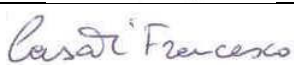


RF TEST REPORT

Test Report No:	25-4791735782-3-1-1-RAD-A
UL Project No:	4791735782
Date of issue:	2026-05-15
Total number of pages:	51
Applicant:	ASSA ABLOY Global Solutions Lodjurskatan 10 261 44 Landskrona - Sweden
Contact's person:	Robin Bengtsson (Robin.bengtsson@assaabloy.com)
Testing Laboratory:	UL International Italia S.r.l. Via delle Industrie, 6 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 Part 15.207, 15.209 & 15.225 RSS-210 Issue 11:2024 RSS-Gen Issue 5:2021
Non-standard test method:	N/A
TRF No.:	Base EMC_rev 51
Test Report Form(s) Originator:	UL International Italia S.r.l.
Master TRF	2017-07
Tested by: (name, function, signature)	Borghesi Matteo <i>Laboratory Technician</i> 
Approved by: (name, function, signature)	Galbiati Andrea Giovanni <i>Senior Engineering Associate</i> 
Authorized by: (name, function, signature)	Casati Francesco <i>Operations Leader</i> 
General disclaimer: The test results presented in this test report relate only to the object tested, as received and not selected by UL. All technical records will be maintained by the Laboratory for minimum 10 years. 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: (*)	Access Control Module
Trade Mark: (*)	ASSA ABLOY Global Solutions
Manufacturer: (*)	ASSA ABLOY Global Solutions Lodjurskatan 10 261 44 Landskrona - Sweden
Model/Type reference: (*)	Adorn
HVIN: (*)	ADORNV1C1
PMN: (*)	Adorn
Ratings: (*)	External supply: 5 – 24 V & 500 mA; Battery supply: 3 x 1.5 V AA batteries General AC/DC Power supply used: model S024DP0500300: Input: 100-240 V; ~50/60 Hz Output: 5 Vdc model PSU100: Input: 100-230 V; ~50/60 Hz Output: 24 Vdc
FCC ID: (*)	2BRES-ADORNV1C1
IC ID: (*)	34655-ADORNV1C1
Testing:	
Type of equipment considered in the present document:	☐ Non-radio product ☒ Combined equipment (non-radio product with radio function) ☐ Radio product ☐ Ancillary equipment
Date of receipt of test item:	2025-06-10 (UL Sample Tag No. 8344222) 2025-07-07 (UL Sample Tag No. 8668412)
UL Sample Tag No.:	8344222 (all tests except Transmitter AC conducted emission) 8668412 (only for Transmitter AC conducted emission)
Status of sample upon receipt:	☒ New and operational ☐ Reconditioned ☐ Damaged ☐ Unknown
Date(s) of performance of tests:	2025-07-03 to 2026-02-26
Name and address of factory(ies): (*)	No information available
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: (*)

Adorn is an access control module intended to be mounted in doors, with the primary functionality of reading RFID credentials for opening the door lock. In addition to RFID, Adorn also implements a 2.4 GHz radio for BLE.

Main microcontroller (MCU)

The nRF52840 is the MCU of Adorn. It has two crystals, one 32 MHz crystal and one 32.768 kHz crystal.

Flash

Adorn has an external flash, which is used to store configuration, audit log, and time of day. The configuration and time of day are used to make access decisions for a given credential.

Detection circuit

Adorn has a pinger circuit connected to the RFID antenna. It works by sending a short pulse to the detection circuit from the MCU. From this pulse, the detection circuit generates a short current pulse through the antenna coil. This current pulse causes a damped oscillation in the antenna coil resonant circuit. A receiver RC integrator creates an envelope pulse of this oscillation. The envelope pulse is measured by the MCU. If a RFID keycard is held close to the antenna coil, the damped oscillation decays faster and the MCU detects this change.

RFID transceiver

If the MCU, by using the detection circuit, registers a detection, it will start the RFID transceiver and try to read a RFID credential. If the read operation is successful, the MCU will typically check if the credential is valid, and in that case unlock the door. The RFID transceiver is an NXP CLRC663. This transceiver contains most of the modules needed for 13.56 MHz RFID credential reading, i.e. transmitter, receiver, decoding circuit and interface to the MCU. The transceiver supports several RFID standards, ISO 14443-A, ISO 14443-B and ISO 15693. On a higher level it supports MIFARE communication and encryption. The transceiver's oscillator is controlled by a 27.12 MHz crystal.

RFID antenna

The RFID antenna is a separate PCB trace antenna, which is mounted to the main PCBA by two connectors. One of the connectors is for extra support and the other connector carries the differential RFID signal pair.

BLE radio

The 2.4 GHz radio capability of the MCU is used for BLE. The MCU is paired with a 2.4 GHz SMT MID chip antenna. In addition to the antenna, the network also includes a filter.

Service interface

Adorn has a USB-C connector as a service interface for communication by USB 2.0. The voltage, VBUS, from the USB-C service interface is supplied directly to the MCU as well as to the external supply rail. When a lock is added to a site, the service interface is used to store specific cryptographic keys to the external flash. These keys are used to ensure that credentials for accessing the door originate from the owners of the site. Audit logs can be read out using the service interface.

Motor controller

Adorn includes an H-bridge motor driver intended for operating a connected lock case.

Buzzer

Adorn includes an externally driven magnetic buzzer transducer, powered by 3.3 V. The buzzer is used to give feedback when the lock is operated,

LED

The Adorn includes a 12 channel LED driver that drives four RGB LEDs to provide visual feedback for the user. Adorn has one additional LED, typically used for debugging.

Power supply

Adorn is supplied from a 4.5 V battery pack (3 AA alkaline batteries) and/or from an external supply between 5 and 24 VDC. If both supply methods are connected, Adorn prioritizes the external supply. The external supply rail and the battery supply rail both have their own switching voltage regulator to generate a 3.3 V output. The 3.3 V outputs are fed to a multiplexer for prioritization and the 3.3 V multiplexer output supplies the internal circuits. This 3.3 V output is also fed to a switching voltage regulator to generate a 4.1 V output on demand, for driving the RFID field, the motor, and the RGB LEDs.

Battery level monitor

Adorn has a circuit for monitoring the voltage of the connected batteries. It measures one third of the actual voltage. So, for three connected batteries, it measures the nominal battery voltage.

RS485 transceiver

Adorn has a transceiver circuit for RS485.

Lock case switches

The lock cases used with Adorn have mechanical switches for signaling events to Adorn. These switches are configured as pull-up in Adorn and pulled to ground in the lock case when the respective event occurs.

UART / I2C

Adorn has four pins that can be configured for either UART or I2C communication with an external device

Document history

Test Report No.	Reason for change	Date of issue
25-4791735782-3-1-0-RAD-A	Original release	2026-02-26
25-4791735782-3-1-1-RAD-A	REV 1. The frequency stability values at -20°C have been added (these values were not reported in the previous version due to a test laboratory error)	2026-05-15

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

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1 Test Item Description

Serial number: (*)		No information available																																																		
Date of production: (*)		No information available																																																		
Ports: (*)																																																				
Port name	Description	Max. length (m)	Attached during test	Shielded	Symmetric	Outdoor use																																														
AC Mains	AC Mains of AC/DC adapter (^)	n.d	☒	☐	☐	☐																																														
DC Mains	Power supply main port of EUT	n.d	☒	☐	☐	☐																																														
Signal/control port	Signal/control port for send the commands	30	☒	☐	☐	☐																																														
Service port	USB-C	1	☐	☐	☐	☐																																														
Supplementary information to the ports:		n.d. = not defined “Symmetric” and “Outdoor use” refer to signal/control port only (^) AC Mains port used only for AC Transmitter AC conducted emission (representative AC/DC adaptor has been used for this scope)																																																		
Rated power supply: (*)		<table border="1"> <thead> <tr> <th rowspan="2"></th> <th rowspan="2">Voltage and frequency</th> <th colspan="4">Reference poles</th> </tr> <tr> <th>N</th> <th>L1</th> <th>L2</th> <th>L3</th> </tr> </thead> <tbody> <tr> <td>☒</td> <td>AC: 100 V; 60 Hz</td> <td>☒</td> <td>☒</td> <td>☐</td> <td>☐</td> </tr> <tr> <td>☒</td> <td>AC: 240 V; 60 Hz</td> <td>☒</td> <td>☒</td> <td>☐</td> <td>☐</td> </tr> <tr> <td>☒</td> <td colspan="5">DC: 5-24 V (external) and 4.5 V (internal)</td> </tr> <tr> <td>☒</td> <td colspan="5">Battery mode: 4.5 V</td> </tr> <tr> <td>☐</td> <td colspan="5">Protective Earth (PE)</td> </tr> <tr> <td>☐</td> <td colspan="5">Functional Earth</td> </tr> </tbody> </table>						Voltage and frequency	Reference poles				N	L1	L2	L3	☒	AC: 100 V; 60 Hz	☒	☒	☐	☐	☒	AC: 240 V; 60 Hz	☒	☒	☐	☐	☒	DC: 5-24 V (external) and 4.5 V (internal)					☒	Battery mode: 4.5 V					☐	Protective Earth (PE)					☐	Functional Earth				
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☒	Battery mode: 4.5 V																																																			
☐	Protective Earth (PE)																																																			
☐	Functional Earth																																																			
Rated power: (*)		---																																																		
Environment of intended use: (*)		☐ Household / Residential ☐ Professional / Commercial / Light-industrial ☐ Industrial ☐ Professional healthcare facility (only for ME) ☐ Home healthcare (only for ME) ☐ Special (only for ME) ☐ Road and Street ☐ Automotive ☐ Railway ☒ Maritime																																																		

Working frequencies: (*)	NFC frequency 13.56 MHz BLE frequency 2400 MHz to 2483.5 MHz Clock 32 MHz crystal; 27.12 MHz crystal; 32.768 kHz crystal Other 32 MHz QSPI; 4 MHz SPI; 100 kHz I2C		
Other parameters: (*)	---		
Firmware/Software version: (*)	Not Available		
Hardware version: (*)	Rev B		
Dimensions in cm (W x H x D): (*)	5.3 x 5.3 x 1.3		
Mounting position: (*)	☒	Table top equipment	
	☐	Wall/Ceiling mounted equipment	
	☐	Floor standing equipment	
	☐	Hand-held equipment	
	☐	Other:	
Modules/parts: (*)	Module/parts of test item	Type	Manufacturer
	---	---	---
Operating modes:			
No.	Description		
1	Continuous transmission on NFC technology @ 13.56 MHz (Modulated signal) Worst case protocol used (^) Original antenna mounted		
Supplemental information to the operating mode:		(^) worst case protocol used reported in the supplementary information of each test section Preliminary tests were carried out both with and without RFID tag. It was found that the configuration without RFID tag represents the worst-case and was recorded in the test report	
Auxiliary equipment (AuxEq): <i>Peripheral equipment that is part of the system under test</i>	Description	Manufacturer	Type
	---	---	---
Associated equipment (AE): <i>Equipment that is not part of the system under test but needed to exercise and/or monitor the EUT</i>	Description	Manufacturer	Type
	AC/DC Power supply	Siemens	PSU100C
	AC/DC Power supply	---	S024DP0500300
Documents as provided by the applicant: (*)	Description	File name	Issue date
	UL CAR_EMC items for clients	UL CAR_EMC items for clients ACM84V2	---
	Test instruction	Test instruction	---
Modifications to the test item during testing:	None		

Copy of marking plate: (*)



1.1 Additional information of integrated radio device(s)

Technology Tested:	NFC
Type of Unit:	High performance multi-protocol NFC
Model of radio module:	CLRC663
Brand of radio module:	NXP
Transmit center Frequency:	13.56 MHz
N° of channel:	1
Antenna Type:	Loop Antenna
Protocol supported:	ISO 14443A, ISO 14443B, ISO 15693

2 Verdict summary section

FCC Part 15 Subpart C (15.225) ISED RSS-210 Issue 11					
FCC clause	IC clause	Test Item	Accreditation	Verdict	Note
15.225(a)	RSS-210 B.6	Field strength of carrier signal	Accredia	P	
15.225(b) 15.225(c) 15.225(d) 15.209	RSS-210 B.6	Field strength of unwanted emissions	Accredia	P	
15.225(e)	RSS-210 B.6	Frequency tolerance of the carrier signal	Accredia	P	
15.207	RSS-Gen 8.8	AC power-line conducted emission	Accredia	P	
15.215	RSS-Gen 6.7	Occupied bandwidth	Accredia	P	
15.203	RSS-Gen 6.8	Antenna requirement	None	P	
Notes:					
1. The EUT utilizes an internal PCB antenna. The device is professionally installed.					

Methods and Procedures
ANSI C63.4-2014 American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10-2020+Cor.1-2023 for FCC American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 for ISED
FCC KDB 414788 D01 Radiated Test Site v01r01 TEST SITES FOR RADIATED EMISSION MEASUREMENTS
FCC KDB 174176 D01 Line Conducted FAQ v01r02 August 7, 2025 AC Power-Line Conducted Emissions Frequently Asked Questions

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 Test Conditions

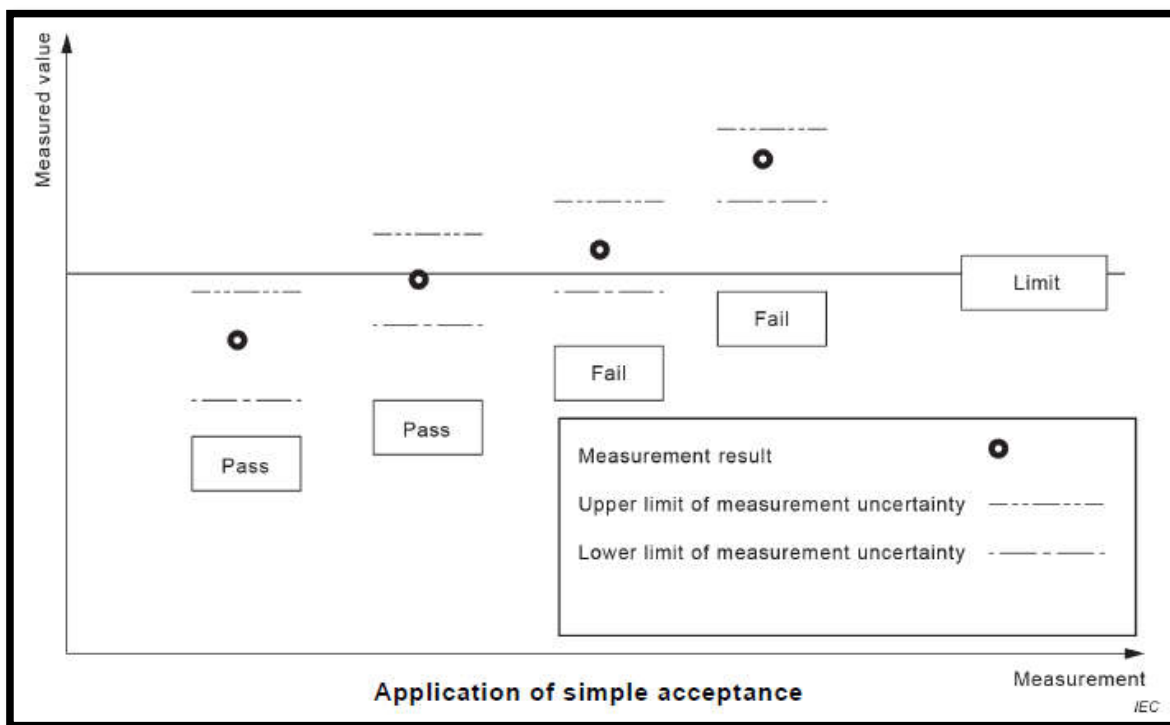
3.1 Environmental reference conditions

	All tests	Transmitter Frequency Stability
Temperature	+10 °C to +40 °C (*)	-20 °C to +55 °C, step 10 °C
Power supply	V_{nom}	V_{nom} ; $V_{nom} - 15\%$; $V_{nom} + 15\%$

(*) Tested temperature range is based on applicant's specifications.

3.2 Conformity decision rule

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



3.3 Formula used for RF emission quantities

AC power-line conducted emission

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

where:

$$\text{Correction (dB)} = \text{VDF LISN (dB)} + \text{insertion loss coaxial cable (dB)}$$

Electric field (9kHz-30MHz)

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

where:

$$\text{Correction (dB)} = \text{Electric antenna factor (dB/m)} + \text{insertion loss coaxial cable (dB)} - 40 \text{ dB/dec}$$

Electric field (30MHz-1GHz)

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

where:

$$\text{Correction (dB)} = \text{Electric antenna factor (dB/m)} + \text{insertion loss attenuator (dB)} + \text{insertion loss coaxial cable (dB)}$$

Margin

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

Linear to logarithmic conversion

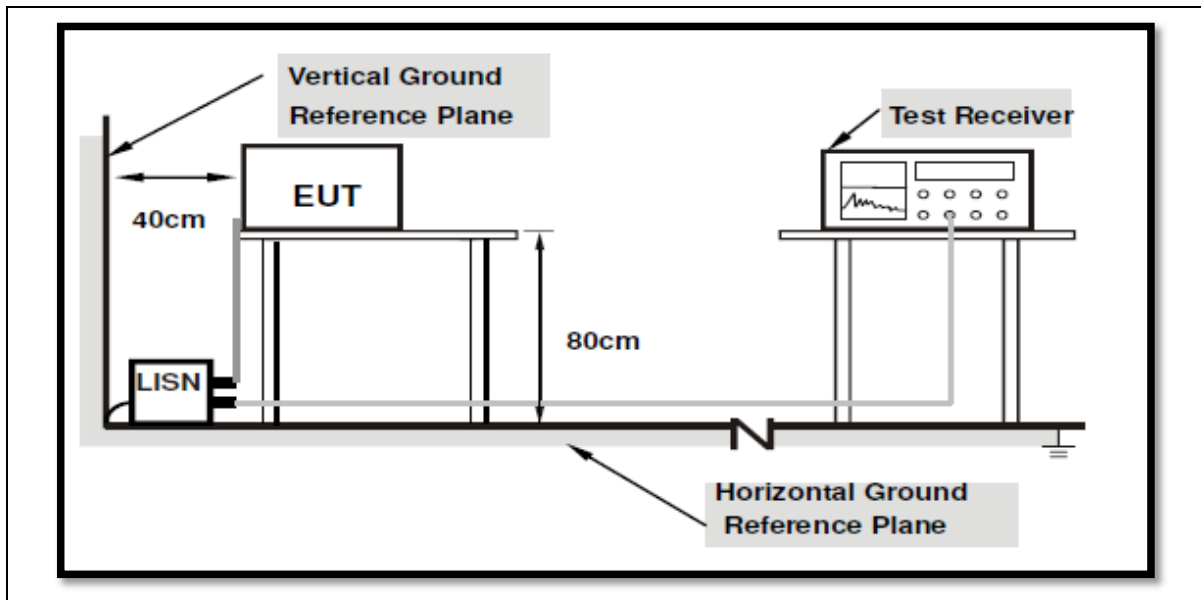
$$\text{Log} = 20 \cdot \log(\text{Lin}) \text{ for voltage and current; } \text{Log} = 10 \cdot \log(\text{Lin}) \text{ for power}$$

4 Emission

4.1 AC power-line conducted emission

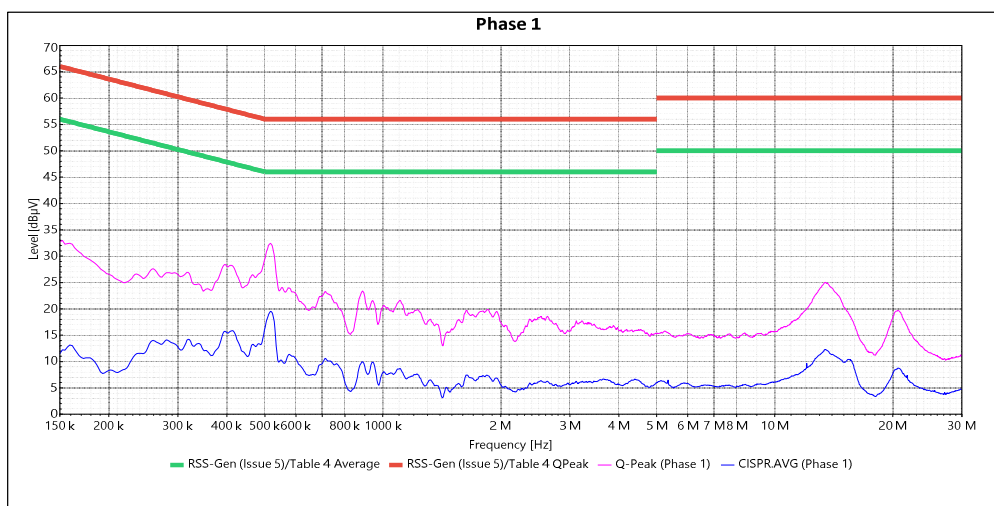
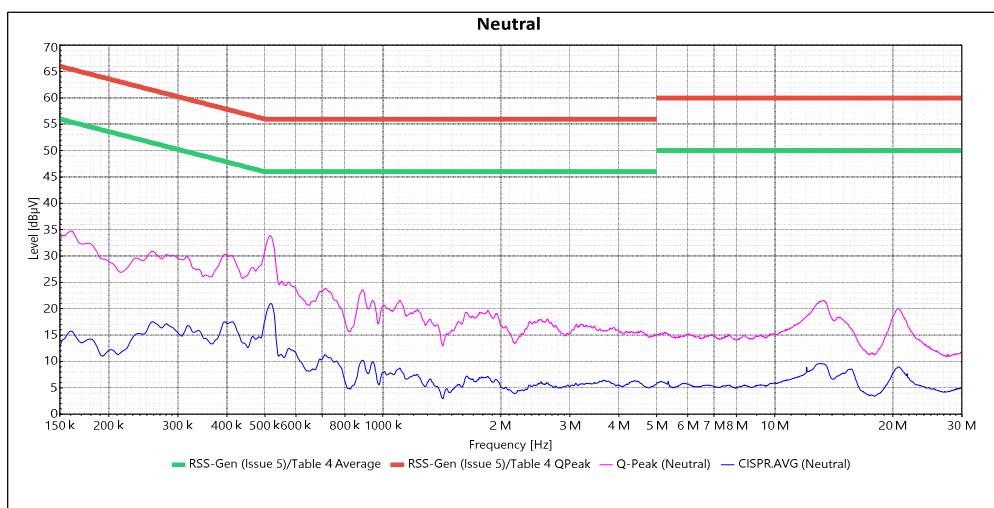
Tested by:	Matteo Borghesi	
Test date:	2025-07-15	
Test location (stand):	Area 11: SR2 (RF emission)	
Ambient temperature:	23 °C	
Relative humidity:	61 %	
Atmospheric pressure:	999 mbar	
FCC Reference:	Part 15.207	
ISED Canada Reference:	RSS-Gen 8.8	
Test Method Used	ANSI C63.10 Section 6.2 / FCC KDB 174176 and notes below	
Test set-up description:	☒	Table-top EUT placed on an insulating support raised 80 cm above the reference ground plane. Vertical plane located at 40 cm to the rear of the EUT.
	☐	Floor-standing EUT with its base in direct electrical contact with, or connected to, a grounded metal floor or grid, placed directly on the reference ground plane, making electric contact
	☐	Floor-standing EUT placed on an insulating support raised up to 12 mm above the reference ground plane
	☐	Floor-standing EUT for raised/false floor installation placed on an insulating support raised up to 34 cm above the reference ground plane
Supplementary test set-up description:	---	
Test method applied:	☒	Artificial mains network
	☐	Artificial mains network used as voltage probe
	☐	Voltage probe
	☐	Other:
Used mains voltage/frequency: (according to 174176 D01 Line Conducted FAQ v01r01)	AC Input: 120 V; 60 Hz with DC input of EUT= 5 Vdc (AC/DC adapter model S024DP0500300) AC Input: 120 V; 60 Hz with DC input of EUT= 24 Vdc (AC/DC adapter model PSU100C) AC Input: 240 V; 60 Hz with DC input of EUT= 5 Vdc (AC/DC adapter model S024DP0500300) AC Input: 240 V; 60 Hz with DC input of EUT= 24 Vdc (AC/DC adapter model PSU100C)	
Deviation to the standard:	☒	None
	☐	
Supplementary information:	Worst case protocol used: ISO 1443B – 848kbps (represent the protocol with the highest amplitude. Evaluation of the highest amplitude is performed by prescan measurements on all protocol implemented) Preliminary Measurements were performed at both 50 Hz and 60 Hz supply frequencies. There was no change to the observed emissions. External DC supply used (worst case).	

Block diagram



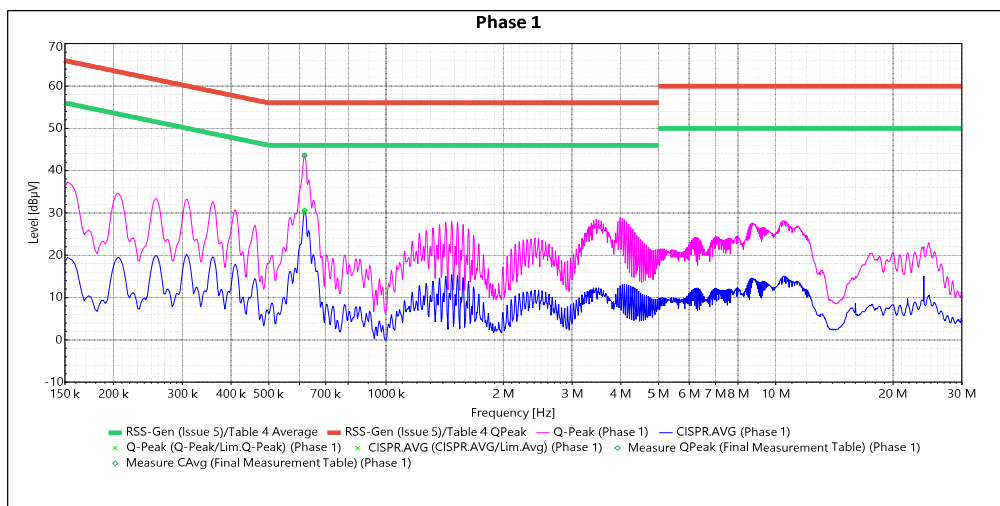
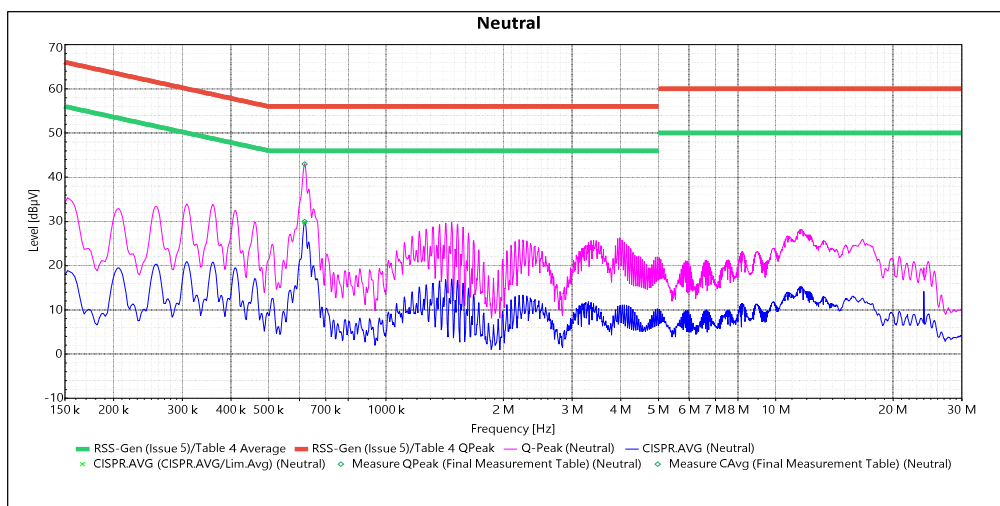
Results

Operating mode	1
Port / terminal	AC Mains / Neutral and Line
Used mains voltage/frequency ...	120 V; 60 Hz
DC input of EUT:	5 Vdc
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
- ☐ Final measurements for emissions that are above -20 dB from the applicable limits are shown below (at least 6 worst frequencies):

Operating mode	1
Port / terminal	AC Mains / Neutral and Line
Used mains voltage/frequency ...	120 V; 60 Hz
DC input of EUT:	24 Vdc
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; Preamp: OFF; Preselector: ON



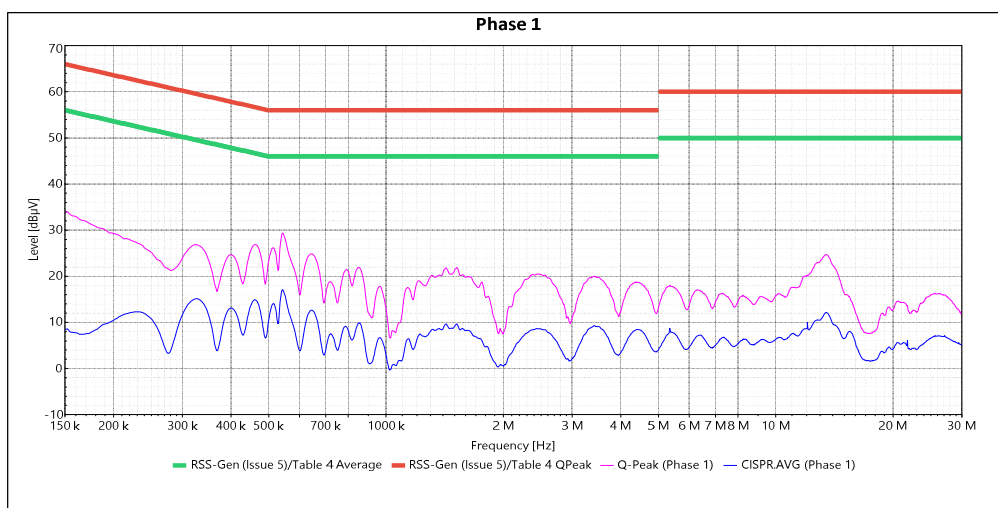
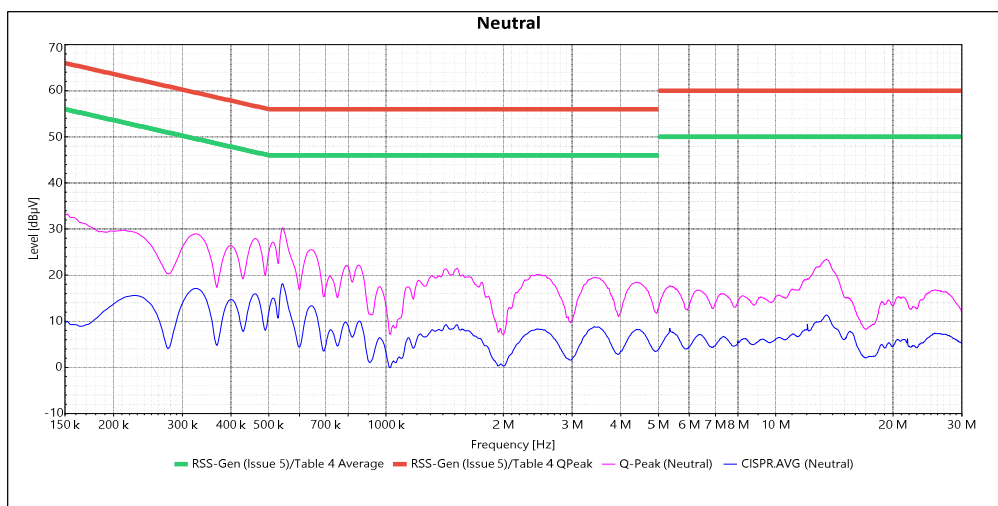
☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit

☒ Final measurements for emissions that are above -20 dB from the applicable limits are shown below (at least 6 worst frequencies):

Final Measurement Table

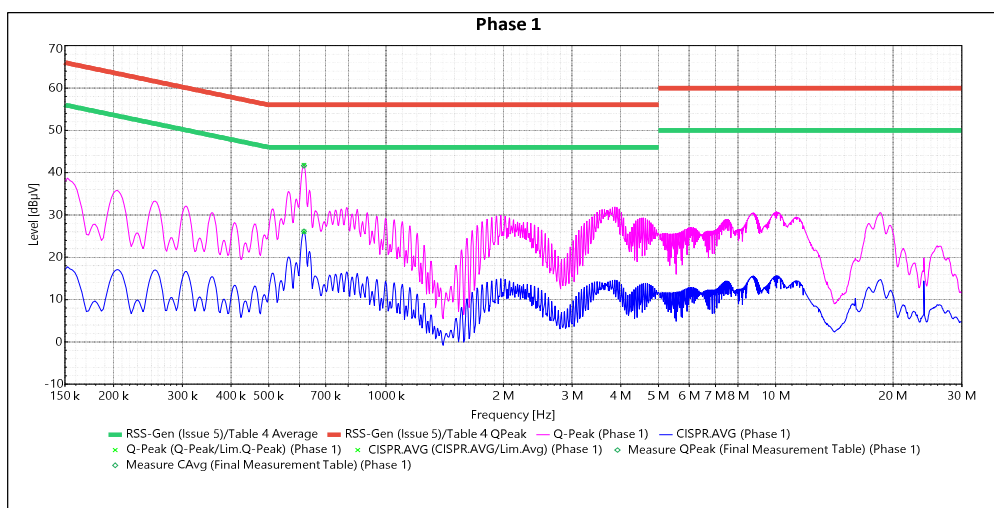
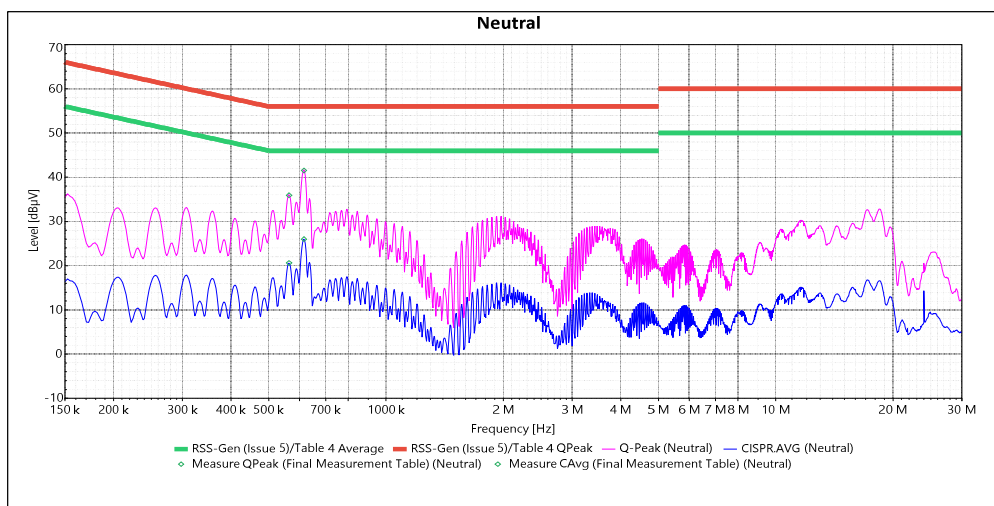
Frequency	Measure QPeak (dBμV)	Limit QPeak (dBμV)	Margin QPeak (dB)	Measure CAvg (dBμV)	Limit Avg (dBμV)	Margin Avg (dB)	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
618 kHz	42.96	56	-13.04	29.96	46	-16.04	9 kHz	5	Pass	10.22
618 kHz	43.58	56	-12.42	30.54	46	-15.46	9 kHz	5	Pass	10.22

Operating mode	1
Port / terminal	AC Mains / Neutral and Line
Used mains voltage/frequency ...	240 V; 60 Hz
DC input of EUT:	5 Vdc
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; Preamp: OFF; Preselector: ON



- ☒ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☐ Final measurements for emissions that are above -20 dB from the applicable limits are shown below (at least 6 worst frequencies):

Operating mode	1
Port / terminal	AC Mains / Neutral and Line
Used mains voltage/frequency ...	240 V; 60 Hz
DC input of EUT:	24 Vdc
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; Preamp: OFF; Preselector: ON



☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit

☒ Final measurements for emissions that are above -20 dB from the applicable limits are shown below (at least 6 worst frequencies):

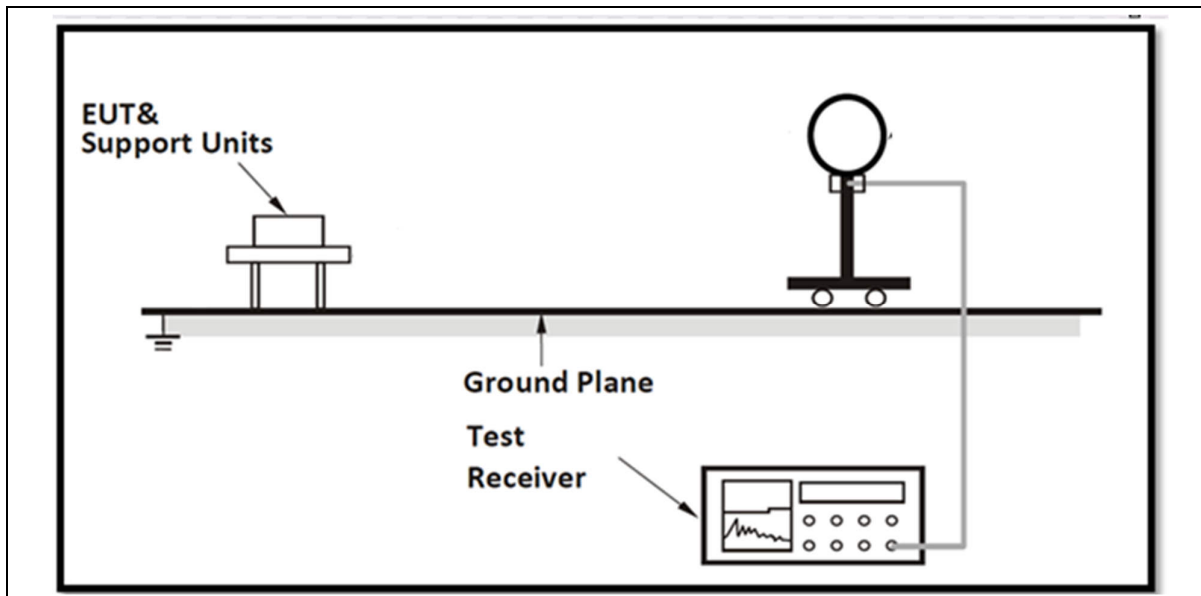
Final Measurement Table

Frequency	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)
564 kHz	35.92	56	-20.08	20.62	46	-25.38	9 kHz	5	Pass	10.22
615.75 kHz	41.53	56	-14.47	26.01	46	-19.99	9 kHz	5	Pass	10.22
615.75 kHz	41.65	56	-14.35	26.11	46	-19.89	9 kHz	5	Pass	10.22

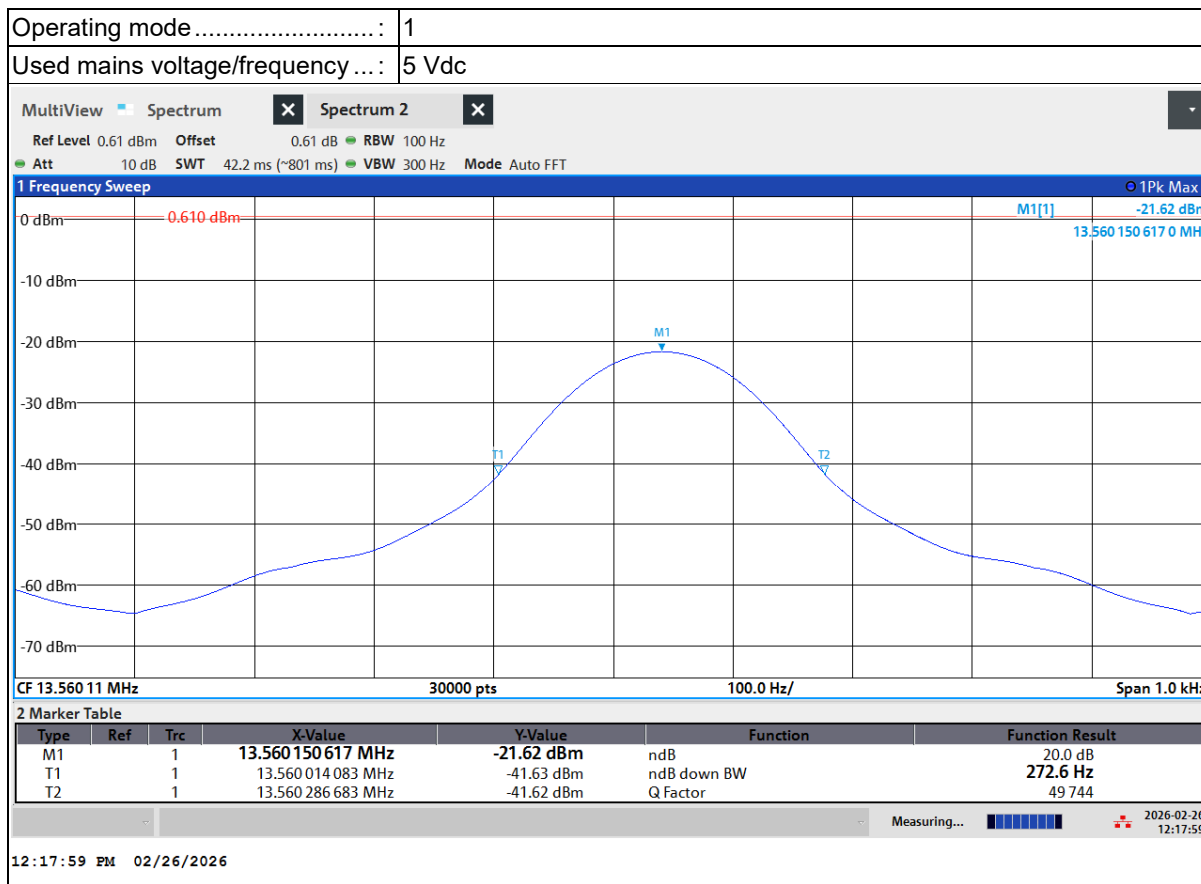
4.2 Occupied Bandwidth

Tested by:	Matteo Borghesi	
Test date:	2026-02-26	
Test location (stand):	Area 8: SAC 3-1.2 (RF emission)	
Ambient temperature:	24 °C	
Relative humidity:	59 %	
Atmospheric pressure:	998 mbar	
FCC Reference:	Part 15.215	
ISED Canada Reference:	RSS-Gen 6.7	
Test Method:	ANSI C63.10, §6.9.2 (-20 dB) ANSI C63.10, §6.9.3 (99 %)	
Setup used:	Measurements were made with the 60 cm loop antenna in close proximity of the EUT.	
Test set-up description:	---	
Antenna:	☐	External connector
	☒	Integrated into the equipment
Used mains voltage/frequency:	External DC supply used (worst case). 5 Vdc - 24 Vdc	
Supplementary information:	Worst case protocol used: ISO 14443A 424kbps (represent the protocol with the widest bandwidth. Evaluation of the widest bandwidth is performed by prescan measurements on all protocol implemented)	

Block diagram



Results of 20 dB Bandwidth

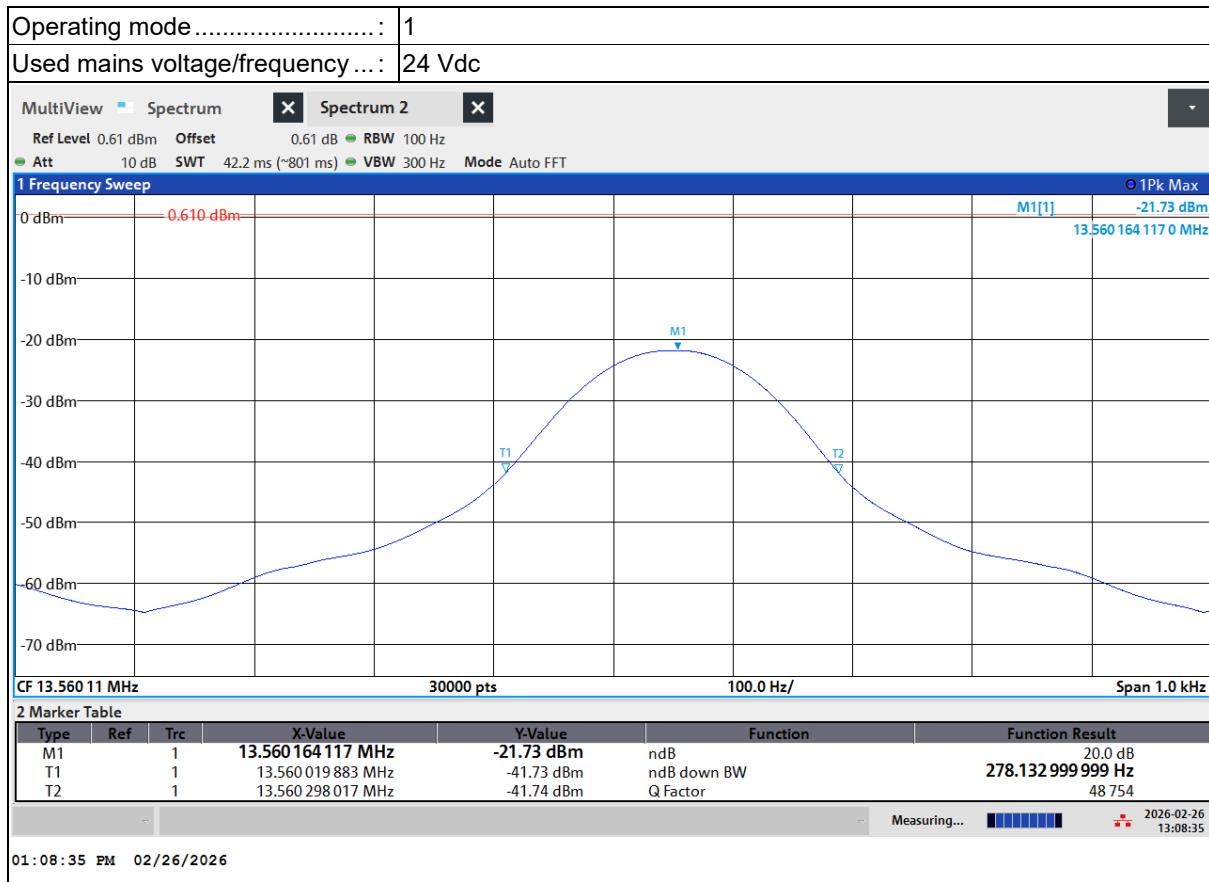


Final measurements table:

f_L (MHz)	F_H (MHz)	20 dB Bandwidth (kHz)	Verdict
13.560014083	13.560286683	0.2726	Pass (^)

(^) 20 dB bandwidth is contained in the designated frequency band 13.110-14.010 MHz.

Note tech: The measurement is considered valid. The RBW could not be set within 1–5% of the occupied bandwidth due to the characteristics of the signal. Therefore, the minimum allowed RBW of 100 Hz was used, in accordance with the standard requirements.



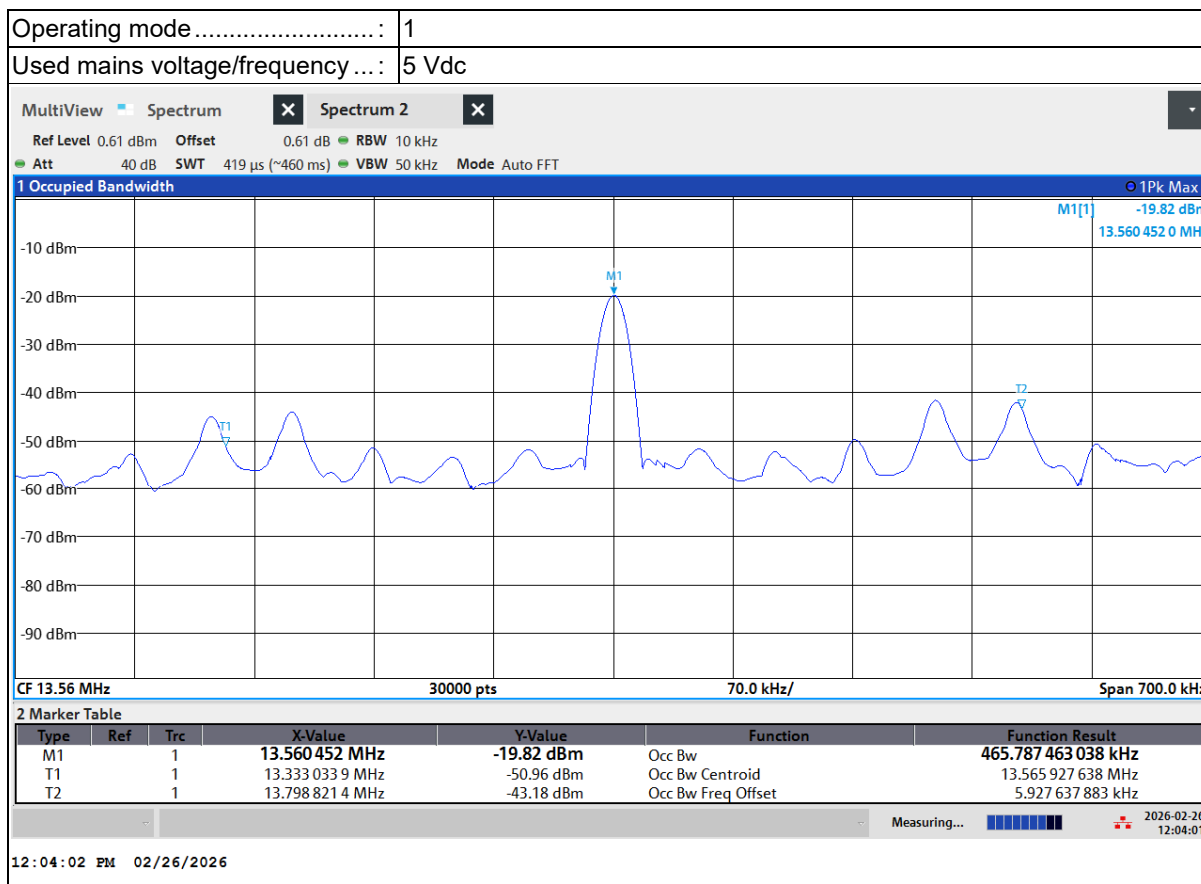
Final measurements table:

f_L (MHz)	F_H (MHz)	20 dB Bandwidth (kHz)	Verdict
13.56001	13.56029	0.2781	Pass (^)

(^) 20 dB bandwidth is contained in the designated frequency band 13.110-14.010 MHz.

Note tech: The measurement is considered valid. The RBW could not be set within 1–5% of the occupied bandwidth due to the characteristics of the signal. Therefore, the minimum allowed RBW of 100 Hz was used, in accordance with the standard requirements.

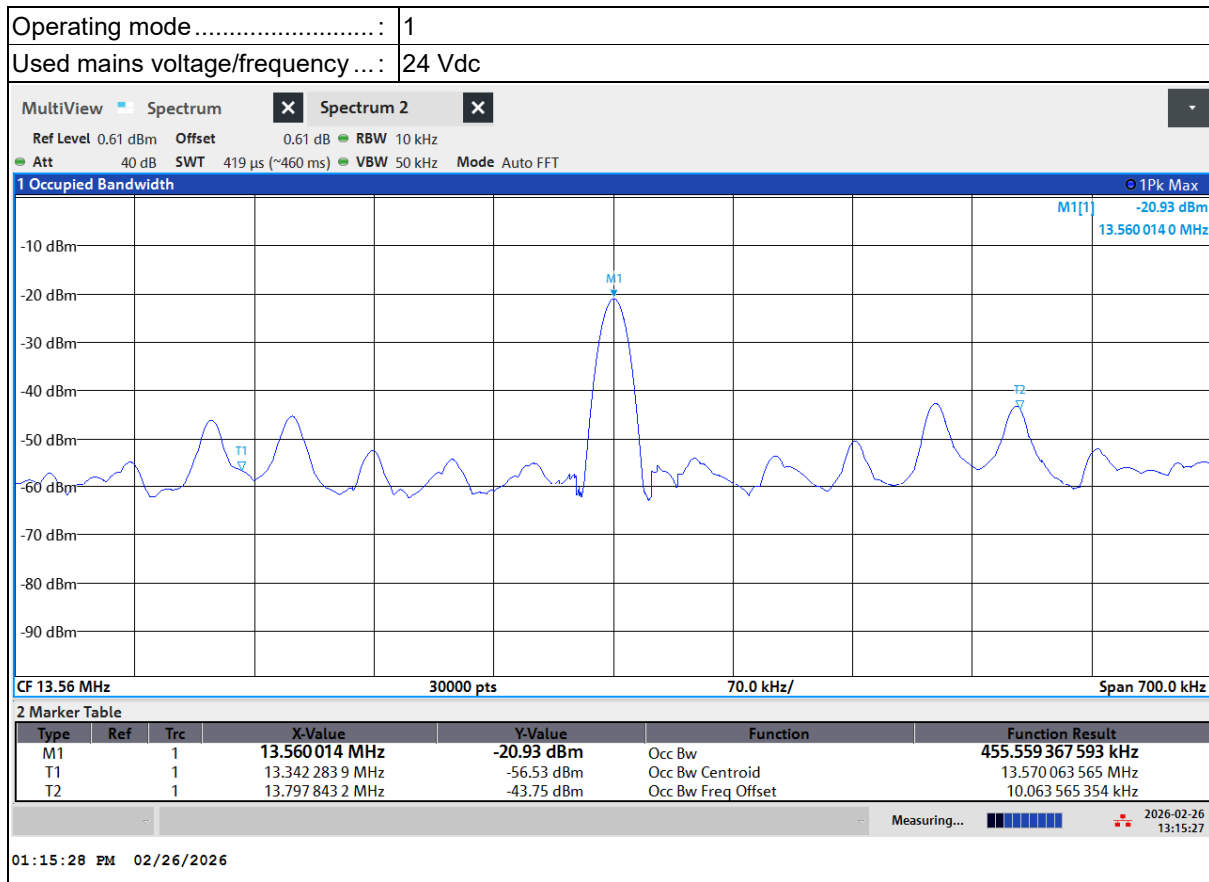
Results of 99% Bandwidth



Final measurements table:

f_c (MHz)	f_L (MHz)	F_H (MHz)	99% Emission Bandwidth (kHz)	Verdict
13.56045	13.33303	13.79882	465.787	Pass (^)

(^) 99 % bandwidth is contained in the designated frequency band 13.110-14.10 MHz.



Final measurements table:

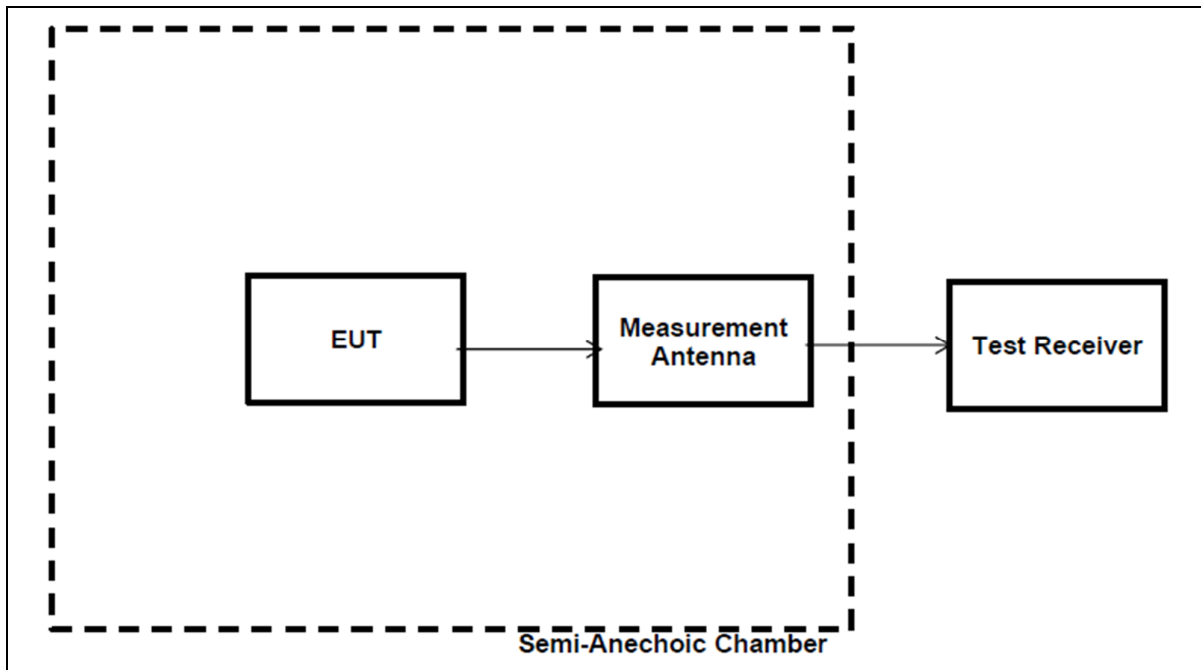
f_c (MHz)	f_L (MHz)	F_H (MHz)	99% Emission Bandwidth (kHz)	Verdict
13.56001	13.34228	13.79784	455.559	Pass (^)

(^) 99 % bandwidth is contained in the designated frequency band 13.110-14.010 MHz.

4.3 Field strength of carrier signal

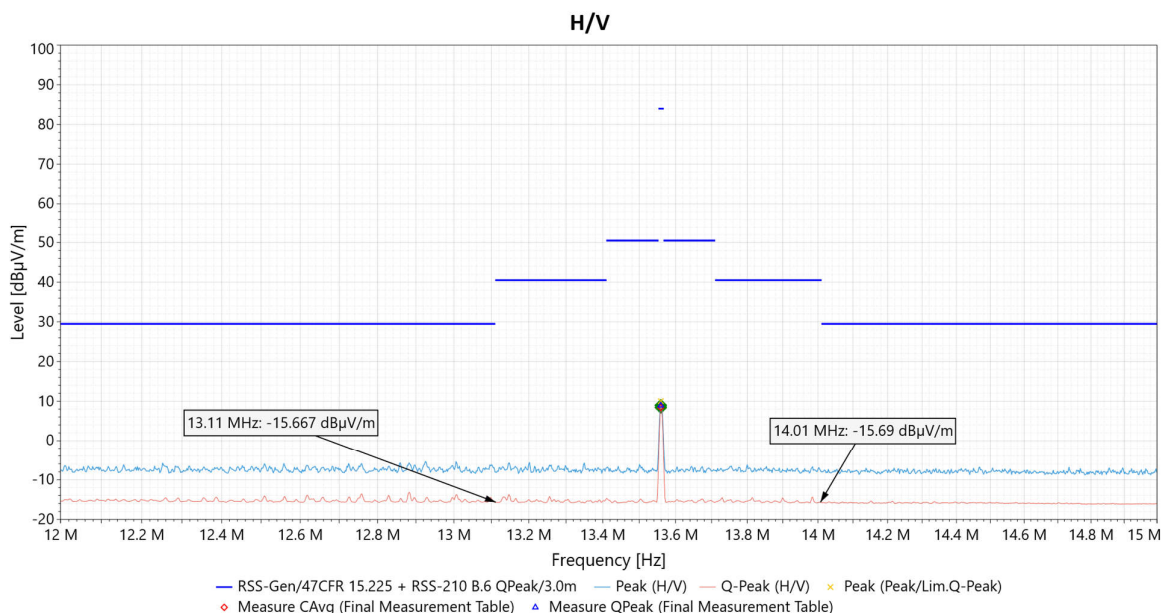
Tested by:	Matteo Borghesi	
Test date:	2025-07-24	
Test location (stand):	Area 8: SAC 3-1.2 (RF emission)	
Ambient temperature:	23 °C	
Relative humidity:	59 %	
Atmospheric pressure:	992 mbar	
FCC Reference:	Part 15.225(a)	
ISED Canada Reference:	RSS-210 B.6	
Test method:	ANSI C63.10, §6.4	
Setup used:	☒	OATS or SAC with measurement distance [m]: 3
	☐	FAR CISPR 16-2-3 with measurement distance [m]: 3
	☐	FAR IEC 61000-4-22 with measurement distance [m]: 3
	☐	TEM Waveguide according IEC 61000-4-20
	☐	FSOATS with measurement distance [m]: 3
	☐	Climatic chamber
Supplementary test set-up description:	---	
Used mains voltage/frequency:	External 5 Vdc (worst case condition)	
Supplementary information:	- In accordance with FCC KDB 414788, an alternative test site may be used for the measurement below 30 MHz (the OATS / SAC comparison data is available upon request). Therefore the result from the semi-anechoic chamber tests is shown in this section of the test report. - The limits are specified at a test distance of 30 m & 300 m. However, as specified by FCC Section 15.31(f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by using the square of an inverse linear distance extrapolation factor. - Therefore the measurement values are extrapolated to a measurement distance of 3 m where field strength of X dBµV/m was measured. 9-490 kHz: from 300 m to 3 m subtracting 80 dB at 40 dB/decade. 490-1705 kHz: from 30 m to 3 m subtracting 40 dB at 40 dB/decade. 2 Worst case protocol used: - ISO 144438A 848kbps (represent the protocol with the highest amplitude. Evaluation of the highest amplitude is performed by prescan measurements on all protocol implemented) - Worst case protocol used: ISO 144438A 424kbps (represent the protocol with the widest bandwidth. Evaluation of the widest bandwidth is performed by prescan measurements on all protocol implemented)	

Block diagram



Results - ISO 14443B - 848kbps

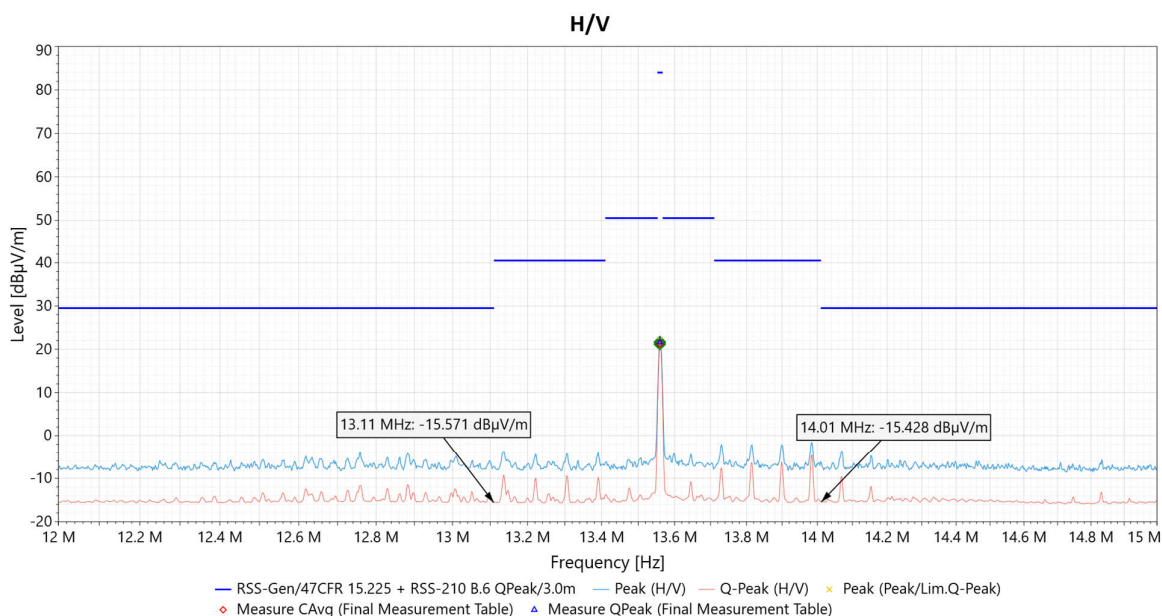
Operating mode	1
Axis	X
Verdict.....	Pass
Instrument settings	Start Frequency: 12 MHz; Stop Frequency: 15 MHz; Step: 2.25 kHz; Sweep Time: 1 s/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



Final Measurement Table

Frequency (MHz)	Measure CAvg (dBμV/m)	Measure QPeak (dBμV/m)	Limit QPeak (dBμV/m)	Margin QPeak	Angle (°)	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
13.559	8.42	8.94	84	-75.06	29.9	9000	5	Pass	-19.72

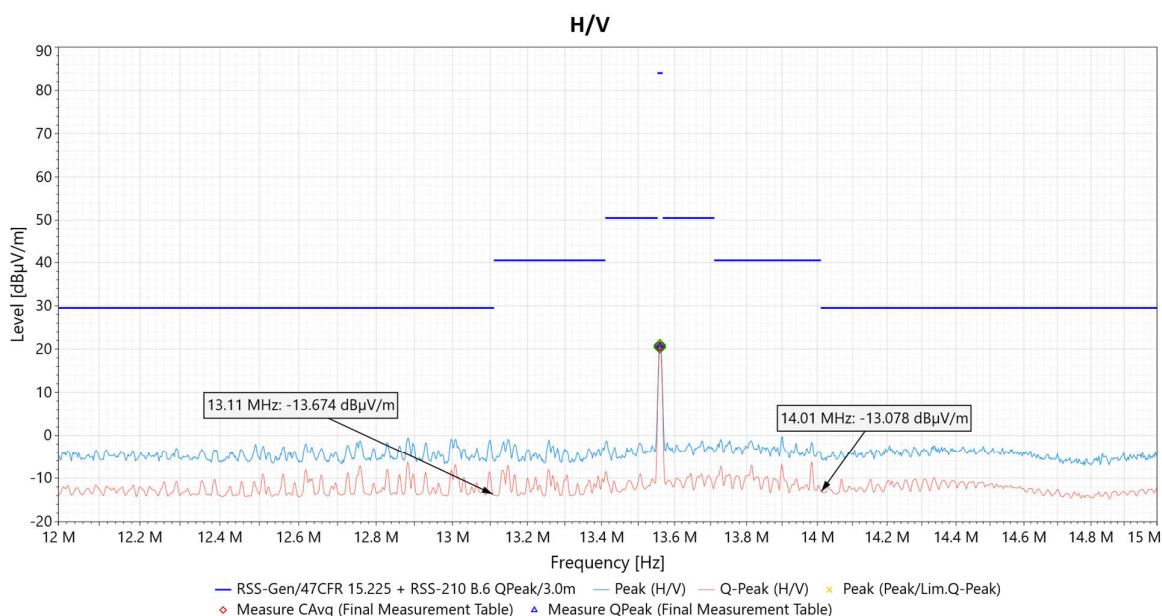
Operating mode	1
Axis	Y
Verdict	Pass
Instrument settings	Start Frequency: 12 MHz; Stop Frequency: 15 MHz; Step: 2.25 kHz; Sweep Time: 1 s/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



Final Measurement Table

Frequency (MHz)	Measure CAvg (dBμV/m)	Measure QPeak (dBμV/m)	Limit QPeak (dBμV/m)	Margin QPeak	Angle (°)	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
13.559	21.18	21.65	84	-62.35	329.9	9000	5	Pass	-19.72

Operating mode	1
Axis	Z
Verdict	Pass
Instrument settings	Start Frequency: 12 MHz; Stop Frequency: 15 MHz; Step: 2.25 kHz; Sweep Time: 1 s/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON

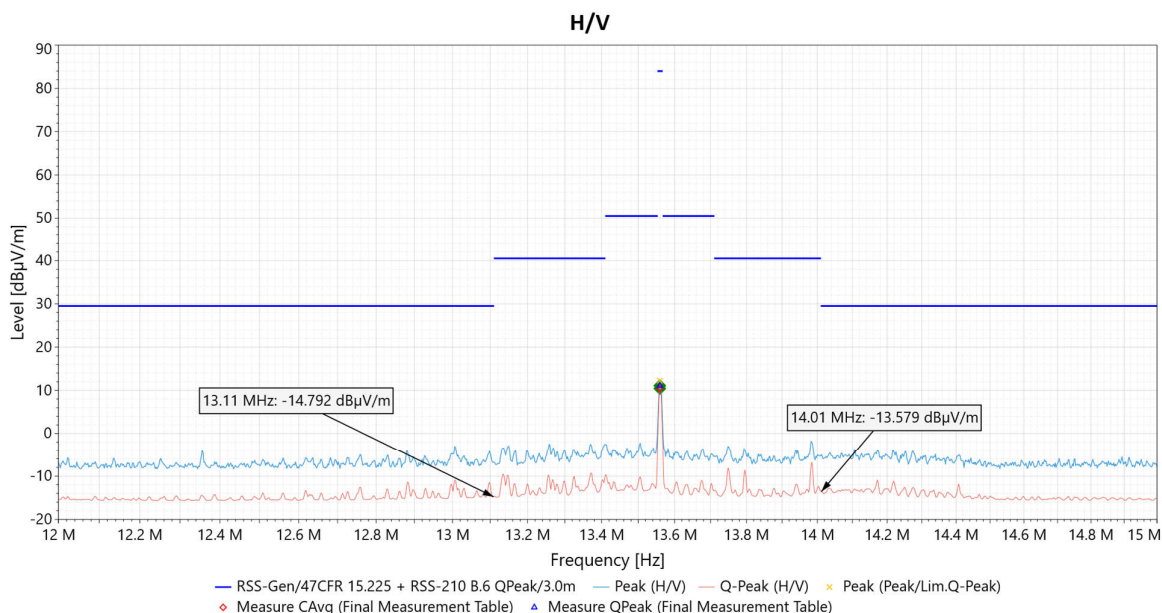


Final Measurement Table

Frequency (MHz)	Measure CAvg (dBμV/m)	Measure QPeak (dBμV/m)	Limit QPeak (dBμV/m)	Margin QPeak	Angle (°)	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
13.559	20.41	20.87	84	-63.13	0.2	9000	5	Pass	-19.72

Results - ISO 14443A - 424kbps

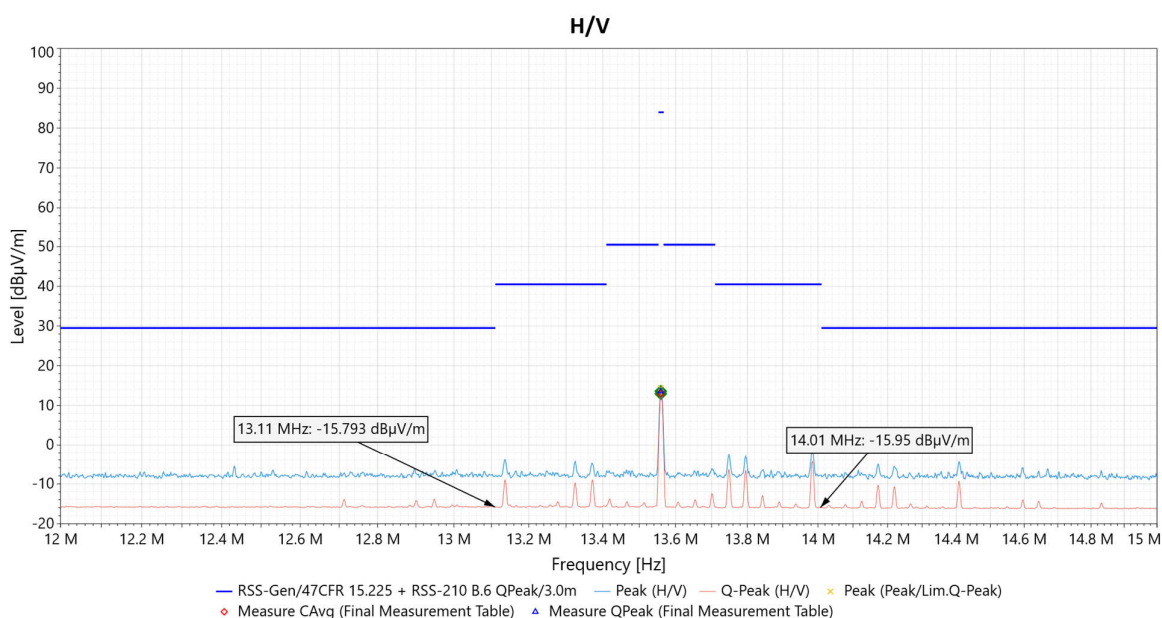
Operating mode	1
Axis	X
Verdict.....	Pass
Instrument settings	Start Frequency: 12 MHz; Stop Frequency: 15 MHz; Step: 2.25 kHz; Sweep Time: 1 s/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



Final Measurement Table

Frequency (MHz)	Measure CAvg (dBμV/m)	Measure QPeak (dBμV/m)	Limit QPeak (dBμV/m)	Margin QPeak	Angle (°)	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
13.559	10.43	11.09	84	-72.91	270.1	9000	5	Pass	-19.72

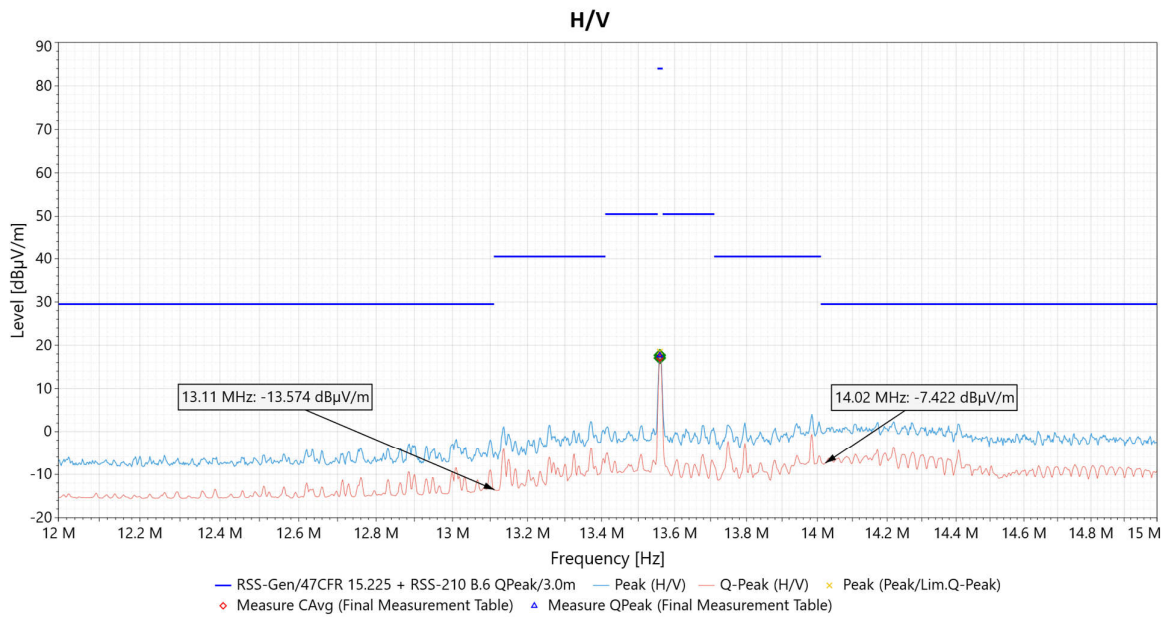
Operating mode	1
Axis	Y
Verdict	Pass
Instrument settings	Start Frequency: 12 MHz; Stop Frequency: 15 MHz; Step: 2.25 kHz; Sweep Time: 1 s/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



Final Measurement Table

Frequency (MHz)	Measure CAvg (dBμV/m)	Measure QPeak (dBμV/m)	Limit QPeak (dBμV/m)	Margin QPeak	Angle (°)	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
13.559	12.91	13.56	84	-70.44	0	9000	5	Pass	-19.72

Operating mode	1
Axis	Z
Verdict	Pass
Instrument settings	Start Frequency: 12 MHz; Stop Frequency: 15 MHz; Step: 2.25 kHz; Sweep Time: 1 s/Step; RF Attenuation: Auto; RBW: 9 kHz; VBW: Auto; Preamplifier: OFF; Preselector: ON



Final Measurement Table

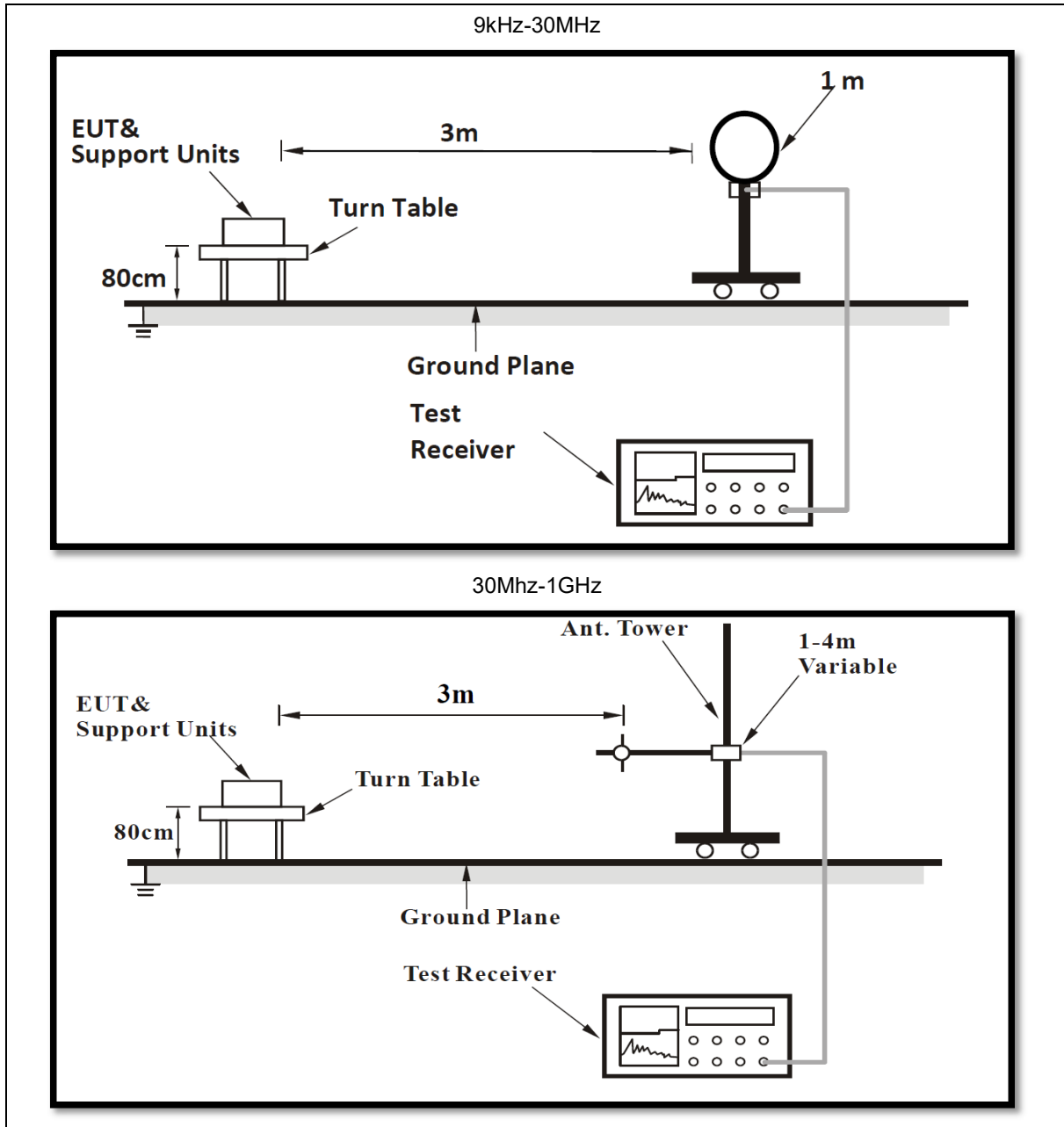
Frequency (MHz)	Measure CAvg (dBμV/m)	Measure QPeak (dBμV/m)	Limit QPeak (dBμV/m)	Margin QPeak	Angle (°)	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
13.559	17.05	17.68	84	-66.32	329.9	9000	5	Pass	-19.72

4.4 Transmitter Radiated Emissions

Tested by:	Matteo Borghesi	
Test date:	2025-07-03	
Test location (stand):	Area 8: SAC 3-1.2 (RF emission)	
Ambient temperature:	23 °C	
Relative humidity:	58 %	
Atmospheric pressure:	1000 mbar	
FCC Reference:	Part 15.225(b)(c)(d), 15.209	
ISED Canada Reference:	RSS-210 B.6	
Test method:	ANSI C63.10, §6.3, 6.4, 6.5	
Setup used:	☒	OATS or SAC with measurement distance [m]: 3
	☐	FAR CISPR 16-2-3 with measurement distance [m]: 3
	☐	FAR IEC 61000-4-22 with measurement distance [m]: 3
	☐	TEM Waveguide according IEC 61000-4-20
	☐	FSOATS with measurement distance [m]: 3
	☐	Climatic chamber
Supplementary test set-up description:	---	
Used mains voltage/frequency:	External 5 Vdc (worst case condition)	
Supplementary information:	<u>For 9kHz-30MHz frequency range only</u> - In accordance with FCC KDB 414788, an alternative test site may be used for the measurement below 30 MHz (the OATS / SAC comparison data is available upon request). Therefore the result from the semi-anechoic chamber tests is shown in this section of the test report. - The limits are specified at a test distance of 30 m & 300 m. However, as specified by FCC Section 15.31(f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by using the square of an inverse linear distance extrapolation factor. - Therefore the measurement values are extrapolated to a measurement distance of 3 m where field strength of X dBμV/m was measured. 9-490 kHz: from 300 m to 3 m subtracting 80 dB at 40 dB/decade. 490-1705 kHz: from 30 m to 3 m subtracting 40 dB at 40 dB/decade. Exclusion band 13.110-14.010 MHz applied. Worst case protocol used: ISO 1443B – 848kbps (represent the protocol with the highest amplitude. Evaluation of the highest amplitude is performed by prescan measurements on all protocol implemented Measurements were performed against CFR 47, Part 15, Subpart C, paragraph 15.209 (a) limits. These limits 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 the free space impedance of 377Ω. For example, the measurement frequency X kHz resulted in a level of Y	

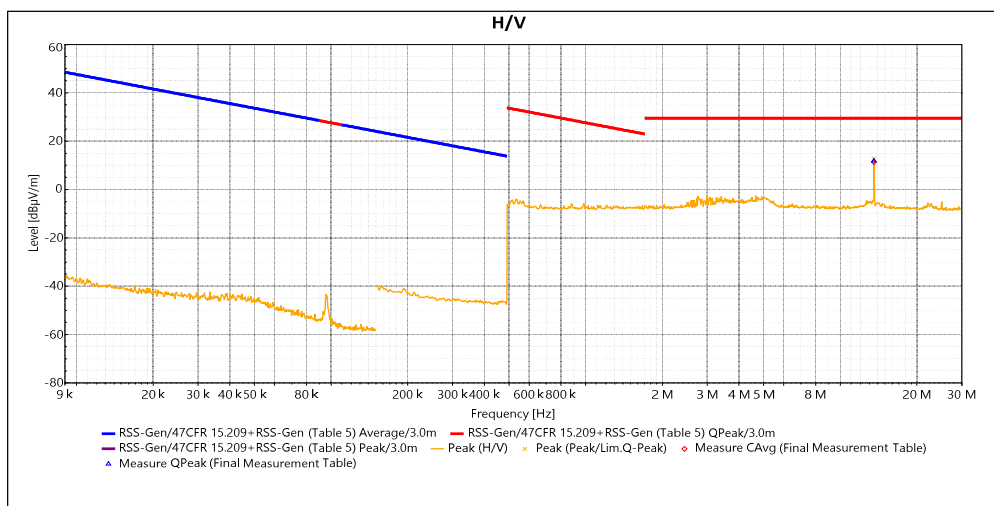
	dB μ V/m, which is equivalent to $Y - 51.5 = Z$ dB μ A/m, which has the same margin, W dB, to the corresponding RSS-Gen Table 6 limit as it has to the 15.209(a) limit.
--	---

Block diagram



Results of spurious emission

Operating mode	1
Axis	X
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; Preamp: 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; Preamp: OFF; Preselector: ON

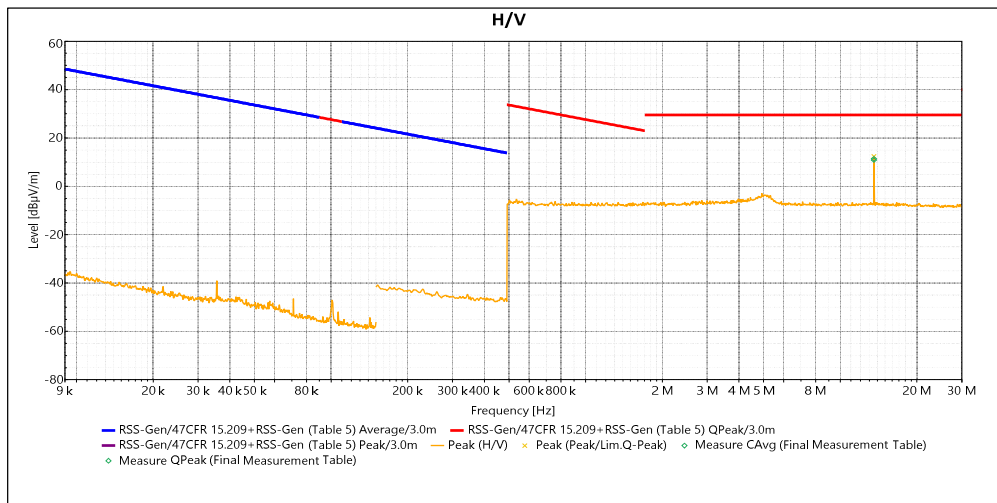


- ☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit
- ☒ Final measurements for emissions that are above -20 dB from the applicable limits are shown below (at least 6 worst frequencies):

Final Measurement Table

Frequency	Measure CAvg (dBμV/m)	Limit Avg (dBμV/m)	Measure QPeak (dBμV/m)	Limit QPeak (dBμV/m)	Margin QPeak	Angle (°)	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
13.56 MHz	11.35	NaN	11.8	29.54	-17.74	149.9	9 kHz	5	Pass	-19.72

Operating mode	1
Axis	Y
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



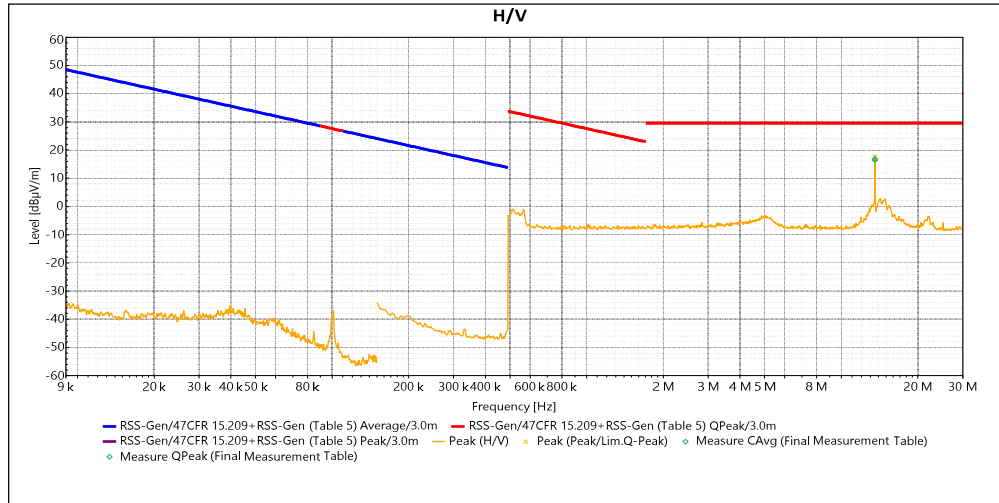
☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit

☒ Final measurements for emissions that are above -20 dB from the applicable limits are shown below (at least 6 worst frequencies):

Final Measurement Table

Frequency	Measure CAvg (dBμV/m)	Limit Avg (dBμV/m)	Measure QPeak (dBμV/m)	Limit QPeak (dBμV/m)	Margin QPeak	Angle (°)	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
13.56 MHz	10.84	NaN	11.34	29.54	-18.2	0.1	9 kHz	5	Pass	-19.72

Operating mode	1
Axis	Z
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



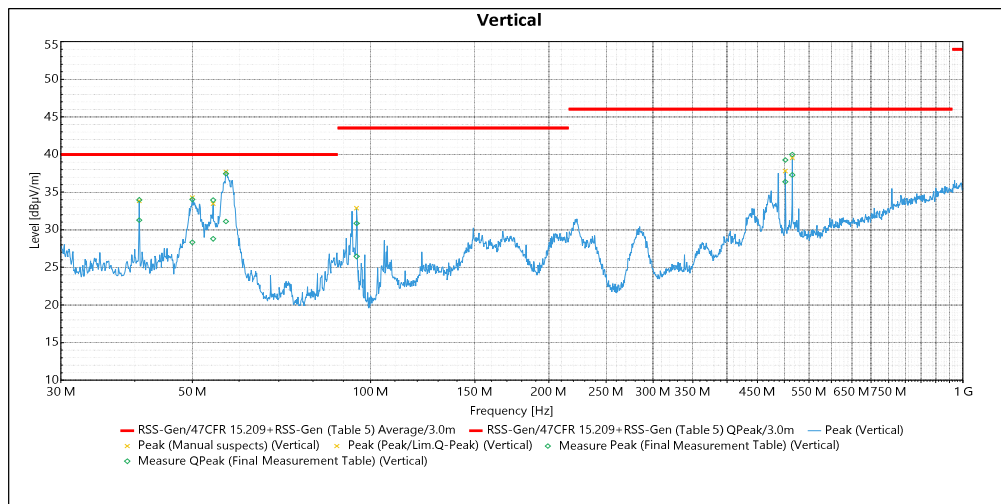
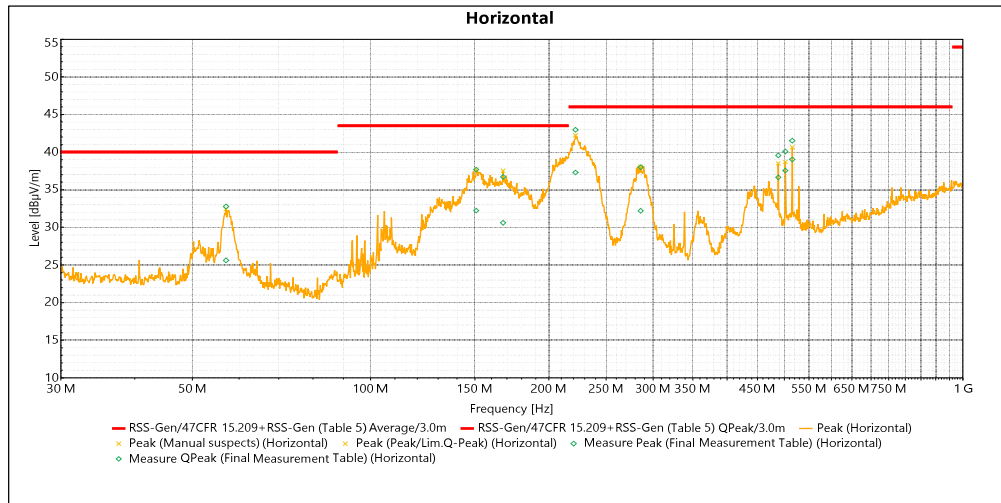
☐ The emissions are below the measurement system noise floor or 20 dB or more below the limit

☒ Final measurements for emissions that are above -20 dB from the applicable limits are shown below (at least 6 worst frequencies):

Final Measurement Table

Frequency	Measure CAvg (dBμV/m)	Limit Avg (dBμV/m)	Measure QPeak (dBμV/m)	Limit QPeak (dBμV/m)	Margin QPeak	Angle (°)	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
13.56 MHz	16.45	NaN	16.9	29.54	-12.64	270.1	9 kHz	5	Pass	-19.72

Operating mode.....	1
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
- ☒ Final measurements for emissions that are above -20 dB from the applicable limits are shown below (at least 6 worst frequencies):

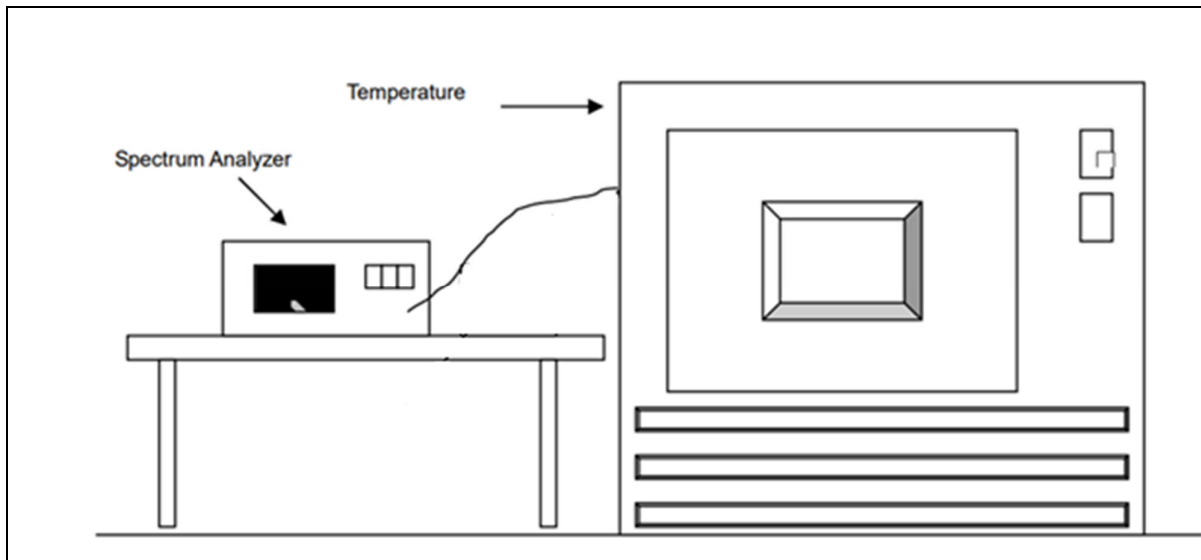
Final Measurement Table

Frequency	Measure Peak (dBuV/m)	Measure QPeak (dBuV/m)	Limit QPeak (dBuV/m)	Margin QPeak (dB)	Max height (m)	Max angle (°)	Polarization	RBW (Hz)	Meas.Time (s)	Comments	Correction (dB)
57.03 MHz	32.78	25.6	40	-14.4	1.17	303.2	Horizontal	120 k	5	Pass	19.74
150.87 MHz	37.68	32.23	43.52	-11.29	1.8	76.5	Horizontal	120 k	5	Pass	20.1
167.34 MHz	36.71	30.6	43.52	-12.92	1.92	96.3	Horizontal	120 k	5	Pass	20.07
221.91 MHz	42.96	37.29	46.02	-8.73	1.01	260.5	Horizontal	120 k	5	Pass	16.74
285.81 MHz	38.01	32.2	46.02	-13.82	1.22	74.1	Horizontal	120 k	5	Pass	20.26
488.16 MHz	39.56	36.64	46.02	-9.38	1.72	57.8	Horizontal	120 k	5	Pass	25.11
501.72 MHz	40.09	37.55	46.02	-8.47	1.73	60.6	Horizontal	120 k	5	Pass	25.41
515.28 MHz	41.52	39.02	46.02	-7	1.54	59.3	Horizontal	120 k	5	Pass	25.85
40.68 MHz	33.96	31.27	40	-8.73	1	133.8	Vertical	120 k	5	Pass	19.47
50.04 MHz	34.03	28.33	40	-11.67	1.01	313.1	Vertical	120 k	5	Pass	20.1
54.21 MHz	33.94	28.79	40	-11.21	1.06	255.1	Vertical	120 k	5	Pass	19.97
57 MHz	37.45	31.1	40	-8.9	1.01	236.9	Vertical	120 k	5	Pass	19.75
94.74 MHz	30.85	26.46	43.52	-17.06	1.16	177.8	Vertical	120 k	5	Pass	14.42
501.72 MHz	39.27	36.38	46.02	-9.64	1.86	26.5	Vertical	120 k	5	Pass	25.41
515.28 MHz	39.99	37.29	46.02	-8.73	1.81	27.5	Vertical	120 k	5	Pass	25.85

4.5 Frequency Tolerance of the carrier signal

Tested by:	Borghesi Matteo	
Test date:	2025-07-24	
Test location (stand):	Laboratory	
Ambient temperature:	See measurement table	
Relative humidity:	64 %	
Atmospheric pressure:	991 mbar	
FCC Reference:	Part 15.225(e)	
ISED Canada Reference:	RSS-210 B.6	
Test method:	ANSI C63.10, §6.8.1, 6.8.2	
Setup used:	☐	OATS or SAC with measurement distance [m]: 3
	☐	FAR CISPR 16-2-3 with measurement distance [m]: 3
	☐	FAR IEC 61000-4-22 with measurement distance [m]: 3
	☐	TEM Waveguide according IEC 61000-4-20
	☐	FSOATS with measurement distance [m]: 3
	☒	Climatic chamber
Supplementary test set-up description:	---	
Temperature range:	-20 °C ; + 55 °C	
Used mains voltage/frequency:	External DC supply used (worst case), 5-24 Vdc 4.25 Vdc (-15% of minimum voltage range) 27.6 Vdc (+15% of maximum voltage range)	
Supplementary information:	The applicant's declared operating frequency 13.56 MHz was used as reference frequency Worst case protocol used: ISO 144438A 424kbps (represent the protocol with the widest bandwidth. Evaluation of the widest bandwidth is performed by prescan measurements on all protocol implemented)	

Block diagram



Results

Extreme Temperature (°C)	Time After EUT power up	Measured Frequency (MHz)	Frequency error		Frequency error limits		Verdict
			%	ppm	%	ppm	
-20	At 0 minutes	13.56011770	0.000008679941	8.679941	±0.01	±100	Pass
	At 2 minutes	13.56011817	0.000008714602	8.714602	±0.01	±100	Pass
	At 5 minutes	13.56018917	0.000013950590	13.95059	±0.01	±100	Pass
	At 10 minutes	13.56024290	0.000017912979	17.91298	±0.01	±100	Pass
-10	At 0 minutes	13.56024363	0.000017966814	17.96681	±0.01	±100	Pass
	At 2 minutes	13.56024377	0.000017977139	17.97714	±0.01	±100	Pass
	At 5 minutes	13.56024390	0.000017986726	17.98673	±0.01	±100	Pass
	At 10 minutes	13.56024397	0.000017991888	17.99189	±0.01	±100	Pass
0	At 0 minutes	13.56024303	0.000017922566	17.92257	±0.01	±100	Pass
	At 2 minutes	13.56024297	0.000017918142	17.91814	±0.01	±100	Pass
	At 5 minutes	13.56024296	0.000017917404	17.9174	±0.01	±100	Pass
	At 10 minutes	13.56024290	0.000017912979	17.91298	±0.01	±100	Pass
10	At 0 minutes	13.56022290	0.000016438053	16.43805	±0.01	±100	Pass
	At 2 minutes	13.56222570	0.000164137168	164.1372	±0.01	±100	Pass
	At 5 minutes	13.56022270	0.000016423304	16.4233	±0.01	±100	Pass
	At 10 minutes	13.56022197	0.000016369469	16.36947	±0.01	±100	Pass
20	At 0 minutes	13.56018917	0.000013950590	13.95059	±0.01	±100	Pass
	At 2 minutes	13.56018897	0.000013935841	13.93584	±0.01	±100	Pass
	At 5 minutes	13.56018890	0.000013930678	13.93068	±0.01	±100	Pass
	At 10 minutes	13.56018850	0.000013901180	13.90118	±0.01	±100	Pass
30	At 0 minutes	13.56015203	0.000011211652	11.21165	±0.01	±100	Pass
	At 2 minutes	13.56015177	0.000011192478	11.19248	±0.01	±100	Pass
	At 5 minutes	13.56015163	0.000011182153	11.18215	±0.01	±100	Pass
	At 10 minutes	13.56015150	0.000011172566	11.17257	±0.01	±100	Pass
40	At 0 minutes	13.56011817	0.000008714602	8.714602	±0.01	±100	Pass
	At 2 minutes	13.56011770	0.000008679941	8.679941	±0.01	±100	Pass
	At 5 minutes	13.56011763	0.000008674779	8.674779	±0.01	±100	Pass
	At 10 minutes	13.56011710	0.000008635693	8.635693	±0.01	±100	Pass
50	At 0 minutes	13.56009310	0.000006865782	6.865782	±0.01	±100	Pass
	At 2 minutes	13.56009303	0.000006860619	6.860619	±0.01	±100	Pass
	At 5 minutes	13.56009323	0.000006875369	6.875369	±0.01	±100	Pass
	At 10 minutes	13.56009310	0.000006865782	6.865782	±0.01	±100	Pass
55	At 0 minutes	13.56009097	0.000006708702	6.708702	±0.01	±100	Pass
	At 2 minutes	13.56008723	0.000006432891	6.432891	±0.01	±100	Pass
	At 5 minutes	13.56008710	0.000006423304	6.423304	±0.01	±100	Pass
	At 10 minutes	13.56087230	0.000064328909	64.32891	±0.01	±100	Pass

Extreme Voltage Conditions	Extreme AC and DC Voltage (V)	Measured Frequency (MHz)	Frequency error		Frequency error limits		Verdict
			%	ppm	%	ppm	
$V_{nom} - 15\%$	AC:85 Vac DC:5 Vdc	13.56013556	0.000009997050	9.99705	± 0.01	± 100	Pass
$V_{nom} + 15\%$	AC:276 Vac DC:5 Vdc	13.56014003	0.000010326696	10.3267	± 0.01	± 100	Pass
$V_{nom} - 15\%$	AC:85 Vac DC:24 Vdc	13.56010563	0.000007789823	7.789823	± 0.01	± 100	Pass
$V_{nom} + 15\%$	AC:276 Vac DC:24 Vdc	13.56011823	0.000008719027	8.719027	± 0.01	± 100	Pass
$V_{nom} - 15\%$	4.25 Vdc	13.56013010	0.000009594395	9.594395	± 0.01	± 100	Pass
$V_{nom} + 15\%$	27.6 Vdc	13.56012276	0.000009053097	9.053097	± 0.01	± 100	Pass

5 List of test equipment

Equipment	Type	Inventory Number	Manufacturer	Serial Number	Last Calibration Date	Calibration Due Date
Test Stand: AC conducted emission						
Line Impedance Stabilization Network 3PH32A	ENV432	154695	Rohde & Schwarz	101335	2025-01-09	2026-01-28
Shielded Room 2 RF Emission	SR2	210412	ETS-Lindgren	-	-	-
3m coaxial cable	3m N(m)-N(m) Highflexx 7	259764	Kabel Kusch	None	2025-03-24	2026-03-28
Software - EMC	Click Rate Analyzer	156536	Rohde & Schwarz	-	-	-
EMI TEST RECEIVER	ESR7	82570	Rohde & Schwarz	-	2024-09-28	2025-09-28
Test Stand: radiated spurious emission 9 kHz – 30 MHz						
12m N(m)-N(m) RF cable	Hyperflex 5 12m	248398	Kabel Kusch	None	2025-05-23	2026-05-28
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	00231682	-	-
EMI TEST RECEIVER	ESW26	246431	Rohde & Schwarz (Koeln) GmbH & Co. KG	103182	2025-03-31	2026-01-28
SEMI-ANECHOIC CHAMBER	FACT3-1.2 STD	210407	ETS-Lindgren	-	-	-
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-	-
Antenna Tripod	CTP 6099	155934	Teseq, Inc	-	-	-
Active Loop Antenna	HLA 6121	155933	Teseq, Inc	45746	2025-02-14	2027-02-28
DC Power Injector	PI 6121	155980	Teseq, Inc	-	-	-
Test Stand: radiated spurious emission 30 MHz – 1000 MHz						
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-	-
NSA Normalized Site Attenuation	NSA FACT3-1.2 STD	210410	ETS-Lindgren	-	2025-04-28	2025-08-28
Trilog-Broadband Antenna	VULB 9168	210290	Schwarzbeck Mess-Elektronik OHG	12441244	2023-08-25	2025-08-28
Tilting Antenna Mast Positioning Tower	2171B/2170B	135821	ETS-Lindgren (Cedar Park, Texas)	-	-	-
SEMI-ANECHOIC CHAMBER	FACT3-1.2 STD	210407	ETS-Lindgren	-	-	-
EMI TEST RECEIVER	ESW26	246431	Rohde & Schwarz (Koeln) GmbH & Co. KG	103182	2025-03-31	2026-01-28
Center, Modular RF Platform	7000-011	210859	ETS-Lindgren	00231682	-	-
Cable 2000mm - 18 GHz	SF126/11SMA/11N/2000	220503	Huber+Suhner	554756/126	2025-05-28	2026-05-28
Cable 8000mm - 18 GHz	SF126/11N/11N/8000	220502	Huber+Suhner	556226/126	2025-05-28	2026-05-28
6dB Attenuator	DGA 9552 N	210263	Schwarzbeck Mess-Elektronik OHG	CH9006	2024-09-05	2025-09-28

Test Stand: Permitted range of operating frequencies, Modulation Bandwidth, H-Field						
Climatic Chamber	SH-642	218136	Espec	93018522	2025-06-03	2026-06-28
SET OF FIELD SENSORS	HZ 11	37347	Rohde & Schwarz (Koeln) GmbH & Co. KG	816.2770.0	-	-
EMI TEST RECEIVER	ESW26	246431	Rohde & Schwarz (Koeln) GmbH & Co. KG	103182	2025-03-31 2026-02-11	2026-01-28 2027-02-28
RF CABLES	LMR-240	175758	TIMES MICROWAVE SYSTEMS	None	2025-02-14	2026-02-28
Test Stand: Auxiliary						
Mini Datalogger (FACT3)	174H	211147	Testo	83306371	2024-10-25	2025-10-28
TRUE-RMS DIGITAL MULTIMETER	289	223467	Fluke Corporation	59040084	2023-09-06	2025-09-28
Laser Measure	RSLDM-50H	224436	RS Pro	210743764	2023-11-10	2025-11-28
Frequency Converter (60 Hz)	FWW-SFUP 40kVA	37730	GUSTAV KLEIN	-	-	-
Isolated voltage variac (60 Hz)	T40NC-6	80699	BELOTTI VARIATORI	-	-	-
CLIMATIC CENTRAL UNIT (SACs side)	iBTHX-W	70611	Omega Engineering Inc.	1040495	2025-04-28	2026-04-28
Mini Datalogger (SR2)	174H	211146	Testo	83293175	2024-10-25	2025-10-28
CLIMATIC CENTRAL UNIT (SRs side)	iBTHX-W	70614	Omega Engineering Inc.	1040496	2025-04-28	2026-04-28

In accordance with ACCREDIA requirements, all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

6 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	0.51	dB
Conducted power, by fast power meter	9 kHz to 8 GHz	0.49	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	3.36	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 >