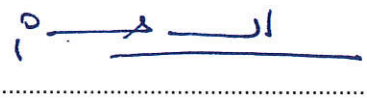
RADIO REPORT

FCC 47 CFR Part 15C
ISED Canada RSS-247

Digital transmission systems operating within the 2400 – 2483.5 MHz band

Report Reference No	G0M-1905-8256-TFC247WF-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 for BIOTRONIK pacemakers, ICDs, CRT-devices and ICMs
Model(s)	Renamic Neo
Additional Model(s)	None
Brand Name(s)	BIOTRONIK
Hardware Version(s)	A.x
Software Version(s)	Porto_WLAN: 1_1_0
FCC-ID	QRI-RENAMICNEO
IC	4708A-RENAMICNEO
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 - 23 °C	
Test Lab Humidity	32 – 38 %	
Date of receipt of test item	2019-05-22	
Report:		
Compiled by	Abdullah Al Jamal	
Tested by (+ signature) (Responsible for Test)	Abdullah Al Jamal	
Approved by (+ signature) (Head of Lab)	Christian Weber	
Date of Issue	2019-12-18	
Total number of pages	180	
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:		
Internal equipment photos provided by applicant.		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2019-12-18	Initial Release	

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
BPSK	Binary Phase Shift Keying
DSSS	Direct Sequence Spread Spectrum
EUT	Equipment Under Test
FCC	Federal Communications Commission
HT	High Throughput
IEEE 802.11	MAC and PHY Layer for WiFi
ISED	Innovation, Science and Economic Development Canada
OFDM	Orthogonal Frequency Division Multiplexing
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
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 for BIOTRONIK pacemakers, ICDs, CRT-devices and ICMs	
Model	Renamic Neo	
Additional Model(s)	None	
Brand Name(s)	BIOTRONIK	
Serial Number(s)	80001072 (Test sample 24167) 80001091 (Test sample 24164)	
Hardware Version(s)	A.x	
Software Version(s)	Porto_WLAN: 1_1_0	
PMN	Renamic Neo	
HVIN	Renamic Neo	
FVIN	N/A	
HMN	N/A	
FCC-ID	QRI-RENAMICNEO	
IC	4708A-RENAMICNEO	
Equipment type	End Product	
Radio type	Transceiver	
Assigned frequency bands	2400 - 2483.5 MHz	
Radio technology	IEEE 802.11 b/g/n (HT20)	
Modulation	BPSK, QPSK, 16-QAM, 32-QAM	
Number of antenna ports	2	
Antenna 1 – Antenna port W	Type	Integrated antenna
	Model	Not specified
	Manufacturer	BIOTRONIK SE & Co. KG
	Gain	4.0 dBi (declared by applicant)
Antenna 2 – Antenna port B	Type	Integrated antenna
	Model	Not specified
	Manufacturer	BIOTRONIK SE & Co. KG
	Gain	4.0 dBi (declared by applicant)
Supply Voltage	V_{NOM}	120 VAC
Operating Temperature	T_{NOM}	23 °C
AC/DC-Adaptor	Model	ATM090T-P190
	Vendor	Adapter Tech
	Input	100 VAC – 240 VDC
	Output	19 VDC
Manufacturer	BIOTRONIK SE & Co. KG Woermannkehre 1 12359 Berlin GERMANY	

1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
None.				
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment: None.				

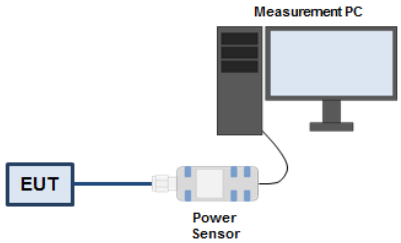
1.5 Test mode output power

1.5.1 Information

Test Information	
Measurement Method	ANSI C63.10 11.9, 14.3

1.5.2 Setup

Test Setup



1.5.3 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Power Sensor	R&S	NRP-Z81	EF00830	2018-07	2019-07

1.5.4 Procedure

Test Procedure

1. EUT set to test mode
2. The peak power is measured with the wideband power sensor
3. The power is measured for the lowest data rate on all three channels
4. For the channel with the highest power the power is also measured for all data rates
5. The data rate with the highest output power is selected for test mode

1.5.5 Results

Results – DSSS Antenna port 1			
Data Rate [Mbps]	Power [dBm] Channel 2412 [MHz]	Power [dBm] Channel 2437 [MHz]	Power [dBm] Channel 2462 [MHz]
1	15.8	16.1	16.5
2	15.9	15.6	16.1
5.5	15.4	15.0	15.5
11	15.4	15.3	15.6

Results - OFDM Antenna port 1			
Data Rate [Mbps]	Power [dBm] Channel 2412 [MHz]	Power [dBm] Channel 2437 [MHz]	Power [dBm] Channel 2462 [MHz]
6	21.9	21.7	22.0
9	21.9	21.7	22.2
12	21.3	21.2	21.7
18	21.4	21.3	21.4
24	22.0	21.5	22.0
36	21.2	21.1	21.2
48	20.1	19.3	20.1
54	20.1	20.0	19.9

Results - HT20 Antenna port 1			
MCS	Power [dBm] Channel 2412 [MHz]	Power [dBm] Channel 2437 [MHz]	Power [dBm] Channel 2462 [MHz]
0	21.9	22.0	21.2
1	21.6	22.2	22.4
2	21.8	21.3	22.1
3	21.8	21.4	21.9
4	21.4	21.3	20.5
5	20.7	19.6	21.5
6	19.3	20.1	20.2
7	19.8	19.9	22.0
8	21.6	21.5	21.3
9	21.3	21.2	22.0
10	21.4	21.7	21.7
11	21.6	21.3	21.8
12	21.9	21.9	21.9
13	20.9	21.5	21.3
14	21.0	22.0	22.0
15	20.2	21.7	21.4

Results – DSSS Antenna port 2			
Data Rate [Mbps]	Power [dBm] Channel 2412 [MHz]	Power [dBm] Channel 2437 [MHz]	Power [dBm] Channel 2462 [MHz]
1	16.2	15.9	16.3
2	16.1	15.4	16.2
5.5	15.3	14.9	15.3
11	15.7	15.4	15.7

Results - OFDM Antenna port 2			
Data Rate [Mbps]	Power [dBm] Channel 2412 [MHz]	Power [dBm] Channel 2437 [MHz]	Power [dBm] Channel 2462 [MHz]
6	21.2	21.3	21.3
9	21.2	21.2	21.4
12	21.0	20.8	20.8
18	21.1	21.0	21.2
24	21.2	20.9	21.8
36	21.0	20.7	20.8
48	20.7	19.6	20.5
54	19.9	19.6	19.8

Results - HT20 Antenna port 2			
MCS	Power [dBm] Channel 2412 [MHz]	Power [dBm] Channel 2437 [MHz]	Power [dBm] Channel 2462 [MHz]
0	21.2	21.3	21.4
1	21.3	21.3	21.6
2	21.1	21.2	21.4
3	21.1	21.1	21.1
4	21.0	21.0	21.3
5	20.3	19.6	20.4
6	20.0	20.0	20.3
7	20.4	19.9	19.4
8	21.2	21.0	21.4
9	20.9	20.4	20.7
10	21.1	20.9	21.0
11	21.2	21.0	21.1
12	21.3	21.1	21.2
13	20.8	20.4	20.6
14	21.2	20.7	21.4
15	20.9	20.8	20.8

1.6 Test Modes

Mode	Description
DSSS (IEEE 802.11b)	Mode = Transmit Modulation = BPSK Spreading = DSSS Bandwidth = 20 MHz Duty cycle = 100% Power setting = Custom settings – software provided by applicant – with Tx Power = 15 dBm Data rate = 1 Mbps
OFDM (IEEE 802.11g)	Mode = Transmit Modulation = BPSK Spreading = OFDM Bandwidth = 20 MHz Duty cycle = 100% Power setting = Custom settings – software provided by applicant – with Tx Power = 15 dBm Data rate = 6 Mbps
HT20 (IEEE 802.11n)	Mode = Transmit Modulation = BPSK Spreading = OFDM Bandwidth = 20 MHz Duty cycle = 100% Power setting (1 Simultaneous Tx) = Custom settings – software provided by applicant – with Tx Power = 15 dBm Power setting (2 Simultaneous Tx) = Custom settings – software provided by applicant – with Tx Power = 15 dBm Data rate (1 Simultaneous Tx) = 6.5 Mbps Data rate (2 Simultaneous Tx) = 13 Mbps MCS (1 Simultaneous Tx) = 0 MCS (2 Simultaneous Tx) = 8
Receive	Mode = Receive
Comment: The above settings were found as worst case during pre-tests.	

1.7 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx / Rx	1	2412
F2	Tx / Rx	6	2437
F3	Tx / Rx	11	2462

1.8 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/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)(1) 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 (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: None.				

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

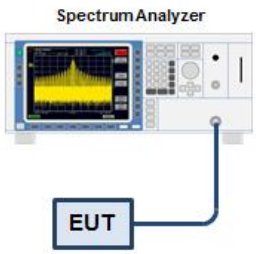
3.1.1 Information

Test Information	
Reference	ISED RSS-Gen, Issue 5 (section 6.6)
Measurement Method	ANSI C63.10 6.9.3
Operator	Abdullah Al Jamal
Date	2019-06-06

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 Analyzer	R&S	FSW 43	EF00896	2018-07	2019-07

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

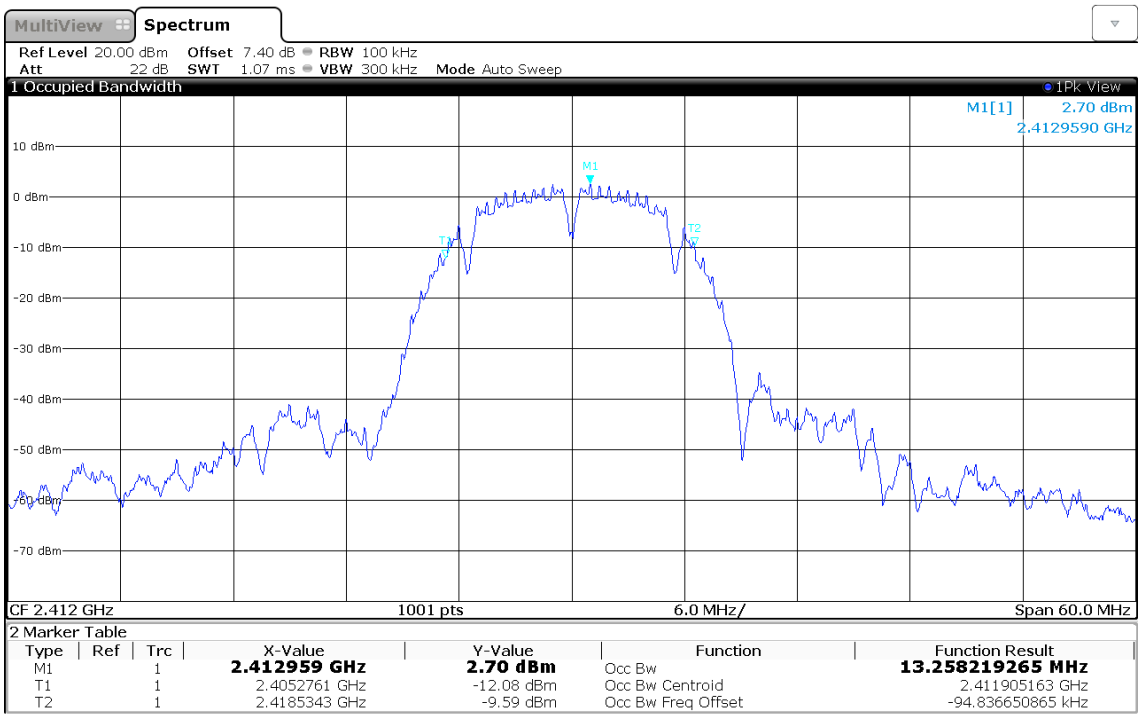
3.1.6 Results

Test Results – Antenna port B		
Mode	Frequency [MHz]	Bandwidth [MHz]
DSSS	2412	13.258
DSSS	2437	13.240
DSSS	2462	13.181
OFDM	2412	16.468
OFDM	2437	16.461
OFDM	2462	16.459
HT20	2412	17.585
HT20	2437	17.575
HT20	2462	17.573

Test Results – Antenna port W		
Mode	Frequency [MHz]	Bandwidth [MHz]
DSSS	2412	13.094
DSSS	2437	13.134
DSSS	2462	13.062
OFDM	2412	16.458
OFDM	2437	16.455
OFDM	2462	16.455
HT20	2412	17.568
HT20	2437	17.568
HT20	2462	17.573

Occupied Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 b, Channel: 1, 2412
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Occupied Bandwidth [MHz]:	13.258



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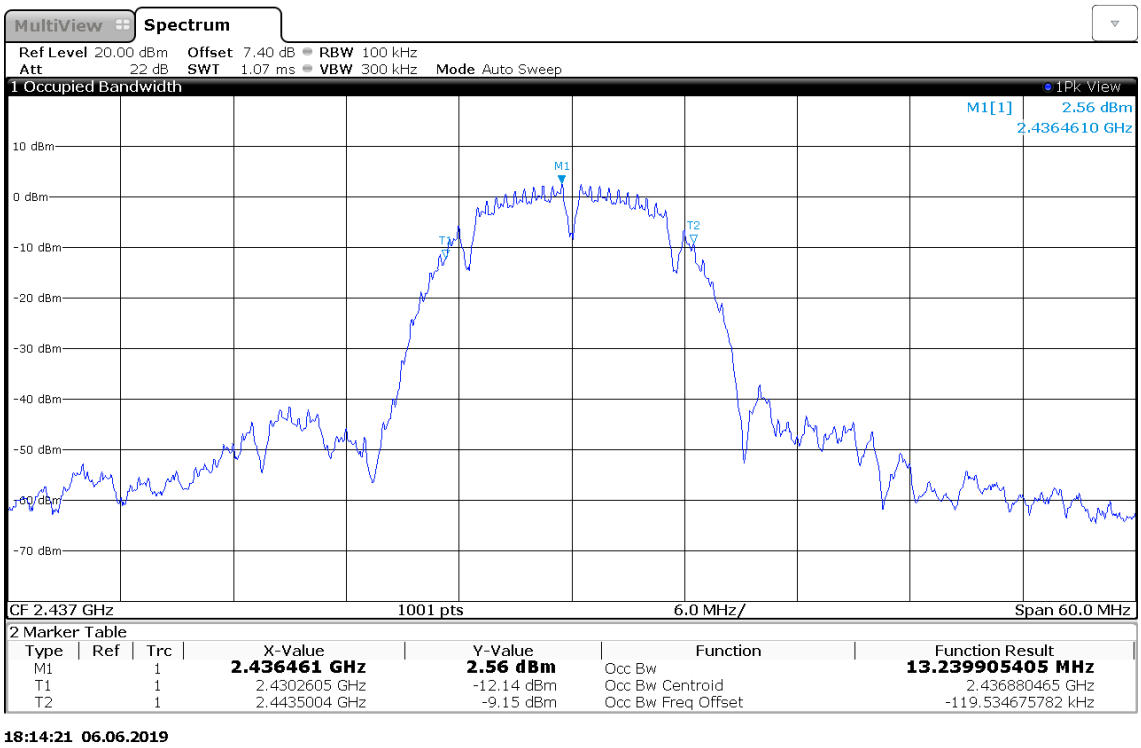
Occupied Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 b, Channel: 6, 2437
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Occupied Bandwidth [MHz]:	13.240



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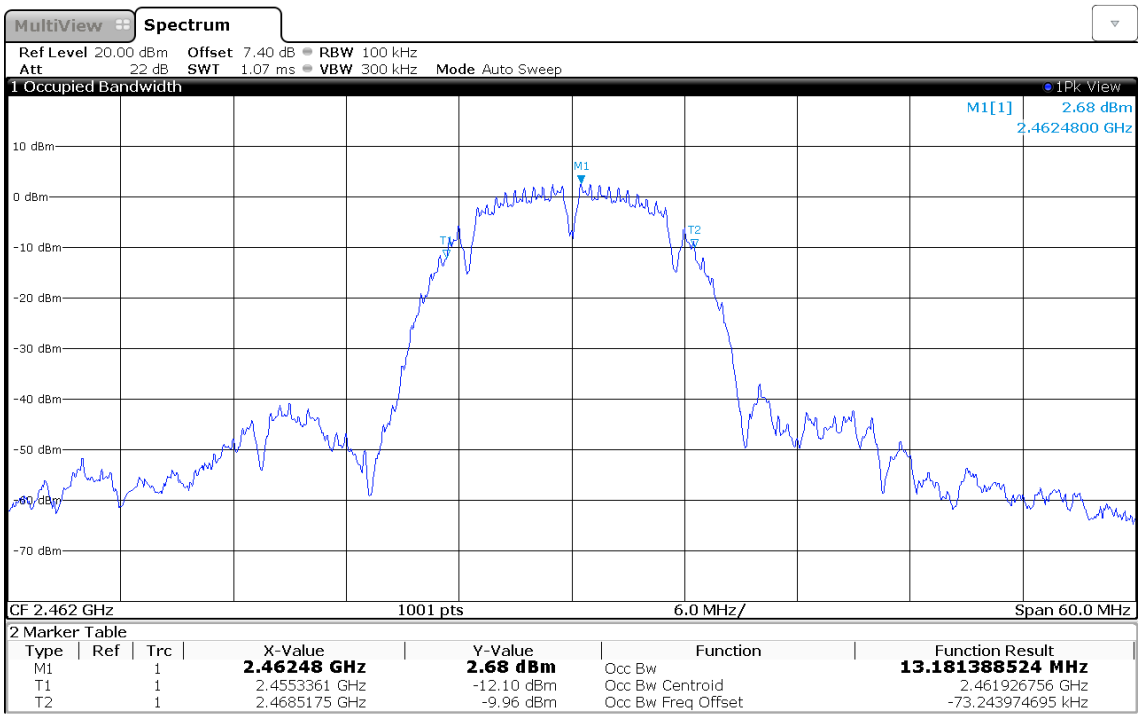
Occupied Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 b, Channel: 11, 2462
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Occupied Bandwidth [MHz]:	13.181



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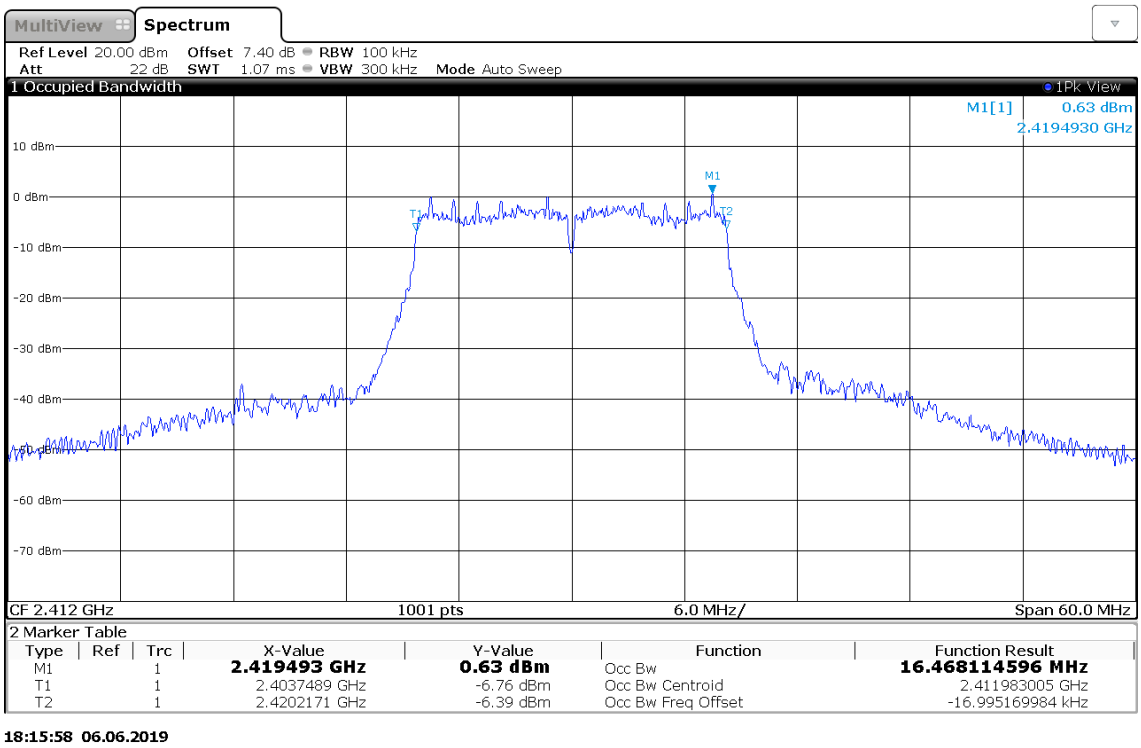
Occupied Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 g, Channel: 1, 2412
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Occupied Bandwidth [MHz]:	16.468



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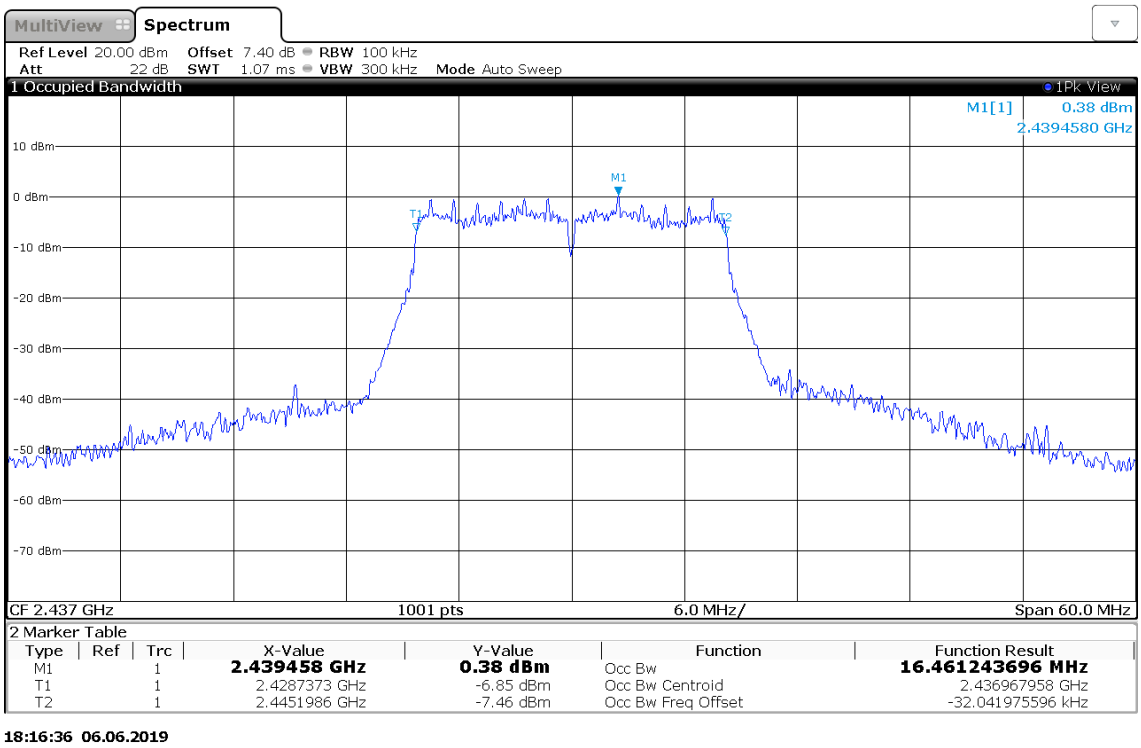
Occupied Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 g, Channel: 6, 2437
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Occupied Bandwidth [MHz]:	16.461



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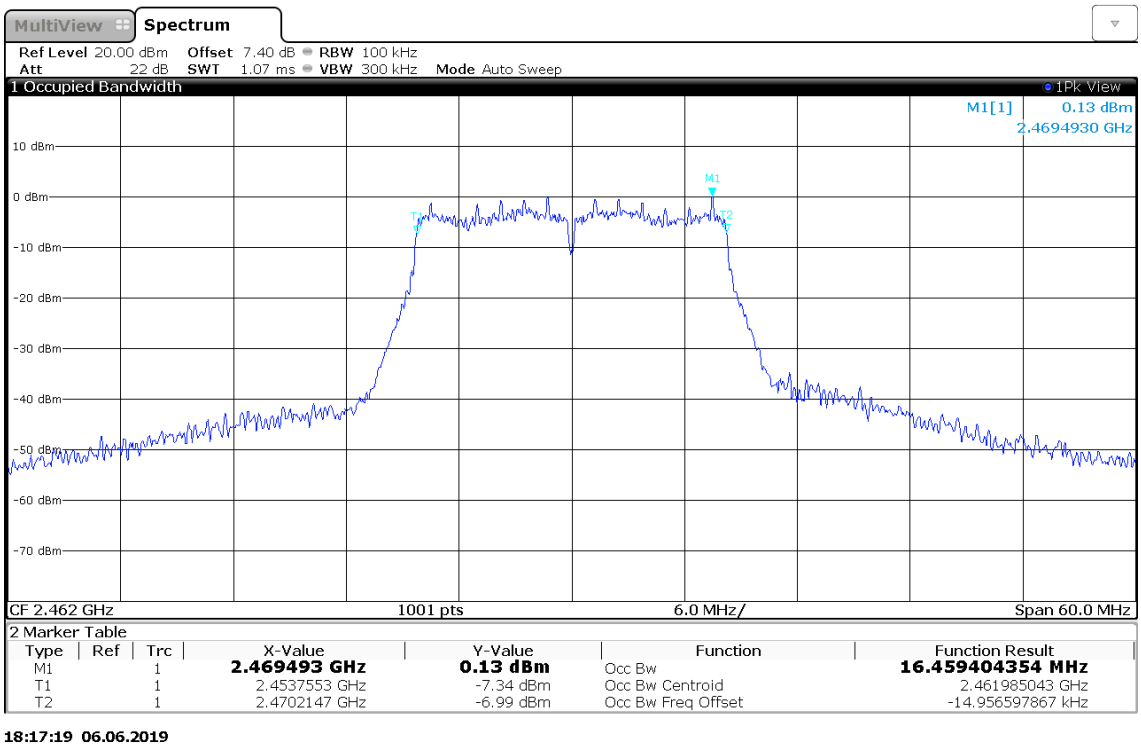
Occupied Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 g, Channel: 11, 2462
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Occupied Bandwidth [MHz]:	16.459



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Occupied Bandwidth

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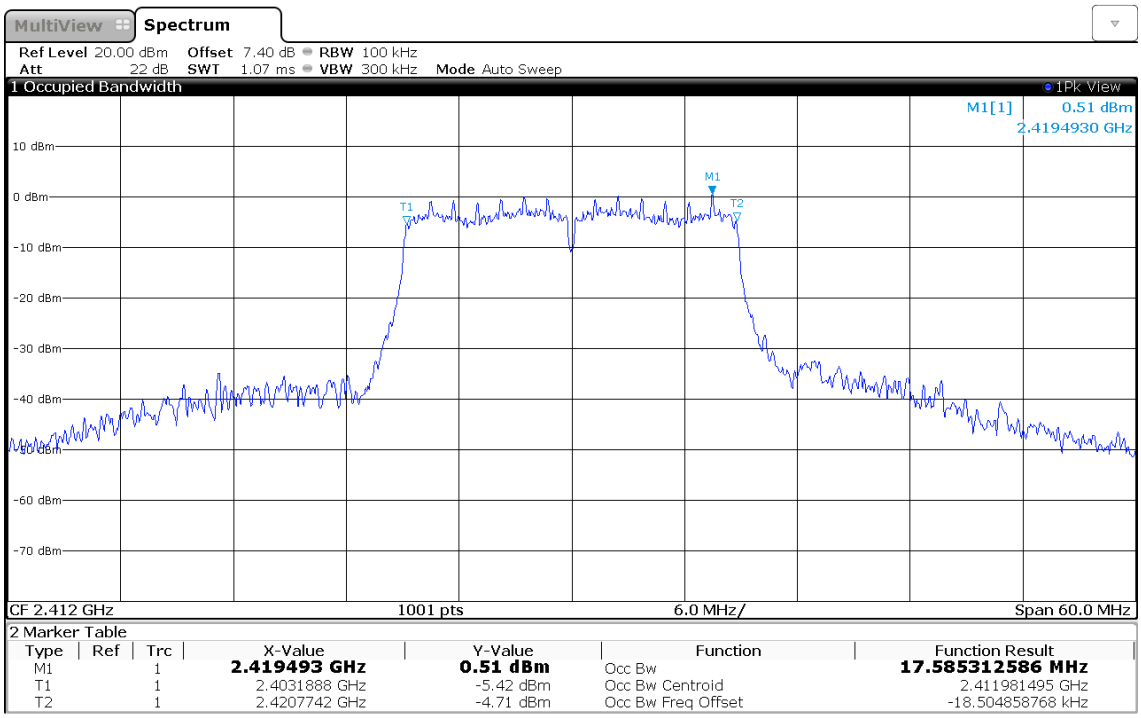
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 n HT20, Channel: 1, 2412
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Occupied Bandwidth [MHz]:	17.585



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Occupied Bandwidth

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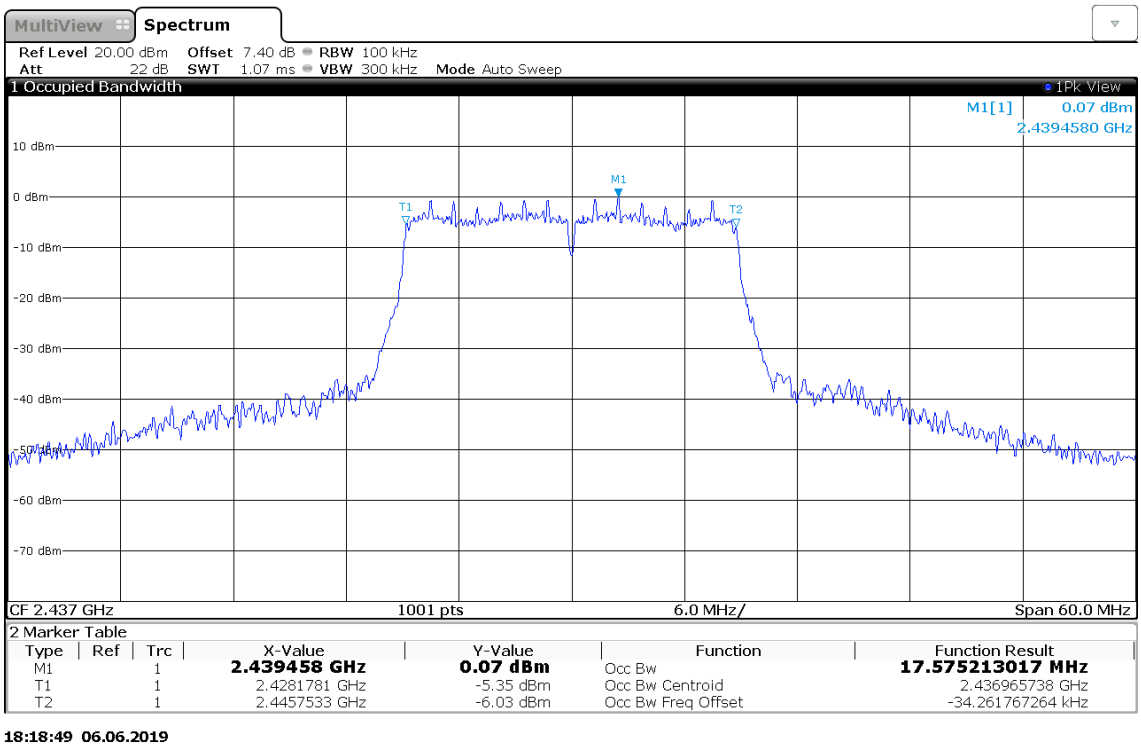
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 n HT20, Channel: 6, 2437
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Occupied Bandwidth [MHz]:	17.575



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Occupied Bandwidth

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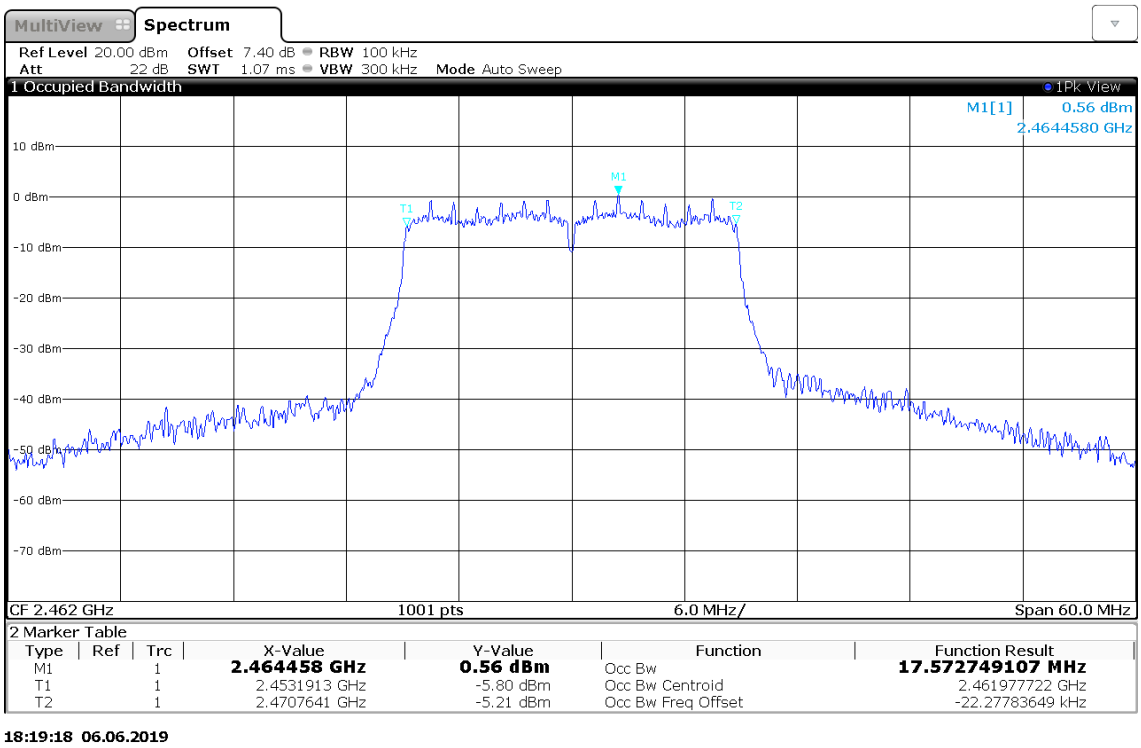
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 n HT20, Channel: 11, 2462
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Occupied Bandwidth [MHz]:	17.573



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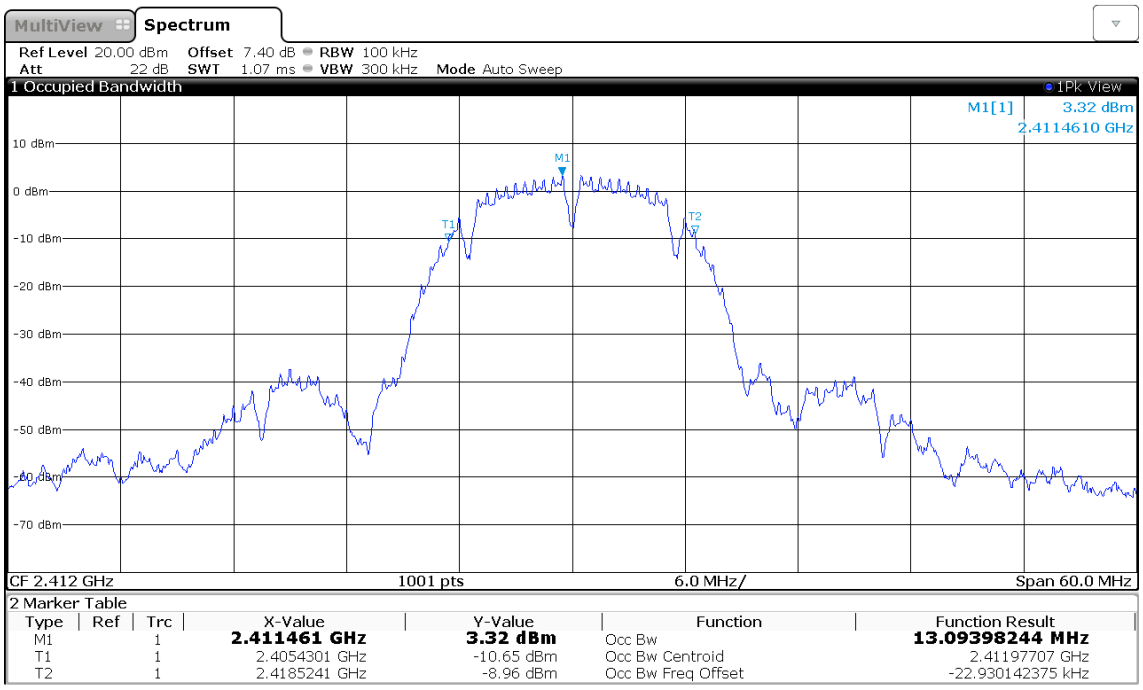
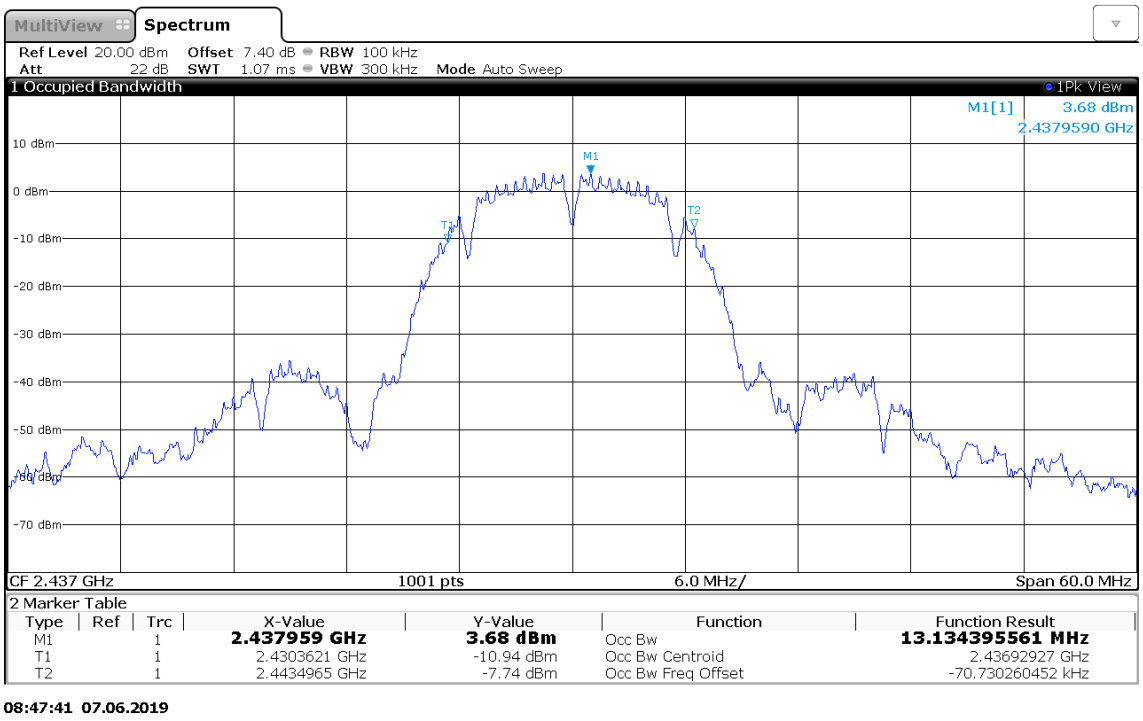
Occupied Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 b, Channel: 1, 2412
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Occupied Bandwidth [MHz]:	13.094



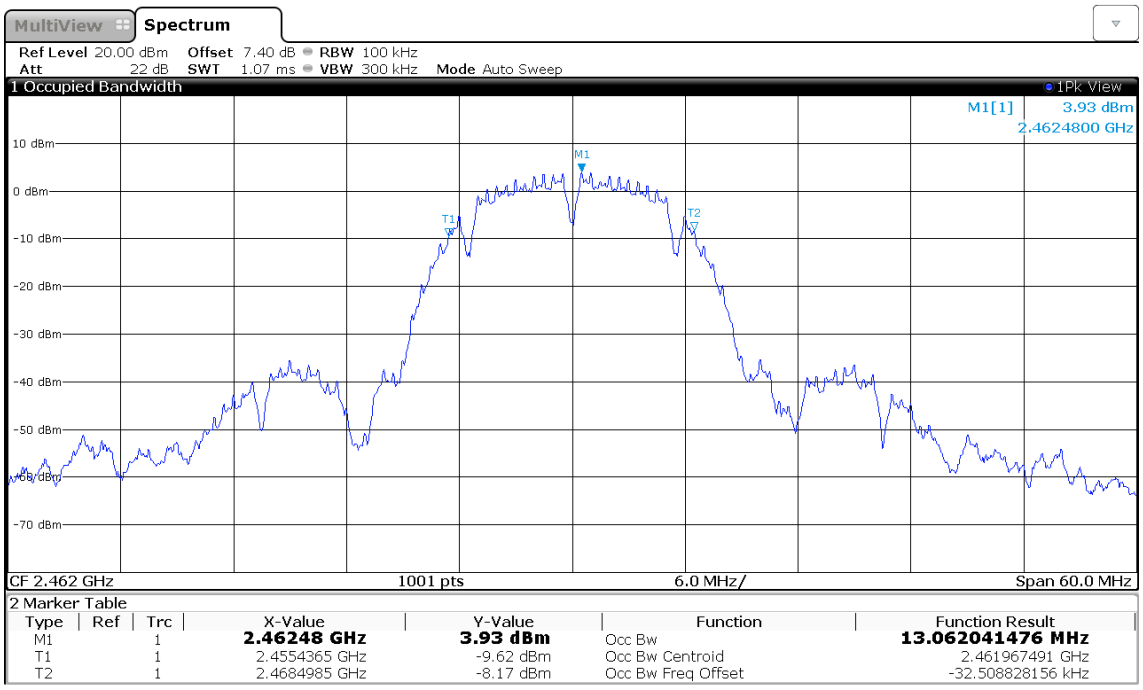
Occupied Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 b, Channel: 6, 2437
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Occupied Bandwidth [MHz]:	13.134



Occupied Bandwidth

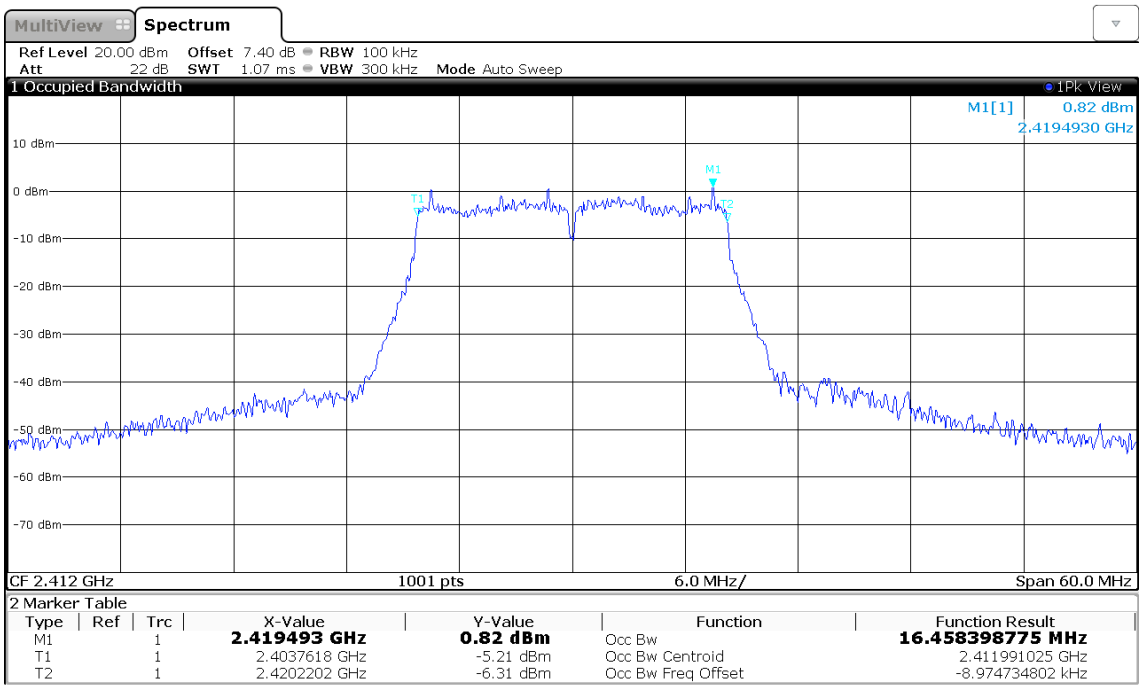
Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 b, Channel: 11, 2462
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Occupied Bandwidth [MHz]:	13.062



08:48:07 07.06.2019

Occupied Bandwidth

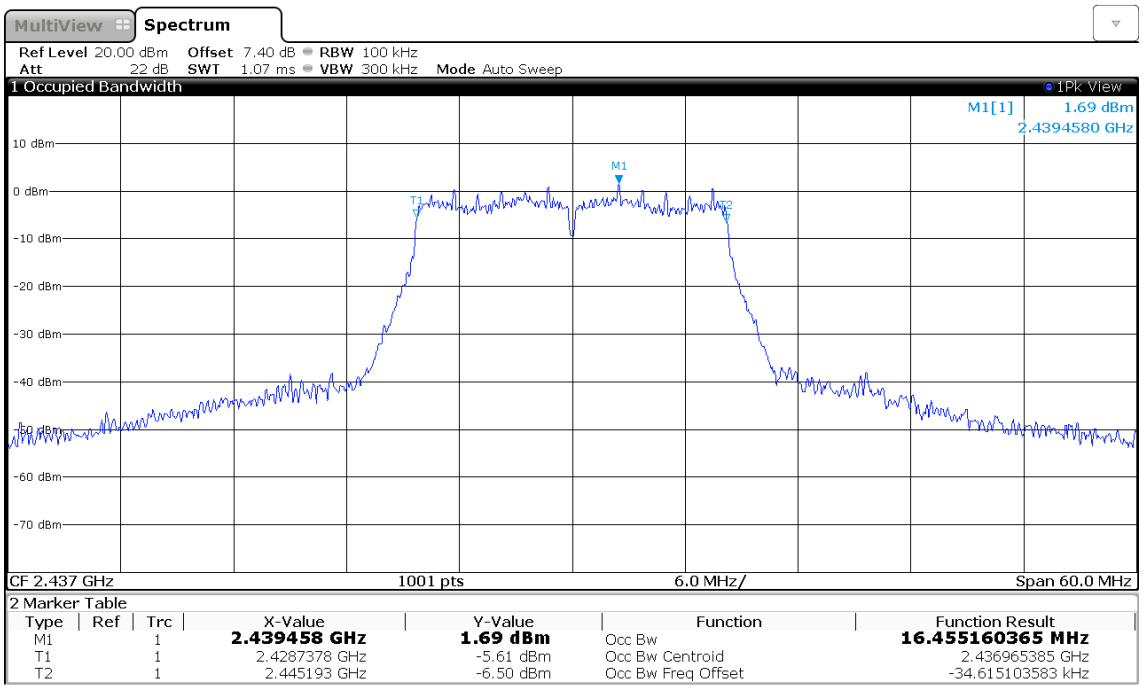
Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 g, Channel: 1, 2412
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Occupied Bandwidth [MHz]:	16.458



08:49:17 07.06.2019

Occupied Bandwidth

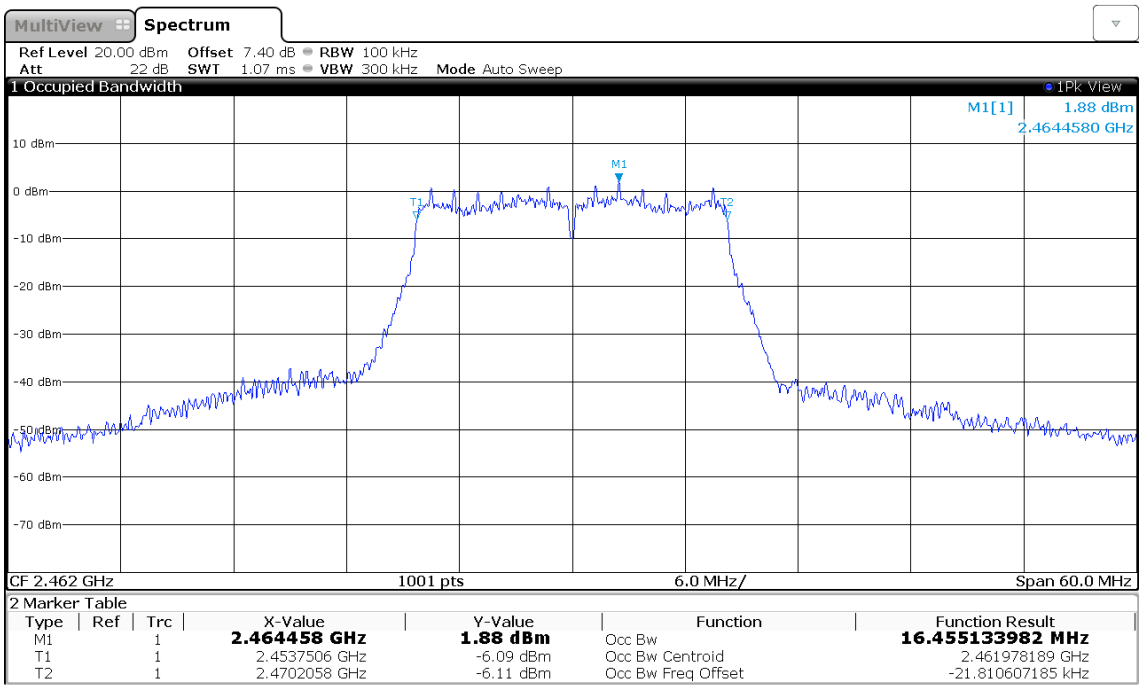
Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 g, Channel: 6, 2437
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Occupied Bandwidth [MHz]:	16.455



08:49:47 07.06.2019

Occupied Bandwidth

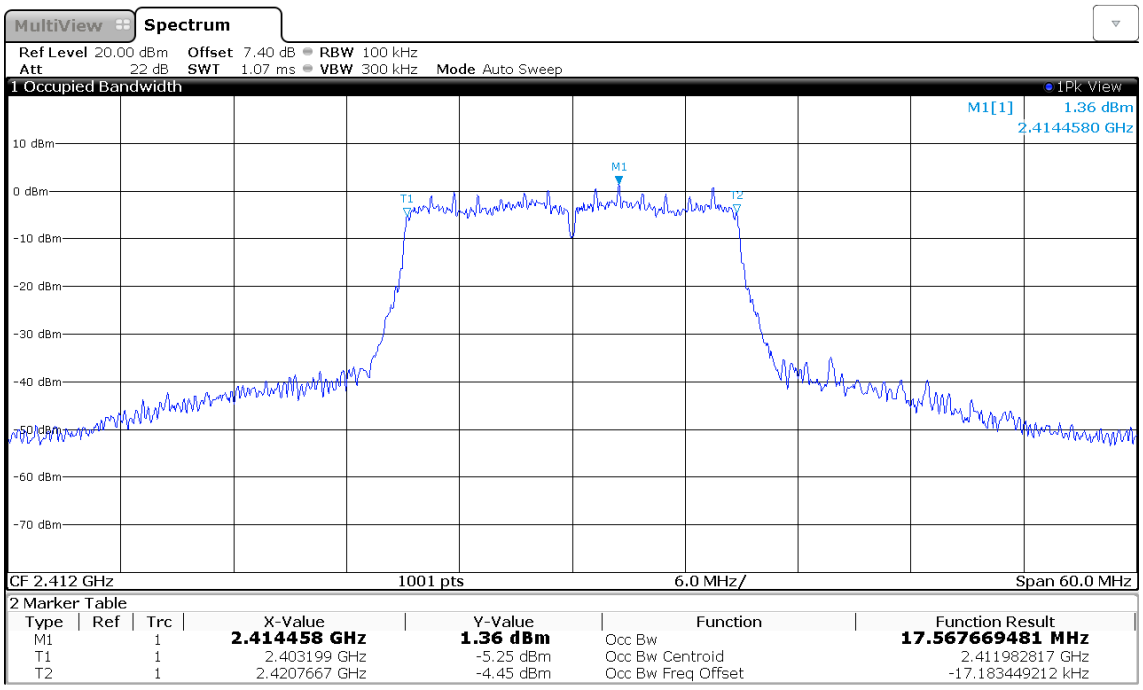
Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 g, Channel: 11, 2462
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Occupied Bandwidth [MHz]:	16.455



08:50:17 07.06.2019

Occupied Bandwidth

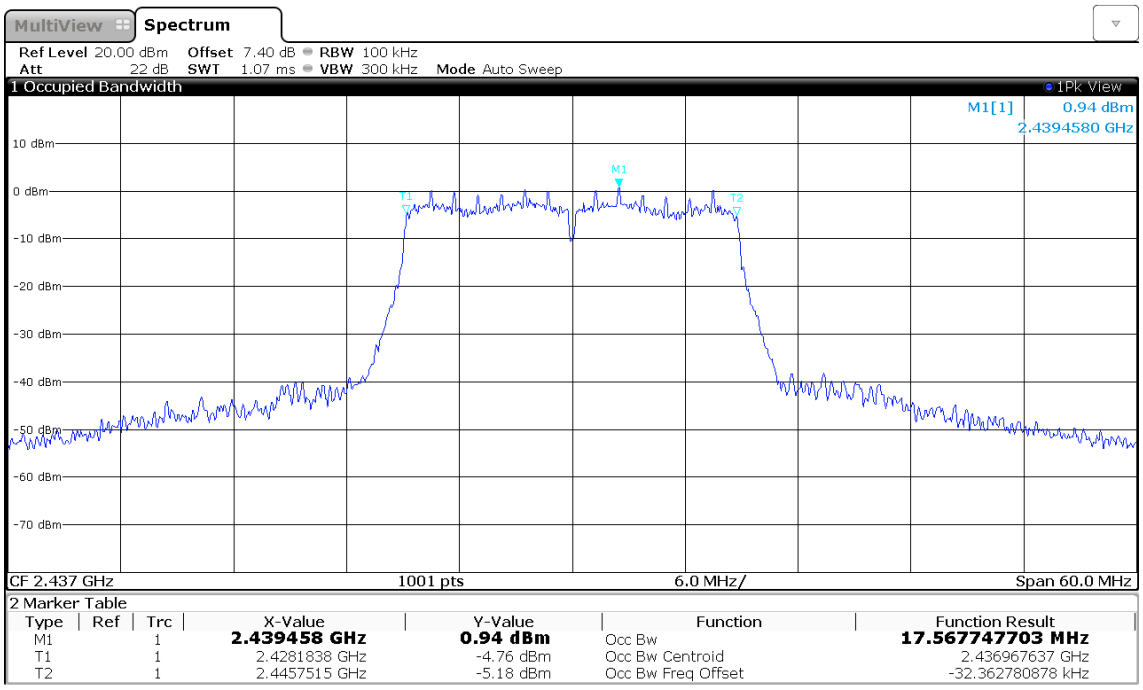
Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 n HT20, Channel: 1, 2412
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Occupied Bandwidth [MHz]:	17.568



08:51:19 07.06.2019

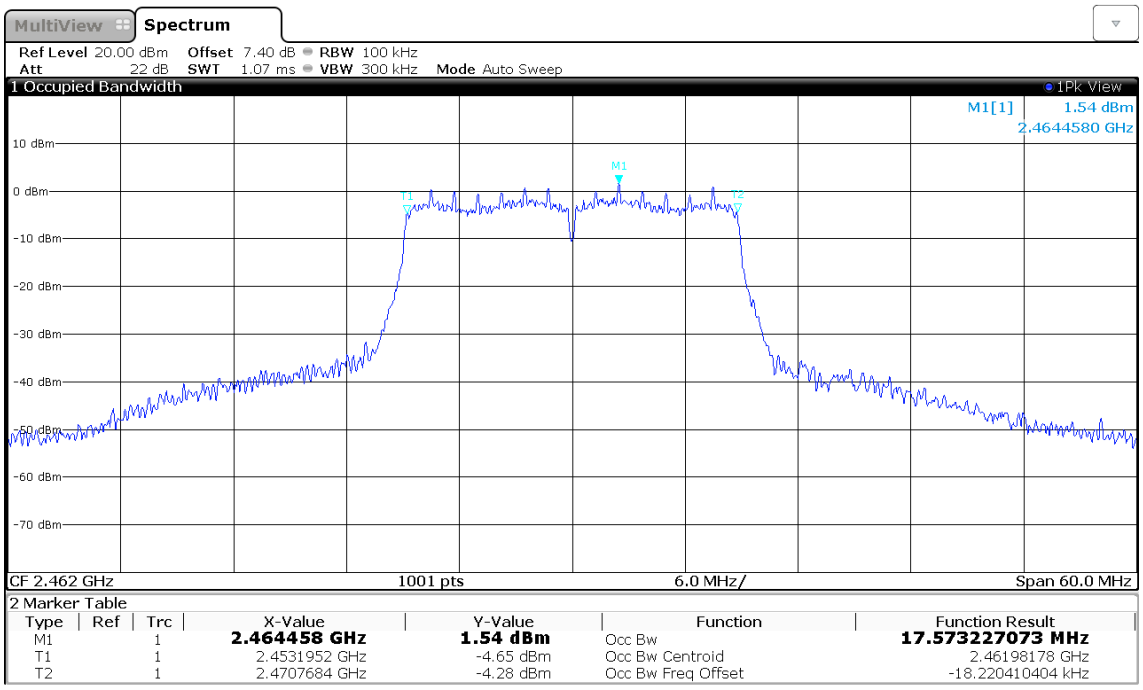
Occupied Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 n HT20, Channel: 6, 2437
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Occupied Bandwidth [MHz]:	17.568



Occupied Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	IEEE 802.11 n HT20, Channel: 11, 2462
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Occupied Bandwidth [MHz]:	17.573



08:52:23 07.06.2019

3.2 Test Conditions and Results - 6 dB bandwidth

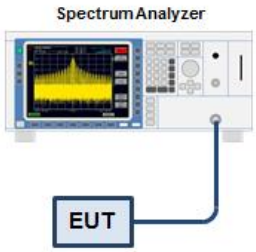
3.2.1 Information

Test Information	
Reference	FCC § 15.247(a)(2); ISED RSS-247, Issue 2 (section 5.2)
Measurement Method	ANSI C63.10 11.8
Operator	Abdullah Al Jamal
Date	2019-06-06

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 Analyzer	R&S	FSW 43	EF00896	2018-07	2019-07

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

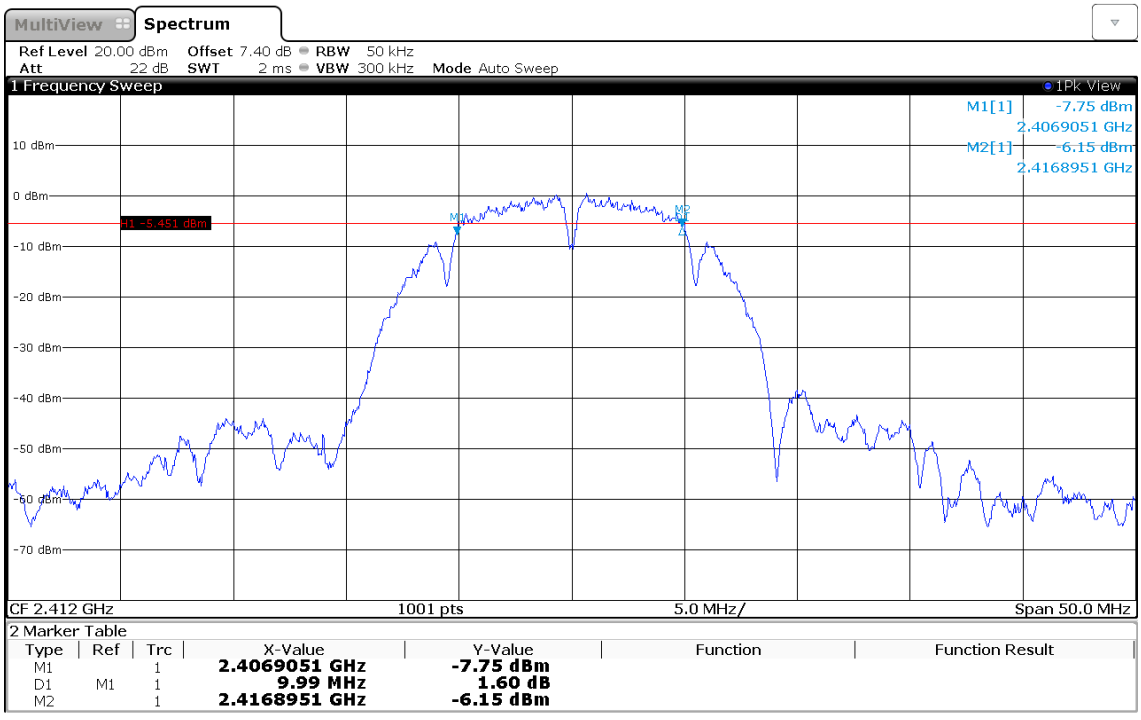
3.2.6 Results

Test Results – Antenna port B				
Mode	Frequency [MHz]	Bandwidth [kHz]	Limit [kHz]	Verdict
DSSS	2412	9990	500	PASS
DSSS	2437	9840	500	PASS
DSSS	2462	10040	500	PASS
OFDM	2412	16384	500	PASS
OFDM	2437	16434	500	PASS
OFDM	2462	16434	500	PASS
HT20	2412	17532	500	PASS
HT20	2437	17532	500	PASS
HT20	2462	17532	500	PASS

Test Results – Antenna port W				
Mode	Frequency [MHz]	Bandwidth [kHz]	Limit [kHz]	Verdict
DSSS	2412	10040	500	PASS
DSSS	2437	10040	500	PASS
DSSS	2462	10040	500	PASS
OFDM	2412	16434	500	PASS
OFDM	2437	16434	500	PASS
OFDM	2462	16434	500	PASS
HT20	2412	17532	500	PASS
HT20	2437	17532	500	PASS
HT20	2462	17632	500	PASS

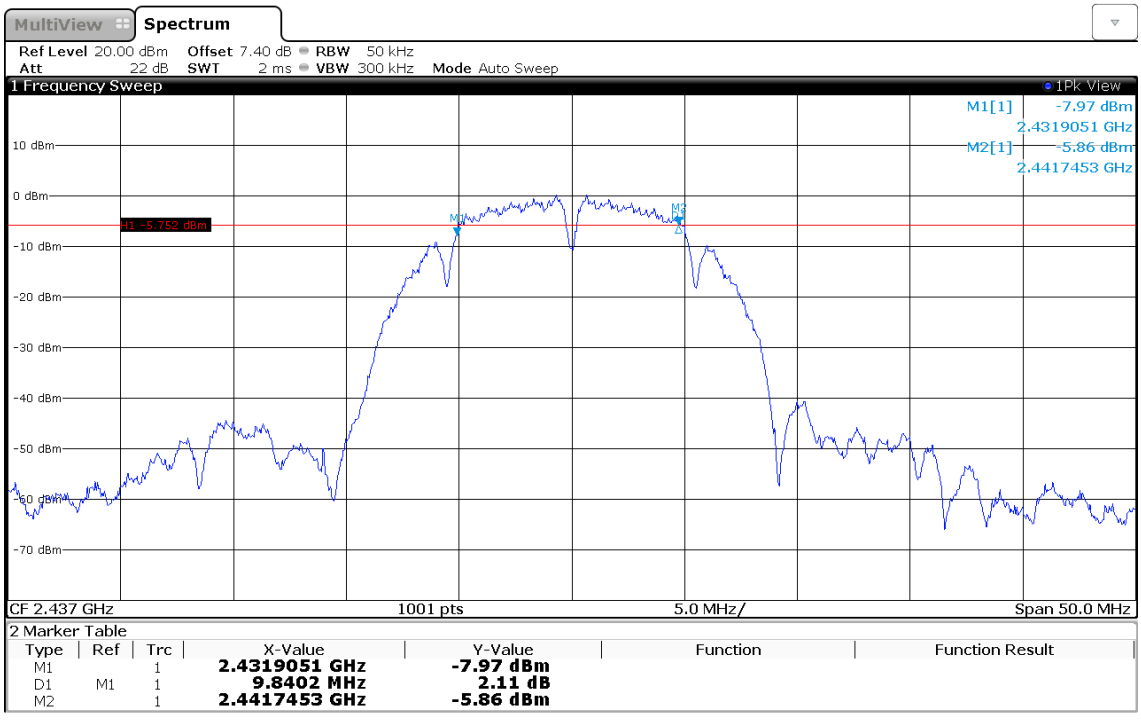
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 b, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Lower Frequency [MHz]:	2406.905
Upper Frequency [MHz]:	2416.895
6 dB Bandwidth [kHz]:	9990



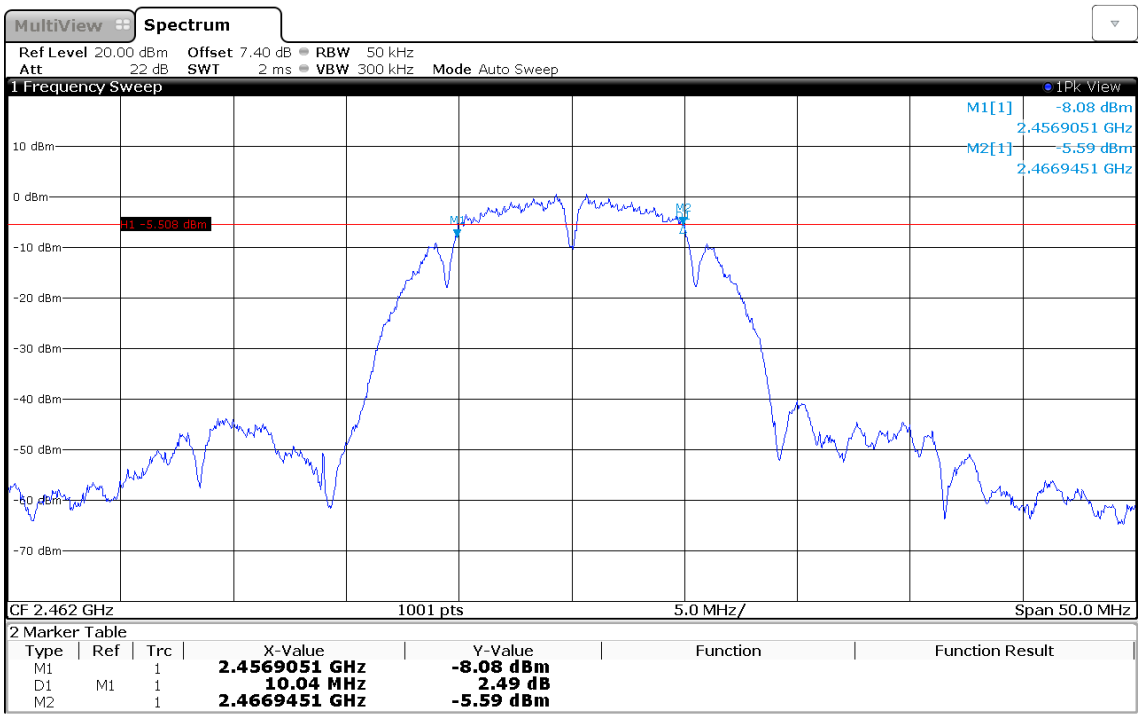
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 b, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Lower Frequency [MHz]:	2431.905
Upper Frequency [MHz]:	2441.745
6 dB Bandwidth [kHz]:	9840



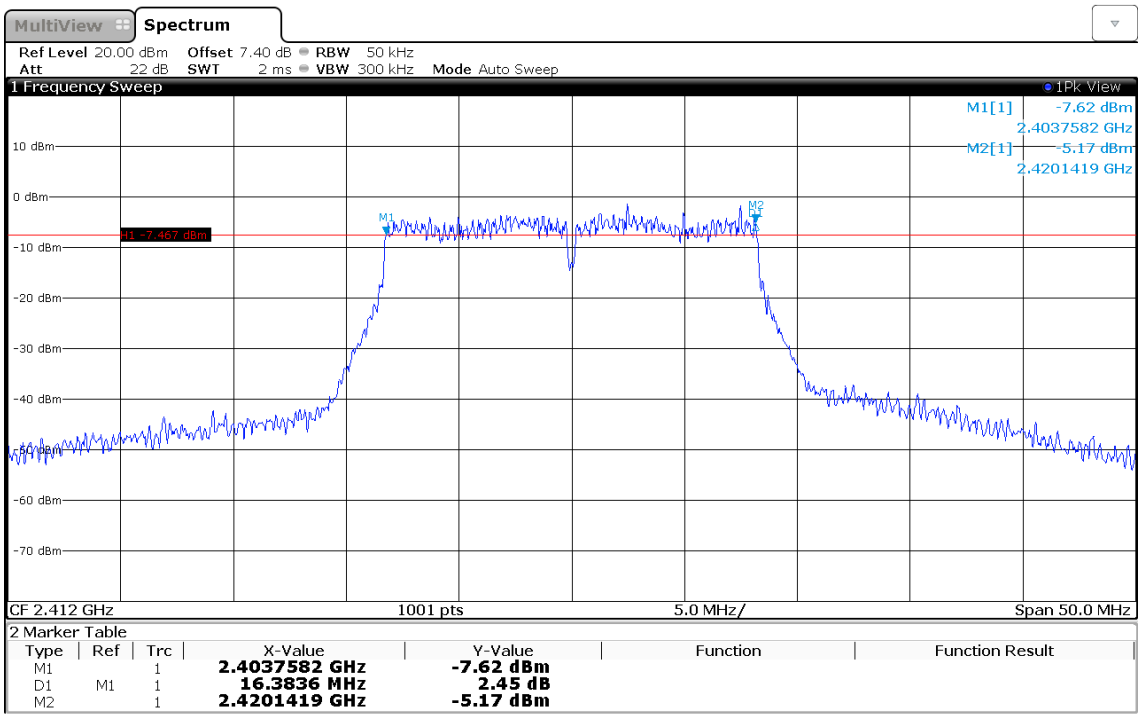
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 b, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Lower Frequency [MHz]:	2456.905
Upper Frequency [MHz]:	2466.945
6 dB Bandwidth [kHz]:	10040



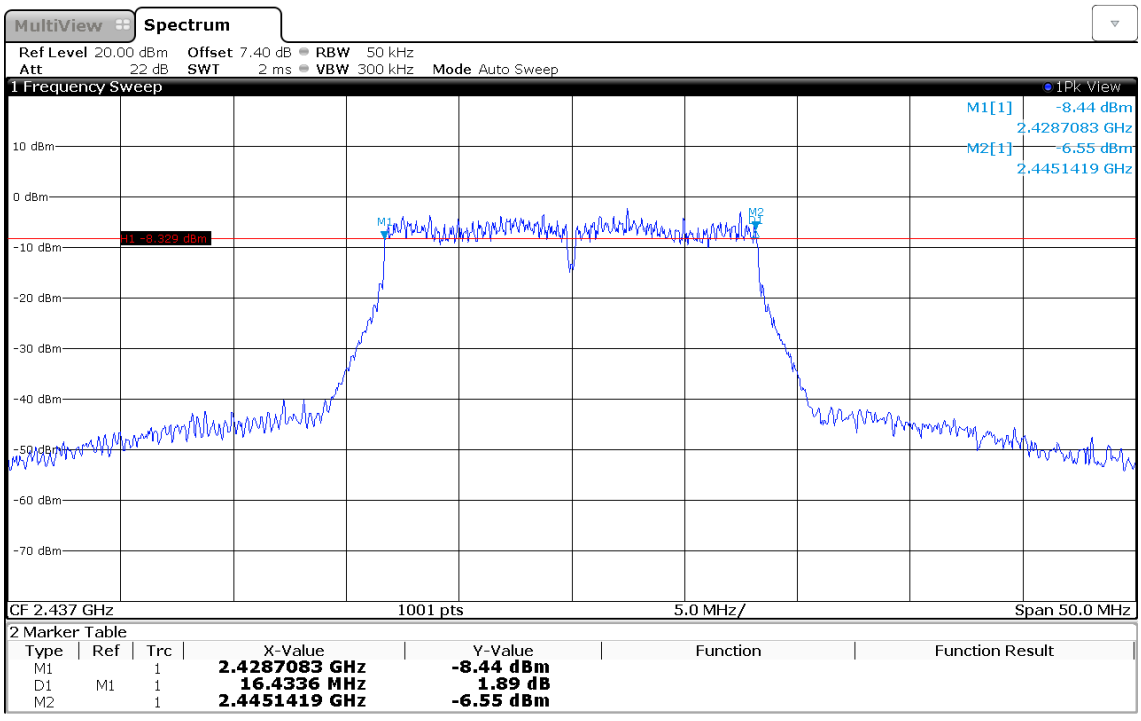
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 g, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Lower Frequency [MHz]:	2403.758
Upper Frequency [MHz]:	2420.142
6 dB Bandwidth [kHz]:	16384



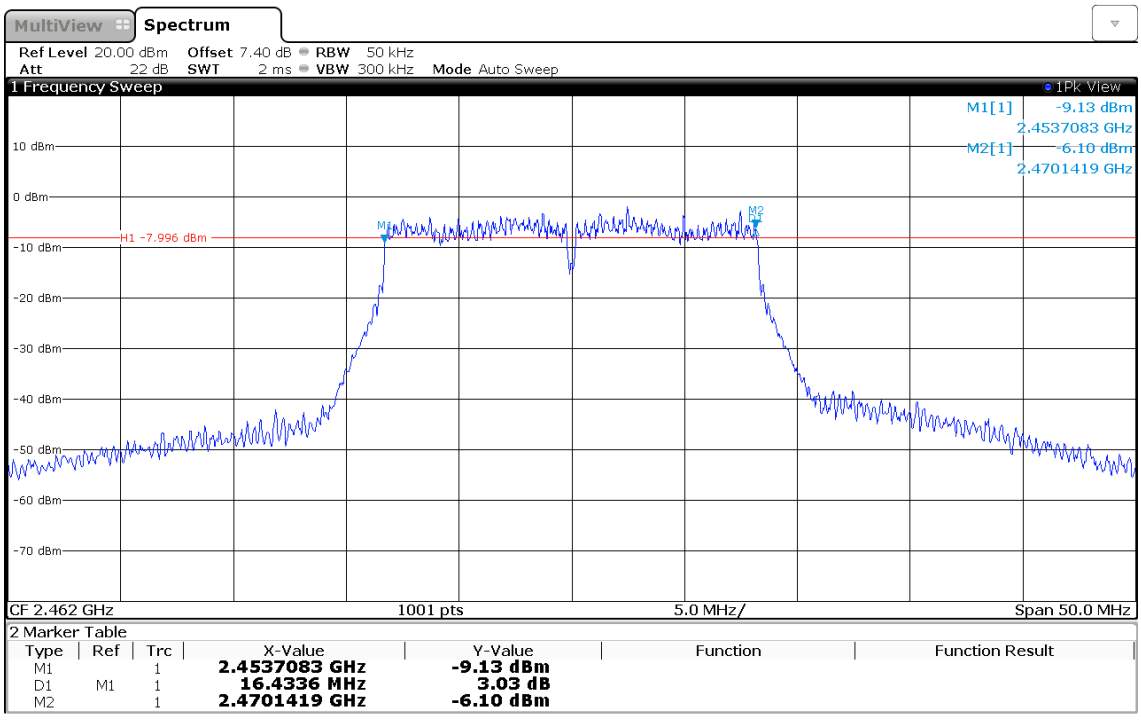
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 g, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Lower Frequency [MHz]:	2428.708
Upper Frequency [MHz]:	2445.142
6 dB Bandwidth [kHz]:	16434



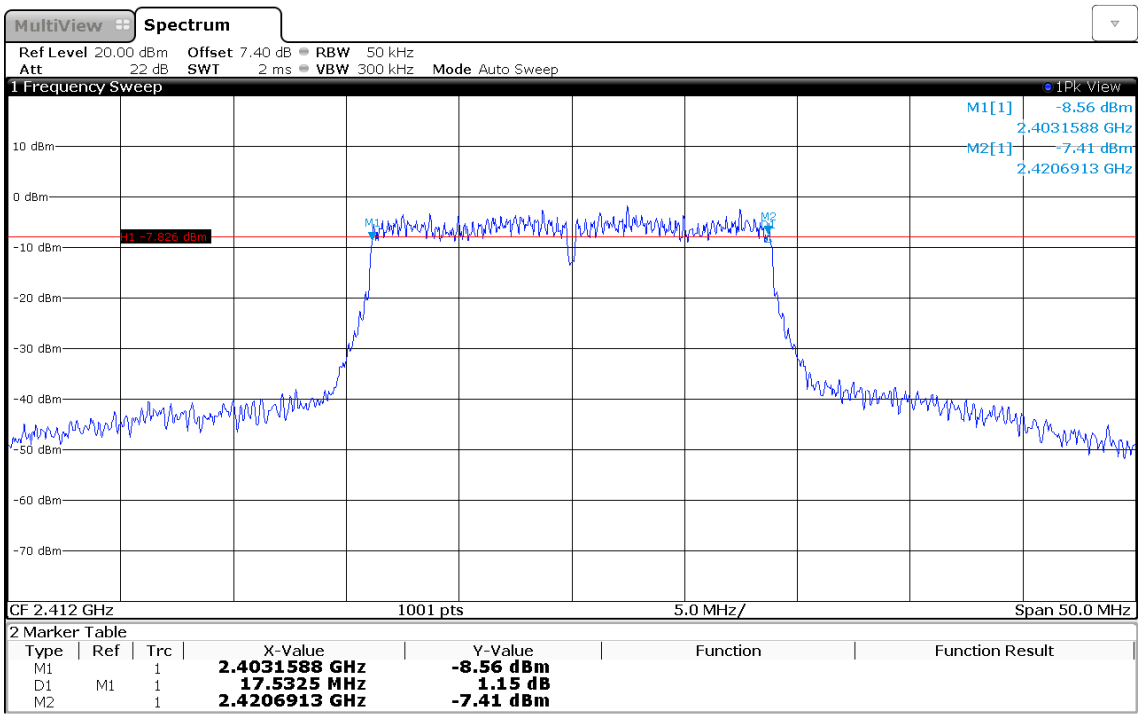
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 g, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Lower Frequency [MHz]:	2453.708
Upper Frequency [MHz]:	2470.142
6 dB Bandwidth [kHz]:	16434



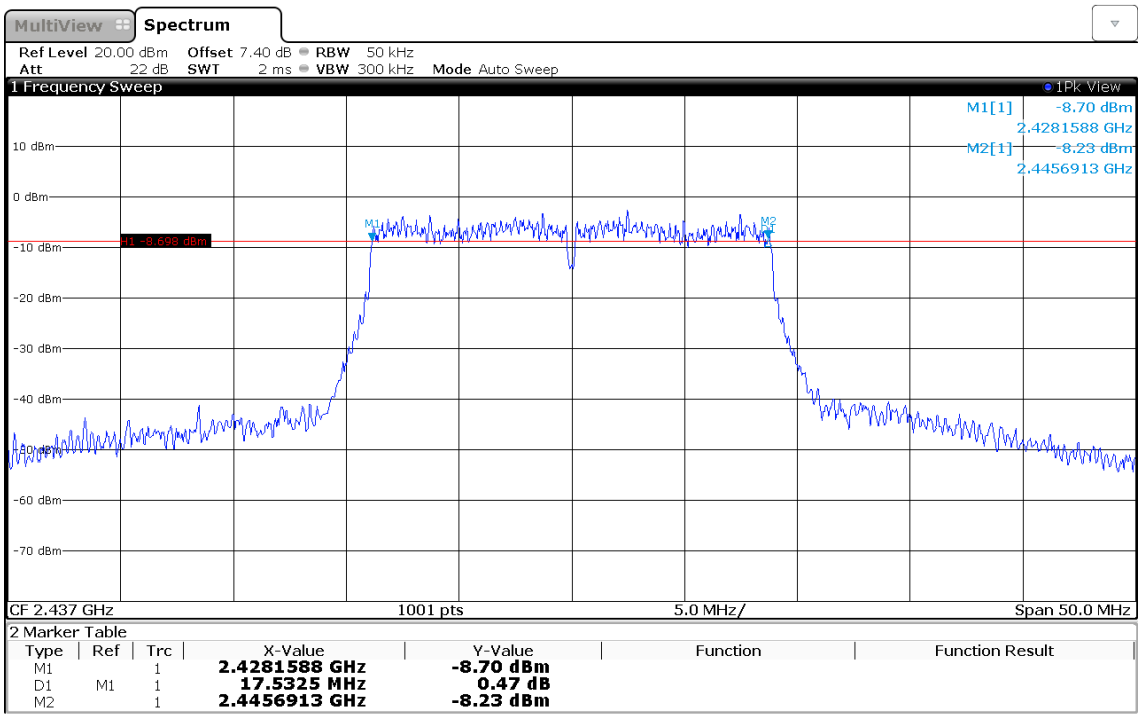
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 n HT20, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Lower Frequency [MHz]:	2403.159
Upper Frequency [MHz]:	2420.691
6 dB Bandwidth [kHz]:	17532



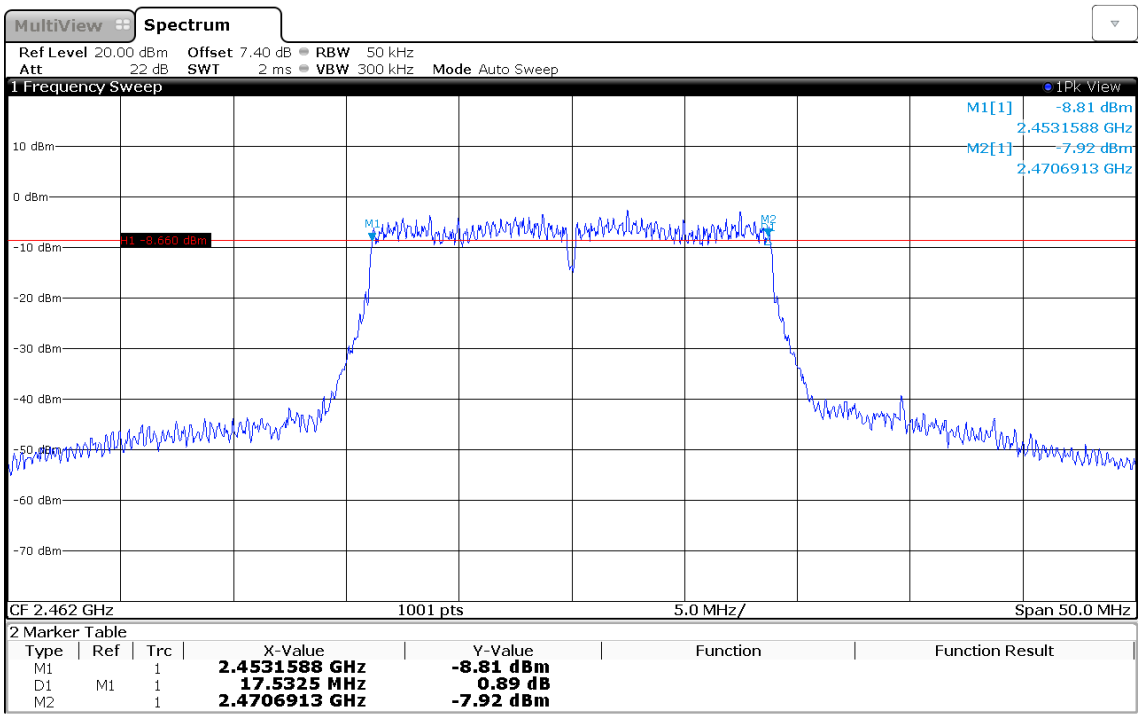
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 n HT20, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Lower Frequency [MHz]:	2428.159
Upper Frequency [MHz]:	2445.691
6 dB Bandwidth [kHz]:	17532



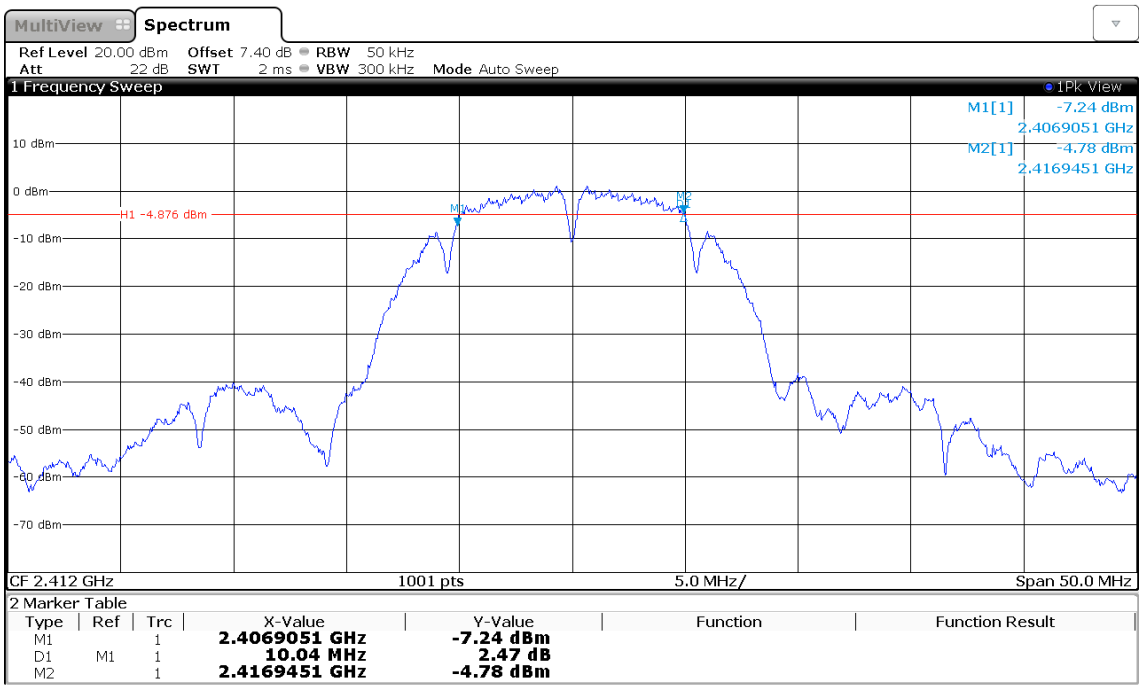
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 n HT20, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Lower Frequency [MHz]:	2453.159
Upper Frequency [MHz]:	2470.691
6 dB Bandwidth [kHz]:	17532



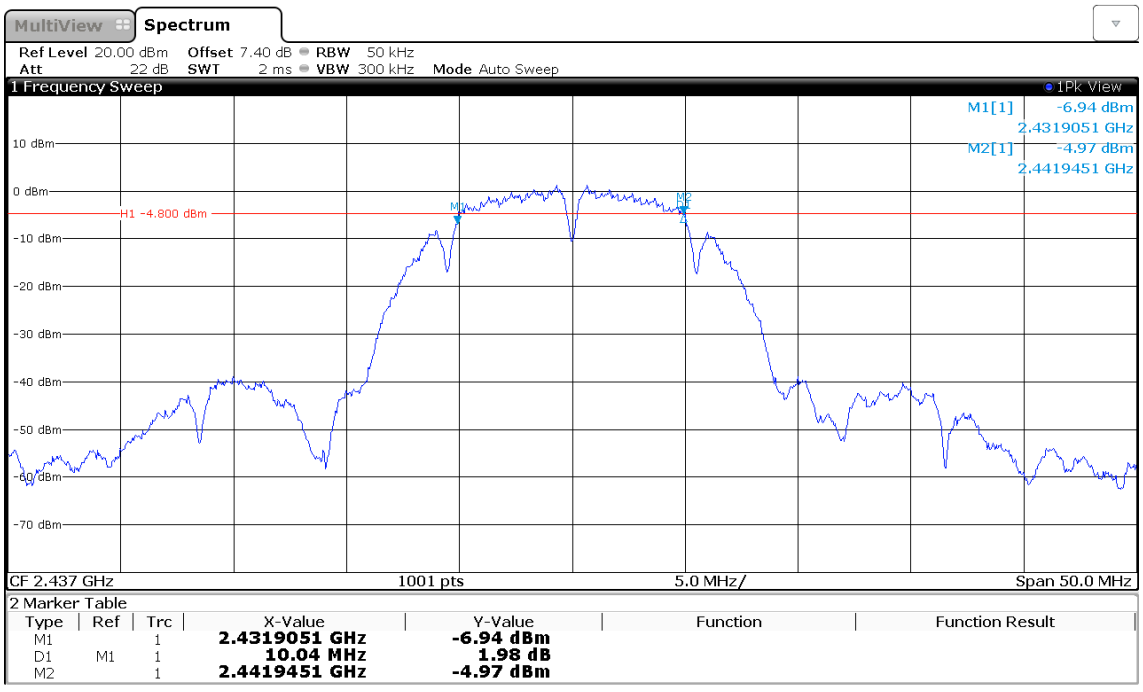
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 b, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Lower Frequency [MHz]:	2406.905
Upper Frequency [MHz]:	2416.945
6 dB Bandwidth [kHz]:	10040



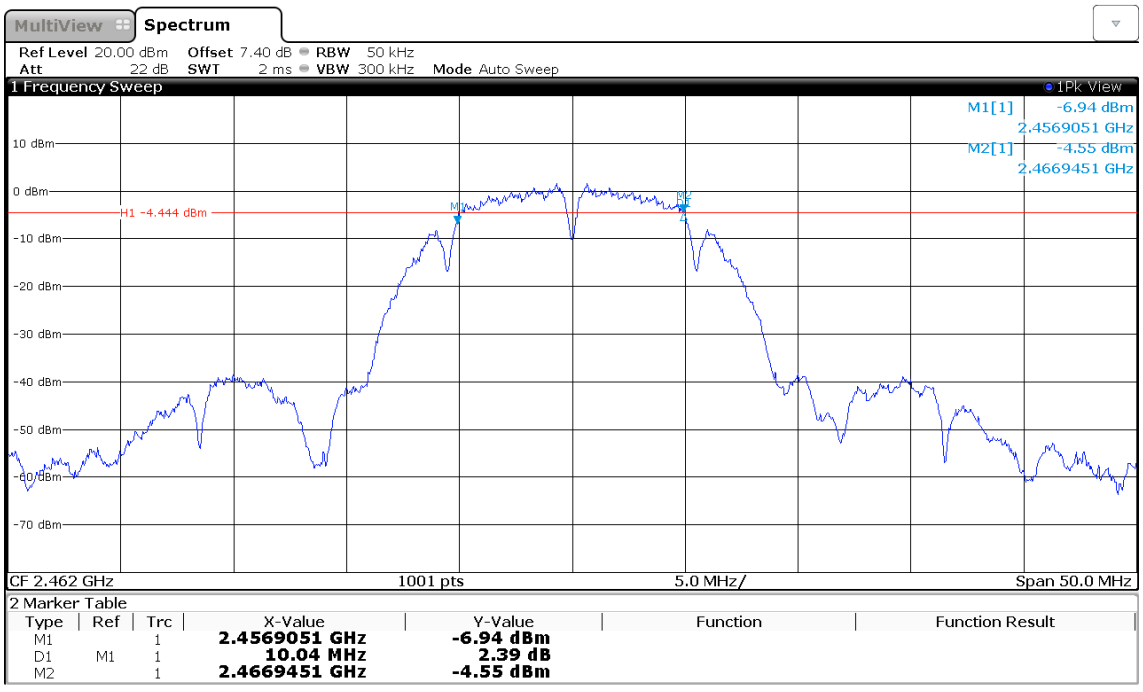
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 b, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Lower Frequency [MHz]:	2431.905
Upper Frequency [MHz]:	2441.945
6 dB Bandwidth [kHz]:	10040



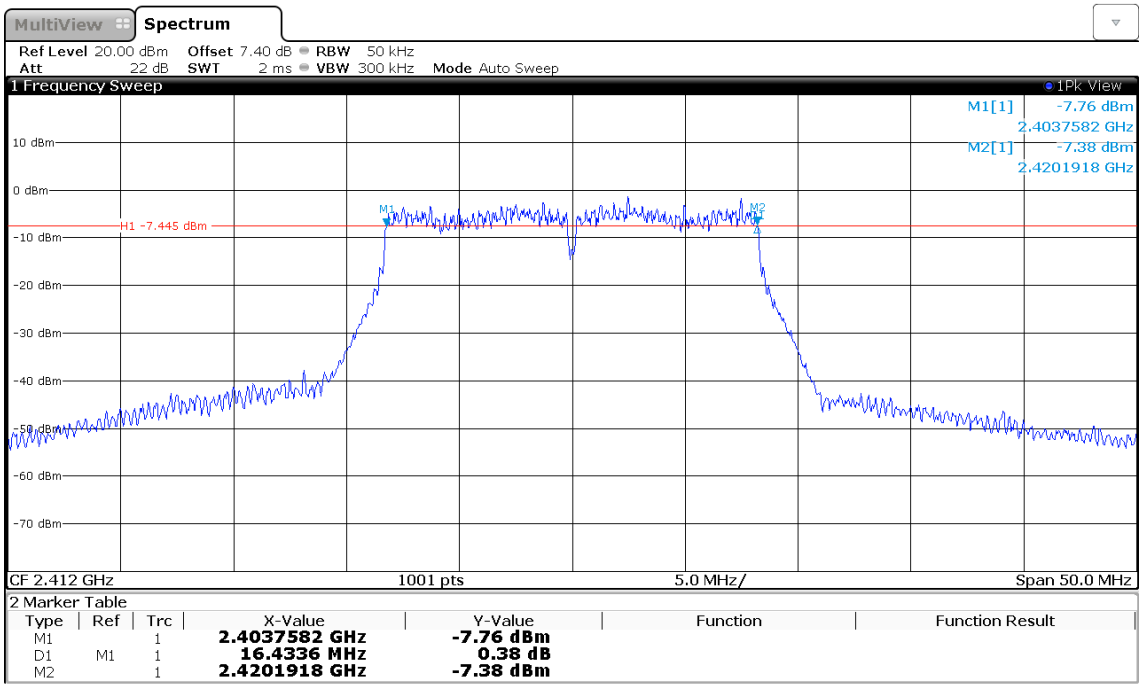
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 b, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Lower Frequency [MHz]:	2456.905
Upper Frequency [MHz]:	2466.945
6 dB Bandwidth [kHz]:	10040



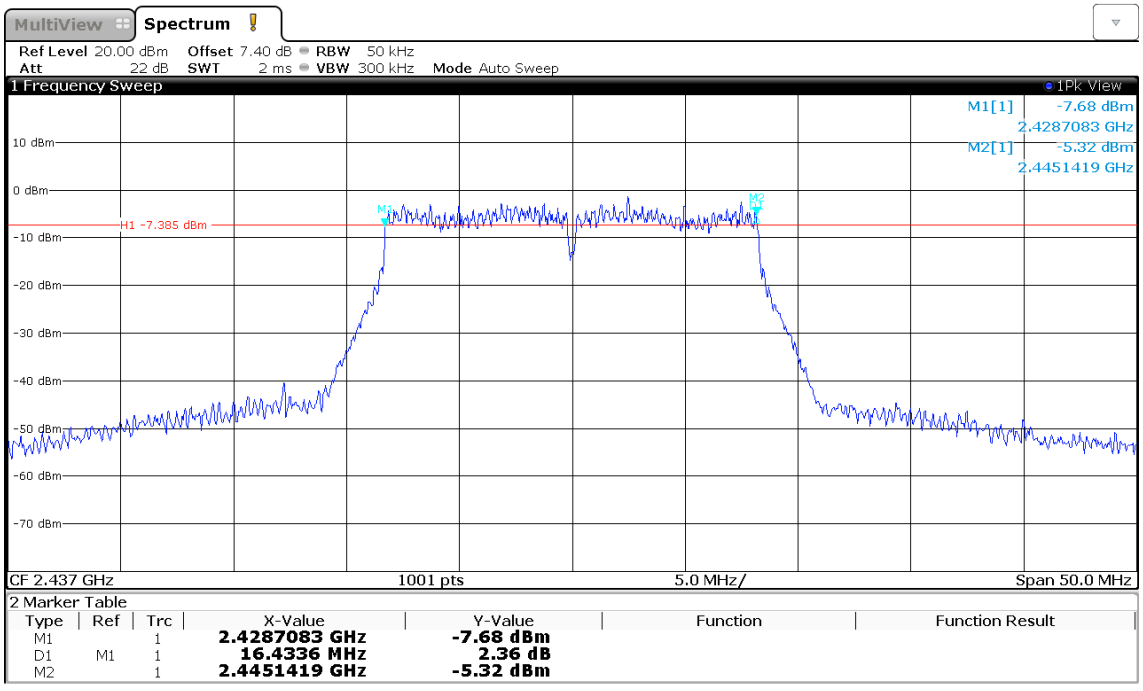
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 g, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Lower Frequency [MHz]:	2403.758
Upper Frequency [MHz]:	2420.192
6 dB Bandwidth [kHz]:	16434



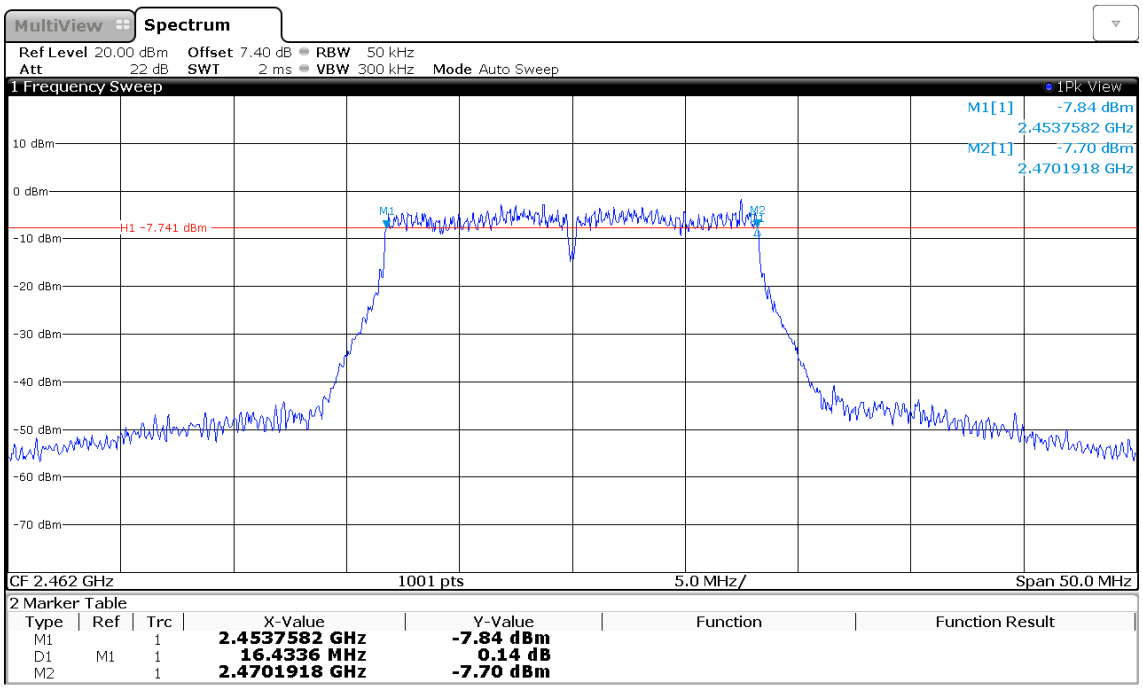
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 g, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Lower Frequency [MHz]:	2428.708
Upper Frequency [MHz]:	2445.142
6 dB Bandwidth [kHz]:	16434



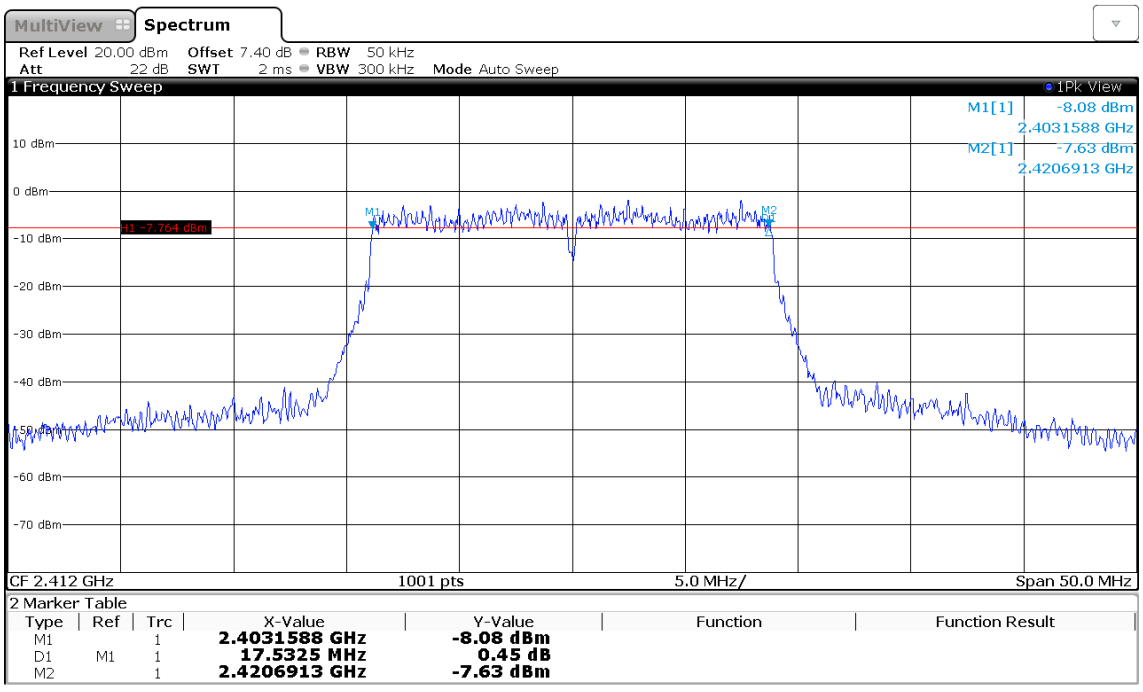
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 g, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Lower Frequency [MHz]:	2453.758
Upper Frequency [MHz]:	2470.192
6 dB Bandwidth [kHz]:	16434



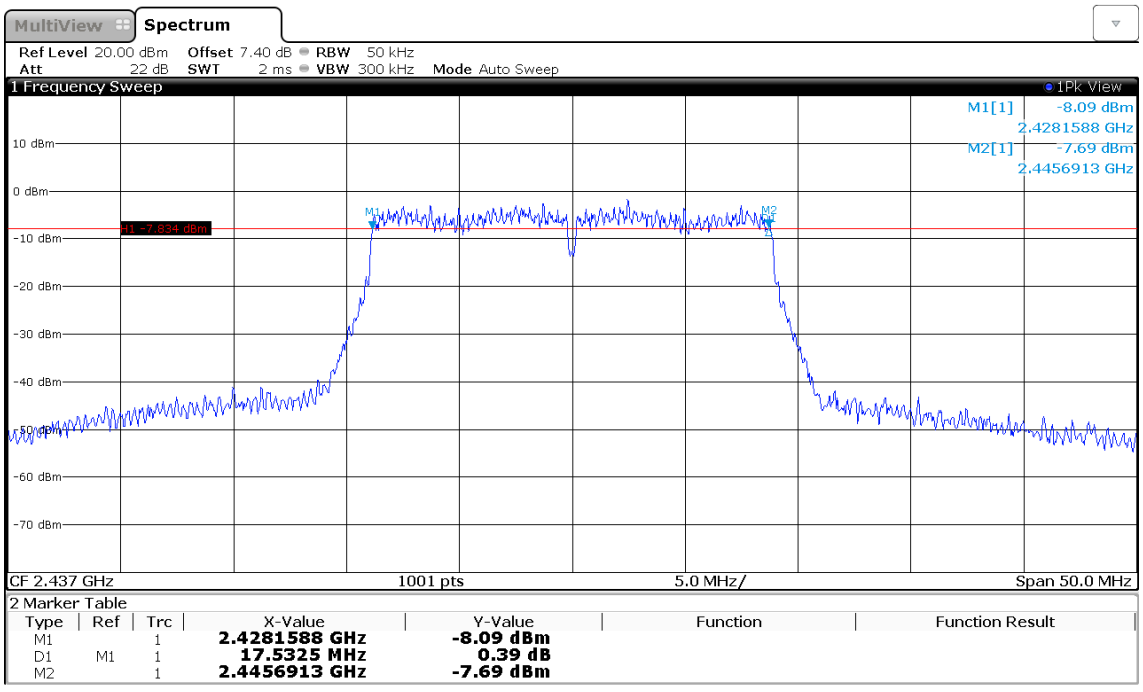
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 n HT20, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Lower Frequency [MHz]:	2403.159
Upper Frequency [MHz]:	2420.691
6 dB Bandwidth [kHz]:	17532



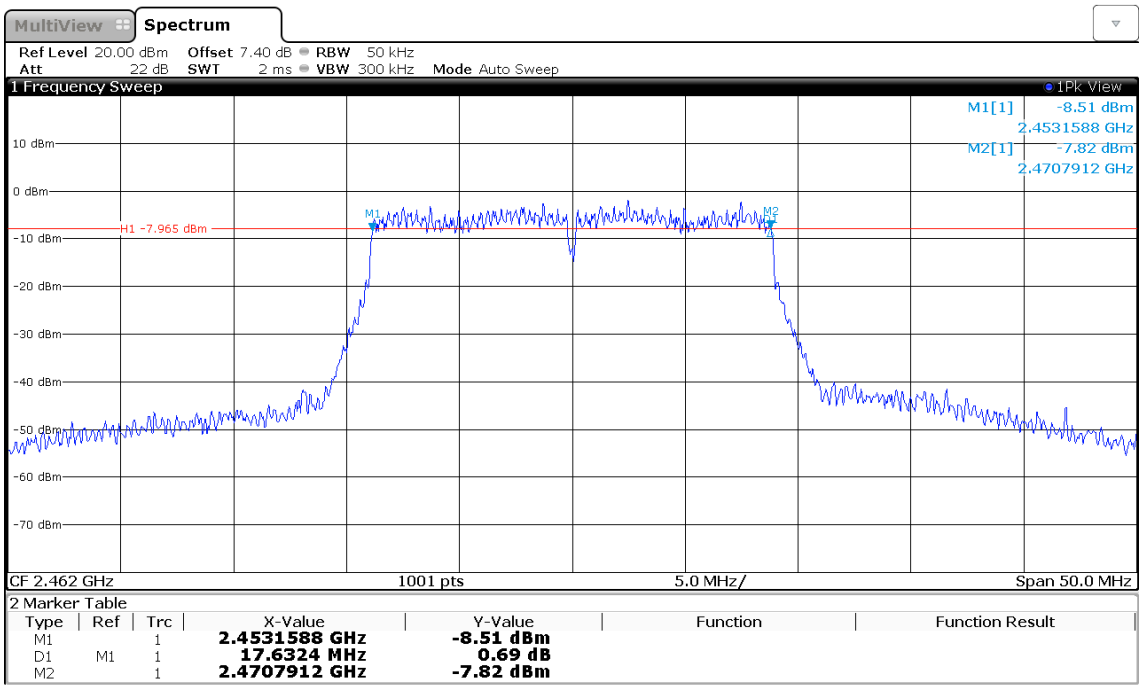
DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 n HT20, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Lower Frequency [MHz]:	2428.159
Upper Frequency [MHz]:	2445.691
6 dB Bandwidth [kHz]:	17532



DTS (6 dB) Bandwidth

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	IEEE 802.11 n HT20, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Lower Frequency [MHz]:	2453.159
Upper Frequency [MHz]:	2470.791
6 dB Bandwidth [kHz]:	17632



3.3 Test Conditions and Results - Maximum peak conducted output power

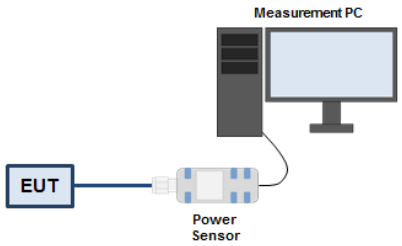
3.3.1 Information

Test Information	
Reference	FCC § 15.247(b)(1); ISED RSS-247, Issue 2 (section 5.4)
Measurement Method	ANSI C63.10 11.9.1
Operator	Abdullah Al Jamal
Date	2019-07-25

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
Power Sensor	R&S	NRP-Z81	EF00830	2018-07	2019-07

3.3.5 Procedure

Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. The EUT antenna port is connected to a wideband power sensor 3. The peak power is measured with the power sensor 4. If the EUT has more than one transmit chain the procedure is repeated for each transmit chain and the power is summed up

3.3.6 Results

Test Results - DSSS				
Channel [MHz]	Power Port 1 [dBm]	Power Port 2 [dBm]	Limit [W]	Verdict
2412	15.9	16.2	1.0	PASS
2437	16.1	15.9	1.0	PASS
2462	16.5	16.3	1.0	PASS

Test Results - OFDM				
Channel [MHz]	Power Port 1 [dBm]	Power Port 2 [dBm]	Limit [W]	Verdict
2412	22.0	21.2	1.0	PASS
2437	21.7	21.3	1.0	PASS
2462	22.2	21.8	1.0	PASS

Test Results - HT20						
Channel [MHz]	Power Port 1 [dBm]	Power Port 2 [dBm]	Total Power [dBm]	Total Power [W]	Limit [W]	Verdict
2412	21.9	21.3	24.6	0.290	1.0	PASS
2437	22.2	21.3	24.8	0.301	1.0	PASS
2462	22.4	21.6	25.0	0.318	1.0	PASS

3.4 Test Conditions and Results - Power spectral density

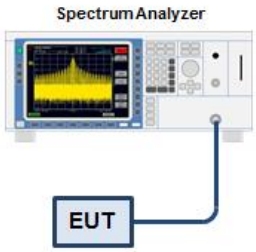
3.4.1 Information

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
Operator	Abdullah Al Jamal
Date	2019-06-07

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 Analyzer	R&S	FSW 43	EF00896	2018-07	2019-07

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

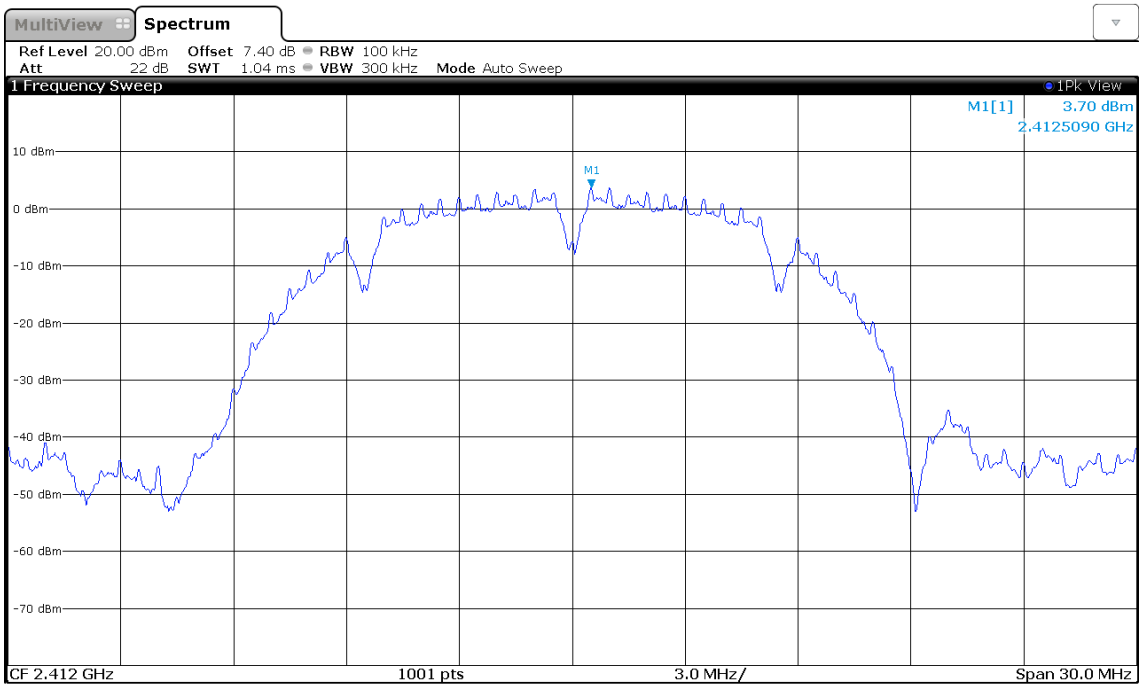
Test Results - DSSS				
Channel [MHz]	PSD Port 1 [dBm/RBW]	PSD Port 2 [dBm/RBW]	Limit [dBm/3kHz]	Verdict
2412	3.22	3.70	8.0	PASS
2437	3.38	3.23	8.0	PASS
2462	3.78	3.86	8.0	PASS

Test Results - OFDM				
Channel [MHz]	PSD Port 1 [dBm/RBW]	PSD Port 2 [dBm/RBW]	Limit [dBm/3kHz]	Verdict
2412	1.49	1.77	8.0	PASS
2437	0.95	1.41	8.0	PASS
2462	1.17	1.32	8.0	PASS

Test Results - HT20					
Channel [MHz]	PSD Port 1 [dBm/RBW]	PSD Port 2 [dBm/RBW]	Total PSD [dBm/RBW]	Limit [dBm/3kHz]	Verdict
2412	0.73	1.33	4.05	8.0	PASS
2437	0.76	1.09	3.94	8.0	PASS
2462	0.86	0.92	3.90	8.0	PASS
RBW = 100 kHz					

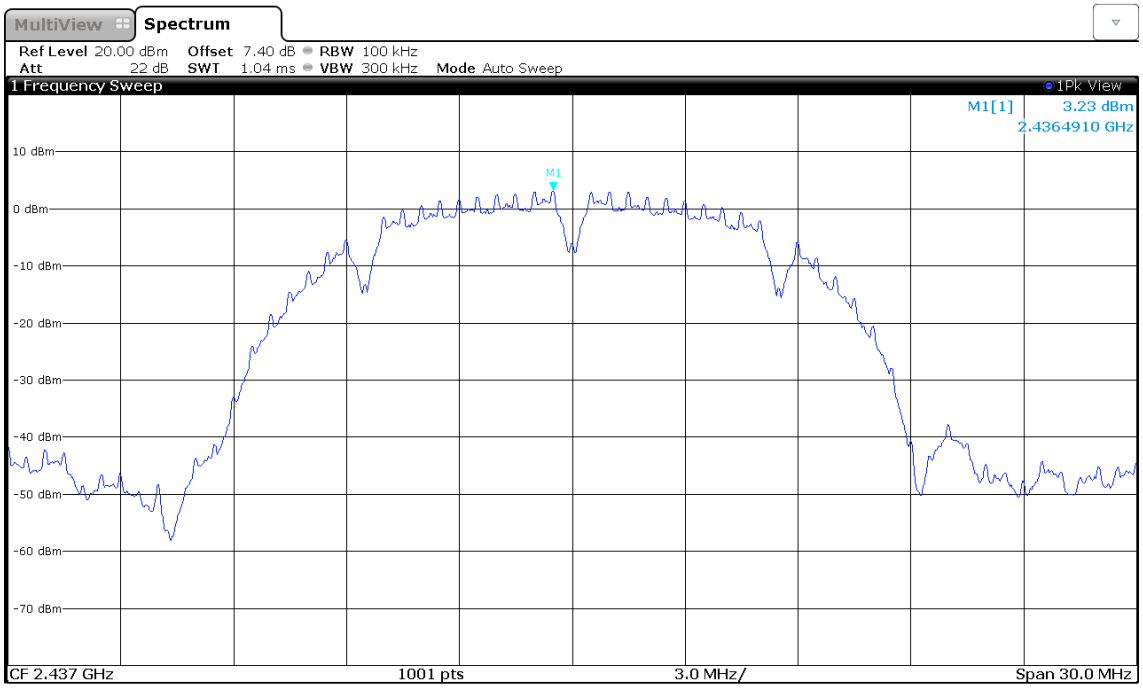
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 b, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Peak Frequency [MHz]:	2412.509
Spectral Density [dBm/RBW]:	3.697
Resolution Bandwidth [kHz]:	100 kHz



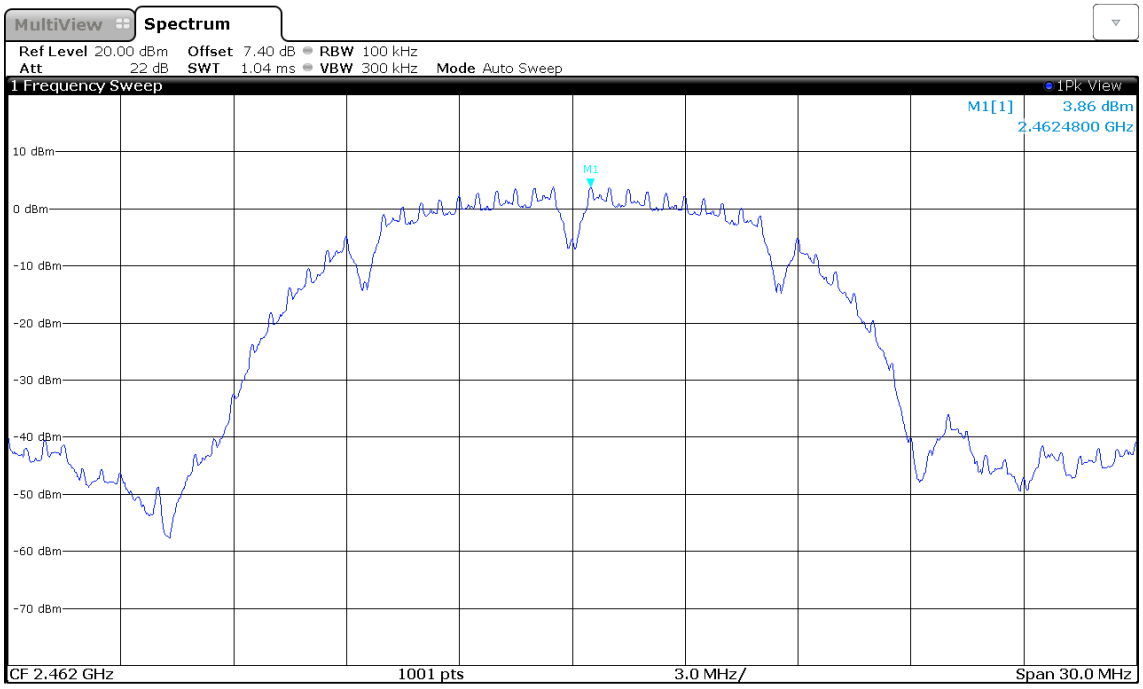
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 b, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Peak Frequency [MHz]:	2436.491
Spectral Density [dBm/RBW]:	3.226
Resolution Bandwidth [kHz]:	100 kHz



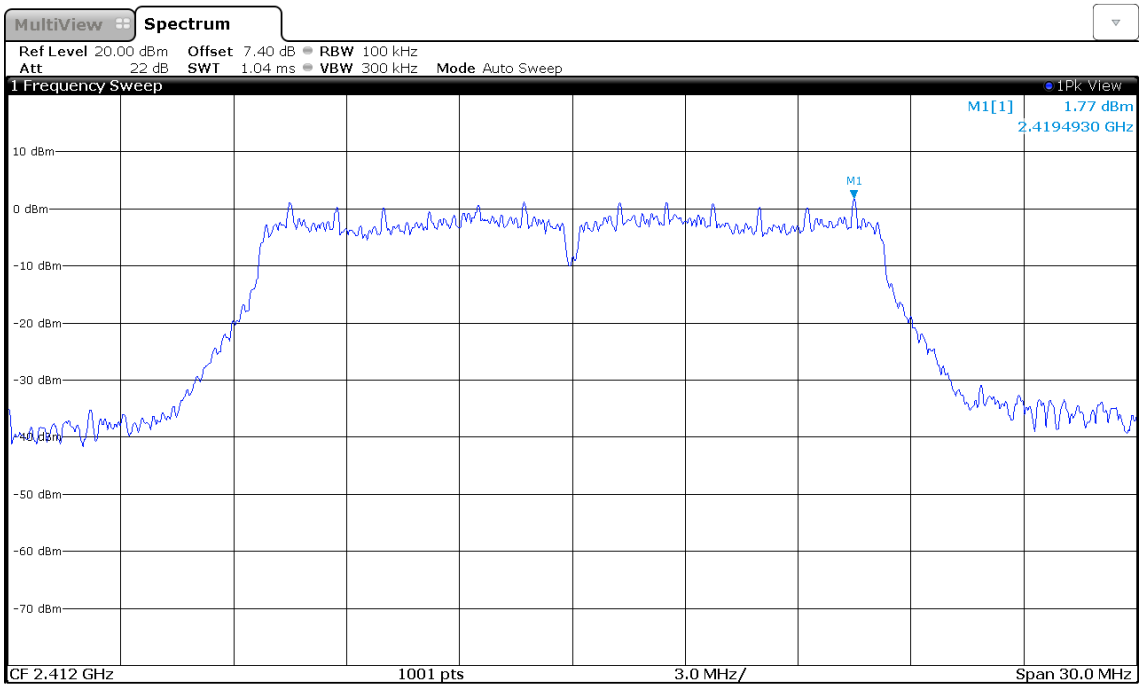
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 b, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Peak Frequency [MHz]:	2462.480
Spectral Density [dBm/RBW]:	3.856
Resolution Bandwidth [kHz]:	100 kHz



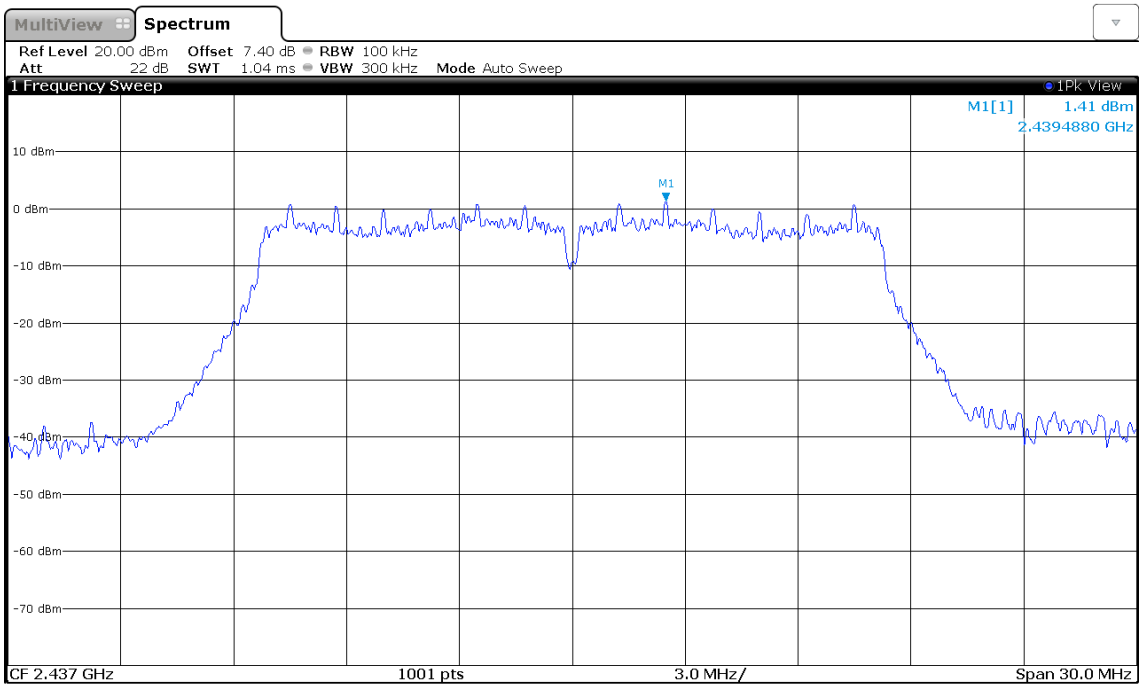
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 g, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Peak Frequency [MHz]:	2419.493
Spectral Density [dBm/RBW]:	1.767
Resolution Bandwidth [kHz]:	100 kHz



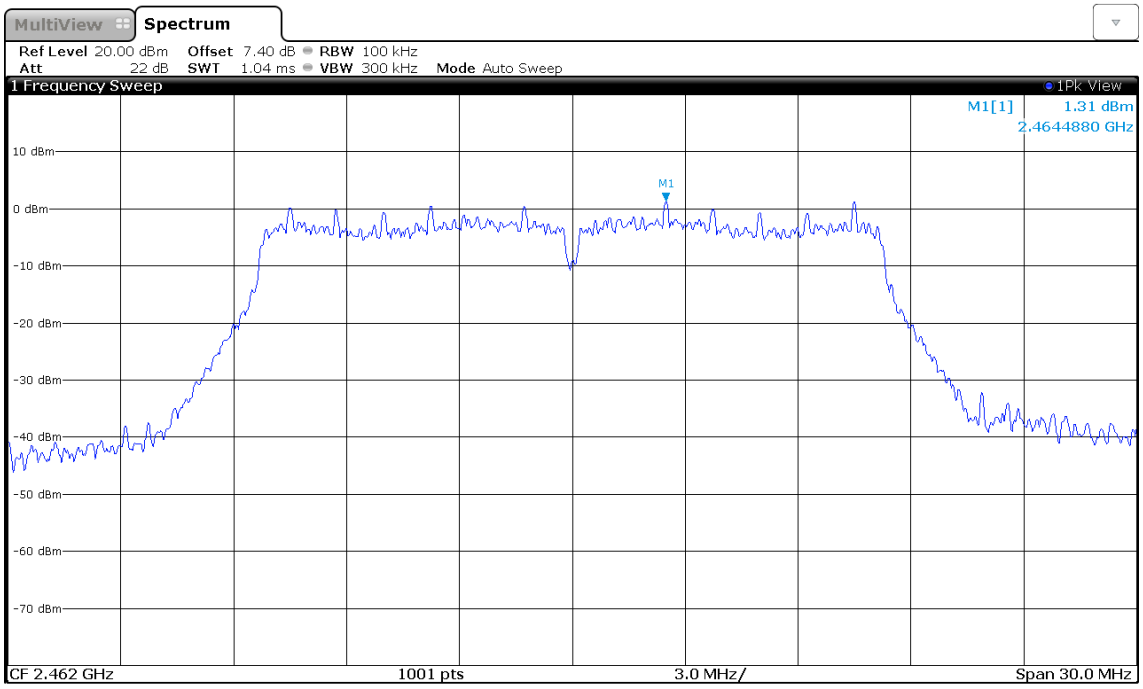
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 g, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Peak Frequency [MHz]:	2439.488
Spectral Density [dBm/RBW]:	1.406
Resolution Bandwidth [kHz]:	100 kHz



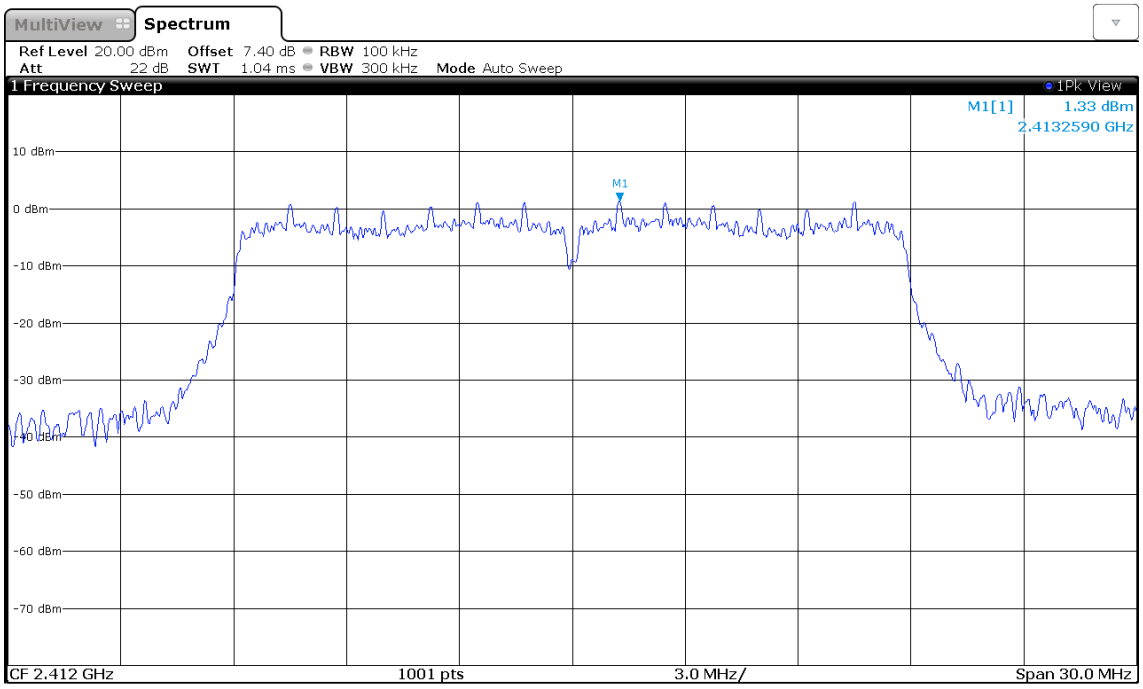
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 g, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Peak Frequency [MHz]:	2464.488
Spectral Density [dBm/RBW]:	1.315
Resolution Bandwidth [kHz]:	100 kHz



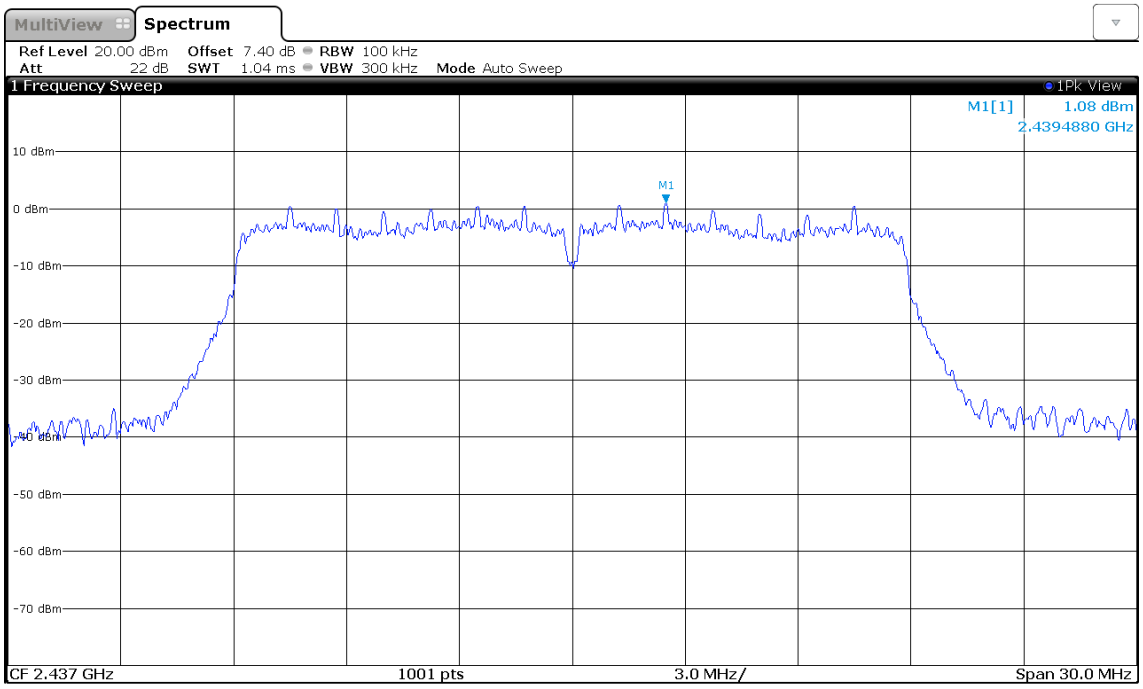
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 n HT20, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Peak Frequency [MHz]:	2413.259
Spectral Density [dBm/RBW]:	1.333
Resolution Bandwidth [kHz]:	100 kHz



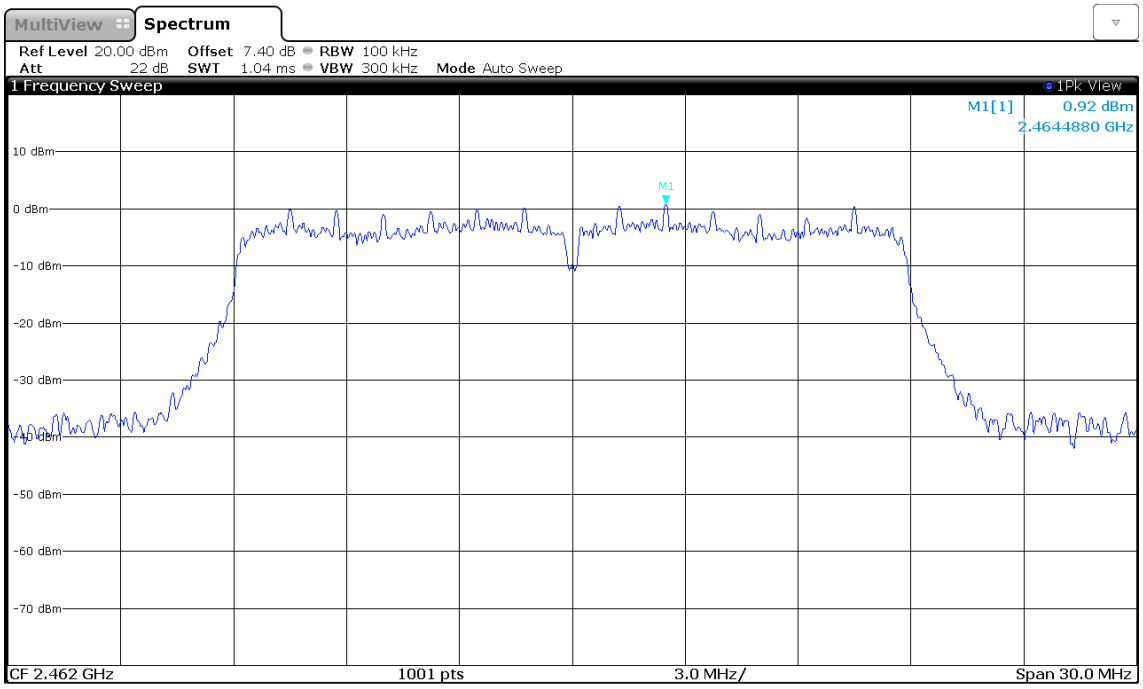
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 n HT20, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Peak Frequency [MHz]:	2439.488
Spectral Density [dBm/RBW]:	1.085
Resolution Bandwidth [kHz]:	100 kHz



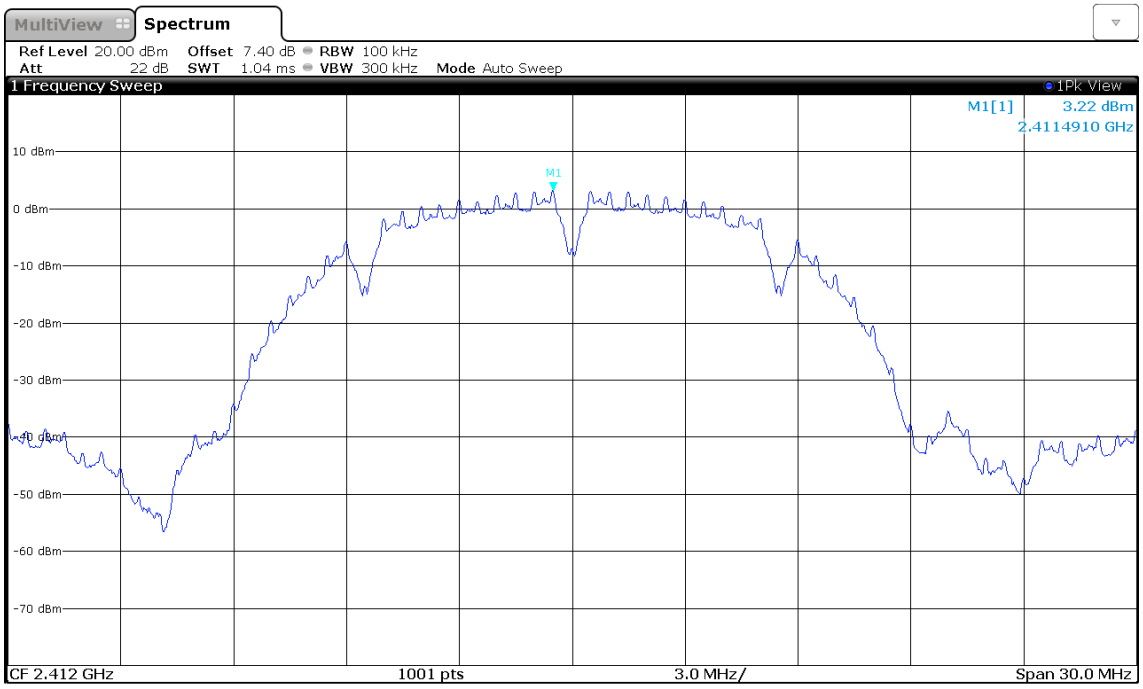
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 n HT20, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Peak Frequency [MHz]:	2464.488
Spectral Density [dBm/RBW]:	0.919
Resolution Bandwidth [kHz]:	100 kHz



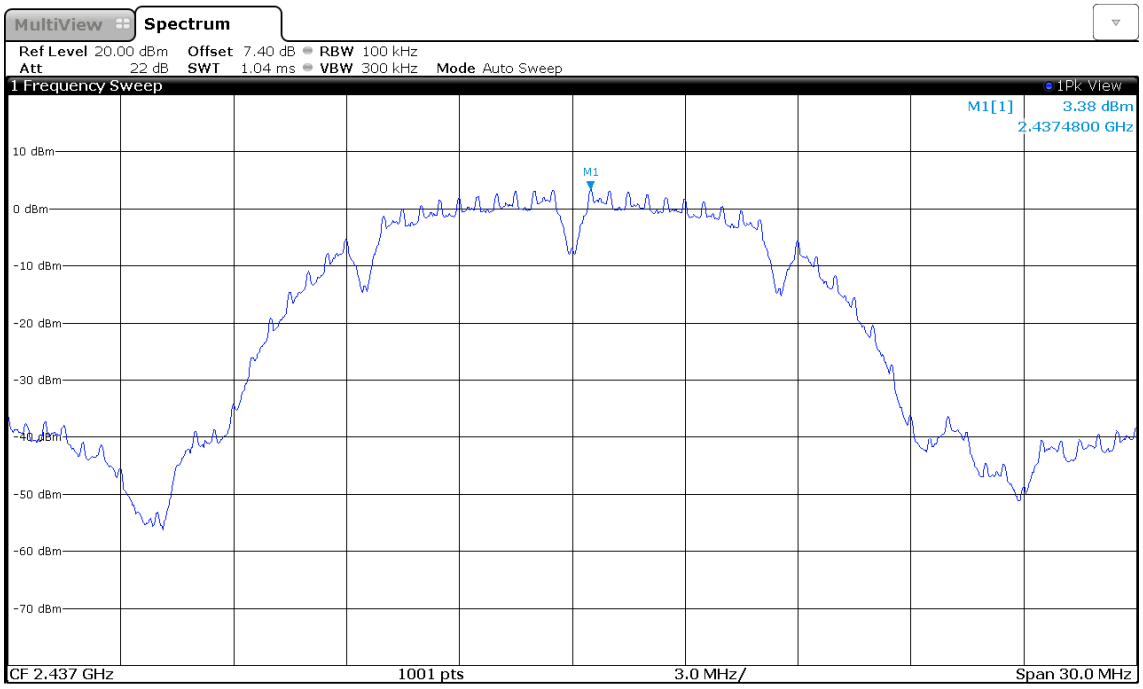
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 b, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Peak Frequency [MHz]:	2411.491
Spectral Density [dBm/RBW]:	3.219
Resolution Bandwidth [kHz]:	100 kHz



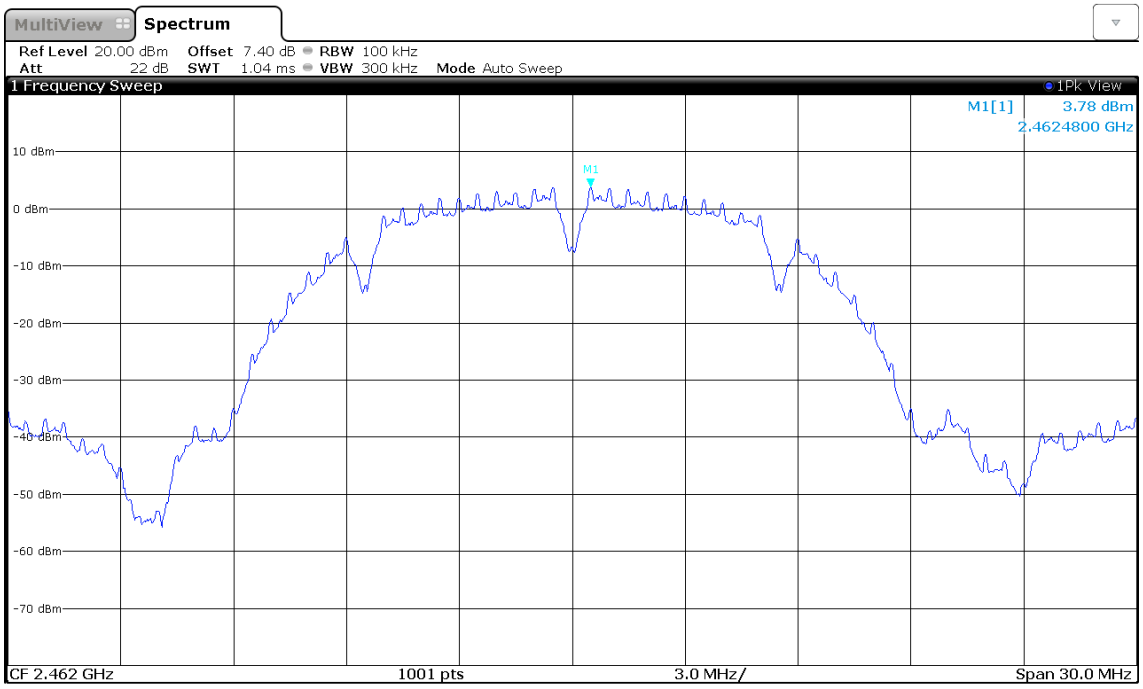
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 b, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Peak Frequency [MHz]:	2437.480
Spectral Density [dBm/RBW]:	3.376
Resolution Bandwidth [kHz]:	100 kHz



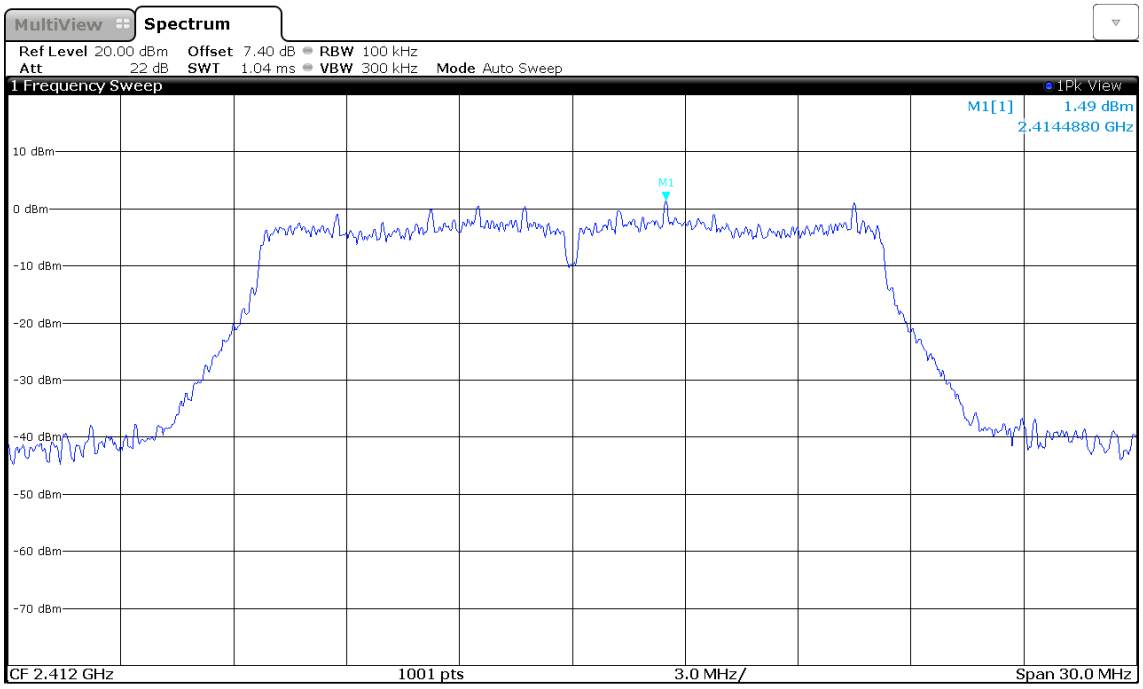
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 b, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Peak Frequency [MHz]:	2462.480
Spectral Density [dBm/RBW]:	3.784
Resolution Bandwidth [kHz]:	100 kHz



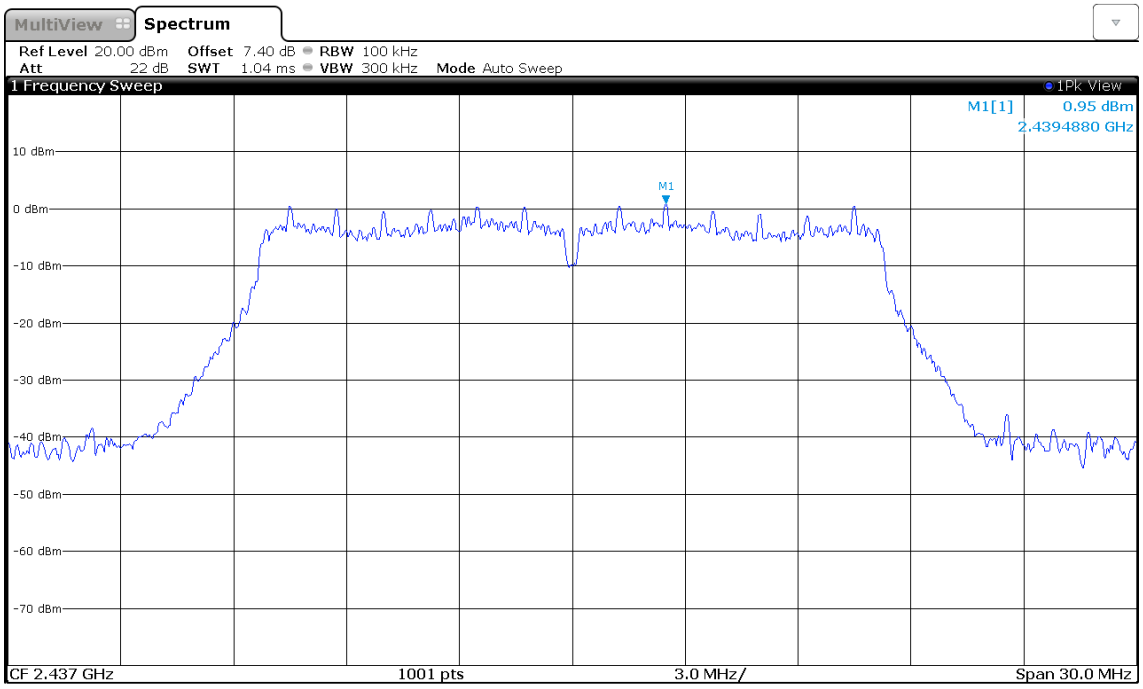
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 g, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Peak Frequency [MHz]:	2414.488
Spectral Density [dBm/RBW]:	1.486
Resolution Bandwidth [kHz]:	100 kHz



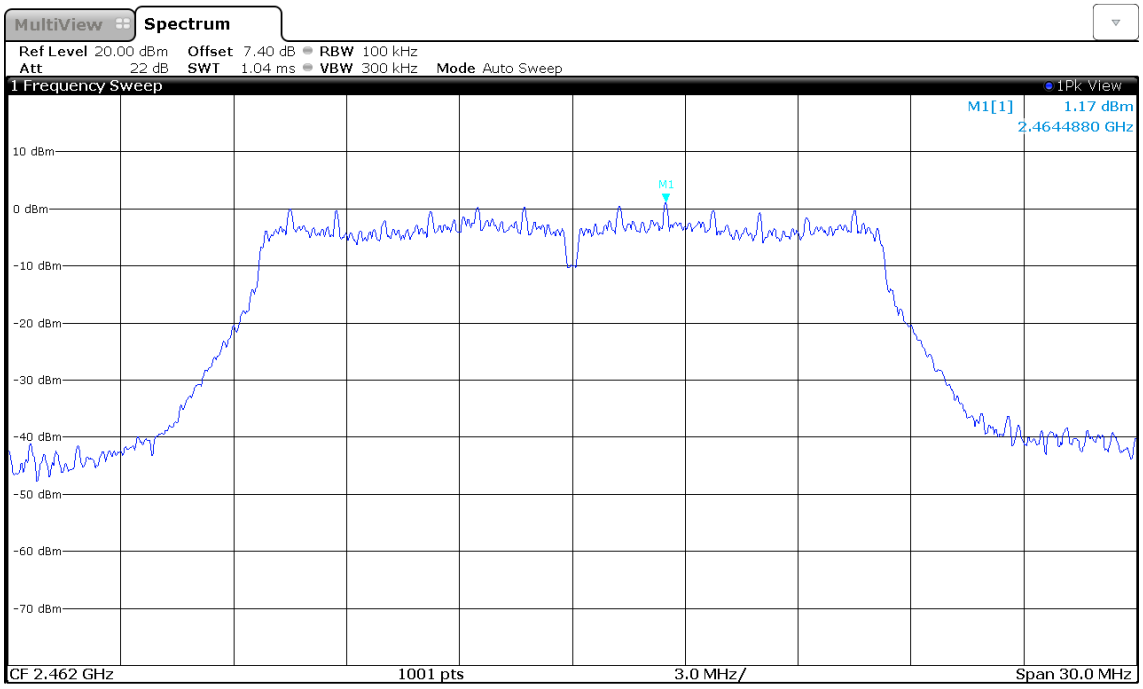
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 g, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Peak Frequency [MHz]:	2439.488
Spectral Density [dBm/RBW]:	0.950
Resolution Bandwidth [kHz]:	100 kHz



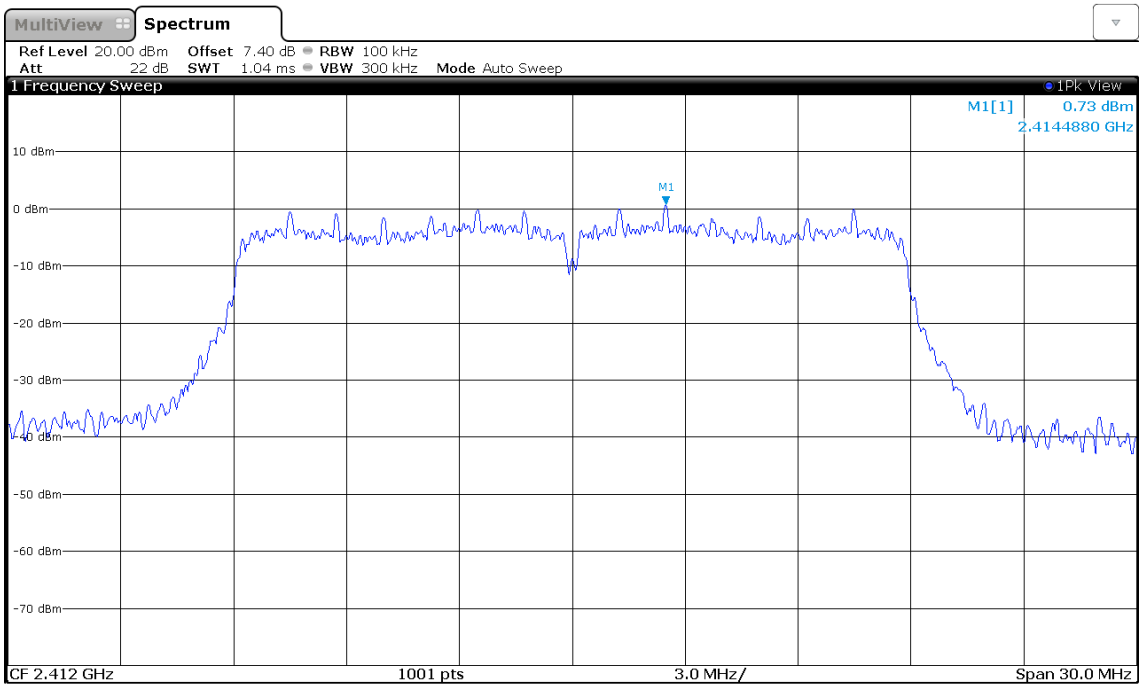
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 g, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Peak Frequency [MHz]:	2464.488
Spectral Density [dBm/RBW]:	1.173
Resolution Bandwidth [kHz]:	100 kHz



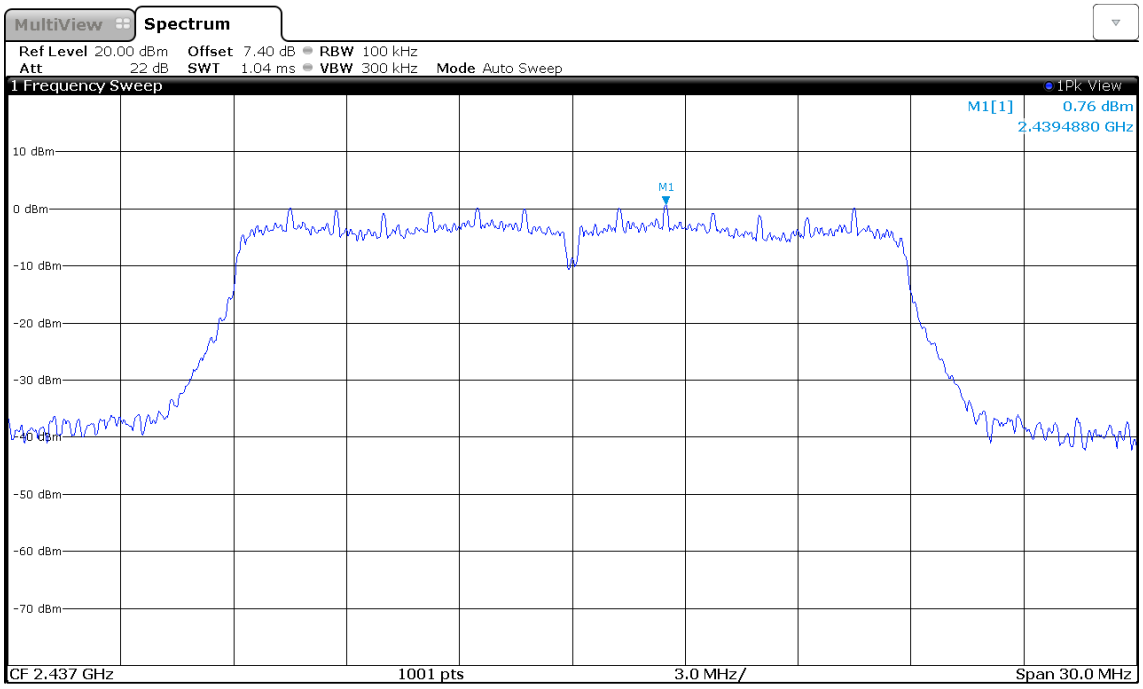
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 n HT20, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Peak Frequency [MHz]:	2414.488
Spectral Density [dBm/RBW]:	0.734
Resolution Bandwidth [kHz]:	100 kHz



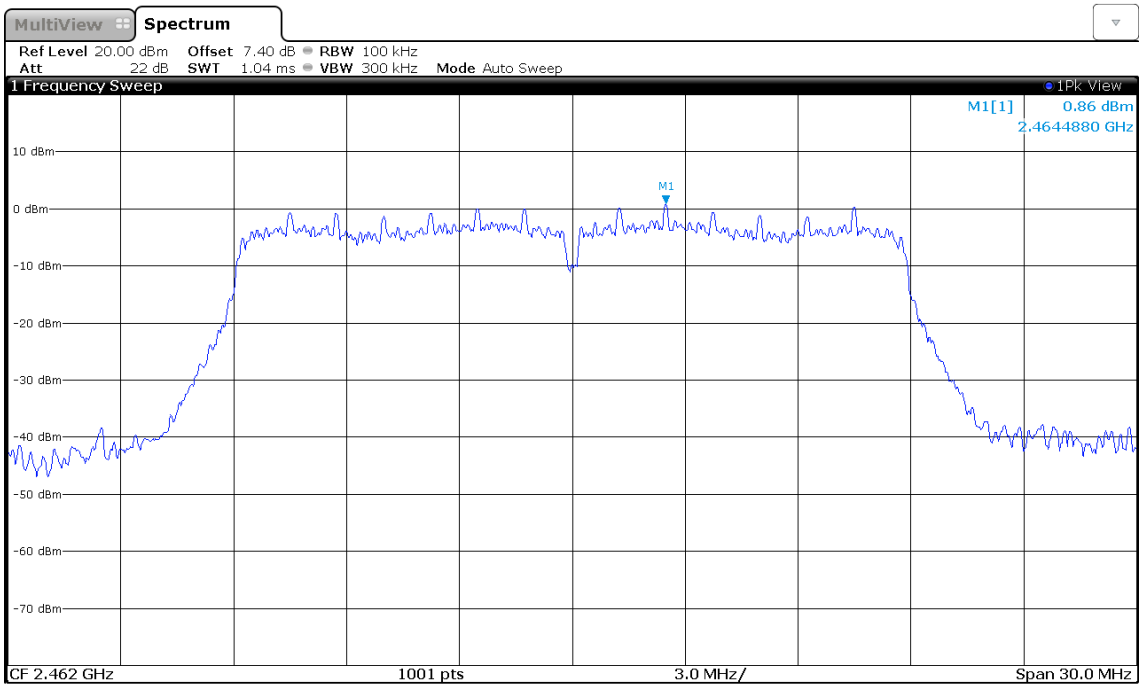
Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 n HT20, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Peak Frequency [MHz]:	2439.488
Spectral Density [dBm/RBW]:	0.762
Resolution Bandwidth [kHz]:	100 kHz



Peak Power Spectral Density

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	IEEE 802.11 n HT20, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Peak Frequency [MHz]:	2464.488
Spectral Density [dBm/RBW]:	0.861
Resolution Bandwidth [kHz]:	100 kHz



3.5 Test Conditions and Results - AC powerline conducted emissions

3.5.1 Information

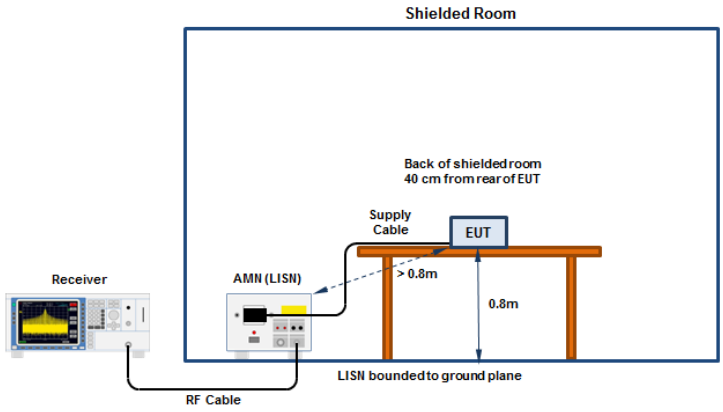
Test Information	
Reference	FCC § 15.207; ISED RSS-247, Issue 2 (section 3.1)
Measurement Method	ANSI C63.10 6.2
Operator	Abdullah Al Jamal
Date	2019-06-24

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	2016.1.10

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	R&S	ESU 26	EF00241	2017-07	2019-07
LISN	R&S	ESH3-Z5	EF00036	2017-01	2019-07

EMI voltage test in the ac-mains according to FCC 47 CFR §15.207

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6°C, Unom: 120 VAC (external power supply)
LISN:	ESH3-Z5 (N)
Mode:	2437 MHz
Test Date:	2019-06-24
Note:	

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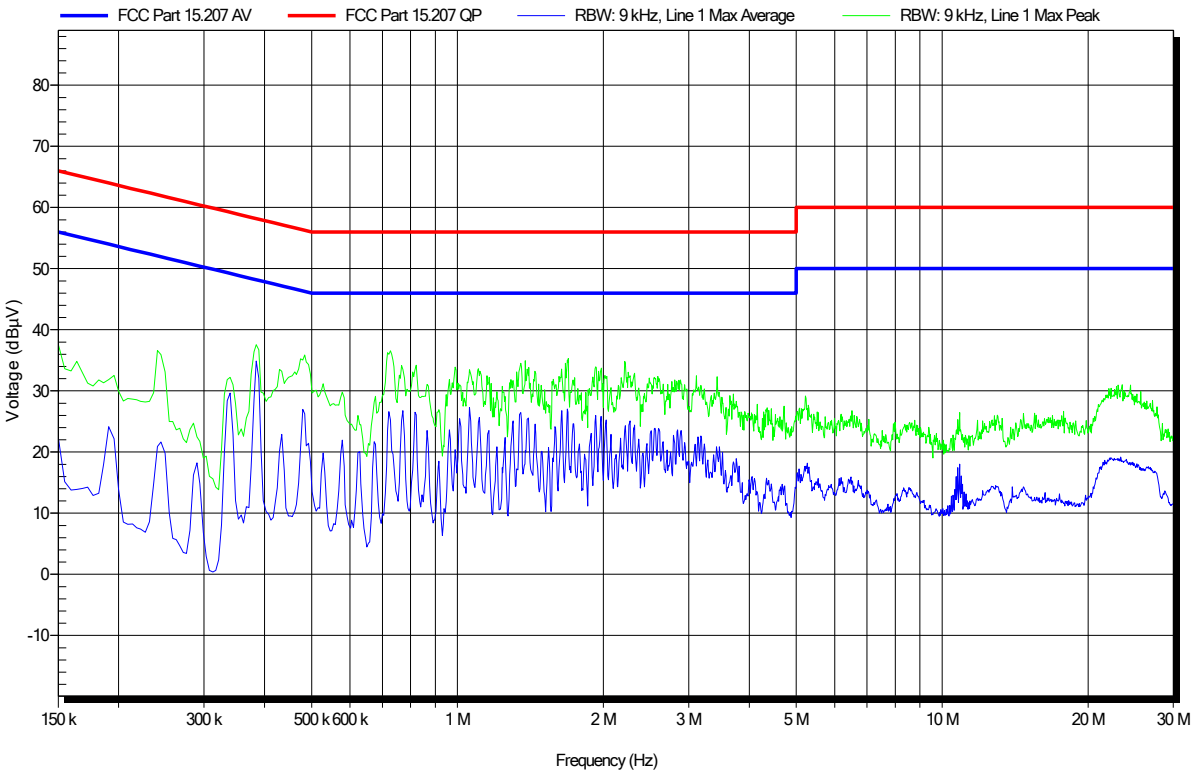

EMI voltage test in the ac-mains according to FCC 47 CFR §15.207

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6°C, Unom: 120 VAC (external power supply)
LISN:	ESH3-Z5 (L)
Mode:	2437 MHz
Test Date:	2019-06-24
Note:	

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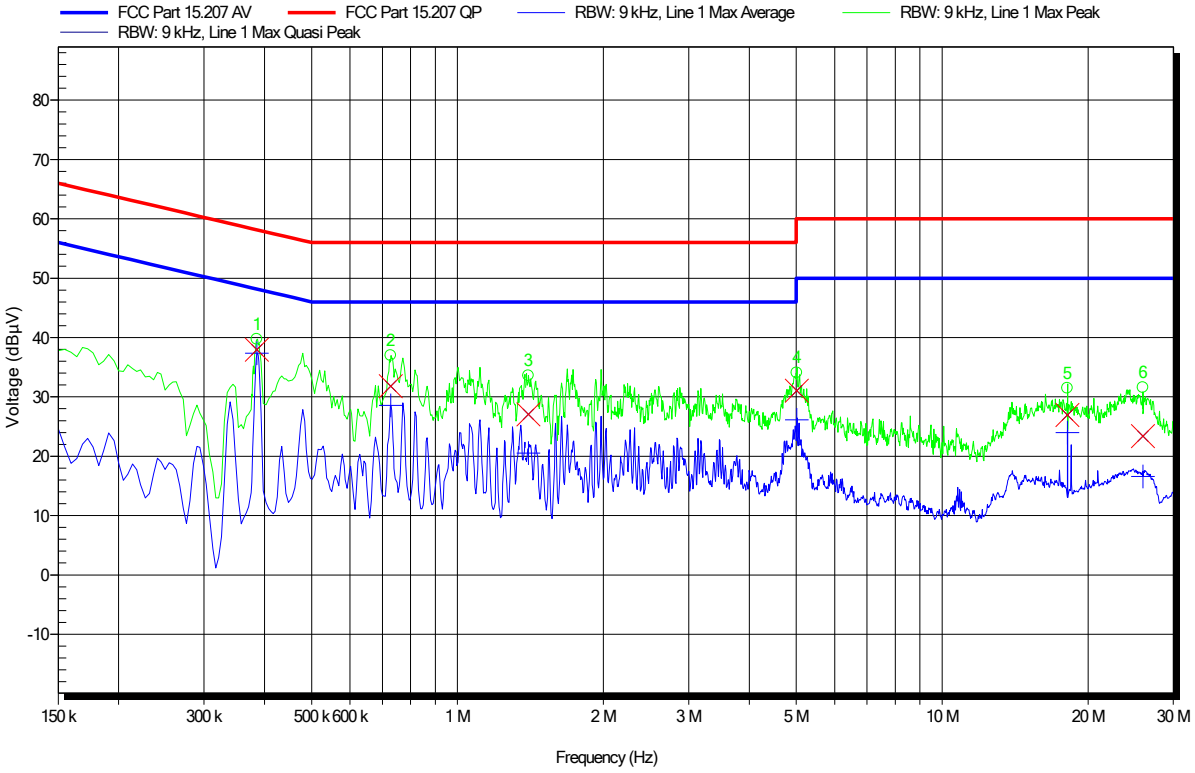


Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
1	385.8 kHz	37.94 dBµV	58.15 dBµV	-20.21 dB	Pass
2	727.8 kHz	31.79 dBµV	56 dBµV	-24.21 dB	Pass
3	1.401 MHz	27.07 dBµV	56 dBµV	-28.93 dB	Pass
4	5.014 MHz	31.05 dBµV	60 dBµV	-28.95 dB	Pass
5	18.138 MHz	26.95 dBµV	60 dBµV	-33.05 dB	Pass
6	25.967 MHz	23.39 dBµV	60 dBµV	-36.61 dB	Pass

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status
1	385.8 kHz	37.36 dBµV	48.15 dBµV	-10.8 dB	Pass
2	727.8 kHz	28.55 dBµV	46 dBµV	-17.45 dB	Pass
3	1.401 MHz	20.54 dBµV	46 dBµV	-25.46 dB	Pass
4	5.014 MHz	26.11 dBµV	50 dBµV	-23.89 dB	Pass
5	18.138 MHz	24 dBµV	50 dBµV	-26 dB	Pass
6	25.967 MHz	16.57 dBµV	50 dBµV	-33.43 dB	Pass

3.6 Test Conditions and Results - Band-edge compliance

3.6.1 Information

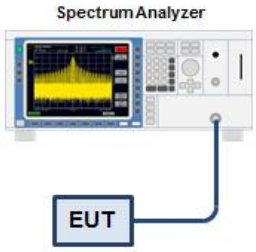
Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Method	ANSI C63.10 11.13
Operator	Abdullah Al Jamal
Date	2019-06-07

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 Analyzer	R&S	FSW 43	EF00896	2018-07	2019-07

3.6.5 Procedure

Test Procedure

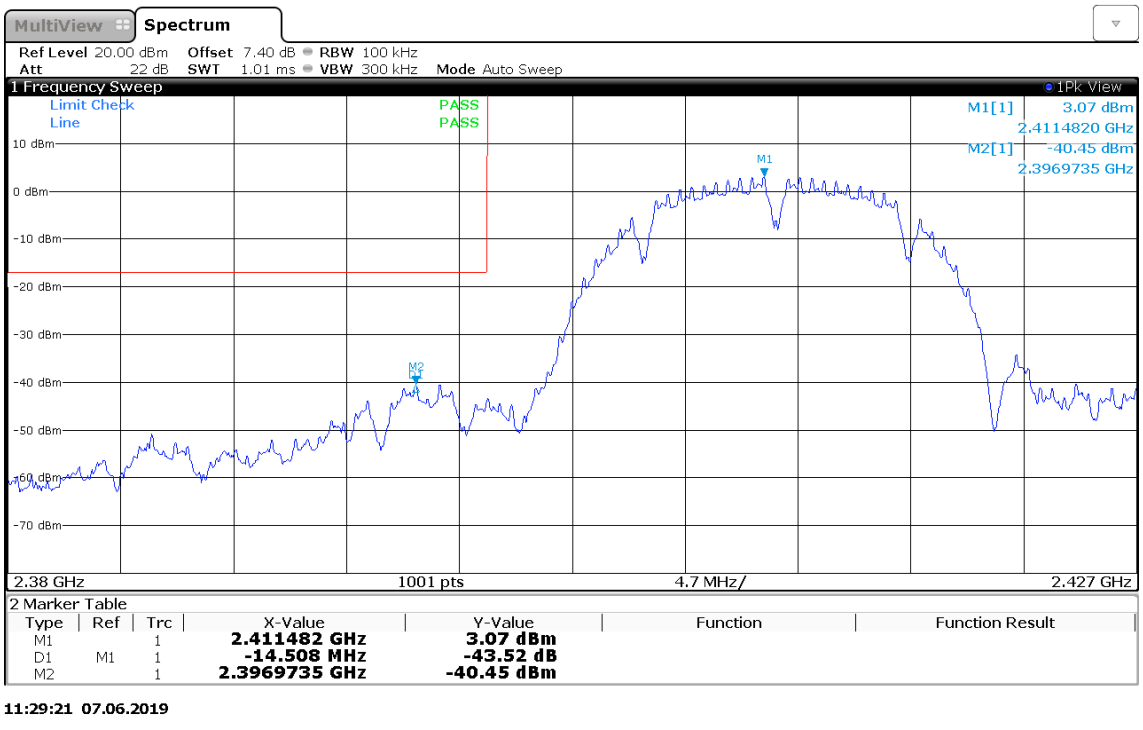
1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels within frequency band and outside frequency band
5. Band edge attenuation is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

3.6.6 Results

Test Results					
Port	Mode	Channel [MHz]	Out-of-band Attenuation [dB]	Limit [dB]	Verdict
1	DSSS	2412	-43.52	-20	PASS
1	DSSS	2462	-57.84	-20	PASS
1	OFDM	2412	-39.31	-20	PASS
1	OFDM	2462	-46.34	-20	PASS
1	HT20	2412	-33.86	-20	PASS
1	HT20	2462	-44.87	-20	PASS
2	DSSS	2412	-41.04	-20	PASS
2	DSSS	2462	-56.75	-20	PASS
2	OFDM	2412	-41.82	-20	PASS
2	OFDM	2462	-48.64	-20	PASS
2	HT20	2412	-37.24	-20	PASS
2	HT20	2462	-47.37	-20	PASS

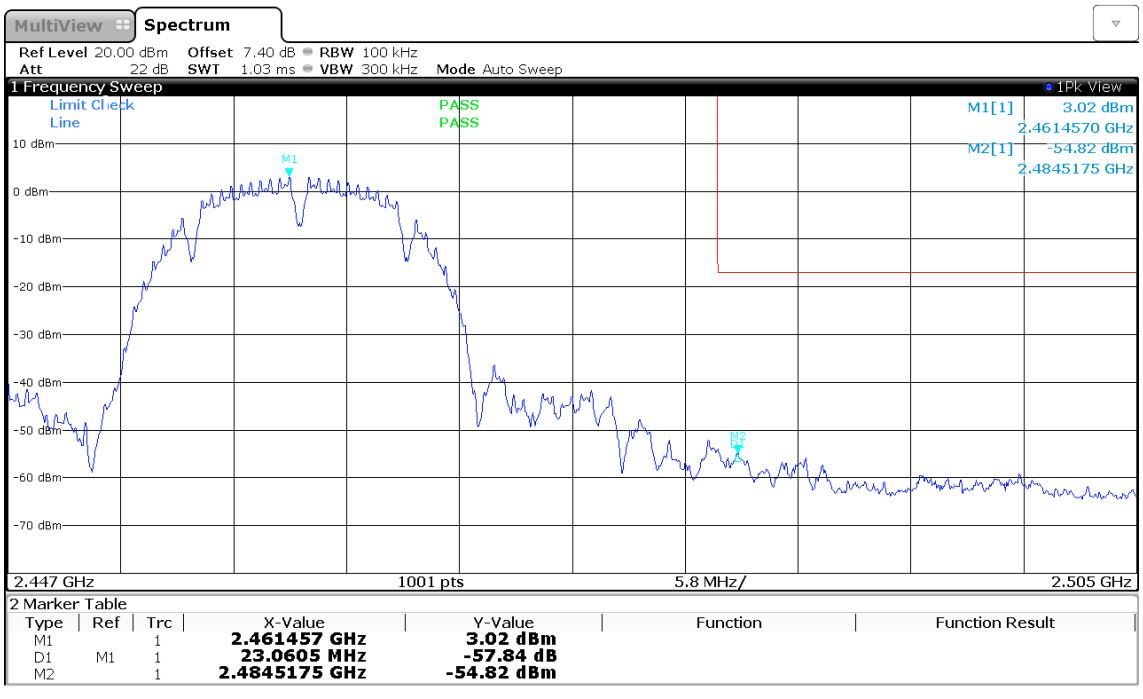
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 b, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Band-edge	Lower
In-band Frequency [MHz]:	2411.482
Max. in-band Level [dBm/100 kHz]:	3.071
Out-of-band Frequency [MHz]:	2396.974
Max. out-of-band Level [dBm/100 kHz]:	-40.448
Attenuation [dB]:	-43.52



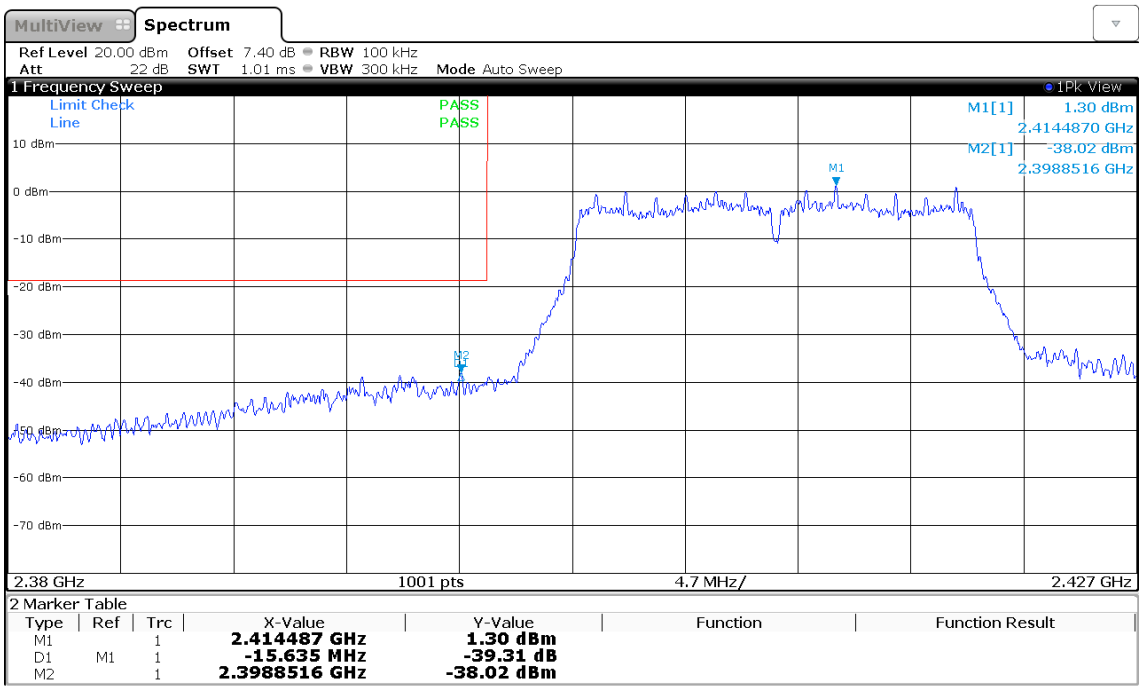
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 b, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Band-edge	Upper
In-band Frequency [MHz]:	2461.457
Max. in-band Level [dBm/100 kHz]:	3.022
Out-of-band Frequency [MHz]:	2484.517
Max. out-of-band Level [dBm/100 kHz]:	-54.818
Attenuation [dB]:	-57.84



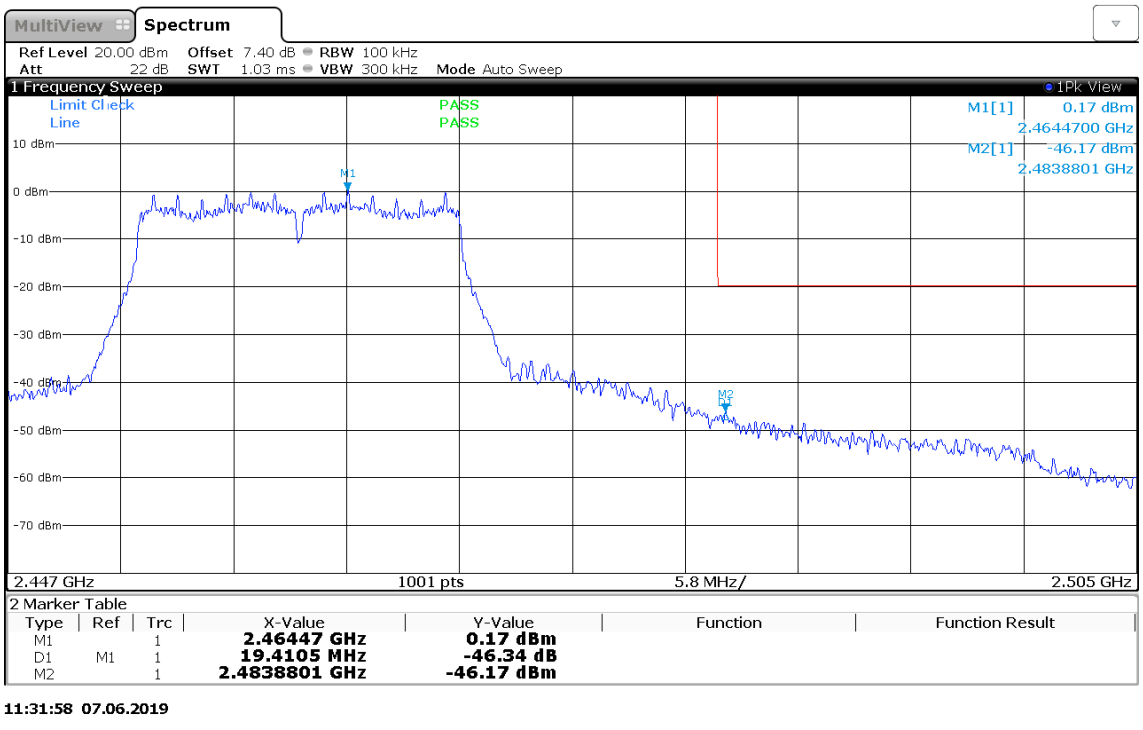
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 g, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Band-edge	Lower
In-band Frequency [MHz]:	2414.487
Max. in-band Level [dBm/100 kHz]:	1.295
Out-of-band Frequency [MHz]:	2398.852
Max. out-of-band Level [dBm/100 kHz]:	-38.018
Attenuation [dB]:	-39.31



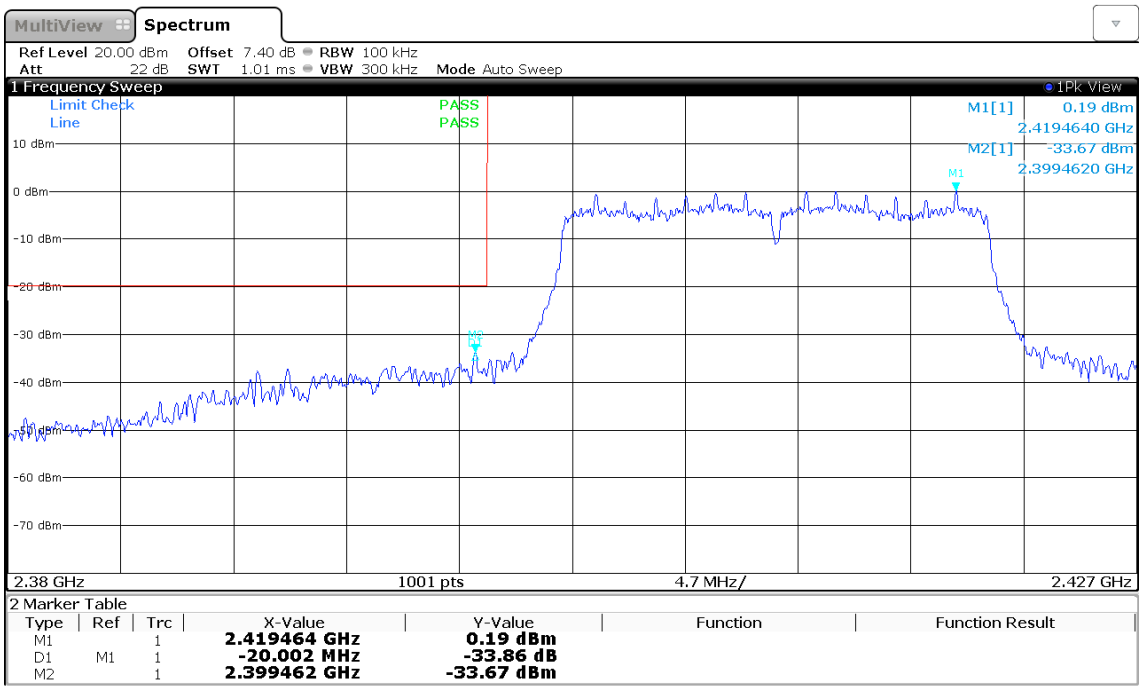
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 g, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Band-edge	Upper
In-band Frequency [MHz]:	2464.47
Max. in-band Level [dBm/100 kHz]:	0.17
Out-of-band Frequency [MHz]:	2483.88
Max. out-of-band Level [dBm/100 kHz]:	-46.166
Attenuation [dB]:	-46.34



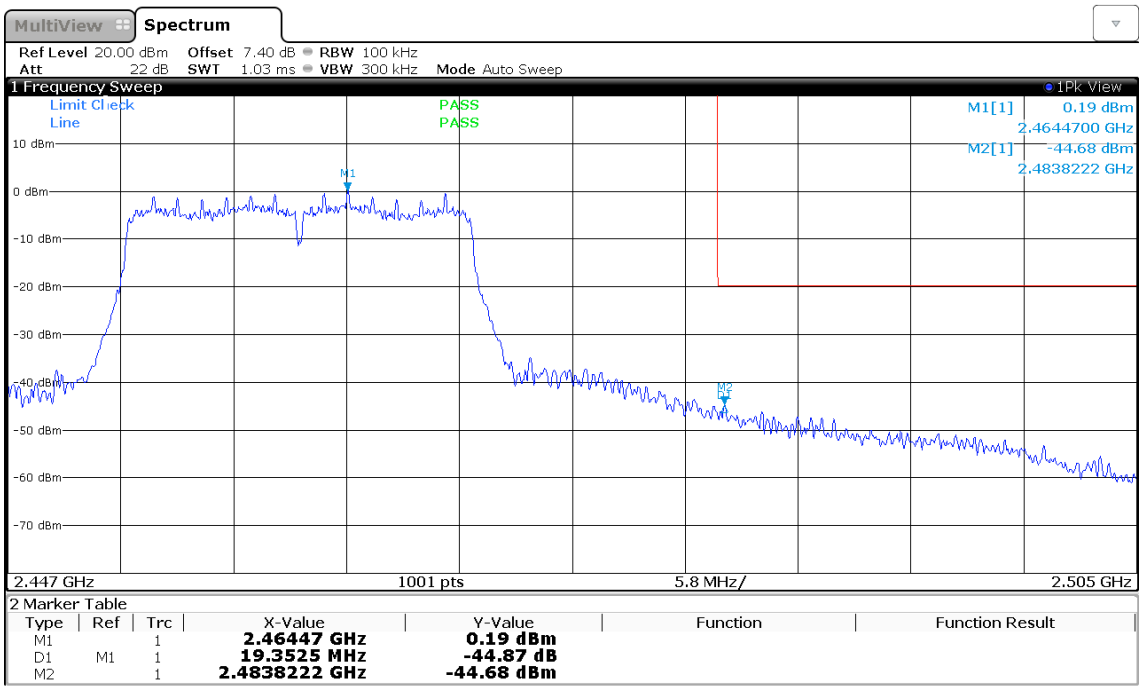
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 n HT20, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Band-edge	Lower
In-band Frequency [MHz]:	2419.464
Max. in-band Level [dBm/100 kHz]:	0.189
Out-of-band Frequency [MHz]:	2399.462
Max. out-of-band Level [dBm/100 kHz]:	-33.669
Attenuation [dB]:	-33.86



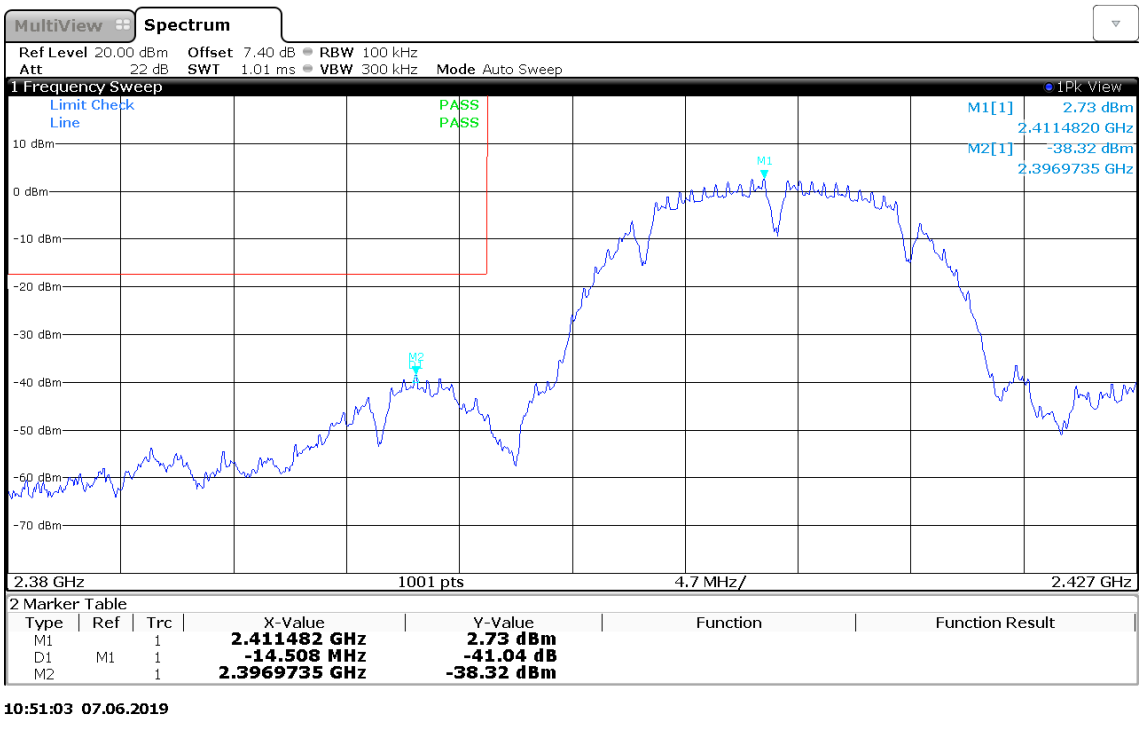
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 n HT20, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	B
Band-edge	Upper
In-band Frequency [MHz]:	2464.47
Max. in-band Level [dBm/100 kHz]:	0.189
Out-of-band Frequency [MHz]:	2483.822
Max. out-of-band Level [dBm/100 kHz]:	-44.677
Attenuation [dB]:	-44.87



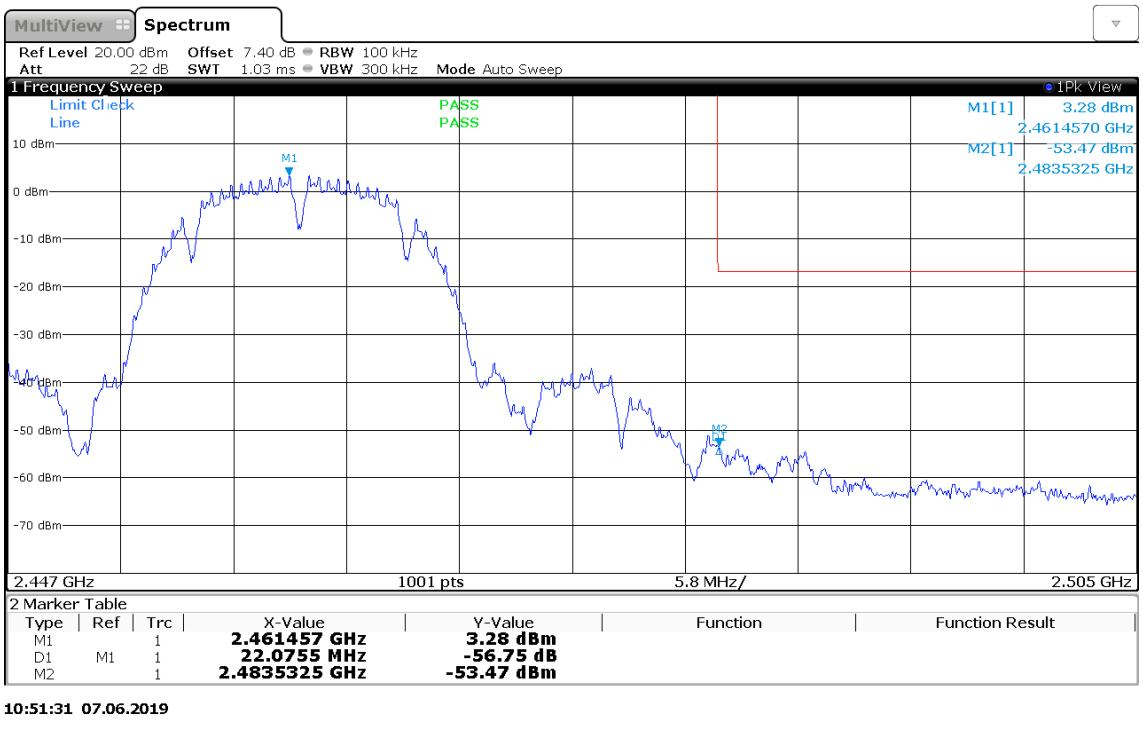
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 b, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Band-edge	Lower
In-band Frequency [MHz]:	2411.482
Max. in-band Level [dBm/100 kHz]:	2.726
Out-of-band Frequency [MHz]:	2396.974
Max. out-of-band Level [dBm/100 kHz]:	-38.316
Attenuation [dB]:	-41.04



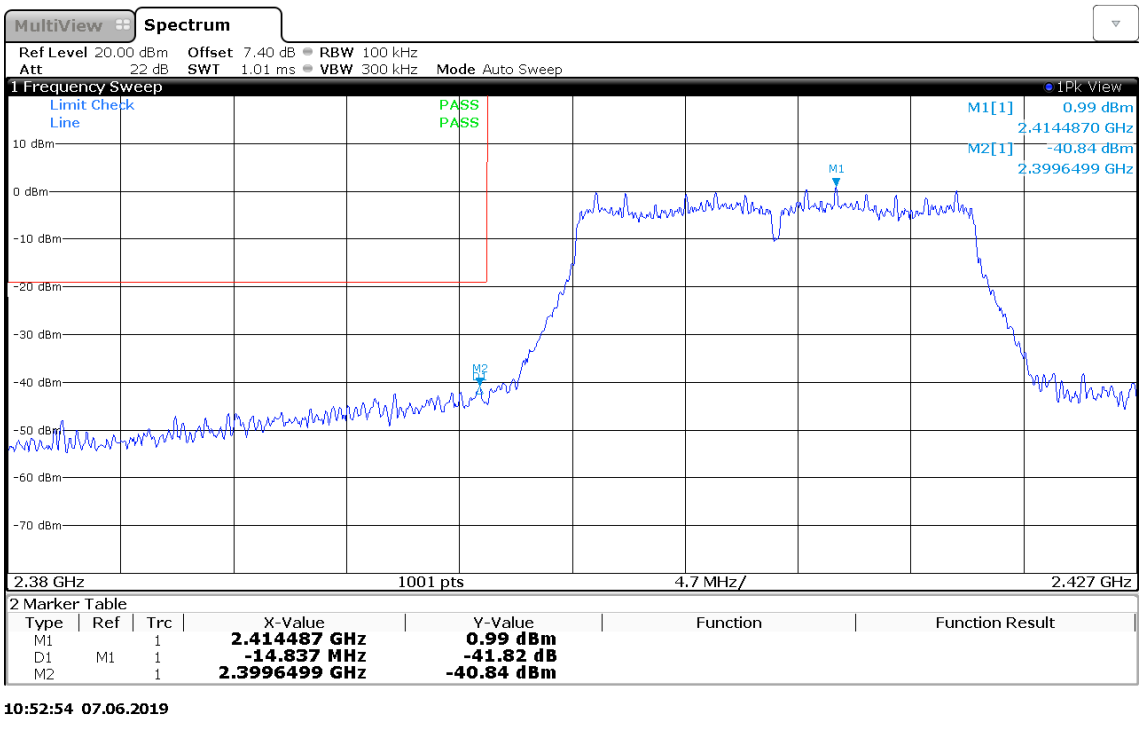
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 b, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Band-edge	Upper
In-band Frequency [MHz]:	2461.457
Max. in-band Level [dBm/100 kHz]:	3.284
Out-of-band Frequency [MHz]:	2483.532
Max. out-of-band Level [dBm/100 kHz]:	-53.469
Attenuation [dB]:	-56.75



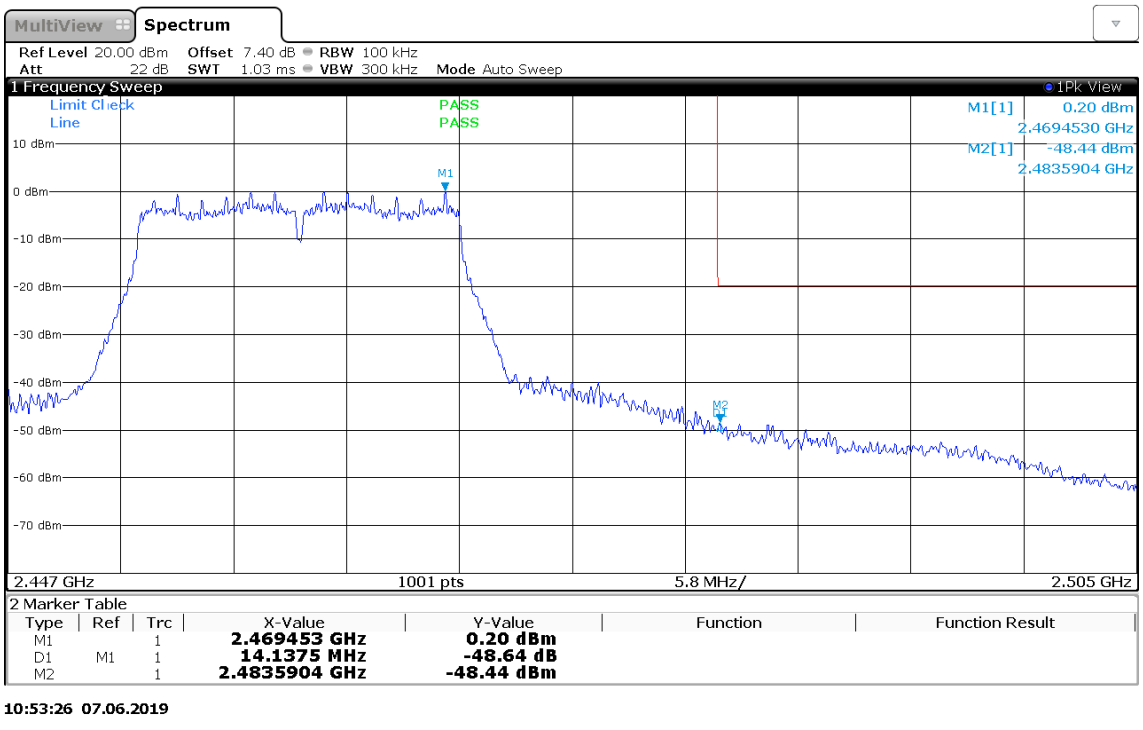
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 g, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Band-edge	Lower
In-band Frequency [MHz]:	2414.487
Max. in-band Level [dBm/100 kHz]:	0.986
Out-of-band Frequency [MHz]:	2399.65
Max. out-of-band Level [dBm/100 kHz]:	-40.837
Attenuation [dB]:	-41.82



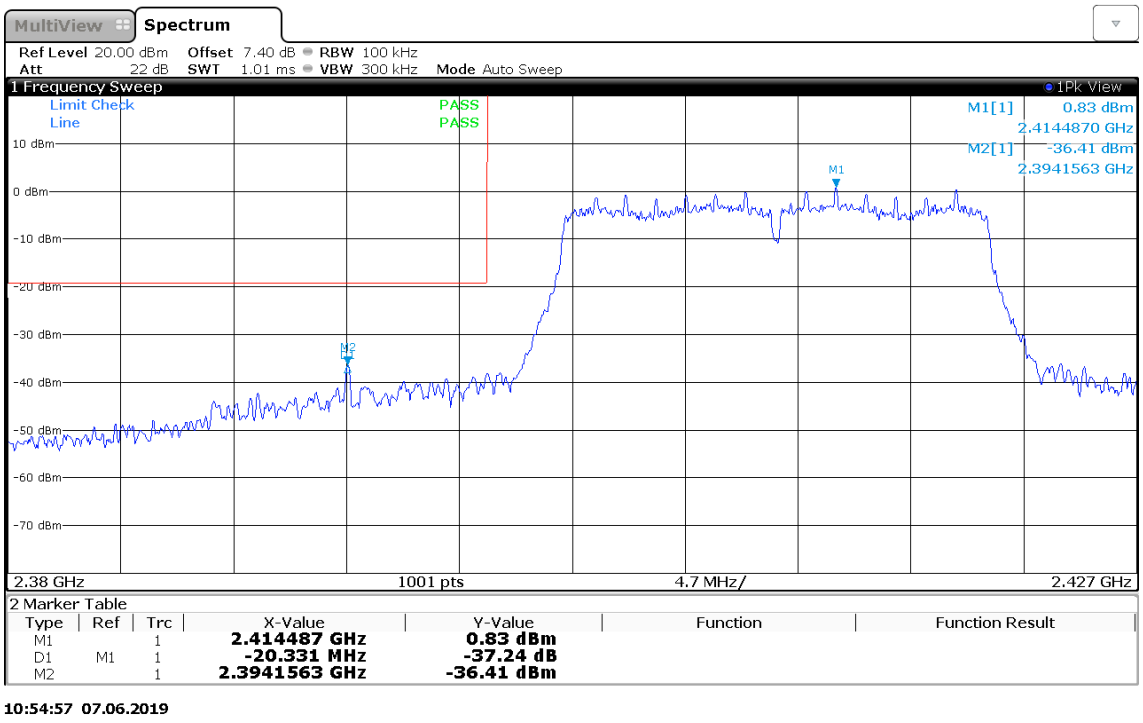
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 g, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Band-edge	Upper
In-band Frequency [MHz]:	2469.453
Max. in-band Level [dBm/100 kHz]:	0.2
Out-of-band Frequency [MHz]:	2483.59
Max. out-of-band Level [dBm/100 kHz]:	-48.441
Attenuation [dB]:	-48.64



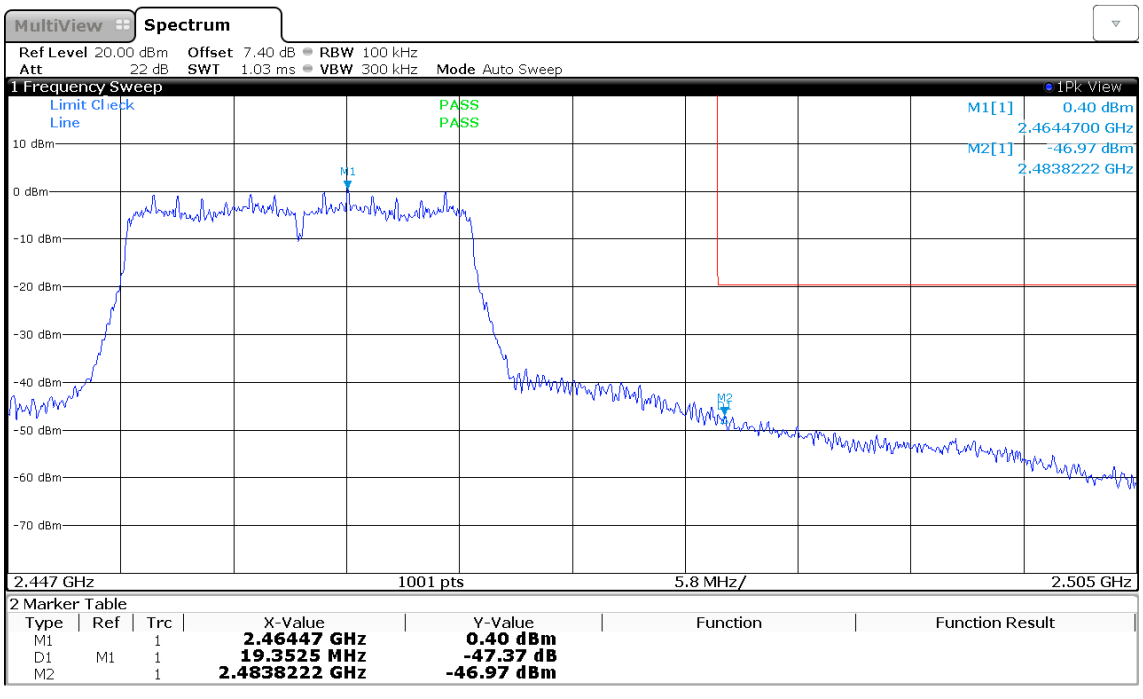
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 n HT20, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Band-edge	Lower
In-band Frequency [MHz]:	2414.487
Max. in-band Level [dBm/100 kHz]:	0.83
Out-of-band Frequency [MHz]:	2394.156
Max. out-of-band Level [dBm/100 kHz]:	-36.411
Attenuation [dB]:	-37.24



Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 n HT20, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Band-edge	Upper
In-band Frequency [MHz]:	2464.47
Max. in-band Level [dBm/100 kHz]:	0.4
Out-of-band Frequency [MHz]:	2483.822
Max. out-of-band Level [dBm/100 kHz]:	-46.973
Attenuation [dB]:	-47.37



3.7 Test Conditions and Results - Conducted spurious emissions

3.7.1 Information

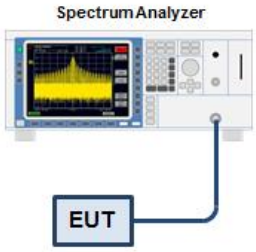
Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Method	ANSI C63.10 11.11
Operator	Abdullah Al Jamal
Date	2019-06-06

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 Analyzer	R&S	FSW 43	EF00896	2018-07	2019-07

3.7.5 Procedure

Test Procedure

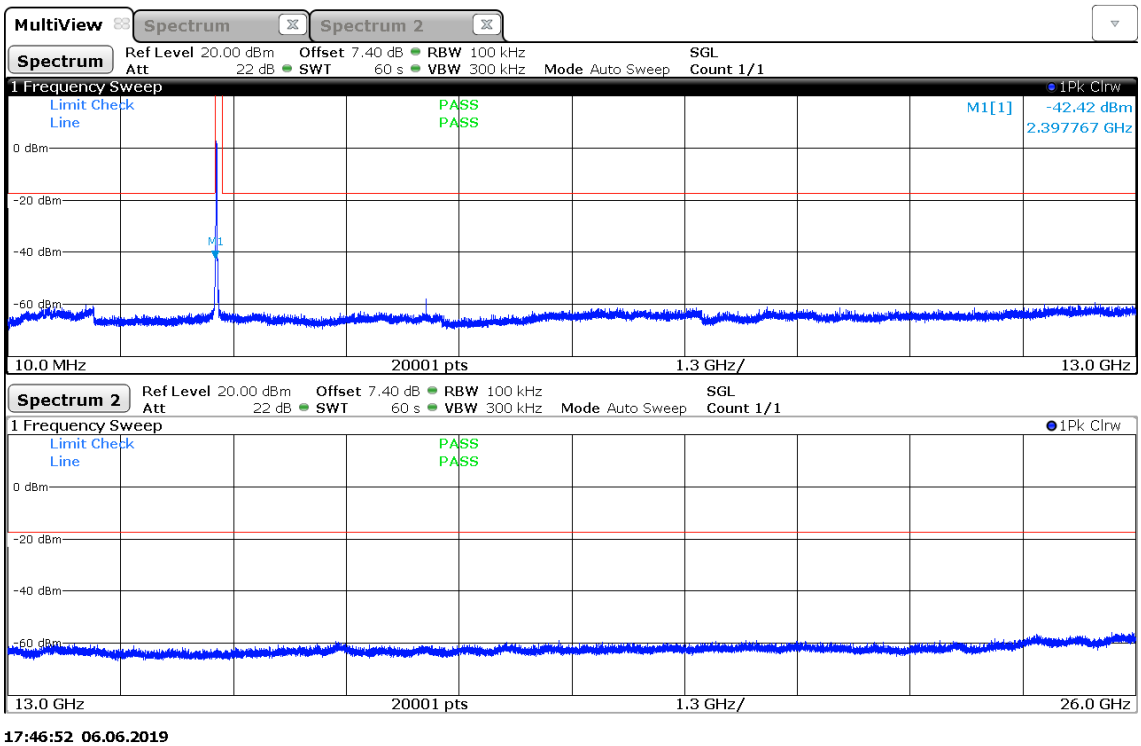
1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels within frequency band and outside frequency band
5. Band edge attenuation is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

3.7.6 Results

Test Results			
Port	Mode	Channel [MHz]	Verdict
1	DSSS	2412	PASS
1	DSSS	2437	PASS
1	DSSS	2462	PASS
1	OFDM	2412	PASS
1	OFDM	2437	PASS
1	OFDM	2462	PASS
1	HT20	2412	PASS
1	HT20	2437	PASS
1	HT20	2462	PASS
2	DSSS	2412	PASS
2	DSSS	2437	PASS
2	DSSS	2462	PASS
2	OFDM	2412	PASS
2	OFDM	2437	PASS
2	OFDM	2462	PASS
2	HT20	2412	PASS
2	HT20	2437	PASS
2	HT20	2462	PASS

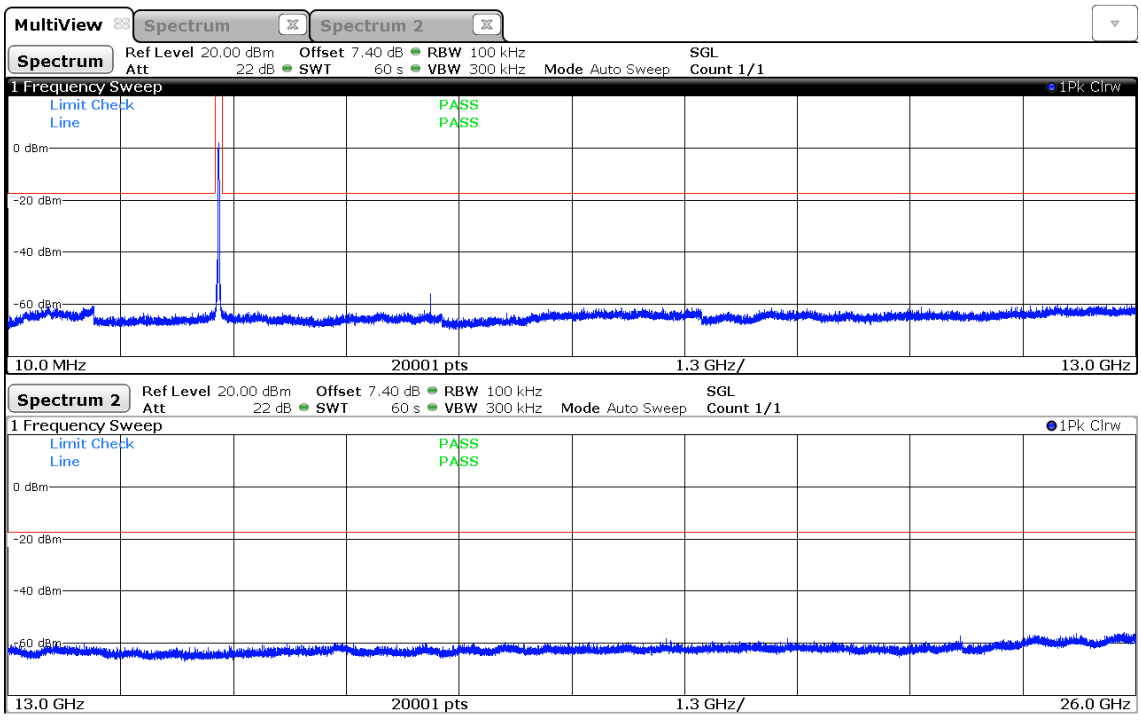
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 b, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Max. in-band Frequency [MHz]:	2413.0
Max. in-band Level [dBm/100 kHz]:	2.7
Out-of-band Limit [dBm/100 kHz]:	-17.3



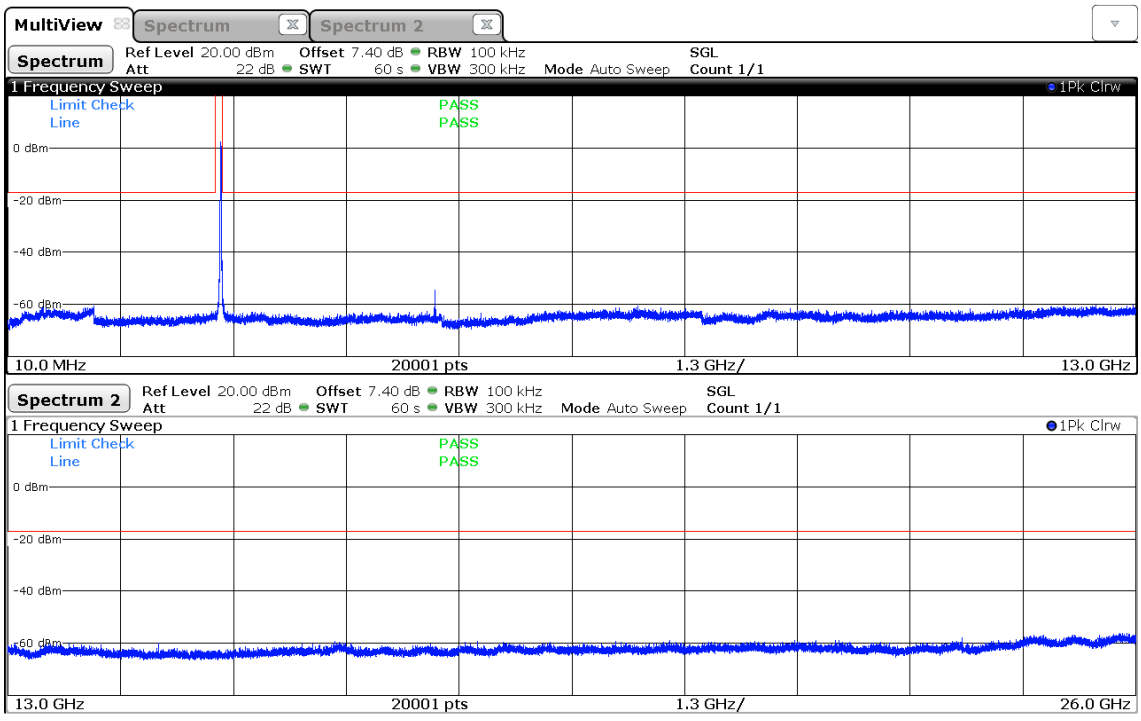
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 b, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Max. in-band Frequency [MHz]:	2436.5
Max. in-band Level [dBm/100 kHz]:	2.6
Out-of-band Limit [dBm/100 kHz]:	-17.4



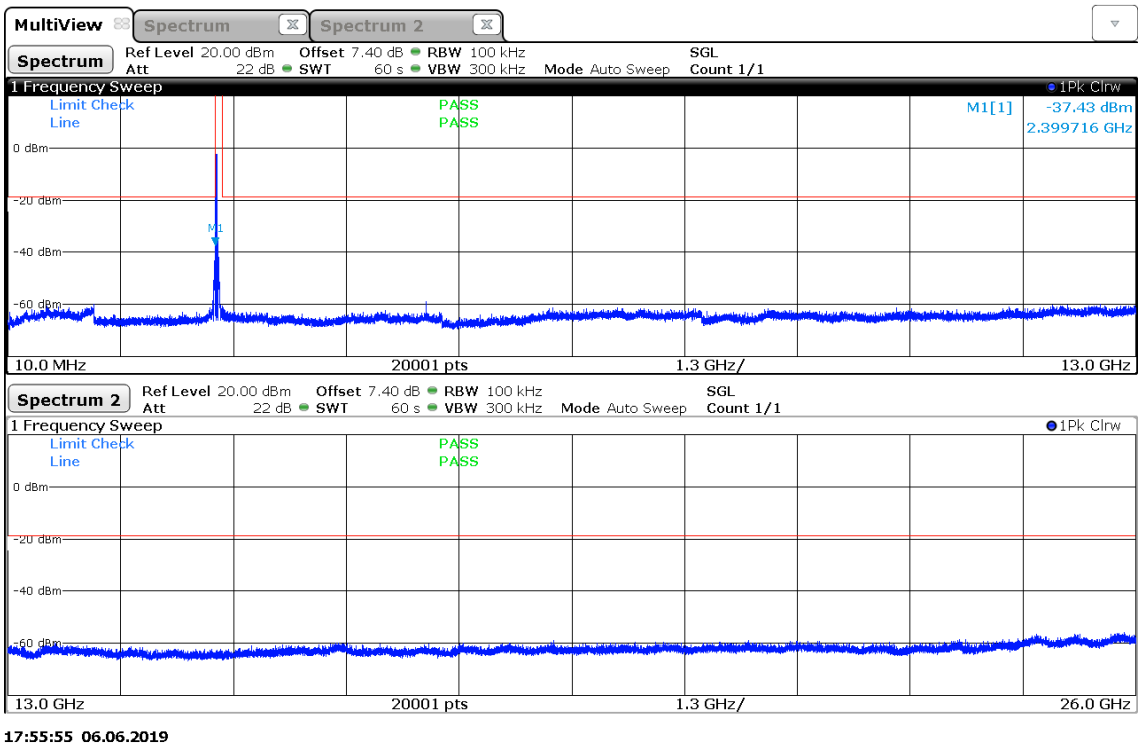
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 b, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Max. in-band Frequency [MHz]:	2461.5
Max. in-band Level [dBm/100 kHz]:	2.9
Out-of-band Limit [dBm/100 kHz]:	-17.1



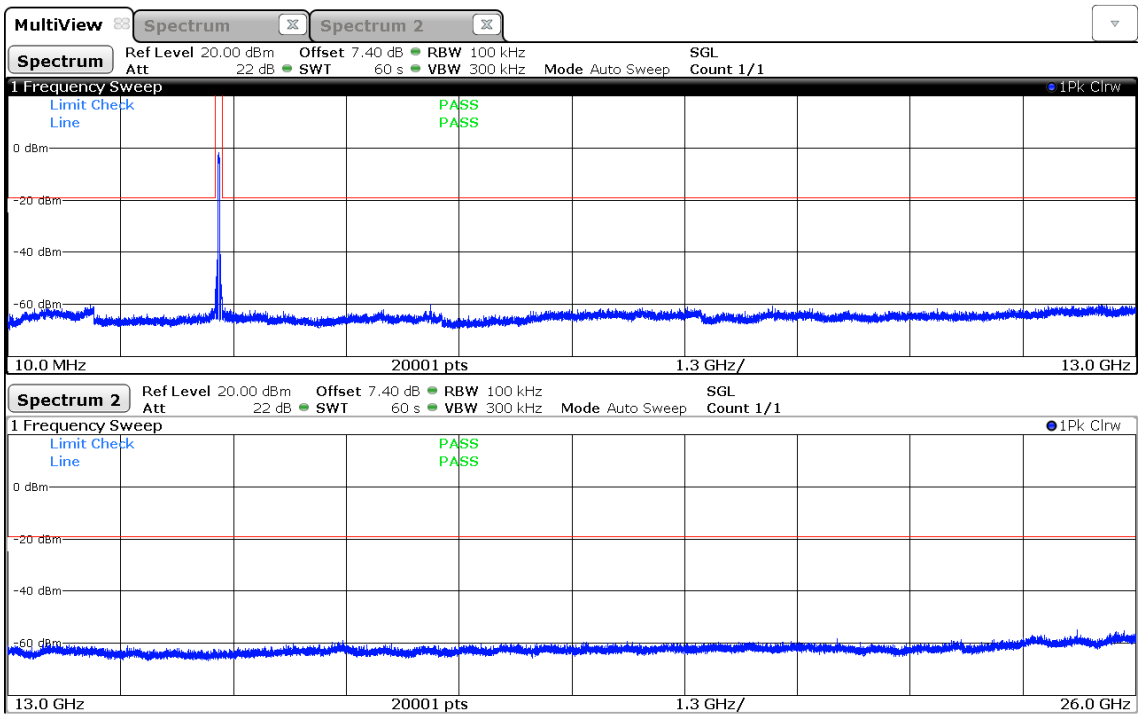
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 g, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Max. in-band Frequency [MHz]:	2414.5
Max. in-band Level [dBm/100 kHz]:	1.2
Out-of-band Limit [dBm/100 kHz]:	-18.8



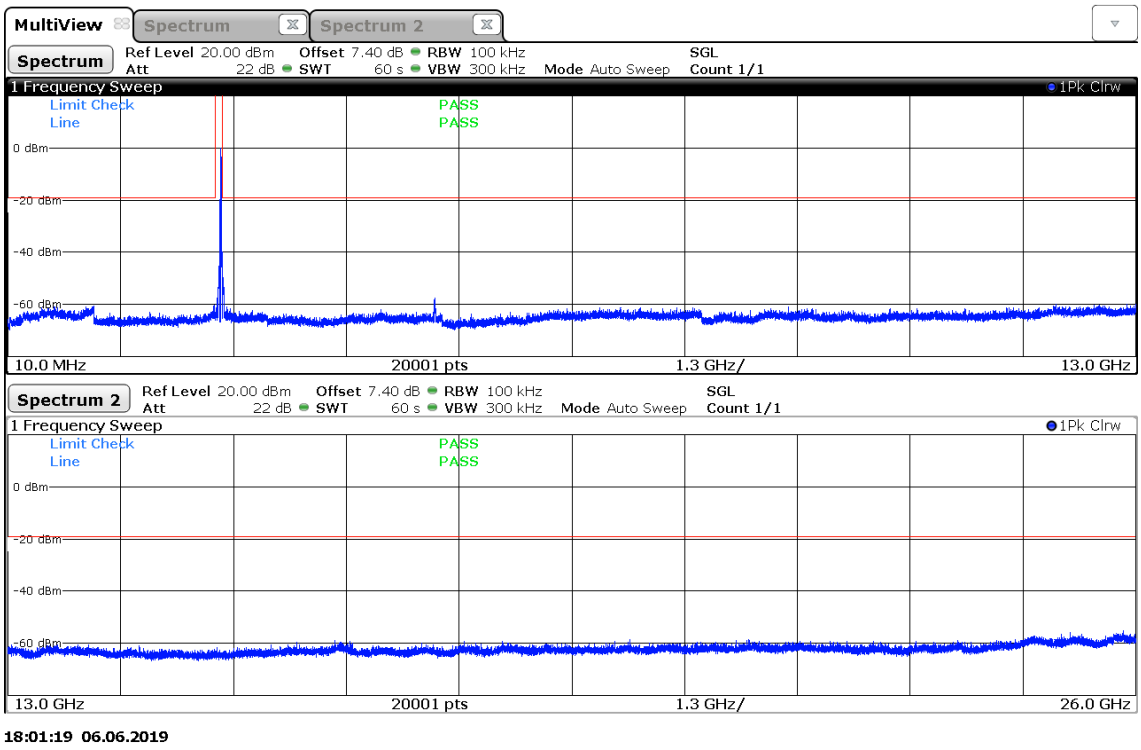
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 g, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Max. in-band Frequency [MHz]:	2439.5
Max. in-band Level [dBm/100 kHz]:	0.8
Out-of-band Limit [dBm/100 kHz]:	-19.2



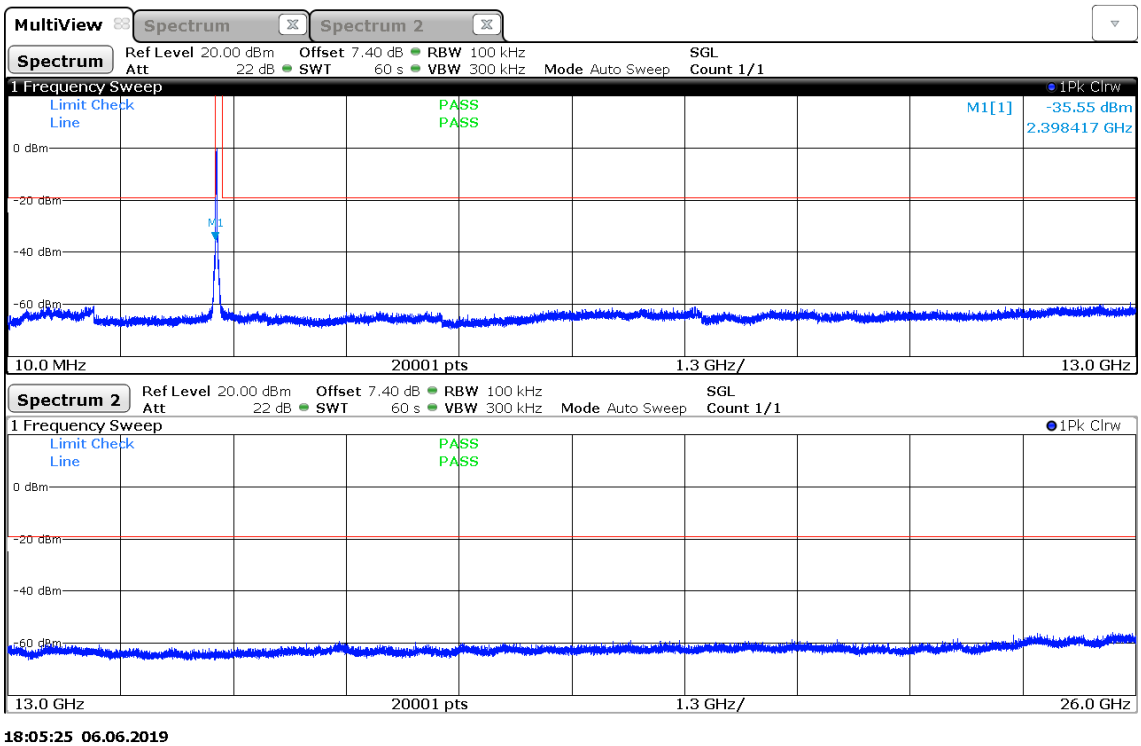
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 g, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Max. in-band Frequency [MHz]:	2464.5
Max. in-band Level [dBm/100 kHz]:	0.8
Out-of-band Limit [dBm/100 kHz]:	-19.2



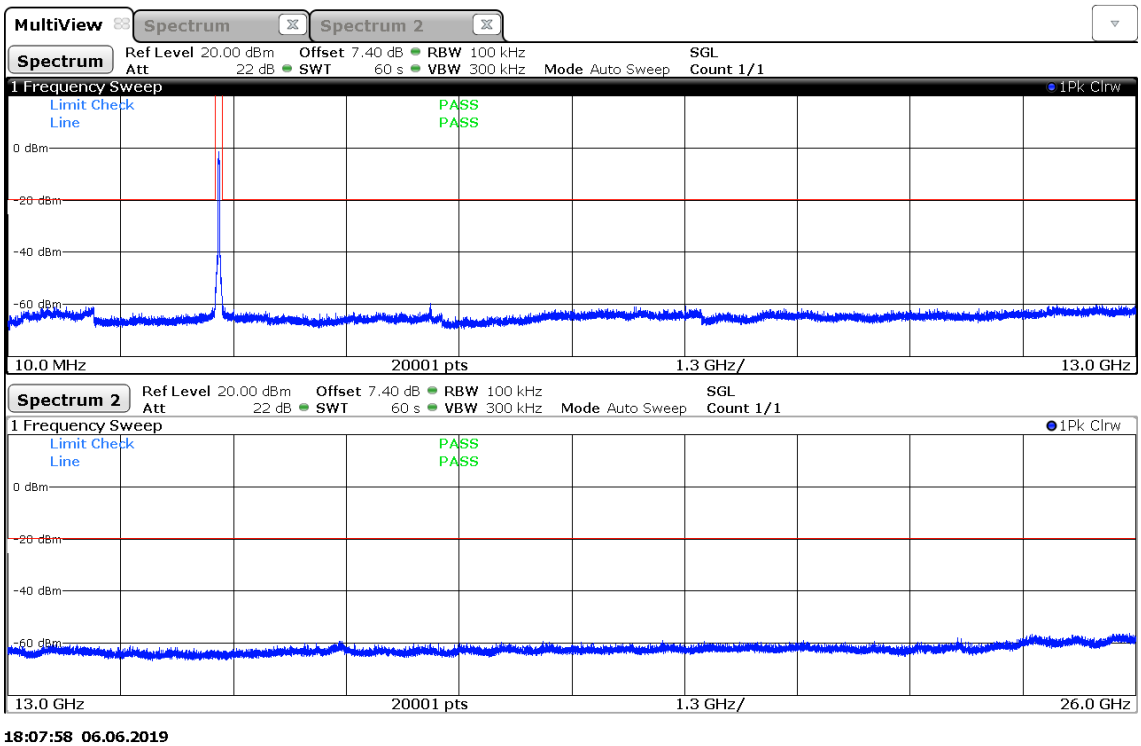
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 n HT20, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Max. in-band Frequency [MHz]:	2414.5
Max. in-band Level [dBm/100 kHz]:	1.0
Out-of-band Limit [dBm/100 kHz]:	-19.0



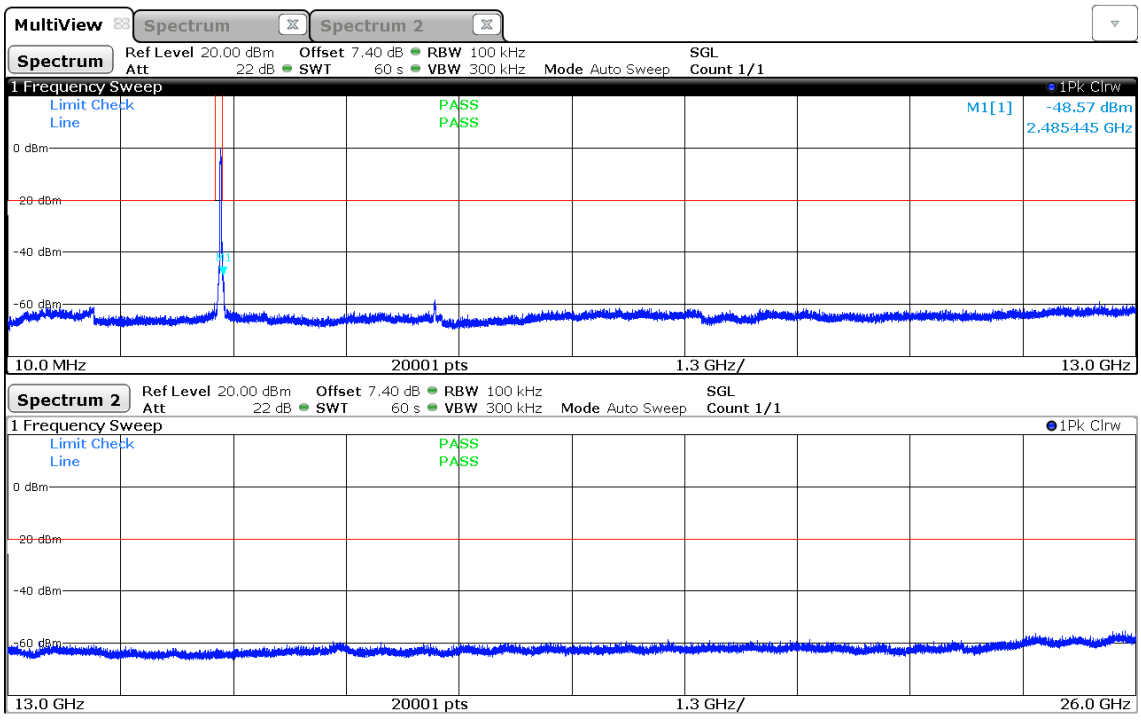
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 n HT20, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Max. in-band Frequency [MHz]:	2439.5
Max. in-band Level [dBm/100 kHz]:	0.2
Out-of-band Limit [dBm/100 kHz]:	-19.8



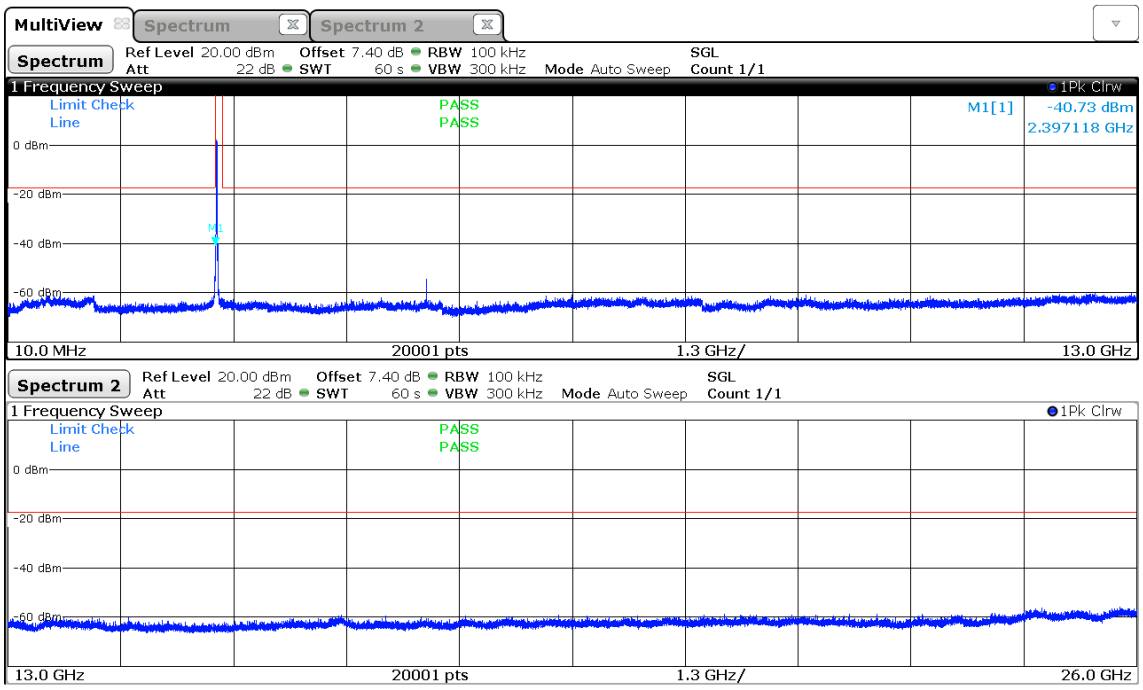
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 n HT20, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-06
Antenna port:	B
Max. in-band Frequency [MHz]:	2464.5
Max. in-band Level [dBm/100 kHz]:	-0.0
Out-of-band Limit [dBm/100 kHz]:	-20.0



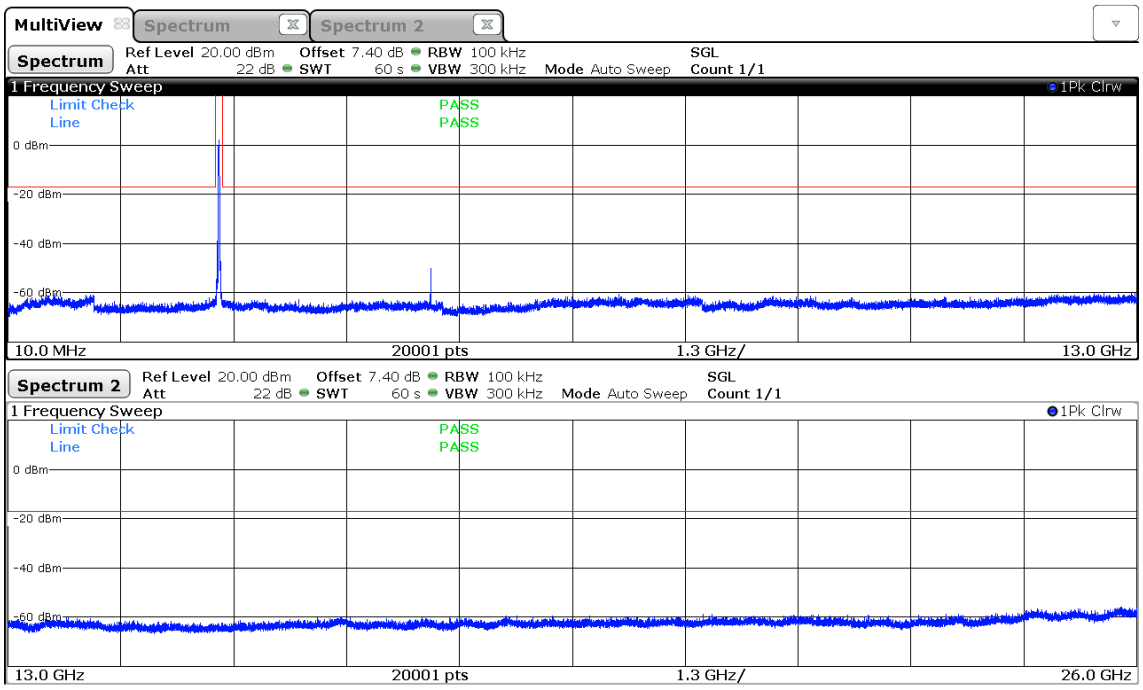
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 b, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Max. in-band Frequency [MHz]:	2412.5
Max. in-band Level [dBm/100 kHz]:	2.7
Out-of-band Limit [dBm/100 kHz]:	-17.3



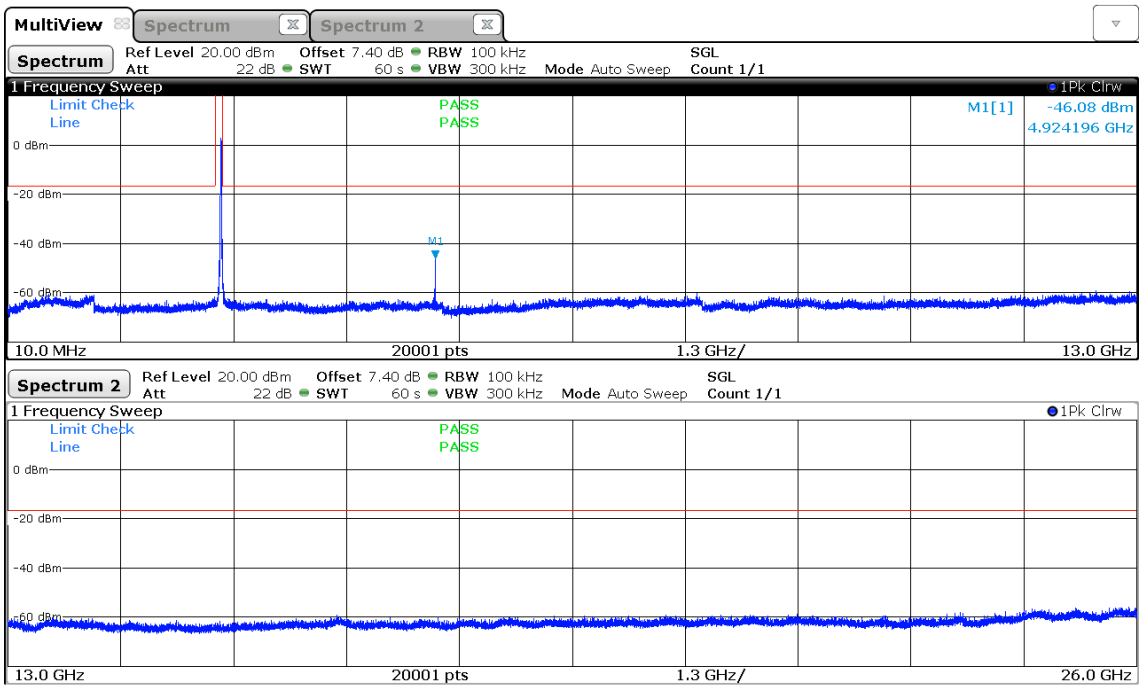
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 b, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Max. in-band Frequency [MHz]:	2437.5
Max. in-band Level [dBm/100 kHz]:	2.9
Out-of-band Limit [dBm/100 kHz]:	-17.1



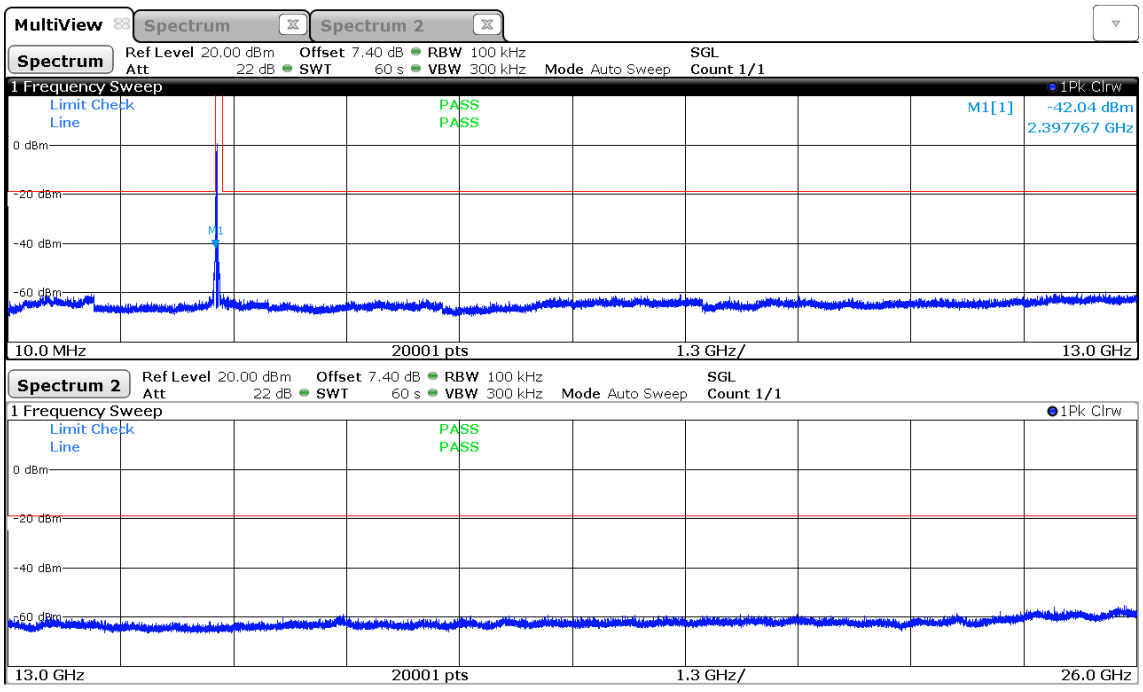
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 b, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Max. in-band Frequency [MHz]:	2461.5
Max. in-band Level [dBm/100 kHz]:	3.4
Out-of-band Limit [dBm/100 kHz]:	-16.6



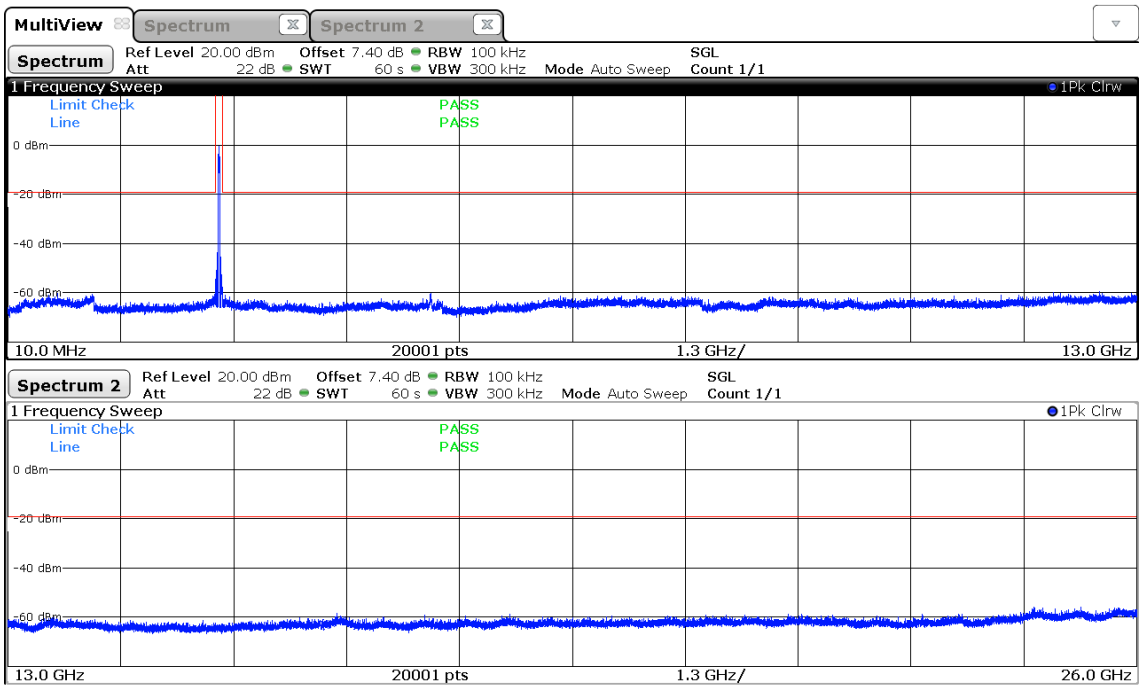
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 g, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Max. in-band Frequency [MHz]:	2414.5
Max. in-band Level [dBm/100 kHz]:	1.0
Out-of-band Limit [dBm/100 kHz]:	-19.0



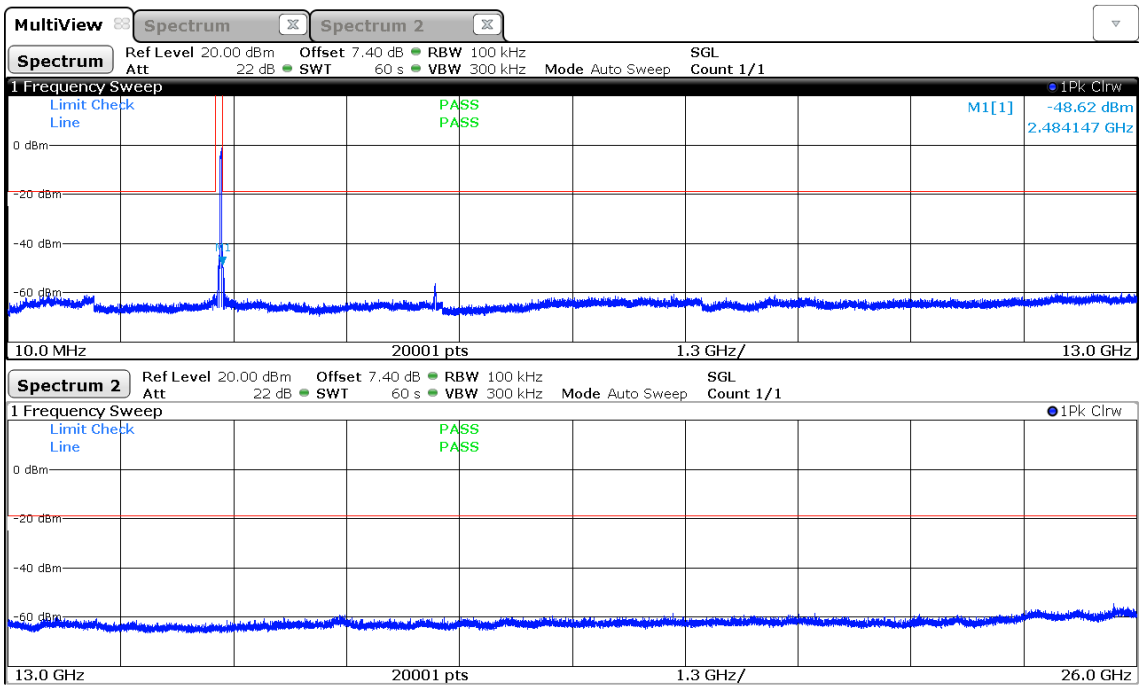
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 g, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Max. in-band Frequency [MHz]:	2439.5
Max. in-band Level [dBm/100 kHz]:	0.7
Out-of-band Limit [dBm/100 kHz]:	-19.3



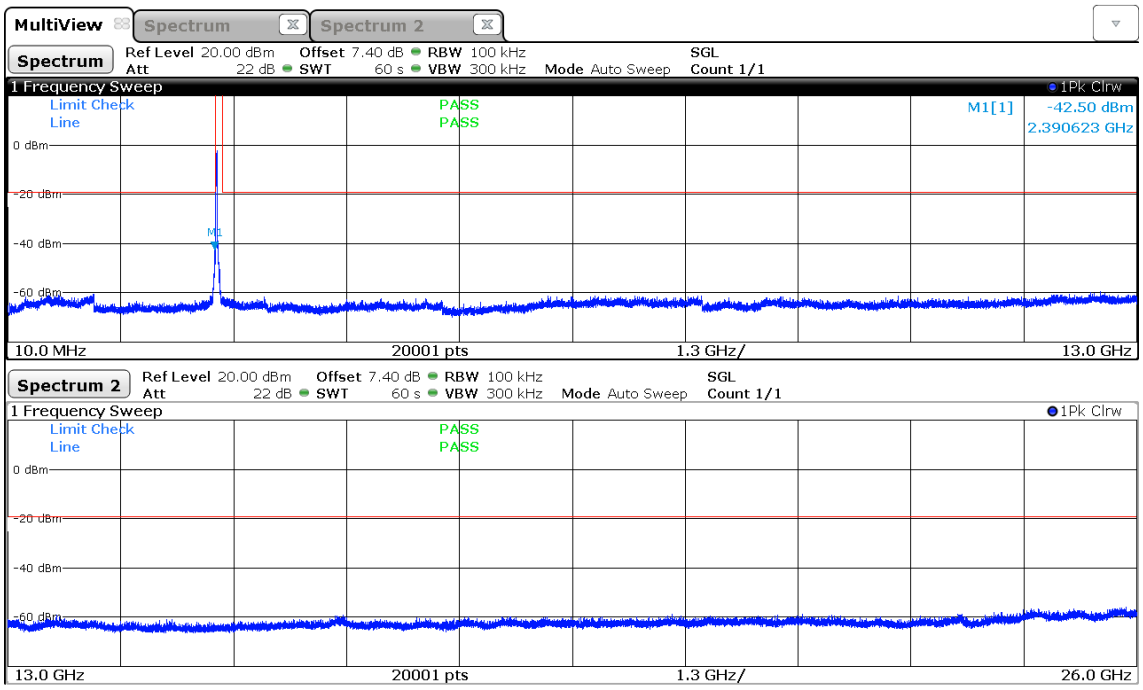
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 g, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Max. in-band Frequency [MHz]:	2464.5
Max. in-band Level [dBm/100 kHz]:	1.0
Out-of-band Limit [dBm/100 kHz]:	-19.0



Conducted Spurious Emissions

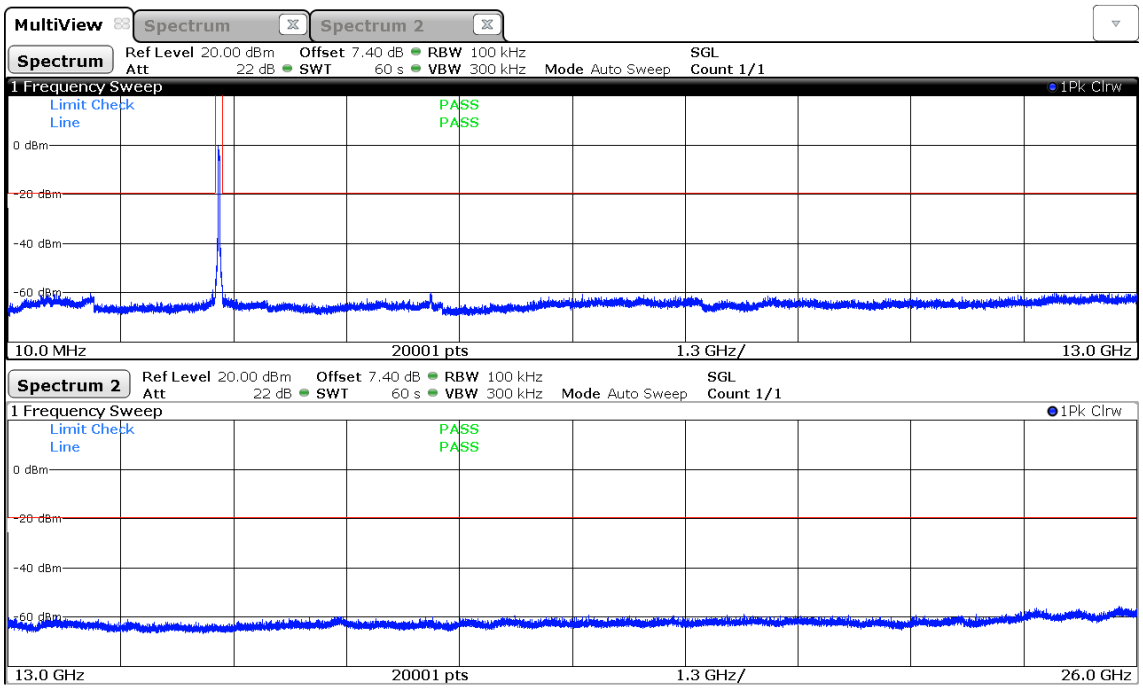
Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 n HT20, Channel: 1, 2412 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Max. in-band Frequency [MHz]:	2414.5
Max. in-band Level [dBm/100 kHz]:	0.9
Out-of-band Limit [dBm/100 kHz]:	-19.1



11:20:47 07.06.2019

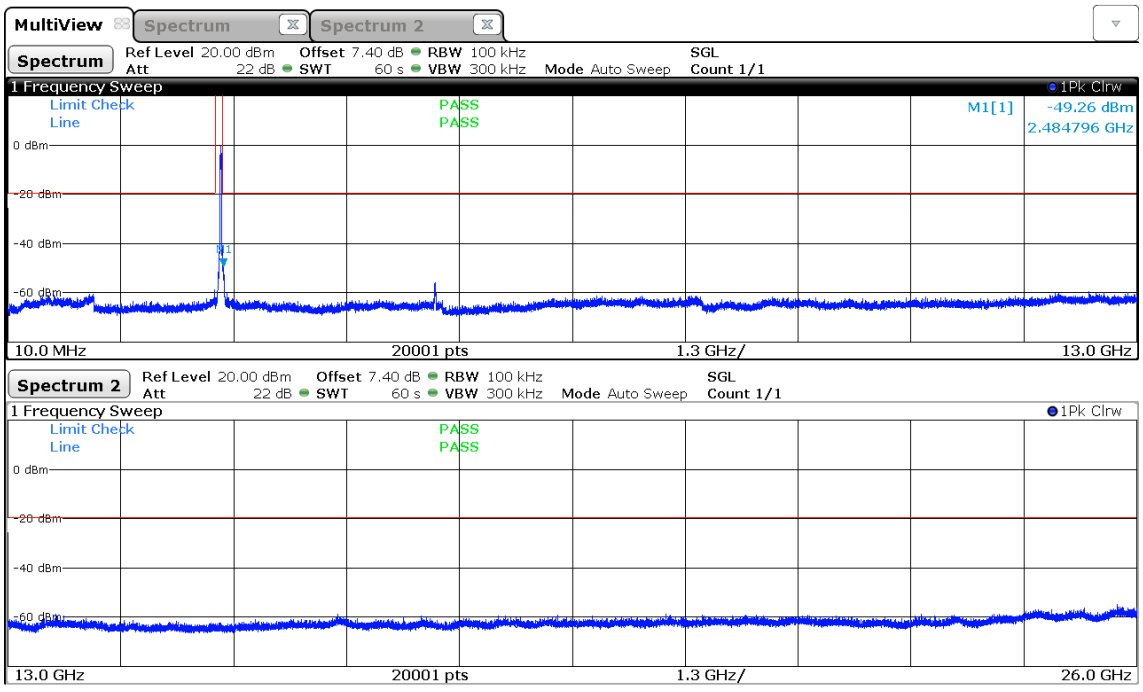
Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 n HT20, Channel: 6, 2437 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Max. in-band Frequency [MHz]:	2439.5
Max. in-band Level [dBm/100 kHz]:	0.5
Out-of-band Limit [dBm/100 kHz]:	-19.5



Conducted Spurious Emissions

Project Number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
Model Description:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Sample ID:	24167
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	IEEE 802.11 n HT20, Channel: 11, 2462 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Abdullah Al Jamal
Test Site:	Eurofins Product Service GmbH
Test Date:	2019-06-07
Antenna port:	W
Max. in-band Frequency [MHz]:	2464.5
Max. in-band Level [dBm/100 kHz]:	0.5
Out-of-band Limit [dBm/100 kHz]:	-19.5



3.8 Test Conditions and Results - Transmitter radiated emissions

3.8.1 Information

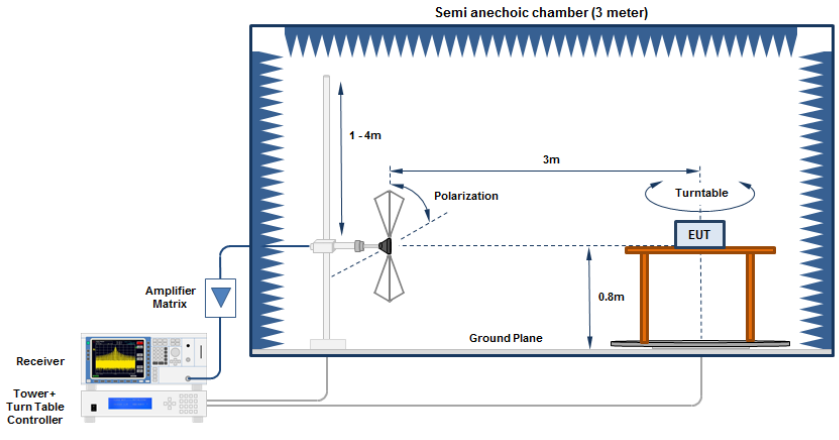
Test Information	
Reference	FCC § 15.247(d); FCC § 15.209; ISED RSS-Gen, Issue 5 (section 6.13)
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6, 11.12
Operator	Abdullah Al Jamal
Date	2019-06-24
Note	The worst-case was determined by previous measurements. The worst-case of all antenna combinations is reported. Only plots containing spurious emissions are shown in this annex. All missing plots contain noise or contain no significant emission only.

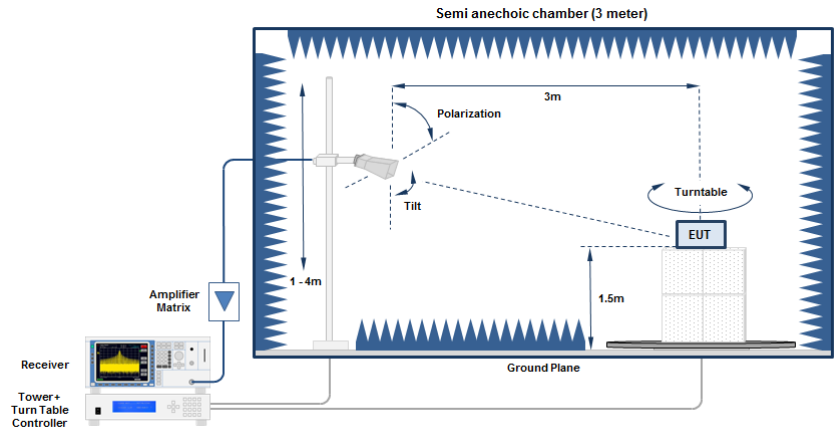
3.8.2 Limits

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

3.8.3 Setup

Test Setup 30 - 1000 MHz



Test Setup > 1 GHz


3.8.4 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
Measurement Receiver	R&S	ESU 26	EF00887	2018-08	2019-08
Antenna	R&S	VULB 9162	EF00978	2016-11	2019-11

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	R&S	ESU 26	EF00887	2018-08	2019-08
Antenna	Schwarzbeck	BBHA 9120D	EF00018	2016-09	2019-09
Antenna	Amplifier Research	AT4560	EF01152	2018-10	2019-10

3.8.5 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

3.8.6 Results

Test Results - HT20 Antenna port 1 (W)						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2412	2388.9	73.99	pk	ver	74.00	-00.01
2412	2388.9	48.10	RMS	ver	54.00	-05.90
2412	2389.4	73.00	pk	ver	74.00	-01.00
2412	2389.4	47.13	RMS	ver	54.00	-06.87
2412	2389.7	70.73	pk	hor	74.00	-03.27
2412	2389.7	47.45	RMS	hor	54.00	-06.55
2412	2389.7	72.90	pk	ver	74.00	-01.10
2412	2389.7	48.23	RMS	ver	54.00	-05.77
2437	2483.8	64.81	pk	hor	74.00	-09.19
2437	2483.8	43.81	RMS	hor	54.00	-10.19
2437	2489.7	62.98	pk	ver	74.00	-11.02
2437	2496.5	57.62	pk	hor	74.00	-16.38
2437	2496.5	39.92	RMS	hor	54.00	-14.08
2462	2399	60.32	pk	hor	95.00	-34.68
2462	2483.6	71.85	pk	ver	74.00	-02.15
2462	2483.6	45.66	RMS	ver	54.00	-08.34
2462	2483.7	71.61	pk	ver	74.00	-02.39
2462	2483.7	46.27	RMS	ver	54.00	-07.73
2462	2484	71.86	pk	ver	74.00	-02.14
2462	2484	46.34	RMS	ver	54.00	-07.66
2462	2484.3	71.98	pk	ver	74.00	-02.02
2462	2484.3	45.99	RMS	ver	54.00	-08.01
2462	2484.5	71.70	pk	ver	74.00	-02.30
2462	2484.5	46.55	RMS	ver	54.00	-07.45

3.9 Test Conditions and Results - Receiver radiated emissions

3.9.1 Information

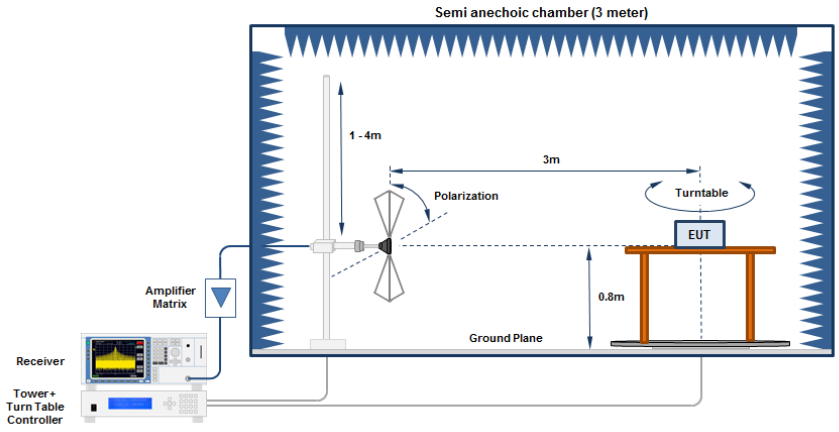
Test Information	
Reference	ISED RSS-247, Issue 2 (section 3.1)
Measurement Method	ANSI C63.10 6.5, 6.6, 11.12
Operator	Abdullah Al Jamal
Date	2019-07-26
Note	Only plots containing spurious emissions are shown in this annex. All missing plots contain noise or contain no significant emission only.

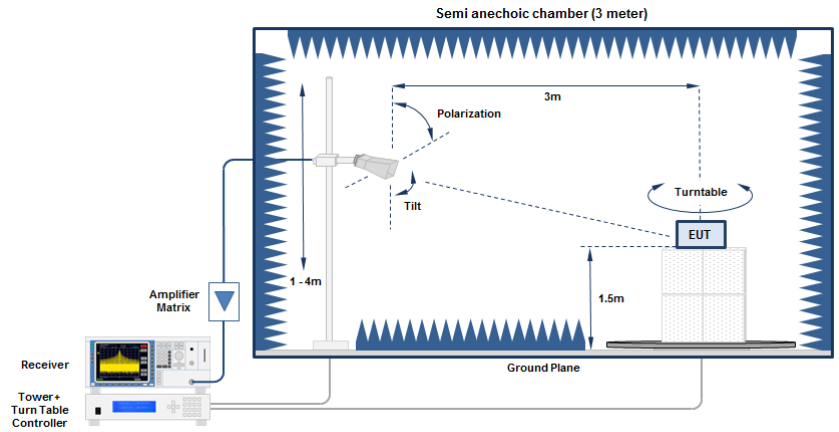
3.9.2 Limits

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

3.9.3 Setup

Test Setup 30 - 1000 MHz



Test Setup > 1 GHz


3.9.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2015.2.4

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	R&S	ESU 26	EF00887	2018-08	2019-08
Antenna	R&S	VULB 9162	EF00978	2016-11	2019-11

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	R&S	ESU 26	EF00887	2018-08	2019-08
Antenna	Schwarzbeck	BBHA 9120D	EF00018	2016-09	2019-09

3.9.5 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

3.9.6 Results

Test Results Antenna port 1 (W)						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2437	31.635	32.98	pk	hor	40.00	-07.02
2437	319.231	34.01	pk	hor	46.00	-11.99
2437	355.128	35.14	pk	ver	46.00	-10.86
2437	639.744	39.19	pk	hor	46.00	-06.81
2437	1135	44.54	pk	hor	53.98	-09.44
2437	1332	44.05	pk	ver	53.98	-09.93
2437	10971	43.96	pk	hor	53.98	-10.02
2437	14555	47.44	pk	hor	53.98	-06.54

ANNEX A Transmitter spurious emissions

Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; Mode n HT20 -- 2412 MHz
Test Date:	2019-06-24
Note:	

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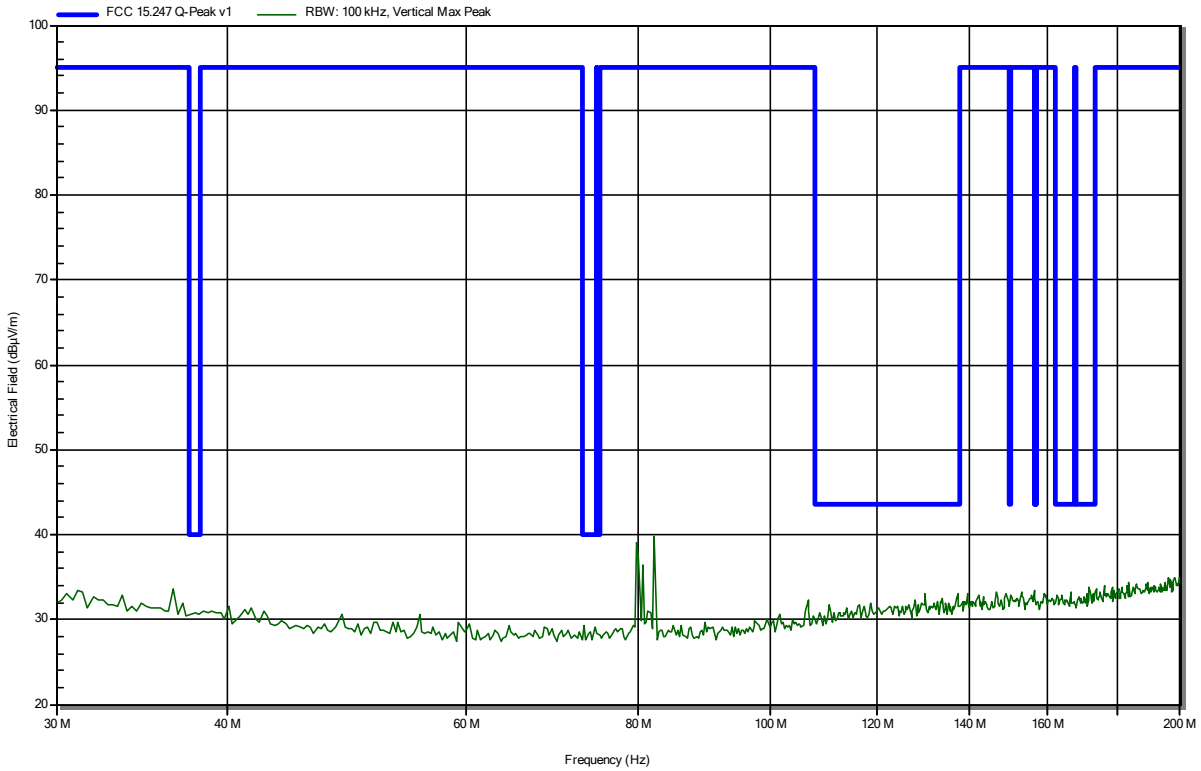
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; Mode n HT20 -- 2412 MHz
Test Date:	2019-06-24
Note:	

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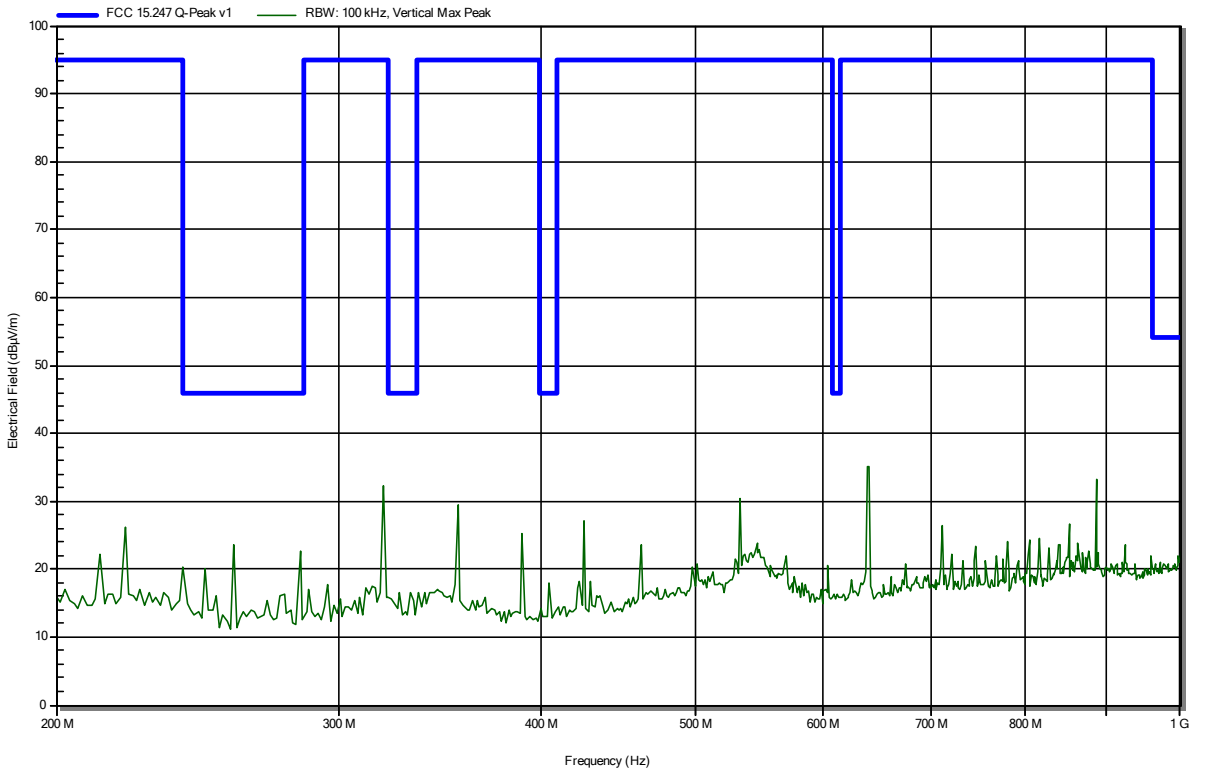
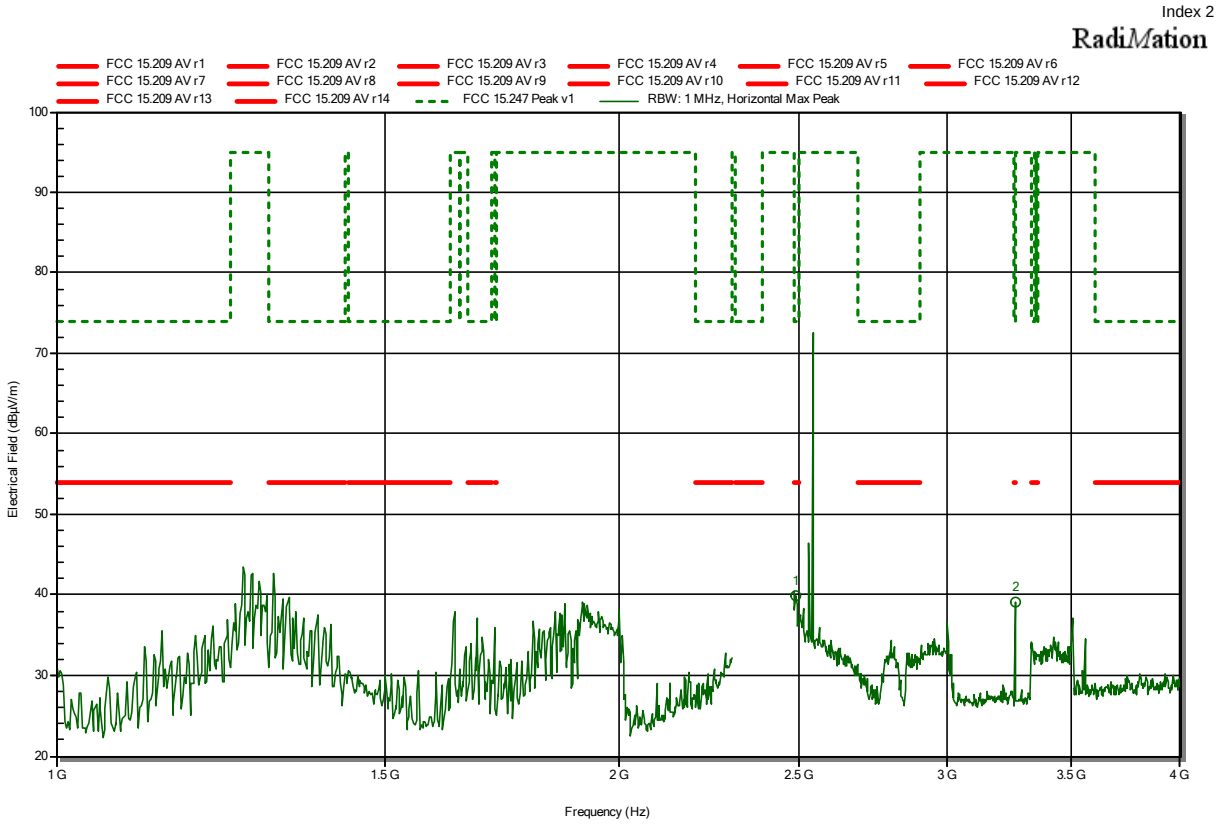
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

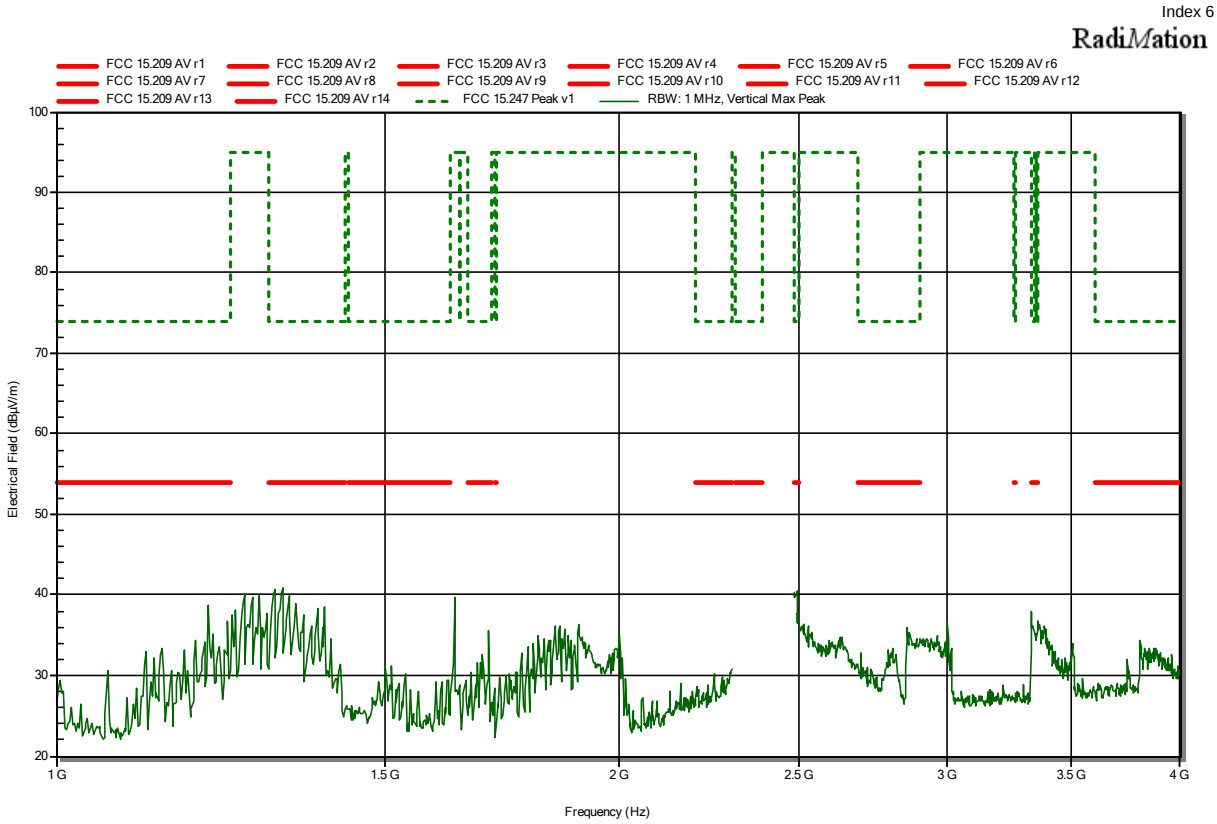
Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2412 MHz
Test Date:	2019-06-20
Note:	



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4884 GHz	39.86 dBµV/m	74 dBµV/m	-34.14 dB	Pass
3.2612 GHz	39.03 dBµV/m	74 dBµV/m	-34.97 dB	Pass

Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2412 MHz
Test Date:	2019-06-20
Note:	



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2412 MHz
Test Date:	2019-06-20
Note:	lower bandedge

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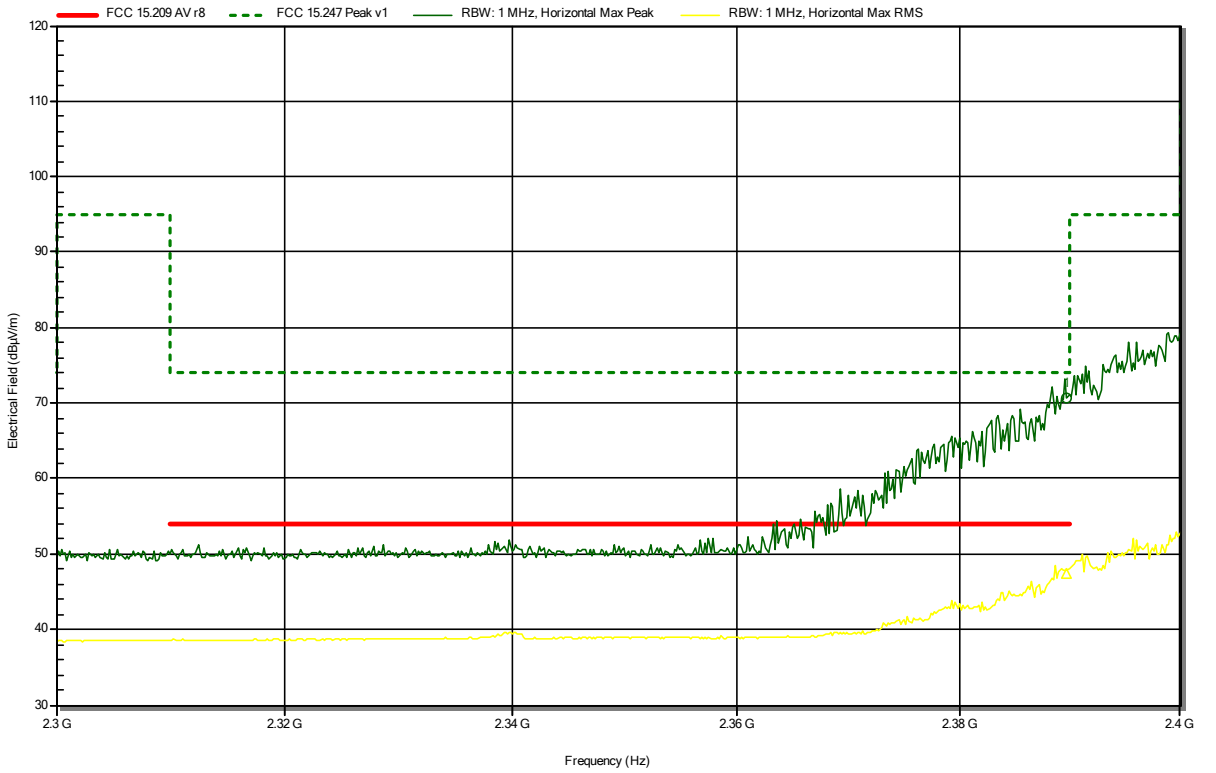
RadiMation

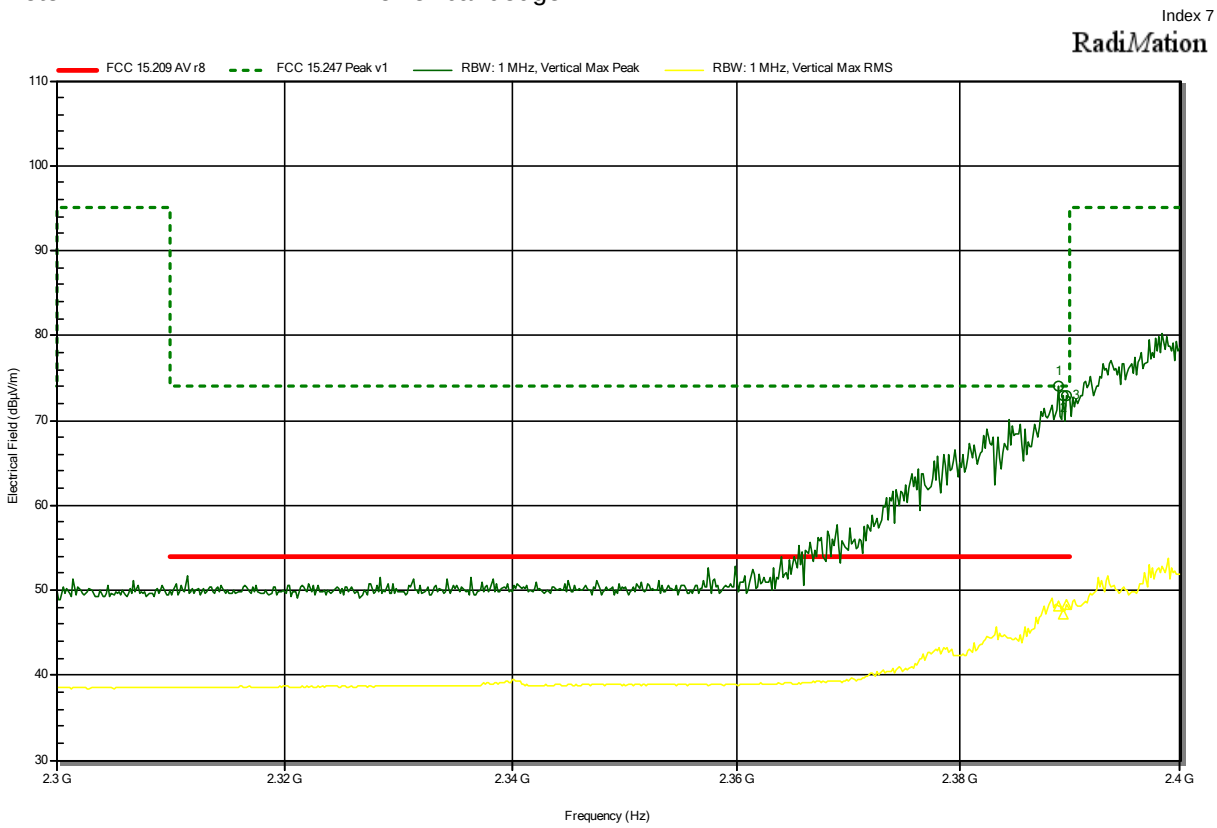


Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.3897 GHz	70.73 dBµV/m	74 dBµV/m	-3.27 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.3897 GHz	47.45 dBµV/m	54 dBµV/m	-6.55 dB	Pass

Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2412 MHz
Test Date:	2019-06-20
Note:	lower bandedge

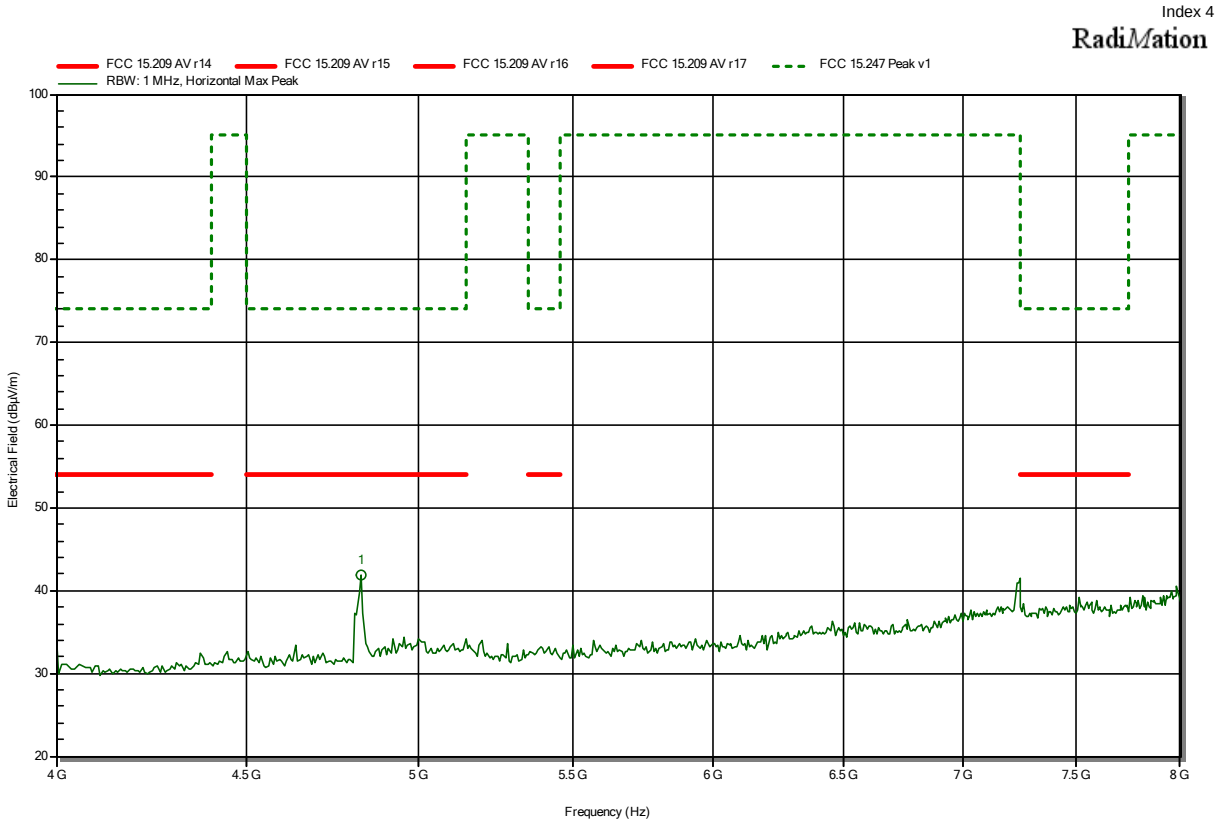


Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.3889 GHz	73.99 dBµV/m	74 dBµV/m	-0.01 dB	Pass
2.3894 GHz	73 dBµV/m	74 dBµV/m	-1 dB	Pass
2.3897 GHz	72.9 dBµV/m	74 dBµV/m	-1.1 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.3889 GHz	48.1 dBµV/m	54 dBµV/m	-5.9 dB	Pass
2.3894 GHz	47.13 dBµV/m	54 dBµV/m	-6.87 dB	Pass
2.3897 GHz	48.23 dBµV/m	54 dBµV/m	-5.77 dB	Pass

Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2412 MHz
Test Date:	2019-06-20
Note:	



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.827 GHz	41.86 dBµV/m	74 dBµV/m	-32.14 dB	Pass

Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2412 MHz
Test Date:	2019-06-20
Note:	

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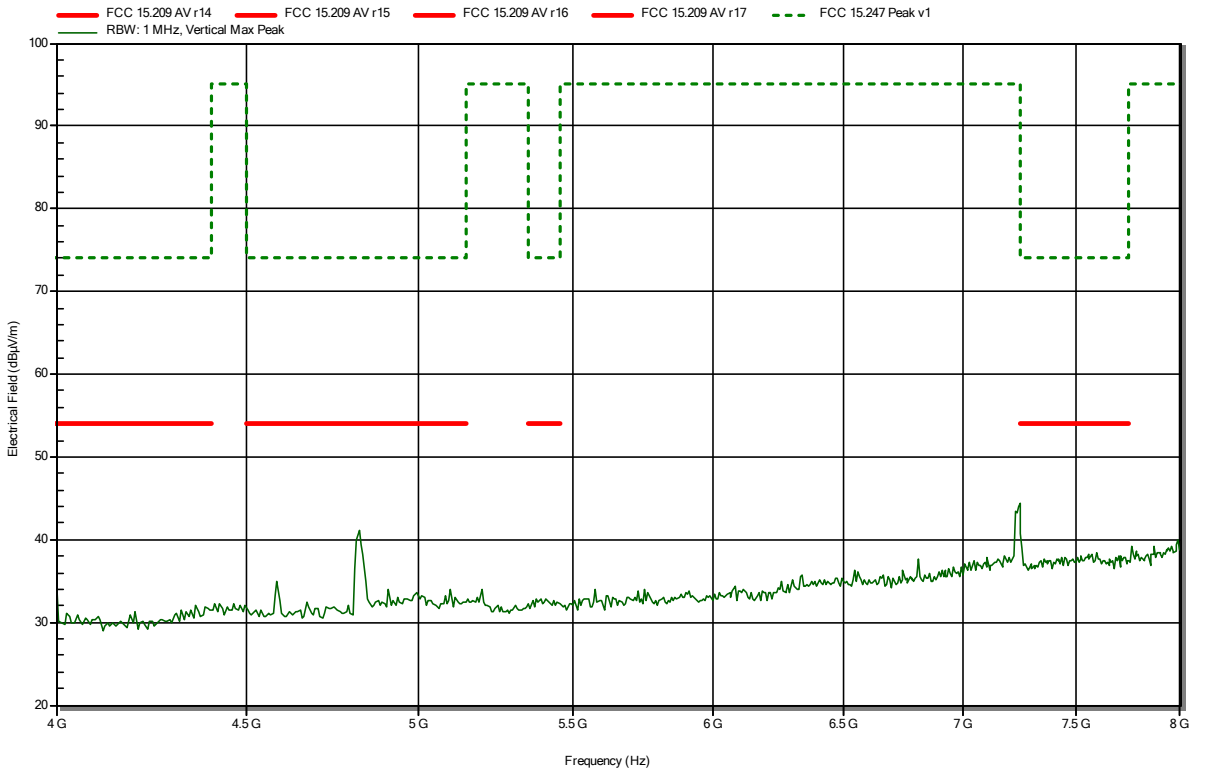
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2412 MHz
Test Date:	2019-06-20
Note:	

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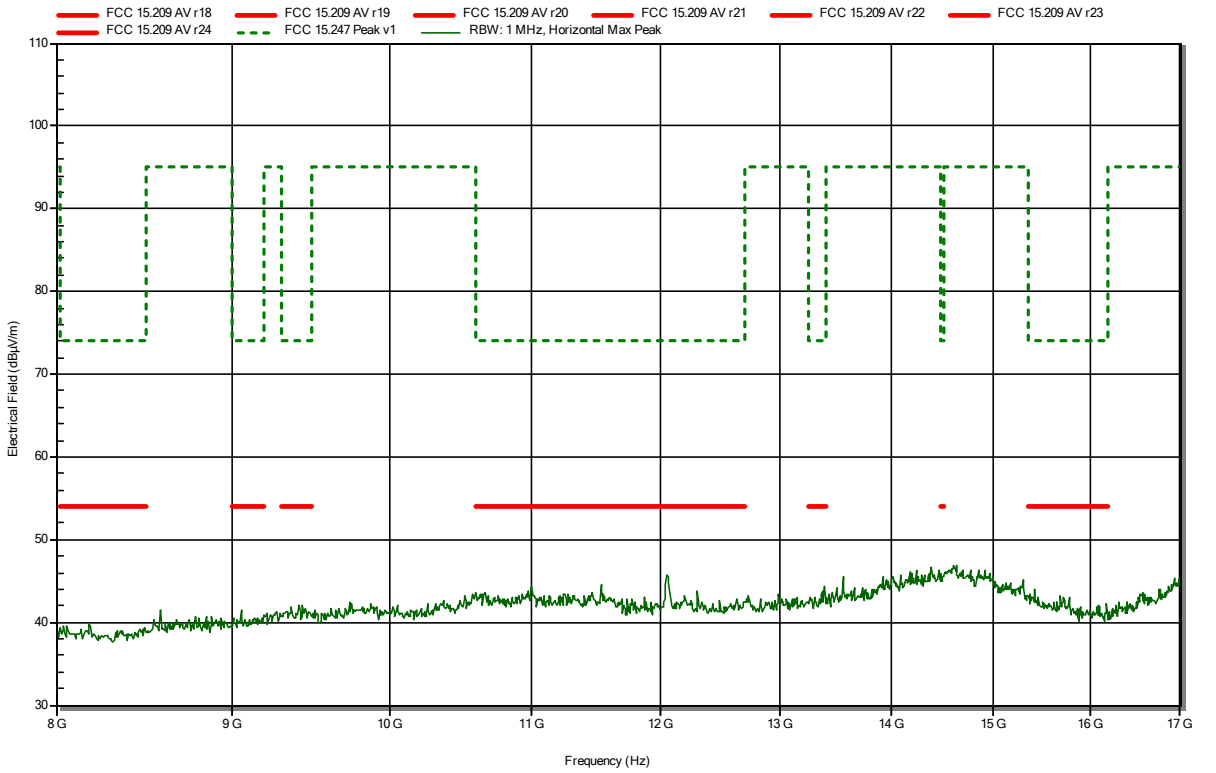
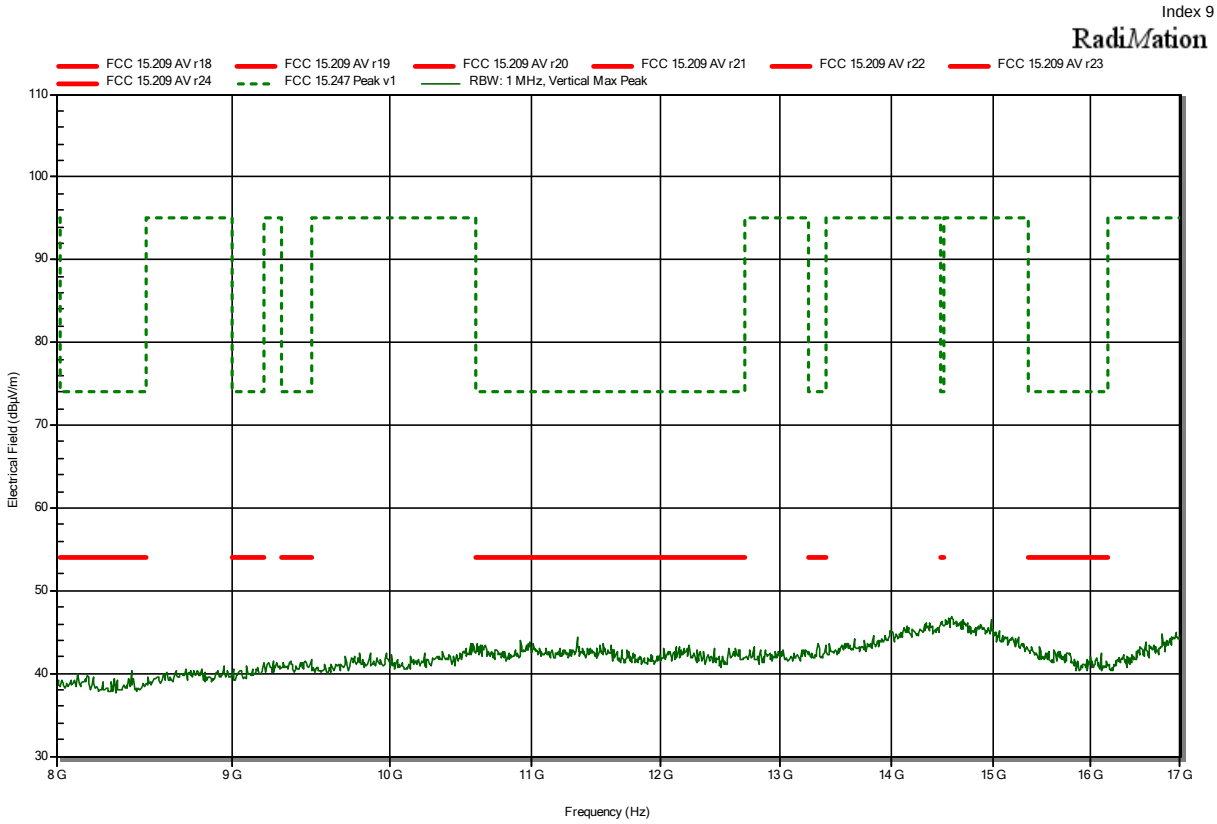
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2412 MHz
Test Date:	2019-06-20
Note:	



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9 °C, Vnom: 120 VAC (external power supply)
Antenna:	Amplifier Research AT4560, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2412 MHz
Test Date:	2019-06-24
Note:	

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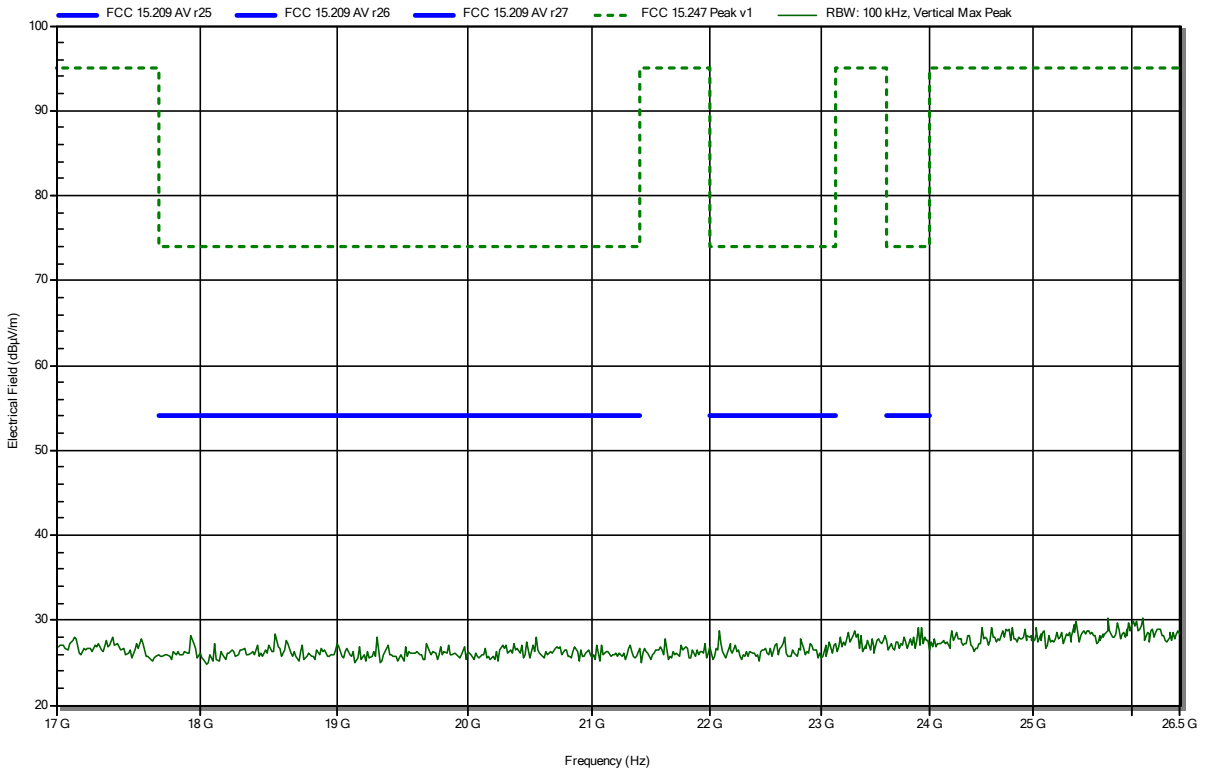
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; Mode n HT20 -- 2437 MHz
Test Date:	2019-06-24
Note:	

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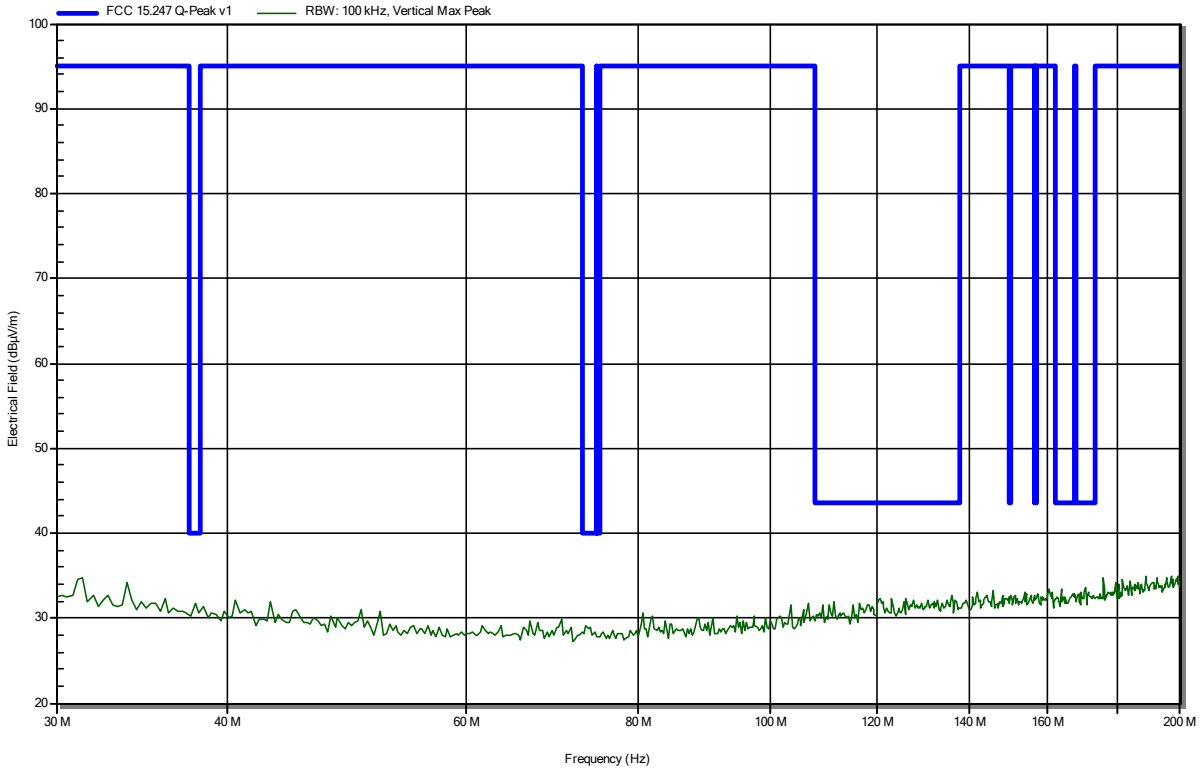
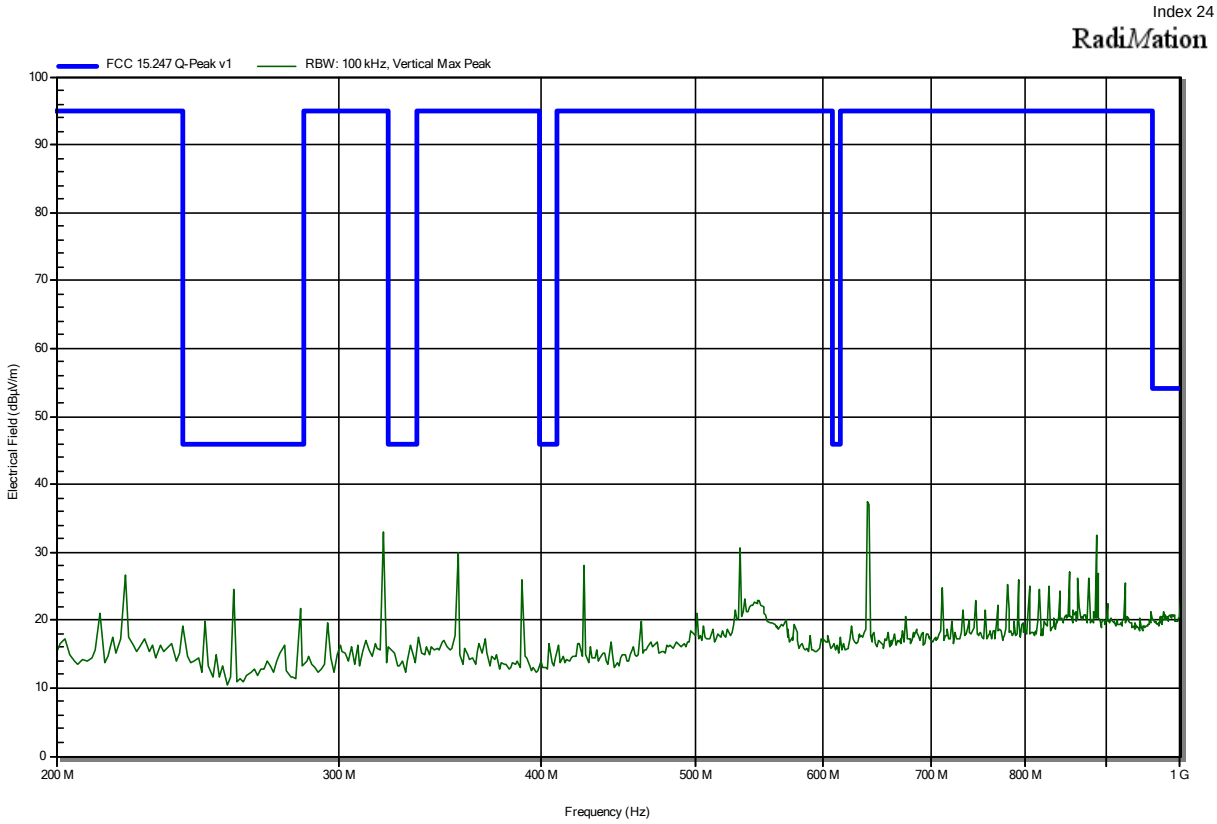
RadiMation



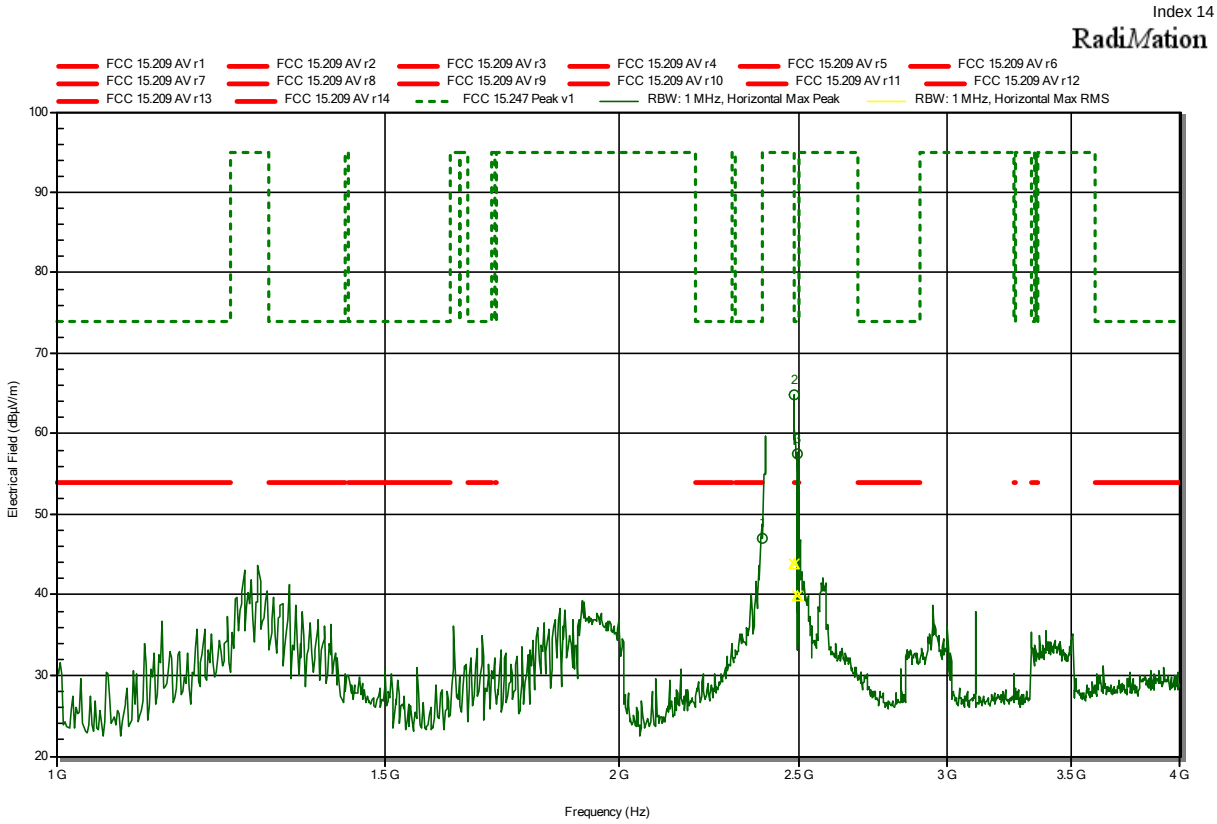
Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; Mode n HT20 -- 2437 MHz
Test Date:	2019-06-24
Note:	



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2437 MHz
Test Date:	2019-06-20
Note:	



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.3888 GHz	46.97 dBµV/m	74 dBµV/m	-27.03 dB	Pass
2.4838 GHz	64.81 dBµV/m	74 dBµV/m	-9.19 dB	Pass
2.4965 GHz	57.62 dBµV/m	74 dBµV/m	-16.38 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4838 GHz	43.81 dBµV/m	54 dBµV/m	-10.19 dB	Pass
2.4965 GHz	39.92 dBµV/m	54 dBµV/m	-14.08 dB	Pass

Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2437 MHz
Test Date:	2019-06-20
Note:	

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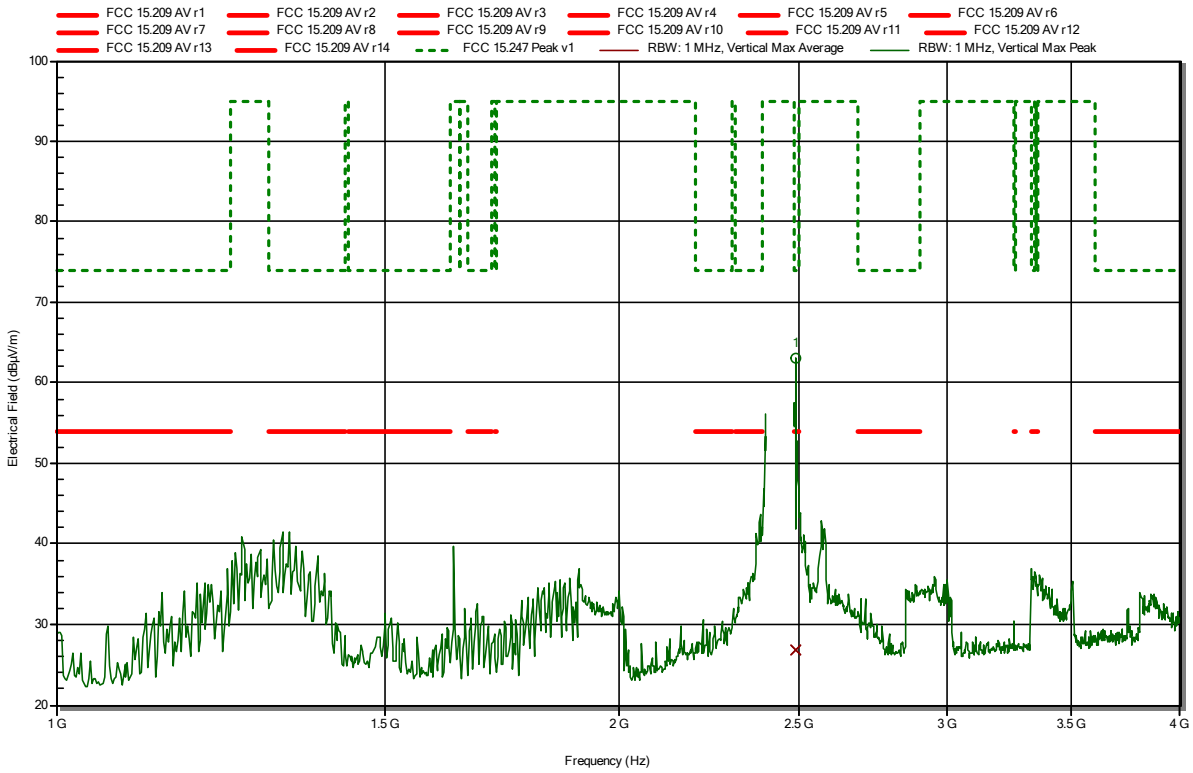
RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4897 GHz	62.98 dBµV/m	74 dBµV/m	-11.02 dB	Pass

Frequency	Average	Average Limit	Average Difference	Average Status
2.4897 GHz	26.75 dBµV/m	54 dBµV/m	-27.25 dB	Pass

Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2437 MHz
Test Date:	2019-06-20
Note:	

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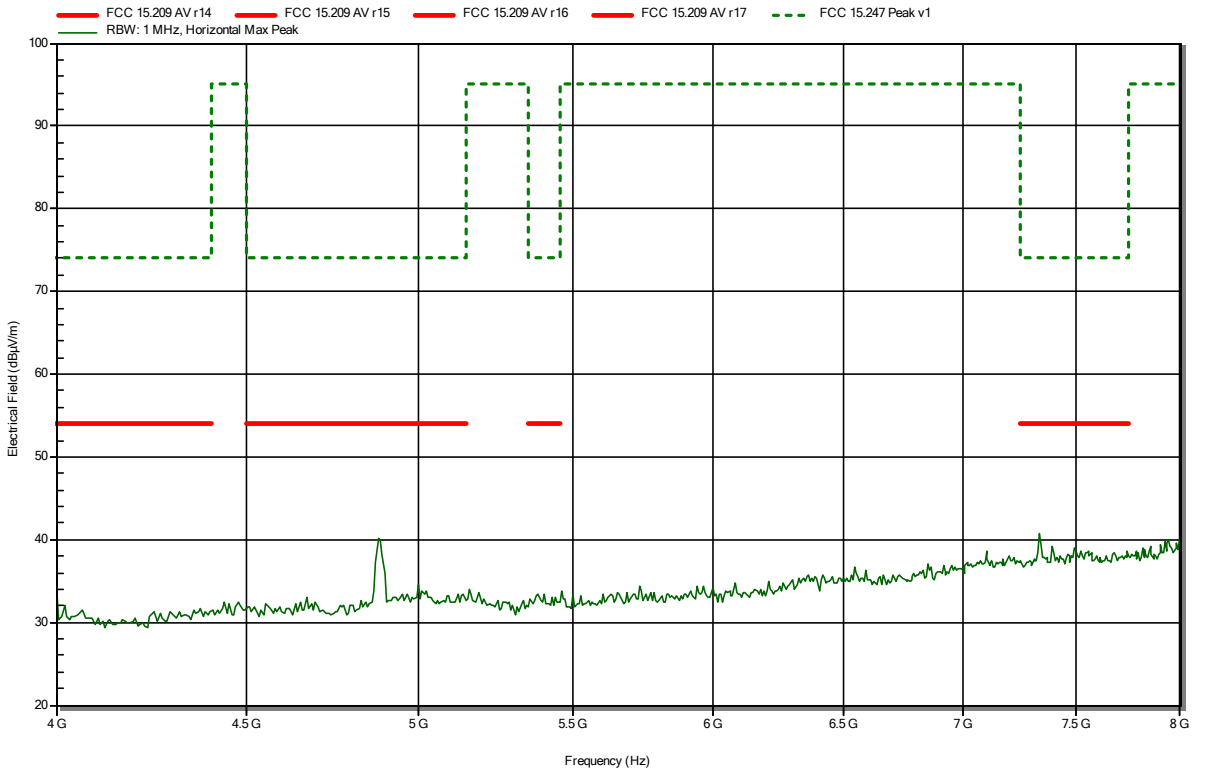
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2437 MHz
Test Date:	2019-06-20
Note:	

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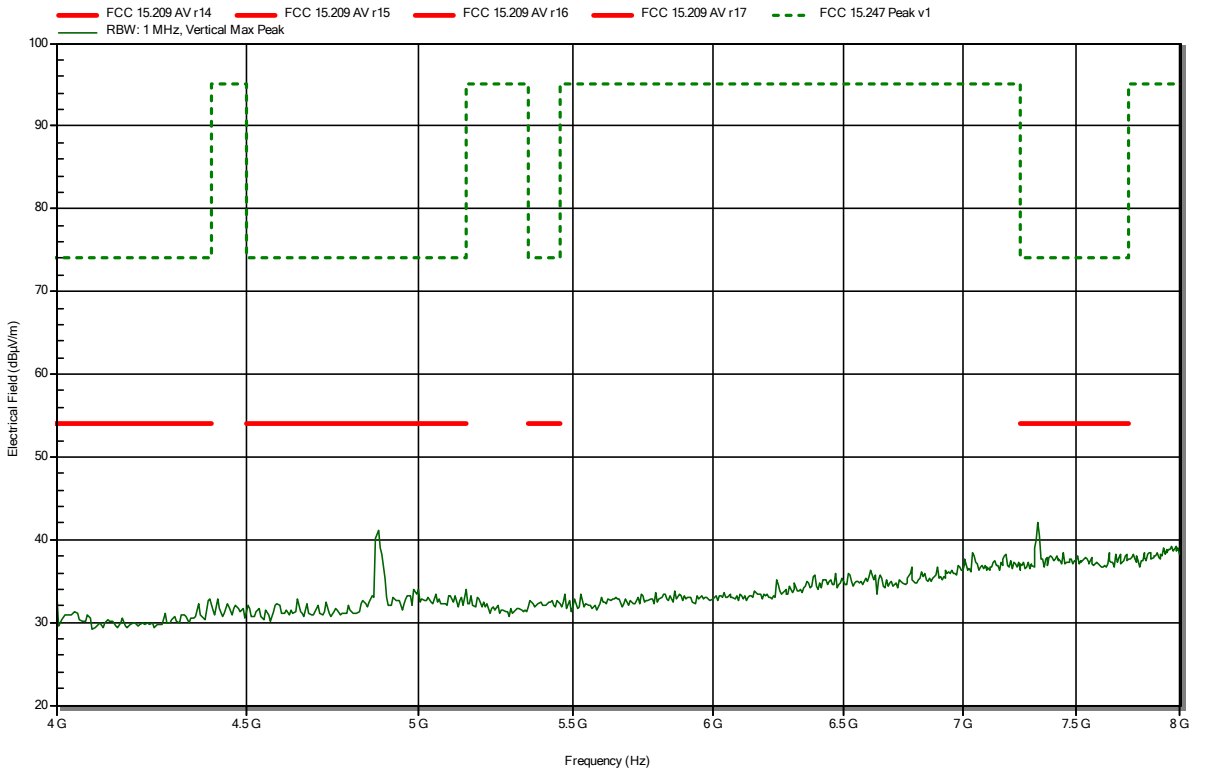
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2437 MHz
Test Date:	2019-06-20
Note:	

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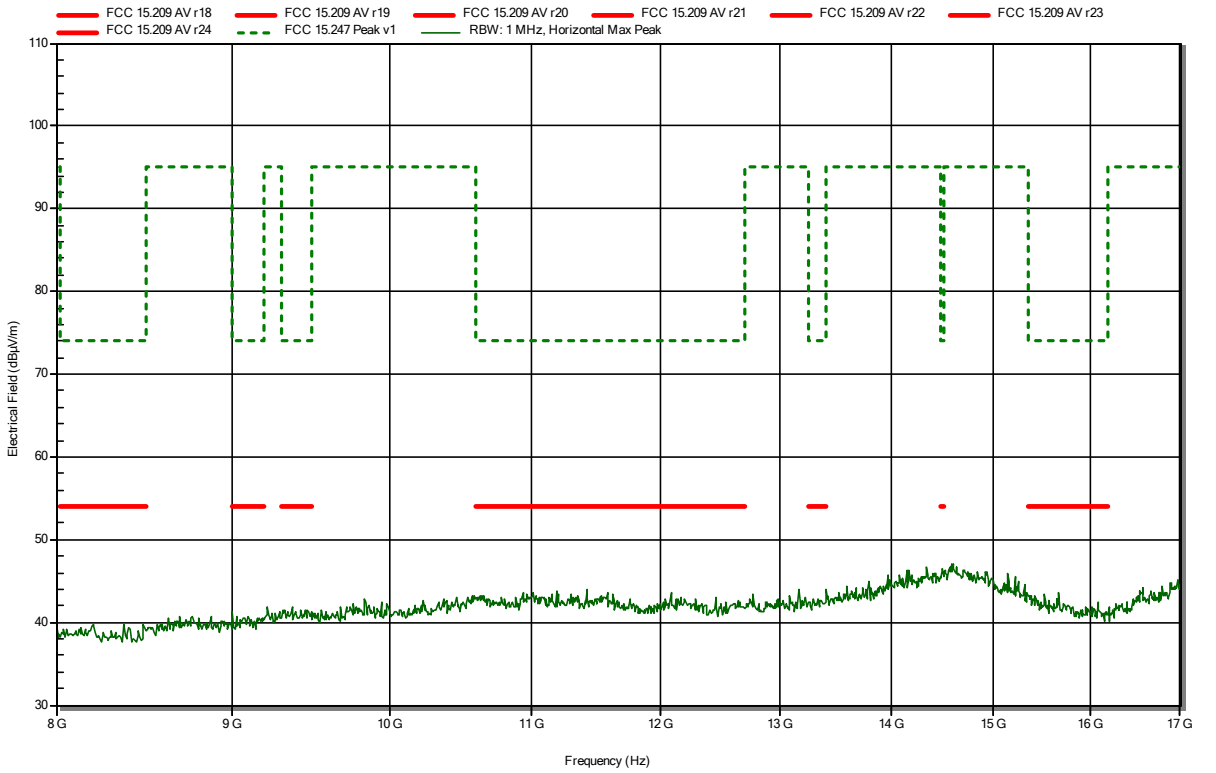
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2437 MHz
Test Date:	2019-06-20
Note:	

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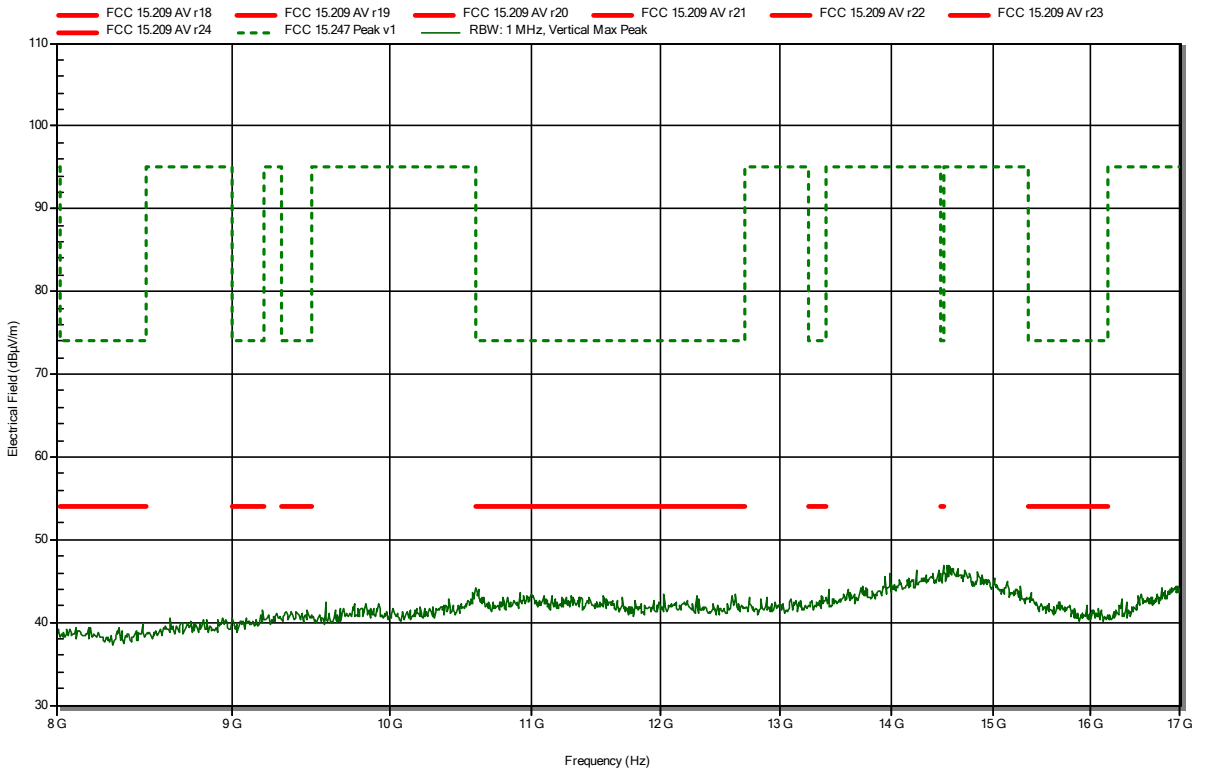
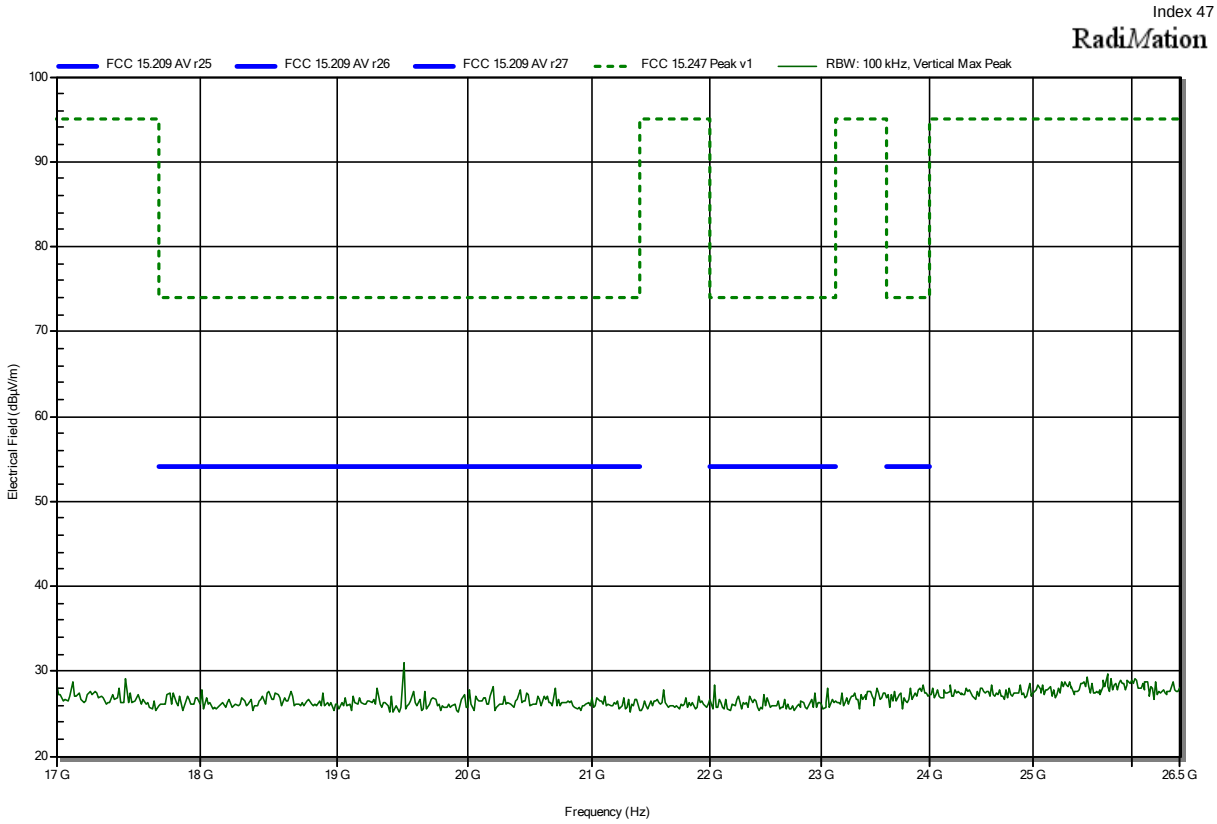
RadiMation



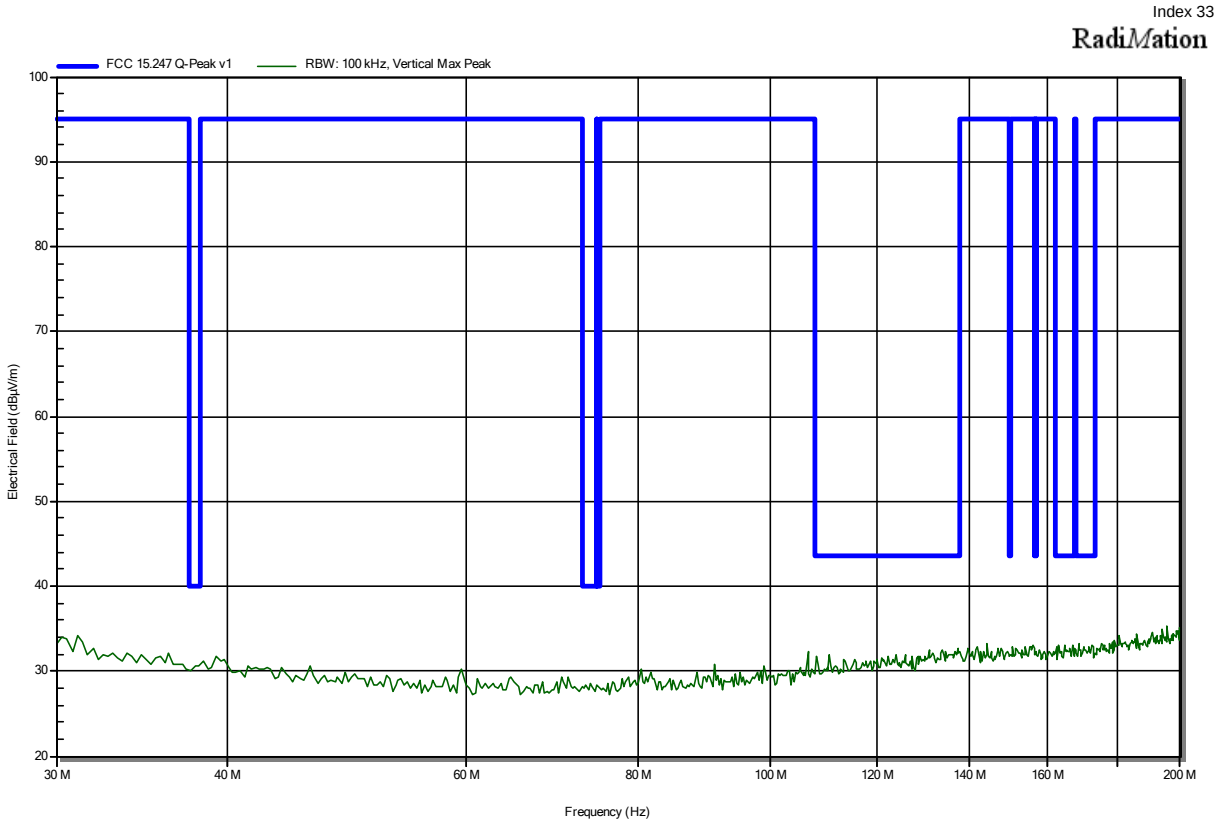
Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9 °C, Vnom: 120 VAC (external power supply)
Antenna:	Amplifier Research AT4560, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2437 MHz
Test Date:	2019-06-24
Note:	



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; Mode n HT20 -- 2462 MHz
Test Date:	2019-06-24
Note:	



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; Mode n HT20 -- 2462 MHz
Test Date:	2019-06-24
Note:	

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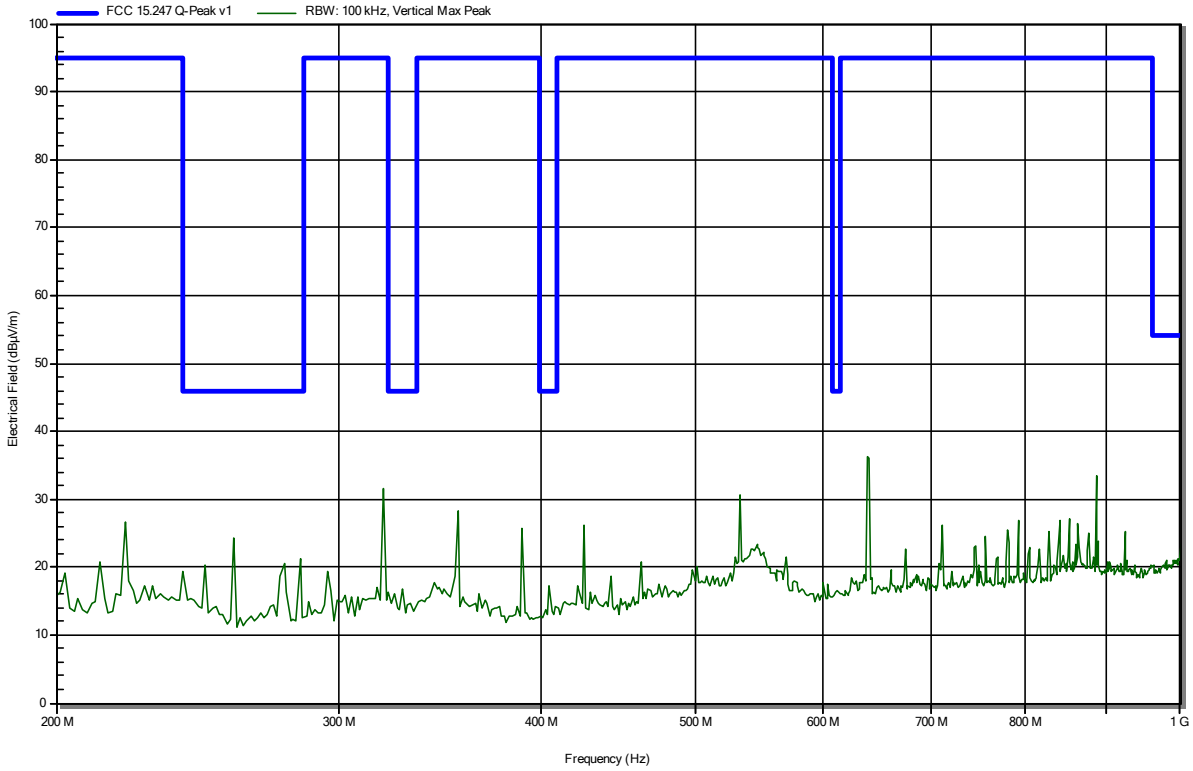
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2462 MHz
Test Date:	2019-06-24
Note:	

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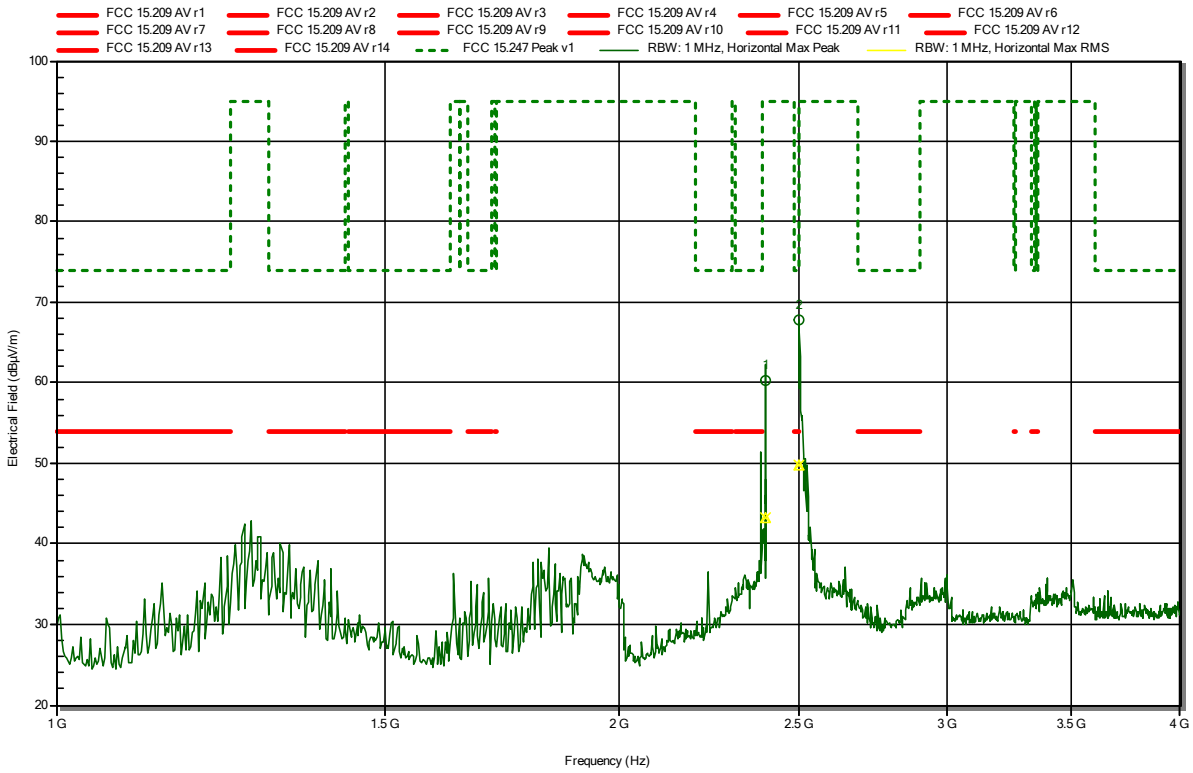
RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.399 GHz	60.32 dBµV/m	95 dBµV/m	-34.68 dB	Pass
2.5 GHz	67.76 dBµV/m	95 dBµV/m	-27.24 dB	Pass

Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2462 MHz
Test Date:	2019-06-24
Note:	

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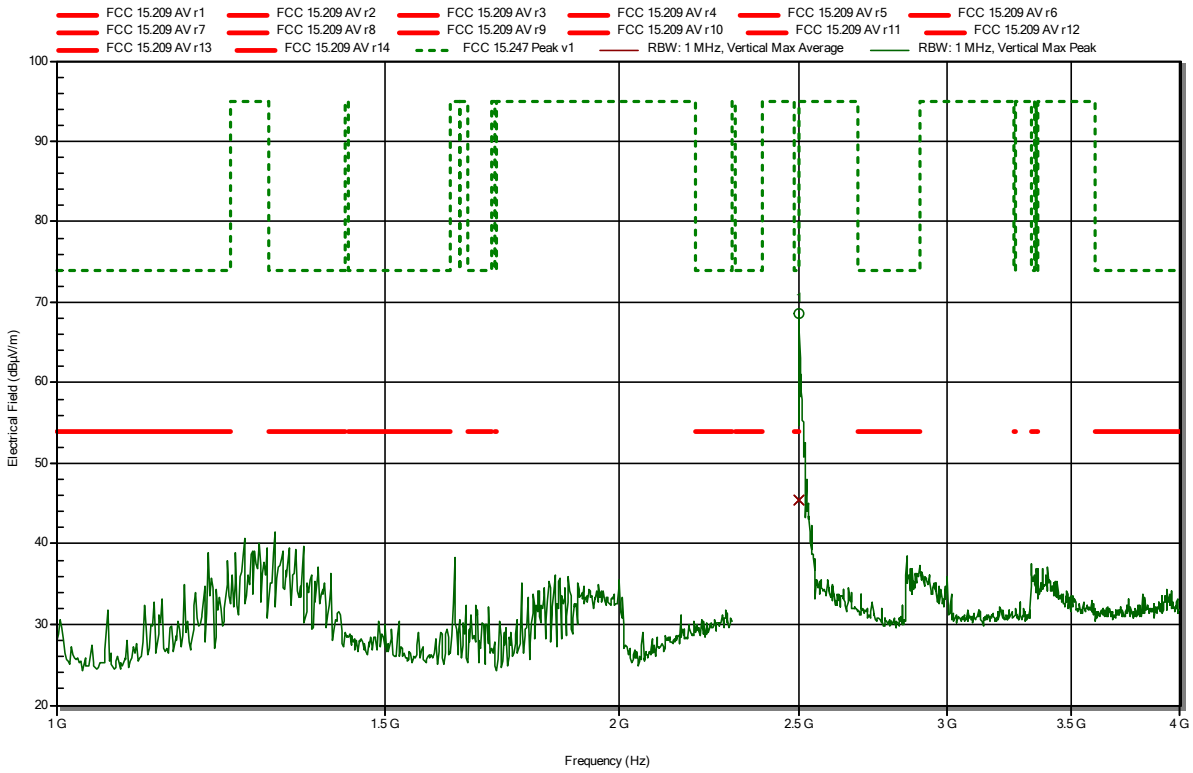
RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.5 GHz	68.7 dBµV/m	95 dBµV/m	-26.3 dB	Pass

Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2462 MHz
Test Date:	2019-06-24
Note:	upper bandedge

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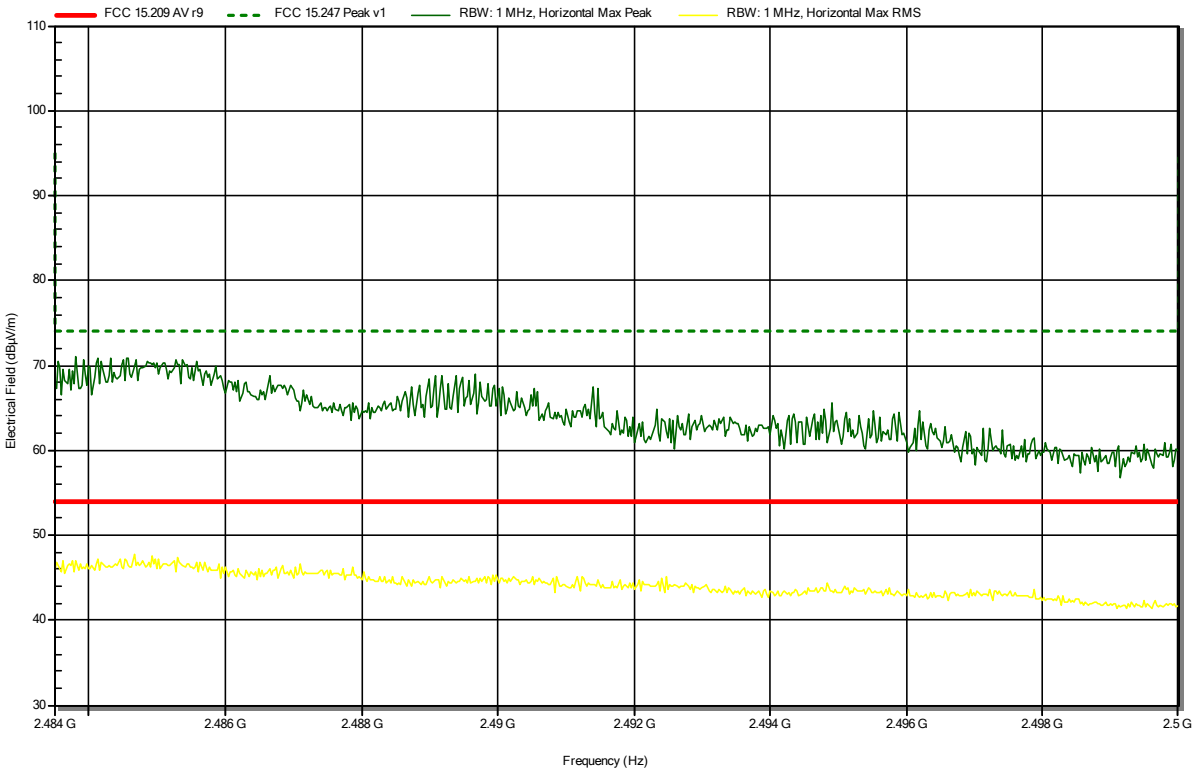
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2462 MHz
Test Date:	2019-06-24
Note:	upper bandedge

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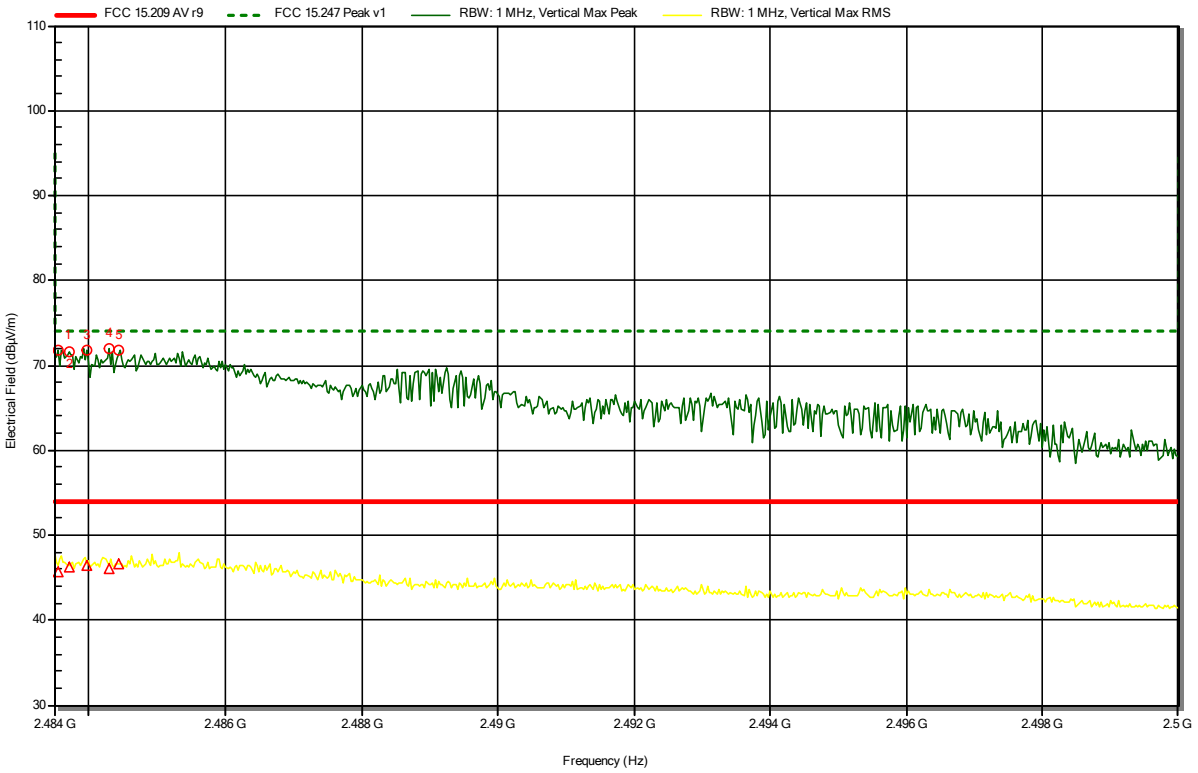
RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4836 GHz	71.85 dBµV/m	74 dBµV/m	-2.15 dB	Pass
2.4837 GHz	71.61 dBµV/m	74 dBµV/m	-2.39 dB	Pass
2.484 GHz	71.86 dBµV/m	74 dBµV/m	-2.14 dB	Pass
2.4843 GHz	71.98 dBµV/m	74 dBµV/m	-2.02 dB	Pass
2.4845 GHz	71.7 dBµV/m	74 dBµV/m	-2.3 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4836 GHz	45.66 dBµV/m	54 dBµV/m	-8.34 dB	Pass
2.4837 GHz	46.27 dBµV/m	54 dBµV/m	-7.73 dB	Pass
2.484 GHz	46.34 dBµV/m	54 dBµV/m	-7.66 dB	Pass
2.4843 GHz	45.99 dBµV/m	54 dBµV/m	-8.01 dB	Pass
2.4845 GHz	46.55 dBµV/m	54 dBµV/m	-7.45 dB	Pass

Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2462 MHz
Test Date:	2019-06-24
Note:	

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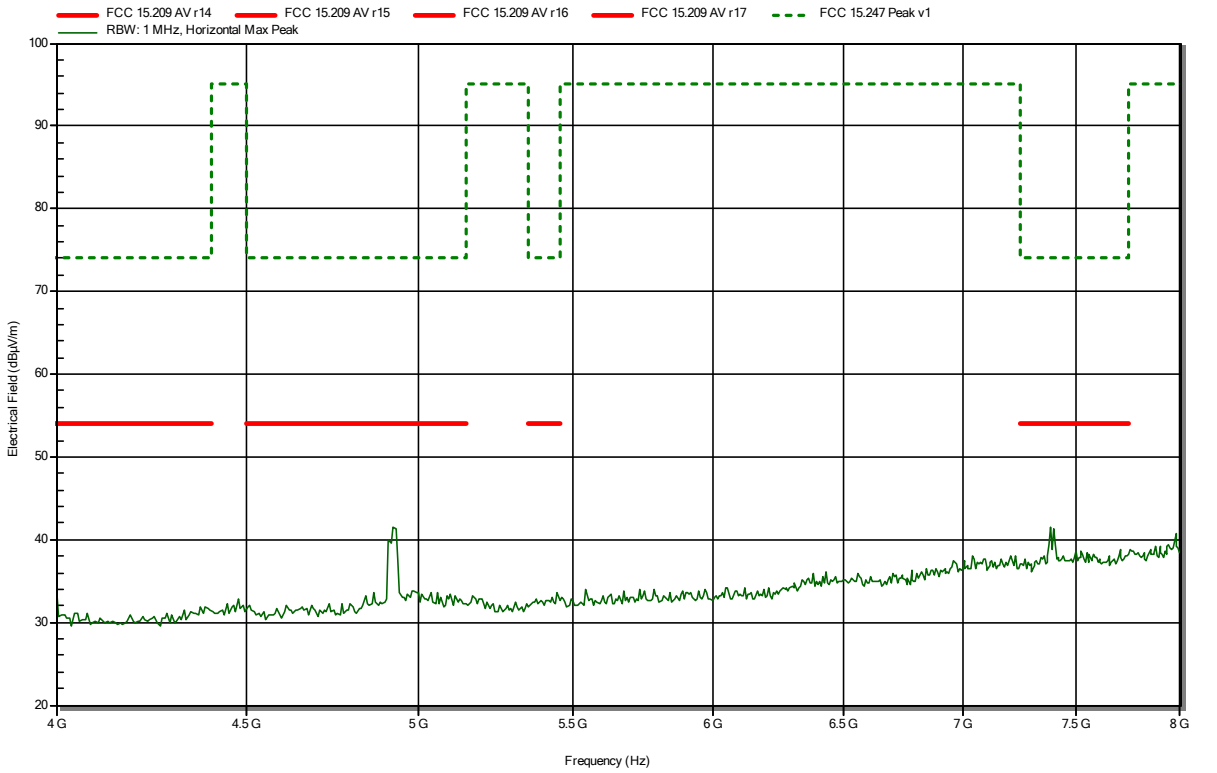
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2462 MHz
Test Date:	2019-06-24
Note:	

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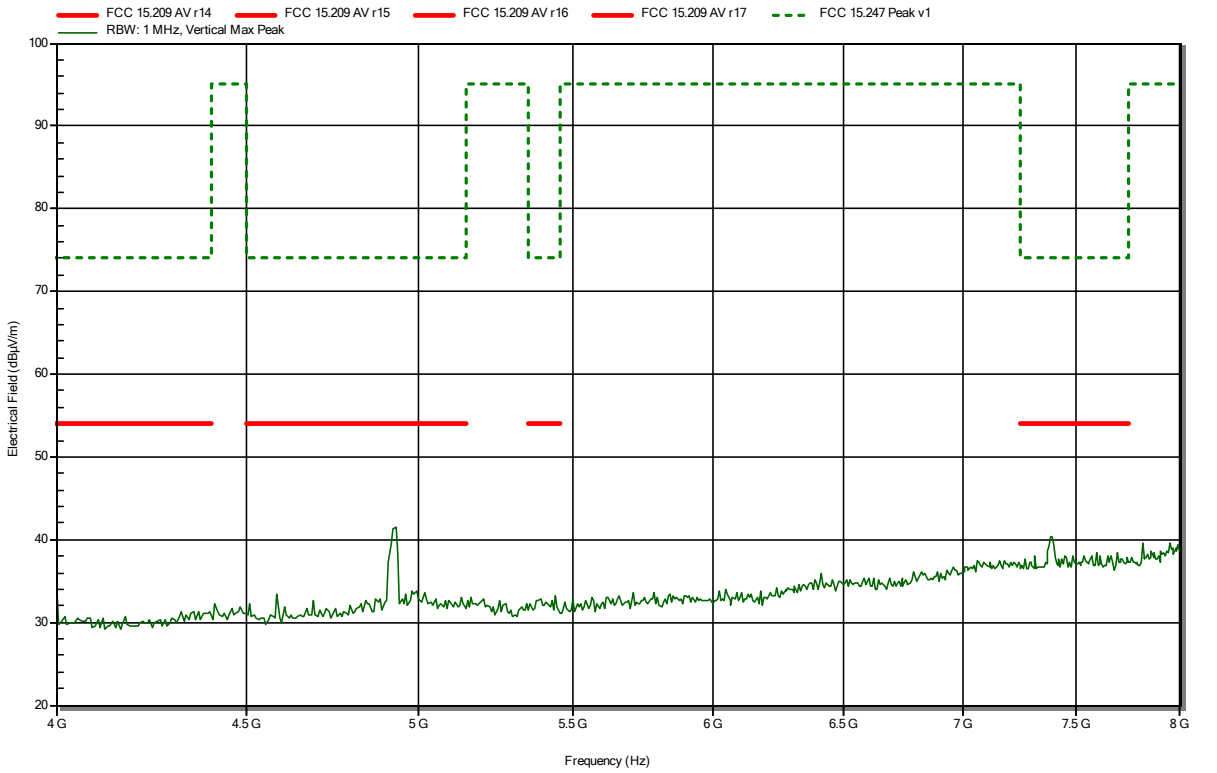
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2462 MHz
Test Date:	2019-06-24
Note:	

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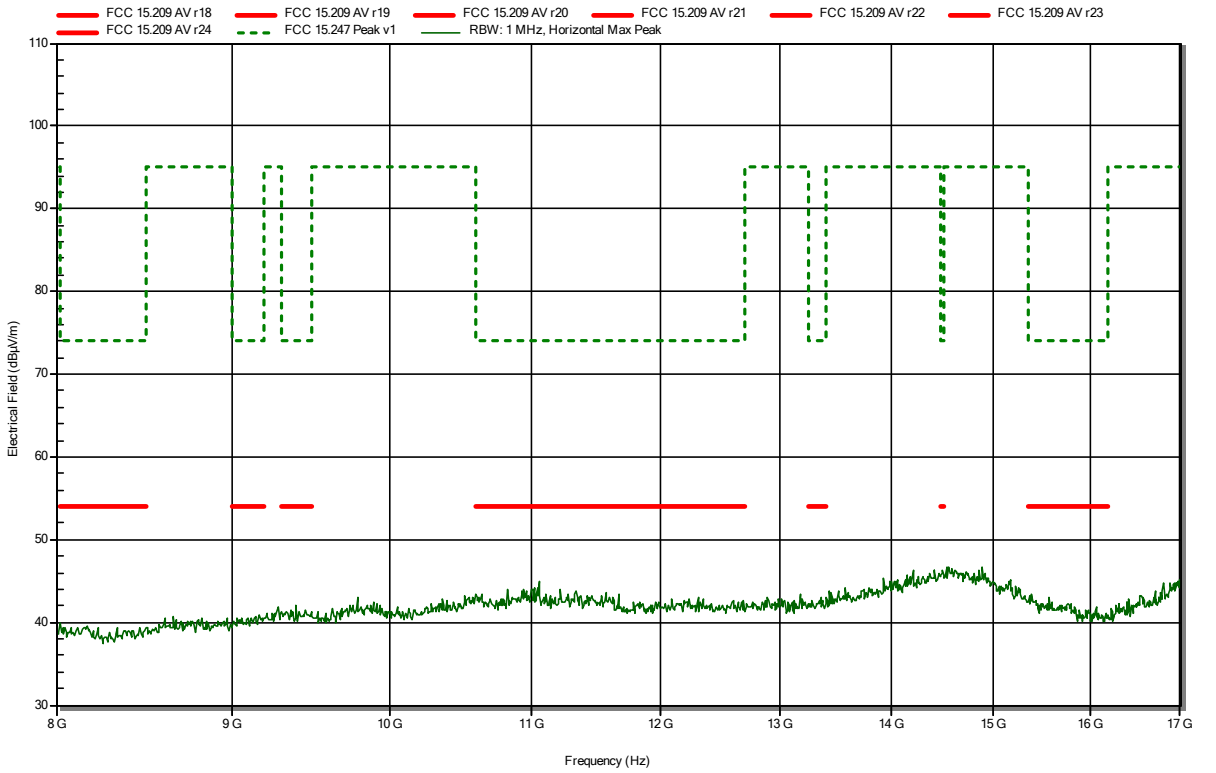
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 25.6 °C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2462 MHz
Test Date:	2019-06-24
Note:	

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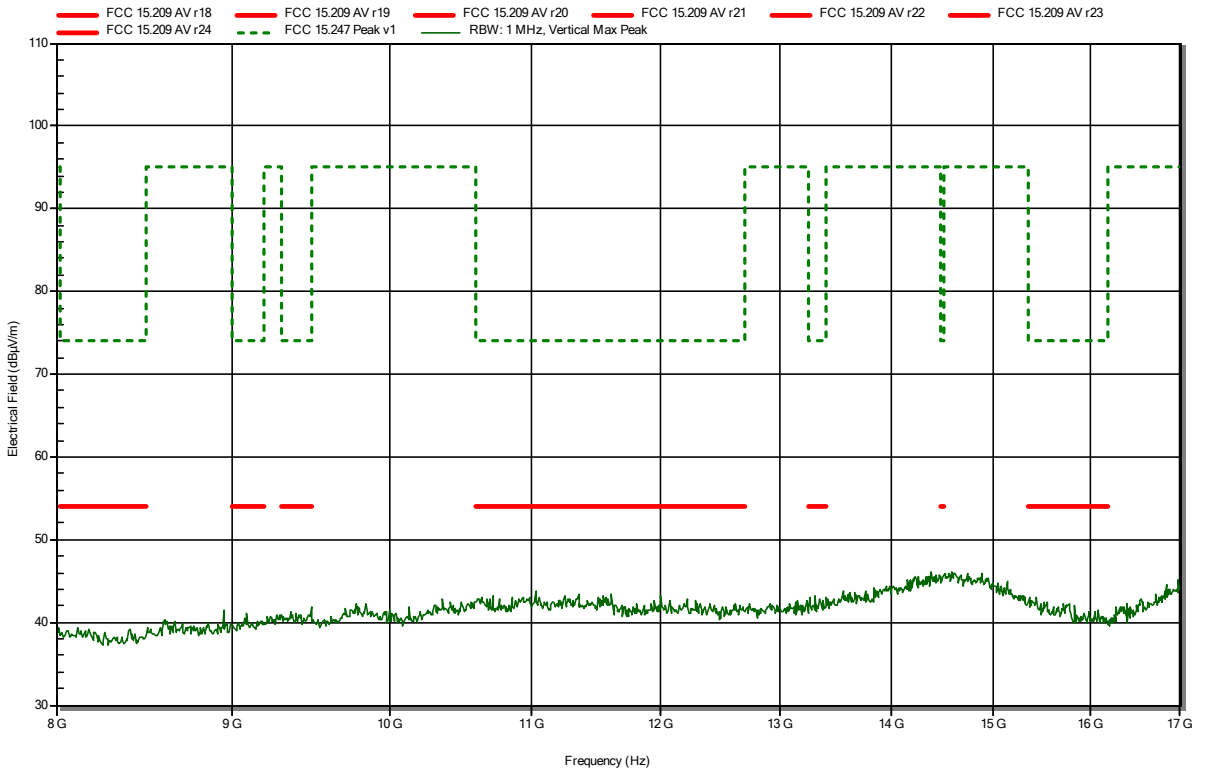
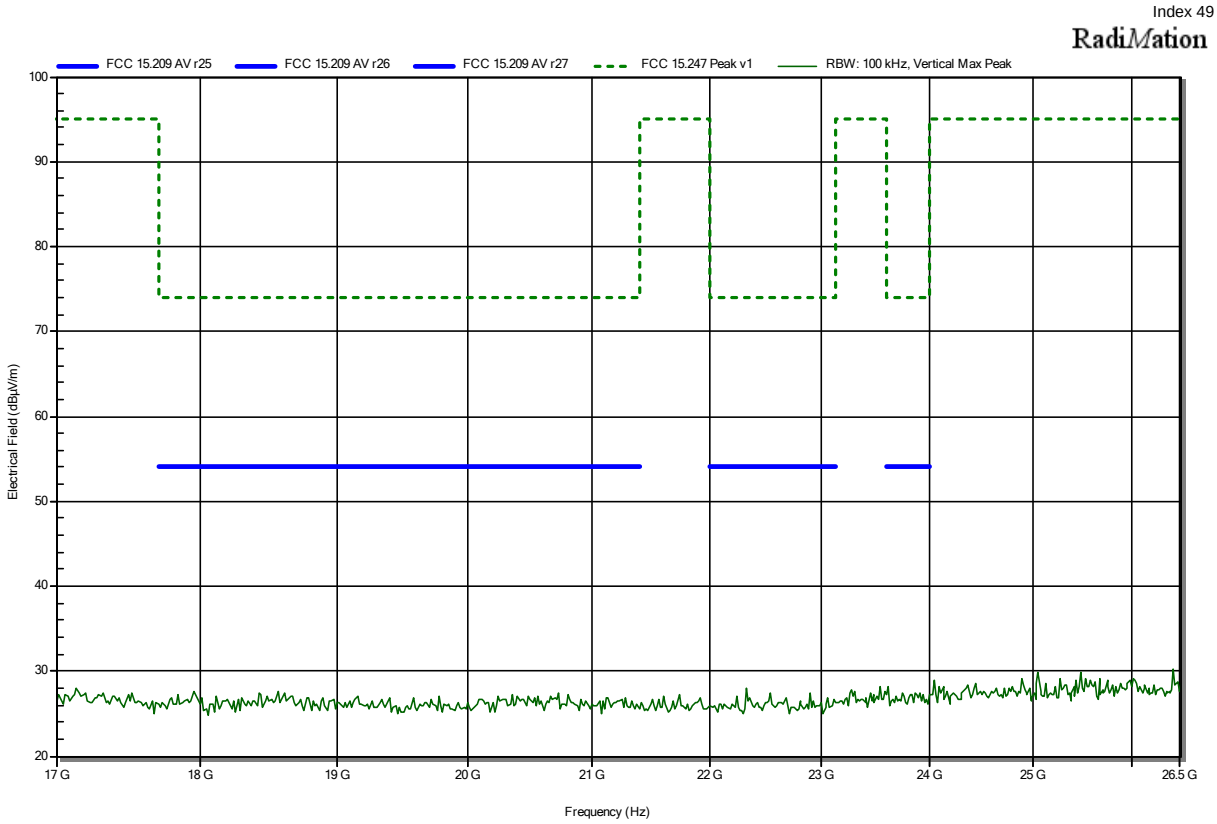
RadiMation



Spurious emissions according to FCC 47 CFR §15.247

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9 °C, Vnom: 120 VAC (external power supply)
Antenna:	Amplifier Research AT4560, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; Mode n HT20 -- 2462 MHz
Test Date:	2019-06-24
Note:	



ANNEX B Receiver spurious emissions

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9°C, Vnom: 120 VAC (external power supply)
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	RX; Mode n HT20 -- 2437 MHz
Test Date:	2019-07-26
Note:	

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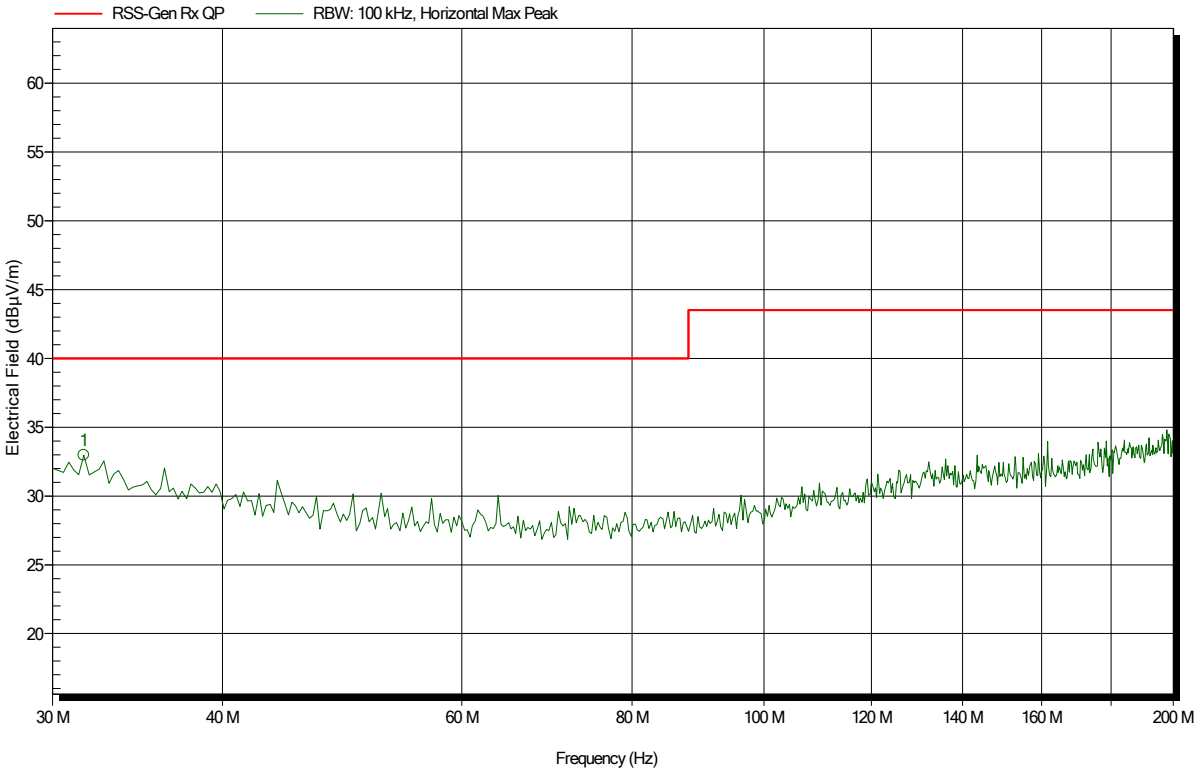

Frequency	Peak	Peak Limit	Peak Difference	Status	Angle	Height
31.635 MHz	32.98 dBµV/m	40 dBµV/m	-7.02 dB	Pass	-1 Degree	1.2 m

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9°C, Vnom: 120 VAC (external power supply)
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	RX; Mode n HT20 -- 2437 MHz
Test Date:	2019-07-26
Note:	

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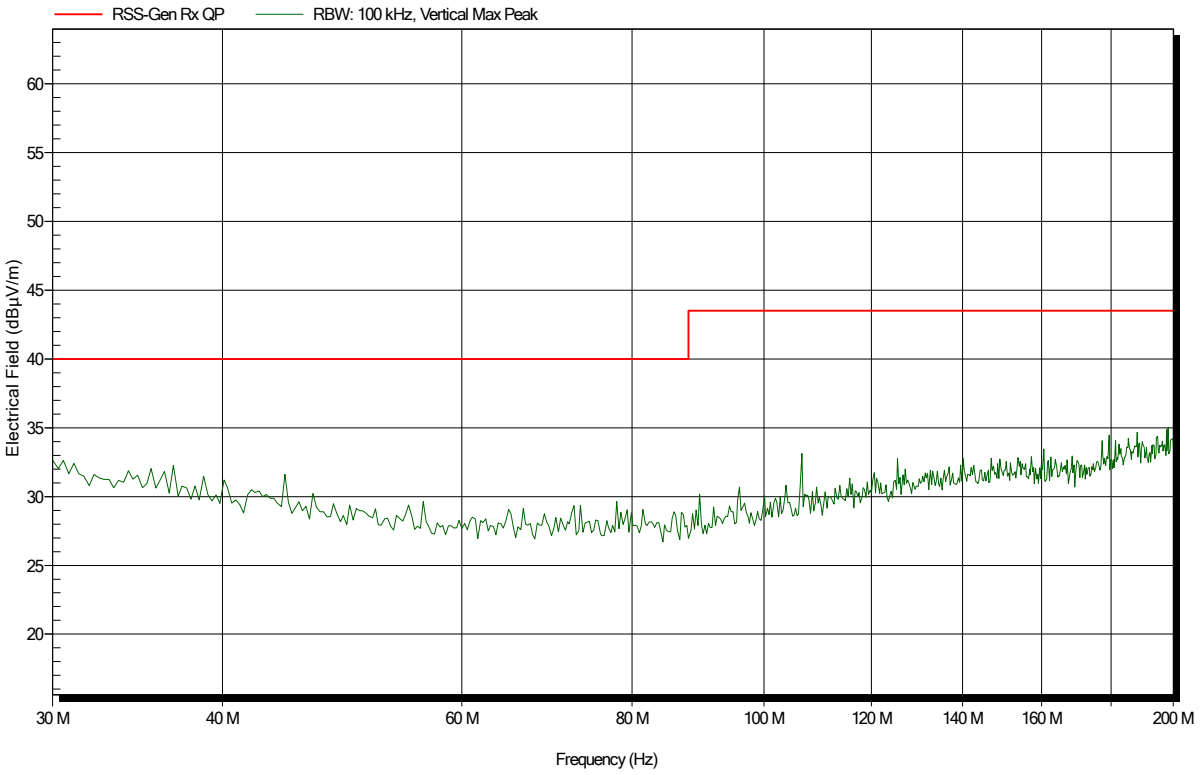

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9°C, Vnom: 120 VAC (external power supply)
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	RX; Mode n HT20 -- 2437 MHz
Test Date:	2019-07-26
Note:	

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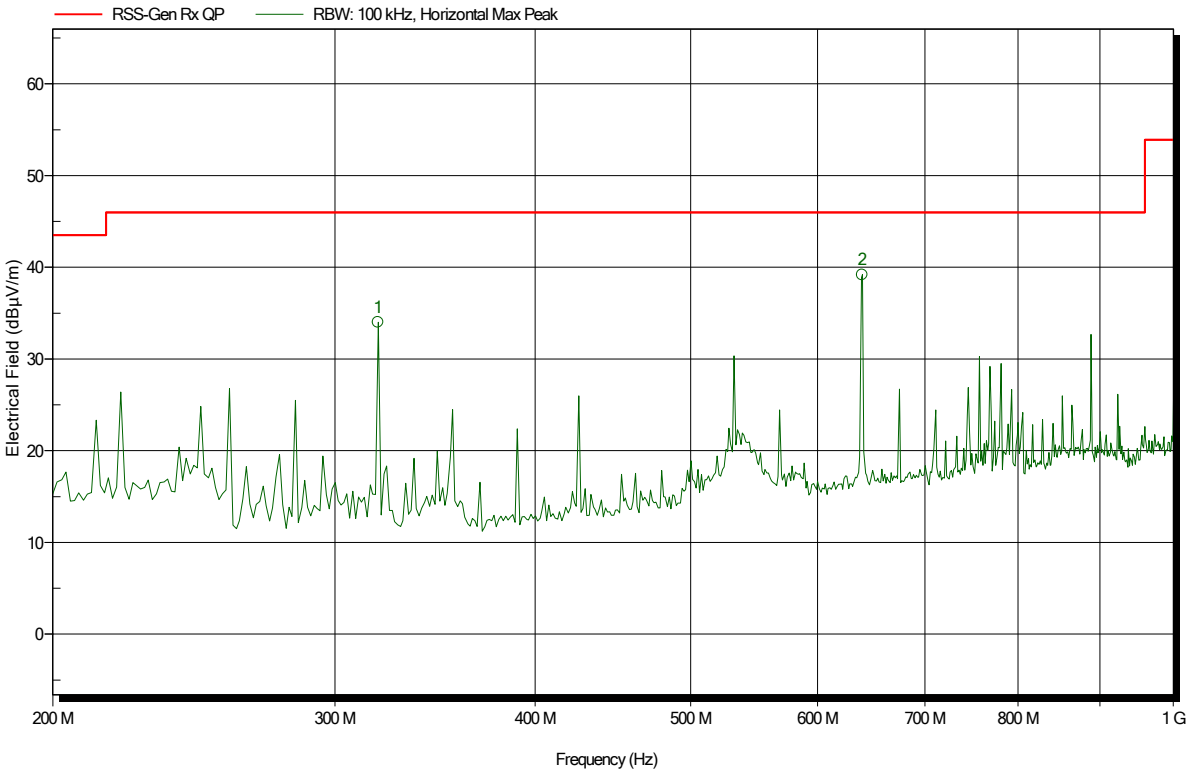

Frequency	Peak	Peak Limit	Peak Difference	Status	Angle	Height
319.231 MHz	34.01 dBµV/m	46 dBµV/m	-11.99 dB	Pass	90 Degree	1.2 m
639.744 MHz	39.19 dBµV/m	46 dBµV/m	-6.81 dB	Pass	270 Degree	1.2 m

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9°C, Vnom: 120 VAC (external power supply)
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	RX; Mode n HT20 -- 2437 MHz
Test Date:	2019-07-26
Note:	

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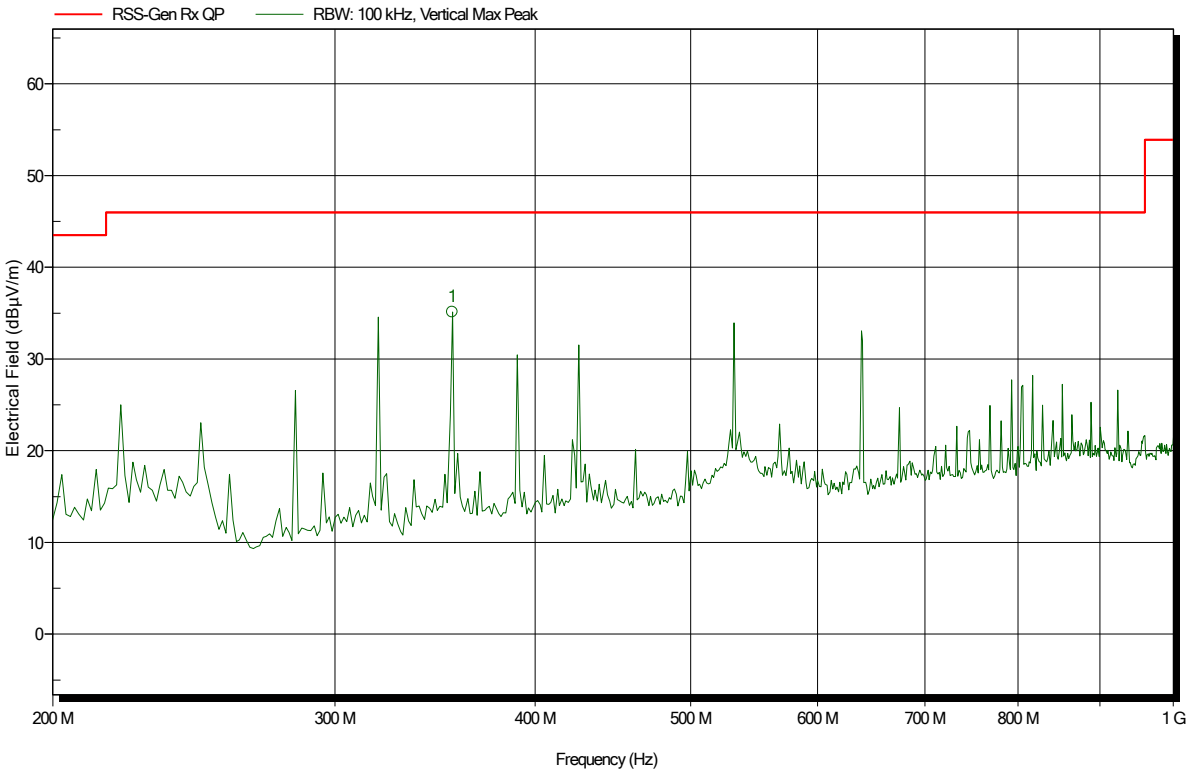

Frequency	Peak	Peak Limit	Peak Difference	Status	Angle	Height
355.128 MHz	35.14 dBµV/m	46 dBµV/m	-10.86 dB	Pass	90 Degree	1.2 m

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9°C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m
Mode:	RX; Mode n HT20 -- 2437 MHz
Test Date:	2019-07-26
Note:	

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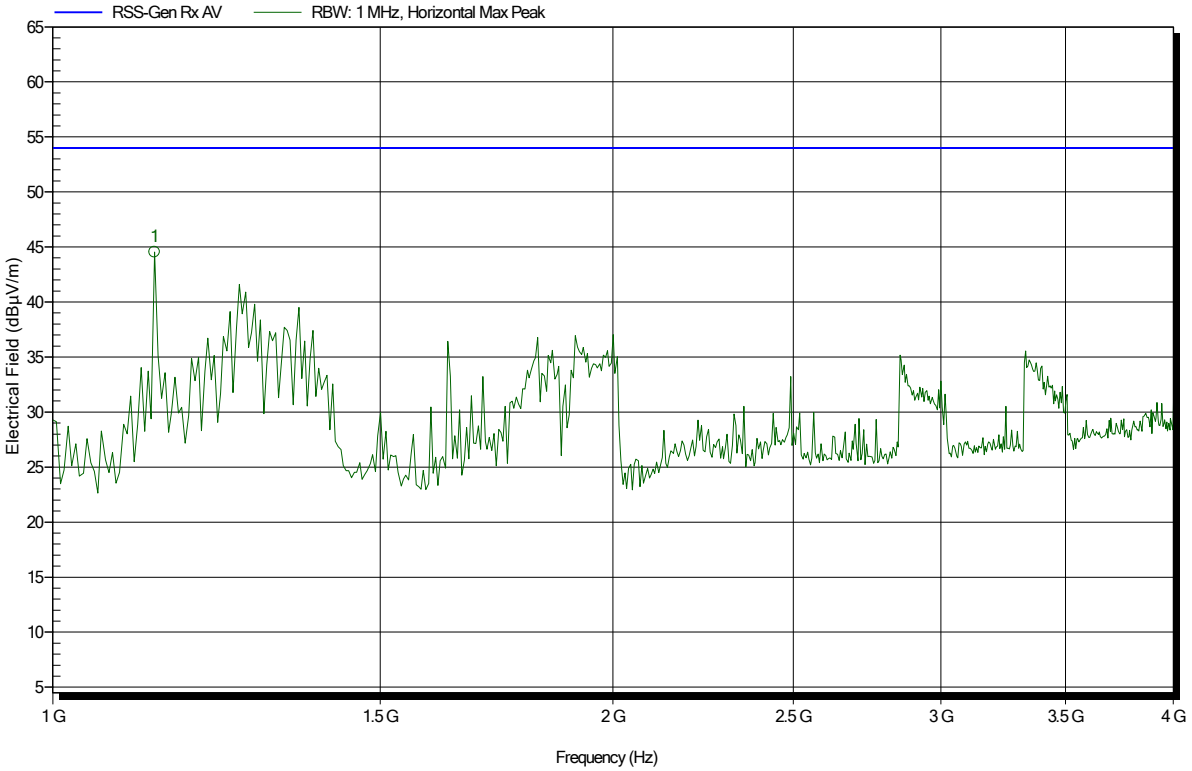

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
1.135 GHz	44.54 dBµV/m	53.98 dBµV/m	-9.44 dB	Pass

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9°C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m
Mode:	RX; Mode n HT20 -- 2437 MHz
Test Date:	2019-07-26
Note:	

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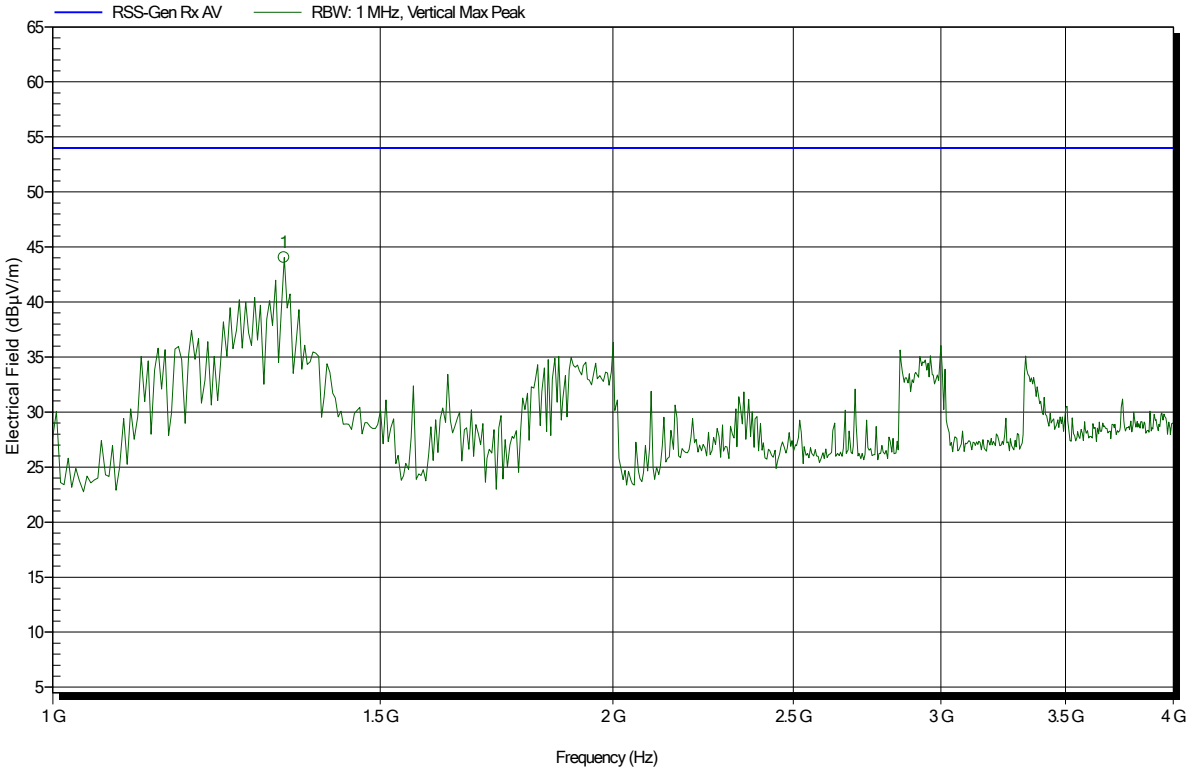

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
1.332 GHz	44.05 dBµV/m	53.98 dBµV/m	-9.93 dB	Pass

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9°C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m
Mode:	RX; Mode n HT20 -- 2437 MHz
Test Date:	2019-07-26
Note:	

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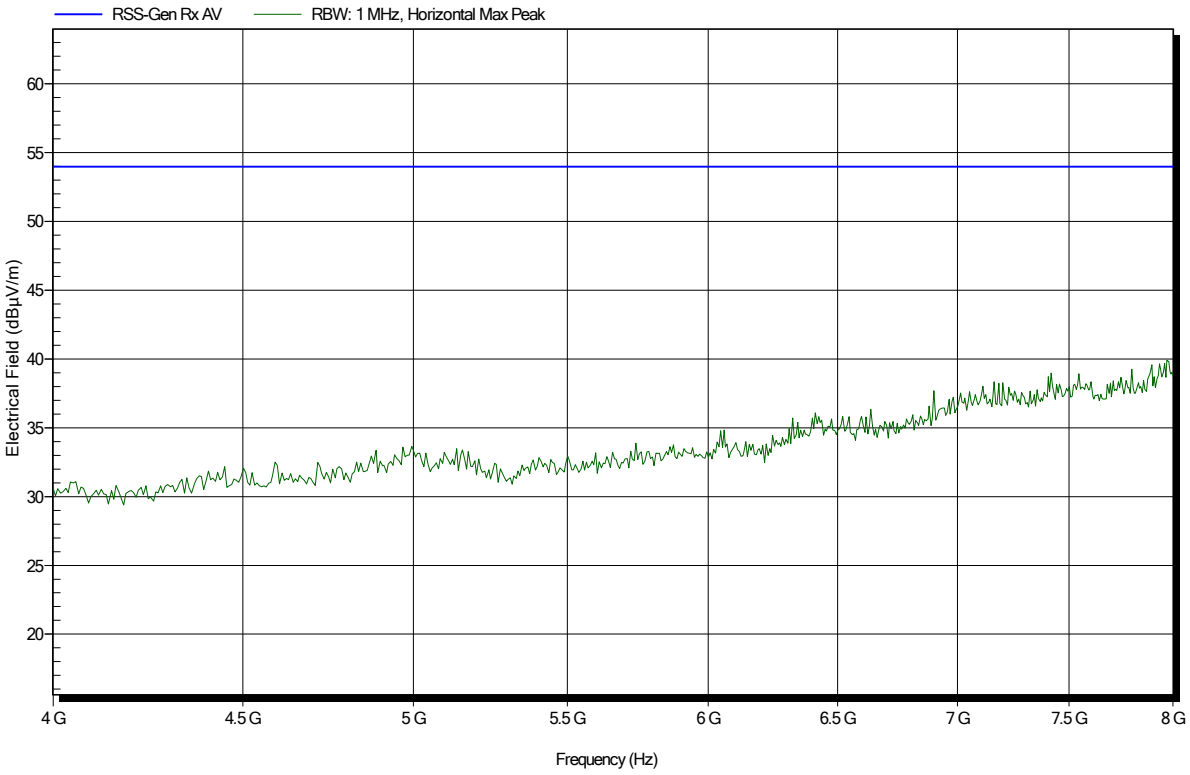

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9°C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m
Mode:	RX; Mode n HT20 -- 2437 MHz
Test Date:	2019-07-26
Note:	

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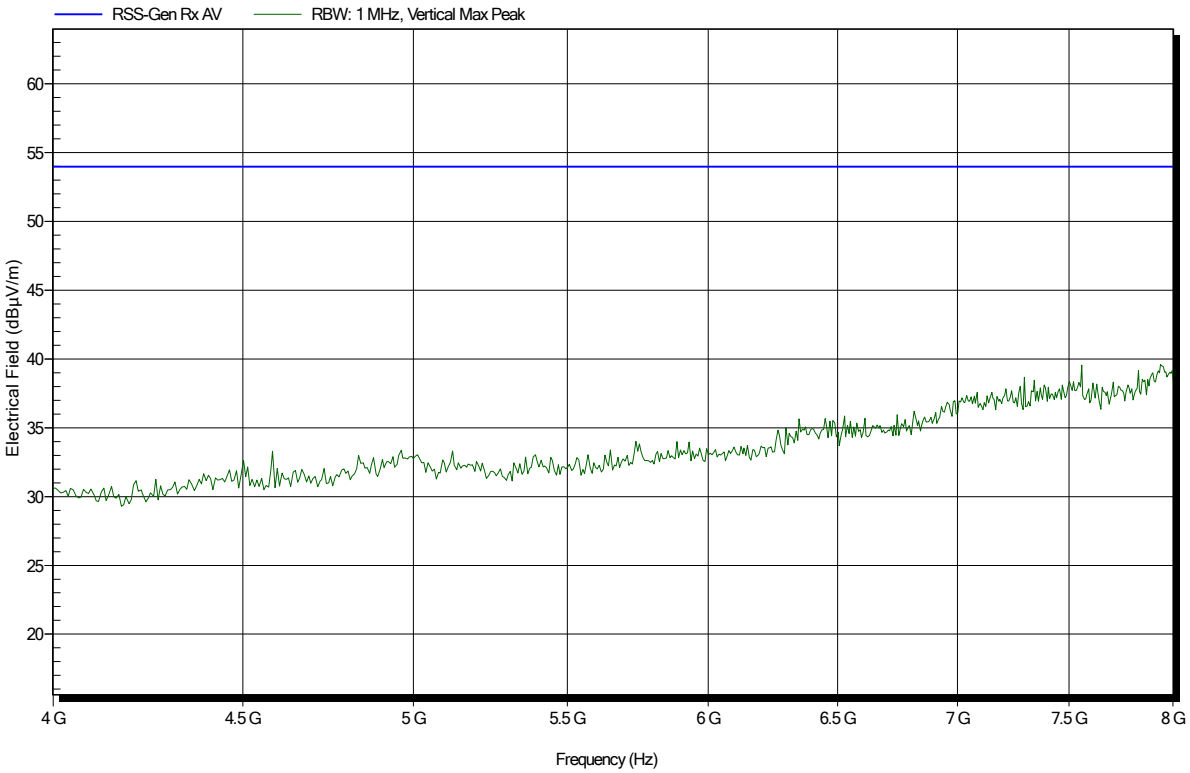

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9°C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	RX; Mode n HT20 -- 2437 MHz
Test Date:	2019-07-26
Note:	

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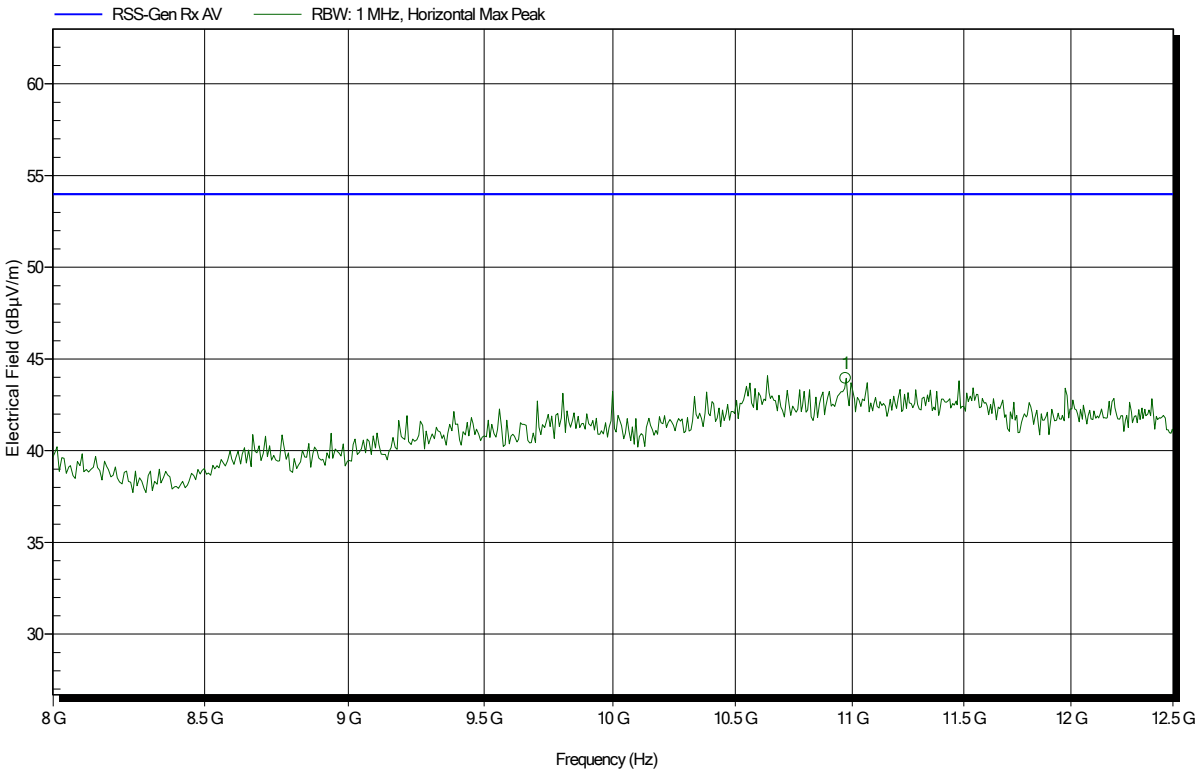

Frequency	Peak	Peak Limit	Peak Difference	Status
10.971 GHz	43.96 dBµV/m	53.98 dBµV/m	-10.02 dB	Pass

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9°C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	RX; Mode n HT20 -- 2437 MHz
Test Date:	2019-07-26
Note:	

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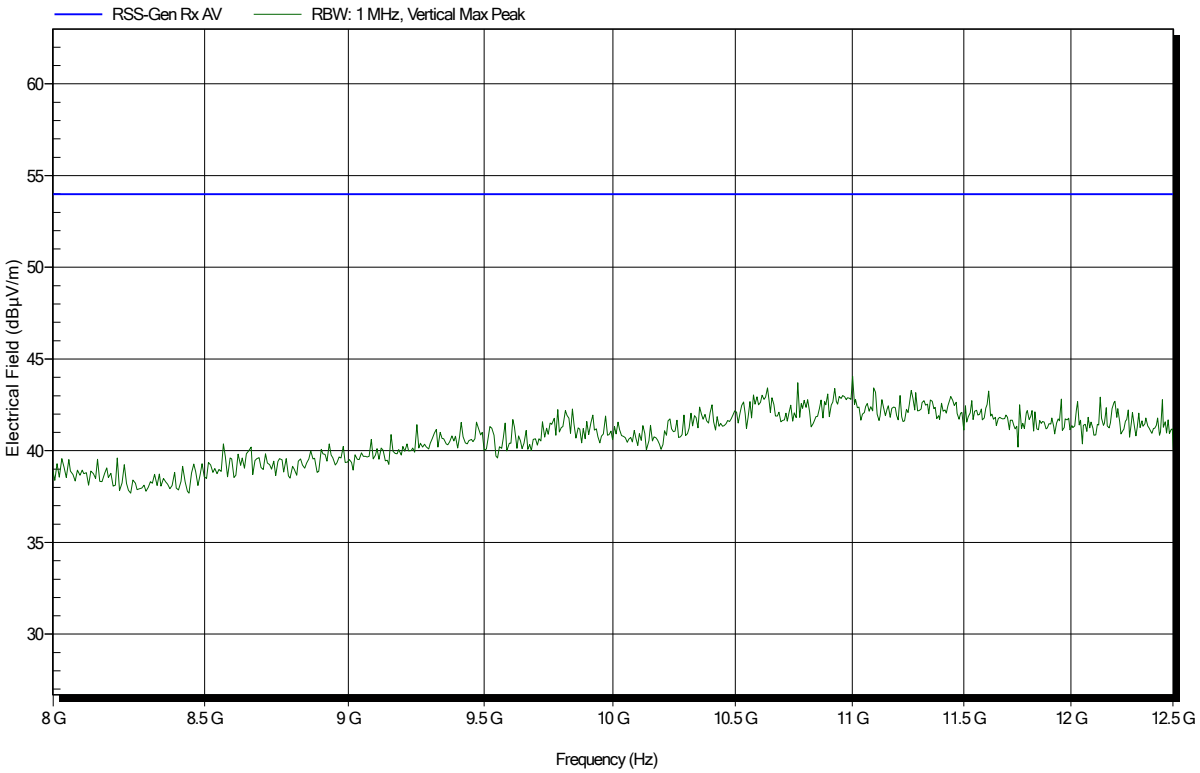

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number:	G0M-1905-8256
Applicant:	BIOTRONIK SE & Co. KG
EUT Name:	Renamic Neo Programming Device
Model:	Renamic Neo
Test Site:	Eurofins Product Service GmbH
Operator:	Abdullah Al Jamal
Test Conditions:	Tnom: 26.9°C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	RX; Mode n HT20 -- 2437 MHz
Test Date:	2019-07-26
Note:	

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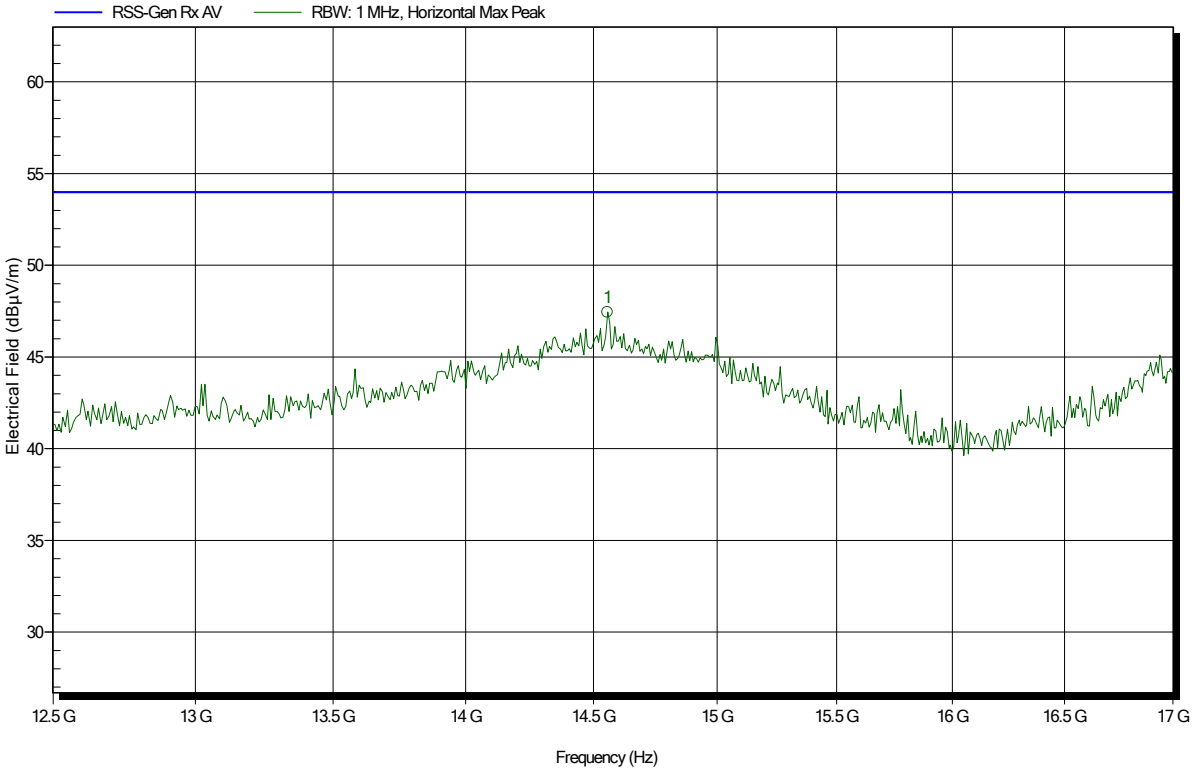

Frequency	Peak	Peak Limit	Peak Difference	Status
14.555 GHz	47.44 dBµV/m	53.98 dBµV/m	-6.54 dB	Pass

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Test Site:	Eurofins Product Service GmbH
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Test Conditions:	Tnom: 26.9°C, Vnom: 120 VAC (external power supply)
Antenna:	Schwarzbeck BBHA 9120D, Vertical
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Mode:	RX; Mode n HT20 -- 2437 MHz
Test Date:	2019-07-26
Note:	

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