RADIO REPORT

FCC 47 CFR Part 15C
ISED Canada RSS-247

Digital transmission systems operating within the 2400 – 2483.5 MHz band

Report Reference No	G0M-1909-8467-TFC247BL-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-2 DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	BIOTRONIK SE & Co. KG
Address	Woermannkehre 1 12359 Berlin GERMANY
Test Specification	According to FCC/ISED rules
Standard	47 CFR Part 15C RSS-247, Issue 2, 2017-02 RSS-Gen, Issue 5, Amendment 1, 2019-03
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Programming device
Model(s)	BIOwand
Additional Model(s)	None
Brand Name(s)	BIOTRONIK
Hardware Version(s)	B
Software Version(s)	BFW_FW_1_0_x
FCC-ID	QRI-BIOWAND
IC	-/-
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 - 26 °C	
Test Lab Humidity	40 – 50 %	
Date of receipt of test item	2019-09-16	
Report:		
Compiled by	Florian Voigt	
Tested by (+ signature) (Responsible for Test)	Florian Voigt supervised by Christian Weber	F. Voigt C. Weber .....
Approved by (+ signature) (Deputy Head of Lab)	Toralf Jahn	T. J .....
Date of Issue	2019-10-02	
Total number of pages	130	
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	2019-10-02	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	Programming device	
Model	BIOwand	
Additional Model(s)	None	
Brand Name(s)	BIOTRONIK	
Serial Number(s)	80300009	
Hardware Version(s)	B	
Software Version(s)	BFW_FW_1_0_x	
PMN	-/-	
HVIN	-/-	
FVIN	-/-	
HMN	-/-	
FCC-ID	QRI-BIOWAND	
IC	-/-	
Equipment type	End Product	
Radio type	Transceiver	
Assigned frequency bands	2400 - 2483.5 MHz	
Radio technology	Bluetooth LE	
Modulation	GFSK	
Number of antenna ports	1	
Radio Module	Type	Bluetooth low engery v5.0 module
	Model	BlueMod+S50/AP
	Manufacturer	Telit
	HW Version	not specified
	SW Version	Nordic SD S132 V5
	FCC-ID	RFR-S50
	IC	4957A-S50
Antenna	Type	integrated
	Model	w3008
	Manufacturer	Pulselarsen
	Gain	1.1dBi
Supply Voltage	V_{NOM}	120 VAC
Operating Temperature	T_{NOM}	25 °C
AC/DC-Adaptor	Model	FW8000M/12
	Vendor	FRIWO
	Input	100-240
	Output	12V
Manufacturer	BIOTRONIK SE & Co. KG Woermannkehre 1 12359 Berlin GERMANY	

1.1 Photos – Equipment External

EUT top side

EUT bottom side

EUT front side

Programming head top side

Programming head bottom side

Plug for programming head

Power supply

Power supply label

1.2 Photos – Equipment Internal

Programming head internal view A

Programming head internal view B

Programming head internal view C

Programming head internal view D

Programming head internal view E

Programming head PCB top side

Programming head PCB bottom side

EUT internal view with PCB

EUT internal view without PCB

EUT PCB top side

EUT PCB top side without shielding

EUT PCB bottom side

LE Radio module

1.3 Photos – Test Setup

Test setup view from measurement antenna

Test setup near view

1.4 Support Equipment.

Product Type	Device	Manufacturer	Model	Comment
AE	Laptop	Lenovo	T540p	Setting test mode, not connected for test
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment:				

1.5 Test Modes

Mode	Description
GFSK1	Mode = Transmit Modulation = GFSK Spreading = None Duty cycle = 63% Rate = 1Mbit/s
GFSK2	Mode = Transmit Modulation = GFSK Spreading = None Duty cycle = 33% Rate = 2Mbit/s
Receive	Mode = Receive
Comment:	

1.6 Test Frequencies

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

1.7 Sample emission level calculation

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

Reading:

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

A.F.:

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

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

Net:

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

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 (section 6.6)	Occupied Bandwidth	ANSI C63.10-2013	N/T	
FCC § 15.247(a)(2) ISED RSS-247, Issue 2 (section 5.2)	6 dB Bandwidth	ANSI C63.10-2013	N/T	
FCC § 15.247(b)(1) ISED RSS-247, Issue 2 (section 5.4)	Maximum peak conducted power	ANSI C63.10-2013	N/T	
FCC § 15.247(e) ISED RSS-247, Issue 2 (section 5.2)	Power spectral density	ANSI C63.10-2013	N/T	
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	N/T	
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Conducted spurious emissions	ANSI C63.10-2013	N/T	
FCC § 15.247(d) FCC § 15.209 ISED RSS-Gen, Issue 5 (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 C63.10-2013	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 - AC powerline conducted emissions

3.1.1 Information

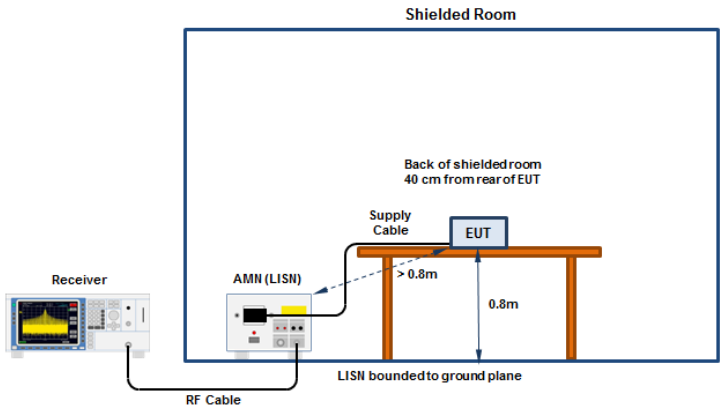
Test Information	
Reference	FCC § 15.207; ISED RSS-247, Issue 2 (section 3.1)
Measurement Method	ANSI C63.10 6.2
Operator	Stefan Dose
Date	2019-09-17

3.1.2 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		

3.1.3 Setup

Test Setup



3.1.4 Equipment

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

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
AMN	R&S	ESH3-Z5	EF00036	2019-07	2021-07
Pulse Limiter	R&S	ESH3-Z2	EF01063	2019-07	2020-07
EMI Test Receiver	Rohde & Schwarz Vertriebs GmbH	ESCS 30	EF00295	2019-07	2020-07
Climatic Sensor	Embedded Data Systems, LLC.	2800100000254 17E	EF01054	2019-05	2020-05

EMI voltage test in the ac-mains according FCC § 15.207 ISED RSS-247, Issue 2 (section 3.1)

Project number: G0M-1909-8467

Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Dose
Test Conditions:	Tnom: 23°C, Unom: 120 V / 60 Hz
LISN:	ESH3-Z5 (L)
Mode:	1
Test Date:	2019-09-17

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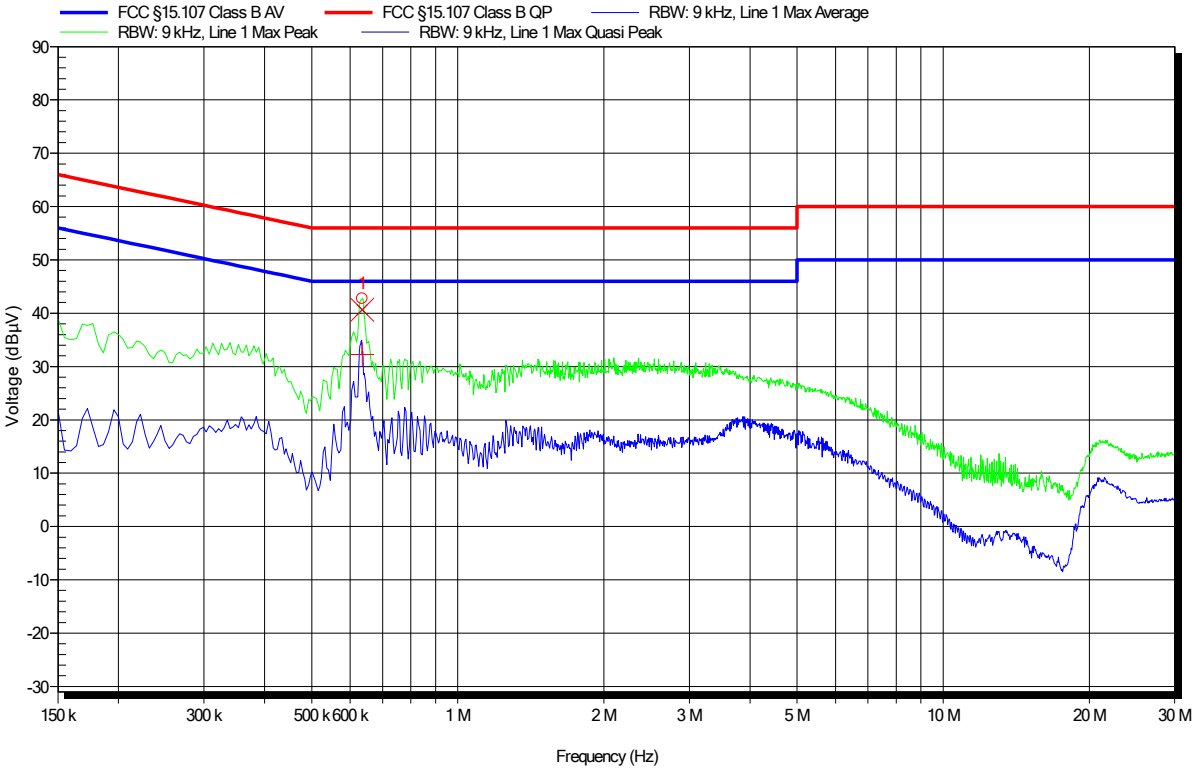

Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
1	635.1 kHz	40.63 dBµV	56 dBµV	-15.37 dB	Pass

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status
1	635.1 kHz	32.25 dBµV	46 dBµV	-13.75 dB	Pass

EMI voltage test in the ac-mains according to FCC § 15.207 ISED RSS-247, Issue 2 (section 3.1)

Project number: G0M-1909-8467

Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Dose
Test Conditions:	Tnom: 23°C, Unom: 120 V / 60 Hz
LISN:	ESH3-Z5 (N)
Mode:	1
Test Date:	2019-09-17

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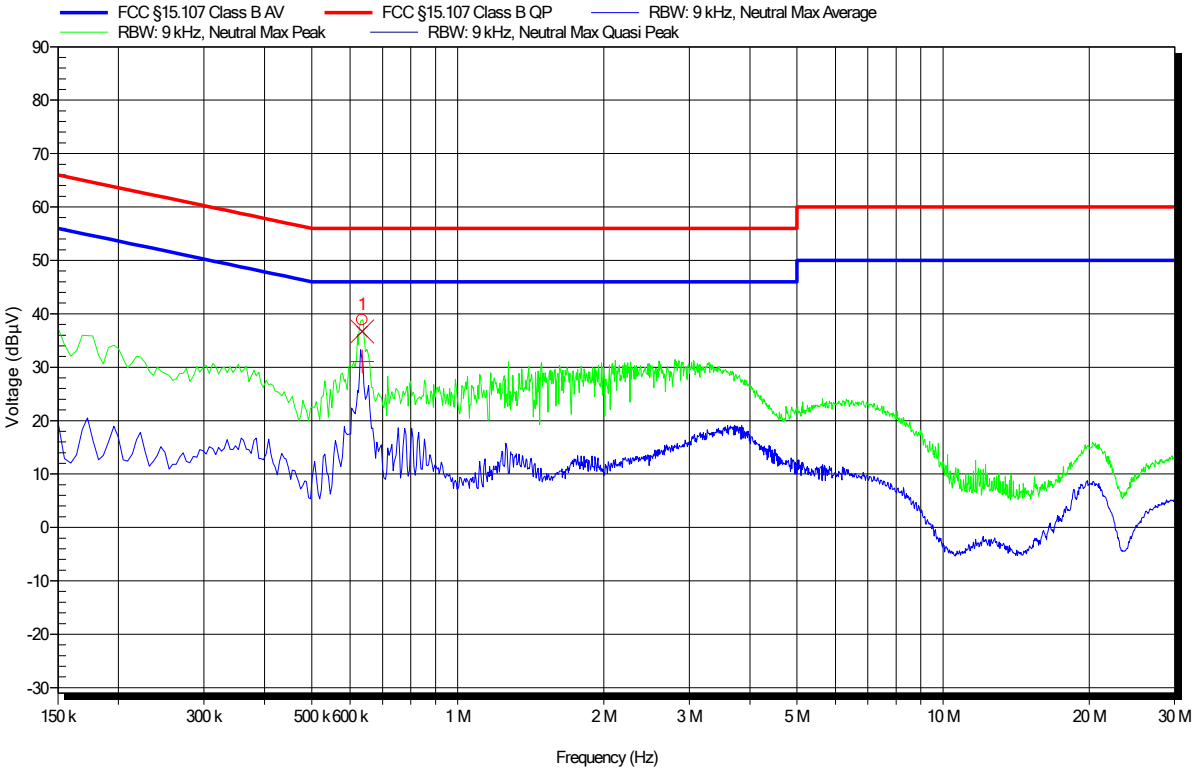


Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
1	635.1 kHz	36.71 dBµV	56 dBµV	-19.29 dB	Pass

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status
1	635.1 kHz	31.04 dBµV	46 dBµV	-14.96 dB	Pass

3.2 Test Conditions and Results - Transmitter radiated emissions

3.2.1 Information

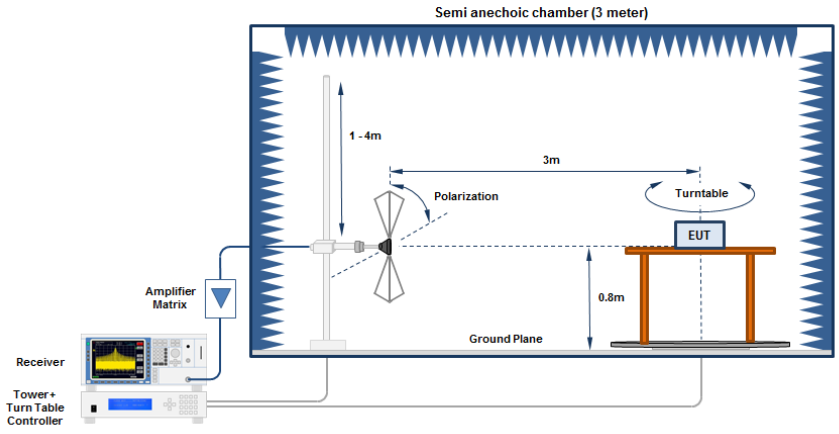
Test Information	
Reference	FCC § 15.247(d); FCC § 15.209; ISED RSS-Gen, Issue 5 (section 6.13)
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6, 11.12
Operator	Florian Voigt
Date	2019-09-17 + 2019-09-18 + 2019-09-30
Comment	EUT position was vertical if not declared otherwise

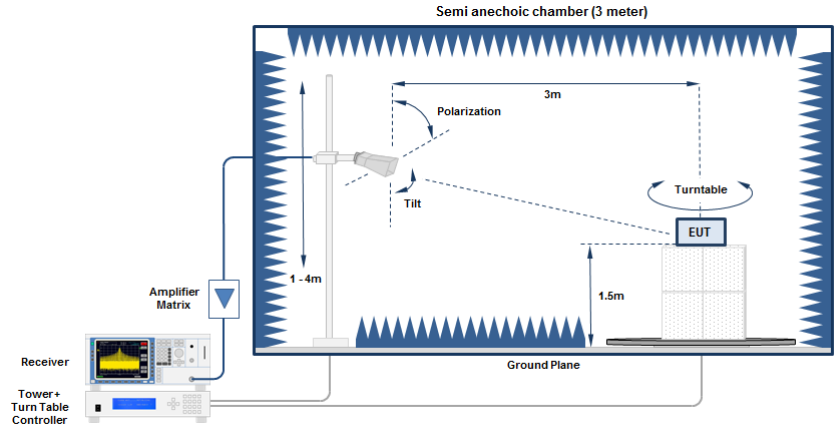
3.2.2 Limits

Limits			
Frequency [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

3.2.3 Setup

Test Setup 30 - 1000 MHz



Test Setup > 1 GHz


3.2.4 Equipment

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

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
EMI Test Receiver	R&S	ESU8	EF00379	2019-07	2020-07
Antenna	R&S	HK 116	EF00030	2019-04	2022-04
Antenna	R&S	HL 223	EF00212	2019-05	2020-05

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Spectrum analyzer	R&S	FSU 26	EF01003	2019-07	2020-07
Antenna	Schwarzbeck	BBHA 9120D	EF00018	2016-09	2019-09
Antenna	Amplifier Research	AT4560	EF00302	2019-05	2020-05

3.2.5 Procedure

Test Procedure 30 - 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

3.2.6 Results

Test Results – GFSK1						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2402	2489.8	39.21	RMS	hor	54.00	-14.79
2440	7319	44.86	RMS	hor	54.00	-09.14
2440	7321	43.37	RMS	ver	54.00	-10.63
2440	7319	47.85	RMS	ver	54.00	-06.15
2480	7439	43.34	RMS	hor	54.00	-10.66
2480	7439	44.94	RMS	ver	54.00	-09.06
2480	2483.5	61.99	pk	hor	74.00	-12.01
2480	2483.5	44.46	RMS	hor	54.00	-09.54
2480	2488	54.30	pk	hor	74.00	-19.70
2480	2488	47.59	RMS	hor	54.00	-06.41
Comment: All RMS-Level values have an additional duty cycle correction offset of $10*Log_{10}(1/0.63)=+2.01$dB applied						

Test Results – GFSK2						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2402	2489.7	37.58	RMS	hor	54.00	-16.42
2440	7321	42.87	RMS	hor	54.00	-11.13
2440	7321	42.22	RMS	ver	54.00	-11.78
2480	2483.5	60.59	pk	hor	74.00	-13.41
2480	2483.5	48.08	RMS	hor	54.00	-05.92
2480	2483.6	56.39	pk	ver	74.00	-17.61
2480	2483.6	45.63	RMS	ver	54.00	-08.37
2480	7439	42.70	RMS	hor	54.00	-11.30
2480	2483.5	61.94	pk	hor	74.00	-12.06
2480	2483.5	49.00	RMS	hor	54.00	-05.00
2480	2483.6	44.08	RMS	ver	54.00	-09.92
2480	2487.9	55.67	pk	hor	74.00	-18.33
2480	2487.9	48.20	RMS	hor	54.00	-05.80
Comment: All RMS-Level values have an additional duty cycle correction offset of $10*Log_{10}(1/0.33)=+4.81$dB applied						

3.3 Test Conditions and Results - Receiver radiated emissions

3.3.1 Information

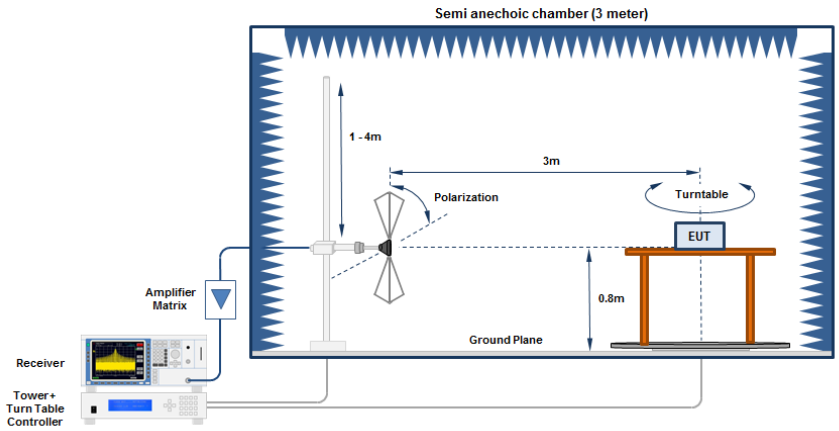
Test Information	
Reference	ISED RSS-247, Issue 2 (section 3.1)
Measurement Method	ANSI C63.10 6.5, 6.6, 11.12
Operator	Florian Voigt
Date	2019-09-18 + 2019-09-30
Comment	EUT position was vertical if not declared otherwise

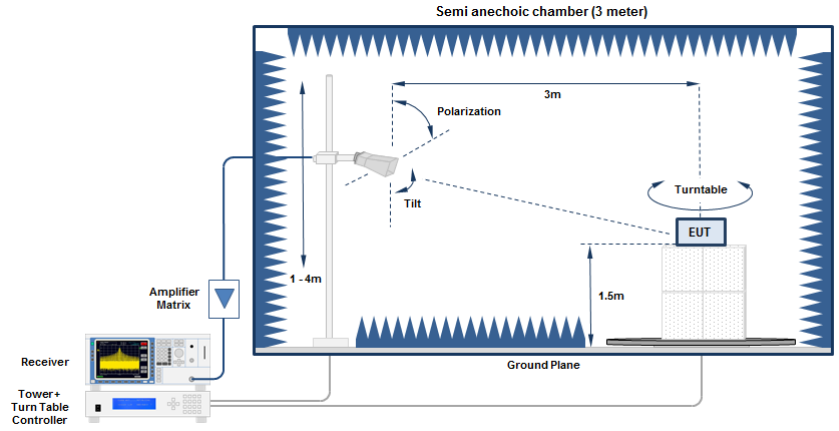
3.3.2 Limits

Limits			
Frequency [MHz]	Detector	Field strength [dBµV/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

3.3.3 Setup

Test Setup 30 - 1000 MHz



Test Setup > 1 GHz


3.3.4 Equipment

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

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
EMI Test Receiver	R&S	ESU8	EF00379	2019-07	2020-07
Antenna	R&S	HK 116	EF00030	2019-04	2022-04
Antenna	R&S	HL 223	EF00212	2019-05	2020-05

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Spectrum analyzer	R&S	FSU 26	EF01003	2019-07	2020-07
Antenna	Schwarzbeck	BBHA 9120D	EF00018	2016-09	2019-09

3.3.5 Procedure

Test Procedure 30 - 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

3.3.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2440	2481	34.67	pk	ver	53.98	-19.31
2440	4878	36.91	pk	hor	53.98	-17.07

ANNEX A Transmitter spurious emissions

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; 2402MHz, 1MBit
Test Date:	2019-09-30
Note:	

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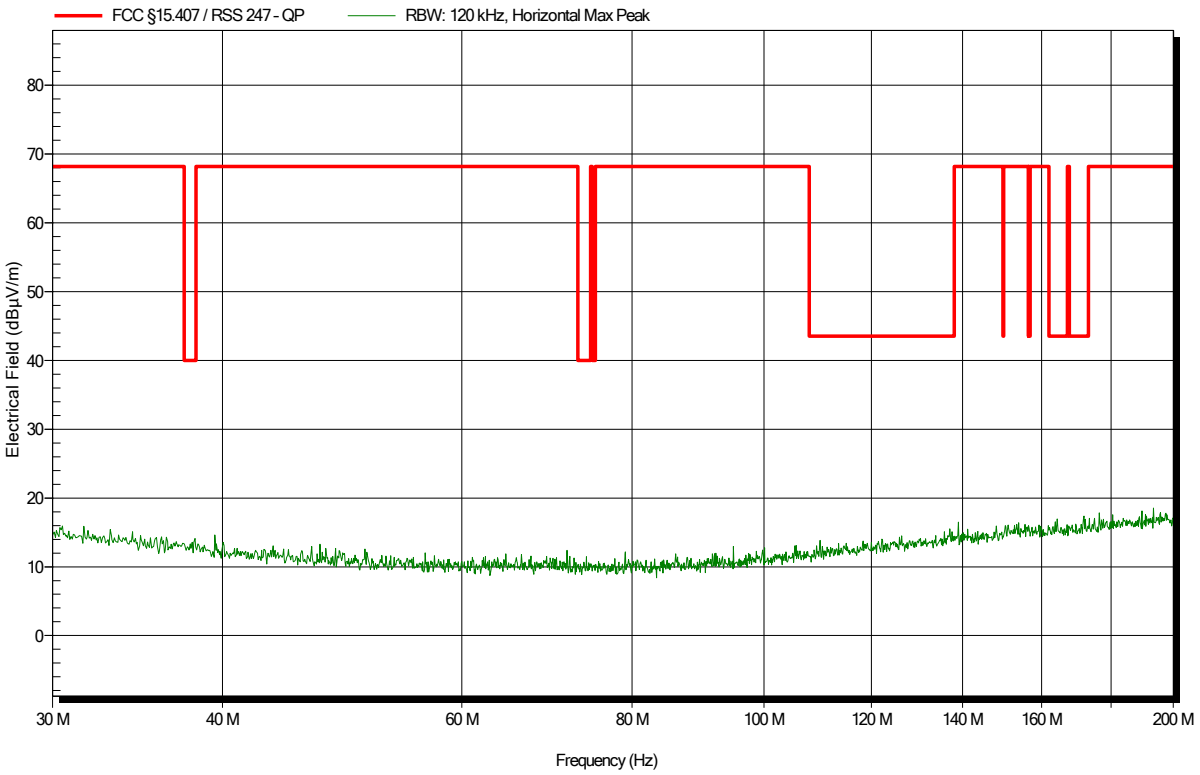

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; 2402MHz, 1MBit
Test Date:	2019-09-30
Note:	

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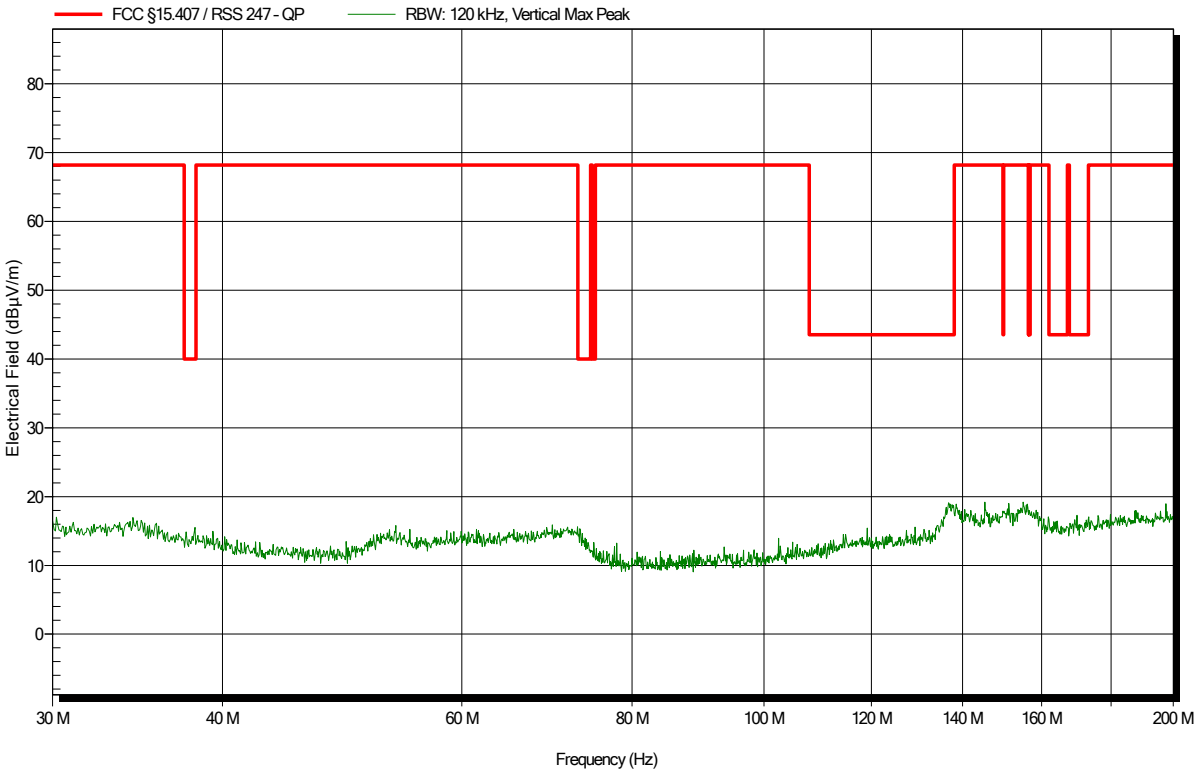

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; 2402MHz, 1MBit
Test Date:	2019-09-30
Note:	

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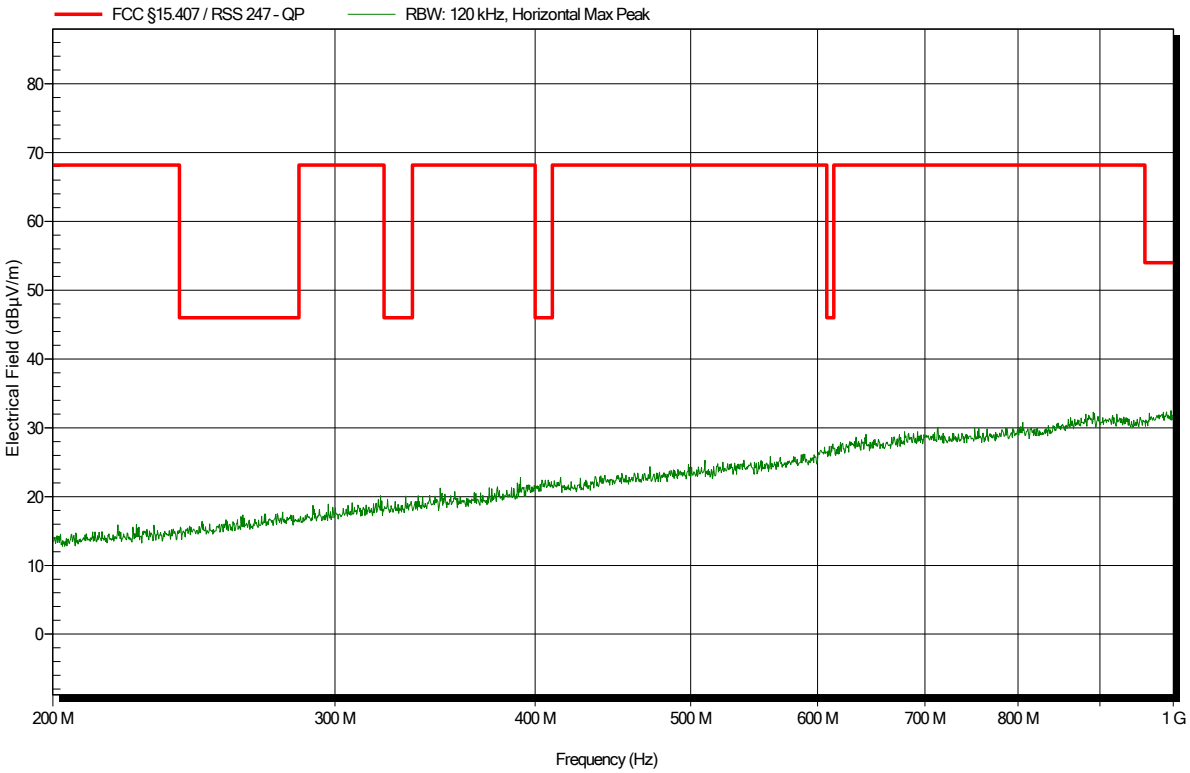

Spurious emissions according to FCC 47 e-CFR §15.247

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Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; 2402MHz, 1MBit
Test Date:	2019-09-30
Note:	

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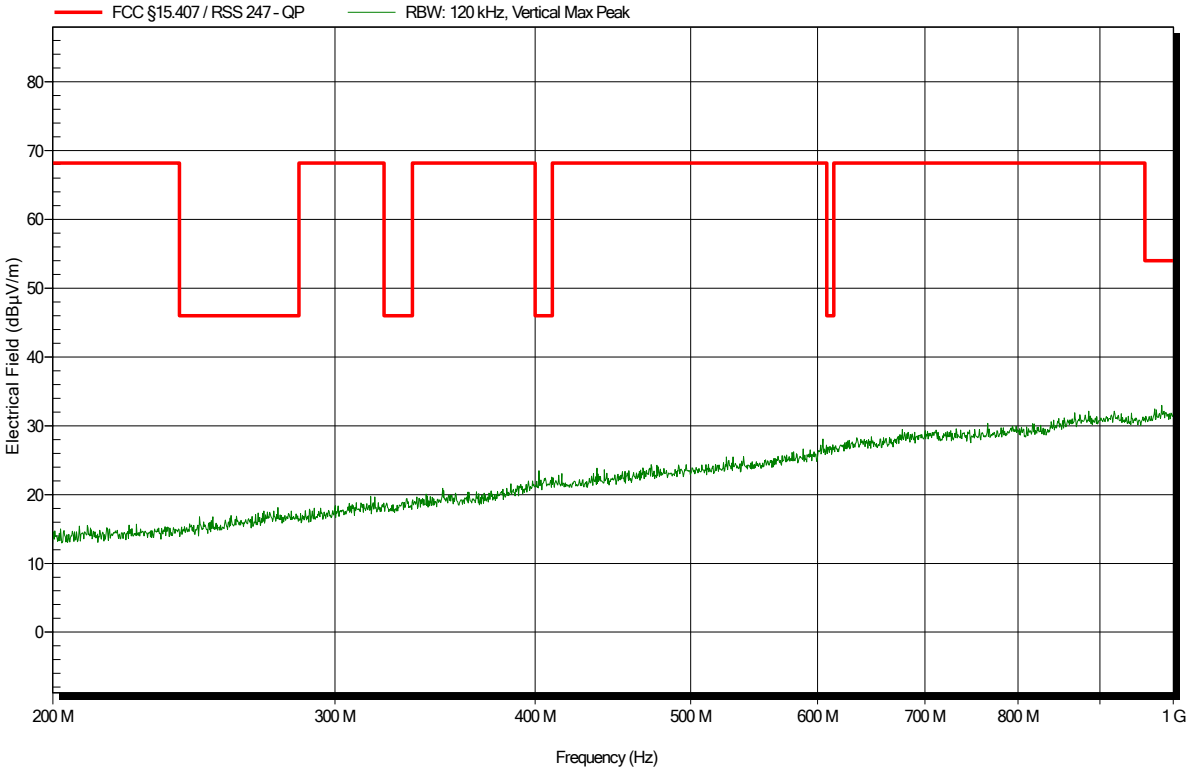

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 1MBit
Test Date:	2019-09-18
Note:	

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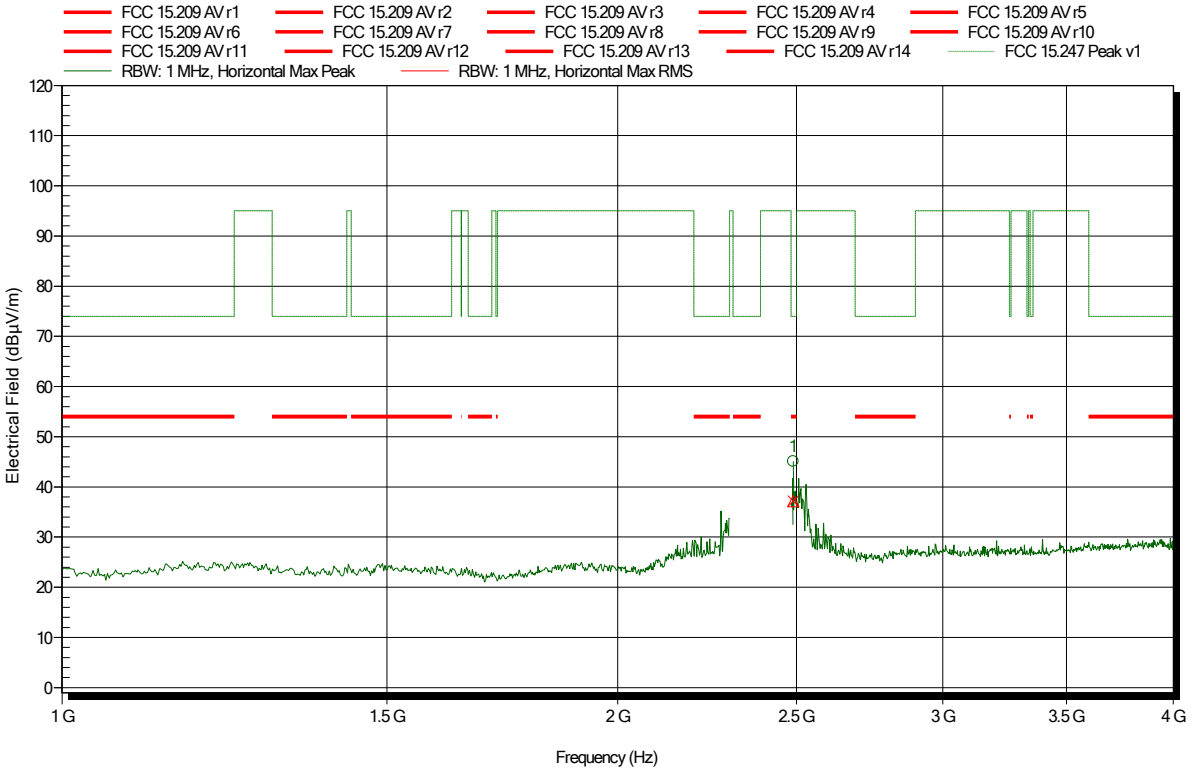

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4898 GHz	45.06 dBµV/m	74 dBµV/m	-28.94 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4898 GHz	37.2 dBµV/m	54 dBµV/m	-16.8 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 1MBit
Test Date:	2019-09-18
Note:	

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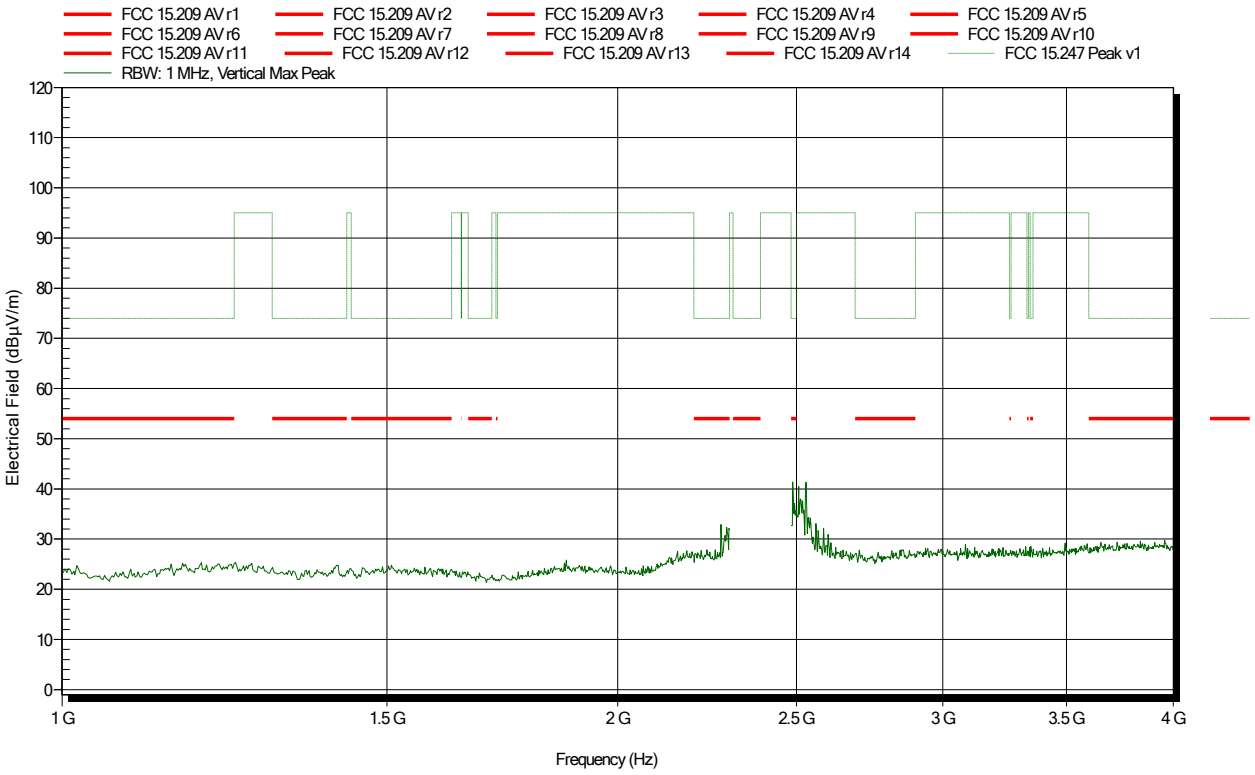

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 1MBit
Test Date:	2019-09-18
Note:	

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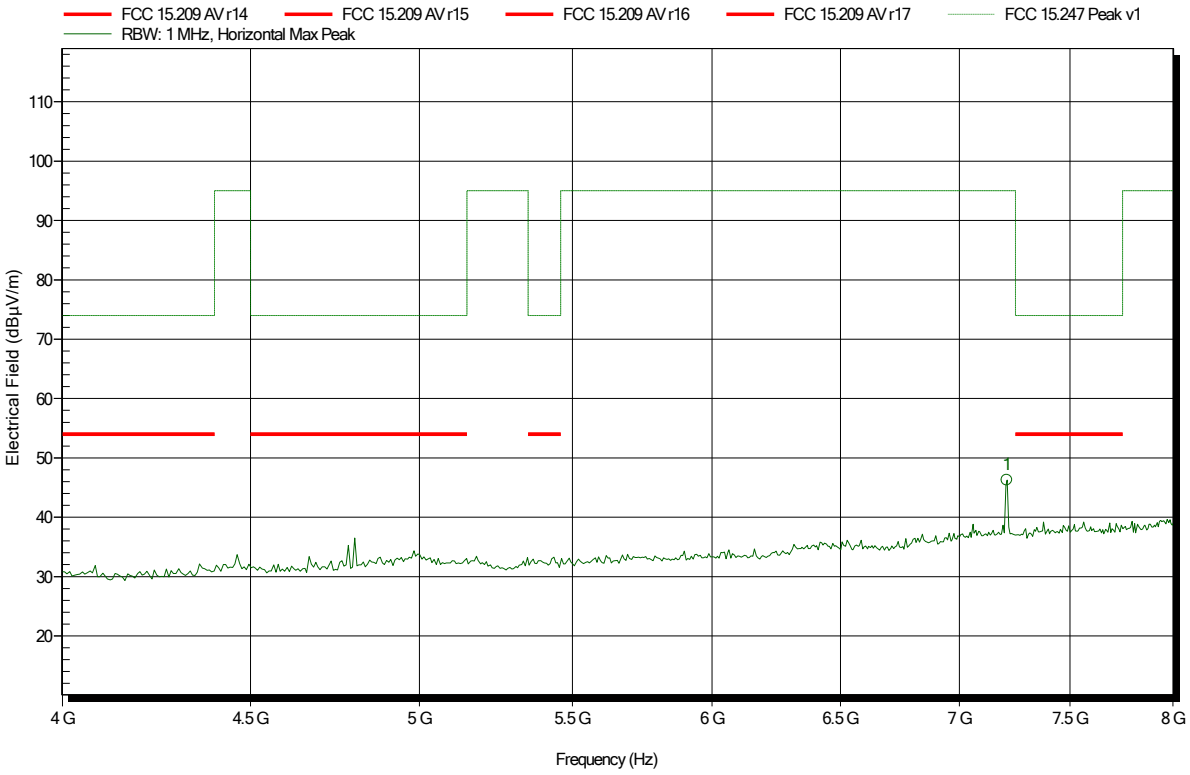

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.212 GHz	46.27 dBµV/m	95 dBµV/m	-48.73 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 1MBit
Test Date:	2019-09-18
Note:	

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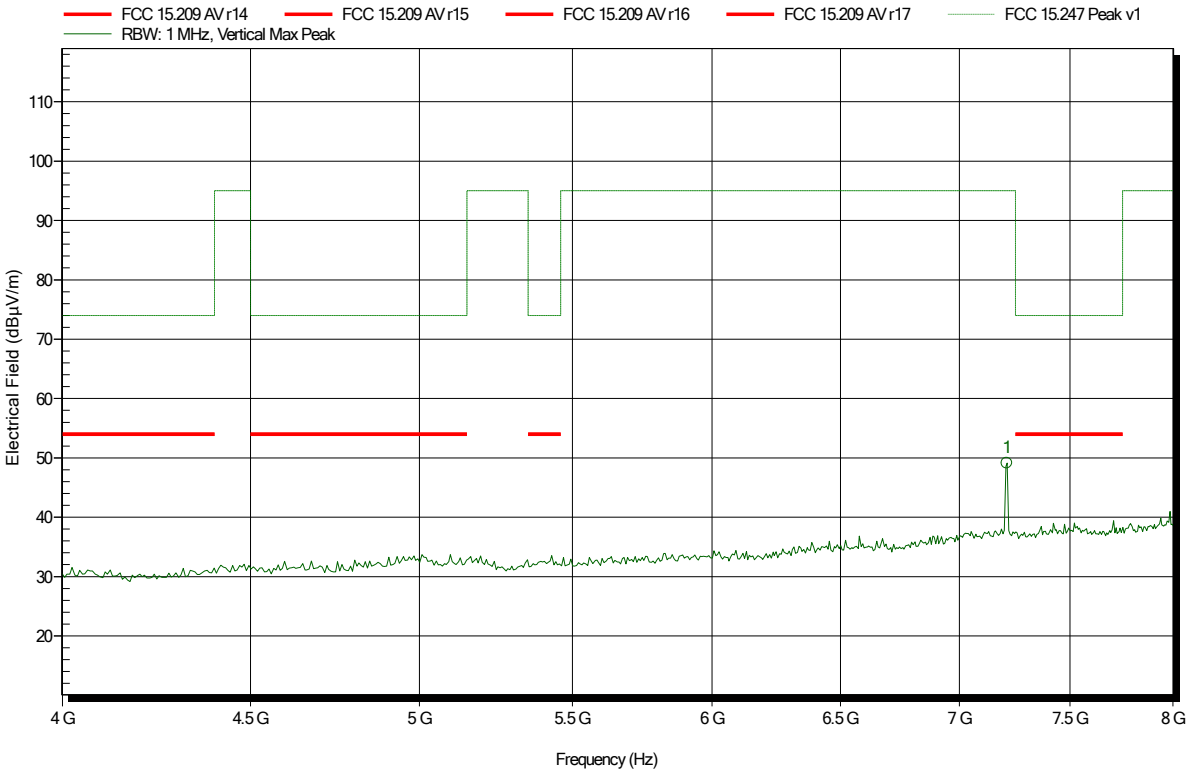

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.212 GHz	49.11 dBµV/m	95 dBµV/m	-45.89 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 1MBit
Test Date:	2019-09-18
Note:	

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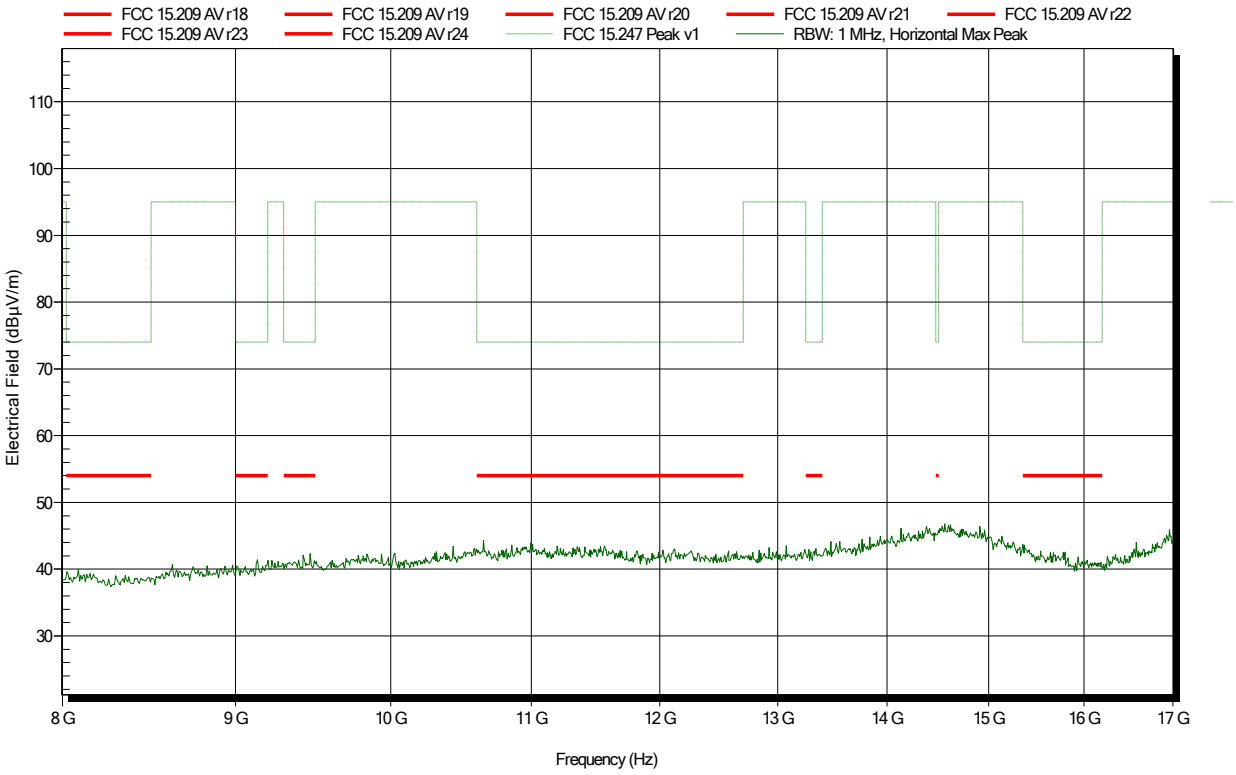

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 1MBit
Test Date:	2019-09-18
Note:	

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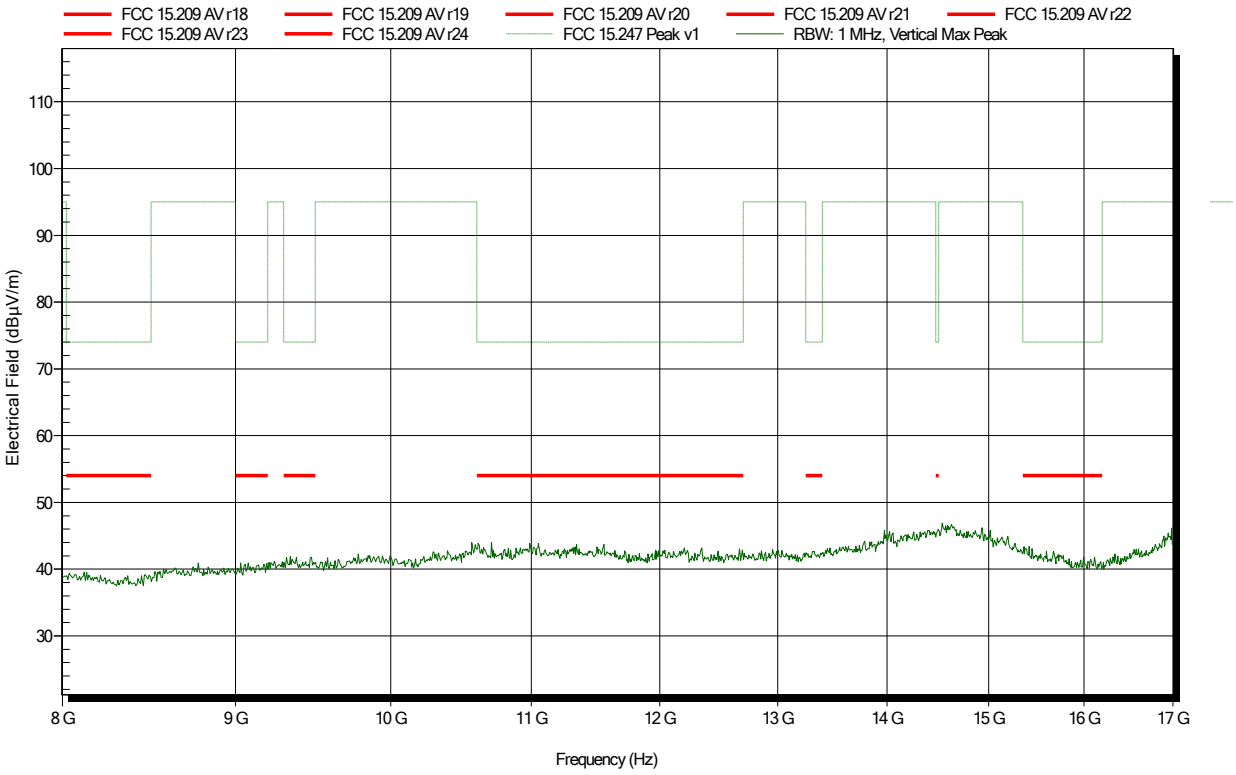

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Amplifier Research AT4560, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 1MBit
Test Date:	2019-09-17
Note:	

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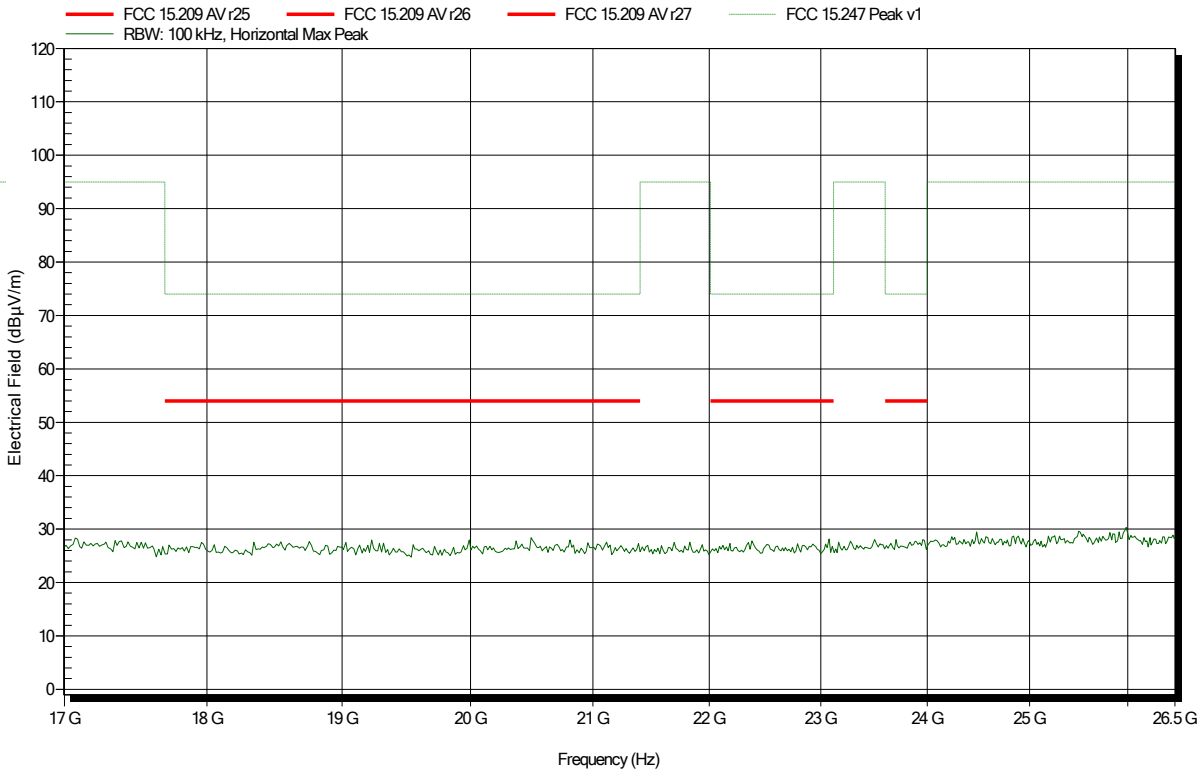

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Amplifier Research AT4560, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 1MBit
Test Date:	2019-09-17
Note:	

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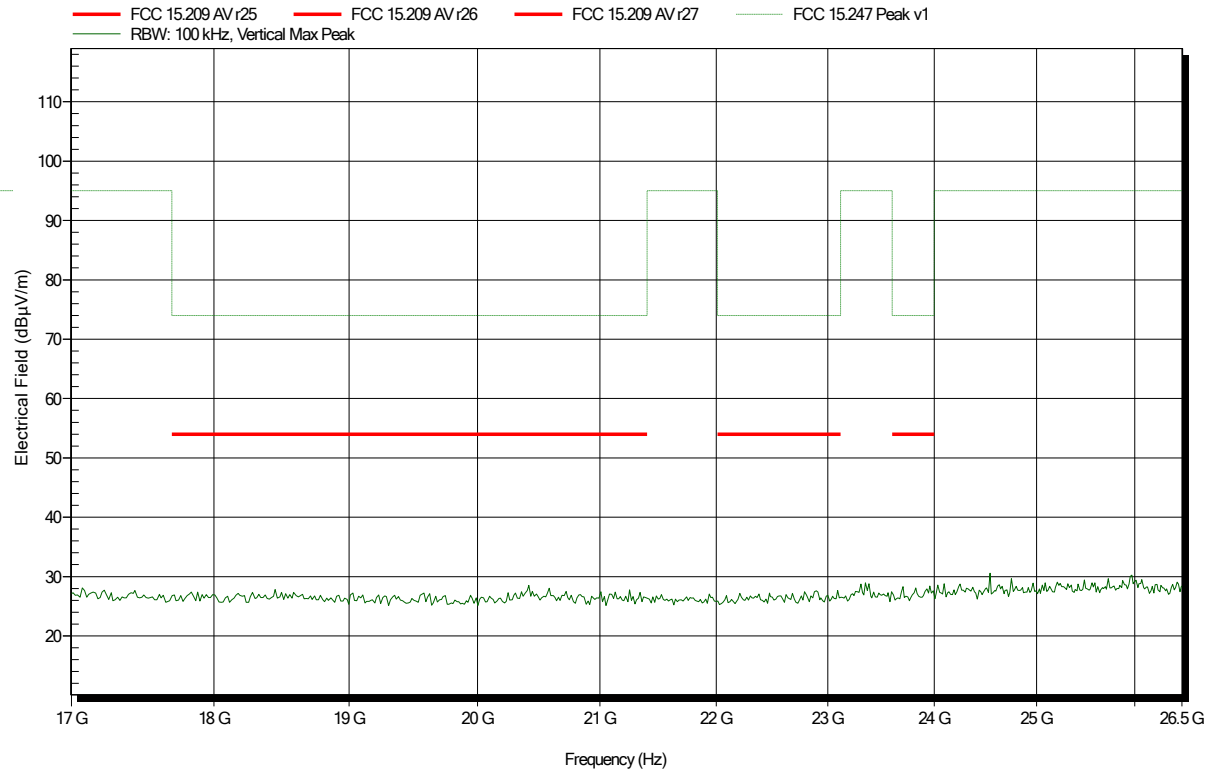

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 1MBit, EUT horiz.
Test Date:	2019-09-18
Note:	lower bandedge

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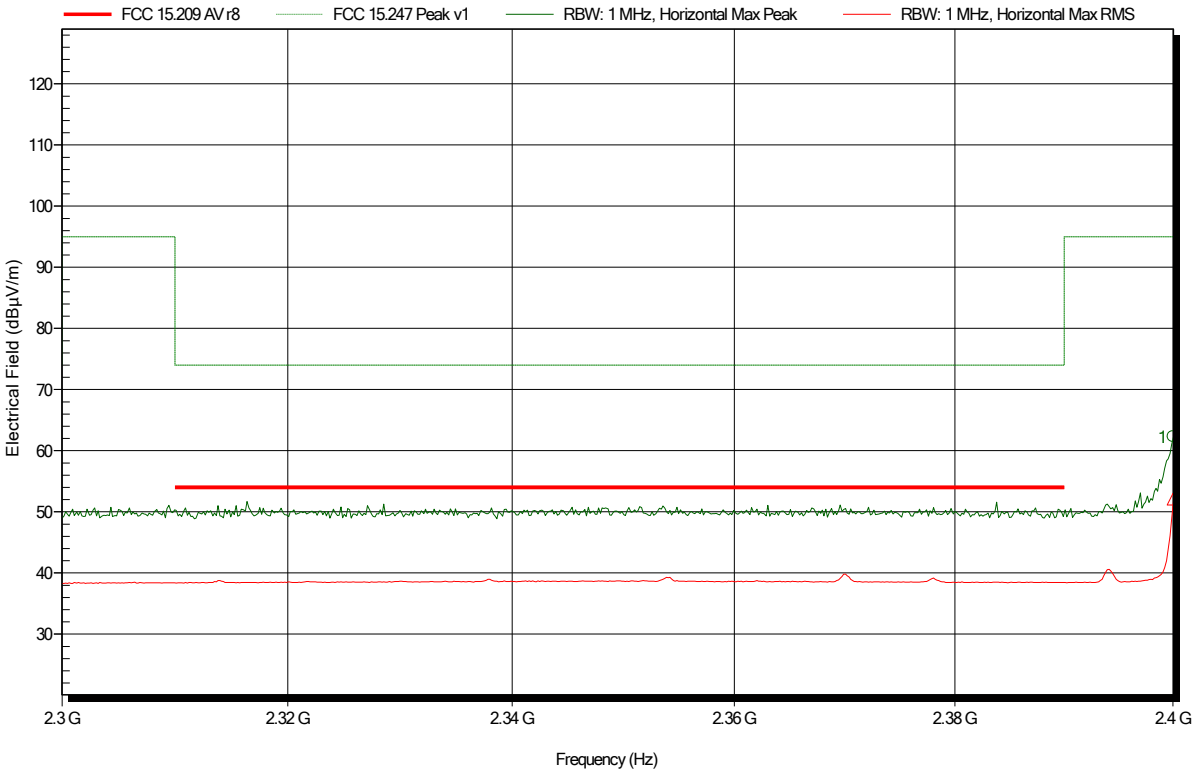

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4 GHz	62.35 dBµV/m	95 dBµV/m	-32.65 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 1MBit, EUT horiz.
Test Date:	2019-09-18
Note:	lower bandedge

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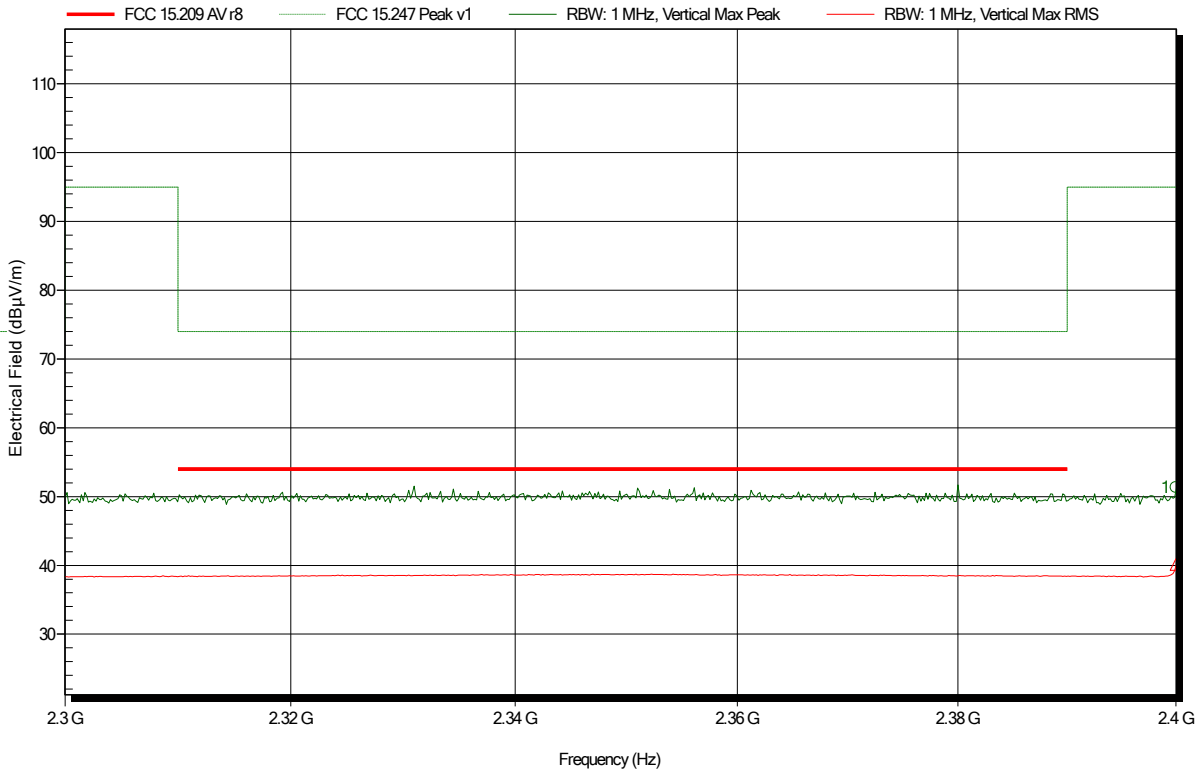

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4 GHz	51.33 dBµV/m	95 dBµV/m	-43.67 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 1MBit, EUT vert.
Test Date:	2019-09-18
Note:	lower bandedge

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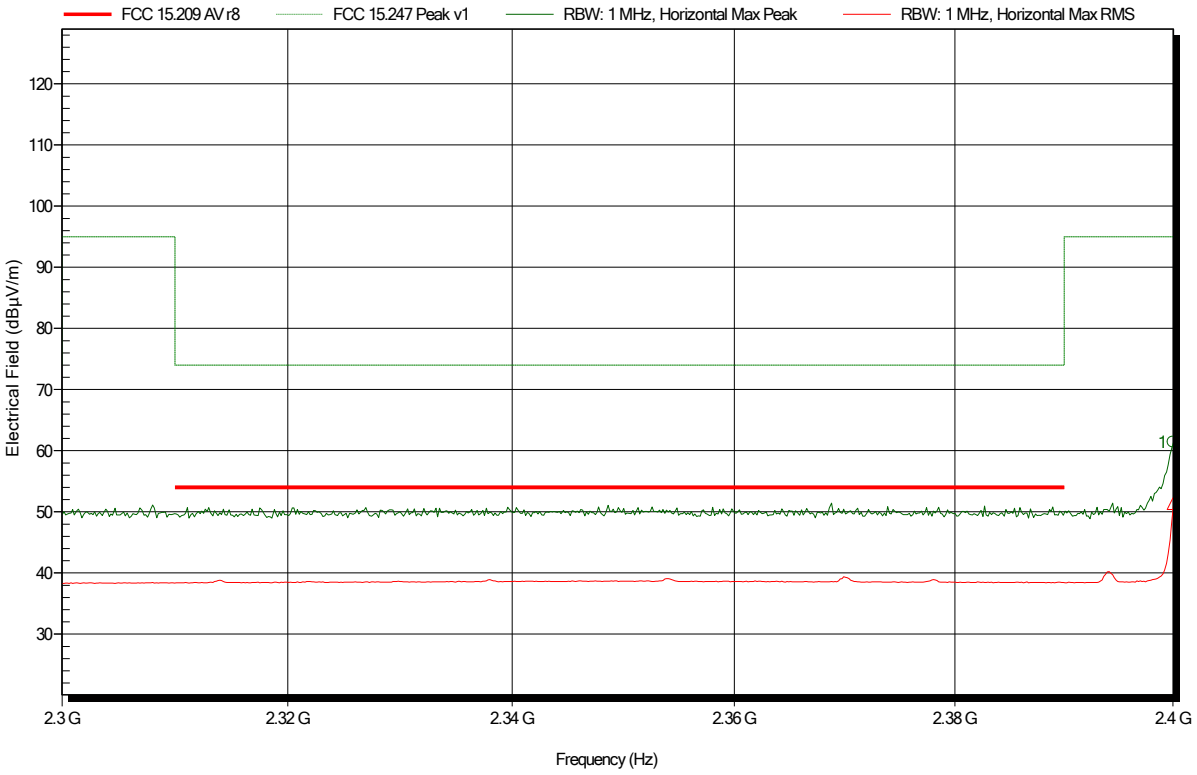

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4 GHz	61.45 dBµV/m	95 dBµV/m	-33.55 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 1MBit, EUT vert.
Test Date:	2019-09-18
Note:	lower bandedge

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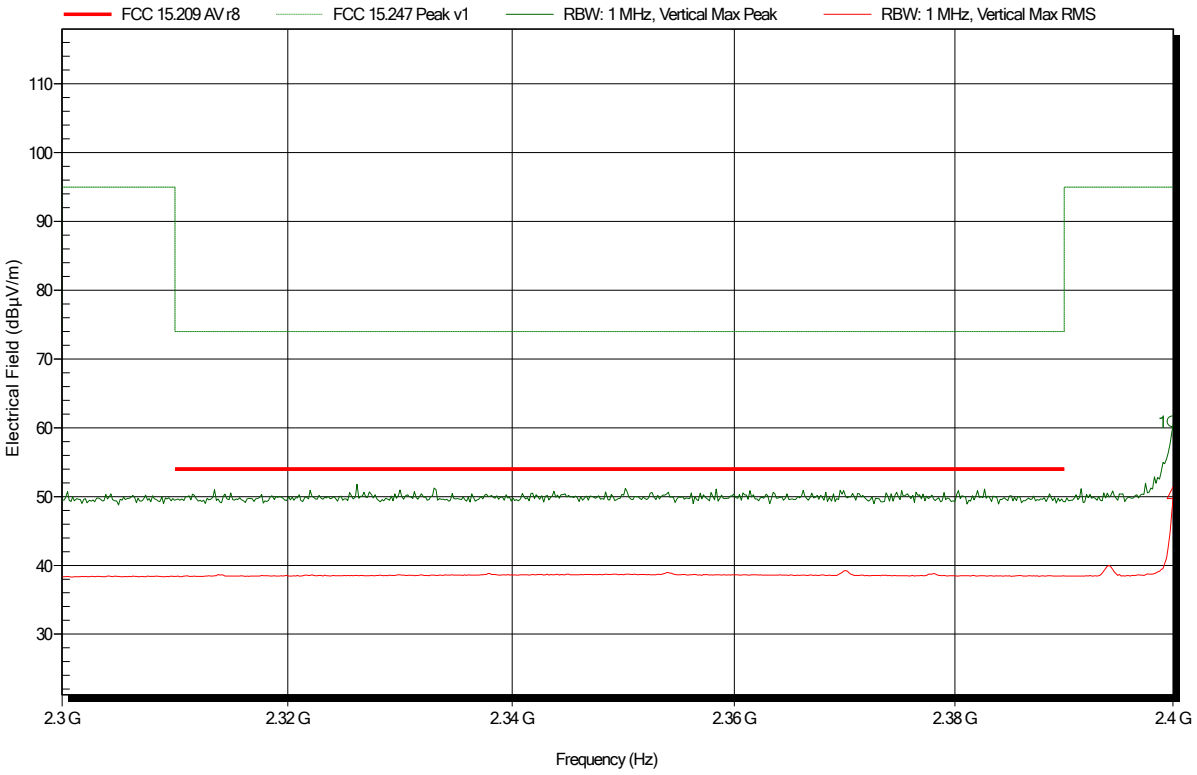

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4 GHz	60.86 dBµV/m	95 dBµV/m	-34.14 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-30
Note:	

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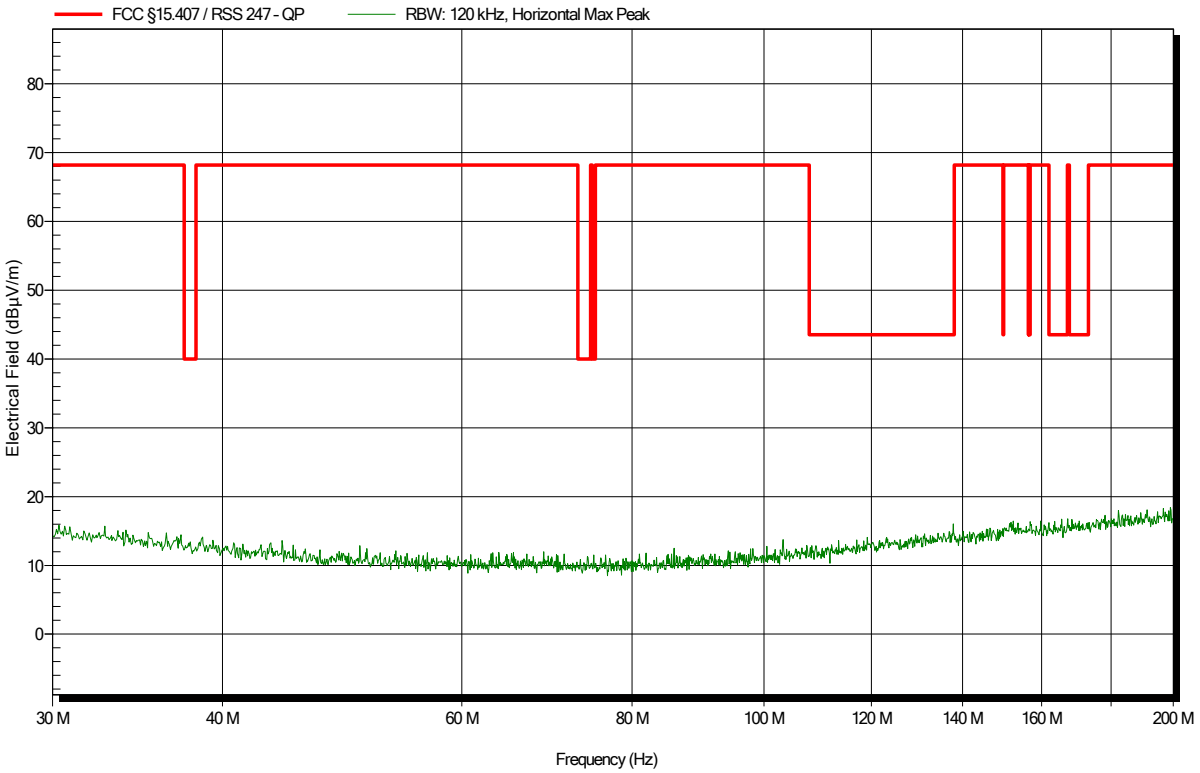

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-30
Note:	

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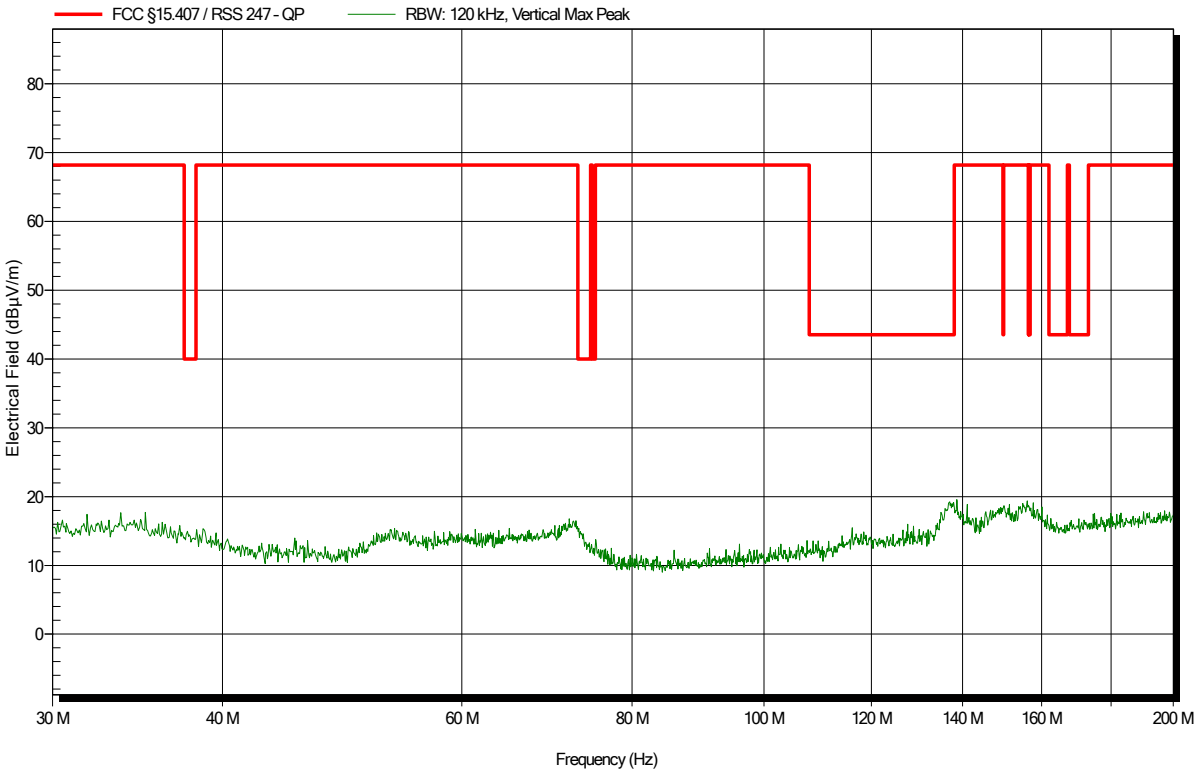

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-30
Note:	

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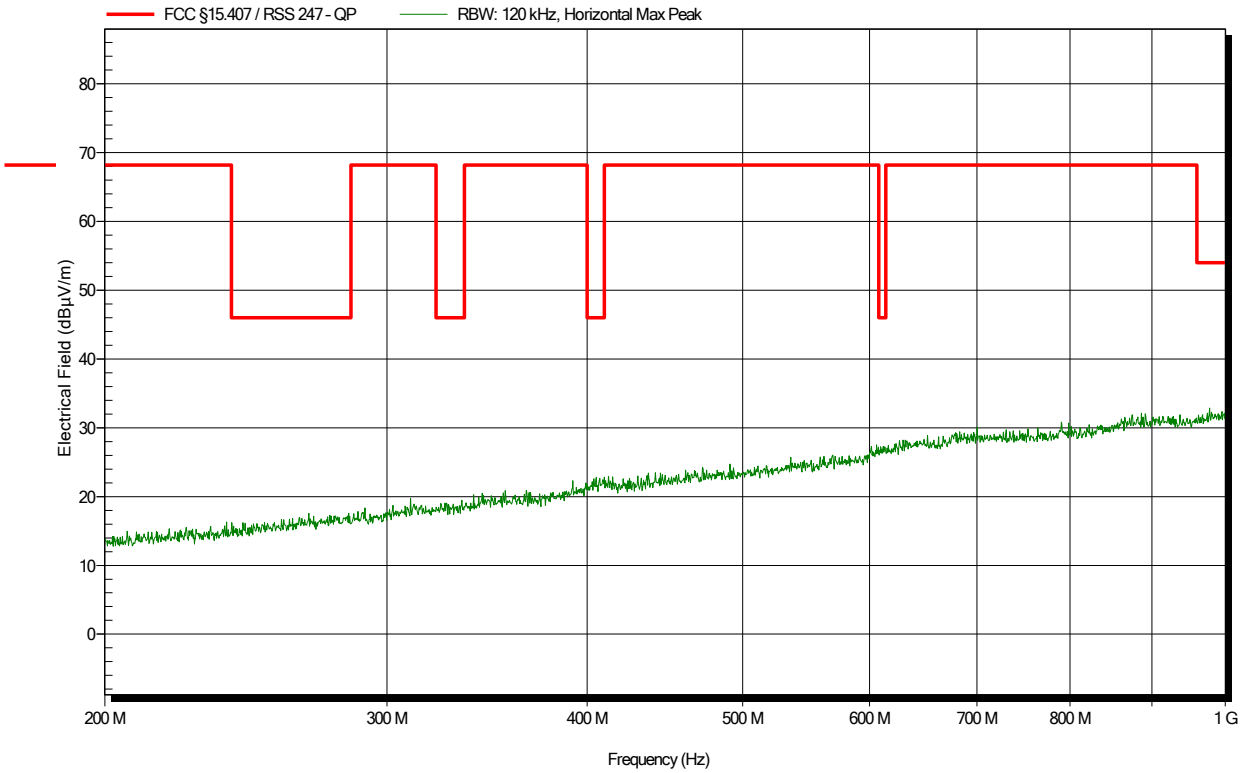

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-30
Note:	

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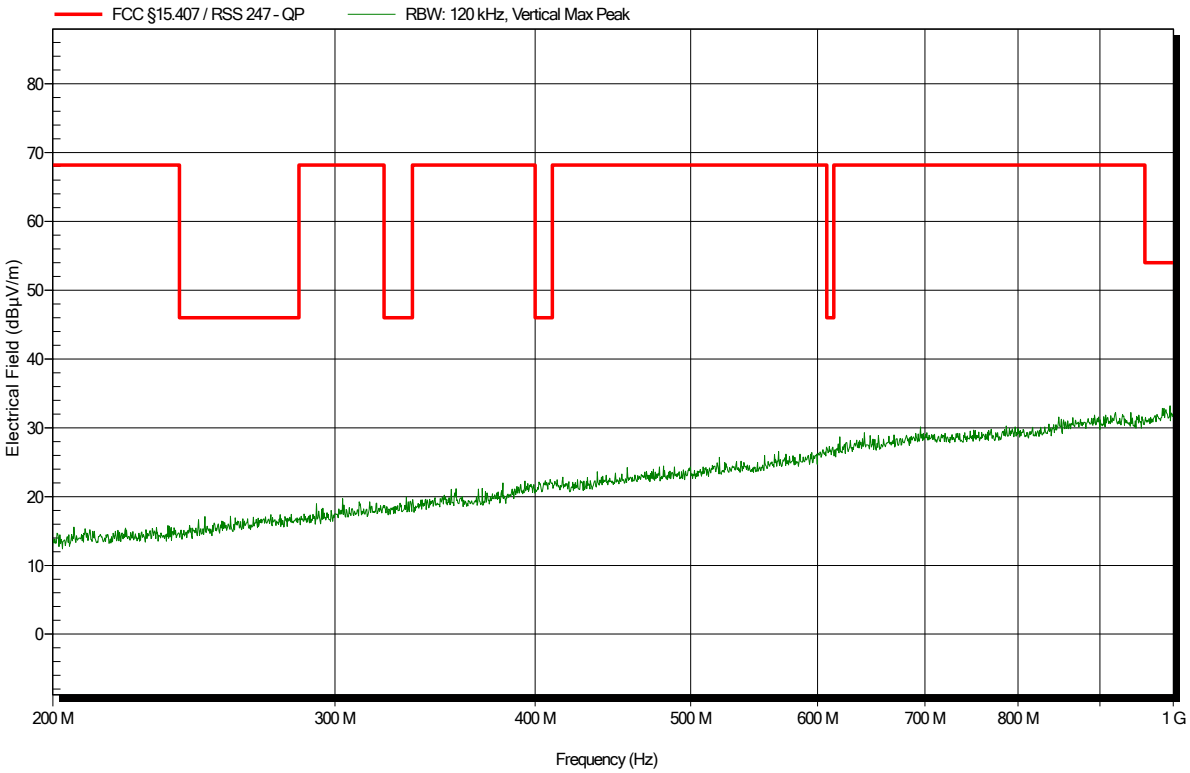

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-17
Note:	

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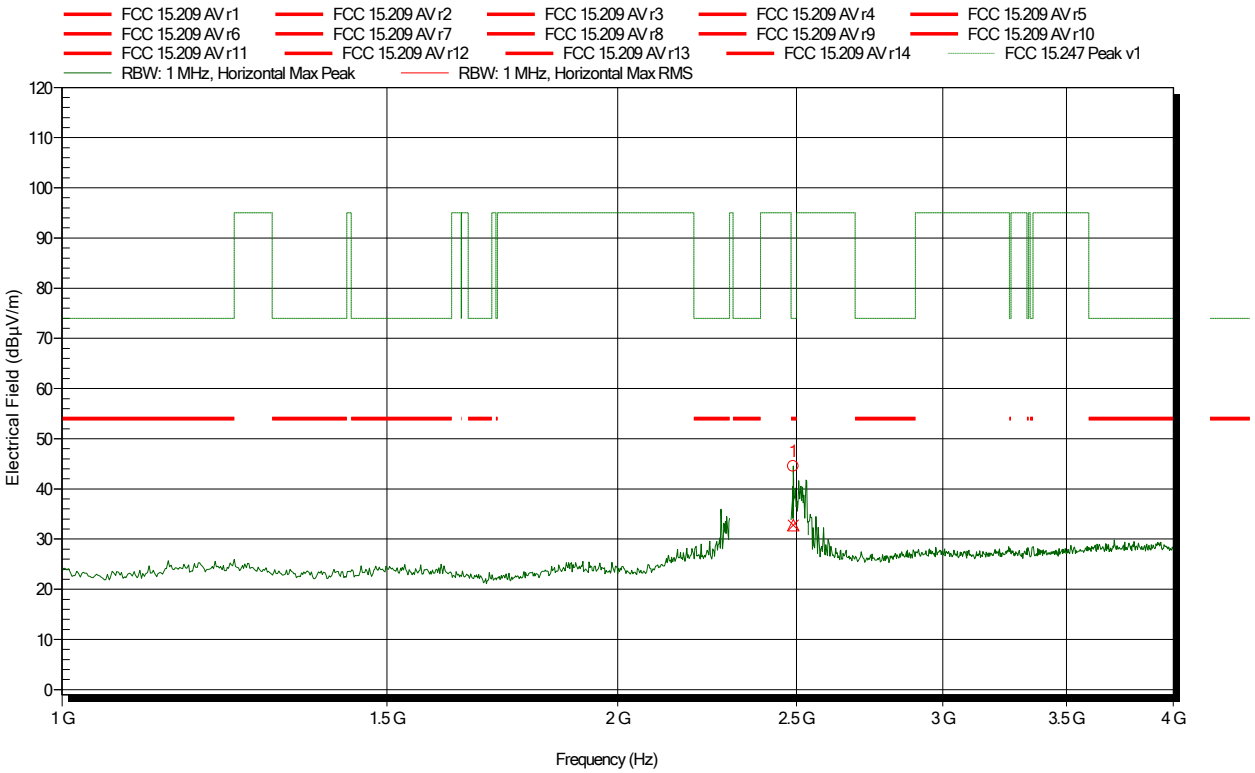

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4897 GHz	44.51 dBµV/m	74 dBµV/m	-29.49 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4897 GHz	32.77 dBµV/m	54 dBµV/m	-21.23 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-17
Note:	

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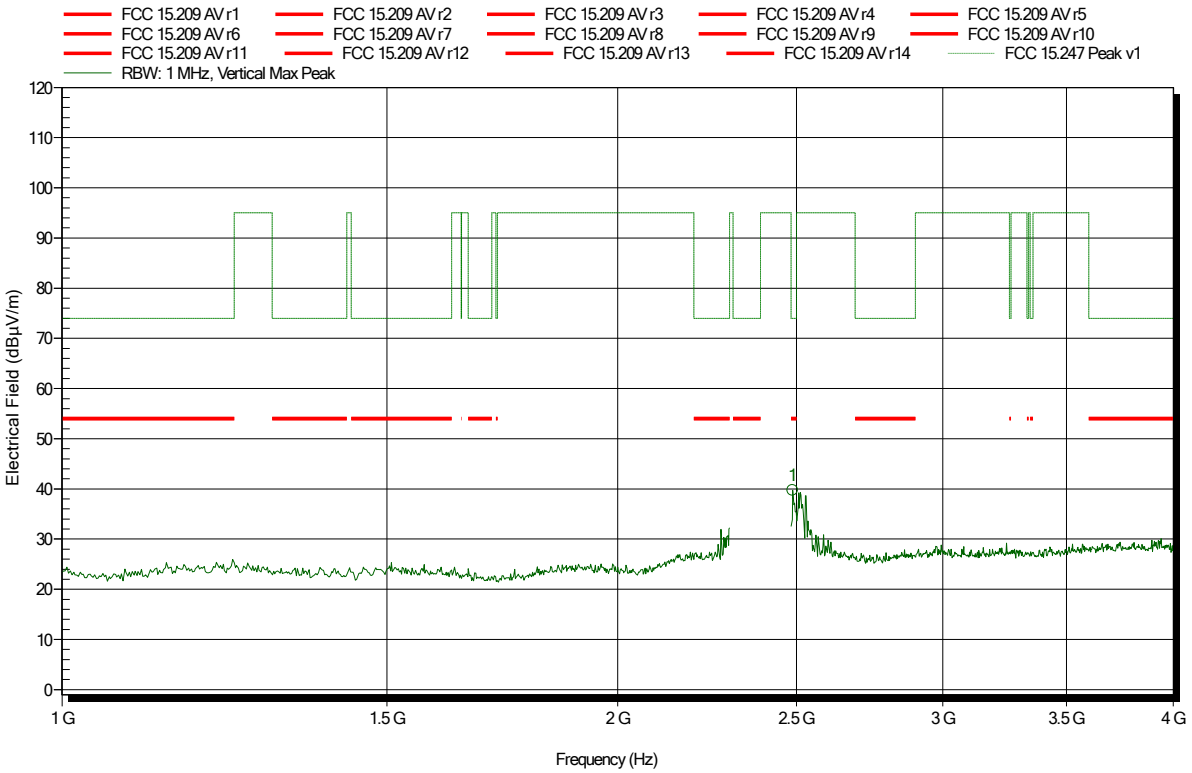

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4884 GHz	39.71 dBµV/m	74 dBµV/m	-34.29 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-17
Note:	lower bandedge

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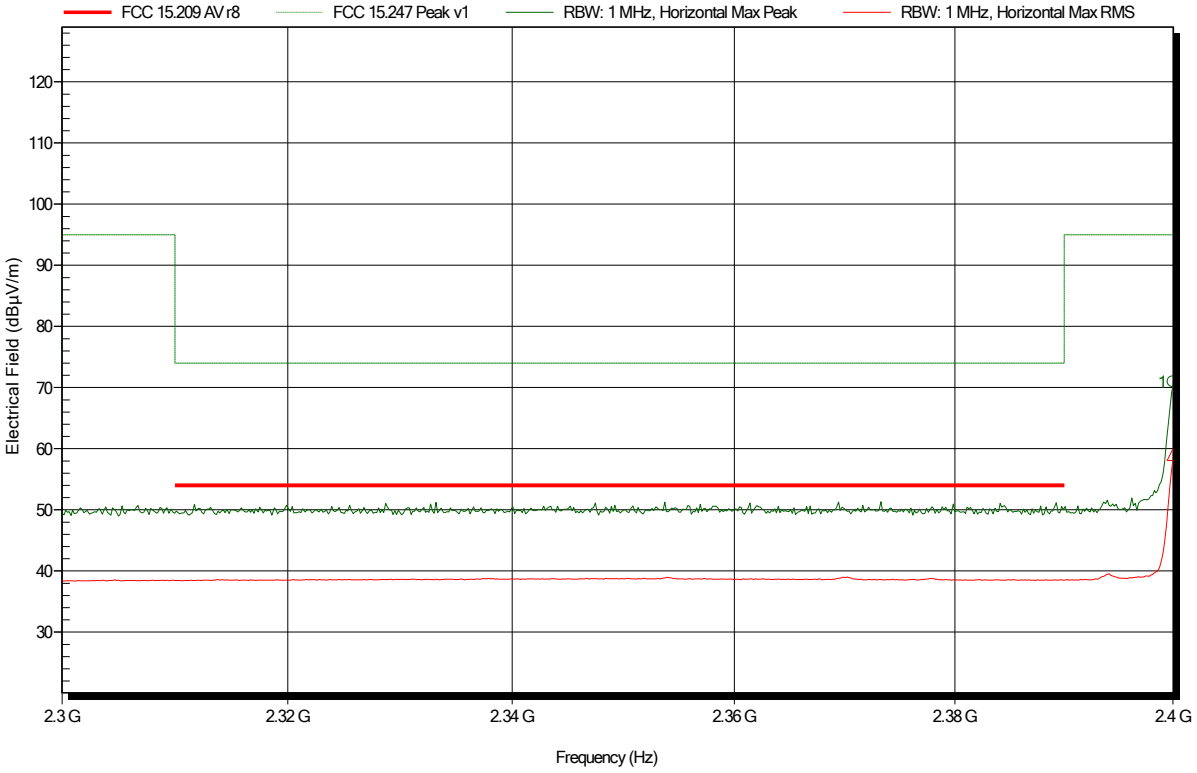

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4 GHz	70.94 dBµV/m	95 dBµV/m	-24.06 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-17
Note:	lower bandedge

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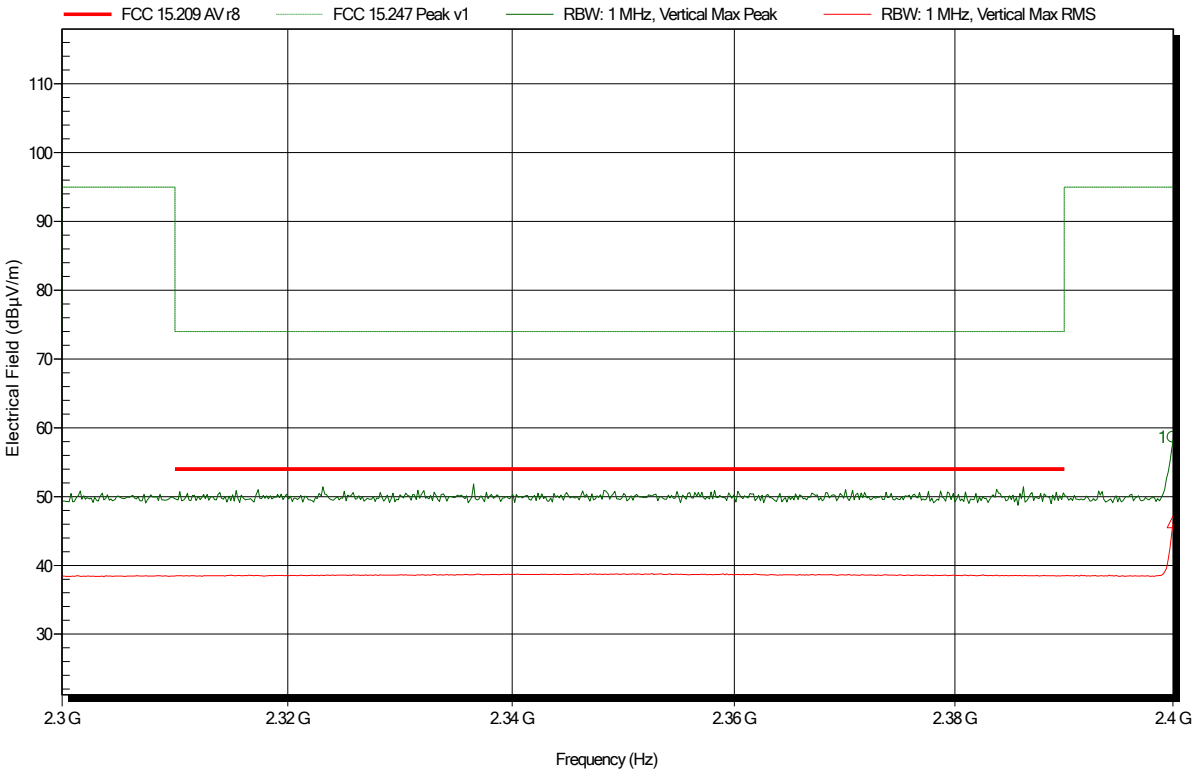

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4 GHz	58.66 dBµV/m	95 dBµV/m	-36.34 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-17
Note:	

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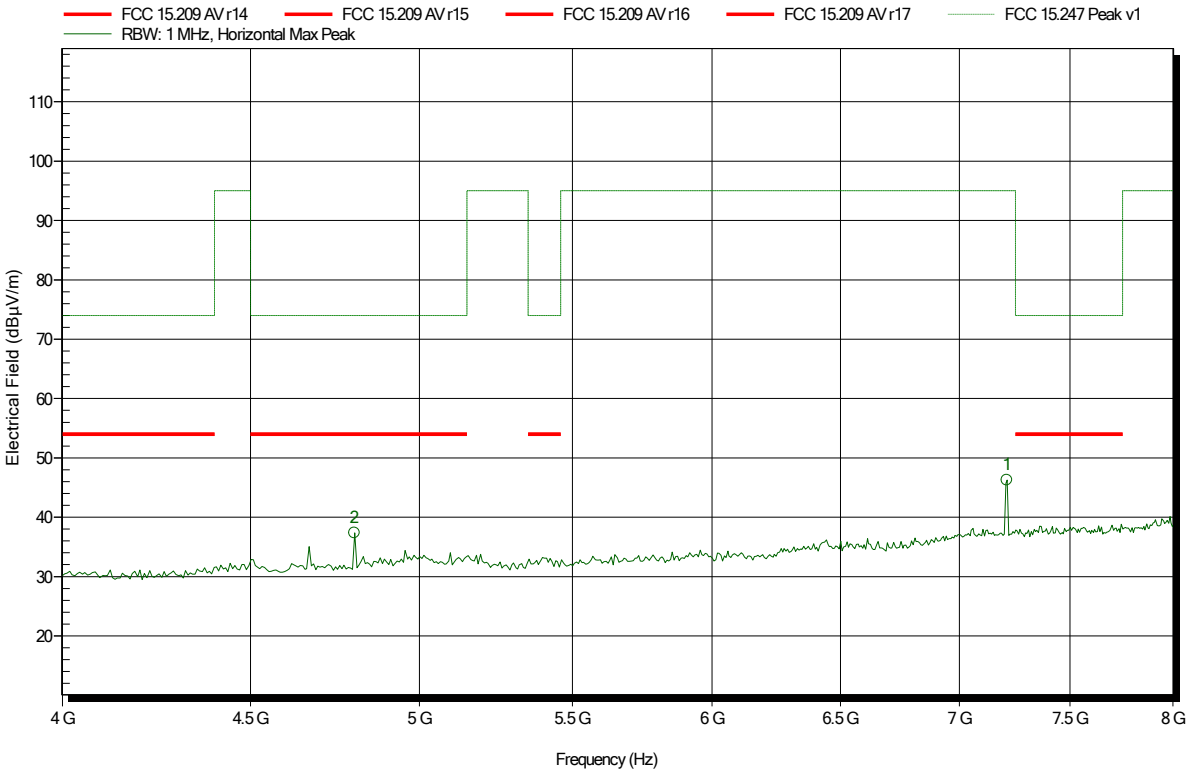

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.801 GHz	37.37 dBµV/m	74 dBµV/m	-36.63 dB	Pass
7.212 GHz	46.26 dBµV/m	95 dBµV/m	-48.74 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-17
Note:	

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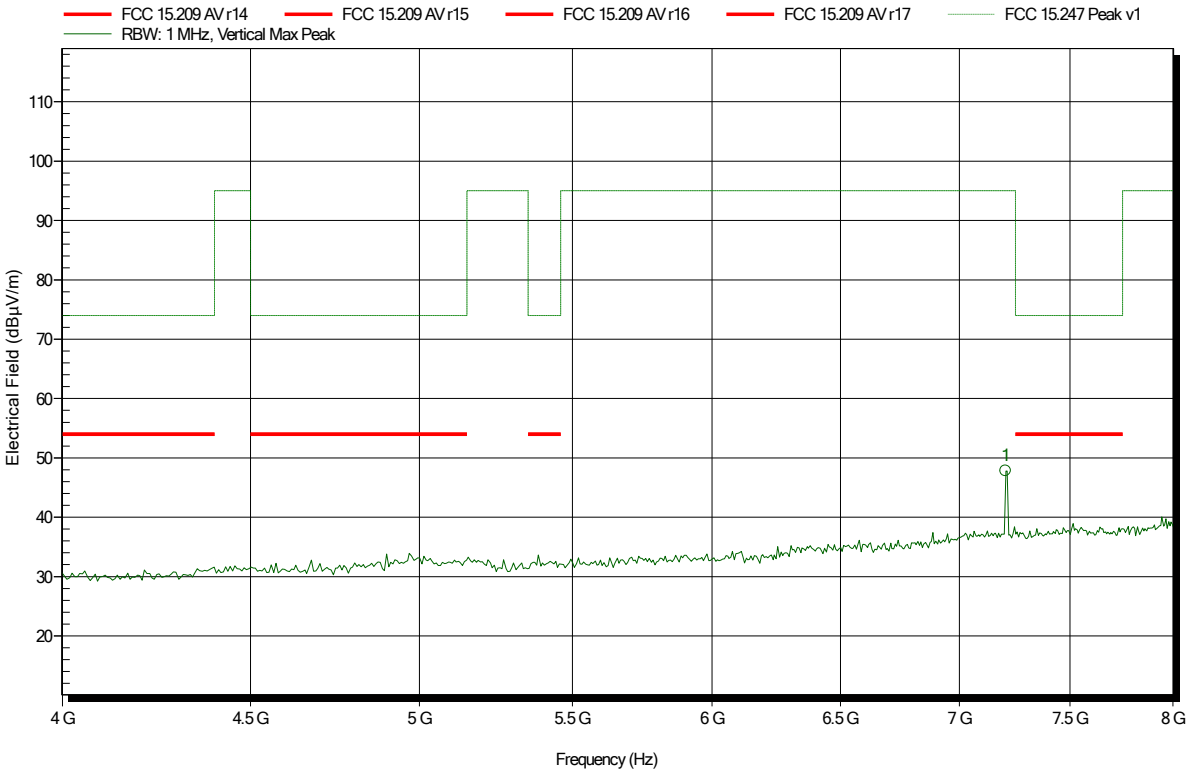

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.205 GHz	47.81 dBµV/m	95 dBµV/m	-47.19 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-17
Note:	

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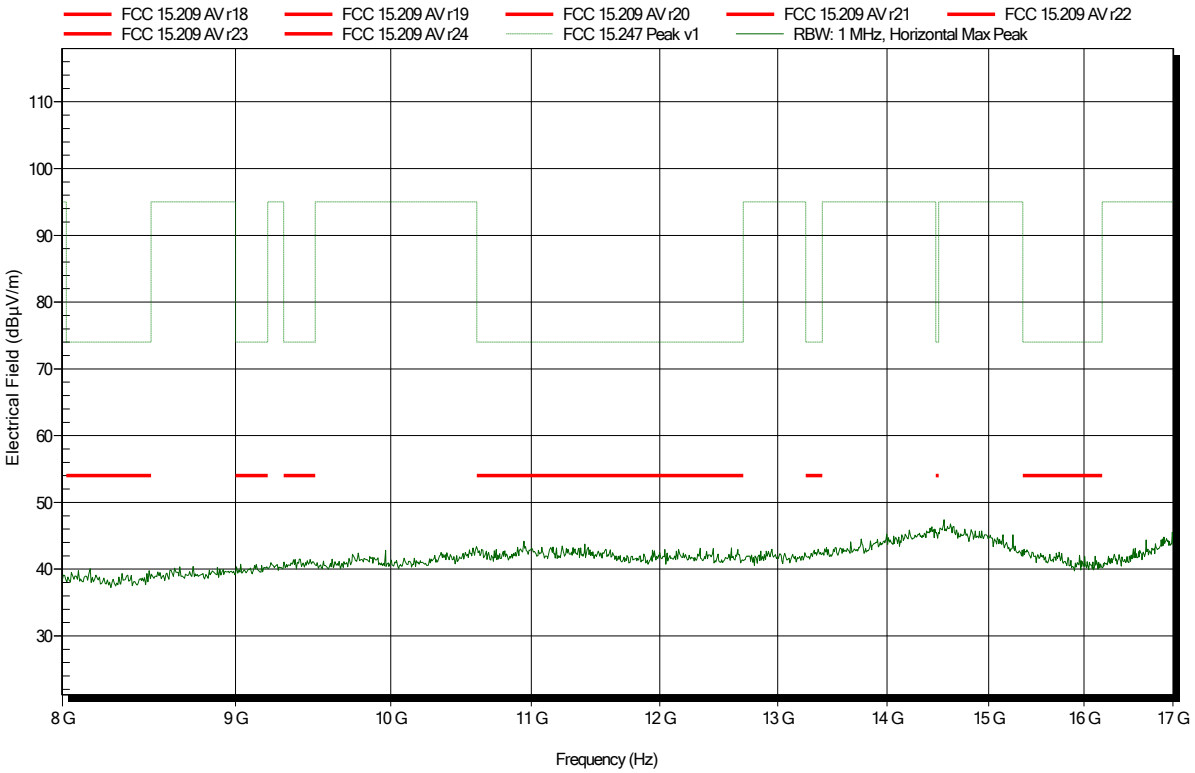

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-17
Note:	

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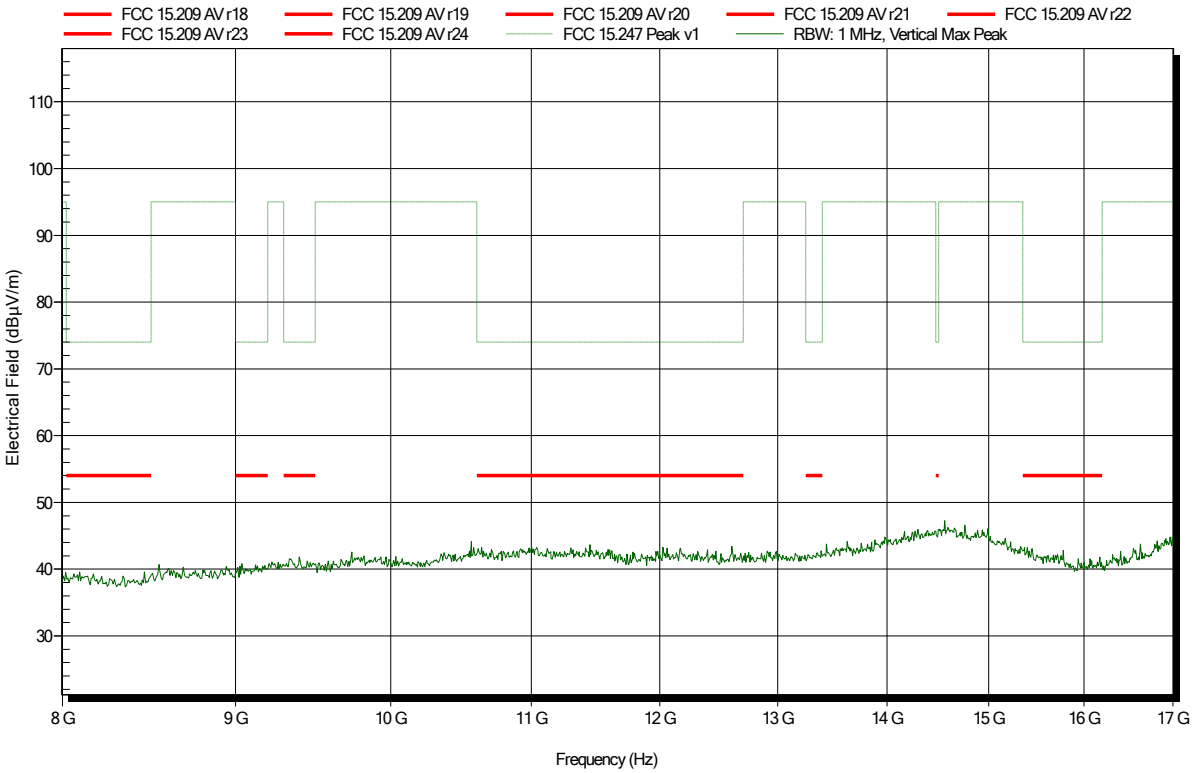

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Amplifier Research AT4560, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-17
Note:	

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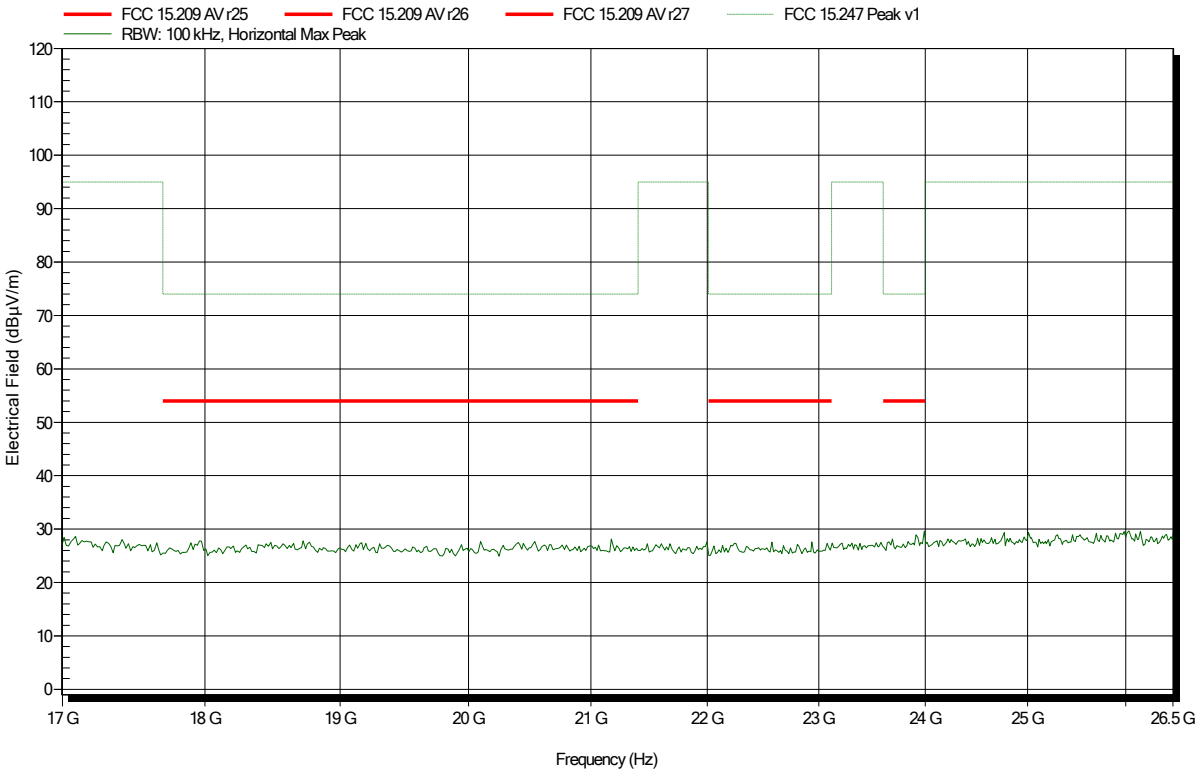

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Amplifier Research AT4560, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2402MHz, 2MBit
Test Date:	2019-09-17
Note:	

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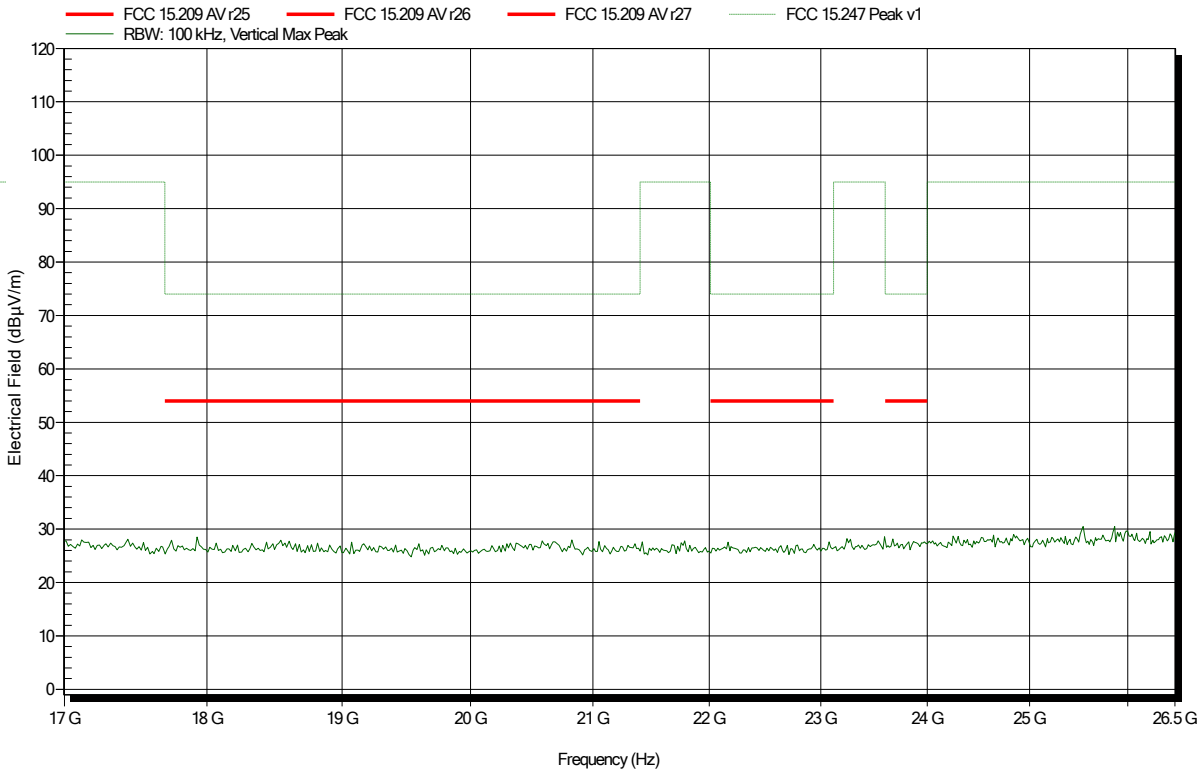

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; 2440MHz, 1MBit
Test Date:	2019-09-30
Note:	

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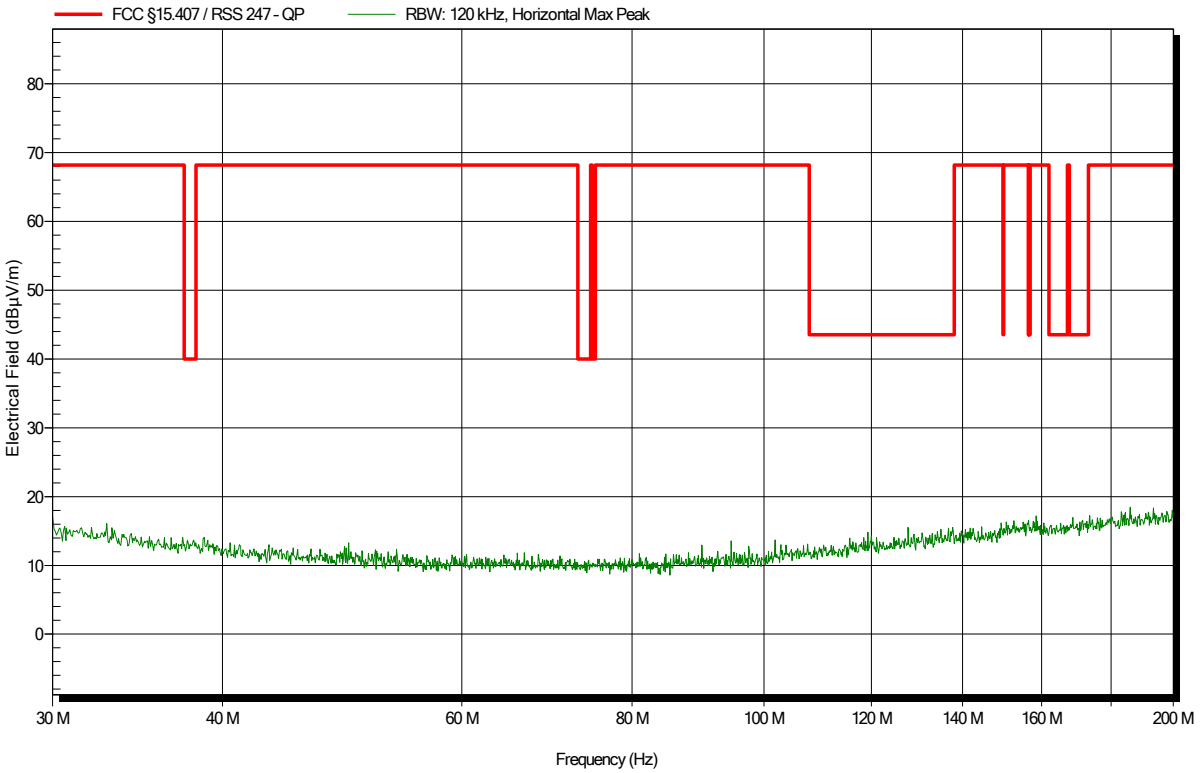

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; 2440MHz, 1MBit
Test Date:	2019-09-30
Note:	

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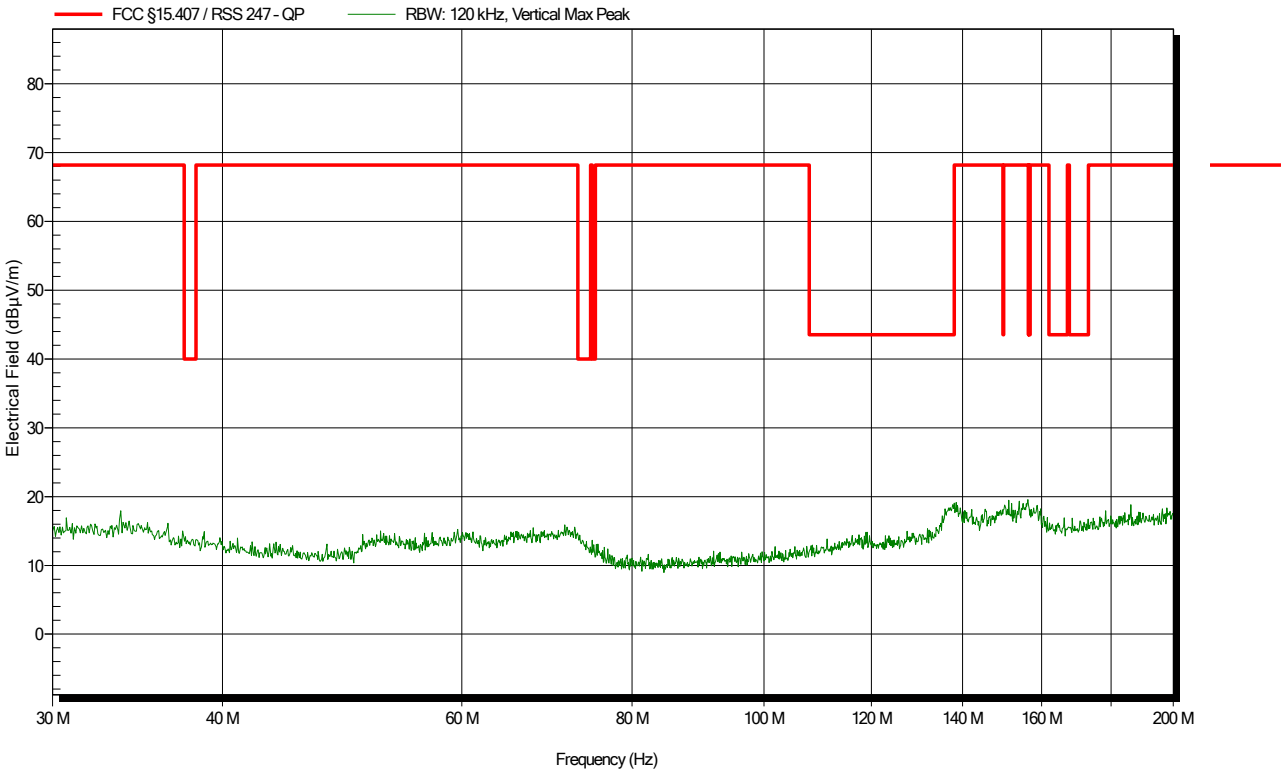

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; 2440MHz, 1MBit
Test Date:	2019-09-30
Note:	

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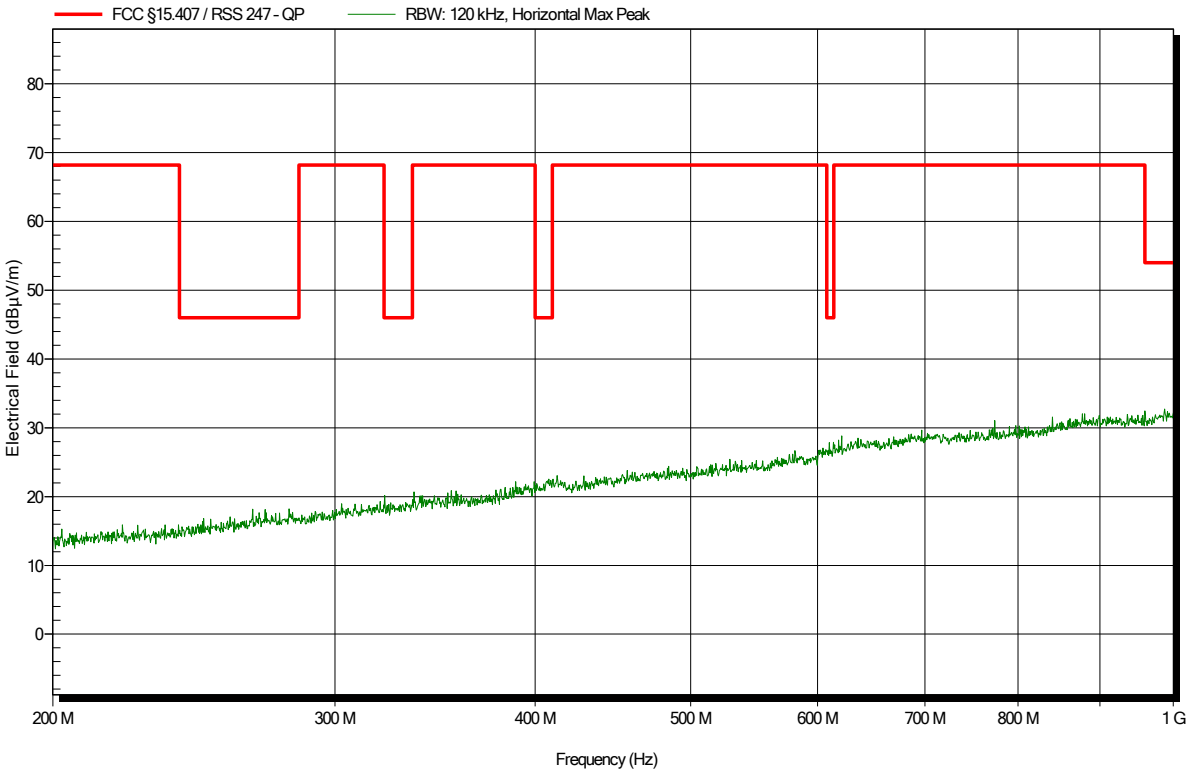

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; 2440MHz, 1MBit
Test Date:	2019-09-30
Note:	

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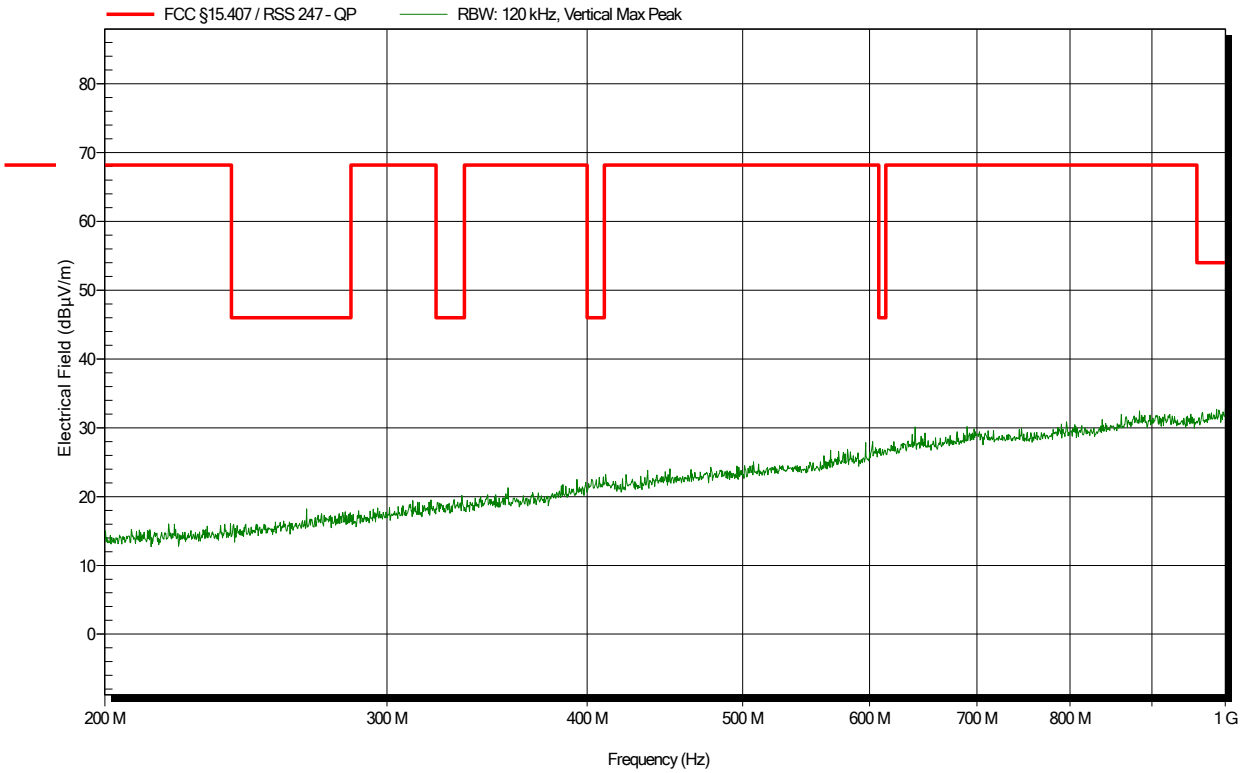

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 1MBit
Test Date:	2019-09-18
Note:	

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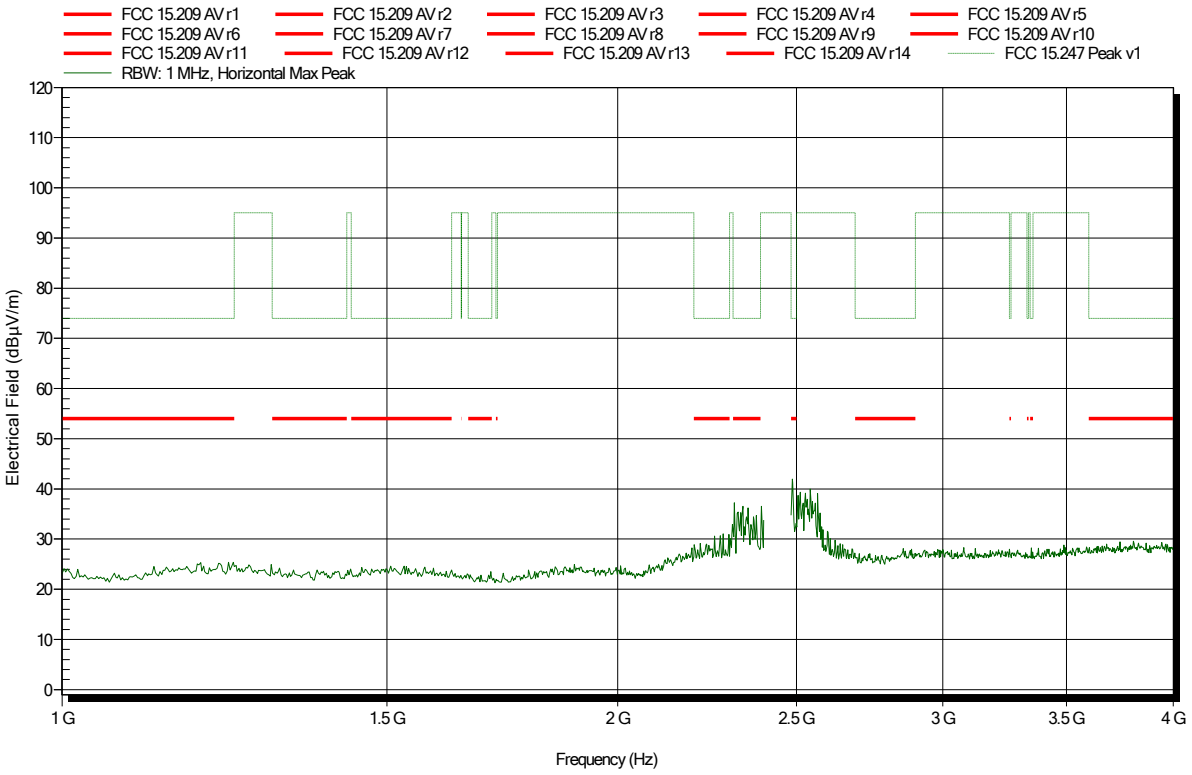

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 1MBit
Test Date:	2019-09-18
Note:	

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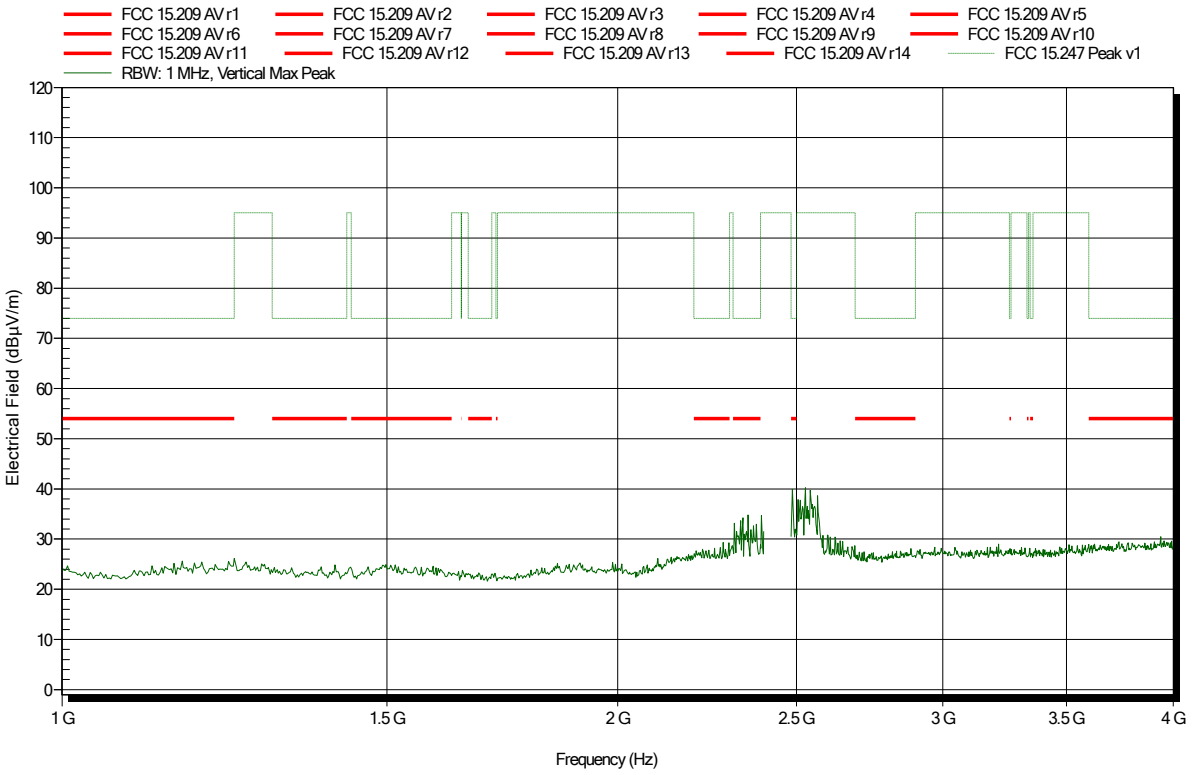

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 1MBit
Test Date:	2019-09-18
Note:	

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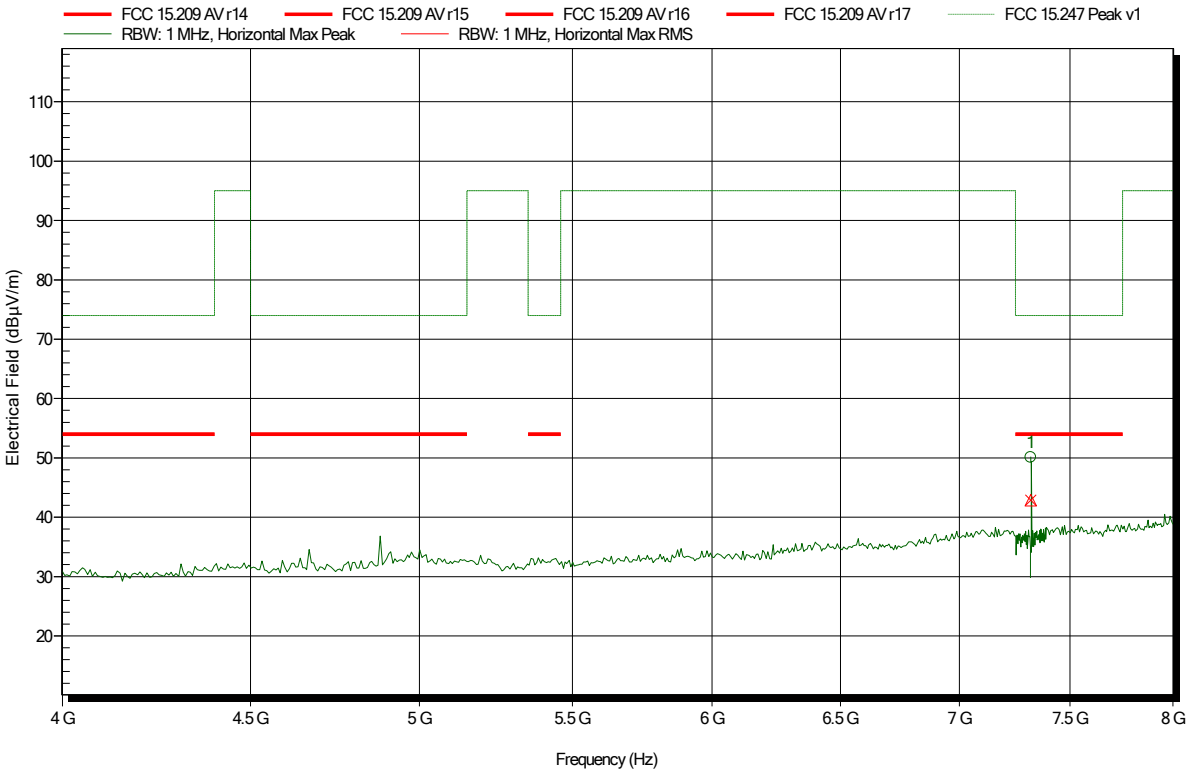

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.319 GHz	50.09 dBµV/m	74 dBµV/m	-23.91 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
7.319 GHz	42.85 dBµV/m	54 dBµV/m	-11.15 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 1MBit
Test Date:	2019-09-18
Note:	

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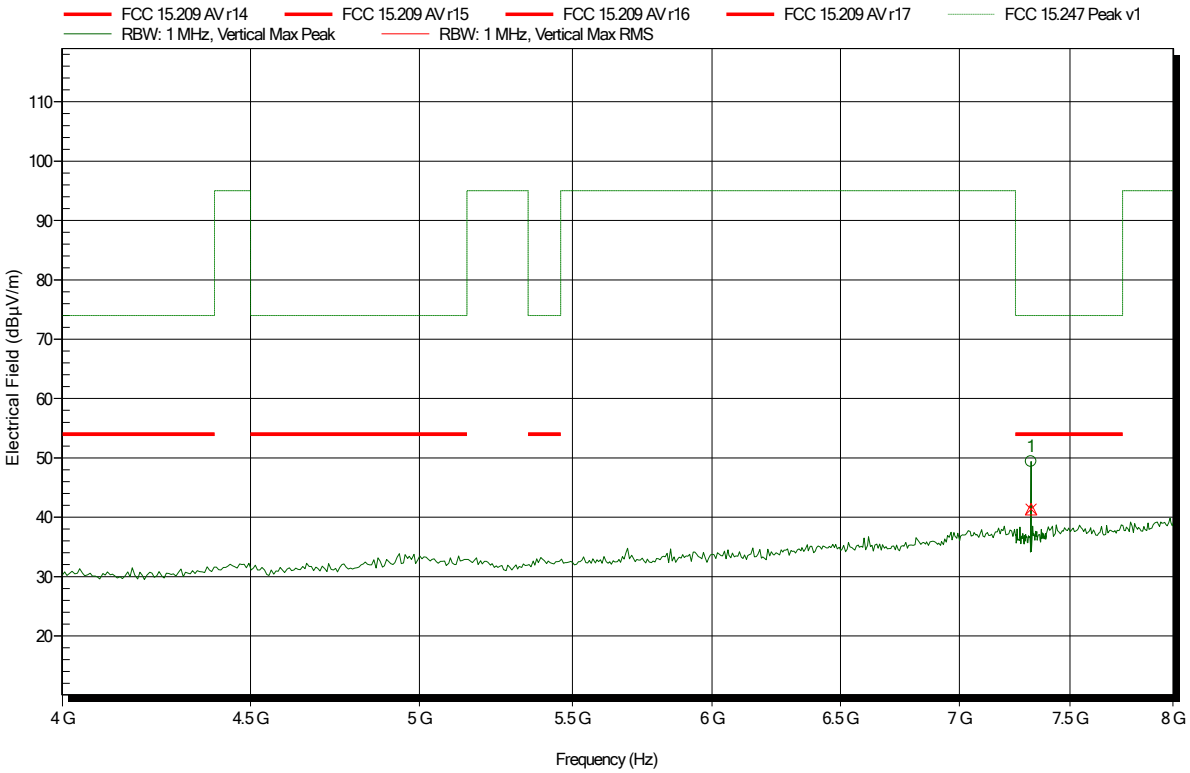

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.321 GHz	49.41 dBµV/m	74 dBµV/m	-24.59 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
7.321 GHz	41.36 dBµV/m	54 dBµV/m	-12.64 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 1MBit
Test Date:	2019-09-18
Note:	

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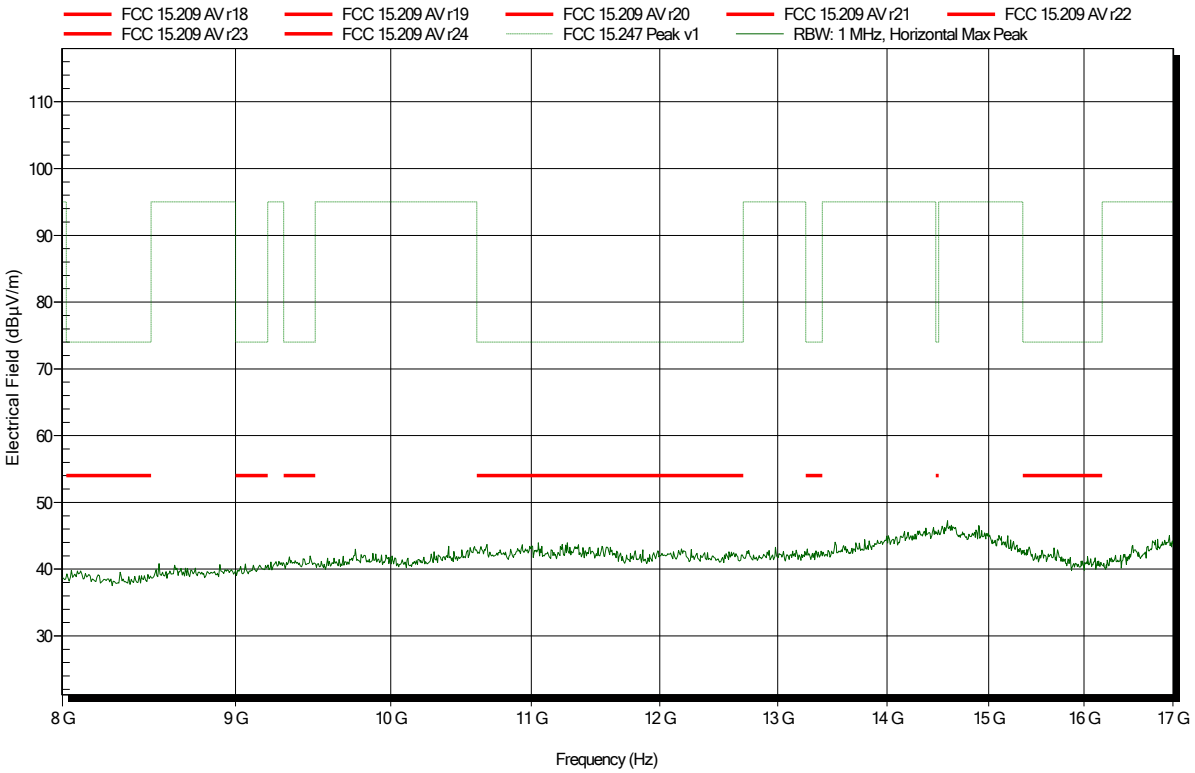

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 1MBit
Test Date:	2019-09-18
Note:	

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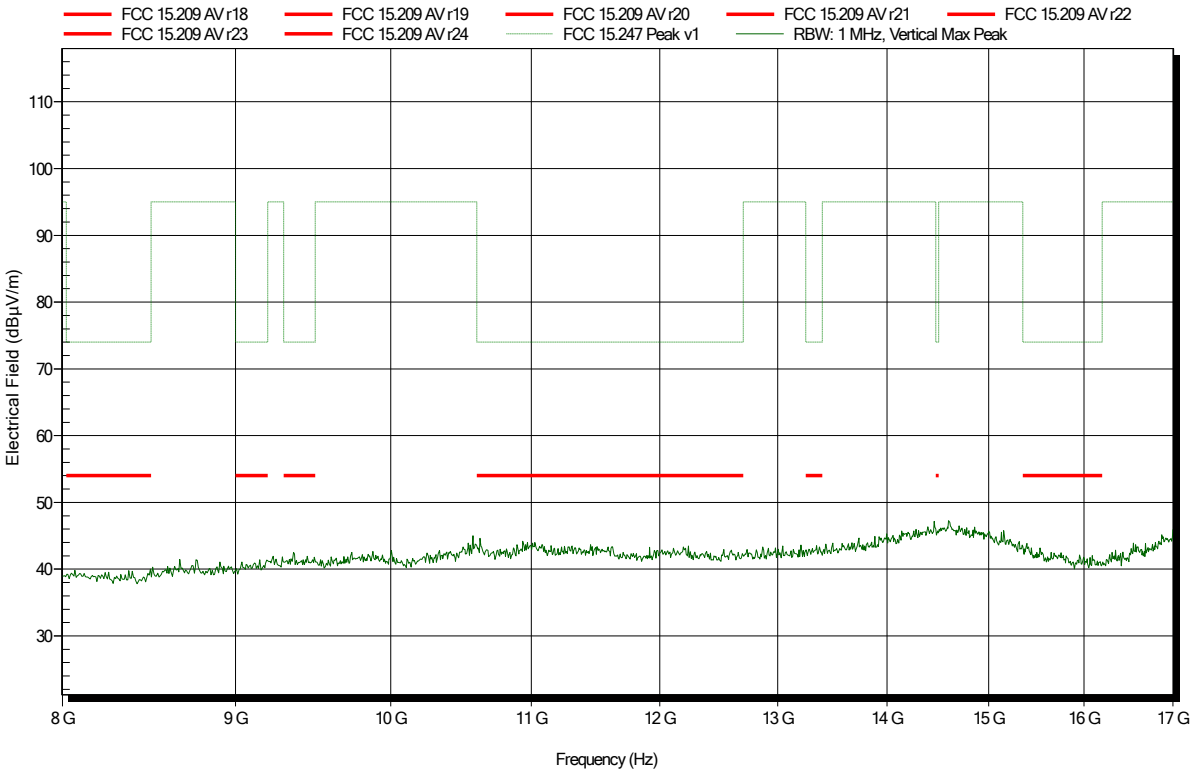

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Amplifier Research AT4560, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 1MBit
Test Date:	2019-09-17
Note:	

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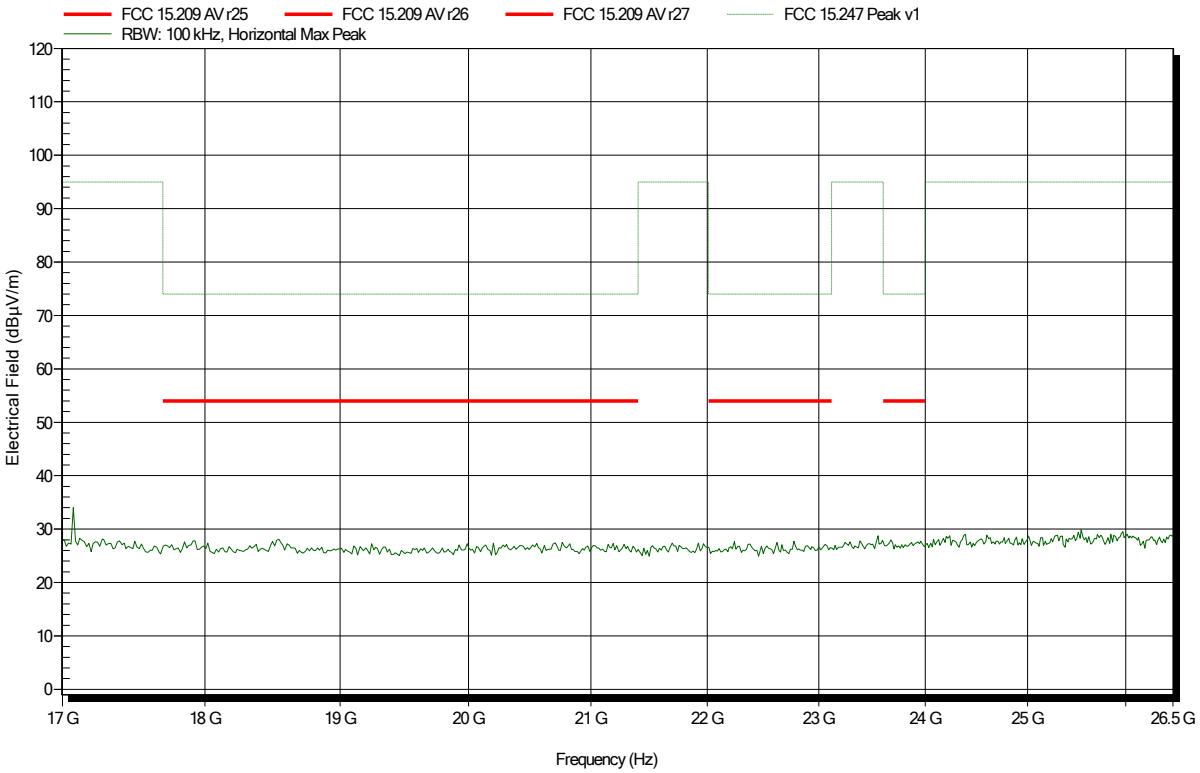

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Amplifier Research AT4560, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 1MBit
Test Date:	2019-09-17
Note:	

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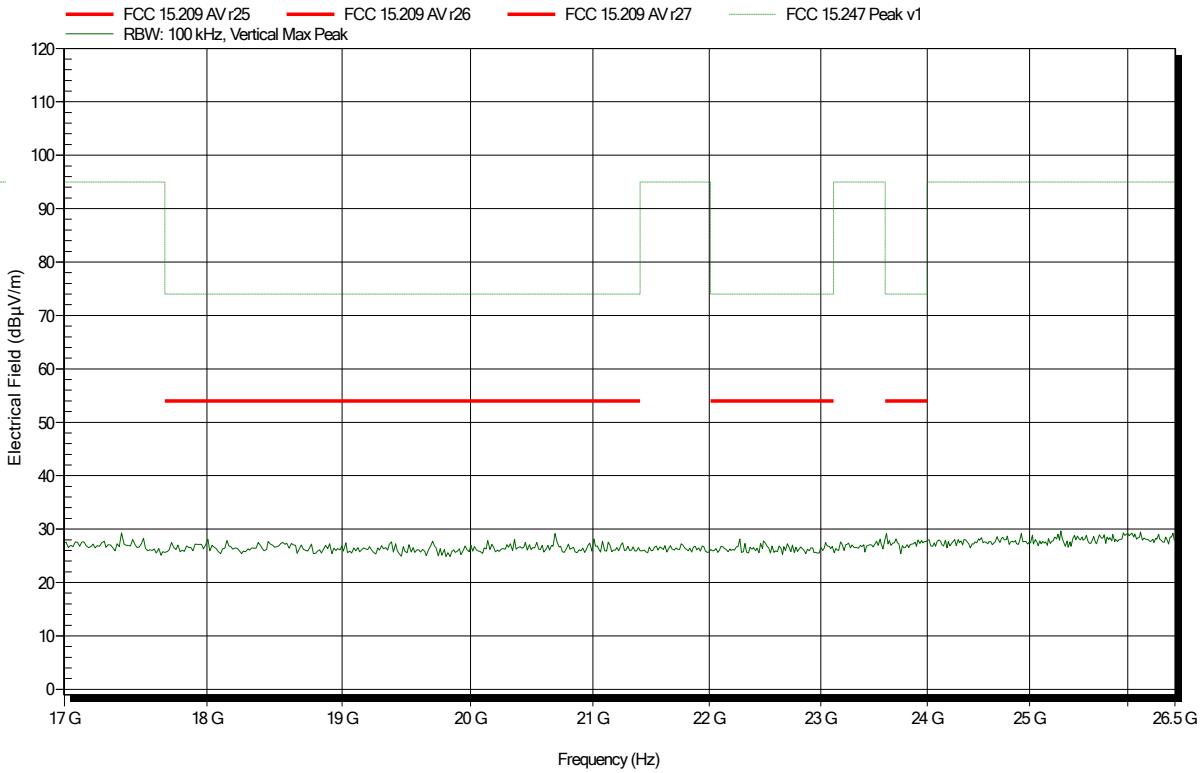

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 1MBit, EUT horiz.
Test Date:	2019-09-18
Note:	

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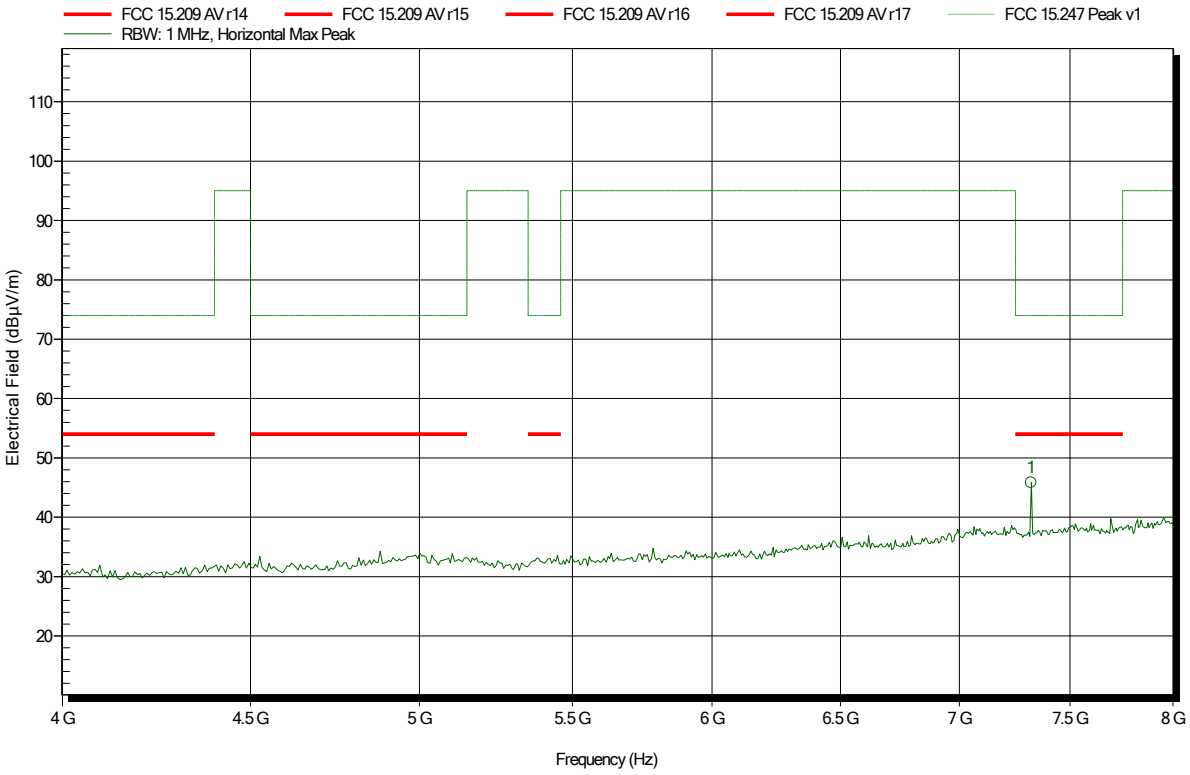

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.321 GHz	45.84 dBµV/m	74 dBµV/m	-28.16 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 1MBit, EUT horiz.
Test Date:	2019-09-18
Note:	

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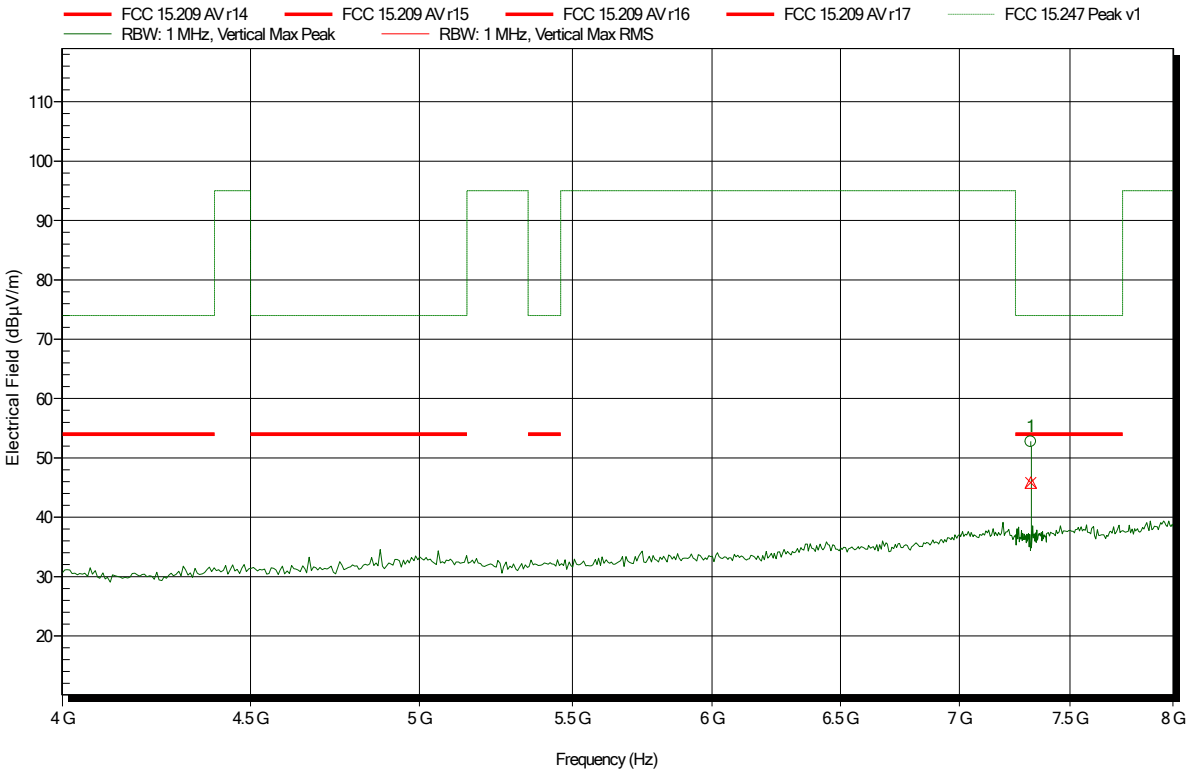

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.319 GHz	52.74 dBµV/m	74 dBµV/m	-21.26 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
7.319 GHz	45.84 dBµV/m	54 dBµV/m	-8.16 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; 2440MHz, 2MBit
Test Date:	2019-09-30
Note:	

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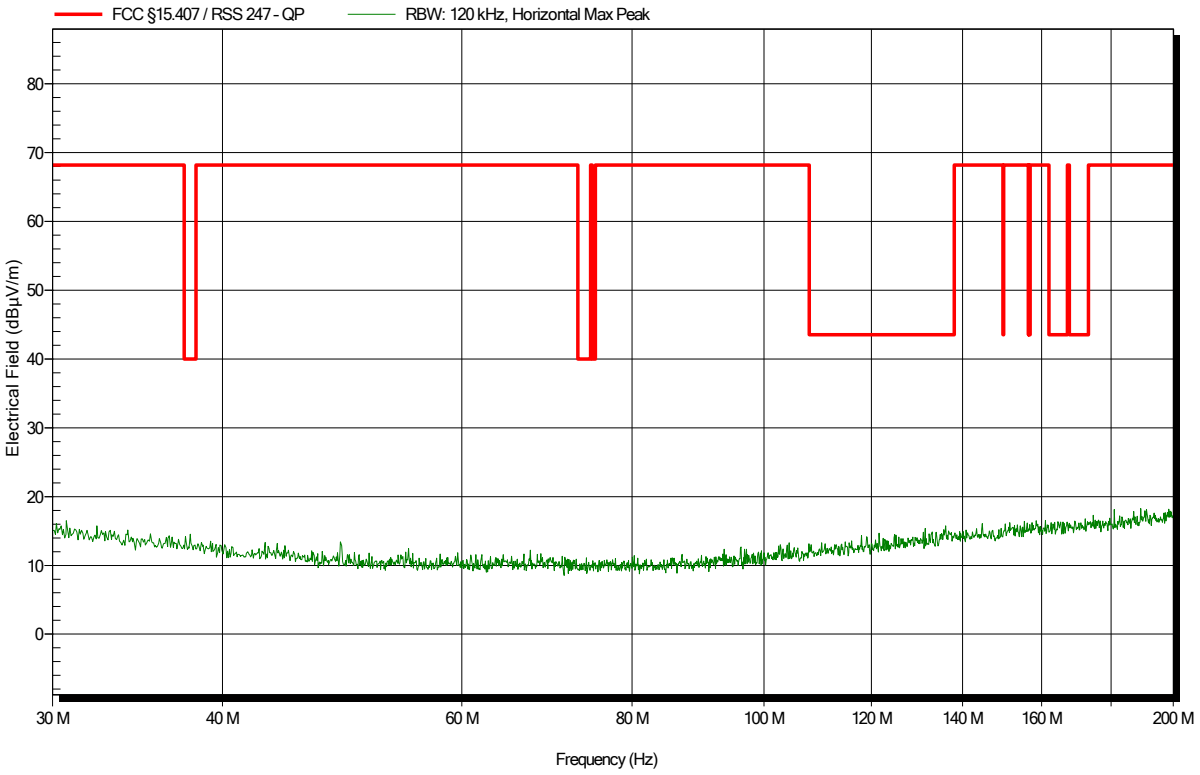

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; 2440MHz, 2MBit
Test Date:	2019-09-30
Note:	

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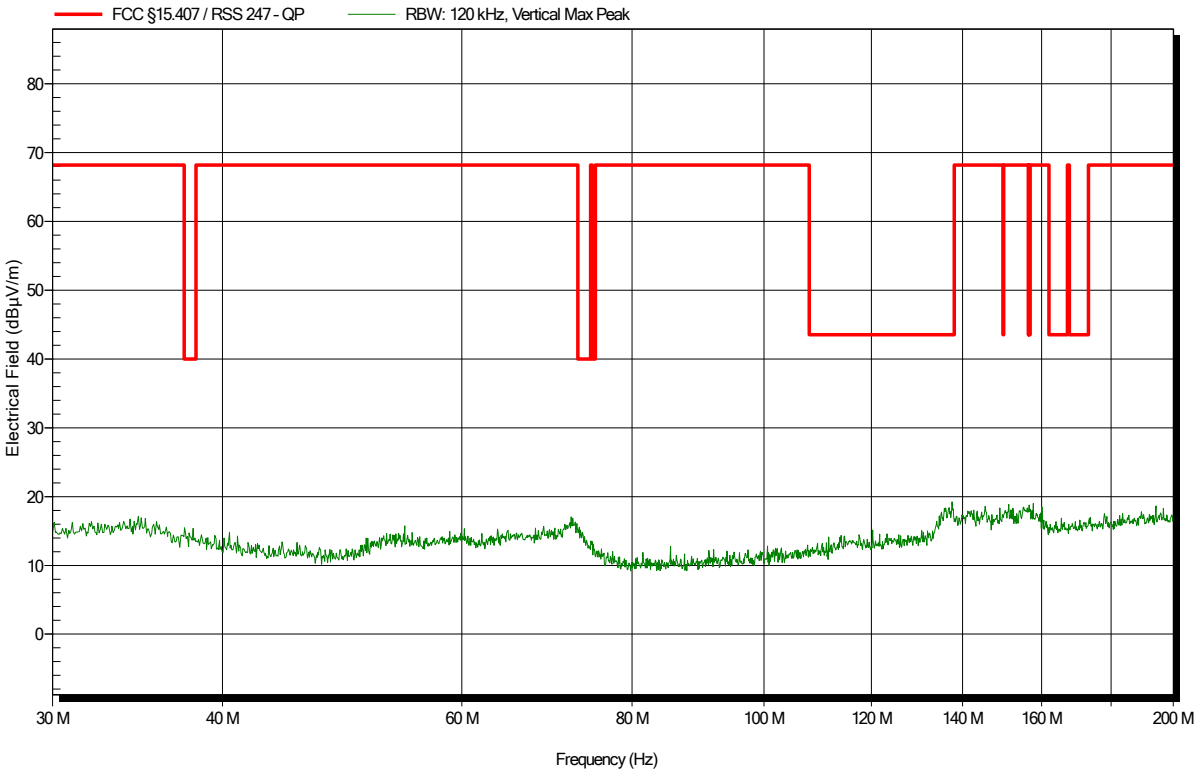

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; 2440MHz, 2MBit
Test Date:	2019-09-30
Note:	

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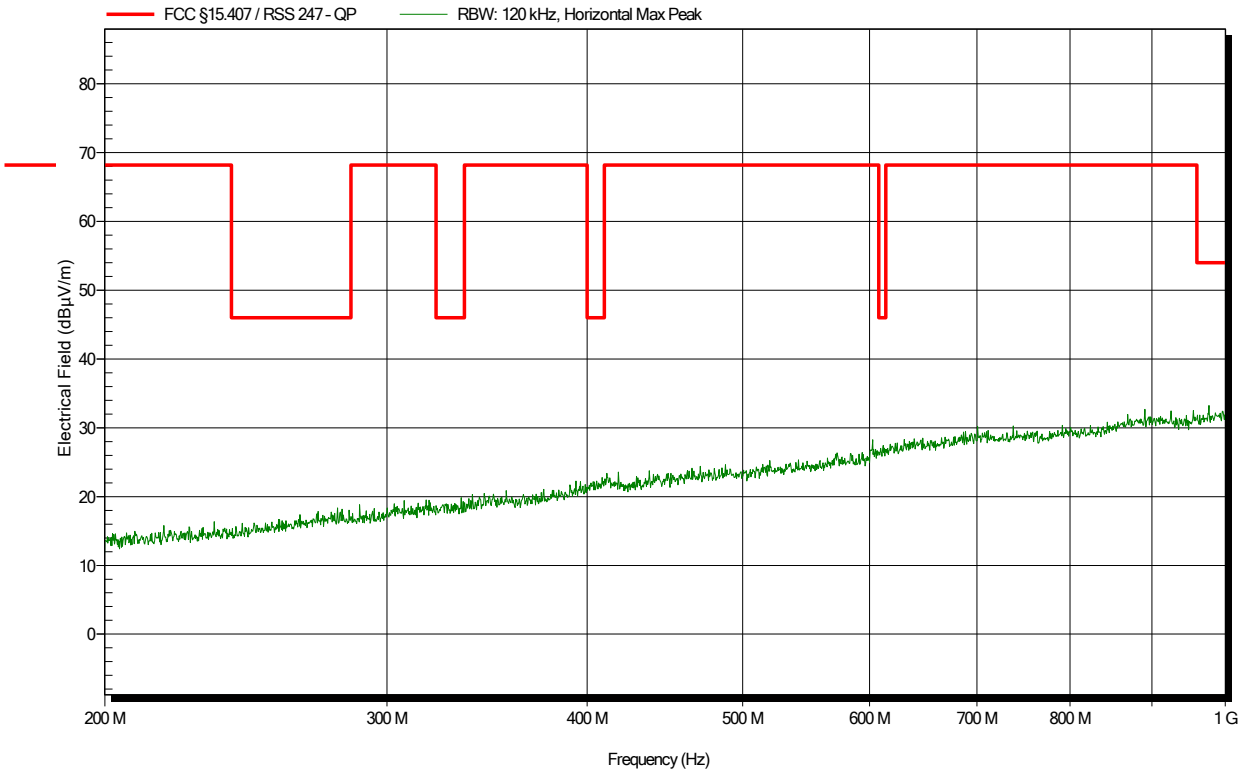

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; 2440MHz, 2MBit
Test Date:	2019-09-30
Note:	

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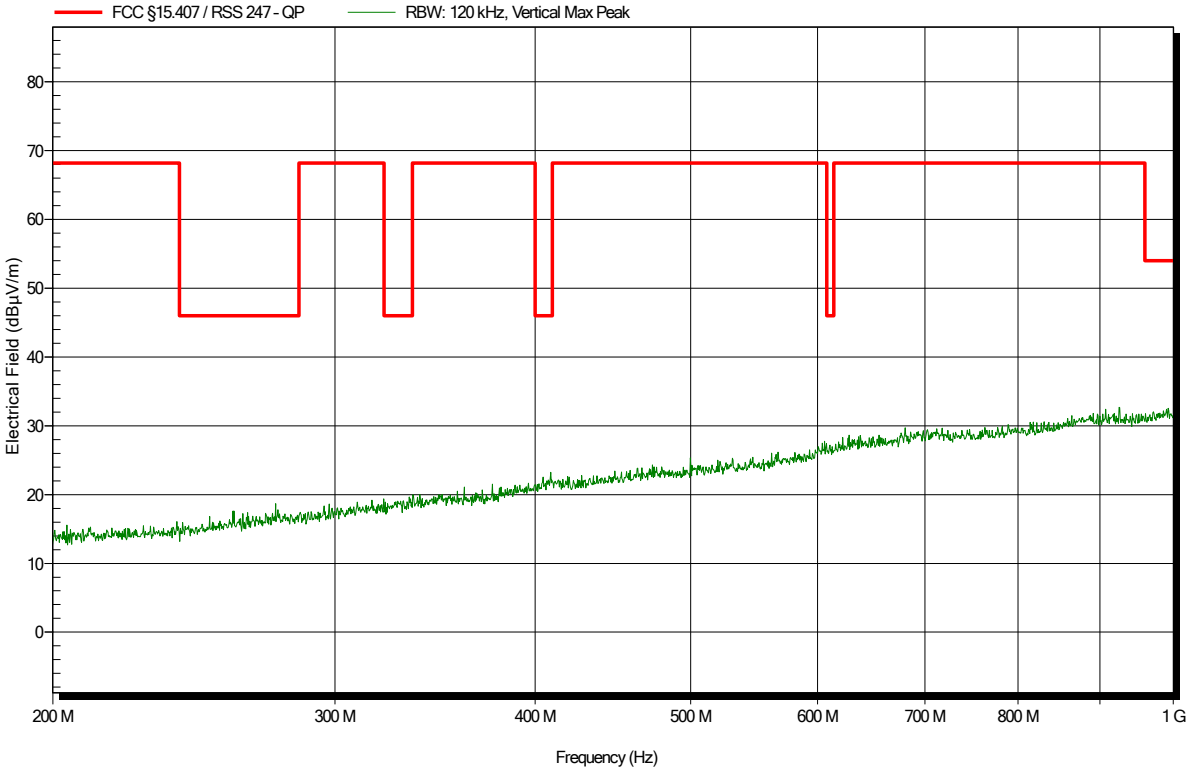

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 2MBit
Test Date:	2019-09-17
Note:	

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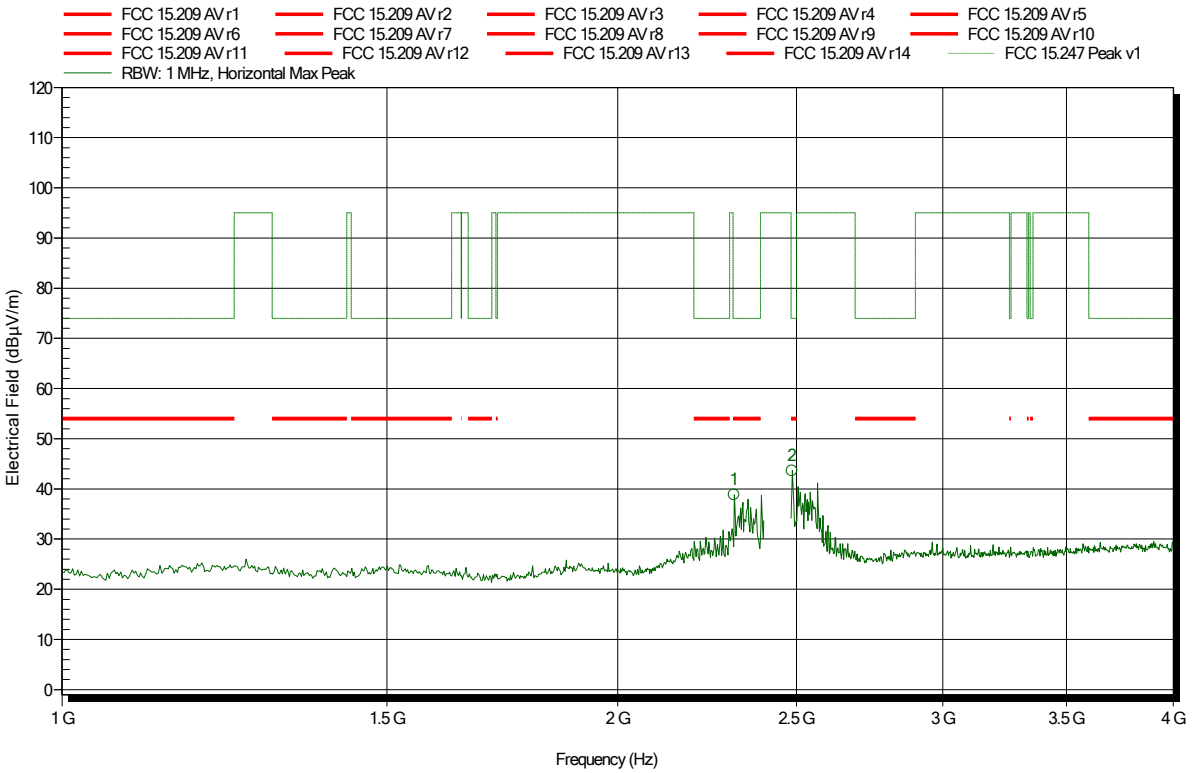

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.3125 GHz	38.84 dBµV/m	74 dBµV/m	-35.16 dB	Pass
2.4859 GHz	43.64 dBµV/m	74 dBµV/m	-30.36 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 2MBit
Test Date:	2019-09-17
Note:	

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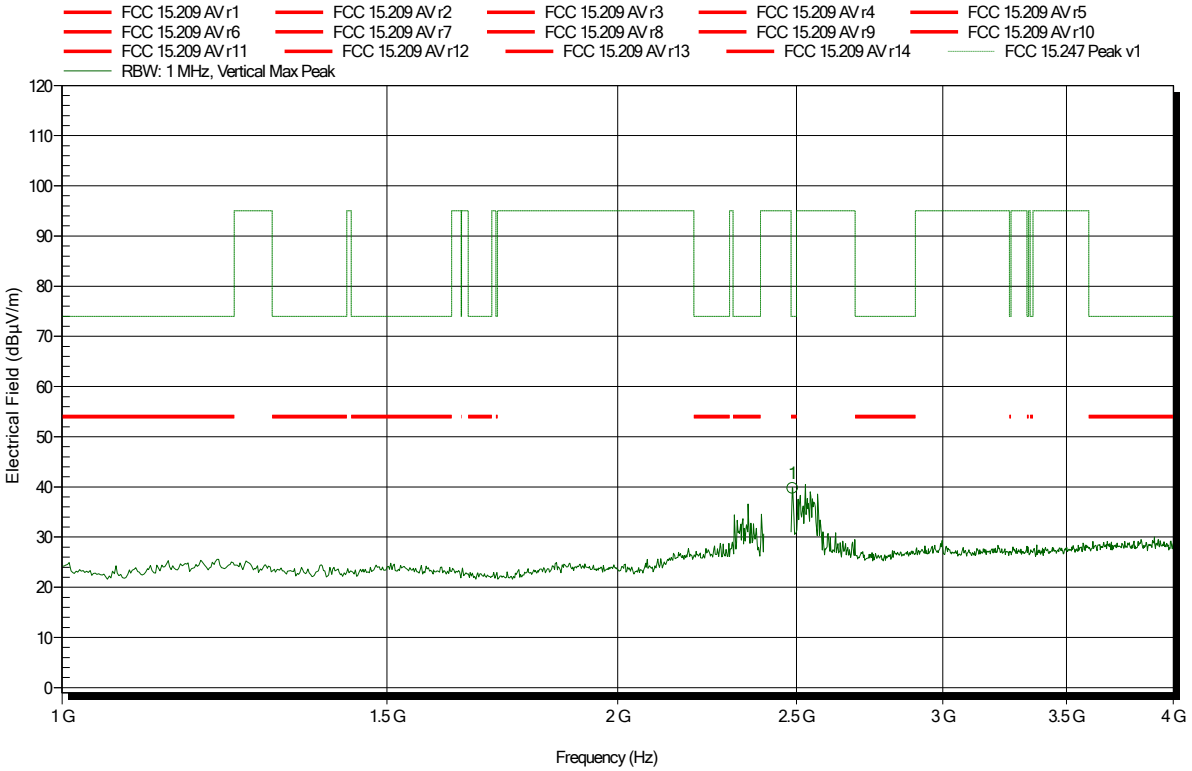

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4884 GHz	39.7 dBµV/m	74 dBµV/m	-34.3 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 2MBit
Test Date:	2019-09-17
Note:	

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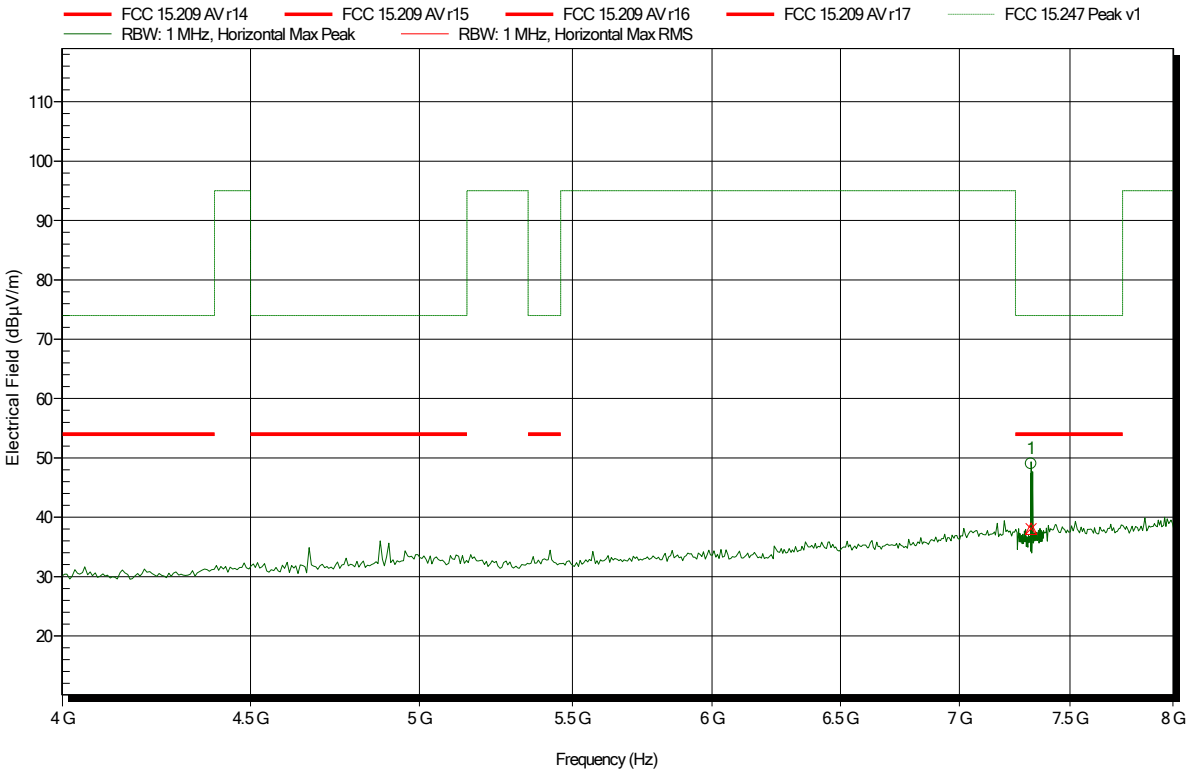

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.321 GHz	49.01 dBµV/m	74 dBµV/m	-24.99 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
7.321 GHz	38.06 dBµV/m	54 dBµV/m	-15.94 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 2MBit
Test Date:	2019-09-17
Note:	

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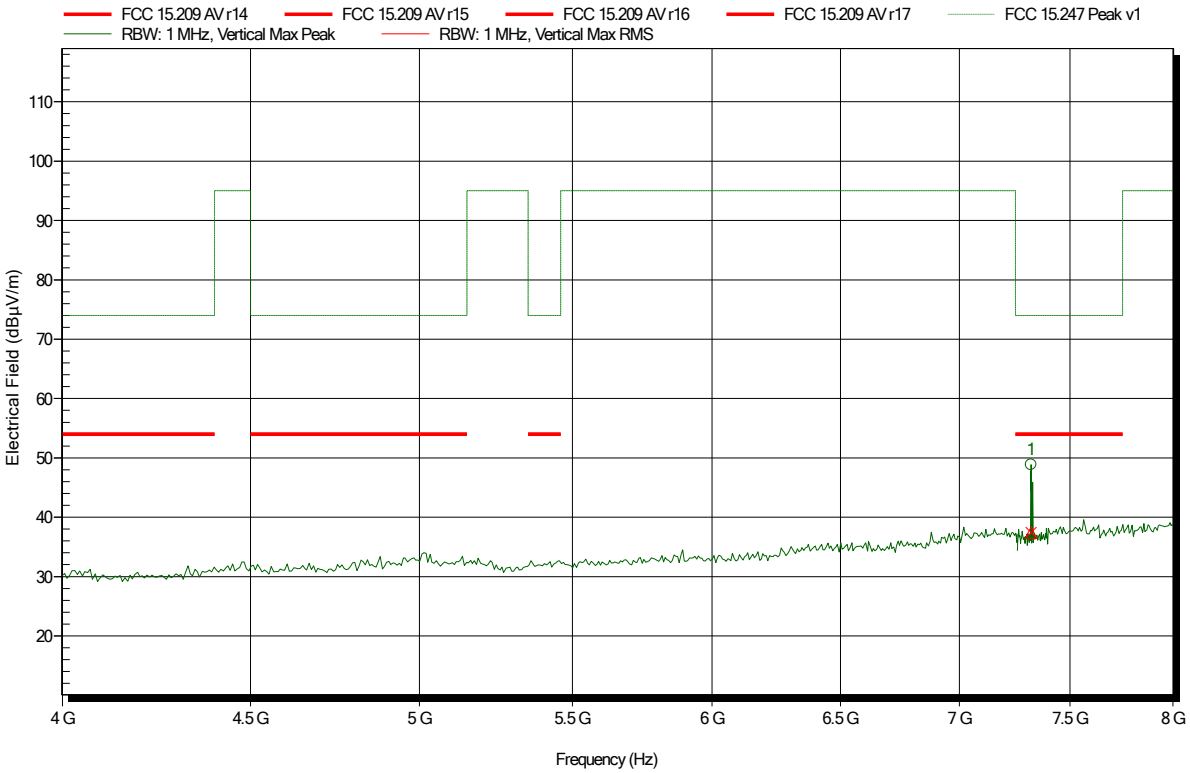

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.321 GHz	48.86 dBµV/m	74 dBµV/m	-25.14 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
7.321 GHz	37.41 dBµV/m	54 dBµV/m	-16.59 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 2MBit
Test Date:	2019-09-17
Note:	

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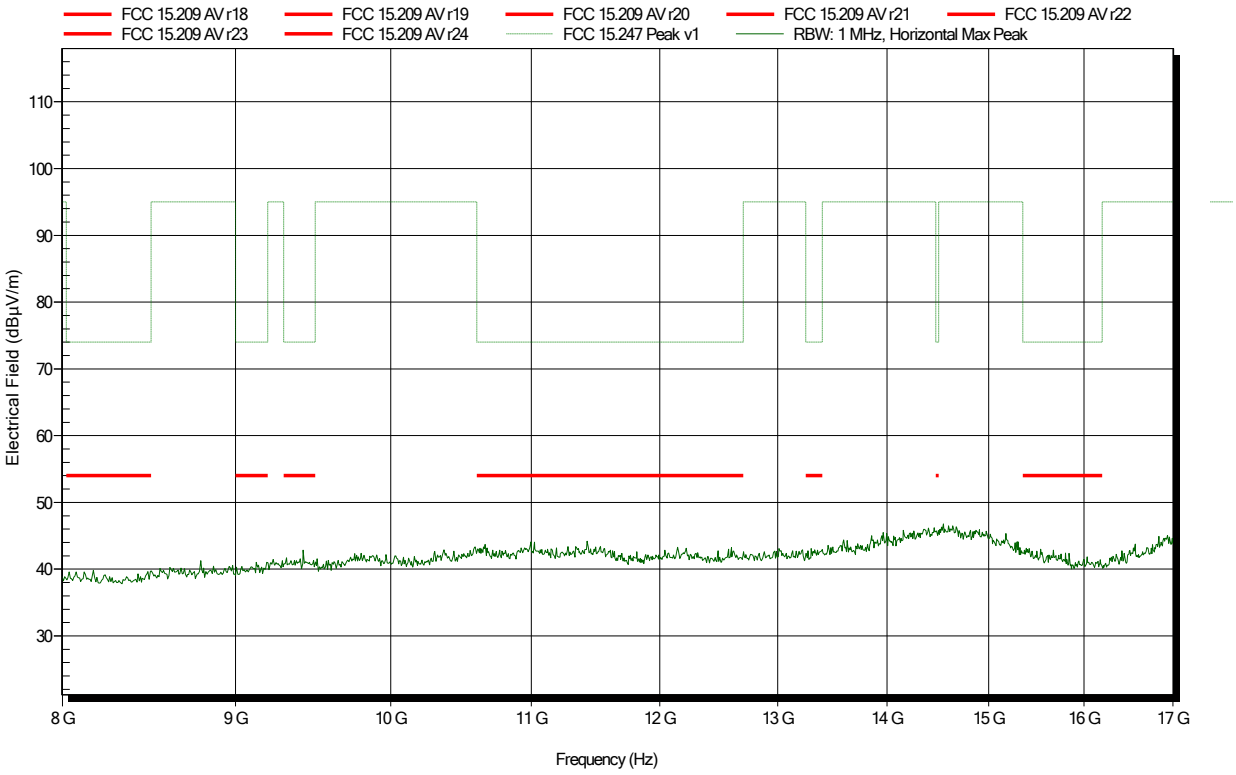

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 2MBit
Test Date:	2019-09-17
Note:	

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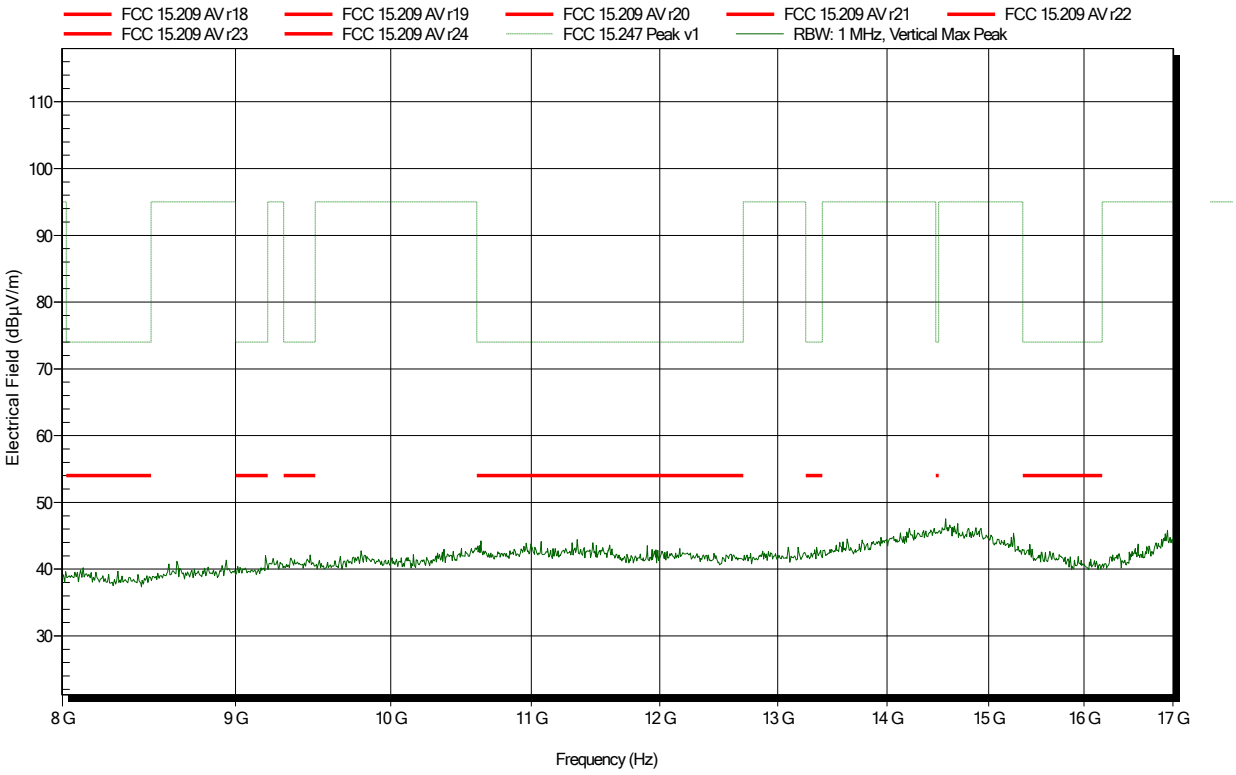

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Amplifier Research AT4560, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 2MBit
Test Date:	2019-09-17
Note:	

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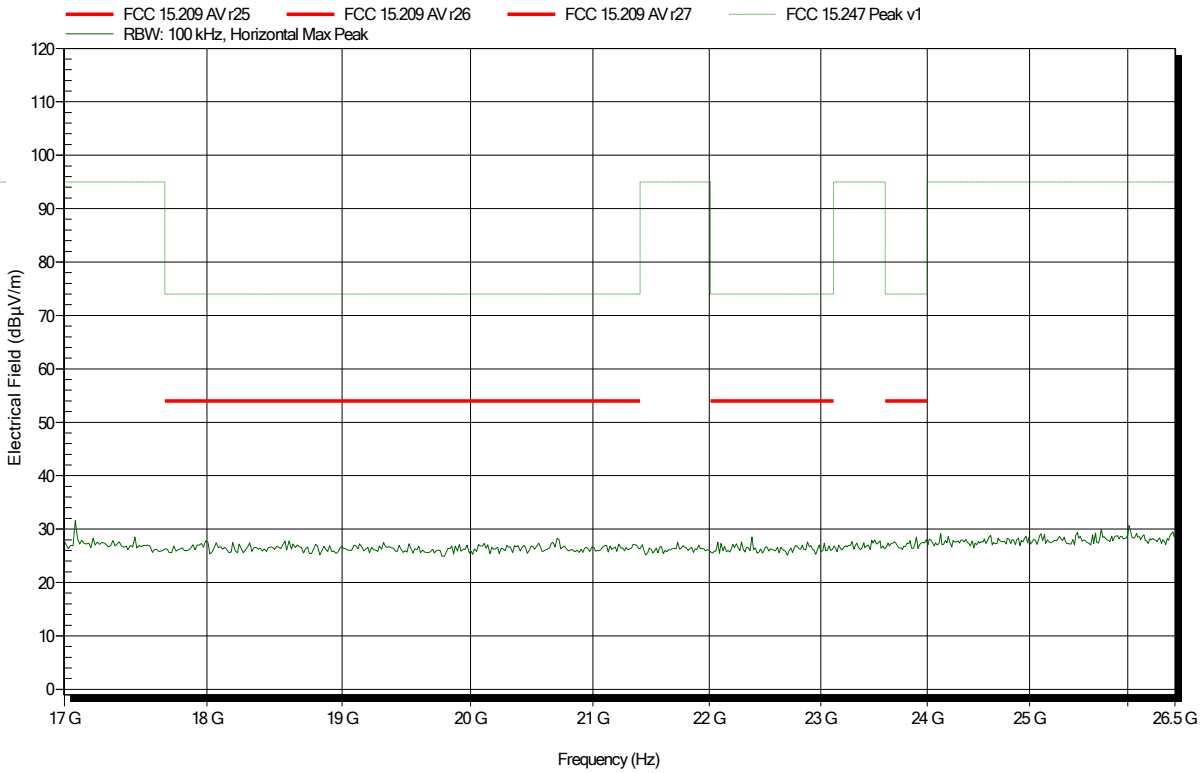

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Amplifier Research AT4560, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2440MHz, 2MBit
Test Date:	2019-09-17
Note:	

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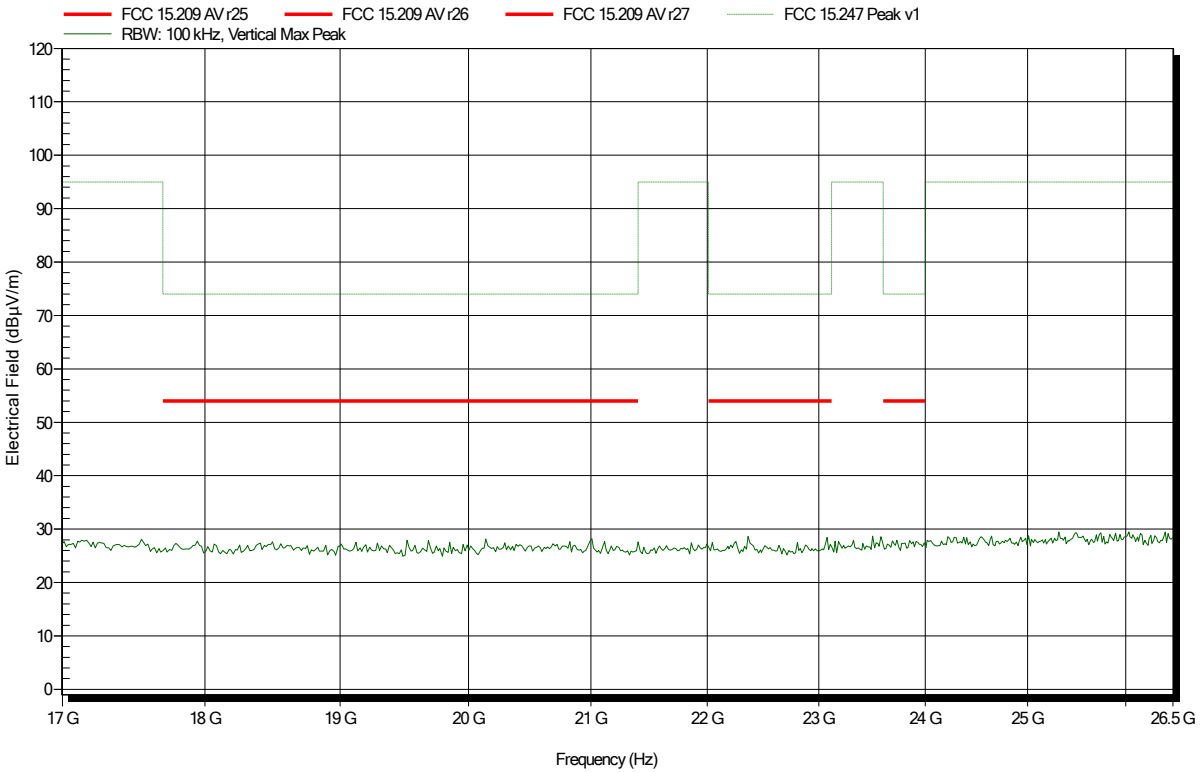

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; 2480MHz, 1MBit
Test Date:	2019-09-30
Note:	

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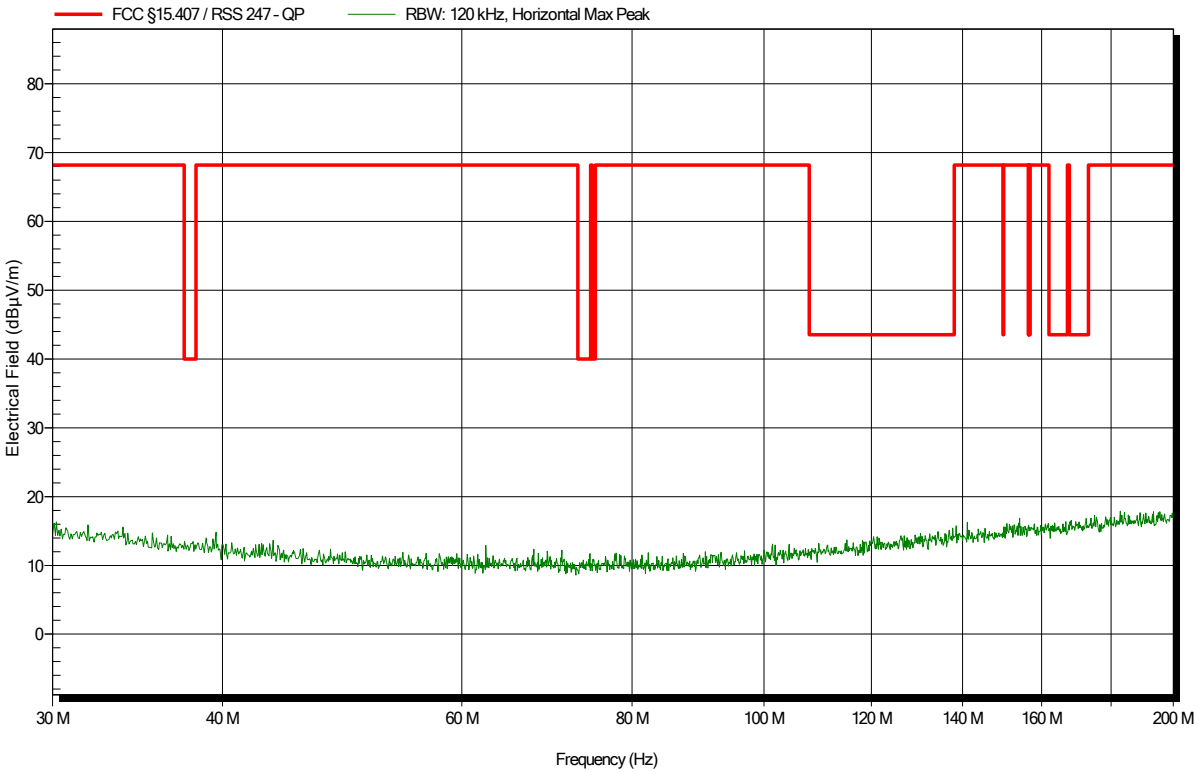

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; 2480MHz, 1MBit
Test Date:	2019-09-30
Note:	

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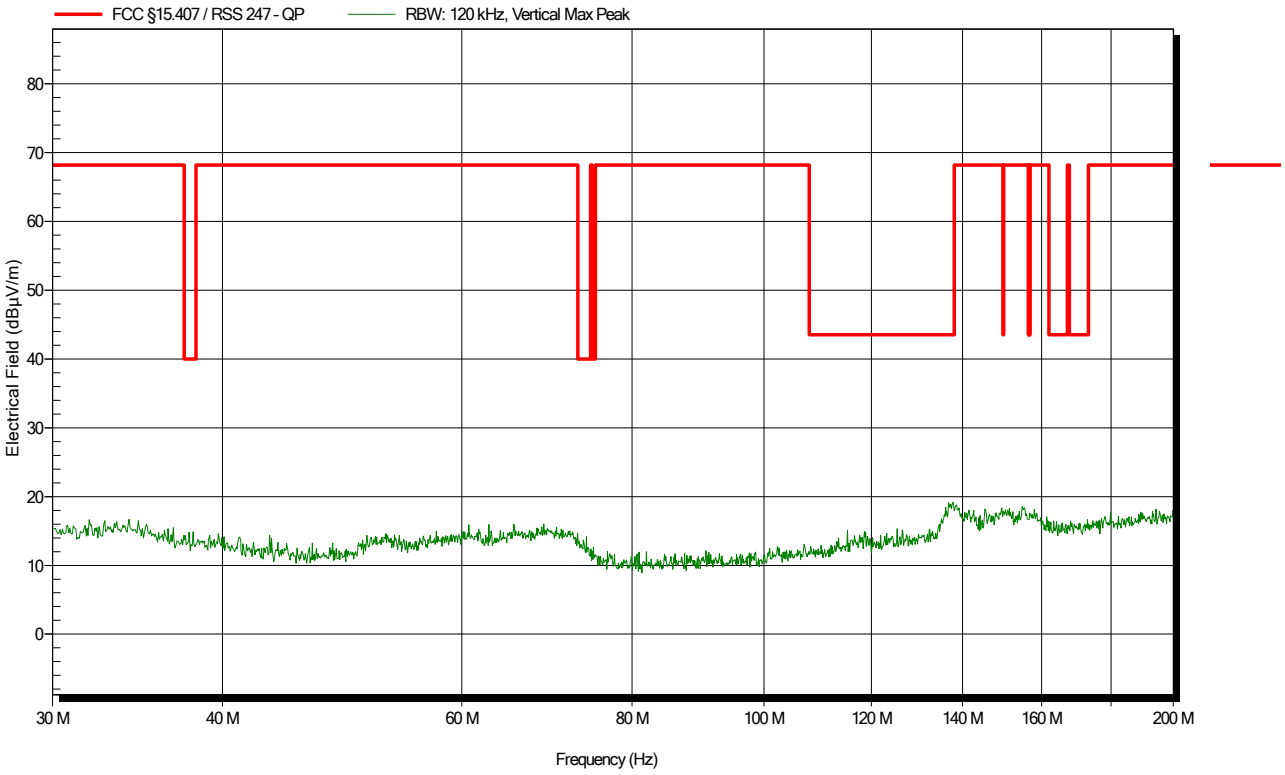

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; 2480MHz, 1MBit
Test Date:	2019-09-30
Note:	

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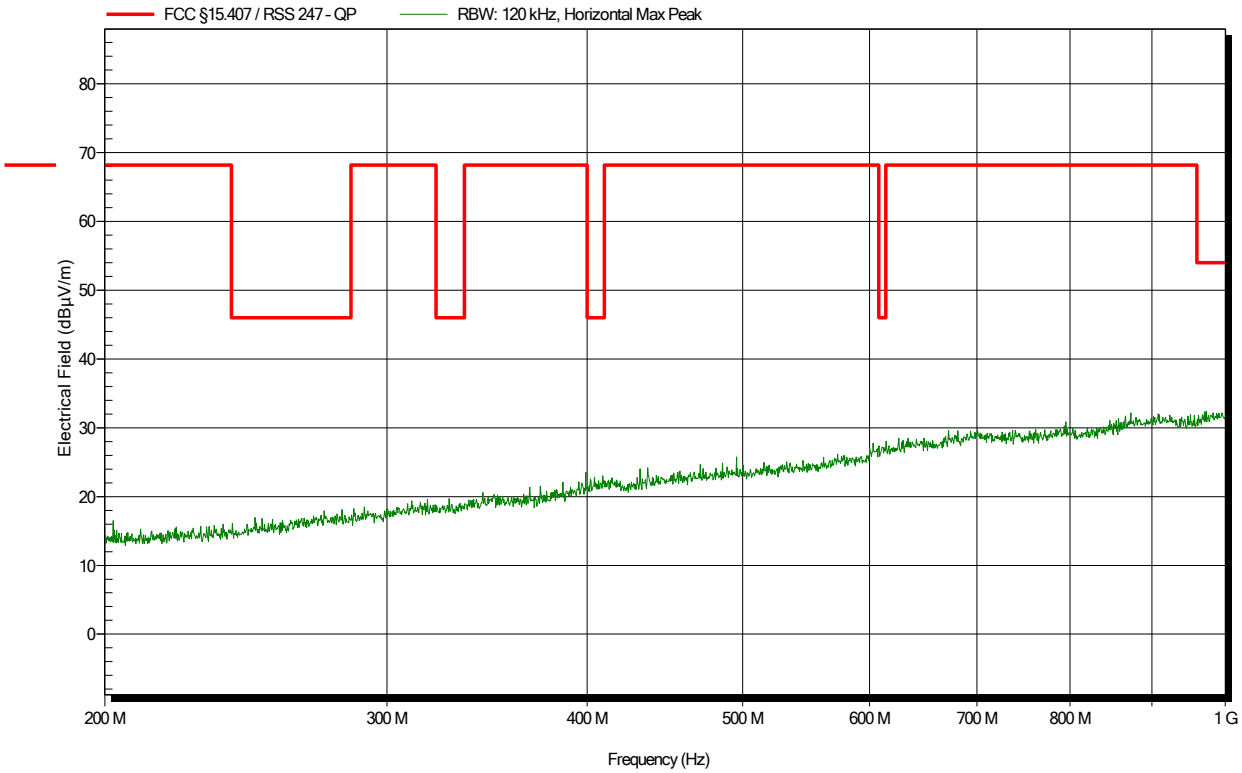

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; 2480MHz, 1MBit
Test Date:	2019-09-30
Note:	

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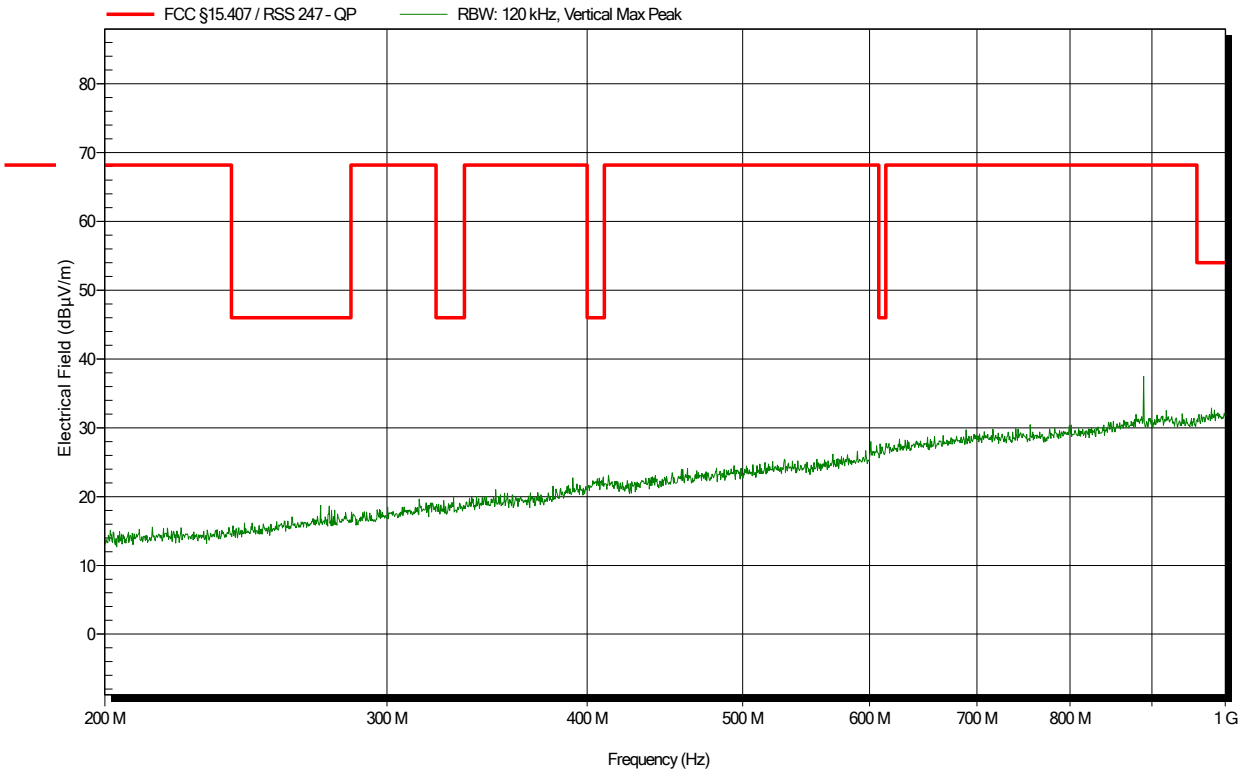

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 1MBit
Test Date:	2019-09-18
Note:	

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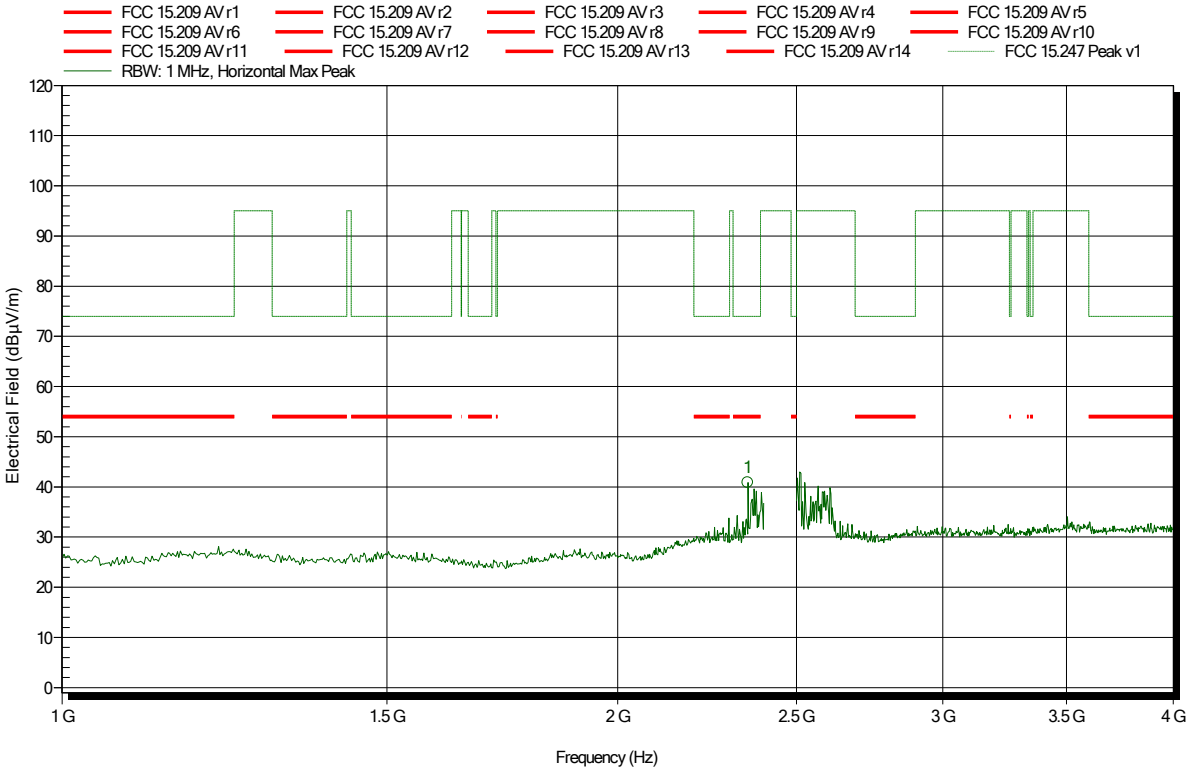

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.353 GHz	40.9 dBµV/m	74 dBµV/m	-33.1 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 1MBit
Test Date:	2019-09-18
Note:	

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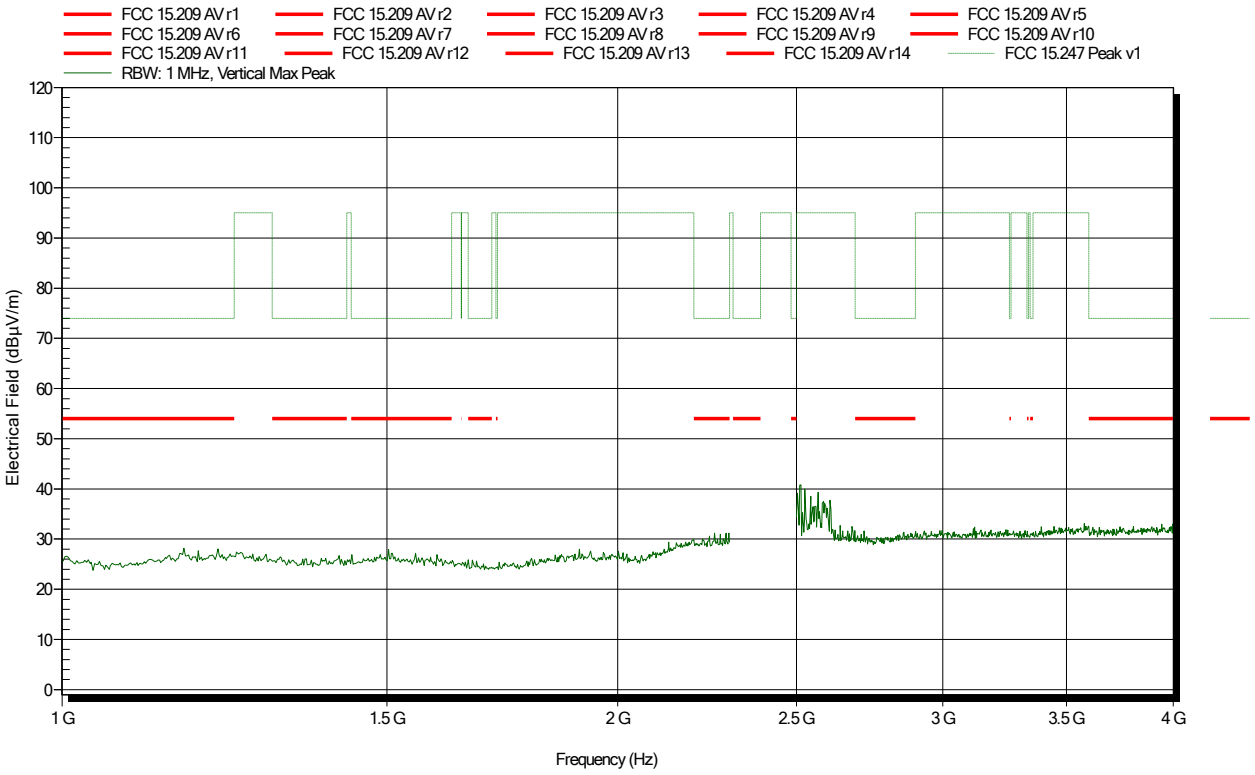

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 1MBit
Test Date:	2019-09-18
Note:	

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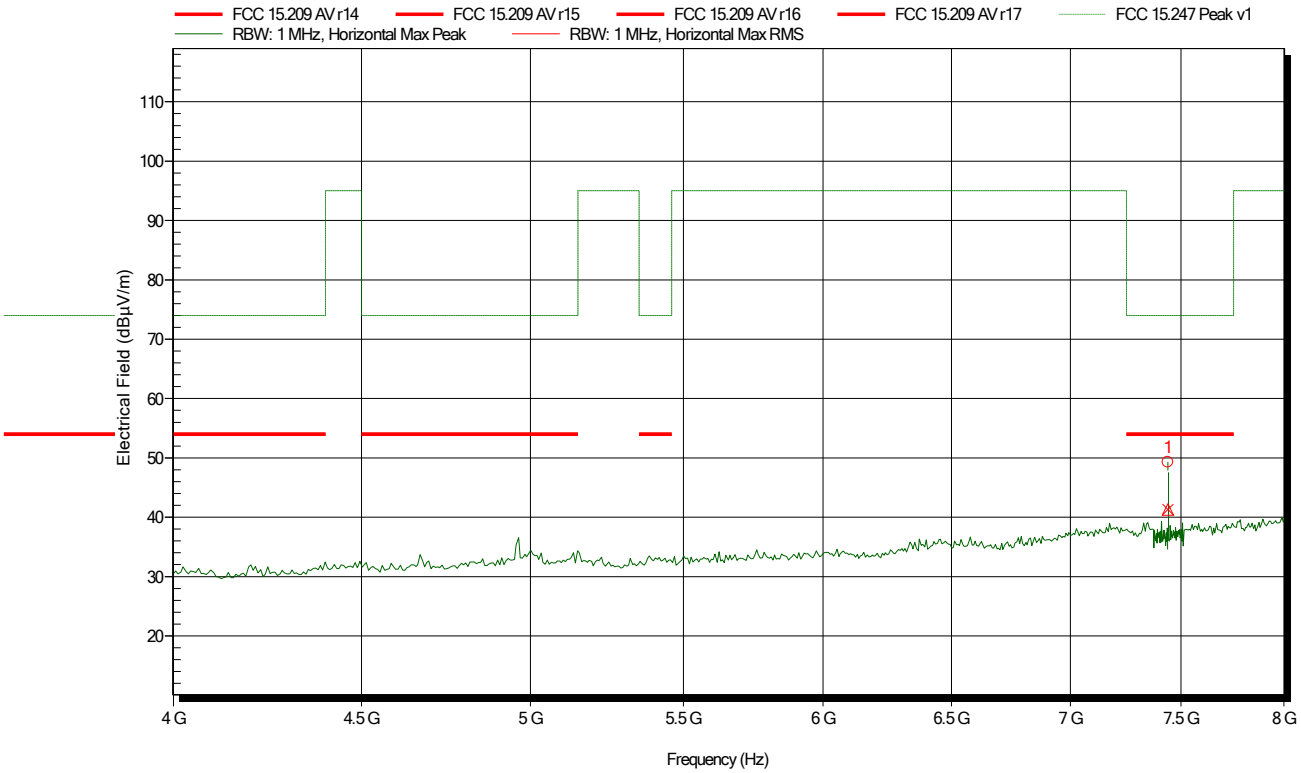

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.439 GHz	49.27 dBµV/m	74 dBµV/m	-24.73 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
7.439 GHz	41.33 dBµV/m	54 dBµV/m	-12.67 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 1MBit
Test Date:	2019-09-18
Note:	

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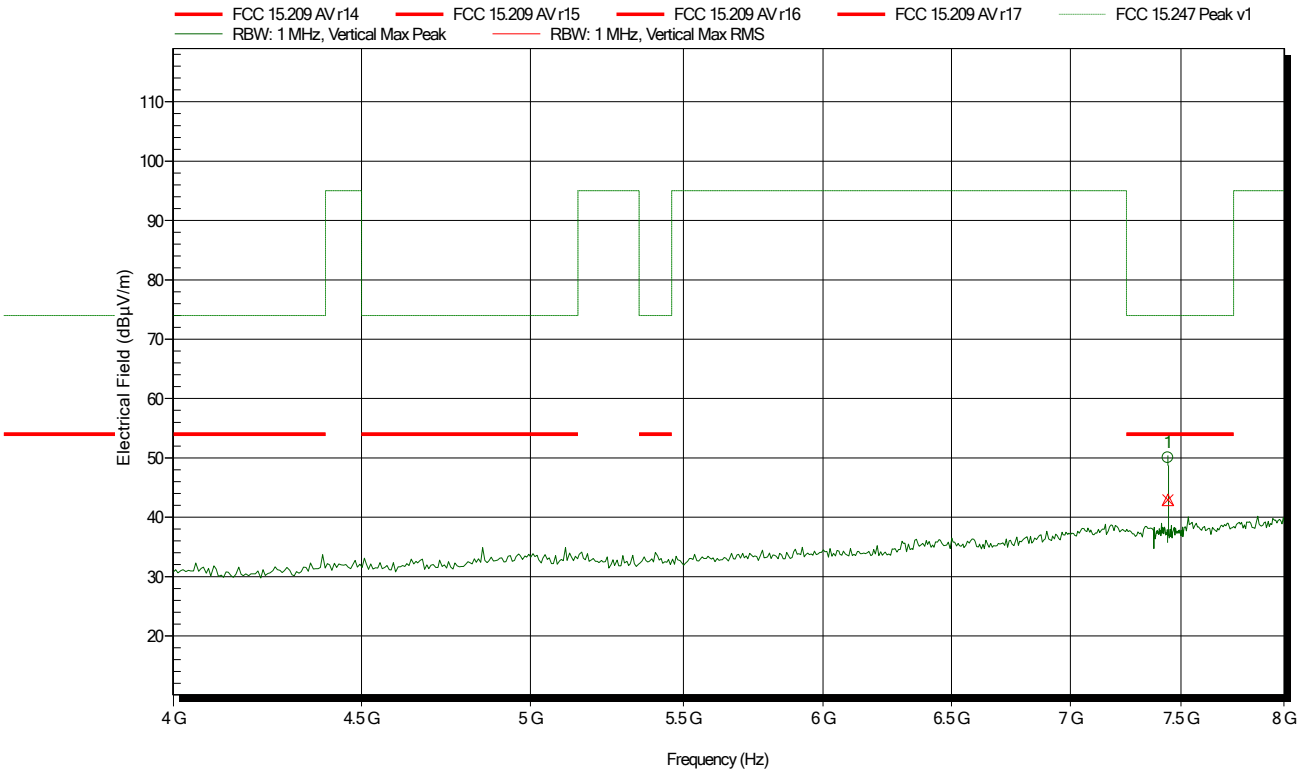

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.439 GHz	50.05 dBµV/m	74 dBµV/m	-23.95 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
7.439 GHz	42.93 dBµV/m	54 dBµV/m	-11.07 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 1MBit
Test Date:	2019-09-18
Note:	

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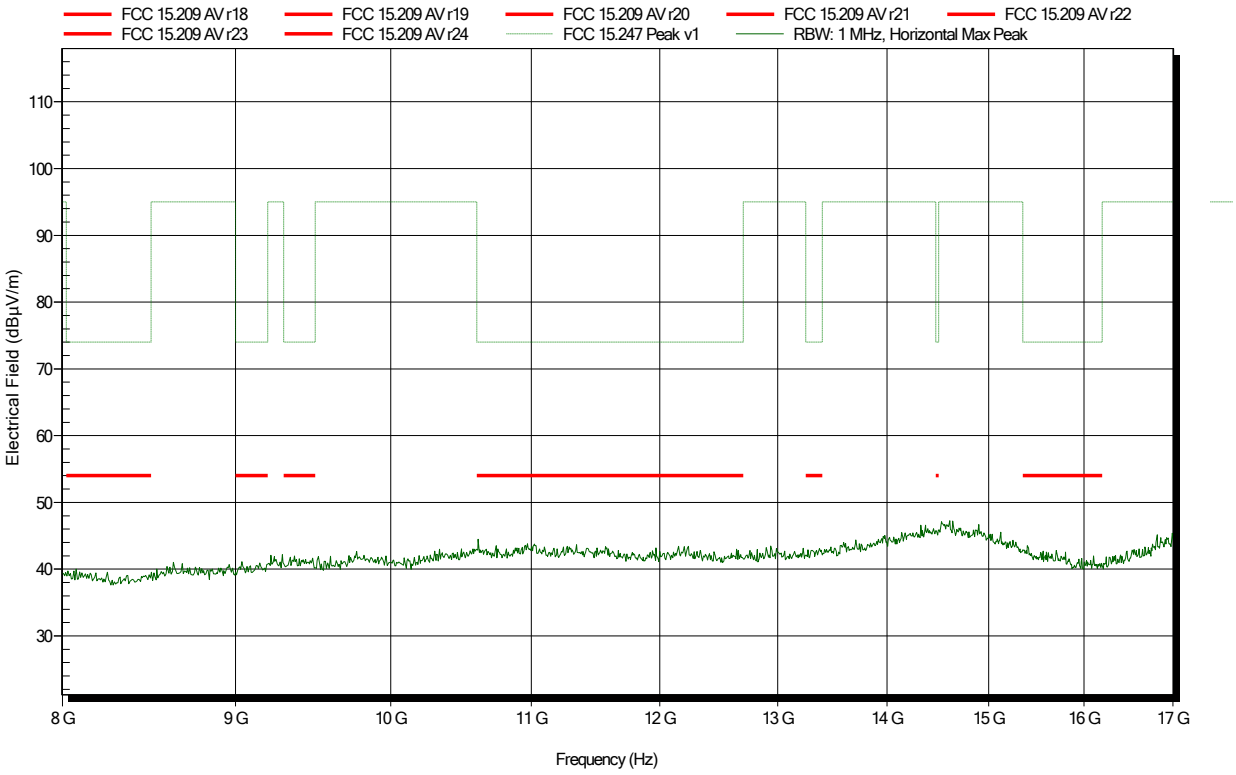

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 1MBit
Test Date:	2019-09-17
Note:	

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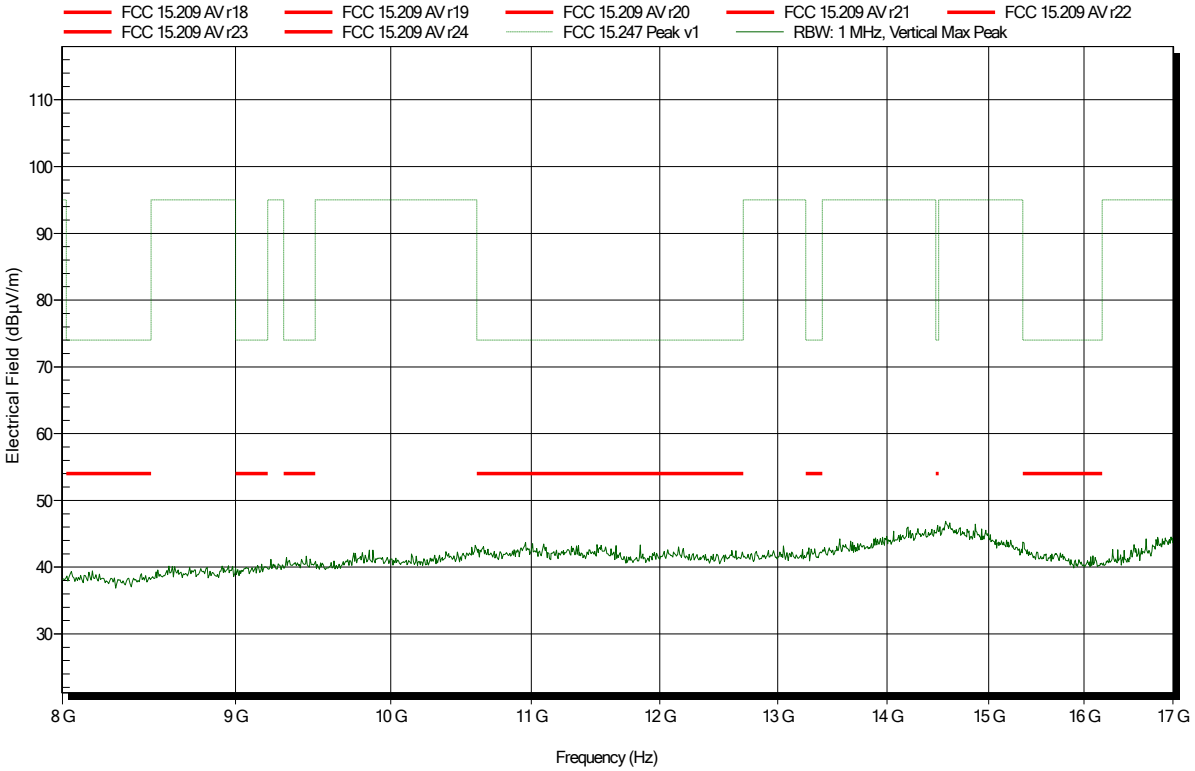

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Amplifier Research AT4560, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 1MBit
Test Date:	2019-09-17
Note:	

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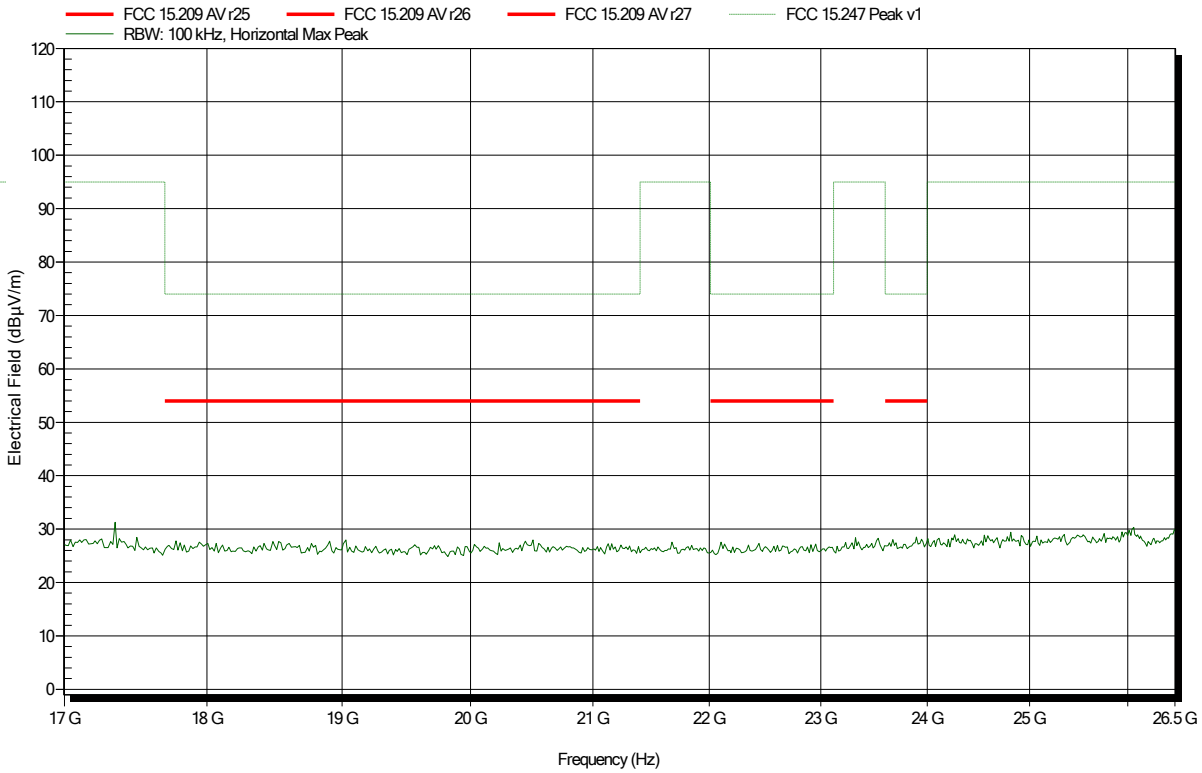

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Amplifier Research AT4560, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 1MBit
Test Date:	2019-09-17
Note:	

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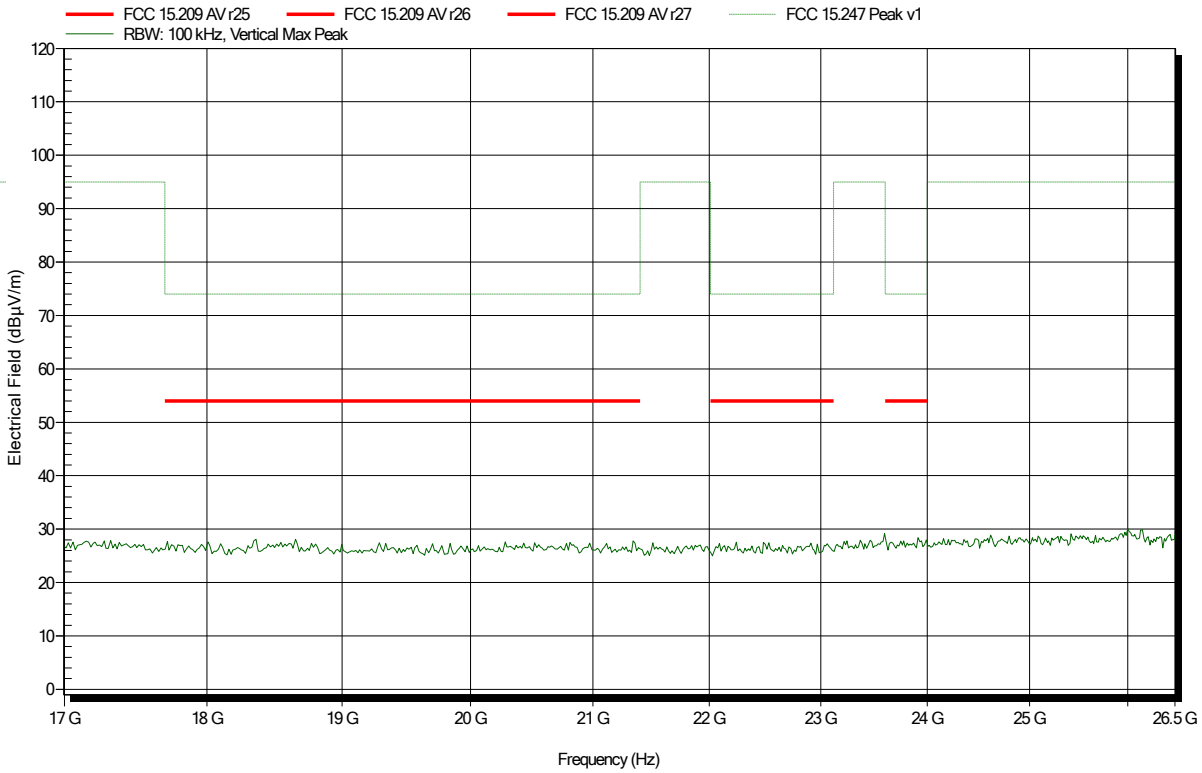

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 1MBit, EUT horiz.
Test Date:	2019-09-18
Note:	upper bandedge

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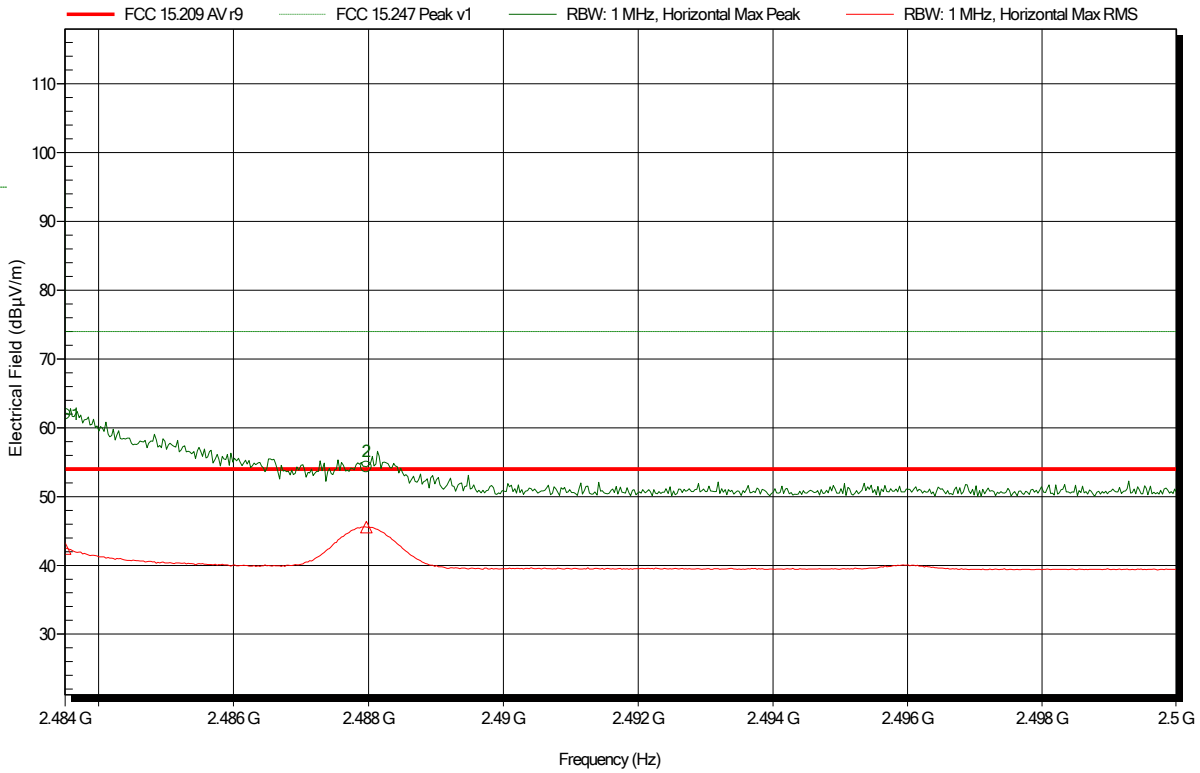

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4835 GHz	61.99 dBµV/m	74 dBµV/m	-12.01 dB	Pass
2.488 GHz	54.3 dBµV/m	74 dBµV/m	-19.7 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4835 GHz	42.45 dBµV/m	54 dBµV/m	-11.55 dB	Pass
2.488 GHz	45.58 dBµV/m	54 dBµV/m	-8.42 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 1MBit, EUT horiz.
Test Date:	2019-09-18
Note:	upper bandedge

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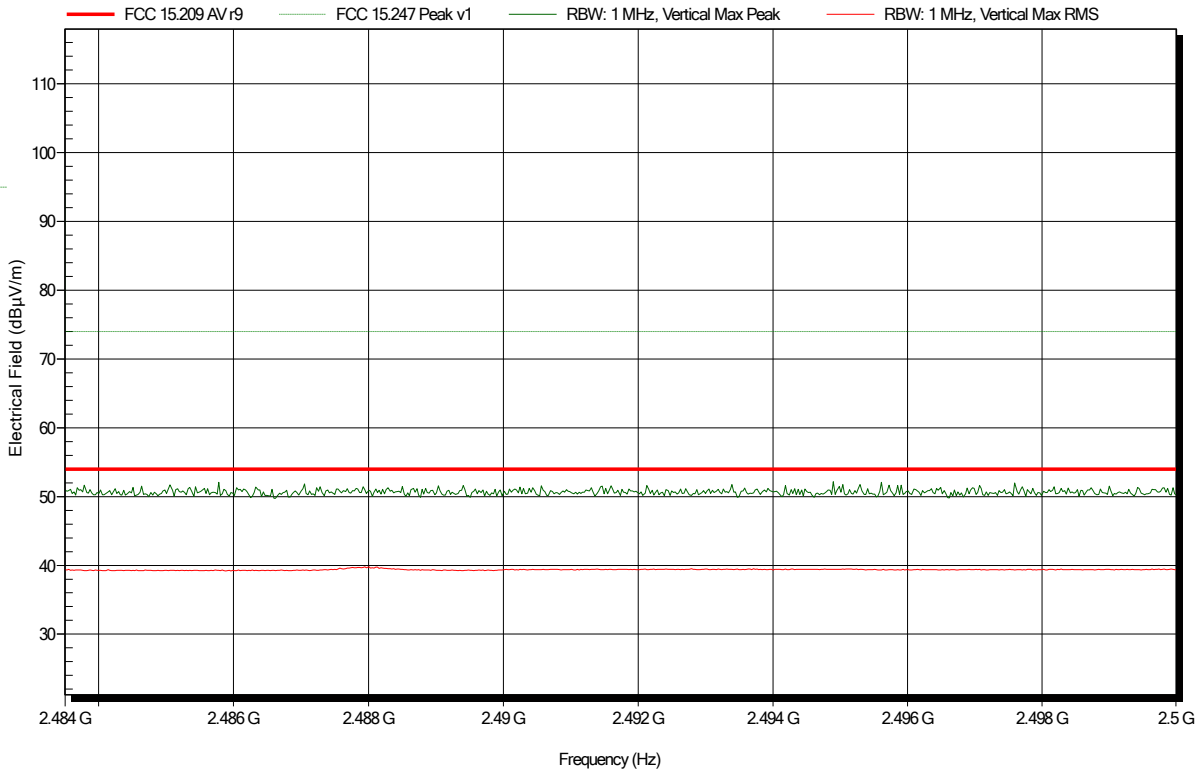

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 1MBit, EUT vert.
Test Date:	2019-09-18
Note:	upper bandedge

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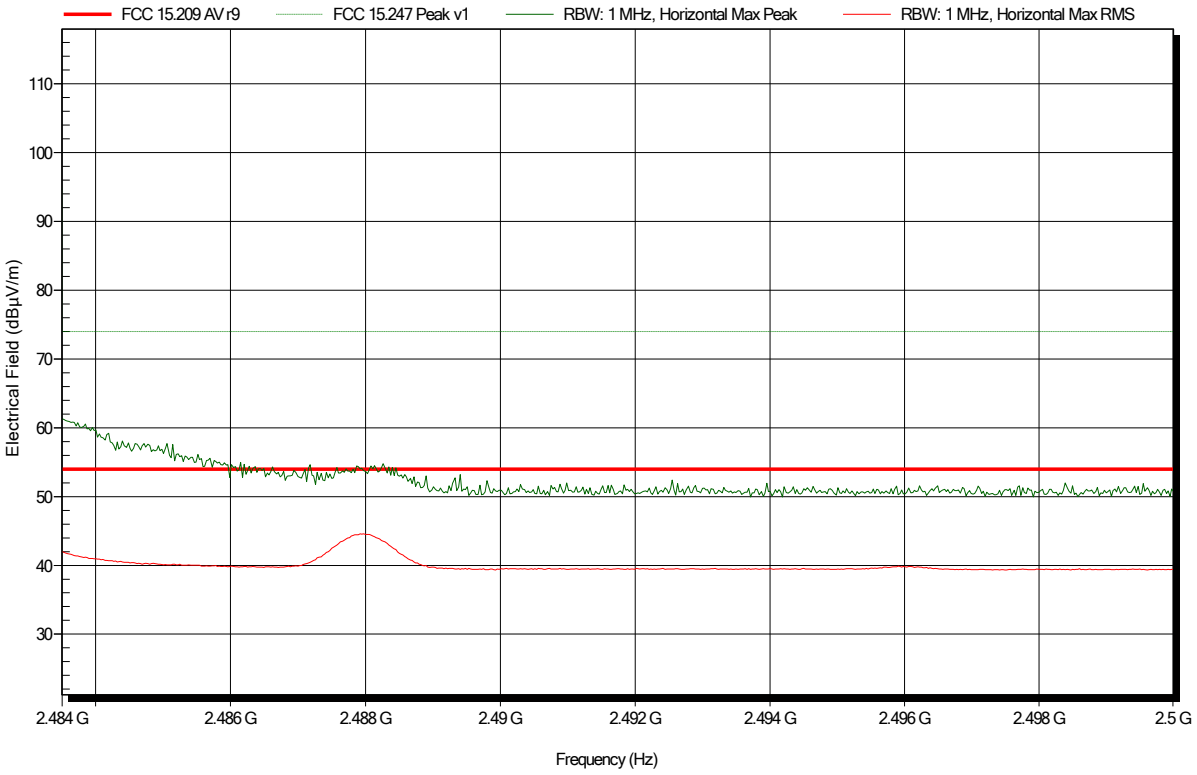

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 1MBit, EUT vert.
Test Date:	2019-09-18
Note:	upper bandedge

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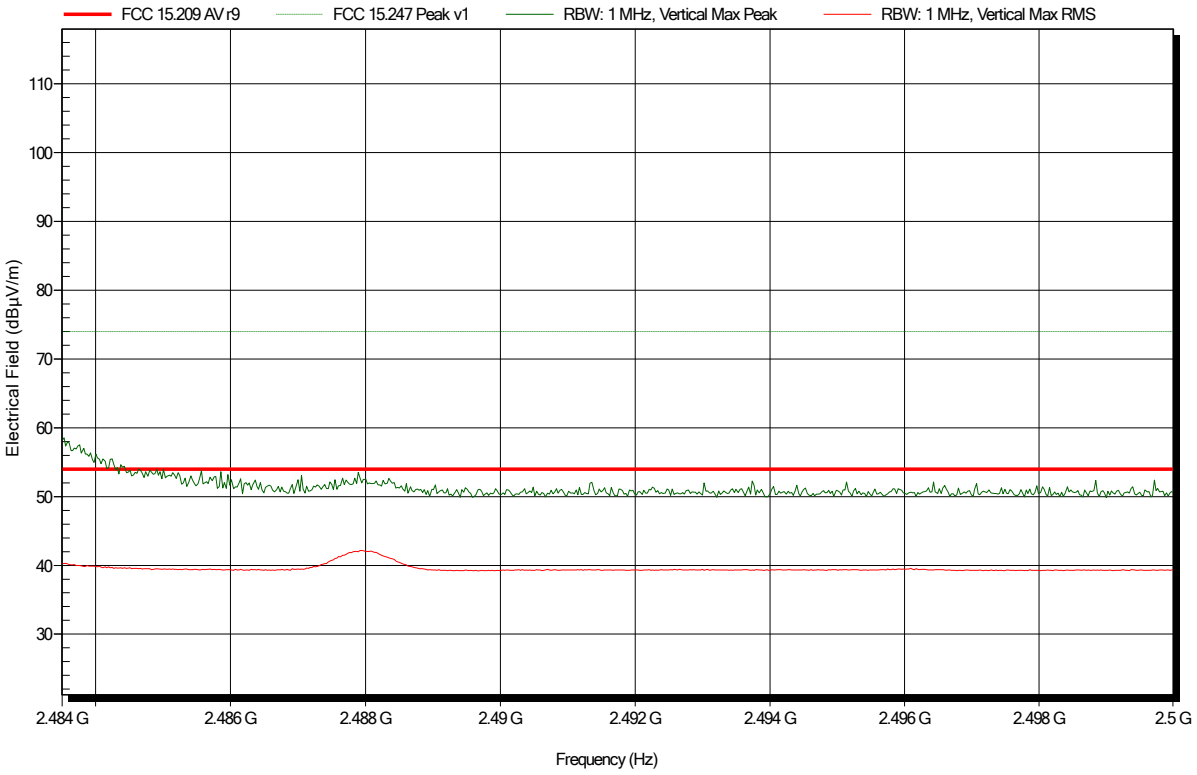

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-30
Note:	

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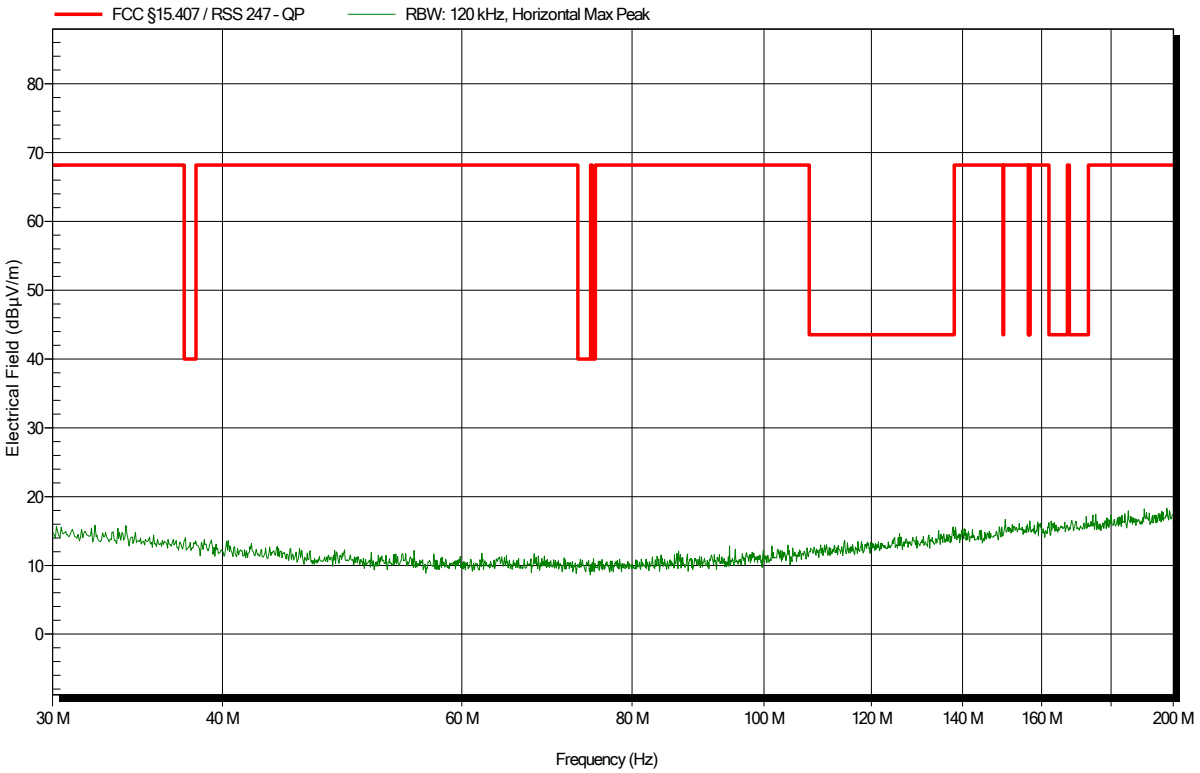

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-30
Note:	

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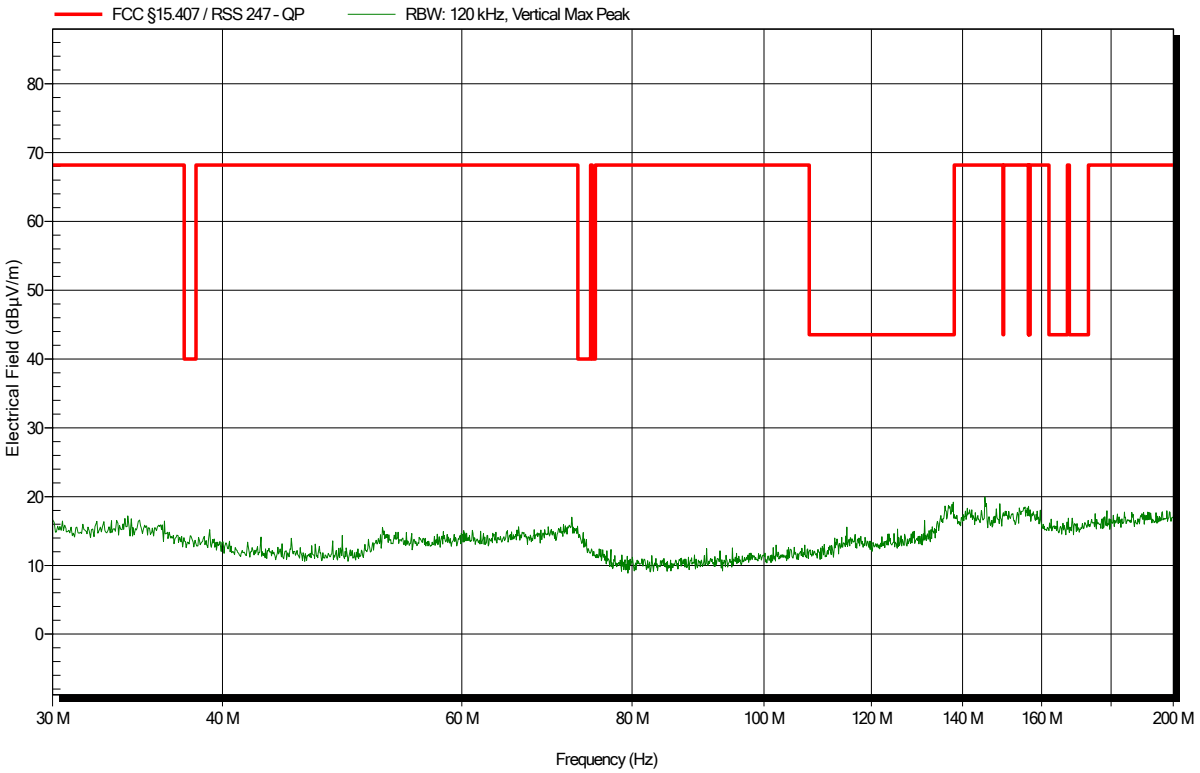

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-30
Note:	

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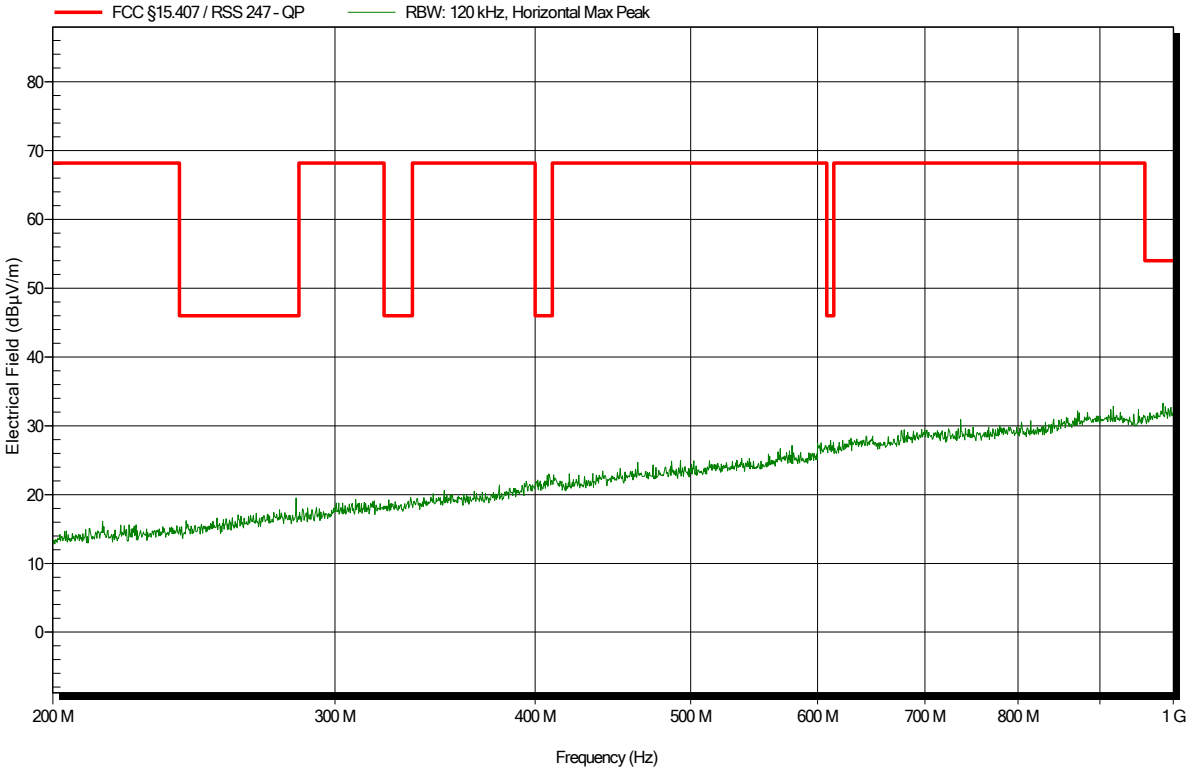

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-30
Note:	

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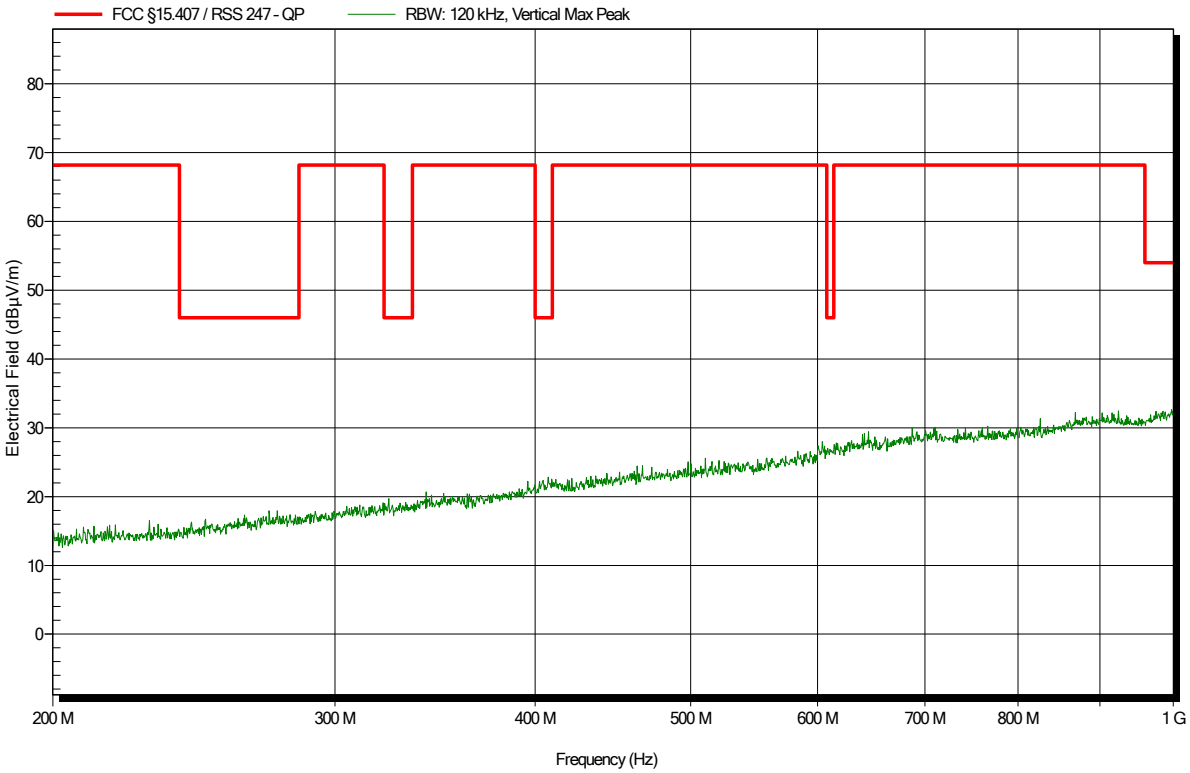

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-17
Note:	

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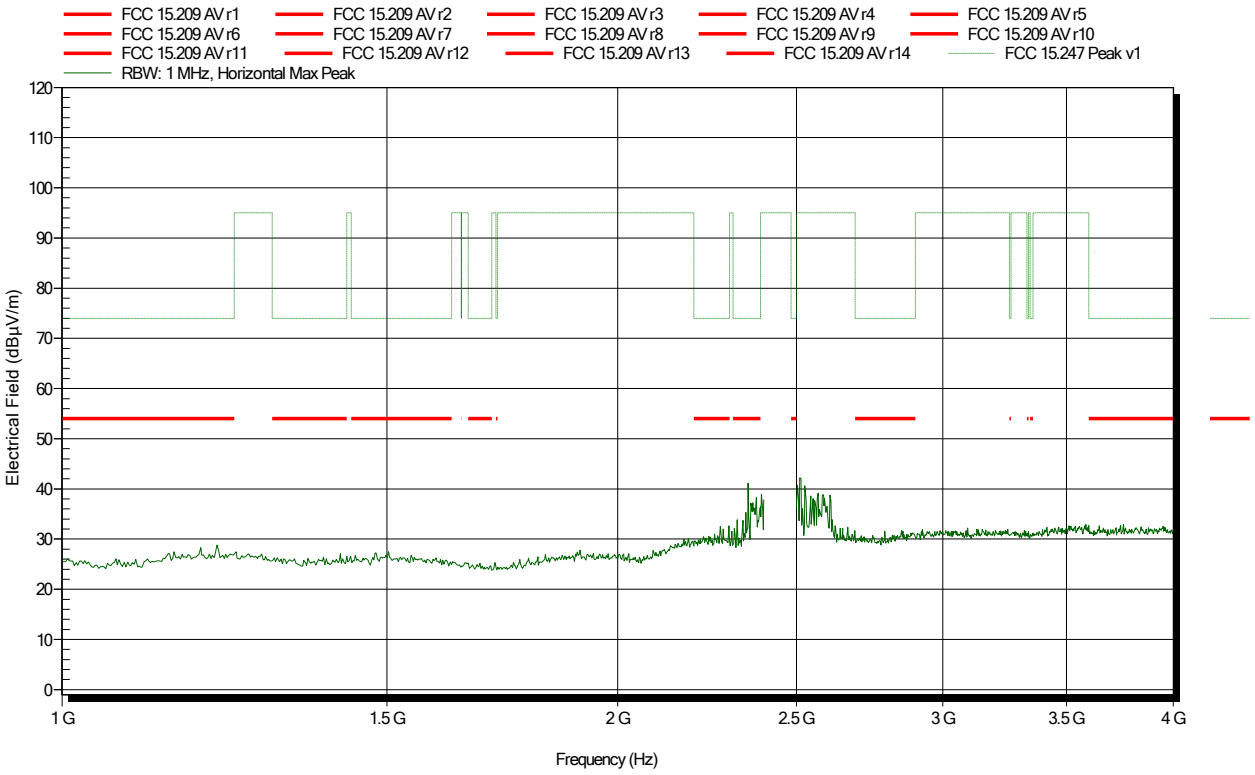

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-17
Note:	

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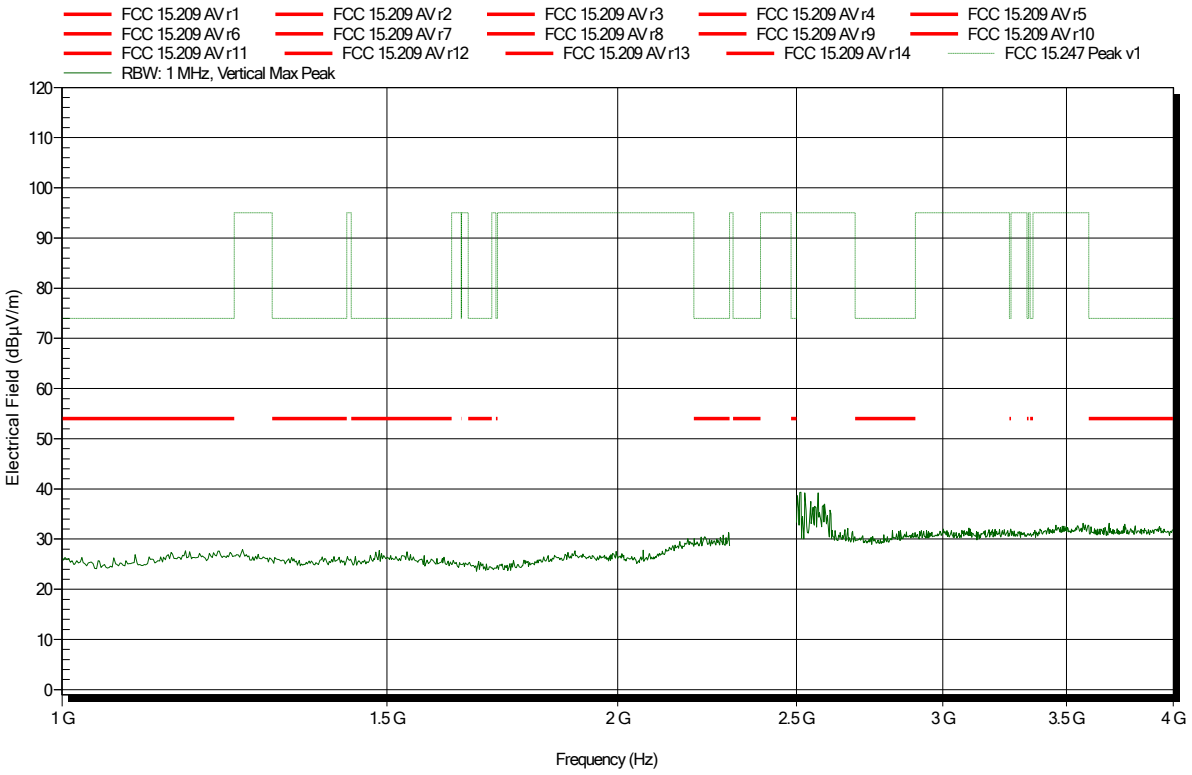

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-17
Note:	upper bandedge

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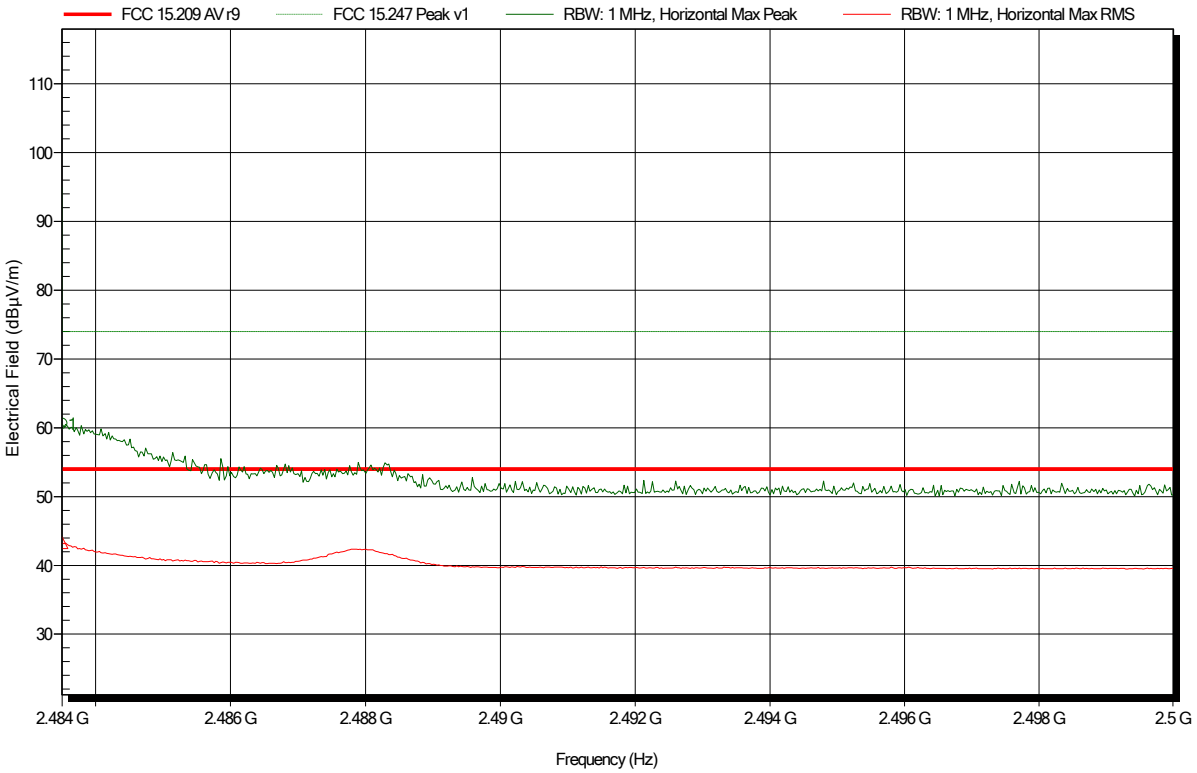

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4835 GHz	60.59 dBµV/m	74 dBµV/m	-13.41 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4835 GHz	43.27 dBµV/m	54 dBµV/m	-10.73 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-17
Note:	upper bandedge

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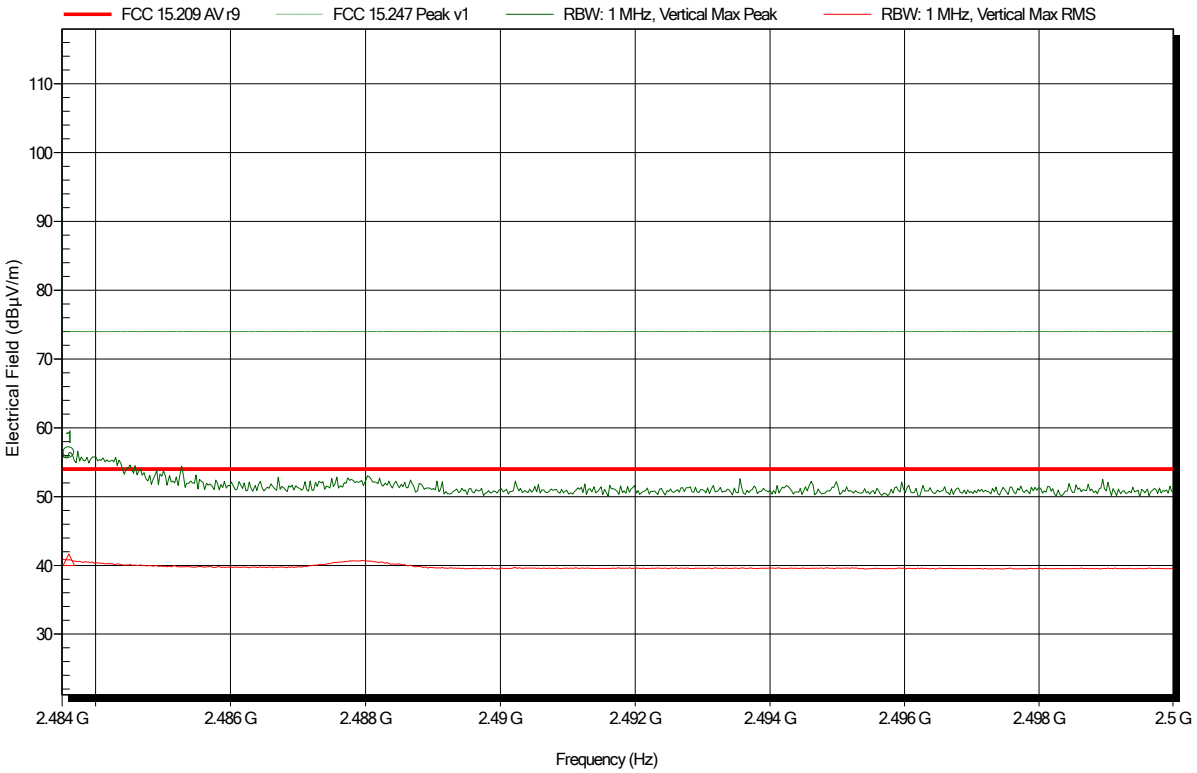

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4836 GHz	56.39 dBµV/m	74 dBµV/m	-17.61 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4836 GHz	40.82 dBµV/m	54 dBµV/m	-13.18 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-17
Note:	

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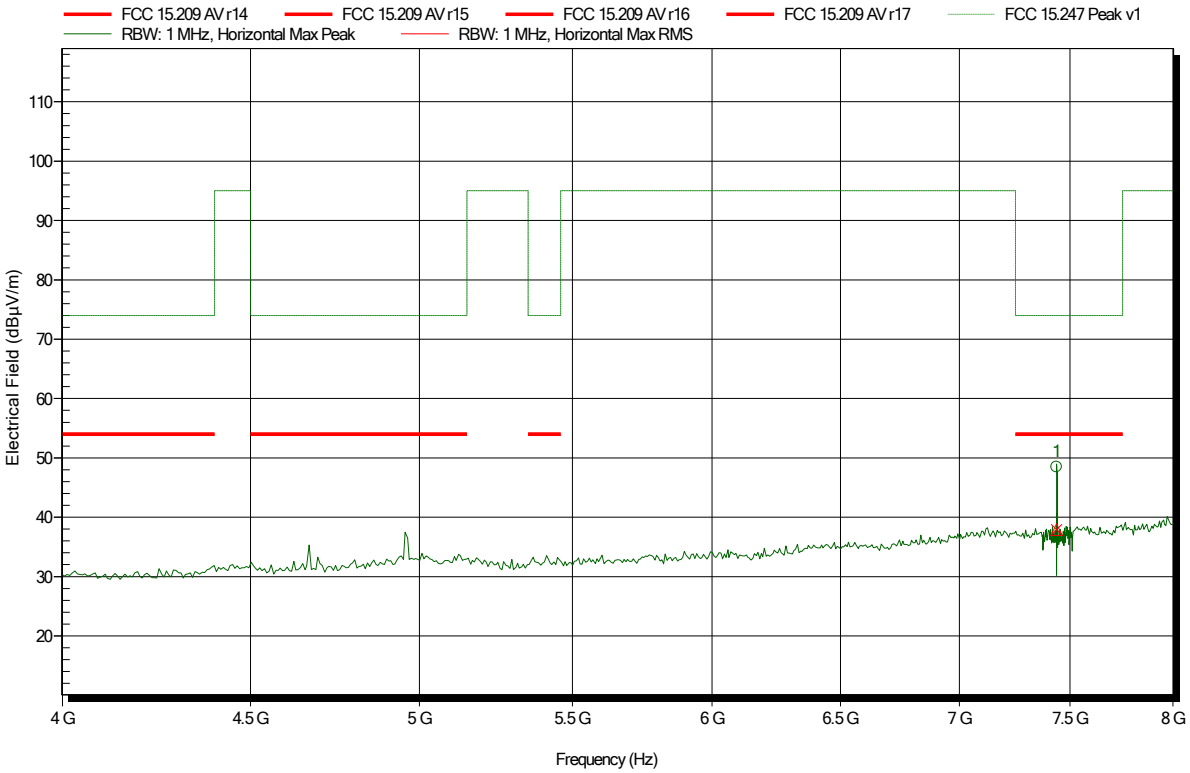

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.439 GHz	48.46 dBµV/m	74 dBµV/m	-25.54 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
7.439 GHz	37.89 dBµV/m	54 dBµV/m	-16.11 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-17
Note:	

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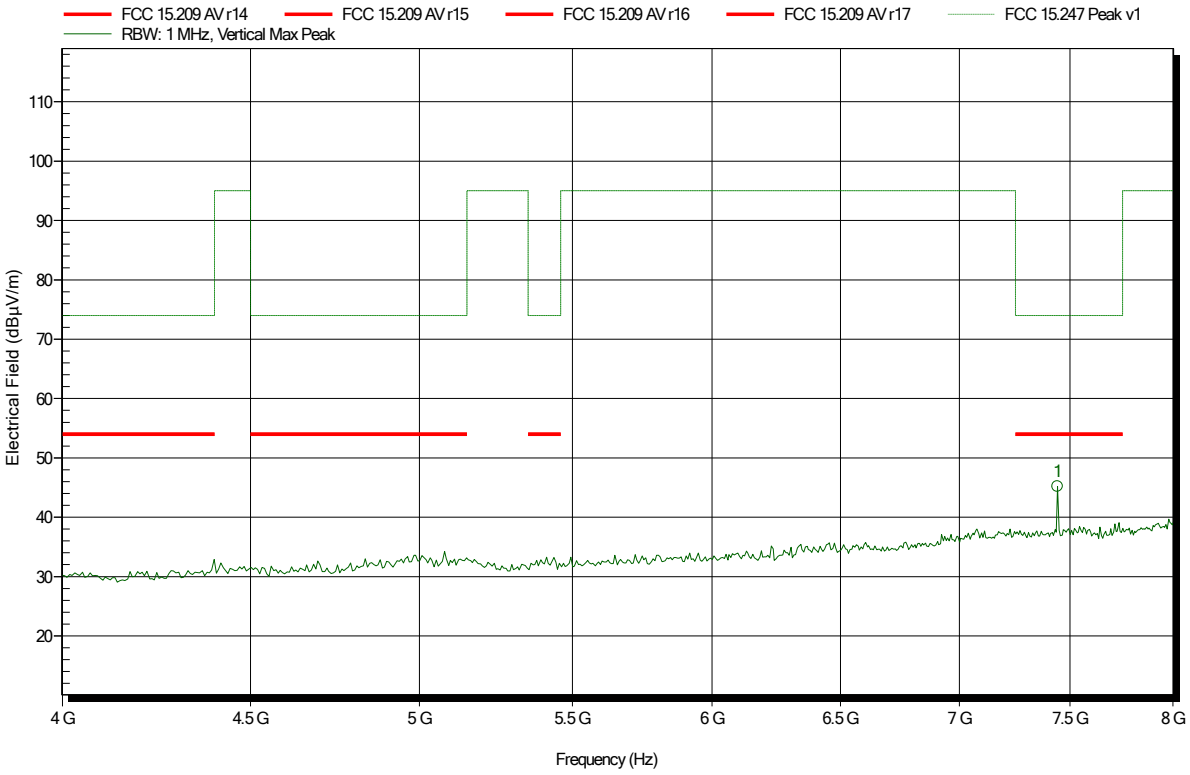

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.442 GHz	45.16 dBµV/m	74 dBµV/m	-28.84 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-17
Note:	

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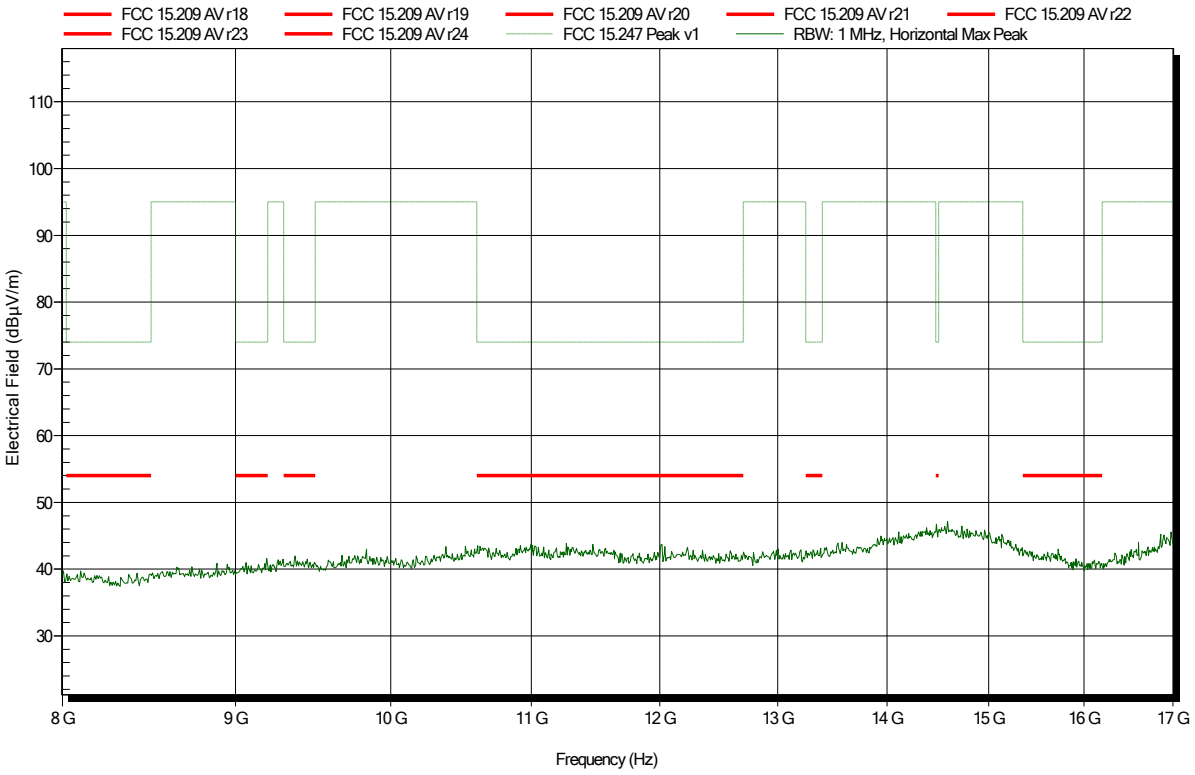

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 23.9°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-17
Note:	

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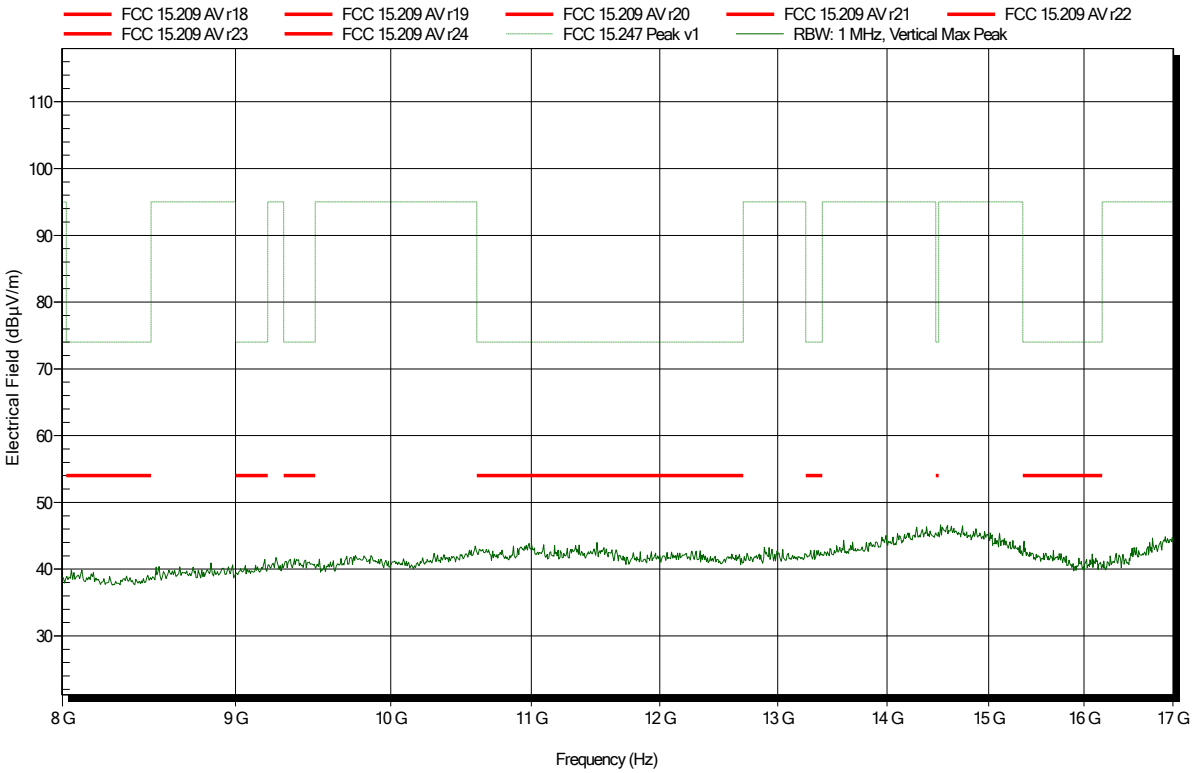

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Amplifier Research AT4560, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-17
Note:	

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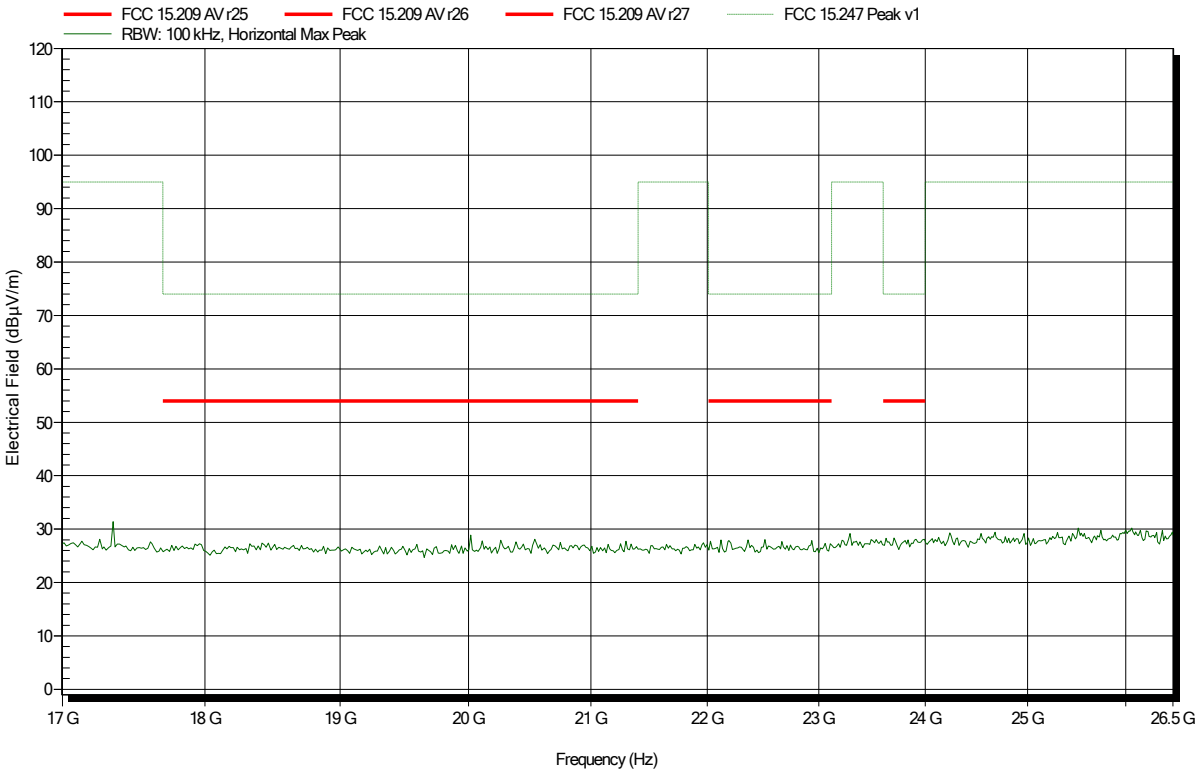

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Amplifier Research AT4560, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 2MBit
Test Date:	2019-09-17
Note:	

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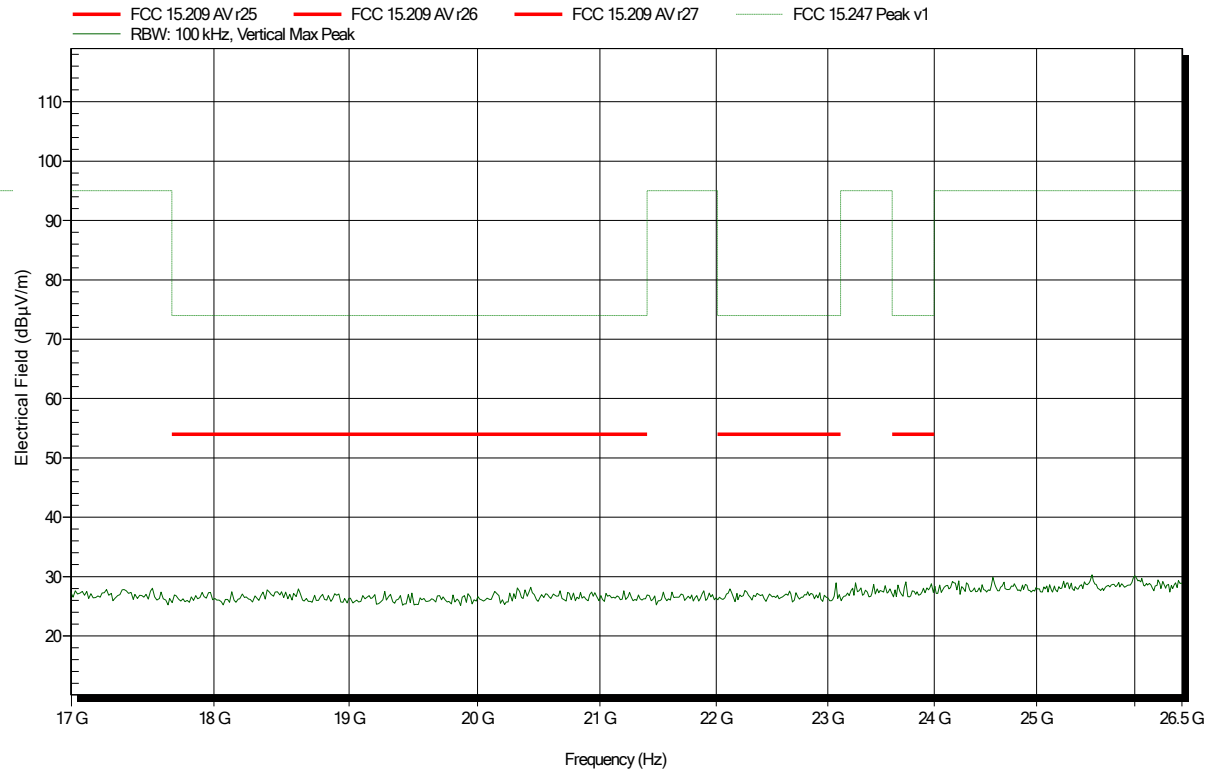

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 2MBit, EUT horiz.
Test Date:	2019-09-17
Note:	upper bandedge

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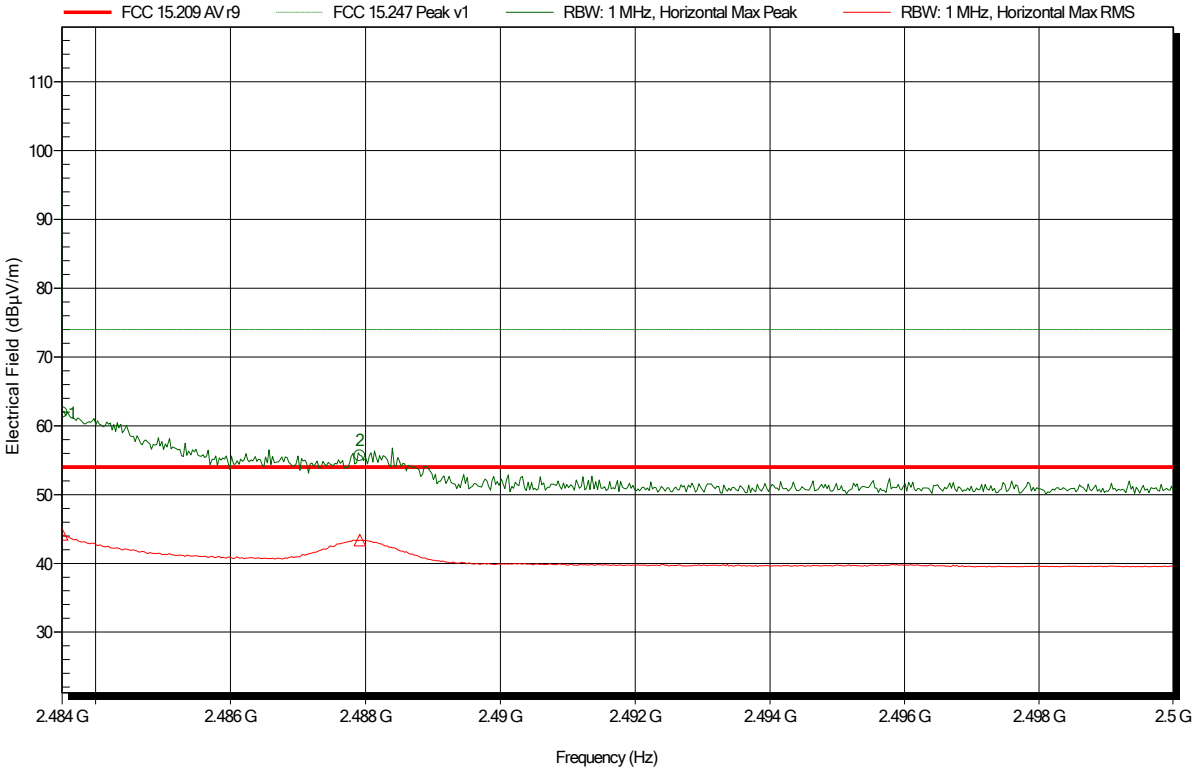

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4835 GHz	61.94 dBµV/m	74 dBµV/m	-12.06 dB	Pass
2.4879 GHz	55.67 dBµV/m	74 dBµV/m	-18.33 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4835 GHz	44.19 dBµV/m	54 dBµV/m	-9.81 dB	Pass
2.4879 GHz	43.39 dBµV/m	54 dBµV/m	-10.61 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 24.1°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 2480MHz, 2MBit, EUT horiz.
Test Date:	2019-09-17
Note:	upper bandedge

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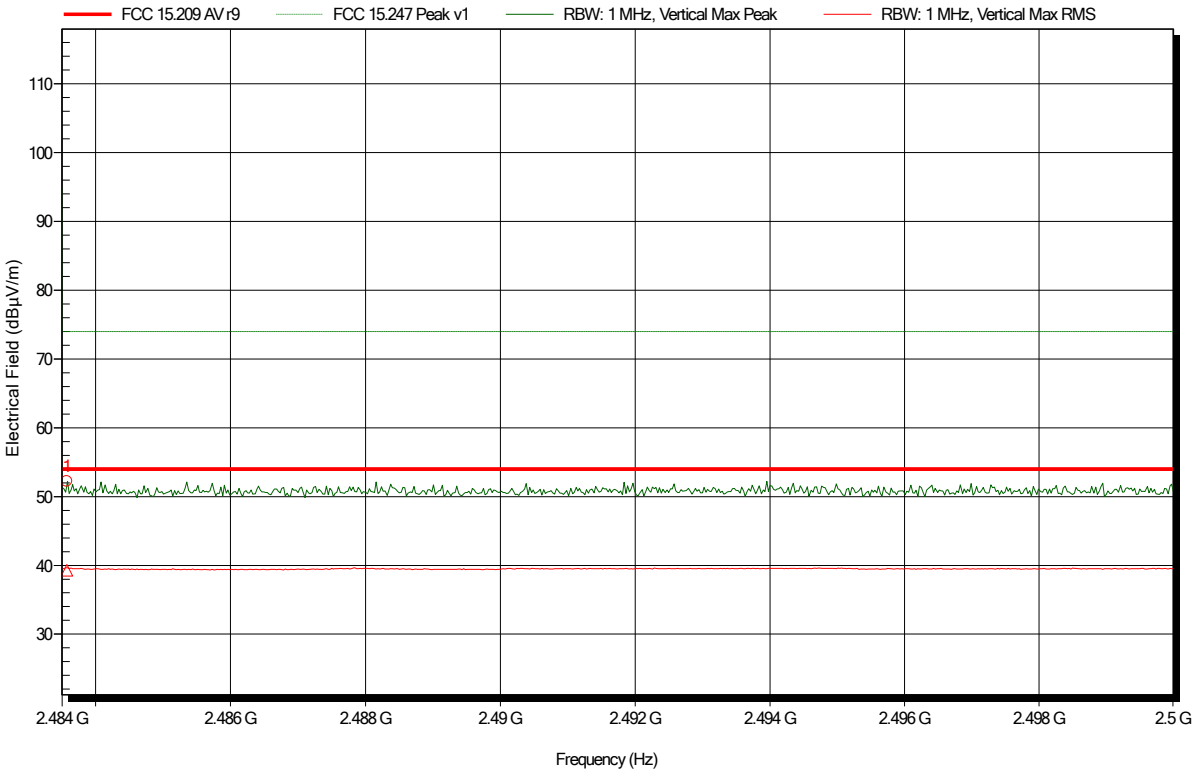

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4836 GHz	52.22 dBµV/m	74 dBµV/m	-21.78 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4836 GHz	39.27 dBµV/m	54 dBµV/m	-14.73 dB	Pass

ANNEX B Receiver spurious emissions

Spurious emissions according to RSS-247 Issue 2

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 22.6°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	RX; 2440MHz
Test Date:	2019-09-30
Note:	

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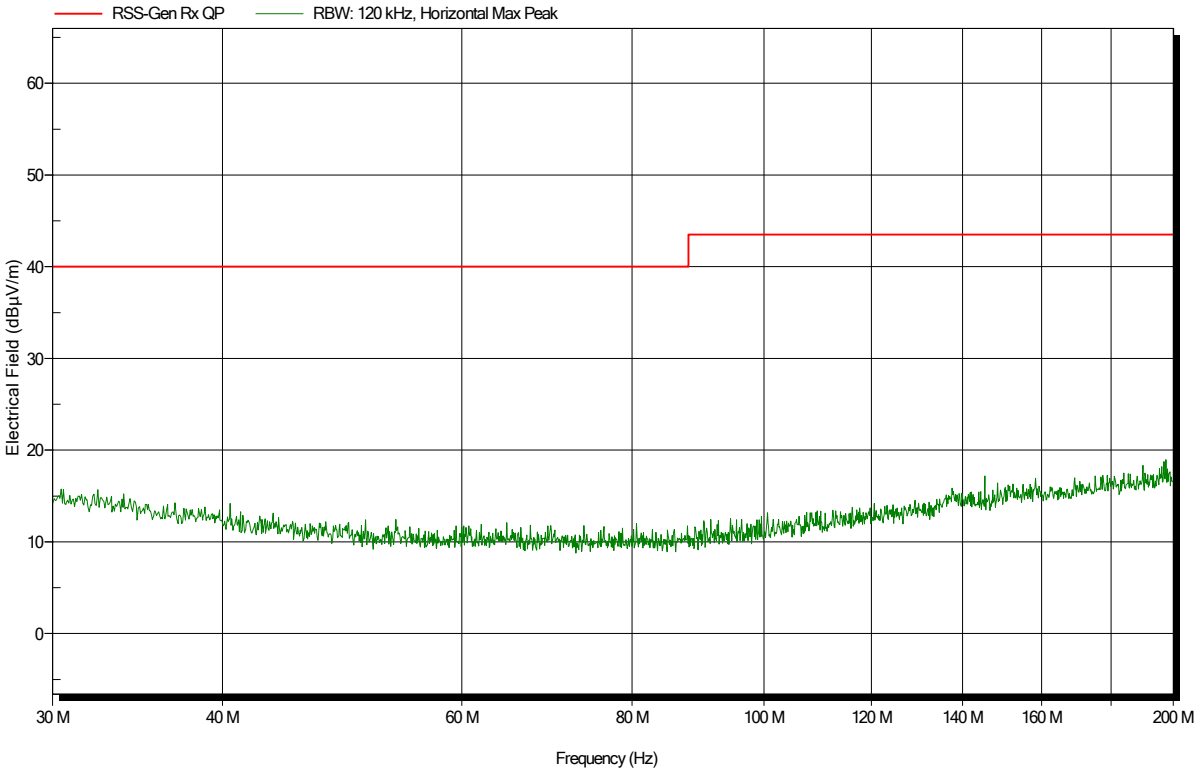

Spurious emissions according to RSS-247 Issue 2

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 22.6°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	RX; 2440MHz
Test Date:	2019-09-30
Note:	

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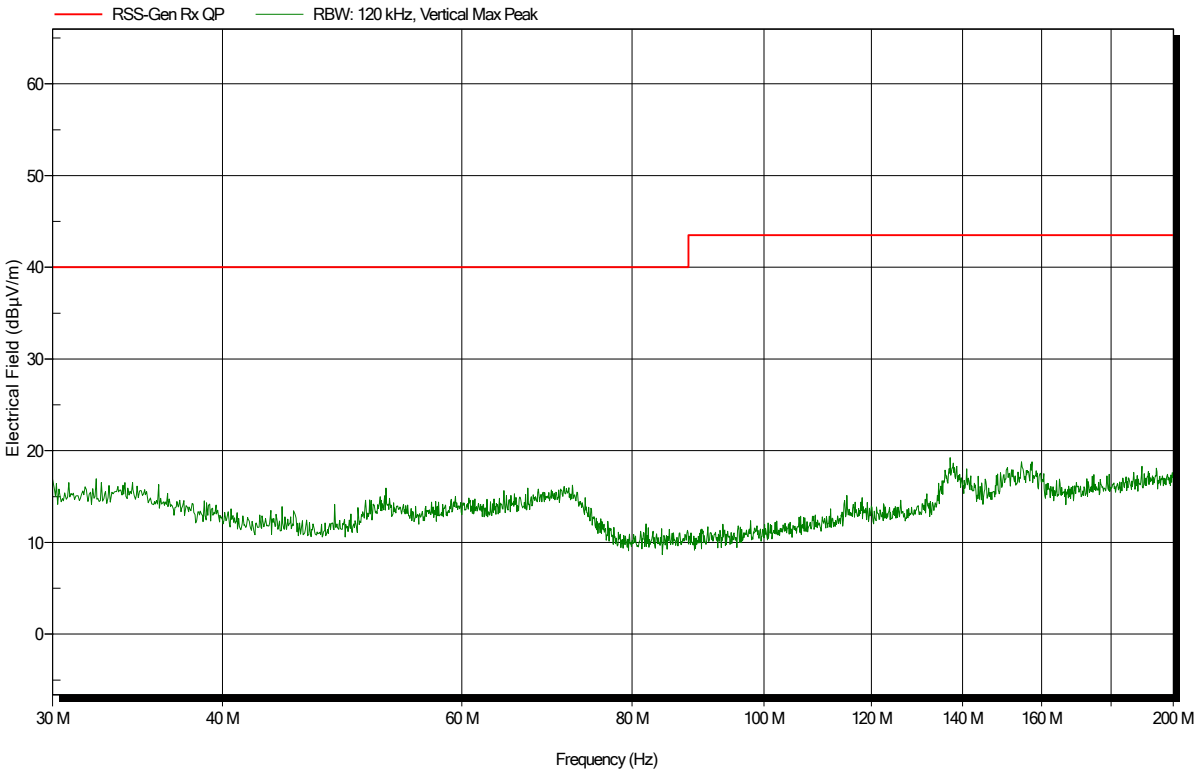

Spurious emissions according to RSS-247 Issue 2

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 22.6°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	RX; 2440MHz
Test Date:	2019-09-30
Note:	

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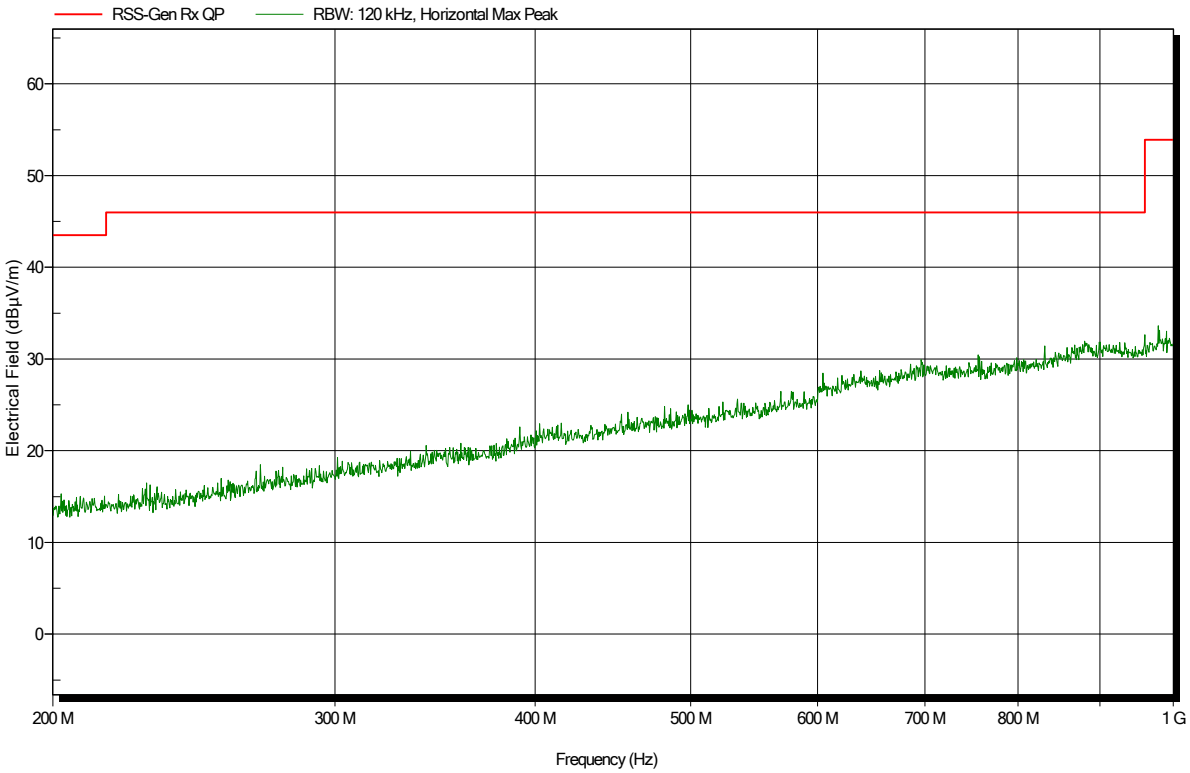

Spurious emissions according to RSS-247 Issue 2

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Test Conditions:	Tnom: 22.6°C, Vnom: 120 VAC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	RX; 2440MHz
Test Date:	2019-09-30
Note:	

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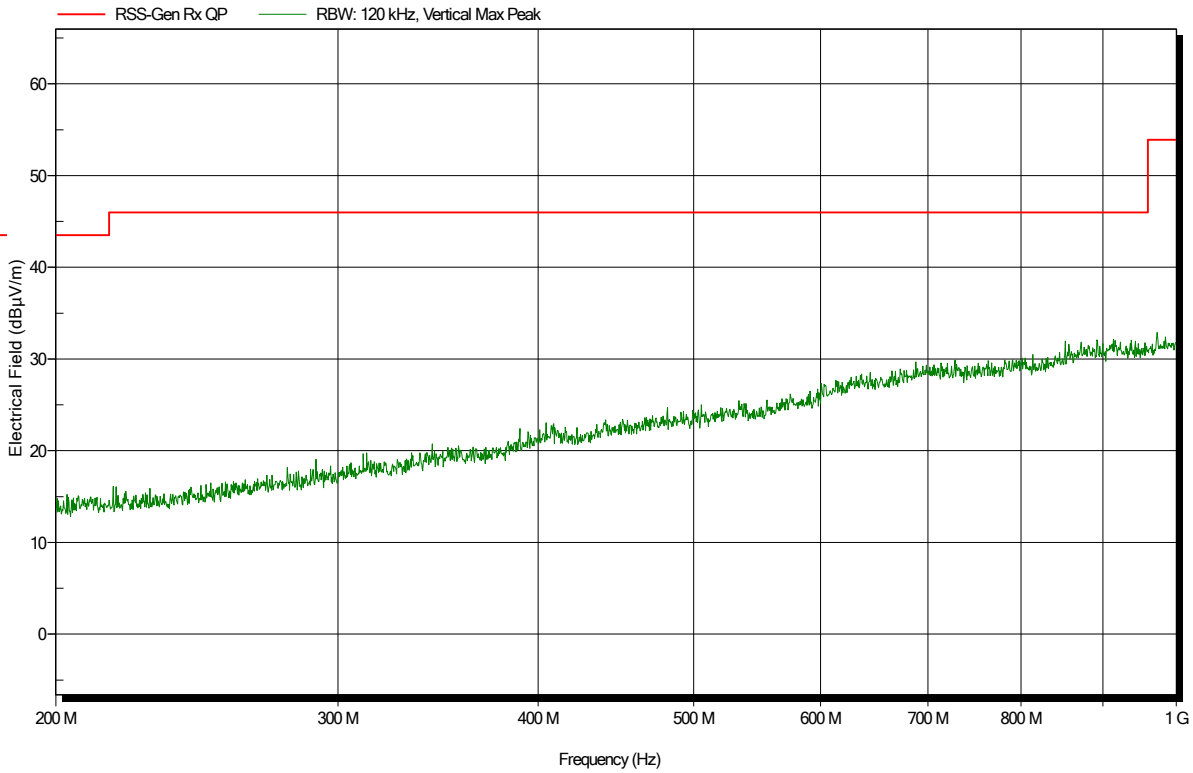

Spurious emissions according to RSS-247 Issue 2

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 22.6°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m
Mode:	RX; 2440MHz
Test Date:	2019-09-18
Note:	

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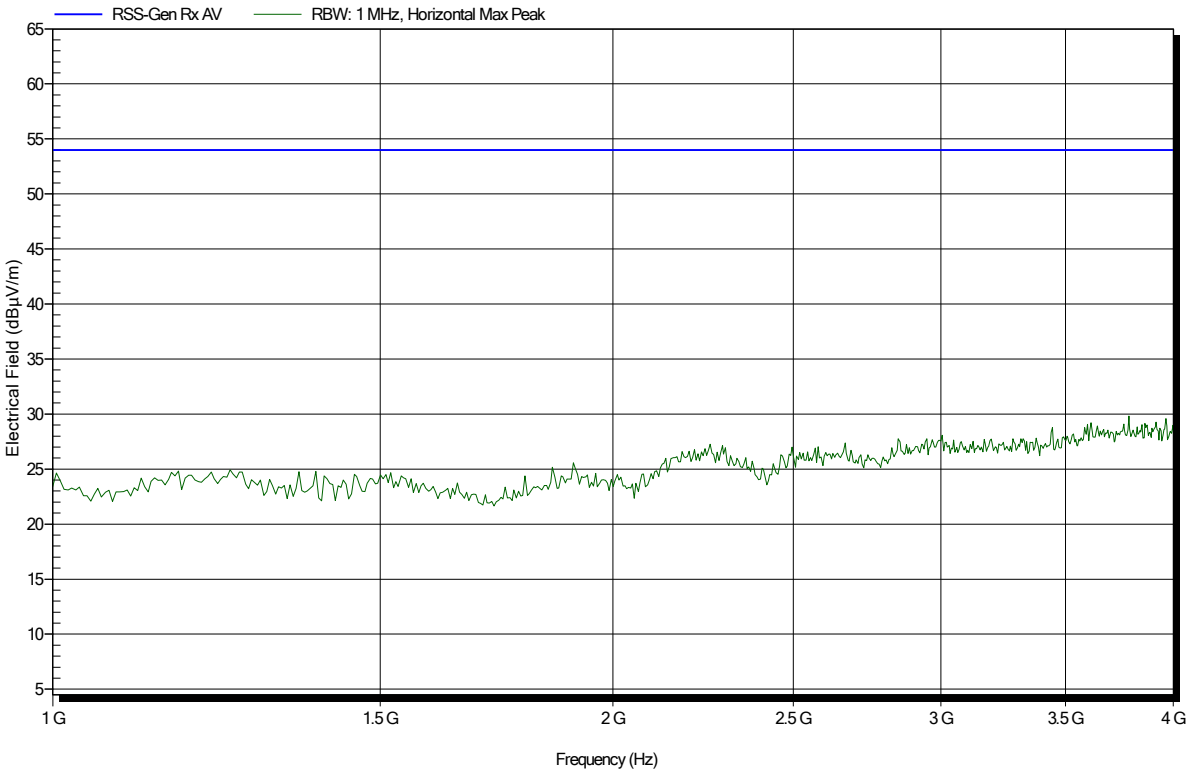
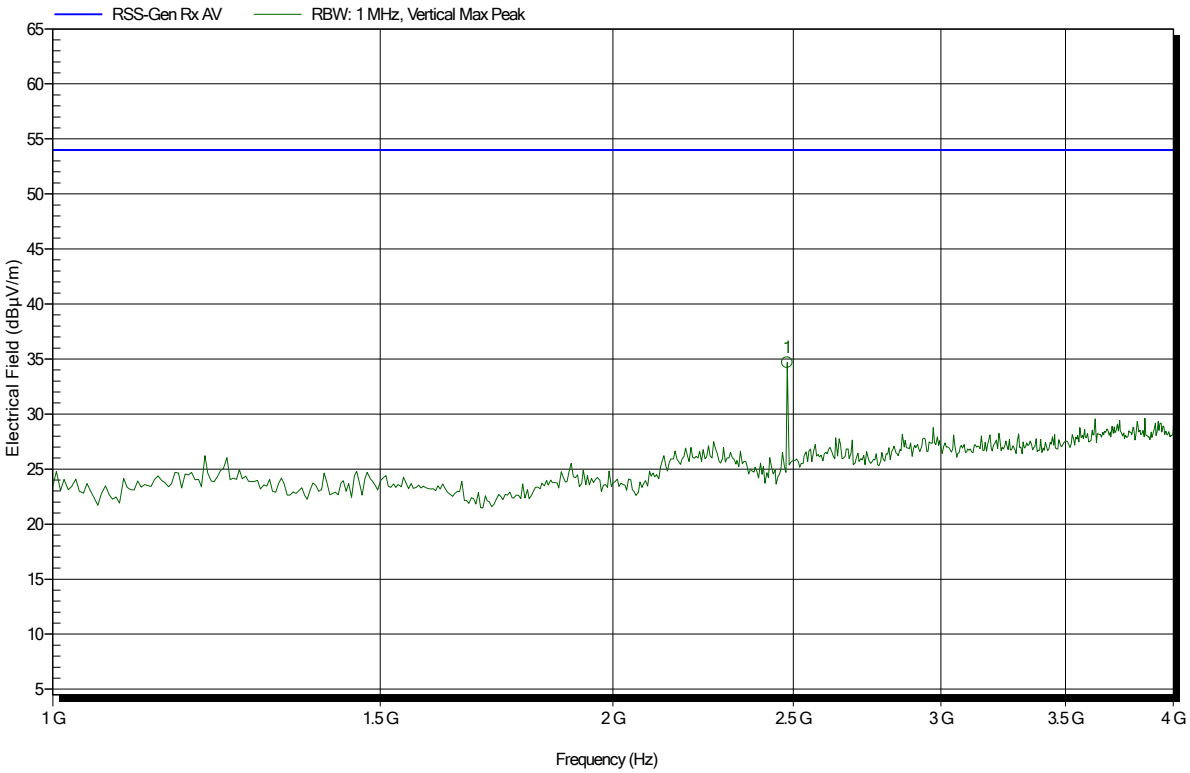


Spurious emissions according to RSS-247 Issue 2

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 22.6°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m
Mode:	RX; 2440MHz
Test Date:	2019-09-18
Note:	

Index 1



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.481 GHz	34.67 dBµV/m	53.98 dBµV/m	-19.31 dB	Pass

Spurious emissions according to RSS-247 Issue 2

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 22.6°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m
Mode:	RX; 2440MHz
Test Date:	2019-09-18
Note:	

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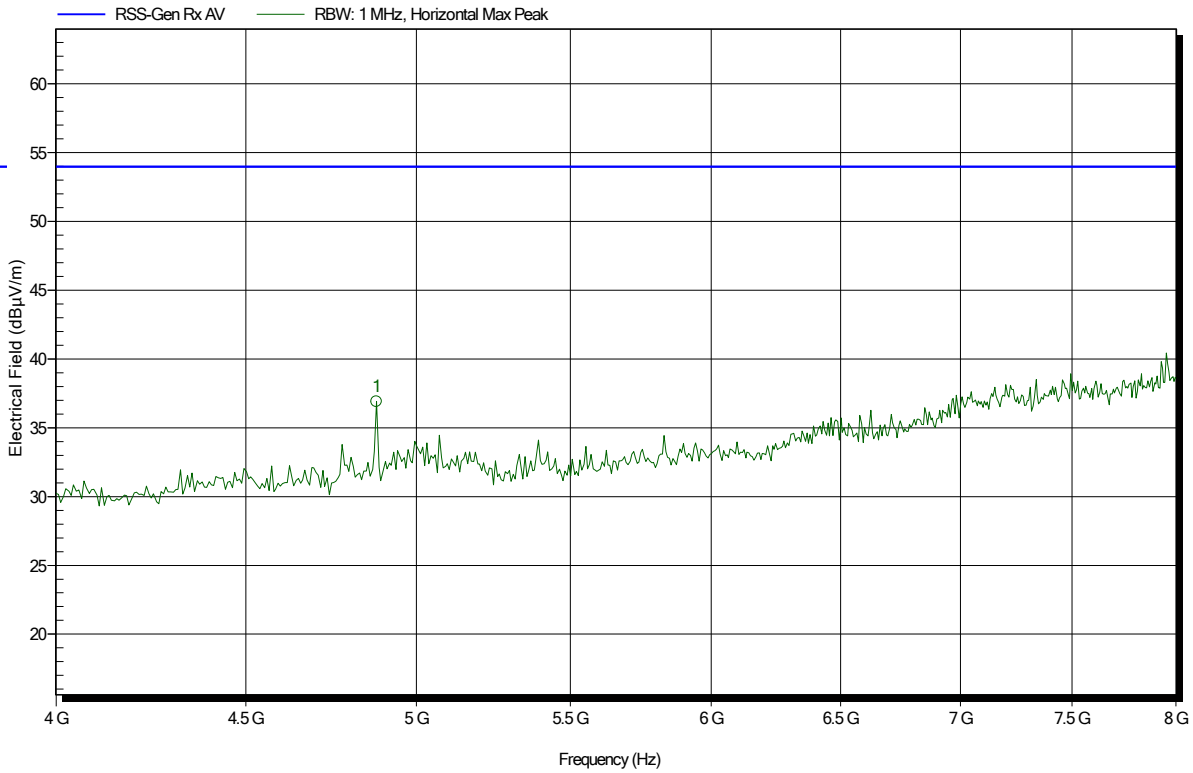
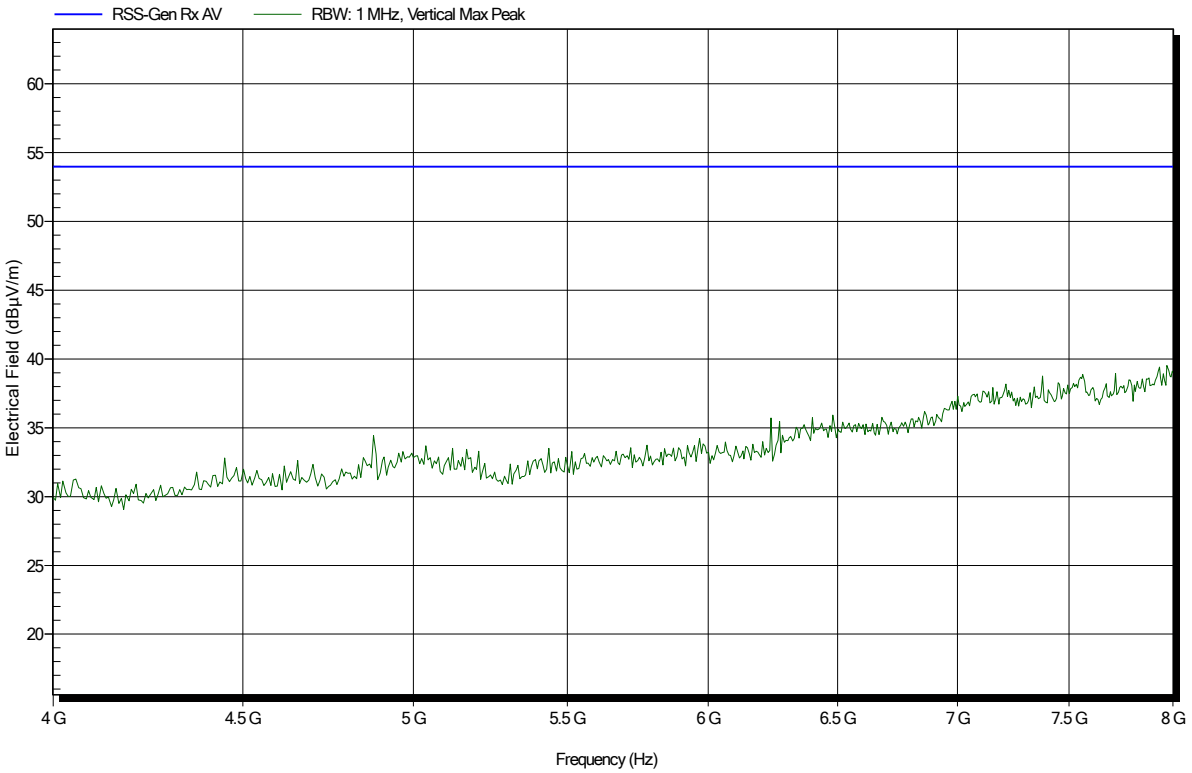


Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.878 GHz	36.91 dBµV/m	53.98 dBµV/m	-17.07 dB	Pass

Spurious emissions according to RSS-247 Issue 2

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 22.6°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m
Mode:	RX; 2440MHz
Test Date:	2019-09-18
Note:	

Index 2



Spurious emissions according to RSS-247 Issue 2

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 22.6°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	RX; 2440MHz
Test Date:	2019-09-18
Note:	

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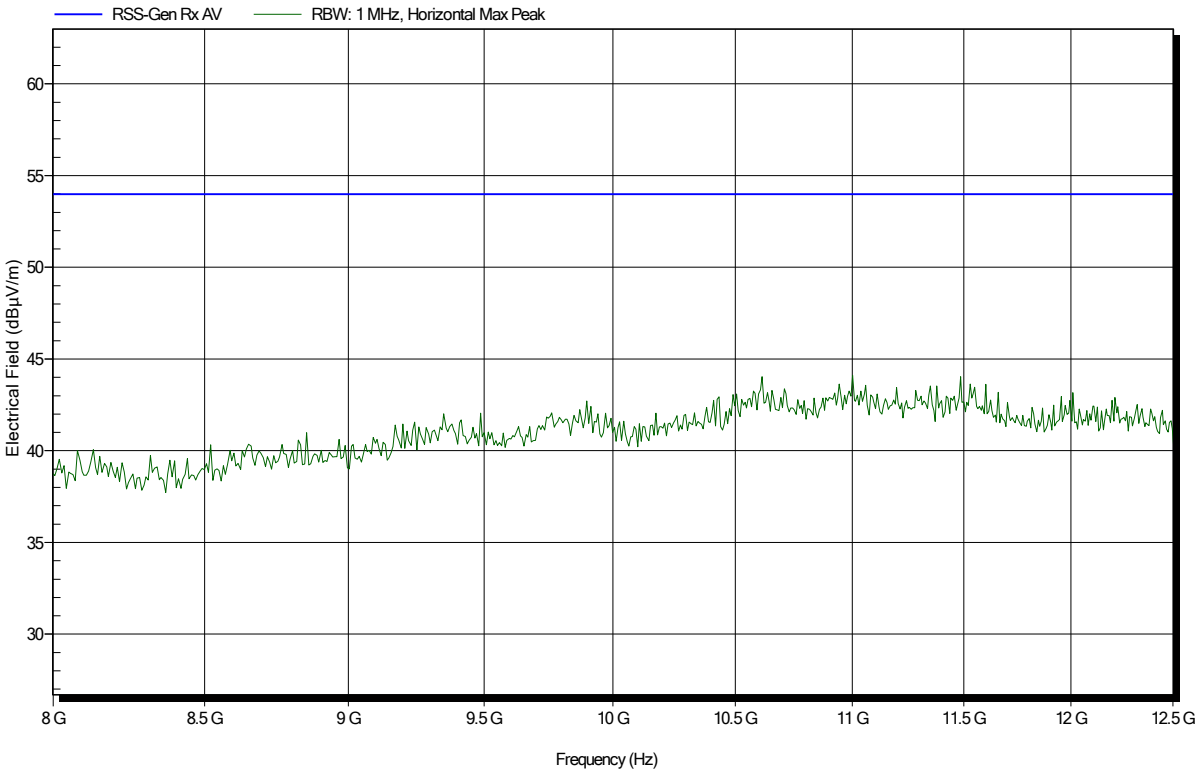

Spurious emissions according to RSS-247 Issue 2

Project number:	G0M-1909-8467
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Programming device
Model:	BIOwand
Test Site:	Eurofins Product Service GmbH
Operator:	Florian Voigt
Test Conditions:	Tnom: 22.6°C, Vnom: 120 VAC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	RX; 2440MHz
Test Date:	2019-09-18
Note:	

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