# RADIO REPORT

**FCC 47 CFR Part 15C**
**ISED Canada RSS-247**

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

| | |
|---|---|
| **Report Reference No** | G0M-2108-9951-TFC247WF-V01 |
| **Testing Laboratory** | Eurofins Product Service GmbH |
| Address | Storkower Str. 38c<br>15526 Reichenwalde<br>Germany |
| Accreditation | DAkkS - Registration number : D-PL-12092-01-03 (ISED)<br>ISED Testing Laboratory site: 3470A<br>DAkkS - Registration number : D-PL-12092-01-04 (FCC)<br>FCC Filed Test Laboratory, Reg.-No.: 96970 |
| **Applicant** | Panasonic Industrial Devices Europe GmbH |
| **Address** | Zeppelinstr. 19<br>21337 Lüneburg<br>GERMANY |
| **Test Specification** | 47 CFR Part 15C<br>RSS-247, Issue 2, 2017-02<br>RSS-Gen, Issue 5, Amendment 2, 2021-02 |
| 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 |
| IC | 216Q-9028 |
| **Test Result** | **PASSED** |

| Possible test case verdicts: | |
|---|---|
| Required by standard but not tested | N/T |
| Not required by standard | N/R |
| Not applicable to EUT | N/A |
| Test object does meet the requirement | P(PASS) |
| Test object does not meet the requirement | F(FAIL) |
| **Testing:** | |
| Test Lab Temperature | 20 °C - 30 °C |
| Test Lab Humidity | 25 % - 55 % |
| Date of receipt of test item | 2021-12-09 |
| **Report:** | |

| | | |
|---|---|---|
| Compiled by | Odai Qawasmeh | |
| Tested by (+ signature) | Odai Qawasmeh | |
| Tested by (+ signature)<br>(Responsible for Test) | Wilfried Treffke | |
| Approved by (+ signature)<br>(Deputy Head of Lab) | Toralf Jahn | |
| Date of Issue | 2022-04-27 | |
| Total number of pages | 70 | |

**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 | |

## ABBREVIATIONS AND ACRONYMS

| Acronyms | |
|---|---|
| Acronym | Description |
| BPSK | Binary Phase Shift Keying |
| DSSS | Direct Sequence Spread Spectrum |
| EUT | Equipment Under Test |
| FCC | Federal Communications Commission |
| HT | High Throughput |
| IEEE 802.11 | MAC and PHY Layer for WiFi |
| ISED | Innovation, Science and Economic Development Canada |
| OFDM | Orthogonal Frequency Division Multiplexing |
| QAM | Quadrature Amplitude Modulation |
| QPSK | Quadrature Phase Shift Keying |
| RBW | Resolution bandwidth |
| RMS | Root mean square |
| VBW | Video bandwidth |
| $V_{NOM}$ | Nominal supply voltage |

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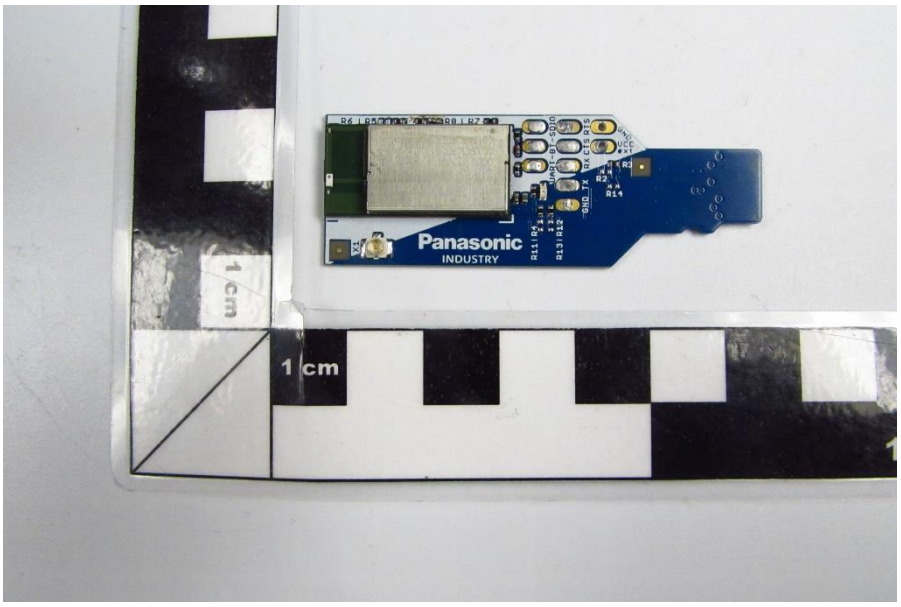
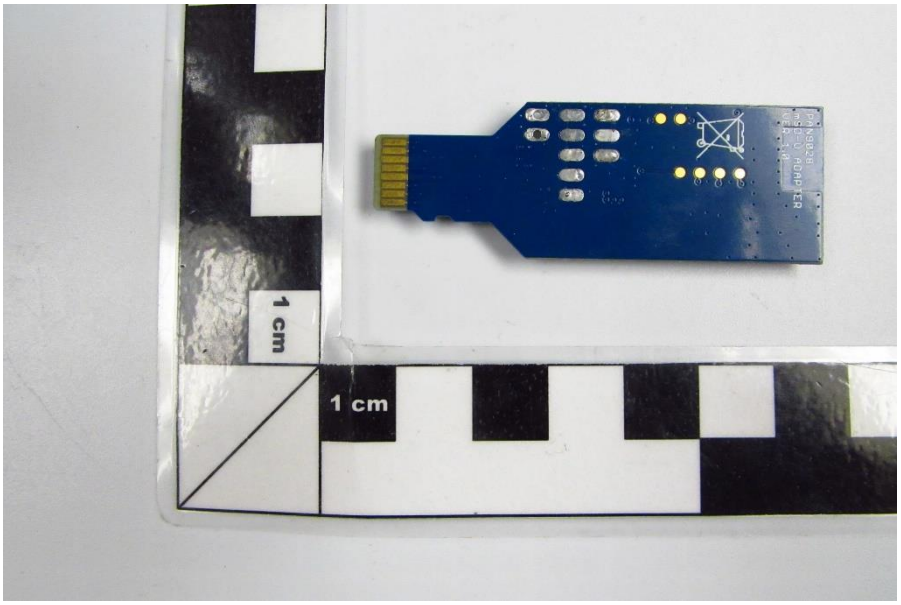
# 1 Equipment (Test Item) Under Test

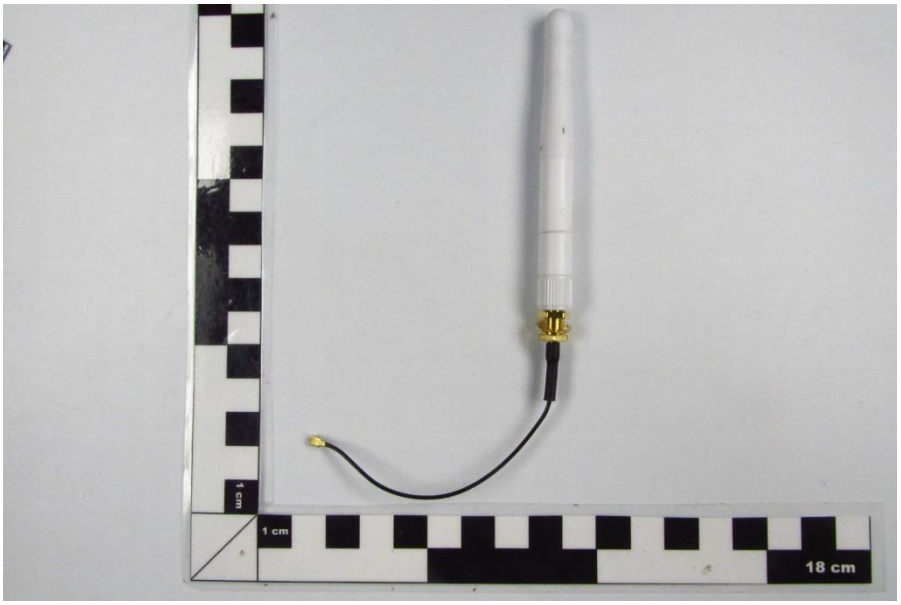
| | | |
|---|---|---|
| Description | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module | |
| Model | ENWF9408A1EF | |
| Additional Model(s) | None | |
| Brand Name(s) | PAN9028 | |
| Serial Number(s) | Prototype | Test Sample ID 37322 |
| Hardware Version(s) | 04 | |
| Software Version(s) | 01 | |
| PMN | 1. PAN9028 2. PAN9028 | |
| HVIN | 1. ENWF9408A1EF 2. ENWF9408A2EF | |
| FVIN | N/A | |
| HMN | N/A | |
| FCC ID | T7V9028 | |
| IC | 216Q-9028 | |
| Equipment type | Radio Module | |
| Radio type | Transceiver | |
| Assigned frequency bands | 2400.0 MHz - 2483.5 MHz | |
| Radio technology | IEEE 802.11 b/g/n (HT20 + HT40) | |
| Modulation | BPSK, QPSK, 16-QAM, 64-QAM | |
| Number of antenna ports | 1 | |
| Antenna | Type | External |
| | Model | X9001091-W3DRMW |
| | Manufacturer | Kyocera AVX |
| | Gain | 1.8 dBi (declared by manufacturer) |
| Supply Voltage | $V_{NOM}$ | 3.3 VDC |
| Operating Temperature | $T_{NOM}$ | 25 °C |
| Manufacturer | Panasonic Industrial Devices Europe GmbH<br>Zeppelinstr. 19<br>21337 Lüneburg<br>GERMANY | |

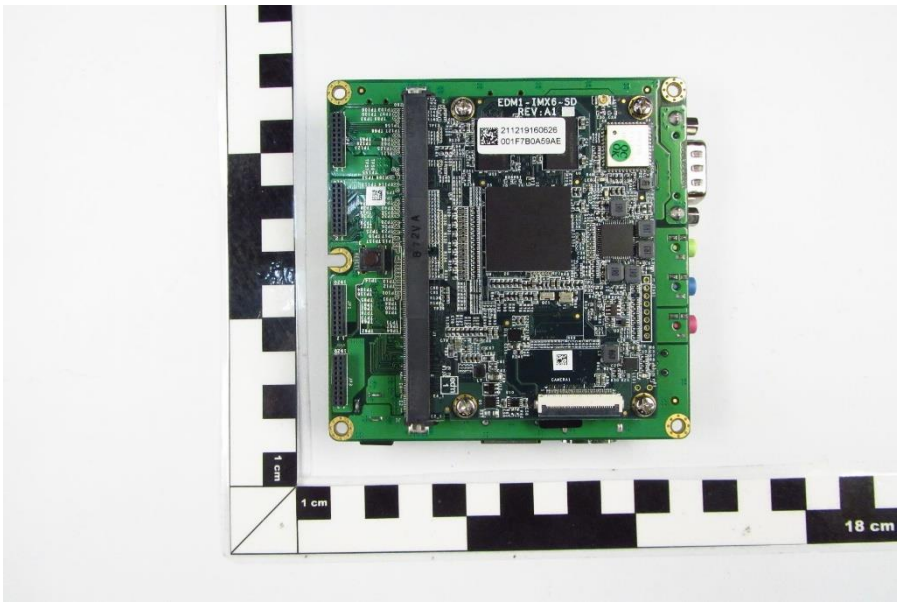
## 1.1 Photos – Equipment External

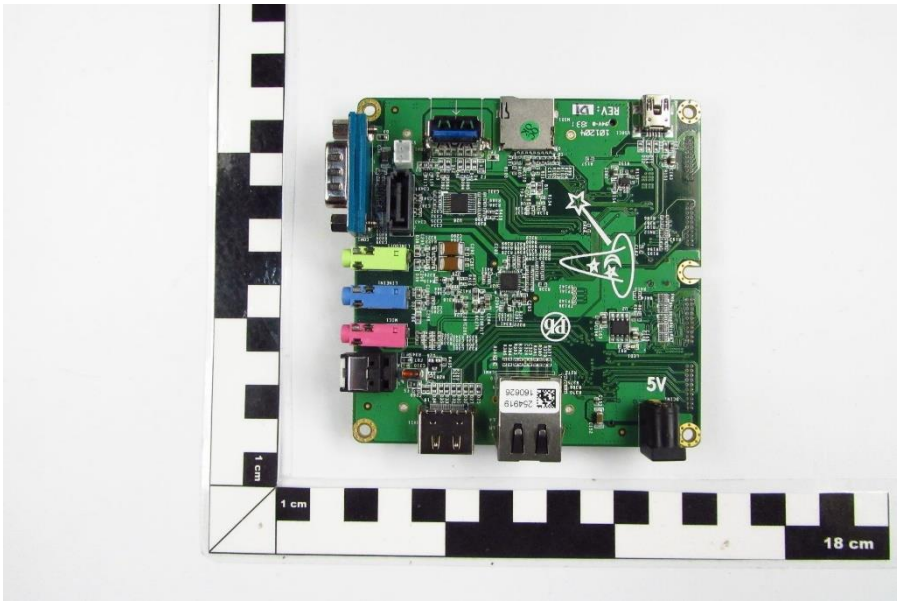
| EUT Top View |
| --- |
|  |



| EUT Bottom View |
| --- |
|  |

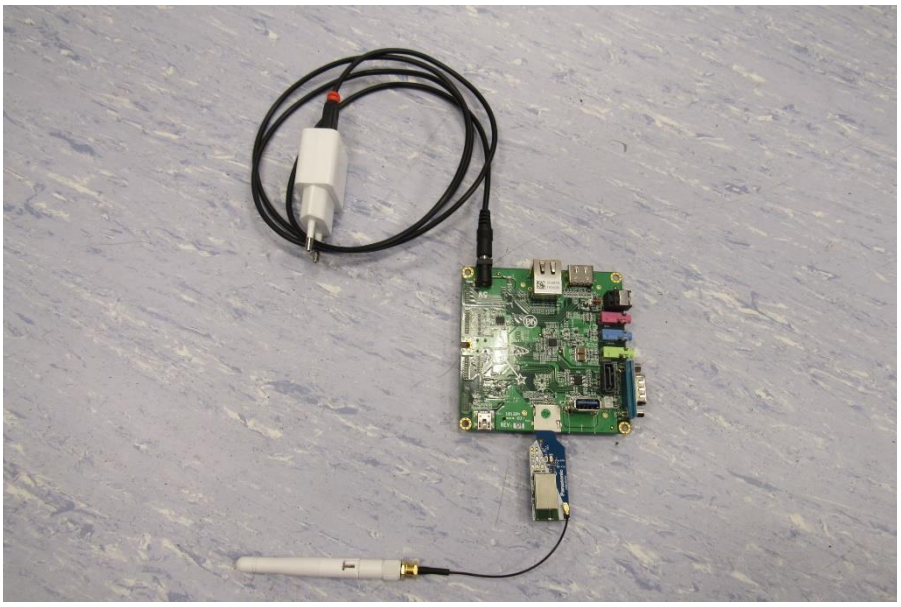
| Antenna |
| --- |
|  |

| Evaluation Board Bottom View |
| --- |
|  |

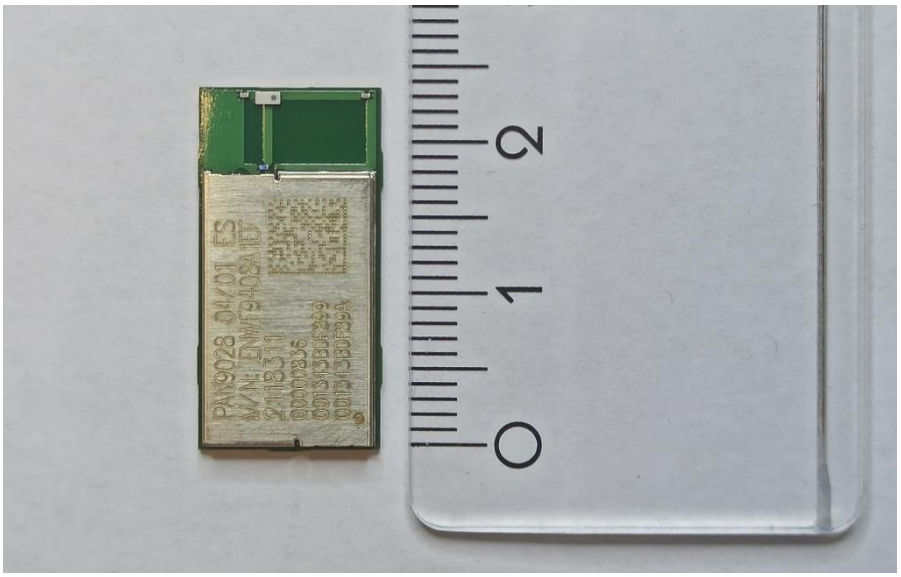
| Evaluation Board Top View |
| --- |
|  |

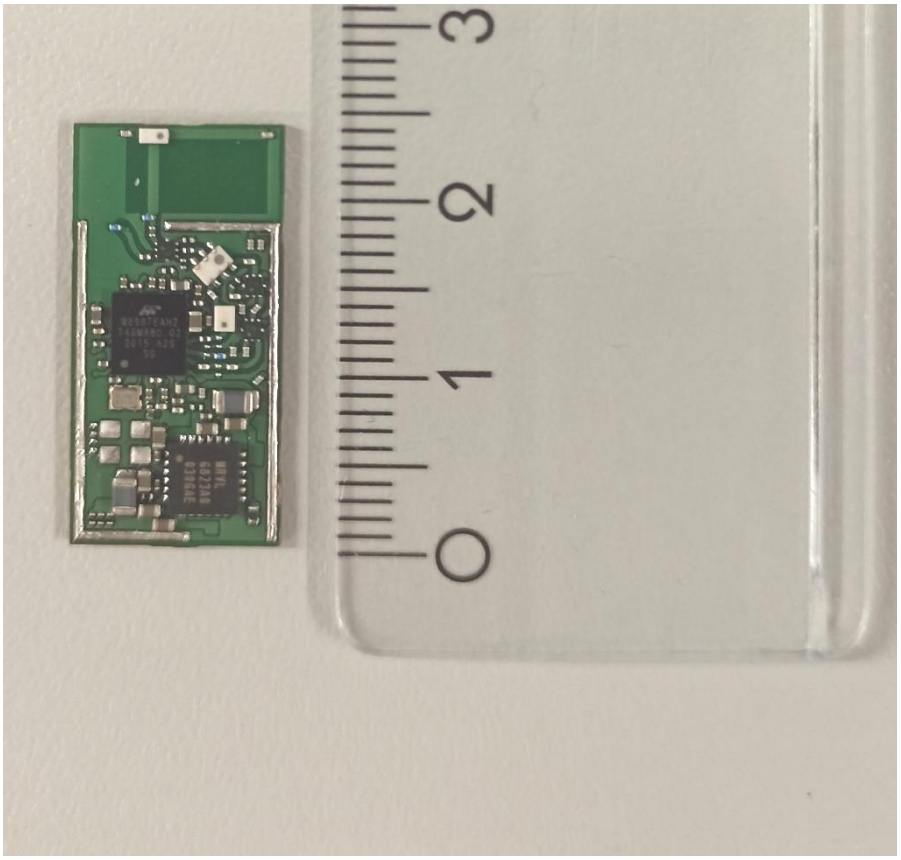


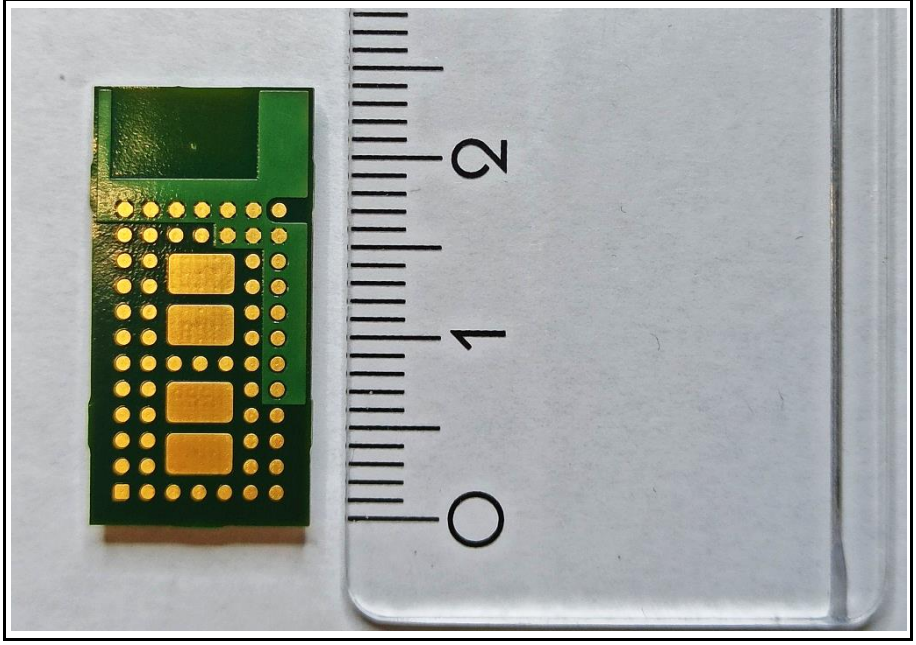
| Supply cable |
| --- |
| |

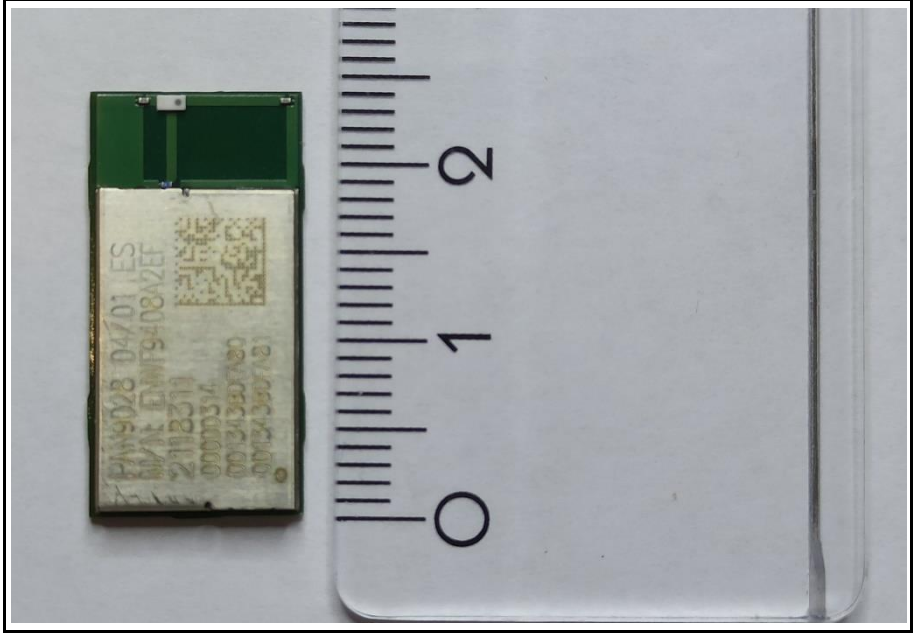
| EUT with auxiliary equipment |
| --- |
|  |

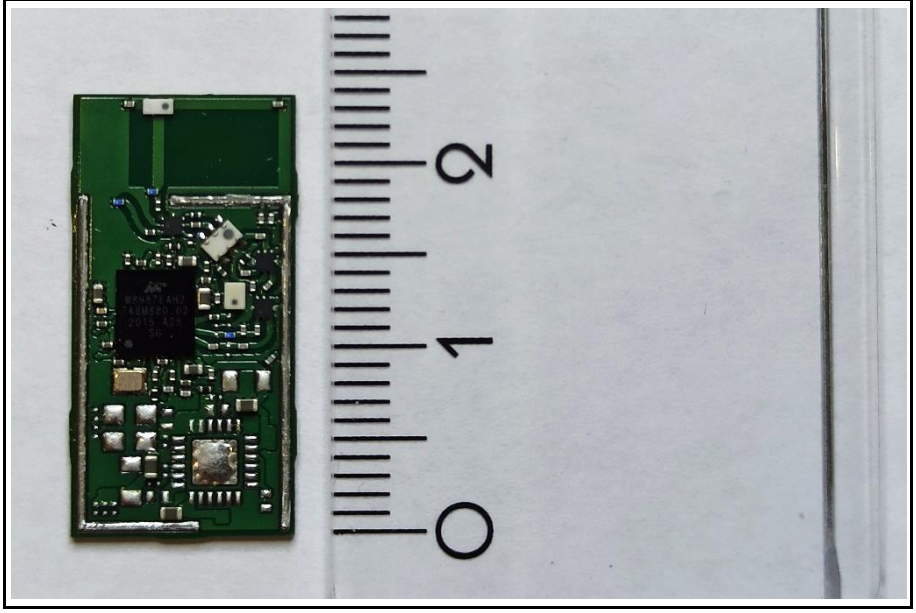
## 1.1 Photos – Equipment Internal

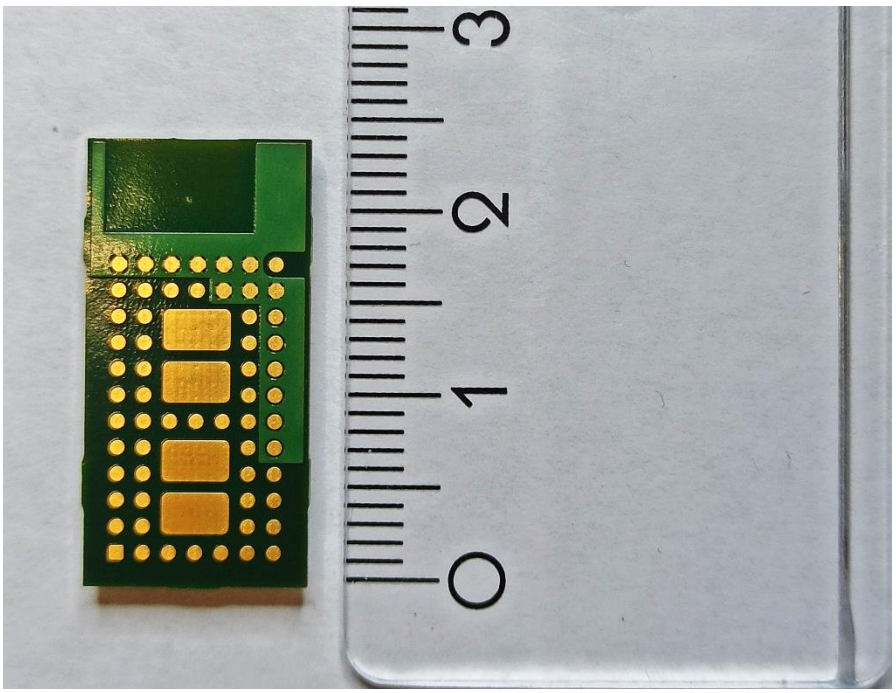
| ENWF9408A1EF_top_case |
|---|
|  |

| ENWF9408A1EF_top_nocase |
|---|
|  |

| ENWF9408A1EF_back |
| --- |
|  |

| ENWF9408A2EF_top_case |
| --- |
|  |

| ENWF9408A2EF_top_nocase |
| --- |
|  |

| ENWF9408A2EF_back |
| --- |
|  |

## 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 | | | |
| Comment: | | | | |

## 1.3 Test Modes

| Mode | Description |
|---|---|
| DSSS<br>(IEEE 802.11b) | Mode = Transmit<br>Modulation = BPSK<br>Spreading = DSSS<br>Bandwidth = 20 MHz<br>Duty cycle = 100%<br>Power setting = Maximum<br>Data rate = 1 Mbps |
| OFDM<br>(IEEE 802.11g) | Mode = Transmit<br>Modulation = OFDM<br>Bandwidth = 20 MHz<br>Duty cycle = 100%<br>Power setting = Maximum<br>Data rate = 9 Mbps |
| HT20<br>(IEEE 802.11n) | Mode = Transmit<br>Modulation = OFDM<br>Bandwidth = 20 MHz<br>Duty cycle = 100%<br>Power setting = Maximum<br>Data rate = MCS 2 |
| HT40<br>(IEEE 802.11n) | Mode = Transmit<br>Modulation = OFDM<br>Bandwidth = 40 MHz<br>Duty cycle = 100%<br>Power setting = Maximum<br>Data Rate = MCS 0 |
| Receive | Mode = Receive |
| Comment: The above settings were found as worst case during pre-tests. | |

## 1.4 Test Frequencies

| Designator | Mode | Channel | Frequency [MHz] |
|---|---|---|---|
| F1 | Tx | 1 | 2412 |
| F3 | Tx / Rx | 6 | 2437 |
| F5 | Tx | 11 | 2462 |

## 1.5 Sample emission level calculation

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

Reading:

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

A.F.:

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

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

Net:

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

Limit:

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

Limit (dBµV/m) = 20*log (µV/m)

Margin:

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

Example only:

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

## 2 Result Summary

| FCC 47 CFR Part 15C, ISED RSS-247 | | | | |
|---|---|---|---|---|
| **Product Standard Reference** | **Requirement** | **Reference Method** | **Result** | **Remarks** |
| ISED RSS-Gen, Issue 5 A2 (section 6.7) | Occupied Bandwidth | ANSI C63.10-2013 | N/R | Informational only |
| FCC § 15.247(a)(2) ISED RSS-247, Issue 2 (section 5.2) | 6 dB Bandwidth | ANSI C63.10-2013 | N/T | |
| FCC § 15.247(b) ISED RSS-247, Issue 2 (section 5.4) | Maximum peak conducted power | ANSI C63.10-2013 | N/T | |
| FCC § 15.247(e) ISED RSS-247, Issue 2 (section 5.2) | Power spectral density | ANSI C63.10-2013 | N/T | |
| FCC § 15.207 ISED RSS-247, Issue 2 (section 3.1) | AC power line conducted emissions | ANSI C63.10-2013 | PASS | |
| FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5) | Band edge compliance | ANSI C63.10-2013 | N/T | |
| FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5) | Conducted spurious emissions | ANSI C63.10-2013 | N/T | |
| FCC § 15.247(d) FCC § 15.209 ISED RSS-Gen, Issue 5 A2 (section 6.13) | Transmitter radiated spurious emissions | ANSI C63.10-2013 | PASS | |
| ISED RSS-247, Issue 2 (section 3.1) | Receiver radiated spurious emissions | ANSI C63.4-2014 | PASS | |
| Comment: | | | | |

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

# 3 Test Conditions and Results

## 3.1 Test Conditions and Results - AC powerline conducted emissions

### 3.1.1 Information

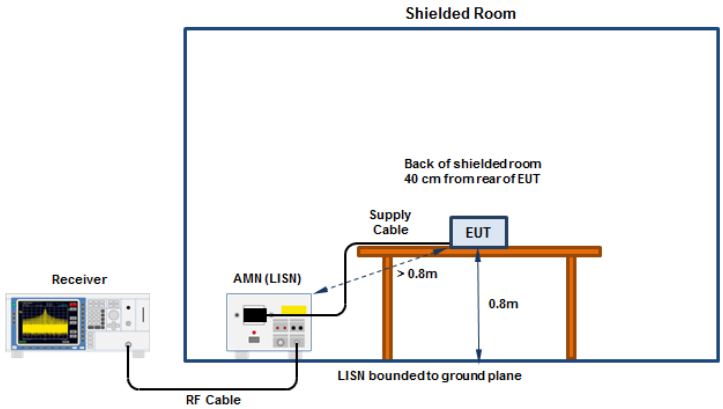
| Test Information | |
|---|---|
| Reference | FCC § 15.207; ISED RSS-247, Issue 2 (section 3.1) |
| Measurement Method | ANSI C63.10 6.2 |
| Measurement Uncertainty | ± 3.82 dB |
| Operator | Odai Qawasmeh |
| Date | 2022-03-25 |

### 3.1.2 Limits

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

### 3.1.3 Setup

**Test Setup**



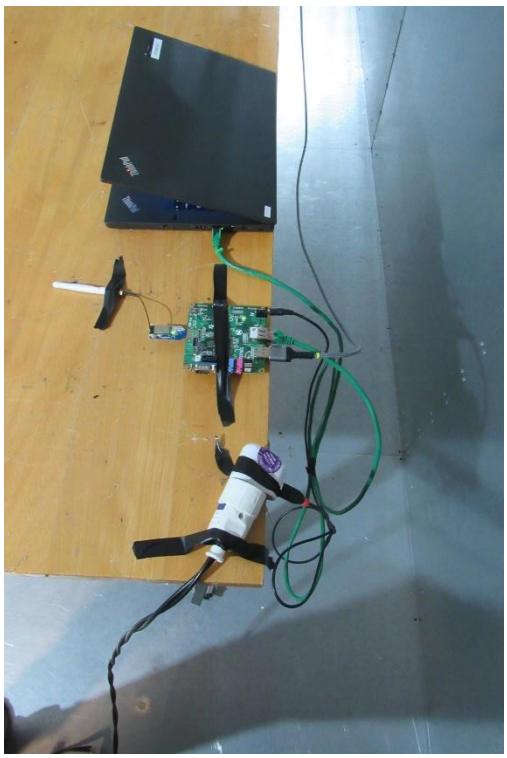

### 3.1.4 Equipment

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

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

3.1.5 Setup Photos

| Setup for measurements 150 kHz - 30 MHz |
| --- |
| |

| Setup for measurements 150 kHz - 30 MHz |
| --- |
|  |

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

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Qawasmeh |
| Test Date: | 2022-03-24 |
| Operating Conditions: | ambient temperature: 20 °Celsius<br>power input: 3.3 VDC |
| LISN: | Schwarzbeck NSLK 8127 RC L |
| Operational Mode: | IEEE802.11 b; 1 Mbps; ext. antenna; 2437 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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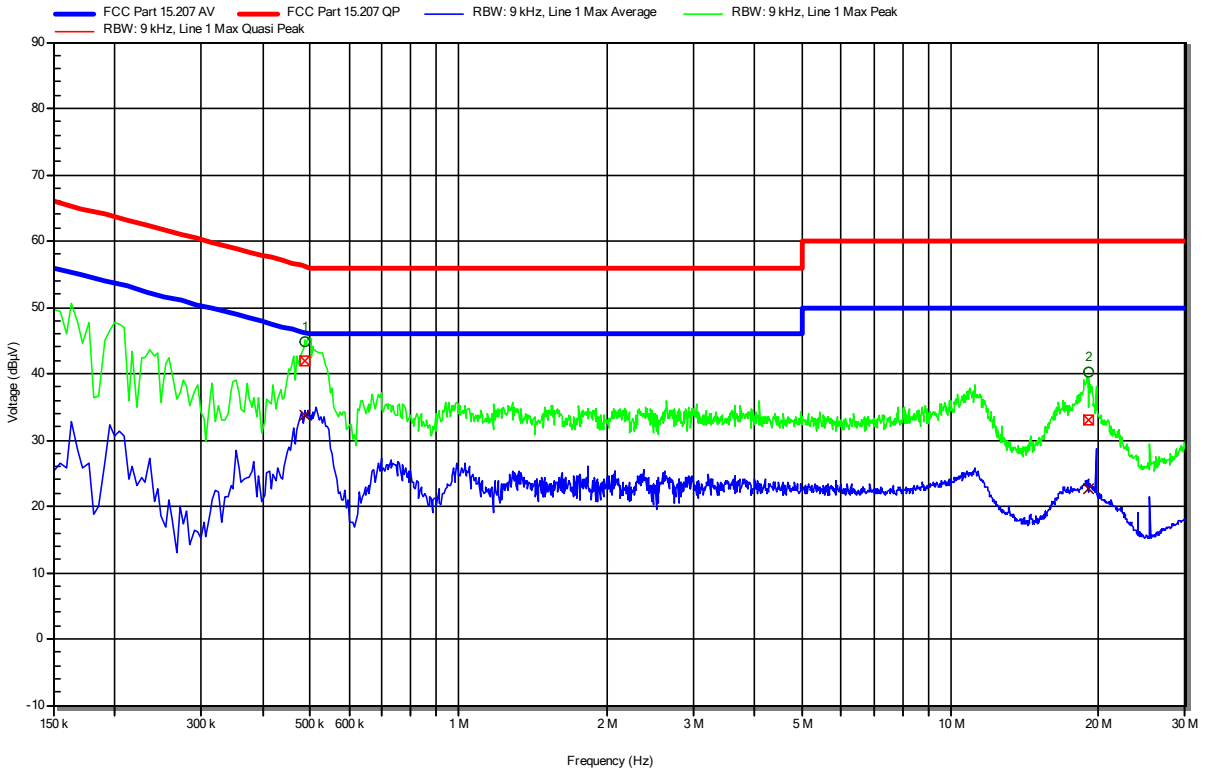
RadiMation




| Peak Number | Frequency | Quasi-Peak | Quasi-Peak Limit | Quasi-Peak Difference | Quasi-Peak Status | LISN |
|---|---|---|---|---|---|---|
| 1 | 487.5 kHz | 41.92 dBµV | 56.21 dBµV | -14.29 dB | Pass | Line 1 |
| 2 | 19.086 MHz | 33.04 dBµV | 60 dBµV | -26.96 dB | Pass | Line 1 |

| Peak Number | Frequency | Average | Average Limit | Average Difference | Average Status | LISN |
|---|---|---|---|---|---|---|
| 1 | 487.5 kHz | 33.67 dBµV | 46.21 dBµV | -12.54 dB | Pass | Line 1 |
| 2 | 19.086 MHz | 22.6 dBµV | 50 dBµV | -27.4 dB | Pass | Line 1 |

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

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Qawasmeh |
| Test Date: | 2022-03-24 |
| Operating Conditions: | ambient temperature: 20 °Celsius<br>power input: 3.3 VDC |
| LISN: | Schwarzbeck NSLK 8127 RC N |
| Operational Mode: | IEEE802.11 b; 1 Mbps; ext. antenna; 2437 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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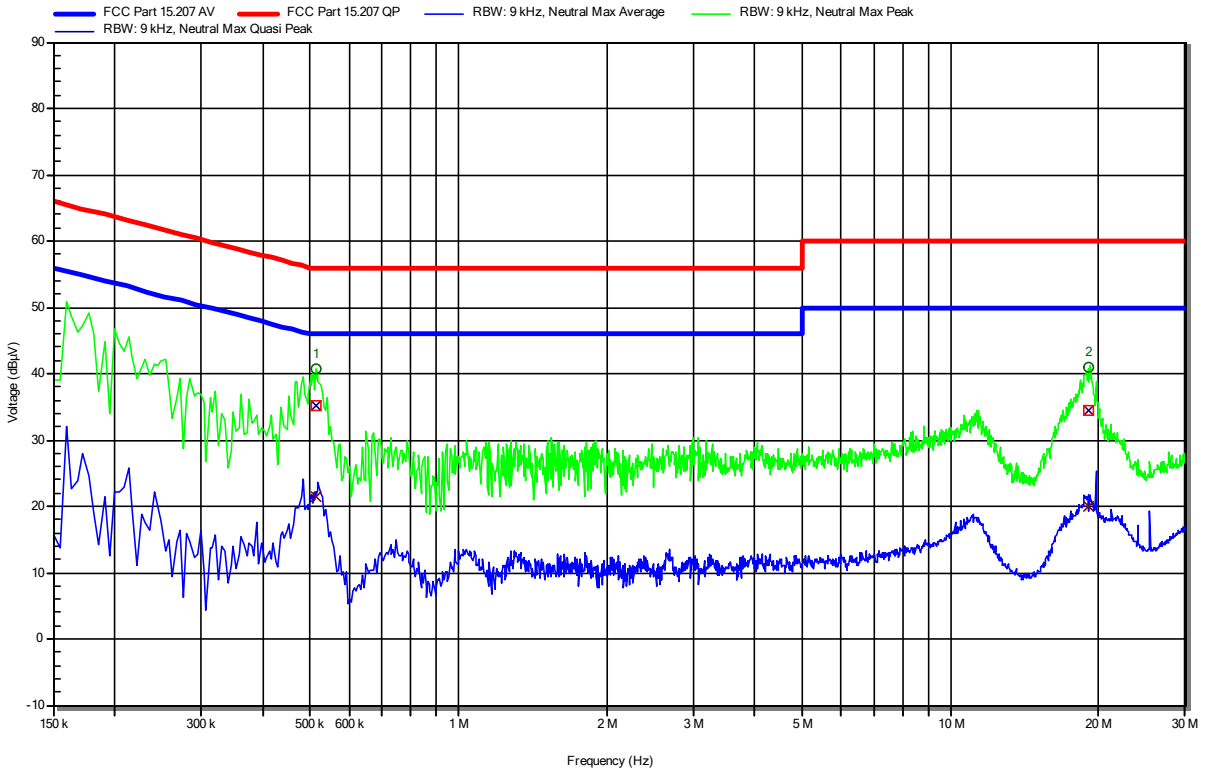
RadiMation




| Peak Number | Frequency | Quasi-Peak | Quasi-Peak Limit | Quasi-Peak Difference | Quasi-Peak Status | LISN |
|---|---|---|---|---|---|---|
| 1 | 514.95 kHz | 35.26 dBµV | 56 dBµV | -20.74 dB | Pass | Neutral |
| 2 | 19.023 MHz | 34.57 dBµV | 60 dBµV | -25.43 dB | Pass | Neutral |

| Peak Number | Frequency | Average | Average Limit | Average Difference | Average Status | LISN |
|---|---|---|---|---|---|---|
| 1 | 514.95 kHz | 21.56 dBµV | 46 dBµV | -24.44 dB | Pass | Neutral |
| 2 | 19.023 MHz | 20 dBµV | 50 dBµV | -30 dB | Pass | Neutral |

**Conducted emissions at the mains power port according to RSS-247**

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Qawasmeh |
| Test Date: | 2022-03-24 |
| Operating Conditions: | ambient temperature: 20 °Celsius<br>power input: 3.3 VDC |
| LISN: | Schwarzbeck NSLK 8127 RC L |
| Operational Mode: | IEEE802.11; ext. antenna; 2437 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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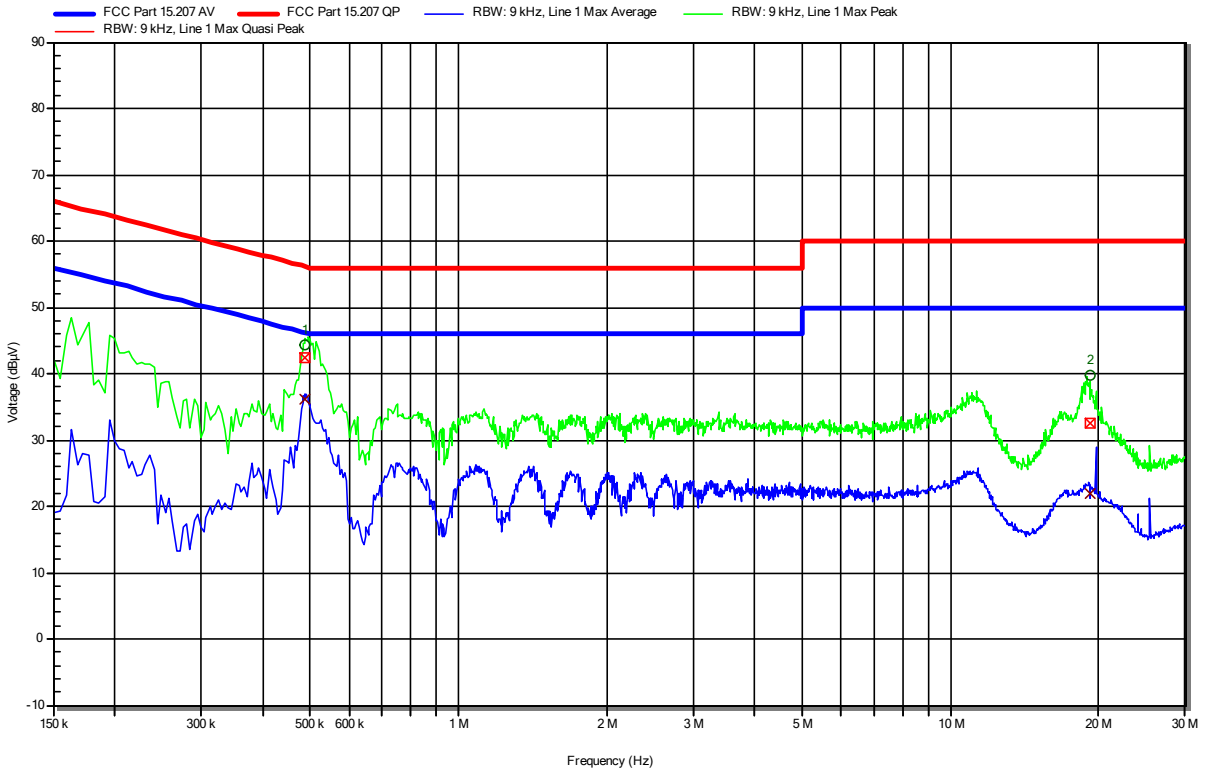
RadiMation



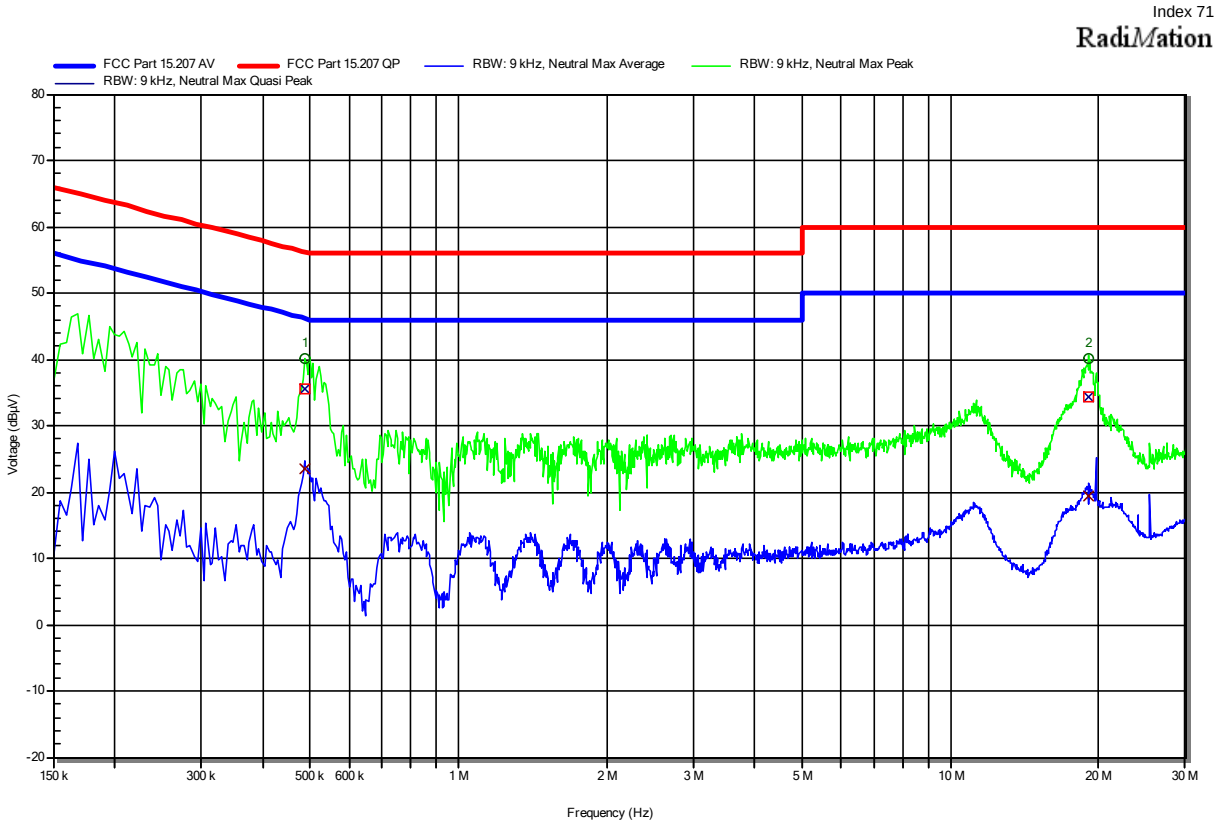

| Peak Number | Frequency | Quasi-Peak | Quasi-Peak Limit | Quasi-Peak Difference | Quasi-Peak Status | LISN |
|---|---|---|---|---|---|---|
| 1 | 487.5 kHz | 42.32 dBµV | 56.21 dBµV | -13.89 dB | Pass | Line 1 |
| 2 | 19.176 MHz | 32.41 dBµV | 60 dBµV | -27.59 dB | Pass | Line 1 |

| Peak Number | Frequency | Average | Average Limit | Average Difference | Average Status | LISN |
|---|---|---|---|---|---|---|
| 1 | 487.5 kHz | 36.13 dBµV | 46.21 dBµV | -10.08 dB | Pass | Line 1 |
| 2 | 19.176 MHz | 22.01 dBµV | 50 dBµV | -27.99 dB | Pass | Line 1 |

**Conducted emissions at the mains power port according to RSS-247**

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Qawasmeh |
| Test Date: | 2022-03-24 |
| Operating Conditions: | ambient temperature: 20 °Celsius<br>power input: 3.3 VDC |
| LISN: | Schwarzbeck NSLK 8127 RC N |
| Operational Mode: | IEEE802.11; ext. antenna; 2437 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 | 487.5 kHz | 35.48 dBµV | 56.21 dBµV | -20.73 dB | Pass | Neutral |
| 2 | 19.055 MHz | 34.25 dBµV | 60 dBµV | -25.75 dB | Pass | Neutral |

| Peak Number | Frequency | Average | Average Limit | Average Difference | Average Status | LISN |
|---|---|---|---|---|---|---|
| 1 | 487.5 kHz | 23.44 dBµV | 46.21 dBµV | -22.77 dB | Pass | Neutral |
| 2 | 19.055 MHz | 19.31 dBµV | 50 dBµV | -30.69 dB | Pass | Neutral |

## 3.2 Test Conditions and Results - Transmitter radiated emissions

### 3.2.1 Information

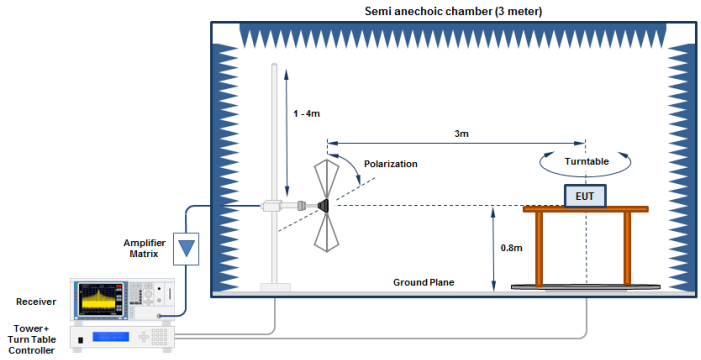
| Test Information | |
|---|---|
| Reference | FCC § 15.247(d); FCC § 15.209; ISED RSS-Gen, Issue 5 A2 (section 6.13) |
| Measurement Uncertainty | ± 5.95 dB |
| Measurement Method | ANSI C63.10 6.4, 6.5, 6.6, 11.12 |
| Operator | Wilfried Treffke |
| Date | 2021-12-15 |

### 3.2.2 Limits

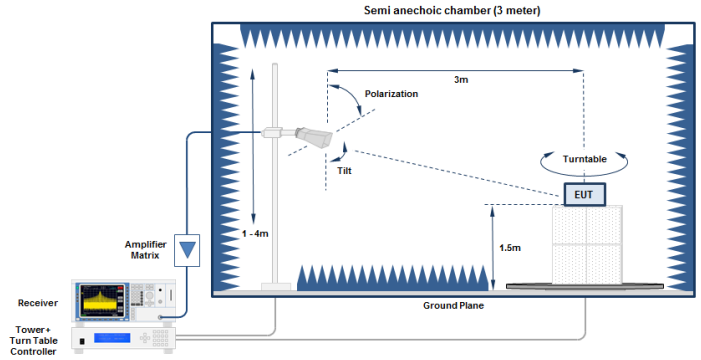
| Limits | | | |
|---|---|---|---|
| Frequency range [MHz] | Detector | Field strength [µV/m] | Measurement distance [m] |
| 0.009 - 0.09 | Average | 2400/F[kHz] | 300 |
| 0.09 - 0.110 | Quasi-Peak | 2400/F[kHz] | 300 |
| 0.110 - 0.490 | Average | 2400/F[kHz] | 300 |
| 0.490 - 1.705 | Quasi-Peak | 24000/F[kHz]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

### 3.2.3 Setup

**Test Setup 30 MHz - 1000 MHz**




**Test Setup > 1 GHz**




### 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 | 2021-07 | 2024-07 |
| 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 | AC 2 | EF01616 | 2021-09 | 2022-09 |
| Spectrum analyzer | R&S | FSU43 | EF01631 | 2021-07 | 2022-07 |
| Antenna | Schwarzbeck | BBHA 9120B | EF01678 | 2021-03 | 2022-03 |
| Antenna | Schwarzbeck | HWRD 650 | EF01679 | 2021-03 | 2022-03 |
| Antenna | Amplifier Research | AT4560 | EF00302 | 2021-06 | 2023-06 |

3.2.5 Procedure

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

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

3.2.6 Results

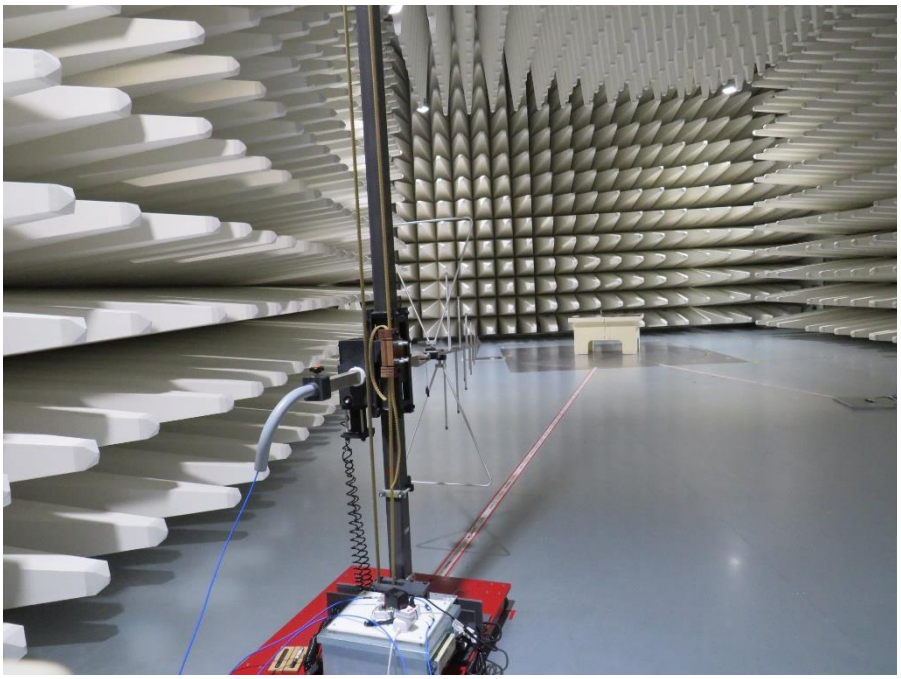
| Test Results - DSSS | | | | | | |
|---|---|---|---|---|---|---|
| Channel [MHz] | Emission [MHz] | Level [dBµV/m] | Det. | Pol. | Limit [dBµV/m] | Margin [dB] |
| 2412 | 2386.2 | 57.43 | pk | ver | 74.00 | -16.57 |
| 2412 | 2386.2 | 47.36 | avg | ver | 54.00 | -06.64 |
| 2412 | 4824 | 48.45 | pk | ver | 74.00 | -25.55 |
| 2412 | 4824 | 46.59 | avg | ver | 54.00 | -07.41 |
| 2412 | 12058 | 39.90 | pk | ver | 74.00 | -34.10 |
| 2412 | 12058 | 35.04 | avg | ver | 54.00 | -18.96 |
| 2412 | 14472 | 41.88 | pk | ver | 74.00 | -32.12 |
| 2412 | 14472 | 38.50 | avg | ver | 54.00 | -15.50 |
| 2437 | 4874 | 48.84 | pk | ver | 74.00 | -25.16 |
| 2437 | 4874 | 47.48 | avg | ver | 54.00 | -06.52 |
| 2437 | 12186 | 41.88 | pk | ver | 74.00 | -32.12 |
| 2437 | 12186 | 35.77 | avg | ver | 54.00 | -18.23 |
| 2462 | 1250 | 45.77 | pk | ver | 74.00 | -28.23 |
| 2462 | 1250 | 43.95 | avg | ver | 54.00 | -10.05 |
| 2462 | 2486.9 | 56.72 | pk | ver | 74.00 | -17.28 |
| 2462 | 2486.9 | 48.50 | avg | ver | 54.00 | -05.50 |
| 2462 | 4924 | 47.22 | pk | ver | 74.00 | -26.78 |
| 2462 | 4924 | 45.03 | avg | ver | 54.00 | -08.97 |
| 2462 | 12309 | 41.97 | pk | ver | 74.00 | -32.03 |
| 2462 | 12309 | 35.84 | avg | ver | 54.00 | -18.16 |

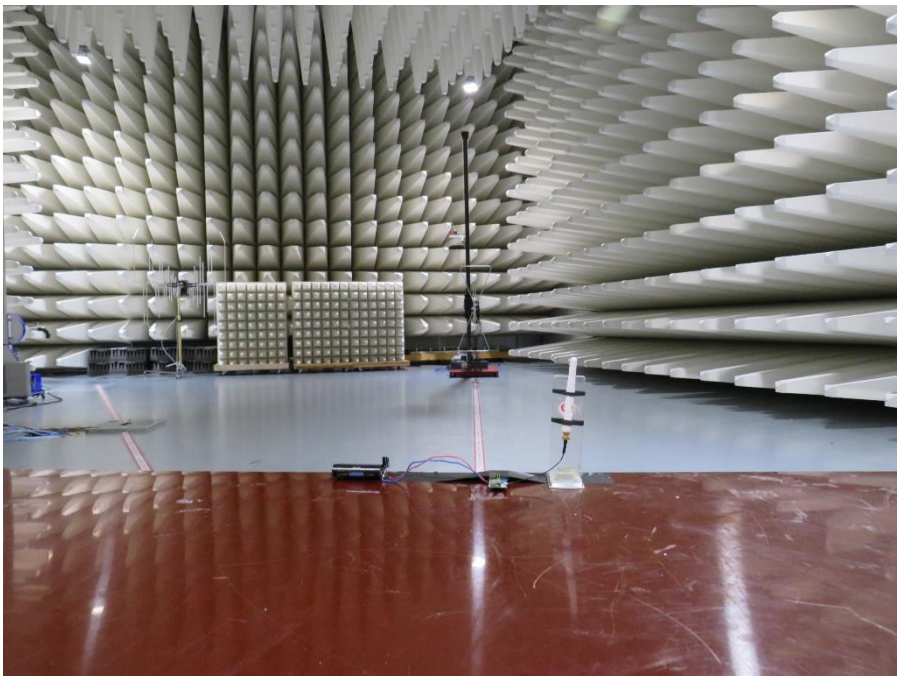
| Test Results - OFDM | | | | | | |
|---|---|---|---|---|---|---|
| Channel [MHz] | Emission [MHz] | Level [dBµV/m] | Det. | Pol. | Limit [dBµV/m] | Margin [dB] |
| 2412 | 1111 | 40.16 | pk | ver | 74.00 | -33.84 |
| 2412 | 1111 | 36.62 | avg | ver | 54.00 | -17.38 |
| 2412 | 1375.1 | 41.78 | pk | ver | 74.00 | -32.22 |
| 2412 | 1375.1 | 37.32 | avg | ver | 54.00 | -16.68 |
| 2412 | 2383 | 59.60 | pk | ver | 74.00 | -14.40 |
| 2412 | 2383 | 49.49 | avg | ver | 54.00 | -04.51 |
| 2412 | 2389.4 | 68.82 | pk | ver | 74.00 | -05.18 |
| 2412 | 2389.4 | 48.85 | avg | ver | 54.00 | -05.15 |
| 2412 | 4827.7 | 48.33 | pk | ver | 74.00 | -25.67 |
| 2412 | 4827.7 | 36.99 | avg | ver | 54.00 | -17.01 |
| 2437 | 1500 | 42.67 | pk | ver | 74.00 | -31.33 |
| 2437 | 1500 | 40.87 | avg | ver | 54.00 | -13.13 |
| 2437 | 4871.1 | 43.96 | pk | ver | 74.00 | -30.04 |
| 2437 | 4871.1 | 36.99 | avg | ver | 54.00 | -17.01 |
| 2462 | 1250 | 42.38 | pk | ver | 74.00 | -31.62 |
| 2462 | 1250 | 39.05 | avg | ver | 54.00 | -14.95 |
| 2462 | 2485.2 | 68.49 | pk | ver | 74.00 | -05.51 |
| 2462 | 2485.2 | 46.99 | avg | ver | 54.00 | -07.01 |

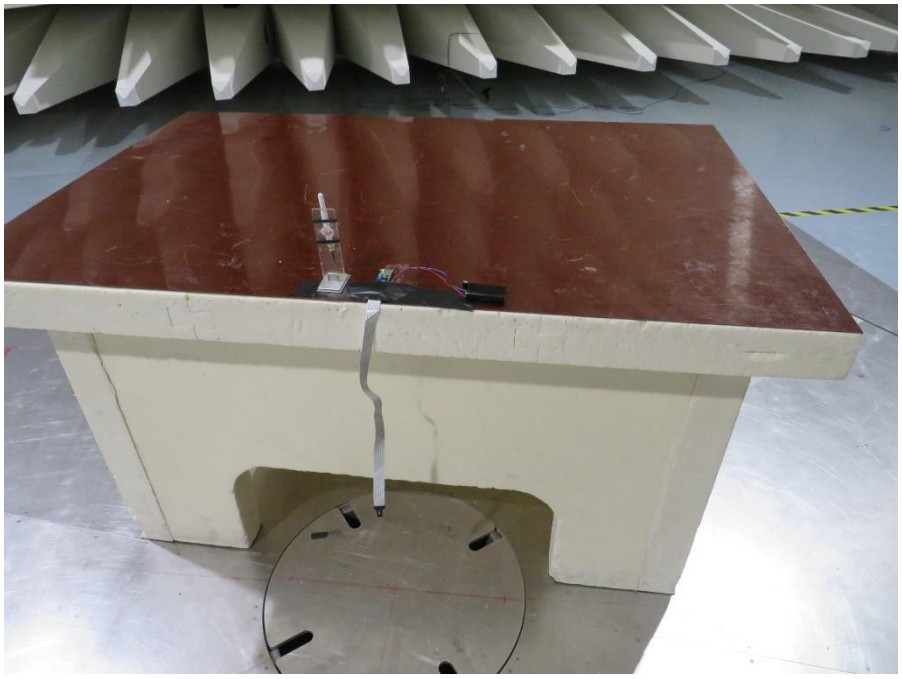
| Test Results - HT20 | | | | | | |
|---|---|---|---|---|---|---|
| Channel [MHz] | Emission [MHz] | Level [dBµV/m] | Det. | Pol. | Limit [dBµV/m] | Margin [dB] |
| 2412 | 1375 | 41.02 | pk | ver | 74.00 | -32.98 |
| 2412 | 1375 | 37.10 | avg | ver | 54.00 | -16.90 |
| 2412 | 2390 | 68.55 | pk | ver | 74.00 | -05.45 |
| 2412 | 2390 | 50.13 | avg | ver | 54.00 | -03.87 |
| 2412 | 4814.8 | 45.36 | pk | ver | 74.00 | -28.64 |
| 2412 | 4814.8 | 36.12 | avg | ver | 54.00 | -17.88 |
| 2437 | 1375 | 41.63 | pk | ver | 74.00 | -32.37 |
| 2437 | 1375 | 37.60 | avg | ver | 54.00 | -16.40 |
| 2437 | 2388.3 | 47.69 | pk | ver | 74.00 | -26.31 |
| 2437 | 2388.3 | 37.11 | avg | ver | 54.00 | -16.89 |
| 2437 | 4874.8 | 44.56 | pk | ver | 74.00 | -29.44 |
| 2437 | 4874.8 | 36.51 | avg | ver | 54.00 | -17.49 |
| 2462 | 1250 | 45.92 | pk | ver | 74.00 | -28.08 |
| 2462 | 1250 | 43.07 | avg | ver | 54.00 | -10.93 |
| 2462 | 1500 | 42.83 | pk | ver | 74.00 | -31.17 |
| 2462 | 1500 | 39.64 | avg | ver | 54.00 | -14.36 |
| 2462 | 2484.6 | 61.34 | pk | ver | 74.00 | -12.66 |
| 2462 | 2484.6 | 49.37 | avg | ver | 54.00 | -04.63 |
| 2462 | 2484.9 | 69.08 | pk | ver | 74.00 | -04.92 |
| 2462 | 2484.9 | 47.10 | avg | ver | 54.00 | -06.90 |

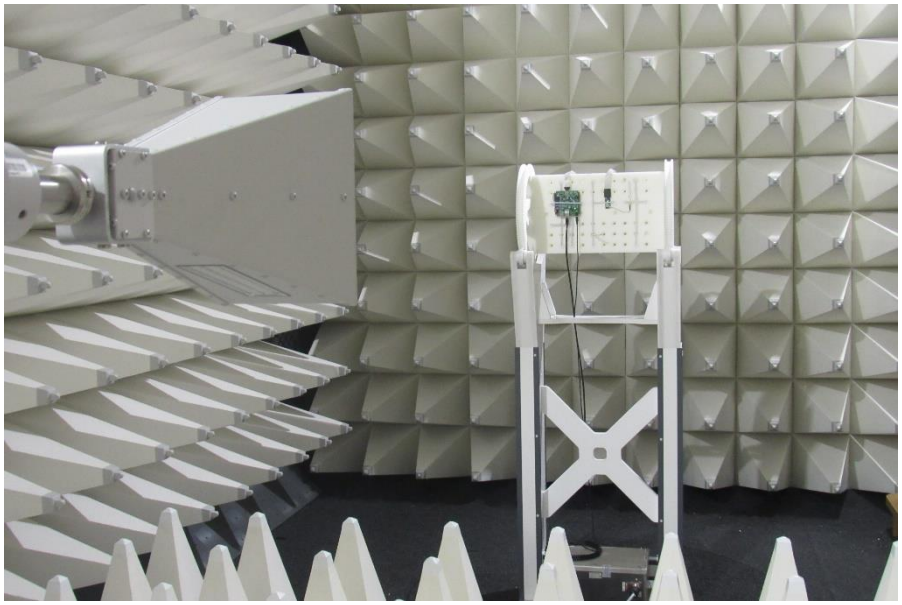
| Test Results - HT40 | | | | | | |
|---|---|---|---|---|---|---|
| Channel [MHz] | Emission [MHz] | Level [dBµV/m] | Det. | Pol. | Limit [dBµV/m] | Margin [dB] |
| 2412 | 1031.9 | 41.25 | pk | ver | 74.00 | -32.75 |
| 2412 | 1031.9 | 36.75 | avg | ver | 54.00 | -17.25 |
| 2412 | 1375 | 40.82 | pk | ver | 74.00 | -33.18 |
| 2412 | 1375 | 38.42 | avg | ver | 54.00 | -15.58 |
| 2412 | 2388.3 | 70.30 | pk | ver | 74.00 | -03.70 |
| 2412 | 2388.3 | 47.44 | avg | ver | 54.00 | -06.56 |
| 2437 | 1375.1 | 41.65 | pk | ver | 74.00 | -32.35 |
| 2437 | 1375.1 | 38.80 | avg | ver | 54.00 | -15.20 |
| 2437 | 1500.2 | 43.31 | pk | ver | 74.00 | -30.69 |
| 2437 | 1500.2 | 39.92 | avg | ver | 54.00 | -14.08 |
| 2462 | 1250 | 45.81 | pk | ver | 74.00 | -28.19 |
| 2462 | 1250 | 44.01 | avg | ver | 54.00 | -09.99 |
| 2462 | 1375 | 42.12 | pk | ver | 74.00 | -31.88 |
| 2462 | 1375 | 38.86 | avg | ver | 54.00 | -15.14 |
| 2462 | 2484.7 | 68.71 | pk | ver | 74.00 | -05.29 |
| 2462 | 2484.7 | 48.10 | avg | ver | 54.00 | -05.90 |

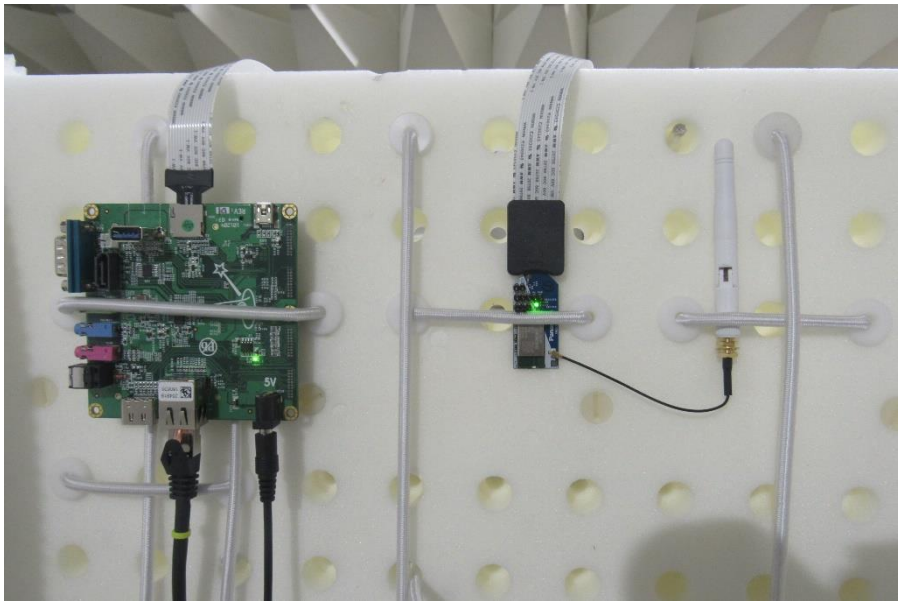
3.2.7 Setup Photos

| Setup for measurements below 1 GHz |
| --- |
|  |

| Setup for measurements below 1 GHz |
| --- |
|  |

| Test Setup |
| --- |
|  |

| Setup for measurement above 1 GHz |
| --- |
|  |

| Test Setup |
| --- |
|  |

## 3.3 Test Conditions and Results - Receiver radiated emissions

### 3.3.1 Information

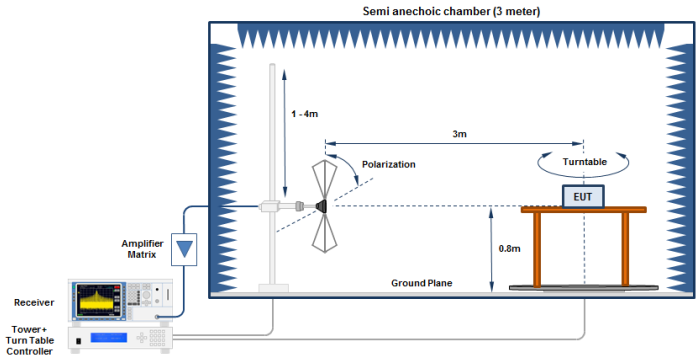
| Test Information | |
|---|---|
| Reference | ISED RSS-247, Issue 2 (section 3.1) |
| Measurement Uncertainty | ± 5.95 dB |
| Measurement Method | ANSI C63.4-2014 8.1-8.3 |
| Operator | Odai Qawasmeh |
| Date | 2022-03-17 |

### 3.3.2 Limits

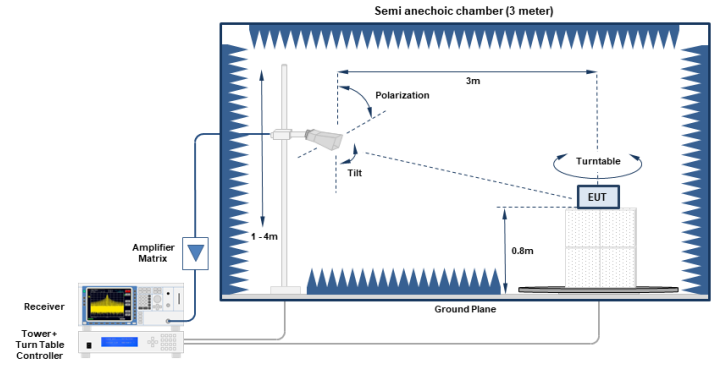
| Limits | | | |
|---|---|---|---|
| Frequency range [MHz] | Detector | Field strength [µV/m] | Measurement distance [m] |
| 30 - 88 | Quasi-Peak | 100 | 3 |
| 88 - 216 | Quasi-Peak | 150 | 3 |
| 216 - 960 | Quasi-Peak | 200 | 3 |
| 960 - 1000 | Quasi-Peak | 500 | 3 |
| >1000 | Average | 500 | 3 |

### 3.3.3 Setup

**Test Setup 30 MHz - 1000 MHz**




**Test Setup > 1 GHz**



3.3.4 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 |

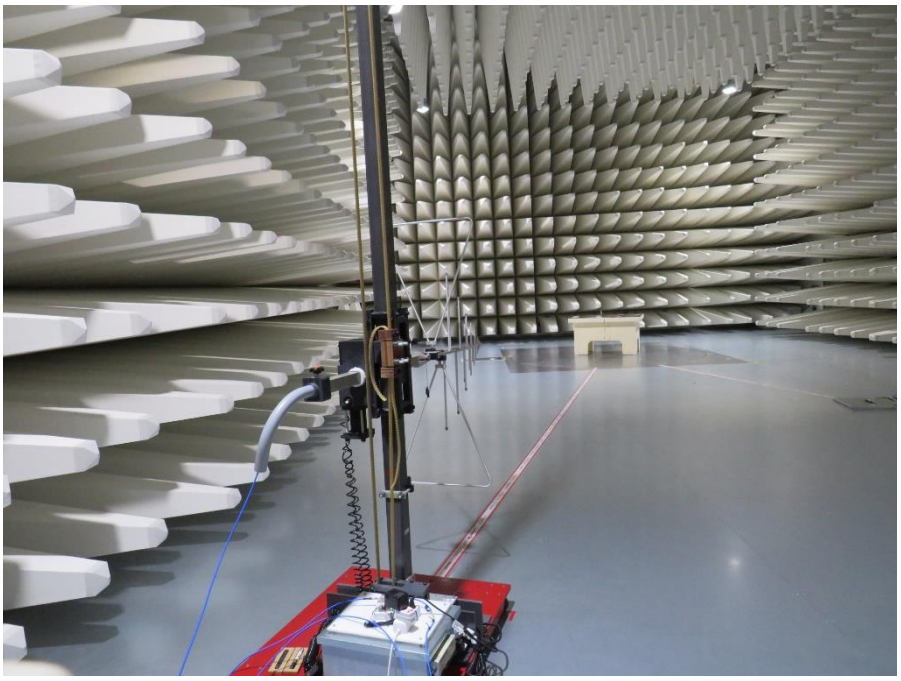
3.3.5 Procedure

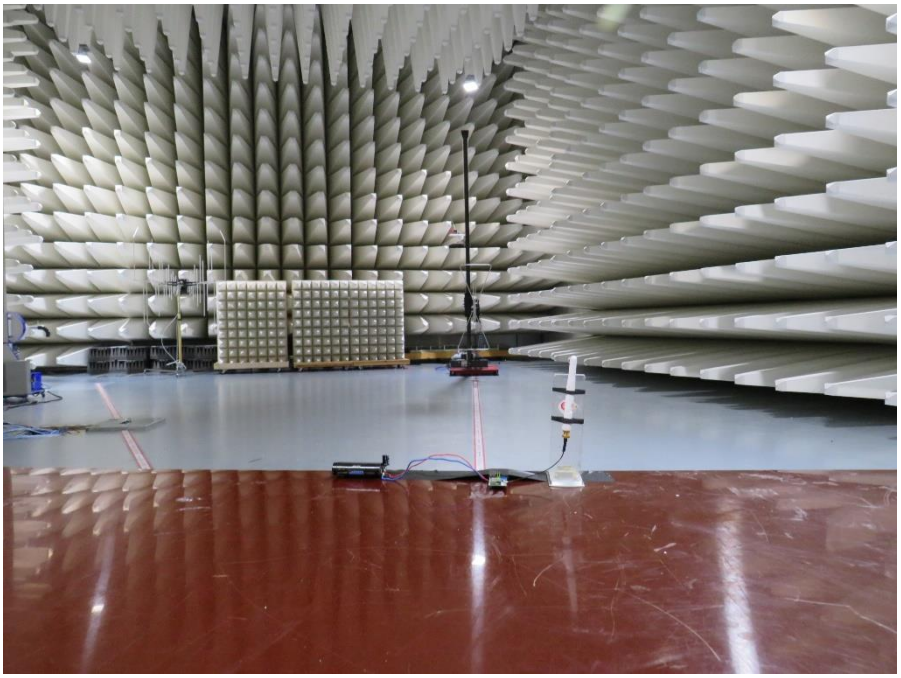
| Test Procedure |
|---|
| 1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground |
| 2. EUT is set to test mode |
| 3. The receiver is set to peak detection with max hold |
| 4. The EUT is rotated through 360° and the height of the antenna is varied from 1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

3.3.6 Results

| Test Results | | | | | | |
|---|---|---|---|---|---|---|
| Channel [MHz] | Emission [MHz] | Level [dBµV/m] | Det. | Pol. | Limit [dBµV/m] | Margin [dB] |
| 2437 | 97.835 | 23.90 | pk | ver | 43.50 | -19.60 |
| 2437 | 6470 | 48.06 | pk | ver | 74.00 | -25.94 |
| 2437 | 6470 | 40.61 | avg | ver | 53.98 | -13.37 |
| 2437 | 17977 | 49.55 | pk | ver | 74.00 | -24.45 |
| 2437 | 17977 | 36.97 | avg | ver | 53.98 | -17.01 |

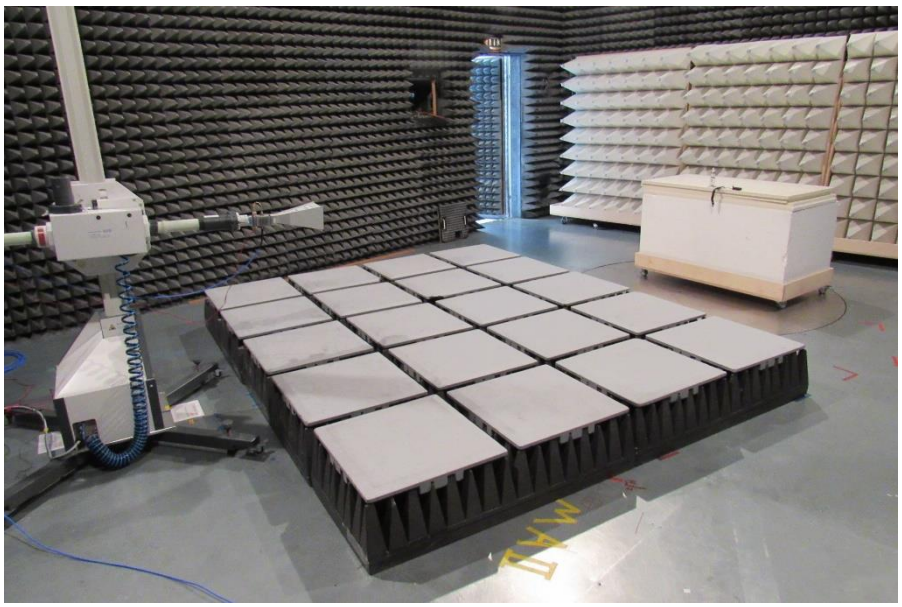
### 3.3.7 Setup Photos

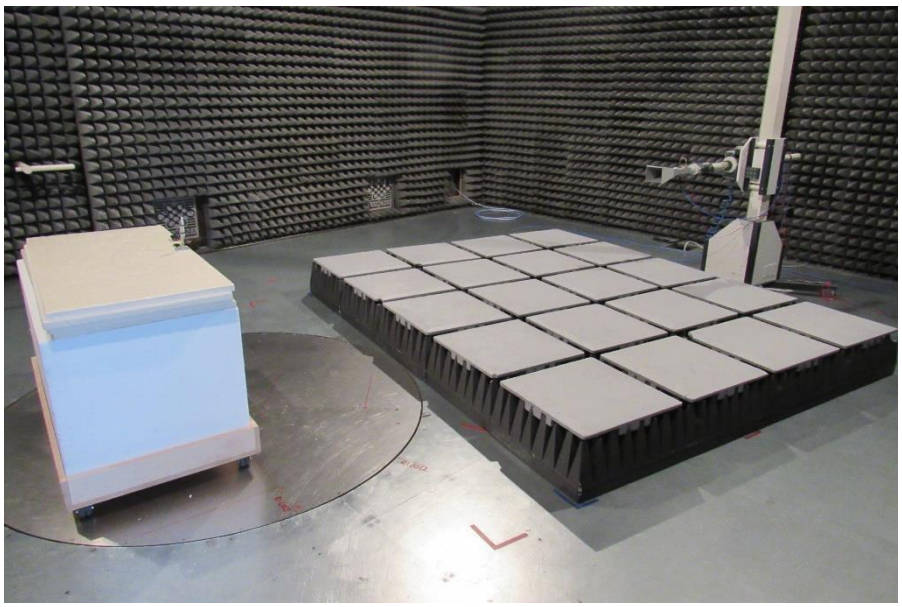
| Setup for measurements below 1 GHz |
| --- |
|  |

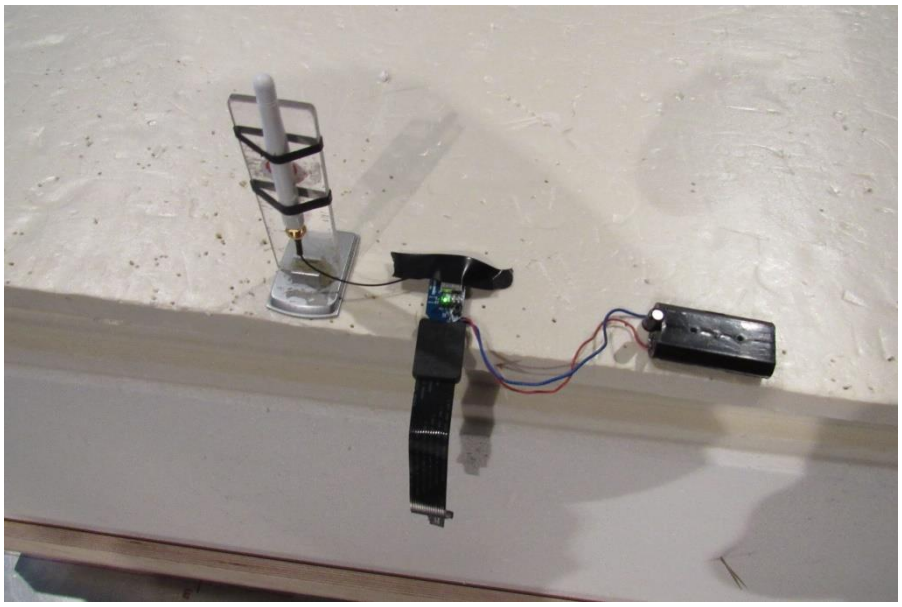
| Setup for measurements below 1 GHz |
| --- |
|  |

**Test Setup**

**Setup for measurements above 1 GHz**



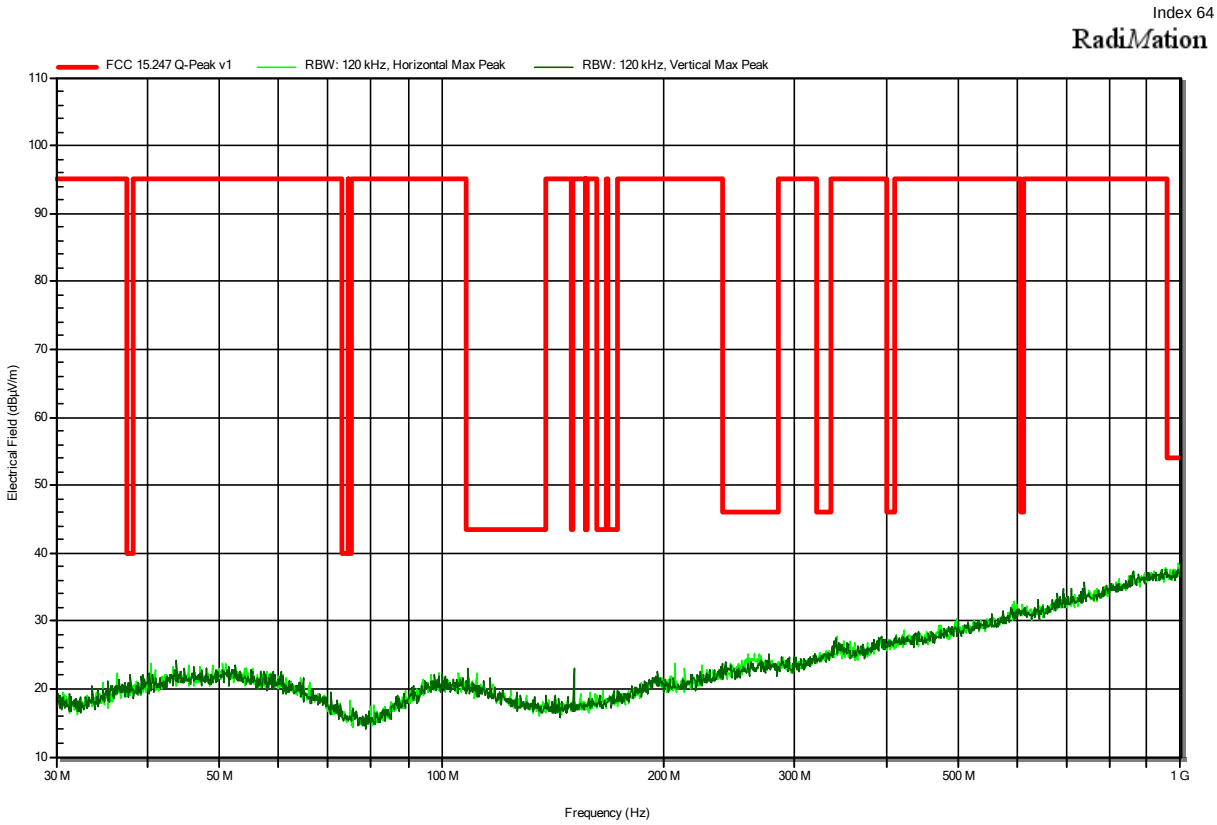
| Setup for measurements above 1 GHz |
| --- |
|  |

| Test Setup |
| --- |
|  |

# ANNEX A Transmitter spurious emissions

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Voigt |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck VULB 9162 |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2412 MHz |
| Test Date: | 2022-03-17 |
| Note: | |



## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Voigt |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck VULB 9162 |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2437 MHz |
| Test Date: | 2022-03-17 |
| Note: | |

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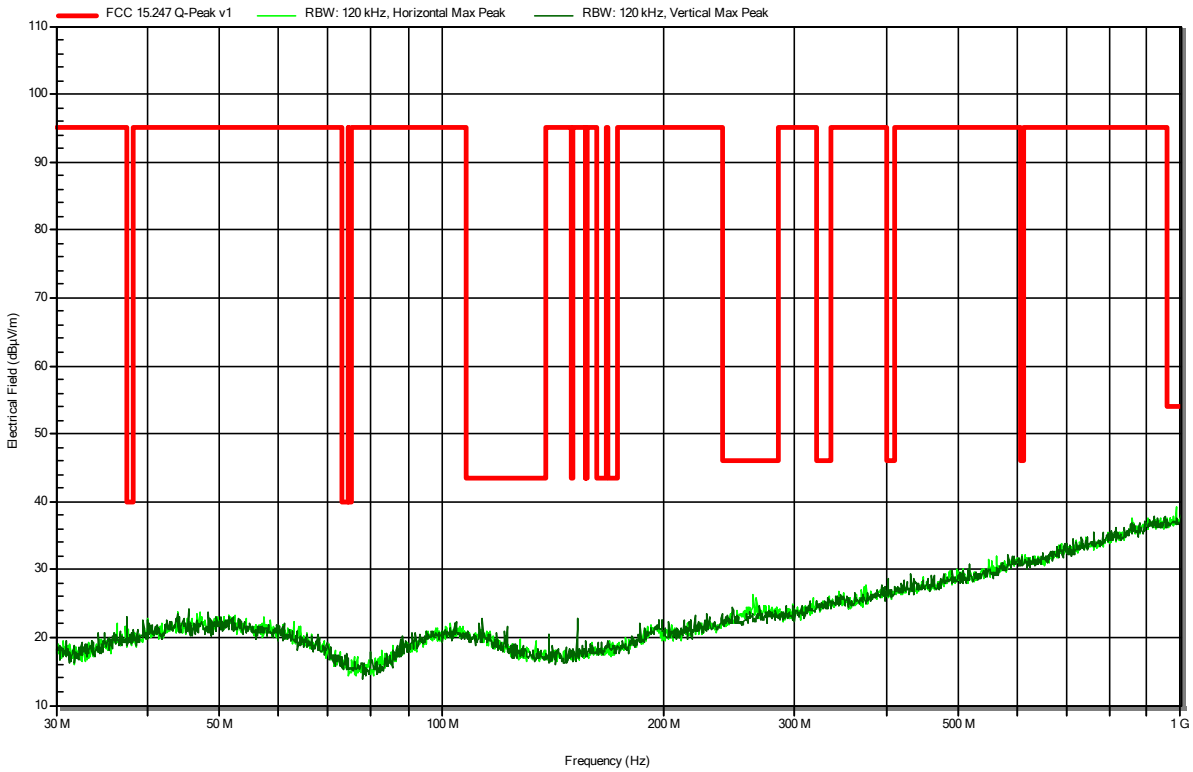
RadiMation



## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Voigt |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck VULB 9162 |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2462 MHz |
| Test Date: | 2022-03-17 |
| Note: | |

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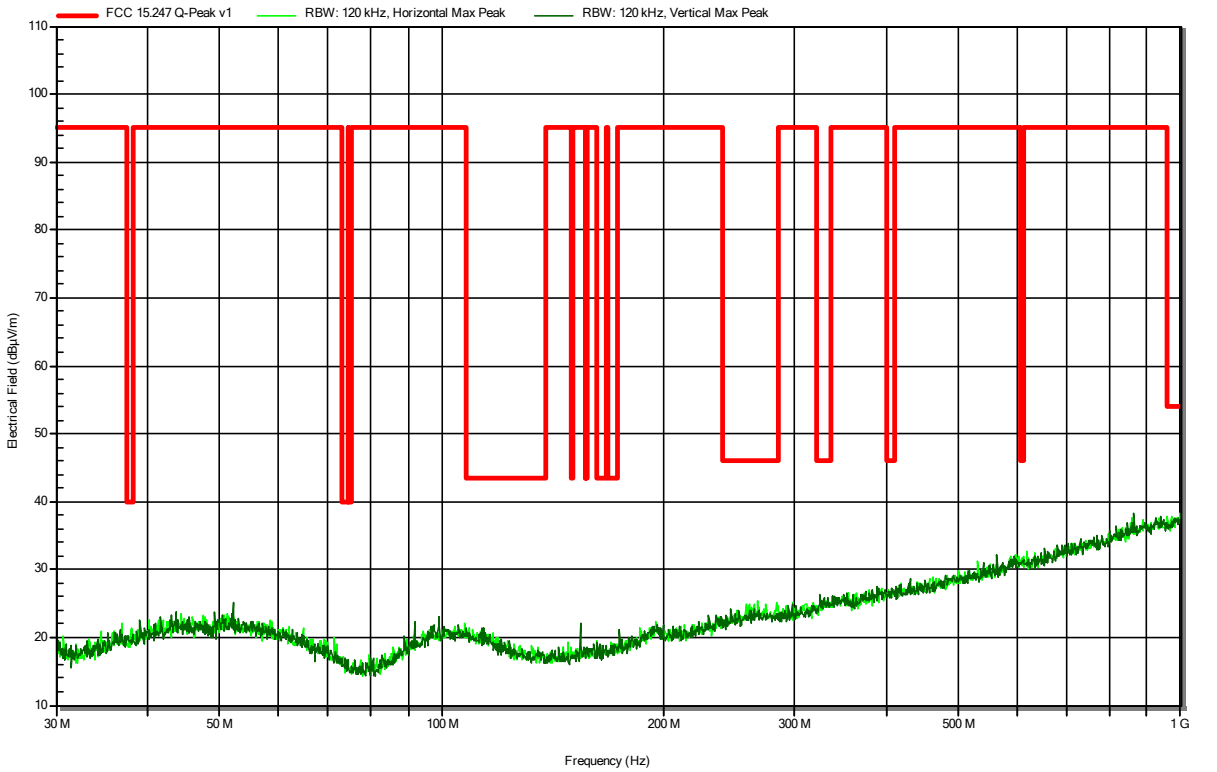
RadiMation



## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2412 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

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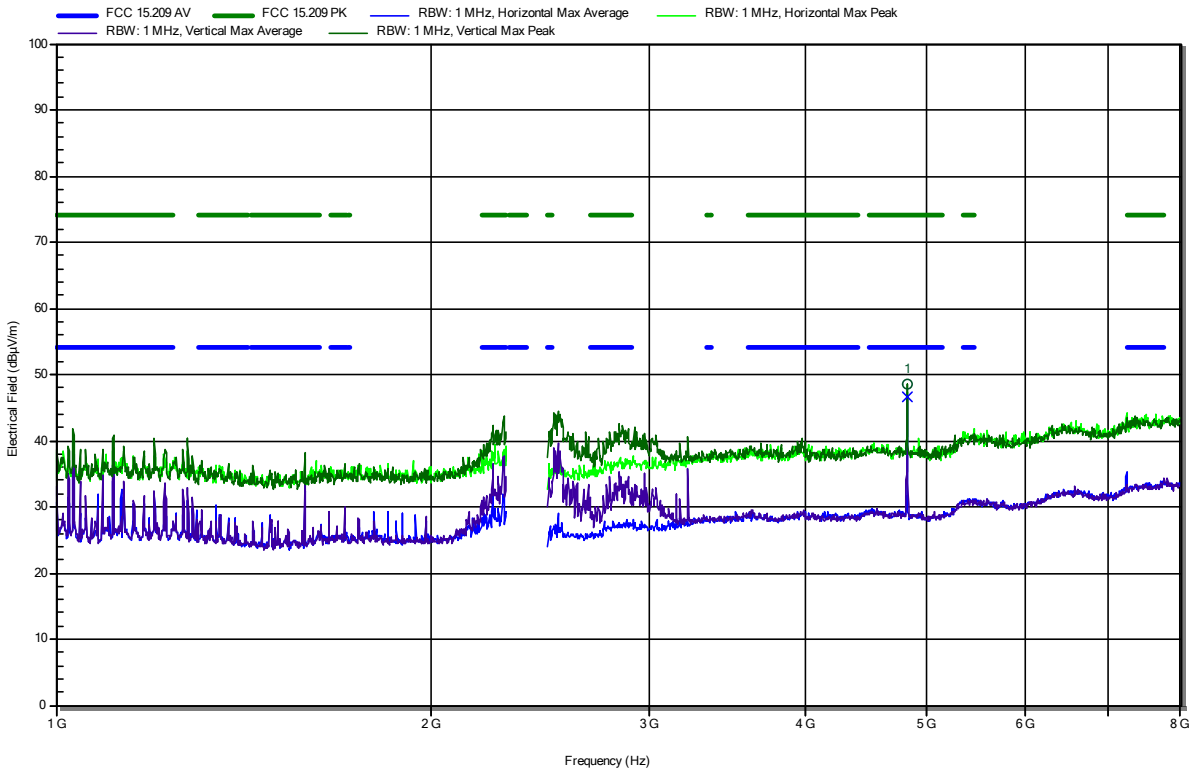
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 4.824 GHz | 48.45 dBµV/m | 74 dBµV/m | -25.55 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 4.824 GHz | 46.59 dBµV/m | 54 dBµV/m | -7.41 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 g; 9 Mbps; ext. antenna; 2412 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

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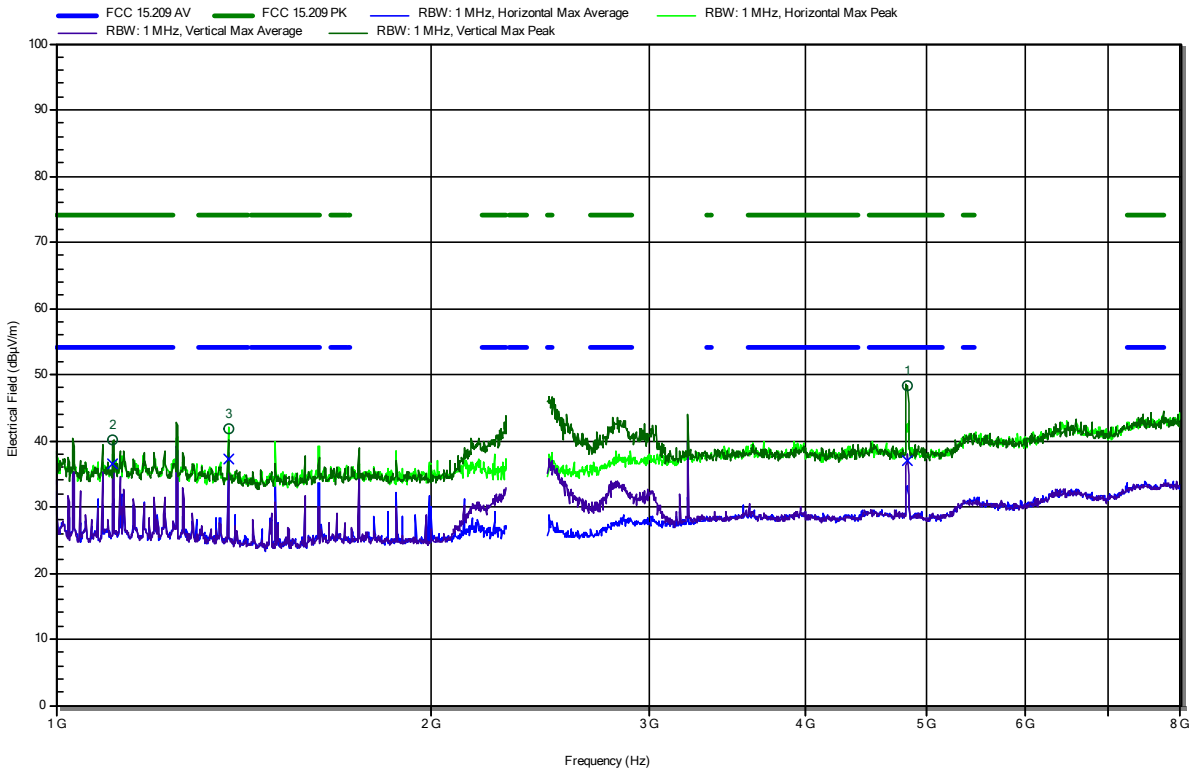
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 1.111 GHz | 40.16 dBµV/m | 74 dBµV/m | -33.84 dB | Pass | Vertical |
| 1.3751 GHz | 41.78 dBµV/m | 74 dBµV/m | -32.22 dB | Pass | Horizontal |
| 4.8277 GHz | 48.33 dBµV/m | 74 dBµV/m | -25.67 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 1.111 GHz | 36.62 dBµV/m | 54 dBµV/m | -17.38 dB | Pass | Vertical |
| 1.3751 GHz | 37.32 dBµV/m | 54 dBµV/m | -16.68 dB | Pass | Horizontal |
| 4.8277 GHz | 36.99 dBµV/m | 54 dBµV/m | -17.01 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 n; HT20; MCS 2; ext. antenna; 2412 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

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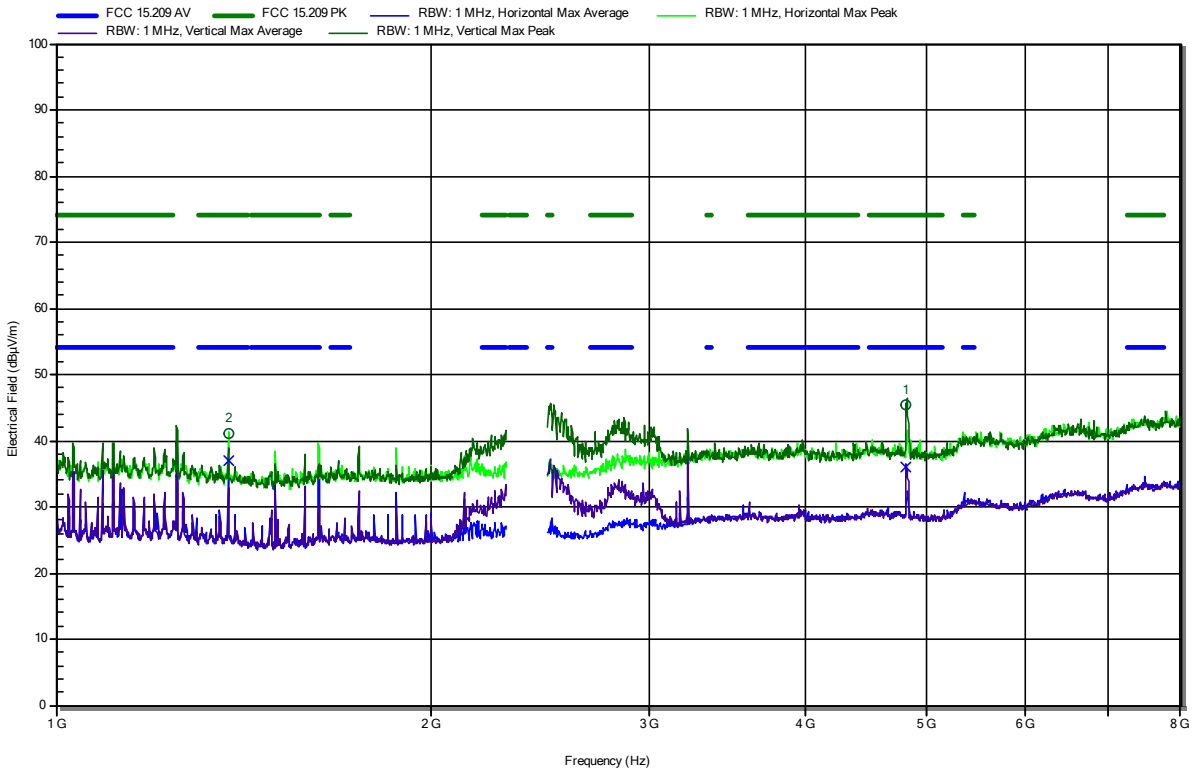
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 1.375 GHz | 41.02 dBµV/m | 74 dBµV/m | -32.98 dB | Pass | Horizontal |
| 4.8148 GHz | 45.36 dBµV/m | 74 dBµV/m | -28.64 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 1.375 GHz | 37.1 dBµV/m | 54 dBµV/m | -16.9 dB | Pass | Horizontal |
| 4.8148 GHz | 36.12 dBµV/m | 54 dBµV/m | -17.88 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 n; HT40; MCS 0; ext. antenna; 2412 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

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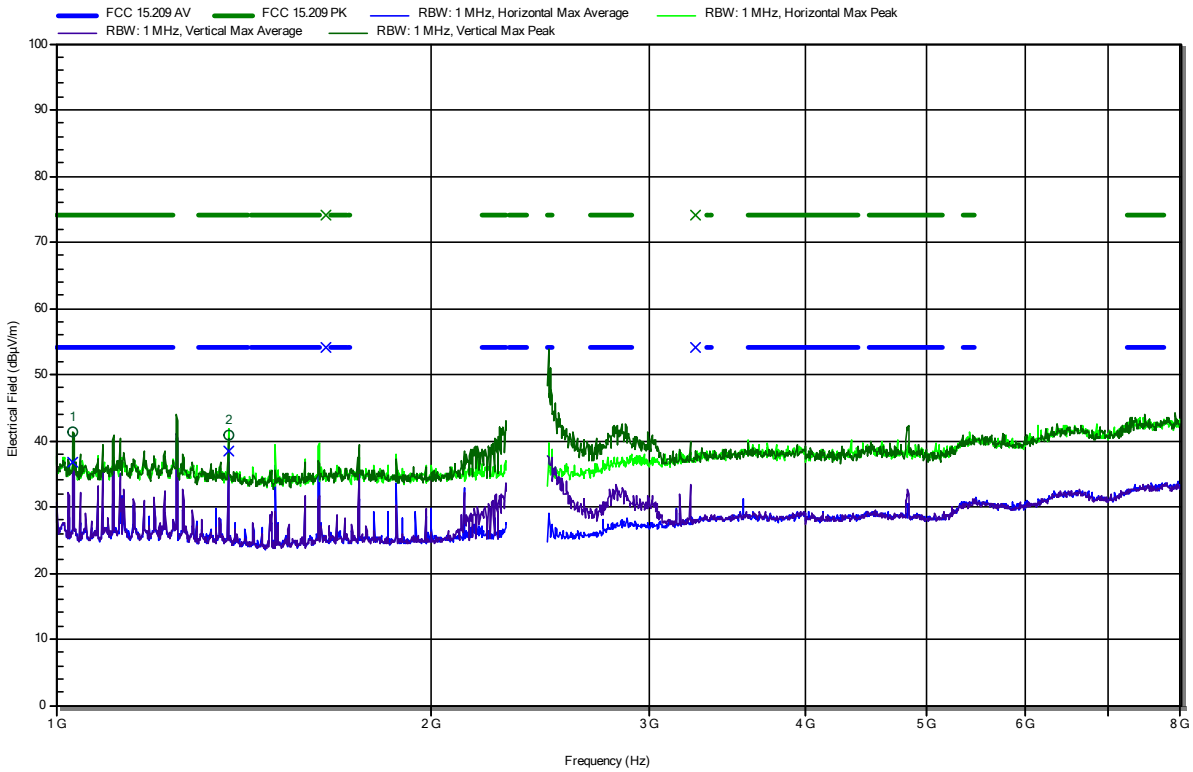
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 1.0319 GHz | 41.25 dBµV/m | 74 dBµV/m | -32.75 dB | Pass | Vertical |
| 1.375 GHz | 40.82 dBµV/m | 74 dBµV/m | -33.18 dB | Pass | Horizontal |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 1.0319 GHz | 36.75 dBµV/m | 54 dBµV/m | -17.25 dB | Pass | Vertical |
| 1.375 GHz | 38.42 dBµV/m | 54 dBµV/m | -15.58 dB | Pass | Horizontal |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2437 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

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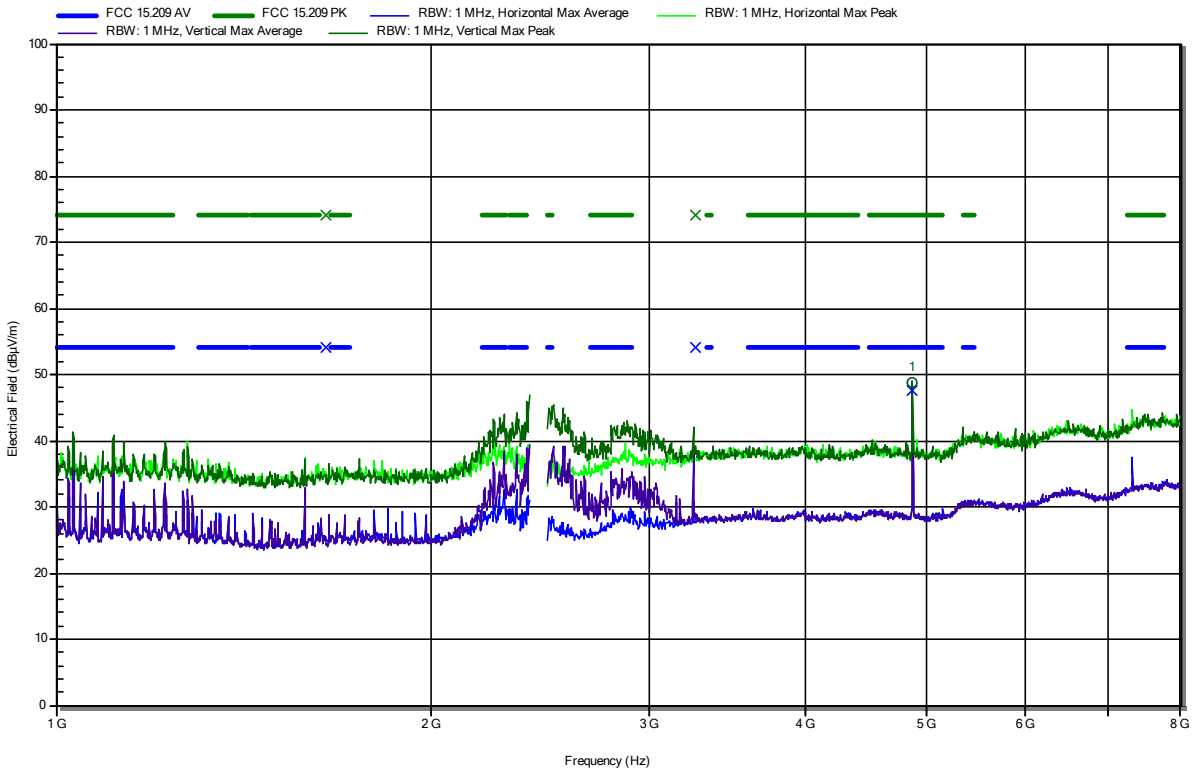
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 4.874 GHz | 48.84 dBµV/m | 74 dBµV/m | -25.16 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 4.874 GHz | 47.48 dBµV/m | 54 dBµV/m | -6.52 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 g; 9 Mbps; ext. antenna; 2437 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

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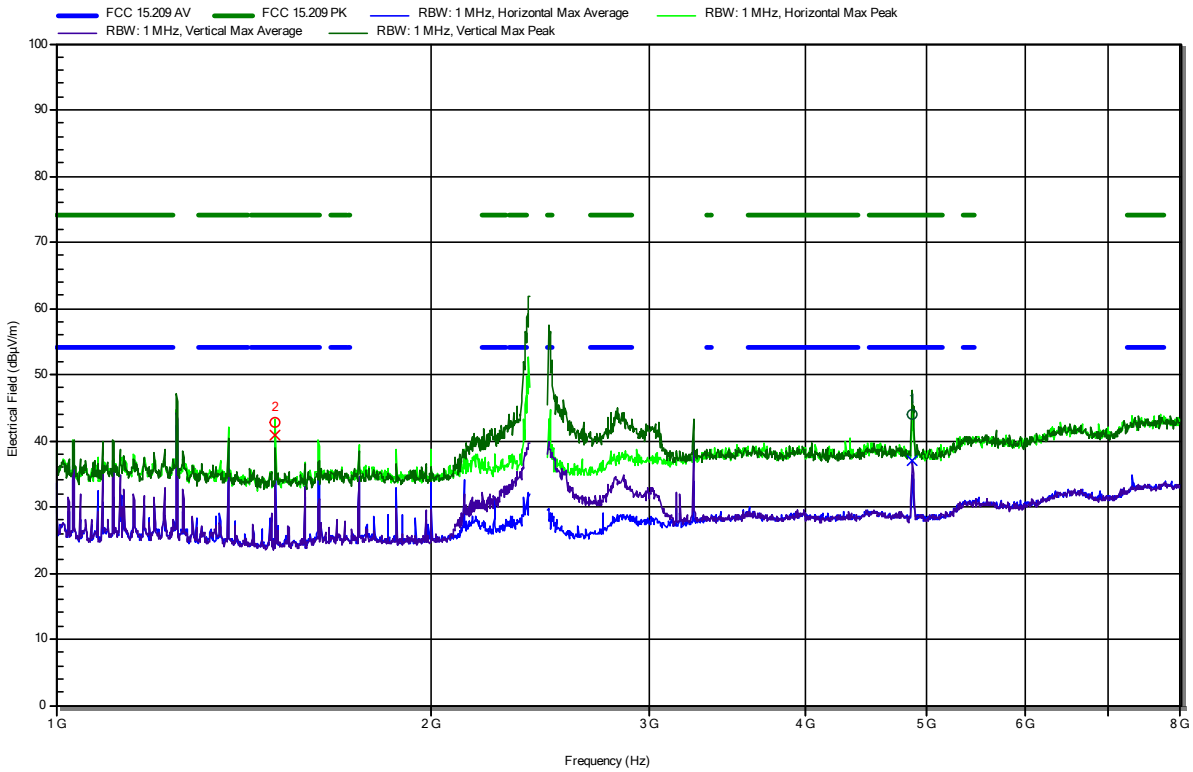
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 1.5 GHz | 42.67 dBµV/m | 74 dBµV/m | -31.33 dB | Pass | Horizontal |
| 4.8711 GHz | 43.96 dBµV/m | 74 dBµV/m | -30.04 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 1.5 GHz | 40.87 dBµV/m | 54 dBµV/m | -13.13 dB | Pass | Horizontal |
| 4.8711 GHz | 36.99 dBµV/m | 54 dBµV/m | -17.01 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 n; HT20; MCS 2; ext. antenna; 2437 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

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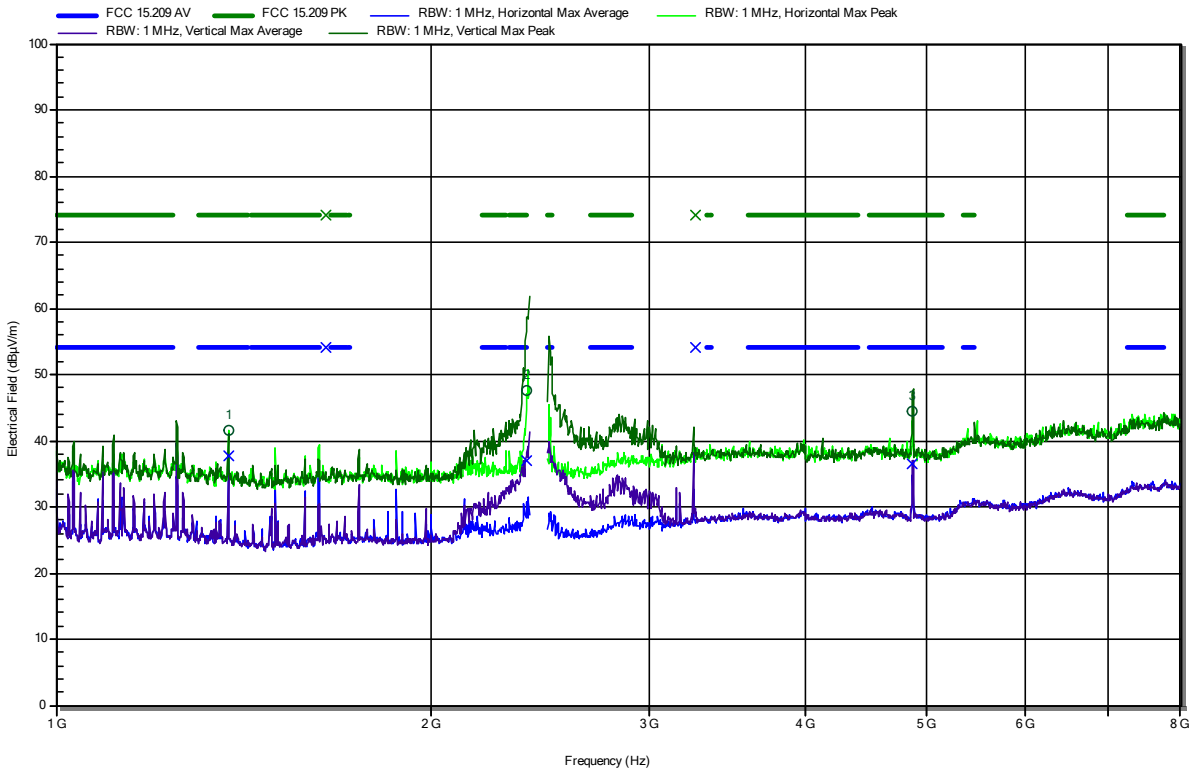
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 1.375 GHz | 41.63 dBµV/m | 74 dBµV/m | -32.37 dB | Pass | Horizontal |
| 2.3883 GHz | 47.69 dBµV/m | 74 dBµV/m | -26.31 dB | Pass | Vertical |
| 4.8748 GHz | 44.56 dBµV/m | 74 dBµV/m | -29.44 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 1.375 GHz | 37.6 dBµV/m | 54 dBµV/m | -16.4 dB | Pass | Horizontal |
| 2.3883 GHz | 37.11 dBµV/m | 54 dBµV/m | -16.89 dB | Pass | Vertical |
| 4.8748 GHz | 36.51 dBµV/m | 54 dBµV/m | -17.49 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 n; HT40; MCS 0; ext. antenna; 2437 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

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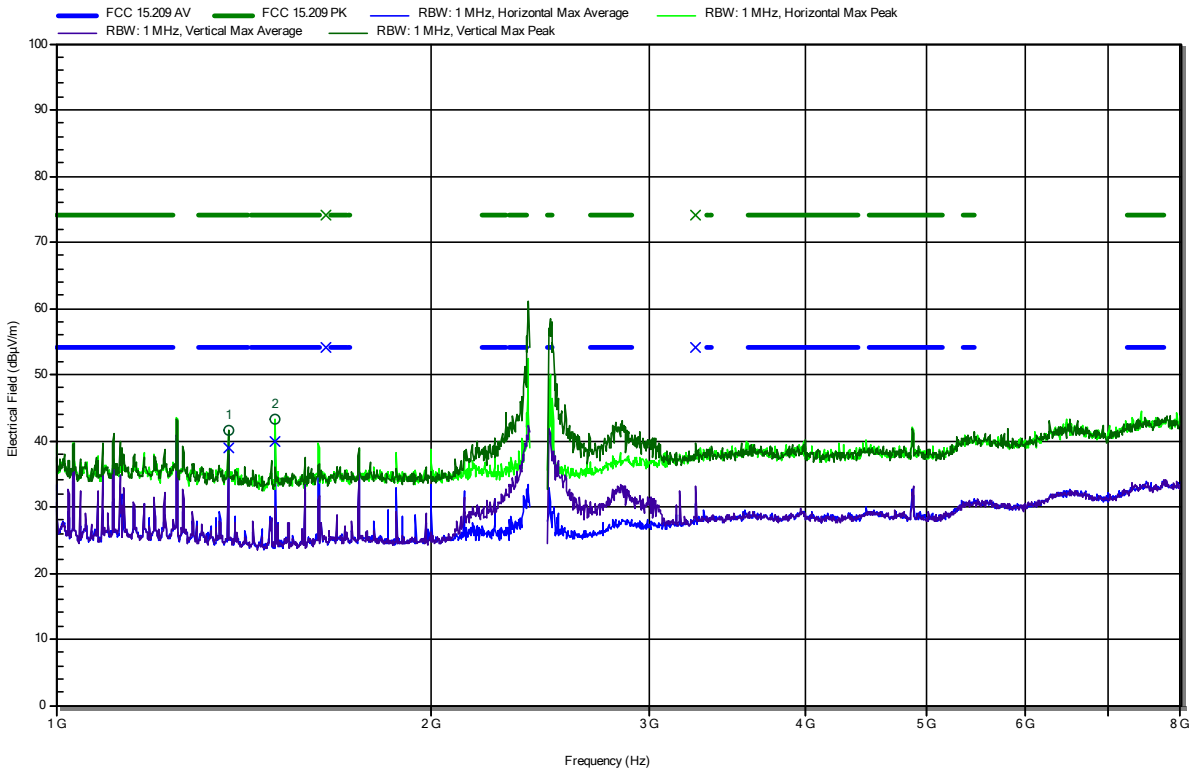
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 1.3751 GHz | 41.65 dBµV/m | 74 dBµV/m | -32.35 dB | Pass | Horizontal |
| 1.5002 GHz | 43.31 dBµV/m | 74 dBµV/m | -30.69 dB | Pass | Horizontal |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 1.3751 GHz | 38.8 dBµV/m | 54 dBµV/m | -15.2 dB | Pass | Horizontal |
| 1.5002 GHz | 39.92 dBµV/m | 54 dBµV/m | -14.08 dB | Pass | Horizontal |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2462 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

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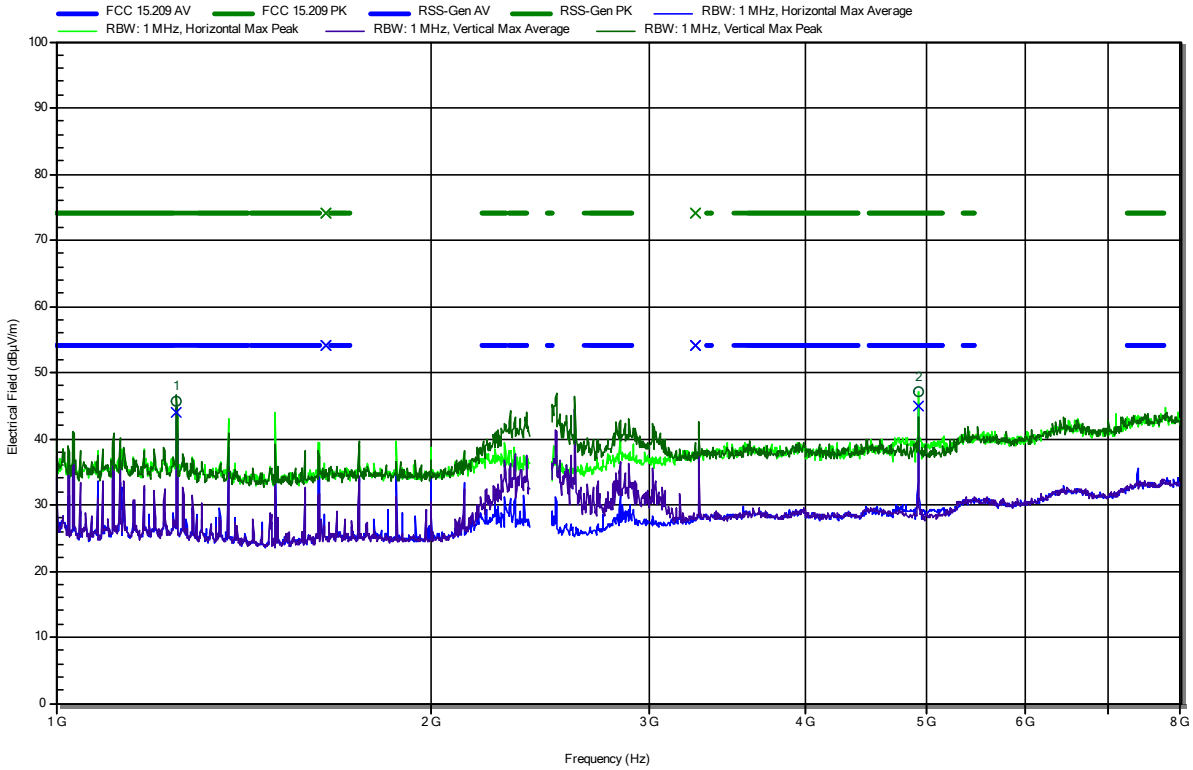
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 1.25 GHz | 45.77 dBµV/m | 74 dBµV/m | -28.23 dB | Pass | Vertical |
| 4.924 GHz | 47.22 dBµV/m | 74 dBµV/m | -26.78 dB | Pass | Horizontal |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 1.25 GHz | 43.95 dBµV/m | 54 dBµV/m | -10.05 dB | Pass | Vertical |
| 4.924 GHz | 45.03 dBµV/m | 54 dBµV/m | -8.97 dB | Pass | Horizontal |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 g; 9 Mbps; ext. antenna; 2462 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

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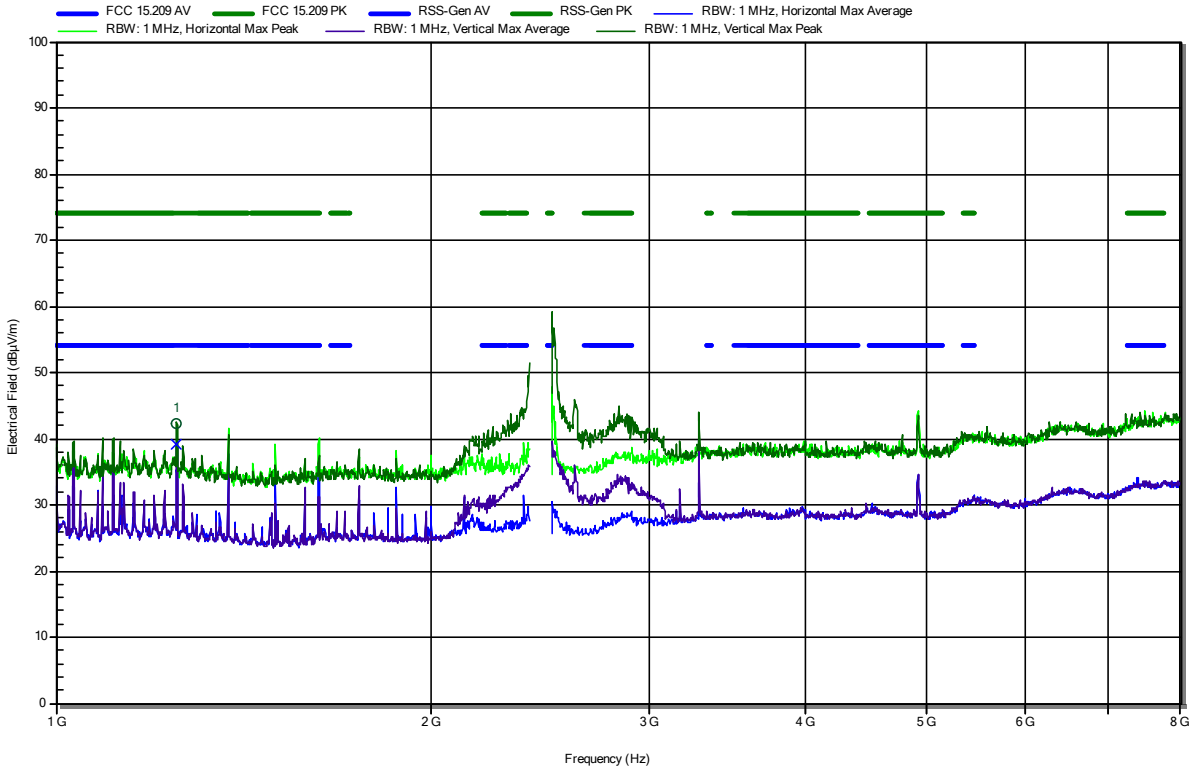
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 1.25 GHz | 42.38 dBµV/m | 74 dBµV/m | -31.62 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 1.25 GHz | 39.05 dBµV/m | 54 dBµV/m | -14.95 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 n; HT20; MCS 2; ext. antenna; 2462 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

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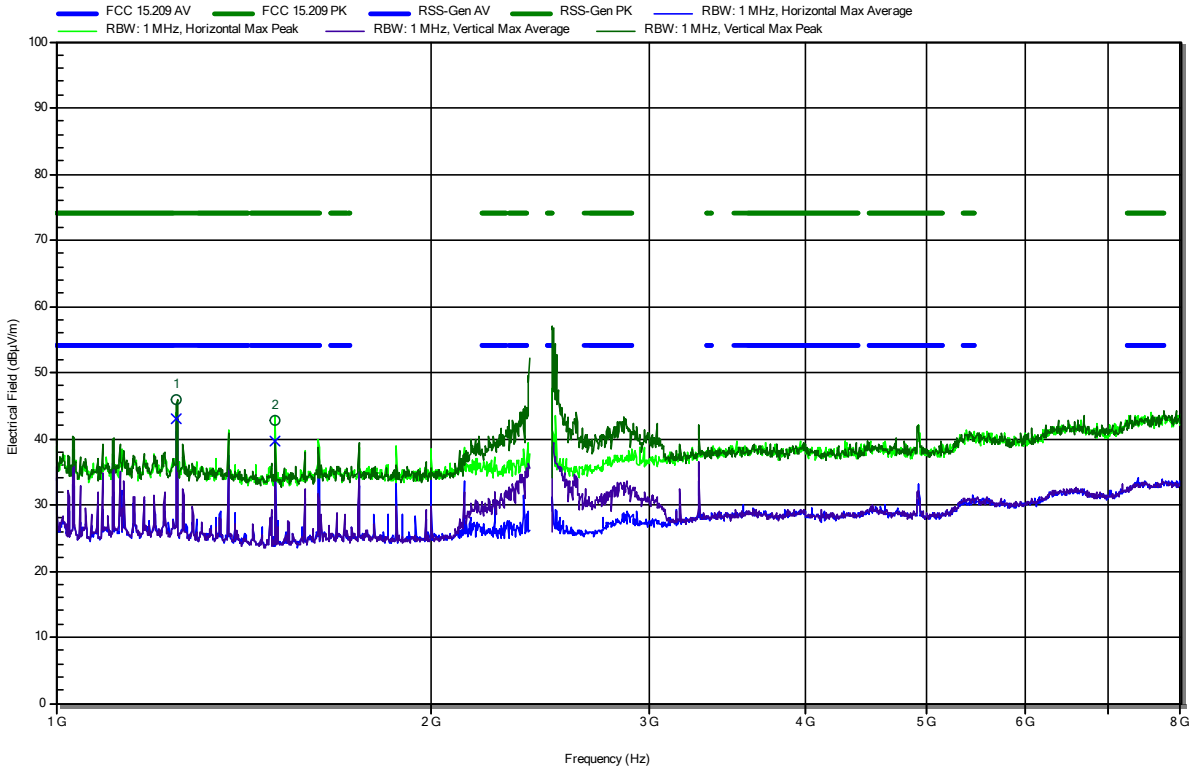
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 1.25 GHz | 45.92 dBµV/m | 74 dBµV/m | -28.08 dB | Pass | Vertical |
| 1.5 GHz | 42.83 dBµV/m | 74 dBµV/m | -31.17 dB | Pass | Horizontal |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 1.25 GHz | 43.07 dBµV/m | 54 dBµV/m | -10.93 dB | Pass | Vertical |
| 1.5 GHz | 39.64 dBµV/m | 54 dBµV/m | -14.36 dB | Pass | Horizontal |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 n; HT40; MCS 0; ext. antenna; 2462 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

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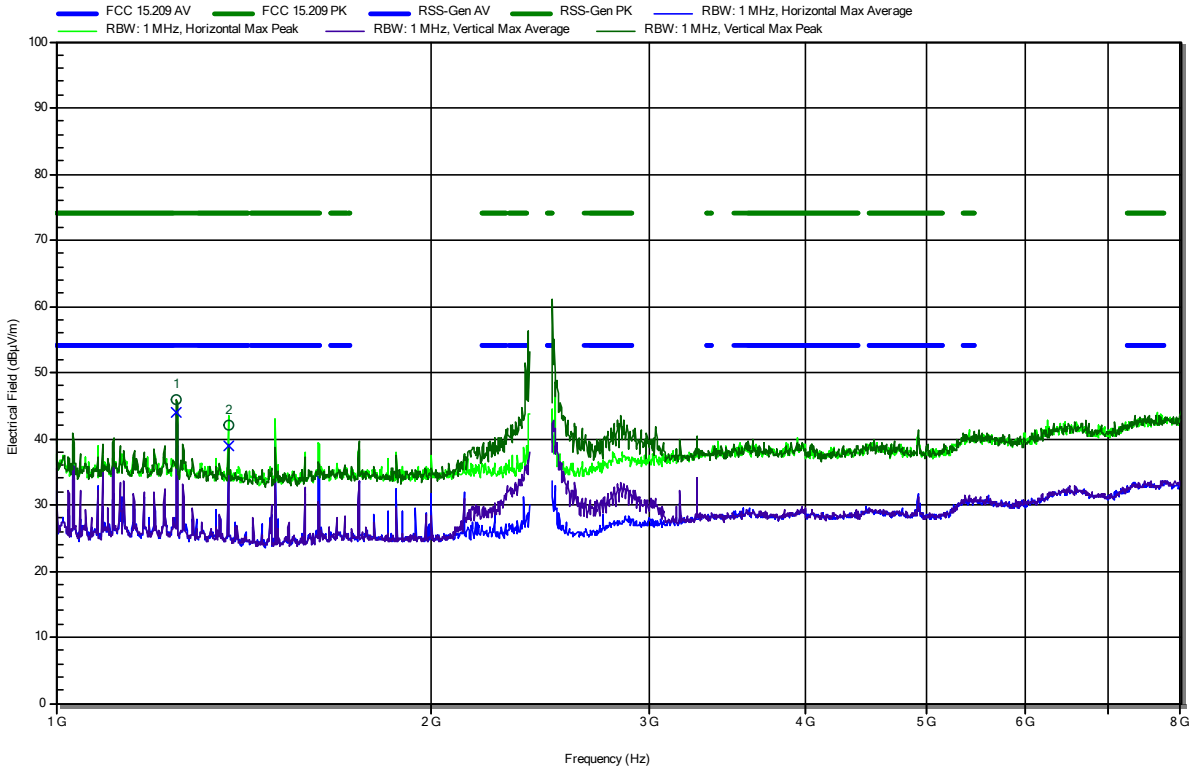
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 1.25 GHz | 45.81 dBµV/m | 74 dBµV/m | -28.19 dB | Pass | Vertical |
| 1.375 GHz | 42.12 dBµV/m | 74 dBµV/m | -31.88 dB | Pass | Horizontal |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 1.25 GHz | 44.01 dBµV/m | 54 dBµV/m | -9.99 dB | Pass | Vertical |
| 1.375 GHz | 38.86 dBµV/m | 54 dBµV/m | -15.14 dB | Pass | Horizontal |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2412 MHz |
| Test Date: | 2021-12-15 |
| Note: | lower bandedge |

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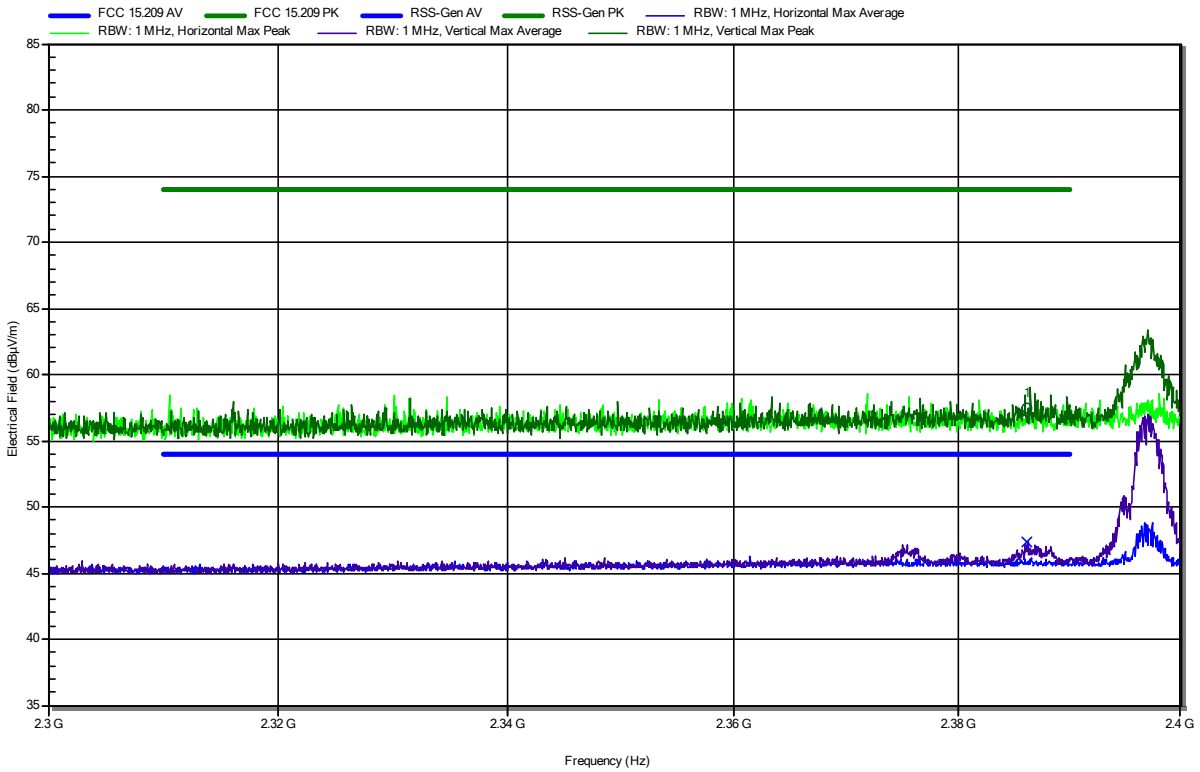
RadiMation

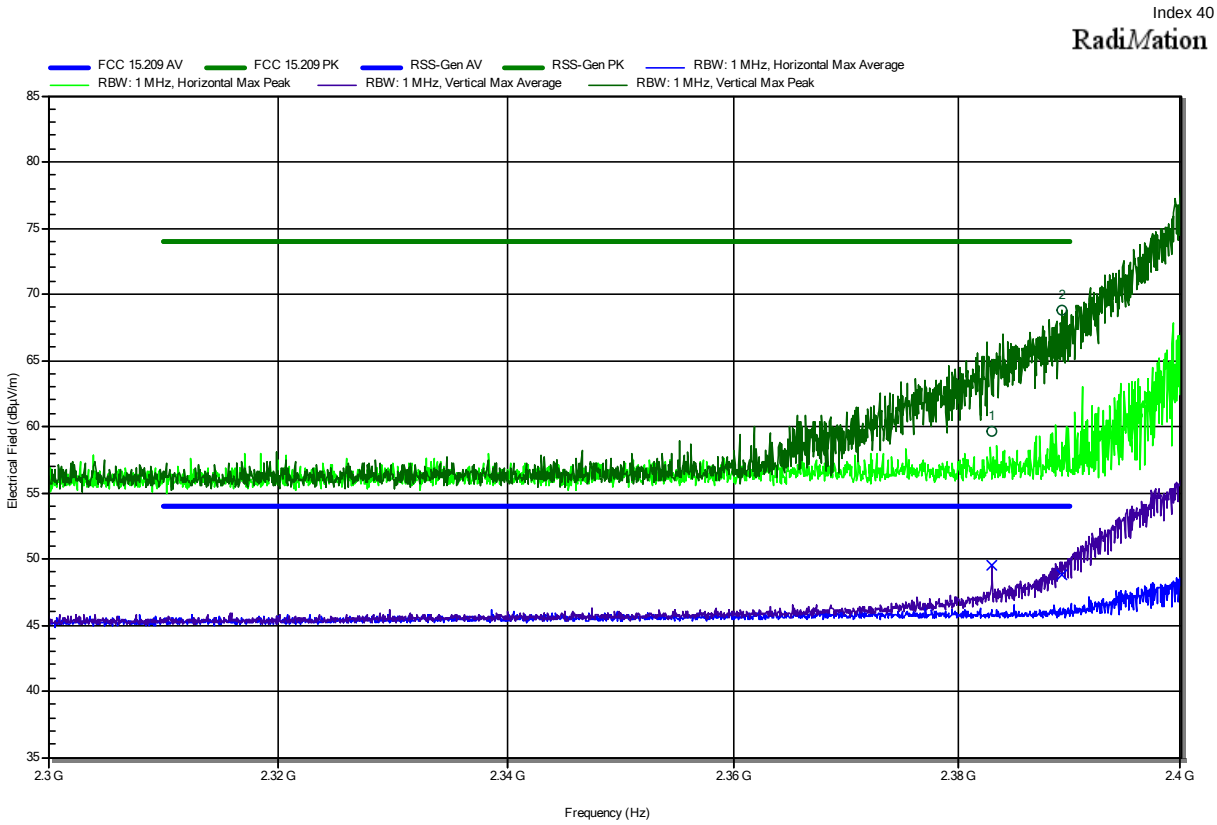



| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 2.3862 GHz | 57.43 dBµV/m | 74 dBµV/m | -16.57 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 2.3862 GHz | 47.36 dBµV/m | 54 dBµV/m | -6.64 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 g; 9 Mbps; ext. antenna; 2412 MHz |
| Test Date: | 2021-12-15 |
| Note: | lower bandedge |

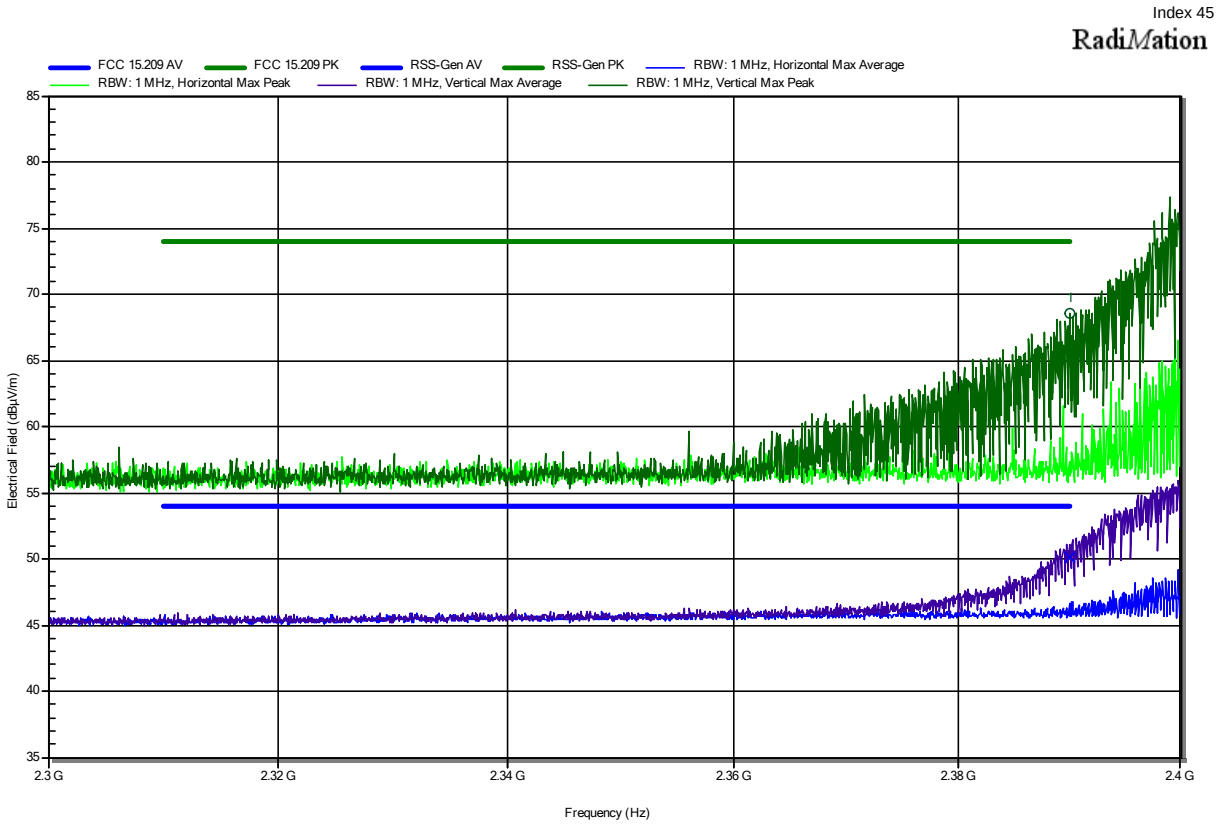



| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 2.383 GHz | 59.6 dBµV/m | 74 dBµV/m | -14.4 dB | Pass | Vertical |
| 2.3894 GHz | 68.82 dBµV/m | 74 dBµV/m | -5.18 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 2.383 GHz | 49.49 dBµV/m | 54 dBµV/m | -4.51 dB | Pass | Vertical |
| 2.3894 GHz | 48.85 dBµV/m | 54 dBµV/m | -5.15 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 n; HT20; MCS 2; ext. antenna; 2412 MHz |
| Test Date: | 2021-12-15 |
| Note: | lower bandedge |

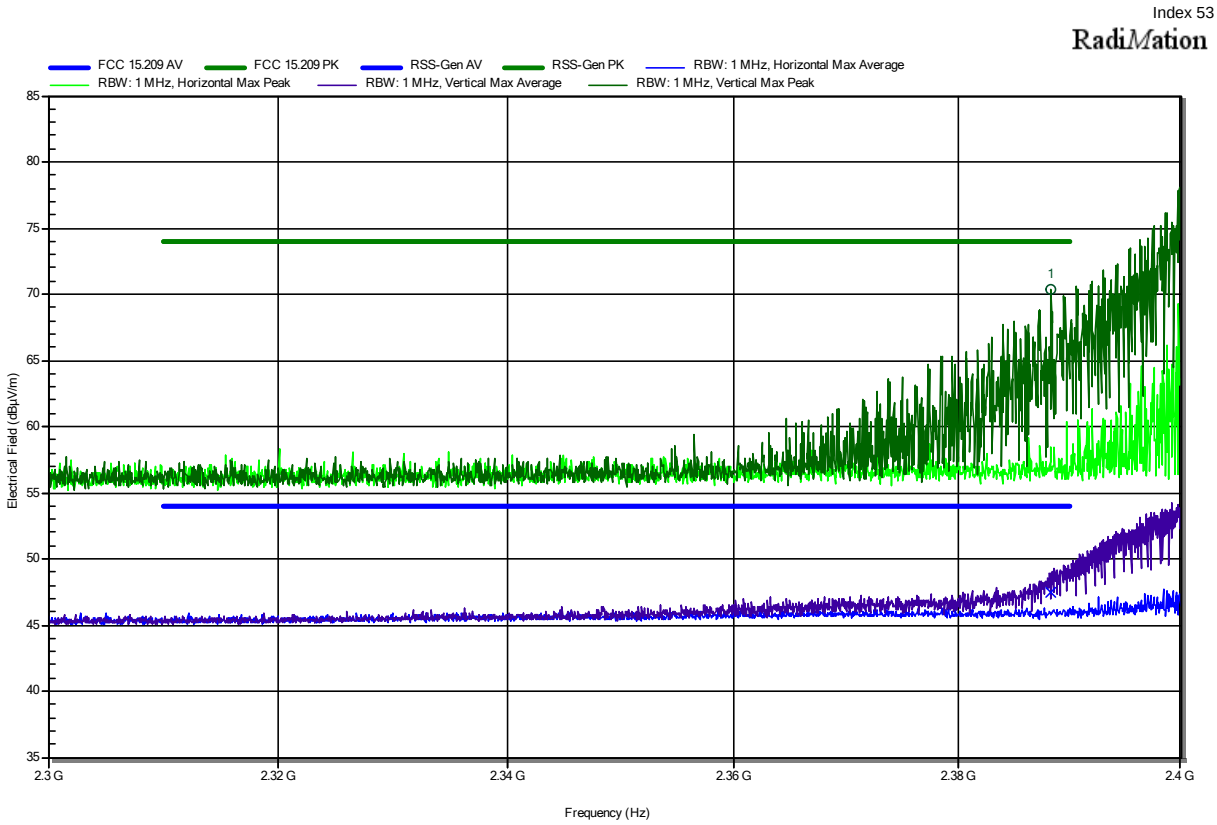



| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 2.39 GHz | 68.55 dBµV/m | 74 dBµV/m | -5.45 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 2.39 GHz | 50.13 dBµV/m | 54 dBµV/m | -3.87 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 n; HT40; MCS 0; ext. antenna; 2412 MHz |
| Test Date: | 2021-12-15 |
| Note: | lower bandedge |




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 2.3883 GHz | 70.3 dBµV/m | 74 dBµV/m | -3.7 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 2.3883 GHz | 47.44 dBµV/m | 54 dBµV/m | -6.56 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2462 MHz |
| Test Date: | 2021-12-15 |
| Note: | upper bandedge |

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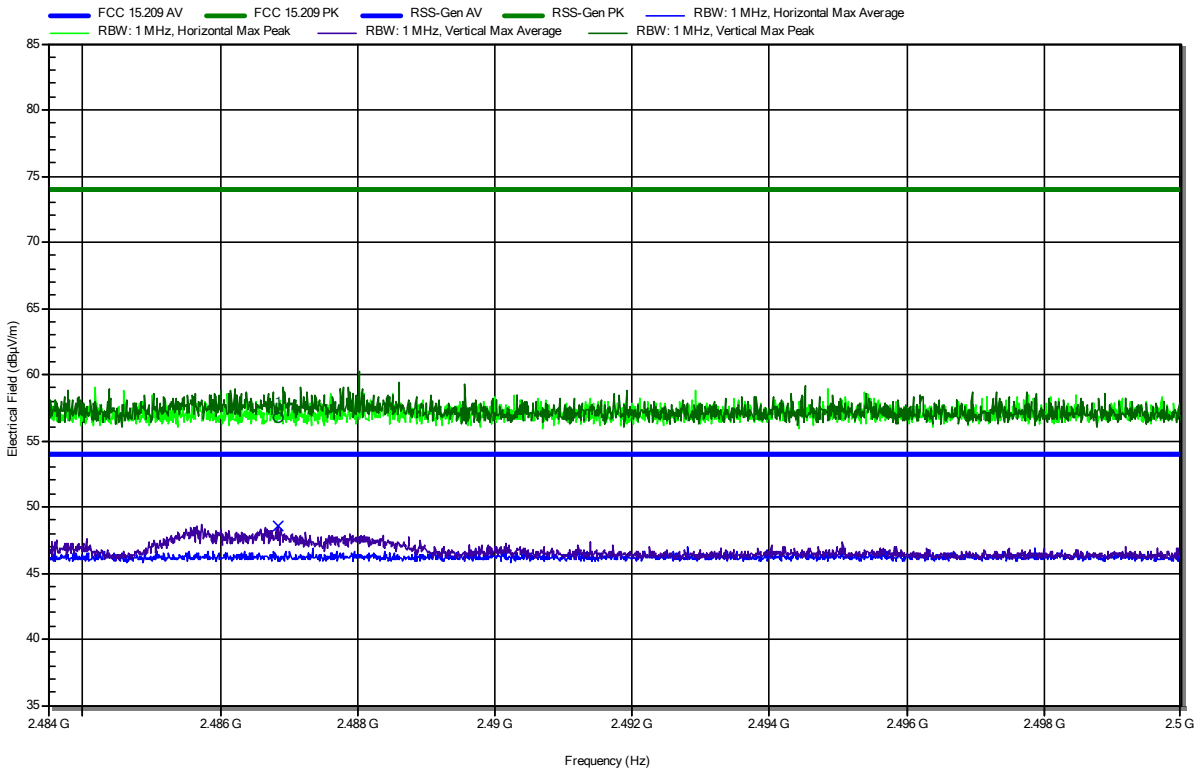
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 2.4869 GHz | 56.72 dBµV/m | 74 dBµV/m | -17.28 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 2.4869 GHz | 48.5 dBµV/m | 54 dBµV/m | -5.5 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 g; 9 Mbps; ext. antenna; 2462 MHz |
| Test Date: | 2021-12-15 |
| Note: | upper bandedge |

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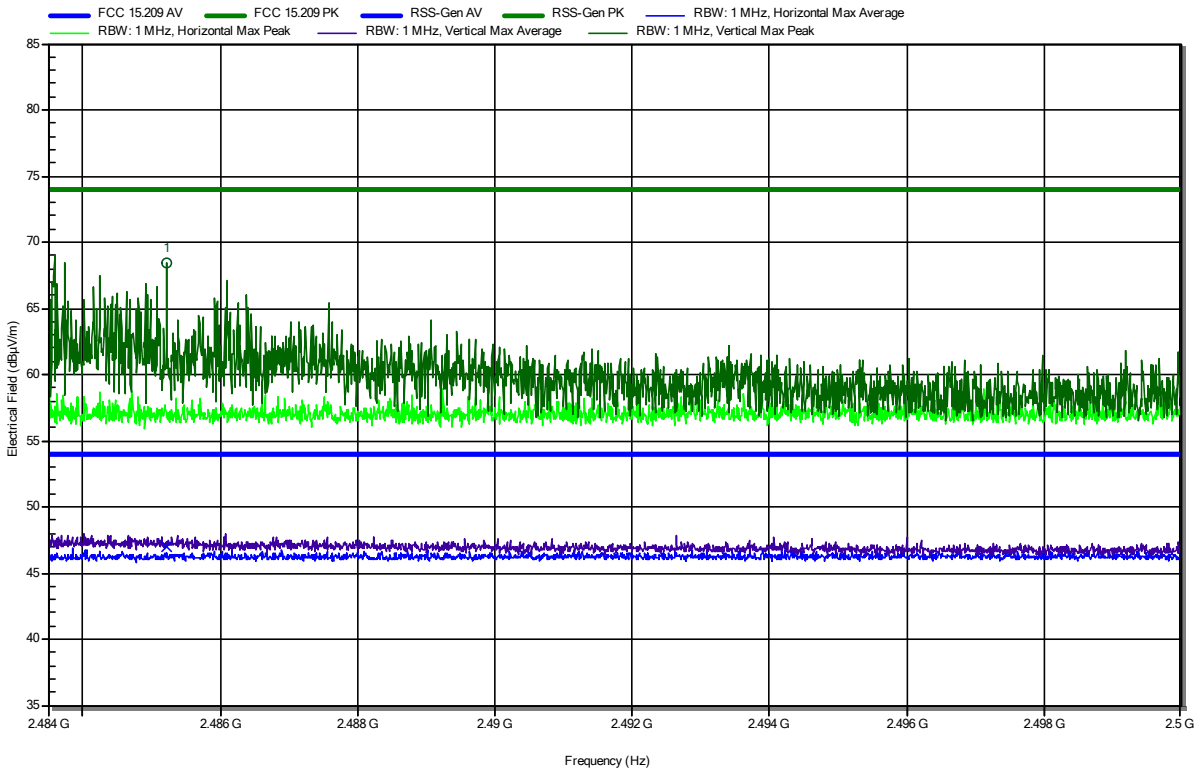
RadiMation




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 2.4852 GHz | 68.49 dBµV/m | 74 dBµV/m | -5.51 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 2.4852 GHz | 46.99 dBµV/m | 54 dBµV/m | -7.01 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 n; HT20; MCS 2; ext. antenna; 2462 MHz |
| Test Date: | 2021-12-15 |
| Note: | upper bandedge |

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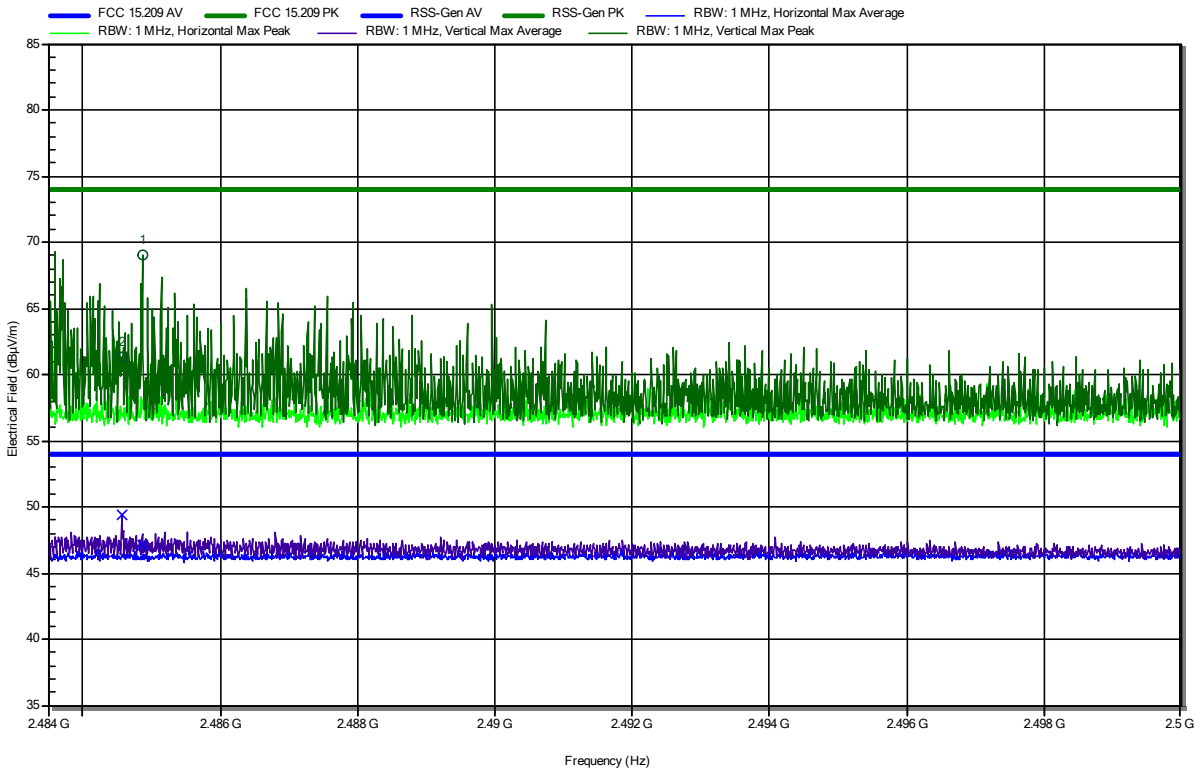
RadiMation

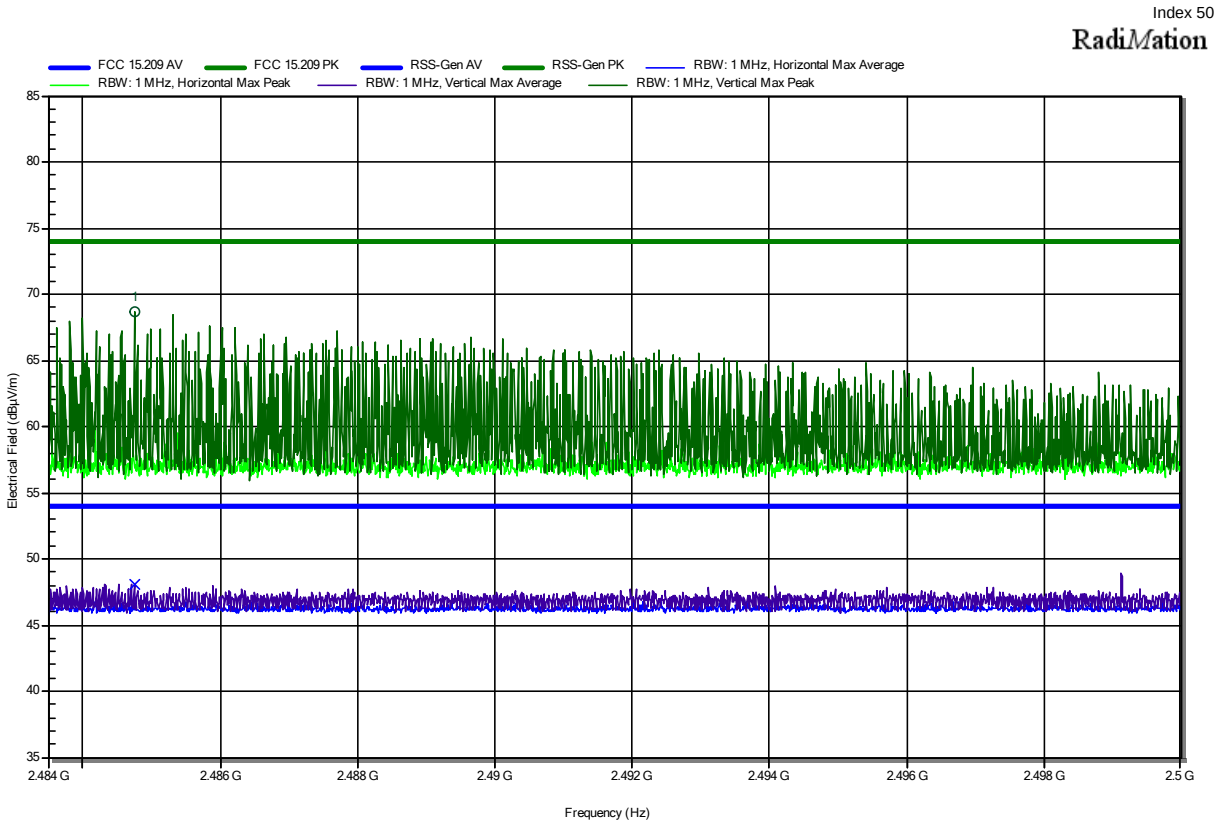



| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 2.4846 GHz | 61.34 dBµV/m | 74 dBµV/m | -12.66 dB | Pass | Vertical |
| 2.4849 GHz | 69.08 dBµV/m | 74 dBµV/m | -4.92 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 2.4846 GHz | 49.37 dBµV/m | 54 dBµV/m | -4.63 dB | Pass | Vertical |
| 2.4849 GHz | 47.1 dBµV/m | 54 dBµV/m | -6.9 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120B |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 n; HT40; MCS 0; ext. antenna; 2462 MHz |
| Test Date: | 2021-12-15 |
| Note: | upper bandedge |




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 2.4847 GHz | 68.71 dBµV/m | 74 dBµV/m | -5.29 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 2.4847 GHz | 48.1 dBµV/m | 54 dBµV/m | -5.9 dB | Pass | Vertical |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck HWRD 650 |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2412 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

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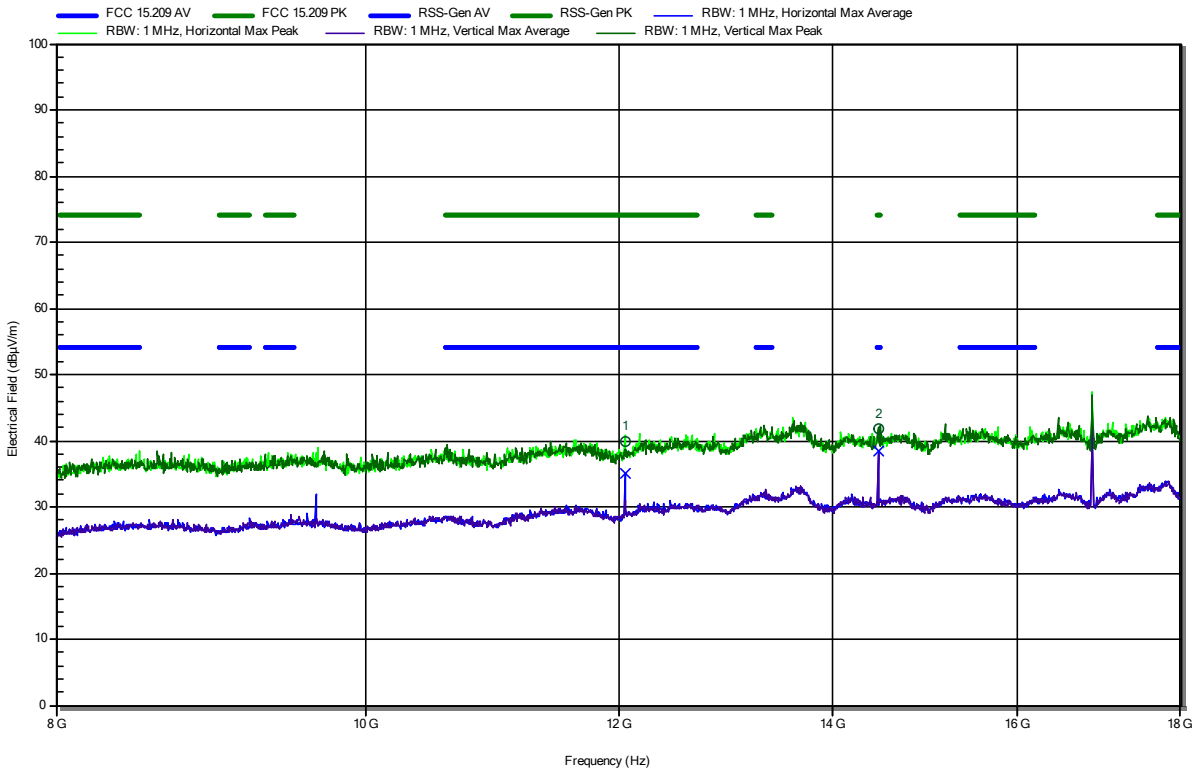
RadiMation

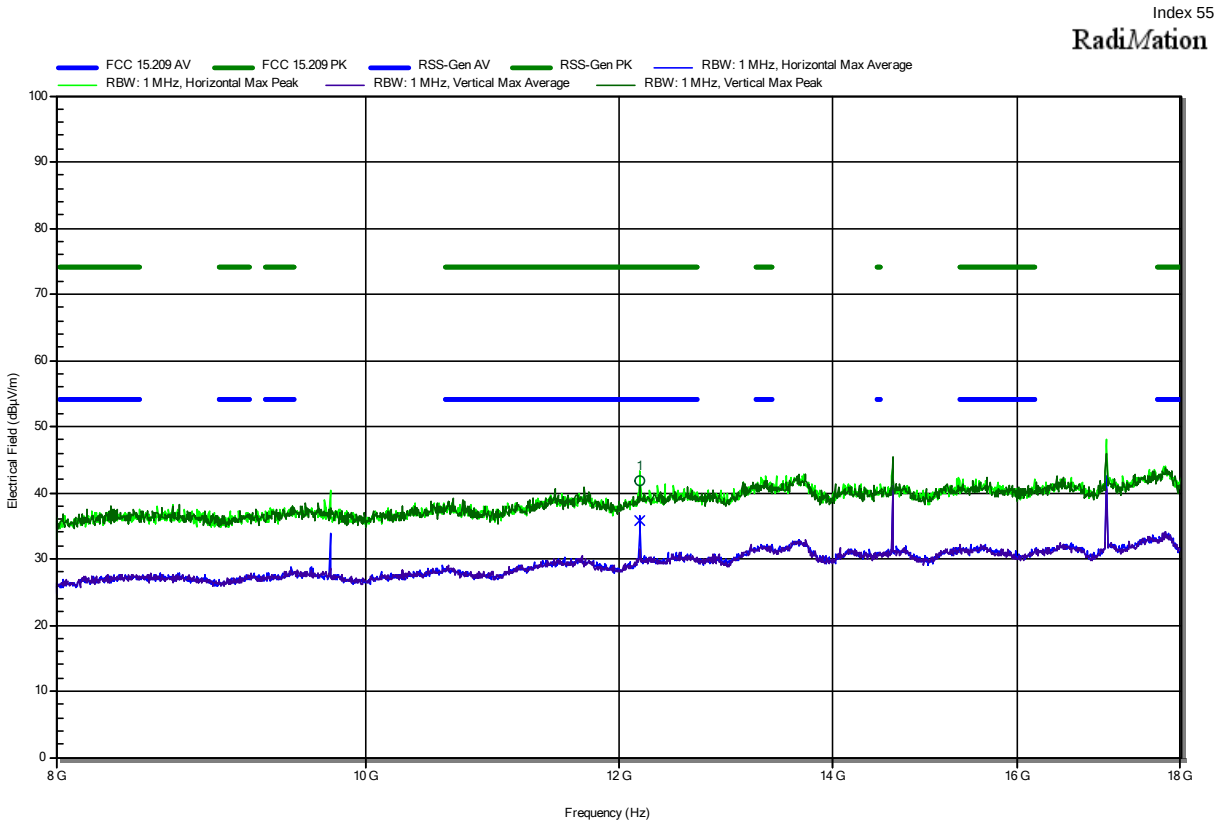



| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 12.058 GHz | 39.9 dBµV/m | 74 dBµV/m | -34.1 dB | Pass | Horizontal |
| 14.472 GHz | 41.88 dBµV/m | 74 dBµV/m | -32.12 dB | Pass | Horizontal |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 12.058 GHz | 35.04 dBµV/m | 54 dBµV/m | -18.96 dB | Pass | Horizontal |
| 14.472 GHz | 38.5 dBµV/m | 54 dBµV/m | -15.5 dB | Pass | Horizontal |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck HWRD 650 |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2437 MHz |
| Test Date: | 2021-12-15 |
| Note: | |

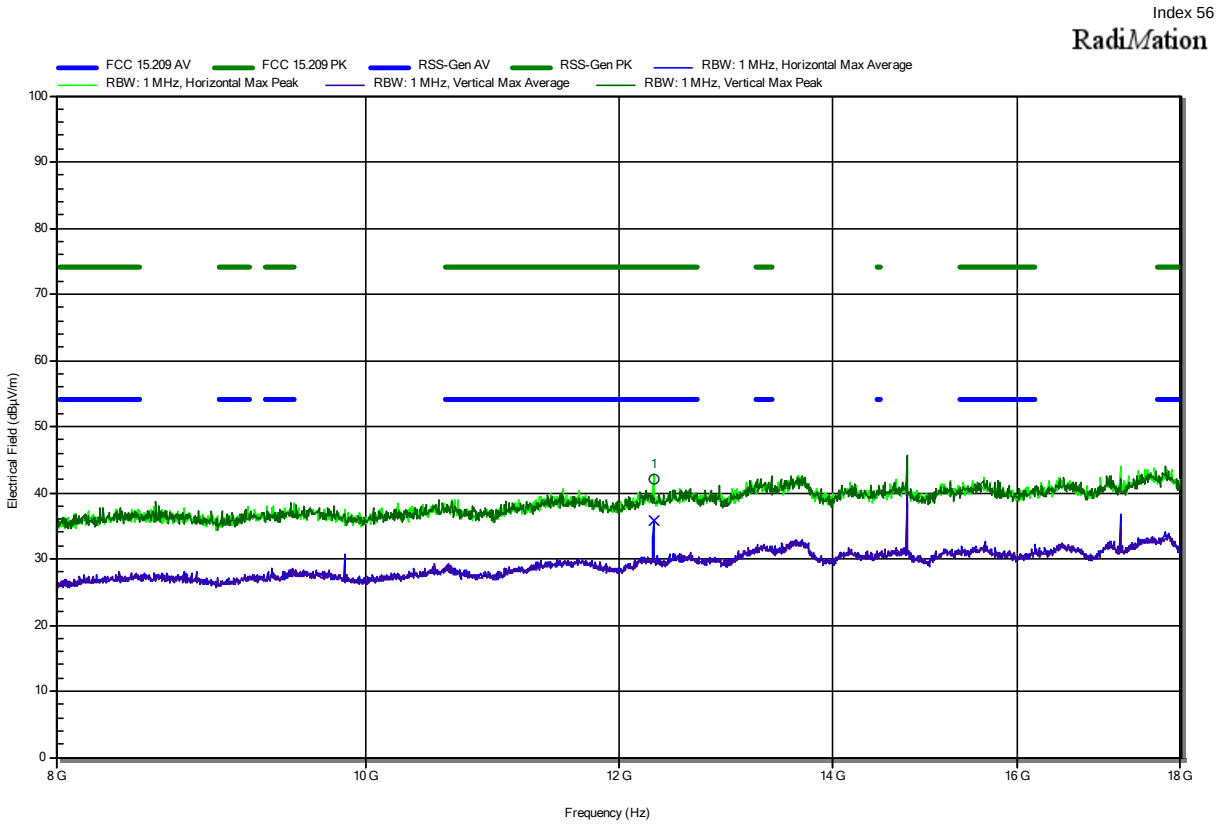



| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 12.186 GHz | 41.88 dBµV/m | 74 dBµV/m | -32.12 dB | Pass | Horizontal |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 12.186 GHz | 35.77 dBµV/m | 54 dBµV/m | -18.23 dB | Pass | Horizontal |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck HWRD 650 |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2462 MHz |
| Test Date: | 2021-12-15 |
| Note: | |




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 12.309 GHz | 41.97 dBµV/m | 74 dBµV/m | -32.03 dB | Pass | Horizontal |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 12.309 GHz | 35.84 dBµV/m | 54 dBµV/m | -18.16 dB | Pass | Horizontal |

## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Amplifier Research AT4560 |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2412 MHz |
| Test Date: | 2021-12-16 |
| Note: | |

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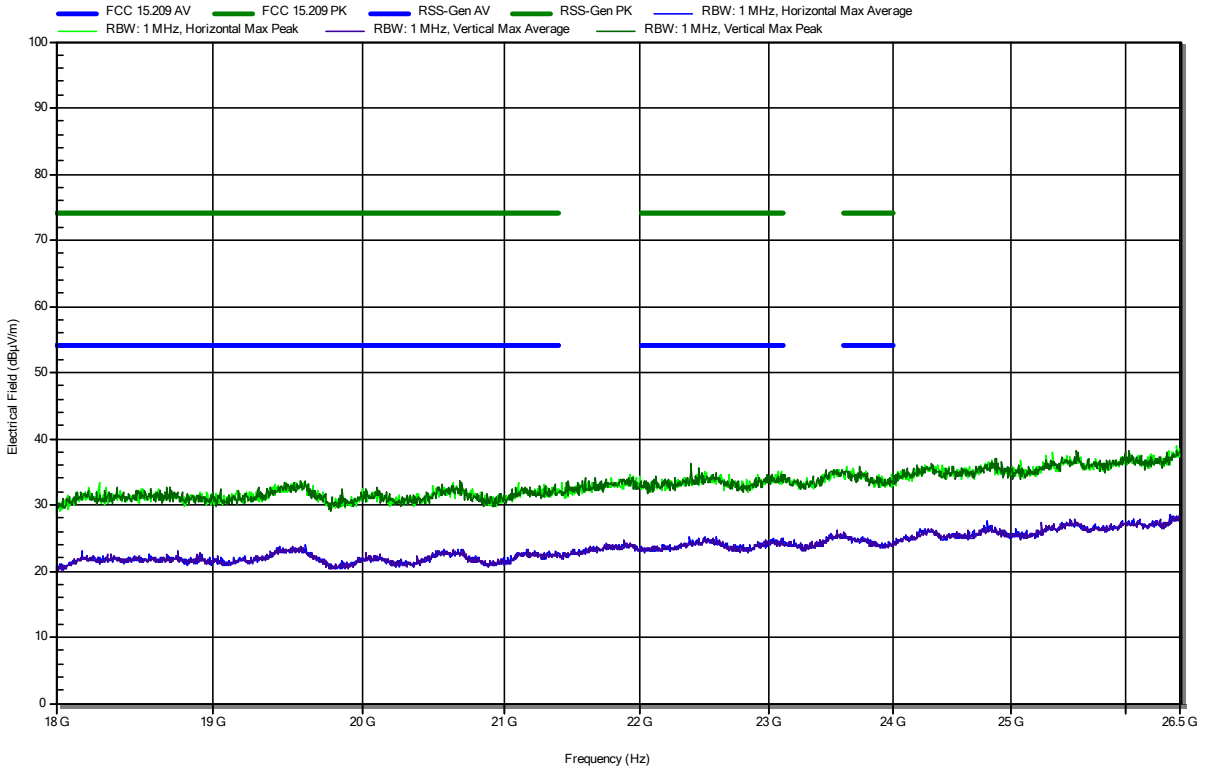
RadiMation



## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Amplifier Research AT4560 |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2437 MHz |
| Test Date: | 2021-12-16 |
| Note: | |

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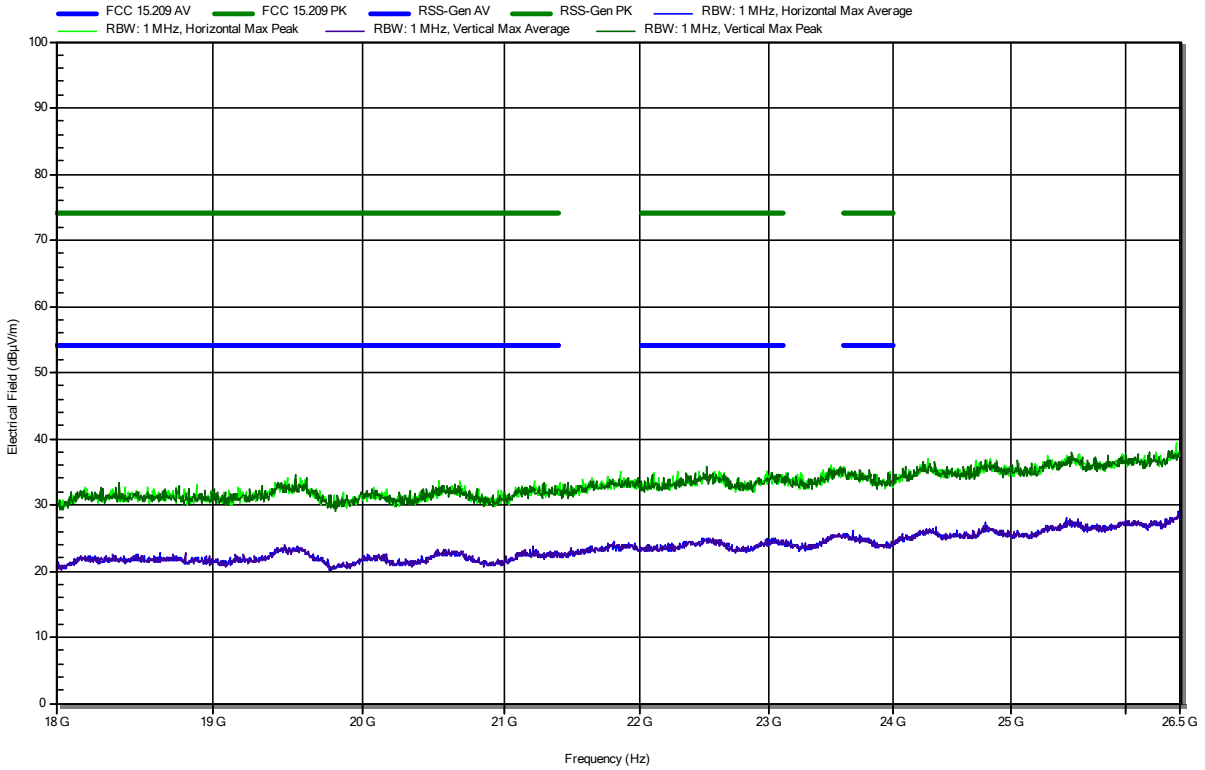
RadiMation



## Radiated Spurious Emissions according to 47 CFR Part 15.247

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Amplifier Research AT4560 |
| Measurement distance: | 3 m |
| Mode: | Tx; IEEE802.11 b; 1 Mbps; ext. antenna; 2462 MHz |
| Test Date: | 2021-12-16 |
| Note: | |

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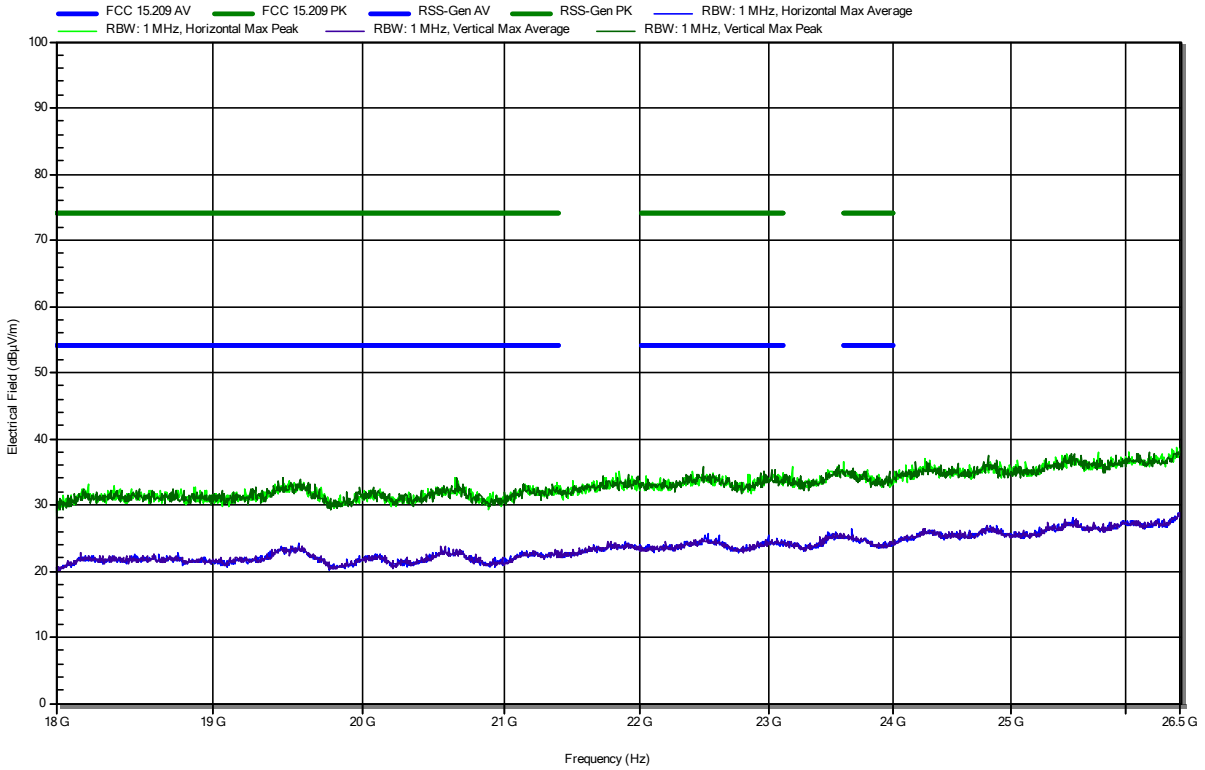
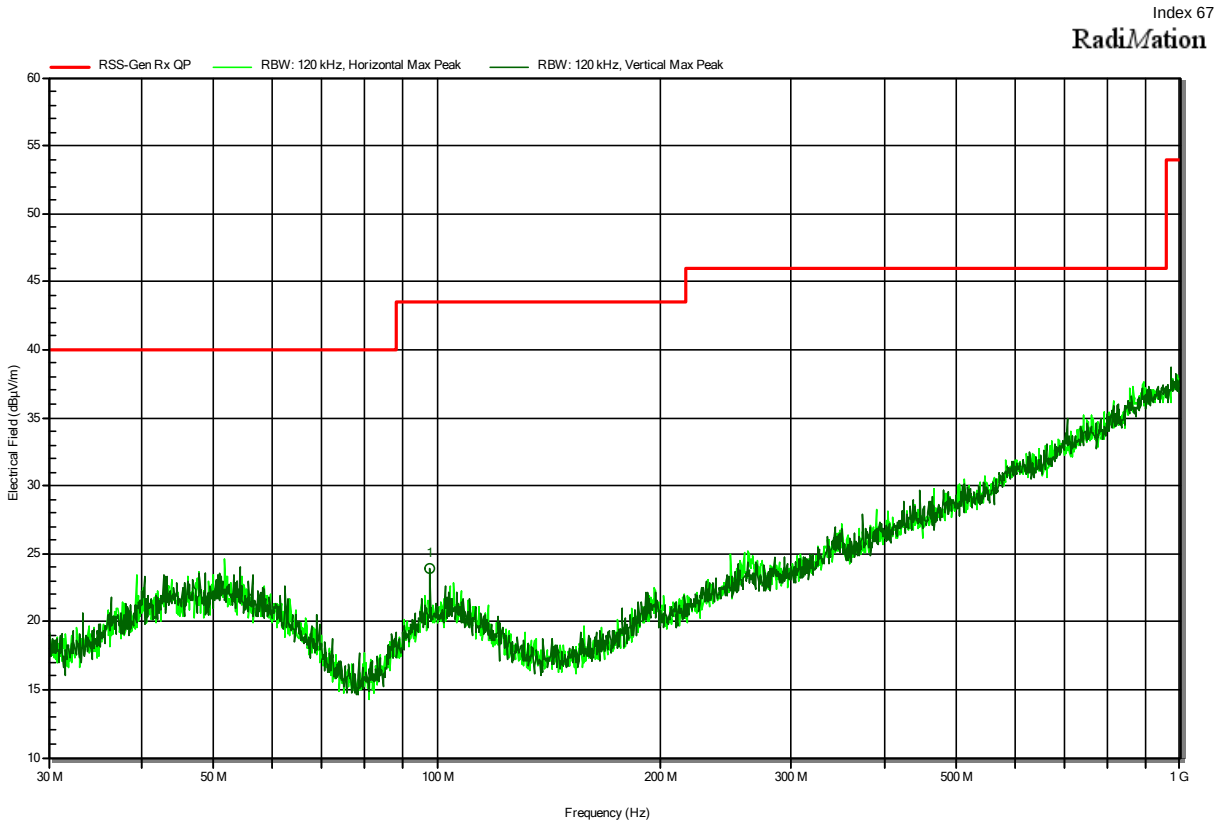
RadiMation



# ANNEX B Receiver spurious emissions

## Radiated Spurious Emissions according to RSS-247, RSS-Gen

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Voigt |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 22 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck VULB 9162 |
| Measurement distance: | 10 m |
| Mode: | Rx; IEEE802.11; ext. antenna; 2437 MHz |
| Test Date: | 2022-03-17 |
| Note: | |




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 97.835 MHz | 23.9 dBµV/m | 43.5 dBµV/m | -19.6 dB | Pass | Vertical |

## Radiated Spurious Emissions according to RSS-247, RSS-Gen

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Qawasmeh |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 20 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck BBHA 9120D |
| Measurement distance: | 3 m |
| Mode: | Rx; IEEE802.11; ext. antenna; 2437 MHz |
| Test Date: | 2022-03-18 |
| Note: | |

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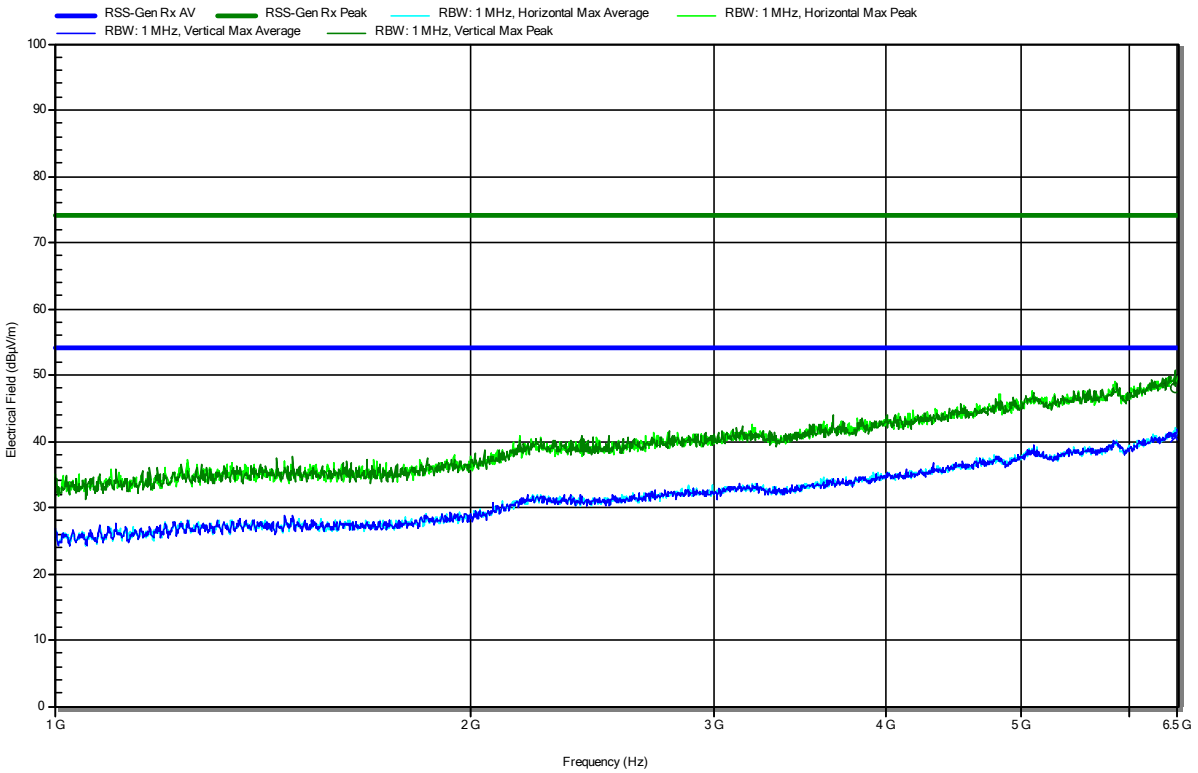
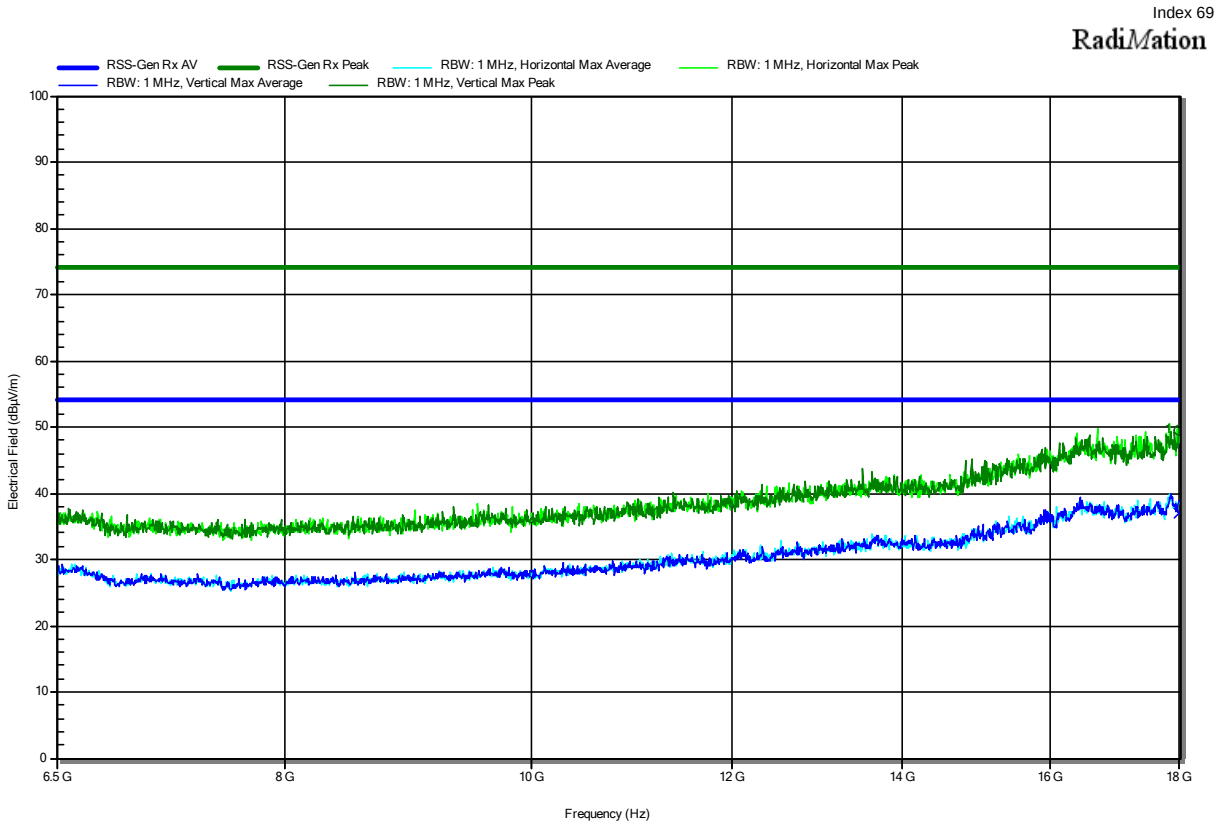
RadiMation




| | | | | | |
|---|---|---|---|---|---|
| Frequency<br>6.47 GHz | Peak<br>48.06 dBµV/m | Peak Limit<br>74 dBµV/m | Peak Difference<br>-25.94 dB | Peak Status<br>Pass | Polarization<br>Horizontal |
| Frequency<br>6.47 GHz | Average<br>40.61 dBµV/m | Average Limit<br>53.98 dBµV/m | Average Difference<br>-13.37 dB | Average Status<br>Pass | Polarization<br>Horizontal |

## Radiated Spurious Emissions according to RSS-247, RSS-Gen

| | |
|---|---|
| Project Number: | G0M-2101-9569 |
| Applicant: | Panasonic Industrial Devices Europe GmbH |
| Model Description: | Wi-Fi Dual Band 2.4/5 GHz and Bluetooth Module |
| Model: | ENWF9408A1EF |
| Test Sample ID: | 37322 |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Qawasmeh |
| Measurement software: | RadiMation, version 2020.1.8 |
| Test Conditions: | Tnom: 20 °Celsius, Vnom: 3.3 VDC |
| Antenna: | Schwarzbeck HWRD 650 |
| Measurement distance: | 3 m |
| Mode: | Rx; IEEE802.11; ext. antenna; 2437 MHz |
| Test Date: | 2022-03-18 |
| Note: | |




| Frequency | Peak | Peak Limit | Peak Difference | Peak Status | Polarization |
|---|---|---|---|---|---|
| 17.977 GHz | 49.55 dBµV/m | 74 dBµV/m | -24.45 dB | Pass | Vertical |

| Frequency | Average | Average Limit | Average Difference | Average Status | Polarization |
|---|---|---|---|---|---|
| 17.977 GHz | 36.97 dBµV/m | 53.98 dBµV/m | -17.01 dB | Pass | Vertical |

= = = END OF TEST REPORT = = =