RADIO REPORT

FCC 47 CFR Part 15C
ISED Canada RSS-210

Operation within the 13.110 – 14.010 MHz band

Report Reference No	G0M-2306-2109-TFC225RI-V02
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	DAkkS - Registration number : D-PL-12092-01-03 (ISED) ISED Testing Laboratory site: 3470A DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	Vaisala Oy
Address	Vanha Nurmijärventie 21 01670 Vantaa Finland
Test Specification	47 CFR Part 15C RSS-210, Issue 10, 2020-04 RSS-Gen, Issue 5, Amendment 2, 2021-02
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Ground Check Device RI41
Model(s)	RI41
Additional Model(s)	None
Brand Name(s)	None
Hardware Version(s)	D
Software Version(s)	2.05
FCC ID	2AO39-RI41
ISED ID	23830-R141
Test Result	**PASSED**

Possible test case verdicts:		
Required by standard but not tested	N/T	
Not required by standard	N/R	
Not applicable to EUT	N/A	
Test object does meet the requirement	P(PASS)	
Test object does not meet the requirement	F(FAIL)	
Testing:		
Test Lab Temperature	20 °C - 30 °C	
Test Lab Humidity	25 % - 55 %	
Date of receipt of test item	2023-09-12	
Report:		
Compiled by	Godson Offorji	
Supervised by (+ signature) (Responsible for Test)	Burkhard Pudell	
Approved by (+ signature) (Test Lab Engineer)	Wilfried Treffke	
Date of Issue	2024-02-21	
Total number of pages	41	
General Remarks:		
The test results presented in this report relate only to the object tested. **The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.** This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		
Additional Comments:		
None		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2023-10-25	Initial Release	--
02	2024-02-21	Replaced document: G0M-2306-2109-TFC225RI-V01 Replaced by: G0M-2306-2109-TFC225RI-V02 Reason: - Update Support Equipment - Update AC powerline conducted emissions photos - Update test procedure 3.2.5 about the extrapolation method	St. Liebich

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
RBW	Resolution bandwidth
RFID	Radio Frequency Identification
RMS	Root mean square
VBW	Video bandwidth
V_{NOM}	Nominal supply voltage

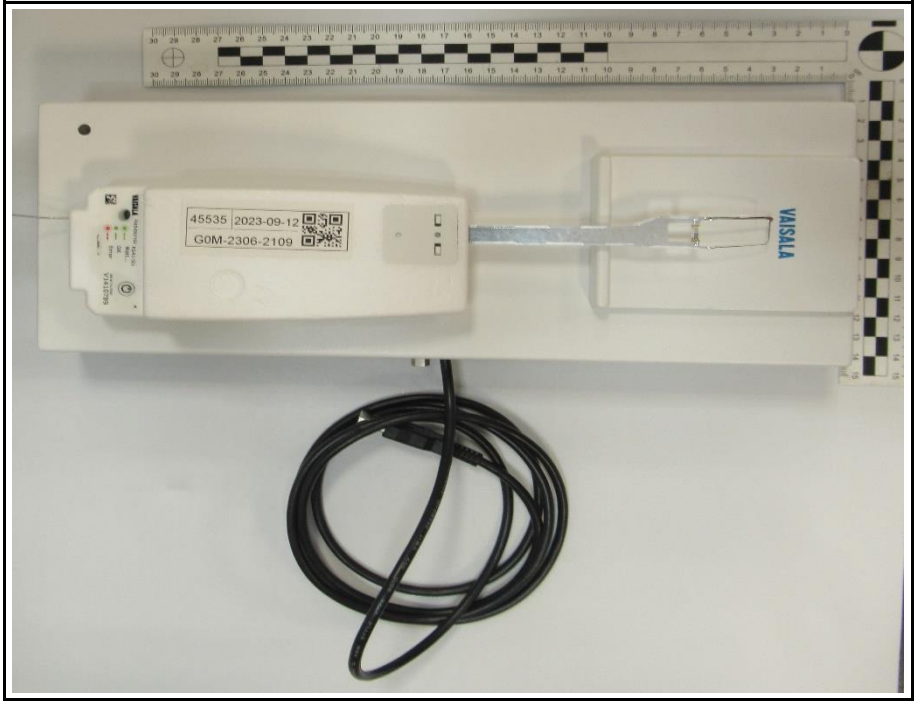
REPORT INDEX

1 Equipment (Test Item) Under Test

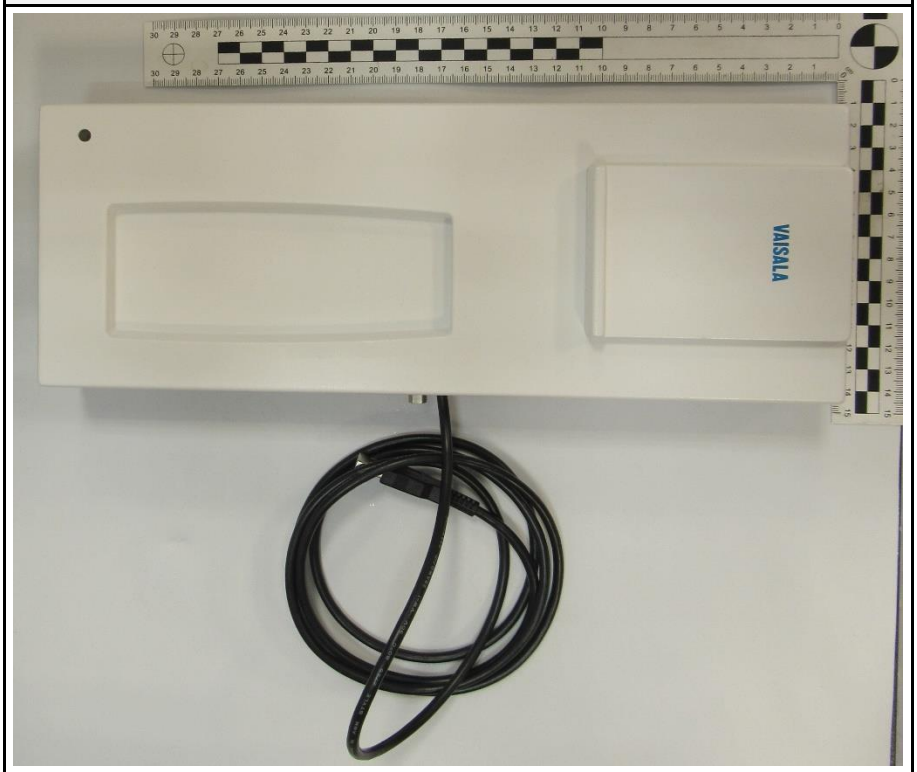
Description	Ground Check Device RI41	
Model	RI41	
Additional Model(s)	None	
Brand Name(s)	None	
Serial Number(s)	V2710001	
Test Sample Id(s)	45709	
Hardware Version(s)	D	
Software Version(s)	2.05	
FCC ID	2AO39-RI41	
ISED ID	23830-R141	
Equipment type	End Product	
Radio type	Interrogator	
Assigned frequency bands	13.110 - 14.010 MHz	
Radio technology	RFID	
Modulation	ASK	
Antenna	Type	Integrated
	Model	PCB loop antenna
	Manufacturer	Vaisala Oyj
	Gain	Unspecified
Supply Voltage	V_{NOM}	5.0 VDC
Operating Temperature	T_{NOM}	25 °C
	T_{MIN}	-20 °C
	T_{MAX}	50 °C
AC/DC-Adaptor	None	
Manufacturer	Vaisala Oy Vanha Nurmijärventie 21 01670 Vantaa Finland	

1.1 Photos – Equipment External

EUT Overview

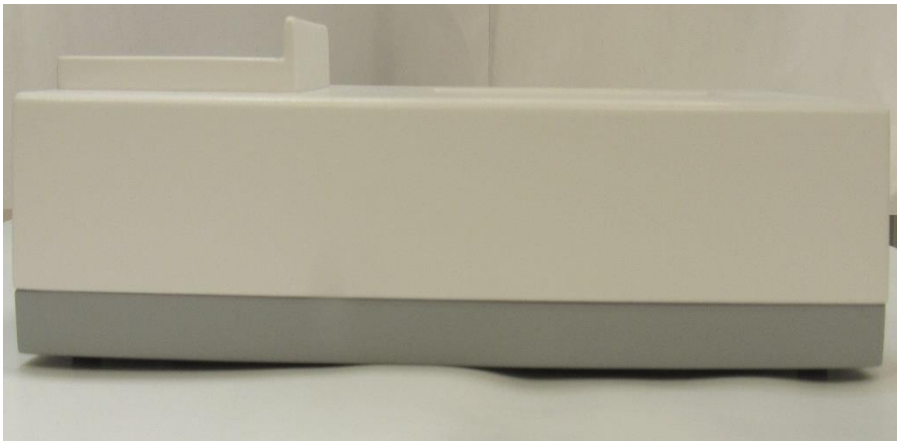


EUT Front view



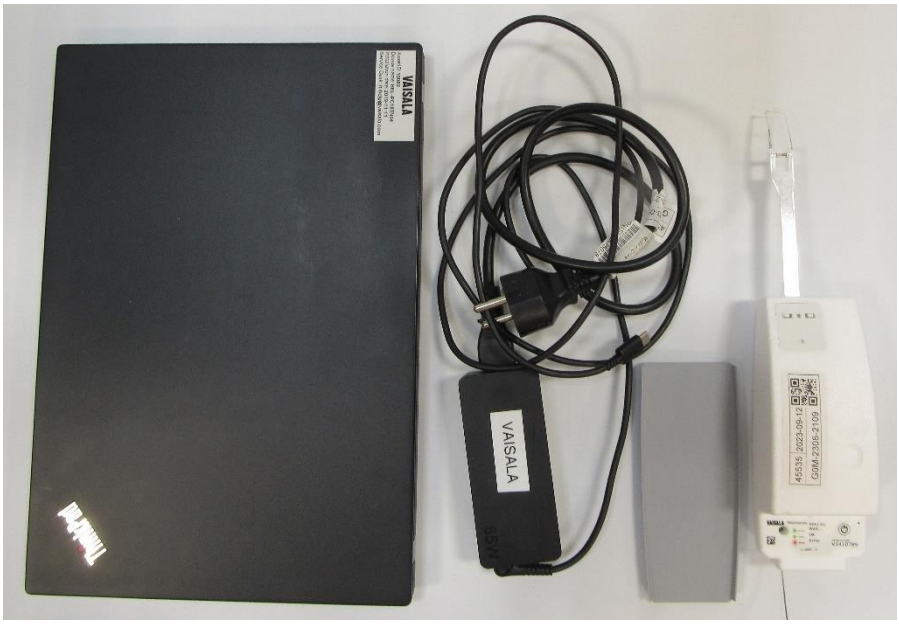
EUT Back view

EUT Right side view

EUT Left side view


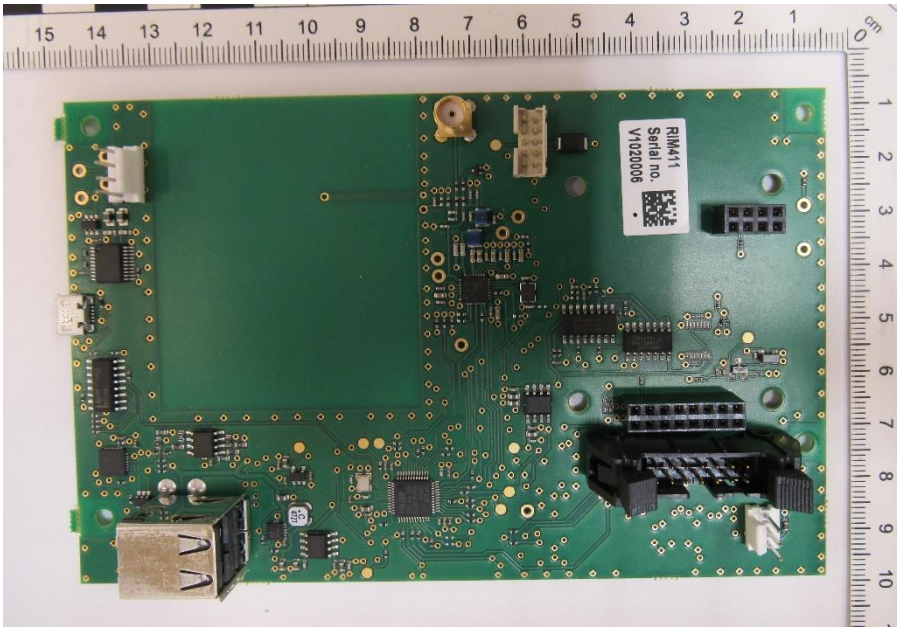
EUT Top view


EUT Down view

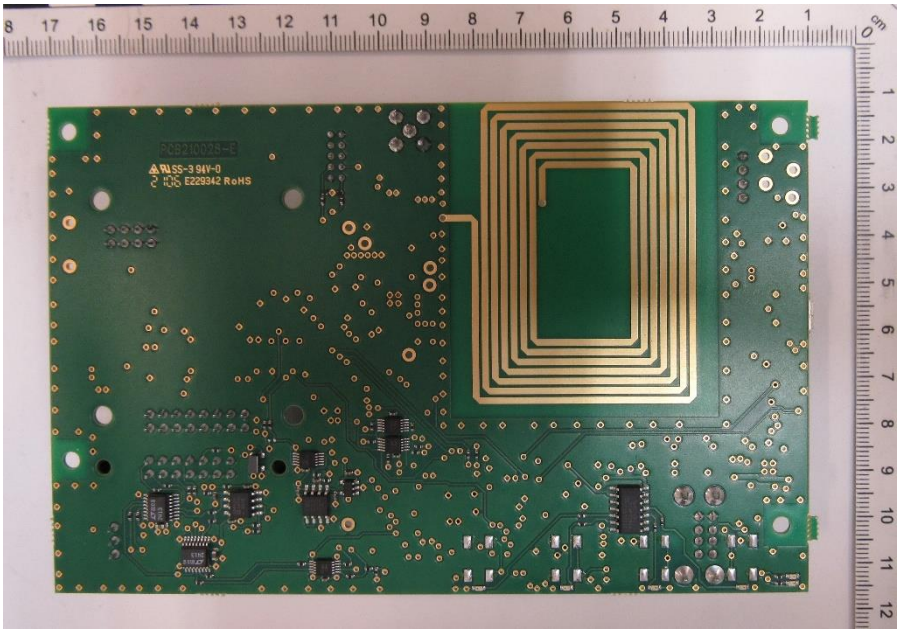

Test Support Equipments


1.2 Photos – Equipment Internal

EUT Internal overview

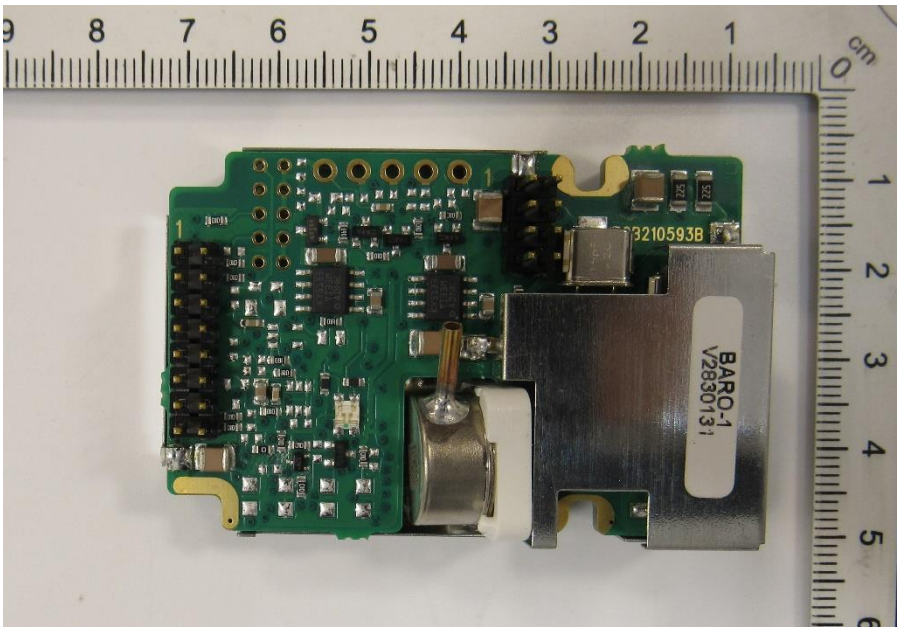

PCB Front view


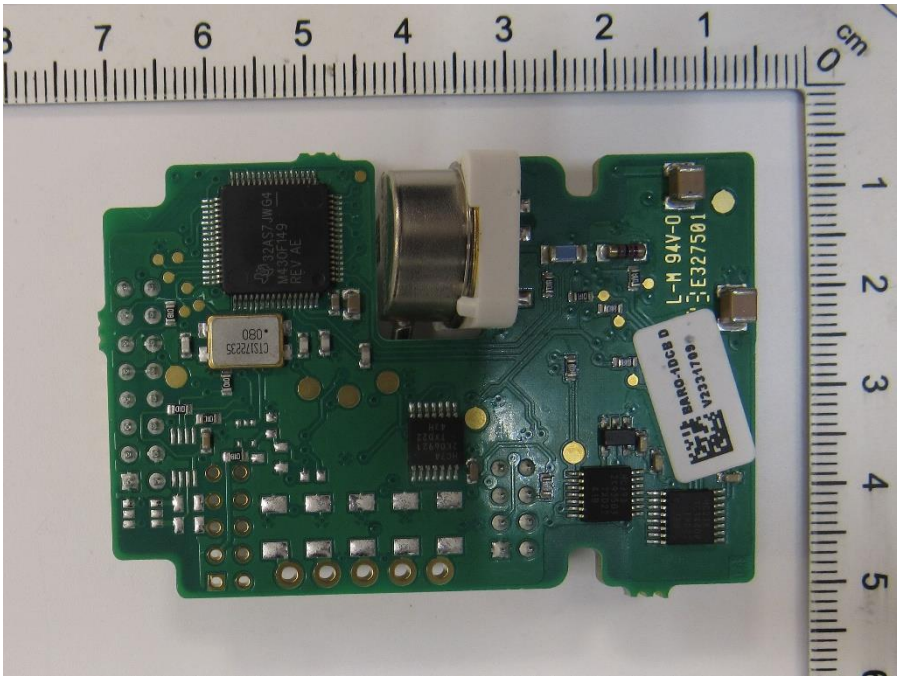
PCB back view

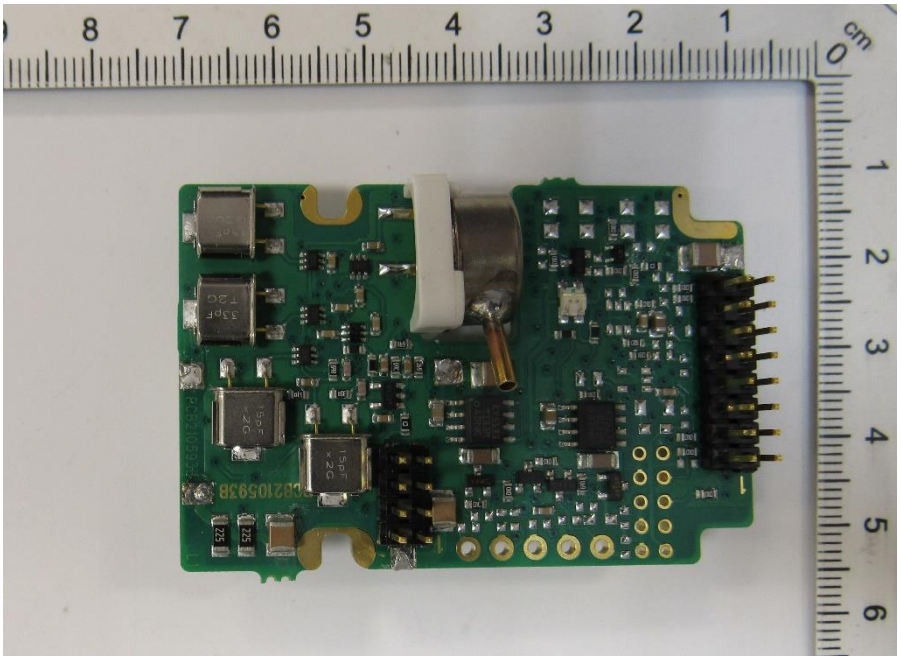


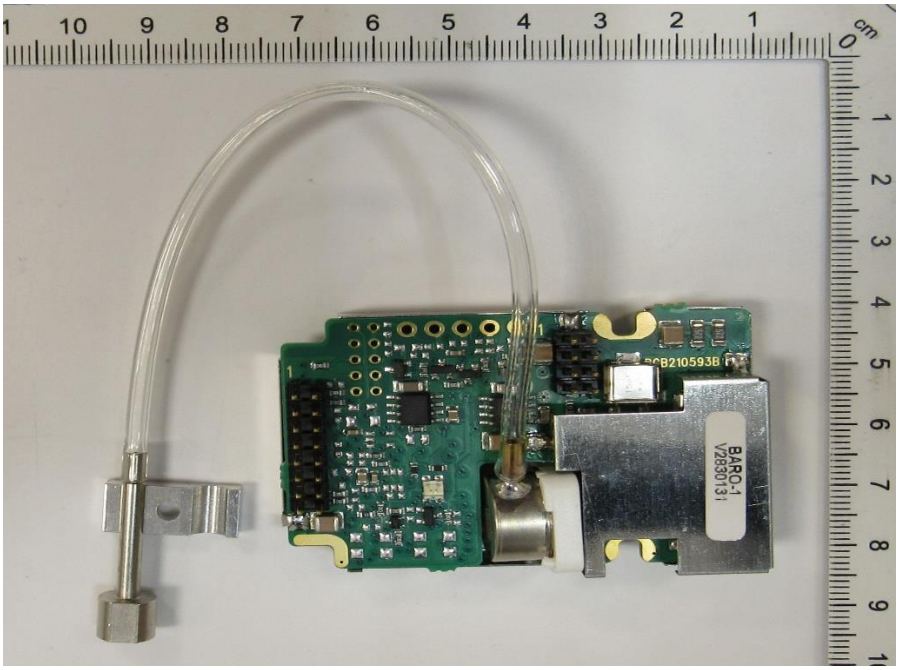
Internal view

Module shielded top view

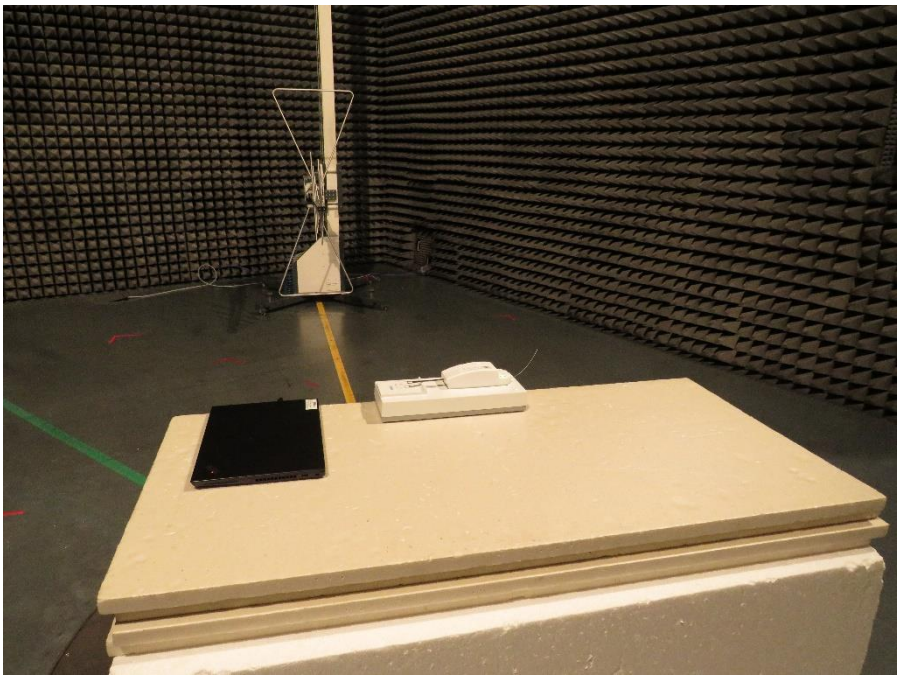

Module shielded down view


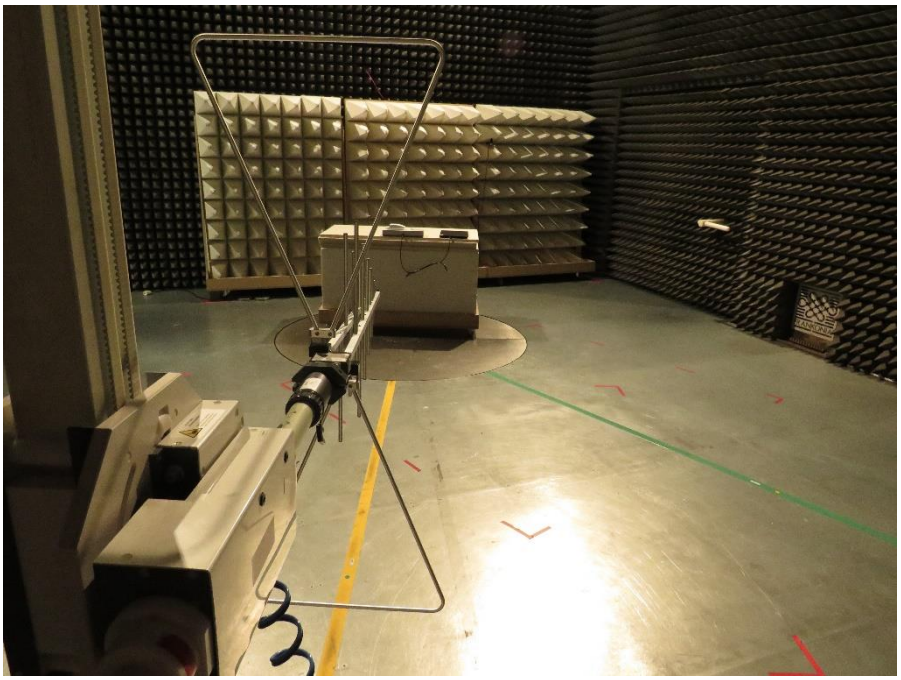
Module unshielded top view


Module unshielded down view


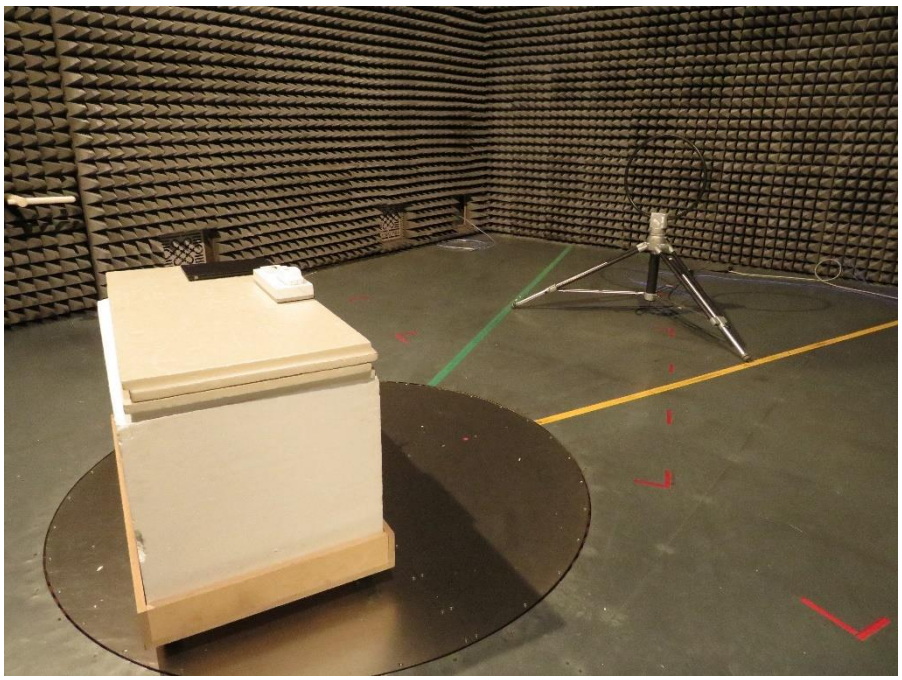
Module with hydro host


1.3 Photos – Test Setup

Test setup above 30 MHz - view 1


Test setup above 30 MHz - view 2


Test setup below 30 MHz - view 1



Test setup below 30 MHz - view 2

1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Laptop	Lenovo	ThinkPad T490s	OS: Windows 10 pro; S/N: PC05HRRV AC/DC adapter: (8SSA10M13945L1 CZ85F0697)
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment: --				

1.5 Test Modes

Mode	Description
Transmit	Mode = Transmit Modulation =ASK Duty cycle = 85%
Comment: The receiver is permanent co-located with transmitter	

1.6 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx	1	13.56

1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyzer in dBµV. Any external preamplifiers used are taken into account through internal analyzer settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyzer. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

Reading on Analyzer (dBµV) + A.F. (dB/m) = Net field strength (dBµV/m)

Net:

This is the net field strength measurement (as shown above).

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Field strength limit:

This is the FCC Class B radiated emission limit (in units of dBµV/m). The FCC limits are given in units of µV/m. The following formula is used to convert the units of µV/m to dBµV/m:

Field strength limit (dBµV/m) = 20 · log (µV/m)

Example only for radiated field strength:

Reading + AF	= Net Reading	:	Net reading	- Field strength limit	= Margin
+21.5 dBµV	+ 26 dB/m	:	47.5 dBµV/m	- 57.0 dBµV/m	= -9.5

2 Result Summary

FCC 47 CFR Part 15C, ISED RSS-210				
Product Standard Reference	**Requirement**	**Reference Method**	**Result**	**Remarks**
ISED RSS-210 5 ISED RSS-Gen 6.7	Occupied Bandwidth	ANSI C63.10-2013	N/R	Informational only
FCC 15.225(a-c) ISED RSS-210 B.6(a)	Fundamental in-band field strength emissions	ANSI C63.10-2013	PASS	--
FCC 15.225(d) FCC 15.209 ISED RSS-210 B.6(a)	Emission radiated outside the specified frequency band	ANSI C63.10-2013	PASS	--
FCC 15.225(e) ISED RSS-210 B.6	Frequency stability	ANSI C63.10-2013	PASS	--
ISED RSS-210 5 ISED RSS-Gen 7.3	Receiver radiated spurious emissions	ANSI C63.10-2013	N/A	Permanently co-located transmitter
47 CFR 15.207 ISED RSS-210 5 RSS-Gen 7.2	AC power line conducted emissions	ANSI C63.10-2013	PASS	--
Comment: The Decision Rule is applied on the basis of ETSI TR 102 273 and ETSI TR 100 028. These standards provide guidance on how to calculate and apply measurement uncertainty whilst providing maximum uncertainties allowance. In all cases due consideration will be given to ILAC-G8:09/2019. Where a result is considered conditional in respect of its proximity to the limit line, the customer would be made aware of situation so that they can make an informed decision on how to proceed.				

Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

3 Test Conditions and Results

3.1 Test Conditions and Results - Occupied bandwidth

3.1.1 Information

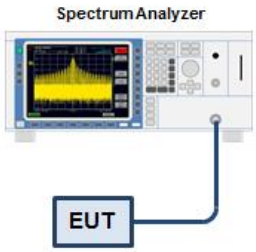
Test Information	
Product Standard Reference	ISED RSS-210 5, ISED RSS-Gen 6.7
Measurement Method	Conducted
Measurement Uncertainty	± 1.26 %
Operator	Godson Offorji
Date	2023-10-05

3.1.2 Limits

Limits
None (Informational only)

3.1.3 Setup

Test Setup



3.1.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 26	EF01003	2023-08	2024-08
Cable	Gigalane	SMS111B	EF00779	2023-03	2024-03

3.1.5 Procedure

Test Procedure

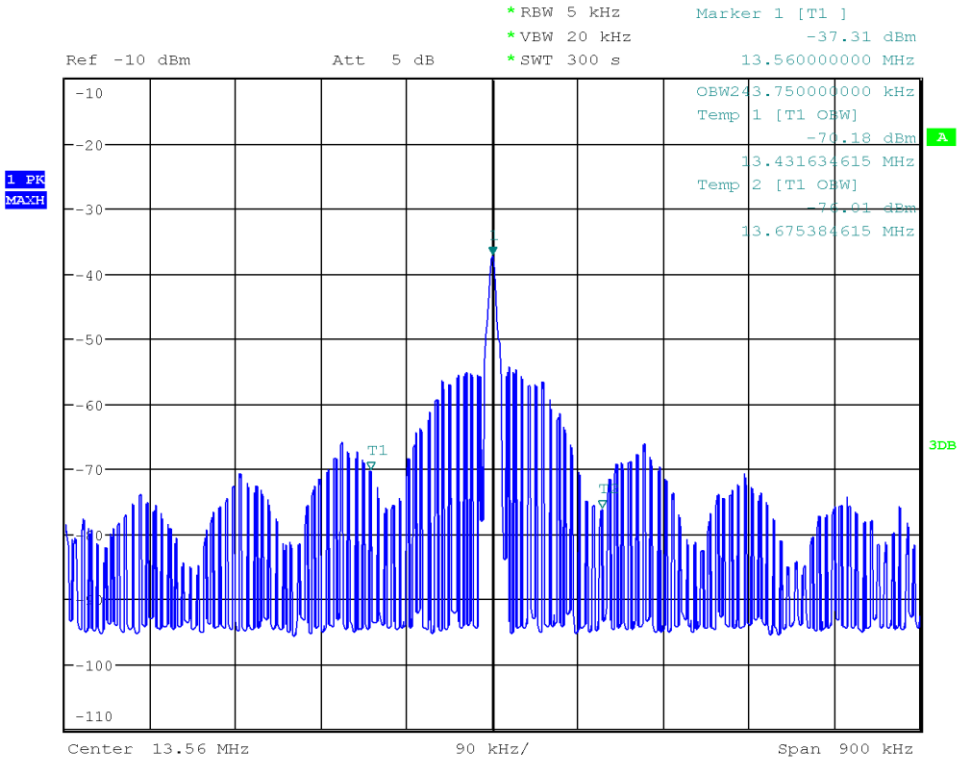
1. EUT set to test mode (Communication tester is used if needed)
2. Span set to at least twice the emission spectrum
3. Resolution bandwidth set between 1 % to 5 % of OBW
4. Occupied Bandwidth (99 %) measurement with spectrum analyzer built in measurement function

3.1.6 Results

Test Results	
Channel [MHz]	Bandwidth [kHz]
13.56	244

Occupied Bandwidth

Project Number:	G0M-2306-2109
Applicant:	Vaisala Oy
Model Description:	Ground Check Device RI41
Model:	RI41
Test Sample ID:	45531
Reference Standards:	FCC 15.225, RSS-210
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	ASK, Channel: 13.56 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Godson Offorji
Test Site:	Eurofins Product Service GmbH
Test Date:	2023-10-05
Occupied Bandwidth [MHz]:	0.244



Date: 5.OCT.2023 14:31:31

3.2 Test Conditions and Results - Fundamental in-band field strength emissions

3.2.1 Information

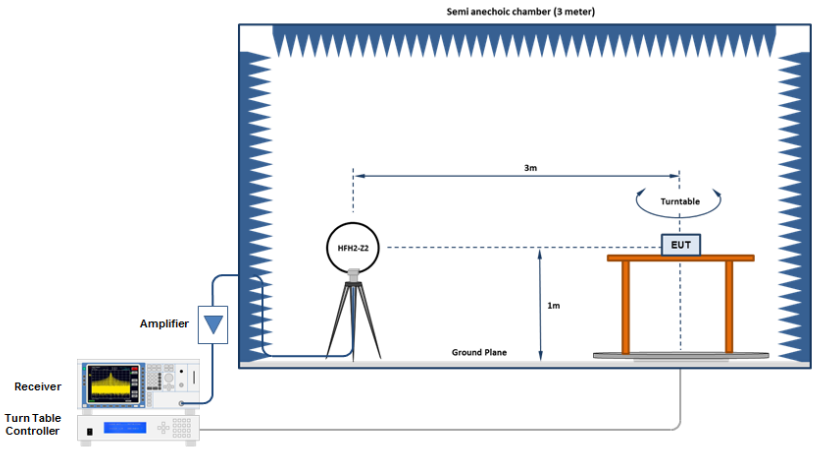
Test Information	
Product Standard Reference	FCC 15.225(a-c) / ISED RSS-210 B.6(a)
Measurement Method	Radiated
Measurement Uncertainty	± 5.95 dB

3.2.2 Limits

Limits			
Frequency ragne [MHz]	Limit [µV/m]	Limit [dBµV/m]	Limit Distance [m]
13.553 - 13.567	15848	84	30
13.410 - 13.553 13.567 - 13.710	334	50.5	30
13.110 - 13.410 13.710 - 14.010	106	40.5	30

3.2.3 Setup

Test Setup < 30 MHz



3.2.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2020.1.8

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-Anechoic Chamber	Frankonia	AC1	EF00062	2022-11	2025-11
EMI Test Receiver	R&S	ESU8	EF00379	2023-08	2024-08
Loop Antenna	R&S	HFH2-Z2	EF00184	2021-01	2024-01

3.2.5 Procedure

Test Procedure
1. EUT set to test mode 2. Span it set according to measurement range 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector 4. Below 30MHz an extrapolation according ANSI 63.10; 6.4.4.2 formula (2) is used. 5. Below 30MHz an extrapolation according RSS-Gen; 6.5 is used. The measured field strength is extrapolated to the distance specified using the formula indicating that the field strength varies as the inverse distance square (40 dB per decade of distance).

3.2.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	FCC 15.225 Measured Level @ 30m [dBµV/m]	RSS-210 Calculated Level @ 30m [dBµV/m]	Detector	Limit @ 30m [dBµV/m]	Verdict
13.56	13.56	39.60	21.00	qpk	84.00	PASS

3.3 Test Conditions and Results - Emissions radiated outside the specified frequency band

3.3.1 Information

Test Information	
Product Standard Reference	FCC 15.225(d) / ISED RSS-210 B.6(a)
Measurement Method	Radiated
Measurement Uncertainty	± 5.95 dB

3.3.2 Limits

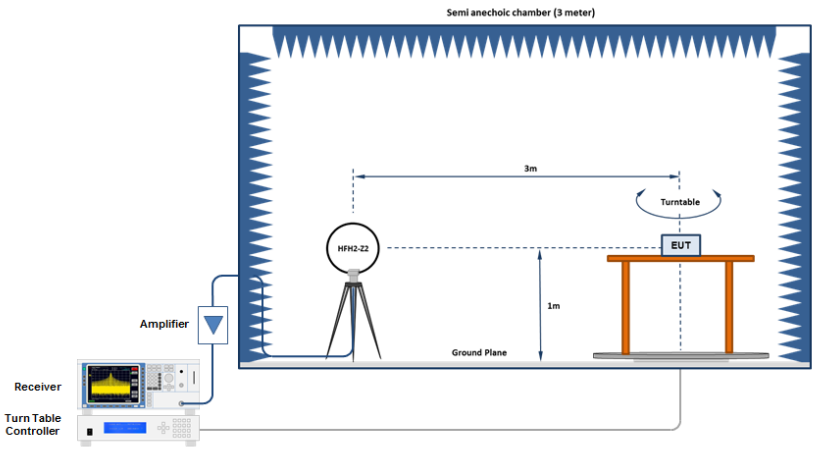
Limits blow 30 MHz according to 47 CFR Part 15.225				
Frequency range [MHz]	Detector	Limit [µV/m]	Limit [dBµV/m]	Limit Distance [m]
0.009 - 0.090	Average	2400/F[kHz]	48.5 to 28.5	300
0.090 - 0.110	Quasi-Peak	2400/F[kHz]	28.5 to 26.8	300
0.110 - 0.490	Average	2400/F[kHz]	26.8 to 13.8	300
0.490 - 1.705	Quasi-Peak	24000/F[kHz]	33.8 to 23.0	30
1.705 - 30	Quasi-Peak	30	29.5	30

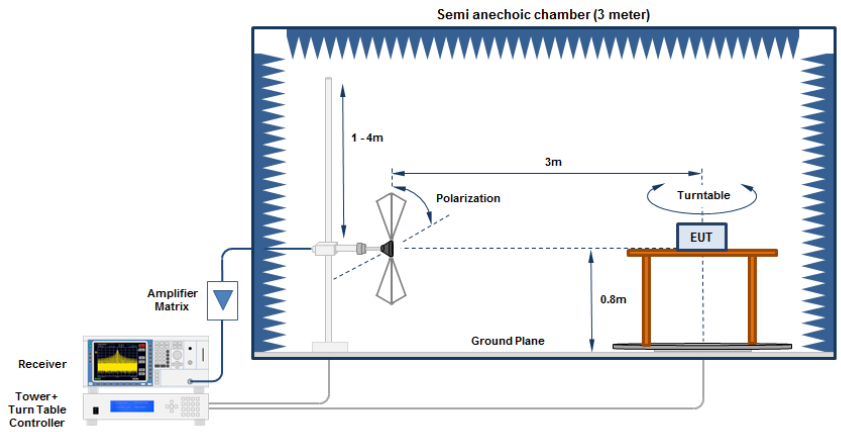
Limits blow 30 MHz according to RSS-Gen				
Frequency range [MHz]	Detector	Limit [µA/m]	Limit [dBµA/m]	Limit Distance [m]
0.009 - 0.090	Average	6.37/F[kHz]	-3.0 to -23.0	300
0.090 - 0.110	Quasi-Peak	6.37/F[kHz]	-23.0 to -24.7	300
0.110 - 0.490	Average	6.37/F[kHz]	-24.7 to -37.7	300
0.490 - 1.705	Quasi-Peak	63.7/F[kHz]	-17.7 to -28.6	30
1.705 - 30	Quasi-Peak	0.08	-21.9	30

Limits above 30 MHz				
Frequency range [MHz]	Detector	Limit [µV/m]	Limit [dBµV/m]	Limit Distance [m]
30 - 88	Quasi-Peak	100	40	3
88 - 216	Quasi-Peak	150	43.5	3

3.3.3 Setup

Test Setup < 30 MHz



Test Setup 30 - 216 MHz


3.3.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2020.1.8

Test Equipment < 30 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2022-11	2025-11
Loop Antenna	R&S	HFH2-Z2	EF00184	2021-01	2024-01
EMI Test Receiver	R&S	ESU8	EF00379	2023-08	2024-08

Test Equipment 30 - 216 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2022-11	2025-11
EMI Test Receiver	R&S	ESU8	EF00379	2023-08	2024-08
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	EF01824	2022-10	2023-10

3.3.5 Procedure

Test Procedure
1. EUT set to test mode 2. Span it set according to measurement range 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz 4. Below 30MHz an extrapolation according ANSI 63.10; 6.4.4.2 is used. 5. Markers are set to maximum emission levels

3.3.6 Results

Test Results below 30 MHz according to 47 CFR Part 15.225						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Detector	Polarization	Limit [dBµV/m]	Margin [dB]
13.56	Comments: No significant spurious emissions					

Test Results below 30 MHz according to RSS-Gen					
Channel [MHz]	Emission [MHz]	Level [dBµA/m]	Detector	Limit [dBµA/m]	Margin [dB]
13.56	27.114	-61.1	PK	-21.9	-39.14

Test Results above 30 MHz					
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]
13.56	40.686	29.33	pk	40.00	-10.67
13.56	40.686	27.19	qpk	40.00	-12.81
13.56	67.794	28.25	pk	40.00	-11.75
13.56	67.794	25.67	qpk	40.00	-14.33
13.56	67.812	28.43	pk	40.00	-11.57
13.56	67.812	25.95	qpk	40.00	-14.05

3.4 Test Conditions and Results - Frequency stability

3.4.1 Information

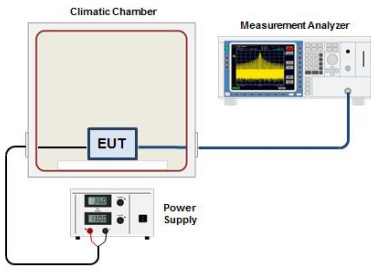
Test Information	
Product Standard Reference	FCC 15.225(e) / ISED RSS-210 B.6(b)
Measurement Method	Conducted
Measurement Uncertainty	± 0.66 PPM
Operator	Godson Offorji
Date	2023-10-06

3.4.2 Limits

Limits
Frequency error limit
±0.01% (±100ppm)

3.4.3 Setup

Test Setup



3.4.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 26	EF01003	2023-08	2024-08
Cable	Gigalane	SMS111B	EF00779	2023-03	2024-03

3.4.5 Procedure

Test Procedure

1. EUT set to test mode
2. The ambient temperature and supply voltage is set according to measurement conditions
3. Span is set to capture fundamental emission
4. Frequency error is measured with frequency counter measurement function

3.4.6 Results

Test Results - Variation of ambient temperature					
Nominal Frequency [MHz]	Voltage [V]	Temperature [°C]	Time after activation [min]	Frequency [MHz]	Deviation [ppm]
13.56	5	50	0	13.560169	12.46
13.56	5	50	2	13.560178	13.13
13.56	5	50	5	13.560177	13.05
13.56	5	50	10	13.560175	12.91
13.56	5	40	0	13.560175	12.91
13.56	5	40	2	13.560176	12.98
13.56	5	40	5	13.560176	12.98
13.56	5	40	10	13.560176	12.98
13.56	5	30	0	13.560176	12.98
13.56	5	30	2	13.560178	13.13
13.56	5	30	5	13.560178	13.13
13.56	5	30	10	13.560178	13.13
13.56	5	20	0	13.560181	13.35
13.56	5	20	2	13.560184	13.57
13.56	5	20	5	13.560184	13.57
13.56	5	20	10	13.560184	13.57
13.56	4.75	20	0	13.560184	13.57
13.56	4.75	20	2	13.560185	13.64
13.56	4.75	20	5	13.560185	13.64
13.56	4.75	20	10	13.560185	13.64
13.56	5.25	20	0	13.560185	13.64
13.56	5.25	20	2	13.560185	13.64
13.56	5.25	20	5	13.560185	13.64
13.56	5.25	20	10	13.560185	13.64
13.56	5	10	0	13.560178	13.13
13.56	5	10	2	13.560179	13.20
13.56	5	10	5	13.560181	13.35
13.56	5	10	10	13.560183	13.50
13.56	5	0	0	13.560183	13.50
13.56	5	0	2	13.560186	13.72
13.56	5	0	5	13.560187	13.79
13.56	5	0	10	13.560189	13.94
13.56	5	-10	0	13.560189	13.94
13.56	5	-10	2	13.560193	14.23
13.56	5	-10	5	13.560193	14.23
13.56	5	-10	10	13.560193	14.23
13.56	5	-20	0	13.560193	14.23
13.56	5	-20	2	13.560188	13.86
13.56	5	-20	5	13.560186	13.72
13.56	5	-20	10	13.560182	13.42
Comment	Limit check: Pass				

3.5 Test Conditions and Results - AC powerline conducted emissions

3.5.1 Information

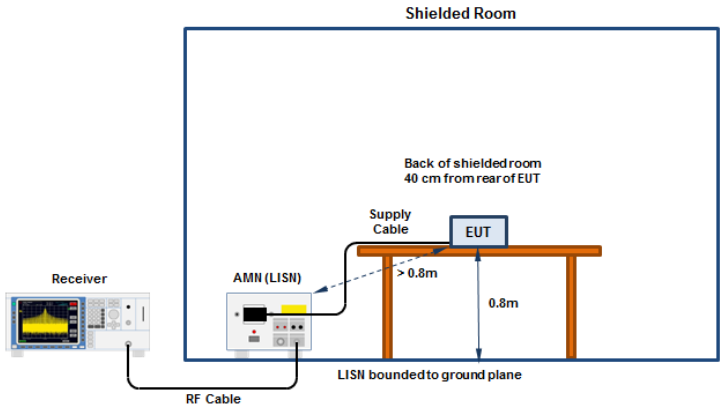
Test Information	
Reference	FCC 15.207; ISED RSS-Gen 7.2
Measurement Method	ANSI C63.10 6.2
Measurement Uncertainty	± 3.82 dB
Operator	Godson Offorji
Date	2023-10-09

3.5.2 Limits

Limits		
Frequency [MHz]	Quasi-Peak [dBµV]	Average [dBµV]
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5	56	46
5 - 30	60	50
* Limit decreases linearly with the logarithm of the frequency		

3.5.3 Setup

Test Setup



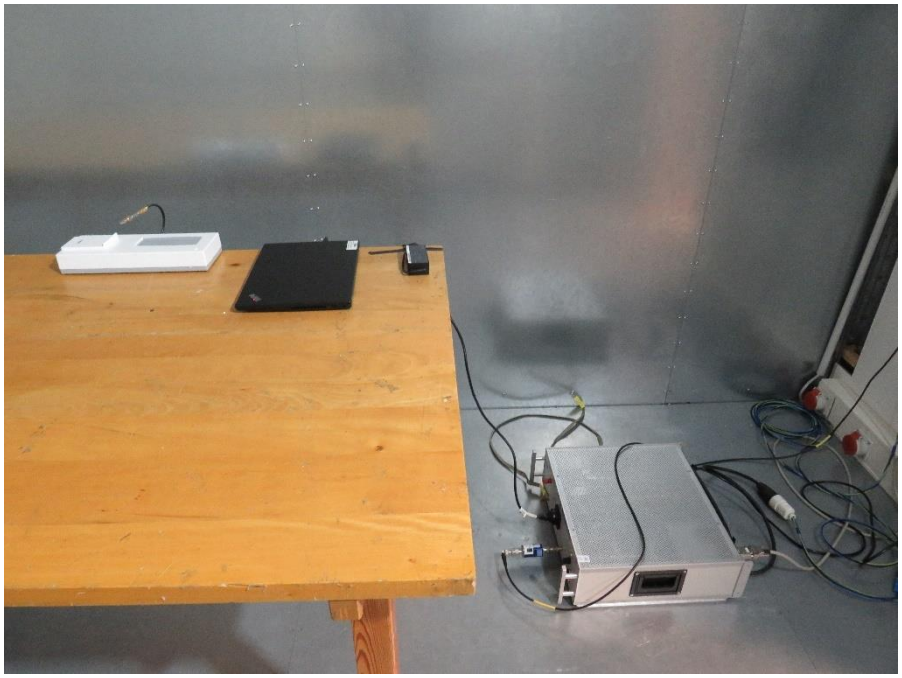
3.5.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2016.1.10

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Test Receiver	R&S	ESR7	EF00943	2023-08	2024-08
Pulse Limiter	R&S	ESH3-Z2	EF01222	2023-08	2025-08
LISN	Schwarzbeck	NSLK 8127 RC	EF01592	2023-06	2024-06

3.5.5 Setup Photos

AC Powerline Setup-view 1



AC Powerline Setup-view 2

Conducted emissions at the mains power port
according to FCC 47 CFR §15.225

Project Number:	G0M-2306-2109
Applicant:	Vaisala Oy
Model Description:	Ground Check Device RI41
Model:	RI41
Test Sample ID:	45531
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Offorji
Test Date:	2023-10-09
Operating Conditions:	ambient temperature: 24 °Celsius power input: 120 Vac / 60 Hz
LISN:	Schwarzbeck NSLK 8127 RC L1
Operational Mode:	ASK, 13.56 MHz
Applied to Port:	AC Mains

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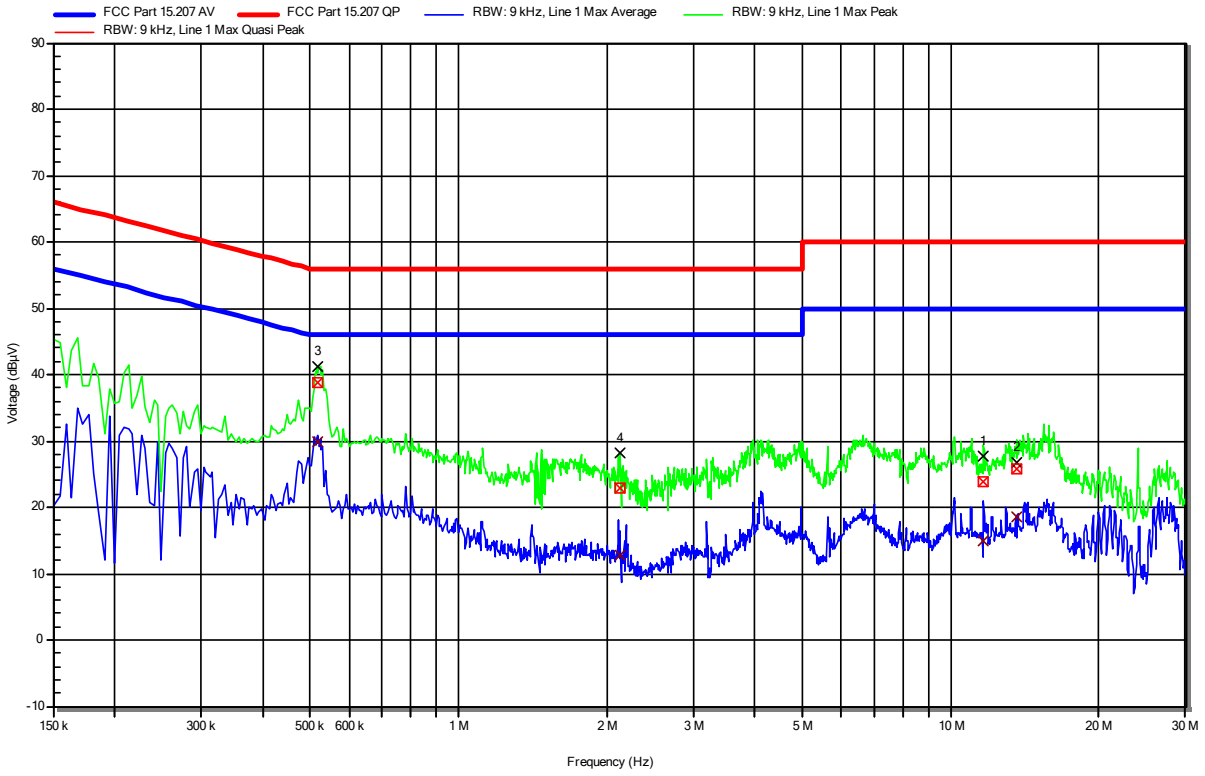
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	11.61 MHz	23.89 dBµV	60 dBµV	-36.11 dB	Pass	Line 1
2	13.64 MHz	25.77 dBµV	60 dBµV	-34.23 dB	Pass	Line 1
3	519 kHz	38.87 dBµV	56 dBµV	-17.13 dB	Pass	Line 1
4	2.13 MHz	23.01 dBµV	56 dBµV	-32.99 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	11.61 MHz	15.02 dBµV	50 dBµV	-34.98 dB	Pass	Line 1
2	13.64 MHz	18.56 dBµV	50 dBµV	-31.44 dB	Pass	Line 1
3	519 kHz	29.83 dBµV	46 dBµV	-16.17 dB	Pass	Line 1
4	2.13 MHz	12.78 dBµV	46 dBµV	-33.22 dB	Pass	Line 1

Conducted emissions at the mains power port
according to FCC 47 CFR §15.225

Project Number:	G0M-2306-2109
Applicant:	Vaisala Oy
Model Description:	Ground Check Device RI41
Model:	RI41
Test Sample ID:	45531
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Offorji
Test Date:	2023-10-09
Operating Conditions:	ambient temperature: 24 °Celsius power input: 120 Vac / 60 Hz
LISN:	Schwarzbeck NSLK 8127, N
Operational Mode:	ASK, 13.56 MHz
Applied to Port:	AC Mains

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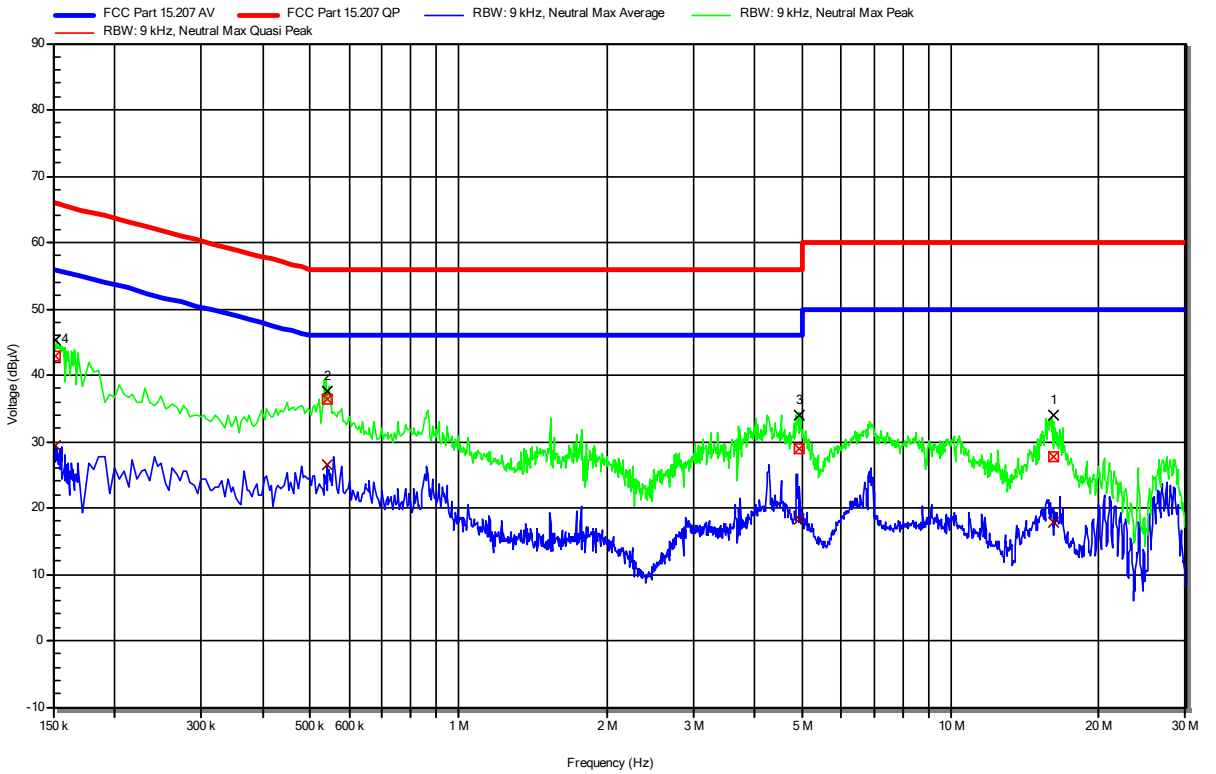
RadiMation



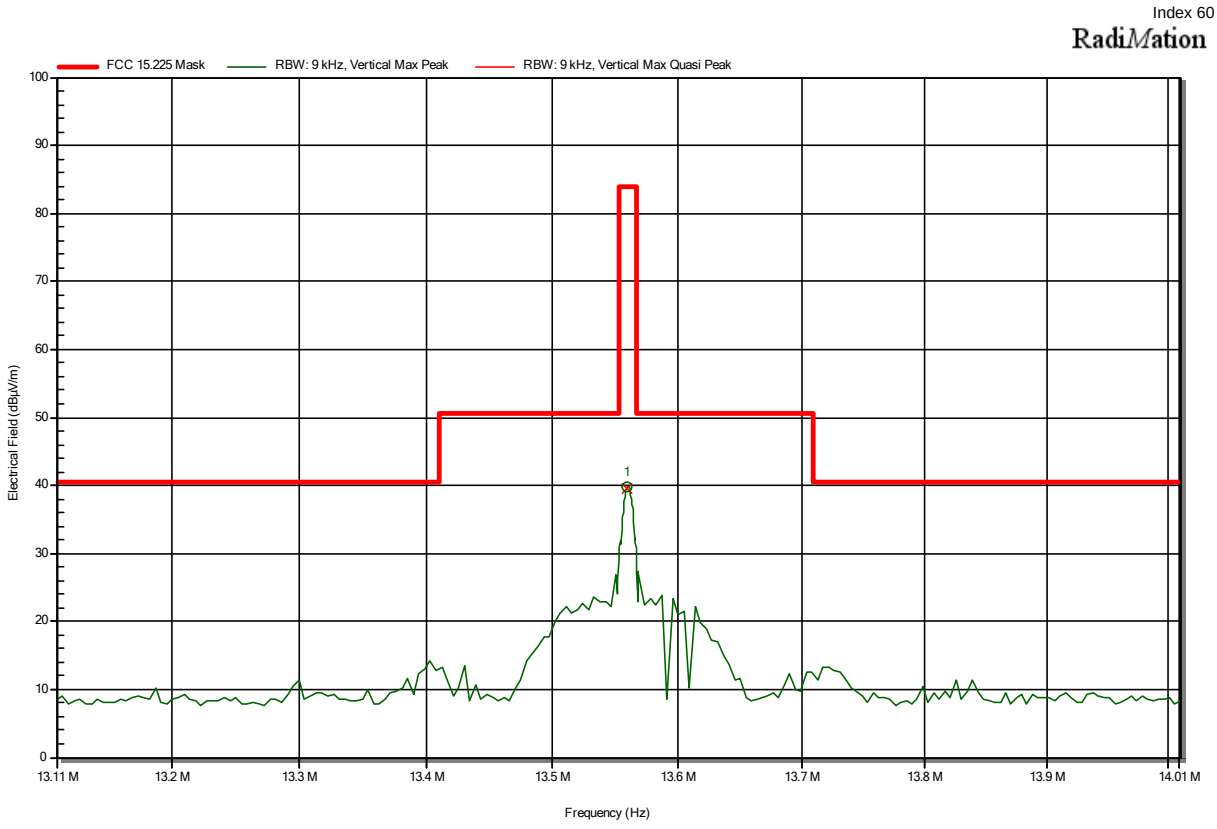
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	16.139 MHz	27.66 dBµV	60 dBµV	-32.34 dB	Pass	Neutral
2	541.5 kHz	36.35 dBµV	56 dBµV	-19.65 dB	Pass	Neutral
3	4.916 MHz	28.87 dBµV	56 dBµV	-27.13 dB	Pass	Neutral
4	152.25 kHz	42.88 dBµV	65.88 dBµV	-22.99 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	16.139 MHz	17.84 dBµV	50 dBµV	-32.16 dB	Pass	Neutral
2	541.5 kHz	26.52 dBµV	46 dBµV	-19.48 dB	Pass	Neutral
3	4.916 MHz	18.26 dBµV	46 dBµV	-27.74 dB	Pass	Neutral
4	152.25 kHz	29.47 dBµV	55.88 dBµV	-26.41 dB	Pass	Neutral

ANNEX A Transmitter in-band emissions

Radiated carrier according to 47 CFR § 15.225, RSS-210 Issue 10

Project Number:	G0M-2306-2109
Applicant:	Vaisala Oy
Model Description:	Ground Check Device RI41
Model:	RI41
Test Sample ID	45709
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Offorji
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 5 VDC USB powered
Antenna:	Rohde & Schwarz HFH 2-Z2, Vertical
Measurement distance:	3 m, converted to 30 m
Mode:	Tx; ASK, 13.56 MHz
Test Date:	2023-10-09



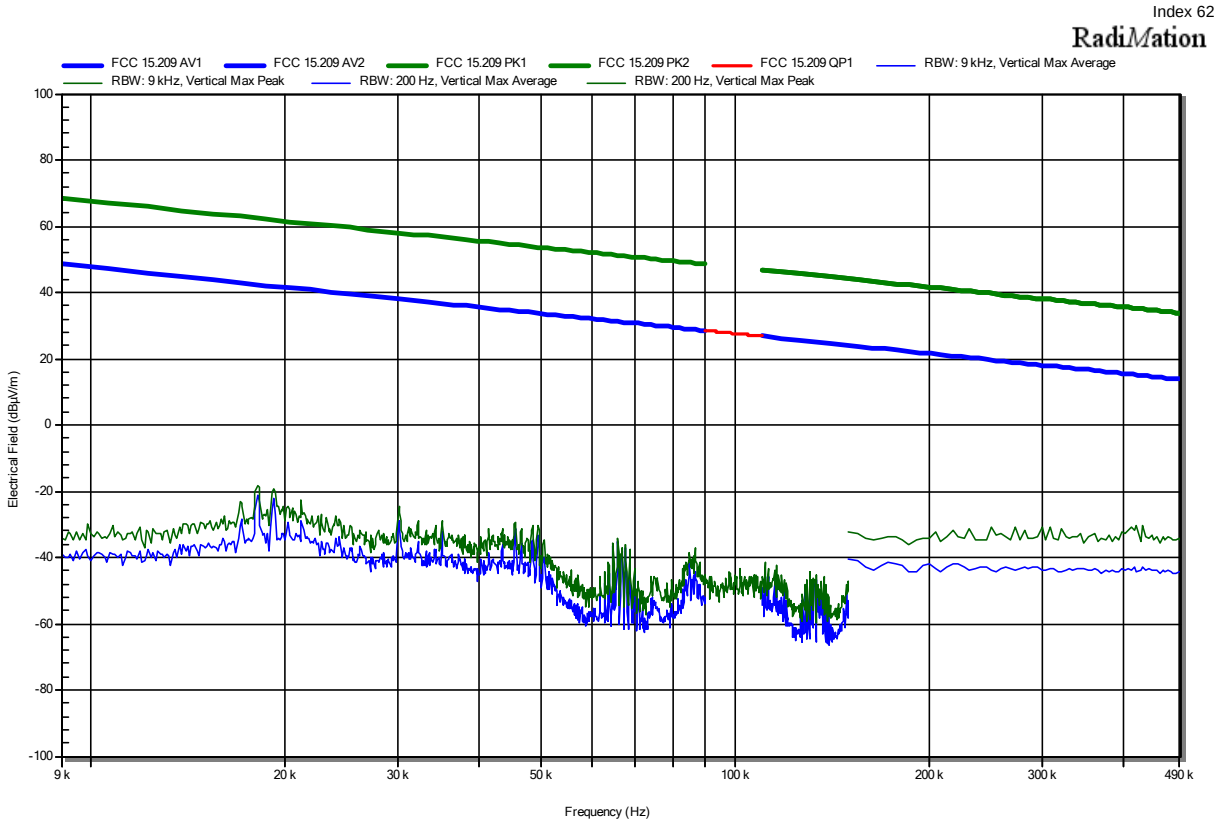
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
13.56 MHz	39.9 dBµV/m	84 dBµV/m	-44.13 dB	Pass

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
13.56 MHz	39.6 dBµV/m	84 dBµV/m	-44.38 dB	Pass

ANNEX B Transmitter radiated spurious emissions - FCC15.225

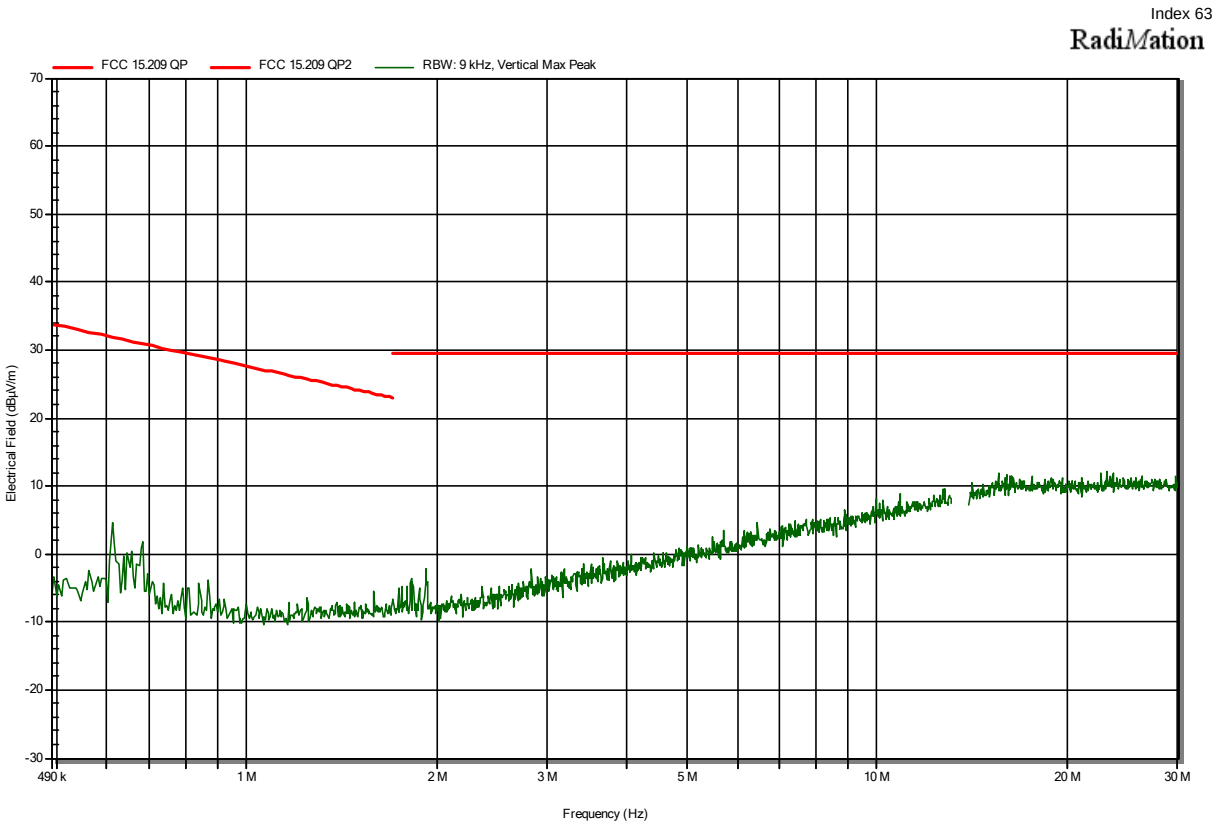
Radiated Spurious Emissions according to 47 CFR § 15.225, RSS-210 Issue 10

Project Number:	G0M-2306-2109
Applicant:	Vaisala Oy
Model Description:	Ground Check Device RI41
Test Sample ID	45709
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Offorji
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 5 VDC USB powered
Antenna:	Rohde & Schwarz HFH 2-Z2, Vertical
Measurement distance:	3 m, converted to 300 m
Mode:	Tx; ASK, 13.56 MHz
Test Date:	2023-10-09



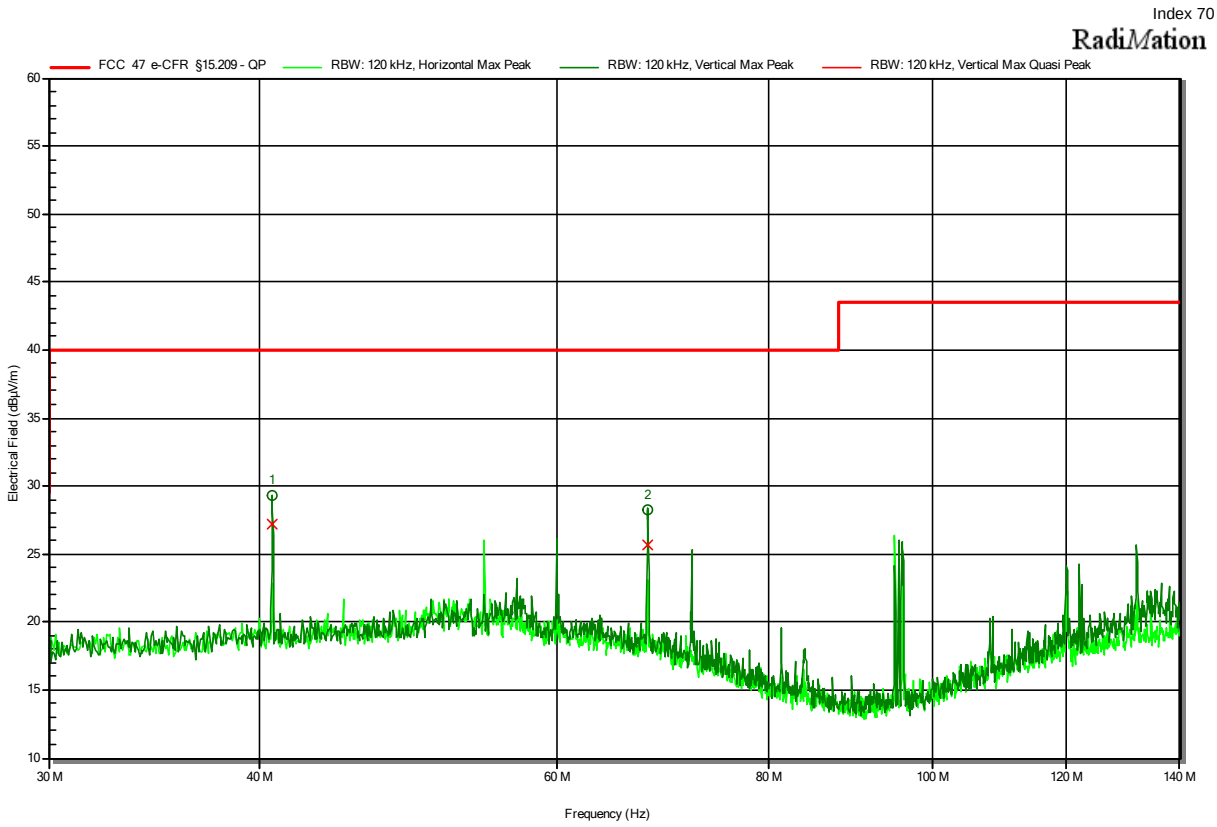
Radiated Spurious Emissions according to 47 CFR § 15.225, RSS-210 Issue 10

Project Number:	G0M-2306-2109
Applicant:	Vaisala Oy
Model Description:	Ground Check Device RI41
Model:	RI41
Test Sample ID	45709
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Offorji
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 5 VDC USB powered
Antenna:	Rohde & Schwarz HFH 2-Z2, Vertical
Measurement distance:	3 m, converted to 30 m
Mode:	Tx; ASK, 13.56 MHz
Test Date:	2023-10-09



Radiated Spurious Emissions according to 47 CFR § 15.225, RSS-210 Issue 10

Project Number:	G0M-2306-2109
Applicant:	Vaisala Oy
Model Description:	Ground Check Device RI41
Model:	RI41
Test Sample ID	45709
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Offorji
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 5 VDC USB powered
Antenna:	Schwarzbeck VULB 9168, Vertical
Measurement distance:	3 m, converted to 3 m
Mode:	Tx; RFID, 13.56 MHz, ASK,
Test Date:	2023-10-09



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
40.686 MHz	29.33 dBµV/m	40 dBµV/m	-10.67 dB	Pass
67.794 MHz	28.25 dBµV/m	40 dBµV/m	-11.75 dB	Pass

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
40.686 MHz	27.19 dBµV/m	40 dBµV/m	-12.81 dB	Pass
67.794 MHz	25.67 dBµV/m	40 dBµV/m	-14.33 dB	Pass

ANNEX C Transmitter radiated spurious emissions – RSS - 210

Radiated Spurious Emissions according to RSS-210 Issue 10

Project Number:	G0M-2306-2109
Applicant:	Vaisala Oy
Model Description:	Ground Check Device RI41
Model:	RI41
Test Sample ID	45709
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Offorji
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 5 VDC USB powered
Antenna:	Rohde & Schwarz HFH 2-Z2, Vertical
Measurement distance:	3 m, converted to 10 m
Mode:	Tx; RFID, 13.56 MHz, ASK,
Test Date:	2023-10-09

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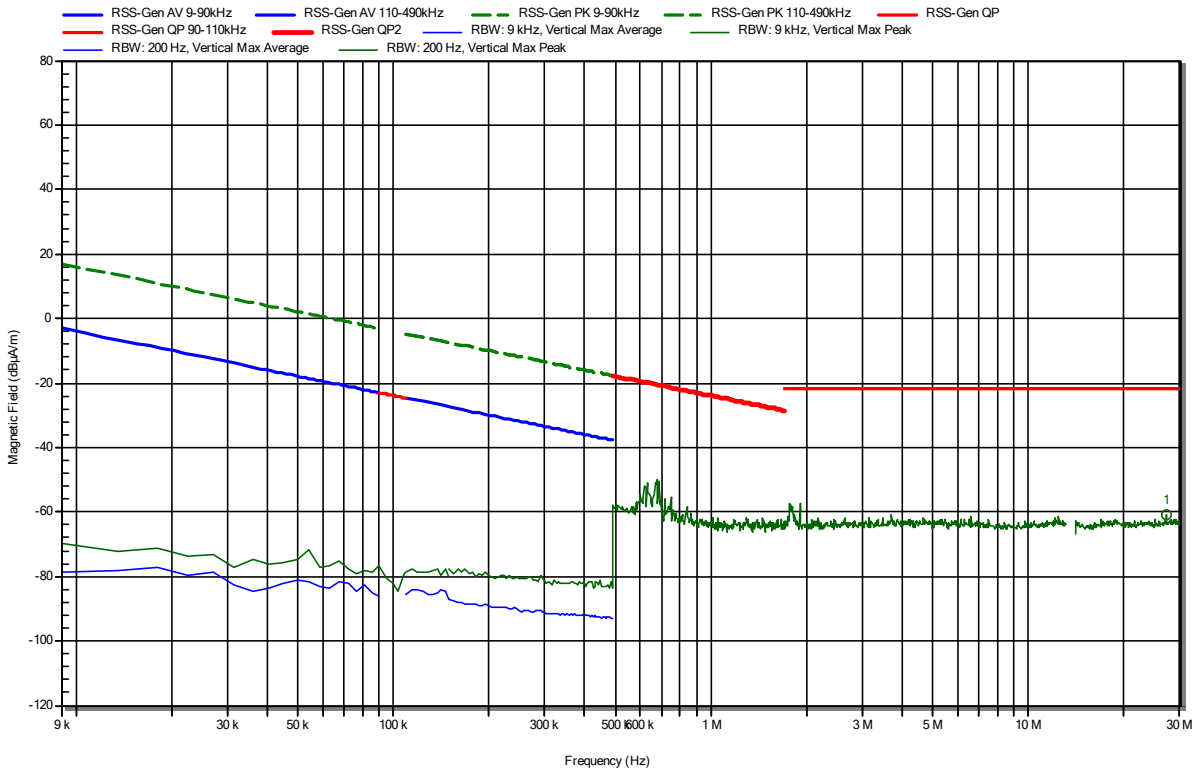
RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
27.114 MHz	-61.1 dBµA/m	-21.9 dBµA/m	-39.14 dB	Pass

Radiated Spurious Emissions according to RSS-210 Issue 10

Project Number:	G0M-2306-2109
Applicant:	Vaisala Oy
Model Description:	Ground Check Device RI41
Model:	RI41
Test Sample ID	45709
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Offorji
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 5 VDC USB powered
Antenna:	Schwarzbeck VULB 9168, Vertical
Measurement distance:	3 m, converted to 3 m
Mode:	Tx; RFID, 13.56 MHz, ASK,
Test Date:	2023-10-09

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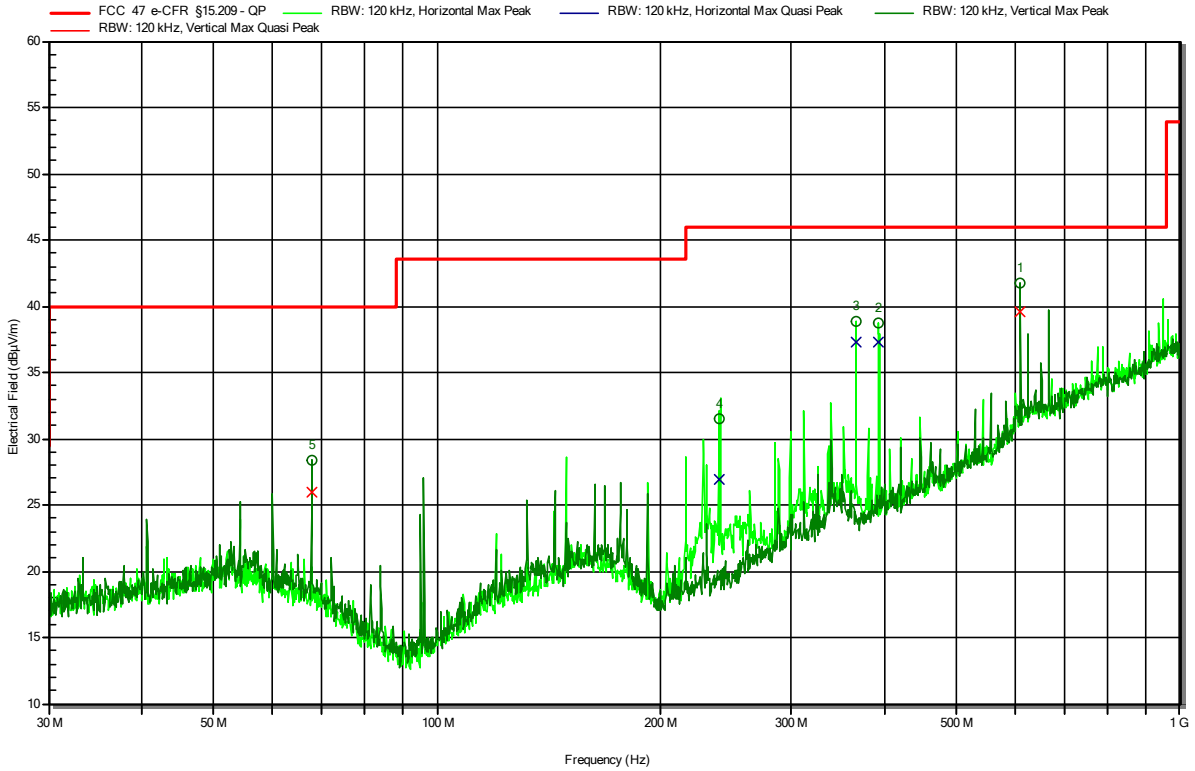
RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
67.812 MHz	28.43 dBµV/m	40 dBµV/m	-11.57 dB	Pass
240.036 MHz	31.47 dBµV/m	46 dBµV/m	-14.53 dB	Pass
366.132 MHz	38.85 dBµV/m	46 dBµV/m	-7.15 dB	Pass
393.246 MHz	38.78 dBµV/m	46 dBµV/m	-7.22 dB	Pass
610.224 MHz	41.72 dBµV/m	46 dBµV/m	-4.28 dB	Pass

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
67.812 MHz	25.95 dBµV/m	40 dBµV/m	-14.05 dB	Pass
240.036 MHz	26.89 dBµV/m	46 dBµV/m	-19.11 dB	Pass
366.132 MHz	37.26 dBµV/m	46 dBµV/m	-8.74 dB	Pass
393.246 MHz	37.32 dBµV/m	46 dBµV/m	-8.68 dB	Pass
610.224 MHz	39.59 dBµV/m	46 dBµV/m	-6.41 dB	Pass

= = = END OF TEST REPORT = = =