RADIO REPORT

FCC 47 CFR Part 15C
ISED Canada RSS-247

Digital transmission systems operating within the 2400.0 MHz - 2483.5 MHz band

Report Reference No	G0M-2106-9856-TFC247BL_AP300S-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	DAkkS - Registration number : D-PL-12092-01-03 (ISED) ISED Testing Laboratory site: 3470A DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	ANDREAS STIHL AG & Co. KG
Address	Andreas-Stihl-Straße 4 71336 Waiblingen GERMANY
Test Specification	47 CFR Part 15C RSS-247, Issue 2, 2017-02 RSS-Gen, Issue 5, Amendment 2, 2021-02
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Battery pack 4850 with Bluetooth-Modul
Model(s)	AP 300 S
Additional Model(s)	AP 200 S
Brand Name(s)	Andreas Stihl AG & Co. KG
Hardware Version(s)	HW 00.04
Software Version(s)	SW 00.92
FCC ID	ALP8AP2
IC	23431-AP2
Test Result	**PASSED**

Possible test case verdicts:		
Required by standard but not tested	N/T	
Not required by standard	N/R	
Not applicable to EUT	N/A	
Test object does meet the requirement	P(PASS)	
Test object does not meet the requirement	F(FAIL)	
Testing:		
Test Lab Temperature	20 °C - 30 °C	
Test Lab Humidity	25 % - 55 %	
Date of receipt of test item	2021-10-25	
Report:		
Compiled by	Jens Degenhardt	
Tested by	Jens Degenhardt	Jens Degenhardt
Responsible for Test	Charline Graf	CG
Approved by (Deputy Head of Lab)	Toralf Jahn	T. J
Date of Issue	2022-02-18	
Total number of pages	78	
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:		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2022-02-18	Initial Release	

ABBREVIATIONS AND ACRONYMS

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

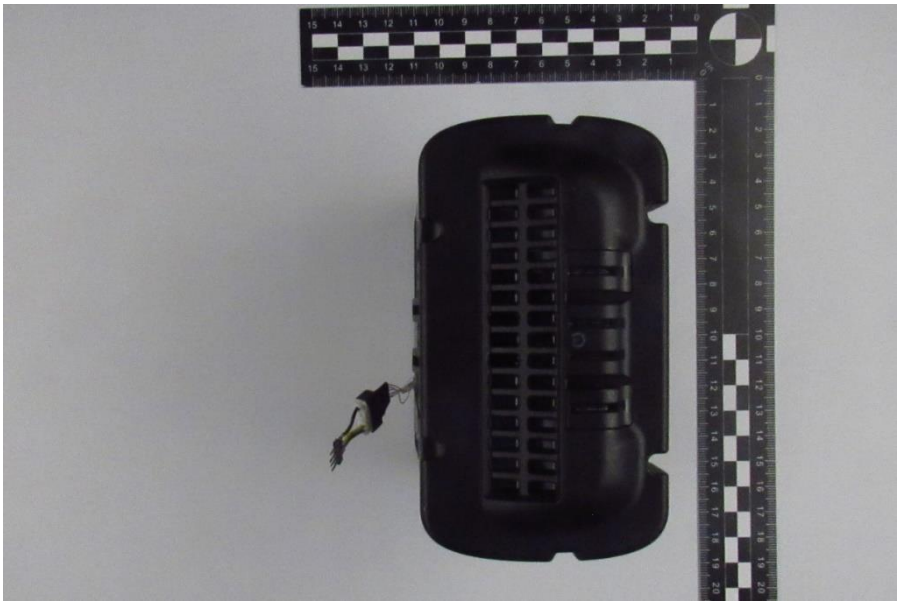
REPORT INDEX

1 Equipment (Test Item) Under Test

Description	Battery pack 4850 with Bluetooth-Modul		
Model	AP 300 S		
Additional Model(s)	AP 200 S		
Brand Name(s)	Andreas Stihl AG & Co. KG		
Serial Number(s)	914701628		
Hardware Version(s)	HW 00.04		
Software Version(s)	SW 00.92		
FCC ID	ALP8AP2		
IC	23431-AP2		
Equipment type	End Product		
Radio type	Transceiver		
Assigned frequency bands	2402.0 MHz - 2480.0 MHz		
Radio technology	Bluetooth LE 4.1		
Bluetooth Specification	LE 1M PHY		Yes
	LE 2M PHY		No
	LE Coded PHY S=8 (125 kbit)		No
	LE Coded PHY S=2 (500 kbit)		No
	Stable Modulation Index - Transmitter		No
	Stable Modulation Index - Receiver		No
Modulation	GFSK		
Number of antenna ports	1		
Antenna	Type	Integrated antenna	
	Model	Inverted F	
	Manufacturer	ANDREAS STIHL AG & Co. KG	
	Gain	2 dBi	
Supply Voltage	V_{NOM}	36 VDC	
Operating Temperature	T_{NOM}	25 °C	
AC/DC-Adaptor	Model	4850	
	Vendor	ANDREAS STIHL AG & Co. KG	
	Input	120VAC/60Hz	
	Output	25.6-36V	
Manufacturer	ANDREAS STIHL AG & Co. KG Andreas-Stihl-Straße 4 71336 Waiblingen GERMANY		

1.1 Photos – Equipment External

EUT front side


EUT back side


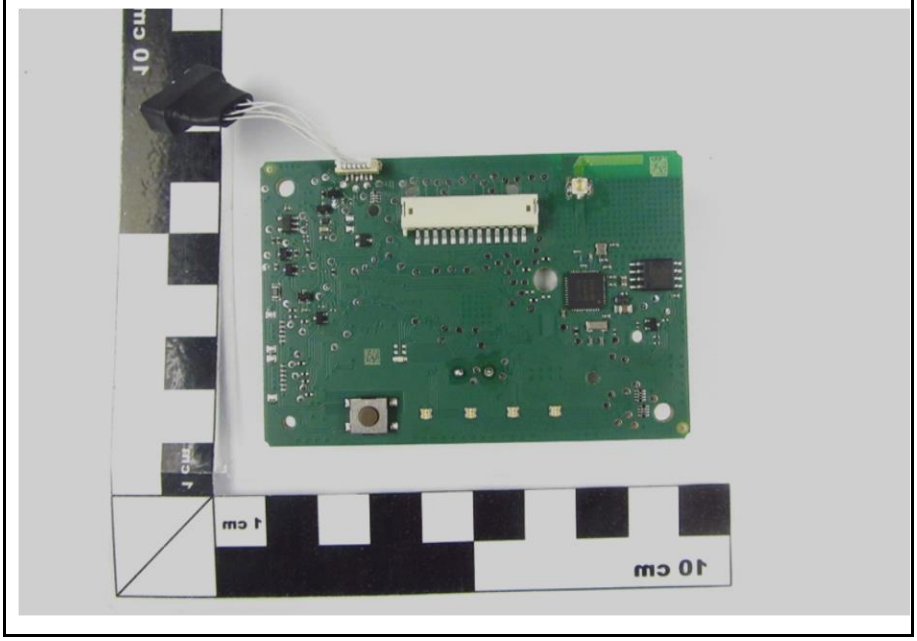
EUT top side

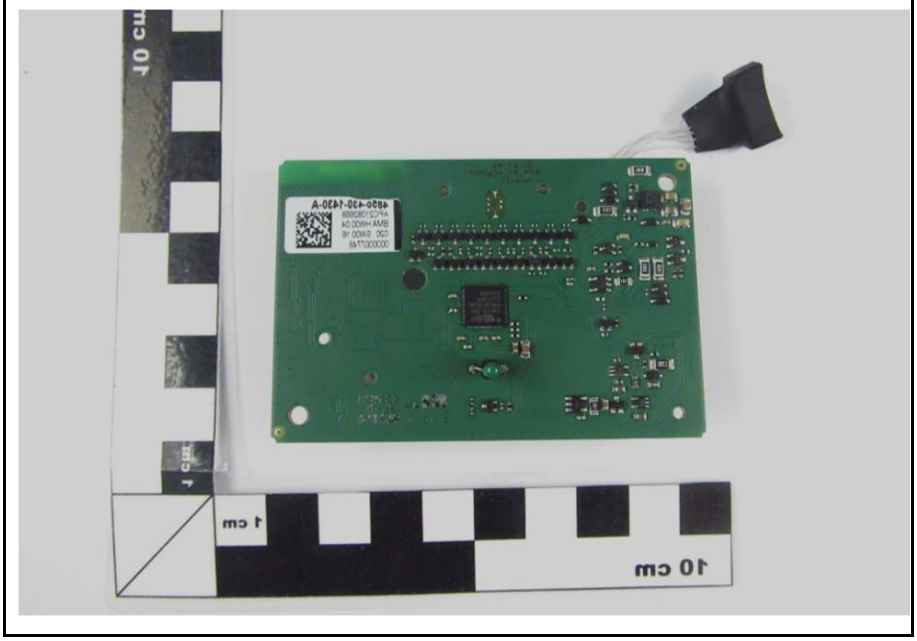

EUT bottom side


EUT right side

EUT left side

1.2 Photos – Equipment Internal

PCB top view


PCB bottom view


1.3 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
CBL	USB to TTl serial adapter	DSD Tech	SH-UO9C	-
AE	Laptop	Lenovo	T440	-
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment:				

1.4 Test Modes

Mode	Description
1Mbit	Mode = Transmit Modulation = GFSK Spreading = None Payload=37 bytes
Receive	Mode = Receive
Comment: unless otherwise noted : datarate= 1Mbit and payload= 37bytes	

Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx / Rx	0	2402
F2	Tx / Rx	19	2440
F3	Tx / Rx	39	2480

1.5 Sample emission level calculation

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

Reading:

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

A.F.:

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

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

Net:

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

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:

Limit (dBµV/m) = 20*log (µV/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 15C, ISED RSS-247				
Product Standard Reference	**Requirement**	**Reference Method**	**Result**	**Remarks**
ISED RSS-Gen, Issue 5 A2 (section 6.7)	Occupied Bandwidth	ANSI C63.10-2013	N/R	Informational only
FCC § 15.247(a)(2) ISED RSS-247, Issue 2 (section 5.2)	6 dB Bandwidth	ANSI C63.10-2013	PASS	
FCC § 15.247(b) ISED RSS-247, Issue 2 (section 5.4)	Maximum peak conducted power	ANSI C63.10-2013	PASS	
FCC § 15.247(e) ISED RSS-247, Issue 2 (section 5.2)	Power spectral density	ANSI C63.10-2013	PASS	
FCC § 15.207 ISED RSS-247, Issue 2 (section 3.1)	AC power line conducted emissions	ANSI C63.10-2013	PASS	
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Band edge compliance	ANSI C63.10-2013	PASS	
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Conducted spurious emissions	ANSI C63.10-2013	PASS	
FCC § 15.247(d) FCC § 15.209 ISED RSS-Gen, Issue 5 A2 (section 6.13)	Transmitter radiated spurious emissions	ANSI C63.10-2013	PASS	
ISED RSS-247, Issue 2 (section 3.1)	Receiver radiated spurious emissions	ANSI C63.4-2014	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

3 Test Conditions and Results

3.1 Test Conditions and Results - Occupied bandwidth

3.1.1 Information

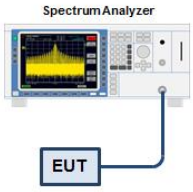
Test Information	
Reference	ISED RSS-Gen, Issue 5 A2 (section 6.7)
Measurement Method	ANSI C63.10 6.9.3
Measurement Uncertainty	± 1.26 %
Test Sample ID	37809
Operator	Jens Degenhardt
Date	2021-12-17

3.1.2 Limits

Limits
None (Informational only)

3.1.3 Setup

Test Setup



3.1.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 3	EF00241	2021-07	2023-07
Cable (diverse)	– (diverse)	– (diverse)	EF00779 CAABA	2020-12	2021-12

3.1.5 Procedure

Test Procedure

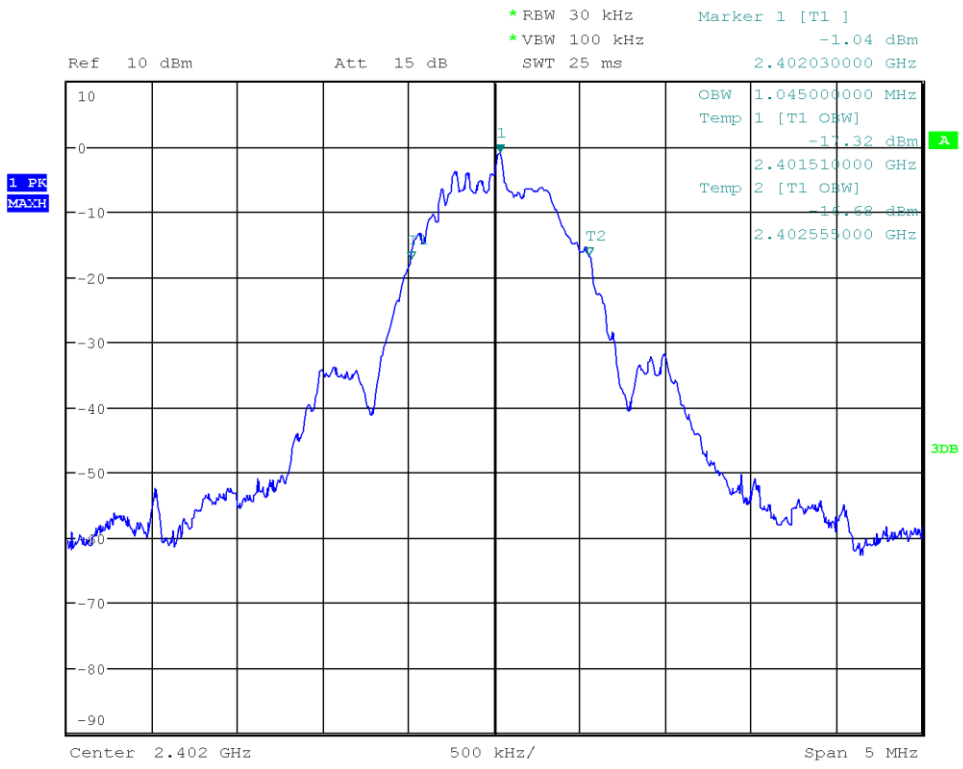
1. EUT transmitter is activated in test mode under normal conditions
2. The spectrum analyzer is set to peak detection and maximum hold with a span twice the emission spectrum
3. The resolution bandwidth is set to the range of 1 % to 5 % of the occupied bandwidth
4. The occupied bandwidth is measured with the build-in analyzer function

3.1.6 Results

Test Results		
Mode	Frequency [MHz]	Bandwidth [MHz]
1Mbit	2402	1.045
1Mbit	2440	1.045
1Mbit	2480	1.055

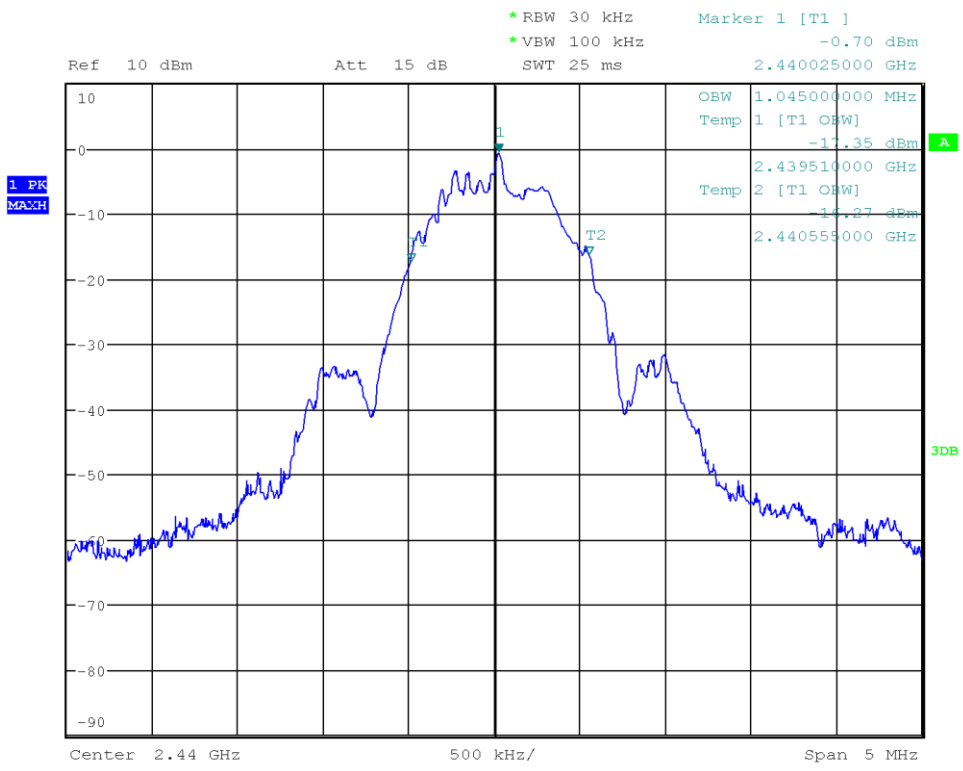
Occupied Bandwidth

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	GFSK, F1
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Occupied Bandwidth [MHz]:	1.045



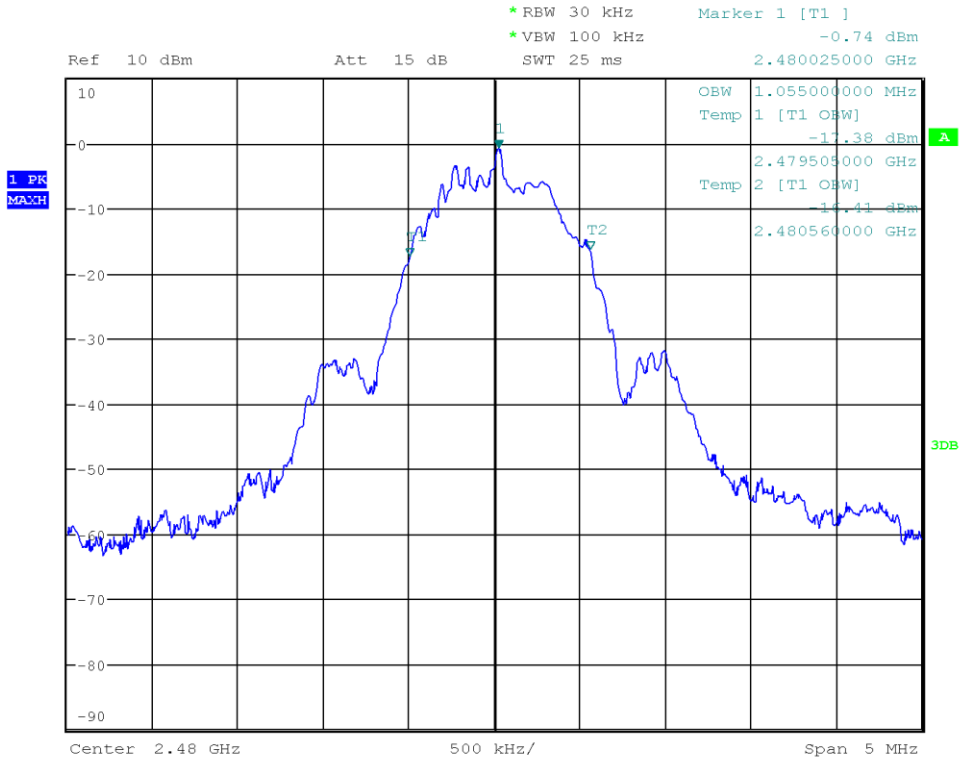
Occupied Bandwidth

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	GFSK, F2
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Occupied Bandwidth [MHz]:	1.045



Occupied Bandwidth

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	GFSK, F3
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Occupied Bandwidth [MHz]:	1.055



3.2 Test Conditions and Results - 6 dB bandwidth

3.2.1 Information

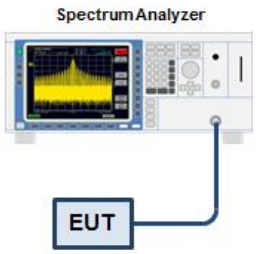
Test Information	
Reference	FCC § 15.247(a)(2); ISED RSS-247, Issue 2 (section 5.2)
Measurement Method	ANSI C63.10 11.8
Measurement Uncertainty	± 1.26 %
Operator	Jens Degenhardt
Date	2021-12-17

3.2.2 Limits

Limits
≥ 500kHz

3.2.3 Setup

Test Setup



3.2.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 3	EF00241	2021-07	2023-07
Cable (diverse)	– (diverse)	– (diverse)	EF00779 CAABA	2020-12	2021-12

3.2.5 Procedure

Test Procedure

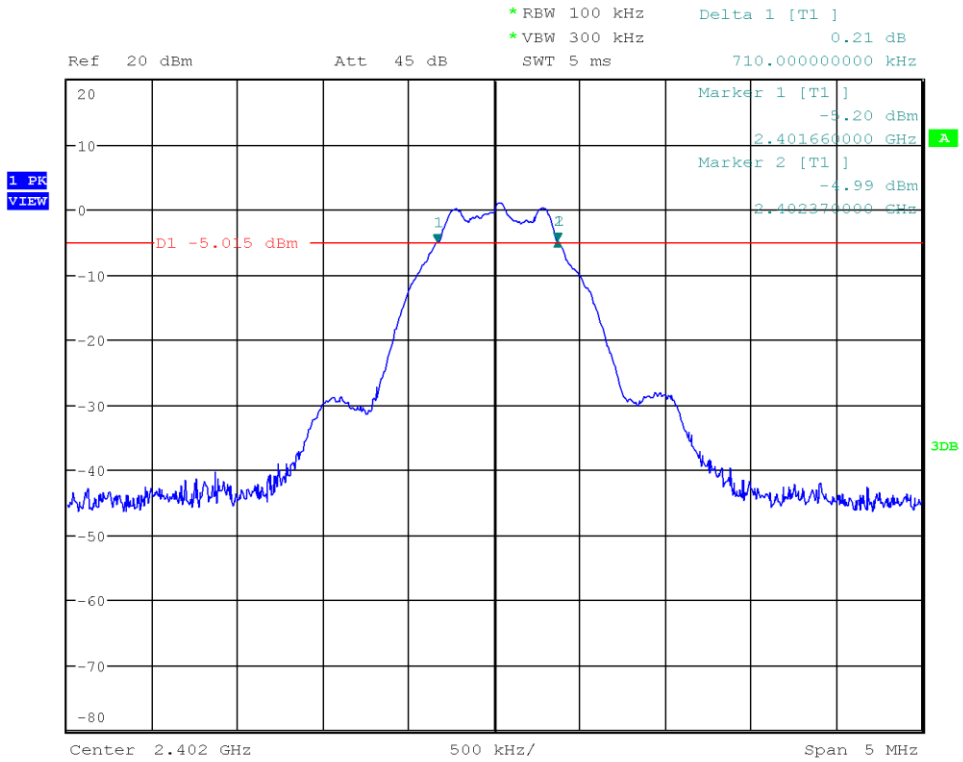
1. EUT set to test mode
2. Span set to at least twice the emission spectrum
3. Detector set to peak and max hold and RBW is set to 100 kHz
4. Envelope peak value of emission spectrum is selected
5. Marker on envelope of spectrum is set to level of -6 dB to the left of the peak
6. Marker on envelope of spectrum is set to level of -6 dB to the right of the peak
7. 6 dB Bandwidth is determined by marker frequency separation

3.2.6 Results

Test Results				
Mode	Frequency [MHz]	Bandwidth [kHz]	Limit [kHz]	Verdict
1Mbit	2402	710	500	PASS
1Mbit	2440	690	500	PASS
1Mbit	2480	695	500	PASS

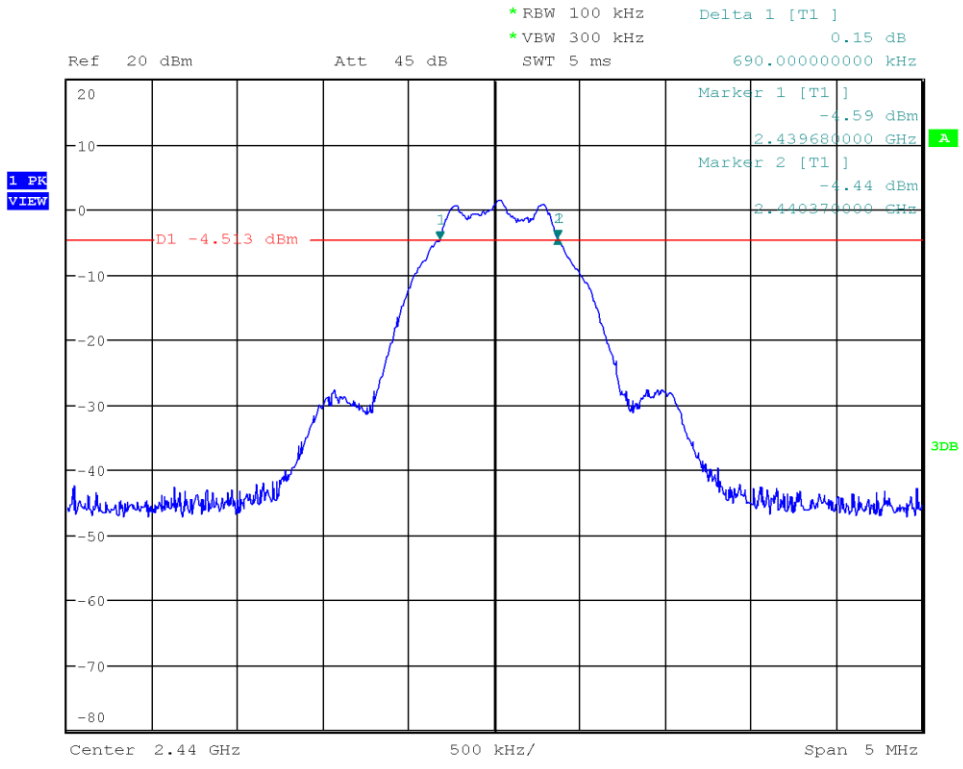
DTS (6 dB) Bandwidth

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	GFSK, F1
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Lower Frequency [MHz]:	2401.660
Upper Frequency [MHz]:	2402.370
6 dB Bandwidth [kHz]:	710



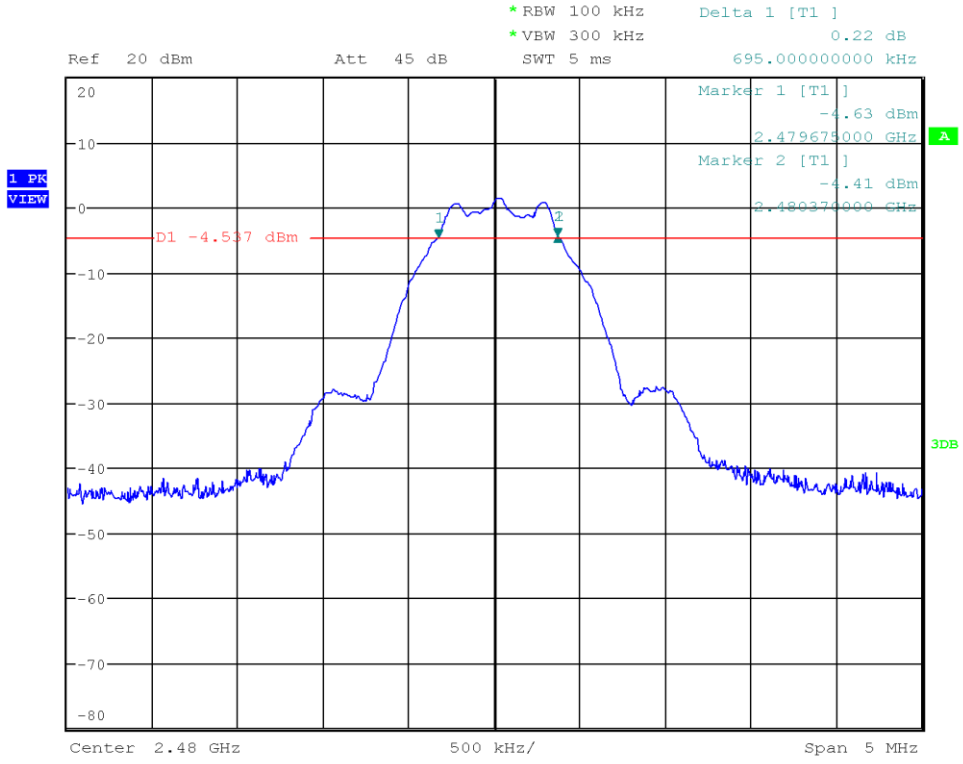
DTS (6 dB) Bandwidth

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	GFSK, F2
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Lower Frequency [MHz]:	2439.680
Upper Frequency [MHz]:	2440.370
6 dB Bandwidth [kHz]:	690



DTS (6 dB) Bandwidth

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	GFSK, F3
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Lower Frequency [MHz]:	2479.675
Upper Frequency [MHz]:	2480.370
6 dB Bandwidth [kHz]:	695



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3.3 Test Conditions and Results - Maximum peak conducted output power

3.3.1 Information

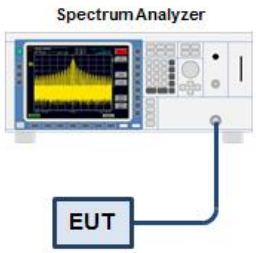
Test Information	
Reference	FCC § 15.247(b); ISED RSS-247, Issue 2 (section 5.4)
Measurement Method	ANSI C63.10 11.9.1
Measurement Uncertainty	± 2.86 dB
Operator	Jens Degenhardt
Date	2021-12-17

3.3.2 Limits

Limits
1 W (30 dBm)
The conducted output power limit specified above is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in the table, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.3 Setup

Test Setup



3.3.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 3	EF00241	2021-07	2023-07
Cable (diverse)	– (diverse)	– (diverse)	EF00779 CAABA	2020-12	2021-12

3.3.5 Procedure

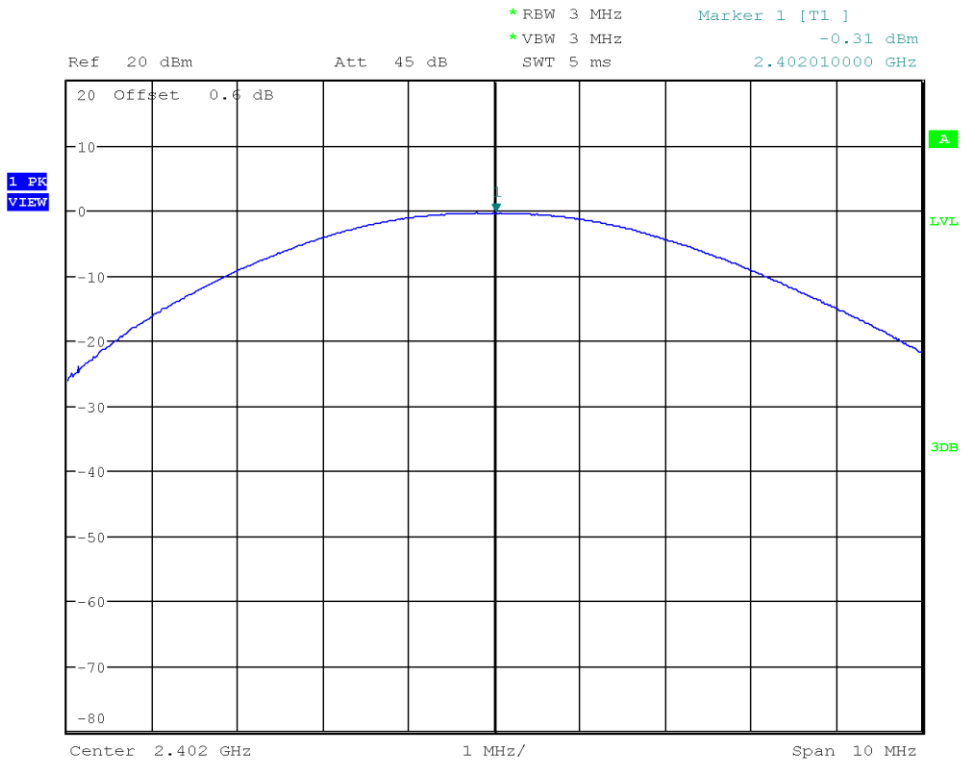
Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Analyzer resolution bandwidth is set ≥ DTS bandwidth 3. Detector set to peak and max hold 4. Sweep time is set to auto 5. After the trace has stabilized a marker is set to peak of envelope

3.3.6 Results

Test Results				
Channel [MHz]	Power [dBm]	Power [W]	Limit [W]	Verdict
2402	-0.311	0.0009	1.0	PASS
2440	-0.085	0.0010	1.0	PASS
2480	-0.276	0.0009	1.0	PASS

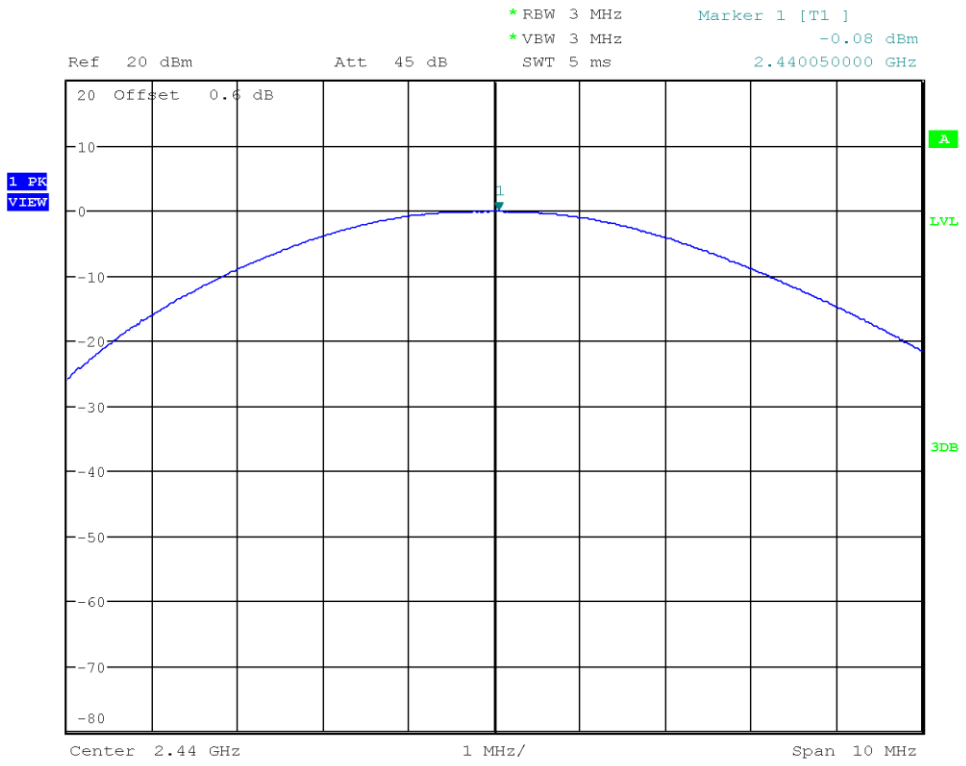
Peak Conducted Output Power

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.9.1.1
Operational Mode:	GFSK, F1
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Peak Power [dBm]:	-0.311
Peak Power [W]:	0.0009



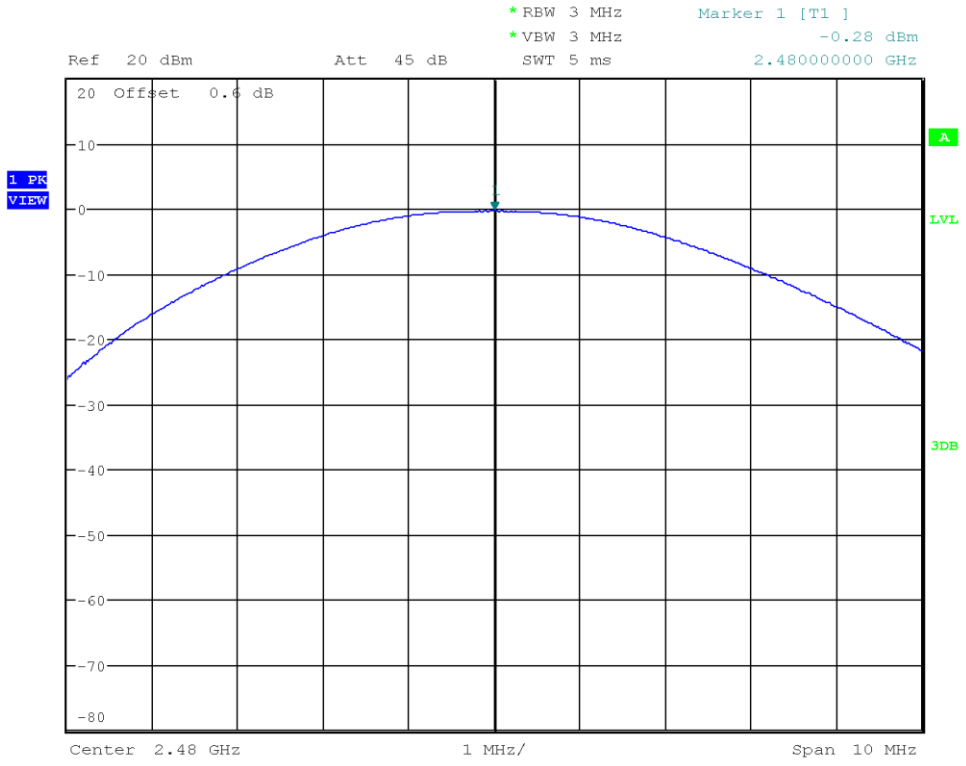
Peak Conducted Output Power

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.9.1.1
Operational Mode:	GFSK, F2
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Peak Power [dBm]:	-0.085
Peak Power [W]:	0.0010



Peak Conducted Output Power

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.9.1.1
Operational Mode:	GFSK, F3
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Peak Power [dBm]:	-0.276
Peak Power [W]:	0.0009



3.4 Test Conditions and Results - Power spectral density

3.4.1 Information

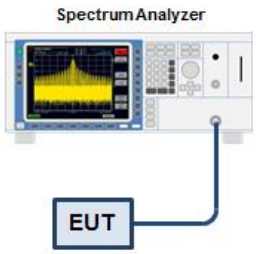
Test Information	
Reference	FCC § 15.247(e); ISED RSS-247, Issue 2 (section 5.2)
Measurement Method	ANSI C63.10 11.10.2, 14.3.2
Measurement Uncertainty	± 2.86 dB
Operator	Jens Degenhardt
Date	2021-12-17

3.4.2 Limits

Limits
8 dBm / 3 kHz

3.4.3 Setup

Test Setup



3.4.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 3	EF00241	2021-07	2023-07
Cable (diverse)	– (diverse)	– (diverse)	EF00779 CAABA	2020-12	2021-12

3.4.5 Procedure

Test Procedure

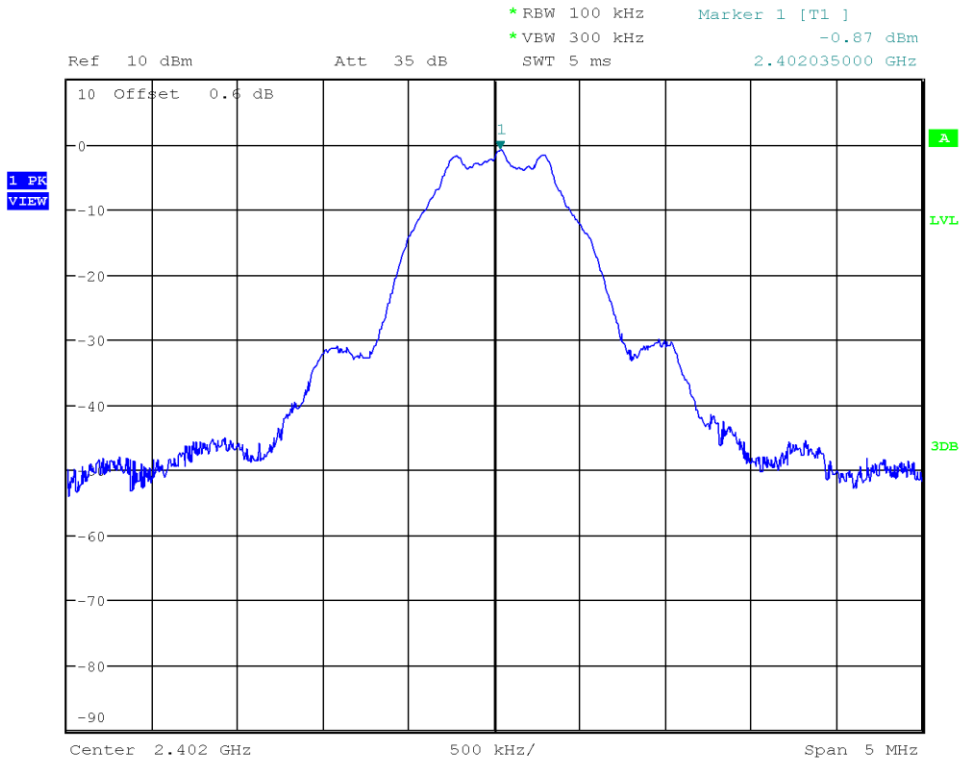
1. EUT set to test mode
2. The analyzer is set to DTS channel center frequency with a span of 1.5 times the DTS bandwidth
3. The RBW is set to 100 kHz with VBW ≥ RBW and the detector is set to peak with max hold
4. After the trace has stabilized a marker is set to the envelope maximum
5. If the power spectral density is above the limit the RBW is reduced (not lower than 3 kHz) and the measurement is repeated
6. If the EUT has more than one transmit chain the procedure is repeated for each transmit chain

3.4.6 Results

Test Results			
Channel [MHz]	PSD [dBm/RBW]	Limit [dBm/3kHz]	Verdict
2402	-0.867	8.0	PASS
2440	2.134	8.0	PASS
2480	2.067	8.0	PASS
RBW = 100 kHz			

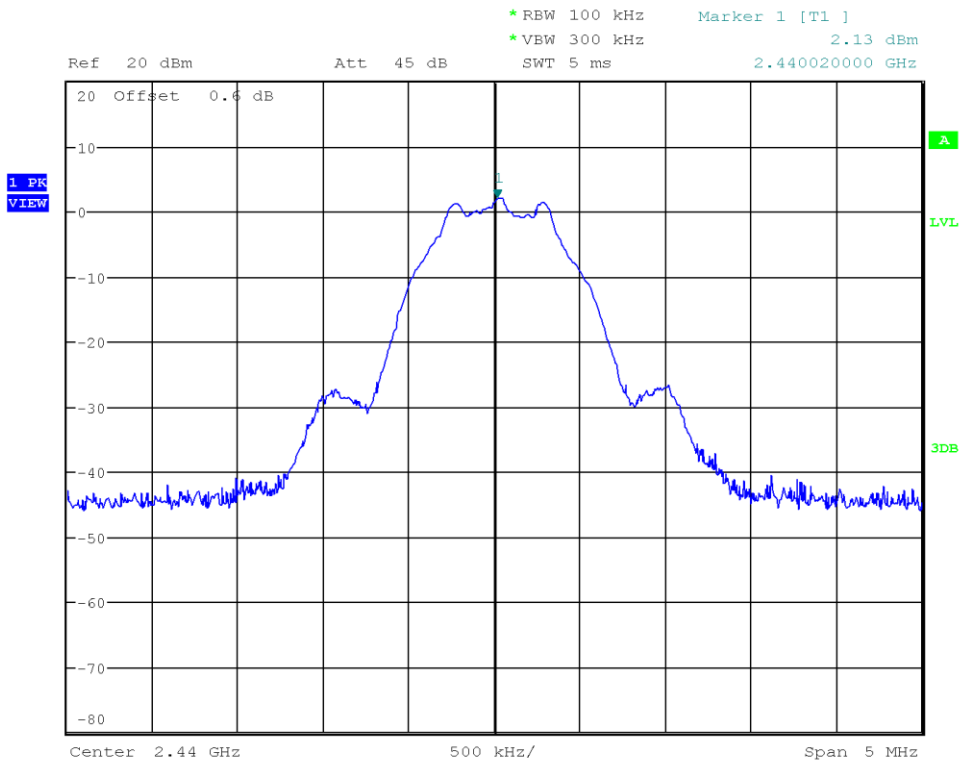
Peak Power Spectral Density

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	GFSK, F1
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Peak Frequency [MHz]:	2402.035
Spectral Density [dBm/RBW]:	-0.867
Resolution Bandwidth [kHz]:	100 kHz



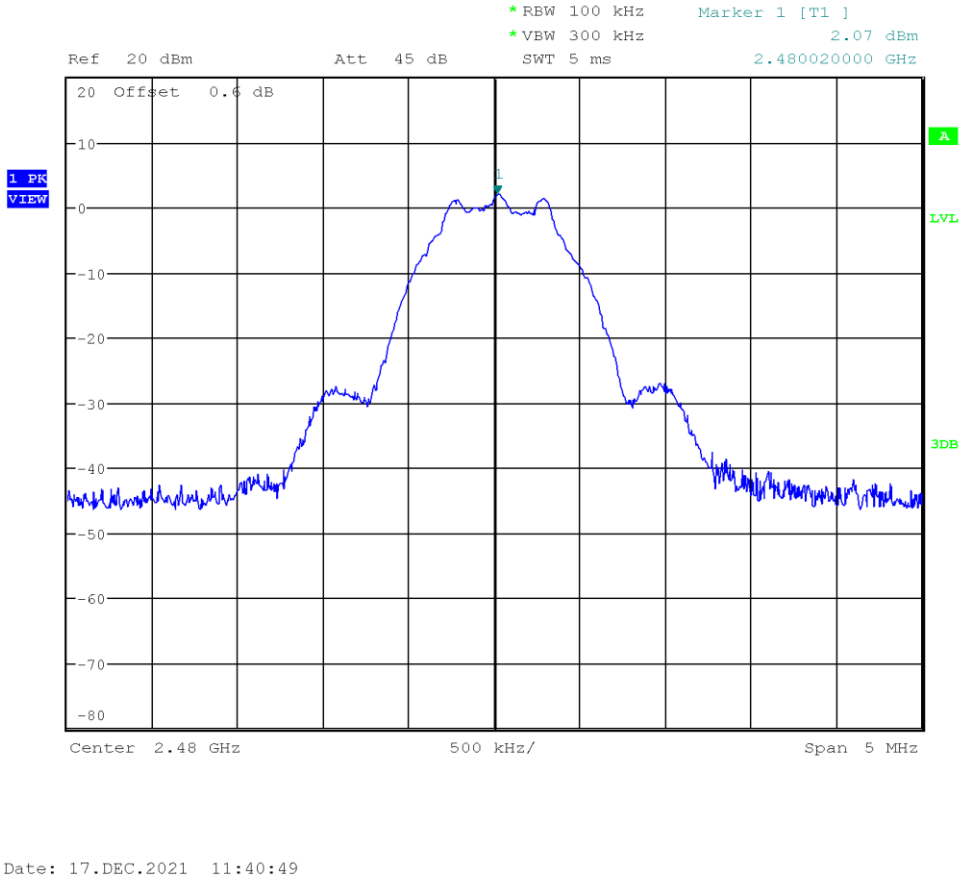
Peak Power Spectral Density

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	GFSK, F2
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Peak Frequency [MHz]:	2440.020
Spectral Density [dBm/RBW]:	2.134
Resolution Bandwidth [kHz]:	100 kHz



Peak Power Spectral Density

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	GFSK, F3
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Peak Frequency [MHz]:	2480.020
Spectral Density [dBm/RBW]:	2.067
Resolution Bandwidth [kHz]:	100 kHz



3.5 Test Conditions and Results - AC powerline conducted emissions

3.5.1 Information

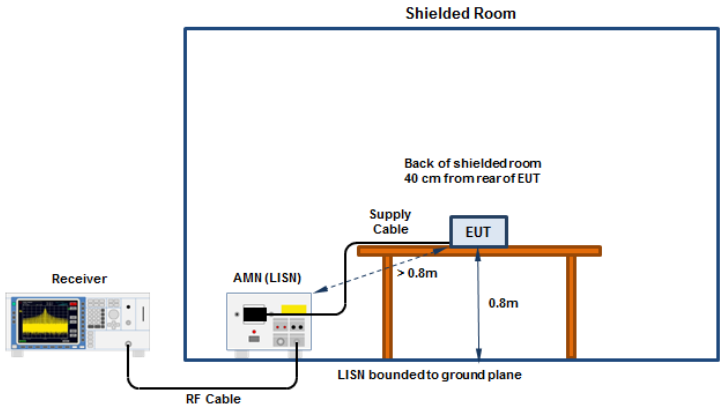
Test Information	
Reference	FCC § 15.207; ISED RSS-247, Issue 2 (section 3.1)
Measurement Method	ANSI C63.10 6.2
Measurement Uncertainty	± 3.82 dB
Operator	Jens Degenhardt
Date	2022-01-06

3.5.2 Limits

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

3.5.3 Setup

Test Setup



3.5.4 Equipment

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

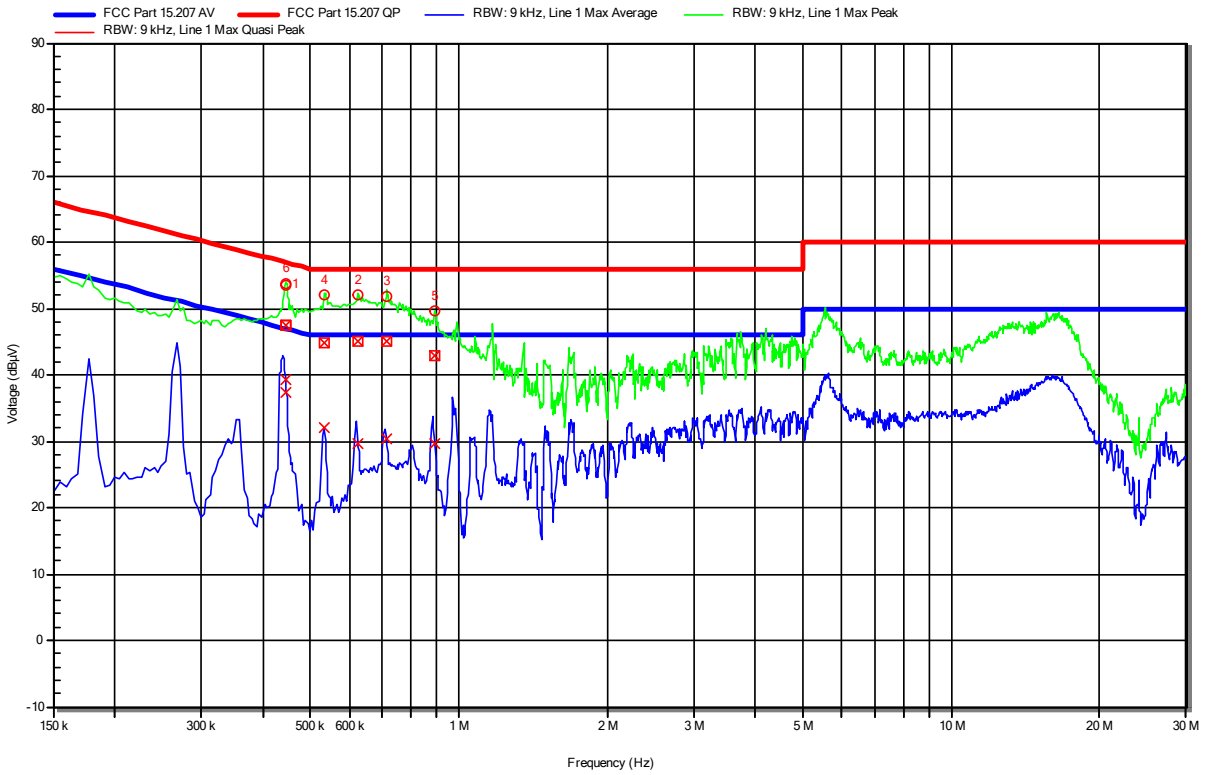
Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Test Receiver	R&S	ESR7	EF00943	2021-08	2022-08
Pulse Limiter	R&S	ESH3-Z2	EF01222	2021-07	2022-07
LISN	Schwarzbeck	NSLK 8127 RC	EF01592	2021-07	2022-07

Conducted emissions at the mains power port
according to 47 CFR Part 15.247

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Test Date:	2022-01-06
Operating Conditions:	ambient temperature: 23 °Celsius power input: Charger AL300 (sample-ID:35883)
LISN:	Schwarzbeck NSLK 8127 RC L
Operational Mode & EUT Configuration:	BT-LE, 2.402GHz, Tx
Applied to Port:	AC.cable of charger AL300 (sample-ID:38023)

Index 47

RadiMation

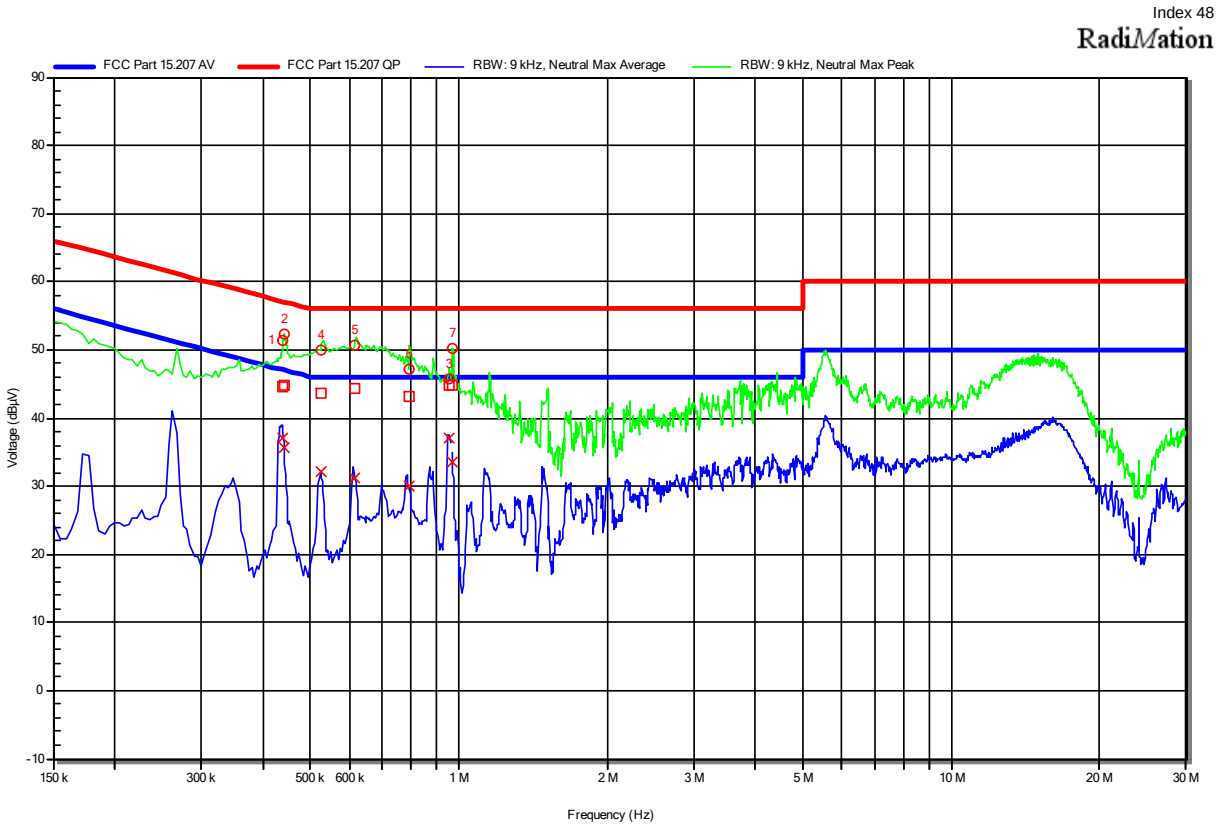


Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	447 kHz	47.5 dBµV	56.93 dBµV	-9.43 dB	Pass	Line 1
2	622.5 kHz	45.18 dBµV	56 dBµV	-10.82 dB	Pass	Line 1
3	712.5 kHz	45.17 dBµV	56 dBµV	-10.83 dB	Pass	Line 1
4	532.5 kHz	44.85 dBµV	56 dBµV	-11.15 dB	Pass	Line 1
5	892.5 kHz	42.83 dBµV	56 dBµV	-13.17 dB	Pass	Line 1
6	444.75 kHz	47.53 dBµV	56.97 dBµV	-9.44 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	447 kHz	37.32 dBµV	46.93 dBµV	-9.61 dB	Pass	Line 1
2	622.5 kHz	29.59 dBµV	46 dBµV	-16.41 dB	Pass	Line 1
3	712.5 kHz	30.41 dBµV	46 dBµV	-15.59 dB	Pass	Line 1
4	532.5 kHz	32.06 dBµV	46 dBµV	-13.94 dB	Pass	Line 1
5	892.5 kHz	29.67 dBµV	46 dBµV	-16.33 dB	Pass	Line 1
6	444.75 kHz	39.28 dBµV	46.97 dBµV	-7.69 dB	Pass	Line 1

Conducted emissions at the mains power port
according to 47 CFR Part 15.247

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Test Date:	2022-01-06
Operating Conditions:	ambient temperature: 23 °Celsius power input: Charger AL300 (sample-ID:35883)
LISN:	Schwarzbeck NSLK 8127 RC N
Operational Mode & EUT Configuration:	BT-LE, 2.48GHz, Tx
Applied to Port:	AC.cable of charger AL300 (sample-ID:38023)

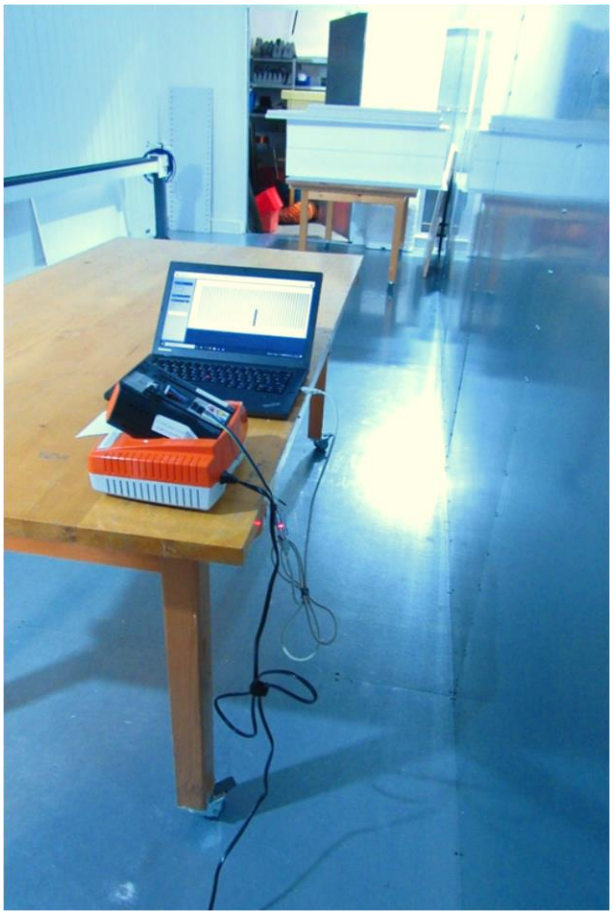


Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	440.25 kHz	44.46 dBµV	57.06 dBµV	-12.59 dB	Pass	Neutral
2	441.6 kHz	44.83 dBµV	57.03 dBµV	-12.2 dB	Pass	Neutral
3	955.5 kHz	44.89 dBµV	56 dBµV	-11.11 dB	Pass	Neutral
4	523.5 kHz	43.65 dBµV	56 dBµV	-12.35 dB	Pass	Neutral
5	613.5 kHz	44.34 dBµV	56 dBµV	-11.66 dB	Pass	Neutral
6	793.5 kHz	43.2 dBµV	56 dBµV	-12.8 dB	Pass	Neutral
7	970.35 kHz	44.9 dBµV	56 dBµV	-11.1 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	440.25 kHz	37.15 dBµV	47.06 dBµV	-9.91 dB	Pass	Neutral
2	441.6 kHz	35.62 dBµV	47.03 dBµV	-11.41 dB	Pass	Neutral
3	955.5 kHz	36.98 dBµV	46 dBµV	-9.02 dB	Pass	Neutral
4	523.5 kHz	32.05 dBµV	46 dBµV	-13.95 dB	Pass	Neutral
5	613.5 kHz	31.31 dBµV	46 dBµV	-14.69 dB	Pass	Neutral
6	793.5 kHz	30.05 dBµV	46 dBµV	-15.95 dB	Pass	Neutral
7	970.35 kHz	33.66 dBµV	46 dBµV	-12.34 dB	Pass	Neutral

3.5.5 Setup Photos

Setup 150kHz-30MHz


Setup 150kHz-30MHz


3.6 Test Conditions and Results - Band-edge compliance

3.6.1 Information

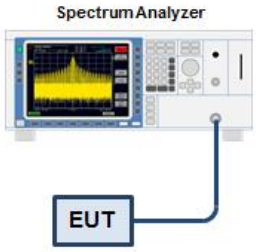
Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Uncertainty	± 3.64 dB
Measurement Method	ANSI C63.10 11.13
Operator	Jens Degenhardt
Date	2021-12-17

3.6.2 Limits

Limits	
Power Measurement	Out-of-band attenuation [dB]
Peak	20
RMS	30

3.6.3 Setup

Test Setup



3.6.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 3	EF00241	2021-07	2023-07
Cable (diverse)	– (diverse)	– (diverse)	EF00779 CAABA	2020-12	2021-12

3.6.5 Procedure

Test Procedure

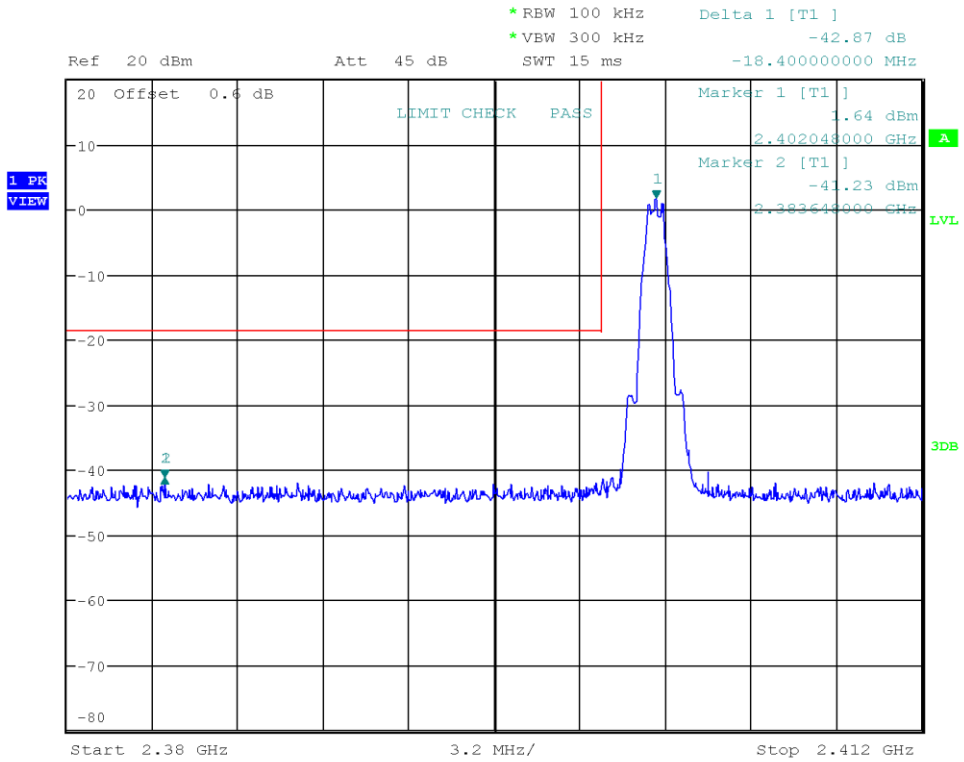
1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels within frequency band and outside frequency band
5. Band edge attenuation is determined from level difference

3.6.6 Results

Test Results				
Mode	Channel [MHz]	Out-of-band Attenuation [dB]	Limit [dB]	Verdict
1Mbit	2402	-42.87	-20	PASS
1Mbit	2480	-43.77	-20	PASS

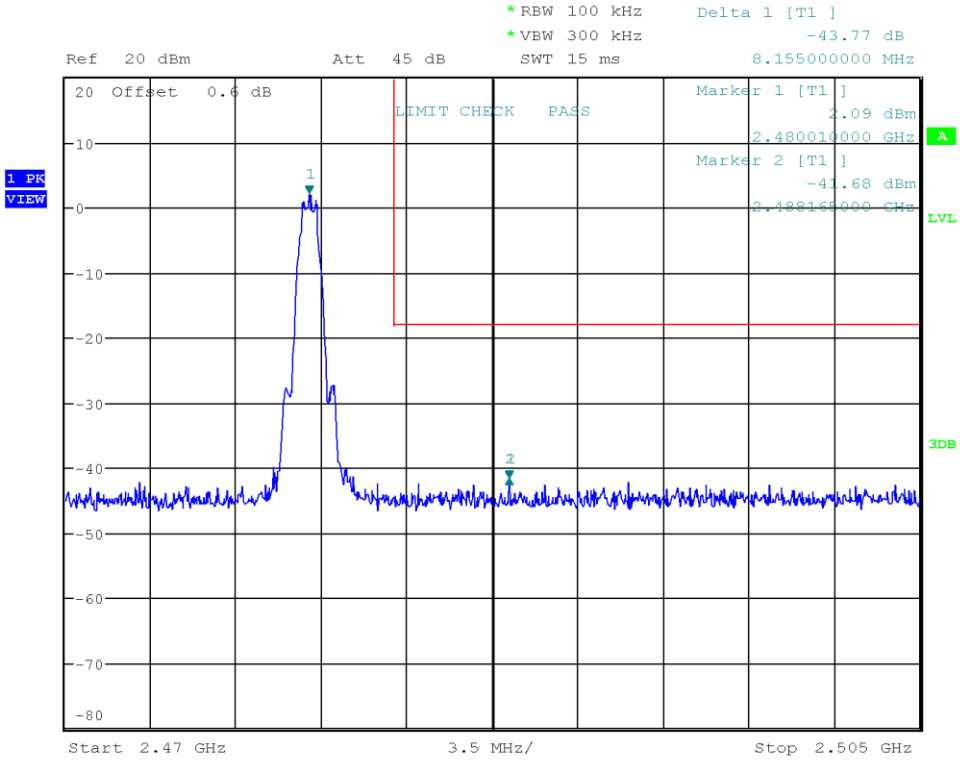
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Band-edge	Lower
In-band Frequency [MHz]:	2402.048
Max. in-band Level [dBm/100 kHz]:	1.641
Out-of-band Frequency [MHz]:	2383.648
Max. out-of-band Level [dBm/100 kHz]:	-41.226
Attenuation [dB]:	-42.87



Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Band-edge	Upper
In-band Frequency [MHz]:	2480.01
Max. in-band Level [dBm/100 kHz]:	2.089
Out-of-band Frequency [MHz]:	2488.165
Max. out-of-band Level [dBm/100 kHz]:	-41.676
Attenuation [dB]:	-43.77



3.7 Test Conditions and Results - Conducted spurious emissions

3.7.1 Information

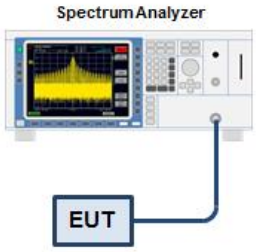
Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Uncertainty	± 4.25 dB
Measurement Method	ANSI C63.10 11.11
Operator	Jens Degenhardt
Date	2021-12-17

3.7.2 Limits

Limits	
Power Measurement	Out-of-band attenuation [dB]
Peak	20
RMS	30

3.7.3 Setup

Test Setup



3.7.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 26	EF01407	2021-08	2022-08
Cable (diverse)	– (diverse)	– (diverse)	EF00779 CAABQ	2020-12	2021-12

3.7.5 Procedure

Test Procedure

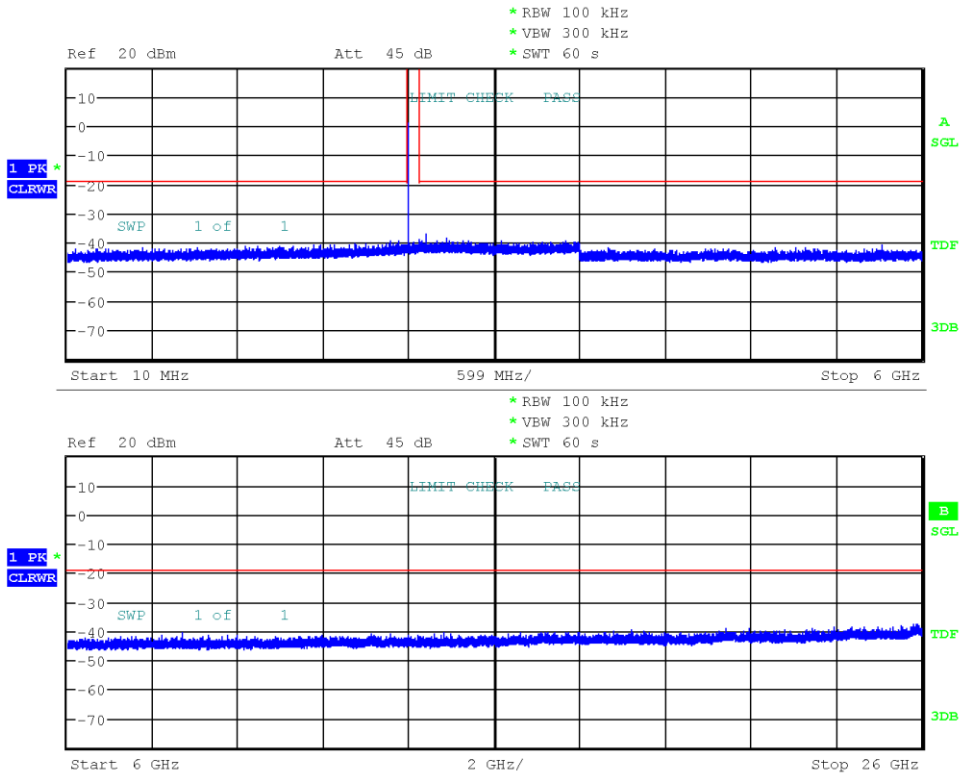
1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels outside frequency band

3.7.6 Results

Test Results		
Mode	Channel [MHz]	Verdict
1Mbit	2402	PASS
1Mbit	2440	PASS
1Mbit	2480	PASS

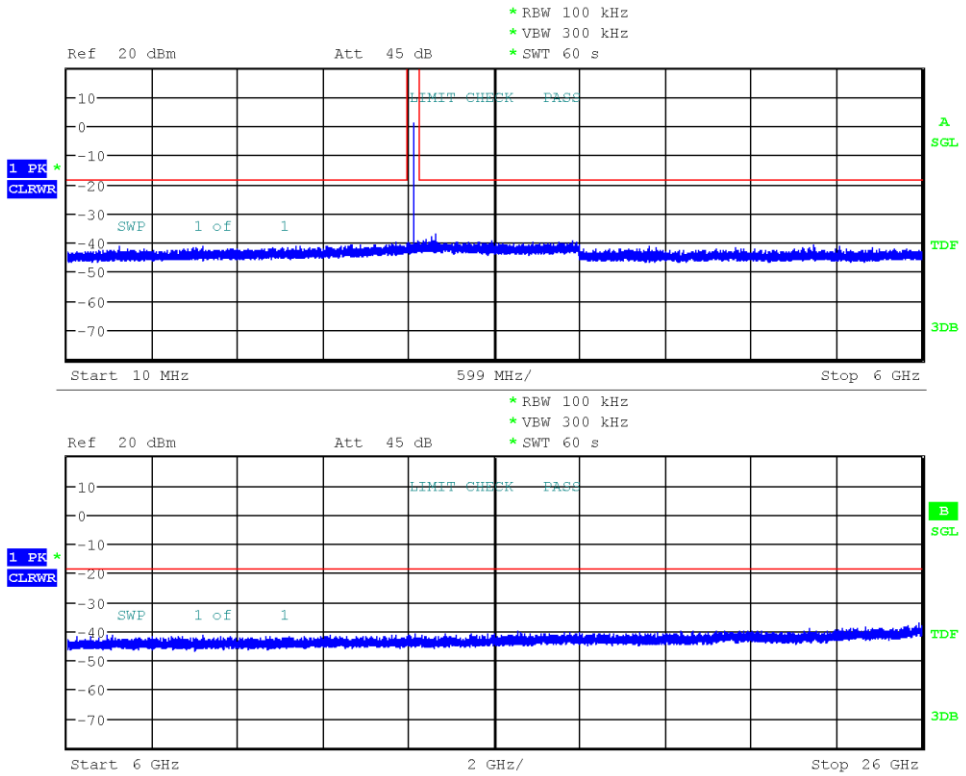
Conducted Spurious Emissions

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	GFSK, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Max. in-band Frequency [MHz]:	2402.0
Max. in-band Level [dBm/100 kHz]:	1.3
Out-of-band Limit [dBm/100 kHz]:	-18.7



Conducted Spurious Emissions

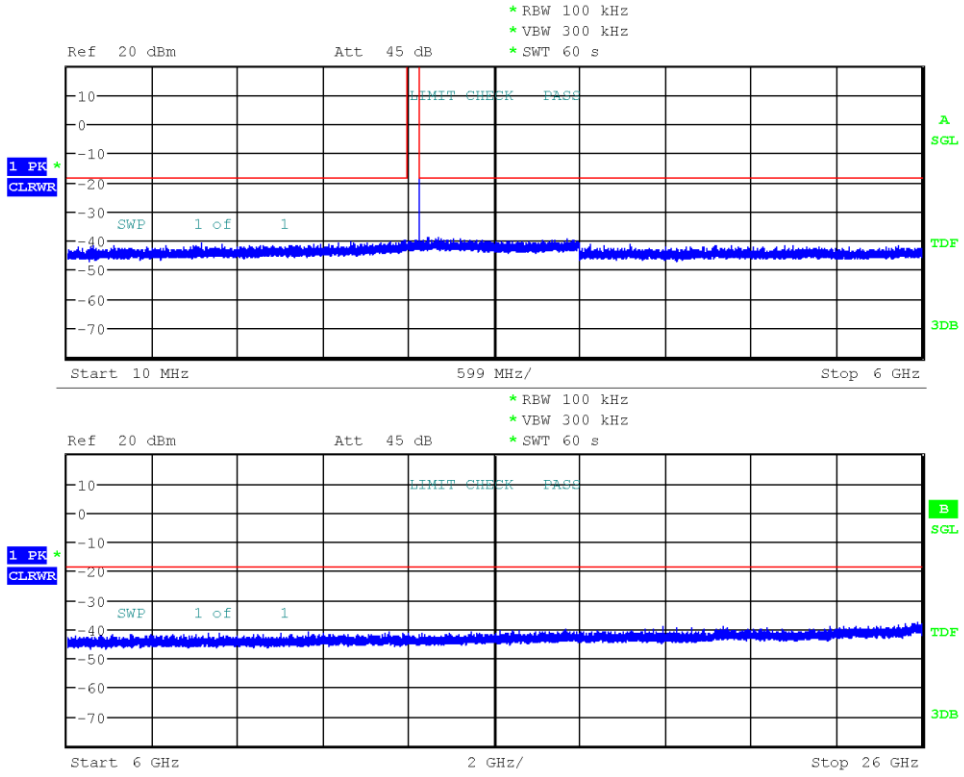
Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	GFSK, Channel: 19, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Max. in-band Frequency [MHz]:	2440.0
Max. in-band Level [dBm/100 kHz]:	1.6
Out-of-band Limit [dBm/100 kHz]:	-18.4



Date: 17.DEC.2021 12:29:01

Conducted Spurious Emissions

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37809
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	GFSK, Channel: 39, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Jens Degenhardt
Test Site:	Eurofins Product Service GmbH
Test Date:	2021-12-17
Max. in-band Frequency [MHz]:	2480.0
Max. in-band Level [dBm/100 kHz]:	1.7
Out-of-band Limit [dBm/100 kHz]:	-18.3



Date: 17.DEC.2021 12:40:35

3.8 Test Conditions and Results - Transmitter radiated emissions

3.8.1 Information

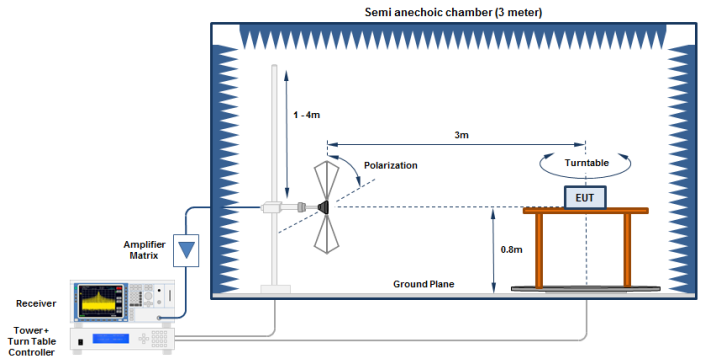
Test Information	
Reference	FCC § 15.247(d); FCC § 15.209; ISED RSS-Gen, Issue 5 A2 (section 6.13)
Measurement Uncertainty	± 5.95 dB
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6, 11.12
Operator	Jens Degenhardt
Date	2021-12-16

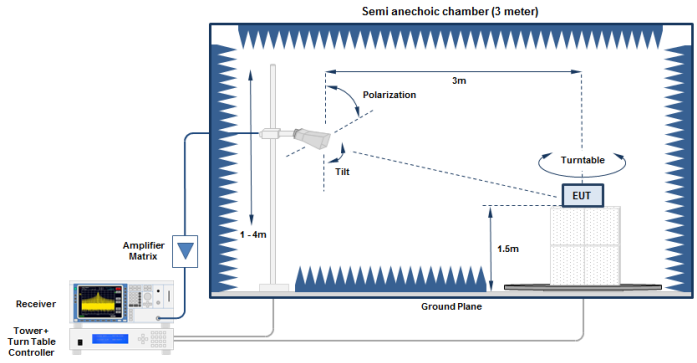
3.8.2 Limits

Limits			
Frequency range [MHz]	Detector	Field strength [µV/m]	Measurement distance [m]
0.009 - 0.09	Average	2400/F[kHz]	300
0.09 - 0.110	Quasi-Peak	2400/F[kHz]	300
0.110 - 0.490	Average	2400/F[kHz]	300
0.490 - 1.705	Quasi-Peak	24000/F[kHz]	30
1.705 - 30.0	Quasi-Peak	30	30
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

3.8.3 Setup

Test Setup 30 MHz - 1000 MHz



Test Setup > 1 GHz


3.8.4 Equipment

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

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2021-02	2024-02
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2021-07	2022-07
Antenna	R&S	HK 116	EF00030	2021-05	2024-05
Antenna	R&S	HL 223	EF00212	2019-05	2022-05

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic chamber	Frankonia	AC 2	EF01616	2021-09	2022-09
Spectrum analyzer	R&S	FSU43	EF01631	2021-07	2022-07
Horn antenna	Schwarzbeck	BBHA 9120B	EF01678	2021-03	2022-03
Horn Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2022-03
Antenna	Amplifier Research	AT4560	EF00302	2021-06	2023-06

3.8.5 Procedure

Test Procedure 30 MHz - 1000 MHz
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector

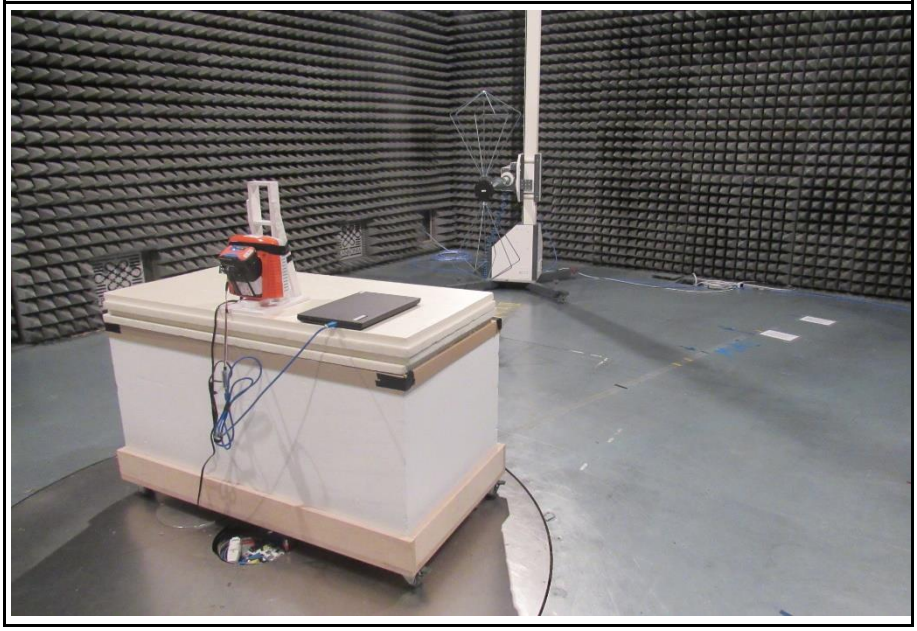
Test Procedure > 1 GHz
1. EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector

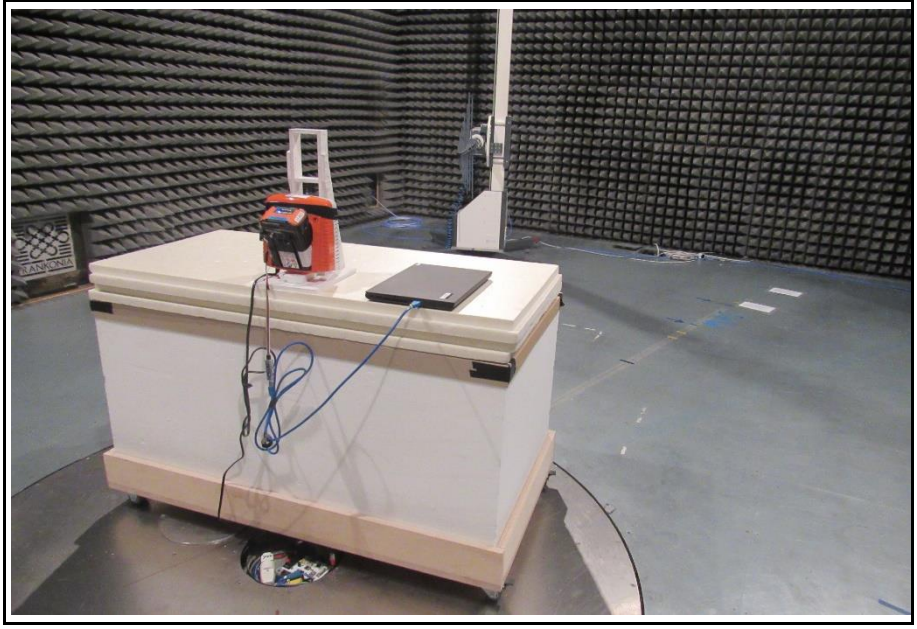
3.8.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2402	92.1775	15.10	pk	ver	95.00	-79.92
2402	397	21.00	pk	ver	95.00	-73.97
2402	2274	51.97	pk	hor	74.00	-22.03
2402	2274	49.18	avg	hor	54.00	-04.82
2402	2338	57.00	pk	hor	74.00	-17.00
2402	2338	47.72	avg	hor	54.00	-06.28
2402	2492.6	51.98	pk	hor	74.00	-22.02
2402	2492.6	49.89	avg	hor	54.00	-04.11
2402	3809.2	50.63	pk	ver	74.00	-23.37
2402	3809.2	29.09	avg	ver	54.00	-24.91
2402	3818.7	54.52	pk	ver	74.00	-19.48
2402	3818.7	31.07	avg	ver	54.00	-22.93
2402	3833.2	53.00	pk	ver	74.00	-21.00
2402	3833.2	29.00	avg	ver	54.00	-25.00
2402	3837.6	47.04	pk	ver	74.00	-26.96
2402	3837.6	28.11	avg	ver	54.00	-25.89
2402	4804	45.69	pk	hor	74.00	-28.31
2402	4804	42.98	avg	hor	54.00	-11.02
2402	17794	44.39	pk	ver	74.00	-29.61
2402	17794	34.45	avg	ver	54.00	-19.55
2402	20687	48.04	pk	hor	74.00	-25.96
2402	20687	36.71	avg	hor	54.00	-17.29
2440	92.0075	14.50	pk	ver	95.00	-80.46
2440	247.48	16.10	pk	ver	46.00	-29.94
2440	1502.3	31.02	pk	ver	74.00	-42.98
2440	1502.3	23.54	avg	ver	54.00	-30.46
2440	2312.2	55.47	pk	hor	74.00	-18.53
2440	2312.2	51.17	avg	hor	54.00	-02.83
2440	2332.3	49.63	pk	ver	74.00	-24.37
2440	2332.3	41.91	avg	ver	54.00	-12.09
2440	2338.5	48.19	pk	hor	74.00	-25.81
2440	2338.5	44.73	avg	hor	54.00	-09.27
2440	2349.1	53.05	pk	hor	74.00	-20.95
2440	2349.1	49.32	avg	hor	54.00	-04.68
2440	2376.1	52.84	pk	hor	74.00	-21.16
2440	2376.1	49.17	avg	hor	54.00	-04.83
2440	4880	46.10	pk	ver	74.00	-27.90
2440	4880	37.83	avg	ver	54.00	-16.17
2440	7320	55.82	pk	hor	74.00	-18.18
2440	7320	49.27	avg	hor	54.00	-04.73
2440	22201	47.56	pk	hor	74.00	-26.44
2440	22201	35.97	avg	hor	54.00	-18.03
2480	85.641	16.80	pk	ver	95.00	-78.19
2480	407.68	22.20	pk	hor	46.00	-23.82
2480	2352	57.70	pk	ver	74.00	-16.30
2480	2352	51.79	avg	ver	54.00	-02.21

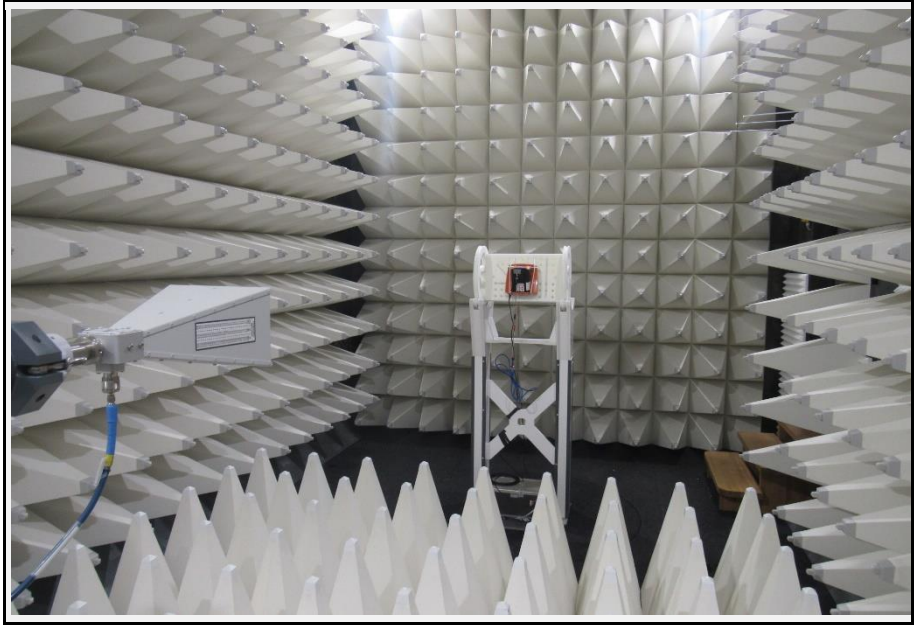
2480	2369	59.45	pk	hor	74.00	-14.55
2480	2369	53.34	avg	hor	54.00	-00.66
2480	2372	56.89	pk	ver	74.00	-17.11
2480	2372	46.94	avg	ver	54.00	-07.06
2480	2389	54.56	pk	hor	74.00	-19.44
2480	2389	51.96	avg	hor	54.00	-02.04
2480	4511	45.85	pk	hor	74.00	-28.15
2480	4511	33.78	avg	hor	54.00	-20.22
2480	4518	46.50	pk	hor	74.00	-27.50
2480	4518	33.98	avg	hor	54.00	-20.02
2480	4960	47.13	pk	hor	74.00	-26.87
2480	4960	36.70	avg	hor	54.00	-17.30
2480	7439	58.12	pk	hor	74.00	-15.88
2480	7439	53.67	avg	hor	54.00	-00.33
2480	17813	44.71	pk	ver	74.00	-29.29
2480	17813	31.58	avg	ver	54.00	-22.42
2480	18381	49.26	pk	ver	74.00	-24.74
2480	18381	36.22	avg	ver	54.00	-17.78

3.8.7 Setup Photos

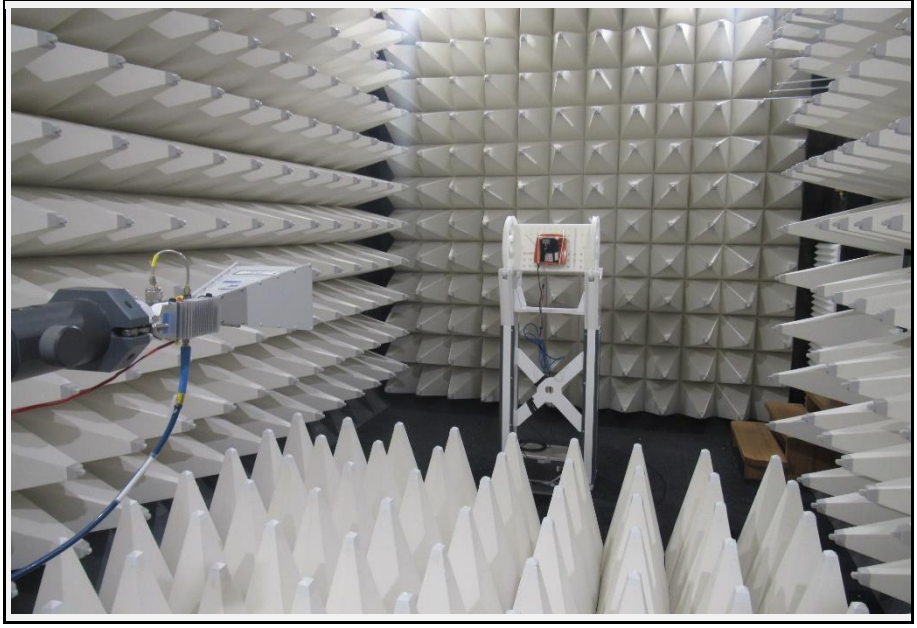
Setup 30-200MHz


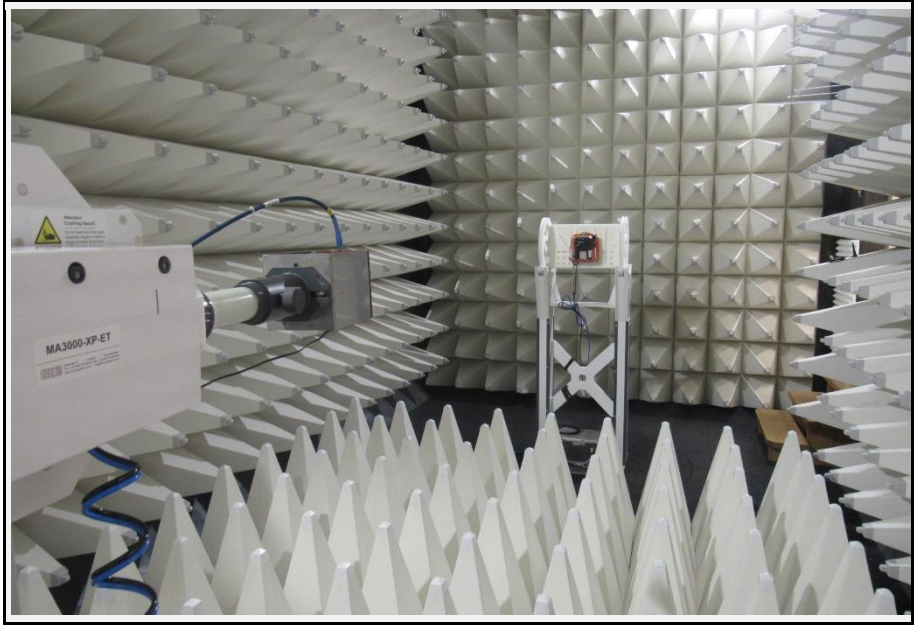
Setup 0.2-1GHz


Setup 1-8GHz



Setup 8-18GHz



Setup 18-26.5GHz


3.9 Test Conditions and Results - Receiver radiated emissions

3.9.1 Information

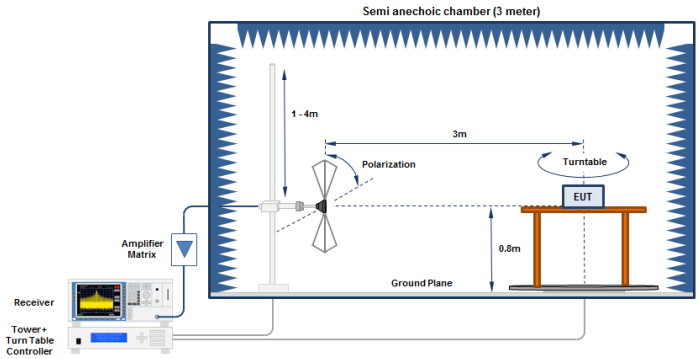
Test Information	
Reference	ISED RSS-247, Issue 2 (section 3.1)
Measurement Uncertainty	± 5.95 dB
Measurement Method	ANSI C63.4-2014 8.1-8.3
Operator	Jens Degenhardt
Date	2021-12-16

3.9.2 Limits

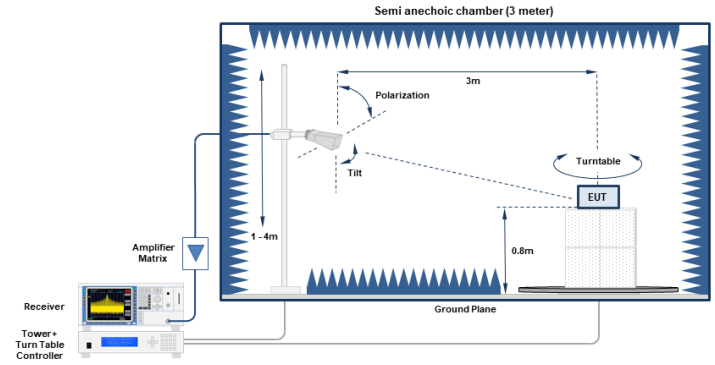
Limits			
Frequency range [MHz]	Detector	Field strength [µV/m]	Measurement distance [m]
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

3.9.3 Setup

Test Setup 30 MHz - 1000 MHz



Test Setup > 1 GHz



3.9.4 Equipment

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

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2021-02	2024-02
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2021-07	2022-07
Antenna	R&S	HK 116	EF00030	2021-05	2024-05
Antenna	R&S	HL 223	EF00212	2019-05	2022-05

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2021-02	2024-02
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2021-07	2022-07
Horn antenna	Schwarzbeck	BBHA 9120B	EF01678	2021-03	2022-03
Horn Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2022-03

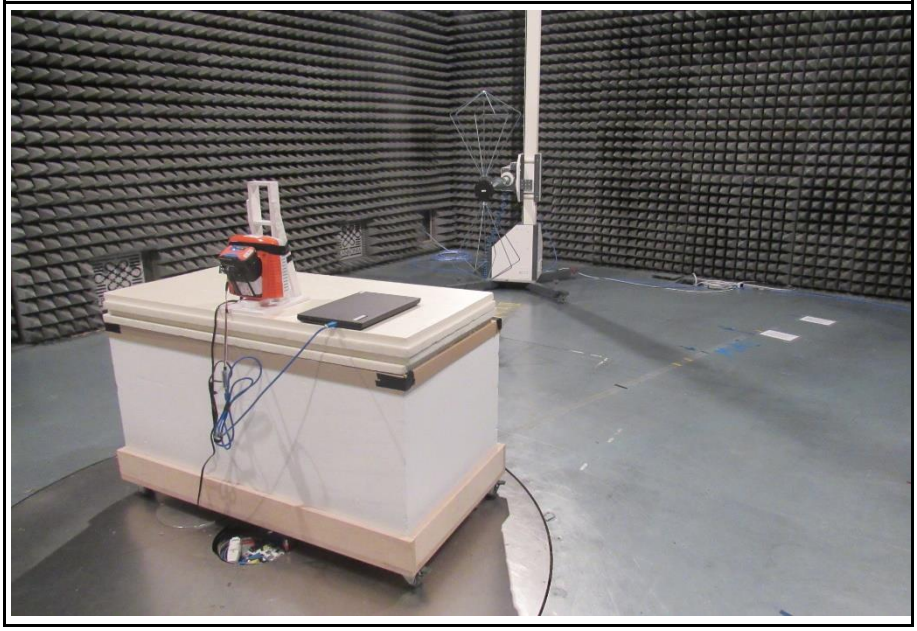
3.9.5 Procedure

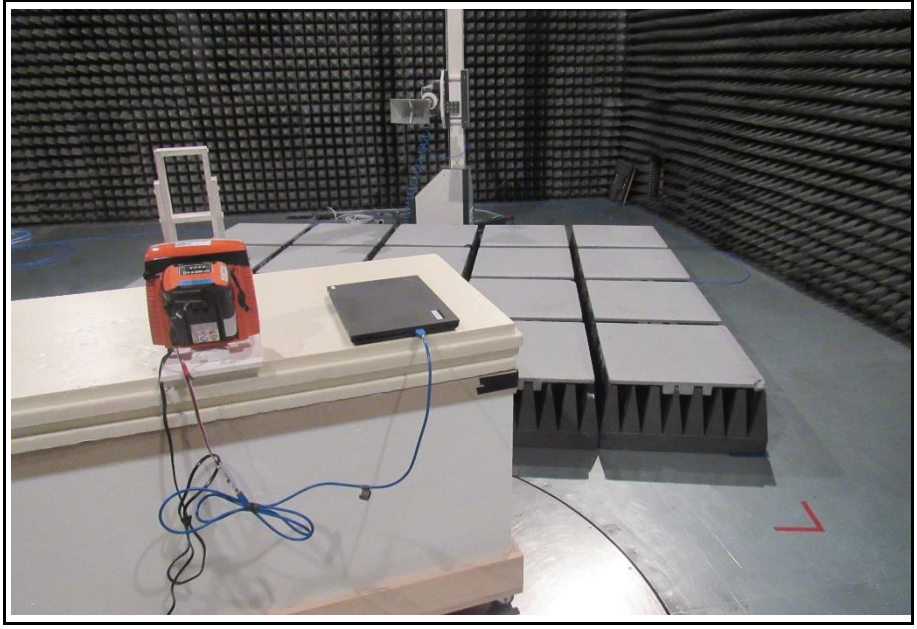
Test Procedure
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground
2. EUT is set to test mode
3. The receiver is set to peak detection with max hold
4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m
5. All significant emissions are measured again using the corresponding final detector

3.9.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2440	4878	45.12	pk	hor	74.00	-28.88
2440	4878	36.38	avg	hor	53.98	-17.60
2440	16395	49.28	pk	ver	74.00	-24.72
2440	16395	35.10	avg	ver	53.98	-18.88

3.9.7 Setup Photos

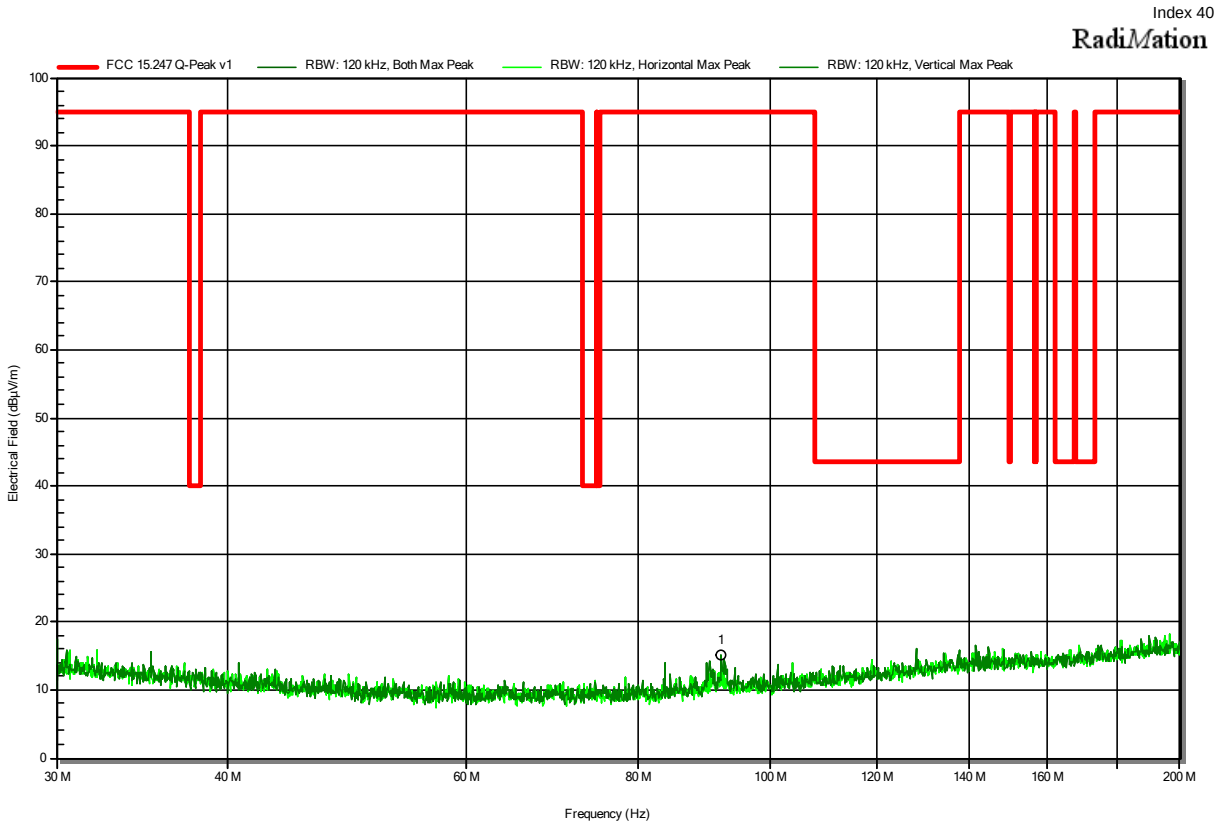
Setup < 1 GHz


Setup > 1 GHz


ANNEX A Transmitter spurious emissions

Radiated Spurious Emissions according to 47 CFR Part 15.247

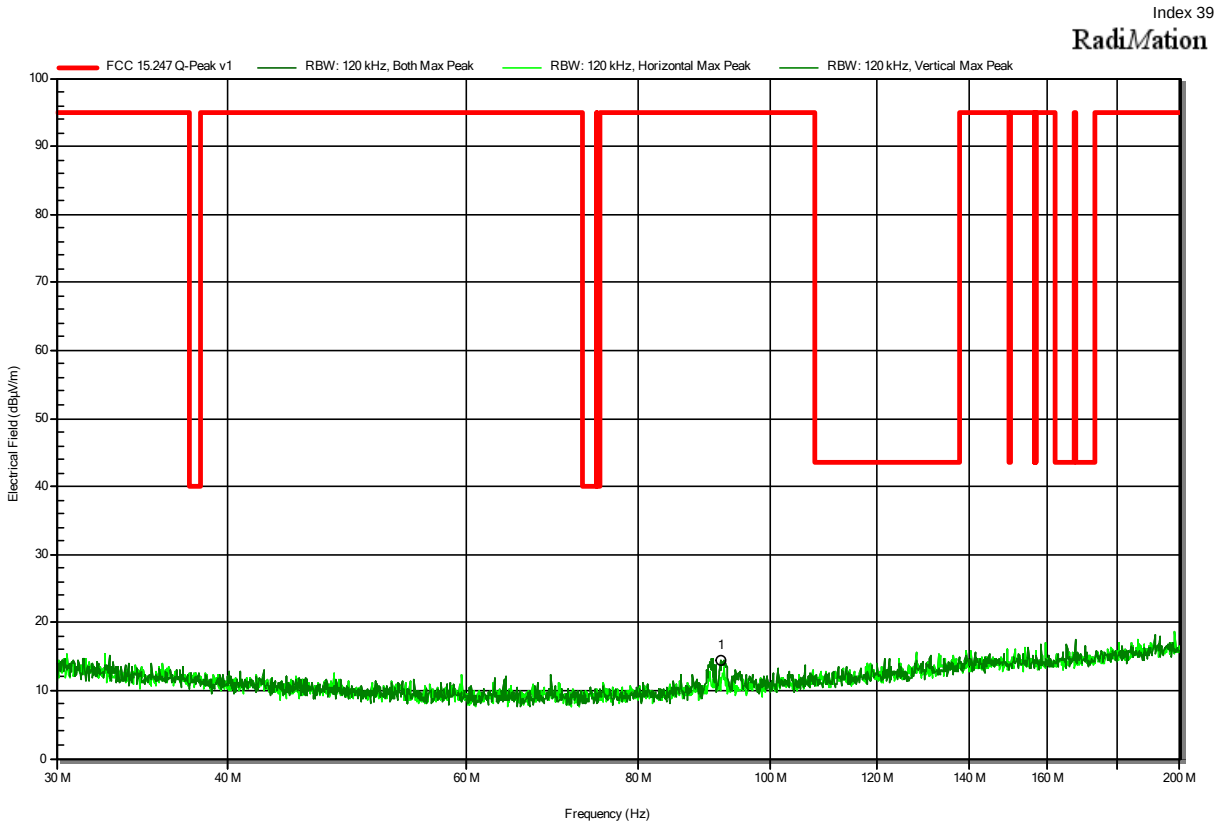
Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Rohde & Schwarz HK 116
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.402GHz
Test Date:	2021-12-16
Note:	EUT vertical



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
92.1775 MHz	15.1 dBµV/m	95 dBµV/m	-79.92 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247

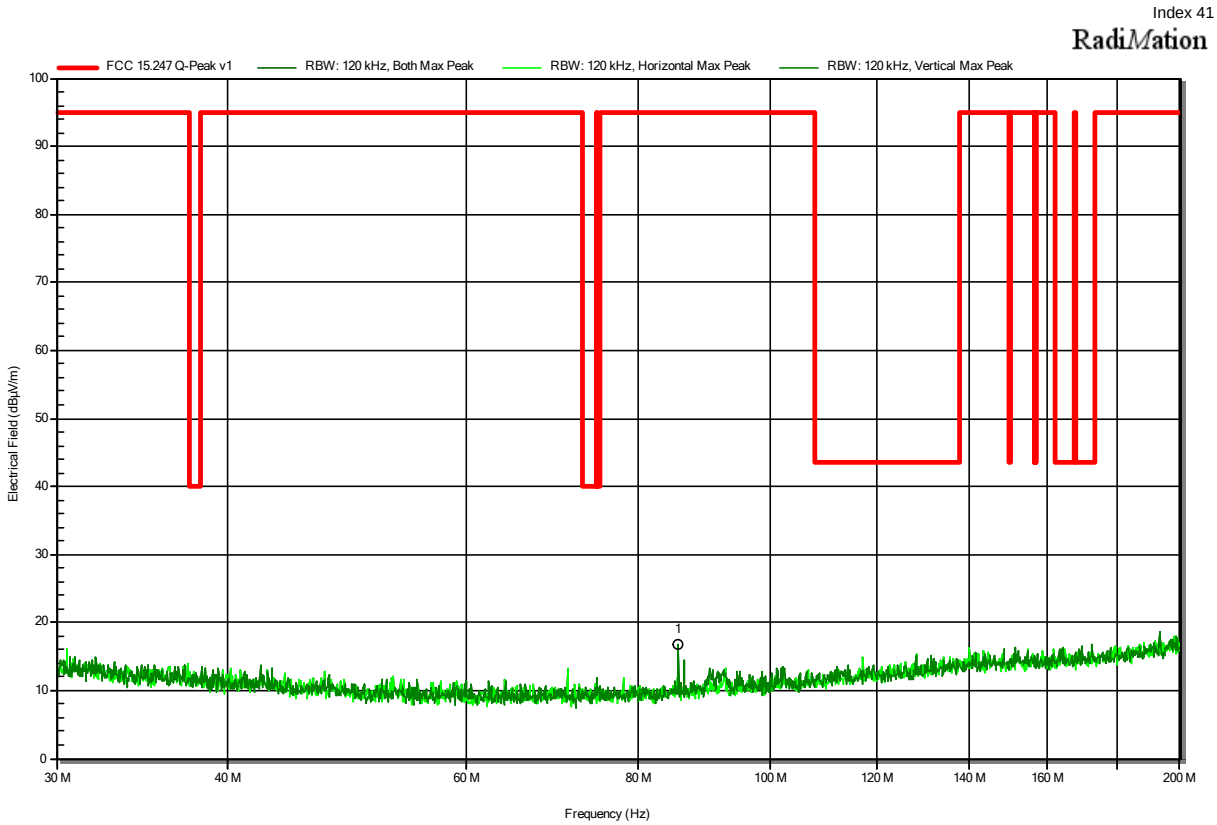
Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Rohde & Schwarz HK 116
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.44GHz
Test Date:	2021-12-16
Note:	EUT vertical



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
92.0075 MHz	14.5 dBµV/m	95 dBµV/m	-80.46 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247

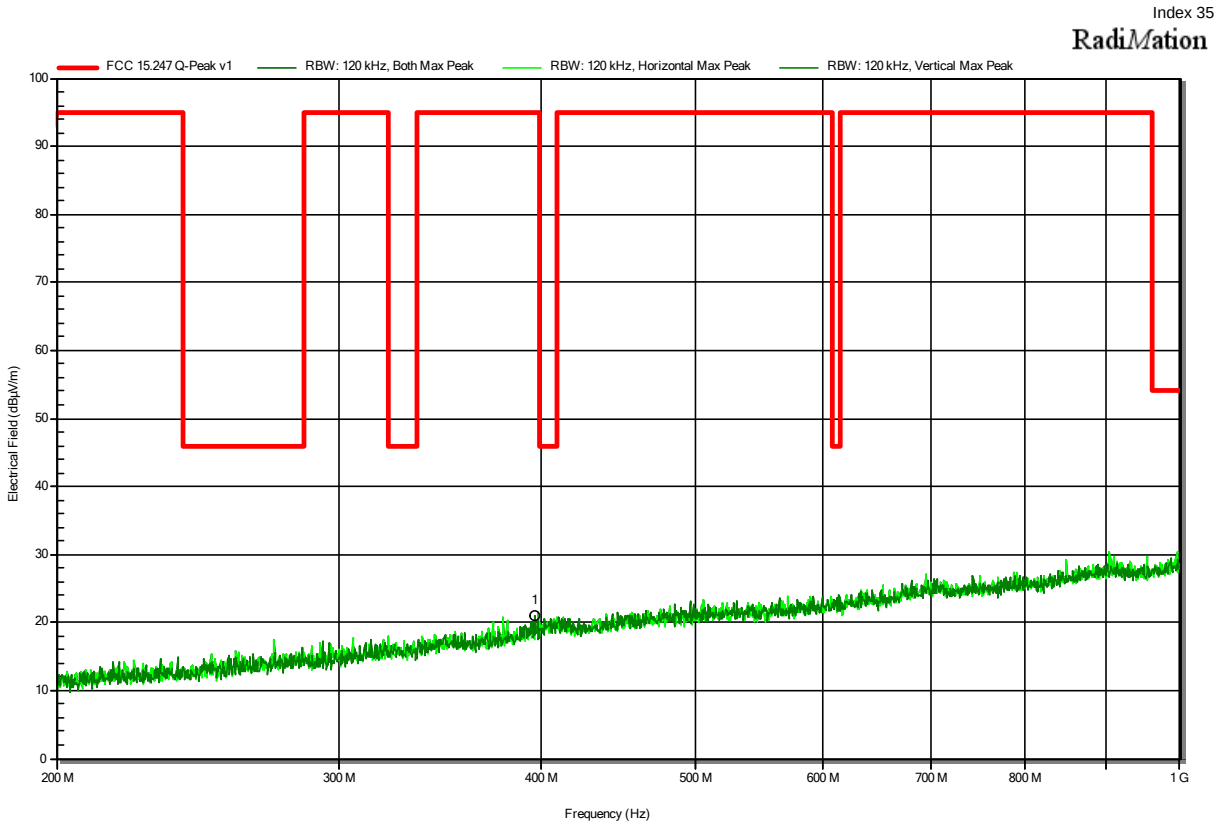
Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Rohde & Schwarz HK 116
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.48GHz
Test Date:	2021-12-16
Note:	EUT vertical



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
85.641 MHz	16.8 dBµV/m	95 dBµV/m	-78.19 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247

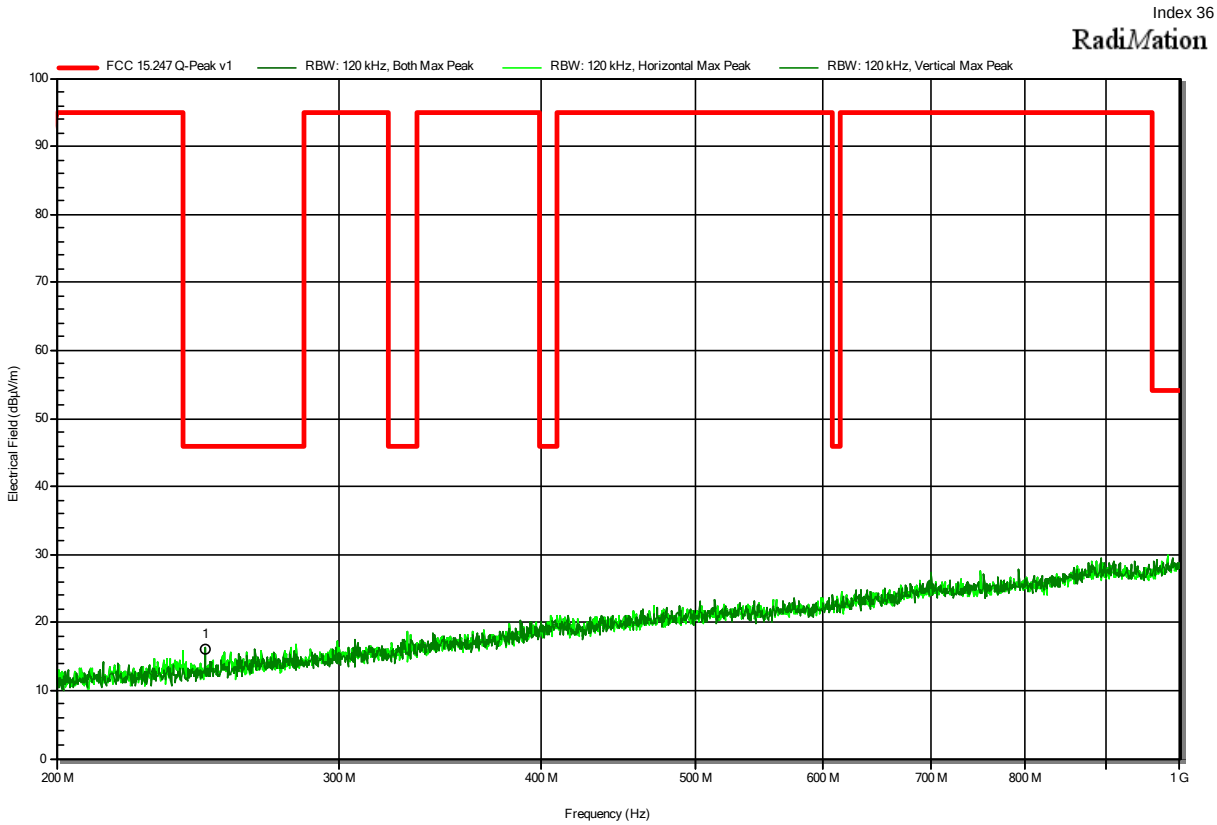
Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Rohde & Schwarz HL 223
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.402GHz
Test Date:	2021-12-16
Note:	EUT vertical



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
397 MHz	21 dBµV/m	95 dBµV/m	-73.97 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247

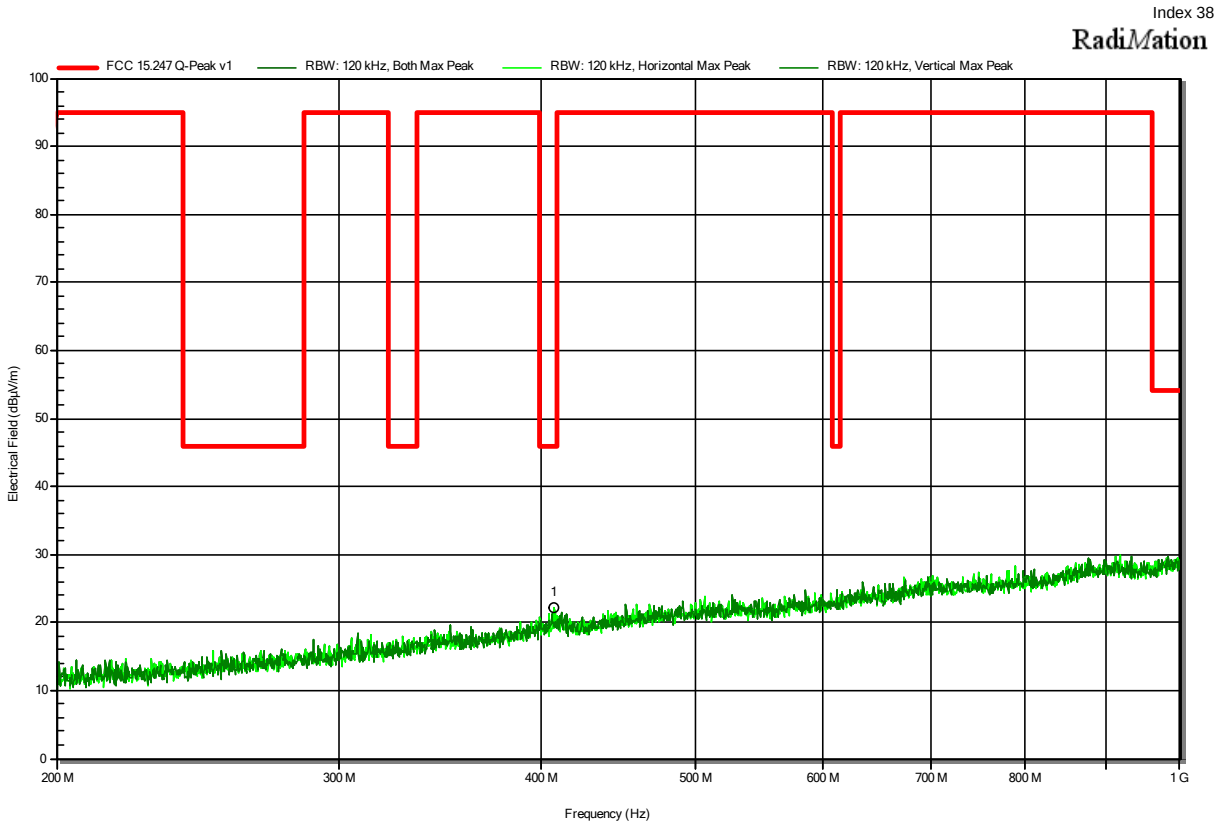
Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Rohde & Schwarz HL 223
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.44GHz
Test Date:	2021-12-16
Note:	EUT vertical



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
247.48 MHz	16.1 dBµV/m	46 dBµV/m	-29.94 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Rohde & Schwarz HL 223
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.48GHz
Test Date:	2021-12-16
Note:	EUT vertical



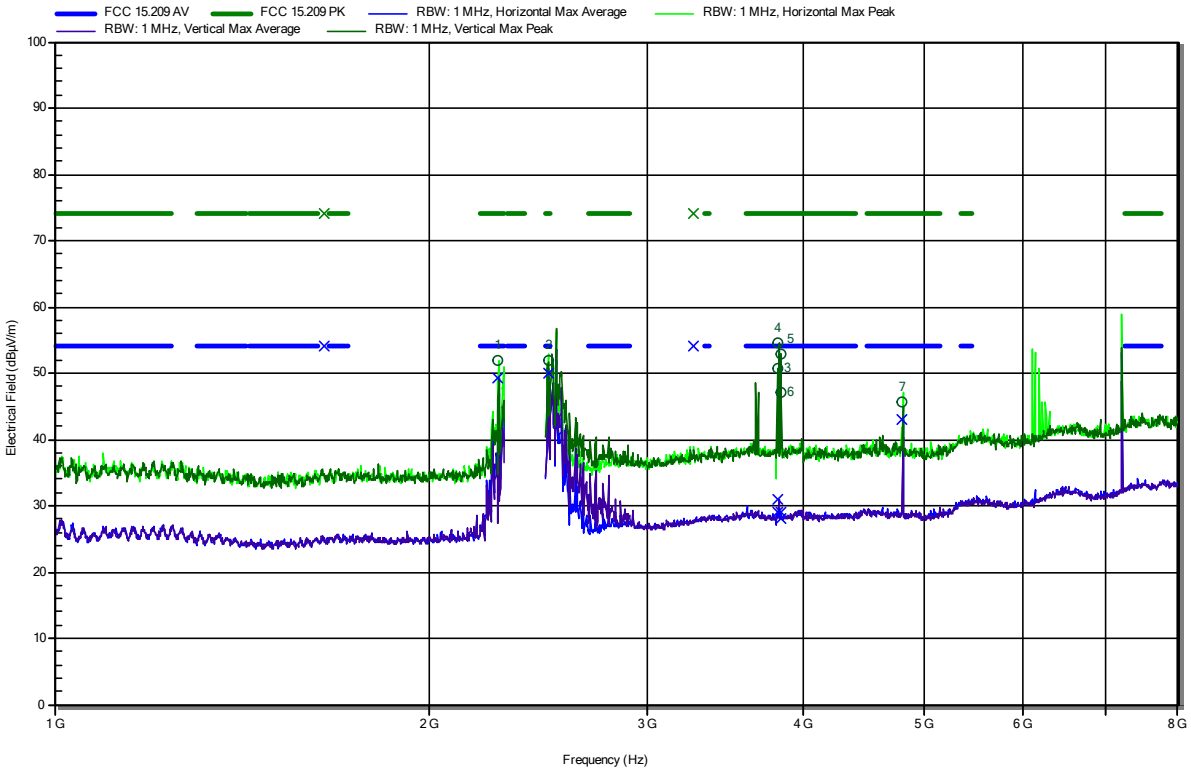
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
407.68 MHz	22.2 dBµV/m	46 dBµV/m	-23.82 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Schwarzbeck BBHA 9120B
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.402GHz
Test Date:	2021-12-16
Note:	EUT vertical

Index 27

RadiMation



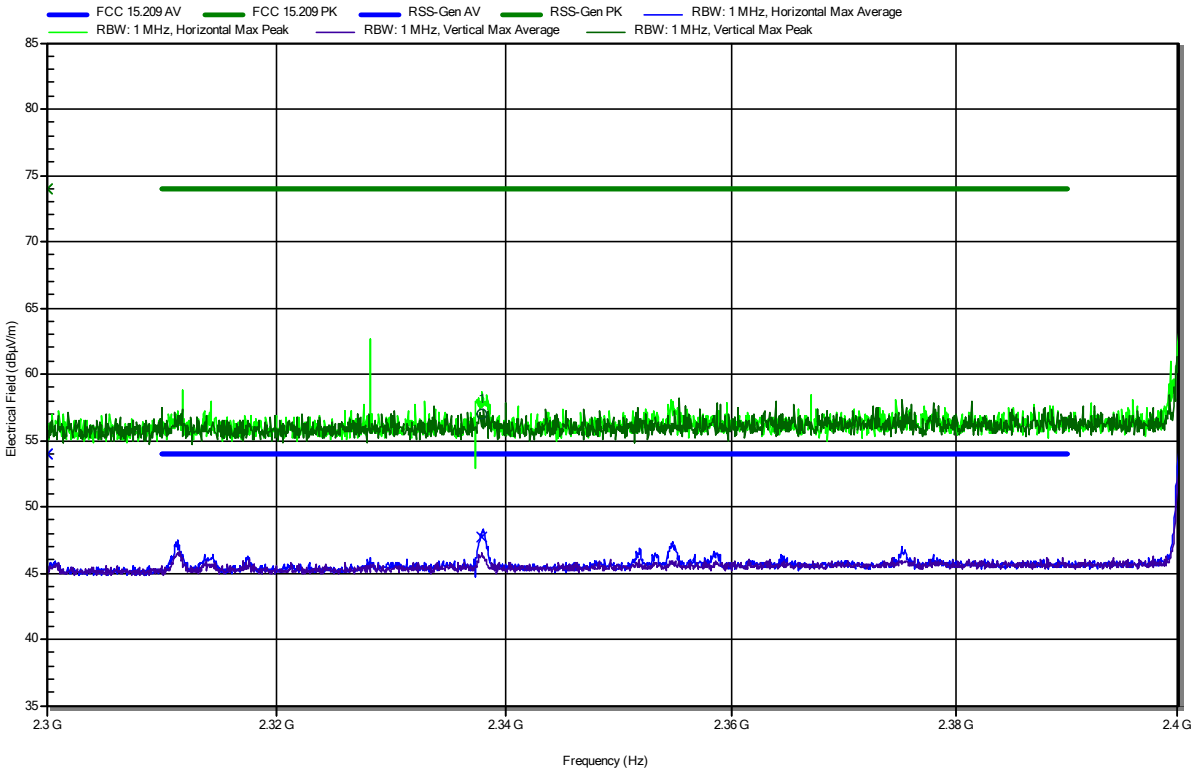
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
2.274 GHz	49.18 dBµV/m	54 dBµV/m	-4.82 dB	Pass	Horizontal
2.4926 GHz	49.89 dBµV/m	54 dBµV/m	-4.11 dB	Pass	Horizontal
3.8092 GHz	29.09 dBµV/m	54 dBµV/m	-24.91 dB	Pass	Vertical
3.8187 GHz	31.07 dBµV/m	54 dBµV/m	-22.93 dB	Pass	Vertical
3.8332 GHz	29 dBµV/m	54 dBµV/m	-25 dB	Pass	Vertical
3.8376 GHz	28.11 dBµV/m	54 dBµV/m	-25.89 dB	Pass	Vertical
4.804 GHz	42.98 dBµV/m	54 dBµV/m	-11.02 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Schwarzbeck BBHA 9120B
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.402GHz
Test Date:	2021-12-16
Note:	lower bandedge, EUT vertical

Index 28

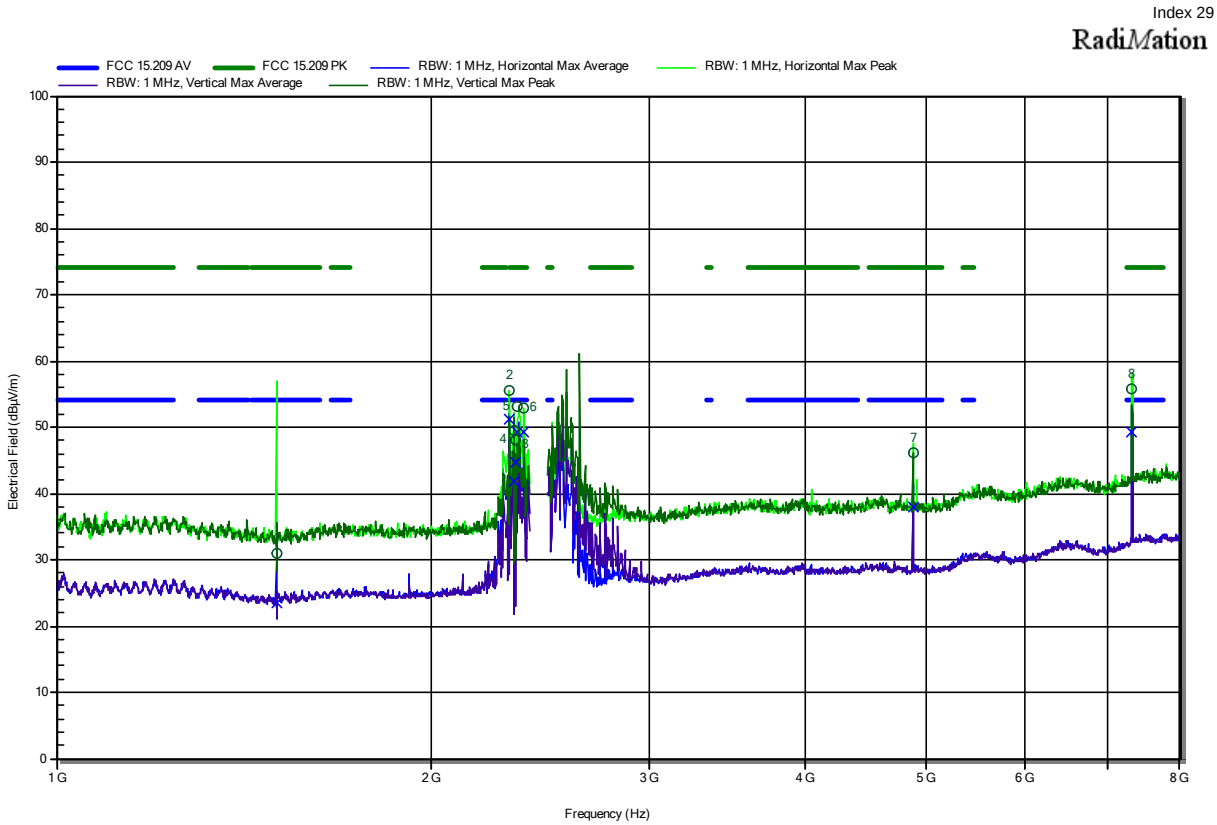
RadiMation



Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
2.338 GHz	47.72 dBµV/m	54 dBµV/m	-6.28 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Schwarzbeck BBHA 9120B
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.44GHz
Test Date:	2021-12-16
Note:	EUT vertical



Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
1.5023 GHz	23.54 dBµV/m	54 dBµV/m	-30.46 dB	Pass	Vertical
2.3122 GHz	51.17 dBµV/m	54 dBµV/m	-2.83 dB	Pass	Horizontal
2.3323 GHz	41.91 dBµV/m	54 dBµV/m	-12.09 dB	Pass	Vertical
2.3385 GHz	44.73 dBµV/m	54 dBµV/m	-9.27 dB	Pass	Horizontal
2.3491 GHz	49.32 dBµV/m	54 dBµV/m	-4.68 dB	Pass	Horizontal
2.3761 GHz	49.17 dBµV/m	54 dBµV/m	-4.83 dB	Pass	Horizontal
4.88 GHz	37.83 dBµV/m	54 dBµV/m	-16.17 dB	Pass	Vertical
7.32 GHz	49.27 dBµV/m	54 dBµV/m	-4.73 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247

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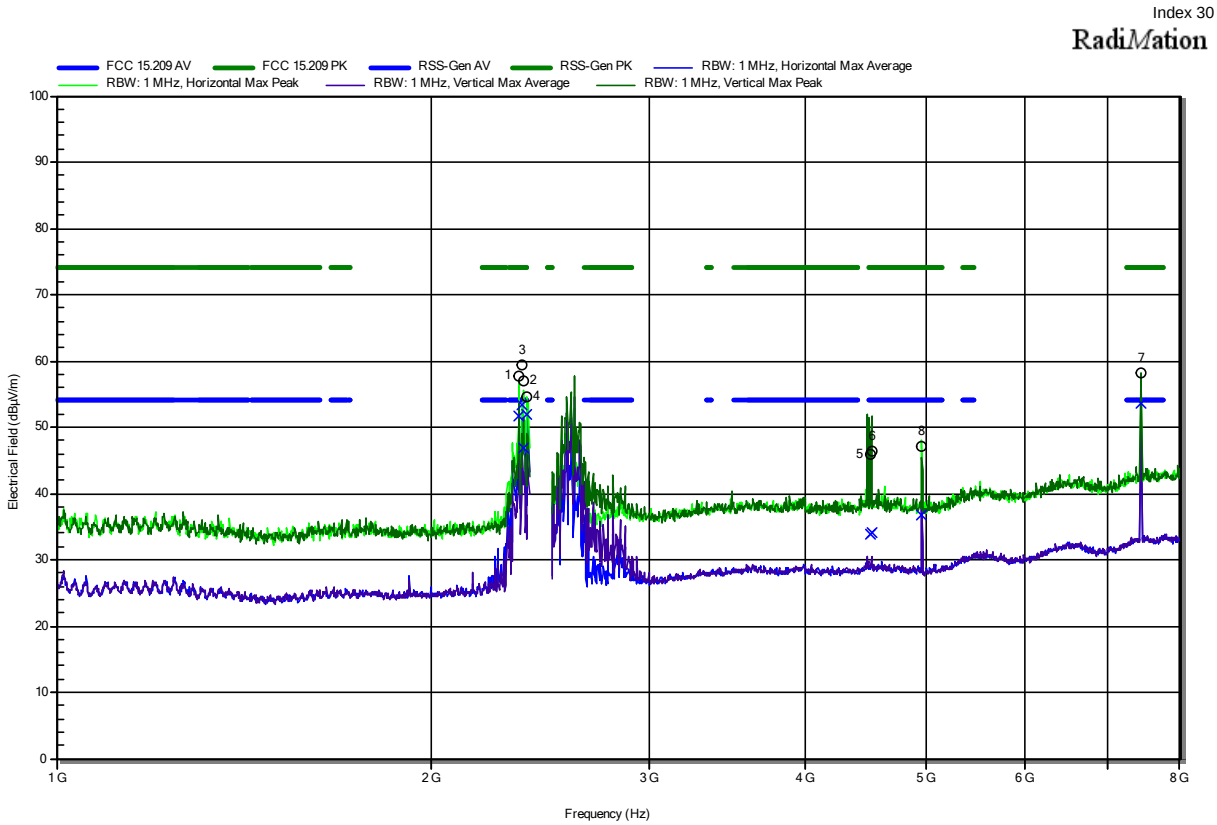
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Schwarzbeck BBHA 9120B
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.48GHz
Test Date:	2021-12-16
Note:	EUT vertical



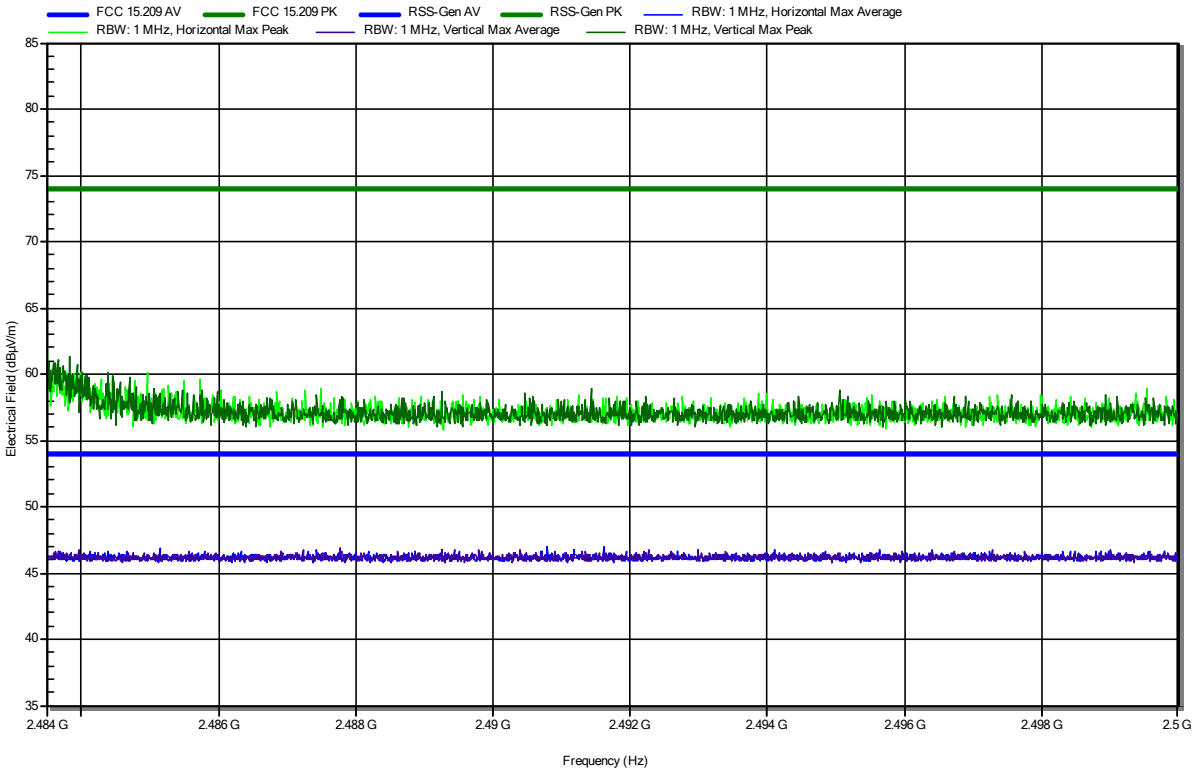
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
2.352 GHz	51.79 dBµV/m	54 dBµV/m	-2.21 dB	Pass	Vertical
2.369 GHz	53.34 dBµV/m	54 dBµV/m	-0.66 dB	Pass	Horizontal
2.372 GHz	46.94 dBµV/m	54 dBµV/m	-7.06 dB	Pass	Vertical
2.389 GHz	51.96 dBµV/m	54 dBµV/m	-2.04 dB	Pass	Horizontal
4.511 GHz	33.78 dBµV/m	54 dBµV/m	-20.22 dB	Pass	Horizontal
4.518 GHz	33.98 dBµV/m	54 dBµV/m	-20.02 dB	Pass	Horizontal
4.96 GHz	36.7 dBµV/m	54 dBµV/m	-17.3 dB	Pass	Horizontal
7.439 GHz	53.67 dBµV/m	54 dBµV/m	-0.33 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Schwarzbeck BBHA 9120B
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.48GHz
Test Date:	2021-12-16
Note:	upper bandedge, EUT vertical

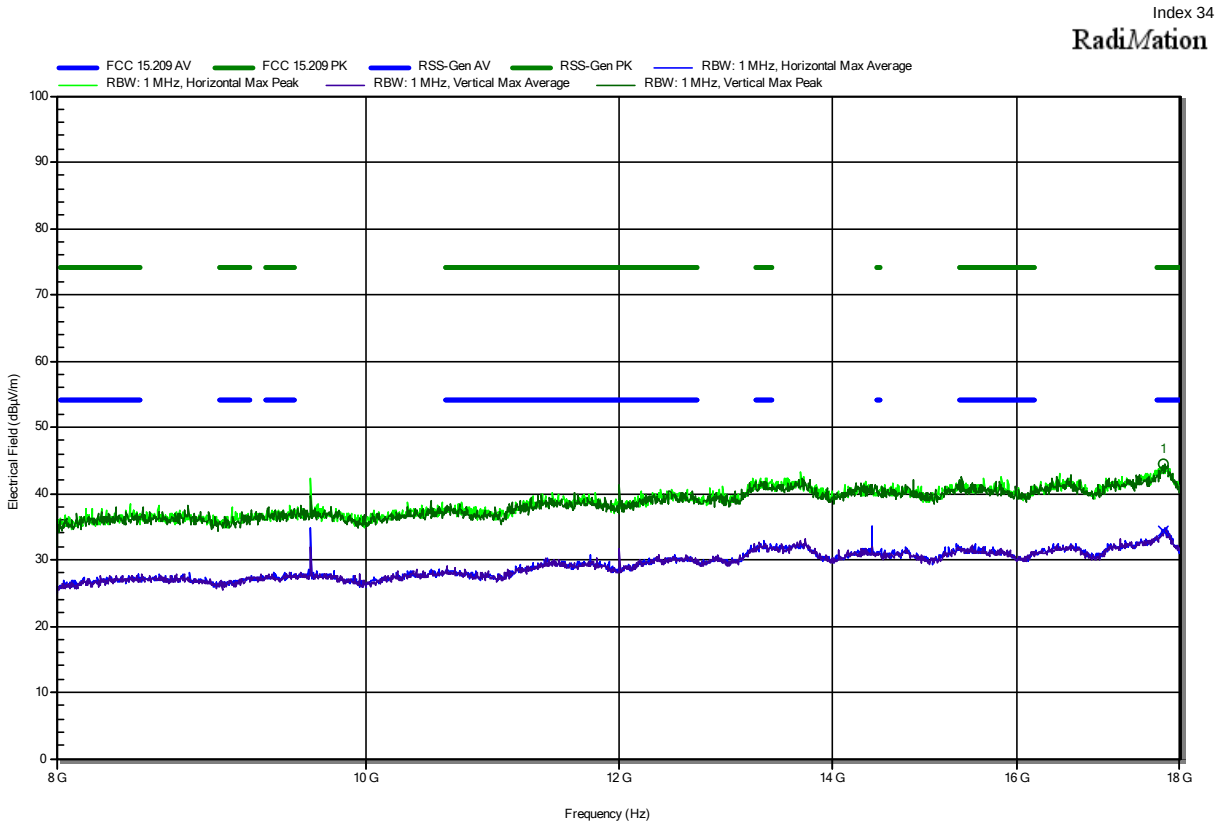
Index 31

RadiMation



Radiated Spurious Emissions according to 47 CFR Part 15.247

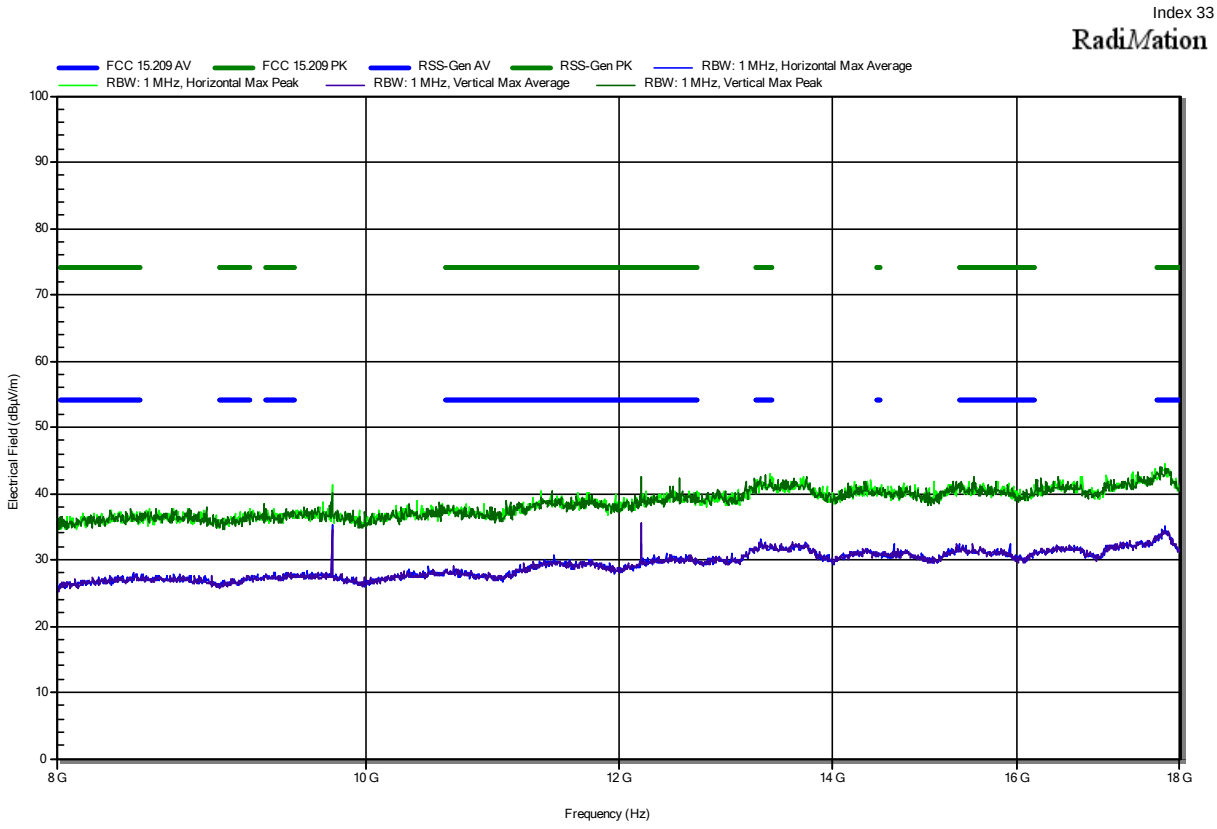
Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Schwarzbeck HWRD 650
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.402GHz
Test Date:	2021-12-16
Note:	EUT vertical



Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
17.794 GHz	34.45 dBµV/m	54 dBµV/m	-19.55 dB	Pass	Vertical

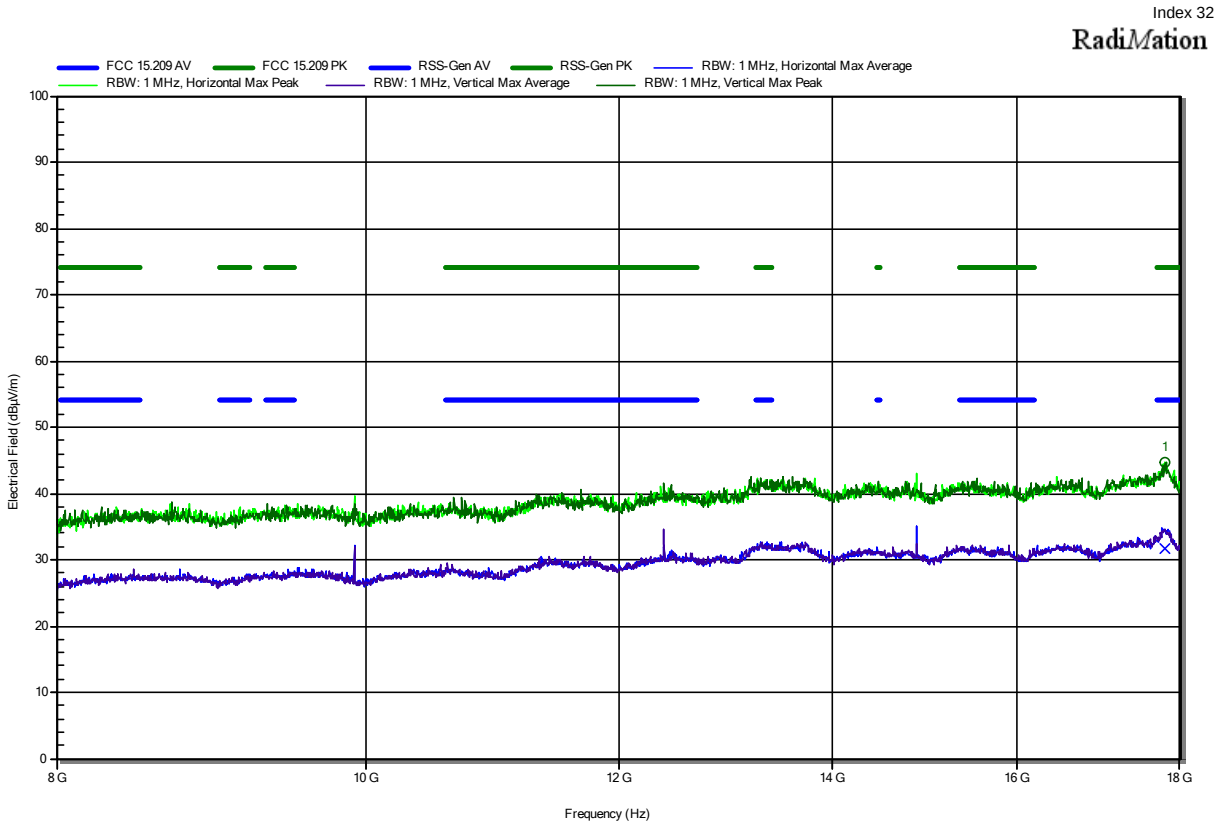
Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Schwarzbeck HWRD 650
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.44GHz
Test Date:	2021-12-16
Note:	EUT vertical



Radiated Spurious Emissions according to 47 CFR Part 15.247

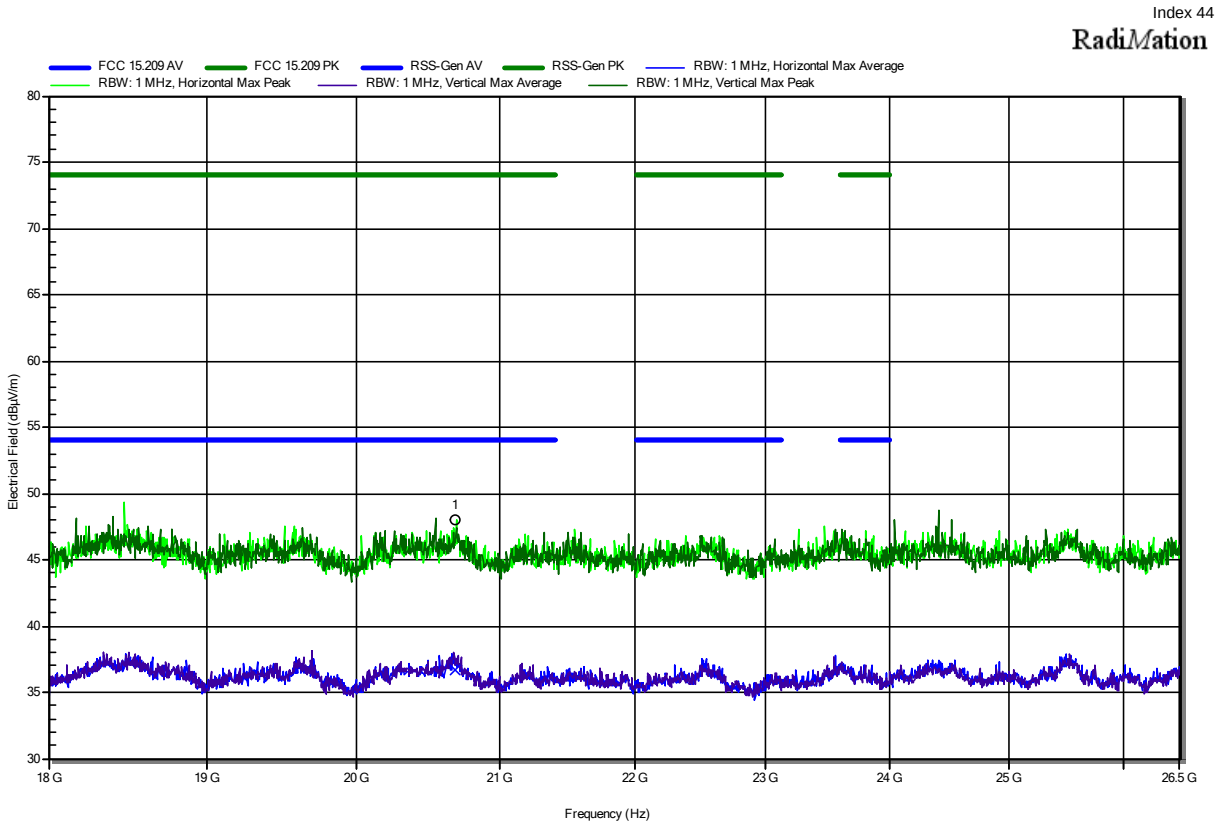
Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Schwarzbeck HWRD 650
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.48GHz
Test Date:	2021-12-16
Note:	EUT vertical



Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
17.813 GHz	31.58 dBµV/m	54 dBµV/m	-22.42 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247

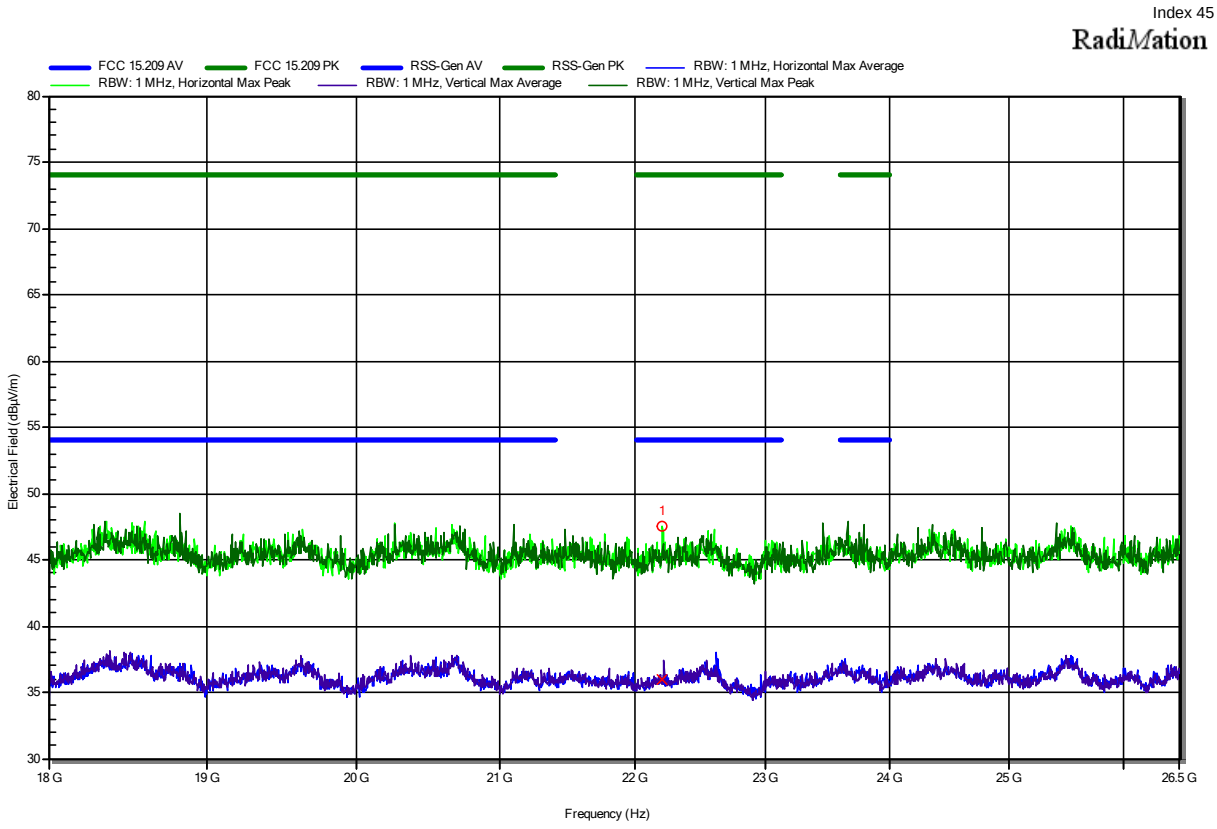
Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Amplifier Research AT4560
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.402GHz
Test Date:	2021-12-17
Note:	EUT vertical



Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
20.687 GHz	36.71 dBµV/m	54 dBµV/m	-17.29 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247

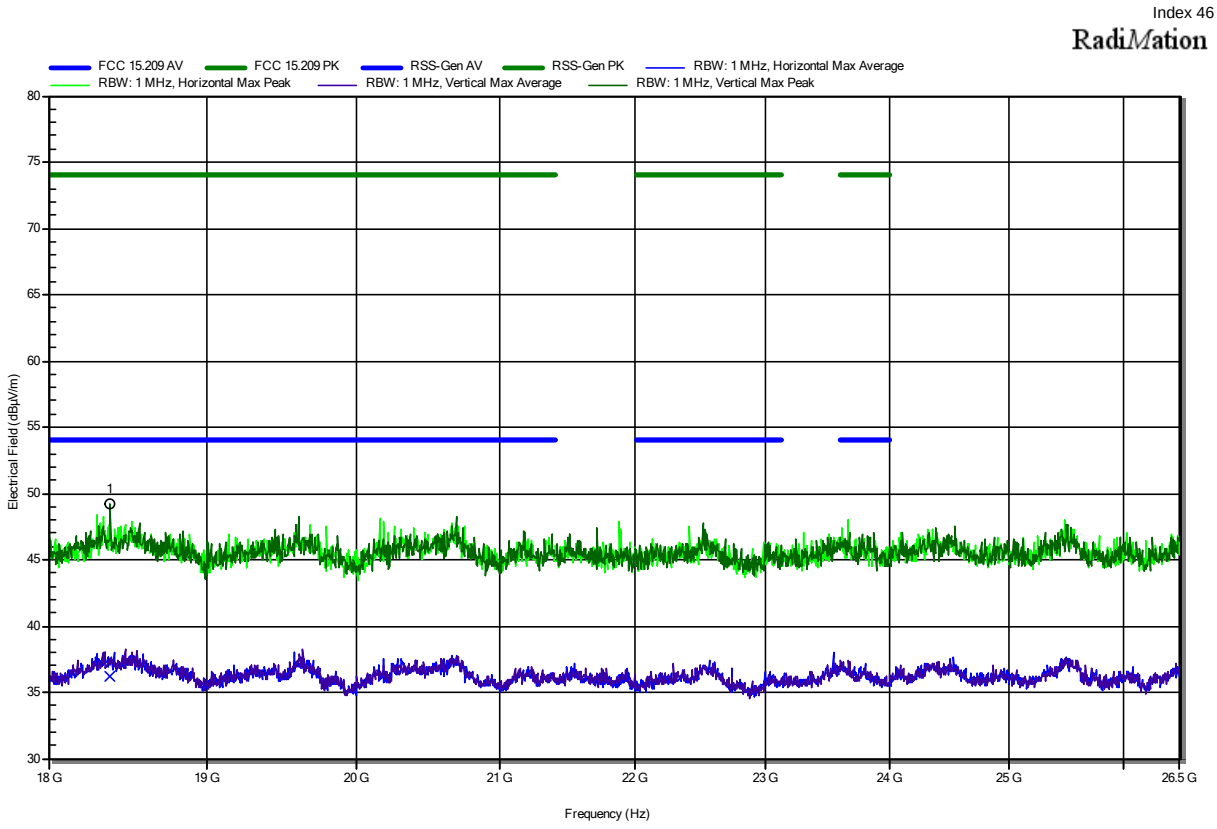
Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Amplifier Research AT4560
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.44GHz
Test Date:	2021-12-17
Note:	EUT vertical



Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
22.201 GHz	35.97 dBµV/m	54 dBµV/m	-18.03 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Amplifier Research AT4560
Measurement distance:	3 m
Mode:	Tx; BT-LE 2.48GHz
Test Date:	2021-12-17
Note:	EUT vertical

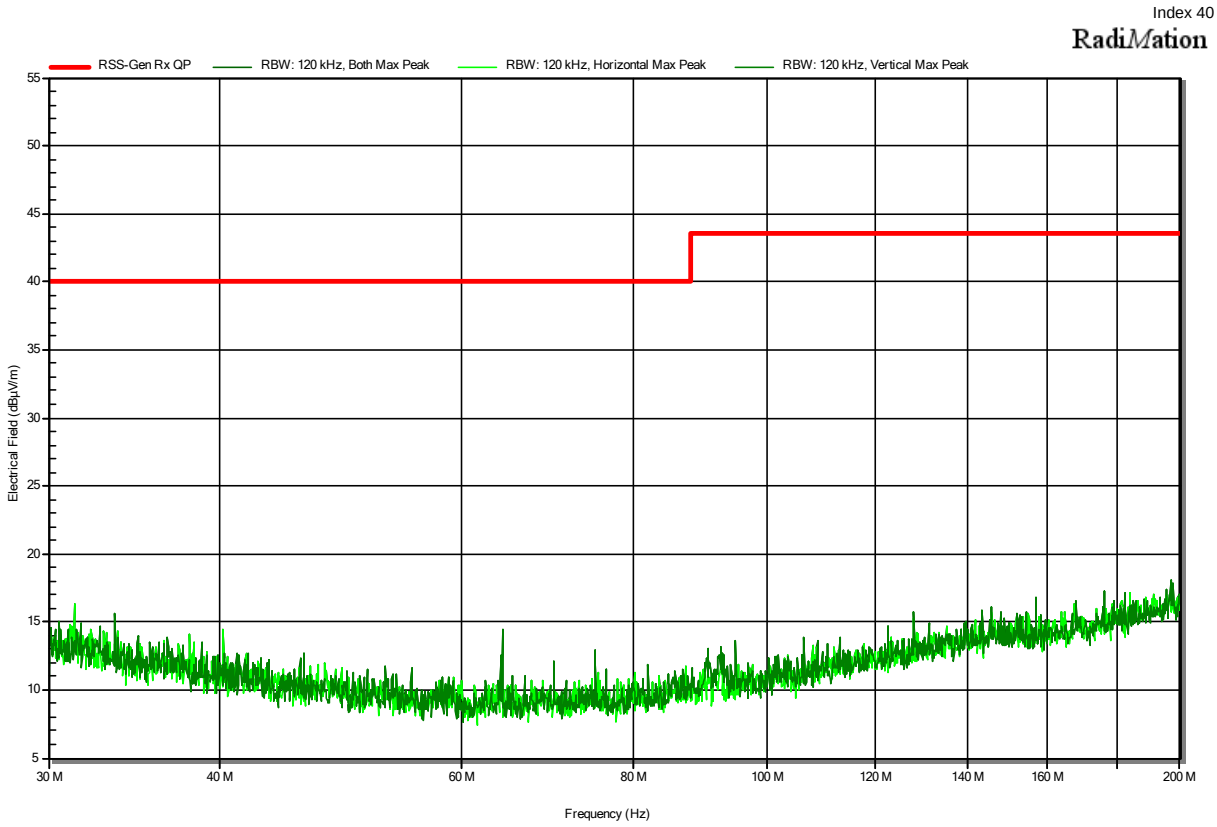


Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
18.381 GHz	36.22 dBµV/m	54 dBµV/m	-17.78 dB	Pass	Vertical

ANNEX B Receiver spurious emissions

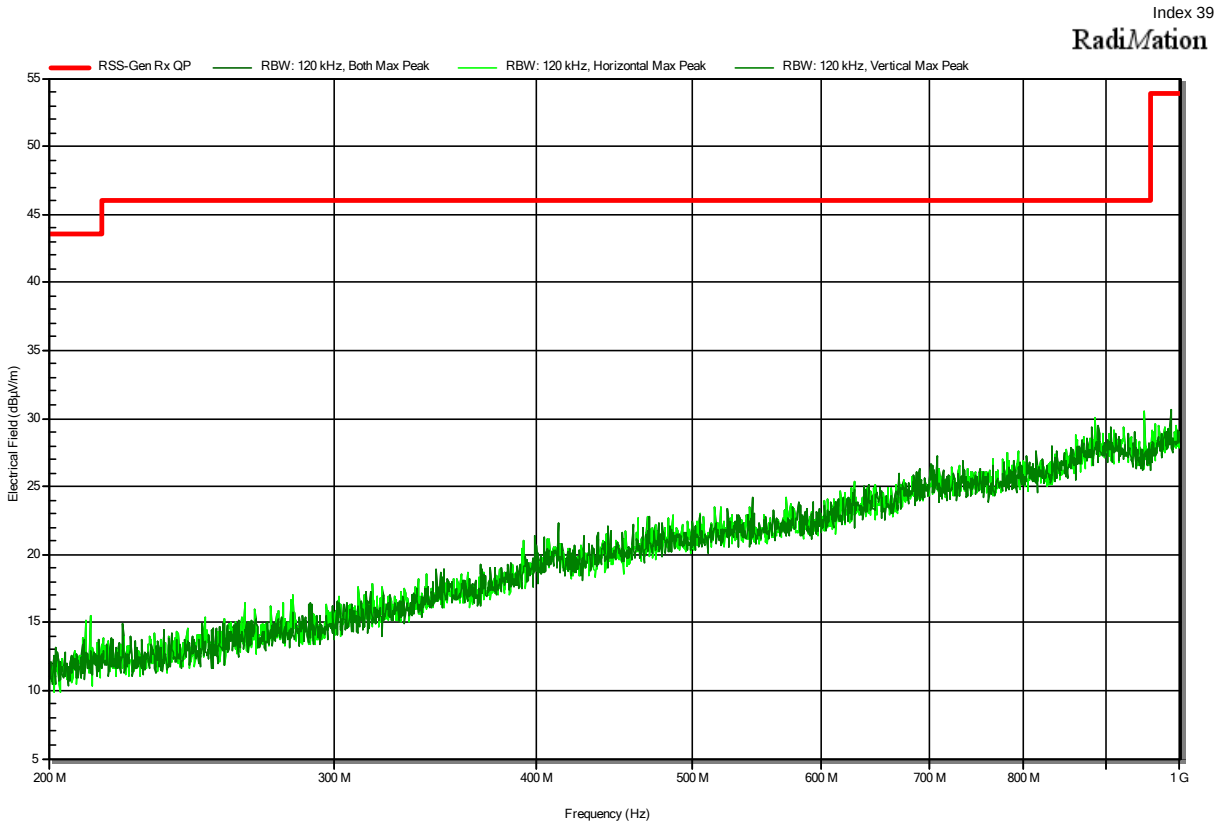
Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-Gen Issue 5

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Rohde & Schwarz HK 116
Measurement distance:	3 m
Mode:	Rx; BT-LE 2.44 GHz Receive
Test Date:	2021-12-16
Note:	EUT vertical



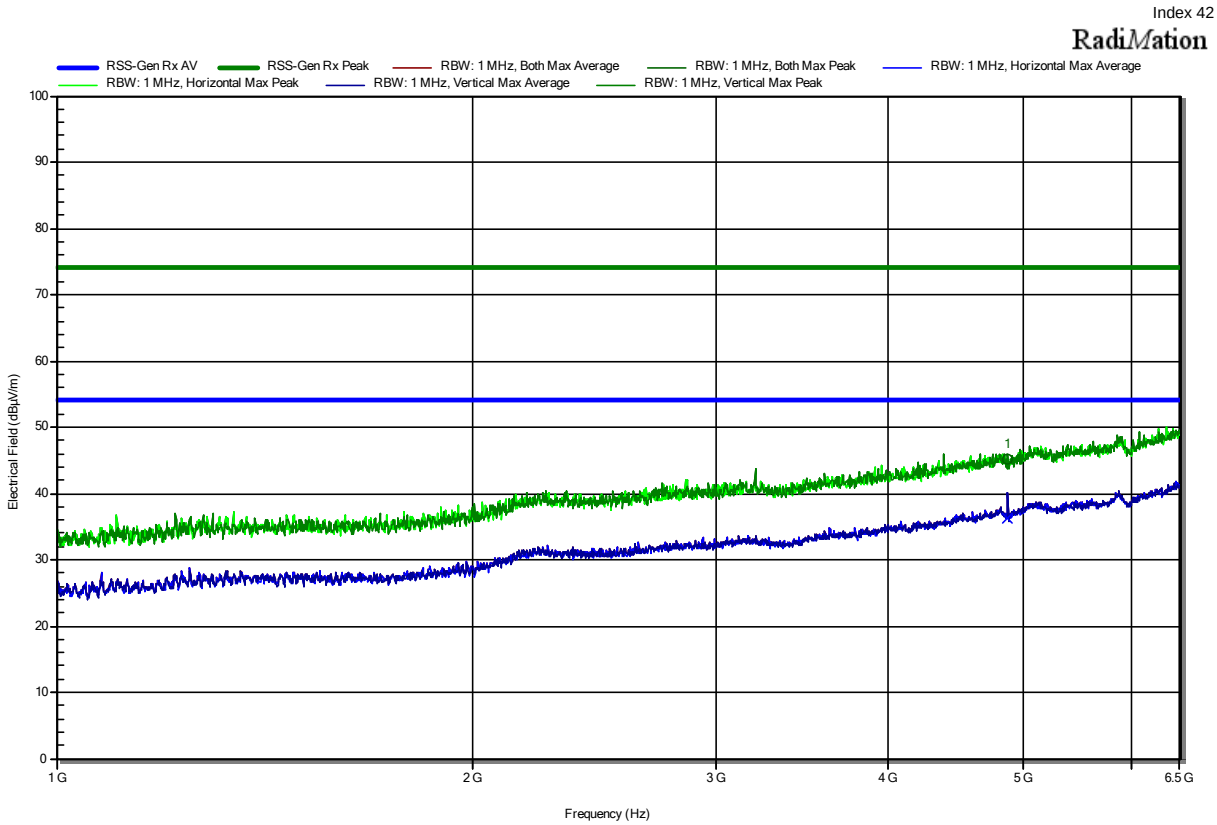
Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-Gen Issue 5

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Rohde & Schwarz HL 223
Measurement distance:	3 m
Mode:	Rx; BT-LE 2.44 GHz Receive
Test Date:	2021-12-16
Note:	EUT vertical



Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-Gen Issue 5

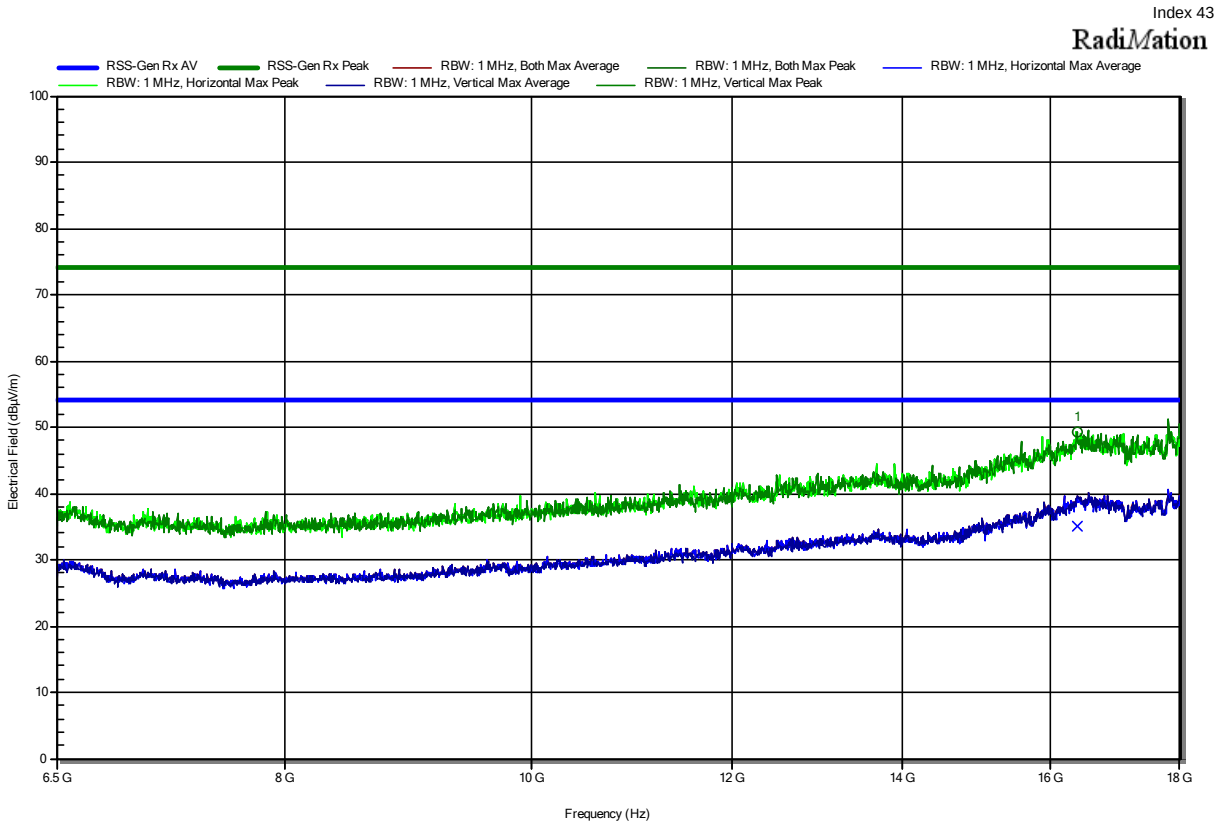
Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Schwarzbeck BBHA 9120D
Measurement distance:	3 m
Mode:	Rx; BT-LE 2.44 GHz Receive
Test Date:	2021-12-17
Note:	EUT vertical



Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
4.878 GHz	36.38 dBµV/m	53.98 dBµV/m	-17.6 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-Gen Issue 5

Project Number:	G0M-2106-9856
Applicant:	ANDREAS STIHL AG & Co. KG
Model Description:	Battery pack 4850 with Bluetooth-Modul
Model:	AP 300 S
Test Sample ID:	37458
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Degenhardt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 23 °Celsius, Vnom: Charger AL300 (sample-ID:35883)
Antenna:	Schwarzbeck HWRD 650
Measurement distance:	3 m
Mode:	Rx; BT-LE 2.44 GHz Receive
Test Date:	2021-12-17
Note:	EUT vertical



Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
16.395 GHz	35.1 dBµV/m	53.98 dBµV/m	-18.88 dB	Pass	Vertical

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