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-1810-7783-TFC247BL-V03
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	DAkkS - Registration number : D-PL-12092-01-03 (ISED) DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970 ISED Testing Laboratory site: 3470A-2
Applicant	Panasonic Industrial Devices Europe GmbH
Address	Zeppelinstr. 19 21337 Lüneburg GERMANY
Test Specification	According to FCC/ISED rules
Standard	47 CFR Part 15C RSS-247, Issue 2, 2017-02 RSS-Gen, Issue 5, 2018-04
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model(s)	ENWF9201A1EF
Additional Model(s)	ENWF9203A1EF
Brand Name(s)	PAN9026
Hardware Version(s)	05
Software Version(s)	01
FCC-ID	T7V-9026
IC	216Q-9026
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	2018-10-04	
Report:		
Compiled by	Wilfried Treffke	
Tested by (+ signature) (Responsible for Test)	Wilfried Treffke	W. Treffke .....
Approved by (+ signature) (Head of Lab)	Christian Weber	C. Weber .....
Date of Issue	2019-06-28	
Total number of pages	96	
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:		
The models ENWF9203A1EF and ENWF9201A1EF are completely identical with respect to the bluetooth low energy radio interface.		

ADDITIONAL VARIANTS

Additional Variants (not tested and not evaluated variants)		
Not-tested Variant	**Description**	
1	Product Type Description	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
	Model name	ENWF9208A1EF (multi region)
	Brand name	PAN9026
	Hardware Version	05
	Software Version	01
Comment: Those named additional variants above have not been tested. Those additional variants of the series have been declared by the manufacturer. The test report explicitly states that those variants were neither tested nor assessed nor evaluated.		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2019-03-05	Initial Release	
02	2019-05-24	Replaced document: G0M-1810-7783-TFC247BL-V01 Replaced by: G0M-1810-7783-TFC247BL-V02 Reason: added an Additional Variant	W. Treffke
03	2019-06-28	Replaced document: G0M-1810-7783-TFC247BL-V02 Replaced by: G0M-1810-7783-TFC247BL-V03 Reason: Result summary corrected	C. Weber

ABBREVIATIONS AND ACRONYMS

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

REPORT INDEX

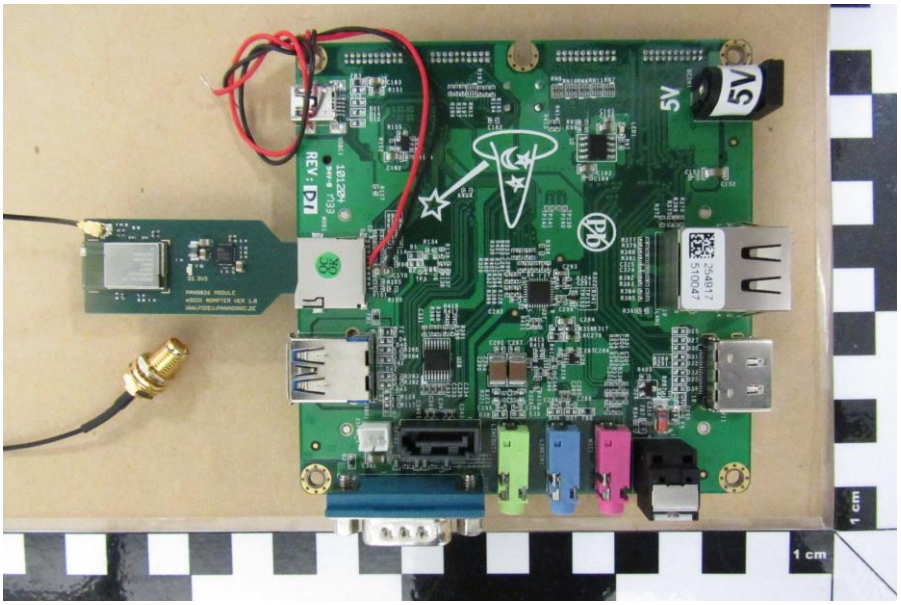
1 Equipment (Test Item) Under Test

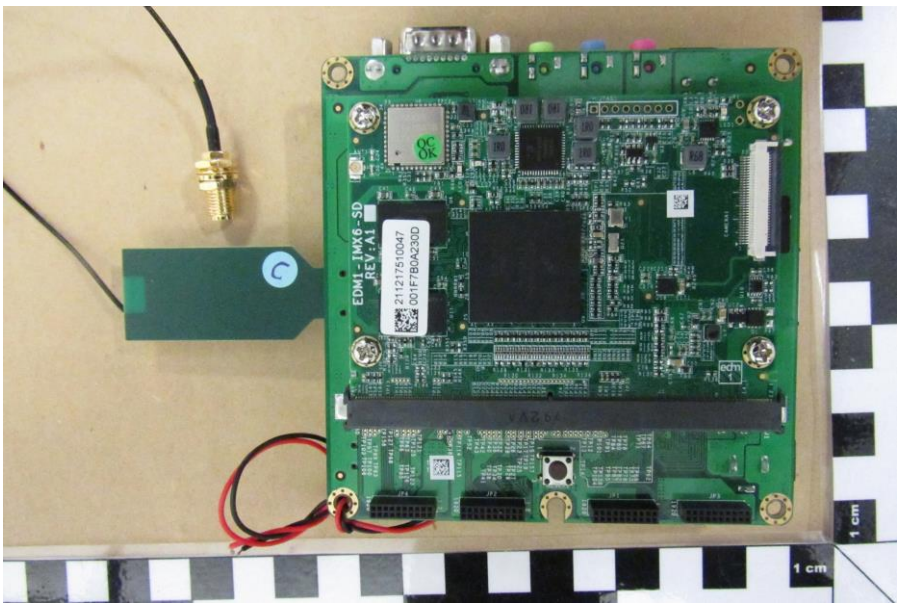
Description	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module	
Model	ENWF9201A1EF	
Additional Model(s)	ENWF9203A1EF	
Brand Name(s)	PAN9026	
Serial Number(s) Model ENWF9201A1EF	1823411;00002129;00134375843B;F9201A1E;0501 (radiated) 1807211;00001040;0013436B110D;F9201A1E;0501 (conducted)	
Serial Number(s) Model ENWF9203A1EF	1829511;00000079;0013437BBD97;F9203A1E;0501 (radiated) 1829511;00000003;0013437AB217;F9203A1E;0501 (conducted)	
Hardware Version(s)	05	
Software Version(s)	01	
PMN	PAN9026	
HVIN	ENWF9203A1EF	
FVIN	-/-	
HMN	-/-	
FCC-ID	T7V-9026 (ENWF9201A1EF)	
IC	216Q-9026 (ENWF9201A1EF)	
Equipment type	Radio Module	
Radio type	Transceiver	
Assigned frequency bands	2400 - 2483.5 MHz	
Radio technology	Bluetooth LE	
Modulation	GFSK	
Number of antenna ports	1	
Antenna	Type	Integrated
	Model	ANT162442DT-2001A2
	Manufacturer	TDK
	Gain	2.1 (customer declaration)
Supply Voltage	V_{NOM}	3.3 VDC
Operating Temperature	T_{NOM}	25 °C
AC/DC-Adaptor	Model	None
	Vendor	None
	Input	None
	Output	None
Manufacturer	Panasonic Industrial Devices Europe GmbH Zeppelinstr. 19 21337 Lüneburg GERMANY	

1.1 Photos – Equipment External

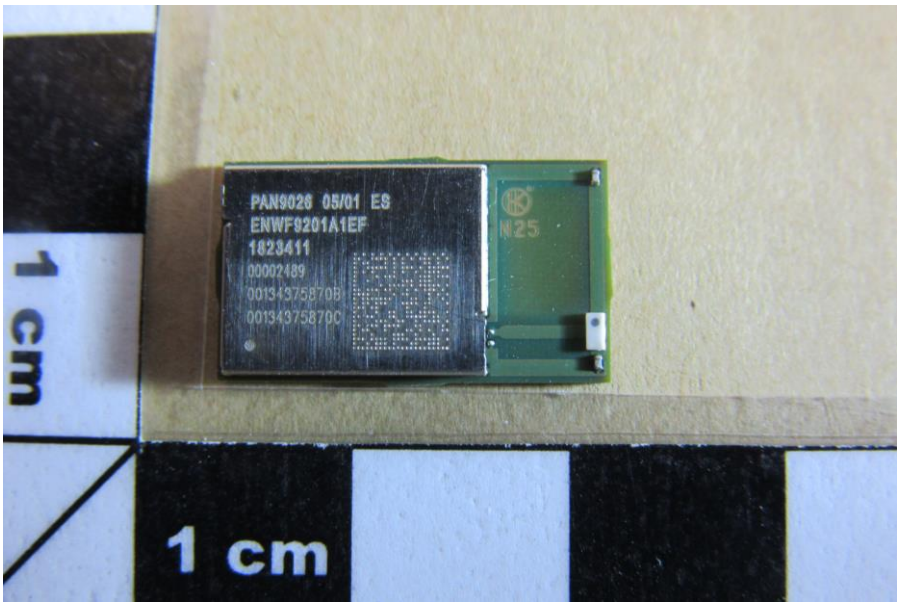
Processor board radiated, front view


Processor board radiated, rear view

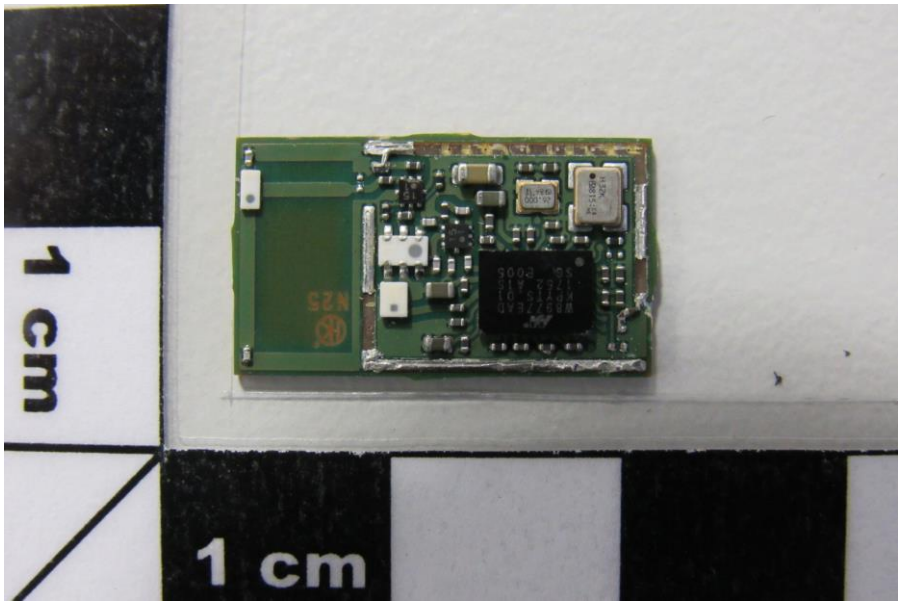

Processor board conducted, top


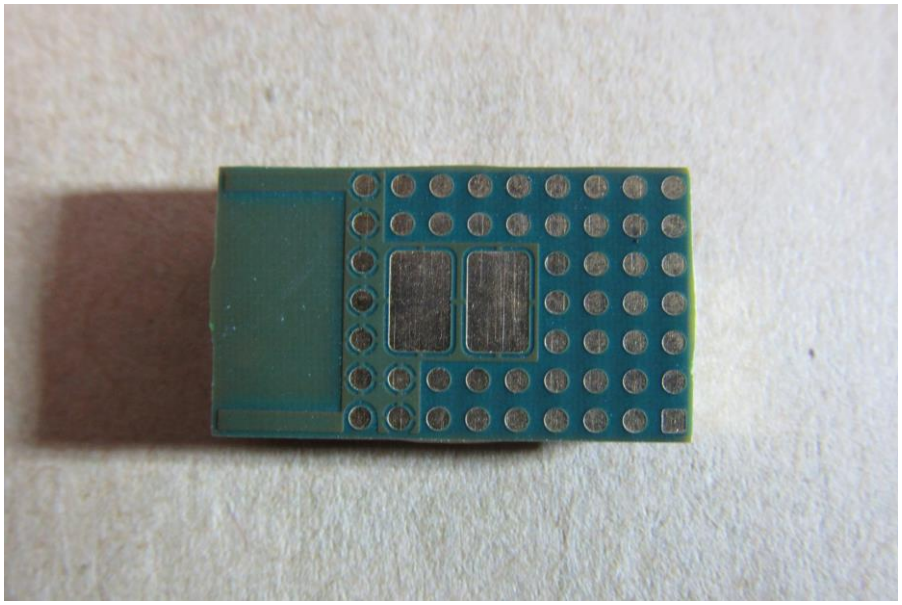
Processor board conducted, bottom


1.2 Photos – Equipment Internal

Module ENWF9201A1EF (FCC)


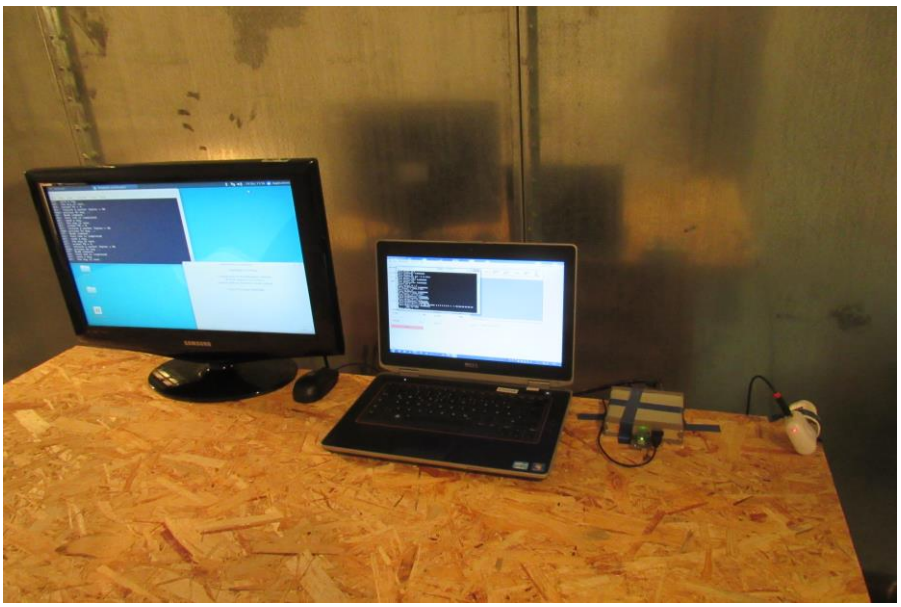
Module ENWF9203A1EF (ISED)


Module without shielding, top view


Module, Bottom view


1.3 Photos – Test Setup

Radiated Setup


Conducted Setup


1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE1	Processor board	Wandboard	WBIMX6U	Wandboard with i.MX6 Dual Core
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
Comment:				

1.5 Test Modes

Mode	Description
GFSK	Mode = Transmit Modulation = GFSK Spreading = None Duty cycle = 62.5%
Receive	Mode = Receive
Comment:	

1.6 Test Frequencies

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

1.7 Sample emission level calculation

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

Reading:

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

A.F.:

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

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

Net:

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

Limit:

This is the FCC Class B radiated emission limit (in units of dBµV/m). The FCC limits are given in units of µV/m. The following formula is used to convert the units of µV/m to dBµV/m:

Limit (dBµV/m) = 20*log (µV/m)

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

Reading + AF	= Net Reading	:	Net reading - FCC limit	= Margin
+21.5 dBµV + 26 dB/m	= 47.5 dBµV/m	:	47.5 dBµV/m - 57.0 dBµV/m	= -9.5 dB

2 Result Summary

FCC 47 CFR Part 15C, ISED RSS-247				
Product Standard Reference	**Requirement**	**Reference Method**	**Result**	**Remarks**
ISED RSS-Gen, Issue 5 (section 6.6)	Occupied Bandwidth	ANSI C63.10-2013	N/R	Informational only, tested with sample ENWF9203A1EF
FCC § 15.247(a)(2) ISED RSS-247, Issue 2 (section 5.2)	6 dB Bandwidth	ANSI C63.10-2013	PASS	tested with sample ENWF9201A1EF
FCC § 15.247(b)(1) ISED RSS-247, Issue 2 (section 5.4)	Maximum peak conducted power	ANSI C63.10-2013	PASS	tested with sample ENWF9201A1EF
FCC § 15.247(e) ISED RSS-247, Issue 2 (section 5.2)	Power spectral density	ANSI C63.10-2013	PASS	tested with sample ENWF9201A1EF
FCC § 15.207 ISED RSS-247, Issue 2 (section 3.1)	AC power line conducted emissions	ANSI C63.10-2013	PASS	tested with sample ENWF9201A1EF
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Band edge compliance	ANSI C63.10-2013	PASS	tested with sample ENWF9201A1EF
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Conducted spurious emissions	ANSI C63.10-2013	PASS	tested with sample ENWF9201A1EF
FCC § 15.247(d) FCC § 15.209 ISED RSS-Gen, Issue 5 (section 6.13)	Transmitter radiated spurious emissions	ANSI C63.10-2013	PASS	tested with sample ENWF9201A1EF
ISED RSS-247, Issue 2 (section 3.1)	Receiver radiated spurious emissions	ANSI C63.10-2013	PASS	tested with sample ENWF9203A1EF
Comment:				

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

3 Test Conditions and Results

3.1 Test Conditions and Results - Occupied bandwidth

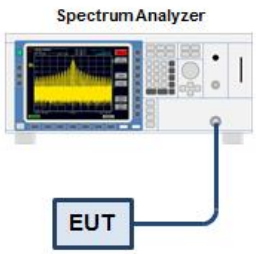
3.1.1 Information

Test Information	
Reference	ISED RSS-Gen, Issue 5 (section 6.6)
Measurement Method	ANSI C63.10 6.9.3
Operator	Wilfried Treffke
Date	2018-11-13

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	FSP30	EF00312	2018-07	2019-07

3.1.5 Procedure

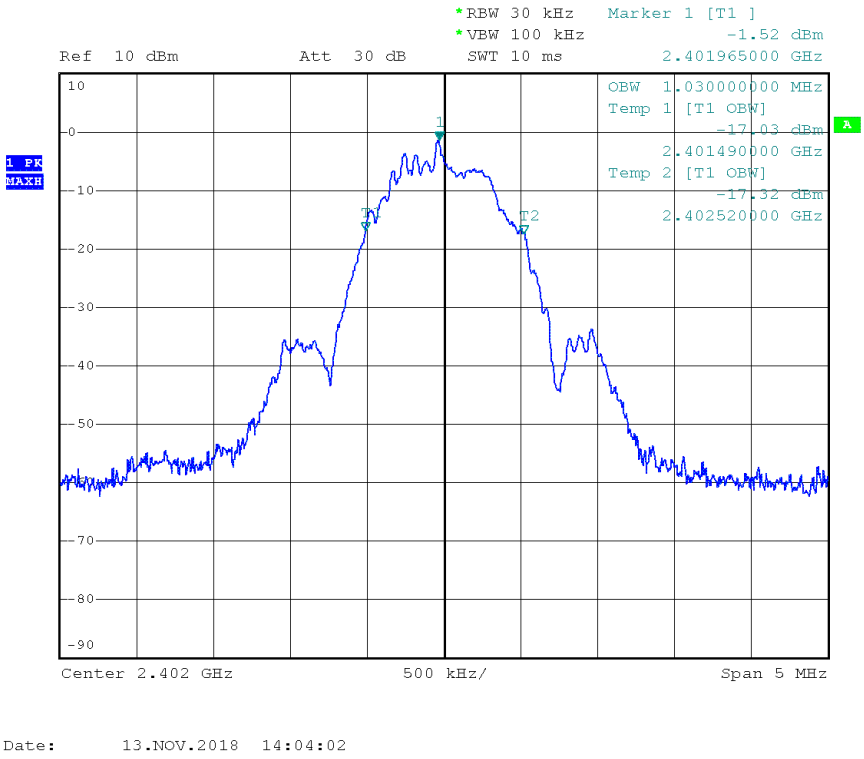
Test Procedure
1. EUT transmitter is activated in test mode under normal conditions 2. The spectrum analyzer is set to peak detection and maximum hold with a span twice the emission spectrum 3. The resolution bandwidth is set to the range of 1 % to 5 % of the occupied bandwidth 4. The occupied bandwidth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

3.1.6 Results

Test Results		
Mode	Frequency [MHz]	Bandwidth [MHz]
GFSK	2402	1.030
GFSK	2440	1.025
GFSK	2480	1.025

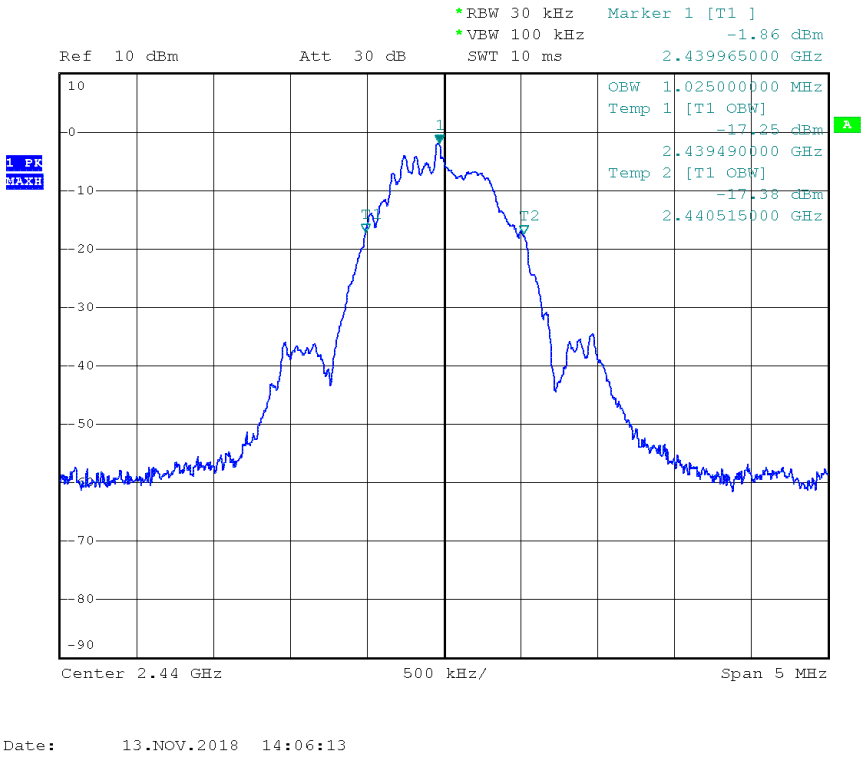
Occupied Bandwidth

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9203A1EF
Test Sample ID:	20584
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	GFSK, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Occupied Bandwidth [MHz]:	1.030



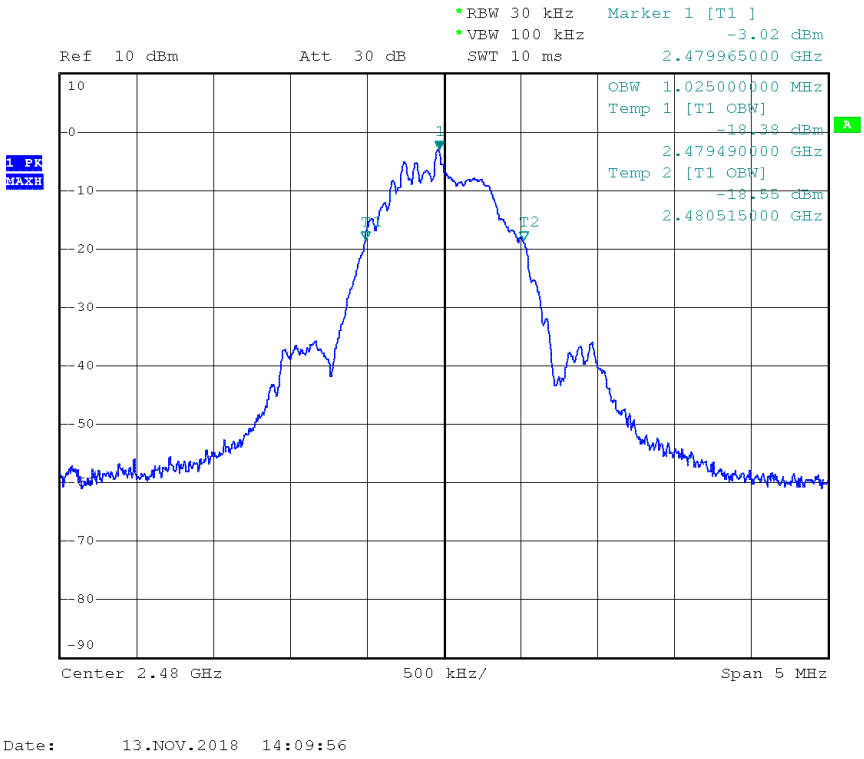
Occupied Bandwidth

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9203A1EF
Test Sample ID:	20584
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	GFSK, Channel: 19, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Occupied Bandwidth [MHz]:	1.025



Occupied Bandwidth

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9203A1EF
Test Sample ID:	20584
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	GFSK, Channel: 39, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Occupied Bandwidth [MHz]:	1.025



3.2 Test Conditions and Results - 6 dB bandwidth

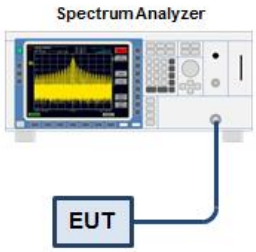
3.2.1 Information

Test Information	
Reference	FCC § 15.247(a)(2); ISED RSS-247, Issue 2 (section 5.2)
Measurement Method	ANSI C63.10 11.8
Operator	Wilfried Treffke
Date	2018-11-13

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	FSP30	EF00312	2018-07	2019-07

3.2.5 Procedure

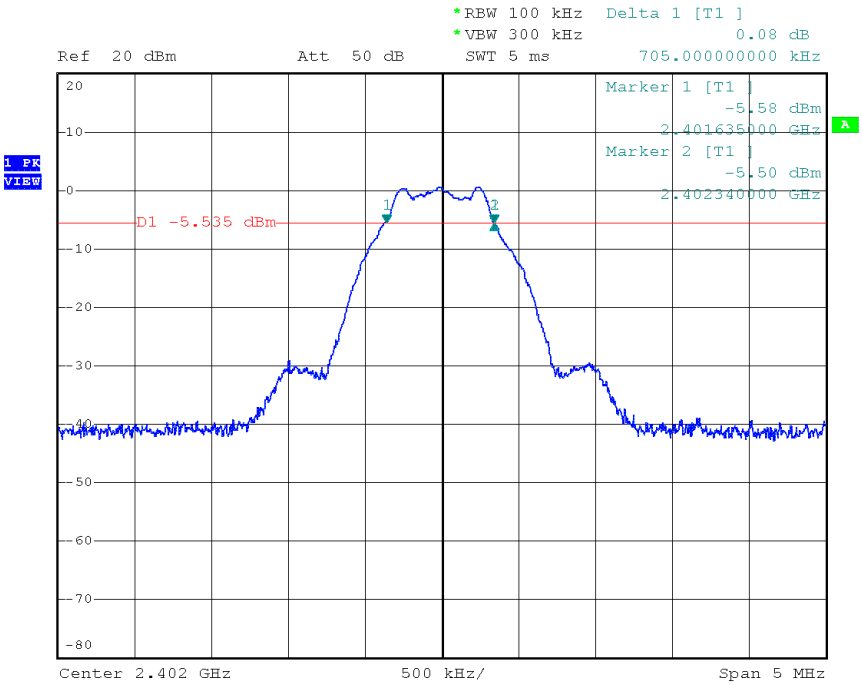
Test Procedure
1. EUT set to test mode 2. Span set to at least twice the emission spectrum 3. Detector set to peak and max hold and RBW is set to 100 kHz 4. Envelope peak value of emission spectrum is selected 5. Marker on envelope of spectrum is set to level of -6 dB to the left of the peak 6. Marker 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				
Mode	Frequency [MHz]	Bandwidth [kHz]	Limit [kHz]	Verdict
GFSK	2402	705	500	PASS
GFSK	2440	700	500	PASS
GFSK	2480	705	500	PASS

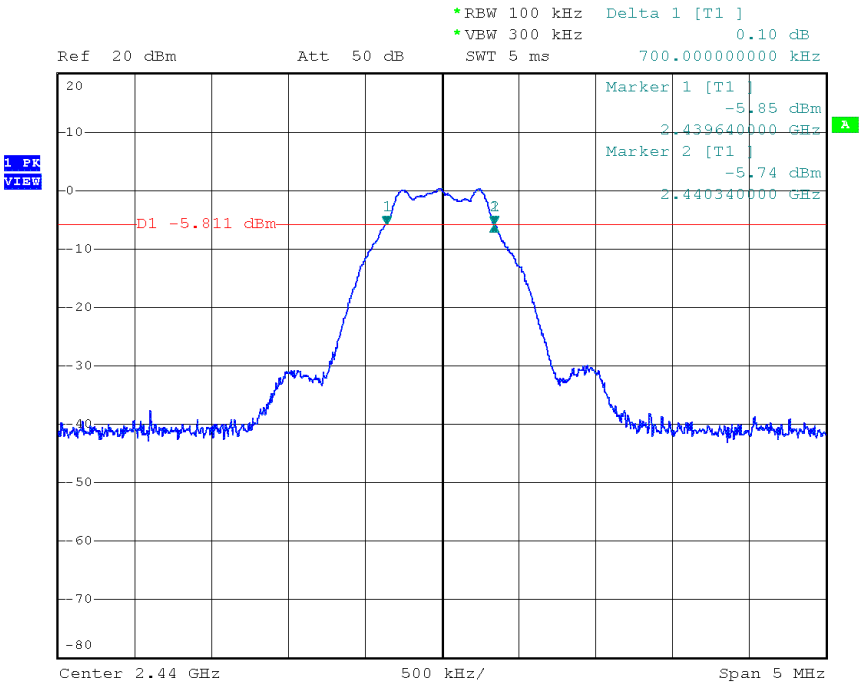
DTS (6 dB) Bandwidth

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF
Test Sample ID:	20576
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	GFSK, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Lower Frequency [MHz]:	2401.635
Upper Frequency [MHz]:	2402.340
6 dB Bandwidth [kHz]:	705



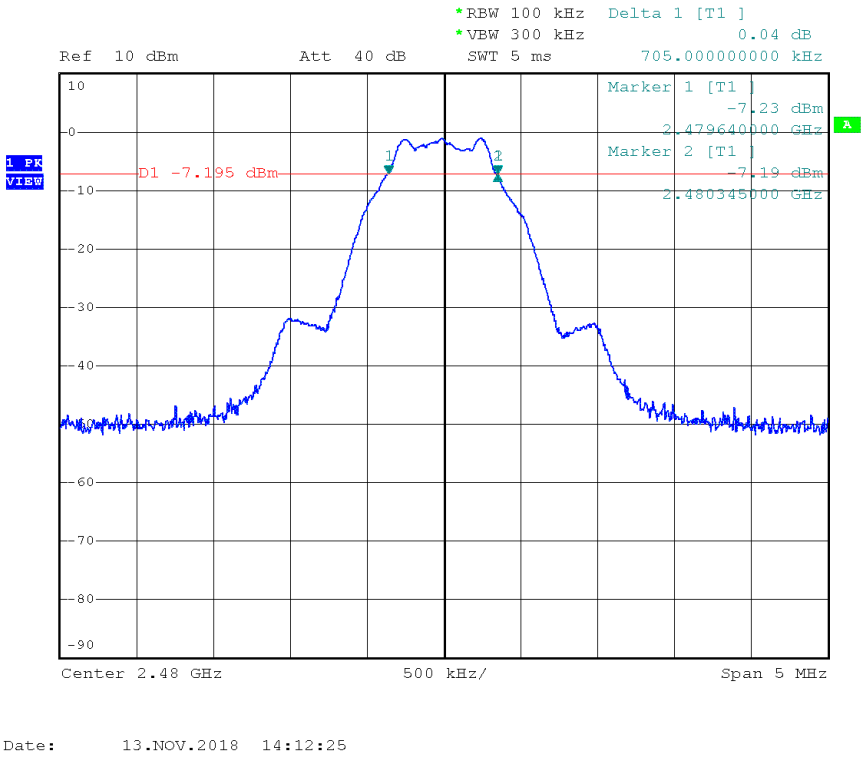
DTS (6 dB) Bandwidth

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF
Test Sample ID:	20576
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	GFSK, Channel: 19, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Lower Frequency [MHz]:	2439.640
Upper Frequency [MHz]:	2440.340
6 dB Bandwidth [kHz]:	700



DTS (6 dB) Bandwidth

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF
Test Sample ID:	20576
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	GFSK, Channel: 39, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Lower Frequency [MHz]:	2479.640
Upper Frequency [MHz]:	2480.345
6 dB Bandwidth [kHz]:	705



3.3 Test Conditions and Results - Maximum peak conducted output power

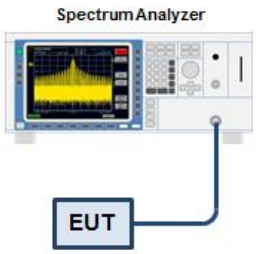
3.3.1 Information

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	Wilfried Treffke
Date	2018-11-13

3.3.2 Limits

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

3.3.3 Setup

Test Setup


3.3.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP30	EF00312	2018-07	2019-07

3.3.5 Procedure

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

3.3.6 Results

Test Results				
Channel [MHz]	Power [dBm]	Power [W]	Limit [W]	Verdict
2402	3.115	0.0020	1.0	PASS
2440	2.881	0.0019	1.0	PASS
2480	1.650	0.0015	1.0	PASS

3.4 Test Conditions and Results - Power spectral density

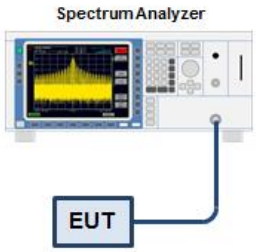
3.4.1 Information

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	Wilfried Treffke
Date	2018-11-13

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	FSP30	EF00312	2018-07	2019-07

3.4.5 Procedure

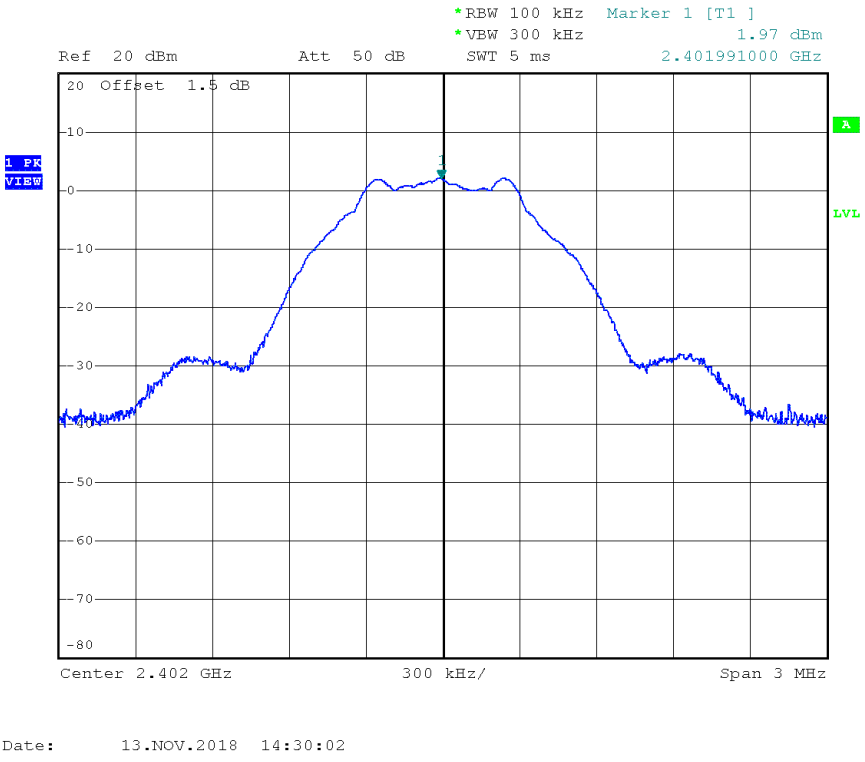
Test Procedure
1. EUT set to test mode 2. The analyzer is set to DTS channel center frequency with a span of 1.5 times the DTS bandwidth 3. The RBW is set to 100 kHz with VBW ≥ RBW and the detector is set to peak with max hold 4. After the trace has stabilized a marker is set to the envelope maximum 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			
Channel [MHz]	PSD [dBm/RBW]	Limit [dBm/3kHz]	Verdict
2402	1.968	8.0	PASS
2440	1.711	8.0	PASS
2480	0.407	8.0	PASS
RBW = 100 kHz			

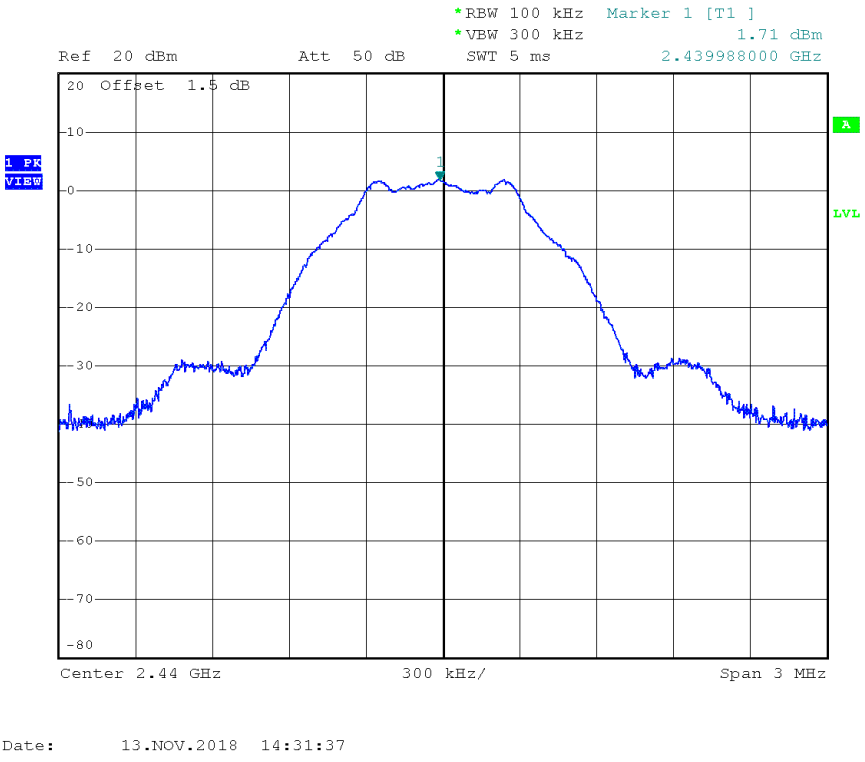
Peak Power Spectral Density

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF
Test Sample ID:	20576
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	GFSK, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Peak Frequency [MHz]:	2401.991
Spectral Density [dBm/RBW]:	1.968
Resolution Bandwidth [kHz]:	100 kHz



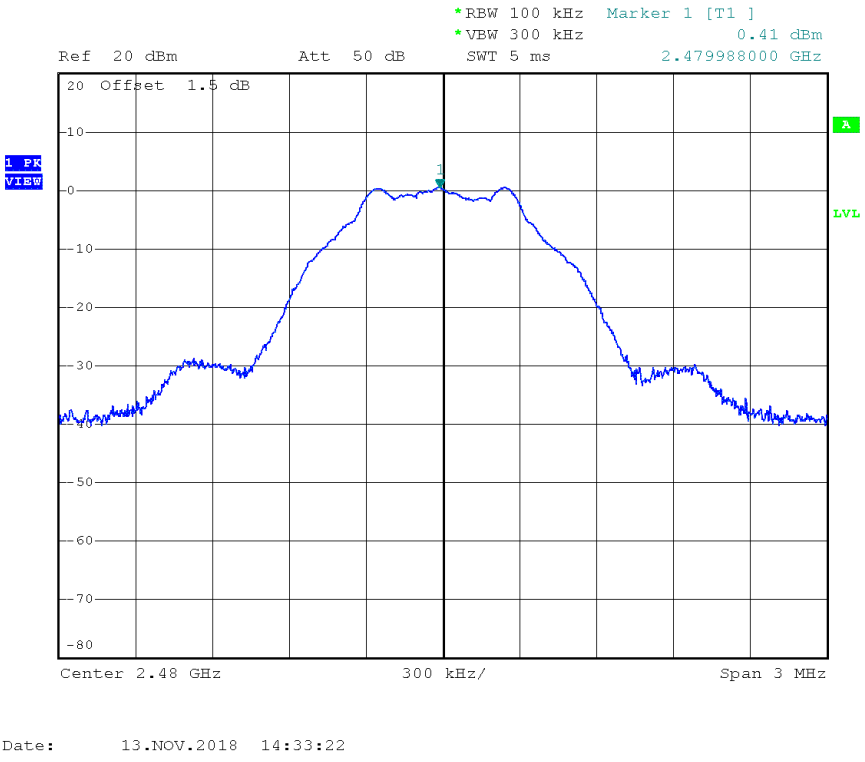
Peak Power Spectral Density

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF
Test Sample ID:	20576
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	GFSK, Channel: 19, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Peak Frequency [MHz]:	2439.988
Spectral Density [dBm/RBW]:	1.711
Resolution Bandwidth [kHz]:	100 kHz



Peak Power Spectral Density

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF
Test Sample ID:	20576
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	GFSK, Channel: 39, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Peak Frequency [MHz]:	2479.988
Spectral Density [dBm/RBW]:	0.407
Resolution Bandwidth [kHz]:	100 kHz



3.5 Test Conditions and Results - AC powerline conducted emissions

3.5.1 Information

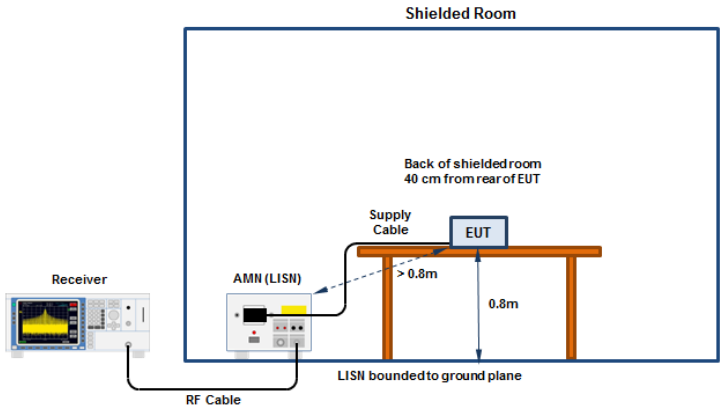
Test Information	
Reference	FCC § 15.207; ISED RSS-247, Issue 2 (section 3.1)
Measurement Method	ANSI C63.10 6.2
Operator	Wilfried Treffke
Date	2018-11-29

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

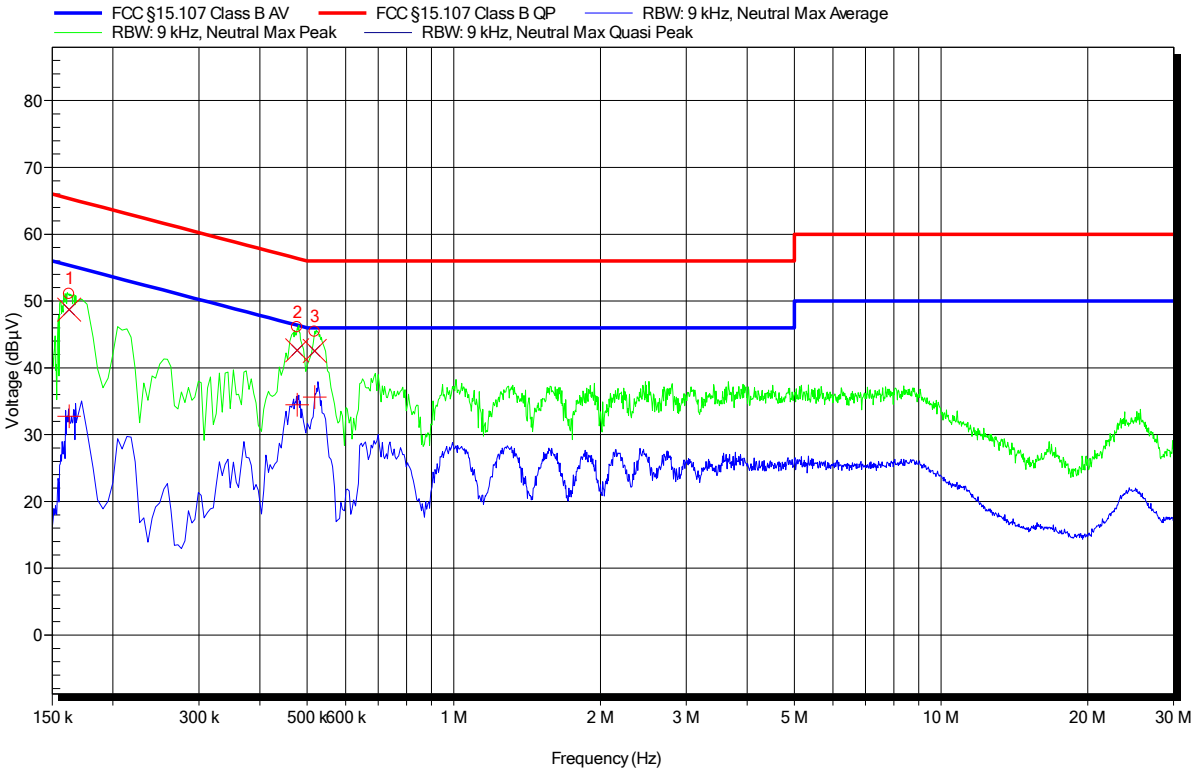
Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Test Receiver	R&S	ESR7	EF00943	2018-07	2019-07
LISN	R&S	ESH3-Z5	EF00036	2017-01	2019-01

EMI voltage test in the ac-mains according to FCC part 15B

Project number: G0M-1810-7783

Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 22.3°C, Unom: 120 VAC / 60 Hz
LISN:	ESH3-Z5 (N)
Mode:	Bluetooth LE, 2402 MHz
Test Date:	2018-11-29
Note:	

Index 3



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
1	162.6 kHz	48.69 dBµV	65.33 dBµV	-16.64 dB	Pass
2	477.15 kHz	42.64 dBµV	56.39 dBµV	-13.75 dB	Pass
3	519 kHz	42.53 dBµV	56 dBµV	-13.47 dB	Pass

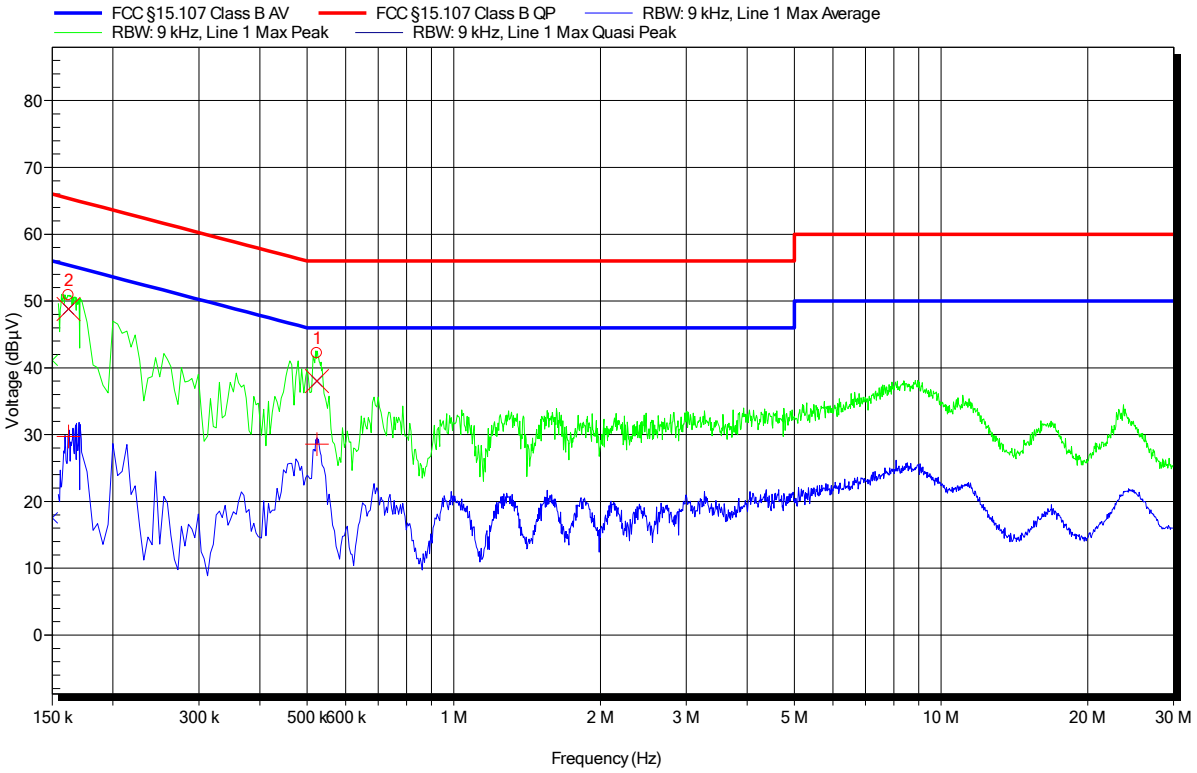
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status
1	162.6 kHz	32.74 dBµV	55.33 dBµV	-22.59 dB	Pass
2	477.15 kHz	34.48 dBµV	46.39 dBµV	-11.91 dB	Pass
3	519 kHz	35.6 dBµV	46 dBµV	-10.4 dB	Pass

EMI voltage test in the ac-mains according to FCC part 15B

Project number: G0M-1810-7783

Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 22.3°C, Unom: 120 VAC / 60 Hz
LISN:	ESH3-Z5 (L)
Mode:	Bluetooth LE, 2402 MHz
Test Date:	2018-11-29
Note:	

Index 4



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
1	523.95 kHz	38.04 dBµV	56 dBµV	-17.96 dB	Pass
2	162.15 kHz	48.79 dBµV	65.35 dBµV	-16.56 dB	Pass

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status
1	523.95 kHz	28.58 dBµV	46 dBµV	-17.42 dB	Pass
2	162.15 kHz	29.72 dBµV	55.35 dBµV	-25.63 dB	Pass

3.6 Test Conditions and Results - Band-edge compliance

3.6.1 Information

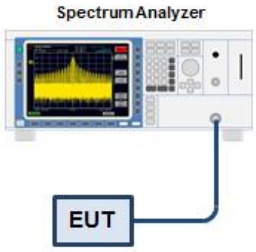
Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Method	ANSI C63.10 11.13
Operator	Wilfried Treffke
Date	2018-11-13

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	FSP30	EF00312	2018-07	2019-07

3.6.5 Procedure

Test Procedure

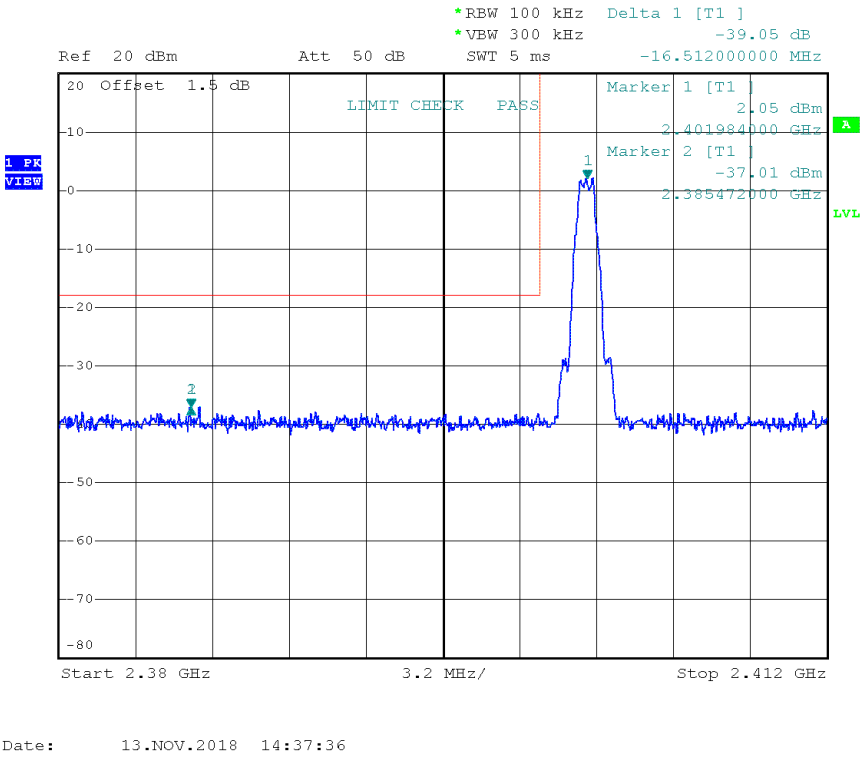
1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels within frequency band and outside frequency band
5. Band edge attenuation is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

3.6.6 Results

Test Results				
Mode	Channel [MHz]	Out-of-band Attenuation [dB]	Limit [dB]	Verdict
GFSK	2402	-39.05	-20	PASS
GFSK	2480	-37.46	-20	PASS

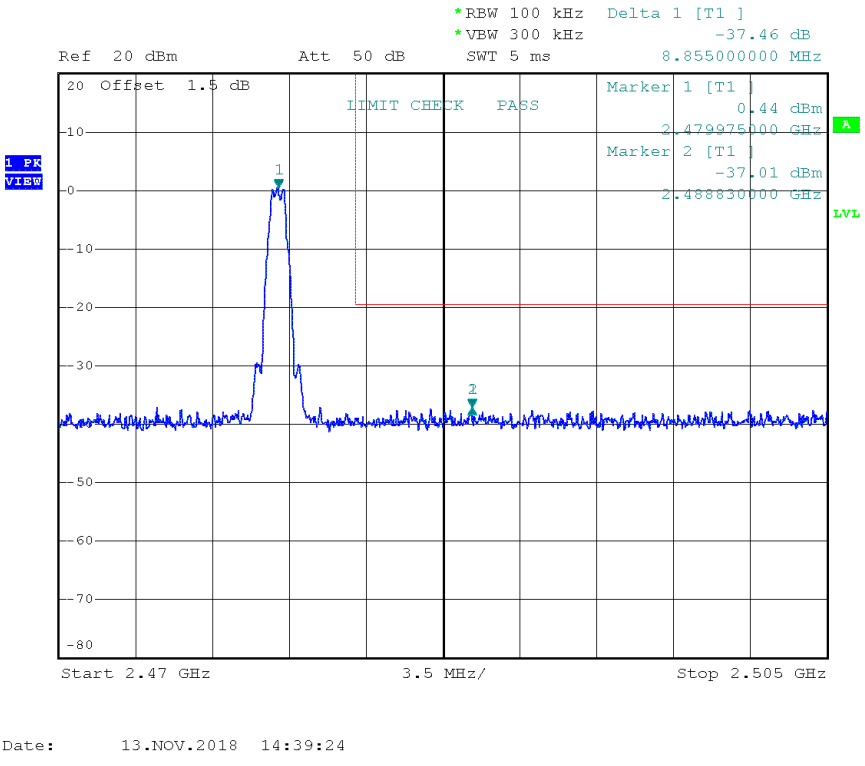
Band-edge Compliance

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF
Test Sample ID:	20576
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Band-edge	Lower
In-band Frequency [MHz]:	2401.984
Max. in-band Level [dBm/100 kHz]:	2.045
Out-of-band Frequency [MHz]:	2385.472
Max. out-of-band Level [dBm/100 kHz]:	-37.007
Attenuation [dB]:	-39.05



Band-edge Compliance

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF
Test Sample ID:	20576
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Band-edge	Upper
In-band Frequency [MHz]:	2479.975
Max. in-band Level [dBm/100 kHz]:	0.445
Out-of-band Frequency [MHz]:	2488.83
Max. out-of-band Level [dBm/100 kHz]:	-37.013
Attenuation [dB]:	-37.46



3.7 Test Conditions and Results - Conducted spurious emissions

3.7.1 Information

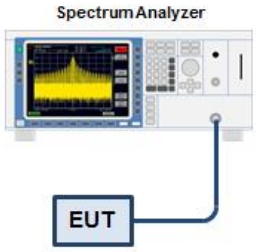
Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Method	ANSI C63.10 11.11
Operator	Wilfried Treffke
Date	2018-11-13

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	FSP30	EF00312	2018-07	2019-07

3.7.5 Procedure

Test Procedure

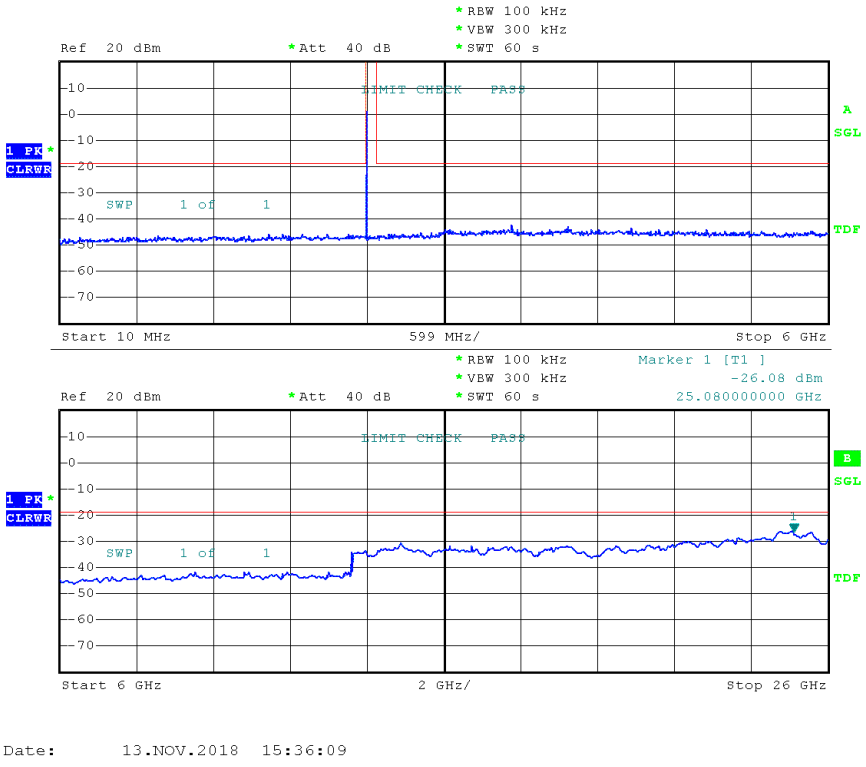
1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels within frequency band and outside frequency band
5. Band edge attenuation is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

3.7.6 Results

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

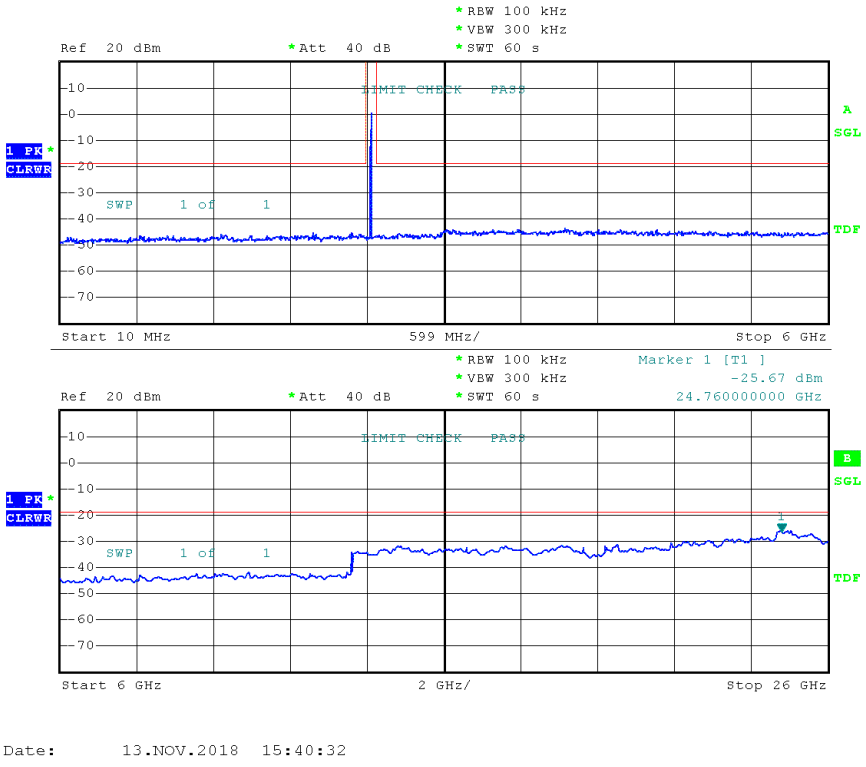
Conducted Spurious Emissions

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF
Test Sample ID:	20576
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	GFSK, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Max. in-band Frequency [MHz]:	2402.2
Max. in-band Level [dBm/100 kHz]:	1.1
Out-of-band Limit [dBm/100 kHz]:	-18.9



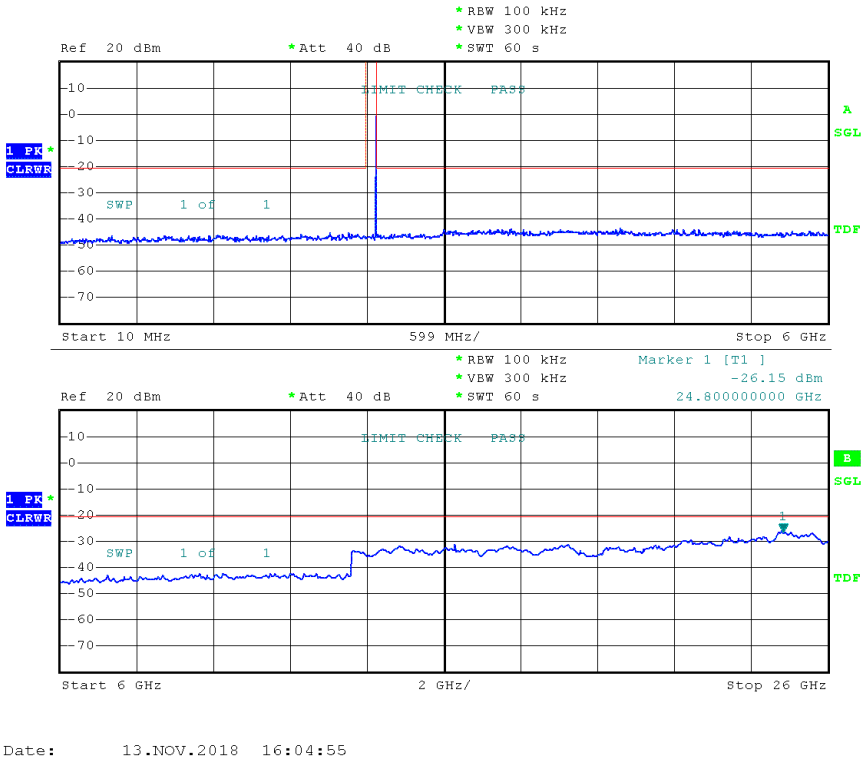
Conducted Spurious Emissions

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF
Test Sample ID:	20576
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	GFSK, Channel: 19, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Max. in-band Frequency [MHz]:	2440.0
Max. in-band Level [dBm/100 kHz]:	0.9
Out-of-band Limit [dBm/100 kHz]:	-19.1



Conducted Spurious Emissions

Project Number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF
Test Sample ID:	20576
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	GFSK, Channel: 39, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Wilfried Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2018-11-13
Max. in-band Frequency [MHz]:	2480.2
Max. in-band Level [dBm/100 kHz]:	-0.4
Out-of-band Limit [dBm/100 kHz]:	-20.4



3.8 Test Conditions and Results - Transmitter radiated emissions

3.8.1 Information

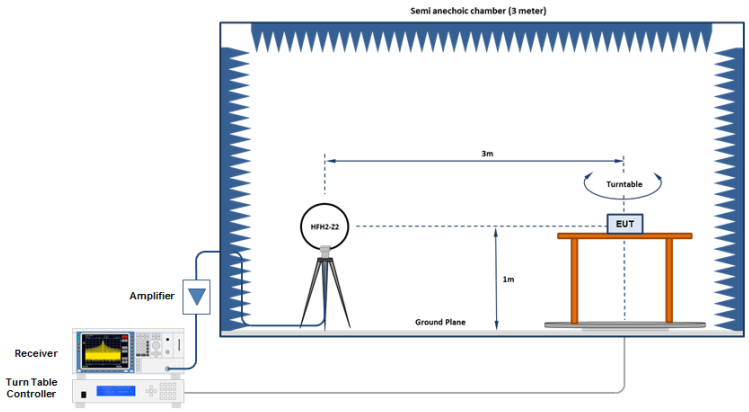
Test Information	
Reference	FCC § 15.247(d); FCC § 15.209; ISED RSS-Gen, Issue 5 (section 6.13)
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6, 11.12
Operator	Wilfried Treffke
Date	2018-11-06

3.8.2 Limits

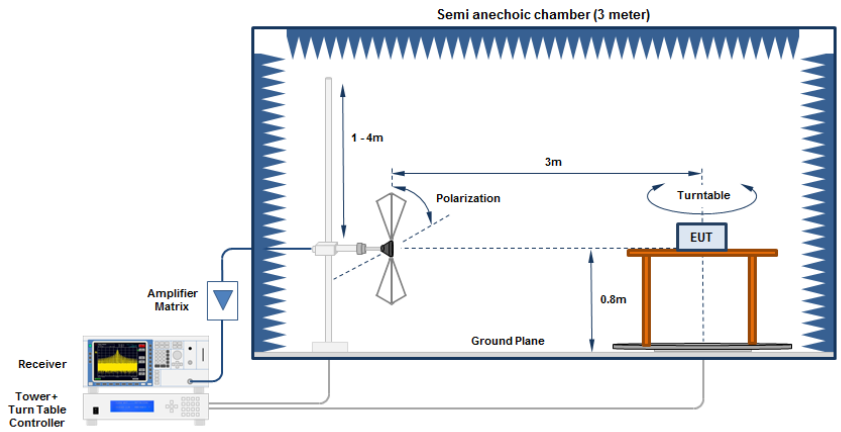
Limits			
Frequency [MHz]	Detector	Field strength [µV/m]	Measurement distance [m]
0.009 - 0.09	Average	2400/F[kHz]	300
0.09 - 0.110	Quasi-Peak	2400/F[kHz]	300
0.110 - 0.490	Average	2400/F[kHz]	300
0.490 - 1.705	Quasi-Peak	24000/F[kHz]	30
1.705 - 30.0	Quasi-Peak	30	30
30 - 88	Quasi-Peak	100	3
88 - 216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

3.8.3 Setup

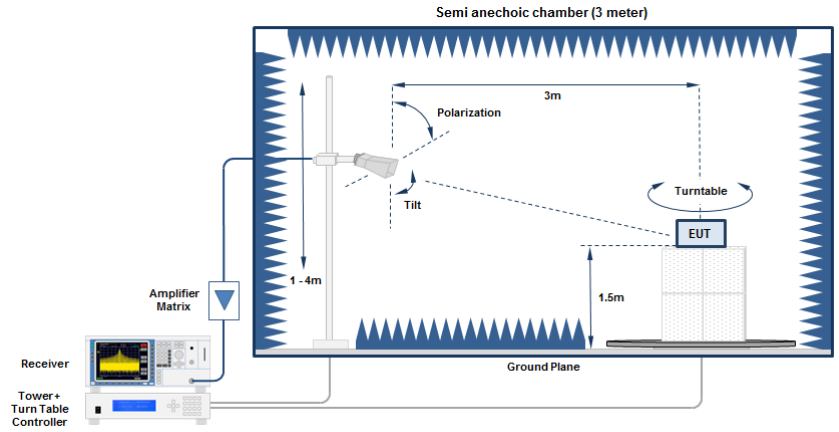
Test Setup < 30 MHz



Test Setup 30 - 1000 MHz



Test Setup > 1 GHz



3.8.4 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	Agilent	N9038A-526/WXP	EF01070	2018-08	2019-08
Antenna	R&S	VULB 9162	EF00978	2016-11	2019-11
Antenna	R&S	HK 116	EF00030	2016-04	2019-04
Antenna	R&S	HL 223	EF00212	2016-04	2019-04

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2018-08	2019-08
Antenna	Schwarzbeck	BBHA 9120D	EF00018	2016-09	2019-09
Antenna	Amplifier Research	AT4560	EF00302	2018-04	2019-04

3.8.5 Procedure

Test Procedure < 30 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 EUT is rotated through 360°
4. The emissions are measured with peak detector and max hold
5. All significant emissions are measured again using the corresponding final detector

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						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2402	124.86	33.94	pk	hor	43.52	-09.58
2402	124.86	37.57	pk	ver	43.52	-05.95
2402	4800	45.64	pk	hor	74.00	-28.36
2440	247.36	39.36	pk	ver	46.00	-06.64
2440	247.498	42.00	pk	hor	46.00	-04.00
2440	407.36	29.21	pk	hor	46.00	-16.79
2440	407.36	27.91	pk	ver	46.00	-18.09
2440	4880	46.87	pk	hor	74.00	-27.13
2440	4880	43.57	RMS	hor	54.00	-10.43
2480	4960	43.74	pk	hor	74.00	-30.26

3.9 Test Conditions and Results - Receiver radiated emissions

3.9.1 Information

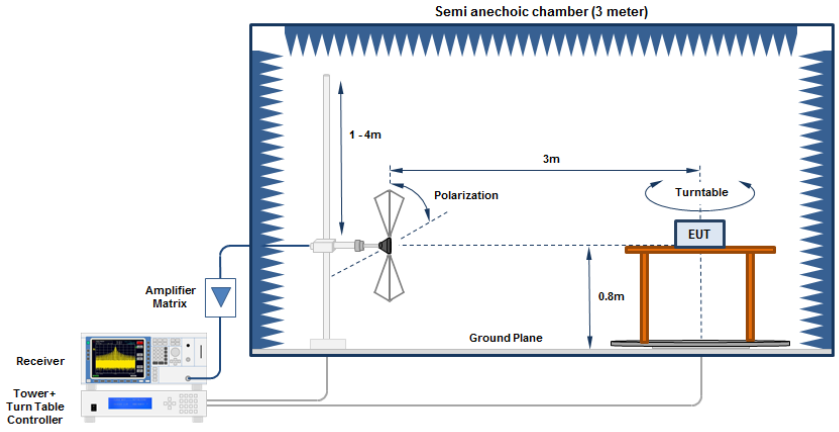
Test Information	
Reference	ISED RSS-247, Issue 2 (section 3.1)
Measurement Method	ANSI C63.10 6.5, 6.6, 11.12
Operator	Wilfried Treffke
Date	2018-11-08

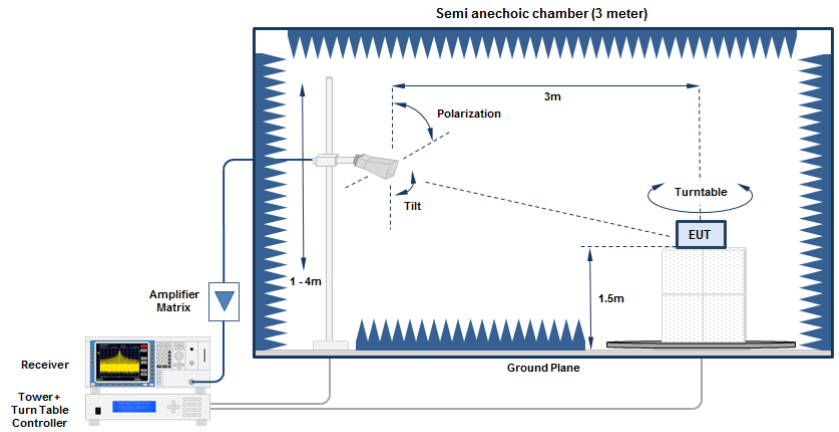
3.9.2 Limits

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	Agilent	N9038A-526/WXP	EF01070	2018-08	2019-08
Antenna	R&S	VULB 9162	EF00978	2016-11	2019-11
Antenna	R&S	HK 116	EF00030	2016-04	2019-04
Antenna	R&S	HL 223	EF00212	2016-04	2019-04

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2018-08	2019-08
Antenna	Schwarzbeck	BBHA 9120D	EF00018	2016-09	2019-09
Antenna	Amplifier Research	AT4560	EF00302	2018-04	2019-04

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						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2440	30.611	37.34	qpk	hor	40.00	-02.66
2440	31.088	34.02	qpk	ver	40.00	-05.98
2440	49.491	37.40	qpk	ver	40.00	-02.60
2440	544.32	39.89	pk	ver	46.00	-06.11
2440	544.482	40.30	qpk	hor	46.00	-05.70
2440	643.476	42.10	qpk	ver	46.00	-03.90
2440	643.482	42.21	qpk	hor	46.00	-03.79
2440	741.44	39.73	pk	ver	46.00	-06.27
2440	742.474	41.33	qpk	hor	46.00	-04.67
2440	841.28	37.61	pk	hor	46.00	-08.39
2440	841.47	41.60	qpk	ver	46.00	-04.40
2440	939.84	39.31	pk	ver	46.00	-06.69
2440	940.465	41.62	qpk	hor	46.00	-04.38
2440	7688	51.00	pk	hor	53.98	-02.98
2440	7824	51.30	pk	ver	53.98	-02.58
2440	14310	49.46	pk	hor	53.98	-04.52

ANNEX A Transmitter spurious emissions

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	HK116, Horizontal
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2402 MHz
Test Date:	2018-11-06
Note:	EUT horizontal

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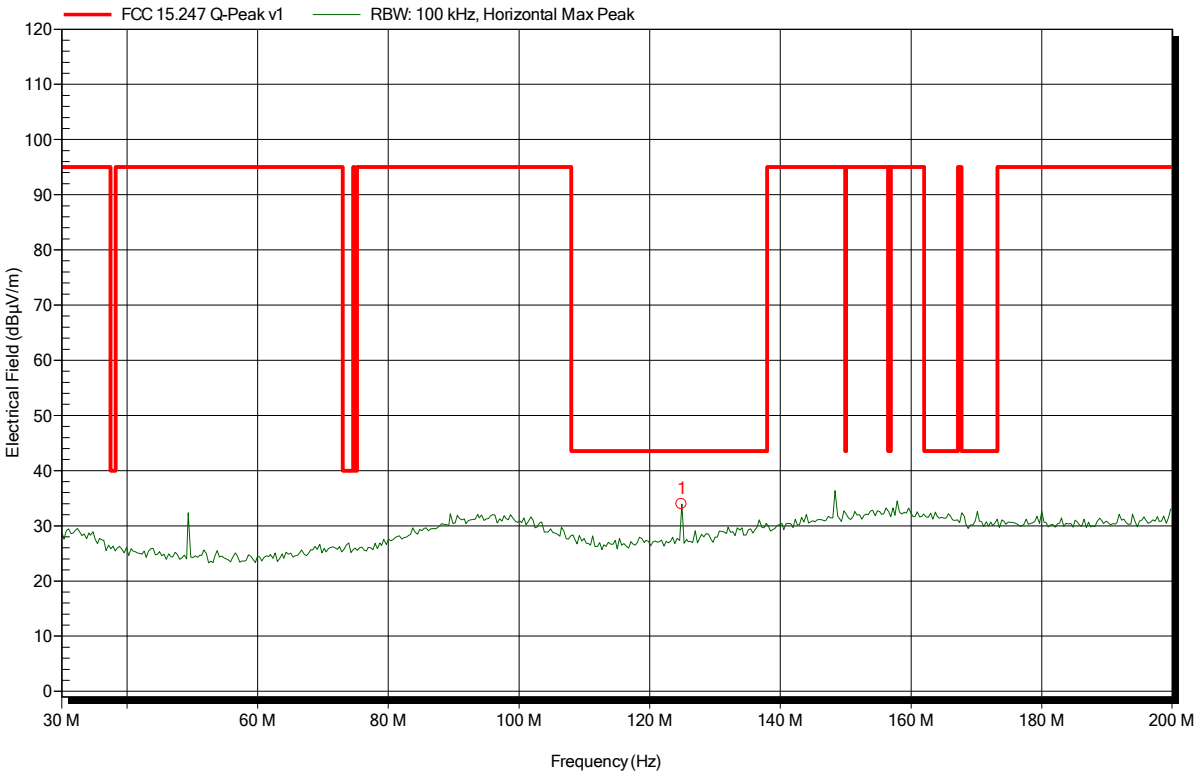

Frequency	Peak	Peak Limit	Peak Difference	Status
124.86 MHz	33.94 dBµV/m	43.52 dBµV/m	-9.58 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	HK116, Vertical
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2402 MHz
Test Date:	2018-11-06
Note:	EUT horizontal

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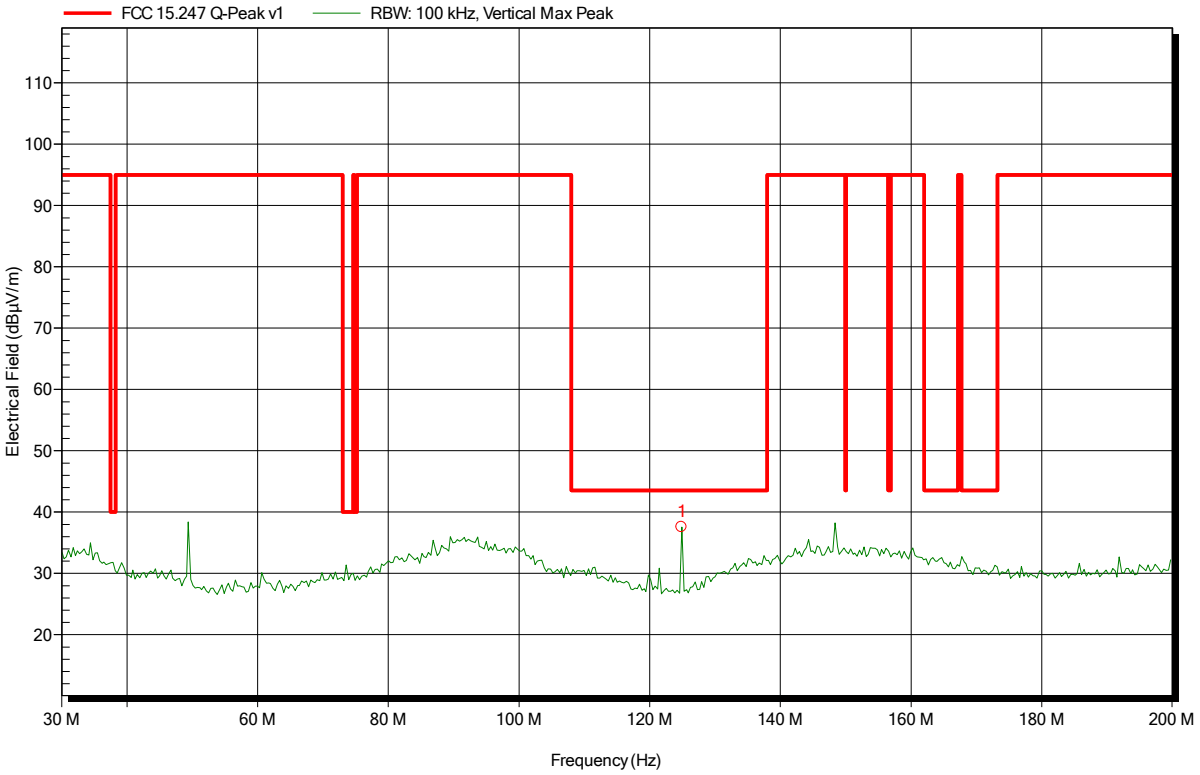

Frequency	Peak	Peak Limit	Peak Difference	Status
124.86 MHz	37.57 dBµV/m	43.52 dBµV/m	-5.95 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2440 MHz
Test Date:	2018-11-08
Note:	

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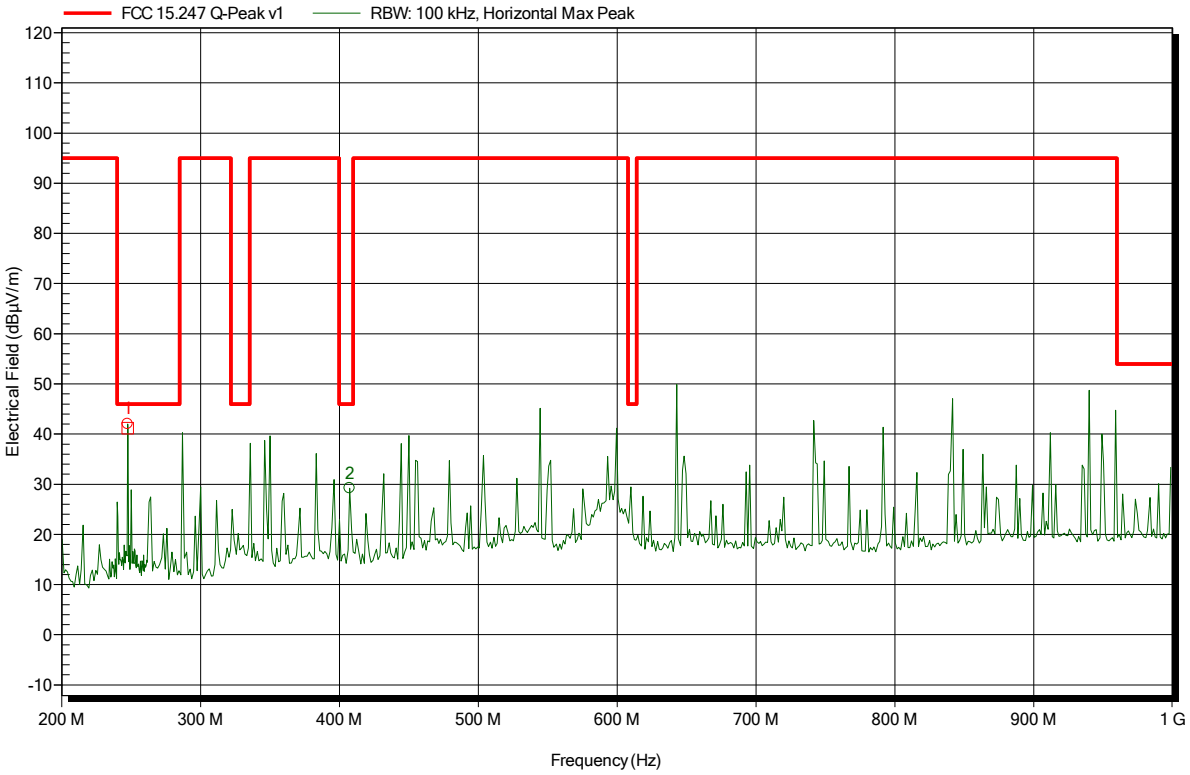

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
247.498 MHz	42 dBµV/m	46 dBµV/m	-4 dB	Pass
407.36 MHz	29.21 dBµV/m	46 dBµV/m	-16.79 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2440 MHz
Test Date:	2018-11-08
Note:	

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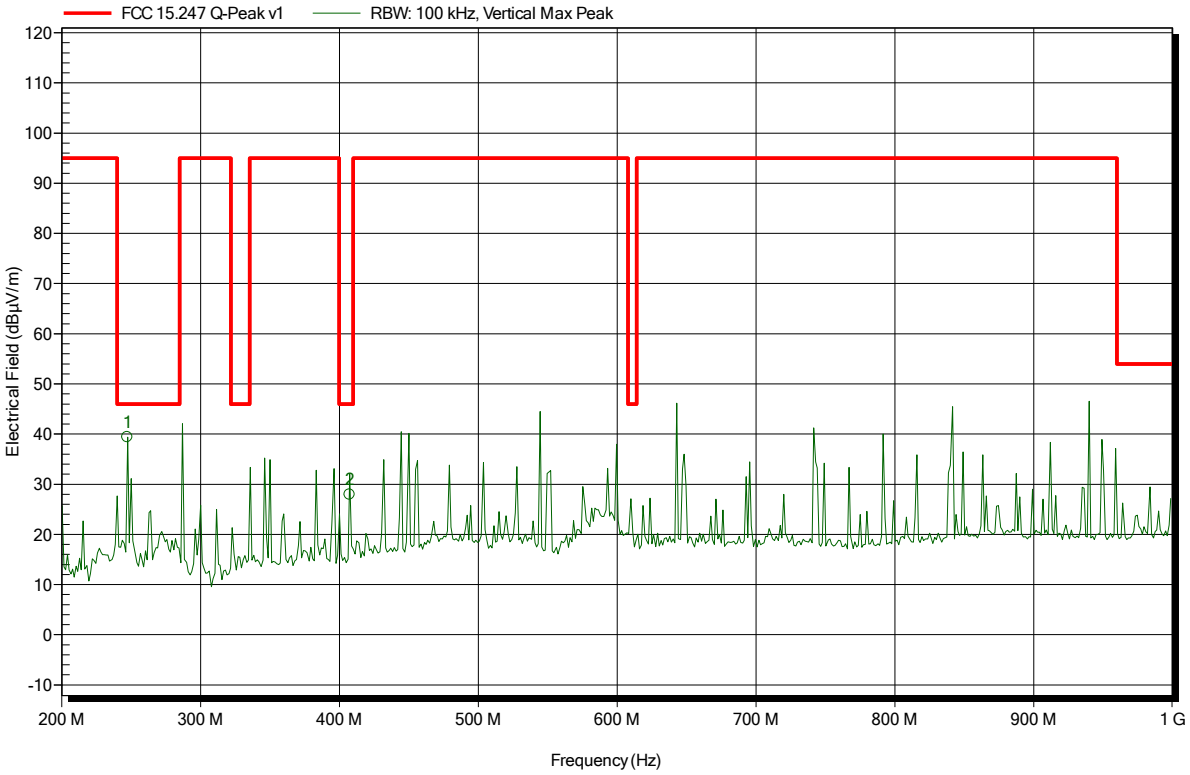

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
247.36 MHz	39.36 dBµV/m	46 dBµV/m	-6.64 dB	Pass
407.36 MHz	27.91 dBµV/m	46 dBµV/m	-18.09 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ETS-Lindgren 3117, Horizontal
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2402 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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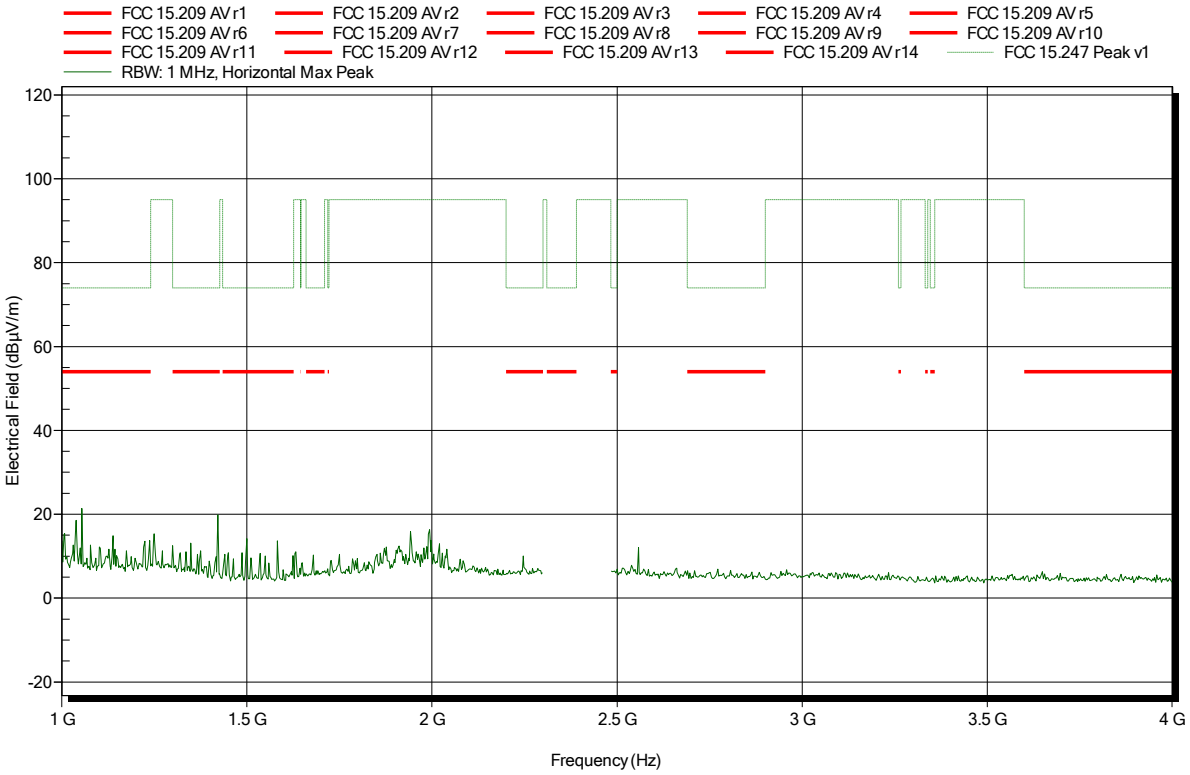

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ETS-Lindgren 3117, Vertical
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2402 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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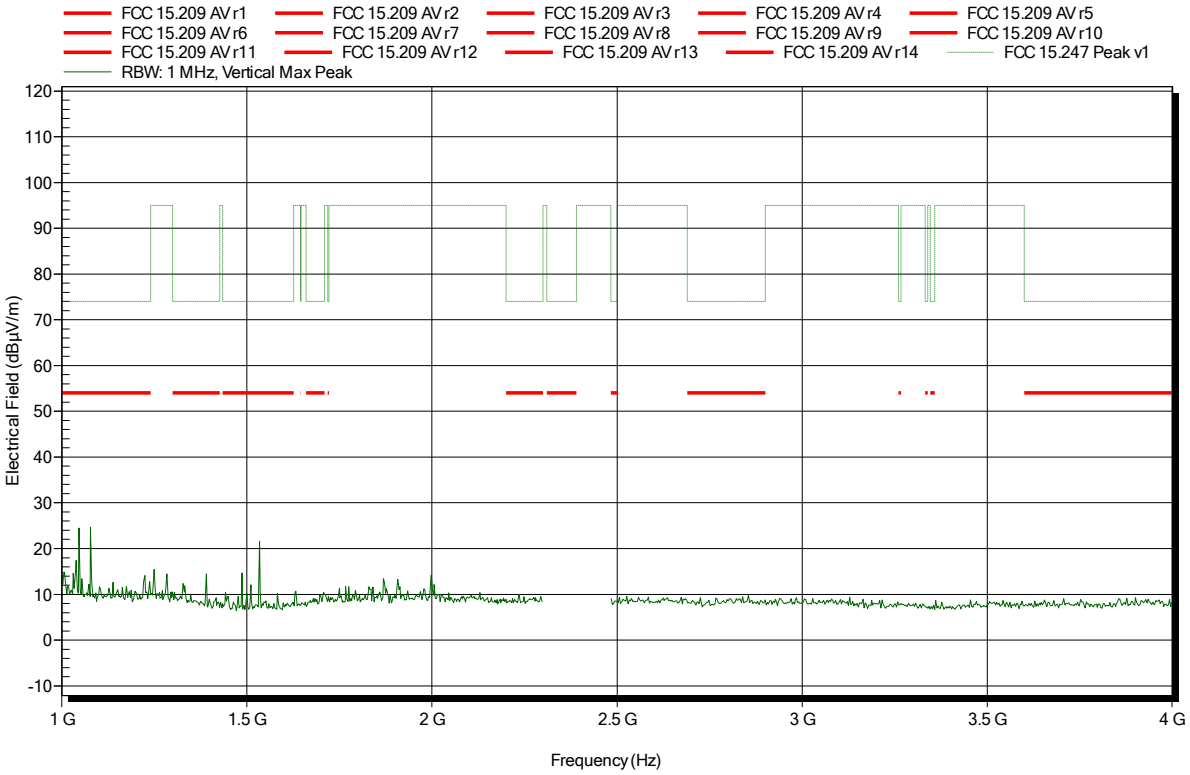

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ETS-Lindgren 3117, Horizontal
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2402 MHz
Test Date:	2018-11-05
Note:	EUT horizontal; lower bandedge

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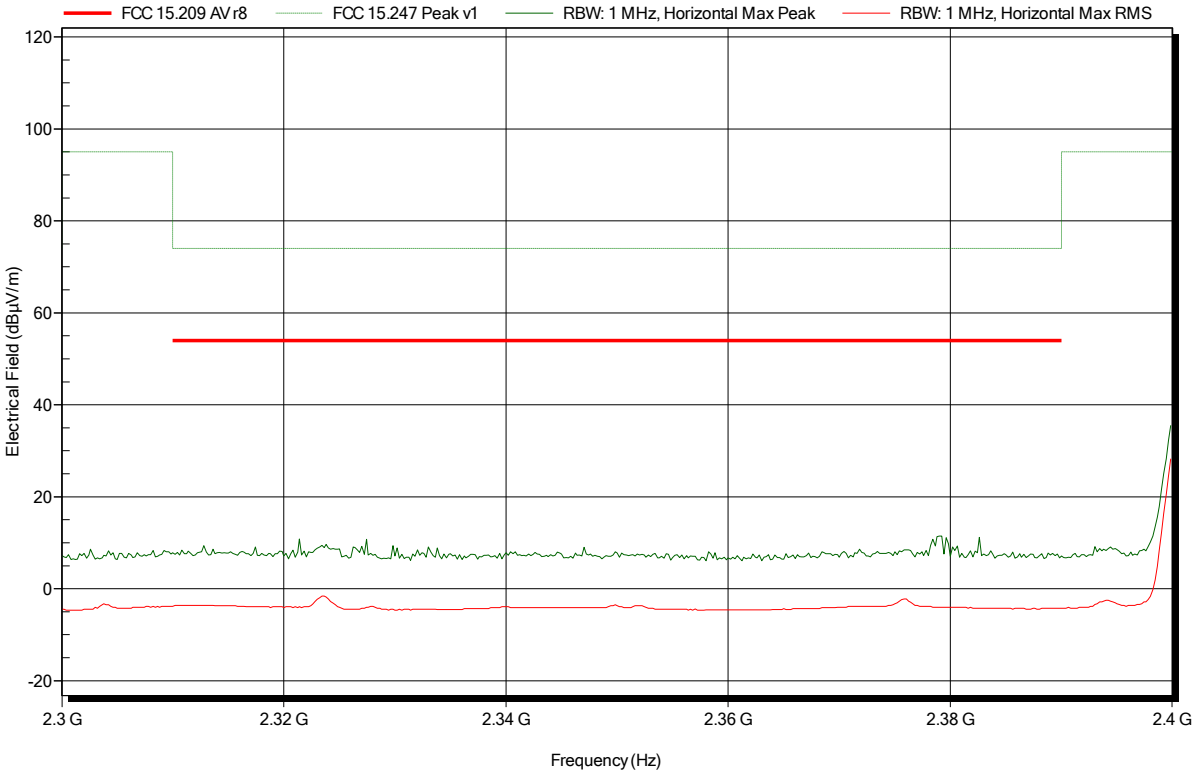

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ETS-Lindgren 3117, Vertical
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2402 MHz
Test Date:	2018-11-05
Note:	EUT horizontal; lower bandedge

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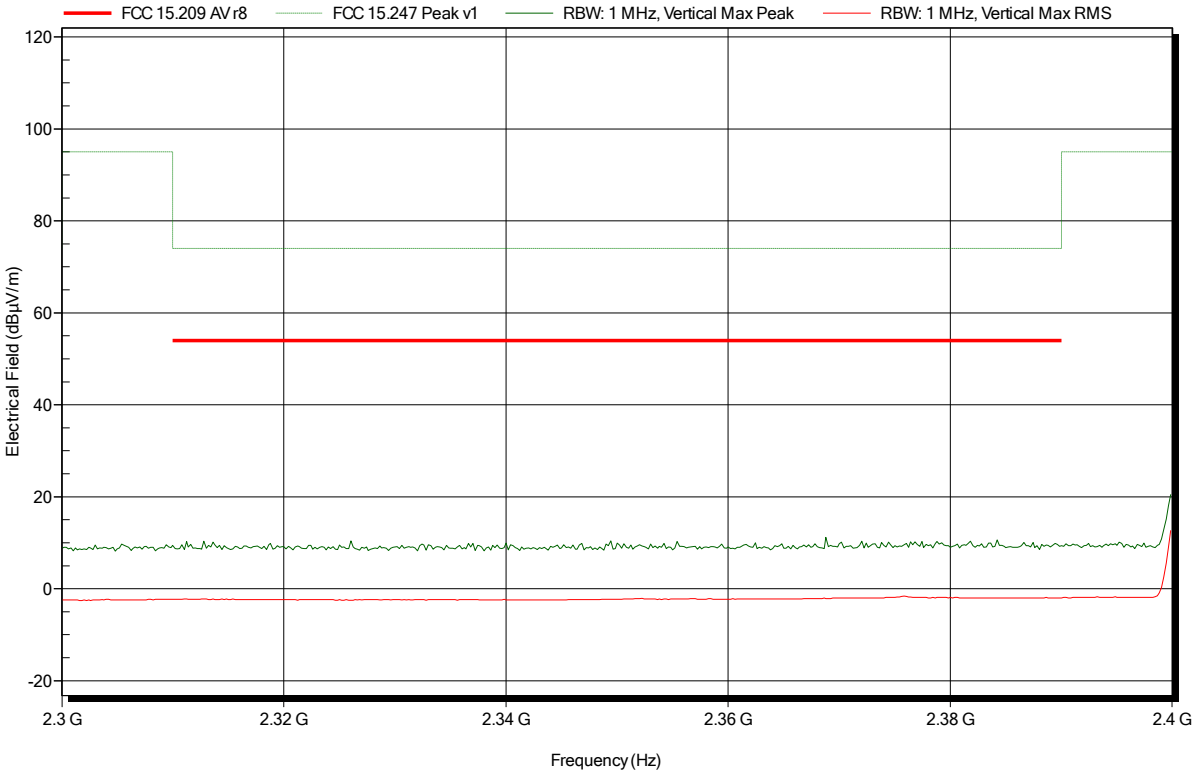

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2402 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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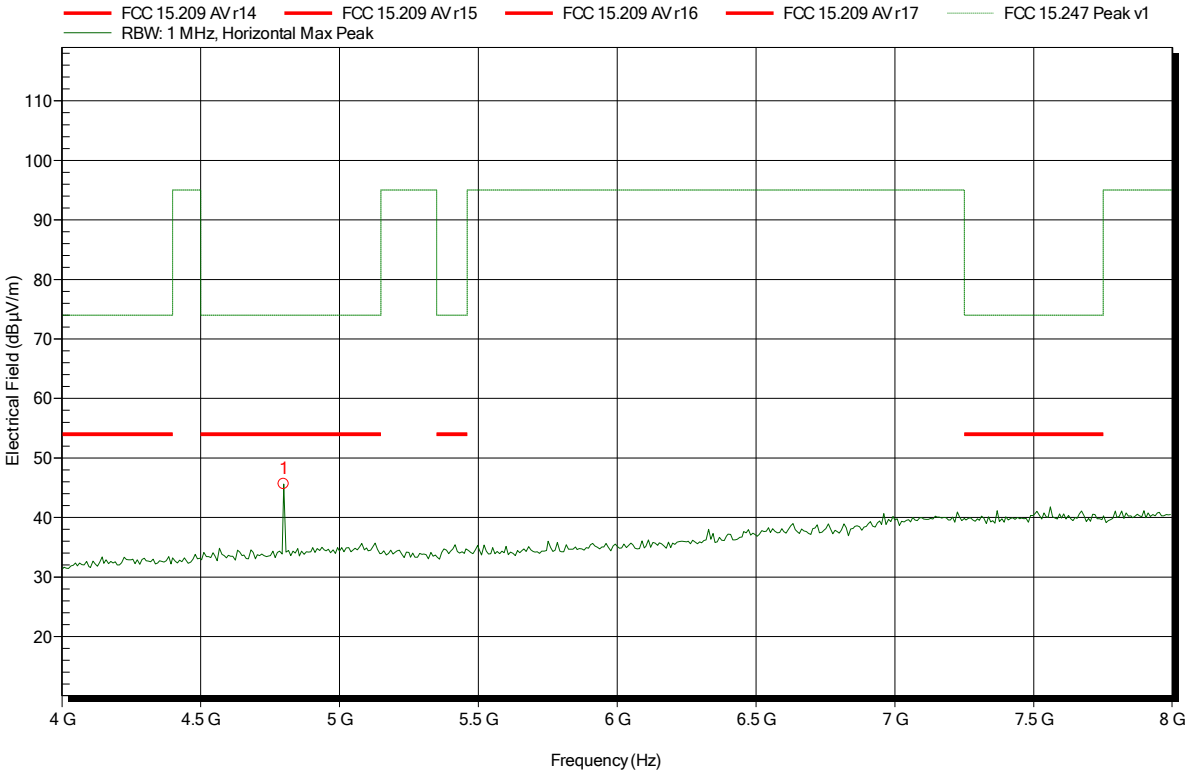

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.8 GHz	45.64 dBµV/m	74 dBµV/m	-28.36 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2402 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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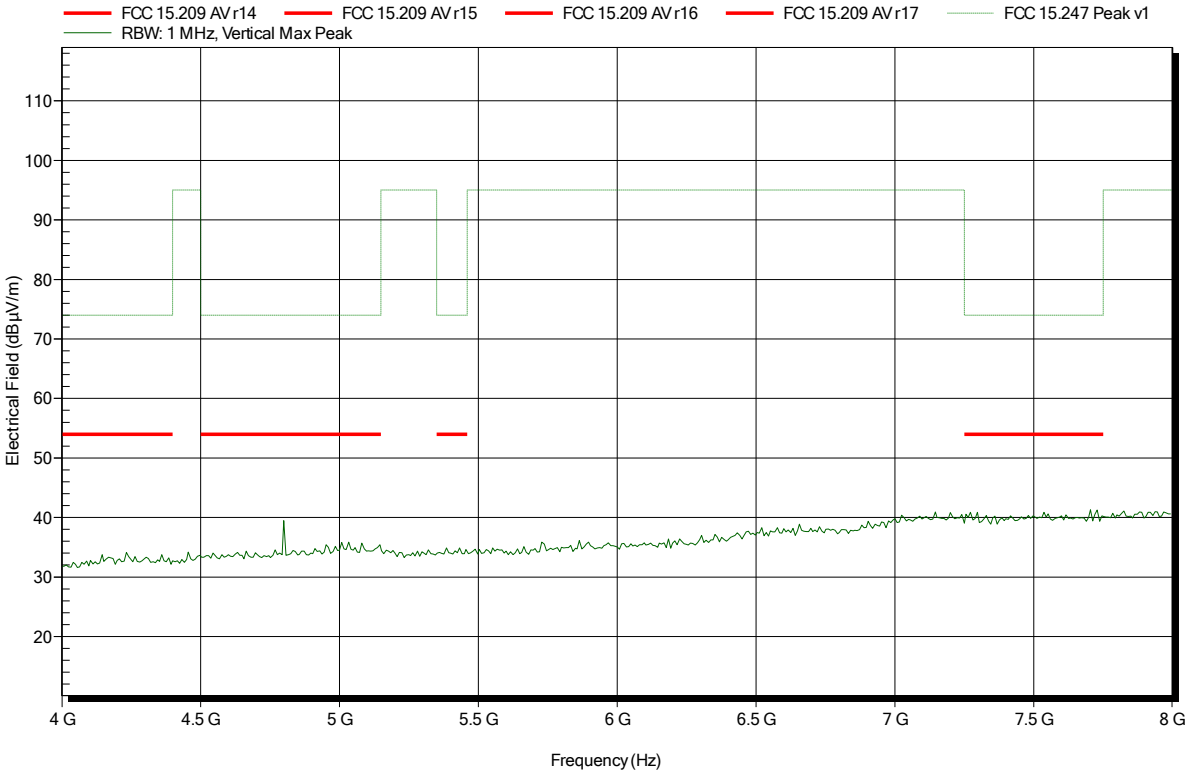

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2402 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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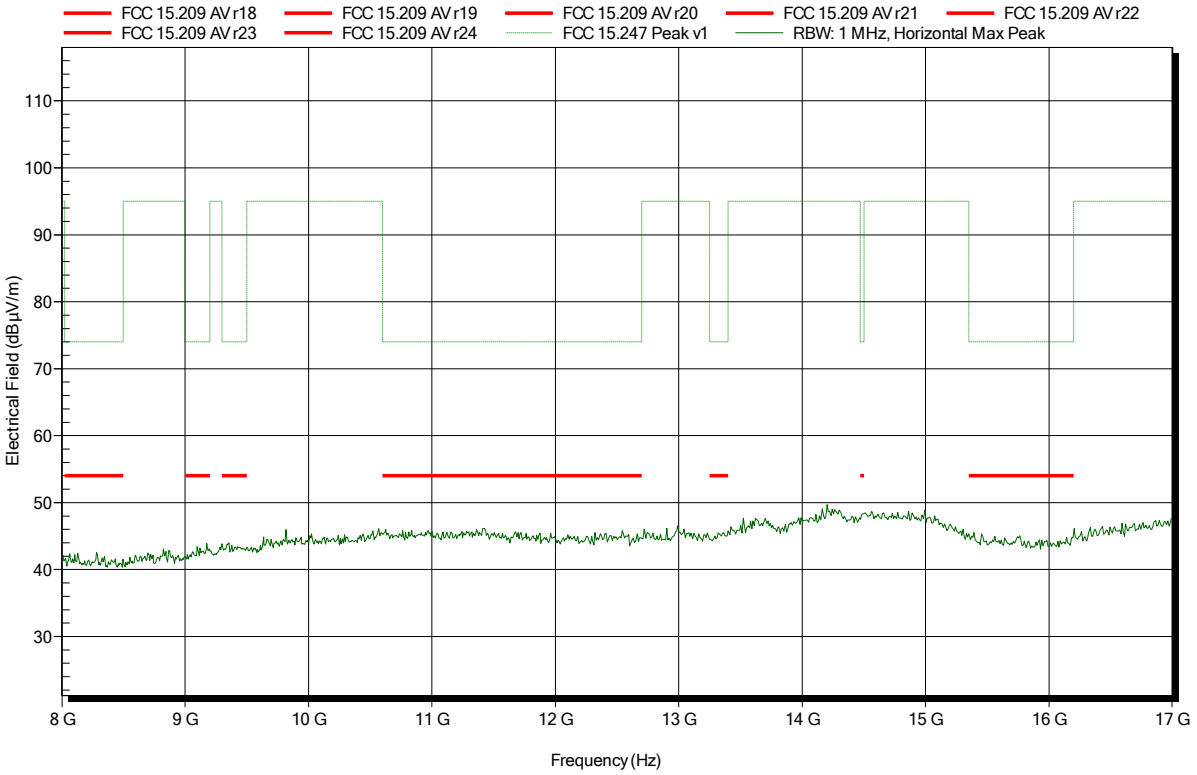

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2402 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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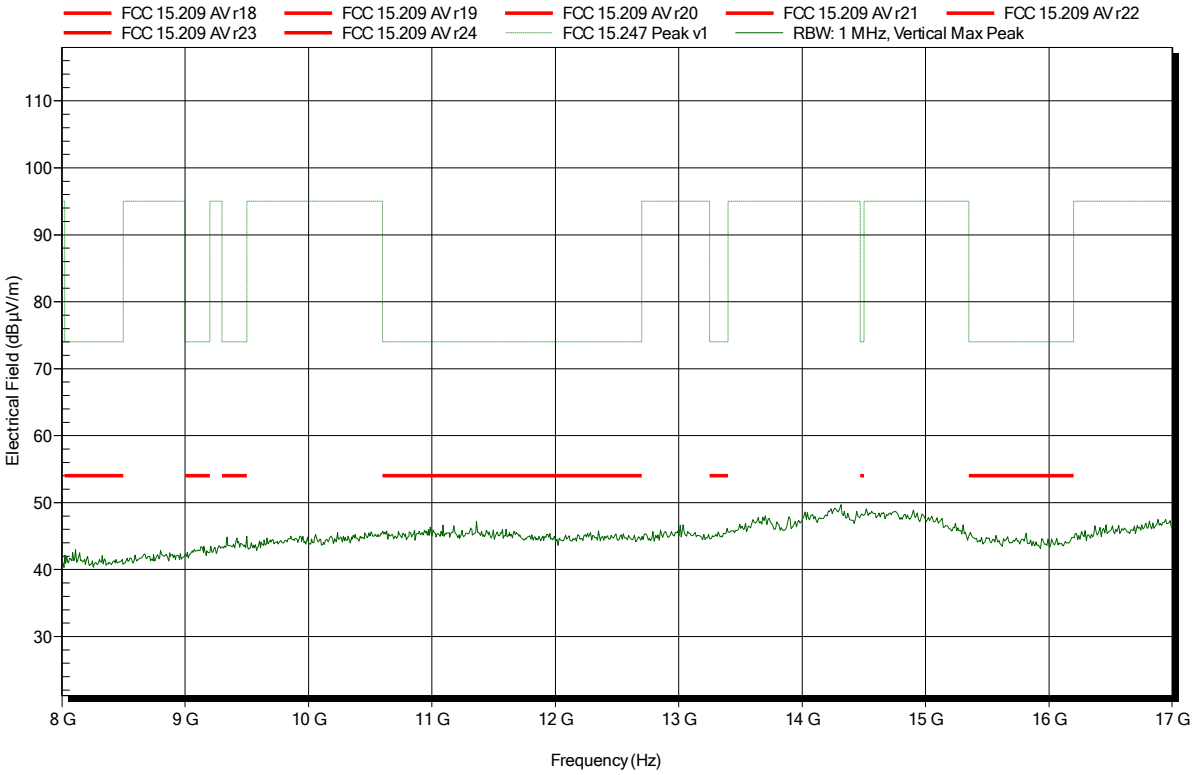

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ATH18G40, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2402 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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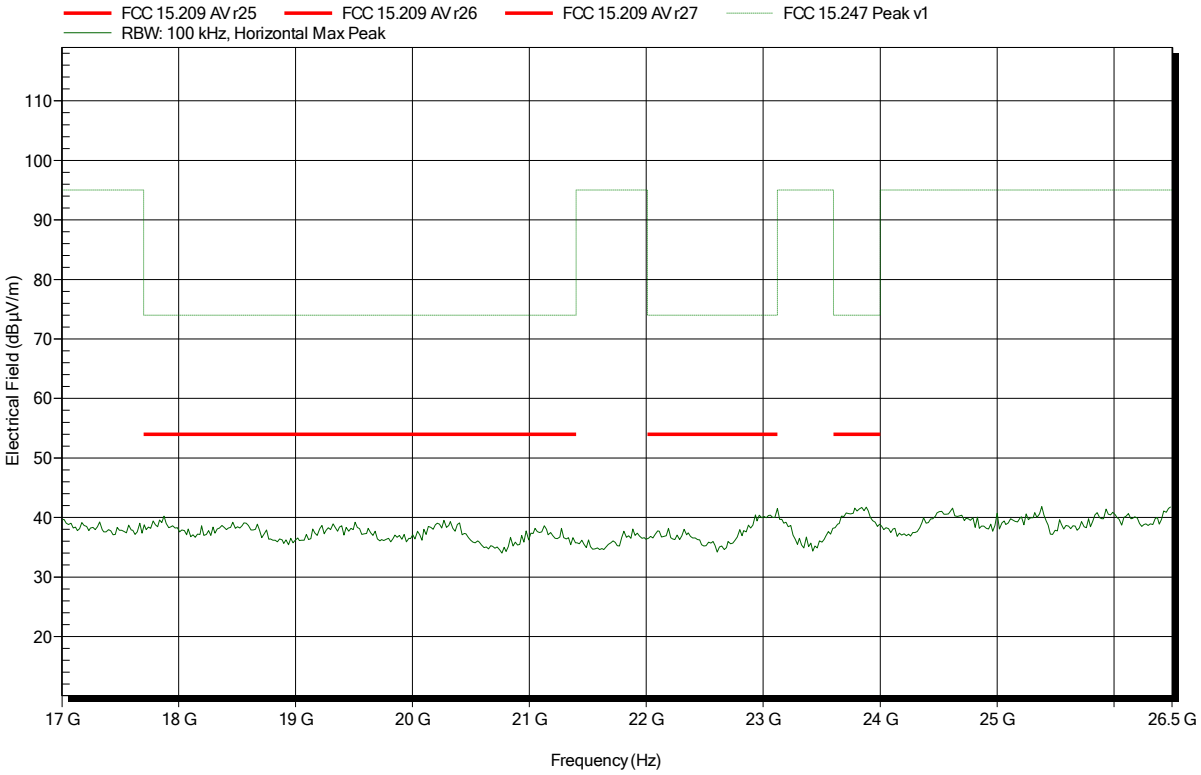

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ATH18G40, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2402 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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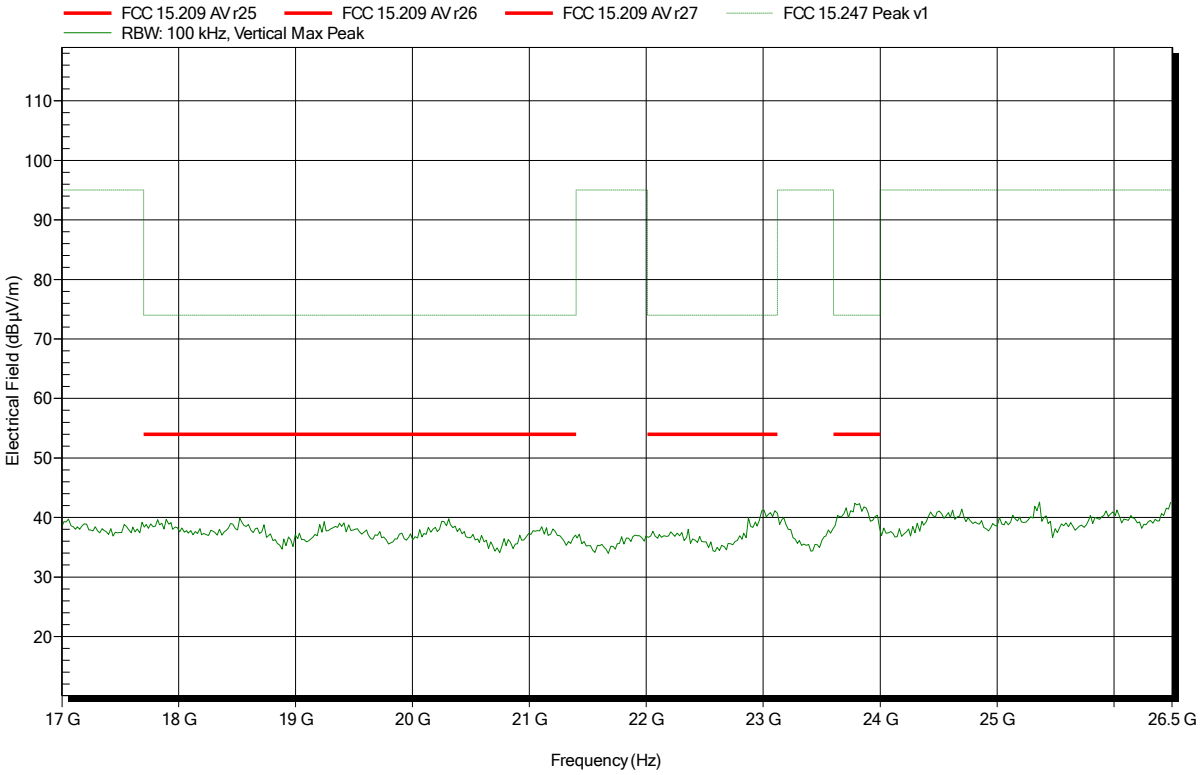

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ETS-Lindgren 3117, Horizontal
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2440 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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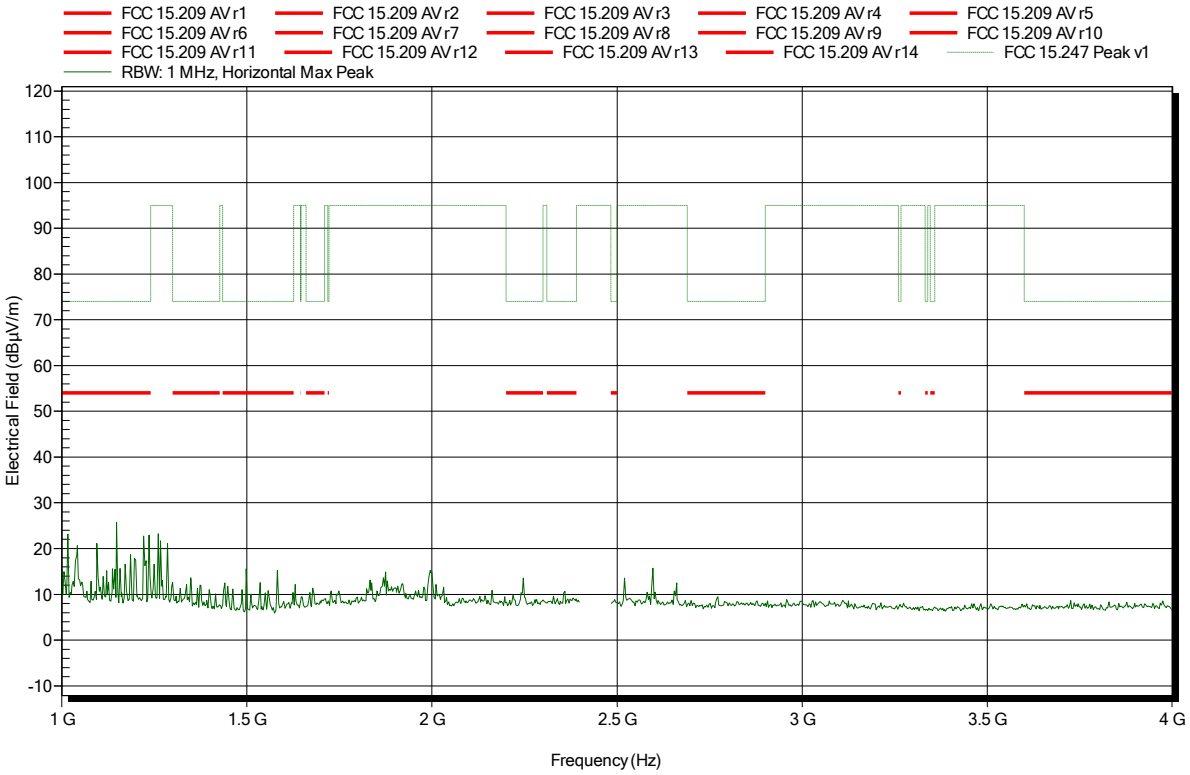

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ETS-Lindgren 3117, Vertical
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2440 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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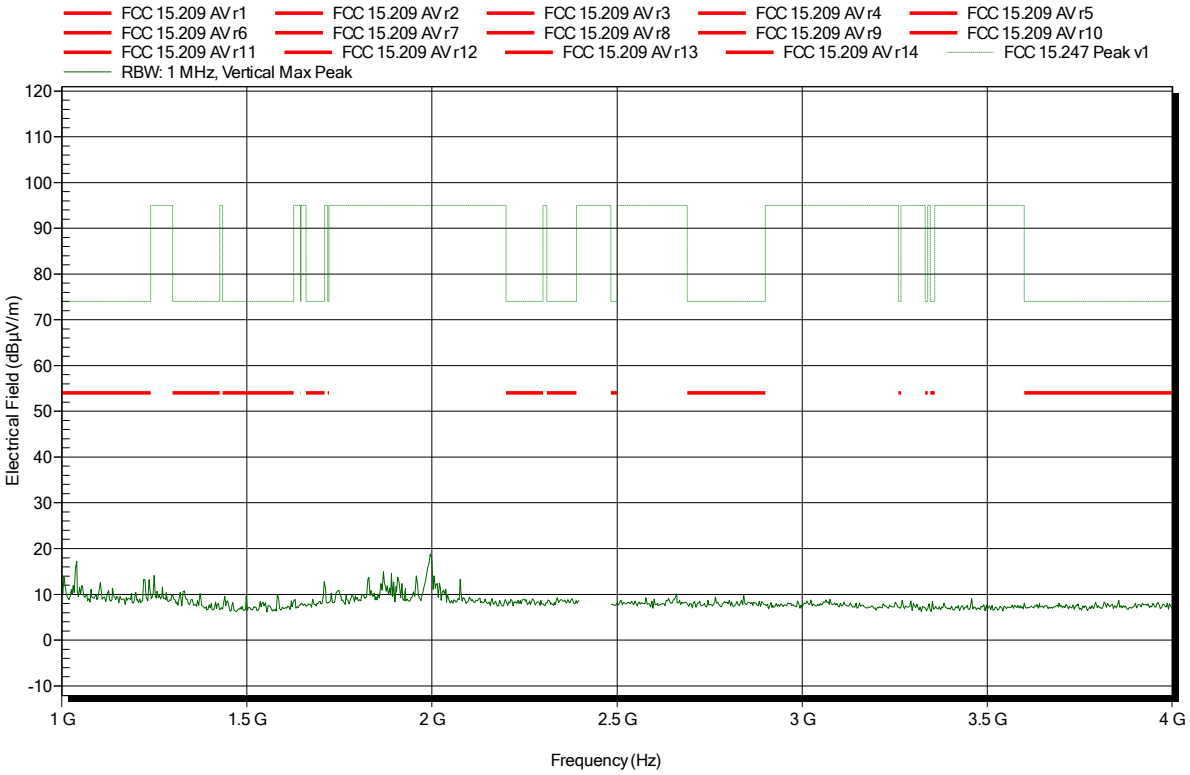

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2440 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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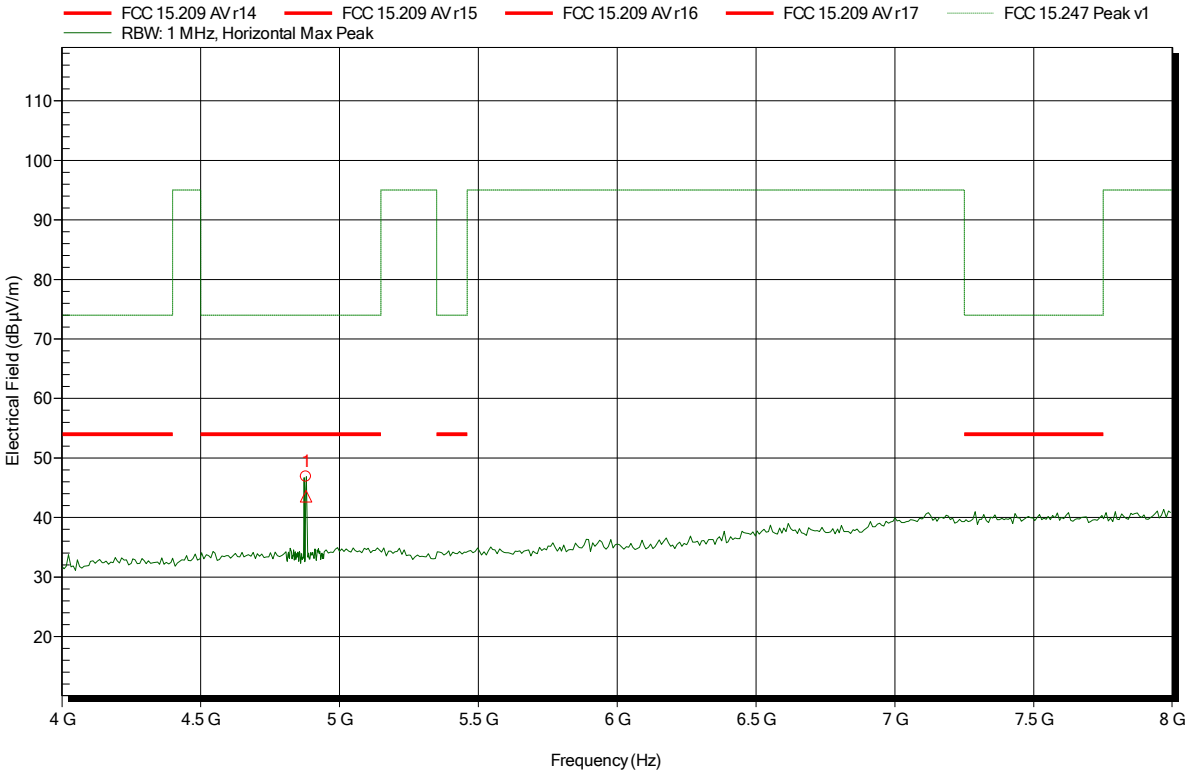

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.88 GHz	46.87 dBµV/m	74 dBµV/m	-27.13 dB	Pass

Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.88 GHz	43.57 dBµV/m	54 dBµV/m	-10.43 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2440 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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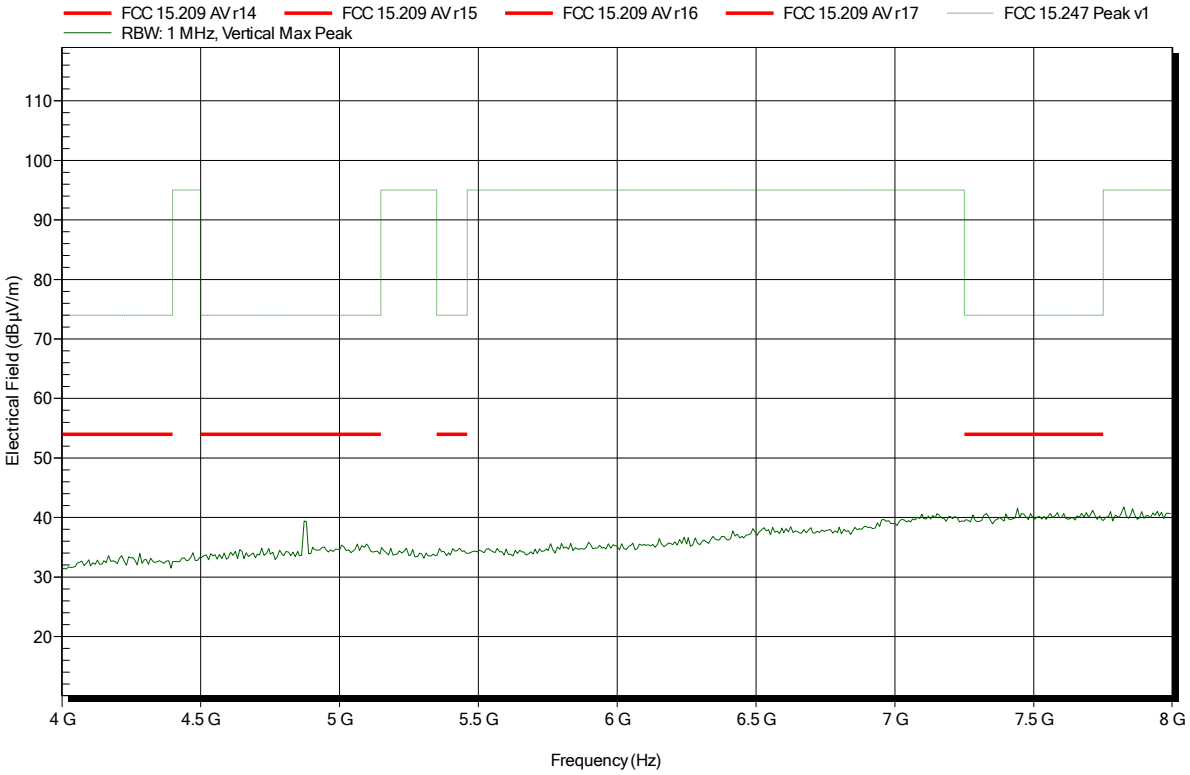

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2440 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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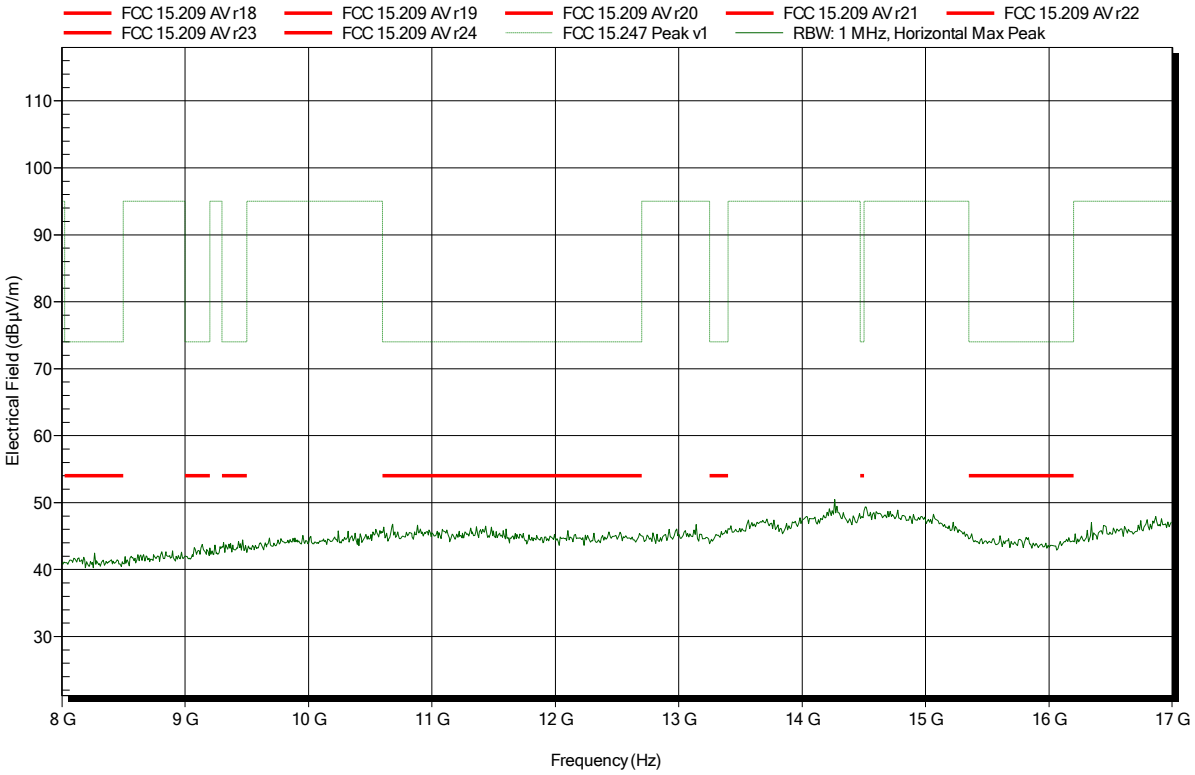

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2440 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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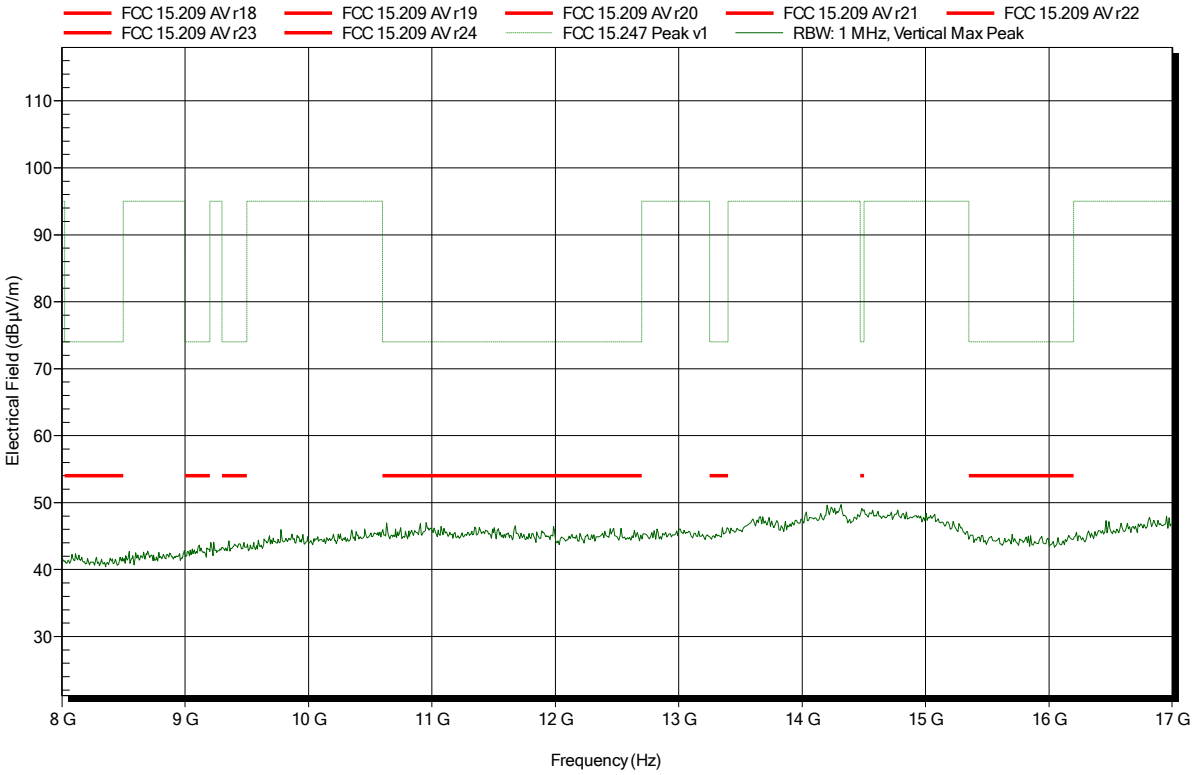

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ATH18G40, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2440 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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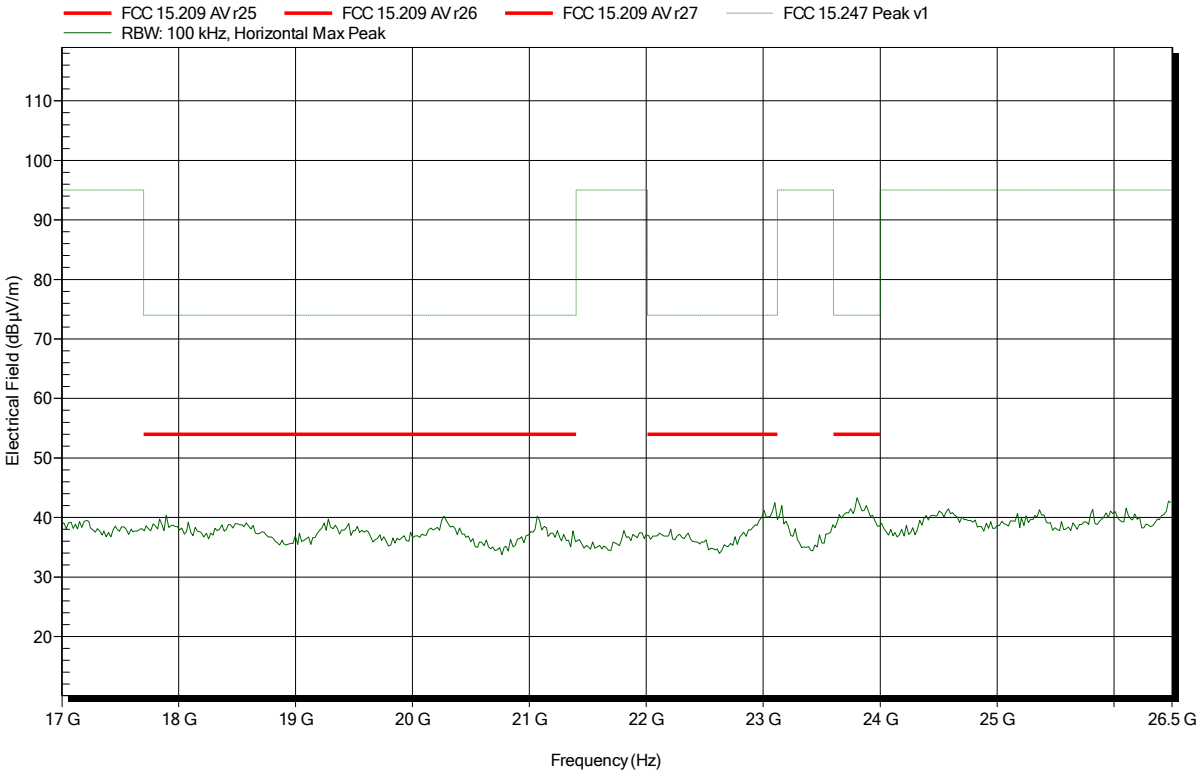

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ATH18G40, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2440 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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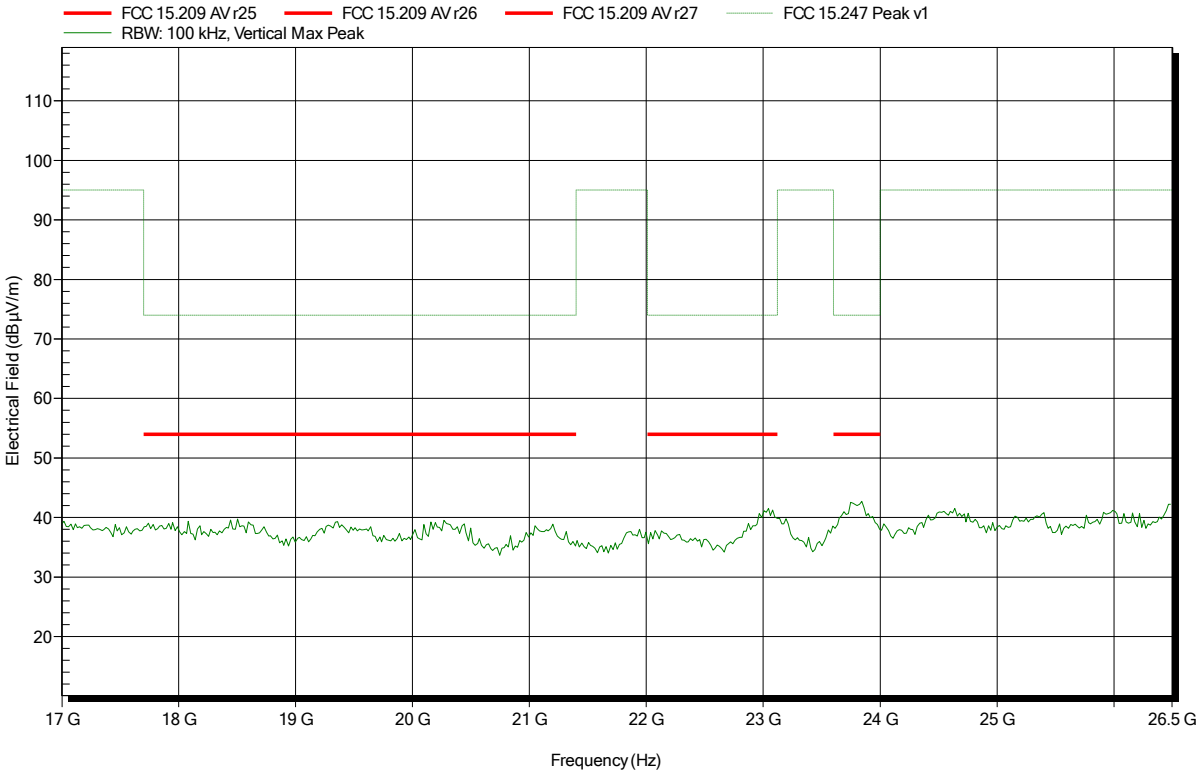

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ETS-Lindgren 3117, Horizontal
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2480 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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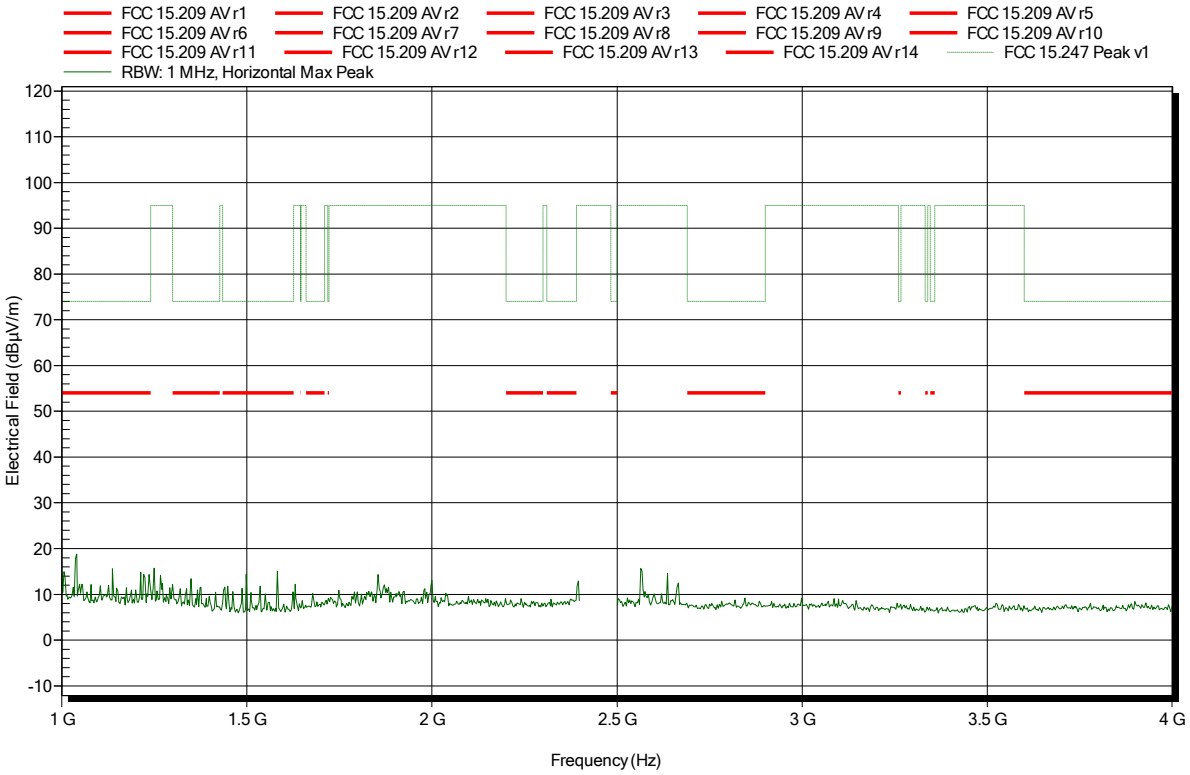

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ETS-Lindgren 3117, Vertical
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2480 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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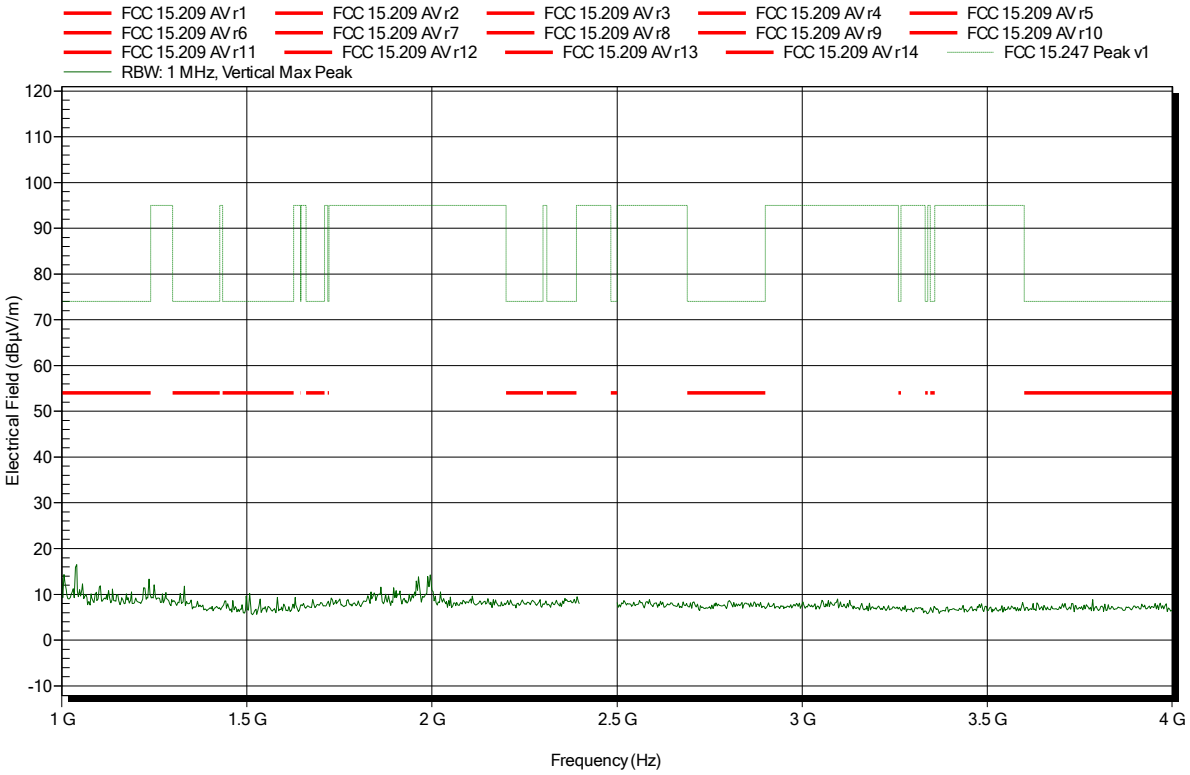

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ETS-Lindgren 3117, Horizontal
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2480 MHz
Test Date:	2018-11-05
Note:	EUT horizontal; higher bandedge

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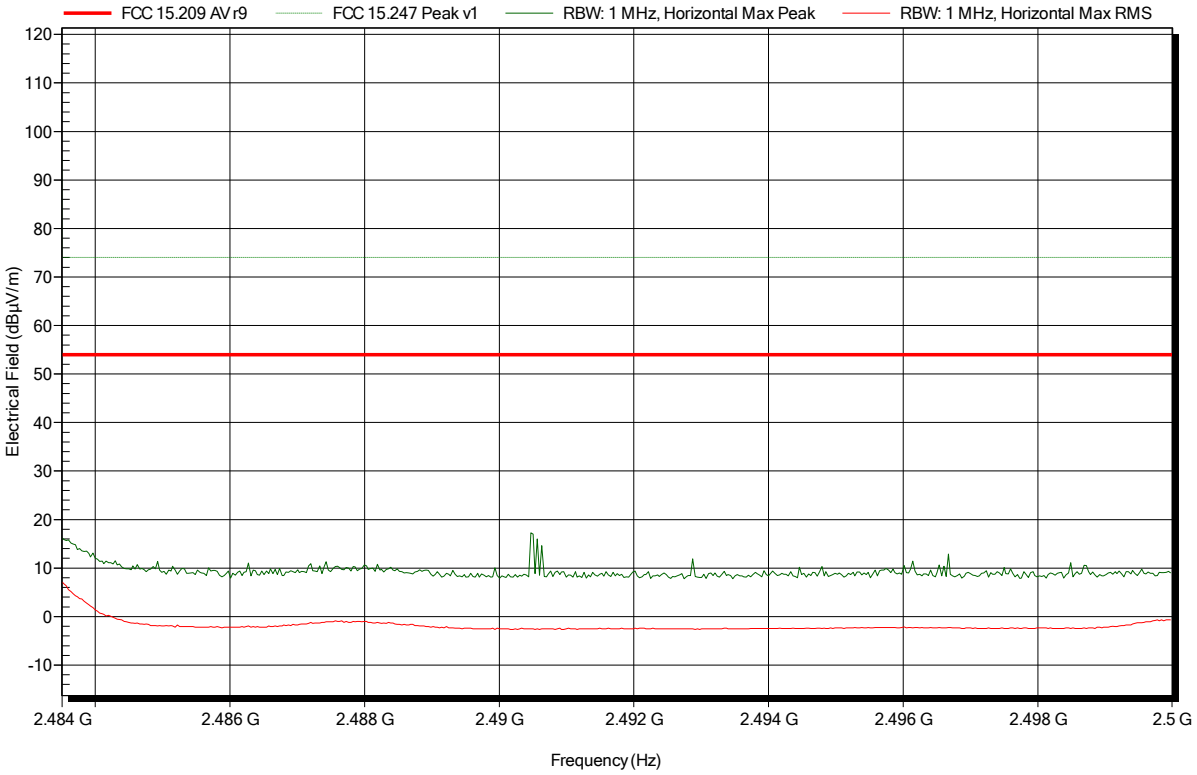

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ETS-Lindgren 3117, Vertical
Measurement distance:	3 m
Mode:	TX; BT-LE; GFSK; 2480 MHz
Test Date:	2018-11-05
Note:	EUT horizontal; higher bandedge

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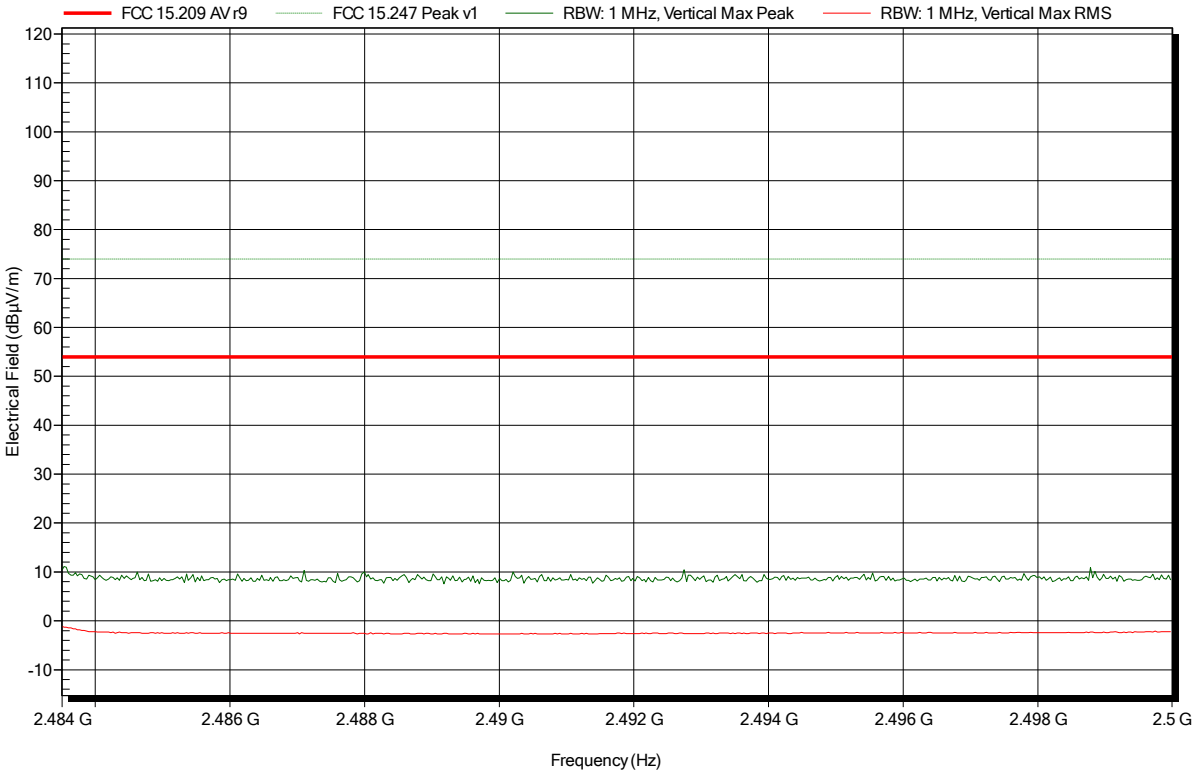

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2480 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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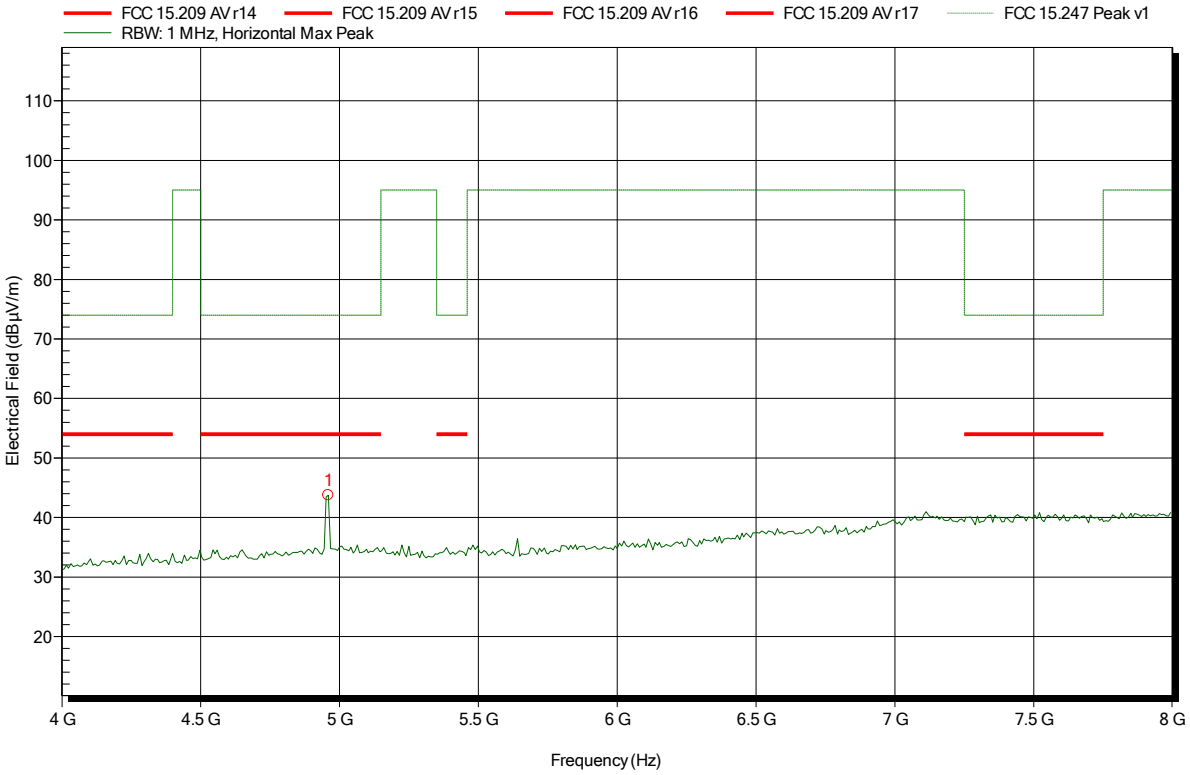

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.96 GHz	43.74 dBµV/m	74 dBµV/m	-30.26 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2480 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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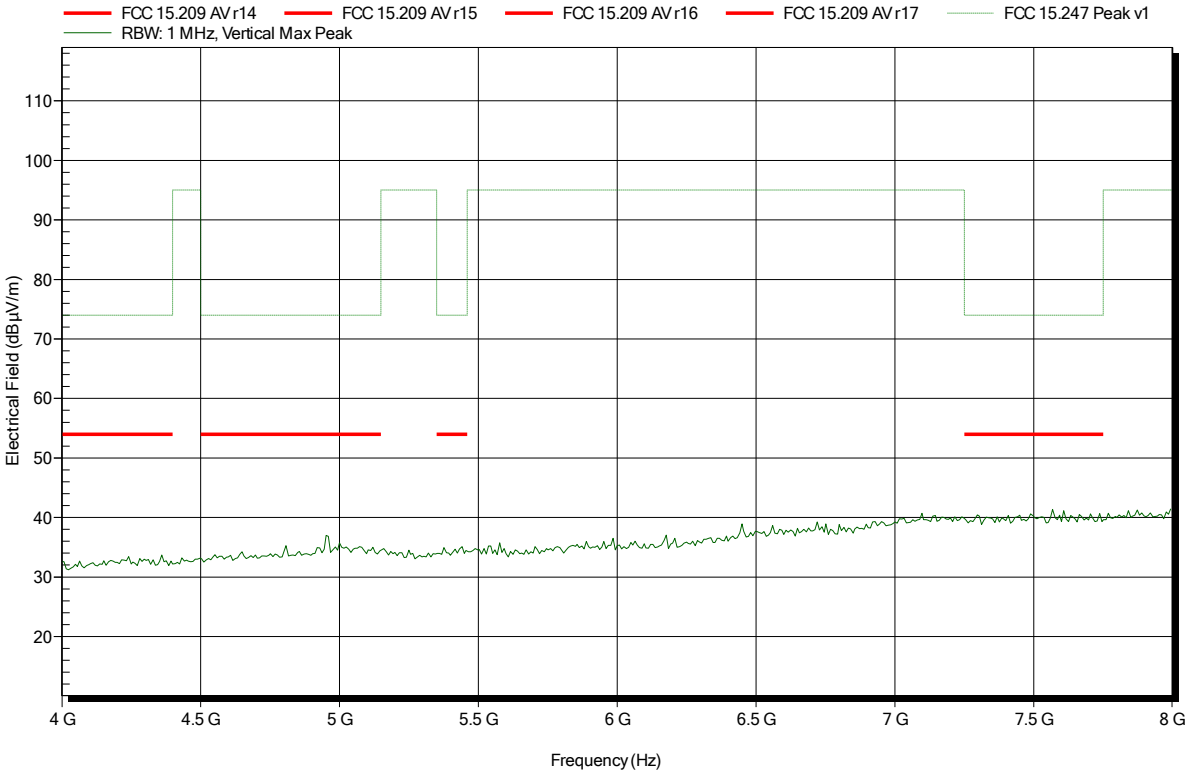

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2480 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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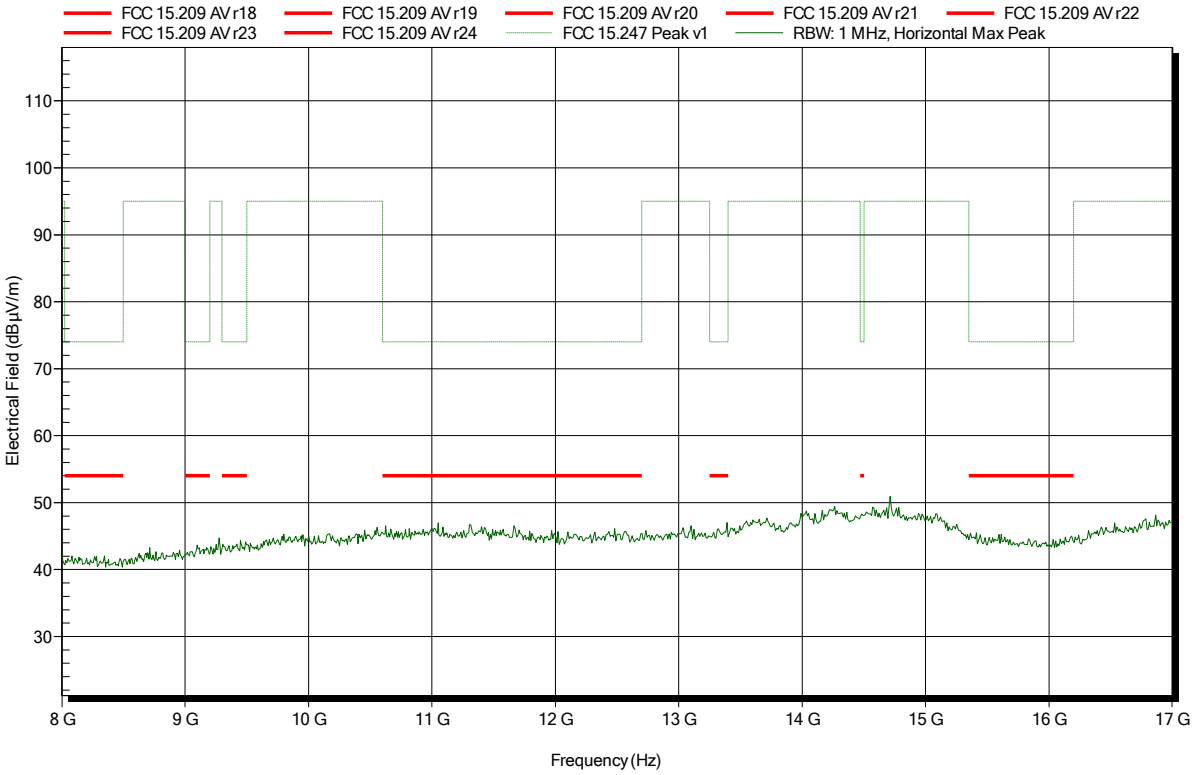

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2480 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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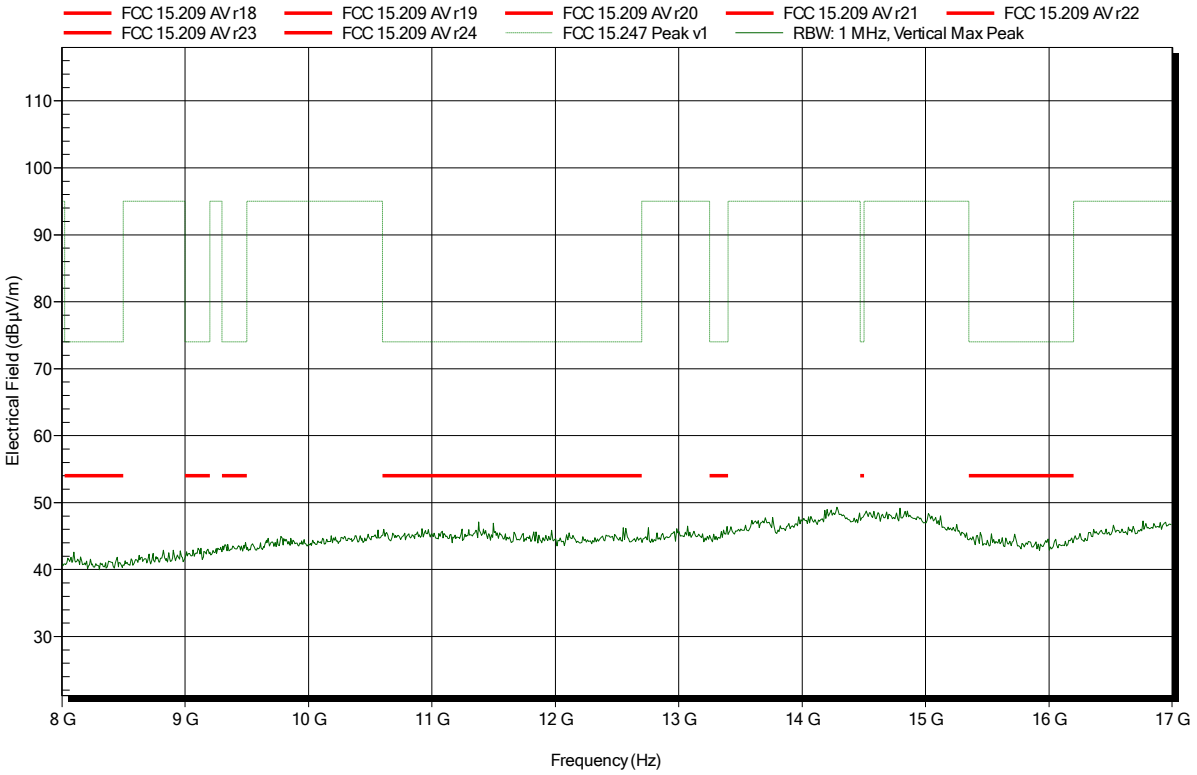

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ATH18G40, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2480 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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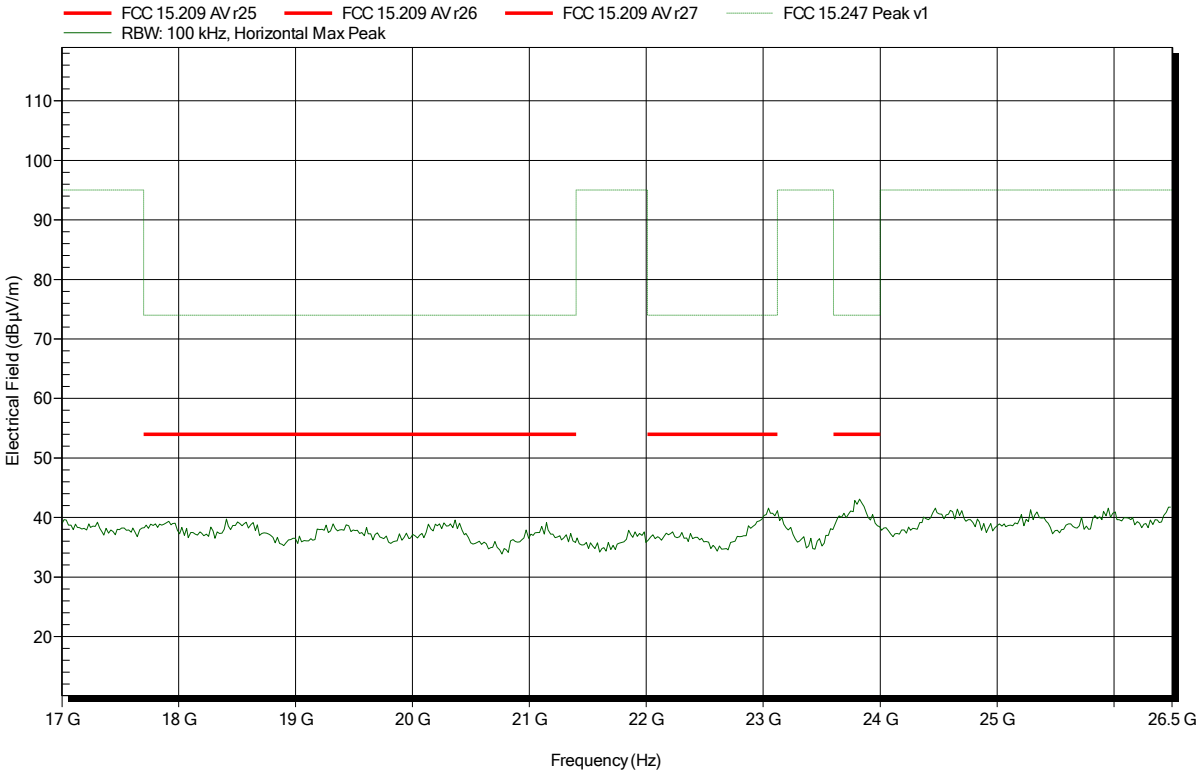

Spurious emissions according to FCC part 15 Subpart C § 15.247

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9201A1EF (Sample 20573)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ATH18G40, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; BT-LE; GFSK; 2480 MHz
Test Date:	2018-11-05
Note:	EUT horizontal

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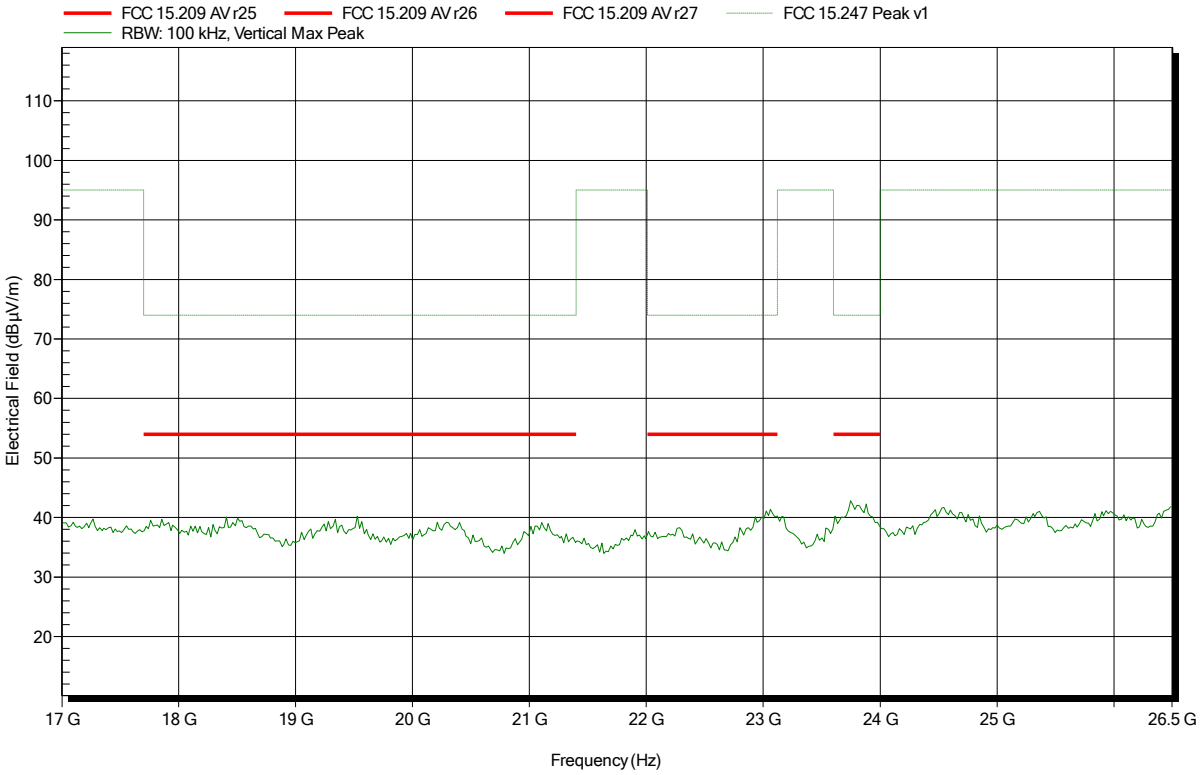
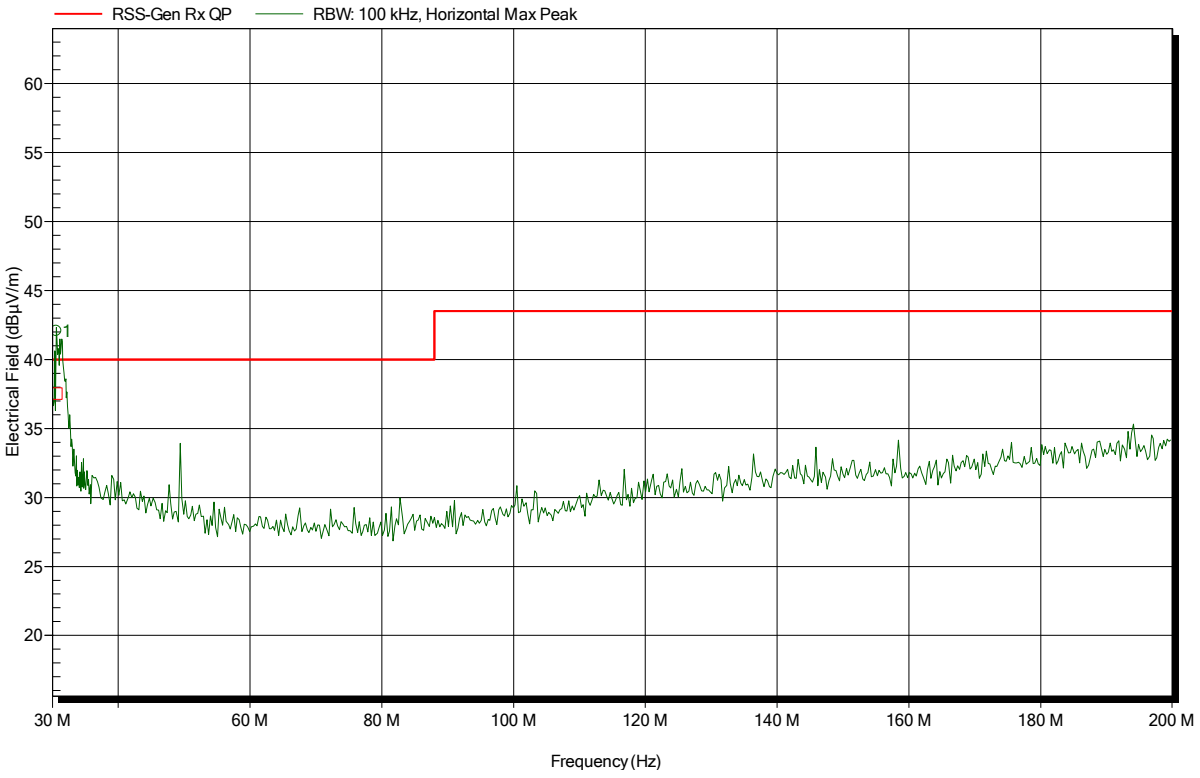


ANNEX B Receiver spurious emissions

Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1810-7783

Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9203A1EF (Sample 20581)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	RX; BLE 2440 MHz
Test Date:	2018-11-08
Note:	



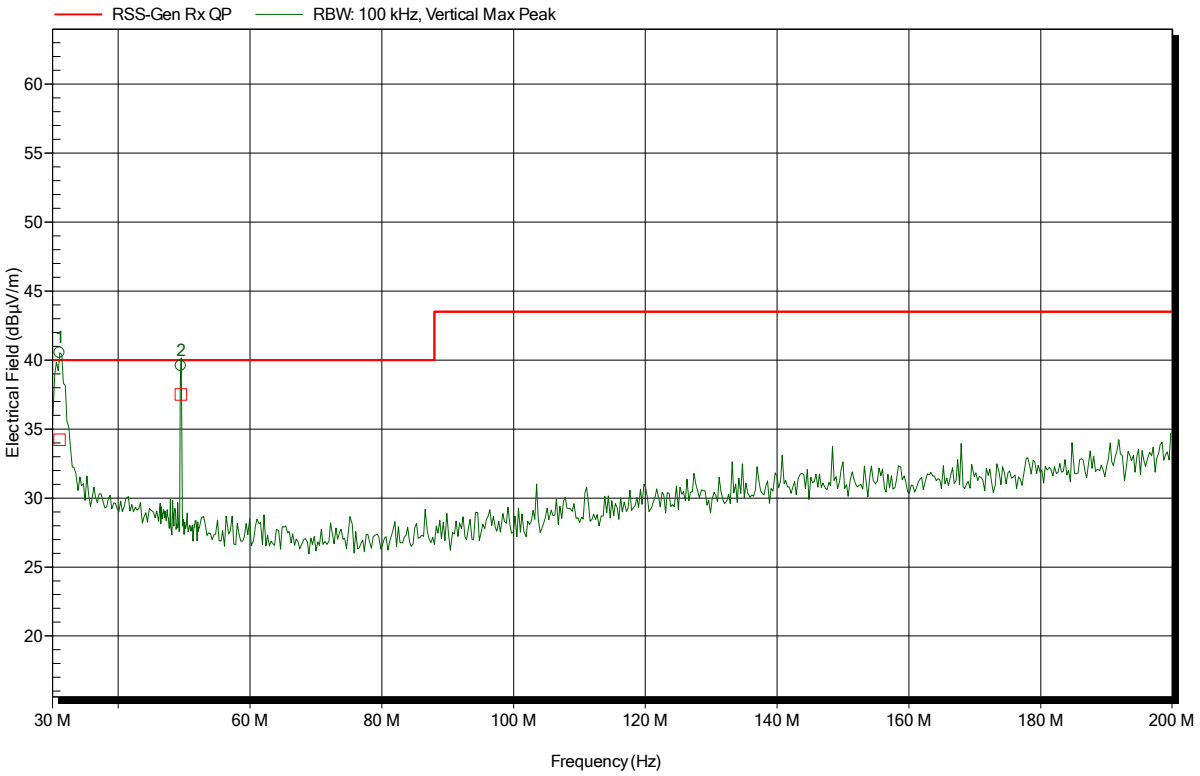
Frequency	Peak	Peak Limit	Peak Difference	Status	Angle	Height
30.611 MHz	42.07 dBµV/m	40 dBµV/m	2.07 dB	---	290 Degree	1.2 m

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
30.611 MHz	37.34 dBµV/m	40 dBµV/m	-2.66 dB	Pass	290 Degree	1.2 m

Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1810-7783

Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9203A1EF (Sample 20581)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	RX; BLE 2440 MHz
Test Date:	2018-11-08
Note:	



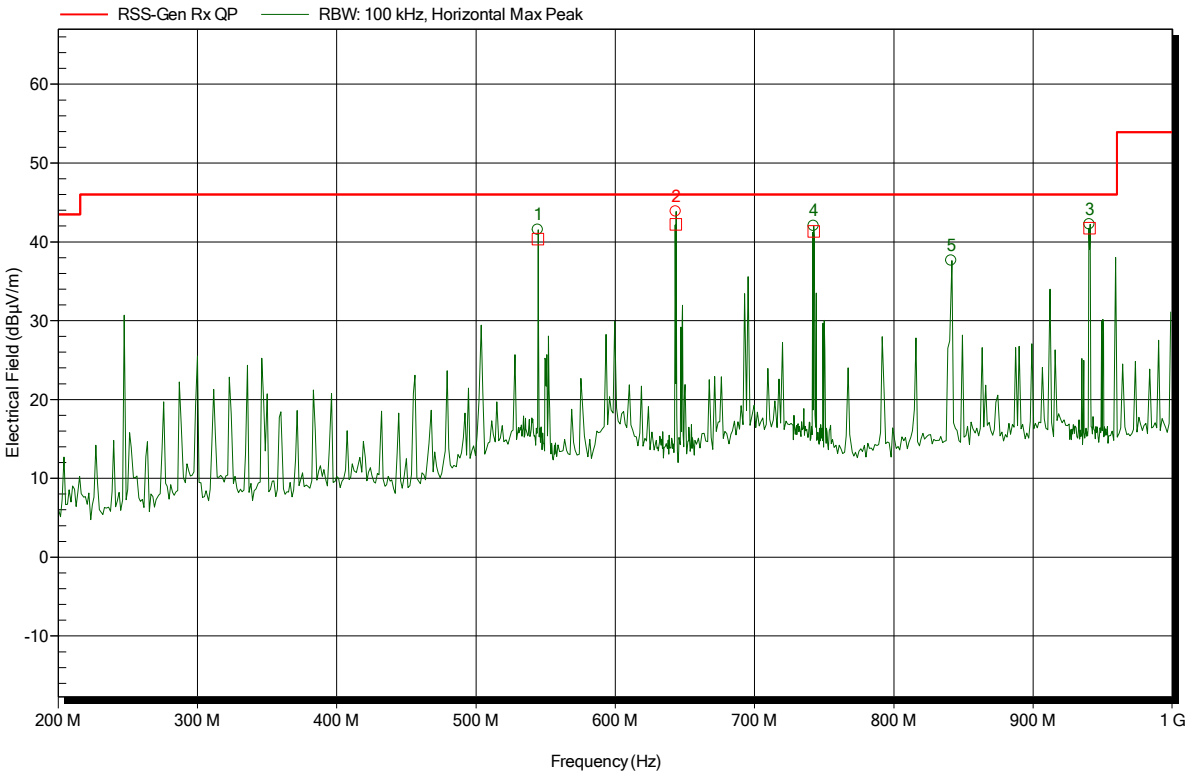
Frequency	Peak	Peak Limit	Peak Difference	Status	Angle	Height
31.088 MHz	40.54 dBµV/m	40 dBµV/m	0.54 dB	---	90 Degree	1.2 m
49.491 MHz	39.57 dBµV/m	40 dBµV/m	-0.43 dB	Pass	61 Degree	1.2 m

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
31.088 MHz	34.02 dBµV/m	40 dBµV/m	-5.98 dB	Pass	90 Degree	1.2 m
49.491 MHz	37.4 dBµV/m	40 dBµV/m	-2.6 dB	Pass	61 Degree	1.2 m

Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1810-7783

Applicant: Panasonic Industrial Devices Europe GmbH
EUT Name: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model: ENWF9203A1EF (Sample 20581)
Test Site: Eurofins Product Service GmbH
Operator: Burkhard Pudell
Test Conditions: Tnom: 24°C, Vnom: 3.3 V DC
Antenna: Rohde & Schwarz HL 223, Horizontal
Measurement distance: 3 m
Mode: RX; BLE 2440 MHz
Test Date: 2018-11-08
Note:



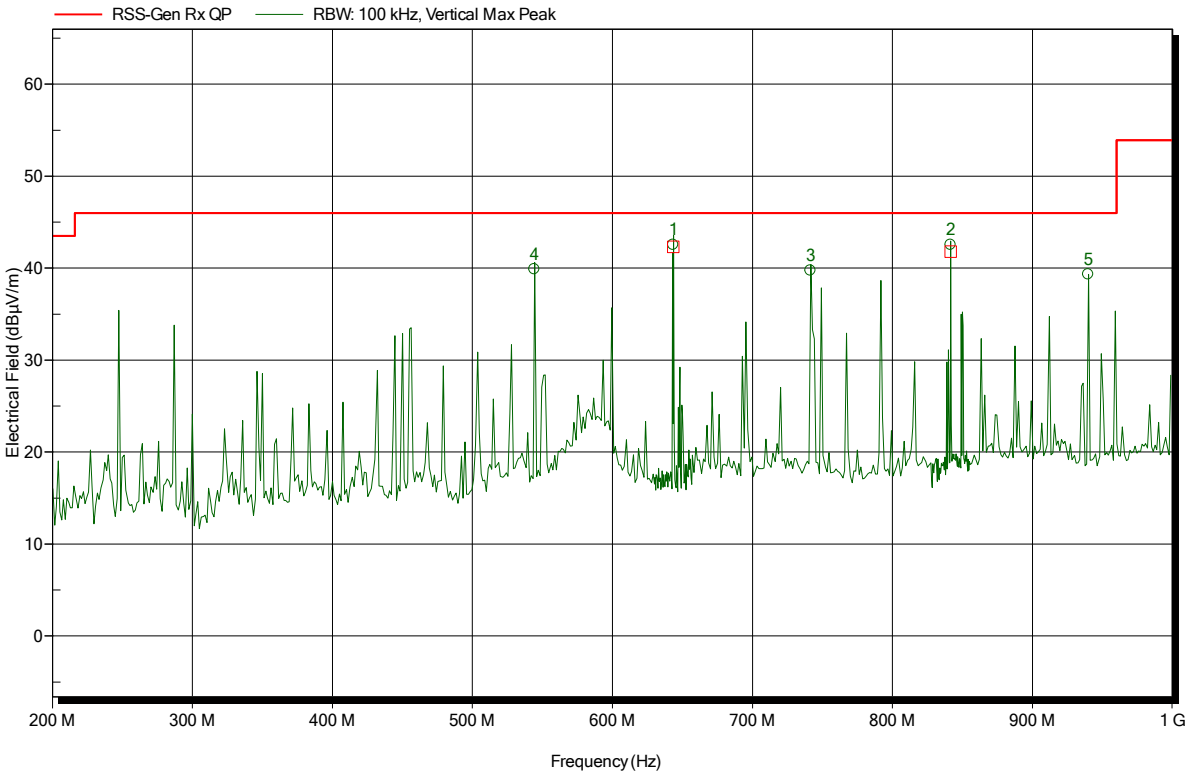
Frequency	Peak	Peak Limit	Peak Difference	Status	Angle	Height
544.482 MHz	41.55 dBµV/m	46 dBµV/m	-4.45 dB	Pass	31 Degree	1.2 m
643.482 MHz	43.83 dBµV/m	46 dBµV/m	-2.17 dB	Pass	31 Degree	1.2 m
742.474 MHz	42.01 dBµV/m	46 dBµV/m	-3.99 dB	Pass	31 Degree	1.2 m
841.28 MHz	37.61 dBµV/m	46 dBµV/m	-8.39 dB	Pass	32 Degree	1.2 m
940.465 MHz	42.23 dBµV/m	46 dBµV/m	-3.77 dB	Pass	31 Degree	1.2 m

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
544.482 MHz	40.30 dBµV/m	46 dBµV/m	-5.70 dB	Pass	31 Degree	1.2 m
643.482 MHz	42.21 dBµV/m	46 dBµV/m	-3.79 dB	Pass	31 Degree	1.2 m
742.474 MHz	41.33 dBµV/m	46 dBµV/m	-4.67 dB	Pass	31 Degree	1.2 m
940.465 MHz	41.62 dBµV/m	46 dBµV/m	-4.38 dB	Pass	31 Degree	1.2 m

Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1810-7783

Applicant: Panasonic Industrial Devices Europe GmbH
EUT Name: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model: ENWF9203A1EF (Sample 20581)
Test Site: Eurofins Product Service GmbH
Operator: Burkhard Pudell
Test Conditions: Tnom: 24°C, Vnom: 3.3 V DC
Antenna: Rohde & Schwarz HL 223, Vertical
Measurement distance: 3 m
Mode: RX; BLE 2440 MHz
Test Date: 2018-11-08
Note:



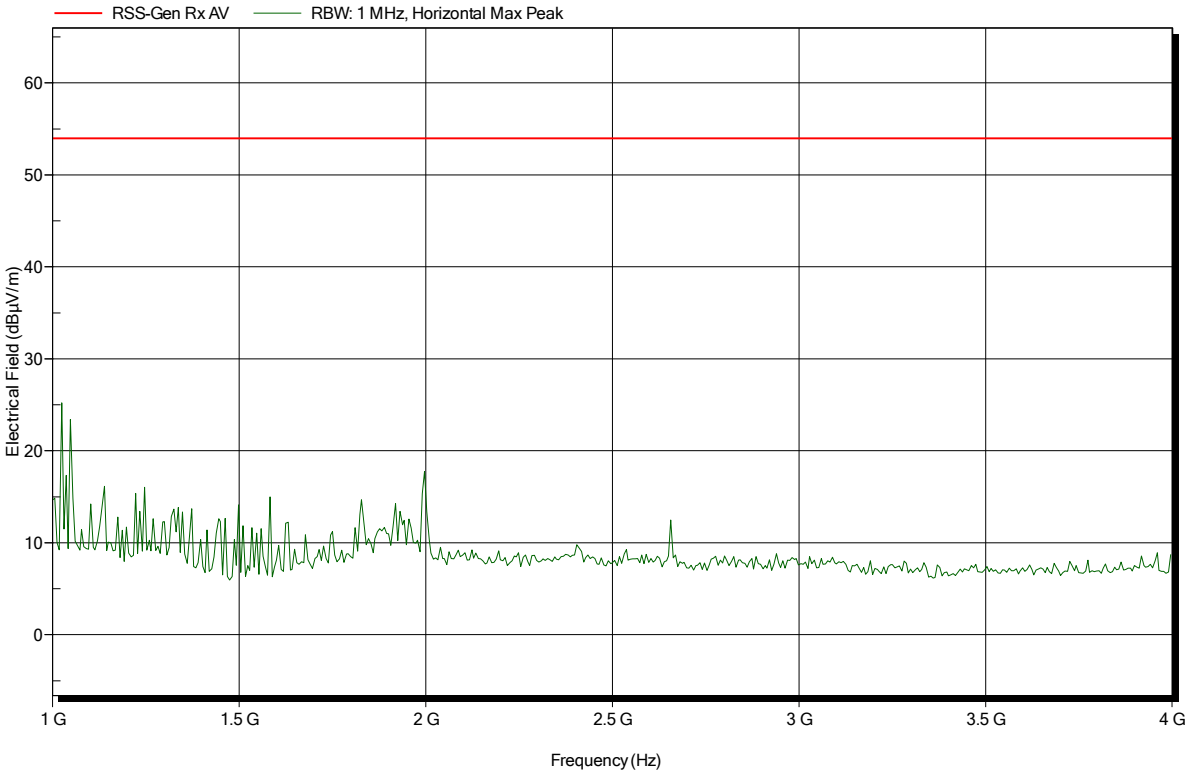
Frequency	Peak	Peak Limit	Peak Difference	Status	Angle	Height
544.32 MHz	39.89 dBµV/m	46 dBµV/m	-6.11 dB	Pass	67 Degree	1.2 m
643.476 MHz	42.51 dBµV/m	46 dBµV/m	-3.49 dB	Pass	358 Degree	1.2 m
741.44 MHz	39.73 dBµV/m	46 dBµV/m	-6.27 dB	Pass	45 Degree	1.2 m
841.47 MHz	42.53 dBµV/m	46 dBµV/m	-3.47 dB	Pass	1 Degree	1.2 m
939.84 MHz	39.31 dBµV/m	46 dBµV/m	-6.69 dB	Pass	67 Degree	1.2 m

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
643.476 MHz	42.1 dBµV/m	46 dBµV/m	-3.9 dB	Pass	358 Degree	1.2 m
841.47 MHz	41.6 dBµV/m	46 dBµV/m	-4.4 dB	Pass	1 Degree	1.2 m

Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1810-7783

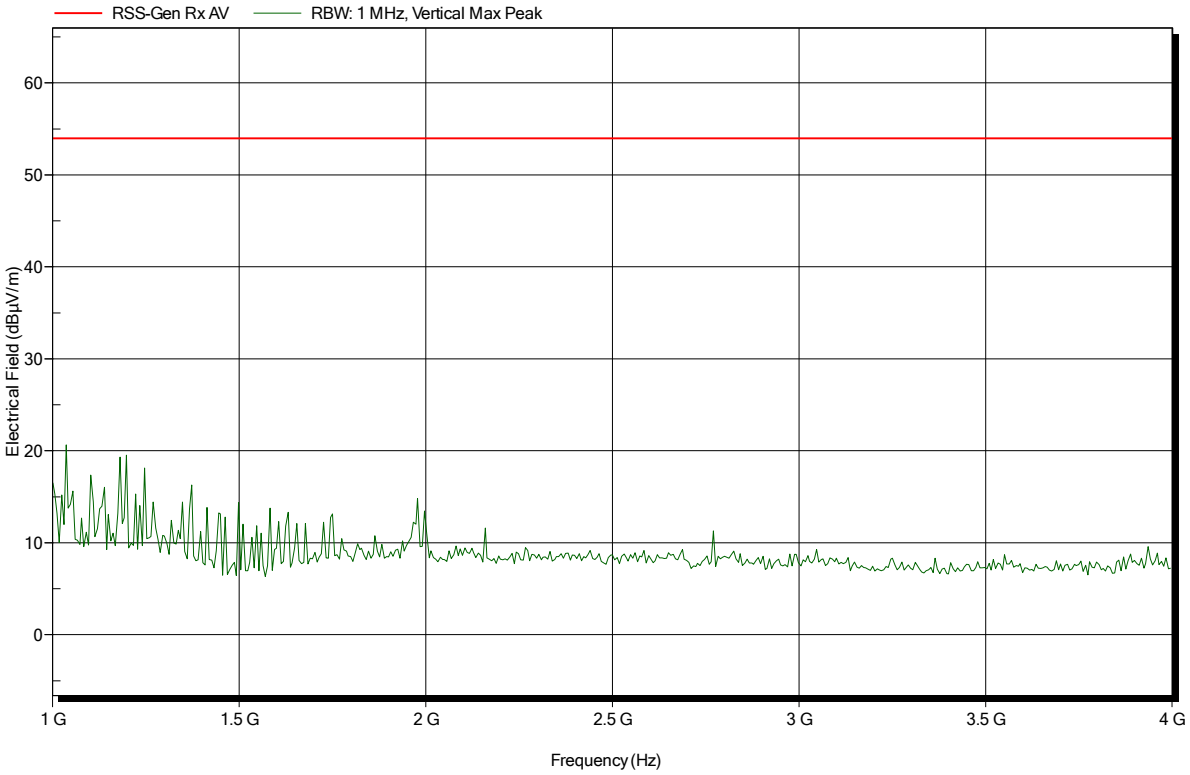
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9203A1EF (Sample 20581)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ETS-Lindgren 3117, Horizontal
Measurement distance:	3 m
Mode:	RX; BLE 2440 MHz
Test Date:	2018-11-06
Note:	EUT horizontal



Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1810-7783

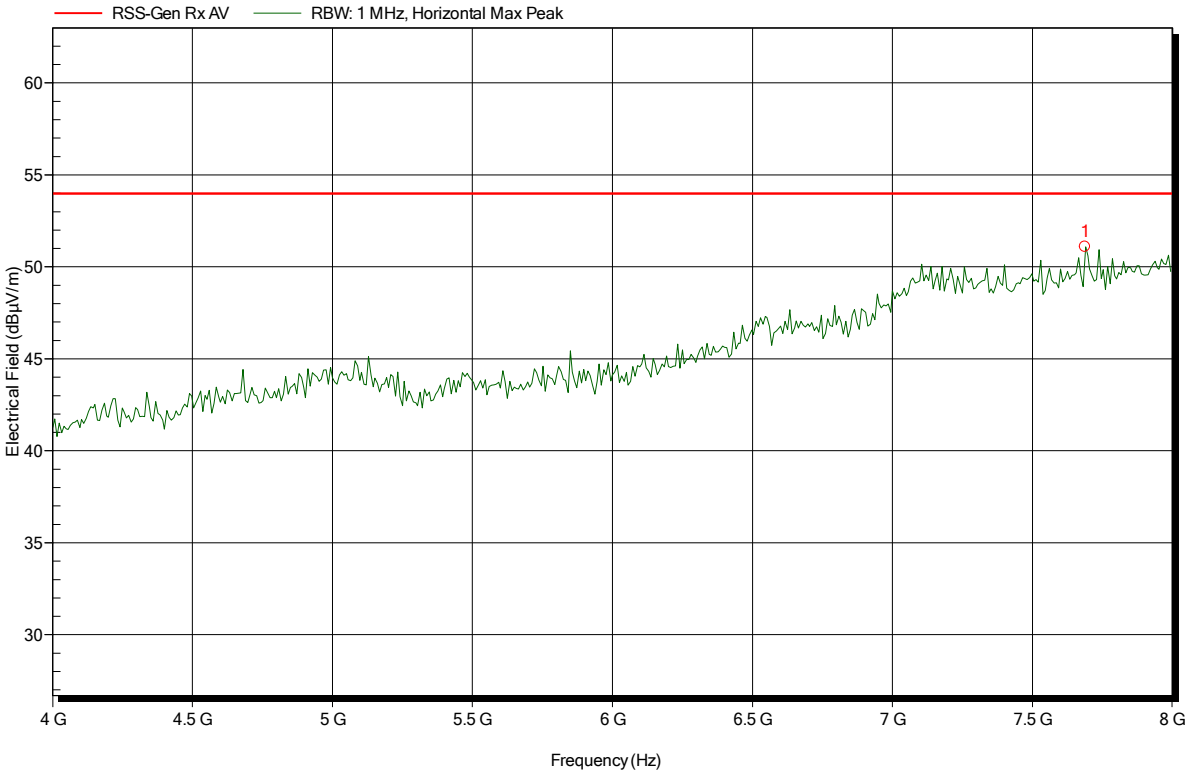
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9203A1EF (Sample 20581)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ETS-Lindgren 3117, Vertical
Measurement distance:	3 m
Mode:	RX; BLE 2440 MHz
Test Date:	2018-11-06
Note:	EUT horizontal



Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1810-7783

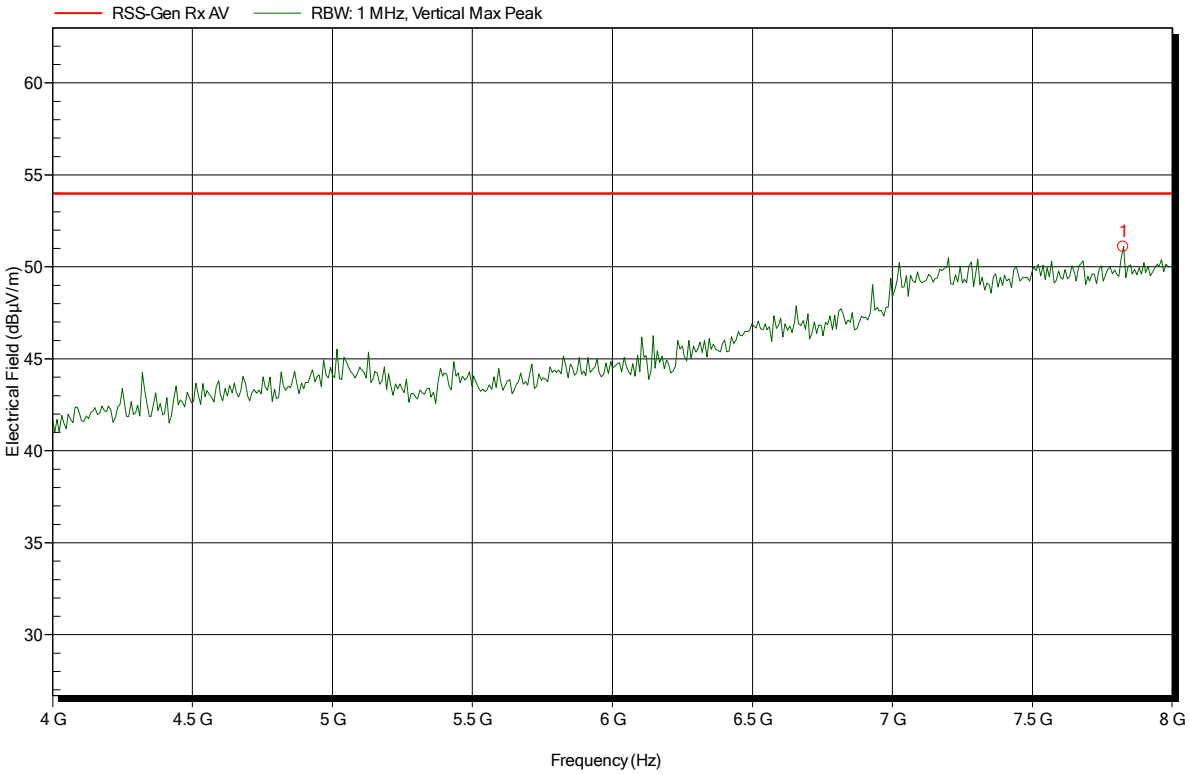
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9203A1EF (Sample 20581)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	RX; BLE 2440 MHz
Test Date:	2018-11-06
Note:	EUT horizontal



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.688 GHz	51.0 dBµV/m	53.98 dBµV/m	-2.98 dB	Pass

Spurious emissions according to ISED RSS-247, I1

Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9203A1EF (Sample 20581)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	RX; BLE 2440 MHz
Test Date:	2018-11-06
Note:	EUT horizontal

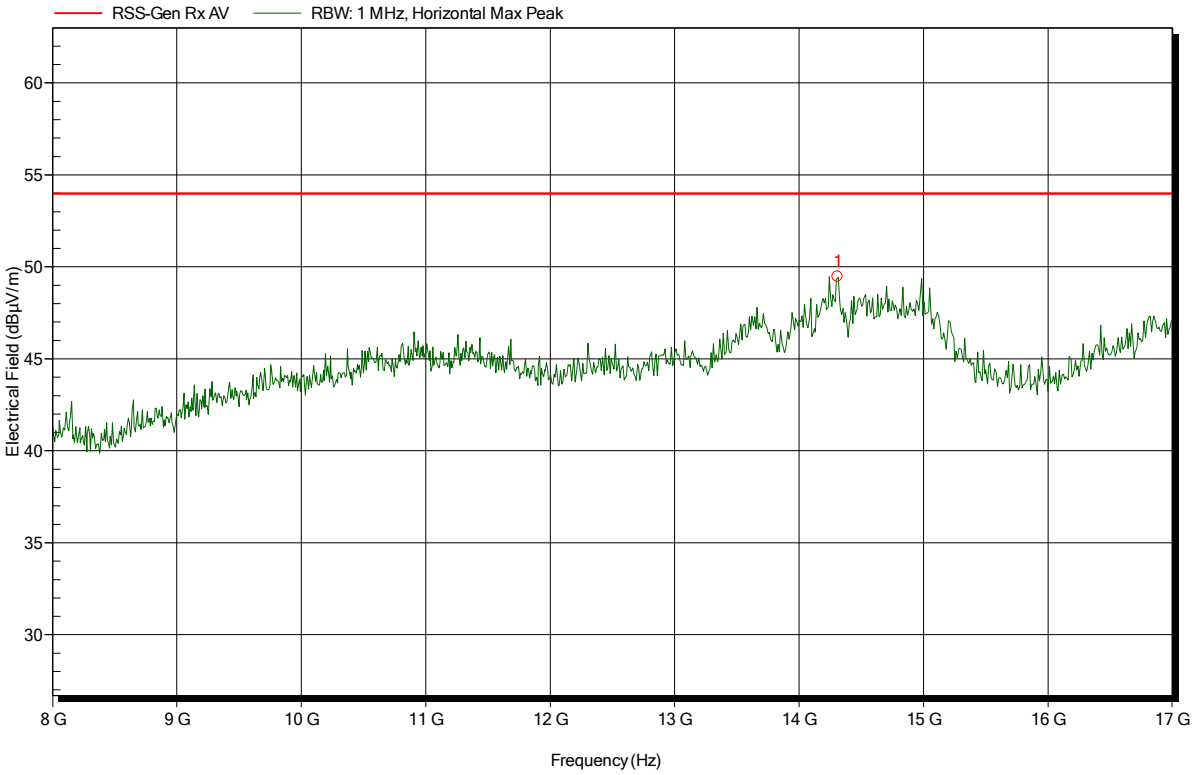


Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.824 GHz	51.3 dBµV/m	53.98 dBµV/m	-2.58 dB	Pass

Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1810-7783

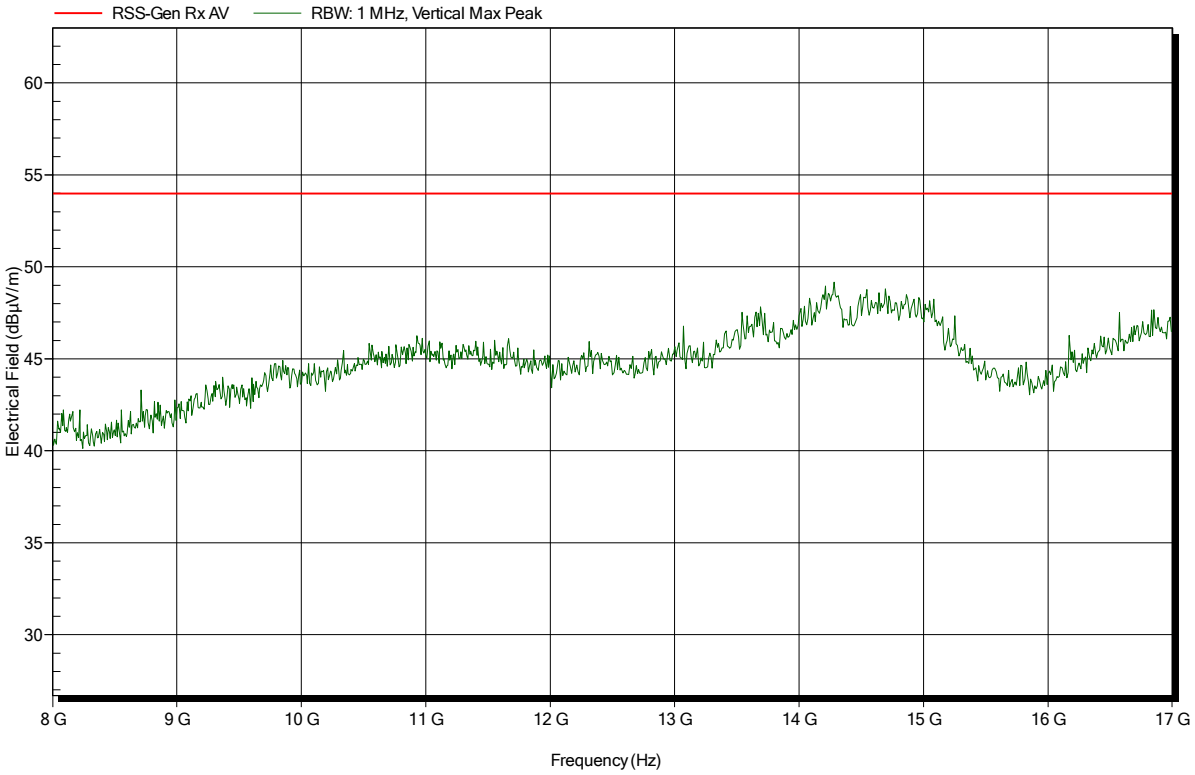
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9203A1EF (Sample 20581)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	RX; BLE 2440 MHz
Test Date:	2018-11-06
Note:	EUT horizontal



Frequency	Peak	Peak Limit	Peak Difference	Status
14.31 GHz	49.46 dBµV/m	53.98 dBµV/m	-4.52 dB	Pass

Spurious emissions according to ISED RSS-247, I1

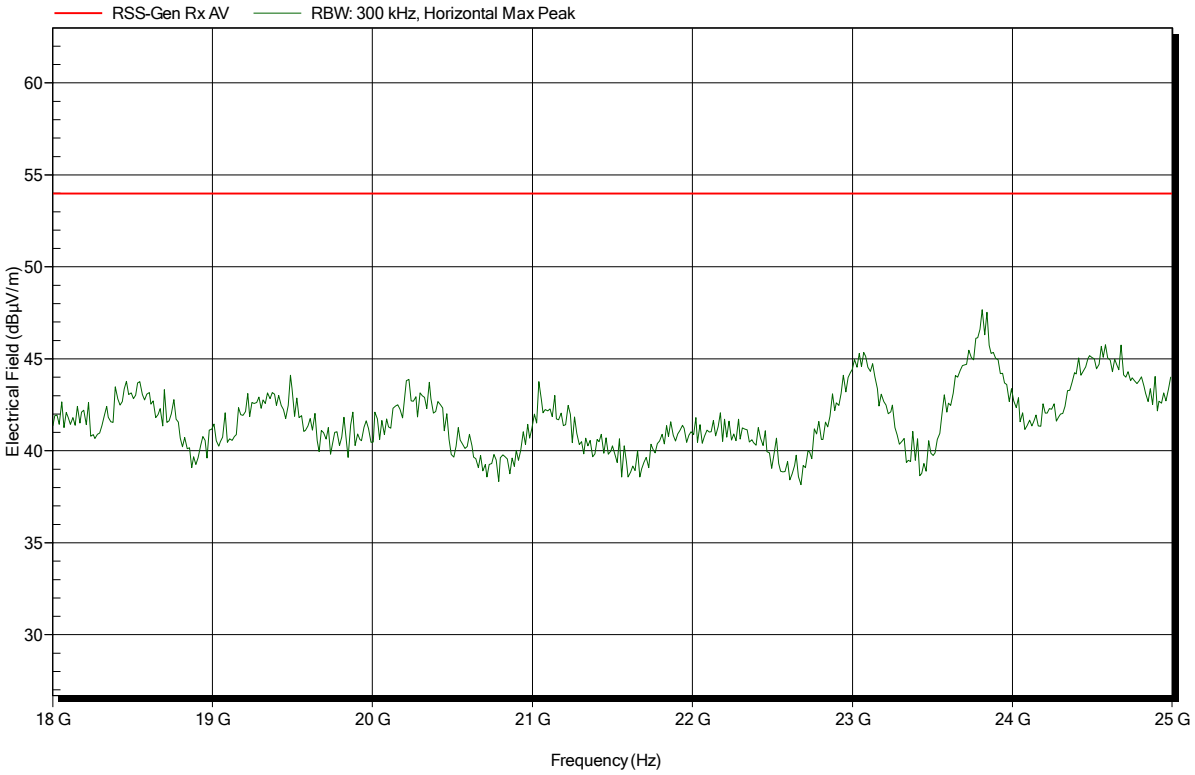
Project number:	G0M-1810-7783
Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9203A1EF (Sample 20581)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	RX; BLE 2440 MHz
Test Date:	2018-11-06
Note:	EUT horizontal



Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1810-7783

Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9203A1EF (Sample 20581)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ATH18G40, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	RX; BLE 2440 MHz
Test Date:	2018-11-06
Note:	EUT horizontal



Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1810-7783

Applicant:	Panasonic Industrial Devices Europe GmbH
EUT Name:	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model:	ENWF9203A1EF (Sample 20581)
Test Site:	Eurofins Product Service GmbH
Operator:	Burkhard Pudell
Test Conditions:	Tnom: 24°C, Vnom: 3.3 V DC
Antenna:	ATH18G40, Vertical
Measurement distance:	1 m converted to 3m
Mode:	RX; BLE 2440 MHz
Test Date:	2018-11-06
Note:	EUT horizontal