LAB N° 1363 L

RF TEST REPORT

Test Report No:	**25-4791291317-6-1-0-RAD-A**
UL Project No:	4791291317
Date of issue:	2025-05-30
Total number of pages:	64
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 *Laboratory Engineer*
Approved by: (name, function, signature)	Francesco Casati *Operations Leader*

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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:	EKIP AWARE (electronic trip unit equipped on Emax3)
Trade Mark: (*)	ABB
Manufacturer: (*)	ABB S.p.A - ABB SACE Division Via Pescaria, 5 24123 Bergamo (BG) – Italy
Model Name or Numer / HVIN: (*)	1SDE001187
PMN: (*)	Ekip Aware
FCC ID: (*)	2AW2L-EKIPAWARE
ISED Canada Certification number: (*)	27527-EKIPAWARE
Ratings: (*)	AC ADAPTER: Input: 100-240 V~; 50/60 Hz Output: 5.25 Vdc; 1 A
Testing:	
Date of receipt of test item:	2025-01-23
UL Sample Tag No.:	7946595 (sample for radiated tests) 7328473 (sample for conducted tests)
Status of sample upon receipt:	☒ New and operational ☐ Reconditioned ☐ Damaged
Date(s) of performance of tests:	2025-03-03 to 2025-03-24
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: (*)

Electronic trip unit equipped on Emax3

Document history

Test Report No.	Reason for change	Date of issue
25-4791291317-6-1-0-RAD-A	Original release	2025-05-30

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

LAB N° 1363 L

Laboratory Accreditation

FCC Accredited Test Firm

Accreditation	MRA	Designation Number	Expiration Date
Ministero delle Sviluppo Economico- Direzione Generale Pianificazione e Gestione dello Spettro Radioelettrico Scope: • 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

1 Test Item Description

<table>
<tr><td>Serial number: (*)</td><td colspan="6">E420036943O0W000 (7328473)
E480014943O0W001 (7946595)</td></tr>
<tr><td>Date of production: (*)</td><td colspan="6">Information not available</td></tr>
<tr><td rowspan="4">Ports: (*)</td><td colspan="2" rowspan="2">Port name and description</td><td colspan="4">Cable</td></tr>
<tr><td>Maximum length(m)</td><td colspan="2">Attached during test</td><td>Shielded</td></tr>
<tr><td colspan="2">USB-C Port</td><td>2</td><td colspan="2">☒</td><td>☒</td></tr>
<tr><td colspan="2">Analogue inputs</td><td>0.2</td><td colspan="2">☒</td><td>☐</td></tr>
<tr><td>Supplementary information to the ports:</td><td colspan="6">n.d. = not defined</td></tr>
<tr><td rowspan="3">Rated power supply: (*)</td><td rowspan="2"></td><td rowspan="2">Voltage and frequency</td><td colspan="4">Reference poles</td></tr>
<tr><td>N</td><td>L1</td><td>L2</td><td>L3</td></tr>
<tr><td>☒</td><td>AC:100-240 V~; 50/60 Hz</td><td>☒</td><td>☒</td><td>☐</td><td>☐</td></tr>
<tr><td>☐</td><td colspan="5">DC:</td></tr>
<tr><td>Rated power: (*)</td><td colspan="6">---</td></tr>
<tr><td>Working frequencies: (*)</td><td colspan="6">Clock: 25 MHz; 32.768 kHz; 32 MHz
Radio Frequencies: BLE @ 2400-2483.5 MHz, NFC @ 13.56 MHz (passive tag)</td></tr>
<tr><td>Other parameters: (*)</td><td colspan="6">Information not available</td></tr>
<tr><td>Firmware/Software version (original): (*)</td><td colspan="6">FW version M4: Titan_M4_v04_16_03
FW version M7: Titan_M7_v04_16_03
FW version BLE: Titan_BLE_v2_8_0</td></tr>
<tr><td>Firmware/Software version (used for testing): (*)</td><td colspan="6">FW version M4: Titan_M4_v04_16_03
FW version M7: Titan_M7_v04_16_03
FW version BLE: Titan_BLE_v2_8_0</td></tr>
<tr><td>Hardware version: (*)</td><td colspan="6">1SDE001187D1801 Rev.K</td></tr>
<tr><td>Dimensions in cm (W x H x D): (*)</td><td colspan="6">20 x 8.5 x 4</td></tr>
</table>

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:	For radiated tests only • 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): *Peripheral equipment that is part of the system under test*	Description	Manufacturer	Type
	RF Cable for testing	LINX	Part number: CSI-RGFI-100-UFFR
Associated equipment (AE): *Equipment that is not part of the system under test but needed to exercise and/or monitor the EUT*	Description	Manufacturer	Type
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Documents as provided by the applicant: **(*)**	Description	File name	Issue date
	---	---	---
Modifications to the test item during testing:	None		

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	P	

Test method: ANSI C63.10-2020+Cor. 1-2023 for FCC and ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 for ISED.

Test guide: KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019

Notes:

1. Parameter measured to apply a correction on other measurements.
2. Radiated method applied.

Possible test case verdicts:

Test case not performed: N/P

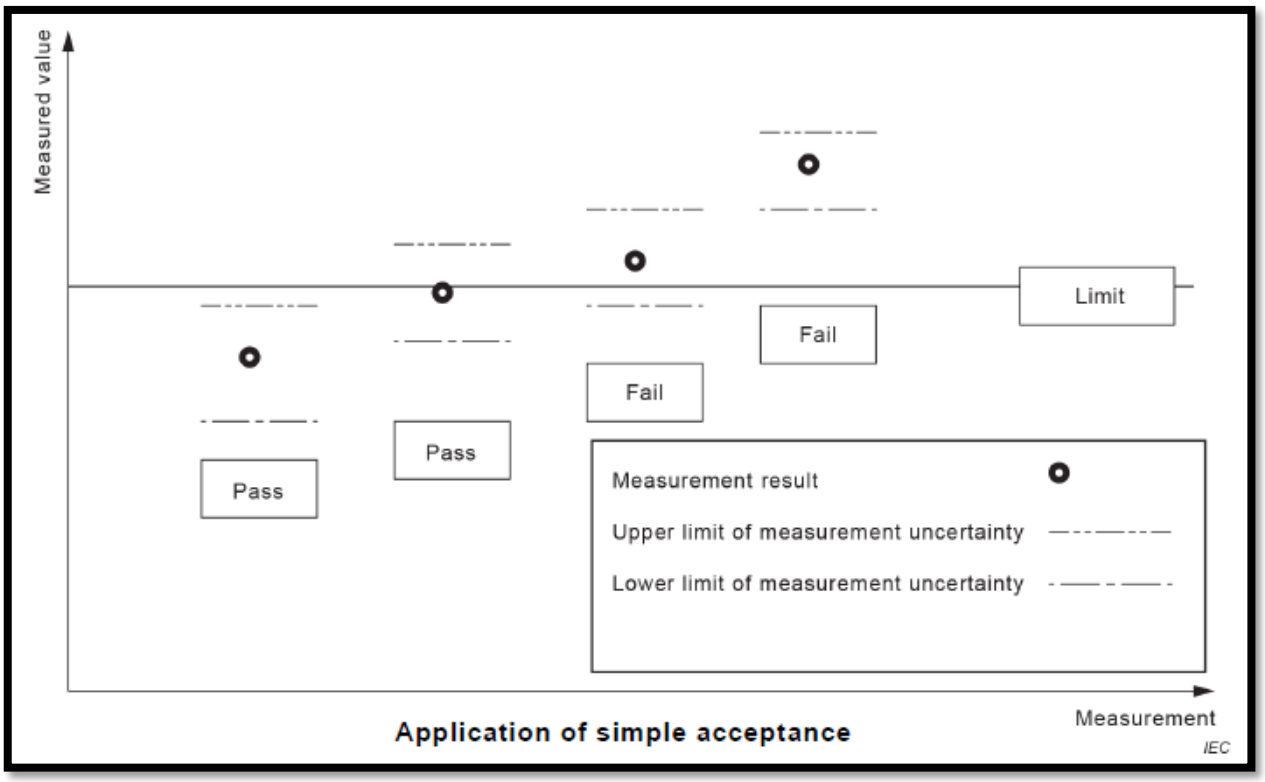
Test case does not apply to test object: N/A

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.



Application of simple acceptance

4 Formulas used

☒ Disturbance voltage
V (dBµV) = V receiver (dBµV) + Correction (dB)
where:
Correction (dB) = I.L. transducer (dB) + I.L. cable (dB)

☐ Magnetic field
H (dBµA/m) = V receiver (dBµV) + Correction (dB)
where:
Correction (dB) = Magnetic antenna factor (dB/Ωm) + I.L. cables (dB)

☒ Electric field
E (dBµV/m) = V receiver (dBµV) + Correction (dB)
where:
Correction (dB) = Electric antenna factor (dB/m) – Gain external preamplifier (dB) + I.L. external filter (dB) + I.L. cables (dB)
Note: external preamplifier and external filter are optional and, if used, are indicated in the list of test equipment

☒ Margin
Margin (dB) = Measure – Limit

☐ Radiated emission limit conversion for a different measuring distance
40 dB/decade (f<30 MHz); 20 dB/decade (f≥30 MHz)

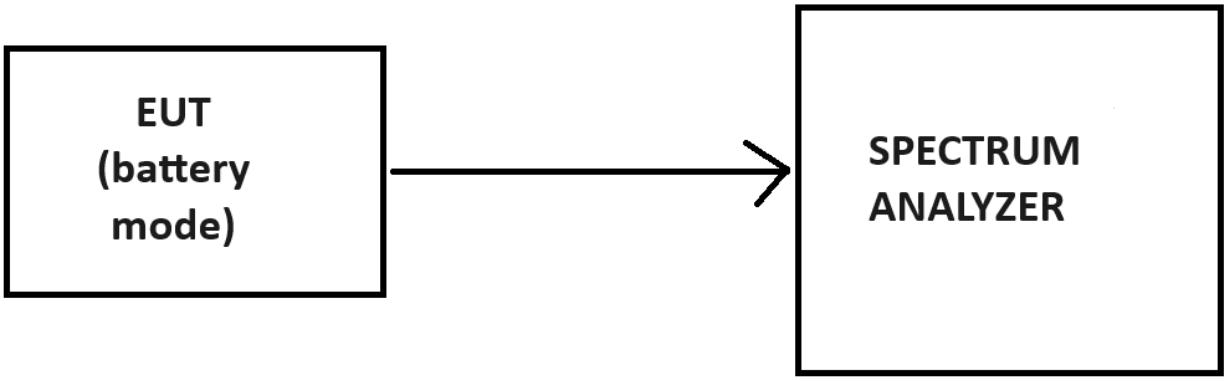
☐ Correction of radiated field from 5 m to 3 m
+8.87 dB (f<30 MHz); +4.44 dB (f≥30 MHz)

☒ Linear to logarithmic conversion
Log = 20*log(Lin) for voltage and current; Log = 10*log(Lin) for power

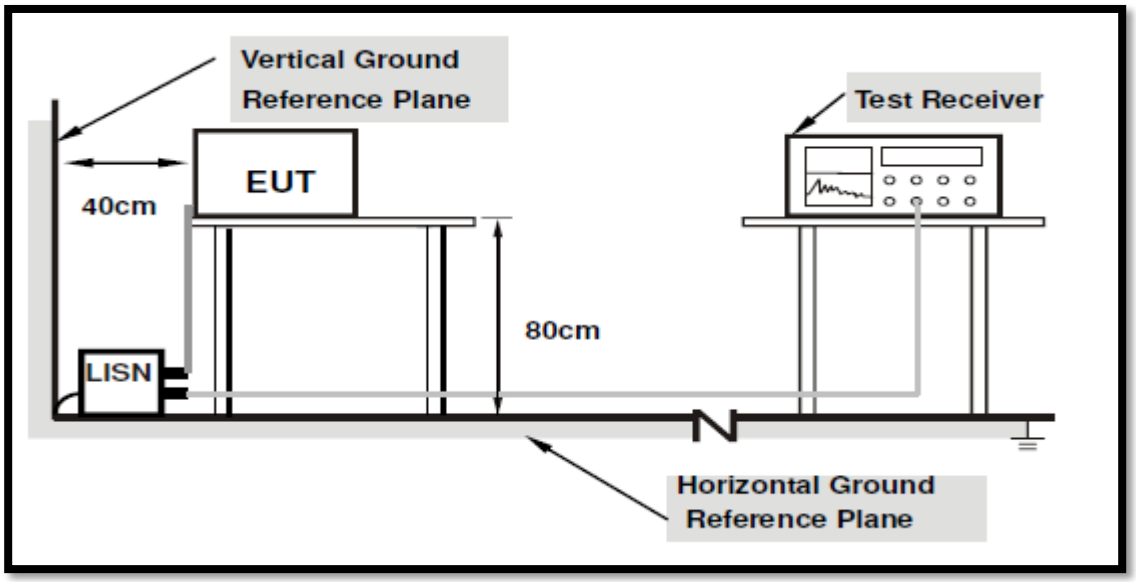
☒ Conducted Radio Measurements
$P_{out\_EUT} = P_{read\_Amplifier}$ (dBm) + Cable Losses (dB) + Attenuator (dB)

5 Test Setup Diagrams

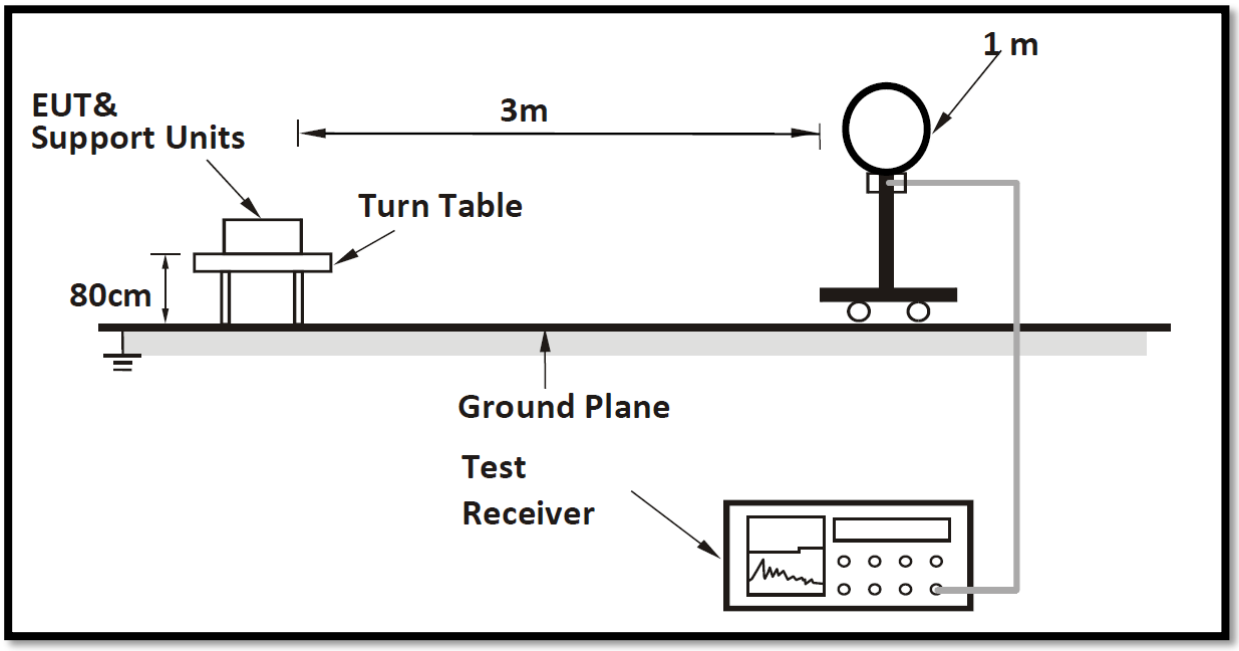
Conducted tests on antenna port:



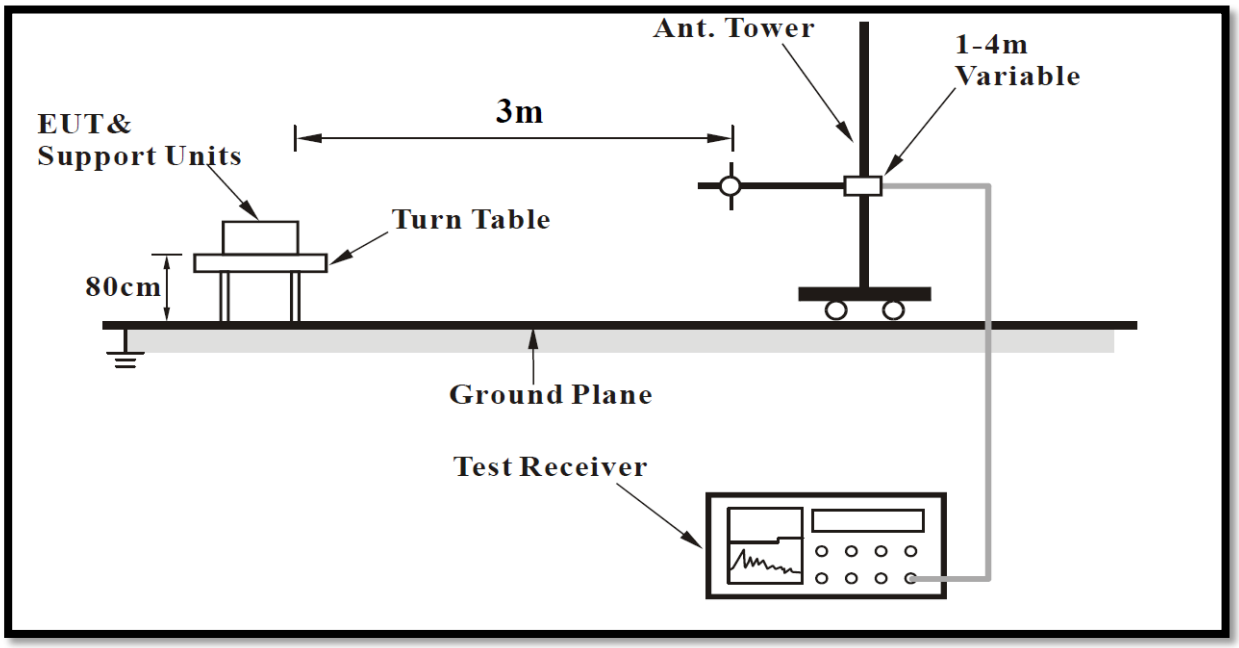
AC Conducted emission:



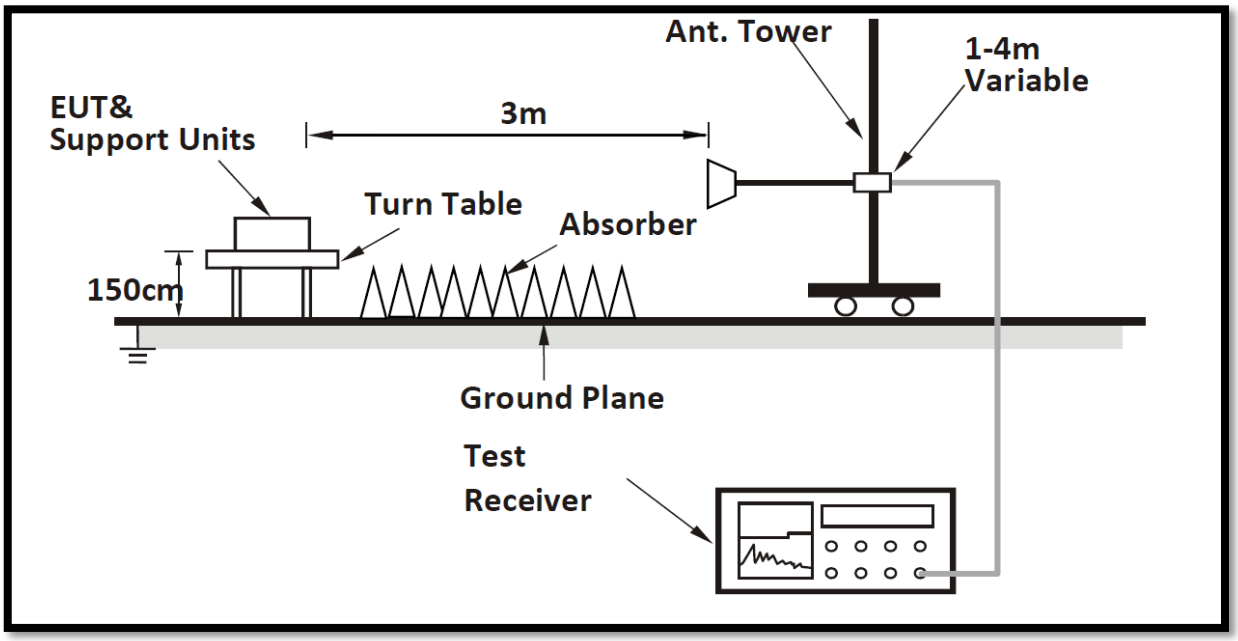
Radiated emission from 9kHz to 30 MHz



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

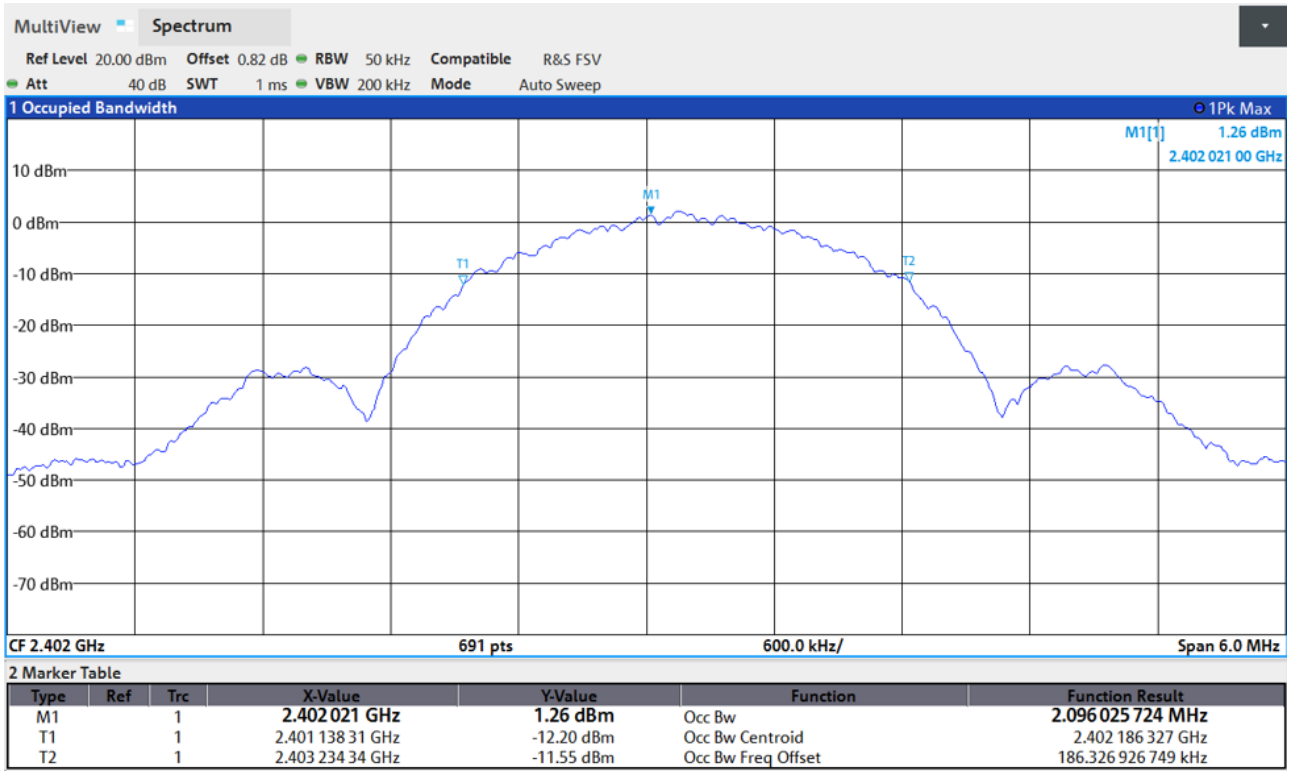
Tested by:	Andrea Giovanni Galbiati
Test date:	2025-03-03
Test location (stand):	EMC Laboratory
Ambient temperature:	22 °C
Relative humidity:	45 %
Atmospheric pressure:	998 mbar
FCC Reference:	Part 15.35 (c)
ISED Reference:	RSS-Gen 8.2
Test Method Used	FCC KDB 558074 Section 6 referencing ANSI C63.10 Section 11.6
Used mains voltage/frequency:	120 V; 60 Hz
Supplementary information:	The transmitter duty cycle was measured using a spectrum/signal analyser in the time domain and calculated by using the following calculation: $$DC\ (\%) = \left(\frac{\sum T_{ON}}{Period\ or\ 100\ ms\ whichever\ is\ the\ lesser}\right) \times 100$$ $$DC\ (dB) = 10 \times log\left(\frac{Period\ or\ 100\ ms\ whichever\ is\ the\ lesser}{\sum T_{ON}}\right)$$

Results:

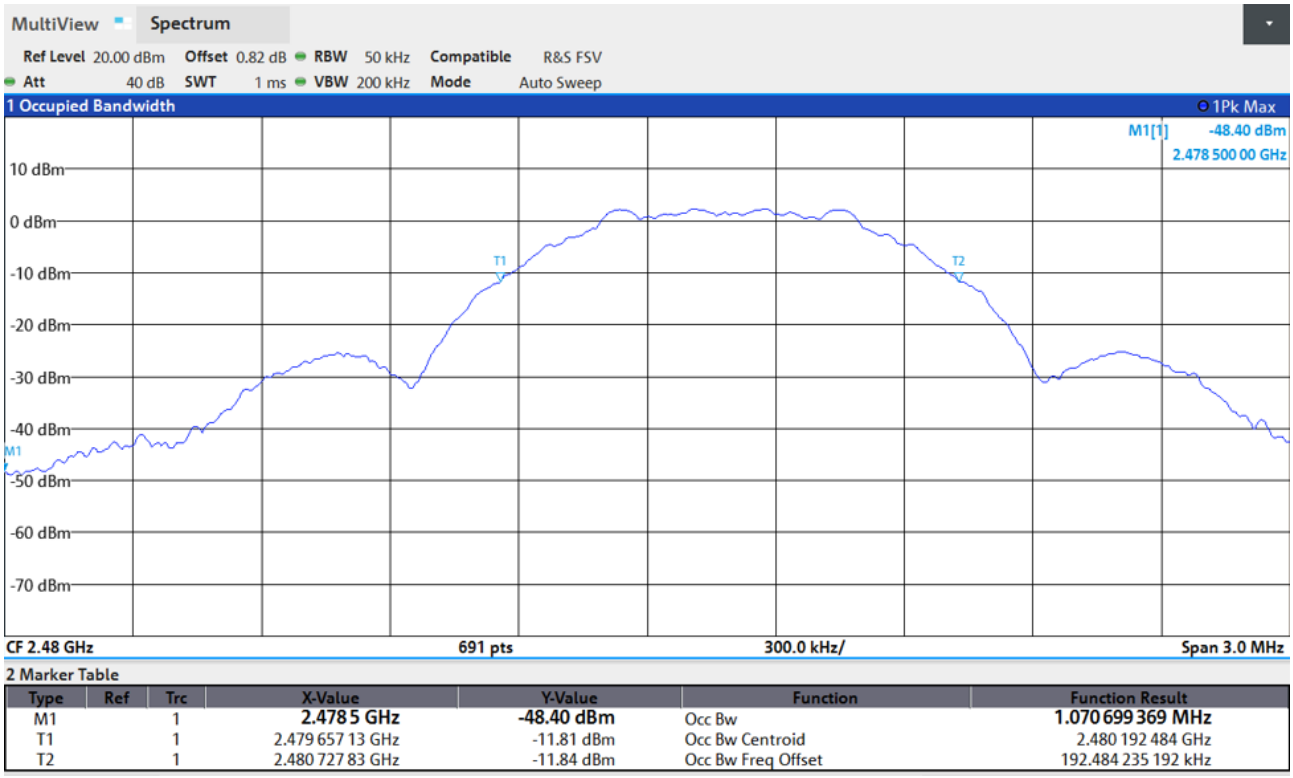
Pulse Duration (µs)	Period (µs)	Duty Cycle (%)	DC Correction Factor (dB)
100	100	100%	0

6.1.2 Transmitter 99% Occupied Bandwidth

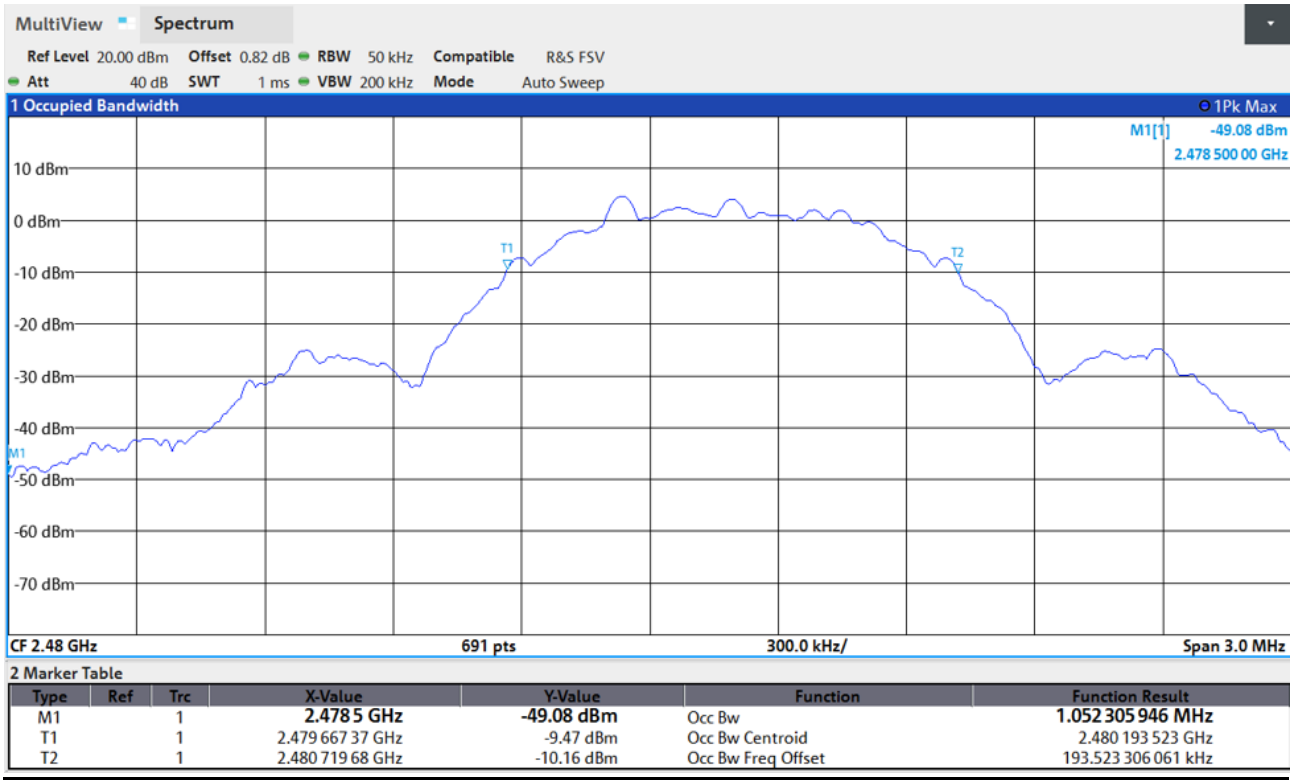
Tested by:	Andrea Giovanni Galbiati
Test date:	2025-03-04
Test location (stand):	EMC Lab
Ambient temperature:	22 °C
Relative humidity:	51 %
Atmospheric pressure:	998 mbar
FCC Reference:	N/A
ISED Reference:	RSS-Gen 6.7
Test Method Used	RSS-Gen 6.7 and Notes below
Used mains voltage/frequency:	120 V; 60 Hz
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 set to 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



Worst case scenario with data rate = 2 Mbps



Worst case scenario with data rate = 1 Mbps



Worst case scenario with data rate = 0.5 Mbps

Worst case scenario with data rate = 0.125 Mbps

Operation mode: 1,2,3

Channel	99% Occupied Bandwidth (kHz)
Bottom	2096.025724
Middle	2094.274780
Top	2090.995254

Operation mode: 4,5,6

Channel	99% Occupied Bandwidth (kHz)
Bottom	1066.148910
Middle	1070.249117
Top	1070.699369

Operation mode: 7,8,9

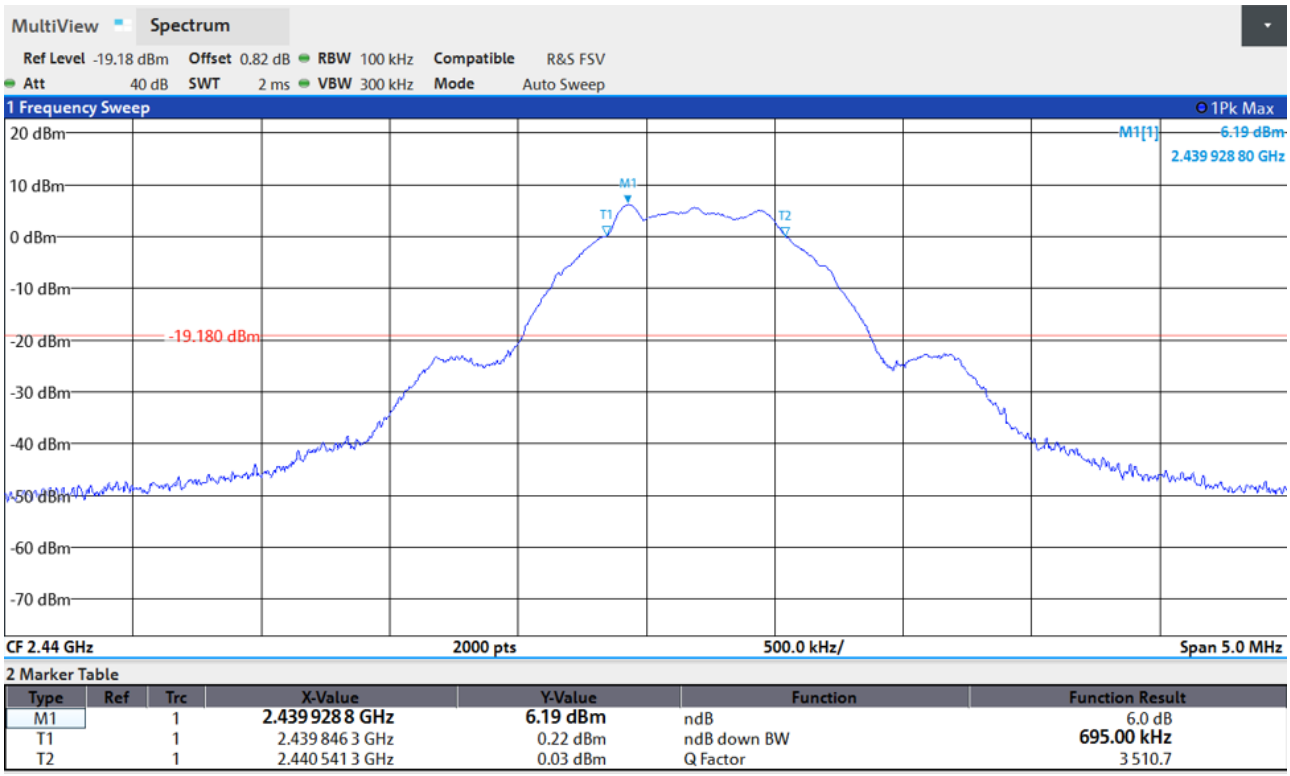
Channel	99% Occupied Bandwidth (kHz)
Bottom	1050.691861
Middle	1052.225128
Top	1052.305946

Operation mode: 10,11,12

Channel	99% Occupied Bandwidth (kHz)
Bottom	1081.522334
Middle	1080.290223
Top	1082.353155

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:	120 V; 60 Hz
Supplementary information:	A correction of 0.82 dB was added to compensate losses of RF cables



Worst case scenario

Operation mode: 1,2,3

Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Result
Bottom	730.00	≥500	Pass
Middle	717.50	≥500	Pass
Top	720.00	≥500	Pass

Operation mode: 4,5,6

Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Result
Bottom	720.00	≥500	Pass
Middle	715.00	≥500	Pass
Top	712.50	≥500	Pass

Operation mode: 7,8,9

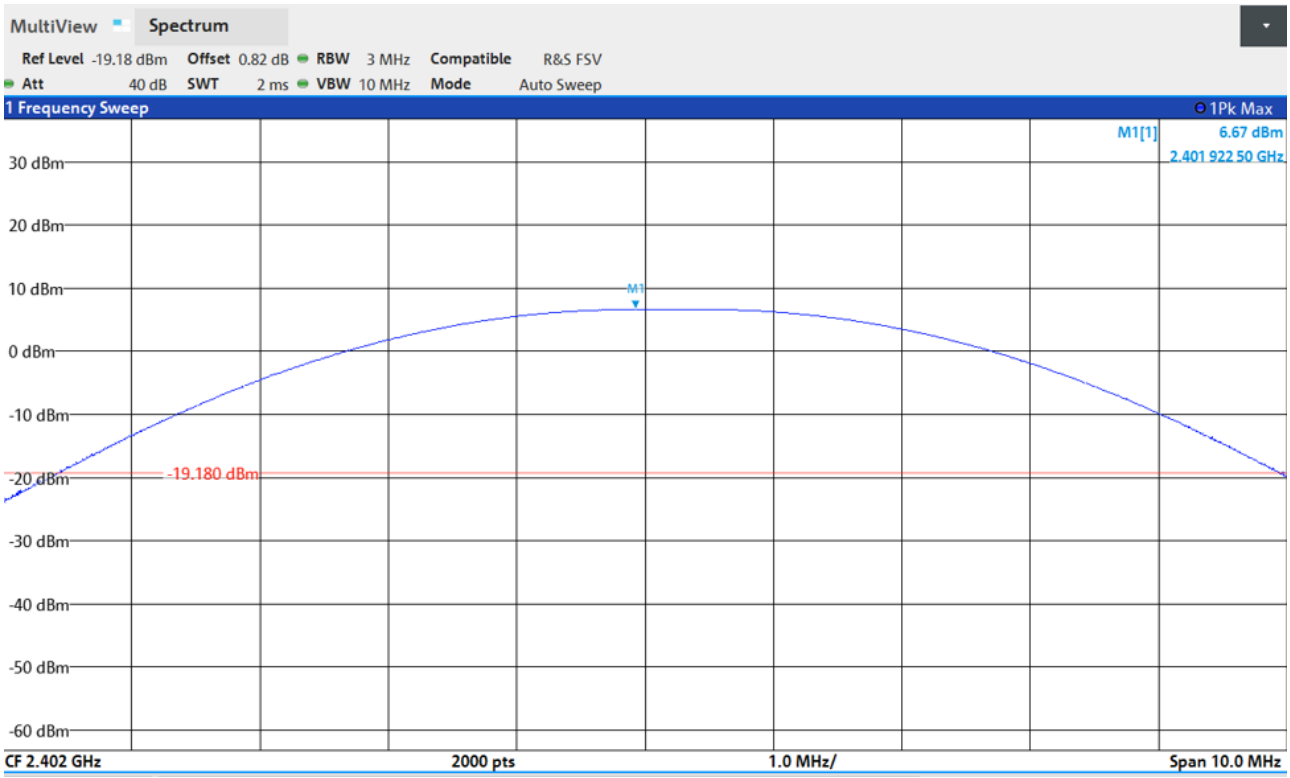
Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Result
Bottom	695.00	≥500	Pass
Middle	695.00	≥500	Pass
Top	700.00	≥500	Pass

Operation mode: 10,11,12

Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Result
Bottom	710.00	≥500	Pass
Middle	707.50	≥500	Pass
Top	720.00	≥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:	120 V; 60 Hz
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.



Worst case scenario

Operation mode: 1,2,3

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	6.62	30.0	-23.38	Pass
Middle	6.26	30.0	-23.74	Pass
Top	5.10	30.0	-24.9	Pass

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	6.62	2.7	9.32	36.0	-26.68	Pass
Middle	6.26	2.7	8.96	36.0	-27.04	Pass
Top	5.10	2.7	7.8	36.0	-28.2	Pass

Operation mode: 4,5,6

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	6.61	30.0	-23.39	Pass
Middle	6.25	30.0	-23.75	Pass
Top	5.59	30.0	-24.41	Pass

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	6.61	2.7	9.31	36.0	-26.69	Pass
Middle	6.25	2.7	8.95	36.0	-27.05	Pass
Top	5.59	2.7	8.29	36.0	-27.71	Pass

Operation mode: 7,8,9

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	6.67	30.0	-23.33	Pass
Middle	6.32	30.0	-23.68	Pass
Top	5.60	30.0	-24.4	Pass

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	6.67	2.7	9.37	36.0	-26.63	Pass
Middle	6.32	2.7	9.02	36.0	-26.98	Pass
Top	5.6	2.7	8.3	36.0	-27.7	Pass

Operation mode: 10,11,12

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	6.64	30.0	-23.36	Pass
Middle	6.33	30.0	-23.67	Pass
Top	5.60	30.0	-24.4	Pass

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	6.64	2.7	9.34	36.0	-26.66	Pass
Middle	6.33	2.7	9.03	36.0	-26.97	Pass
Top	5.6	2.7	8.3	36.0	-27.7	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:	120 V; 60 Hz
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)

Worst case scenario

Operation mode: 1,2,3

Channel	Output Power (dBm)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-2.48	8.0	-10.48	Pass
Middle	-3.07	8.0	-11.07	Pass
Top	-4.27	8.0	-12.27	Pass

Operation mode: 4,5,6

Channel	Output Power (dBm)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	0.29	8.0	-7.71	Pass
Middle	-0.09	8.0	-8.09	Pass
Top	-0.74	8.0	-8.74	Pass

Operation mode: 7,8,9

Channel	Output Power (dBm)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	0.82	8.0	-7.18	Pass
Middle	0.02	8.0	-7.98	Pass
Top	-0.36	8.0	-8.36	Pass

Operation mode: 10,11,12

Channel	Output Power (dBm)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	0.70	8.0	-7.3	Pass
Middle	0.30	8.0	-7.7	Pass
Top	-0.40	8.0	-8.4	Pass

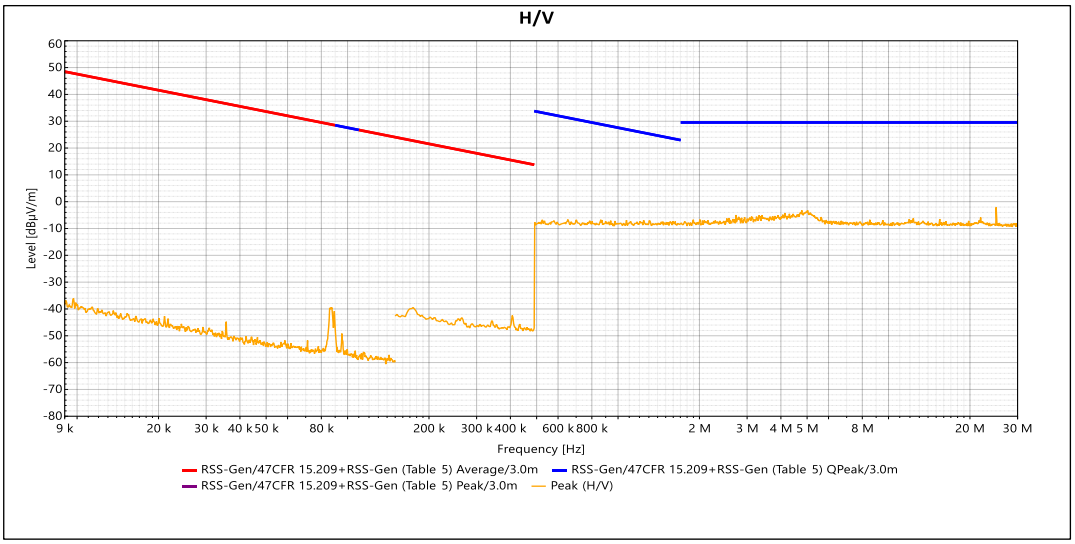
6.2 Radiated Test Results

6.2.1 Transmitter Radiated Emission < 1 GHz

Tested by:	Andrea Giovanni Galbiati
Test date:	2025-03-10
Test location (stand):	Area 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 & 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:	120 V; 60 Hz
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 inpedance of 377Ω. For example, the measument 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

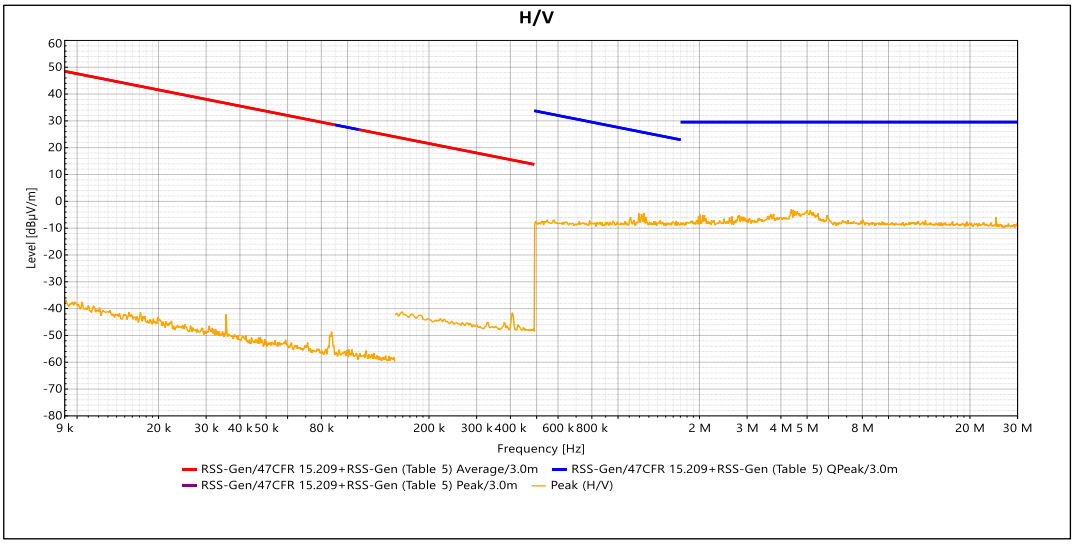
Results:

Operating mode..... :	1
Used mains voltage/frequency... :	120 V; 60 Hz
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



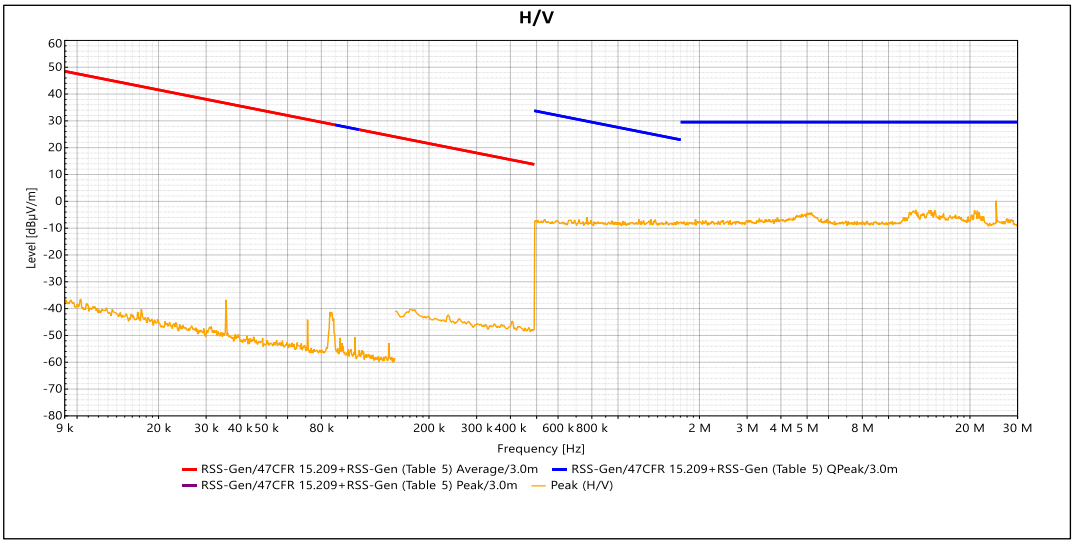
☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode..... :	1
Used mains voltage/frequency... :	120 V; 60 Hz
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



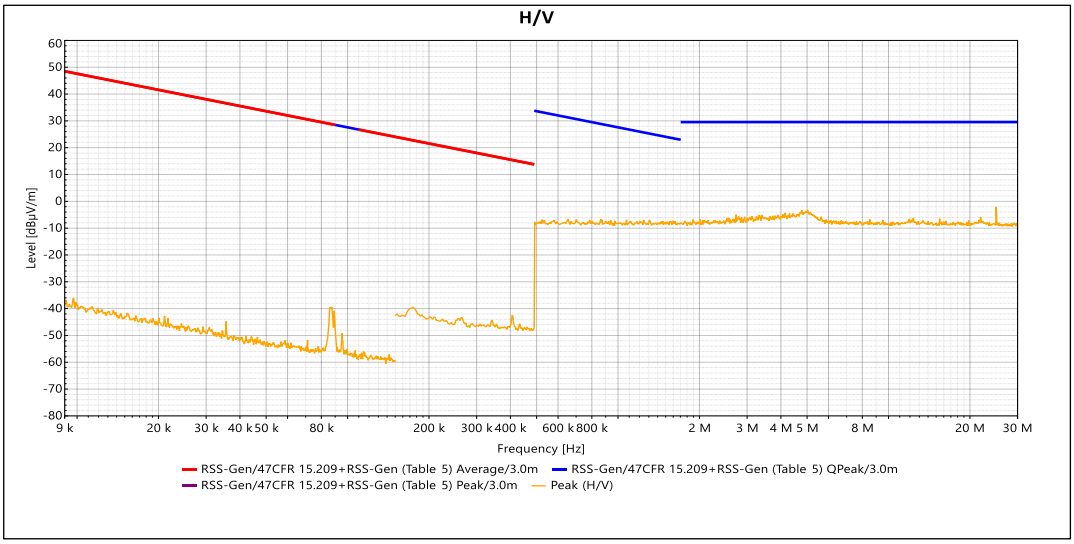
☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode..... :	1
Used mains voltage/frequency... :	120 V; 60 Hz
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



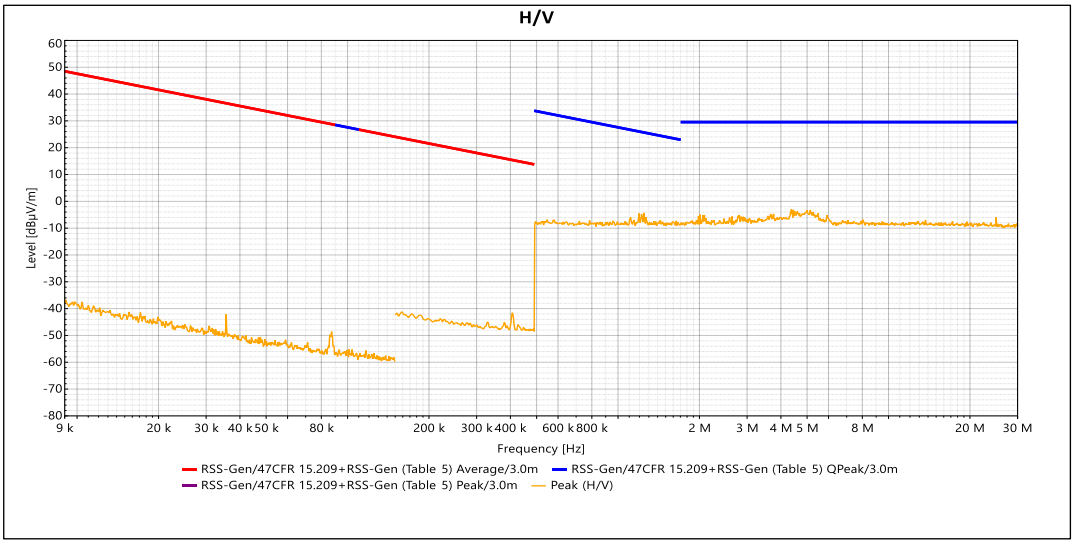
☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode..... :	2
Used mains voltage/frequency... :	120 V; 60 Hz
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



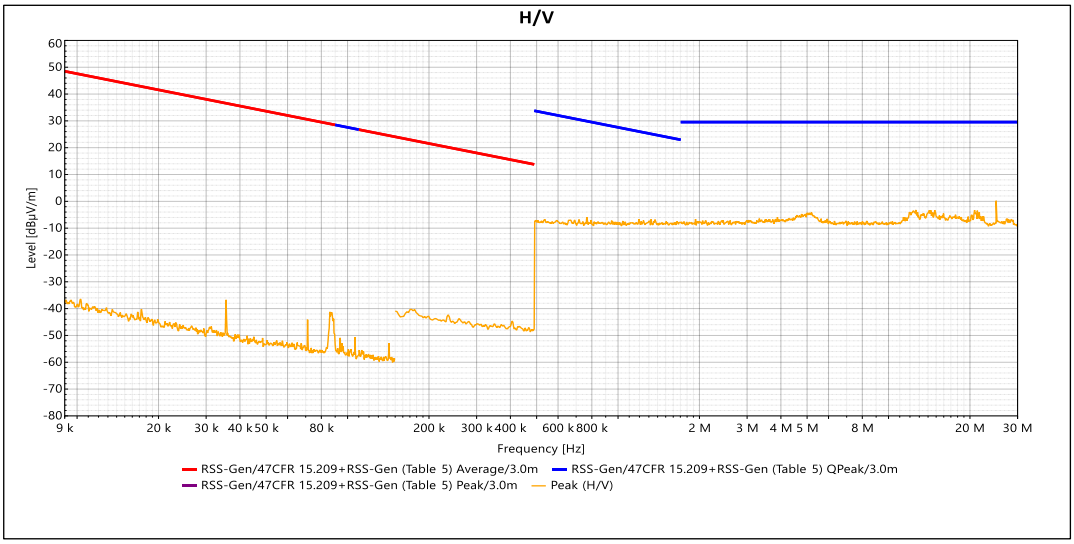
☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode..... :	2
Used mains voltage/frequency... :	120 V; 60 Hz
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



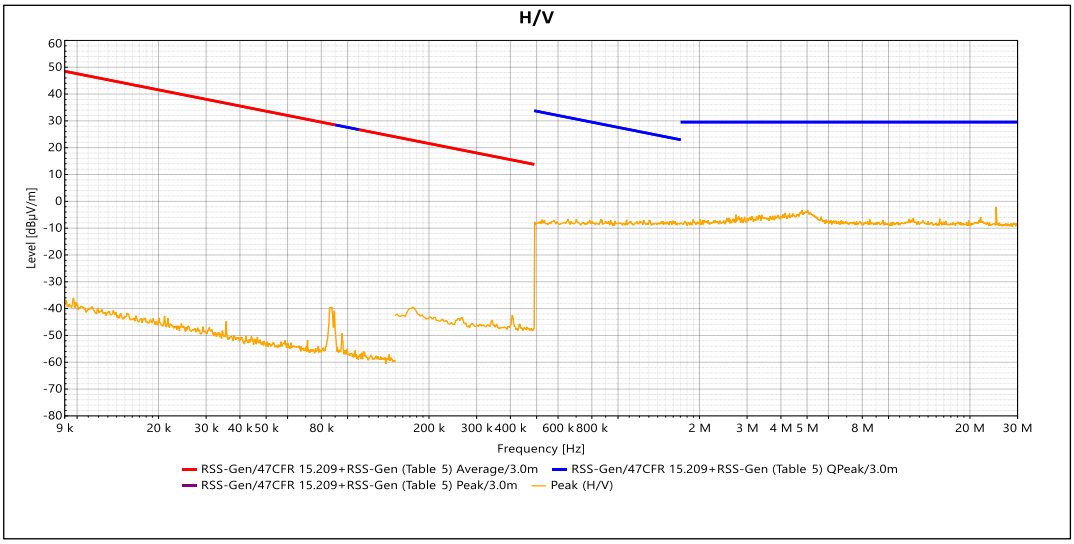
☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode..... :	2
Used mains voltage/frequency... :	120 V; 60 Hz
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



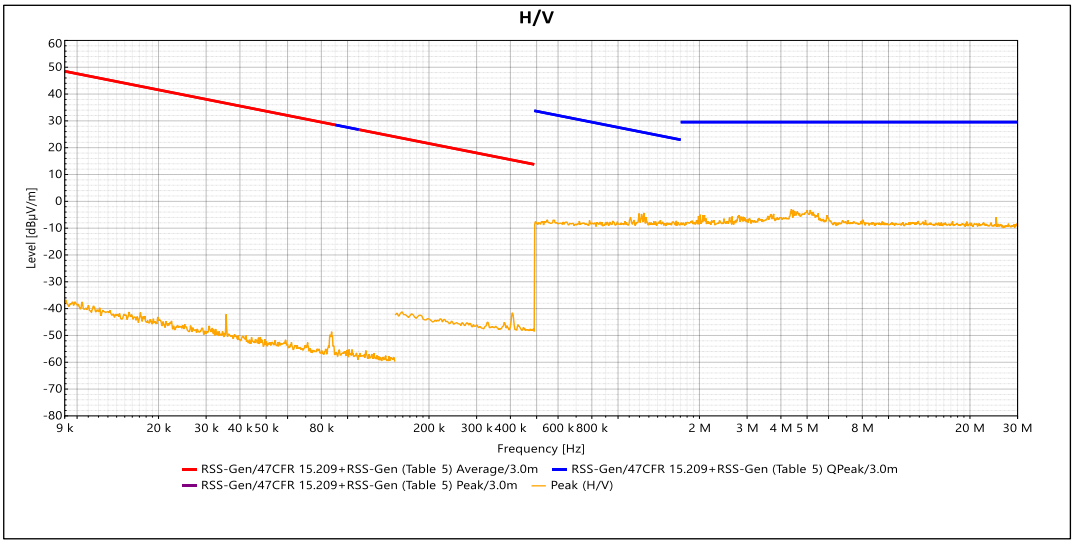
☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode..... :	3
Used mains voltage/frequency... :	120 V; 60 Hz
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



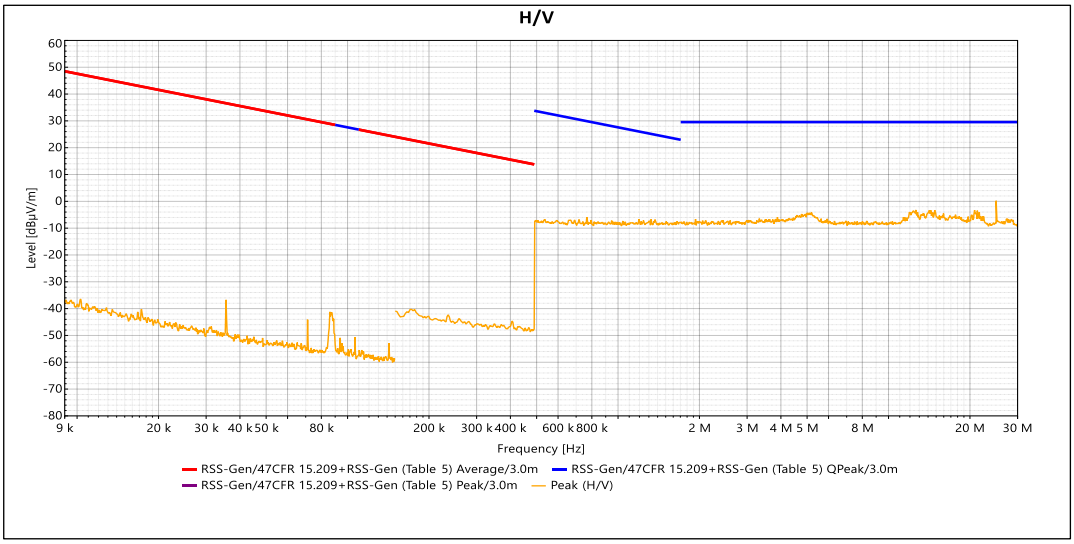
☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode..... :	3
Used mains voltage/frequency... :	120 V; 60 Hz
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



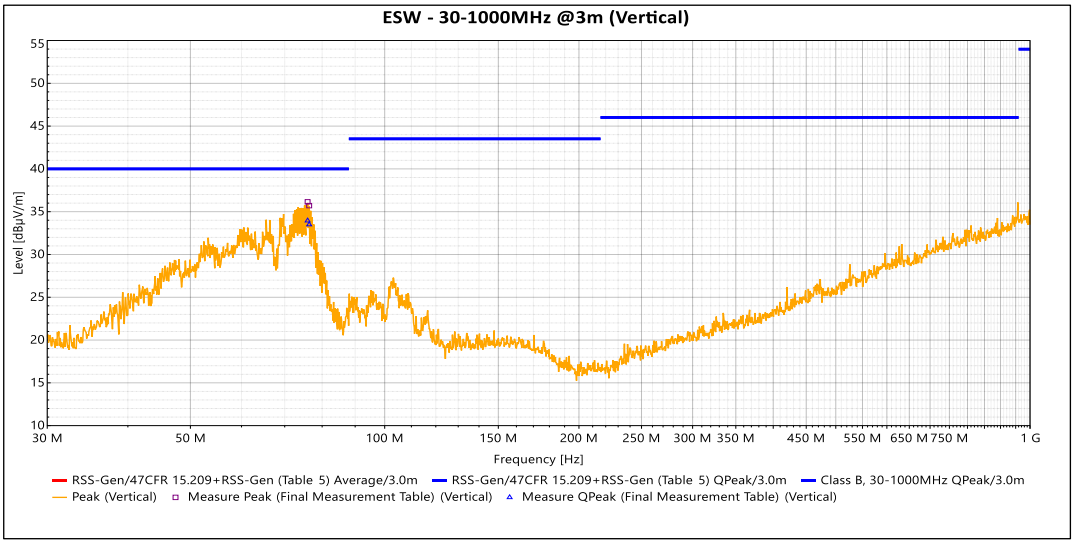
☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

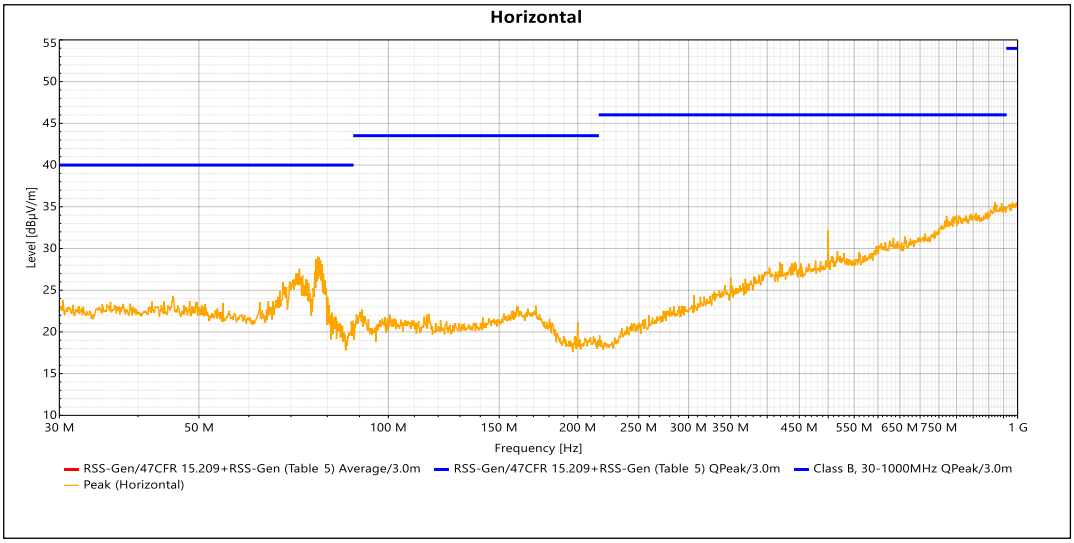
Operating mode..... :	3
Used mains voltage/frequency... :	120 V; 60 Hz
Axis ..... :	Z
Orientation of EUT ..... :	Vertical
Verdict ..... :	Pass
Instrument settings..... :	Start Frequency: 9 kHz; Stop Frequency: 150 kHz; Step: 50 Hz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 200 Hz; VBW: Auto; 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... :	120 V; 60 Hz
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



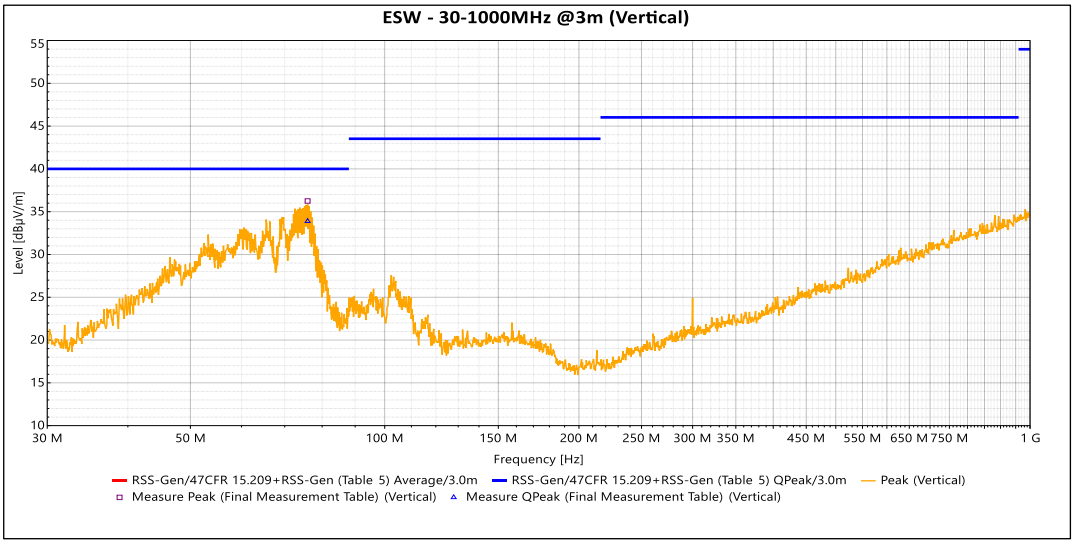


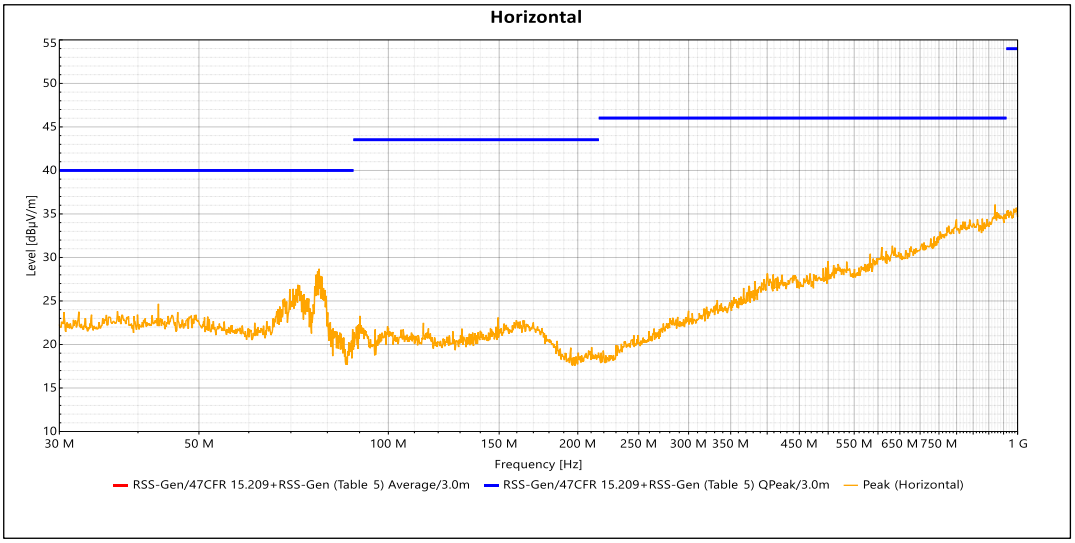
☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☒ The measurement results of highest emissions relative to the limit for each detector type are shown below:

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)
75.96 M	36.149	33.948	40	-6.052	1.047	25.9	Vertical	120 k	5	Pass	16.684
76.38 M	35.706	33.496	40	-6.504	1.057	12.1	Vertical	120 k	5	Pass	16.555

Operating mode..... :	2
Used mains voltage/frequency... :	120 V; 60 Hz
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



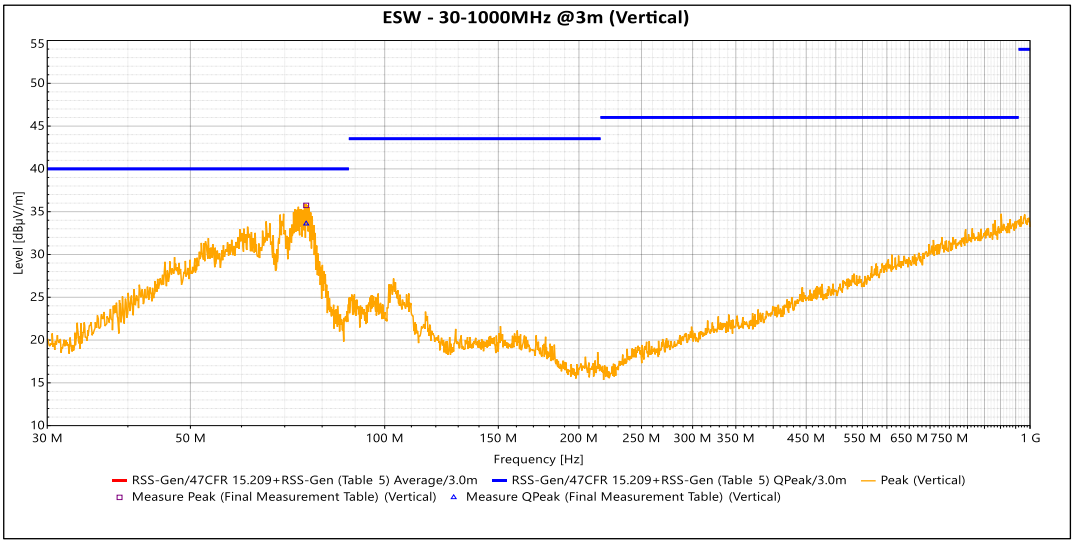


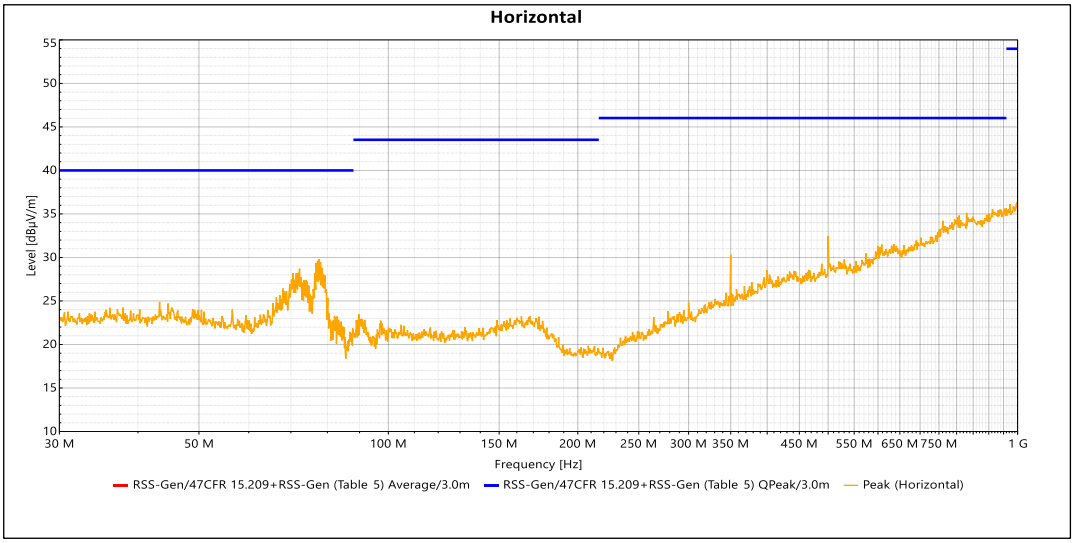
☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☒ The measurement results of highest emissions relative to the limit for each detector type are shown below:

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)
75.96 M	36.249	33.888	40	-6.112	1.032	351.2	Vertical	120 k	5	Pass	16.684

Operating mode..... :	3
Used mains voltage/frequency... :	120 V; 60 Hz
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

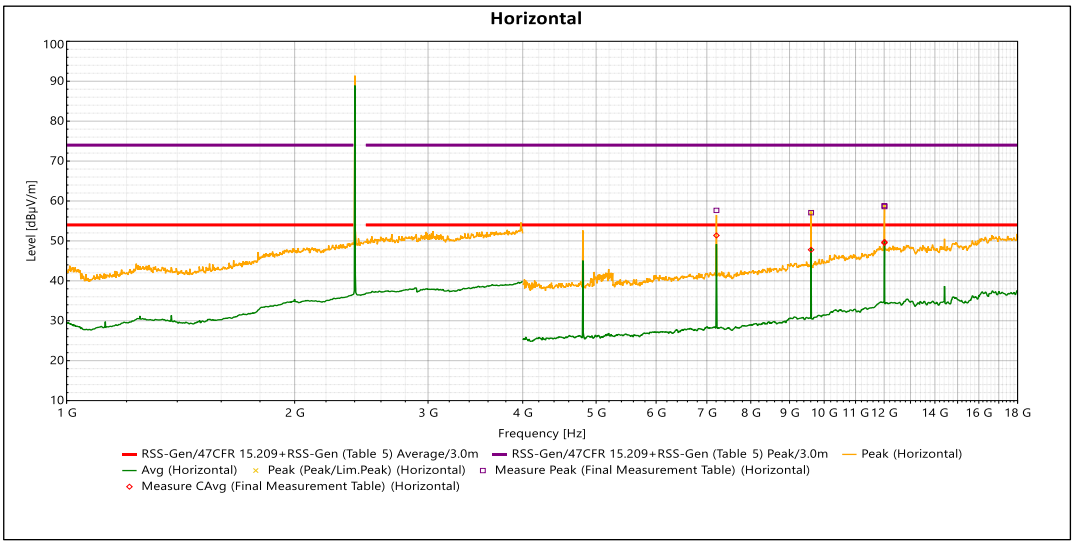
Frequency	Measure Peak (dBµV/m)	Measure QPeak (dBµV/m)	Limit QPeak (dBµV/m)	Margin QPeak (dB)	Max height (m)	Max angle (°)	Polarization	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
75.57 M	35.736	33.596	40	-6.404	1.026	346.1	Vertical	120 k	5	Pass	16.741

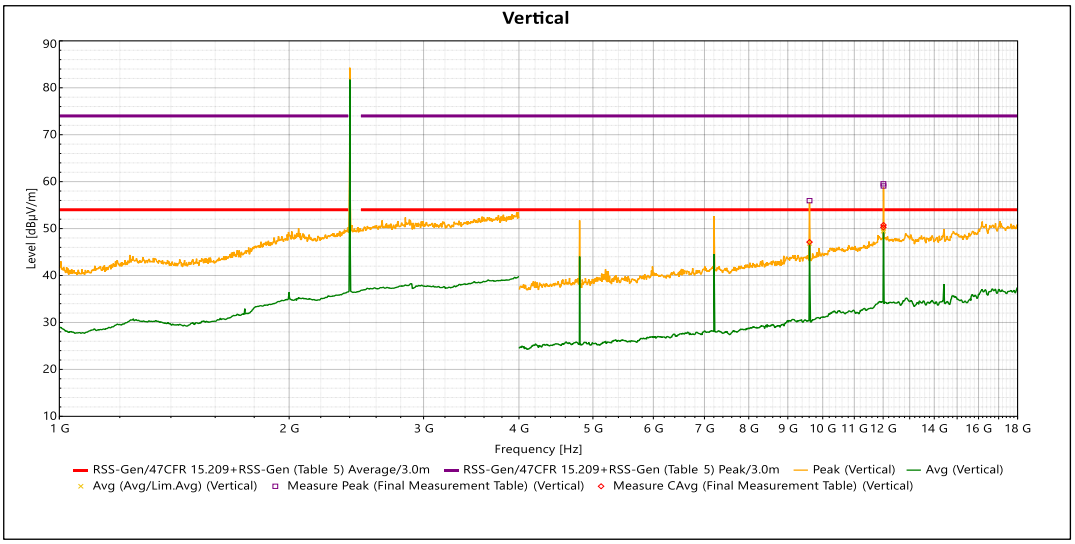
6.2.2 Transmitter Radiated Emission > 1 GHz

Tested by:	Andrea Giovanni Galbiati
Test date:	2025-03-11 to 2025-03-24
Test location (stand):	Area 8: SAC 3-1.2 (RF emission)
Ambient temperature:	22 °C (2025-03-11) 22 °C (2025-03-24)
Relative humidity:	45 % (2025-03-11) 47 % (2025-03-24)
Atmospheric pressure:	997 mbar (2025-03-11) 1101 mbar (2025-03-24)
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 6.6
Frequency Range	1 GHz to 26 GHz
Used mains voltage/frequency:	120 V; 60 Hz
Supplementary information:	---

Results:

Operating mode..... :	1
Used mains voltage/frequency... :	120 V; 60 Hz
Orientation of EUT ..... :	Vertical
Verdict ..... :	Pass
Instrument settings..... :	Start Frequency: 1 GHz; Stop Frequency: 4 GHz; Step: 250 kHz; Sweep Time: 20 ms/Step; RF Attenuation: Auto; RBW: 1 MHz; VBW: Auto; Preamplifier: ON; Preselector: ON
Instrument settings..... :	Start Frequency: 4 GHz; Stop Frequency: 18 GHz; Step: 250 kHz; Sweep Time: 20 ms/Step; RF Attenuation: Auto; RBW: 1 MHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



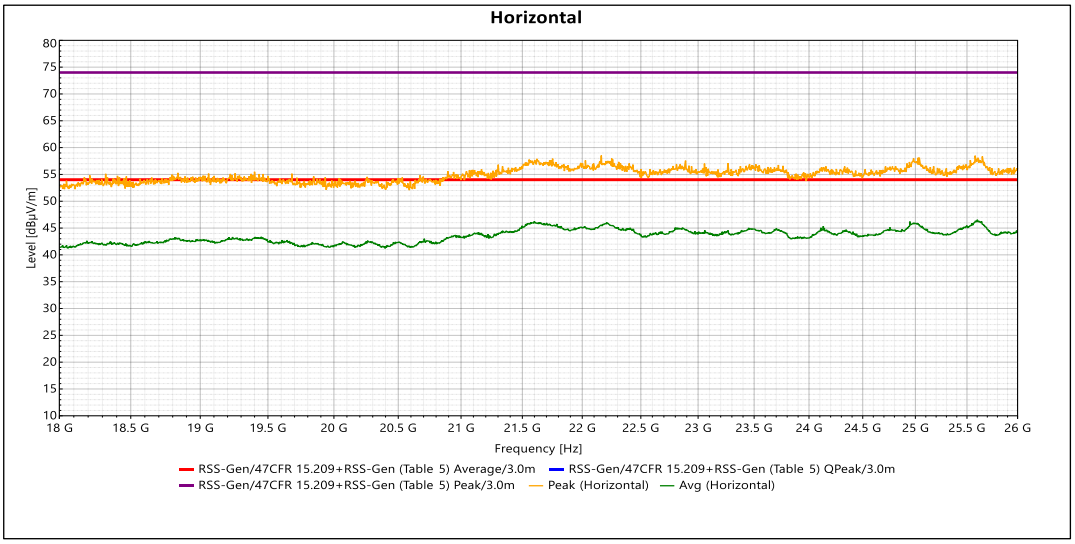


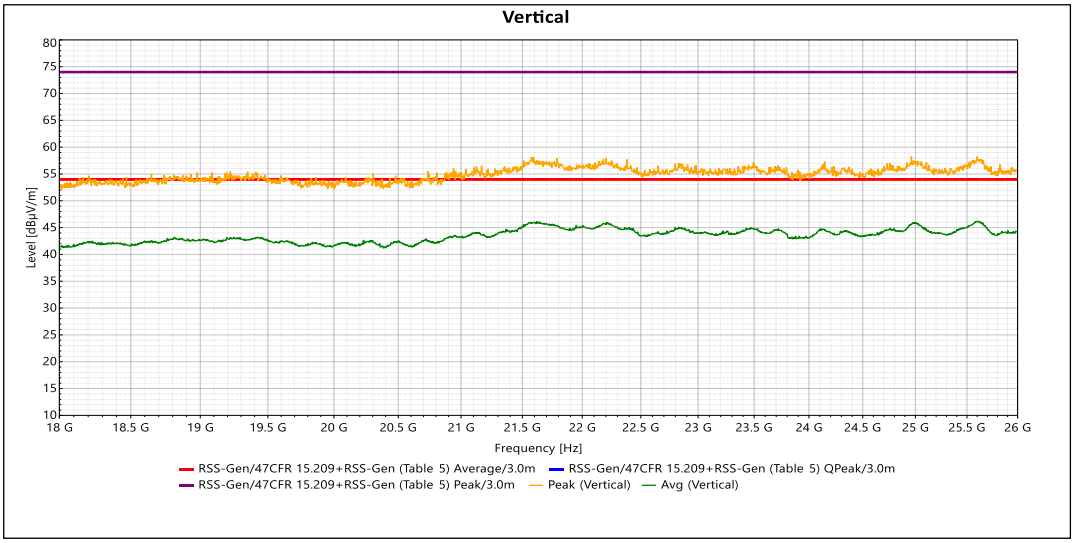
☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☒ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Final Measurement Table

Frequency	Measure Peak (dBµV/m)	Limit Peak (dBµV/m)	Margin Peak (dB)	Measure CAvg (dBµV/m)	Limit Avg (dBµV/m)	Margin Avg (dB)	Height (m)	Angle (°)	Polarization	RBW (MHz)	Meas.Time (s)	Comments	Correction (dB)
7.208 GHz	57.647	74	-16.353	51.365	54	-2.635	1.209	113.3	Horizontal	1	5	Pass	3.141
9.611 GHz	57.062	74	-16.938	47.773	54	-6.227	1.577	84.2	Horizontal	1	5	Pass	6.948
12.008 GHz	58.835	74	-15.165	49.498	54	-4.502	1.046	88.1	Horizontal	1	5	Pass	11.261
12.013 GHz	58.606	74	-15.394	49.711	54	-4.289	1	89.8	Horizontal	1	5	Pass	11.268
9.61 GHz	55.948	74	-18.052	47.121	54	-6.879	1.798	119	Vertical	1	5	Pass	6.947
12.008 GHz	59.537	74	-14.463	50.269	54	-3.731	2.136	118.4	Vertical	1	5	Pass	11.261
12.013 GHz	59.082	74	-14.918	50.755	54	-3.245	2.109	117.9	Vertical	1	5	Pass	11.268

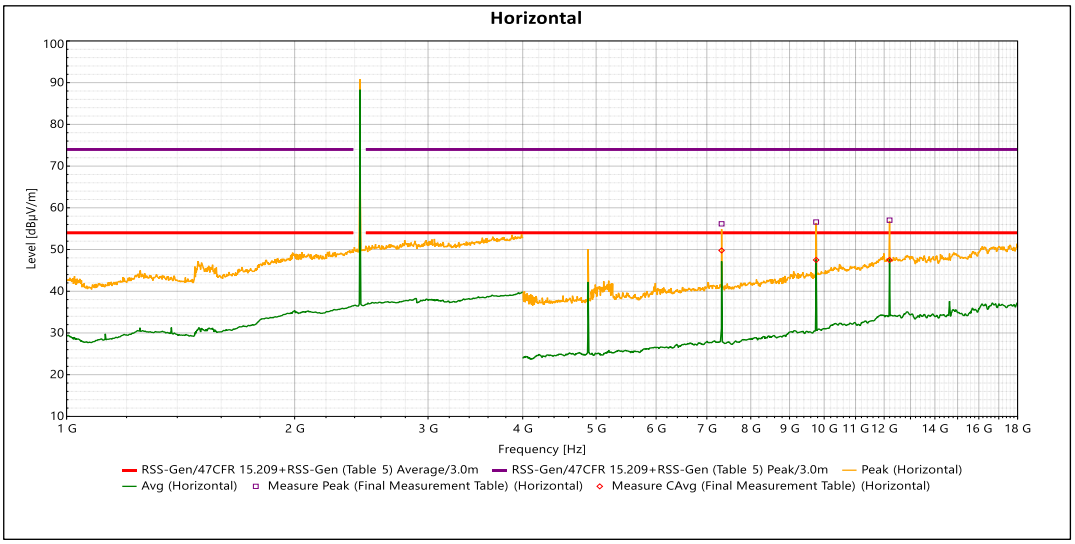
Operating mode..... :	1
Used mains voltage/frequency... :	120 V; 60 Hz
Orientation of EUT ..... :	Vertical
Verdict ..... :	Pass
Instrument settings..... :	Start Frequency: 18 GHz; Stop Frequency: 26 GHz; Step: 30000 Pts; Sweep Time: 5 s; RF Attenuation: 0 dB; RBW: 1 MHz; VBW: 3 MHz; Preamplifier: OFF; Preselector: OFF

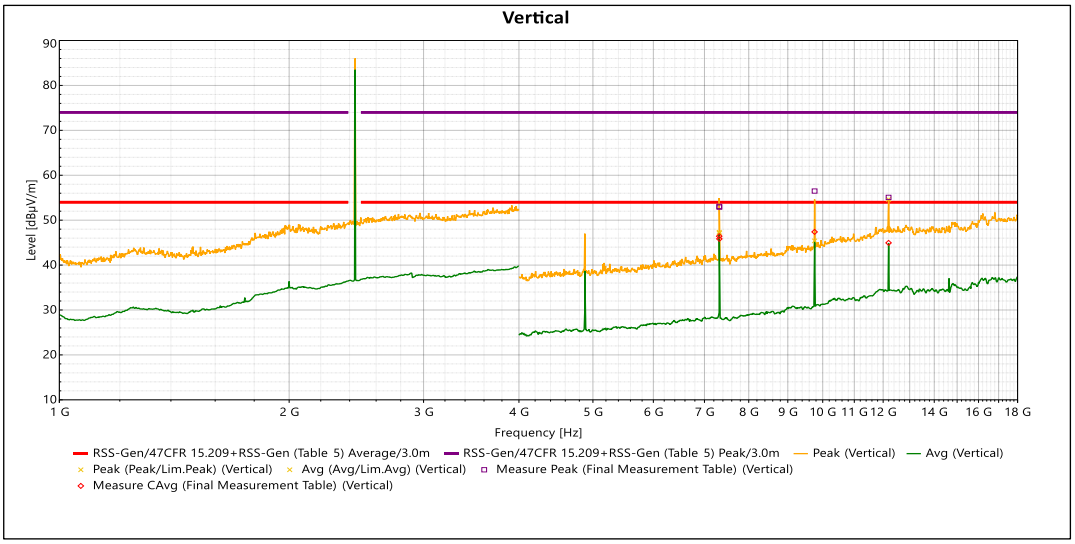




☒ The emissions are below the measurement system noise floor
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode..... :	2
Used mains voltage/frequency... :	120 V; 60 Hz
Orientation of EUT ..... :	Vertical
Verdict ..... :	Pass
Instrument settings..... :	Start Frequency: 1 GHz; Stop Frequency: 4 GHz; Step: 250 kHz; Sweep Time: 20 ms/Step; RF Attenuation: Auto; RBW: 1 MHz; VBW: Auto; Preamplifier: ON; Preselector: ON
Instrument settings..... :	Start Frequency: 4 GHz; Stop Frequency: 18 GHz; Step: 250 kHz; Sweep Time: 20 ms/Step; RF Attenuation: Auto; RBW: 1 MHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



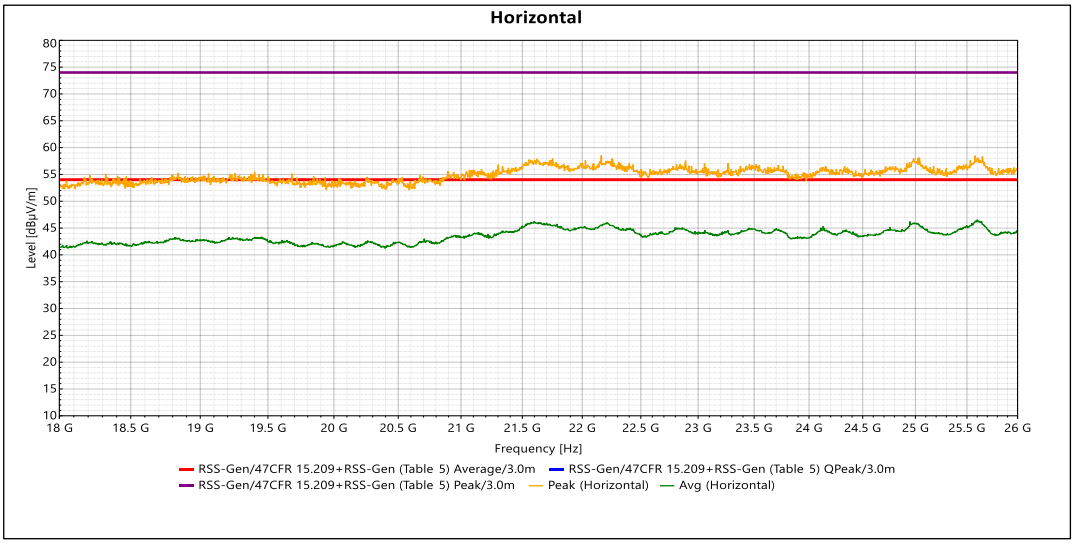


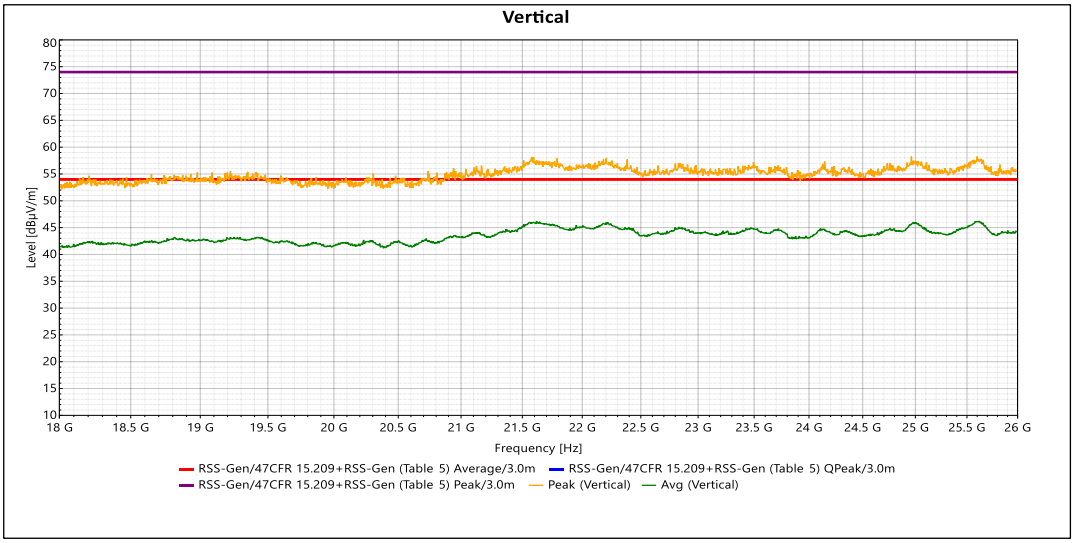
☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☒ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Final Measurement Table

Frequency	Measure Peak (dBµV/m)	Limit Peak (dBµV/m)	Margin Peak (dB)	Measure CAvg (dBµV/m)	Limit Avg (dBµV/m)	Margin Avg (dB)	Height (m)	Angle (°)	Polarization	RBW (MHz)	Meas.Time (s)	Comments	Correction (dB)
7.322 GHz	56.159	74	-17.841	49.776	54	-4.224	1.063	103.4	Horizontal	1	5	Pass	3.292
9.759 GHz	56.592	74	-17.408	47.495	54	-6.505	1.404	82.8	Horizontal	1	5	Pass	7.221
12.198 GHz	57.039	74	-16.961	47.469	54	-6.531	1.076	89	Horizontal	1	5	Pass	11.305
7.319 GHz	53.062	74	-20.938	46.427	54	-7.573	1.122	2.9	Vertical	1	5	Pass	3.287
7.322 GHz	52.905	74	-21.095	45.834	54	-8.166	1.208	3.8	Vertical	1	5	Pass	3.292
9.759 GHz	56.481	74	-17.519	47.385	54	-6.615	1.747	15.6	Vertical	1	5	Pass	7.221
12.198 GHz	55.072	74	-18.928	44.942	54	-9.058	2.241	37.1	Vertical	1	5	Pass	11.305

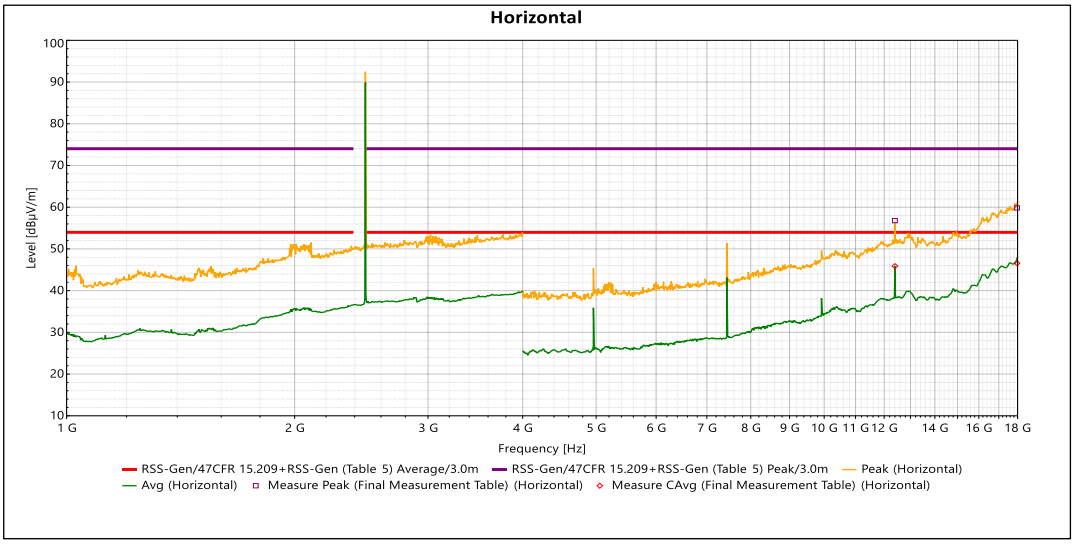
Operating mode..... :	2
Used mains voltage/frequency... :	120 V; 60 Hz
Orientation of EUT ..... :	Vertical
Verdict ..... :	Pass
Instrument settings..... :	Start Frequency: 18 GHz; Stop Frequency: 26 GHz; Step: 30000 Pts; Sweep Time: 5 s; RF Attenuation: 0 dB; RBW: 1 MHz; VBW: 3 MHz; Preamplifier: OFF; Preselector: OFF

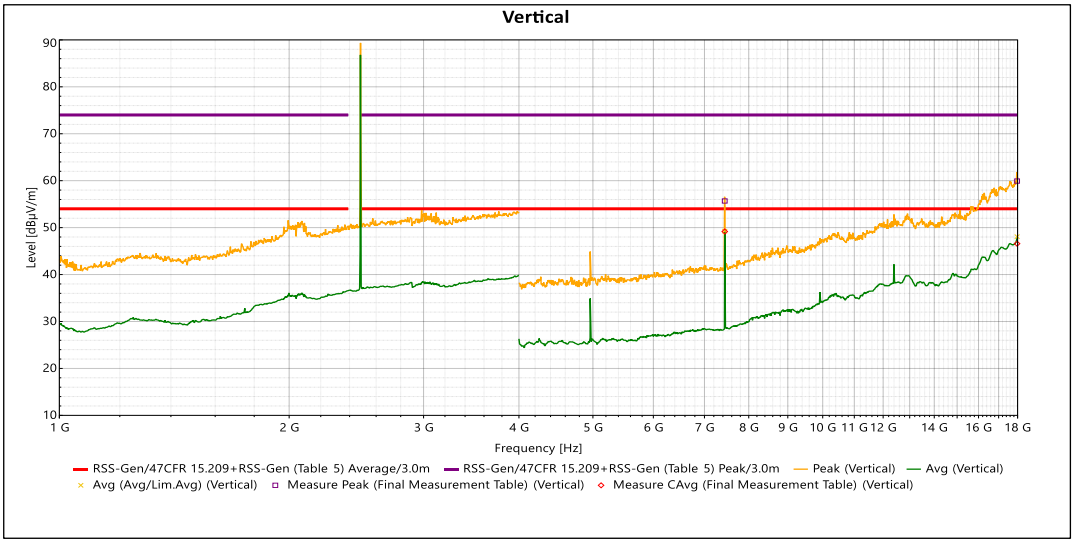




☒ The emissions are below the measurement system noise floor
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Operating mode..... :	3
Used mains voltage/frequency... :	120 V; 60 Hz
Orientation of EUT ..... :	Vertical
Verdict ..... :	Pass
Instrument settings..... :	Start Frequency: 1 GHz; Stop Frequency: 4 GHz; Step: 250 kHz; Sweep Time: 20 ms/Step; RF Attenuation: Auto; RBW: 1 MHz; VBW: Auto; Preamplifier: ON; Preselector: ON



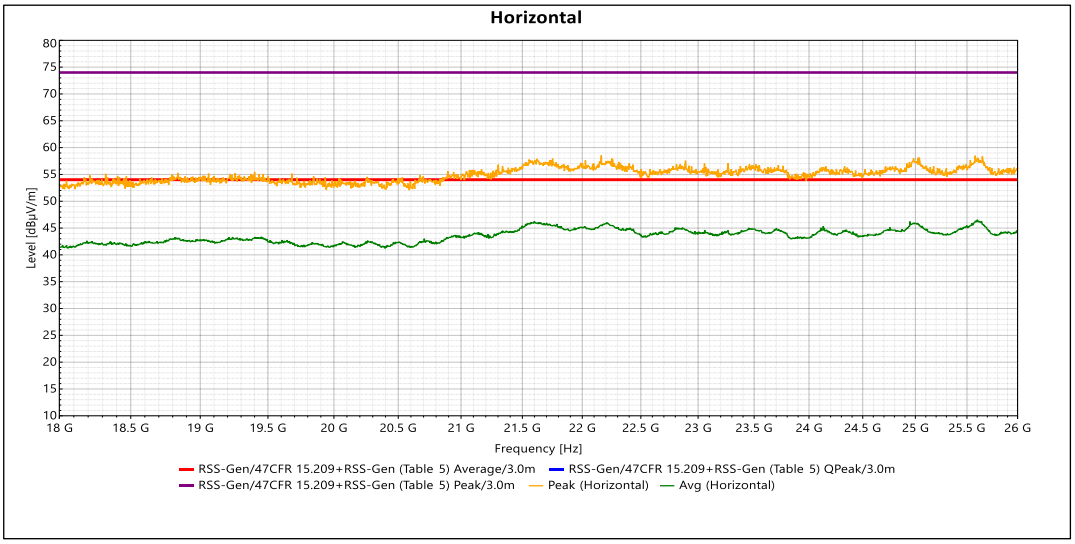


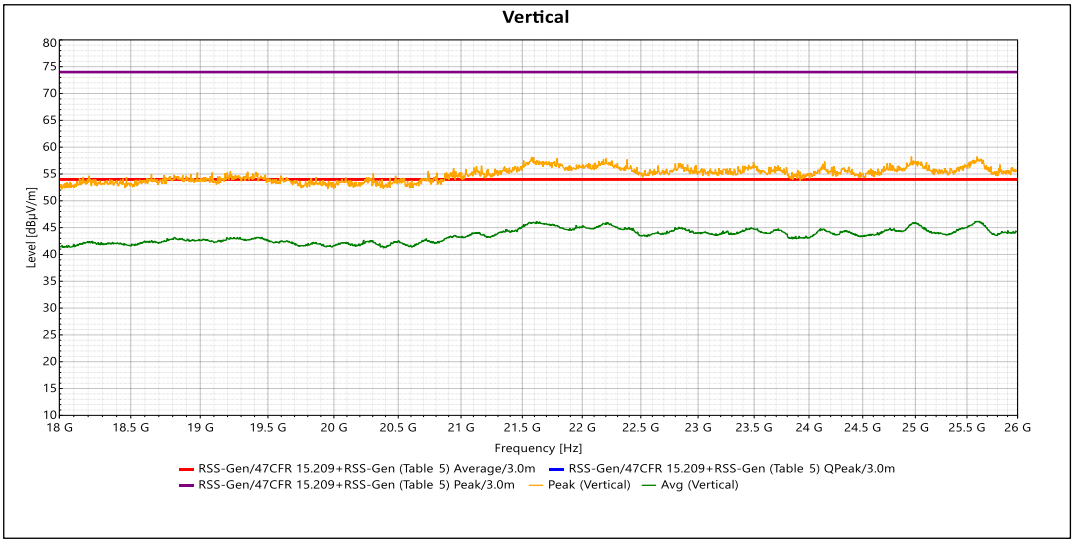
☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☒ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Final Measurement Table

Frequency	Measure Peak (dBµV/m)	Limit Peak (dBµV/m)	Margin Peak (dB)	Measure CAvg (dBµV/m)	Limit Avg (dBµV/m)	Margin Avg (dB)	Height (m)	Angle (°)	Polarization	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
12.398 GHz	56.782	74	-17.218	45.884	54	-8.116	1.095	57.8	Horizontal	1	5	Pass	20.934
18 GHz	59.832	74	-14.168	46.567	54	-7.433	3.071	22.3	Horizontal	1	5	Pass	31.26
7.442 GHz	55.677	74	-18.323	49.171	54	-4.829	1.851	2.3	Vertical	1	5	Pass	13.361
18 GHz	59.923	74	-14.077	46.578	54	-7.422	3.254	10.6	Vertical	1	5	Pass	31.26

Operating mode..... :	3
Used mains voltage/frequency... :	120 V; 60 Hz
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

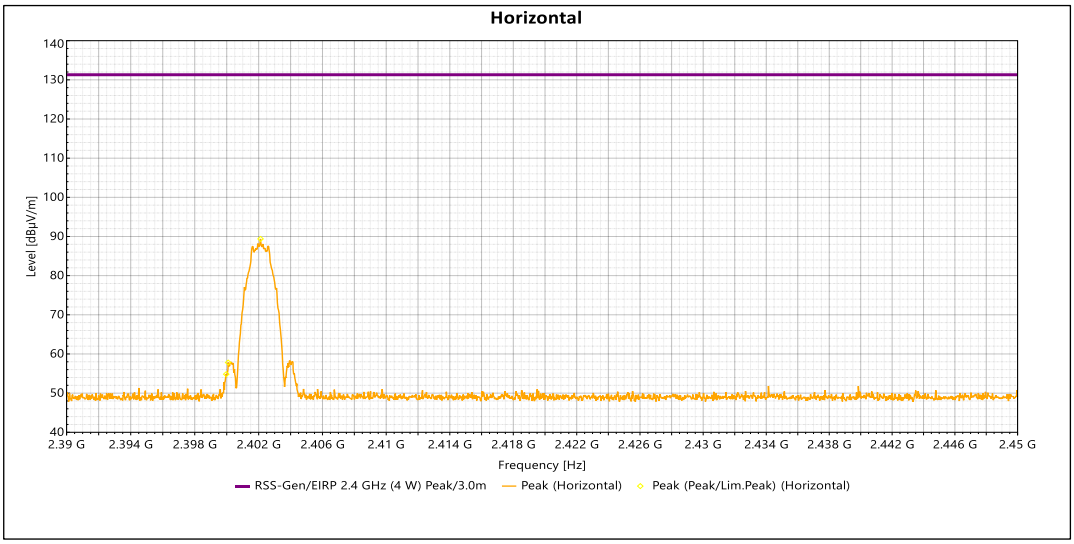
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

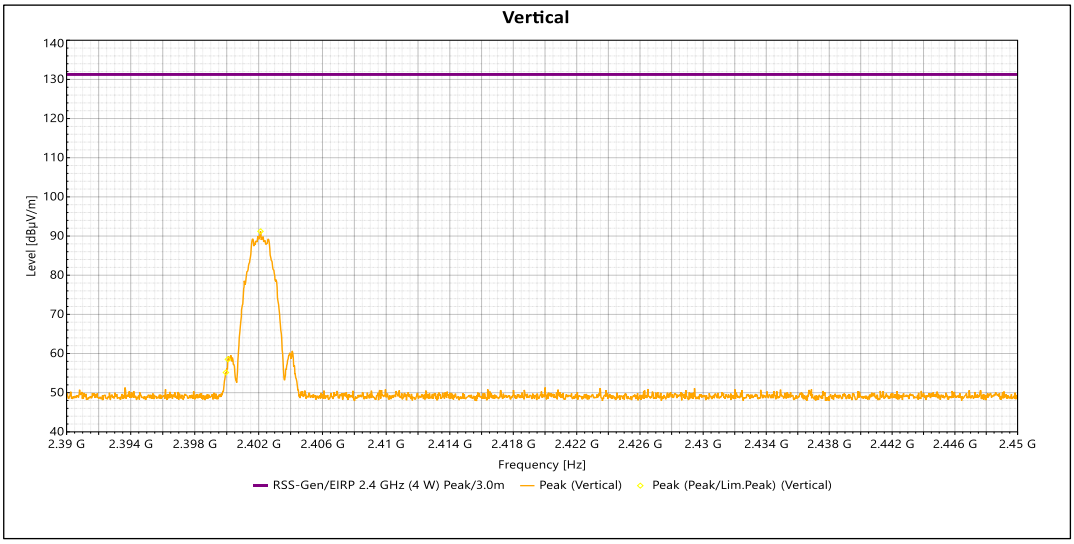
6.2.3 Transmitter Band Edge Radiated Emission and restricted band evaluation

Tested by:	Andrea Giovanni Galbiati
Test date:	2025-03-11
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
Used mains voltage/frequency:	120 V; 60 Hz
Supplementary information:	None

Results of band edge measurements

Operating mode..... :	1
Used mains voltage/frequency... :	120 V; 60 Hz
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





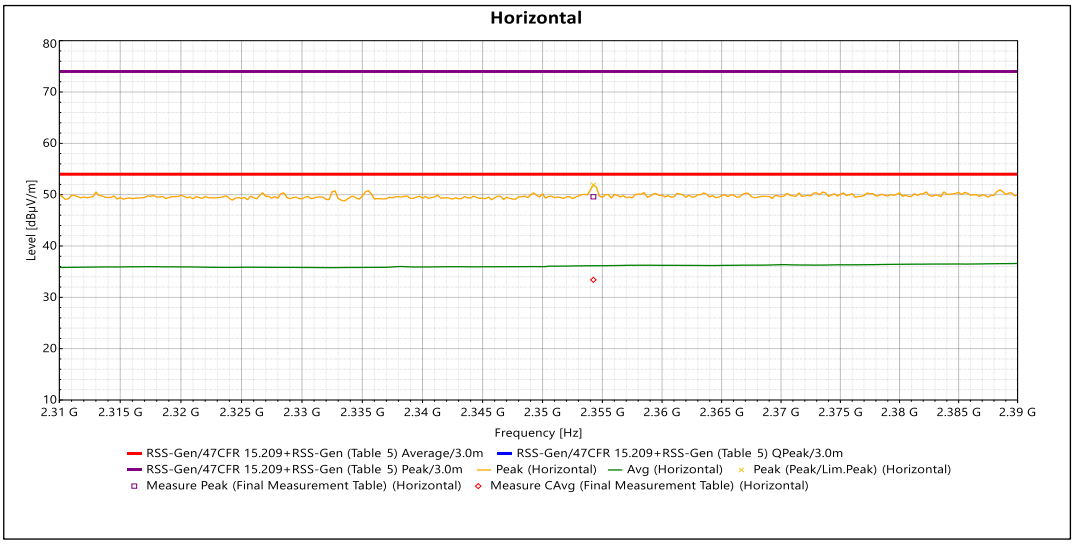
Final measurement table

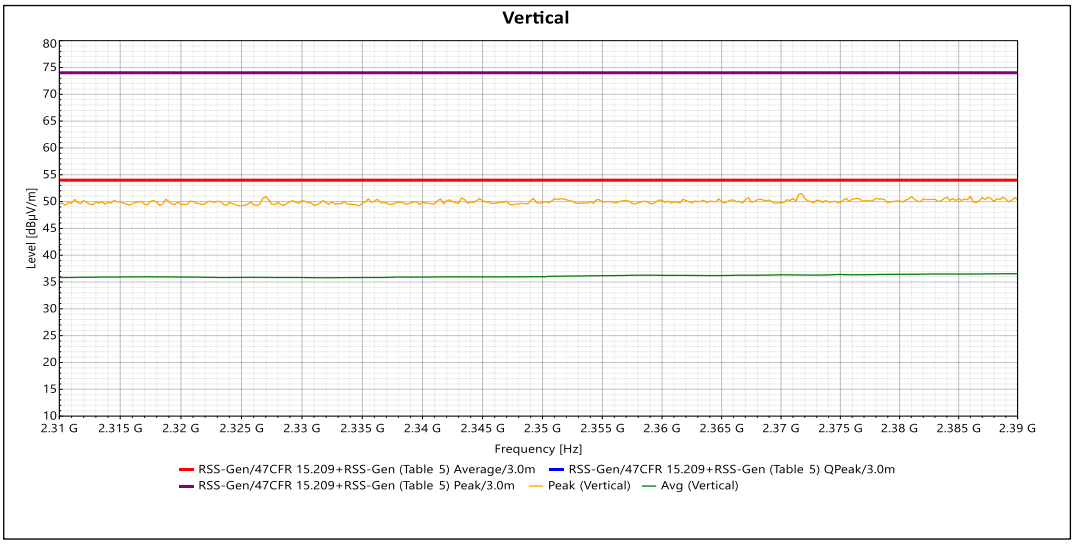
Channel	Max peak of in-band emission (dBµv/m)	Frequency of max peak at the band edge (MHz)	Max peak of Carrier (dBµv/m)	Delta (dB)	Polarization	Margin (dB)	Result
Bottom	57.812	2400	89.381	31.569	Horizontal	>20 dB	Pass
Bottom	54.841	2399	89.381	34.54	Horizontal	>20 dB	Pass
Bottom	58.525	2400	91.204	32.679	Vertical	>20 dB	Pass
Bottom	55.157	2399	91.204	36.047	Vertical	>20 dB	Pass

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

Results of restricted band measurement

Operating mode..... :	1
Used mains voltage/frequency... :	120 V; 60 Hz
Orientation of EUT ..... :	Vertical
Verdict ..... :	Pass
Instrument settings..... :	Start Frequency: 2.31 GHz; Stop Frequency: 2.39 GHz; Step: 250 kHz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 1 MHz; VBW: Auto; Preamplifier: ON; Preselector: ON



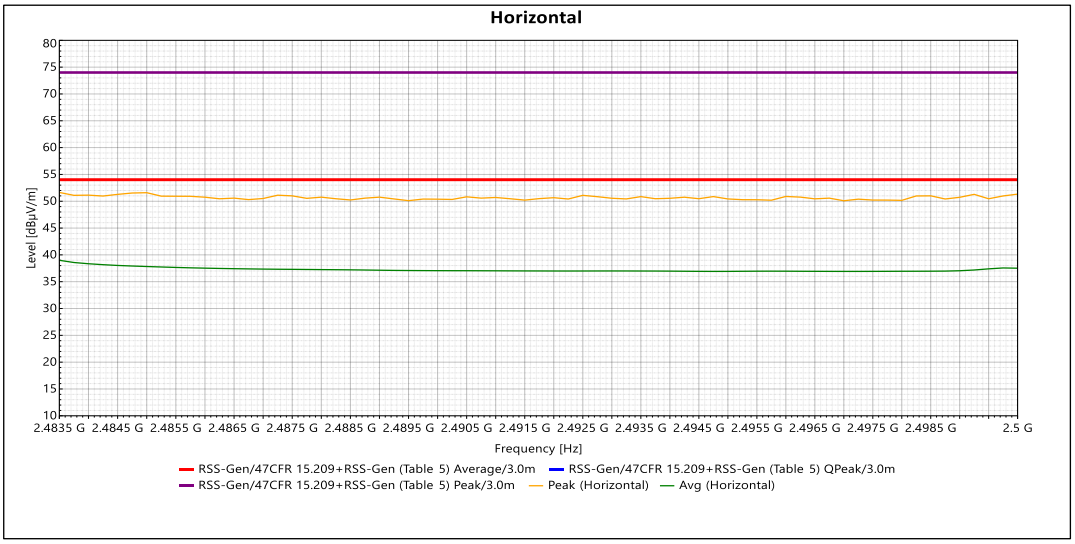


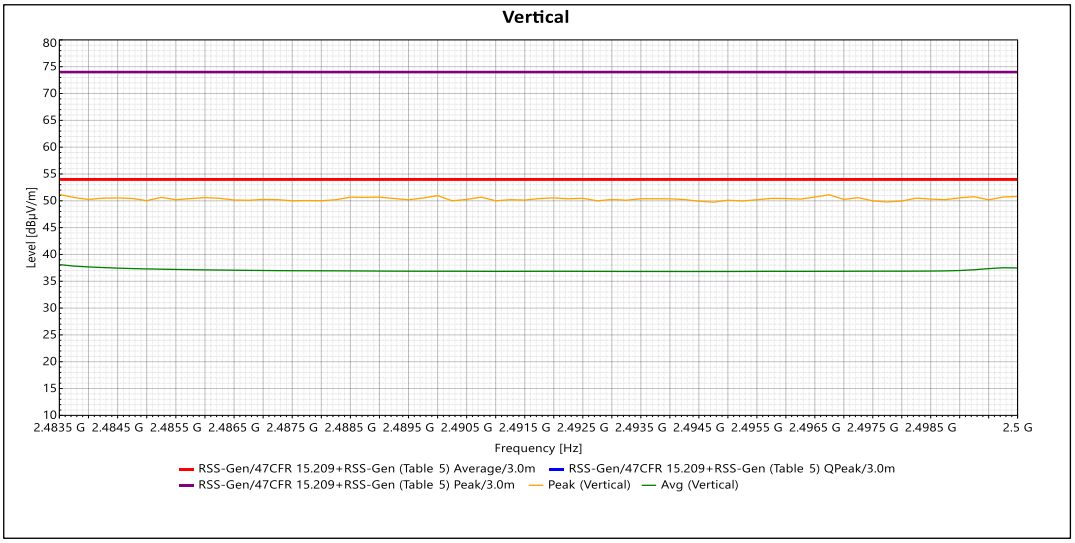
☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Final Measurement Table

Frequency	Measure Peak (dBµV/m)	Limit Peak (dBµV/m)	Margin Peak (dB)	Measure CAvg (dBµV/m)	Limit Avg (dBµV/m)	Margin Avg (dB)	Height (m)	Angle (°)	Polarization	RBW (MHz)	Meas.Time (s)	Comments	Correction (dB)
2.354 GHz	49.588	74	-24.412	33.407	54	-20.593	2.934	37.5	Horizontal	1	5	Pass	36.435

Operating mode..... :	3
Used mains voltage/frequency... :	120 V; 60 Hz
Orientation of EUT ..... :	Vertical
Verdict ..... :	Pass
Instrument settings..... :	Start Frequency: 2.4835 GHz; Stop Frequency: 2.5 GHz; Step: 250 kHz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 1 MHz; VBW: Auto; Preamplifier: ON; Preselector: ON





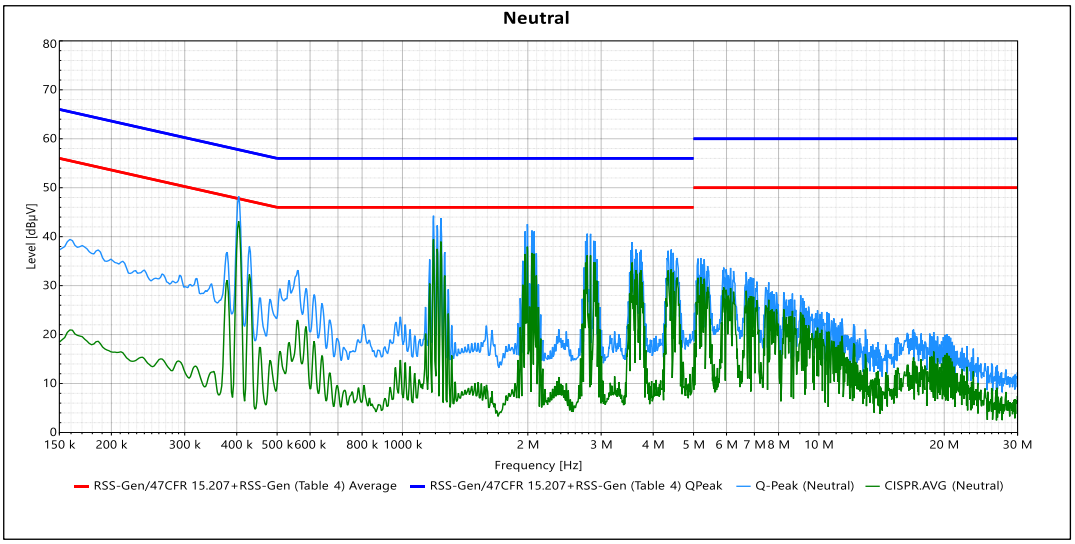
☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

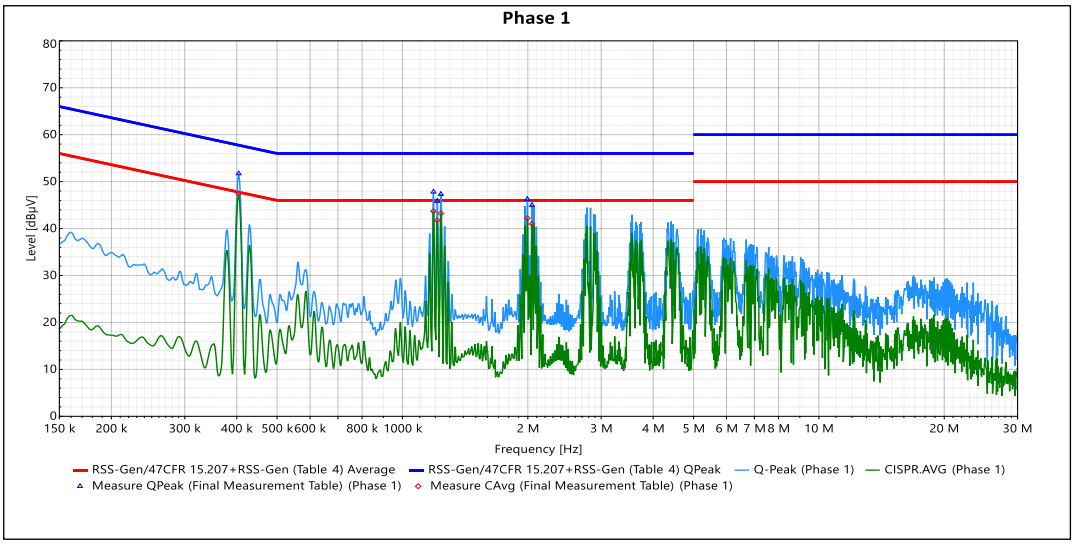
6.3 Transmitter AC Conducted Emissions

Tested by:	Andrea Giovanni Galbiati	
Test date:	2025-03-17	
Test location (stand):	Area 11: SR2 (RF emission)	
Ambient temperature:	22 °C	
Relative humidity:	45 %	
Atmospheric pressure:	998 mbar	
Test set-up description:	☒	Set-up Type A (40 cm distance to vertical ground plane and 80 cm to horizontal ground plane)
	☐	Set-up Type B (40 cm distance to horizontal ground plane)
	☐	Floor standing equipment set-up (10 cm over ground plane)
	☐	80 cm to horizontal ground plane (vertical ground plane not used according to ANSI C63.4-2014 clause 5.2.3)
	☐	Artificial hand applied
	☐	Other:
FCC Reference:	Part 15.207	
ISED Canada Reference:	RSS-Gen 8.8	
Test Method Used	ANSI C63.10 Section 6.2 / FCC KDB 174176 and notes below	
Used mains voltage/frequency:	120 V; 60 Hz 240 V; 60 Hz	
Supplementary information:	• The 120V and 240V power supply have been investigated during pre-scanning. Only worst case (120V) condition has been recorded in this report • Data rate 0.125 Mbps, 0.5 Mbps, 1 Mbps and 2 Mbps have been investigated during pre-scanning. Only worst case 2 Mbps has been recorded in this report	

Results

Operating mode..... :	1
Port / terminal..... :	AC Mains
Verdict ..... :	Pass
Instrument settings..... :	Start Frequency: 150 kHz; Stop Frequency: 30 MHz; Step: 2.25 kHz; Sweep Time: 1 s/Step; RF Attenuation: Auto; 10 dB min attenuation: ON; RBW: 9 kHz; Preamplifier: OFF; Preselector: ON



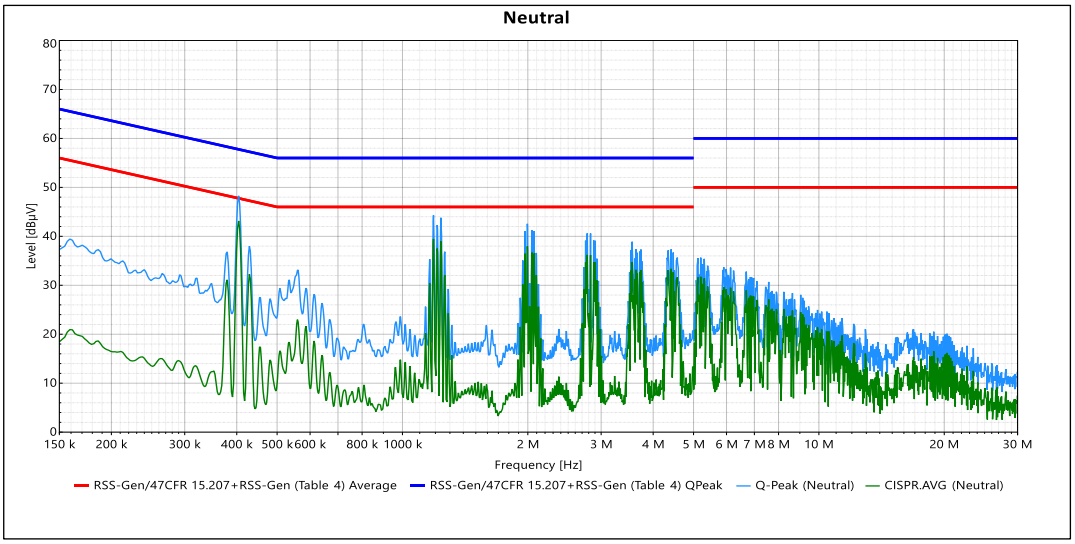


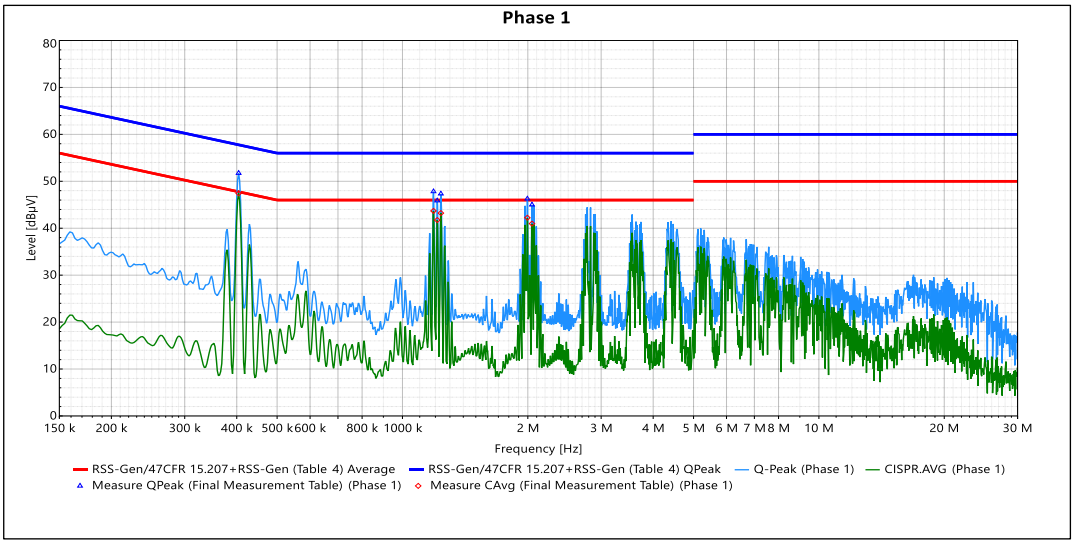
☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☒ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Final Measurement Table

Frequency	Measure QPeak (dBµV)	Limit QPeak (dBµV)	Margin QPeak (dB)	Measure CAvg (dBµV)	Limit Avg (dBµV)	Margin Avg (dB)	Terminal	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
404.25 k	51.737	57.766	-6.029	47.442	47.766	-0.323	Phase 1	9 k	5	Pass	10.23
1.187 M	47.833	56	-8.167	43.689	46	-2.311	Phase 1	9 k	5	Pass	10.249
1.212 M	45.87	56	-10.13	41.741	46	-4.259	Phase 1	9 k	5	Pass	10.25
1.237 M	47.344	56	-8.656	43.224	46	-2.776	Phase 1	9 k	5	Pass	10.25
1.995 M	46.275	56	-9.725	42.234	46	-3.766	Phase 1	9 k	5	Pass	10.262
2.047 M	44.999	56	-11.001	40.977	46	-5.023	Phase 1	9 k	5	Pass	10.263

Operating mode..... :	2
Port / terminal..... :	AC Mains
Verdict ..... :	Pass
Instrument settings..... :	Start Frequency: 150 kHz; Stop Frequency: 30 MHz; Step: 2.25 kHz; Sweep Time: 1 s/Step; RF Attenuation: Auto; 10 dB min attenuation: ON; RBW: 9 kHz; Preamplifier: OFF; Preselector: ON



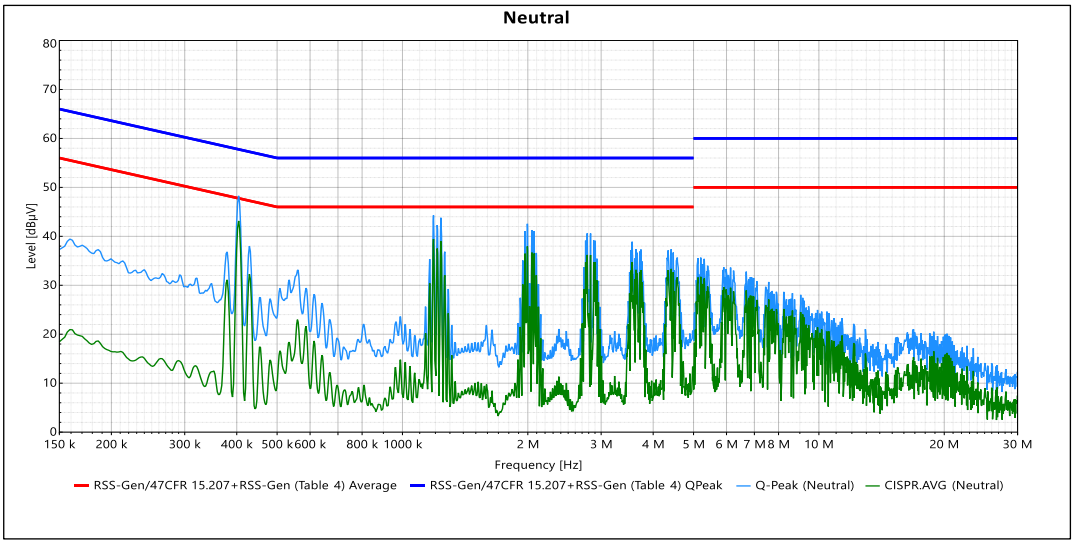


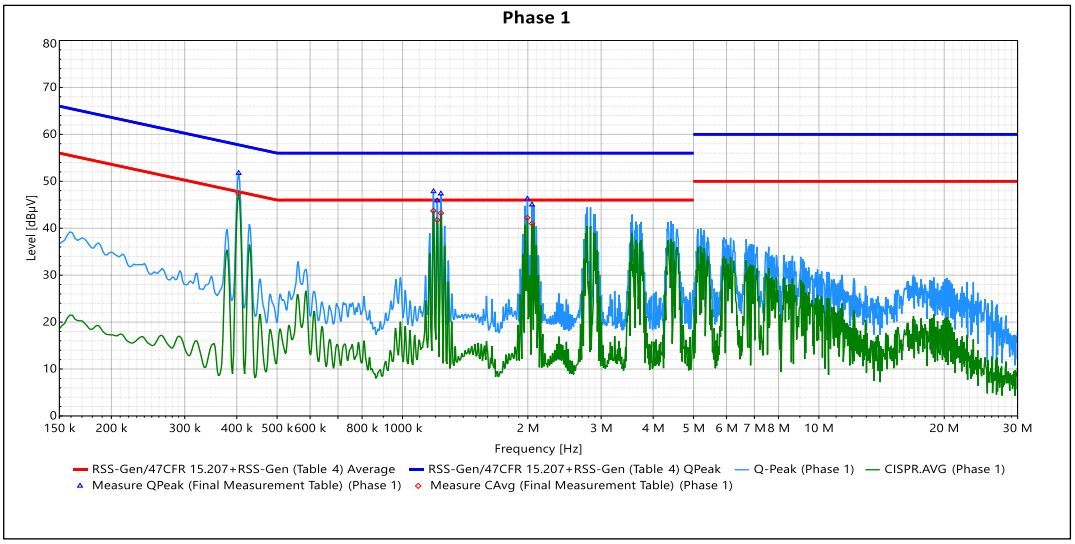
☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit
☒ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Final Measurement Table

Frequency	Measure QPeak (dBµV)	Limit QPeak (dBµV)	Margin QPeak (dB)	Measure CAvg (dBµV)	Limit Avg (dBµV)	Margin Avg (dB)	Terminal	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
404.25 k	51.737	57.766	-6.029	47.442	47.766	-0.323	Phase 1	9 k	5	Pass	10.23
1.187 M	47.833	56	-8.167	43.689	46	-2.311	Phase 1	9 k	5	Pass	10.249
1.212 M	45.87	56	-10.13	41.741	46	-4.259	Phase 1	9 k	5	Pass	10.25
1.237 M	47.344	56	-8.656	43.224	46	-2.776	Phase 1	9 k	5	Pass	10.25
1.995 M	46.275	56	-9.725	42.234	46	-3.766	Phase 1	9 k	5	Pass	10.262
2.047 M	44.999	56	-11.001	40.977	46	-5.023	Phase 1	9 k	5	Pass	10.263

Operating mode..... :	3
Port / terminal..... :	AC Mains
Verdict ..... :	Pass
Instrument settings..... :	Start Frequency: 150 kHz; Stop Frequency: 30 MHz; Step: 2.25 kHz; Sweep Time: 1 s/Step; RF Attenuation: Auto; 10 dB min attenuation: ON; RBW: 9 kHz; 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:

Final Measurement Table

Frequency	Measure QPeak (dBµV)	Limit QPeak (dBµV)	Margin QPeak (dB)	Measure CAvg (dBµV)	Limit Avg (dBµV)	Margin Avg (dB)	Terminal	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
404.25 k	51.737	57.766	-6.029	47.442	47.766	-0.323	Phase 1	9 k	5	Pass	10.23
1.187 M	47.833	56	-8.167	43.689	46	-2.311	Phase 1	9 k	5	Pass	10.249
1.212 M	45.87	56	-10.13	41.741	46	-4.259	Phase 1	9 k	5	Pass	10.25
1.237 M	47.344	56	-8.656	43.224	46	-2.776	Phase 1	9 k	5	Pass	10.25
1.995 M	46.275	56	-9.725	42.234	46	-3.766	Phase 1	9 k	5	Pass	10.262
2.047 M	44.999	56	-11.001	40.977	46	-5.023	Phase 1	9 k	5	Pass	10.263

7 List of test equipment

Equipment	Type	Inventory Number	Manufacturer	Serial Number	Last Calibration Date	Calibration Due Date
Test Stand: Auxiliary equipment						
Frequency Converter (60 Hz)	FWW-SFUP 40kVA	37730	GUSTAV KLEIN	-	-	-
CLIMATIC CENTRAL UNIT (SACs side)	iBTHX-W	70611	Omega Engineering Inc.	1040495	2024-04-05	2025-04-28
CLIMATIC CENTRAL UNIT (SRs side)	iBTHX-W	70614	Omega Engineering Inc.	1040496	2024-04-05	2025-04-28
Laser Measure	RSLDM-50H	224436	RS Pro	210743764	2023-11-10	2025-11-28
TRUE-RMS DIGITAL MULTIMETER	289	169495	Fluke Corporation	40780217	2023-04-05	2025-04-28
Mini Datalogger (FACT3)	174H	211147	Testo	83306371	2024-10-25	2025-10-28
Mini Datalogger (SR2)	174H	211146	Testo	83293175	2024-10-25	2025-10-28
Test Stand: Transmitter AC Conducted Emissions						
EMI TEST RECEIVER	ESR7	204729	Rohde & Schwarz	102380	2024-04-12	2025-06-28
Line Impedance Stabilization Network 3PH32A	ENV432	154695	Rohde & Schwarz	101335	2025-01-09	2026-01-28
RF CABLES	LMR-240	175758	TIMES MICROWAVE SYSTEMS	None	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	None	2024-09-05	2025-09-28
Software - EMC	BAT-EMC	156535	Nexio Technologies		-	-

Test Stand: Transmitter Radiated Emission 1GHz to 18G						
Tilting Antenna Mast Positioning Tower	2171B/2170B	135821	ETS-Lindgren (Cedar Park, Texas)	-	-	-
Double Ridged Broadband Horn Antenna	3117	138662	ETS-Lindgren (Cedar Park, Texas)	00208482	2025-01-30	2027-01-28
Cable 8000mm - 18 GHz	SF126/11N/11N/8000	220502	Huber+Suhner	556226/126	2024-05-10	2025-05-28
Cable 2000mm - 18 GHz	SF126/11SMA/11N/2000	220503	Huber+Suhner	554756/126	2024-05-10	2025-05-28
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	00231682	-	-
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	1	2024-10-28	2025-10-28
Low-Noise EMI Preamplifier	BLMA 0118-4A	209025	BONN Elektronik	2113244A	2025-03-24	2026-03-28
EMI TEST RECEIVER	ESW26	246431	Rohde & Schwarz (Koeln) GmbH & Co. KG	103182	2024-03-07	2025-03-28
SVSWR Voltage Standing Wave Ratio	SVSWR FACT3-1.2 STD	210409	ETS-Lindgren	SVSWR FACT3-1.2 STD	2022-04-12	2025-04-28
Software - EMC	BAT-EMC	156535	Nexio Technologies		-	-
Cable 500mm - 0.04 to 18 GHz	SF102E-50-11N20611SMA218	216937	Huber+Suhner	536582/2E	2025-03-25	2026-03-28
Test Stand: Transmitter Radiated Emission 18 GHz to 26 GHz						
Double Ridged Broadband Horn Antenna	3116C	210452	ETS-Lindgren	00240011	2024-05-20	2027-05-28
Cable 6000mm - 0.04 to 26.5 GHz	SF526S-600-2X11PC35501	216873	Huber+Suhner	2717237001	2025-03-24	2026-03-28
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	00231682	-	-
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	536580/2E	2025-03-24	2026-03-28
Low-Noise EMI Preamplifier	BLMA 1840-1A	209026	BONN Elektronik	2113244B	2024-07-18	2025-07-28
Signal and Spectrum Analyzer 44 GHz	FSV3044	213658	Rohde & Schwarz	101224	2024-04-26	2025-04-28
Software - EMC	BAT-EMC	156535	Nexio Technologies		-	-

Test Stand: Transmitter Radiated Emission 30 MHz to 1000 MHz						
Trilog-Broadband Antenna	VULB 9168	210290	Schwarzbeck Mess-Elektronik OHG	1244	2023-08-25	2025-08-28
6dB Attenuator	DGA 9552 N	210263	Schwarzbeck Mess-Elektronik OHG	CH9006	2024-09-05	2025-09-28
Cable 8000mm - 18 GHz	SF126/11N/11N/8000	220502	Huber+Suhner	556226/126	2024-05-10	2025-05-28
Cable 2000mm - 18 GHz	SF126/11SMA/11N/2000	220503	Huber+Suhner	554756/126	2024-05-10	2025-05-28
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	00231682	-	-
EMI TEST RECEIVER	ESW26	246431	Rohde & Schwarz (Koeln) GmbH & Co. KG	103182	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	NSA FACT3-1.2 STD	2022-04-12	2025-04-28
Software - EMC	BAT-EMC	156535	Nexio Technologies		-	-
Test Stand: Transmitter Radiated Emission 9 kHz to 30 MHz						
12m N(m)-N(m) RF cable	Hyperflex 5 12m	248398	Kabel Kusch	None	2024-05-14	2025-05-28
Active Loop Antenna	HLA 6121	155933	Teseq, Inc	45746	2025-02-14	2027-02-28
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	00231682	-	-
DC Power Injector	PI 6121	155980	Teseq, Inc	-	-	-
EMI TEST RECEIVER	ESW26	246431	Rohde & Schwarz (Koeln) GmbH & Co. KG	103182	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: Antenna port measurements						
Signal and Spectrum Analyzer 44 GHz	FSV3044	213658	Rohde & Schwarz	101224	2024-04-26	2025-04-28

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 µs 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 intendended with prefix "±".

< END OF TEST REPORT >