

EMC TEST REPORT	
Title 47 CFR Part 15B, ISED ICES-003 Issue 7	
Report Reference No	G0M-2106-9857-EF0115B-V01
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	ANDREAS STIHL AG & Co. KG
Address	Andreas-Stihl-Straße 4 71336 Waiblingen 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	battery pack 4871 AR-C
Model(s)	AR 2000 L
Additional Model(s)	None
Brand Name(s)	Andreas Stihl AG & Co. KG
Hardware Version(s)	HW 03.10: User Interface HW 03.12: Mainelektronik (BMS)
Software Version(s)	SW 00.17: User Interface SW 00.11: Mainelektronik (BMS)
FCC-ID	2ALP8AR1
IC	23431-AR1
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	2021-07-15	
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	2021-09-30	
Total number of pages	47	
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:		

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	2021-09-30	Initial Release	-

REPORT INDEX

1	Equipment (Test Item) Under Test.....	6
1.1	Equipment Ports.....	7
1.2	Equipment Photos – Internal (provide by customer).....	8
1.3	Equipment Photos - External.....	10
1.4	Support Equipment.....	17
1.5	Operational Modes.....	18
1.6	EUT Configuration.....	18
1.7	Sample emission level calculation.....	19
2	Result Summary.....	20
2.1	Test Conditions and Results - Radiated emissions acc. to ANSI C63.4.....	21
2.2	Test Conditions and Results - Conducted emissions acc. to ANSI C63.4.....	40
3	Measurement Uncertainty	47

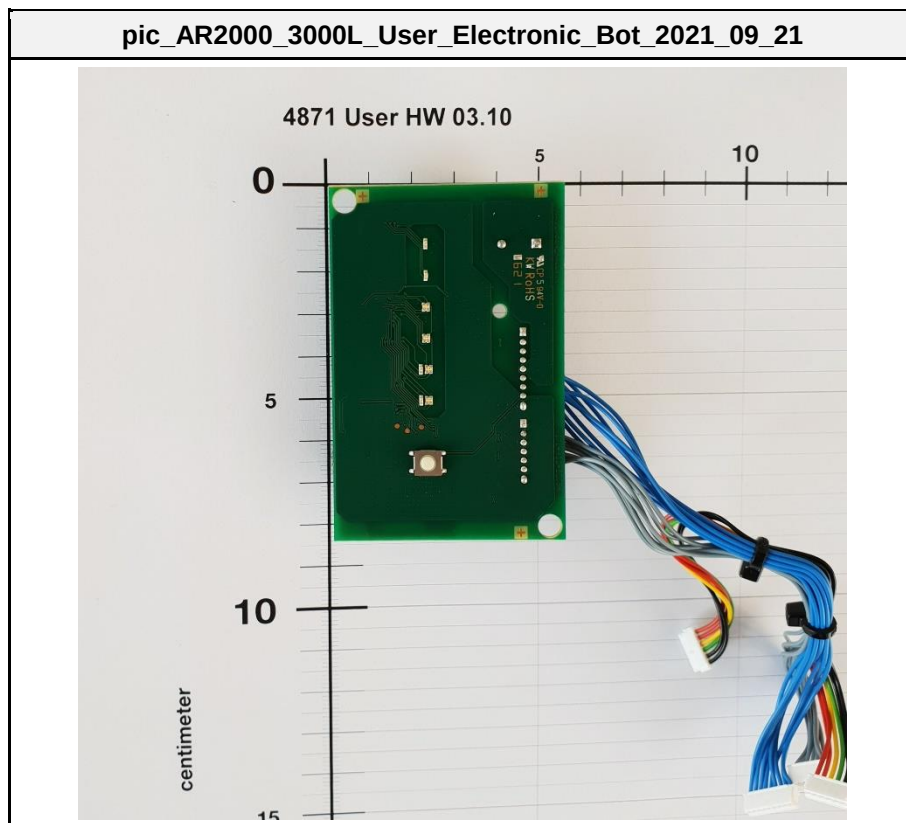
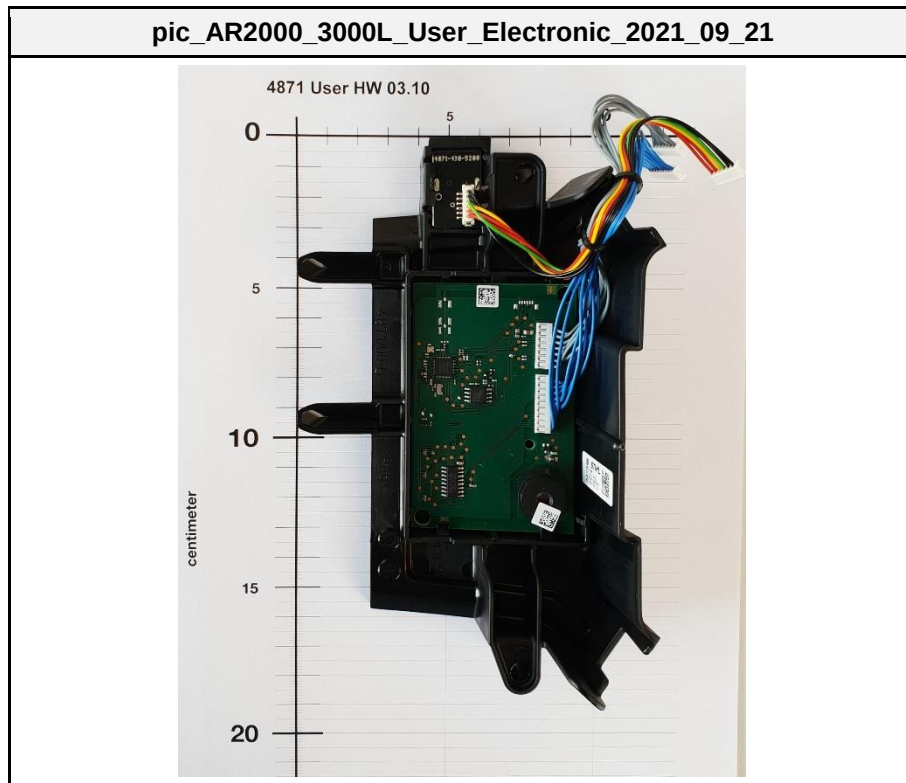
1 Equipment (Test Item) Under Test

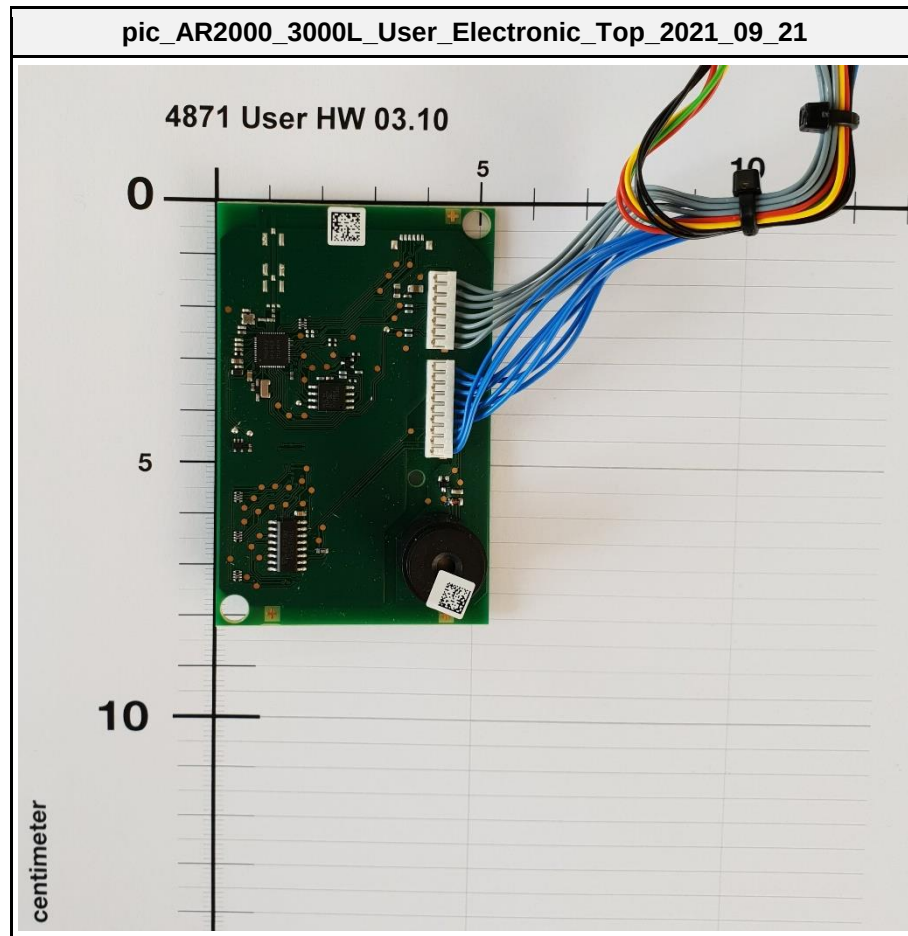
Description	battery pack 4871 AR-C	
Intended Use	Backpackable lithium-ion battery with 1.015 Wh battery energy for long run times. USB port, Bluetooth® interface for connection with STIHL connected.	
Model	AR 2000 L	
Additional Model(s)	None	
Brand Name(s)	Andreas Stihl AG & Co. KG	
Serial Number(s)	190360569	
Hardware Version(s)	HW 03.10: User Interface HW 03.12: Mainelektronik (BMS)	
Software Version(s)	SW 00.17: User Interface SW 00.11: Mainelektronik (BMS)	
EUT Dimensions [cm]	36 x 28 x 12	
FCC-ID	2ALP8AR1	
IC	23431-AR1	
Class	Class B	
Equipment type	Table top	
Highest internal frequency [MHz]	32 MHz CPU clock / 2480 MHz Bluetooth	
Radio Module	Type	Bluetooth Low Energy module
	Model	Unspecified
	Manufacturer	Unspecified
	FCC-ID	Unspecified
	IC	Unspecified
Supply Voltage	V _{NOM}	36 VDC
AC/DC-Adaptor	Model	Stihl AL 300
	Vendor	Andreas Stihl AG & Co. KG
	Input	120V AC / 60Hz
	Output	25.6-36V DC
Manufacturer	ANDREAS STIHL AG & Co. KG Andreas-Stihl-Straße 4 71336 Waiblingen GERMANY	

1.1 Equipment Ports

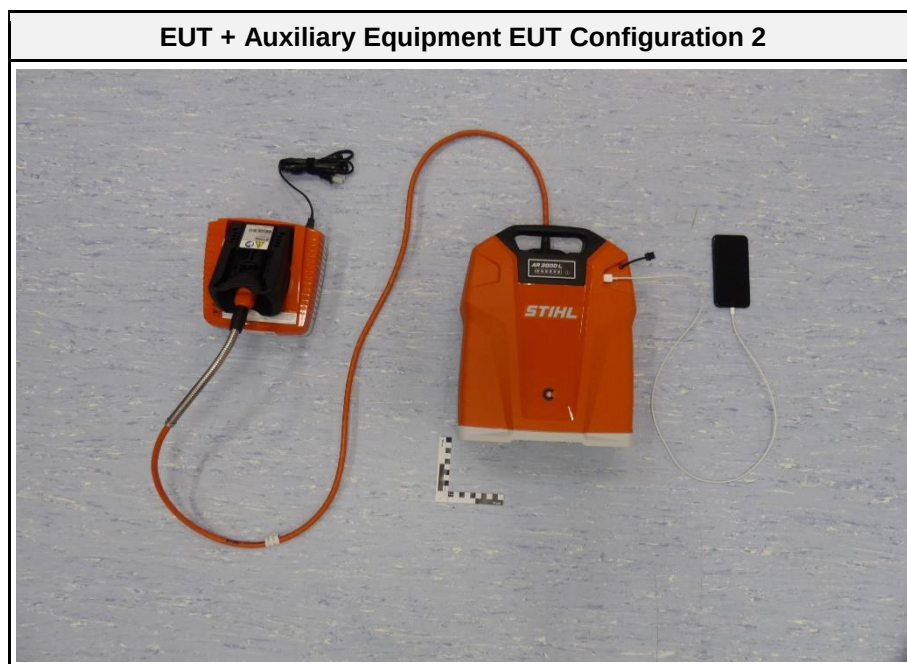
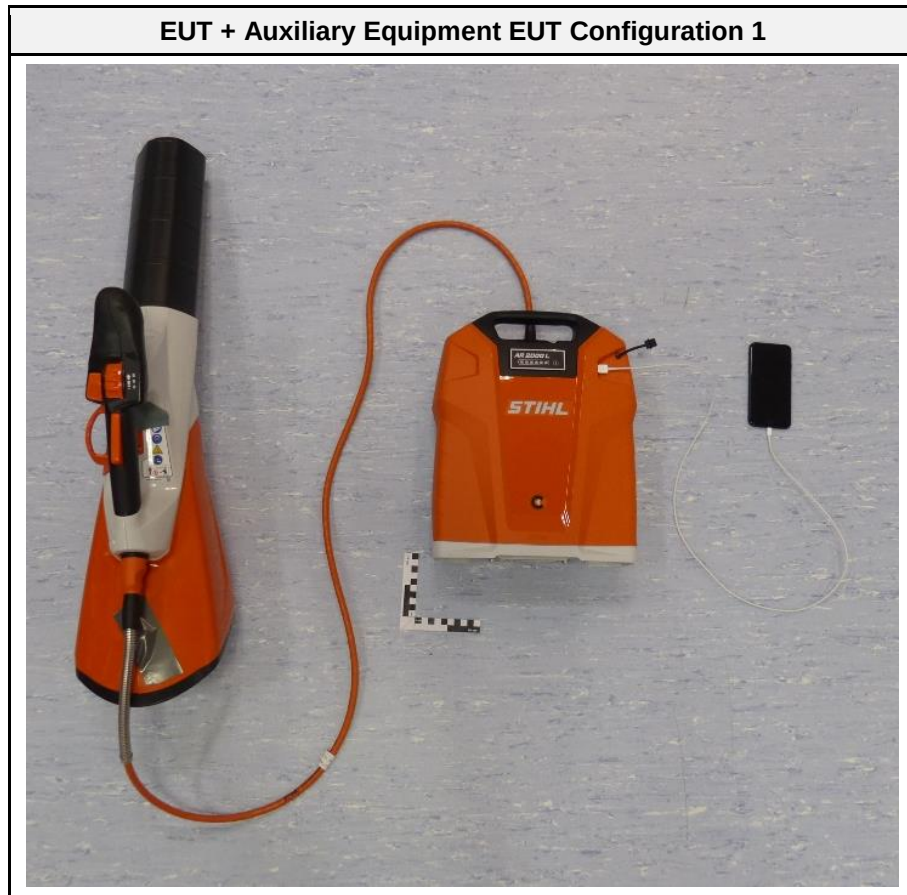
Name	Type	Attributes	Comment
Power	AC	Count: 1 Cable length [m]: 2 Direction: IO Service only: No Shielded: No	Charger
Power	DC	Count: 1 Cable length [m]: 0 Direction: IO Service only: No Shielded: No	-
USB	DC	Count: 1 Cable length [m]: 5 Direction: IO Service only: No Shielded: No	Only Charging port
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 (provide by customer)





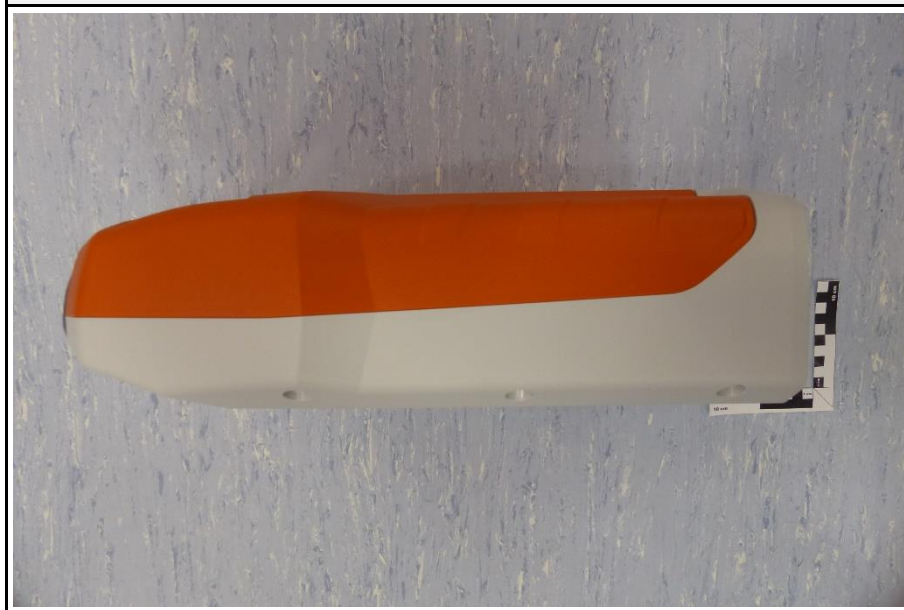
1.3 Equipment Photos - External



EUT FRONT



EUT LEFT



EUT RIGHT



EUT TOP



EUT BACK



EUT BOTTOM



EUT USB-Port



EUT Label 1



EUT Label 2

4871-400-6510-C Var: 11 Rev: 04 | V
AKKUMULATOR
 AR 2000 L FuSi;V-Serie;Samsung 48G;10s6p; HW: 03.12; SW
 Applikation): 00.11; SW (Bootloader): 01.01 ;
 Parameterversion: 3, EU-Ausführung
 +1250A1; +1251A1; +4851B*; +4852A*; +4853*; +4857A*; +4859A*;
 +4863A*; +4864A1; +4866A1; +4867A*; +4869A*; +4871A2;
 '0090136235) ANDREAS STIHL D2 Anlage: 16.06.2021

Stand: 17.06.2021

Charger



Charger Label



1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
CBL	Connection cable for power transmission for accumulators AR L	STIHL	-	1.8m
CBL	USB	-	-	-
AE	iPhone	Apple	iPhone SE / MX9R2ZD/A	-
AE	Leaf blower	STIHL	BGA 200	-
AE	Adapter AP for power transmission from devices with battery bay	STIHL	-	-
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
MON	Monitoring Equipment			
CBL	Connecting Cable			
Comment:				

1.5 Operational Modes

Mode #	Description
1	EUT powered Leaf blower and charge iPhone. Leaf blower operates continuous with low blower level. Bluetooth Low Energy Connection between EUT and iPhone. Status information from EUT were transmitted via Bluetooth Low Energy to iPhone
2	Charging. Bluetooth Low Energy Connection between EUT and iPhone. Status information from EUT were transmitted via Bluetooth Low Energy to iPhone
Comment:	

1.6 EUT Configuration

Configuration #	Description
1	EUT assembled with connection cable to leaf blower. iPhone connected with USB wire, to EUT USB-Port, for charging
2	EUT assembled with connection cable and Adapter AP. Adapter AP is placed in charger. iPhone connected with USB wire, to EUT USB-Port, for charging
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:				

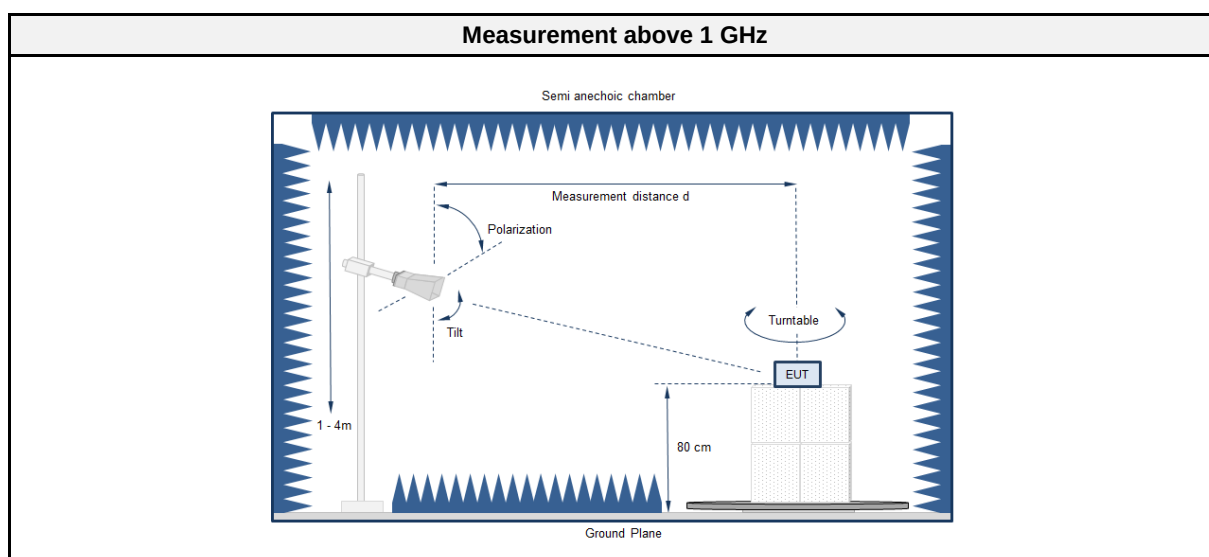
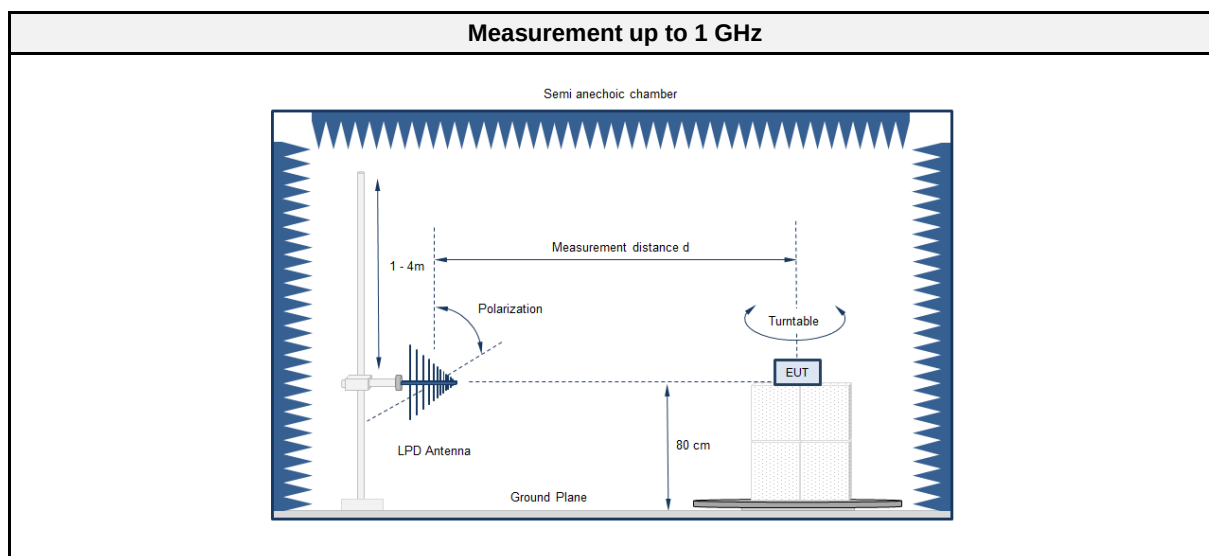
Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

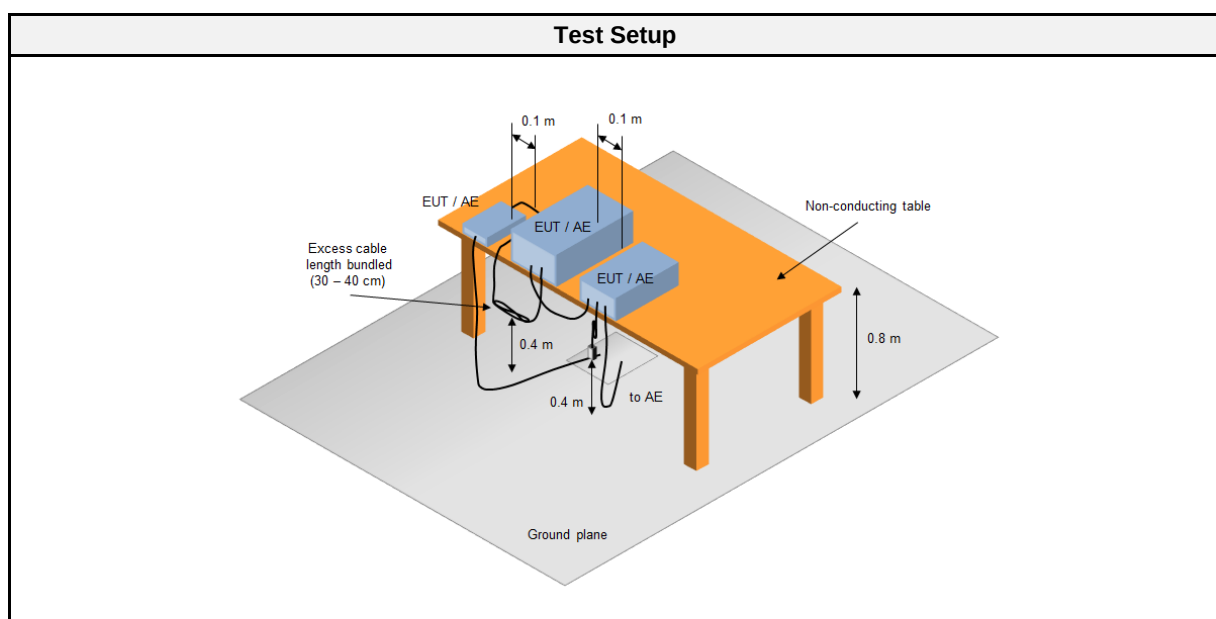
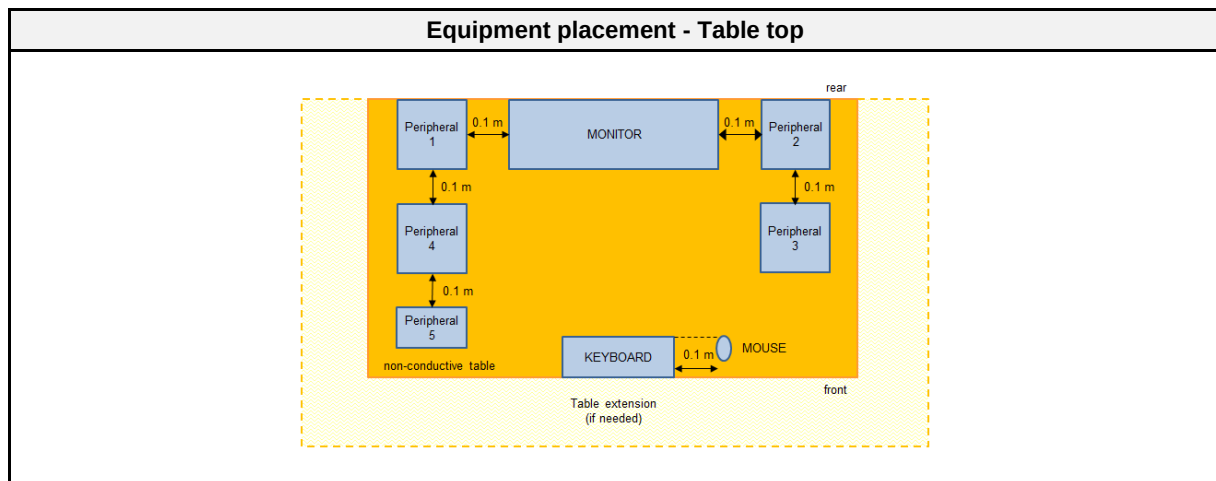
2.1 Test Conditions and Results - Radiated emissions acc. to ANSI C63.4

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]	2480
Measurement range	30 MHz to 12400 MHz
Temperature [°C]	21 ±3
Humidity [%]	48 ±3
Operator	Matthias Handrik
Date	2021-08-30 - 2021-09-03

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 (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.

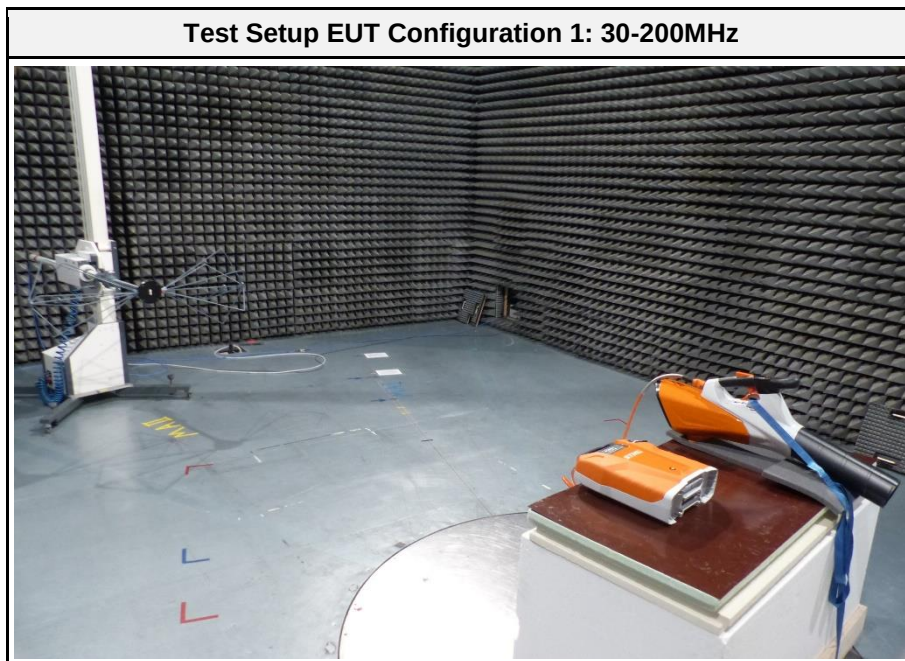
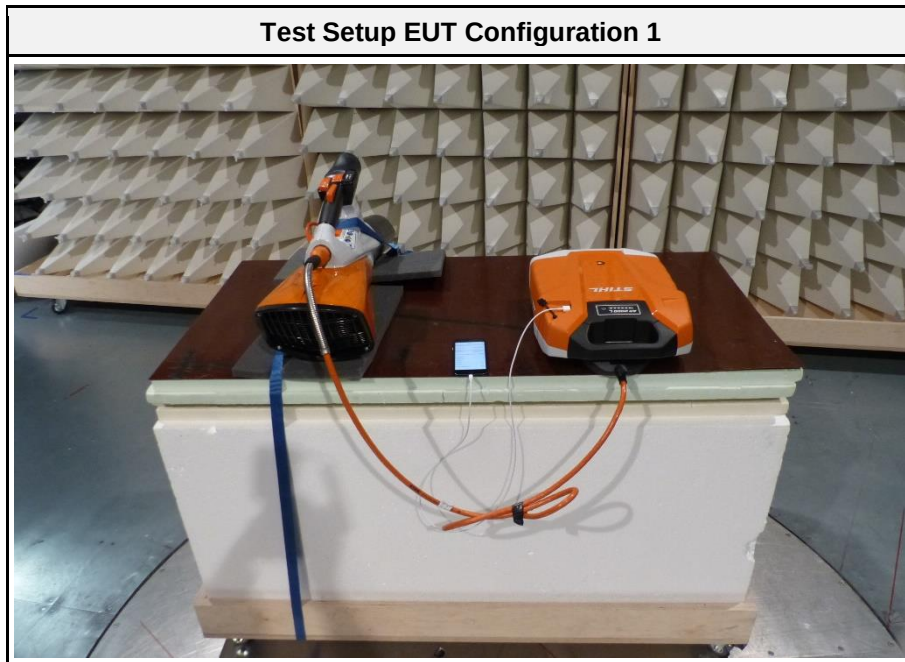
2.1.5 Limits

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

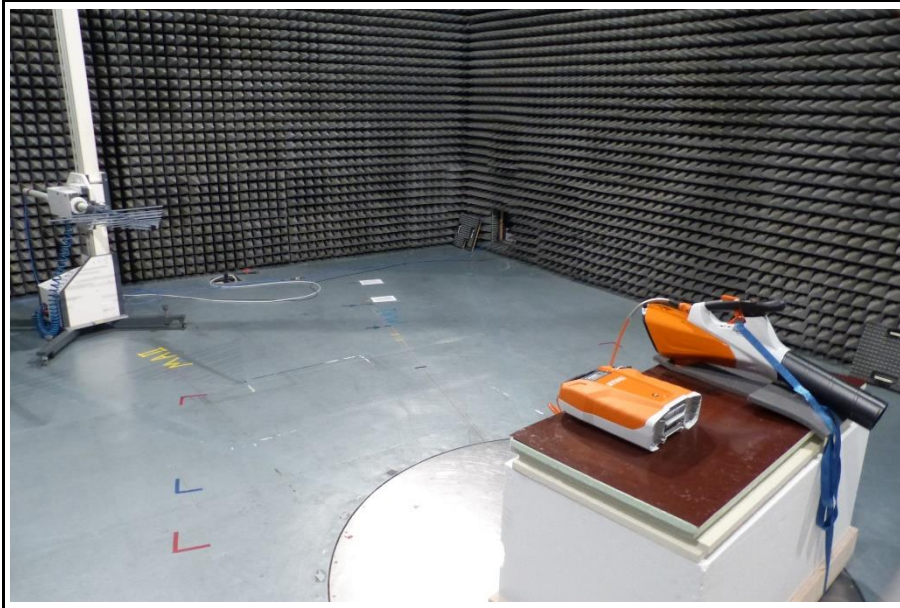
2.1.6 Results

Test Results			
Operational mode	EUT Configuration	Verdict	Remark
1	1	PASS	-
2	2	PASS	-

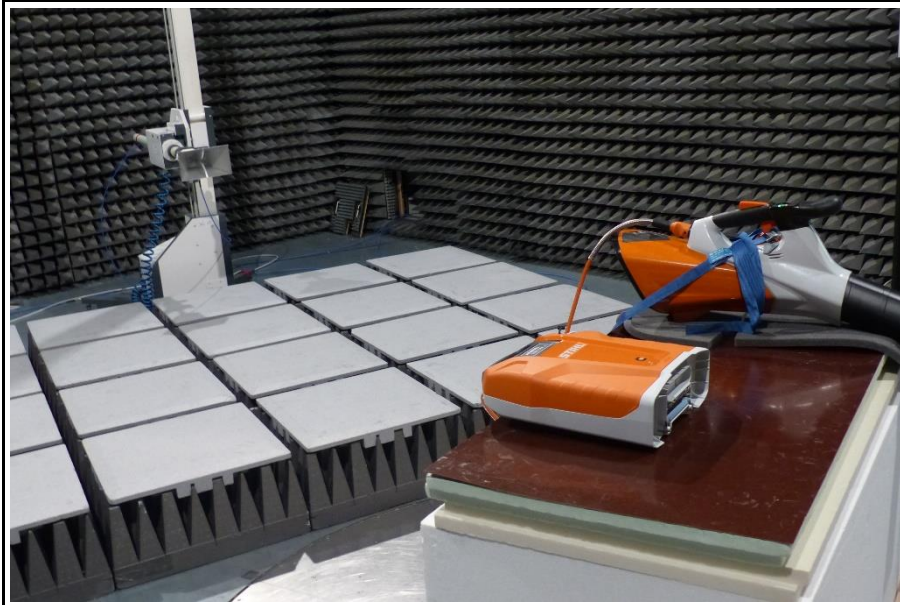
2.1.7 Setup Photos



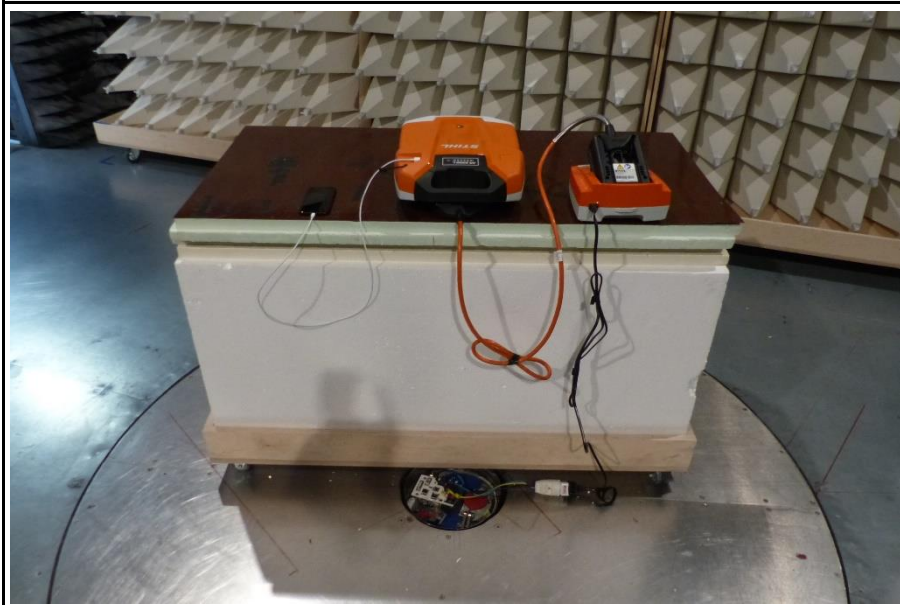
Test Setup EUT Configuration 1: 200-1000MHz



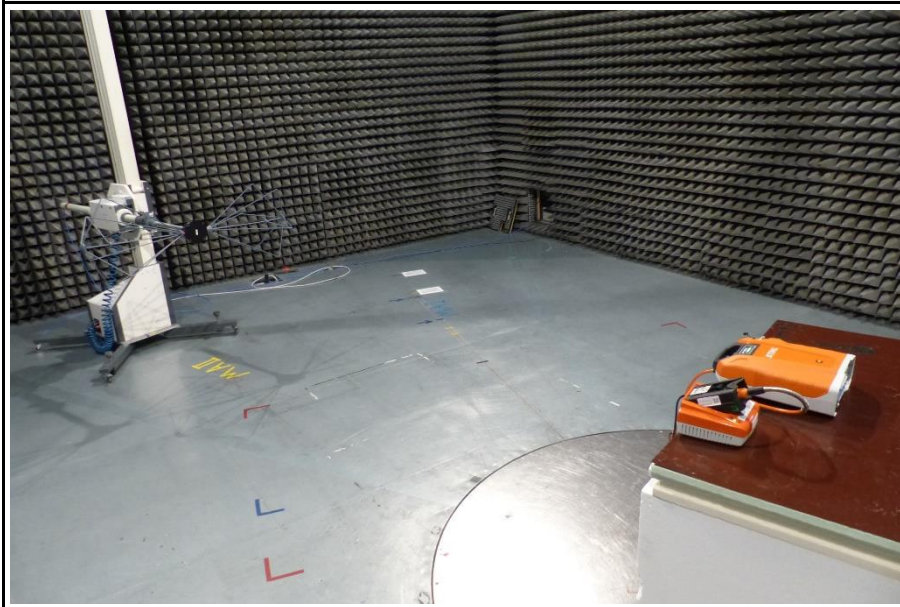
Test Setup EUT Configuration 1: 1-13GHz



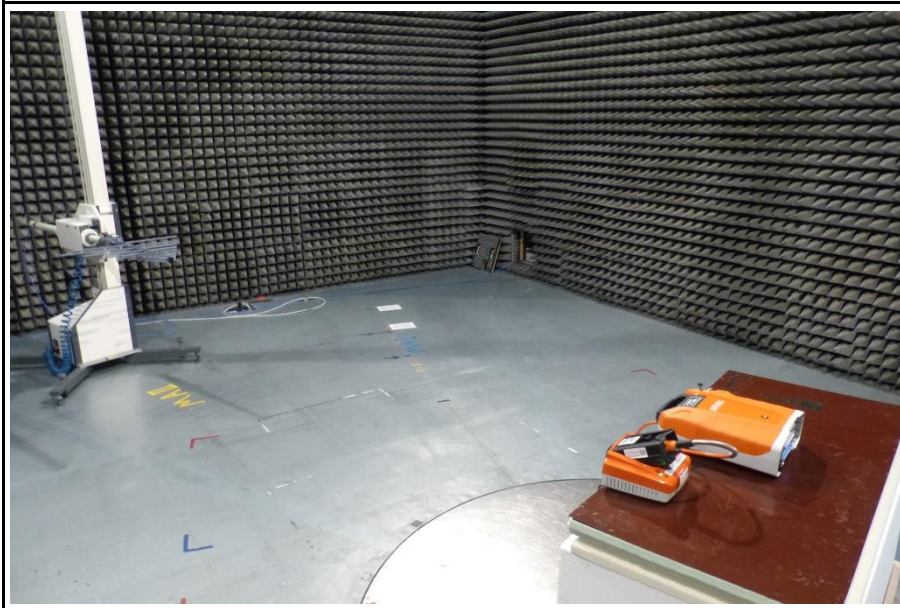
Test Setup EUT Configuration 2



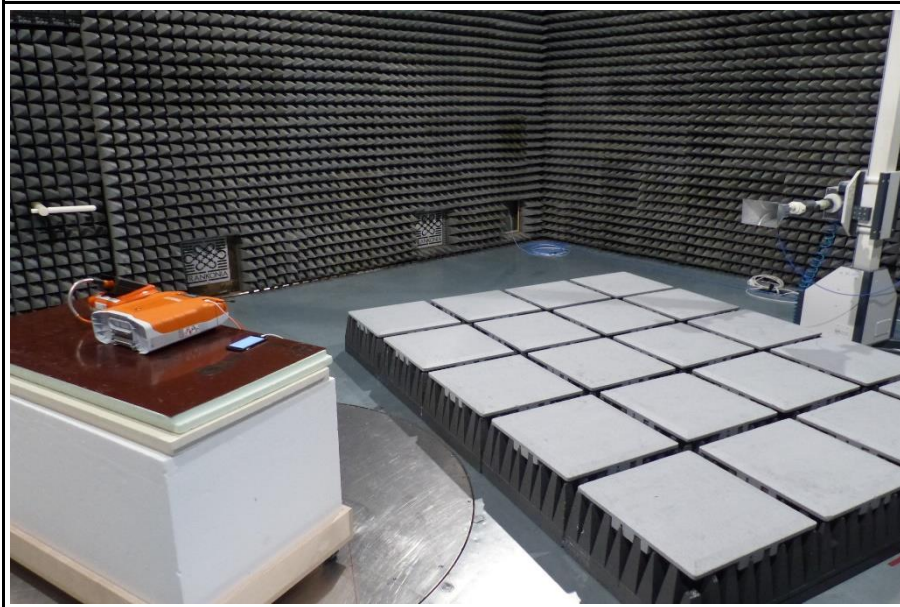
Test Setup EUT Configuration 2: 30-200MHz



Test Setup EUT Configuration 2: 200-1000MHz



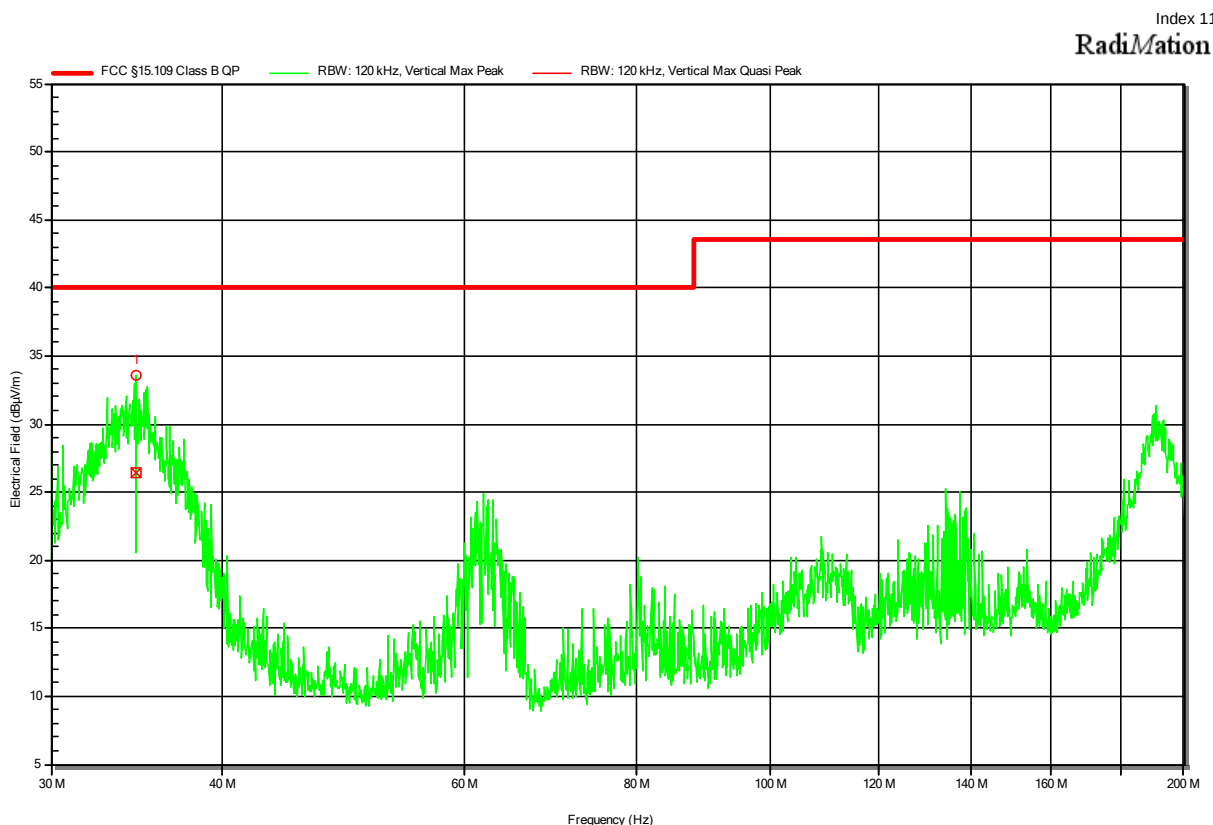
Test Setup EUT Configuration 2: 1-13 GHz



2.1.8 Records

Radiated emissions according to FCC part 15B

Project Number: G0M-2106-9857
 Applicant: ANDREAS STIHL AG & Co. KG
 Model Description: battery pack 4871 AR-C
 Model: AR 2000 L
 Test Sample ID: 35704
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Handrik
 Test Date: 2021-09-01
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 36V DC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement Distance: 3m
 Operational Mode & 1
 EUT Configuration: 1
 Note 1:



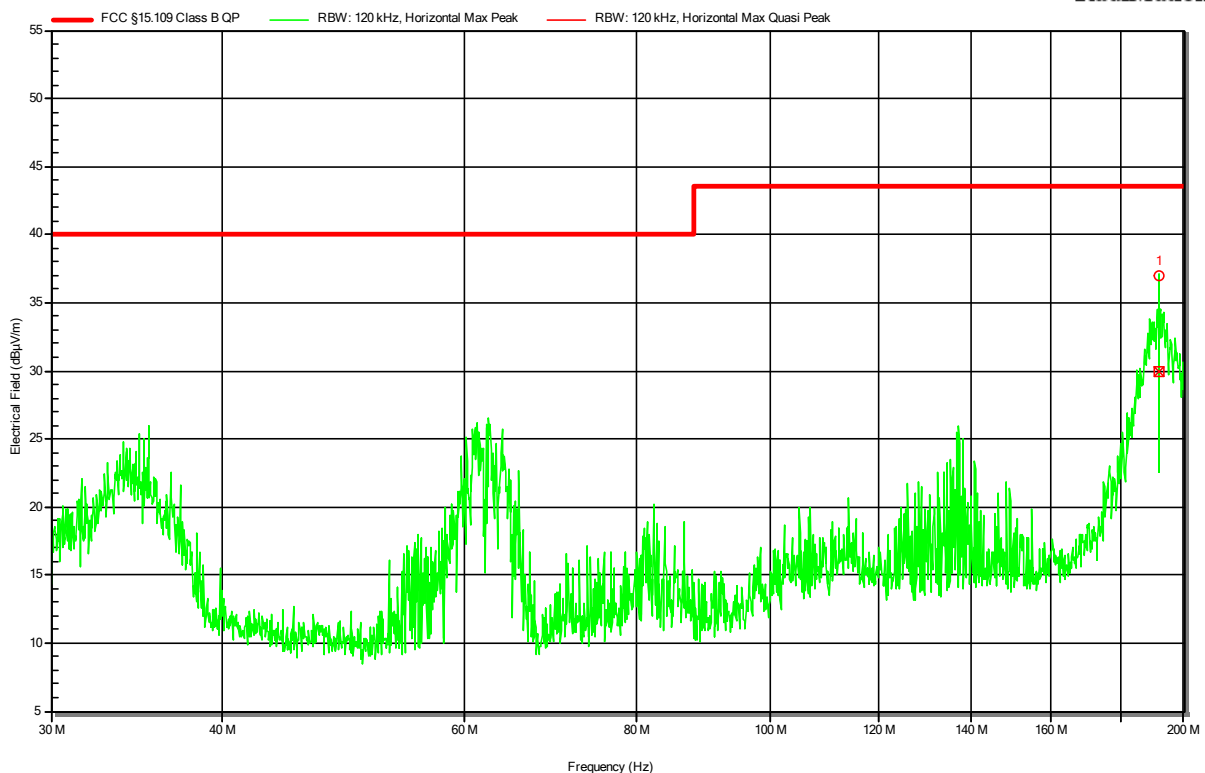
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	34.594 MHz	26.41 dBµV/m	40 dBµV/m	-13.59 dB	Pass	-117 degrees	1 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2106-9857
 Applicant: ANDREAS STIHL AG & Co. KG
 Model Description: battery pack 4871 AR-C
 Model: AR 2000 L
 Test Sample ID: 35704
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Handrik
 Test Date: 2021-09-01
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 36V DC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement Distance: 3m
 Operational Mode & 1
 EUT Configuration: 1
 Note 1:

Index 15

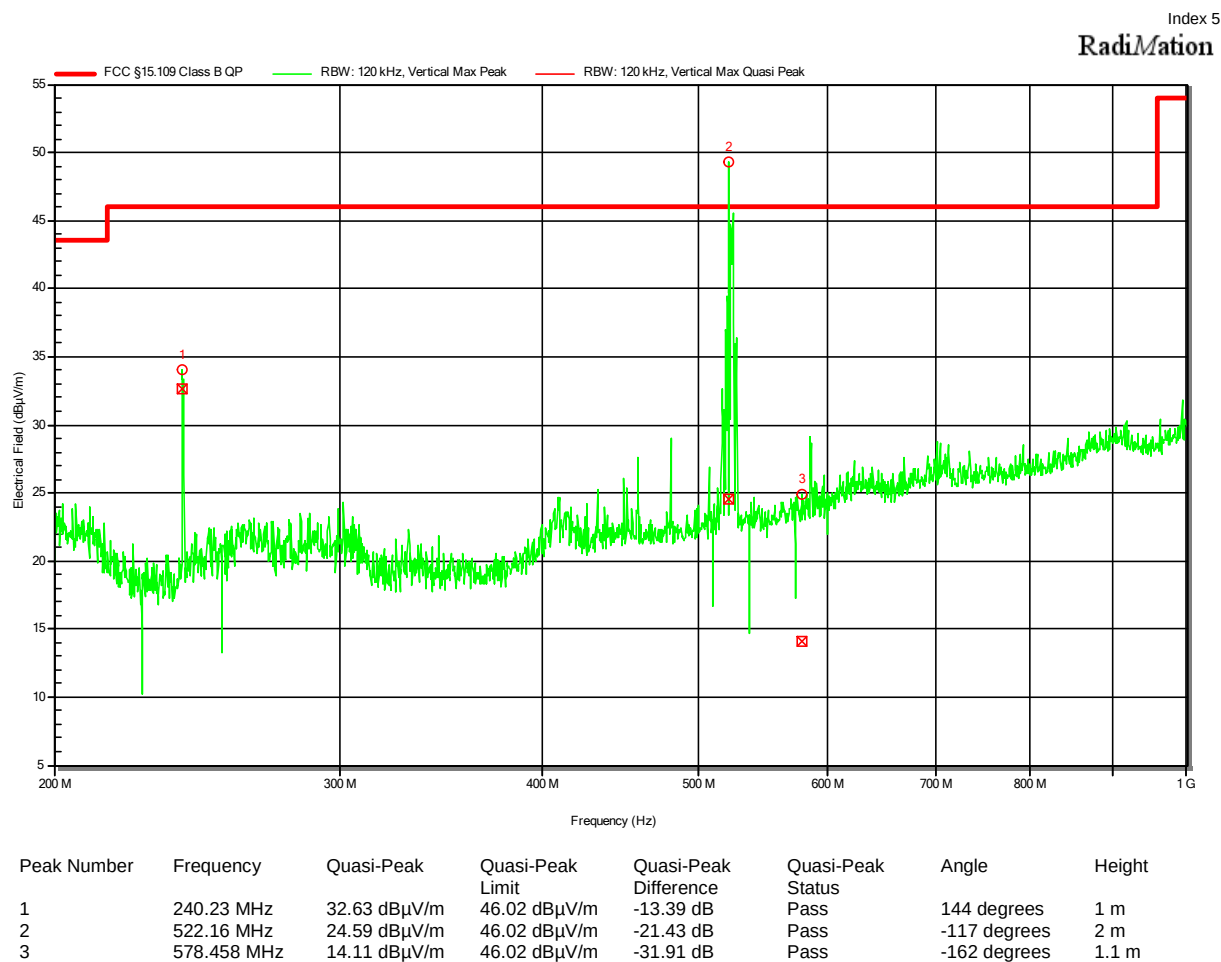
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	191.866 MHz	29.93 dBµV/m	43.52 dBµV/m	-13.59 dB	Pass	-108 degrees	1.25 m

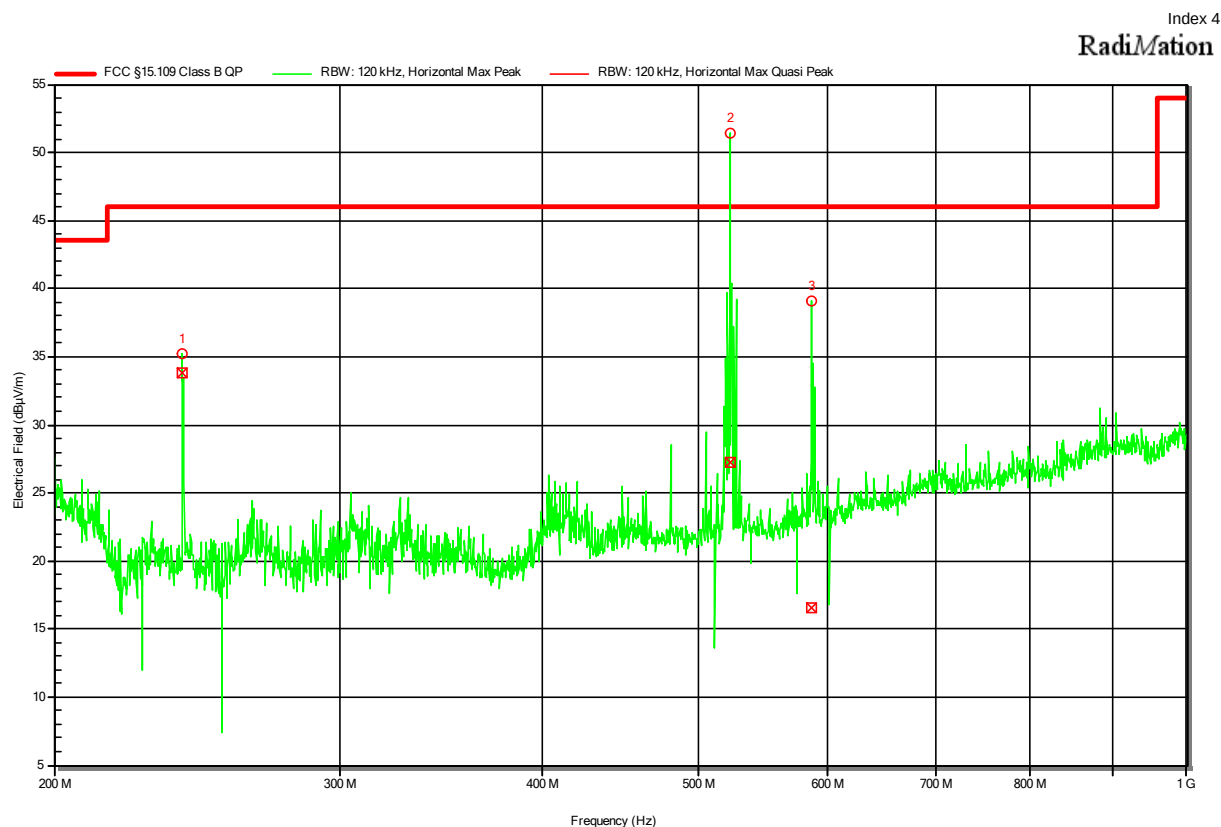
**Radiated emissions
according to FCC part 15B**

Project Number: G0M-2106-9857
 Applicant: ANDREAS STIHL AG & Co. KG
 Model Description: battery pack 4871 AR-C
 Model: AR 2000 L
 Test Sample ID: 35704
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Handrik
 Test Date: 2021-08-30
 Operating Conditions: ambient temperature: 22 °Celsius
 power input: 36V DC
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement Distance: 3m
 Operational Mode & EUT Configuration: 1
 Note 1:



Radiated emissions according to FCC part 15B

Project Number: G0M-2106-9857
Applicant: ANDREAS STIHL AG & Co. KG
Model Description: battery pack 4871 AR-C
Model: AR 2000 L
Test Sample ID: 35704
Test Site: Eurofins Product Service GmbH
Operator: Mr. Handrik
Test Date: 2021-08-30
Operating Conditions: ambient temperature: 22 °Celsius
power input: 36V DC
Antenna: Rohde & Schwarz HL 223, Horizontal
Measurement Distance: 3m
Operational Mode & 1
EUT Configuration: 1
Note 1:



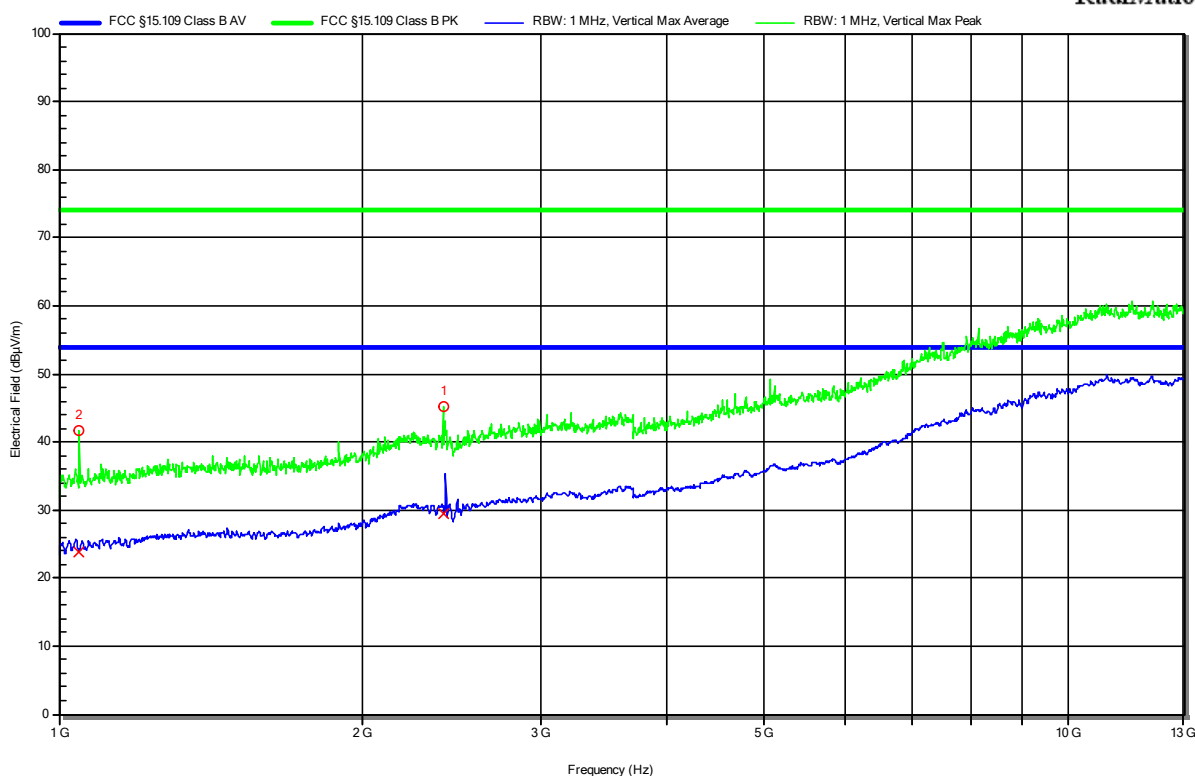
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	240.237 MHz	33.81 dBµV/m	46.02 dBµV/m	-12.21 dB	Pass	-117 degrees	1.25 m
2	523.245 MHz	27.23 dBµV/m	46.02 dBµV/m	-18.79 dB	Pass	-54 degrees	2.25 m
3	586.215 MHz	16.53 dBµV/m	46.02 dBµV/m	-29.49 dB	Pass	-36 degrees	3.2 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2106-9857
 Applicant: ANDREAS STIHL AG & Co. KG
 Model Description: battery pack 4871 AR-C
 Model: AR 2000 L
 Test Sample ID: 35704
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Handrik
 Test Date: 2021-09-03
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 36V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement Distance: 3m
 Operational Mode & EUT Configuration: 1
 Note 1: 2.4GHz Notchfilter

Index 24

RadiMation



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.403 GHz	45.21 dBμV/m	Bluetooth Low Energy Carrier				
2	1.047 GHz	41.6 dBμV/m	73.98 dBμV/m	-32.38 dB	Pass	0 degrees	1 m

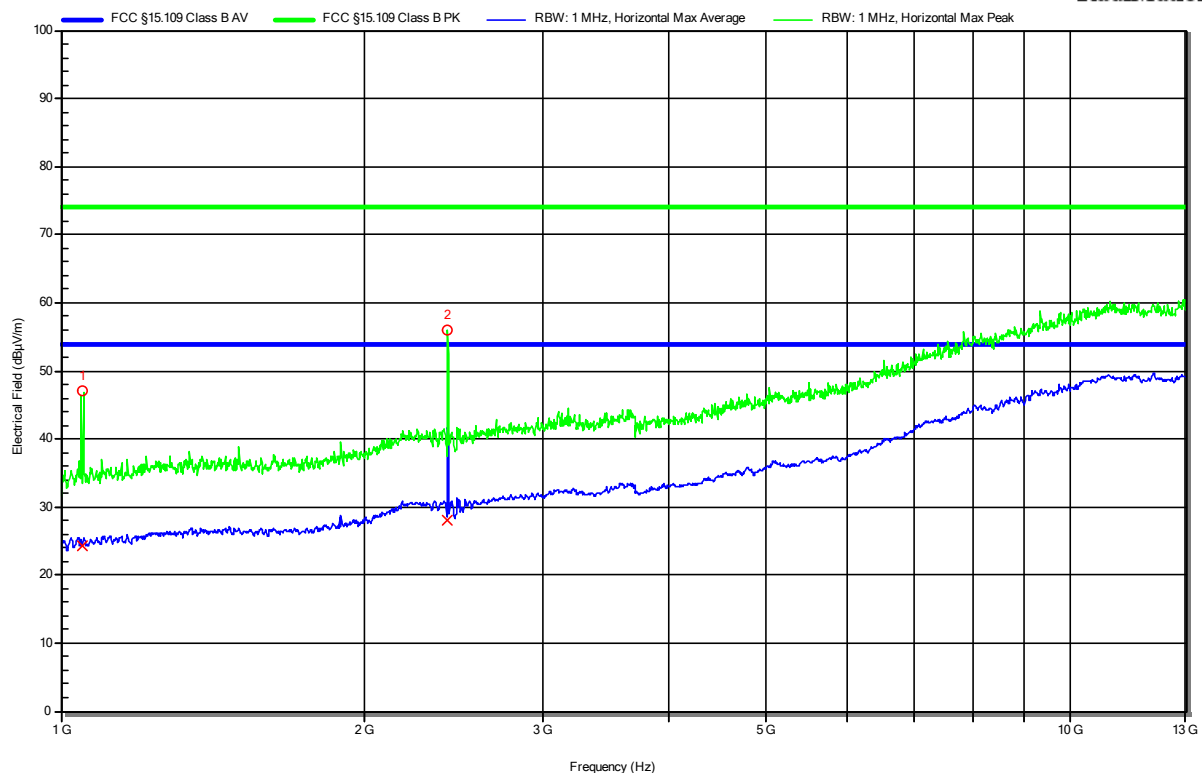
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	2.403 GHz	29.35 dBμV/m	Bluetooth Low Energy Carrier				
2	1.047 GHz	23.73 dBμV/m	53.98 dBμV/m	-30.25 dB	Pass	0 degrees	1 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2106-9857
 Applicant: ANDREAS STIHL AG & Co. KG
 Model Description: battery pack 4871 AR-C
 Model: AR 2000 L
 Test Sample ID: 35704
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Handrik
 Test Date: 2021-09-03
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 36V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement Distance: 3m
 Operational Mode & EUT Configuration: 1
 Note 1: 2.4GHz Notchfilter

Index 26

RadiMation



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.052 GHz	46.96 dBμV/m	73.98 dBμV/m	-27.02 dB	Pass	0 degrees	1 m
2	2.414 GHz	56.09 dBμV/m	Bluetooth Low Energy Carrier				

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.052 GHz	24.34 dBμV/m	53.98 dBμV/m	-29.64 dB	Pass	0 degrees	1 m
2	2.414 GHz	28.13 dBμV/m	Bluetooth Low Energy Carrier				

Test Report No.: G0M-2106-9857-EF0115B-V01

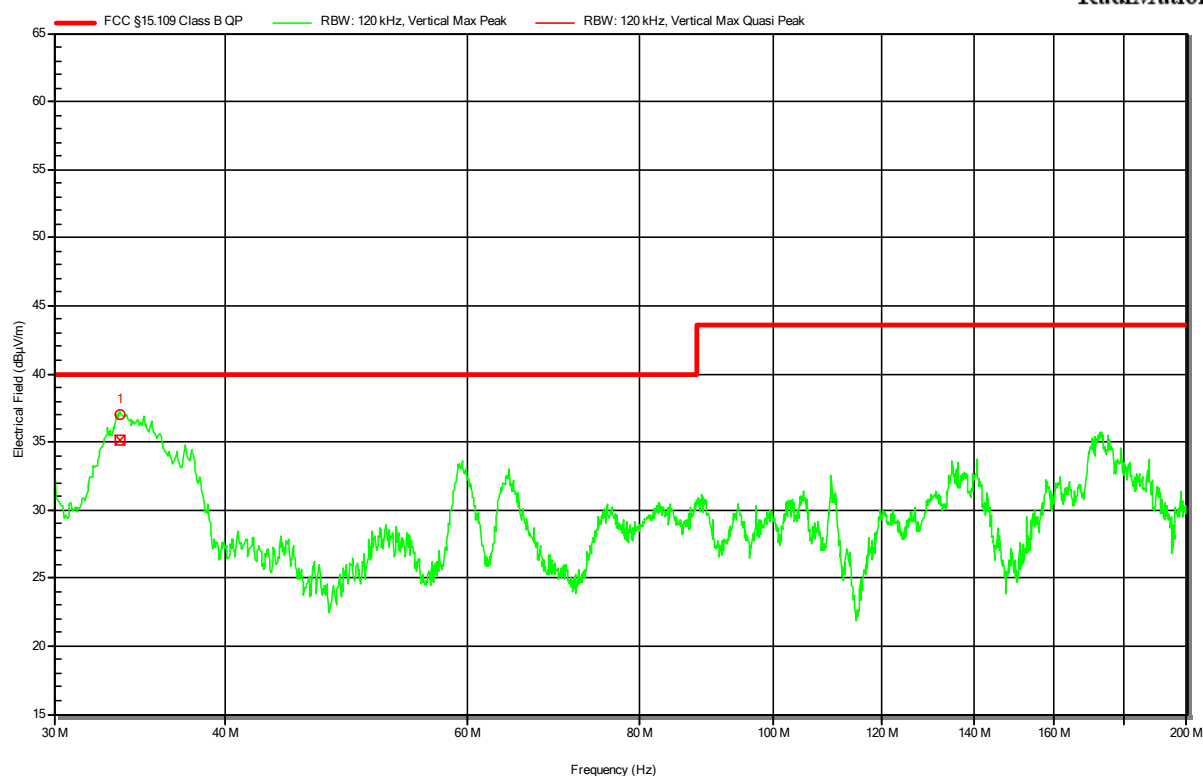
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated emissions according to FCC part 15B

Project Number: G0M-2106-9857
Applicant: ANDREAS STIHL AG & Co. KG
Model Description: battery pack 4871 AR-C
Model: AR 2000 L
Test Sample ID: 35704
Test Site: Eurofins Product Service GmbH
Operator: Mr. Handrik
Test Date: 2021-09-01
Operating Conditions: ambient temperature: 21 °Celsius
power input: 120V AC / 60Hz
Antenna: Rohde & Schwarz HK 116, Vertical
Measurement Distance: 3m
Operational Mode & 2
EUT Configuration: 2
Note 1:

Index 16

RadiMation



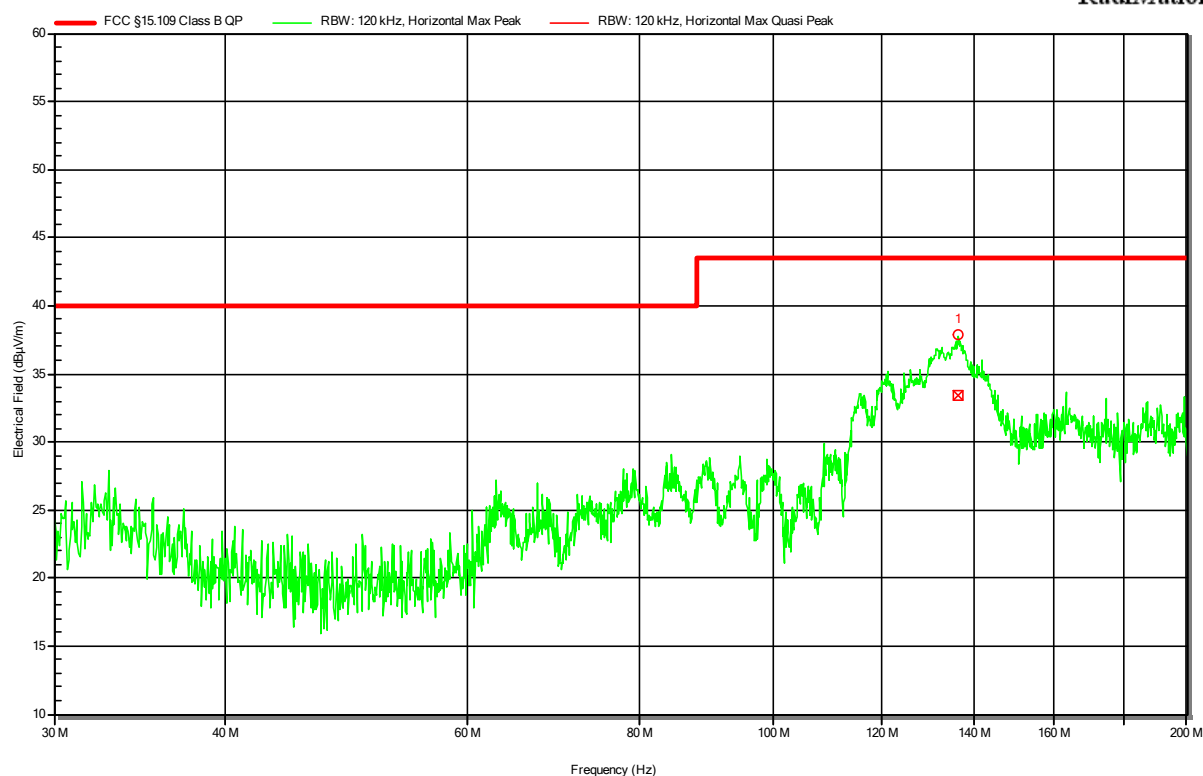
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	33.501 MHz	35.1 dBµV/m	40 dBµV/m	-4.9 dB	Pass	180 degrees	1 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2106-9857
 Applicant: ANDREAS STIHL AG & Co. KG
 Model Description: battery pack 4871 AR-C
 Model: AR 2000 L
 Test Sample ID: 35704
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Handrik
 Test Date: 2021-09-01
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 120V AC / 60Hz
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement Distance: 3m
 Operational Mode & EUT Configuration: 2
 Note 1:

Index 17

RadiMation



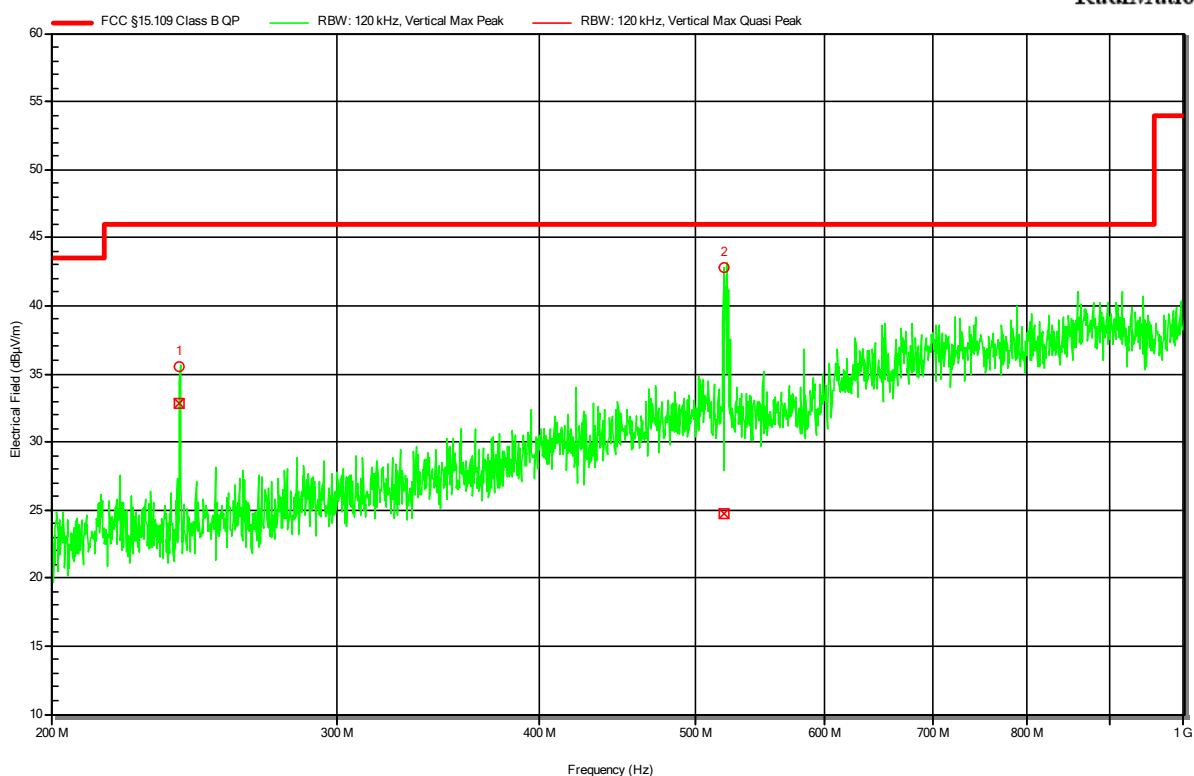
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	136.48 MHz	33.38 dBµV/m	43.52 dBµV/m	-10.14 dB	Pass	130 degrees	2.3 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2106-9857
Applicant: ANDREAS STIHL AG & Co. KG
Model Description: battery pack 4871 AR-C
Model: AR 2000 L
Test Sample ID: 35704
Test Site: Eurofins Product Service GmbH
Operator: Mr. Handrik
Test Date: 2021-09-01
Operating Conditions: ambient temperature: 21 °Celsius
power input: 120V AC / 60Hz
Antenna: Rohde & Schwarz HL 223, Vertical
Measurement Distance: 3m
Operational Mode & EUT Configuration: 2
Note 1:

Index 18

Radiation



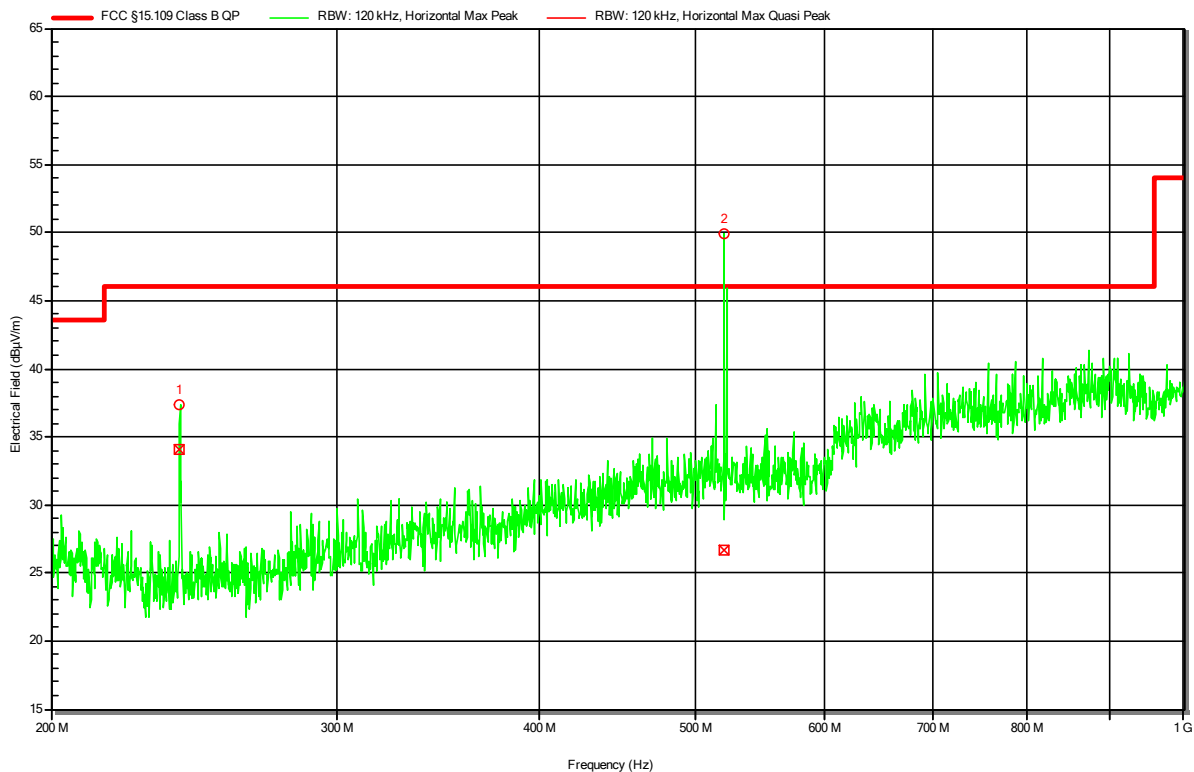
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	240.186 MHz	32.84 dBµV/m	46.02 dBµV/m	-13.18 dB	Pass	-50 degrees	1 m
2	520.805 MHz	24.69 dBµV/m	46.02 dBµV/m	-21.33 dB	Pass	-50 degrees	1 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2106-9857
 Applicant: ANDREAS STIHL AG & Co. KG
 Model Description: battery pack 4871 AR-C
 Model: AR 2000 L
 Test Sample ID: 35704
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Handrik
 Test Date: 2021-09-01
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 120V AC / 60Hz
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement Distance: 3m
 Operational Mode & EUT Configuration: 2
 Note 1:

Index 19

RadiMation



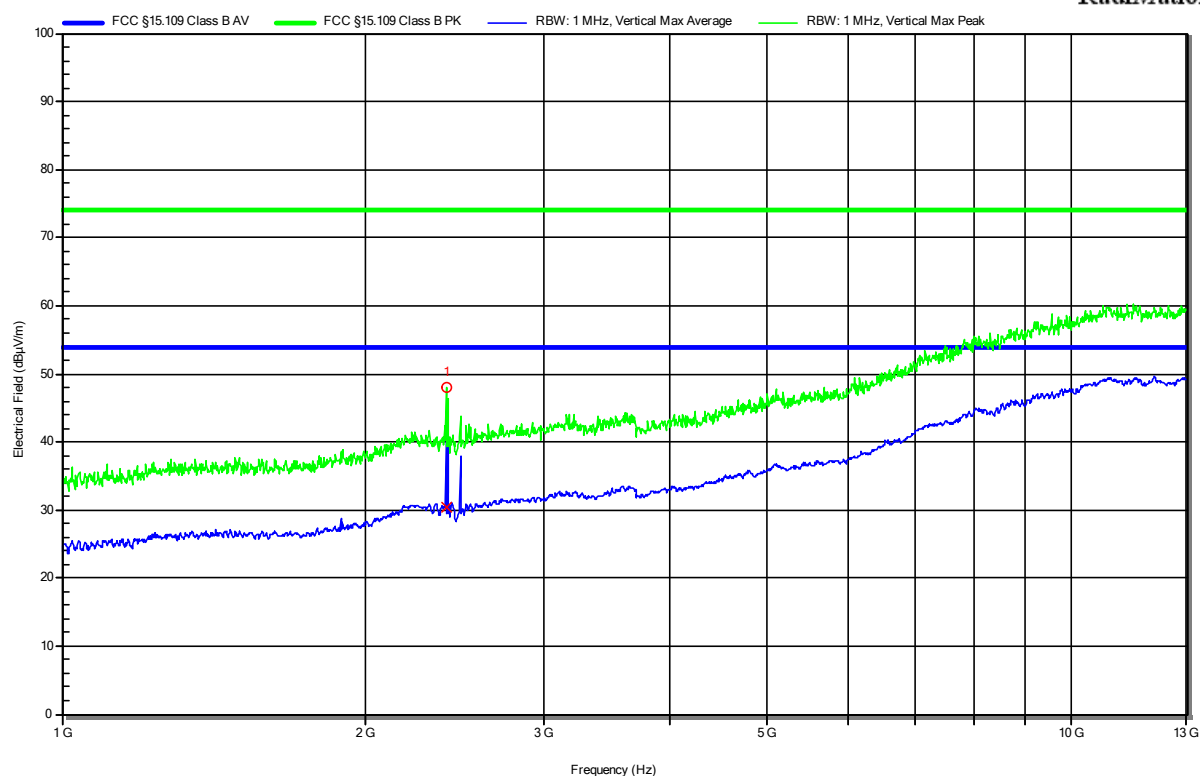
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	240.168 MHz	34.07 dBμV/m	46.02 dBμV/m	-11.95 dB	Pass	-130 degrees	1.3 m
2	520.745 MHz	26.7 dBμV/m	46.02 dBμV/m	-19.32 dB	Pass	-130 degrees	1.3 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2106-9857
 Applicant: ANDREAS STIHL AG & Co. KG
 Model Description: battery pack 4871 AR-C
 Model: AR 2000 L
 Test Sample ID: 35704
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Handrik
 Test Date: 2021-09-03
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: 120V AC / 60Hz
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement Distance: 3m
 Operational Mode & EUT Configuration: 2
 Note 1: 2.4GHz Notchfilter

Index 32

RadiMation



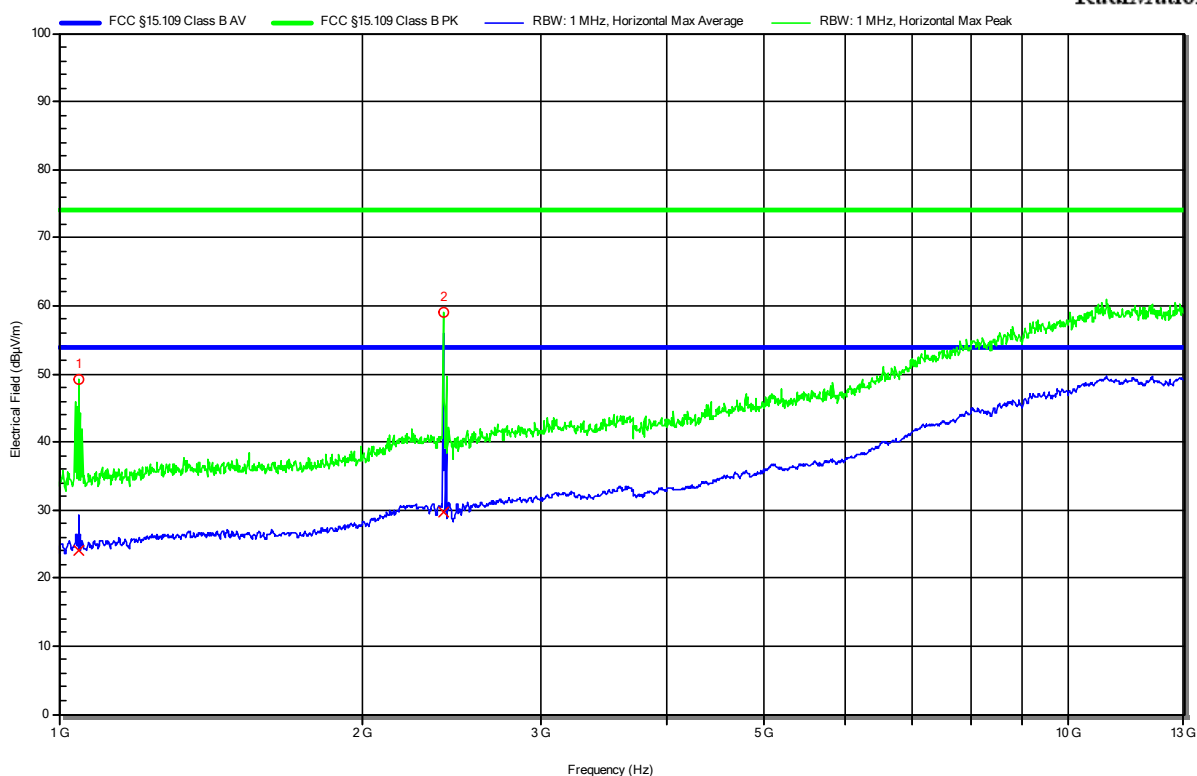
Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.401 GHz	48 dBμV/m	Bluetooth Low Energy carrier				

Radiated emissions according to FCC part 15B

Project Number: G0M-2106-9857
Applicant: ANDREAS STIHL AG & Co. KG
Model Description: battery pack 4871 AR-C
Model: AR 2000 L
Test Sample ID: 35704
Test Site: Eurofins Product Service GmbH
Operator: Mr. Handrik
Test Date: 2021-09-03
Operating Conditions: ambient temperature: 21 °Celsius
power input: 120V AC / 60Hz
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance: 3m
Operational Mode & EUT Configuration: 2
Note 1: 2.4GHz Notchfilter

Index 31

RadiMation



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.046 GHz	49.28 dBμV/m	73.98 dBμV/m	-24.69 dB	Pass	60 degrees	1 m
2	2.402 GHz	58.99 dBμV/m	Bluetooth Low Energy carrier				

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.046 GHz	23.99 dBμV/m	53.98 dBμV/m	-29.98 dB	Pass	60 degrees	1 m
2	2.402 GHz	29.77 dBμV/m	Bluetooth Low Energy carrier				

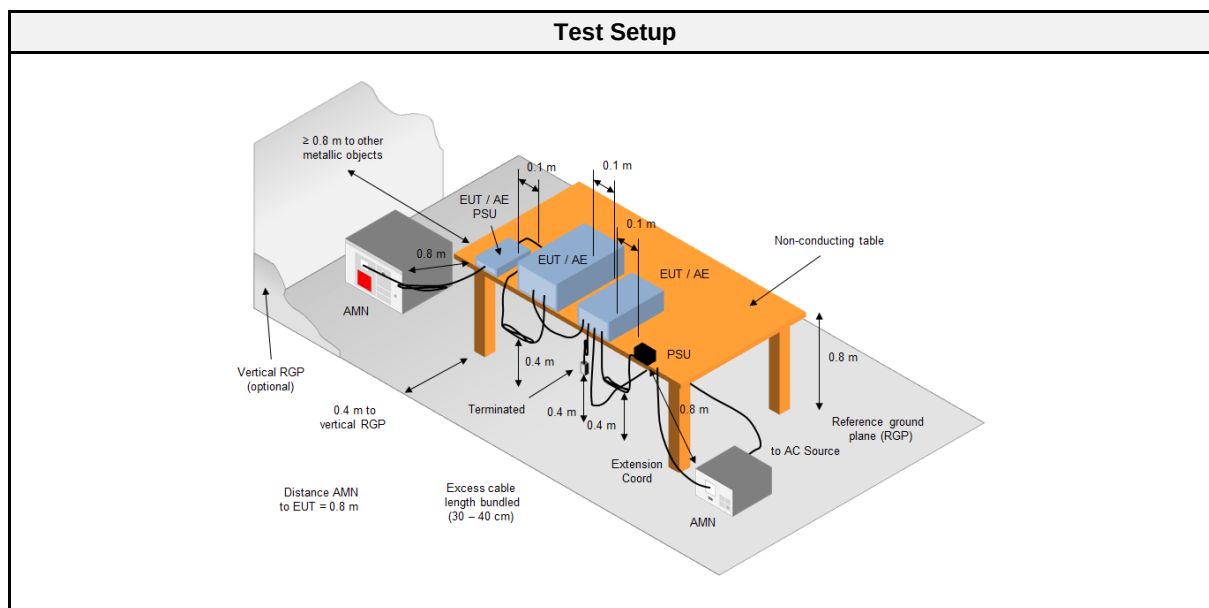
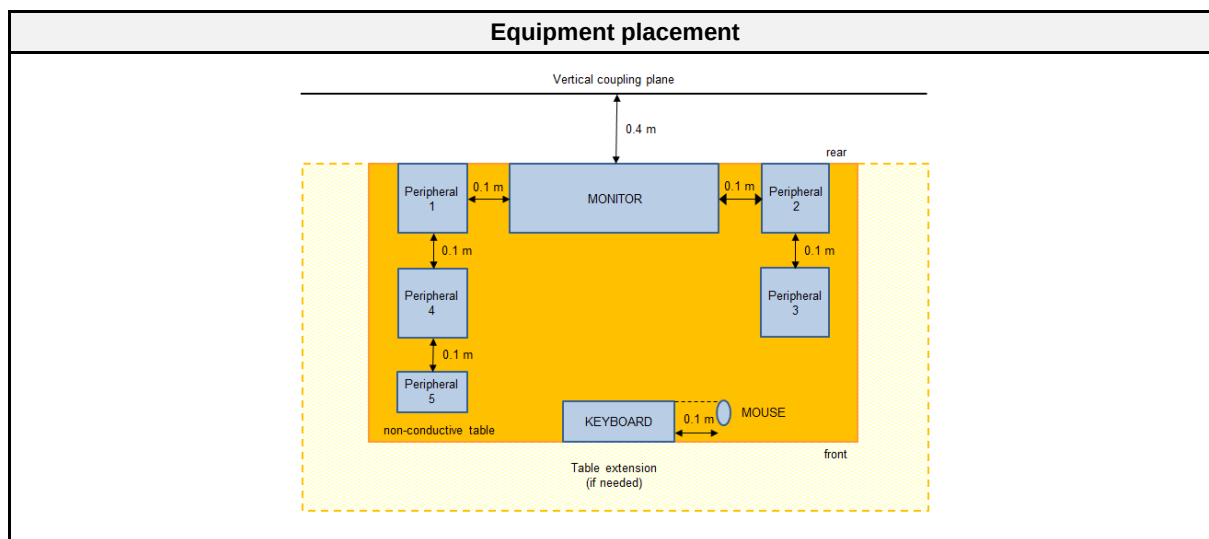
Test Report No.: G0M-2106-9857-EF0115B-V01

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

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]	22 ±3
Humidity [%]	52 ±3
Operator	Matthias Handrik
Date	2021-08-31

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
AC & DC Power Supply	Chroma ATE Inc.	61604	EF01380	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

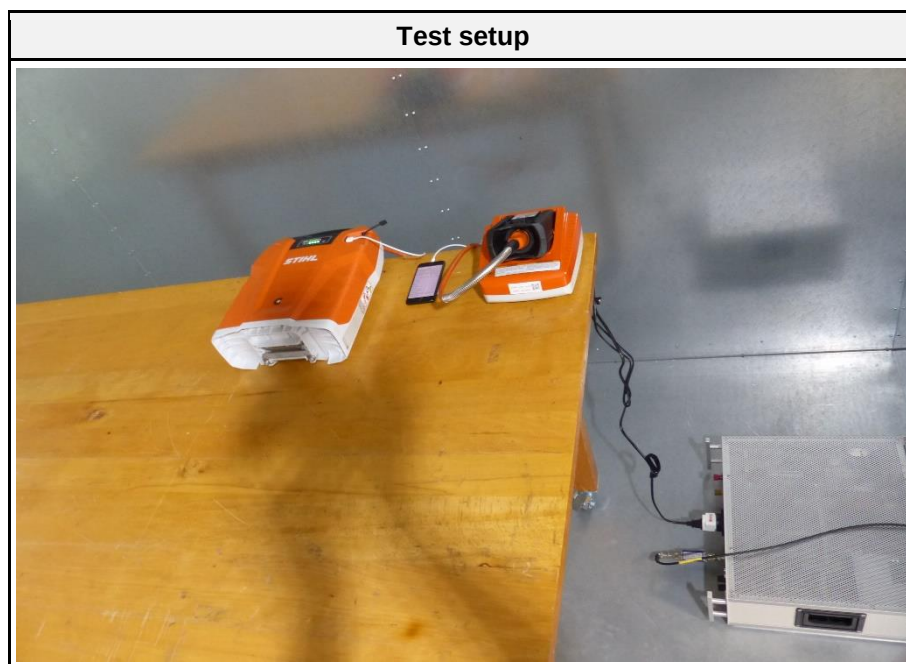
2.2.5 Limits

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
Power	AMN	2	2	PASS	-

2.2.7 Setup Photos



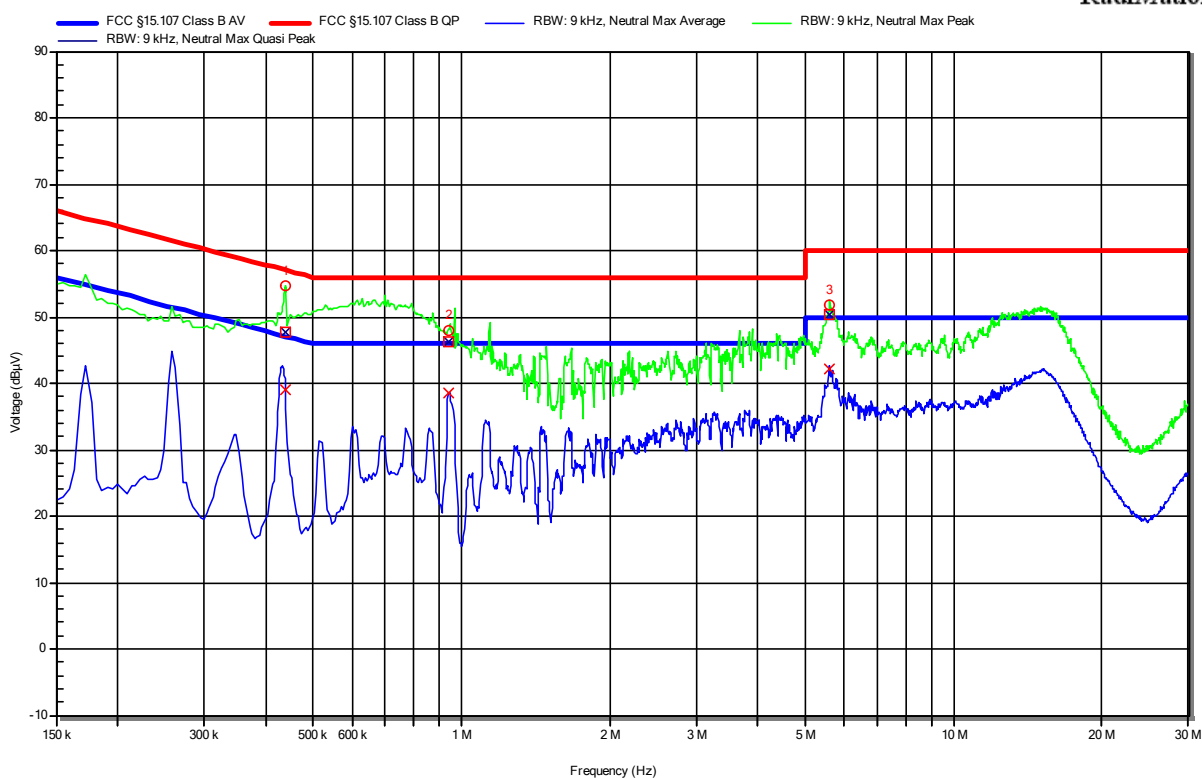
2.2.8 Records

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

Project Number: G0M-2106-9857
 Applicant: ANDREAS STIHL AG & Co. KG
 Model Description: battery pack 4871 AR-C
 Model: AR 2000 L
 Test Sample ID: 35704
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Handrik
 Test Date: 2021-08-31
 Operating Conditions: ambient temperature: 22 °Celsius
 power input: 120V AC / 60Hz
 LISN: Schwarzbeck NSLK 8127 RC N
 Operational Mode & EUT Configuration: 2
 Applied to Port: AC-Mains
 Note 1:

Index 6

RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	438.183 kHz	47.68 dBμV	57.1 dBμV	-9.42 dB	Pass	Neutral
2	941.958 kHz	46.2 dBμV	56 dBμV	-9.8 dB	Pass	Neutral
3	5.6 MHz	50.25 dBμV	60 dBμV	-9.75 dB	Pass	Neutral

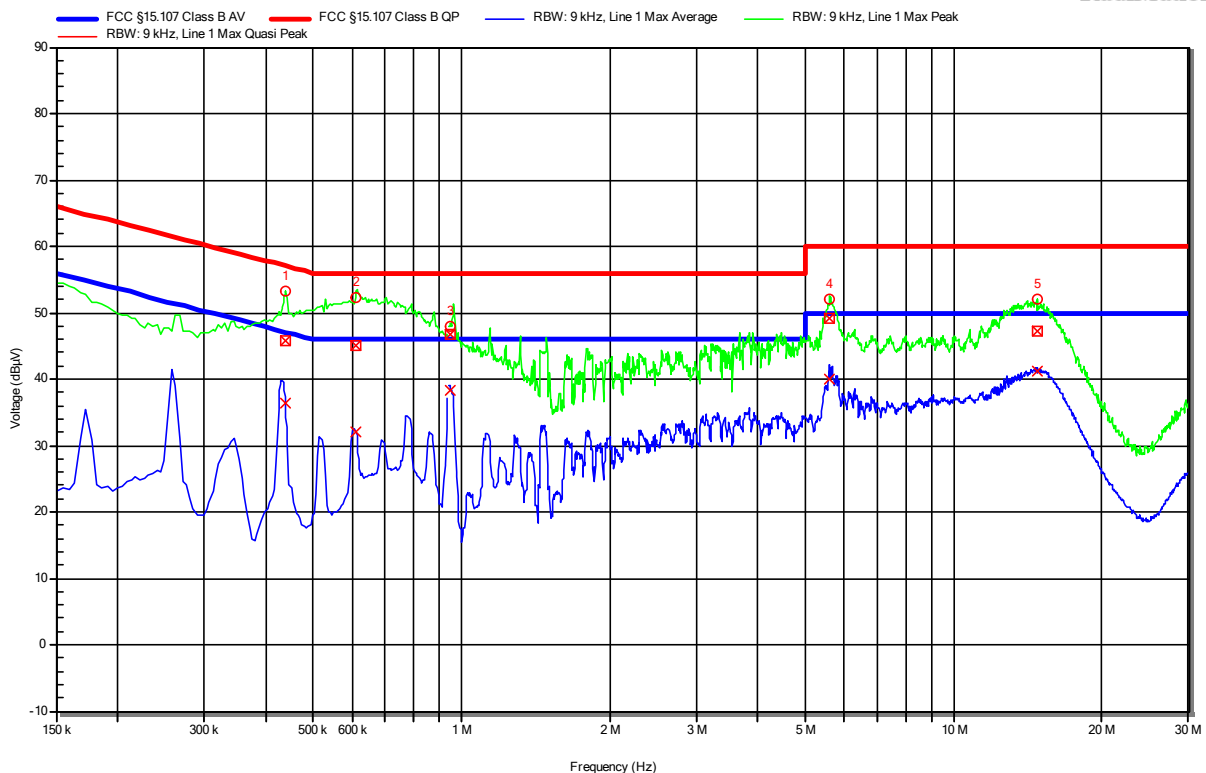
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	438.183 kHz	39.16 dBμV	47.1 dBμV	-7.94 dB	Pass	Neutral
2	941.958 kHz	38.46 dBμV	46 dBμV	-7.54 dB	Pass	Neutral
3	5.6 MHz	42.17 dBμV	50 dBμV	-7.83 dB	Pass	Neutral

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

Project Number: G0M-2106-9857
 Applicant: ANDREAS STIHL AG & Co. KG
 Model Description: battery pack 4871 AR-C
 Model: AR 2000 L
 Test Sample ID: 35704
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Handrik
 Test Date: 2021-08-31
 Operating Conditions: ambient temperature: 22 °Celsius
 power input: 120V AC / 60Hz
 LISN: Schwarzbeck NSLK 8127 RC L
 Operational Mode & 2
 EUT Configuration: 2
 Applied to Port: AC-Mains
 Note 1:

Index 7

Radiation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	438 kHz	45.88 dBμV	57.1 dBμV	-11.22 dB	Pass	Line 1
2	609 kHz	45.06 dBμV	56 dBμV	-10.94 dB	Pass	Line 1
3	951 kHz	46.84 dBμV	56 dBμV	-9.16 dB	Pass	Line 1
4	5.604 MHz	49.11 dBμV	60 dBμV	-10.89 dB	Pass	Line 1
5	14.807 MHz	47.28 dBμV	60 dBμV	-12.72 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	438 kHz	36.32 dBμV	47.1 dBμV	-10.78 dB	Pass	Line 1
2	609 kHz	32.14 dBμV	46 dBμV	-13.86 dB	Pass	Line 1
3	951 kHz	38.39 dBμV	46 dBμV	-7.61 dB	Pass	Line 1
4	5.604 MHz	40.08 dBμV	50 dBμV	-9.92 dB	Pass	Line 1
5	14.807 MHz	41.32 dBμV	50 dBμV	-8.68 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 18GHz @3m, 5.95dB