Nalloy, LLC

REVISED TEST REPORT TO 102802-3A

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.: 102802-3B

Date of issue: March 21, 2022

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:

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Customer Reference Number: 2D-03187704

Project Number: 102802

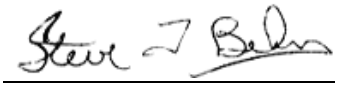
DATE OF EQUIPMENT RECEIPT: March 18, 2020
DATE(S) OF TESTING: March 18, 24 and 27, 2020
April 1-3, 2020

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.
Revision B: To replace 15.207 AC Conducted Emissions data.

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

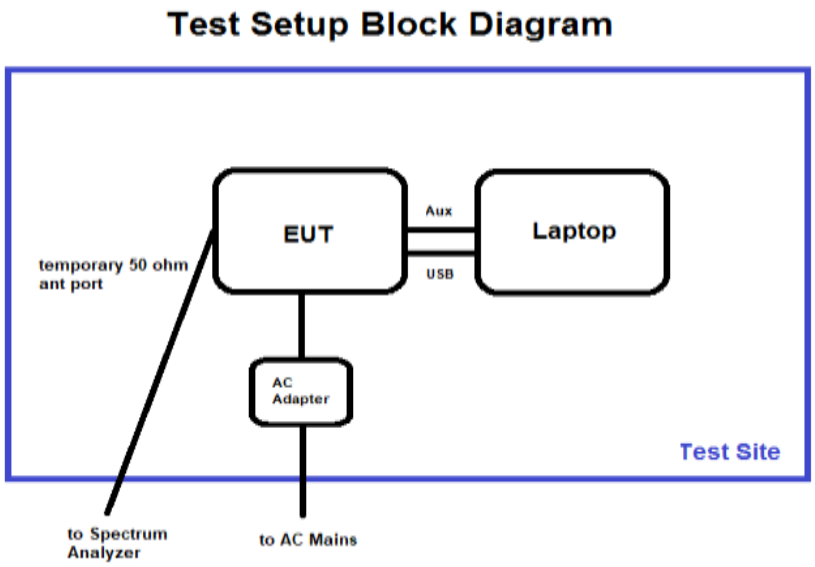
Support Equipment:

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

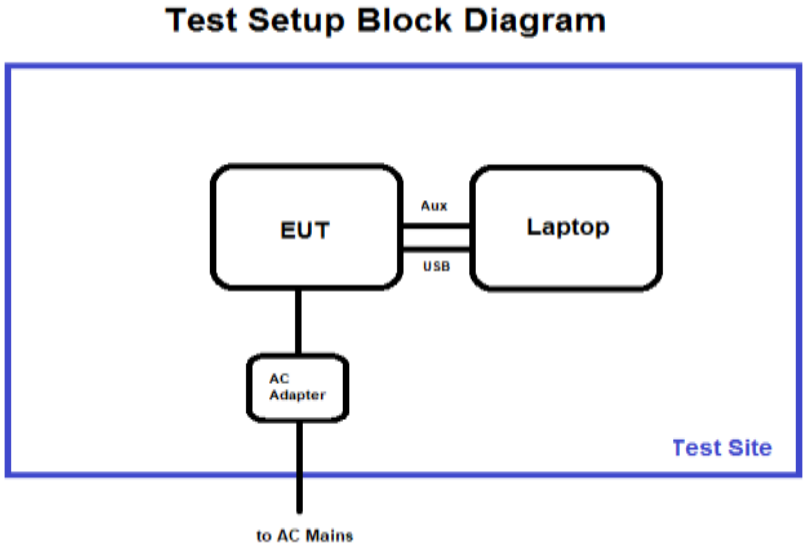
General Product Information:

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 802.11n802 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)



Tx Cond Ant Port



Tx with Antenna

FCC Part 15 Subpart C

15.247(a)(2) 6dB Bandwidth

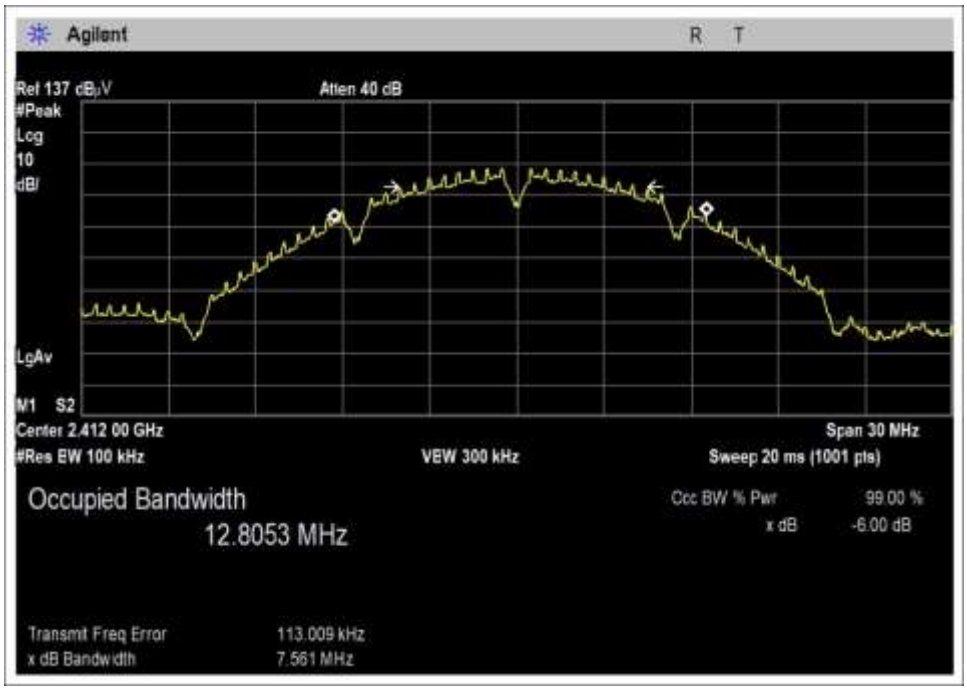
Test Setup/Conditions			
Test Location:	Bothell Lab Bench	Test Engineer:	M. Harrison
Test Method:	ANSI C63.10 (2013), KDB 558074 (v05r02 APRIL 2, 2019) KDB 662911 (v02r01 10/31/2013)	Test Date(s):	3/24/2020
Configuration:	1		
Test Setup:	Duty Cycle: 100% (Test Mode) Test Mode: Continuously transmitting 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

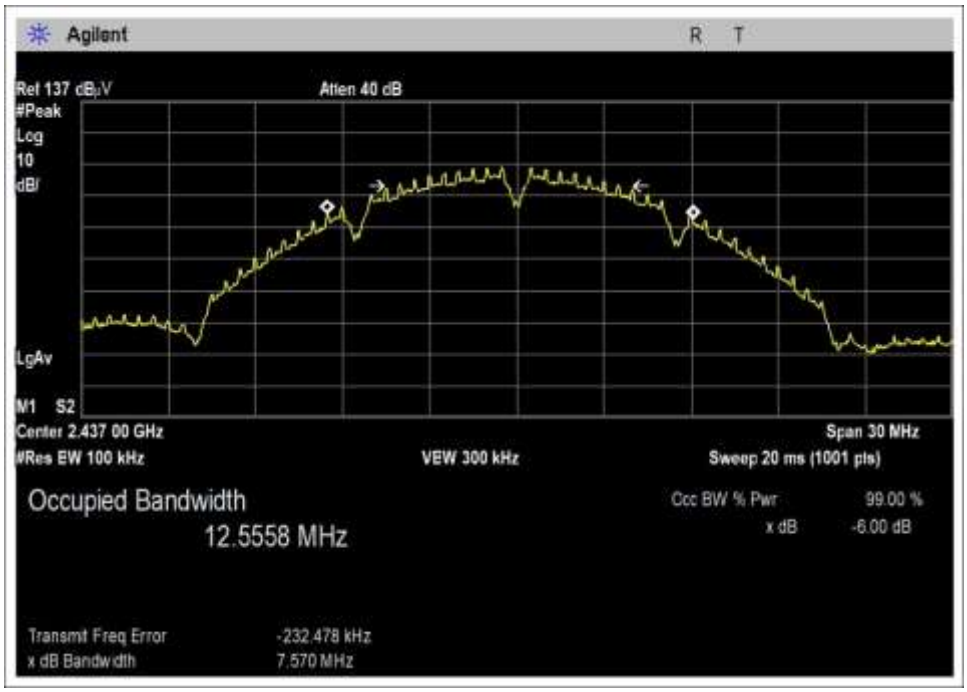
Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
02673	Spectrum Analyzer	Agilent	E4446A	2/22/2019	2/22/2021

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

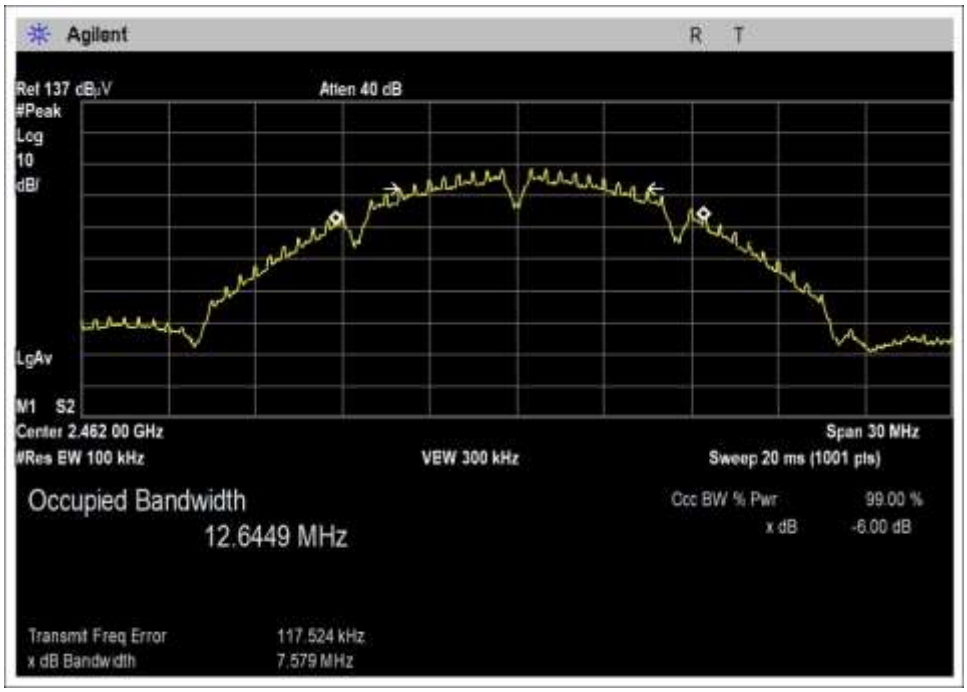
802.11b Plot(s)



OBW Low Channel AP0



OBW Middle Channel AP0



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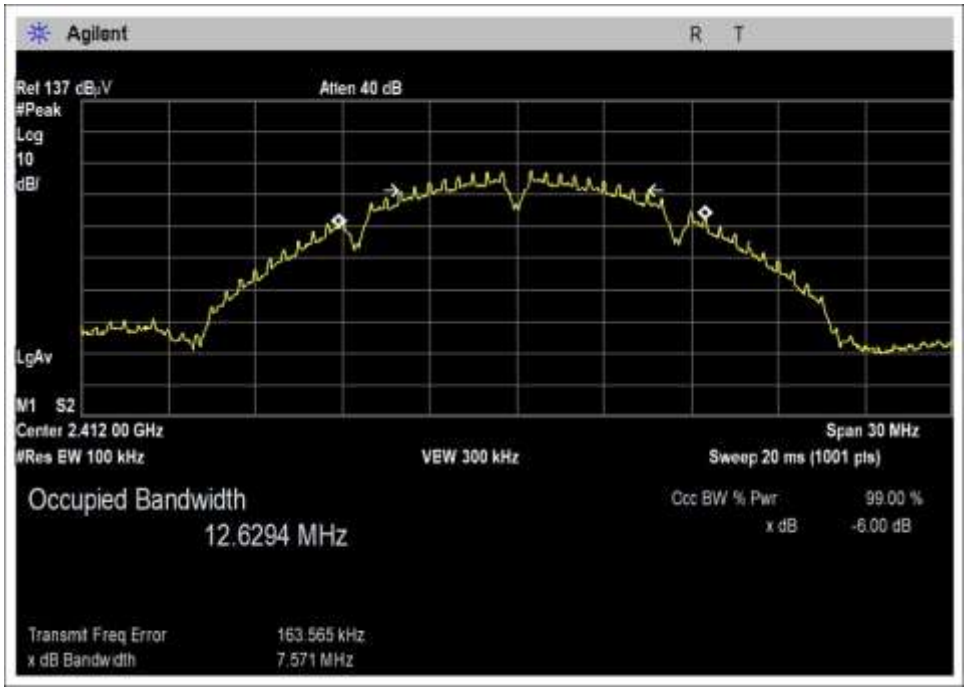

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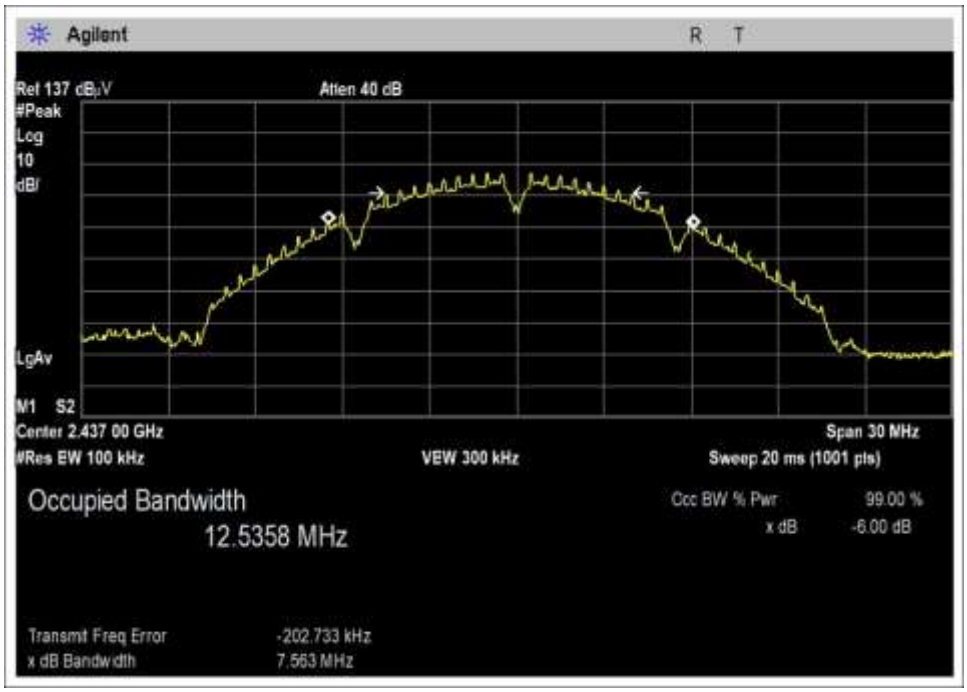

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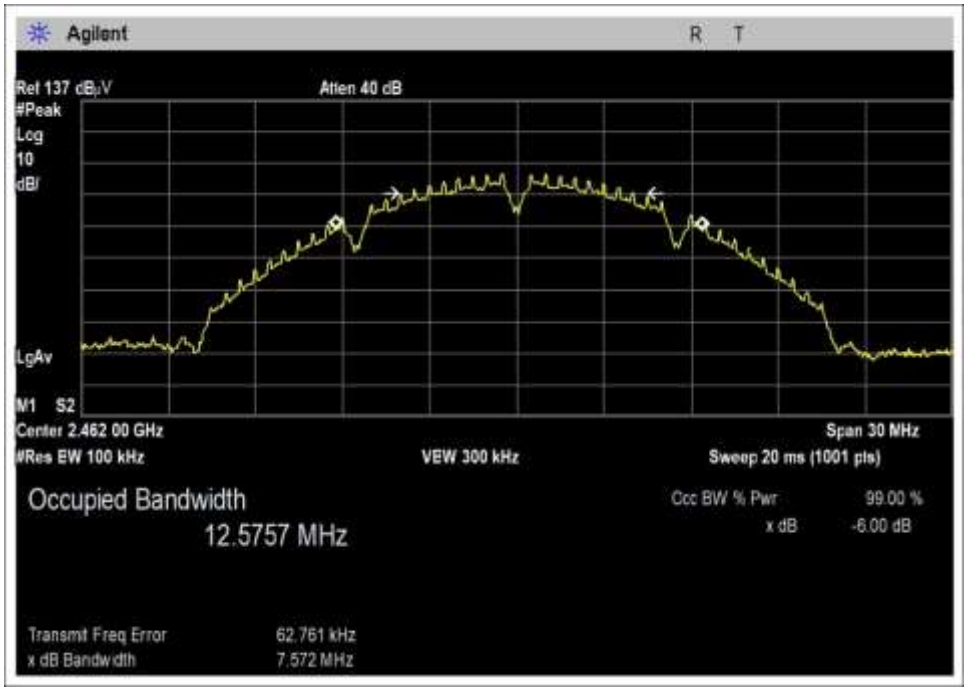
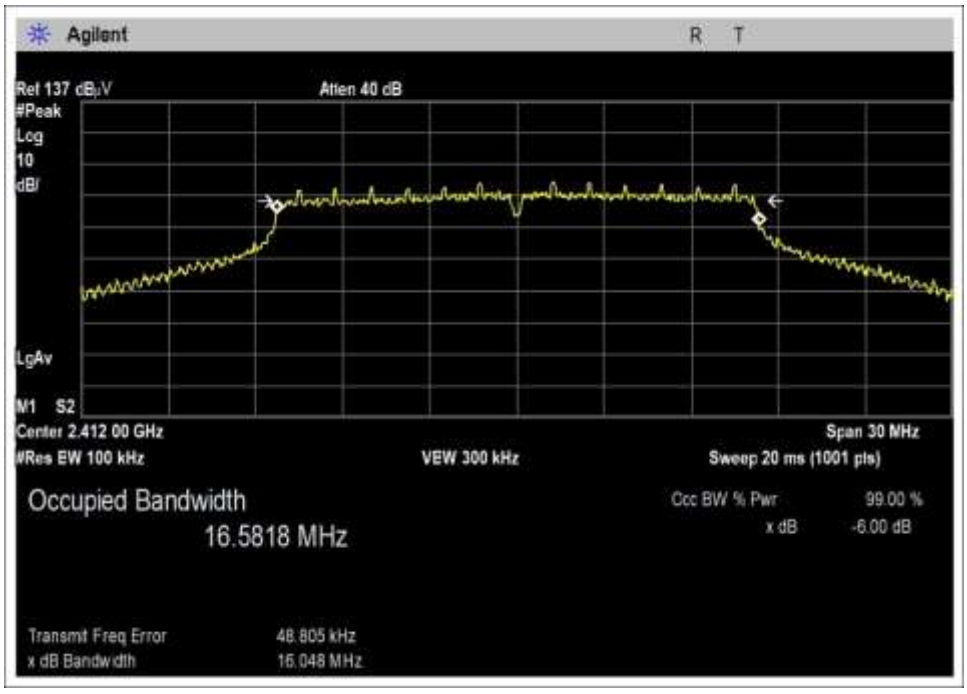


OBW High Channel AP1

802.11g Plot(s)



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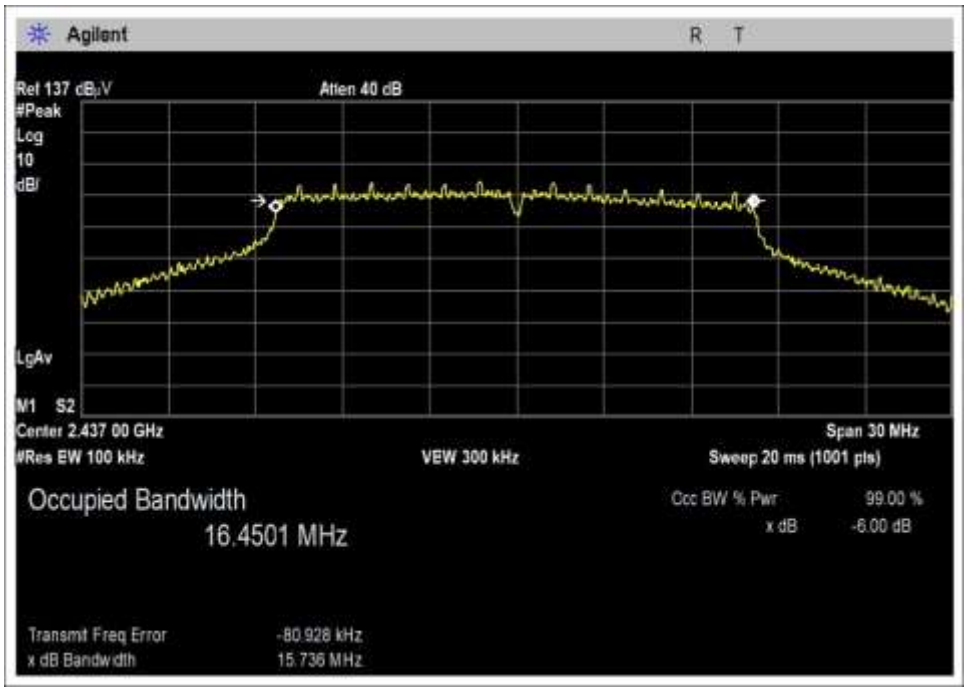

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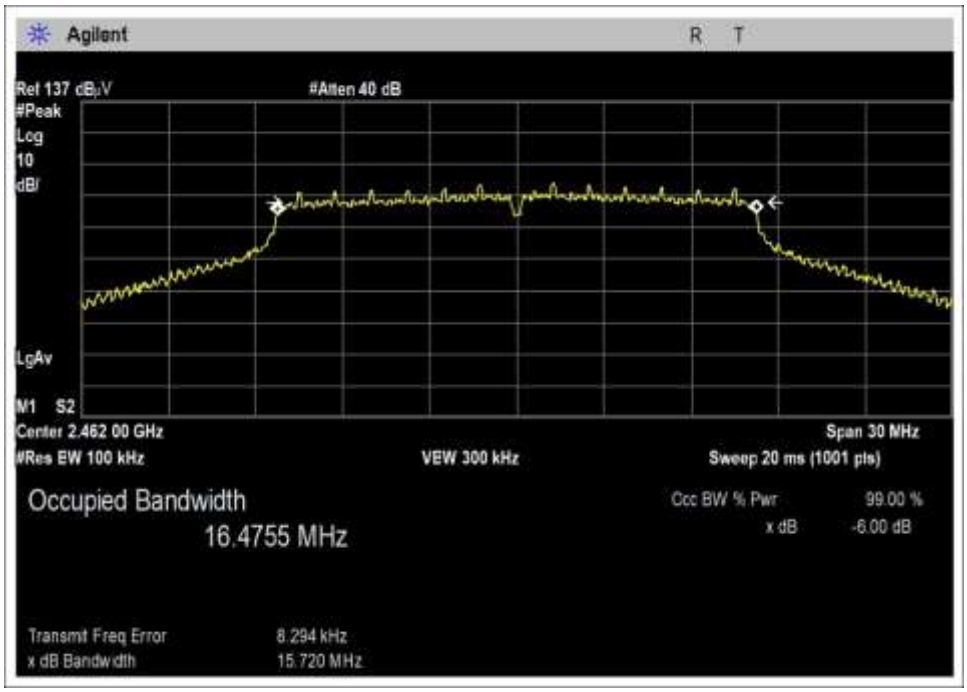

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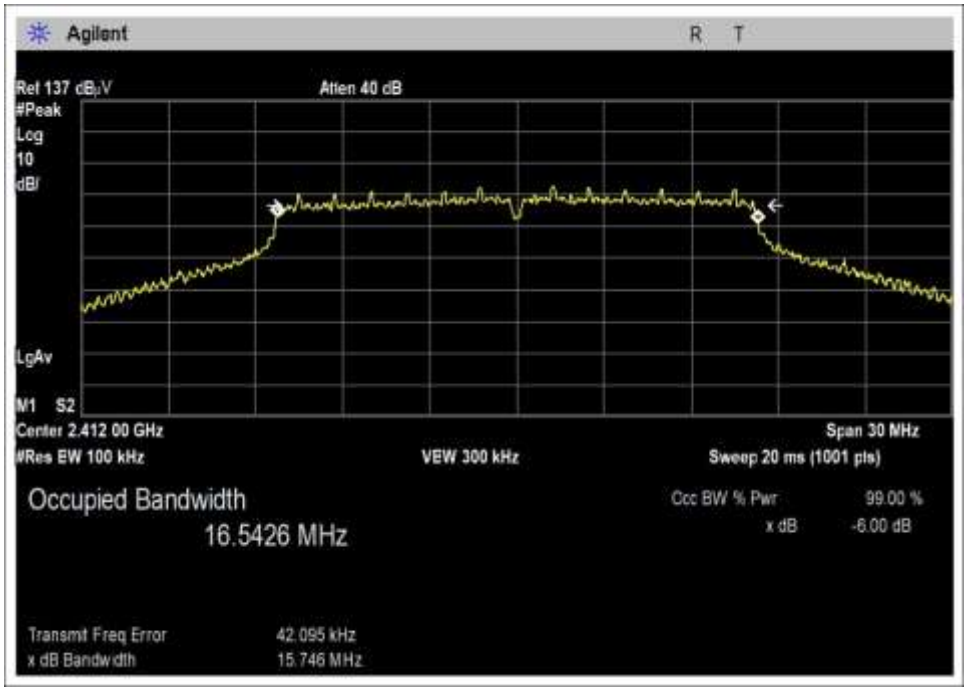

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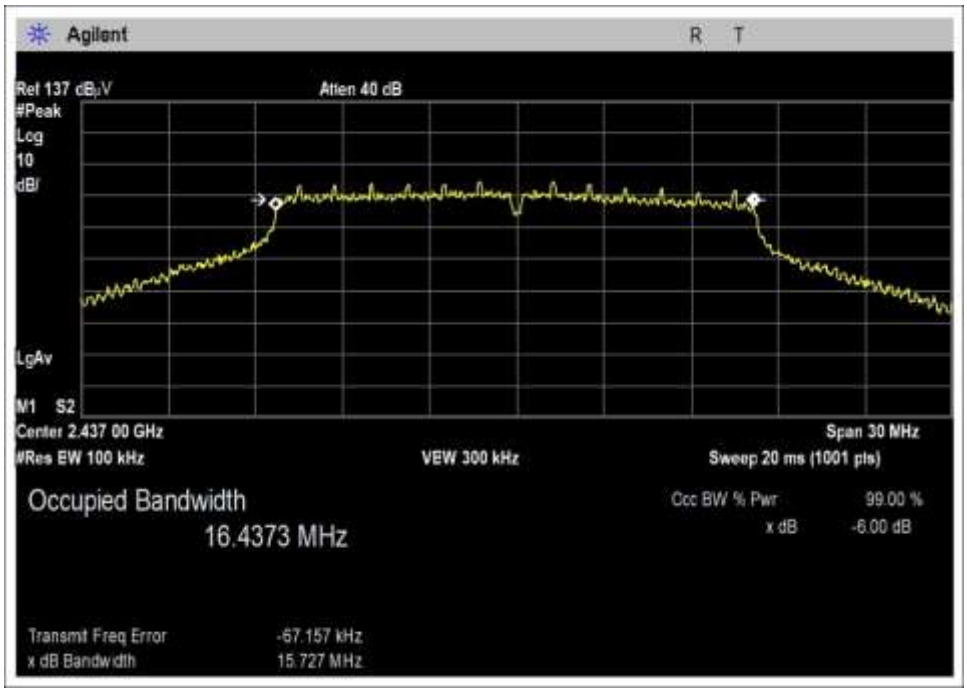

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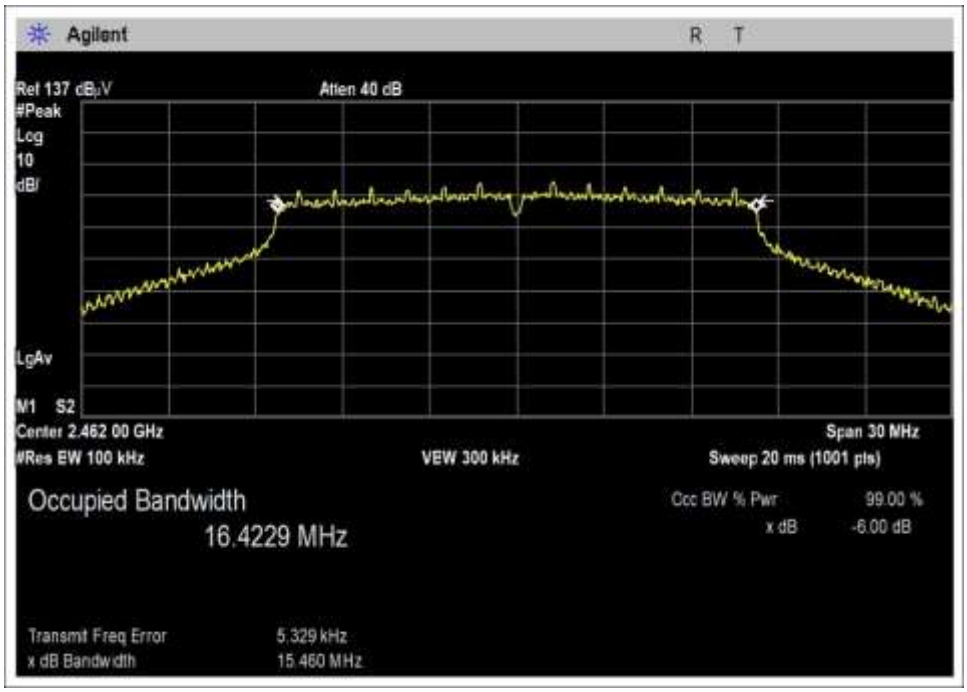
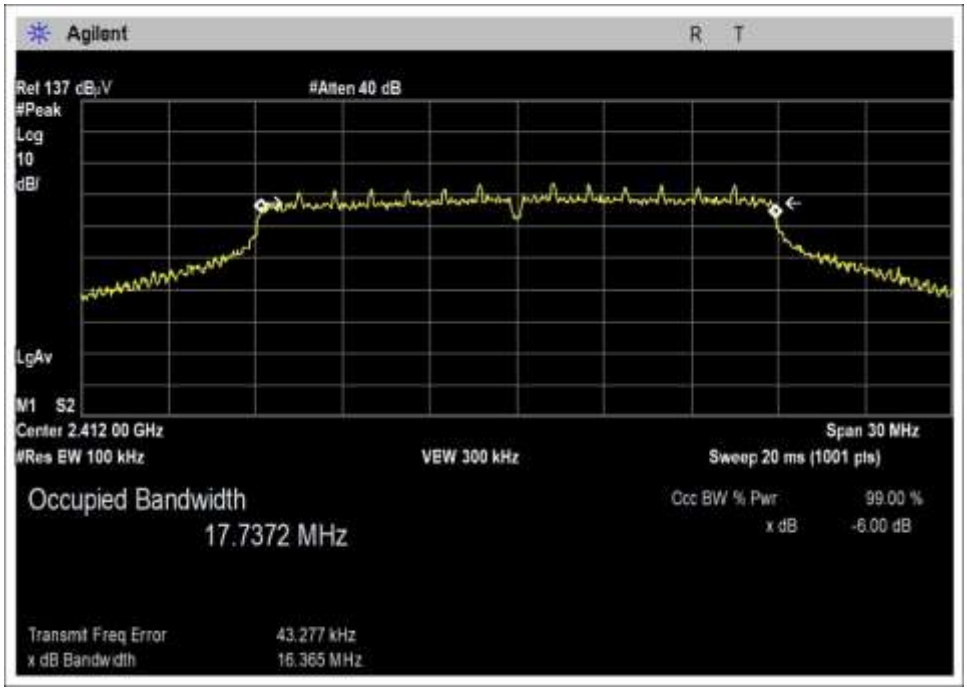
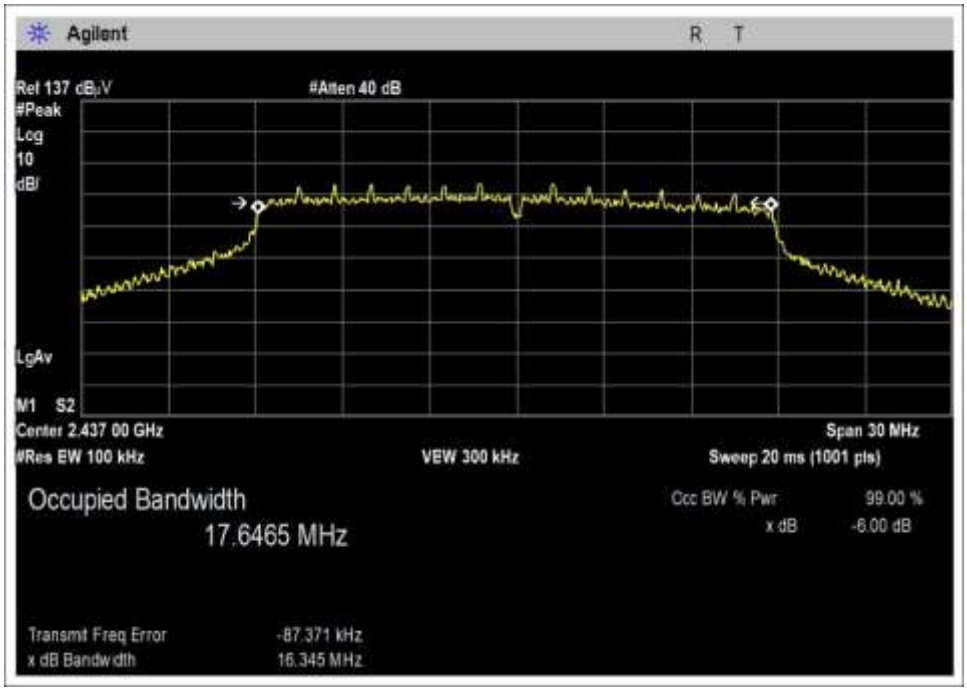


OBW High Channel AP1

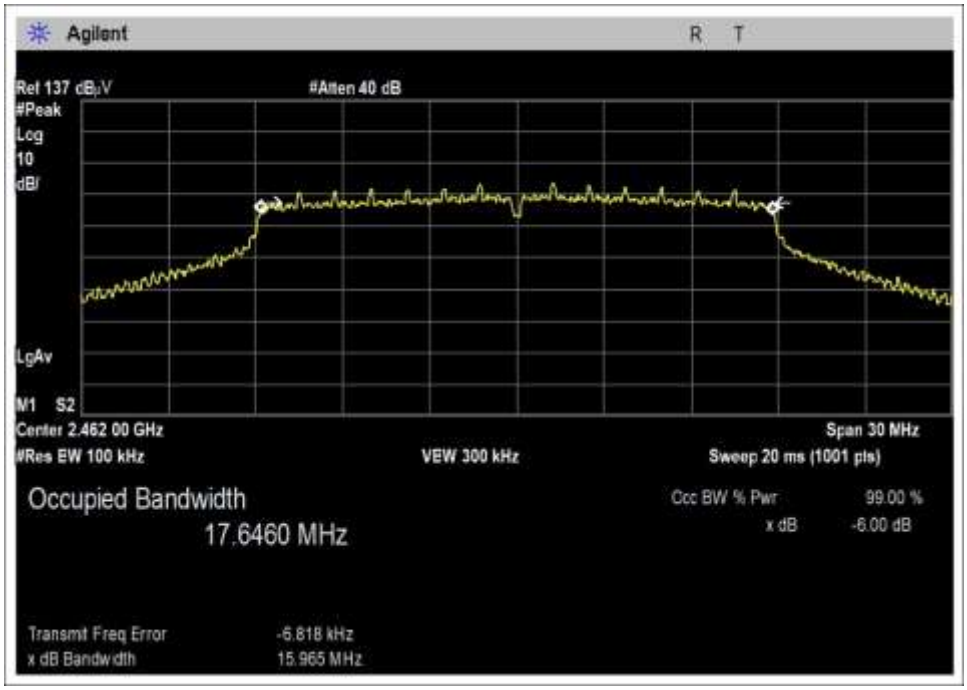
802.11n20 Plot(s)



OBW Low Channel AP0



OBW Middle Channel AP0



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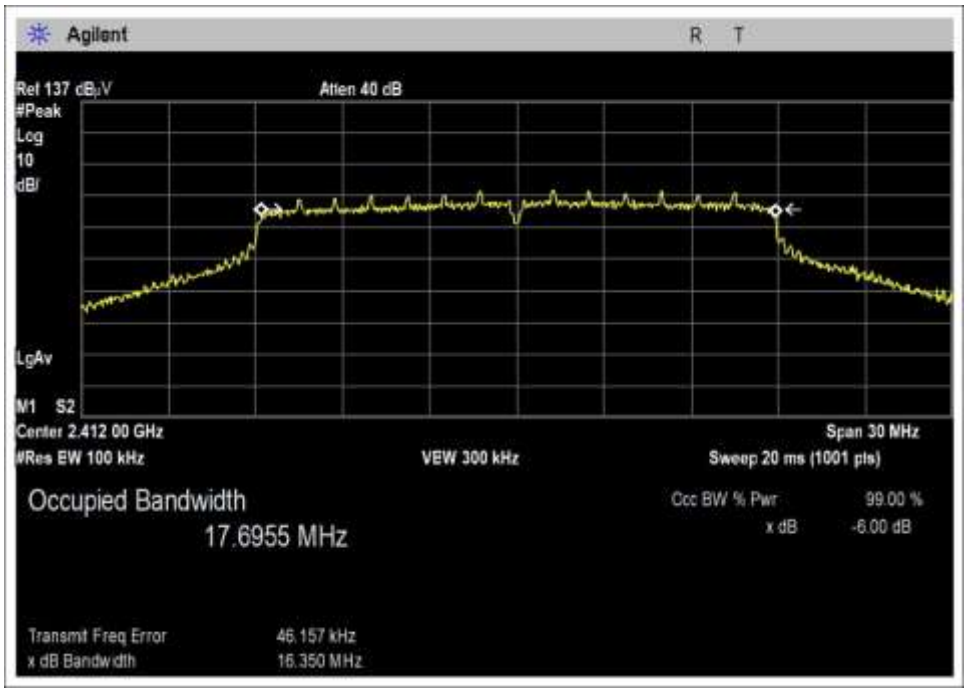

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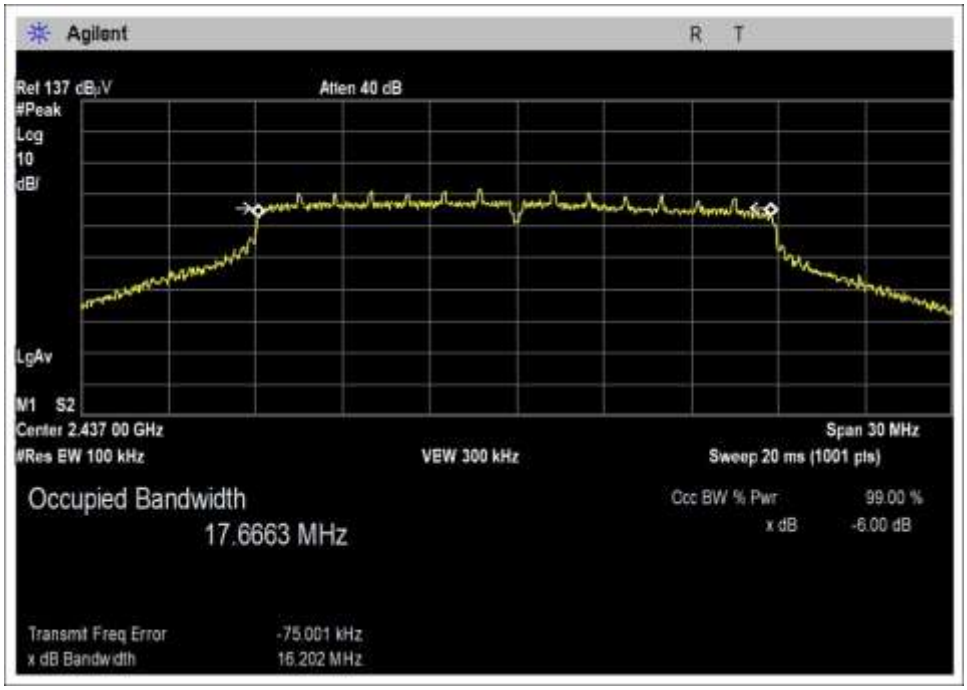

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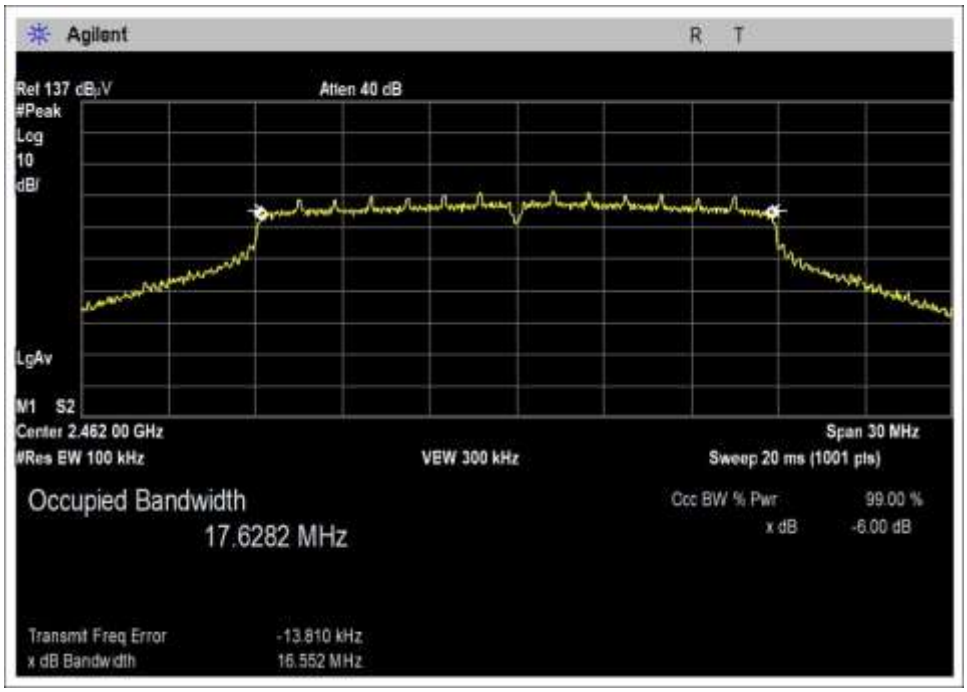
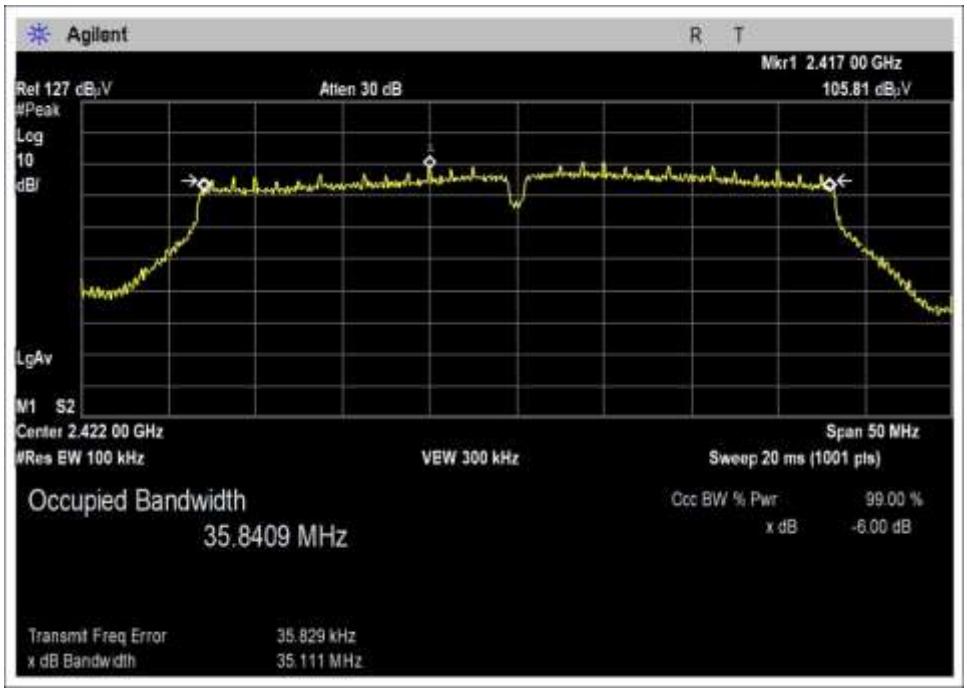


OBW High Channel AP1

802.11n40 Plot(s)



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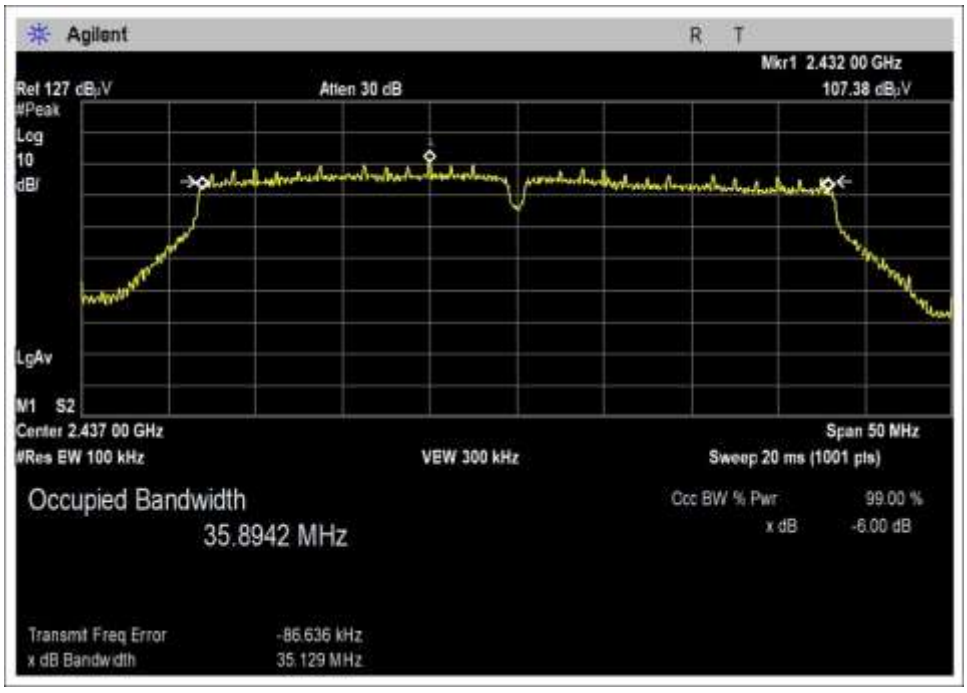
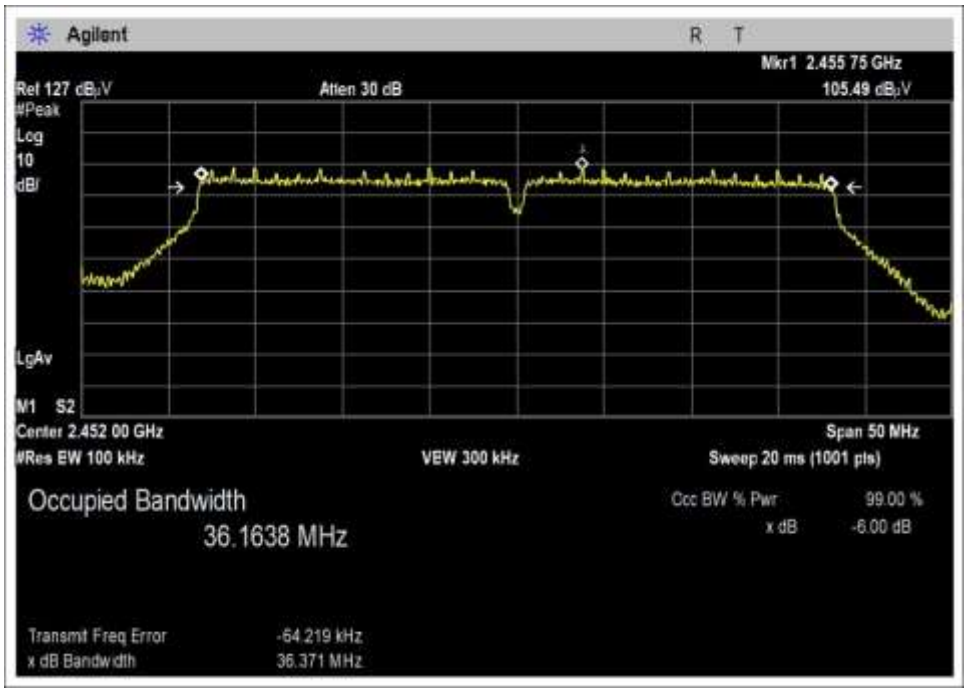
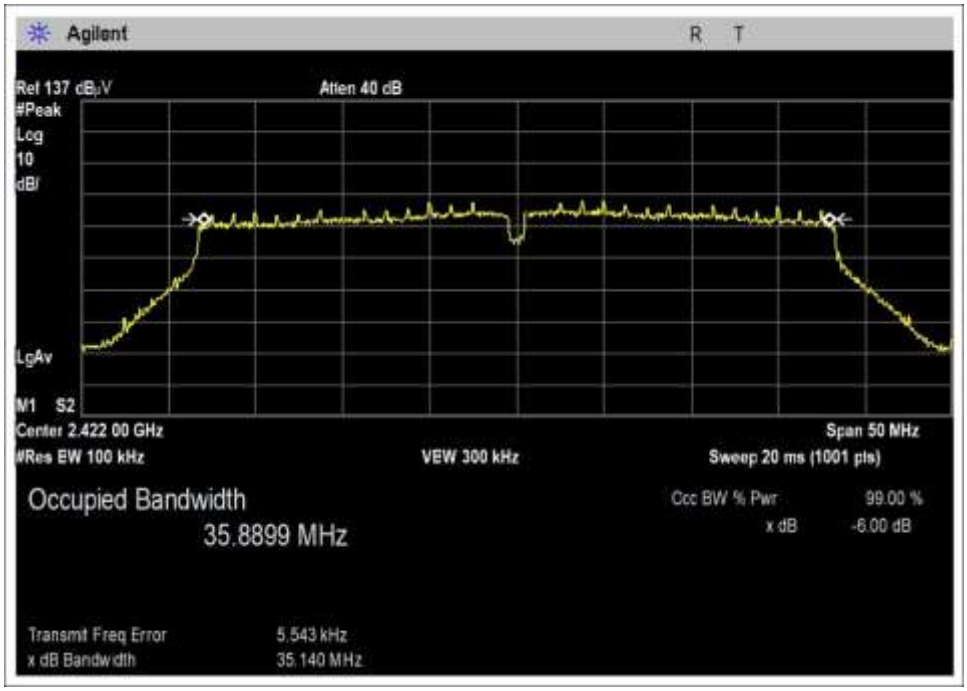


OBW Middle Channel AP0



OBW High Channel AP0



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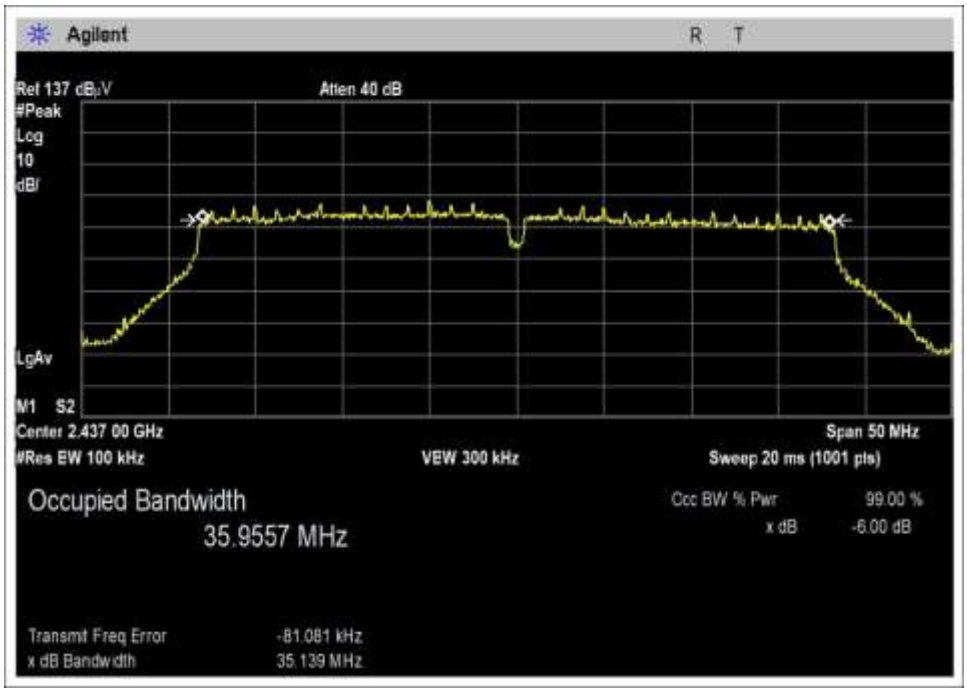
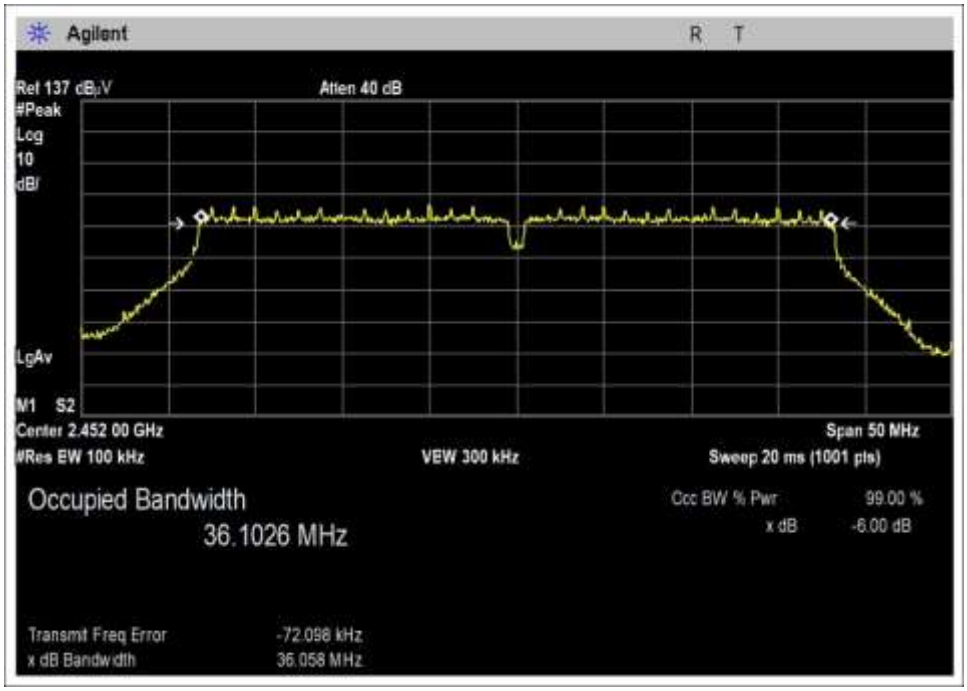


OBW Middle Channel AP1



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) KDB 662911 (v02r01 10/31/2013)	Test Date(s):	3/24/2020
Configuration:	1		
Test Setup:	Duty Cycle: 100% (Test Mode) Test Mode: Continuously transmitting Test Setup: The EUT is transmitting through the antenna port connector and is attached to the spectrum analyzer. 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.

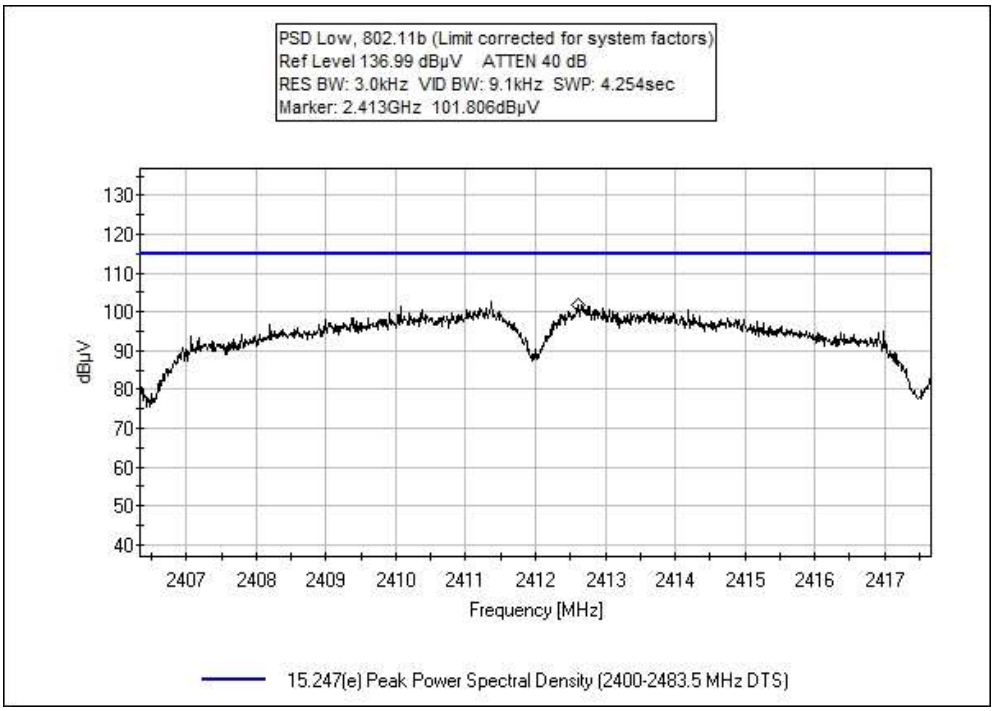
Test Setup Photo(s)

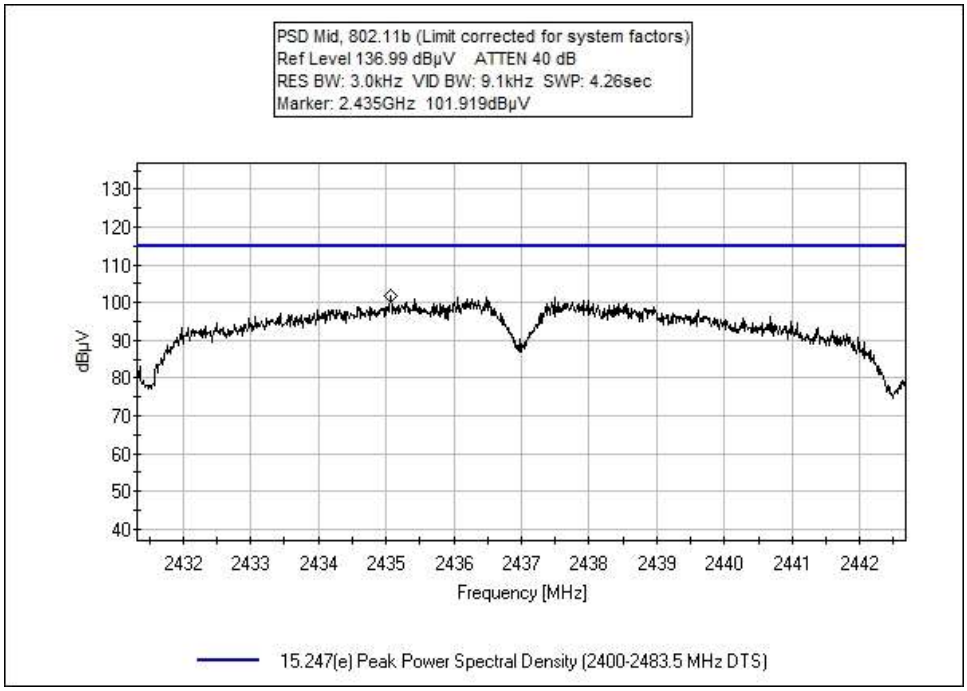
15.247(e) Power Spectral Density

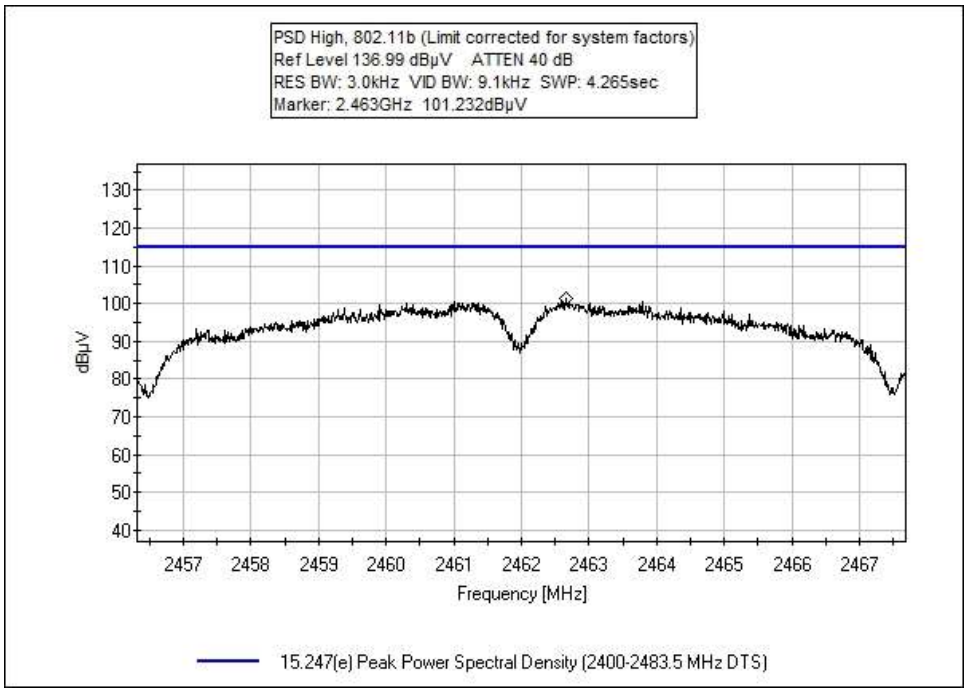
Test Data Summary - RF Conducted Measurement				
Measurement Method: PKPSD * Per 11.10.2 Method PKPSD (peak PSD) of ANSI 63.10(2013), Peak PSD method is optional if the maximum conducted (average) output power was used to determine compliance. Measured Peak PSD is below the Limit. Peak PSD should be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

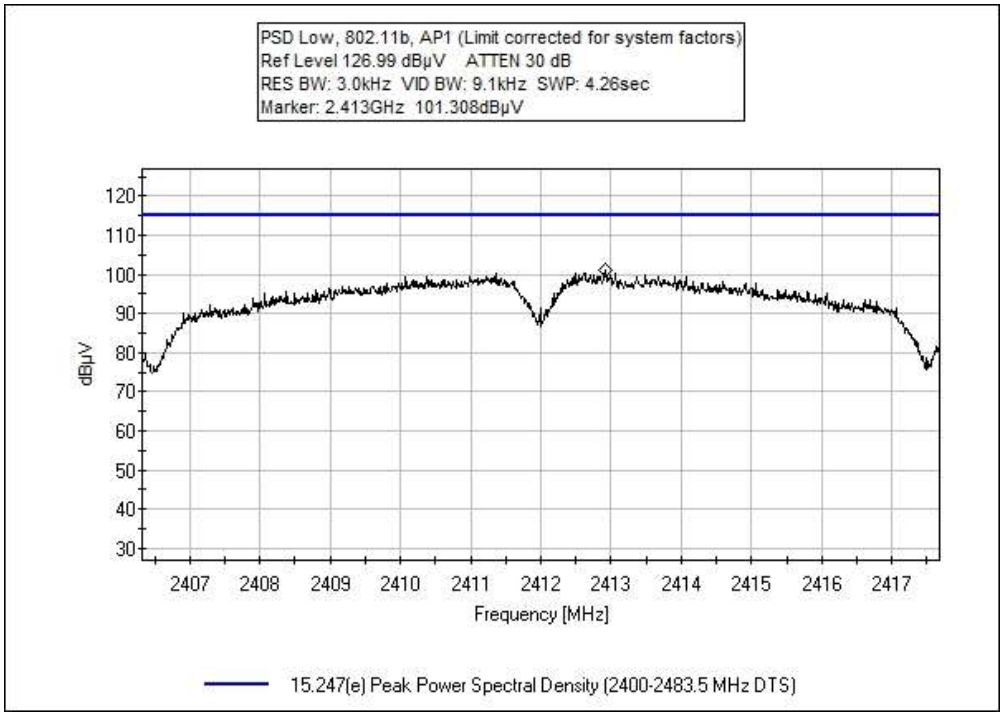
Test Data Summary - RF Conducted Measurement					
Measurement Method: PKPSD 802.11n is and MIMO Summed using KDB662911 (E)(2)(b) * Per 11.10.2 Method PKPSD (peak PSD) of ANSI 63.10(2013), Peak PSD method is optional if the maximum conducted (average) output power was used to determine compliance. Measured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

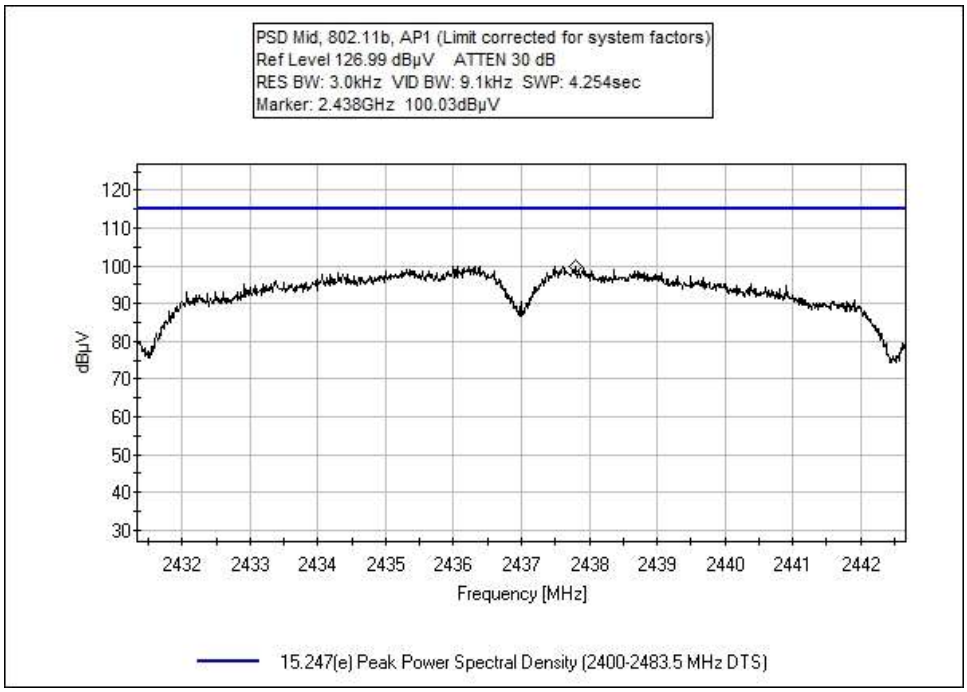
802.11b Plots

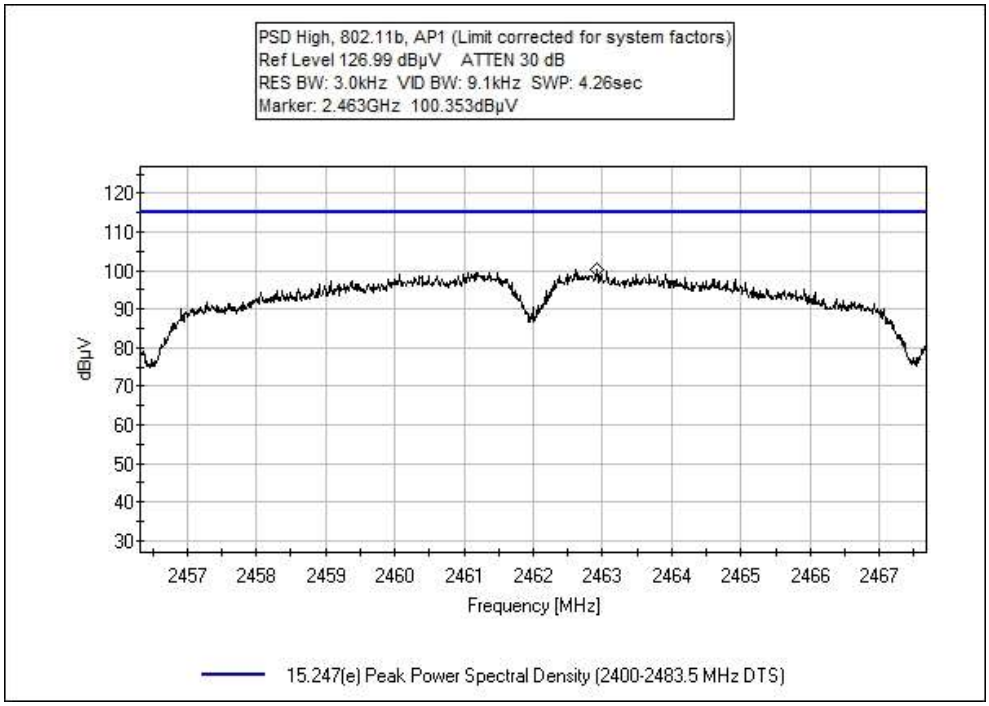




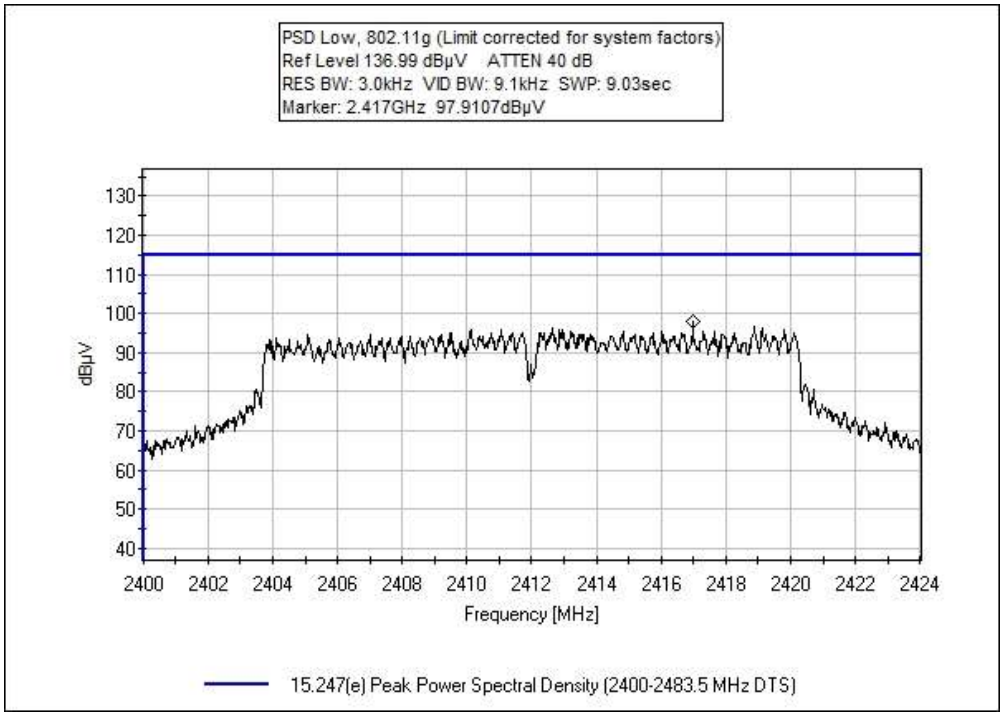

PSD High, 802.11b (Limit corrected for system factors)
Ref Level 136.99 dBµV ATTEN 40 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 4.265sec
Marker: 2.463GHz 101.232dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
2457
2458
2459
2460
2461
2462
2463
2464
2465
2466
2467
Frequency [MHz]
15.247(e) Peak Power Spectral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

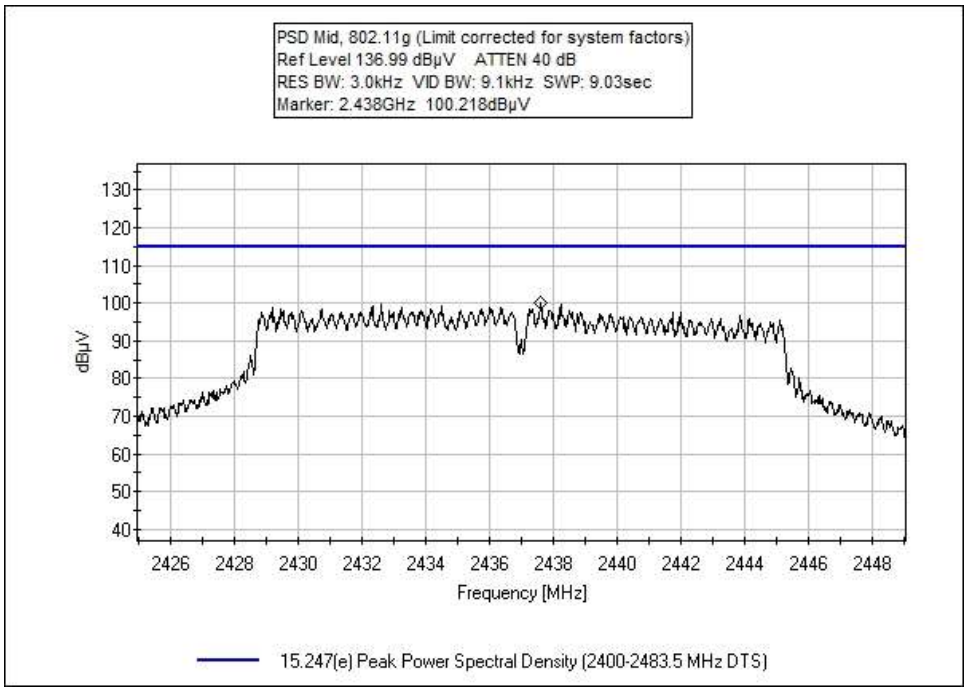

PSD Low, 802.11b, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 4.26sec
Marker: 2.413GHz 101.308dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2407
2408
2409
2410
2411
2412
2413
2414
2415
2416
2417
Frequency [MHz]
15.247(e) Peak Power Spectral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

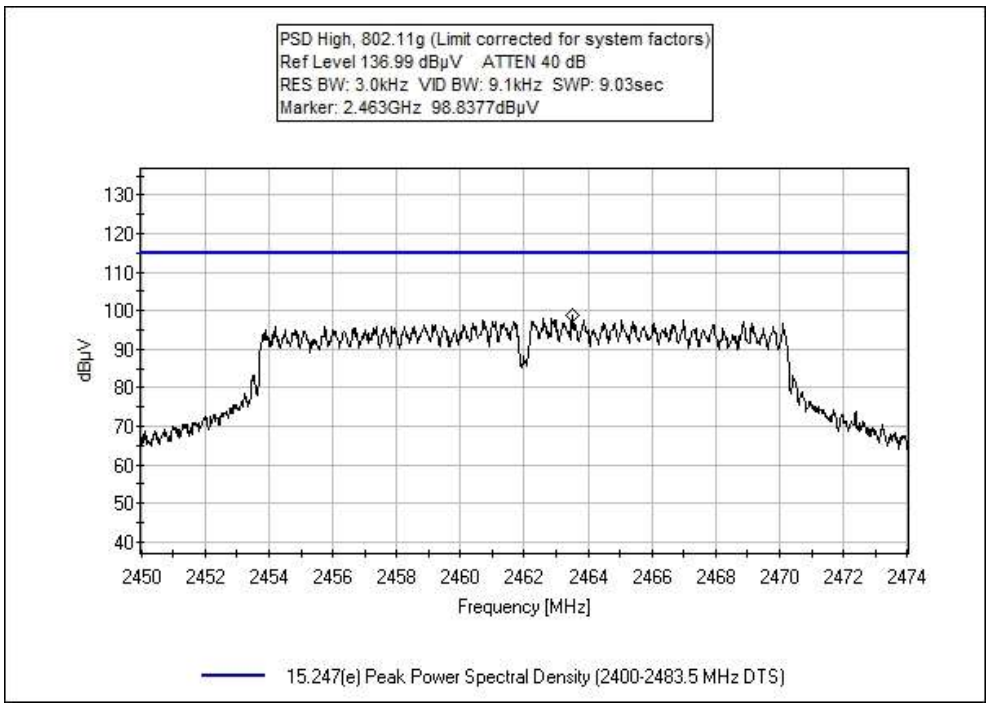

PSD Mid, 802.11b, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 4.254sec
Marker: 2.438GHz 100.03dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2432
2433
2434
2435
2436
2437
2438
2439
2440
2441
2442
Frequency [MHz]
15.247(e) Peak Power Spectral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

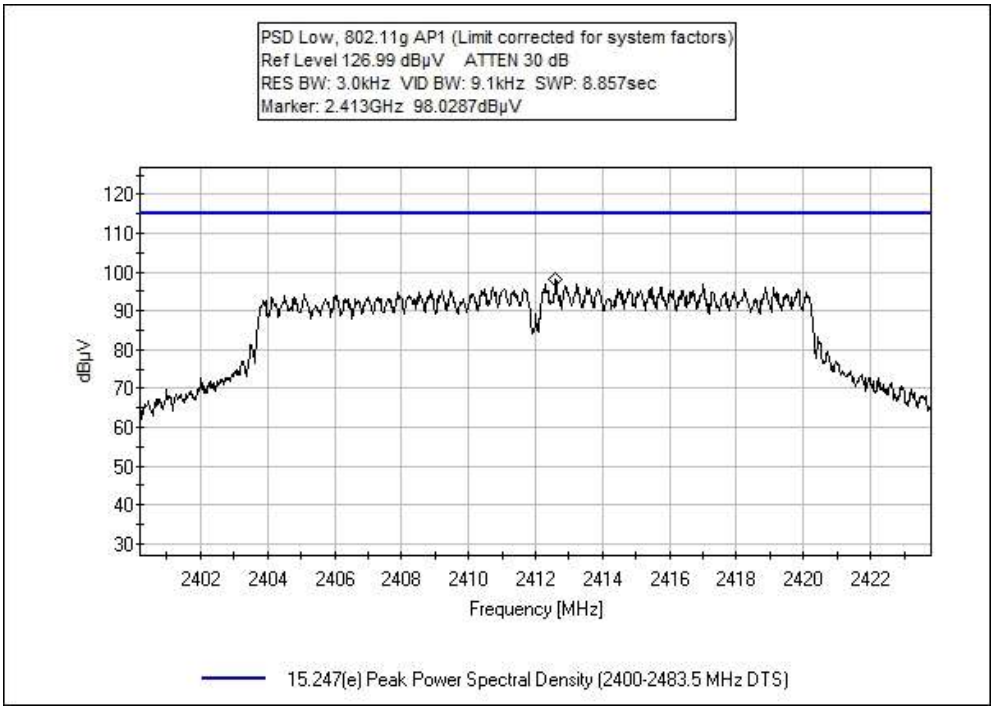

PSD High, 802.11b, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 4.26sec
Marker: 2.463GHz 100.353dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2457
2458
2459
2460
2461
2462
2463
2464
2465
2466
2467
Frequency [MHz]
15.247(e) Peak Power Spectral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

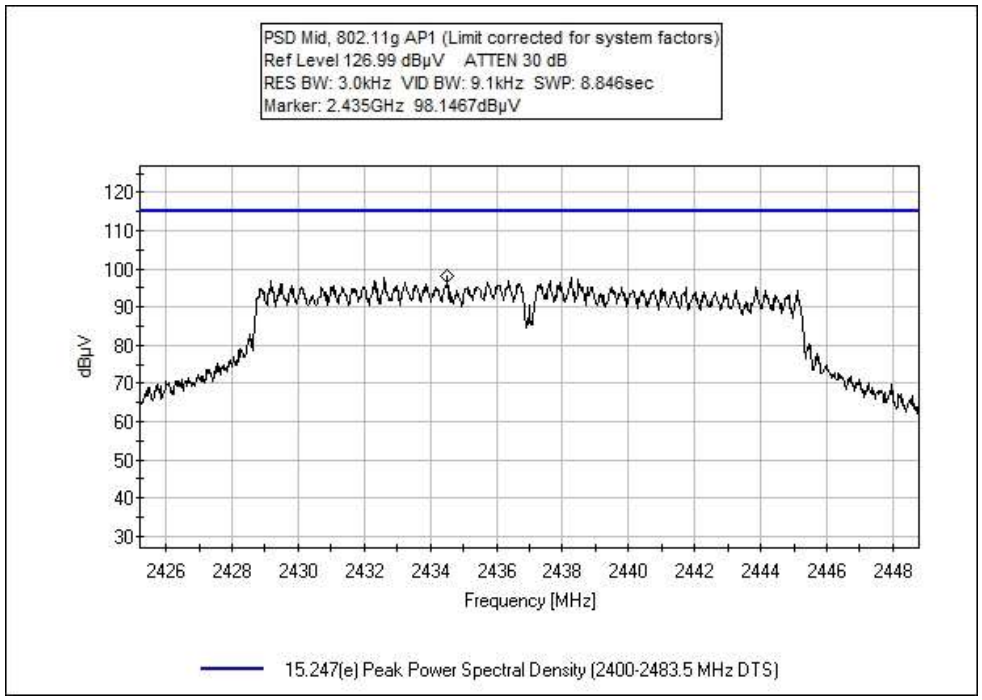
802.11g Plots

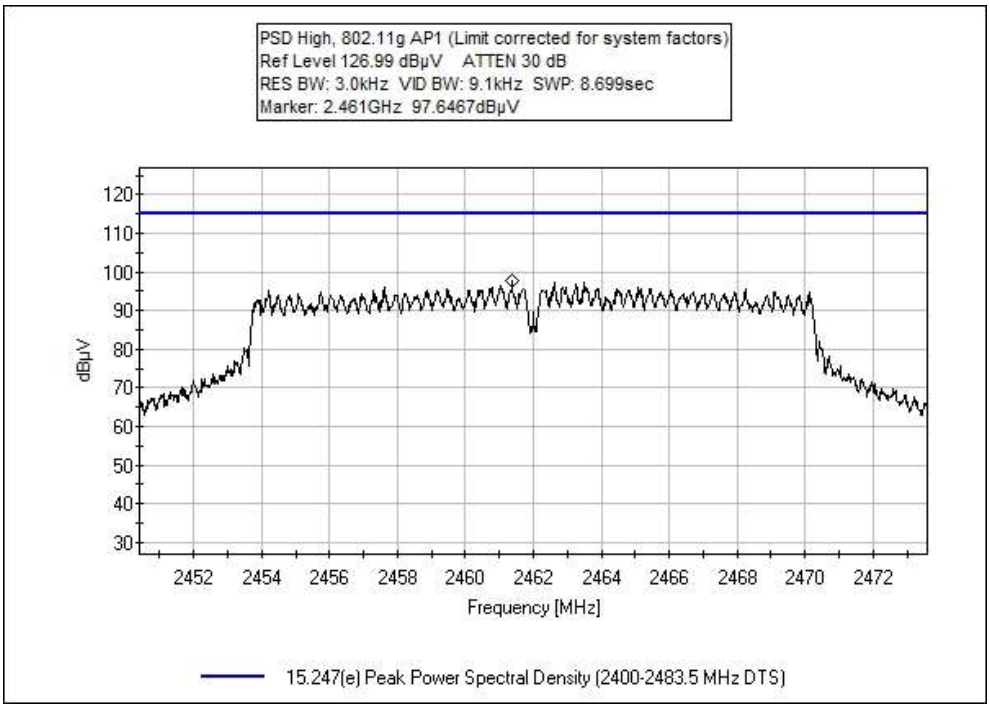




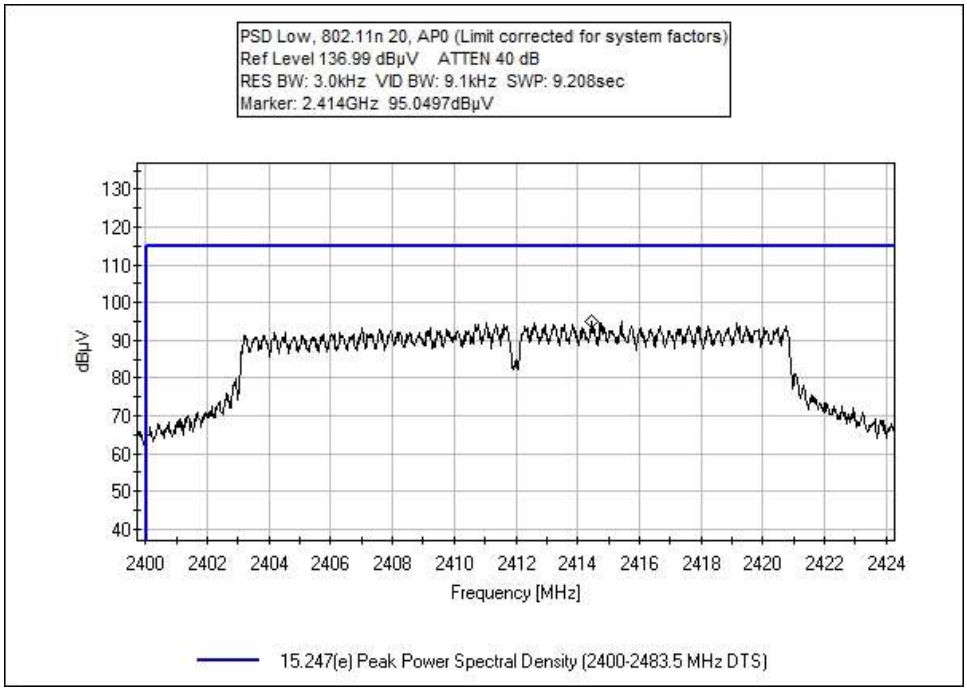

PSD High, 802.11g (Limit corrected for system factors)
Ref Level 136.99 dBµV ATTEN 40 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 9.03sec
Marker: 2.463GHz 98.8377dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
2450 2452 2454 2456 2458 2460 2462 2464 2466 2468 2470 2472 2474
Frequency [MHz]
15.247(e) Peak Power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

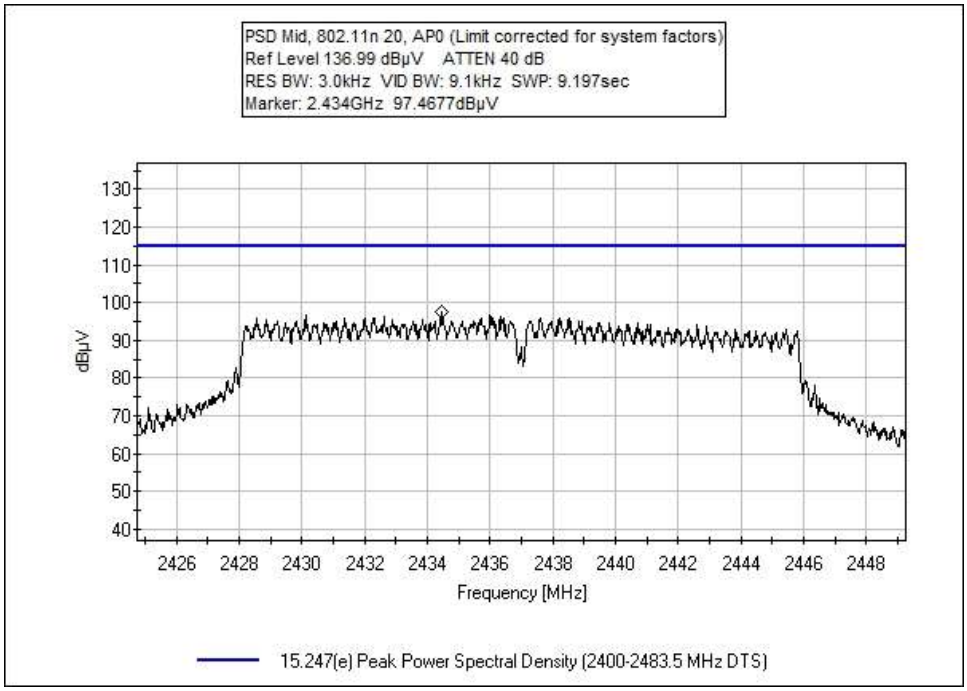

PSD Low, 802.11g AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 8.857sec
Marker: 2.413GHz 98.0287dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2402 2404 2406 2408 2410 2412 2414 2416 2418 2420 2422
Frequency [MHz]
15.247(e) Peak Power Spectral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

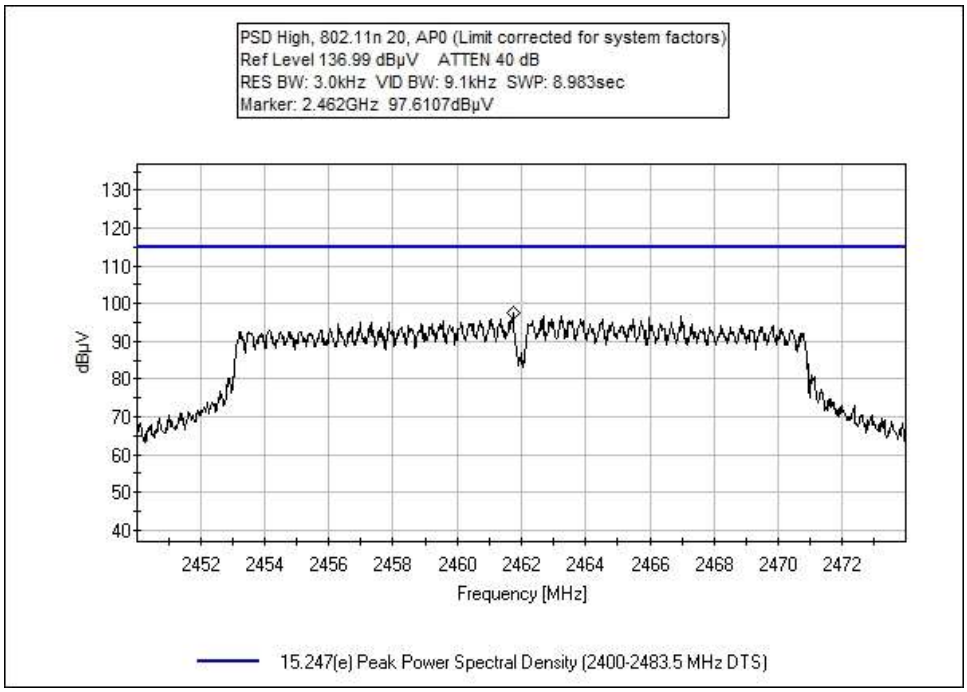

PSD Mid, 802.11g AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 8.846sec
Marker: 2.435GHz 98.1467dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2426 2428 2430 2432 2434 2436 2438 2440 2442 2444 2446 2448
Frequency [MHz]
15.247(e) Peak Power Spectral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

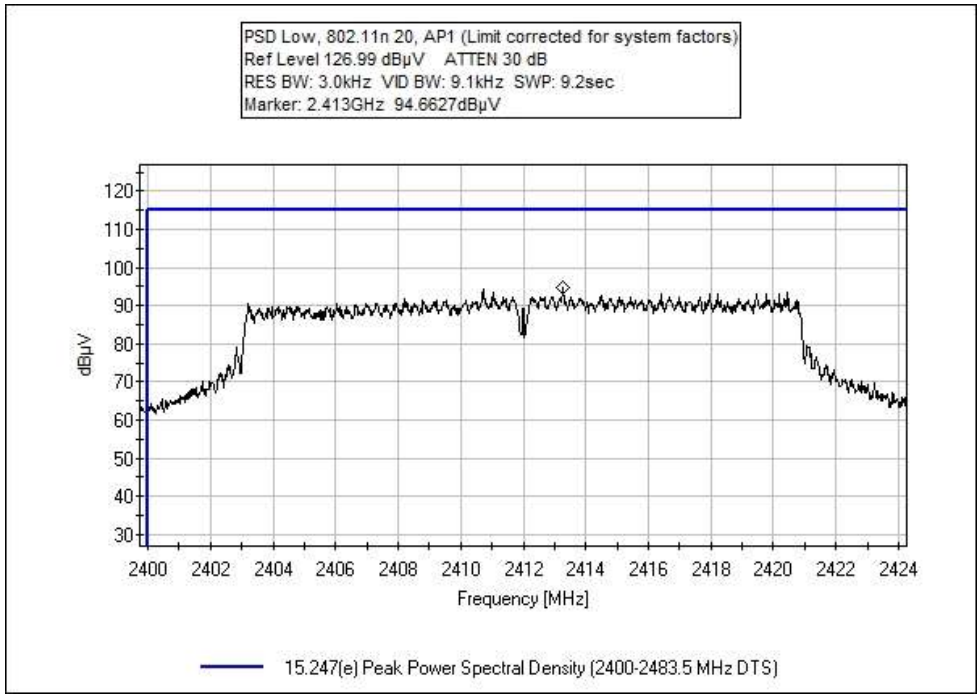

PSD High, 802.11g AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 8.699sec
Marker: 2.461GHz 97.6467dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2452 2454 2456 2458 2460 2462 2464 2466 2468 2470 2472
Frequency [MHz]
15.247(e) Peak Power Spectral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

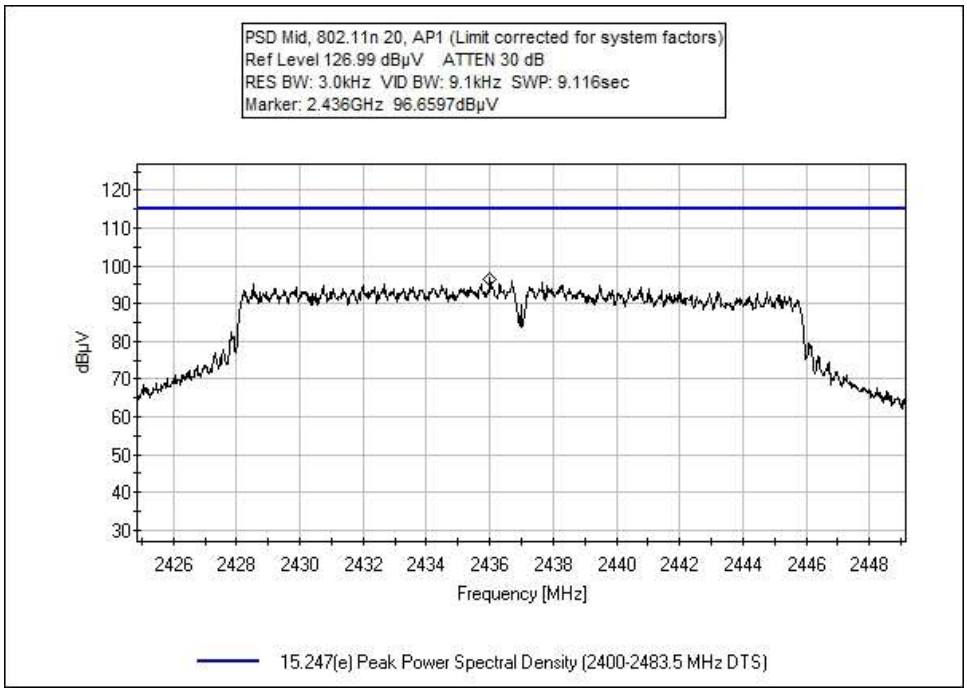
802.11n20 Plots

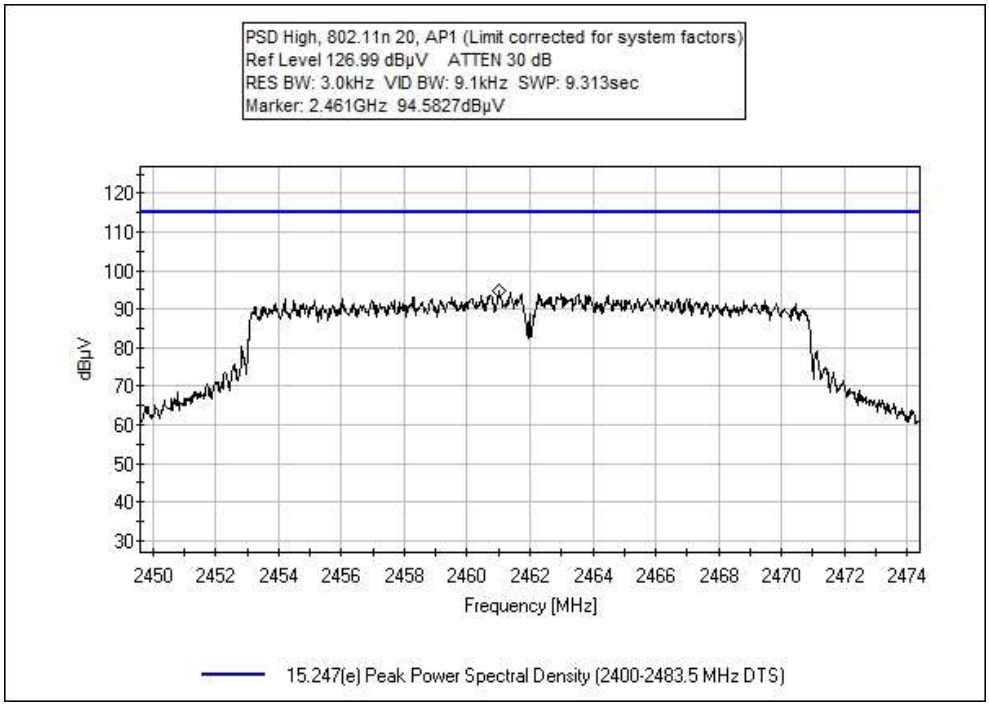




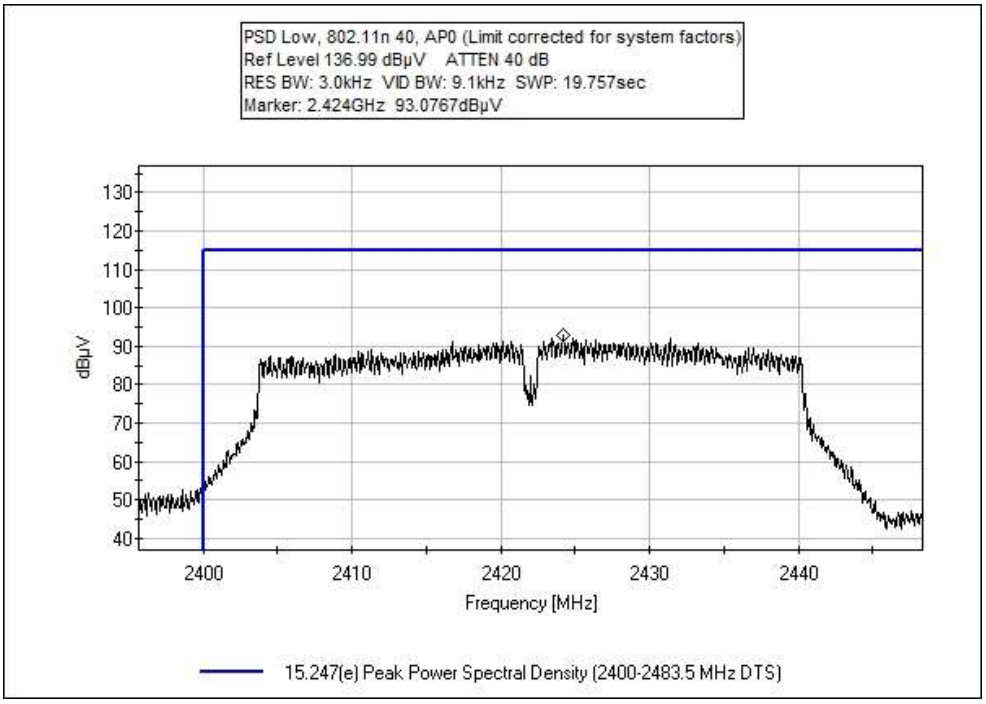

PSD High, 802.11n 20, AP0 (Limit corrected for system factors)
Ref Level 136.99 dBµV ATTEN 40 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 8.983sec
Marker: 2.462GHz 97.6107dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
2452 2454 2456 2458 2460 2462 2464 2466 2468 2470 2472
Frequency [MHz]
15.247(e) Peak Power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

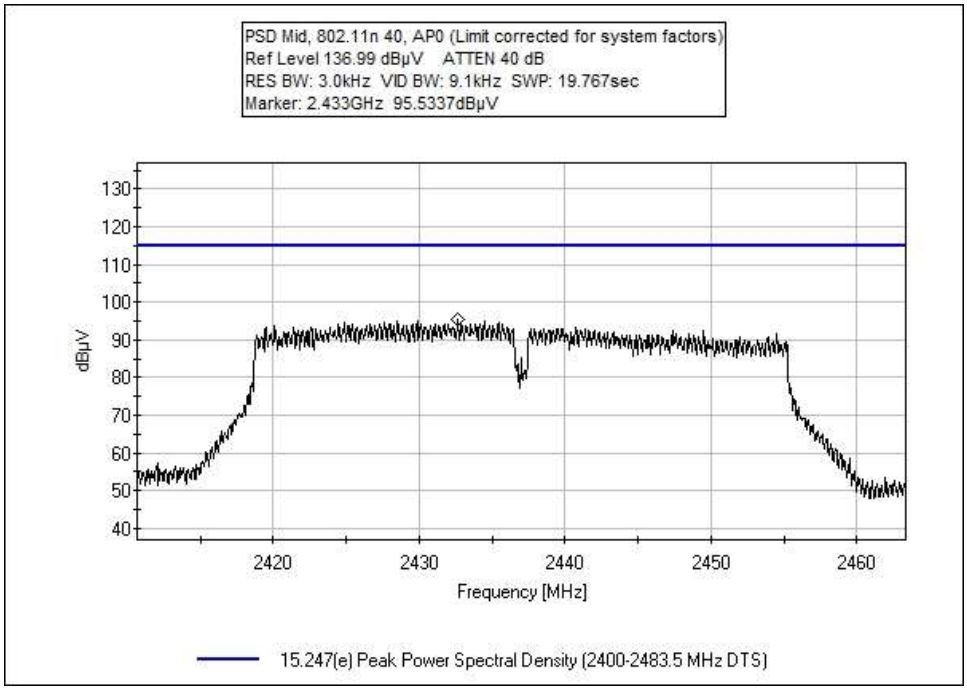

PSD Low, 802.11n 20, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 9.2sec
Marker: 2.413GHz 94.6627dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2400 2402 2404 2406 2408 2410 2412 2414 2416 2418 2420 2422 2424
Frequency [MHz]
15.247(e) Peak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

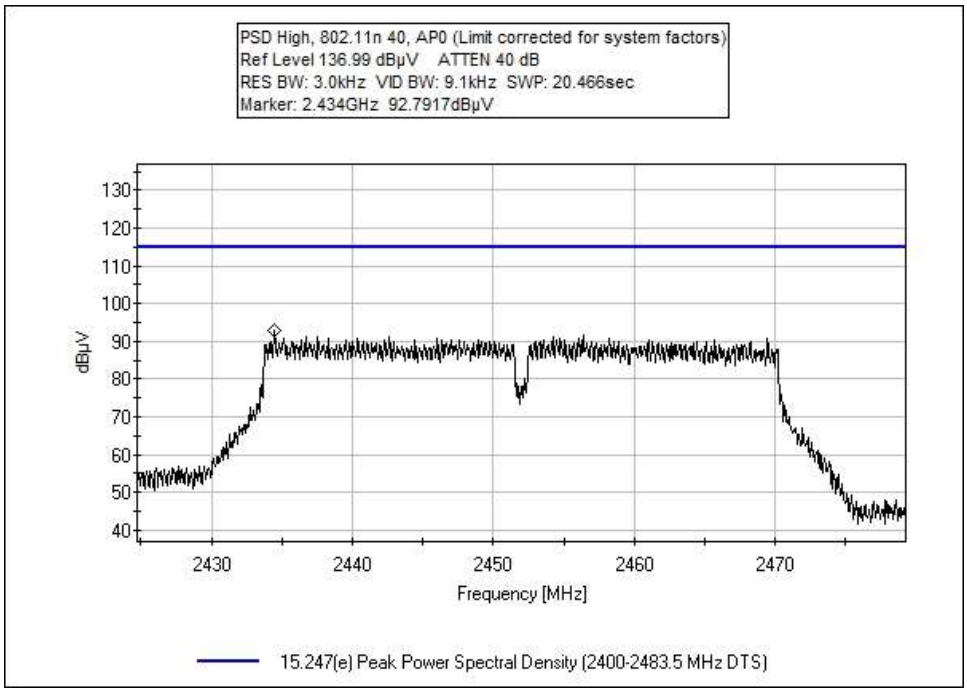

PSD Mid, 802.11n 20, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 9.116sec
Marker: 2.436GHz 96.6597dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2426 2428 2430 2432 2434 2436 2438 2440 2442 2444 2446 2448
Frequency [MHz]
15.247(e) Peak Power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

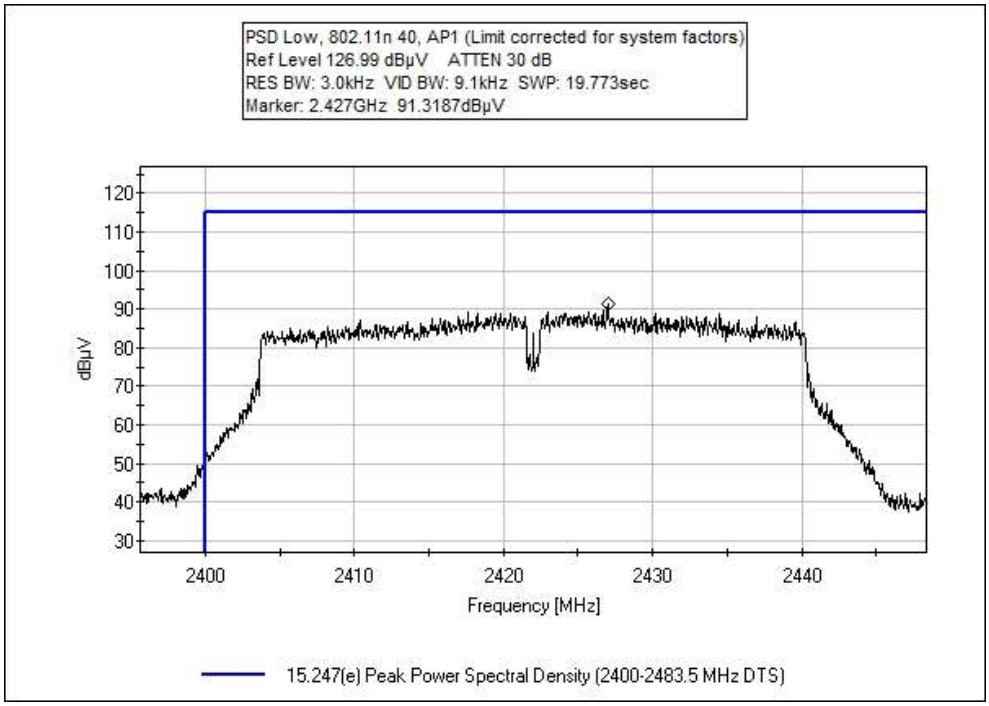

PSD High, 802.11n 20, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 9.313sec
Marker: 2.461GHz 94.5827dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2450 2452 2454 2456 2458 2460 2462 2464 2466 2468 2470 2472 2474
Frequency [MHz]
15.247(e) Peak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

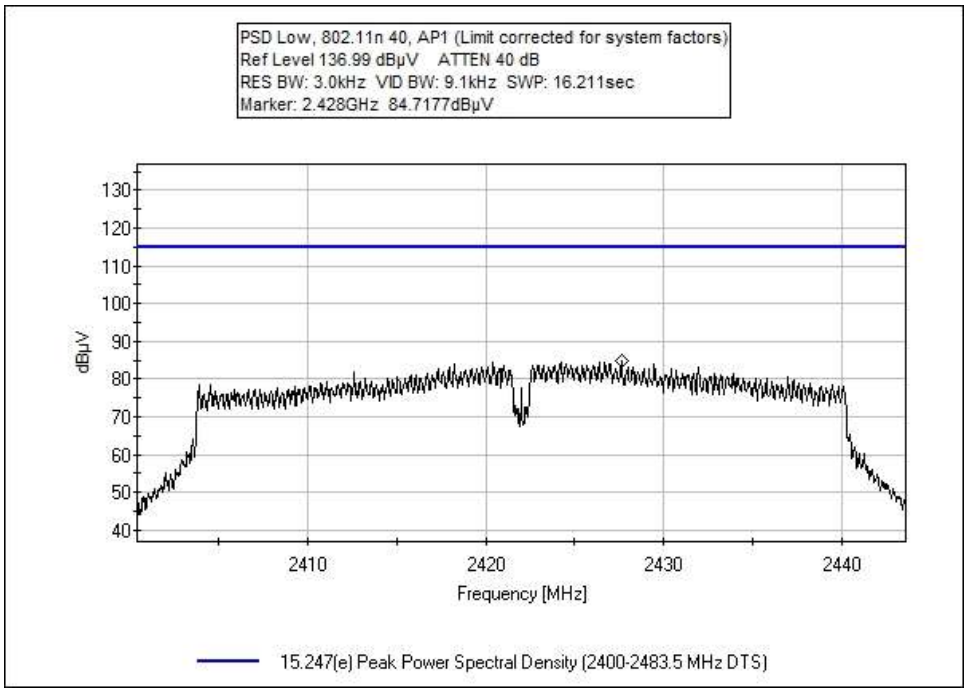
802.11n40 Plots

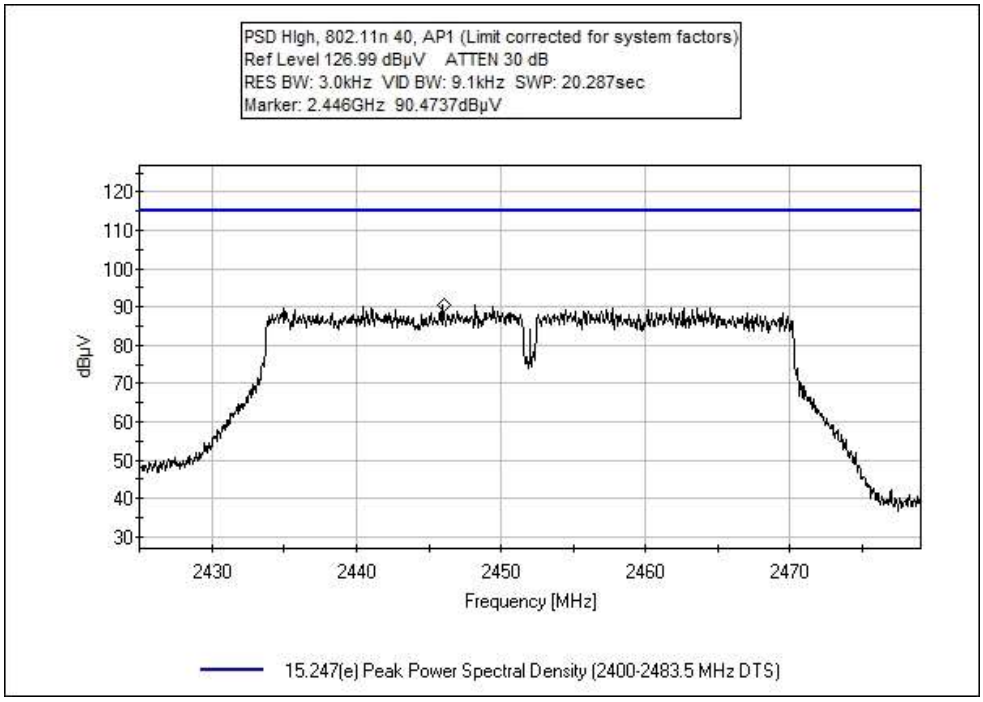





PSD High, 802.11n 40, AP0 (Limit corrected for system factors)
Ref Level 136.99 dBµV ATTEN 40 dB
RES BW: 3.0kHz VID BW: 9.1kHz SWP: 20.466sec
Marker: 2.434GHz 92.7917dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
2430
2440
2450
2460
2470
Frequency [MHz]
15.247(e) Peak Power Spectral Density (2400-2483.5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

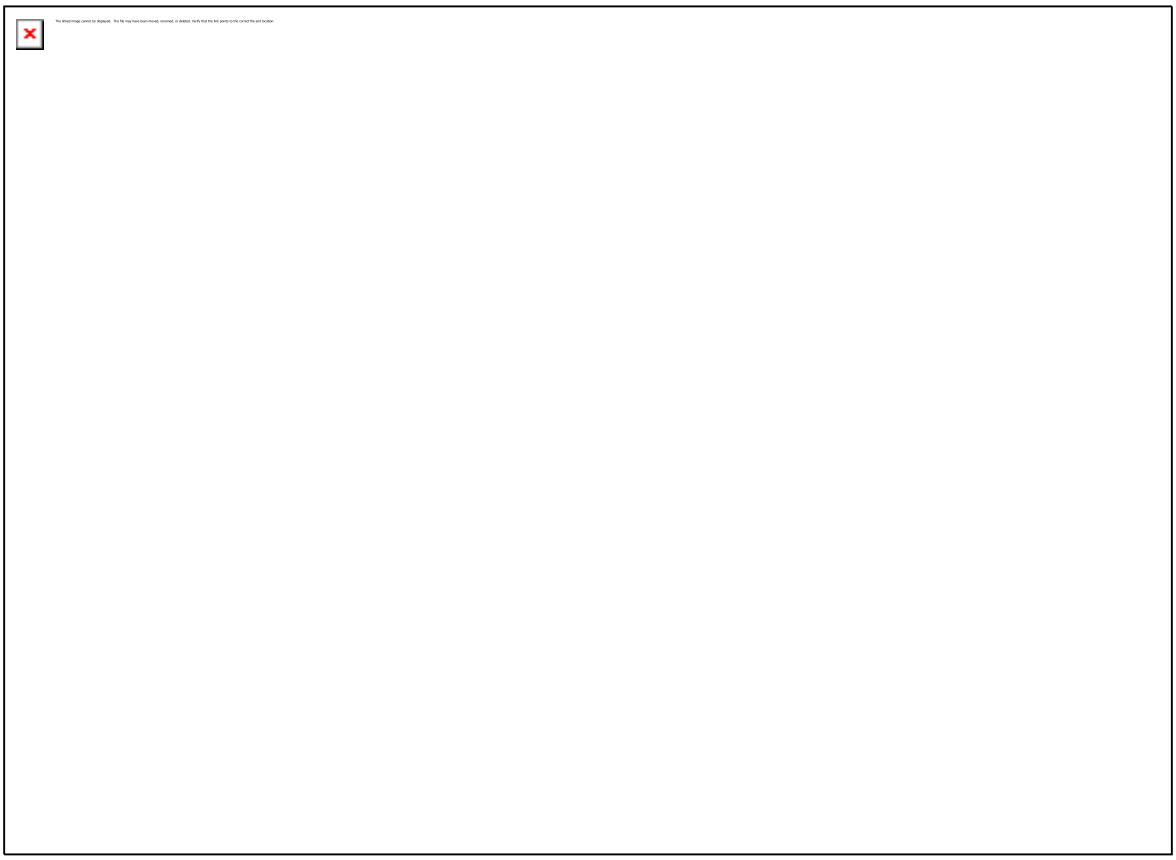
Frequency Range: 2400-2483.5 MHz
Frequency tested: 2412, 2437, 2462
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: 802.11b, 1mbps (worst-case)

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)

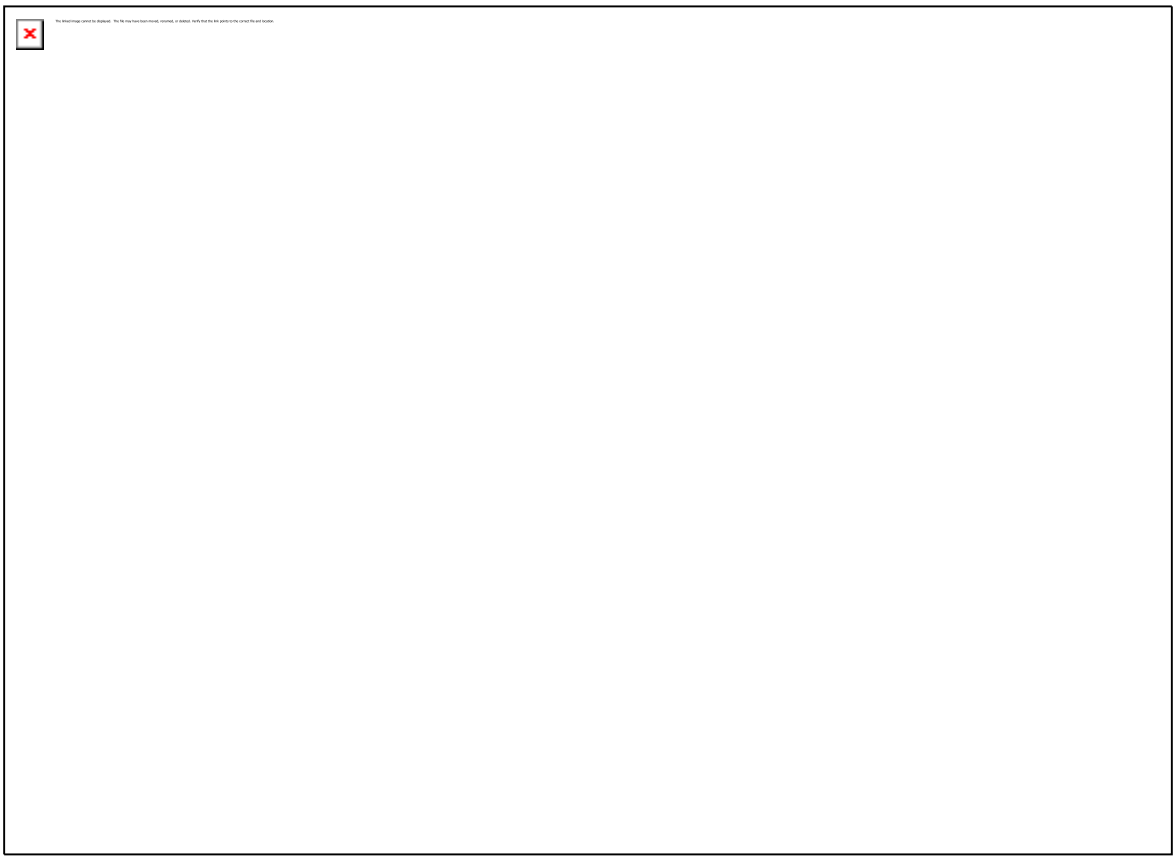
Antenna type: Linear Polarized
Antenna Gain: 3.7 dBi.

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)

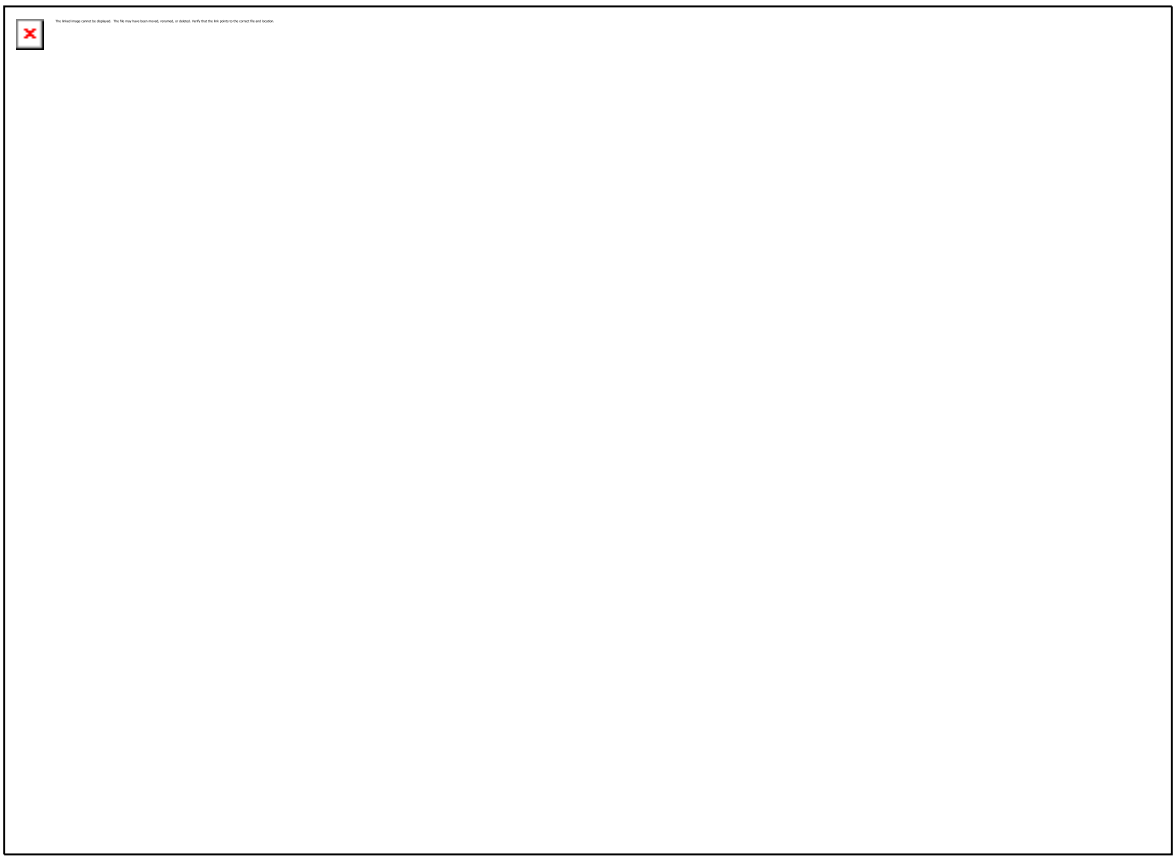
Antenna type: Linear Polarized
Antenna Gain: 3.7 dBi.

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)

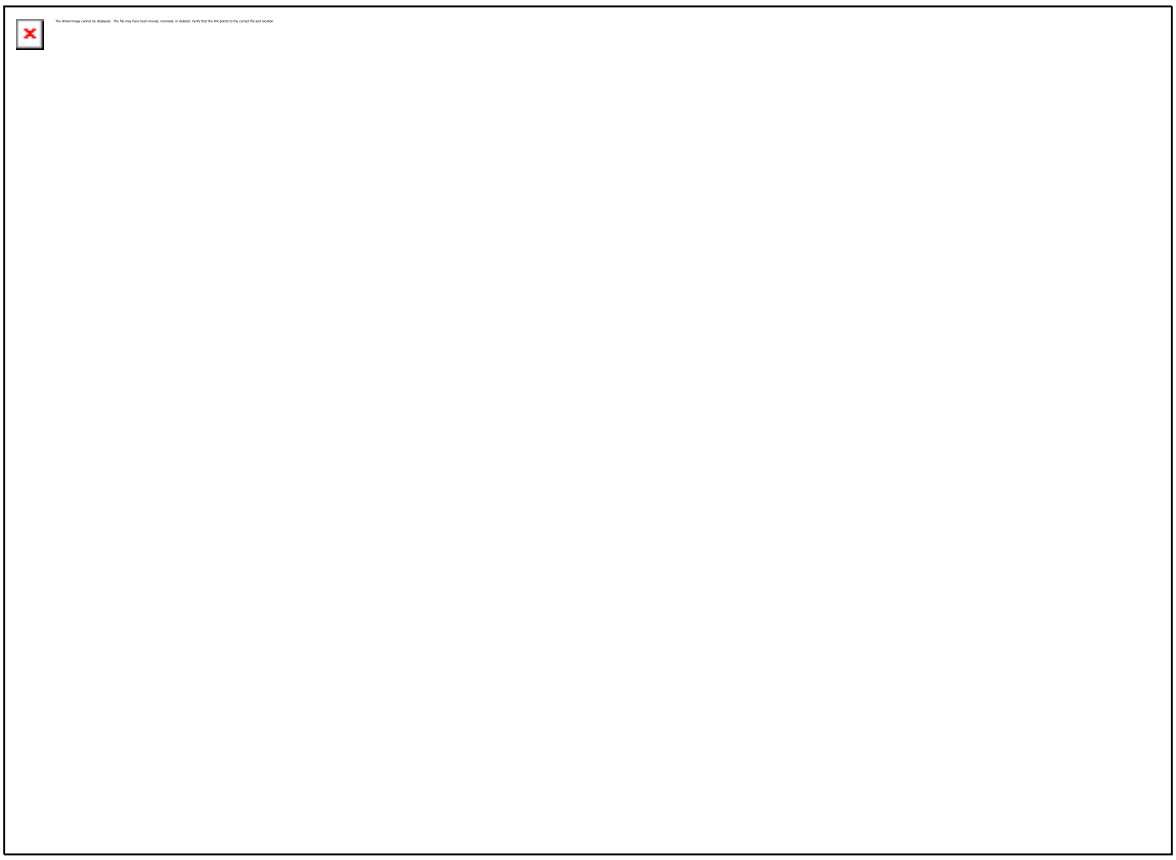
Antenna type: Linear Polarized
Antenna Gain: 3.7 dBi.

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

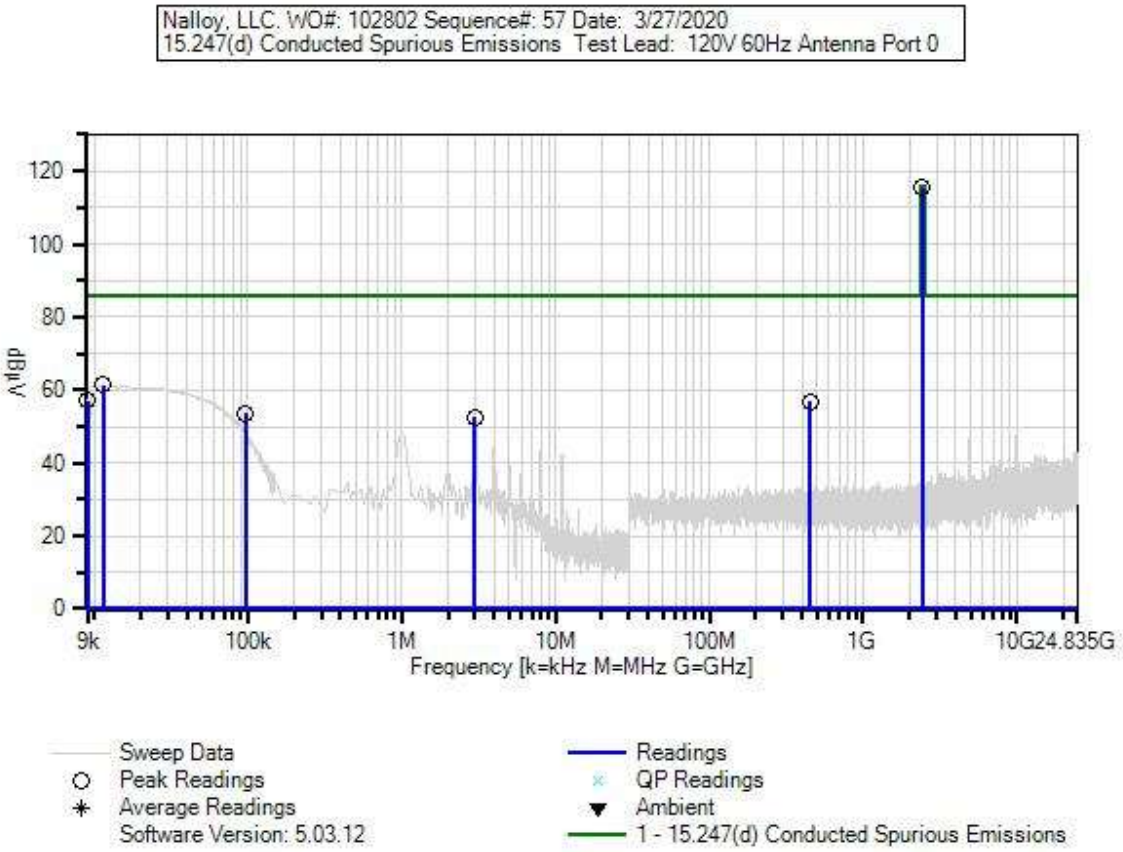
Frequency Range: 9kHz-25GHz
Frequency tested: 2412
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11b, 1mbps (worst-case)**

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

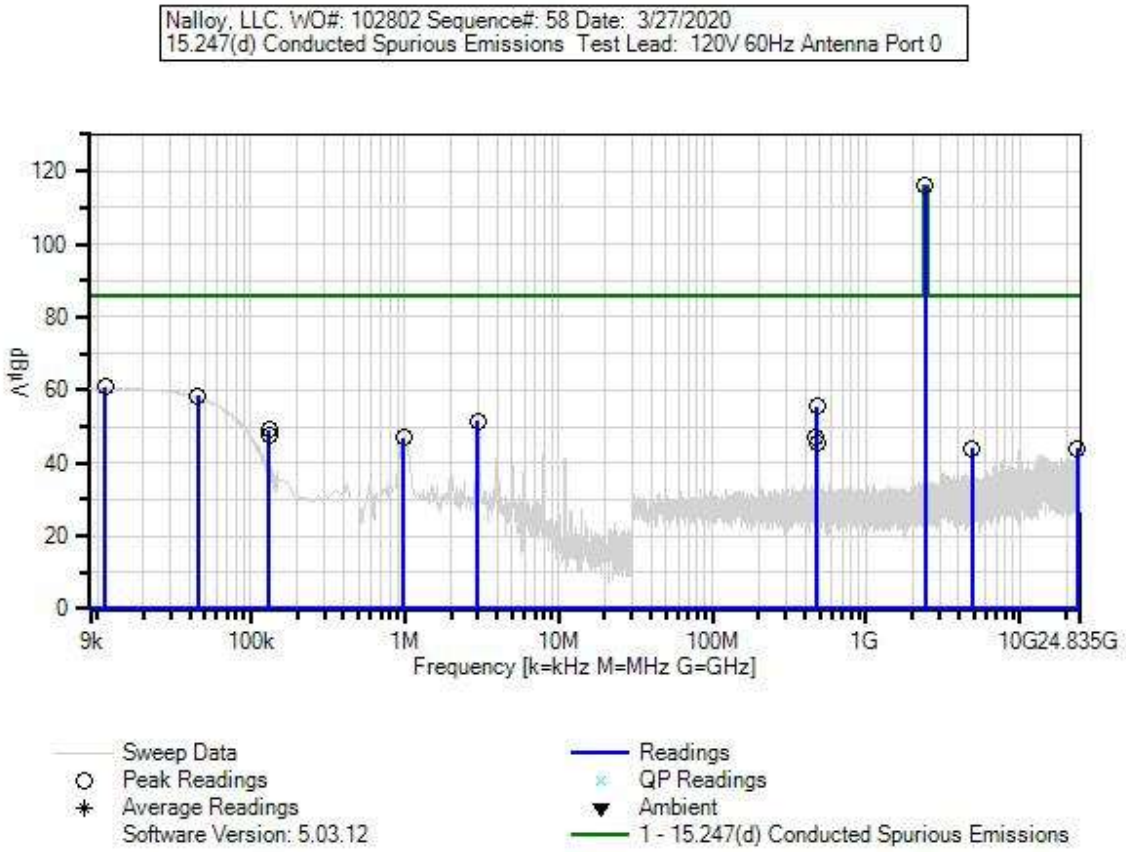
Frequency Range: 9kHz-25GHz
Frequency tested: 2437
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11b, 1mbps (worst-case)**

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

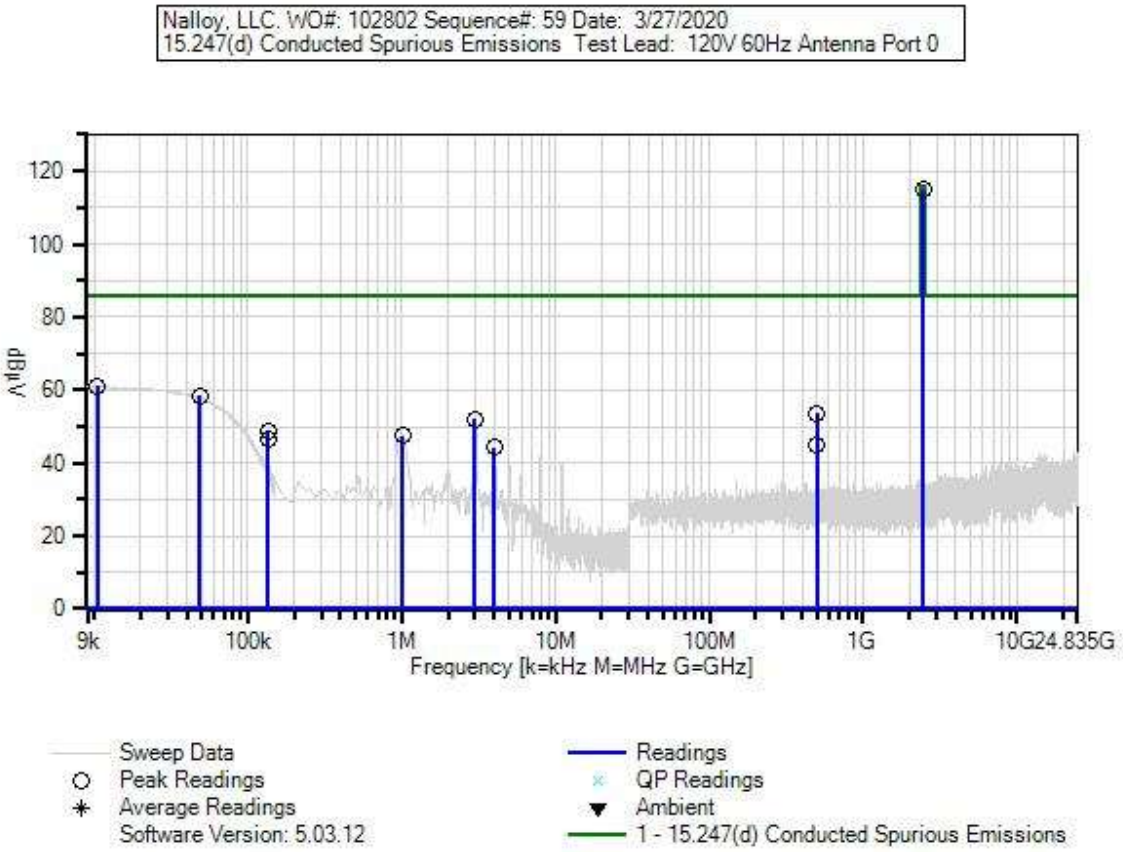
Frequency Range: 9kHz-25GHz
Frequency tested: 2462
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11b, 1mbps (worst-case)**

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

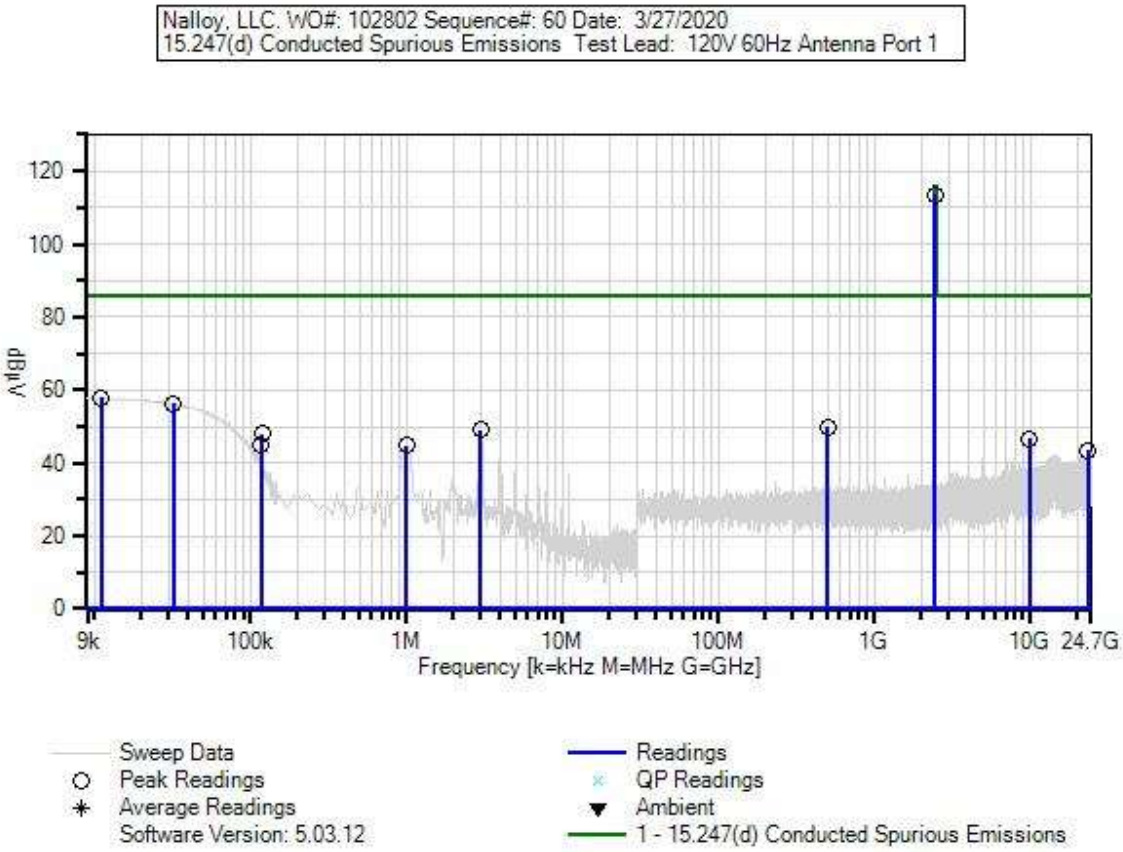
Frequency Range: 9kHz-25GHz
Frequency tested: 2462
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11b, 1mbps (worst-case)**

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

7	9848.008M	46.7	+0.0	46.7	86.0	-39.3	Anten
8	118.275k	45.0	+0.0	45.0	86.0	-41.0	Anten
9	1.006M	44.9	+0.0	44.9	86.0	-41.1	Anten
10	23499.546 M	43.4	+0.0	43.4	86.0	-42.6	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:	12:21:09
Tested By:	Matthew Harrison	Sequence#:	61
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

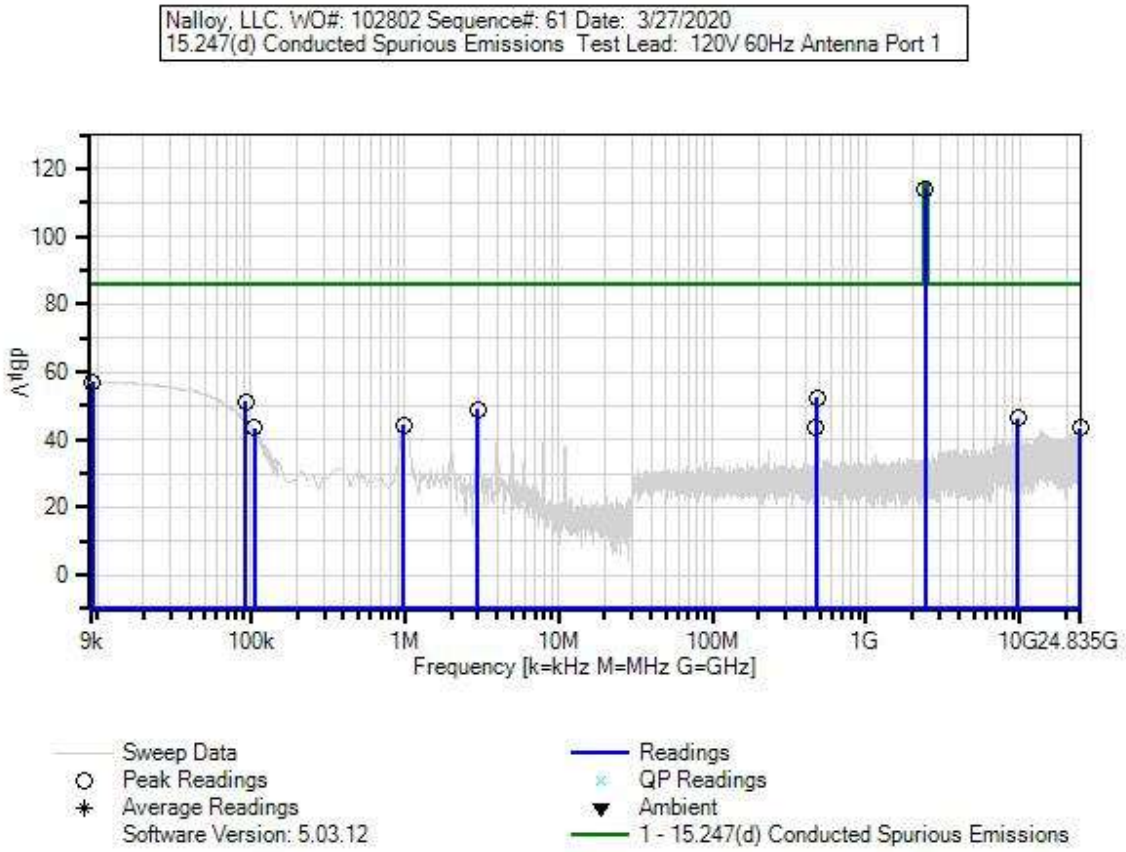
Frequency Range: 9kHz-25GHz
Frequency tested: 2437
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11b, 1mbps (worst-case)**

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 1

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2435.990M	114.0					+0.0	114.0	116.0	-2.0	Anten
2	9.282k	57.1					+0.0	57.1	86.0	-28.9	Anten
3	476.246M	52.3					+0.0	52.3	86.0	-33.7	Anten
4	92.613k	51.1					+0.0	51.1	86.0	-34.9	Anten
5	2.991M	48.8					+0.0	48.8	86.0	-37.2	Anten
6	9747.908M	46.4					+0.0	46.4	86.0	-39.6	Anten

7	985.573k	44.4		+0.0	44.4	86.0	-41.6	Anten
8	474.744M	43.5		+0.0	43.5	86.0	-42.5	Anten
9	24813.078 M	43.3		+0.0	43.3	86.0	-42.7	Anten
10	105.021k	43.3		+0.0	43.3	86.0	-42.7	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:	12:29:39
Tested By:	Matthew Harrison	Sequence#:	62
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

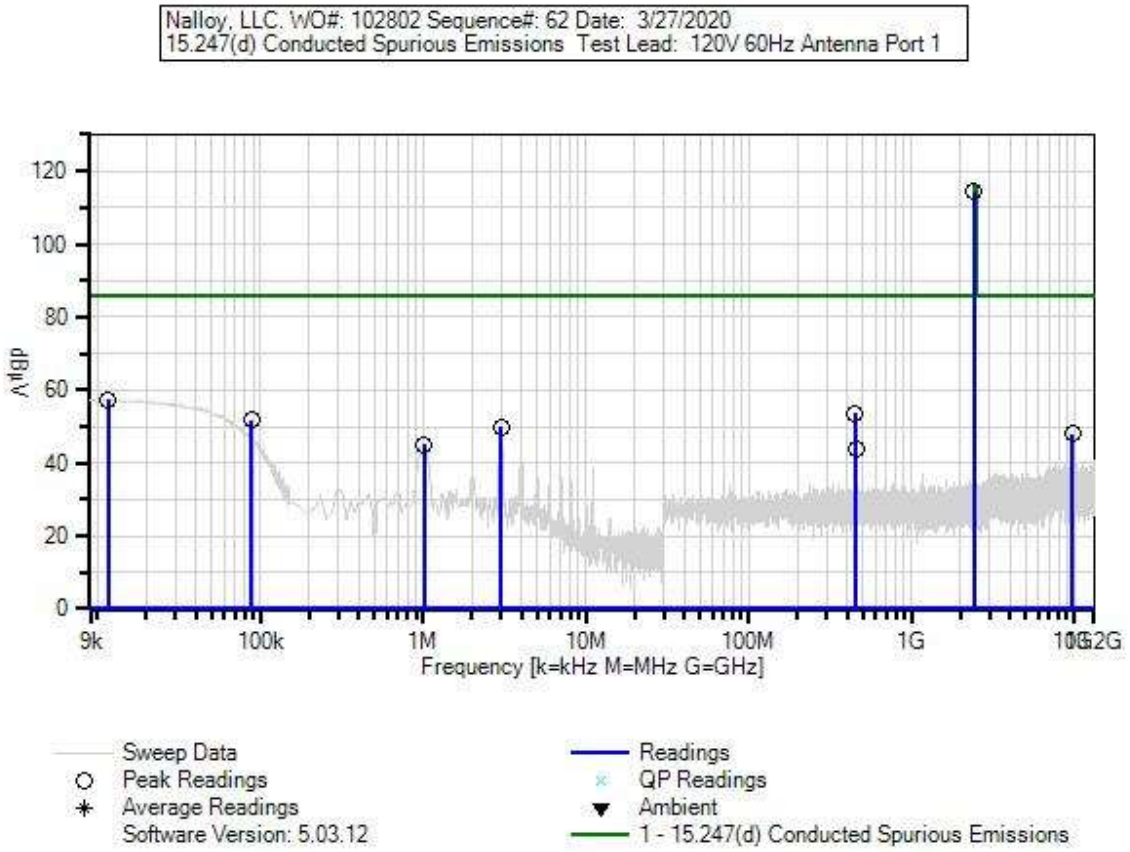
Frequency Range: 9kHz-25GHz
Frequency tested: 2412
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11b, 1mbps (worst-case)**

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 1

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2412.480M	114.3					+0.0	114.3	116.0	-1.7	Anten
2	11.679k	57.4					+0.0	57.4	86.0	-28.6	Anten
3	451.321M	53.7					+0.0	53.7	86.0	-32.3	Anten
4	88.665k	51.7					+0.0	51.7	86.0	-34.3	Anten

5	2.991M	49.8	+0.0	49.8	86.0	-36.2	Anten
6	9647.908M	47.9	+0.0	47.9	86.0	-38.1	Anten
7	1.006M	45.1	+0.0	45.1	86.0	-40.9	Anten
8	452.822M	44.1	+0.0	44.1	86.0	-41.9	Anten

802.11g 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:	12:51:24
Tested By:	Matthew Harrison	Sequence#:	63
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

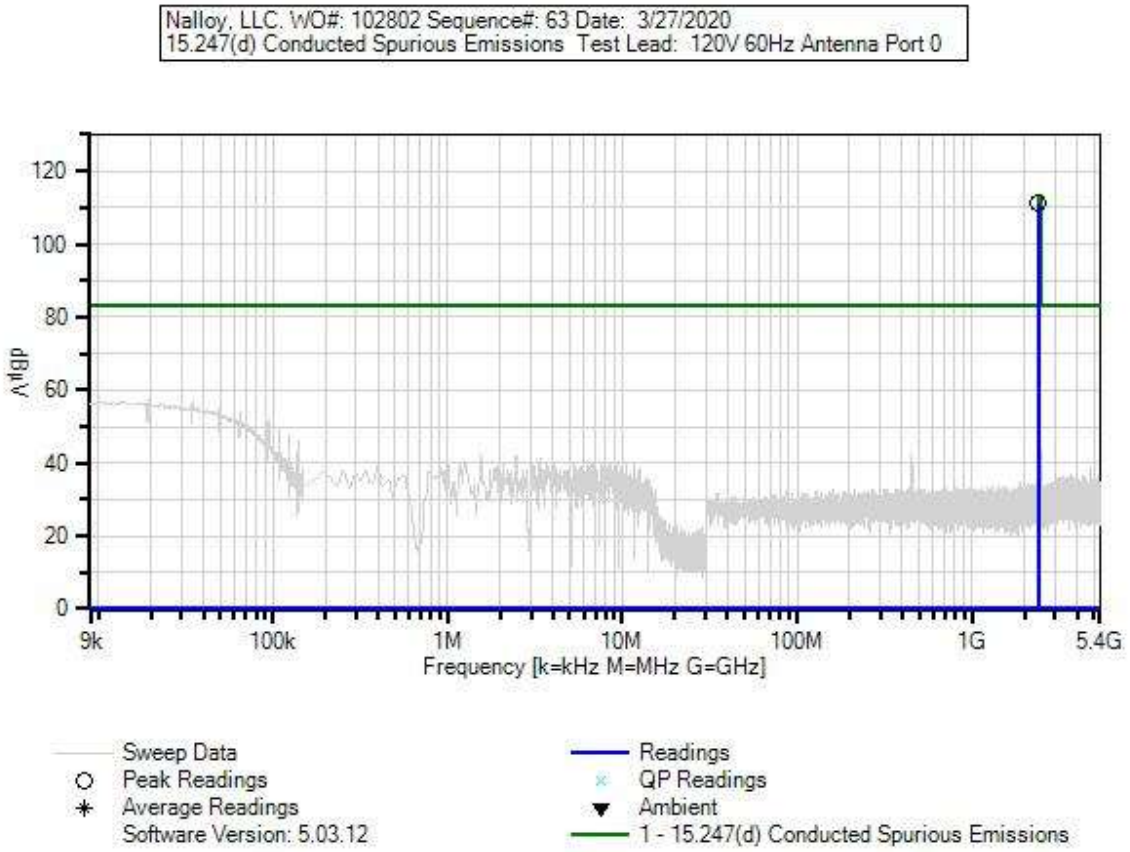
Frequency Range: 9kHz-25GHz
Frequency tested: 2412
Firmware power setting: 13 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11g, 6 mbps (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
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	2413.250M	111.2					+0.0	111.2	113.2	-2.0	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:	13:01:23
Tested By:	Matthew Harrison	Sequence#:	64
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

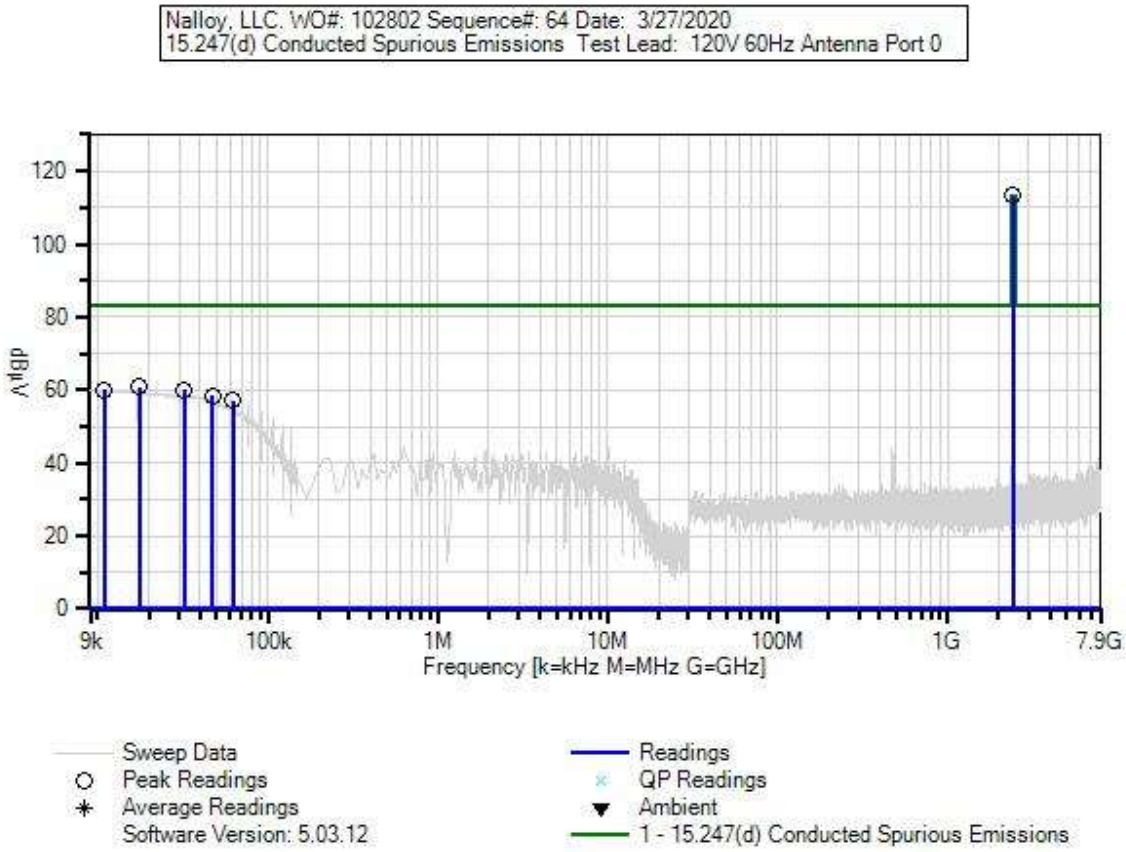
Frequency Range: 9kHz-25GHz
Frequency tested: 2437
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11g, 6 mbps (worst-case)**

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	2435.710M	113.2					+0.0	113.2	113.2	+0.0	Anten
2	17.460k	60.8					+0.0	60.8	83.2	-22.4	Anten
3	32.406k	60.1					+0.0	60.1	83.2	-23.1	Anten
4	10.833k	60.0					+0.0	60.0	83.2	-23.2	Anten
5	47.352k	58.5					+0.0	58.5	83.2	-24.7	Anten
6	62.439k	57.2					+0.0	57.2	83.2	-26.0	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:	13:11:36
Tested By:	Matthew Harrison	Sequence#:	65
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

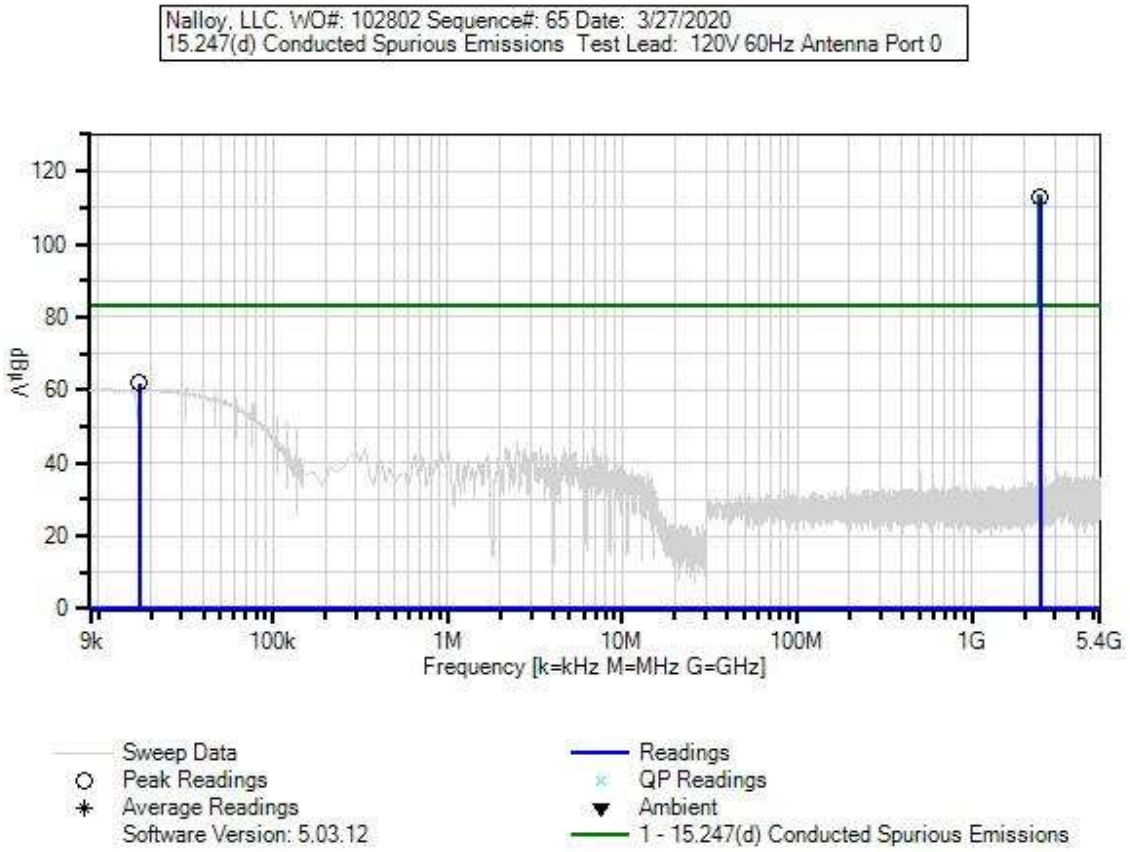
Frequency Range: 9kHz-25GHz
Frequency tested: 2462
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11g, 6 mbps (worst-case)**

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	2463.240M	112.9					+0.0	112.9	113.2	-0.3	Anten
2	17.178k	61.8					+0.0	61.8	83.2	-21.4	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:	13:22:11
Tested By:	Matthew Harrison	Sequence#:	66
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

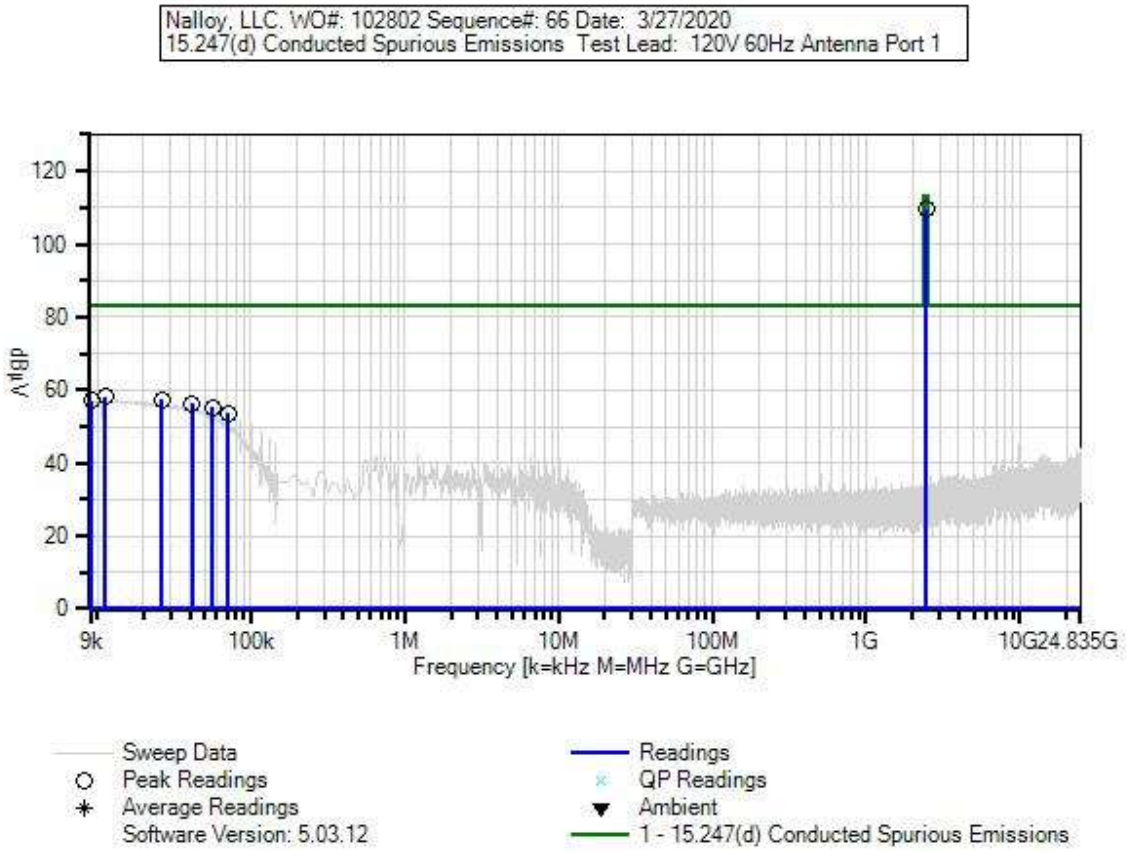
Frequency Range: 9kHz-25GHz
Frequency tested: 2462
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11g, 6 mbps (worst-case)**

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	2456.990M	109.4					+0.0	109.4	113.2	-3.8	Anten
2	11.256k	58.3					+0.0	58.3	83.2	-24.9	Anten
3	26.202k	57.4					+0.0	57.4	83.2	-25.8	Anten

4	9.141k	57.1	+0.0	57.1	83.2	-26.1	Anten
5	41.148k	56.4	+0.0	56.4	83.2	-26.8	Anten
6	56.094k	55.2	+0.0	55.2	83.2	-28.0	Anten
7	71.040k	53.7	+0.0	53.7	83.2	-29.5	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:	13:30:48
Tested By:	Matthew Harrison	Sequence#:	67
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

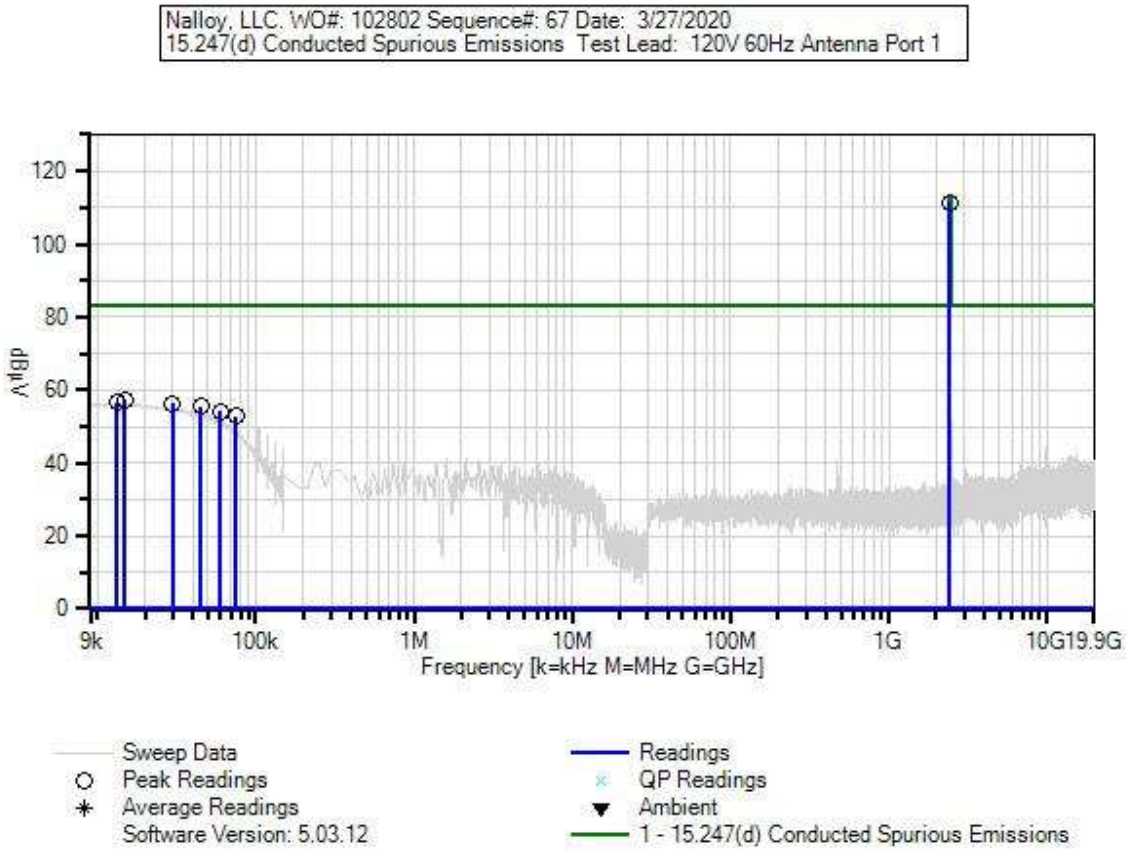
Frequency Range: 9kHz-25GHz
Frequency tested: 2437
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11g, 6 mbps (worst-case)**

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	2435.720M	111.4					+0.0	111.4	113.2	-1.8	Anten
2	14.922k	57.5					+0.0	57.5	83.2	-25.7	Anten
3	13.230k	56.5					+0.0	56.5	83.2	-26.7	Anten

4	29.868k	56.2	+0.0	56.2	83.2	-27.0	Anten
5	44.814k	55.4	+0.0	55.4	83.2	-27.8	Anten
6	59.760k	54.1	+0.0	54.1	83.2	-29.1	Anten
7	74.847k	52.7	+0.0	52.7	83.2	-30.5	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:	13:37:20
Tested By:	Matthew Harrison	Sequence#:	68
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

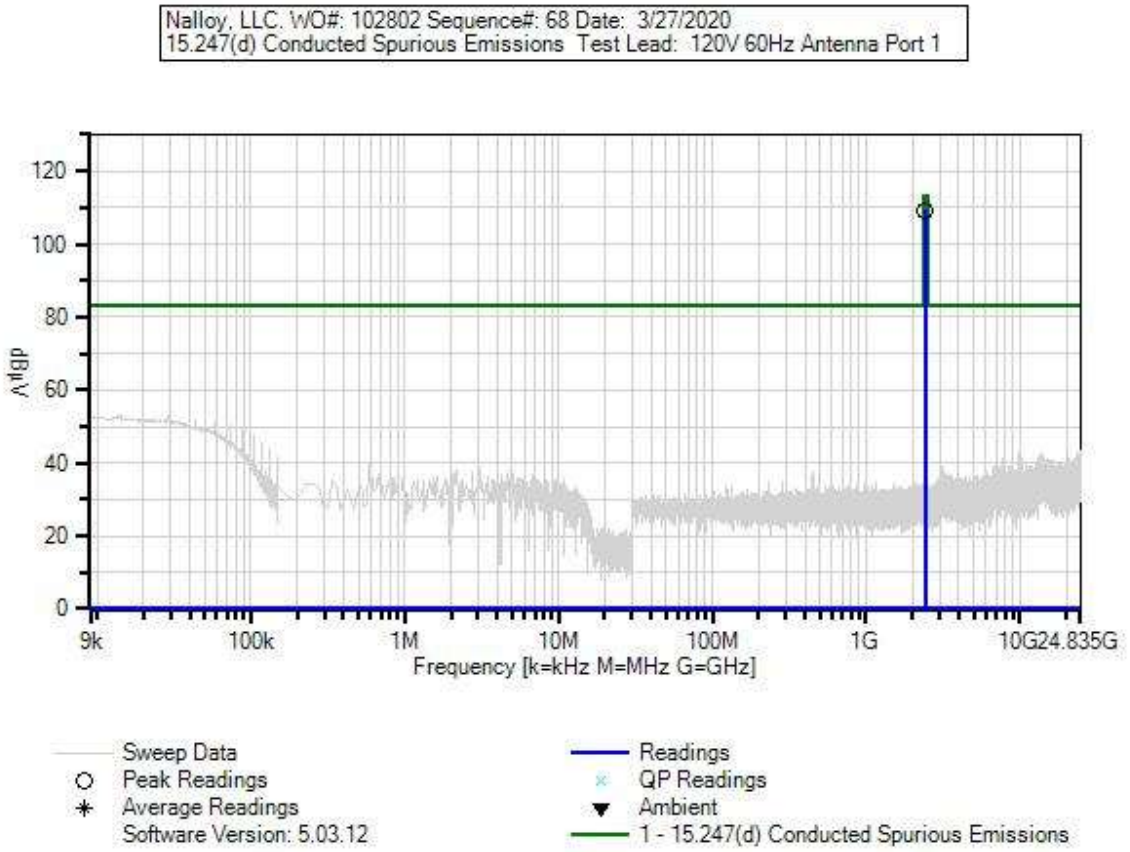
Frequency Range: 9kHz-25GHz
Frequency tested: 2412
Firmware power setting: 13 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11g, 6 mbps (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
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	2413.240M	109.1					+0.0	109.1	113.2	-4.1	Anten

802.11n20 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:	13:55:25
Tested By:	Matthew Harrison	Sequence#:	69
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: 12 dBm for Low 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
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	2413.240M	110.2					+0.0	110.2	112.2	-2.0	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:	14:01:09
Tested By:	Matthew Harrison	Sequence#:	70
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

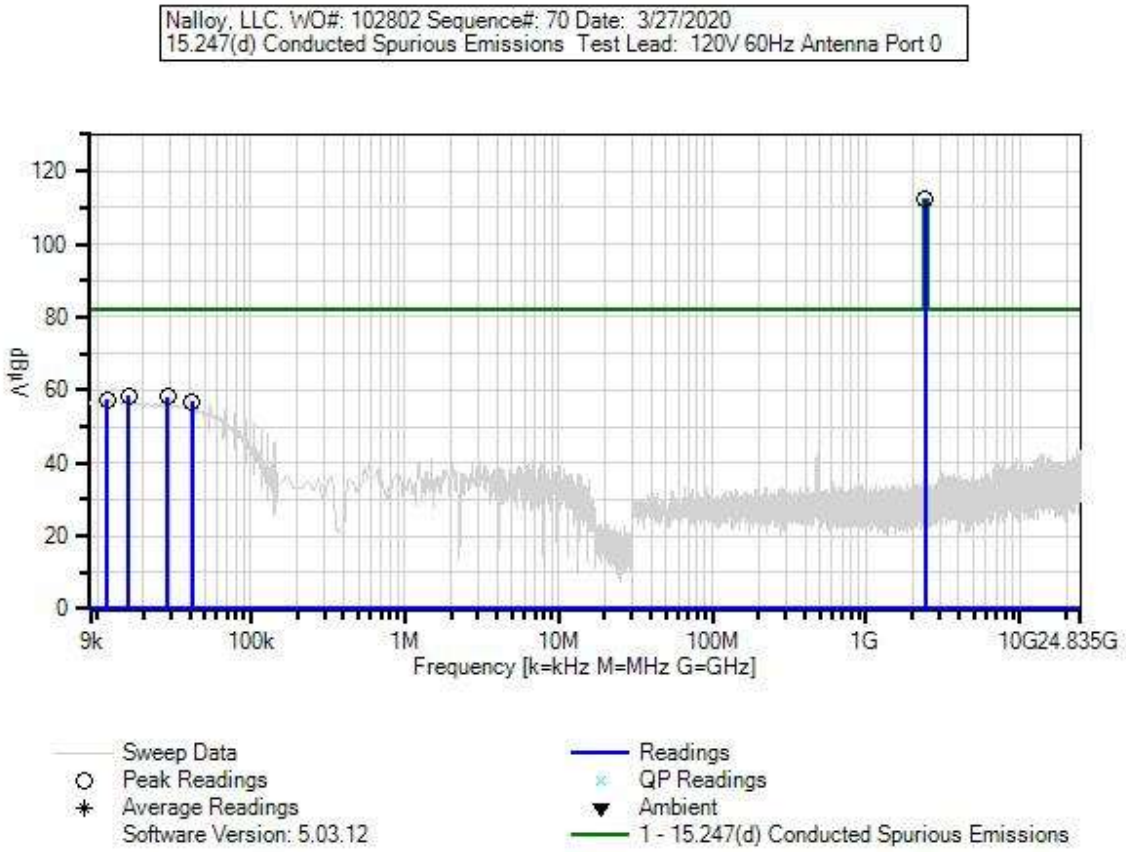
Frequency Range: 9kHz-25GHz
Frequency tested: 2437
Firmware power setting: 14 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11n, 20MHz BW, MCS8 (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
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	2435.720M	112.1					+0.0	112.1	112.2	-0.1	Anten
2	16.050k	58.4					+0.0	58.4	82.2	-23.8	Anten
3	28.740k	58.1					+0.0	58.1	82.2	-24.1	Anten
4	11.538k	57.4					+0.0	57.4	82.2	-24.8	Anten
5	41.289k	56.8					+0.0	56.8	82.2	-25.4	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:	14:09:27
Tested By:	Matthew Harrison	Sequence#:	71
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

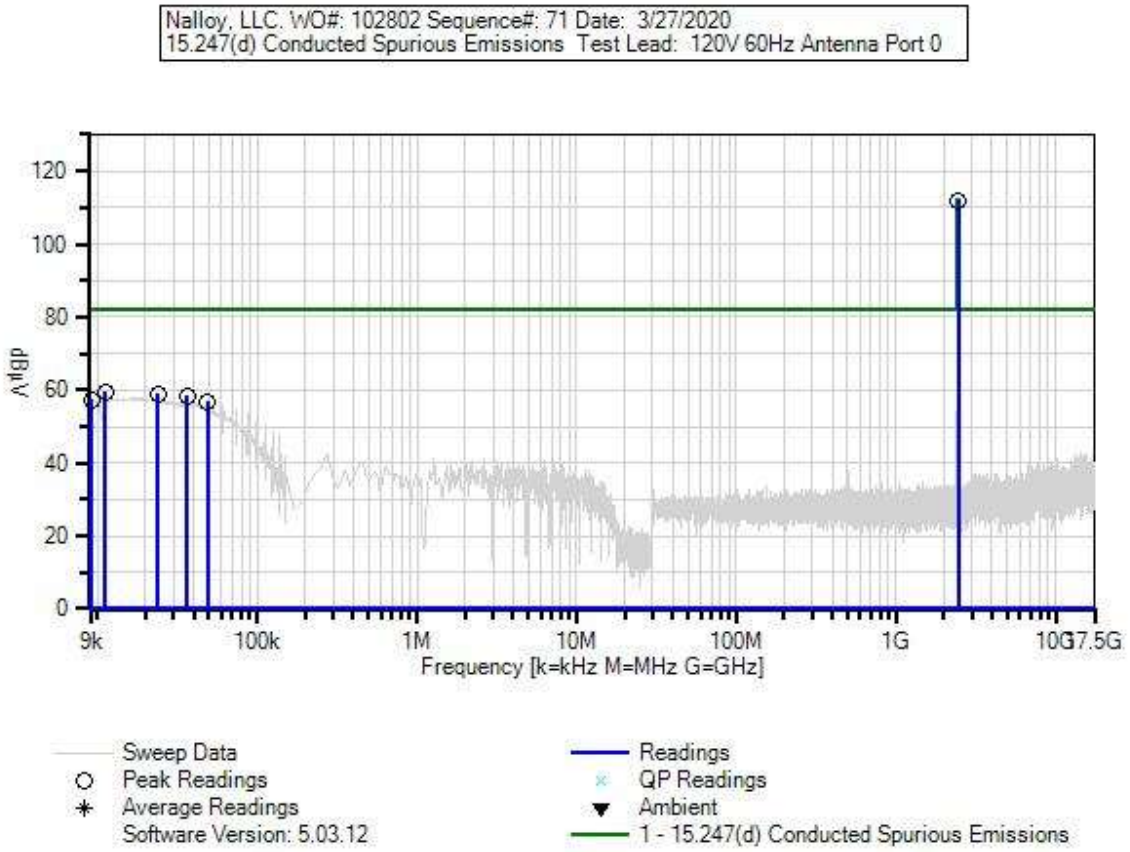
Frequency Range: 9kHz-25GHz
Frequency tested: 2462
Firmware power setting: 14 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11n, 20MHz BW, MCS8 (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
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	2460.730M	111.9					+0.0	111.9	112.2	-0.3	Anten
2	11.115k	59.6					+0.0	59.6	82.2	-22.6	Anten
3	23.805k	59.0					+0.0	59.0	82.2	-23.2	Anten
4	36.495k	58.5					+0.0	58.5	82.2	-23.7	Anten
5	9.141k	57.4					+0.0	57.4	82.2	-24.8	Anten
6	49.044k	56.8					+0.0	56.8	82.2	-25.4	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:	14:21:58
Tested By:	Matthew Harrison	Sequence#:	72
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

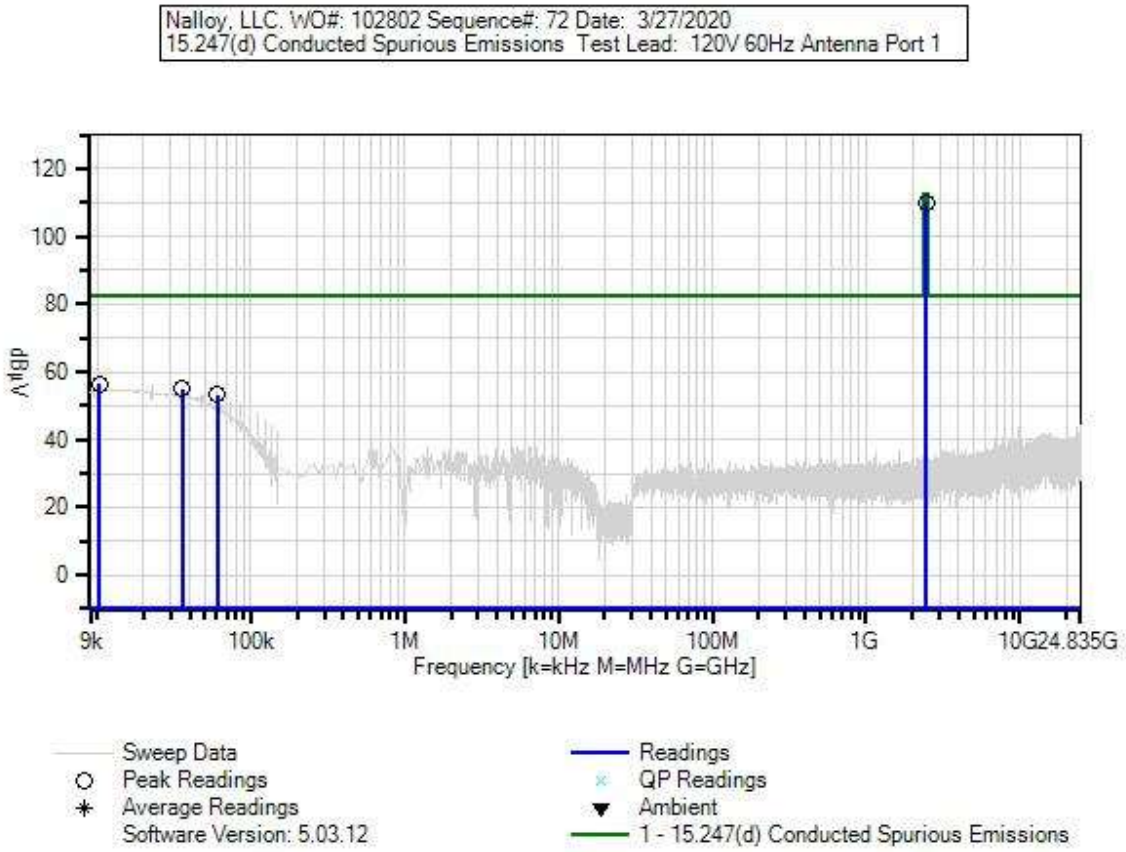
Frequency Range: 9kHz-25GHz
Frequency tested: 2462
Firmware power setting: 14 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11n, 20MHz BW, MCS8 (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
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	2463.250M	110.0					+0.0	110.0	112.2	-2.2	Anten
2	10.269k	56.4					+0.0	56.4	82.2	-25.8	Anten
3	35.508k	55.1					+0.0	55.1	82.2	-27.1	Anten
4	60.747k	53.2					+0.0	53.2	82.2	-29.0	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:	14:30:55
Tested By:	Matthew Harrison	Sequence#:	73
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

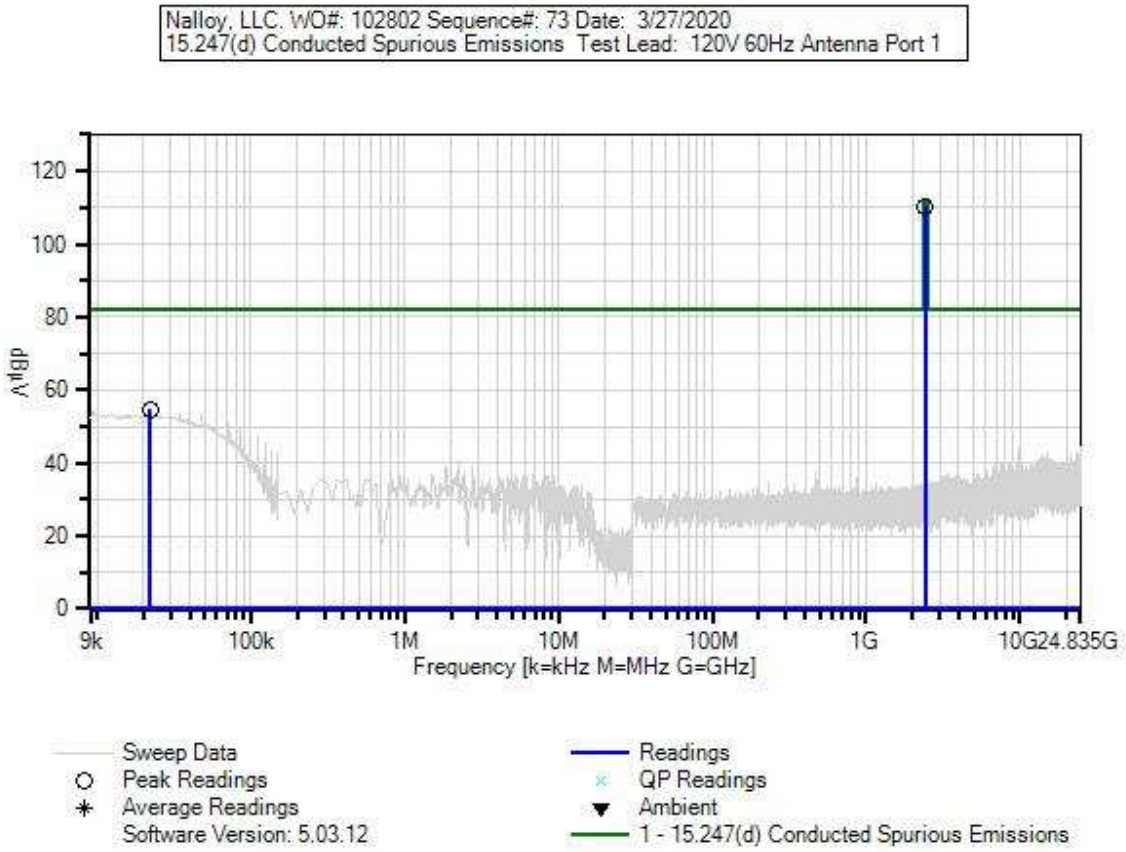
Frequency Range: 9kHz-25GHz
Frequency tested: 2437
Firmware power setting: 14 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11n, 20MHz BW, MCS8 (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
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	2435.730M	110.3					+0.0	110.3	112.2	-1.9	Anten
2	21.972k	54.7					+0.0	54.7	82.2	-27.5	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:	14:45:54
Tested By:	Matthew Harrison	Sequence#:	74
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

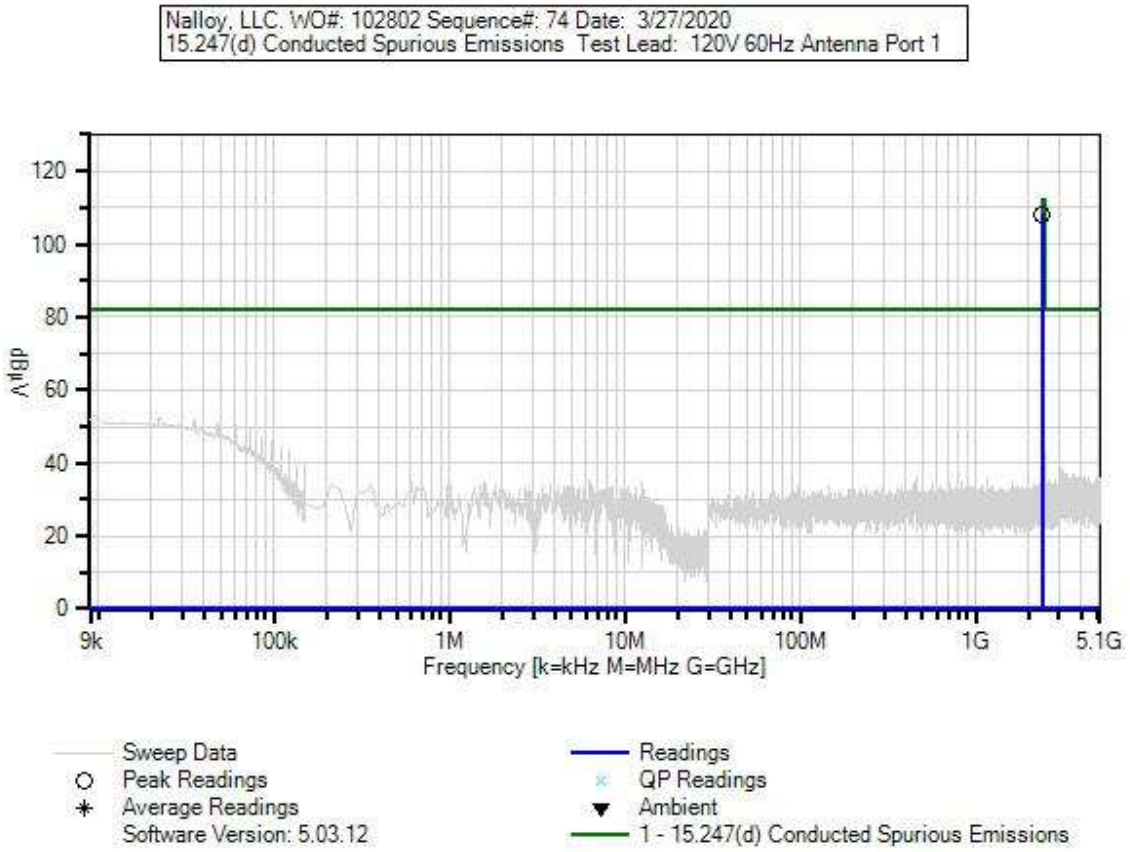
Frequency Range: 9kHz-25GHz
Frequency tested: 2412
Firmware power setting: 12 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11n, 20MHz BW, MCS8 (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
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	2413.250M	108.1					+0.0	108.1	112.2	-4.1	Anten

802.11n40 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:	14:58:30
Tested By:	Matthew Harrison	Sequence#:	75
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

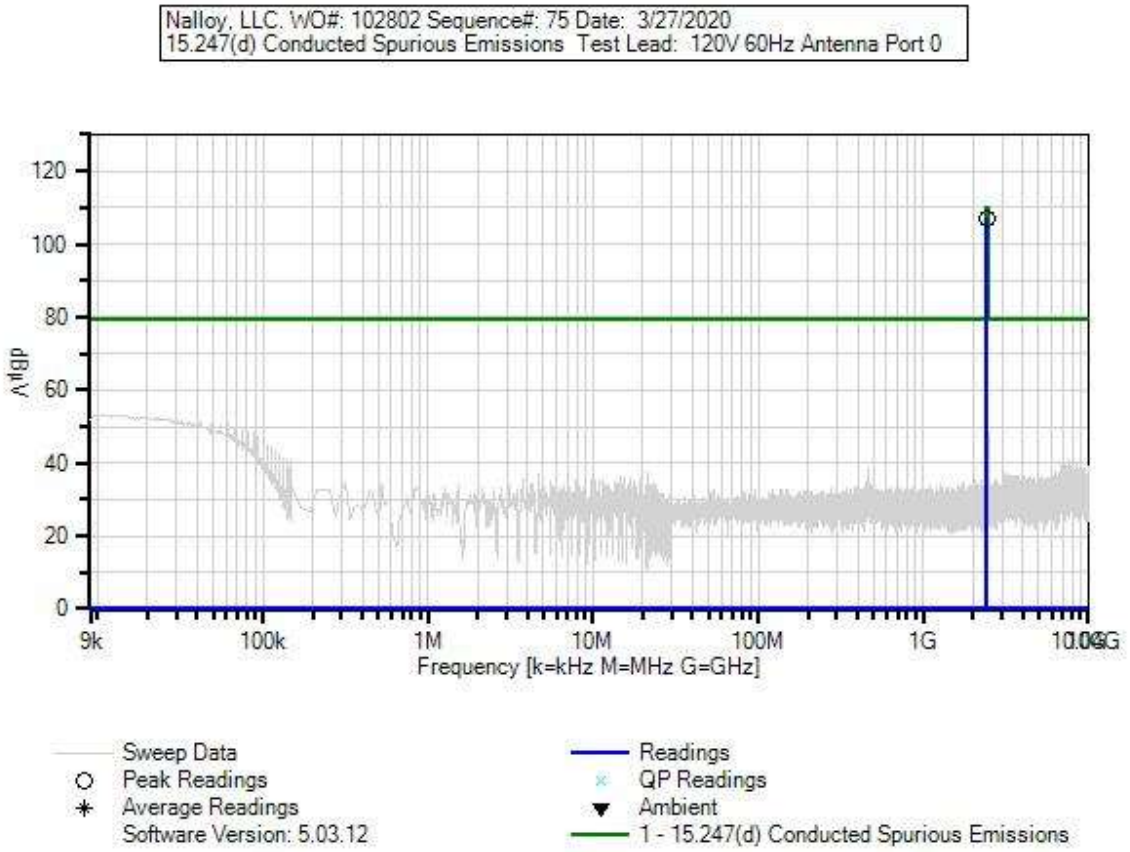
Frequency Range: 9kHz-25GHz
Frequency tested: 2422
Firmware power setting: 11 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11n, 40MHz BW, MCS8 (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
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	2425.750M	107.2					+0.0	107.2	109.7	-2.5	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:	15:06:37
Tested By:	Matthew Harrison	Sequence#:	76
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

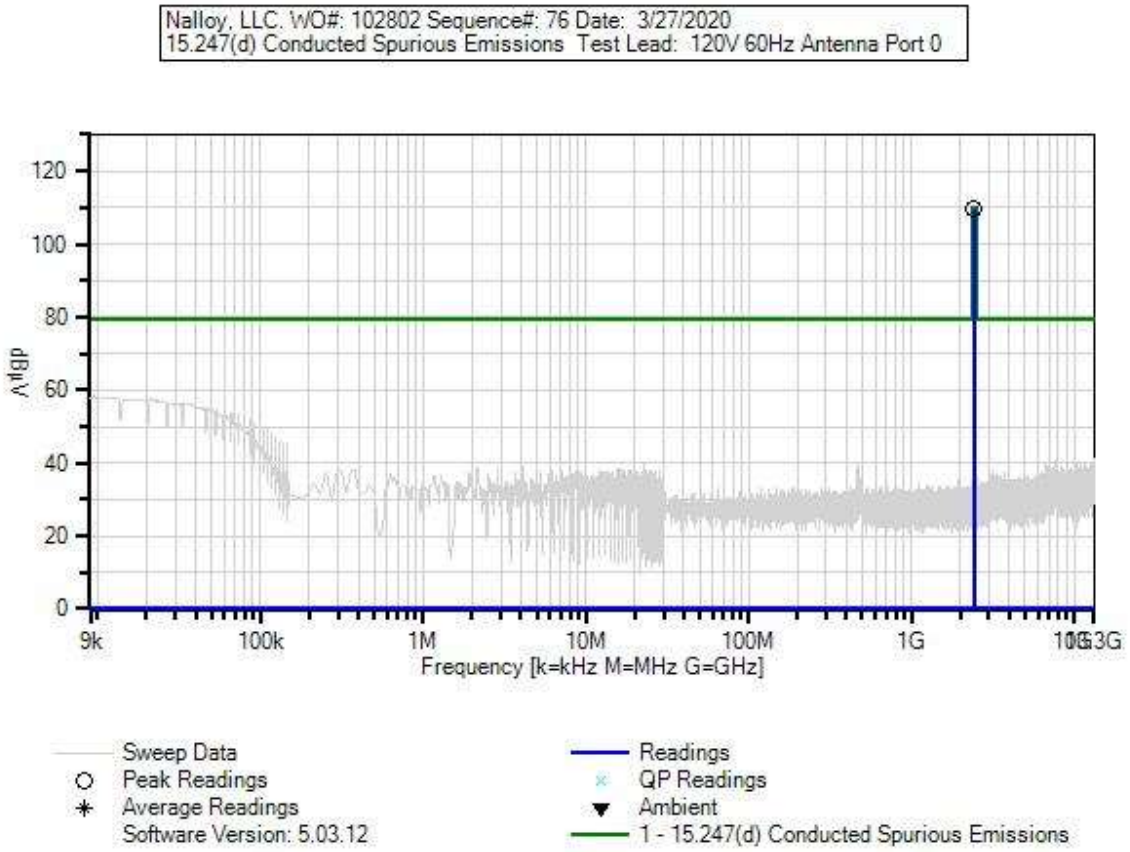
Frequency Range: 9kHz-25GHz
Frequency tested: 2437
Firmware power setting: 14 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11n, 40MHz BW, MCS8 (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
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	2432.000M	109.5					+0.0	109.5	109.7	-0.2	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:	15:15:51
Tested By:	Matthew Harrison	Sequence#:	77
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

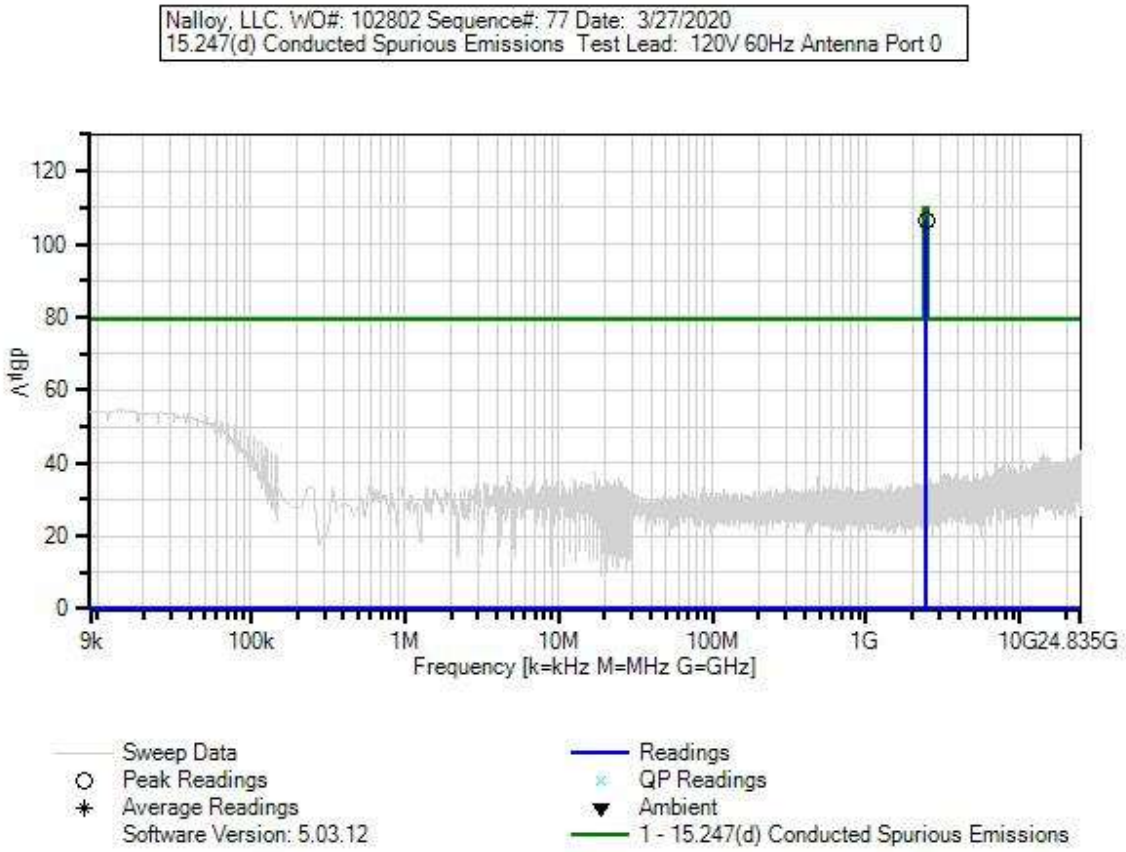
Frequency Range: 9kHz-25GHz
Frequency tested: 2452
Firmware power setting: 12 dBm
EUT Firmware:
Protocol /MCS/Modulation**: 802.11n, 40MHz BW, MCS8 (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
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	2455.730M	106.6					+0.0	106.6	109.7	-3.1	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:	15:21:34
Tested By:	Matthew Harrison	Sequence#:	78
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: 2452
Firmware power setting: 12 dBm
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
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	2456.950M	104.1					+0.0	104.1	109.7	-5.6	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:	15:29:59
Tested By:	Matthew Harrison	Sequence#:	79
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

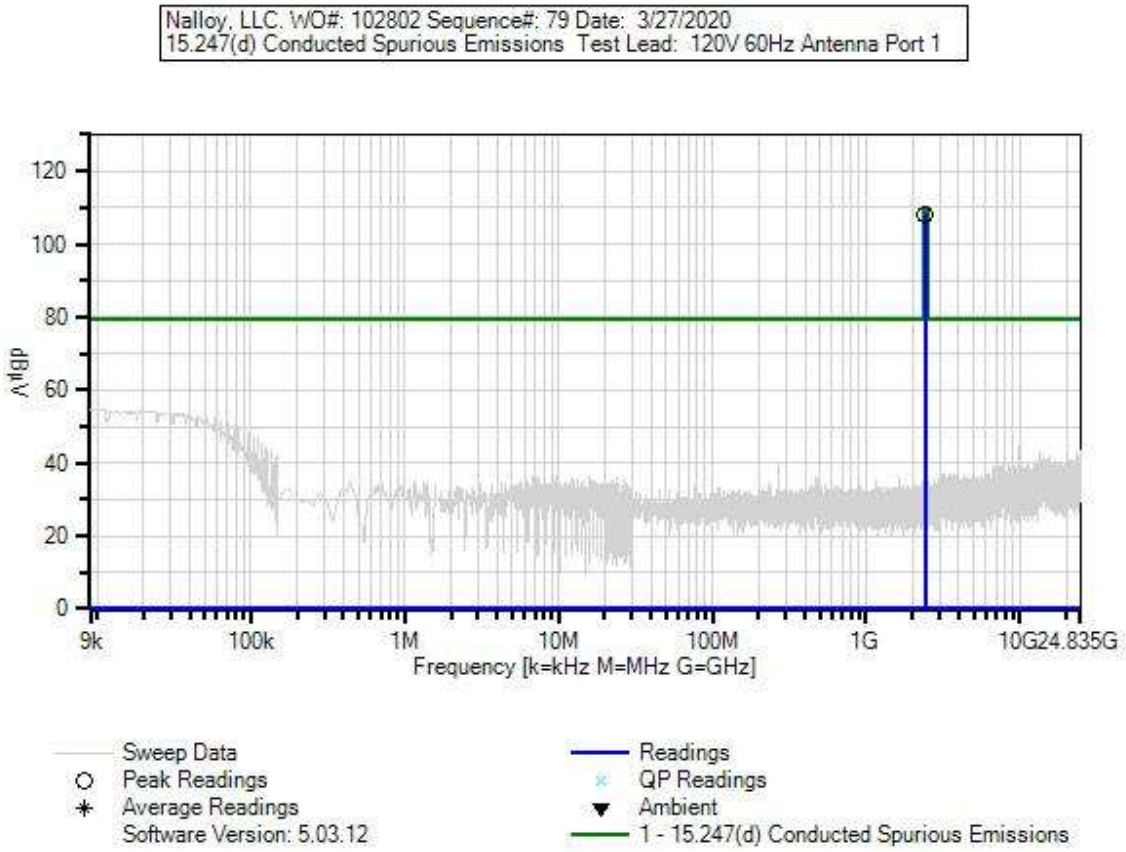
Frequency Range: 9kHz-25GHz
Frequency tested: 2437
Firmware power setting: 14 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11n, 40MHz BW, MCS8 (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
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	2431.970M	108.2					+0.0	108.2	109.7	-1.5	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:	15:37:43
Tested By:	Matthew Harrison	Sequence#:	80
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: 2422
Firmware power setting: 11 dBm
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
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	2426.990M	105.0					+0.0	105.0	109.7	-4.7	Anten

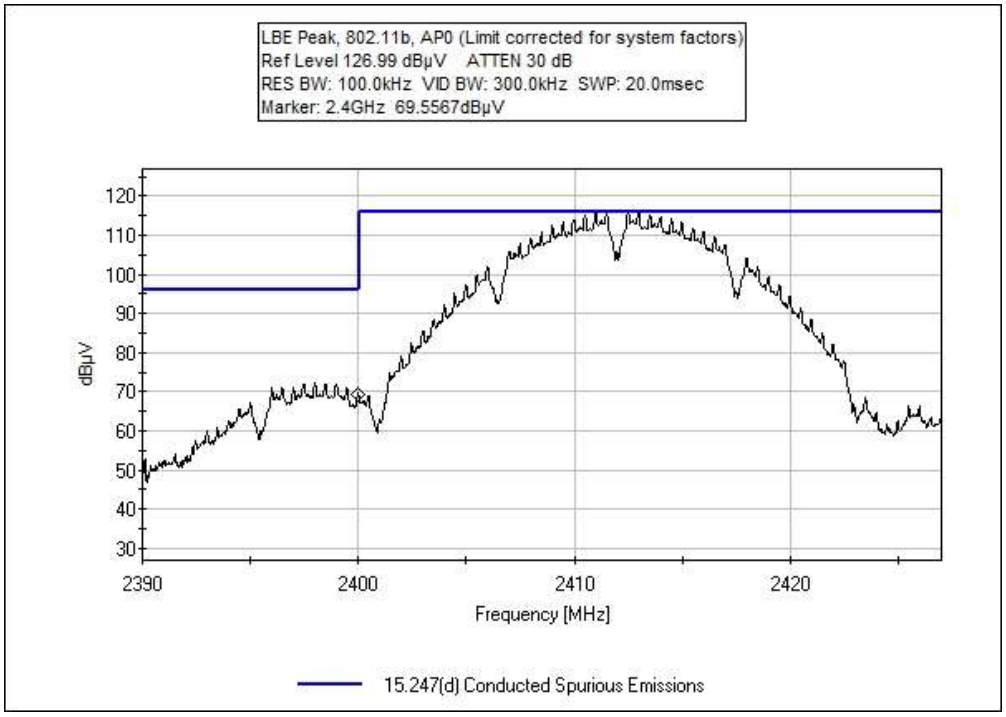
Band Edge

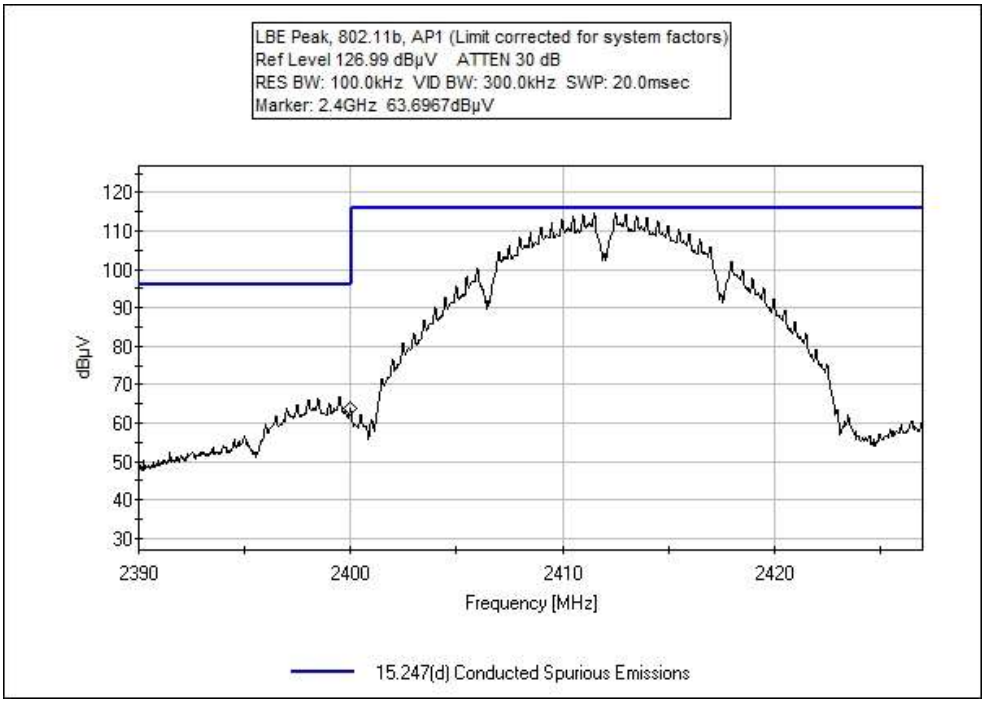
Band Edge Summary

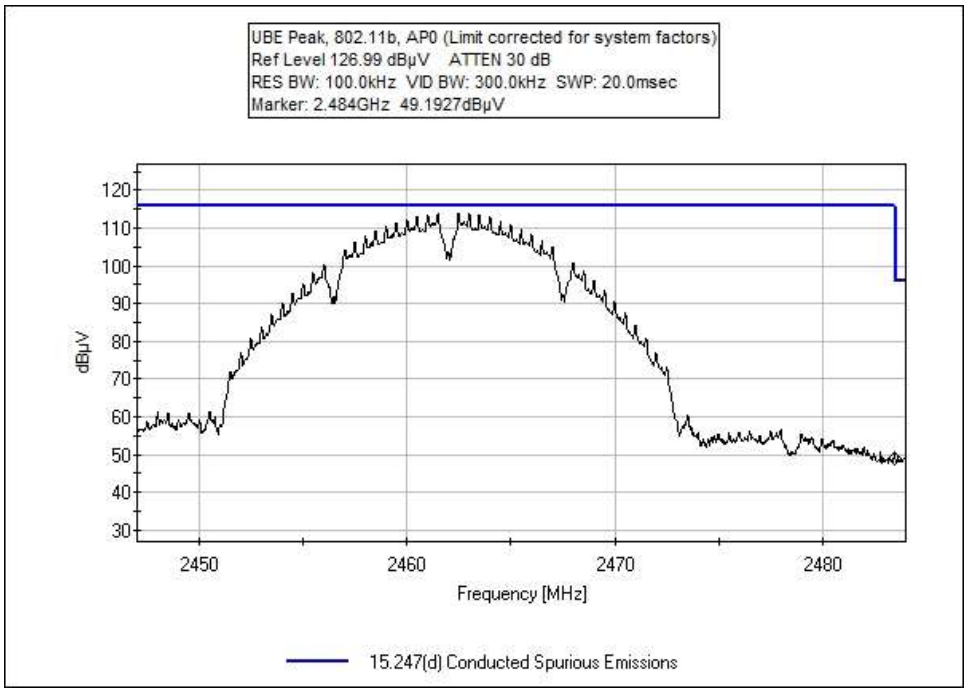
Limit applied: Max Power/100kHz - 20dB.
For 802.11n MIMO KDB662911 (E)(3)(b) When testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding.

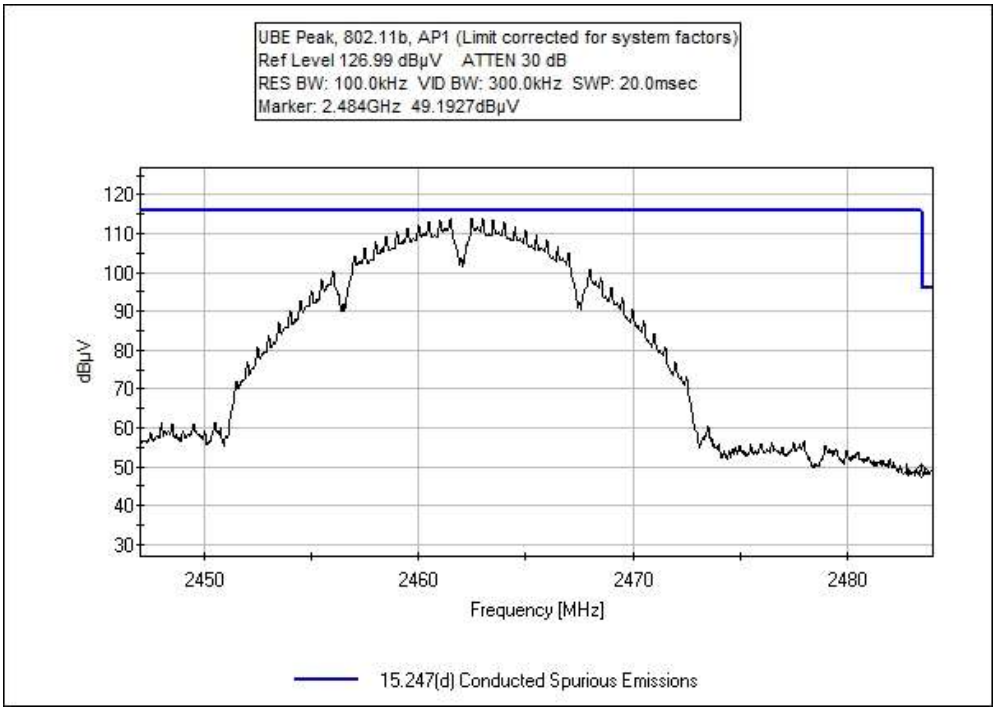
Frequency (MHz)	Modulation	Measured (dBµV)	Limit (dBµV)	Results
2400.0	CCK, AP0	69.6	<96	Pass
2483.5	CCK, AP0	51.2	<96	Pass
2400.0	CCK, AP1	63.6	<96	Pass
2483.5	CCK, AP1	49.2	<96	Pass
2400.0	OFDM, AP0	82.7	<93.2	Pass
2483.5	OFDM, AP0	61.9	<93.2	Pass
2400.0	OFDM, AP1	79.8	<93.2	Pass
2483.5	OFDM, AP1	55.5	<93.2	Pass
2400.0	MCS 20M, AP0	82.2	<93.2	Pass
2483.5	MCS 20M, AP0	62.8	<93.2	Pass
2400.0	MCS 20M, AP1	79.8	<93.2	Pass
2483.5	MCS 20M, AP1	55.5	<93.2	Pass
2400.0	MCS 40M, AP0	69.1	<89.7	Pass
2483.5	MCS 40M, AP0	60.8	<89.7	Pass
2400.0	MCS 40M, AP1	67.3	<89.7	Pass
2483.5	MCS 40M, AP1	54.3	<89.7	Pass

802.11b Band Edge Plots

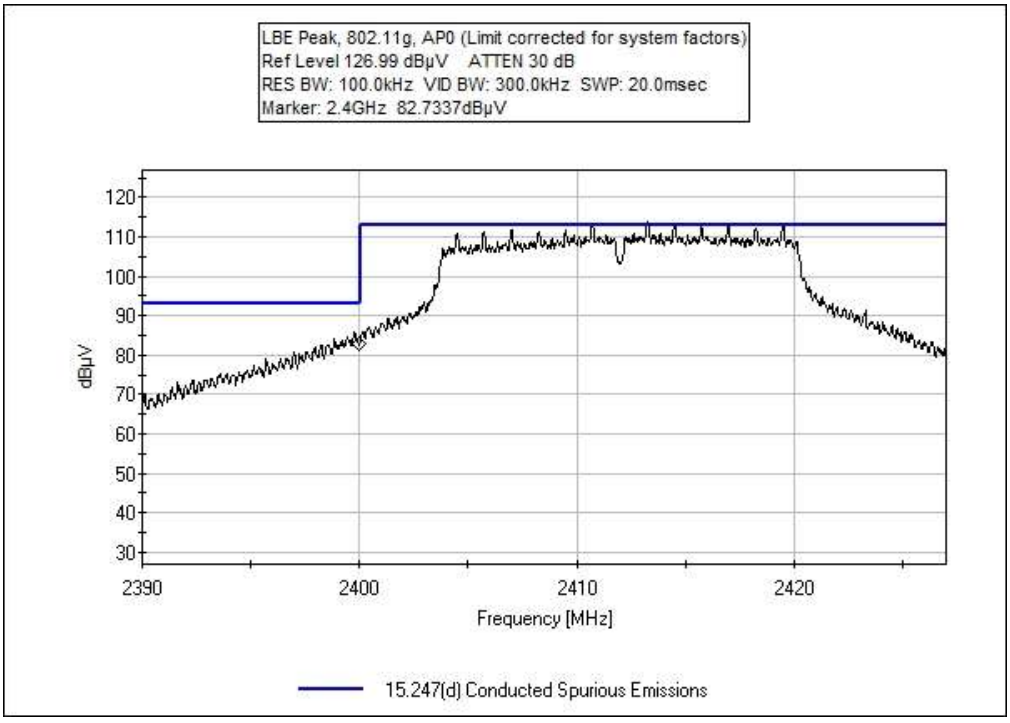


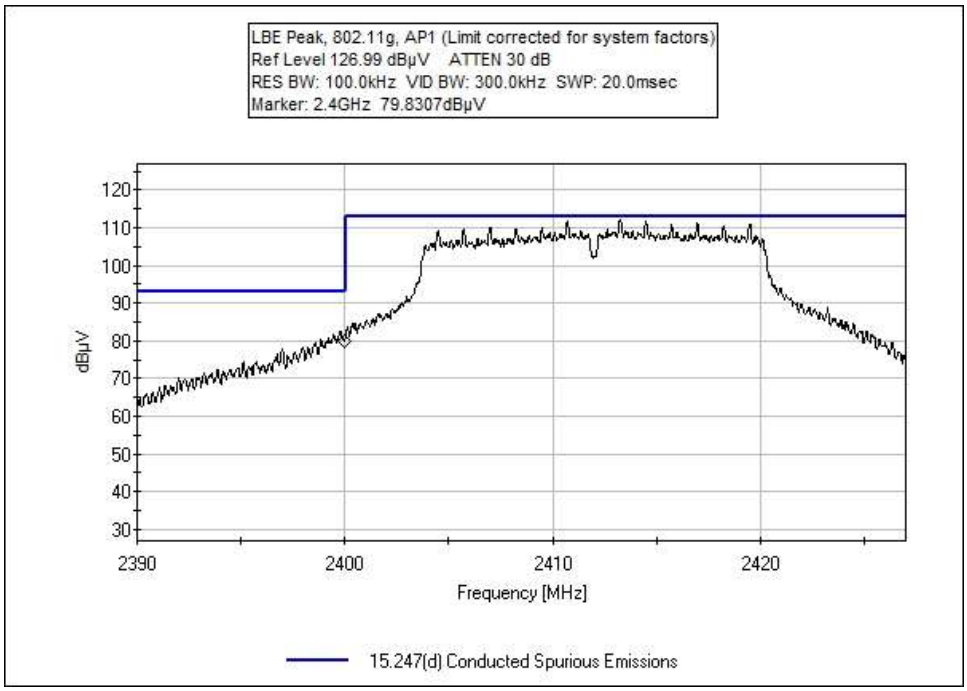


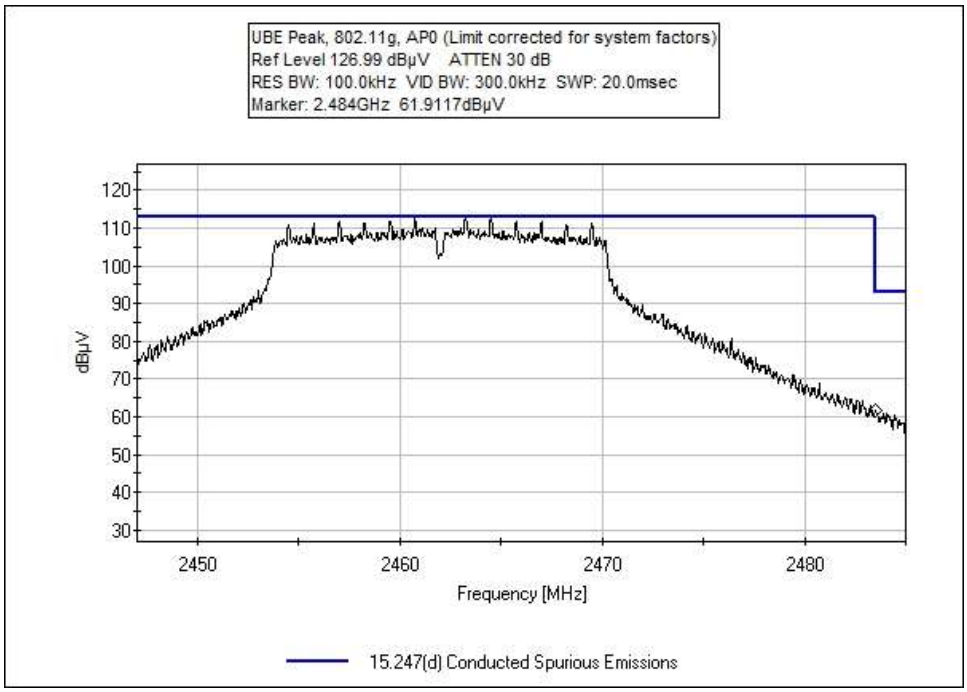

UBE Peak, 802.11b, AP0 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 2.484GHz 49.1927dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2450
2460
2470
2480
Frequency [MHz]
15.247(d) Conducted Spurious Emissions

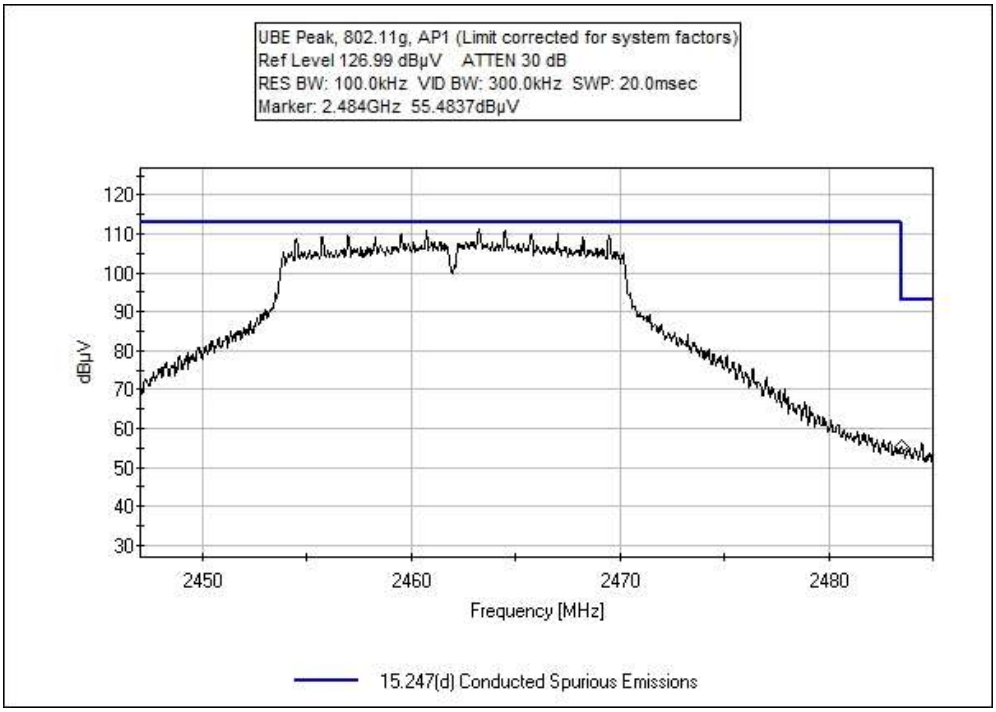

UBE Peak, 802.11b, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 2.484GHz 49.1927dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2450
2460
2470
2480
Frequency [MHz]
15.247(d) Conducted Spurious Emissions

802.11g Band Edge Plots

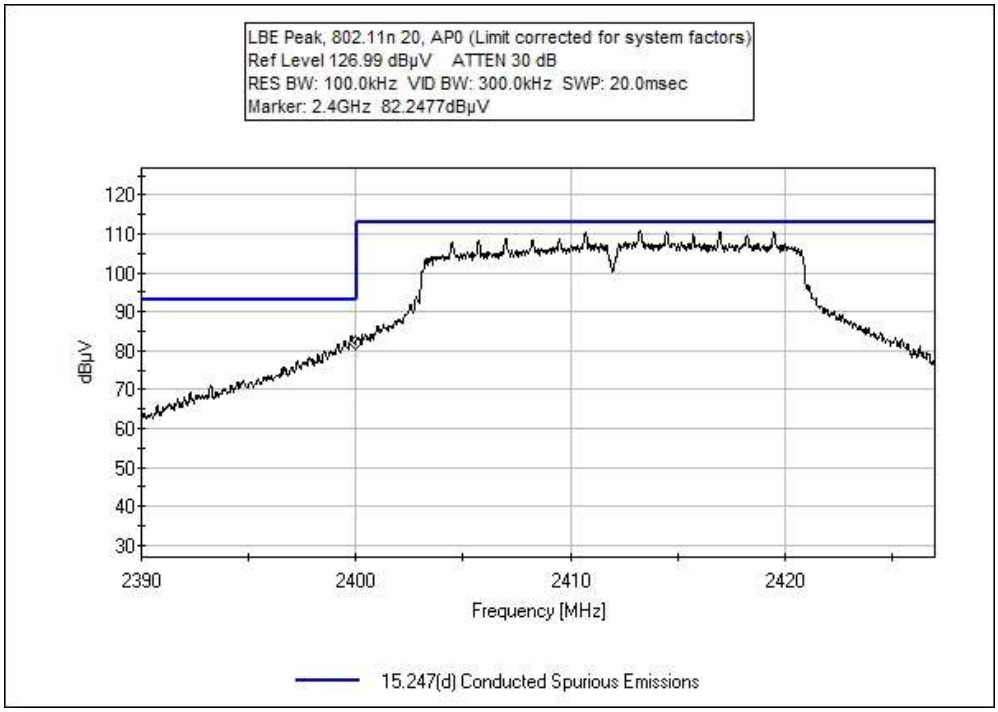


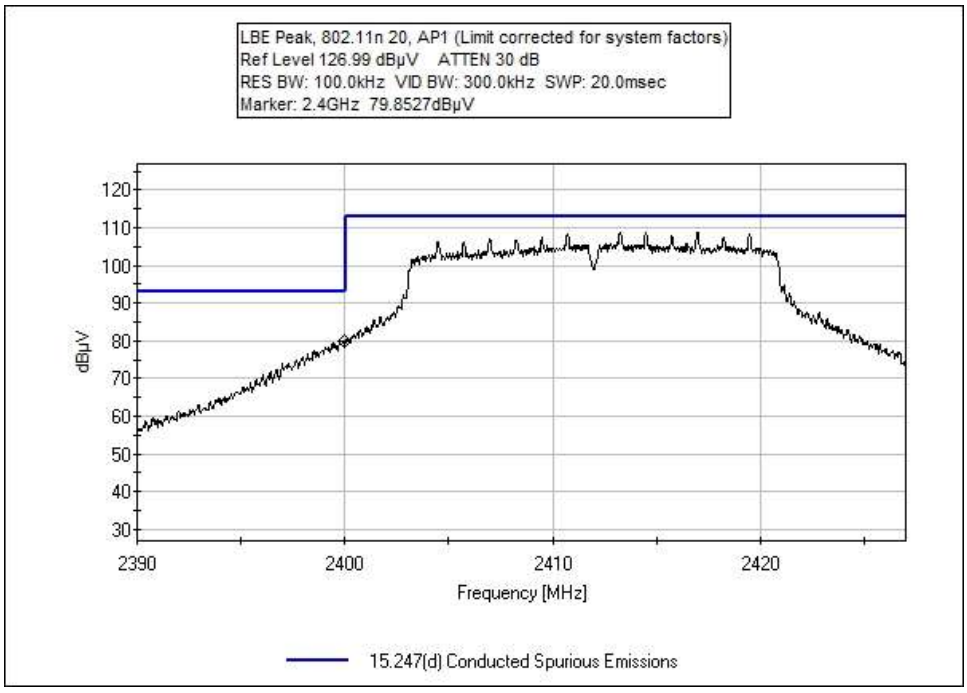


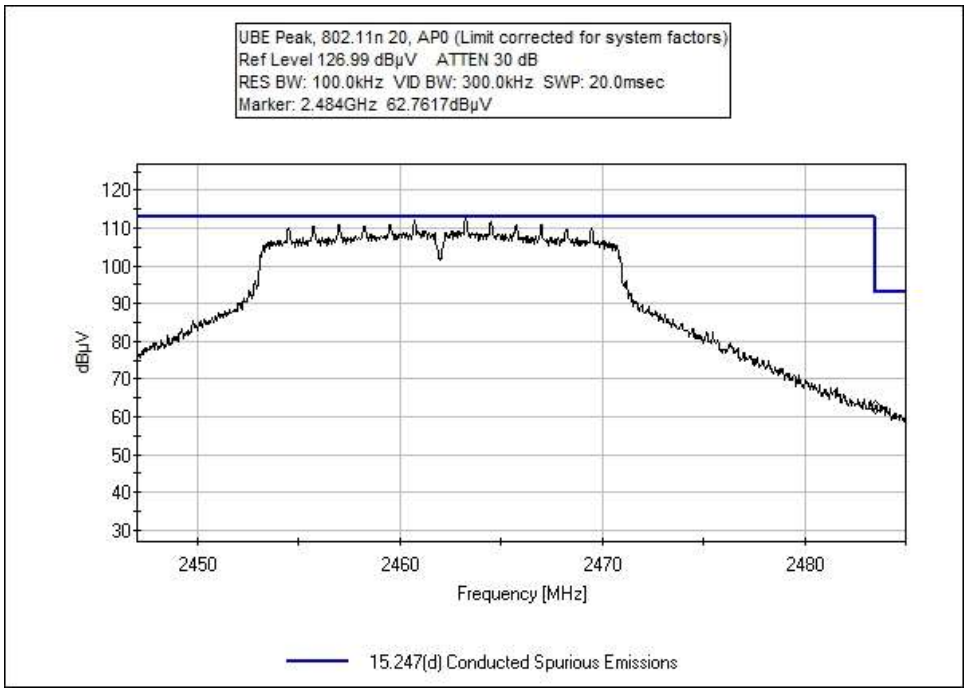

UBE Peak, 802.11g, AP0 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 2.484GHz 61.9117dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2450
2460
2470
2480
Frequency [MHz]
15.247(d) Conducted Spurious Emissions

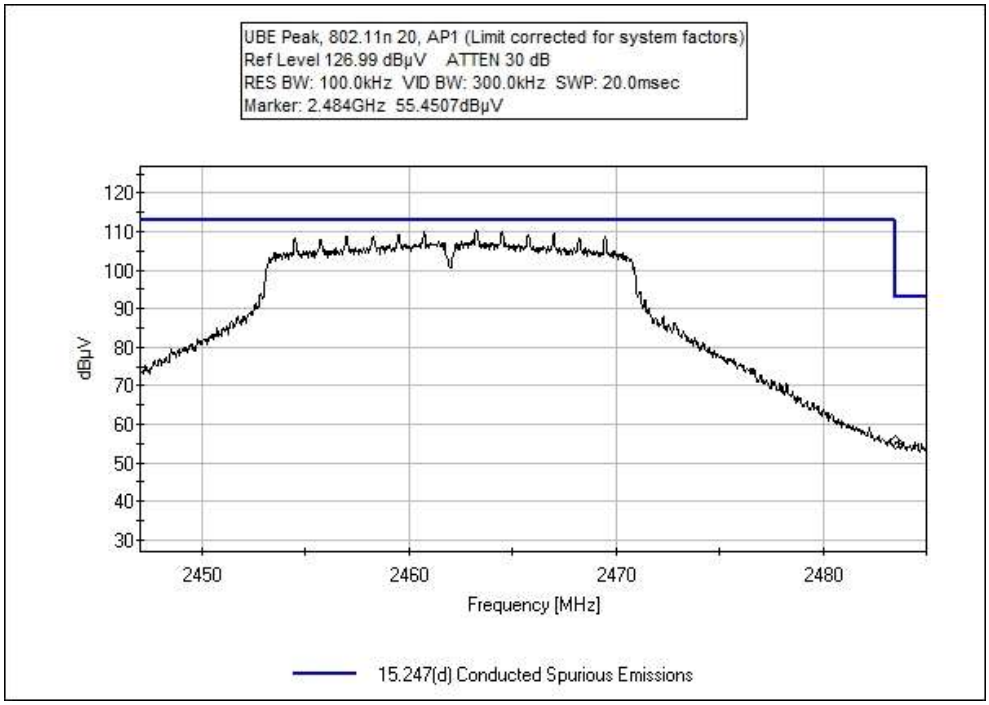

UBE Peak, 802.11g, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 2.484GHz 55.4837dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2450
2460
2470
2480
Frequency [MHz]
15.247(d) Conducted Spurious Emissions

802.11n20 Band Edge Plots

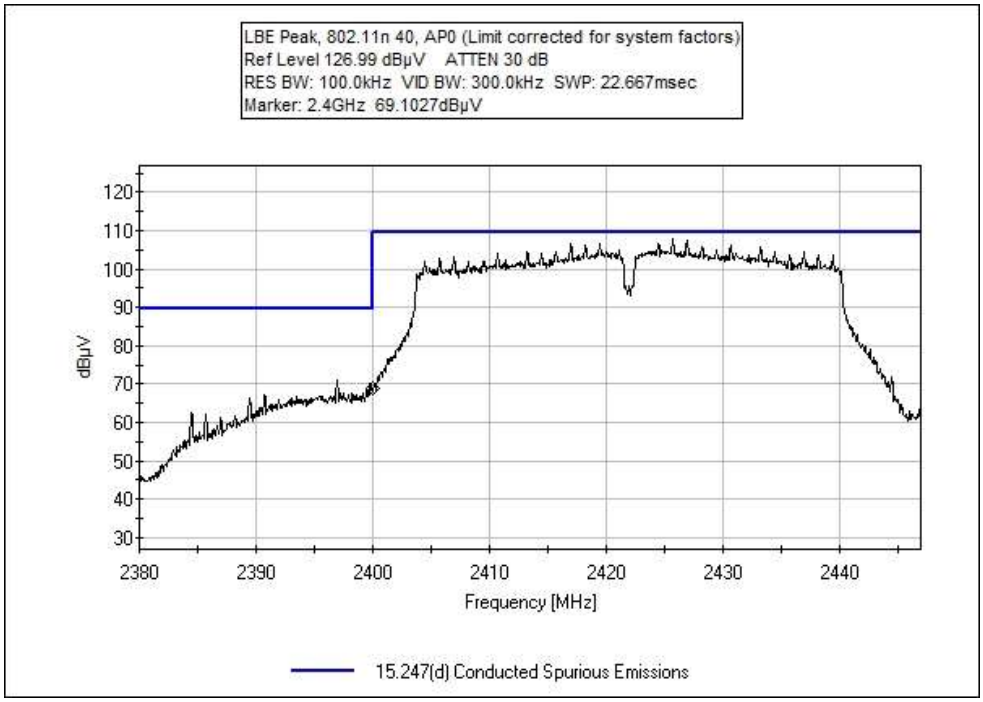


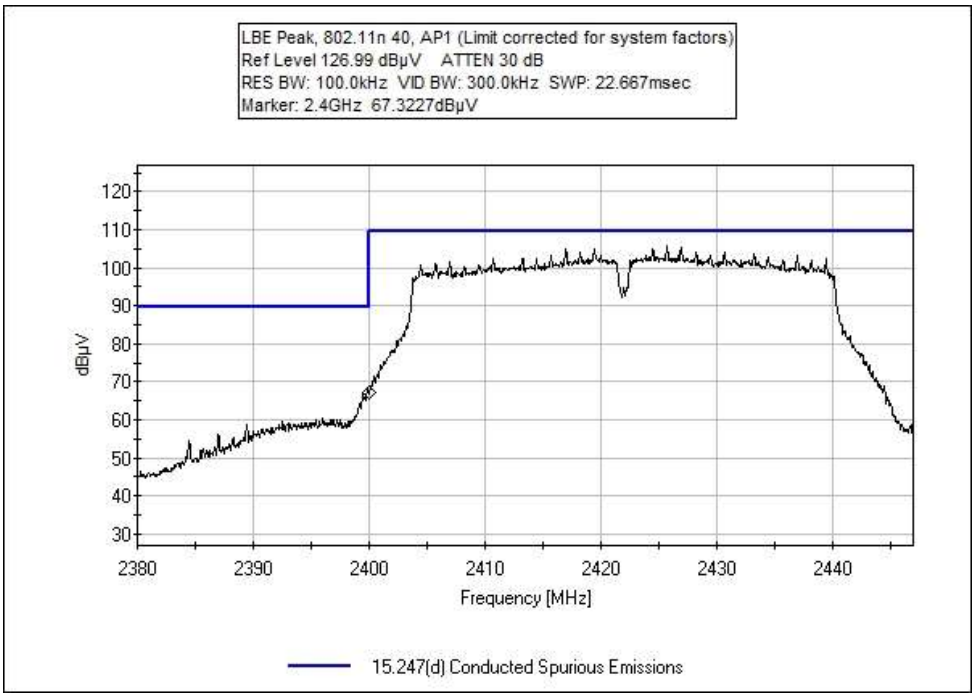


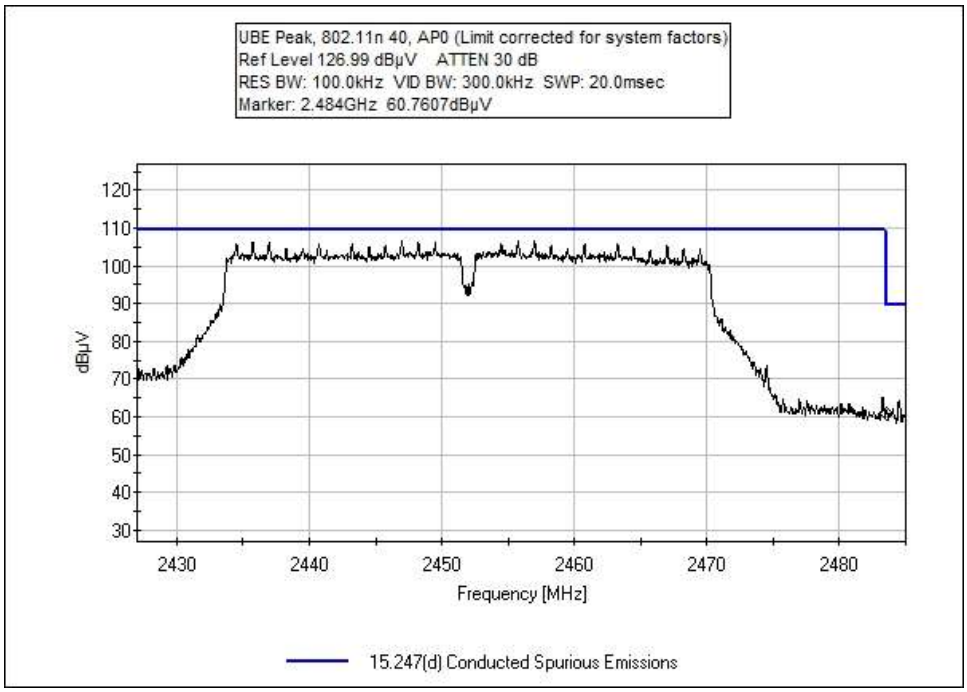

UBE Peak, 802.11n 20, AP0 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 2.484GHz 62.7617dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2450
2460
2470
2480
Frequency [MHz]
15.247(d) Conducted Spurious Emissions

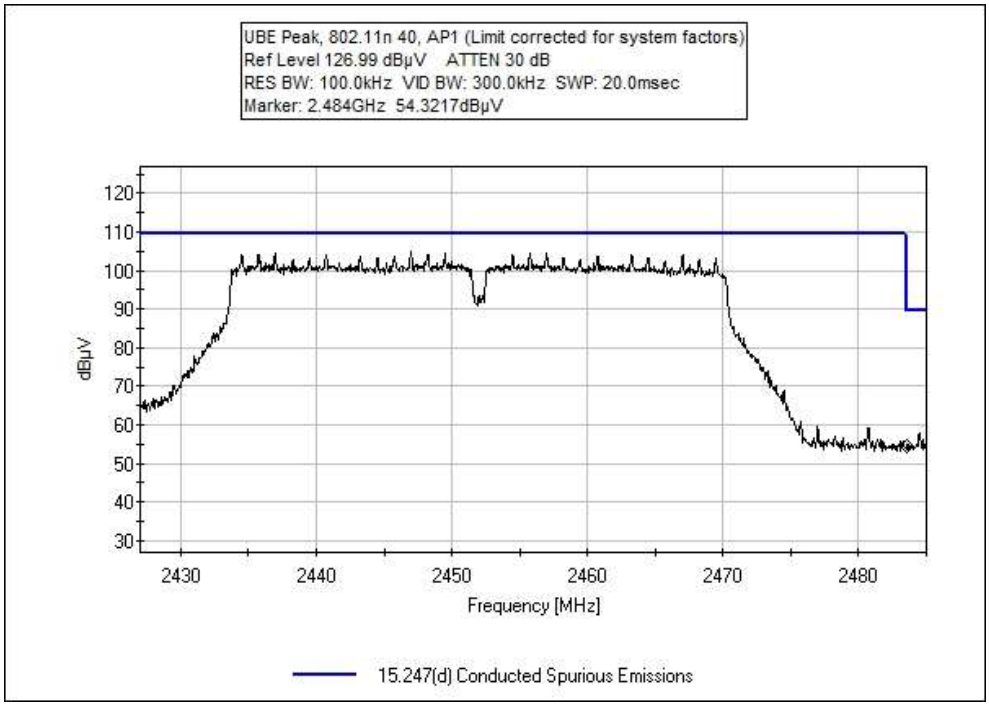

UBE Peak, 802.11n 20, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 2.484GHz 55.4507dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2450
2460
2470
2480
Frequency [MHz]
15.247(d) Conducted Spurious Emissions

802.11n40 Band Edge Plots






UBE Peak, 802.11n 40, AP0 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 2.484GHz 60.7607dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2430
2440
2450
2460
2470
2480
Frequency [MHz]
15.247(d) Conducted Spurious Emissions


UBE Peak, 802.11n 40, AP1 (Limit corrected for system factors)
Ref Level 126.99 dBµV ATTEN 30 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 2.484GHz 54.3217dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2430
2440
2450
2460
2470
2480
Frequency [MHz]
15.247(d) Conducted Spurious Emissions

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(d) Conducted Spurious Emissions**		
Work Order #:	**102802**	Date:	4/3/2020
Test Type:	**Conducted Emissions**	Time:	09:37:07
Tested By:	Matthew Harrison	Sequence#:	112
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: 28%
Pressure: 101.3 kPa
Frequency Range: 2.4-2483.5GHz
Frequency tested: 2412, 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 conducted measurements.
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	2400.000M	69.6					+0.0	69.6	96.0	-26.4	Anten
2	2400.000M	63.6					+0.0	63.6	96.0	-32.4	Anten
3	2483.500M	51.1					+0.0	51.1	96.0	-44.9	Anten
4	2483.500M	49.2					+0.0	49.2	96.0	-46.8	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:	4/3/2020
Test Type:	**Conducted Emissions**	Time:	10:10:52
Tested By:	Matthew Harrison	Sequence#:	113
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: 28%
Pressure: 101.3 kPa

Frequency Range: 9kHz-25GHz
Frequency tested: 2412, 2462
Firmware power setting: 13 dBm for Low Channel, 15 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 conducted measurements.
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
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	2400.000M	82.7	+0.0				+0.0	82.7	93.2	-10.5	Anten
2	2400.000M	79.8	+0.0				+0.0	79.8	93.2	-13.4	Anten
3	2483.500M	61.9	+0.0				+0.0	61.9	93.2	-31.3	Anten
4	2483.500M	55.5	+0.0				+0.0	55.5	93.2	-37.7	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:	4/3/2020
Test Type:	**Conducted Emissions**	Time:	10:51:11
Tested By:	Matthew Harrison	Sequence#:	114
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: 28%
Pressure: 101.3 kPa

Frequency Range: 9kHz-25GHz
Frequency tested: 2412, 2462
Firmware power setting: 12 dBm for Low Channel, 14 dBm for High Channel
EUT Firmware:
Protocol /MCS/Modulation: **802.11n,** 20MHz BW, MCS8 (worst-case)

KDB662911 (E)(3)(b) When testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding.

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 conducted measurements.
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	2400.000M	82.2					+0.0	82.2	93.2	-11.0	Anten
2	2400.000M	79.9					+0.0	79.9	93.2	-13.3	Anten
3	2483.500M	62.8					+0.0	62.8	93.2	-30.4	Anten
4	2483.500M	55.5					+0.0	55.5	93.2	-37.7	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:	4/3/2020
Test Type:	**Conducted Emissions**	Time:	11:20:41
Tested By:	Matthew Harrison	Sequence#:	115
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: 28%
Pressure: 101.3 kPa

Frequency Range: 9kHz-25GHz
Frequency tested: 2422, 2452
Firmware power setting: 11 dBm for Low Channel, 12 dBm for High Channel
EUT Firmware:
Protocol /MCS/Modulation: **802.11n**, 40MHz BW, MCS8 (worst-case)

KDB662911 (E)(3)(b) When testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding.

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 conducted measurements.
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
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	2400.000M	69.1	+0.0				+0.0	69.1	89.7	-20.6	Anten
2	2400.000M	67.3	+0.0				+0.0	67.3	89.7	-22.4	Anten
3	2483.500M	60.8	+0.0				+0.0	60.8	89.7	-28.9	Anten
4	2483.500M	54.3	+0.0				+0.0	54.3	89.7	-35.4	Anten

Test Setup Photo(s)

15.247(d) Radiated Emissions & Band Edge

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(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**102802**	Date:	4/2/2020
Test Type:	**Maximized Emissions**	Time:	15:10:06
Tested By:	Matthew Harrison	Sequence#:	5
Software:	EMITest 5.03.12		

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: 45%
Pressure: 101.3 kPa

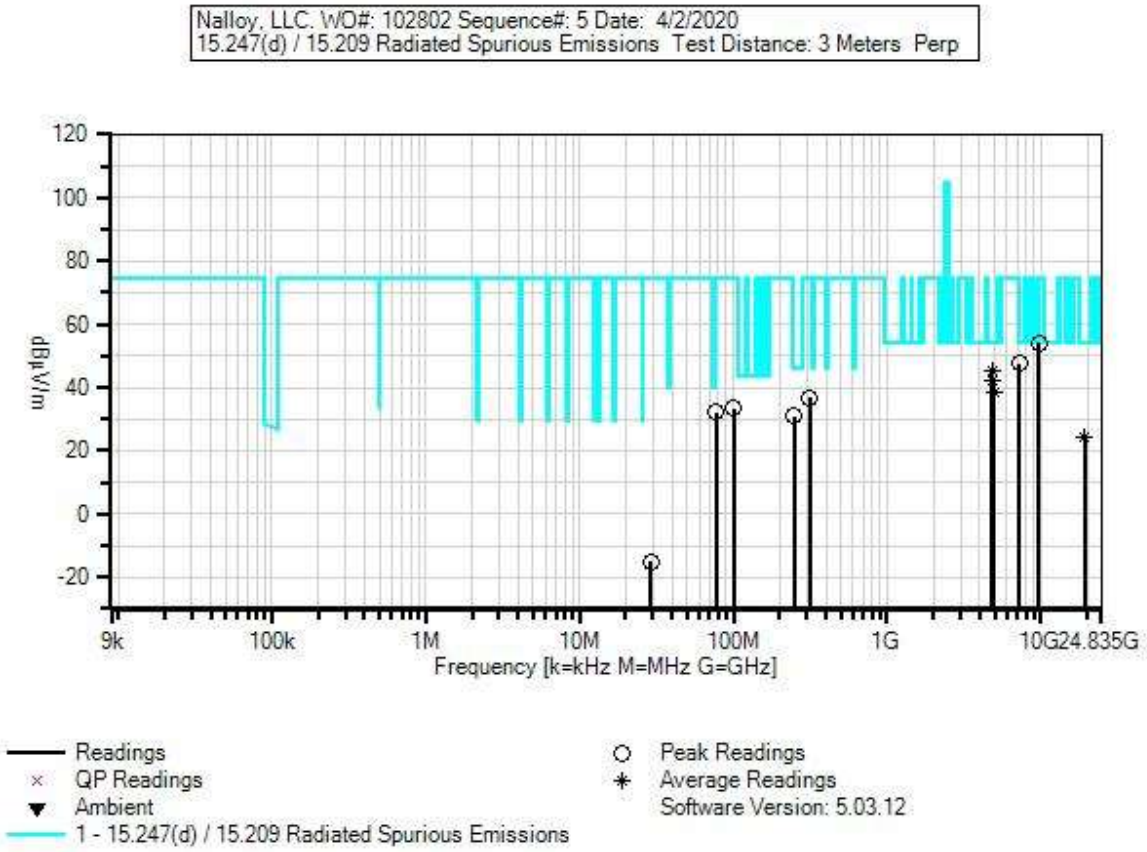
Frequency Range: 9kHz-25 GHz
Frequency tested: 2412, 2437, 2462 MHz
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11b, 1mbps (worst-case)**

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 1.5m high on a styrofoam table.
Modifications Added: None
Setup: EUT is connected to a Laptop via USB and Audio cable.

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


Nalloy, LLC. WO#: 102802 Sequence#: 5 Date: 4/2/2020
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp
120
100
80
60
40
20
0
-20
dBµV/m
9k
100k
1M
10M
100M
1G
10G24.835G
Frequency [k=kHz M=MHz G=GHz]
Readings
QP Readings
Ambient
1 - 15.247(d) / 15.209 Radiated Spurious Emissions
Peak Readings
Average Readings
Software Version: 5.03.12

Test Equipment:

ID	Asset #	Description	Model	Cal Date	Cal Due Date
T1	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T2	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T4	AN03540	Preamp	83017A	5/13/2019	5/13/2021
T5	ANP07504	Cable	CLU40-KMKM-02.00F	1/17/2019	1/17/2021
T6	AN03116	High Pass Filter	11SH10-00313	1/22/2019	1/22/2021
T7	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	10/16/2018	10/16/2020
T8	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T9	ANP06678	Cable	32026-29801-29801-144	2/20/2020	2/20/2022
T10	ANP07211	Cable	32026-29801-29801-18	8/7/2019	8/7/2021
T11	ANP07212	Cable	32026-29801-29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
T12	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T13	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T14	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T15	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T16	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T17	AN00052	Loop Antenna	6502	5/7/2018	5/7/2020

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9 T13 T17	T2 T6 T10 T14	T3 T7 T11 T15	T4 T8 T12 T16	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	4823.820M Ave	40.3	+32.4 +0.5 +0.0 +0.0 +0.0	+4.1 +0.6 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	45.2	54.0	-8.8	Horiz
^	4823.820M	46.6	+32.4 +0.5 +0.0 +0.0 +0.0	+4.1 +0.6 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	51.5	54.0	-2.5	Horiz
3	4874.000M Ave	37.3	+32.5 +0.5 +0.0 +0.0 +0.0	+4.2 +0.6 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	42.4	54.0	-11.6	Horiz
^	4874.000M	43.8	+32.5 +0.5 +0.0 +0.0 +0.0	+4.2 +0.6 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	48.9	54.0	-5.1	Horiz

5	250.100M	37.9	+0.0 +0.0 +0.0 +12.2 +0.0	+0.0 +0.0 +0.0 +5.8	+0.2 +0.0 +0.0 +0.8	+0.0 +0.0 -27.0 +1.0	+0.0	30.9	46.0	-15.1	Horiz
6	4924.000M Ave	33.5	+32.6 +0.5 +0.0 +0.0 +0.0	+4.2 +0.5 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	38.6	54.0	-15.4	Horiz
^	4924.000M	41.3	+32.6 +0.5 +0.0 +0.0 +0.0	+4.2 +0.5 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	46.4	54.0	-7.6	Horiz
8	9648.280M	41.5	+37.6 +0.5 +0.0 +0.0 +0.0	+6.2 +0.9 +0.0 +0.0	+1.3 +0.0 +0.0 +0.0	-33.9 +0.0 +0.0 +0.0	+0.0	54.1	74.6	-20.5	Horiz
9	7236.000M	37.8	+36.6 +0.5 +0.0 +0.0 +0.0	+5.3 +0.7 +0.0 +0.0	+1.1 +0.0 +0.0 +0.0	-34.5 +0.0 +0.0 +0.0	+0.0	47.5	74.6	-27.1	Horiz
10	19296.000 M Ave	25.0	+0.0 +0.0 +8.9 +0.0 +0.0	+0.0 +0.0 +0.9 +0.0	+0.0 -13.0 +1.0 +0.0	+0.0 +1.8 +0.0 +0.0	+0.0	24.6	54.0	-29.4	Horiz
^	19296.000 M	38.4	+0.0 +0.0 +8.9 +0.0 +0.0	+0.0 +0.0 +0.9 +0.0	+0.0 -13.0 +1.0 +0.0	+0.0 +1.8 +0.0 +0.0	+0.0	38.0	54.0	-16.0	Horiz
12	315.700M	41.9	+0.0 +0.0 +0.0 +13.9 +0.0	+0.0 +0.0 +0.0 +5.8	+0.2 +0.0 +0.0 +0.9	+0.0 +0.0 -27.1 +1.1	+0.0	36.7	74.6	-37.9	Horiz
13	100.500M	46.0	+0.0 +0.0 +0.0 +8.1 +0.0	+0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.5	+0.0 +0.0 -27.7 +0.6	+0.0	33.4	74.6	-41.2	Horiz
14	77.300M	46.4	+0.0 +0.0 +0.0 +6.9 +0.0	+0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.4	+0.0 +0.0 -27.8 +0.5	+0.0	32.3	74.6	-42.3	Horiz

15	29.075M	18.6	+0.0 +0.0 +0.0 +0.0 +5.8	+0.3 +0.0 +0.0 +0.0	+0.1 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-40.0	-15.2	74.6	-89.8	Perp
16	75.130k	39.6	+0.0 +0.0 +0.0 +0.0 +9.7	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-80.0	-30.7	74.6	-105.3	Perp

Test Location:	CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Nalloy, LLC.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**102802**	Date:	4/2/2020
Test Type:	**Maximized Emissions**	Time:	15:17:52
Tested By:	Matthew Harrison	Sequence#:	6
Software:	EMITest 5.03.12		

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: 45%
Pressure: 101.3 kPa

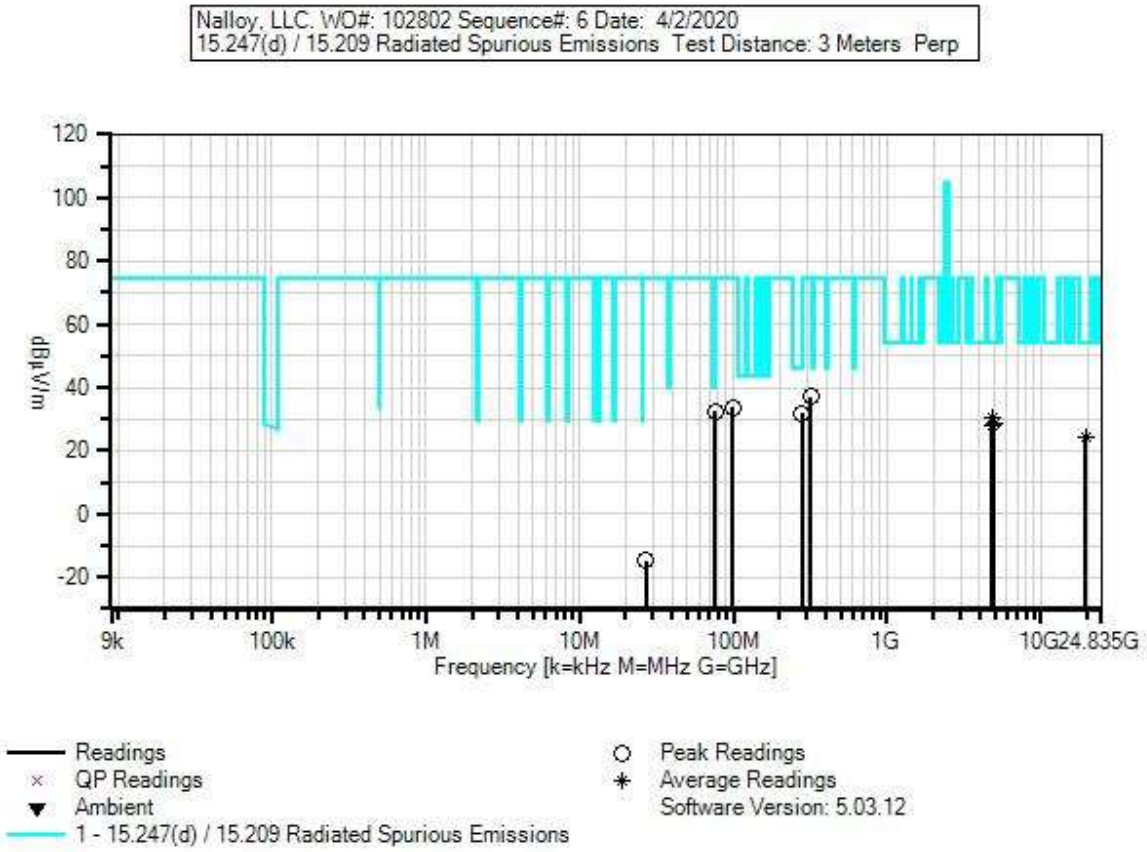
Frequency Range: 9kHz-25GHz
Frequency tested: 2412, 2437, 2462
Firmware power setting: 13 dBm for Low Chanel, 15 dBm for Mid and High Channels
EUT Firmware:
Protocol /MCS/Modulation: **802.11g, 6 mbps (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup 1.5m high on a styrofoam table.
Modifications Added: None
Setup: EUT is connected to a Laptop via USB and Audio cable.

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


Nalloy, LLC. WO#: 102802 Sequence#: 6 Date: 4/2/2020
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp
120
100
80
60
40
20
0
-20
dBµV/m
9k
100k
1M
10M
100M
1G
10G24.835G
Frequency [k=kHz M=MHz G=GHz]
Readings
QP Readings
Ambient
1 - 15.247(d) / 15.209 Radiated Spurious Emissions
Peak Readings
Average Readings
Software Version: 5.03.12

Test Equipment:

ID	Asset #	Description	Model	Cal Date	Cal Due Date
T1	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T2	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T4	AN03540	Preamp	83017A	5/13/2019	5/13/2021
T5	ANP07504	Cable	CLU40-KMKM-02.00F	1/17/2019	1/17/2021
T6	AN03116	High Pass Filter	11SH10-00313	1/22/2019	1/22/2021
T7	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	10/16/2018	10/16/2020
T8	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T9	ANP06678	Cable	32026-29801-29801-144	2/20/2020	2/20/2022
T10	ANP07211	Cable	32026-29801-29801-18	8/7/2019	8/7/2021
T11	ANP07212	Cable	32026-29801-29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
T12	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T13	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T14	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T15	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T16	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T17	AN00052	Loop Antenna	6502	5/7/2018	5/7/2020

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9 T13 T17	T2 T6 T10 T14	T3 T7 T11 T15	T4 T8 T12 T16	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	277.100M	38.2	+0.0 +0.0 +0.0 +12.7 +0.0	+0.0 +0.0 +0.0 +5.8	+0.2 +0.0 +0.0 +0.8	+0.0 +0.0 -27.0 +1.0	+0.0	31.7	46.0	-14.3	Horiz
2	4824.000M Ave	25.9	+32.4 +0.5 +0.0 +0.0 +0.0	+4.1 +0.6 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	30.8	54.0	-23.2	Horiz
^	4824.000M	41.4	+32.4 +0.5 +0.0 +0.0 +0.0	+4.1 +0.6 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	46.3	54.0	-7.7	Horiz

4	4924.000M Ave	23.5	+32.6 +0.5 +0.0 +0.0 +0.0	+4.2 +0.5 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	28.6	54.0	-25.4	Horiz
^	4924.000M	39.7	+32.6 +0.5 +0.0 +0.0 +0.0	+4.2 +0.5 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	44.8	54.0	-9.2	Horiz
6	4874.000M Ave	23.1	+32.5 +0.5 +0.0 +0.0 +0.0	+4.2 +0.6 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	28.2	54.0	-25.8	Horiz
^	4874.000M	37.5	+32.5 +0.5 +0.0 +0.0 +0.0	+4.2 +0.6 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	42.6	54.0	-11.4	Horiz
8	19496.000 M Ave	24.4	+0.0 +0.0 +9.0 +0.0 +0.0	+0.0 +0.0 +1.0 +0.0	+0.0 -12.9 +0.8 +0.0	+0.0 +1.8 +0.0 +0.0	+0.0	24.1	54.0	-29.9	Horiz
^	19496.000 M	36.5	+0.0 +0.0 +9.0 +0.0 +0.0	+0.0 +0.0 +1.0 +0.0	+0.0 -12.9 +0.8 +0.0	+0.0 +1.8 +0.0 +0.0	+0.0	36.2	54.0	-17.8	Horiz
10	319.600M	42.2	+0.0 +0.0 +0.0 +14.1 +0.0	+0.0 +0.0 +0.0 +5.8	+0.2 +0.0 +0.0 +0.9	+0.0 +0.0 -27.1 +1.1	+0.0	37.2	74.6	-37.4	Horiz
11	98.500M	46.4	+0.0 +0.0 +0.0 +8.0 +0.0	+0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.5	+0.0 +0.0 -27.7 +0.6	+0.0	33.7	74.6	-40.9	Vert

12	76.400M	46.7	+0.0 +0.0 +0.0 +6.9 +0.0	+0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.4	+0.0 +0.0 -27.8 +0.5	+0.0	32.6	74.6	-42.0	Vert
13	27.015M	18.4	+0.0 +0.0 +0.0 +0.0 +6.4	+0.3 +0.0 +0.0 +0.0	+0.1 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-40.0	-14.8	74.6	-89.4	Perp
14	54.120k	39.2	+0.0 +0.0 +0.0 +0.0 +10.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-80.0	-30.8	74.6	-105.4	Perp

Test Location:	CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Nalloy, LLC.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**102802**	Date:	4/2/2020
Test Type:	**Maximized Emissions**	Time:	15:24:41
Tested By:	Matthew Harrison	Sequence#:	7
Software:	EMITest 5.03.12		

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: 45%
Pressure: 101.3 kPa

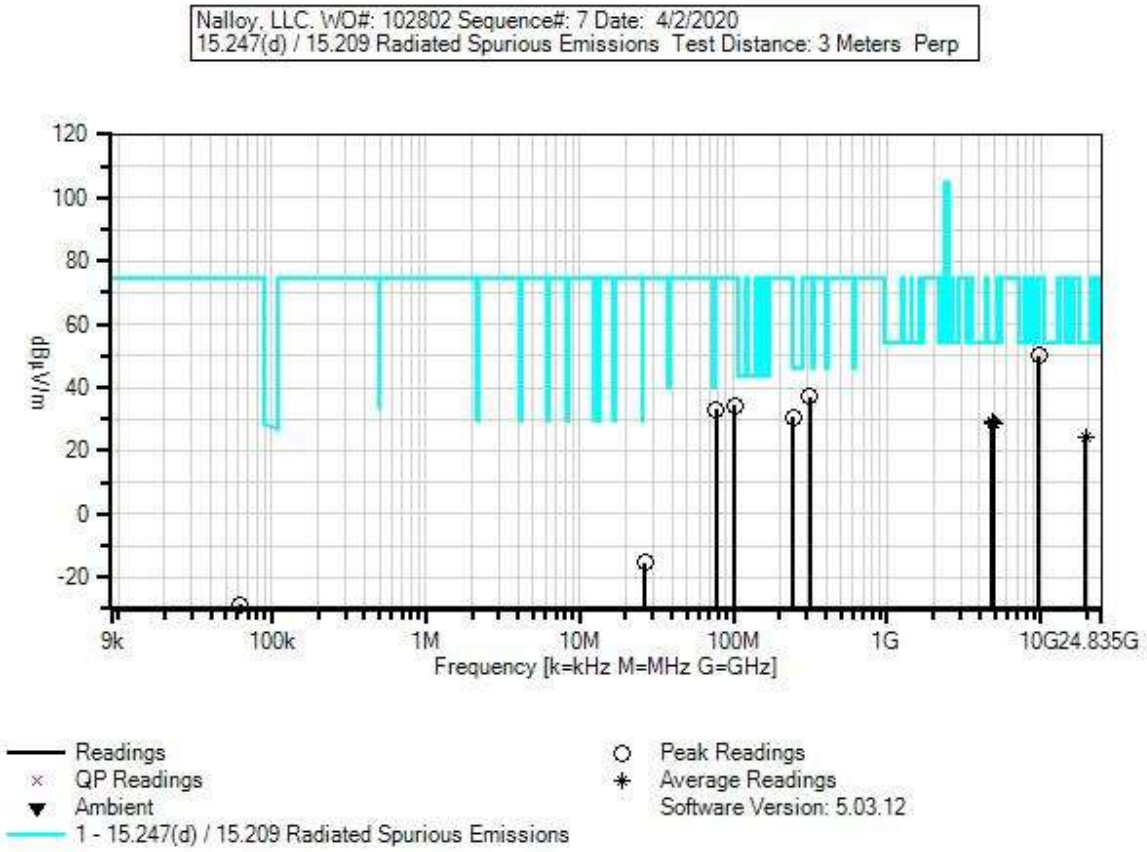
Frequency Range: 9kHz-25GHz
Frequency tested: 2412, 2437, 2462
Firmware power setting: 12 dBm for Low Channel, 14 dBm for Mid and High Channels
EUT Firmware:
Protocol /MCS/Modulation: **802.11n, 20MHz BW, MCS8 (worst-case)**

Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup 1.5m high on a styrofoam table.
Modifications Added: None
Setup: EUT is connected to a Laptop via USB and Audio cable.

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


Nalloy, LLC. WO#: 102802 Sequence#: 7 Date: 4/2/2020
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp
120
100
80
60
40
20
0
-20
dBµV/m
9k
100k
1M
10M
100M
1G
10G24.835G
Frequency [k=kHz M=MHz G=GHz]
Readings
QP Readings
Ambient
1 - 15.247(d) / 15.209 Radiated Spurious Emissions
Peak Readings
Average Readings
Software Version: 5.03.12

Test Equipment:

ID	Asset #	Description	Model	Cal Date	Cal Due Date
T1	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T2	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T4	AN03540	Preamp	83017A	5/13/2019	5/13/2021
T5	ANP07504	Cable	CLU40-KMKM-02.00F	1/17/2019	1/17/2021
T6	AN03116	High Pass Filter	11SH10-00313	1/22/2019	1/22/2021
T7	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	10/16/2018	10/16/2020
T8	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T9	ANP06678	Cable	32026-29801-29801-144	2/20/2020	2/20/2022
T10	ANP07211	Cable	32026-29801-29801-18	8/7/2019	8/7/2021
T11	ANP07212	Cable	32026-29801-29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
T12	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T13	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T14	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T15	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T16	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T17	AN00052	Loop Antenna	6502	5/7/2018	5/7/2020

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9 T13 T17	T2 T6 T10 T14	T3 T7 T11 T15	T4 T8 T12 T16	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	245.300M	38.1	+0.0 +0.0 +0.0 +12.0 +0.0	+0.0 +0.0 +0.0 +5.8	+0.2 +0.0 +0.0 +0.8	+0.0 +0.0 -27.1 +1.0	+0.0	30.8	46.0	-15.2	Horiz
2	9748.120M	37.7	+37.5 +0.4 +0.0 +0.0 +0.0	+6.3 +0.7 +0.0 +0.0	+1.3 +0.0 +0.0 +0.0	-33.9 +0.0 +0.0 +0.0	+0.0	50.0	74.6	-24.6	Horiz
3	4824.000M Ave	24.1	+32.4 +0.5 +0.0 +0.0 +0.0	+4.1 +0.6 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	29.0	54.0	-25.0	Horiz
^	4824.000M	39.3	+32.4 +0.5 +0.0 +0.0 +0.0	+4.1 +0.6 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	44.2	54.0	-9.8	Horiz

5	4924.000M Ave	23.5	+32.6 +0.5 +0.0 +0.0 +0.0	+4.2 +0.5 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	28.6	54.0	-25.4	Horiz
^	4924.000M	39.2	+32.6 +0.5 +0.0 +0.0 +0.0	+4.2 +0.5 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	44.3	54.0	-9.7	Horiz
7	4874.000M Ave	23.4	+32.5 +0.5 +0.0 +0.0 +0.0	+4.2 +0.6 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	28.5	54.0	-25.5	Horiz
^	4874.000M	38.5	+32.5 +0.5 +0.0 +0.0 +0.0	+4.2 +0.6 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	43.6	54.0	-10.4	Horiz
9	19496.000 M Ave	24.3	+0.0 +0.0 +9.0 +0.0 +0.0	+0.0 +0.0 +1.0 +0.0	+0.0 -12.9 +0.8 +0.0	+0.0 +1.8 +0.0 +0.0	+0.0	24.0	54.0	-30.0	Horiz
^	19496.000 M	36.1	+0.0 +0.0 +9.0 +0.0 +0.0	+0.0 +0.0 +1.0 +0.0	+0.0 -12.9 +0.8 +0.0	+0.0 +1.8 +0.0 +0.0	+0.0	35.8	54.0	-18.2	Horiz
11	314.700M	42.5	+0.0 +0.0 +0.0 +13.8 +0.0	+0.0 +0.0 +0.0 +5.8	+0.2 +0.0 +0.0 +0.9	+0.0 +0.0 -27.1 +1.1	+0.0	37.2	74.6	-37.4	Horiz
12	101.400M	47.0	+0.0 +0.0 +0.0 +8.1 +0.0	+0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.5	+0.0 +0.0 -27.7 +0.6	+0.0	34.4	74.6	-40.2	Vert

13	77.300M	47.2	+0.0 +0.0 +0.0 +6.9 +0.0	+0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.4	+0.0 +0.0 -27.8 +0.5	+0.0	33.1	74.6	-41.5	Vert
14	26.627M	17.7	+0.0 +0.0 +0.0 +0.0 +6.5	+0.3 +0.0 +0.0 +0.0	+0.1 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-40.0	-15.4	74.6	-90.0	Perp
15	62.580k	41.7	+0.0 +0.0 +0.0 +0.0 +9.7	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-80.0	-28.6	74.6	-103.2	Perp

Test Location:	CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Nalloy, LLC.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**102802**	Date:	4/2/2020
Test Type:	**Maximized Emissions**	Time:	15:29:31
Tested By:	Matthew Harrison	Sequence#:	8
Software:	EMITest 5.03.12		

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: 45%
Pressure: 101.3 kPa

Frequency Range: 9kHz-25GHz
Frequency tested: 2422, 2437, 2452
Firmware power setting: 11 dBm for Low Channel, 14dBm for Mid Channel, 12 dBm for High Channel
EUT Firmware:
Protocol /MCS/Modulation: **802.11n, 40MHz BW, MCS8 (worst-case)**

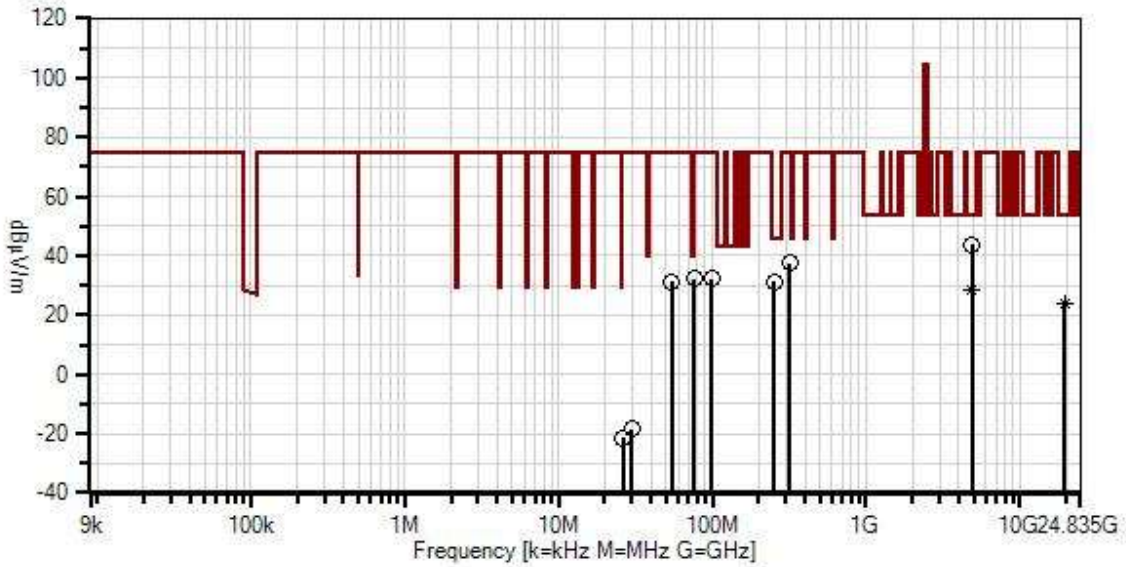
Antenna type: Linear Polarized
Antenna Gain : 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013
Test Mode: Transmitting
Test Setup: EUT is setup 1.5m high on a styrofoam table.
Modifications Added: None
Setup: EUT is connected to a Laptop via USB and Audio cable.

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

Nalloy, LLC. WO#: 102802 Sequence#: 8 Date: 4/2/2020
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp



Readings
QP Readings
Ambient
1 - 15.247(d) / 15.209 Radiated Spurious Emissions
Peak Readings
Average Readings
Software Version: 5.03.12

Test Equipment:

ID	Asset #	Description	Model	Cal Date	Cal Due Date
T1	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T2	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T4	AN03540	Preamp	83017A	5/13/2019	5/13/2021
T5	ANP07504	Cable	CLU40-KMKM-02.00F	1/17/2019	1/17/2021
T6	AN03116	High Pass Filter	11SH10-00313	1/22/2019	1/22/2021
T7	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	10/16/2018	10/16/2020
T8	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T9	ANP06678	Cable	32026-29801-29801-144	2/20/2020	2/20/2022
T10	ANP07211	Cable	32026-29801-29801-18	8/7/2019	8/7/2021
T11	ANP07212	Cable	32026-29801-29801-18	8/7/2019	8/7/2021
T12	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
T13	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T14	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T15	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T16	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T17	ANP05360	Cable	RG214	2/3/2020	2/3/2022
	AN00052	Loop Antenna	6502	5/7/2018	5/7/2020

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9 T13 T17	T2 T6 T10 T14	T3 T7 T11 T15	T4 T8 T12 T16	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	4851.850M	38.8	+32.4 +0.5 +0.0 +0.0 +0.0	+4.1 +0.6 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	43.7	54.0	-10.3	Horiz
2	253.000M	38.2	+0.0 +0.0 +0.0 -27.0 +1.0	+0.0 +0.0 +0.0 +12.3	+0.2 +0.0 +0.0 +5.8	+0.0 +0.0 +0.0 +0.8	+0.0	31.3	46.0	-14.7	Horiz
3	4904.000M Ave	23.5	+32.5 +0.5 +0.0 +0.0 +0.0	+4.2 +0.5 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	28.5	54.0	-25.5	Horiz
^	4904.000M	39.3	+32.5 +0.5 +0.0 +0.0 +0.0	+4.2 +0.5 +0.0 +0.0	+0.9 +0.0 +0.0 +0.0	-33.6 +0.0 +0.0 +0.0	+0.0	44.3	54.0	-9.7	Horiz

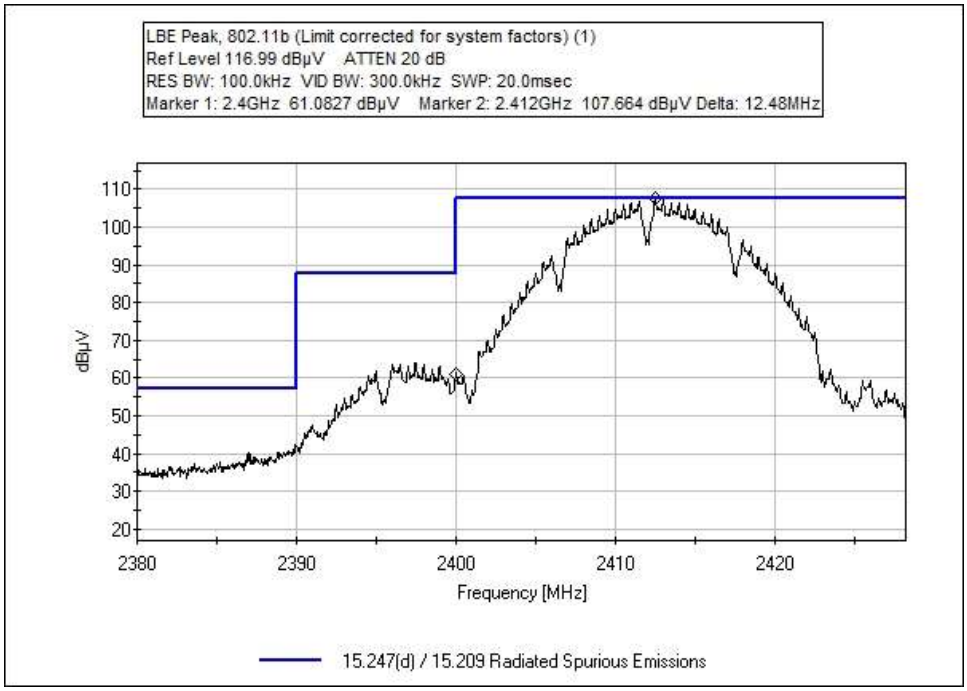
5	4874.000M	23.1	+32.5	+4.2	+0.9	-33.6	+0.0	28.2	54.0	-25.8	Horiz
	Ave		+0.5	+0.6	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
6	4844.000M	23.3	+32.4	+4.1	+0.9	-33.6	+0.0	28.2	54.0	-25.8	Horiz
	Ave		+0.5	+0.6	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	4844.000M	38.6	+32.4	+4.1	+0.9	-33.6	+0.0	43.5	54.0	-10.5	Horiz
			+0.5	+0.6	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
8	19496.000	24.3	+0.0	+0.0	+0.0	+0.0	+0.0	24.0	54.0	-30.0	Horiz
	M		+0.0	+0.0	-12.9	+1.8					
	Ave		+9.0	+1.0	+0.8	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	19496.000	36.0	+0.0	+0.0	+0.0	+0.0	+0.0	35.7	54.0	-18.3	Horiz
	M		+0.0	+0.0	-12.9	+1.8					
			+9.0	+1.0	+0.8	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
10	318.600M	42.7	+0.0	+0.0	+0.2	+0.0	+0.0	37.6	74.6	-37.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			-27.1	+14.0	+5.8	+0.9					
			+1.1								
11	98.500M	45.1	+0.0	+0.0	+0.1	+0.0	+0.0	32.4	74.6	-42.2	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			-27.7	+8.0	+5.8	+0.5					
			+0.6								
12	76.400M	46.3	+0.0	+0.0	+0.1	+0.0	+0.0	32.2	74.6	-42.4	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			-27.8	+6.9	+5.8	+0.4					
			+0.5								
13	54.200M	44.8	+0.0	+0.0	+0.1	+0.0	+0.0	31.1	74.6	-43.5	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			-27.9	+7.5	+5.8	+0.4					
			+0.4								
14	29.881M	21.2	+0.0	+0.3	+0.1	+0.0	-40.0	-18.4	74.6	-93.0	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

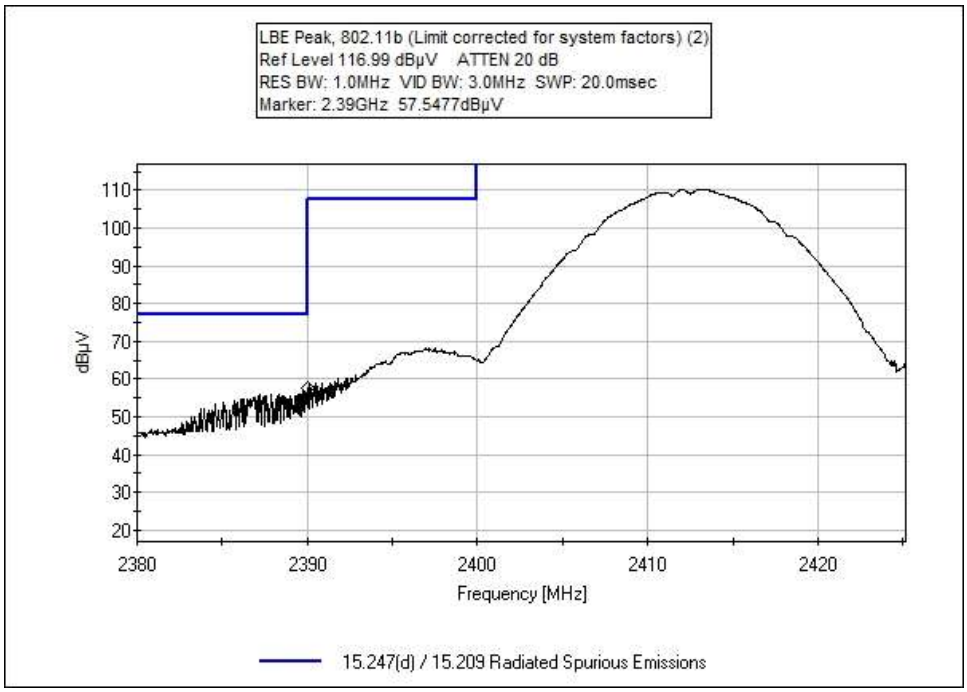
15	26.209M	18.2	+0.0 +0.0 +0.0 +0.0 +0.0	+0.3 +0.0 +0.0 +0.0	+0.1 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-40.0	-21.4	74.6	-96.0	Perp
16	62.580k	39.6	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-80.0	-40.4	74.6	-115.0	Perp

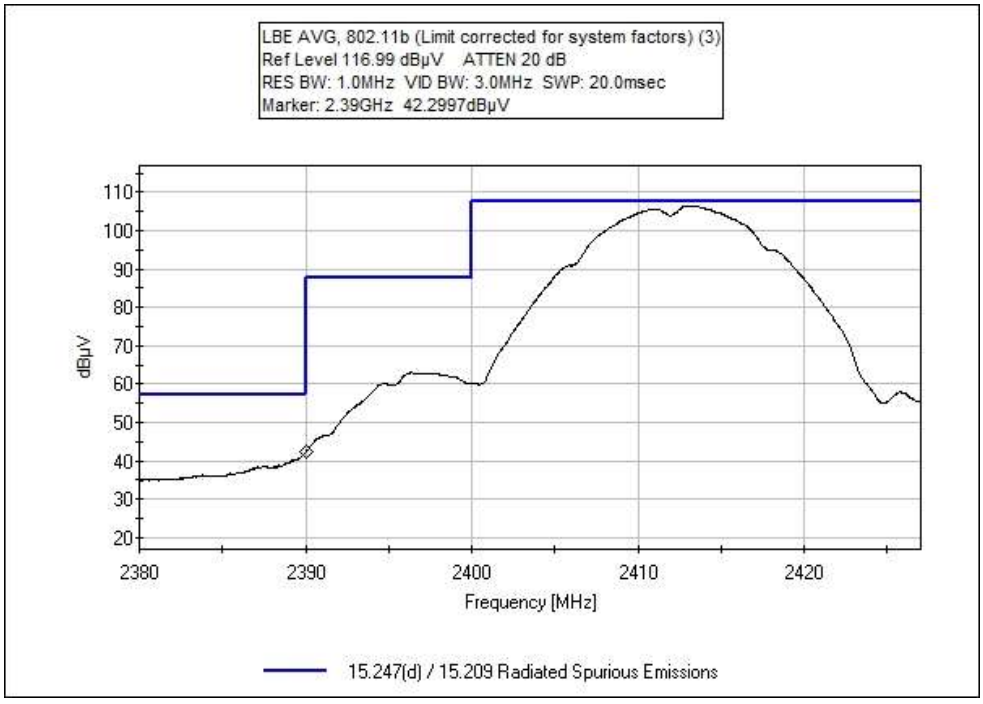
Band Edge

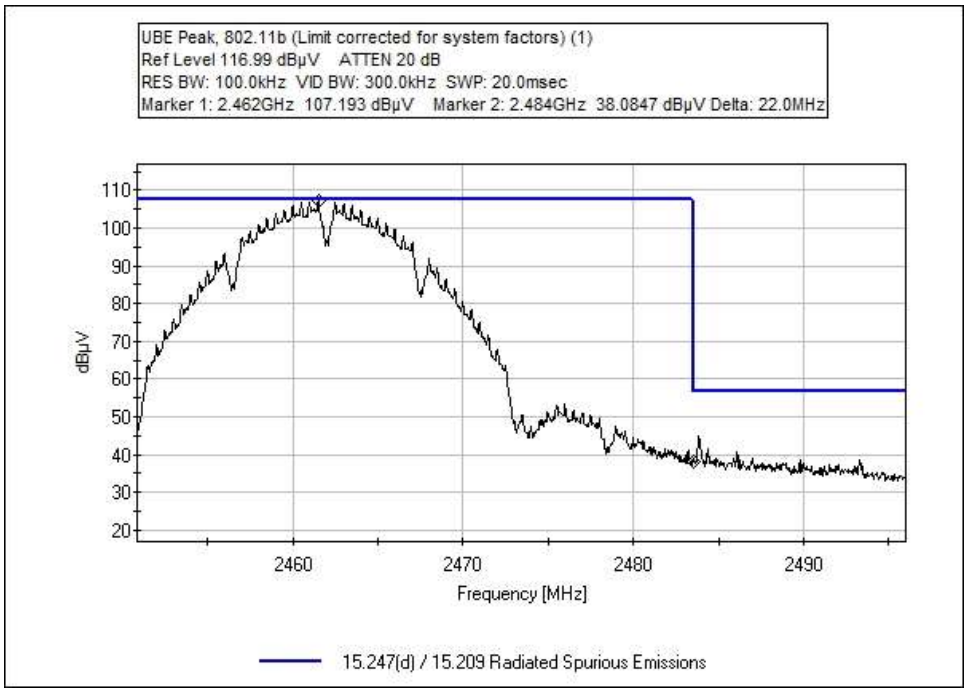
Band Edge Summary					
Frequency (MHz)	**Modulation**	**Ant. Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
2390.0	OOK	Linear Polarized	39.2	<54	Pass
2400.0	OOK	Linear Polarized	58	<84.6	Pass
2483.5	OOK	Linear Polarized	36.7	<54	Pass
2390.0	OFDM	Linear Polarized	50.2	<54	Pass
2400.0	OFDM	Linear Polarized	66.8	<82	Pass
2483.5	OFDM	Linear Polarized	48.2	<54	Pass
2390.0	MCS (20M)	Linear Polarized	49.2	<54	Pass
2400.0	MCS (20M)	Linear Polarized	70.6	<82.6	Pass
2483.5	MCS (20M)	Linear Polarized	48.9	<54	Pass
2390.0	MCS (40M)	Linear Polarized	49.7	<54	Pass
2400.0	MCS (40M)	Linear Polarized	66	<79.2	Pass
2483.5	MCS (40M)	Linear Polarized	49.4	<54	Pass

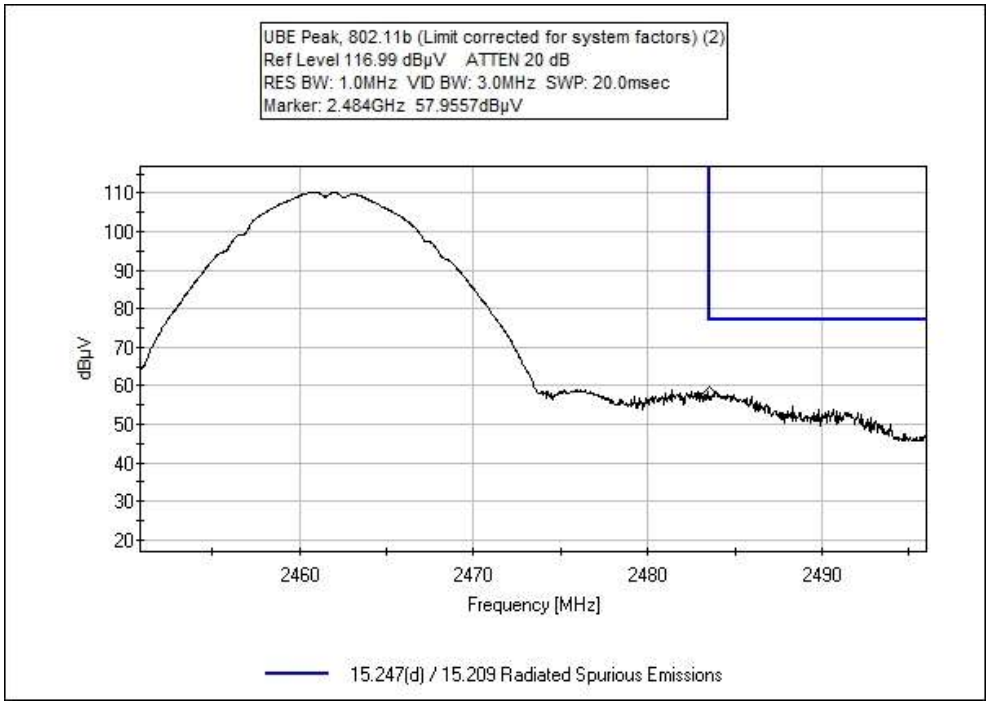
802.11b Band Edge Plots

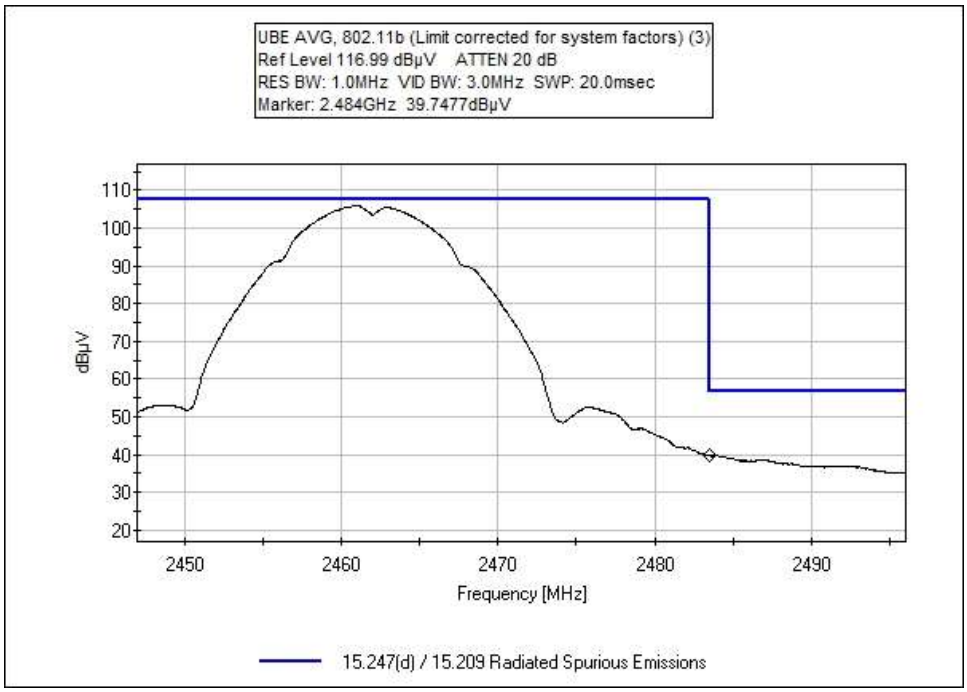



LBE Peak, 802.11b (Limit corrected for system factors) (2)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 20.0msec
Marker: 2.39GHz 57.5477dBµV
dBµV
110
100
90
80
70
60
50
40
30
20
2380
2390
2400
2410
2420
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

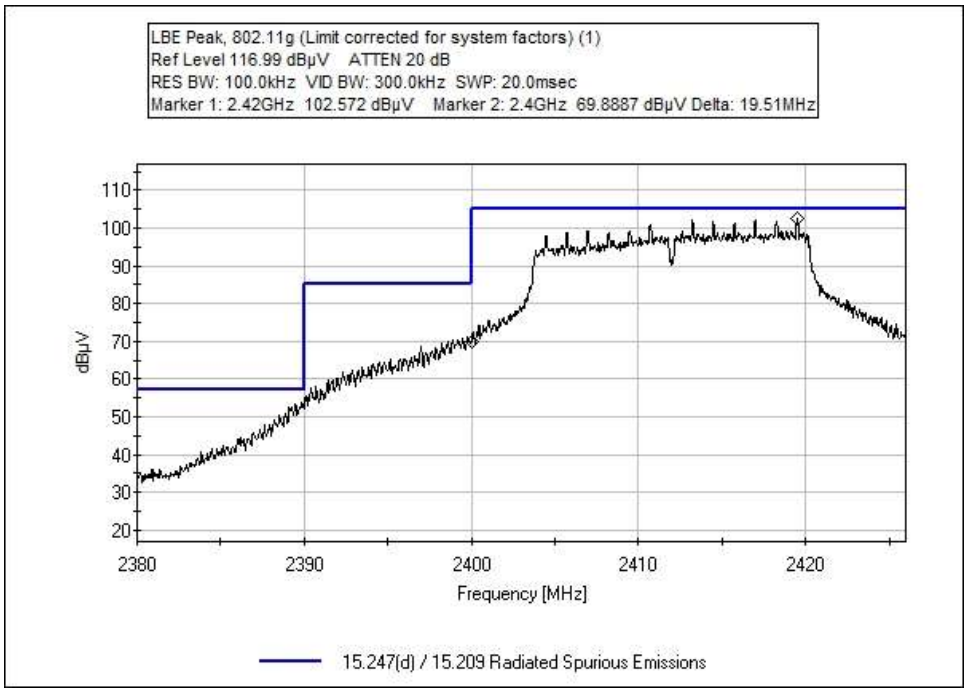

LBE AVG, 802.11b (Limit corrected for system factors) (3)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 20.0msec
Marker: 2.39GHz 42.2997dBµV
dBµV
110
100
90
80
70
60
50
40
30
20
2380
2390
2400
2410
2420
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

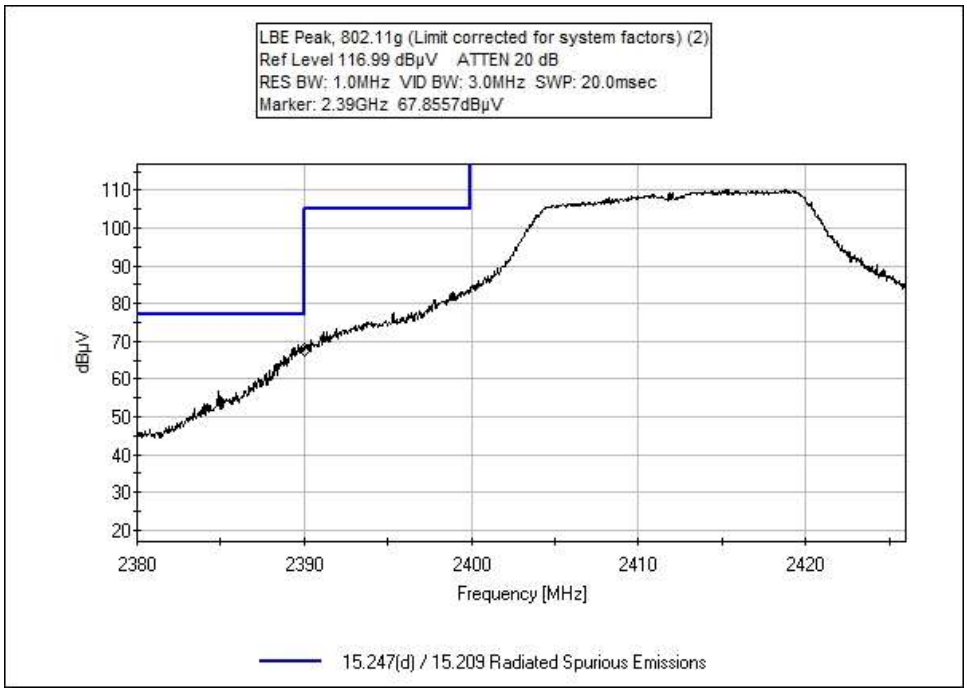

UBE Peak, 802.11b (Limit corrected for system factors) (1)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker 1: 2.462GHz 107.193 dBµV Marker 2: 2.484GHz 38.0847 dBµV Delta: 22.0MHz
dBµV
110
100
90
80
70
60
50
40
30
20
2460
2470
2480
2490
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

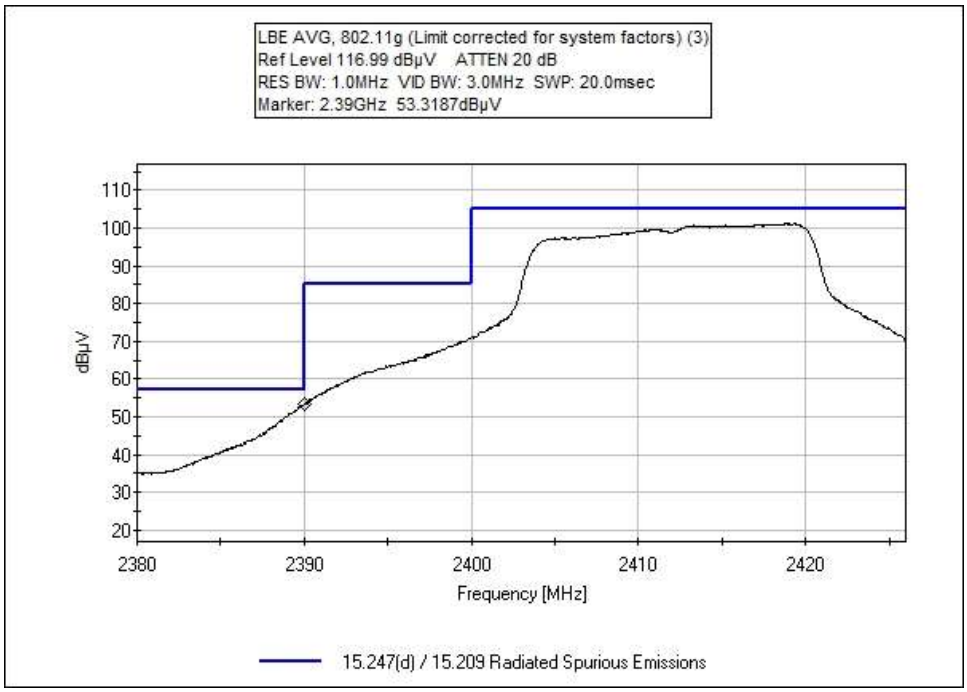

UBE Peak, 802.11b (Limit corrected for system factors) (2)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 20.0msec
Marker: 2.484GHz 57.9557dBµV
dBµV
110
100
90
80
70
60
50
40
30
20
2460
2470
2480
2490
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

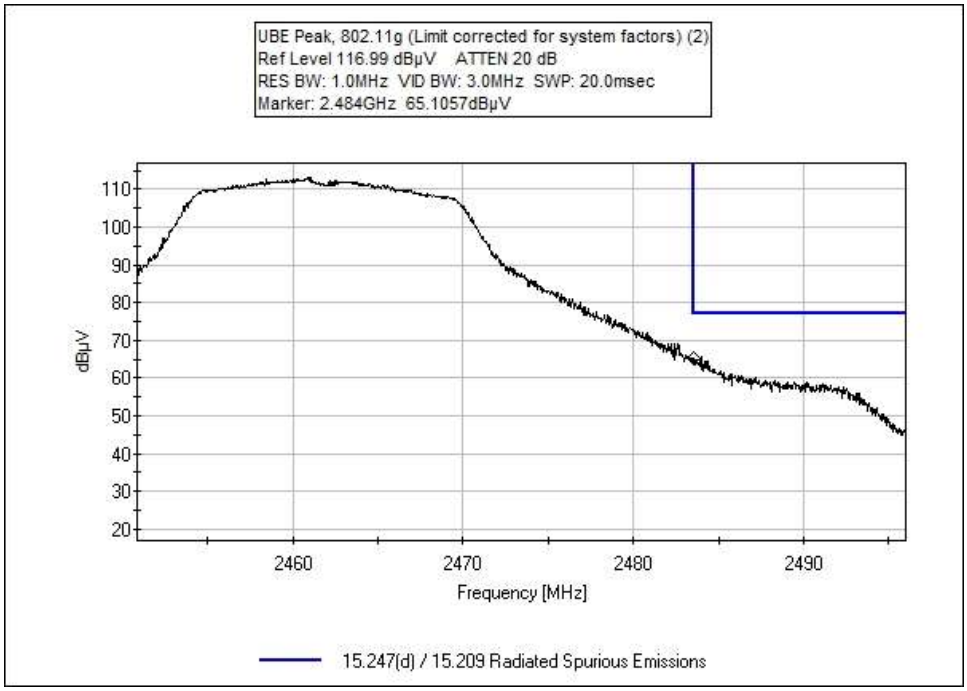

UBE AVG, 802.11b (Limit corrected for system factors) (3)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 20.0msec
Marker: 2.484GHz 39.7477dBµV
110
100
90
80
70
60
50
40
30
20
dBµV
2450
2460
2470
2480
2490
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

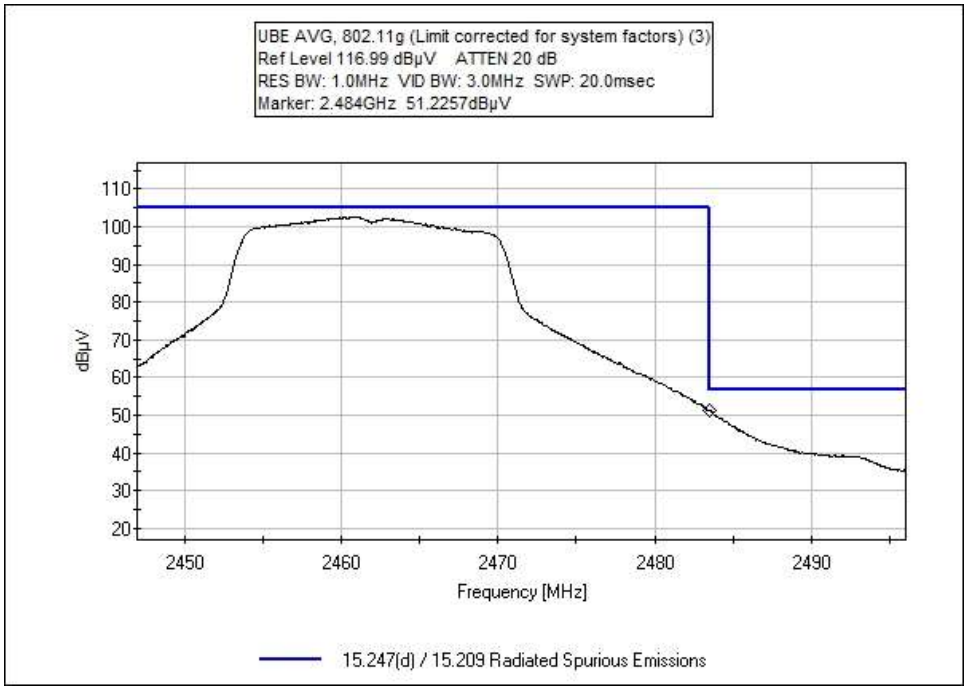
802.11g Band Edge Plots



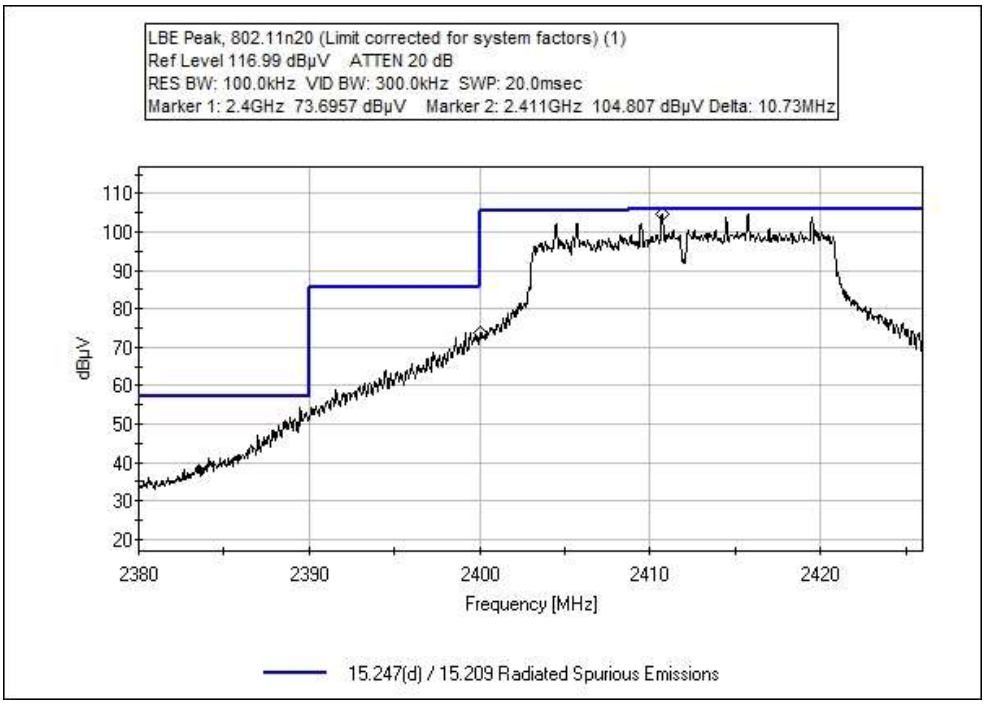


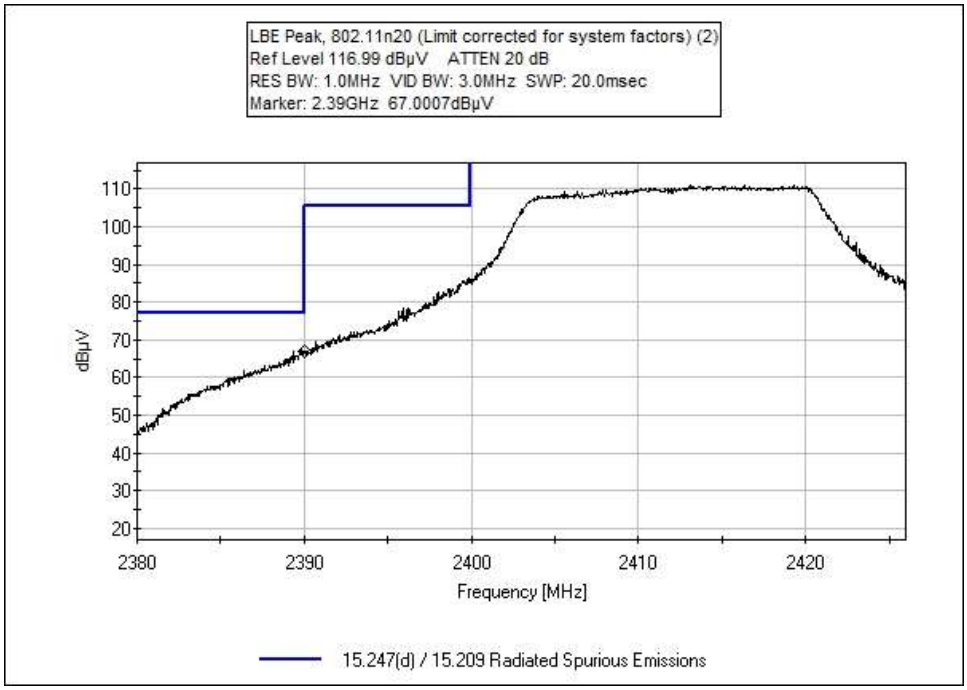

LBE AVG, 802.11g (Limit corrected for system factors) (3)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 20.0msec
Marker: 2.39GHz 53.3187dBµV
dBµV
110
100
90
80
70
60
50
40
30
20
2380
2390
2400
2410
2420
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

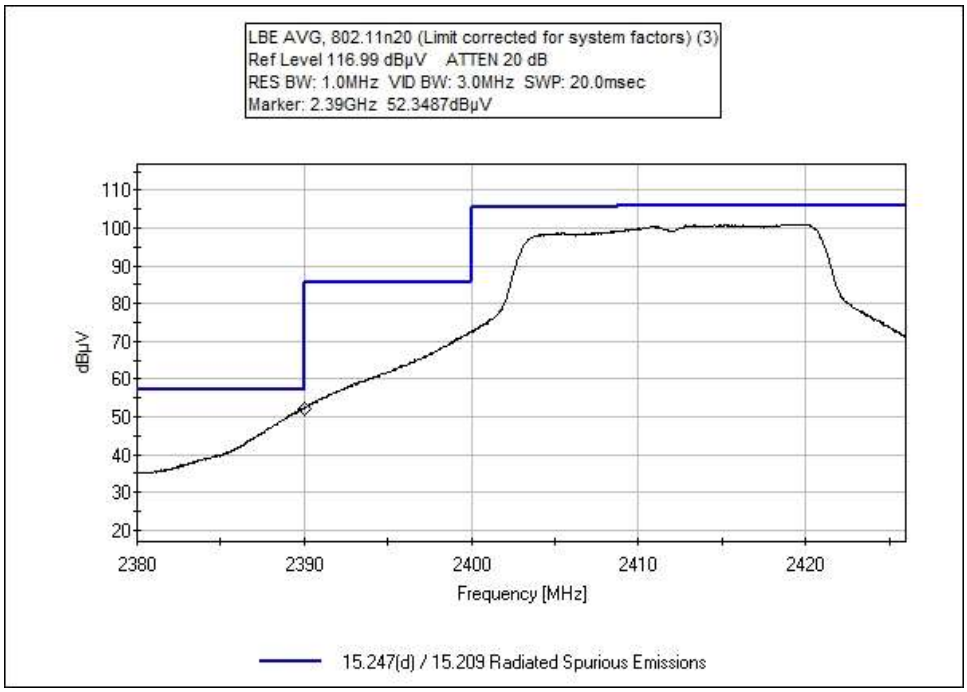

UBE Peak, 802.11g (Limit corrected for system factors) (2)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 20.0msec
Marker: 2.484GHz 65.1057dBµV
dBµV
110
100
90
80
70
60
50
40
30
20
2460
2470
2480
2490
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

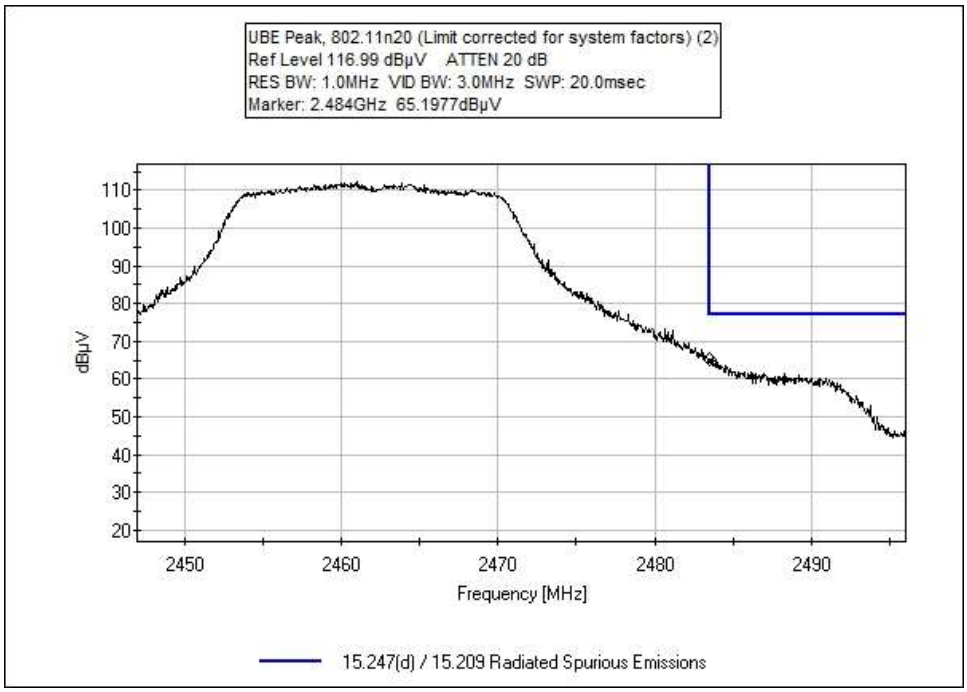

UBE AVG, 802.11g (Limit corrected for system factors) (3)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 20.0msec
Marker: 2.484GHz 51.2257dBµV
dBµV
110
100
90
80
70
60
50
40
30
20
2450
2460
2470
2480
2490
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

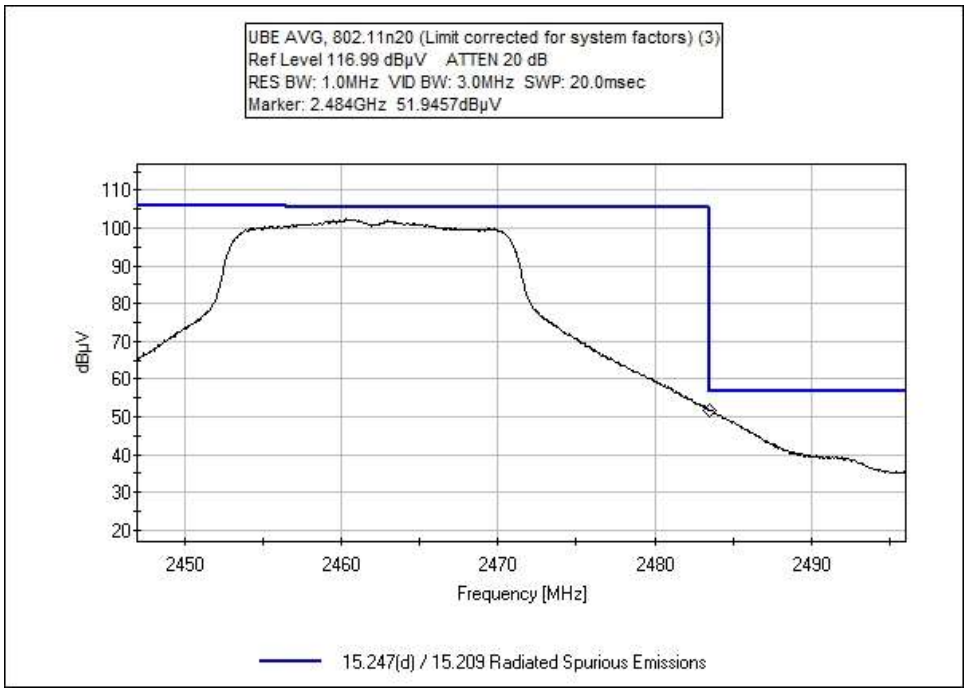
802.11n20 Band Edge Plots



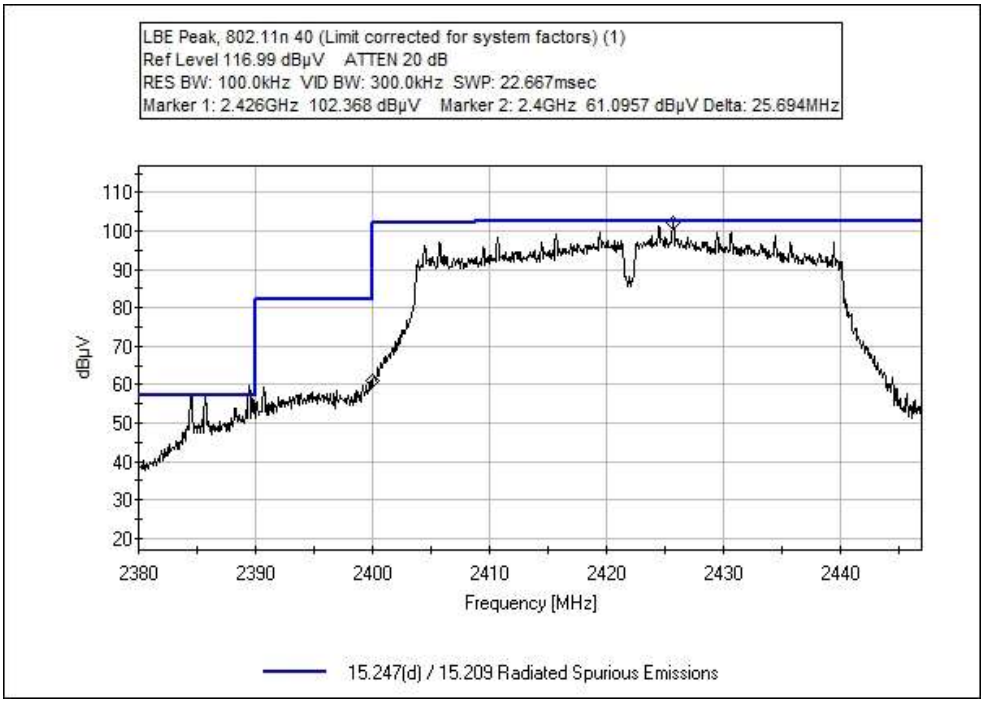


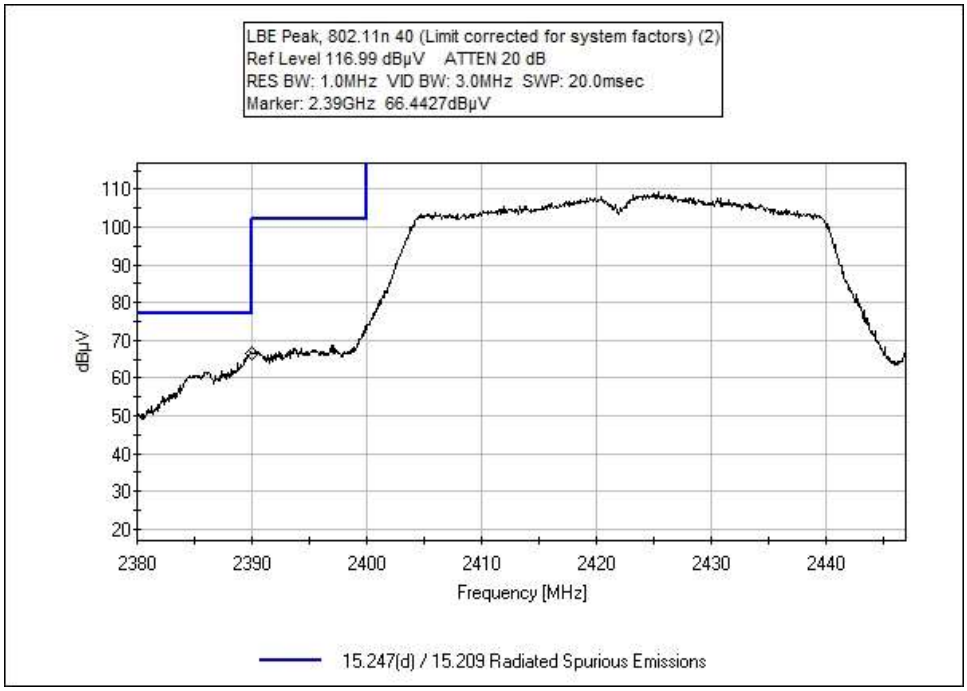

LBE AVG, 802.11n20 (Limit corrected for system factors) (3)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 20.0msec
Marker: 2.39GHz 52.3487dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

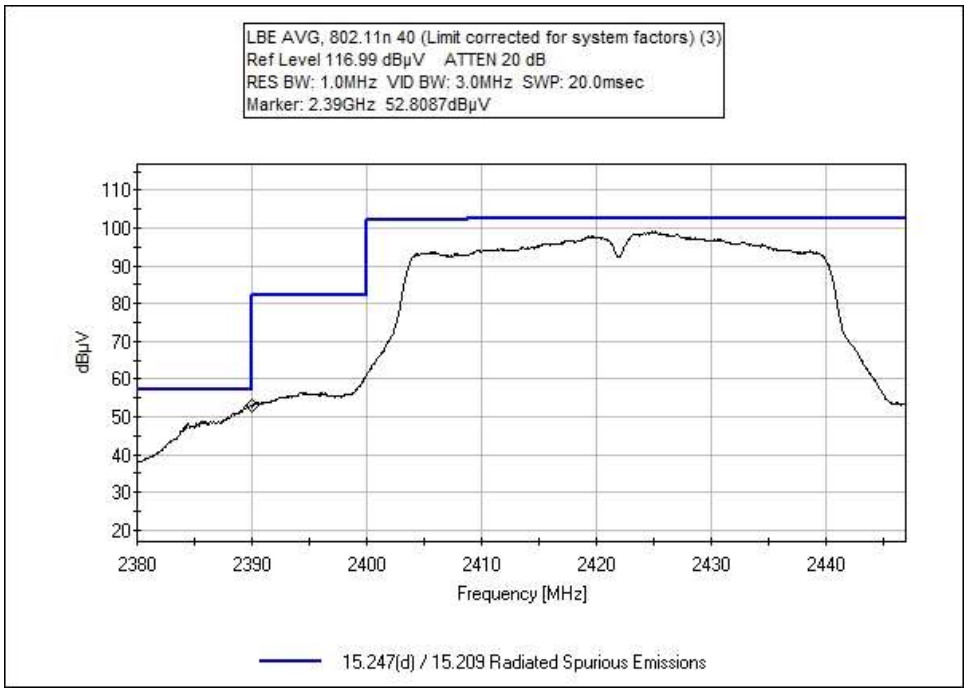

UBE Peak, 802.11n20 (Limit corrected for system factors) (2)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 20.0msec
Marker: 2.484GHz 65.1977dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

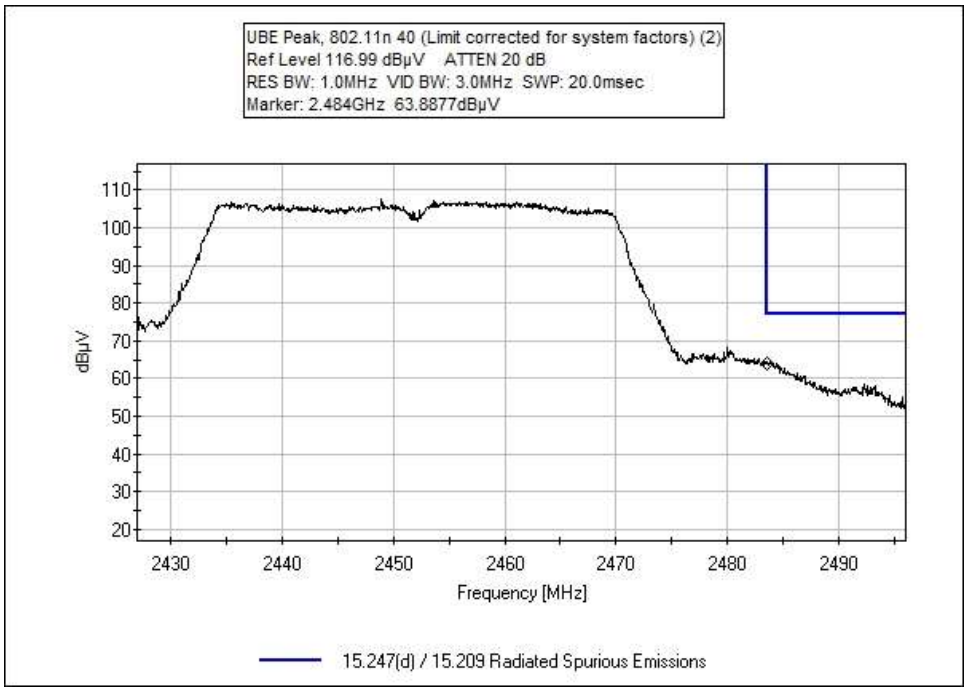

UBE AVG, 802.11n20 (Limit corrected for system factors) (3)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 20.0msec
Marker: 2.484GHz 51.9457dBµV
dBµV
110
100
90
80
70
60
50
40
30
20
2450
2460
2470
2480
2490
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

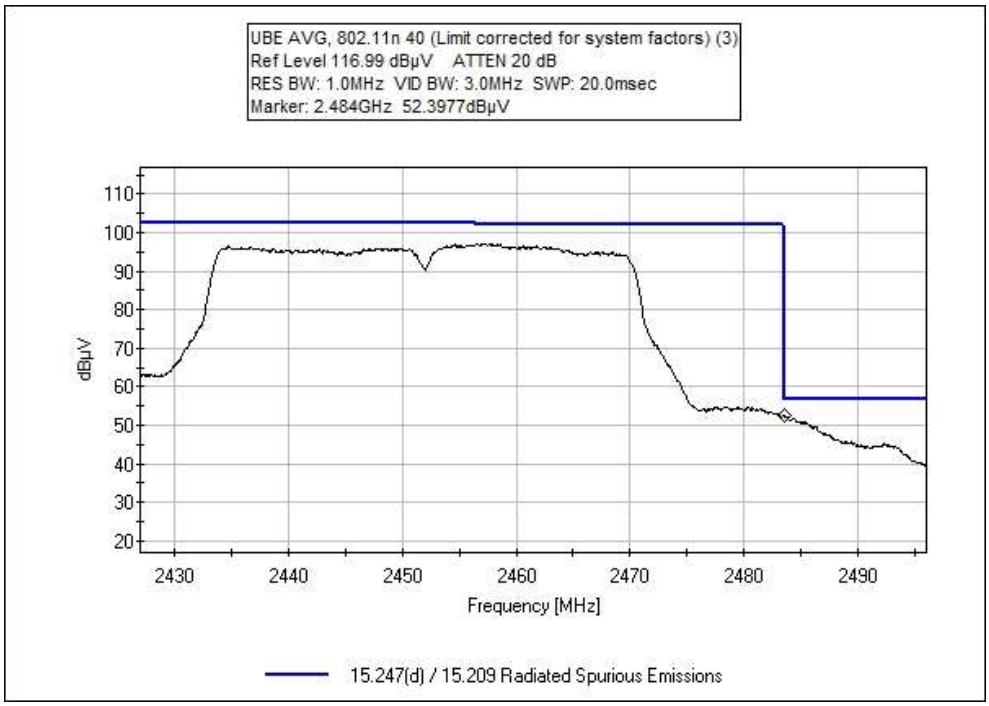
802.11n40 Band Edge Plots






LBE AVG, 802.11n 40 (Limit corrected for system factors) (3)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 20.0msec
Marker: 2.39GHz 52.8087dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


UBE Peak, 802.11n 40 (Limit corrected for system factors) (2)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 20.0msec
Marker: 2.484GHz 63.8877dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions


UBE AVG, 802.11n 40 (Limit corrected for system factors) (3)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 20.0msec
Marker: 2.484GHz 52.3977dBµV
dBµV
110
100
90
80
70
60
50
40
30
20
2430
2440
2450
2460
2470
2480
2490
Frequency [MHz]
15.247(d) / 15.209 Radiated Spurious Emissions

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(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**102802**	Date:	3/18/2020
Test Type:	**Maximized Emissions**	Time:	14:21:04
Tested By:	Matthew Harrison	Sequence#:	1
Software:	EMITest 5.03.12		

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: 2390-2483.5 MHz
Frequency tested: 2412, 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 1.5m high on a Styrofoam table.
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
T1	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T2	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T4	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T5	AN03540	Preamp	83017A	5/13/2019	5/13/2021
T6	ANP07504	Cable	CLU40-KMKM-02.00F	1/17/2019	1/17/2021

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	2412.480M	107.7	+27.6 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	104.5	104.6	-0.1	Horiz 190
2	2461.500M	107.2	+27.6 -34.3	+2.7 +0.3	+0.6	+0.0	+0.0 350	104.1	104.6	-0.5	Horiz 210
3	2390.000M Ave	42.3	+27.7 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	39.2	54.0 1MHz RBW	-14.8	Horiz
^	2390.000M	57.5	+27.7 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	54.4	74.0 1MHz RBW	-19.6	Horiz
5	2483.500M Ave	39.7	+27.6 -34.2	+2.7 +0.3	+0.6	+0.0	+0.0	36.7	54.0 1MHz RBW	-17.3	Horiz
^	2483.500M	58.0	+27.6 -34.2	+2.7 +0.3	+0.6	+0.0	+0.0	55.0	74.0 1MHz RBW	-19.0	Horiz
7	2400.000M	61.1	+27.7 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	58.0	84.6	-26.6	Horiz

Test Location:	CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Nalloy, LLC.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**102802**	Date:	3/18/2020
Test Type:	**Maximized Emissions**	Time:	14:13:07
Tested By:	Matthew Harrison	Sequence#:	2
Software:	EMITest 5.03.12		

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: 2390-2483.5 MHz
Frequency tested: 2412, 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 1.5m high on a Styrofoam table.
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
T1	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T2	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T4	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T5	AN03540	Preamp	83017A	5/13/2019	5/13/2021
T6	ANP07504	Cable	CLU40-KMKM-02.00F	1/17/2019	1/17/2021

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	2460.730M	105.1	+27.6 -34.3	+2.7 +0.3	+0.6	+0.0	+0.0 350	102.0	102.0	+0.0	Horiz 210
2	2419.510M	102.6	+27.6 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	99.4	102.0	-2.6	Horiz
3	2390.000M Ave	53.3	+27.7 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	50.2	54.0 1MHz RBW	-3.8	Horiz
^	2390.000M	67.9	+27.7 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	64.8	74.0 1MHz RBW	-9.2	Horiz
5	2483.500M Ave	51.2	+27.6 -34.2	+2.7 +0.3	+0.6	+0.0	+0.0	48.2	54.0 1MHz RBW	-5.8	Horiz
^	2483.500M	50.6	+27.6 -34.2	+2.7 +0.3	+0.6	+0.0	+0.0	47.6	54.0	-6.4	Horiz
^	2483.500M	65.1	+27.6 -34.2	+2.7 +0.3	+0.6	+0.0	+0.0	62.1	74.0 1MHz RBW	-11.9	Horiz
8	2400.000M	69.9	+27.7 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	66.8	82.0	-15.2	Horiz

Test Location:	CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Nalloy, LLC.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**102802**	Date:	3/18/2020
Test Type:	**Maximized Emissions**	Time:	14:41:46
Tested By:	Matthew Harrison	Sequence#:	3
Software:	EMITest 5.03.12		

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: 2390-2483.5 MHz
Frequency tested: 2412, 2462
Firmware power setting: 12 dBm for Low Channel, 14 dBm for 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 1.5m high on a Styrofoam table.
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
T1	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T2	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T4	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T5	AN03540	Preamp	83017A	5/13/2019	5/13/2021
T6	ANP07504	Cable	CLU40-KMKM-02.00F	1/17/2019	1/17/2021

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	2460.720M	105.7	+27.6 -34.3	+2.7 +0.3	+0.6	+0.0	+0.0 350	102.6	102.6	+0.0	Horiz 190
2	2410.730M	104.8	+27.6 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0 350	101.6	102.6	-1.0	Horiz 189
3	2390.000M Ave	52.3	+27.7 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	49.2	54.0 1MHz RBW	-4.8	Horiz
^	2390.000M	67.0	+27.7 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	63.9	74.0 1MHz RBW	-10.1	Horiz
5	2483.500M Ave	51.9	+27.6 -34.2	+2.7 +0.3	+0.6	+0.0	+0.0	48.9	54.0 1MHz RBW	-5.1	Horiz
^	2483.500M	53.2	+27.6 -34.2	+2.7 +0.3	+0.6	+0.0	+0.0	50.2	54.0	-3.8	Horiz
^	2483.500M	65.2	+27.6 -34.2	+2.7 +0.3	+0.6	+0.0	+0.0	62.2	74.0 1MHz RBW	-11.8	Horiz
8	2400.000M	73.7	+27.7 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	70.6	82.6	-12.0	Horiz

Test Location:	CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Nalloy, LLC.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**102802**	Date:	3/18/2020
Test Type:	**Maximized Emissions**	Time:	16:43:03
Tested By:	Matthew Harrison	Sequence#:	4
Software:	EMITest 5.03.12		

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: 2390-2483.5 MHz
Frequency tested: 2422, 2452
Firmware power setting: 11 dBm for Low Channel, 12 dBm for 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 1.5m high on a Styrofoam table.
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
T1	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T2	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T4	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T5	AN03540	Preamp	83017A	5/13/2019	5/13/2021
T6	ANP07504	Cable	CLU40-KMKM-02.00F	1/17/2019	1/17/2021

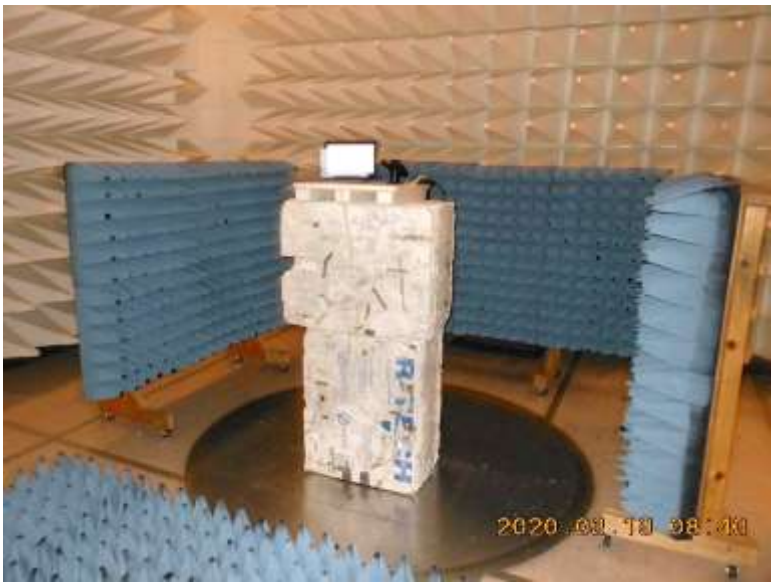
Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	2425.694M	102.4	+27.6 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0 190	99.2	99.2	+0.0	Horiz 350
2	2437.005M	100.3	+27.6 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0 350	97.1	99.2	-2.1	Horiz 190
3	2390.000M Ave	52.8	+27.7 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	49.7	54.0 1MHz RBW	-4.3	Horiz
^	2390.000M	66.4	+27.7 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	63.3	74.0 1MHz RBW	-10.7	Horiz
5	2483.500M Ave	52.4	+27.6 -34.2	+2.7 +0.3	+0.6	+0.0	+0.0	49.4	54.0 1MHz RBW	-4.6	Horiz
^	2483.500M	52.5	+27.6 -34.2	+2.7 +0.3	+0.6	+0.0	+0.0	49.5	54.0	-4.5	Horiz
^	2483.500M	63.9	+27.6 -34.2	+2.7 +0.3	+0.6	+0.0	+0.0	60.9	74.0 1MHz RBW	-13.1	Horiz
8	2400.000M	69.1	+27.7 -34.3	+2.6 +0.3	+0.6	+0.0	+0.0	66.0	79.2	-13.2	Horiz

Test Setup Photo(s)

Below 1GHz

Below 1GHz



Above 1GHz

Above 1GHz

15.207 AC Conducted Emissions

Test Setup / Conditions / Data

Test Location:	CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Nalloy, LLC.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**102802**	Date:	4/1/2020
Test Type:	**Conducted Emissions**	Time:	07:05:00
Tested By:	Matthew Harrison	Sequence#:	82
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: 28%
Pressure: 101.3 kPa

Frequency Range: 150kHz-30MHz
Frequency tested: 2412
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation**: 802.11b,** 1mbps (worst-case)

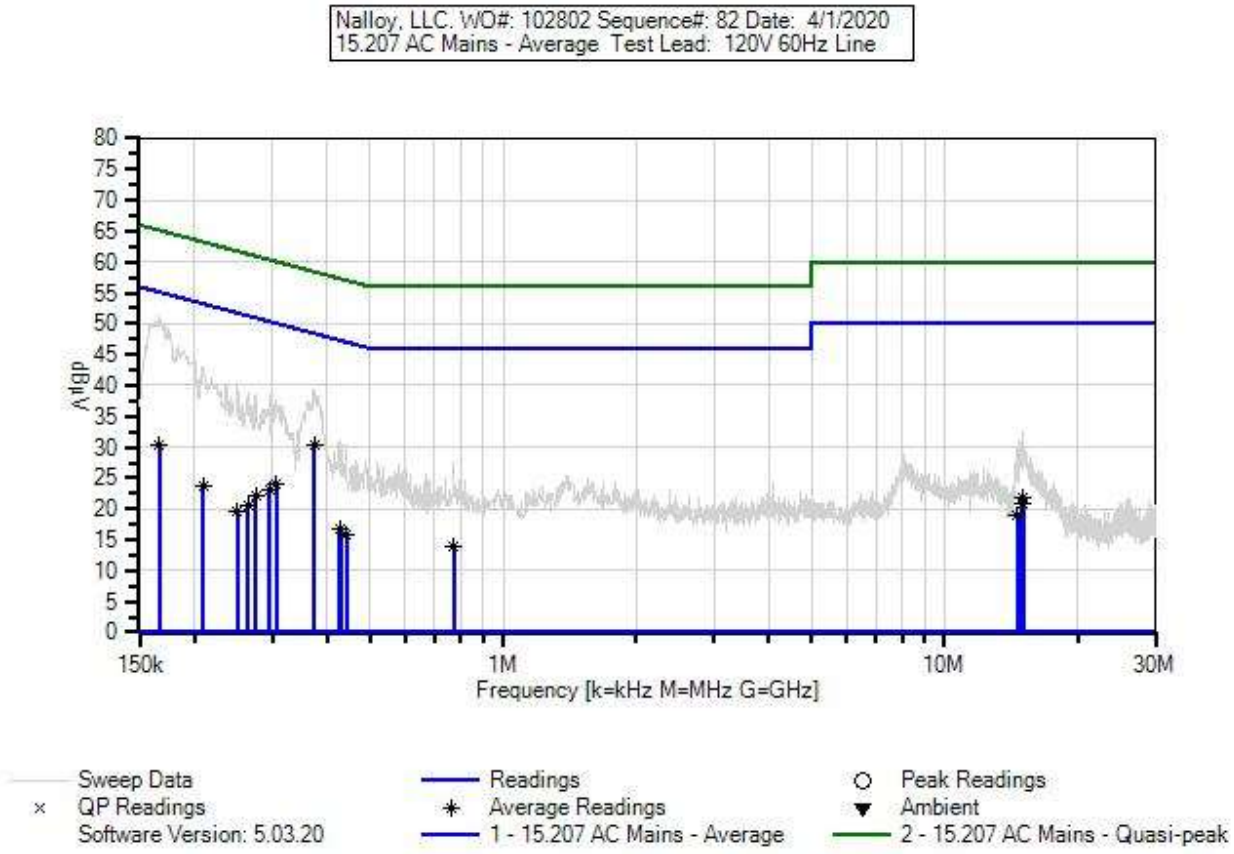
Antenna type: Linear Polarized
Antenna Gain: 3.7 dBi.

Duty Cycle: 100% Modulated

Test Method: ANSI C63.10: 2013

Test Mode: Transmitting
Test Setup: EUT is setup for conducted measurements.
Setup: EUT is connected to a Laptop via USB and Audio cable.

802.11b, g, n Modes, 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
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T1	ANP06219	Attenuator	768-10	4/13/2018	4/13/2020
T2	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T4	AN01311	50uH LISN-Line1 (L)	3816/2	2/24/2020	2/24/2022
	AN01311	50uH LISN-Line2 (N)	3816/2	2/24/2020	2/24/2022
T5	AN02611	High Pass Filter	HE9615-150K-50-720B	1/10/2020	1/10/2022

Measurement Data: Reading listed by margin. Test Lead: Line

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	373.252k	20.4	+9.1	+0.0	+0.0	-0.6	+0.0	30.3	48.4	-18.1	Line
	Ave		+0.2								
^	373.252k	30.6	+9.1	+0.0	+0.0	-0.6	+0.0	40.5	48.4	-7.9	Line
			+0.2								
3	166.726k	19.1	+9.1	+0.0	+0.0	-1.6	+0.0	30.3	55.1	-24.8	Line
	Ave		+0.5								
^	166.725k	43.1	+9.1	+0.0	+0.0	-1.6	+0.0	54.3	55.1	-0.8	Line
			+0.5								
5	306.349k	14.1	+9.1	+0.0	+0.0	-0.7	+0.0	24.0	50.1	-26.1	Line
	Ave		+0.1								
^	306.349k	29.2	+9.1	+0.0	+0.0	-0.7	+0.0	39.1	50.1	-11.0	Line
			+0.1								
7	296.168k	13.1	+9.1	+0.0	+0.0	-0.7	+0.0	23.0	50.3	-27.3	Line
	Ave		+0.1								
^	296.168k	30.2	+9.1	+0.0	+0.0	-0.7	+0.0	40.1	50.3	-10.2	Line
			+0.1								
9	14.959M	11.5	+9.1	+0.2	+0.1	-0.6	+0.0	21.7	50.0	-28.3	Line
	Ave		+0.2								
^	14.959M	23.7	+9.1	+0.2	+0.1	-0.6	+0.0	33.9	50.0	-16.1	Line
			+0.2								
11	275.079k	12.2	+9.1	+0.0	+0.0	-0.8	+0.0	22.2	51.0	-28.8	Line
	Ave		+0.1								
^	275.079k	30.3	+9.1	+0.0	+0.0	-0.8	+0.0	40.3	51.0	-10.7	Line
			+0.1								
13	15.067M	10.8	+9.1	+0.2	+0.1	-0.6	+0.0	21.0	50.0	-29.0	Line
	Ave		+0.2								
^	15.067M	23.5	+9.1	+0.2	+0.1	-0.6	+0.0	33.7	50.0	-16.3	Line
			+0.2								
15	208.904k	13.3	+9.1	+0.0	+0.0	-1.1	+0.0	23.7	53.2	-29.5	Line
	Ave		+0.2								
^	208.903k	35.0	+9.1	+0.0	+0.0	-1.1	+0.0	45.4	53.2	-7.8	Line
			+0.2								
17	429.247k	7.0	+9.1	+0.1	+0.0	-0.5	+0.0	16.9	47.3	-30.4	Line
	Ave		+0.2								
18	425.611k	6.8	+9.1	+0.1	+0.0	-0.5	+0.0	16.7	47.3	-30.6	Line
	Ave		+0.2								
^	429.247k	22.2	+9.1	+0.1	+0.0	-0.5	+0.0	32.1	47.3	-15.2	Line
			+0.2								
^	425.611k	21.8	+9.1	+0.1	+0.0	-0.5	+0.0	31.7	47.3	-15.6	Line
			+0.2								
21	264.899k	10.4	+9.1	+0.0	+0.0	-0.8	+0.0	20.5	51.3	-30.8	Line
	Ave		+0.2								
^	264.898k	30.4	+9.1	+0.0	+0.0	-0.8	+0.0	40.5	51.3	-10.8	Line
			+0.2								
23	14.580M	8.6	+9.1	+0.2	+0.1	-0.6	+0.0	18.8	50.0	-31.2	Line
	Ave		+0.2								
^	14.580M	20.9	+9.1	+0.2	+0.1	-0.6	+0.0	31.1	50.0	-18.9	Line
			+0.2								

25 Ave	440.882k	5.8	+9.1 +0.2	+0.1	+0.0	-0.5	+0.0	15.7	47.0	-31.3	Line
^	440.882k	21.5	+9.1 +0.2	+0.1	+0.0	-0.5	+0.0	31.4	47.0	-15.6	Line
27 Ave	772.488k	4.4	+9.1 +0.2	+0.0	+0.0	-0.3	+0.0	14.0	46.0	-32.0	Line
^	772.488k	18.6	+9.1 +0.2	+0.0	+0.0	-0.3	+0.0	28.2	46.0	-17.8	Line
29 Ave	250.354k	9.3	+9.1 +0.2	+0.0	+0.0	-0.9	+0.0	19.5	51.7	-32.2	Line
^	250.354k	31.9	+9.1 +0.2	+0.0	+0.0	-0.9	+0.0	42.1	51.7	-9.6	Line

Test Location:	CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Nalloy, LLC.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**102802**	Date:	4/1/2020
Test Type:	**Conducted Emissions**	Time:	07:15:13
Tested By:	Matthew Harrison	Sequence#:	83
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: 28%
Pressure: 101.3 kPa

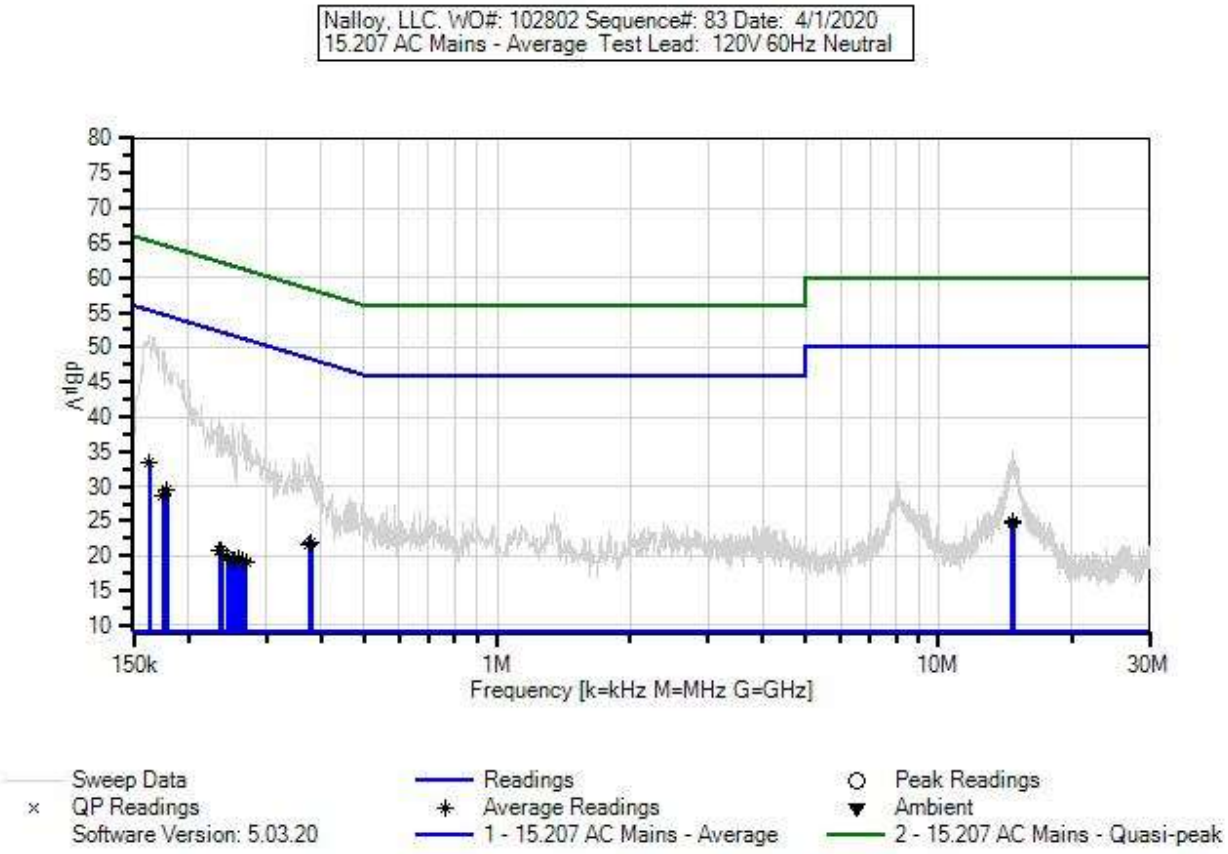
Frequency Range: 150kHz-30MHz
Frequency tested: 2412
Firmware power setting: 15 dBm
EUT Firmware:
Protocol /MCS/Modulation: **802.11b**, 1mbps (worst-case)

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.
Setup: EUT is connected to a Laptop via USB and Audio cable.

802.11b, g, n Modes, 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
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T1	ANP06219	Attenuator	768-10	4/13/2018	4/13/2020
T2	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
	AN01311	50uH LISN-Line1 (L)	3816/2	2/24/2020	2/24/2022
T4	AN01311	50uH LISN-Line2 (N)	3816/2	2/24/2020	2/24/2022
T5	AN02611	High Pass Filter	HE9615-150K-50-720B	1/10/2020	1/10/2022

Measurement Data: Reading listed by margin. Test Lead: Neutral

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	163.089k	22.1	+9.1	+0.0	+0.0	-1.6	+0.0	33.3	55.3	-22.0	Neutr
	Ave		+0.5								
^	163.088k	43.8	+9.1	+0.0	+0.0	-1.6	+0.0	55.0	55.3	-0.3	Neutr
			+0.5								
3	14.743M	14.7	+9.1	+0.2	+0.1	-0.6	+0.0	24.9	50.0	-25.1	Neutr
	Ave		+0.2								
^	14.743M	26.1	+9.1	+0.2	+0.1	-0.6	+0.0	36.3	50.0	-13.7	Neutr
			+0.2								
5	178.360k	18.6	+9.1	+0.0	+0.0	-1.4	+0.0	29.5	54.6	-25.1	Neutr
	Ave		+0.4								
6	14.661M	14.6	+9.1	+0.2	+0.1	-0.6	+0.0	24.8	50.0	-25.2	Neutr
	Ave		+0.2								
^	14.661M	25.5	+9.1	+0.2	+0.1	-0.6	+0.0	35.7	50.0	-14.3	Neutr
			+0.2								
8	175.451k	17.8	+9.1	+0.0	+0.0	-1.4	+0.0	28.7	54.7	-26.0	Neutr
	Ave		+0.4								
^	175.451k	41.5	+9.1	+0.0	+0.0	-1.4	+0.0	52.4	54.7	-2.3	Neutr
			+0.4								
^	178.360k	39.8	+9.1	+0.0	+0.0	-1.4	+0.0	50.7	54.6	-3.9	Neutr
			+0.4								
11	379.796k	12.1	+9.1	+0.0	+0.0	-0.5	+0.0	21.9	48.3	-26.4	Neutr
	Ave		+0.2								
12	375.433k	11.6	+9.1	+0.0	+0.0	-0.6	+0.0	21.5	48.4	-26.9	Neutr
	Ave		+0.2								
^	375.432k	25.8	+9.1	+0.0	+0.0	-0.6	+0.0	35.7	48.4	-12.7	Neutr
			+0.2								
^	379.796k	24.3	+9.1	+0.0	+0.0	-0.5	+0.0	34.1	48.3	-14.2	Neutr
			+0.2								
15	235.082k	10.6	+9.1	+0.0	+0.0	-0.9	+0.0	20.8	52.3	-31.5	Neutr
	Ave		+0.2								
16	237.991k	10.5	+9.1	+0.0	+0.0	-0.9	+0.0	20.7	52.2	-31.5	Neutr
	Ave		+0.2								
^	235.082k	31.6	+9.1	+0.0	+0.0	-0.9	+0.0	41.8	52.3	-10.5	Neutr
			+0.2								
^	237.990k	30.7	+9.1	+0.0	+0.0	-0.9	+0.0	40.9	52.2	-11.3	Neutr
			+0.2								
19	259.807k	9.4	+9.1	+0.0	+0.0	-0.8	+0.0	19.5	51.4	-31.9	Neutr
	Ave		+0.2								
^	259.807k	29.3	+9.1	+0.0	+0.0	-0.8	+0.0	39.4	51.4	-12.0	Neutr
			+0.2								
21	269.261k	9.1	+9.1	+0.0	+0.0	-0.8	+0.0	19.2	51.1	-31.9	Neutr
	Ave		+0.2								
22	245.263k	9.8	+9.1	+0.0	+0.0	-0.9	+0.0	20.0	51.9	-31.9	Neutr
	Ave		+0.2								
^	245.262k	29.1	+9.1	+0.0	+0.0	-0.9	+0.0	39.3	51.9	-12.6	Neutr
			+0.2								

24 Ave	264.898k	9.2	+9.1 +0.2	+0.0	+0.0	-0.8	+0.0	19.3	51.3	-32.0	Neutr
^	264.897k	30.5	+9.1 +0.2	+0.0	+0.0	-0.8	+0.0	40.6	51.3	-10.7	Neutr
^	269.260k	29.0	+9.1 +0.2	+0.0	+0.0	-0.8	+0.0	39.1	51.1	-12.0	Neutr
27 Ave	254.717k	9.4	+9.1 +0.2	+0.0	+0.0	-0.8	+0.0	19.5	51.6	-32.1	Neutr
28 Ave	251.808k	9.2	+9.1 +0.2	+0.0	+0.0	-0.9	+0.0	19.4	51.7	-32.3	Neutr
^	251.807k	30.6	+9.1 +0.2	+0.0	+0.0	-0.9	+0.0	40.8	51.7	-10.9	Neutr
^	254.716k	28.6	+9.1 +0.2	+0.0	+0.0	-0.8	+0.0	38.7	51.6	-12.9	Neutr

Test Setup Photo(s)

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

Uncertainties reported are worst case for all CKC Laboratories' sites and represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit. Individual measurements were compared with the displayed limit value in the margin column. The margin was calculated based on subtracting the limit value from the corrected measurement value; a positive margin represents a measurement exceeding the limit, while a negative margin represents a measurement less than the limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB/m)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or caret (“^”) was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point, the measuring device is set into the linear mode and the scan time is reduced.