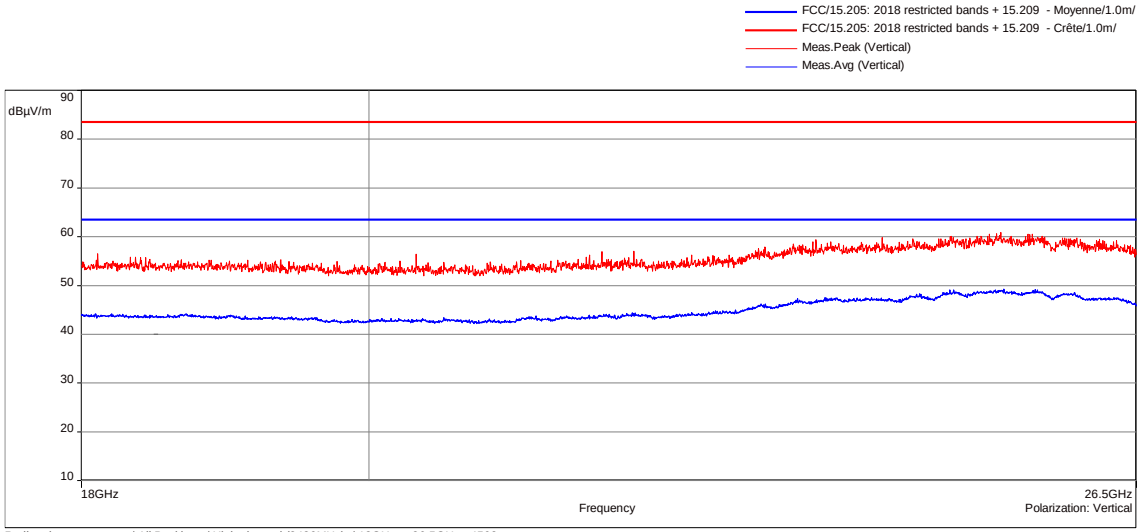


Radiated measurement / All Positions / Mid channel (2426MHz) / 18GHz to 26.5GHz - 4599

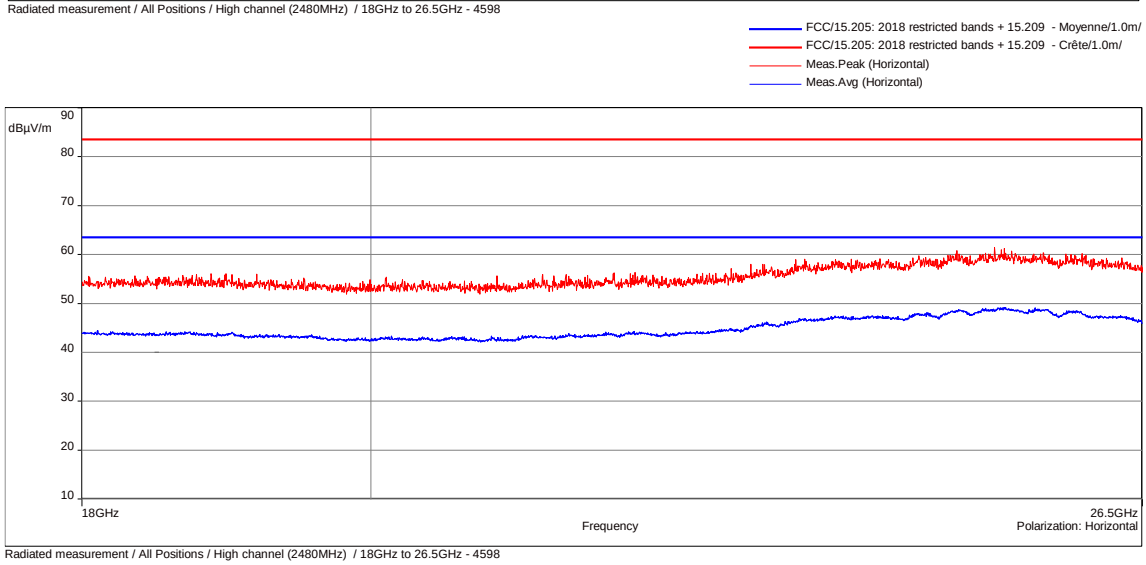
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	18GHz-26.5GHz	1MHz	3MHz	Peak, Avg
Horizontal	18GHz-26.5GHz	1MHz	3MHz	Peak, Avg
Configuration:	N/A			
Comments:	N/A			

EUT modification(s): N/A

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
RADIATED MEASUREMENT / ALL POSITIONS / HIGH CHANNEL (2480MHZ) / 18GHZ TO 26.5GHZ		EMI4598	
EUT mode:	Modulated	**T (°C):**	19.7
Test Date:	20/10/2021	**H (%):**	33.7
Test Operator:	ATO	**P (hPa):**	1009



Radiated measurement / All Positions / High channel (2480MHz) / 18GHz to 26.5GHz - 4598

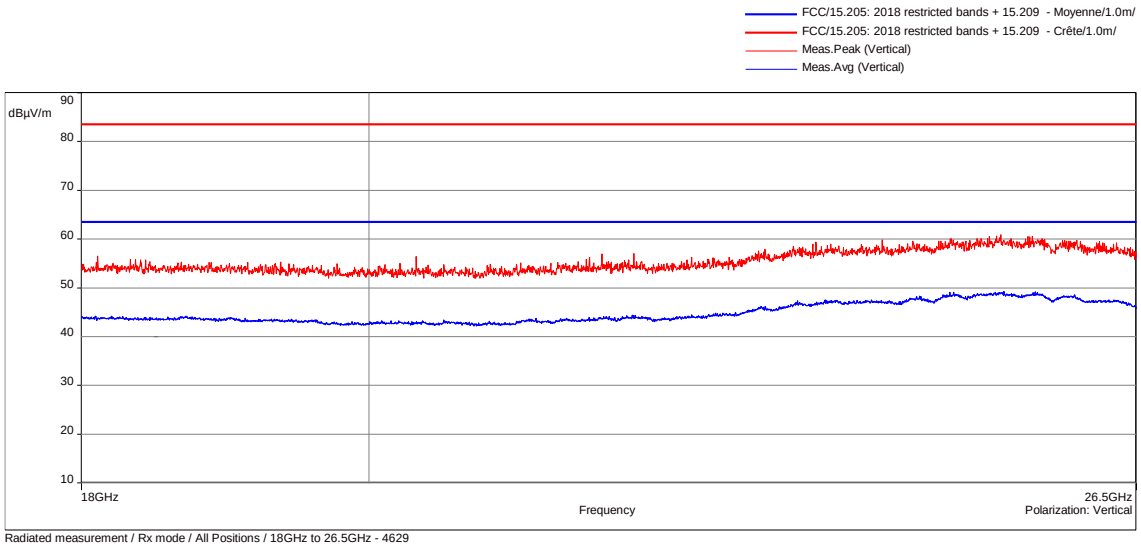


Radiated measurement / All Positions / High channel (2480MHz) / 18GHz to 26.5GHz - 4598

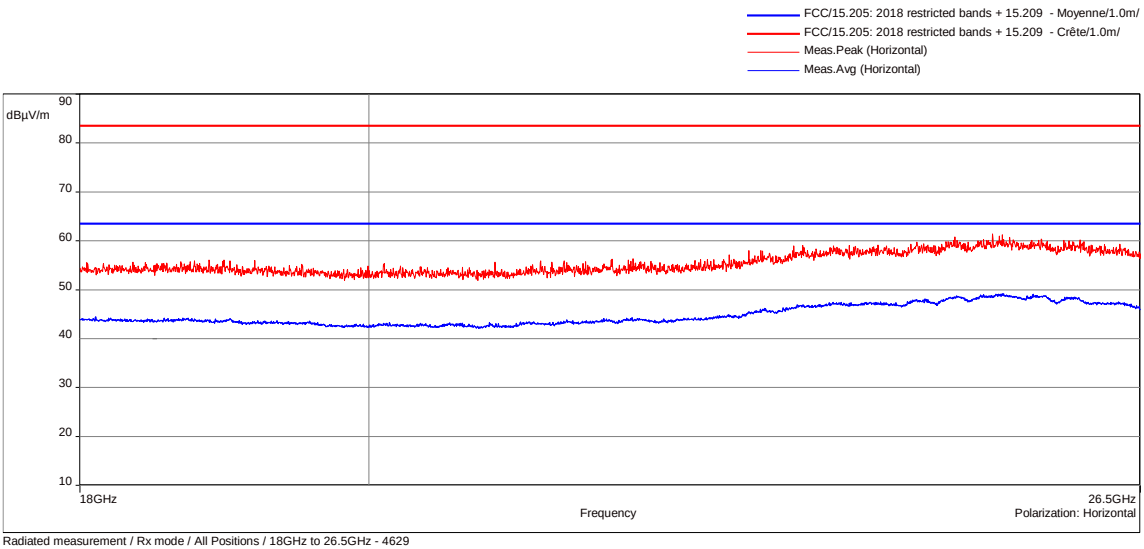
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	18GHz-26.5GHz	1MHz	3MHz	Peak, Avg
Horizontal	18GHz-26.5GHz	1MHz	3MHz	Peak, Avg
Configuration:	N/A			
Comments:	N/A			

EUT modification(s): N/A

RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >30MHZ - GRAPH			
RADIATED MEASUREMENT / RX MODE / ALL POSITIONS / 18GHZ TO 26.5GHZ		EMI4629	
EUT mode:	Modulated	**T (°C):**	19.7
Test Date:	20/10/2021	**H (%):**	33.7
Test Operator:	ATO	**P (hPa):**	1009



Radiated measurement / Rx mode / All Positions / 18GHz to 26.5GHz - 4629



Radiated measurement / Rx mode / All Positions / 18GHz to 26.5GHz - 4629

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	18GHz-26.5GHz	1MHz	3MHz	Peak, Avg
Horizontal	18GHz-26.5GHz	1MHz	3MHz	Peak, Avg
Configuration:	N/A			
Comments:	N/A			

EUT modification(s): N/A

6.9. Frequency error (*)

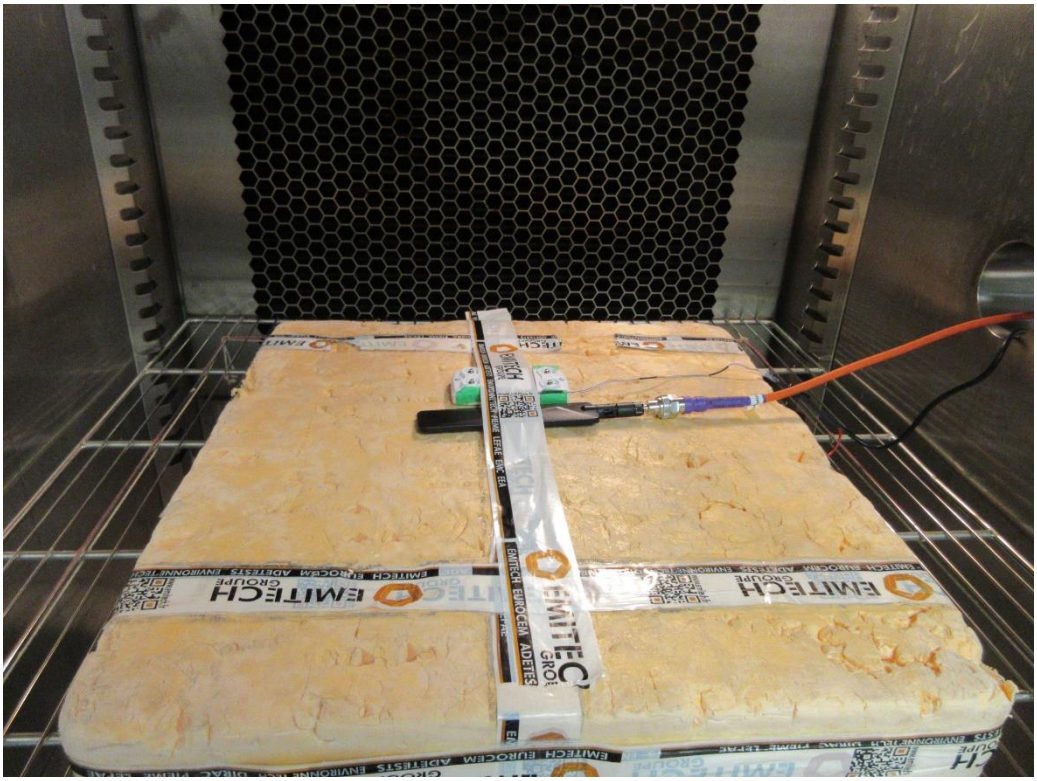
Reference standard:	FCC part 15 Radio part 15.215 and RSS-Gen
Test method:	FCC part 15 Radio part 15.215 and RSS-Gen
Test description: Frequency error is the difference between the measured unmodulated carrier frequency under extreme conditions and the nominal Centre Frequency as stated by the manufacturer. This measurement procedure only applies if the EUT can generate an unmodulated carrier. EUT is set inside the climatic enclosure. It is connected to the measuring receiver via 50Ω attenuator(s). RBW=300Hz	

TEST CASE	EUT MODE	SEVERITY	RESULT TAB.	VERDICT
Low channel / 25°C	Unmodulated	0.001%	EMI4690	**PASS**
Mid channel / 25°C	Unmodulated	0.001%	EMI4691	**PASS**
High channel / 25°C	Unmodulated	0.001%	EMI4692	**PASS**
Low channel / 10°C	Unmodulated	0.001%	EMI4693	**PASS**
Mid channel / 10°C	Unmodulated	0.001%	EMI4694	**PASS**
High channel / 10°C	Unmodulated	0.001%	EMI4695	**PASS**
Low channel / 40°C	Unmodulated	0.001%	EMI4696	**PASS**
Mid channel / 40°C	Unmodulated	0.001%	EMI4697	**PASS**
High channel / 40°C	Unmodulated	0.001%	EMI4698	**PASS**

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	24.2 °C
Relative Humidity	20 to 75 %	35.4 %
Atmospheric pressure	N/A	1002 hPa
Test method deviation: N/A		
Supplementary information: EUT is powered by internal batteries and extrêmes tests conditions are not made under COFRAC accréditation.		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Attenuator	Radiall	R412710124	17328	22/06/2020	22/08/2023
Cable	MegaPhase	TM18-N1N1-118	12841	04/10/2022	04/12/2024
Climatic enclosure	CLIMATS	EXCAL 7714-HA	14261	01/09/2022	01/11/2023
Spectrum analyzer	Rohde & Schwarz	FPL1007	17908	02/11/2022	02/01/2024
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024
Thermohygrometer	Bioblock Scientific	Météostar	0963	07/06/2021	07/08/2023

Blank cells = Permanent validity

TEST SETUP PHOTO(S) – CLIMATIC ENCLOSURE


FREQUENCY ERROR - TABULATED RESULTS				
TEST CASE	FREQUENCY (MHZ)	FREQUENCY ERROR	LIMIT	RESULT TAB.
Low channel / 25°C	2401.690835	0%	0.001%	EMI4690
Mid channel / 25°C	2425.690222	0%	0.001%	EMI4691
High channel / 25°C	2479.688803	0%	0.001%	EMI4692
Low channel / 10°C	2401.693836	0.00012%	0.001%	EMI4693
Mid channel / 10°C	2425.693276	0.00013%	0.001%	EMI4694
High channel / 10°C	2479.691991	0.00013%	0.001%	EMI4695
Low channel / 40°C	2401.689056	0.00007%	0.001%	EMI4696
Mid channel / 40°C	2425.688499	0.00007%	0.001%	EMI4697
High channel / 40°C	2479.687150	0.00007%	0.001%	EMI4698

End of test report