# Nalloy, LLC

**REVISED TEST REPORT TO 102802-3**

## Model: PFAY0H

**Tested to The Following Standards:**

**FCC Part 15 Subpart C Section(s)**

**15.207 & 15.247**
**(DTS 2400-2483.5 MHz)**

**Report No.: 102802-3A**

**Date of issue: June 24, 2020**

**This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of testing for CKC Laboratories, Inc.**

**We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.**

**Test Certificate # 803.01**

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# ADMINISTRATIVE INFORMATION

## Test Report Information

**REPORT PREPARED FOR:**

Nalloy, LLC
2301 5th Avenue
Seattle, WA 98108

**REPORT PREPARED BY:**

Terri Rayle
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Representative: Naga Suryadevara
Customer Reference Number: 2D-03187704

Project Number: 102802

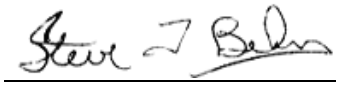
**DATE OF EQUIPMENT RECEIPT:** March 18, 2020
**DATE(S) OF TESTING:** March 18, 24 and 27, 2020
April 1-3, 2020

## Revision History

**Original:** Testing of the Model: PFAY0H to FCC Part 15 Subpart C Section(s) 15.207 & 15.247 (DTS 2400-2483.5 MHz)
**Revision A:** To replace the Section 15.247(d) Conducted Spurious data and Section 15.247 (d) Radiated Spurious data due to limit changed -10dB. Added statement to Section 15.247(e) PSD to clarify measurement option and revised Section 15.247(b)(3) Power Input measurement option to AVGPM.

## Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the equipment provided by the client, tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



***Steve Behm***
***Director of Quality Assurance & Engineering Services***
***CKC Laboratories, Inc.***

# Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
Canyon Park
22116 23rd Drive S.E., Suite A
Bothell, WA 98021

# Software Versions

| CKC Laboratories Proprietary Software | Version |
|---|---|
| EMITest Emissions | 5.03.12 |

# Site Registration & Accreditation Information

| Location | *NIST CB # | FCC | Japan |
|---|---|---|---|
| Canyon Park, Bothell, WA | US0081 | US1022 | A-0136 |
| Brea, CA | US0060 | US1025 | A-0136 |
| Fremont, CA | US0082 | US1023 | A-0136 |
| Mariposa, CA | US0103 | US1024 | A-0136 |

*CKC's list of NIST designated countries can be found at: https://standards.gov/cabs/designations.html

# SUMMARY OF RESULTS

## Standard / Specification: FCC Part 15 Subpart C - 15.247 (DTS)

| Test Procedure | Description | Modifications | Results |
|---|---|---|---|
| 15.247(a)(2) | 6dB Bandwidth | NA | Pass |
| 15.247(b)(3) | Output Power | NA | Pass |
| 15.247(e) | Power Spectral Density | NA | Pass |
| 15.247(d) | RF Conducted Emissions & Band Edge | NA | Pass |
| 15.247(d) | Radiated Emissions & Band Edge | NA | Pass |
| 15.207 | AC Conducted Emissions | NA | Pass |

NA = Not Applicable

| ISO/IEC 17025 Decision Rule |
|---|
| The declaration of pass or fail herein is based upon assessment to the specification(s) listed above, including where applicable, assessment of measurement uncertainties. For performance related tests, equipment was monitored for specified criteria identified in that section of testing. |
| |

# Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

| Summary of Conditions |
|---|
| No modifications were made during testing. |
| |

**Modifications listed above must be incorporated into all production units.**

# Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

| Summary of Conditions |
|---|
| None |
| |

# EQUIPMENT UNDER TEST (EUT)

During testing, numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

### Configuration 1

***Equipment Tested:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| NA | Nalloy, LLC. | PFAY0H | 9906679780 |

***Support Equipment:***

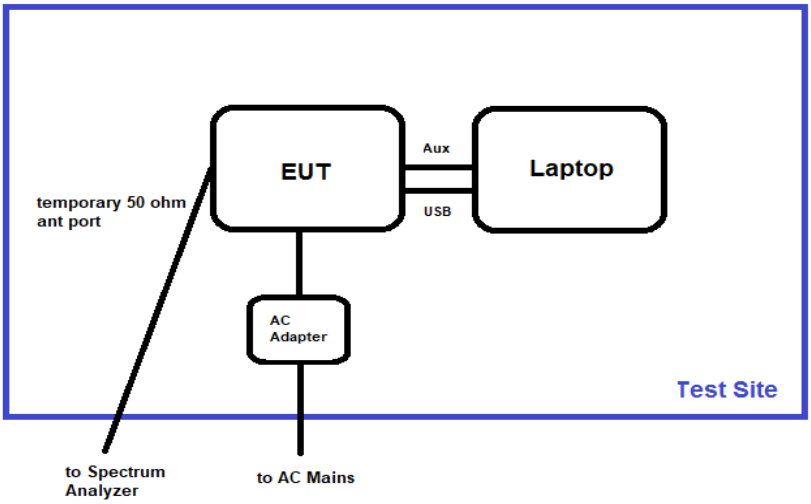
| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| PC | Lenovo | 81KT | YD07YGLG |
| PC PSU | Lenovo | ADL45WCC | NA |
| EUT PSU | Delta Electronics | MDS-030AAC15 | 24QW96P00CS |

## General Product Information:

| Product Information | Manufacturer-Provided Details |
|---|---|
| Equipment Type: | Stand-Alone Equipment |
| Type of Wideband System: | 802.11b, 802.11g, 802.11n (20 and 40MHz BW) |
| Operating Frequency Range: | 2412-2462 MHz |
| Modulation Type(s): | CCK, DBPSK/DQPSK+DSSS, BPSK, QPSK, 16-QAM, 64-QAM |
| Maximum Duty Cycle: | 100% Modulated (tested worst-case) |
| Number of TX Chains: | 1 |
| Antenna Type(s) and Gain: | 802.11b and 802.11g Linear Polarized / 3.7 dBi<br>802.11n802<br>MIMO with Antenna 0 Linear Polarized / 3.7dBi and Antenna 1 Linear Polarized / 3.6dBi |
| Beamforming Type: | NA |
| Antenna Connection Type: | Integral |
| Nominal Input Voltage: | 120VAC |
| Firmware / Software used for Test: | ro.build.id=PKQ1.180819.001 |

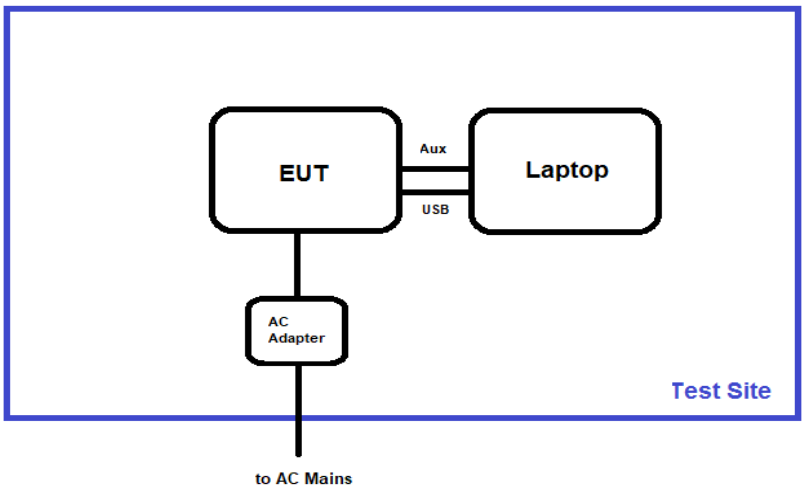
## Block Diagram (s)

**Test Setup Block Diagram**




Tx Cond Ant Port

**Test Setup Block Diagram**




Tx with Antenna

# FCC Part 15 Subpart C

## 15.247(a)(2) 6dB Bandwidth

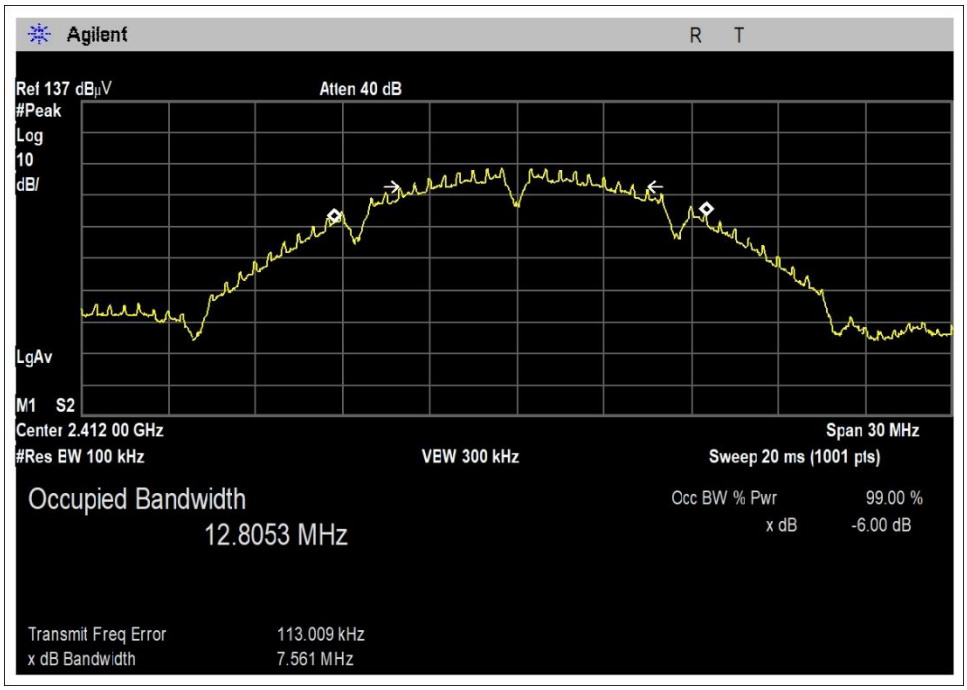
| Test Setup/Conditions | | | |
|---|---|---|---|
| Test Location: | Bothell Lab Bench | Test Engineer: | M. Harrison |
| Test Method: | ANSI C63.10 (2013), KDB 558074 (v05r02 APRIL 2, 2019)<br><br>KDB 662911 (v02r01 10/31/2013 ) | Test Date(s): | 3/24/2020 |
| Configuration: | 1 | | |
| Test Setup: | Duty Cycle: 100% (Test Mode)<br><br>Test Mode: Continuously transmitting<br>Test Setup: EUT is transmitting through the antenna port connector and is attached to the spectrum analyzer. | | |

| Environmental Conditions | | | |
|---|---|---|---|
| Temperature (ºC) | 20 | Relative Humidity (%): | 35 |

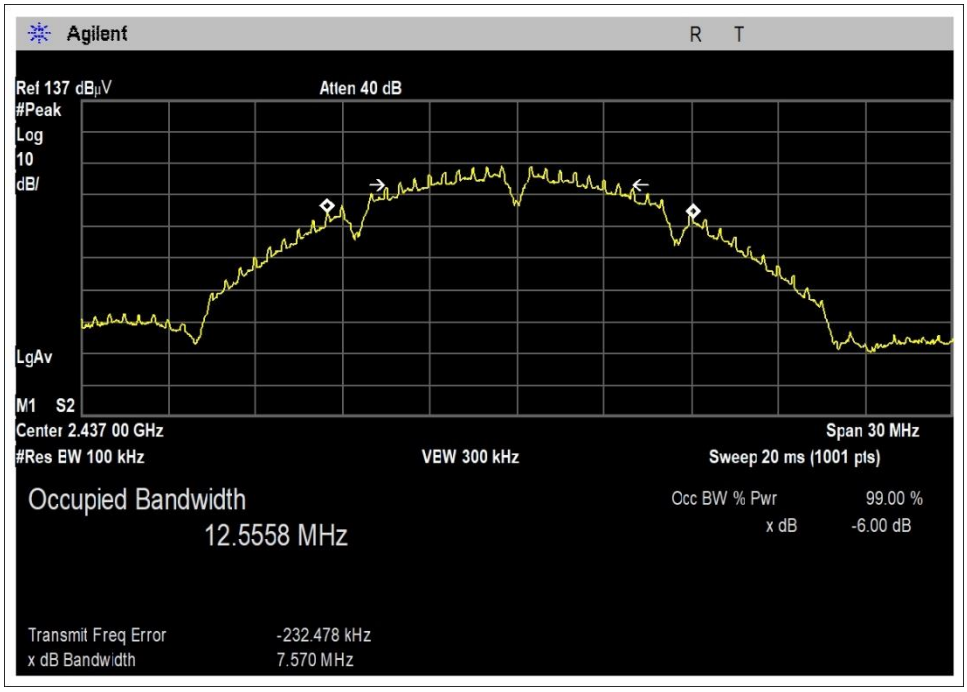
| Test Equipment | | | | | |
|---|---|---|---|---|---|
| **Asset#** | **Description** | **Manufacturer** | **Model** | **Cal Date** | **Cal Due** |
| 02673 | Spectrum Analyzer | Agilent | E4446A | 2/22/2019 | 2/22/2021 |
| | | | | | |

| Test Data Summary | | | | | |
|---|---|---|---|---|---|
| Frequency (MHz) | Antenna Port | Modulation | Measured (kHz) | Limit (kHz) | Results |
| 2412 | 0 | CCK | 7561 | ≥500 | Pass |
| 2437 | 0 | CCK | 7570 | ≥500 | Pass |
| 2462 | 0 | CCK | 7579 | ≥500 | Pass |
| 2412 | 1 | CCK | 7571 | ≥500 | Pass |
| 2437 | 1 | CCK | 7563 | ≥500 | Pass |
| 2462 | 1 | CCK | 7572 | ≥500 | Pass |
| 2412 | 0 | OFDM | 16048 | ≥500 | Pass |
| 2437 | 0 | OFDM | 15736 | ≥500 | Pass |
| 2462 | 0 | OFDM | 15720 | ≥500 | Pass |
| 2412 | 1 | OFDM | 15746 | ≥500 | Pass |
| 2437 | 1 | OFDM | 15727 | ≥500 | Pass |
| 2462 | 1 | OFDM | 15460 | ≥500 | Pass |
| 2412 | 0 | MCS (20M) | 16365 | ≥500 | Pass |
| 2437 | 0 | MCS (20M) | 16345 | ≥500 | Pass |
| 2462 | 0 | MCS (20M) | 15965 | ≥500 | Pass |
| 2412 | 1 | MCS (20M) | 16350 | ≥500 | Pass |
| 2437 | 1 | MCS (20M) | 16202 | ≥500 | Pass |
| 2462 | 1 | MCS (20M) | 16552 | ≥500 | Pass |
| 2422 | 0 | MCS (40M) | 35111 | ≥500 | Pass |
| 2437 | 0 | MCS (40M) | 35129 | ≥500 | Pass |
| 2452 | 0 | MCS (40M) | 36371 | ≥500 | Pass |
| 2422 | 1 | MCS (40M) | 35140 | ≥500 | Pass |
| 2437 | 1 | MCS (40M) | 35139 | ≥500 | Pass |
| 2452 | 1 | MCS (40M) | 36058 | ≥500 | Pass |

## 802.11b Plot(s)




OBW Low Channel AP0

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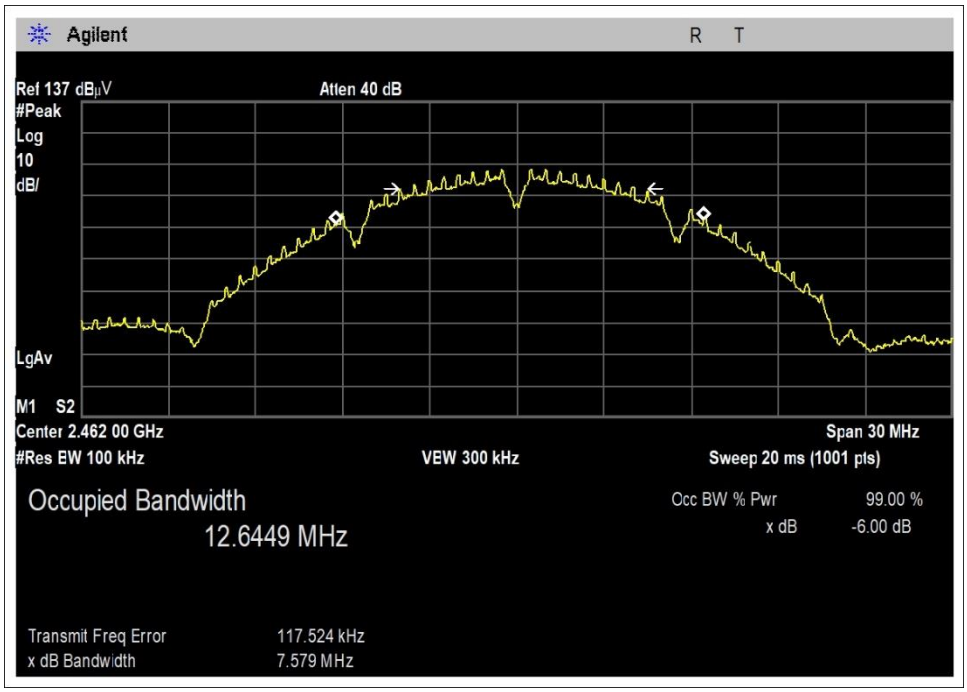
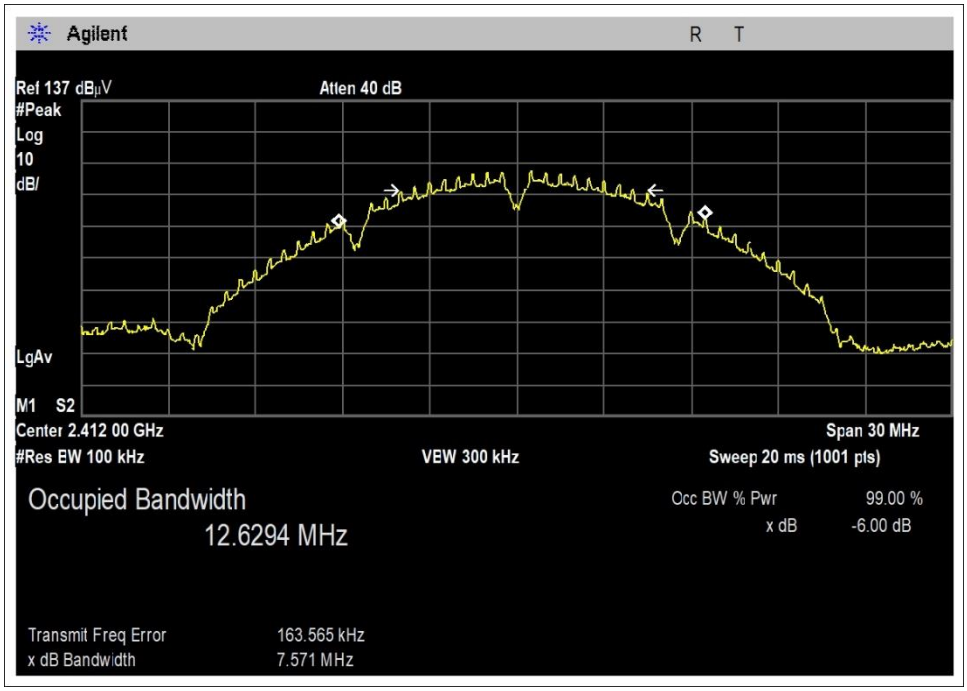
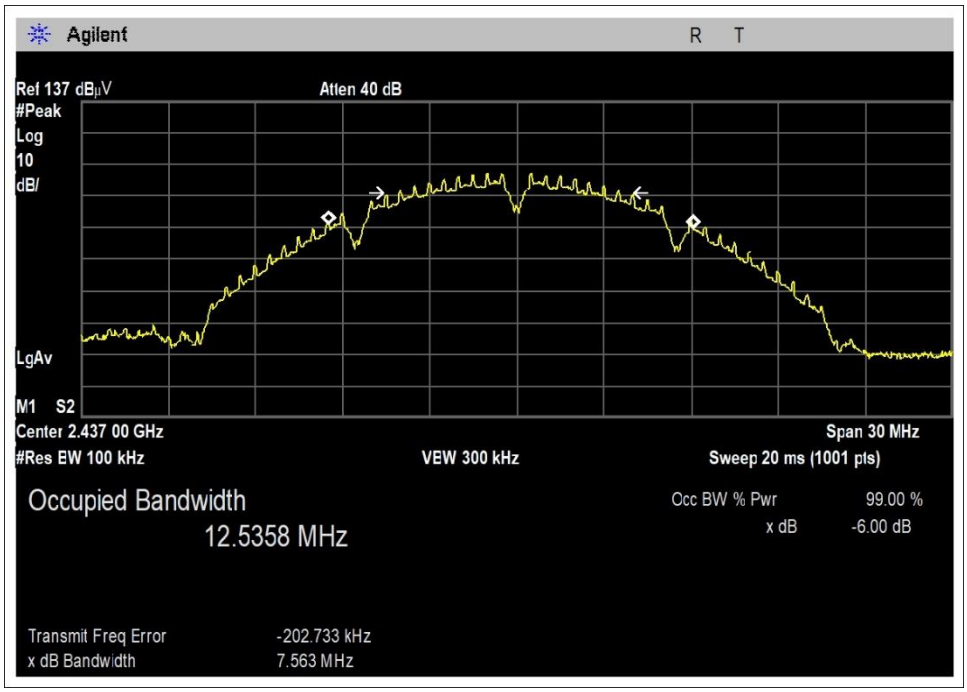



OBW High Channel AP0




OBW Low Channel AP1

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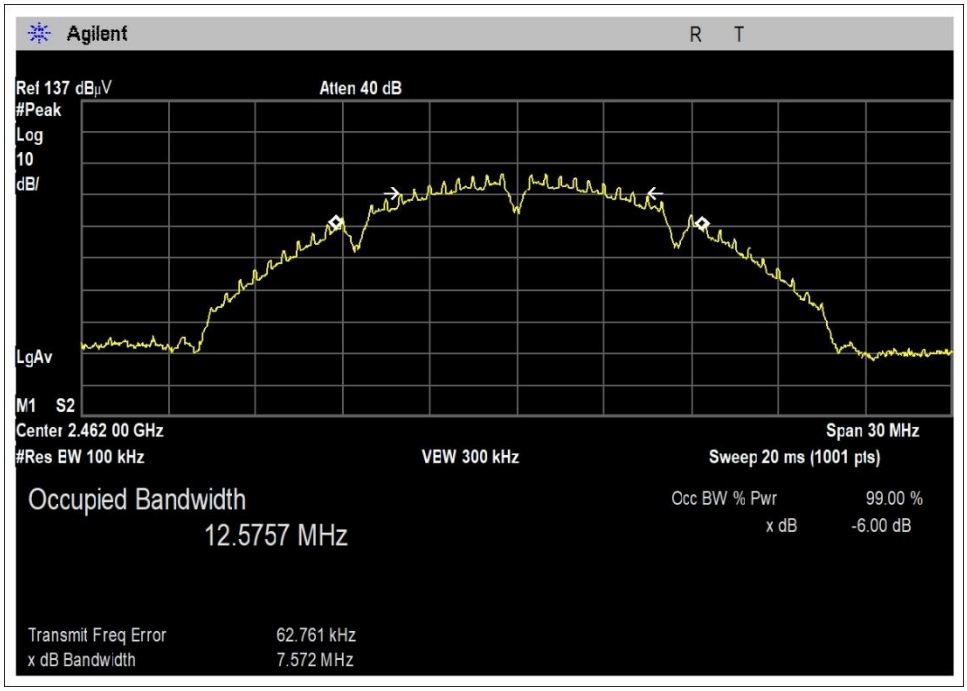
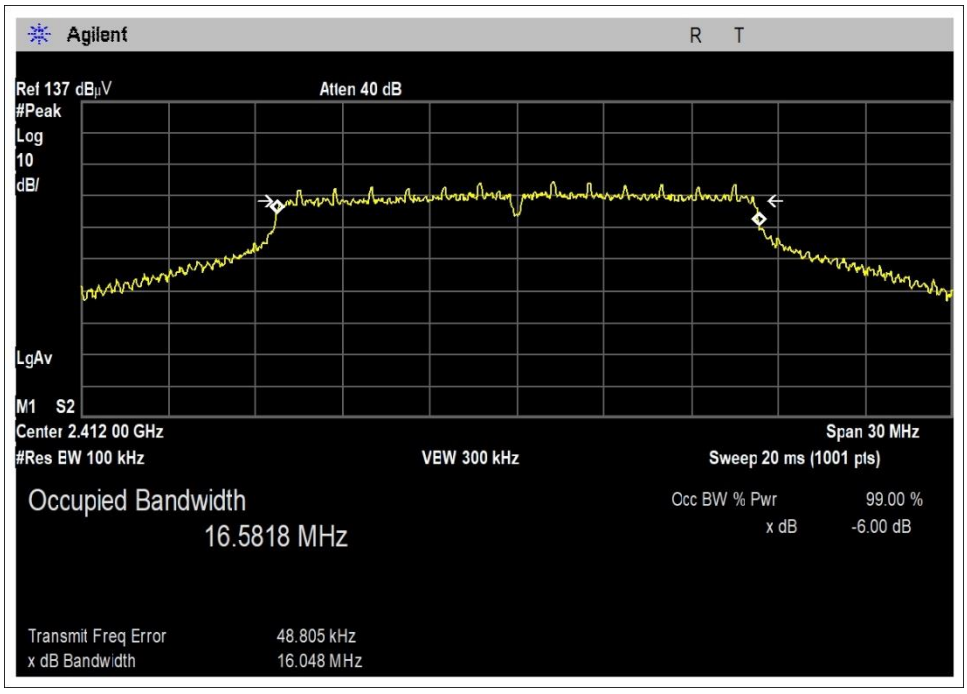
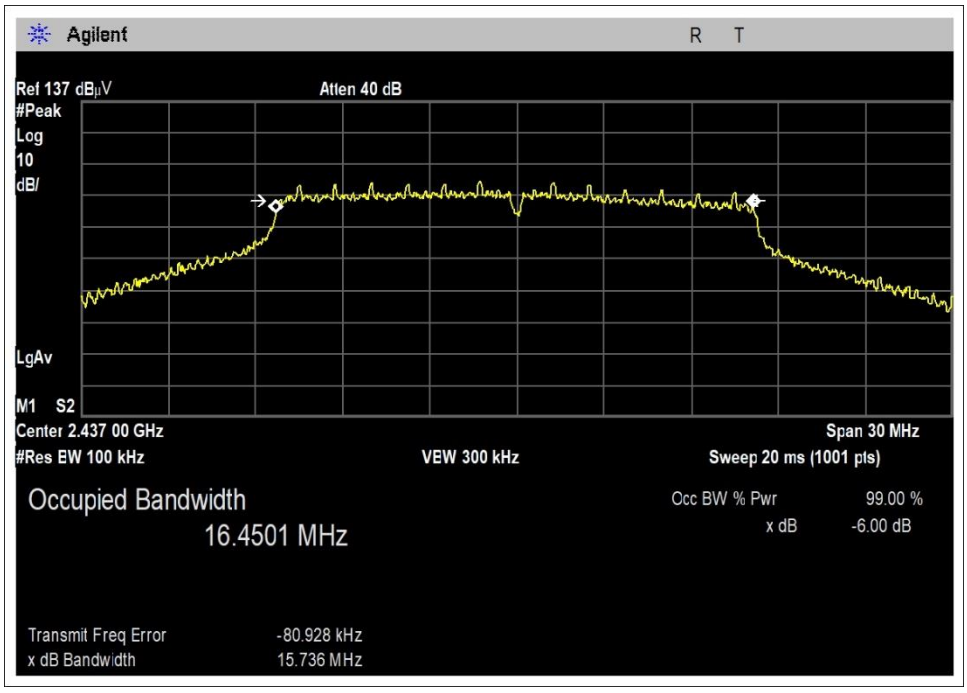



OBW High Channel AP1

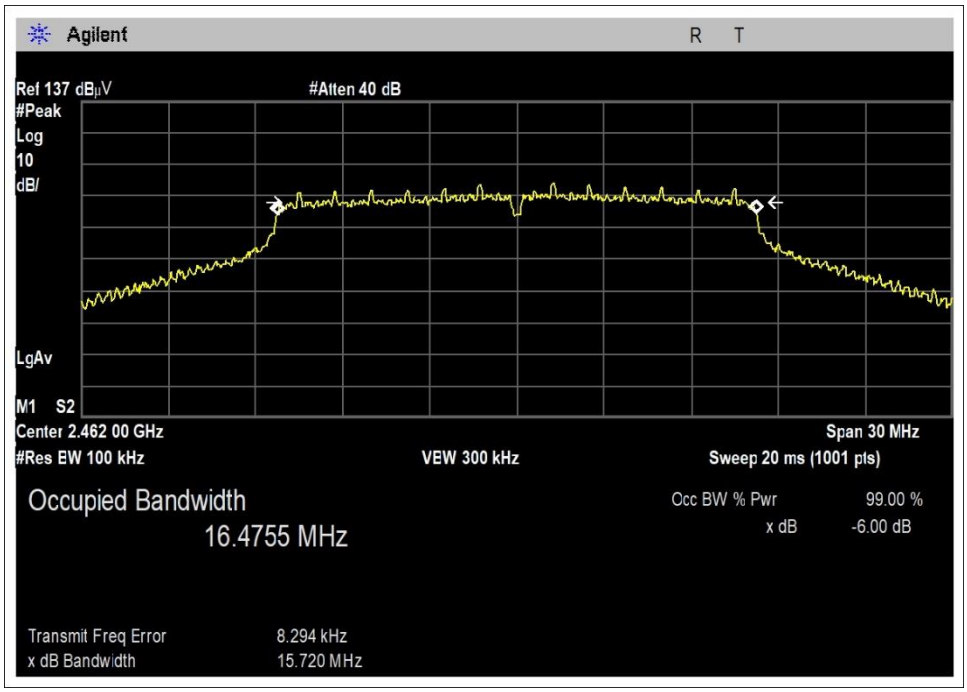
## 802.11g Plot(s)



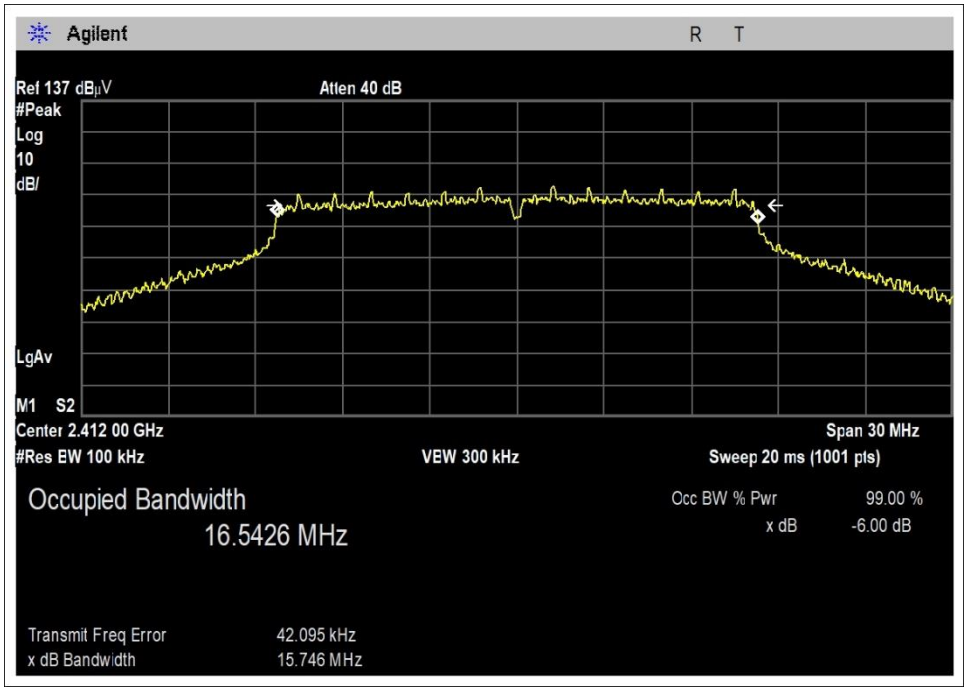

OBW Low Channel AP0



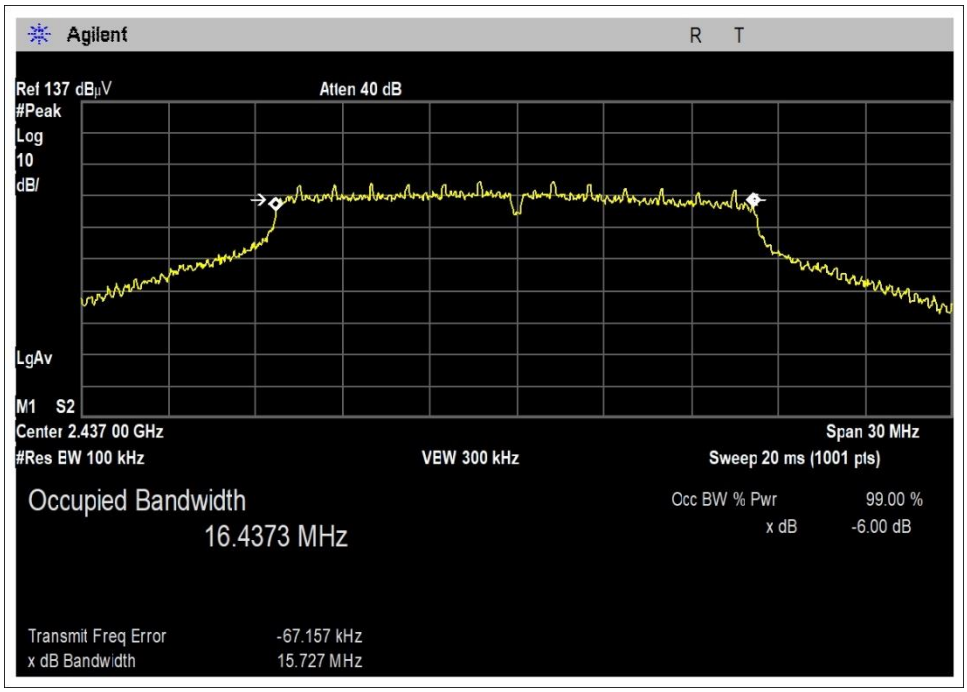

OBW Middle Channel AP0



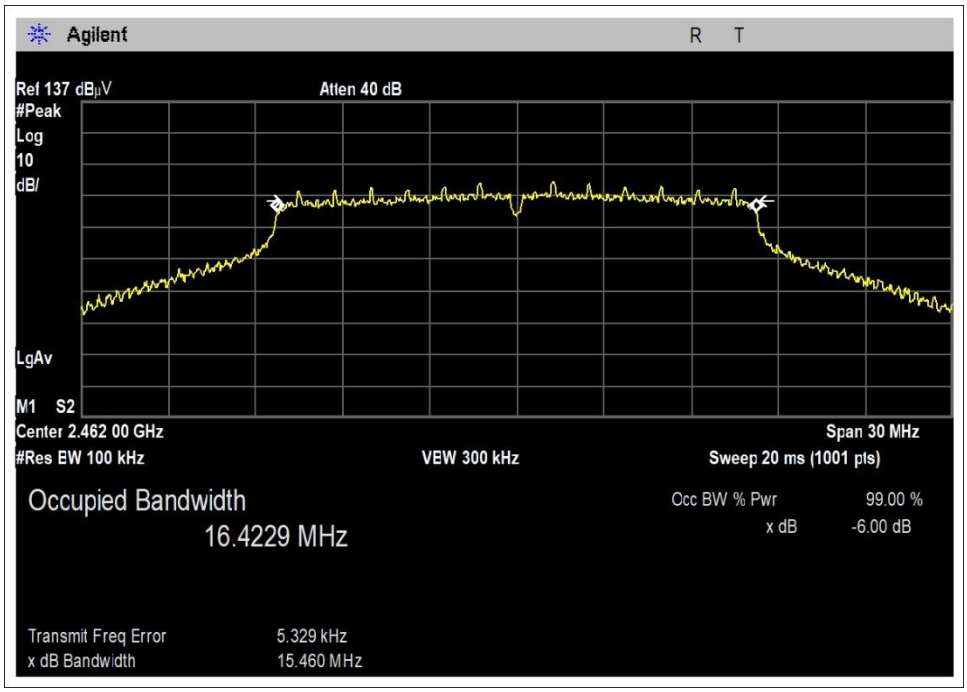

OBW High Channel AP0




OBW Low Channel AP1

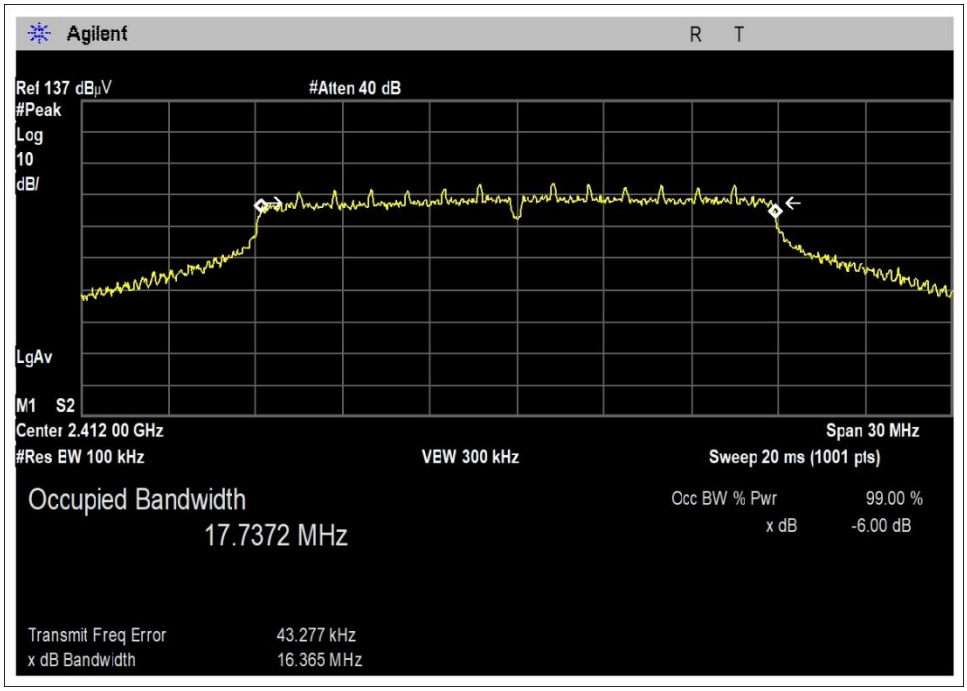



OBW Middle Channel AP1

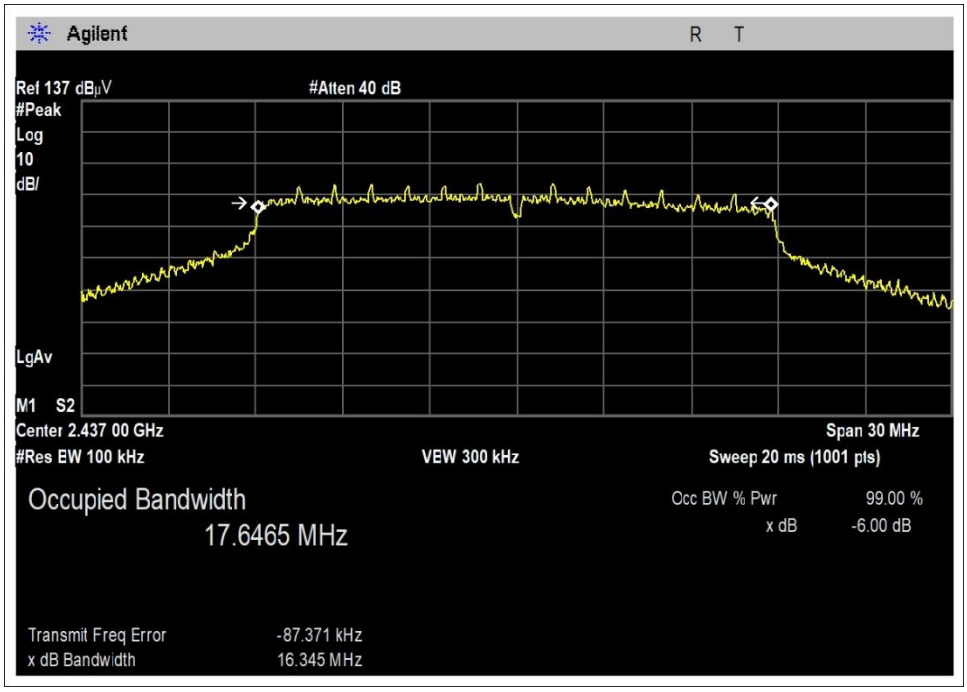



OBW High Channel AP1

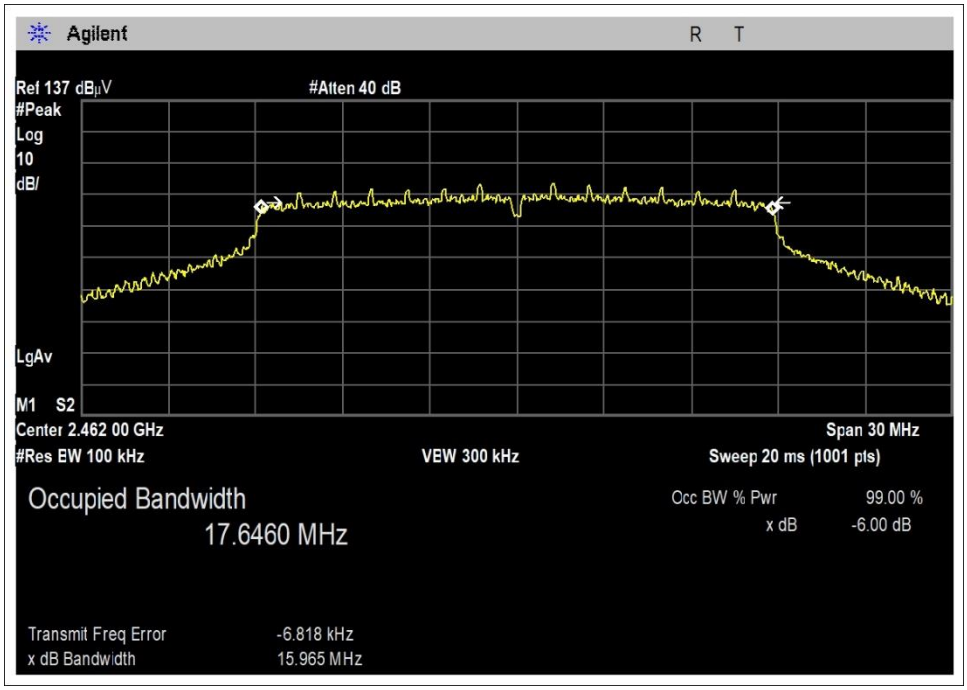
## 802.11n20 Plot(s)



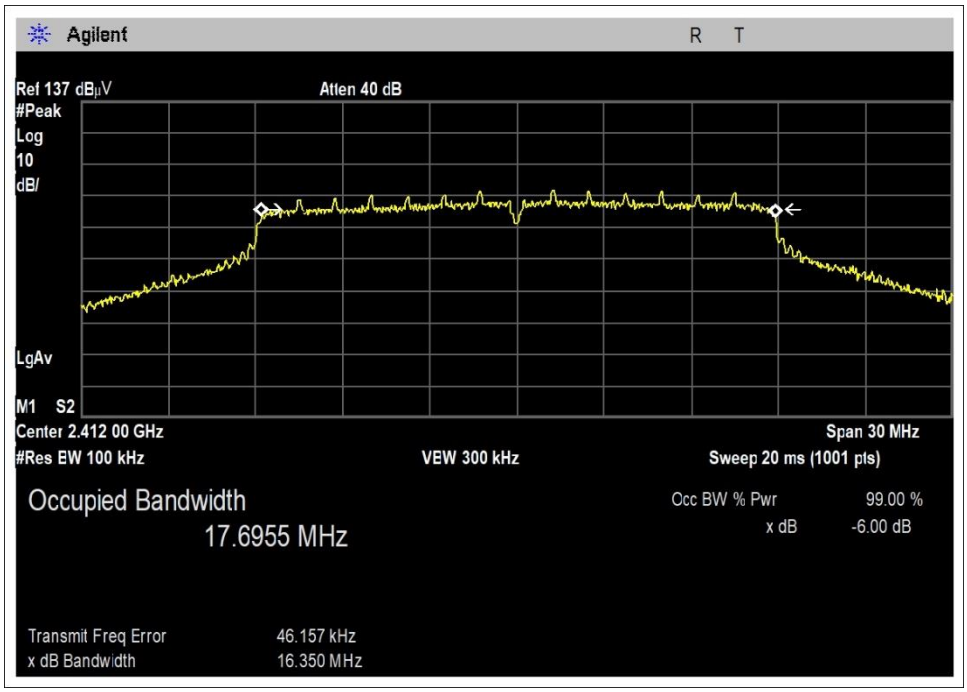

OBW Low Channel AP0



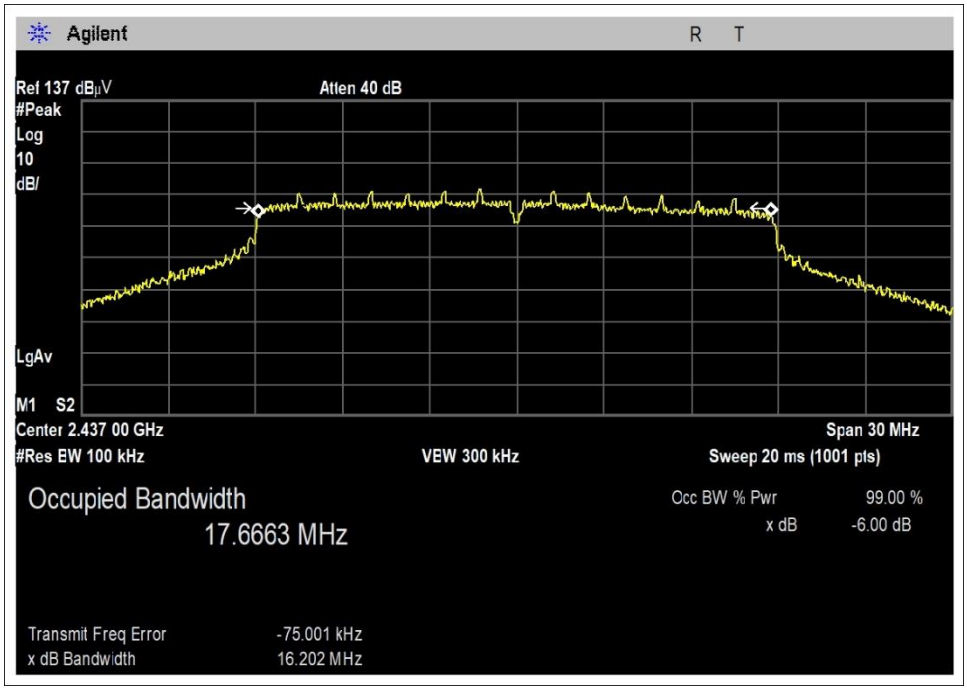

OBW Middle Channel AP0




OBW High Channel AP0




OBW Low Channel AP1

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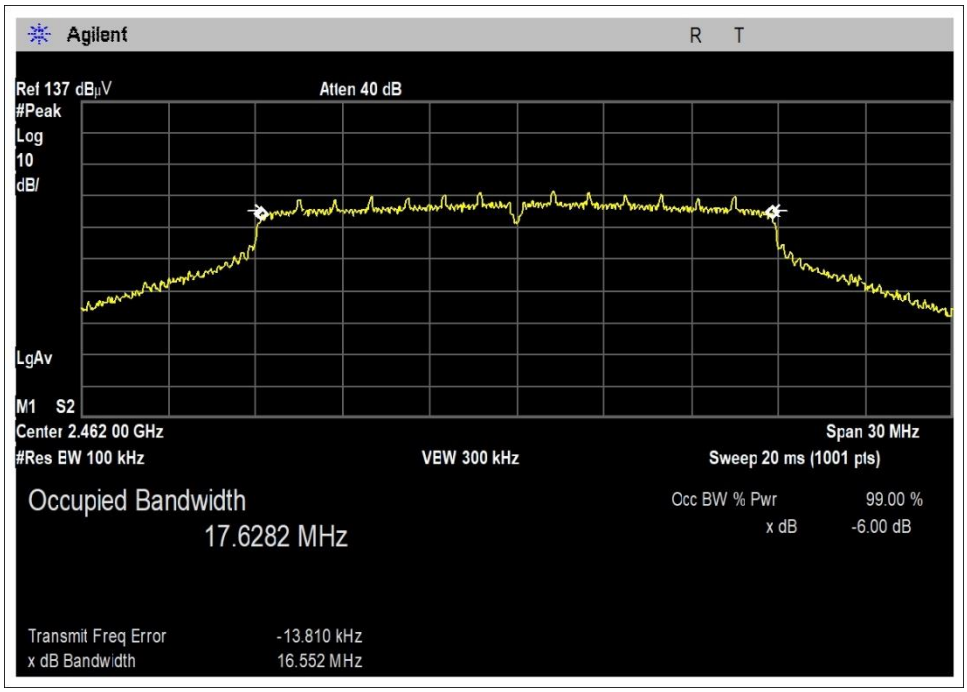
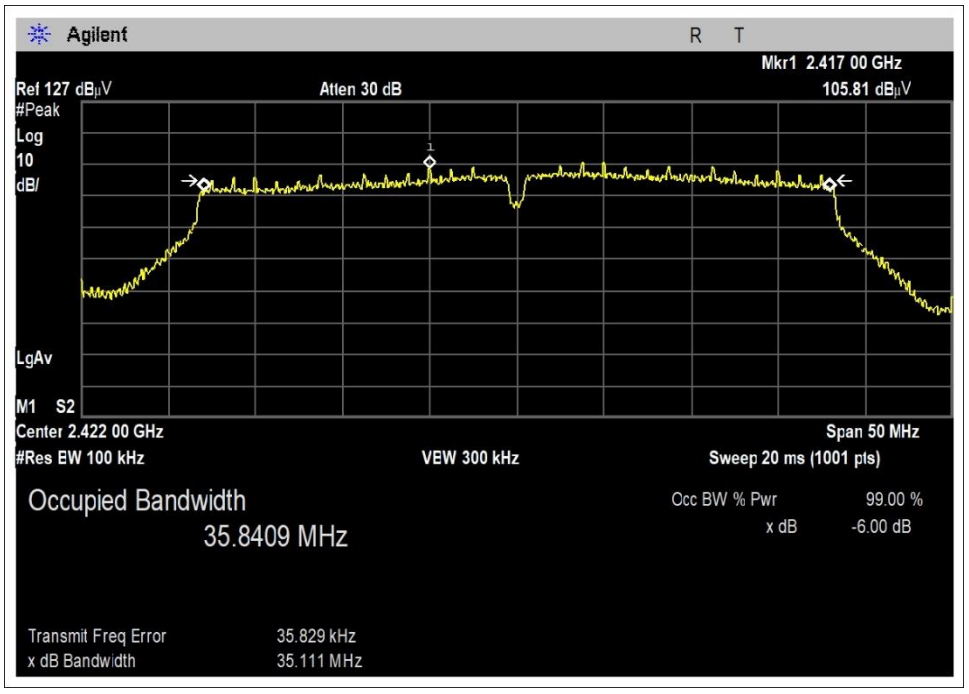
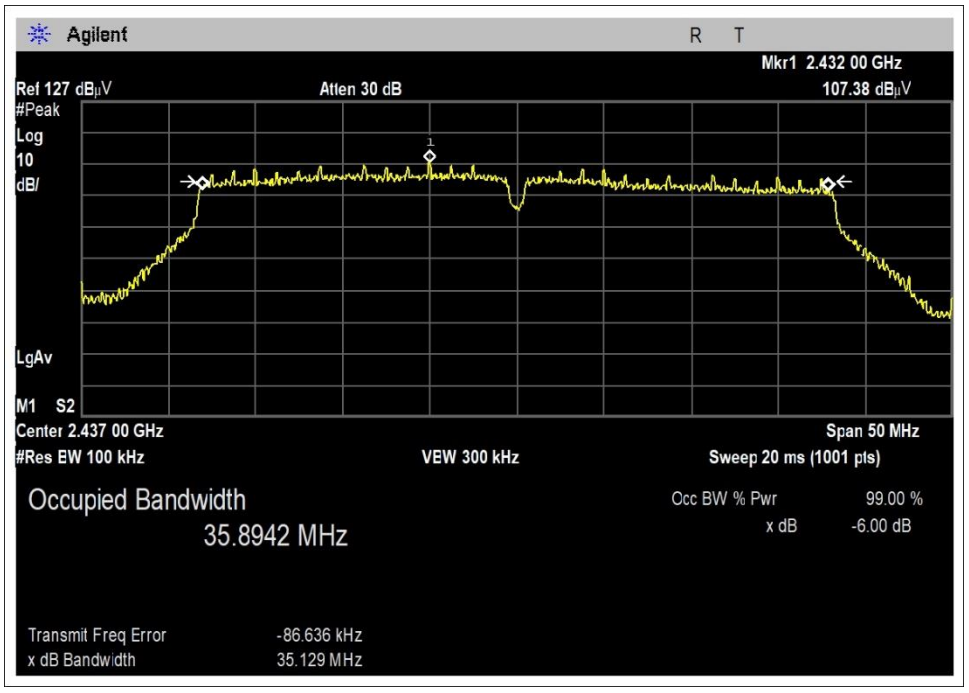



OBW High Channel AP1

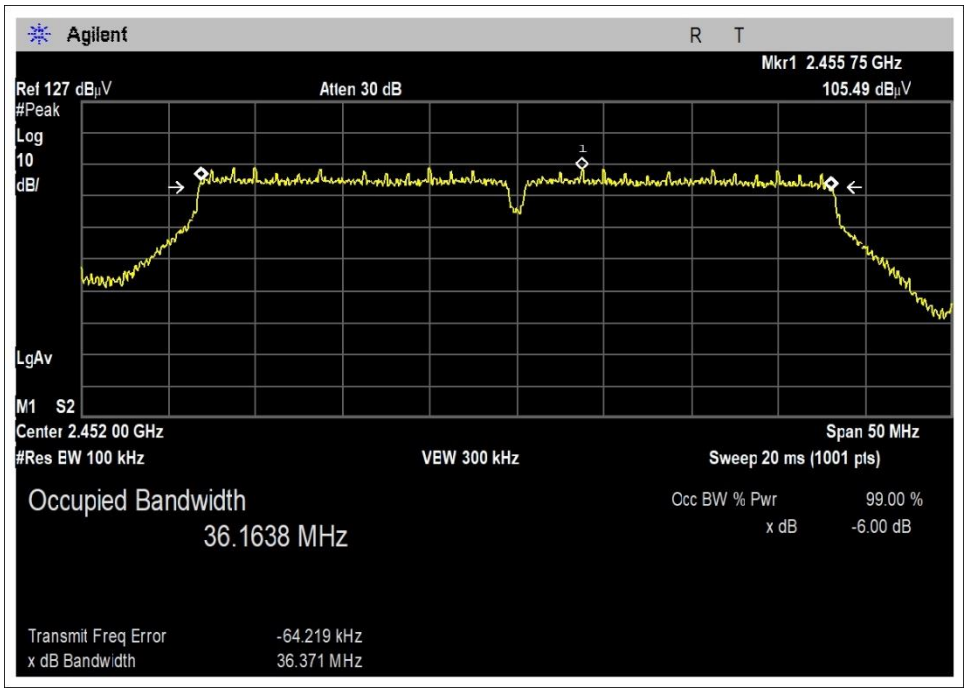
## 802.11n40 Plot(s)



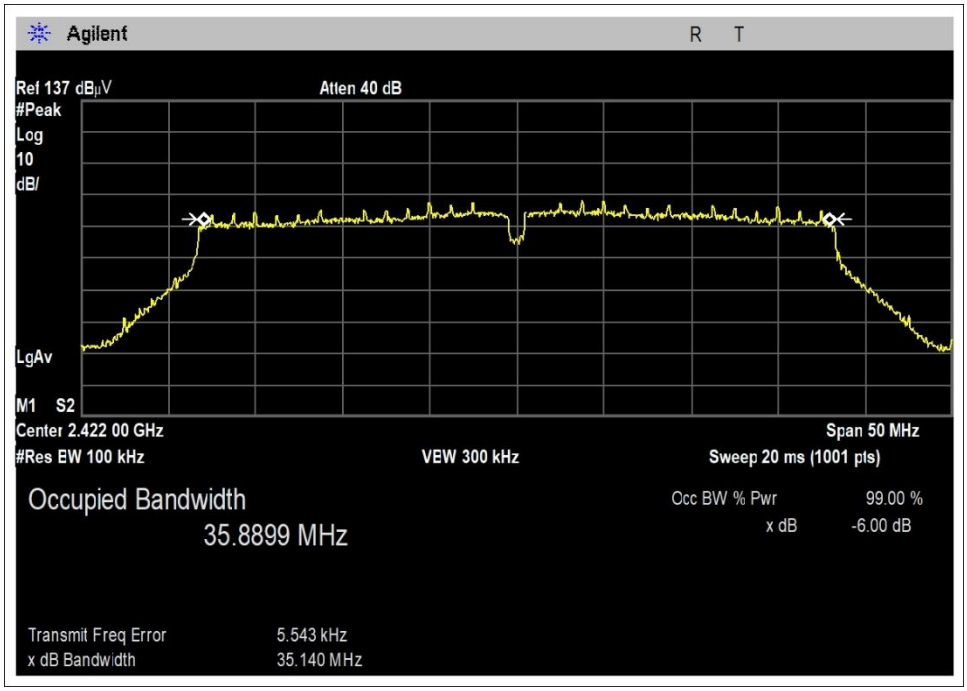

OBW Low Channel AP0



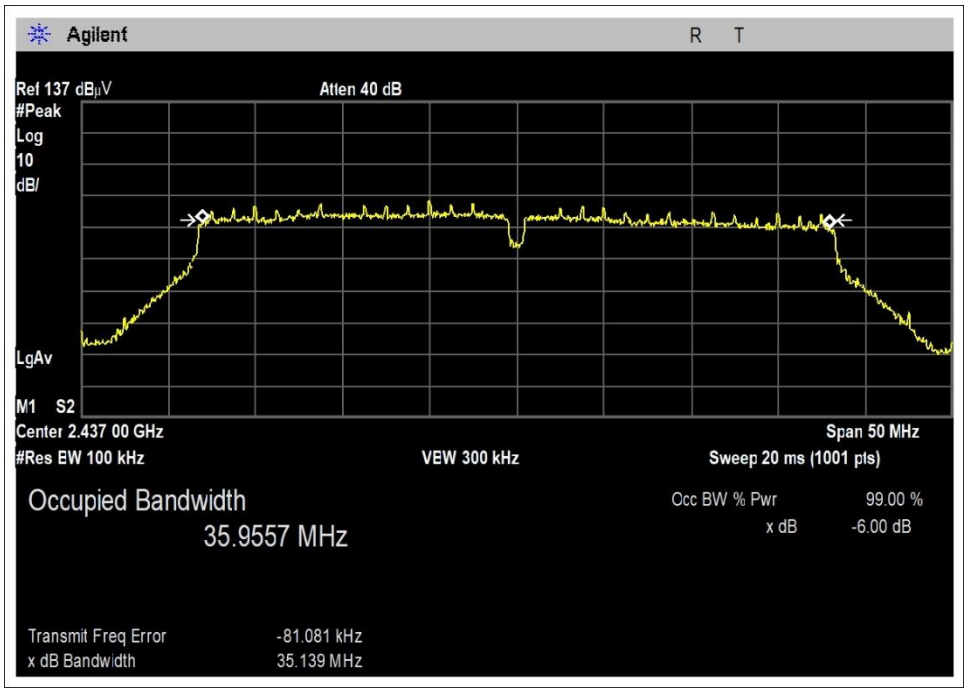

OBW Middle Channel AP0



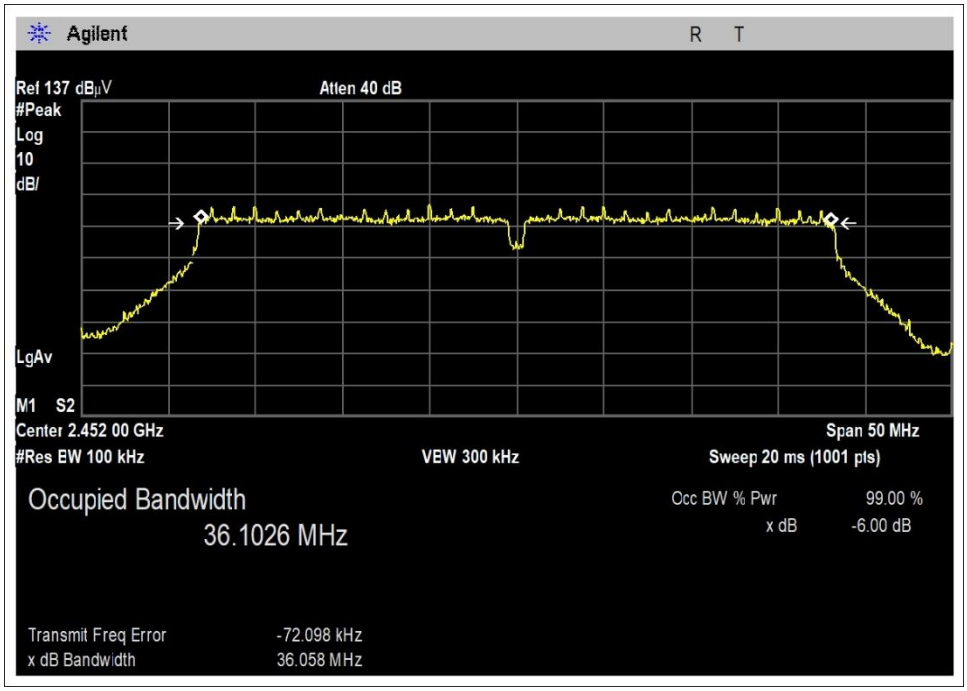

OBW High Channel AP0




OBW Low Channel AP1




OBW Middle Channel AP1




OBW High Channel AP1

## Test Setup Photo(s)

# 15.247(b)(3) Output Power

| Test Setup / Conditions | | | |
|---|---|---|---|
| Test Location: | Bothell Lab Bench | Test Engineer: | M. Harrison |
| Test Method: | ANSI C63.10 (2013), KDB 558074 (v05r02 APRIL 2, 2019)<br><br>KDB 662911 (v02r01 10/31/2013 ) | Test Date(s): | 3/24/2020 |
| Configuration: | 1 | | |
| Test Setup: | Duty Cycle: 100% (Test Mode)<br><br>Test Mode: Continuously transmitting<br>Test Setup: The EUT is transmitting through the antenna port connector and is attached to the spectrum analyzer.<br><br>802.11n is and MIMO Summed using KDB662911 (E)(1) | | |

| Environmental Conditions | | | |
|---|---|---|---|
| Temperature (ºC) | 20 | Relative Humidity (%): | 35 |

| Test Equipment | | | | | |
|---|---|---|---|---|---|
| **Asset#** | **Description** | **Manufacturer** | **Model** | **Cal Date** | **Cal Due** |
| 03530 | Power Sensor | ETS | 7002-006 | 6/6/2019 | 6/6/2021 |
| P05748 | Attenuator | Pasternack | PE7004-20 | 3/4/2020 | 3/4/2022 |
| 02673 | Spectrum Analyzer | Agilent | E4446A | 2/22/2019 | 2/22/2021 |
| 03514 | Multimeter | Fluke | 87 | 12/7/2018 | 12/7/2020 |
| P07527 | Variac | Simpson | NA | 11/21/2018 | 11/21/2020 |

| Test Data Summary - Voltage Variations | | | | | |
|---|---|---|---|---|---|
| Frequency (MHz) | Modulation / Ant Port | $V_{Minimum}$ (dBm) | $V_{Nominal}$ (dBm) | $V_{Maximum}$ (dBm) | Max Deviation from $V_{Nominal}$ (dB) |
| 2412 | CCK / AP0 | 17.45 | 17.45 | 17.4 | 0.05 |
| 2437 | CCK / AP0 | 17.33 | 17.33 | 17.33 | 0 |
| 2462 | CCK / AP0 | 17.01 | 17 | 17 | 0.01 |
| 2412 | CCK / AP1 | 15.55 | 15.5 | 15.49 | 0.1 |
| 2437 | CCK / AP1 | 15.33 | 15.3 | 15.36 | 0.1 |
| 2462 | CCK / AP1 | 15 | 15.07 | 15 | 0.07 |
| 2412 | OFDM / AP0 | 14.58 | 14.5 | 14.57 | 0.03 |
| 2437 | OFDM / AP0 | 16.36 | 16.4 | 16.36 | 0.04 |
| 2462 | OFDM / AP0 | 15.99 | 16 | 15.92 | 0.08 |
| 2412 | OFDM / AP1 | 12.76 | 12.72 | 12.72 | 0.04 |
| 2437 | OFDM / AP1 | 14.39 | 14.41 | 14.39 | 0.02 |
| 2462 | OFDM / AP1 | 14.07 | 14.09 | 14.11 | 0.02 |
| 2412 | MCS 20 / AP0 | 13.25 | 13.26 | 13.25 | 0.01 |
| 2437 | MCS 20 / AP0 | 15.23 | 15.25 | 15.22 | 0.03 |
| 2462 | MCS 20 / AP0 | 14.96 | 15.02 | 14.97 | 0.06 |
| 2412 | MCS 20 / AP1 | 11.59 | 11.6 | 11.61 | 0.01 |
| 2437 | MCS 20 / AP1 | 13.41 | 13.4 | 13.41 | 0.01 |
| 2462 | MCS 20 / AP1 | 13.12 | 13.08 | 13.13 | 0.05 |
| 2422 | MCS 40 / AP0 | 12.89 | 12.9 | 12.89 | 0.01 |
| 2437 | MCS 40 / AP0 | 15.66 | 15.66 | 15.65 | 0.01 |
| 2452 | MCS 40 / AP0 | 13.35 | 13.4 | 13.37 | 0.05 |
| 2422 | MCS 40 / AP1 | 10.71 | 10.75 | 10.72 | 0.04 |
| 2437 | MCS 40 / AP1 | 13.82 | 13.84 | 13.81 | 0.02 |
| 2452 | MCS 40 / AP1 | 11.43 | 11.44 | 11.43 | 0.01 |

Test performed using operational mode with the highest output power, representing worst case.

## ***Parameter Definitions:***

Measurements performed at input voltage Vnominal ± 15%.

| Parameter | Value |
|---|---|
| $V_{Nominal}$: | 120 |
| $V_{Minimum}$: | 102 |
| $V_{Maximum}$: | 138 |

| Test Data Summary - RF Conducted Measurement | | | | | |
|---|---|---|---|---|---|
| Measurement Option: AVGPM | | | | | |
| **Frequency (MHz)** | **Modulation** | **Ant. Type / Gain (dBi)** | **Measured (dBm)** | **Limit (dBm)** | **Results** |
| 2412 | CCK / AP0 | Linear Polarized / 3.7 | 17.45 | ≤30 | Pass |
| 2437 | CCK / AP0 | Linear Polarized / 3.7 | 17.33 | ≤30 | Pass |
| 2462 | CCK / AP0 | Linear Polarized / 3.7 | 17 | ≤30 | Pass |
| 2412 | CCK / AP1 | Linear Polarized / 3.6 | 15.5 | ≤30 | Pass |
| 2437 | CCK / AP1 | Linear Polarized / 3.6 | 15.3 | ≤30 | Pass |
| 2462 | CCK / AP1 | Linear Polarized / 3.6 | 15.07 | ≤30 | Pass |
| 2412 | OFDM / AP0 | Linear Polarized / 3.7 | 14.5 | ≤30 | Pass |
| 2437 | OFDM / AP0 | Linear Polarized / 3.7 | 16.4 | ≤30 | Pass |
| 2462 | OFDM / AP0 | Linear Polarized / 3.7 | 16 | ≤30 | Pass |
| 2412 | OFDM / AP1 | Linear Polarized / 3.6 | 12.72 | ≤30 | Pass |
| 2437 | OFDM / AP1 | Linear Polarized / 3.6 | 14.41 | ≤30 | Pass |
| 2462 | OFDM / AP1 | Linear Polarized / 3.6 | 14.09 | ≤30 | Pass |

| Test Data Summary - RF Conducted Measurement | | | | | | |
|---|---|---|---|---|---|---|
| Measurement Option: AVGPM | | | | | | |
| **Frequency (MHz)** | **Modulation** | **Ant. Type / Gain (dBi)** | **Measured (dBm)** | **Summed Power (dBm)** | **Limit (dBm)** | **Results** |
| 2412 | MCS 20 / AP0 | Linear Polarized / 3.7 | 13.26 | 15.5 | ≤30 | Pass |
| 2412 | MCS 20 / AP1 | Linear Polarized / 3.6 | 11.6 | | | |
| 2437 | MCS 20 / AP0 | Linear Polarized / 3.7 | 15.25 | 17.4 | ≤30 | Pass |
| 2437 | MCS 20 / AP1 | Linear Polarized / 3.6 | 13.4 | | | |
| 2462 | MCS 20 / AP0 | Linear Polarized / 3.7 | 15.02 | 17.2 | ≤30 | Pass |
| 2462 | MCS 20 / AP1 | Linear Polarized / 3.6 | 13.08 | | | |
| 2422 | MCS 40 / AP0 | Linear Polarized / 3.7 | 12.9 | 15.0 | ≤30 | Pass |
| 2422 | MCS 40 / AP1 | Linear Polarized / 3.6 | 10.75 | | | |
| 2437 | MCS 40 / AP0 | Linear Polarized / 3.7 | 15.66 | 17.9 | ≤30 | Pass |
| 2437 | MCS 40 / AP1 | Linear Polarized / 3.6 | 13.84 | | | |
| 2452 | MCS 40 / AP0 | Linear Polarized / 3.7 | 13.4 | 15.5 | ≤30 | Pass |
| 2452 | MCS 40 / AP1 | Linear Polarized / 3.6 | 11.44 | | | |

For fixed point-to-point antennas, the limit is calculated in accordance with 15.247(c)(1):

$$Limit = 30 - Roundup\left(\frac{G-6}{3}\right)$$

For directional beamforming antennas, the limit is calculated in accordance with 15.247(c)(2) and KDB 662911.

## Test Setup Photo(s)

# 15.247(e) Power Spectral Density

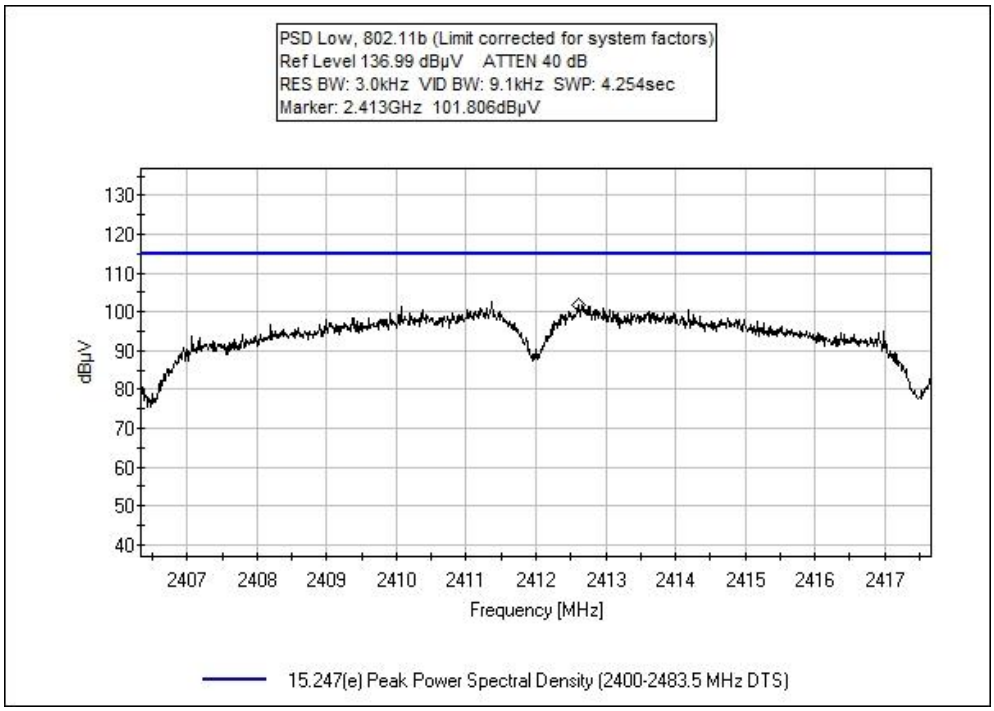
| Test Data Summary - RF Conducted Measurement |
|---|
| Measurement Method: PKPSD<br>* Per 11.10.2 Method PKPSD (peak PSD) of ANSI 63.10(2013), Peak PSD method is optional if the maximum conducted (average) output power was used to determine compliance.<br>Measured Peak PSD is below the Limit. Peak PSD should be slightly higher than Aver PSD. |

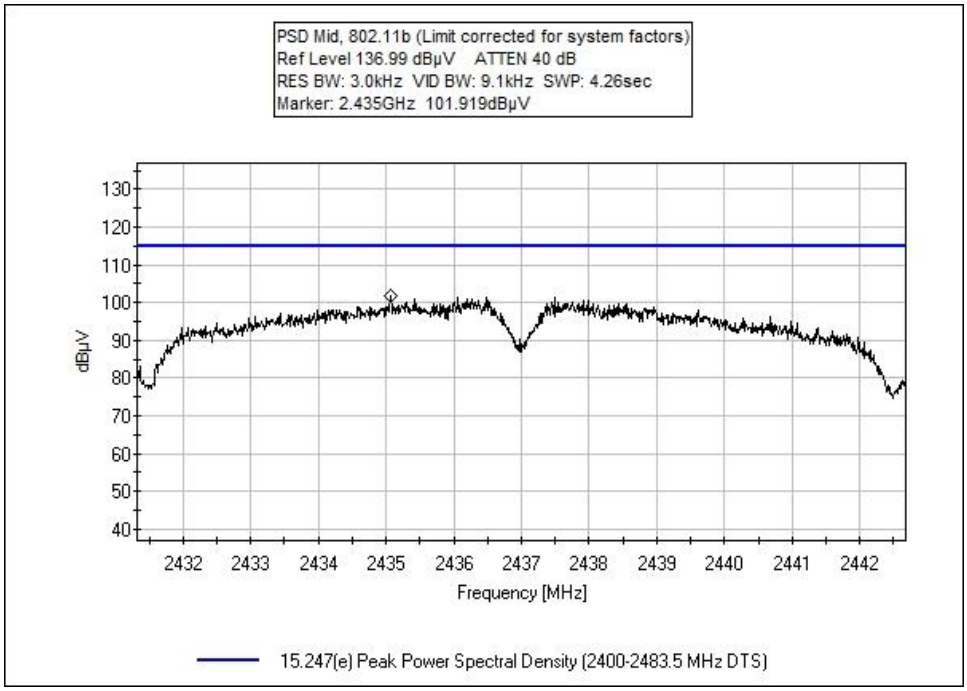
| Frequency (MHz) | Modulation | Measured (dBµV /3kHz) | Limit (dBµV/3kHz) | Results |
|---|---|---|---|---|
| 2412 | CCK AP0 | 101.8 | ≤115 | Pass |
| 2437 | CCK AP0 | 101.9 | ≤115 | Pass |
| 2462 | CCK AP0 | 101.2 | ≤115 | Pass |
| 2412 | CCK AP1 | 101.3 | ≤115 | Pass |
| 2437 | CCK AP1 | 100.1 | ≤115 | Pass |
| 2462 | CCK AP1 | 100.4 | ≤115 | Pass |
| 2412 | OFDM AP0 | 97.9 | ≤115 | Pass |
| 2437 | OFDM AP0 | 100.2 | ≤115 | Pass |
| 2462 | OFDM AP0 | 98.8 | ≤115 | Pass |
| 2412 | OFDM AP1 | 98 | ≤115 | Pass |
| 2437 | OFDM AP1 | 98.1 | ≤115 | Pass |
| 2462 | OFDM AP1 | 97.6 | ≤115 | Pass |

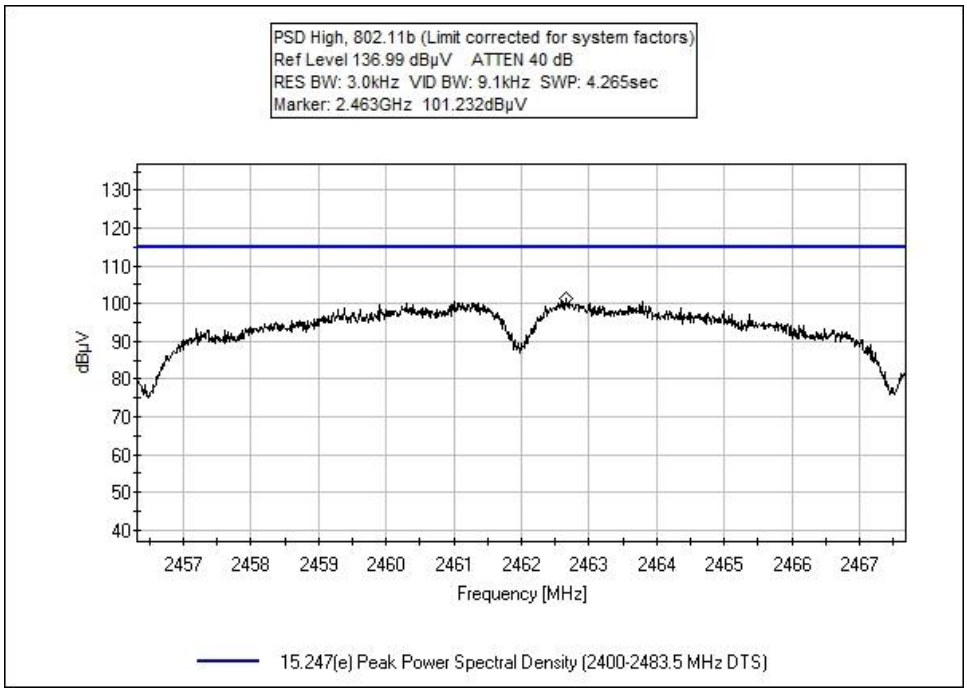
| Test Data Summary - RF Conducted Measurement |
|---|
| Measurement Method: PKPSD<br>802.11n is and MIMO Summed using KDB662911 (E)(2)(b)<br>* Per 11.10.2 Method PKPSD (peak PSD) of ANSI 63.10(2013), Peak PSD method is optional if the maximum conducted (average) output power was used to determine compliance.<br>Measured Peak PSD is below the Limit. Peak PSD should be slightly higher than Aver PSD. |

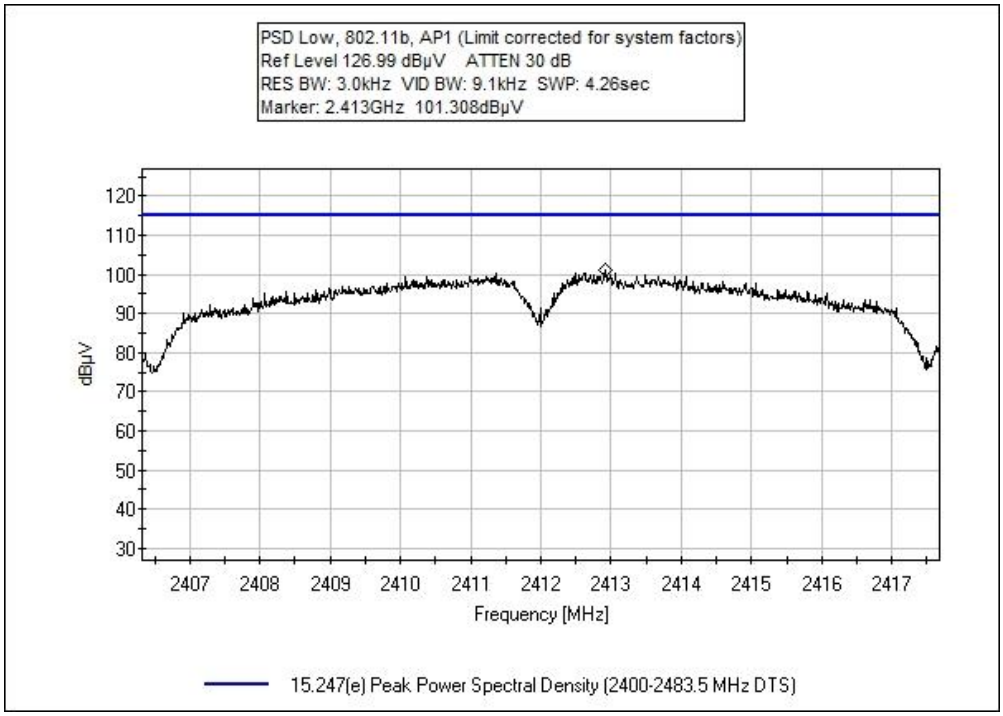
| Frequency (MHz) | Modulation | Measured (dBµV /3kHz) | Summed PSD (dBm) | Limit (dBµV/3kHz) | Results |
|---|---|---|---|---|---|
| 2412 | MCS 20 / AP0 | 95.1 | 97.9 | ≤115 | Pass |
| 2412 | MCS 20 / AP1 | 94.7 | | | |
| 2437 | MCS 20 / AP0 | 97.5 | 100.1 | ≤115 | Pass |
| 2437 | MCS 20 / AP1 | 96.7 | | | |
| 2462 | MCS 20 / AP0 | 97.6 | 99.4 | ≤115 | Pass |
| 2462 | MCS 20 / AP1 | 94.6 | | | |
| 2422 | MCS 40 / AP0 | 93.1 | 95.3 | ≤115 | Pass |
| 2422 | MCS 40 / AP1 | 91.3 | | | |
| 2437 | MCS 40 / AP0 | 95.5 | 97.2 | ≤115 | Pass |
| 2437 | MCS 40 / AP1 | 92.4 | | | |
| 2452 | MCS 40 / AP0 | 92.8 | 94.8 | ≤115 | Pass |

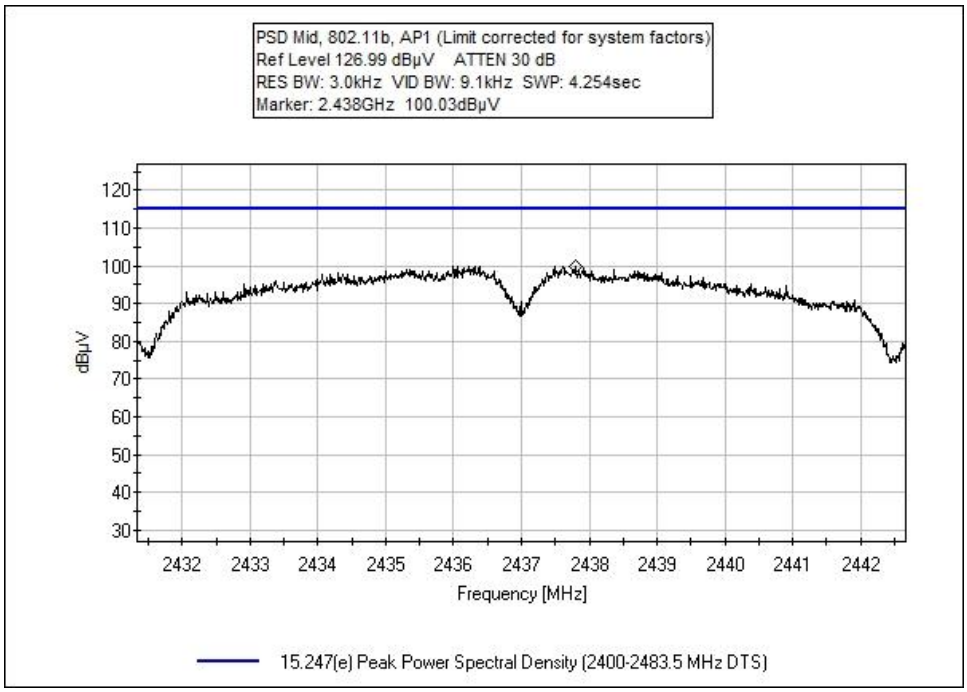
## 802.11b Plots

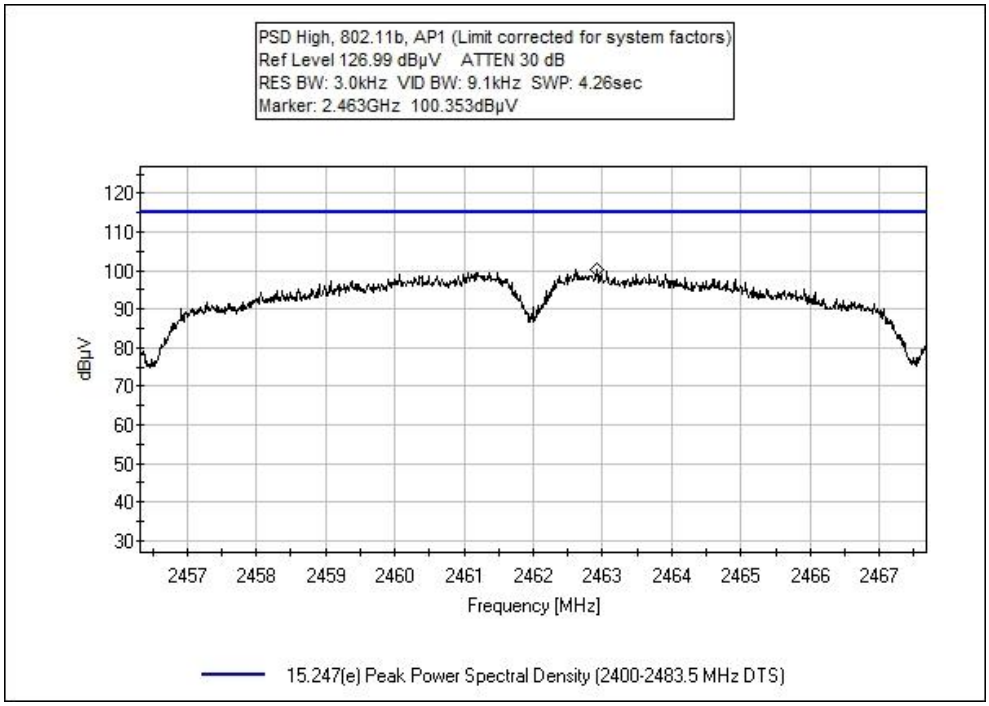


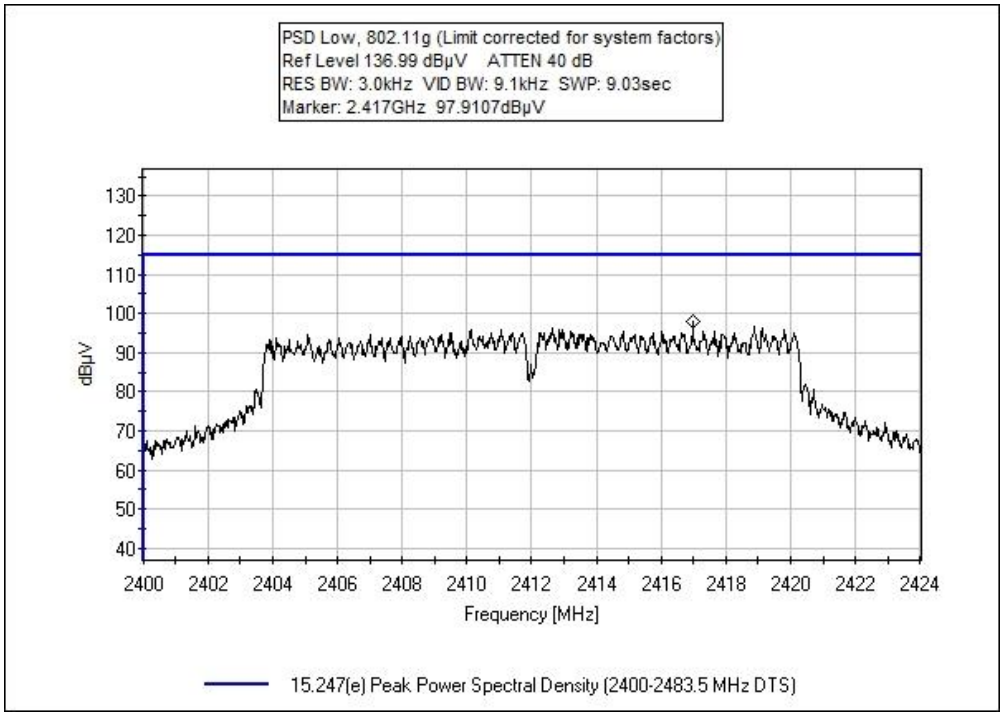

PSD High, 802.11b (Limit corrected for system factors)
Ref Level 136.99 dBµV ATTEN 40 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 4.265sec
Marker: 2.463GHz 101.232dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
2457
2458
2459
2460
2461
2462
2463
2464
2465
2466
2467
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)

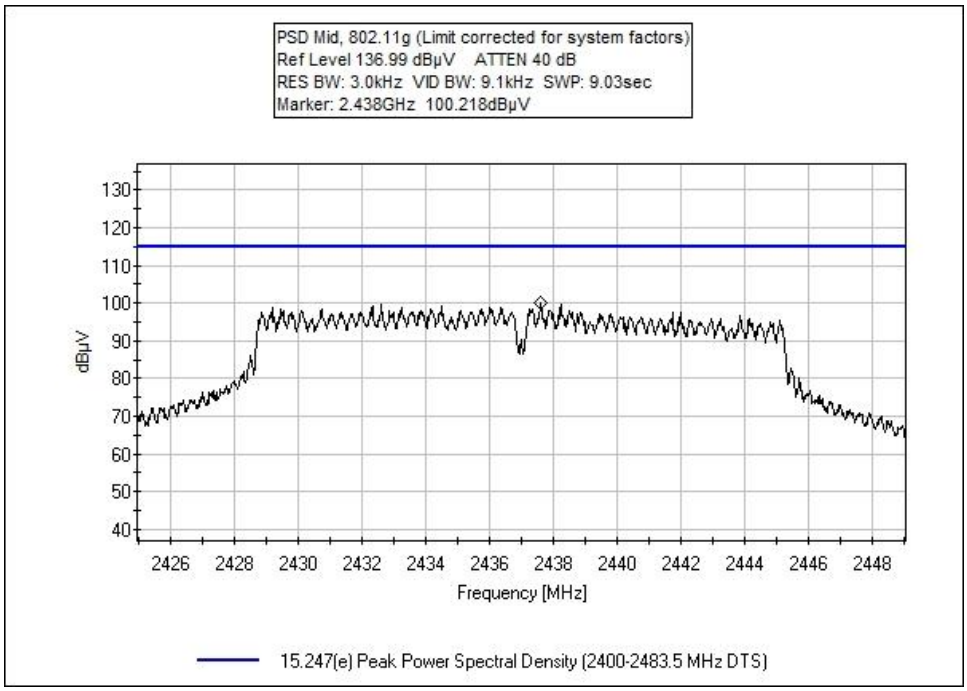

PSD Low, 802.11b, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 4.26sec
Marker: 2.413GHz 101.308dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2407
2408
2409
2410
2411
2412
2413
2414
2415
2416
2417
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)

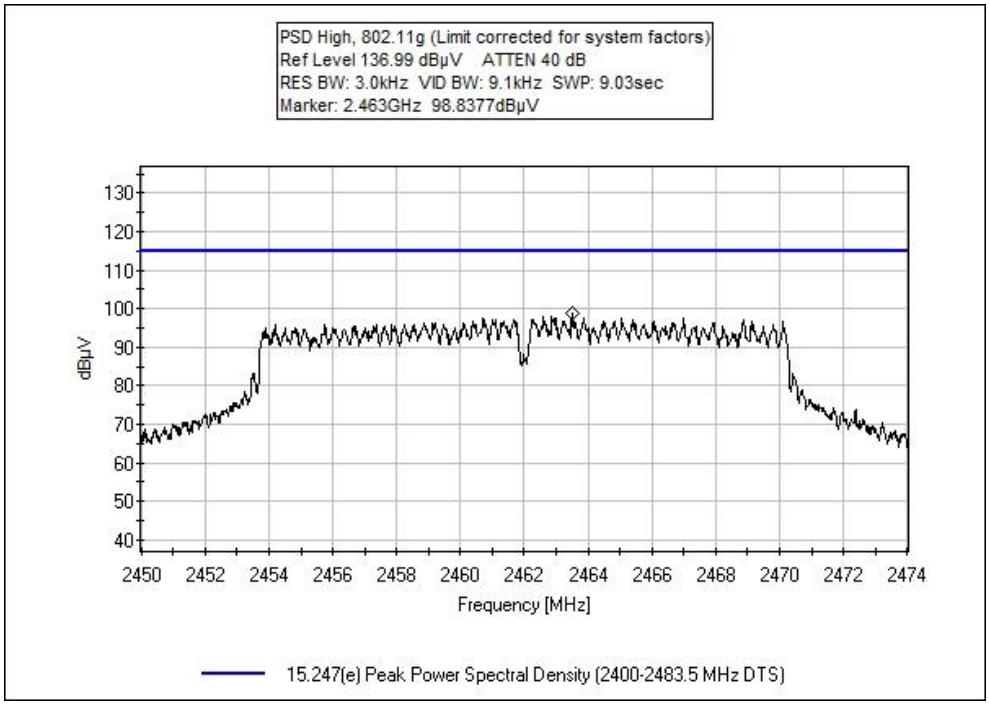

PSD Mid, 802.11b, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 4.254sec
Marker: 2.438GHz 100.03dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)

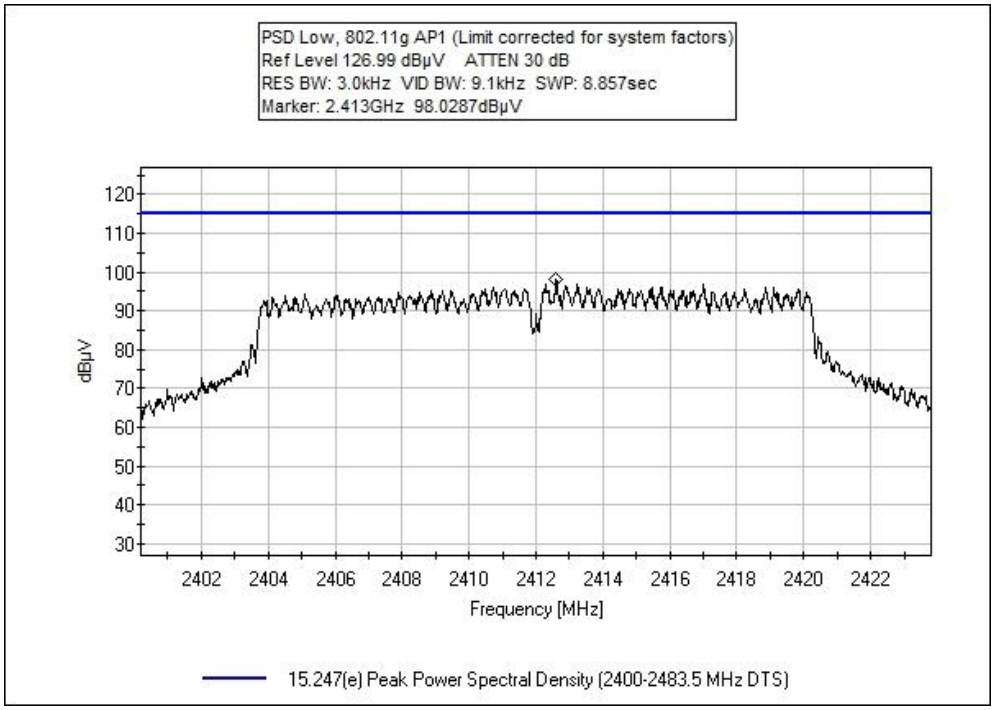

PSD High, 802.11b, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 4.26sec
Marker: 2.463GHz 100.353dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)

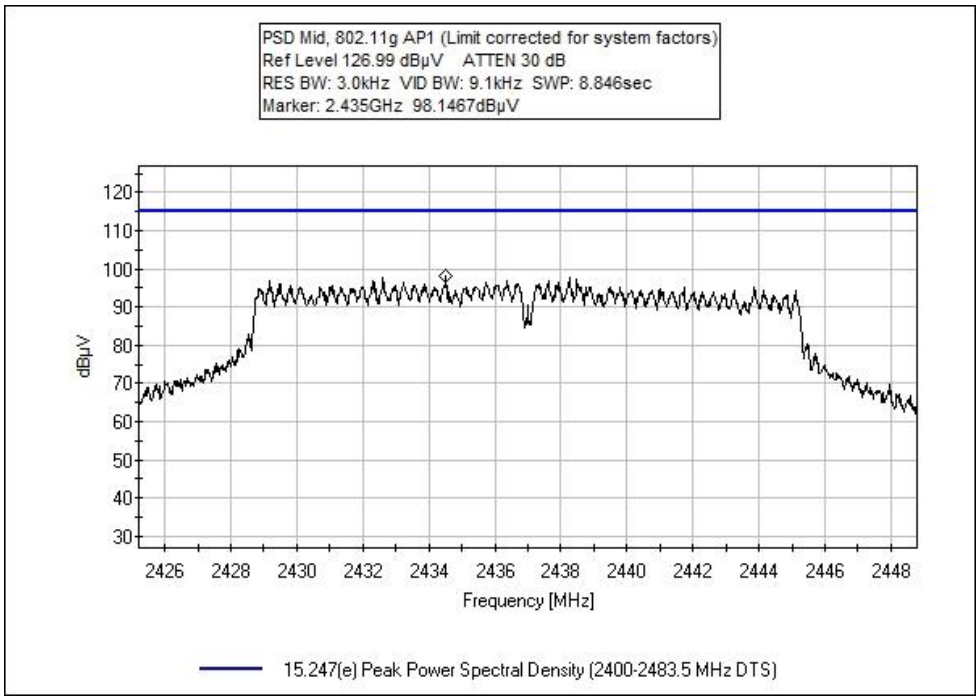
## 802.11g Plots

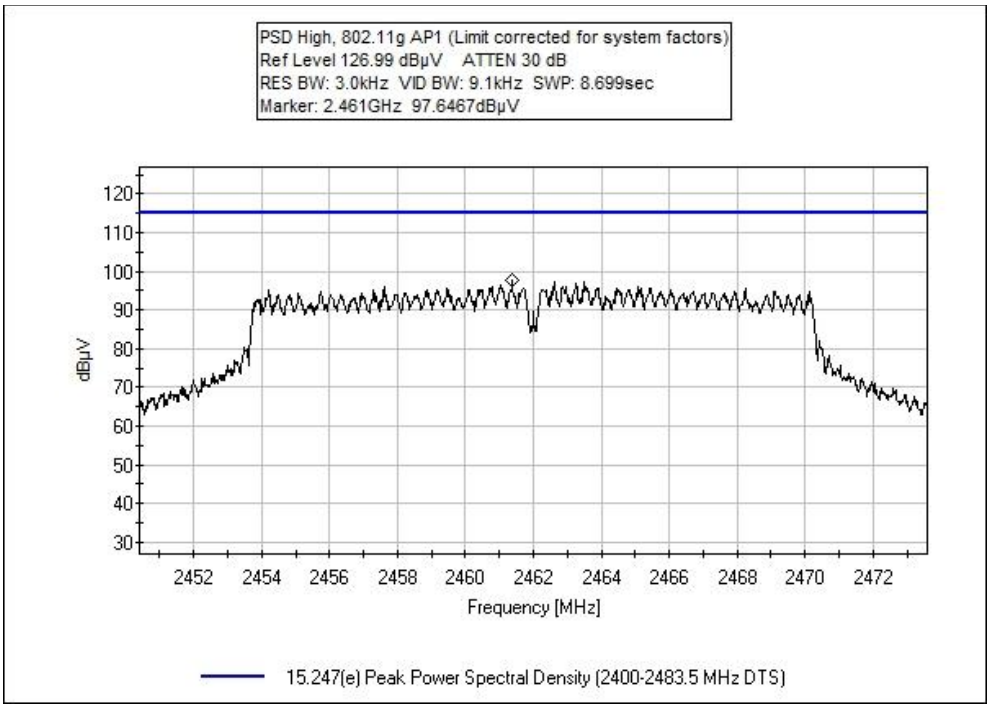


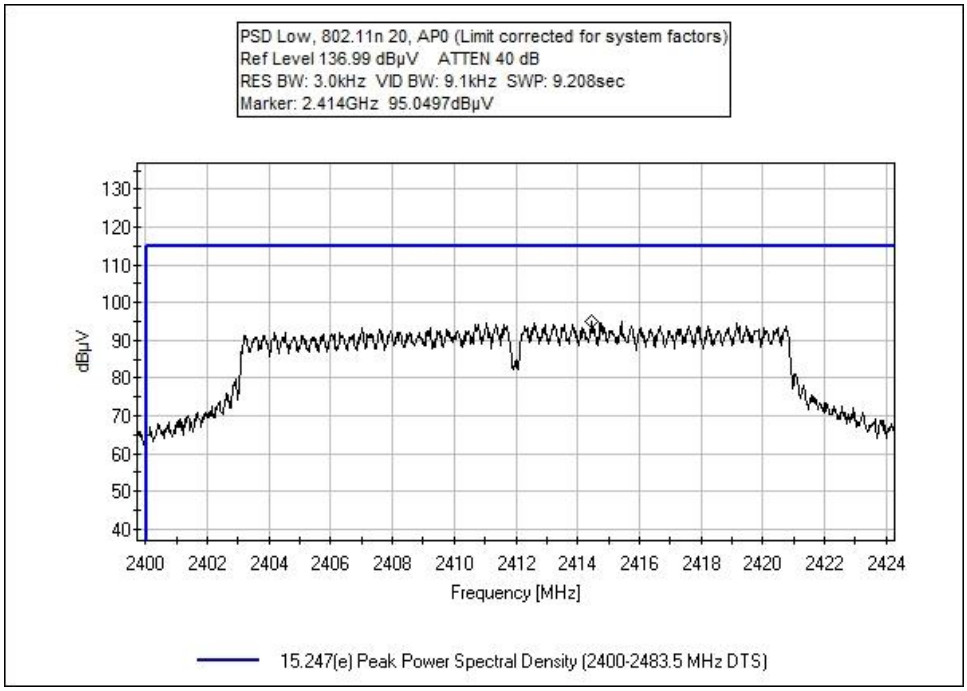

PSD High, 802.11g (Limit corrected for system factors)
Ref Level 136.99 dBµV ATTEN 40 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 9.03sec
Marker: 2.463GHz 98.8377dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
2450 2452 2454 2456 2458 2460 2462 2464 2466 2468 2470 2472 2474
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)

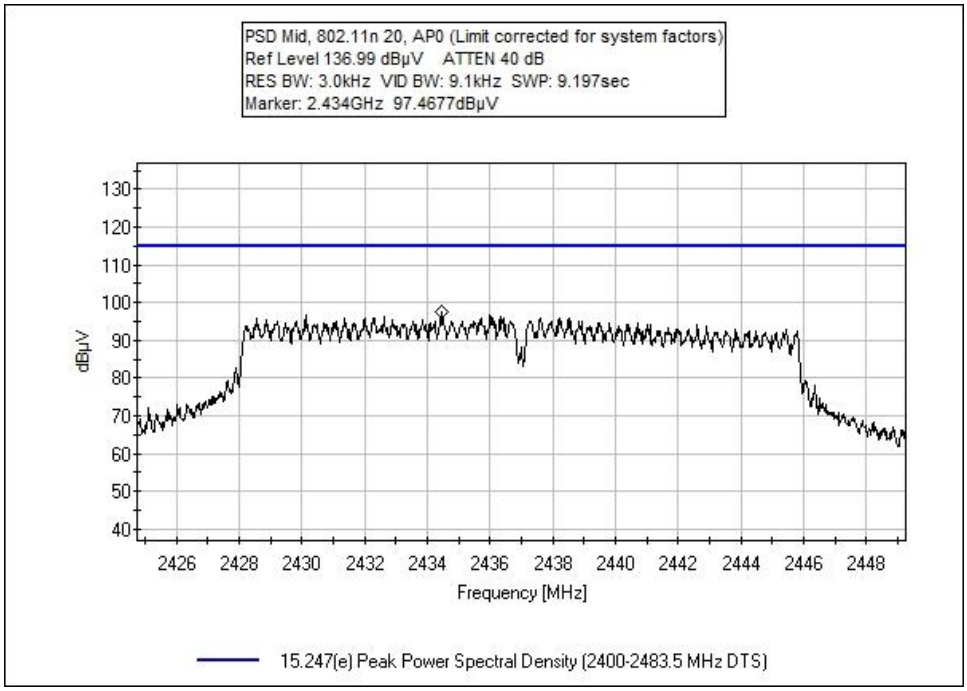

PSD Low, 802.11g AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 8.857sec
Marker: 2.413GHz 98.0287dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2402 2404 2406 2408 2410 2412 2414 2416 2418 2420 2422
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)

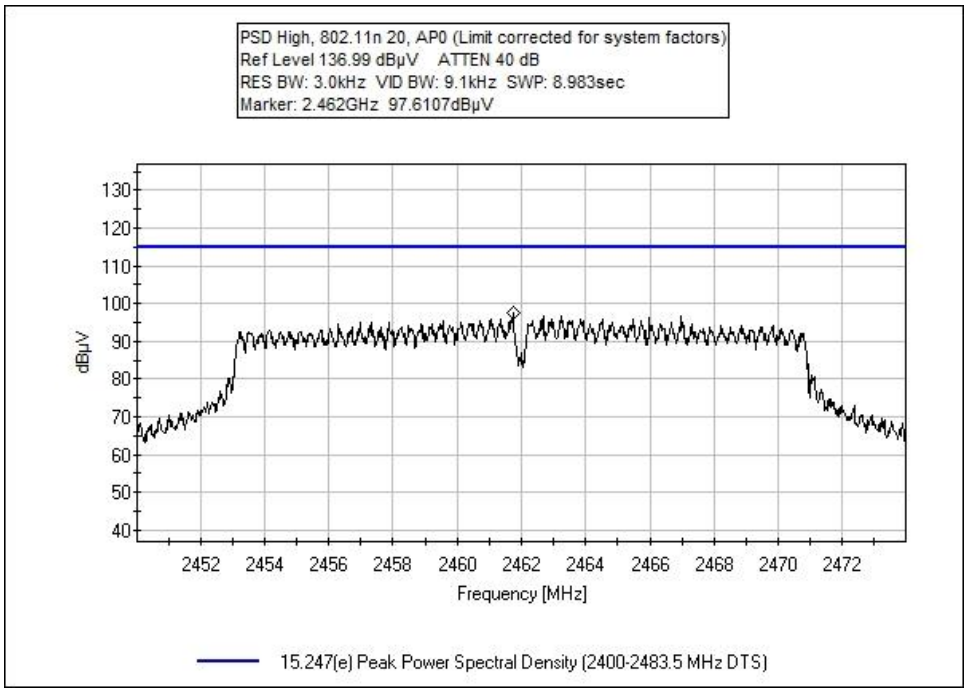

PSD Mid, 802.11g AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 8.846sec
Marker: 2.435GHz 98.1467dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2426 2428 2430 2432 2434 2436 2438 2440 2442 2444 2446 2448
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)

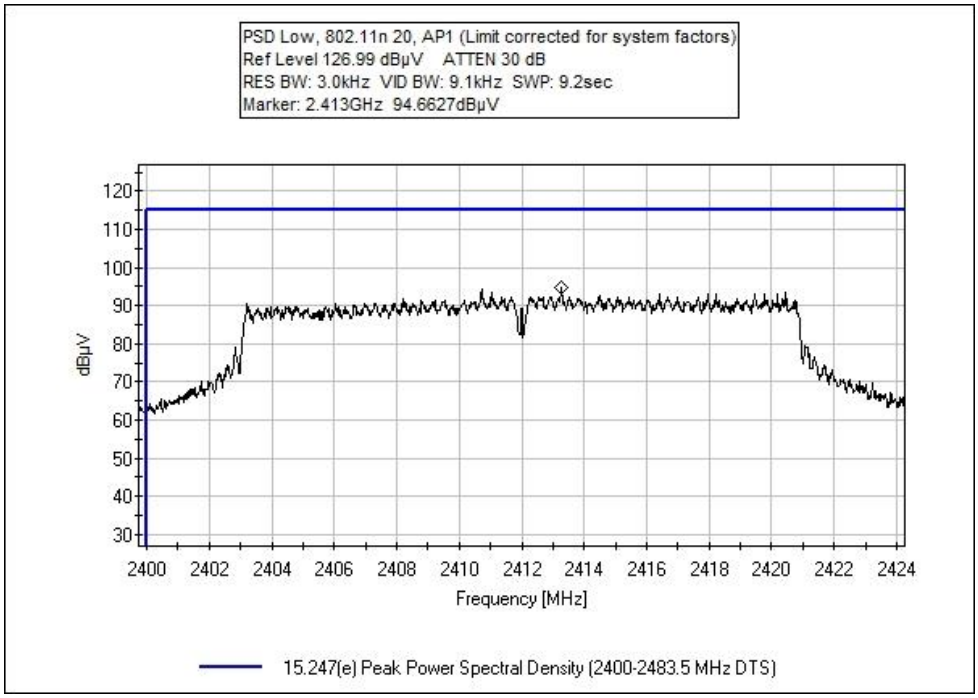

PSD High, 802.11g AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 8.699sec
Marker: 2.461GHz 97.6467dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2452 2454 2456 2458 2460 2462 2464 2466 2468 2470 2472
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)

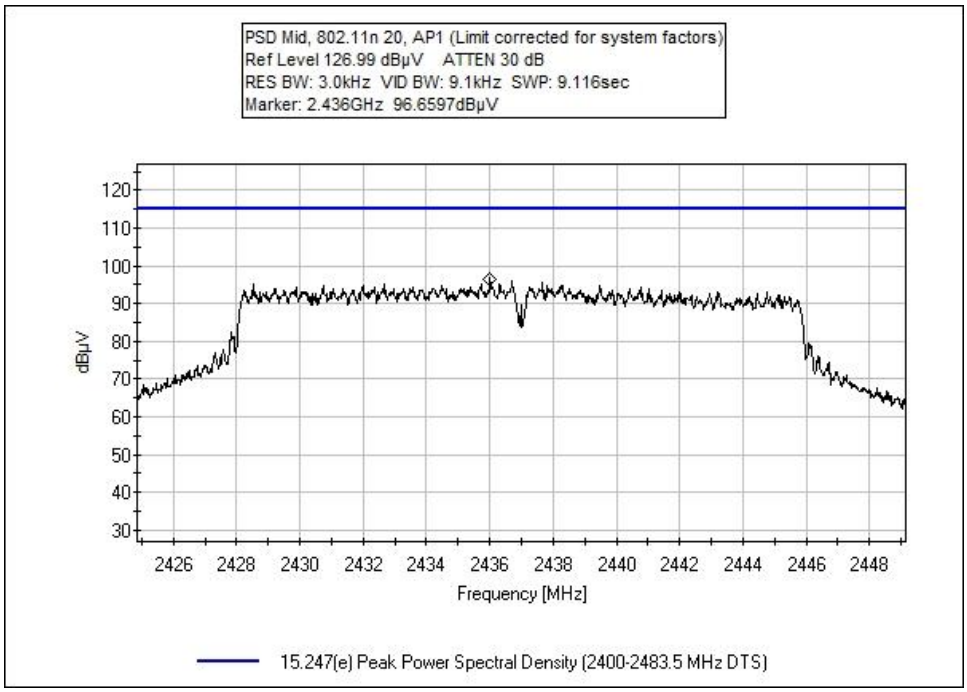
## 802.11n20 Plots

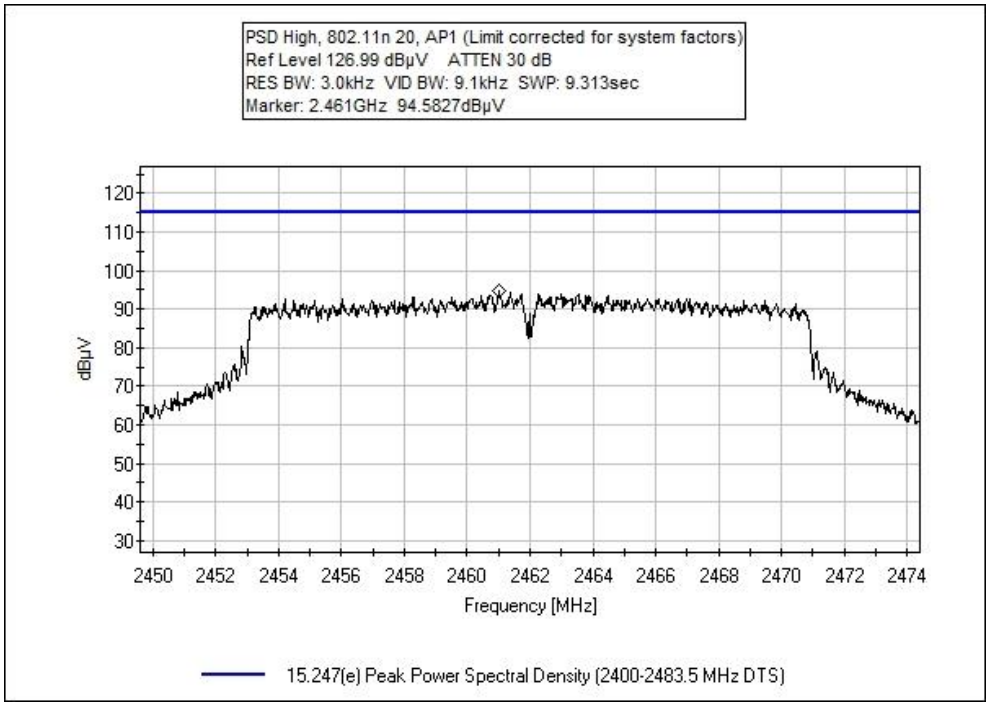


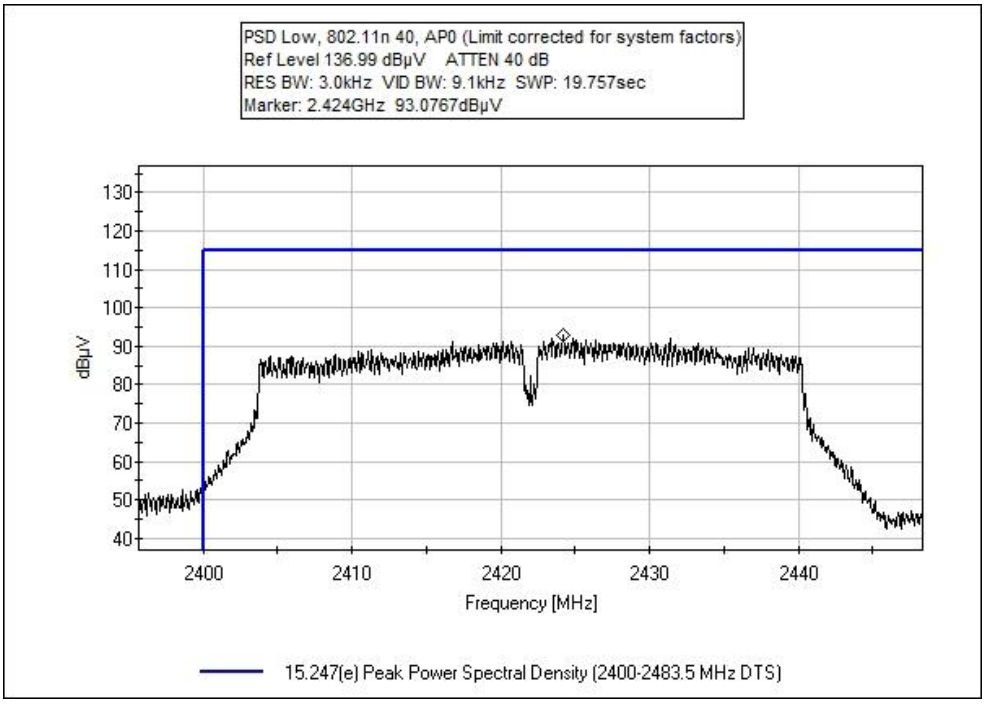

PSD High, 802.11n 20, AP0 (Limit corrected for system factors)
Ref Level 136.99 dBµV ATTEN 40 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 8.983sec
Marker: 2.462GHz 97.6107dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
2452 2454 2456 2458 2460 2462 2464 2466 2468 2470 2472
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)

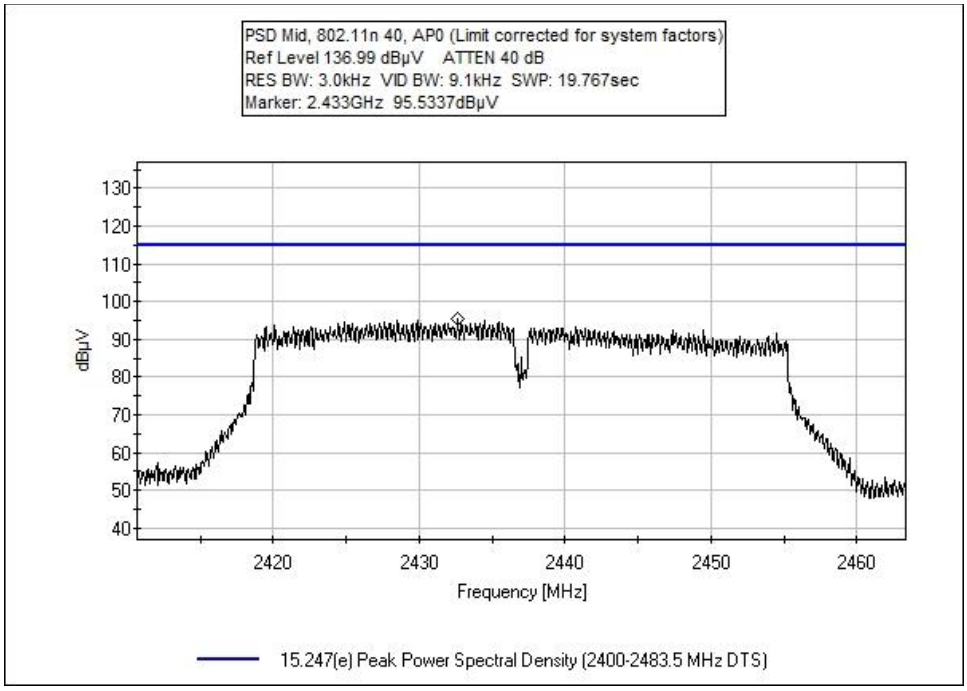

PSD Low, 802.11n 20, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 9.2sec
Marker: 2.413GHz 94.6627dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2400 2402 2404 2406 2408 2410 2412 2414 2416 2418 2420 2422 2424
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)

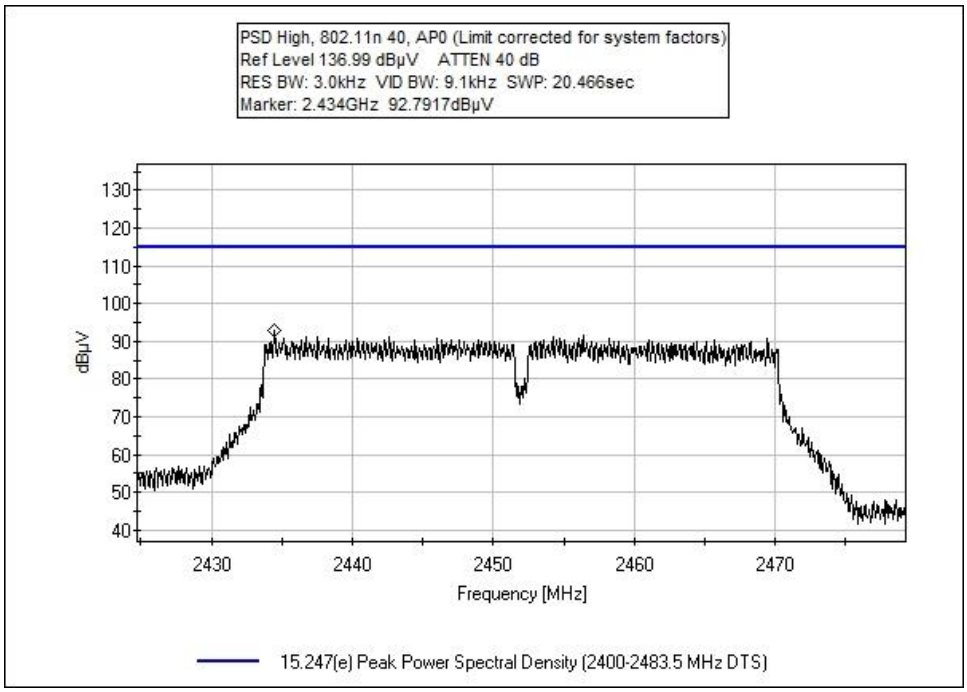

PSD Mid, 802.11n 20, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 9.116sec
Marker: 2.436GHz 96.6597dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2426 2428 2430 2432 2434 2436 2438 2440 2442 2444 2446 2448
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)

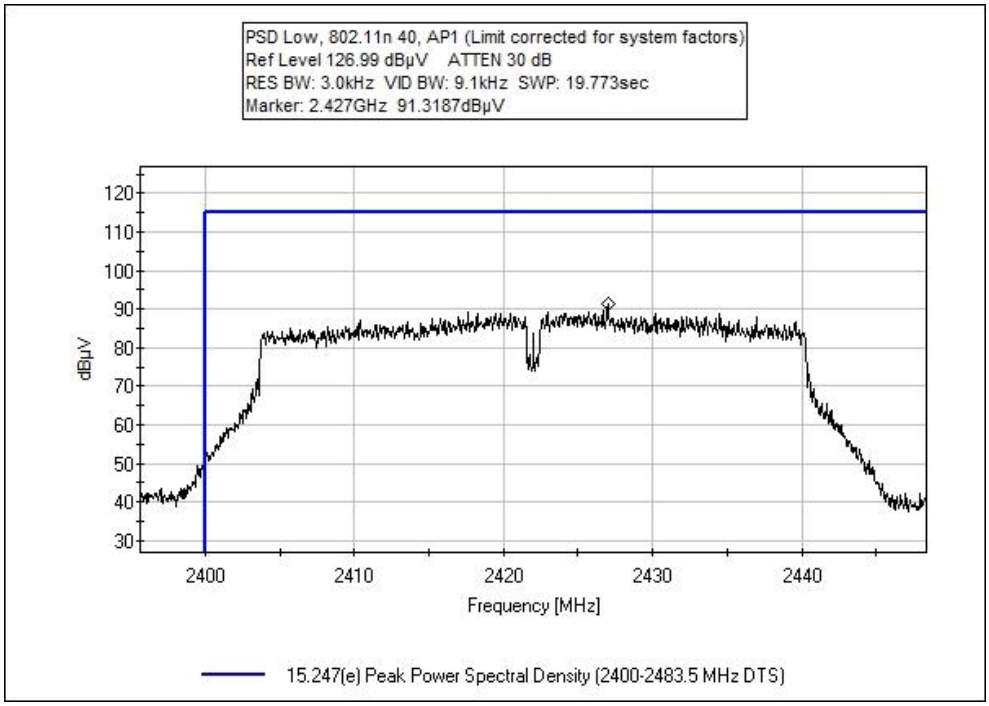

PSD High, 802.11n 20, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 9.313sec
Marker: 2.461GHz 94.5827dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2450 2452 2454 2456 2458 2460 2462 2464 2466 2468 2470 2472 2474
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)

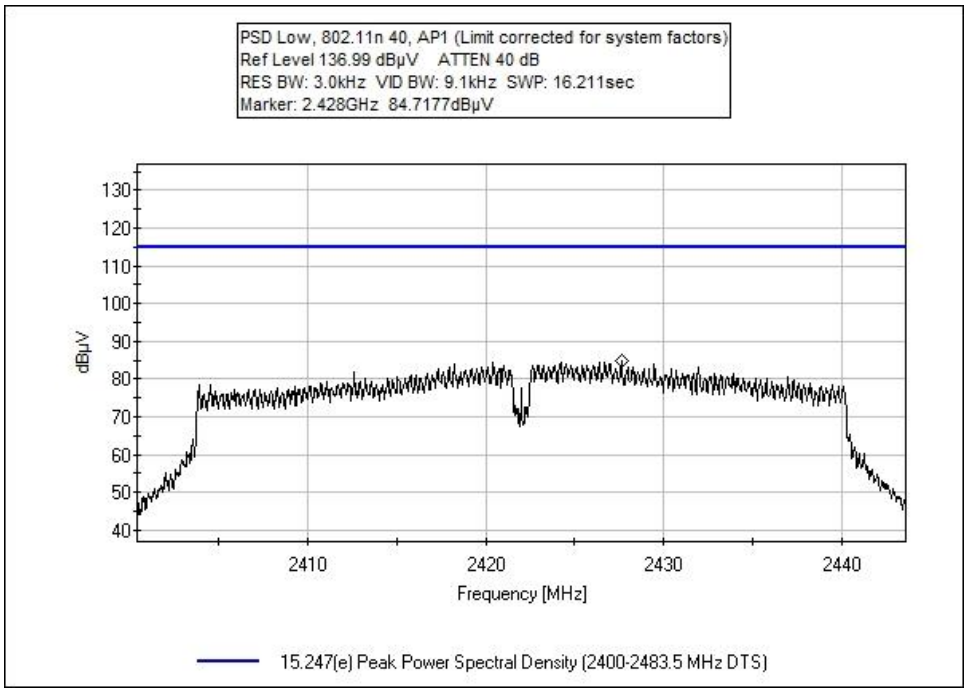
## 802.11n40 Plots

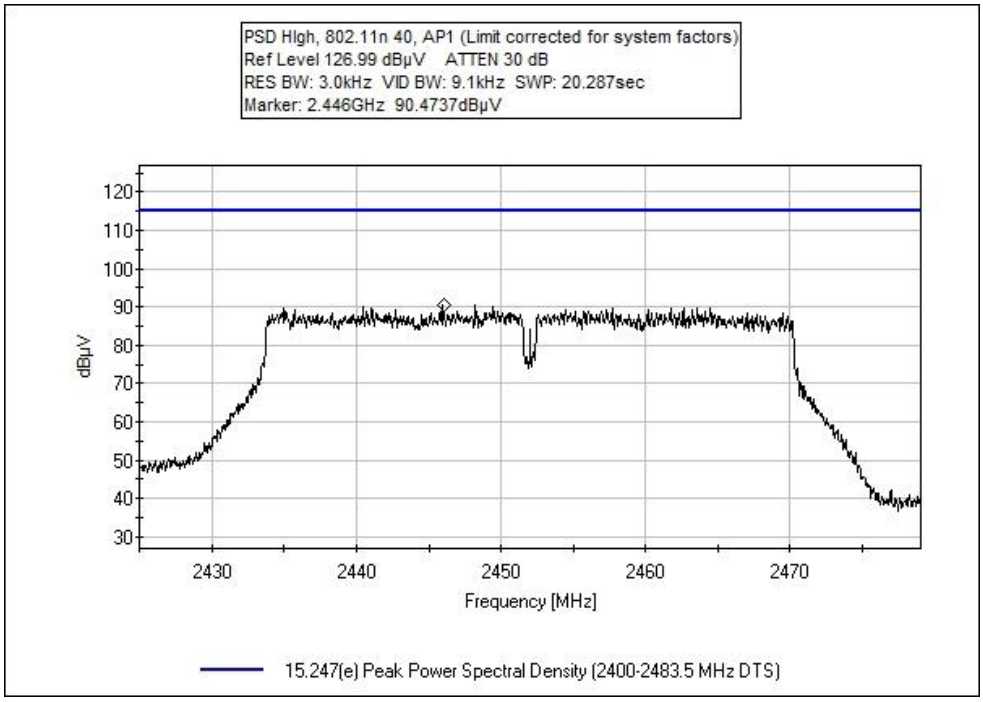



PSD High, 802.11n 40, AP0 (Limit corrected for system factors)
Ref Level 136.99 dBµV ATTEN 40 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 20.466sec
Marker: 2.434GHz 92.7917dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
2430
2440
2450
2460
2470
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)


PSD Low, 802.11n 40, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 19.773sec
Marker: 2.427GHz 91.3187dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2400
2410
2420
2430
2440
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)


PSD Low, 802.11n 40, AP1 (Limit corrected for system factors)
Ref Level 136.99 dBµV ATTEN 40 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 16.211sec
Marker: 2.428GHz 84.7177dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
2410
2420
2430
2440
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)


PSD High, 802.11n 40, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 20.287sec
Marker: 2.446GHz 90.4737dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2430
2440
2450
2460
2470
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)

## Test Setup / Conditions / Data

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr. SE • Bothell, WA 98021 • 800-500-4362 | | |
| Customer: | **Nalloy, LLC.** | | |
| Specification: | **15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)** | | |
| Work Order #: | **102802** | Date: | 4/3/2020 |
| Test Type: | **Conducted Emissions** | Time: | 07:36:46 |
| Tested By: | Matthew Harrison | Sequence#: | 34 |
| Software: | EMITest 5.03.12 | | 120V 60Hz |

***Equipment Tested:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Test Conditions / Notes:***

Environmental Conditions:
Temperature: 22° C
Humidity: 45%
Pressure: 101.3 kPa

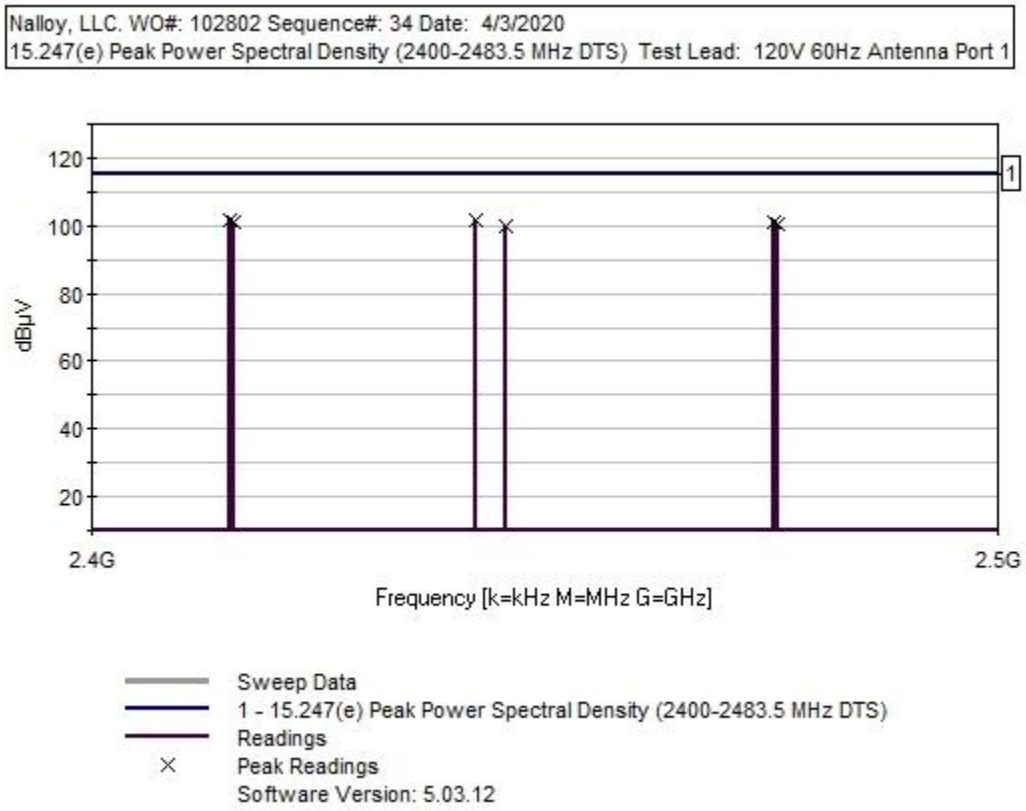
Frequency Range: 2400-2483.5 MHz
Frequency tested: 2412, 2437, 2462
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: 802.11b, 1mbps (worst-case)

Antenna type: Linear Polarized
Antenna Gain: 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
KDB 558074 (v05r02 APRIL 2, 2019)
KDB 662911 (v02r01 October 31, 2013 )
Test Mode: Transmitting
Test Setup: EUT is setup for a direct connection to antenna port.
Setup: EUT is connected to a Laptop via USB.

Low, Mid, and High channels along with all data rates investigated, worst-case provided.




***Test Equipment:***

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| | AN02673 | Spectrum Analyzer | E4446A | 2/22/2019 | 2/22/2021 |

***Measurement Data:*** Reading listed by margin. Test Lead: Antenna Port 1

| # | Freq MHz | Rdng dBµV | dB | dB | dB | dB | Dist Table | Corr dBµV | Spec dBµV | Margin dB | Polar Ant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2435.000M | 101.9 | | | | | +0.0 | 101.9 | 115.0 | -13.1 | Anten |
| 2 | 2412.601M | 101.8 | | | | | +0.0 | 101.8 | 115.0 | -13.2 | Anten |
| 3 | 2412.920M | 101.3 | | | | | +0.0 | 101.3 | 115.0 | -13.7 | Anten |
| 4 | 2462.659M | 101.2 | | | | | +0.0 | 101.2 | 115.0 | -13.8 | Anten |
| 5 | 2462.908M | 100.4 | | | | | +0.0 | 100.4 | 115.0 | -14.6 | Anten |
| 6 | 2437.794M | 100.0 | | | | | +0.0 | 100.0 | 115.0 | -15.0 | Anten |

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr. SE • Bothell, WA 98021 • 800-500-4362 | | |
| Customer: | **Nalloy, LLC.** | | |
| Specification: | **15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)** | | |
| Work Order #: | **102802** | Date: | 4/3/2020 |
| Test Type: | **Conducted Emissions** | Time: | 07:57:06 |
| Tested By: | Matthew Harrison | Sequence#: | 35 |
| Software: | EMITest 5.03.12 | | 120V 60Hz |

***Equipment Tested:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Test Conditions / Notes:***

Environmental Conditions:
Temperature: 22° C
Humidity: 45%
Pressure: 101.3 kPa

Frequency Range: 2400-2483.5 MHz
Frequency tested: 2412, 2437, 2462
Firmware power setting: 13 dBm for Low Chanel, 15 dBm for High Channel
EUT Firmware:
Protocol /MCS/Modulation: 802.11g, 6 mbps (worst-case)

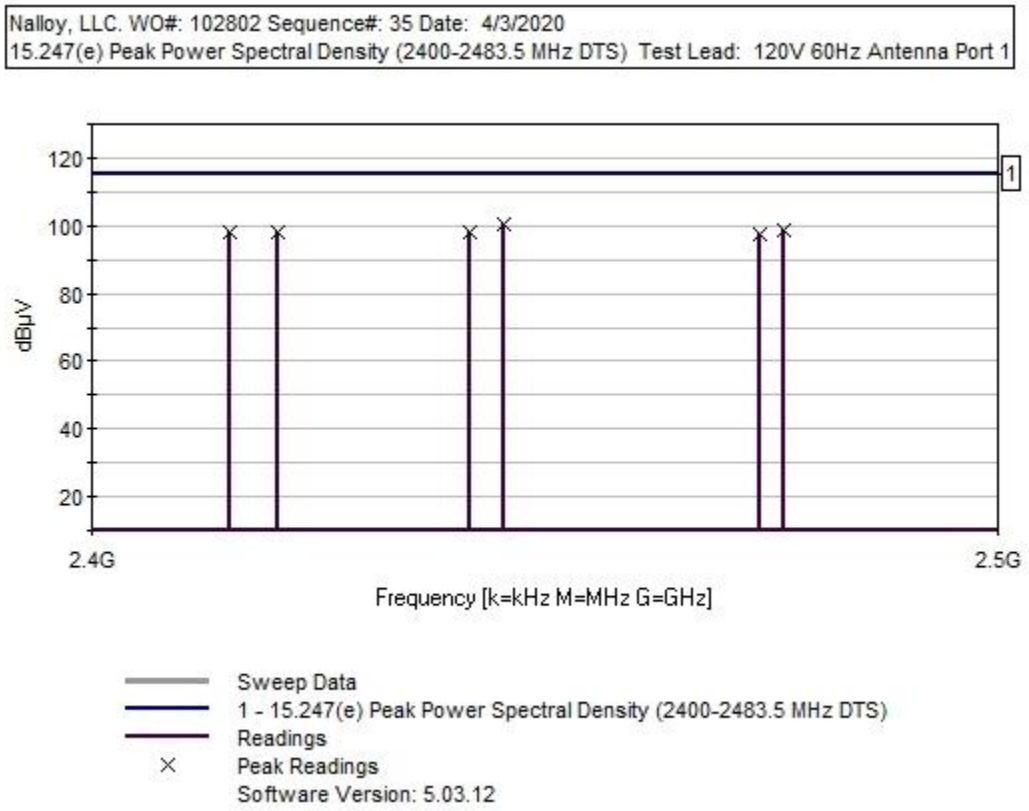
Antenna type: Linear Polarized
Antenna Gain: 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
KDB 558074 (v05r02 APRIL 2, 2019)
KDB 662911 (v02r01 October 31, 2013 )

Test Mode: Transmitting
Test Setup: EUT is setup for a direct connection to antenna port.
Setup: EUT is connected to a Laptop via USB.

Low, Mid, and High channels along with all data rates investigated, worst-case provided.




***Test Equipment:***

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| | AN02673 | Spectrum Analyzer | E4446A | 2/22/2019 | 2/22/2021 |

***Measurement Data:*** Reading listed by margin. Test Lead: Antenna Port 1

| # | Freq MHz | Rdng dBµV | dB | dB | dB | dB | Dist Table | Corr dBµV | Spec dBµV | Margin dB | Polar Ant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2437.602M | 100.2 | | | | | +0.0 | 100.2 | 115.0 | -14.8 | Anten |
| 2 | 2463.492M | 98.8 | | | | | +0.0 | 98.8 | 115.0 | -16.2 | Anten |
| 3 | 2434.524M | 98.1 | | | | | +0.0 | 98.1 | 115.0 | -16.9 | Anten |
| 4 | 2412.590M | 98.0 | | | | | +0.0 | 98.0 | 115.0 | -17.0 | Anten |
| 5 | 2416.983M | 97.9 | | | | | +0.0 | 97.9 | 115.0 | -17.1 | Anten |
| 6 | 2461.374M | 97.6 | | | | | +0.0 | 97.6 | 115.0 | -17.4 | Anten |

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362 | | |
| Customer: | **Nalloy, LLC.** | | |
| Specification: | **15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)** | | |
| Work Order #: | **102802** | Date: | 4/3/2020 |
| Test Type: | **Conducted Emissions** | Time: | 08:15:36 |
| Tested By: | Matthew Harrison | Sequence#: | 36 |
| Software: | EMITest 5.03.12 | | 120V 60Hz |

***Equipment Tested:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Test Conditions / Notes:***

Environmental Conditions:
Temperature: 22° C
Humidity: 45%
Pressure: 101.3 kPa

Frequency Range: 2400-2483.5 MHz
Frequency tested: 2412, 2437, 2462
Firmware power setting: 12 dBm for Low Channel, 14 dBm for Middle and High Channel
EUT Firmware:
Protocol /MCS/Modulation: 802.11n, 20MHz BW, MCS8 (worst-case)

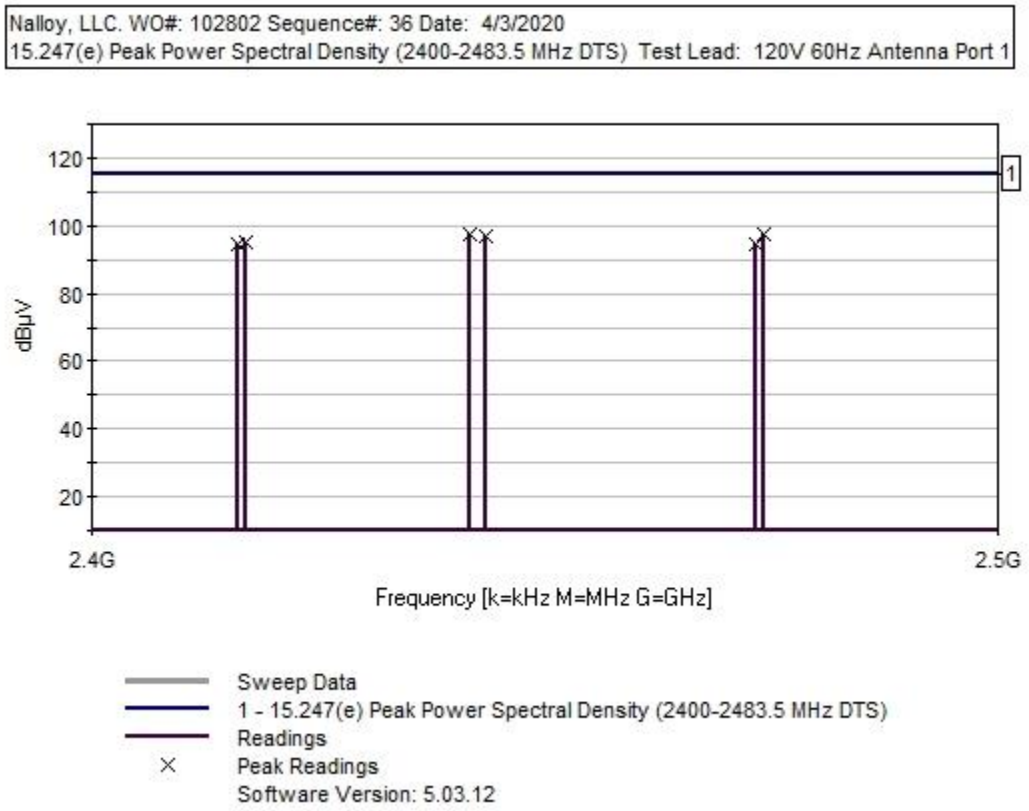
Antenna type: Linear Polarized
Antenna Gain: 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
KDB 558074 (v05r02 APRIL 2, 2019)
KDB 662911 (v02r01 October 31, 2013 )

Test Mode: Transmitting
Test Setup: EUT is setup for a direct connection to antenna port.
Setup: EUT is connected to a Laptop via USB

Low, Mid, and High channels along with all data rates investigated, worst-case provided.




***Test Equipment:***

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| | AN02673 | Spectrum Analyzer | E4446A | 2/22/2019 | 2/22/2021 |

***Measurement Data:*** Reading listed by margin. Test Lead: Antenna Port 1

| # | Freq MHz | Rdng dBµV | dB | dB | dB | dB | Dist Table | Corr dBµV | Spec dBµV | Margin dB | Polar Ant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2461.737M | 97.6 | | | | | +0.0 | 97.6 | 115.0 | -17.4 | Anten |
| 2 | 2434.450M | 97.5 | | | | | +0.0 | 97.5 | 115.0 | -17.5 | Anten |
| 3 | 2436.004M | 96.7 | | | | | +0.0 | 96.7 | 115.0 | -18.3 | Anten |
| 4 | 2414.000M | 95.0 | | | | | +0.0 | 95.0 | 115.0 | -20.0 | Anten |
| 5 | 2413.275M | 94.7 | | | | | +0.0 | 94.7 | 115.0 | -20.3 | Anten |
| 6 | 2461.007M | 94.6 | | | | | +0.0 | 94.6 | 115.0 | -20.4 | Anten |

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362 | | |
| Customer: | **Nalloy, LLC.** | | |
| Specification: | **15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)** | | |
| Work Order #: | **102802** | Date: | 4/3/2020 |
| Test Type: | **Conducted Emissions** | Time: | 08:47:52 |
| Tested By: | Matthew Harrison | Sequence#: | 37 |
| Software: | EMITest 5.03.12 | | 120V 60Hz |

***Equipment Tested:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Test Conditions / Notes:***

Environmental Conditions:
Temperature: 22° C
Humidity: 45%
Pressure: 101.3 kPa

Frequency Range: 2400-2483.5 MHz
Frequency tested: 2422, 2437, 2452
Firmware power setting: 11 dBm for Low Channel, 14 dBm for Middle Channel, and 12dBm High Channel
EUT Firmware:
Protocol /MCS/Modulation: 802.11n, 40MHz BW, MCS8 (worst-case)

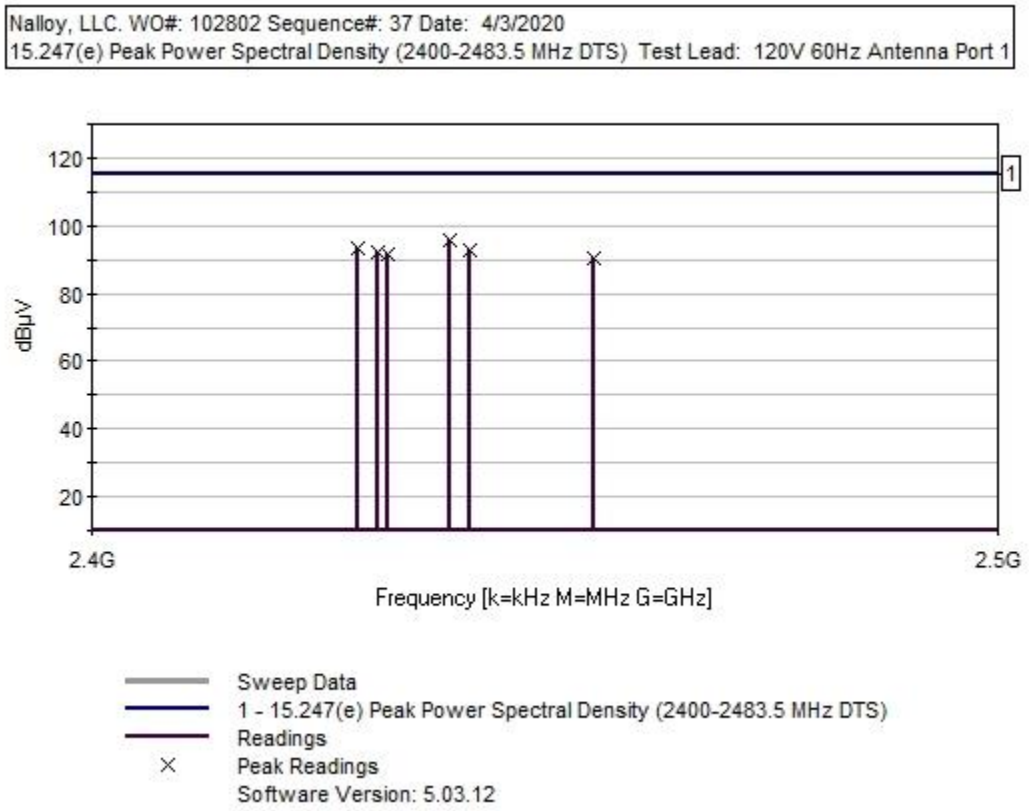
Antenna type: Linear Polarized
Antenna Gain: 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
KDB 558074 (v05r02 APRIL 2, 2019)
KDB 662911 (v02r01 October 31, 2013 )

Test Mode: Transmitting
Test Setup: EUT is setup for a direct connection to antenna port.
Setup: EUT is connected to a Laptop via USB

Low, Mid, and High channels along with all data rates investigated, worst-case provided.




***Test Equipment:***

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| T1 | AN02673 | Spectrum Analyzer | E4446A | 2/22/2019 | 2/22/2021 |

***Measurement Data:*** Reading listed by margin. Test Lead: Antenna Port 1

| # | Freq MHz | Rdng dBµV | T1 dB | dB | dB | dB | Dist Table | Corr dBµV | Spec dBµV | Margin dB | Polar Ant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2432.630M | 95.5 | +0.0 | | | | +0.0 | 95.5 | 115.0 | -19.5 | Anten |
| 2 | 2424.160M | 93.1 | +0.0 | | | | +0.0 | 93.1 | 115.0 | -21.9 | Anten |
| 3 | 2434.490M | 92.8 | +0.0 | | | | +0.0 | 92.8 | 115.0 | -22.2 | Anten |
| 4 | 2426.040M | 92.4 | +0.0 | | | | +0.0 | 92.4 | 115.0 | -22.6 | Anten |
| 5 | 2427.010M | 91.3 | +0.0 | | | | +0.0 | 91.3 | 115.0 | -23.7 | Anten |
| 6 | 2446.000M | 90.5 | +0.0 | | | | +0.0 | 90.5 | 115.0 | -24.5 | Anten |

## Test Setup Photo(s)

# 15.247(d) RF Conducted Emissions & Band Edge

## Test Setup / Conditions / Data

## 802.11b Data

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362 | | |
| Customer: | **Nalloy, LLC.** | | |
| Specification: | **15.247(d) Conducted Spurious Emissions** | | |
| Work Order #: | **102802** | Date: | 3/27/2020 |
| Test Type: | **Conducted Emissions** | Time: | 11:38:04 |
| Tested By: | Matthew Harrison | Sequence#: | 57 |
| Software: | EMITest 5.03.12 | | 120V 60Hz |

***Equipment Tested:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Test Conditions / Notes:***

Temperature: 22° C
Humidity: 28%
Pressure: 101.3 kPa

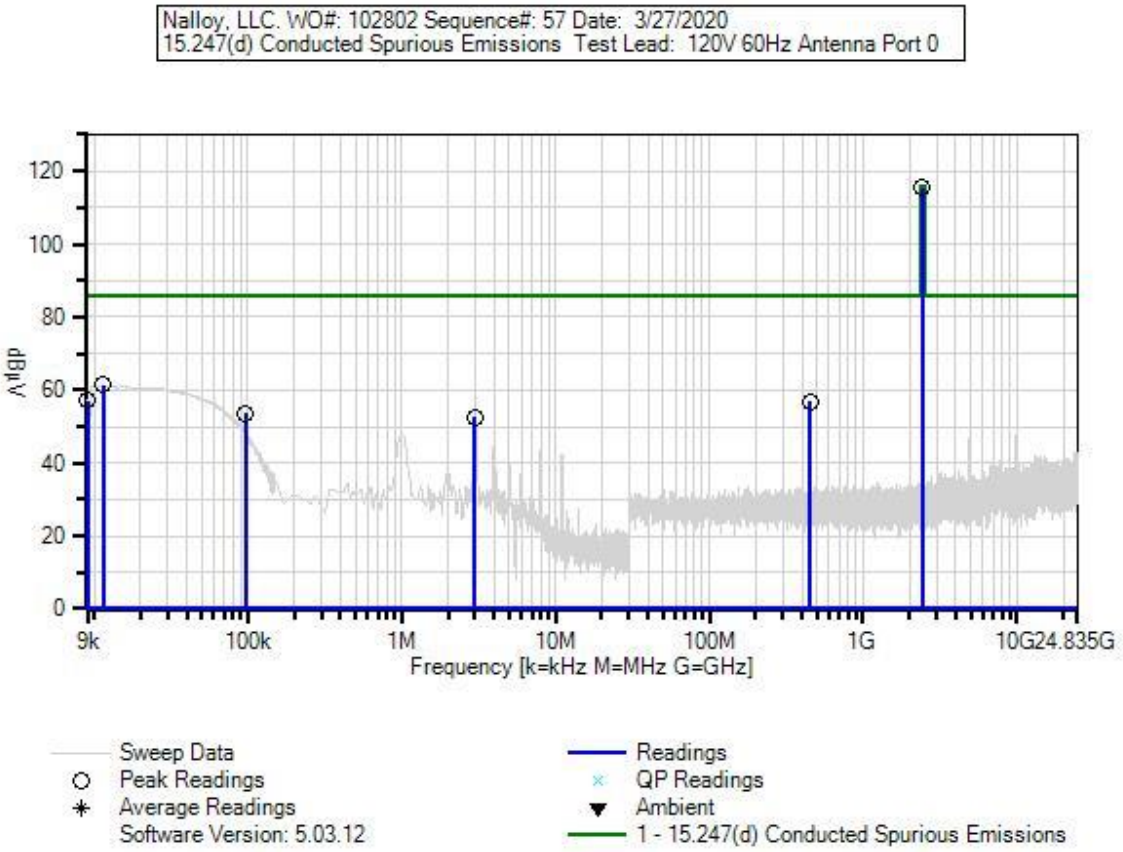
Frequency Range: 9kHz-25GHz
**Frequency tested: 2412**
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11b, 1mbps (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup for conducted measurements.
Modifications Added: None
Setup: EUT is connected to a Laptop via USB and Audio cable.

All data rates investigated, worst-case provided.




***Test Equipment:***

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| | AN02673 | Spectrum Analyzer | E4446A | 2/22/2019 | 2/22/2021 |

***Measurement Data:*** Reading listed by margin. Test Lead: Antenna Port 0

| # | Freq MHz | Rdng dBµV | dB | dB | dB | dB | Dist Table | Corr dBµV | Spec dBµV | Margin dB | Polar Ant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2412.480M | 115.5 | | | | | +0.0 | 115.5 | 116.0 | -0.5 | Anten |
| 2 | 11.397k | 61.3 | | | | | +0.0 | 61.3 | 86.0 | -24.7 | Anten |
| 3 | 9.000k | 57.2 | | | | | +0.0 | 57.2 | 86.0 | -28.8 | Anten |
| 4 | 451.321M | 56.8 | | | | | +0.0 | 56.8 | 86.0 | -29.2 | Anten |
| 5 | 96.279k | 53.5 | | | | | +0.0 | 53.5 | 86.0 | -32.5 | Anten |
| 6 | 2.991M | 52.6 | | | | | +0.0 | 52.6 | 86.0 | -33.4 | Anten |

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362 | | |
| Customer: | **Nalloy, LLC.** | | |
| Specification: | **15.247(d) Conducted Spurious Emissions** | | |
| Work Order #: | **102802** | Date: | 3/27/2020 |
| Test Type: | **Conducted Emissions** | Time: | 11:48:38 |
| Tested By: | Matthew Harrison | Sequence#: | 58 |
| Software: | EMITest 5.03.12 | | 120V 60Hz |

***Equipment Tested:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Test Conditions / Notes:***

Temperature: 22° C
Humidity: 28%
Pressure: 101.3 kPa

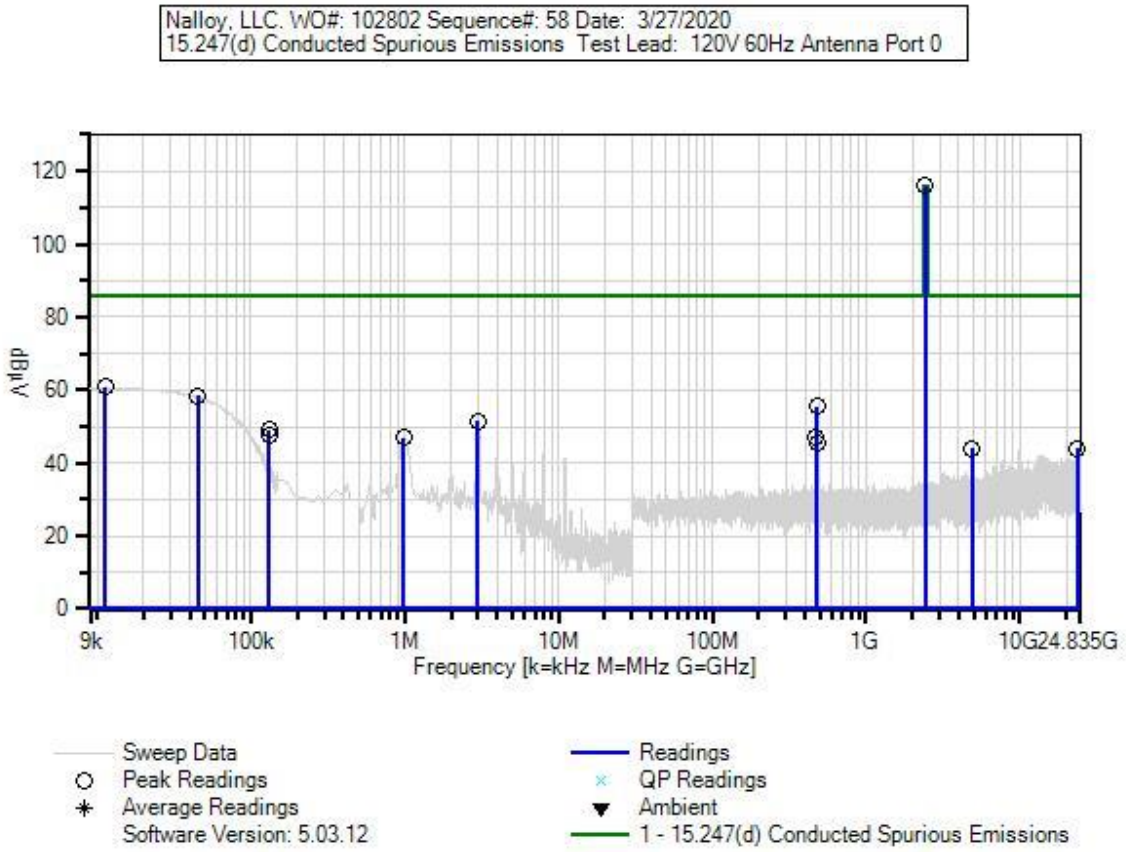
Frequency Range: 9kHz-25GHz
**Frequency tested: 2437**
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11b, 1mbps (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup for conducted measurements.
Modifications Added: None
Setup: EUT is connected to a Laptop via USB and Audio cable.

All data rates investigated, worst-case provided.




***Test Equipment:***

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| | AN02673 | Spectrum Analyzer | E4446A | 2/22/2019 | 2/22/2021 |

***Measurement Data:*** Reading listed by margin. Test Lead: Antenna Port 0

| # | Freq MHz | Rdng dBµV | dB | dB | dB | dB | Dist Table | Corr dBµV | Spec dBµV | Margin dB | Polar Ant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2437.503M | 116.0 | | | | | +0.0 | 116.0 | 116.0 | +0.0 | Anten |
| 2 | 11.256k | 60.8 | | | | | +0.0 | 60.8 | 86.0 | -25.2 | Anten |
| 3 | 45.237k | 58.5 | | | | | +0.0 | 58.5 | 86.0 | -27.5 | Anten |
| 4 | 476.246M | 55.6 | | | | | +0.0 | 55.6 | 86.0 | -30.4 | Anten |
| 5 | 2.991M | 51.4 | | | | | +0.0 | 51.4 | 86.0 | -34.6 | Anten |
| 6 | 131.952k | 49.1 | | | | | +0.0 | 49.1 | 86.0 | -36.9 | Anten |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 131.247k | 47.6 | +0.0 | 47.6 | 86.0 | -38.4 | Anten |
| 8 | 474.744M | 47.0 | +0.0 | 47.0 | 86.0 | -39.0 | Anten |
| 9 | 985.573k | 46.9 | +0.0 | 46.9 | 86.0 | -39.1 | Anten |
| 10 | 477.747M | 45.6 | +0.0 | 45.6 | 86.0 | -40.4 | Anten |
| 11 | 23558.405 M | 44.0 | +0.0 | 44.0 | 86.0 | -42.0 | Anten |
| 12 | 4873.939M | 43.9 | +0.0 | 43.9 | 86.0 | -42.1 | Anten |

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362 | | |
| Customer: | **Nalloy, LLC.** | | |
| Specification: | **15.247(d) Conducted Spurious Emissions** | | |
| Work Order #: | **102802** | Date: | 3/27/2020 |
| Test Type: | **Conducted Emissions** | Time: | 11:58:53 |
| Tested By: | Matthew Harrison | Sequence#: | 59 |
| Software: | EMITest 5.03.12 | | 120V 60Hz |

***Equipment Tested:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Test Conditions / Notes:***

Temperature: 22° C
Humidity: 28%
Pressure: 101.3 kPa

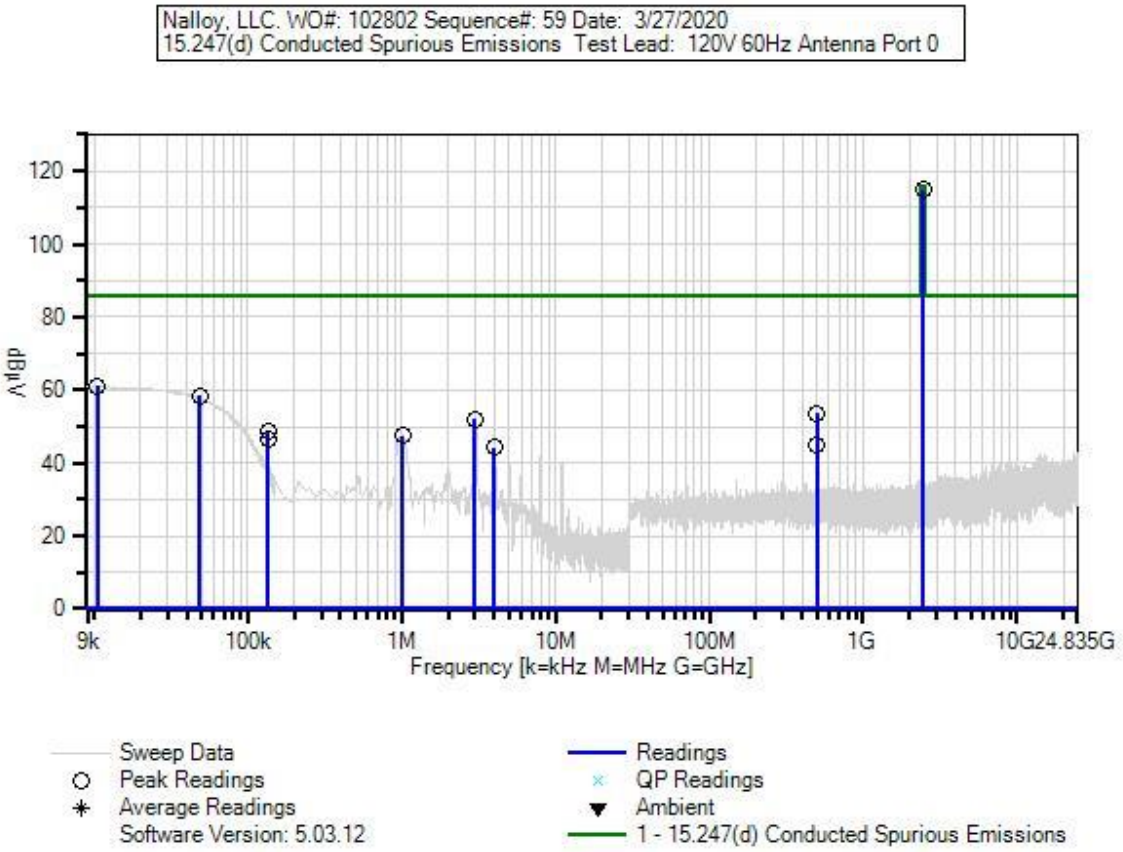
Frequency Range: 9kHz-25GHz
**Frequency tested: 2462**
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11b, 1mbps (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup for conducted measurements.
Modifications Added: None
Setup: EUT is connected to a Laptop via USB and Audio cable.

All data rates investigated, worst-case provided.




***Test Equipment:***

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| | AN02673 | Spectrum Analyzer | E4446A | 2/22/2019 | 2/22/2021 |

***Measurement Data:*** Reading listed by margin. Test Lead: Antenna Port 0

| # | Freq MHz | Rdng dBµV | dB | dB | dB | dB | Dist Table | Corr dBµV | Spec dBµV | Margin dB | Polar Ant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2460.510M | 114.8 | | | | | +0.0 | 114.8 | 116.0 | -1.2 | Anten |
| 2 | 10.551k | 61.1 | | | | | +0.0 | 61.1 | 86.0 | -24.9 | Anten |
| 3 | 48.480k | 58.4 | | | | | +0.0 | 58.4 | 86.0 | -27.6 | Anten |
| 4 | 501.271M | 53.6 | | | | | +0.0 | 53.6 | 86.0 | -32.4 | Anten |
| 5 | 2.991M | 51.9 | | | | | +0.0 | 51.9 | 86.0 | -34.1 | Anten |
| 6 | 135.195k | 48.7 | | | | | +0.0 | 48.7 | 86.0 | -37.3 | Anten |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 1.006M | 47.6 | +0.0 | 47.6 | 86.0 | -38.4 | Anten |
| 8 | 134.631k | 46.8 | +0.0 | 46.8 | 86.0 | -39.2 | Anten |
| 9 | 499.769M | 45.2 | +0.0 | 45.2 | 86.0 | -40.8 | Anten |
| 10 | 4.015M | 44.2 | +0.0 | 44.2 | 86.0 | -41.8 | Anten |

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362 | | |
| Customer: | **Nalloy, LLC.** | | |
| Specification: | **15.247(d) Conducted Spurious Emissions** | | |
| Work Order #: | **102802** | Date: | 3/27/2020 |
| Test Type: | **Conducted Emissions** | Time: | 12:07:07 |
| Tested By: | Matthew Harrison | Sequence#: | 60 |
| Software: | EMITest 5.03.12 | | 120V 60Hz |

***Equipment Tested:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Configuration 1 | | | |

***Test Conditions / Notes:***

Temperature: 22° C
Humidity: 28%
Pressure: 101.3 kPa

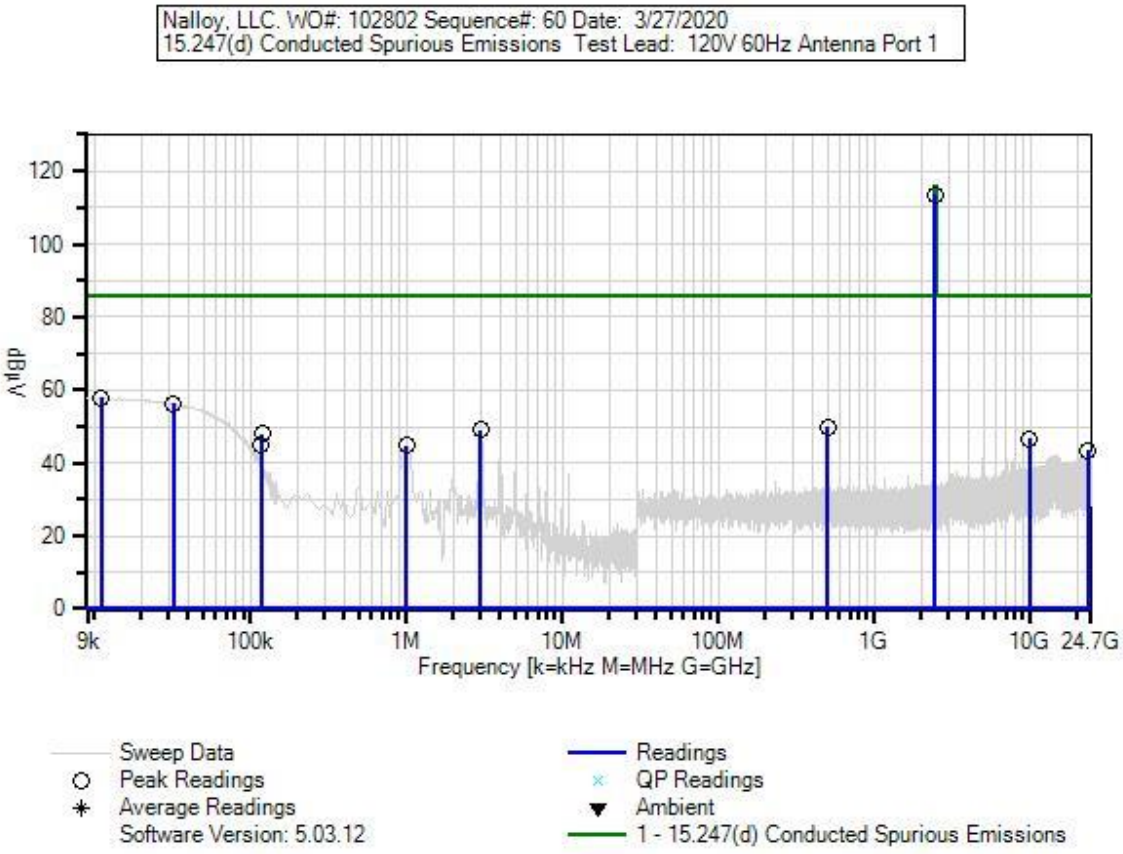
Frequency Range: 9kHz-25GHz
**Frequency tested: 2462**
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11b, 1mbps (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup for conducted measurements.
Modifications Added: None
Setup: EUT is connected to a Laptop via USB and Audio cable.

All data rates investigated, worst-case provided.




***Test Equipment:***

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| | AN02673 | Spectrum Analyzer | E4446A | 2/22/2019 | 2/22/2021 |

***Measurement Data:*** Reading listed by margin. Test Lead: Antenna Port 1

| # | Freq MHz | Rdng dBµV | dB | dB | dB | dB | Dist Table | Corr dBµV | Spec dBµV | Margin dB | Polar Ant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2461.470M | 113.6 | | | | | +0.0 | 113.6 | 116.0 | -2.4 | Anten |
| 2 | 11.115k | 57.9 | | | | | +0.0 | 57.9 | 86.0 | -28.1 | Anten |
| 3 | 32.265k | 56.4 | | | | | +0.0 | 56.4 | 86.0 | -29.6 | Anten |
| 4 | 501.271M | 49.9 | | | | | +0.0 | 49.9 | 86.0 | -36.1 | Anten |
| 5 | 3.012M | 49.1 | | | | | +0.0 | 49.1 | 86.0 | -36.9 | Anten |
| 6 | 118.980k | 47.9 | | | | | +0.0 | 47.9 | 86.0 | -38.1 | Anten |