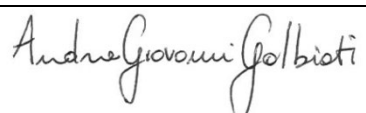
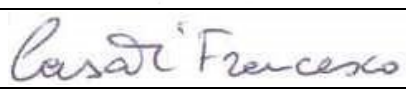


RF TEST REPORT

Test Report No:	24-4791398688-3-1-0-RAD-A	
UL Project No:	4791398688	
Date of issue:	2024-10-18	
Total number of pages:	54	
Applicant:	PsiControl NV Steверlyncklaan 15 8900 Ieper – Belgium	
Contact's person:	Hendrik Caron (hendrik.caron@psicontrol.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_FCC 15C/RSS-247_Accredia_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 	
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 CAN communication
Trade Mark: (*)	 Atlas Copco (Logo: )
Manufacturer: (*)	PsiControl NV Stevelyncklaan 15 8900 Ieper – Belgium
Model Name or Numer / HVIN: (*)	MK5 LINK
PMN: (*)	MK5 LINK
FCC ID: (*)	2BLGZ-MK5LINK
ISED Canada Certification number: (*)	33124-MK5LINK
Ratings: (*)	24 V; 2 VA; 0.05 A; 50/60 Hz
Testing:	
Date of receipt of test item:	2024-09-16
UL Sample Tag No.:	7392667
Status of sample upon receipt:	☒ New and operational ☐ Reconditioned ☐ Damaged
Date(s) of performance of tests:	2024-10-11 to 2024-10-17
Name and address of factory(ies): (*)	Psicontrol Srl Strada Gării 89 Râșnov 505400 – Romania PsiControl NV Stevelyncklaan 15 8900 Ieper – Belgium
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: (*)

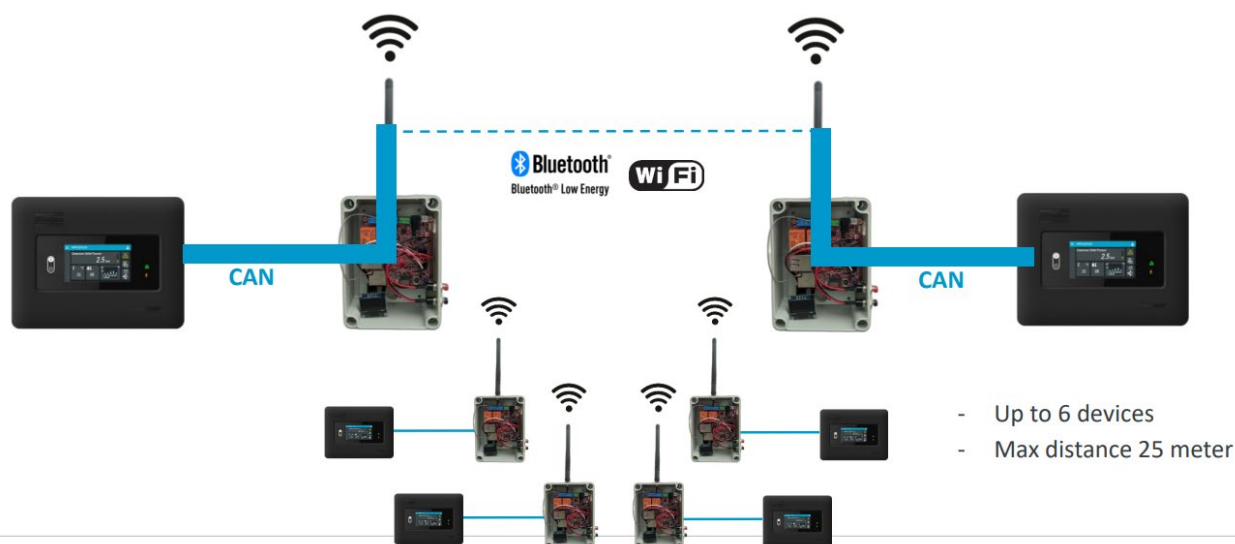
The Atlas Copco MK5 Link module is a wireless M2M module used to optimize machine communications in the compressor room.

The module supports WiFi and BLE wireless communication integrated into a dedicated DIN-mounted housing.

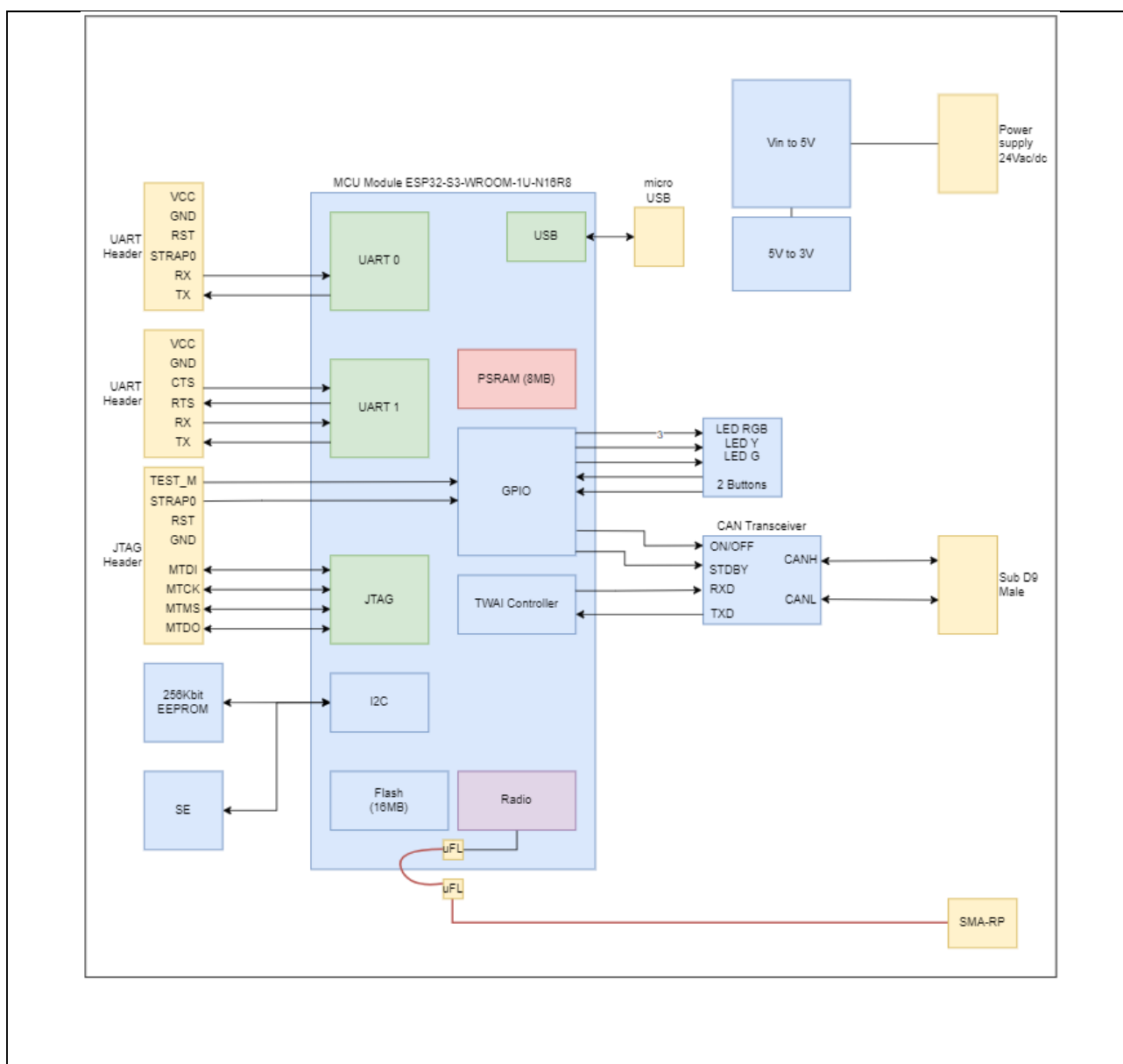
Current solution:



MK5 Link solution:



The MK5 Link module concept is illustrated in the diagram below.



Document history

Test Report No.	Reason for change	Date of issue
24-4791398688-3-1-0-RAD-A	Original release	2024-10-18

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

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

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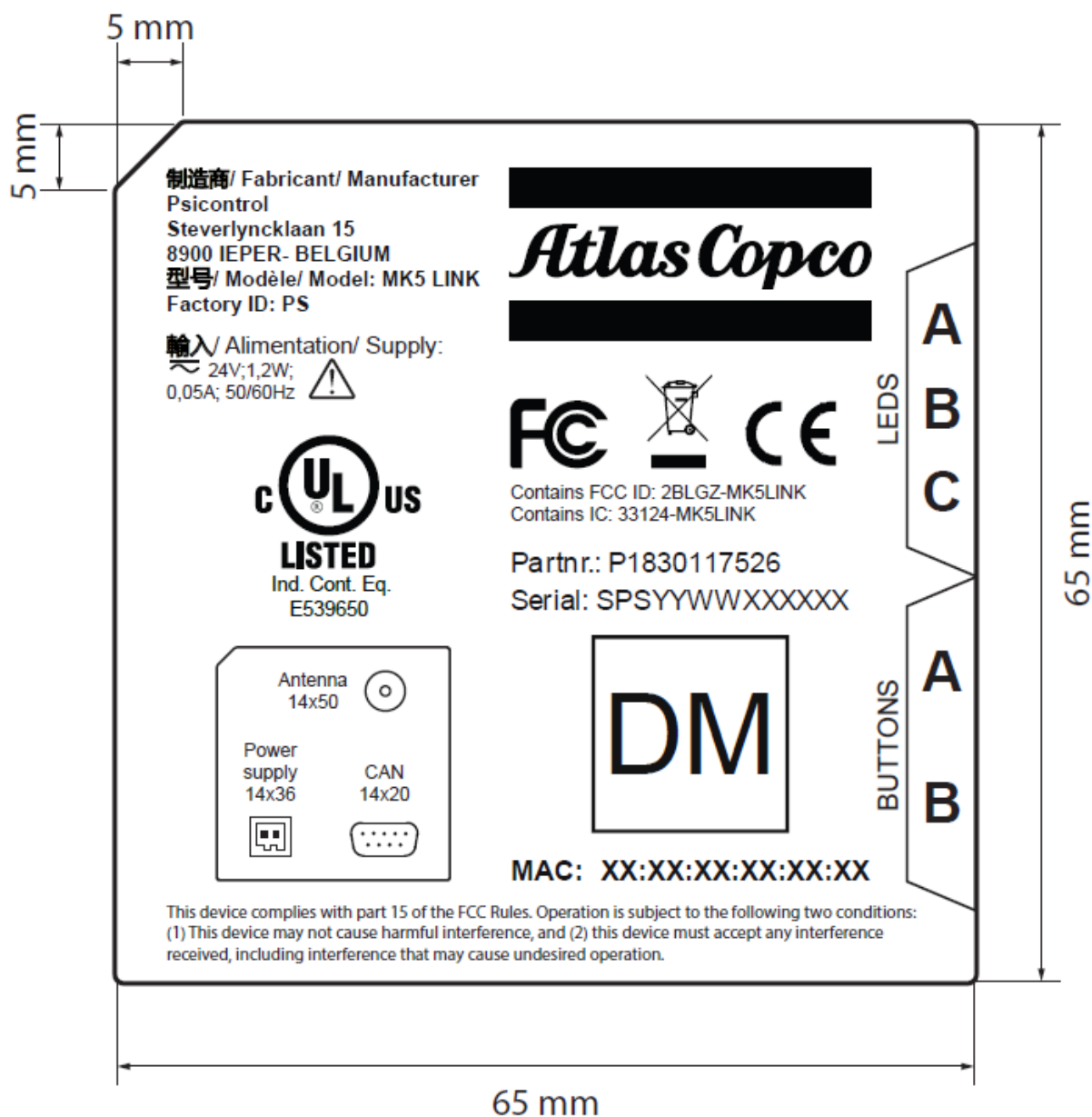
1	Test Item Description	8
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1.2	Additional information related to antenna (*)	12
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1 Test Item Description

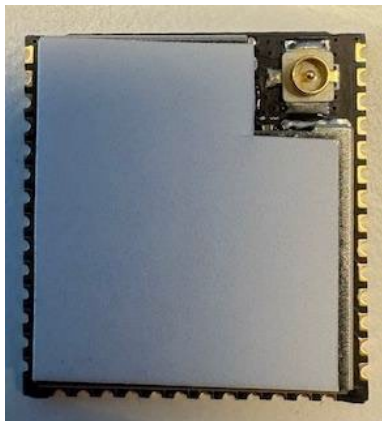
Serial number: (*)	No information available						
Date of production: (*)	No information available						
Ports: (*)	Port name and description		Cable				
			Maximum length(m)	Attached during test	Shielded		
	AC Mains		< 1	☒	☐		
Supplementary information to the ports:	---						
Rated power supply: (*)		Voltage and frequency		Reference poles			
	N			L1	L2	L3	
	☒	AC: 24 V; 50/60 Hz		☒	☒	☐	☐
	☐	DC					
Rated power: (*)	---						
Working frequencies: (*)	2400 to 2483.5 MHz						
Other parameters: (*)	No information available						
Firmware/Software version (original): (*)	No information available						
Firmware/Software version (used for testing): (*)	No information available						
Hardware version: (*)	1v2						
Dimensions in cm (W x H x D): (*)	8.4 x 11.8 x 2.5						

Number	Operating modes		
1	Continuous transmission on BLE technology. Bottom channel Maximum power Data rate: 1 Mbps		
2	Continuous transmission on BLE technology. Middle channel Maximum power Data rate: 1 Mbps		
3	Continuous transmission on BLE technology. Top channel Maximum power Data rate: 1 Mbps		
Supplemental information to the operating mode:			
Worst case conditions have been selected based on pre-scan evaluation			
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
	Trasformer	mdexx	TAM4396-0EG50-OFS1
Documents as provided by the applicant: (*)	Description	File name	Issue date
	---	---	---
Modifications to the test item during testing:	None		

Copy of marking plate: (*)



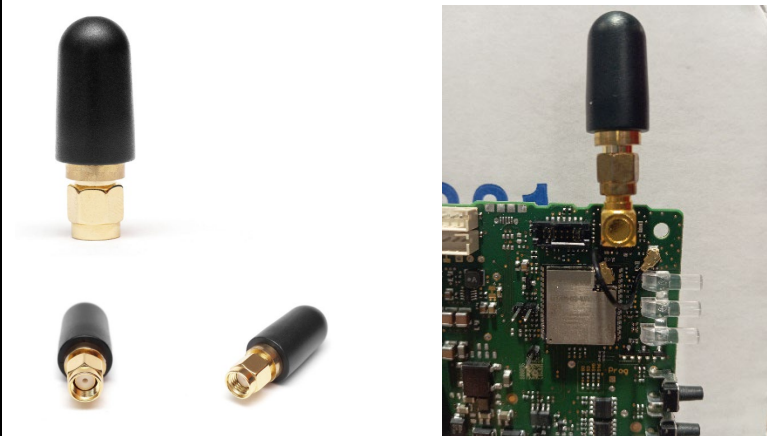
1.1 Additional information of integrated radio module (*)

Producer :	PsiControl NV
Module name :	MK5 LINK
Frequency range :	2400 MHz to 2483.5 MHz
FCC ID :	2BLGZ-MK5LINK
IC ID:	33124-MK5LINK
Photo:	top view :  Bottom view: 

1.2 Additional information related to antenna (*)

Producer :	2J antenna concepthor		
Antenna model :	2J0202-C75G		
Antenna and electrical specifications			
Parameters	2.4/5.0/6.0 GHz ISM Antenna		
Standards	WiFi, BT, ZigBee, ISM		
Band (MHz)	2.4 GHz	5.0 GHz	6.0 GHz
Frequency (MHz)	2410-2490	4920-5925	5925-7125
Return Loss (dB)	~-13.3	~-4.6	~-3.0
VSWR	~1.6:1	~4.3:1	5.8:1
Efficiency (%)	~67.7	~31.0	~25.1
Peak Gain (dBi)	~-3.1	~-0.2	~-0.7
Average Gain (dB)	~-1.7	~-5.2	~-6.0
Impedance (Ohm)	50		
Polarisation	Linear		
Radiation Pattern	Omni-Directional		
Max. Input Power (W)	25		
Connector Type	SMA Male RP		

Photo:



2 Verdict summary section

Standard clause		Description	Accreditation	Verdict	Note
FCC	ISED				
15.203	RSS-Gen 6.8	Antenna requirements	Accredia	N/P	1
15.207	RSS-Gen 8.8	AC power-line conducted emissions	Accredia	P	
15.209 15.247(d)	RSS-Gen 6.13 RSS-Gen 8.9 RSS-Gen 8.10	Radiated emissions & restricted bands emissions	Accredia	P	
15.247(a)(1)	RSS-247 5.1	20 dB emission bandwidth	Accredia	N/P	1
15.247(a)(1)	RSS-247 5.1(b)	Carrier frequency separation	Accredia	N/P	1
15.247(a)(1)(iii)	RSS-247 5.1(d)	Quantity of hopping channels	Accredia	N/P	1
15.247(a)(1)(iii)	RSS-247 5.1(d)	Time of occupancy (dwell time)	Accredia	N/P	1
15.247(a)(2)	RSS-247 5.2(a)	6 dB emission bandwidth	Accredia	N/P	1
---	RSS-Gen 6.7	99% emission bandwidth	Accredia	N/P	1
15.247(b)	RSS-247 5.4(d) RSS-247 5.4(f)	Maximum peak conducted output power	Accredia	N/P	1
15.247(b)	RSS-Gen 6.12 RSS-247 5.4(d)	Transmitter maximum (average) output power	Accredia	N/P	1
15.247(d)	RSS-247 5.5	Band edge	Accredia	P	
15.247(e)	RSS-247 5.2(b)	Power spectral density	Accredia	N/P	1
Test method: ANSI C63.10-2013 Test guide: FCC/KDB-558074 D01 15.247 Meas Guidance v05r02 Notes: 1. Not performed according to Applicant's request.					

Possible test case verdicts:

Test case not performed: N/P

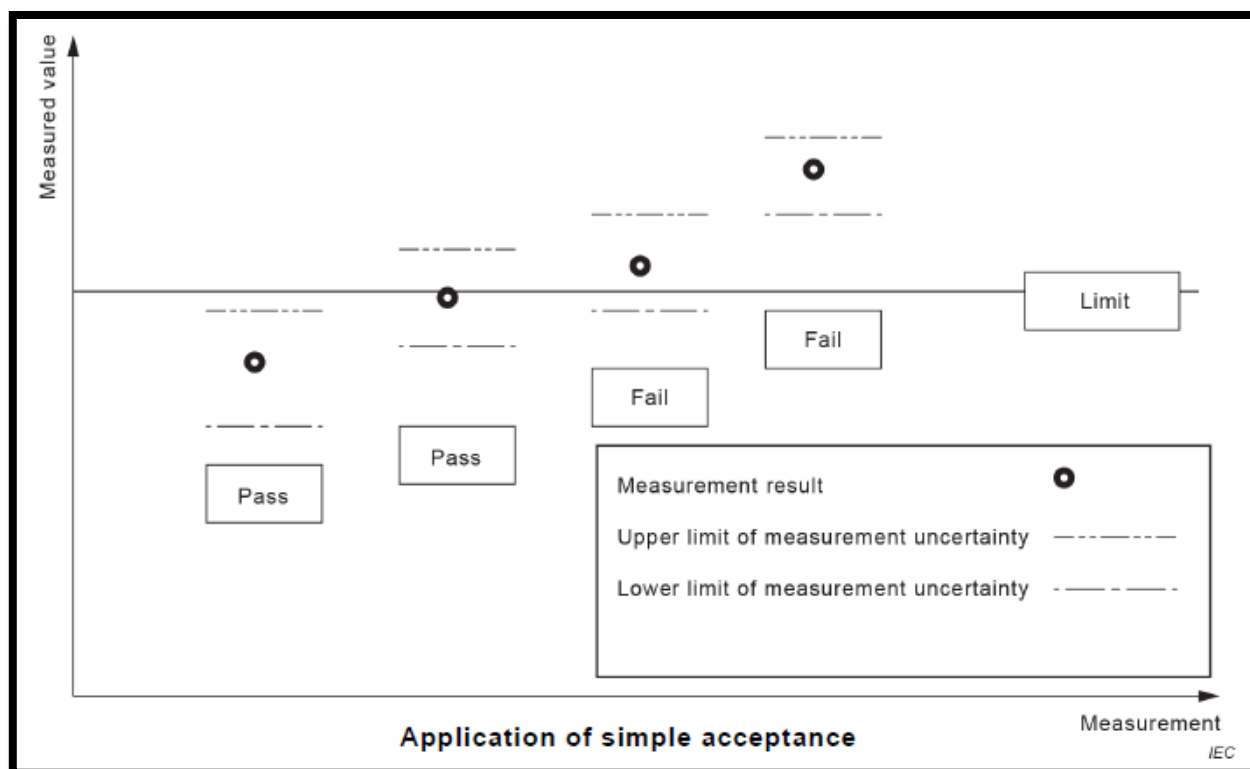
Test case does not apply to test object: N/A

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

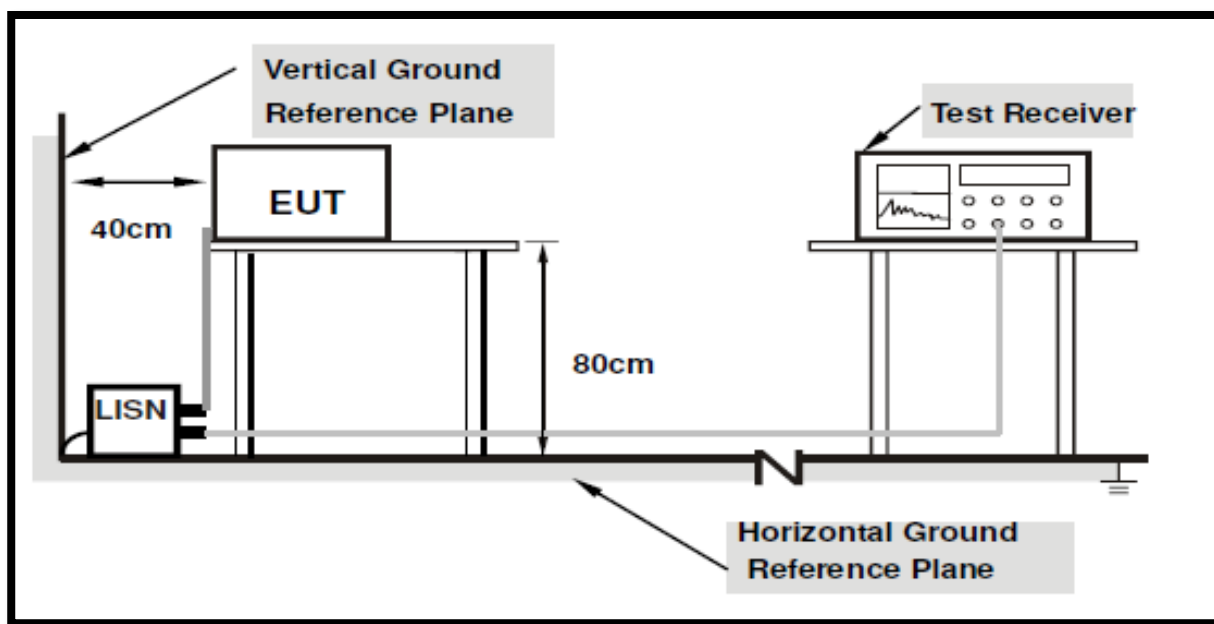
$$\text{Log} = 20 \cdot \log(\text{Lin}) \text{ for voltage and current; } \text{Log} = 10 \cdot \log(\text{Lin}) \text{ for power}$$

☐ Conducted Radio Measurements

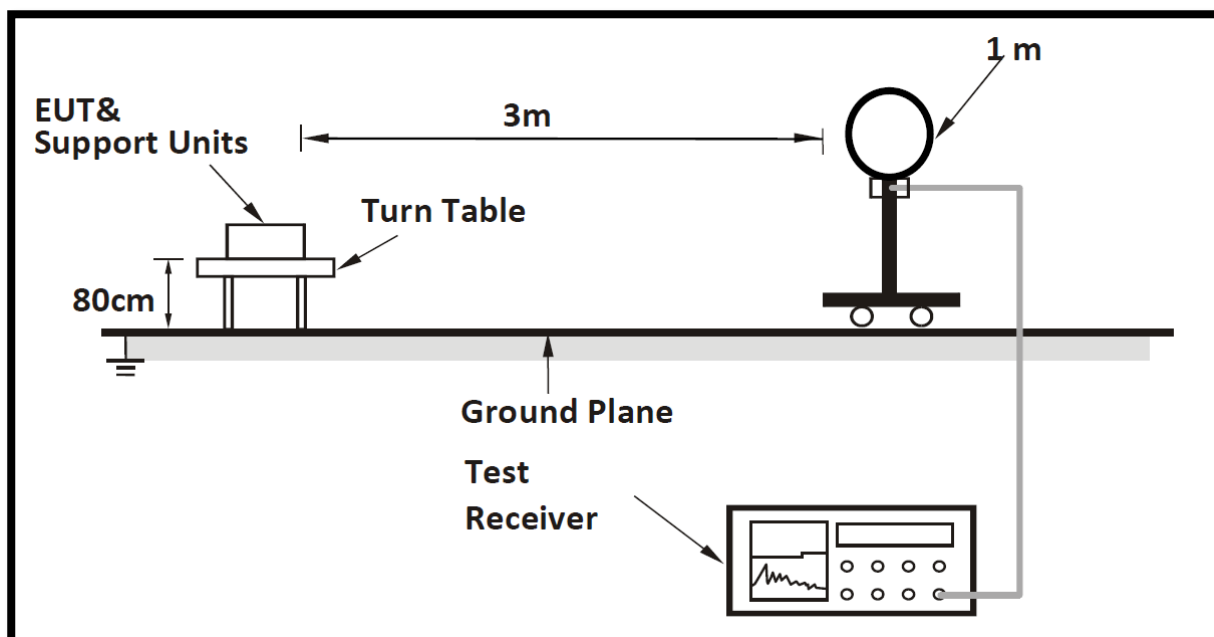
$$P_{\text{out_EUT}} = P_{\text{read_Amplifier}} \text{ (dBm)} + \text{Cable Losses (dB)} + \text{Attenuator (dB)}$$

5 Test Setup Diagrams

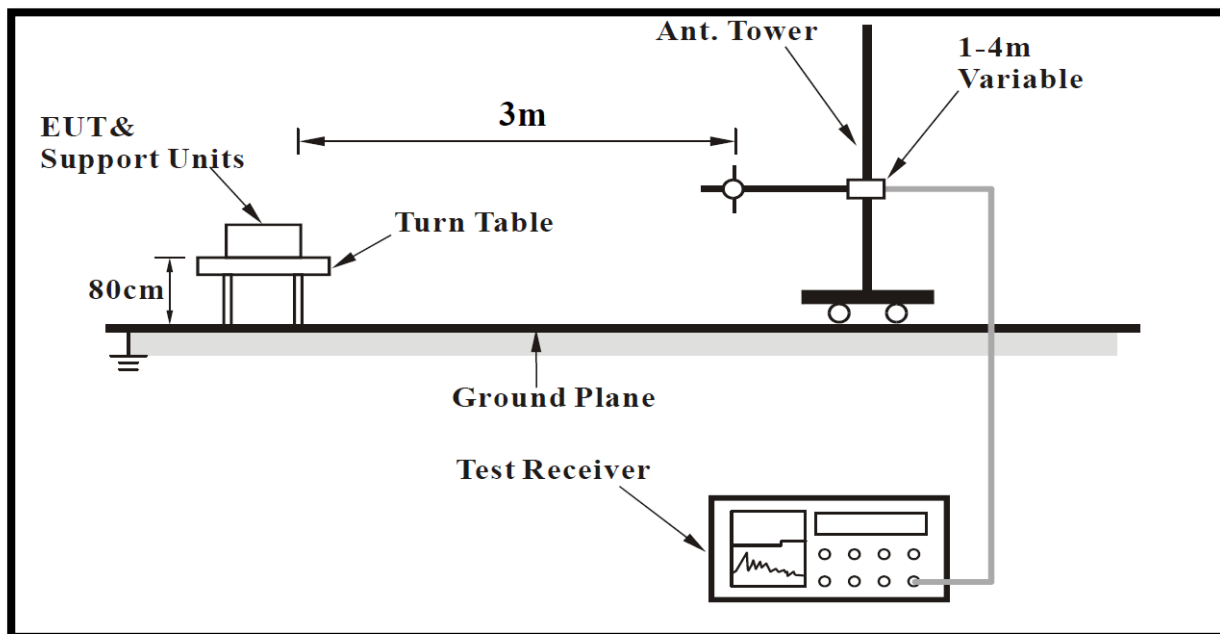
AC Conducted emission:



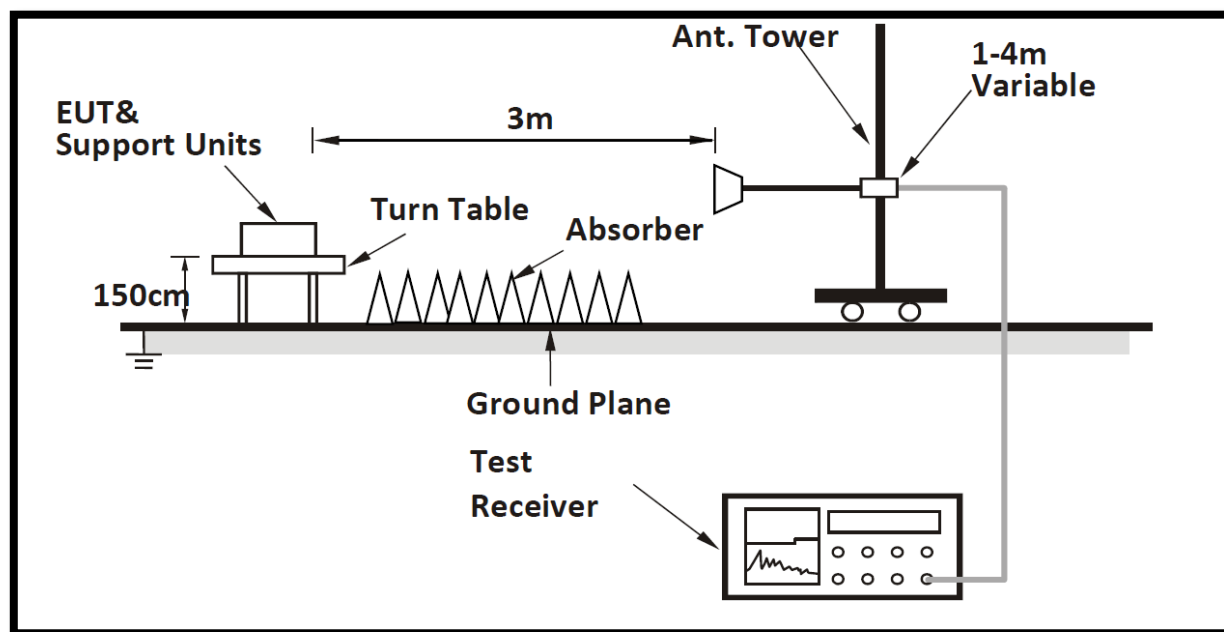
Radiated emission from 9kHz to 30 MHz



Radiated emission from 30 MHz to 1 GHz



Radiated emission from 1 GHz to 26 GHz



6 Tests

6.1 Radiated Test Results

6.1.1 Transmitter Radiated Emission ≤ 30 MHz

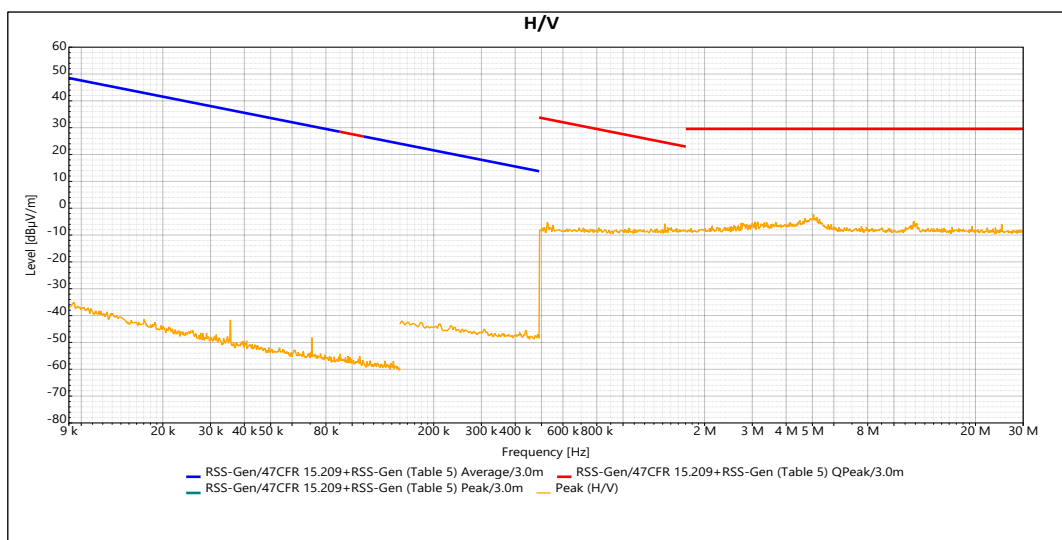
Tested by:	Andrea Giovanni Galbiati
Test date:	2024-10-11
Test location (stand):	Area 8: SAC 3-1.2 (RF emission)
Ambient temperature:	22 °C
Relative humidity:	45 %
Atmospheric pressure:	998 mbar
FCC Reference:	15.209(a)
ISED Canada Reference:	RSS-Gen, 6.13 & 8.9
Test Method Used	ANSI C63.10, Sections 6.3 and 6.4
Frequency Range	9 kHz to 30 MHz
Used mains voltage/frequency:	Pre-scan evaluation for the following power supply has been performed: • 24 V +25/-25%; 50/60 Hz • 24 Vdc +10/-10% 24 V; 60 Hz represent the worst case condition
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 had a duty cycle $< 98\%$ the duty cycle correction factor has been applied to the average result. The corrected level is shown below: <i>Average result + Correction Factor DC = Corrected average level</i> 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

Axis:	X		
Operating Mode:	1		
Test result:	Pass	Tested on:	2024-10-11

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

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

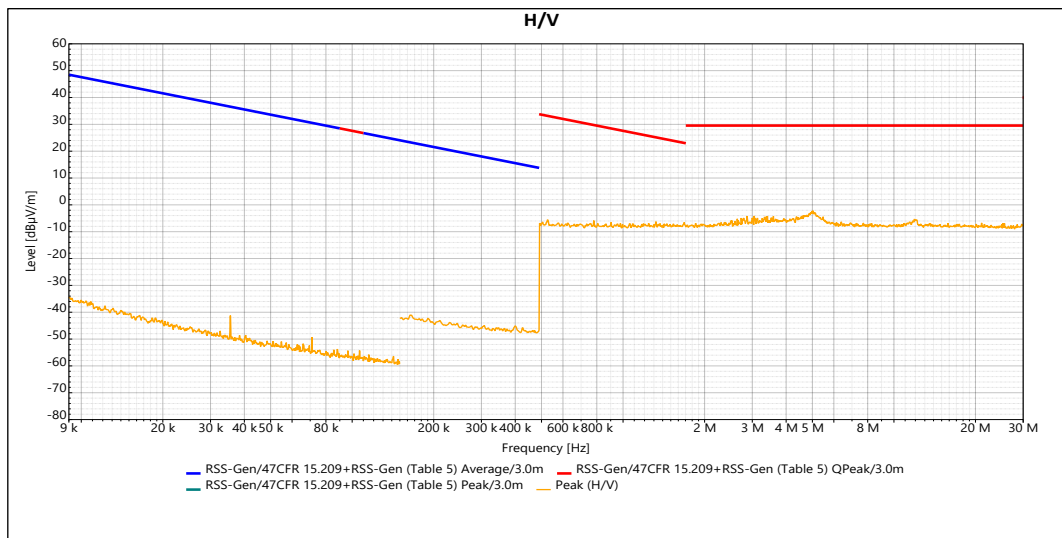


- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Axis:	Y		
Operating Mode:	1		
Test result:	Pass	Tested on:	2024-10-11

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

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

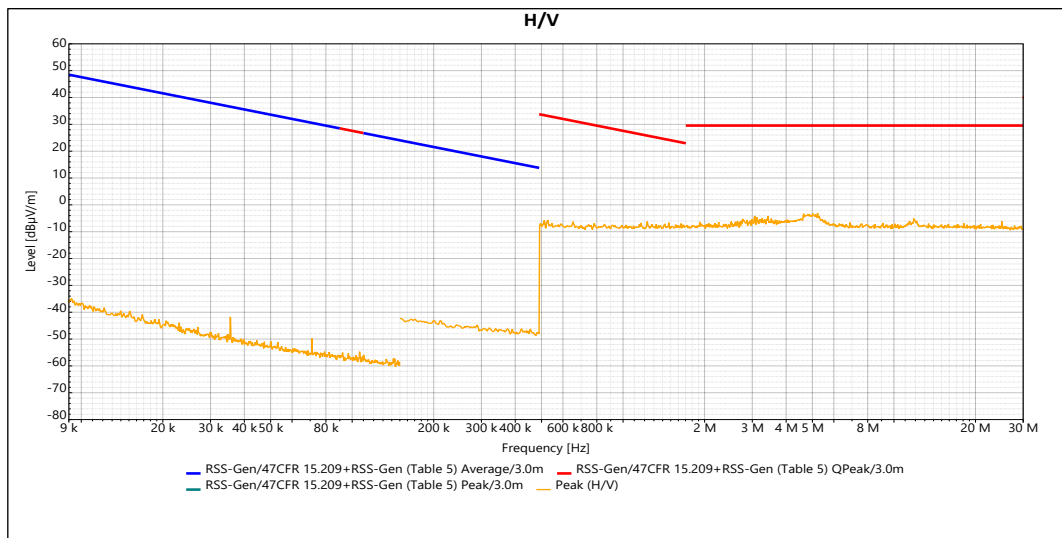


- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Axis:	Z		
Operating Mode:	1		
Test result:	Pass	Tested on:	2024-10-11

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

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

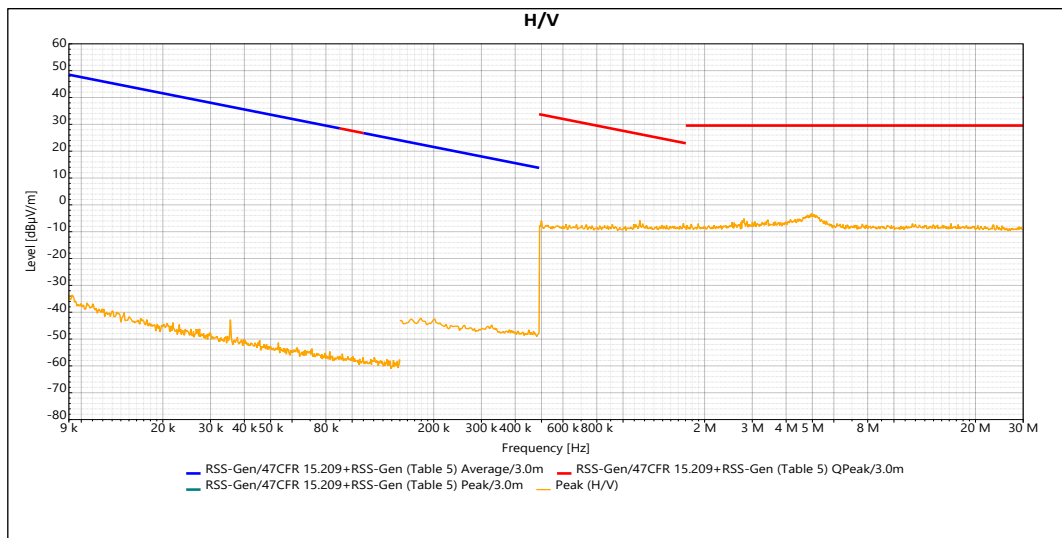


- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Axis:	X		
Operating Mode:	2		
Test result:	Pass	Tested on:	2024-10-11

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

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

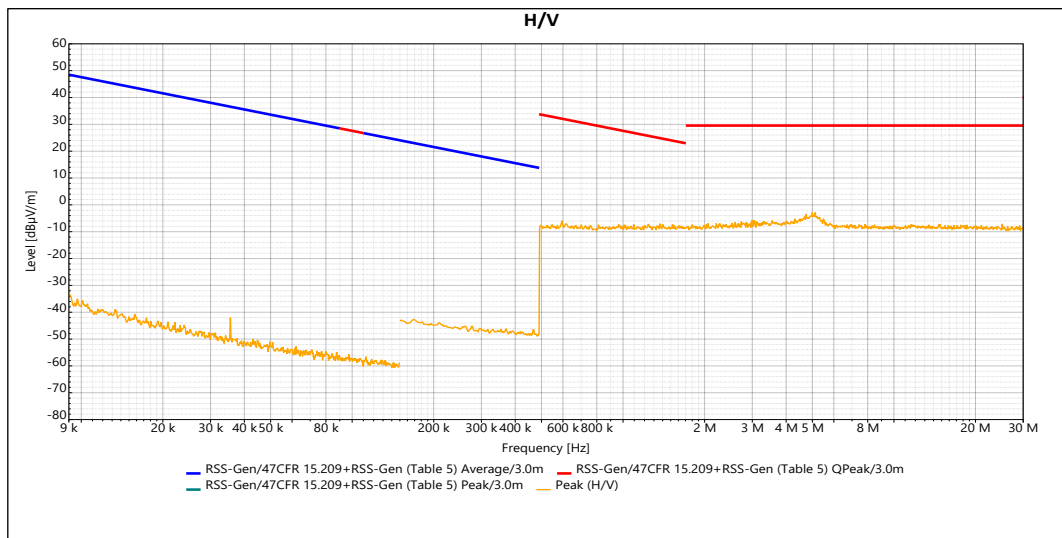


- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Axis:	Y		
Operating Mode:	2		
Test result:	Pass	Tested on:	2024-10-11

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

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

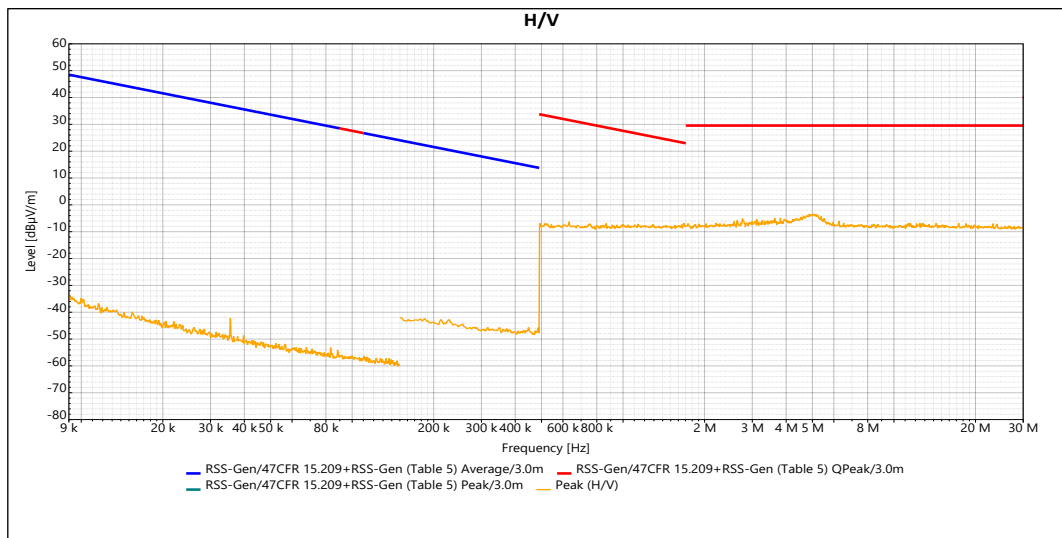


- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Axis:	Z		
Operating Mode:	2		
Test result:	Pass	Tested on:	2024-10-11

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

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

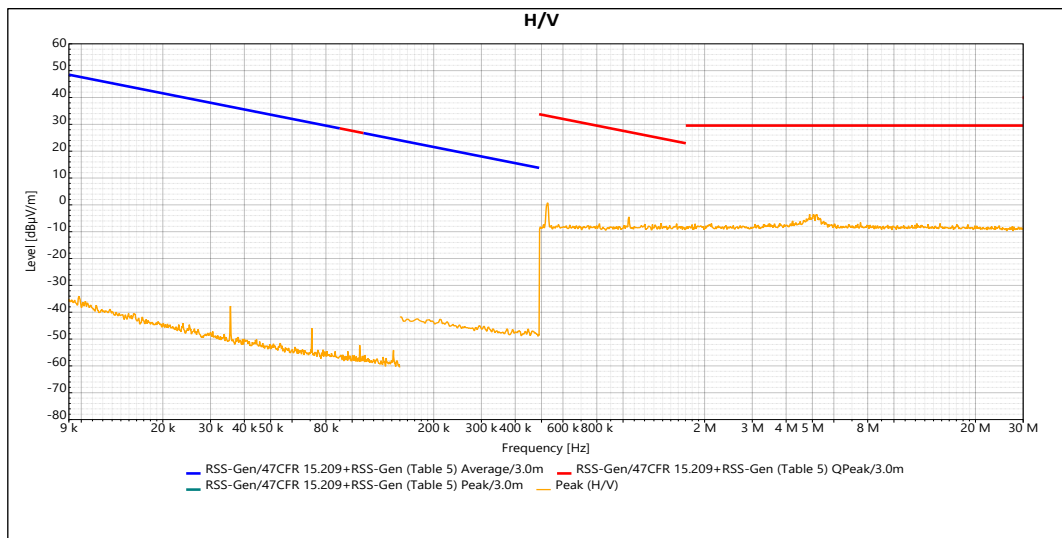


- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Axis:	X		
Operating Mode:	3		
Test result:	Pass	Tested on:	2024-10-11

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

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

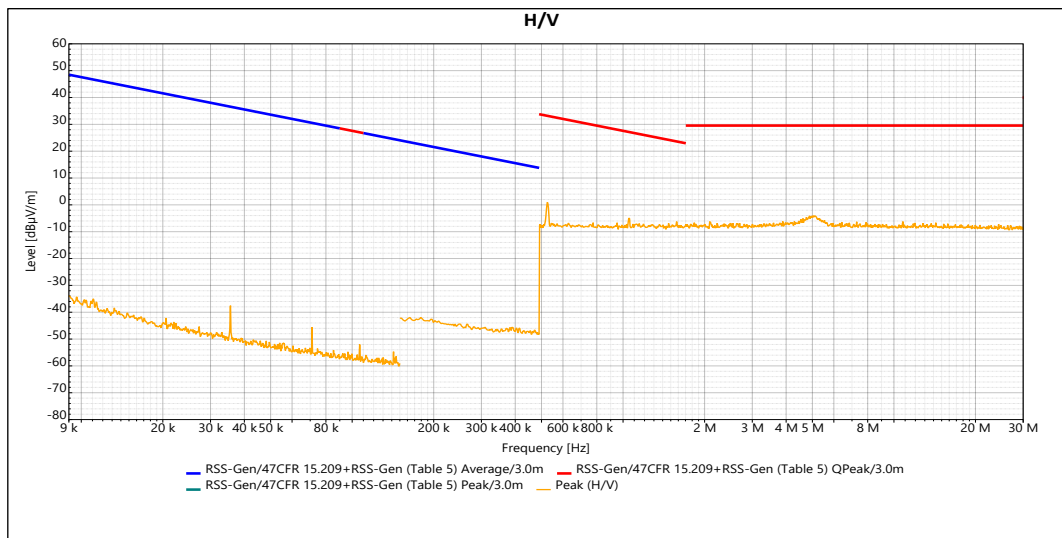


- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Axis:	Y		
Operating Mode:	3		
Test result:	Pass	Tested on:	2024-10-11

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

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

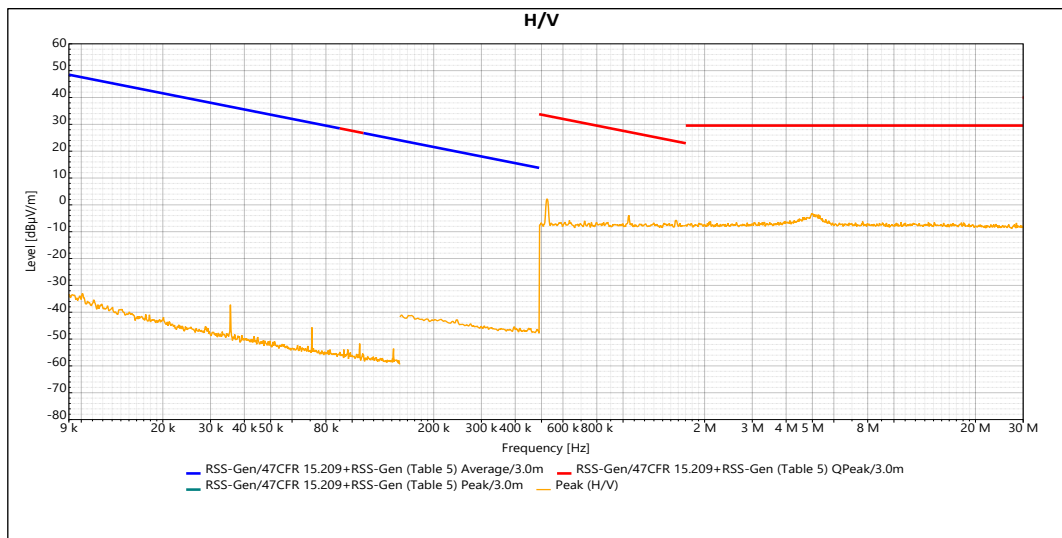


- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Axis:	Z		
Operating Mode:	3		
Test result:	Pass	Tested on:	2024-10-11

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

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:

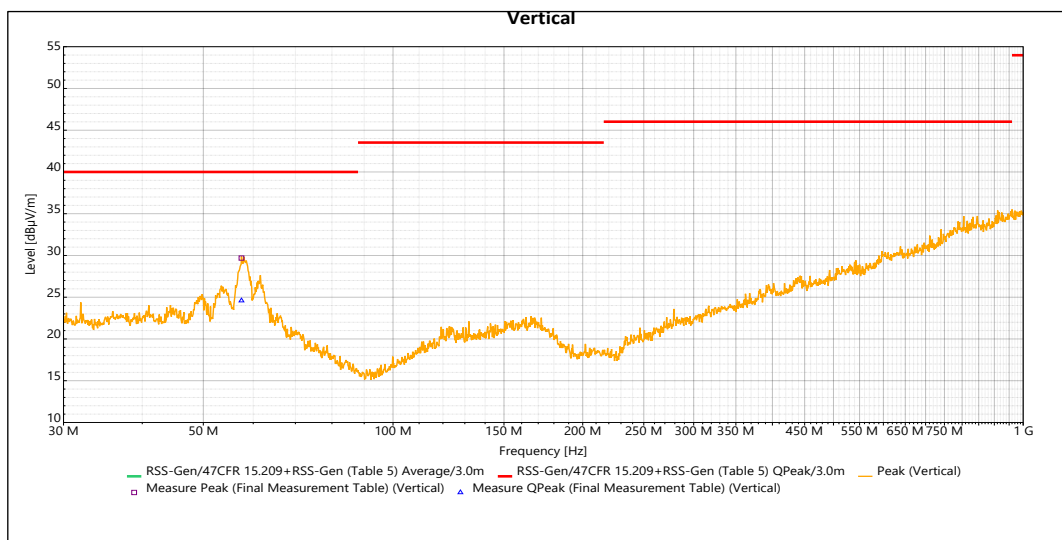
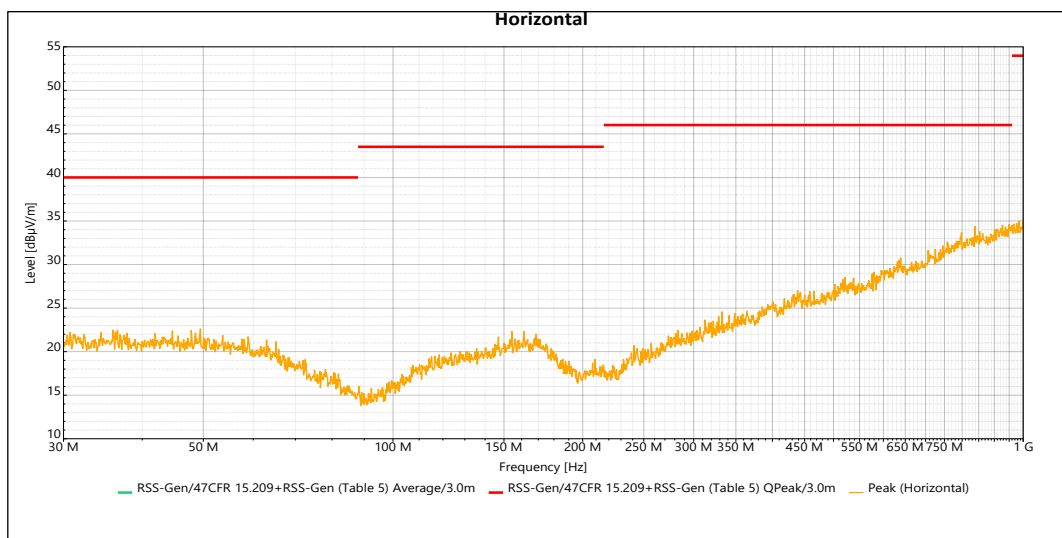
6.1.2 Transmitter Radiated Emission ≥ 30 MHz

Tested by:	Andrea Giovanni Galbiati
Test date:	2024-10-11 to 2024-10-14
Test location (stand):	Area 8: SAC 3-1.2 (RF emission)
Ambient temperature:	22 °C (2024-10-11) 22 °C (2024-10-14)
Relative humidity:	45 % (2024-10-11) 48 % (2024-10-14)
Atmospheric pressure:	997 mbar (2024-10-11) 989 mbar (2024-10-14)
FCC Reference:	15.209(a)
ISED Canada Reference:	RSS-Gen, 6.13 & 8.9
Test Method Used	ANSI C63.10, Sections 6.3, 6.5 and 6.6
Frequency Range	30 MHz to 26 GHz
Used mains voltage/frequency:	Pre-scan evaluation for the following power supply has been performed: 24 V +25/-25%; 50/60 Hz 24 Vdc +10/-10% 24 V; 60 Hz represent the worst case condition
Supplementary information:	The transmitter duty cycle was taken from module report For 1 Mbps data rate the Duty cycle was 83.69 %. In according to the formula below, the correction duty cycle factor is 0.77 dB $DC (\%) = \left(\frac{\sum T_{ON}}{\text{Period or 100 ms whichever is the lesser}} \right) \times 100$ $DC (dB) = 10 \times \log \left(\frac{\text{Period or 100 ms whichever is the lesser}}{\sum T_{ON}} \right)$

Results

Operating Mode:	1		
Test result:	Pass	Tested on:	2024-10-11

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



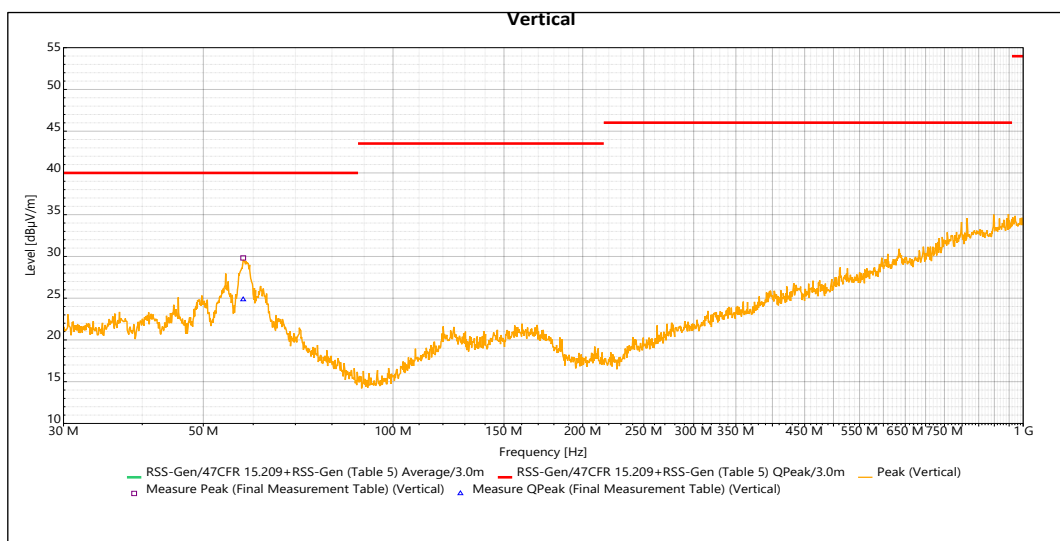
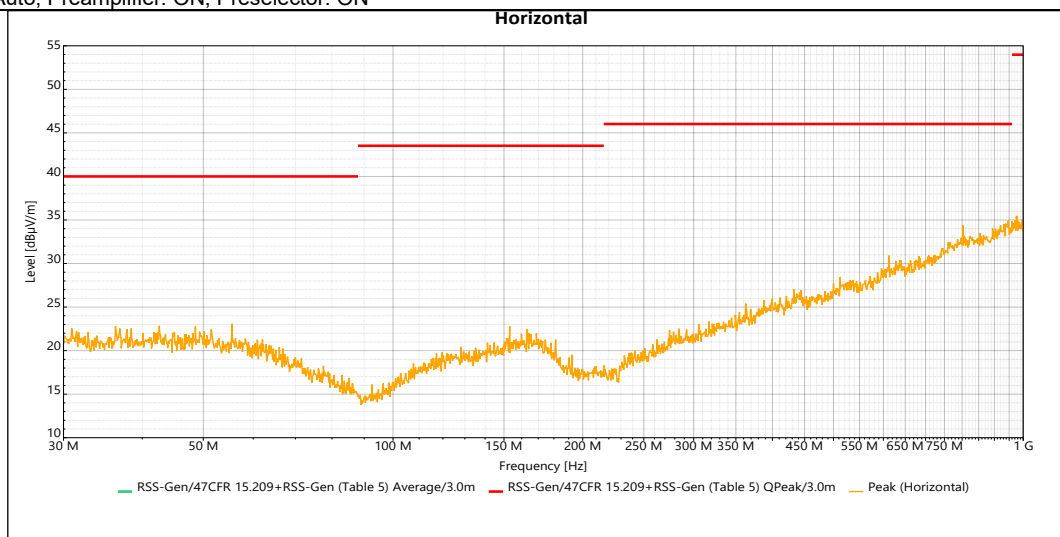
- ☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☒ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Final Measurement Table

Frequency	SR #	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)
57.48 MHz	2	29.692	24.593	40	-15.407	1.074	356.2	Vertical	120 k	5	Pass	19.694

Operating Mode:	2	
Test result:	Pass	Tested on: 2024-10-11

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



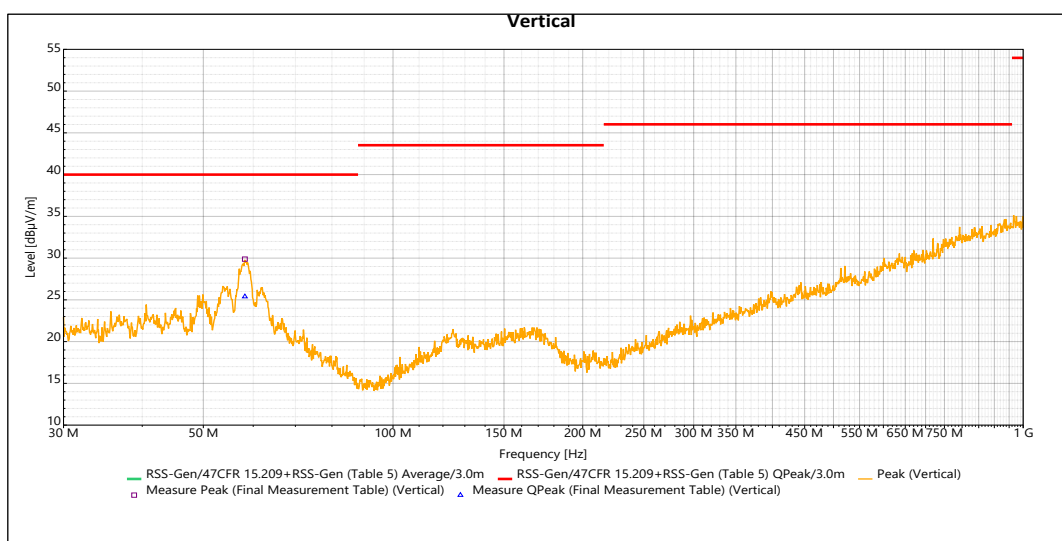
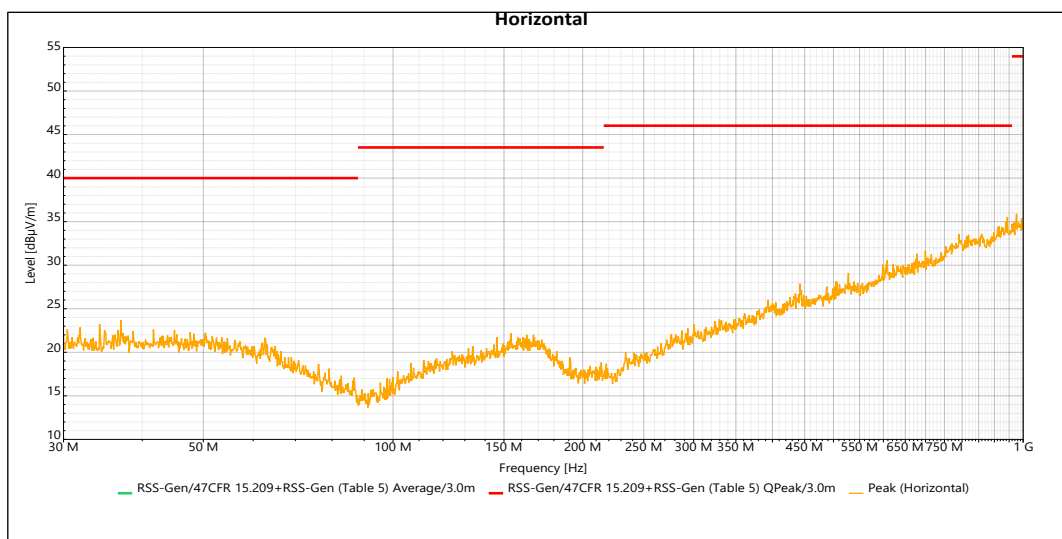
- ☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☒ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Final Measurement Table

Frequency	SR #	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)
57.84 MHz	2	29.821	24.841	40	-15.159	1.005	309.8	Vertical	120 k	5	Pass	19.669

Operating Mode:	3	
Test result:	Pass	Tested on: 2024-10-11

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:

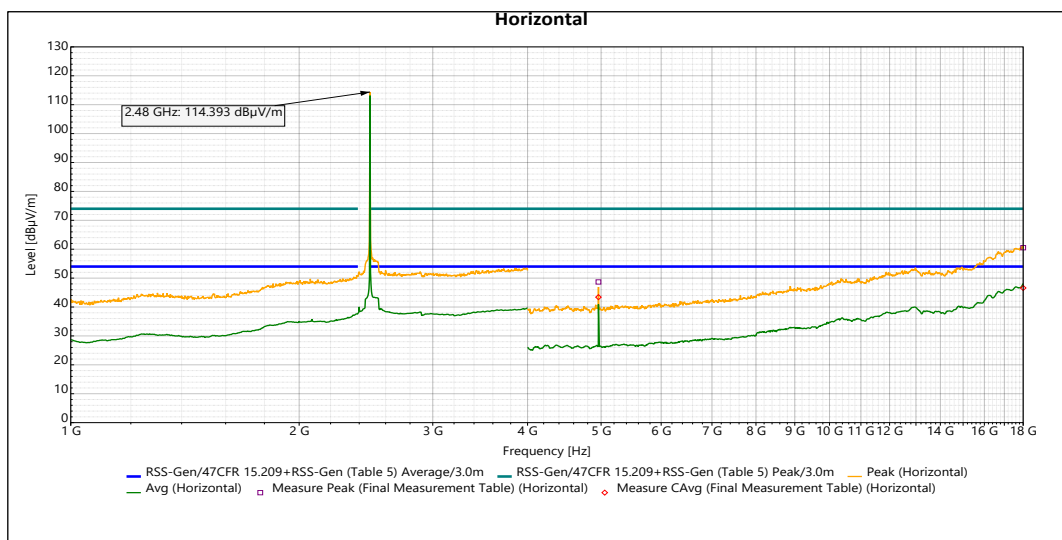
Final Measurement Table

Frequency	SR #	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)
58.2 MHz	2	29.88	25.388	40	-14.612	1	319.4	Vertical	120 k	5	Pass	19.632

Operating Mode:	3	
Test result:	Pass	Tested on: 2024-10-14

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

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	SR #	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)
4.96 GHz	2	48.665	74	-25.335	43.408	54	-10.592	2.325	287.1	Horizontal	1 M	5	Pass	7.49
18 GHz	2	60.524	74	-13.476	46.591	54	-7.409	3.457	308.8	Horizontal	1 M	5	Pass	31.299

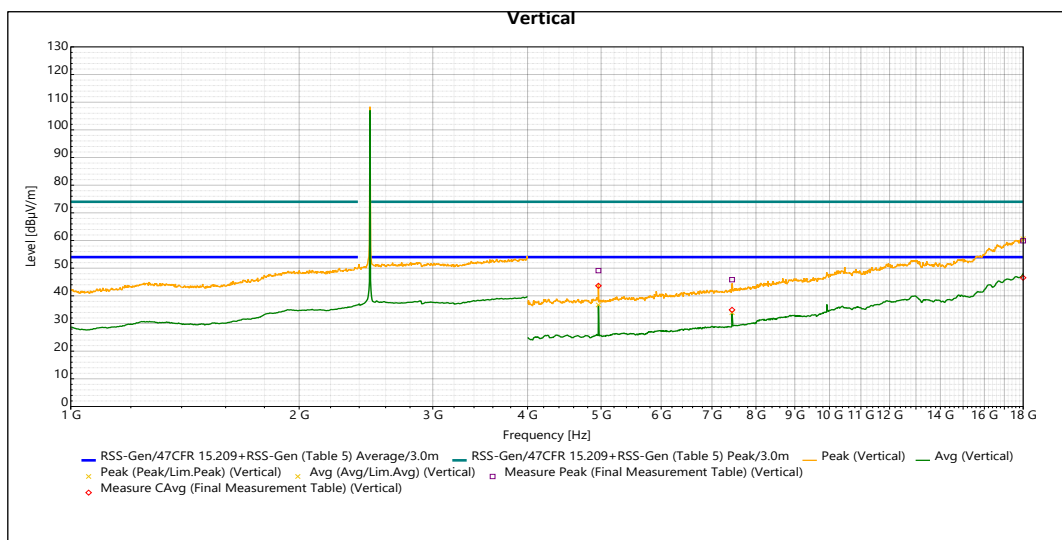
Corrected avg measurements (With correction DC= 0.77 dB)

Frequency	SR #	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)
4.96 GHz	2	48.665	74	-25.335	44.178	54	-9.822	2.325	287.1	Horizontal	1 M	5	Pass	7.49
18 GHz	2	60.524	74	-13.476	47.361	54	-6.639	3.457	308.8	Horizontal	1 M	5	Pass	31.299

Operating Mode:	3		
Test result:	Pass	Tested on:	2024-10-14

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

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	SR #	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)
4.96 GHz	2	49.121	74	-24.879	43.641	54	-10.359	2.136	355.4	Vertical	1 M	5	Pass	7.49
7.44 GHz	2	45.838	74	-28.162	34.921	54	-19.079	1.334	312.7	Vertical	1 M	5	Pass	13.472
17.995 GHz	2	59.905	74	-14.095	46.526	54	-7.474	1.589	329.4	Vertical	1 M	5	Pass	31.289

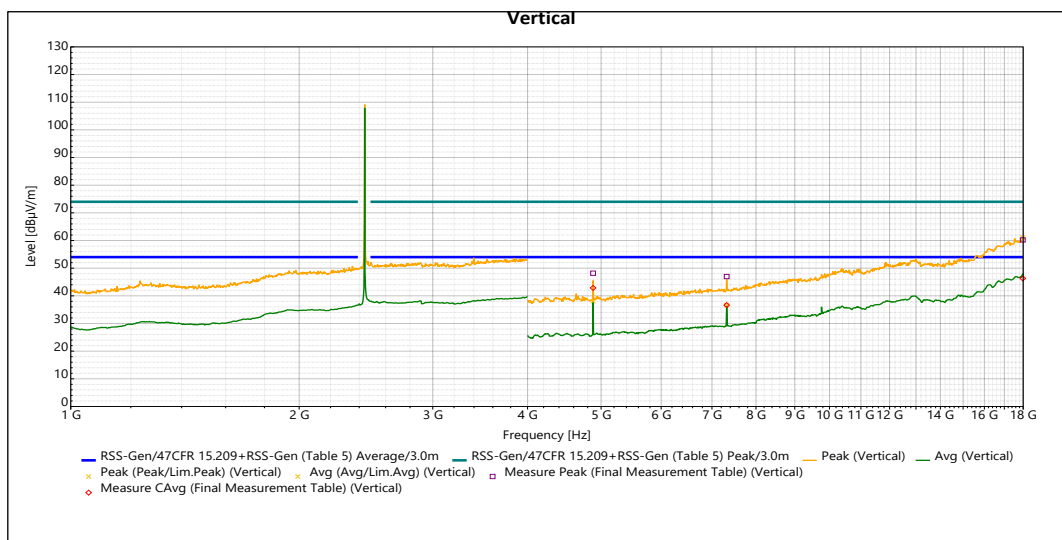
Corrected avg measurements (With correction DC= 0.77 dB)

Frequency	SR #	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)
4.96 GHz	2	49.121	74	-24.879	44.411	54	-9.589	2.136	355.4	Vertical	1 M	5	Pass	7.49
7.44 GHz	2	45.838	74	-28.162	35.691	54	-18.309	1.334	312.7	Vertical	1 M	5	Pass	13.472
17.995 GHz	2	59.905	74	-14.095	47.296	54	-6.704	1.589	329.4	Vertical	1 M	5	Pass	31.289

Operating Mode:	2
Test result:	Pass
Tested on:	2024-10-14

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

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	SR #	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)
4.88 GHz	2	48.182	74	-25.818	42.863	54	-11.137	2.317	357.4	Vertical	1 M	5	Pass	7.436
7.32 GHz	2	46.968	74	-27.032	36.637	54	-17.363	1.69	318.9	Vertical	1 M	5	Pass	13.324
17.981 GHz	2	60.225	74	-13.775	46.325	54	-7.675	1.411	347.2	Vertical	1 M	5	Pass	31.257

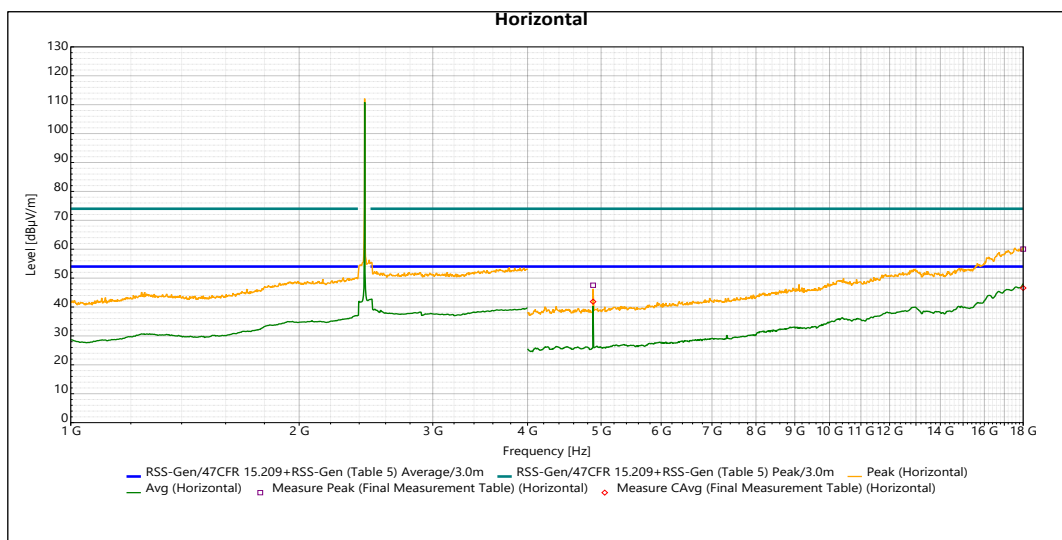
Corrected avg measurements (With correction DC= 0.77 dB)

Frequency	SR #	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)
4.88 GHz	2	48.182	74	-25.818	43.633	54	-10.367	2.317	357.4	Vertical	1 M	5	Pass	7.436
7.32 GHz	2	46.968	74	-27.032	37.407	54	-16.593	1.69	318.9	Vertical	1 M	5	Pass	13.324
17.981 GHz	2	60.225	74	-13.775	47.095	54	-6.905	1.411	347.2	Vertical	1 M	5	Pass	31.257

Operating Mode:	2		
Test result:	Pass	Tested on:	2024-10-14

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

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	SR #	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)
4.88 GHz	2	47.538	74	-26.462	41.851	54	-12.149	2.163	342.9	Horizontal	1 M	5	Pass	7.436
18 GHz	2	60.048	74	-13.952	46.584	54	-7.416	2.908	355.9	Horizontal	1 M	5	Pass	31.299

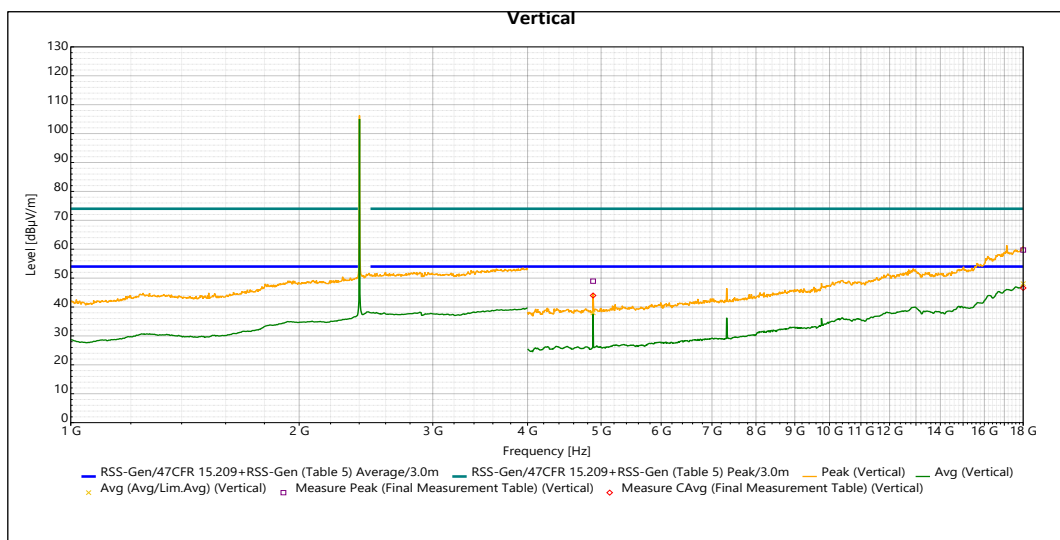
Corrected avg measurements (With correction DC= 0.77 dB)

Frequency	SR #	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)
4.88 GHz	2	47.538	74	-26.462	42.621	54	-11.379	2.163	342.9	Horizontal	1 M	5	Pass	7.436
18 GHz	2	60.048	74	-13.952	47.354	54	-6.646	2.908	355.9	Horizontal	1 M	5	Pass	31.299

Operating Mode:	1		
Test result:	Pass	Tested on:	2024-10-14

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

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

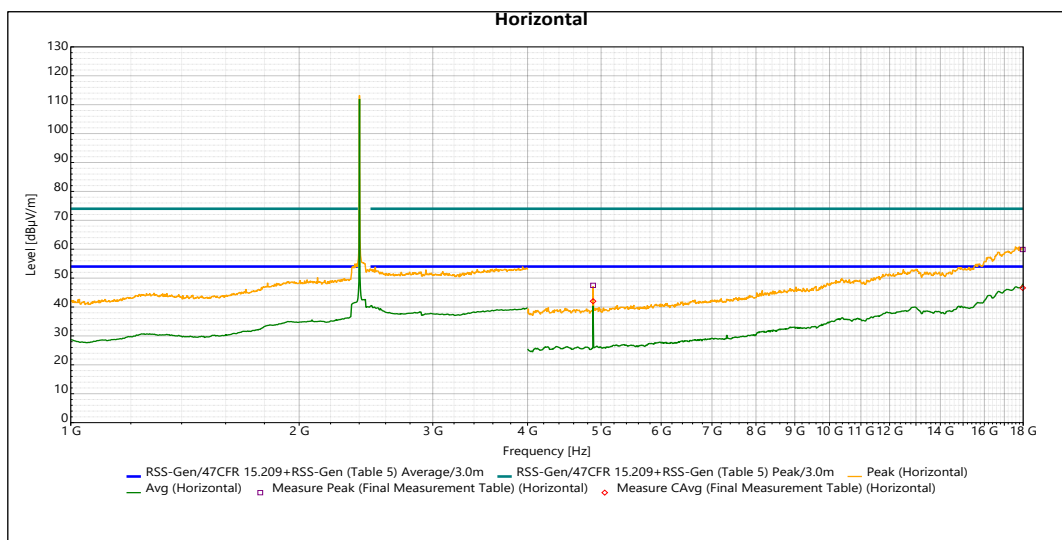
Frequency	SR #	Measure Peak (dBμV/m)	Limit Peak (dBμV/m)	Margin Peak (dB)	Measure CAvg (dBμV/m)	Limit Avg (dBμV/m)	Margin Avg (dB)	Height (m)	Angle (°)	Polarization	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
4.88 GHz	2	48.953	74	-25.047	43.99	54	-10.01	2.478	358	Vertical	1 M	5	Pass	7.436
18 GHz	2	59.717	74	-14.283	46.586	54	-7.414	2.738	357.9	Vertical	1 M	5	Pass	31.299

Corrected avg measurements (With correction DC= 0.77 dB)

Frequency	SR #	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)
4.88 GHz	2	48.953	74	-25.047	44.76	54	-9.24	2.478	358	Vertical	1 M	5	Pass	7.436
18 GHz	2	59.717	74	-14.283	47.356	54	-6.644	2.738	357.9	Vertical	1 M	5	Pass	31.299

Operating Mode:	1		
Test result:	Pass	Tested on:	2024-10-14

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
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

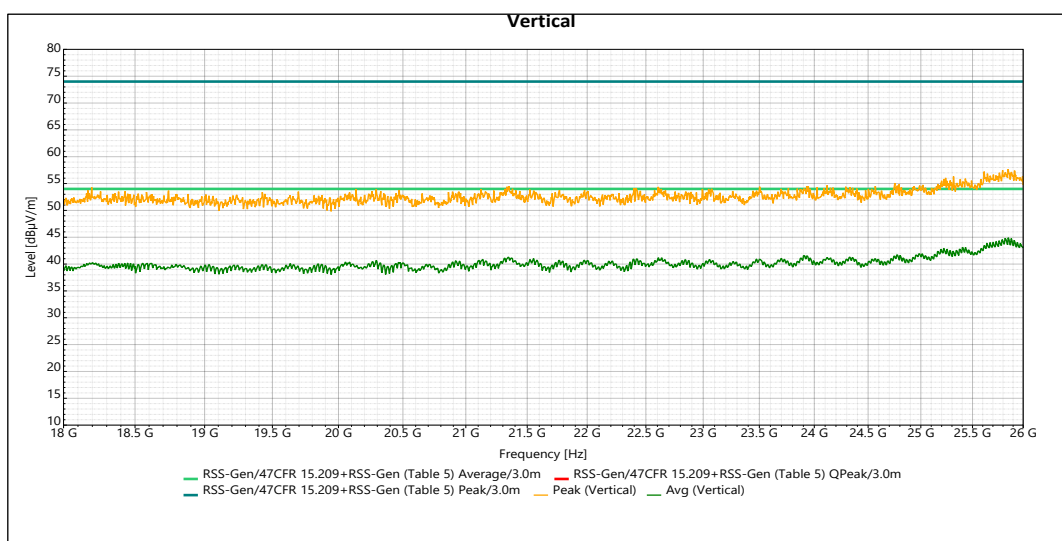
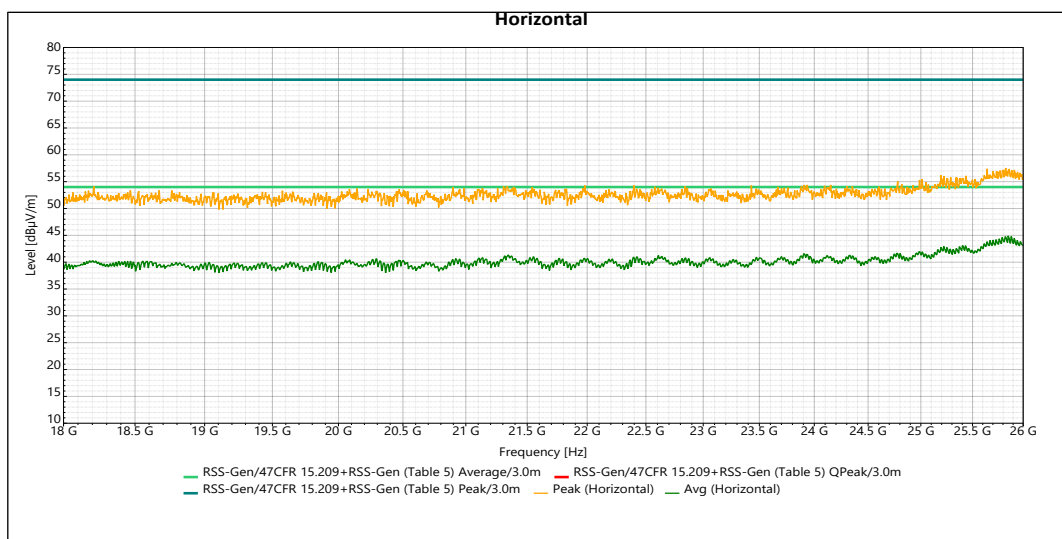
Frequency	SR #	Measure Peak (dBμV/m)	Limit Peak (dBμV/m)	Margin Peak (dB)	Measure CAvg (dBμV/m)	Limit Avg (dBμV/m)	Margin Avg (dB)	Height (m)	Angle (°)	Polarization	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
4.88 GHz	2	47.491	74	-26.509	42.011	54	-11.989	2.384	347.6	Horizontal	1 M	5	Pass	7.436
18 GHz	2	59.909	74	-14.091	46.599	54	-7.401	3.873	317.7	Horizontal	1 M	5	Pass	31.3

Corrected avg measurements (With correction DC= 0.77 dB)

Frequency	SR #	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)
4.88 GHz	2	47.491	74	-26.509	42.781	54	-11.219	2.384	347.6	Horizontal	1 M	5	Pass	7.436
18 GHz	2	59.909	74	-14.091	47.369	54	-6.631	3.873	317.7	Horizontal	1 M	5	Pass	31.3

Operating Mode:	1	
Test result:	Pass	Tested on: 2024-10-14

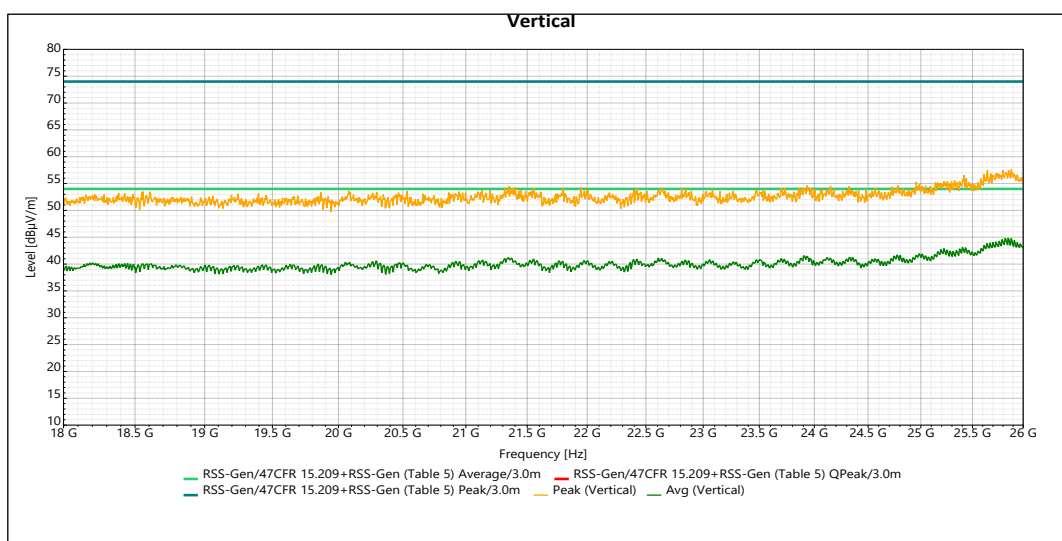
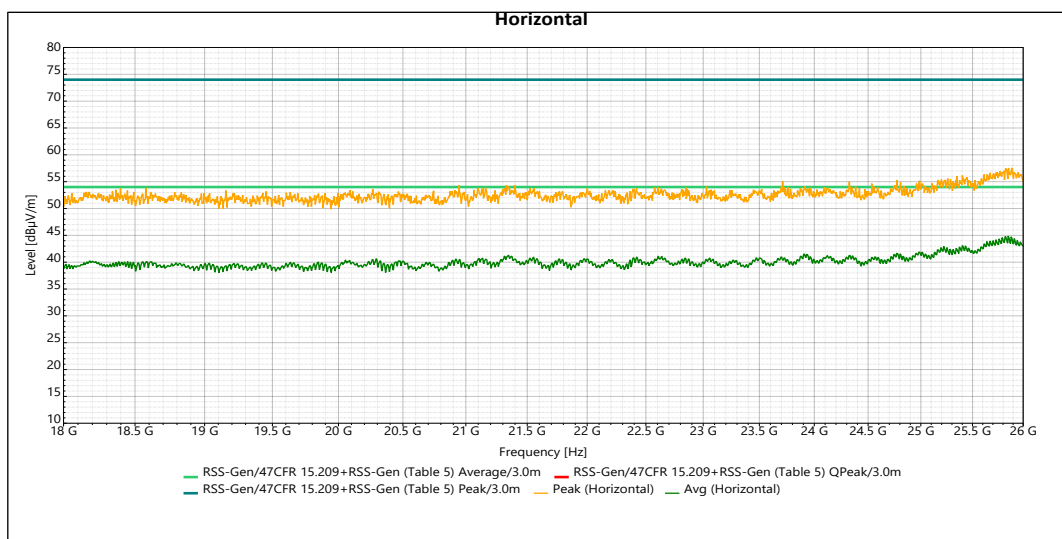
Start Frequency: 18 GHz; Stop Frequency: 26 GHz; Step: 250 kHz; Sweep Time: 20 ms/Step; RF Attenuation: Auto; RBW: 1 MHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



- ☒ 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:

Operating Mode:	2	
Test result:	Pass	Tested on: 2024-10-14

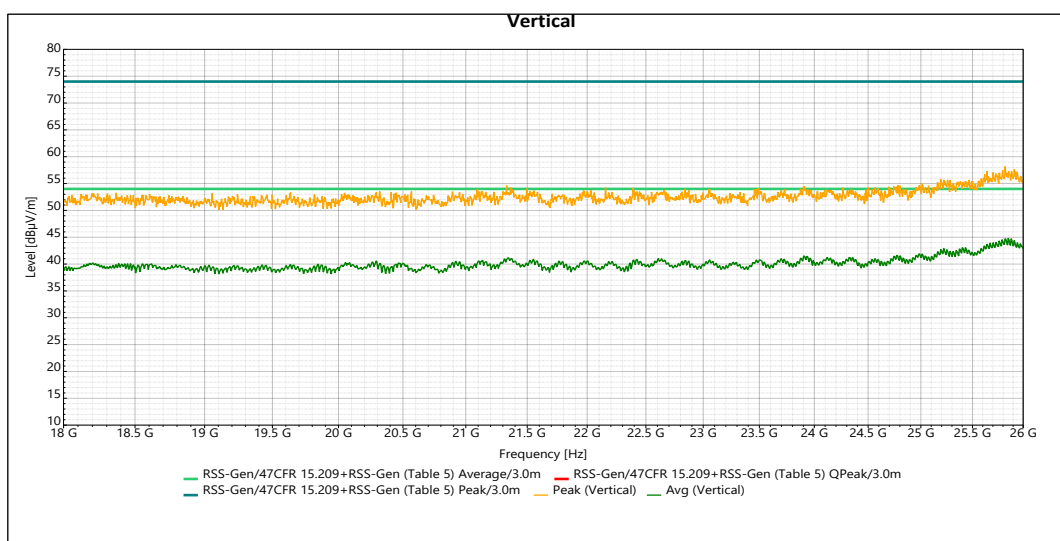
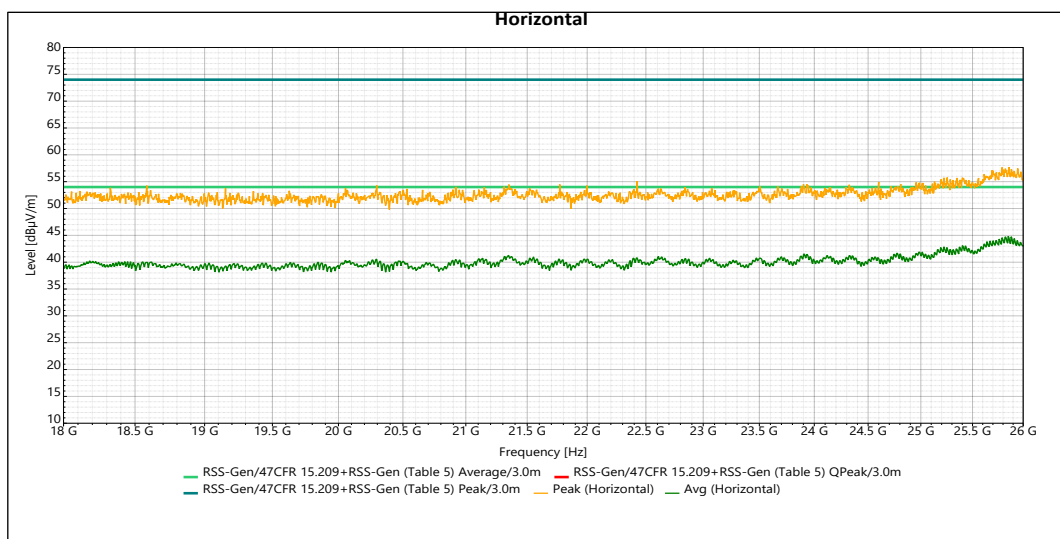
Start Frequency: 18 GHz; Stop Frequency: 26 GHz; Step: 250 kHz; Sweep Time: 20 ms/Step; RF Attenuation: Auto; RBW: 1 MHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



- ☒ 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:

Operating Mode:	3	
Test result:	Pass	Tested on: 2024-10-14

Start Frequency: 18 GHz; Stop Frequency: 26 GHz; Step: 250 kHz; Sweep Time: 20 ms/Step; RF Attenuation: Auto; RBW: 1 MHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



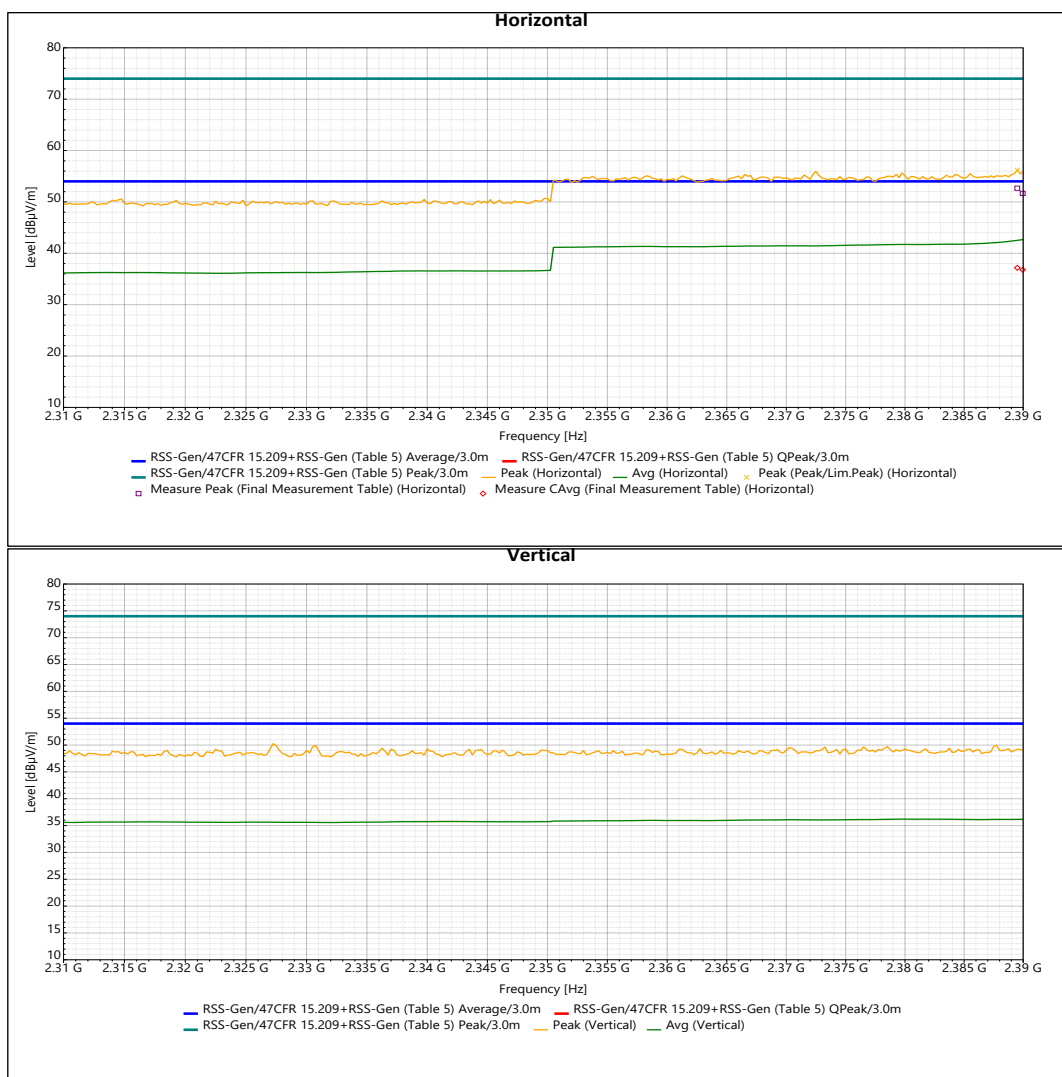
- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ The measurement results of highest emissions relative to the limit for each detector type are shown below:

6.1.3 Transmitter Band Edge Radiated Emission and restricted band evaluation

Tested by:	Andrea Giovanni Galbiati
Test date:	2024-10-14
Test location (stand):	Area 8: SAC 3-1.2 (RF emission)
Ambient temperature:	22 °C
Relative humidity:	45 %
Atmospheric pressure:	998 mbar
FCC Reference:	15.247(d) and 15.209(a)
ISED Canada Reference:	RSS-Gen, 6.13 & 8.9 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:	Pre-scan evaluation for the following power supply has been performed: • 24 V +25/-25%; 50/60 Hz • 24 Vdc +10/-10% 24 V; 60 Hz represent the worst case condition
Supplementary information:	As the EUT had a duty cycle < 98% the duty cycle correction factor has been applied to the average result. The corrected level is shown below: <i>Upper Band Average result + Correction Factor DC = Corrected band edge level</i>

Restricted band evaluation:

Operating Mode:	1		
Test result:	Pass	Tested on:	2024-10-14
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

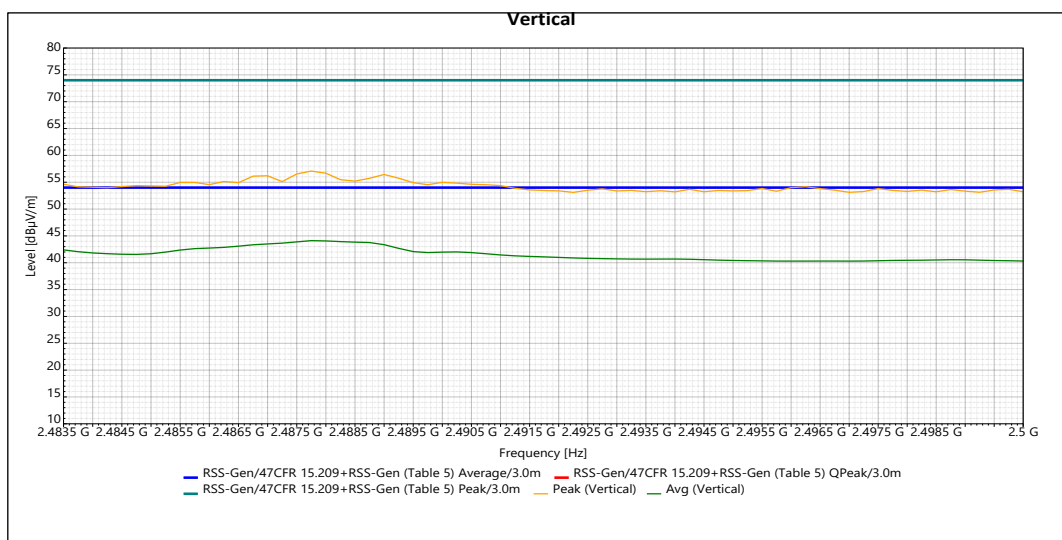
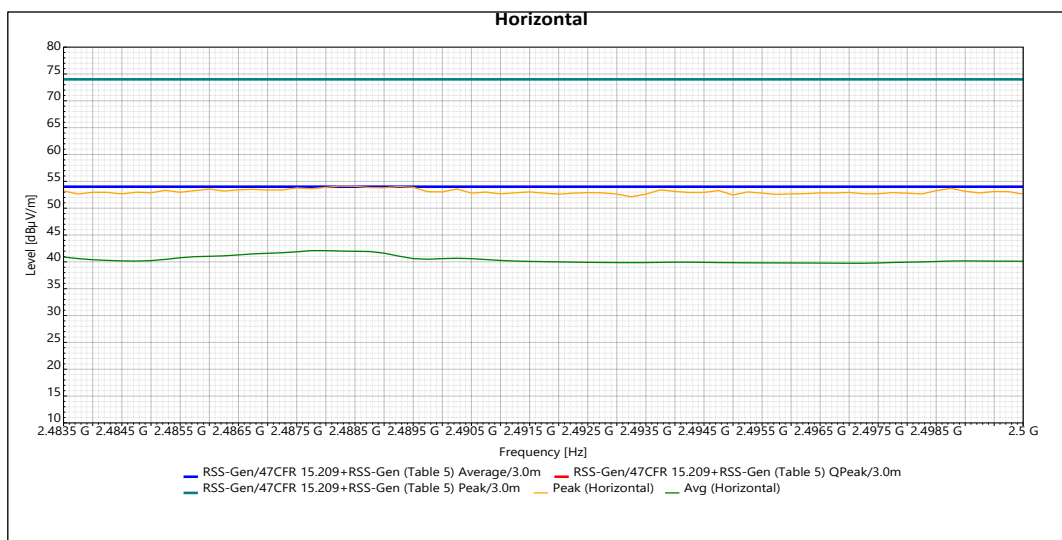
Frequency	SR #	Measure Peak (dBμV/m)	Limit Peak (dBμV/m)	Margin Peak (dB)	Measure CAvg (dBμV/m)	Limit Avg (dBμV/m)	Margin Avg (dB)	Height (m)	Angle (°)	Polarization	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
2.39 GHz	1	52.671	74	-21.329	37.18	54	-16.82	2.37	201.6	Horizontal	1 M	5	Pass	36.52
2.39 GHz	1	51.658	74	-22.342	36.791	54	-17.209	1.629	229.1	Horizontal	1 M	5	Pass	36.519

Corrected avg measurements (With correction DC= 0.77 dB)

Frequency	SR #	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)
2.39 GHz	1	52.671	74	-21.329	37.950	54	-16.05	2.37	201.6	Horizontal	1 M	5	Pass	36.52
2.39 GHz	1	51.658	74	-22.342	37.561	54	-16.439	1.629	229.1	Horizontal	1 M	5	Pass	36.519

Operating Mode:	3		
Test result:	Pass	Tested on:	2024-10-11

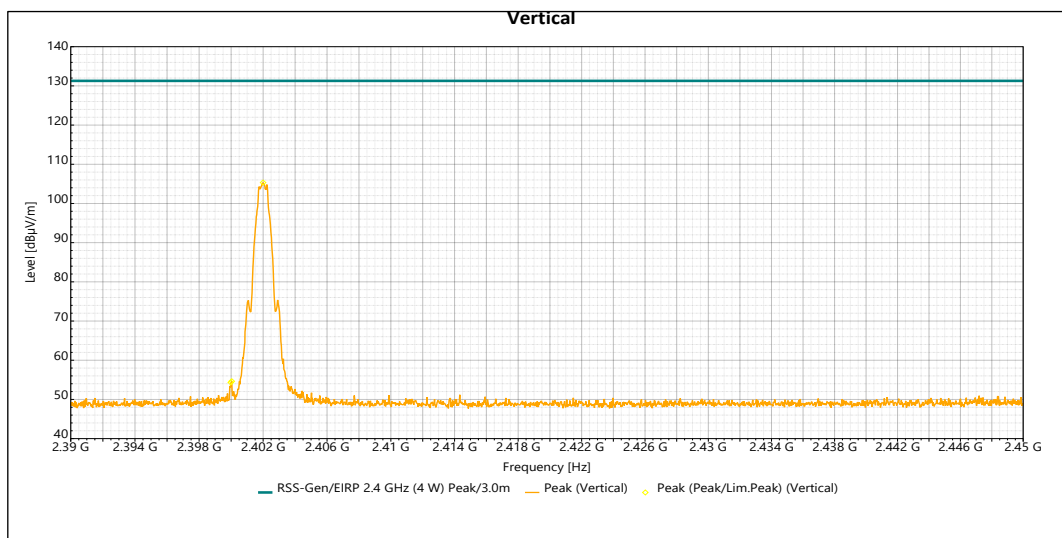
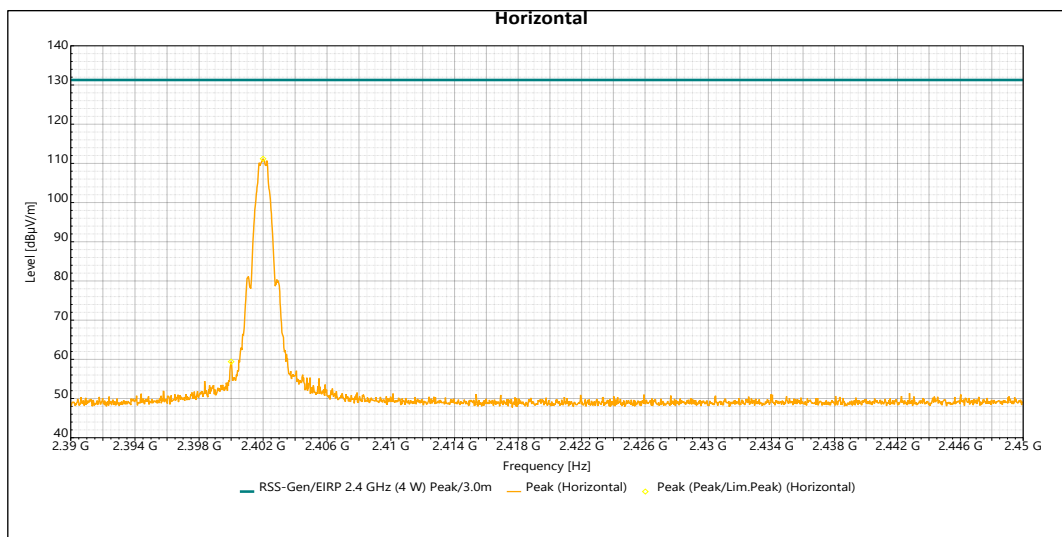
Start Frequency: 2.4835 GHz; Stop Frequency: 2.5 GHz; Step: 250 kHz; Sweep Time: 500 ms/Step; RF Attenuation: Auto; RBW: 1 MHz; VBW: Auto; Preamplifier: ON; Preselector: ON



- ☒ 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:

Band Edge Evaluation:

Operating Mode:	1	
Test result:	Pass	Tested on: 2024-10-14
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		

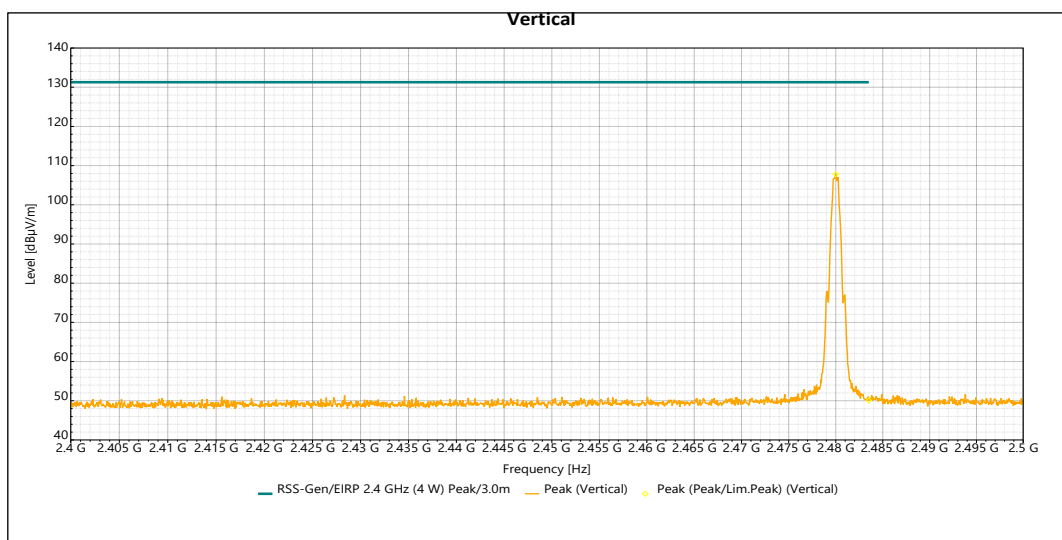
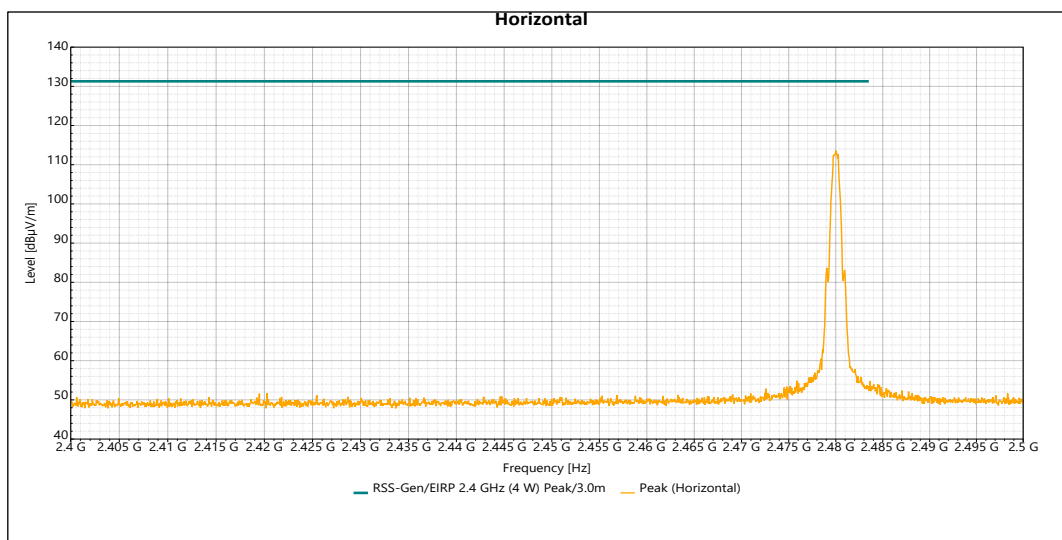


Channel	Max peak of in-band emission (dBm)	Frequency of max peak at the band edge (MHz)	Peak of carrier (dB)	Delta (dB)	Margin (dB)	polarization	Result
Bottom	59.399	2400	111.179	51.780	>20 dB	Horizontal	Pass
Bottom	54.641	2400	105.328	50.687	>20 dB	Vertical	Pass

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

Operating Mode:	3	
Test result:	Pass	Tested on: 2024-10-14

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



Channel	Max peak of in-band emission (dBm)	Frequency of max peak at the band edge (MHz)	Peak of carrier (dB)	Delta (dB)	Margin (dB)	polarization	Result
Top	52.295	2483.5	113.598	61.303	>20 dB	Horizontal	Pass
Top	50.045	2483.5	107.845	57.800	>20 dB	Vertical	Pass

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

6.2 Conducted Test Results

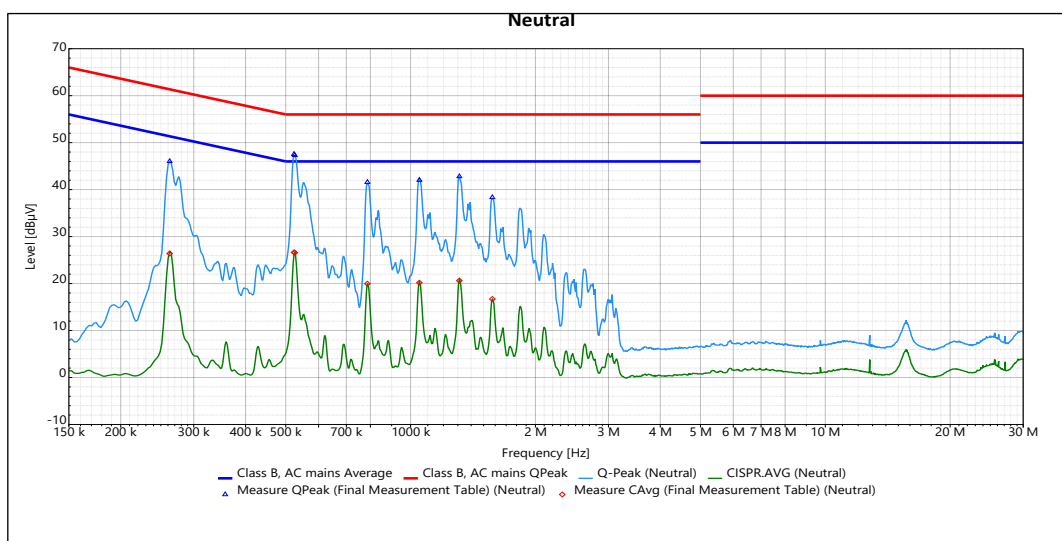
6.2.1 Transmitted AC Conducted Spurious Emissions

Tested by:	Andrea Giovanni Galbiati	
Test date:	2024-10-17	
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:	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:	Pre-scan evaluation for the following power supply has been performed: • 24 V +25/-25%; 50/60 Hz • 24 Vdc +10/-10% 24 V; 60 Hz represent the worst case condition	
Supplementary information:	---	

Results

Operating Mode:	1 (worst case condition)		
Port tested:	AC Mains		
Line tested:	Neutral		
Test result:	Pass	Tested on:	2024-10-17

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



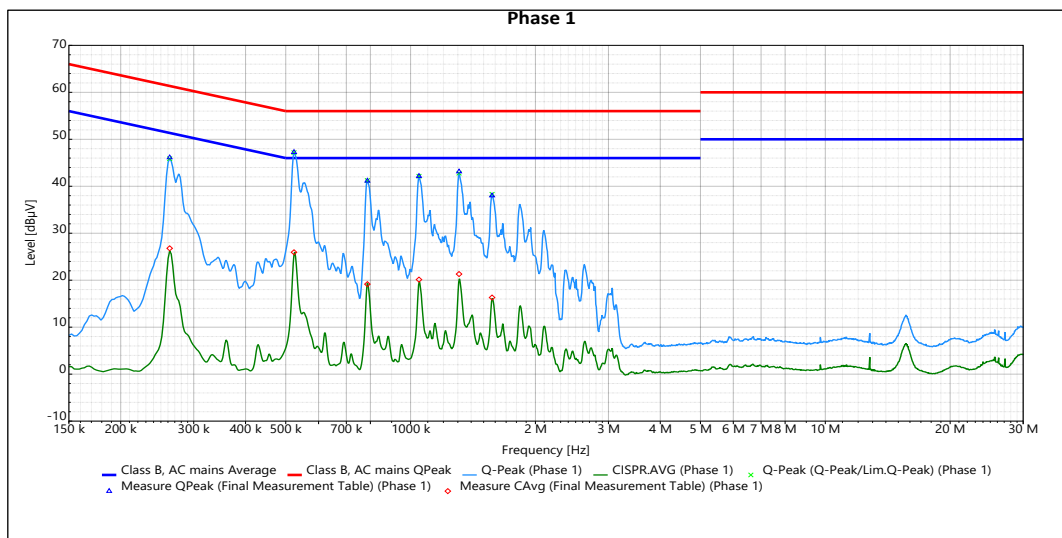
- ☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☒ The measurement results of highest emissions relative to the limit for each detector type are shown below:

Final Measurement Table

Frequency	SR #	Measure QPeak (dBμV)	Limit QPeak (dBμV)	Margin QPeak (dB)	Measure CAvg (dBμV)	Limit Avg (dBμV)	Margin Avg (dB)	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
262.5 kHz	1	46.034	61.352	-15.318	26.376	51.352	-24.976	9 k	5	Pass	10.321
523.5 kHz	1	47.55	56	-8.45	26.652	46	-19.348	9 k	5	Pass	10.326
525.75 kHz	1	47.324	56	-8.676	26.559	46	-19.441	9 k	5	Pass	10.326
786.75 kHz	1	41.578	56	-14.422	19.959	46	-26.041	9 k	5	Pass	10.337
1.05 MHz	1	42.039	56	-13.961	20.18	46	-25.82	9 k	5	Pass	10.338
1.311 MHz	1	42.81	56	-13.19	20.621	46	-25.379	9 k	5	Pass	10.344
1.574 MHz	1	38.346	56	-17.654	16.701	46	-29.299	9 k	5	Pass	10.352

Operating Mode:	1 (worst case condition)		
Port tested:	AC Mains		
Line tested:	Line		
Test result:	Pass	Tested on:	2024-10-17

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	SR #	Measure QPeak (dBμV)	Limit QPeak (dBμV)	Margin QPeak (dB)	Measure CAvg (dBμV)	Limit Avg (dBμV)	Margin Avg (dB)	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
262.5 kHz	1	46.123	61.352	-15.229	26.79	51.352	-24.562	9 k	5	Pass	10.321
523.5 kHz	1	47.249	56	-8.751	25.954	46	-20.046	9 k	5	Pass	10.326
786.75 kHz	1	41.164	56	-14.836	19.159	46	-26.841	9 k	5	Pass	10.337
1.048 MHz	1	42.157	56	-13.843	20.132	46	-25.868	9 k	5	Pass	10.338
1.309 MHz	1	43.119	56	-12.881	21.313	46	-24.687	9 k	5	Pass	10.344
1.572 MHz	1	38.01	56	-17.99	16.313	46	-29.687	9 k	5	Pass	10.352

7 List of test equipment

Equipment	Type	Inventory number	Manufacturer	Serial Number	Last calibration date	Calibration due date
Test Stand: Transmitter Radiated Emission (9kHz-30 MHz)						
Software - EMC	BAT-EMC	156535	Nexio Technologies		-	-
SEMI-ANECHOIC CHAMBER	FACT3-1.2 STD	210407	ETS-Lindgren	-	-	-
DC Power Injector	PI 6121	155980	Teseq, Inc	-	-	-
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	2023-02-06	2025-02-28
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	00231682	-	-
Antenna Tripod	CTP 6099	155934	Teseq, Inc	-	-	-
EMI TEST RECEIVER	ESW26	246431	Rohde & Schwarz (Koeln) GmbH & Co. KG	103182	2024-03-07	2025-03-28
Test Stand: Transmitter Radiated Emission (30MHz-1GHz)						
EMI TEST RECEIVER	ESW26	246431	Rohde & Schwarz (Koeln) GmbH & Co. KG	103182	2024-03-07	2025-03-28
Software - EMC	BAT-EMC	156535	Nexio Technologies		-	-
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
Trilog-Broadband Antenna	VULB 9168	210290	Schwarzbeck Mess-Elektronik OHG	1244	2023-08-25	2025-08-28
SEMI-ANECHOIC CHAMBER	FACT3-1.2 STD	210407	ETS-Lindgren	-	-	-
6dB Attenuator	DGA 9552 N	210263	Schwarzbeck Mess-Elektronik OHG	CH9006	2024-09-05	2025-09-28
NSA Normalized Site Attenuation	NSA FACT3-1.2 STD	210410	ETS-Lindgren	NSA FACT3-1.2 STD	2022-04-12	2025-04-28
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	00231682	-	-
Tilting Antenna Mast Positioning Tower	2171B/2170B	135821	ETS-Lindgren (Cedar Park, Texas)	-	-	-
Test Stand: Transmitter Radiated Emission (1GHz-18GHz), Radiated Band Edge and Radiated Emission in restricted bands						
Low-Noise EMI Preamplifier	BBV 9718 C	179026	Schwarzbeck Mess-Elektronik OHG	0002700027	2024-02-20	2025-02-28
Microwave Coaxial Cable N to Sma-M	AK 9515 H	213199	Schwarzbeck Mess-Elektronik OHG	00169	2024-05-10	2025-05-28
Highpass Filter	WHKX12-2520-2800-18000-60ST	154712	Wainwright Instruments GmbH	1	2023-10-27	2024-10-28
Absorber High Frequency	EHP-12	212616	ETS-Lindgren	-	-	-
Software - EMC	BAT-EMC	156535	Nexio Technologies		-	-
SVSWR Voltage Standing Wave Ratio	SVSWR FACT3-1.2 STD	210409	ETS-Lindgren	SVSWR FACT3-1.2 STD	2022-04-12	2025-04-28
Double Ridged Broadband Horn Antenna	3117	138662	ETS-Lindgren (Cedar Park, Texas)	00208482	2023-01-20	2025-01-28
EMI TEST RECEIVER	ESW26	246431	Rohde & Schwarz (Koeln) GmbH & Co. KG	103182	2024-03-07	2025-03-28
Tilting Antenna Mast Positioning Tower	2171B/2170B	135821	ETS-Lindgren (Cedar Park, Texas)	-	-	-
SEMI-ANECHOIC CHAMBER	FACT3-1.2 STD	210407	ETS-Lindgren	-	-	-
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	00231682	-	-
Cable 2000mm - 18 GHz	SF126/11SMA/11N/2000	220503	Huber+Suhner	554756/126	2024-05-10	2025-05-28
Cable 8000mm - 18 GHz	SF126/11N/11N/8000	220502	Huber+Suhner	556226/126	2024-05-10	2025-05-28

Test Stand: Transmitter Radiated Emission (18GHz-26GHz)						
Cable 500mm - 0.04 to 40 GHz	SF102E-50-2X11SK252	216877	Huber+Suhner	536580/2E	2024-03-04	2025-03-28
Low-Noise EMI Preamplifier	BLMA 1840-1A	209026	BONN Elektronik	2113244B	2024-07-18	2025-07-28
Cable 6000mm - 0.04 to 26.5 GHz	SF526S-600-2X11PC35501	216873	Huber+Suhner	2717237001	2024-03-04	2025-03-28
Double Ridged Broadband Horn Antenna	3116C	210452	ETS-Lindgren	00240011	2024-05-20	2027-05-28
Absorber High Frequency	EHP-12	212616	ETS-Lindgren	-	-	-
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-	-
EMI TEST RECEIVER	ESW26	246431	Rohde & Schwarz (Koeln) GmbH & Co. KG	103182	2024-03-07	2025-03-28
Tilting Antenna Mast Positioning Tower	2171B/2170B	135821	ETS-Lindgren (Cedar Park, Texas)	-	-	-
SEMI-ANECHOIC CHAMBER	FACT3-1.2 STD	210407	ETS-Lindgren	-	-	-
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	00231682	-	-
Test Stand: Transmitted AC conducted Spurious Emissions						
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
RF CABLES	LMR-240	175758	TIMES MICROWAVE SYSTEMS	None	2024-02-22	2025-02-28
Line Impedance Stabilization Network 3PH32A	ENV432	154695	Rohde & Schwarz	101335	2024-01-25	2025-01-28
EMI TEST RECEIVER	ESR7	204729	Rohde & Schwarz	102380	2024-04-12	2025-06-28
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-	-
Test Stand: Auxiliary equipments						
Mini Datalogger (SR2)	174H	211146	Testo	83293175	2023-10-18	2024-10-28
Mini Datalogger (FACT3)	174H	211147	Testo	83306371	2023-10-18	2024-10-28
TRUE-RMS DIGITAL MULTIMETER	289	169495	Fluke Corporation	40780217	2023-04-05	2025-04-28
Laser Measure	RSLDM-50H	224436	RS Pro	210743764	2023-11-10	2024-11-28

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 >

Attachment 1: Critical Component List (*)

(section excluded from ILAC regulations)

Not provided by the Applicant.

< END OF ATTACHMENT 1 >



Attachment 2: Product Identity Declaration / Model Variants (*)

(section excluded from ILAC regulations)

Not provided by the Applicant or Not Applicable.

< END OF ATTACHMENT 2 >

Attachment 3: Opinions and Interpretations

(section excluded from ILAC regulations)

Not Applicable.

< END OF ATTACHMENT 3 >