

EMC TEST REPORT	
Title 47 CFR Part 15B, ISED ICES-003 Issue 7	
Report Reference No	G0M-2112-1231-EF0115B-V02
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	    A2LA - Registration number: 1983.01 (ISED) ISED wireless device testing laboratory: CN 3470A DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	eResearchTechnology GmbH
Address	Sieboldstrasse 3 97230 Estenfeld Germany
Test Specification Standard(s)	Title 47 CFR Part 15 Subpart B ISED ICES-003 Issue 7 ANSI C63.4:2014+A1:2017
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Spirometer System
Model(s)	SpiroSphere
Additional Model(s)	None
Brand Name(s)	None
Hardware Version(s)	N7 (12.07.06)
Software Version(s)	SpiroSpherePackage V4.6.5 Jet_Lib + TestAPP 1.0.0
FCC-ID	2AAUFSPS003
IC	11335A-SPS003
Test Result	PASSED

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	2022-02-03	
Report:		
Compiled by	Stephan Liebich	
Tested by (+ signature) (Responsible for Test)	Stephan Liebich	
Approved by (+ signature) (Test Lab Technician)	Andreas Pflug	
Date of Issue	2022-10-04	
Total number of pages	75	
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:		
Without 2G/3G tested.		

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
T _{NOM}	Nominal operating temperature
V _{NOM}	Nominal supply voltage

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2022-05-12	Initial Release	--
02	2022-10-04	Replaced document: G0M-2112-1231-EF0115B-V01 Replaced by: G0M-2112-1231-EF0115B-V02 Reason: Page 1 & 6, FCC IDs corrected.	S. Liebich

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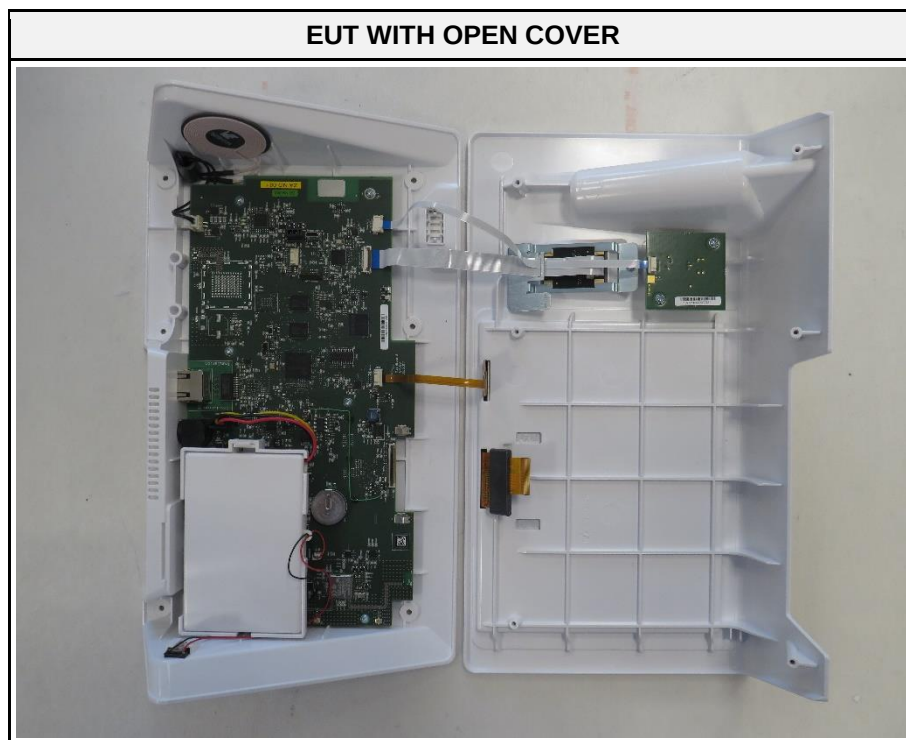
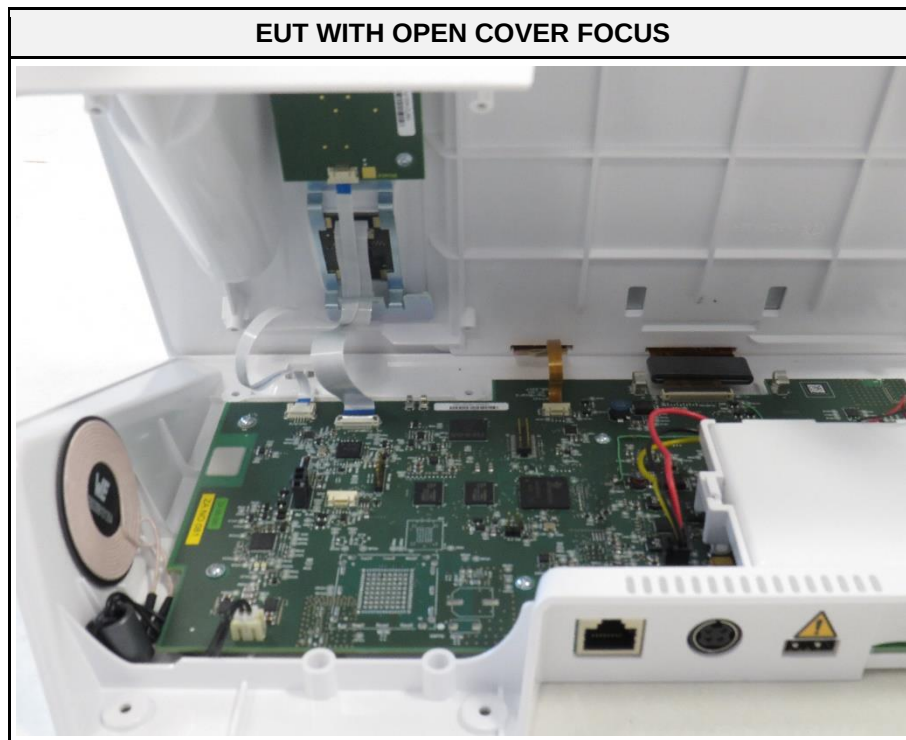
1 Equipment (Test Item) Under Test

Description	Spirometer System (The SpiroSphere is a compact device to measure inspiratory and expiratory lung function parameters in adults and children aged 4 years and older.)	
Model	SpiroSphere	
Additional Model(s)	None	
Brand Name(s)	None	
Serial Number(s)	10010004	
Sample-ID	38263	
Hardware Version(s)	N7 (12.07.06)	
Software Version(s)	SpiroSpherePackage V4.6.5 Jet_Lib + TestAPP 1.0.0	
EUT Dimensions [cm]	33 x 20 x 18	
FCC-ID	2AAUFSPS003	
IC	11335A-SPS003	
Class	Class B	
Equipment type	Table top	
Highest internal frequency [MHz]	2470 (radio frequency) 20 to 71 (clock frequency display) 52 (eMMC bus clock) 25 (ETH PH)	
Radio Module 1	Type	Bluetooth Basic Rate / Bluetooth Low Energy / IEEE 802.11 b/g/n
	Model	WL18 MODGB
	Manufacturer	Texas Instruments
	FCC-ID	Z64-WL18SBMOD
	IC	451I-WL18SBMOD
Radio Module 2	Type	Wireless Power Transmission System
	Model	unspecified
	Manufacturer	unspecified
	FCC-ID	--
	IC	--
Supply Voltage	V _{NOM}	120 V AC / 60 Hz via dedicated AC/DC-adaptor 3.7 V DC by internal rechargeable lithium ion battery
AC/DC-Adaptor	Model	GTM91099-3009-4.0-T2
	Vendor	GlobTek, Inc.
	Input	100 to 240 V AC 50/60 Hz
	Output	5 V DC
Manufacturer	eResearchTechnology GmbH Sieboldstrasse 3 97230 Estenfeld Germany	
Factory	Zollner Elektronik AG Wiesenweg 1 93499 Zandt Germany	

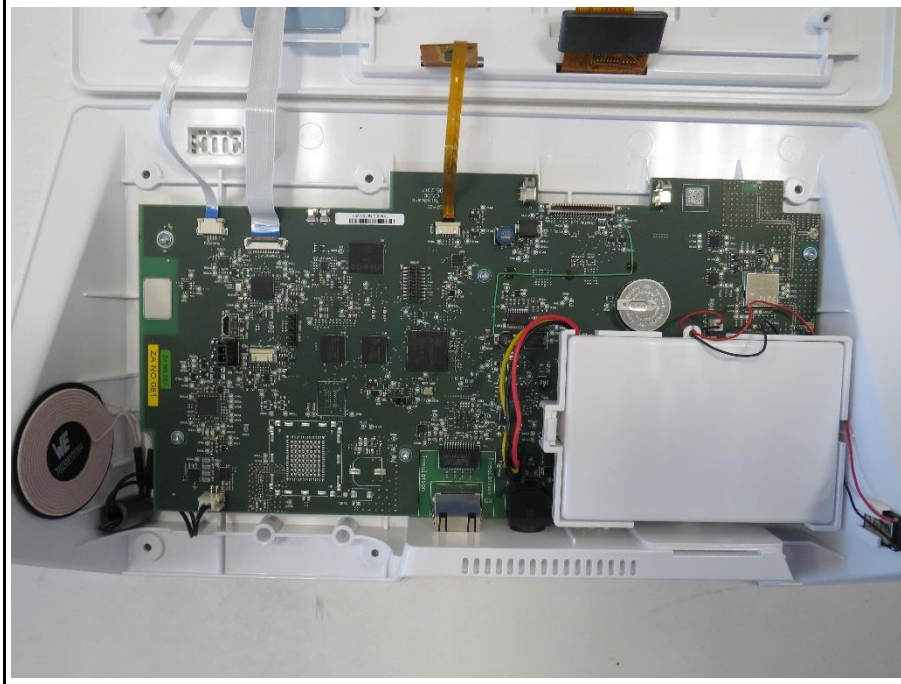
1.1 Equipment Ports

Name	Type	Attributes	Comment
AC Mains	AC	Count: 1 Cable length [m]: > 3 Direction: In Service only: No Shielded: No	Port of dedicated AC/DC-adapter
USB 2.0	IO	Count: 2 Cable length [m]: < 3 Direction: IO Service only: No Shielded: Yes	--
Ethernet	IO	Count: 1 Cable length [m]: < 30 Direction: IO Service only: No Shielded: Yes	Shield on both sides connected to ground; CAT 5e
USB	IO	Count: 1 Cable length [m]: < 3 Direction: IO Service only: Yes Shielded: Yes	USB 2.0
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		

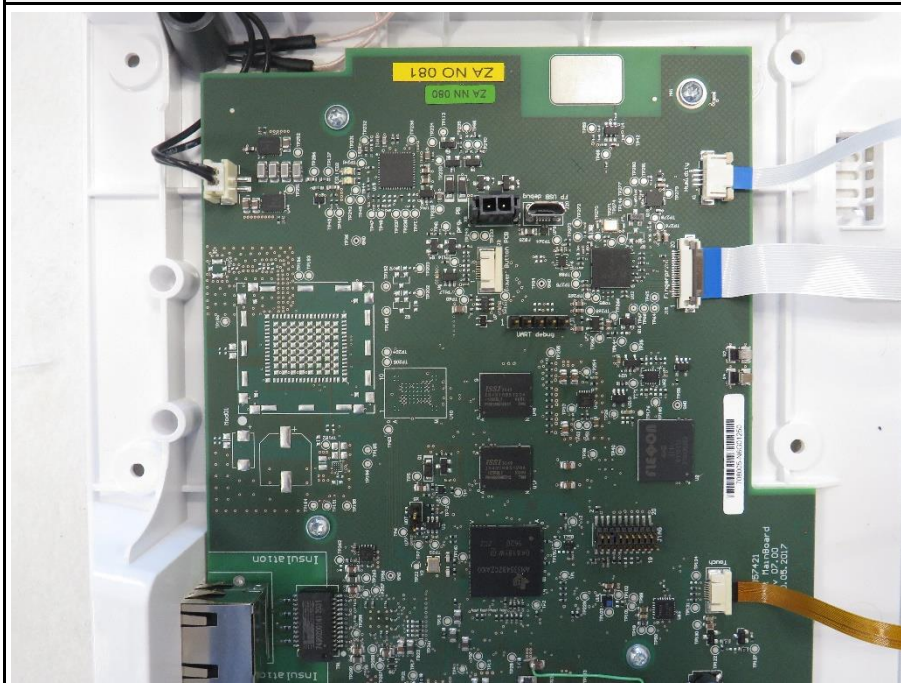
1.2 Equipment Photos - Internal



EUT PCB MAINBOARD



EUT PCB MAINBOARD FOCUS 1



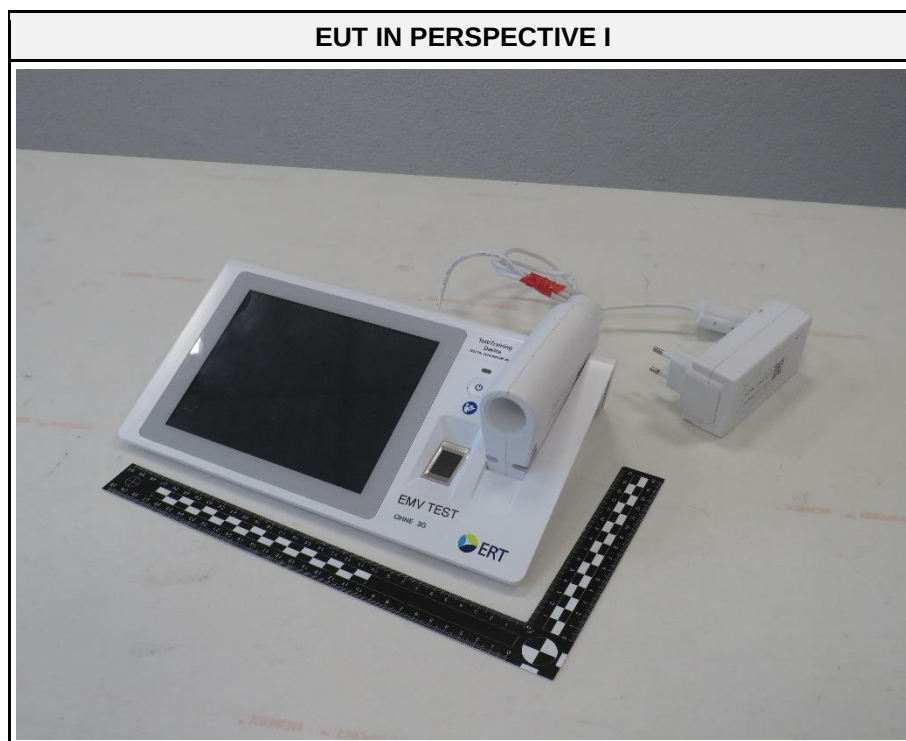
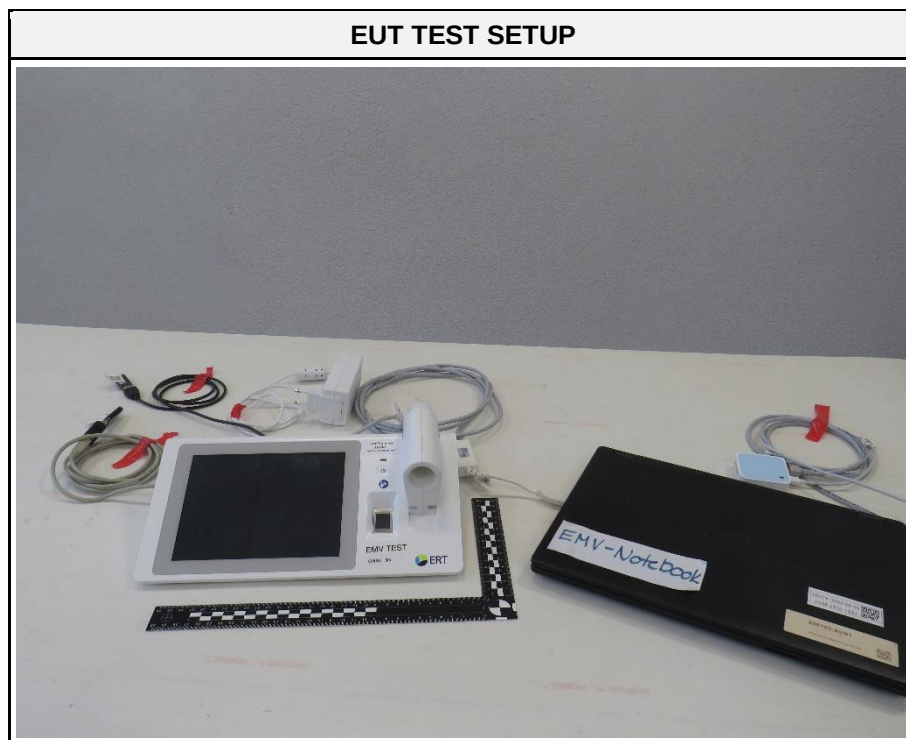
EUT PCB MAINBOARD FOCUS 2



EUT PCB FINGERPRINT SWITCH



1.3 Equipment Photos - External



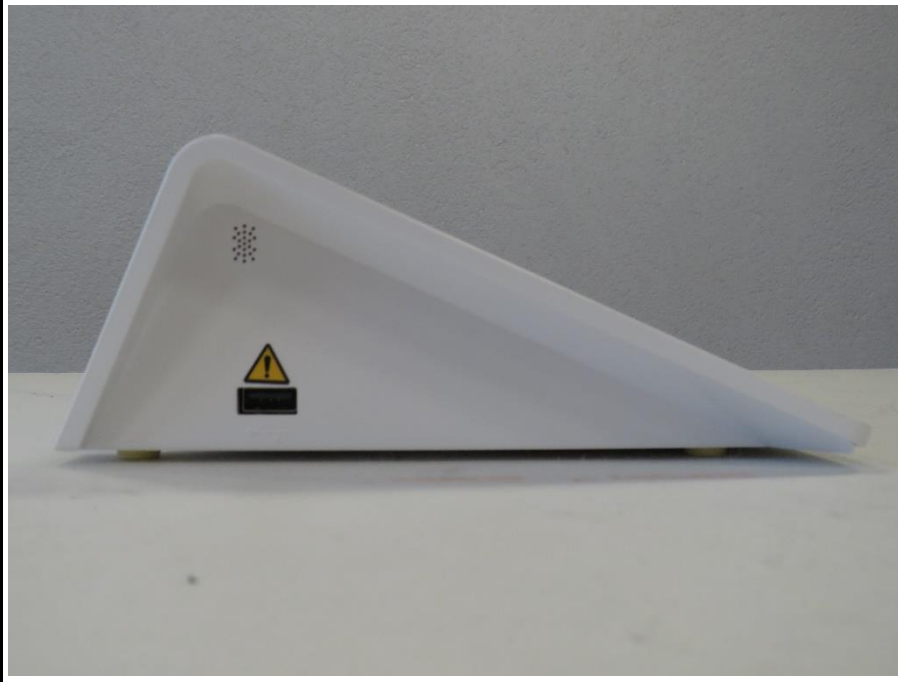
EUT IN PERSPECTIVE II



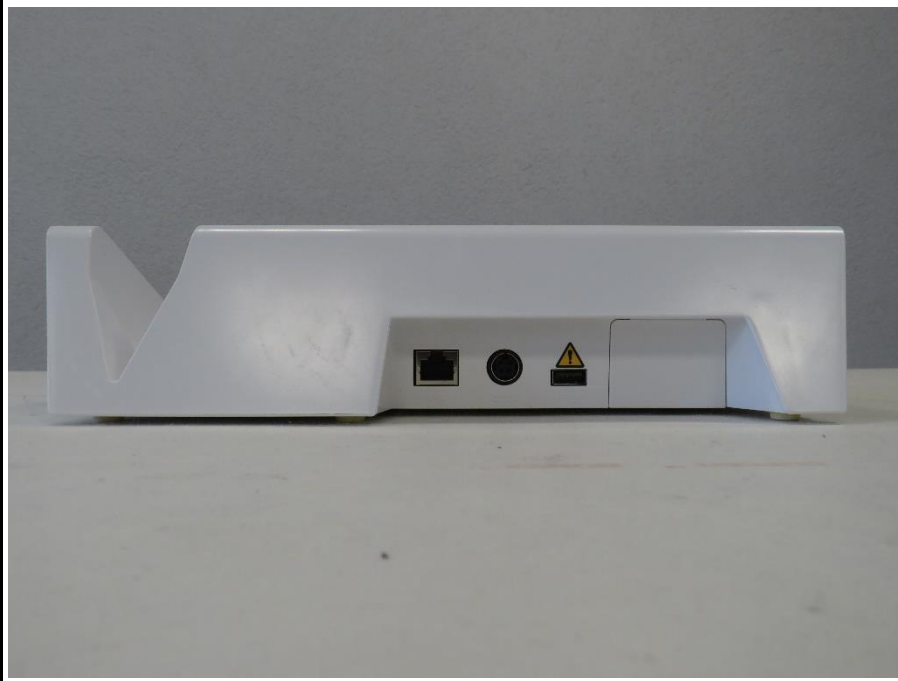
EUT FRONT SIDE



EUT LEFT SIDE



EUT REAR SIDE



EUT CONNECTORS REAR



EUT RIGHT SIDE



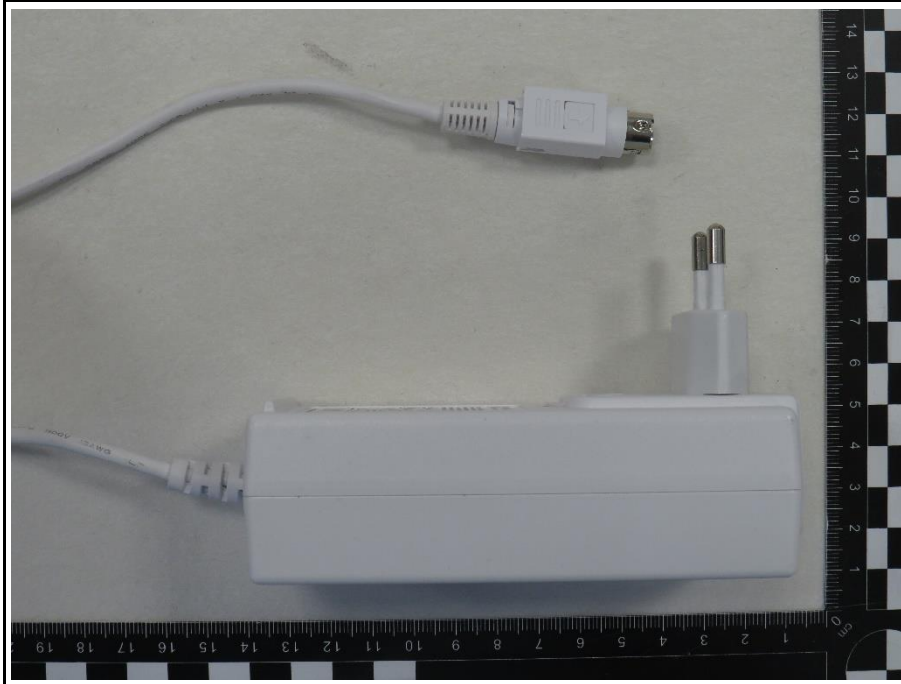
EUT BOTTOM SIDE



EUT LABEL



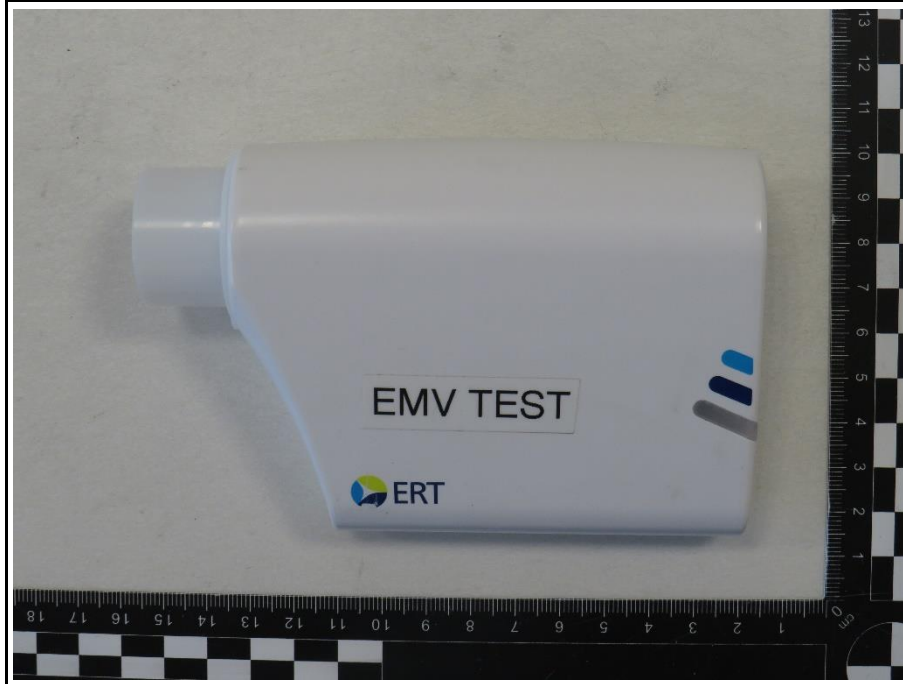
AC/DC-ADAPTER



AC/DC-ADAPTER LABEL



SPIROSPHERE SENSOR RIGHT SIDE



SPIROSPHERE SENSOR TOP SIDE



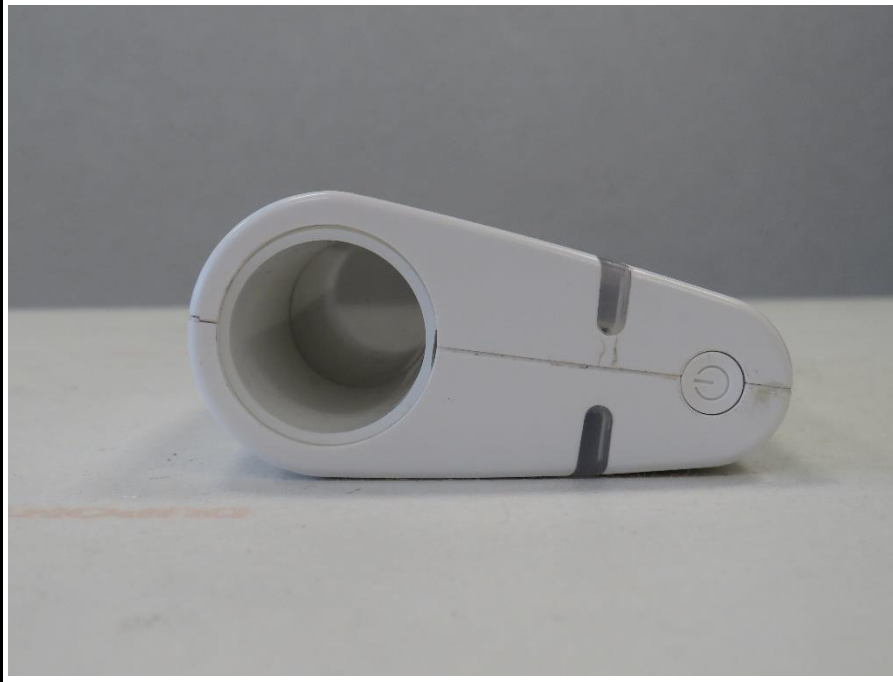
SPIROSPHERE SENSOR BOTTOM SIDE



SPIROSPHERE SENSOR FRONT SIDE



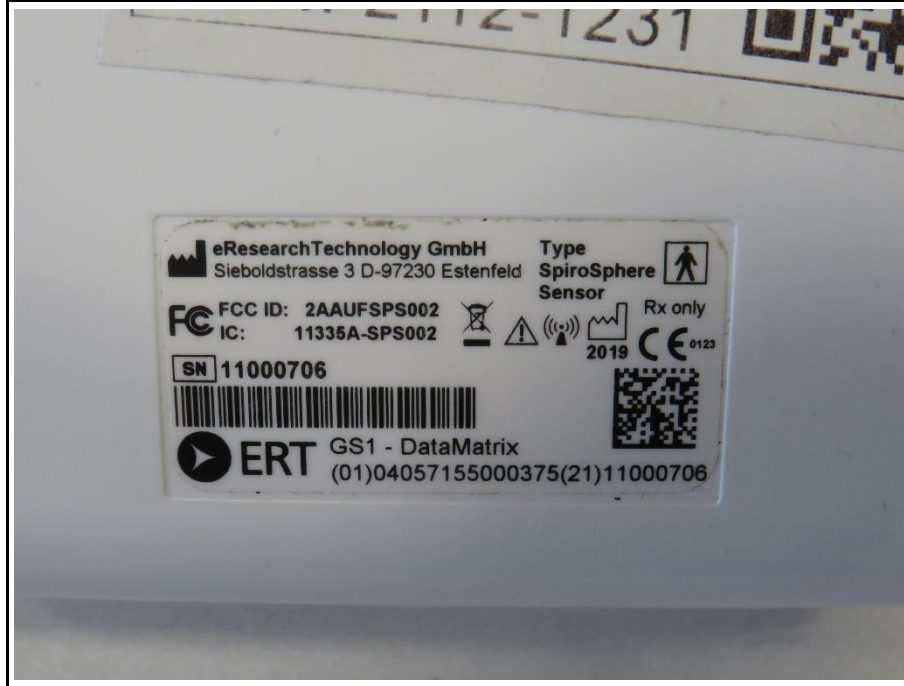
SPIROSPHERE SENSOR REAR SIDE



SPIROSPHERE SENSOR LEFT SIDE



SPIROSPHERE SENSOR LABEL



1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
SIM/AE	Sensor Unit	ERT	SpiroSphere Sensor	Customer Support Equipment; Companion Device for Bluetooth connection and Wireless Power Transmission
MON	Laptop	Fujitsu	LIFEBOOK E Series	Customer Support Equipment
SIM	Software	Hammer Software	MetaPing 1.7.2.34	Customer Support Equipment; for WLAN and LAN traffic
SIM	USB-Stick	Silicon-Power	UFD 3.0 Silicon-Power8G USB Device	2x for data traffic via USB
AE	WLAN Router	tp-link	TL-WR802N(EU)	Customer Support Equipment
AE	USB/Ethernet-adapter	StarTech.com	USB31000SW	Customer Support Equipment
CBL	LAN-cable	Datwyler Uninet	652011	Customer Support Equipment; CAT.5e
CBL	USB-cable	AWM	E74020-C	USB 2.0
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
MON	Monitoring Equipment			
CBL	Connecting Cable			
Comment: --				

1.5 Operational Modes

Mode #	Description
1	Battery mode Highest traffic on all ports (Ping [MetaPing-SW] via LAN connection + read and write date via USB connection). WLAN 2.4 GHz is activated and sends windows ping to WLAN Router.
2	Battery mode Continues measuring of flow signal/data from Sensor Unit via Bluetooth connection. Highest traffic on all ports (Ping [MetaPing-SW] via LAN connection + read and write date via USB connection). WLAN 2.4 GHz is activated and sends windows ping to WLAN Router.
3	Charging mode (AC) Continues measuring of flow signal/data from Sensor Unit via Bluetooth connection. Highest traffic on all ports (Ping [MetaPing-SW] via LAN connection + read and write date via USB connection). WLAN 2.4 GHz is activated and sends windows ping to WLAN Router.
4	Charging mode (AC) Continuous battery charging of Sensor Unit. Highest traffic on all ports (Ping [MetaPing-SW] via LAN connection + read and write date via USB connection). WLAN 2.4 GHz is activated and sends windows ping to WLAN Router.
Comment: --	

1.6 EUT Configuration

Configuration #	Description
1	EUT is powered by 3.7 V DC via internal lithium ion battery. Sensor Unit is inserted into the EUT. All ports are connected to the corresponding support equipment (see block diagram). Both sides of the Ethernet cable shield are connected to ground. Block diagram:
2	EUT is powered by 3.7 V DC via internal lithium ion battery. Sensor Unit is next to the EUT. All ports are connected to the corresponding support equipment (see block diagram). Both sides of the Ethernet cable shield are connected to ground.
3	EUT is powered via dedicated AC/DC-adapter. AC/DC-adapter is powered by external laboratory power supply unit. Sensor Unit is next to the EUT. All ports are connected to the corresponding support equipment (see block diagram). Both sides of the Ethernet cable shield are connected to ground.
4	EUT is powered via dedicated AC/DC-adapter. AC/DC-adapter is powered by external laboratory power supply unit. Sensor Unit is inserted into the EUT. All ports are connected to the corresponding support equipment (see block diagram).

	Both sides of the Ethernet cable shield are connected to ground.
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

Title 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: --				

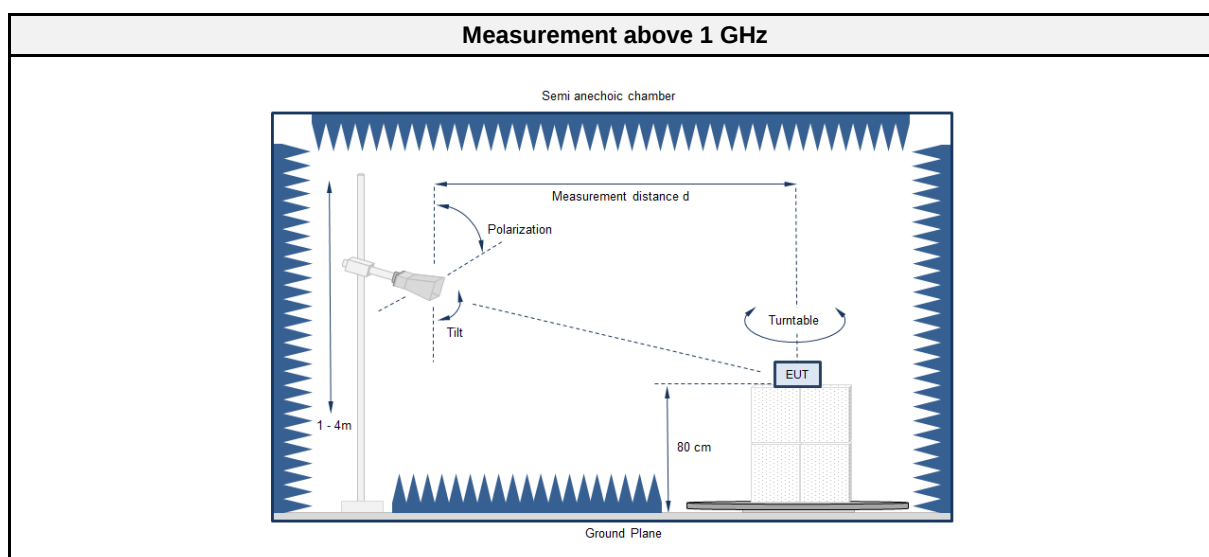
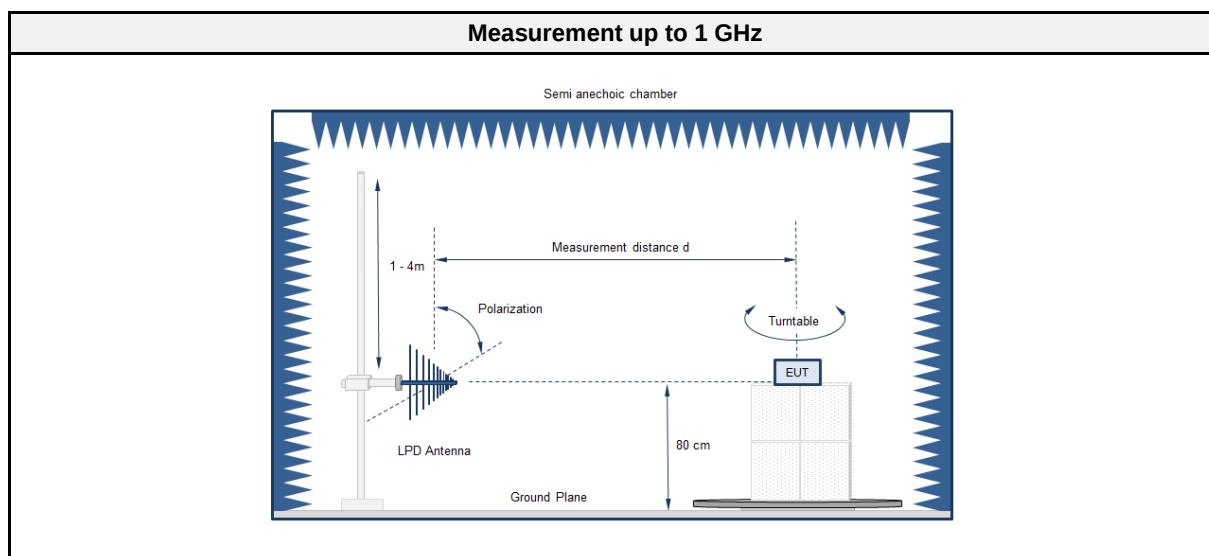
Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

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

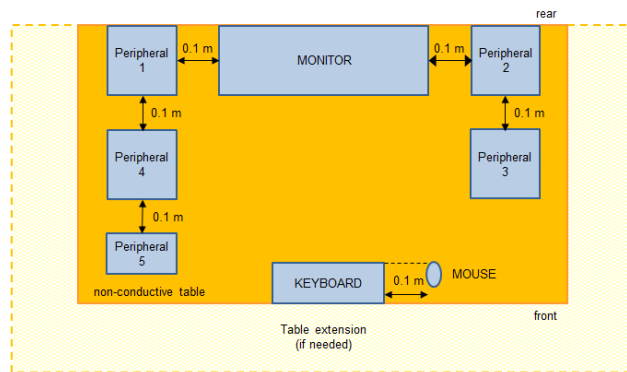
2.1.1 Information

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]	2470
Measurement range	30 MHz to 13000 MHz
Temperature [°C]	20 – 23
Humidity [%]	29 – 38
Operator	Stephan Liebich
Date	2022-02-09 and 2022-02-14

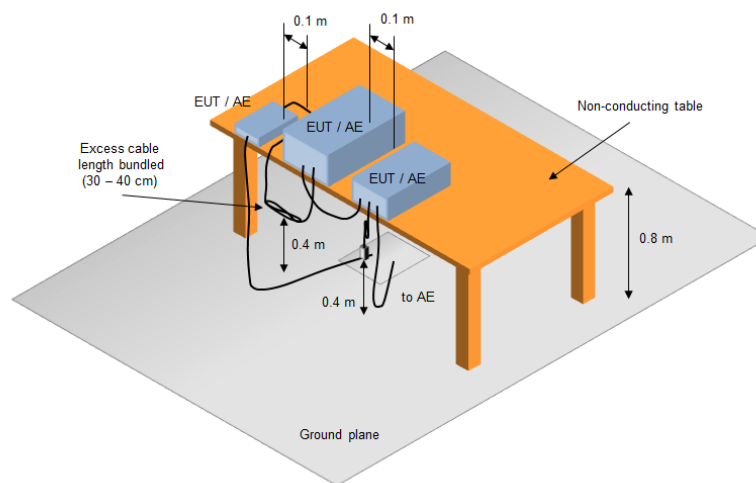
2.1.2 Setup



Equipment placement - Table top



Test 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 (NSA)	Frankonia	AC1	EF00062	2021-02	2024-02
Anechoic chamber (SVSWR)	Frankonia	AC 1	EF01011	2019-06	2022-06
Programmable AC Source	Chroma ATE Inc.	61604	EF01068	2021-07	2022-07
EMI Test Receiver	Keysight	N9038A-526/WXP	EF01070	2021-07	2022-07
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

Exploratory measurement
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

Final measurement
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

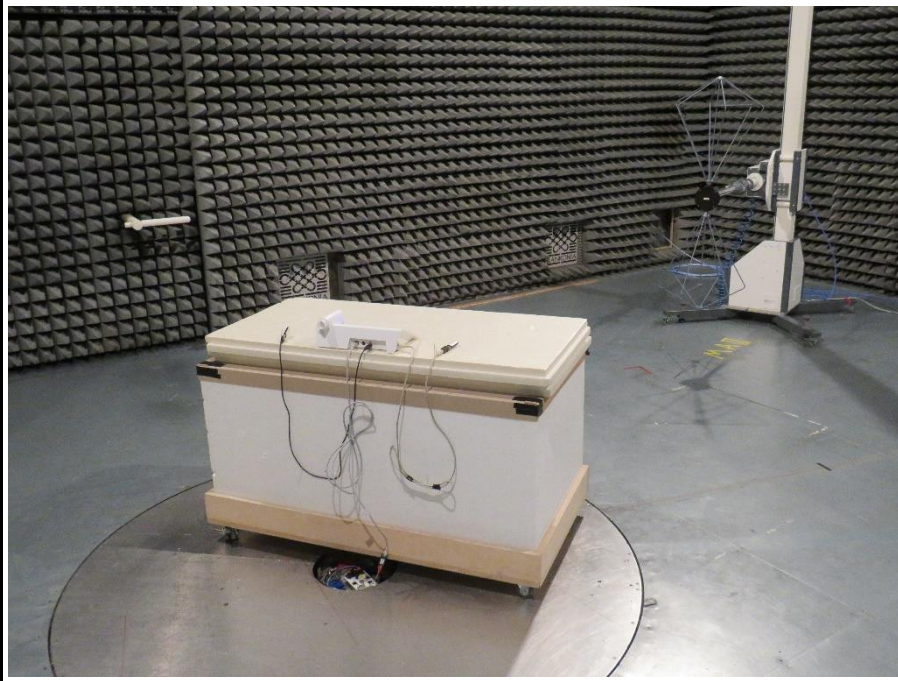
Class B @ 3 m		
Frequency [MHz]	Detector	Limit [dB μ V/m]
30 - 88	Quasi-peak	40
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46
960 - 1000	Quasi-peak	54
> 1000	Peak	74
	Average	54

2.1.6 Results

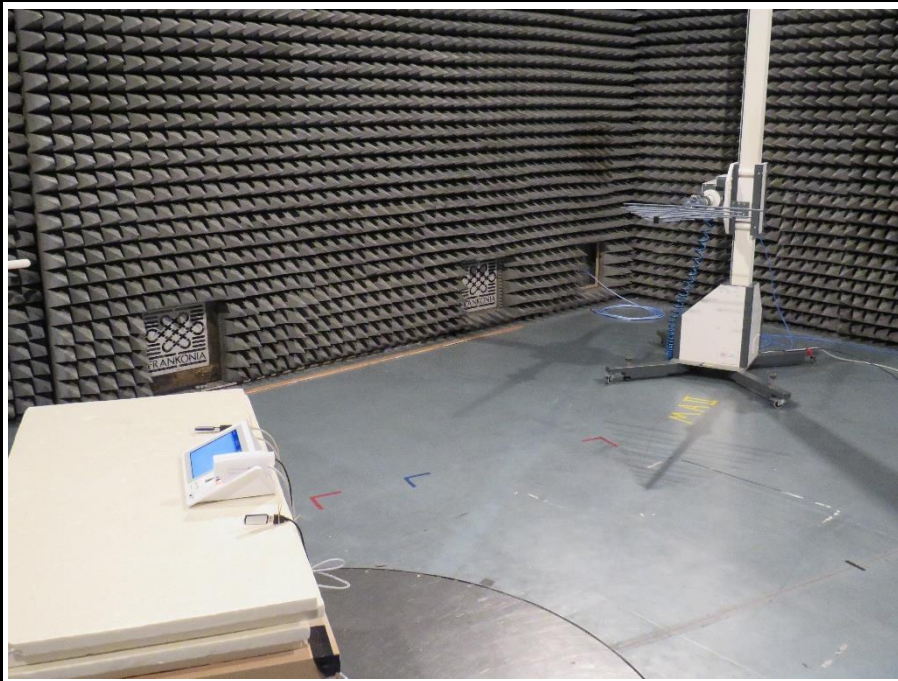
Test Results			
Operational mode	EUT Configuration	Verdict	Remark
1	1	PASS	--
2	2	PASS	--
3	3	PASS	120 V AC / 60 Hz
4	4	PASS	120 V AC / 60 Hz

2.1.7 Setup Photos

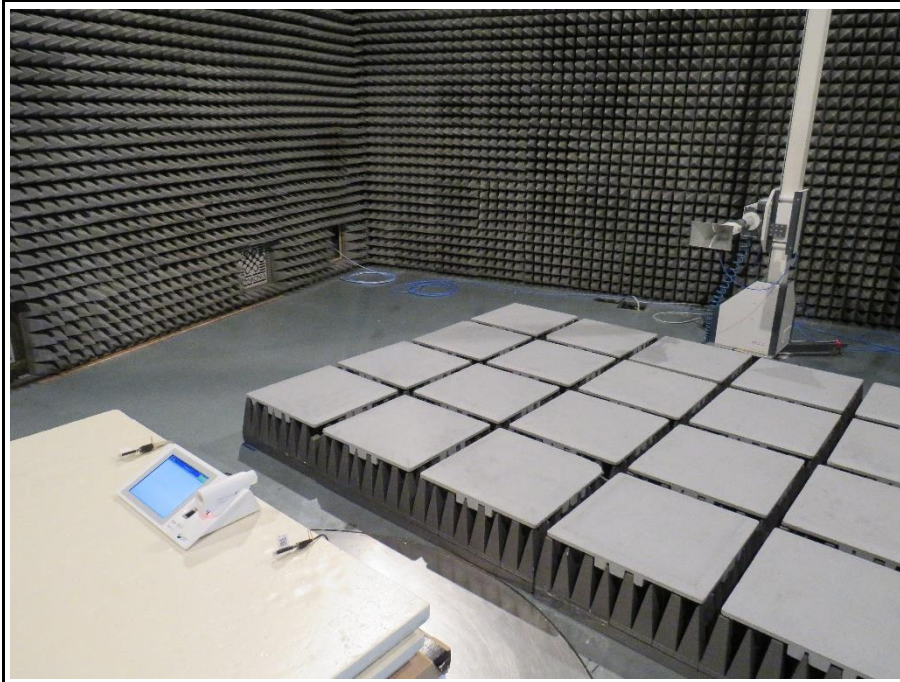
TEST SETUP - 30 MHz to 200 MHz - EUT CONFIGURATION 1



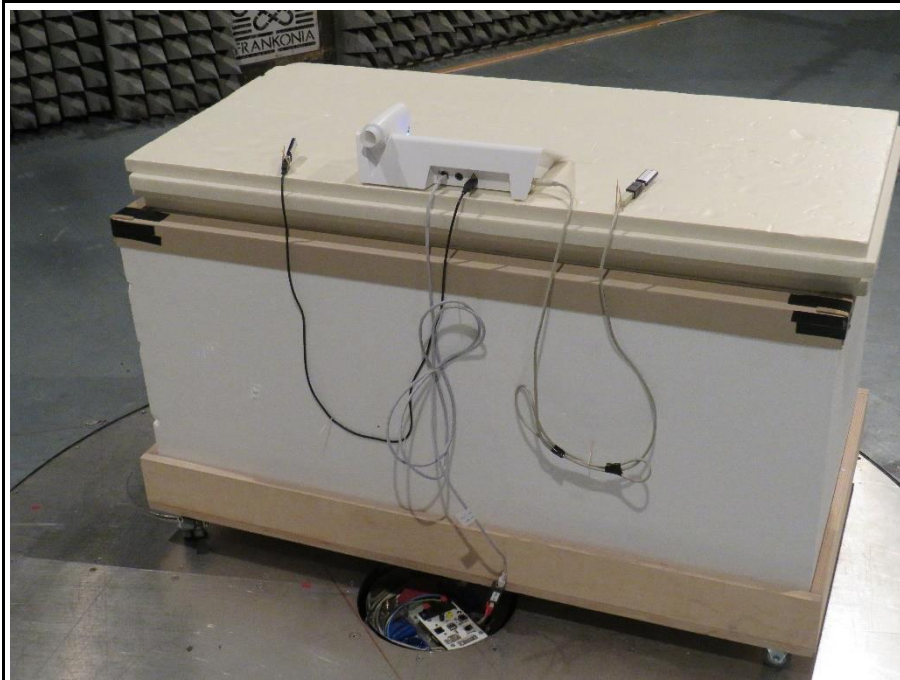
TEST SETUP - 200 MHz to 1 GHz - EUT CONFIGURATION 1



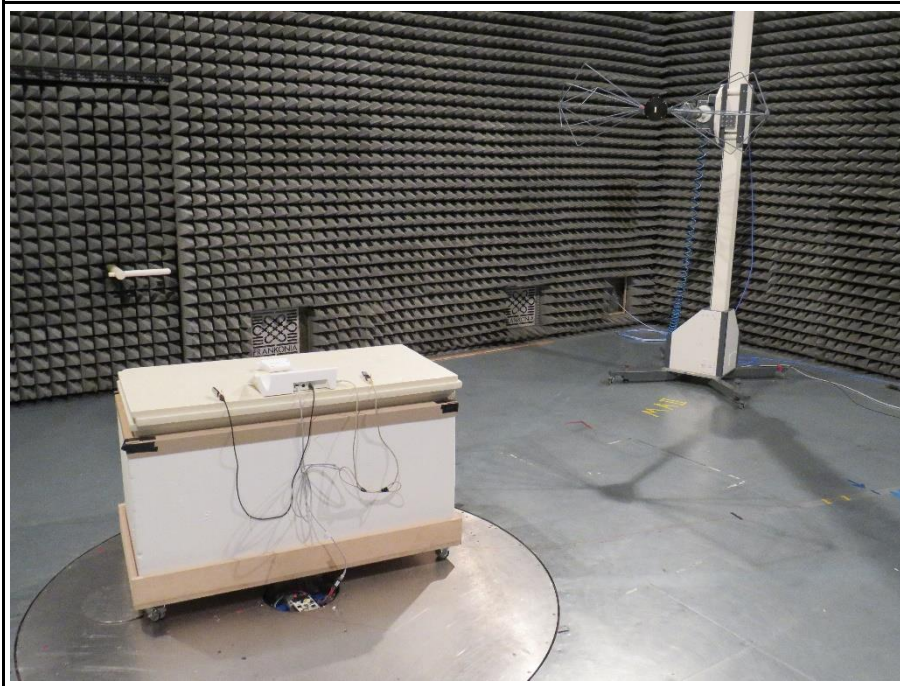
TEST SETUP - 1 GHz to 13 GHz - EUT CONFIGURATION 1



TEST SETUP - FOCUS - EUT CONFIGURATION 1



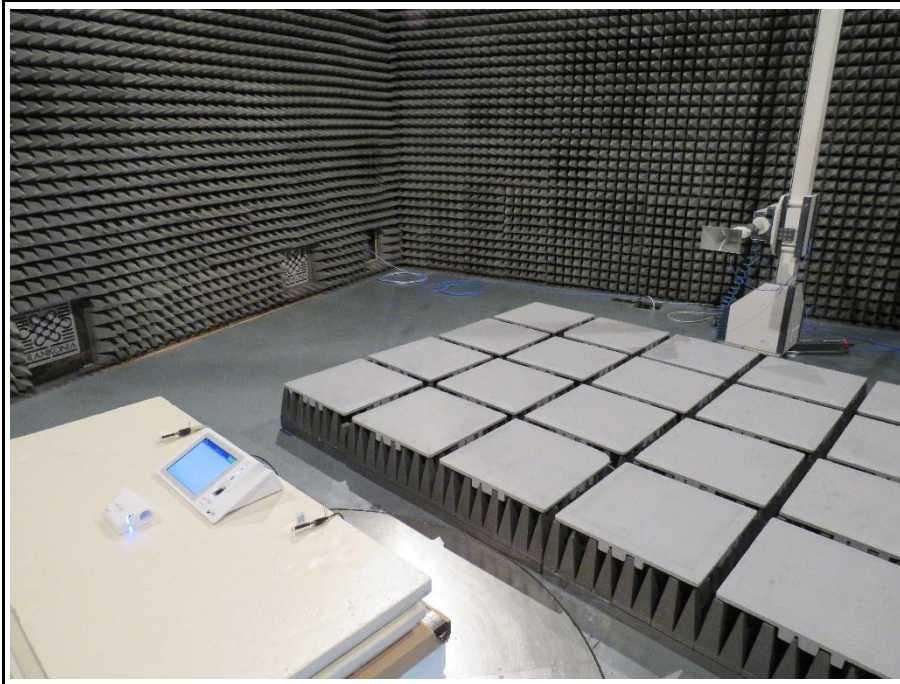
TEST SETUP - 30 MHz to 200 MHz - EUT CONFIGURATION 2



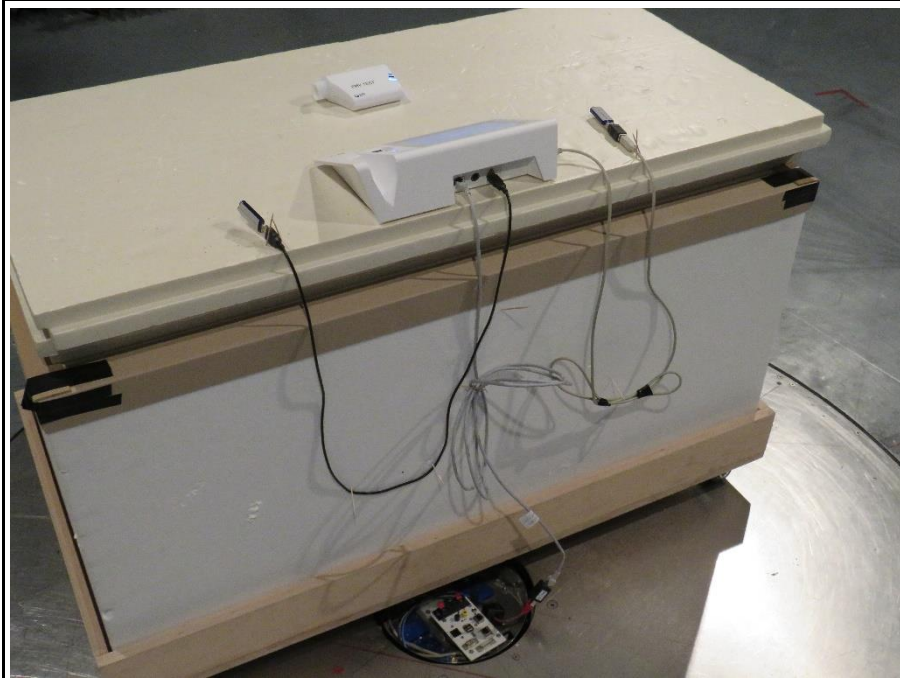
TEST SETUP - 200 MHz to 1 GHz - EUT CONFIGURATION 2



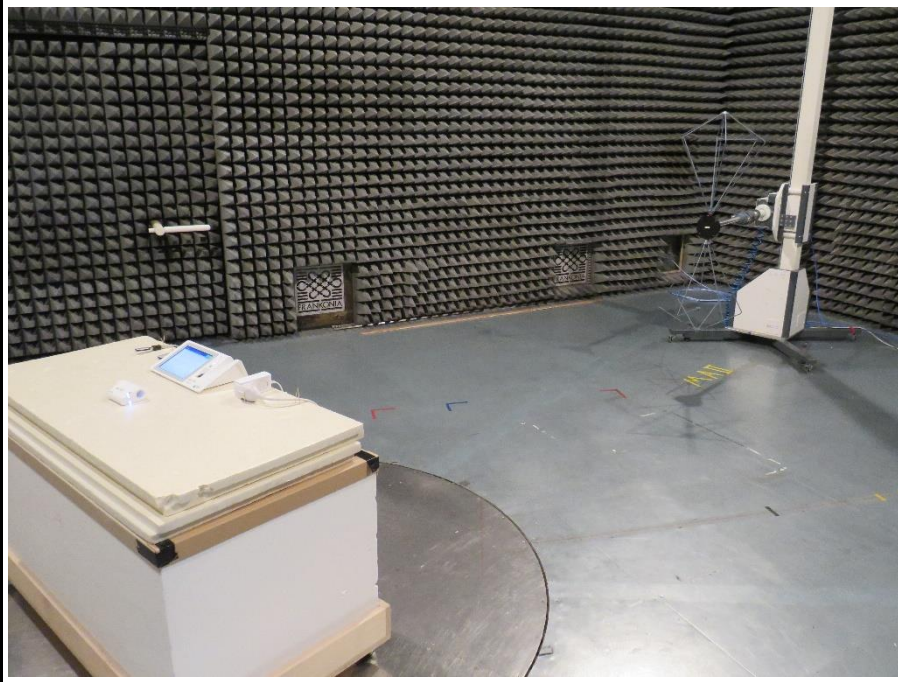
TEST SETUP - 1 GHz to 13 GHz - EUT CONFIGURATION 2



TEST SETUP - FOCUS - EUT CONFIGURATION 2



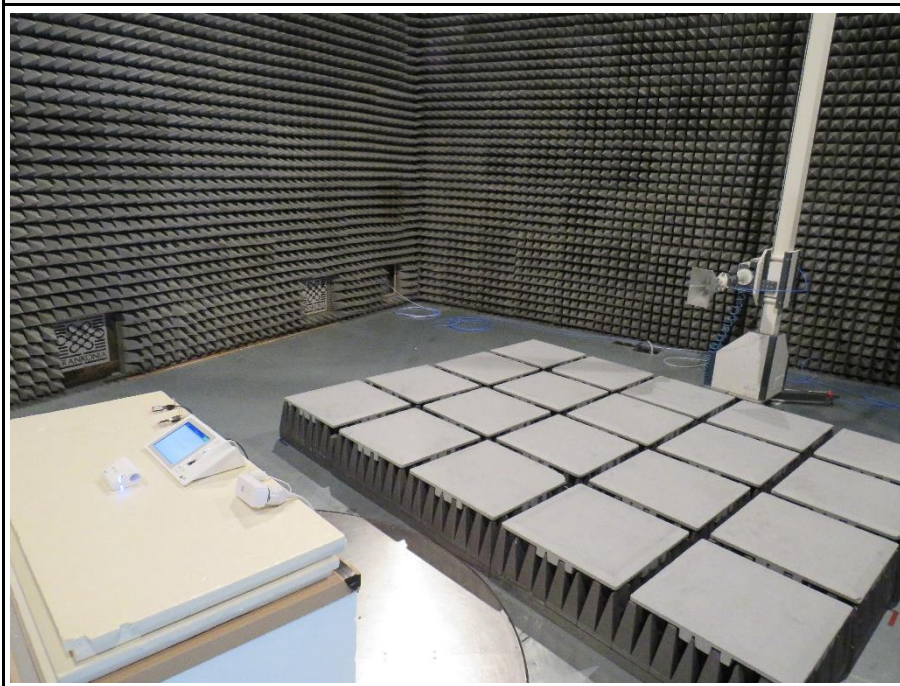
TEST SETUP - 30 MHz to 200 MHz - EUT CONFIGURATION 3



TEST SETUP - 200 MHz to 1 GHz - EUT CONFIGURATION 3



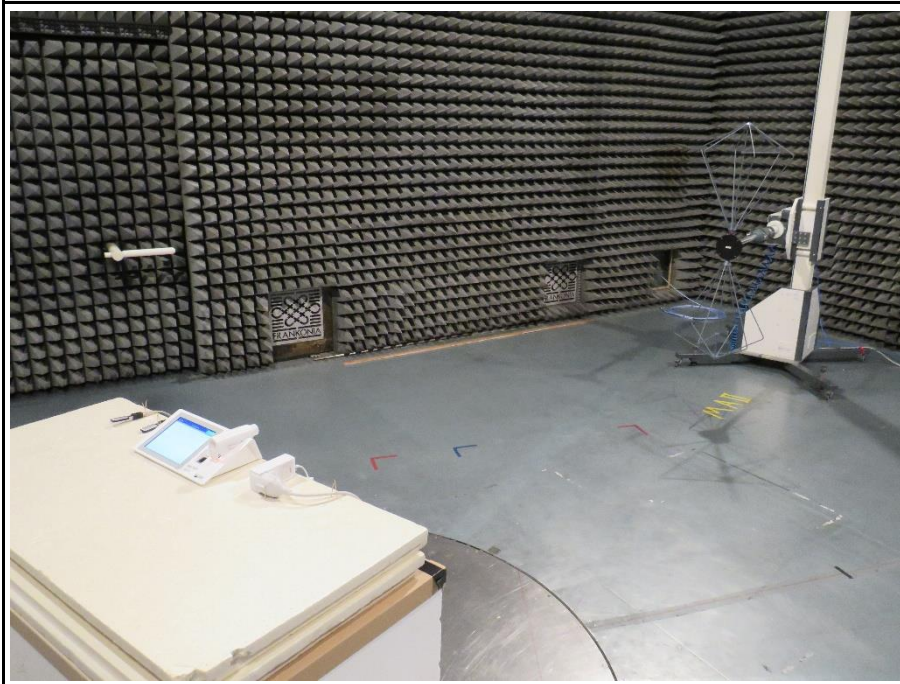
TEST SETUP - 1 GHz to 13 GHz - EUT CONFIGURATION 3



TEST SETUP - FOCUS - EUT CONFIGURATION 3



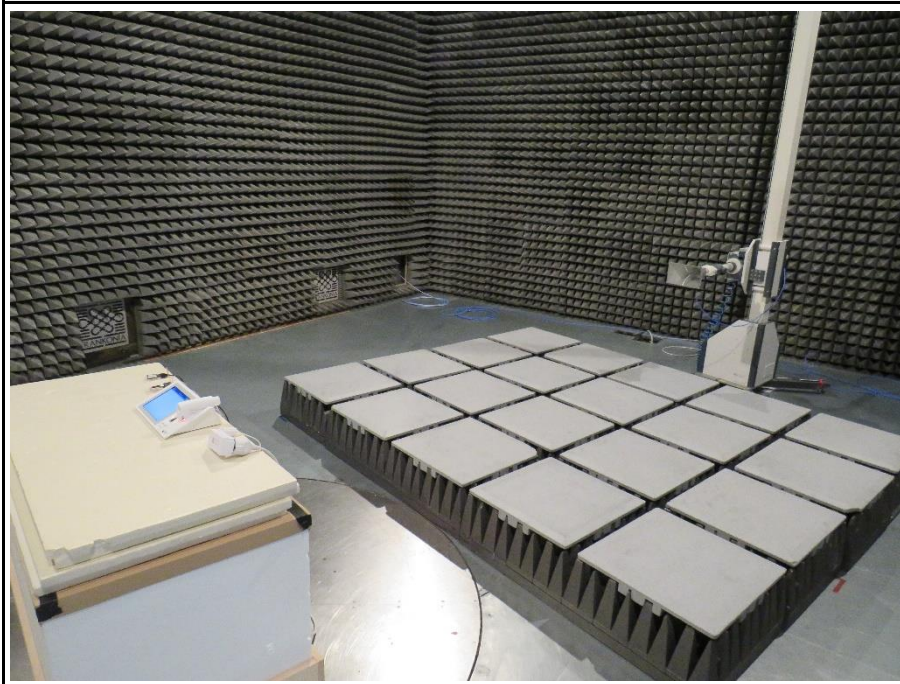
TEST SETUP - 30 MHz to 200 MHz - EUT CONFIGURATION 4



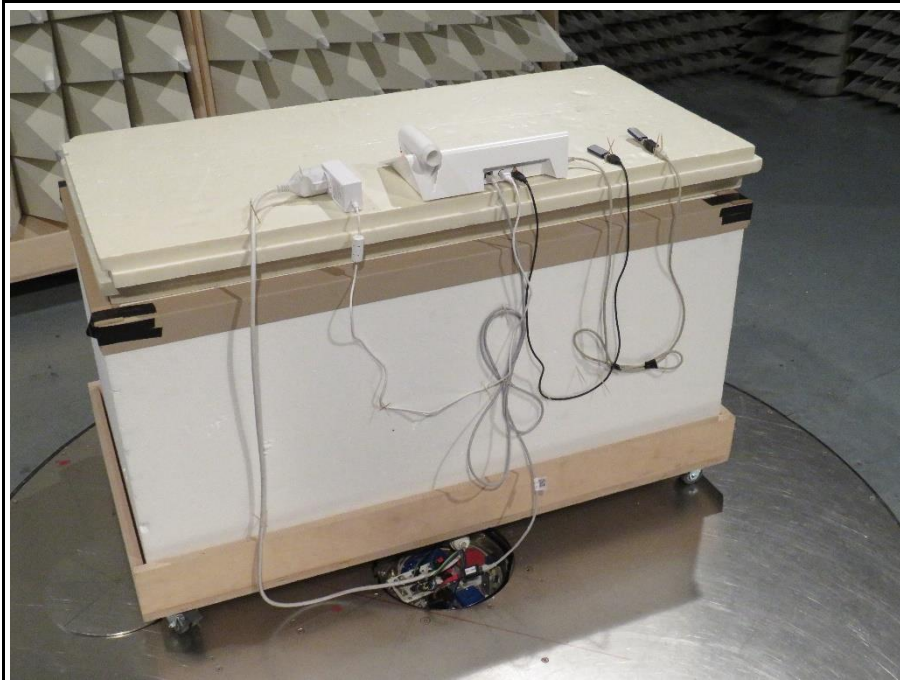
TEST SETUP - 200 MHz to 1 GHz - EUT CONFIGURATION 4



TEST SETUP - 1 GHz to 13 GHz - EUT CONFIGURATION 4



TEST SETUP - FOCUS - EUT CONFIGURATION 4



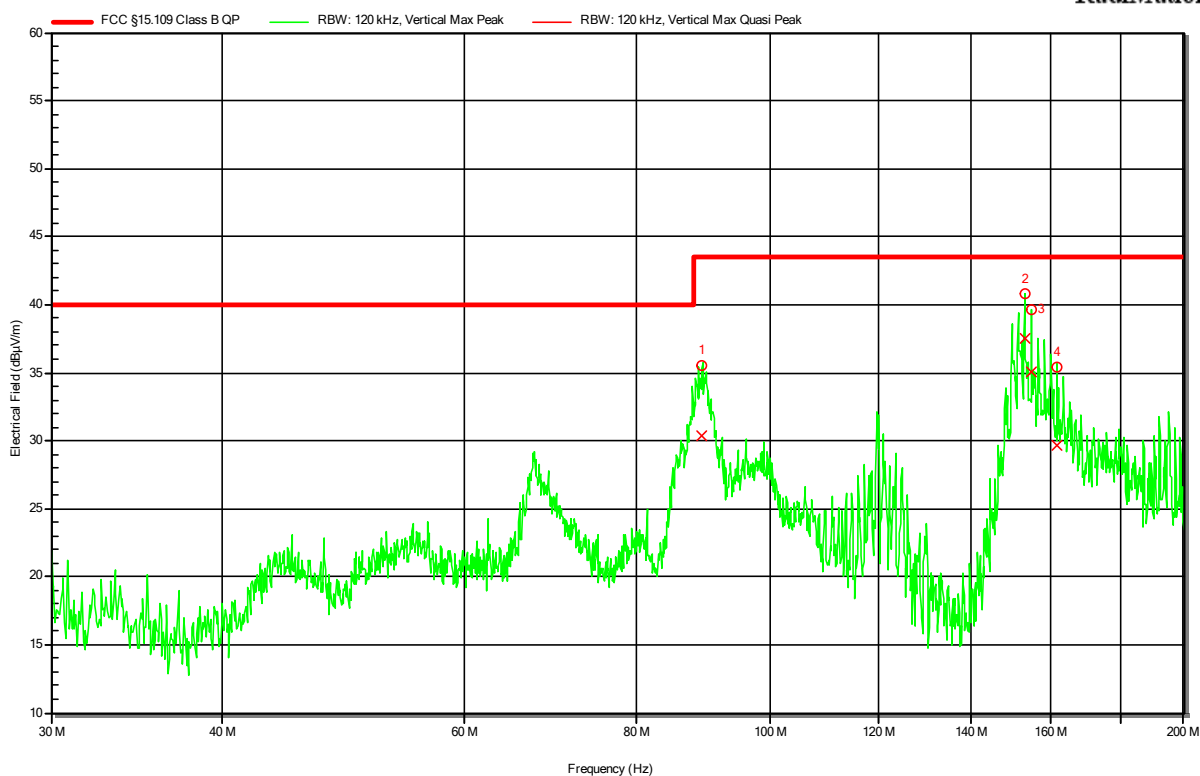
2.1.8 Records

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-09
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 3.7 V DC by internal lithium ion battery
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 1
 EUT Configuration: 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	89.323 MHz	30.34 dBµV/m	43.52 dBµV/m	-13.18 dB	Pass	-10 degrees	1 m
2	153.354 MHz	37.54 dBµV/m	43.52 dBµV/m	-5.98 dB	Pass	-10 degrees	1 m
3	155.041 MHz	35.11 dBµV/m	43.52 dBµV/m	-8.41 dB	Pass	-10 degrees	1 m
4	161.724 MHz	29.64 dBµV/m	43.52 dBµV/m	-13.88 dB	Pass	-10 degrees	1 m

Test Report No.: G0M-2112-1231-EF0115B-V02

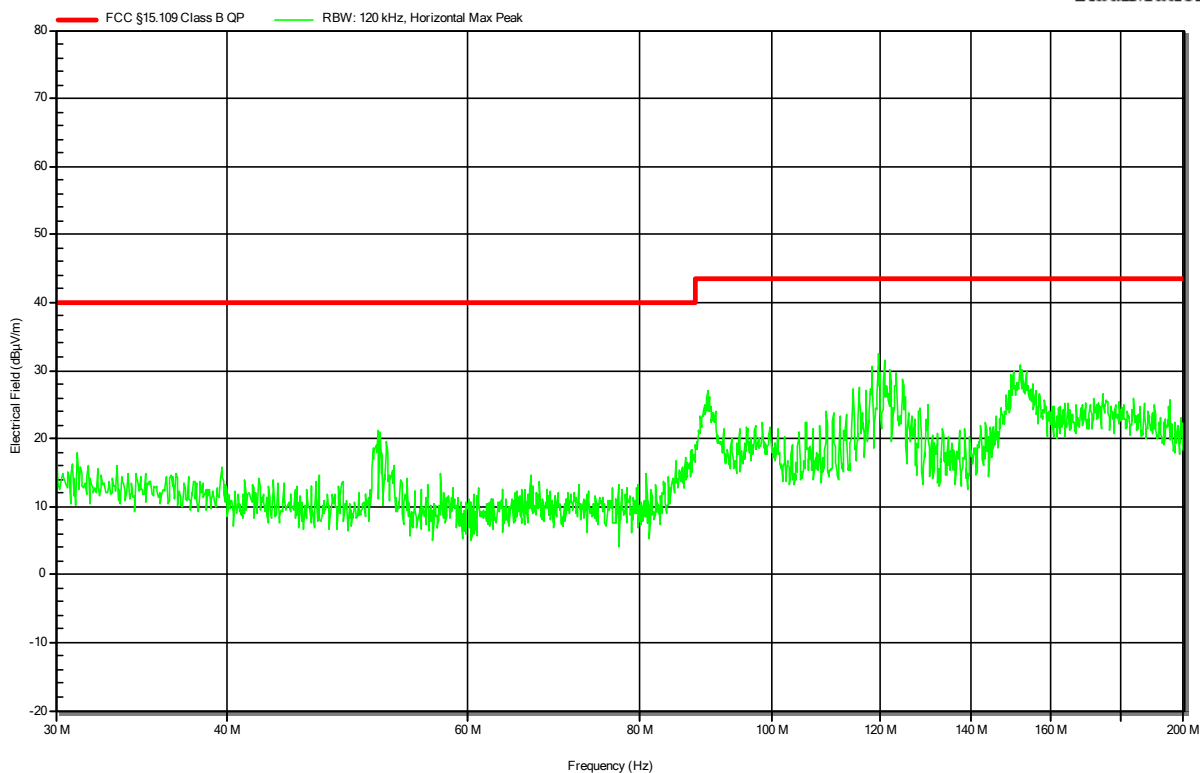
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

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

Project Number:	G0M-2112-1231
Applicant:	eResearchTechnology GmbH
Model Description:	Spirometer System
Model:	SpiroSphere
Test Sample ID:	38263
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Liebich
Test Date:	2022-02-09
Operating Conditions:	ambient temperature: 21 °Celsius power input: 3.7 V DC by internal lithium ion battery
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	--

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RadiMation

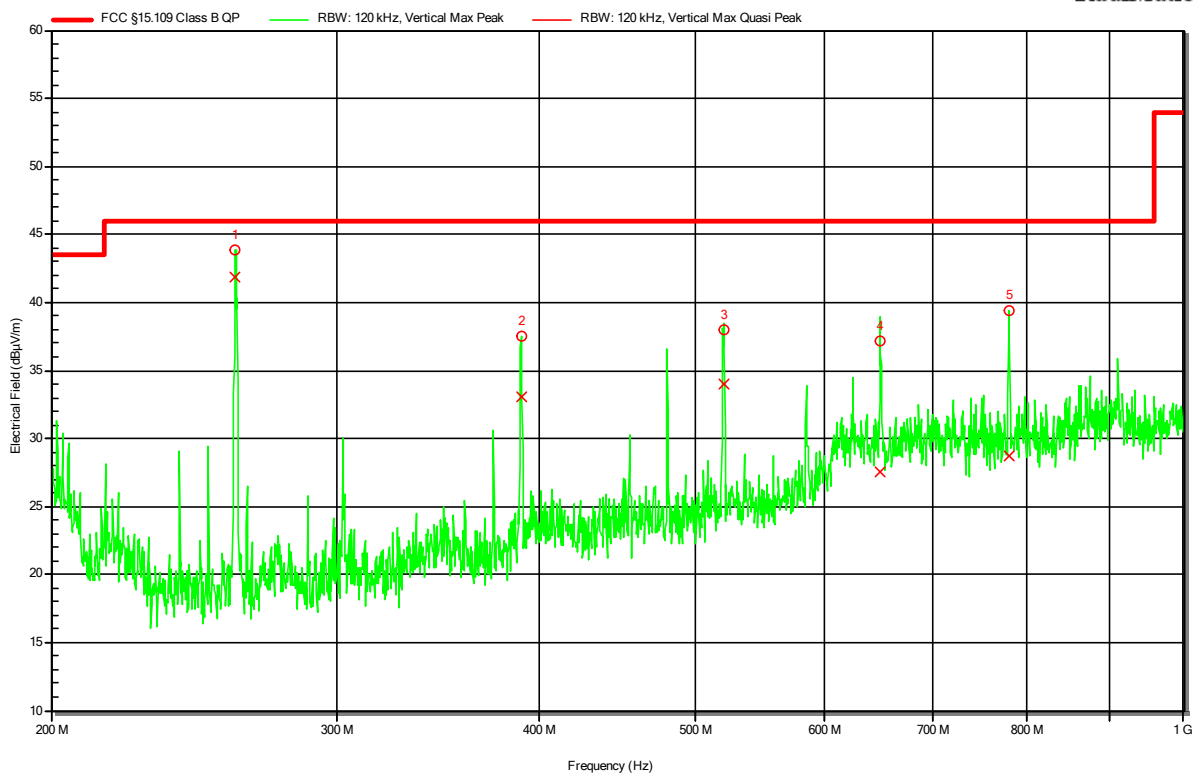


Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
Applicant: eResearchTechnology GmbH
Model Description: Spirometer System
Model: SpiroSphere
Test Sample ID: 38263
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Date: 2022-02-09
Operating Conditions: ambient temperature: 21 °Celsius
power input: 3.7 V DC by internal lithium ion battery
Antenna: Rohde & Schwarz HL 223, Vertical
Measurement Distance: 3m
Operational Mode: Mode 1
EUT Configuration: Configuration 1
Note 1: --

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Radiation



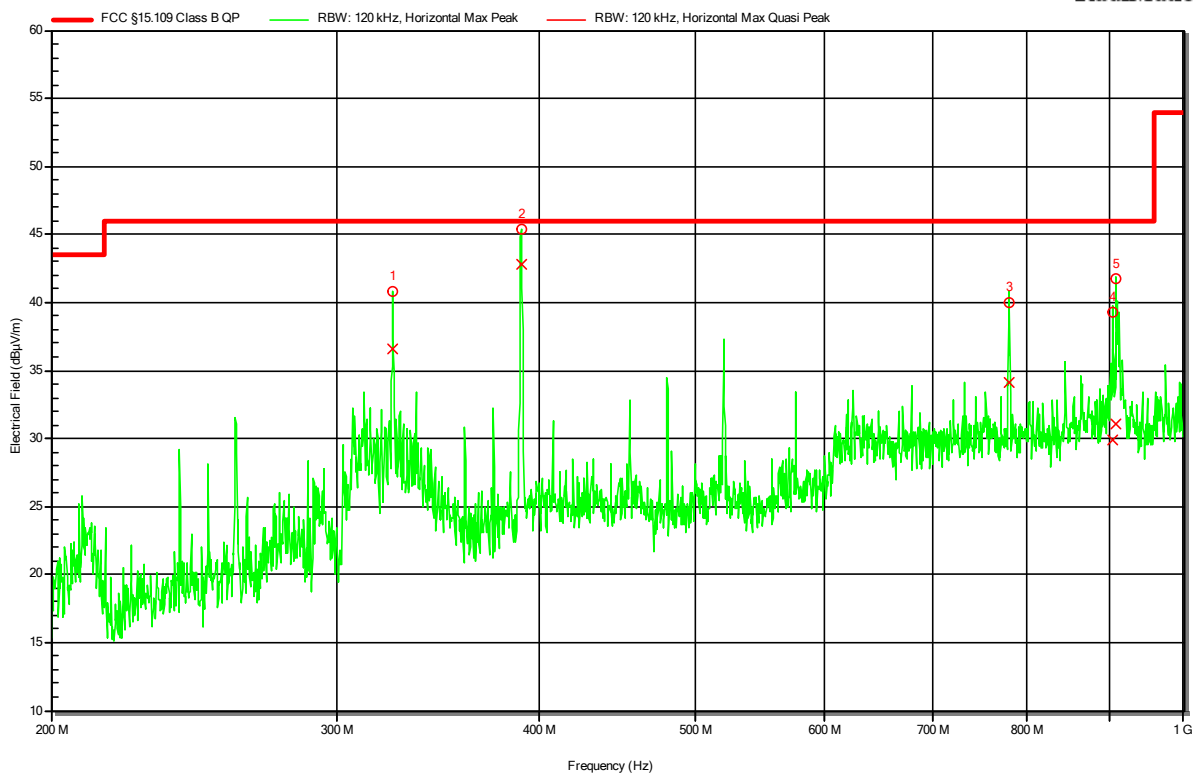
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	260.048 MHz	41.88 dBμV/m	46.02 dBμV/m	-4.14 dB	Pass	180 degrees	1 m
2	390.057 MHz	33.05 dBμV/m	46.02 dBμV/m	-12.97 dB	Pass	180 degrees	1 m
3	520.108 MHz	34.01 dBμV/m	46.02 dBμV/m	-12.01 dB	Pass	180 degrees	1 m
4	650.165 MHz	27.53 dBμV/m	46.02 dBμV/m	-18.49 dB	Pass	180 degrees	1 m
5	780.21 MHz	28.7 dBμV/m	46.02 dBμV/m	-17.32 dB	Pass	180 degrees	1 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-09
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 3.7 V DC by internal lithium ion battery
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement Distance: 3m
 Operational Mode: Mode 1
 EUT Configuration: Configuration 1
 Note 1: --

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RadiMation



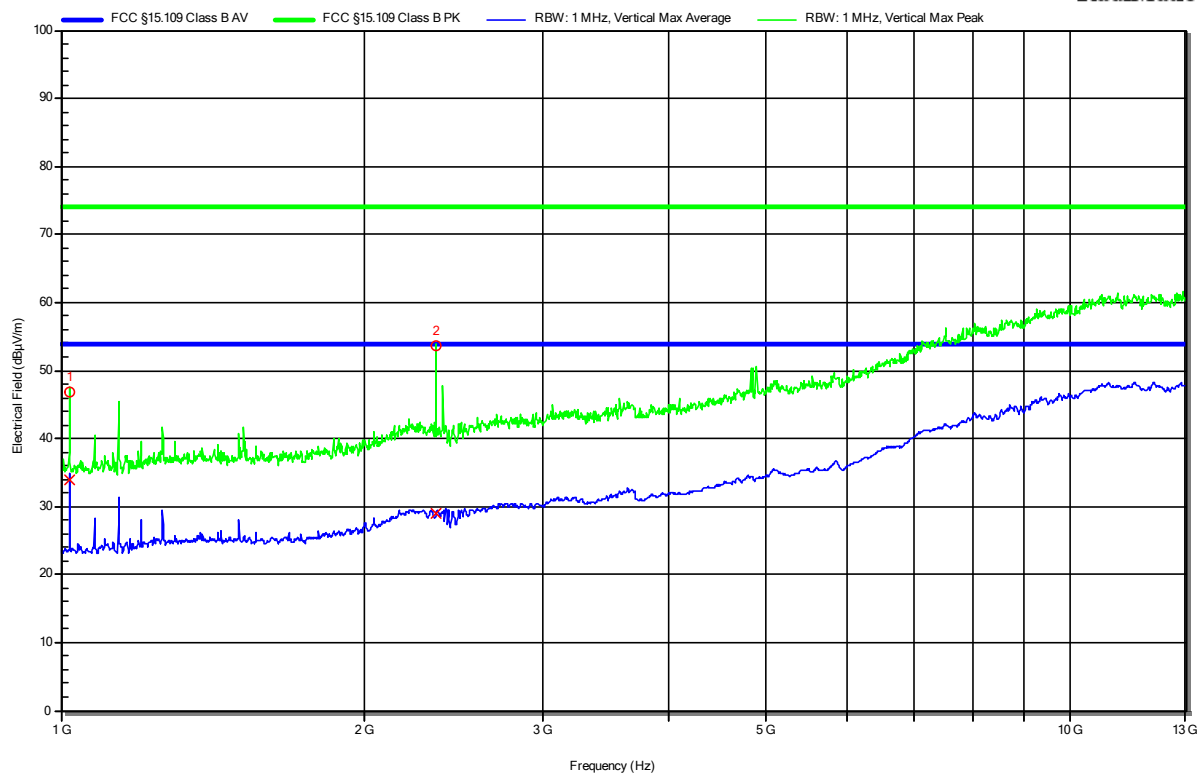
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	325.044 MHz	36.58 dBµV/m	46.02 dBµV/m	-9.44 dB	Pass	30 degrees	1.1 m
2	390.033 MHz	42.82 dBµV/m	46.02 dBµV/m	-3.2 dB	Pass	30 degrees	1.1 m
3	780.06 MHz	34.16 dBµV/m	46.02 dBµV/m	-11.86 dB	Pass	30 degrees	1.1 m
4	904.611 MHz	29.94 dBµV/m	46.02 dBµV/m	-16.08 dB	Pass	30 degrees	1.1 m
5	908.574 MHz	31.04 dBµV/m	46.02 dBµV/m	-14.98 dB	Pass	30 degrees	1.1 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-14
 Operating Conditions: ambient temperature: 22 °Celsius
 power input: 3.7 V DC by internal lithium ion battery
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 1
 EUT Configuration: Configuration 1
 Note 1: --

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RadiMation



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.02 GHz	46.95 dBμV/m	73.98 dBμV/m	-27.03 dB	Pass	180 degrees	1 m
2	2.353 GHz	53.63 dBμV/m	73.98 dBμV/m	-20.35 dB	Pass	180 degrees	1 m

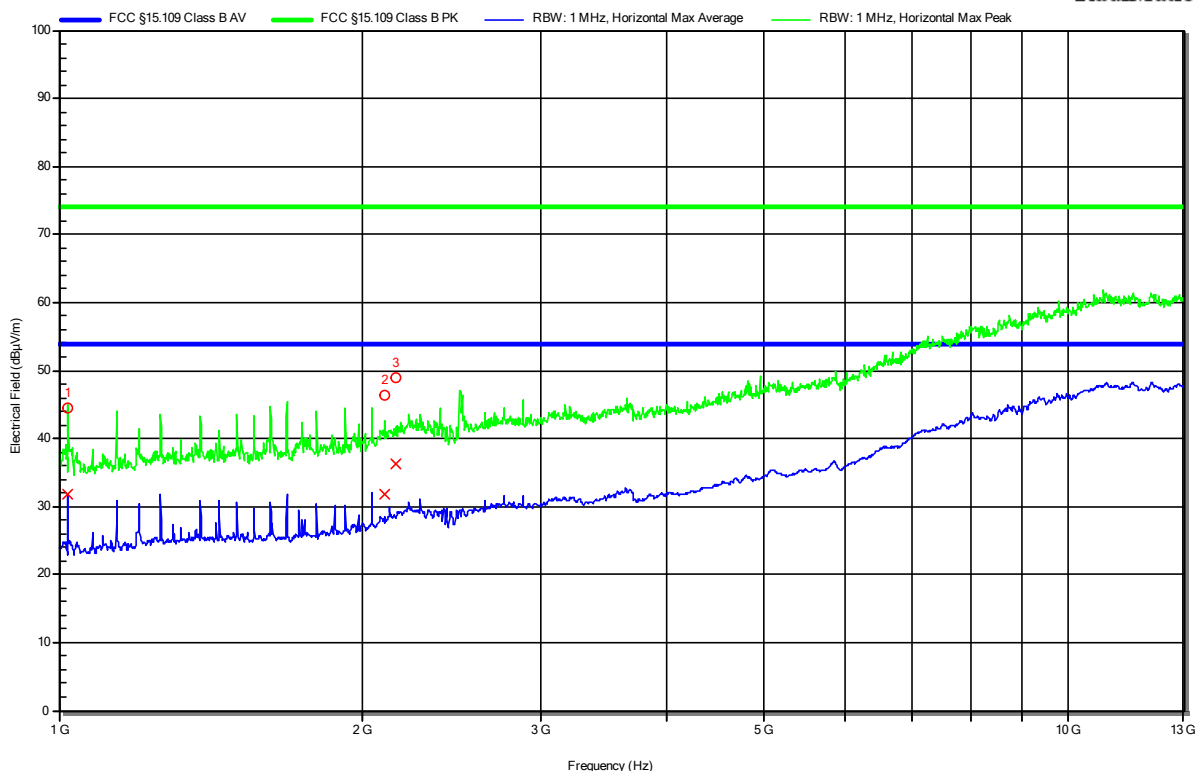
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.02 GHz	33.83 dBμV/m	53.98 dBμV/m	-20.15 dB	Pass	180 degrees	1 m
2	2.353 GHz	29.09 dBμV/m	53.98 dBμV/m	-24.89 dB	Pass	180 degrees	1 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-14
 Operating Conditions: ambient temperature: 22 °Celsius
 power input: 3.7 V DC by internal lithium ion battery
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement Distance: 3m
 Operational Mode: Mode 1
 EUT Configuration: Configuration 1
 Note 1: --

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Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.02 GHz	44.6 dBµV/m	73.98 dBµV/m	-29.38 dB	Pass	50 degrees	1 m
2	2.1 GHz	46.43 dBµV/m	73.98 dBµV/m	-27.55 dB	Pass	50 degrees	1 m
3	2.16 GHz	49.06 dBµV/m	73.98 dBµV/m	-24.92 dB	Pass	50 degrees	1 m

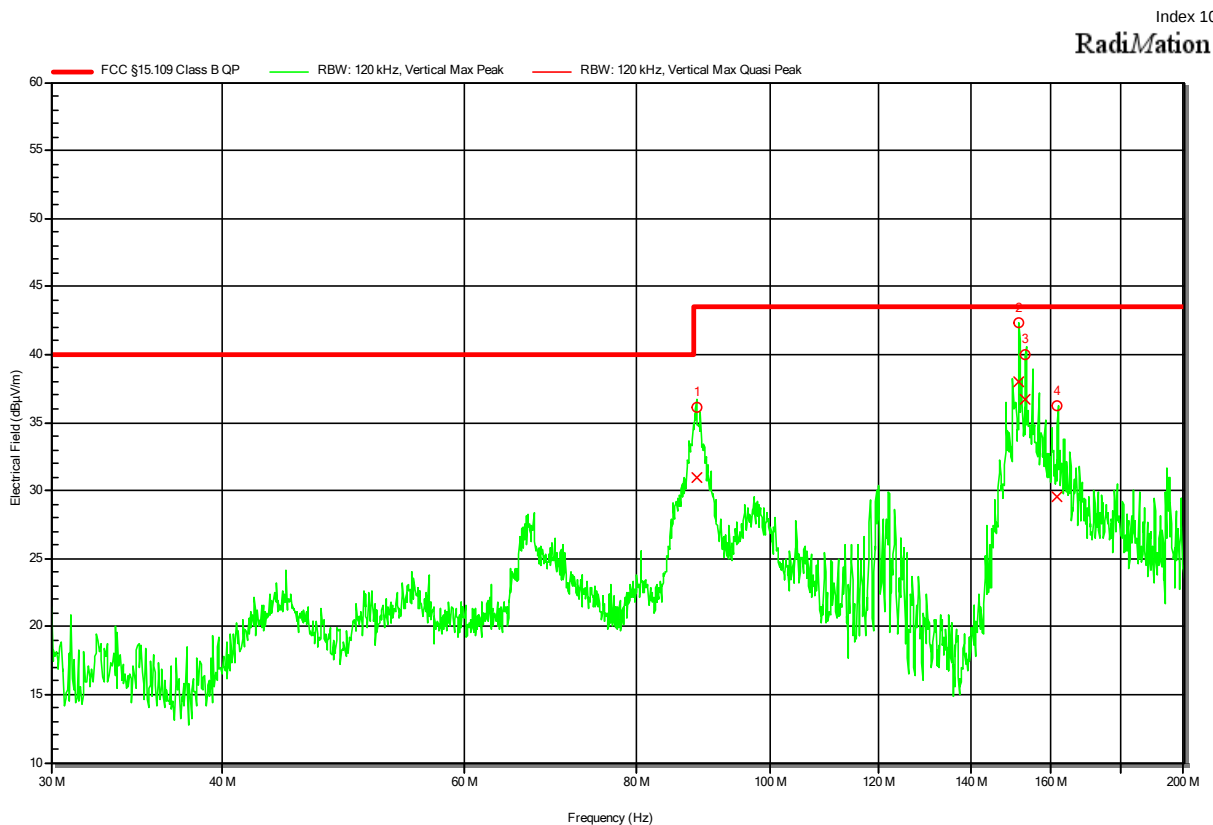
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.02 GHz	31.71 dBµV/m	53.98 dBµV/m	-22.27 dB	Pass	50 degrees	1 m
2	2.1 GHz	31.79 dBµV/m	53.98 dBµV/m	-22.19 dB	Pass	50 degrees	1 m
3	2.16 GHz	36.26 dBµV/m	53.98 dBµV/m	-17.72 dB	Pass	50 degrees	1 m

Test Report No.: G0M-2112-1231-EF0115B-V02

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

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

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-09
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 3.7 V DC by internal lithium ion battery
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 2
 EUT Configuration: Configuration 2
 Note 1: --



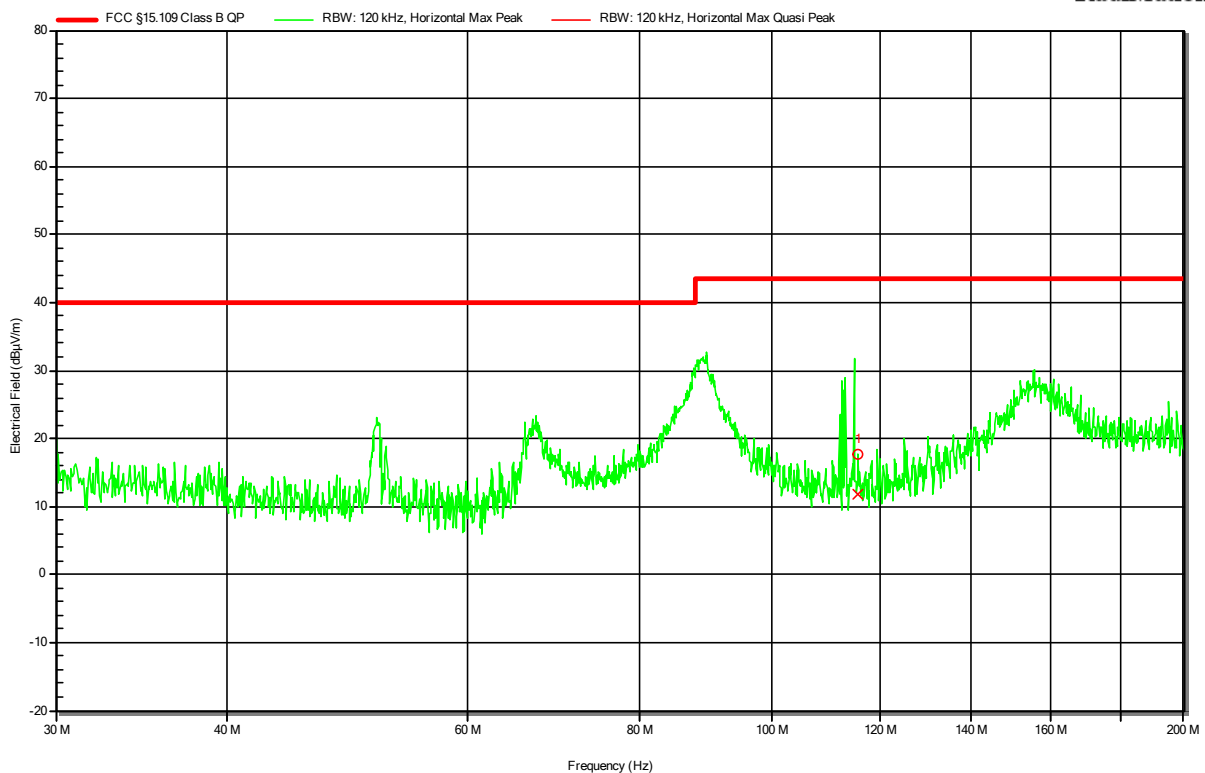
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	88.428 MHz	31.01 dBµV/m	43.52 dBµV/m	-12.51 dB	Pass	-20 degrees	1 m
2	151.85 MHz	38.02 dBµV/m	43.52 dBµV/m	-5.5 dB	Pass	-20 degrees	1 m
3	153.552 MHz	36.75 dBµV/m	43.52 dBµV/m	-6.77 dB	Pass	-20 degrees	1 m
4	161.977 MHz	29.5 dBµV/m	43.52 dBµV/m	-14.02 dB	Pass	-20 degrees	1 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-09
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 3.7 V DC by internal lithium ion battery
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement Distance: 3m
 Operational Mode: Mode 2
 EUT Configuration: Configuration 2
 Note 1: --

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RadiMation



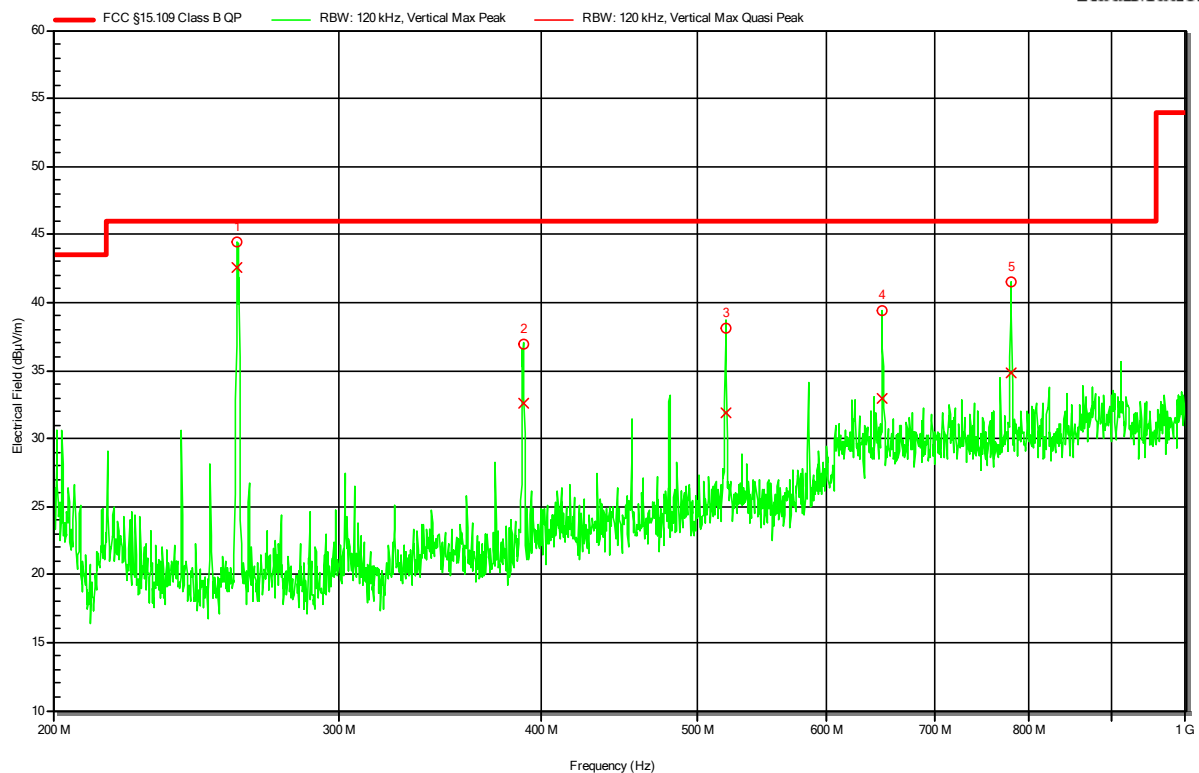
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	115.691 MHz	11.74 dBμV/m	43.52 dBμV/m	-31.78 dB	Pass	47 degrees	2.3 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
Applicant: eResearchTechnology GmbH
Model Description: Spirometer System
Model: SpiroSphere
Test Sample ID: 38263
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Date: 2022-02-09
Operating Conditions: ambient temperature: 21 °Celsius
power input: 3.7 V DC by internal lithium ion battery
Antenna: Rohde & Schwarz HL 223, Vertical
Measurement Distance: 3m
Operational Mode: Mode 2
EUT Configuration: Configuration 2
Note 1: --

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Radiation



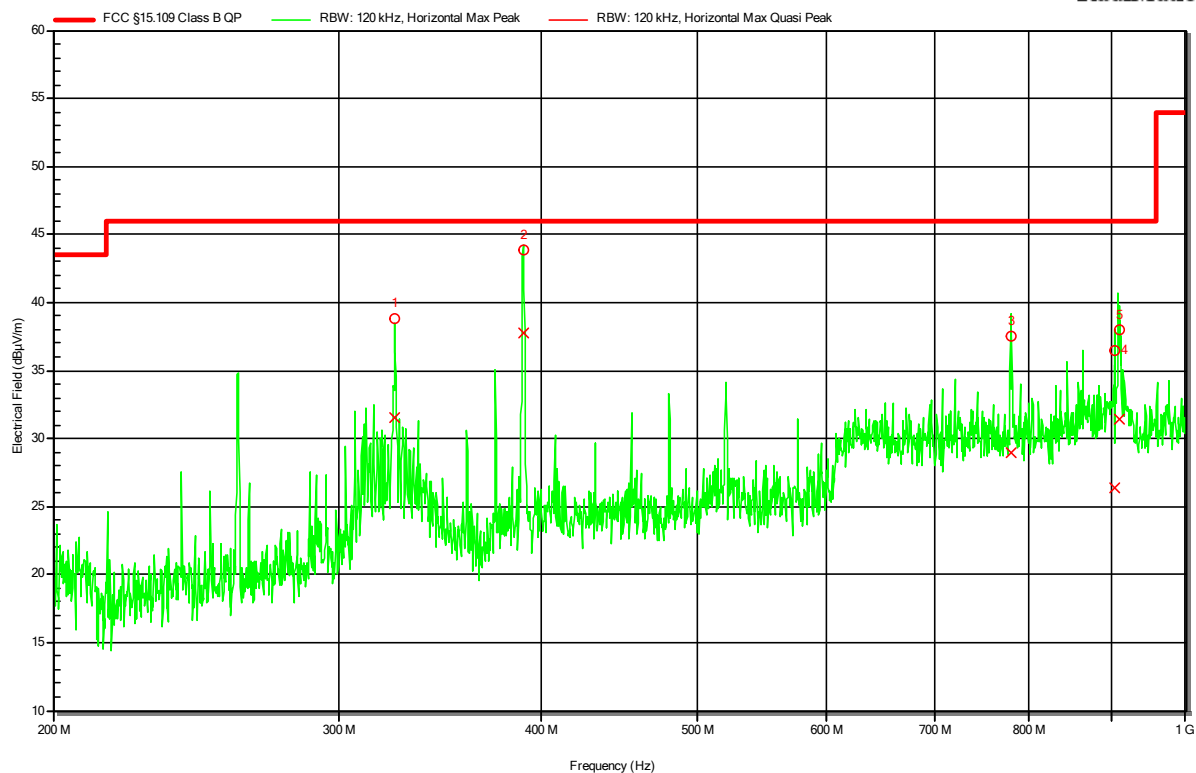
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	260.018 MHz	42.52 dBµV/m	46.02 dBµV/m	-3.5 dB	Pass	180 degrees	1 m
2	390.039 MHz	32.55 dBµV/m	46.02 dBµV/m	-13.47 dB	Pass	180 degrees	1 m
3	520.072 MHz	31.88 dBµV/m	46.02 dBµV/m	-14.14 dB	Pass	180 degrees	1 m
4	650.075 MHz	32.97 dBµV/m	46.02 dBµV/m	-13.05 dB	Pass	180 degrees	1 m
5	780.042 MHz	34.84 dBµV/m	46.02 dBµV/m	-11.18 dB	Pass	180 degrees	1 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-09
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 3.7 V DC by internal lithium ion battery
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement Distance: 3m
 Operational Mode: Mode 2
 EUT Configuration: Configuration 2
 Note 1: --

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RadiMation



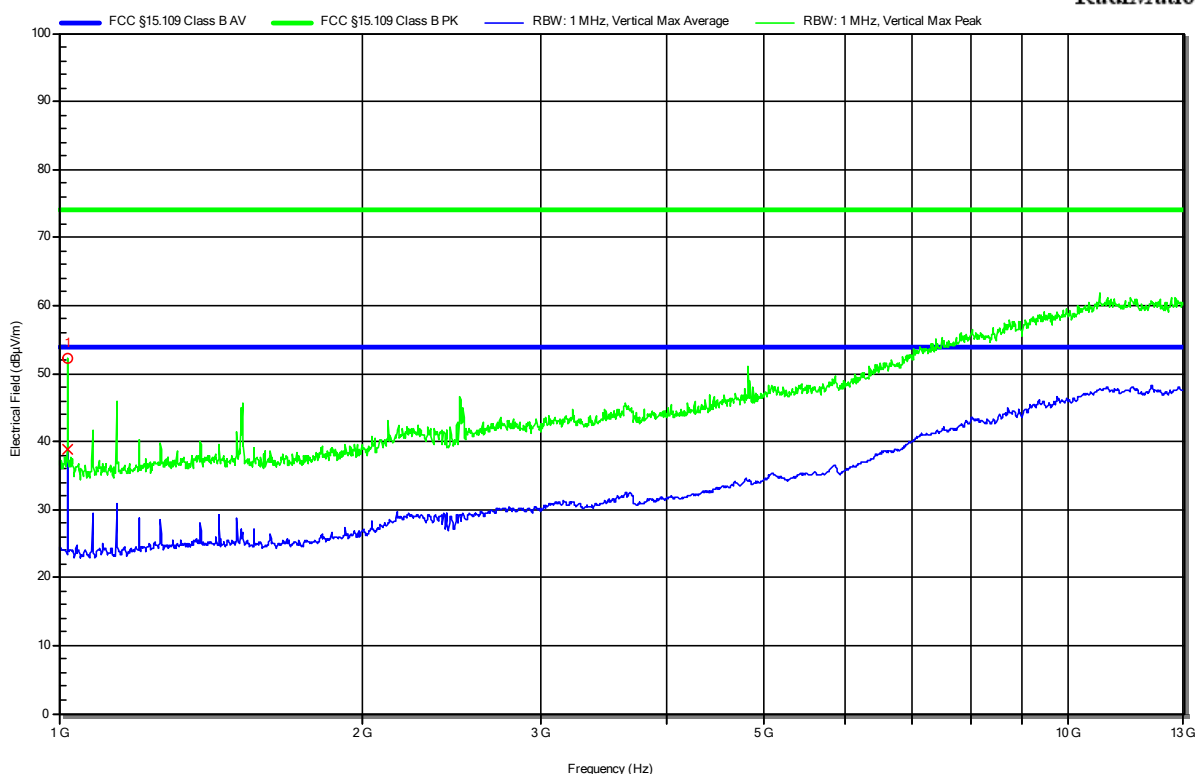
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	325.068 MHz	31.53 dBμV/m	46.02 dBμV/m	-14.49 dB	Pass	45 degrees	1.1 m
2	390.033 MHz	37.75 dBμV/m	46.02 dBμV/m	-8.27 dB	Pass	45 degrees	1.1 m
3	780.018 MHz	29.01 dBμV/m	46.02 dBμV/m	-17.01 dB	Pass	45 degrees	1.1 m
4	903.633 MHz	26.37 dBμV/m	46.02 dBμV/m	-19.65 dB	Pass	45 degrees	1.1 m
5	909.997 MHz	31.43 dBμV/m	46.02 dBμV/m	-14.59 dB	Pass	45 degrees	1.1 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-14
 Operating Conditions: ambient temperature: 22 °Celsius
 power input: 3.7 V DC by internal lithium ion battery
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 2
 EUT Configuration: Configuration 2
 Note 1: --

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Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.02 GHz	52.2 dBμV/m	73.98 dBμV/m	-21.78 dB	Pass	150 degrees	1 m

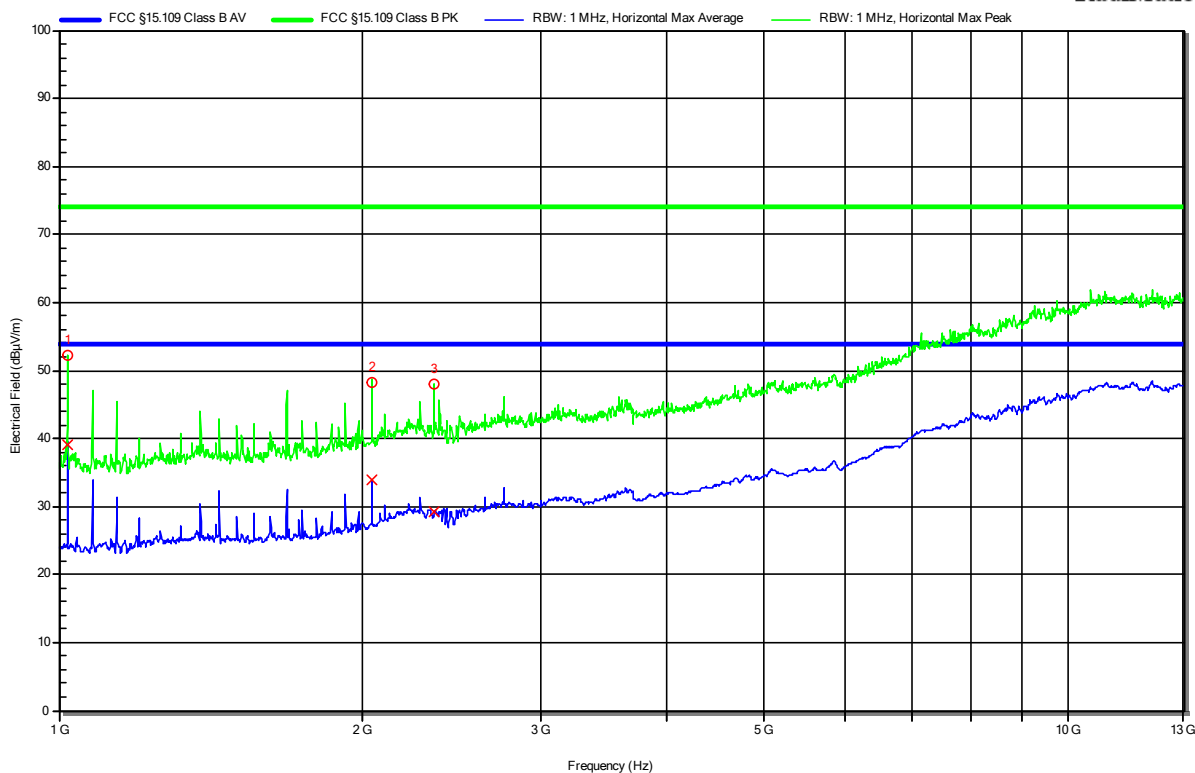
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.02 GHz	38.87 dBμV/m	53.98 dBμV/m	-15.11 dB	Pass	150 degrees	1 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-14
 Operating Conditions: ambient temperature: 22 °Celsius
 power input: 3.7 V DC by internal lithium ion battery
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement Distance: 3m
 Operational Mode: Mode 2
 EUT Configuration: Configuration 2
 Note 1: --

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Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.02 GHz	52.32 dBμV/m	73.98 dBμV/m	-21.66 dB	Pass	55 degrees	1.7 m
2	2.04 GHz	48.23 dBμV/m	73.98 dBμV/m	-25.75 dB	Pass	55 degrees	1.7 m
3	2.354 GHz	47.97 dBμV/m	73.98 dBμV/m	-26.01 dB	Pass	55 degrees	1.7 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.02 GHz	39.14 dBμV/m	53.98 dBμV/m	-14.84 dB	Pass	55 degrees	1.7 m
2	2.04 GHz	33.95 dBμV/m	53.98 dBμV/m	-20.03 dB	Pass	55 degrees	1.7 m
3	2.354 GHz	29.22 dBμV/m	53.98 dBμV/m	-24.76 dB	Pass	55 degrees	1.7 m

Test Report No.: G0M-2112-1231-EF0115B-V02

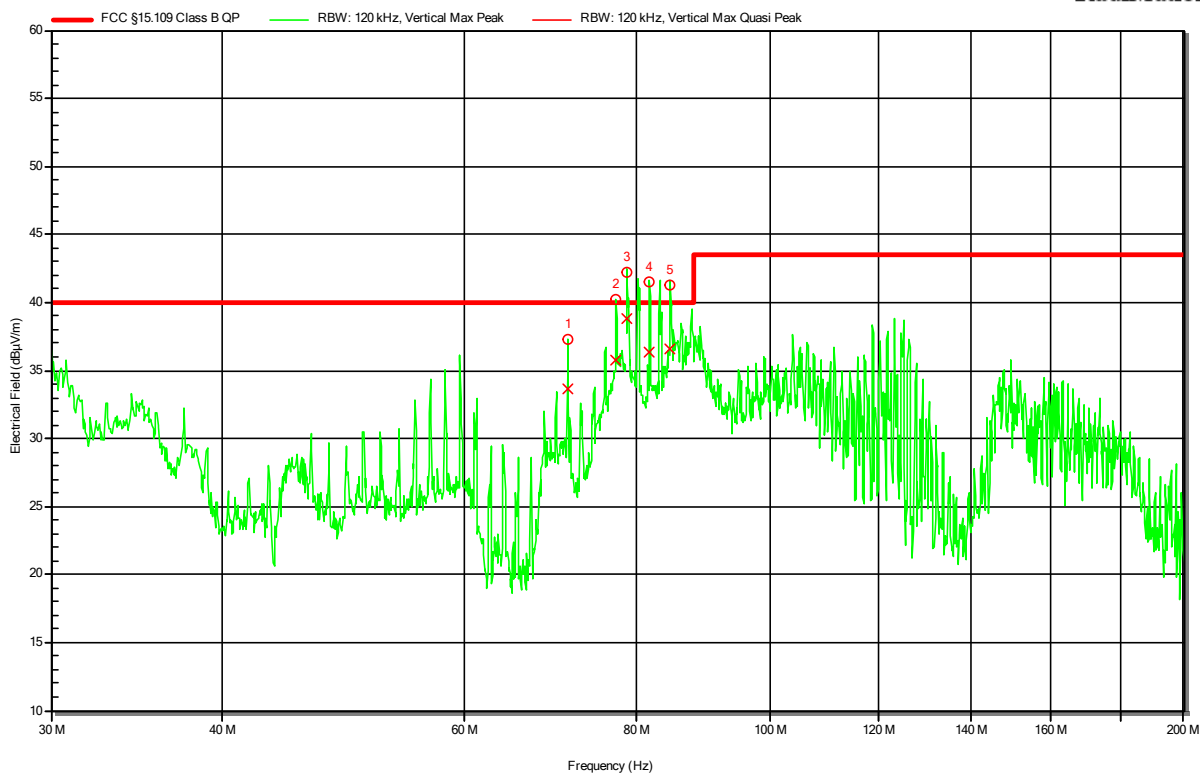
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

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

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-09
 Operating Conditions: ambient temperature: 22 °Celsius
 power input: 120 V AC / 60 Hz
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 3
 EUT Configuration: Configuration 3
 Note 1: --

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RadiMation



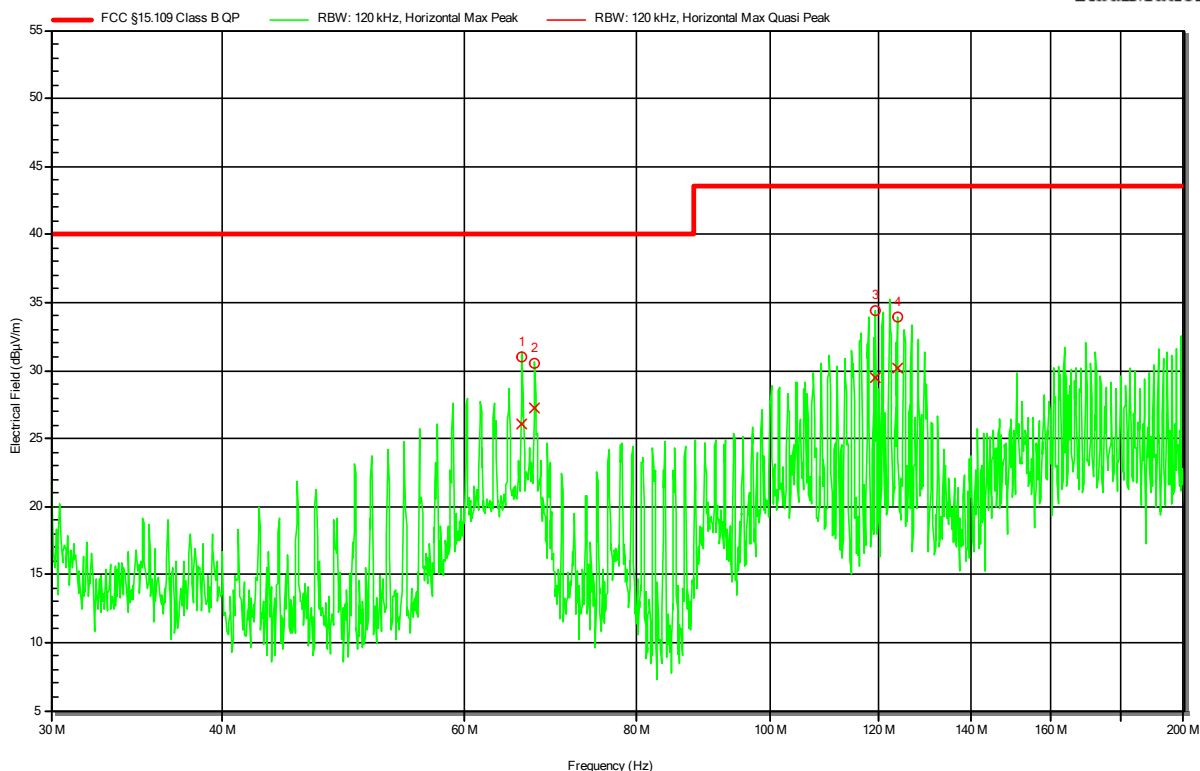
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	71.308 MHz	33.7 dBµV/m	40 dBµV/m	-6.3 dB	Pass	90 degrees	1 m
2	77.307 MHz	35.77 dBµV/m	40 dBµV/m	-4.23 dB	Pass	90 degrees	1 m
3	78.712 MHz	38.8 dBµV/m	40 dBµV/m	-1.2 dB	Pass	90 degrees	1 m
4	81.733 MHz	36.34 dBµV/m	40 dBµV/m	-3.66 dB	Pass	90 degrees	1 m
5	84.567 MHz	36.59 dBµV/m	40 dBµV/m	-3.41 dB	Pass	90 degrees	1 m

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

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-09
 Operating Conditions: ambient temperature: 22 °Celsius
 power input: 120 V AC / 60 Hz
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement Distance: 3m
 Operational Mode: Mode 3
 EUT Configuration: Configuration 3
 Note 1: --

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RadiMation



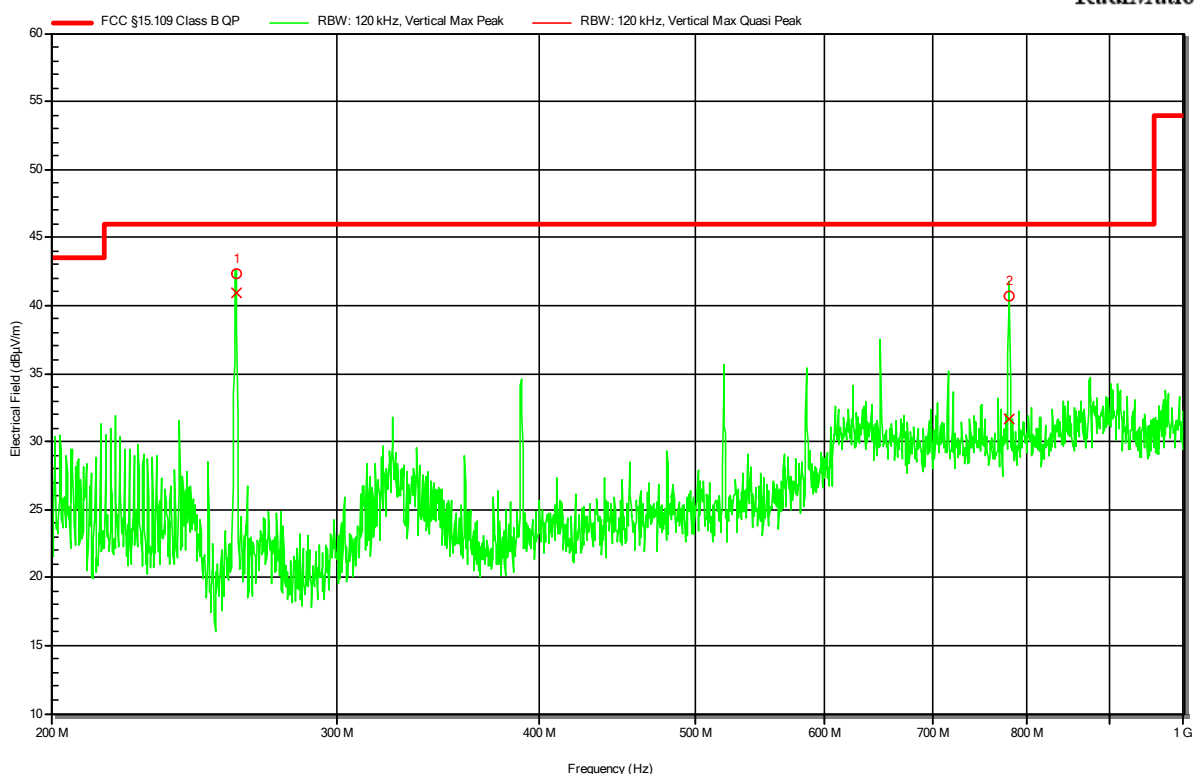
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	66.012 MHz	26.02 dBμV/m	40 dBμV/m	-13.98 dB	Pass	180 degrees	1.7 m
2	67.423 MHz	27.19 dBμV/m	40 dBμV/m	-12.81 dB	Pass	180 degrees	1.7 m
3	119.264 MHz	29.51 dBμV/m	43.52 dBμV/m	-14.01 dB	Pass	180 degrees	1.7 m
4	123.725 MHz	30.13 dBμV/m	43.52 dBμV/m	-13.39 dB	Pass	180 degrees	1.7 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
Applicant: eResearchTechnology GmbH
Model Description: Spirometer System
Model: SpiroSphere
Test Sample ID: 38263
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Date: 2022-02-09
Operating Conditions: ambient temperature: 21 °Celsius
power input: 120 V AC / 60 Hz
Antenna: Rohde & Schwarz HL 223, Vertical
Measurement Distance: 3m
Operational Mode: Mode 3
EUT Configuration: Configuration 3
Note 1: --

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RadiMation



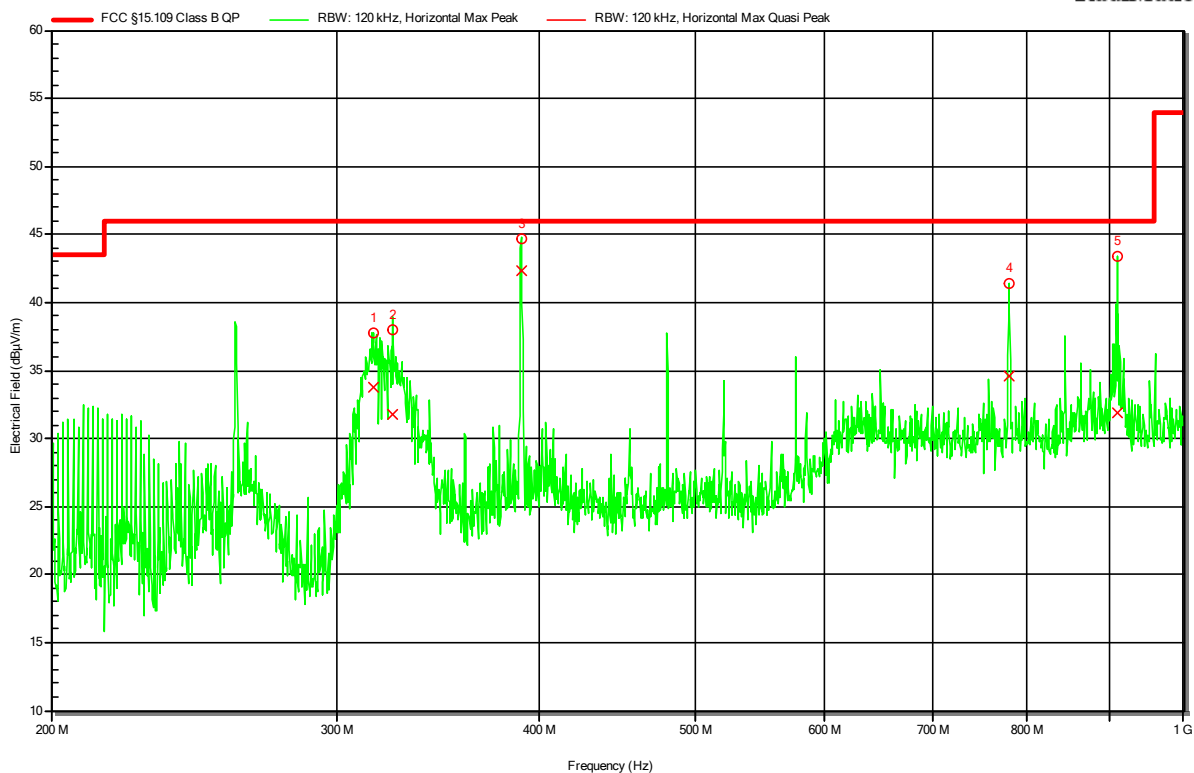
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	260.06 MHz	40.97 dBμV/m	46.02 dBμV/m	-5.05 dB	Pass	0 degrees	1.7 m
2	780.072 MHz	31.68 dBμV/m	46.02 dBμV/m	-14.34 dB	Pass	0 degrees	1.7 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
Applicant: eResearchTechnology GmbH
Model Description: Spirometer System
Model: SpiroSphere
Test Sample ID: 38263
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Date: 2022-02-09
Operating Conditions: ambient temperature: 21 °Celsius
power input: 120 V AC / 60 Hz
Antenna: Rohde & Schwarz HL 223, Horizontal
Measurement Distance: 3m
Operational Mode: Mode 3
EUT Configuration: Configuration 3
Note 1: --

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RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	316.007 MHz	33.8 dBμV/m	46.02 dBμV/m	-12.22 dB	Pass	45 degrees	1.1 m
2	324.881 MHz	31.76 dBμV/m	46.02 dBμV/m	-14.26 dB	Pass	45 degrees	1.1 m
3	390.009 MHz	42.36 dBμV/m	46.02 dBμV/m	-3.66 dB	Pass	45 degrees	1.1 m
4	779.946 MHz	34.6 dBμV/m	46.02 dBμV/m	-11.42 dB	Pass	45 degrees	1.1 m
5	909.493 MHz	31.85 dBμV/m	46.02 dBμV/m	-14.17 dB	Pass	45 degrees	1.1 m

Test Report No.: G0M-2112-1231-EF0115B-V02

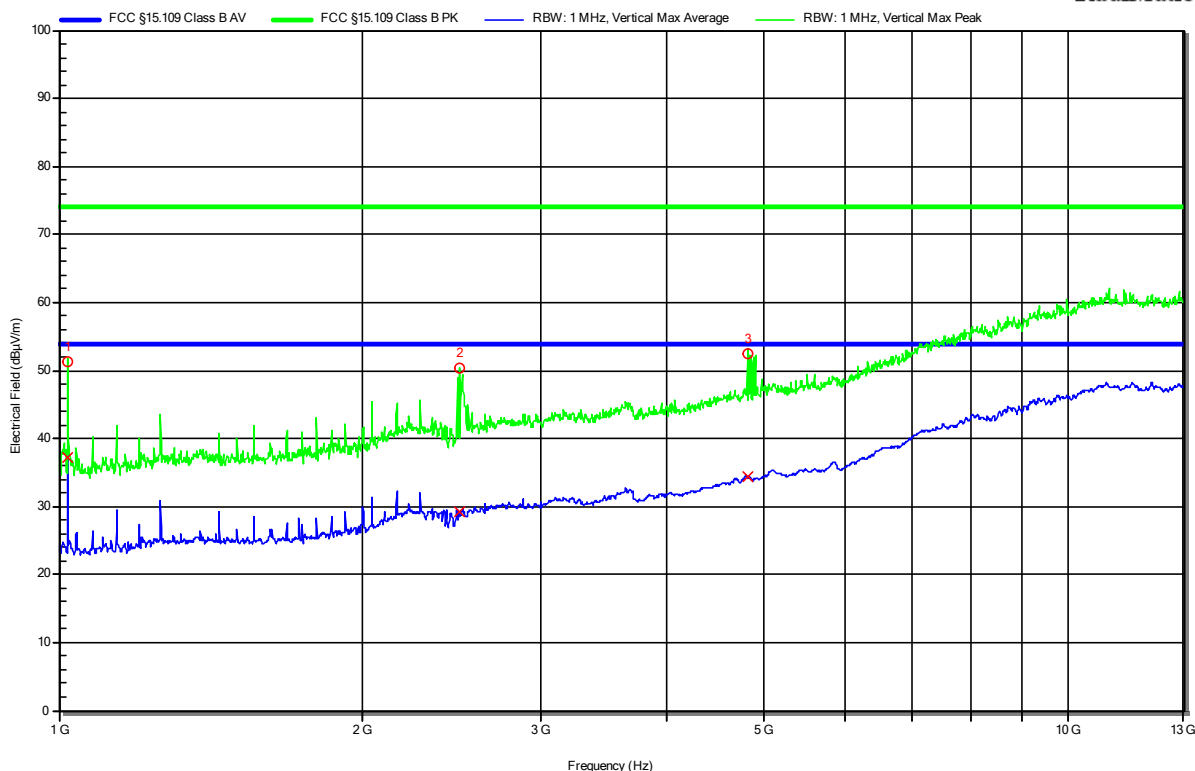
Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-14
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 120 V AC / 60 Hz
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 3
 EUT Configuration: Configuration 3
 Note 1: --

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Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.02 GHz	51.32 dBμV/m	73.98 dBμV/m	-22.66 dB	Pass	20 degrees	1.1 m
2	2.493 GHz	50.28 dBμV/m	73.98 dBμV/m	-23.7 dB	Pass	20 degrees	1.1 m
3	4.819 GHz	52.41 dBμV/m	73.98 dBμV/m	-21.57 dB	Pass	20 degrees	1.1 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.02 GHz	37.28 dBμV/m	53.98 dBμV/m	-16.7 dB	Pass	20 degrees	1.1 m
2	2.493 GHz	29.19 dBμV/m	53.98 dBμV/m	-24.79 dB	Pass	20 degrees	1.1 m
3	4.819 GHz	34.44 dBμV/m	53.98 dBμV/m	-19.54 dB	Pass	20 degrees	1.1 m

Test Report No.: G0M-2112-1231-EF0115B-V02

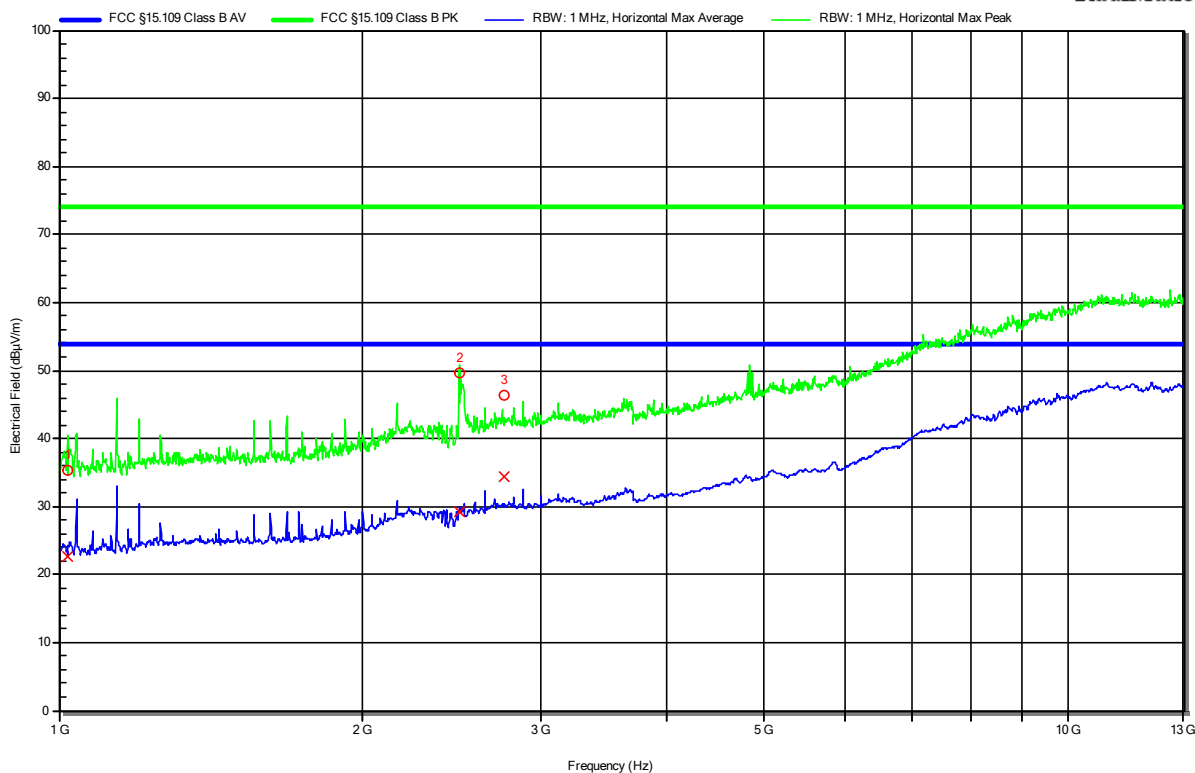
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
Applicant: eResearchTechnology GmbH
Model Description: Spirometer System
Model: SpiroSphere
Test Sample ID: 38263
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Date: 2022-02-14
Operating Conditions: ambient temperature: 21 °Celsius
power input: 120 V AC / 60 Hz
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance: 3m
Operational Mode: Mode 3
EUT Configuration: Configuration 3
Note 1: --

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RadiMation



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.02 GHz	35.32 dBμV/m	73.98 dBμV/m	-38.66 dB	Pass	120 degrees	1.2 m
2	2.493 GHz	49.7 dBμV/m	73.98 dBμV/m	-24.28 dB	Pass	120 degrees	1.2 m
3	2.76 GHz	46.46 dBμV/m	73.98 dBμV/m	-27.52 dB	Pass	120 degrees	1.2 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.02 GHz	22.6 dBμV/m	53.98 dBμV/m	-31.38 dB	Pass	120 degrees	1.2 m
2	2.493 GHz	29.15 dBμV/m	53.98 dBμV/m	-24.83 dB	Pass	120 degrees	1.2 m
3	2.76 GHz	34.4 dBμV/m	53.98 dBμV/m	-19.58 dB	Pass	120 degrees	1.2 m

Test Report No.: G0M-2112-1231-EF0115B-V02

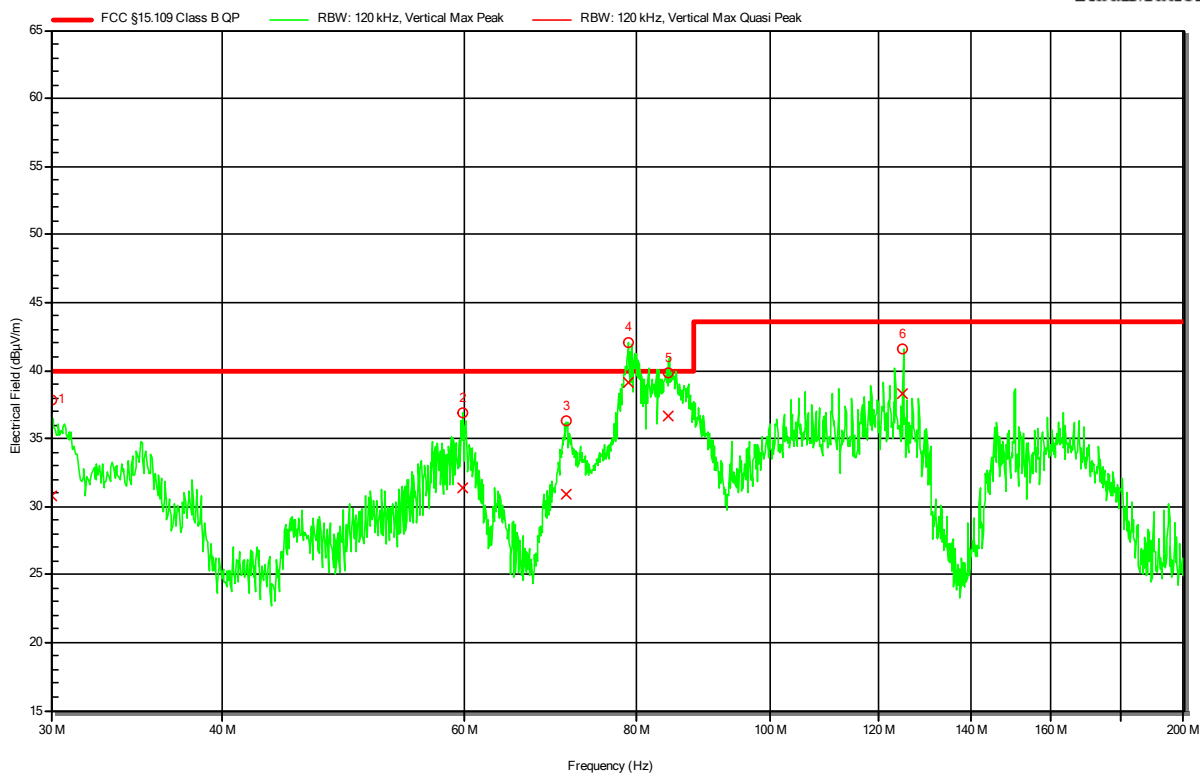
Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
Applicant: eResearchTechnology GmbH
Model Description: Spirometer System
Model: SpiroSphere
Test Sample ID: 38263
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Date: 2022-02-09
Operating Conditions: ambient temperature: 22 °Celsius
power input: 120 V AC / 60 Hz
Antenna: Rohde & Schwarz HK 116, Vertical
Measurement Distance: 3m
Operational Mode: Mode 4
EUT Configuration: Configuration 4
Note 1: --

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RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	30 MHz	30.8 dBµV/m	40 dBµV/m	-9.2 dB	Pass	110 degrees	1 m
2	59.791 MHz	31.38 dBµV/m	40 dBµV/m	-8.62 dB	Pass	110 degrees	1 m
3	71.194 MHz	30.92 dBµV/m	40 dBµV/m	-9.08 dB	Pass	110 degrees	1 m
4	78.832 MHz	39.11 dBµV/m	40 dBµV/m	-0.89 dB	Pass	110 degrees	1 m
5	84.405 MHz	36.63 dBµV/m	40 dBµV/m	-3.37 dB	Pass	110 degrees	1 m
6	124.992 MHz	38.32 dBµV/m	43.52 dBµV/m	-5.2 dB	Pass	110 degrees	1 m

Test Report No.: G0M-2112-1231-EF0115B-V02

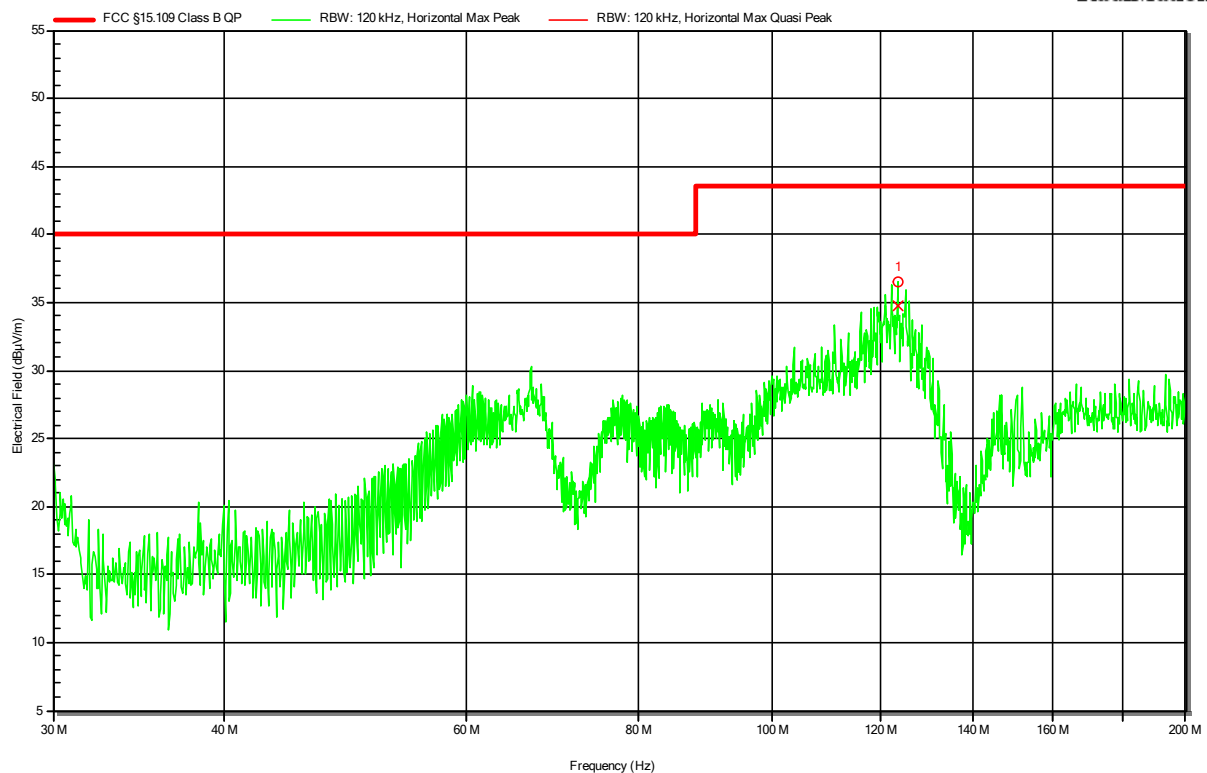
Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
Applicant: eResearchTechnology GmbH
Model Description: Spirometer System
Model: SpiroSphere
Test Sample ID: 38263
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Date: 2022-02-09
Operating Conditions: ambient temperature: 22 °Celsius
power input: 120 V AC / 60 Hz
Antenna: Rohde & Schwarz HK 116, Horizontal
Measurement Distance: 3m
Operational Mode: Mode 4
EUT Configuration: Configuration 4
Note 1: --

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RadiMation



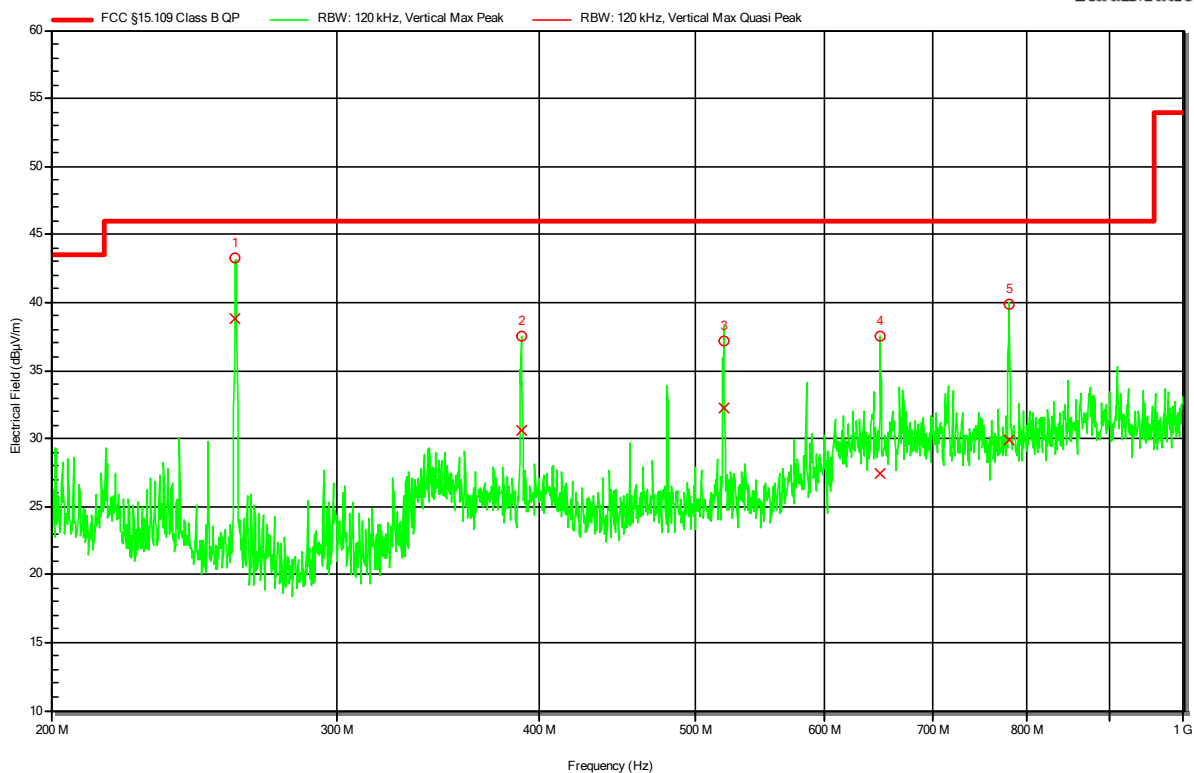
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	123.479 MHz	34.81 dBμV/m	43.52 dBμV/m	-8.71 dB	Pass	140 degrees	2.7 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-09
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 120 V AC / 60 Hz
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 4
 EUT Configuration: Configuration 4
 Note 1: --

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RadiMation



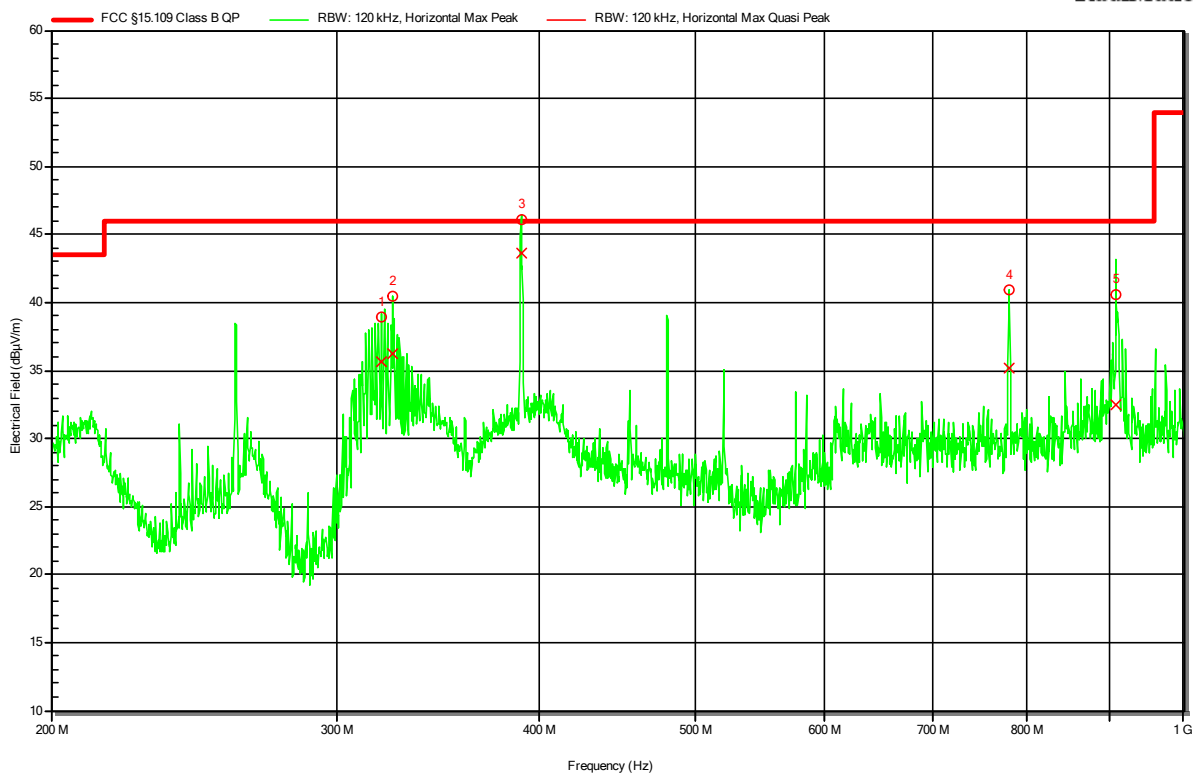
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	260.042 MHz	38.84 dBμV/m	46.02 dBμV/m	-7.18 dB	Pass	160 degrees	1 m
2	390.081 MHz	30.59 dBμV/m	46.02 dBμV/m	-15.43 dB	Pass	160 degrees	1 m
3	520.114 MHz	32.29 dBμV/m	46.02 dBμV/m	-13.73 dB	Pass	160 degrees	1 m
4	650.093 MHz	27.37 dBμV/m	46.02 dBμV/m	-18.65 dB	Pass	160 degrees	1 m
5	780.054 MHz	29.95 dBμV/m	46.02 dBμV/m	-16.07 dB	Pass	160 degrees	1 m

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

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-09
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 120 V AC / 60 Hz
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement Distance: 3m
 Operational Mode: Mode 4
 EUT Configuration: Configuration 4
 Note 1: --

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RadiMation



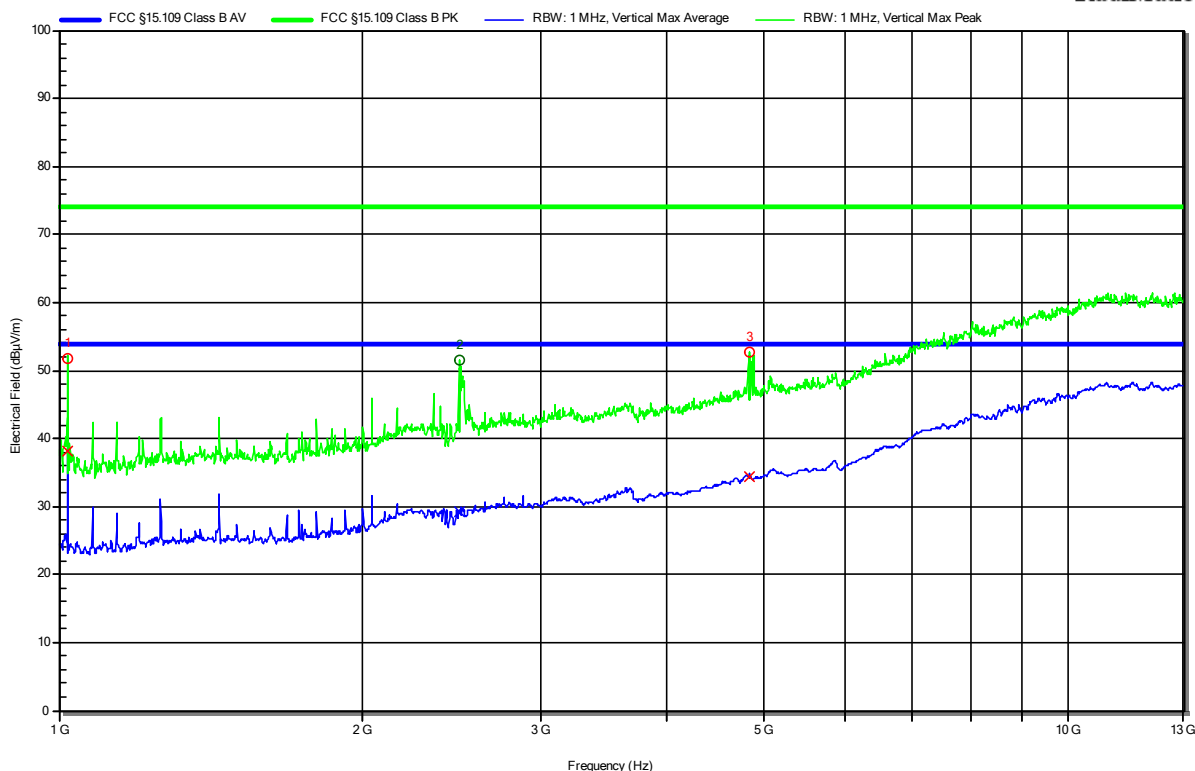
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	319.664 MHz	35.61 dBµV/m	46.02 dBµV/m	-10.41 dB	Pass	30 degrees	1 m
2	325.116 MHz	36.18 dBµV/m	46.02 dBµV/m	-9.84 dB	Pass	30 degrees	1 m
3	390.045 MHz	43.64 dBµV/m	46.02 dBµV/m	-2.38 dB	Pass	30 degrees	1 m
4	780.192 MHz	35.12 dBµV/m	46.02 dBµV/m	-10.9 dB	Pass	30 degrees	1 m
5	908.436 MHz	32.53 dBµV/m	46.02 dBµV/m	-13.49 dB	Pass	30 degrees	1 m

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

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-14
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 120 V AC / 60 Hz
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 4
 EUT Configuration: Configuration 4
 Note 1: --

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Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.02 GHz	51.85 dBμV/m	73.98 dBμV/m	-22.13 dB	Pass	20 degrees	1 m
2	2.492 GHz	51.52 dBμV/m	73.98 dBμV/m	-22.46 dB	Pass	20 degrees	1 m
3	4.828 GHz	52.61 dBμV/m	73.98 dBμV/m	-21.37 dB	Pass	20 degrees	1 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.02 GHz	38.16 dBμV/m	53.98 dBμV/m	-15.82 dB	Pass	20 degrees	1 m
2	2.492 GHz	29.22 dBμV/m	53.98 dBμV/m	-24.76 dB	Pass	20 degrees	1 m
3	4.828 GHz	34.35 dBμV/m	53.98 dBμV/m	-19.63 dB	Pass	20 degrees	1 m

Test Report No.: G0M-2112-1231-EF0115B-V02

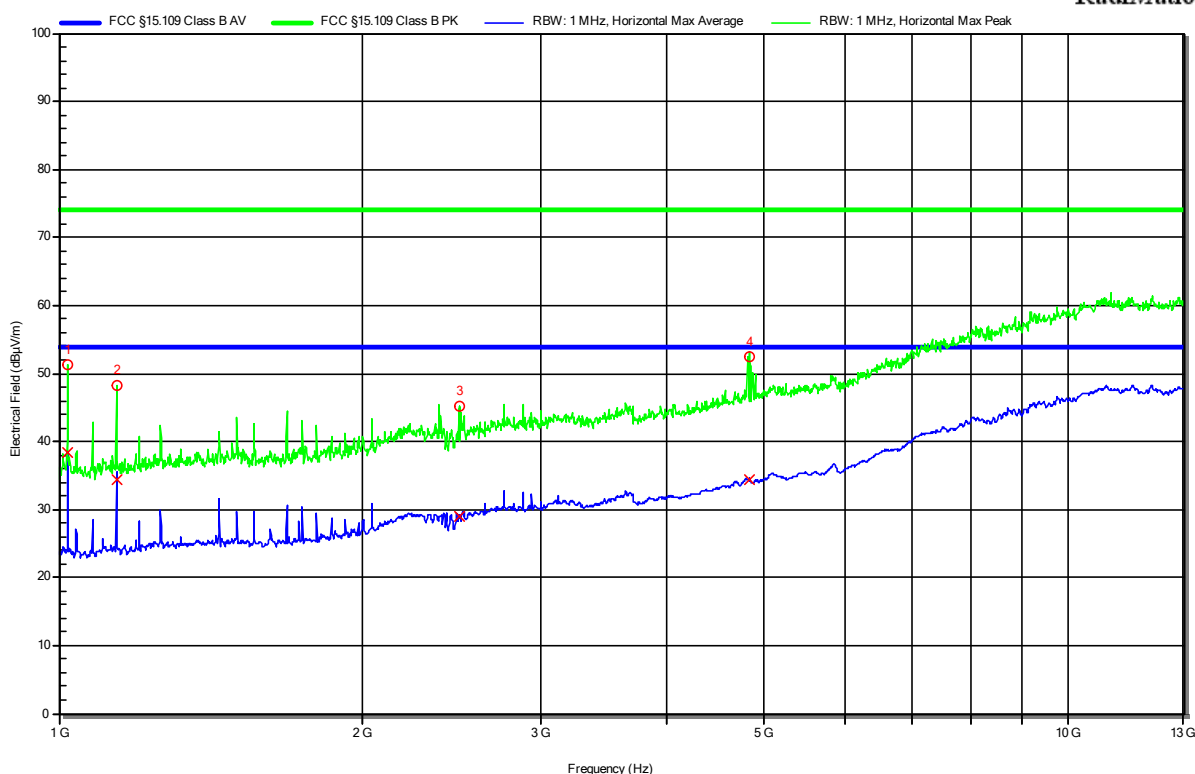
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated emissions according to FCC part 15B

Project Number: G0M-2112-1231
Applicant: eResearchTechnology GmbH
Model Description: Spirometer System
Model: SpiroSphere
Test Sample ID: 38263
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Date: 2022-02-14
Operating Conditions: ambient temperature: 21 °Celsius
power input: 120 V AC / 60 Hz
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance: 3m
Operational Mode: Mode 4
EUT Configuration: Configuration 4
Note 1: --

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Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.02 GHz	51.18 dBμV/m	73.98 dBμV/m	-22.8 dB	Pass	90 degrees	1 m
2	1.14 GHz	48.25 dBμV/m	73.98 dBμV/m	-25.73 dB	Pass	90 degrees	1 m
3	2.493 GHz	45.07 dBμV/m	73.98 dBμV/m	-28.91 dB	Pass	90 degrees	1 m
4	4.826 GHz	52.5 dBμV/m	73.98 dBμV/m	-21.48 dB	Pass	90 degrees	1 m

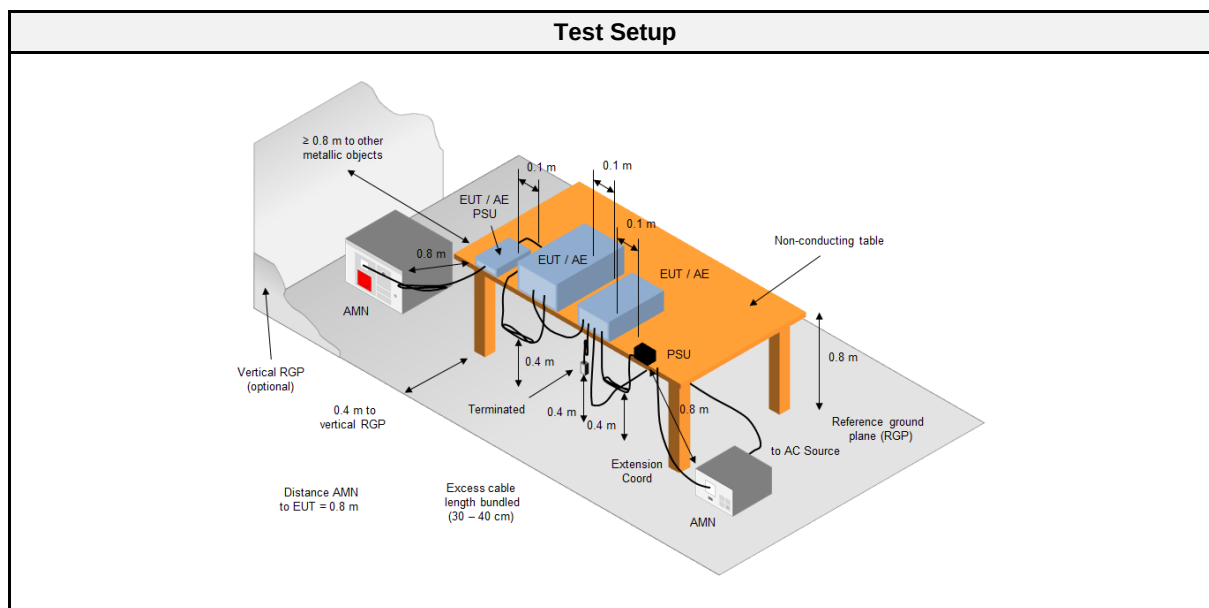
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.02 GHz	38.28 dBμV/m	53.98 dBμV/m	-15.7 dB	Pass	90 degrees	1 m
2	1.14 GHz	34.37 dBμV/m	53.98 dBμV/m	-19.61 dB	Pass	90 degrees	1 m
3	2.493 GHz	28.95 dBμV/m	53.98 dBμV/m	-25.03 dB	Pass	90 degrees	1 m
4	4.826 GHz	34.34 dBμV/m	53.98 dBμV/m	-19.64 dB	Pass	90 degrees	1 m

Test Report No.: G0M-2112-1231-EF0115B-V02

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

2.2.1 Information

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	2021-07	2022-07
AMN	R&S	ESH3-Z5	EF00036	2021-08	2023-08
Pulse Limiter	R&S	ESH3-Z2	EF01063	2021-07	2022-07
EMI Test Receiver	R&S	ESR 7	EF00943	2021-08	2022-08
Climatic Sensor	Embedded Data Systems, LLC.	2800100000254 17E	EF01054	2021-03	2022-03

2.2.4 Procedure

Exploratory measurement	
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)
2.	The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN.
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).
4.	The LISN measurement port was connected to a measurement receiver
5.	I/O cables were bundled not longer than 0.4 m
6.	Measurement was performed in the frequency range 0.15 – 30MHz on each current-carrying conductor
7.	To maximize the emissions the cable positions were manipulated
8.	The worst configuration of EUT and cables is shown on a test setup picture at item 2.2.2

Final measurement	
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)
2.	The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN.
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).
4.	The LISN measurement port was connected to a measurement receiver
5.	The EUT and cable arrangement were based on the exploratory measurement results
6.	The test data of the worst-case conditions were recorded and shown on the next pages

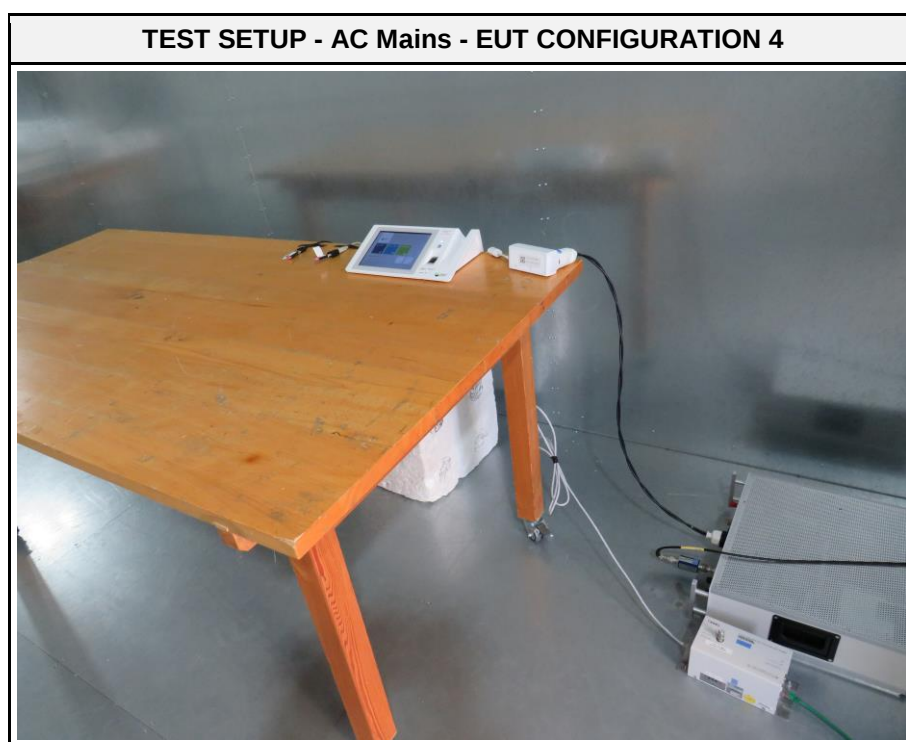
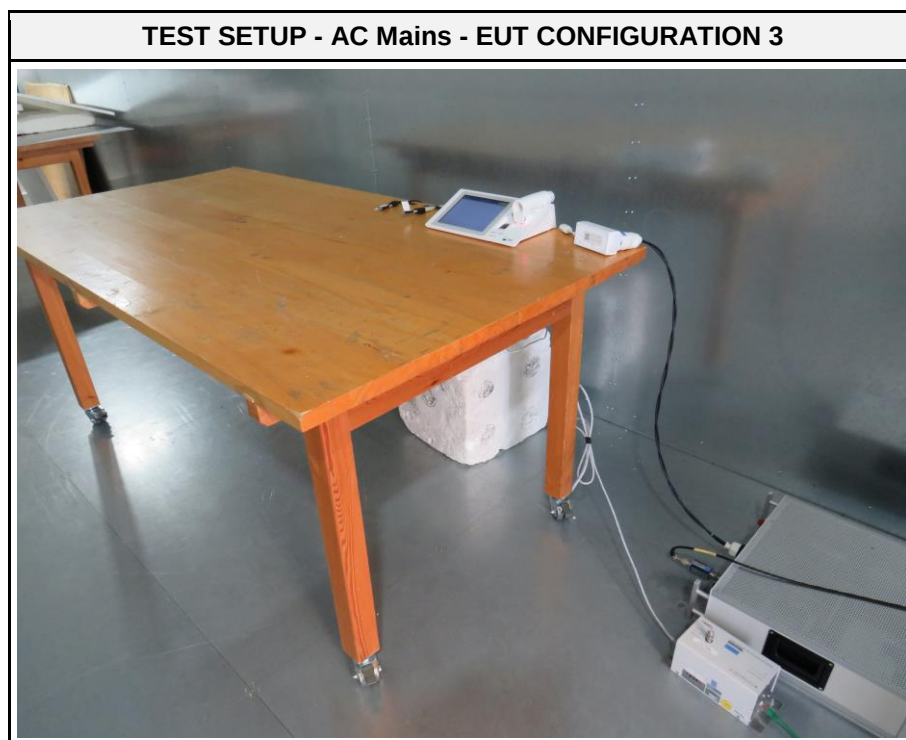
2.2.5 Limits

Class B		
Frequency [MHz]	Quasi-peak Limit [dBμV]	Average Limit [dBμV]
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
AC Mains	AMN	3	3	PASS	120 V AC / 60 Hz
AC Mains	AMN	4	4	PASS	120 V AC / 60 Hz

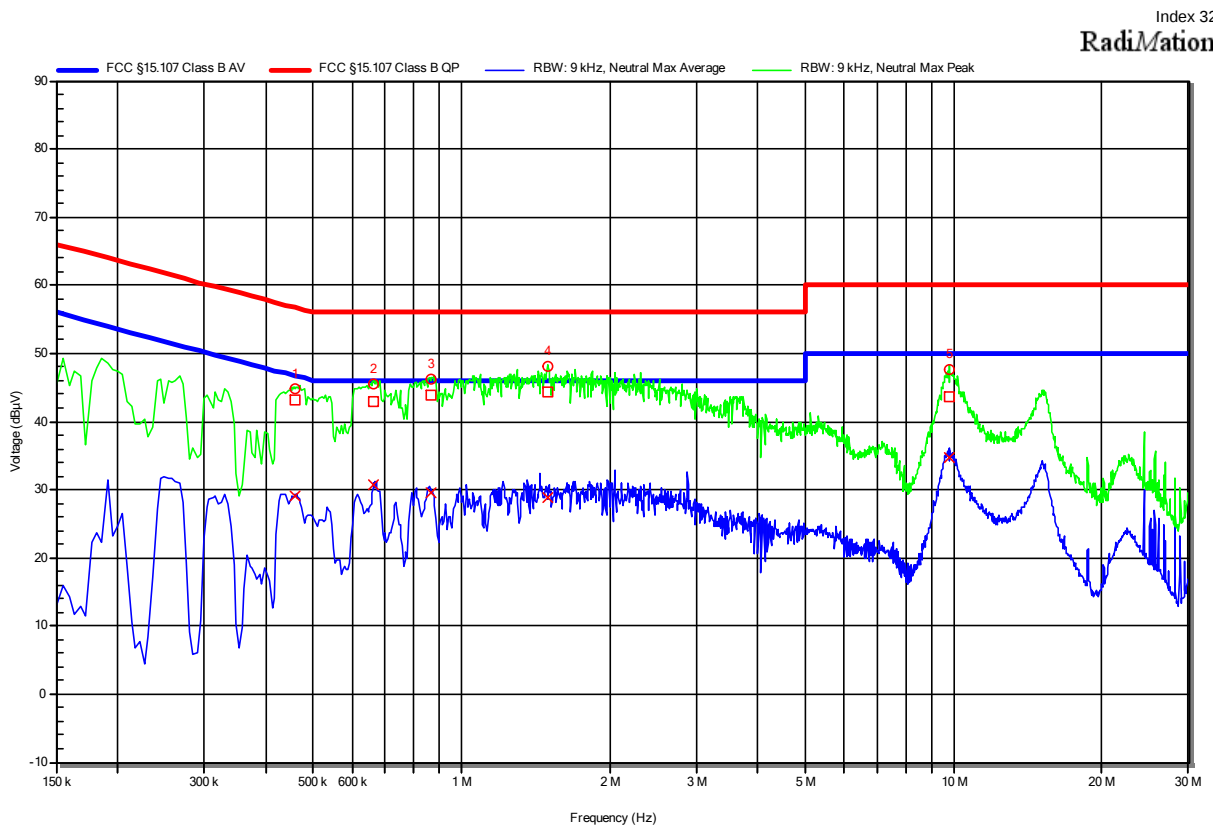
2.2.7 Setup Photos



2.2.8 Records

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

Project Number: G0M-2112-1231
 Applicant: eResearchTechnology GmbH
 Model Description: Spirometer System
 Model: SpiroSphere
 Test Sample ID: 38263
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Date: 2022-02-09
 Operating Conditions: ambient temperature: 22 °Celsius
 power input: 120 V AC / 60 Hz
 LISN: Schwarzbeck NSLK 8127 RC N
 Operational Mode: Mode 3
 EUT Configuration: Configuration 3
 Applied to Port: AC Mains
 Note 1: --



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	460.5 kHz	43.22 dBµV	56.68 dBµV	-13.47 dB	Pass	Neutral
2	664.8 kHz	42.97 dBµV	56 dBµV	-13.03 dB	Pass	Neutral
3	870 kHz	43.87 dBµV	56 dBµV	-12.13 dB	Pass	Neutral
4	1.495 MHz	44.36 dBµV	56 dBµV	-11.64 dB	Pass	Neutral
5	9.794 MHz	43.55 dBµV	60 dBµV	-16.45 dB	Pass	Neutral

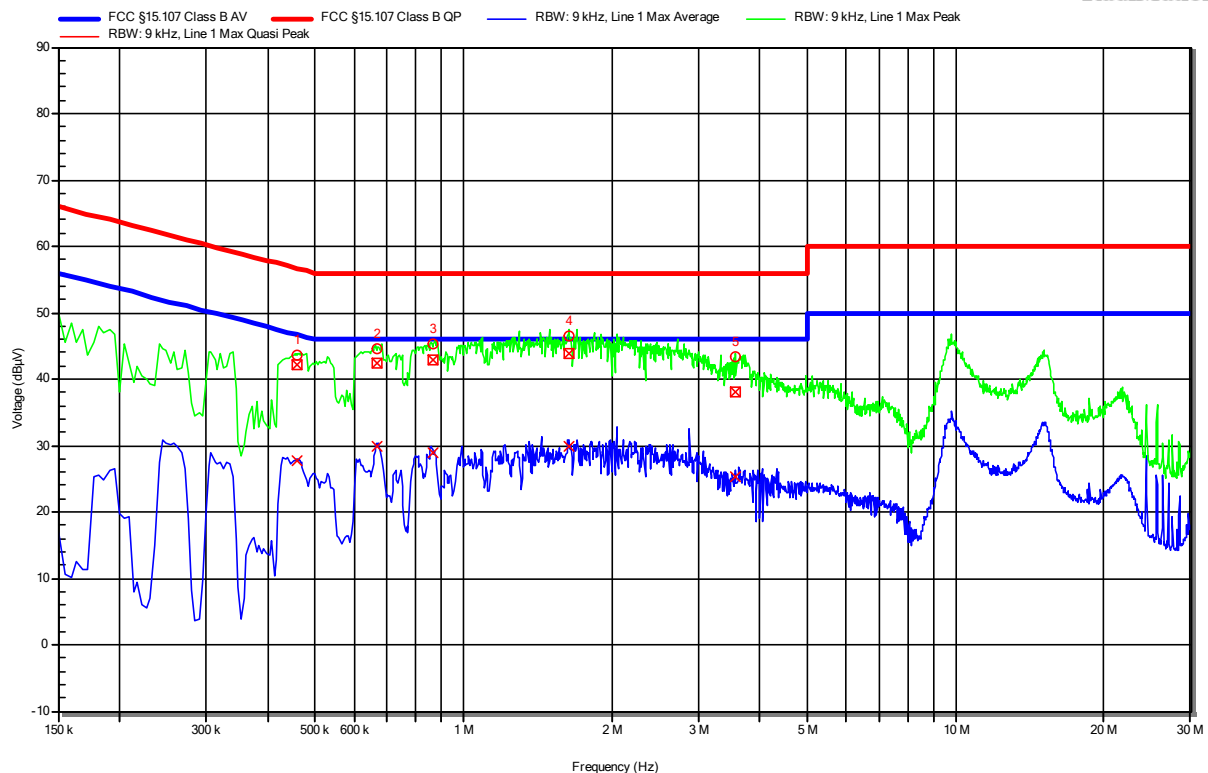
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	460.5 kHz	29.06 dBµV	46.68 dBµV	-17.63 dB	Pass	Neutral
2	664.8 kHz	30.63 dBµV	46 dBµV	-15.37 dB	Pass	Neutral
3	870 kHz	29.5 dBµV	46 dBµV	-16.5 dB	Pass	Neutral
4	1.495 MHz	28.96 dBµV	46 dBµV	-17.04 dB	Pass	Neutral
5	9.794 MHz	34.83 dBµV	50 dBµV	-15.17 dB	Pass	Neutral

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

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Applicant: eResearchTechnology GmbH
Model Description: Spirometer System
Model: SpiroSphere
Test Sample ID: 38263
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Date: 2022-02-09
Operating Conditions: ambient temperature: 22 °Celsius
power input: 120 V AC / 60 Hz
LISN: Schwarzbeck NSLK 8127 RC L
Operational Mode: Mode 3
EUT Configuration: Configuration 3
Applied to Port: AC Mains
Note 1: --

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Radiation

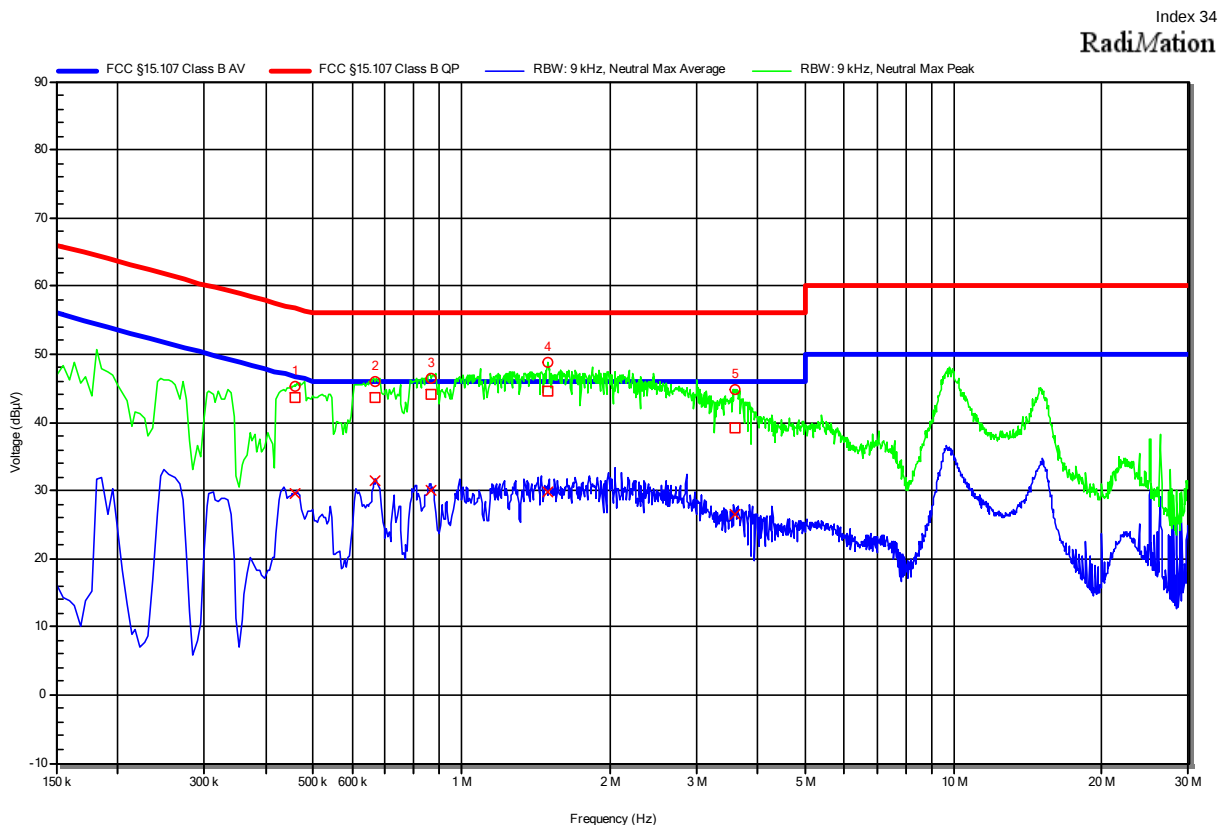


Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	460.5 kHz	42.12 dBµV	56.68 dBµV	-14.56 dB	Pass	Line 1
2	667.5 kHz	42.33 dBµV	56 dBµV	-13.67 dB	Pass	Line 1
3	870 kHz	42.96 dBµV	56 dBµV	-13.04 dB	Pass	Line 1
4	1.635 MHz	43.73 dBµV	56 dBµV	-12.27 dB	Pass	Line 1
5	3.57 MHz	38.08 dBµV	56 dBµV	-17.92 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	460.5 kHz	27.8 dBµV	46.68 dBµV	-18.88 dB	Pass	Line 1
2	667.5 kHz	29.86 dBµV	46 dBµV	-16.14 dB	Pass	Line 1
3	870 kHz	28.82 dBµV	46 dBµV	-17.18 dB	Pass	Line 1
4	1.635 MHz	29.92 dBµV	46 dBµV	-16.08 dB	Pass	Line 1
5	3.57 MHz	25.4 dBµV	46 dBµV	-20.6 dB	Pass	Line 1

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

Project Number: G0M-2112-1231
Applicant: eResearchTechnology GmbH
Model Description: Spirometer System
Model: SpiroSphere
Test Sample ID: 38263
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Date: 2022-02-09
Operating Conditions: ambient temperature: 22 °Celsius
power input: 120 V AC / 60 Hz
LISN: Schwarzbeck NSLK 8127 RC N
Operational Mode: Mode 4
EUT Configuration: Configuration 4
Applied to Port: AC Mains
Note 1: --



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	460.5 kHz	43.57 dBµV	56.68 dBµV	-13.11 dB	Pass	Neutral
2	667.95 kHz	43.67 dBµV	56 dBµV	-12.33 dB	Pass	Neutral
3	870 kHz	44.09 dBµV	56 dBµV	-11.91 dB	Pass	Neutral
4	1.497 MHz	44.6 dBµV	56 dBµV	-11.4 dB	Pass	Neutral
5	3.593 MHz	39.14 dBµV	56 dBµV	-16.86 dB	Pass	Neutral

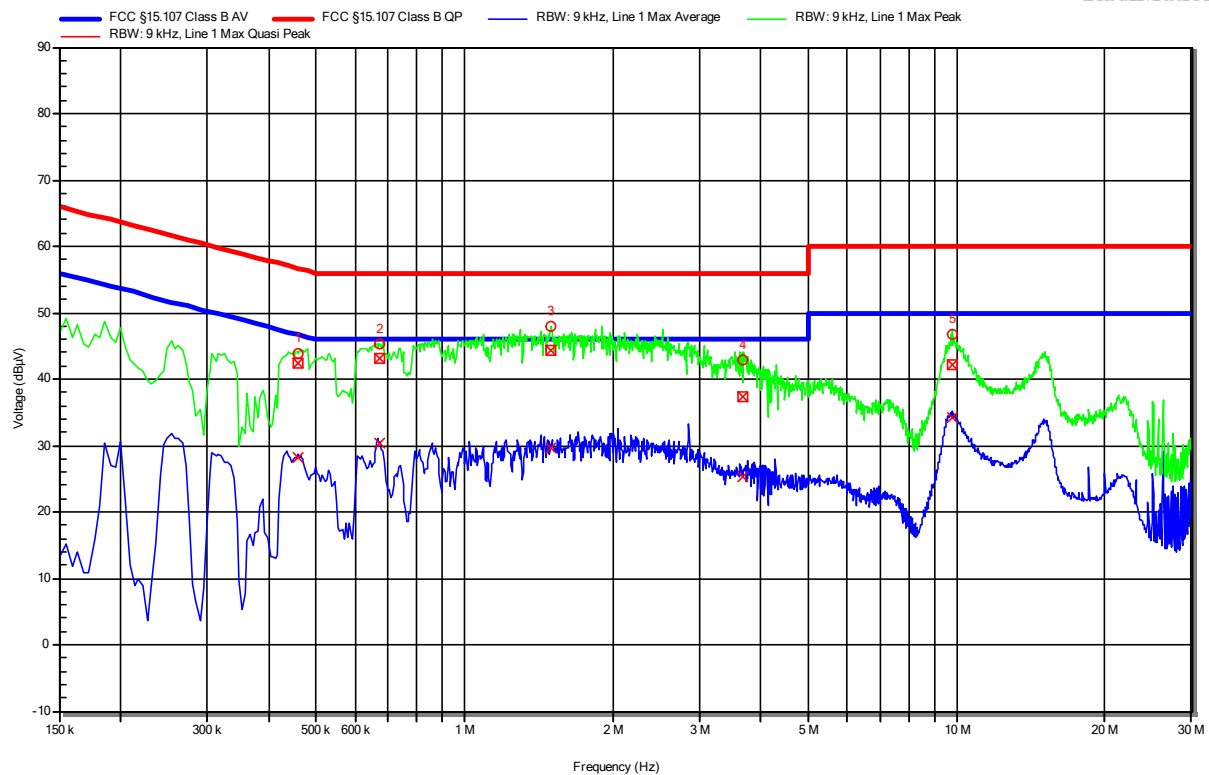
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	460.5 kHz	29.58 dBµV	46.68 dBµV	-17.11 dB	Pass	Neutral
2	667.95 kHz	31.42 dBµV	46 dBµV	-14.58 dB	Pass	Neutral
3	870 kHz	30.06 dBµV	46 dBµV	-15.94 dB	Pass	Neutral
4	1.497 MHz	29.9 dBµV	46 dBµV	-16.1 dB	Pass	Neutral
5	3.593 MHz	26.58 dBµV	46 dBµV	-19.42 dB	Pass	Neutral

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

Project Number: G0M-2112-1231
Applicant: eResearchTechnology GmbH
Model Description: Spirometer System
Model: SpiroSphere
Test Sample ID: 38263
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Date: 2022-02-09
Operating Conditions: ambient temperature: 22 °Celsius
power input: 120 V AC / 60 Hz
LISN: Schwarzbeck NSLK 8127 RC L
Operational Mode: Mode 4
EUT Configuration: Configuration 4
Applied to Port: AC Mains
Note 1: --

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Radiation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	460.5 kHz	42.41 dBµV	56.68 dBµV	-14.27 dB	Pass	Line 1
2	672 kHz	43.23 dBµV	56 dBµV	-12.77 dB	Pass	Line 1
3	1.498 MHz	44.22 dBµV	56 dBµV	-11.78 dB	Pass	Line 1
4	3.687 MHz	37.32 dBµV	56 dBµV	-18.68 dB	Pass	Line 1
5	9.803 MHz	42.06 dBµV	60 dBµV	-17.94 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	460.5 kHz	28.29 dBµV	46.68 dBµV	-18.39 dB	Pass	Line 1
2	672 kHz	30.35 dBµV	46 dBµV	-15.65 dB	Pass	Line 1
3	1.498 MHz	29.61 dBµV	46 dBµV	-16.39 dB	Pass	Line 1
4	3.687 MHz	25.32 dBµV	46 dBµV	-20.68 dB	Pass	Line 1
5	9.803 MHz	34.33 dBµV	50 dBµV	-15.67 dB	Pass	Line 1

3 Measurement Uncertainty

All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2.

Test Name	Measurement Uncertainty
Conducted emissions at the mains power port	150kHz to 30MHz, 3.35dB
Radiated Emission	30MHz to 200MHz @ 3m, 5.1dB 200MHz to 1GHz @ 3m, 5.3dB >1GHz to 6GHz @3m, 5.95dB