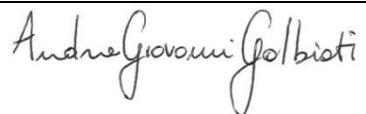
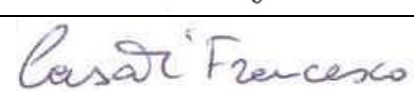


RF TEST REPORT

Test Report No:	25-4791291317-24-1-0-RAD-A	
UL Project No:	4791291317	
Date of issue:	2025-03-31	
Total number of pages:	56	
Applicant:	ABB S.p.A - ABB SACE Division Via Pescaria, 5 24123 Bergamo (BG) – Italy	
Contact's person:	Raviele Gianluca (Gianluca.raviele@it.abb.com) Pozzari Stefano (stefano.pozzari@it.abb.com)	
Testing Laboratory:	UL International Italia S.r.l. Via delle Industrie, 6 (Sede A) 20061 Carugate (MI) – Italy	
Testing location:	UL International Italia S.r.l. Via delle Industrie, 6 20061 Carugate (MI) – Italy	
Test specification:		
Regulations:	FCC/ISED	
Standards:	FCC Parts 15.207 & 15.209(a) & 15.247 RSS-247 Issue 3:2023 RSS-Gen Issue 5:2021	
Non-standard test method:	N/A	
Scope of testing:	Wireless - New testing	
TRF No.:	TRF_Accredia_FCC/ISED-FT_rev 0	
Test Report Form(s) Originator:	UL International Italia S.r.l.	
Master TRF	2017-07	
Compiled by: (name, function, signature)	Andrea Giovanni Galbiati <i>Laboratory Engineer</i>	
Approved by: (name, function, signature)	Francesco Casati <i>Operations Leader</i>	
General disclaimer: The test results presented in this test report relate only to the object tested, not selected by UL International Italia S.r.l.. This report shall not be reproduced, except in full, without the written approval of the issuing Testing Laboratory. This document contains data (of information) using color and if printed, should be printed in color to retain legibility and the information represented by the color.		
Declination of responsibility: Data provided by the customer are clearly identified with (*). UL International Italia S.r.l. cannot be considered responsible for this information, for any other document sent by the Applicant/Manufacturer and for any difference between the software version present in the tested sample and that present in the object intended for final sale. In some cases, the software in the tested sample is in a version dedicated exclusively to the test, and therefore does not represent the software installed in the final version of the product.		

Test Item Description:	Wireless Sensor, T-Sense Ambient (for Emax3 circuit breakers)
Trade Mark: (*)	ABB
Manufacturer: (*)	ABB S.p.A - ABB SACE Division Via Pescaria, 5 24123 Bergamo (BG) – Italy
HVIN: (*)	1SDE001215
PMN: (*)	T-Sense Ambient
FCC ID: (*)	2AW2L-TSENSEAMB
ISED Canada Certification number: (*)	27527-TSENSEAMB
Ratings: (*)	3 Vdc (from battery)
Testing:	
Date of receipt of test item:	2024-12-17
UL Sample Tag No.:	7946602 (sample for radiated tests) 7328609 (sample for conducted tests)
Status of sample upon receipt:	☒ New and operational ☐ Reconditioned ☐ Damaged
Date(s) of performance of tests:	2025-03-03 to 2025-03-25
Name and address of factory(ies): (*)	ABB S.p.A - ABB SACE Division Via Enrico Fermi, 40 03100 Frosinone (FR) – Italy
General remarks: A cross ☒ in a rectangular shape means that this option is applied. ☒ Indicates that the listed condition, standard or equipment is applicable for this report. ☐ Indicates that the listed condition, standard or equipment is not applicable for this report. Throughout this report a ☐ comma / ☒ point is used as decimal separator. Where not otherwise specified or communicated in writing, statements of conformity (e.g. Pass/Fail) are established according to the following decision rule: considering that the applied test standards take measurement uncertainty into account, acceptance limit equals the tolerance limit (simple acceptance). This leads to a maximum 50% of false accept or false reject when the measured value equals the tolerance limit. See ILAC-G8:09/2019 for further details.	

General product information: (*) Wireless Sensor for industrial application (designed for use with circuit breakers)
--

Document history

Test Report No.	Reason for change	Date of issue
25-4791291317-24-1-0-RAD-A	Original release	2025-03-31

NOTE: New test report issue cancels and replaces the previous one.

Laboratory Accreditation

FCC Accredited Test Firm

Accreditation	MRA	Designation Number	Expiration Date
Ministero dello Sviluppo Economico- Direzione Generale Pianificazione e Gestione dello Spettro Radioelettrico <u>Scope:</u> • Unintentional Radiators - FCC Part 15 Subpart B • Industrial, Scientific, and Medical Equipment - FCC Part 18 • Intentional Radiators - FCC Part 15 Subpart C	US-EU	IT0010	2025-06-25

ISED Wireless Device Testing Laboratory

Company Number	CAB Identifier	Scope/Recognition Date	Expiration Date
UL INTERNATIONAL ITALIA S.R.L.	IT0008	RSS-GEN (2023-10-06) RSS-247 (2023-10-06)	RECOGNIZED UNTIL: 2025-06-16 ACCREDIA ISO/IEC 17025:2017 Expires: 2025-06-16

Table of Contents

Laboratory Accreditation	4
1 Test Item Description	6
1.1 Additional information of radio device(s)	9
1.2 Description of Available Antennas	9
2 Verdict summary section	10
3 Conformity decision rule	11
4 Formulas used	12
5 Test Setup Diagrams	13
6 Tests	16
6.1 Antenna Port Test Results	16
6.1.1 Transmitter Duty Cycle	16
6.1.2 Transmitter 99% Occupied Bandwidth	17
6.1.3 Transmitter Minimum 6 dB Bandwidth	20
6.1.4 Transmitter Maximum Peak Output Power	22
6.1.5 Transmitter Power Spectral Density	25
6.2 Radiated Test Results	27
6.2.1 Transmitter Radiated Emission < 1 GHz	27
6.2.2 Transmitter Radiated Emission > 1 GHz	40
6.2.3 Transmitter Band Edge Radiated Emission and restricted band evaluation	47
7 List of test equipment	53
8 Measurement instrumentation uncertainties	56

1 Test Item Description

Serial number: (*)	Information not available						
Date of production: (*)	Information not available						
Ports: (*)	Port name and description		Cable				
			Maximum length(m)	Attached during test	Shielded		
	---		---	☐	☐		
Supplementary information to the ports:	---						
Rated power supply: (*)		Voltage and frequency	Reference poles				
			N	L1	L2	L3	
	☐	---	☐	☐	☐	☐	
	☒	DC: 3 V					
Rated power: (*)	---						
Working frequencies: (*)	Clock:32.768 kHz; 32 MHz Radio Frequencies: BLE @ 2400-2483.5 MHz						
Other parameters: (*)	Information not available						
Firmware/Software version (original): (*)	abb_ws_v02_05_00						
Firmware/Software version (used for testing): (*)	abb_ws_v02_05_00						
Hardware version: (*)	1SDE001215D1801-F						
Dimensions in cm (W x H x D): (*)	3.5 x 2 x 5						

Number	Operating modes
1	Continuous transmission on BT LE @2.4 GHz technology: Channel: Bottom (Center frequency: 2402 MHz) Data rate: 2 Mbps Max Power
2	Continuous transmission on BT LE @2.4 GHz technology: Channel: Middle (Center frequency: 2440 MHz) Data rate: 2 Mbps Max Power
3	Continuous transmission on BT LE @2.4 GHz technology: Channel: Top (Center frequency: 2480 MHz) Data rate: 2 Mbps Max Power
4	Continuous transmission on BT LE @2.4 GHz technology: Channel: Bottom (Center frequency: 2402 MHz) Data rate: 1 Mbps Max Power
5	Continuous transmission on BT LE @2.4 GHz technology: Channel: Middle (Center frequency: 2440 MHz) Data rate: 1 Mbps Max Power
6	Continuous transmission on BT LE @2.4 GHz technology: Channel: Top (Center frequency: 2480 MHz) Data rate: 1 Mbps Max Power
7	Continuous transmission on BT LE @2.4 GHz technology: Channel: Bottom (Center frequency: 2402 MHz) Data rate: 0.5 Mbps Max Power
8	Continuous transmission on BT LE @2.4 GHz technology: Channel: Middle (Center frequency: 2440 MHz) Data rate: 0.5 Mbps Max Power
9	Continuous transmission on BT LE @2.4 GHz technology: Channel: Top (Center frequency: 2480 MHz) Data rate: 0.5 Mbps Max Power
10	Continuous transmission on BT LE @2.4 GHz technology: Channel: Bottom (Center frequency: 2402 MHz) Data rate: 0.125 Mbps Max Power
11	Continuous transmission on BT LE @2.4 GHz technology: Channel: Middle (Center frequency: 2440 MHz) Data rate: 0.125 Mbps Max Power
12	Continuous transmission on BT LE @2.4 GHz technology: Channel: Top (Center frequency: 2480 MHz) Data rate: 0.125 Mbps Max Power

Supplemental information to the operating mode:	<u>For radiated tests only</u> - Pre-scans in the X,Y and Z axis of orientation of EUT have been performed. The worst case of orientation was recorded in the test report. - Pre-scans in the 0.125 Mbps, 0.5 Mbps, 1 Mbps and 2 Mbps have been performed. The worst case of data rate was recorded in the test report.		
Auxiliary equipment (AuxEq): <i>Peripheral equipment that is part of the system under test</i>	Description	Manufacturer	Type
	---	---	---
Associated equipment (AE): <i>Equipment that is not part of the system under test but needed to exercise and/or monitor the EUT</i>	Description	Manufacturer	Type
	---	---	---
Documents as provided by the applicant: (*)	Description	File name	Issue date
	---	---	---
Modifications to the test item during testing:	In order to solve a failure in the Transmitting Radiated Emission tests, the power of the BT LE signal was lowered ('output_power pos 6dBm' command was used for the setting power)		

Copy of marking plate: (*)
Not available

1.1 Additional information of radio device(s)

Technology Tested:	Bluetooth Low Energy	
Type of Unit:	Bluetooth 5 Chip	
Transmit Frequency Range:	2400-2483.5 MHz	
Model of radio module:	nRF52833	
Brand of radio module:	Nordic	
Transmit Channels Tested:	Channel ID	Channel Frequency (MHz)
	Bottom	2402
	Middle	2440
	Top	2480

1.2 Description of Available Antennas

Antenna description	
Manufacturer:	Abracon
Model/Type reference:	ACAG0301-2450-T
Mounting:	---
Description:	The ACAG0301-2450-T is a high gain, multi-layer Ceramic Chip Antenna designed for 2450 MHz for Wi-Fi, Bluetooth, ZigBee and ISM applications. These antennas are made using Low Temperature Co-Fired Ceramic (LTCC) technology.
Gain (dBi)	2.7
Other information can be taken from the test reports of module certification and/or from manufacturer's data sheet.	

2 Verdict summary section

FCC Reference (47CFR)	ISED Canada Reference	Measurement	Verdict	Note
Part 15.35(c)	N/A	Transmitter Duty Cycle	N/A	1
N/A	RSS-Gen 6.7	Transmitter 99% Occupied Bandwidth	P	
Part 15.247(a)(2)	RSS-Gen 6.7 / RSS-247 5.2(a)	Transmitter Minimum 6 dB Bandwidth	P	
Part 15.247(b)(3)	RSS-Gen 6.12 / RSS-247 5.4(d)	Transmitter Maximum Peak Output Power	P	
Part 15.247(e)	RSS-247 5.2(b)	Transmitter Power Spectral Density	P	
Part 15.247(d)	RSS-Gen 6.13 / RSS-247 5.5	Transmitter Conducted Emissions	N/A	2
Part 15.247(d) & 15.209(a)	RSS-Gen 6.13 / RSS-247 5.5	Transmitter Band Edge Conducted Emissions	N/A	2
Part 15.247(d) & 15.209(a)	RSS-Gen 6.13 / RSS-247 5.5	Transmitter Radiated Emissions	P	
Part 15.247(d) & 15.209(a)	RSS-Gen 6.13 / RSS-247 5.5	Transmitter Band Edge Radiated Emissions	P	
Part 15.207	RSS-Gen 8.8	Transmitter AC Conducted Emissions	N/A	3
Test method: ANSI C63.10-2013 for FCC and ANSI C63.10-2020 for ISED. Test guide: KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019 Notes: - Parameter measured to apply a correction on other measurements. - Radiated method applied. - The EUT is supplied by internal battery without any direct or indirect connection to the AC mains network.				

Possible test case verdicts:

Test case not performed: N/P

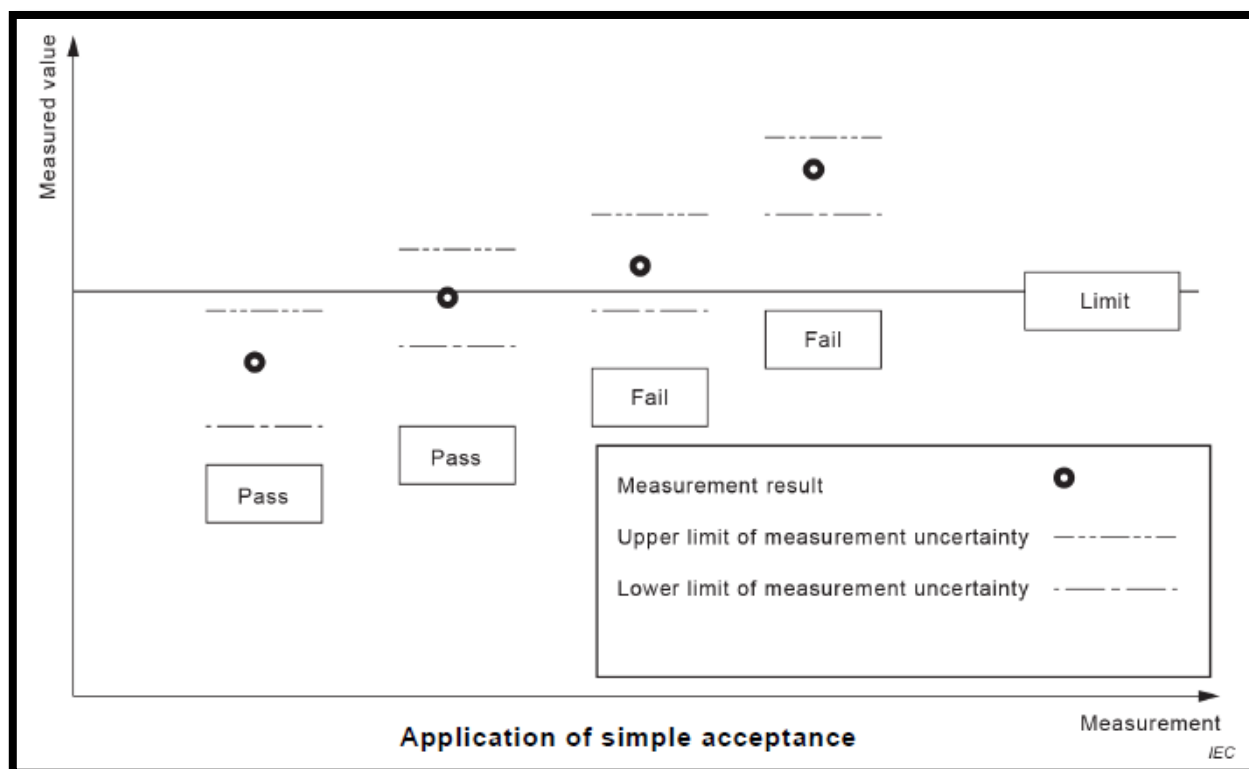
Test case does not apply to test object: N/A

Test object does meet requirement: Pass (P)

Test object does not meet requirement: Fail (F)

3 Conformity decision rule

Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.



4 Formulas used

☒ Disturbance voltage

$$V \text{ (dB}\mu\text{V)} = V \text{ receiver (dB}\mu\text{V)} + \text{Correction (dB)}$$

where:

$$\text{Correction (dB)} = \text{I.L. transducer (dB)} + \text{I.L. cable (dB)}$$

☐ Magnetic field

$$H \text{ (dB}\mu\text{A/m)} = V \text{ receiver (dB}\mu\text{V)} + \text{Correction (dB)}$$

where:

$$\text{Correction (dB)} = \text{Magnetic antenna factor (dB}/\Omega\text{m)} + \text{I.L. cables (dB)}$$

☒ Electric field

$$E \text{ (dB}\mu\text{V/m)} = V \text{ receiver (dB}\mu\text{V)} + \text{Correction (dB)}$$

where:

$$\text{Correction (dB)} = \text{Electric antenna factor (dB/m)} - \text{Gain external preamplifier (dB)} + \text{I.L. external filter (dB)} + \text{I.L. cables (dB)}$$

Note: external preamplifier and external filter are optional and, if used, are indicated in the list of test equipment

☒ Margin

$$\text{Margin (dB)} = \text{Measure} - \text{Limit}$$

☐ Radiated emission limit conversion for a different measuring distance

$$40 \text{ dB/decade (f < 30 MHz); } 20 \text{ dB/decade (f} \geq 30 \text{ MHz)}$$

☐ Correction of radiated field from 5 m to 3 m

$$+8.87 \text{ dB (f < 30 MHz); } +4.44 \text{ dB (f} \geq 30 \text{ MHz)}$$

☒ Linear to logarithmic conversion

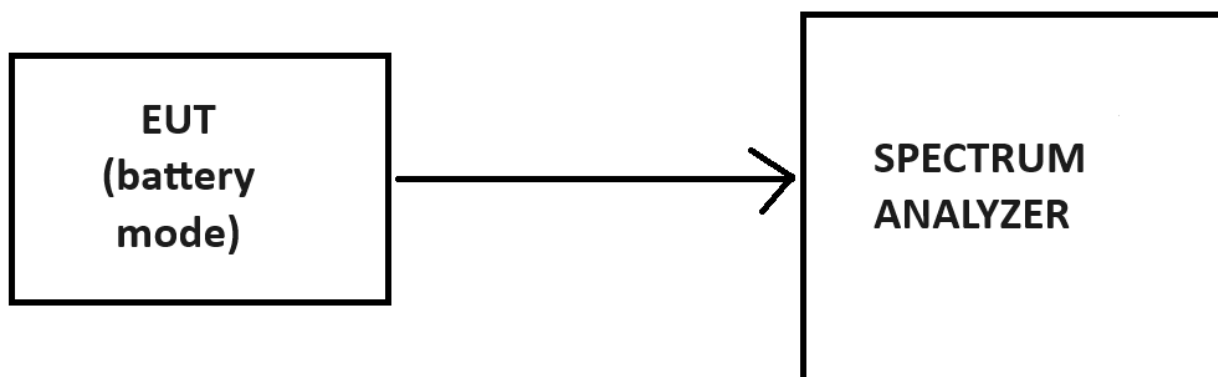
$$\text{Log} = 20 \cdot \log(\text{Lin}) \text{ for voltage and current; } \text{Log} = 10 \cdot \log(\text{Lin}) \text{ for power}$$

☒ Conducted Radio Measurements

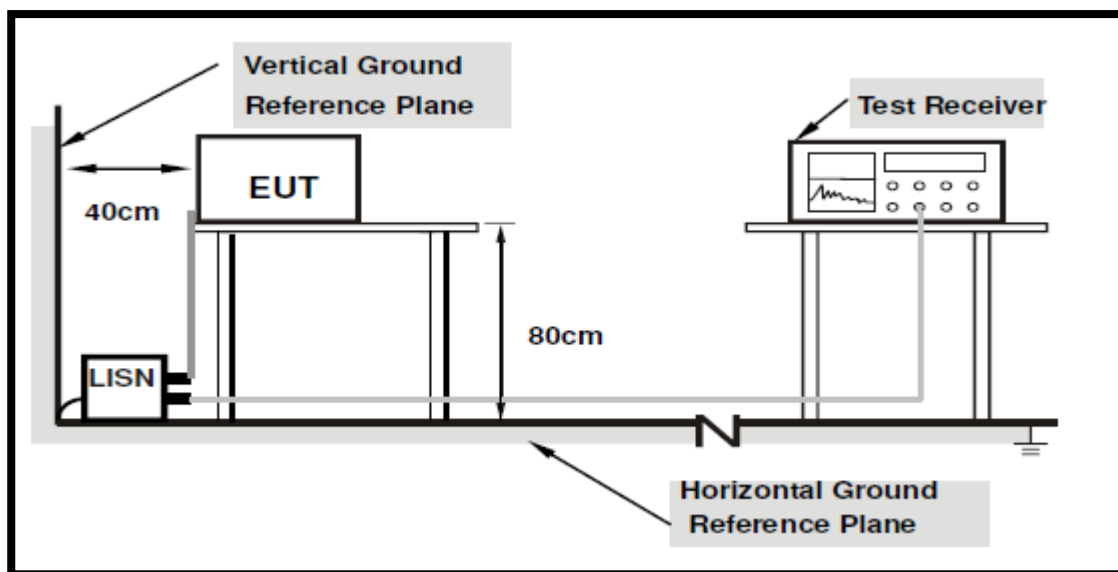
$$P_{\text{out_EUT}} = P_{\text{read_Amplifier}} \text{ (dBm)} + \text{Cable Losses (dB)} + \text{Attenuator (dB)}$$

5 Test Setup Diagrams

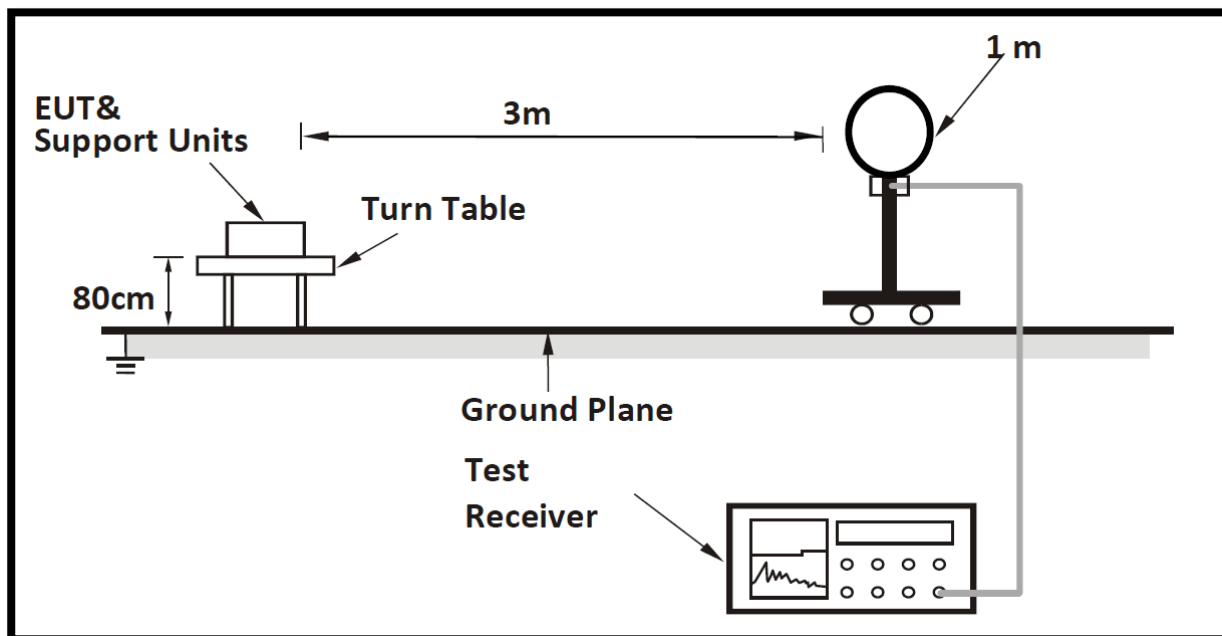
Conducted tests on antenna port:



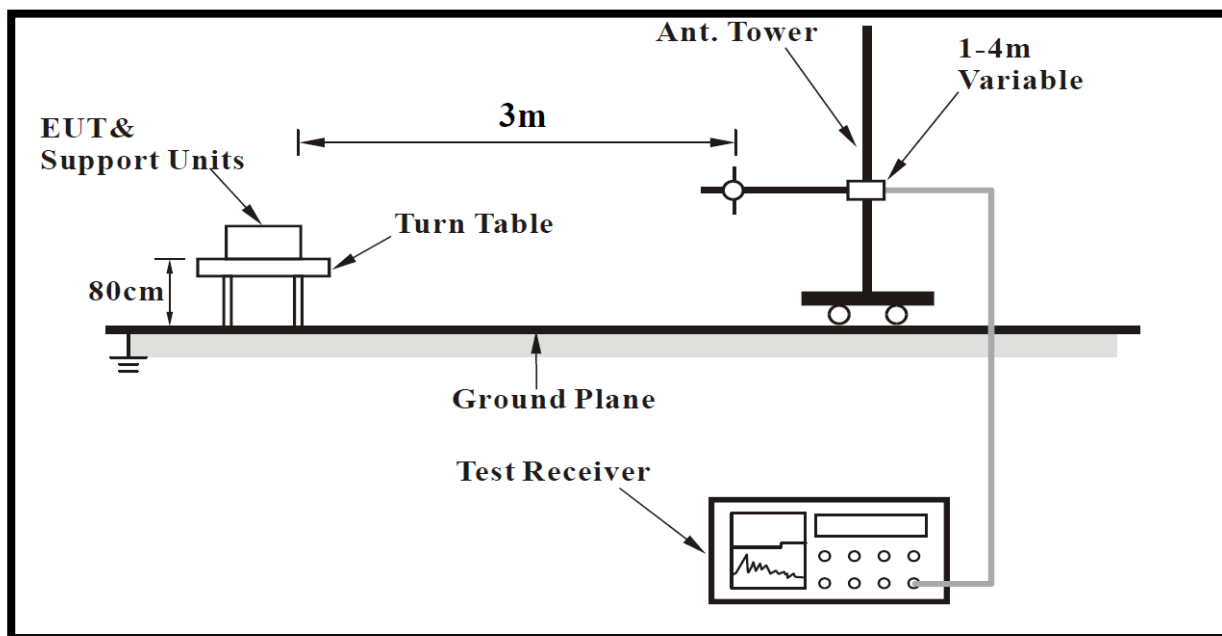
AC Conducted emission:



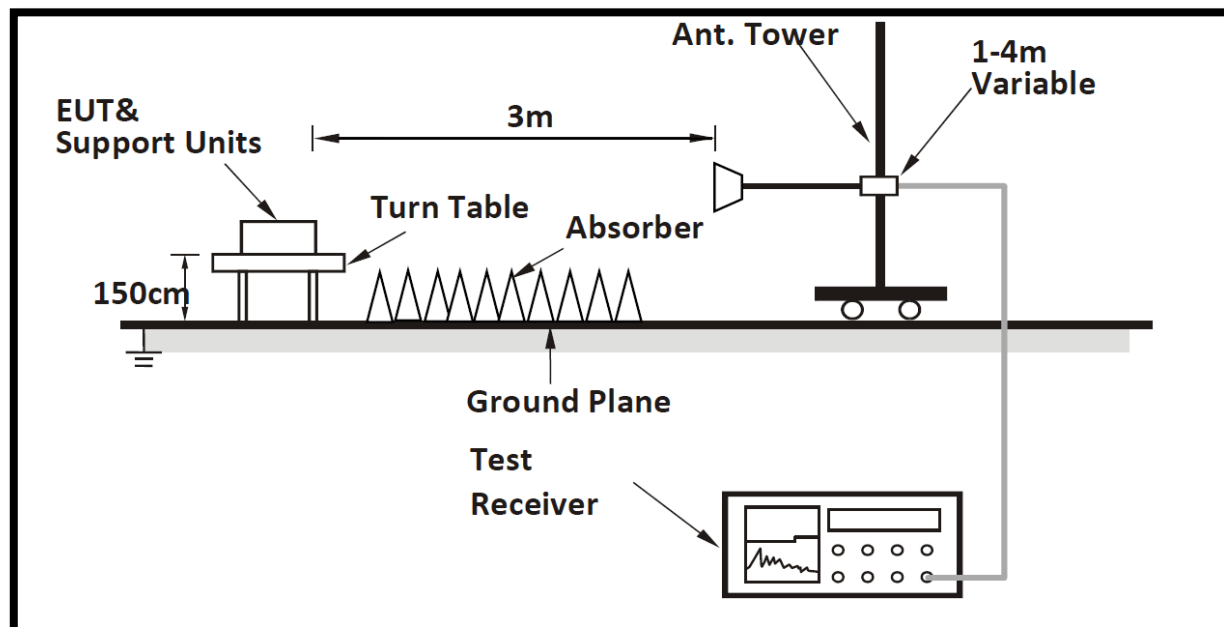
Radiated emission from 9kHz to 30 MHz



Radiated emission from 30 MHz to 1 GHz



Radiated emission from 1 GHz to 26 GHz



6 Tests

6.1 Antenna Port Test Results

6.1.1 Transmitter Duty Cycle

Tested by:	Andrea Giovanni Galbiati
Test date:	2025-03-03
Test location (stand):	EMC Laboratory
Ambient temperature:	22 °C
Relative humidity:	45 %
Atmospheric pressure:	998 mbar
FCC Reference:	Part 15.35 (c)
ISED Reference:	RSS-Gen 8.2
Test Method Used	FCC KDB 558074 Section 6 referencing ANSI C63.10 Section 11.6
Used mains voltage/frequency:	Fully charged battery
Supplementary information:	The transmitter duty cycle was measured using a spectrum/signal analyser in the time domain and calculated by using the following calculation: $DC (\%) = \left(\frac{\sum T_{ON}}{\text{Period or 100 ms whichever is the lesser}} \right) \times 100$ $DC (dB) = 10 \times \log \left(\frac{\text{Period or 100 ms whichever is the lesser}}{\sum T_{ON}} \right)$

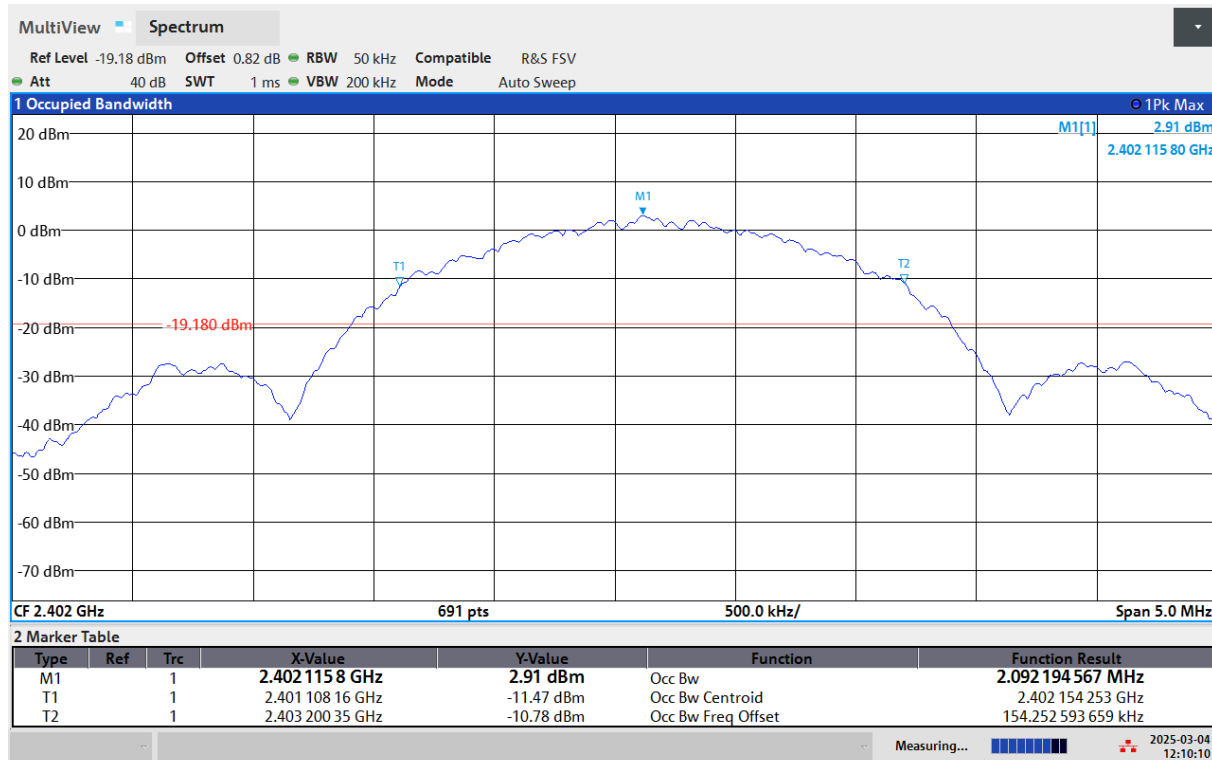
Results:

Pulse Duration (µs)	Period (µs)	Duty Cycle (%)	DC Correction Factor (dB)
100	100	100%	0

6.1.2 Transmitter 99% Occupied Bandwidth

Tested by:	Andrea Giovanni Galbiati
Test date:	2025-03-04
Test location (stand):	EMC Lab
Ambient temperature:	22 °C
Relative humidity:	51 %
Atmospheric pressure:	998 mbar
FCC Reference:	N/A
ISED Reference:	RSS-Gen 6.7
Test Method Used	RSS-Gen 6.7 and Notes below
Used mains voltage/frequency:	Fully charged battery
Supplementary information:	The 99% emission bandwidth was measured using the signal analyser occupied bandwidth function. The resolution bandwidth was set in the range of 1% to 5% of the occupied bandwidth and the video bandwidth was set to more than 3 times the resolution bandwidth. The span was set to capture all products of the modulation process including emission skirts. A correction of 0.82 dB was added to compensate losses of RF cables

Example of measurement (operation mode 1)



12:10:12 PM 03/04/2025

Operation mode: 1,2,3

Channel	99% Occupied Bandwidth (kHz)
Bottom	2092.1946
Middle	2095.3942
Top	2110.4414

Operation mode: 4,5,6

Channel	99% Occupied Bandwidth (kHz)
Bottom	1070.3312
Middle	1070.3195
Top	1070.6659

Operation mode: 7,8,9

Channel	99% Occupied Bandwidth (kHz)
Bottom	1046.9162
Middle	1050.9235
Top	1053.1524

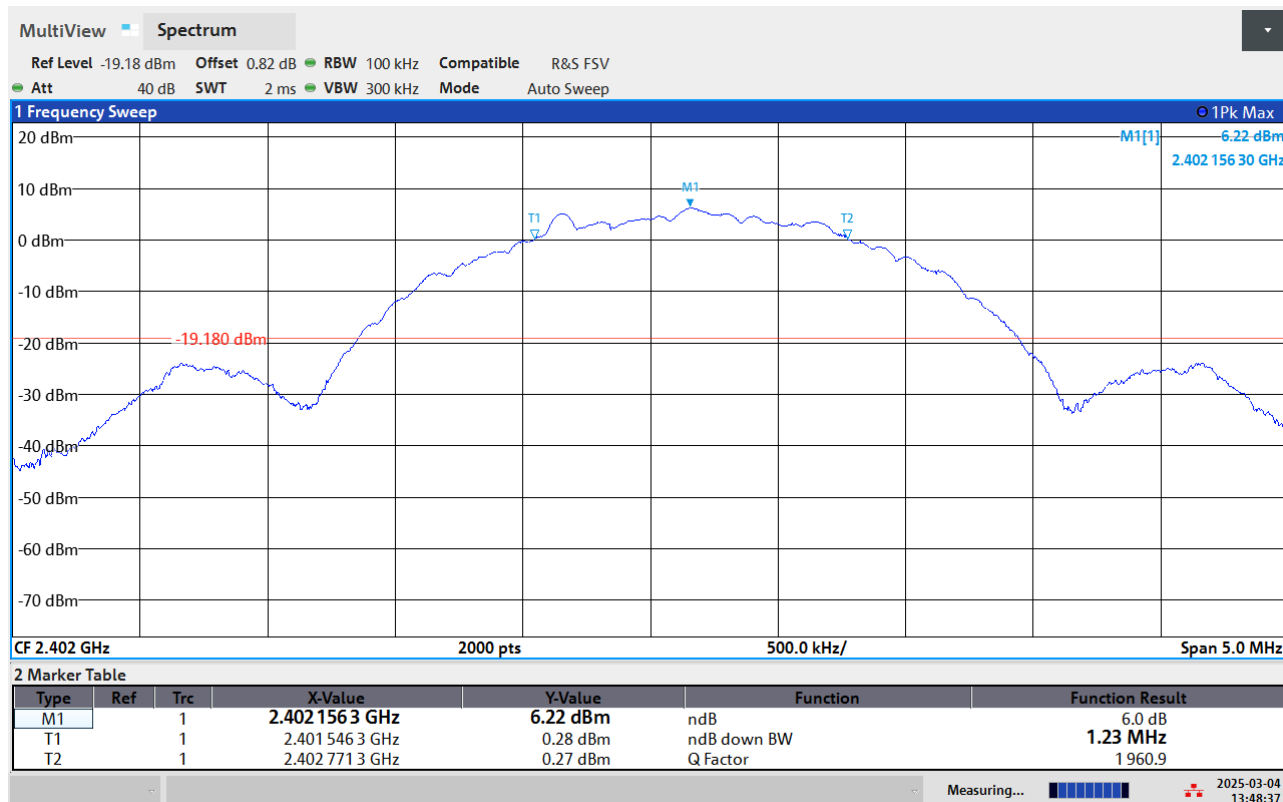
Operation mode: 10,11,12

Channel	99% Occupied Bandwidth (kHz)
Bottom	1074.6779
Middle	1078.2204
Top	1087.5482

6.1.3 Transmitter Minimum 6 dB Bandwidth

Tested by:	Andrea Giovanni Galbiati
Test date:	2025-03-04
Test location (stand):	EMC Lab
Ambient temperature:	22 °C
Relative humidity:	45 %
Atmospheric pressure:	996 mbar
FCC Reference:	Part 15.247(a)(2)
ISED Canada Reference:	RSS-Gen 6.7 / RSS-247 5.2(a)
Test Method Used	FCC KDB 558074 Section 8.2 referencing ANSI C63.10 Section 11.8.2
Used mains voltage/frequency:	Fully charged battery
Supplementary information:	A correction of 0.82 dB was added to compensate losses of RF cables

Example of measurement (operation mode 1)



01:48:37 PM 03/04/2025

Operation mode: 1,2,3

Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Result
Bottom	1230	≥ 500	Pass
Middle	1210	≥ 500	Pass
Top	1240	≥ 500	Pass

Operation mode: 4,5,6

Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Result
Bottom	720.0	≥ 500	Pass
Middle	732.5	≥ 500	Pass
Top	747.5	≥ 500	Pass

Operation mode: 7,8,9

Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Result
Bottom	700.0	≥ 500	Pass
Middle	700.0	≥ 500	Pass
Top	697.5	≥ 500	Pass

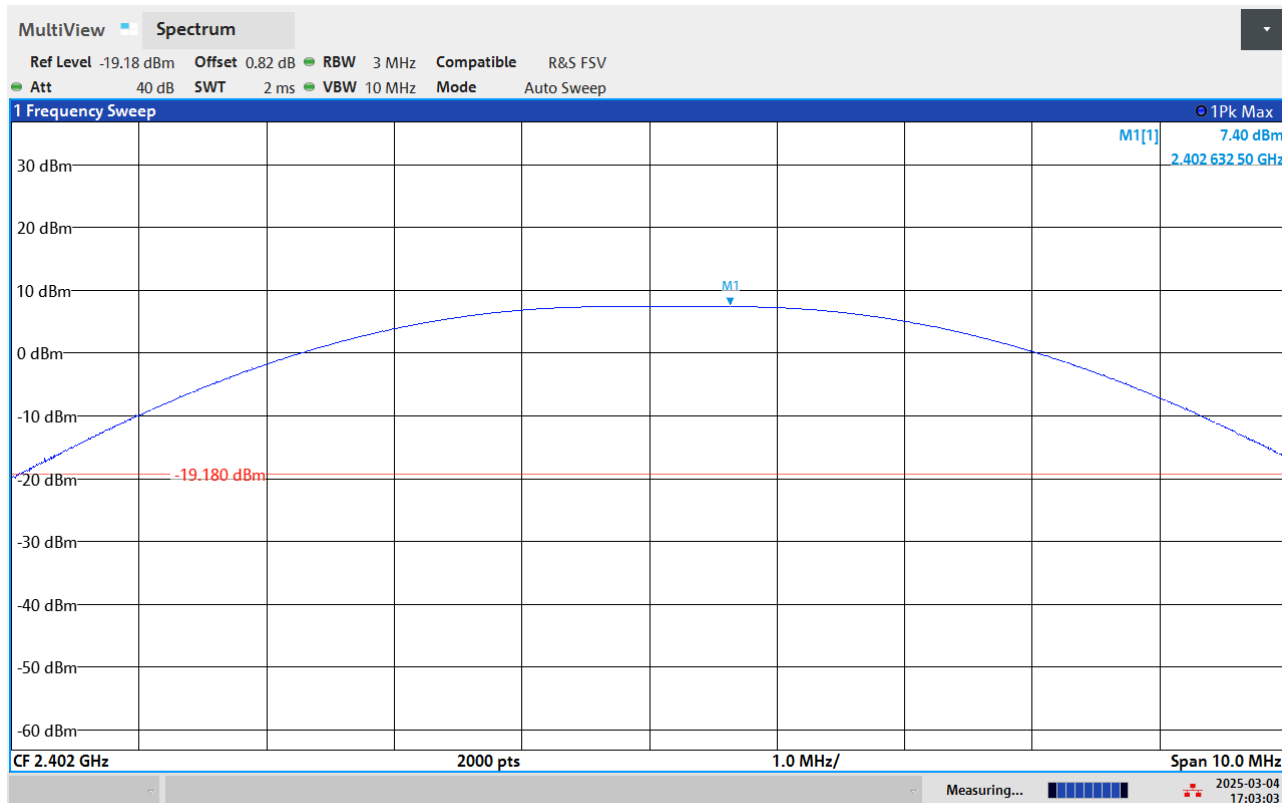
Operation mode: 10,11,12

Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Result
Bottom	712.5	≥ 500	Pass
Middle	677.5	≥ 500	Pass
Top	717.5	≥ 500	Pass

6.1.4 Transmitter Maximum Peak Output Power

Tested by:	Andrea Giovanni Galbiati
Test date:	2025-03-04
Test location (stand):	EMC Lab
Ambient temperature:	22 °C
Relative humidity:	45 %
Atmospheric pressure:	998 mbar
FCC Reference:	Part 15.247(b)(3)
ISED Canada Reference:	RSS-Gen 6.12 / RSS-247 5.4(d)
Test Method Used	FCC KDB 558074 Section 8.3.1.1 referencing ANSI C63.10 Section 11.9.1.1 and Notes below
Used mains voltage/frequency:	Fully charged battery
Supplementary information:	- Instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges was used. - The conducted power was added to the declared antenna gain to obtain the EIRP. - A correction of 0.82 dB was added to compensate losses of RF cables.

Example of measurement (operation mode 1)



05:03:04 PM 03/04/2025

Operation mode: 1,2,3

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	7.40	30.0	-22.60	Pass
Middle	7.41	30.0	-22.59	Pass
Top	7.22	30.0	-22.78	Pass

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	7.40	2.7	10.10	36.0	-25.90	Pass
Middle	7.41	2.7	10.11	36.0	-25.89	Pass
Top	7.22	2.7	9.92	36.0	-26.08	Pass

Operation mode: 4,5,6

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	7.39	30.0	-22.61	Pass
Middle	7.42	30.0	-22.58	Pass
Top	7.23	30.0	-22.77	Pass

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	7.39	2.7	10.09	36.0	-25.91	Pass
Middle	7.42	2.7	10.12	36.0	-25.88	Pass
Top	7.23	2.7	9.93	36.0	-26.07	Pass

Operation mode: 7,8,9

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	7.39	30.0	-22.61	Pass
Middle	7.42	30.0	-22.58	Pass
Top	7.22	30.0	-22.78	Pass

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	7.39	2.7	10.09	36.0	-25.91	Pass
Middle	7.42	2.7	10.12	36.0	-25.88	Pass
Top	7.22	2.7	9.92	36.0	-26.08	Pass

Operation mode: 10,11,12

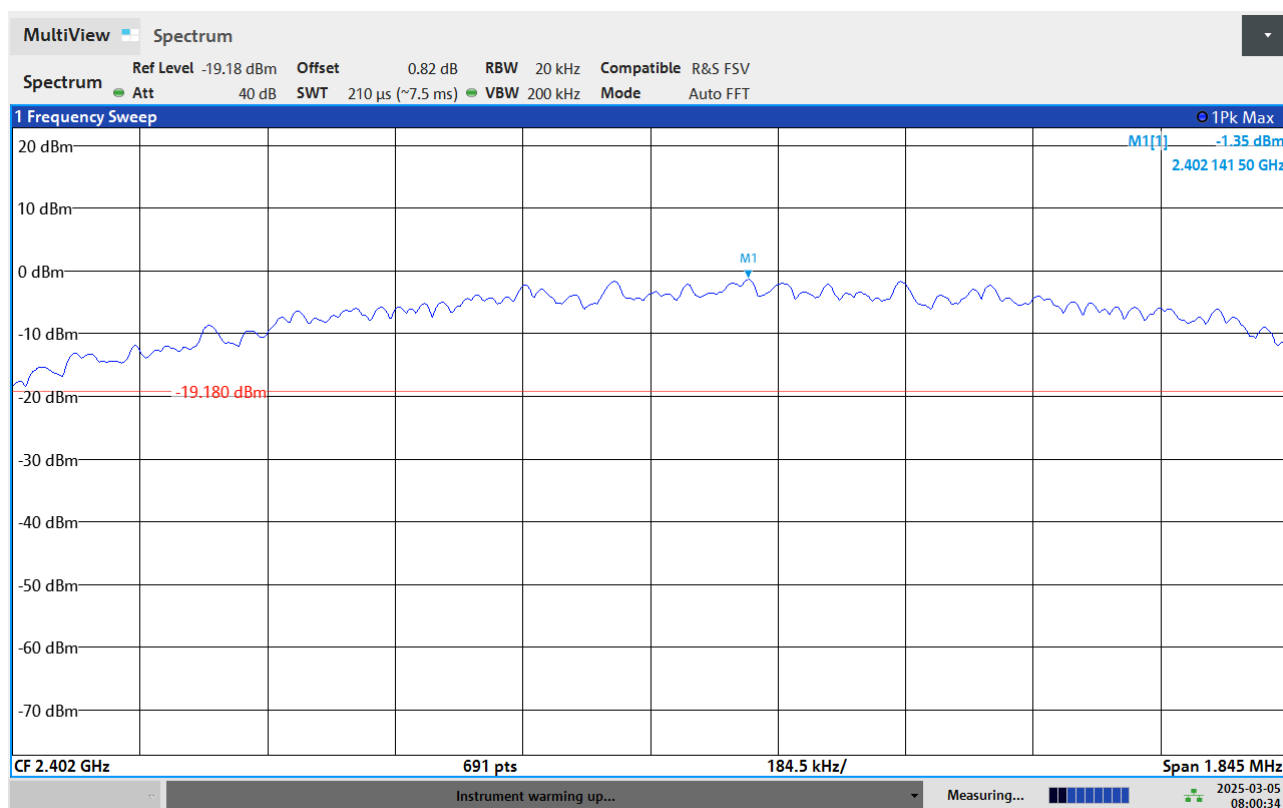
Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	7.39	30.0	-22.61	Pass
Middle	7.40	30.0	-22.6	Pass
Top	7.23	30.0	-22.77	Pass

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	7.39	2.7	10.09	36.0	-25.91	Pass
Middle	7.40	2.7	10.1	36.0	-25.9	Pass
Top	7.23	2.7	9.93	36.0	-26.07	Pass

6.1.5 Transmitter Power Spectral Density

Tested by:	Andrea Giovanni Galbiati
Test date:	2025-03-05
Test location (stand):	EMC Lab
Ambient temperature:	22 °C
Relative humidity:	45 %
Atmospheric pressure:	998 mbar
FCC Reference:	Part 15.247(e)
ISED Canada Reference:	RSS-247 5.2(b)
Test Method Used	FCC KDB 558074 Section 8.4 referencing ANSI C63.10 Section 11.10.2
Used mains voltage/frequency:	Fully charged battery
Supplementary information:	The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cable. An RF level offset was entered on the signal analyser to compensate for the loss of the attenuator and RF cable.

Example of measurement (operation mode 1)



08:00:34 AM 03/05/2025

Operation mode: 1,2,3

Channel	Output Power (dBm)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-1.35	8.0	-9.35	Pass
Middle	-1.56	8.0	-9.56	Pass
Top	-1.37	8.0	-9.37	Pass

Operation mode: 4,5,6

Channel	Output Power (dBm)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	1.36	8.0	-6.64	Pass
Middle	1.35	8.0	-6.65	Pass
Top	1.18	8.0	-6.82	Pass

Operation mode: 7,8,9

Channel	Output Power (dBm)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	1.74	8.0	-6.26	Pass
Middle	1.80	8.0	-6.2	Pass
Top	1.58	8.0	-6.42	Pass

Operation mode: 10,11,12

Channel	Output Power (dBm)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	0.82	8.0	-7.18	Pass
Middle	1.57	8.0	-6.43	Pass
Top	1.39	8.0	-6.61	Pass

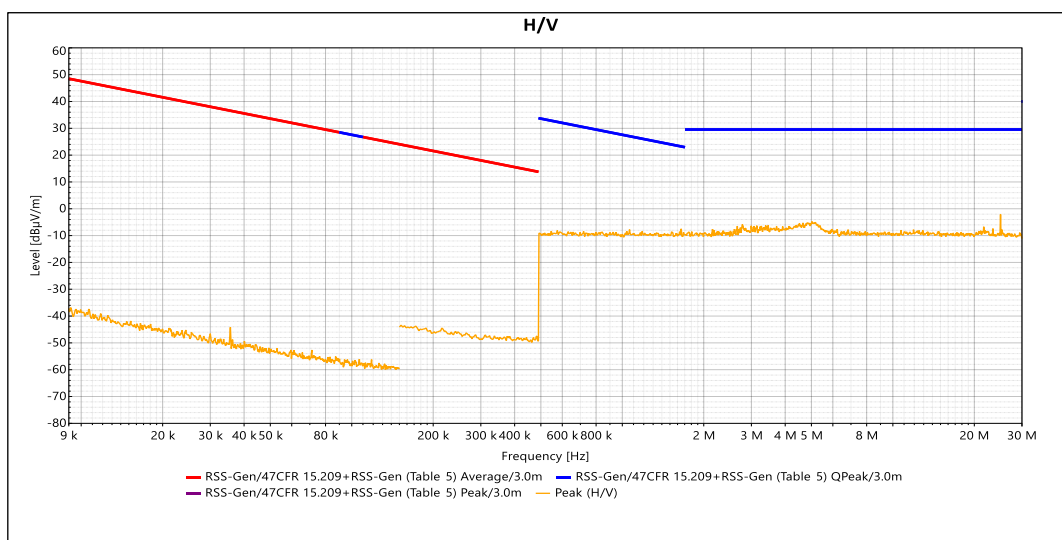
6.2 Radiated Test Results

6.2.1 Transmitter Radiated Emission < 1 GHz

Tested by:	Andrea Giovanni Galbiati
Test date:	2025-03-10
Test location (stand):	Area 9: SAC 5-3.0 (RF emission)
Ambient temperature:	22 °C
Relative humidity:	45 %
Atmospheric pressure:	998 mbar
FCC Reference:	Parts 15.247(d) & 15.209(a)
ISED Canada Reference:	RSS-Gen 6.13 & 8.9 / RSS-247 5.5
Test Method Used	ANSI C63.10 Sections 6.3, 6.4 and 6.5
Frequency Range	9 kHz to 1000 MHz
Used mains voltage/frequency:	Fully charged battery
Supplementary information:	Measurements below 30 MHz were performed in a semi-anechoic chamber at 3 metres. ANSI C63.10 clause 5.2 states an alternative test site that can demonstrate equivalence to an open area test site may be used for measurements below 30 MHz. Therefore, measurements were performed in a semi-anechoic chamber. The correlation data between semi-anechoic chamber and an open field test site is available upon request As the EUT has a duty cycle > 99%, the duty cycle correction factor was not applied. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a). are identical to those in RSS-Gen Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using a free space impedance of 377Ω. For example, the measurement frequency X kHz resulted in a level of Y dBμV/m which is equivalent to $Y - 51.5 = Z$ dBμA/m, which has the same margin, W dB, to the corresponding RSS-Gen Table 6 limit as it has to the 15.209(a) limit

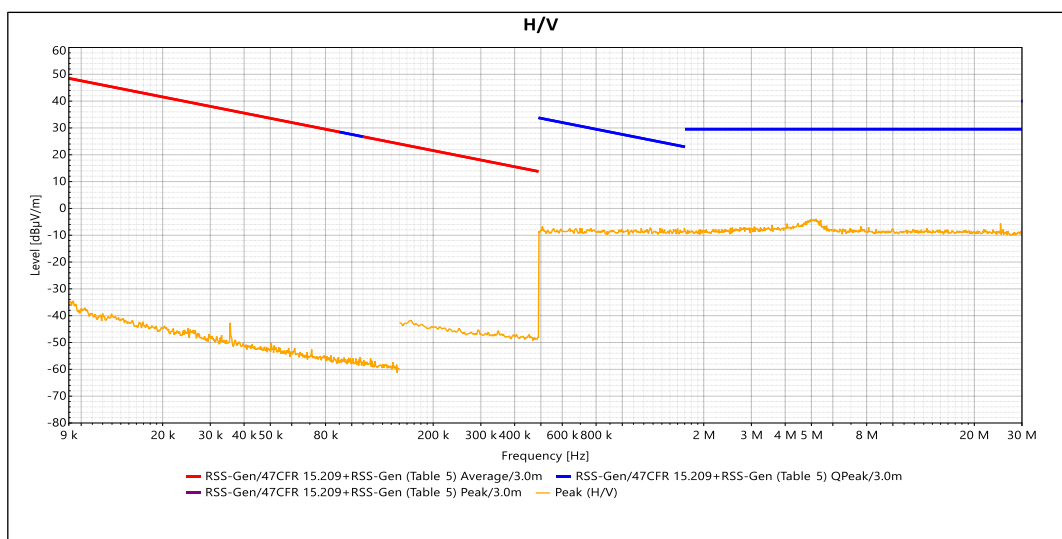
Results:

Operating mode	1
Used mains voltage/frequency ...	Fully charged battery
Axis	X
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 9 kHz; Stop Frequency: 150 kHz; Step: 50 Hz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 200 Hz; VBW: Auto; Preamplifier: OFF; Preselector: ON
Instrument settings	Start Frequency: 150 kHz; Stop Frequency: 30 MHz; Step: 2.25 kHz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



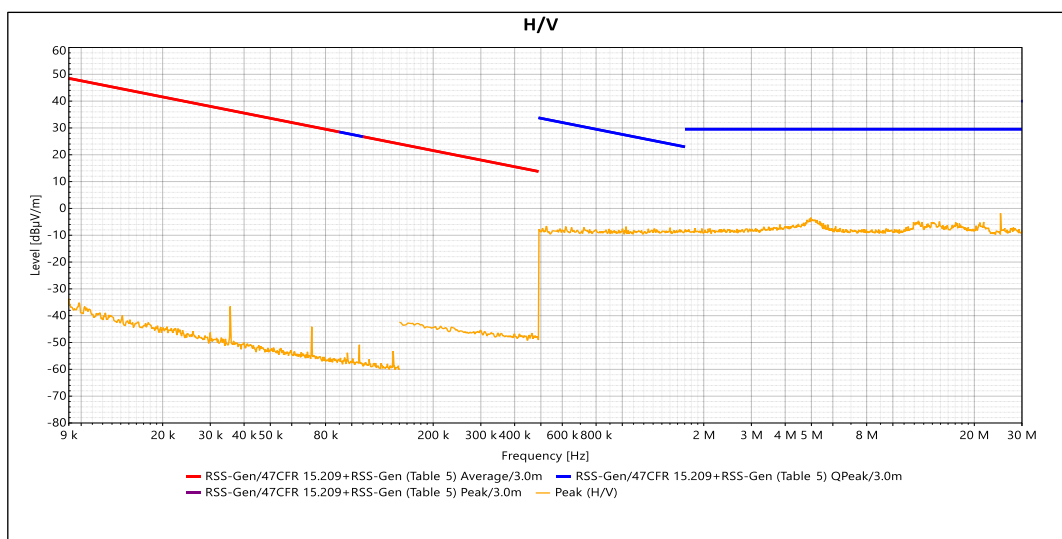
- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	1
Used mains voltage/frequency ...	Fully charged battery
Axis	Y
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 9 kHz; Stop Frequency: 150 kHz; Step: 50 Hz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 200 Hz; VBW: Auto; Preamplifier: OFF; Preselector: ON
Instrument settings	Start Frequency: 150 kHz; Stop Frequency: 30 MHz; Step: 2.25 kHz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



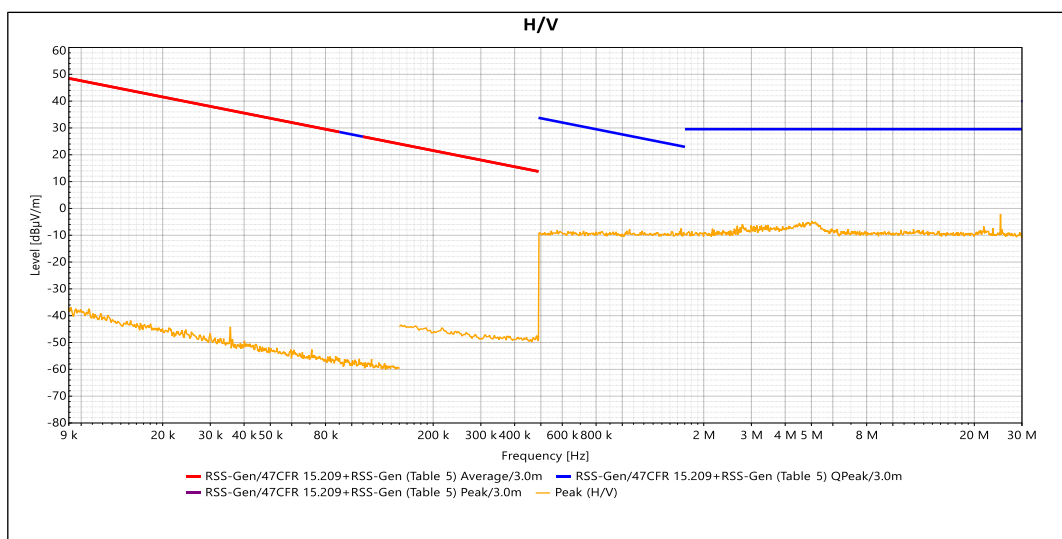
- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	1
Used mains voltage/frequency ...	Fully charged battery
Axis	Z
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 9 kHz; Stop Frequency: 150 kHz; Step: 50 Hz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 200 Hz; VBW: Auto; Preamplifier: OFF; Preselector: ON
Instrument settings	Start Frequency: 150 kHz; Stop Frequency: 30 MHz; Step: 2.25 kHz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



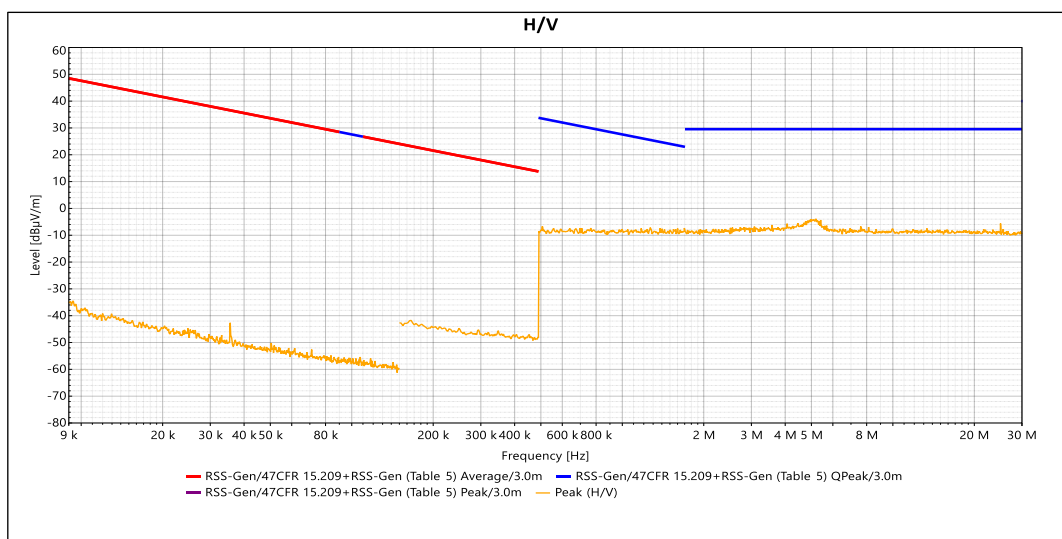
- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	2
Used mains voltage/frequency ...	Fully charged battery
Axis	X
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 9 kHz; Stop Frequency: 150 kHz; Step: 50 Hz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 200 Hz; VBW: Auto; Preamplifier: OFF; Preselector: ON
Instrument settings	Start Frequency: 150 kHz; Stop Frequency: 30 MHz; Step: 2.25 kHz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



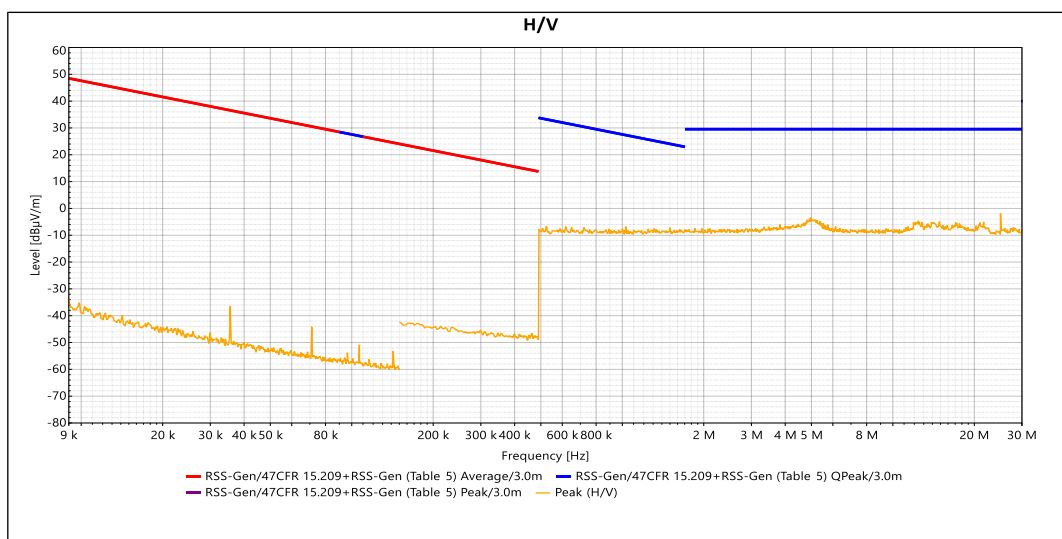
- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	2
Used mains voltage/frequency ...	Fully charged battery
Axis	Y
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 9 kHz; Stop Frequency: 150 kHz; Step: 50 Hz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 200 Hz; VBW: Auto; Preamplifier: OFF; Preselector: ON
Instrument settings	Start Frequency: 150 kHz; Stop Frequency: 30 MHz; Step: 2.25 kHz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



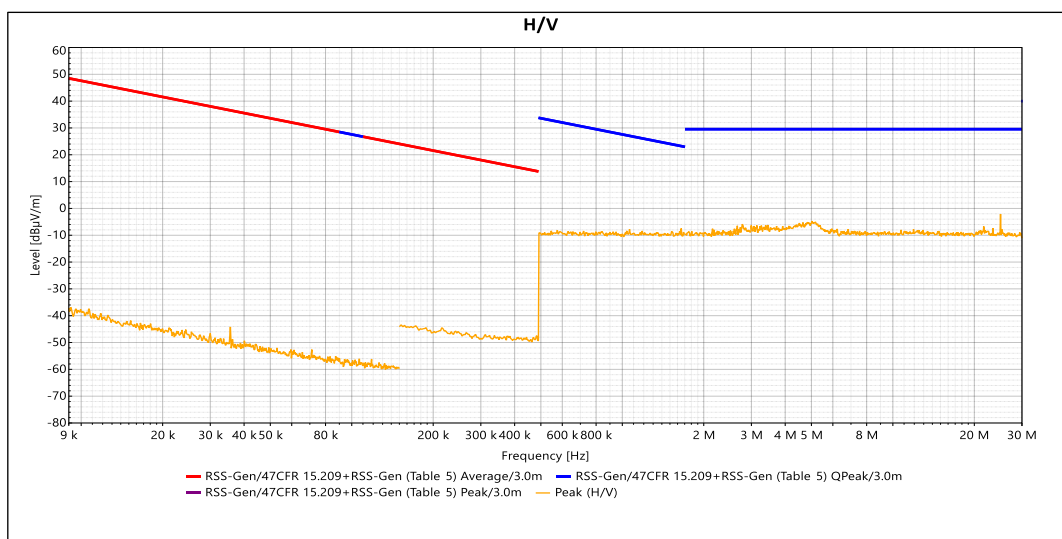
- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	2
Used mains voltage/frequency ...	Fully charged battery
Axis	Z
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 9 kHz; Stop Frequency: 150 kHz; Step: 50 Hz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 200 Hz; VBW: Auto; Preamplifier: OFF; Preselector: ON
Instrument settings	Start Frequency: 150 kHz; Stop Frequency: 30 MHz; Step: 2.25 kHz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



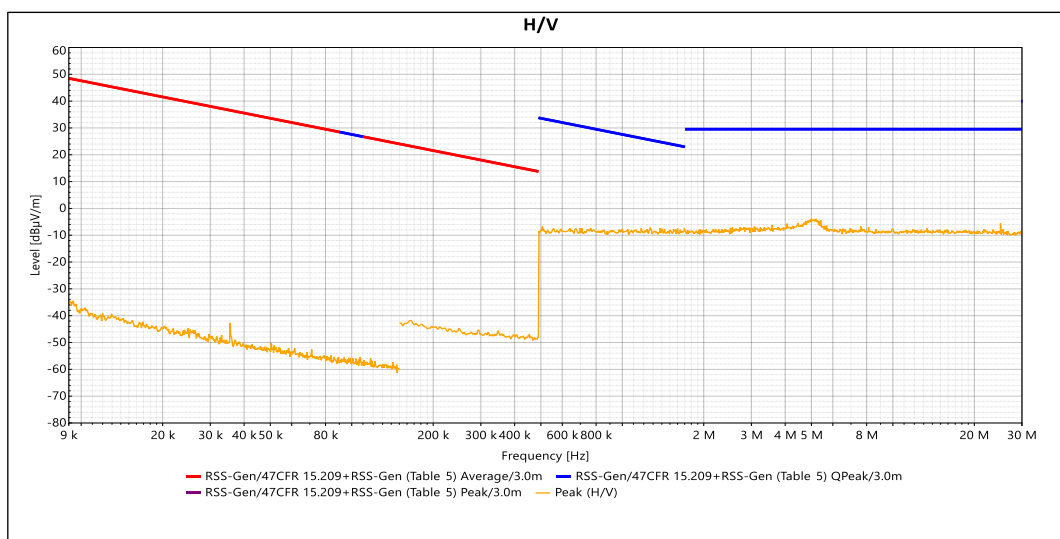
- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	3
Used mains voltage/frequency ...	Fully charged battery
Axis	X
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 9 kHz; Stop Frequency: 150 kHz; Step: 50 Hz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 200 Hz; VBW: Auto; Preamplifier: OFF; Preselector: ON
Instrument settings	Start Frequency: 150 kHz; Stop Frequency: 30 MHz; Step: 2.25 kHz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



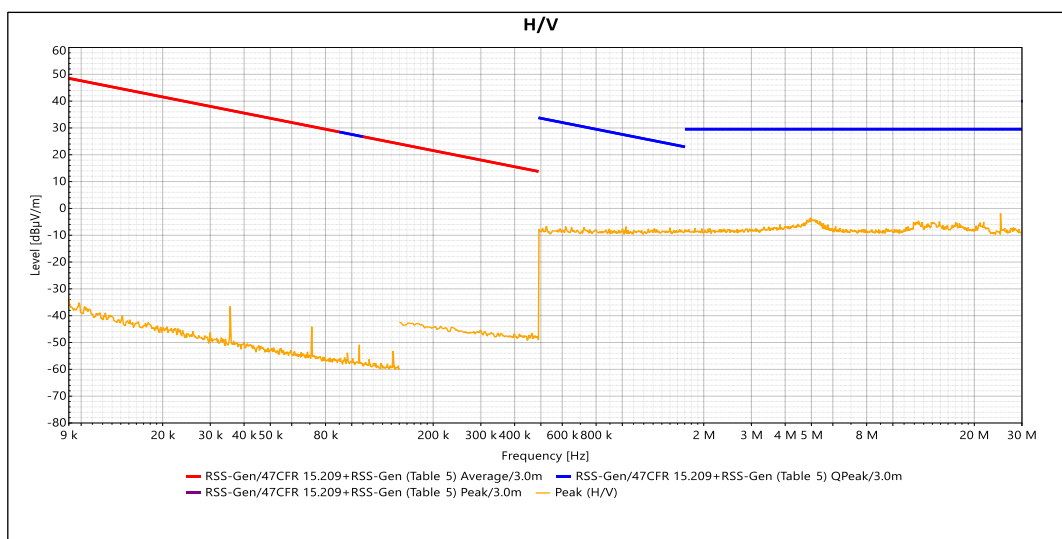
- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	3
Used mains voltage/frequency ...	Fully charged battery
Axis	Y
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 9 kHz; Stop Frequency: 150 kHz; Step: 50 Hz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 200 Hz; VBW: Auto; Preamplifier: OFF; Preselector: ON
Instrument settings	Start Frequency: 150 kHz; Stop Frequency: 30 MHz; Step: 2.25 kHz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



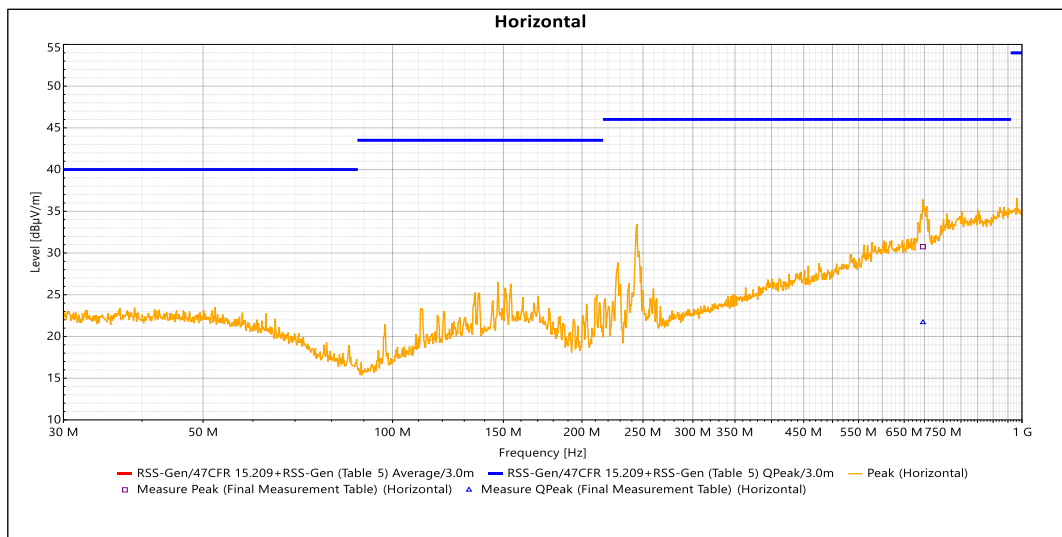
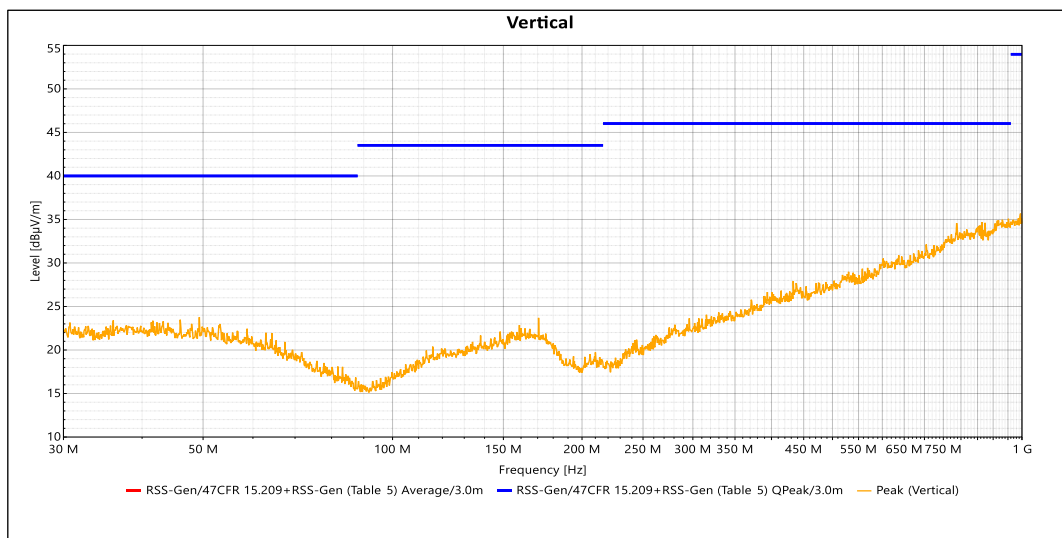
- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	3
Used mains voltage/frequency ...	Fully charged battery
Axis	Z
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 9 kHz; Stop Frequency: 150 kHz; Step: 50 Hz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 200 Hz; VBW: Auto; Preamplifier: OFF; Preselector: ON
Instrument settings	Start Frequency: 150 kHz; Stop Frequency: 30 MHz; Step: 2.25 kHz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	1
Used mains voltage/frequency ...	Fully charged battery
Orientation of EUT	Vertical
Verdict	Pass
Instrument settings	Start Frequency: 30 MHz; Stop Frequency: 1 GHz; Step: 30 kHz; Sweep Time: 20 ms/Step; RF Attenuation: Auto; RBW: 120 kHz; VBW: Auto; Preamplifier: ON; Preselector: ON

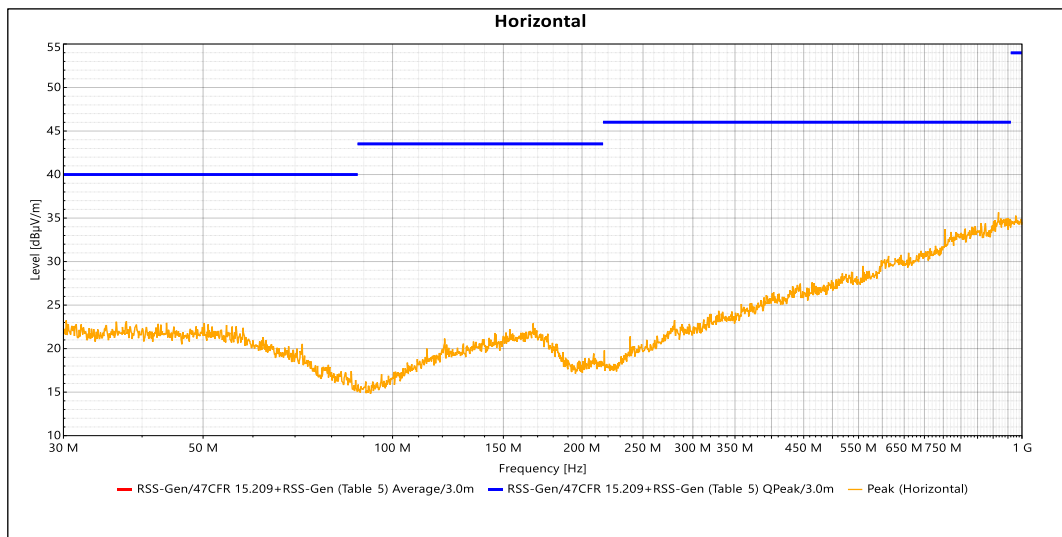
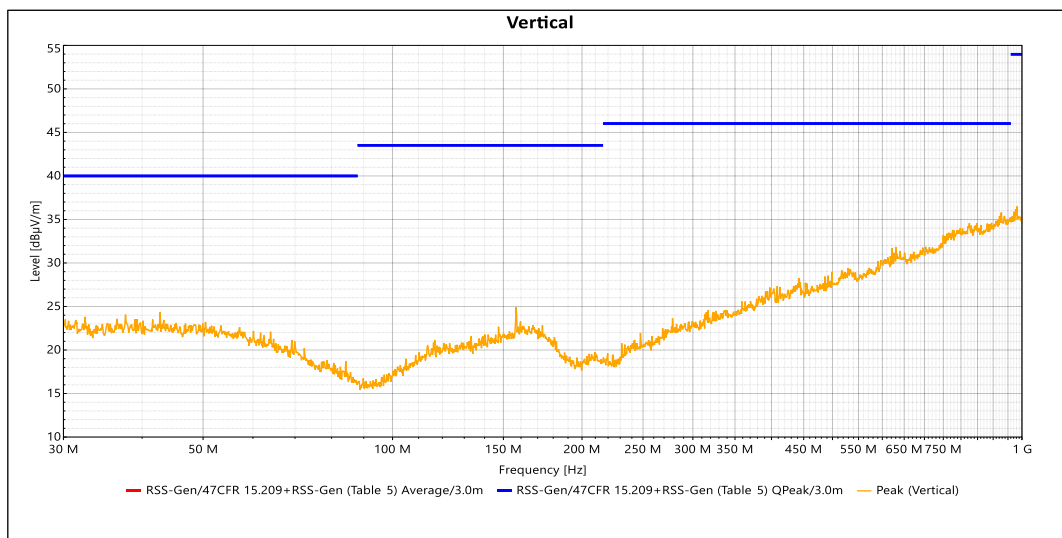


- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☒ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Final Measurement Table

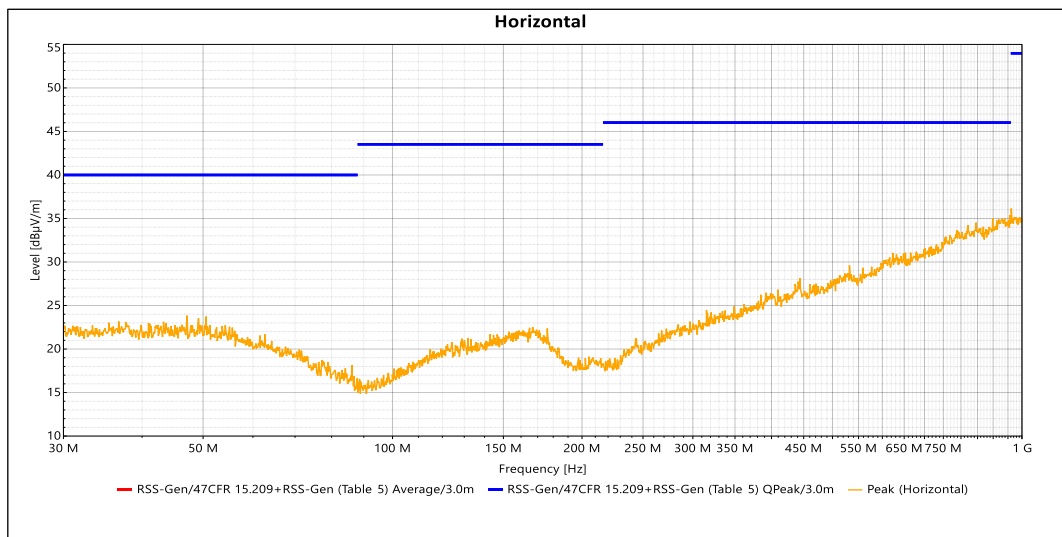
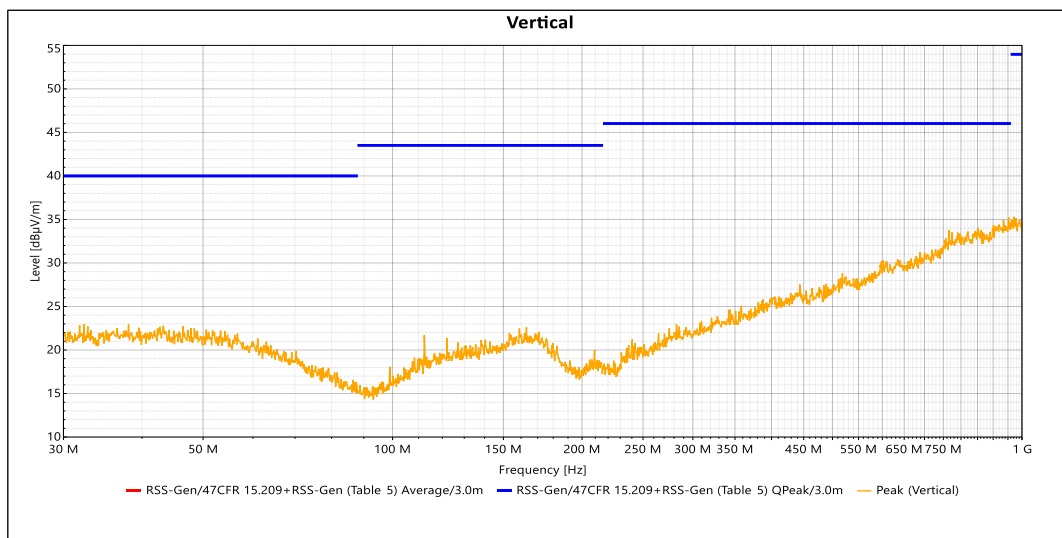
Frequency	Measure Peak (dBμV/m)	Measure QPeak (dBμV/m)	Limit QPeak (dBμV/m)	Margin QPeak (dB)	Max height (m)	Max angle (°)	Polarization	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
696.24 M	30.76	21.684	46.02	-24.336	3.199	355.9	Horizontal	120 k	5	Pass	29.017

Operating mode	2
Used mains voltage/frequency ...	Fully charged battery
Orientation of EUT	Vertical
Verdict	Pass
Instrument settings	Start Frequency: 30 MHz; Stop Frequency: 1 GHz; Step: 30 kHz; Sweep Time: 20 ms/Step; RF Attenuation: Auto; RBW: 120 kHz; VBW: Auto; Preamplifier: ON; Preselector: ON



- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	3
Used mains voltage/frequency ...	Fully charged battery
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 30 MHz; Stop Frequency: 1 GHz; Step: 30 kHz; Sweep Time: 20 ms/Step; RF Attenuation: Auto; RBW: 120 kHz; VBW: Auto; Preamplifier: ON; Preselector: ON



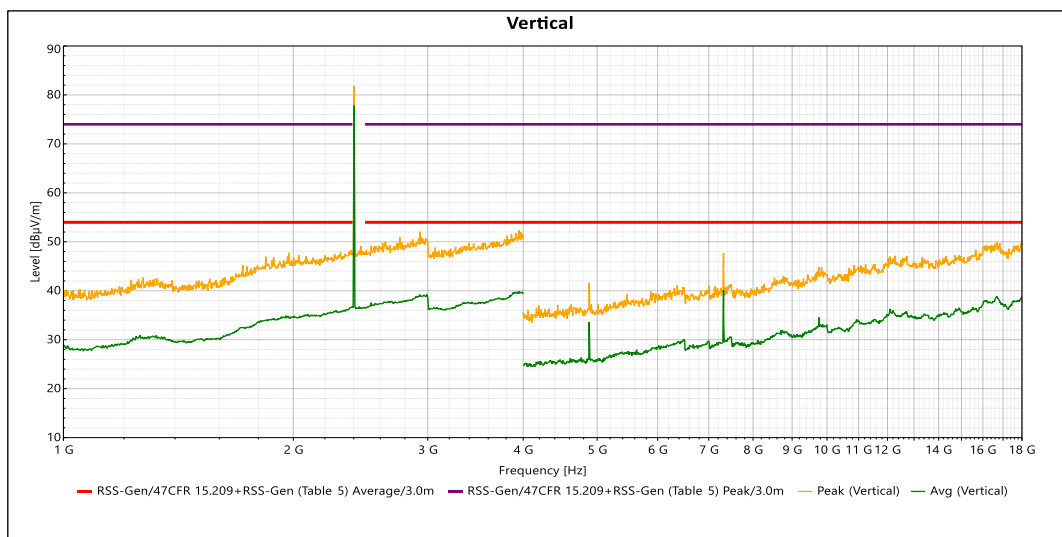
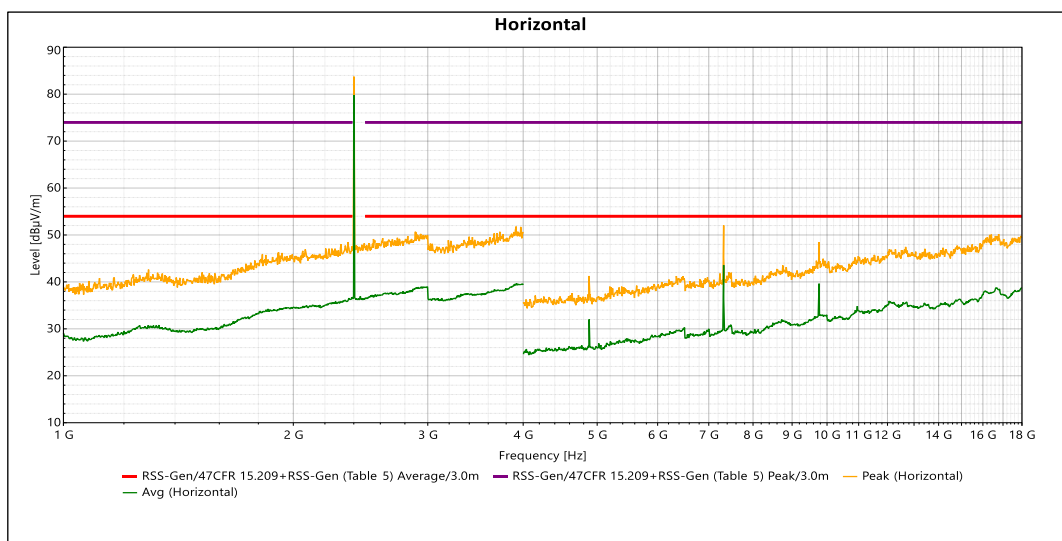
- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

6.2.2 Transmitter Radiated Emission > 1 GHz

Tested by:	Andrea Giovanni Galbiati
Test date:	2025-03-24 to 2025-03-25
Test location (stand):	Area 8: SAC 3-1.2 (RF emission)
Ambient temperature:	22 °C (2025-03-24) 22 °C (2025-03-25)
Relative humidity:	45 % (2025-03-24) 47 % (2025-03-25)
Atmospheric pressure:	997 mbar (2025-03-24) 1101 mbar (2025-03-25)
FCC Reference:	Parts 15.247(d) & 15.209(a)
ISED Canada Reference:	RSS-Gen 6.13 & 8.9 / RSS-247 5.5
Test Method Used	ANSI C63.10 Sections 6.3, 6.4 and 6.5
Frequency Range	1 GHz to 26 GHz
Used mains voltage/frequency:	Fully charged battery
Supplementary information:	None

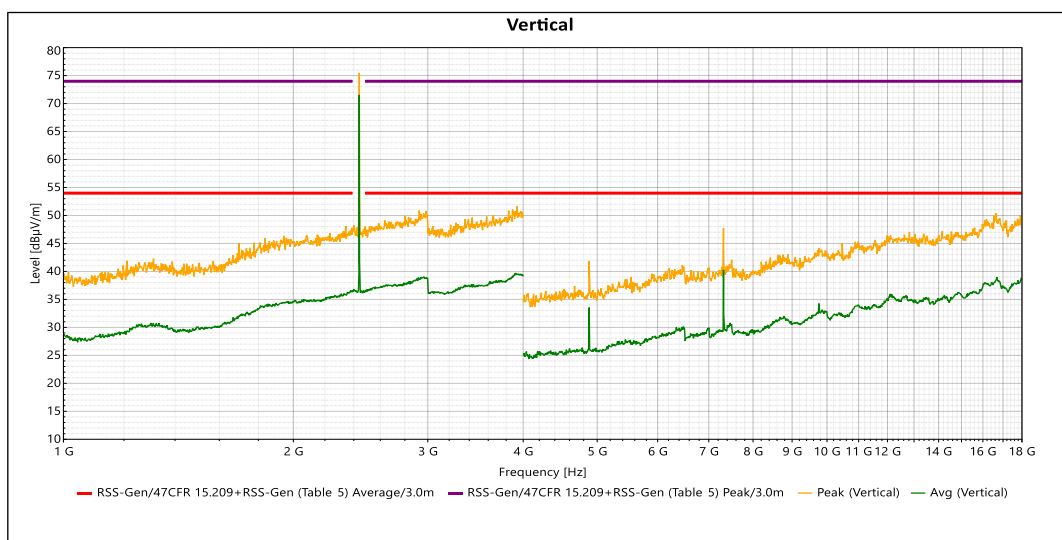
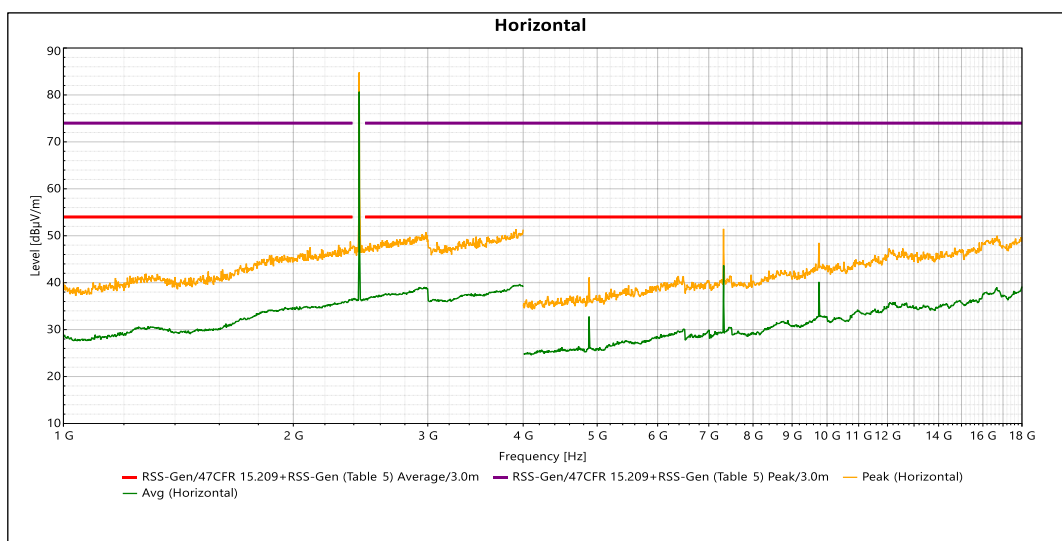
Results:

Operating mode	1
Used mains voltage/frequency ...	Fully charged battery
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 1 GHz; Stop Frequency: 4 GHz; Step: 10000 Pts; Sweep Time: 5 s; RF Attenuation: 0 dB; RBW: 500 kHz; VBW: 1.5 MHz; Preamplifier: ON; Preselector: ON
Instrument settings	Start Frequency: 4 GHz; Stop Frequency: 18 GHz; Step: 30000 Pts; Sweep Time: 5 s; RF Attenuation: 0 dB; RBW: 500 kHz; VBW: 1.5 MHz; Preamplifier: OFF; Preselector: ON



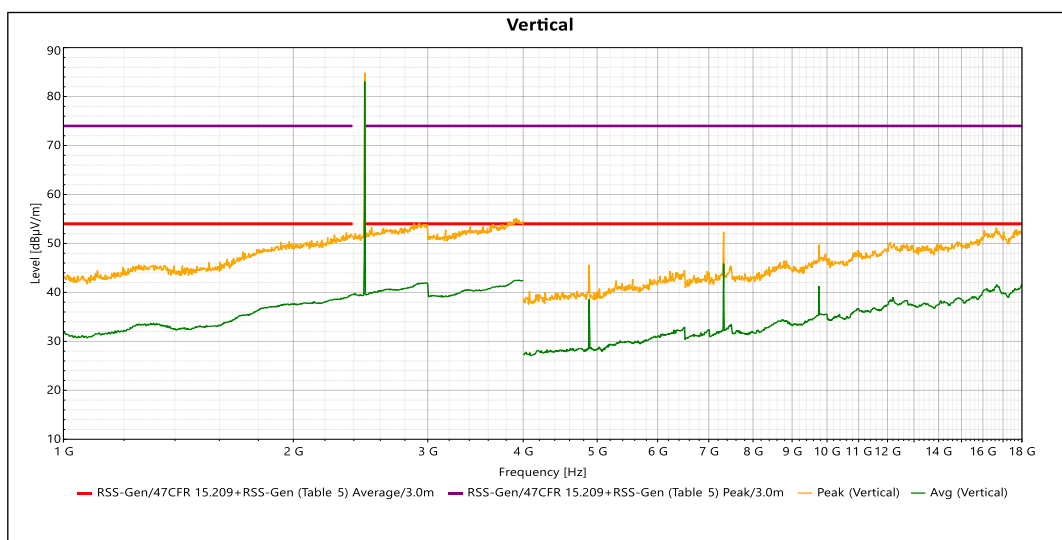
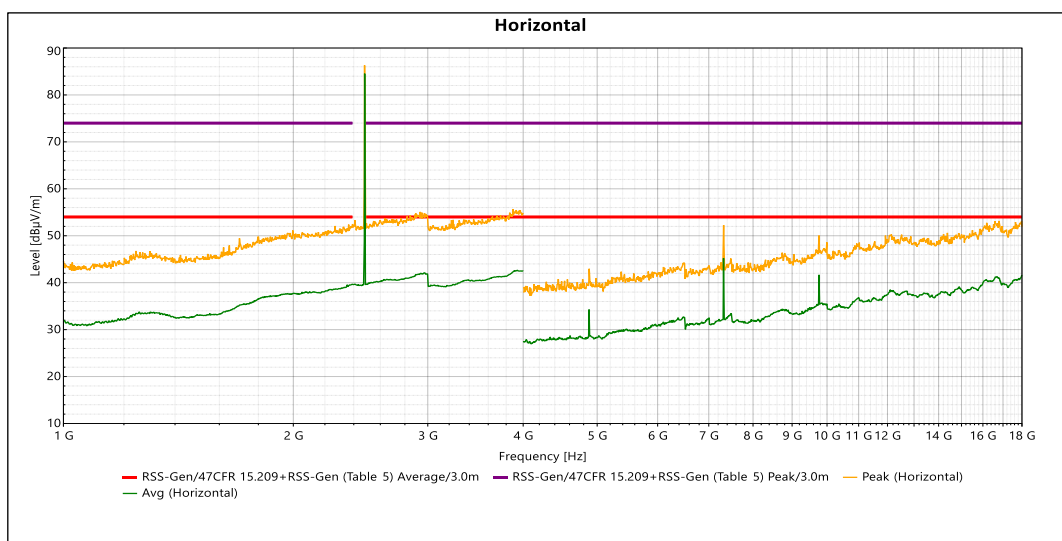
- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	2
Used mains voltage/frequency ...	Fully charged battery
Orientation of EUT	Vertical
Verdict	Pass
Instrument settings	Start Frequency: 1 GHz; Stop Frequency: 4 GHz; Step: 10000 Pts; Sweep Time: 5 s; RF Attenuation: 0 dB; RBW: 500 kHz; VBW: 1.5 MHz; Preamplifier: ON; Preselector: ON
Instrument settings	Start Frequency: 4 GHz; Stop Frequency: 18 GHz; Step: 30000 Pts; Sweep Time: 5 s; RF Attenuation: 0 dB; RBW: 500 kHz; VBW: 1.5 MHz; Preamplifier: OFF; Preselector: ON



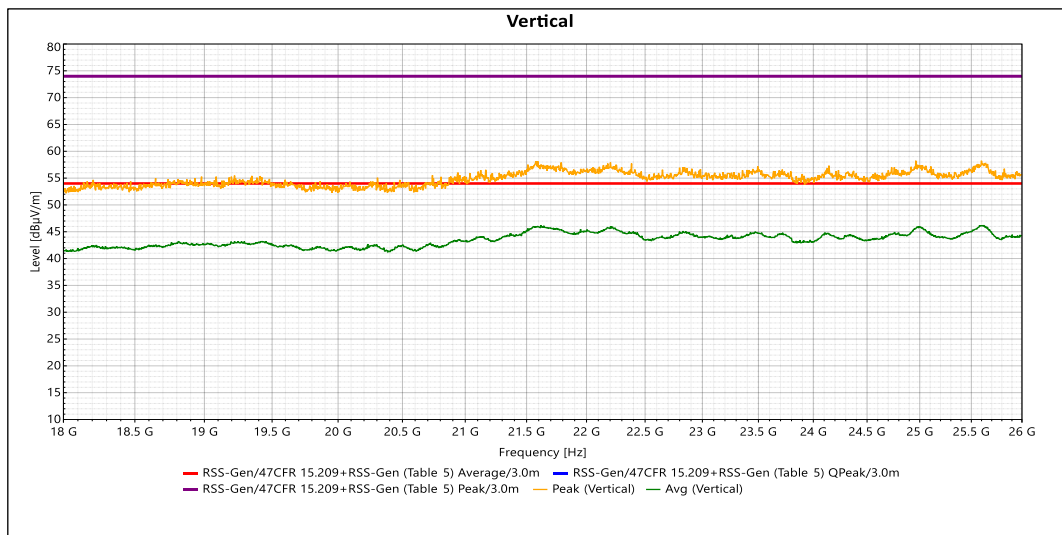
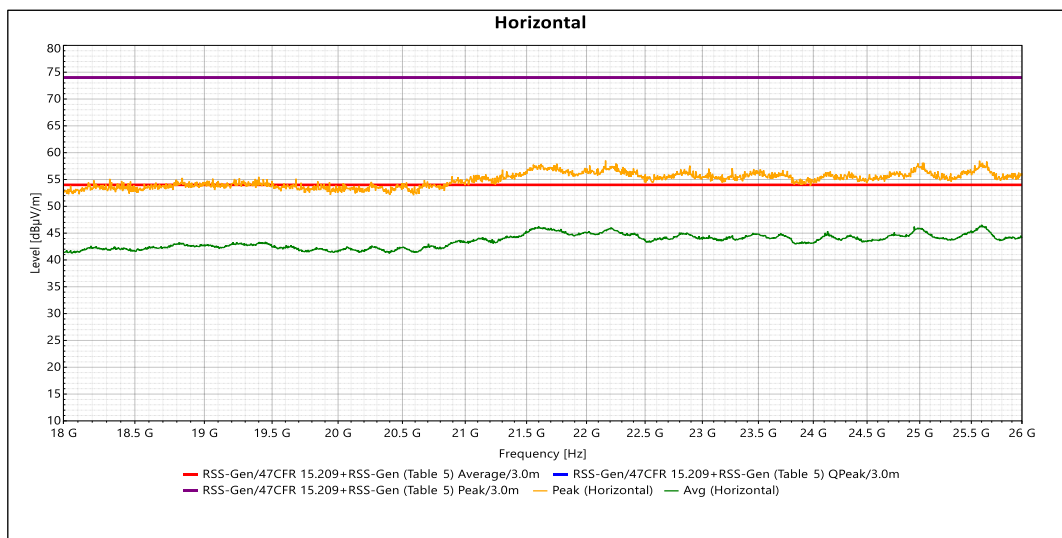
- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	3
Used mains voltage/frequency ...	Fully charged battery
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 1 GHz; Stop Frequency: 4 GHz; Step: 10000 Pts; Sweep Time: 5 s; RF Attenuation: 0 dB; RBW: 1 MHz; VBW: 3 MHz; Preamplifier: ON; Preselector: ON
Instrument settings	Start Frequency: 4 GHz; Stop Frequency: 18 GHz; Step: 30000 Pts; Sweep Time: 5 s; RF Attenuation: 0 dB; RBW: 1 MHz; VBW: 3 MHz; Preamplifier: OFF; Preselector: ON



- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

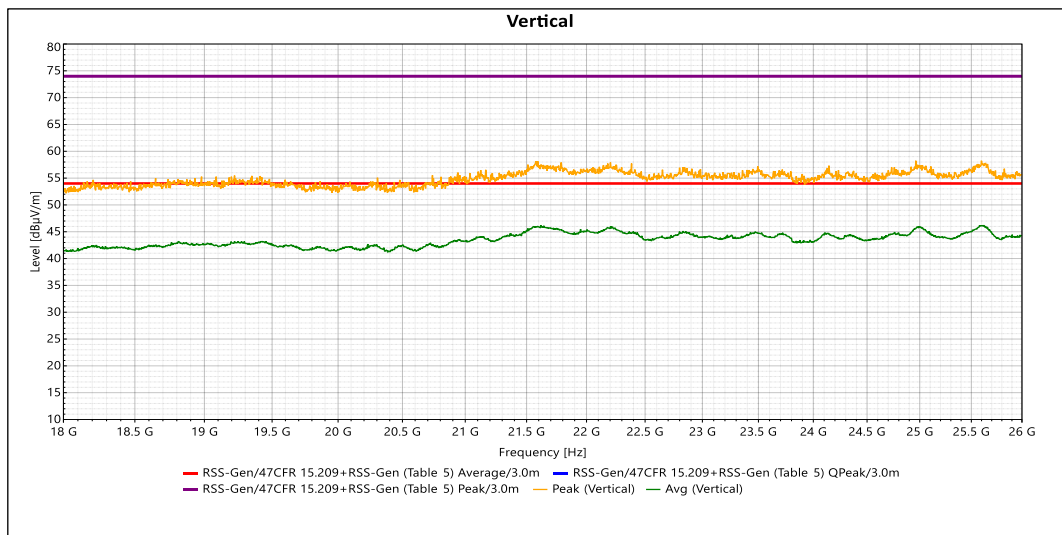
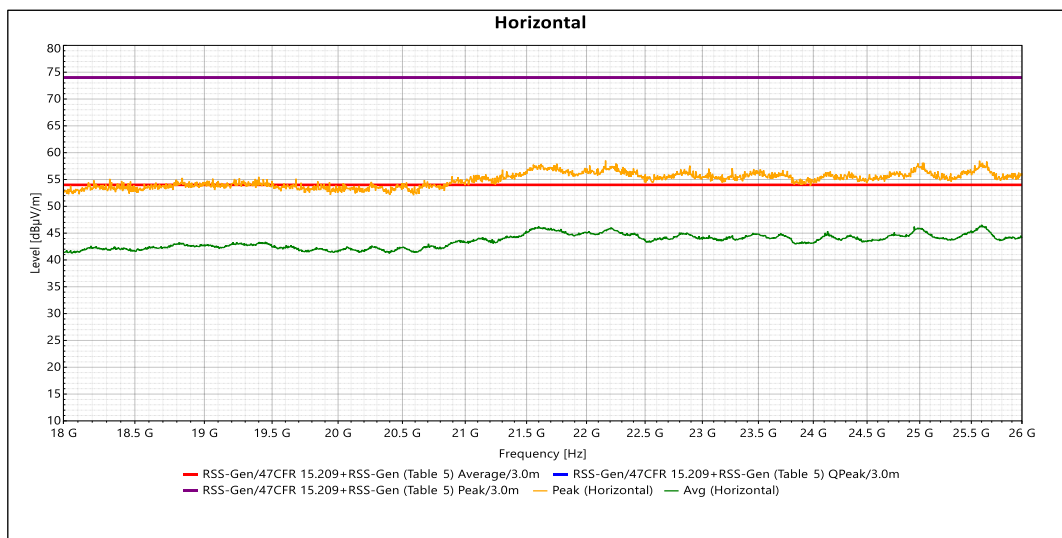
Operating mode	1
Used mains voltage/frequency ...	Fully charged battery
Orientation of EUT	Vertical
Verdict	Pass
Instrument settings	Start Frequency: 18 GHz; Stop Frequency: 26 GHz; Step: 30000 Pts; Sweep Time: 5 s; RF Attenuation: 0 dB; RBW: 1 MHz; VBW: 3 MHz; Preamplifier: OFF; Preselector: OFF



☒ The emissions are below the measurement system noise floor

☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

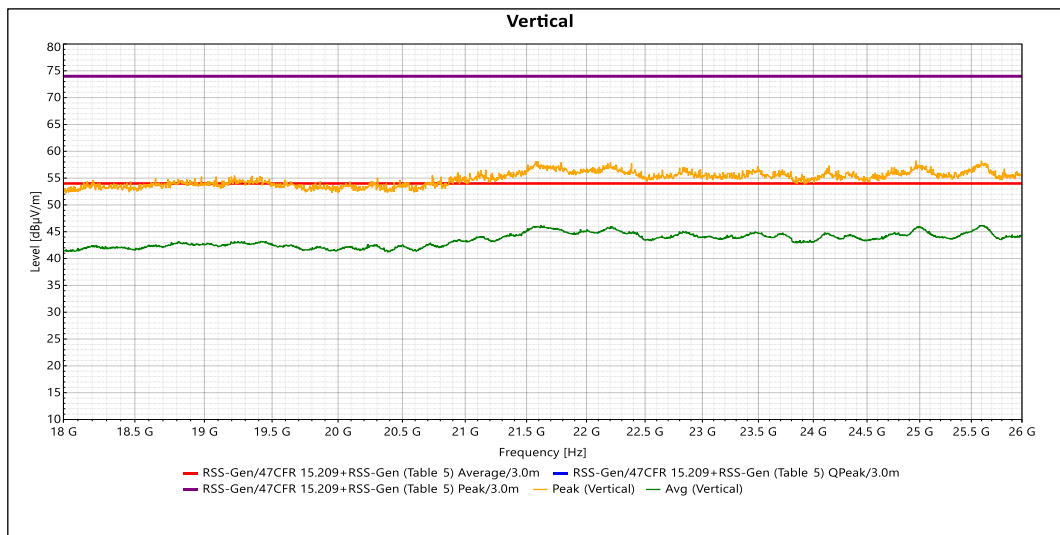
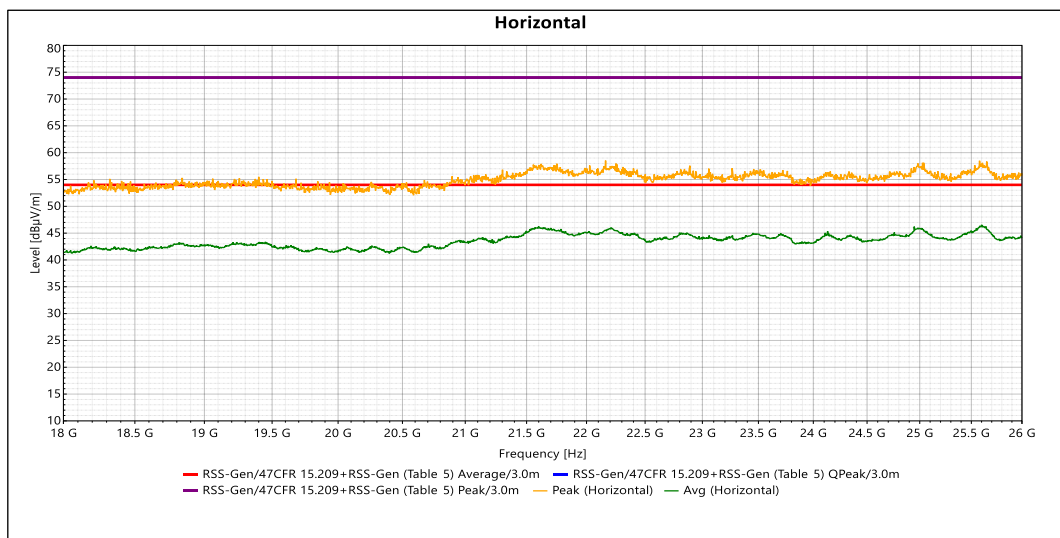
Operating mode	2
Used mains voltage/frequency ...	Fully charged battery
Orientation of EUT	Vertical
Verdict	Pass
Instrument settings	Start Frequency: 18 GHz; Stop Frequency: 26 GHz; Step: 30000 Pts; Sweep Time: 5 s; RF Attenuation: 0 dB; RBW: 1 MHz; VBW: 3 MHz; Preamplifier: OFF; Preselector: OFF



☒ The emissions are below the measurement system noise floor

☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	3
Used mains voltage/frequency ...	Fully charged battery
Orientation of EUT	Vertical
Verdict	Pass
Instrument settings	Start Frequency: 18 GHz; Stop Frequency: 26 GHz; Step: 30000 Pts; Sweep Time: 5 s; RF Attenuation: 0 dB; RBW: 1 MHz; VBW: 3 MHz; Preamplifier: OFF; Preselector: OFF



☒ The emissions are below the measurement system noise floor

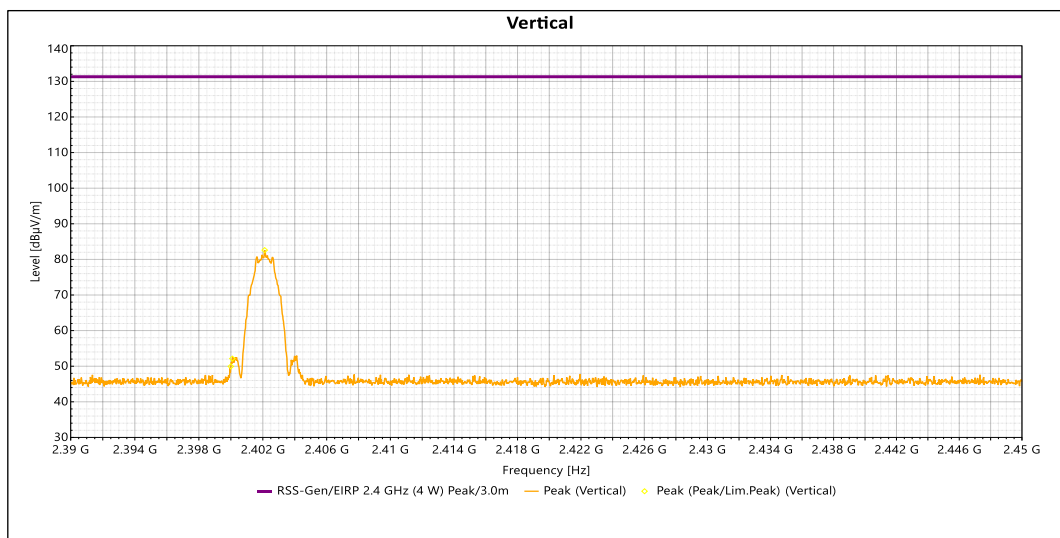
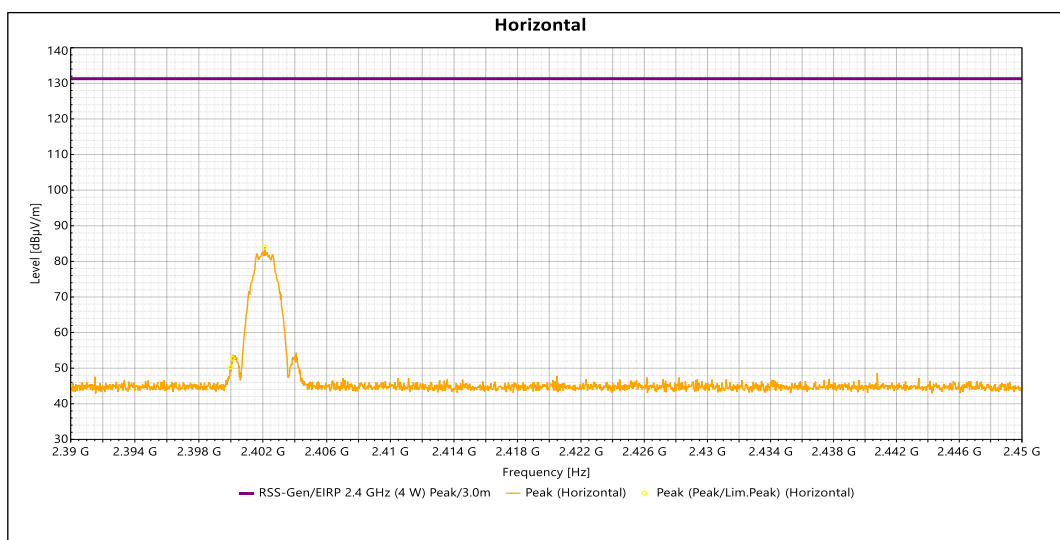
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

6.2.3 Transmitter Band Edge Radiated Emission and restricted band evaluation

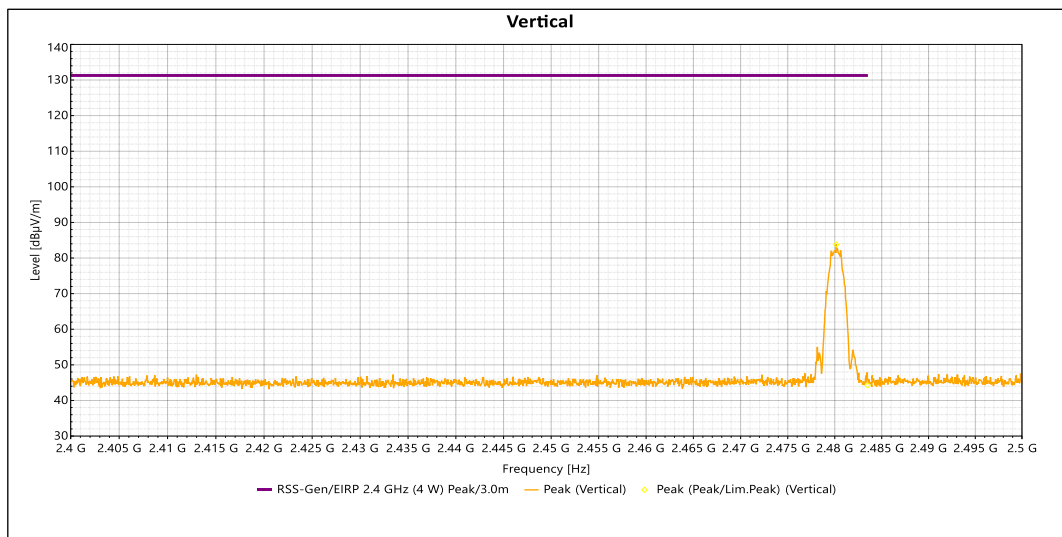
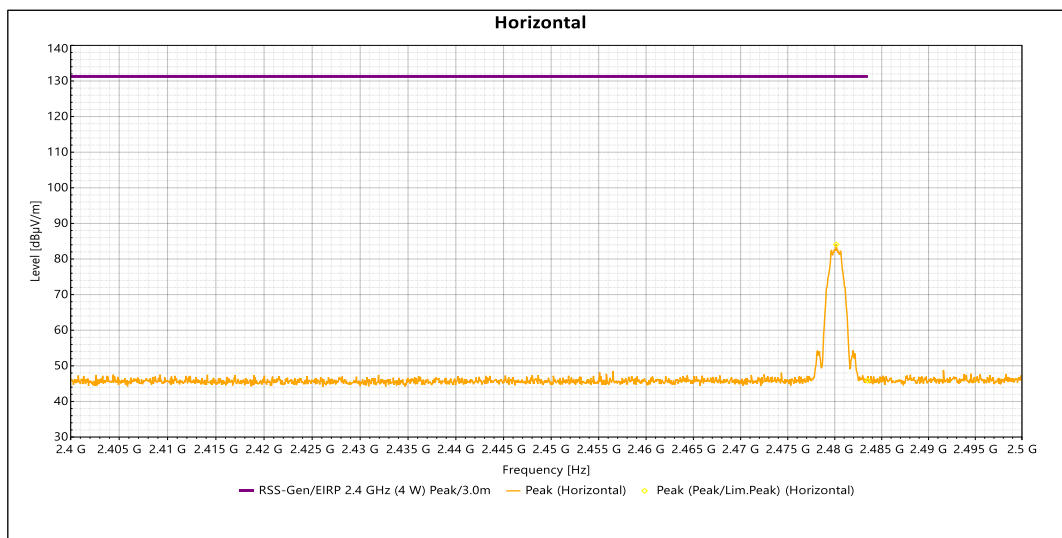
Tested by:	Andrea Giovanni Galbiati
Test date:	2025-03-25
Test location (stand):	Area 8: SAC 3-1.2 (RF emission)
Ambient temperature:	22 °C
Relative humidity:	45 %
Atmospheric pressure:	998 mbar
FCC Reference:	Parts 15.247(d) & 15.209(a)
ISED Canada Reference:	RSS-Gen 6.13 / RSS-247 5.5
Test Method Used	KDB 558074 Section 8.7 referencing ANSI C63.10 Sections 11.11, 11.12 & 11.13
Used mains voltage/frequency:	Fully charged battery
Supplementary information:	None

Results of band edge measurements

Operating mode	1
Used mains voltage/frequency ...	Fully charged battery
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 2.39 GHz; Stop Frequency: 2.45 GHz; Step: 20000 Pts; Sweep Time: 1 s; RF Attenuation: 10 dB; RBW: 100 kHz; VBW: 300 kHz; Preamplifier: ON; Preselector: ON



Operating mode	3
Used mains voltage/frequency ...	Fully charged battery
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 2.4 GHz; Stop Frequency: 2.5 GHz; Step: 20000 Pts; Sweep Time: 1 s; RF Attenuation: 10 dB; RBW: 100 kHz; VBW: 300 kHz; Preamplifier: ON; Preselector: ON



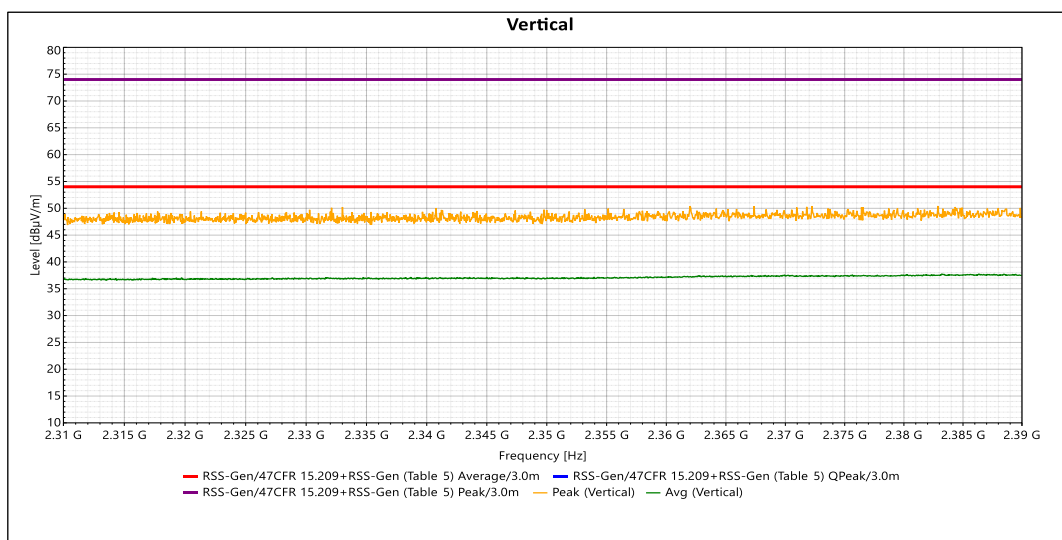
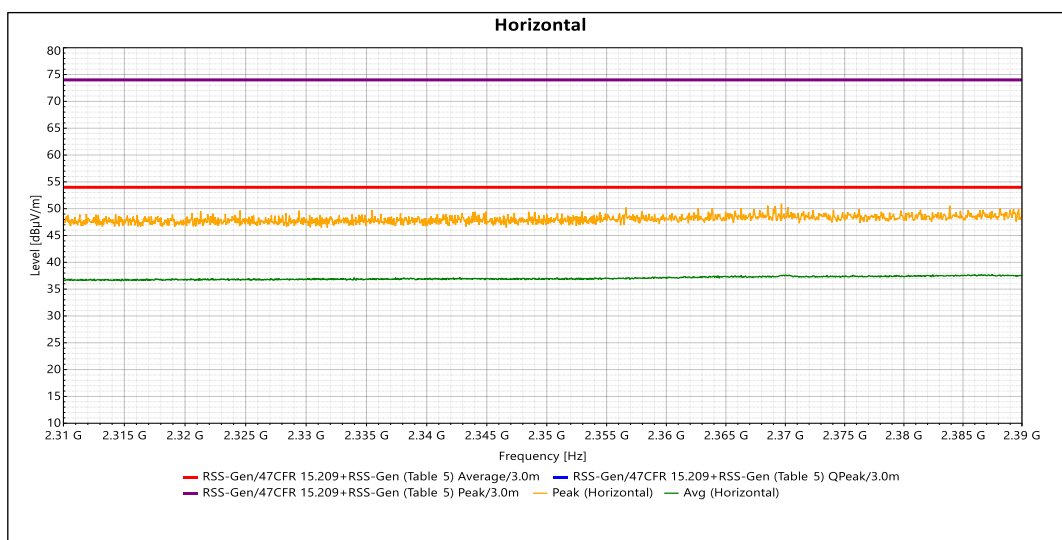
Final measurement table

Channel	Max peak of in-band emission (dBμV/m)	Frequency of max peak at the band edge (MHz)	Max peak of Carrier (dBμV/m)	Delta (dB)	Polarization	Margin (dB)	Result
Bottom	52.781	2400	84.031	-31.250	Horizontal	>20 dB	Pass
Bottom	50.377	2399	84.031	-33.654	Horizontal	>20 dB	Pass
Bottom	52.138	2400	82.604	-30.466	Vertical	>20 dB	Pass
Bottom	49.943	2399	82.604	-32.661	Vertical	>20 dB	Pass
Top	45.812	2483.5	84.072	-38.260	Horizontal	>20 dB	Pass
Top	44.221	2483.5	83.803	-39.582	Vertical	>20 dB	Pass

NOTE: 20 dB margin applied because conducted output power was measured using Peak detector.

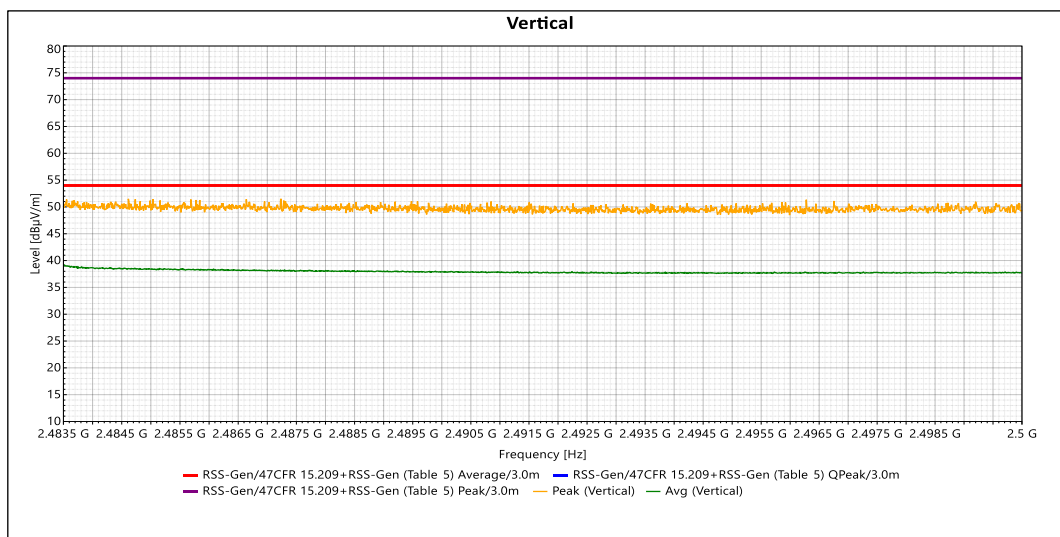
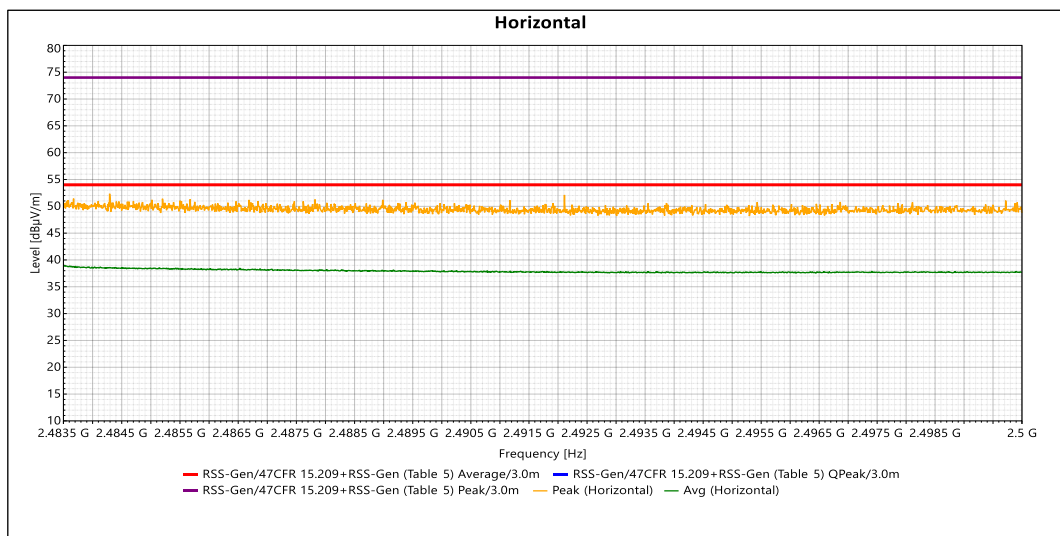
Results of restricted band measurements

Operating mode	1
Used mains voltage/frequency ...	Fully charged battery
Orientation of EUT	Vertical
Verdict.....	Pass
Instrument settings	Start Frequency: 2.31 GHz; Stop Frequency: 2.39 GHz; Step: 4000 Pts; Sweep Time: 5 s; RF Attenuation: 0 dB; RBW: 1 MHz; VBW: 3 MHz; Preamplifier: ON; Preselector: ON



- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode	3
Used mains voltage/frequency ...	Fully charged battery
Orientation of EUT	Vertical
Verdict	Pass
Instrument settings	Start Frequency: 2.4835 GHz; Stop Frequency: 2.5 GHz; Step: 4000 Pts; Sweep Time: 5 s; RF Attenuation: 0 dB; RBW: 1 MHz; VBW: 3 MHz; Preamplifier: ON; Preselector: ON



- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

7 List of test equipment

Equipment	Model/Type	Inventory Number	Manufacturer	Last Cal Date	Cal Due Date
Test Stand: Antenna Port Test Results					
Signal and Spectrum Analyzer 44 GHz	FSV3044	213658	Rohde & Schwarz	2024-04-26	2025-04-28
Test Stand: Transmitted AC Conducted Spurious Emissions					
EMI TEST RECEIVER	ESR7	204729	Rohde & Schwarz	2024-04-12	2025-06-28
Line Impedance Stabilization Network 3PH32A	ENV432	154695	Rohde & Schwarz	2025-01-09	2026-01-28
RF CABLES	LMR-240	175758	TIMES MICROWAVE SYSTEMS	2025-02-14	2026-02-28
Shielded Room 2 RF Emission	-	210412	ETS-Lindgren	-	-
Sheat current blocking cable	MSS 9630	210320	Schwarzbeck Mess-Elektronik OHG	2024-09-05	2025-09-28
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-
Test Stand: Transmitter Radiated Emission from 1 to 18 GHz					
Double Ridged Broadband Horn Antenna	3117	138662	ETS-Lindgren (Cedar Park, Texas)	2025-01-30	2027-01-28
Cable 8000mm - 18 GHz	SF126/11N/11N/8000	220502	Huber+Suhner	2024-05-10	2025-05-28
Cable 2000mm - 18 GHz	SF126/11SMA/11N/2000	220503	Huber+Suhner	2024-05-10	2025-05-28
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	-	-
SEMI-ANECHOIC CHAMBER	FACT3-1.2 STD	210407	ETS-Lindgren	-	-
Absorber High Frequency	EHP-12	212616	ETS-Lindgren	-	-
Highpass Filter	WHKX12-2520-2800-18000-60ST	154712	Wainwright Instruments GmbH	2024-10-28	2025-10-28
Tilting Antenna Mast Positioning Tower	2171B/2170B	135821	ETS-Lindgren (Cedar Park, Texas)	-	-
Cable 500mm - 0.04 to 18 GHz	SF102E-50-11N20611SMA218	216937	Huber+Suhner	2025-03-25	2026-03-28
Low-Noise EMI Preamplifier	BLMA 0118-4A	209025	BONN Elektronik	2025-03-24	2026-03-28
EMI TEST RECEIVER	ESW26	246431	Rohde & Schwarz (Koeln) GmbH & Co. KG	2024-03-07	2025-03-28
SVSWR Voltage Standing Wave Ratio	SVSWR FACT3-1.2 STD	210409	ETS-Lindgren	2022-04-12	2025-04-28
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-

Test Stand: Transmitter Radiated Emission From 18 to 26 GHz					
Double Ridged Broadband Horn Antenna	3116C	210452	ETS-Lindgren	2024-05-20	2027-05-28
Cable 6000mm - 0.04 to 26.5 GHz	SF526S-600-2X11PC35501	216873	Huber+Suhner	2025-03-24	2026-03-28
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	-	-
SEMI-ANECHOIC CHAMBER	FACT3-1.2 STD	210407	ETS-Lindgren	-	-
Absorber High Frequency	EHP-12	212616	ETS-Lindgren	-	-
Tilting Antenna Mast Positioning Tower	2171B/2170B	135821	ETS-Lindgren (Cedar Park, Texas)	-	-
Cable 500mm - 0.04 to 40 GHz	SF102E-50-2X11SK252	216877	Huber+Suhner	2025-03-24	2026-03-28
Low-Noise EMI Preamplifier	BLMA 1840-1A	209026	BONN Elektronik	2024-07-18	2025-07-28
Signal and Spectrum Analyzer 44 GHz	FSV3044	213658	Rohde & Schwarz	2024-04-26	2025-04-28
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-
Test Stand: Transmitter Radiated Emission from 30 to 1000 MHz					
Trilog-Broadband Antenna	VULB 9168	210290	Schwarzbeck Mess-Elektronik OHG	2023-08-25	2025-08-28
6dB Attenuator	DGA 9552 N	210263	Schwarzbeck Mess-Elektronik OHG	2024-09-05	2025-09-28
Cable 8000mm - 18 GHz	SF126/11N/11N/8000	220502	Huber+Suhner	2024-05-10	2025-05-28
Cable 2000mm - 18 GHz	SF126/11SMA/11N/2000	220503	Huber+Suhner	2024-05-10	2025-05-28
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	-	-
EMI TEST RECEIVER	ESW26	246431	Rohde & Schwarz (Koeln) GmbH & Co. KG	2024-03-07	2025-03-28
SEMI-ANECHOIC CHAMBER	FACT3-1.2 STD	210407	ETS-Lindgren	-	-
Tilting Antenna Mast Positioning Tower	2171B/2170B	135821	ETS-Lindgren (Cedar Park, Texas)	-	-
NSA Normalized Site Attenuation	NSA FACT3-1.2 STD	210410	ETS-Lindgren	2022-04-12	2025-04-28
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-
Test Stand: Transmitter Radiated Emission from 9 kHz to 30 MHz					
12m N(m)-N(m) RF cable	Hyperflex 5 12m	248398	Kabel Kusch	2024-05-14	2025-05-28
Active Loop Antenna	HLA 6121	155933	Teseq, Inc	2025-02-14	2027-02-28
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	-	-
DC Power Injector	PI 6121	155980	Teseq, Inc	-	-
EMI TEST RECEIVER	ESW26	246431	Rohde & Schwarz (Koeln) GmbH & Co. KG	2024-03-07	2025-03-28
SEMI-ANECHOIC CHAMBER	FACT3-1.2 STD	210407	ETS-Lindgren	-	-
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-
Antenna Tripod	CTP 6099	155934	Teseq, Inc	-	-

Test Stand: Auxiliary Equipments					
Frequency Converter (60 Hz)	FWW-SFUP 40kVA	37730	GUSTAV KLEIN	-	-
CLIMATIC CENTRAL UNIT (SACs side)	iBTHX-W	70611	Omega Engineering Inc.	2024-04-05	2025-04-28
CLIMATIC CENTRAL UNIT (SRs side)	iBTHX-W	70614	Omega Engineering Inc.	2024-04-05	2025-04-28
Laser Measure	RSLDM-50H	224436	RS Pro	2023-11-10	2025-11-28
TRUE-RMS DIGITAL MULTIMETER	289	169495	Fluke Corporation	2023-04-05	2025-04-28
Mini Datalogger (FACT3)	174H	211147	Testo	2024-10-25	2025-10-28
Mini Datalogger (SR2)	174H	211146	Testo	2024-10-25	2025-10-28

8 Measurement instrumentation uncertainties

The Uncertainty of Measurement (UoM) for each unit measured in this Test Report was estimated in accordance with the UL International Italia document No. 23-CL-G0025 and is retained on file. Details of the estimation of UoM may be made available upon request, in particular for quantities not listed.

Measurement	Range	Ulab	Unit
Frequency	9 kHz to 40 GHz	0.5	kHz
Time	0.7 μ s to 16000 s	3.00	%
Conducted power, by spectrum analyzer	9 kHz to 40 GHz	0.45	dB
Conducted power, by fast power meter	9 kHz to 8 GHz	0.41	dB
Temperature (ambient)	15 to 35 °C	0.72	°C
Temperature (climatic chamber)	-40 to 100 °C	1.63	°C
Humidity (ambient)	30 to 70 %	5.76	%RH
Humidity (climatic chamber)	30 to 95 %	3.95	%RH
Supply voltage (AC)	0 to 500 V	3.00	%
Supply voltage (DC)	0 to 15 V	0.28	%
Conducted disturbance at mains and other port power using V-AMN	9 kHz to 150 kHz	3.71	dB
Conducted disturbance at mains and other port power using V-AMN	150 kHz to 30 MHz	3.32	dB
Radiated disturbance (magnetic field using a loop antenna)	9 kHz to 30 MHz	3.16	dB
Radiated disturbance (electric field strength in SAC 3, hybrid antenna, Hor)	30 MHz to 1000 MHz	4.22	dB
Radiated disturbance (electric field strength in SAC 3, hybrid antenna, Ver)	30 MHz to 1000 MHz	5.64	dB
Radiated disturbance (electric field strength in SAC 5, hybrid antenna, Hor)	30 MHz to 1000 MHz	3.98	dB
Radiated disturbance (electric field strength in SAC 5, hybrid antenna, Ver)	30 MHz to 1000 MHz	5.66	dB
Radiated disturbance (electric field strength in FSOATS 3) (1)	1 GHz to 6 GHz	5.43	dB
Radiated disturbance (electric field strength in FSOATS 3) (2)	1 GHz to 6 GHz	4.29	dB
Radiated disturbance (electric field strength in FSOATS 3) (1)	6 GHz to 18 GHz	5.18	dB
Radiated disturbance (electric field strength in FSOATS 3) (2)	6 GHz to 18 GHz	4.22	dB
Radiated disturbance (electric field strength in FSOATS 5) (1)	1 GHz to 6 GHz	5.12	dB
Radiated disturbance (electric field strength in FSOATS 5) (2)	1 GHz to 6 GHz	4.13	dB
Radiated disturbance (electric field strength in FSOATS 5) (1)	6 GHz to 18 GHz	5.63	dB
Radiated disturbance (electric field strength in FSOATS 5) (2)	6 GHz to 18 GHz	4.54	dB
Radiated disturbance (electric field strength in FSOATS 3) (1)	18 GHz to 40 GHz	7.63	dB
Radiated disturbance (electric field strength in FSOATS 5) (1)	18 GHz to 40 GHz	7.63	dB
Radiated Spurious Emission (ERP/EIRP, Substitution Method)	25 MHz to 26 GHz	5.97	dB

Legend/Remarks:

n.d.: not defined

(1) Using external EMI preamplifier.

(2) Not using external EMI preamplifier.

Supplementary information:

- The measurement uncertainty values are calculated and correspond to an expansion factor (coverage factor) $k = 2$ (which provide confidence level of 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

- Listed values are intended with prefix "±".

< END OF TEST REPORT >