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NVLAP TESTING
NVLAP LAB CODE 600157-0

Test laboratory accredited according to ISO 17025

Report:	**Electromagnetic compatibility and Radio spectrum matters**	Report no:	**23CH-00972.R02**
Test item description:	**Door operator**		
Applicant:	**Gilgen Doors Systems AG, Freiburgstrasse 34, 3150 Schwarzenburg, SWITZERLAND**		
Manufacturer:	**Gilgen Doors Systems AG, Freiburgstrasse 34, 3150 Schwarzenburg, SWITZERLAND**		
Model/Type reference:	**Control Panel +**	Serial no:	**072510011.24030001**
Trade mark:	**Gilgen Door Systems**	Date of tests:	**2024-05-23 to 2024-06-03**

Standards		**Result**
47 CFR, Part 15, Subpart C	Code of Federal Regulations - Title 47 - Telecommunication, Part 15 - Radio frequency devices §15.209 and §15.247	**Pass**

These results were achieved without any modification of the EUT.

Test performed by
Ms C. Clément
EMC test-engineer

Report prepared by
Ms C. Clément
EMC test-engineer

Report controlled and approved by
Mr A. Phadtare
EMC test-engineer

Rossens, 2025-04-28

Main language : English

The present document results from tests on one specimen and does not prejudge to the conformity of all the manufactured products.
This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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1. Summary of test results

§	Test Type		Result
	Emission		**CFR 47 Part 15 Subpart C**
--	AC Conducted emission	CFR 47 § 15.207	N/A [1]
6.1	Minimum 6 dB Bandwidth	CFR 47 § 15.247 (a)(2)	Pass
6.2	Duty cycle	CFR 47 § 15.35 (c)	Pass
6.3	Power spectral density	CFR 47 § 15.247 (e)	Pass
6.4	Maximum output power	CFR 47 § 15.247 (b)(3)	Pass
6.5	Radiated emission (unwanted emission)	CFR 47 § 15.209 (a) CFR 47 § 15.247 (d)	Pass
6.6	Band-edge emission (radiated)	CFR 47 § 15.209 (a) CFR 47 § 15.247 (d)	Pass

1. Powered with DC

2. Abbreviations

Electromagnetic compatibility and radio spectrum matters:

AC	Alternating current
AFA	Adaptive Frequency Agility
AM	Amplitude Modulation
AN	Artificial Network
AV	Average
BB	Broad Band
BW	Bandwidth
CDN	Coupling Decoupling Network
CW	Continuous Wave
d(t)	Relative voltage change characteristic
DAA	Detect And Avoid spectrum access technique
dB	Decibel
dBi	Gain in decibels relative to an isotropic antenna
DC	Direct current
DL	Downlink
dmax	Maximum relative voltage change
DS	Defined State
DSSS	Direct Sequence Spread Spectrum
e.i.r.p.	equivalent isotropic radiated power
EMC	ElectroMagnetic Compatibility
ERC	European Radiocommunication Committee
ESA	Electrical/electronic sub-assembly
ESD	Electro Static Discharge
EUT	Equipment under Test
FHSS	Frequency Hopping Spread Spectrum
FS	Functional Safety
GBSAR	Ground Based Synthetic Aperture Radar
GRP	Ground reference plane
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ISM	Industrial Scientific Medical (frequency band)
ITU	International Telecommunications Union
ITU-R	International Telecommunications Union, Radio Sector
ITU-T	International Telecommunications Union, Telecommunications Sector
L1,L2,L3	Phase
LBT	Listen Before Talk
LISN	Line impedance stabilization network
MDS	Absorbing measuring clamp
MU	Master Unit
N	Neutral
NB	Narrow Band
NRI	National Radio Interfaces
N/A	Not Applicable
PE	Protective earth
PK	Peak
Plt	Long-term flicker indicator
PM	Pulse Modulation
Pst	Short-term flicker Indicator
QFE	Local atmospheric pressure (Field Elevation)
QP	Quasi-Peak
R&TTE	Radio and Telecommunications Terminal Equipment
RBW	Resolution Bandwidth
RF	Radio Frequency
RFID	Radio Frequency Identification
RU	Remote Unit
Rx	Receiver
SAC	Semi-Anechoic chamber
SCU	System Control Unit
SF-CW	Step Frequency Continuous Wave (spread spectrum)
SND/ND	Signal + Noise + Distorsion divided by Noise + Distorsion
SRD	Short Range Device
TEM	Transverse ElectroMagnetic cell
TETRA	Terrestrial Trunked Radio
THD	Total Harmonic Distortion
Tx	Transmitter
UL	Uplink
UWB	Ultra Wide Band
VBW	Video Bandwidth
VSWR	Voltage Standing Wave Ratio

Date & Time Format: yyyy-MM-dd, HH:mm

General vocabulary: http://www.electropedia.org

3. Applicant

Applicant name and address	Gilgen Doors Systems AG Freiburgstrasse 34 3150 Schwarzenburg SWITZERLAND
Contact Person	Mr. Martin Liechti
Telephone	+41 31 734 46 85
E-mail	martin.liechti@gilgends.com

4. Equipment under test

4.1 Identification

Manufacturer name and address	Gilgen Doors Systems AG Freiburgstrasse 34 3150 Schwarzenburg SWITZERLAND
Name and address of factory (ies)	Gilgen Doors Systems AG Freiburgstrasse 34 3150 Schwarzenburg SWITZERLAND
Production country	Switzerland
Trade mark	Gilgen Door Systems
Test item description	Door operator
Use description	The Gilgen Control Panel enables to set the operating mode of the door. A second control level enables the access to the most common additional functions. Gilgen Control Panel communicates via Bluetooth with a Smartphone or with Gilgen Connect Mobile (app). Full access to all door parameters is possible via the app.
Model/Type reference	Control Panel + 45-0725-100/12 (Frontend black) 45-0725-100/11 (Frontend white)
FCC ID	2BLJF-CONNECTCP
Serial no	072510011.24030001 EUT has no S/N (prototype). Marking Gilgen: RADIO #1: Used for Radiated Emission tests RADIO #2: Used for Conducted Emission tests
Software version	V0.8.12d
Highest internal frequency	100 MHz
Highest radio service frequency	2480 MHz
Supply	U = 9 – 26 VDC / I = 171 mA / 500 mA / P = 4.5 W
Dimension	~ 5.5 cm x 5.5 cm x 3 cm (l x w x h)
Weight	~ 0.2 kg
EUT photos and setup	See document 23CH-00972.R02_Annex1.pdf (dated 2025-04-28), 8 pages
Technical documentation	None. The equipment is completely identified by the above-mentioned information. Gilgen Doors Systems AG assures the traceability of the documentation and is responsible for the product identification.

The information in this table is provided by the customer and not verified by Eurofins Electric & Electronic Product Testing AG

4.2 Radio service

Technology tested	Bluetooth Low Energy (BLE)		
Type	☐ Transmitter ☐ Receiver ☒ Transceiver		
Transmitter frequency range	2402 MHz to 2480 MHz		
Tested channels	BOT channel	MID channel	TOP channel
	2402 MHz	2440 MHz	2480 MHz
Modulation	GFSK		
Data rate	1 Mbps		
Max Output Power	Declared by Applicant: 0 dBm		
Antenna gain	According to AUT test report (23CH-00972.R04 (Dated 2025-04-28), 28 pages): 2.402 GHz (BOT): -6.02 dBi 2.440 GHz (MID): -4.89 dBi 2.480 GHz (TOP): -3.91 dBi		
Antenna type	PCB trace		
Power supply	ext. DC supply: + 12 VDC or + 24 VDC		

The information in this table is provided by the customer and not verified by Eurofins Electric & Electronic Product Testing AG

4.3 Tested equipment list

Test sample	Tested equip.	S/N	Explanation*
Sample #1	GILGEN Control Pannel +	RADIO #1	Equipment with openings in the casing
Sample #2	GILGEN Control Pannel +	RADIO #2	Equipment with coaxial cable to antenna (test antenna)

* The information in this table are provided by the customer and not verified by Eurofins Electric & Electronic Product Testing AG

4.4 Classification

CFR 47 Part 15	Intentional radiator (Subpart C) ☒ The highest fundamental frequency of the EUT is less than 10 GHz (measurement shall be made up to the tenth harmonic or 40 GHz, whichever is lower). ☐ The highest fundamental frequency of the EUT is between 10 GHz and 30 GHz (measurement shall be made up to the fifth harmonic or 100 GHz, whichever is lower). ☐ The highest fundamental frequency of the EUT is above 30 GHz (measurement shall be made up to the fifth harmonic or 200 GHz, whichever is lower).

4.5 Ports

Port	Cable			Remark
	Max. length	Type	Screen	
X200	≤ 30 m	None	None	Power supply: + 24VDC, 0V CAN communication

5. Test conditions

5.1 Climatic conditions, location and date

Location	Date	Temp	Pressure (QFE)	Rel. humidity
Eurofins Electric & Electronic Product Testing AG Route de Montena 75 1728 Rossens SWITZERLAND	2024-05-23 to 2024-06-03	See §6		

5.2 Test facility and methodology

The alternate test site is accepted by FCC:
- Test Firm Registration Number: 683197
- Designation Number: CH5001

Conducted and radiated measurements are performed according to the ANSI C63.4 (2014) + C63.4a (2017) and ANSI C63.10 (2020) procedures.

5.3 Attendant persons

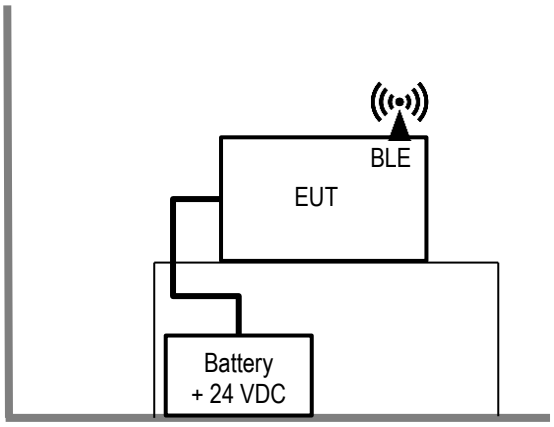
Test Engineer(s):

Ms C. Clément

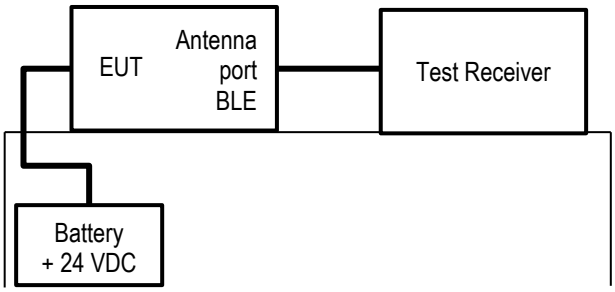
Other(s):

Name	Company
Mr M. Liechti (partially)	Gilgen Doors Systems AG
Mr. B. Frei (partially)	Gilgen Doors Systems AG

5.4 Test configuration



Test configuration – Radiated Emission



Test configuration – Conducted Emission

5.5 Operating conditions

Power supply during tests: + 24 VDC from external battery
- Continuous TX
- Duty cycle 100 %
- Max power set to 9 (0 dBm)
- GFSK Modulated Carrier with PRBS9
- Data rate 1 Mbps

5.6 Monitoring of the EUT

The performance of the EUT during the test is monitored as following:

The EUT is monitored (setup of frequency) with a software installed on a portable PC.
Software used : SmartSnippets Toolbox v5.0.24.4128

5.7 Auxiliary equipment

The following pieces of equipment are used for the monitoring of the EUT or are necessary for the EUT but they are not part of the EUT.

Product	Brand	Model No.	ID	Remark
Portable PC	DELL	Vostro 3750	H2M20Q1	Eurofins equipment Used to configure the BLE channels

5.8 General remarks

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Compliance assessment

The statements of conformity are made on the basis of the testing standards and by applying the measurement uncertainties according to the rules in the applied standards as follows:

- Compliance is deemed to occur if no measured value exceeds the respective limit.
- Non-compliance is deemed to occur if any measured value exceeds the respective limit.

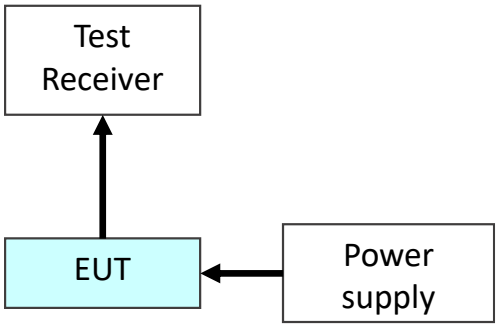
No additional margin to the limit is considered under the condition that the measurement instruments fulfil the requirements of the IECEE OD-5014 and the measurement uncertainty does not exceed the limits given in the relevant standards (e.g. U_{CISPR} as per CISPR 16-4-2, IEC 61000-4 series or product standards).

6. Test results

6.1 Minimum 6 dB bandwidth

FCC reference:	Part 15.247 (a)(2)
Test Method:	6 dB Bandwidth test was performed using a spectrum analyser in accordance with FCC KDB 558074 Section 8.2 referring ANSI C63.10 Section 11.8.1 Option 1
Limit:	Minimum 6 dB bandwidth shall be at least 500 kHz

Test setup



Block diagram

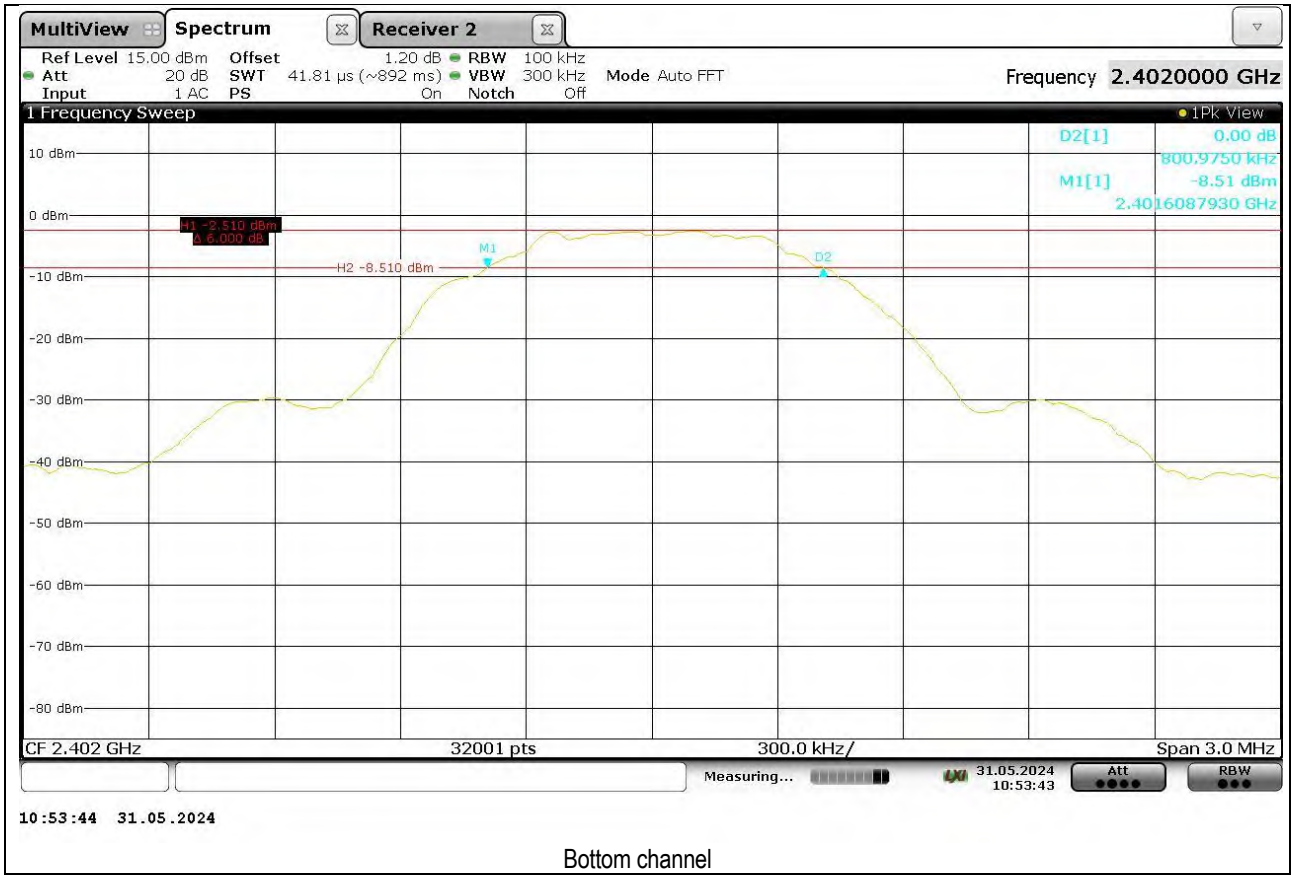
Test summary

Test engineer:	Ms C. Clément		
Test date:	2024-05-31		
Climatic conditions:	Temperature: 23 °C	Humidity: 42 %	Pressure QFE: 931 hPa
Test site:	Laboratory		
Test sample used:	Sample #2, see §4.3		
Operating mode:	See §5.5		
Cables connected:	DC supply, temporary antenna cable		
Modifications:	None		
Spectrum Analyser:	RBW: 100 kHz, VBW: 300 kHz		
	Detector: Peak, Trace mode: Max Hold		
	Sweep time: Auto, Span: 3 MHz		
	Measurement: 6 dB down from the peak of the signal		
Remarks:	Measured values take into consideration the external attenuation correction factors. The RF cable attenuation including the RF connector is assumed to be 1.2 dB (no information given by the Applicant on the RF cable attenuation).		

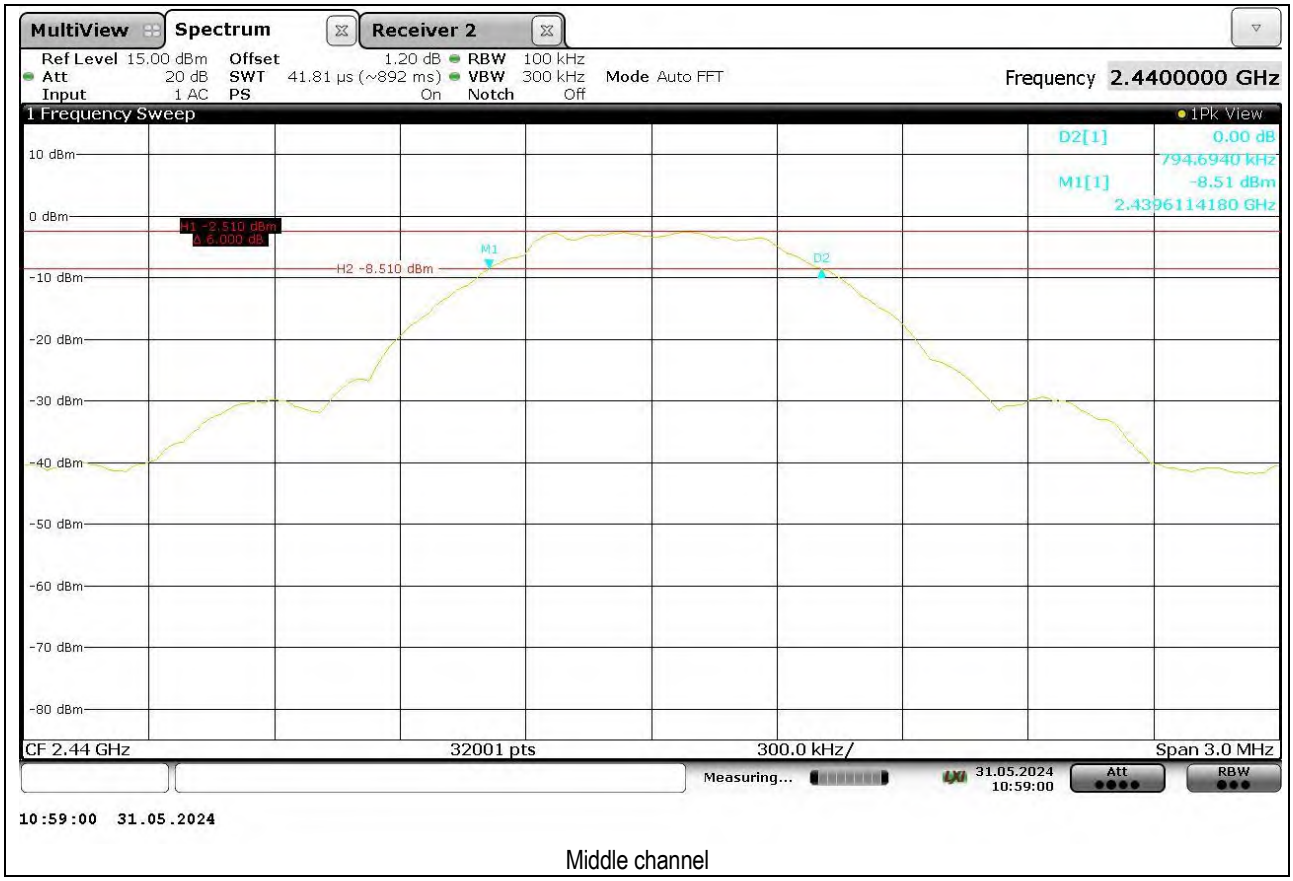
Result:	☒ **pass**	☐ **fail**	☐ **not applicable**	☐ **partly tested**

Results of the test

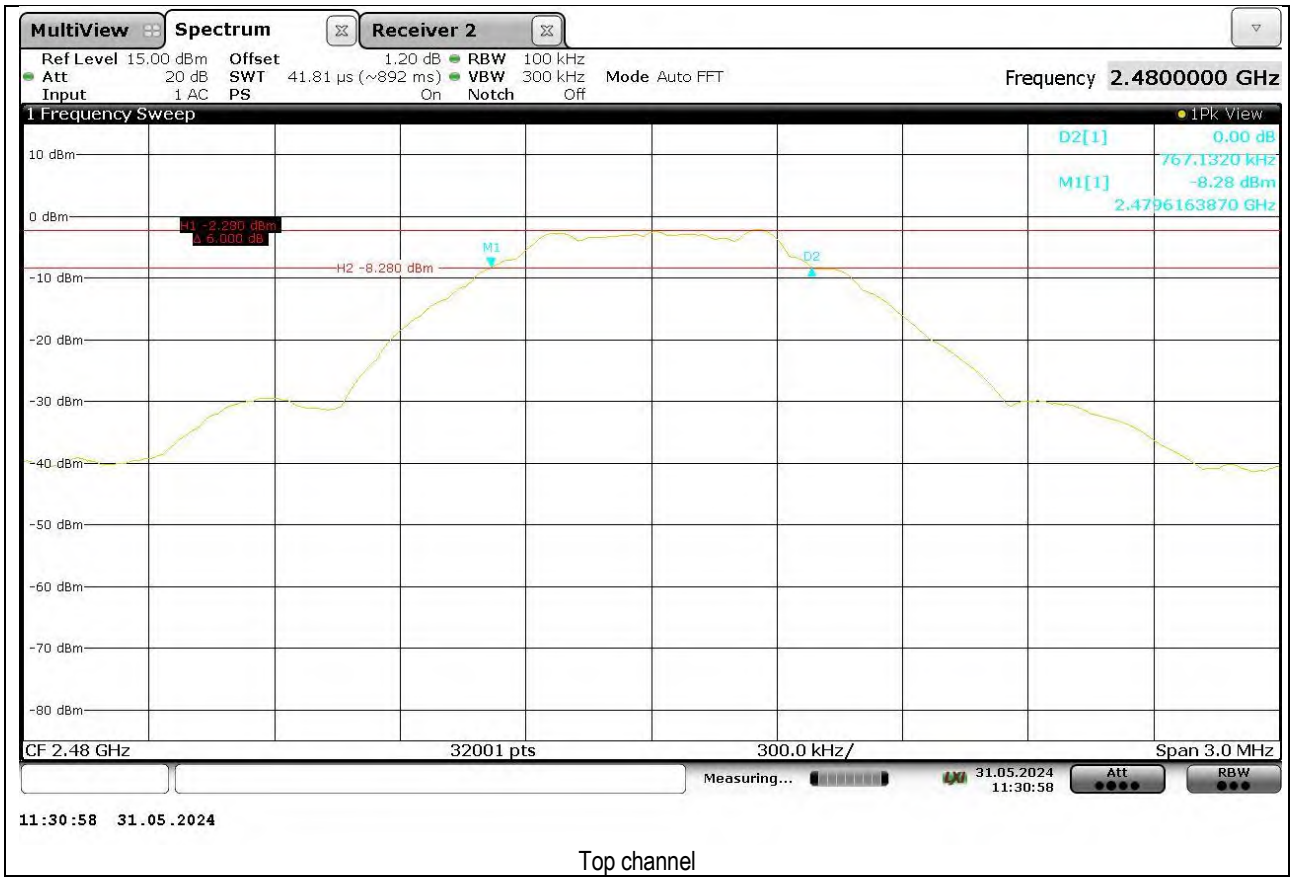
Frequency [GHz]	Channel	6 dB bandwidth [kHz]	Limit [kHz]	Margin [kHz]	Result
2.402	BOT	800.97	500	300.97	Pass
2.440	MID	794.69	500	294.69	Pass
2.480	TOP	767.13	500	267.13	Pass



Bottom channel



Middle channel



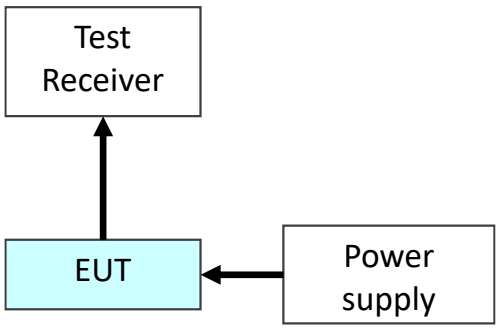
Top channel

6.2 Duty cycle

FCC reference: Part 15.35 (c)

Test Method: Test was performed using a spectrum analyser in accordance with FCC KDB 558074 Section 6 referring ANSI C63.10 Section 11.6.

Test setup



Block diagram

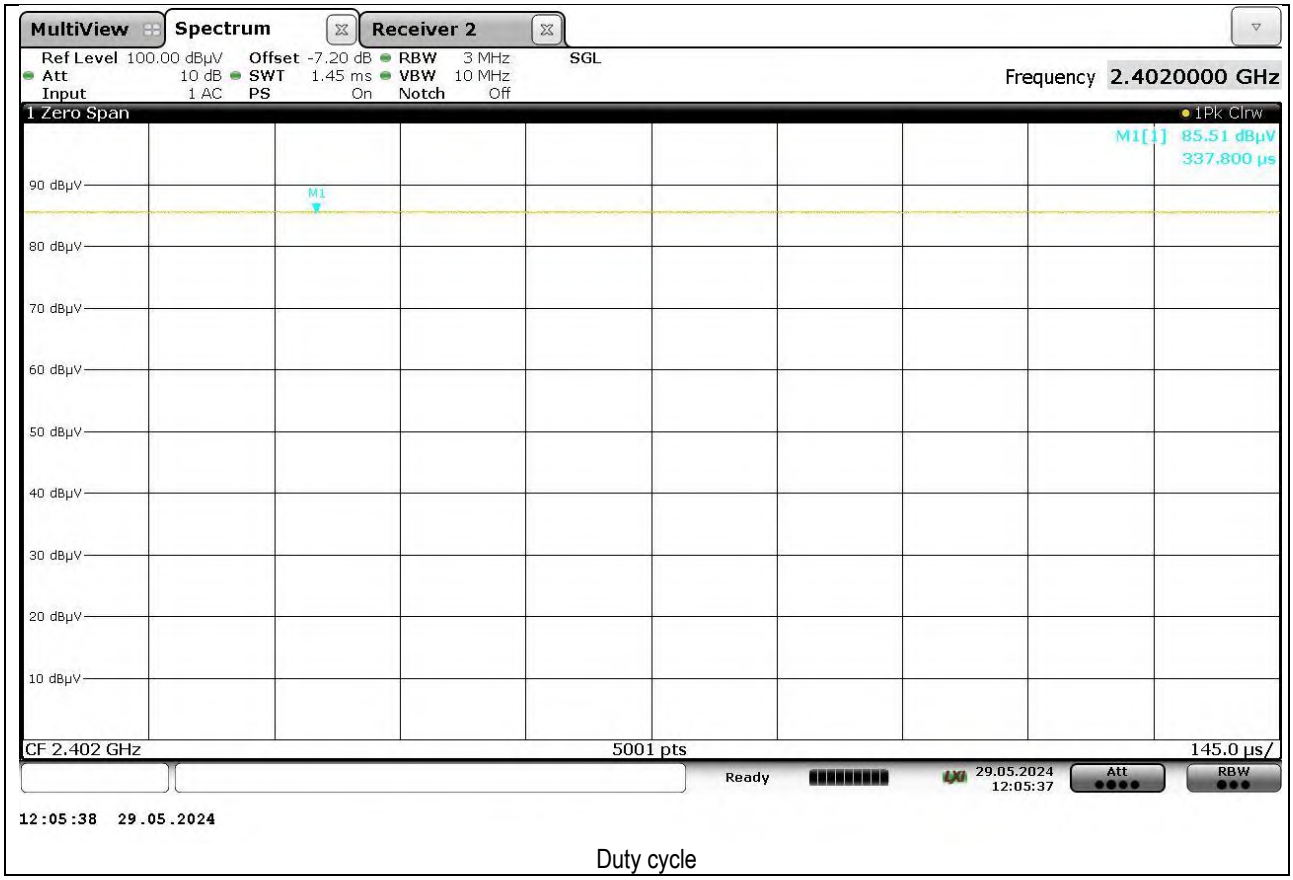
Test summary

Test engineer:	Ms C. Clément		
Test date:	2024-05-31		
Climatic conditions:	Temperature: 23 °C	Humidity: 42 %	Pressure QFE: 931 hPa
Test site:	Laboratory		
Test sample used:	Sample #2, see §4.3		
Operating mode:	See §5.5		
Cables connected:	DC supply, temporary antenna cable		
Modifications:	None		
Spectrum Analyser:	RBW: 3 MHz, VBW: 10 MHz		
	Detector: Peak, Trace mode: Max Hold		
	Sweep time: Auto, Span: 0		
Remarks:	Measured values take into consideration the external attenuation correction factors. The RF cable attenuation including the RF connector is assumed to be 1.2 dB (no information given by the Applicant on the RF cable attenuation).		

Result:	☒ **pass**	☐ **fail**	☐ **not applicable**	☐ **partly tested**

Results of the test

Duty cycle: 100 %



Duty cycle

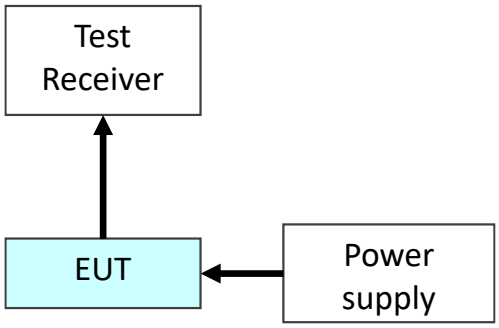
6.3 Power spectral density

FCC reference: Part 15.247 (e)

Test Method: Test was performed using a spectrum analyser in accordance with FCC KDB 558074 Section 8.4 referring ANSI C63.10 Section 11.10.

Limit: 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.

Test setup



Block diagram

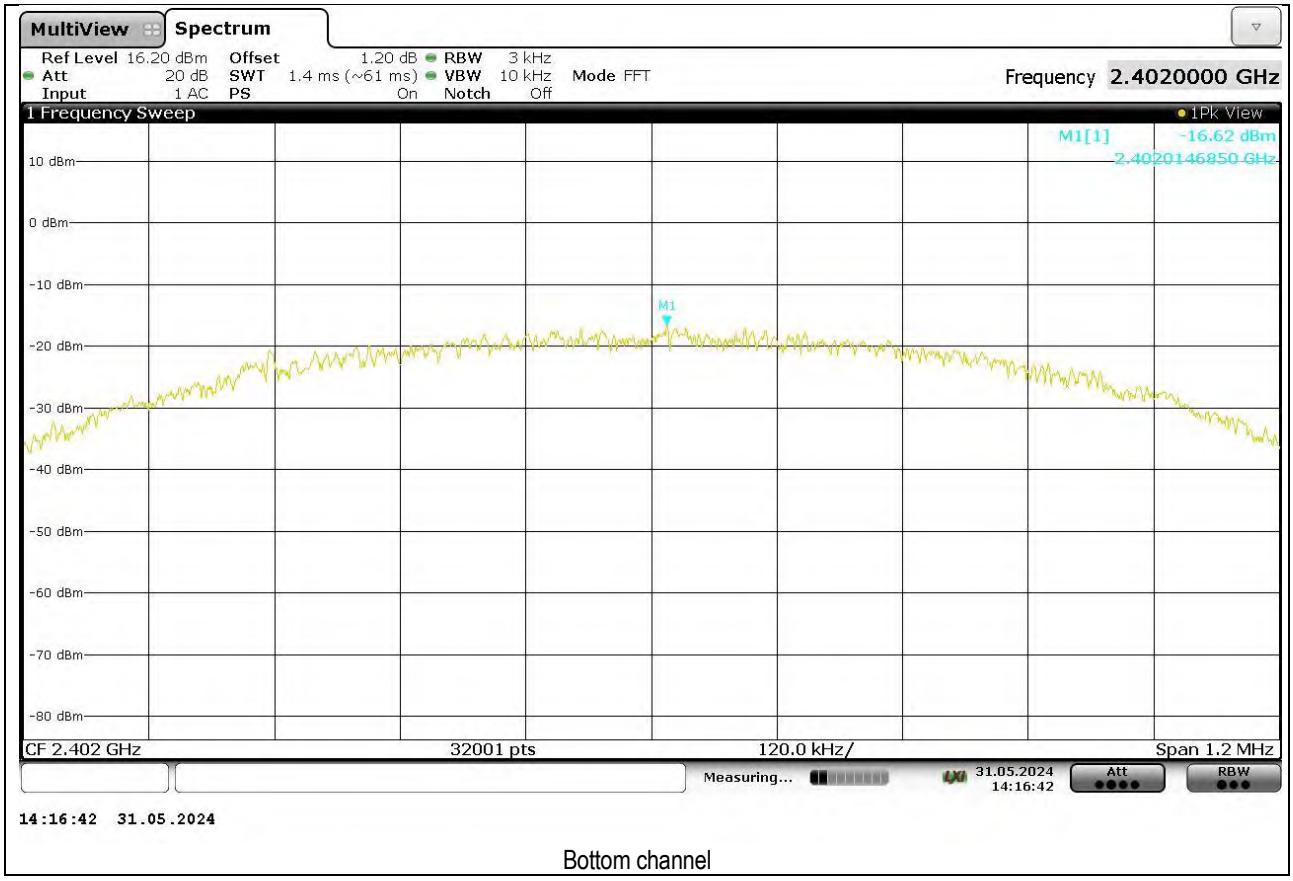
Test summary

Test engineer:	Ms C. Clément		
Test date:	2024-05-31		
Climatic conditions:	Temperature: 23 °C	Humidity: 42 %	Pressure QFE: 931 hPa
Test site:	Laboratory		
Test sample used:	Sample #2, see §4.3		
Operating mode:	See §5.5		
Cables connected:	DC supply, temporary antenna cable		
Modifications:	None		
Spectrum Analyser:	RBW: 3 kHz, VBW: 10 kHz		
	Detector: Peak, Trace mode: Max Hold		
	Sweep time: Auto		
	Measurement: Marker placed on the peak of the signal		
Remarks:	Measured values take into consideration the external attenuation correction factors. The RF cable attenuation including the RF connector is assumed to be 1.2 dB (no information given by the Applicant on the RF cable attenuation).		

Result:	☒ **pass**	☐ **fail**	☐ **not applicable**	☐ **partly tested**

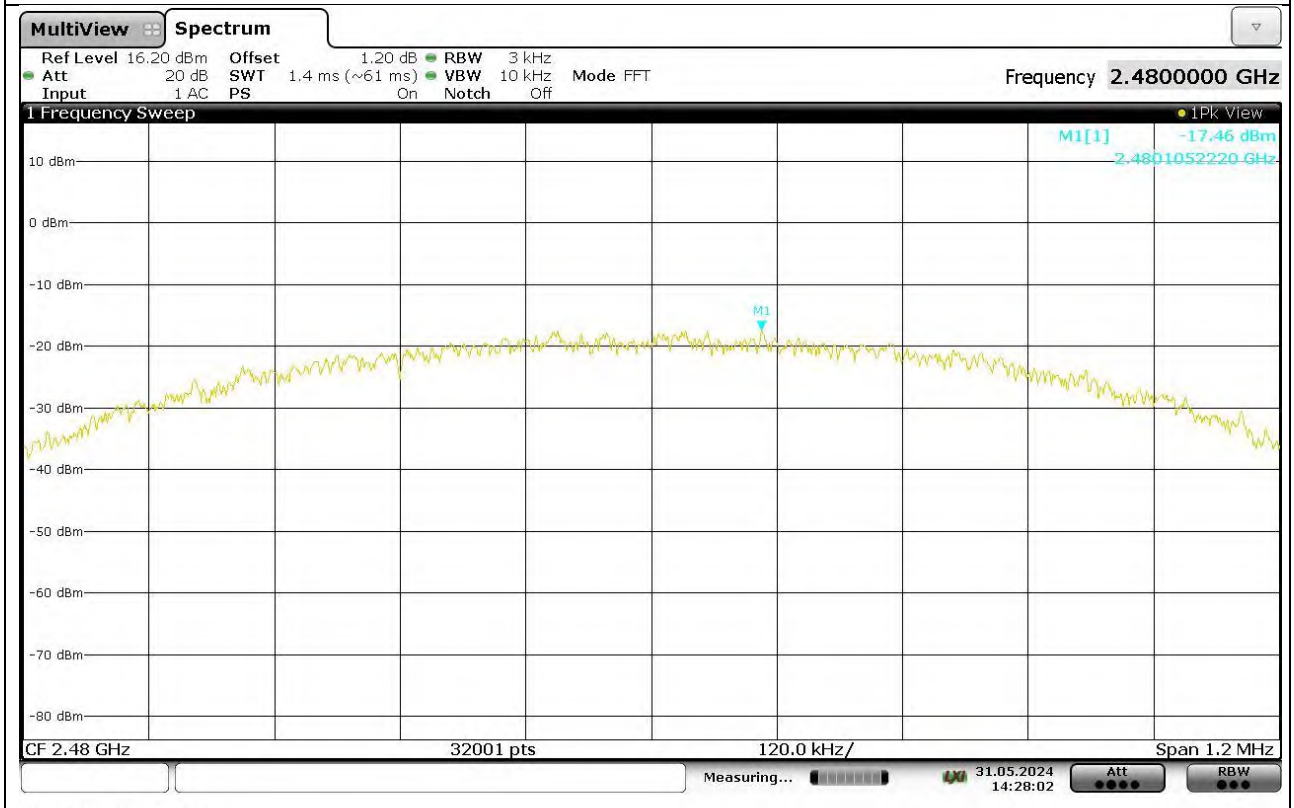
Results of the test

Frequency [GHz]	Channel	PSD / 3 kHz band [dBm]	Limit / 3 kHz band [dBm]	Margin [dB]	Result
2.402	BOT	-16.62	8	-24.62	Pass
2.440	MID	-16.24	8	-24.24	Pass
2.480	TOP	-17.46	8	-25.46	Pass



Bottom channel

Middle channel

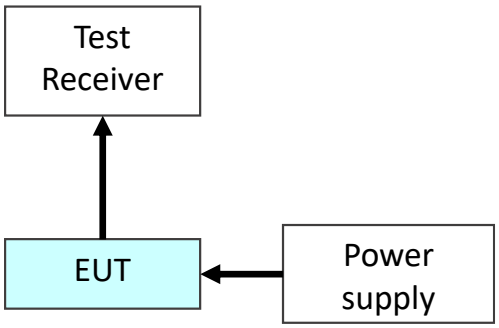


Top channel

6.4 Maximum peak conducted output power

FCC reference:	Part 15.247 (b)(3)
Test Method:	Test was performed using a spectrum analyser in accordance with FCC KDB 558074 Section 8.3.1.1 with RBW > DTS Bandwidth referring ANSI C63.10:2013 Section 11.9.1.1
Limit:	Maximum 1 Watt (= 30 dBm) for systems using antennas with directional gains that do not exceed 6 dBi. If antennas with directional gains exceeding 6 dBi are used, the maximum peak output power shall be reduced as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi

Test setup



Block diagram

Test summary

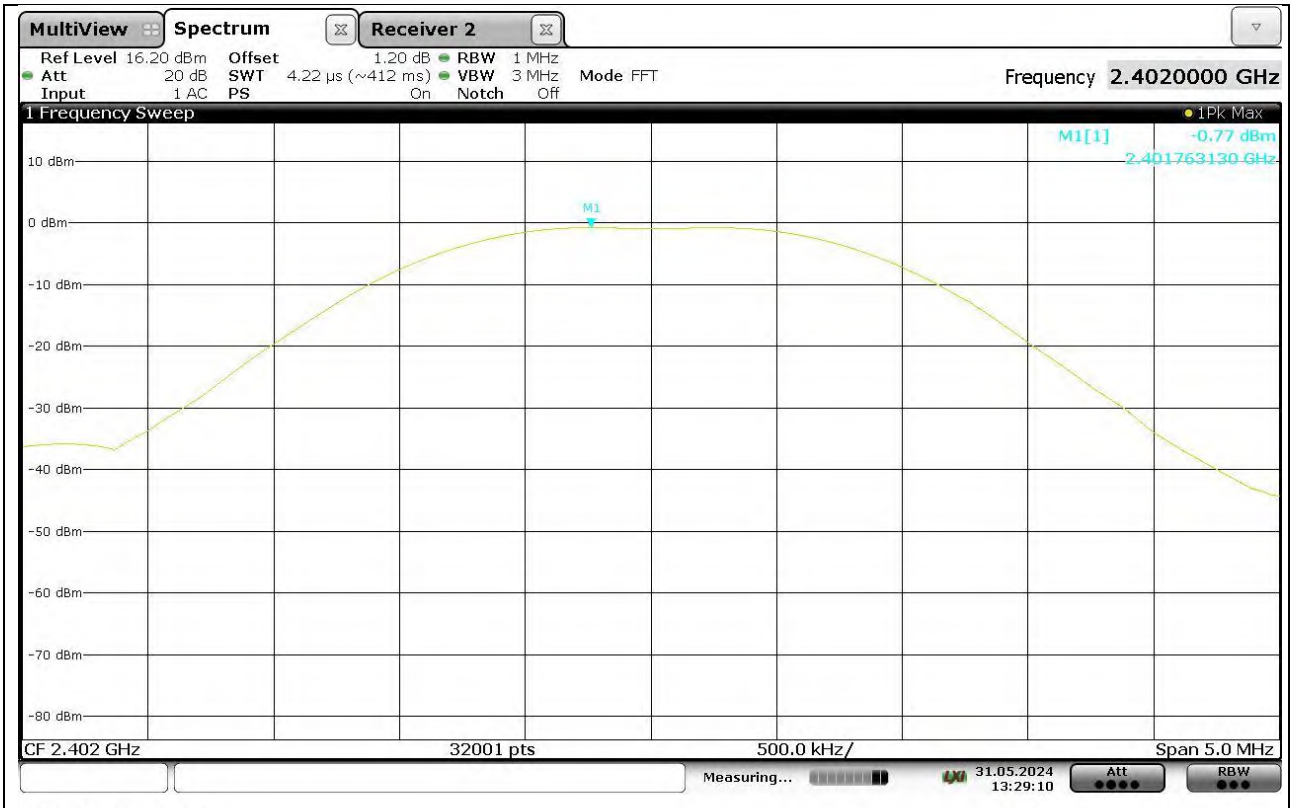
Test engineer:	Ms C. Clément		
Test date:	2024-05-31		
Climatic conditions:	Temperature: 23 °C	Humidity: 42 %	Pressure QFE: 931 hPa
Test site:	Laboratory		
Test sample used:	Sample #2, see §4.3		
Operating mode:	See §5.5		
Cables connected:	DC supply, temporary antenna cable		
Modifications:	None		
Spectrum Analyser:	RBW: 1 MHz, VBW: 3 MHz		
	Detector: Peak, Trace mode: Max Hold		
	Sweep time: Auto, Span: 5 MHz		
	Measurement: Marker placed on the peak of the signal		
Remarks:	Measured values take into consideration the external attenuation correction factors. The RF cable attenuation including the RF connector is assumed to be 1.2 dB (no information given by the Applicant on the RF cable attenuation).		
	Applicant declares Antenna Gain < 6 dBi. Declared power by applicant: 0 dBm		

Result:	☒ **pass**	☐ **fail**	☐ **not applicable**	☐ **partly tested**

Results of the test

Frequency [GHz]	Channel	Conducted Peak Power [dBm]	Limit [dBm]	Margin [dB]	Result
2.402	BOT	-0.77	30	-30.77	Pass
2.440	MID	-1.03	30	-31.03	Pass
2.480	TOP	-1.22	30	-31.22	Pass

Frequency [GHz]	Channel	Conducted Peak Power [dBm]	Declared Antenna Gain [dBi]	EIRP [dBm]	De Facto EIRP Limit [dBm]	Margin [dB]	Result
2.402	BOT	-0.77	-6.02	-6.79	36	-36.77	Pass
2.440	MID	-1.03	-4.89	-5.92	36	-37.03	Pass
2.480	TOP	-1.22	-3.91	-5.13	36	-37.22	Pass



Bottom channel

Middle channel

Top channel

6.5 Radiated emission

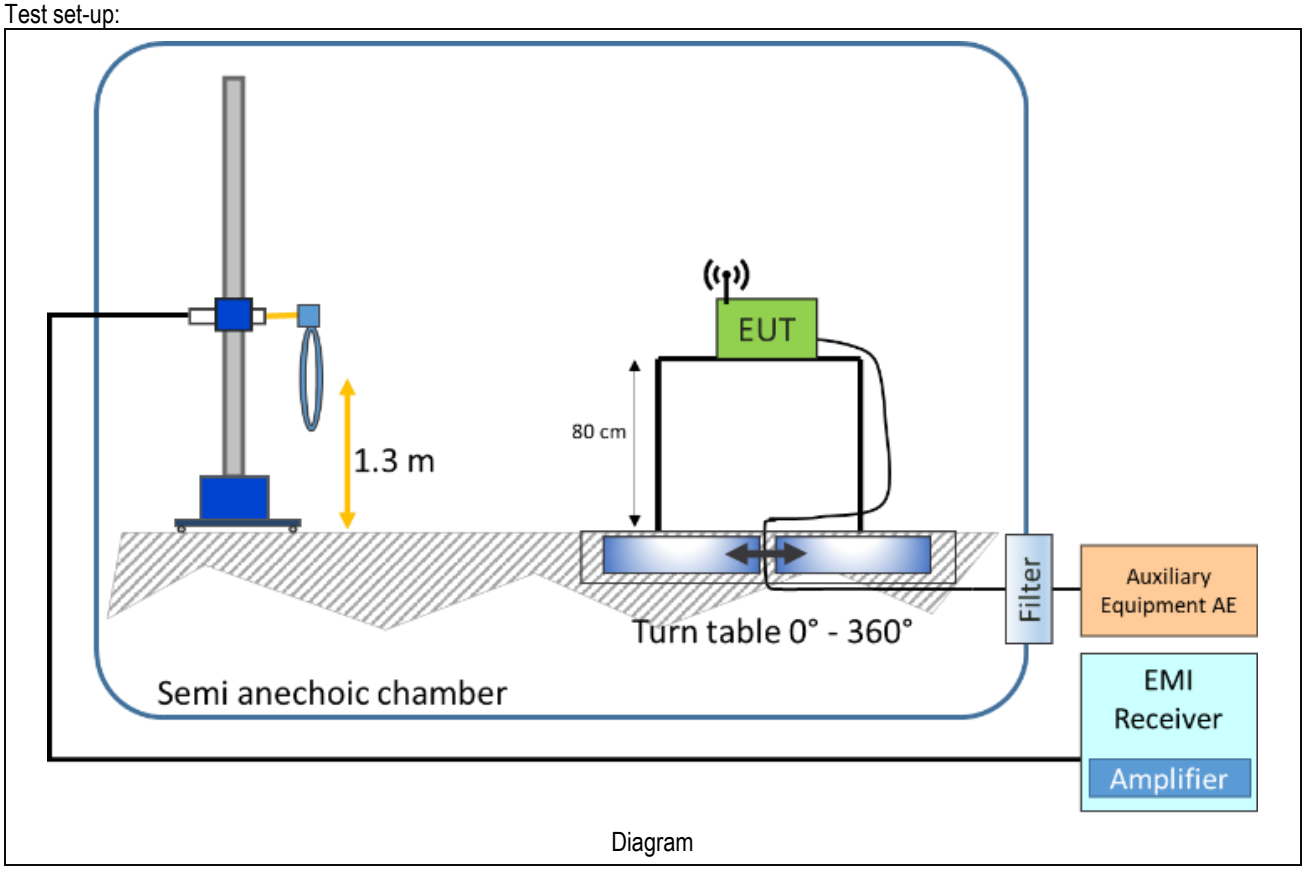
6.5.1 9 kHz to 30 MHz

FCC reference: Part 15.247 (d) and Part 15.209 (a)

Test Method: FCC KDB 558074 Section 8.5 and Section 8.6 referring ANSI C63.10 Section 11.11, 11.12, 6.3 and 6.5

Measuring method: The magnetic disturbance radiated by the equipment under test is measured using a spectrum analyser and a wide band magnetic antenna. The centre of the antenna is placed at 1.3 m height, first in the direction of the apparatus under test, then at 90° to the apparatus and horizontally. The turning table is operated through 360° during the measurement. The recording is carried out considering the maximum value of the disturbance appearing during the functioning of the apparatus under test. The peak values are recorded continuously on a graph. The values exceeding the limits shall be re-measured using a measuring receiver.

Test set-up:



Diagram

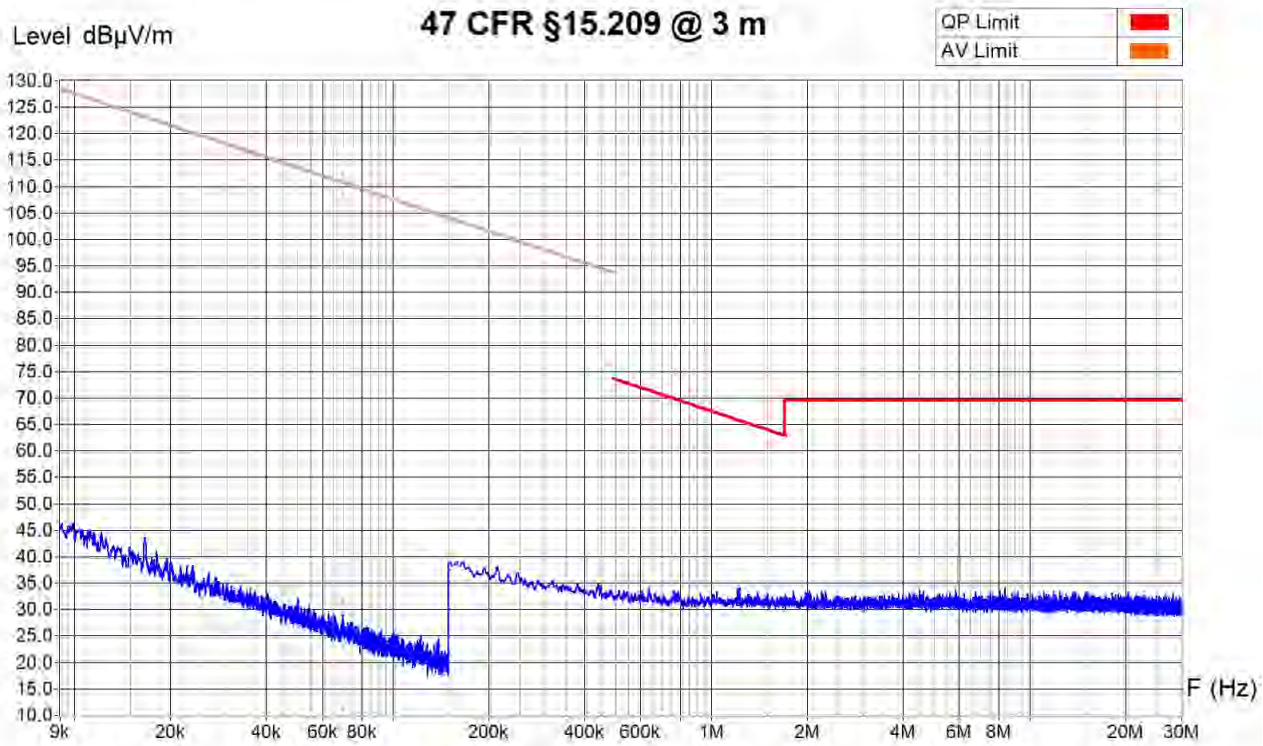
Result:	☒ pass	☐ fail	☐ not applicable	☐ partly tested

Test summary

Test engineer:	Ms C. Clément			
Test date:	2024-06-03			
Climatic conditions:	Temperature: 23 °C	Humidity: 47 %	Pressure QFE: 934 hPa	
Test site:	☒ SAC3	☐ SAC5	☐ SAC10	☐ Open test site
Meas. distance:	☒ 3 m	☐ 10 m		
Position of EUT:	0.8 m (height of the equipment under test above floor)			
Test sample used:	Sample #1, see §4.3			
Operating mode:	See §5.5			
Cables connected:	DC supply			
Modifications:	None			
Remarks:	Limit values expressed in dBµV/m and transformed to a measuring distance of 3 m (factor used = 40 dB/decade) if necessary e.g.: for f = 9 kHz the limit is 2400/f(kHz)µV/m at 300 m;			

$$20\ log\left(\frac{\frac{2400}{9}\frac{\mu V}{m}}{1\frac{\mu V}{m}}\right) + 40\ log\left(\frac{300m}{3m}\right) = 128.5\ \frac{dB\mu V}{m}\ at\ 3m$$

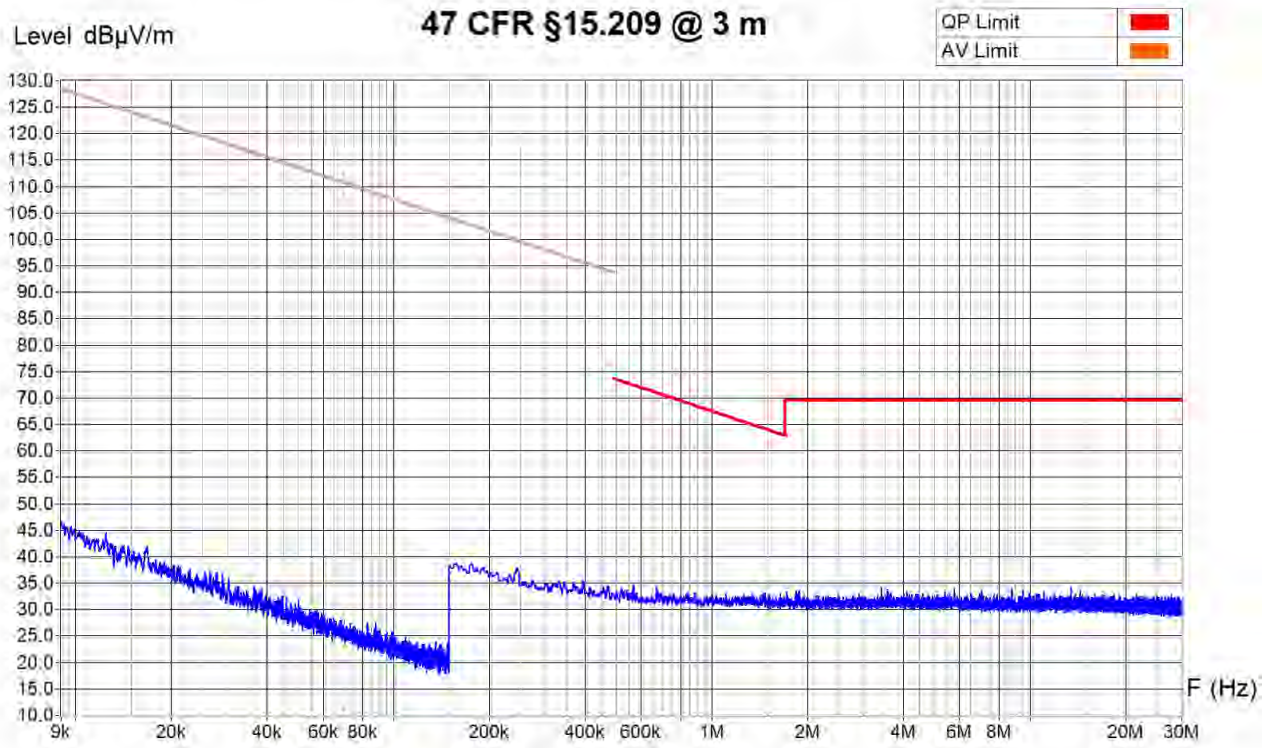
Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, BOT (2.402 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is lying



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 18:58
Filename: 23CH-00972_FCC_RESpurious9k-

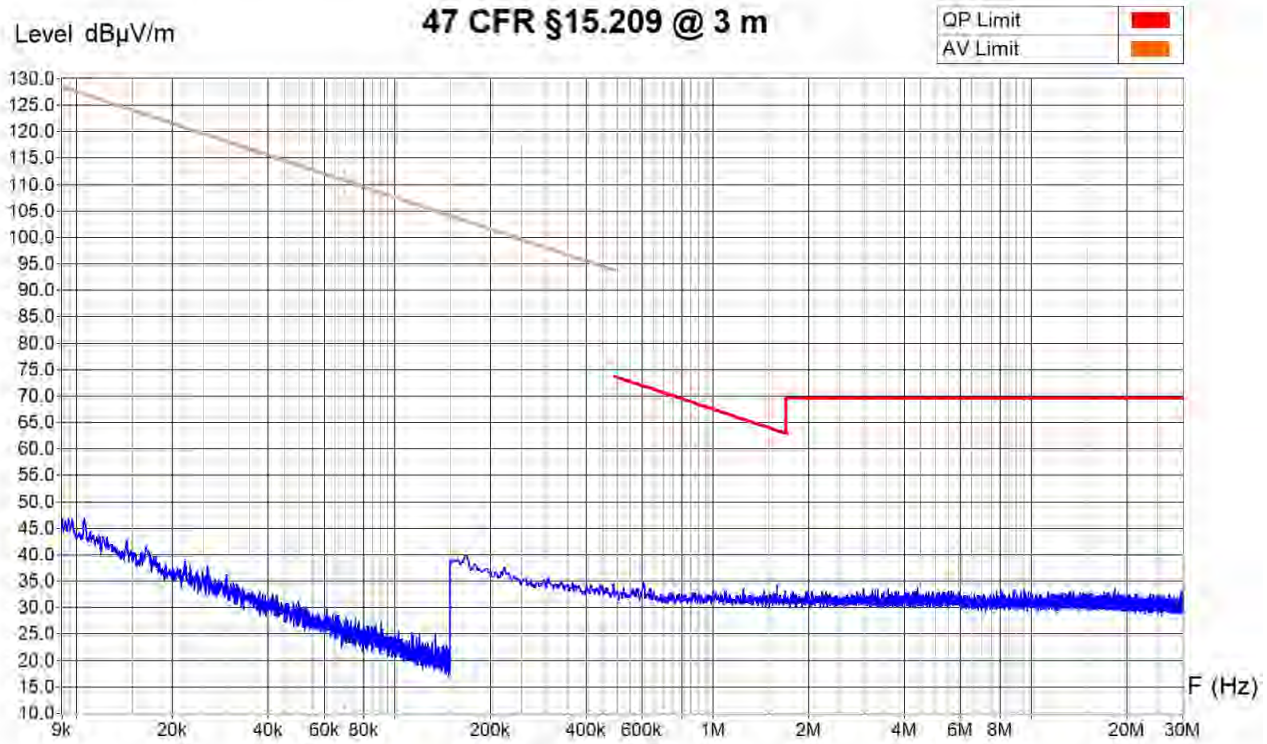
Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, BOT (2.402 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is standing



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 18:52
Filename: 23CH-00972_FCC_RESpurious9k-

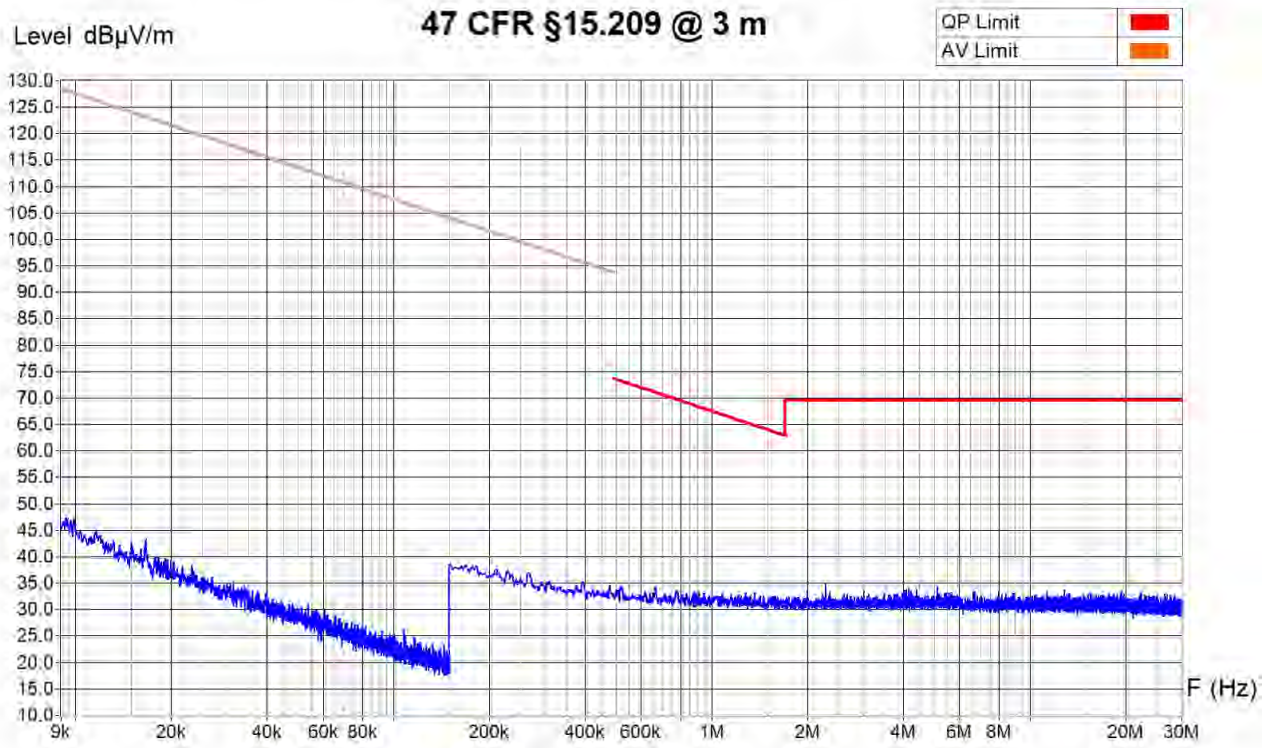
Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, MID (2.44 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC EUT is lying



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 19:05
Filename: 23CH-00972_FCC_RESpurious9k-

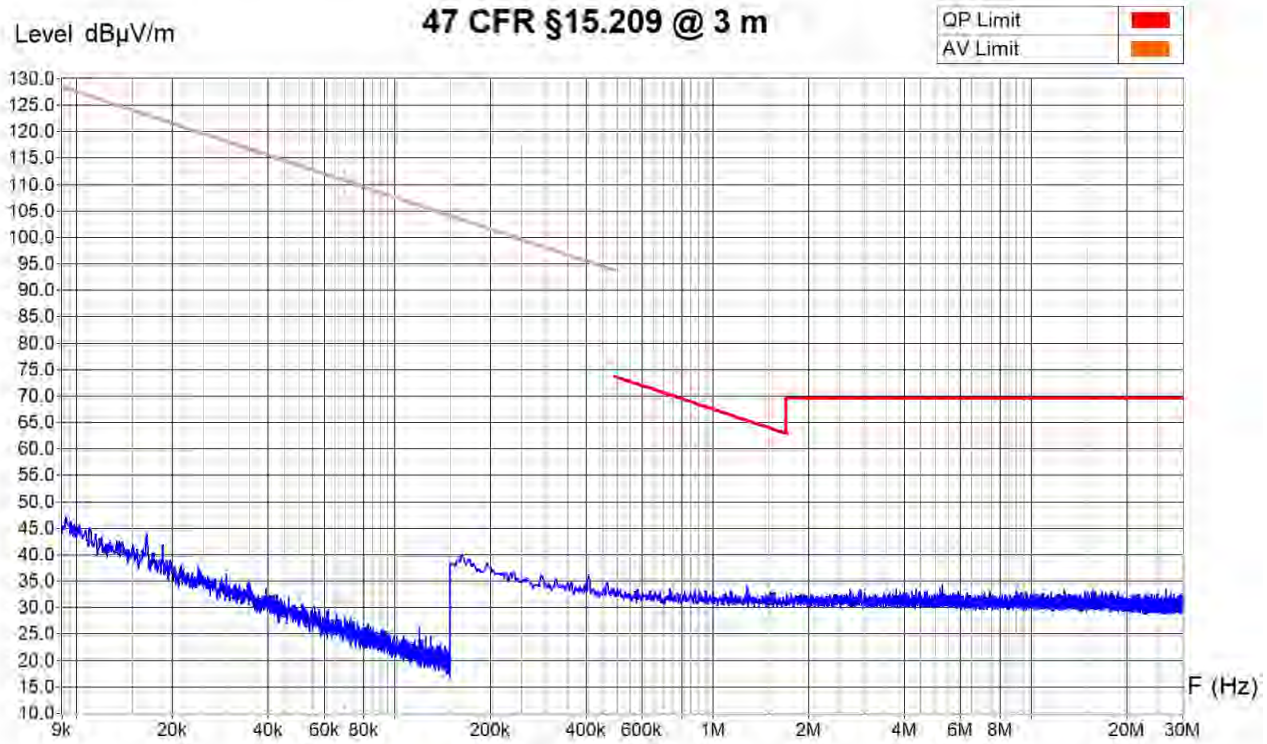
Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, MID (2.44 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is standing



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 18:45
Filename: 23CH-00972_FCC_RESpurious9k-

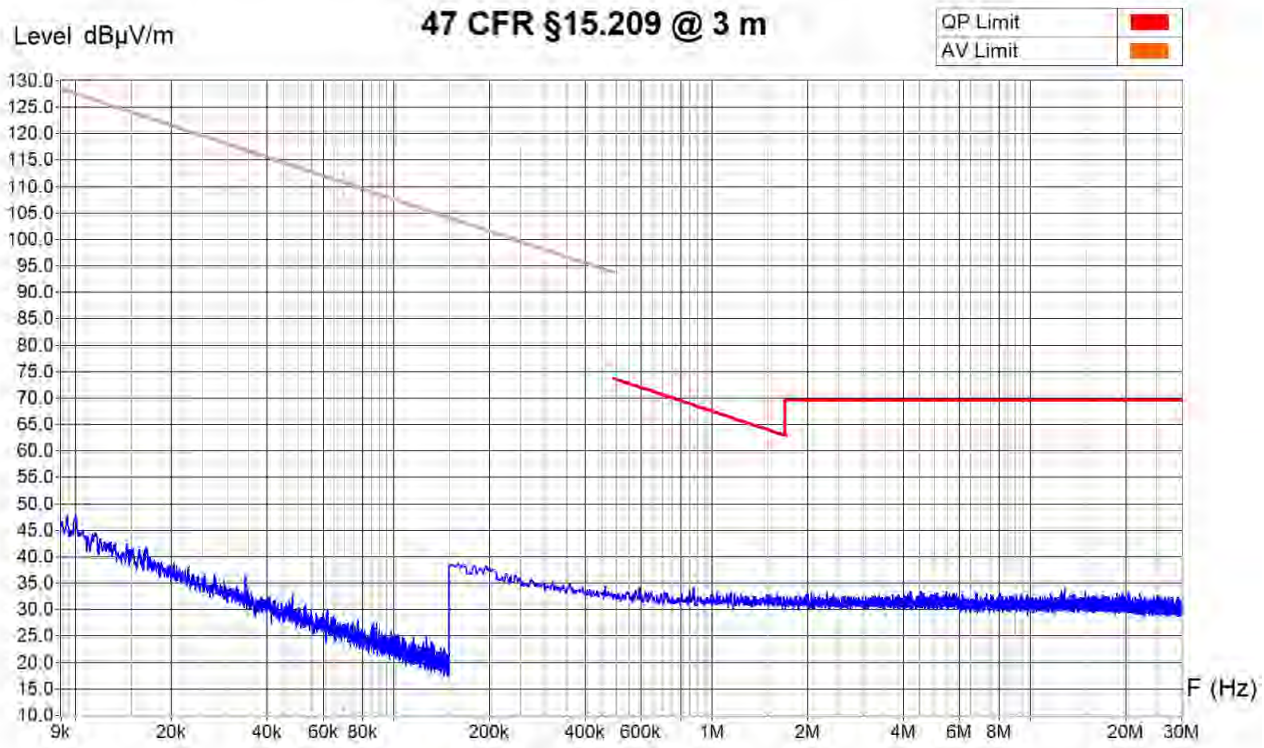
Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, TOP (2.48 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC EUT is lying



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 19:11
Filename: 23CH-00972_FCC_RESpurious9k-

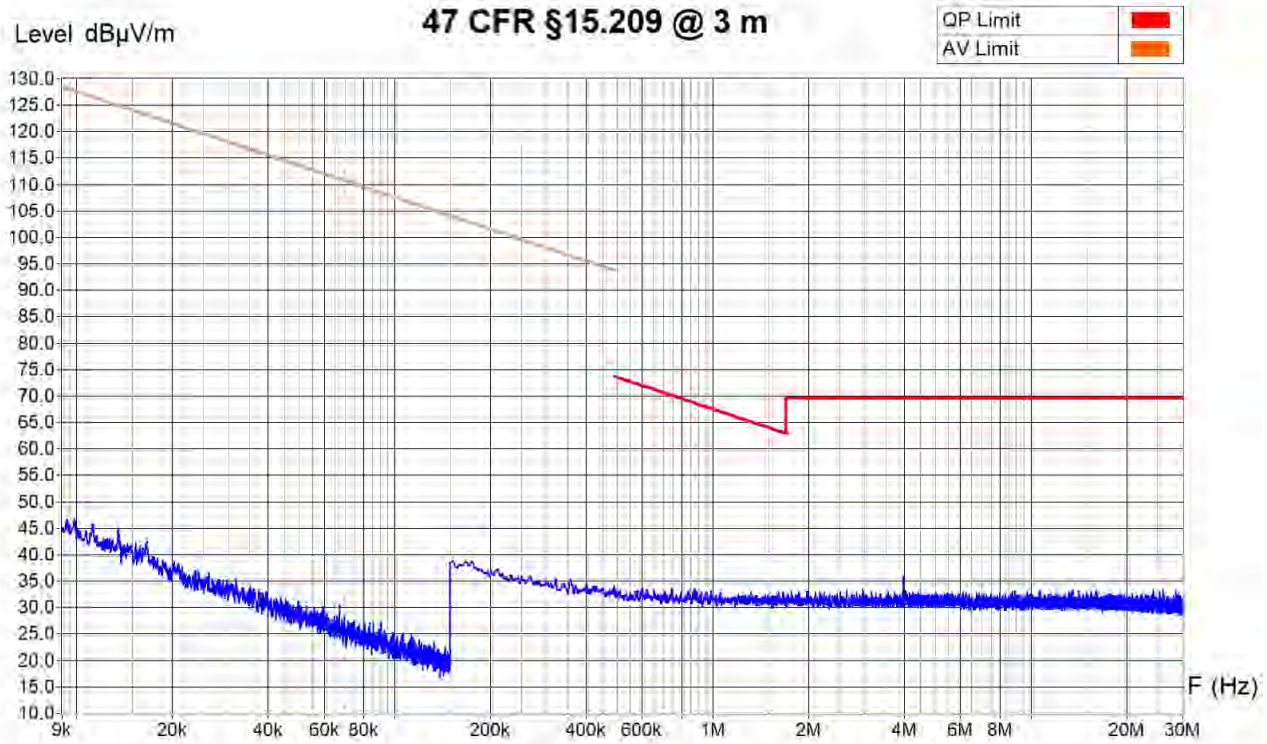
Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, TOP (2.48 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is standing



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 18:38
Filename: 23CH-00972_FCC_RESpurious9k-

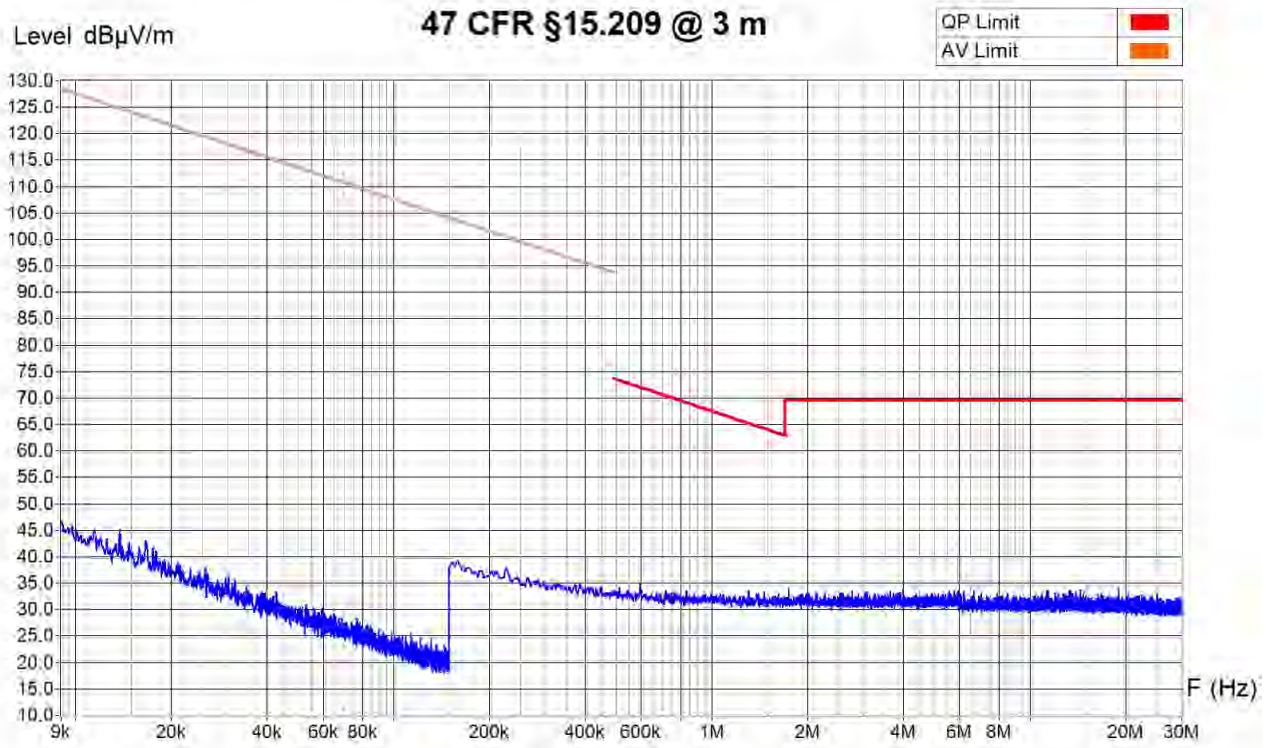
Measurement Type :	Radiated Field
Polarisation :	Parallel
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, BOT (2.402 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is lying



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 17:25
Filename: 23CH-00972_FCC_RESpurious9k-

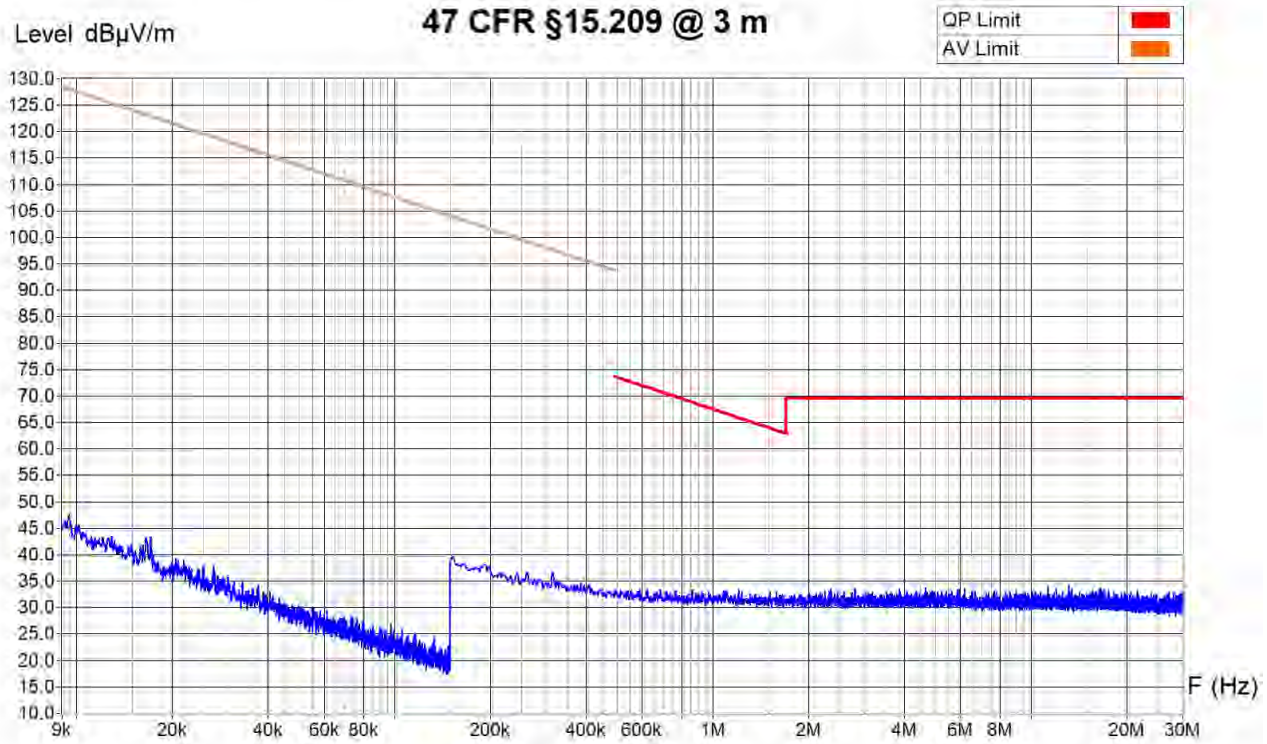
Measurement Type :	Radiated Field
Polarisation :	Parallel
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, BOT (2.402 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC EUT is standing



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 17:18
Filename: 23CH-00972_FCC_RESpurious9k-

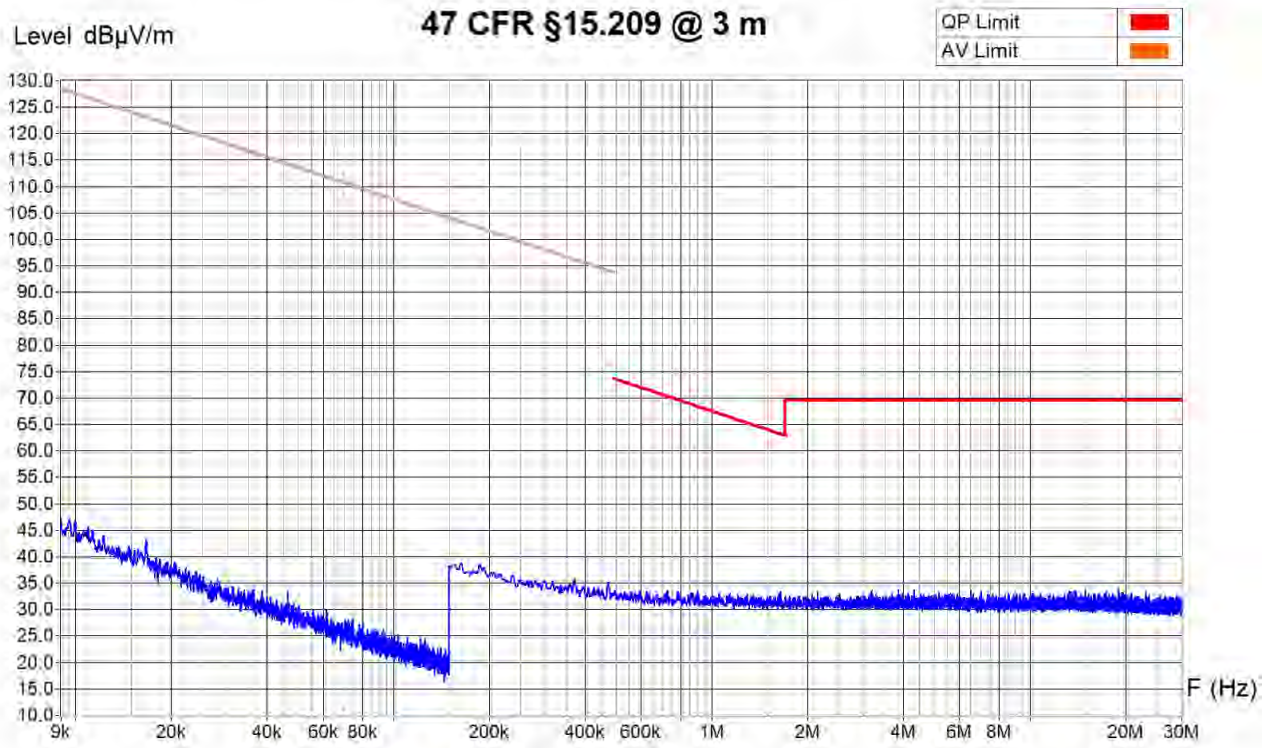
Measurement Type :	Radiated Field
Polarisation :	Parallel
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, MID (2.44 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is lying



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 17:32
Filename: 23CH-00972_FCC_RESpurious9k-

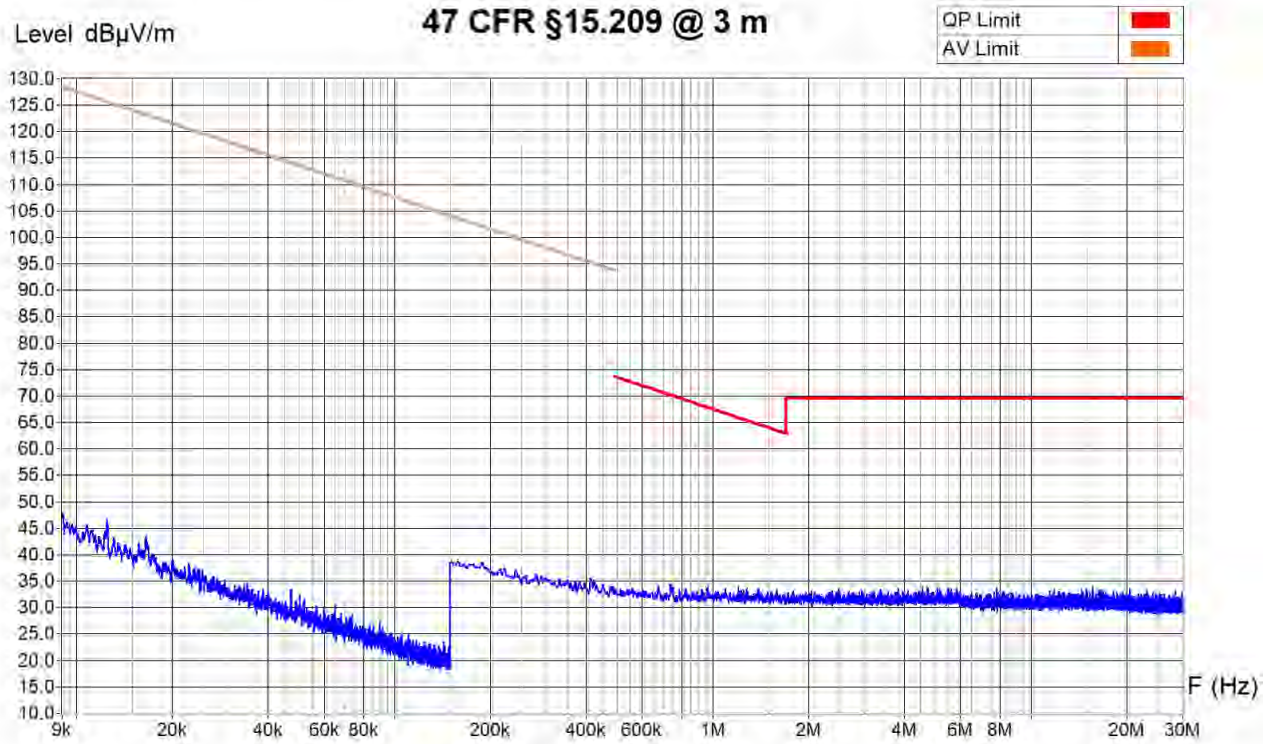
Measurement Type :	Radiated Field
Polarisation :	Parallel
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, MID (2.44 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is standing



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 17:11
Filename: 23CH-00972_FCC_RESpurious9k-

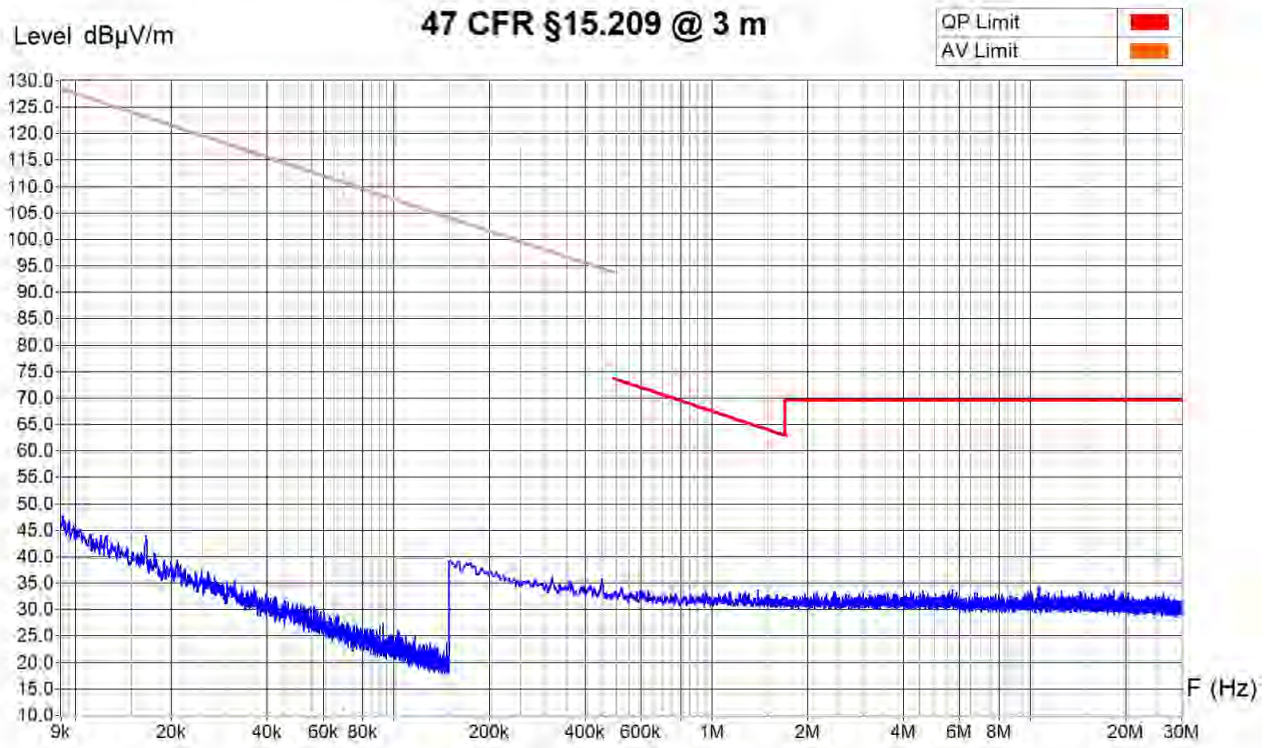
Measurement Type :	Radiated Field
Polarisation :	Parallel
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, TOP (2.48 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is lying



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 17:40
Filename: 23CH-00972_FCC_RESpurious9k-

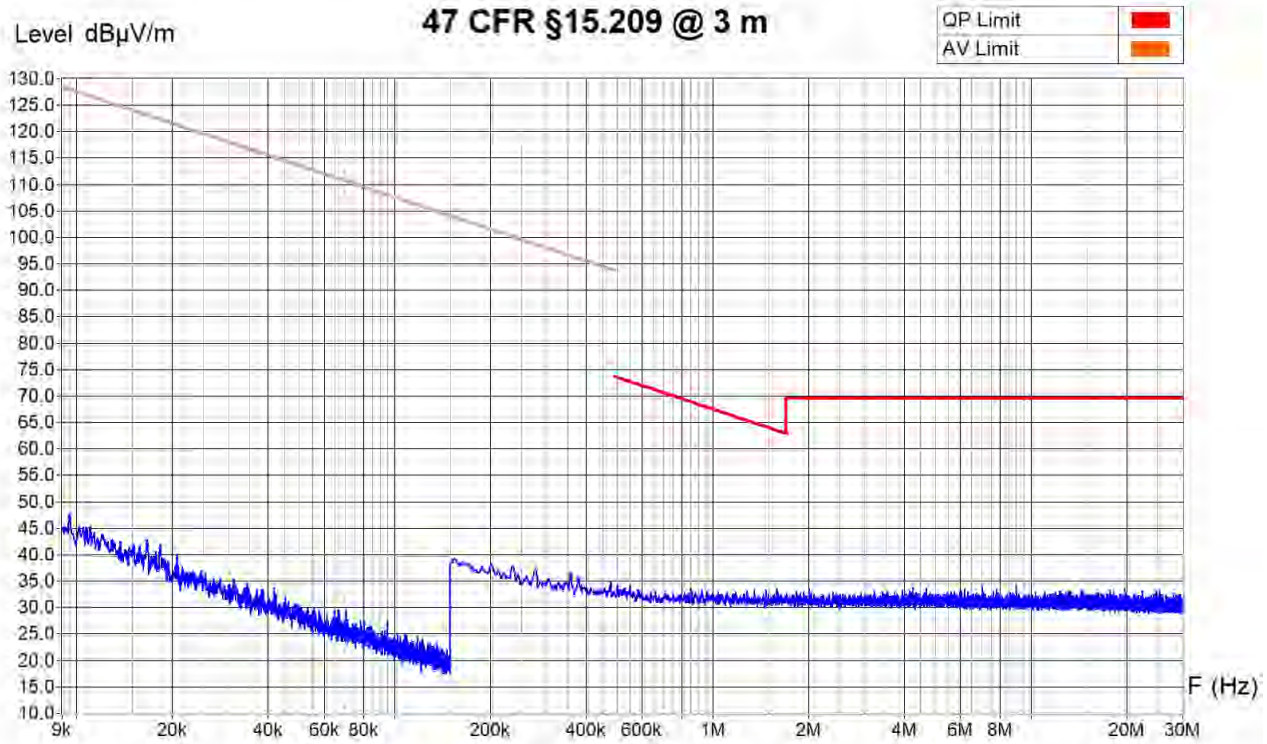
Measurement Type :	Radiated Field
Polarisation :	Parallel
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, TOP (2.48 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is standing



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-08-03 17:00
Filename: 23CH-00972_FCC_RESpurious9k-

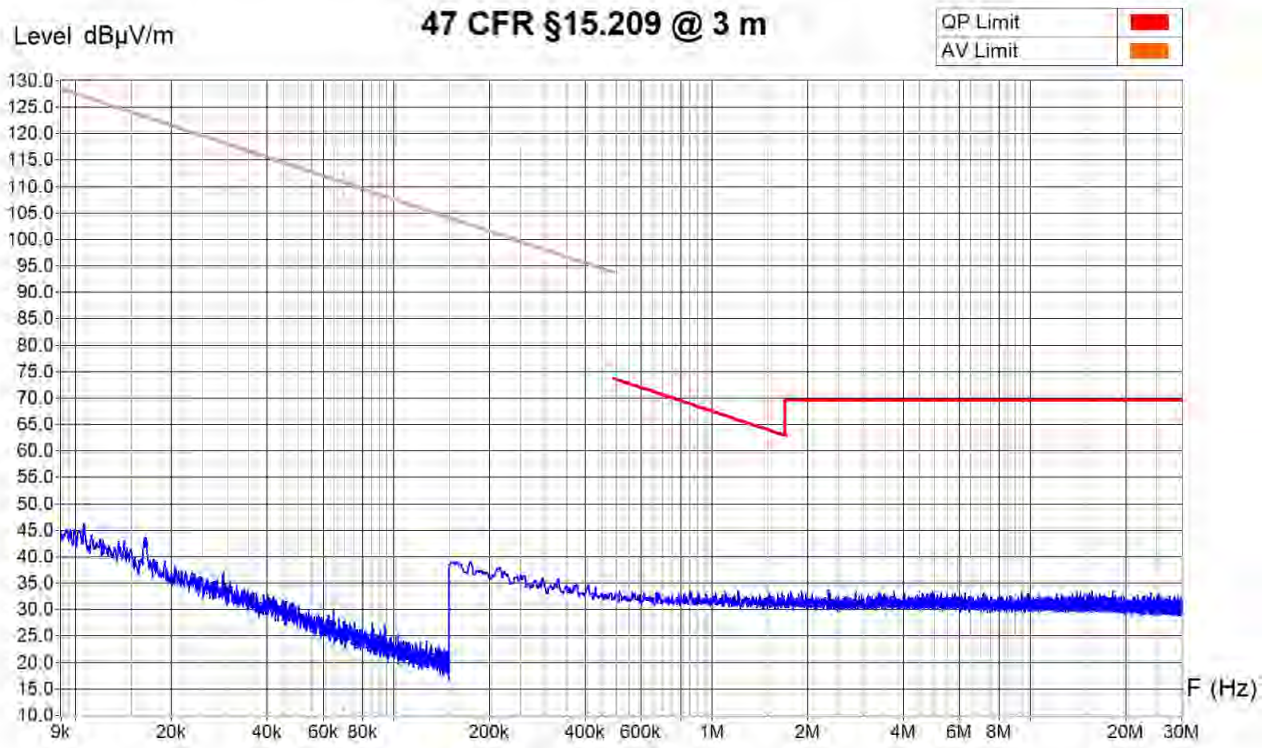
Measurement Type :	Radiated Field
Polarisation :	Perpendicular
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, BOT (2.402 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is lying



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 18:04
Filename: 23CH-00972_FCC_RESpurious9k-

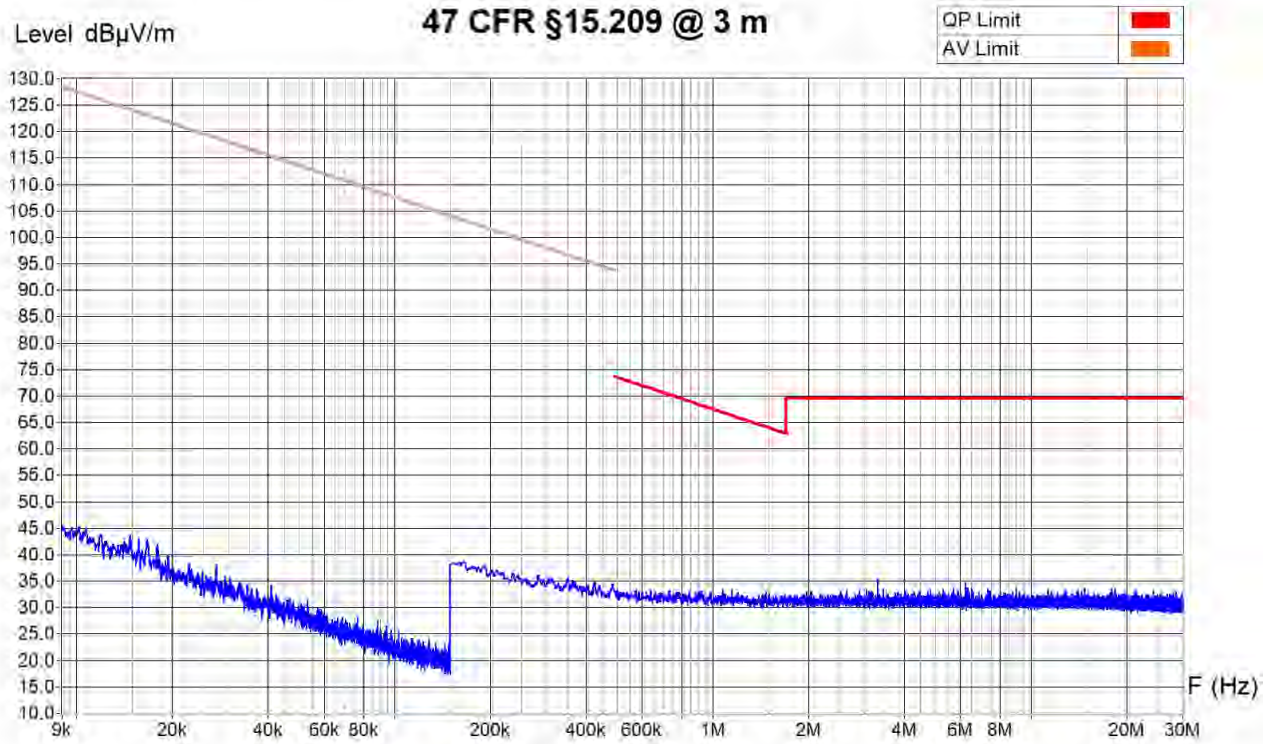
Measurement Type :	Radiated Field
Polarisation :	Perpendicular
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, BOT (2.402 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is standing



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 18:11
Filename: 23CH-00972_FCC_RESpurious9k-

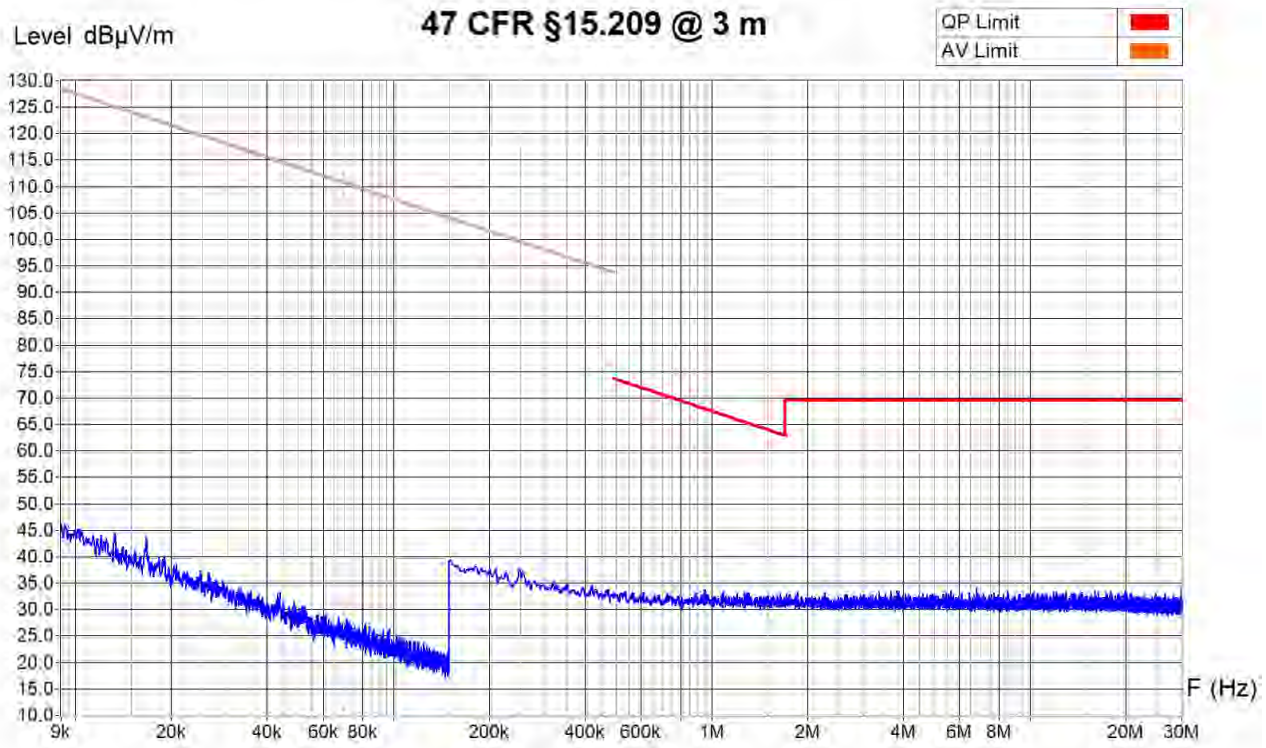
Measurement Type :	Radiated Field
Polarisation :	Perpendicular
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, MID (2.44 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is lying



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 17:57
Filename: 23CH-00972_FCC_RESpurious9k-

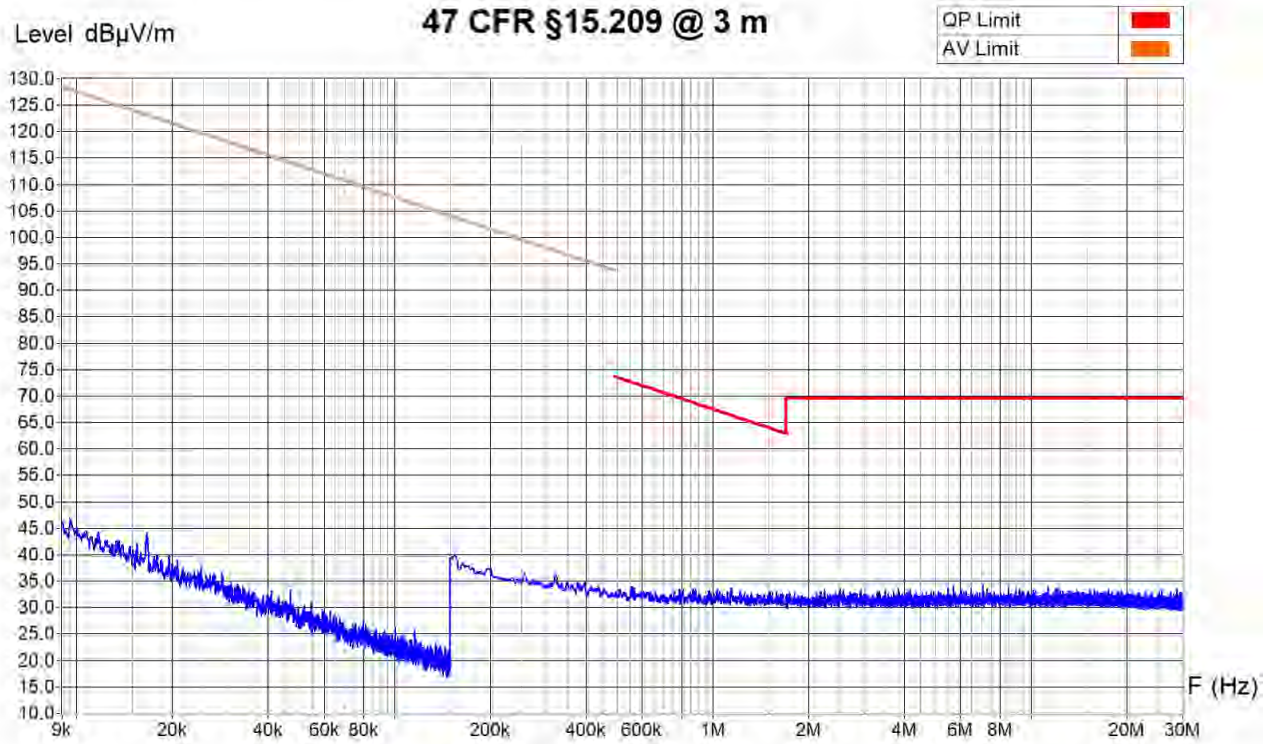
Measurement Type :	Radiated Field
Polarisation :	Perpendicular
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, MID (2.44 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is standing



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 18:20
Filename: 23CH-00972_FCC_RESpurious9k-

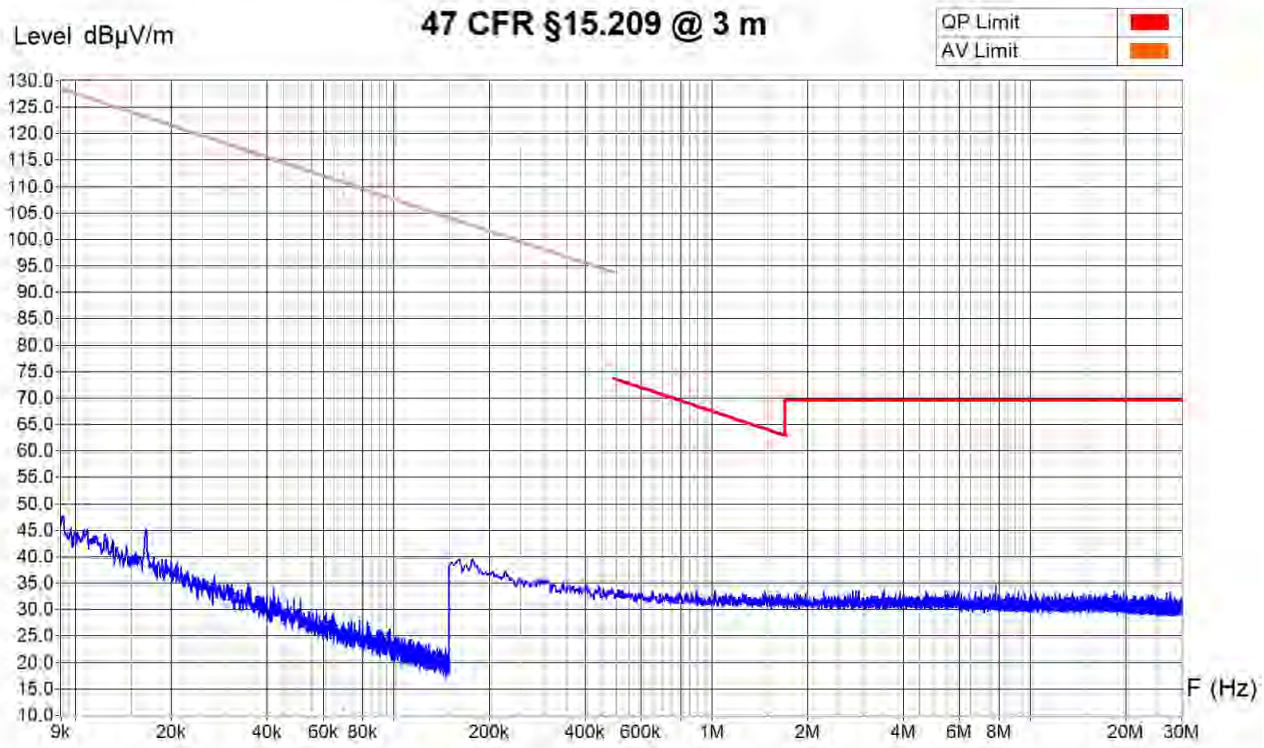
Measurement Type :	Radiated Field
Polarisation :	Perpendicular
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, TOP (2.48 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is lying



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 17:48
Filename: 23CH-00972_FCC_RESpurious9k-

Measurement Type :	Radiated Field
Polarisation :	Perpendicular
Table Angle :	0° - 360°
Antenna Height :	1.3 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, TOP (2.48 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is standing



Zone	9 KHz - 150 KHz	150 KHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	500 KHz	500 KHz	500 KHz
Resol Bandwidth	200 Hz	9 KHz	9 KHz

Operator: C. Clément
Date/Time: 2024-06-03 18:28
Filename: 23CH-00972_FCC_RESpurious9k-

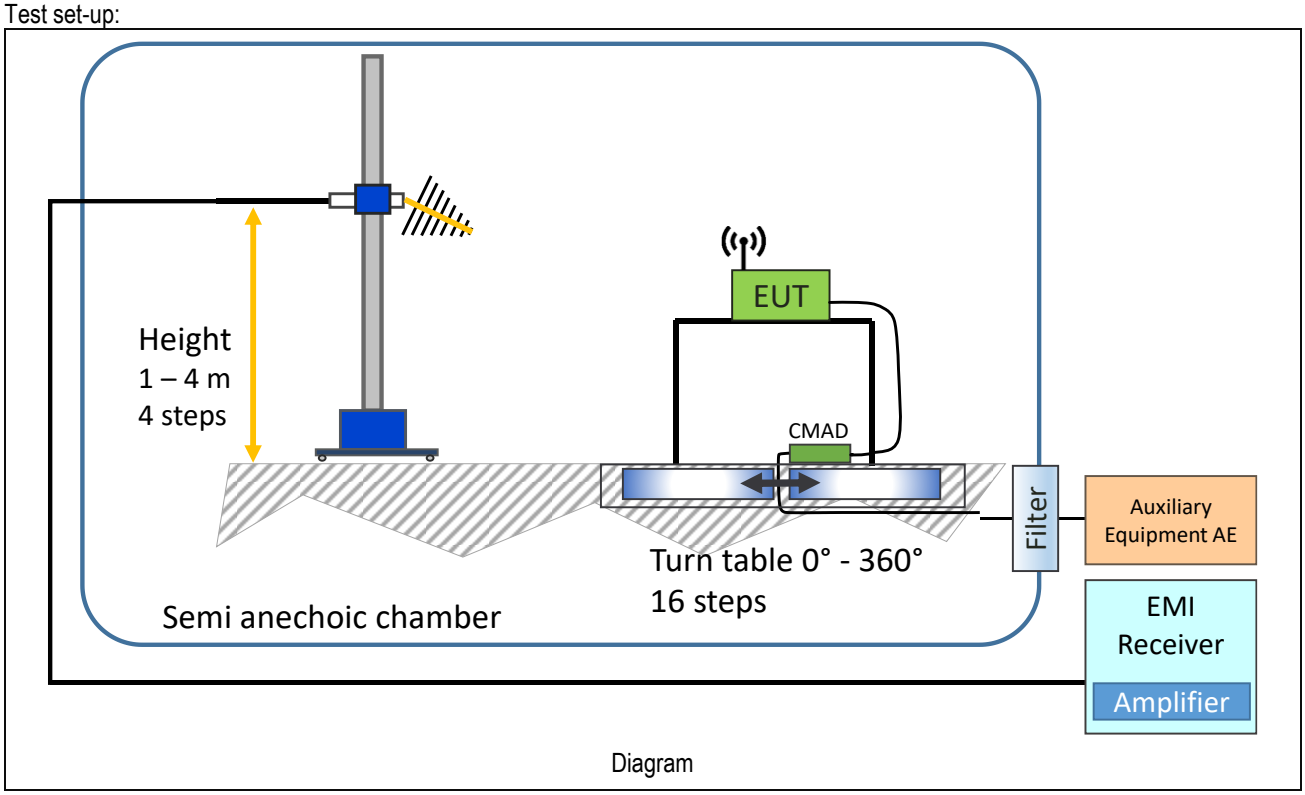
6.5.2 30 MHz to 1 GHz

FCC reference: Part 15.247 (d) and Part 15.209 (a)

Test Method: FCC KDB 558074 Section 8.5 and Section 8.6 referring ANSI C63.10 Section 11.11, 11.12, 6.3 and 6.5

Measuring method: The electromagnetic disturbance radiated by the equipment is measured using a spectrum analyser and a wide band antenna. The antenna is moved from 1 to 4 m in height successively with horizontal and vertical polarisations. The turning table is operated through 360° during the measurements. The recordings are carried out taking into account the maximum value of all the disturbances appearing while the apparatus is under test. The peak values are recorded continuously on the graph. The values exceeding a limit shall be re-measured manually using a receiver.

Test set-up:



Diagram

Result:	☒ **pass**	☐ **fail**	☐ **not applicable**	☐ **partly tested**

Test summary

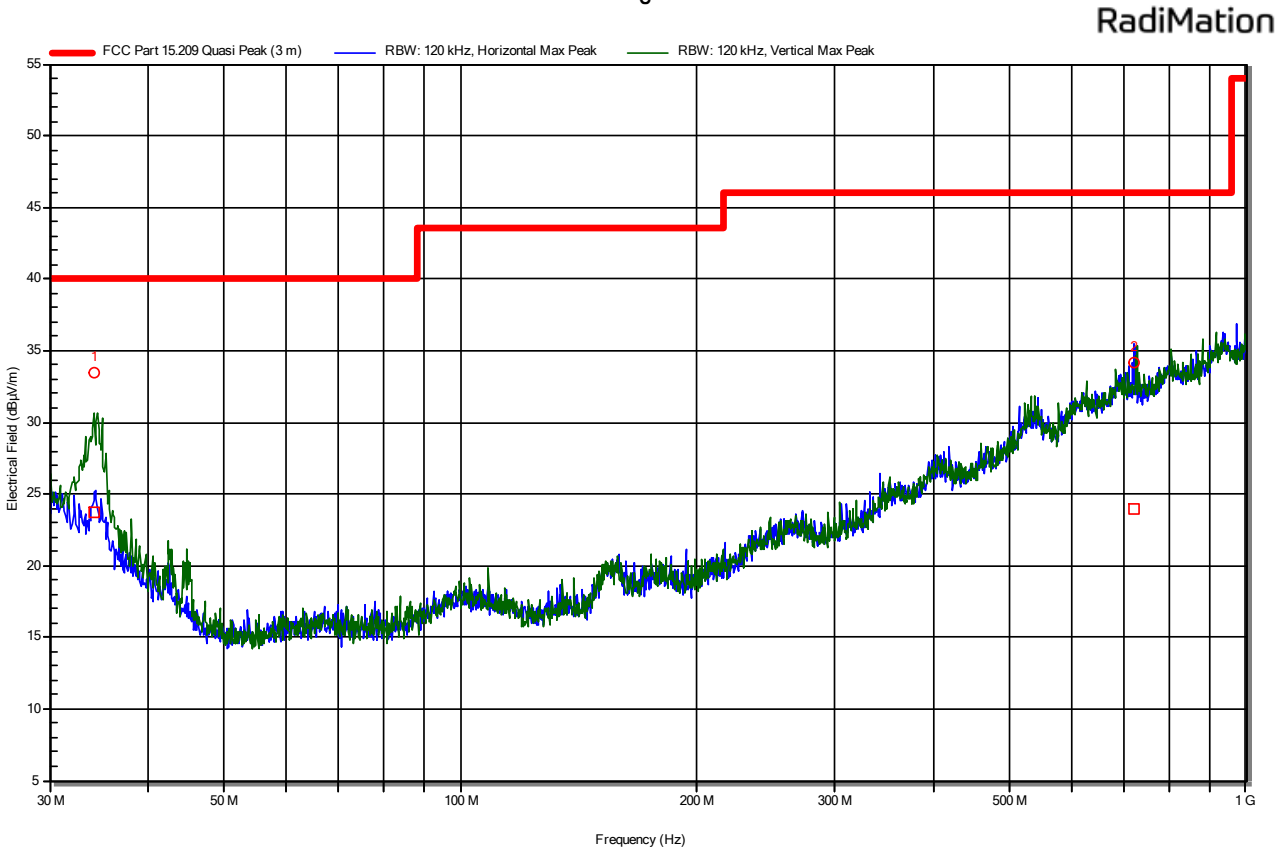
Test engineer:	Ms C. Clément		
Test date:	2024-06-03		
Climatic conditions:	Temperature: 23 °C	Humidity: 47 %	Pressure QFE: 934 hPa
Test site:	☐ SAC3	☒ SAC5	☐ SAC10 ☐ Open test site
Meas. distance:	☒ 3 m	☐ 10 m	
Position of EUT:	0.8 m (height of the equipment under test above floor)		
Test sample used:	Sample #1, see §4.3		
Operating mode:	See §5.5		
Cables connected:	DC supply		
Modifications:	None		
Remarks:	Limit values expressed in dBµV/m and transformed to a measuring distance of 3 m (factor used = 20 dB/decade) if necessary e.g.: for f = 40 MHz the limit is 100 µV/m at 3 m;		

$$20\log\left(\frac{100\frac{\mu V}{m}}{1\frac{\mu V}{m}}\right)=40\frac{dB\mu V}{m}\ at\ 3m$$

Results

Measurement	RE 30 MHz to 1 GHz	**Test ID**	#2	**Date and time**	23.05.2024 09:11:58	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, BOT (2.402 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is standing						
Antenna Height	1 m to 4 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 degrees to 360 degrees, 16 step(s)	**Distance**	3 m
Test Place	ROS-SAC5			**Software**	Radimation 2023.2.5 (SAC5 RE 30M-1G Std Class-A&B 3m ETS 19-15 ESU26-i1-LAN)		
Equipment	Device Type / ID Turn table / SAC5 Antenna tower / SAC5 Cable antenna -> preamp / SAC5_RE Spectrum analyser / 168593 Antenna / 19-15			**Settings**	Band(s): 30 MHz - 1 GHz, Reference Level: 90 dBµV RBW: 120 kHz, VBW: 500 kHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 9701 steps per Band, Attenuator: 0 dB, Internal preamp: 10 dB, Measure time: Auto [120 ms] Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 10 s, AVG 1 s / 10 s		

47 CFR §15.209

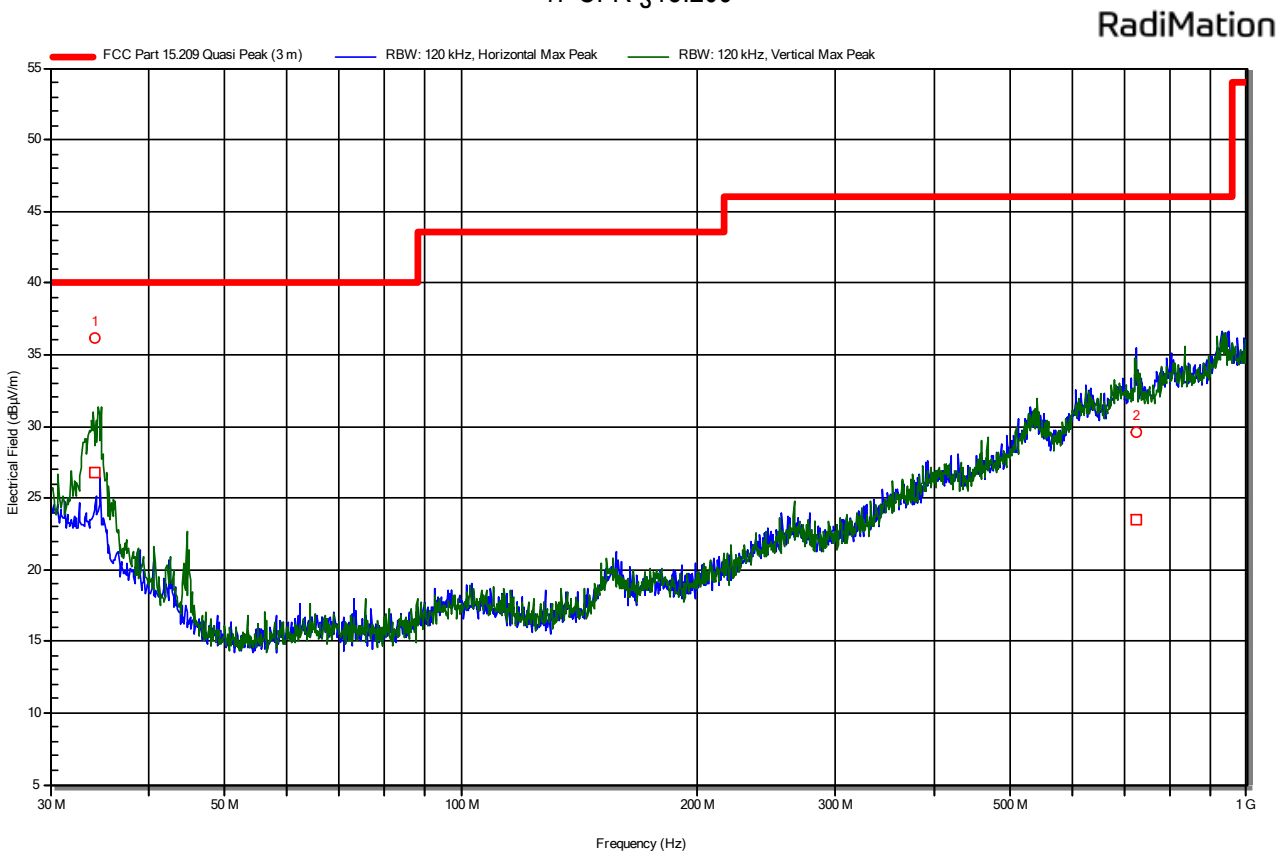


Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Quasi-Peak (dBµV/m)	Quasi-Peak Difference (dB)	Angle (degrees)	Height (m)	Polarization	Status
1	34.2	33.47	23.68	-16.32	157	1	Vertical	Pass
2	721.6	34.12	23.95	-22.11	203	4	Horizontal	Pass

Measurement	RE 30 MHz to 1 GHz	**Test ID**	#3	**Date and time**	23.05.2024 09:52:31	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, MID (2.44 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is standing						
Antenna Height	1 m to 4 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 degrees to 360 degrees, 16 step(s)	**Distance**	3 m
Test Place	ROS-SAC5			**Software**	Radimation 2023.2.5 (SAC5 RE 30M-1G Std Class-A&B 3m ETS 19-15 ESU26-i1-LAN)		
Equipment	Device Type / ID Turn table / SAC5 Antenna tower / SAC5 Cable antenna -> preamp / SAC5_RE Spectrum analyser / 168593 Antenna / 19-15			**Settings**	Band(s): 30 MHz - 1 GHz, Reference Level: 90 dBµV RBW: 120 kHz, VBW: 500 kHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 9701 steps per Band, Attenuator: 0 dB, Internal preamp: 10 dB, Measure time: Auto [120 ms] Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 10 s, AVG 1 s / 10 s		

47 CFR §15.209

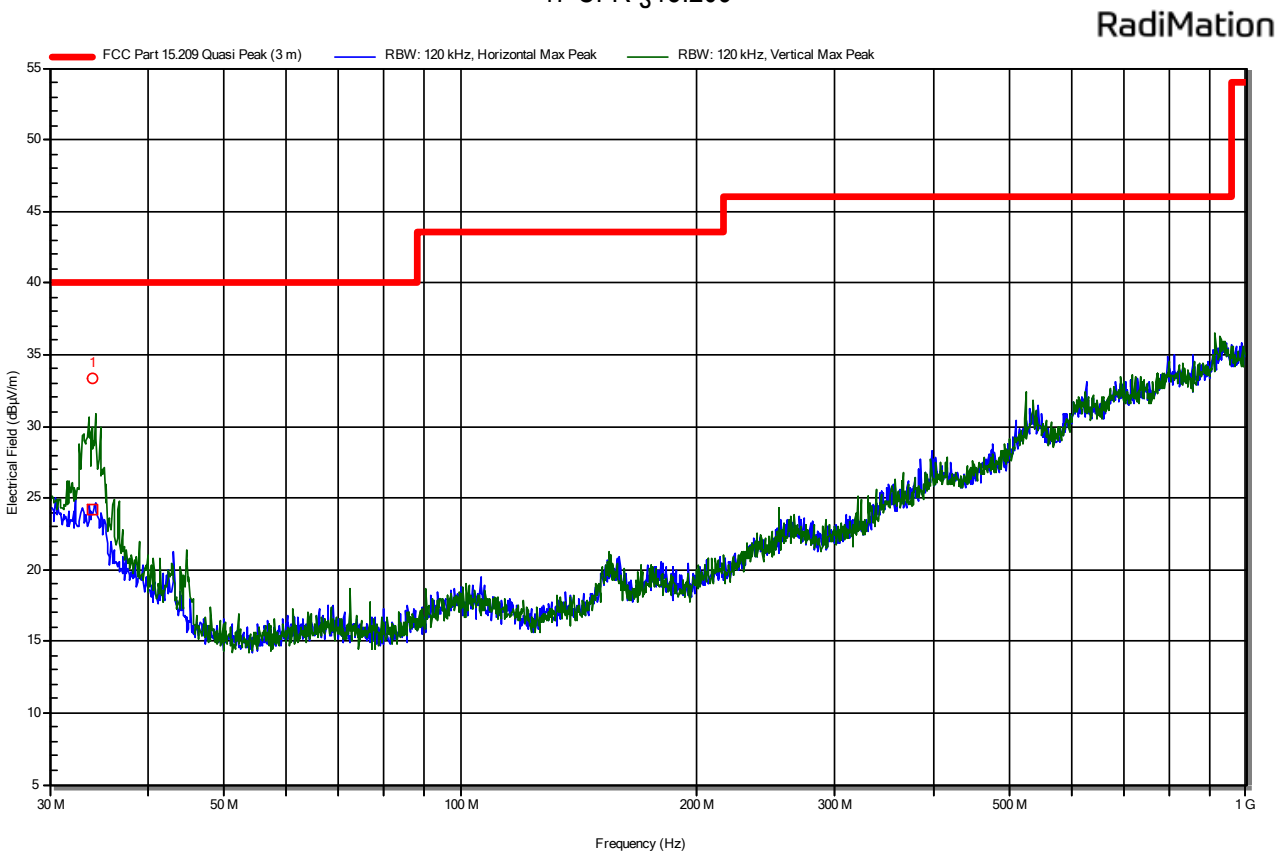


Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Quasi-Peak (dBµV/m)	Quasi-Peak Difference (dB)	Angle (degrees)	Height (m)	Polarization	Status
1	34.2	36.16	26.77	-13.23	135	1	Vertical	Pass
2	724.009	29.59	23.51	-22.55	292	4	Horizontal	Pass

Measurement	RE 30 MHz to 1 GHz	**Test ID**	#4	**Date and time**	23.05.2024 10:30:24	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, TOP (2.48 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is standing						
Antenna Height	1 m to 4 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 degrees to 360 degrees, 16 step(s)	**Distance**	3 m
Test Place	ROS-SAC5			**Software**	Radimation 2023.2.5 (SAC5 RE 30M-1G Std Class-A&B 3m ETS 19-15 ESU26-i1-LAN)		
Equipment	Device Type / ID Turn table / SAC5 Antenna tower / SAC5 Cable antenna -> preamp / SAC5_RE Spectrum analyser / 168593 Antenna / 19-15			**Settings**	Band(s): 30 MHz - 1 GHz, Reference Level: 90 dBµV RBW: 120 kHz, VBW: 500 kHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 9701 steps per Band, Attenuator: 0 dB, Internal preamp: 10 dB, Measure time: Auto [120 ms] Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 10 s, AVG 1 s / 10 s		

47 CFR §15.209



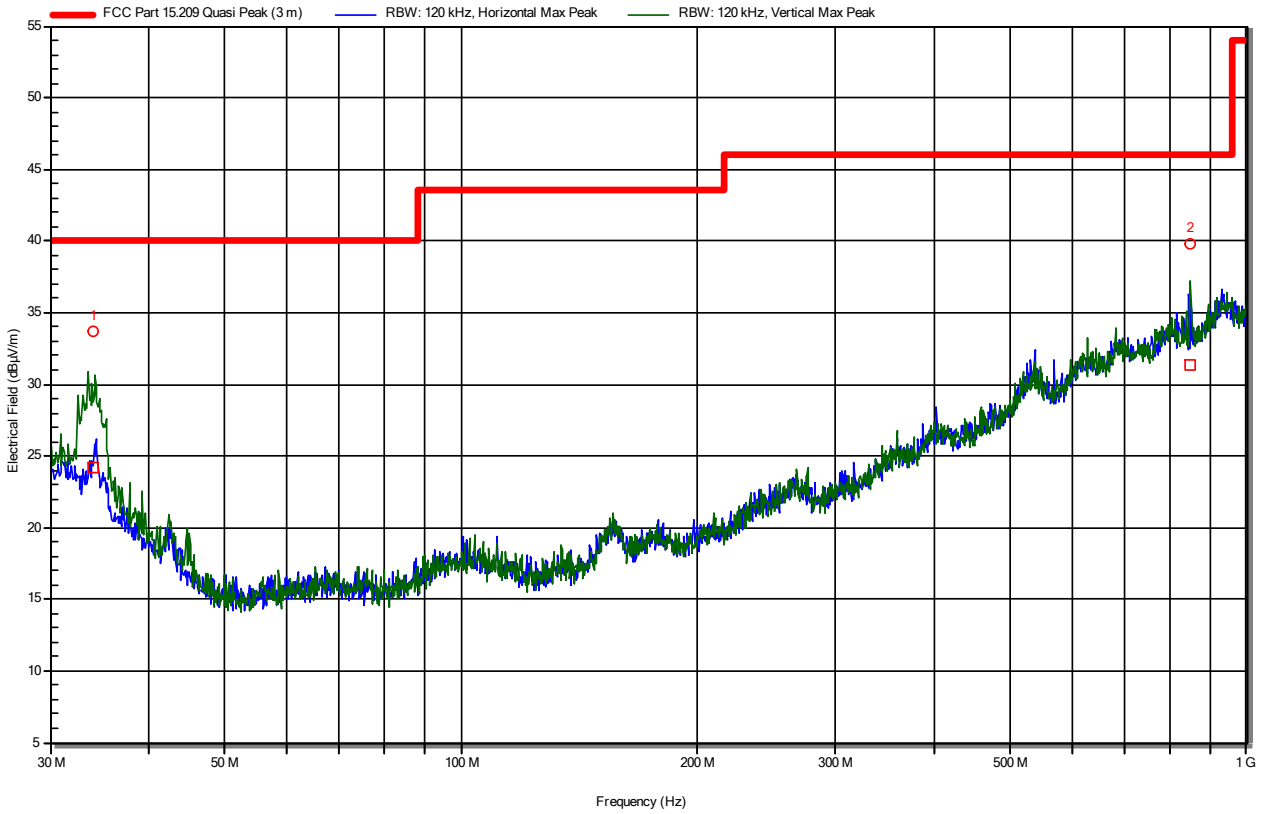
Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Quasi-Peak (dBµV/m)	Quasi-Peak Difference (dB)	Angle (degrees)	Height (m)	Polarization	Status
1	34	33.38	24.2	-15.8	158	1	Vertical	Pass

Measurement	RE 30 MHz to 1 GHz	**Test ID**	#5	**Date and time**	23.05.2024 11:10:56	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, TOP (2.48 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is lying						
Antenna Height	1 m to 4 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 degrees to 360 degrees, 16 step(s)	**Distance**	3 m
Test Place	ROS-SAC5		**Software**	Radimation 2023.2.5 (SAC5 RE 30M-1G Std Class-A&B 3m ETS 19-15 ESU26-i1-LAN)			
Equipment	Device Type / ID Turn table / SAC5 Antenna tower / SAC5 Cable antenna -> preamp / SAC5_RE Spectrum analyser / 168593 Antenna / 19-15		**Settings**	Band(s): 30 MHz - 1 GHz, Reference Level: 90 dBµV RBW: 120 kHz, VBW: 500 kHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 9701 steps per Band, Attenuator: 0 dB, Internal preamp: 10 dB, Measure time: Auto [120 ms] Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 10 s, AVG 1 s / 10 s			

47 CFR §15.209

RadiMation

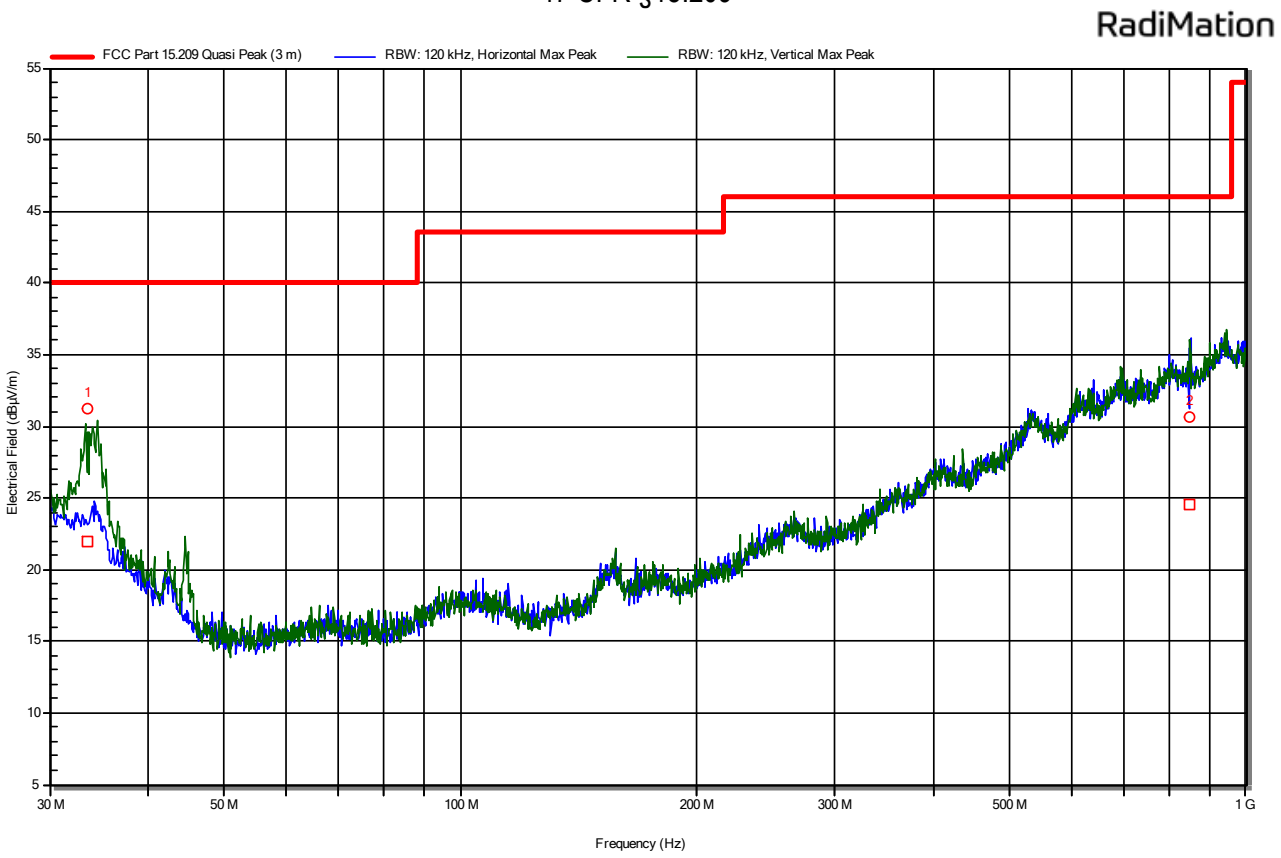


Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Quasi-Peak (dBµV/m)	Quasi-Peak Difference (dB)	Angle (degrees)	Height (m)	Polarization	Status
1	34	33.67	24.18	-15.82	157	1	Vertical	Pass
2	846.9	39.74	31.3	-14.76	225	2	Horizontal	Pass

Measurement	RE 30 MHz to 1 GHz	**Test ID**	#6	**Date and time**	2024-05-23 11:49:28	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, MID (2.44 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is lying						
Antenna Height	1 m to 4 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 degrees to 360 degrees, 16 step(s)	**Distance**	3 m
Test Place	ROS-SAC5			**Software**	Radimation 2023.2.5 (SAC5 RE 30M-1G Std Class-A&B 3m ETS 19-15 ESU26-i1-LAN)		
Equipment	Device Type / ID Antenna tower / SAC5 Antenna / 19-15 Turn table / SAC5 Cable antenna -> preamp / SAC5_RE Spectrum analyser / 168593			**Settings**	Band(s): 30 MHz - 1 GHz, Reference Level: 90 dBµV RBW: 120 kHz, VBW: 500 kHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 9701 steps per Band, Attenuator: 0 dB, Internal preamp: 10 dB, Measure time: Auto [120 ms] Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 10 s, AVG 1 s / 10 s		

47 CFR §15.209



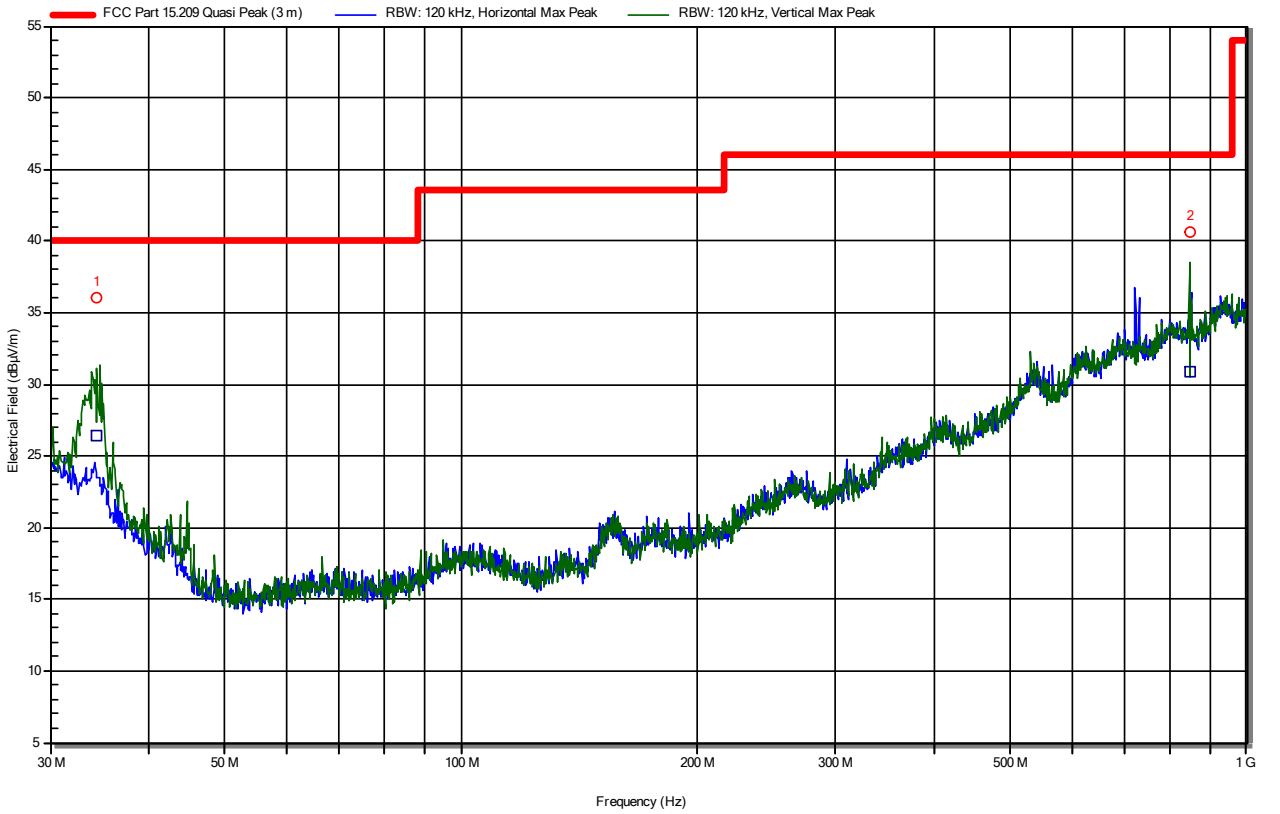
Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Quasi-Peak (dBµV/m)	Quasi-Peak Difference (dB)	Angle (degrees)	Height (m)	Polarization	Status
1	33.6	31.29	21.95	-18.05	180	2	Vertical	Pass
2	846.5	30.6	24.51	-21.49	112	1	Horizontal	Pass

Measurement	RE 30 MHz to 1 GHz	**Test ID**	#7	**Date and time**	23.05.2024 13:30:17	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, BOT (2.402 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is lying						
Antenna Height	1 m to 4 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 degrees to 360 degrees, 16 step(s)	**Distance**	3 m
Test Place	ROS-SAC5		**Software**	Radimation 2023.2.5 (SAC5 RE 30M-1G Std Class-A&B 3m ETS 19-15 ESU26-i1-LAN)			
Equipment	Device Type / ID Turn table / SAC5 Antenna tower / SAC5 Cable antenna -> preamp / SAC5_RE Spectrum analyser / 168593 Antenna / 19-15		**Settings**	Band(s): 30 MHz - 1 GHz, Reference Level: 90 dBµV RBW: 120 kHz, VBW: 500 kHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 9701 steps per Band, Attenuator: 0 dB, Internal preamp: 10 dB, Measure time: Auto [120 ms] Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 10 s, AVG 1 s / 10 s			

47 CFR §15.209

RadiMation



Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Quasi-Peak (dBµV/m)	Quasi-Peak Difference (dB)	Angle (degrees)	Height (m)	Polarization	Status
1	34.281	36.07	26.43	-13.57	135	1	Vertical	Pass
2	847.3	40.67	30.84	-15.22	225	3	Vertical	Pass

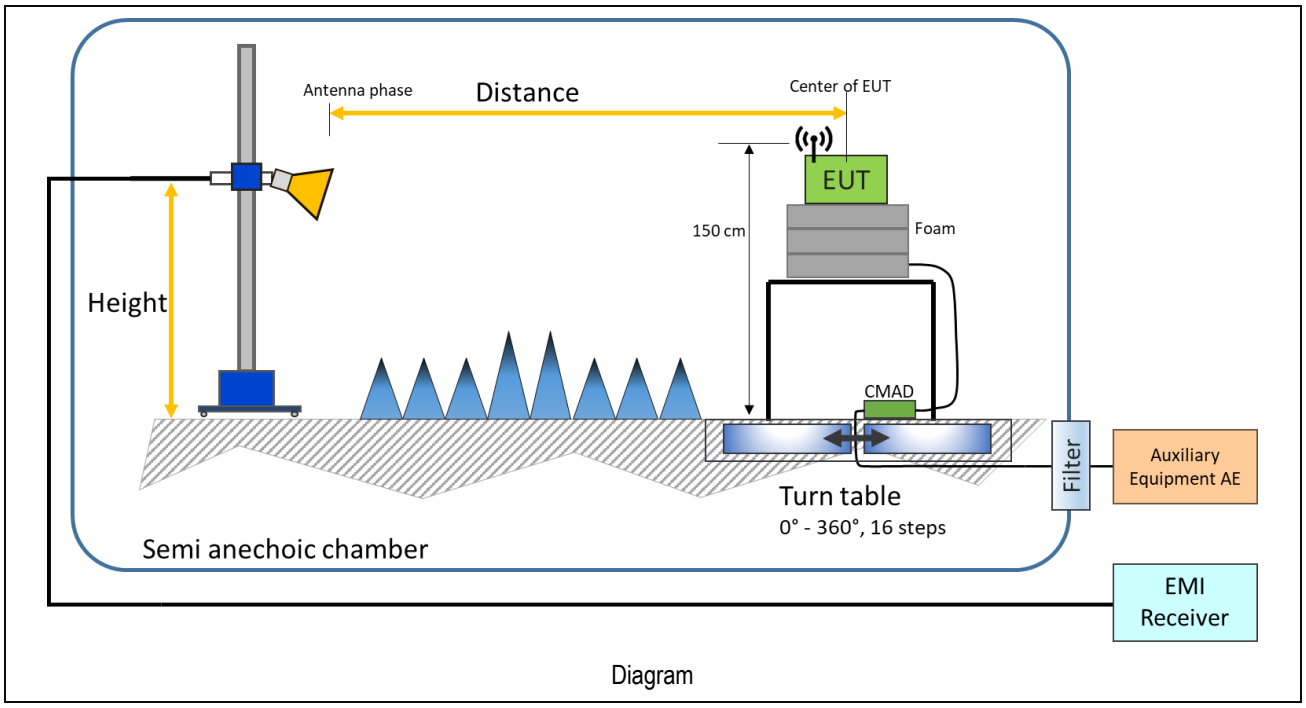
6.5.3 1 GHz to 6 GHz

FCC reference: Part 15.247 (d) and Part 15.209 (a)

Test Method: FCC KDB 558074 Section 8.5 and Section 8.6 referring ANSI C63.10 Section 11.11, 11.12, 6.3 and 6.5

Measuring method: The electromagnetic disturbance radiated by the equipment is measured using a spectrum analyser and a wide band antenna. The antenna is moved from 1 to 4 m in height successively with horizontal and vertical polarisations. The turning table is operated through 360° during the measurements. The recordings are carried out considering the maximum value of all the disturbances appearing while the apparatus is under test. The peak values are recorded continuously on the graph. The values exceeding a limit shall be re-measured manually using a receiver.

Test set-up:



Diagram

Result:	☒ pass	☐ fail	☐ not applicable	☐ partly tested

Test summary

Test engineer:	Ms C. Clément			
Test date:	2024-06-03			
Climatic conditions:	Temperature: 23 °C	Humidity: 47 %	Pressure QFE: 934 hPa	
Test site:	☒ SAC3	☐ SAC5	☐ SAC10	☐ Open test site
Meas. distance:	☒ 3 m	☐ 10 m		
Position of EUT:	1.5 m (height of the equipment under test above floor)			
Test sample used:	Sample #1, see §4.3			
Operating mode:	See §5.5			
Cables connected:	DC supply			
Modifications:	None			
Remarks:	Limit values expressed in dBµV/m and transformed to a measuring distance of 3 m (factor used = 20 dB/decade) if necessary e.g.: for f = 1 GHz the limit is 500µV/m at 3m; $20\ log\left(\frac{500\frac{\mu V}{m}}{1\frac{\mu V}{m}}\right) + 20\ log\left(\frac{3m}{3m}\right) = 53.98\ \frac{dB\mu V}{m}\ at\ 3m$			

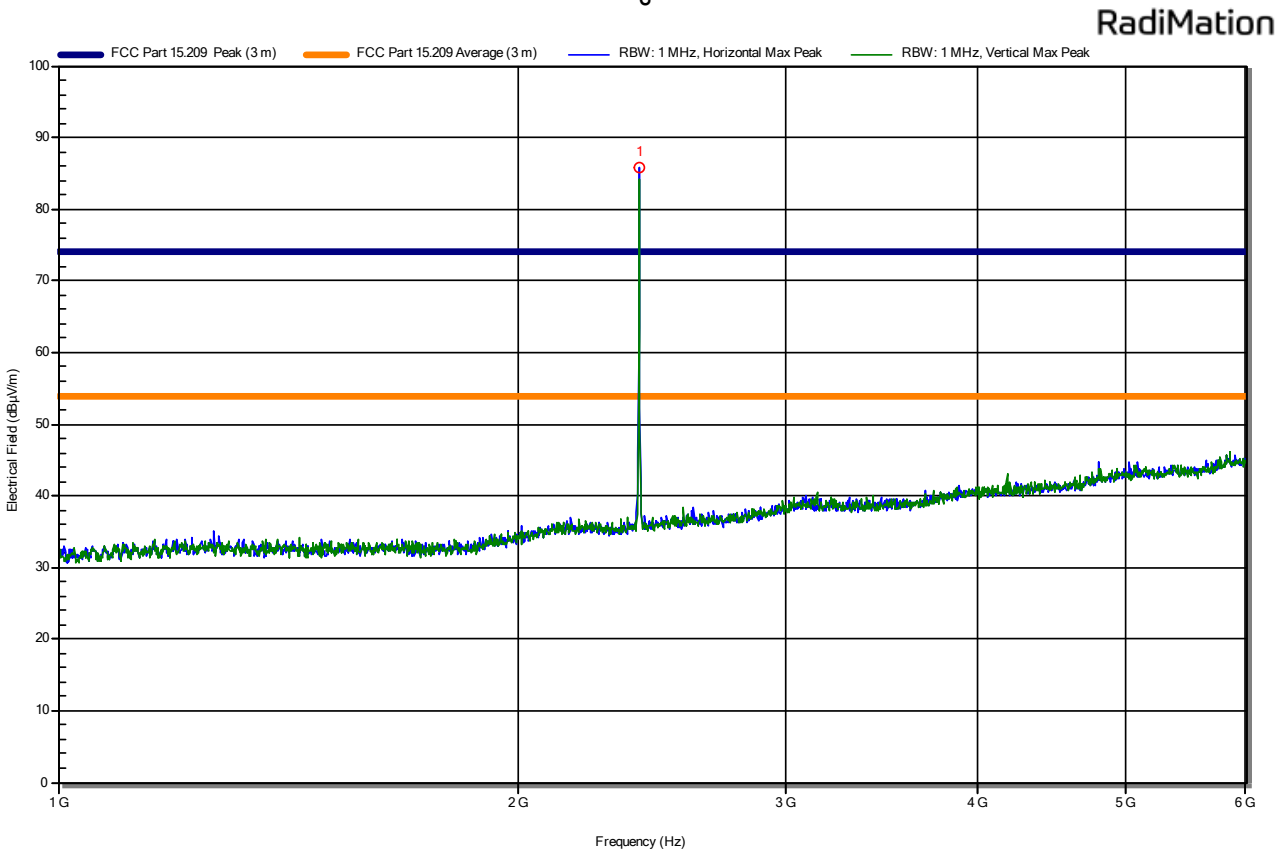
Results

Measurement	RE 1 GHz to 6 GHz	**Test ID**	#2	**Date and time**	23.05.2024 14:30:55	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, BOT (2.402 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is standing						
Antenna Height	1 m to 4 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 ° to 360 °, 16 step(s)	**Distance**	3 m
Test Place	ROS-SAC3			**Software**	Radimation 2023.2.5 (RE FCC 1-6G ESW26 Schwarzbeck 9120D SAC3)		

Equipment			**Settings**	
	Device Type	ID		
	Pre amplifier	14-27		
	Cable antenna -> preamp	15-16		
	Antenna tower	17-02		
	Turn table	17-02		
	Spectrum analyser	21-07		
	Cable antenna -> preamp	11-61		
	Antenna	22-07		
	Cable preamp -> analyser	15-15		

Band(s): 1 GHz - 6 GHz, Reference Level: 100 dBµV
RBW: 1 MHz, VBW: 3 MHz, Sweeptime: 200 ms, Number of Sweeps: 10
Step freq: Fixed step count: 5001 steps per Band, Attenuator: 0.0 dB, Internal preamp: 0 dB,
Measure time: 2 s
Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 5 s, AVG 1 s / 10 s

47 CFR §15.209

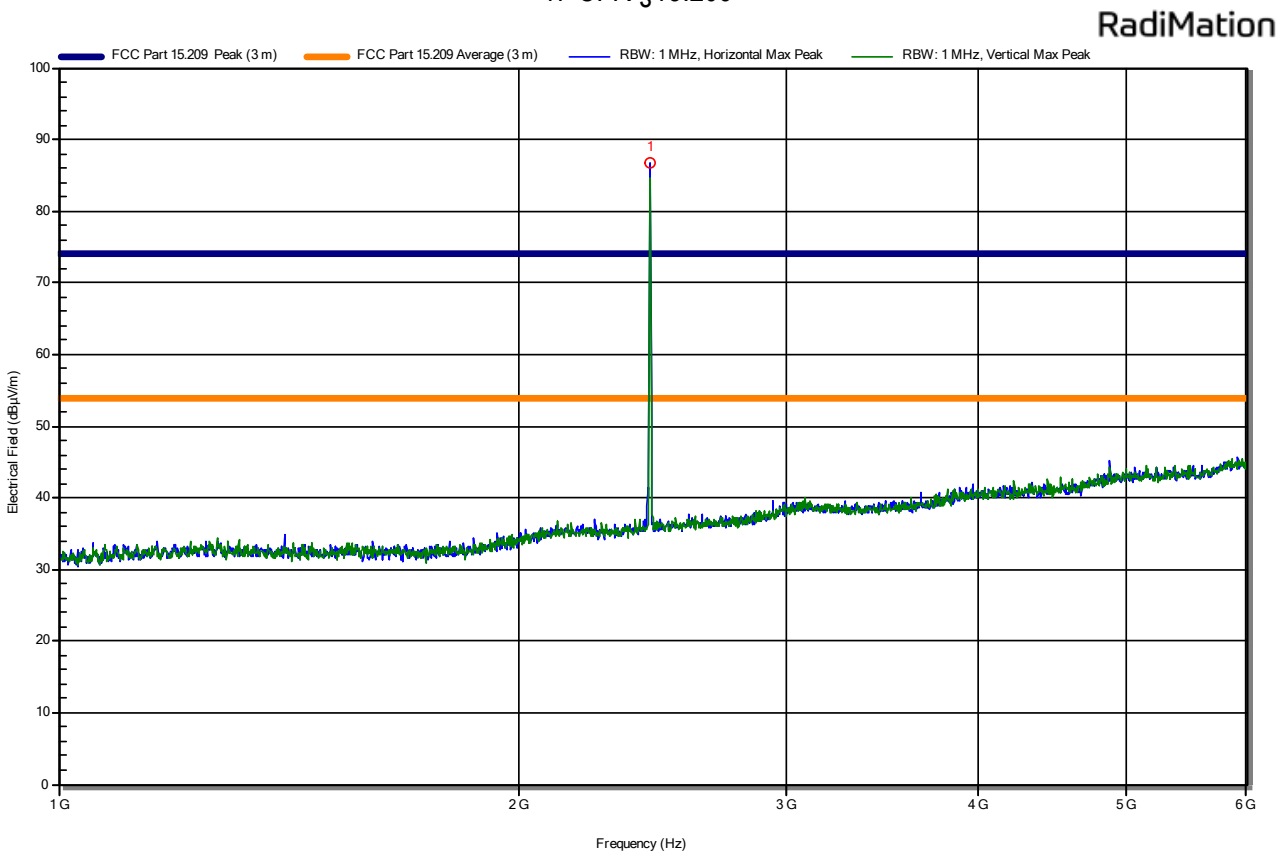


Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Angle (°)	Height (m)	Polarization
1	2402	85.8	203	1	Horizontal

Measurement	RE 1 GHz to 6 GHz	**Test ID**	#3	**Date and time**	23.05.2024 14:59:58	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, MID (2.44 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is standing						
Antenna Height	1 m to 4 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 ° to 360 °, 16 step(s)	**Distance**	3 m
Test Place	ROS-SAC3			**Software**	Radimation 2023.2.5 (RE FCC 1-6G ESW26 Schwarzbeck 9120D SAC3)		
Equipment	Device Type / ID Cable antenna -> preamp 11-61 Turn table 17-02 Antenna 22-07 Pre amplifier 14-27 Antenna tower 17-02 Spectrum analyser 21-07 Cable antenna -> preamp 15-16 Cable preamp -> analyser 15-15			**Settings**	Band(s): 1 GHz - 6 GHz, Reference Level: 100 dBµV RBW: 1 MHz, VBW: 3 MHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 5001 steps per Band, Attenuator: 0.0 dB, Internal preamp: 0 dB, Measure time: 2 s Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 5 s, AVG 1 s / 10 s		

47 CFR §15.209

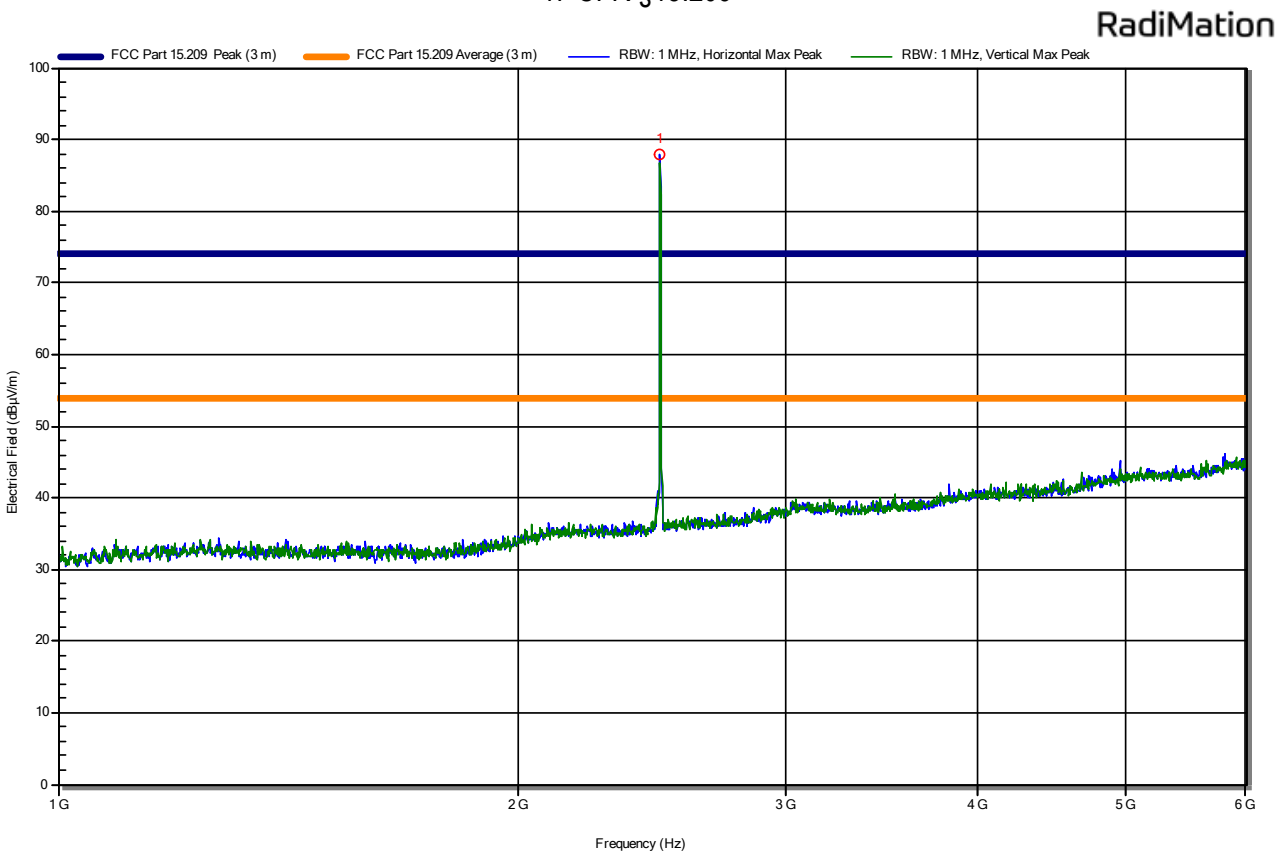


Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Angle (°)	Height (m)	Polarization
1	2440	86.7	315	1	Horizontal

Measurement	RE 1 GHz to 6 GHz	**Test ID**	#4	**Date and time**	23.05.2024 15:30:40	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, TOP (2.48 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is standing						
Antenna Height	1 m to 4 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 ° to 360 °, 16 step(s)	**Distance**	3 m
Test Place	ROS-SAC3			**Software**	Radimation 2023.2.5 (RE FCC 1-6G ESW26 Schwarzbeck 9120D SAC3)		
Equipment	Device Type / ID Cable antenna -> preamp 11-61 Turn table 17-02 Antenna 22-07 Pre amplifier 14-27 Antenna tower 17-02 Spectrum analyser 21-07 Cable antenna -> preamp 15-16 Cable preamp -> analyser 15-15			**Settings**	Band(s): 1 GHz - 6 GHz, Reference Level: 100 dBµV RBW: 1 MHz, VBW: 3 MHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 5001 steps per Band, Attenuator: 0.0 dB, Internal preamp: 0 dB, Measure time: 2 s Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 5 s, AVG 1 s / 10 s		

47 CFR §15.209

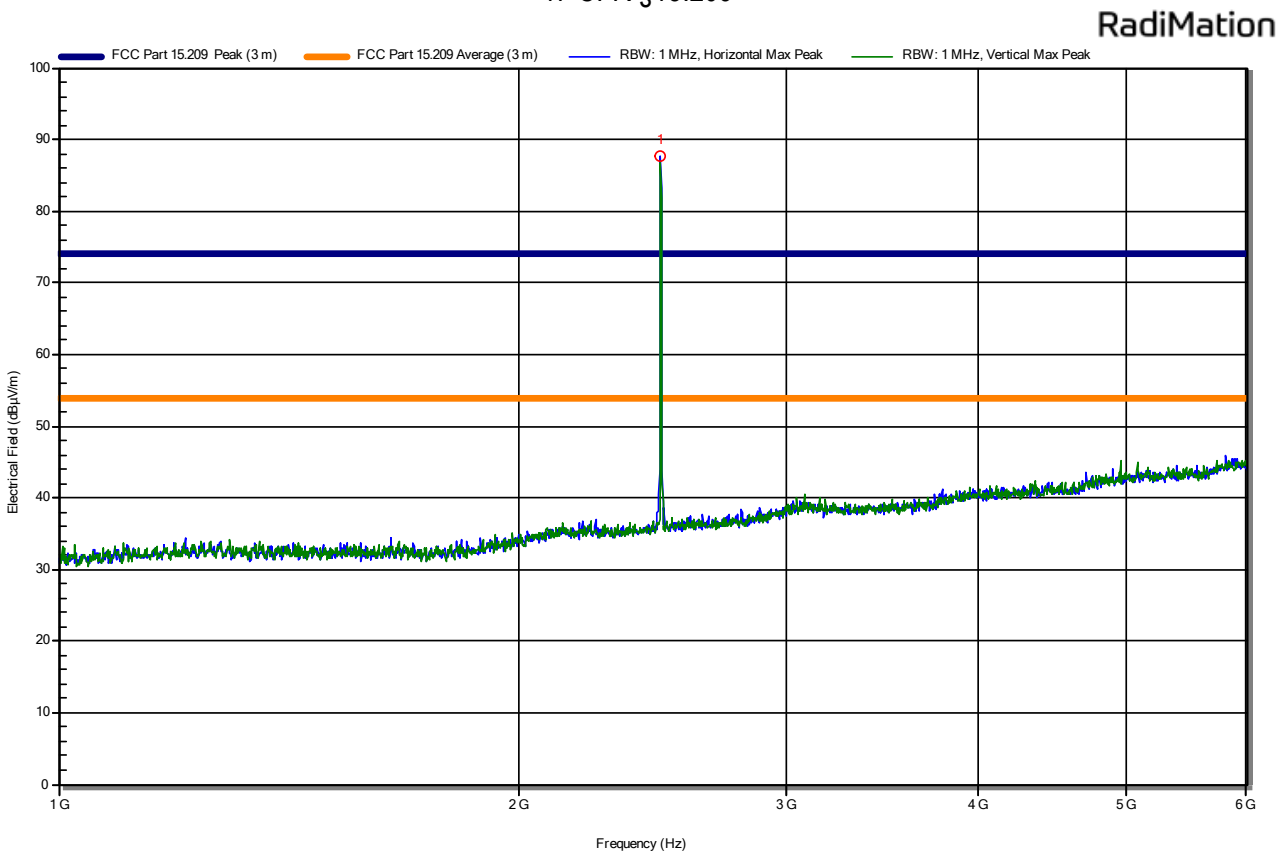


Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Angle (°)	Height (m)	Polarization
1	2480	88	315	1	Horizontal

Measurement	RE 1 GHz to 6 GHz		**Test ID**	#5	**Date and time**	23.05.2024 15:59:41	**Operator**	C. Clément
EUT	CP+				**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, TOP (2.48 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is lying							
Antenna Height	1 m to 4 m, 4 step(s)	**Polarization**	Both		**Table Angle**	0 ° to 360 °, 16 step(s)	**Distance**	3 m
Test Place	ROS-SAC3		**Software**		Radimation 2023.2.5 (RE FCC 1-6G ESW26 Schwarzbeck 9120D SAC3)			
Equipment	Device Type / ID Cable antenna -> preamp 11-61 Turn table 17-02 Antenna 22-07 Pre amplifier 14-27 Antenna tower 17-02 Spectrum analyser 21-07 Cable antenna -> preamp 15-16 Cable preamp -> analyser 15-15		**Settings**		Band(s): 1 GHz - 6 GHz, Reference Level: 100 dBµV RBW: 1 MHz, VBW: 3 MHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 5001 steps per Band, Attenuator: 0.0 dB, Internal preamp: 0 dB, Measure time: 2 s Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 5 s, AVG 1 s / 10 s			

47 CFR §15.209



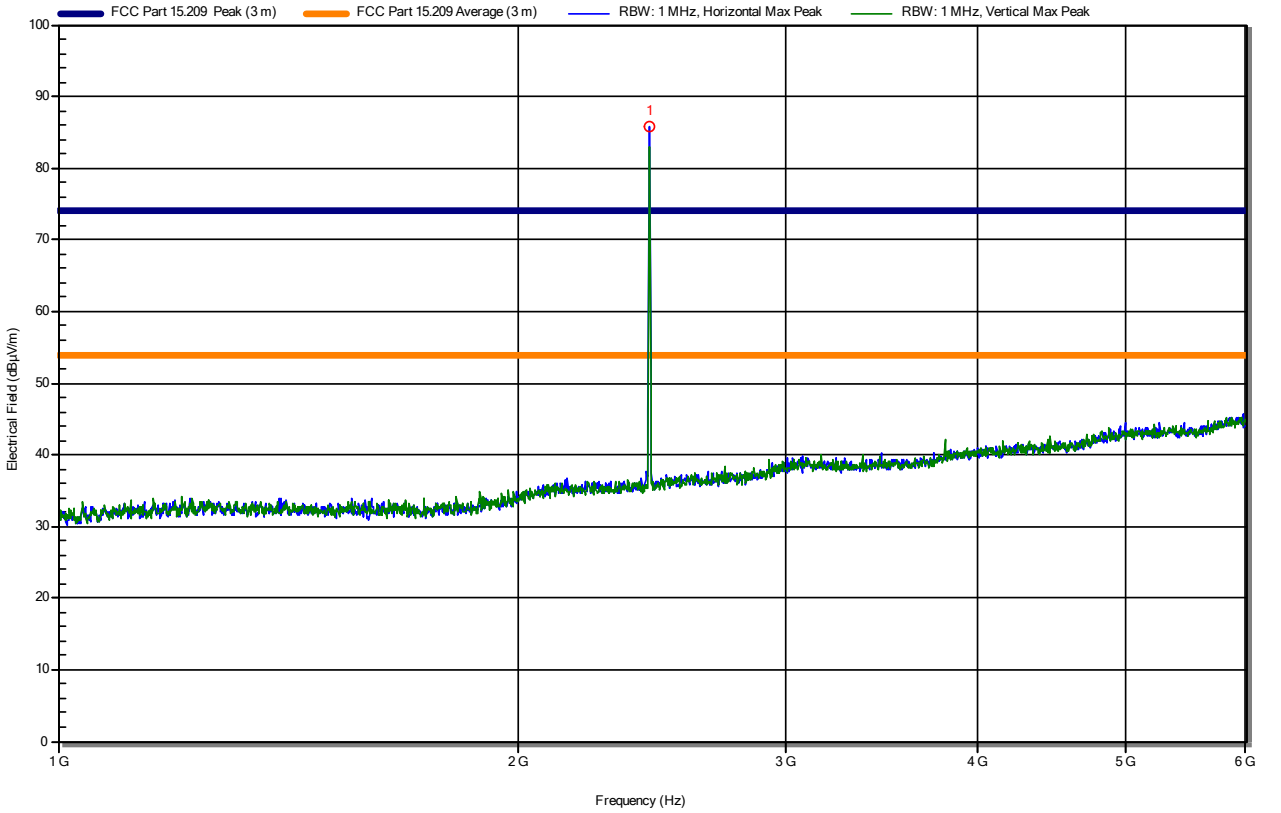
Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Angle (°)	Height (m)	Polarization
1	2480	87.7	292	4	Horizontal

Measurement	RE 1 GHz to 6 GHz	**Test ID**	#6	**Date and time**	23.05.2024 16:26:17	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, MID (2.44 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is lying						
Antenna Height	1 m to 4 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 ° to 360 °, 16 step(s)	**Distance**	3 m
Test Place	ROS-SAC3			**Software**	Radimation 2023.2.5 (RE FCC 1-6G ESW26 Schwarzbeck 9120D SAC3)		
Equipment	Device Type / ID Cable antenna -> preamp 11-61 Turn table 17-02 Antenna 22-07 Pre amplifier 14-27 Antenna tower 17-02 Spectrum analyser 21-07 Cable antenna -> preamp 15-16 Cable preamp -> analyser 15-15			**Settings**	Band(s): 1 GHz - 6 GHz, Reference Level: 100 dBµV RBW: 1 MHz, VBW: 3 MHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 5001 steps per Band, Attenuator: 0.0 dB, Internal preamp: 0 dB, Measure time: 2 s Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 5 s, AVG 1 s / 10 s		

47 CFR §15.209

RadiMation

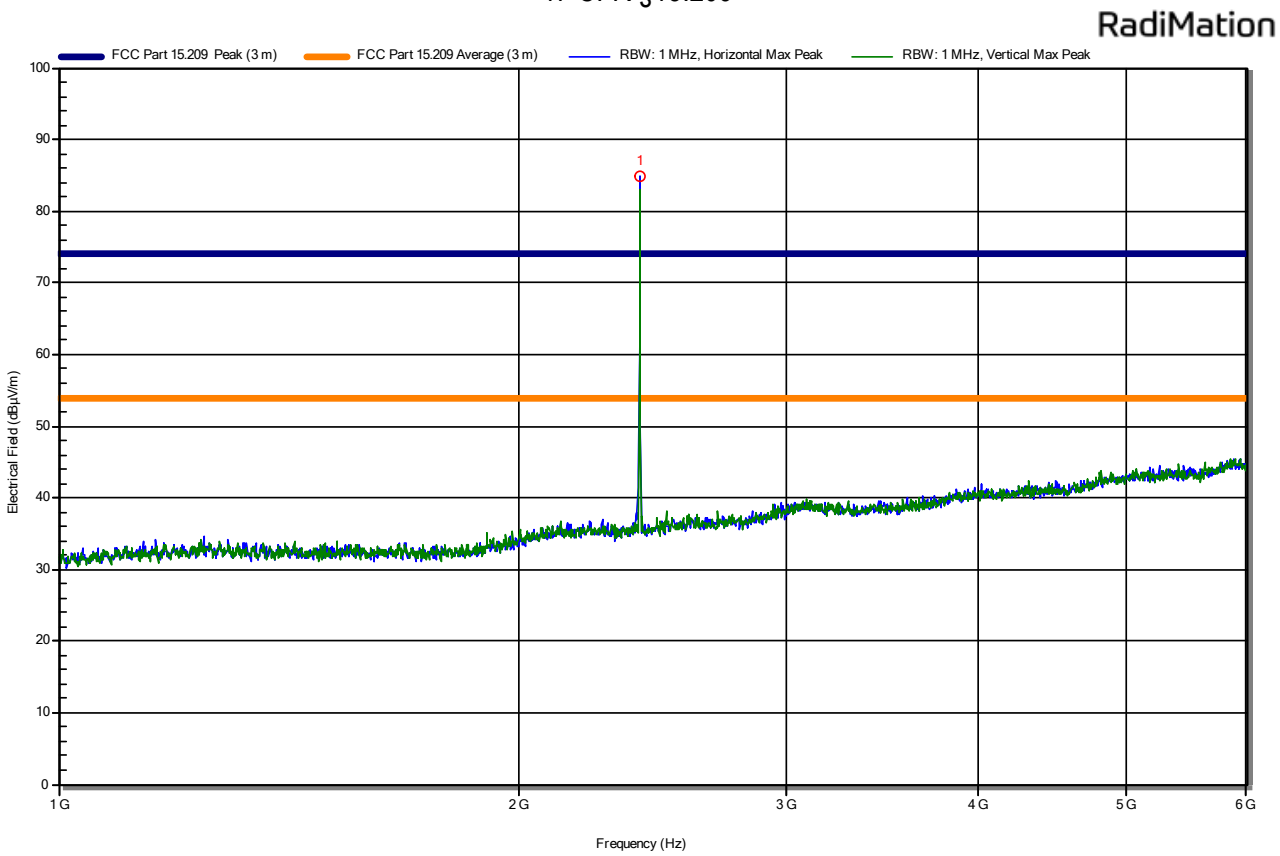


Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Angle (°)	Height (m)	Polarization
1	2440	85.8	292	4	Horizontal

Measurement	RE 1 GHz to 6 GHz	**Test ID**	#7	**Date and time**	23.05.2024 16:53:29	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, BOT (2.402 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is lying						
Antenna Height	1 m to 4 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 ° to 360 °, 16 step(s)	**Distance**	3 m
Test Place	ROS-SAC3			**Software**	Radimation 2023.2.5 (RE FCC 1-6G ESW26 Schwarzbeck 9120D SAC3)		
Equipment	Device Type / ID Cable antenna -> preamp 11-61 Turn table 17-02 Antenna 22-07 Pre amplifier 14-27 Antenna tower 17-02 Spectrum analyser 21-07 Cable antenna -> preamp 15-16 Cable preamp -> analyser 15-15			**Settings**	Band(s): 1 GHz - 6 GHz, Reference Level: 100 dBµV RBW: 1 MHz, VBW: 3 MHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 5001 steps per Band, Attenuator: 0.0 dB, Internal preamp: 0 dB, Measure time: 2 s Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 5 s, AVG 1 s / 10 s		

47 CFR §15.209



Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Angle (°)	Height (m)	Polarization
1	2402	84.9	180	4	Horizontal

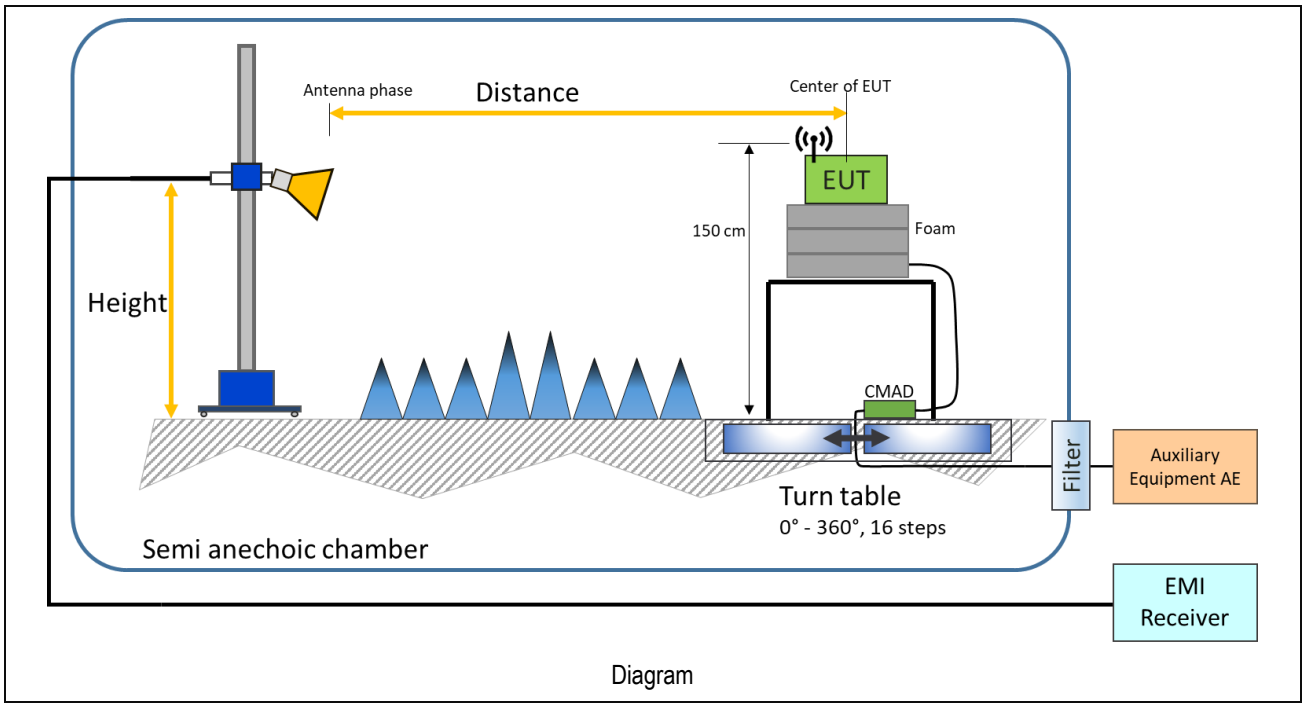
6.5.4 6 GHz to 18 GHz

FCC reference: Part 15.247 (d) and Part 15.209 (a)

Test Method: FCC KDB 558074 Section 8.5 and Section 8.6 referring ANSI C63.10 Section 11.11, 11.12, 6.3 and 6.5

Measuring method: The electromagnetic disturbance radiated by the equipment is measured using a spectrum analyser and a wide band antenna. The antenna is moved from 1 to 4 m in height successively with horizontal and vertical polarisations. The turning table is operated through 360° during the measurements. The recordings are carried out considering the maximum value of all the disturbances appearing while the apparatus is under test. The peak values are recorded continuously on the graph. The values exceeding a limit shall be re-measured manually using a receiver.

Test set-up:



Diagram

Result:	☒ pass	☐ fail	☐ not applicable	☐ partly tested

Test summary

Test engineer:	Ms C. Clément			
Test date:	2024-06-03			
Climatic conditions:	Temperature: 23 °C	Humidity: 47 %	Pressure QFE: 934 hPa	
Test site:	☒ SAC3	☐ SAC5	☐ SAC10	☐ Open test site
Meas. distance:	☒ 1 m	☐ 3 m	☐ 10 m	
Position of EUT:	1.5 m (height of the equipment under test above floor)			
Test sample used:	Sample #1, see §4.3			
Operating mode:	See §5.5			
Cables connected:	DC supply			
Modifications:	None			
Remarks:	Limit values expressed in dBµV/m and transformed to a measuring distance of 1 m (factor used = 20 dB/decade) if necessary e.g.: for f = 6 GHz the limit is 500µV/m at 3 m;			

$$20\ log\left(\frac{500\frac{\mu V}{m}}{1\frac{\mu V}{m}}\right) + 20\ log\left(\frac{3m}{1m}\right) = 63.5\ \frac{dB\mu V}{m}\ at\ 1m$$

Results

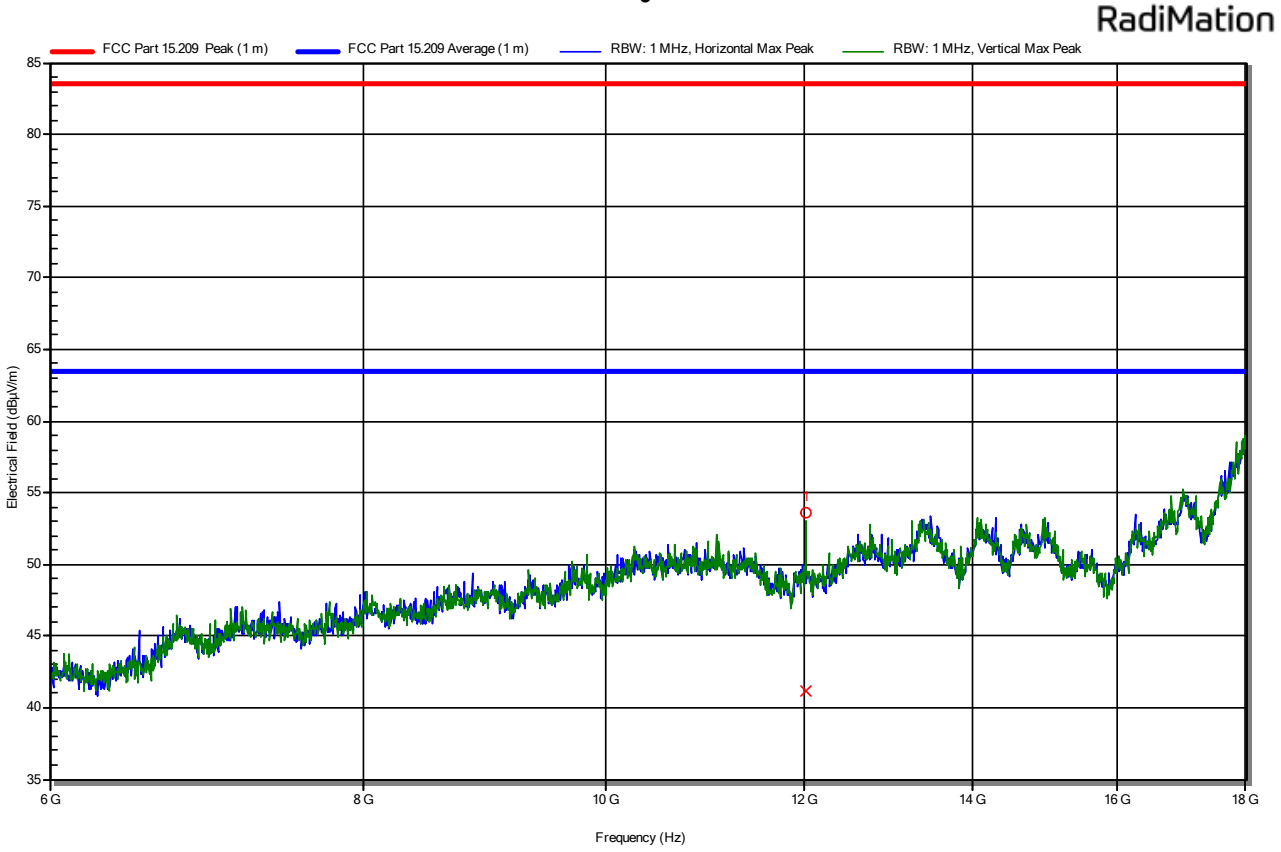
Measurement	RE 6 GHz to 18 GHz	**Test ID**	#9	**Date and time**	24.05.2024 08:32:32	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, BOT (2.402 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is lying						
Antenna Height	1.5 m to 3 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 degrees to 360 degrees, 16 step(s)	**Distance**	1 m
Test Place	ROS-SAC3			**Software**	Radimation 2023.2.5 (RE 6-18G ESW26 Schwarzbeck 9120D SAC3 outside)		

Equipment	Device Type	ID
	Cable preamp -> analyser	15-15
	Antenna tower	17-02
	Antenna	22-07
	Cable preamp -> analyser	11-61
	Cable preamp -> analyser	15-16
	Turn table	17-02
	Pre amplifier	14-27
	Cable antenna -> preamp	11-30
	Spectrum analyser	21-07

Settings

Band(s): 6 GHz - 18 GHz, Reference Level: 80 dBµV
RBW: 1 MHz, VBW: 3 MHz, Sweeptime: 200 ms, Number of Sweeps: 10
Step freq: Fixed step count: 5001 steps per Band, Attenuator: 0.0 dB, Internal preamp: 0 dB, Measure time: 2 s
Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 10 s, AVG 1 s / 10 s

47 CFR §15.209

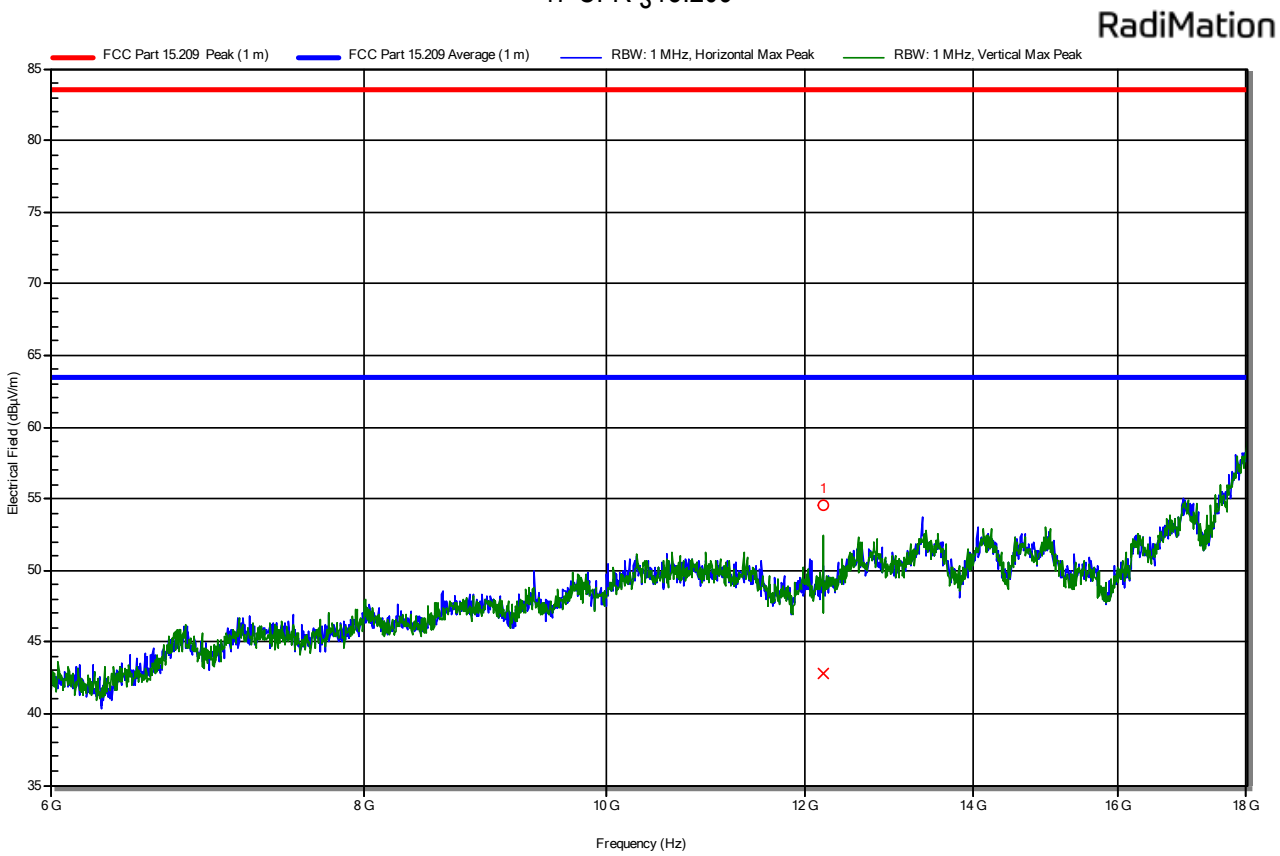


Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Peak Difference (dB)	Average (dBµV/m)	Average Difference (dB)	Angle (degrees)	Height (m)	Polarization	Status
1	12009.6	53.6	-29.9	41.2	-22.3	225	2.5	Vertical	Pass

Measurement	RE 6 GHz to 18 GHz	**Test ID**	#10	**Date and time**	24.05.2024 09:08:13	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, MID (2.44 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is lying						
Antenna Height	1.5 m to 3 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 degrees to 360 degrees, 16 step(s)	**Distance**	1 m
Test Place	ROS-SAC3		**Software**	Radimation 2023.2.5 (RE 6-18G ESW26 Schwarzbeck 9120D SAC3 outside)			
Equipment	Device Type / ID Turn table 17-02 Antenna 22-07 Cable antenna -> preamp 11-30 Cable preamp -> analyser 15-15 Antenna tower 17-02 Spectrum analyser 21-07 Cable preamp -> analyser 15-16 Cable preamp -> analyser 11-61 Pre amplifier 14-27		**Settings**	Band(s): 6 GHz - 18 GHz, Reference Level: 80 dBµV RBW: 1 MHz, VBW: 3 MHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 5001 steps per Band, Attenuator: 0.0 dB, Internal preamp: 0 dB, Measure time: 2 s Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 10 s, AVG 1 s / 10 s			

47 CFR §15.209



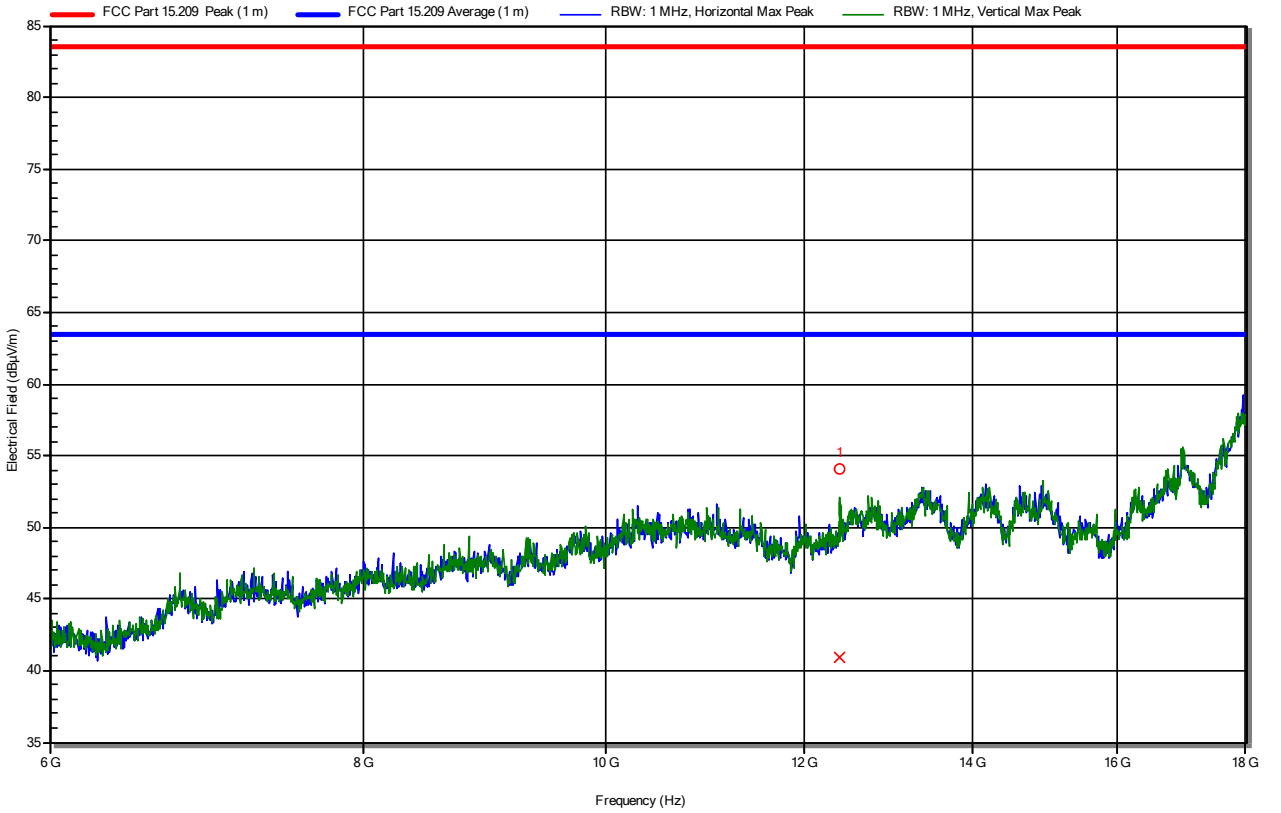
Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Peak Difference (dB)	Average (dBµV/m)	Average Difference (dB)	Angle (degrees)	Height (m)	Polarization	Status
1	12201.6	54.6	-28.9	42.8	-20.7	293	2.5	Vertical	Pass

Measurement	RE 6 GHz to 18 GHz	**Test ID**	#11	**Date and time**	24.05.2024 09:52:17	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, TOP (2.48 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is lying						
Antenna Height	1.5 m to 3 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 degrees to 360 degrees, 16 step(s)	**Distance**	1 m
Test Place	ROS-SAC3			**Software**	Radimation 2023.2.5 (RE 6-18G ESW26 Schwarzbeck 9120D SAC3 outside)		
Equipment	Device Type / ID Turn table 17-02 Antenna 22-07 Cable antenna -> preamp 11-30 Cable preamp -> analyser 15-15 Antenna tower 17-02 Spectrum analyser 21-07 Cable preamp -> analyser 15-16 Cable preamp -> analyser 11-61 Pre amplifier 14-27			**Settings**	Band(s): 6 GHz - 18 GHz, Reference Level: 80 dBµV RBW: 1 MHz, VBW: 3 MHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 5001 steps per Band, Attenuator: 0.0 dB, Internal preamp: 0 dB, Measure time: 2 s Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 10 s, AVG 1 s / 10 s		

47 CFR §15.209

RadiMation

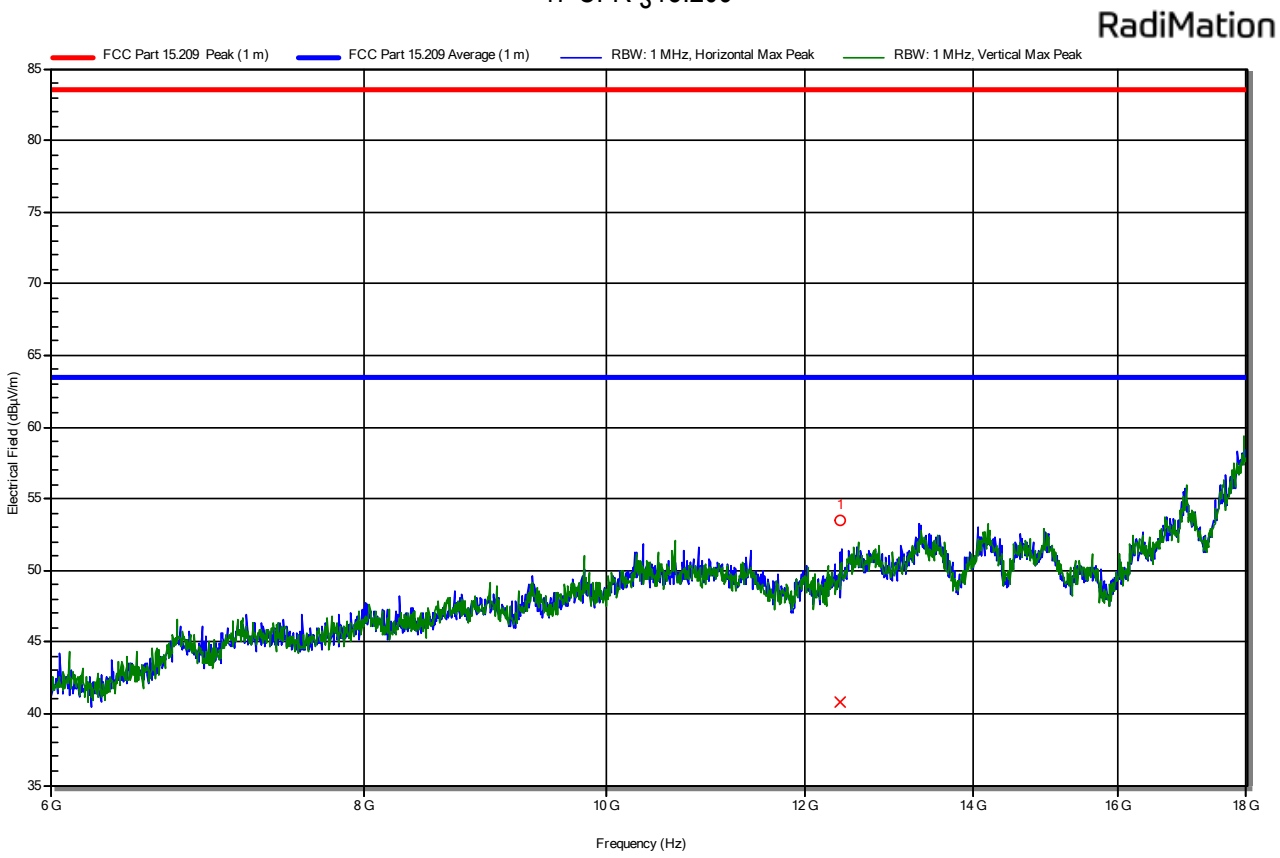


Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Peak Difference (dB)	Average (dBµV/m)	Average Difference (dB)	Angle (degrees)	Height (m)	Polarization	Status
1	12399.565	54.1	-29.4	40.9	-22.6	293	2.5	Vertical	Pass

Measurement	RE 6 GHz to 18 GHz	**Test ID**	#12	**Date and time**	24.05.2024 10:21:49	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, TOP (2.48 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is standing						
Antenna Height	1.5 m to 3 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 degrees to 360 degrees, 16 step(s)	**Distance**	1 m
Test Place	ROS-SAC3		**Software**	Radimation 2023.2.5 (RE 6-18G ESW26 Schwarzbeck 9120D SAC3 outside)			
Equipment	Device Type / ID Turn table 17-02 Antenna 22-07 Cable antenna -> preamp 11-30 Cable preamp -> analyser 15-15 Antenna tower 17-02 Spectrum analyser 21-07 Cable preamp -> analyser 15-16 Cable preamp -> analyser 11-61 Pre amplifier 14-27		**Settings**	Band(s): 6 GHz - 18 GHz, Reference Level: 80 dBµV RBW: 1 MHz, VBW: 3 MHz, Sweeptime: 200 ms, Number of Sweeps: 10 Step freq: Fixed step count: 5001 steps per Band, Attenuator: 0.0 dB, Internal preamp: 0 dB, Measure time: 2 s Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 10 s, AVG 1 s / 10 s			

47 CFR §15.209



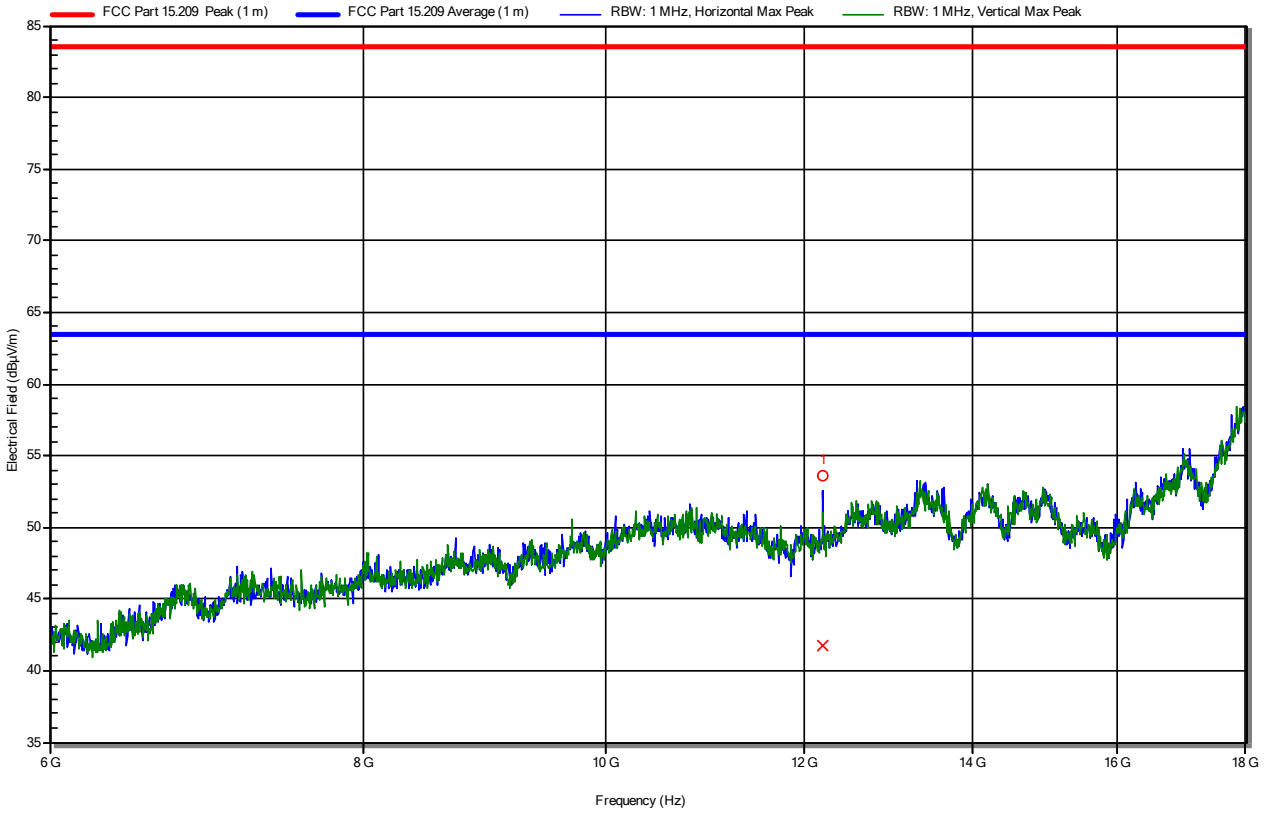
Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Peak Difference (dB)	Average (dBµV/m)	Average Difference (dB)	Angle (degrees)	Height (m)	Polarization	Status
1	12400.8	53.5	-30.0	40.8	-22.7	225	2.5	Horizontal	Pass

Measurement	RE 6 GHz to 18 GHz	**Test ID**	#13	**Date and time**	24.05.2024 11:02:29	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, MID (2.44 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is standing						
Antenna Height	1.5 m to 3 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 degrees to 360 degrees, 16 step(s)	**Distance**	1 m
Test Place	ROS-SAC3			**Software**	Radimation 2023.2.5 (RE 6-18G ESW26 Schwarzbeck 9120D SAC3 outside)		
Equipment	Device Type / ID Turn table 17-02 Antenna 22-07 Cable antenna -> preamp 11-30 Cable preamp -> analyser 15-15 Antenna tower 17-02 Spectrum analyser 21-07 Cable preamp -> analyser 15-16 Cable preamp -> analyser 11-61 Pre amplifier 14-27			**Settings**	Band(s): 6 GHz - 18 GHz, Reference Level: 80 dBµV RBW: 1 MHz, VBW: 3 MHz, Sweeptime: 200 ms, Number of Sweeps: 15 Step freq: Fixed step count: 5001 steps per Band, Attenuator: 0.0 dB, Internal preamp: 0 dB, Measure time: 2 s Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 10 s, AVG 1 s / 10 s		

47 CFR §15.209

RadiMation

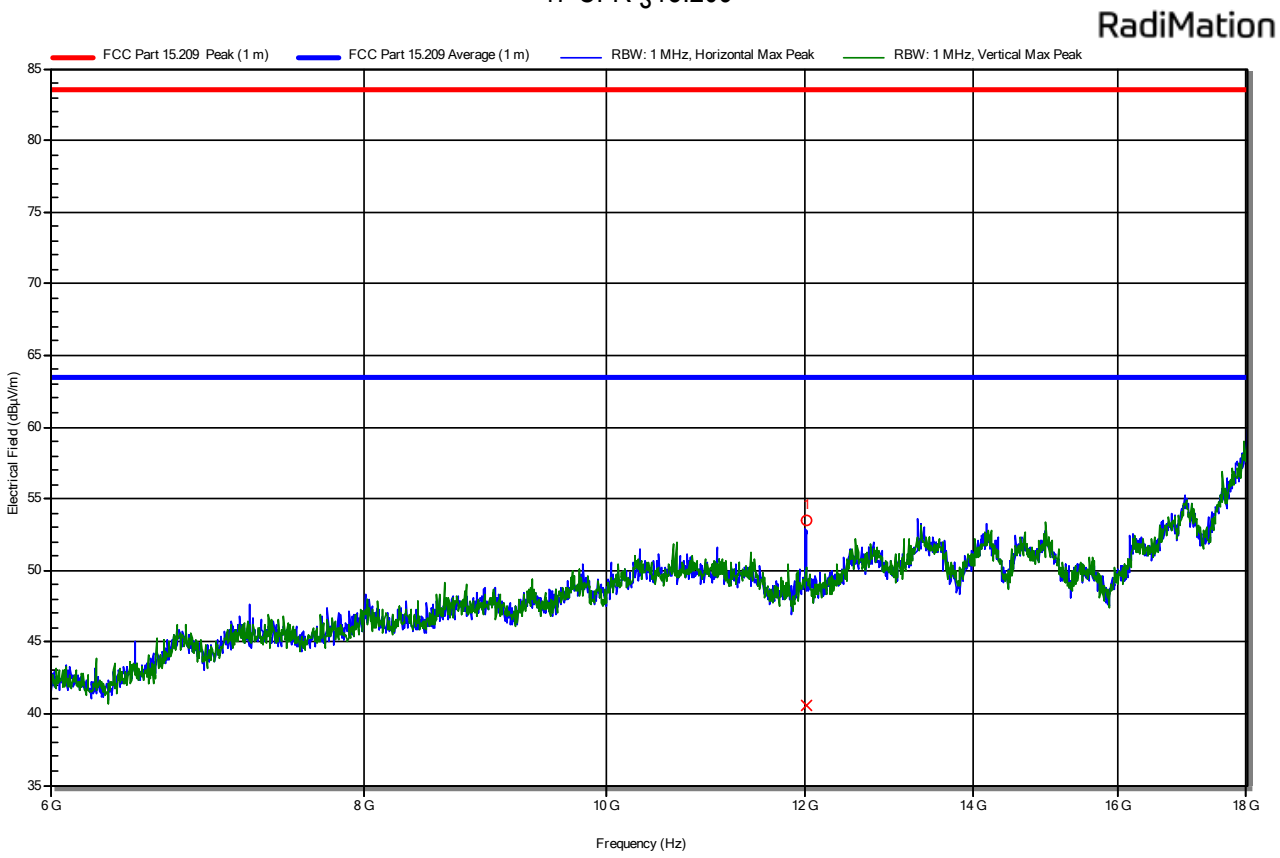


Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Peak Difference (dB)	Average (dBµV/m)	Average Difference (dB)	Angle (degrees)	Height (m)	Polarization	Status
1	12200.686	53.6	-29.9	41.7	-21.8	225	1.5	Horizontal	Pass

Measurement	RE 6 GHz to 18 GHz	**Test ID**	#15	**Date and time**	24.05.2024 12:11:07	**Operator**	C. Clément
EUT	CP+			**Order**	23CH-00972	**Verdict**	Pass
Notes	EUT: CP+ Operating mode: Continuous duty (100 %), TX, BOT (2.402 GHz), Power level set to 9 (0 dBm) Power supply: 24 VDC from battery Connected cables: Power supply Modifications: None Remarks: EUT is standing						
Antenna Height	1.5 m to 3 m, 4 step(s)	**Polarization**	Both	**Table Angle**	0 degrees to 360 degrees, 16 step(s)	**Distance**	1 m
Test Place	ROS-SAC3		**Software**	Radimation 2023.2.5 (RE 6-18G ESW26 Schwarzbeck 9120D SAC3 outside)			
Equipment	Device Type / ID Turn table 17-02 Antenna 22-07 Cable antenna -> preamp 11-30 Cable preamp -> analyser 15-15 Antenna tower 17-02 Spectrum analyser 21-07 Cable preamp -> analyser 15-16 Cable preamp -> analyser 11-61 Pre amplifier 14-27		**Settings**	Band(s): 6 GHz - 18 GHz, Reference Level: 80 dBµV RBW: 1 MHz, VBW: 3 MHz, Sweeptime: 200 ms, Number of Sweeps: 15 Step freq: Fixed step count: 5001 steps per Band, Attenuator: 0.0 dB, Internal preamp: 0 dB, Measure time: 2 s Final Measurement/Observation Time: PK 1 s / 10 s, QP 1 s / 10 s, AVG 1 s / 10 s			

47 CFR §15.209



Detected peaks

Peak Number	Frequency (MHz)	Peak (dBµV/m)	Peak Difference (dB)	Average (dBµV/m)	Average Difference (dB)	Angle (degrees)	Height (m)	Polarization	Status
1	12009.6	53.5	-30.0	40.5	-23.0	247	2	Horizontal	Pass

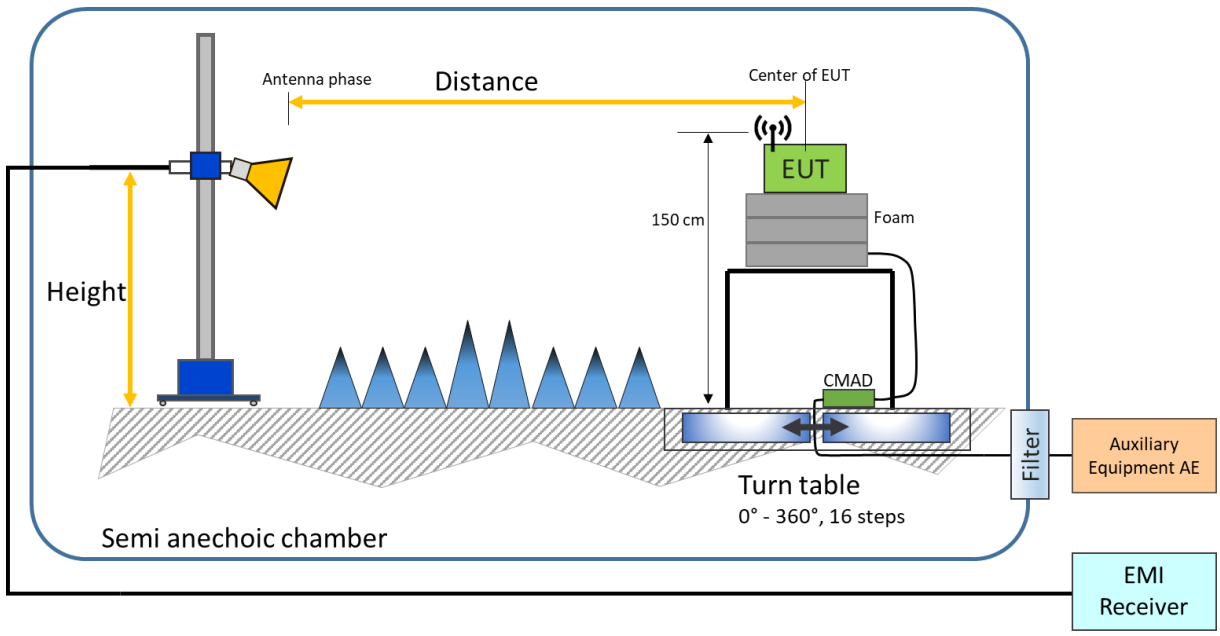
6.5.5 18 GHz to 26 GHz

FCC reference: Part 15.247 (d) and Part 15.209 (a)

Test Method: FCC KDB 558074 Section 8.5 and Section 8.6 referring ANSI C63.10 Section 11.11, 11.12, 6.3 and 6.5

Measuring method: The electromagnetic disturbance radiated by the equipment is measured using a spectrum analyser and a wide band antenna. The antenna is 1.5 m high with horizontal and vertical polarisations. The turning table is operated through 360° during the measurements. The recordings are carried out considering the maximum value of all the disturbances appearing while the apparatus is under test. The peak values are recorded continuously on the graph. The values exceeding a limit shall be re-measured manually using a receiver.

Test set-up:



Diagram

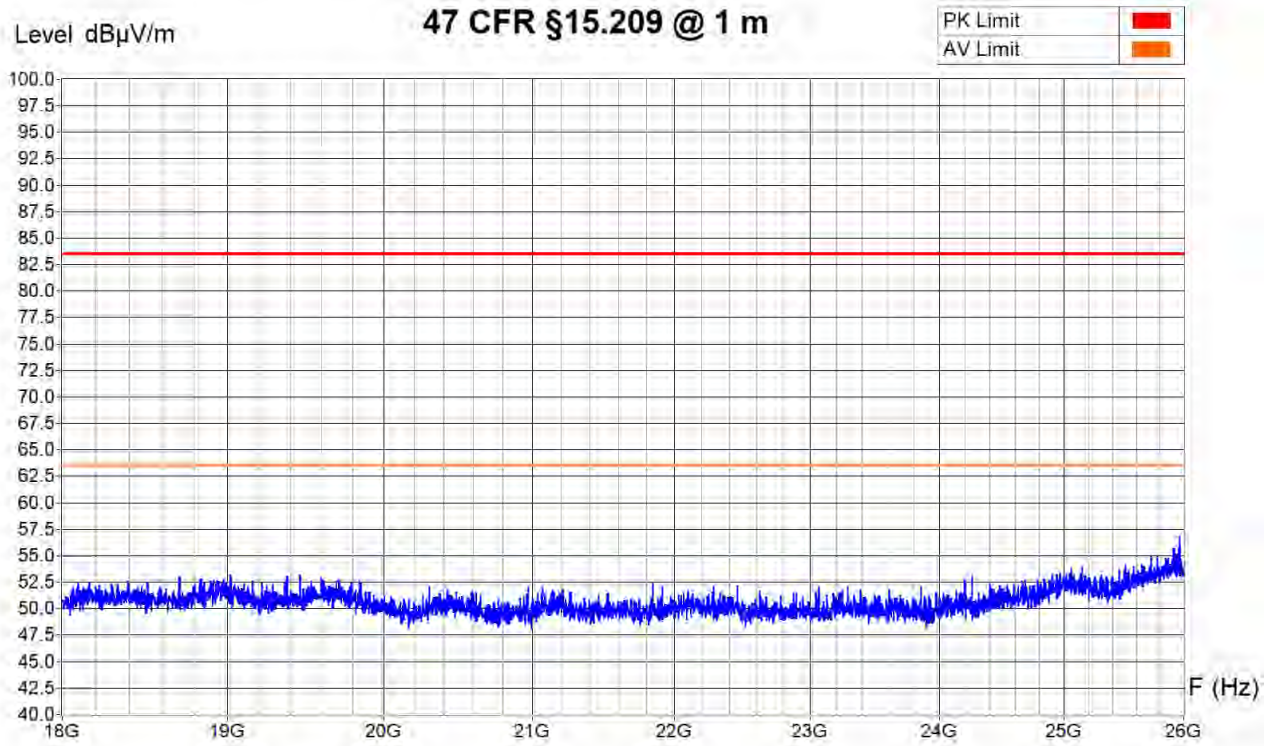
Result:	☒ pass	☐ fail	☐ not applicable	☐ partly tested

Test summary

Test engineer:	Ms C. Clément			
Test date:	2024-06-03			
Climatic conditions:	Temperature: 23 °C	Humidity: 47 %	Pressure QFE: 934 hPa	
Test site:	☒ SAC3	☐ SAC5	☐ SAC10	☐ Open test site
Meas. distance:	☒ 1 m	☐ 3 m	☐ 10 m	
Position of EUT:	1.5 m (height of the equipment under test above floor)			
Test sample used:	Sample #1, see §4.3			
Operating mode:	See §5.5			
Cables connected:	DC supply			
Modifications:	None			
Remarks:	Limit values expressed in dBµV/m and transformed to a measuring distance of 1 m (factor used = 20 dB/decade) if necessary e.g.: for f = 18 GHz the limit is 500µV/m at 3 m;			

$$20\ log\left(\frac{500\frac{\mu V}{m}}{1\frac{\mu V}{m}}\right) + 20\ log\left(\frac{3m}{1m}\right) = 63.5\ \frac{dB\mu V}{m}\ at\ 1\,m$$

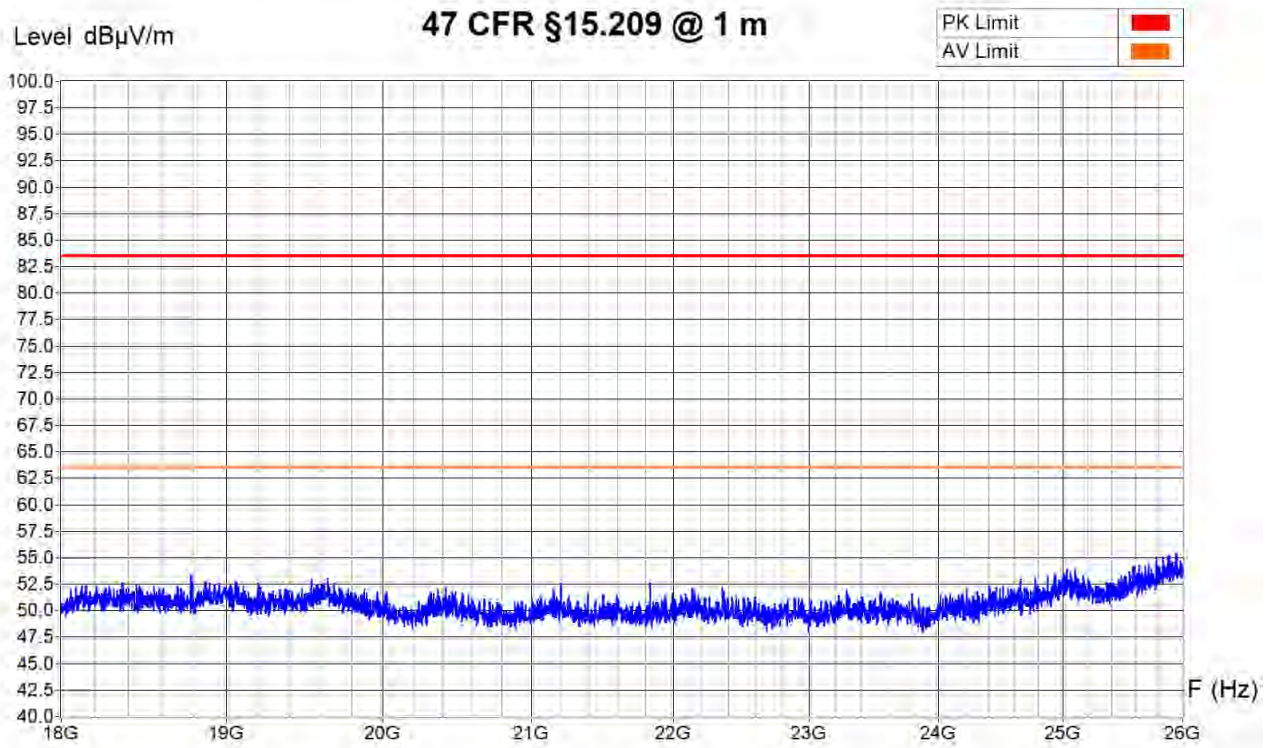
Measurement Type :	Radiated Field
Polarisation :	Vertical
Table Angle :	0° - 360°
Antenna Height :	1.5 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, TOP (2.48 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC EUT is standing



Zone	18 GHz - 26 GHz
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: C. Clément
Date/Time: 2024-06-03 15:38
Filename: 23CH-00972_FCC_RESpurious1M-

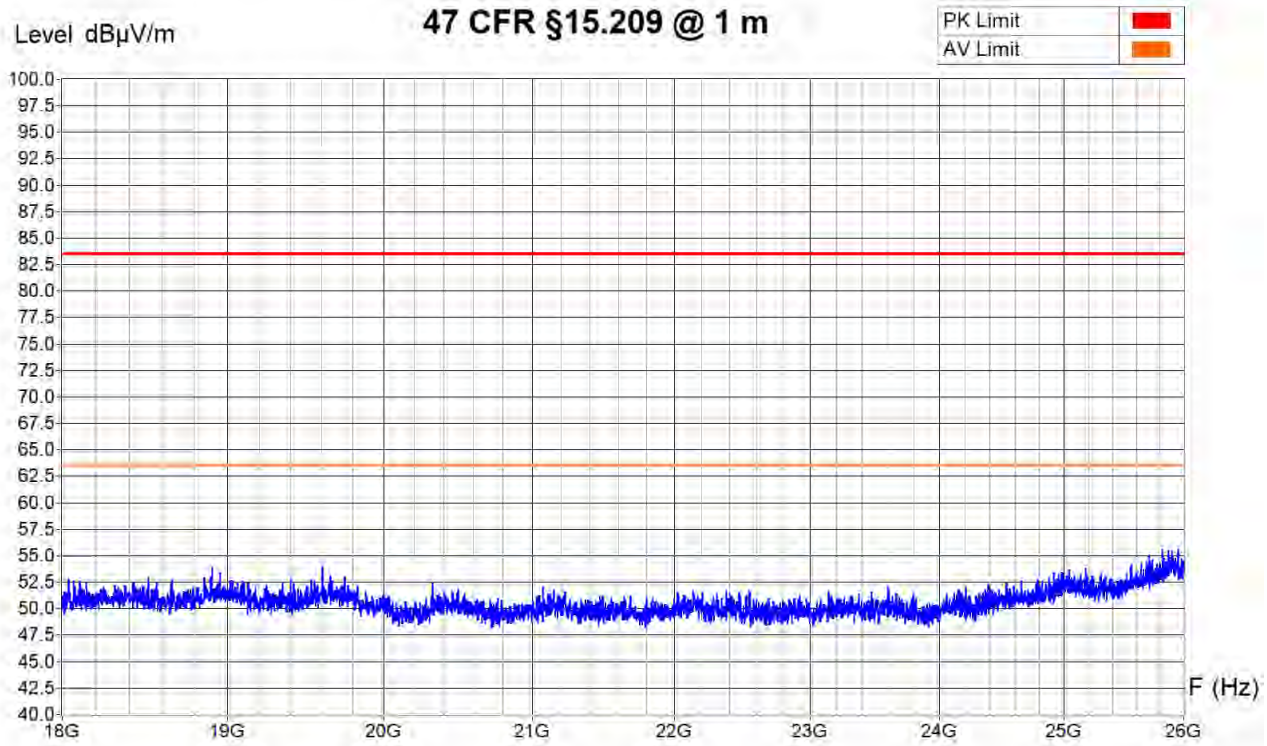
Measurement Type :	Radiated Field
Polarisation :	Vertical
Table Angle :	0° - 360°
Antenna Height :	1.5 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, TOP (2.48 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC EUT is lying



Zone	18 GHz - 26 GHz
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: C. Clément
Date/Time: 2024-06-03 16:01
Filename: 23CH-00972_FCC_RESpurious18-

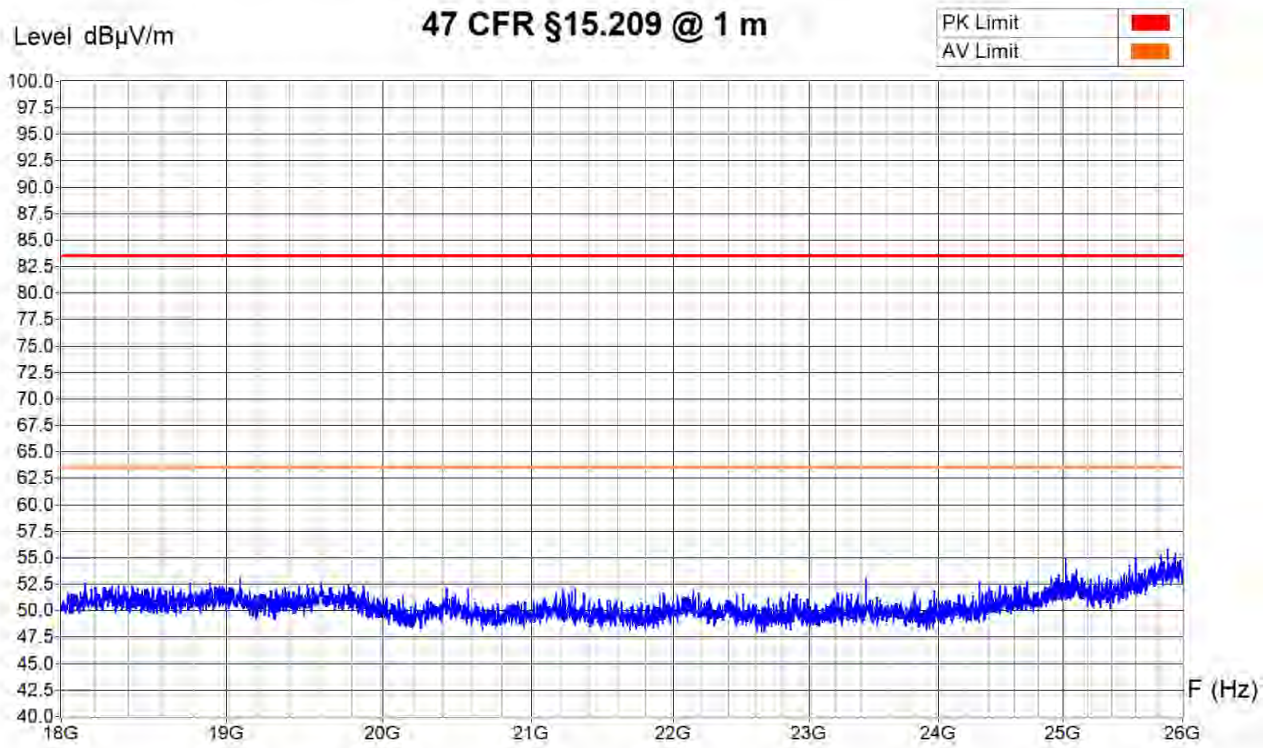
Measurement Type :	Radiated Field
Polarisation :	Vertical
Table Angle :	0° - 360°
Antenna Height :	1.5 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, MID (2.44 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is standing



Zone	18 GHz - 26 GHz
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: C. Clément
Date/Time: 2024-06-03 15:43
Filename: 23CH-00972_FCC_RESpurious1M-

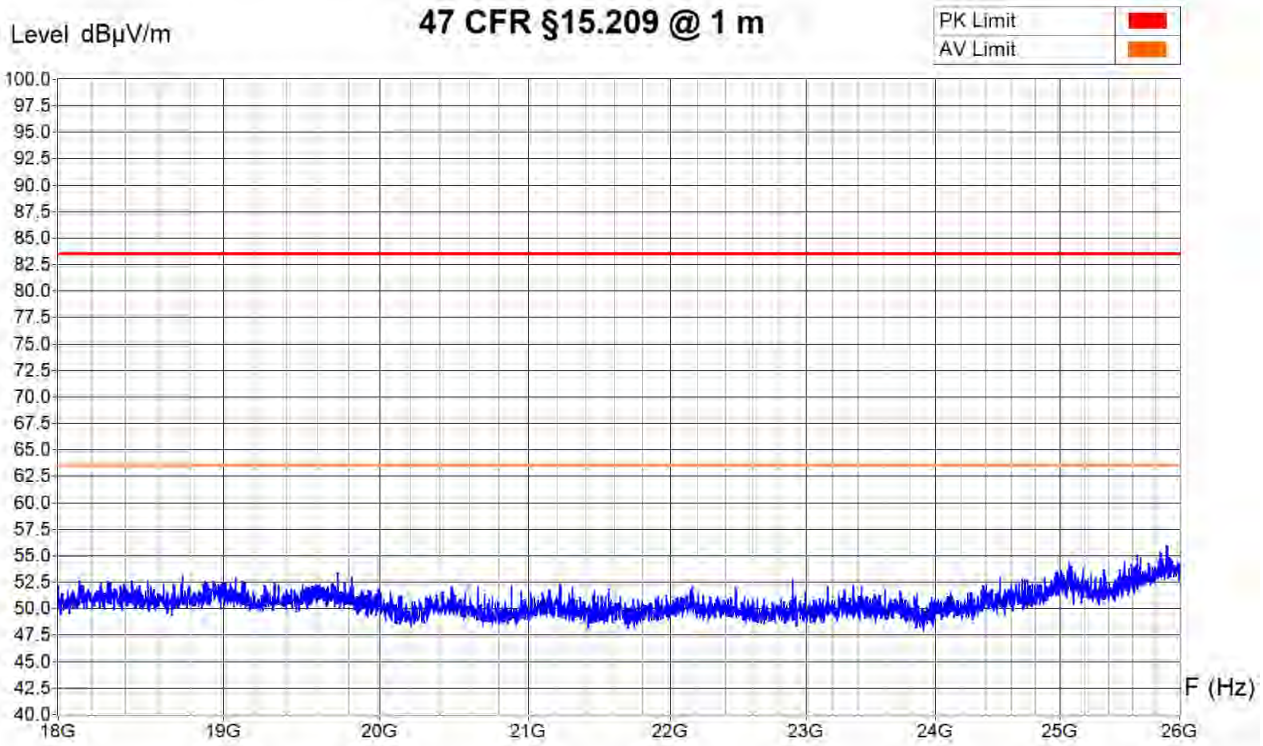
Measurement Type :	Radiated Field
Polarisation :	Vertical
Table Angle :	0° - 360°
Antenna Height :	1.5 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, MID (2.44 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC EUT is lying



Zone	18 GHz - 26 GHz
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: C. Clément
Date/Time: 2024-06-03 15:56
Filename: 23CH-00972_FCC_RESpurious1R-

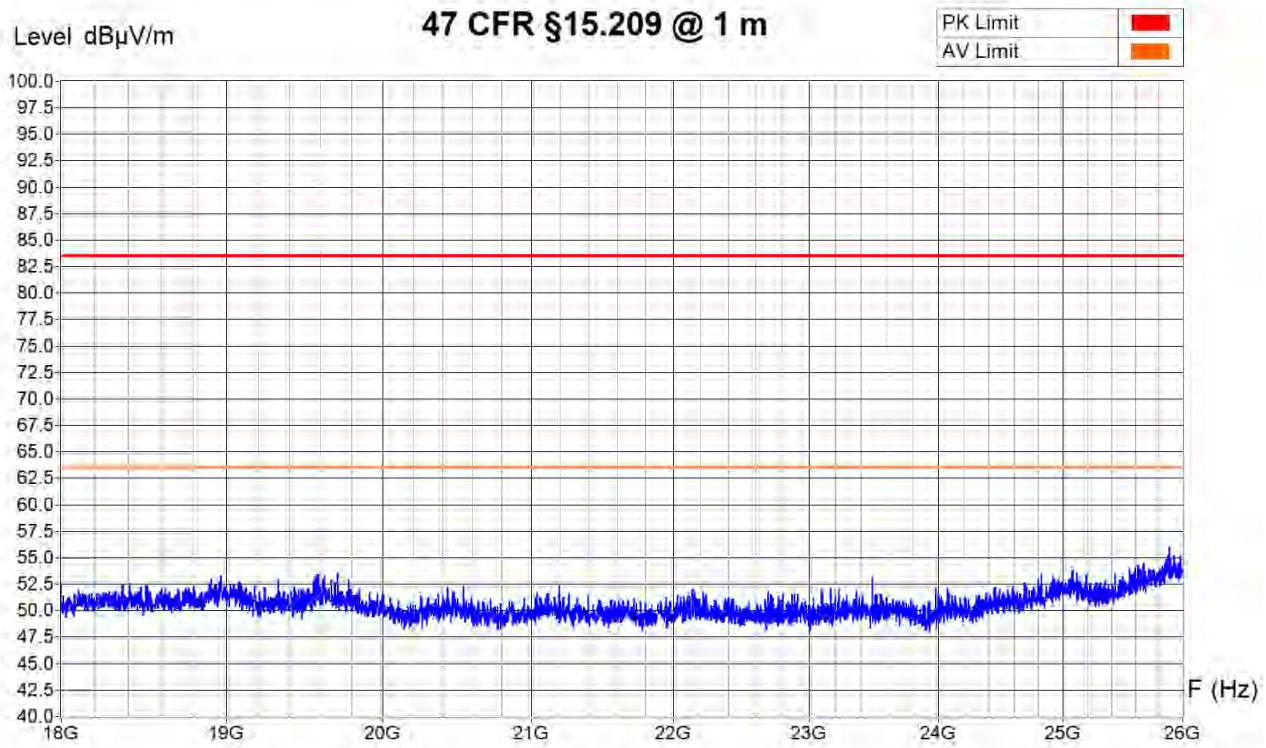
Measurement Type :	Radiated Field
Polarisation :	Vertical
Table Angle :	0° - 360°
Antenna Height :	1.5 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, BOT (2.402 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC EUT is standing



Zone	18 GHz - 26 GHz
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: C. Clément
Date/Time: 2024-06-03 15:48
Filename: 23CH-00972_FCC_RESpurious18-

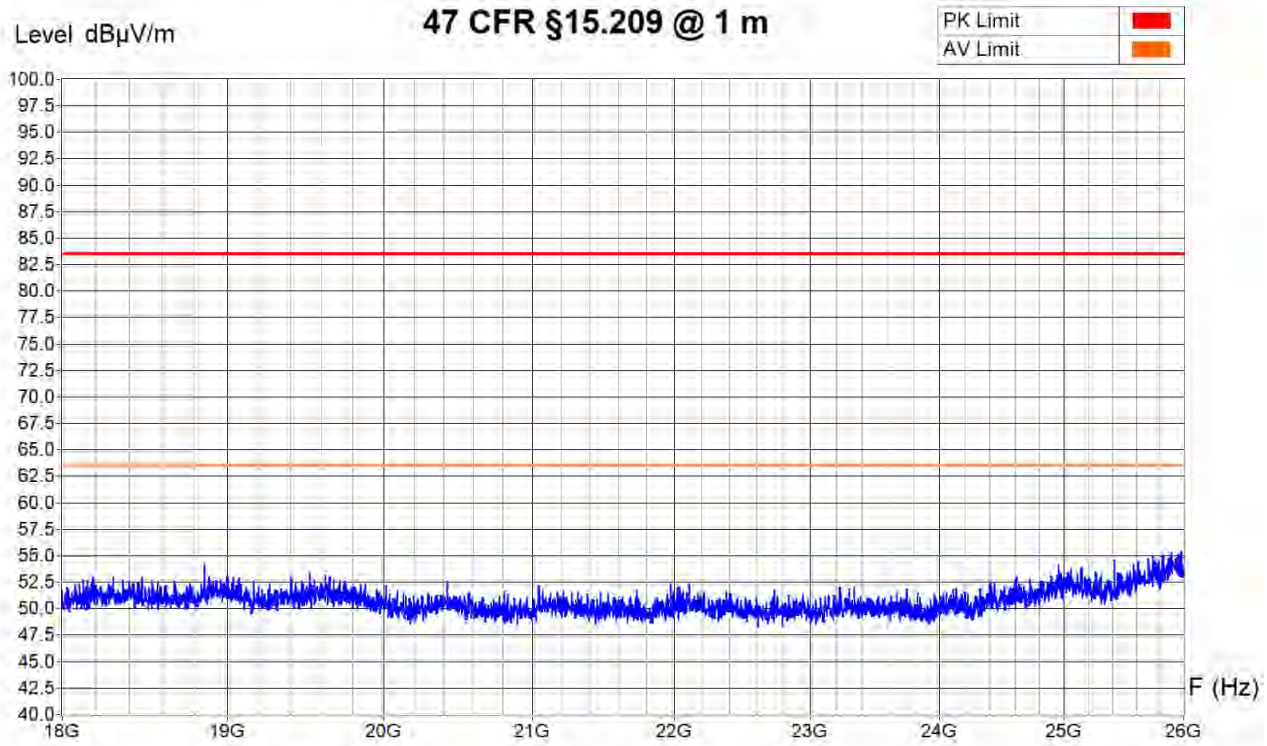
Measurement Type :	Radiated Field
Polarisation :	Vertical
Table Angle :	0° - 360°
Antenna Height :	1.5 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, BOT (2.402 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC EUT is lying



Zone	18 GHz - 26 GHz
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: C. Clément
Date/Time: 2024-06-03 15:52
Filename: 23CH-00972_FCC_RESpurious1M-

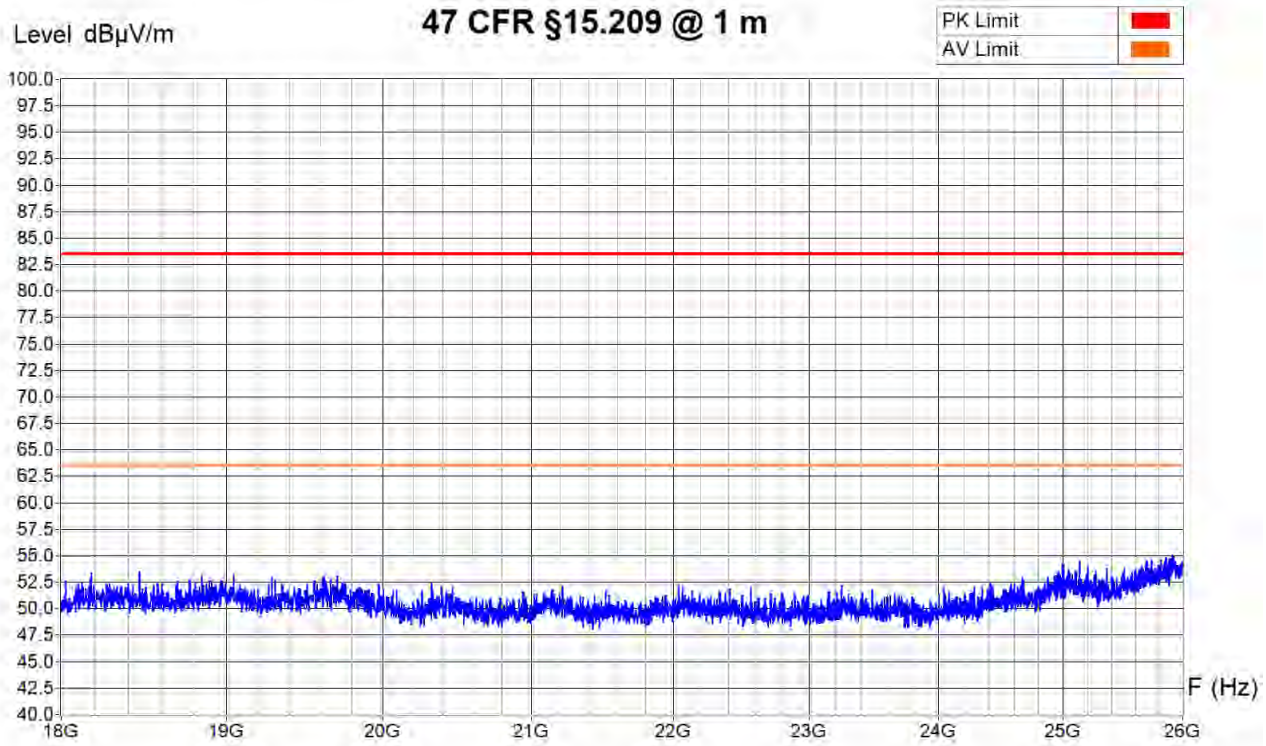
Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0° - 360°
Antenna Height :	1.5 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, TOP (2.48 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC EUT is standing



Zone	18 GHz - 26 GHz
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: C. Clément
Date/Time: 2024-06-03 15:27
Filename: 23CH-00972_FCC_RESpurious(M-

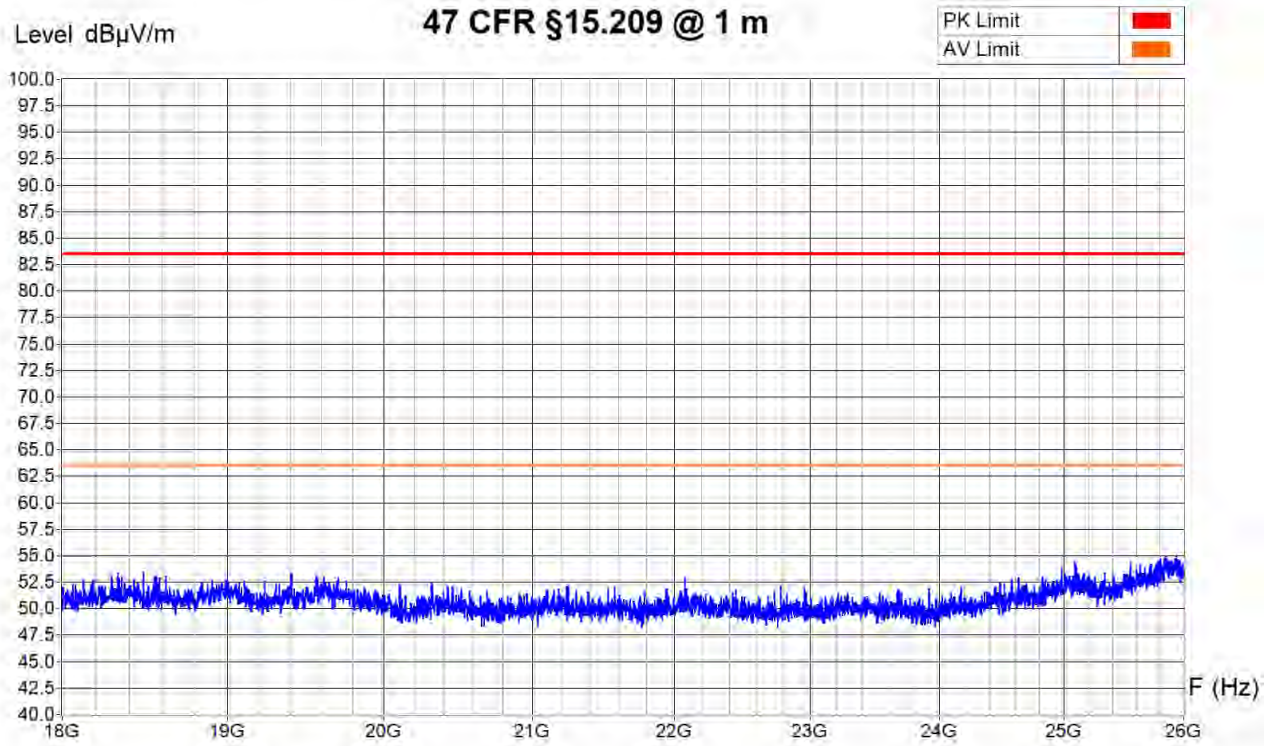
Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0° - 360°
Antenna Height :	1.5 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, TOP (2.48 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC EUT is lying



Zone	18 GHz - 26 GHz
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: C. Clément
Date/Time: 2024-06-03 14:52
Filename: 23CH-00972_FCC_RESpurious1M-

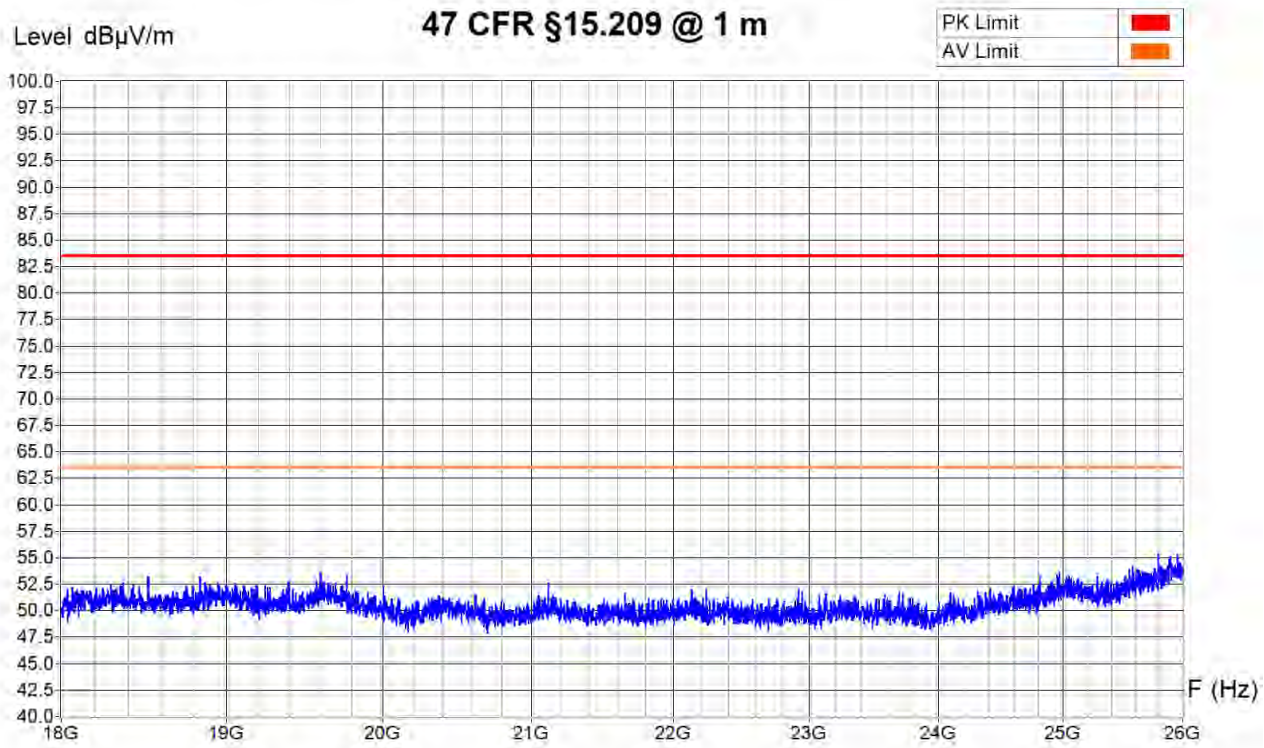
Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0° - 360°
Antenna Height :	1.5 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, MID (2.44 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC
	EUT is standing



Zone	18 GHz - 26 GHz
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: C. Clément
Date/Time: 2024-06-03 15:23
Filename: 23CH-00972_FCC_RESpurious18-

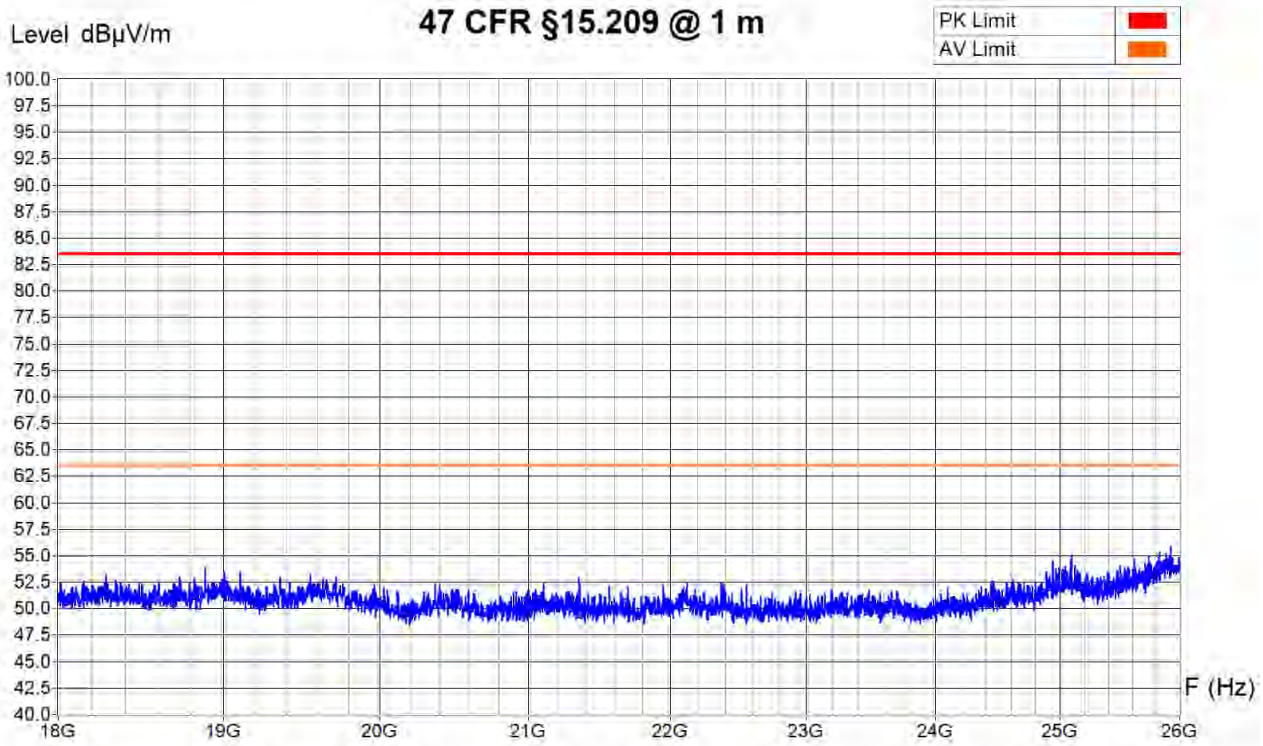
Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0° - 360°
Antenna Height :	1.5 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, MID (2.44 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC EUT is lying



Zone	18 GHz - 26 GHz
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: C. Clément
Date/Time: 2024-06-03 15:07
Filename: 23CH-00972_FCC_RESpurious1M-

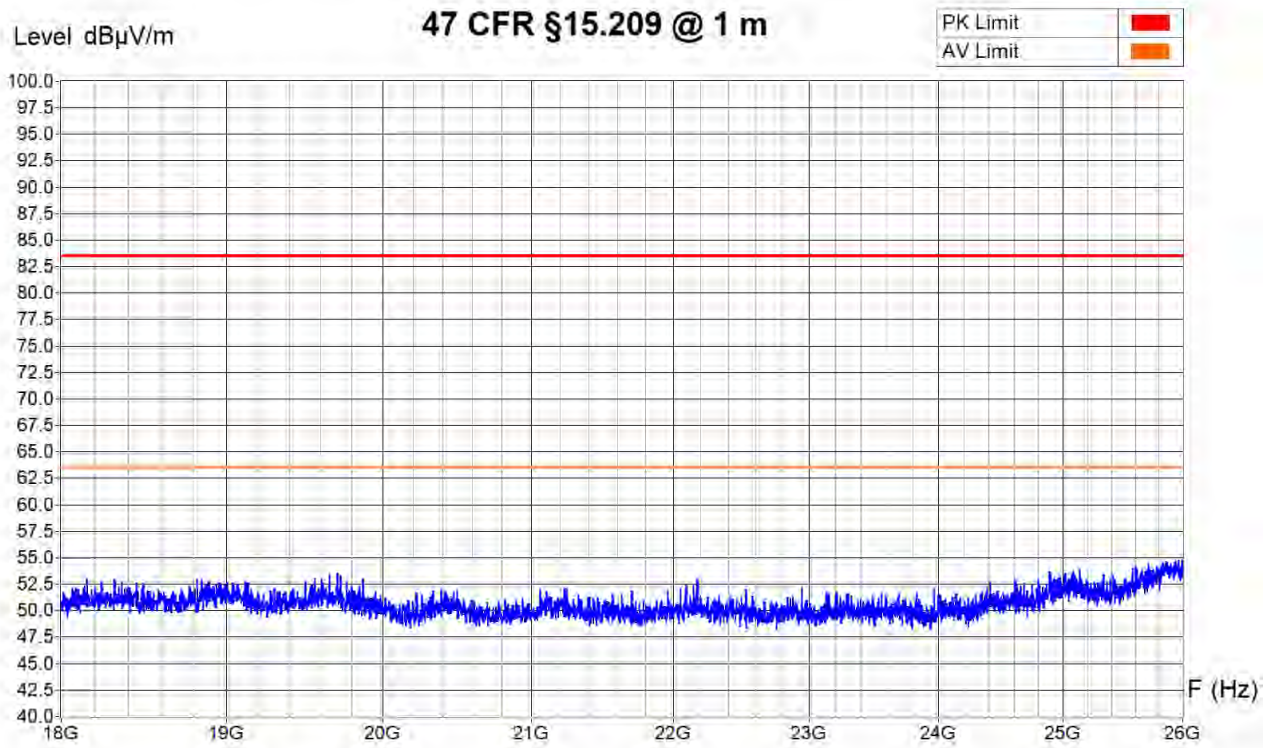
Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0° - 360°
Antenna Height :	1.5 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, BOT (2.402 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC EUT is standing



Zone	18 GHz - 26 GHz
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: C. Clément
Date/Time: 2024-06-03 15:18
Filename: 23CH-00972_FCC_RESpurious18-

Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0° - 360°
Antenna Height :	1.5 m
Equipment Under Test :	CP+
Set-Up :	SAC3, see photos
Operating Conditions :	Continuous TX, BOT (2.402 GHz), max power set to 9 (0 dBm)
Remarks :	Power supply: + 24 VDC EUT is lying



Zone	18 GHz - 26 GHz
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: C. Clément
Date/Time: 2024-06-03 15:12
Filename: 23CH-00972_FCC_RESpurious1M-

6.6 Band-edge emission (radiated)

FCC reference: Part 15.247 (d) and 15.209 (a)

Test Method: FCC KDB 558074 Section 8.7 referencing ANSI C63.10 Section 6.10.4, 6.10.5, 11.11, 11.2 and 11.13

Lower band edge within non-restricted band

Test Method: As it falls within a non-restricted band, only peak measurement is required. As the maximum peak conducted output power was previously measured, in accordance with FCC KDB 558074 Section 8.7 lower band edge measurements was performed with peak detector and the – 20 dBc limit applied.

Limit: In any 100 kHz bandwidth outside the frequency band, the radio frequency power 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.

Lower band edge within restricted band

Test Method: As it falls within a restricted band, both peak and average measurement are required. A marker is placed on the highest point on each trace.

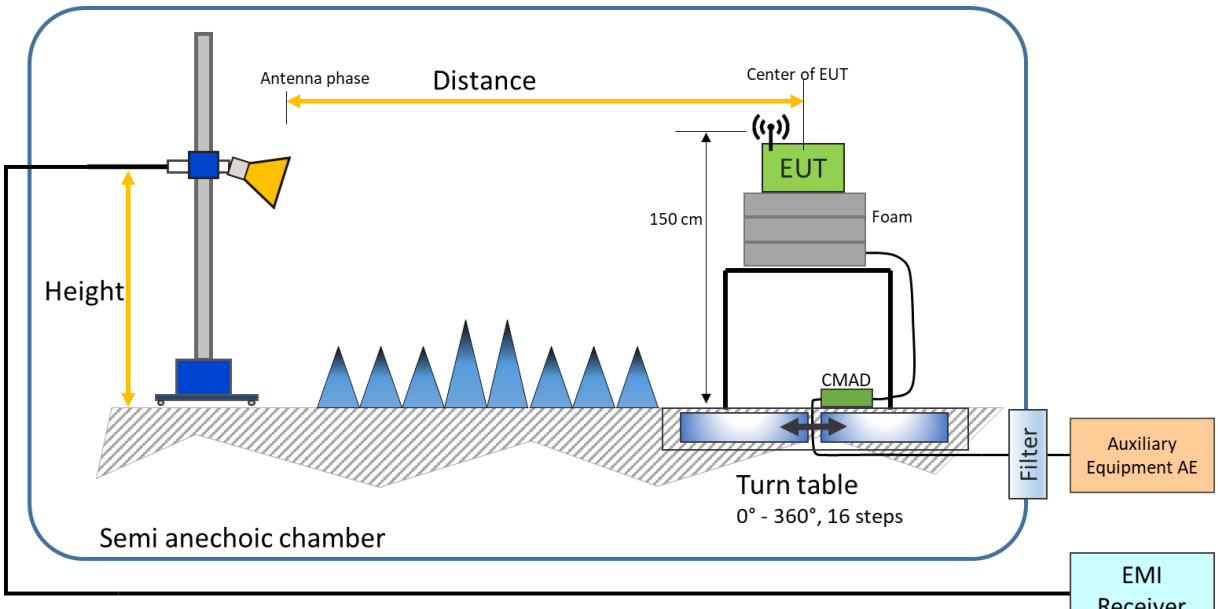
Limit: According FCC §15.209

Upper band edge

Test Method: As it falls within a restricted band, both peak and average measurement are required. A marker is placed on the highest point on each trace. Also, markers are placed at the edge of the band.

Limit: According FCC §15.209

Test setup



Diagram

Result:	☒ **pass**	☐ **fail**	☐ **not applicable**	☐ **partly tested**

Test summary

Test engineer:	Ms C. Clément		
Test date:	2024-06-03		
Climatic conditions:	Temperature: 22 °C	Humidity: 46 %	Pressure QFE: 937 hPa
Test site:	☒ SAC3	☐ SAC5	☐ SAC10
	☐ Laboratory	☐ Shielded room	☐ Open test site
Distance:	☐ 1 m	☒ 3 m	☐ 10 m
Position of EUT:	1.5 m (height of the equipment under test above floor)		
Test sample used:	Sample #1, see §4.3		
Operating mode:	See §5.5		
Cables connected:	DC supply		
Modifications:	None		

Spectrum Analyser:

Lower band edge within non-restricted band:

RBW: 100 kHz, VBW: 300 kHz

Detector: Peak, Trace mode: Max Hold

Sweep time: Auto, Span: 5 MHz

Measurement: Marker placed on the peak of the signal

Lower band edge in the restricted band:

RBW: 1 MHz, VBW: 3 MHz

Detector: Peak, Trace mode: Max Hold and RMS

Sweep time: Auto, Span: 8 MHz

Measurement: Markers placed on the highest point on each trace

Upper band edge in the restricted band:

RBW: 1 MHz, VBW: 3 MHz

Detector: Peak, Trace mode: Max Hold and RMS

Sweep time: Auto, Span: 5 MHz

Measurement: Markers placed on the highest point on each trace

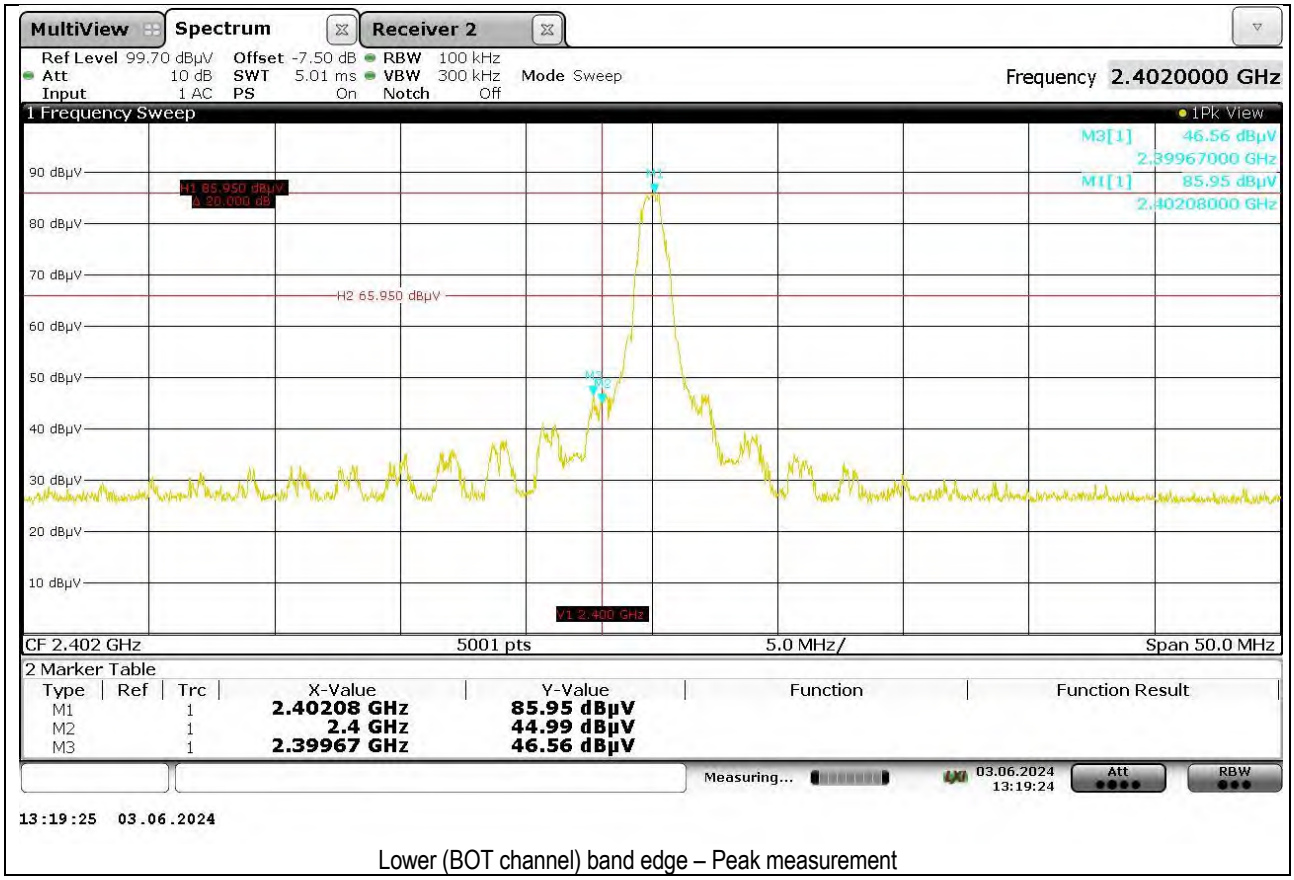
Remarks: The EUT was transmitting continuously with duty cycle > 98 %, therefore no duty cycle correction was required.

Results - EUT is standing

Lower band edge

Channel	Antenna height [cm]	Antenna polarisation	Turntable [°]
BOT	124	Horizontal	190

Frequency [GHz]	Channel	Peak level [dBuV]	-20 dBc Limit [dBuV]	Margin [dB]	Result
2.402	BOT	85.95	65.95	--	--
2.440	MID	44.99	65.95	-20.96	Pass
2.480	TOP	46.56	65.95	-19.39	Pass

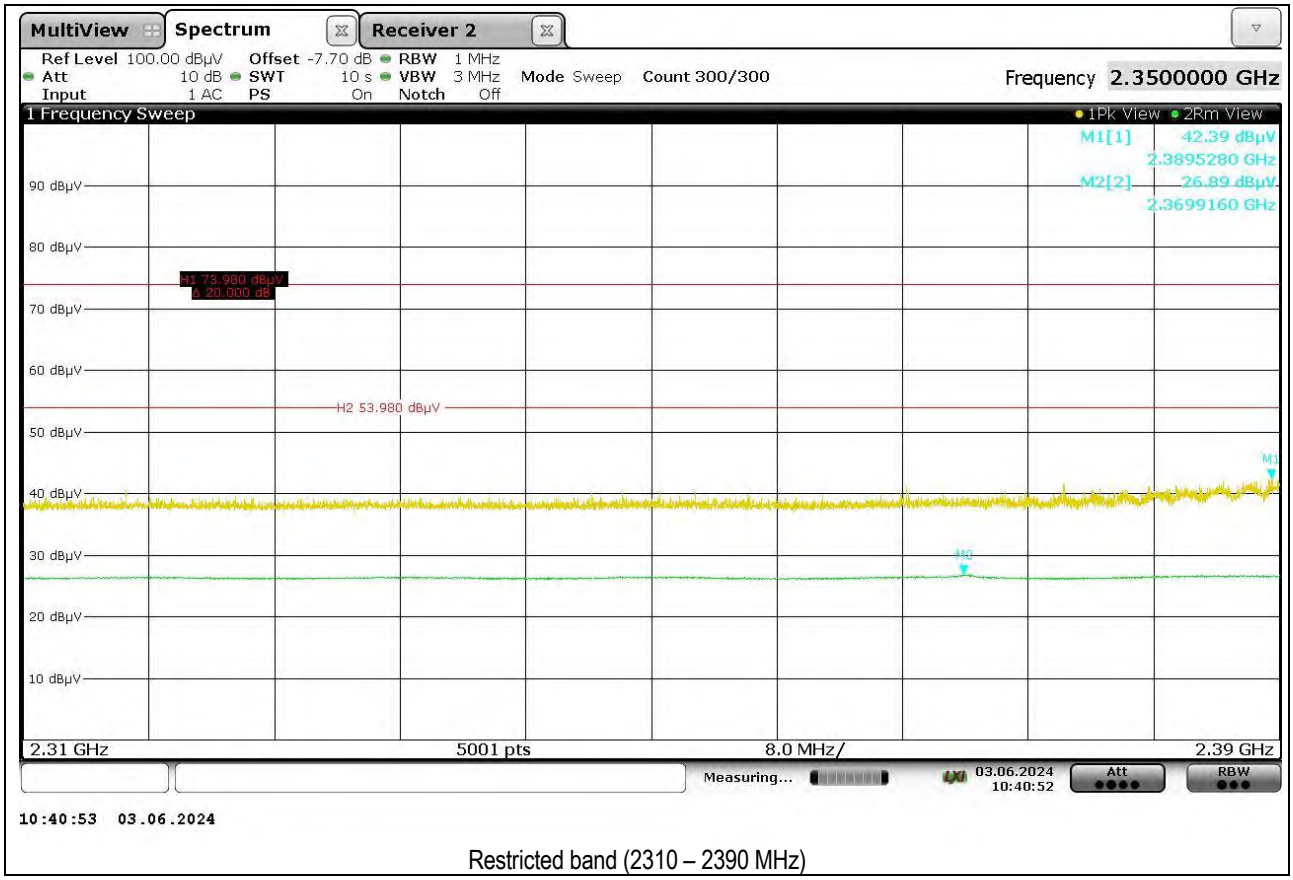


Lower (BOT channel) band edge – Peak measurement

Lower restricted band (2310 – 2390 MHz)

Frequency [GHz]	Peak level [dBuV]	Peak limit [dBuV]	Peak Margin [dB]	Result
2.390	42.39	73.98	-31.59	Pass

Frequency [GHz]	Average level [dBuV]	Average limit [dBuV]	Average Margin [dB]	Result
2.370	26.89	53.98	-27.09	Pass



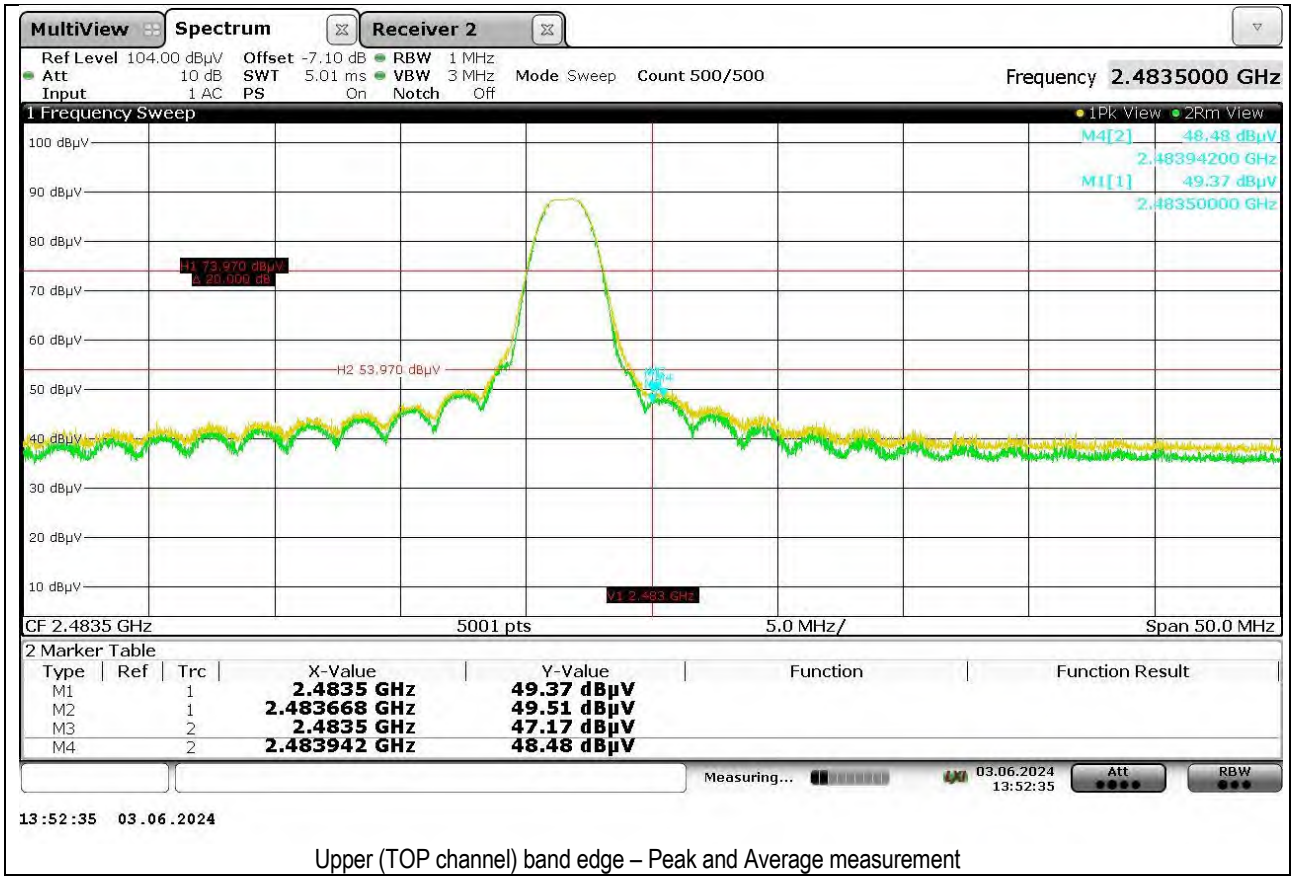
Restricted band (2310 – 2390 MHz)

Upper restricted band (2483.5 – 2500 MHz)

Channel	Antenna height [cm]	Antenna polarisation	Turntable [°]
TOP	100	Horizontal	315

Frequency [GHz]	Peak level [dBuV]	Peak limit [dBuV]	Peak Margin [dB]	Result
2.4836	49.41	73.98	-24.57	Pass

Frequency [GHz]	Average level [dBuV]	Average limit [dBuV]	Average Margin [dB]	Result
2.4839	48.48	53.98	-5.5	Pass



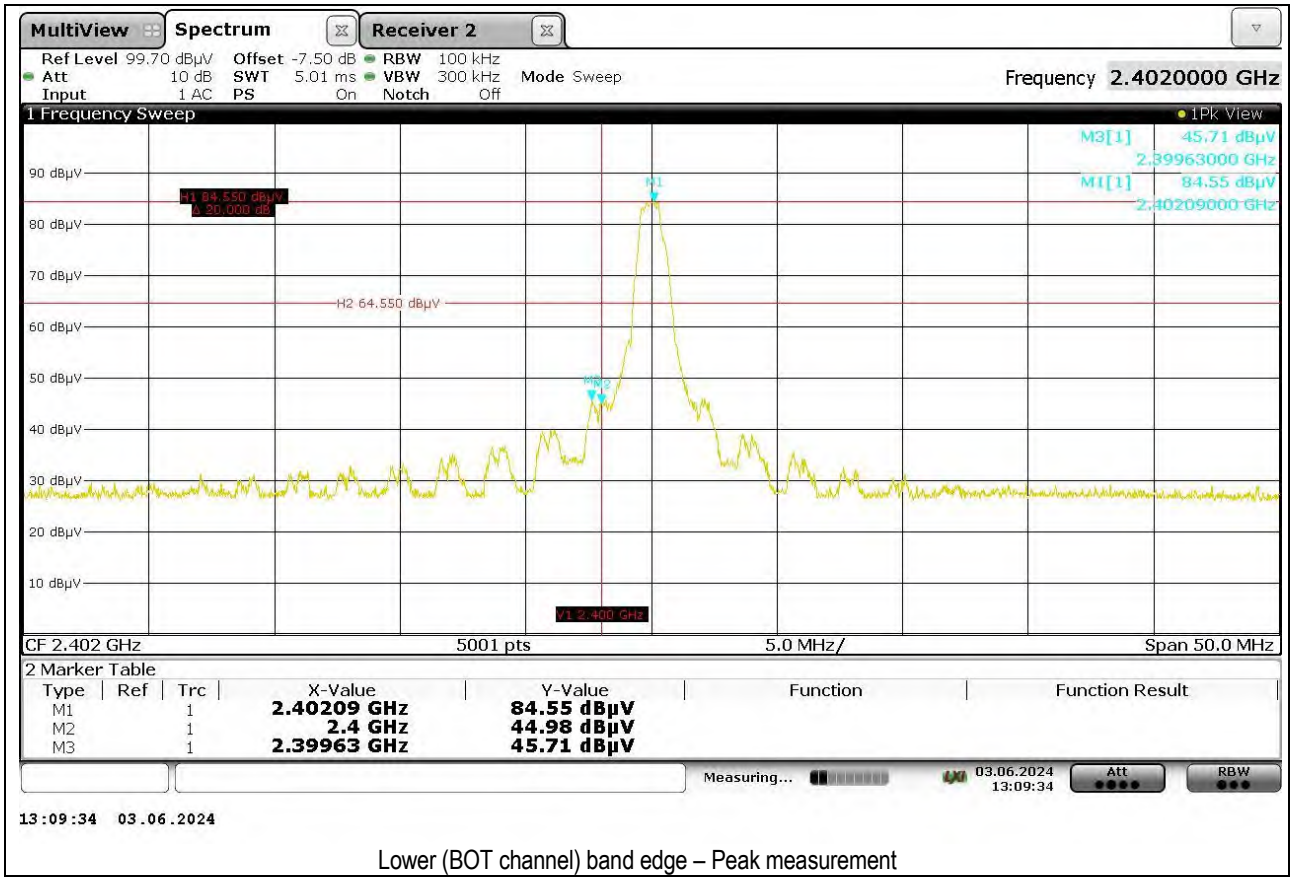
Upper (TOP channel) band edge – Peak and Average measurement

Results - EUT is lying

Lower band edge

Channel	Antenna height [cm]	Antenna polarisation	Turntable [°]
BOT	124	Horizontal	190

Frequency [GHz]	Channel	Peak level [dBuV]	-20 dBc Limit [dBuV]	Margin [dB]	Result
2.402	BOT	84.50	64.50	--	--
2.440	MID	44.98	64.50	-19.52	Pass
2.480	TOP	45.71	64.50	-18.79	Pass

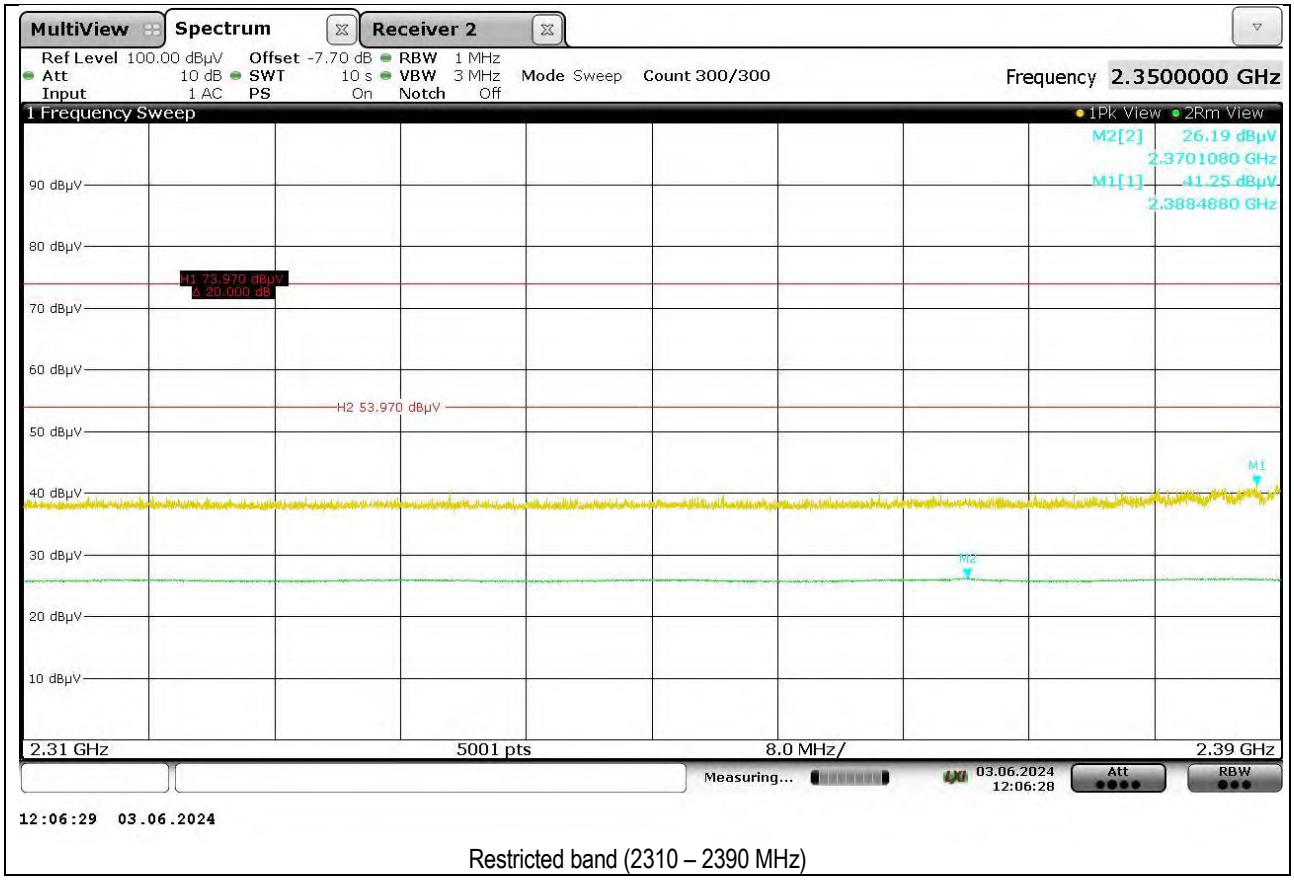


Lower (BOT channel) band edge – Peak measurement

Lower restricted band (2310 – 2390 MHz)

Frequency [GHz]	Peak level [dBuV]	Peak limit [dBuV]	Peak Margin [dB]	Result
2.370	41.25	73.98	-32.73	Pass

Frequency [GHz]	Average level [dBuV]	Average limit [dBuV]	Average Margin [dB]	Result
2.388	26.19	53.98	-27.79	Pass



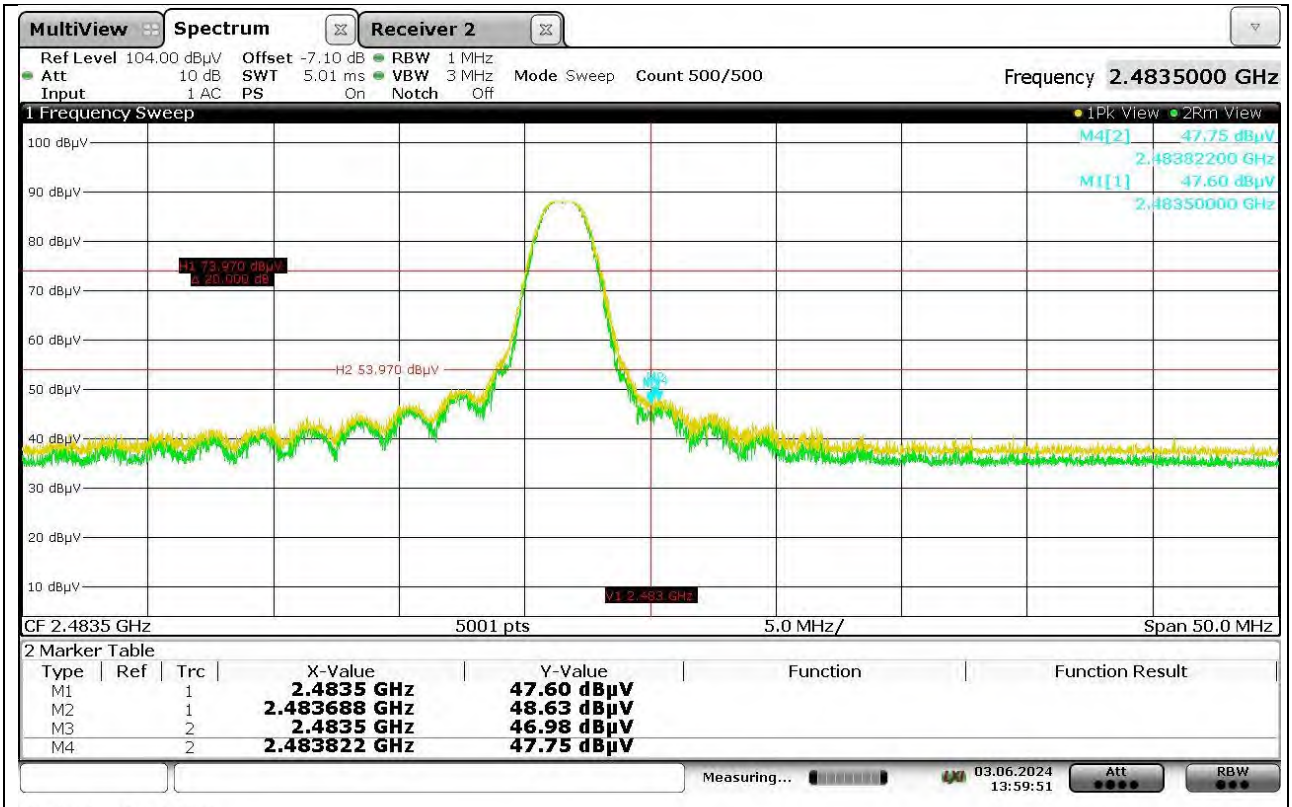
Restricted band (2310 – 2390 MHz)

Upper restricted band (2483.5 – 2500 MHz)

Channel	Antenna height [cm]	Antenna polarisation	Turntable [°]
TOP	360	Horizontal	185

Frequency [GHz]	Peak level [dBuV]	Peak limit [dBuV]	Peak Margin [dB]	Result
2.4836	48.73	73.98	-25.25	Pass

Frequency [GHz]	Average level [dBuV]	Average limit [dBuV]	Average Margin [dB]	Result
2.4838	47.75	53.98	-6.23	Pass



Upper (TOP channel) band edge – Peak and Average measurement

7. List of test equipment

Remark: Calibration interval may be extended based on sufficient calibration data and experience of use (see IECEE OD-5011:2019 clause 8.2.5)

Equipment	Type	Inventory no.	Manufacturer	Last calibration date	Calibration due date	
Test stand: Radio Conducted Emission						
EMI Test Receiver	ESW26	2021-07	Rohde & Schwarz	2024-03-22	2025-03-22	
Test stand: Radiated disturbances – 9 kHz to 30 MHz						
SAC3						
Semi Anechoic Chamber	SAC 3 m	2019-00	Albatross Projects	2023-07-13	2026-07-13	
EMI Test Receiver	ESW26	2021-07	Rohde & Schwarz	2024-03-22	2025-03-22	
Active Loop Antenna 10 kHz - 30 MHz	HLA6120	1990-25	Chase	2022-09-15	2024-03-15	*
Coax Cable	Sucoflex 104A	2015-16	Huber+Suhner	2023-08-17	2025-02-17	
Cable Sucoflex 18 GHz	SF106PA	2011-61	Huber & Suhner	2023-08-17	2025-02-17	
Coaxial Cable	Sucoflex 104A	2015-15	Huber+Suhner	2023-08-17	2026-08-17	
Coaxial Cable	Sucoflex 106	2021-03A	Huber+Suhner	2023-08-16	2025-02-16	
Comb Generator 5 kHz to 1 GHz	YRS02	2023-03	York	2023-02-01	2024-08-01	
Common Mode Absorption Device	FGZ 40X15E	1994-49F	Luethi	2021-05-20	2024-05-20	*
NCD HDcon6102	Controller NCD	2017-02	Maturo	No Cal.	No Cal.	
EMC hardened Camera	HDCam6E130	2019-12	Pontis	No Cal.	No Cal.	
Antenna Mast	TAM4.5-E-Bus	2017-10	Maturo	No Cal.	No Cal.	
Turntable 150 cm	TT1.5SI-1t	2019-18	Maturo	No Cal.	No Cal.	
Thermo - Hygro & Barometer	T7511	2014-35	Comet System	2023-09-28	2024-09-28	
Software	Vitam 2.4.13			No Cal.	No Cal.	
Test stand: Radiated disturbances - 30 MHz to 1000 MHz						
SAC5						
Semi Anechoic Chamber	SAC 5 m	2019-01	Albatross Projects	2023-09-04	2026-09-04	
EMI Test Receiver	ESU26	168593	Rohde & Schwarz	2024-03-18	2024-05-31	*
BiConiLog Antenna 30 MHz - 6000 MHz / 1 kW	3142E	2019-15	ETS-Lindgren	2022-09-21	2024-03-21	*
Cable; Sucoflex 18 GHz / 1.1 m	Sucoflex 106A	2021-06	Huber & Suhner	2023-08-16	2025-02-16	
Coaxial Cable	Sucoflex 106	2021-04	Huber+Suhner	2024-03-18	2024-05-31	*
Coaxial Cable	Sucoflex 106	2021-03B	Huber+Suhner	2023-08-16	2025-02-16	
Comb Generator 10 MHz to 6 GHz	YRS03	2023-08	York	2023-08-16	2025-02-16	
NCD HDcon6102	Controller NCD	16-LaBe-01	Maturo	2023-02-01	2024-08-01	
EMC hardened Camera	HDCam6E130	2019-13	Pontis	No Cal.	No Cal.	
Antenna Mast	TAM4.0-P-Bus	16-LaBe-03	Maturo	No Cal.	No Cal.	
Turntable 200 cm	TT2.0SI-2t	2019-19	Maturo	No Cal.	No Cal.	
Thermo-, hygro- & barometer	T7510	2020-02	Comet System	2023-09-15	2024-09-15	
Software	RadiMation 2023.2.5			No Cal.	No Cal.	

Equipment	Type	Inventory no.	Manufacturer	Last calibration date	Calibration due date	
Test stand: Radiated disturbances - 1000 MHz to 6000 MHz						
SAC3						
Semi Anechoic Chamber	SAC 3 m	2019-00	Albatross Projects	2023-07-13	2026-07-13	
EMI Test Receiver	ESW26	2021-07	Rohde & Schwarz	2024-03-22	2025-03-22	
Horn Antenna 1 - 18 GHz / 200W	BBHA 9120 D	2022-07	Schwarzbeck	2023-09-08	2025-03-08	
Preamplifier	AFS42-00101800-25-S-42	2014-27	MITEQ	2023-02-09	2024-08-09	
Coax Cable	Sucoflex 104A	2015-16	Huber+Suhner	2023-08-17	2025-02-17	
Cable Sucoflex 18 GHz	SF106PA	2011-61	Huber & Suhner	2023-08-17	2025-02-17	
Coax Cable	Sucoflex 104A	2015-15	Huber+Suhner	2023-08-17	2026-08-17	
Coaxial Cable	Sucoflex 106	2021-03A	Huber+Suhner	2023-08-16	2025-02-16	
Comb Generator 10 MHz to 6 GHz	YRS03	2023-05	York	2023-02-01	2024-08-01	
NCD HDcon6102	Controller NCD	2017-02	Maturo	No Cal.	No Cal.	
EMC hardened Camera	HDCam6E130	2019-12	Pontis	No Cal.	No Cal.	
Antenna Mast	TAM4.5-E-Bus	2017-10	Maturo	No Cal.	No Cal.	
Turntable 150 cm	TT1.5SI-1t	2019-18	Maturo	No Cal.	No Cal.	
Thermo - Hygro & Barometer	T7511	2014-35	Comet System	2023-09-28	2024-09-28	
Software	RadiMation 2023.2.5			No Cal.	No Cal.	
Test stand: Radiated disturbances - 6000 MHz to 18000 MHz						
SAC3						
Semi Anechoic Chamber	SAC 3 m	2019-00	Albatross Projects	2023-07-13	2026-07-13	
Horn Antenna 1 - 18 GHz / 200W	BBHA 9120 D	2022-07	Schwarzbeck	2023-09-08	2025-03-08	
Cable; 18 GHz 3 m	ST18A	2011-30	Huber & Suhner	2023-08-28	2025-02-28	
Comb Generator 1 - 40 GHz	CGE03	2017-08	York EMC Services	2024-03-19	2024-05-31	*
Preamplifier	AFS42-00101800-25-S-42	2014-27	MITEQ	2023-02-09	2024-08-09	
Cable Sucoflex 18 GHz	SF106PA	2011-60B	Huber & Suhner	2023-08-28	2025-02-28	
EMI Test Receiver	ESW26	2021-07	Rohde & Schwarz	2024-03-22	2025-03-22	
Thermo - Hygro & Barometer	T7511	2014-35	Comet System	2023-09-28	2024-09-28	
Software	RadiMation 2023.2.5			No Cal.	No Cal.	
NCD HDcon6102	Controller NCD	2017-02	Maturo	No Cal.	No Cal.	
EMC hardened Camera	HDCam6E130	2019-12	Pontis	No Cal.	No Cal.	
Antenna Mast	TAM4.5-E-Bus	2017-10	Maturo	No Cal.	No Cal.	
Turntable 150 cm	TT1.5SI-1t	2019-18	Maturo	No Cal.	No Cal.	
Filter	SH 6472	2012-06	BSC	No Cal.	No Cal.	

Equipment	Type	Inventory no.	Manufacturer	Last calibration date	Calibration due date	
Test stand: Radiated disturbances - 18 GHz to 40 GHz						
inside SAC3						
Semi Anechoic Chamber	SAC 3 m	2019-00	Albatross Projects	2023-07-13	2026-07-13	
Spectrum Analyzer	E4407B	2007-53	HP	2022-07-27	2025-07-27	
Horn antenna	3160-09	1998-12	EMCO	2021-02-10	2024-02-10	*
Cable	SF104	2011-62	Huber&Suhner	2023-08-30	2026-08-30	
Cable; 11SMA-451/11SMA-451/0.5M	SF104P	2010-81	Huber & Suhner	2023-08-30	2026-08-30	
Power Supply; 0 à 16 V / 0 - 5 A	EA-PS 2016-050	2006-62	Elektro-Automatik	No Cal.	No Cal.	
Thermo - Hygro & Barometer	T7511	2014-35	Comet System	2023-09-28	2024-09-28	
Software	Vitam 2.4.13			No Cal.	No Cal.	

*Calibration interval extended, based on sufficient calibration data and experience of use (see IECEE OD-5011:2019 clause 8.2.5)

8. Measurement instrumentation uncertainties

The reported uncertainty of measurement is stated as combined standard uncertainty multiplied by a coverage factor k = 2 (if not stated otherwise).

The measured value (y) and the associated expanded uncertainty (U) represent the interval (y ±U) which contains the value of the measured quantity with a probability of approximately 95 %. The uncertainty was estimated according to the standard applying on the test conducted and base also by following the guidelines of the ISO (GUM:1995).

The measurement uncertainty contains contributions originating from the standard for the measurement equipment used, from the calibration method and the standard applying to the EUT (with own dedicated chapters).

See clause 4.8 in OD 2020 and document AA-STS 41.01-09 measurement uncertainty, dated 2021-06-02 for more details.

	Measurements According to CISPR 16-4-2:2011+AMD1:2014+AMD2:2018	**normal distribution**	**Estimated uncertainty of the measurement results: U_{lab}**	**Maximum uncertainty defined by the standard: U_{CISPR}**
Radiated disturbance	Magnetic field for ERA/ERTMS/033281 (X, Y & Z axis) 27 kHz – 1250 kHz	k = 2	± 3.0 dB	Not given
	Disturbance current in a LLAS 9 kHz – 30 MHz: acc. table F.1	k=2	N/A	± 3.3 dB
	Electric field strength in a SAC @ 3 m, 5 m and 10 m 30 – 1000 MHz, acc. table D.1 to D.4	k=2	± 4.24 dB (30-300 MHz) ± 3.59 dB (200-1000 MHz)	± 6.3 dB
	Electric field strength in a FAR @ 3 m 1 – 6 GHz, acc. table E.1	k=2	± 4.94 dB	± 5.2 dB
	Electric field strength in a FAR @ 3 m 6 – 18 GHz, acc. table E.2	k=2	± 3.79 dB	± 5.5dB

* The MU of the probe used for calibration of the homogenous field is already near 2.0 dB