


<b>EMC TEST REPORT</b> <b>FCC 47 CFR Part 15B, ISED ICES-003 Issue 7</b>	
<b>Report Reference No</b>	G0M-2103-9684-EF0115B-V02
<b>Testing Laboratory</b>	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	 <p>A2LA - Registration number: 1983.01 (ISED) ISED wireless device testing laboratory: CN 3470A FCC Filed Test Laboratory, Reg.-No.: 96970</p>
<b>Applicant</b>	Vaisala Oyi
Address	Vanha Nurmijärventie 21 01670 Vantaa FINLAND
<b>Test Specification Standard(s)</b>	47 CFR Part 15 Subpart B ISED ICES-003 Issue 7 ANSI C63.4:2014+A1:2017
Non-Standard Test Method	None
<b>Equipment under Test (EUT):</b>	
Product Description	VaiNet Wireless Data Logger
Model(s)	RFL100
Additional Model(s)	None
Brand Name(s)	None
Hardware Version(s)	Z
Software Version(s)	1.4.0
FCC-ID	2AO39-RFL100A
IC	23830-RFL100A
<b>Test Result</b>	<b>PASSED</b>

Possible test case verdicts:		
required by standard but not tested	N/T	
not required by standard	N/R	
required by standard but not appl. to test object	N/A	
test object does meet the requirement	P(PASS)	
test object does not meet the requirement	F(FAIL)	
Testing:		
Date of receipt of test item	2021-04-23	
Report:		
Compiled by	Matthias Handrik	
Tested by (+ signature) (Responsible for Test)	Matthias Handrik	
Approved by (+ signature) (Deputy Head of Lab)	Jens Marquardt	
Date of Issue	2021-07-22	
Total number of pages	45	
General Remarks:		
<p>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.</p>		
Additional Comments:		

**ABBREVIATIONS AND ACRONYMS**

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
T <sub>NOM</sub>	Nominal operating temperature
V <sub>NOM</sub>	Nominal supply voltage

**VERSION HISTORY**

Version History			
Version	Issue Date	Remarks	Revised By
01	2021-05-27	Initial Release	-
02	2021-07-22	Replaced document: G0M-2103-9684-EF0115B-V01 Replaced by: G0M-2103-9684-EF0115B-V02  Reason: HVIN/ /PMN added.	M. Handrik

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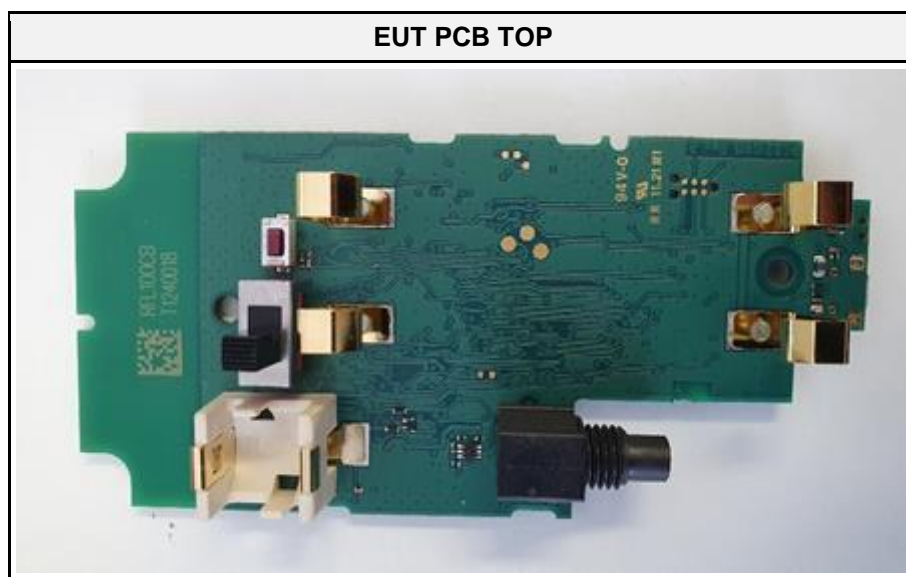
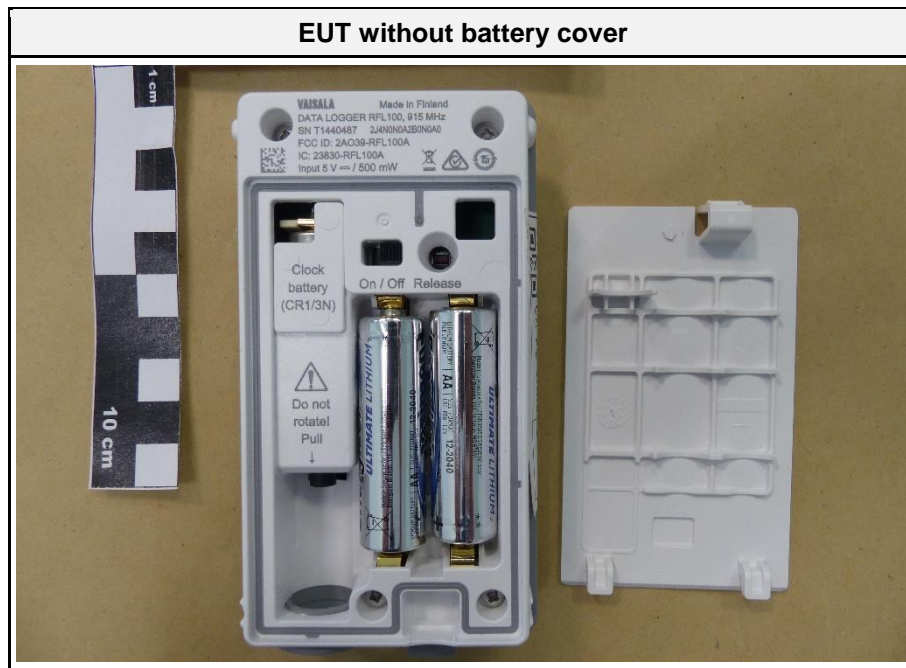
## 1 Equipment (Test Item) Under Test

Description	VaiNet Wireless Data Logger	
Model	RFL100	
Additional Model(s)	None	
Brand Name(s)	None	
Serial Number(s)	T1440487	
Hardware Version(s)	Z	
Software Version(s)	1.4.0	
EUT Dimensions [cm]	11 x 6 x 3	
FCC-ID	2AO39-RFL100A	
IC	23830-RFL100A	
HVIN	RFL100 ; CWL100	
PMN	RFL100 ; CWL100	
HMN	N/A	
FVIN	N/A	
Class	Class B	
Equipment type	Table top	
Highest internal frequency [MHz]	928	
Radio Module	Type	LoRa module
	Model	Unspecified
	Manufacturer	Unspecified
	FCC-ID	Unspecified
	IC	Unspecified
Supply Voltage	V <sub>NOM</sub>	3 VDC non rechargeable Lithium battery 5 V DC
AC/DC-Adaptor	Model	FW8002.1MUSB/05
	Vendor	Friwo
	Input	100-240V AC
	Output	5V DC
Manufacturer	Vaisala Oyi Vanha Nurmijärventie 21 01670 Vantaa FINLAND	

**1.1 Equipment Ports**

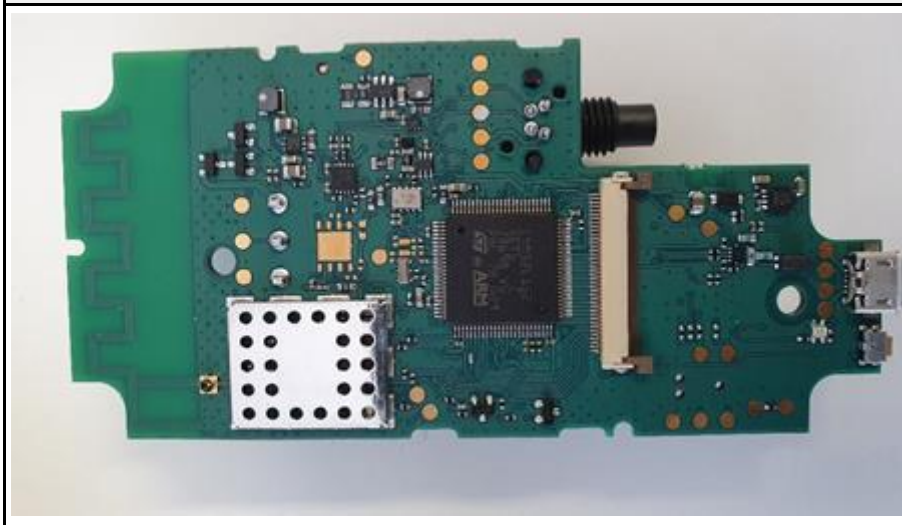
Name	Type	Attributes	Comment
Service (doubles as DC power port)	DC	Count: 1 Direction: In Max. cable length [m]: 2 Shielded: No Service Remark: No	Used via dedicated AC/DC adaptor with 120V AC / 60Hz.
Probe splitter connector	IO	Count: 1 Direction: In Max. cable length [m]: 1 Shielded: No Service Remark: No	M8, female
Description:			
AC	AC mains power input/output port		
DC	DC power input/output port		
BAT	DC power input port connected to external battery		
IO	Input/Output port		
TP	Telecommunication port		
NE	Non-electrical port		

## 1.2 Equipment Photos - Internal

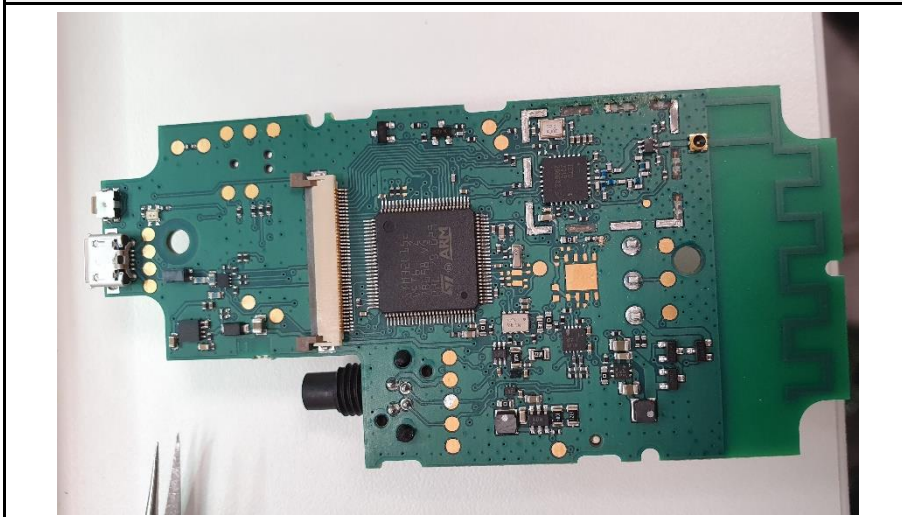




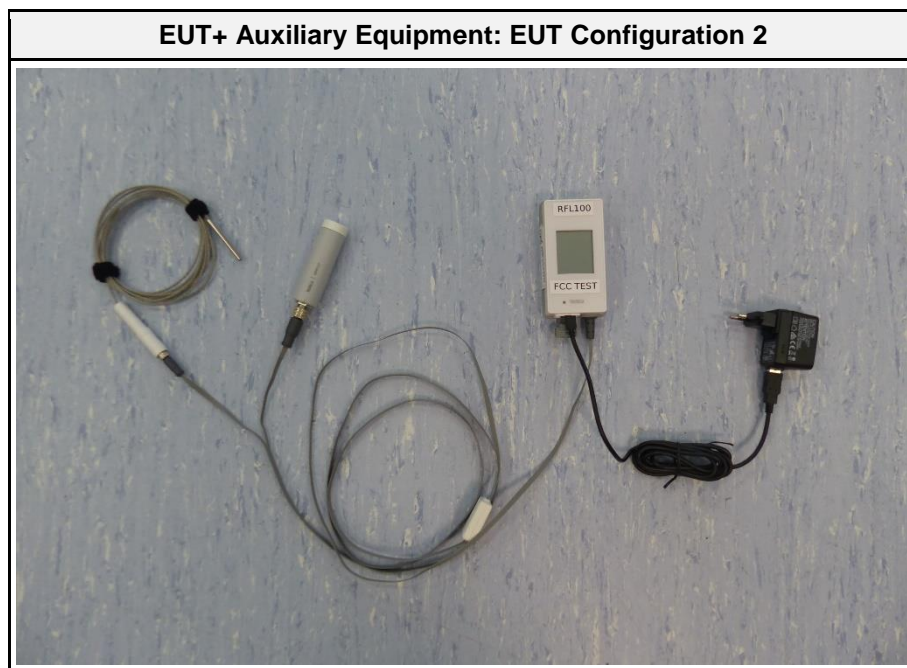
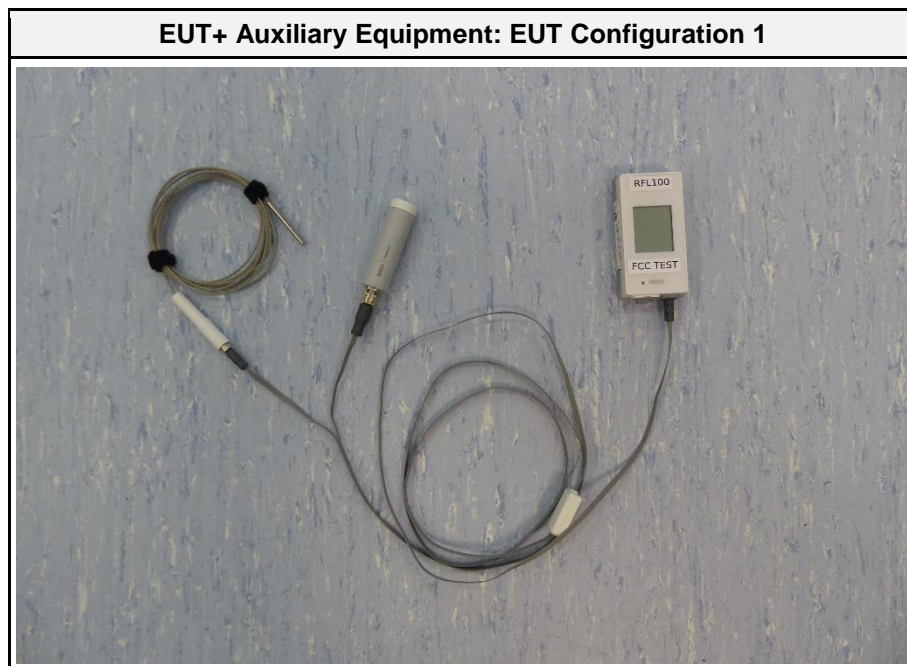
**EUT PCB BOTTOM**

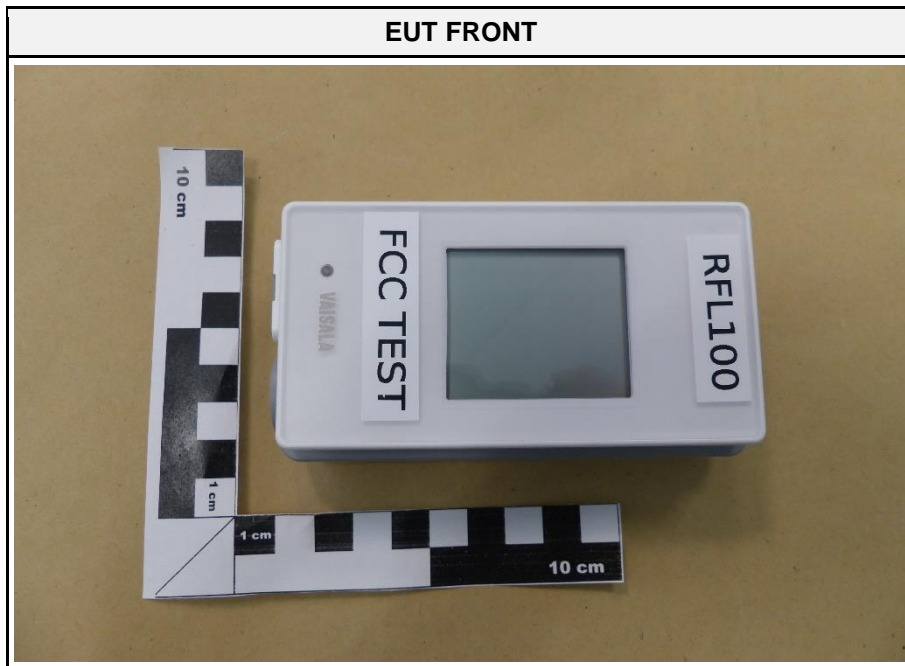


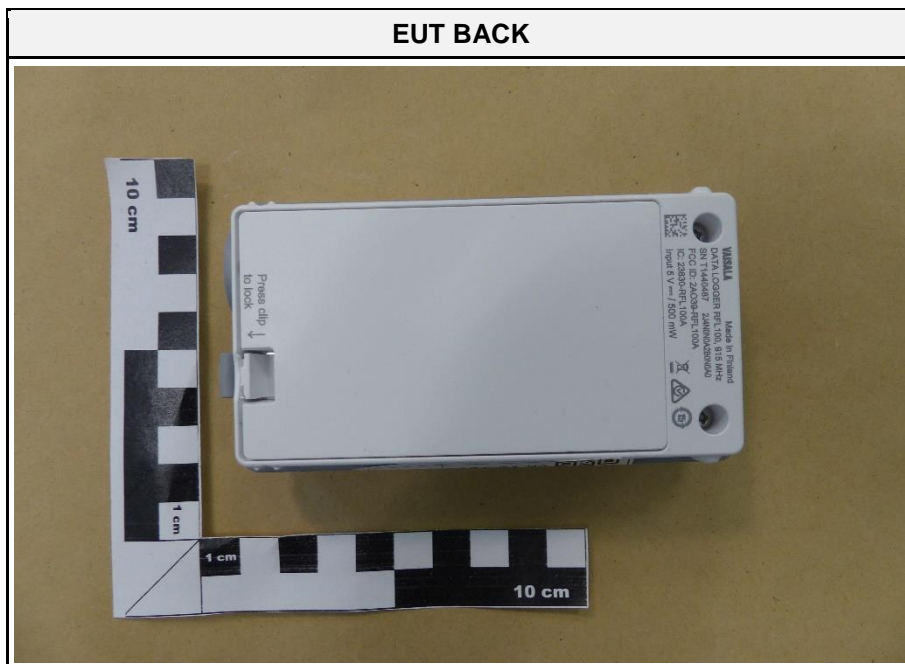
**EUT PCB BOTTOM without shield**



### 1.3 Equipment Photos - External





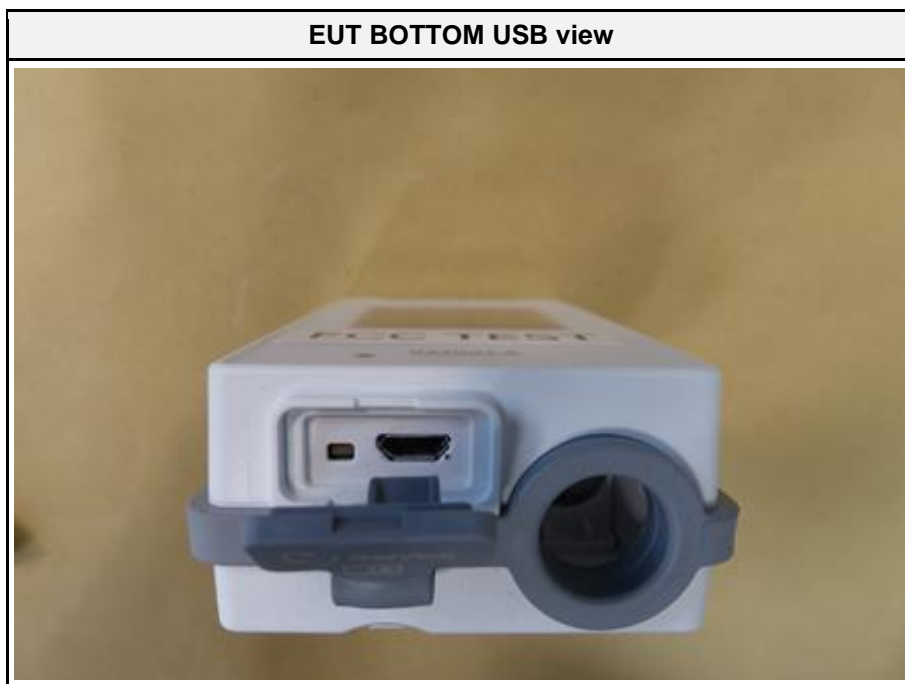
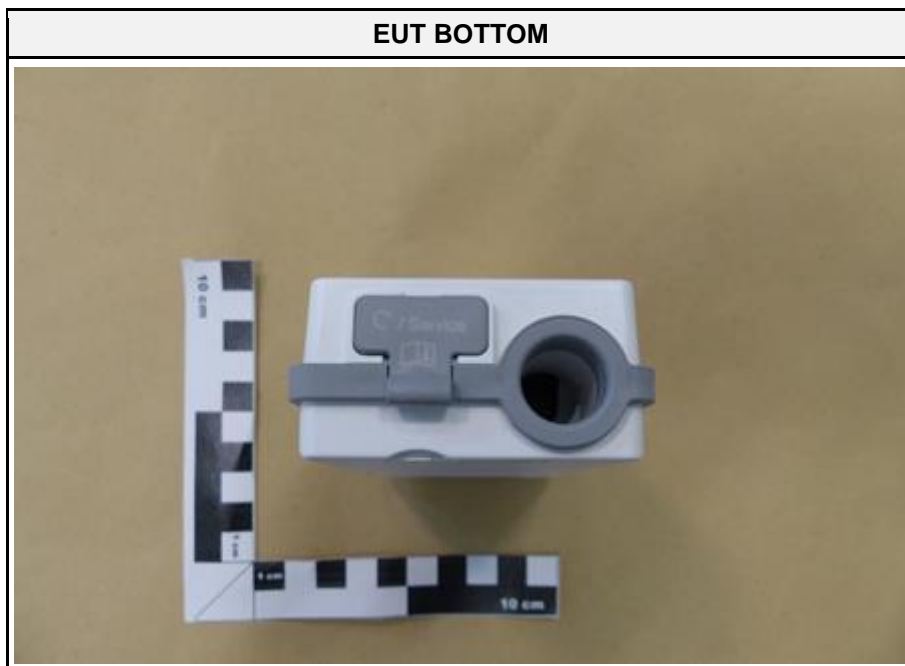


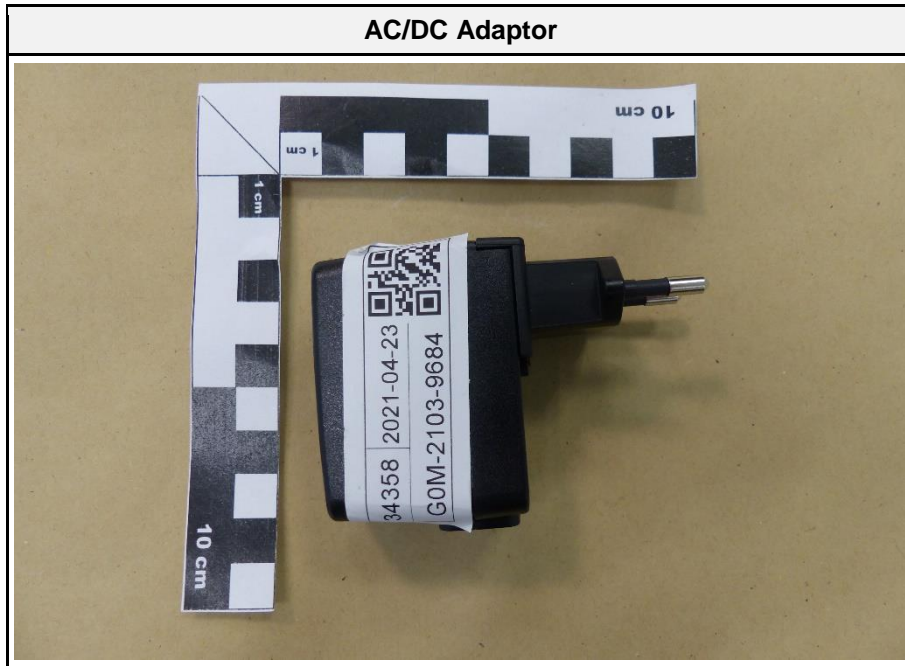
EUT label



EUT TOP







#### 1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Laptop	Lenovo	ThinkPad T460s	Customer Support Equipment
CBL	USB A to Micro USB	unspecified	unspecified	Customer Support Equipment
AE	Temperature Probe	Vaisala	TMP115	Customer Support Equipment
AE	Carbon Dioxide Probe	Vaisala	GMP251	Customer Support Equipment
CBL	Probe Splitter M8/M12	Vaisala	CBL211050	Customer Support Equipment
AE	Lithium batteries	Energizer	2 x L91VPX	Customer Support Equipment
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
MON	Monitoring Equipment			
CBL	Connecting Cable			
Comment:				



## 1.5 Operational Modes

Mode #	Description
1	EUT operates in Test mode. Via test script from laptop (middle), EUT is set in Test mode for continuous transmit in 915 MHz ISM band.
Comment:	

## 1.6 EUT Configuration

Configuration #	Description
1	EUT powered via internal battery. EUT assembled with probe splitter wire and temperate probe, carbon dioxide probe USB port not connected, customer declaration for Service Port not tested.
2	EUT powered via dedicated AC/DC adaptor. EUT assembled with USB wire for connection to AC/DC adaptor. EUT assembled with probe splitter wire and temperate probe, carbon dioxide probe
Comment:	

### 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 analyser in dBµV. Any external preamplifiers used are taken into account through internal analyser 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 analyser. 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:

$$\text{Reading on Analyser (dB}\mu\text{V)} + \text{A.F. (dB/m)} = \text{Net field strength (dB}\mu\text{V/m)}$$

Net:

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

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:

$$\text{Limit (dB}\mu\text{V/m)} = 20 \cdot \log(\mu\text{V/m})$$

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.

Example only:

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

## 2 Result Summary

FCC 47 CFR Part 15B, ISED ICES-003 Issue 7				
Reference	Requirement	Reference Method	Result	Remarks
Emission				
FCC 15.109 ICES-003, 3.2.2	Radiated emissions	ANSI C63.4:2014 +A1:2017	PASS	-
FCC 15.107 ICES-003, 3.2.1	AC power line conducted emissions	ANSI C63.4:2014 +A1:2017	PASS	-
Comment:				

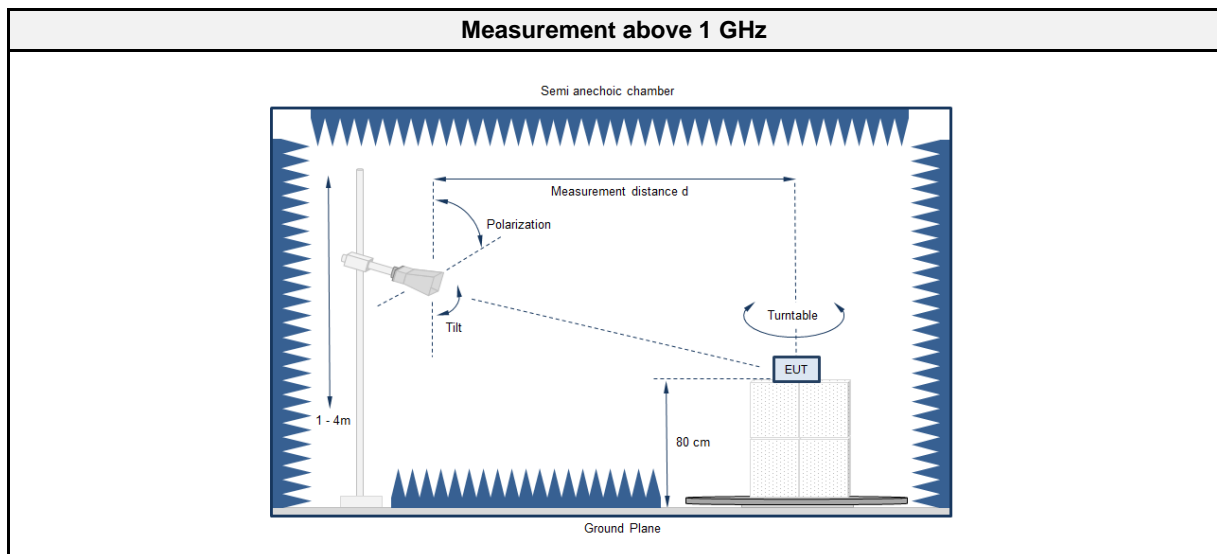
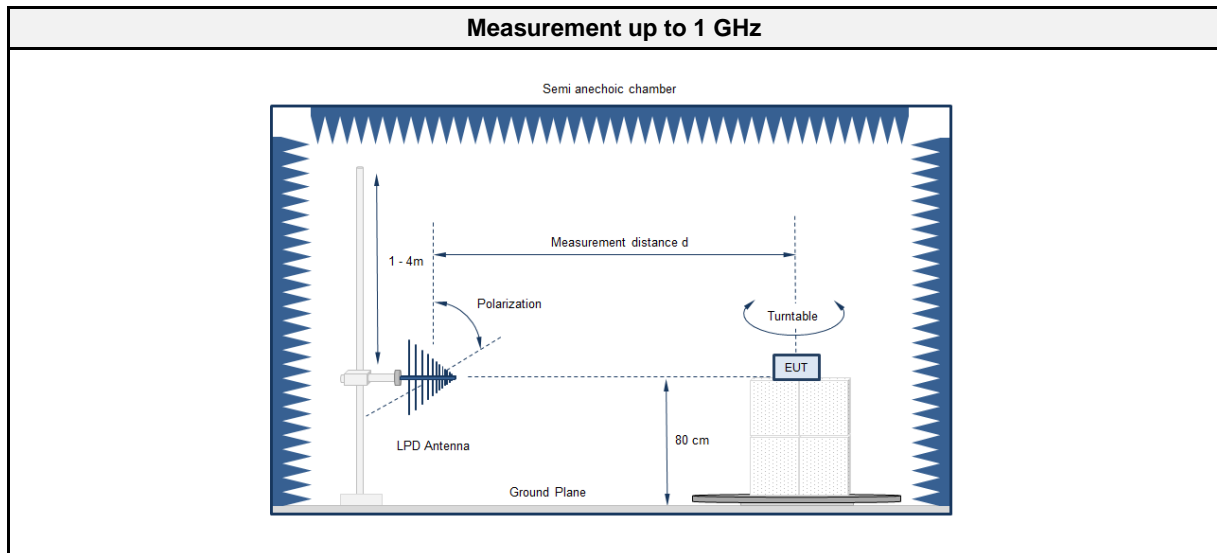
Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

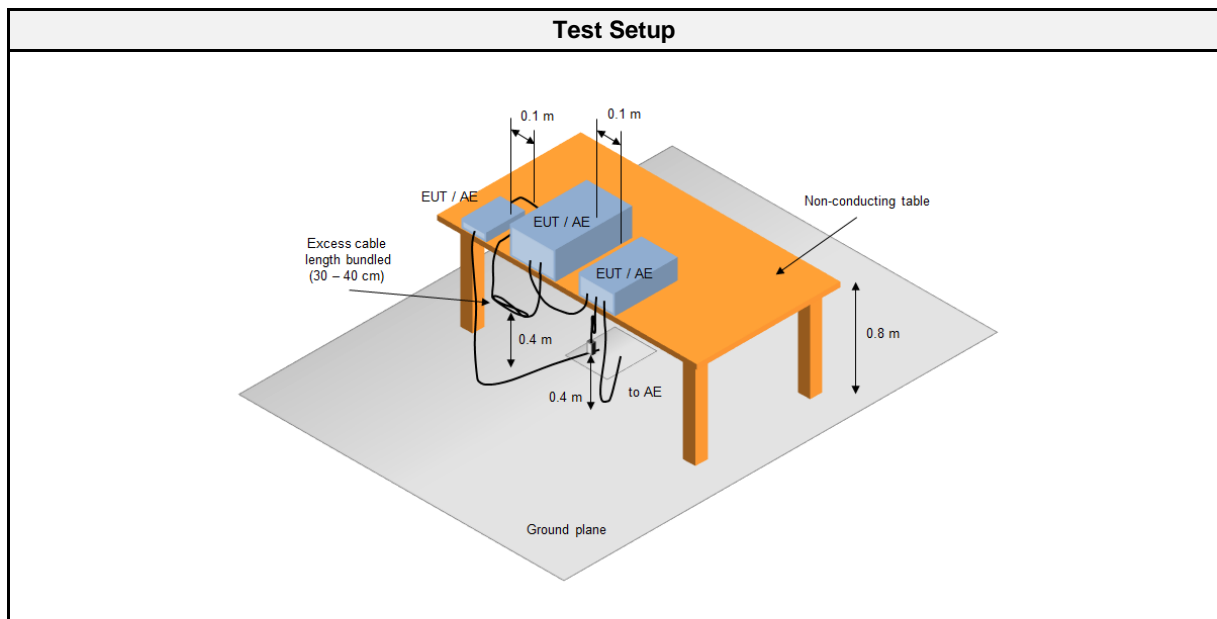
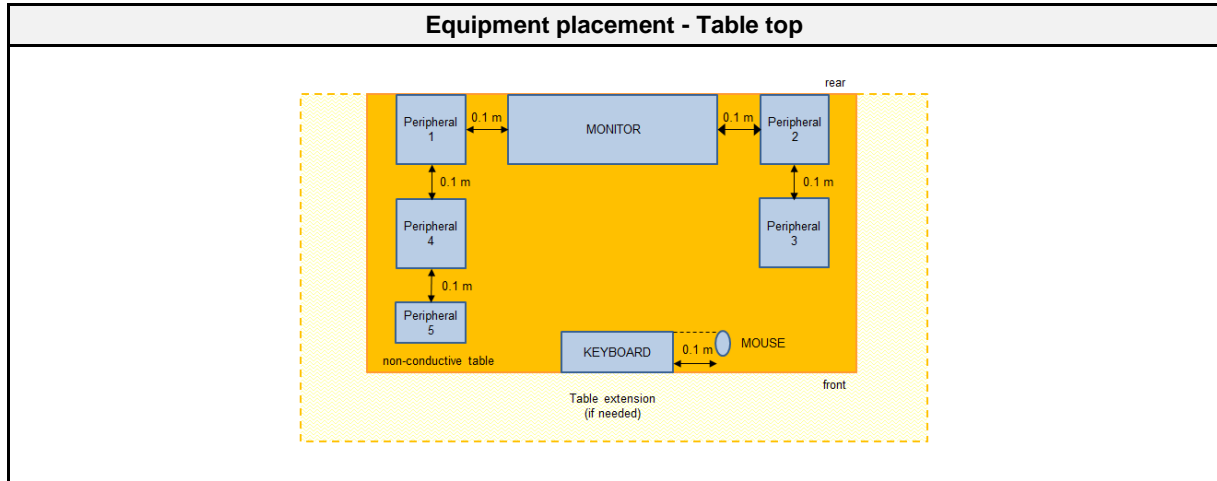
## 2.1 Test Conditions and Results - Radiated emissions acc. to ANSI C63.4

### 2.1.1 Information

Test Information	
Reference	FCC 15.109, ICES-003, 3.2.2
Reference method	ANSI C63.4:2014+A1:2017 Section 8
Equipment class	Class B
Equipment type	Table top
Highest internal frequency [MHz]	928
Measurement range	30 MHz to 5000 MHz
Temperature [°C]	21 ±3
Humidity [%]	44 ±3
Operator	Matthias Handrik
Date	2021-05-18

### 2.1.2 Setup





2.1.3 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
Anechoic chamber	Frankonia	AC1	EF00062	2021-02	2024-02
EMI Test Receiver	Keysight	N9038A-526/WXP	EF01070	2020-06	2021-06
Biconical Antenna	R&S	HK 116	EF00030	2021-05	2024-05
LPD Antenna	R&S	HL 223	EF00187	2019-05	2022-05
Horn Antenna	Schwarzbeck	BBHA9120D	EF00018	2019-10	2022-10
Climatic Sensor	Embedded Data Systems, LLC.	2800100000254 17E	EF01054	2021-03	2022-03

2.1.4 Procedure

<b>Exploratory measurement</b>	
1.	The EUT was placed on a non-conductive table at a height of 0.8m.
2.	The EUT and support equipment, if needed, were set up to simulate typical usage.
3.	Cables, of type and length specified by the manufacturer, were connected to at least one port of each type and were terminated by a device or simulating load of actual usage.
4.	The antenna was placed at a distance of 3 or 10 m.
5.	The received signal was monitored at the measurement receiver.
6.	This procedure has to be performed in both antenna polarizations, horizontal and vertical.
7.	The arrangement of the equipment with the maximum emission level is shown on the setup picture at item 2.1.2

<b>Final measurement</b>	
1.	The EUT was placed on a 0.8 m non-conductive table at a 3 m distance from the receive antenna. The antenna output was connected to the measurement receiver.
2.	A biconical antenna was used for the frequency range 30 – 200 MHz, a logarithmic periodical antenna was used for the frequency range from 200 – 1000 MHz. Above one 1 GHz a Double Ridged Broadband Horn antenna was used. The antenna was placed on an adjustable height antenna mast.
3.	The EUT and cable arrangement were based on the exploratory measurement results.
4.	Emissions were maximized at each frequency by rotating the EUT and adjusting the receive antenna height and polarization. The maximum values were recorded.
5.	The test data of the worst-case conditions were recorded and shown on the next pages.

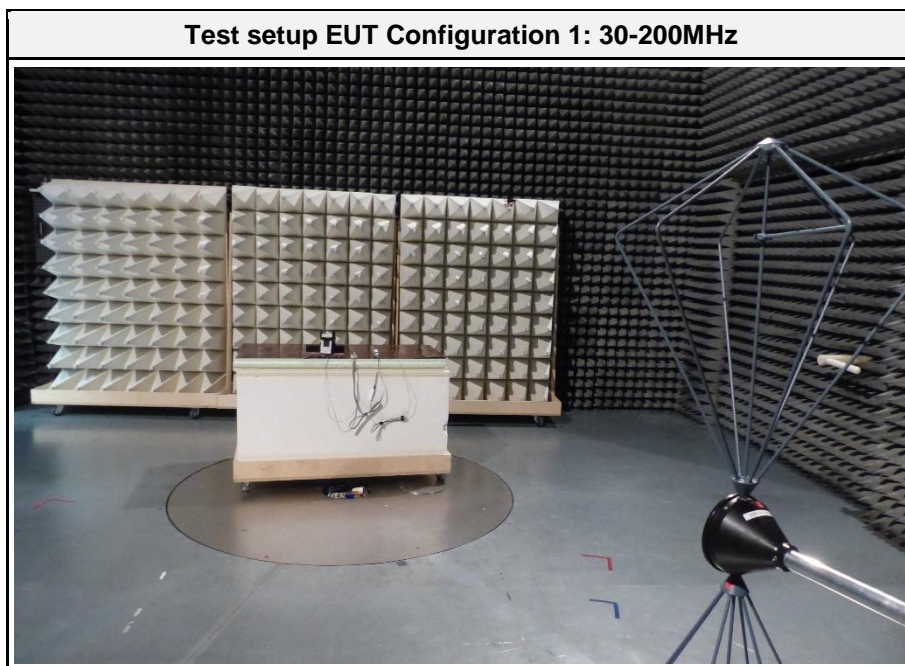
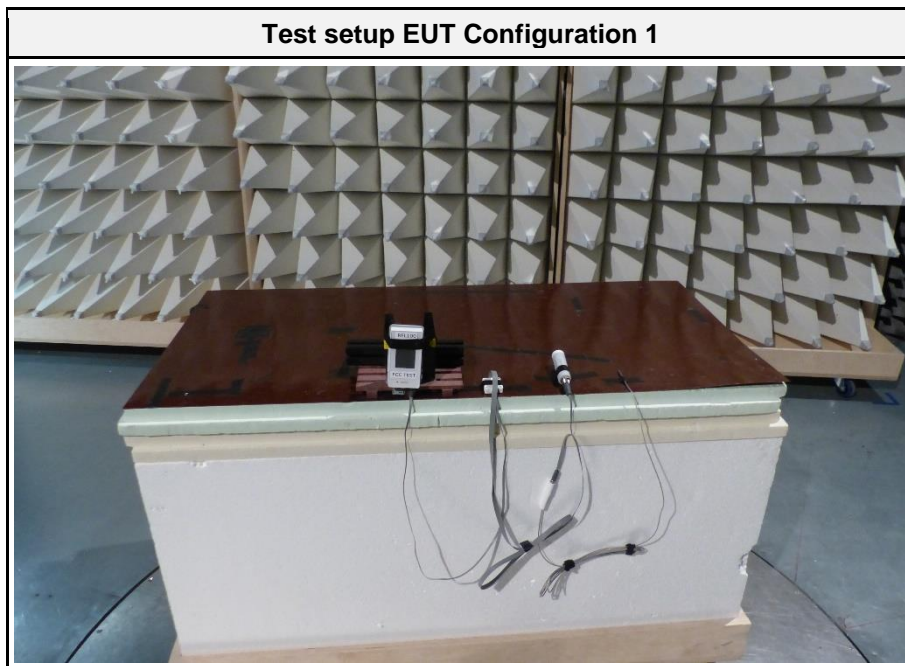
2.1.5 Limits

<b>Class B @ 3 m</b>		
Frequency [MHz]	Detector	Limit [dBµV/m]
30 - 88	Quasi-peak	40
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46
960 - 1000	Quasi-peak	54
> 1000	Peak Average	74 54

2.1.6 Results

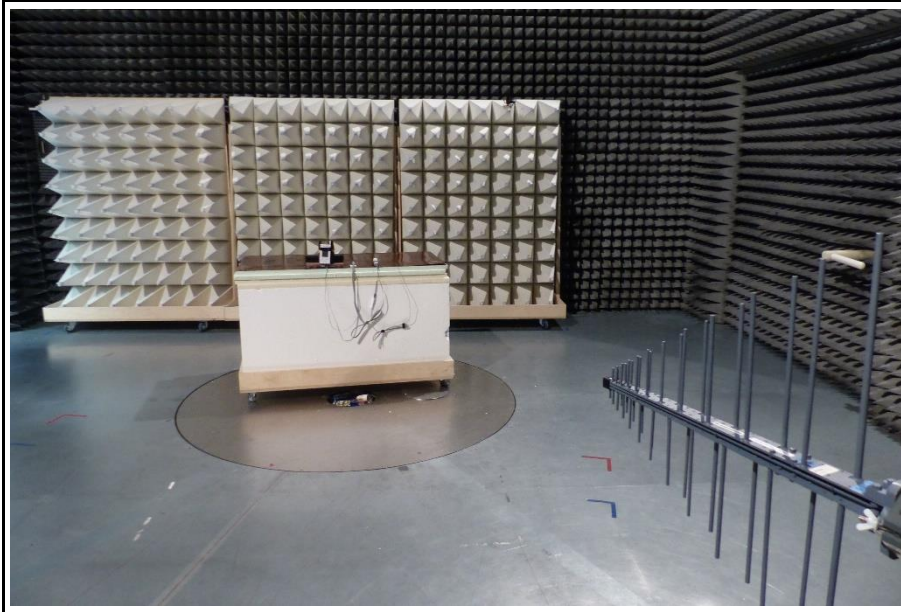
<b>Test Results</b>			
Operational mode	EUT Configuration	Verdict	Remark
1	1	PASS	-
1	2	PASS	-

2.1.7 Setup Photos

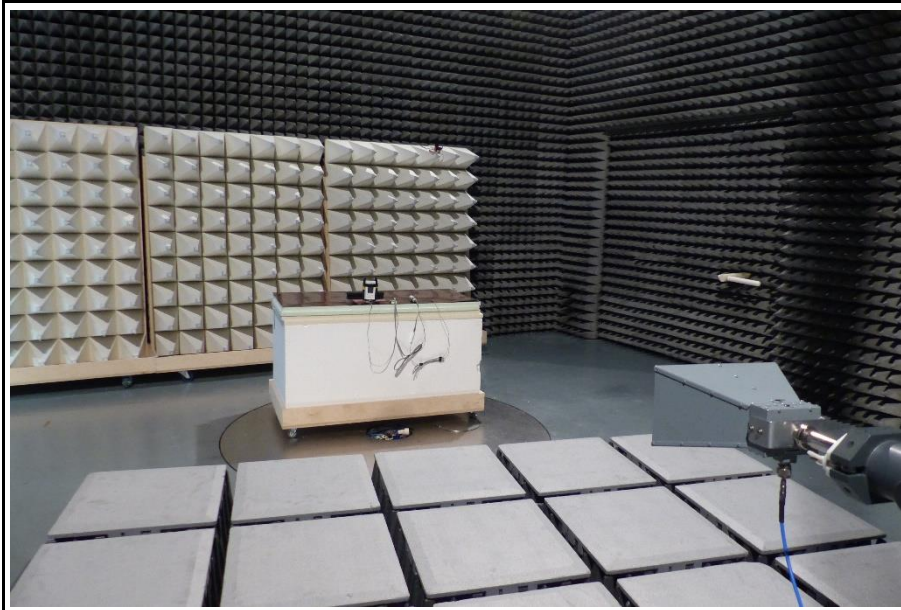




**Test setup EUT Configuration 1: 200-1000MHz**



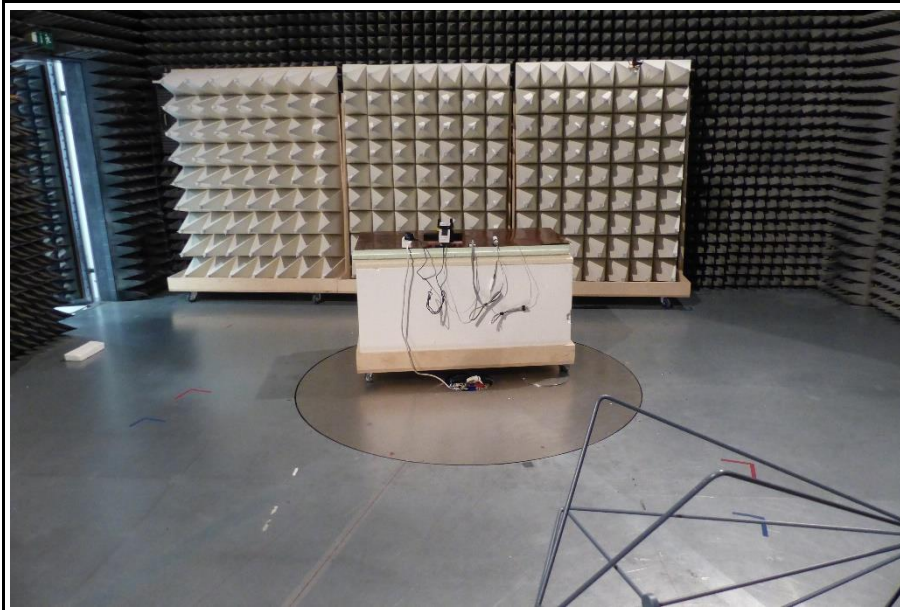
**Test setup EUT Configuration 1: 1-5GHz**



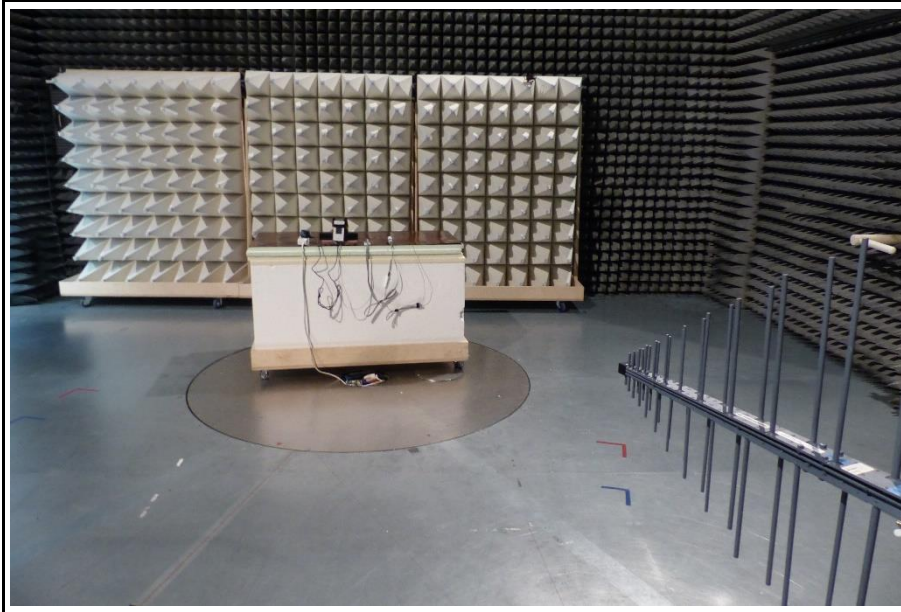
**Test setup EUT Configuration 2**



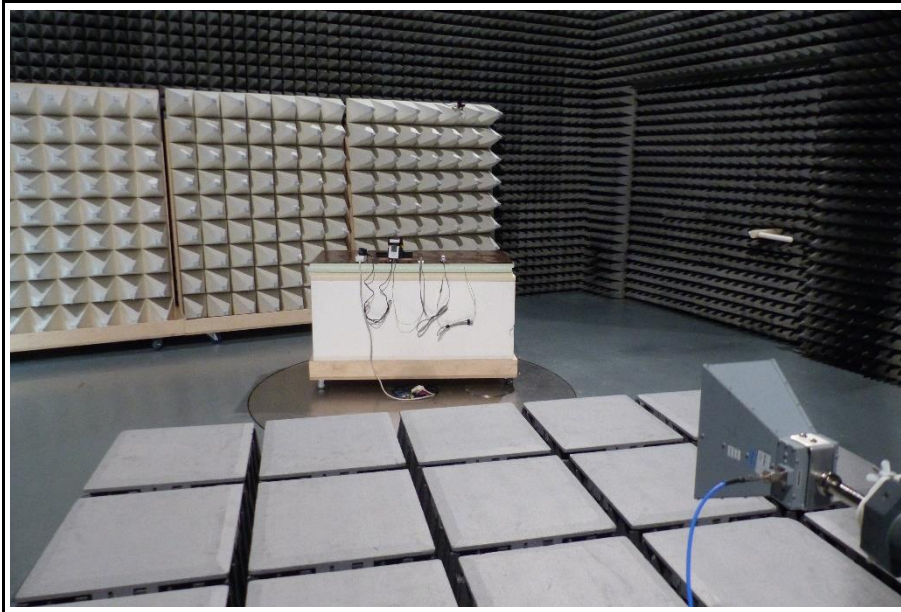
**Test setup EUT Configuration 1: 30-200MHz**



Test setup EUT Configuration 2: 200-1000MHz



Test setup EUT Configuration 2: 1-5GHz



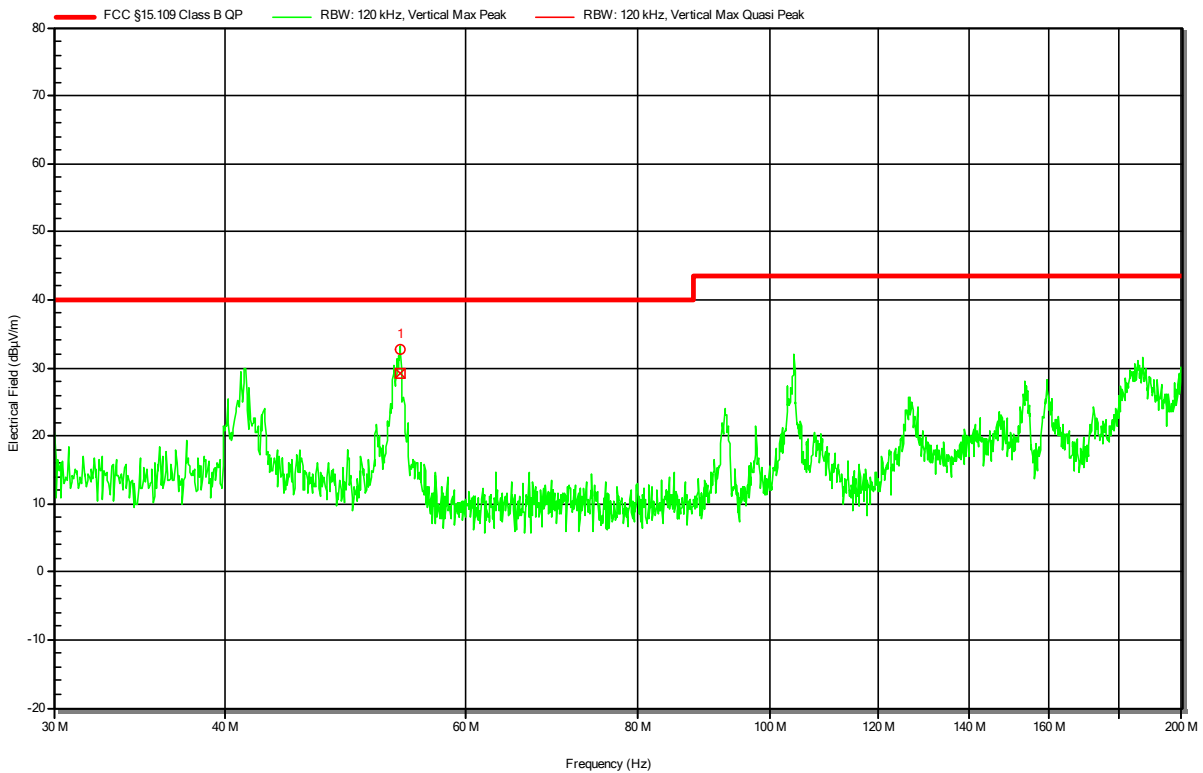
2.1.8 Records

**Radiated emissions according to FCC part 15B**

Project Number: G0M-2103-9684  
 Applicant: Vaisala Oyi  
 Model Description: VaiNet Wireless Data Logger  
 Model: RFL100  
 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-18  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 2x1.5V DC  
 Antenna: Rohde & Schwarz HK 116, Vertical  
 Measurement Distance: 3m  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 1  
 Note 1:

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**RadiMation**



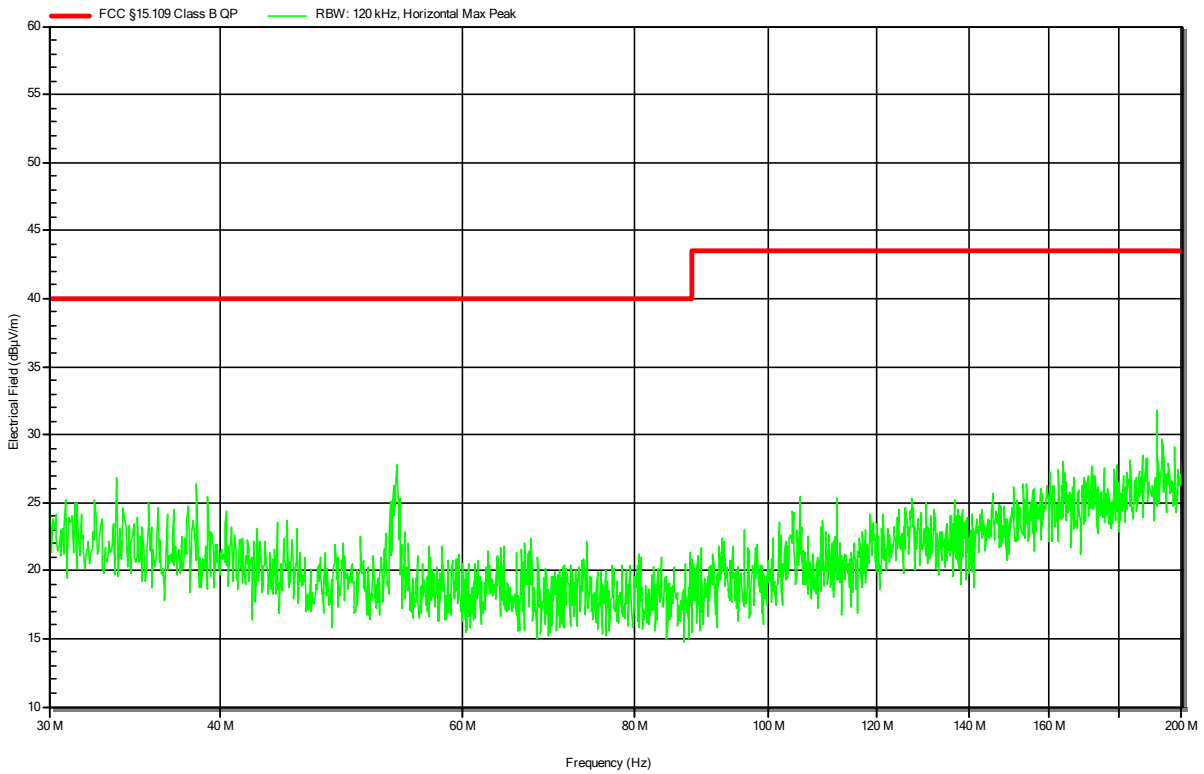
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	53,738 MHz	29,16 dBµV/m	40 dBµV/m	-10,84 dB	Pass	-113 degrees	1 m

**Radiated emissions according to FCC part 15B**

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 Model Description: VaiNet Wireless Data Logger  
 Model: RFL100  
 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-18  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 2x1.5V DC  
 Antenna: Rohde & Schwarz HK 116, Horizontal  
 Measurement Distance: 3m  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 1  
 Note 1:

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**RadiMation**

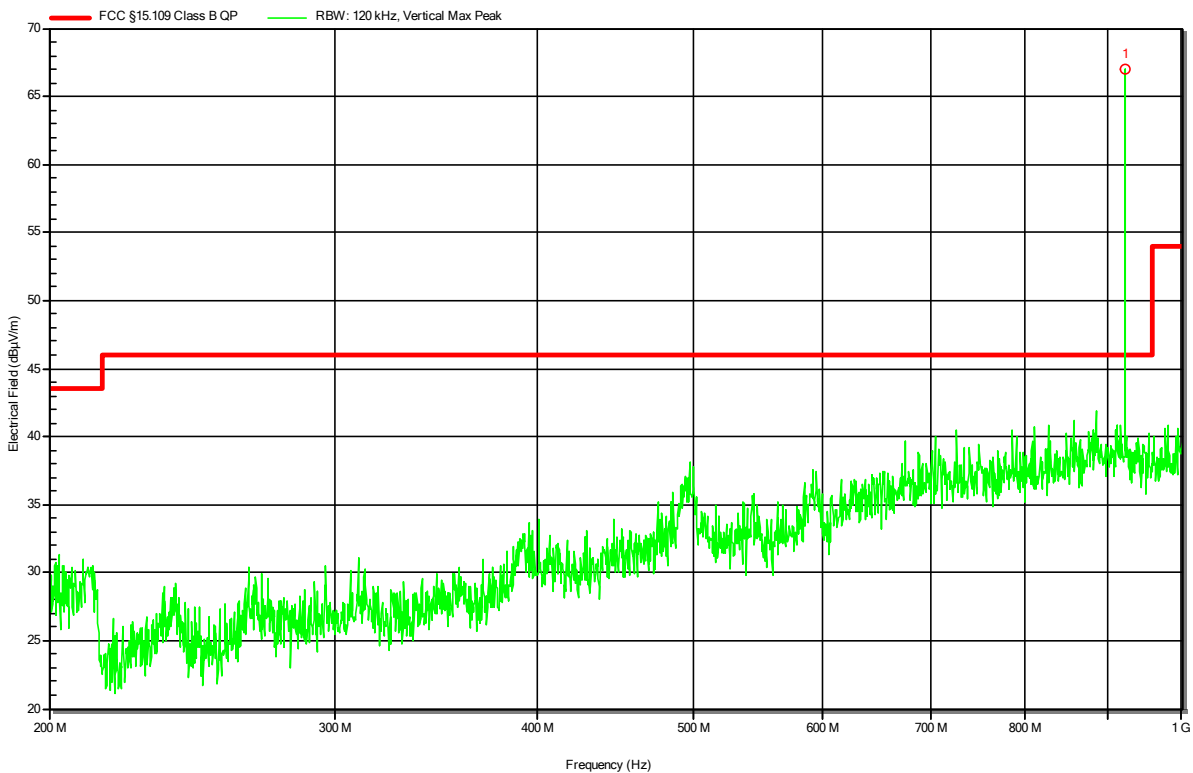


**Radiated emissions according to FCC part 15B**

Project Number: G0M-2103-9684  
 Applicant: Vaisala Oyi  
 Model Description: VaiNet Wireless Data Logger  
 Model: RFL100  
 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-18  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 2x1.5V DC  
 Antenna: Rohde & Schwarz HL 223, Vertical  
 Measurement Distance: 3m  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 1  
 Note 1:

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RadiMation



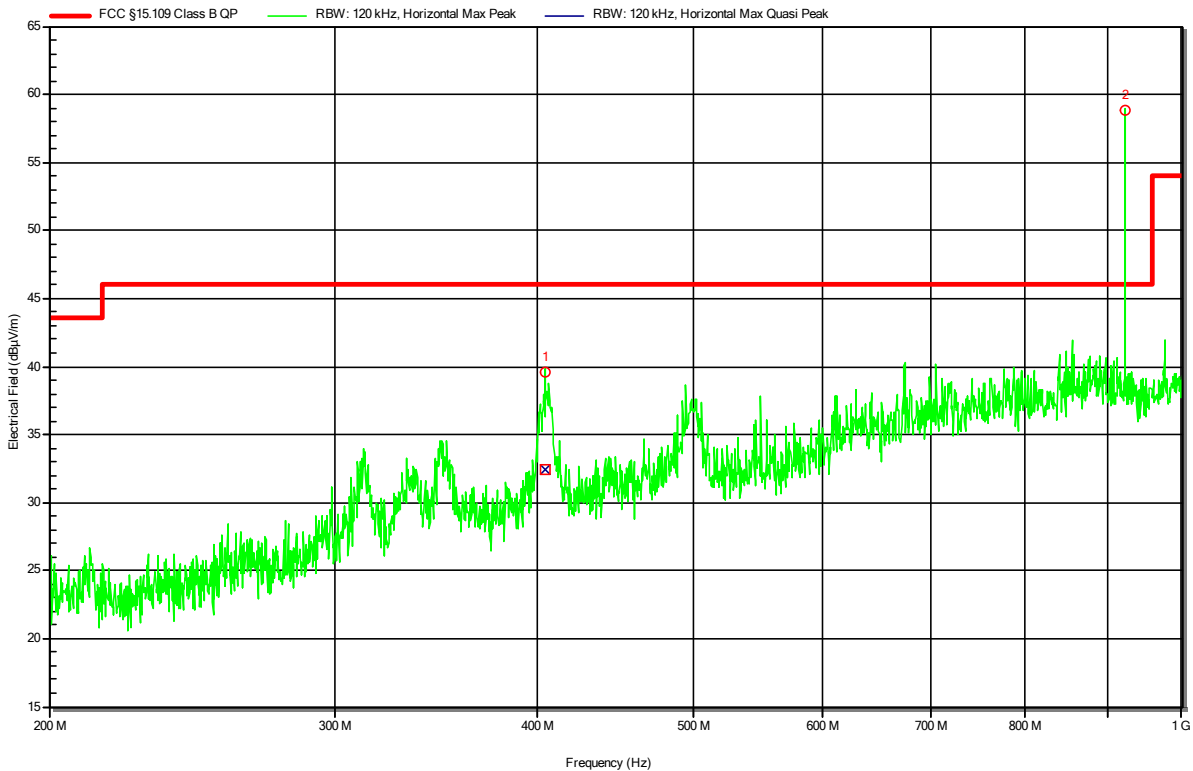
Peak Number	Frequency	Angle	Height
1	922.065 MHz	LoRa carrier	

**Radiated emissions according to FCC part 15B**

Project Number: G0M-2103-9684  
 Applicant: Vaisala Oyi  
 Model Description: VaiNet Wireless Data Logger  
 Model: RFL100  
 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-18  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 2x1.5V DC  
 Antenna: Rohde & Schwarz HL 223, Horizontal  
 Measurement Distance: 3m  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 1  
 Note 1:

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RadiMation



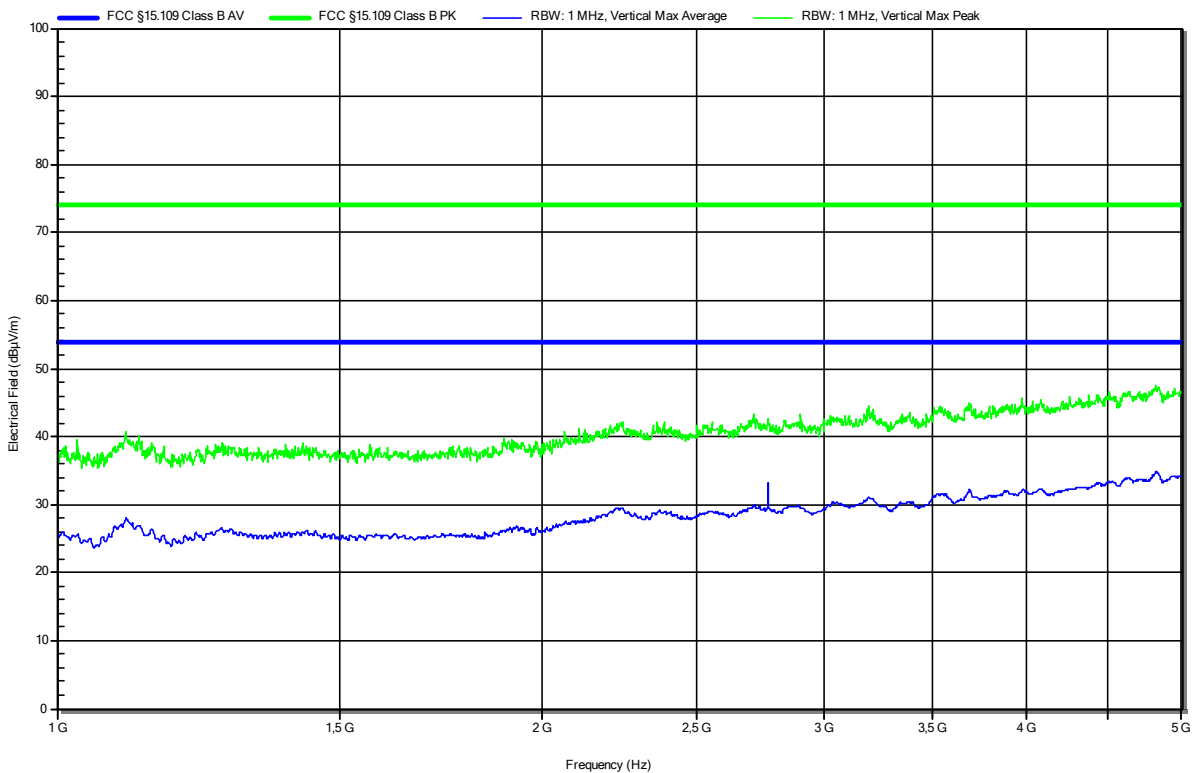
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	404,455 MHz	32,38 dBµV/m	46,02 dBµV/m	-13,64 dB	Pass	-180 degrees	1 m
2	922,065 MHz	LoRa carrier					

**Radiated emissions according to FCC part 15B**

Project Number: G0M-2103-9684  
 Applicant: Vaisala Oyi  
 Model Description: VaiNet Wireless Data Logger  
 Model: RFL100  
 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-18  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 2x1.5V DC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement Distance: 3m  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 1  
 Note 1:

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**RadiMation**



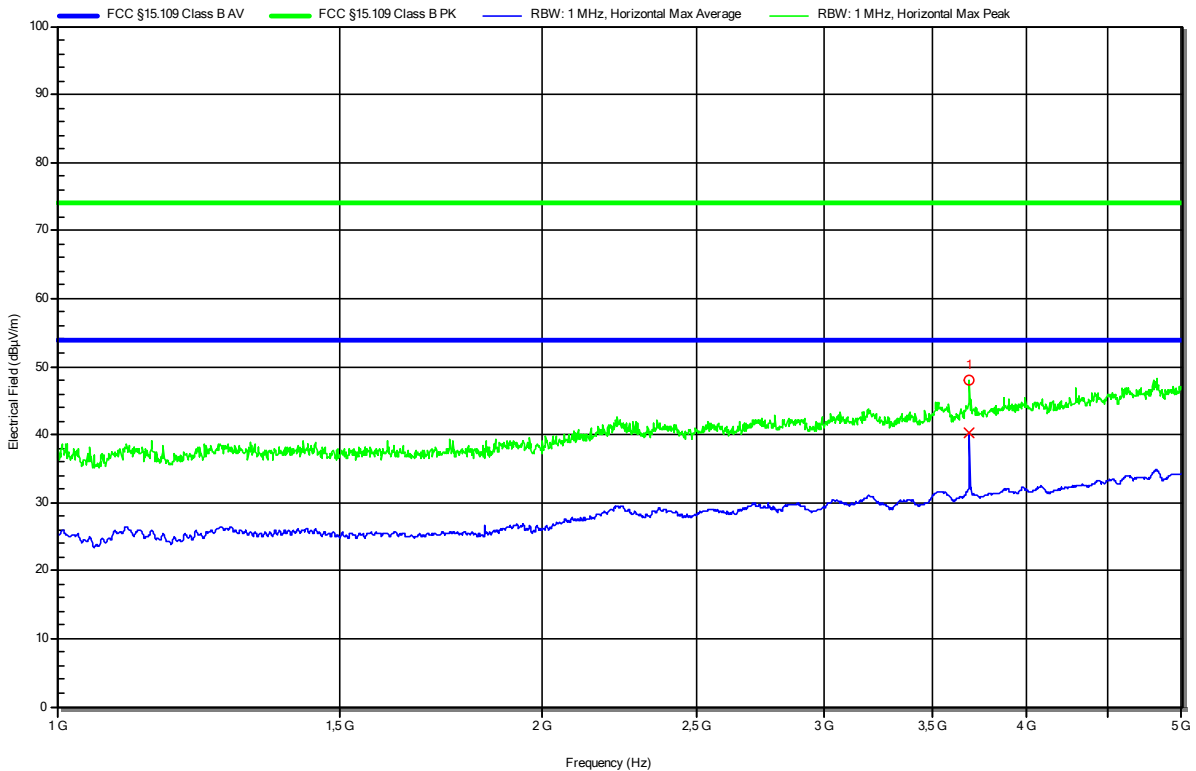


**Radiated emissions according to FCC part 15B**

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 Applicant: Vaisala Oyi  
 Model Description: VaiNet Wireless Data Logger  
 Model: RFL100  
 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-18  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 2x1.5V DC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement Distance: 3m  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 1  
 Note 1:

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RadiMation



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	3,689 GHz	48,02 dBµV/m	4 <sup>th</sup> harmonic LoRa				

**Radiated emissions according to FCC part 15B**

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 Model: RFL100  
 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-18  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 120V AC / 60Hz  
 Antenna: Rohde & Schwarz HK 116, Vertical  
 Measurement Distance: 3m  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 2  
 Note 1:

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RadiMation



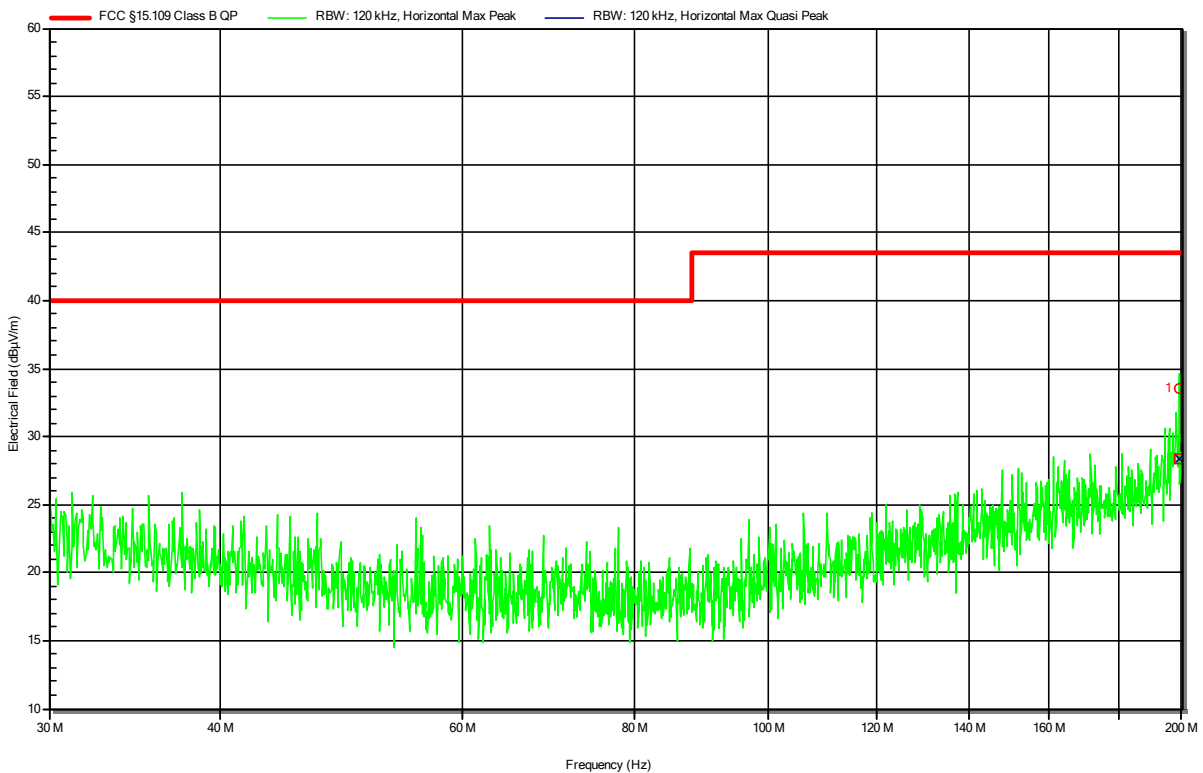
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	41,493 MHz	30,77 dBµV/m	40 dBµV/m	-9,23 dB	Pass	-128 degrees	1 m
2	186,045 MHz	33,38 dBµV/m	43,52 dBµV/m	-10,14 dB	Pass	-128 degrees	1 m

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 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-18  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 120V AC / 60Hz  
 Antenna: Rohde & Schwarz HK 116, Horizontal  
 Measurement Distance: 3m  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 2  
 Note 1:

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**RadiMation**



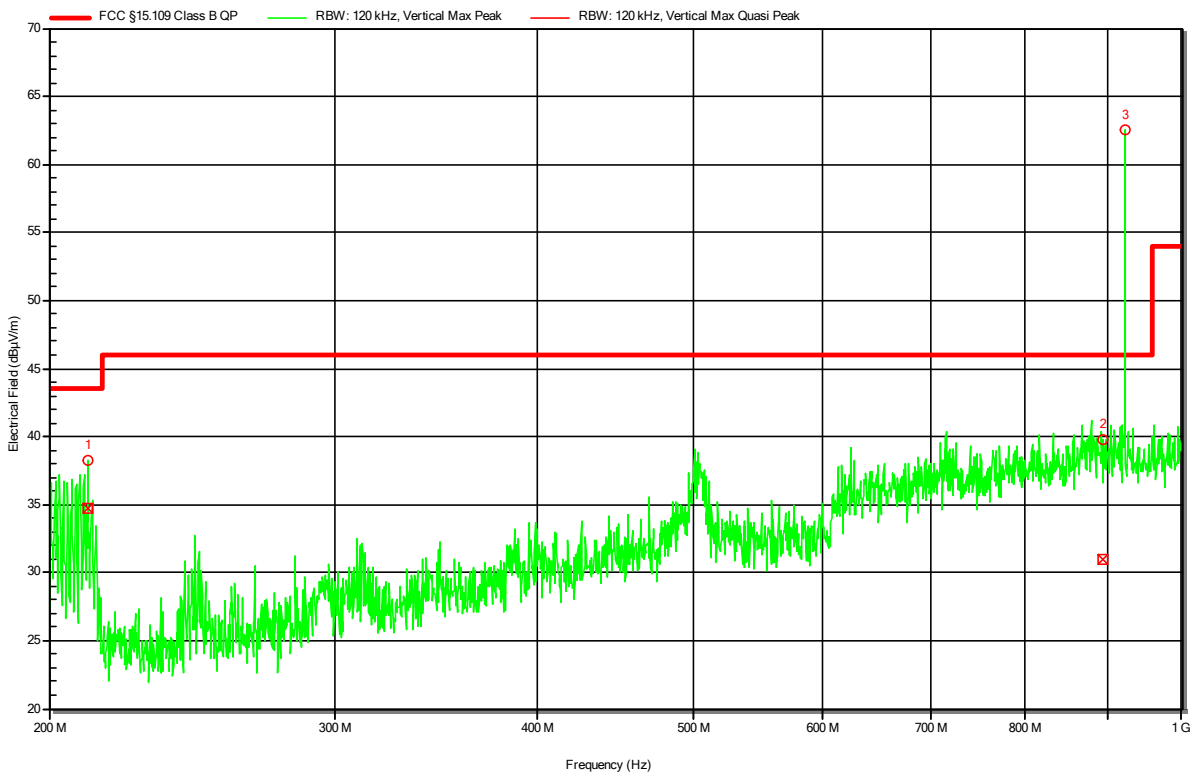
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	199,286 MHz	28,36 dBµV/m	43,52 dBµV/m	-15,16 dB	Pass	78 degrees	1 m

**Radiated emissions according to FCC part 15B**

Project Number: G0M-2103-9684  
 Applicant: Vaisala Oyi  
 Model Description: VaiNet Wireless Data Logger  
 Model: RFL100  
 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-18  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 120V AC / 60Hz  
 Antenna: Rohde & Schwarz HL 223, Vertical  
 Measurement Distance: 3m  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 2  
 Note 1:

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RadiMation



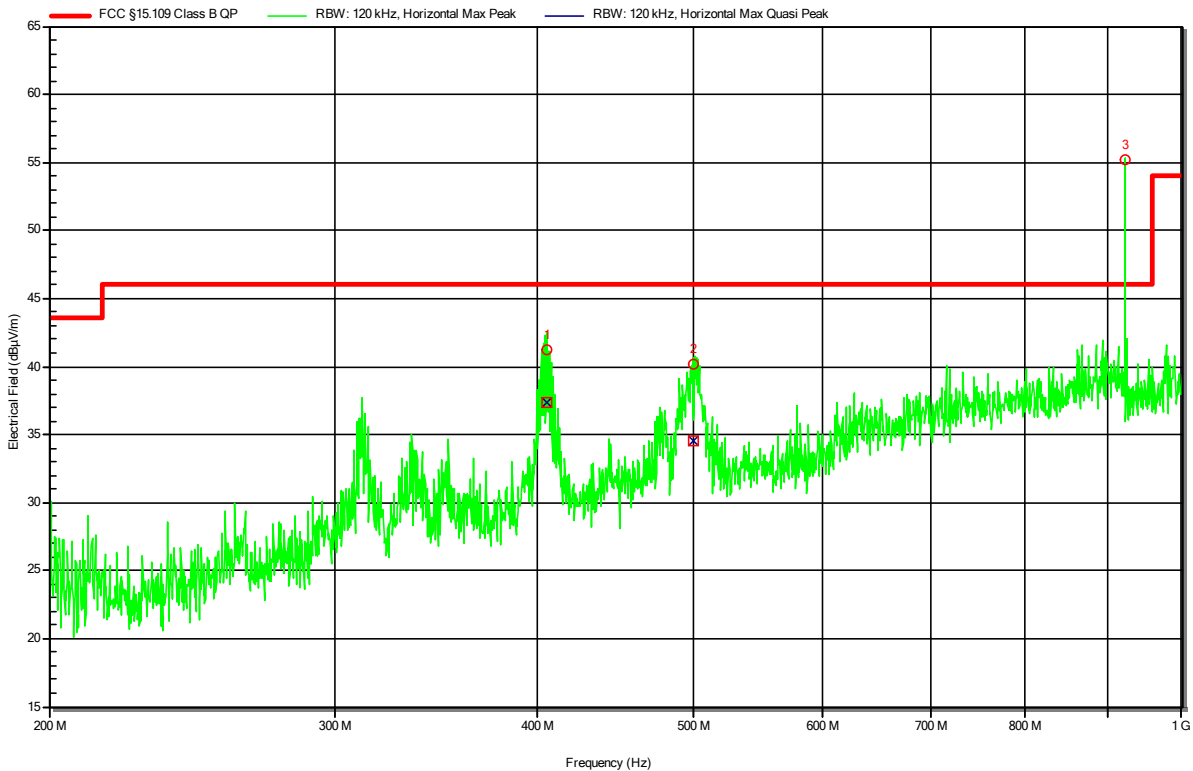
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	211,336 MHz	34,71 dBµV/m	43,52 dBµV/m	-8,81 dB	Pass	66 degrees	1 m
2	893,329 MHz	30,97 dBµV/m	46,02 dBµV/m	-15,05 dB	Pass	66 degrees	1 m
3	922,065 MHz	LoRa carrier					

**Radiated emissions according to FCC part 15B**

Project Number: G0M-2103-9684  
 Applicant: Vaisala Oyi  
 Model Description: VaiNet Wireless Data Logger  
 Model: RFL100  
 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-18  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 120V AC / 60Hz  
 Antenna: Rohde & Schwarz HL 223, Horizontal  
 Measurement Distance: 3m  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 2  
 Note 1:

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RadiMation



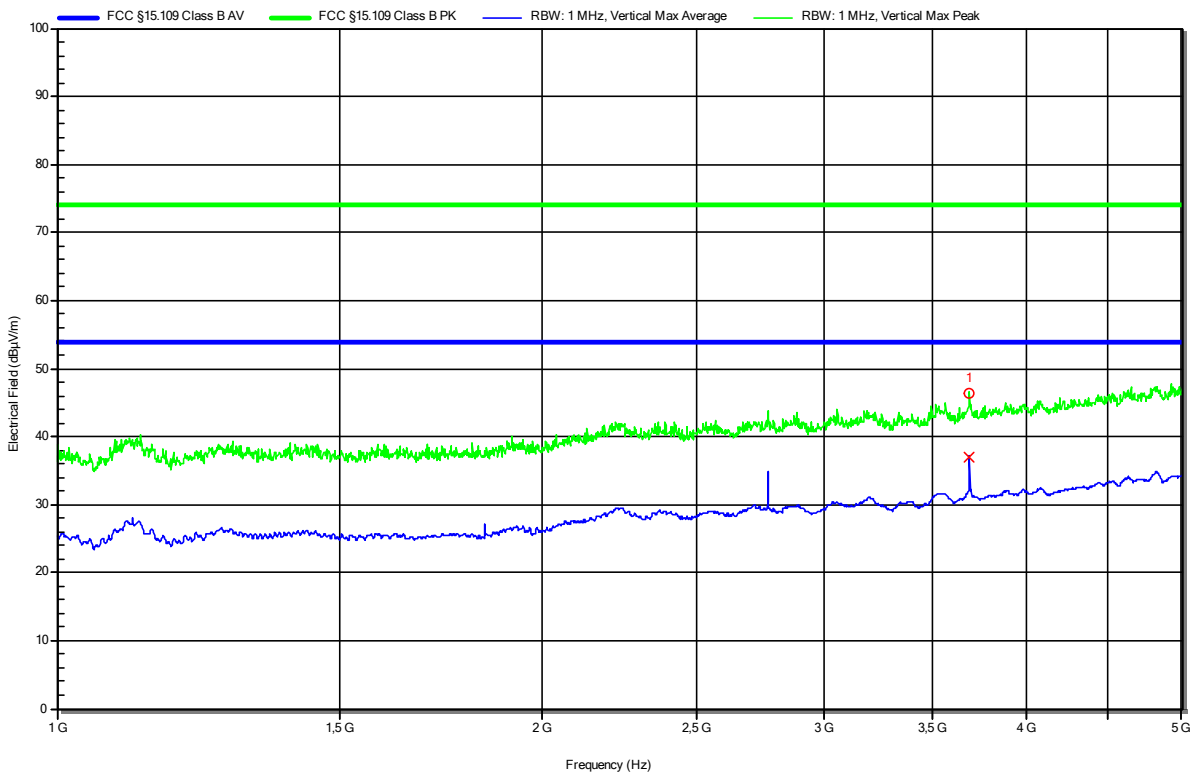
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	405,764 MHz	37,34 dBµV/m	46,02 dBµV/m	-8,68 dB	Pass	-180 degrees	1 m
2	500,006 MHz	34,52 dBµV/m	46,02 dBµV/m	-11,5 dB	Pass	-180 degrees	1 m
3	922,065 MHz	LoRa carrier	46,02 dBµV/m	-11,5 dB	Pass	-180 degrees	1 m

**Radiated emissions according to FCC part 15B**

Project Number: G0M-2103-9684  
 Applicant: Vaisala Oyi  
 Model Description: VaiNet Wireless Data Logger  
 Model: RFL100  
 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-18  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 120V AC / 60Hz  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement Distance: 3m  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 2  
 Note 1:

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**RadiMation**



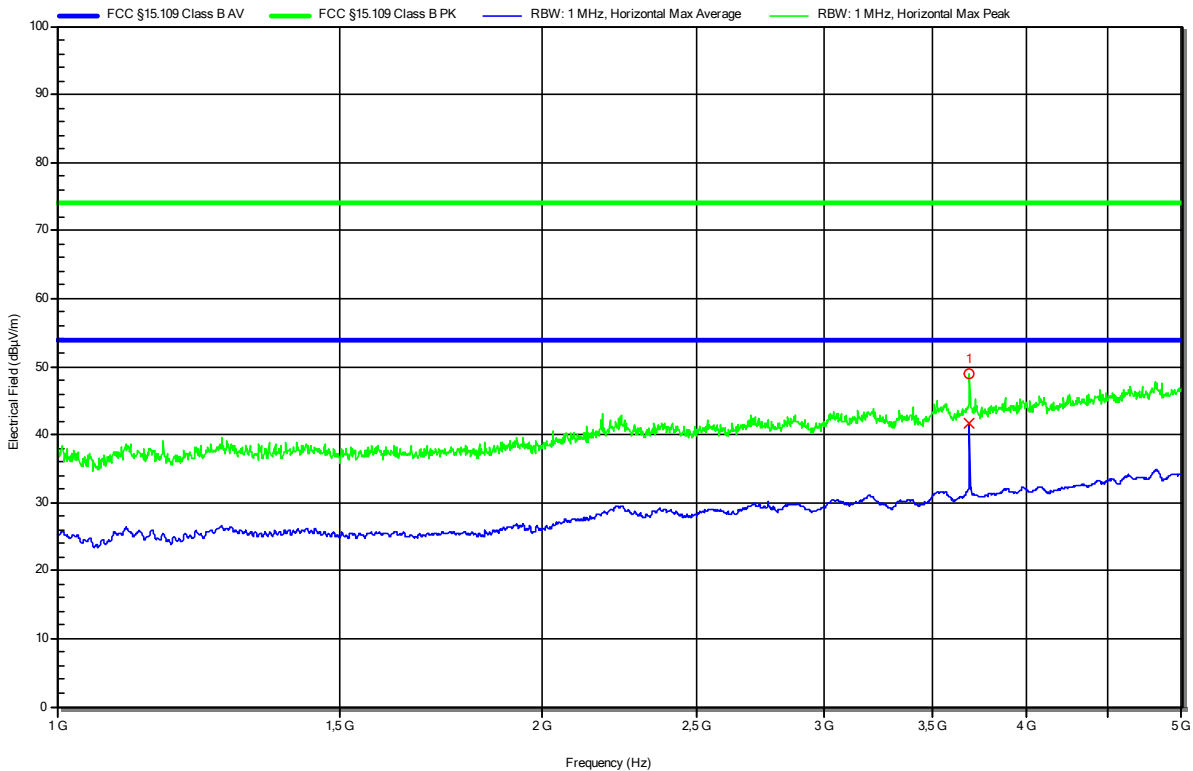
Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	3,689 GHz	46,42 dBµV/m	4 <sup>th</sup> harmonic LoRa				

**Radiated emissions according to FCC part 15B**

Project Number: G0M-2103-9684  
 Applicant: Vaisala Oyi  
 Model Description: VaiNet Wireless Data Logger  
 Model: RFL100  
 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-18  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 120V AC / 60Hz  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement Distance: 3m  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 2  
 Note 1:

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**RadiMation**



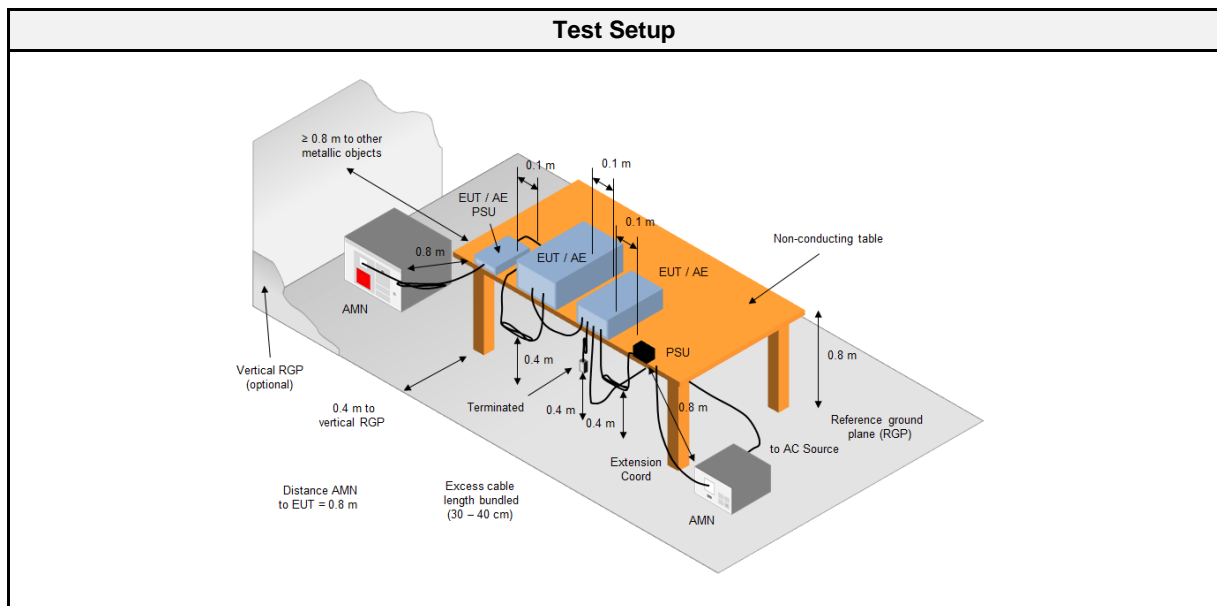
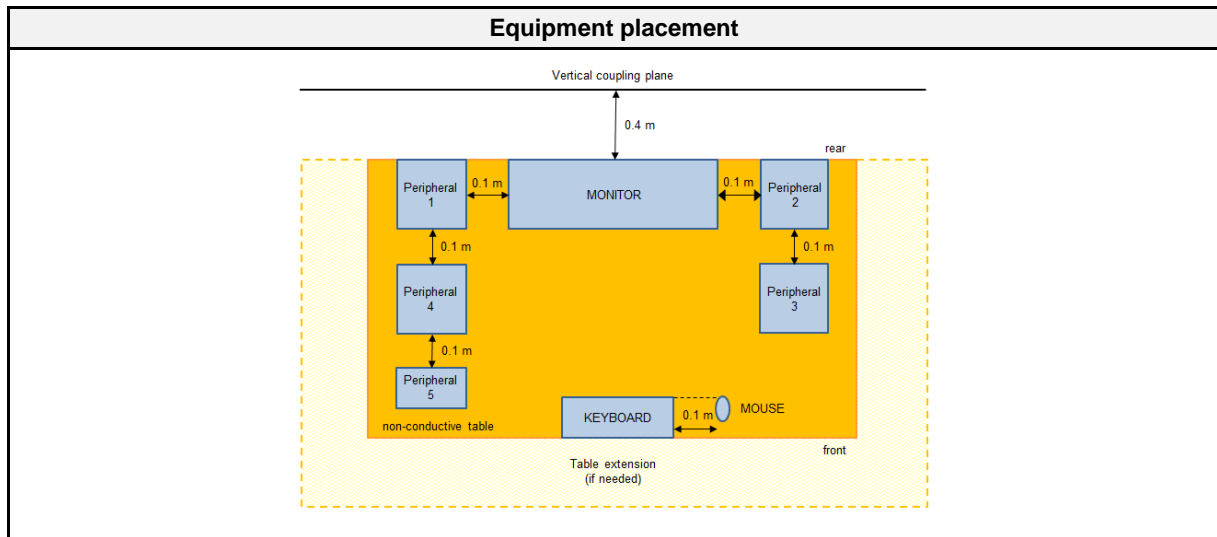
Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	3,689 GHz	48,93 dBµV/m	4 <sup>th</sup> harmonic LoRa				

## 2.2 Test Conditions and Results - Conducted emissions acc. to ANSI C63.4

### 2.2.1 Information

Test Information	
Reference	FCC 15.107, ICES-003, 3.2.1
Reference method	ANSI C63.4:2014+A1:2017 Section 12
Measurement range	150 kHz to 30 MHz
Equipment class	Class B
Equipment type	Table top
Temperature [°C]	21 ±3
Humidity [%]	37 ±3
Operator	Matthias Handrik
Date	2021-05-19

### 2.2.2 Setup





2.2.3 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
AMN	Schwarzbeck	NSLK 8127	EF01592	2020-07	2021-07
Pulse Limiter	R&S	ESH3-Z2	EF01063	2020-07	2021-07
EMI Test Receiver	R&S	ESR 7	EF00943	2020-07	2021-07
Climatic Sensor	Embedded Data Systems, LLC.	2800100000254 17E	EF01054	2021-03	2022-03

2.2.4 Procedure

Exploratory measurement
<ol style="list-style-type: none"> <li>1. The EUT was placed on a non conductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2014 item 7.3.1)</li> <li>2. The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN.</li> <li>3. The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length).</li> <li>4. The LISN measurement port was connected to a measurement receiver</li> <li>5. I/O cables were bundled not longer than 0.4 m</li> <li>6. Measurement was performed in the frequency range 0.15 – 30MHz on each current-carrying conductor</li> <li>7. To maximize the emissions the cable positions were manipulated</li> <li>8. The worst configuration of EUT and cables is shown on a test setup picture at item 2.2.2</li> </ol>

Final measurement
<ol style="list-style-type: none"> <li>1. The EUT was placed on a non conductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2014 item 7.3.1)</li> <li>2. The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN.</li> <li>3. The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length).</li> <li>4. The LISN measurement port was connected to a measurement receiver</li> <li>5. The EUT and cable arrangement were based on the exploratory measurement results</li> <li>6. The test data of the worst-case conditions were recorded and shown on the next pages</li> </ol>

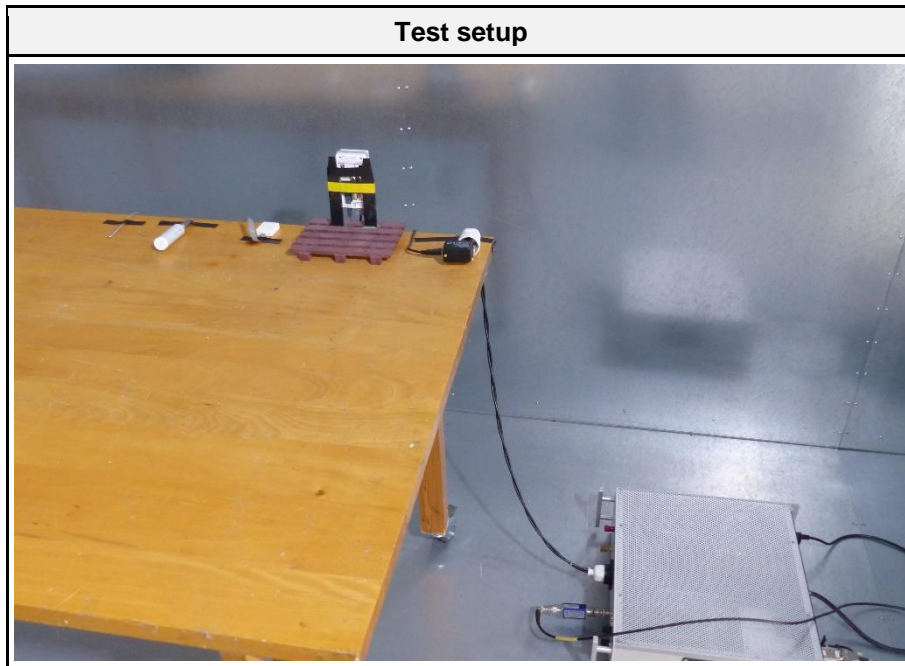
## 2.2.5 Limits

Class B		
Frequency [MHz]	Quasi-peak Limit [dB $\mu$ V]	Average Limit [dB $\mu$ V]
0.15 - 0.5	66 - 56 *	56 - 46 *
0.5 - 5	56	46
5 - 30	60	50
* Decreases with the logarithm of the frequency		

## 2.2.6 Results

AC power line conducted emissions					
Port	Coupling	Operational mode	EUT Configuration	Verdict	Remark
Power	AMN	1	2	PASS	-

2.2.7 Setup Photos



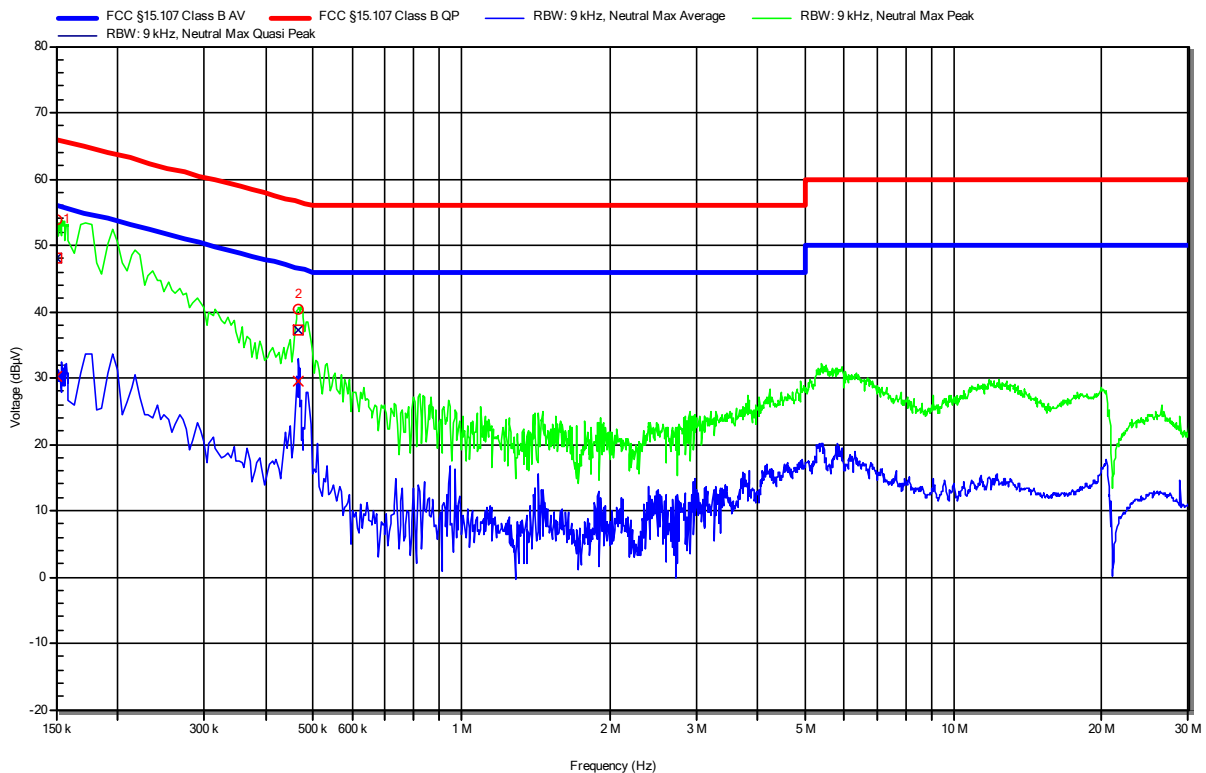
2.2.8 Records

**Conducted emissions at the mains power port according to FCC part 15B**

Project Number: G0M-2103-9684  
 Applicant: Vaisala Oyi  
 Model Description: VaiNet Wireless Data Logger  
 Model: RFL100  
 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-19  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 120V AC / 60Hz  
 LISN: Schwarzbeck NSLK 8127 RC, N  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 2  
 Applied to Port: AC Mains  
 Note 1:

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**RadiMation**



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	150 kHz	48.14 dBµV	66 dBµV	-17.86 dB	Pass	Neutral
2	465 kHz	37.35 dBµV	56.6 dBµV	-19.26 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	150 kHz	30.18 dBµV	56 dBµV	-25.82 dB	Pass	Neutral
2	465 kHz	29.52 dBµV	46.6 dBµV	-17.08 dB	Pass	Neutral

Test Report No.: G0M-2103-9684-EF0115B-V02

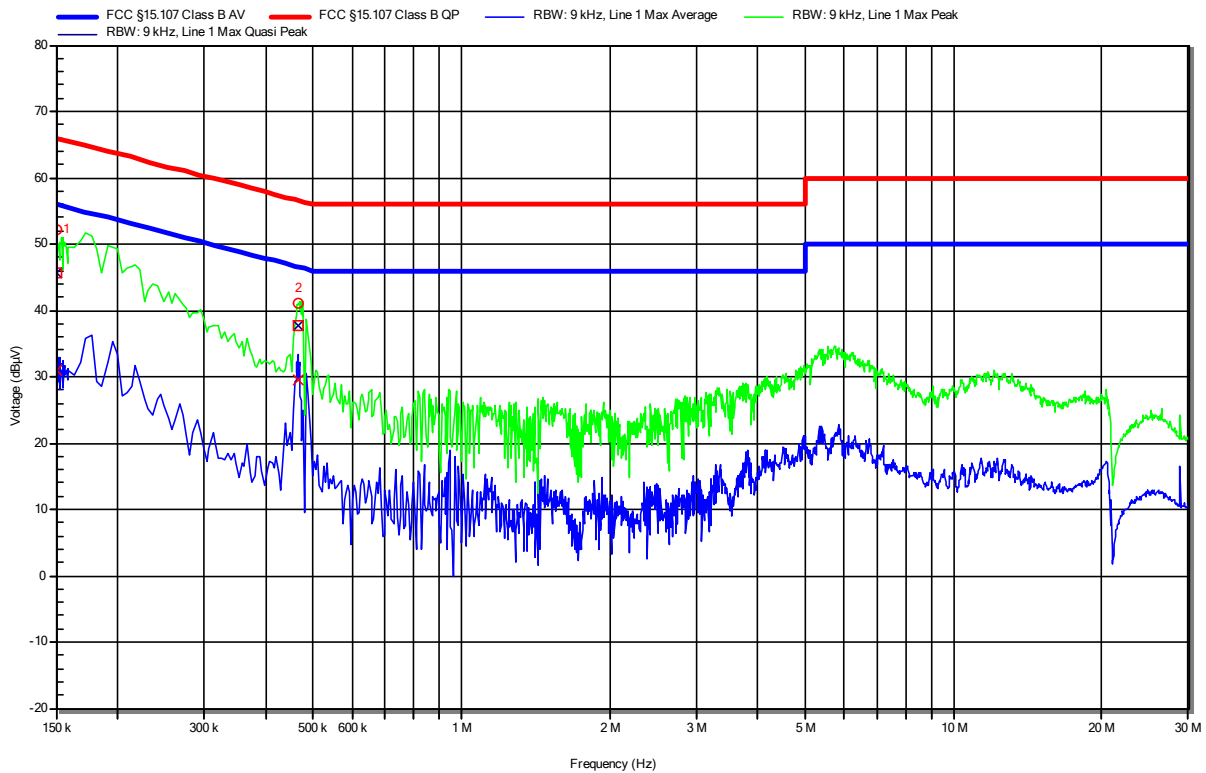
Eurofins Product Service GmbH  
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

**Conducted emissions at the mains power port according to FCC part 15B**

Project Number: G0M-2103-9684  
 Applicant: Vaisala Oyi  
 Model Description: VaiNet Wireless Data Logger  
 Model: RFL100  
 Test Sample ID: 34356  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Handrik  
 Test Date: 2021-05-19  
 Operating Conditions: ambient temperature: 21 °Celsius  
 power input: 120V AC / 60Hz  
 LISN: Schwarzbeck NSLK 8127 RC, L1  
 Operational Mode & EUT Configuration: Operational mode 1  
 EUT configuration 2  
 Applied to Port: AC Mains  
 Note 1:

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RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	150 kHz	45.65 dBµV	66 dBµV	-20.35 dB	Pass	Line 1
2	466.35 kHz	37.76 dBµV	56.58 dBµV	-18.82 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	150 kHz	31.01 dBµV	56 dBµV	-24.99 dB	Pass	Line 1
2	466.35 kHz	29.58 dBµV	46.58 dBµV	-17 dB	Pass	Line 1

Test Report No.: G0M-2103-9684-EF0115B-V02

Eurofins Product Service GmbH  
 Storkower Str. 38c, D-15526 Reichenwalde, Germany