

RADIO REPORT FCC 47 CFR Part 15E Unlicensed National Information Infrastructure Devices in the 5 GHz Bands	
Report Reference No	G0M-2108-9951-TFC407WF-V02
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	 DAkkS - Registration number : D-PL-12092-01-04 FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	Panasonic Industrial Devices Europe GmbH
Address	Zeppelinstr. 19 21337 Lüneburg GERMANY
Test Specification	47 CFR Part 15E
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
Model(s)	ENWF9408A1EF
Additional Model(s)	None
Brand Name(s)	PAN9028
Hardware Version(s)	04
Software Version(s)	01
FCC ID	T7V9028
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	2021-05-27	
Report:		
Compiled by	Wilfried Treffke	
Tested by (+ signature)	Odai Qawasmeh	
Tested by (+ signature) (Responsible for Test)	Wilfried Treffke	
Approved by (+ signature) (Deputy Head of Lab)	Toralf Jahn	
Date of Issue	2022-05-27	
Total number of pages	93	
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 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	ENWF9408A2EF
	Brand name	PAN9028
	Hardware Version	04
	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	2022-04-27	Initial Release	
02	2022-05-27	Replaced document: G0M-2108-9951-TFC407WF-V01 Replaced by: G0M-2108-9951-TFC407WF-V02 Reason: Correction of the antenna gain according to the new Declaration concerning Antenna Specification (2022-05-16)	W. Treffke

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
BPSK	Binary Phase Shift Keying
EIRP	Equivalent Isotropic Radiated Power
EUT	Equipment Under Test
FCC	Federal Communications Commission
HT	High Throughput
IEEE 802.11	MAC and PHY Layer for WiFi
OFDM	Orthogonal Frequency Division Multiplexing
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
RBW	Resolution bandwidth
RMS	Root mean square
TPC	Transmit Power Control
VBW	Video bandwidth
VHT	Very High Throughput

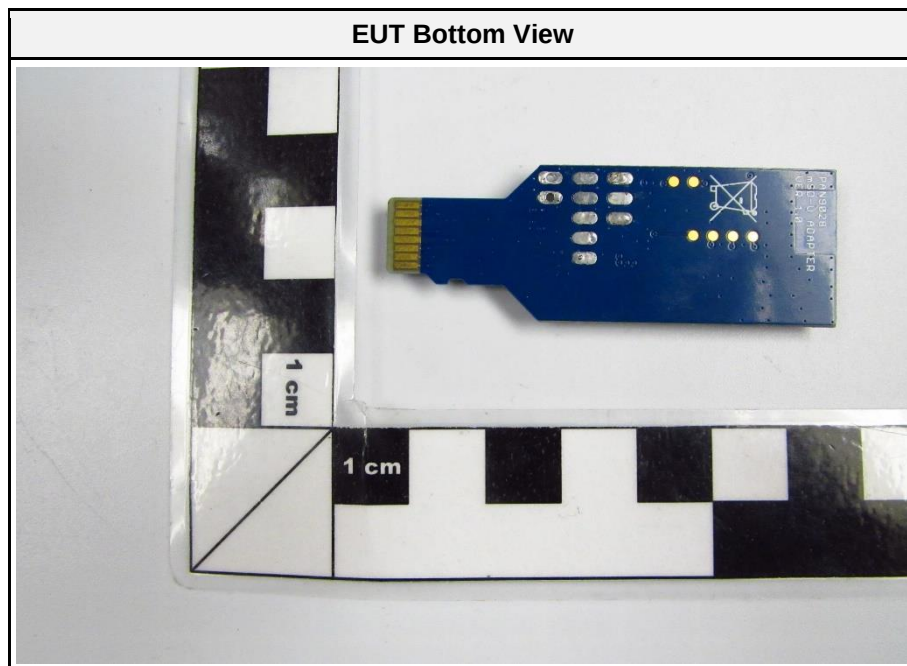
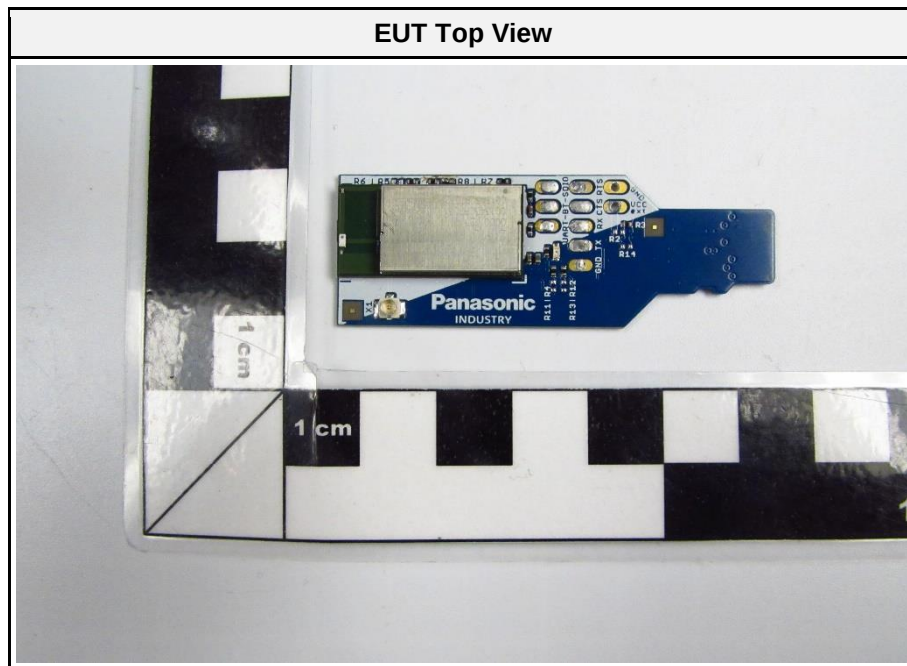
REPORT INDEX

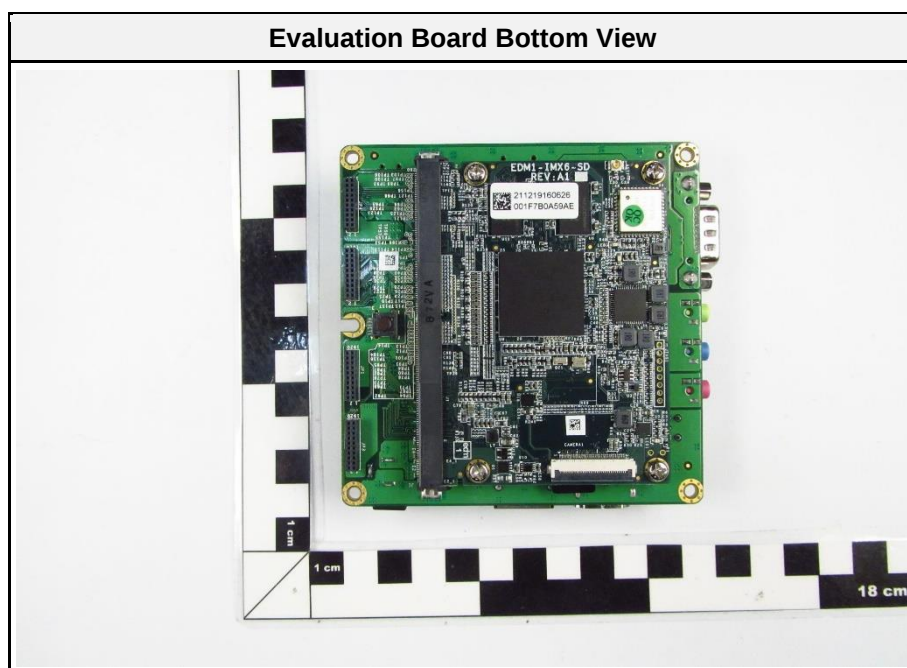
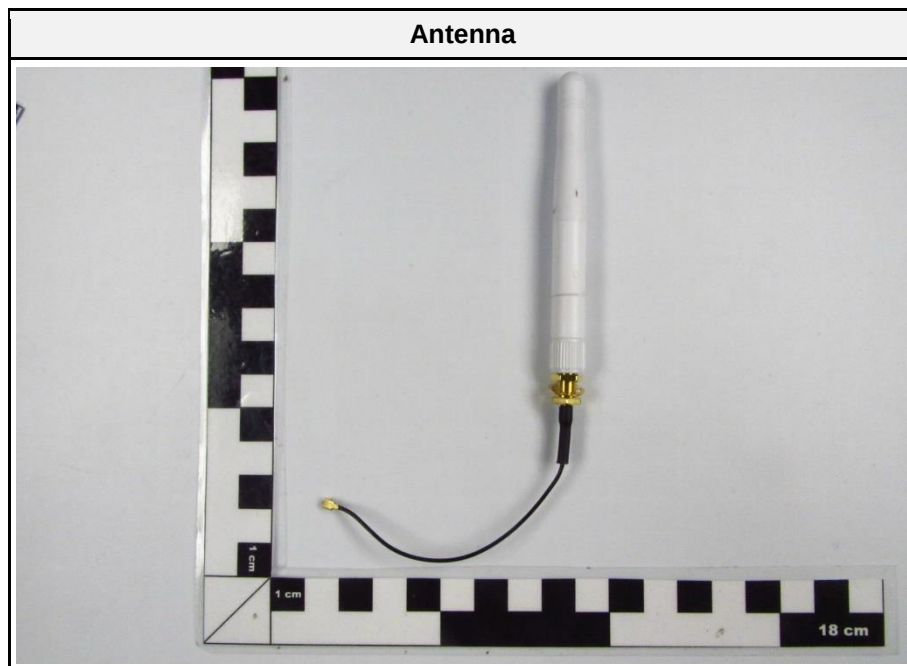
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1 Equipment (Test Item) Under Test

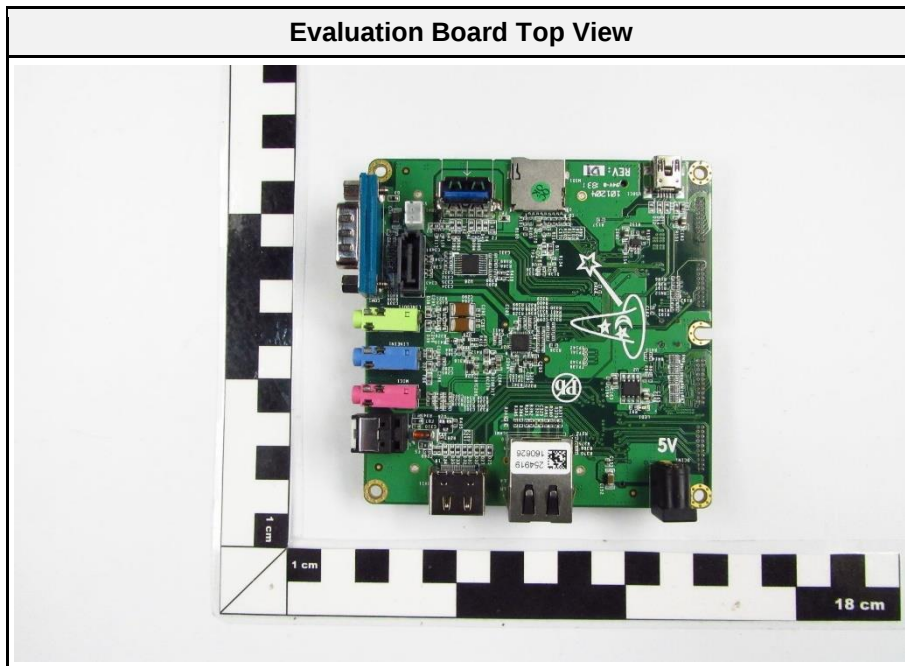
Description	Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module	
Model	ENWF9408A1EF	
Additional Model(s)	None	
Brand Name(s)	PAN9028	
Serial Number(s)	Proto type	Radiated Test Sample ID 37723
Hardware Version(s)	04	
Software Version(s)	01	
FCC-ID	T7V9028	
Equipment type	Radio Module	
Device type	Access point, Client	
Radio type	Transceiver	
Assigned frequency bands	5150 - 5250 MHz 5725 - 5850 MHz	
Radio technology	IEEE 802.11a IEEE 802.11n (HT20) IEEE 802.11n (HT40) IEEE 802.11ac (VHT20) IEEE 802.11ac (VHT40) IEEE 802.11ac (VHT80)	
Modulation	BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM	
Number of antenna ports	1	
Transmit power control	No	
Antenna	Type	External antenna
	Model	X9001091-W3DRMW
	Manufacturer	Kyocera AVX
	Gain	2.9 dBi (Declaration concerning Antenna Specification 2022-05-16)
Supply Voltage	V _{NOM}	3.3 V
	V _{MIN}	3.0 V
	V _{MAX}	3.6 V
Operating Temperature	T _{NOM}	25 °C
Battery supply	Yes	
AC/DC-Adaptor	Model	None
Manufacturer	Panasonic Industrial Devices Europe GmbH Zeppelinstr. 19 21337 Lüneburg GERMANY	

1.1 Photos – Equipment External

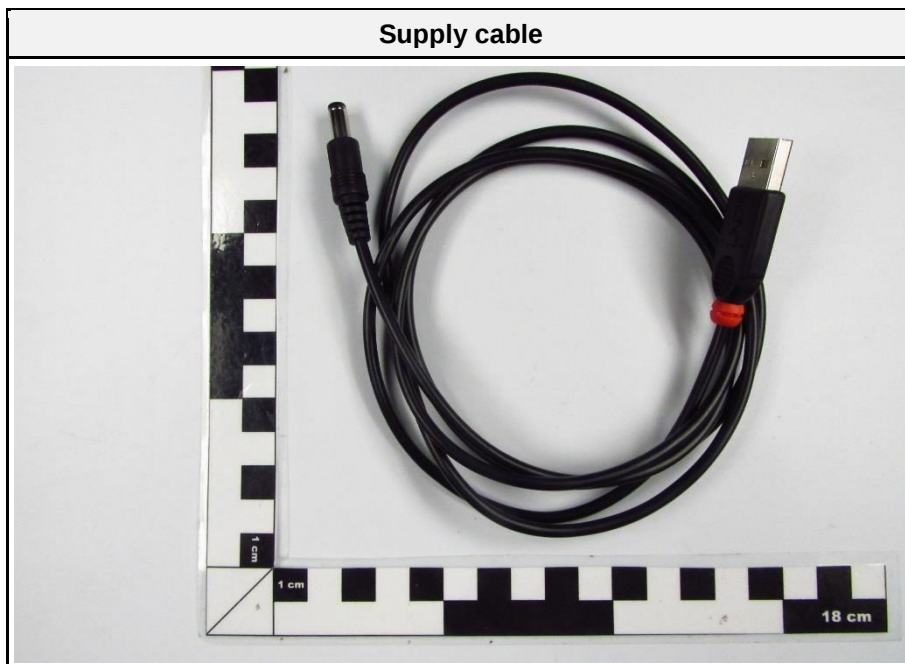




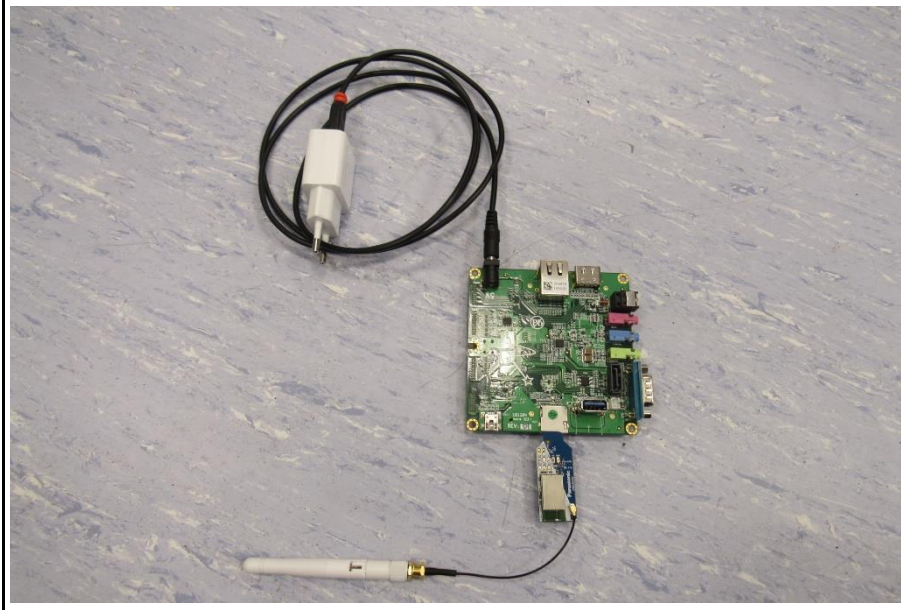
Evaluation Board Top View



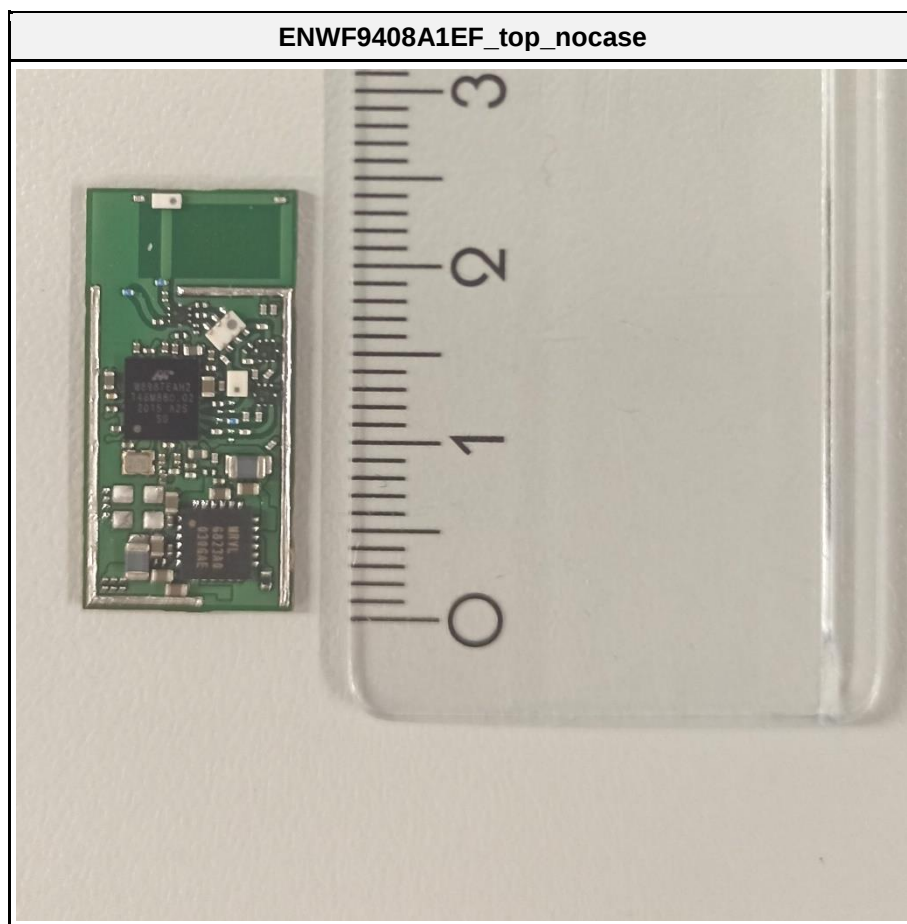
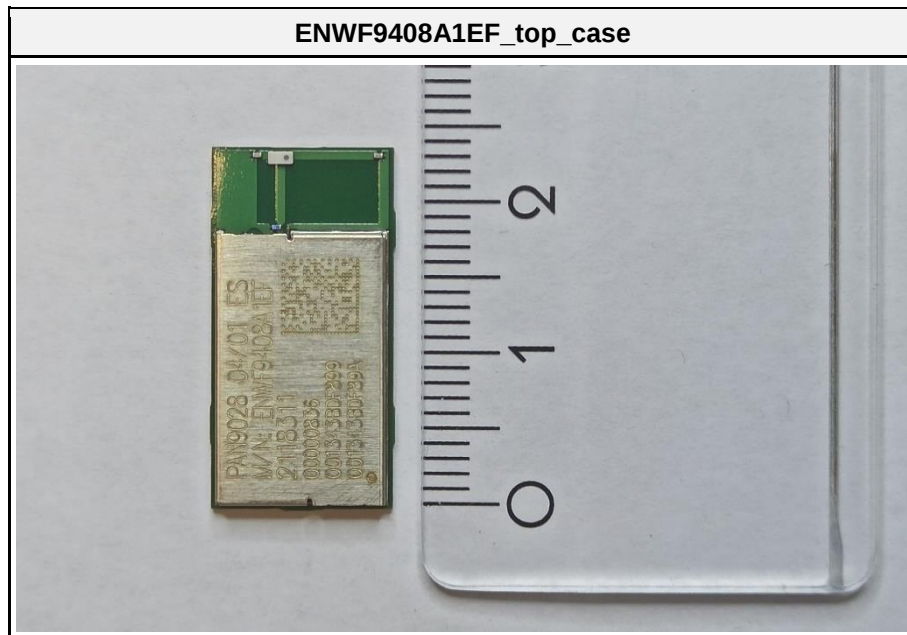
Supply cable

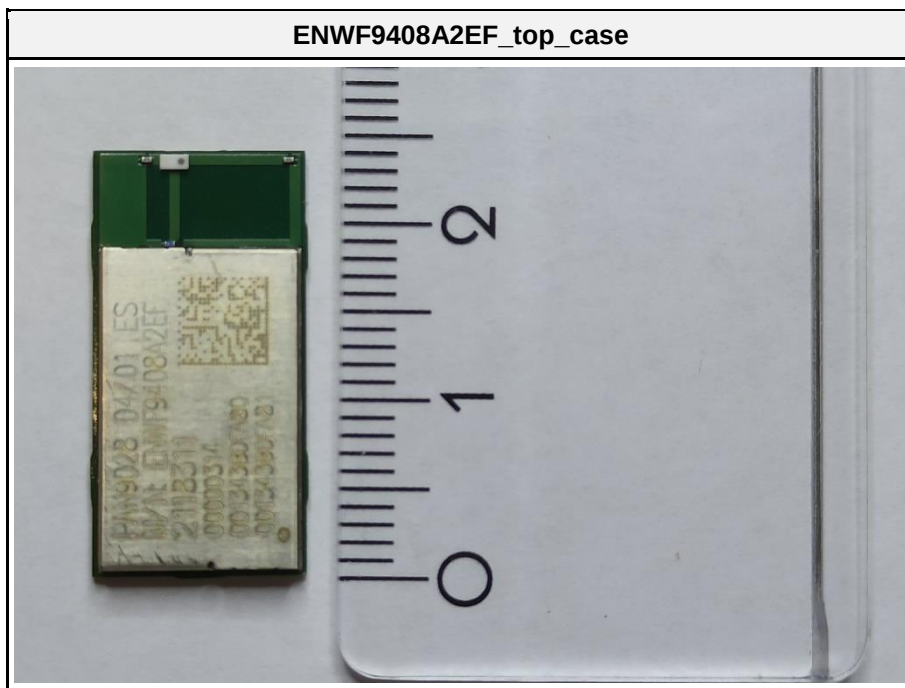
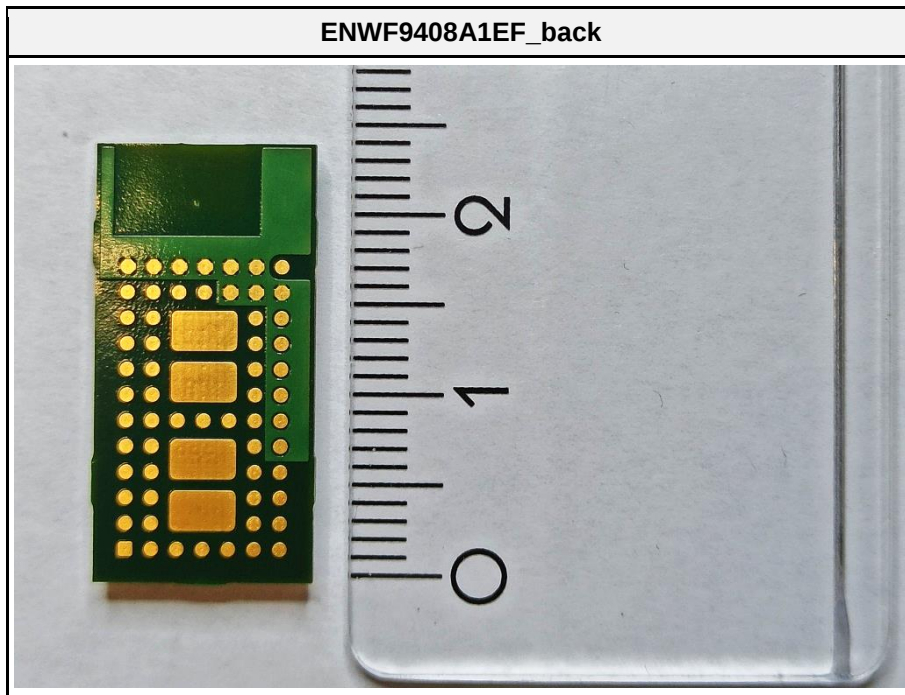


EUT with auxiliary equipment

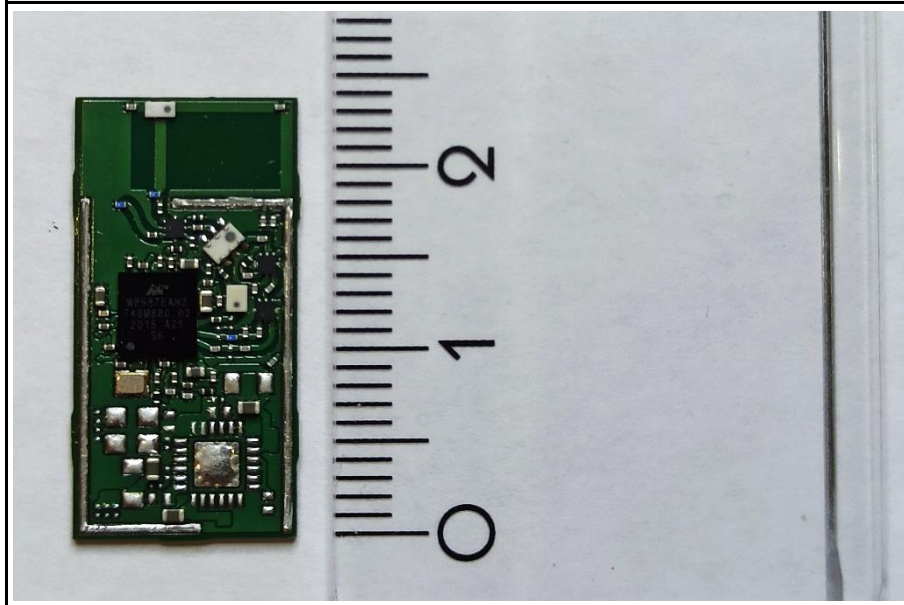


1.1 Photos – Equipment Internal

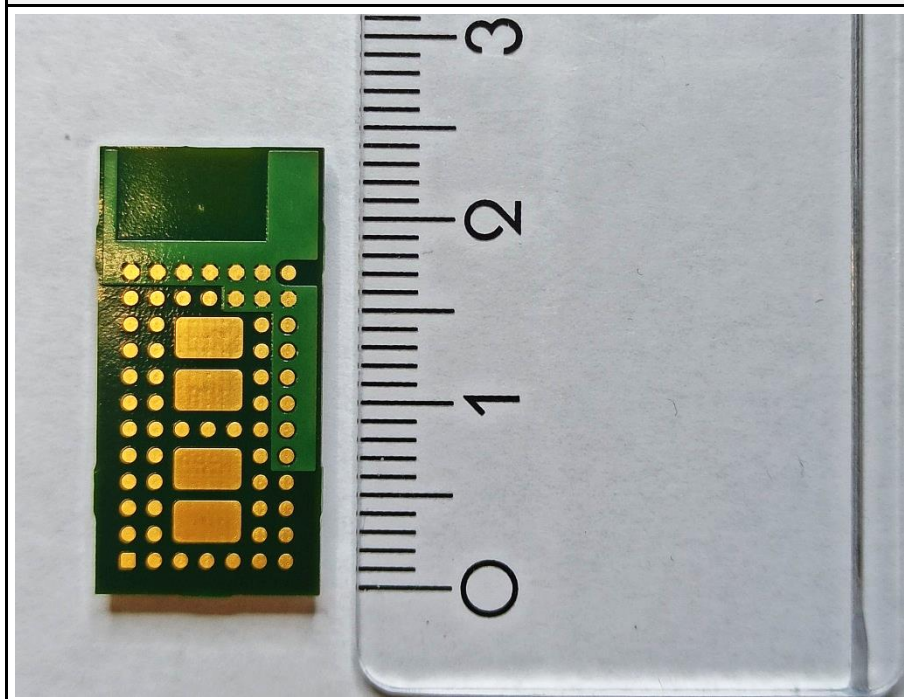




ENWF9408A2EF_top_nocase



ENWF9408A2EF_back



1.1 Photos – Test Setup

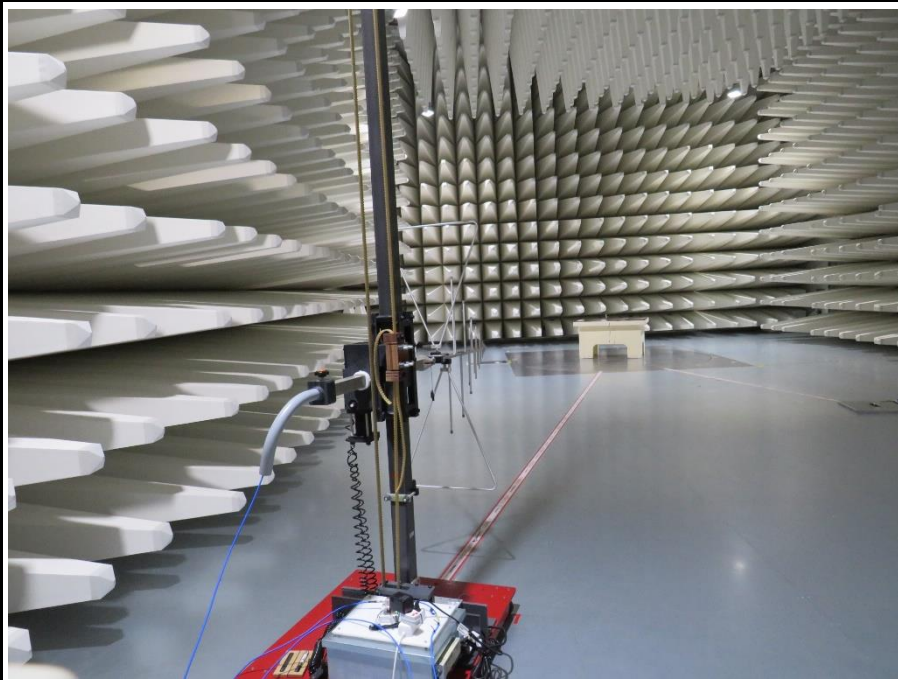
Test setup A - conducted measurement



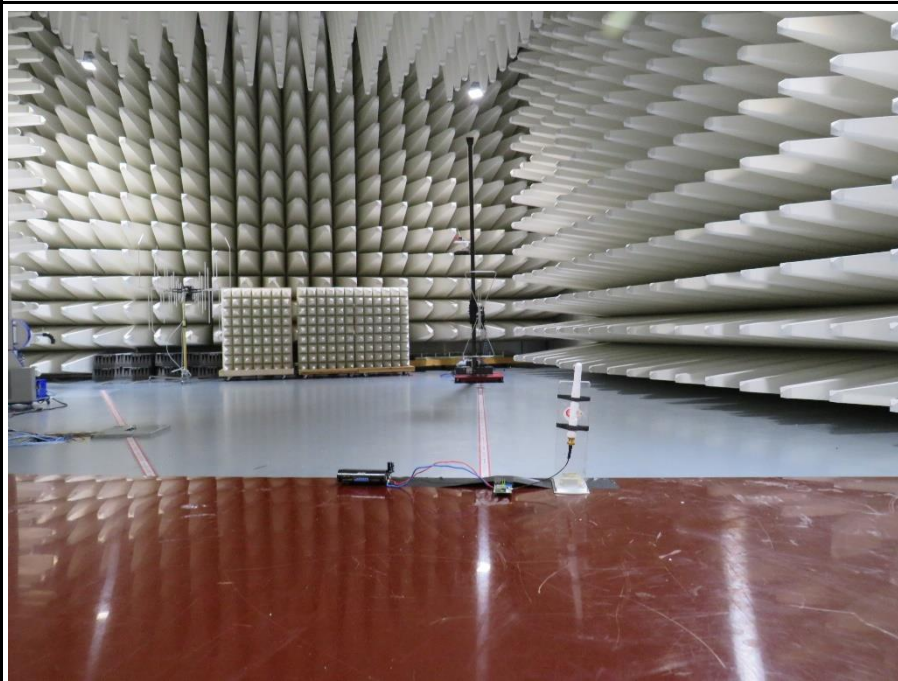
Test setup B - conducted measurement



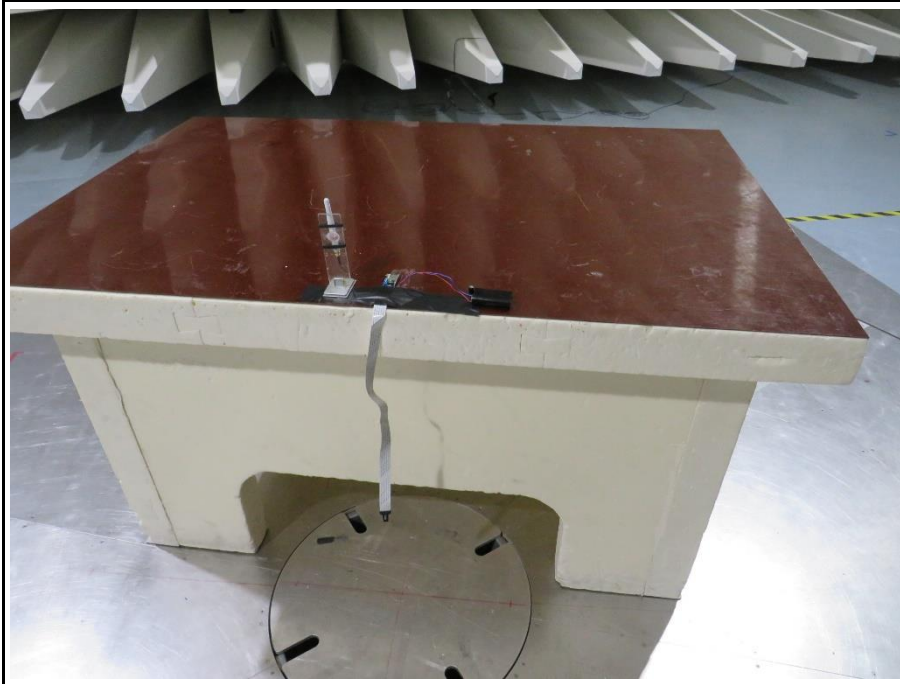
Setup for measurements below 1 GHz



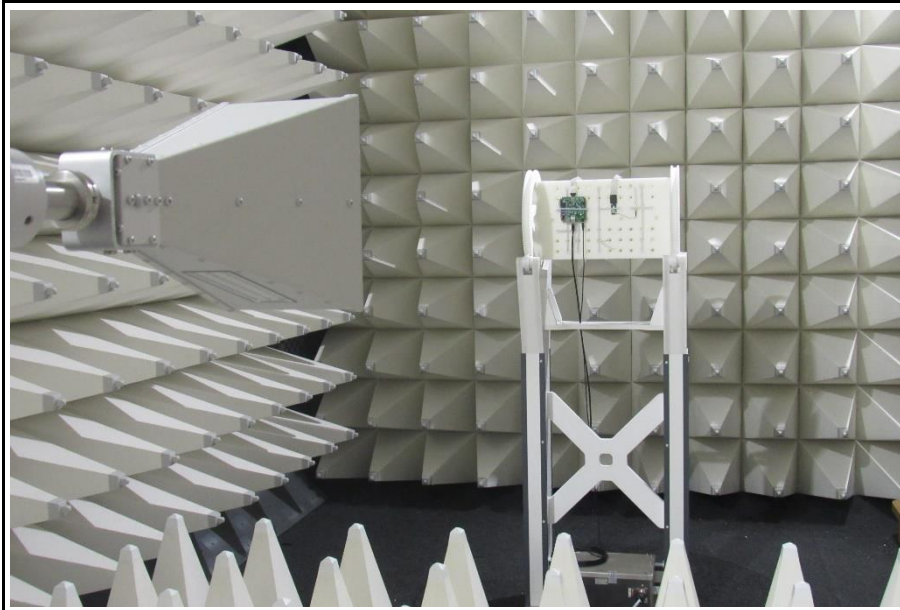
Setup for measurements below 1 GHz



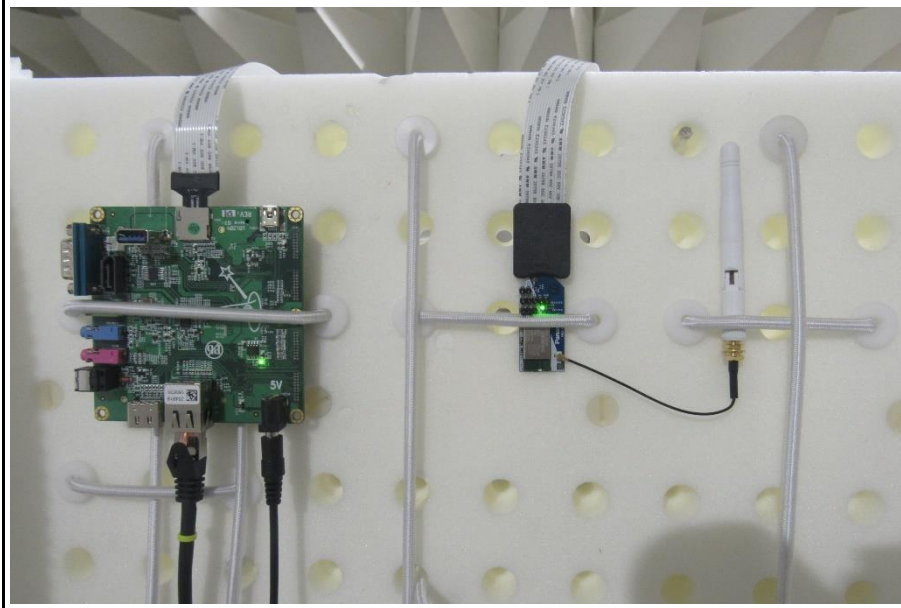
Test Setup



Setup for measurement above 1 GHz



Test Setup



1.2 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Controller	Wandboard	WBIMX6U	Wandboard with i.MX6 Dual Core
SFT	WLANipulator	Panasonic	-	for configuring test modes
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
SFT Note: The Equipment Under Test used an operating system with a test firmware. The driver for the tested technology was running in a manufacturer mode.				
Comment:				

1.3 Test mode duty cycle evaluation

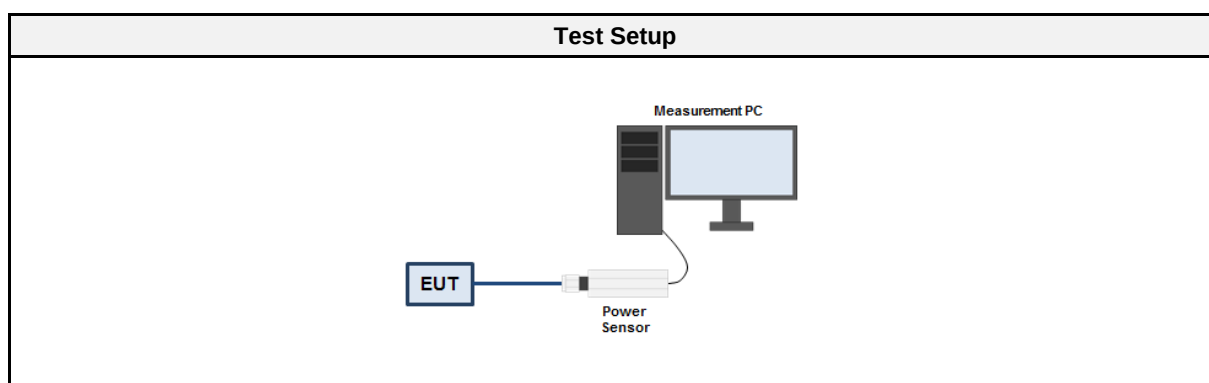
1.3.1 Information

Test Information	
Measurement Method	ANSI C63.10 12.2

1.3.2 Requirements

Requirements	
Duty cycle	Duty cycle correction
≥ 98 %	No correction required
< 98 %	Correction required ($10 \times \log_{10}(1/DC)$)

1.3.3 Setup



1.3.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Power Sensor	ETS-Lindgren	7002-006	EF00934	2021-07	2022-07

1.3.5 Procedure

Test Procedure
1. EUT set to test mode 2. Sweep time is set long enough to capture at least 5 bursts 3. The maximum burst duration T_{ON} is measured 4. The minimum idle duration T_{OFF} is measured 5. The duty cycle is calculated by $DC = T_{ON} / (T_{ON} + T_{OFF})$ 6. The duty cycle correction is calculated by $DC = 10 \times \log_{10}(T_{ON} / (T_{ON} + T_{OFF}))$

1.3.6 Results

Duty Cycle Results				
Mode	Channel [MHz]	Data rate [Mbps]	Duty Cycle [%]	Correction Factor [dB]
OFDM	5180	6	98.9	0
HT20	5180	6.5	98.7	0
HT40	5180	13	98.6	0
VHT20	5180	8.6	98.7	0
VHT40	5180	17.2	98.7	0
VHT80	5180	36	98.4	0

1.4 Test Modes

Mode	Description
OFDM (IEEE 802.11a)	Mode = Transmit Modulation = OFDM/BPSK Bandwidth = 20 MHz Duty cycle = 98.9% Power setting = max Data rate = 6 Mbps
VHT40 (IEEE 802.11n)	Mode = Transmit Modulation = OFDM/BPSK Bandwidth = 40 MHz Duty cycle = 98.7% Power setting (1 Simultaneous Tx) = max Data rate (1 Simultaneous Tx) = 13 Mbps MCS (1 Simultaneous Tx) = 0
VHT80 (IEEE 802.11ac)	Mode = Transmit Modulation = OFDM/BPSK Bandwidth = 80 MHz Duty cycle = 98.4% Power setting (1 Simultaneous Tx) = max Data rate (1 Simultaneous Tx) = 13 Mbps MCS (1 Simultaneous Tx) = 0
Comment: The above settings were found as worst case during pre-tests. The values for the maximum output power are stored in the test software and are unchangeable.	

1.5 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx / Rx	36	5180
F2	Tx / Rx	40	5200
F3	Tx / Rx	48	5240
F4	Tx / Rx	36+40	5190
F5	Tx / Rx	44+48	5230
F6	Tx / Rx	36+40+44+48	5210
F7	Tx / Rx	149	5745
F8	Tx / Rx	157	5785
F9	Tx / Rx	165	5825
F10	Tx / Rx	149+153	5755
F11	Tx / Rx	157+161	5795
F12	Tx / Rx	149+153+157+161	5775

1.6 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:

$$\text{Reading on Analyzer (dB}\mu\text{V)} + \text{A.F. (dB/m)} = \text{Net field strength (dB}\mu\text{V/m)}$$

Net:

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

Limit:

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

$$\text{Limit (dB}\mu\text{V/m)} = 20 \cdot \log(\mu\text{V/m})$$

Margin:

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

Example only:

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

1.7 Normative References

References	
Designator	Reference
KDB 789033	KDB 789033 D02 v02r01
ANSI C63.10	ANSI C63.10:2013

2 Result Summary

FCC 47 CFR Part 15E				
Product Standard Reference	Requirement	Reference Method	Result	Remarks
FCC 15.407(e)	6 dB bandwidth	KDB 789033 C.2	N/T	Only required in 5725-5850 MHz band.
FCC 15.407(a)(2),(a)(5),(h)(2)	26 dB bandwidth	KDB 789033 C.1	N/T	No limit. Basis for other measurements.
FCC 15.407(a)	Maximum output power	KDB 789033 E	N/T	
FCC 15.407(a)	Transmit power control	KDB 789033 E	N/R	Required in 5250-5350 and 5470-5725 MHz bands. Not required for EIRP < 500 mW.
FCC 15.407(a)	Power spectral density	KDB 789033 F	N/T	
FCC 15.407(g)	Frequency stability	ANSI C63.10 6.8	N/T	
FCC 15.207	AC power line conducted emissions	ANSI C63.10 6.2	PASS	
FCC 15.407(b)	Transmitter radiated emissions	KDB 789033 G	PASS	
FCC 15.407(a)	Radiation pattern	KDB 789033 H	N/T	5150-5250 MHz band only with EIRP > 21 dBm
Comment:				

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

3 Test Conditions and Results

3.1 Test Conditions and Results - AC power line conducted emissions

3.1.1 Information

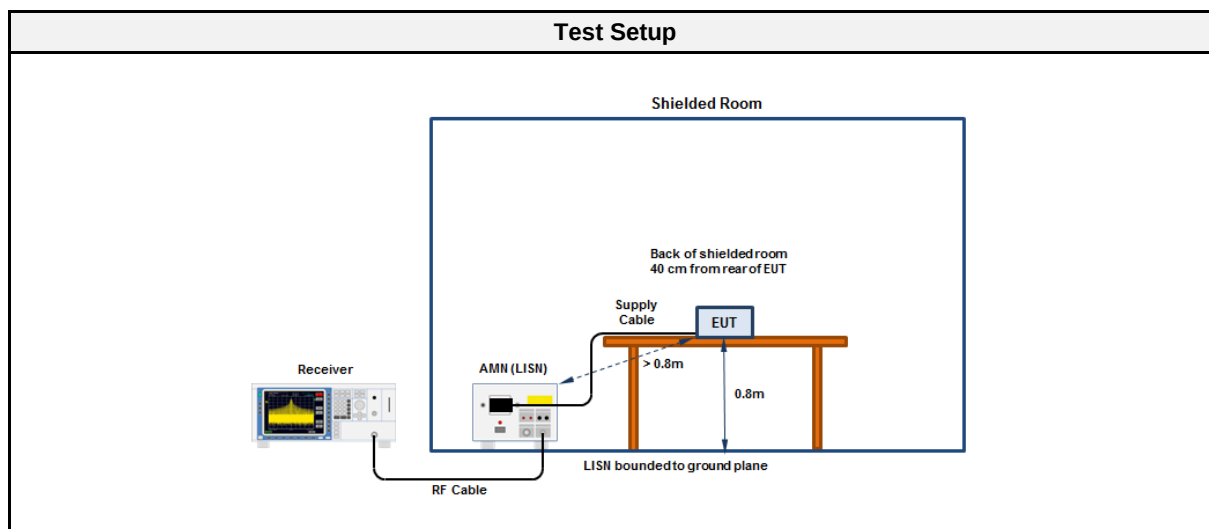
Test Information	
Reference	FCC 15.207
Measurement Method	ANSI C63.10 6.2
Operator	Wilfried Treffke
Date	2022-03-24
Measurement uncertainty	±3.82 %

3.1.2 Limits

Limits		
Frequency [MHz]	Quasi-Peak [dBμV]	Average [dBμV]
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5	56	46
5 - 30	60	50

* Limit decreases linearly with the logarithm of the frequency

3.1.3 Setup



3.1.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2018.1.8

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

Test Report No.: G0M-2108-9951-TFC407WF-V02

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

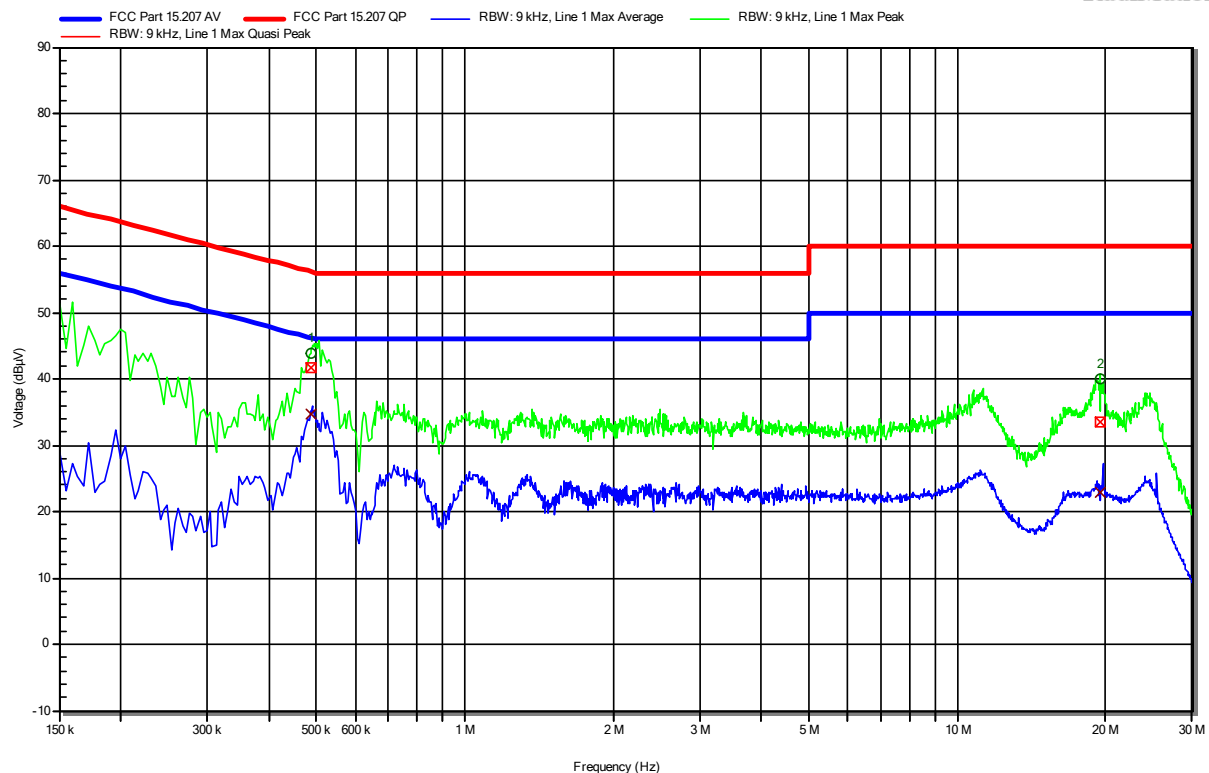
Conducted emissions at the mains power port according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Test Date: 2022-03-24
 Operating Conditions: ambient temperature: 20 °Celsius
 power input: 3.3 VDC
 LISN: Schwarzbeck NSLK 8127 RC L
 Operational Mode: IEEE802.11 a; 6 Mbps; ext. antenna; 5745 MHz
 EUT Configuration:
 Applied to Port: 3.3 VDC via Evaluation Board (supplied with AC/DC Adapter 120 VAC / 60 Hz)

Note 1:

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RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	487.5 kHz	41.71 dBμV	56.21 dBμV	-14.5 dB	Pass	Line 1
2	19.442 MHz	33.56 dBμV	60 dBμV	-26.44 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	487.5 kHz	34.81 dBμV	46.21 dBμV	-11.4 dB	Pass	Line 1
2	19.442 MHz	22.8 dBμV	50 dBμV	-27.2 dB	Pass	Line 1

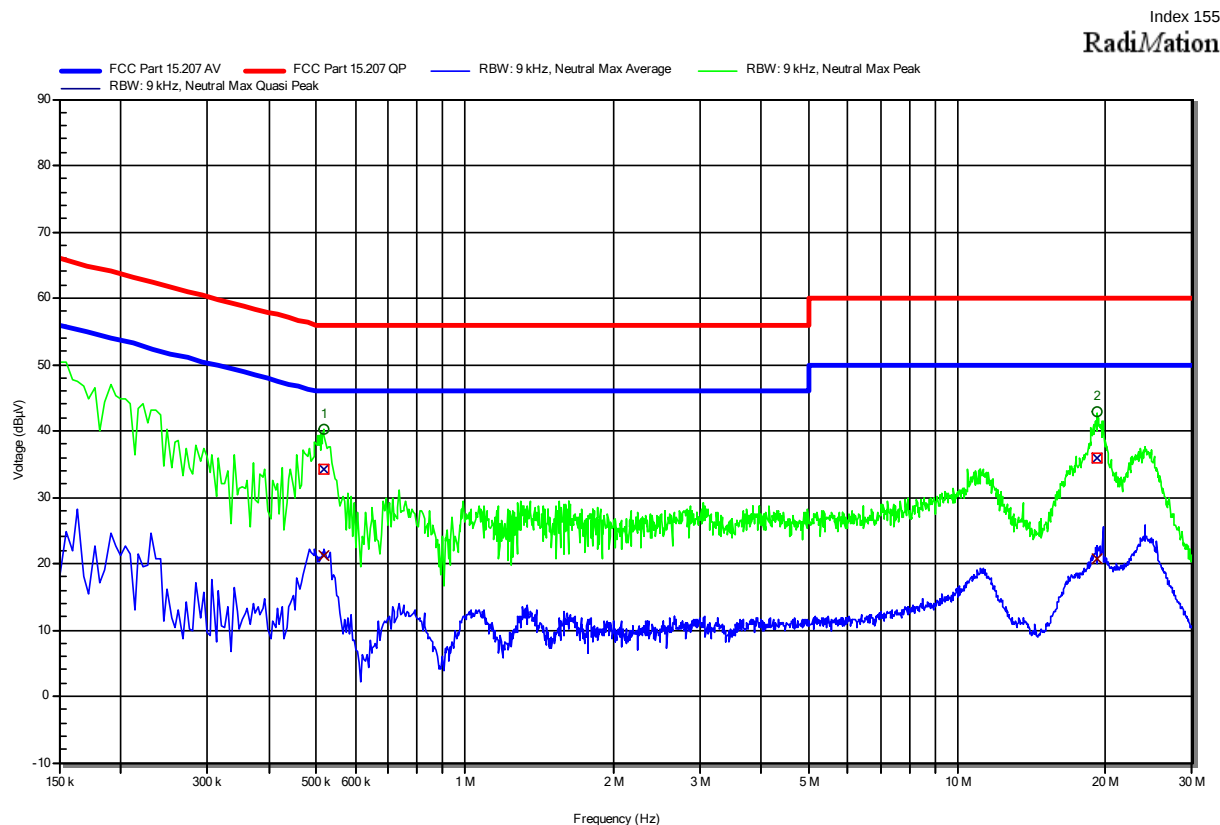
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 Test Date: 2022-03-24
 Operating Conditions: ambient temperature: 20 °Celsius
 power input: 3.3 VDC
 LISN: Schwarzbeck NSLK 8127 RC N
 Operational Mode: IEEE802.11 a; 6 Mbps; ext. antenna; 5745 MHz
 EUT Configuration:
 Applied to Port: 3.3 VDC via Evaluation Board (supplied with AC/DC Adapter 120 VAC / 60 Hz)

Note 1:



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	516.3 kHz	34.31 dBμV	56 dBμV	-21.69 dB	Pass	Neutral
2	19.203 MHz	36 dBμV	60 dBμV	-24 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	516.3 kHz	21.28 dBμV	46 dBμV	-24.72 dB	Pass	Neutral
2	19.203 MHz	20.64 dBμV	50 dBμV	-29.36 dB	Pass	Neutral

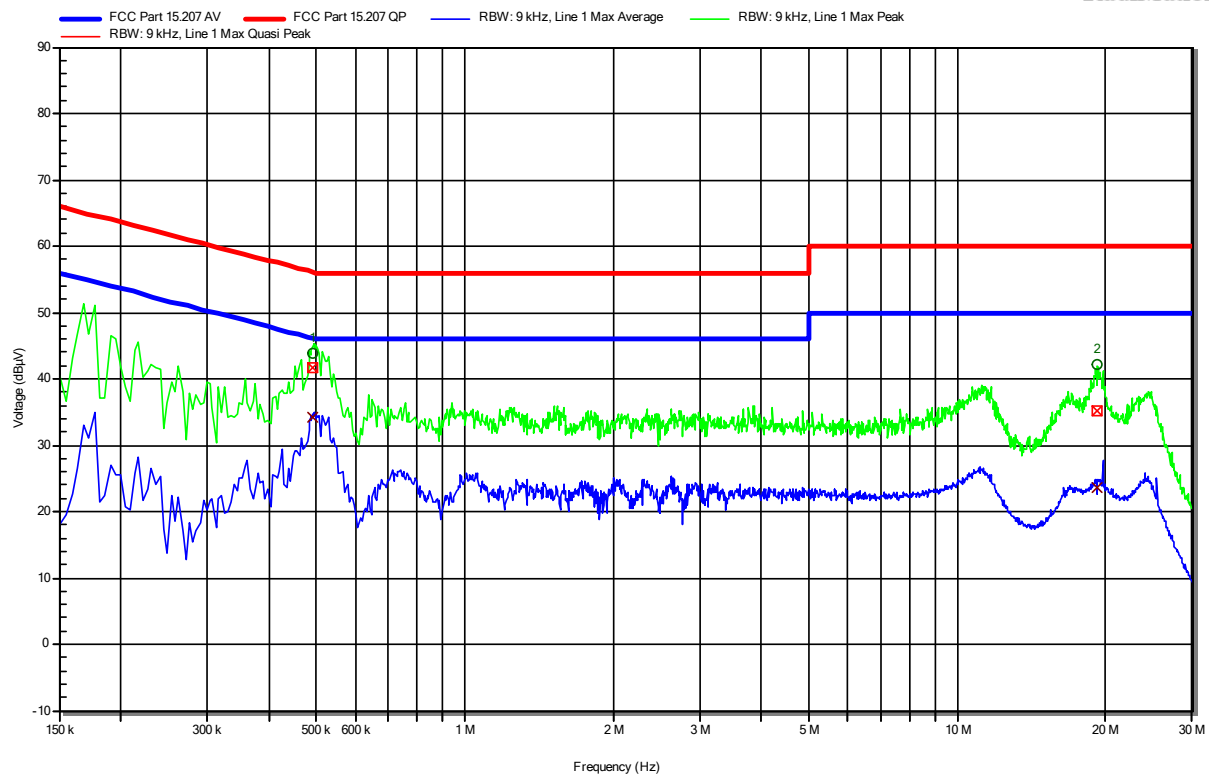
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 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Test Date: 2022-03-24
 Operating Conditions: ambient temperature: 20 °Celsius
 power input: 3.3 VDC
 LISN: Schwarzbeck NSLK 8127 RC L
 Operational Mode: IEEE802.11 ac; MCS0; ext. antenna; 5210 MHz
 EUT Configuration:
 Applied to Port: 3.3 VDC via Evaluation Board (supplied with AC/DC Adapter 120 VAC / 60 Hz)

Note 1:

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RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	492 kHz	41.65 dBμV	56.13 dBμV	-14.48 dB	Pass	Line 1
2	19.244 MHz	35.3 dBμV	60 dBμV	-24.7 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	492 kHz	34.21 dBμV	46.13 dBμV	-11.93 dB	Pass	Line 1
2	19.244 MHz	23.67 dBμV	50 dBμV	-26.33 dB	Pass	Line 1

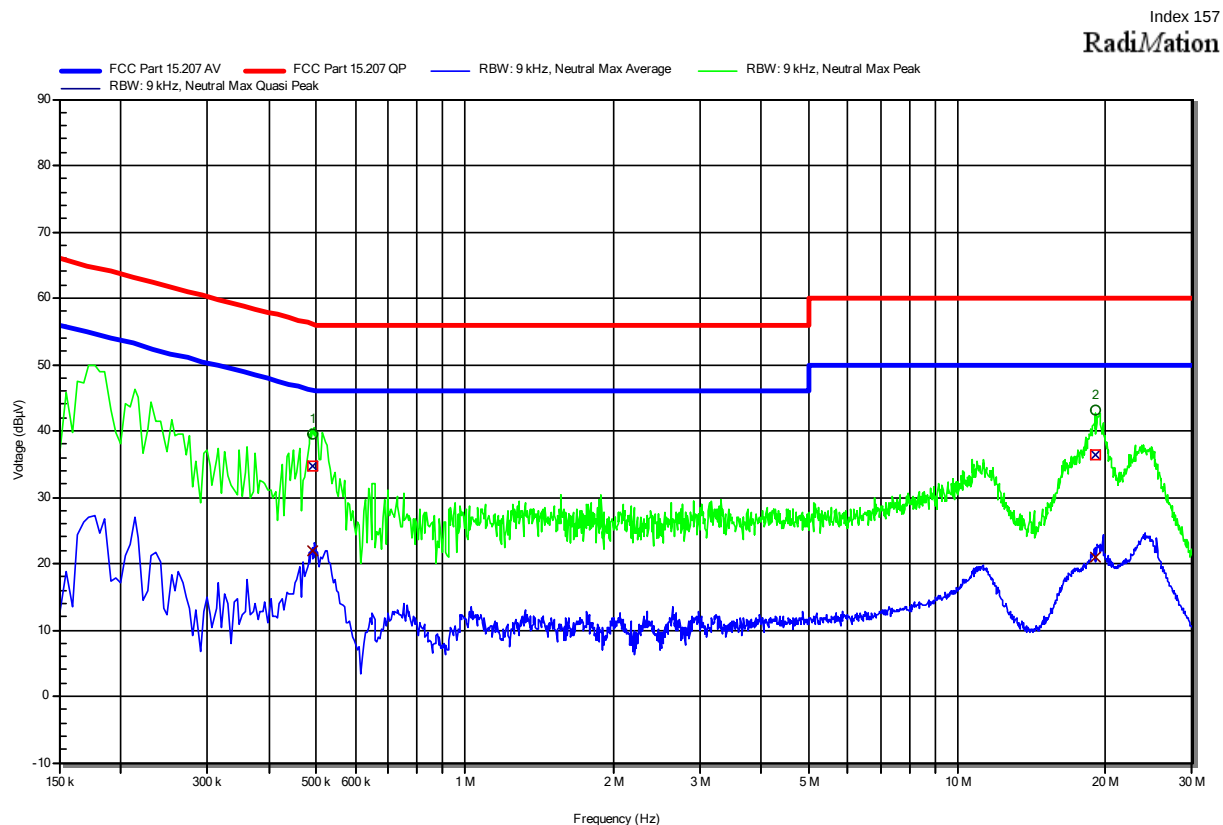
Test Report No.: G0M-2108-9951-TFC407WF-V02

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

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 Applied to Port: 3.3 VDC via Evaluation Board (supplied with AC/DC Adapter 120 VAC / 60 Hz)

Note 1:



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	492 kHz	34.59 dBμV	56.13 dBμV	-21.54 dB	Pass	Neutral
2	19.127 MHz	36.42 dBμV	60 dBμV	-23.58 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	492 kHz	21.91 dBμV	46.13 dBμV	-24.22 dB	Pass	Neutral
2	19.127 MHz	20.96 dBμV	50 dBμV	-29.04 dB	Pass	Neutral

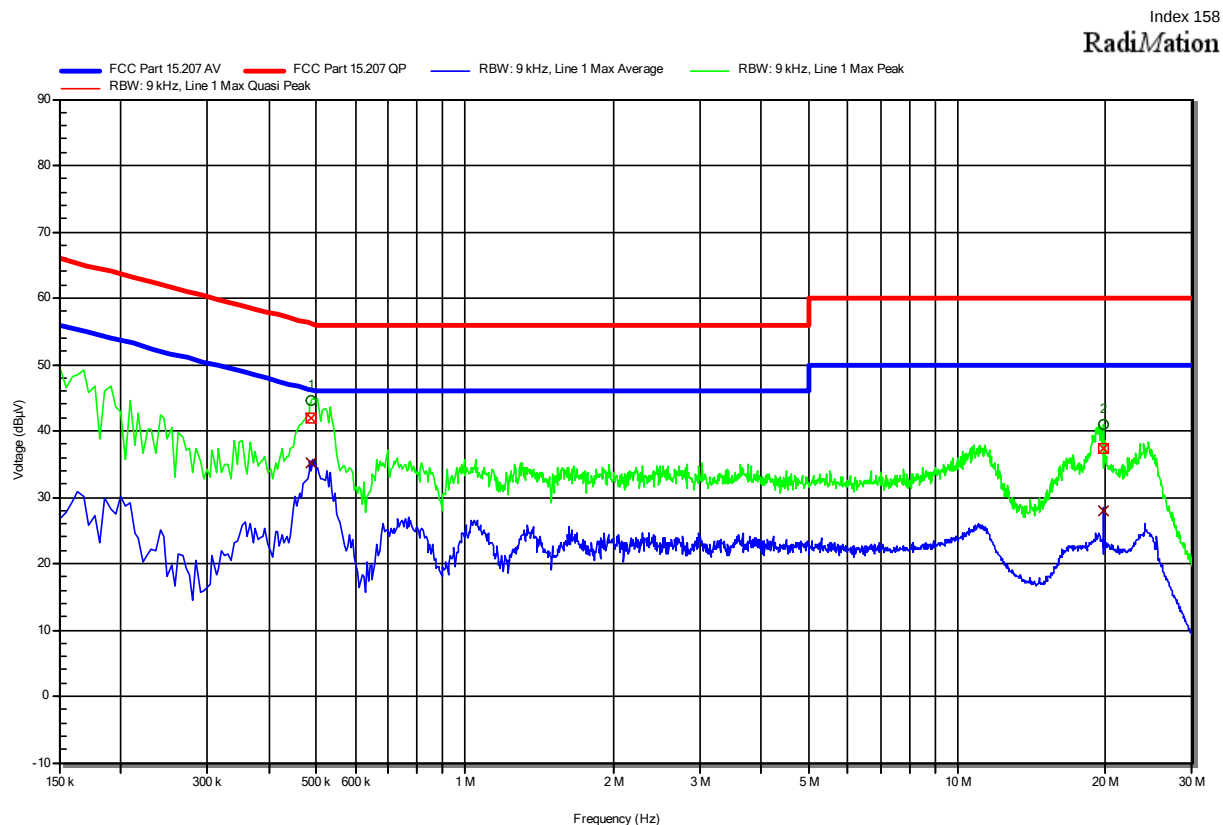
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 Model: ENWF9408A1EF
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 Operator: Mr. Qawasmeh
 Test Date: 2022-03-24
 Operating Conditions: ambient temperature: 20 °Celsius
 power input: 3.3 VDC
 LISN: Schwarzbeck NSLK 8127 RC L
 Operational Mode: IEEE802.11 n; MCS0; ext. antenna; 5755 MHz
 EUT Configuration:
 Applied to Port: 3.3 VDC via Evaluation Board (supplied with AC/DC Adapter 120 VAC / 60 Hz)

Note 1:



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	488.85 kHz	41.82 dBμV	56.19 dBμV	-14.37 dB	Pass	Line 1
2	19.756 MHz	37.24 dBμV	60 dBμV	-22.76 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	488.85 kHz	35.12 dBμV	46.19 dBμV	-11.06 dB	Pass	Line 1
2	19.756 MHz	27.94 dBμV	50 dBμV	-22.06 dB	Pass	Line 1

Test Report No.: G0M-2108-9951-TFC407WF-V02

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

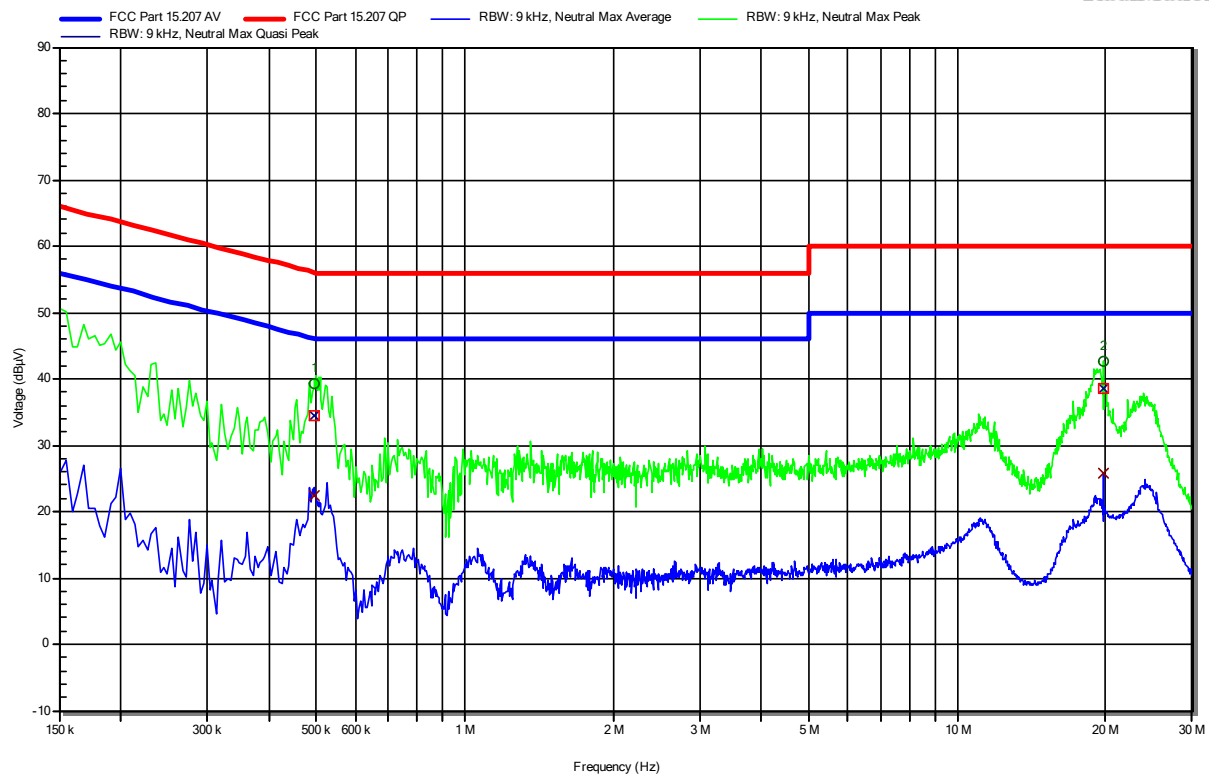
Conducted emissions at the mains power port according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Test Date: 2022-03-24
 Operating Conditions: ambient temperature: 20 °Celsius
 power input: 3.3 VDC
 LISN: Schwarzbeck NSLK 8127 RC N
 Operational Mode: IEEE802.11 n; MCS0; ext. antenna; 5755 MHz
 EUT Configuration:
 Applied to Port: 3.3 VDC via Evaluation Board (supplied with AC/DC Adapter 120 VAC / 60 Hz)

Note 1:

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RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	493.8 kHz	34.44 dBμV	56.1 dBμV	-21.66 dB	Pass	Neutral
2	19.757 MHz	38.45 dBμV	60 dBμV	-21.55 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	493.8 kHz	22.44 dBμV	46.1 dBμV	-23.67 dB	Pass	Neutral
2	19.757 MHz	25.69 dBμV	50 dBμV	-24.31 dB	Pass	Neutral

Test Report No.: G0M-2108-9951-TFC407WF-V02

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

3.2 Test Conditions and Results - Transmitter radiated emissions

3.2.1 Information

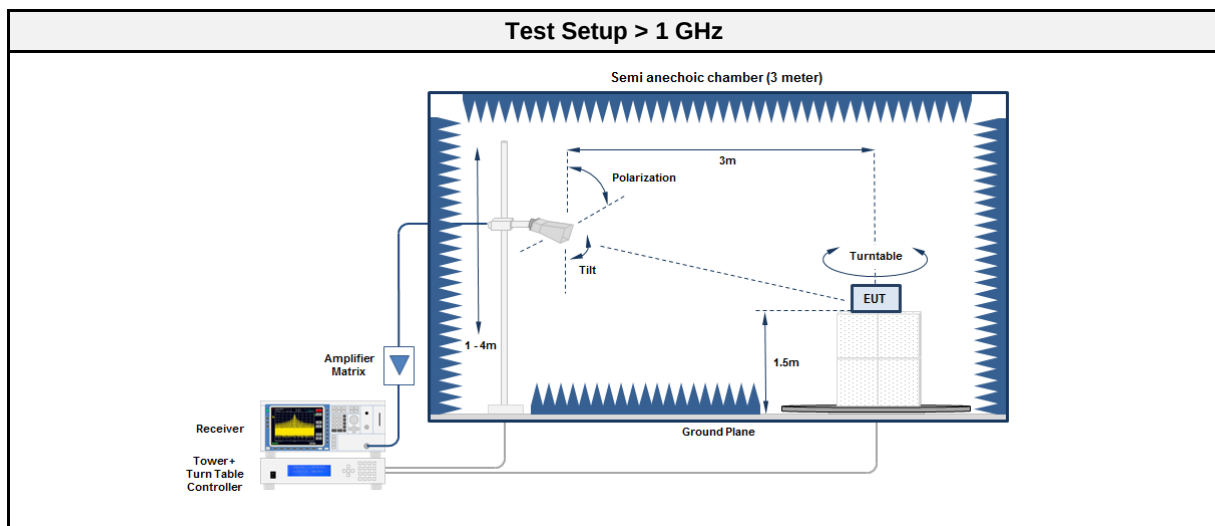
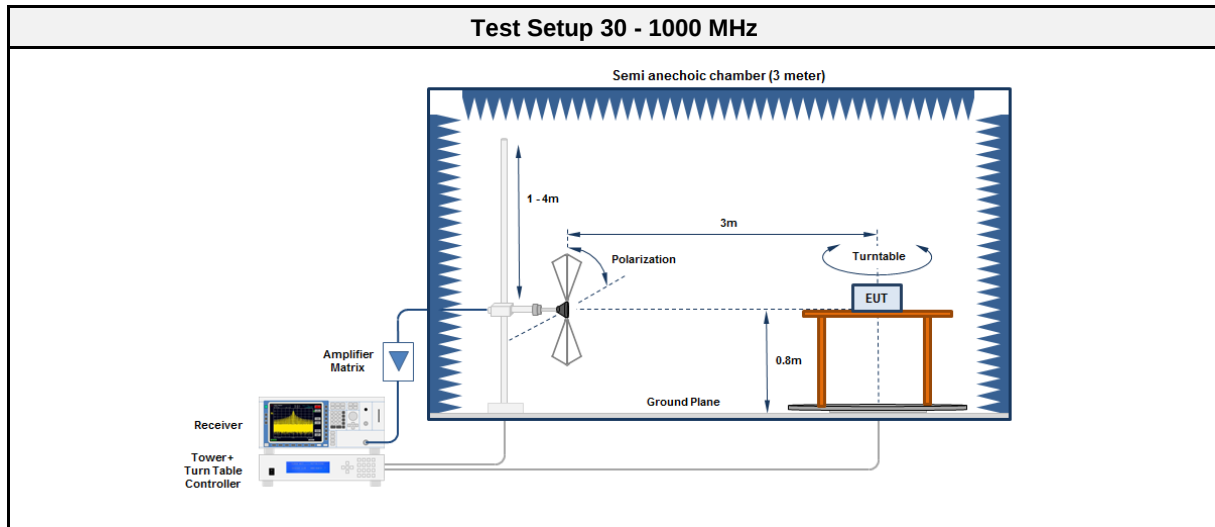
Test Information	
Reference	FCC 15.407(b)
Measurement Method	KDB 789033 G
Operator	Wilfried Treffke
Date	2022-03-17
Measurement uncertainty	±5.1 %
Additional information	Measurement plots not listed in this test report (related to the frequency range to be measured) contain noise floor only. No significant emissions measured in these measurement ranges. An evaluation was performed manually with the spectrum analyser.

3.2.2 Limits

Limits - Restricted frequency bands and below 1 GHz			
Frequency [MHz]	Detector	Field strength [µV/m]	Measurement distance [m]
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

Limits - Outside restricted frequency bands above 1 GHz			
Frequency band [MHz]	Power limit [dBm EIRP]	Field strength limit [dBµV/m]	Measurement distance [m]
5150 - 5250	-27 dBm/MHz	68.2	3
5250 - 5350	-27 dBm/MHz	68.2	3
5470 - 5725	-27 dBm/MHz	68.2	3
5725 - 5850	-27 dBm/MHz @ ±75 MHz from band edge	68.2	3
5725 - 5850	10 to -27 dBm/MHz @ ±25 to ±75 MHz from band edge	105.2 to 68.2	3
5725 - 5850	15.6 to 10 dBm/MHz @ ±5 to ±25 MHz from band edge	110.8 to 105.2	3
5725 - 5850	27 to 15.6 dBm/MHz @ ±0 to ±5 MHz from band edge	122.2 to 110.8	3

3.2.3 Setup



3.2.4 Equipment

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

Test Equipment 30 MHz - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC6	EF00062	2021-02	2024-02
EMI Test Receiver	R&S	ESU26	EF00887	2021-07	2022-07
Trilog Broadband Antenna	Schwarzbeck	VULB 9162	EF00978	2019-10	2022-10

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

3.2.5 Procedure

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

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

3.2.6 Results

Test Results - Channel 36 / 5180 MHz - OFDM					
Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
429.575	29.58	pk	ver	68.20	-38.62
4183	55.39	pk	ver	74.00	-18.61
4183	43.24	RMS	ver	54.00	-10.76
5150	67.29	pk	ver	74.00	-06.71
5150	52.52	RMS	ver	54.00	-01.48
15540	66.77	pk	ver	74.00	-07.23
15540	50.02	RMS	ver	54.00	-03.98
18350	48.57	pk	hor	74.00	-25.43

Test Results - Channel 48 / 5240 MHz - OFDM					
Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
4842	49.12	pk	ver	74.00	-24.88
4842	48.26	RMS	ver	54.00	-05.74
15723	58.69	pk	hor	74.00	-15.31
15723	49.18	RMS	hor	54.00	-04.82
20958	52.95	pk	ver	74.00	-21.05
20958	40.21	RMS	ver	54.00	-13.79
26207	49.45	pk	hor	68.20	-18.75
26207	49.06	RMS	hor	68.20	-19.14

Test Results - Channel 36+40 / 5190 MHz - VHT40					
Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
162.179	22.81	pk	ver	43.52	-20.71
2897	45.52	pk	ver	74.00	-28.48
4851	52.82	pk	ver	74.00	-21.18
5149	72.99	pk	ver	74.00	-01.01
5149	52.17	RMS	ver	54.00	-01.83
15559	59.04	pk	ver	74.00	-14.96
15559	44.94	RMS	ver	54.00	-09.06
18526	47.74	pk	ver	74.00	-26.26
25911	51.04	pk	hor	68.20	-17.16

Test Results - Channel 44+48 / 5230 MHz - VHT40					
Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
163.407	21.45	pk	ver	43.52	-22.07
4785	50.81	pk	ver	74.00	-23.19
5410	50.54	pk	ver	74.00	-23.46
15689	55.85	pk	hor	74.00	-18.15
15689	44.76	RMS	hor	54.00	-09.24
18349	46.80	pk	ver	74.00	-27.20
18349	38.96	RMS	ver	54.00	-15.04
26136	50.93	pk	hor	68.20	-17.27

Test Results - Channel 36+40+44+48 / 5210 MHz - VHT80					
Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
1375	39.01	pk	hor	74.00	-34.99
5150	63.96	pk	ver	74.00	-10.04
5150	50.71	RMS	ver	54.00	-03.29
7329	43.26	pk	ver	74.00	-30.74
15632	52.11	pk	hor	74.00	-21.89
15632	41.59	RMS	hor	54.00	-12.41
17294	55.93	pk	ver	68.20	-12.27

Test Results - Channel 149 / 5745 MHz - OFDM					
Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
4302	43.54	pk	ver	74.00	-30.46
11489	64.86	pk	ver	74.00	-09.14
11489	53.60	RMS	ver	54.00	-00.40
17235	57.76	pk	hor	68.20	-10.44
17235	48.88	RMS	hor	68.20	-19.32
17798	48.00	pk	ver	74.00	-26.00

Test Results - Channel 165 / 5825 MHz - OFDM					
Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
4363	44.04	pk	ver	74.00	-29.96
17477	57.25	pk	ver	68.20	-10.95
17477	48.14	RMS	ver	68.20	-20.06
17730	47.90	pk	hor	74.00	-26.10

Test Results - Channel 149+153 / 5755 MHz - VHT40					
Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
17269	56.24	pk	ver	68.20	-11.96
17269	48.62	RMS	ver	68.20	-19.58

Test Results - Channel 157+161 / 5795 MHz - VHT40					
Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
Comments: No significant spurious emissions					

Test Results - Channel 149+153+157+161 / 5775 MHz - VHT80					
Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
Comments: No significant spurious emissions					

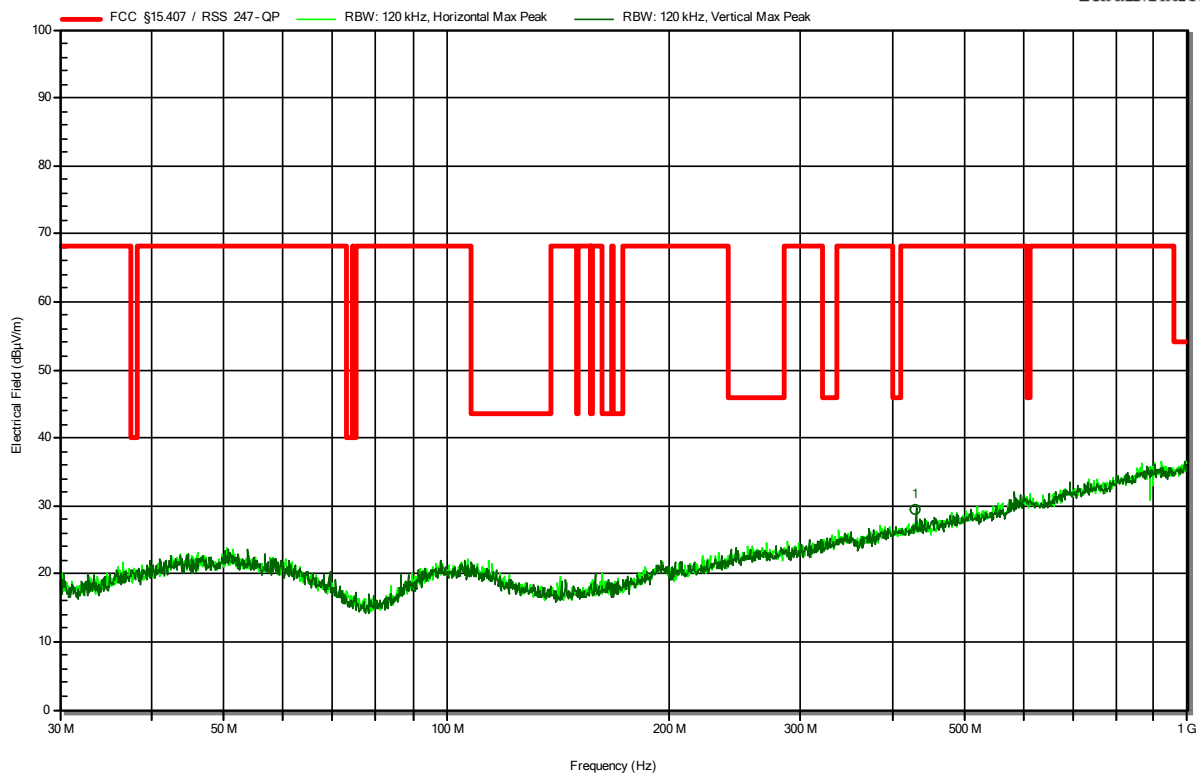
ANNEX A Transmitter spurious emissions

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck VULB 9162
 Measurement distance: 10 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5180 MHz
 Test Date: 2022-03-17
 Note:

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
429.575 MHz	29.58 dBμV/m	68.2 dBμV/m	-38.62 dB	Pass	Vertical

Test Report No.: G0M-2108-9951-TFC407WF-V02

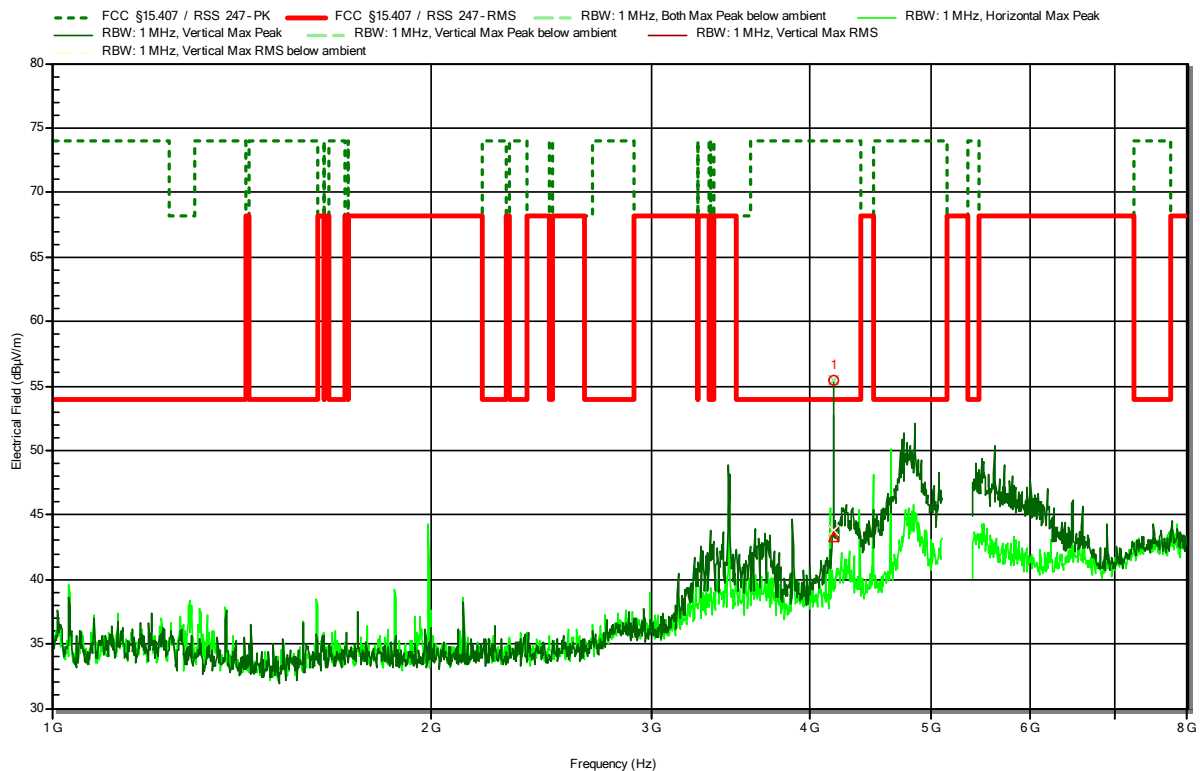
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5180 MHz
 Test Date: 2022-03-08
 Note:

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
4.183 GHz	55.39 dBµV/m	74 dBµV/m	-18.61 dB	Pass	Vertical
Frequency	RMS	RMS Limit	RMS Difference	RMS Status	Polarization
4.183 GHz	43.24 dBµV/m	54 dBµV/m	-10.76 dB	Pass	Vertical

Test Report No.: G0M-2108-9951-TFC407WF-V02

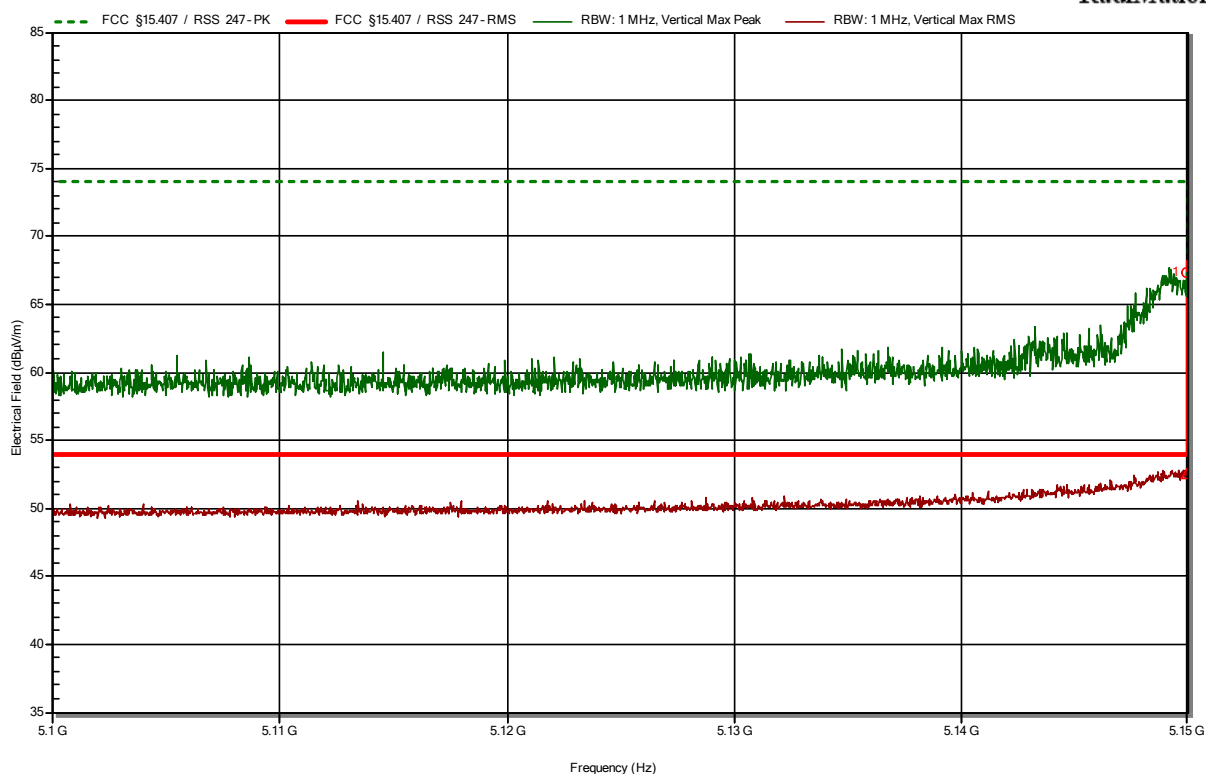
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5180 MHz
 Test Date: 2022-03-09
 Note: lower band area - Pass

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
5.15 GHz	67.29 dBμV/m	74 dBμV/m	-6.71 dB	Pass	Vertical
Frequency	RMS	RMS Limit	RMS Difference	RMS Status	Polarization
5.15 GHz	52.52 dBμV/m	54 dBμV/m	-1.48 dB	Pass	Vertical

Test Report No.: G0M-2108-9951-TFC407WF-V02

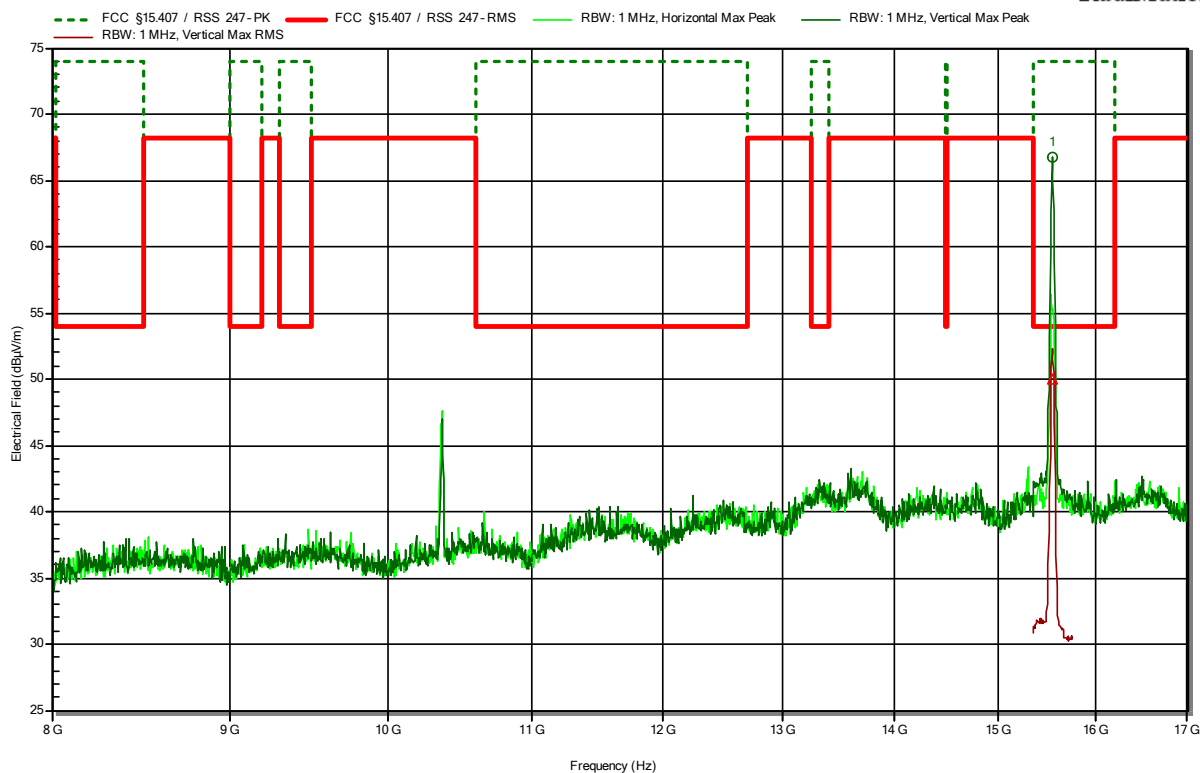
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5180 MHz
 Test Date: 2022-03-08
 Note:

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RadiMation



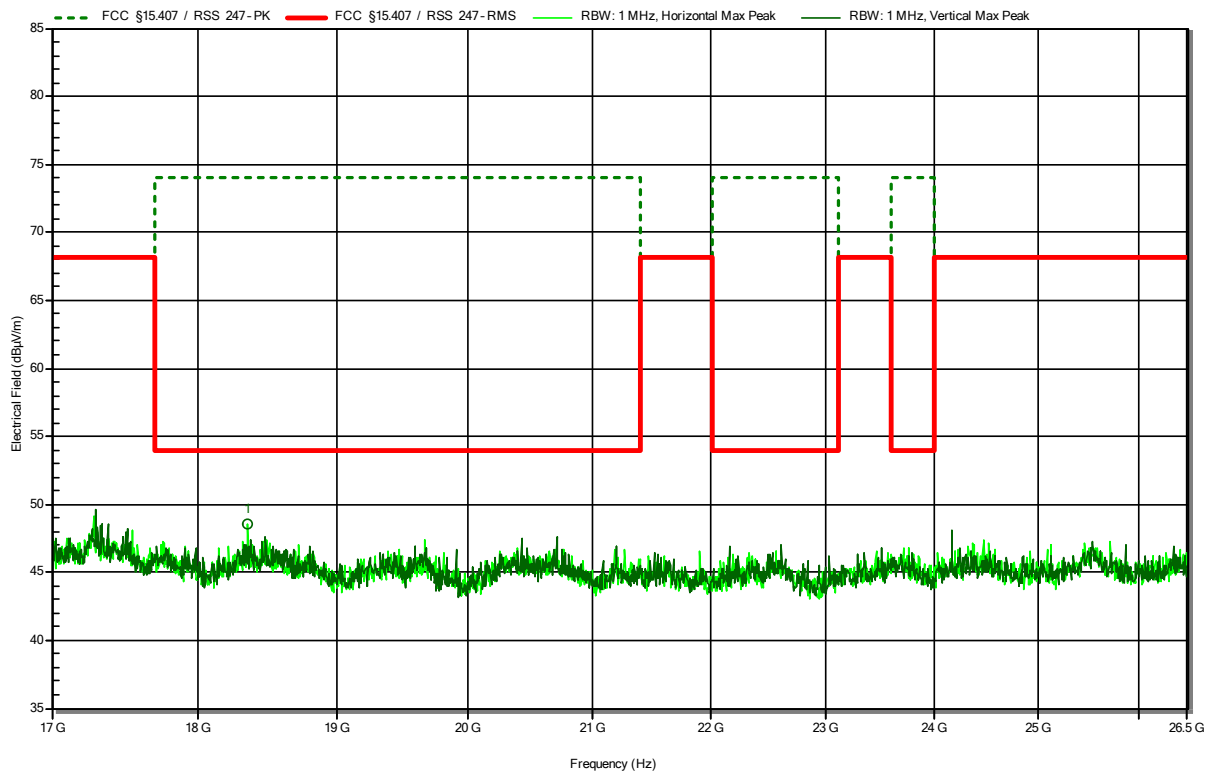
Frequency 15.54 GHz	Peak 66.77 dBμV/m	Peak Limit 74 dBμV/m	Peak Difference -7.23 dB	Peak Status Pass	Polarization Vertical
Frequency 15.54 GHz	RMS 50.02 dBμV/m	RMS Limit 54 dBμV/m	RMS Difference -3.98 dB	RMS Status Pass	Polarization Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5180 MHz
 Test Date: 2022-03-22
 Note:

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RadiMation



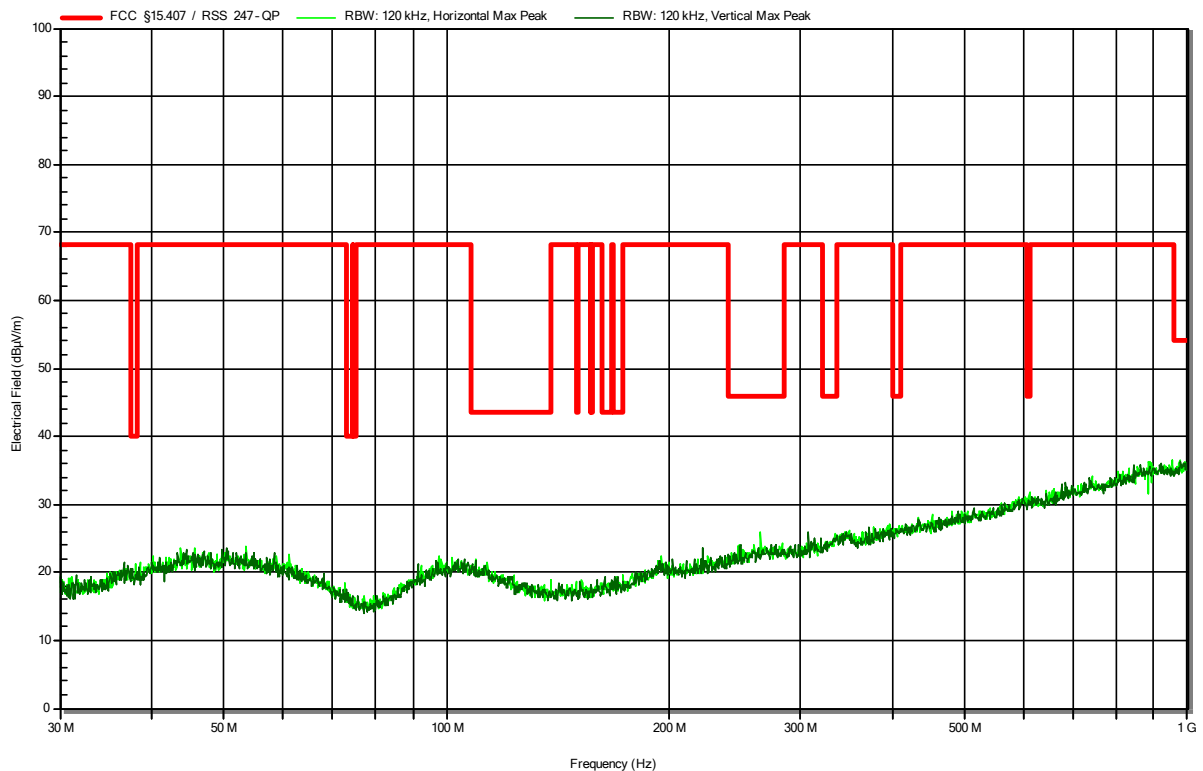
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
18.35 GHz	48.57 dBμV/m	74 dBμV/m	-25.43 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck VULB 9162
 Measurement distance: 10 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5240 MHz
 Test Date: 2022-03-17
 Note:

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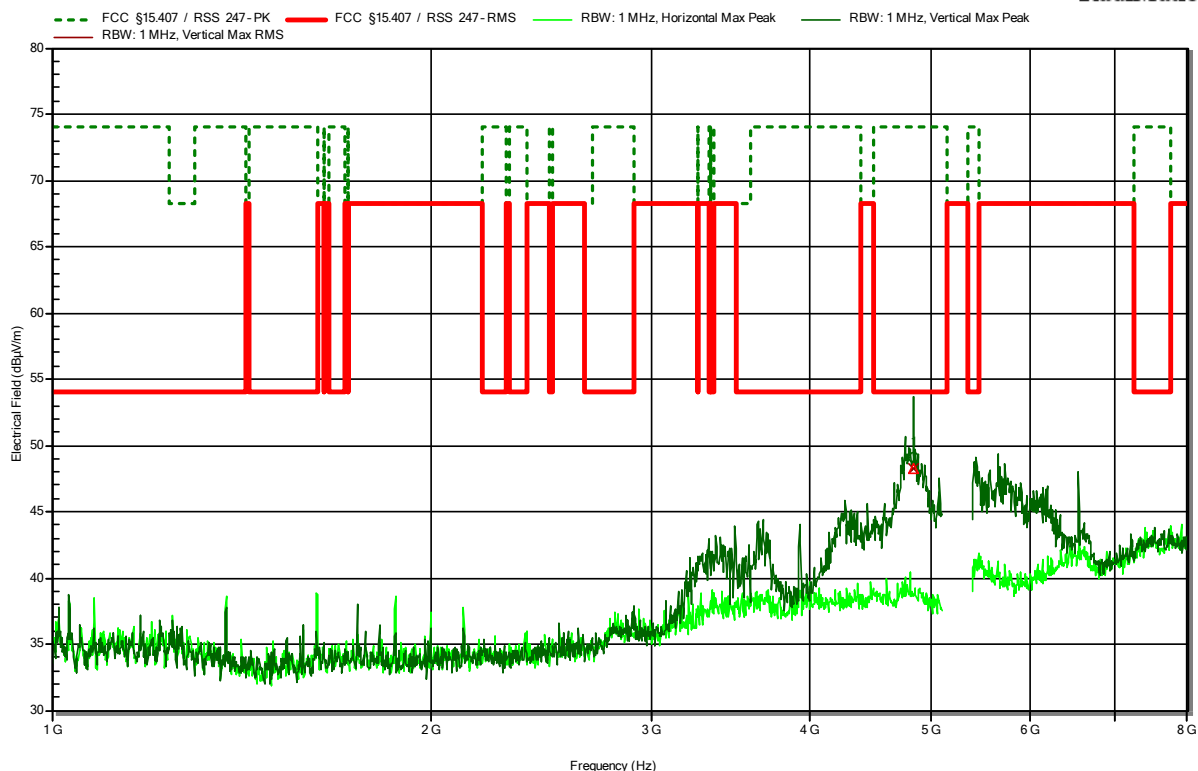


Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5240 MHz
 Test Date: 2022-03-08
 Note:

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RadiMation



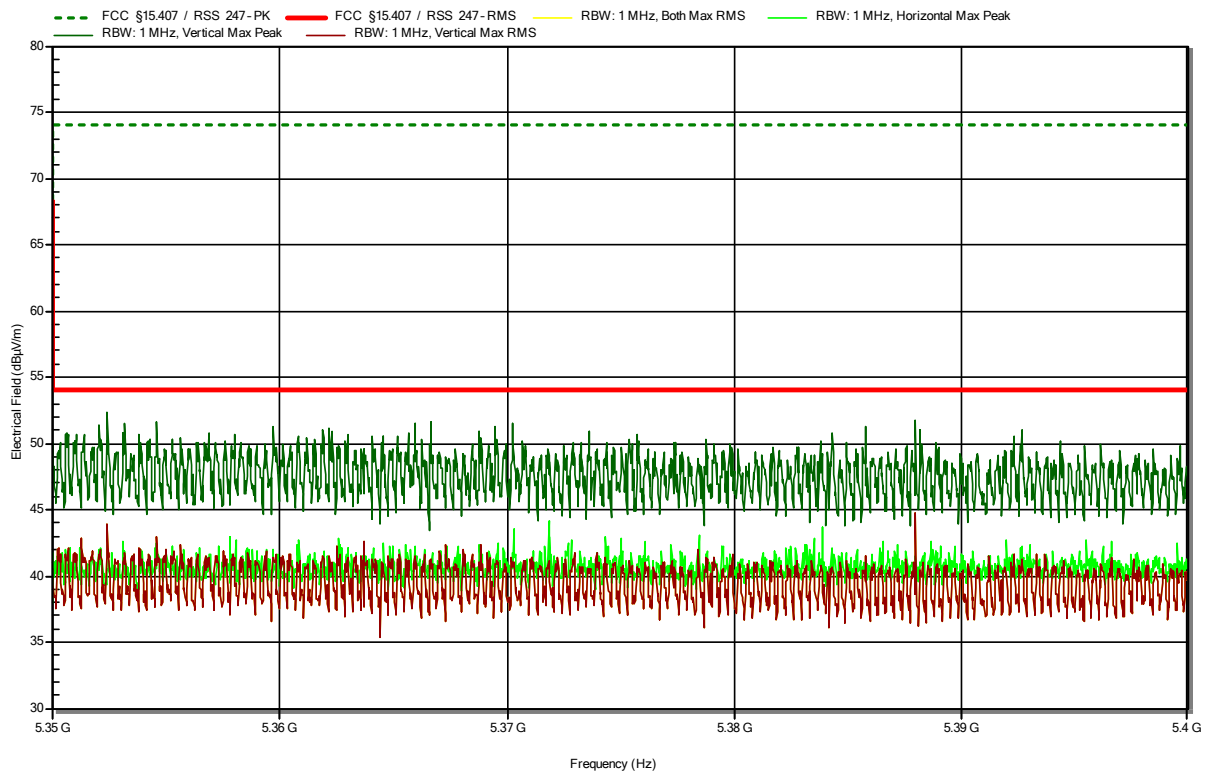
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
4.842 GHz	49.12 dBμV/m	74 dBμV/m	-24.88 dB	Pass	Vertical
Frequency	RMS	RMS Limit	RMS Difference	RMS Status	Polarization
4.842 GHz	48.26 dBμV/m	54 dBμV/m	-5.74 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5240 MHz
 Test Date: 2022-03-09
 Note: upper bandedge

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RadiMation

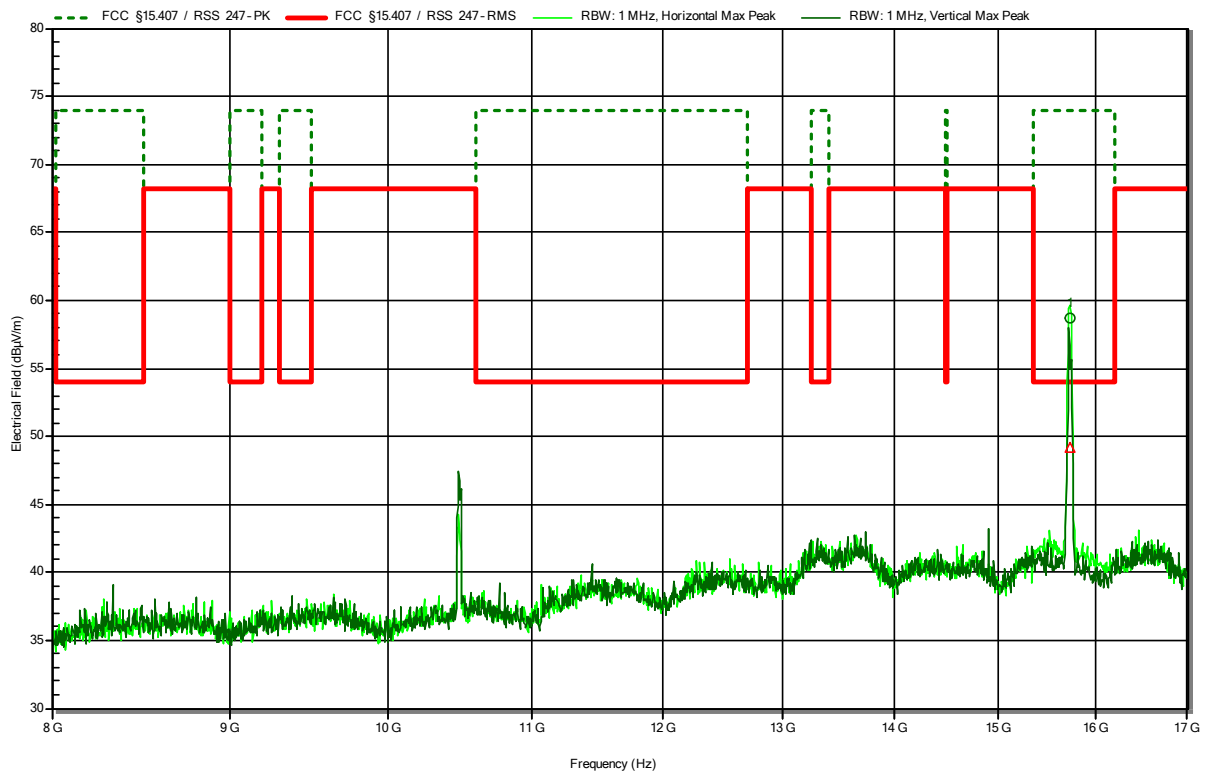


Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5240 MHz
 Test Date: 2022-03-08
 Note:

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RadiMation



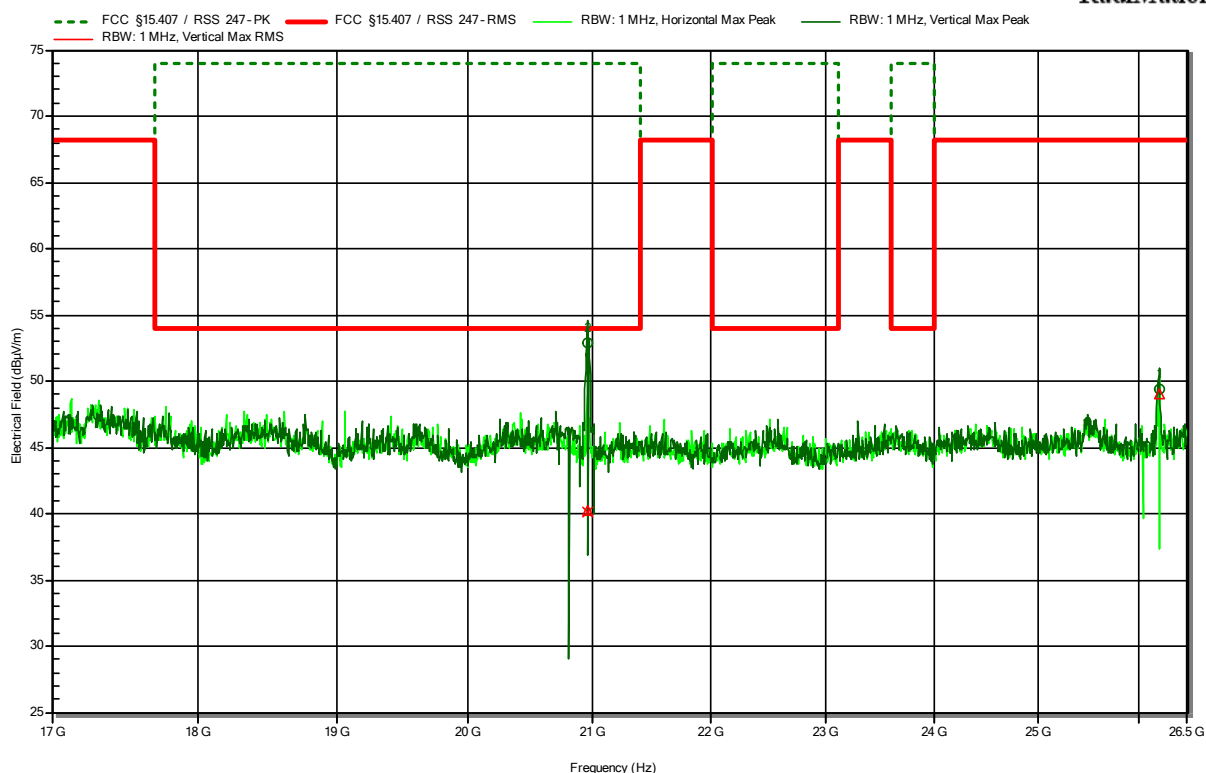
Frequency 15.723 GHz	Peak 58.69 dBμV/m	Peak Limit 74 dBμV/m	Peak Difference -15.31 dB	Peak Status Pass	Polarization Horizontal
Frequency 15.723 GHz	RMS 49.18 dBμV/m	RMS Limit 54 dBμV/m	RMS Difference -4.82 dB	RMS Status Pass	Polarization Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5240 MHz
 Test Date: 2022-03-22
 Note:

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
20.958 GHz	52.95 dBμV/m	74 dBμV/m	-21.05 dB	Pass	Vertical
26.207 GHz	49.45 dBμV/m	68.2 dBμV/m	-18.75 dB	Pass	Horizontal

Frequency	RMS	RMS Limit	RMS Difference	RMS Status	Polarization
20.958 GHz	40.21 dBμV/m	54 dBμV/m	-13.79 dB	Pass	Vertical
26.207 GHz	49.06 dBμV/m	68.2 dBμV/m	-19.14 dB	Pass	Horizontal

Test Report No.: G0M-2108-9951-TFC407WF-V02

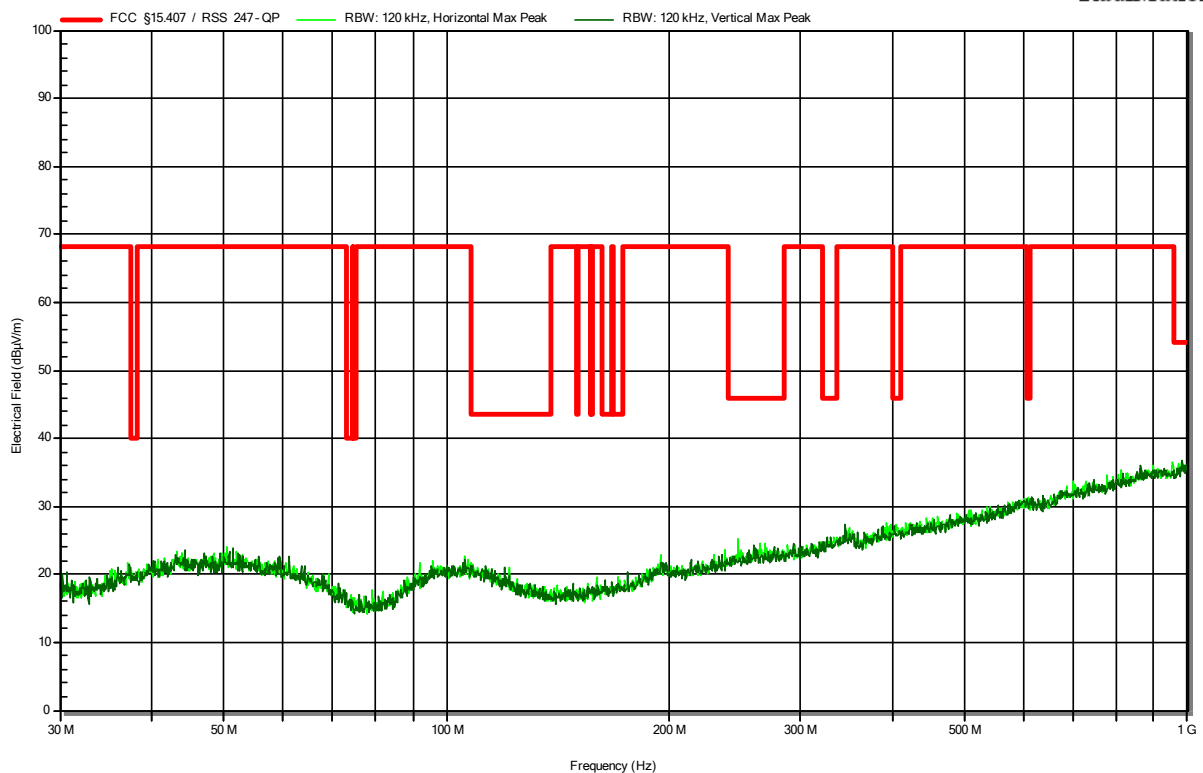
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck VULB 9162
 Measurement distance: 10 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5745 MHz
 Test Date: 2022-03-17
 Note:

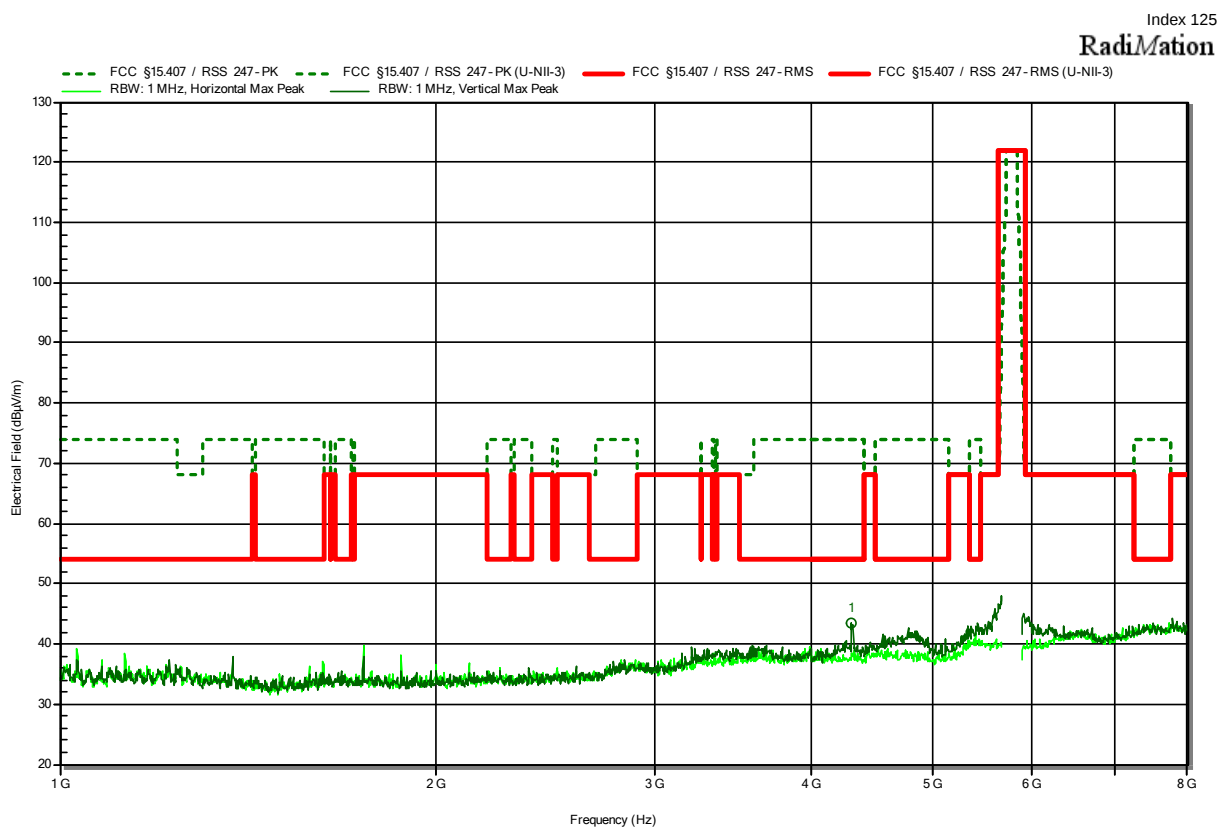
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RadiMation



Radiated Spurious Emissions according to 47 CFR Part 15.407

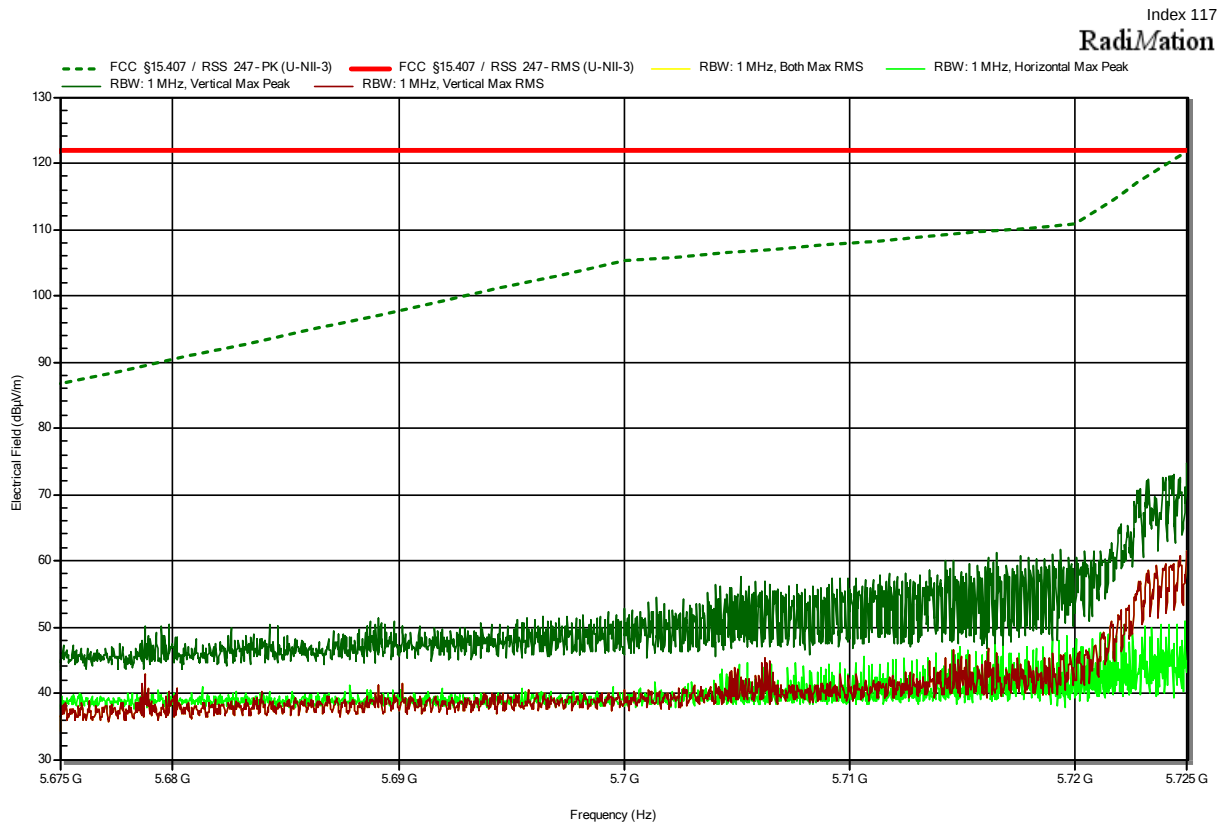
Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5745 MHz
 Test Date: 2022-03-09
 Note:



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
4.302 GHz	43.54 dBμV/m	74 dBμV/m	-30.46 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5745 MHz
 Test Date: 2022-03-09
 Note: lower band area

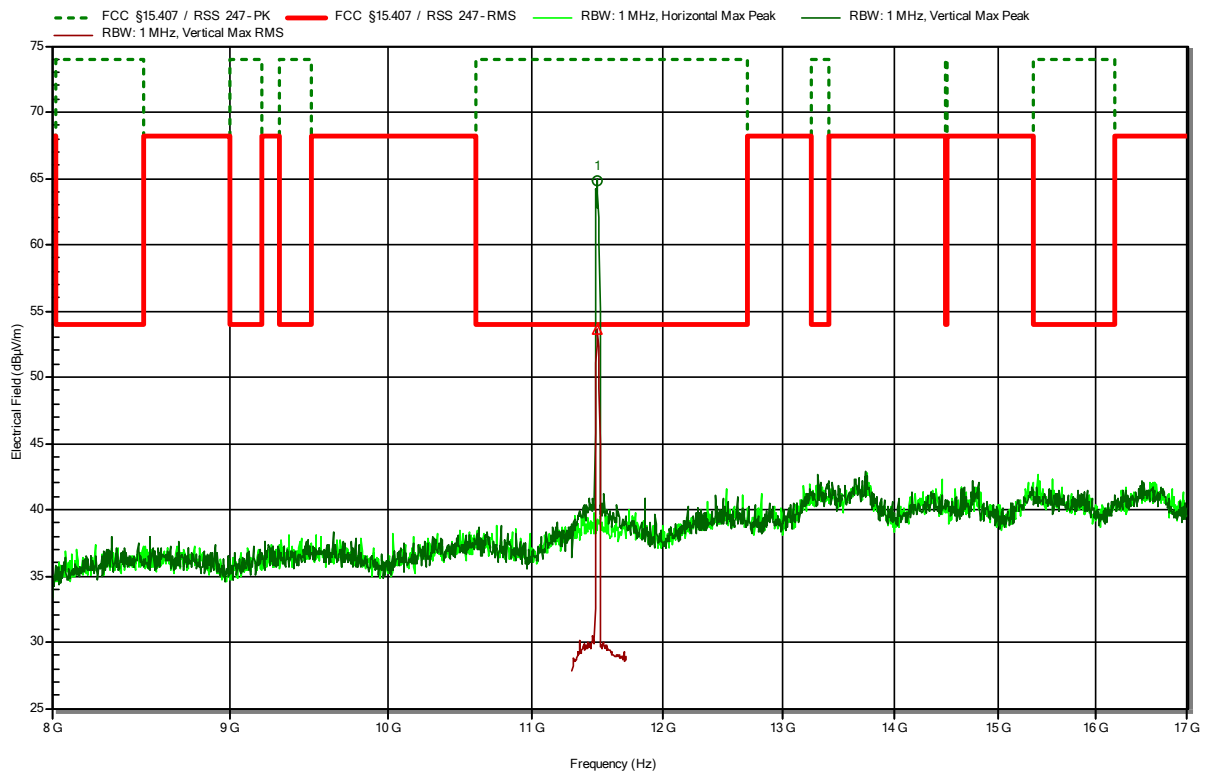


Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5745 MHz
 Test Date: 2022-03-08
 Note:

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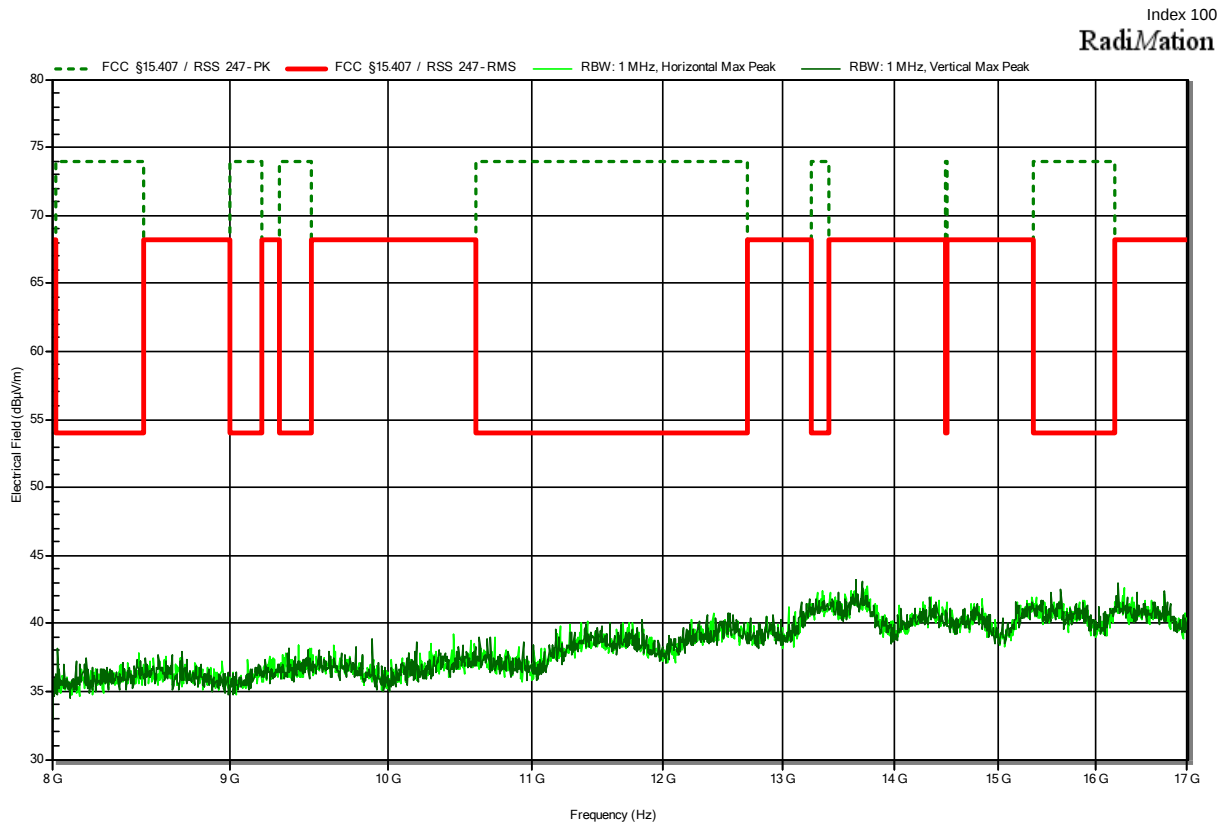
RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
11.489 GHz	64.86 dBμV/m	74 dBμV/m	-9.14 dB	Pass	Vertical
Frequency	RMS	RMS Limit	RMS Difference	RMS Status	Polarization
11.489 GHz	53.6 dBμV/m	54 dBμV/m	-0.4 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5745 MHz
 Test Date: 2022-03-08
 Note:

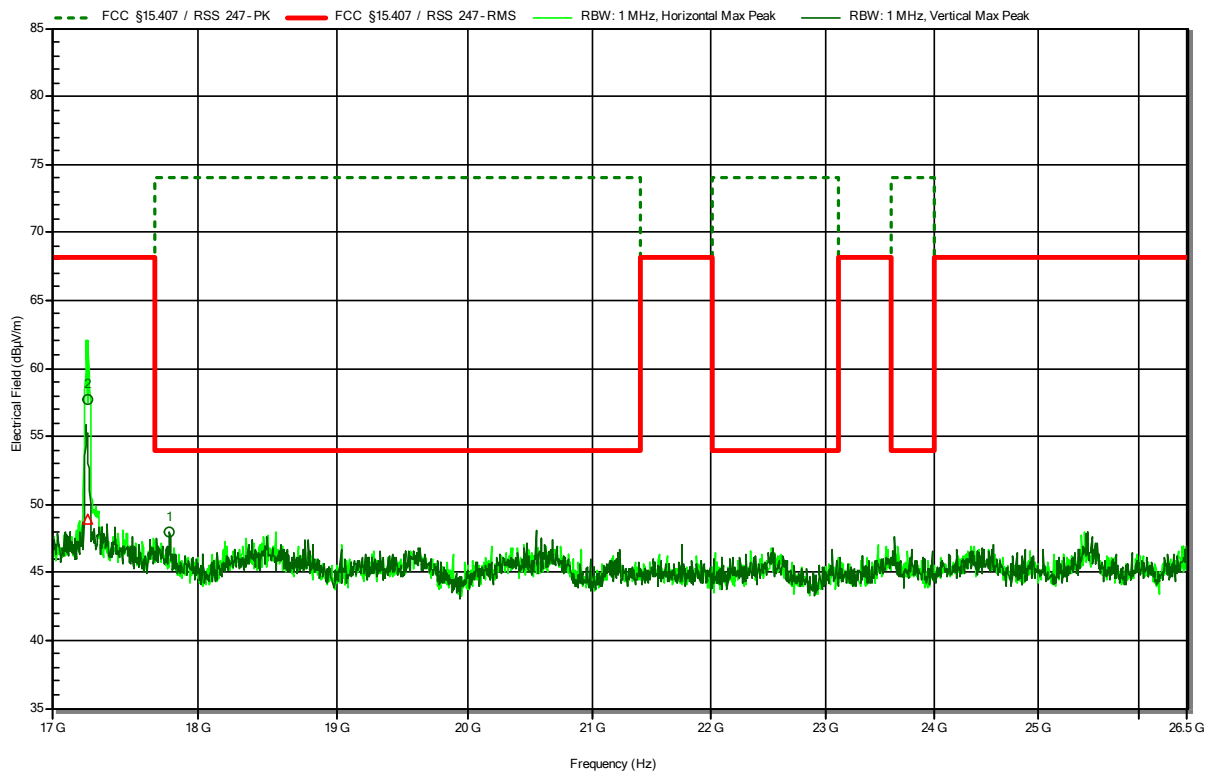


Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5745 MHz
 Test Date: 2022-03-22
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
17.235 GHz	57.76 dBμV/m	68.2 dBμV/m	-10.44 dB	Pass	Horizontal
17.798 GHz	48 dBμV/m	74 dBμV/m	-26 dB	Pass	Vertical

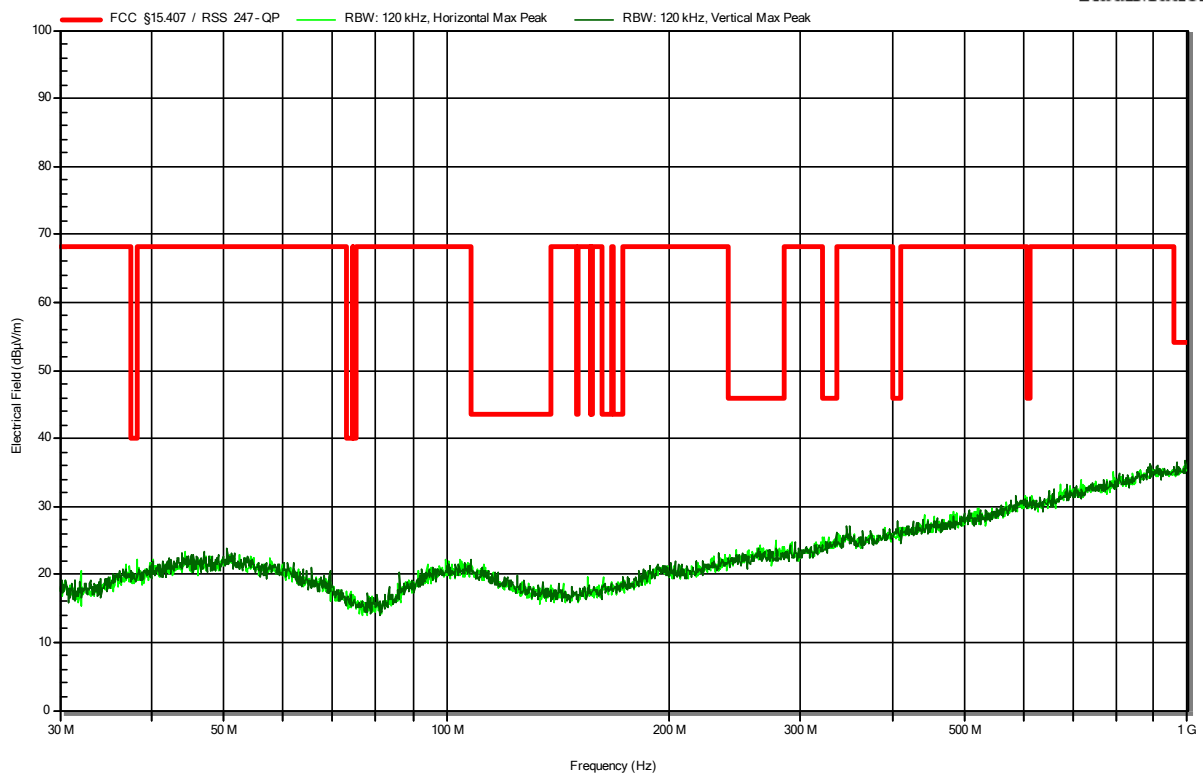
Frequency	RMS	RMS Limit	RMS Difference	RMS Status	Polarization
17.235 GHz	48.88 dBμV/m	68.2 dBμV/m	-19.32 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck VULB 9162
 Measurement distance: 10 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5825 MHz
 Test Date: 2022-03-17
 Note:

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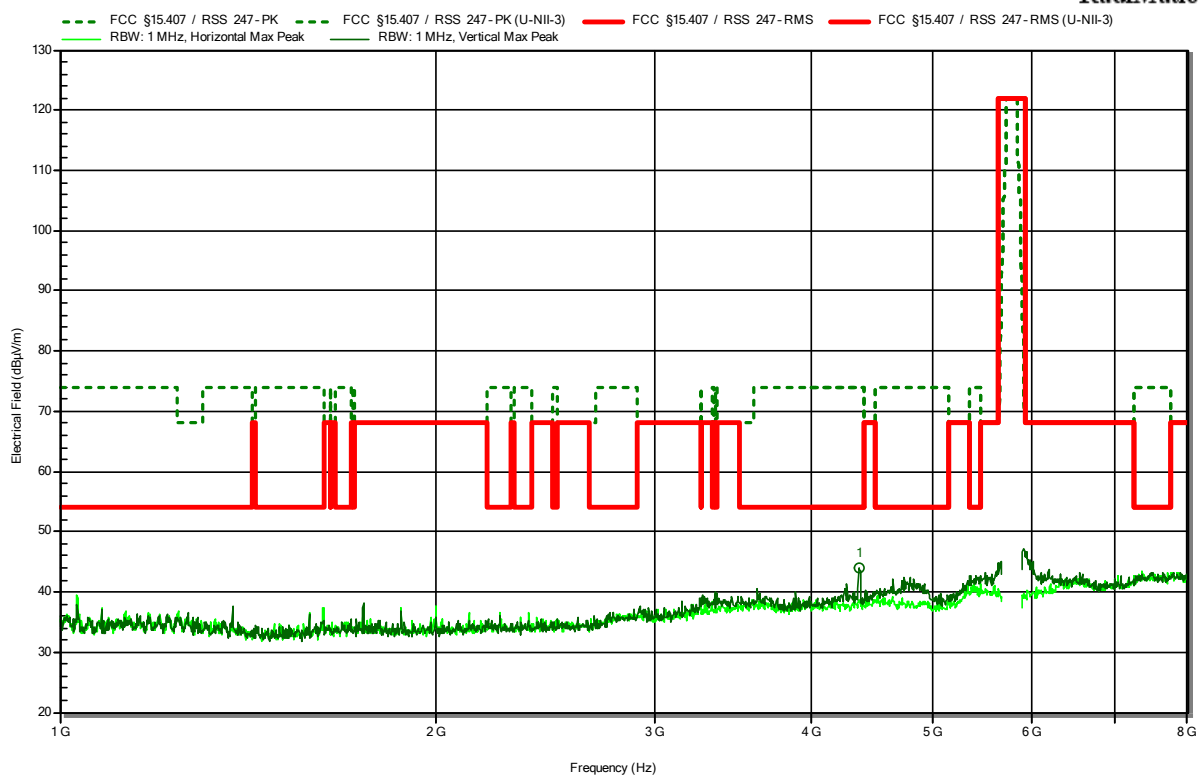


Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5825 MHz
 Test Date: 2022-03-09
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
4.363 GHz	44.04 dBμV/m	74 dBμV/m	-29.96 dB	Pass	Vertical

Test Report No.: G0M-2108-9951-TFC407WF-V02

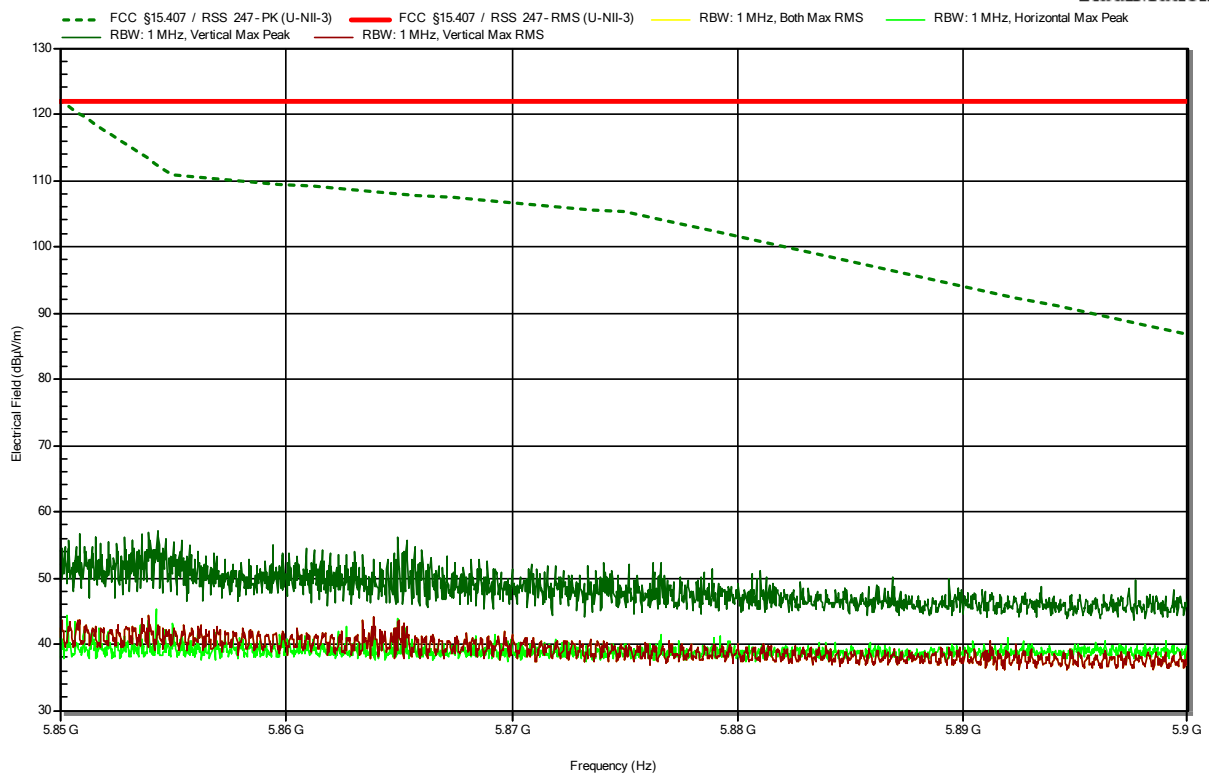
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5825 MHz
 Test Date: 2022-03-09
 Note: upper band area

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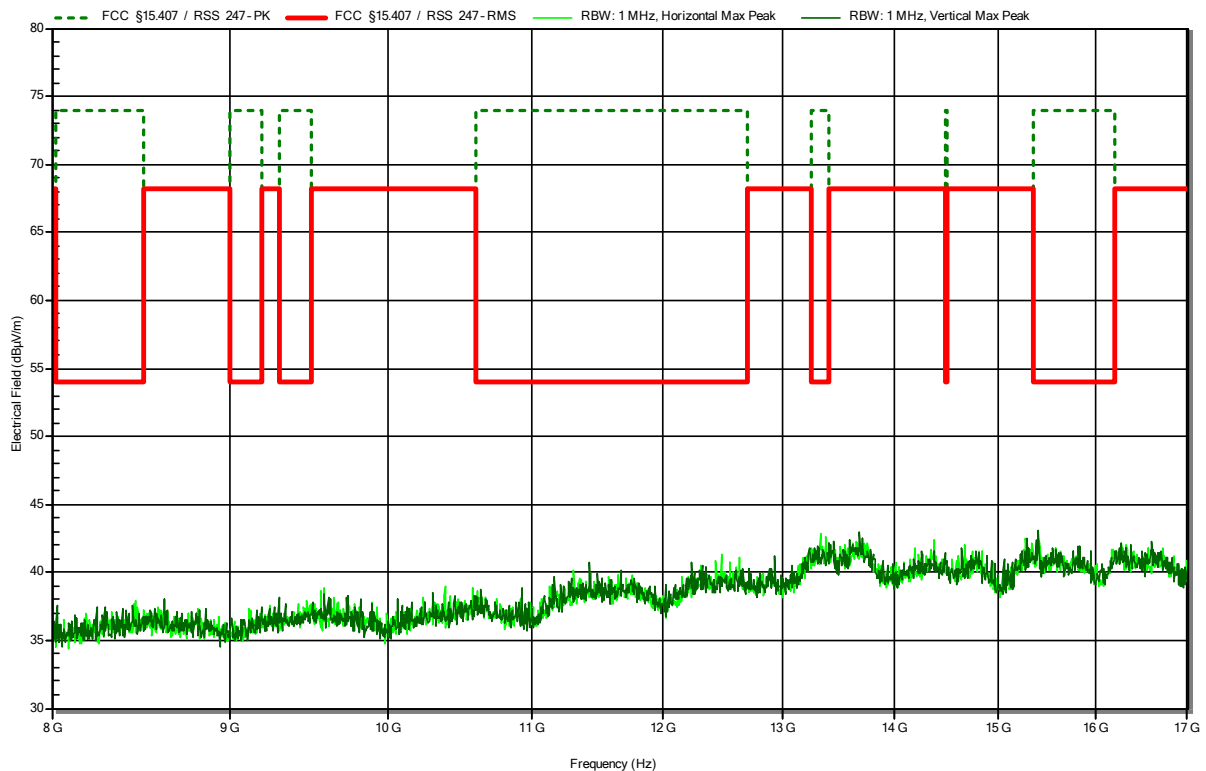


Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5825 MHz
 Test Date: 2022-03-08
 Note:

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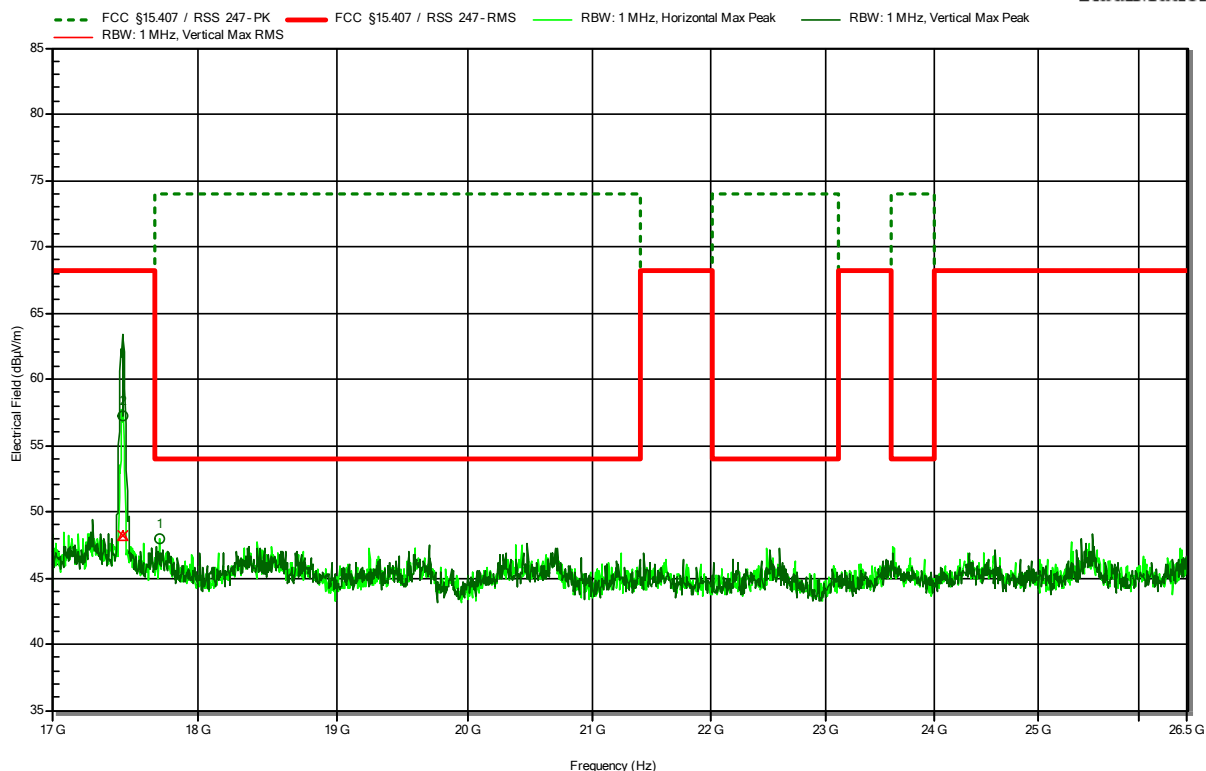


Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5825 MHz
 Test Date: 2022-03-22
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
17.477 GHz	57.25 dBμV/m	68.2 dBμV/m	-10.95 dB	Pass	Vertical
17.73 GHz	47.9 dBμV/m	74 dBμV/m	-26.1 dB	Pass	Horizontal
Frequency	RMS	RMS Limit	RMS Difference	RMS Status	Polarization
17.477 GHz	48.14 dBμV/m	68.2 dBμV/m	-20.06 dB	Pass	Vertical

Test Report No.: G0M-2108-9951-TFC407WF-V02

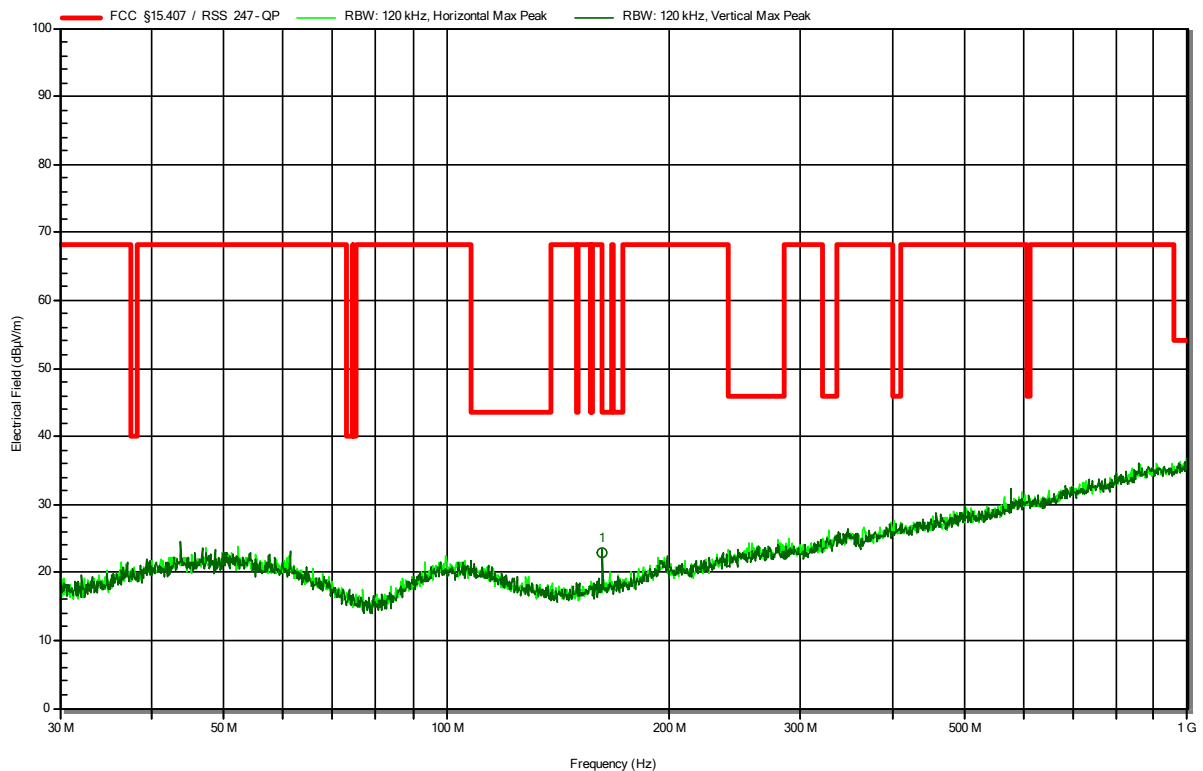
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck VULB 9162
 Measurement distance: 10 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5190 MHz
 Test Date: 2022-03-17
 Note:

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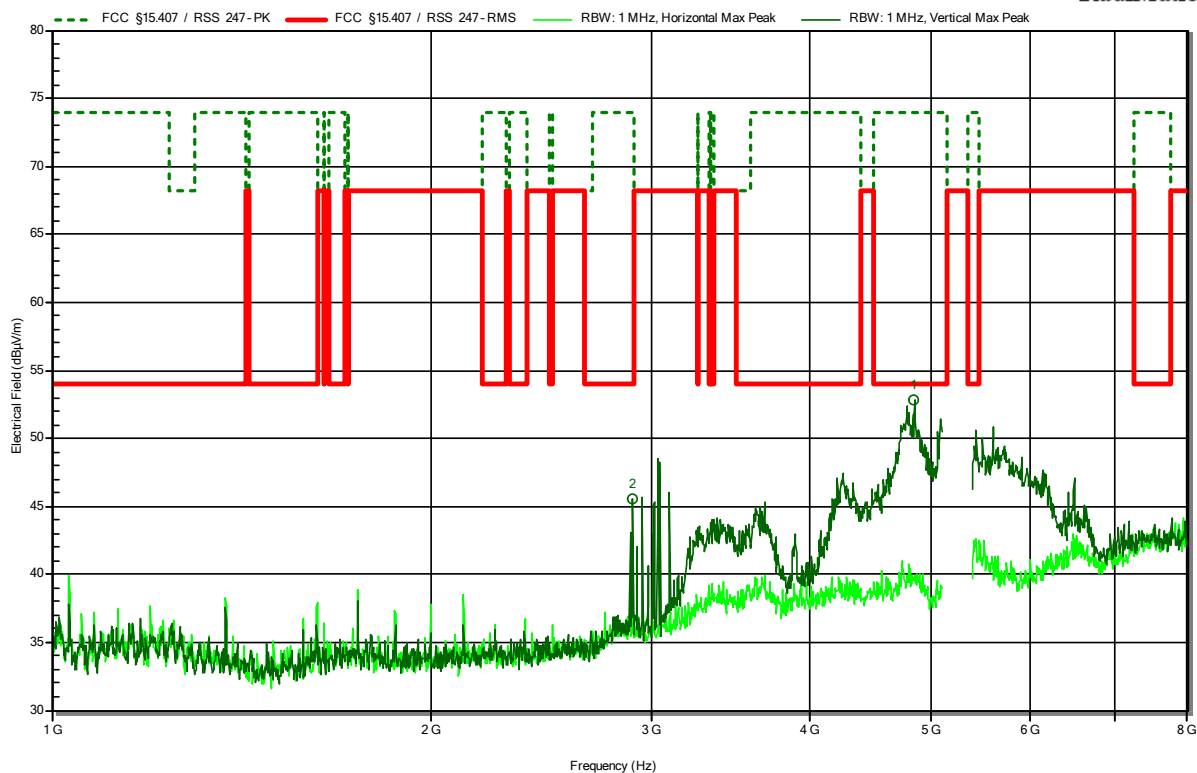
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
162.179 MHz	22.81 dBμV/m	43.52 dBμV/m	-20.71 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5190 MHz
 Test Date: 2022-03-09
 Note:

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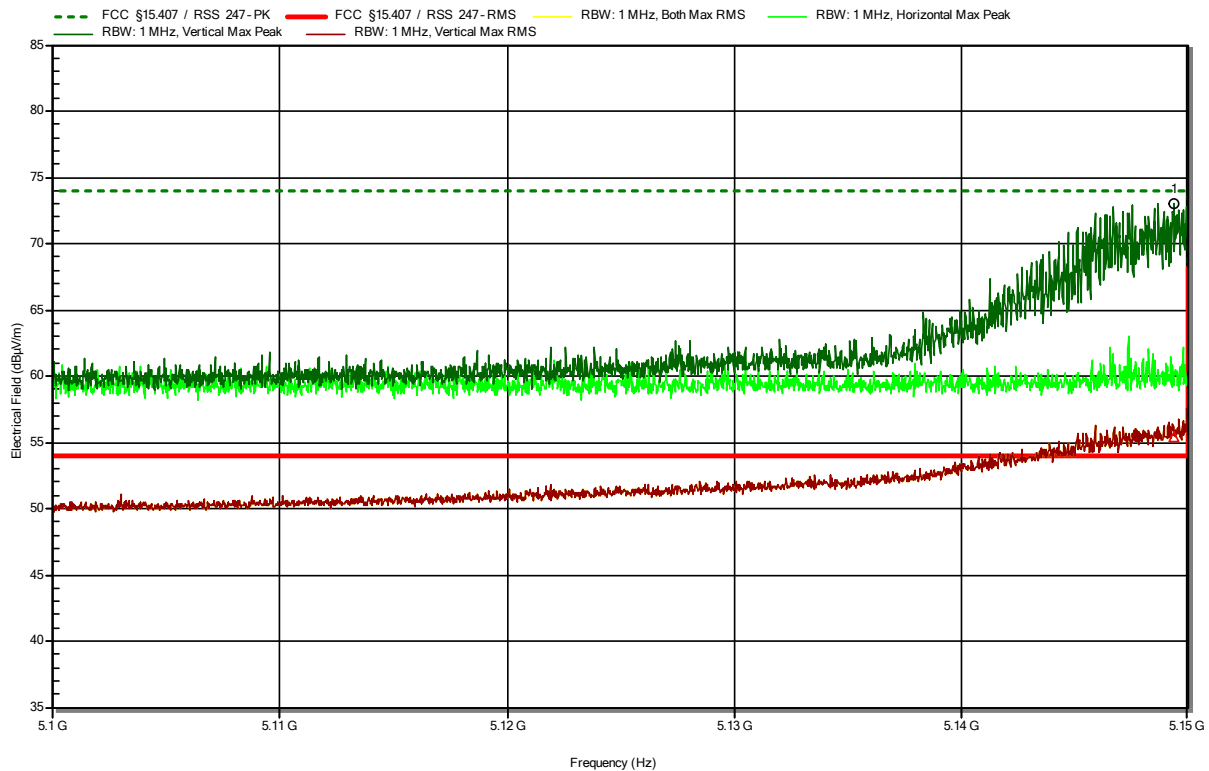
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
2.897 GHz	45.52 dBμV/m	74 dBμV/m	-28.48 dB	Pass	Vertical
4.851 GHz	52.82 dBμV/m	74 dBμV/m	-21.18 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5190 MHz
 Test Date: 2022-03-09
 Note: lower band area

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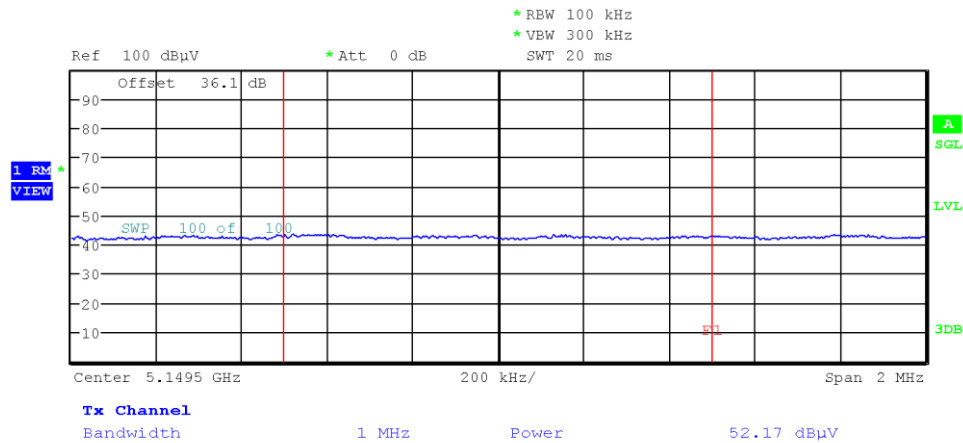
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
5.149 GHz	72.99 dBμV/m	74 dBμV/m	-1.01 dB	Pass	Vertical
Frequency	RMS	RMS Limit	RMS Difference	RMS Status	Polarization
5.149 GHz	55.47 dBμV/m	54 dBμV/m	1.47 dB	Pre measurement	Vertical

Test Report No.: G0M-2108-9951-TFC407WF-V02

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

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-03-09
 Operating Conditions: Tnom/Vnom
 Mode: Integration Method
 Note 1: 789033 D02 General UNII Test Procedures New Rules v02r01
 Note 2: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5190 MHz
 Note 3: lower band area UNII-1; final Measurement



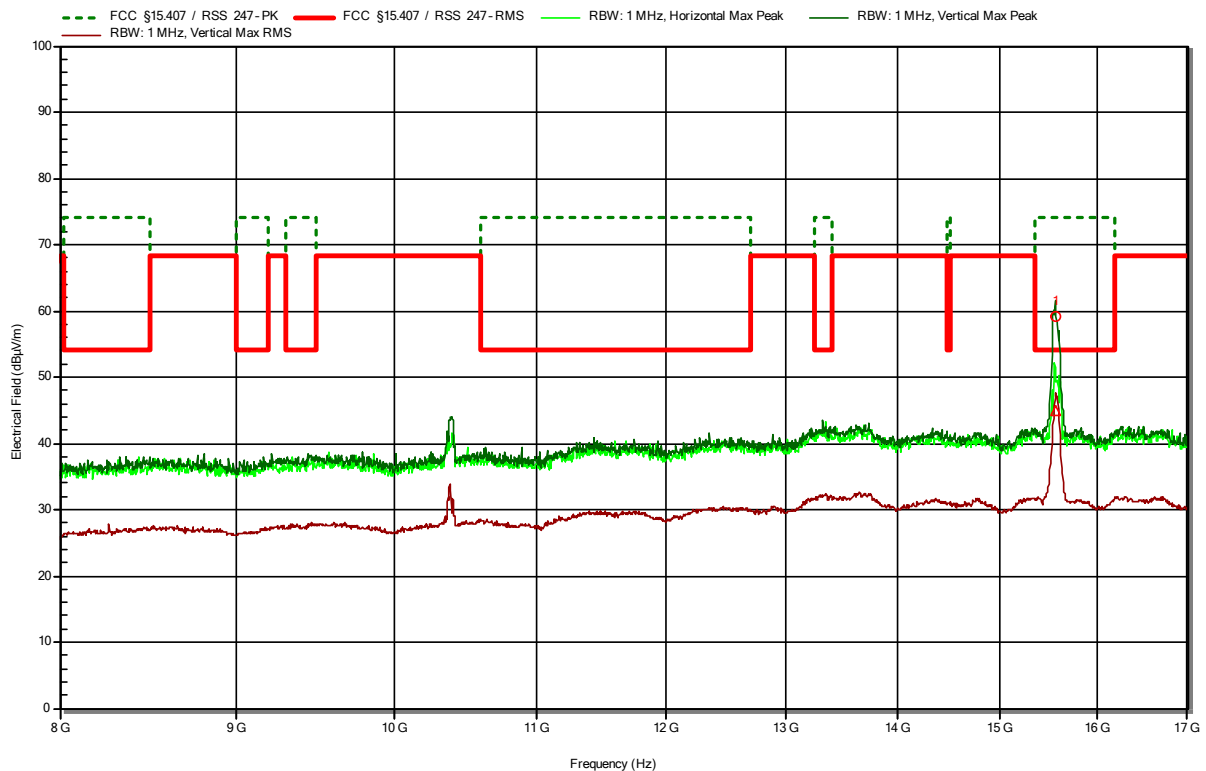
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Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5190 MHz
 Test Date: 2022-03-08
 Note:

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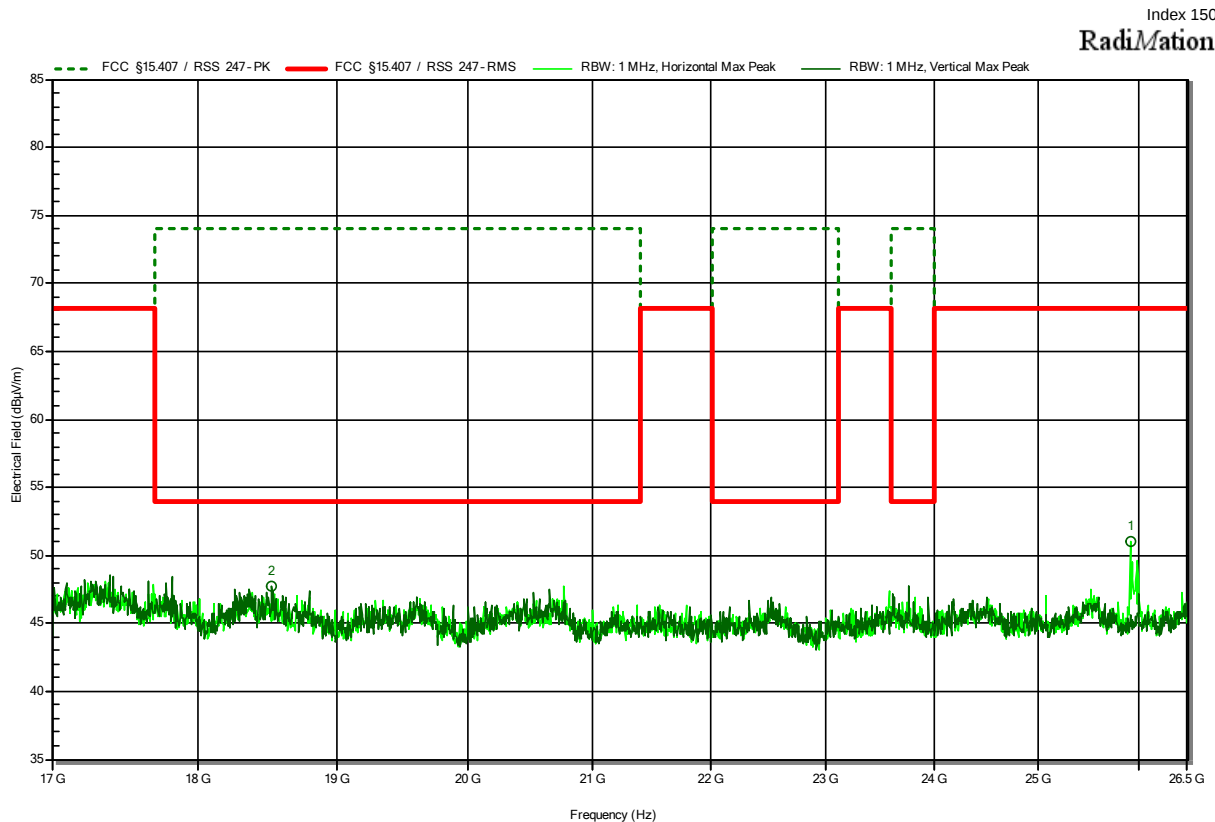
Frequency 15.559 GHz	Peak 59.04 dBμV/m	Peak Limit 74 dBμV/m	Peak Difference -14.96 dB	Peak Status Pass	Polarization Vertical
Frequency 15.559 GHz	RMS 44.94 dBμV/m	RMS Limit 54 dBμV/m	RMS Difference -9.06 dB	RMS Status Pass	Polarization Vertical

Test Report No.: G0M-2108-9951-TFC407WF-V02

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

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5190 MHz
 Test Date: 2022-03-22
 Note:



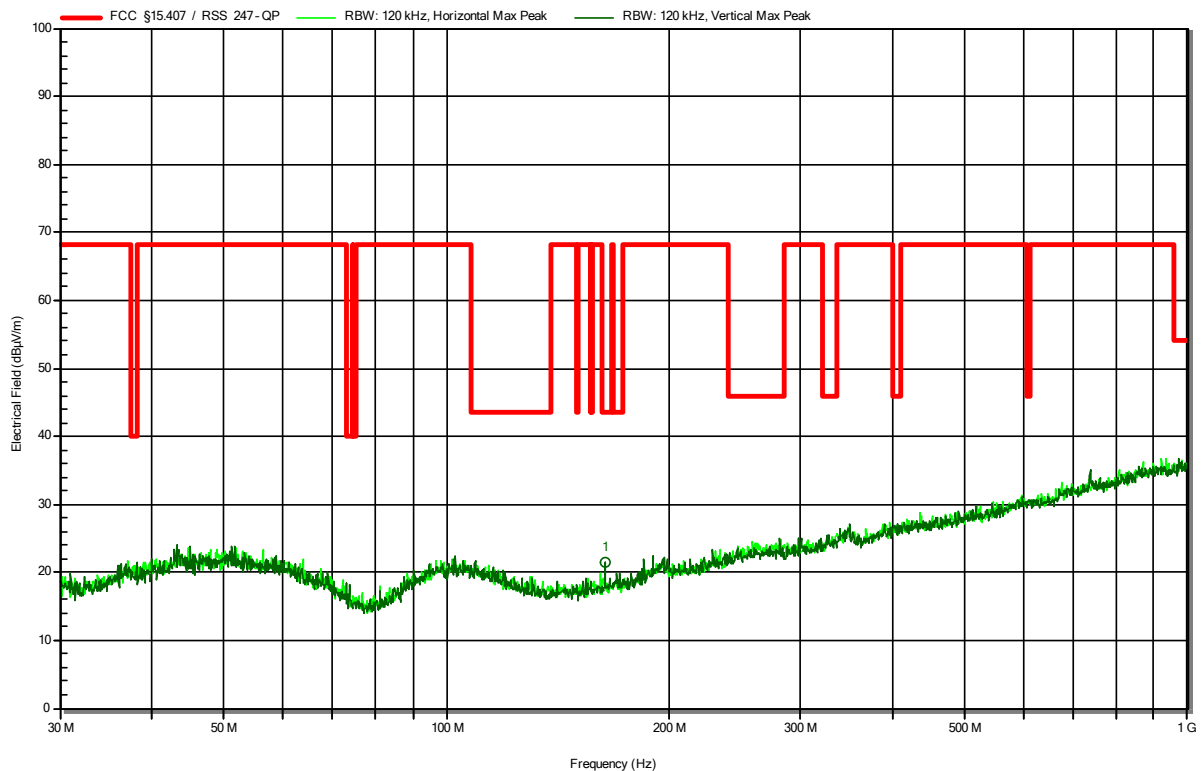
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
18.526 GHz	47.74 dBμV/m	74 dBμV/m	-26.26 dB	Pass	Vertical
25.911 GHz	51.04 dBμV/m	68.2 dBμV/m	-17.16 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck VULB 9162
 Measurement distance: 10 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5230 MHz
 Test Date: 2022-03-17
 Note:

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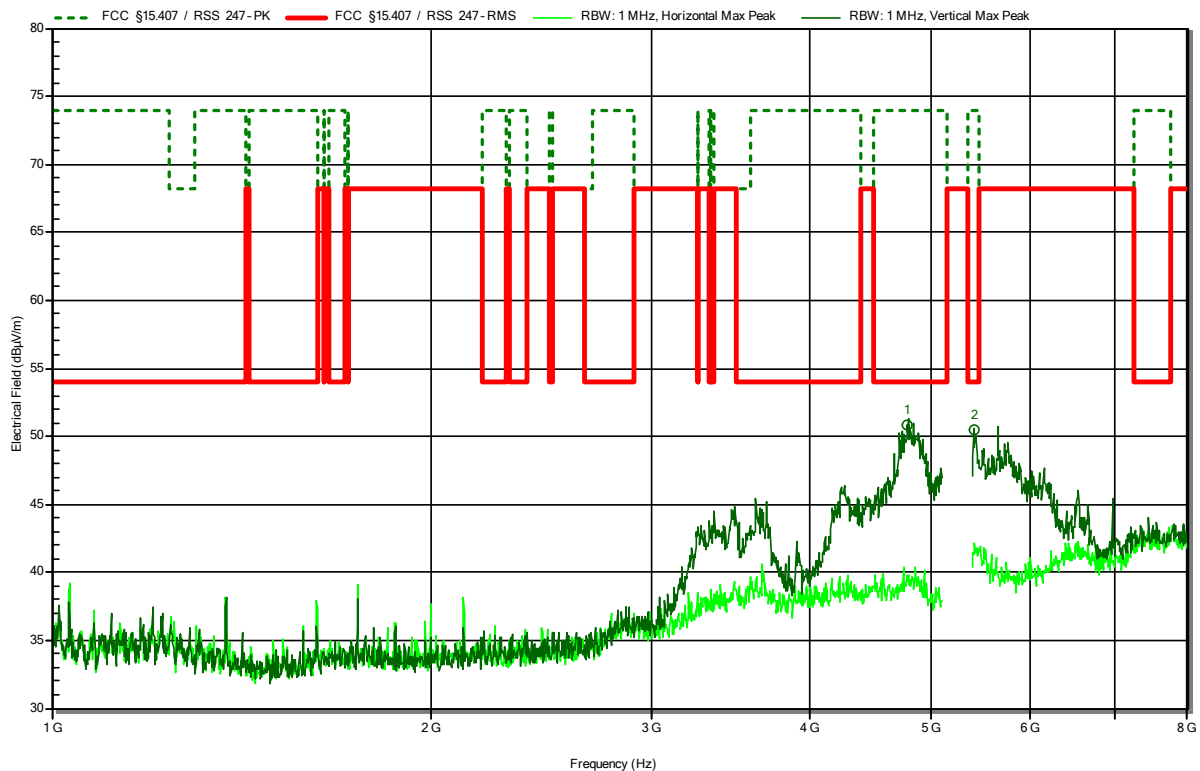
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
163.407 MHz	21.45 dBμV/m	43.52 dBμV/m	-22.07 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5230 MHz
 Test Date: 2022-03-09
 Note:

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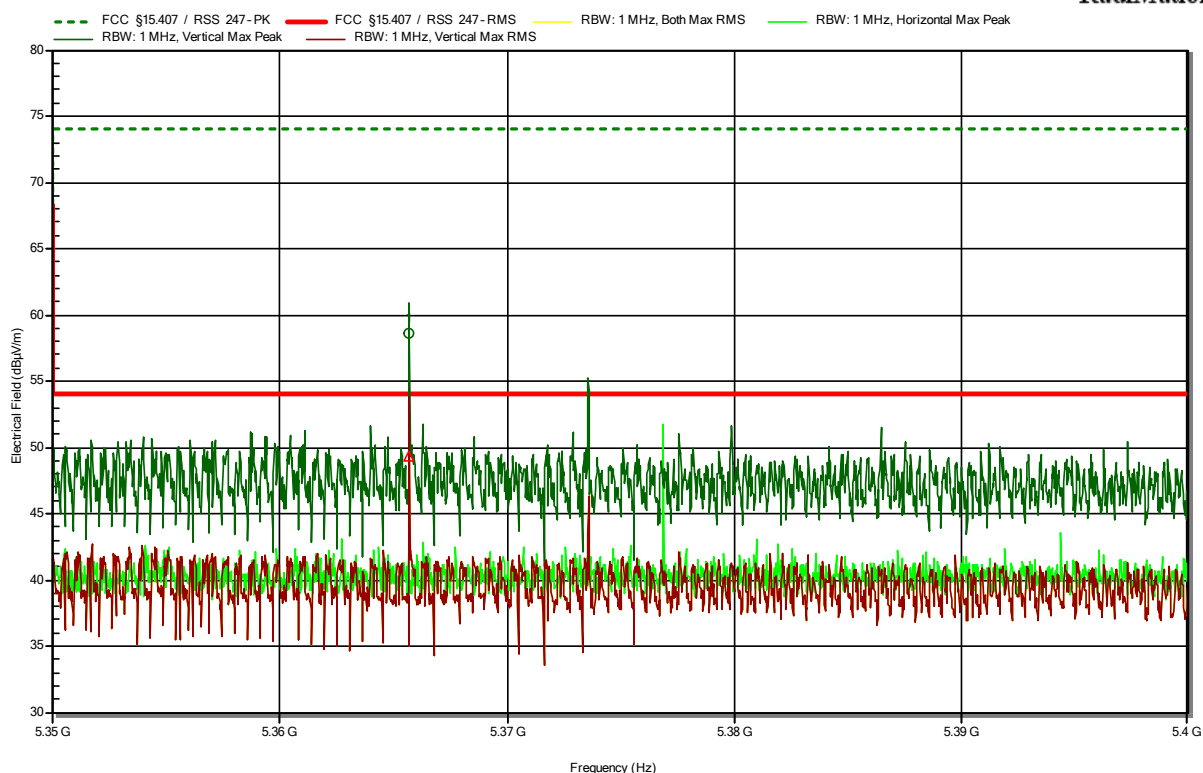
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
4.785 GHz	50.81 dBμV/m	74 dBμV/m	-23.19 dB	Pass	Vertical
5.41 GHz	50.54 dBμV/m	74 dBμV/m	-23.46 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 n; MSC0; ext. antenna; 5230 MHz
 Test Date: 2022-03-09
 Note: upper bandedge

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Frequency 5.366 GHz	Peak 58.59 dBμV/m	Peak Limit 74 dBμV/m	Peak Difference -15.41 dB	Peak Status Pass	Polarization Vertical
Frequency 5.366 GHz	RMS 49.36 dBμV/m	RMS Limit 54 dBμV/m	RMS Difference -4.64 dB	RMS Status Pass	Polarization Vertical

Test Report No.: G0M-2108-9951-TFC407WF-V02

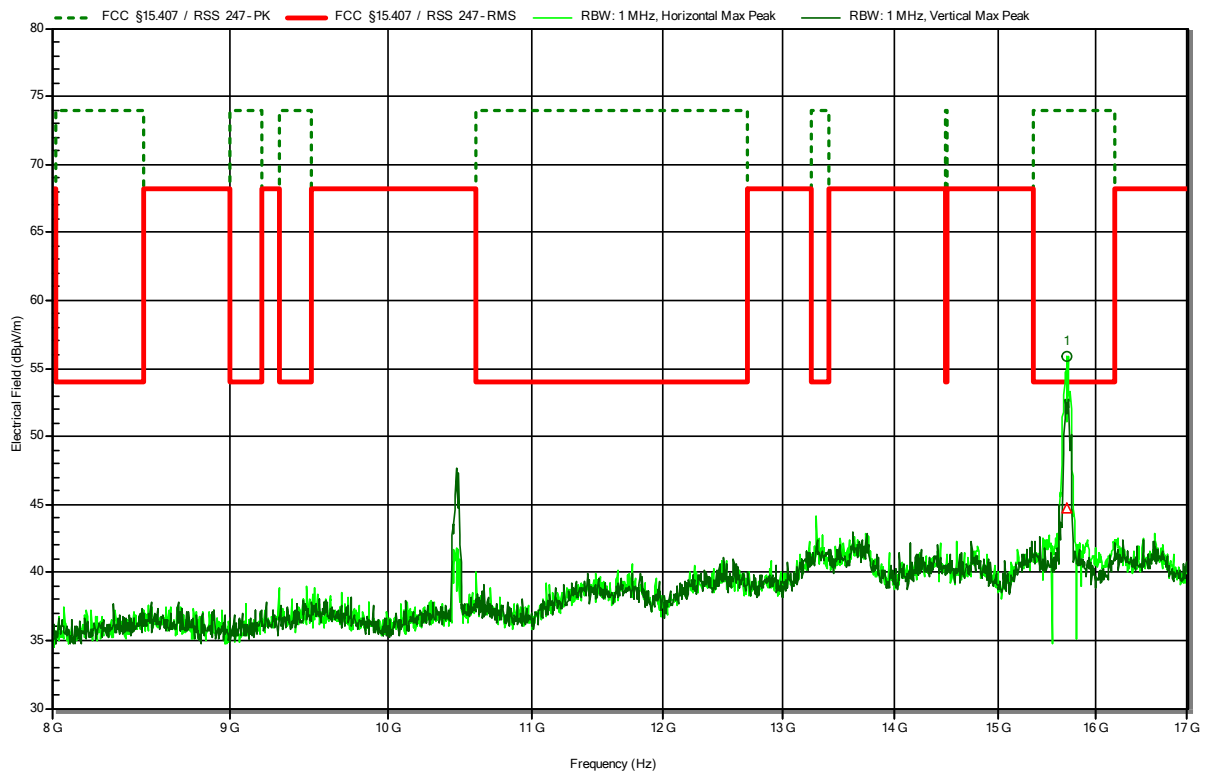
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5230 MHz
 Test Date: 2022-03-08
 Note:

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RadiMation



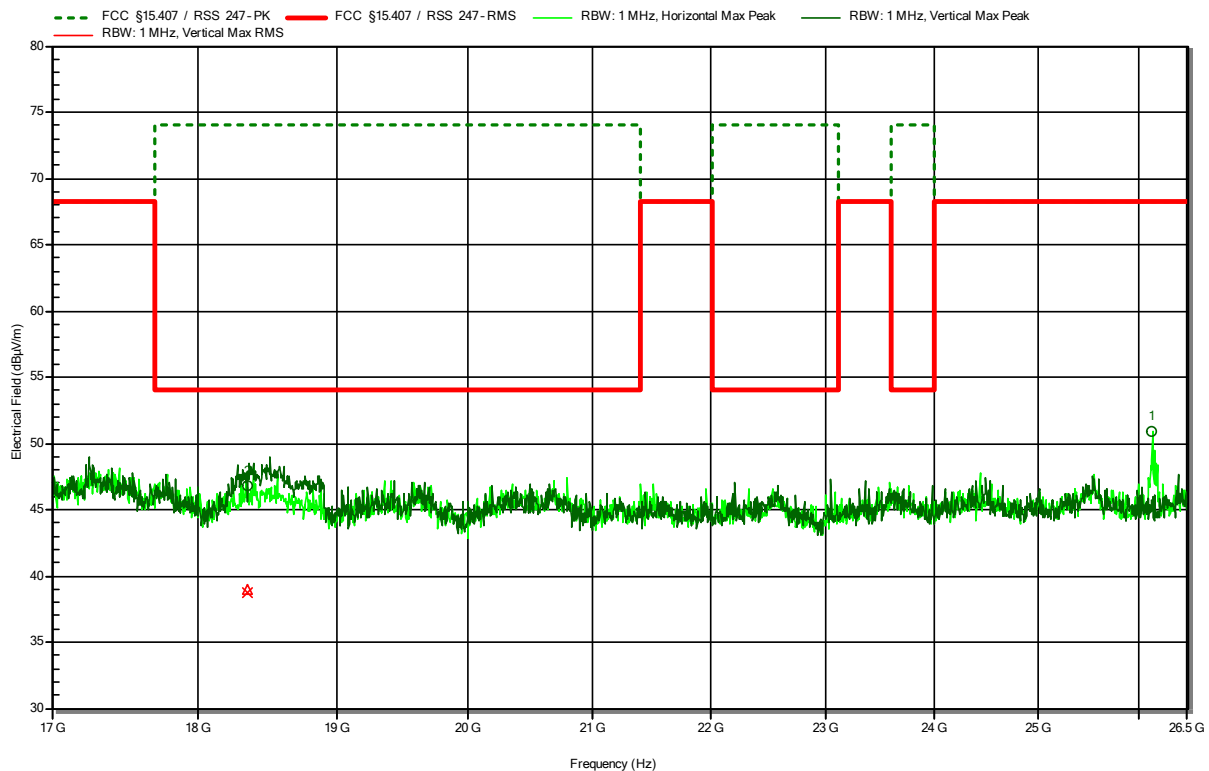
Frequency 15.689 GHz	Peak 55.85 dBμV/m	Peak Limit 74 dBμV/m	Peak Difference -18.15 dB	Peak Status Pass	Polarization Horizontal
Frequency 15.689 GHz	RMS 44.76 dBμV/m	RMS Limit 54 dBμV/m	RMS Difference -9.24 dB	RMS Status Pass	Polarization Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5230 MHz
 Test Date: 2022-03-22
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
18.349 GHz	46.8 dBμV/m	74 dBμV/m	-27.2 dB	Pass	Vertical
26.136 GHz	50.93 dBμV/m	68.2 dBμV/m	-17.27 dB	Pass	Horizontal

Frequency	RMS	RMS Limit	RMS Difference	RMS Status	Polarization
18.349 GHz	38.96 dBμV/m	54 dBμV/m	-15.04 dB	Pass	Vertical

Test Report No.: G0M-2108-9951-TFC407WF-V02

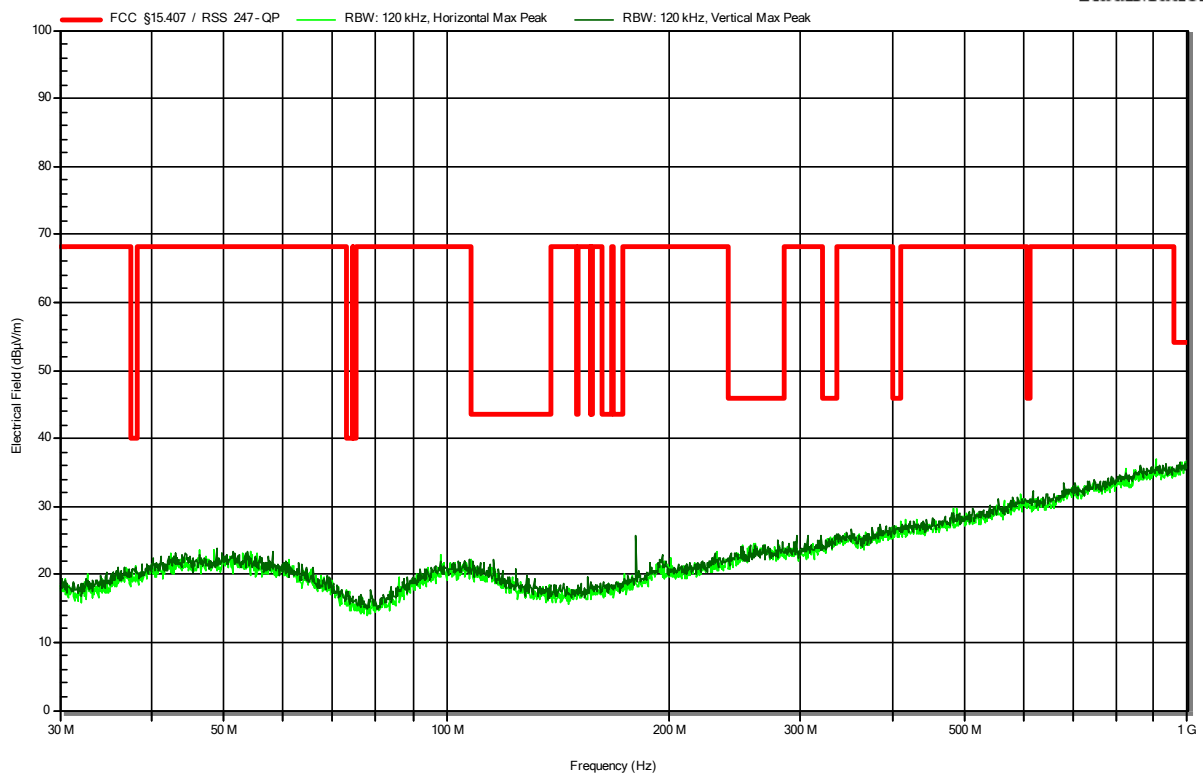
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
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 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck VULB 9162
 Measurement distance: 10 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5755 MHz
 Test Date: 2022-03-17
 Note:

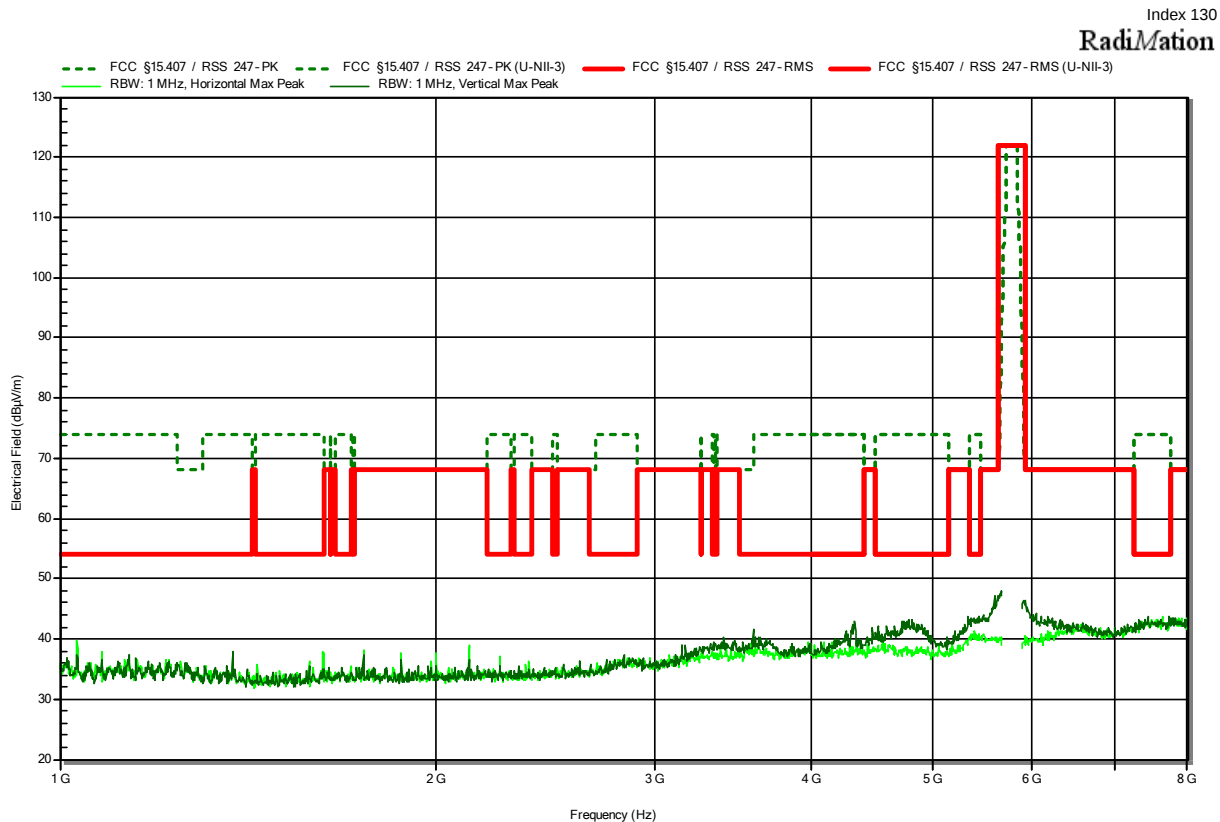
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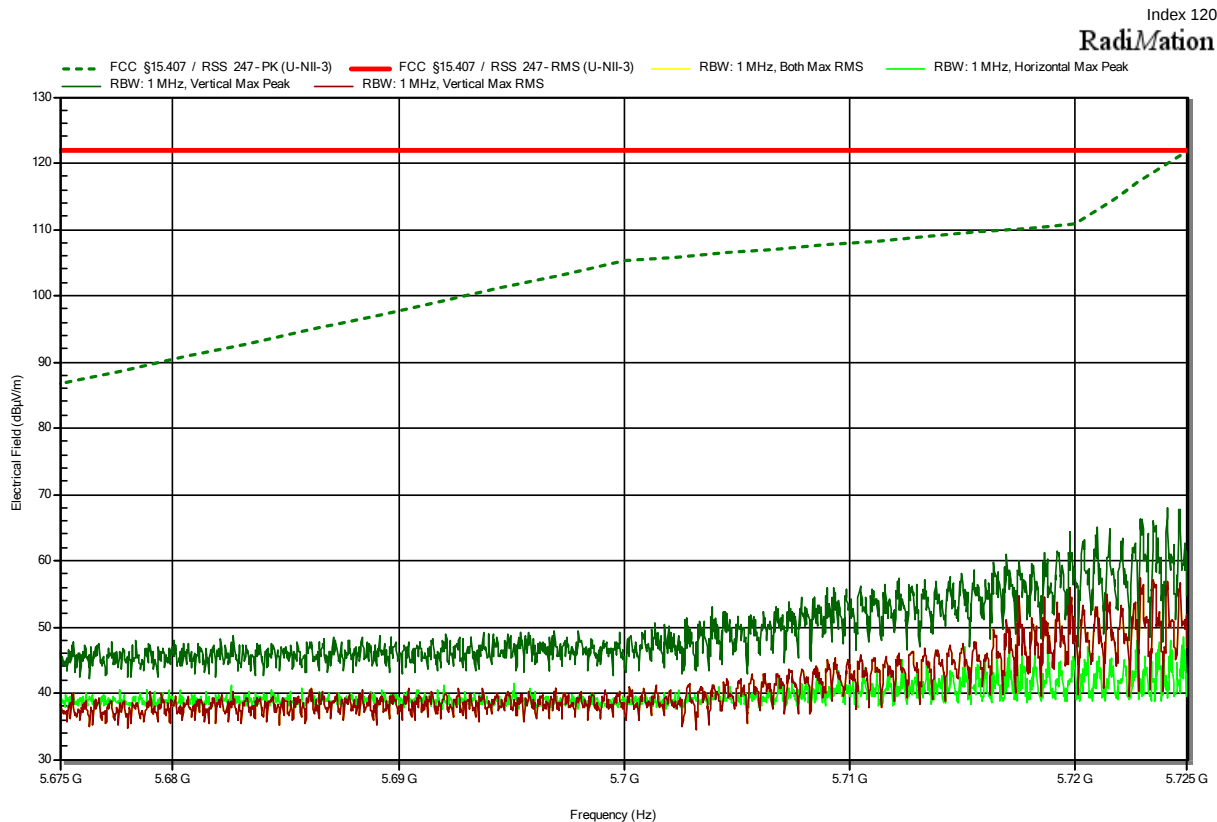
Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5755 MHz
 Test Date: 2022-03-09
 Note:



Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
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 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
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 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5755 MHz
 Test Date: 2022-03-09
 Note: lower band area

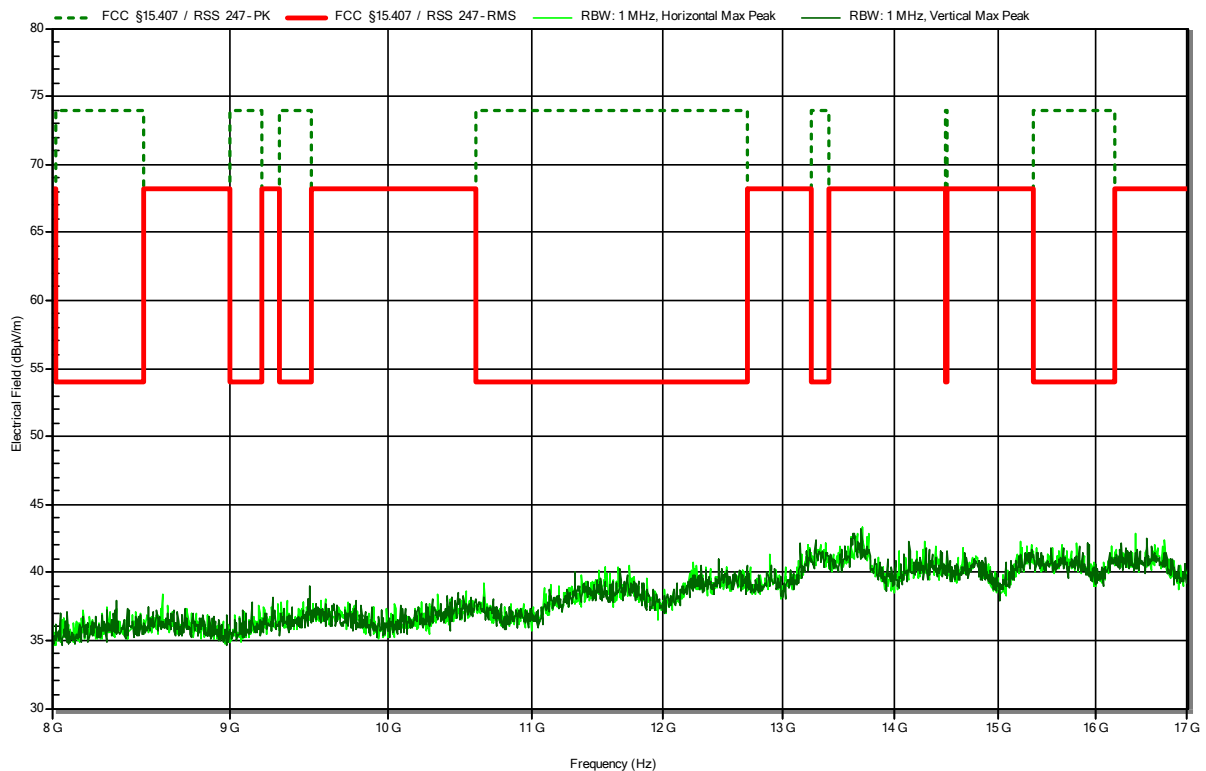


Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5755 MHz
 Test Date: 2022-03-08
 Note:

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RadiMation

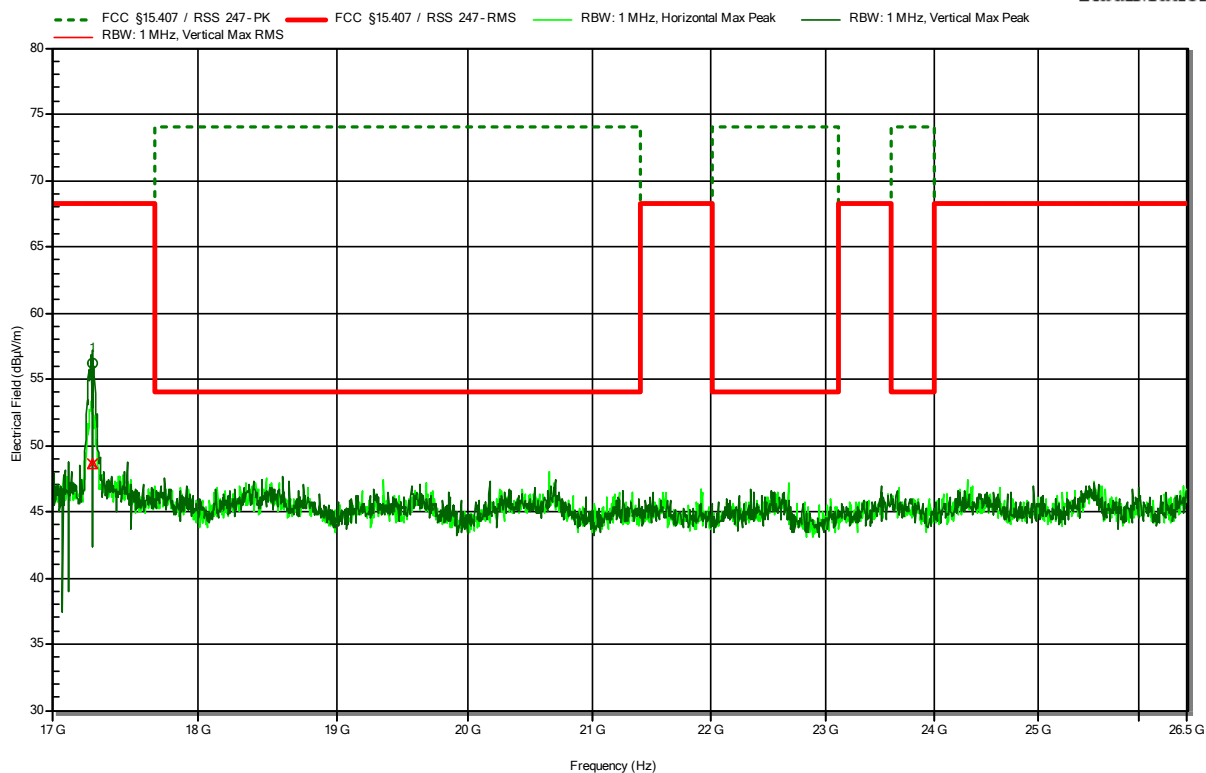


Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5755 MHz
 Test Date: 2022-03-22
 Note:

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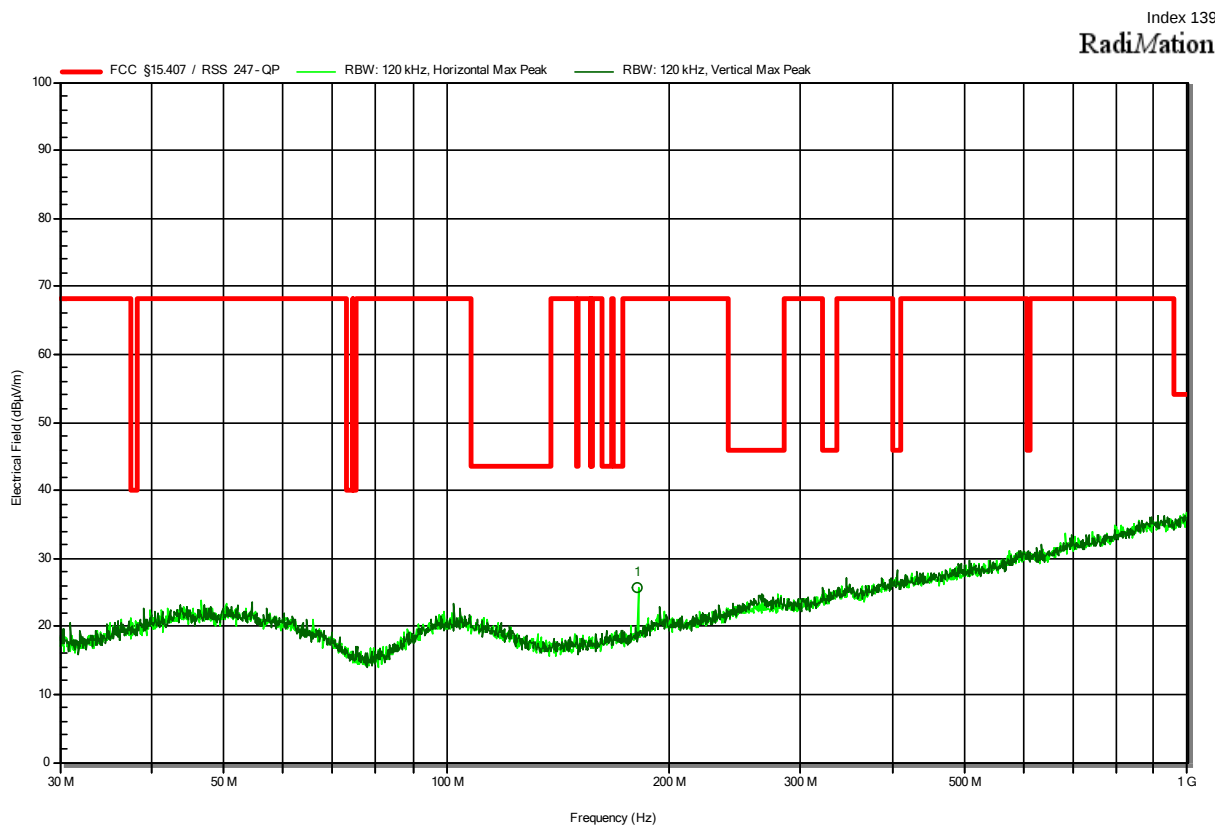
RadiMation



Frequency 17.269 GHz	Peak 56.24 dBμV/m	Peak Limit 68.2 dBμV/m	Peak Difference -11.96 dB	Peak Status Pass	Polarization Vertical
Frequency 17.269 GHz	RMS 48.62 dBμV/m	RMS Limit 68.2 dBμV/m	RMS Difference -19.58 dB	RMS Status Pass	Polarization Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck VULB 9162
 Measurement distance: 10 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5795 MHz
 Test Date: 2022-03-17
 Note:



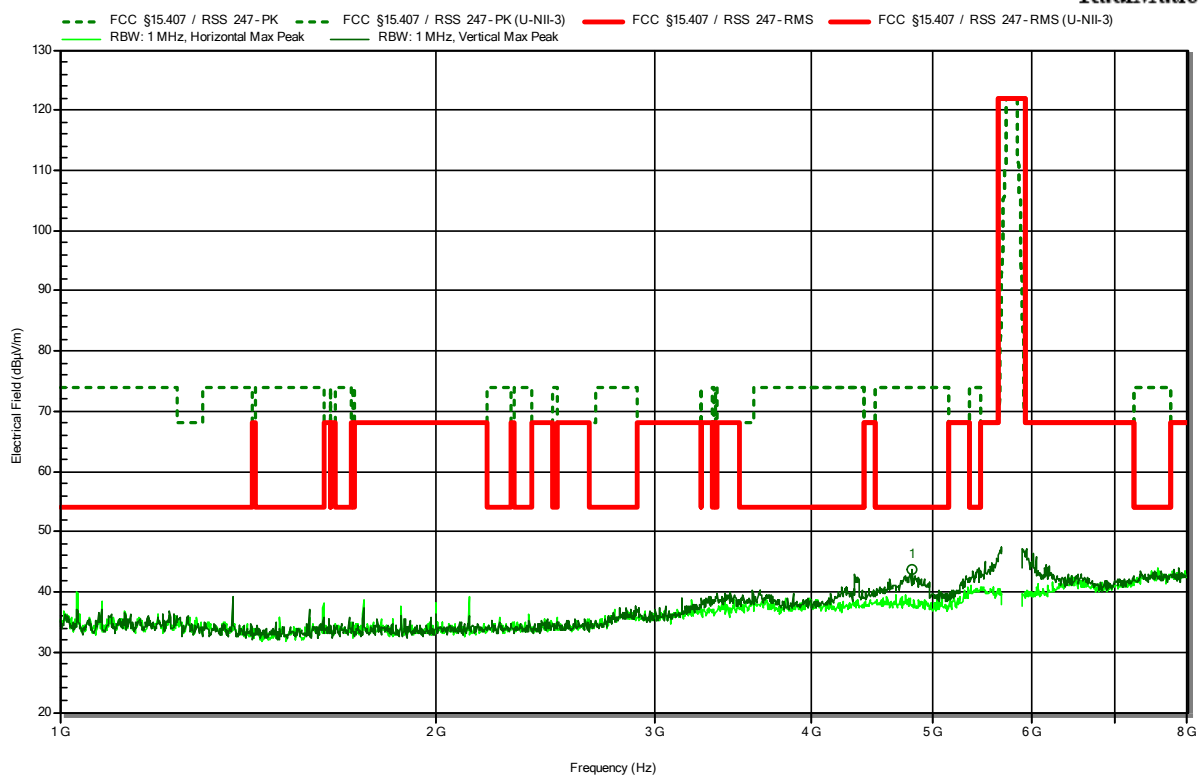
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
181.094 MHz	25.8 dBμV/m	68.2 dBμV/m	-42.4 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 a; 6 Mbps; ext. antenna; 5795 MHz
 Test Date: 2022-03-09
 Note:

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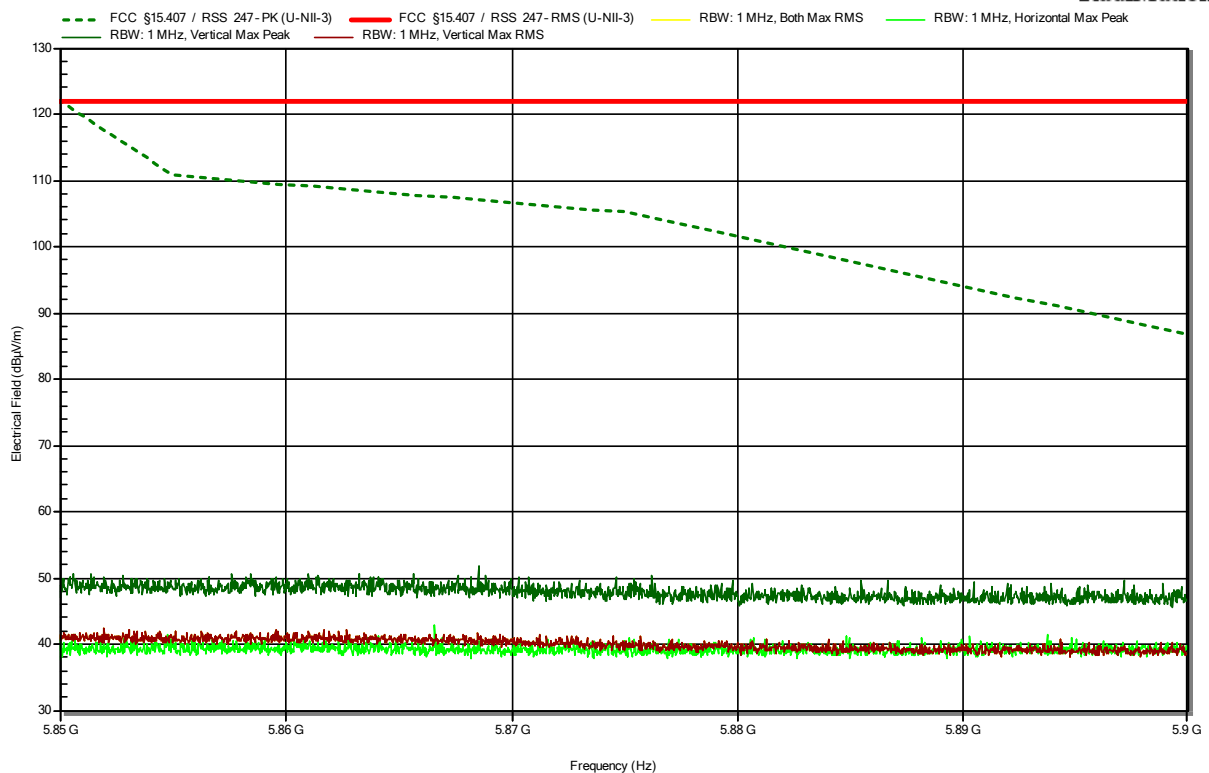
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
4.815 GHz	43.63 dBμV/m	74 dBμV/m	-30.37 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

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 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11n; HT40; MSC0; ext. antenna; 5795 MHz
 Test Date: 2022-03-09
 Note: upper band area

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RadiMation

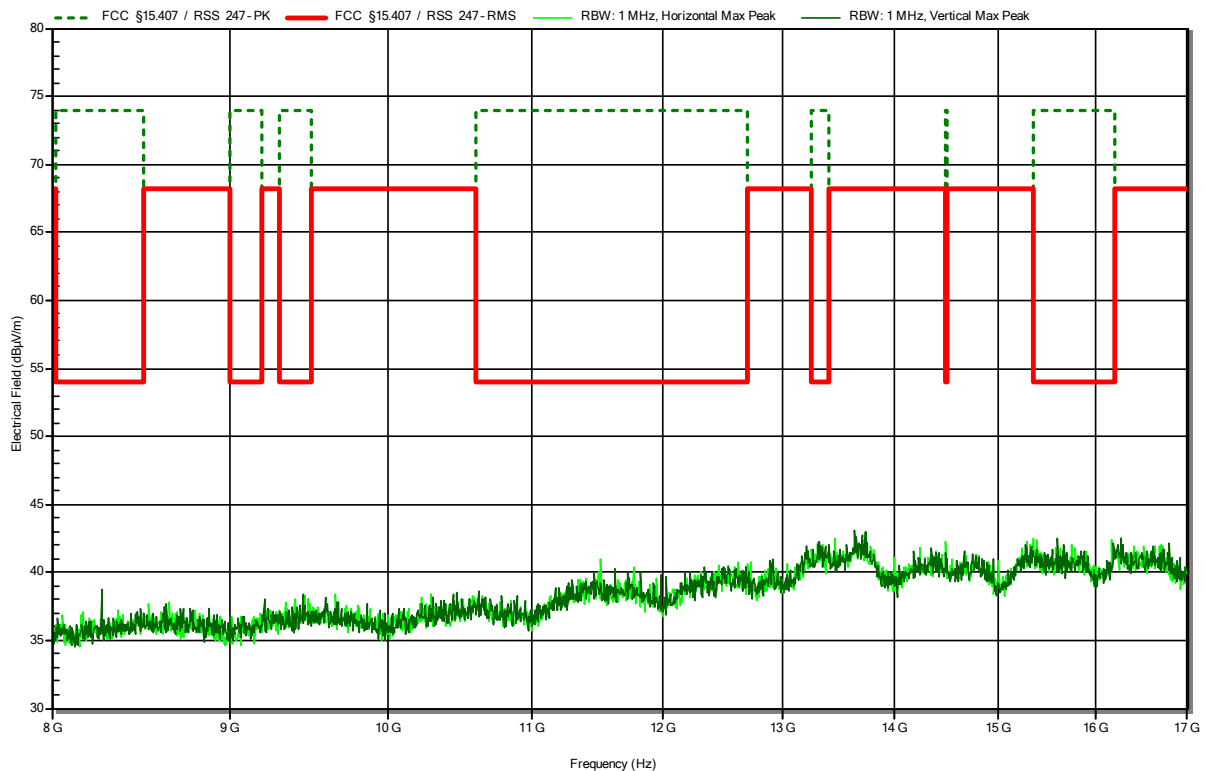


Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11n; HT40; MCS0; ext. antenna; 5795 MHz
 Test Date: 2022-03-08
 Note:

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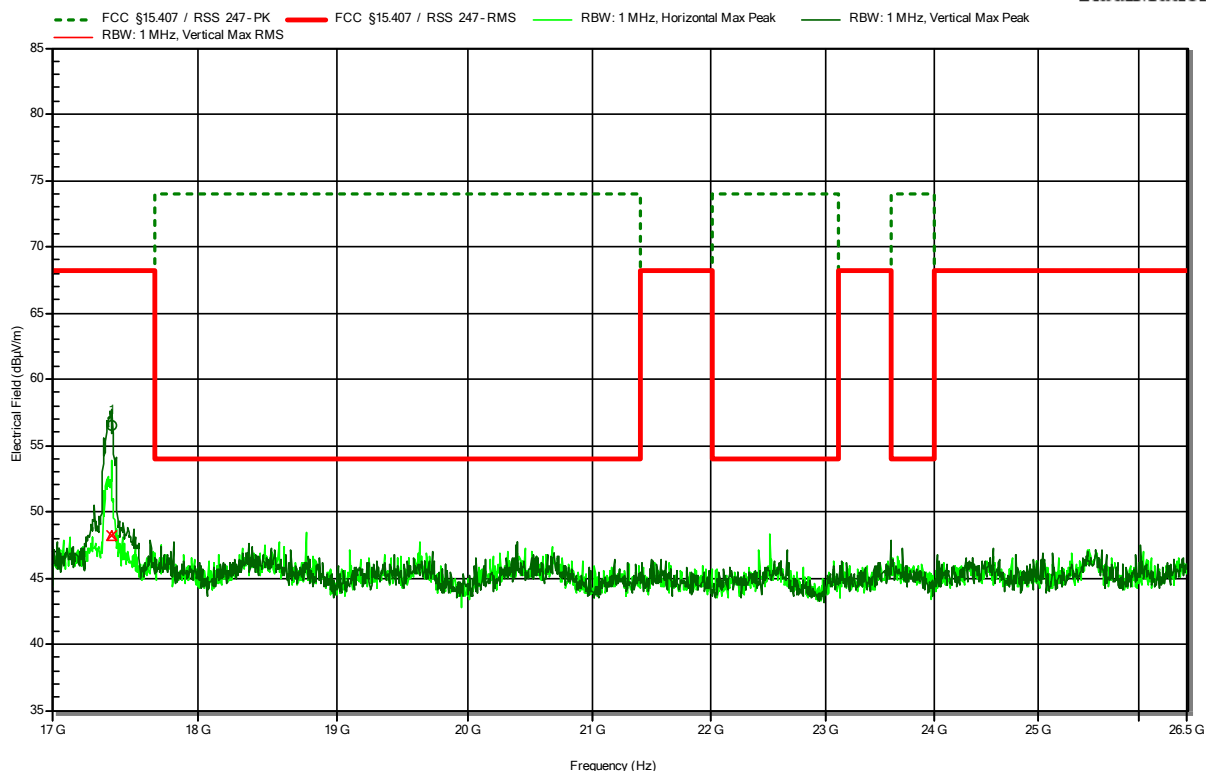


Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 n; MSC0; ext. antenna; 5795 MHz
 Test Date: 2022-03-22
 Note:

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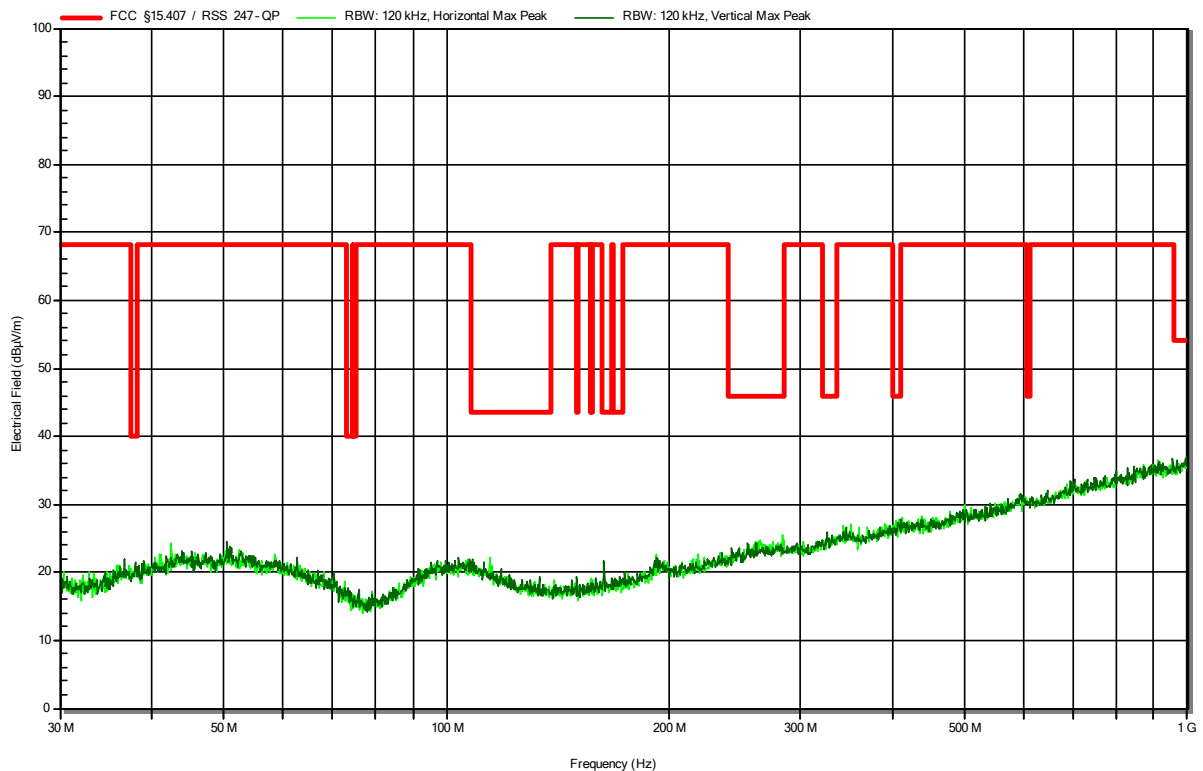
Frequency 17.398 GHz	Peak 56.56 dBμV/m	Peak Limit 68.2 dBμV/m	Peak Difference -11.64 dB	Peak Status Pass	Polarization Vertical
Frequency 17.398 GHz	RMS 48.25 dBμV/m	RMS Limit 68.2 dBμV/m	RMS Difference -19.95 dB	RMS Status Pass	Polarization Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck VULB 9162
 Measurement distance: 10 m
 Mode: Tx; IEEE802.11ac; HT80; MCS0; ext. antenna; 5210 MHz
 Test Date: 2022-03-17
 Note:

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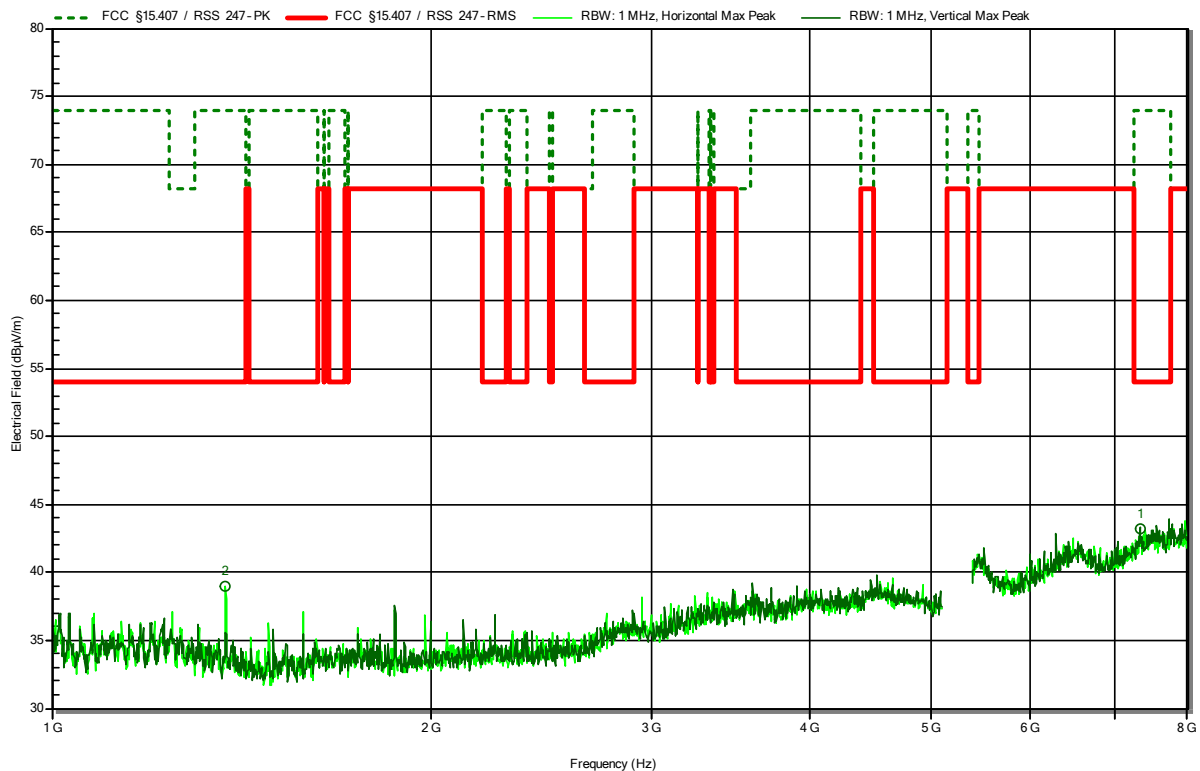


Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11ac; HT80; MCS0; ext. antenna; 5210 MHz
 Test Date: 2022-03-22
 Note:

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RadiMation



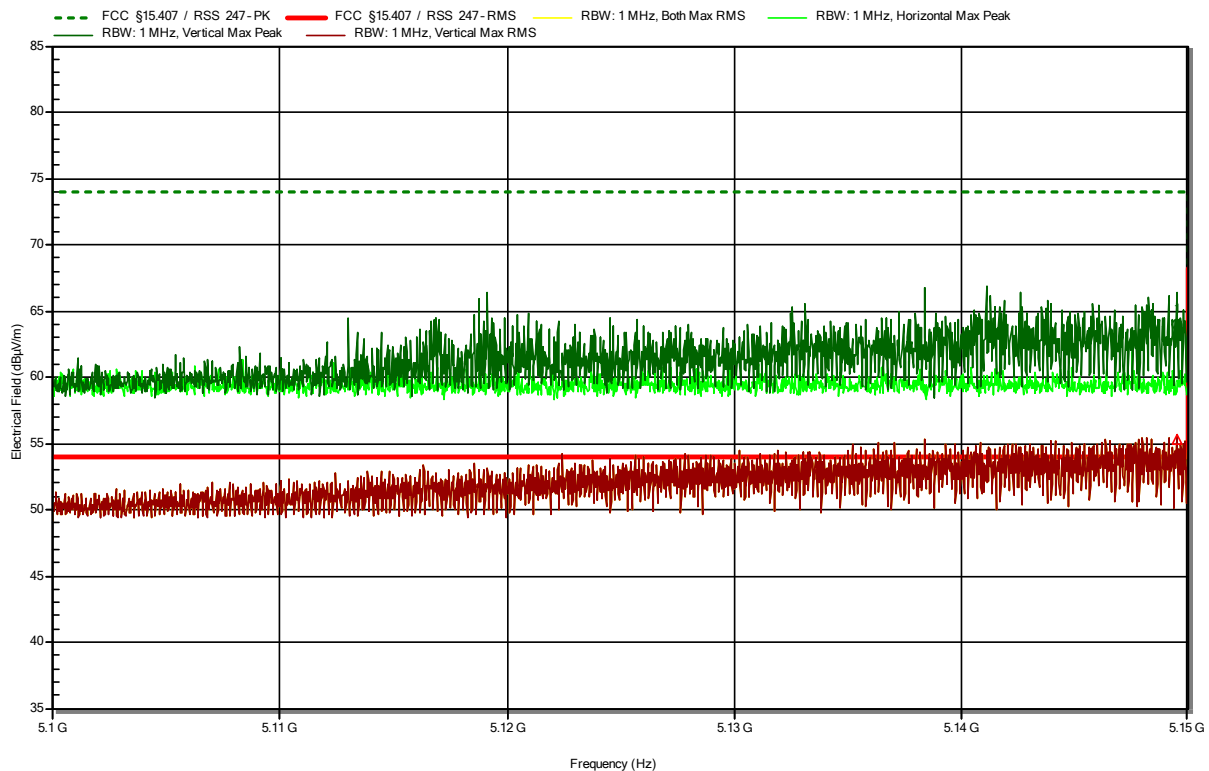
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
1.375 GHz	39.01 dBμV/m	74 dBμV/m	-34.99 dB	Pass	Horizontal
7.329 GHz	43.26 dBμV/m	74 dBμV/m	-30.74 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11ac; HT80; MCS0; ext. antenna; 5210 MHz
 Test Date: 2022-03-09
 Note: lower band area

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RadiMation



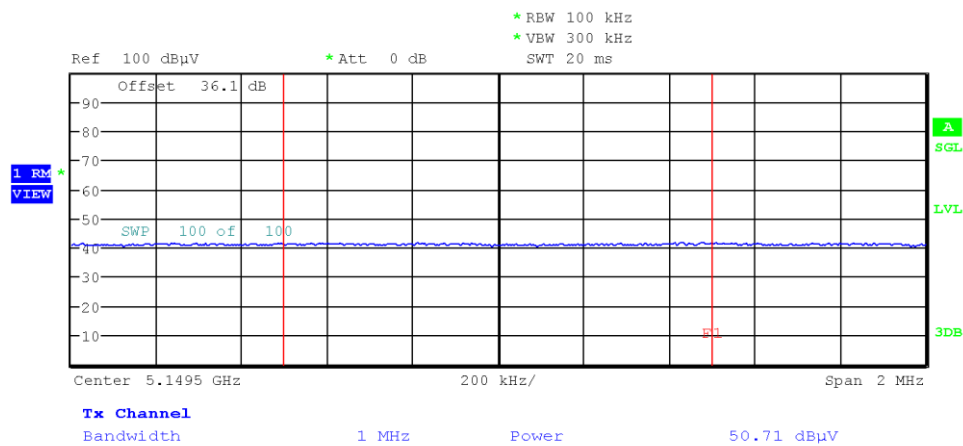
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
5.15 GHz	63.96 dBμV/m	74 dBμV/m	-10.04 dB	Pass	Vertical
Frequency	RMS	RMS Limit	RMS Difference	RMS Status	Polarization
5.15 GHz	55.27 dBμV/m	54 dBμV/m	1.27 dB	Pre-measurement	Vertical

Test Report No.: G0M-2108-9951-TFC407WF-V02

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

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Operator: Wilfried Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-03-09
 Operating Conditions: Tnom/Vnom
 Mode: Integration Method
 Note 1: 789033 D02 General UNII Test Procedures New Rules v02r01
 Note 2: Tx; IEEE802.11ac; HT80; MCS0; ext. antenna; 5210 MHz
 Note 3: lower band area UNII-1, final Measurement



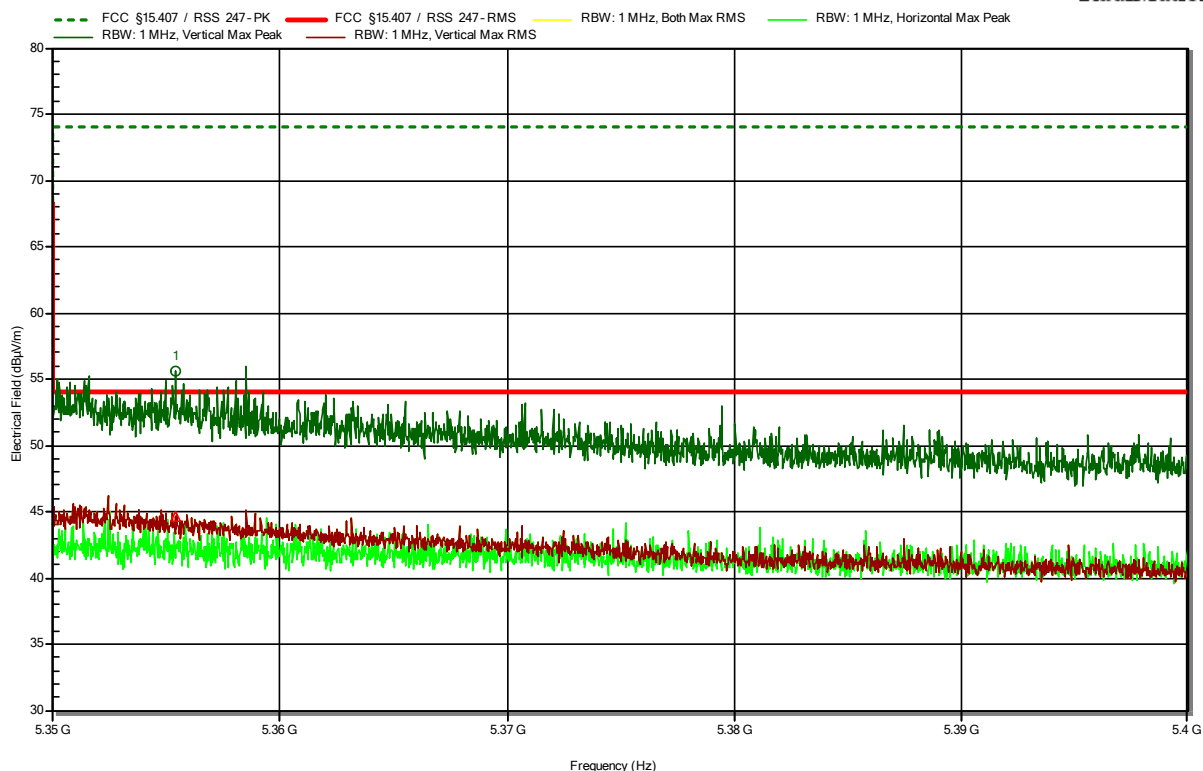
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Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 ac; MCS0; ext. antenna; 5210 MHz
 Test Date: 2022-03-09
 Note: upper bandedge

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RadiMation



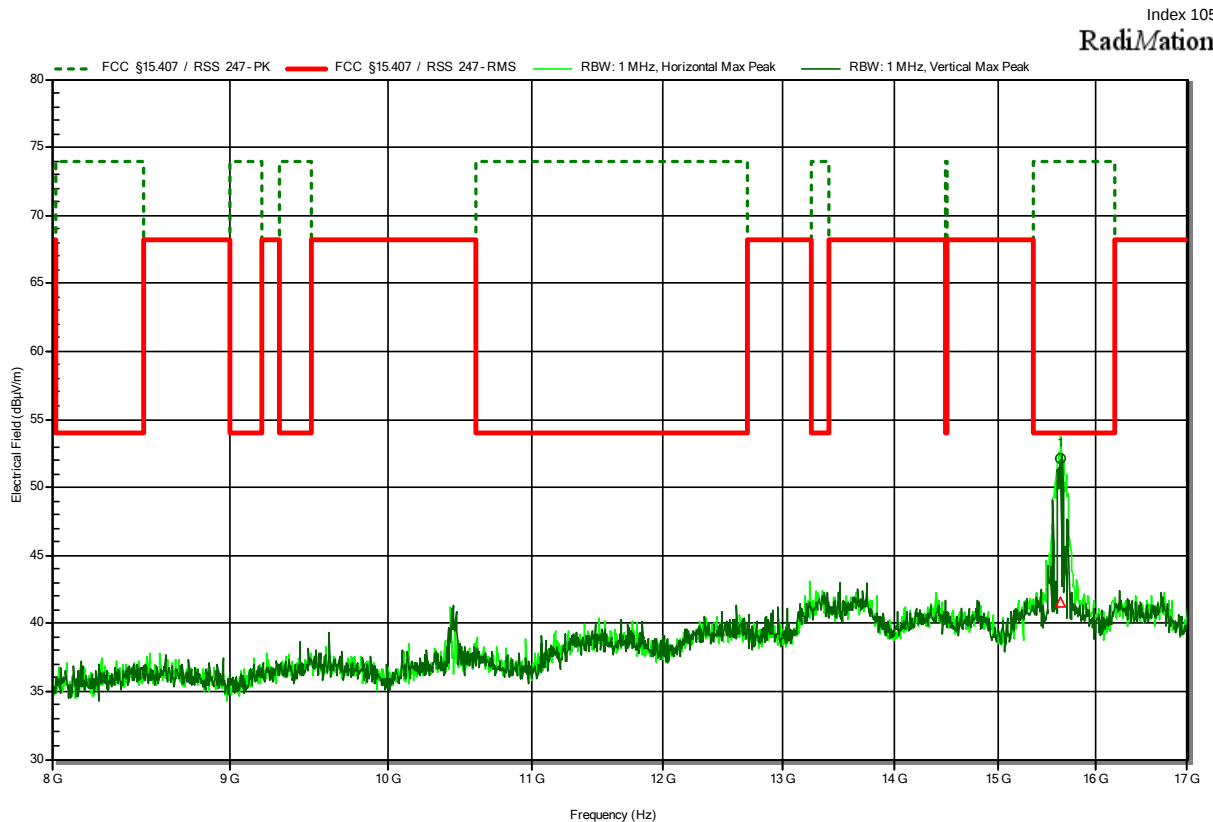
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
5.355 GHz	55.55 dBμV/m	74 dBμV/m	-18.45 dB	Pass	Vertical
Frequency	RMS	RMS Limit	RMS Difference	RMS Status	Polarization
5.355 GHz	44.65 dBμV/m	54 dBμV/m	-9.35 dB	Pass	Vertical

Test Report No.: G0M-2108-9951-TFC407WF-V02

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

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11ac; HT80; MCS0; ext. antenna; 5210 MHz
 Test Date: 2022-03-08
 Note:



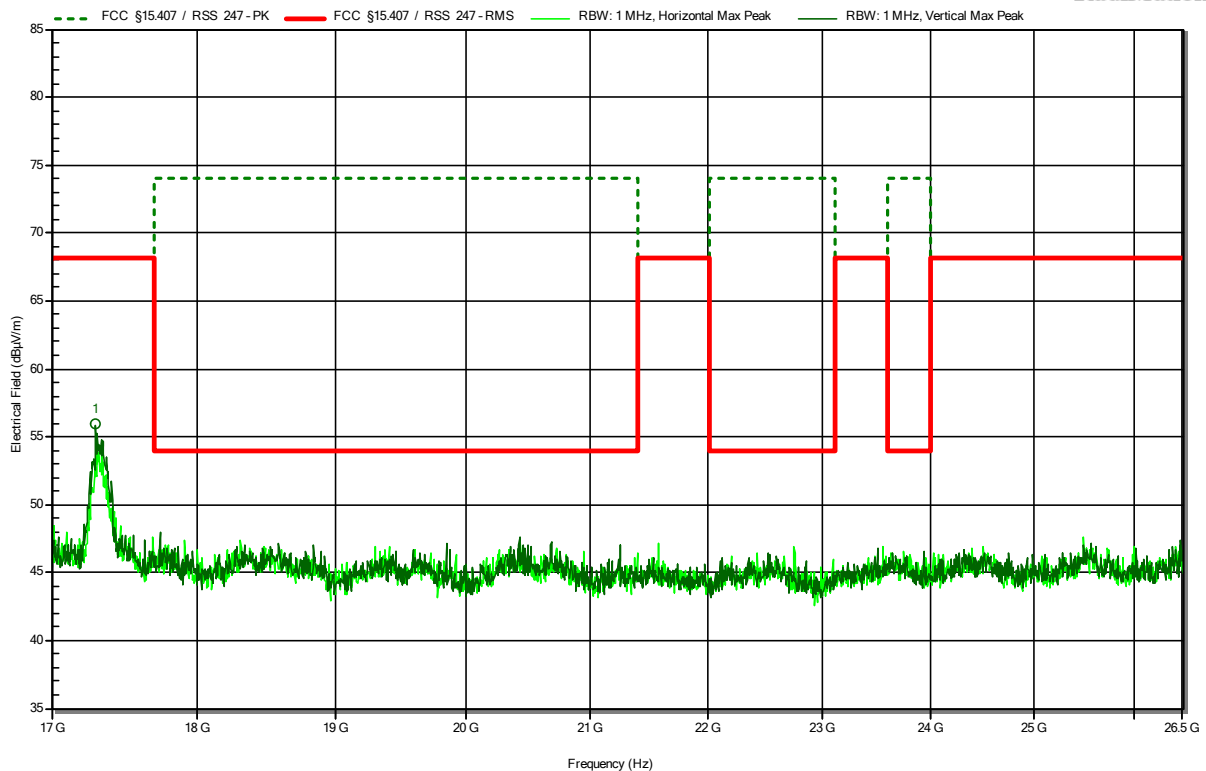
Frequency 15.632 GHz	Peak 52.11 dBμV/m	Peak Limit 74 dBμV/m	Peak Difference -21.89 dB	Peak Status Pass	Polarization Horizontal
Frequency 15.632 GHz	RMS 41.59 dBμV/m	RMS Limit 54 dBμV/m	RMS Difference -12.41 dB	RMS Status Pass	Polarization Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11ac; HT80; MCS0; ext. antenna; 5210 MHz
 Test Date: 2022-03-22
 Note:

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RadiMation



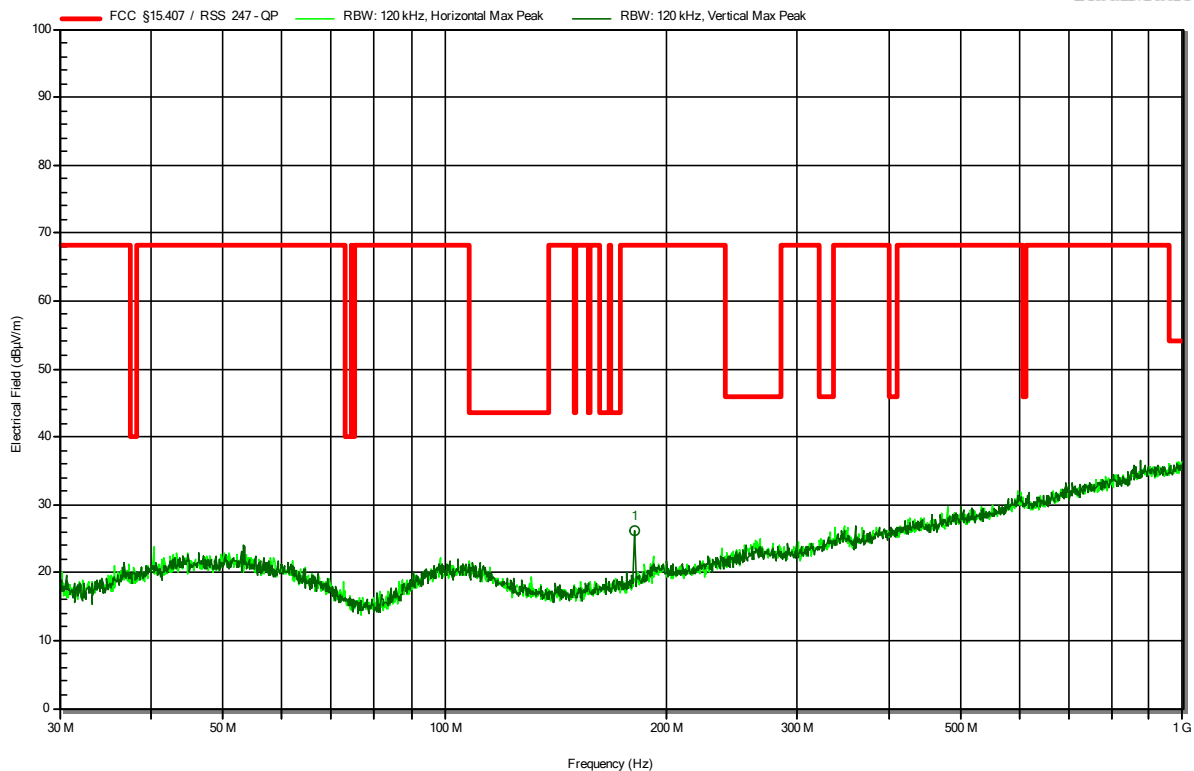
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
17.294 GHz	55.93 dBμV/m	68.2 dBμV/m	-12.27 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Voigt
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck VULB 9162
 Measurement distance: 10 m
 Mode: Tx; IEEE802.11ac; HT80; MCS0; ext. antenna; 5775 MHz
 Test Date: 2022-03-17
 Note:

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RadiMation



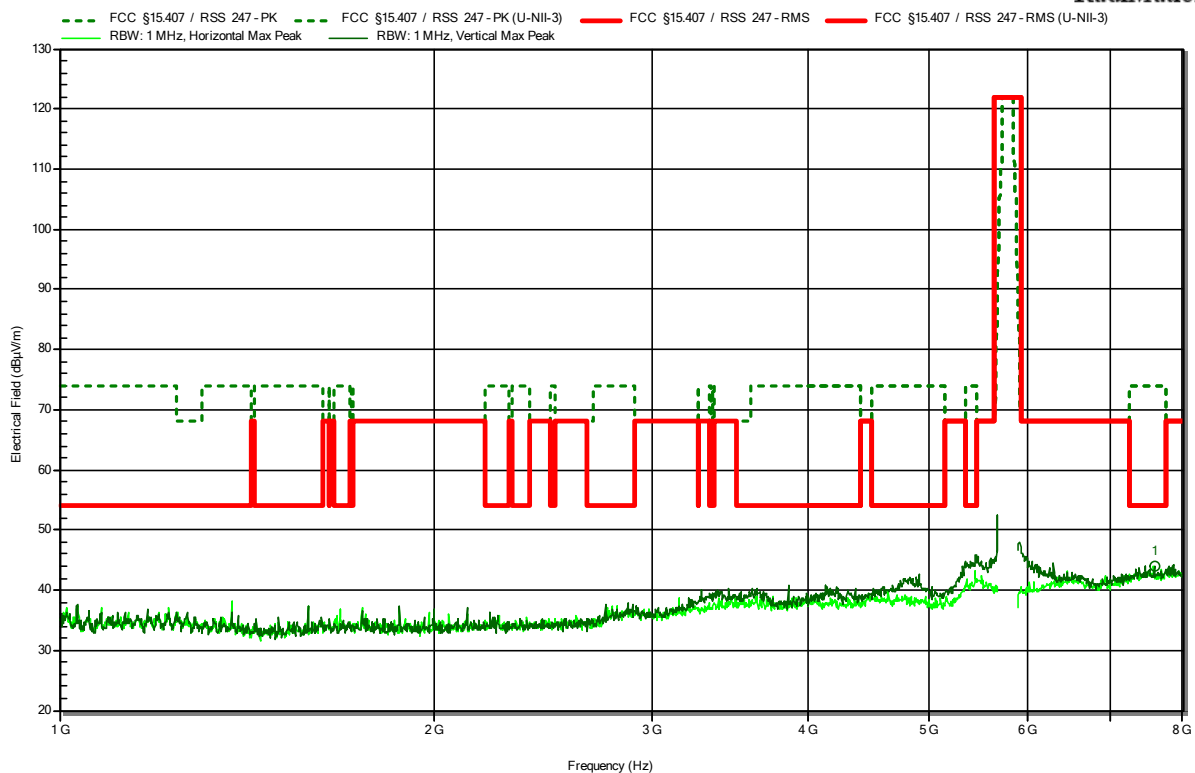
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
180.447 MHz	26.25 dBμV/m	68.2 dBμV/m	-41.95 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
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 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11ac; HT80; MCS0; ext. antenna; 5775 MHz
 Test Date: 2022-03-22
 Note:

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
7.59 GHz	43.98 dBμV/m	74 dBμV/m	-30.02 dB	Pass	Vertical

Test Report No.: G0M-2108-9951-TFC407WF-V02

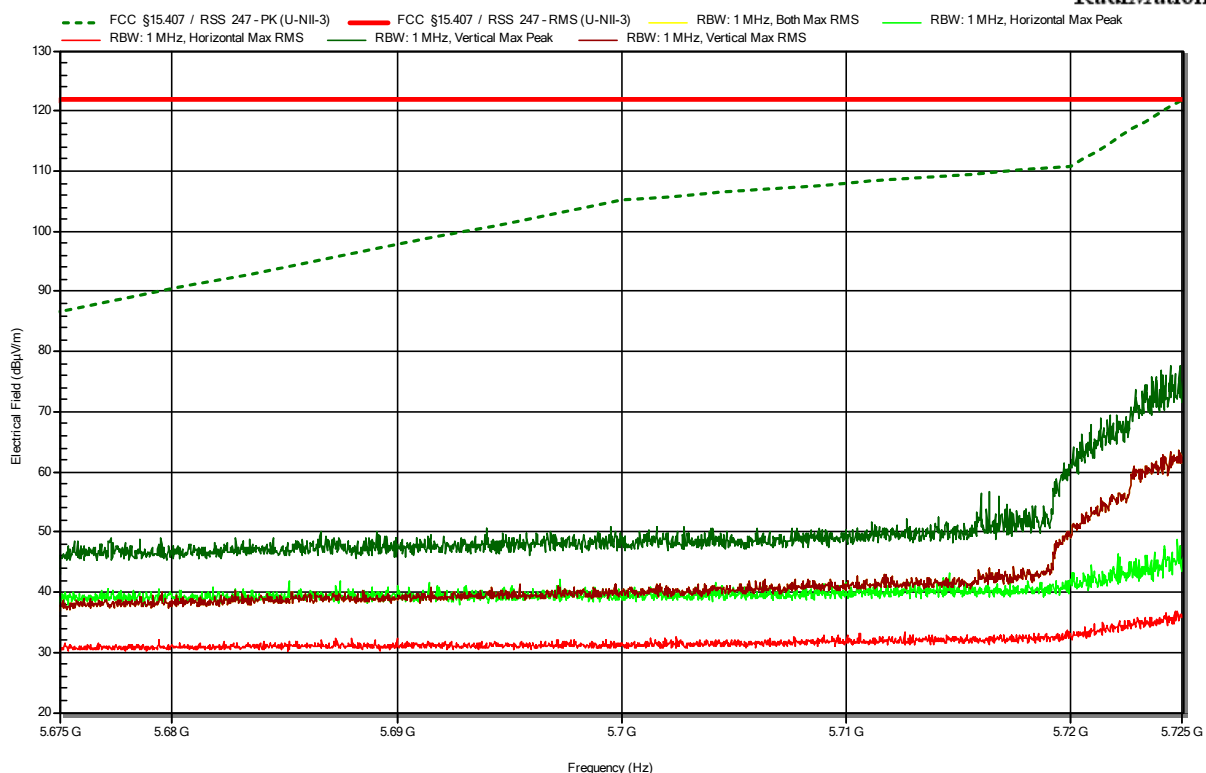
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.407

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 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 ac; MSC0; ext. antenna; 5775 MHz
 Test Date: 2022-03-09
 Note: lower band area

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RadiMation

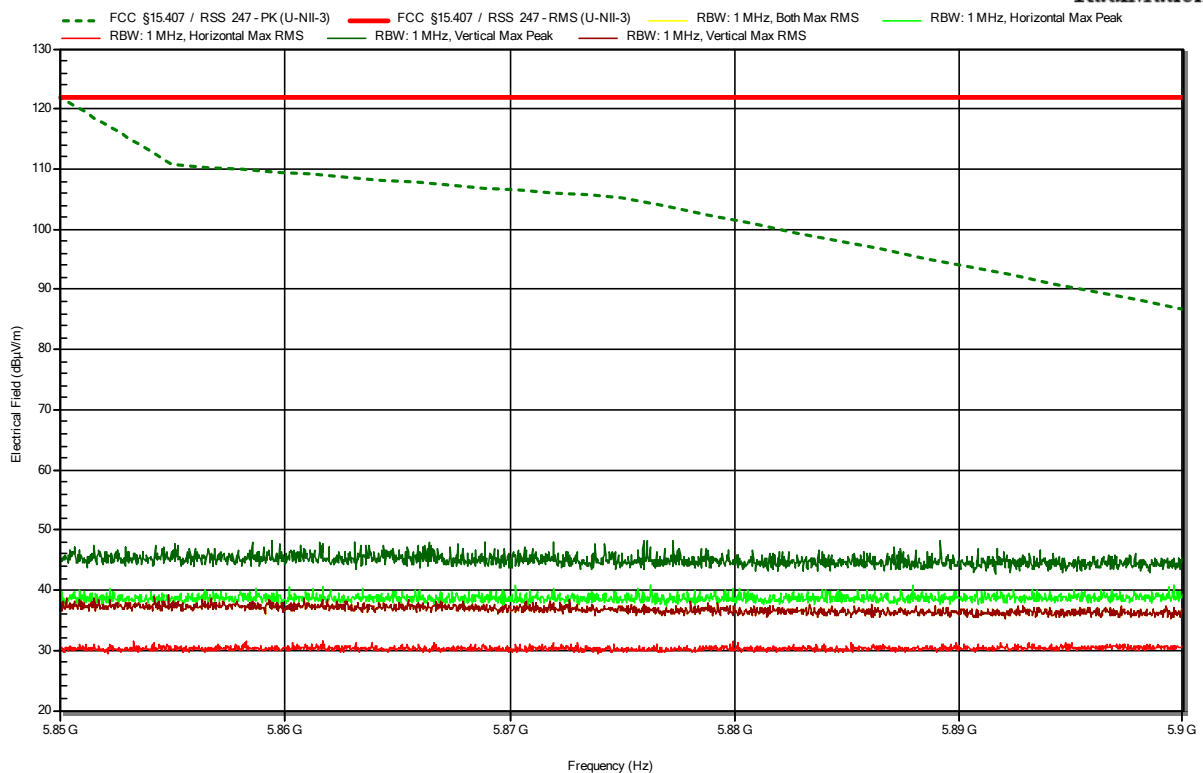


Radiated Spurious Emissions according to 47 CFR Part 15.407

Project Number: G0M-2108-9951
 Applicant: Panasonic Industrial Devices Europe GmbH
 Model Description: Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module
 Model: ENWF9408A1EF
 Test Sample ID: 37323
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11 ac; MSC0; ext. antenna; 5775 MHz
 Test Date: 2022-03-09
 Note: upper band area

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RadiMation

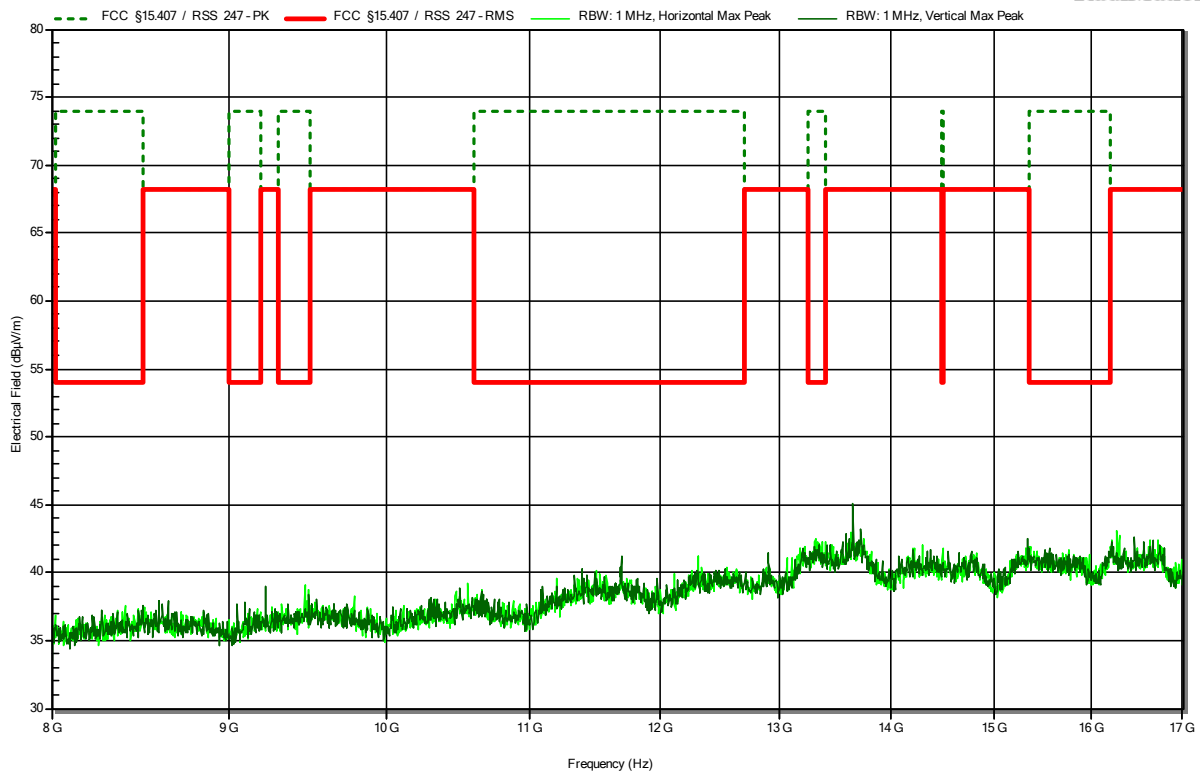


Radiated Spurious Emissions according to 47 CFR Part 15.407

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 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Treffke
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11ac; HT80; MCS0; ext. antenna; 5775 MHz
 Test Date: 2022-03-08
 Note:

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RadiMation

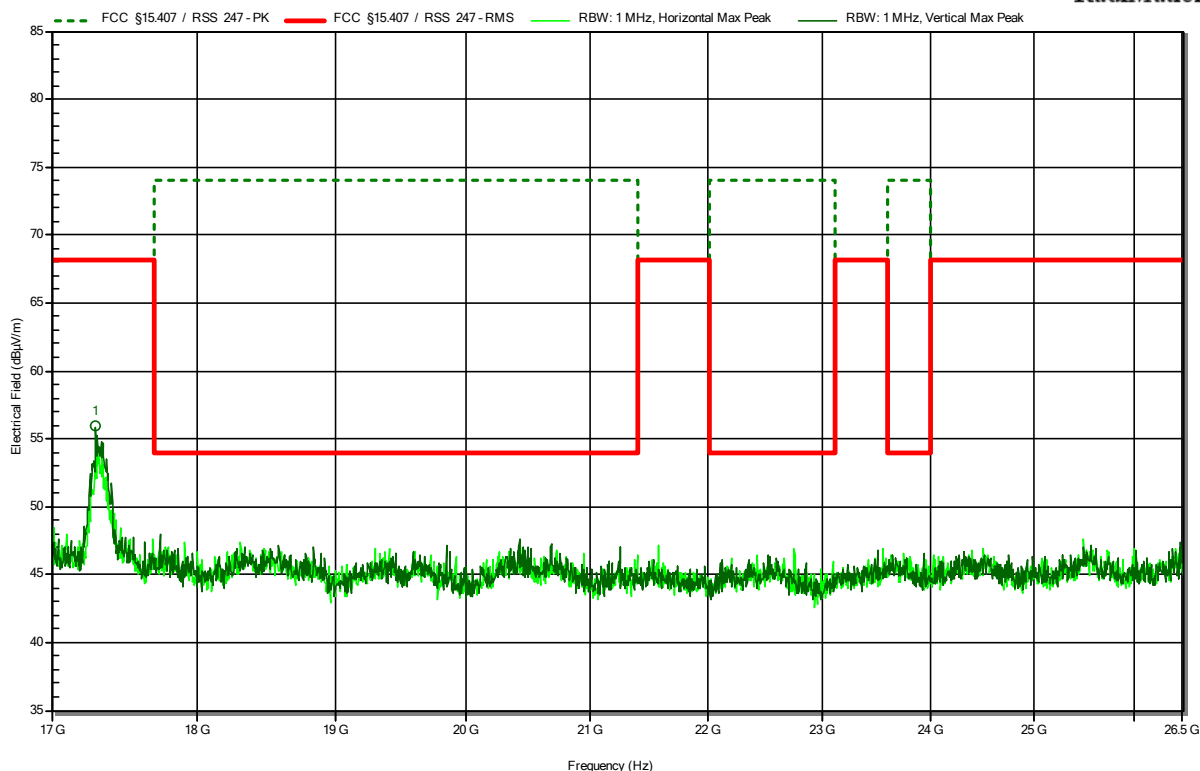


Radiated Spurious Emissions according to 47 CFR Part 15.407

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 Test Site: Eurofins Product Service GmbH
 Operator: Mrs Hoang
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 24 °Celsius, Vnom: 3.3 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; IEEE802.11ac; HT80; MCS0; ext. antenna; 5775 MHz
 Test Date: 2022-03-22
 Note:

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
17.294 GHz	55.93 dBμV/m	68.2 dBμV/m	-12.27 dB	Pass	Vertical

== = END OF TEST REPORT == =

Test Report No.: G0M-2108-9951-TFC407WF-V02

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