

# Nalloy, LLC

REVISED TEST REPORT TO 102802-6A

Model: PFAY0H

Tested to The Following Standards:

FCC Part 15 Subpart E Section(s)

15.207 & 15.407  
(NII 5.15 – 5.25GHz)

Report No.: 102802-6B

Date of issue: March 21, 2022



Test Certificate # 803.01

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.

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## ADMINISTRATIVE INFORMATION

### Test Report Information

**REPORT PREPARED FOR:**

Nalloy, LLC  
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Seattle, WA 98108

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

**REPORT PREPARED BY:**

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

Project Number: 102802

**DATE OF EQUIPMENT RECEIPT:**

March 19, 2020

**DATE(S) OF TESTING:**

March 19, 2020  
April 1, 2, 6 and 8, 2020

### Revision History

**Original:** Testing of the Model: PFAY0H, to FCC Part 15 Subpart E Section(s) 15.207 & 15.407 (NII 5.15 – 5.25GHz).

**Revision A:** To correct the Antenna Gain in the General Product Table and in summary tables in Output Power, PSD and Radiated Emissions Band Edge to MIMO with Antenna 0 Linear Polarized / 5.3dBi and Antenna 1 Linear Polarized / 5.9dBi.

**Revision A:** To replace AC 15.207 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 E - 15.407 (NII)

Test Procedure	Description	Modifications	Results
15.215	Occupied Bandwidth	NA	Pass
15.407(a)(1)	Output Power	NA	Pass
15.407(a)(1)	Power Spectral Density	NA	Pass
15.407(a)(1)(iii)	EIRP at >30° Elevation	NA	NA1
15.407(g)	Frequency Stability	NA	NP
15.407(b)	Radiated Emissions & Band Edge	NA	Pass
15.207	AC Conducted Emissions	NA	Pass

NA = Not Applicable

NA1 = Not applicable because EUT is for indoor use.

NP Test not performed because grantee is responsible for ensuring that the EUT meets Section 15.407(g) requirements.

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:

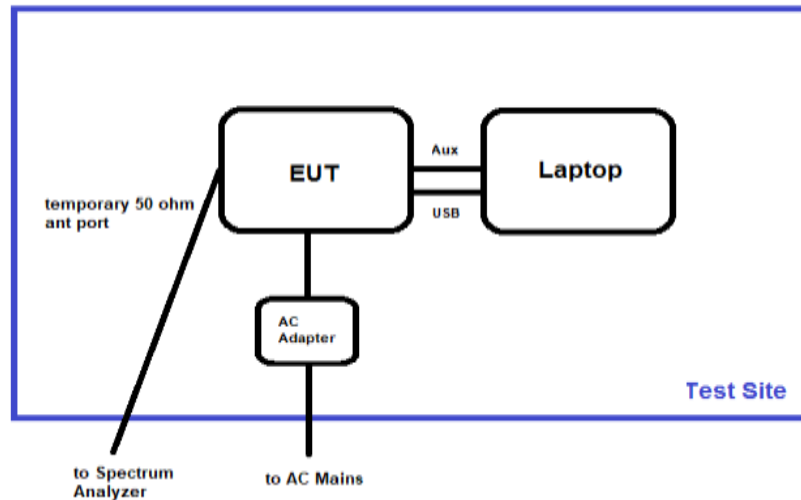
Device	Manufacturer	Model #	S/N
PC	Lenovo	81KT	YD07YGLG
PC PSU	Lenovo	ADL45WCC	NA
EUT PSU	Delta Electronics	MDS-030AAC15	24QW96P00CS

## General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Type of Wideband System:	802.11a, ac, n
Operating Frequency Range:	5180-5240 MHz
Modulation Type(s):	BPSK, QPSK, 16-QAM, 64-QAM
Maximum Duty Cycle:	100% Modulated (Tested Worst-Case)
Number of TX Chains:	1
Antenna Type(s) and Gain:	MIMO with Antenna 0 Linear Polarized / 5.3dBi and Antenna 1 Linear Polarized / 5.9dBi
Beamforming Type:	NA
Antenna Connection Type:	Integral (External connector provided to facilitate testing)
Nominal Input Voltage:	120VAC
Firmware / Software used for Test:	ro.build.id=PKQ1.180819.001

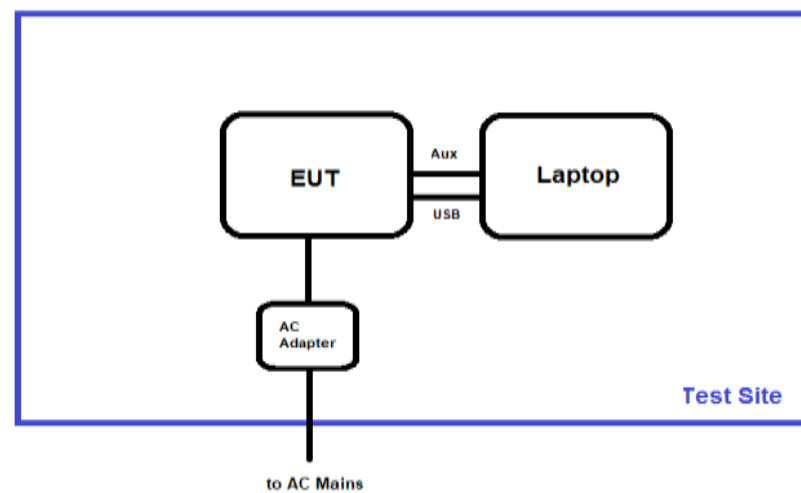
## Block Diagram (s)

### Test Setup Block Diagram



Tx Cond Ant Port

### Test Setup Block Diagram



Tx with Antenna

## FCC Part 15 Subpart E

### 15.215 Occupied Bandwidth

Test Setup/Conditions			
Test Location:	Bothell Lab Bench	Test Engineer:	M. Harrison
Test Method:	ANSI C63.10 (2013), KDB 789033 (v02r01 December 14, 2017)	Test Date(s):	4/6/2020
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 (°C)	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



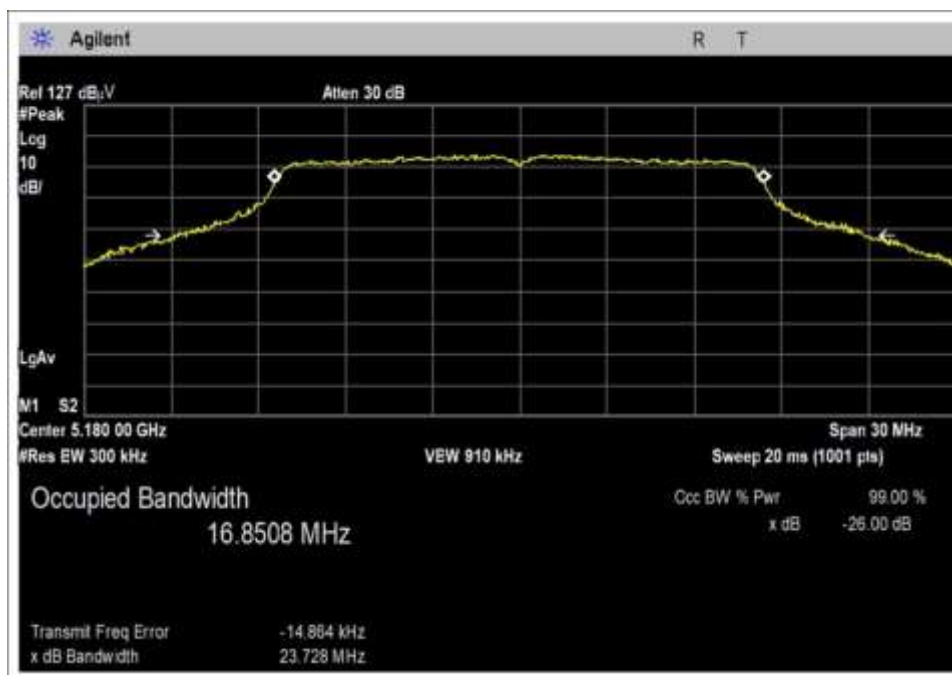
### 26dB Occupied Bandwidth

Test Data Summary					
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)	Results
5180	0	802.11a	23728	None	Pass
5220	0	802.11a	23577		
5240	0	802.11a	23954		
5180	1	802.11a	23735	None	Pass
5220	1	802.11a	23703		
5240	1	802.11a	23540		
5180	0	802.11n20	25007	None	Pass
5220	0	802.11n20	25002		
5240	0	802.11n20	25058		
5180	1	802.11n20	25136	None	Pass
5220	1	802.11n20	25536		
5240	1	802.11n20	25378		
5190	0	802.11n40	41764	None	Pass
5230	0	802.11n40	41941		
5190	1	802.11n40	41470	None	Pass
5230	1	802.11n40	41299		
5180	0	802.11ac20	24755	None	Pass
5220	0	802.11ac20	24746		
5240	0	802.11ac20	25092		
5180	1	802.11ac20	25160	None	Pass
5220	1	802.11ac20	24909		
5240	1	802.11ac20	24888		
5190	0	802.11ac40	41346	None	Pass
5230	0	802.11ac40	41439		
5190	1	802.11ac40	41670	None	Pass
5230	1	802.11ac40	41597		
5210	0	802.11ac80	83921	None	Pass
5210	1	802.11ac80	83681	None	Pass

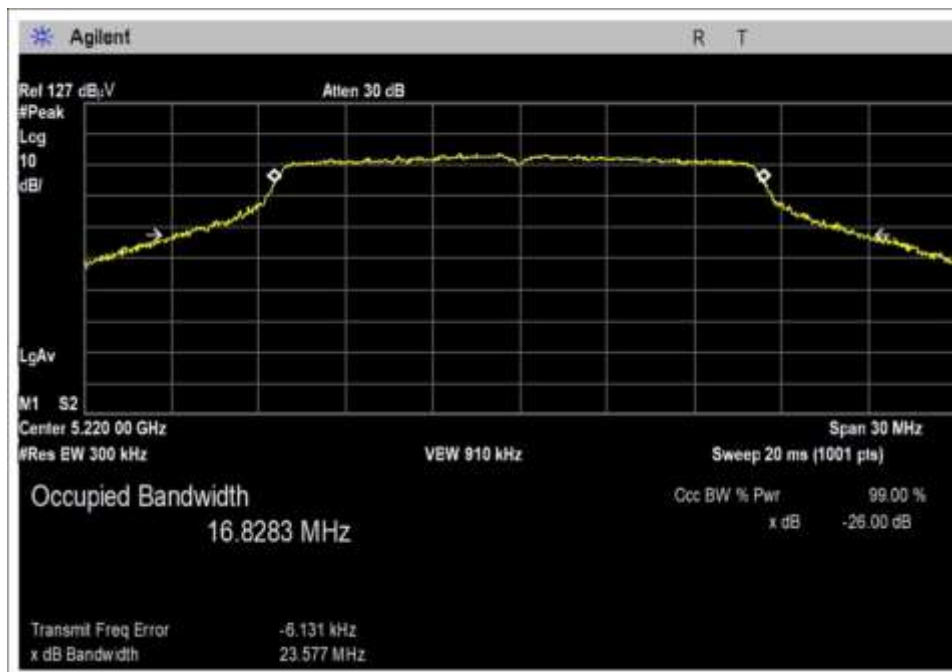
**99% Occupied Bandwidth**

Test Data Summary					
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)	Results
5180	0	802.11a	16850.8	None	Pass
5220	0	802.11a	16823.3		
5240	0	802.11a	16867.1		
5180	1	802.11a	16761.8	None	Pass
5220	1	802.11a	16788		
5240	1	802.11a	16725.1		
5180	0	802.11n20	17964.6	None	Pass
5220	0	802.11n20	17998.3		
5240	0	802.11n20	17966.3		
5180	1	802.11n20	17992	None	Pass
5220	1	802.11n20	18013		
5240	1	802.11n20	17973		
5190	0	802.11n40	36243.2	None	Pass
5230	0	802.11n40	36265.1		
5190	1	802.11n40	36206.4	None	Pass
5230	1	802.11n40	36204.6		
5180	0	802.11ac20	17921.4	None	Pass
5220	0	802.11ac20	17957.3		
5240	0	802.11ac20	17974.4		
5180	1	802.11ac20	17985.2	None	Pass
5220	1	802.11ac20	17955.3		
5240	1	802.11ac20	17924.8		
5190	0	802.11ac40	36253.3	None	Pass
5230	0	802.11ac40	36241.2		
5190	1	802.11ac40	36234.7	None	Pass
5230	1	802.11ac40	36275.4		
5210	0	802.11ac80	75571.4	None	Pass
5210	1	802.11ac80	75586.9	None	Pass

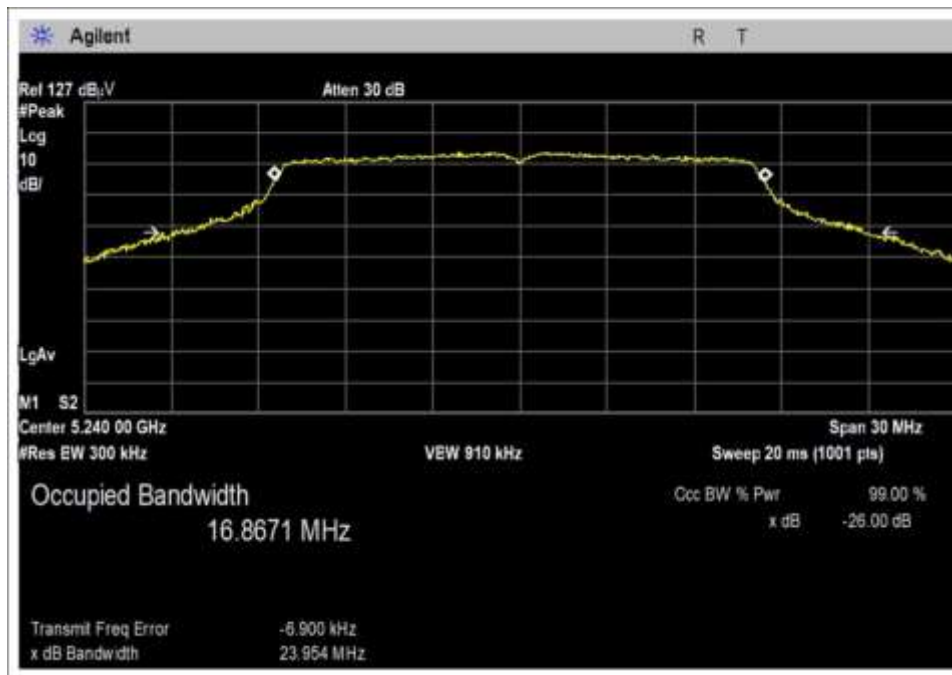
## 802.11a Plot(s)



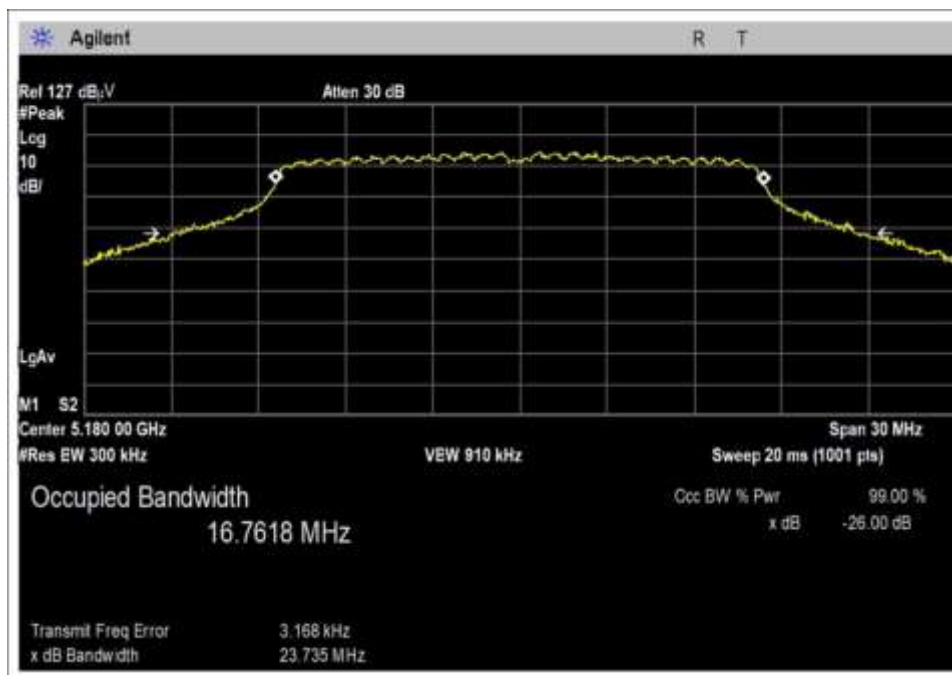
99p+26dB BW Low Channel AP0



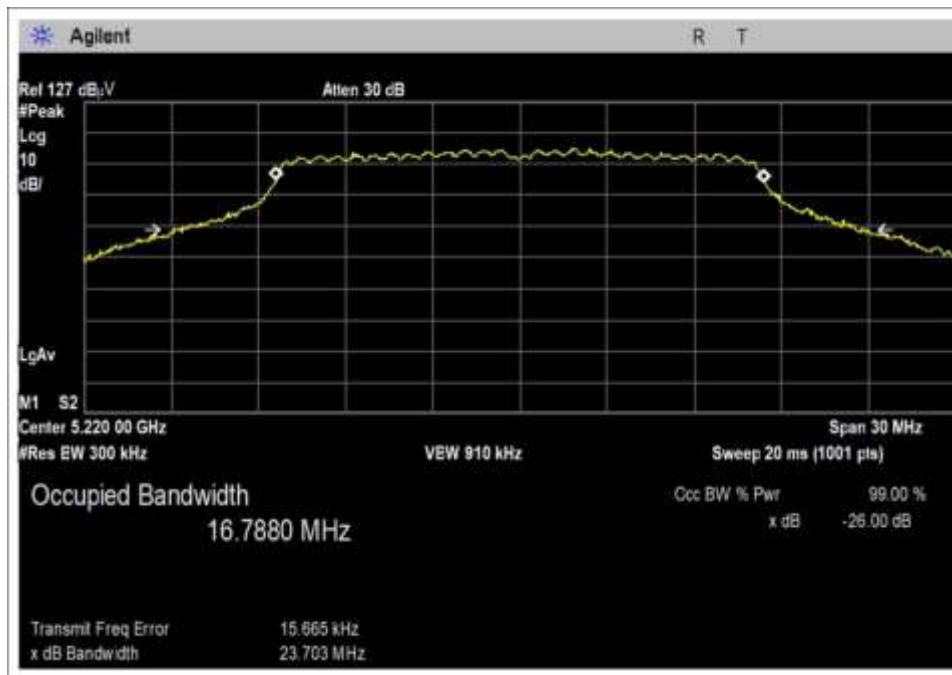
99p+26dB BW Middle Channel AP0



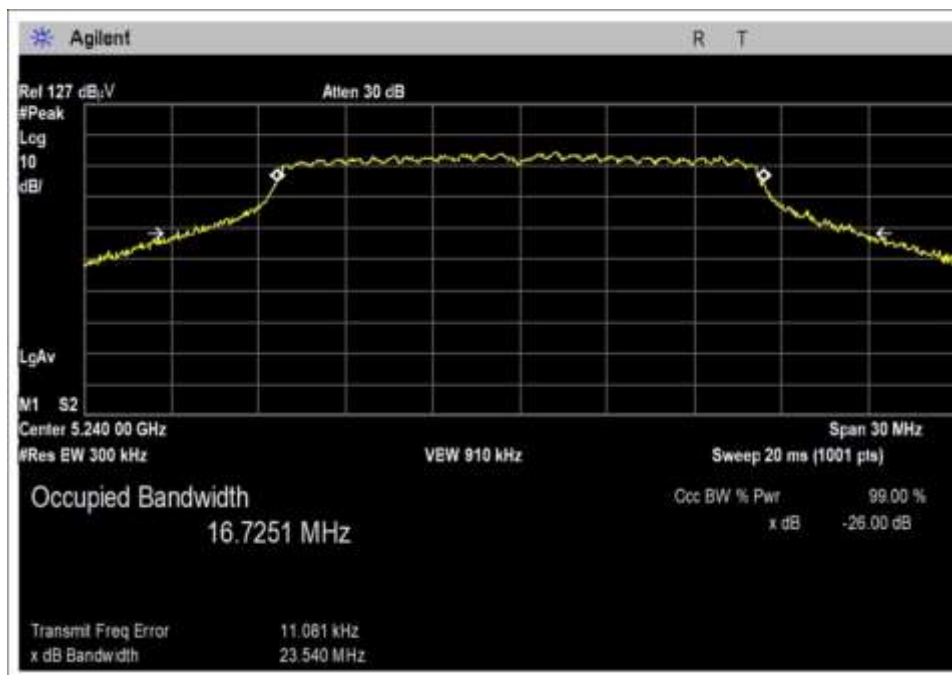
99p+26dB BW High Channel AP0



99p+26dB BW Low Channel AP1

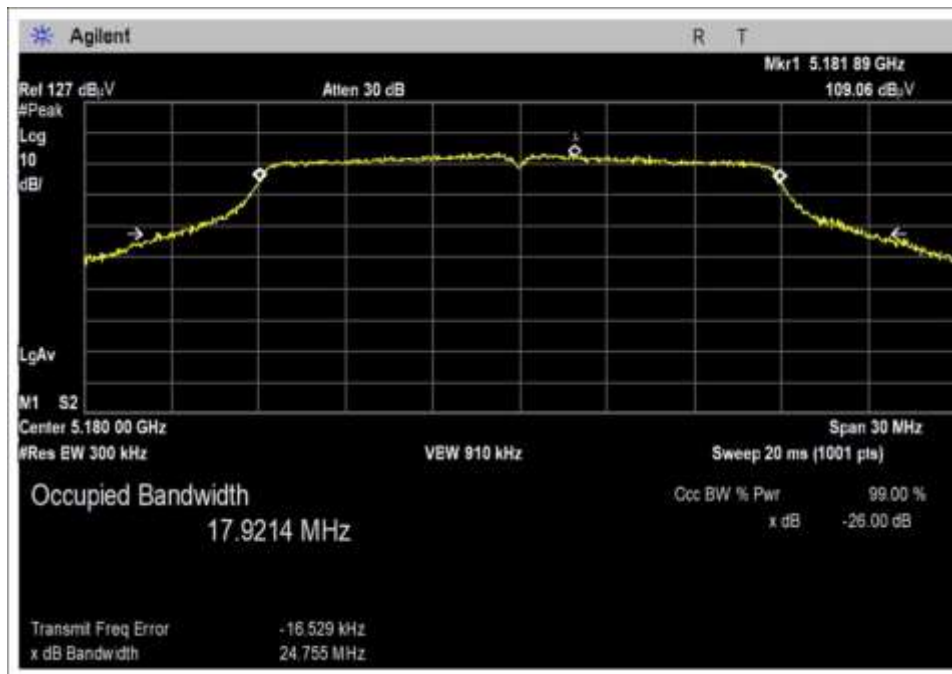


99p+26dB BW Middle Channel AP1

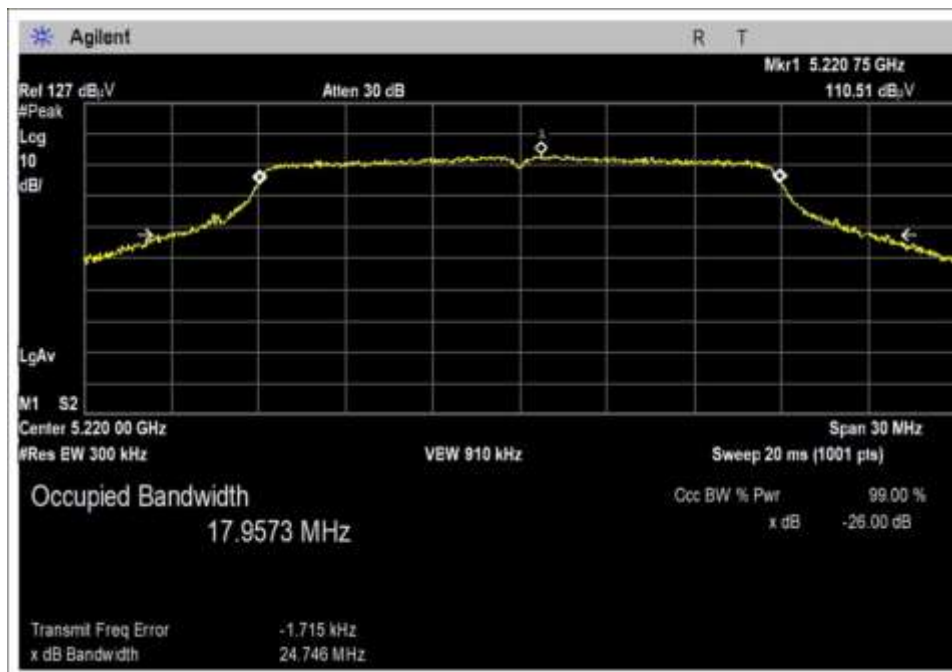


99p+26dB BW High Channel AP1

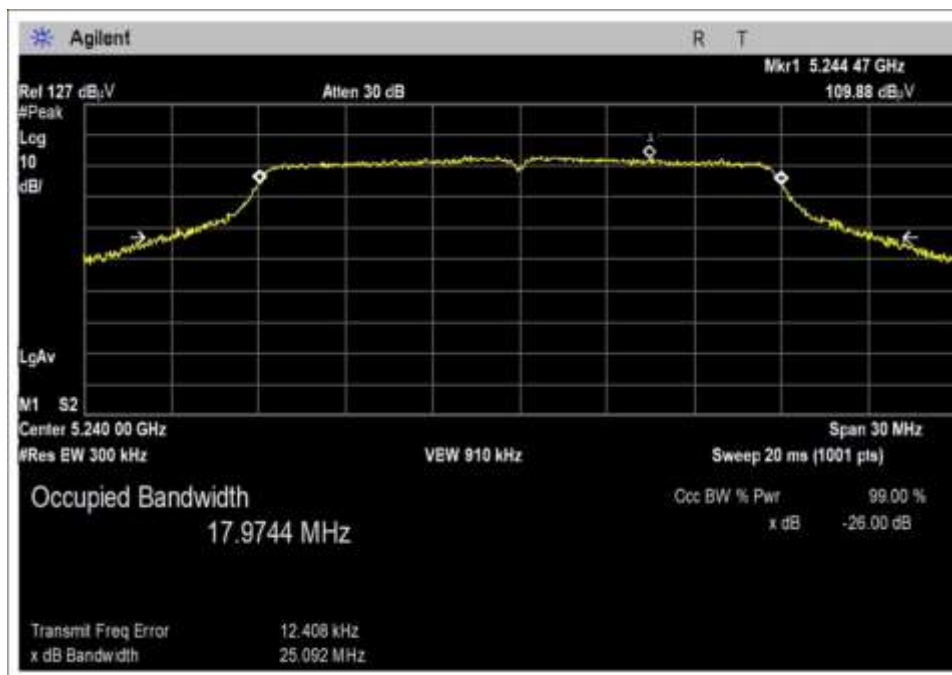
## 802.11ac20 Plot(s)



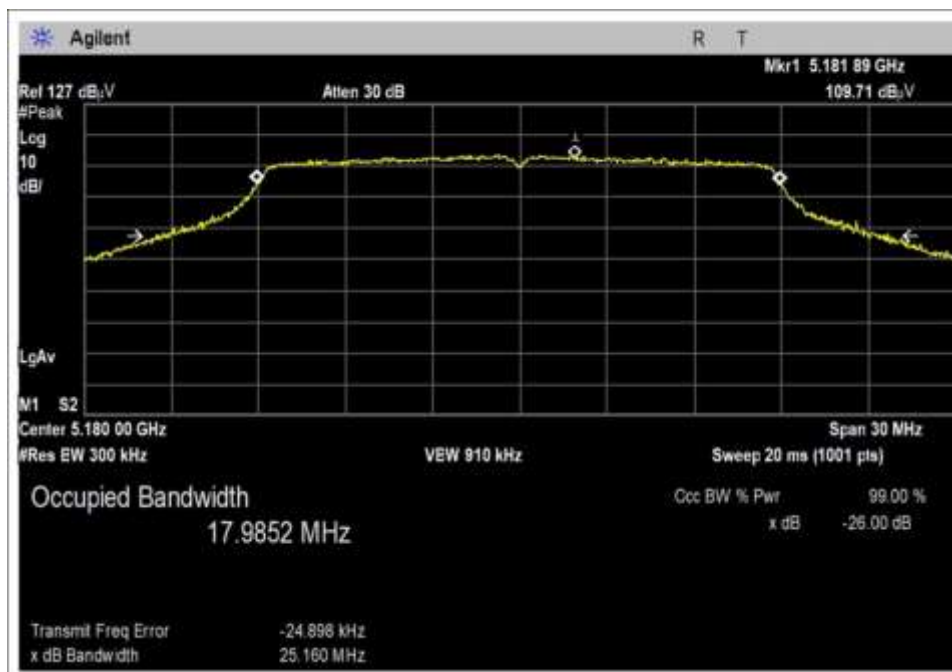
99p+26dB BW Low Channel AP0



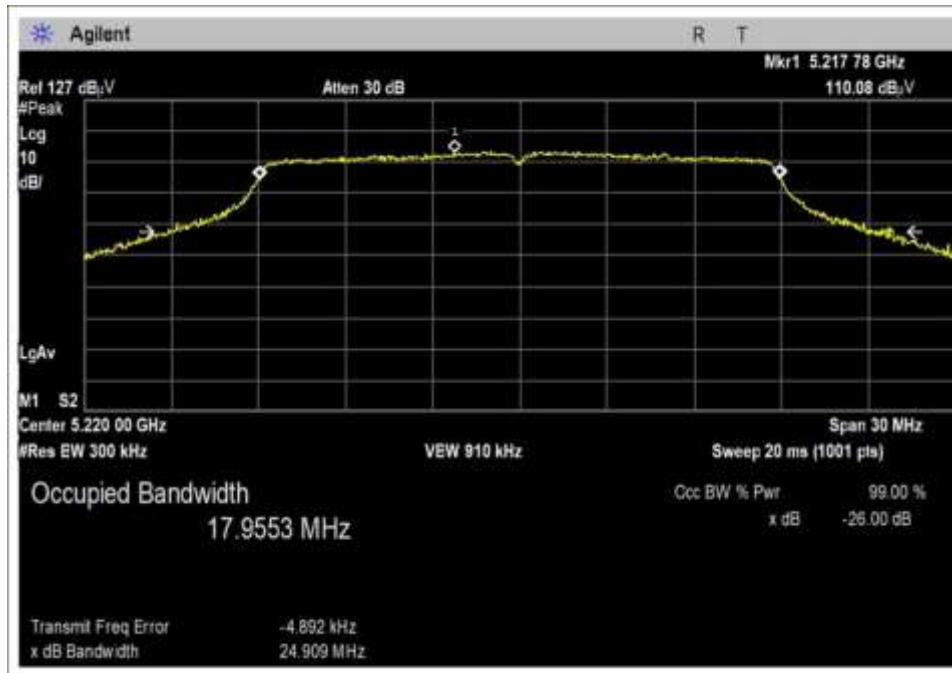
99p+26dB BW Middle Channel AP0



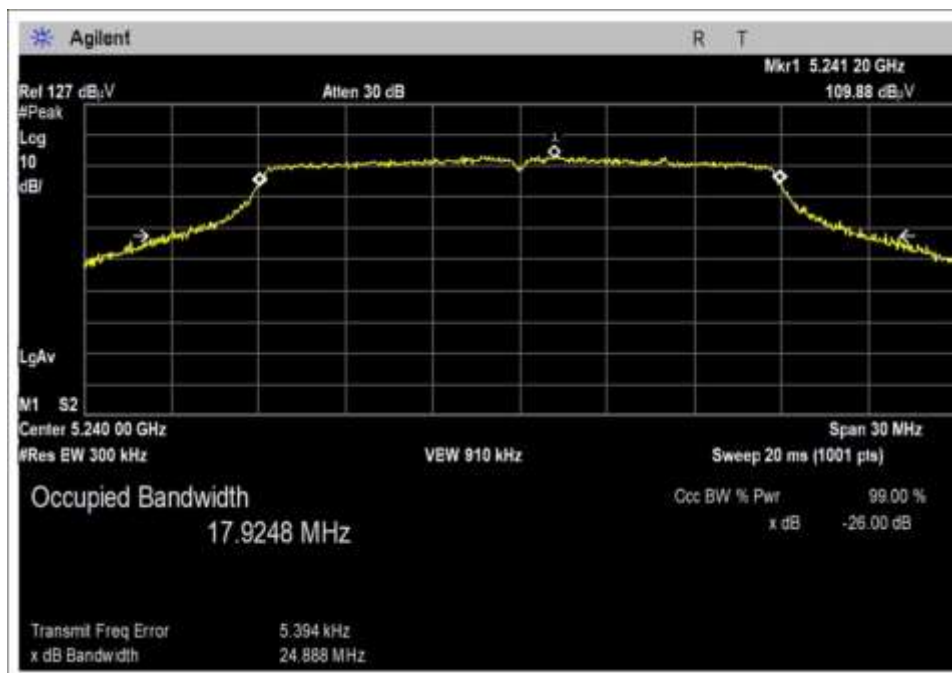
99p+26dB BW High Channel AP0



99p+26dB BW Low Channel AP1



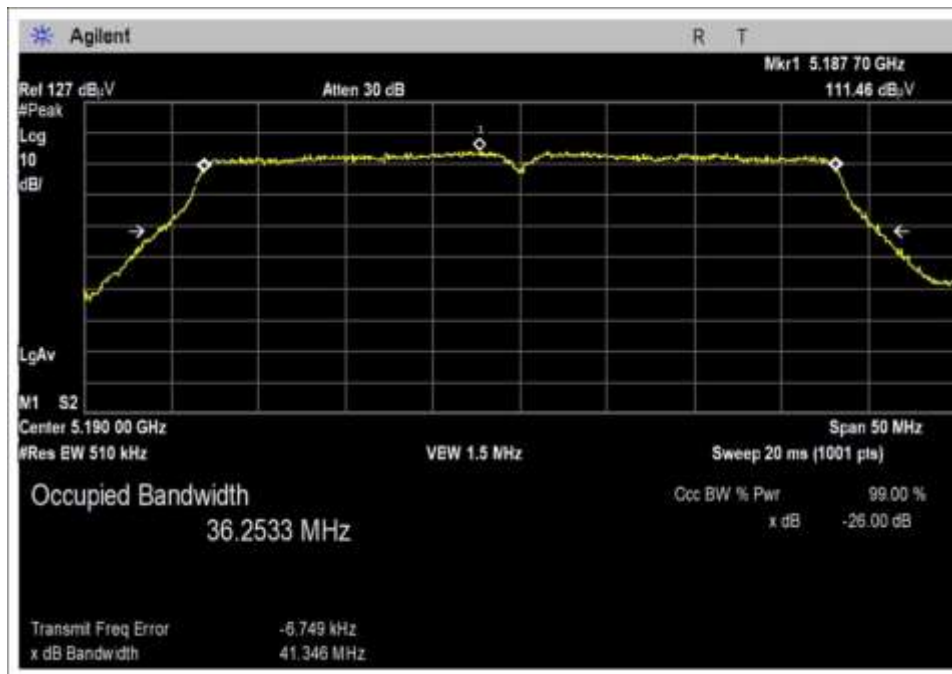
99p+26dB BW Middle Channel AP1



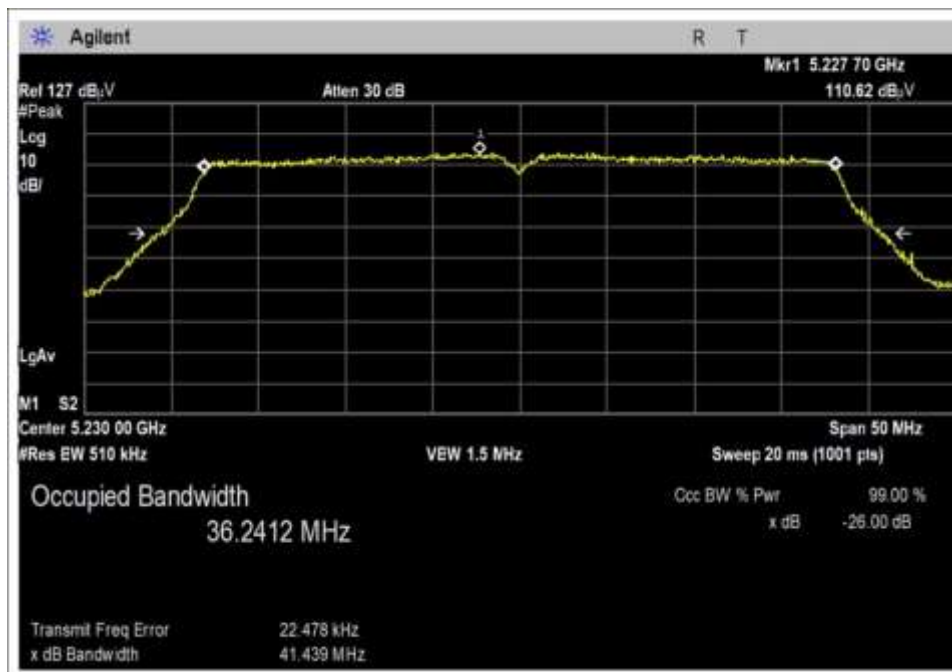
99p+26dB BW High Channel AP1



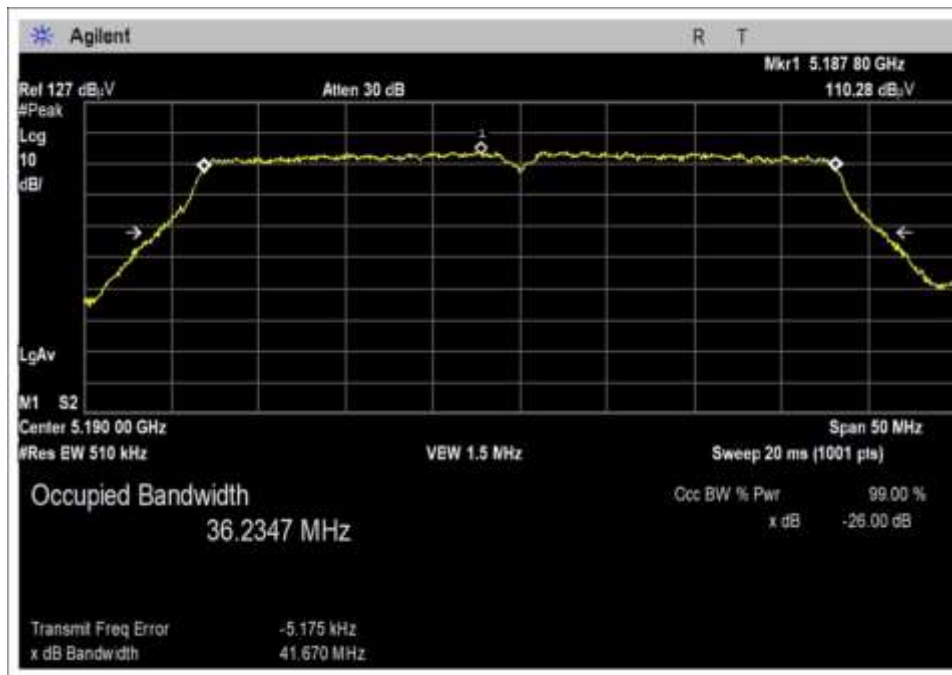
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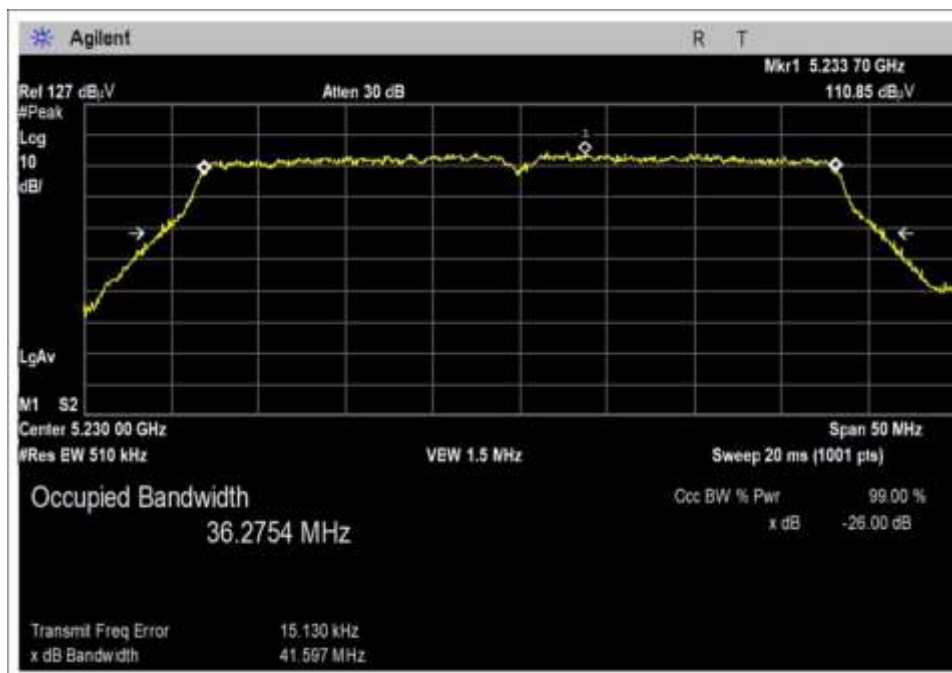
99p+26dB BW Low Channel AP0



99p+26dB BW High Channel AP0

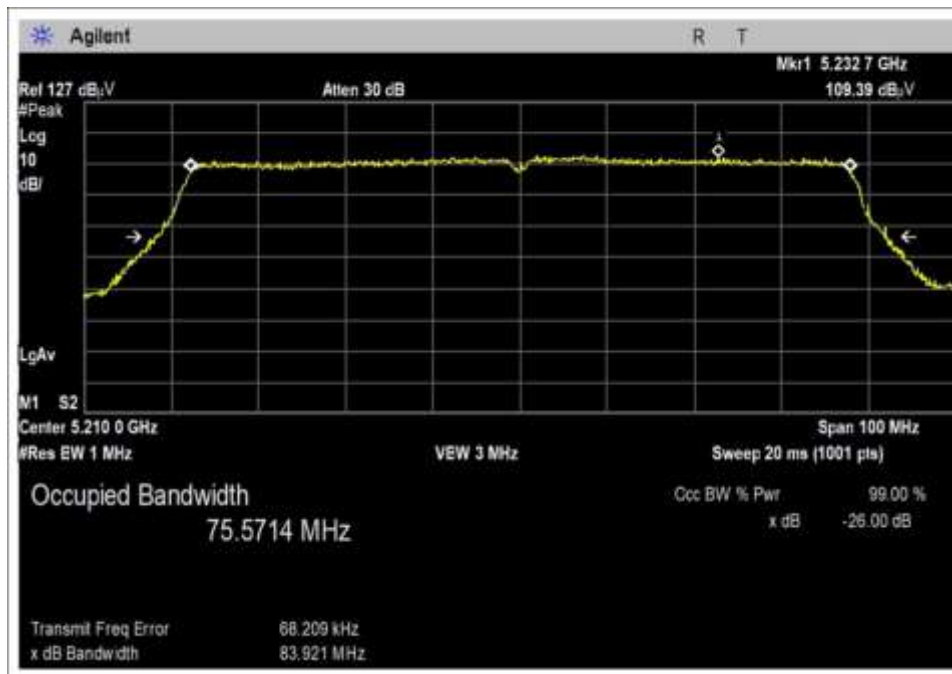


99p+26dB BW Low Channel AP1

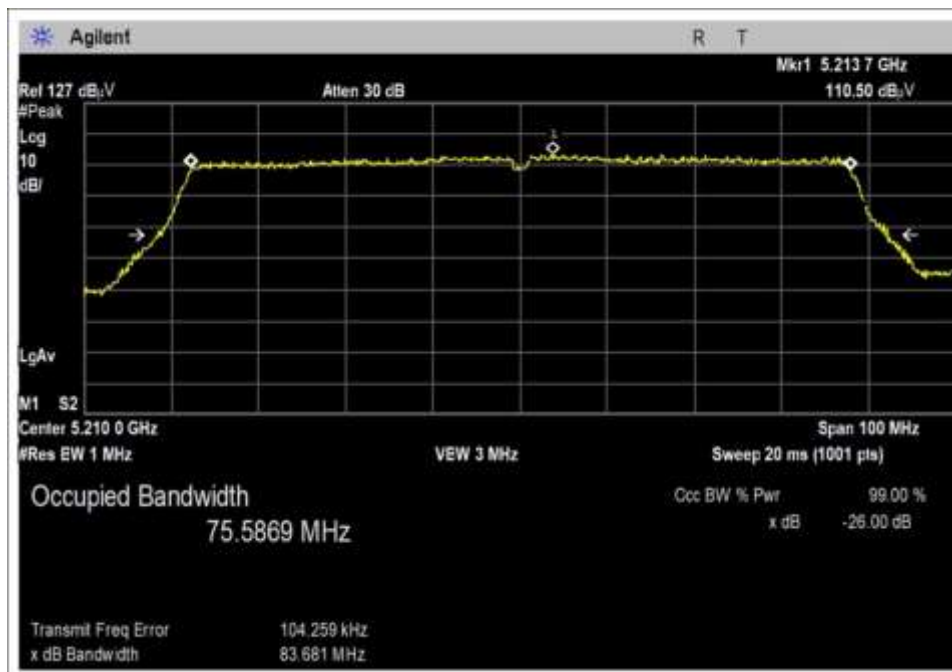


99p+26dB BW High Channel AP1

## 802.11ac80 Plot(s)

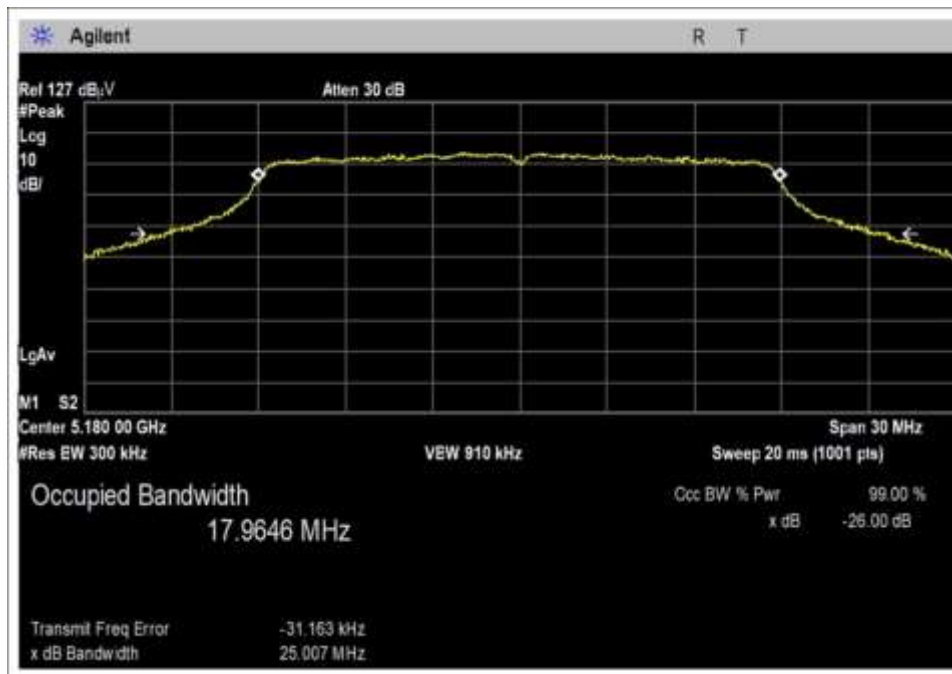


99p+26dB BW AP0



99p+26dB BW AP1

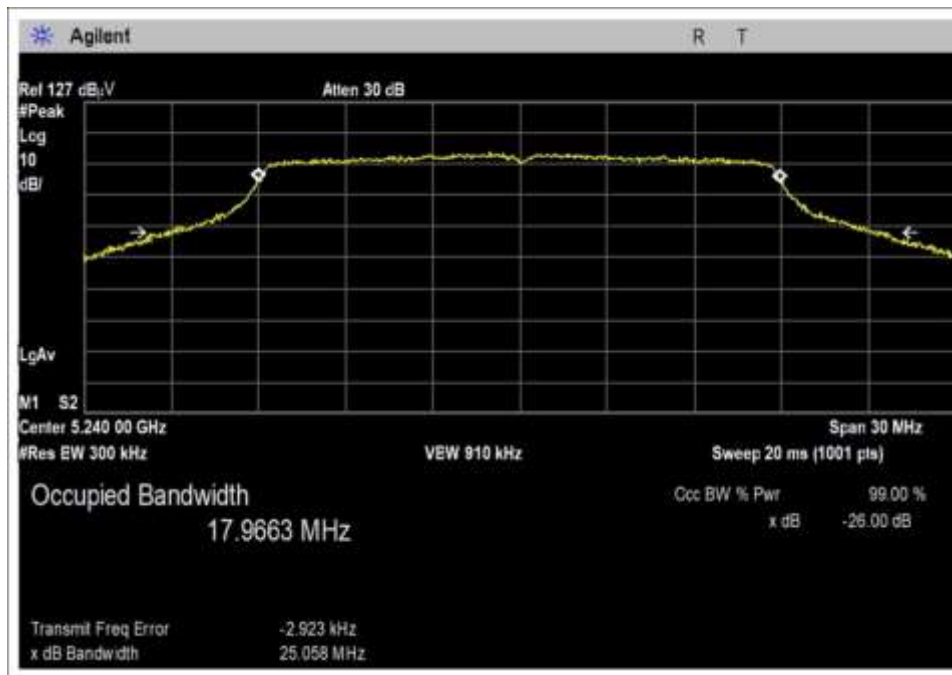
## 802.11n20 Plot(s)



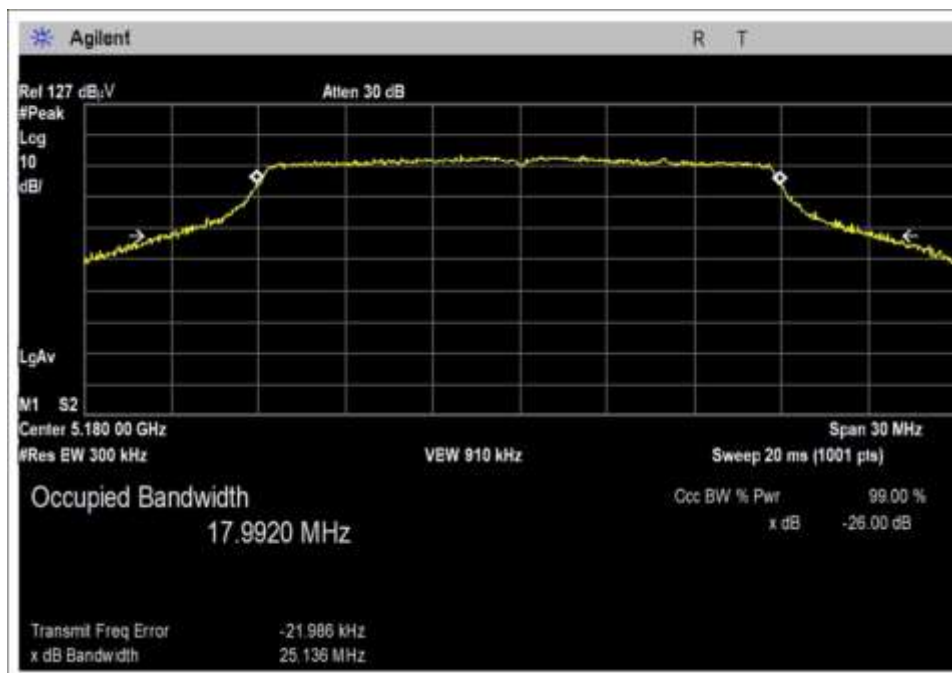
99p+26dB BW Low Channel AP0



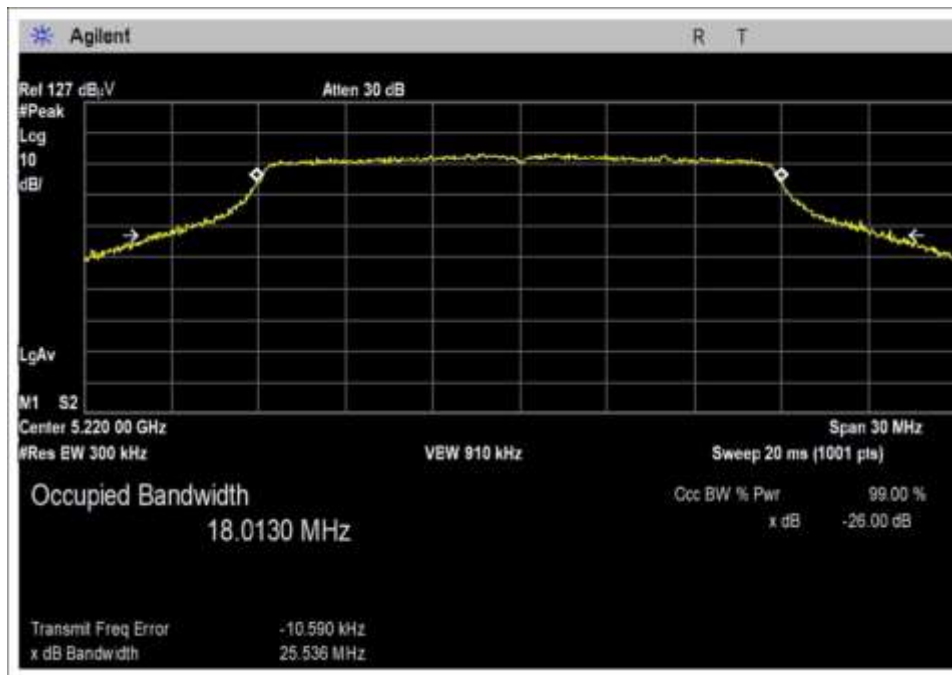
99p+26dB BW Middle Channel AP0



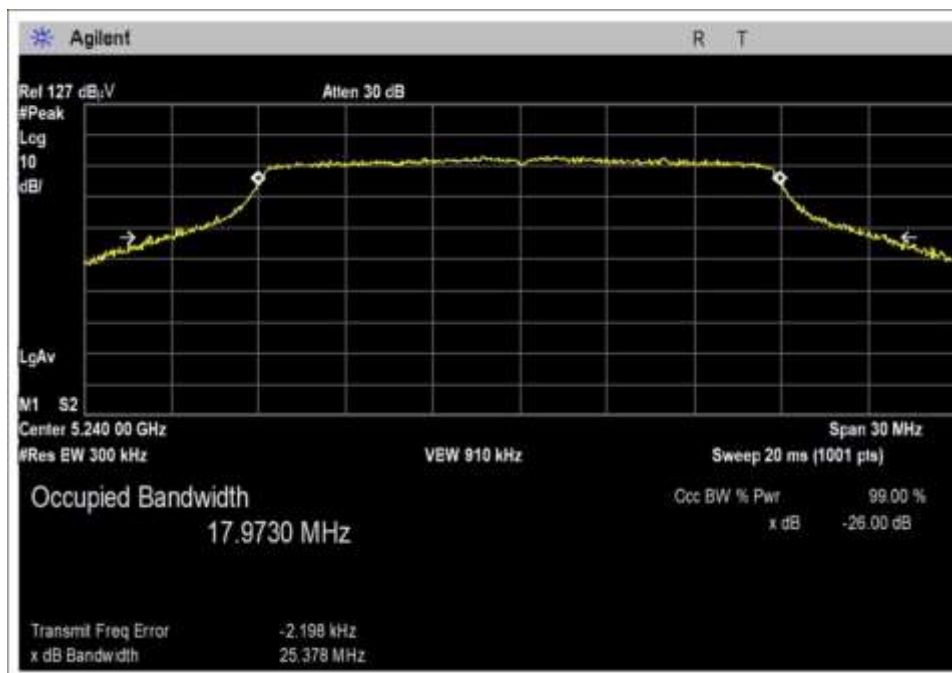
99p+26dB BW High Channel AP0



99p+26dB BW Low Channel AP1

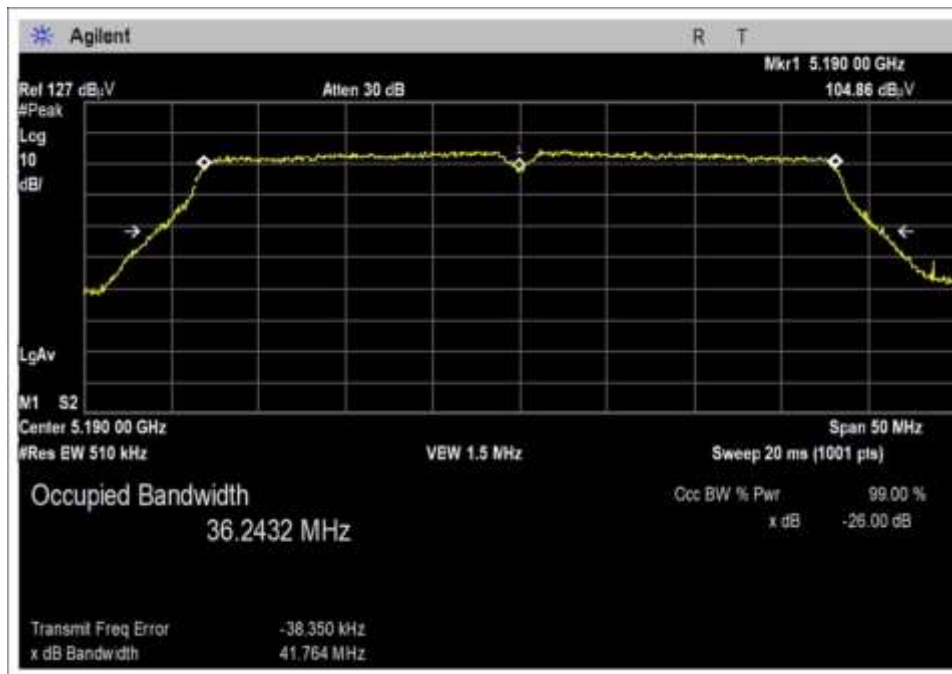


99p+26dB BW Middle Channel AP1

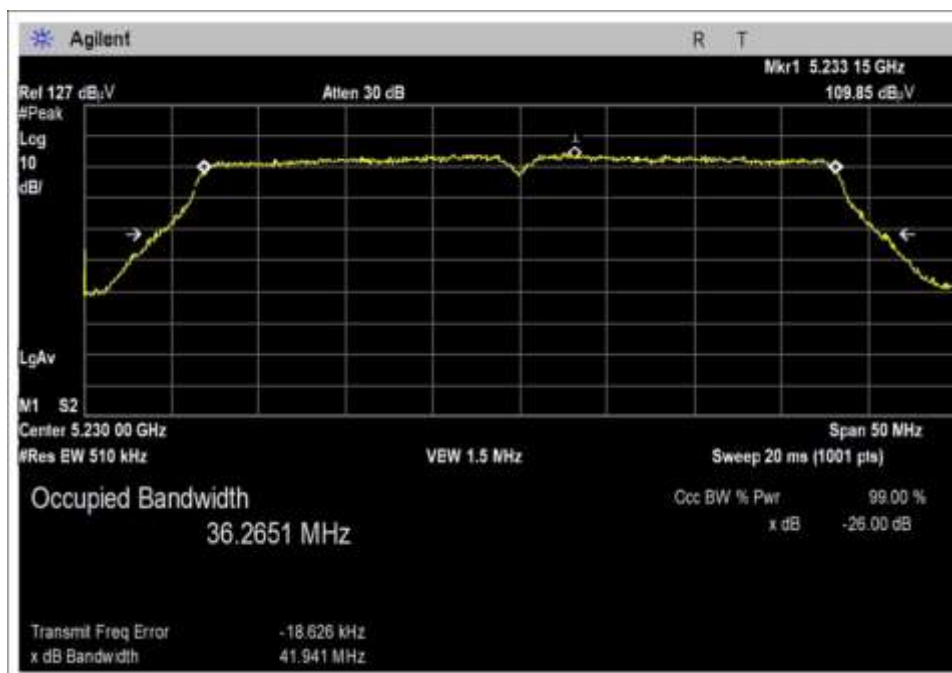


99p+26dB BW High Channel AP1

## 802.11n40 Plot(s)

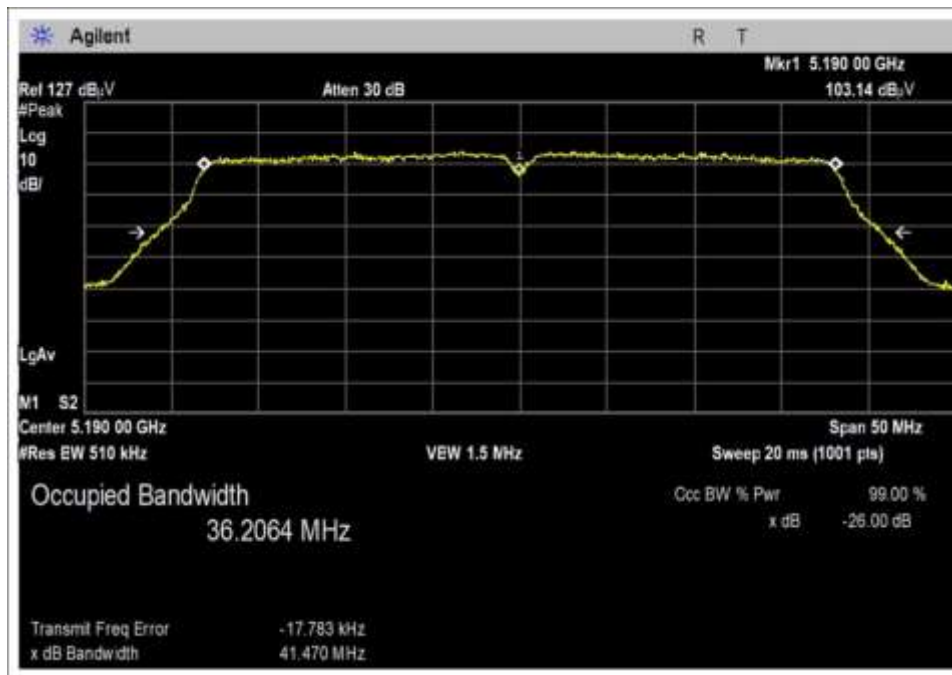


99p+26dB BW Low Channel AP0

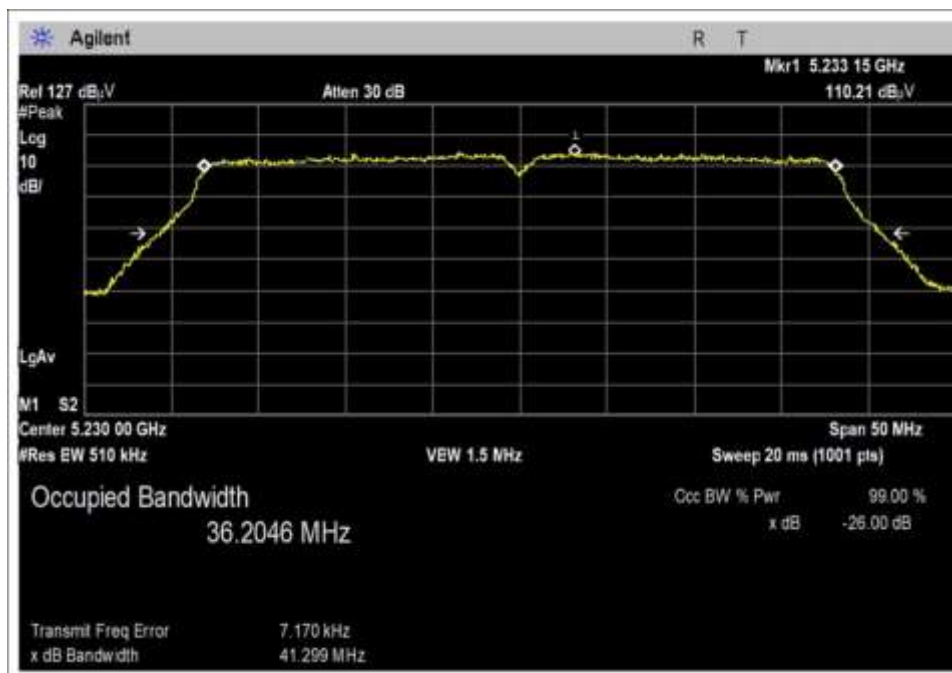


99p+26dB BW High Channel AP0





99p+26dB BW Low Channel AP1



99p+26dB BW High Channel AP1



Test Setup Photo(s)



## 15.407(a)(1) Output Power

Test Setup/Conditions			
Test Location:	Bothell Lab Bench	Test Engineer:	M. Harrison
Test Method:	ANSI C63.10 (2013), KDB 789033 (v02r01 December 14, 2017) KDB 662911 (v02r01 10/31/2013 )	Test Date(s):	4/6/2020
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 Power Meter. 802.11n and 802.11ac are MIMO and summed using KDB662911 (E)(1)		

Environmental Conditions			
Temperature (°C)	20	Relative Humidity (%):	35

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
P05748	Attenuator	Pasternack	PE7004-20	3/4/2020	3/4/2022
03530	Power Sensor	ETS	7002-006	6/6/2019	6/6/2021
01318	Multimeter	Fluke	Fluke 85	7/22/2019	7/22/2021
P07527	Variac	Simpson	NA	11/21/2018	11/21/2020

Test Data Summary - Voltage Variations					
Frequency (MHz)	Modulation / Ant Port	V <sub>Minimum</sub> (dBm)	V <sub>Nominal</sub> (dBm)	V <sub>Maximum</sub> (dBm)	Max Deviation from V <sub>Nominal</sub> (dB)
5180	802.11a / 0	11.8	12	11.8	0.2
5220	802.11a / 0	11.2	11.2	11.1	0.1
5240	802.11a / 0	11.3	11.3	11.3	0
5180	802.11a / 1	11.6	11.6	11.6	0
5220	802.11a / 1	11.3	11.4	11.3	0.1
5240	802.11a / 1	11.3	11.3	11.3	0
5180	802.11n20 / 0	11.6	11.6	11.6	0
5220	802.11n20 / 0	11.4	11.4	11.4	0
5240	802.11n20 / 0	11.5	11.5	11.5	0
5180	802.11n20 / 1	11.5	11.5	11.5	0
5220	802.11n20 / 1	11.7	11.7	11.7	0
5240	802.11n20 / 1	11.4	11.4	11.4	0
5190	802.11n40 / 0	12.3	12.4	12.3	0.1
5230	802.11n40 / 0	12.1	12.1	12.1	0
5190	802.11n40 / 1	12.2	12.3	12.2	0.1
5230	802.11n40 / 1	12	12	12	0
5180	802.11ac20 / 0	11.9	12	11.9	0.1
5220	802.11ac20 / 0	11.5	11.5	11.5	0
5240	802.11ac20 / 0	11.5	11.5	11.5	0
5180	802.11ac20 / 1	11.8	11.8	11.8	0
5220	802.11ac20 / 1	11.7	11.7	11.7	0
5240	802.11ac20 / 1	11.2	11.2	11.2	0
5190	802.11ac40 / 0	10.8	10.8	10.8	0
5230	802.11ac40 / 0	10.9	10.9	10.9	0
5190	802.11ac40 / 1	11	11	11	0
5230	802.11ac40 / 1	11.1	11.1	11.1	0
5210	802.11ac80 / 0	10.6	10.6	10.6	0
5210	802.11ac80 / 1	10.7	10.7	10.7	0

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

### **Parameter Definitions:**

Measurements performed at input voltage V<sub>Nominal</sub> ± 15%.

Parameter	Value
V <sub>Nominal</sub> :	120
V <sub>Minimum</sub> :	102
V <sub>Maximum</sub> :	138

Test Data Summary - RF Conducted Measurement					
Measurement Option: AVGPM					
Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Limit (dBm)	Results
5180	802.11a / 0	Linear Polarized / 5.3	12	≤30	Pass
5220	802.11a / 0	Linear Polarized / 5.3	11.2	≤30	Pass
5240	802.11a / 0	Linear Polarized / 5.3	11.3	≤30	Pass
5180	802.11a / 1	Linear Polarized / 5.9	11.6	≤30	Pass
5220	802.11a / 1	Linear Polarized / 5.9	11.4	≤30	Pass
5240	802.11a / 1	Linear Polarized / 5.9	11.3	≤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
5180	802.11n20 / 0	Linear Polarized / 5.3	11.6	14.9	≤30	Pass
5180	802.11n20 / 1	Linear Polarized / 5.9	11.5			
5220	802.11n20 / 0	Linear Polarized / 5.3	11.4	14.6	≤30	Pass
5220	802.11n20 / 1	Linear Polarized / 5.9	11.7			
5240	802.11n20 / 0	Linear Polarized / 5.3	11.5	14.5	≤30	Pass
5240	802.11n20 / 1	Linear Polarized / 5.9	11.4			
5190	802.11n40 / 0	Linear Polarized / 5.3	12.4	15.4	≤30	Pass
5190	802.11n40 / 1	Linear Polarized / 5.9	12.3			
5230	802.11n40 / 0	Linear Polarized / 5.3	12.4	15.2	≤30	Pass
5230	802.11n40 / 1	Linear Polarized / 5.9	12			

Test Data Summary - RF Conducted Measurement						
Measurement Option: AVGPM						
Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Summed Power (dBm)	Limit (dBm)	Results
5180	802.11ac20 / 0	Linear Polarized / 5.3	12	14.9	≤30	Pass
5180	802.11ac20 / 1	Linear Polarized / 5.9	11.8			
5220	802.11ac20 / 0	Linear Polarized / 5.3	11.5	14.6	≤30	Pass
5220	802.11ac20 / 1	Linear Polarized / 5.9	11.7			
5240	802.11ac20 / 0	Linear Polarized / 5.3	11.5	14.4	≤30	Pass
5240	802.11ac20 / 1	Linear Polarized / 5.9	11.2			
5190	802.11ac40 / 0	Linear Polarized / 5.3	10.8	13.9	≤30	Pass
5190	802.11ac40 / 1	Linear Polarized / 5.9	11			
5230	802.11ac40 / 0	Linear Polarized / 5.3	10.9	14.0	≤30	Pass
5230	802.11ac40 / 1	Linear Polarized / 5.9	11.1			
5210	802.11ac80 / 0	Linear Polarized / 5.3	10.6	13.7	≤30	Pass
5210	802.11ac80 / 1	Linear Polarized / 5.9	10.7			

For access points using antennas other than in fixed point-to-point applications, the limit is calculated in accordance with 15.407(a)(1)(i):

$$\text{Limit} = 30 - \text{Roundup}(G - 6)$$

For access points using antennas in fixed point-to-point applications, the limit is calculated in accordance with 15.407(a)(1)(ii):

$$\text{Limit} = 30 - \text{Roundup}(G - 23)$$

For client devices access points using antennas in fixed point-to-point applications, the limit is calculated in accordance with 15.407(a)(1)(iii):

$$\text{Limit} = 24 - \text{Roundup}(G - 6)$$

#### Test Setup Photo(s)



## 15.407(a)(1) Power Spectral Density

Test Setup/Conditions – RF Conducted Measurement			
Test Location:	Bothell Lab Bench	Test Engineer:	M. Harrison
Test Method:	ANSI C63.10 (2013), KDB 789033 (v02r01 December 14, 2017) KDB 662911 (v02r01 10/31/2013 )	Test Date(s):	4/8/2020
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 (°C)	20	Relative Humidity (%):	40

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

### Test Data Summary - RF Conducted Measurement

Measurement Option: AVGSA-1

Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm/MHz)	Limit (dBm/MHz)	Results
5180	802.11a / 0	Linear Polarized / 5.3	0.45	≤17	Pass
5220	802.11a / 0	Linear Polarized / 5.3	0.18	≤17	Pass
5240	802.11a / 0	Linear Polarized / 5.3	0.27	≤17	Pass
5180	802.11a / 1	Linear Polarized / 5.9	0.25	≤17	Pass
5220	802.11a / 1	Linear Polarized / 5.9	0.47	≤17	Pass
5240	802.11a / 1	Linear Polarized / 5.9	0.28	≤17	Pass

### Test Data Summary - RF Conducted Measurement

802.11n and 802.11ac are MIMO and are Summed using KDB662911 (E)(2)(b)

Measurement Option: AVGPM

Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Summed Power (dBm)	Limit (dBm)	Results
5180	802.11n20 / 0	Linear Polarized / 5.3	-0.23	2.9	≤17	Pass
5180	802.11n20 / 1	Linear Polarized / 5.9	-0.05			
5220	802.11n20 / 0	Linear Polarized / 5.3	-0.38	2.8	≤17	Pass
5220	802.11n20 / 1	Linear Polarized / 5.9	0.04			
5240	802.11n20 / 0	Linear Polarized / 5.3	-0.24	2.8	≤17	Pass
5240	802.11n20 / 1	Linear Polarized / 5.9	-0.15			
5190	802.11n40 / 0	Linear Polarized / 5.3	-3.11	-0.1	≤17	Pass
5190	802.11n40 / 1	Linear Polarized / 5.9	-3.15			
5230	802.11n40 / 0	Linear Polarized / 5.3	-3.17	0.0	≤30	Pass
5230	802.11n40 / 1	Linear Polarized / 5.9	-2.79			

### Test Data Summary - RF Conducted Measurement

802.11n and 802.11ac are MIMO and are Summed using KDB662911 (E)(2)(b)

Measurement Option: AVGPM

Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Summed Power (dBm)	Limit (dBm)	Results
5180	802.11ac20 / 0	Linear Polarized / 5.3	-0.01	2.9	≤17	Pass
5180	802.11ac20 / 1	Linear Polarized / 5.9	-0.25			
5220	802.11ac20 / 0	Linear Polarized / 5.3	-0.16	2.8	≤17	Pass
5220	802.11ac20 / 1	Linear Polarized / 5.9	-0.21			
5240	802.11ac20 / 0	Linear Polarized / 5.3	-0.14	2.9	≤17	Pass
5240	802.11ac20 / 1	Linear Polarized / 5.9	0.05			
5190	802.11ac40 / 0	Linear Polarized / 5.3	-2.83	0.2	≤17	Pass
5190	802.11ac40 / 1	Linear Polarized / 5.9	-2.76			
5230	802.11ac40 / 0	Linear Polarized / 5.3	-2.83	0.2	≤17	Pass
5230	802.11ac40 / 1	Linear Polarized / 5.9	-2.82			
5210	802.11ac80 / 0	Linear Polarized / 5.3	-7.04	3.8	≤17	Pass
5210	802.11ac80 / 1	Linear Polarized / 5.9	-6.54			

For access points using antennas other than in fixed point-to-point applications, the limit is calculated in accordance with 15.407(a)(1)(i):

$$\text{Limit} = 17 - \text{Roundup}(G - 6)$$

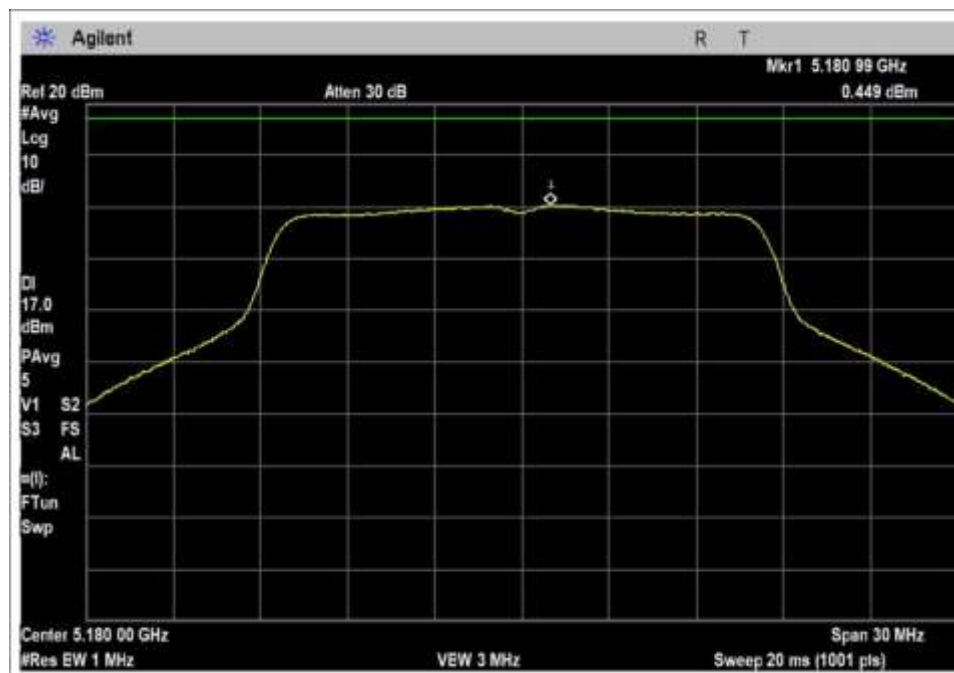
For access points using antennas in fixed point-to-point applications, the limit is calculated in accordance with 15.407(a)(1)(ii):

$$\text{Limit} = 17 - \text{Roundup}(G - 23)$$

For client devices access points using antennas in fixed point-to-point applications, the limit is calculated in accordance with 15.407(a)(1)(iii):

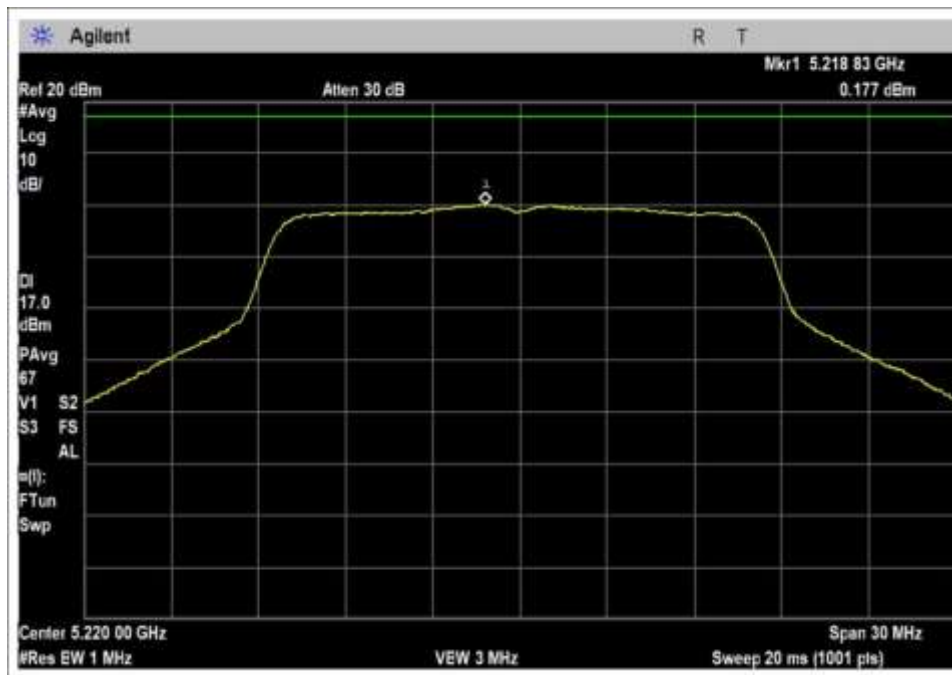
## RF Conducted

### 802.11a Test Plot(s)

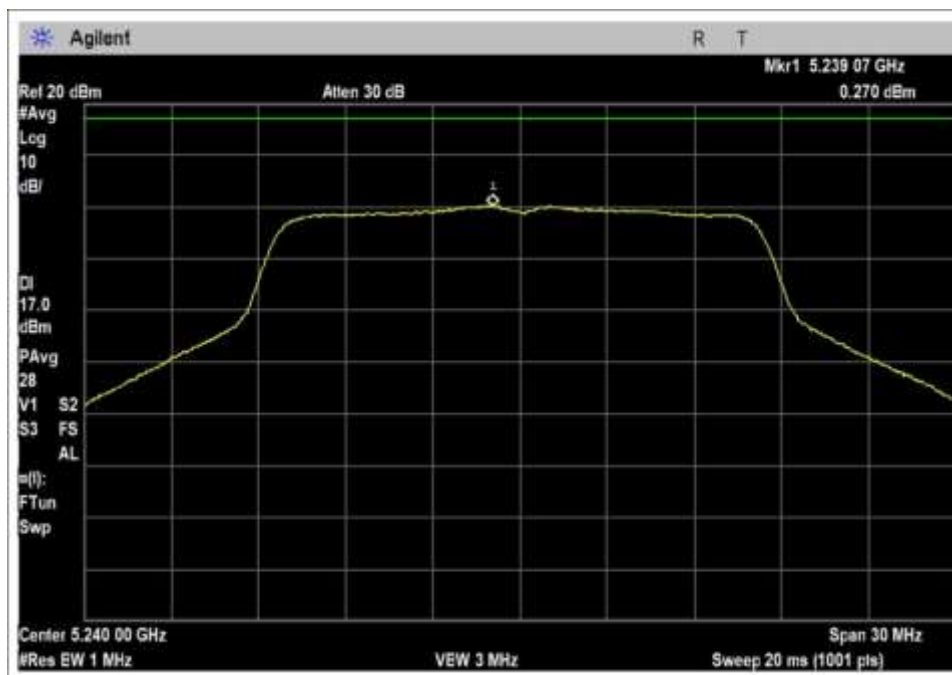


AP0 Low Channel

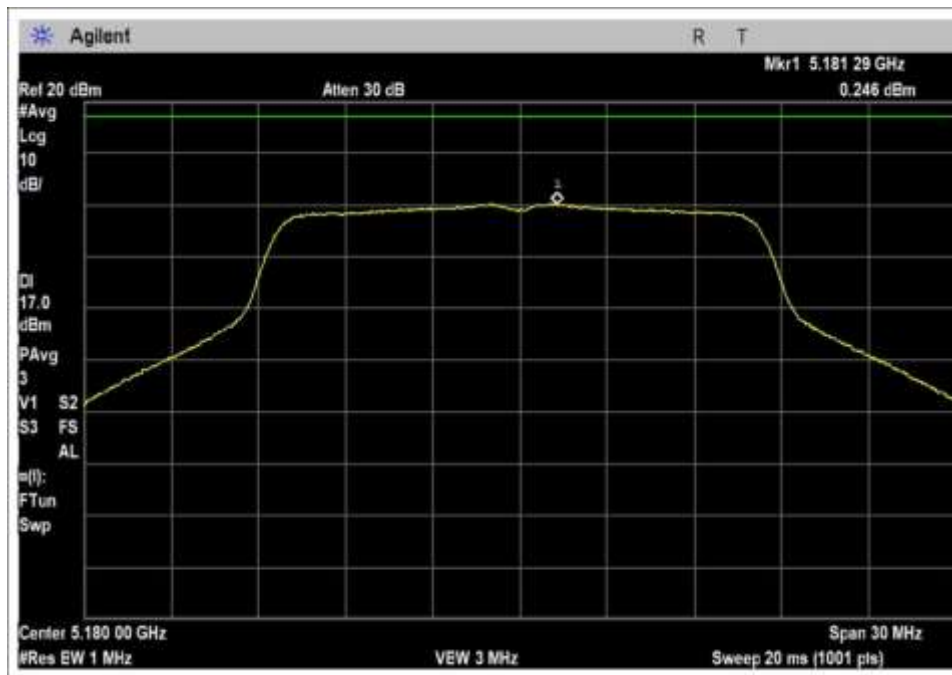




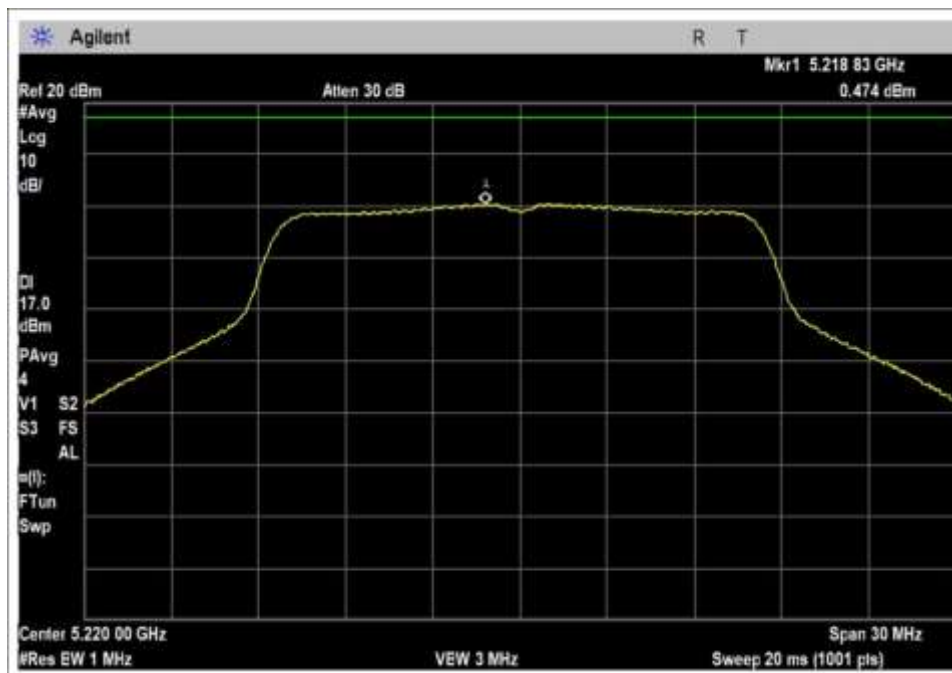
APO Middle Channel



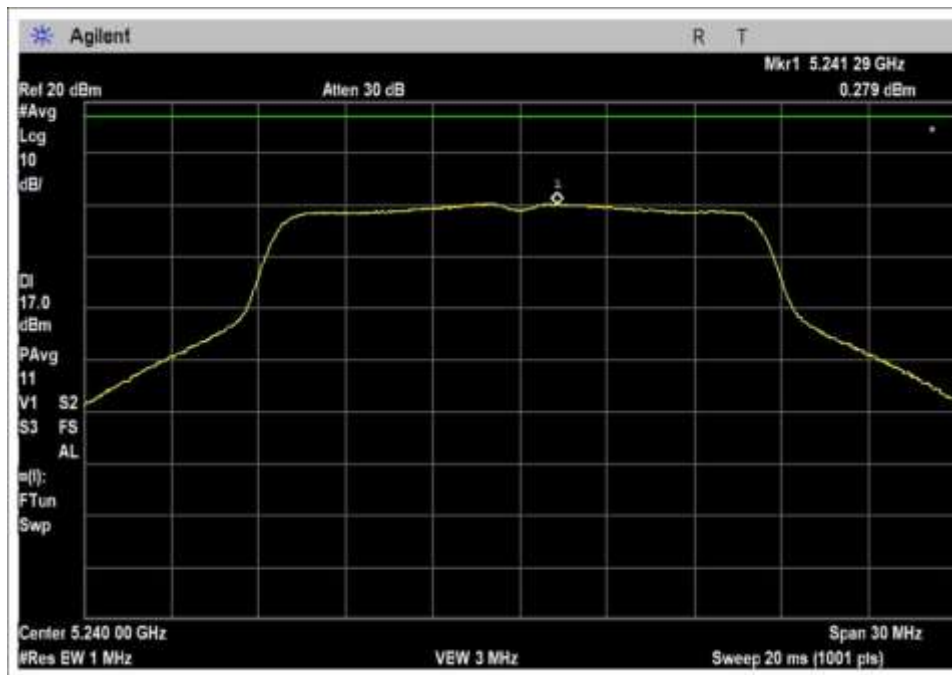
APO High Channel



AP1 Low Channel

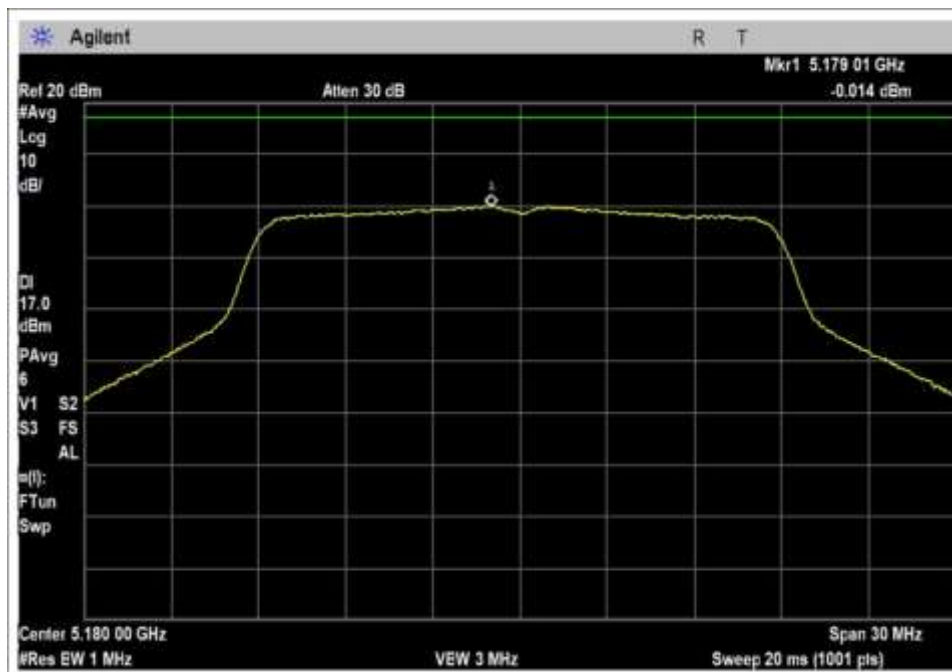


AP1 Middle Channel

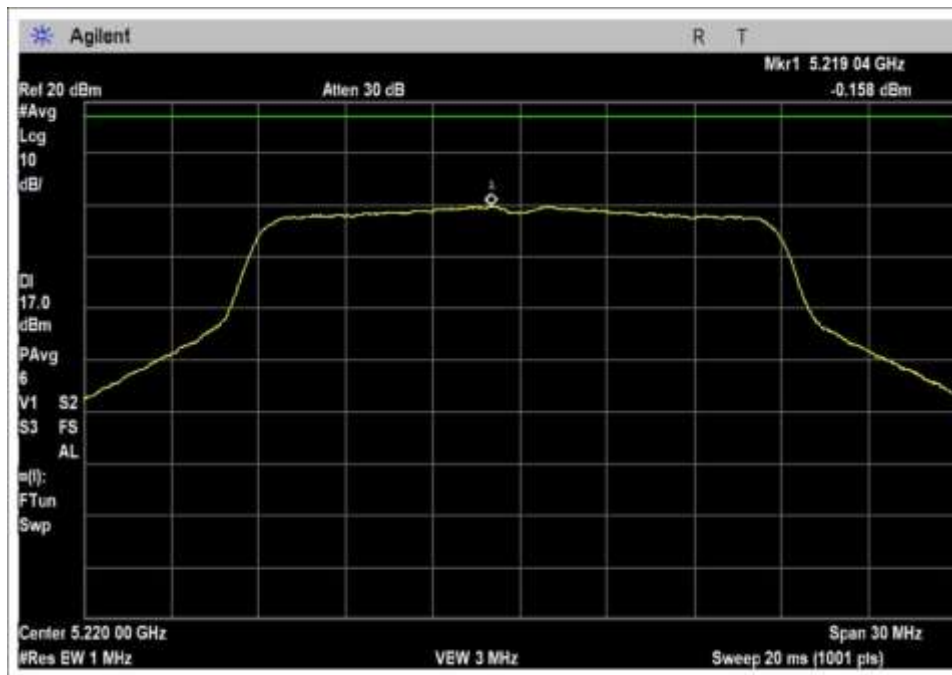


AP1 High Channel

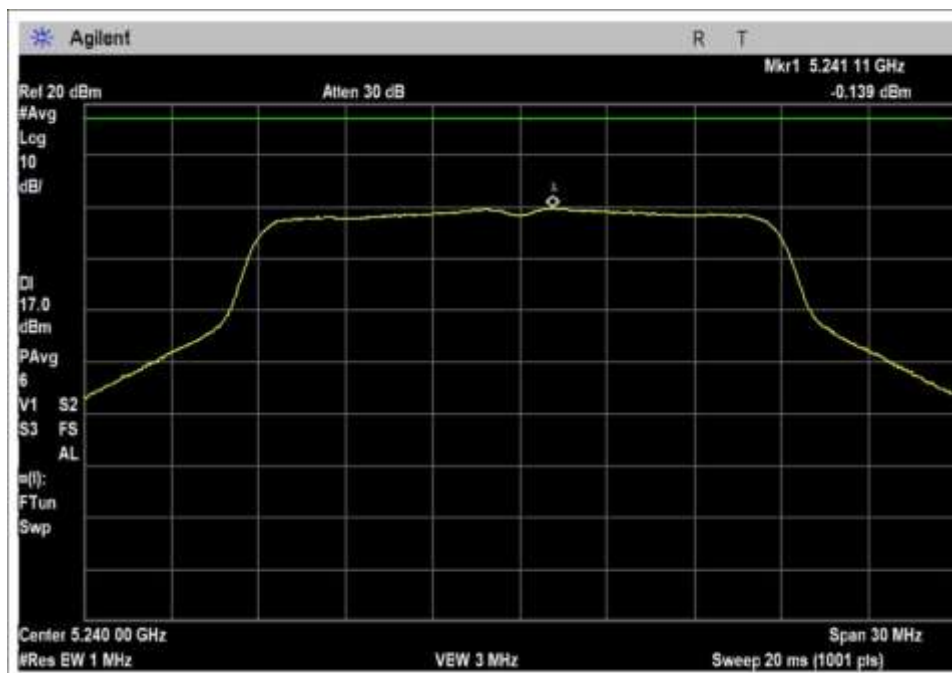
### 802.11ac20 Test Plot(s)



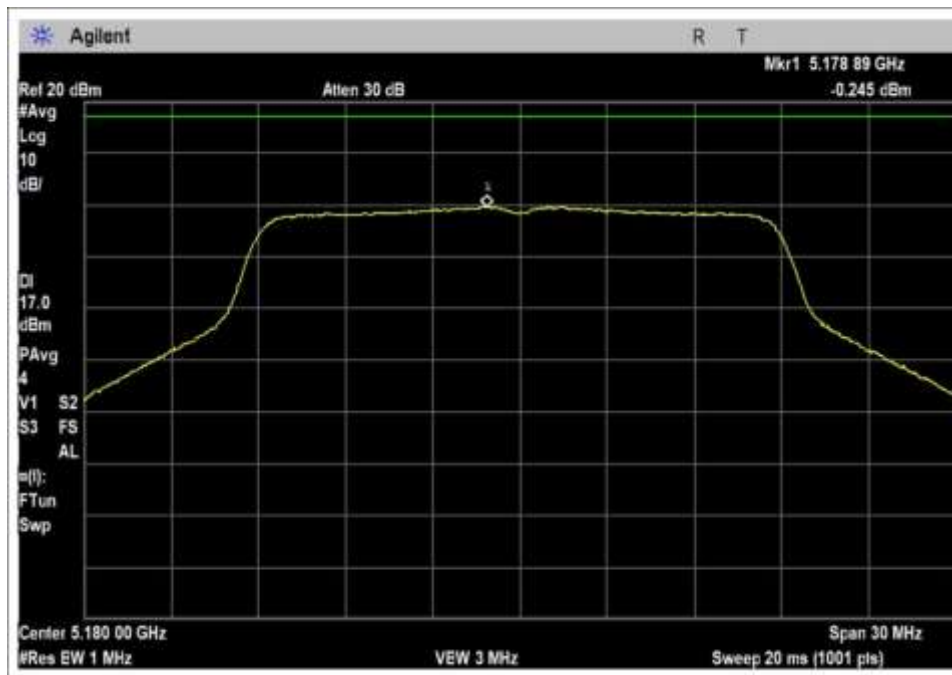
AP0 Low Channel



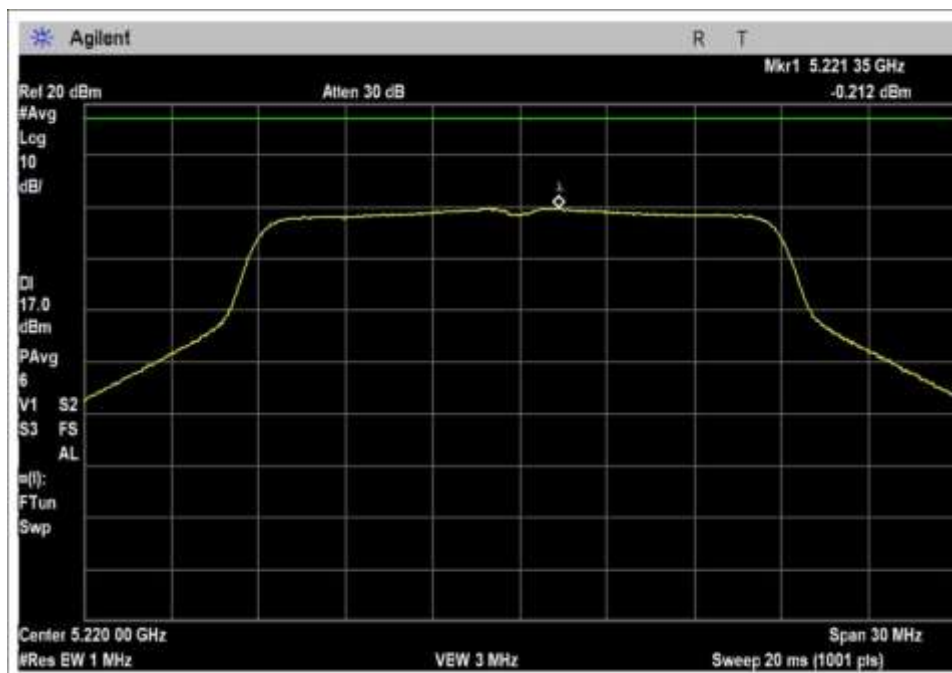
APO Middle Channel



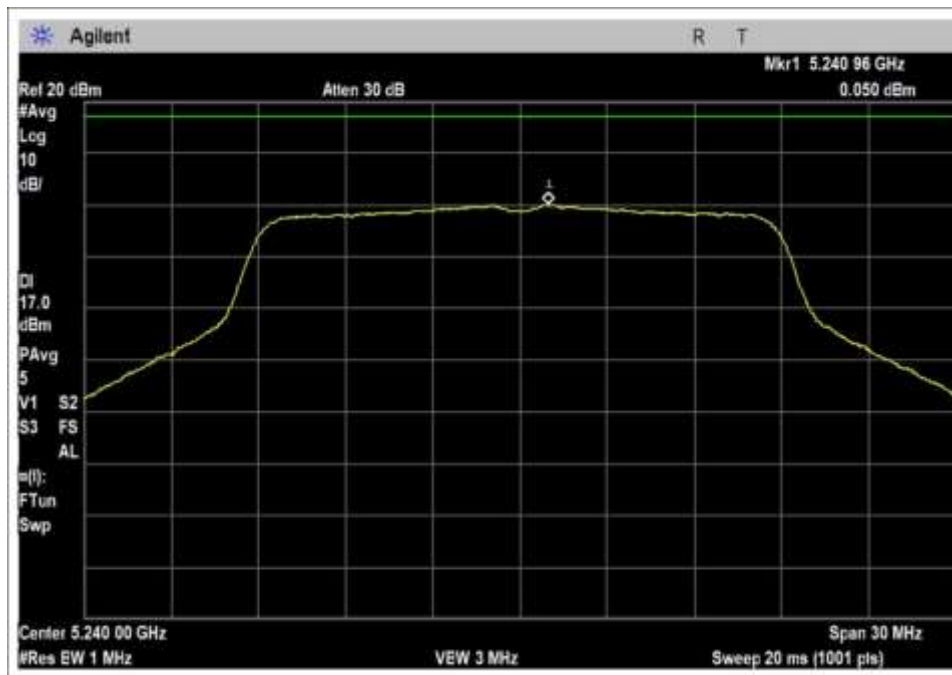
APO High Channel



AP1 Low Channel

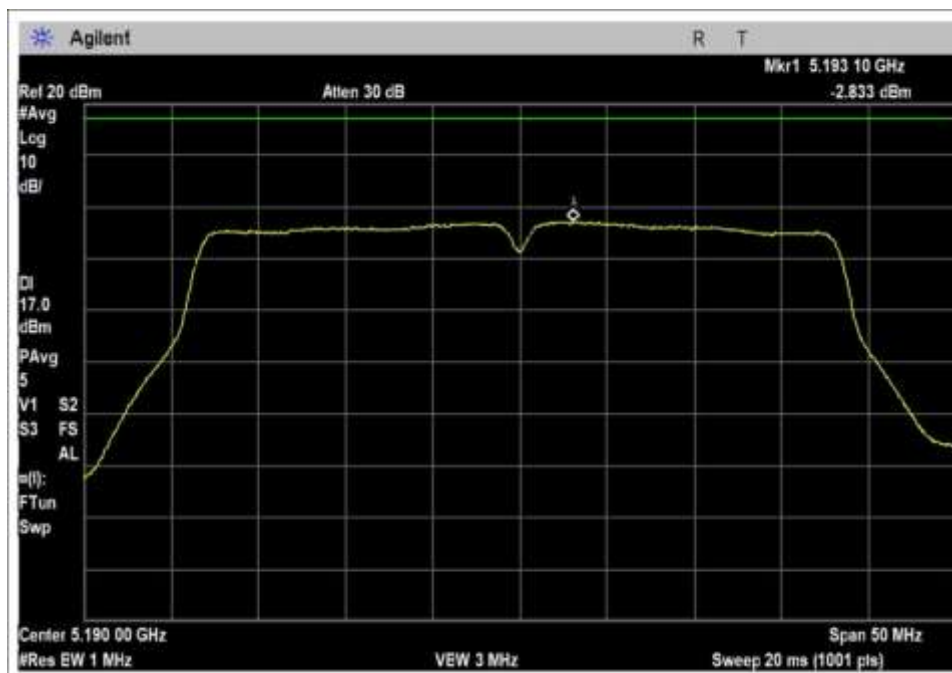


AP1 Middle Channel

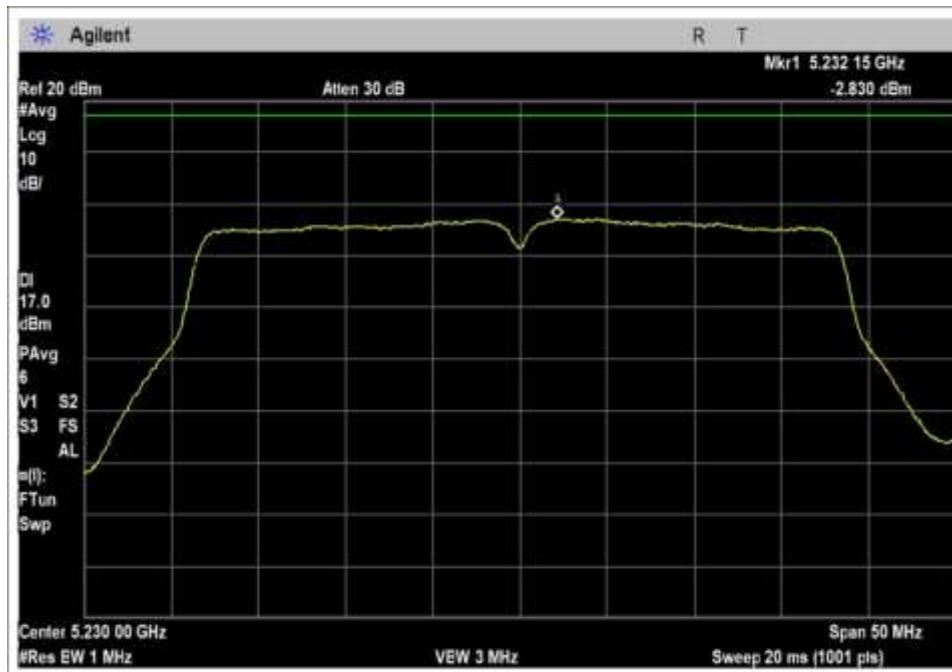


AP1 High Channel

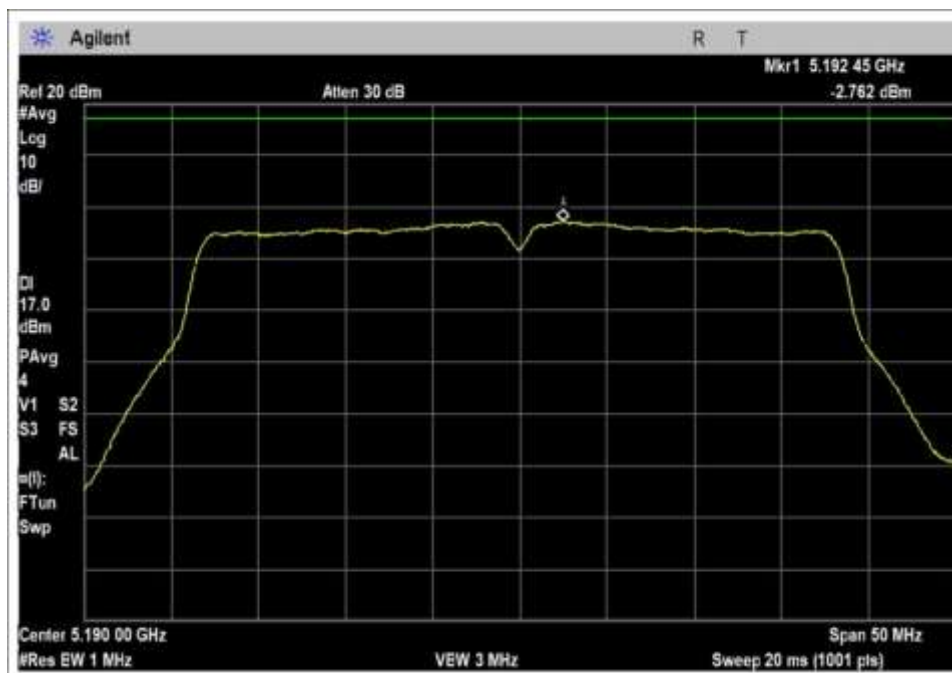
### 802.11ac40 Test Plot(s)



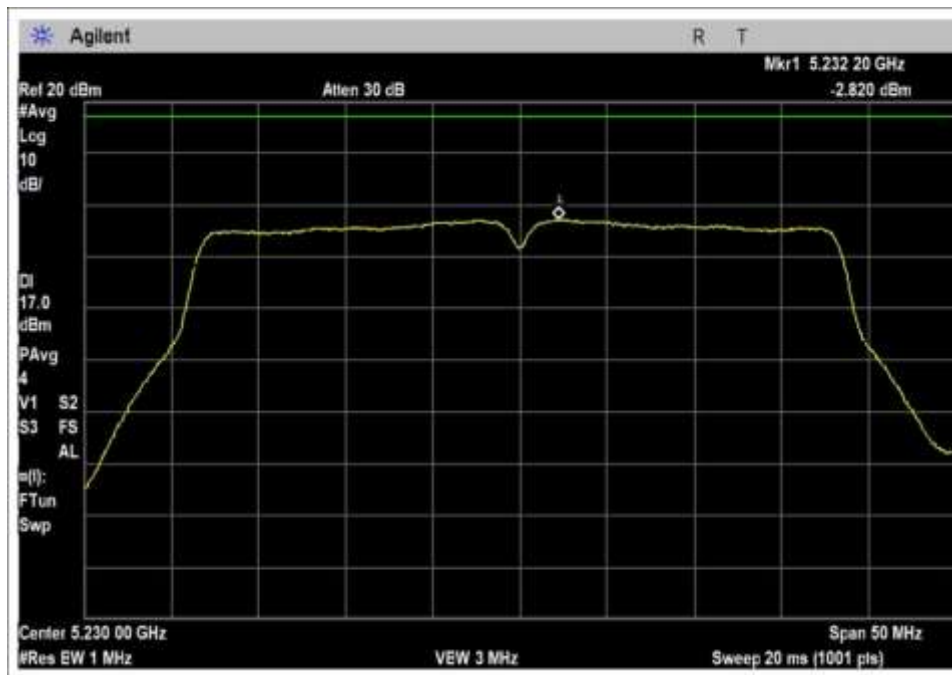
AP0 Low Channel



APO High Channel

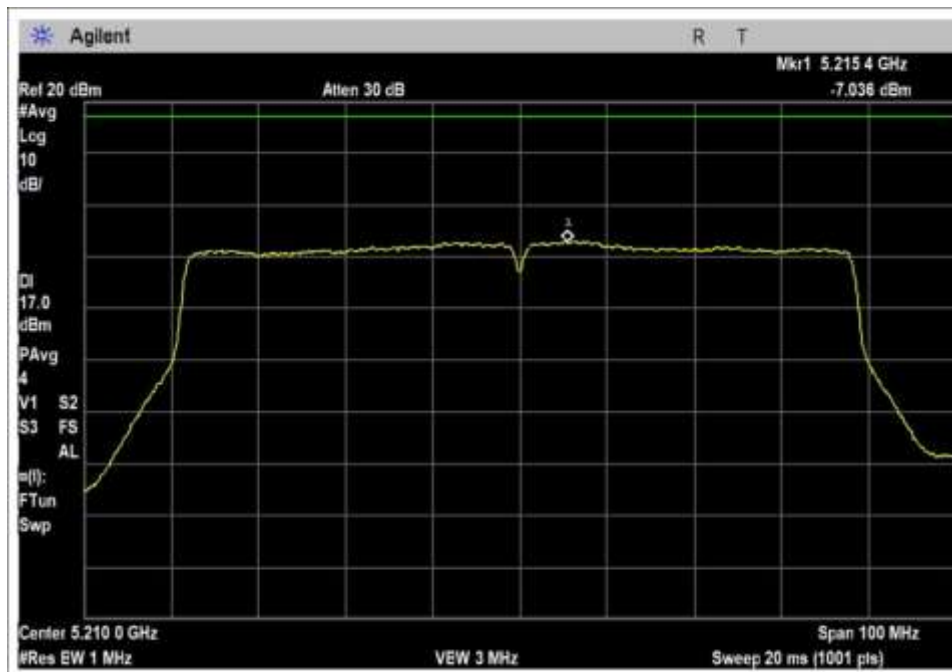


AP1 Low Channel



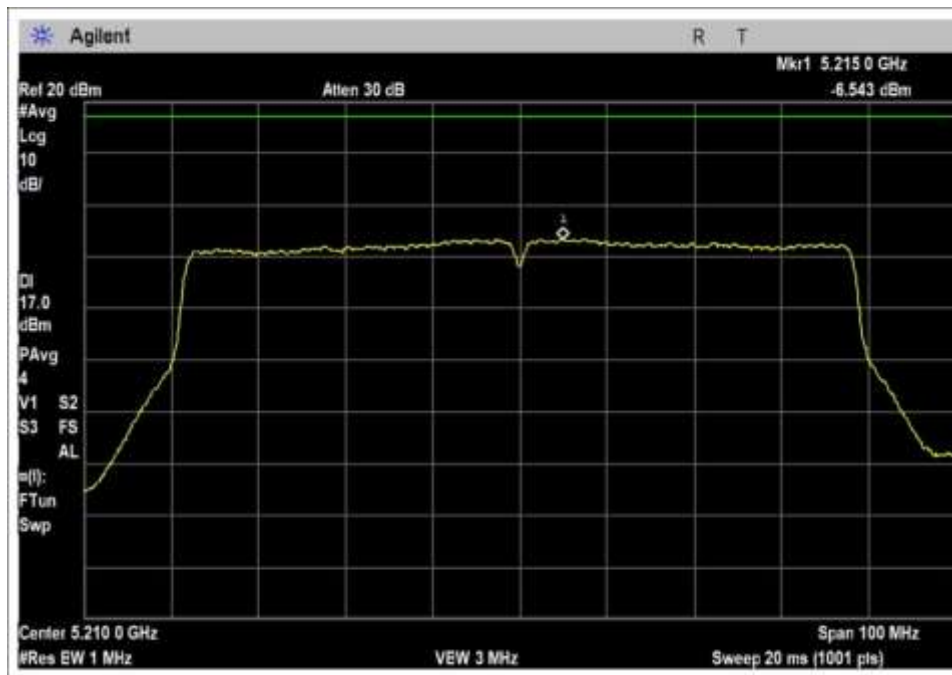
AP1 High Channel

### 802.11ac80 Test Plot(s)



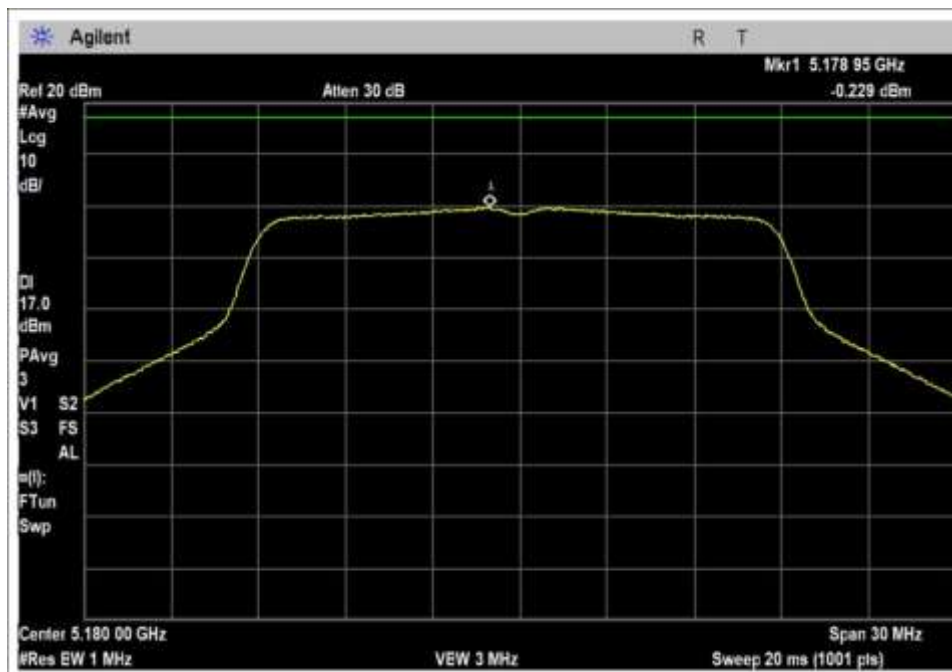
APO



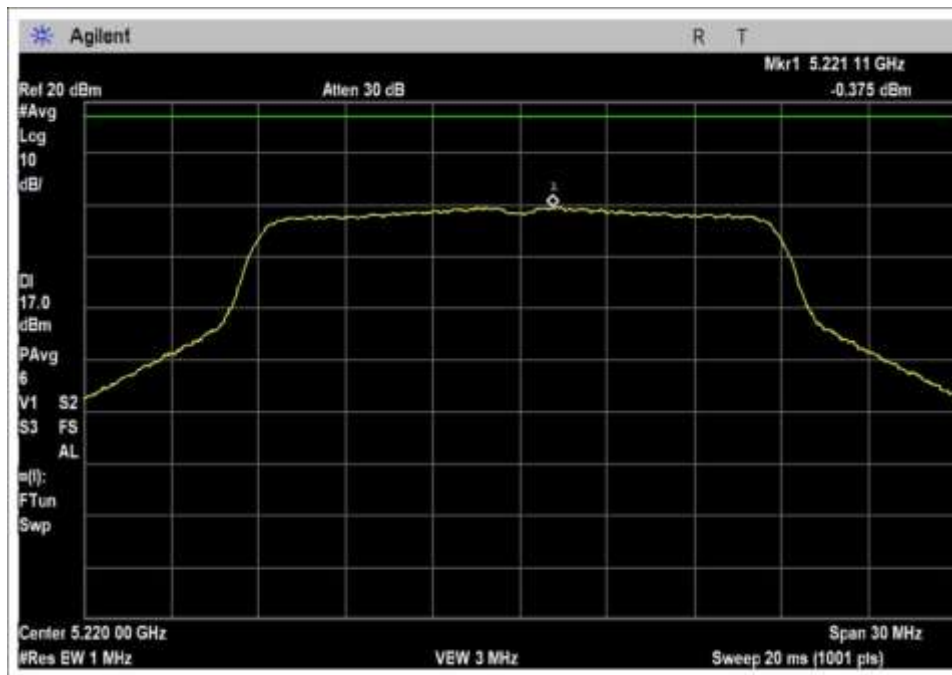


AP1

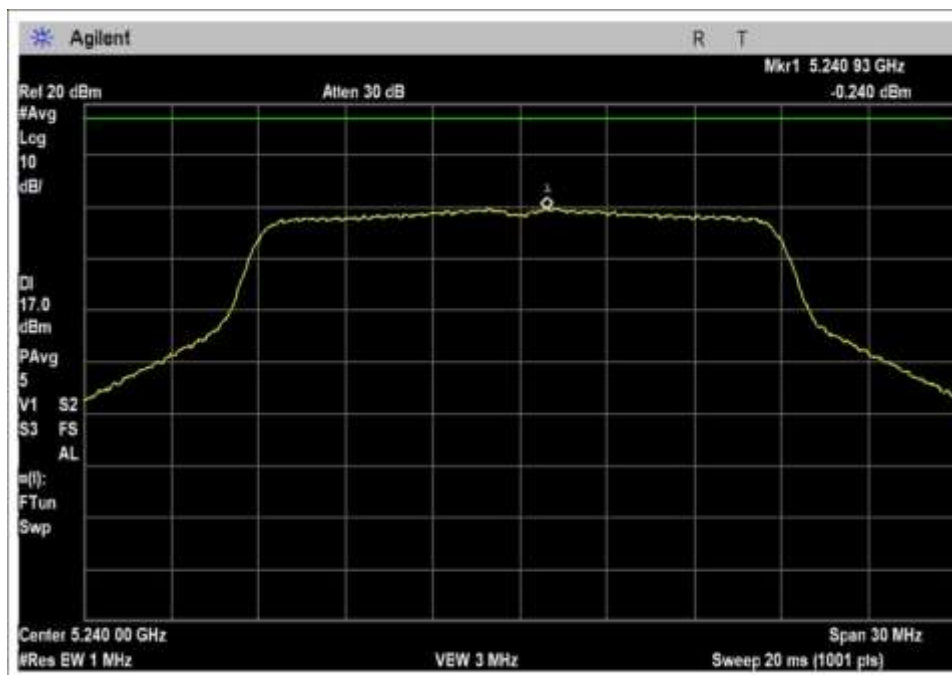
### 802.11n20 Test Plot(s)



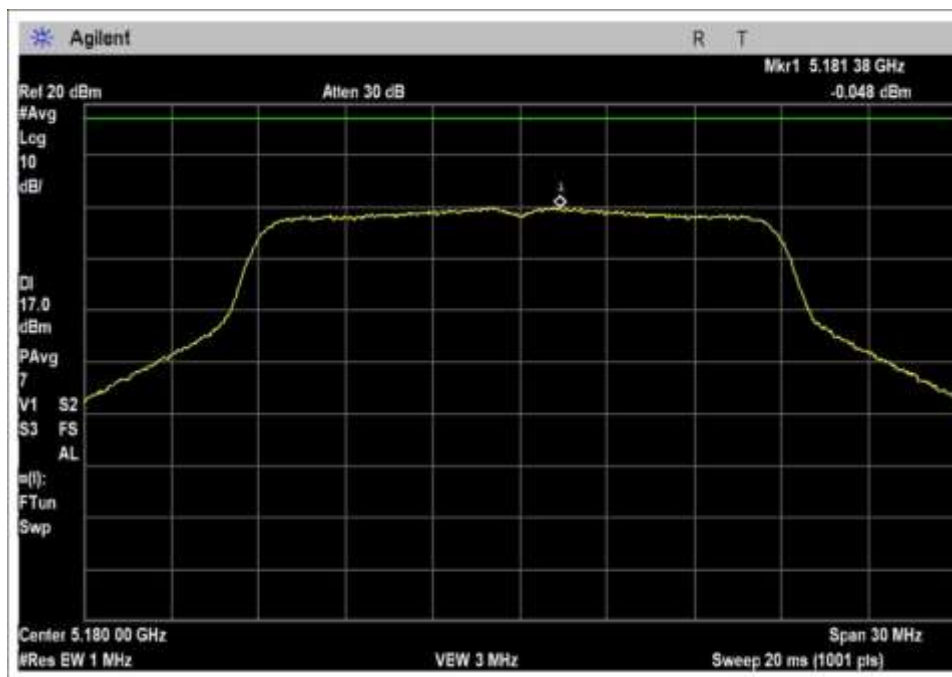
AP0 Low Channel



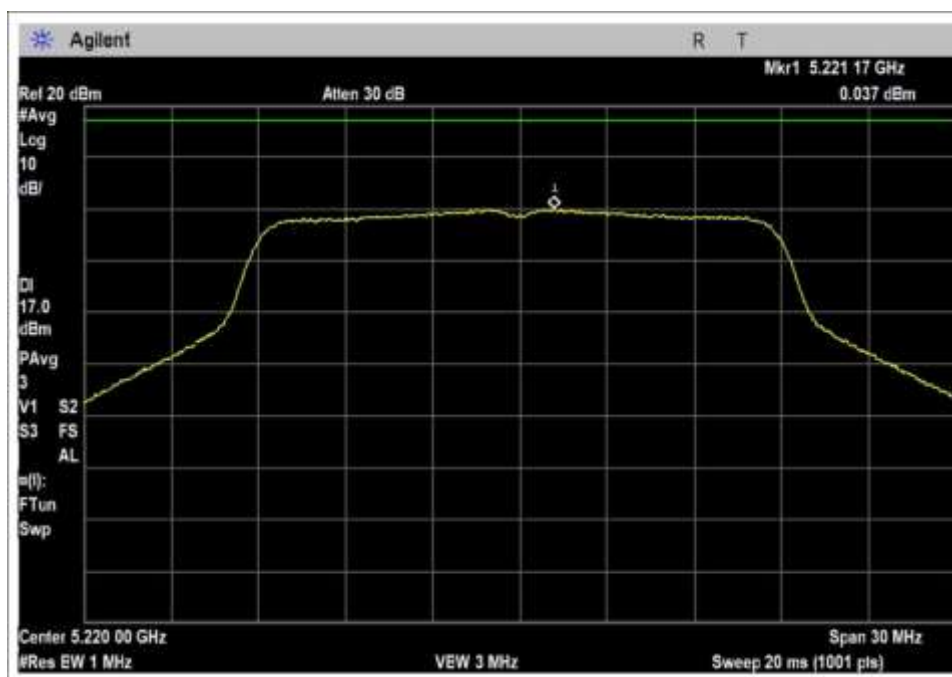
APO Middle Channel



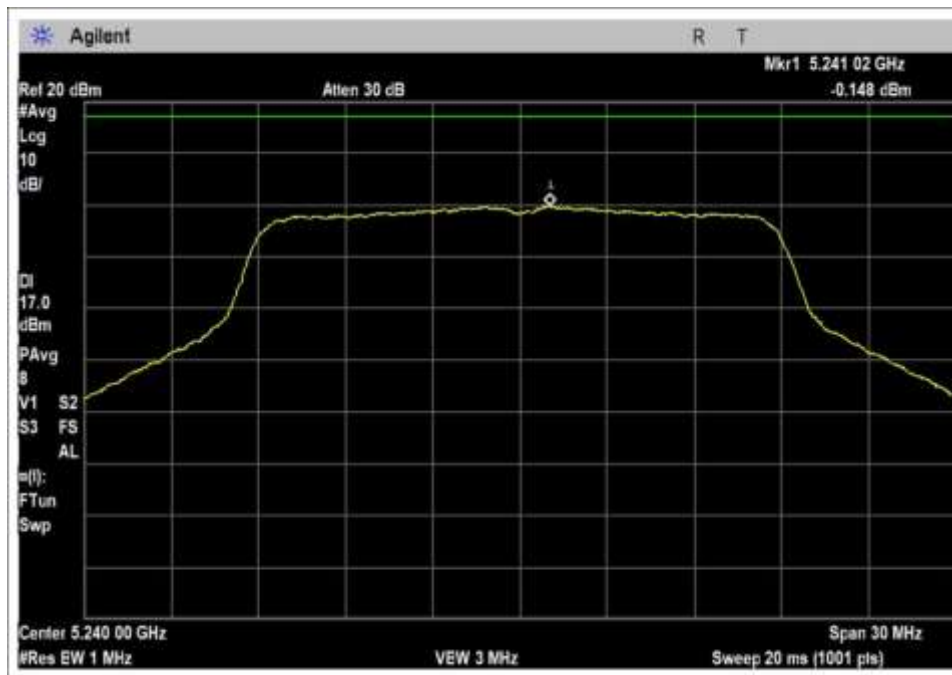
APO High Channel



AP1 Low Channel

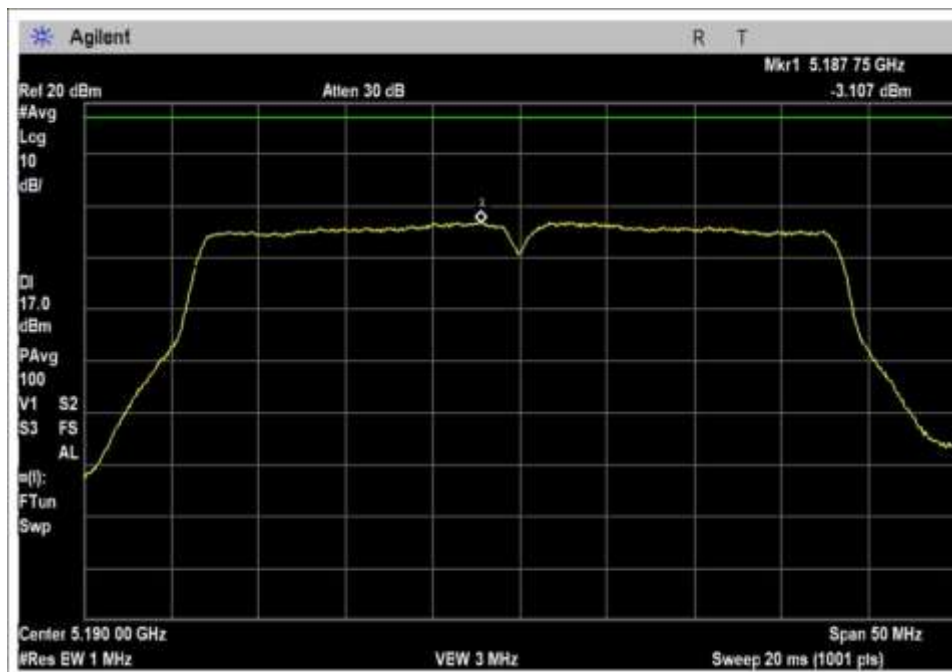


AP1 Middle Channel

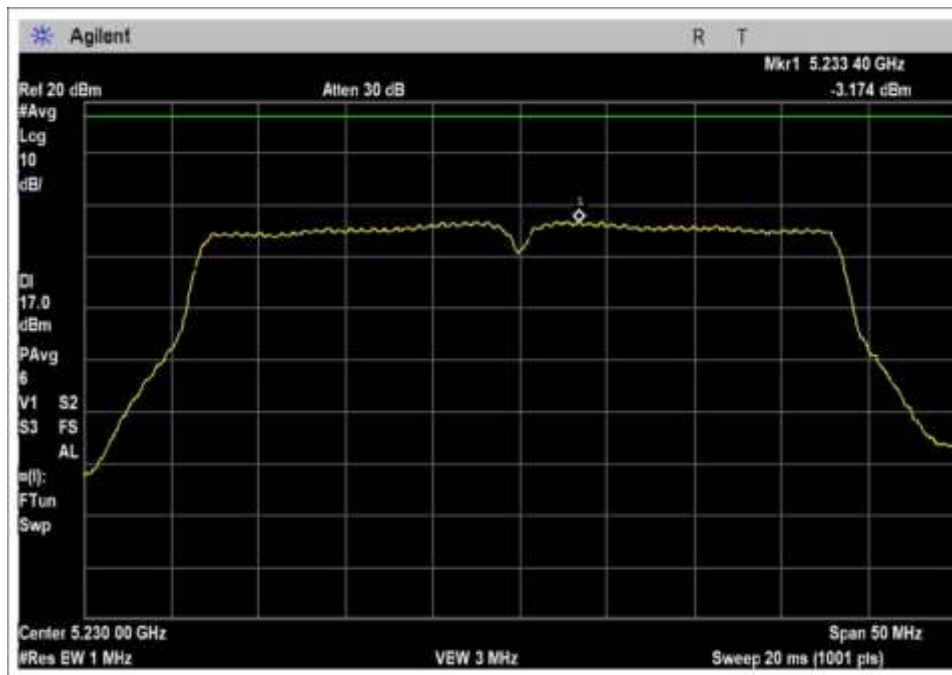


AP1 High Channel

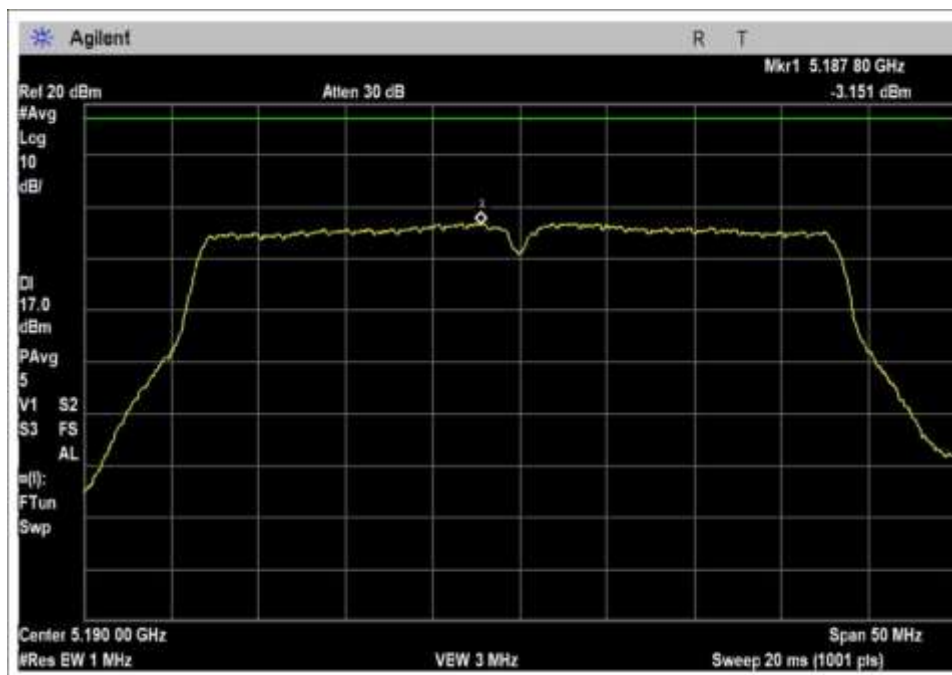
### 802.11n40 Test Plot(s)



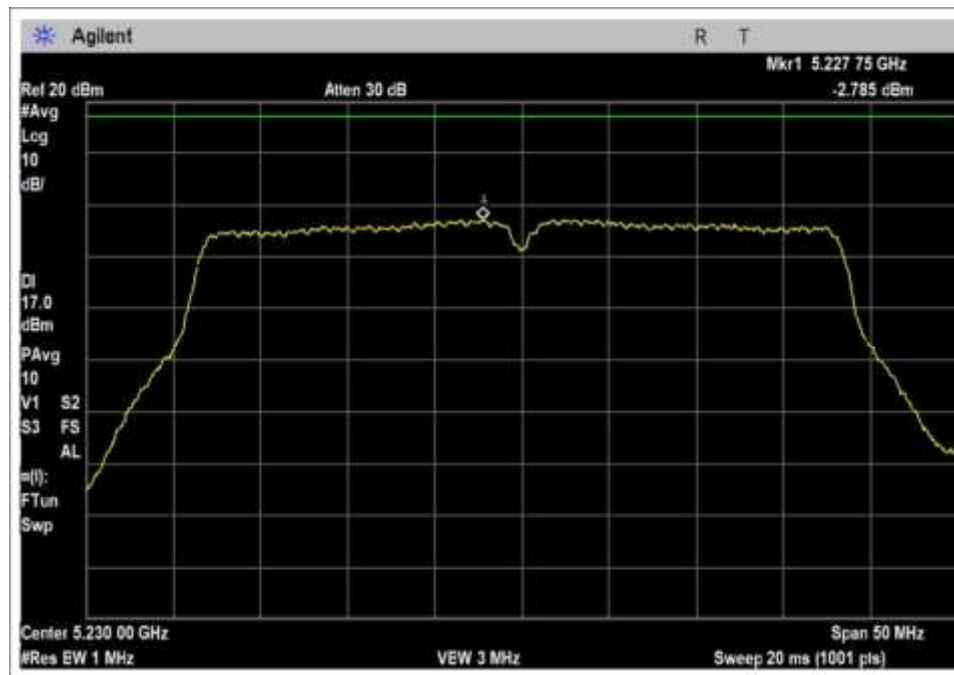
AP0 Low Channel



APO High Channel



AP1 Low Channel



AP1 High Channel

### Test Setup Photo(s)



## 15.407(b) Radiated Emissions & Band Edge

### Test Setup / Conditions / Data

Test Setup/Conditions			
Test Location:	Bothell Lab C3	Test Engineer:	M. Harrison
Test Method:	ANSI C63.10 (2013), KDB 789033 v02r01 December 14, 2017)	Test Date(s):	3/20/2020
Configuration:	1		
	<p>(4) For transmitters operating in the 5.725-5.85 GHz band:</p> <p>(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</p> <p><math>E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2</math>, for <math>d = 3 \text{ m}</math></p>		

## 15.209 Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
 Customer: **Nalloy, LLC.**  
 Specification: **15.209 Radiated Emissions**  
 Work Order #: **102802** Date: 4/2/2020  
 Test Type: **Maximized Emissions** Time: 15:55:29  
 Tested By: Matthew Harrison Sequence#: 27  
 Software: EMITest 5.03.12

### Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

### Support Equipment:

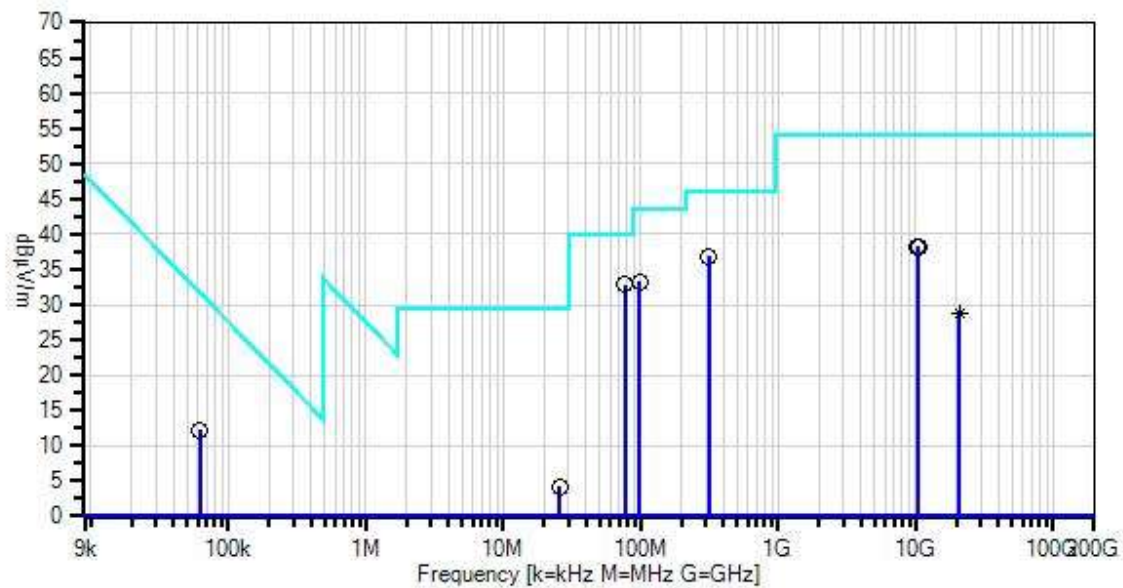
Device	Manufacturer	Model #	S/N
Configuration 1			

### Test Conditions / Notes:

<p>Environmental Conditions:          Temperature: 22° C          Humidity: 45%          Pressure: 101.3 kPa</p> <p>Frequency Range: 9kHz-40GHz          Frequency tested: 5180, 5220, 5240 MHz</p> <p>Firmware power setting: 14 dBm          EUT Firmware:          Protocol /MCS/Modulation: 802.11a, 20MHz BW, 6Mbps(worst-case)</p> <p>Antenna type: Linear Polarized          Antenna Gain: 5.9 dBi.</p> <p>Duty Cycle: 100% Modulated</p> <p>Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017)          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.</p> <p>All data rates investigated, worst-case provided</p> <p><b>No emissions found above 26GHz</b></p>
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Nalloy, LLC. WO#: 102802 Sequence#: 27 Date: 4/2/2020  
15.209 Radiated Emissions Test Distance: 3 Meters Perp



— Sweep Data  
\* QP Readings  
Software Version: 5.03.12

— Readings  
\* Average Readings  
— 1 - 15.209 Radiated Emissions

○ Peak Readings  
▼ Ambient

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T1	ANP06515	Cable	Heliac	6/29/2018	6/29/2020
T2	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
	AN03540	Preamplifier	83017A	5/13/2019	5/13/2021
	ANP07504	Cable	CLU40- KMKM-02.00F	1/17/2019	1/17/2021
T3	AN02741	Active Horn Antenna	AMFW-5F- 12001800-20- 10P	4/26/2019	4/26/2021
T4	AN02742	Active Horn Antenna	AMFW-5F- 18002650-20- 10P	10/16/2018	10/16/2020
T5	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T6	ANP06678	Cable	32026-29801- 29801-144	2/20/2020	2/20/2022
T7	ANP07211	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
T8	ANP07212	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
T9	AN02307	Preamplifier	8447D	1/10/2020	1/10/2022
T10	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T11	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T12	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T13	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T14	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	T2 T6 T10 T14	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	76.400M	46.9	+0.0 +0.0 -27.8 +0.5	+0.1 +0.0 +6.9 +0.0	+0.0 +0.0 +5.8	+0.0 +0.0 +0.4	+0.0	32.8	40.0	-7.2	Vert
2	314.700M	42.1	+0.0 +0.0 -27.1 +1.1	+0.2 +0.0 +13.8 +0.0	+0.0 +0.0 +5.8	+0.0 +0.0 +0.9	+0.0	36.8	46.0	-9.2	Horiz

3	98.500M	45.9	+0.0	+0.1	+0.0	+0.0	+0.0	33.2	43.5	-10.3	Vert
			+0.0	+0.0	+0.0	+0.0					
			-27.7	+8.0	+5.8	+0.5					
			+0.6	+0.0							
4	10445.070 M	42.7	+6.2	+1.4	-12.0	+0.0	+0.0	38.3	54.0	-15.7	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
5	10364.590 M	42.8	+6.2	+1.3	-12.1	+0.0	+0.0	38.2	54.0	-15.8	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
6	10480.330 M	42.4	+6.2	+1.4	-11.9	+0.0	+0.0	38.1	54.0	-15.9	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
7	62.439k	42.5	+0.0	+0.0	+0.0	+0.0	-40.0	12.2	31.7	-19.5	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+9.7							
8	20720.000 M Ave	29.6	+0.0	+0.0	+0.0	-13.9	+0.0	28.9	54.0	-25.1	Horiz
			+1.9	+9.2	+0.9	+1.2					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
^	20720.000 M	44.6	+0.0	+0.0	+0.0	-13.9	+0.0	43.9	54.0	-10.1	Horiz
			+1.9	+9.2	+0.9	+1.2					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
10	25.821M	17.0	+0.3	+0.1	+0.0	+0.0	-20.0	4.2	29.5	-25.3	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+6.8							



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
Customer: **Nalloy, LLC.**  
Specification: **15.209 Radiated Emissions**  
Work Order #: **102802** Date: 4/2/2020  
Test Type: **Maximized Emissions** Time: 16:11:37  
Tested By: Matthew Harrison Sequence#: 30  
Software: EMITest 5.03.12

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

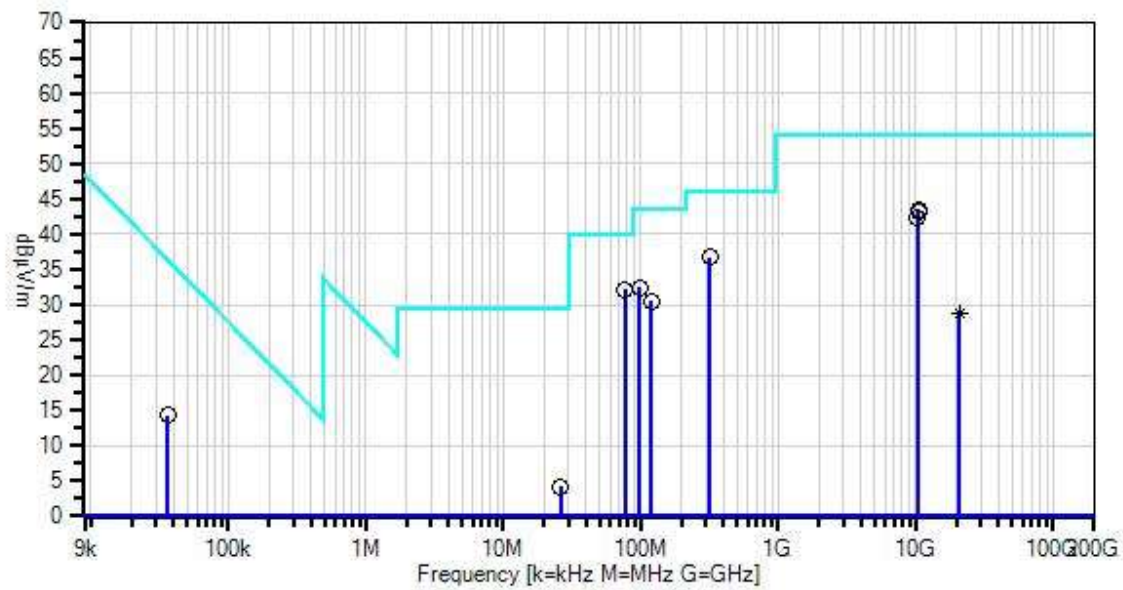
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Environmental Conditions: Temperature: 22° C Humidity: 45% Pressure: 101.3 kPa  Frequency Range: 9kHz-40GHz Frequency tested: 5180, 5220, 5240 MHz  Firmware power setting: 14 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11ac, 20MHz BW, MCS0 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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.  All data rates investigated, worst-case provided  <b>No emissions found above 26GHz</b>
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Nalloy, LLC. WO#: 102802 Sequence#: 30 Date: 4/2/2020  
15.209 Radiated Emissions Test Distance: 3 Meters Perp



— Sweep Data  
\* QP Readings  
Software Version: 5.03.12  
— Readings  
\* Average Readings  
— 1 - 15.209 Radiated Emissions  
○ Peak Readings  
▼ Ambient

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T1	ANP06515	Cable	Heliac	6/29/2018	6/29/2020
T2	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
	AN03540	Preamplifier	83017A	5/13/2019	5/13/2021
	ANP07504	Cable	CLU40- KMKM-02.00F	1/17/2019	1/17/2021
T3	AN02741	Active Horn Antenna	AMFW-5F- 12001800-20- 10P	4/26/2019	4/26/2021
T4	AN02742	Active Horn Antenna	AMFW-5F- 18002650-20- 10P	10/16/2018	10/16/2020
T5	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T6	ANP06678	Cable	32026-29801- 29801-144	2/20/2020	2/20/2022
T7	ANP07211	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
T8	ANP07212	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
T9	AN02307	Preamplifier	8447D	1/10/2020	1/10/2022
T10	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T11	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T12	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T13	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T14	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	T2 T6 T10 T14	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	77.300M	46.3	+0.0 +0.0 -27.8 +0.5	+0.1 +0.0 +6.9 +0.0	+0.0 +0.0 +5.8	+0.0 +0.0 +0.4	+0.0	32.2	40.0	-7.8	Vert
2	319.600M	41.7	+0.0 +0.0 -27.1 +1.1	+0.2 +0.0 +14.1 +0.0	+0.0 +0.0 +5.8	+0.0 +0.0 +0.9	+0.0	36.7	46.0	-9.3	Horiz

3	10478.800 M	47.6	+6.2 +0.0 +0.0 +0.0	+1.4 +0.0 +0.0 +0.0	-11.9 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0	43.3	54.0	-10.7	Horiz
4	10440.210 M	47.6	+6.2 +0.0 +0.0 +0.0	+1.4 +0.0 +0.0 +0.0	-12.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0	43.2	54.0	-10.8	Horiz
5	98.500M	45.1	+0.0 +0.0 -27.7 +0.6	+0.1 +0.0 +8.0 +0.0	+0.0 +0.0 +5.8 +0.5	+0.0 +0.0 +0.5 +0.5	+0.0	32.4	43.5	-11.1	Vert
6	10361.230 M	47.0	+6.2 +0.0 +0.0 +0.0	+1.3 +0.0 +0.0 +0.0	-12.1 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0	42.4	54.0	-11.6	Horiz
7	118.800M	43.0	+0.0 +0.0 -27.6 +0.6	+0.1 +0.0 +8.0 +0.0	+0.0 +0.0 +5.8 +0.5	+0.0 +0.0 +0.5 +0.5	+0.0	30.4	43.5	-13.1	Vert
8	36.495k	43.8	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +10.6	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-40.0	14.4	36.3	-21.9	Perp
9	20720.000 M Ave	29.5	+0.0 +1.9 +0.0 +0.0	+0.0 +9.2 +0.0 +0.0	+0.0 +0.9 +0.0 +0.0	-13.9 +1.2 +0.0 +0.0	+0.0	28.8	54.0	-25.2	Horiz
^	20720.000 M	45.0	+0.0 +1.9 +0.0 +0.0	+0.0 +9.2 +0.0 +0.0	+0.0 +0.9 +0.0 +0.0	-13.9 +1.2 +0.0 +0.0	+0.0	44.3	54.0	-9.7	Horiz
11	26.269M	17.2	+0.3 +0.0 +0.0 +0.0	+0.1 +0.0 +0.0 +6.6	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	-20.0	4.2	29.5	-25.3	Perp



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
Customer: **Nalloy, LLC.**  
Specification: **15.209 Radiated Emissions**  
Work Order #: **102802** Date: 4/2/2020  
Test Type: **Maximized Emissions** Time: 16:16:14  
Tested By: Matthew Harrison Sequence#: 31  
Software: EMITest 5.03.12

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Support Equipment:***

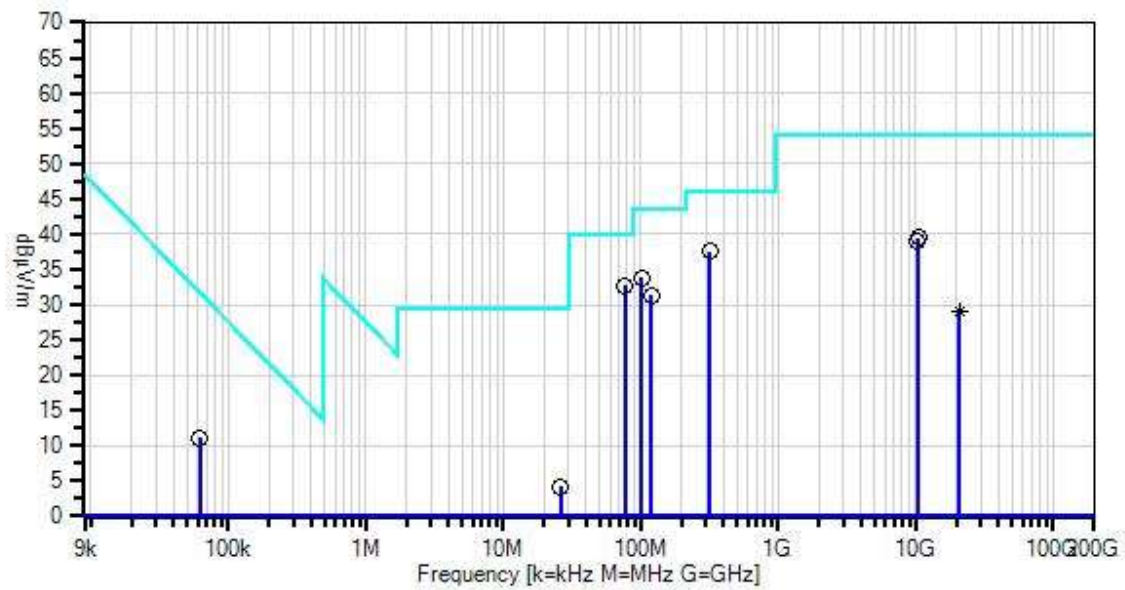
Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Environmental Conditions: Temperature: 22° C Humidity: 45% Pressure: 101.3 kPa  Frequency Range: 9kHz-40GHz Frequency tested: 5190, 5230 MHz  Firmware power setting: 13 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11ac, 40MHz BW, MCS0 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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.  All data rates investigated, worst-case provided  <b>No Emissions found above 26GHz</b>
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Nalloy, LLC. WO#: 102802 Sequence#: 31 Date: 4/2/2020  
15.209 Radiated Emissions Test Distance: 3 Meters Perp



— Sweep Data  
\* QP Readings  
Software Version: 5.03.12  
— Readings  
\* Average Readings  
○ Peak Readings  
▼ Ambient  
— 1 - 15.209 Radiated Emissions

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T1	ANP06515	Cable	Heliac	6/29/2018	6/29/2020
T2	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
	AN03540	Preamplifier	83017A	5/13/2019	5/13/2021
	ANP07504	Cable	CLU40- KMKM-02.00F	1/17/2019	1/17/2021
T3	AN02741	Active Horn Antenna	AMFW-5F- 12001800-20- 10P	4/26/2019	4/26/2021
T4	AN02742	Active Horn Antenna	AMFW-5F- 18002650-20- 10P	10/16/2018	10/16/2020
T5	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T6	ANP06678	Cable	32026-29801- 29801-144	2/20/2020	2/20/2022
T7	ANP07211	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
T8	ANP07212	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
T9	AN02307	Preamplifier	8447D	1/10/2020	1/10/2022
T10	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T11	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T12	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T13	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T14	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	T2 T6 T10 T14	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	76.400M	46.8	+0.0 +0.0 -27.8 +0.5	+0.1 +0.0 +6.9 +0.0	+0.0 +0.0 +5.8	+0.0 +0.0 +0.4	+0.0	32.7	40.0	-7.3	Vert
2	318.600M	42.6	+0.0 +0.0 -27.1 +1.1	+0.2 +0.0 +14.0 +0.0	+0.0 +0.0 +5.8	+0.0 +0.0 +0.9	+0.0	37.5	46.0	-8.5	Horiz

3	102.400M	46.4	+0.0	+0.1	+0.0	+0.0	+0.0	33.8	43.5	-9.7	Vert
			+0.0	+0.0	+0.0	+0.0					
			-27.7	+8.1	+5.8	+0.5					
			+0.6	+0.0							
4	118.800M	43.9	+0.0	+0.1	+0.0	+0.0	+0.0	31.3	43.5	-12.2	Vert
			+0.0	+0.0	+0.0	+0.0					
			-27.6	+8.0	+5.8	+0.5					
			+0.6	+0.0							
5	10462.150 M	43.9	+6.2	+1.4	-12.0	+0.0	+0.0	39.5	54.0	-14.5	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
6	10378.650 M	43.5	+6.2	+1.3	-12.1	+0.0	+0.0	38.9	54.0	-15.1	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
7	62.439k	41.4	+0.0	+0.0	+0.0	+0.0	-40.0	11.1	31.7	-20.6	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+9.7							
8	20760.000 M Ave	29.7	+0.0	+0.0	+0.0	-14.0	+0.0	29.1	54.0	-24.9	Horiz
			+2.0	+9.3	+0.9	+1.2					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
^	20760.000 M	45.2	+0.0	+0.0	+0.0	-14.0	+0.0	44.6	54.0	-9.4	Horiz
			+2.0	+9.3	+0.9	+1.2					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
10	26.239M	17.2	+0.3	+0.1	+0.0	+0.0	-20.0	4.2	29.5	-25.3	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+6.6							



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
 Customer: **Nalloy, LLC.**  
 Specification: **15.209 Radiated Emissions**  
 Work Order #: **102802** Date: 4/2/2020  
 Test Type: **Maximized Emissions** Time: 16:17:43  
 Tested By: Matthew Harrison Sequence#: 32  
 Software: EMITest 5.03.12

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

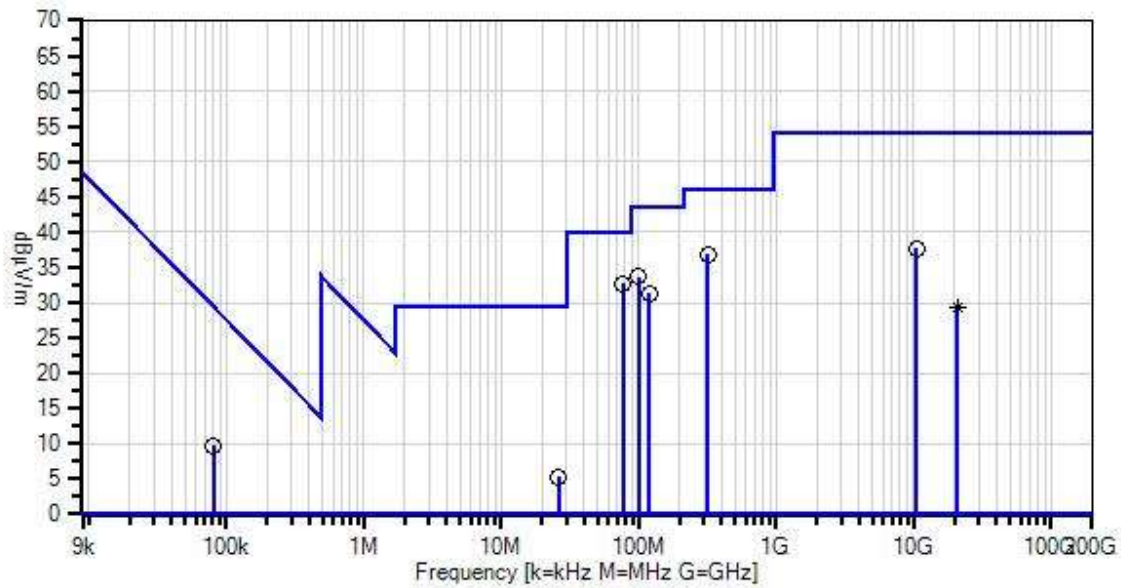
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Environmental Conditions: Temperature: 22° C Humidity: 45% Pressure: 101.3 kPa  Frequency Range: 9kHz - 40GHz Frequency tested: 5210 MHz  Firmware power setting: 13 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11ac, 80MHz BW, MCS0 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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.  All data rates investigated, worst-case provided  <b>No Emissions found above 26GHz</b>
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Nalloy, LLC. WO#: 102802 Sequence#: 32 Date: 4/2/2020  
15.209 Radiated Emissions Test Distance: 3 Meters Perp



— Sweep Data  
\* QP Readings  
Software Version: 5.03.12  
— Readings  
\* Average Readings  
— 1 - 15.209 Radiated Emissions  
○ Peak Readings  
▼ Ambient

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T1	ANP06515	Cable	Heliac	6/29/2018	6/29/2020
T2	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
	AN03540	Preamplifier	83017A	5/13/2019	5/13/2021
	ANP07504	Cable	CLU40- KMKM-02.00F	1/17/2019	1/17/2021
T3	AN02741	Active Horn Antenna	AMFW-5F- 12001800-20- 10P	4/26/2019	4/26/2021
T4	AN02742	Active Horn Antenna	AMFW-5F- 18002650-20- 10P	10/16/2018	10/16/2020
T5	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T6	ANP06678	Cable	32026-29801- 29801-144	2/20/2020	2/20/2022
T7	ANP07211	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
T8	ANP07212	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
T9	AN02307	Preamplifier	8447D	1/10/2020	1/10/2022
T10	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T11	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T12	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T13	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T14	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	T2 T6 T10 T14	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	77.300M	46.8	+0.0 +0.0 -27.8 +0.5	+0.1 +0.0 +6.9 +0.0	+0.0 +0.0 +5.8	+0.0 +0.0 +0.4	+0.0	32.7	40.0	-7.3	Vert
2	318.600M	42.0	+0.0 +0.0 -27.1 +1.1	+0.2 +0.0 +14.0 +0.0	+0.0 +0.0 +5.8	+0.0 +0.0 +0.9	+0.0	36.9	46.0	-9.1	Horiz

3	100.500M	46.2	+0.0	+0.1	+0.0	+0.0	+0.0	33.6	43.5	-9.9	Vert
			+0.0	+0.0	+0.0	+0.0					
			-27.7	+8.1	+5.8	+0.5					
			+0.6	+0.0							
4	118.800M	44.0	+0.0	+0.1	+0.0	+0.0	+0.0	31.4	43.5	-12.1	Vert
			+0.0	+0.0	+0.0	+0.0					
			-27.6	+8.0	+5.8	+0.5					
			+0.6	+0.0							
5	10429.900 M	42.2	+6.2	+1.3	-12.0	+0.0	+0.0	37.7	54.0	-16.3	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
6	80.346k	40.1	+0.0	+0.0	+0.0	+0.0	-40.0	9.8	29.5	-19.7	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+9.7							
7	26.120M	18.3	+0.3	+0.1	+0.0	+0.0	-20.0	5.4	29.5	-24.1	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+6.7							
8	20852.200 M Ave	30.0	+0.0	+0.0	+0.0	-14.1	+0.0	29.3	54.0	-24.7	Horiz
			+2.0	+9.3	+0.9	+1.2					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
^	20852.200 M	44.5	+0.0	+0.0	+0.0	-14.1	+0.0	43.8	54.0	-10.2	Horiz
			+2.0	+9.3	+0.9	+1.2					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
 Customer: **Nalloy, LLC.**  
 Specification: **15.209 Radiated Emissions**  
 Work Order #: **102802** Date: 4/2/2020  
 Test Type: **Maximized Emissions** Time: 16:05:56  
 Tested By: Matthew Harrison Sequence#: 28  
 Software: EMITest 5.03.12

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Support Equipment:***

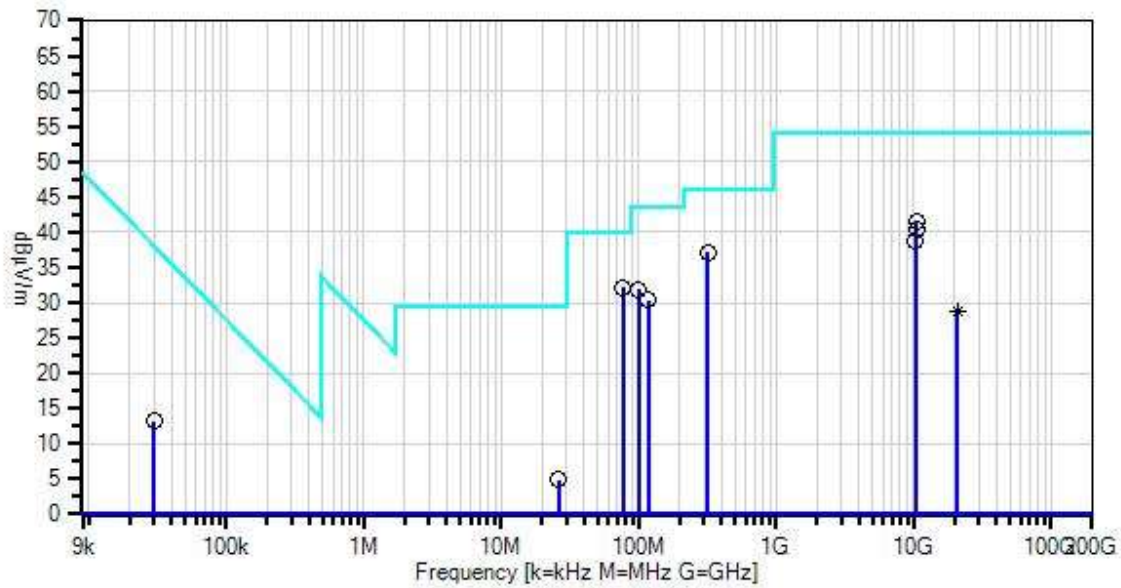
Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Environmental Conditions: Temperature: 22° C Humidity: 45% Pressure: 101.3 kPa  Frequency Range: 9kHz-40GHz Frequency tested: 5180, 5220, 5240 MHz  Firmware power setting: 14 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11n, 20MHz BW, MCS8 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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.  All data rates investigated, worst-case provided  <b>No emissions found above 26GHz</b>
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Nalloy, LLC. WO#: 102802 Sequence#: 28 Date: 4/2/2020  
15.209 Radiated Emissions Test Distance: 3 Meters Perp



— Sweep Data  
\* QP Readings  
Software Version: 5.03.12  
— Readings  
\* Average Readings  
○ Peak Readings  
▼ Ambient  
— 1 - 15.209 Radiated Emissions

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T1	ANP06515	Cable	Heliac	6/29/2018	6/29/2020
T2	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
	AN03540	Preamplifier	83017A	5/13/2019	5/13/2021
	ANP07504	Cable	CLU40- KMKM-02.00F	1/17/2019	1/17/2021
T3	AN02741	Active Horn Antenna	AMFW-5F- 12001800-20- 10P	4/26/2019	4/26/2021
T4	AN02742	Active Horn Antenna	AMFW-5F- 18002650-20- 10P	10/16/2018	10/16/2020
T5	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T6	ANP06678	Cable	32026-29801- 29801-144	2/20/2020	2/20/2022
T7	ANP07211	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
T8	ANP07212	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
T9	AN02307	Preamplifier	8447D	1/10/2020	1/10/2022
T10	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T11	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T12	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T13	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T14	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	T2 T6 T10 T14	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	76.400M	46.3	+0.0 +0.0 -27.8 +0.5	+0.1 +0.0 +6.9 +0.0	+0.0 +0.0 +5.8	+0.0 +0.0 +0.4	+0.0	32.2	40.0	-7.8	Vert
2	317.600M	42.2	+0.0 +0.0 -27.1 +1.1	+0.2 +0.0 +14.0 +0.0	+0.0 +0.0 +5.8	+0.0 +0.0 +0.9	+0.0	37.1	46.0	-8.9	Horiz

3	100.500M	44.5	+0.0	+0.1	+0.0	+0.0	+0.0	31.9	43.5	-11.6	Vert
			+0.0	+0.0	+0.0	+0.0					
			-27.7	+8.1	+5.8	+0.5					
			+0.6	+0.0							
4	10446.600 M	45.9	+6.2	+1.4	-12.0	+0.0	+0.0	41.5	54.0	-12.5	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
5	117.900M	43.0	+0.0	+0.1	+0.0	+0.0	+0.0	30.4	43.5	-13.1	Vert
			+0.0	+0.0	+0.0	+0.0					
			-27.6	+8.0	+5.8	+0.5					
			+0.6	+0.0							
6	10474.840 M	44.7	+6.2	+1.4	-11.9	+0.0	+0.0	40.4	54.0	-13.6	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
7	10362.580 M	43.3	+6.2	+1.3	-12.1	+0.0	+0.0	38.7	54.0	-15.3	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
8	26.030M	17.8	+0.3	+0.1	+0.0	+0.0	-20.0	4.9	29.5	-24.6	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+6.7							
9	29.727k	42.3	+0.0	+0.0	+0.0	+0.0	-40.0	13.3	38.1	-24.8	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+11.0							
10	20720.000 M Ave	29.6	+0.0	+0.0	+0.0	-13.9	+0.0	28.9	54.0	-25.1	Horiz
			+1.9	+9.2	+0.9	+1.2					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
^	20720.000 M	44.8	+0.0	+0.0	+0.0	-13.9	+0.0	44.1	54.0	-9.9	Horiz
			+1.9	+9.2	+0.9	+1.2					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
Customer: **Nalloy, LLC.**  
Specification: **15.209 Radiated Emissions**  
Work Order #: **102802** Date: 4/2/2020  
Test Type: **Maximized Emissions** Time: 16:08:26  
Tested By: Matthew Harrison Sequence#: 29  
Software: EMITest 5.03.12

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

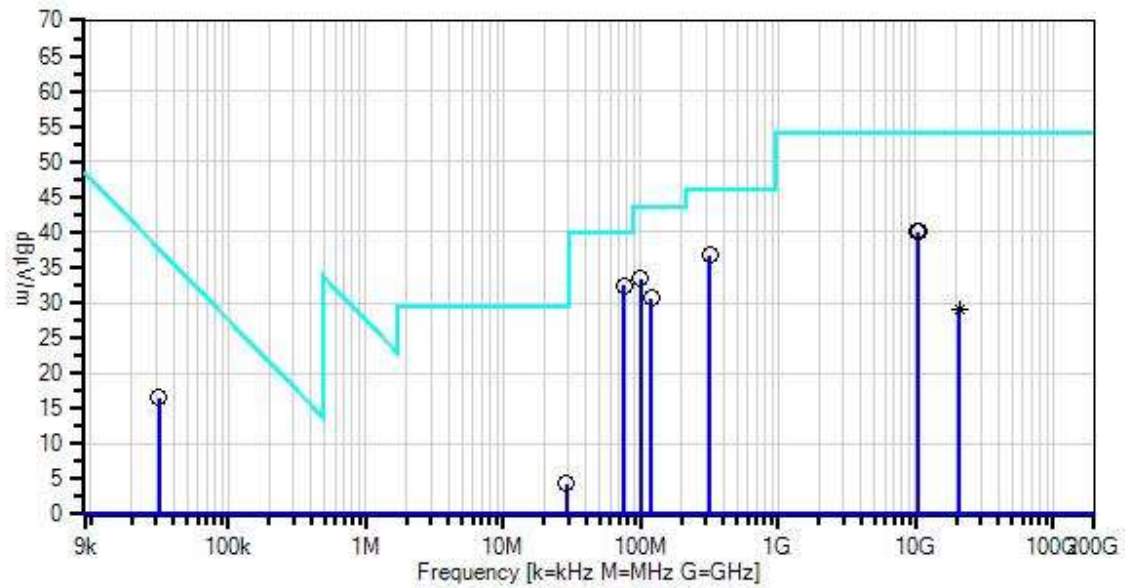
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Environmental Conditions: Temperature: 22° C Humidity: 45% Pressure: 101.3 kPa  Frequency Range: 9kHz-40GHz Frequency tested: 5190, 5230 MHz  Firmware power setting: 14 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11n, 40MHz BW, MCS8 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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.  All data rates investigated, worst-case provided  <b>No emissions found above 26GHz</b>
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Nalloy, LLC. WO#: 102802 Sequence#: 29 Date: 4/2/2020  
15.209 Radiated Emissions Test Distance: 3 Meters Perp



— Sweep Data  
\* QP Readings  
Software Version: 5.03.12  
— Readings  
\* Average Readings  
○ Peak Readings  
▼ Ambient  
— 1 - 15.209 Radiated Emissions

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T1	ANP06515	Cable	Heliac	6/29/2018	6/29/2020
T2	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
	AN03540	Preamplifier	83017A	5/13/2019	5/13/2021
	ANP07504	Cable	CLU40- KMKM-02.00F	1/17/2019	1/17/2021
T3	AN02741	Active Horn Antenna	AMFW-5F- 12001800-20- 10P	4/26/2019	4/26/2021
T4	AN02742	Active Horn Antenna	AMFW-5F- 18002650-20- 10P	10/16/2018	10/16/2020
T5	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T6	ANP06678	Cable	32026-29801- 29801-144	2/20/2020	2/20/2022
T7	ANP07211	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
T8	ANP07212	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
T9	AN02307	Preamplifier	8447D	1/10/2020	1/10/2022
T10	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T11	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T12	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T13	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T14	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	T2 T6 T10 T14	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	75.400M	46.4	+0.0 +0.0 -27.8 +0.5	+0.1 +0.0 +7.0 +0.0	+0.0 +0.0 +5.8	+0.0 +0.0 +0.4	+0.0	32.4	40.0	-7.6	Vert
2	319.600M	41.7	+0.0 +0.0 -27.1 +1.1	+0.2 +0.0 +14.1 +0.0	+0.0 +0.0 +5.8	+0.0 +0.0 +0.9	+0.0	36.7	46.0	-9.3	Horiz

3	319.600M	41.7	+0.0	+0.2	+0.0	+0.0	+0.0	36.7	46.0	-9.3	Horiz
			+0.0	+0.0	+0.0	+0.0					
			-27.1	+14.1	+5.8	+0.9					
			+1.1	+0.0							
4	99.500M	46.1	+0.0	+0.1	+0.0	+0.0	+0.0	33.5	43.5	-10.0	Vert
			+0.0	+0.0	+0.0	+0.0					
			-27.7	+8.1	+5.8	+0.5					
			+0.6	+0.0							
5	118.800M	43.3	+0.0	+0.1	+0.0	+0.0	+0.0	30.7	43.5	-12.8	Vert
			+0.0	+0.0	+0.0	+0.0					
			-27.6	+8.0	+5.8	+0.5					
			+0.6	+0.0							
6	10442.500 M	44.5	+6.2	+1.4	-12.0	+0.0	+0.0	40.1	54.0	-13.9	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
7	10382.300 M	44.7	+6.2	+1.3	-12.1	+0.0	+0.0	40.1	54.0	-13.9	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
8	31.278k	45.7	+0.0	+0.0	+0.0	+0.0	-40.0	16.6	37.7	-21.1	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+10.9							
9	20760.000 M Ave	29.7	+0.0	+0.0	+0.0	-14.0	+0.0	29.1	54.0	-24.9	Horiz
			+2.0	+9.3	+0.9	+1.2					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
^	20760.000 M	44.8	+0.0	+0.0	+0.0	-14.0	+0.0	44.2	54.0	-9.8	Horiz
			+2.0	+9.3	+0.9	+1.2					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
11	28.985M	18.1	+0.3	+0.1	+0.0	+0.0	-20.0	4.4	29.5	-25.1	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+5.9							

## 15.407 Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
 Customer: **Nalloy, LLC.**  
 Specification: **15.407(b)(1) Radiated Spurious Emissions**  
 Work Order #: **102802** Date: 4/2/2020  
 Test Type: **Maximized Emissions** Time: 15:55:29  
 Tested By: Matthew Harrison Sequence#: 27  
 Software: EMITest 5.03.12

### Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

### Support Equipment:

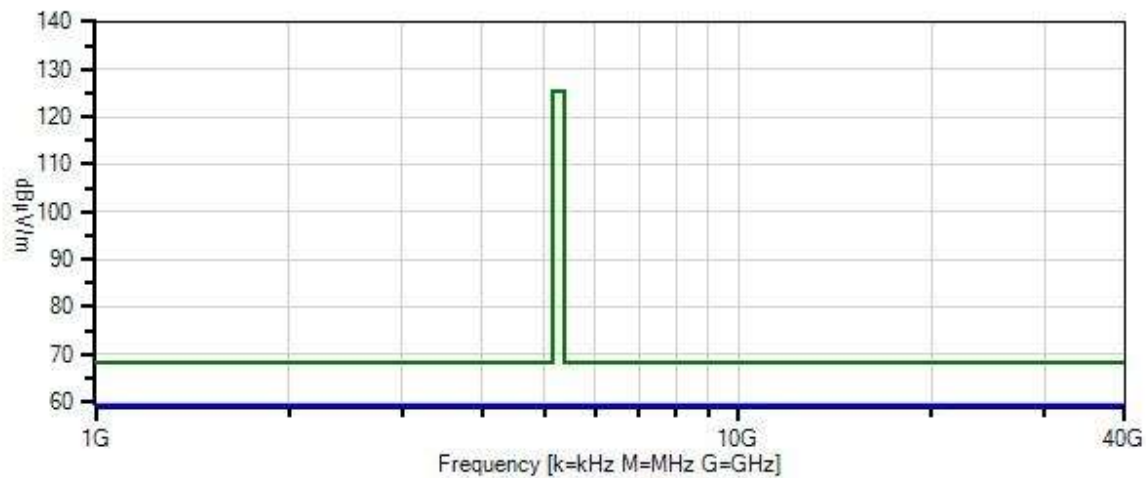
Device	Manufacturer	Model #	S/N
Configuration 1			

### Test Conditions / Notes:

<p>Environmental Conditions:          Temperature: 22° C          Humidity: 45%          Pressure: 101.3 kPa</p> <p>Frequency Range: 1-40GHz          Frequency tested: 5180, 5220, 5240 MHz  <math>E[dB\mu V/m] = EIRP[dBm] + 95.2</math>, for <math>d = 3</math> m</p> <p>Firmware power setting: 14 dBm          EUT Firmware:          Protocol /MCS/Modulation: 802.11a, 20MHz BW, 6Mbps(worst-case)</p> <p>Antenna type: Linear Polarized          Antenna Gain: 5.9 dBi.</p> <p>Duty Cycle: 100% Modulated</p> <p>Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017)          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.</p> <p>All data rates investigated, worst-case provided</p> <p><b>No emissions found above 26GHz</b></p>
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Nalloy, LLC. WO#: 102802 Sequence#: 27 Date: 4/2/2020  
15.407(b)(1) Radiated Spurious Emissions - Client Devices Test Distance: 3 Meters Perp



- Sweep Data
- Readings
- Peak Readings
- × QP Readings
- \* Average Readings
- ▼ Ambient
- Software Version: 5.03.12
- 1 - 15.407(b)(1) Radiated Spurious Emissions - Client Devices

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T1	ANP06515	Cable	Heliac	6/29/2018	6/29/2020
T2	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
	AN03540	Preamplifier	83017A	5/13/2019	5/13/2021
	ANP07504	Cable	CLU40- KMKM-02.00F	1/17/2019	1/17/2021
T3	AN02741	Active Horn Antenna	AMFW-5F- 12001800-20- 10P	4/26/2019	4/26/2021
T4	AN02742	Active Horn Antenna	AMFW-5F- 18002650-20- 10P	10/16/2018	10/16/2020
T5	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T6	ANP06678	Cable	32026-29801- 29801-144	2/20/2020	2/20/2022
T7	ANP07211	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
T8	ANP07212	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
	AN02307	Preamplifier	8447D	1/10/2020	1/10/2022
	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
	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	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB $\mu$ V	T5 dB	T6 dB	T7 dB	T8 dB	Table	dB $\mu$ V/m	dB $\mu$ V/m	dB	Ant
1	20720.000 M	44.6	+0.0 +1.9	+0.0 +9.2	+0.0 +0.9	-13.9 +1.2	+0.0	43.9	68.2	-24.3	Horiz
2	10445.070 M	42.7	+6.2 +0.0	+1.4 +0.0	-12.0 +0.0	+0.0 +0.0	+0.0	38.3	68.2	-29.9	Horiz
3	10364.590 M	42.8	+6.2 +0.0	+1.3 +0.0	-12.1 +0.0	+0.0 +0.0	+0.0	38.2	68.2	-30.0	Horiz
4	10480.330 M	42.4	+6.2 +0.0	+1.4 +0.0	-11.9 +0.0	+0.0 +0.0	+0.0	38.1	68.2	-30.1	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
 Customer: **Nalloy, LLC.**  
 Specification: **15.407(b)(1) Radiated Spurious Emissions**  
 Work Order #: **102802** Date: 4/2/2020  
 Test Type: **Maximized Emissions** Time: 16:11:37  
 Tested By: Matthew Harrison Sequence#: 30  
 Software: EMITest 5.03.12

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

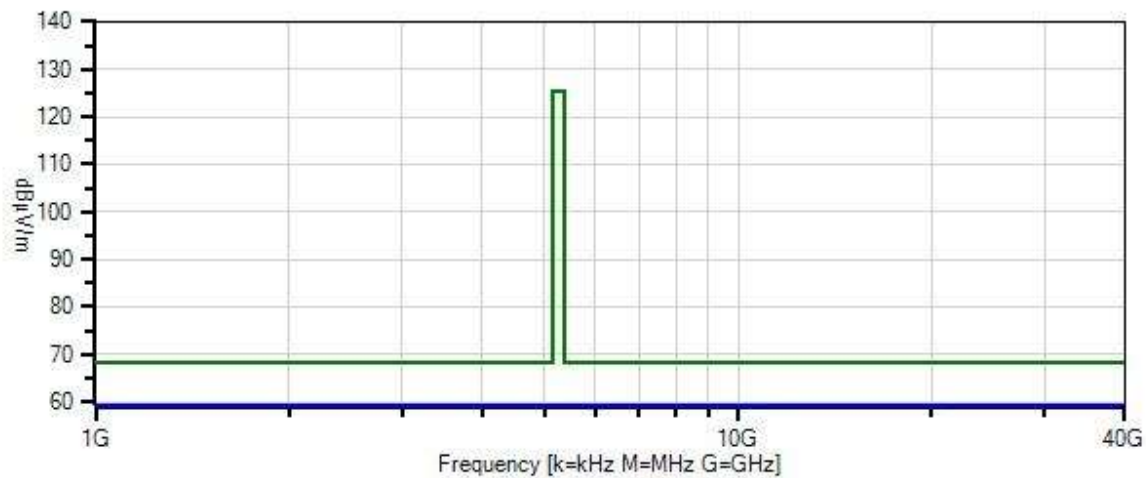
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Environmental Conditions: Temperature: 22° C Humidity: 45% Pressure: 101.3 kPa  Frequency Range: 1-40GHz Frequency tested: 5180, 5220, 5240 MHz $E[dB\mu V/m] = EIRP[dBm] + 95.2$ , for $d = 3$ m  Firmware power setting: 14 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11ac, 20MHz BW, MCS0 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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.  All data rates investigated, worst-case provided  <b>No emissions found above 26GHz</b>
--

Nalloy, LLC. WO#: 102802 Sequence#: 30 Date: 4/2/2020  
 15.407(b)(1) Radiated Spurious Emissions - Client Devices Test Distance: 3 Meters Perp



- Sweep Data
- Readings
- Peak Readings
- × QP Readings
- \* Average Readings
- ▼ Ambient
- Software Version: 5.03.12
- 1 - 15.407(b)(1) Radiated Spurious Emissions - Client Devices

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T1	ANP06515	Cable	Heliac	6/29/2018	6/29/2020
T2	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
	AN03540	Preamplifier	83017A	5/13/2019	5/13/2021
	ANP07504	Cable	CLU40- KMKM-02.00F	1/17/2019	1/17/2021
T3	AN02741	Active Horn Antenna	AMFW-5F- 12001800-20- 10P	4/26/2019	4/26/2021
T4	AN02742	Active Horn Antenna	AMFW-5F- 18002650-20- 10P	10/16/2018	10/16/2020
T5	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T6	ANP06678	Cable	32026-29801- 29801-144	2/20/2020	2/20/2022
T7	ANP07211	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
T8	ANP07212	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
	AN02307	Preamplifier	8447D	1/10/2020	1/10/2022
	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
	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	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB $\mu$ V	T5 dB	T6 dB	T7 dB	T8 dB	Table	dB $\mu$ V/m	dB $\mu$ V/m	dB	Ant
1	20720.000 M	45.0	+0.0 +1.9	+0.0 +9.2	+0.0 +0.9	-13.9 +1.2	+0.0	44.3	68.2	-23.9	Horiz
2	10478.800 M	47.6	+6.2 +0.0	+1.4 +0.0	-11.9 +0.0	+0.0 +0.0	+0.0	43.3	68.2	-24.9	Horiz
3	10440.210 M	47.6	+6.2 +0.0	+1.4 +0.0	-12.0 +0.0	+0.0 +0.0	+0.0	43.2	68.2	-25.0	Horiz
4	10361.230 M	47.0	+6.2 +0.0	+1.3 +0.0	-12.1 +0.0	+0.0 +0.0	+0.0	42.4	68.2	-25.8	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
 Customer: **Nalloy, LLC.**  
 Specification: **15.407(b)(1) Radiated Spurious Emissions**  
 Work Order #: **102802** Date: 4/2/2020  
 Test Type: **Maximized Emissions** Time: 16:16:14  
 Tested By: Matthew Harrison Sequence#: 31  
 Software: EMITest 5.03.12

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Support Equipment:***

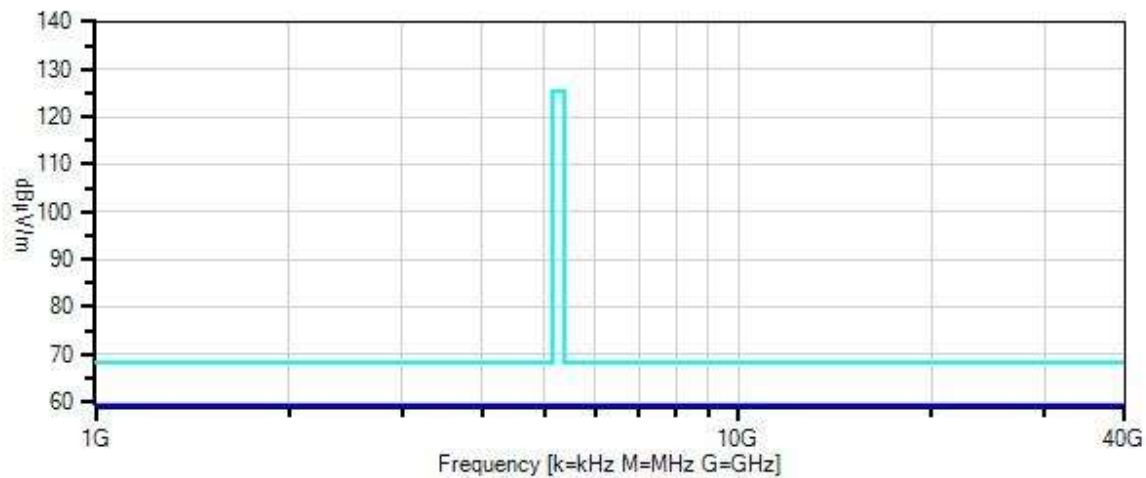
Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Environmental Conditions: Temperature: 22° C Humidity: 45% Pressure: 101.3 kPa  Frequency Range: 1-40GHz Frequency tested: 5190, 5230 MHz $E[dB\mu V/m] = EIRP[dBm] + 95.2$ , for $d = 3$ m  Firmware power setting: 13 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11ac, 40MHz BW, MCS0 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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.  All data rates investigated, worst-case provided  <b>No Emissions found above 26GHz</b>
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Nalloy, LLC. WO#: 102802 Sequence#: 31 Date: 4/2/2020  
 15.407(b)(1) Radiated Spurious Emissions - Client Devices Test Distance: 3 Meters Perp



Sweep Data  
 Readings  
 ○ Peak Readings  
 × QP Readings  
 \* Average Readings  
 ▼ Ambient  
 Software Version: 5.03.12  
 1 - 15.407(b)(1) Radiated Spurious Emissions - Client Devices

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T1	ANP06515	Cable	Heliac	6/29/2018	6/29/2020
T2	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
	AN03540	Preamplifier	83017A	5/13/2019	5/13/2021
	ANP07504	Cable	CLU40- KMKM-02.00F	1/17/2019	1/17/2021
T3	AN02741	Active Horn Antenna	AMFW-5F- 12001800-20- 10P	4/26/2019	4/26/2021
T4	AN02742	Active Horn Antenna	AMFW-5F- 18002650-20- 10P	10/16/2018	10/16/2020
T5	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T6	ANP06678	Cable	32026-29801- 29801-144	2/20/2020	2/20/2022
T7	ANP07211	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
T8	ANP07212	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
	AN02307	Preamplifier	8447D	1/10/2020	1/10/2022
	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
	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	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	T5	T6	T7	T8	Table	dBμV/m	dBμV/m	dB	Ant
1	20760.000 M	45.2	+0.0 +2.0	+0.0 +9.3	+0.0 +0.9	-14.0 +1.2	+0.0	44.6	68.2	-23.6	Horiz
2	10462.150 M	43.9	+6.2 +0.0	+1.4 +0.0	-12.0 +0.0	+0.0 +0.0	+0.0	39.5	68.2	-28.7	Horiz
3	10378.650 M	43.5	+6.2 +0.0	+1.3 +0.0	-12.1 +0.0	+0.0 +0.0	+0.0	38.9	68.2	-29.3	Horiz

Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
 Customer: **Nalloy, LLC.**  
 Specification: **15.407(b)(1) Radiated Spurious Emissions**  
 Work Order #: **102802** Date: 4/2/2020  
 Test Type: **Maximized Emissions** Time: 16:17:43  
 Tested By: Matthew Harrison Sequence#: 32  
 Software: EMITest 5.03.12

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

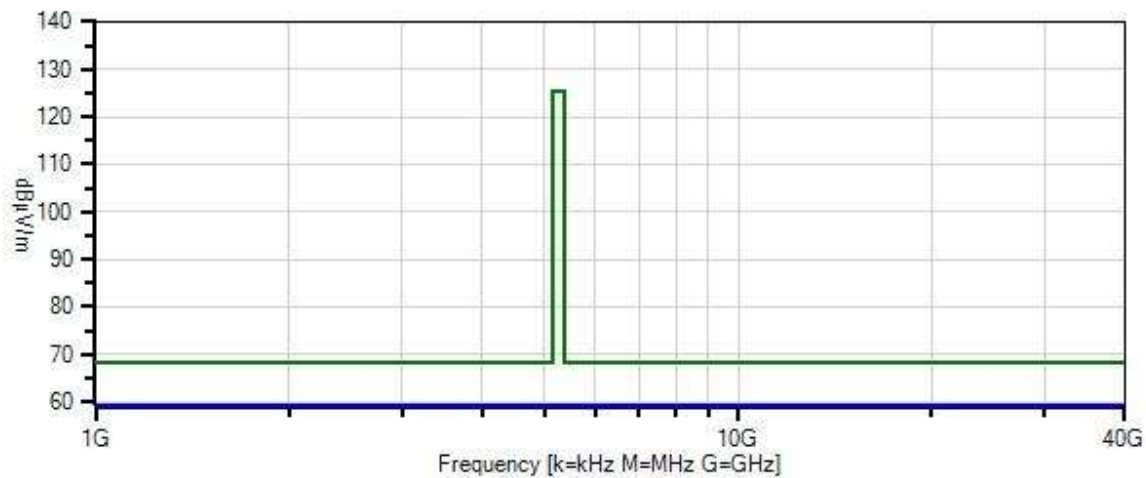
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Environmental Conditions: Temperature: 22° C Humidity: 45% Pressure: 101.3 kPa  Frequency Range: 1-40GHz Frequency tested: 5210 MHz $E[dB\mu V/m] = EIRP[dBm] + 95.2$ , for $d = 3$ m  Firmware power setting: 13 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11ac, 80MHz BW, MCS0 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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.  All data rates investigated, worst-case provided  <b>No Emissions found above 26GHz</b>
--

Nalloy, LLC. WO#: 102802 Sequence#: 32 Date: 4/2/2020  
15.407(b)(1) Radiated Spurious Emissions - Client Devices Test Distance: 3 Meters Perp



- Sweep Data
- Readings
- Peak Readings
- × QP Readings
- \* Average Readings
- ▼ Ambient
- Software Version: 5.03.12
- 1 - 15.407(b)(1) Radiated Spurious Emissions - Client Devices

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T1	ANP06515	Cable	Heliac	6/29/2018	6/29/2020
T2	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
	AN03540	Preamplifier	83017A	5/13/2019	5/13/2021
	ANP07504	Cable	CLU40- KMKM-02.00F	1/17/2019	1/17/2021
T3	AN02741	Active Horn Antenna	AMFW-5F- 12001800-20- 10P	4/26/2019	4/26/2021
T4	AN02742	Active Horn Antenna	AMFW-5F- 18002650-20- 10P	10/16/2018	10/16/2020
T5	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T6	ANP06678	Cable	32026-29801- 29801-144	2/20/2020	2/20/2022
T7	ANP07211	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
T8	ANP07212	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
	AN02307	Preamplifier	8447D	1/10/2020	1/10/2022
	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
	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	T2 T6	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB $\mu$ V	dB	dB	dB	dB	Table	dB $\mu$ V/m	dB $\mu$ V/m	dB	Ant
1	20852.200 M	44.5	+0.0 +2.0	+0.0 +9.3	+0.0 +0.9	-14.1 +1.2	+0.0	43.8	68.2	-24.4	Horiz
2	10429.900 M	42.2	+6.2 +0.0	+1.3 +0.0	-12.0 +0.0	+0.0 +0.0	+0.0	37.7	68.2	-30.5	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
 Customer: **Nalloy, LLC.**  
 Specification: **15.407(b)(1) Radiated Spurious Emissions**  
 Work Order #: **102802** Date: 4/2/2020  
 Test Type: **Maximized Emissions** Time: 16:05:56  
 Tested By: Matthew Harrison Sequence#: 28  
 Software: EMITest 5.03.12

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

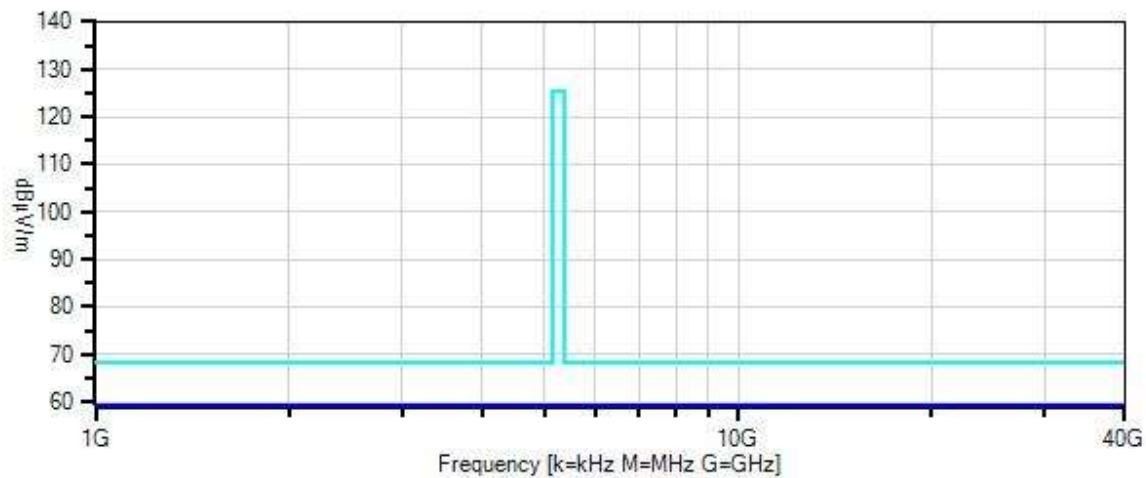
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Environmental Conditions: Temperature: 22° C Humidity: 45% Pressure: 101.3 kPa  Frequency Range: 1-40GHz Frequency tested: 5180, 5220, 5240 MHz $E[dB\mu V/m] = EIRP[dBm] + 95.2$ , for $d = 3$ m  Firmware power setting: 14 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11n, 20MHz BW, MCS8 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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.  All data rates investigated, worst-case provided  <b>No emissions found above 26GHz</b>
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Nalloy, LLC. WO#: 102802 Sequence#: 28 Date: 4/2/2020  
15.407(b)(1) Radiated Spurious Emissions - Client Devices Test Distance: 3 Meters Perp



- Sweep Data
- Readings
- Peak Readings
- × QP Readings
- \* Average Readings
- ▼ Ambient
- Software Version: 5.03.12
- 1 - 15.407(b)(1) Radiated Spurious Emissions - Client Devices

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01467	Horn Antenna- ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T1	ANP06515	Cable	Heliac	6/29/2018	6/29/2020
T2	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
	AN03540	Preamp	83017A	5/13/2019	5/13/2021
	ANP07504	Cable	CLU40- KMKM-02.00F	1/17/2019	1/17/2021
T3	AN02741	Active Horn Antenna	AMFW-5F- 12001800-20- 10P	4/26/2019	4/26/2021
T4	AN02742	Active Horn Antenna	AMFW-5F- 18002650-20- 10P	10/16/2018	10/16/2020
T5	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T6	ANP06678	Cable	32026-29801- 29801-144	2/20/2020	2/20/2022
T7	ANP07211	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
T8	ANP07212	Cable	32026-29801- 29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
	AN02307	Preamp	8447D	1/10/2020	1/10/2022
	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
	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	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB $\mu$ V	T5 dB	T6 dB	T7 dB	T8 dB	Table	dB $\mu$ V/m	dB $\mu$ V/m	dB	Ant
1	20720.000 M	44.8	+0.0 +1.9	+0.0 +9.2	+0.0 +0.9	-13.9 +1.2	+0.0	44.1	68.2	-24.1	Horiz
2	10446.600 M	45.9	+6.2 +0.0	+1.4 +0.0	-12.0 +0.0	+0.0 +0.0	+0.0	41.5	68.2	-26.7	Horiz
3	10474.840 M	44.7	+6.2 +0.0	+1.4 +0.0	-11.9 +0.0	+0.0 +0.0	+0.0	40.4	68.2	-27.8	Horiz
4	10362.580 M	43.3	+6.2 +0.0	+1.3 +0.0	-12.1 +0.0	+0.0 +0.0	+0.0	38.7	68.2	-29.5	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
 Customer: **Nalloy, LLC.**  
 Specification: **15.407(b)(1) Radiated Spurious Emissions**  
 Work Order #: **102802** Date: 4/2/2020  
 Test Type: **Maximized Emissions** Time: 16:08:26  
 Tested By: Matthew Harrison Sequence#: 29  
 Software: EMITest 5.03.12

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

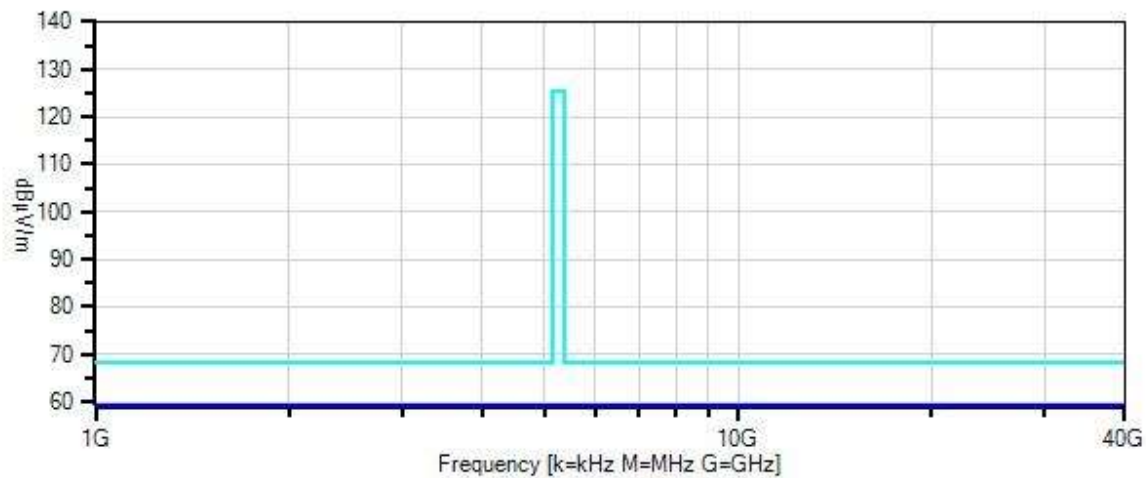
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Environmental Conditions: Temperature: 22° C Humidity: 45% Pressure: 101.3 kPa  Frequency Range: 1-40GHz Frequency tested: 5190, 5230 MHz $E[dB\mu V/m] = EIRP[dBm] + 95.2$ , for $d = 3\text{ m}$  Firmware power setting: 14 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11n, 40MHz BW, MCS8 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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.  All data rates investigated, worst-case provided  <b>No emissions found above 26GHz</b>
--

Nalloy, LLC. WO#: 102802 Sequence#: 29 Date: 4/2/2020  
 15.407(b)(1) Radiated Spurious Emissions - Client Devices Test Distance: 3 Meters Perp



— Sweep Data  
 — Readings  
 ○ Peak Readings  
 × QP Readings  
 \* Average Readings  
 ▼ Ambient  
 Software Version: 5.03.12  
 — 1 - 15.407(b)(1) Radiated Spurious Emissions - Client Devices

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T1	ANP06515	Cable	Heliac	6/29/2018	6/29/2020
T2	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
	AN03540	Preamp	83017A	5/13/2019	5/13/2021
	ANP07504	Cable	CLU40-KMKM-02.00F	1/17/2019	1/17/2021
T3	AN02741	Active Horn Antenna	AMFW-5F-12001800-20-10P	4/26/2019	4/26/2021
T4	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	10/16/2018	10/16/2020
T5	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T6	ANP06678	Cable	32026-29801-29801-144	2/20/2020	2/20/2022
T7	ANP07211	Cable	32026-29801-29801-18	8/7/2019	8/7/2021
T8	ANP07212	Cable	32026-29801-29801-18	8/7/2019	8/7/2021
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN02743	Active Horn Antenna	AMFW-5F-260400-33-8P	4/26/2019	4/26/2021
	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
	AN02307	Preamp	8447D	1/10/2020	1/10/2022
	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
	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.

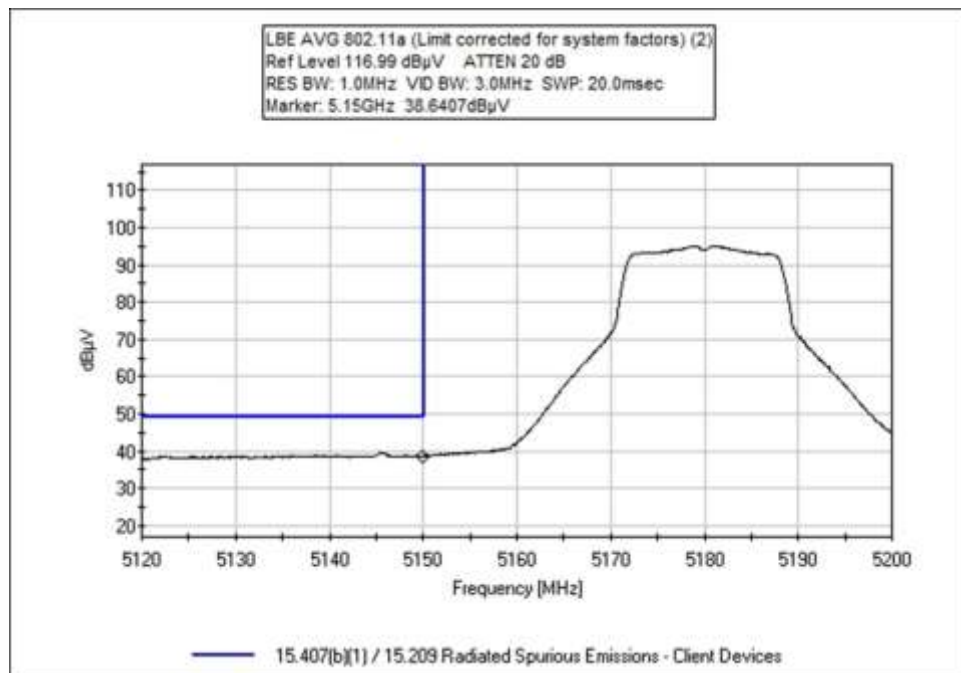
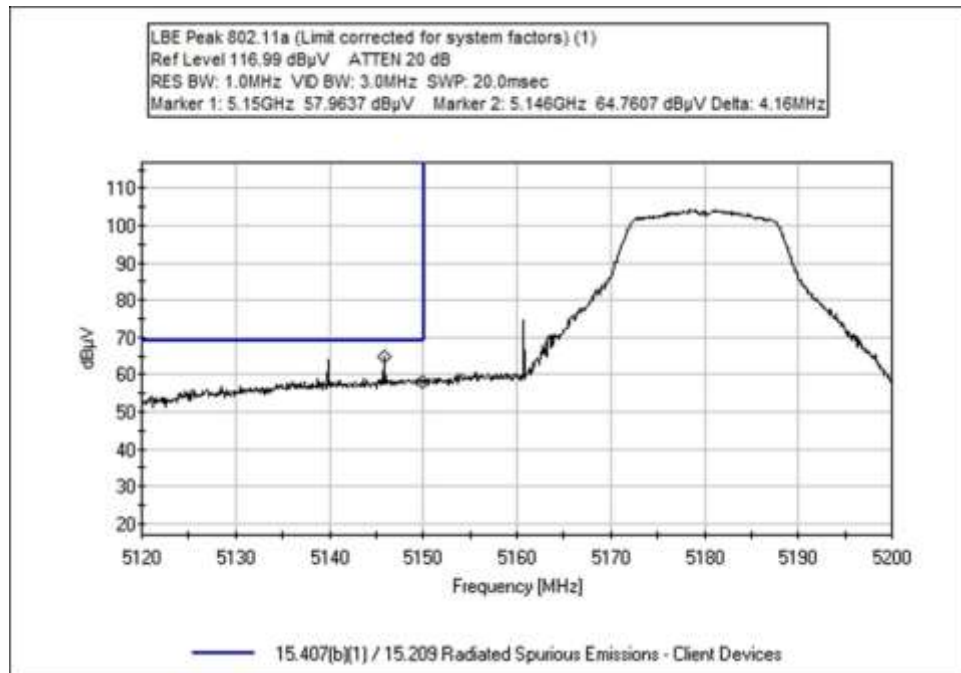
Test Distance: 3 Meters

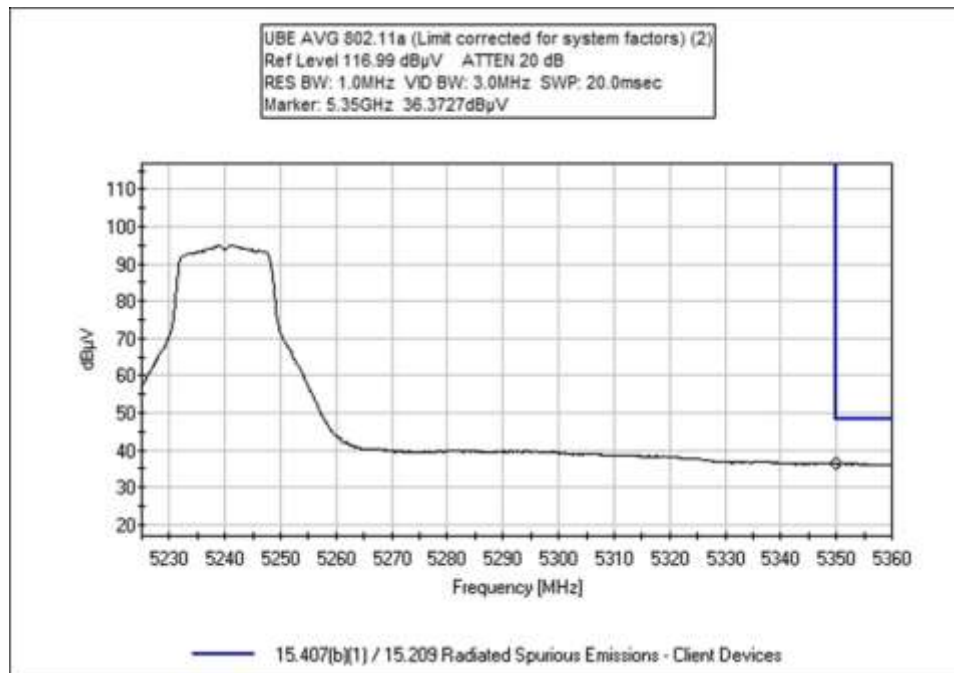
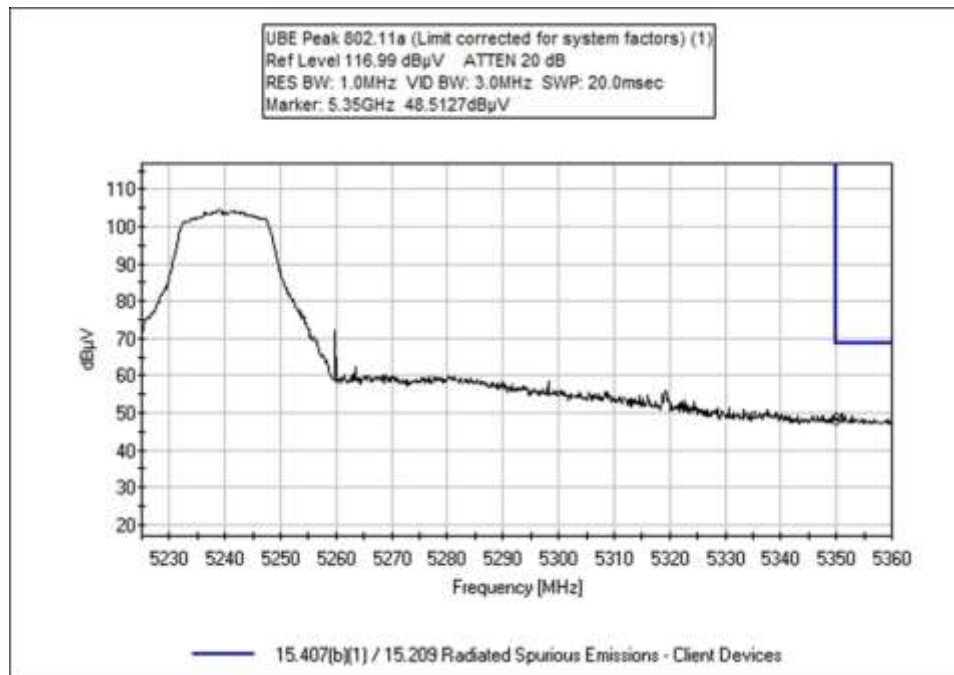
#	Freq	Rdng	T1 T5	T2 T6	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB $\mu$ V	dB	dB	dB	dB	Table	dB $\mu$ V/m	dB $\mu$ V/m	dB	Ant
1	20760.000 M	44.8	+0.0 +2.0	+0.0 +9.3	+0.0 +0.9	-14.0 +1.2	+0.0	44.2	68.2	-24.0	Horiz
2	10442.500 M	44.5	+6.2 +0.0	+1.4 +0.0	-12.0 +0.0	+0.0 +0.0	+0.0	40.1	68.2	-28.1	Horiz
3	10382.300 M	44.7	+6.2 +0.0	+1.3 +0.0	-12.1 +0.0	+0.0 +0.0	+0.0	40.1	68.2	-28.1	Horiz

Band Edge Summary					
Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
5150	802.11a	Linear Polarized / 5.9dBi	43.6	<54	Pass
5350	802.11a	Linear Polarized / 5.9dBi	41.9	<54	Pass
5150	802.11n20	Linear Polarized / 5.9dBi	44.1	<54	Pass
5350	802.11n20	Linear Polarized / 5.9dBi	41.9	<54	Pass
5150	802.11n40	Linear Polarized / 5.9dBi	47.8	<54	Pass
5350	802.11n40	Linear Polarized / 5.9dBi	42.4	<54	Pass
5150	802.11ac20	Linear Polarized / 5.9dBi	44.4	<54	Pass
5350	802.11ac20	Linear Polarized / 5.9dBi	42	<54	Pass
5150	802.11ac40	Linear Polarized / 5.9dBi	49.6	<54	Pass
5350	802.11ac40	Linear Polarized / 5.9dBi	42.5	<54	Pass
5150	802.11ac80	Linear Polarized / 5.9dBi	47.4	<54	Pass
5350	802.11ac80	Linear Polarized / 5.9dBi	41.6	<54	Pass

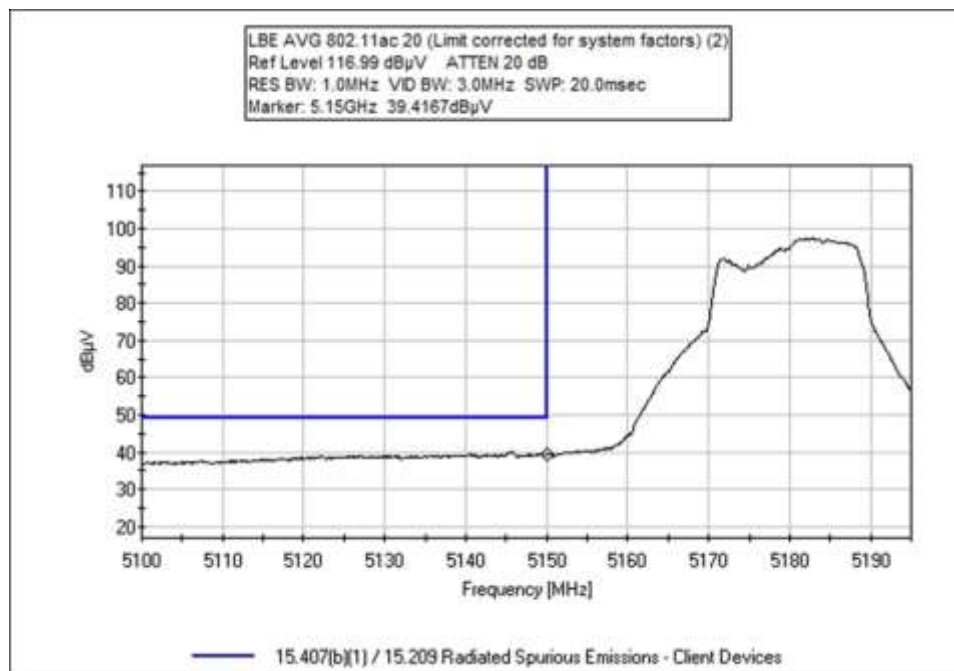
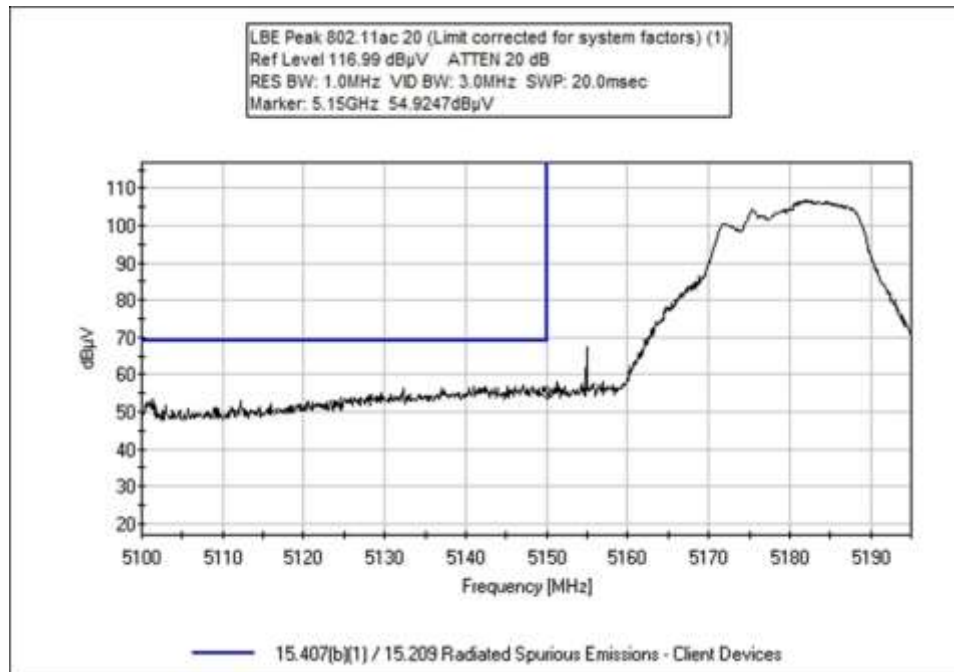
## Band Edge Plots

### 802.11a Plots

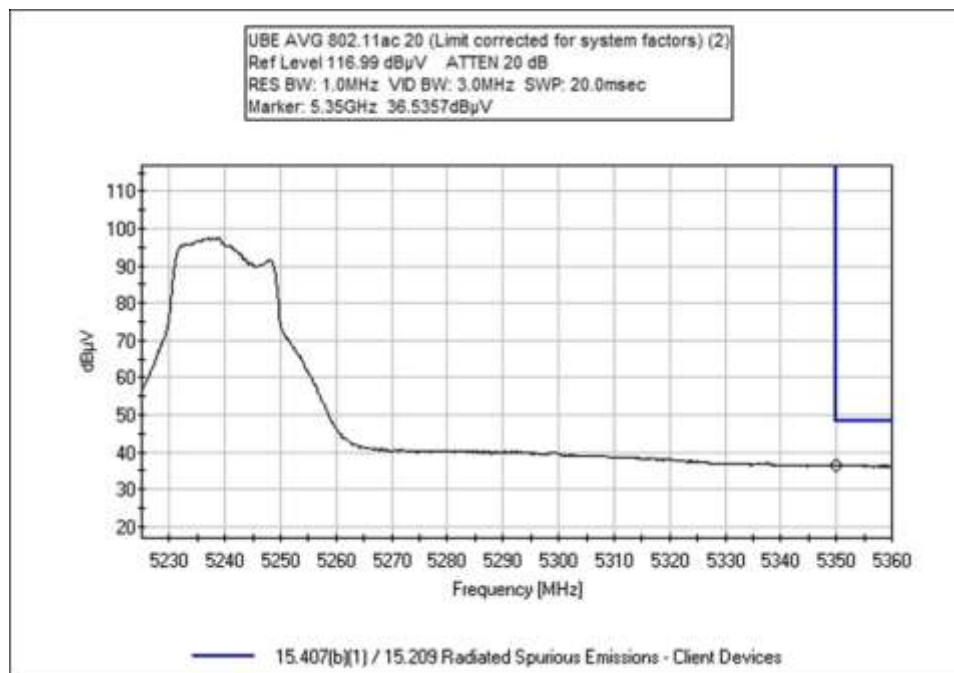
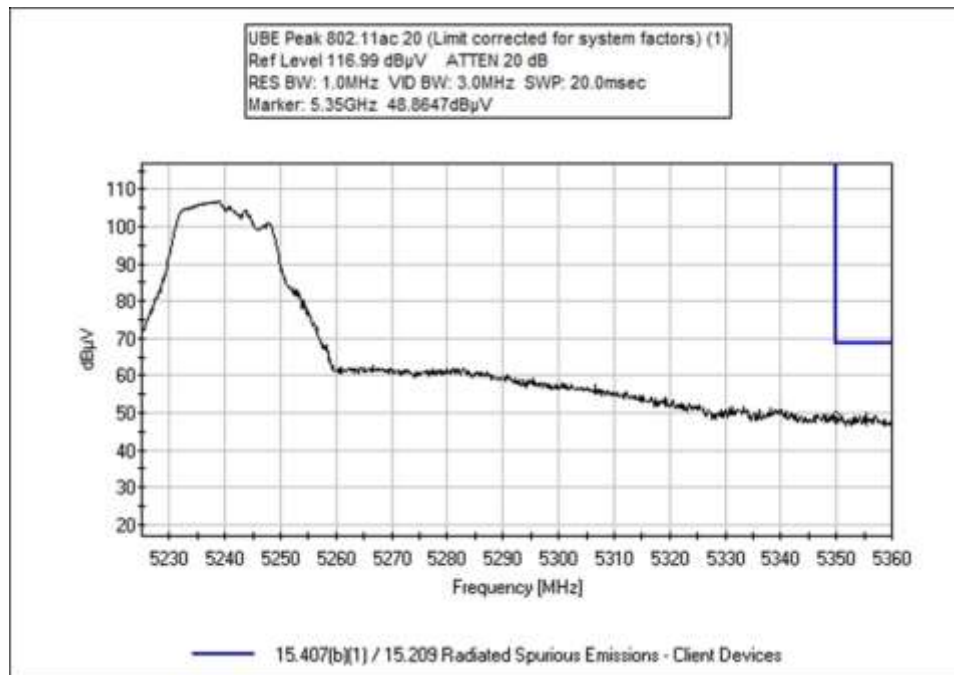




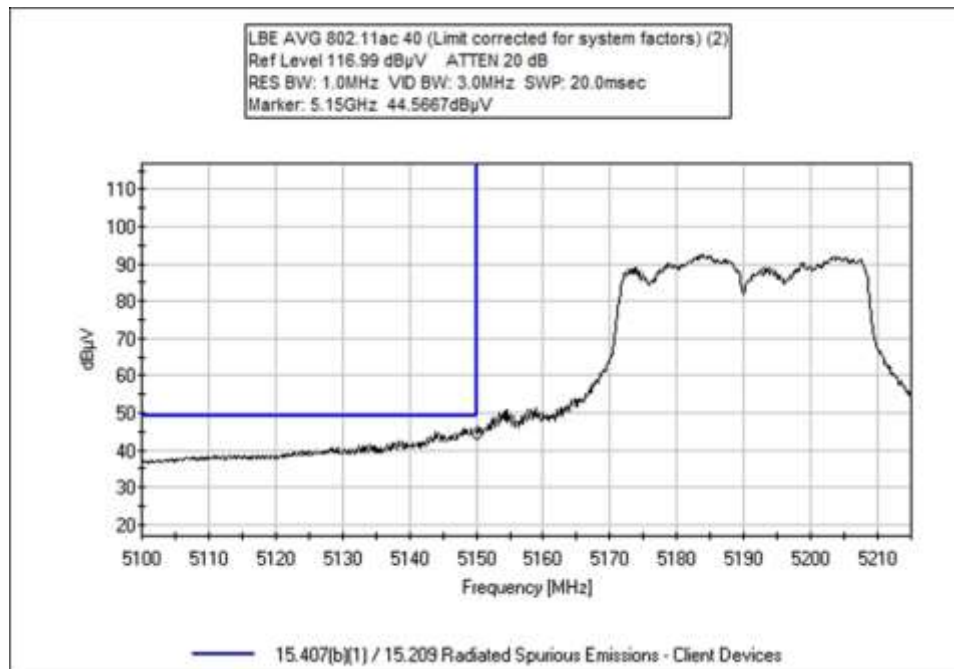
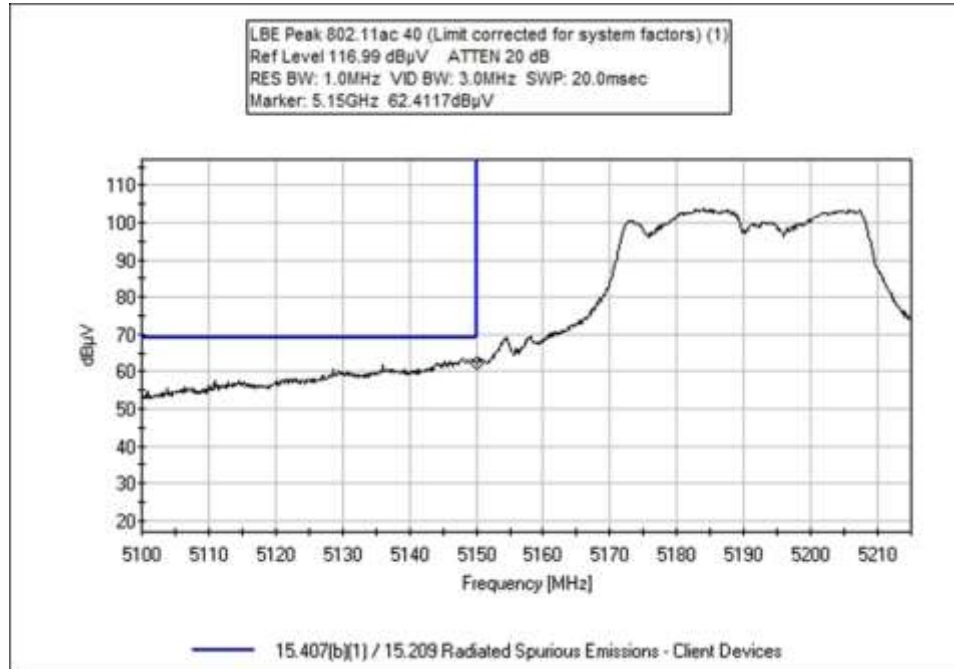
## 802.11ac20 Plots

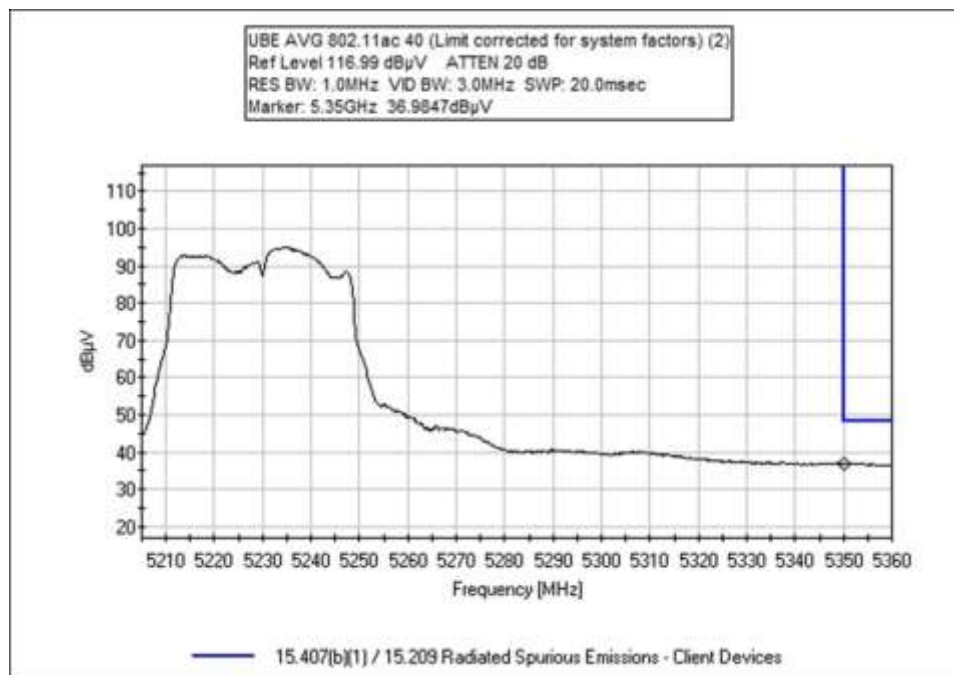
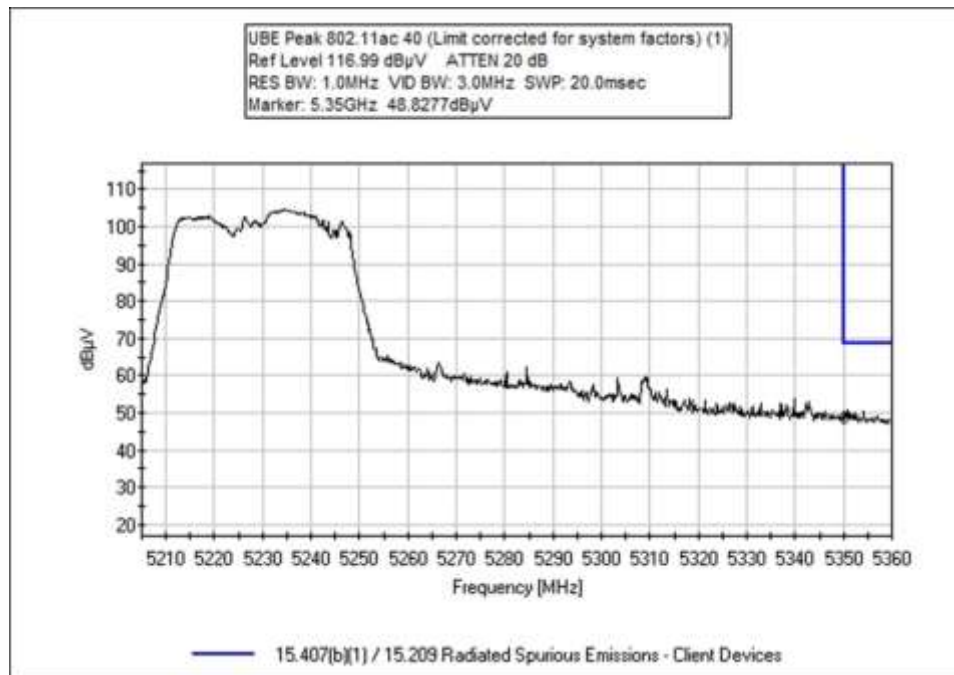




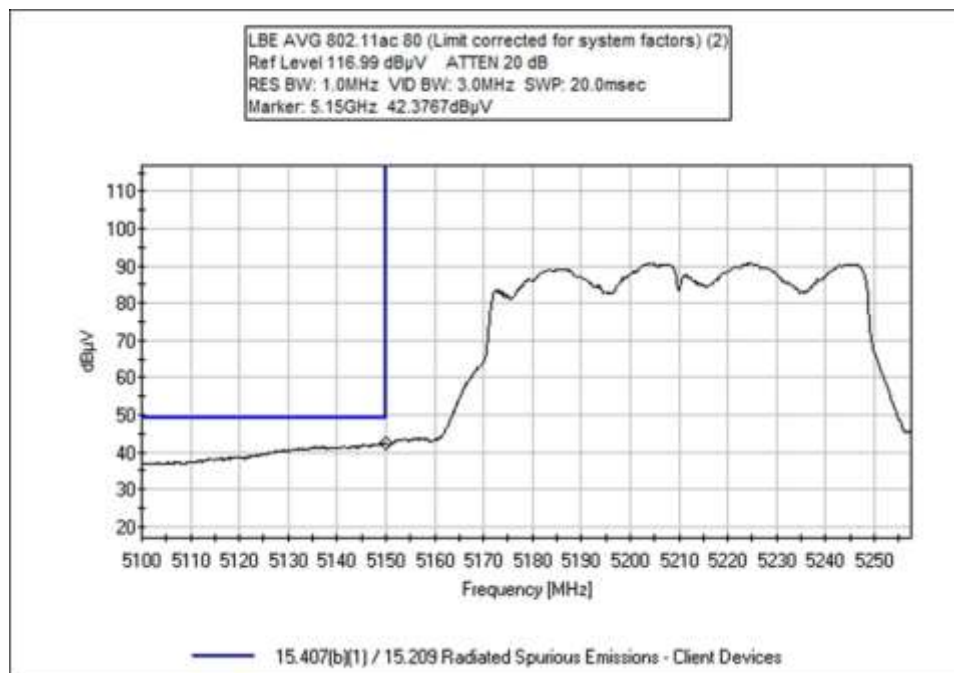
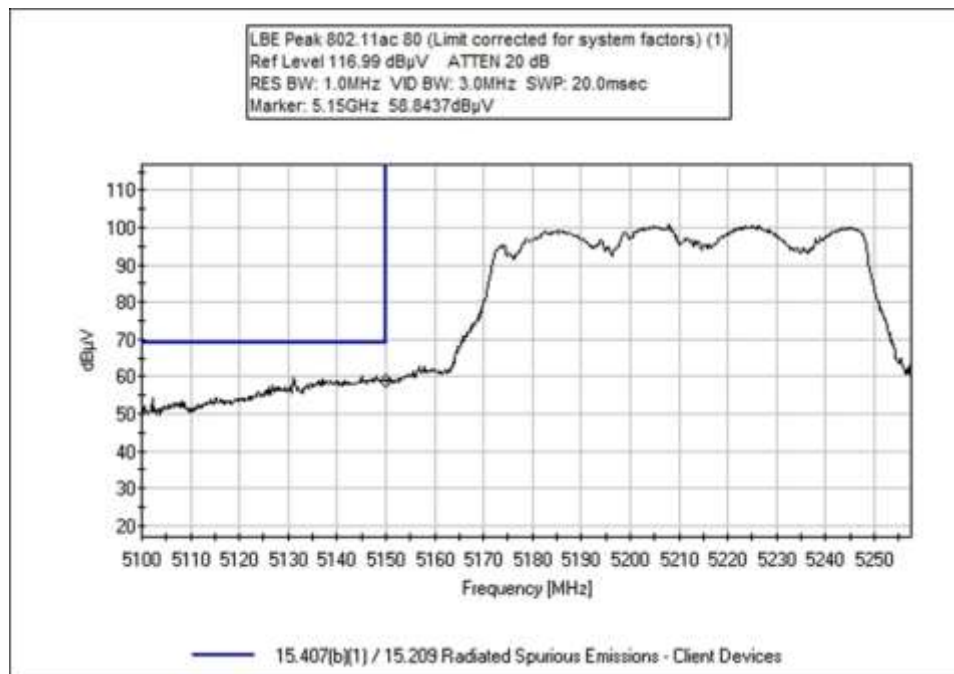


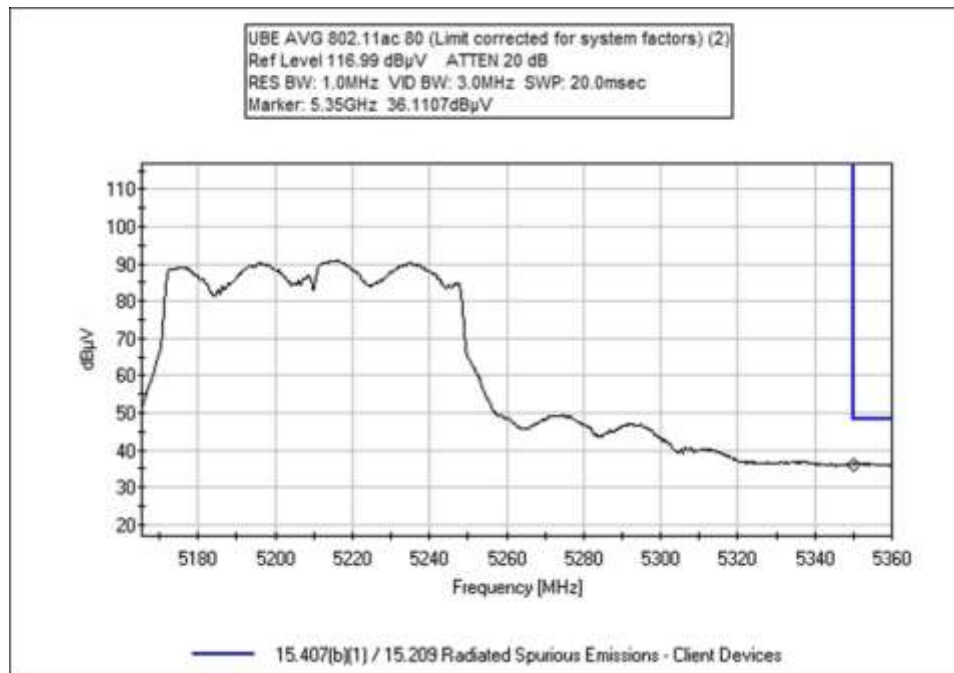
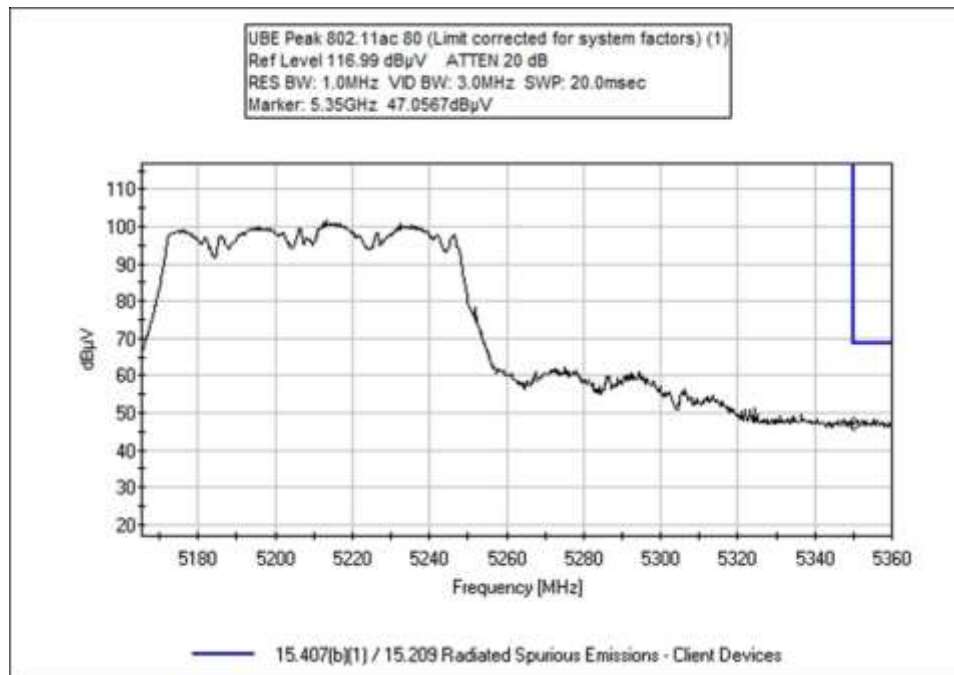
## 802.11ac40 Plots



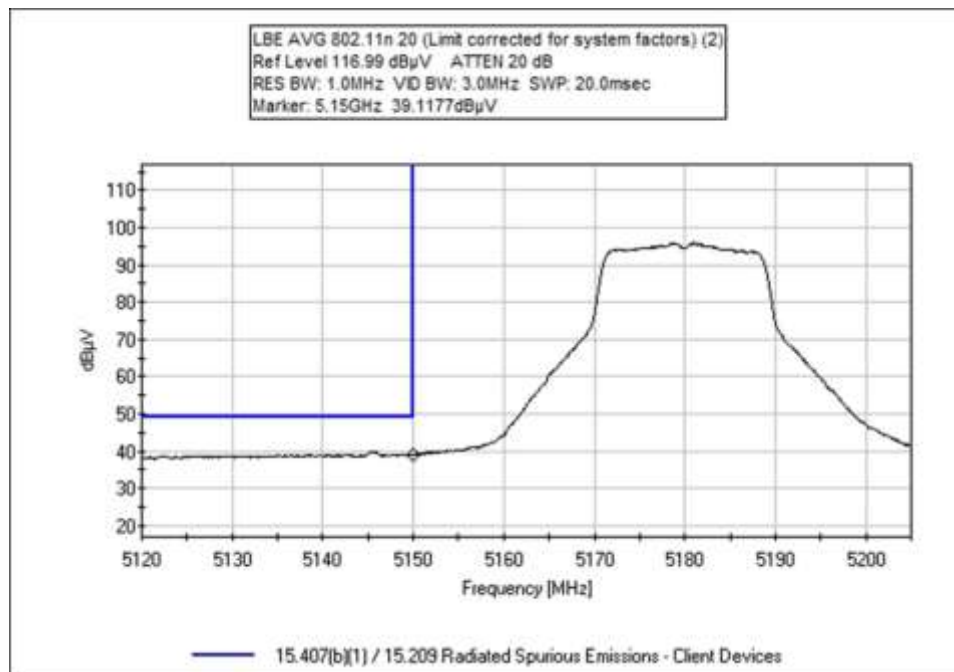
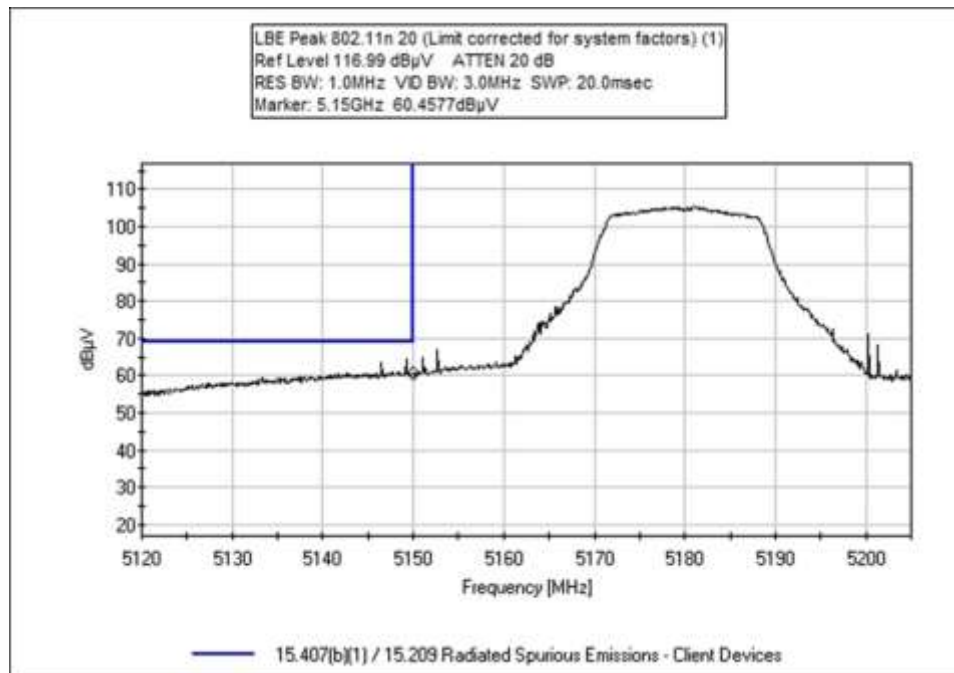


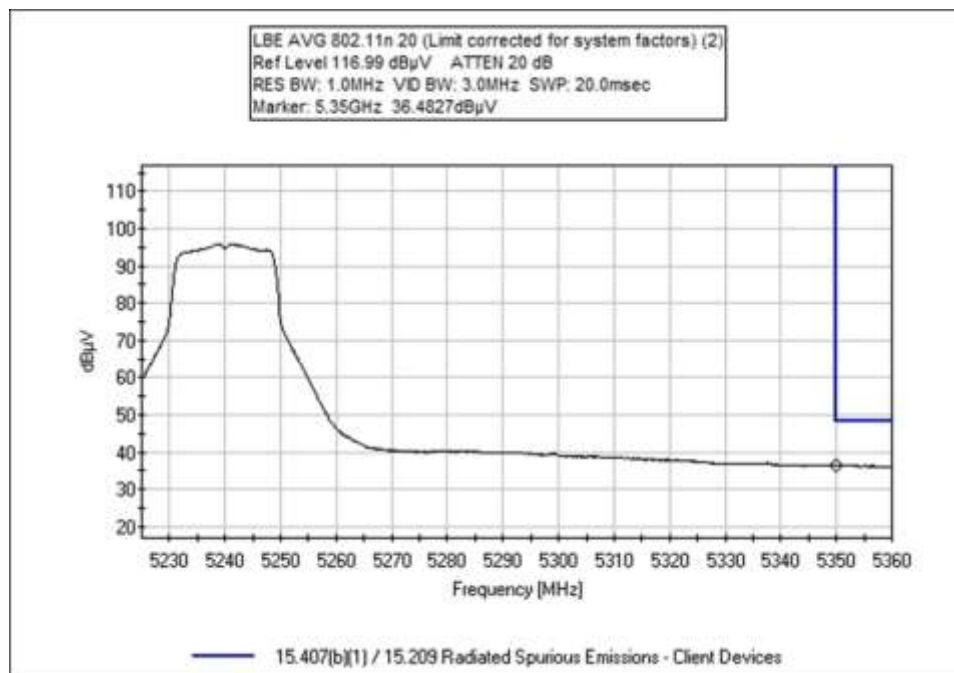
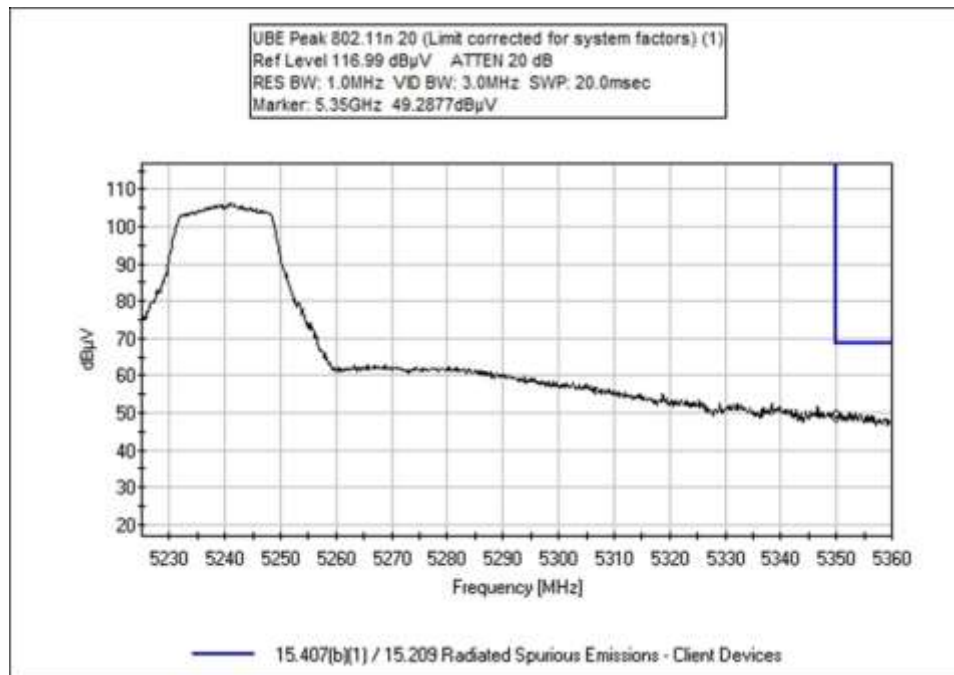
## 802.11ac80 Plots





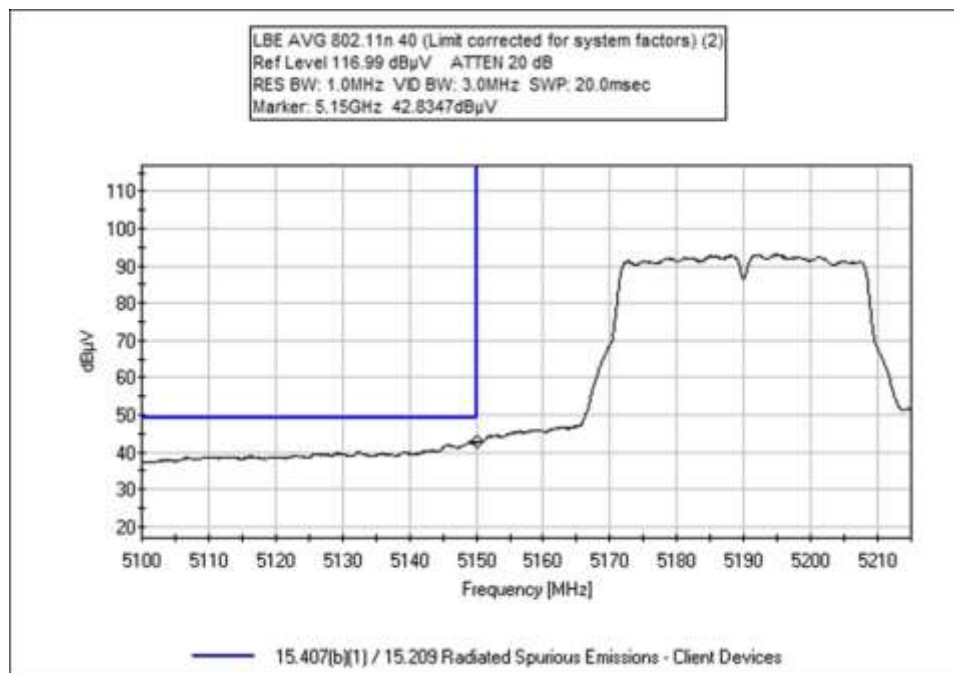
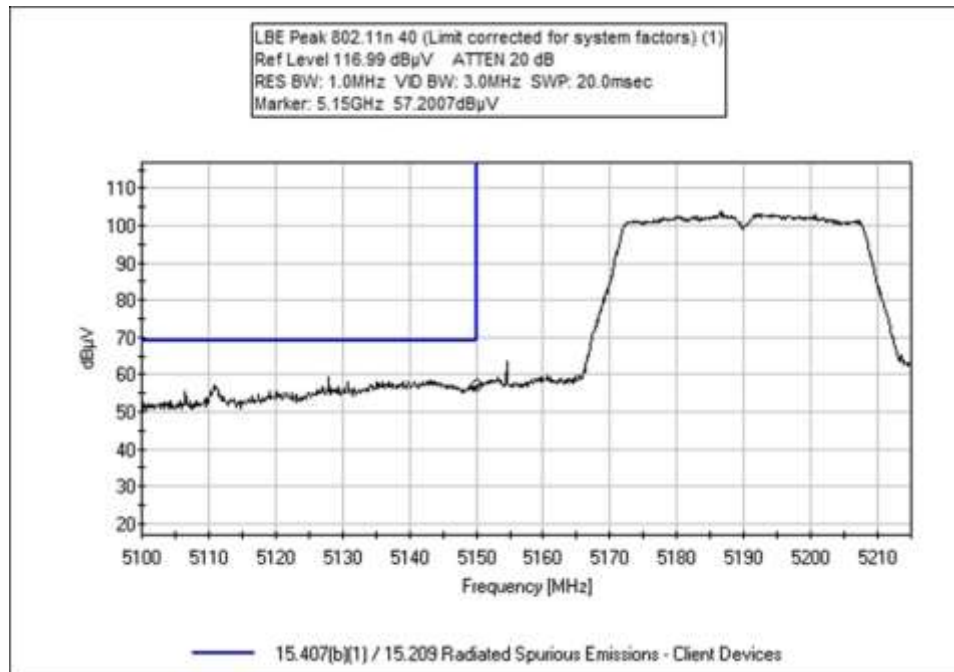
## 802.11n20 Plots



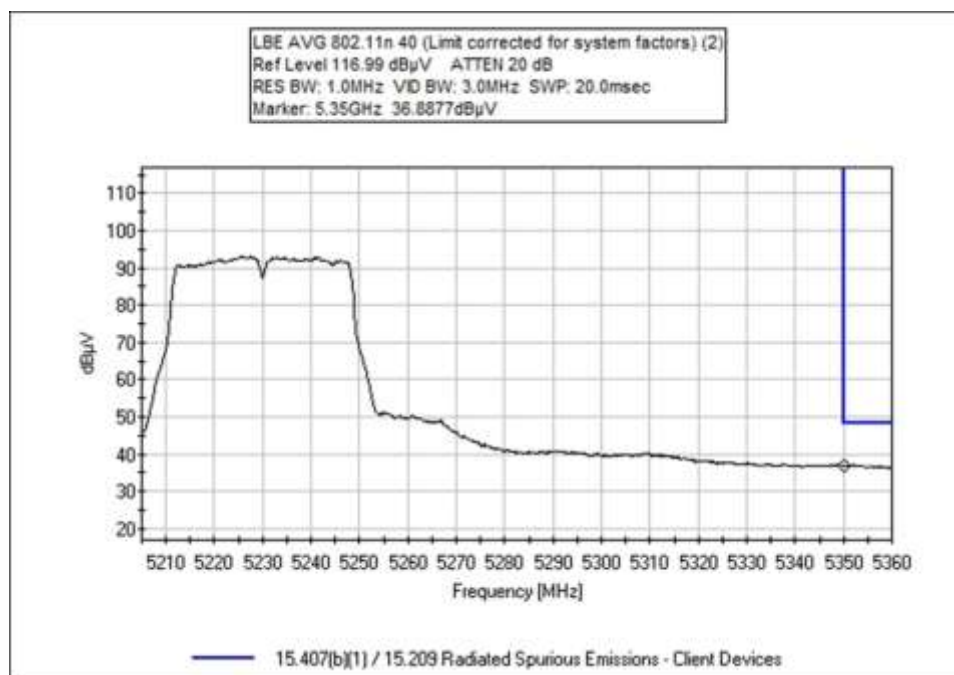
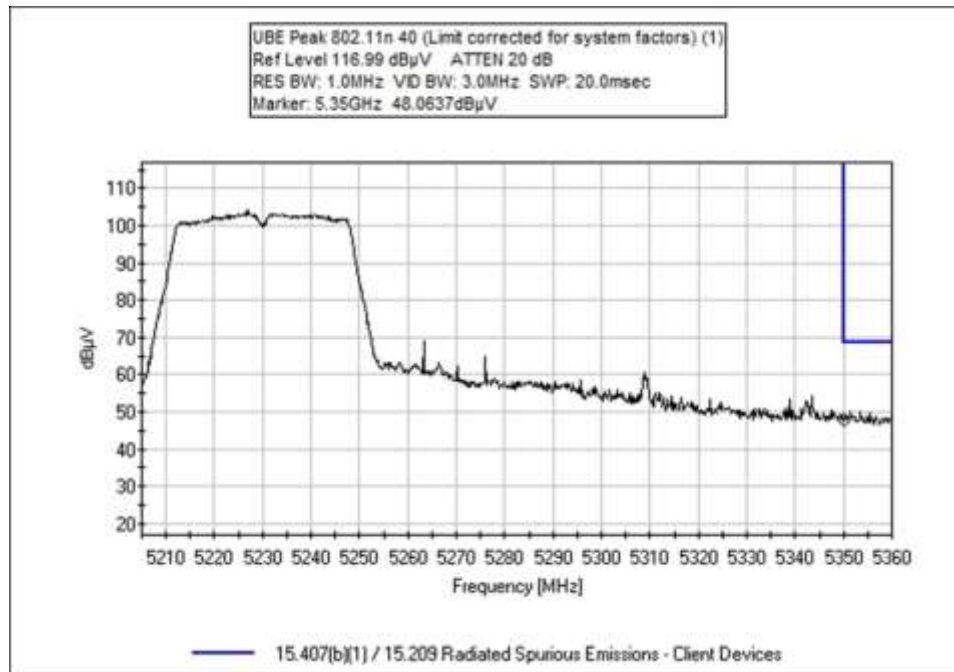




## 802.11n40 Plots







### Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
 Customer: **Nalloy, LLC.**  
 Specification: **15.407(b)(1) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **102802** Date: 3/19/2020  
 Test Type: **Maximized Emissions** Time: 14:29:44  
 Tested By: Matthew Harrison Sequence#: 11  
 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: 5150-4350 MHz Frequency tested: 5180, 5240 MHz Firmware power setting: 14 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11ac, 20MHz BW, MCS0 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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
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**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	Heliac	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
T4	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T5	AN03540	Preamplifier	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 MHz	Rdng dBμV	T1 T5 dB	T2 T6 dB	T3 dB	T4 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5150.000M	39.4	+32.9	+4.3	+0.9	+0.0	+0.0	44.4	54.0	-9.6	Horiz
	Ave		-33.6	+0.5							
^	5150.000M	54.9	+32.9	+4.3	+0.9	+0.0	+0.0	59.9	74.0	-14.1	Horiz
			-33.6	+0.5							
3	5350.000M	36.5	+33.3	+4.4	+0.9	+0.0	+0.0	42.0	54.0	-12.0	Horiz
	Ave		-33.6	+0.5							
^	5350.000M	48.9	+33.3	+4.4	+0.9	+0.0	+0.0	54.4	74.0	-19.6	Horiz
			-33.6	+0.5							
5	5237.825M	106.9	+33.1	+4.3	+0.9	+0.0	+0.0	112.1	125.2	-13.1	Horiz
			-33.6	+0.5			302				185
6	5182.270M	107.0	+33.0	+4.3	+0.9	+0.0	+0.0	112.1	125.2	-13.1	Horiz
			-33.6	+0.5							



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
Customer: **Nalloy, LLC.**  
Specification: **15.407(b)(1) / 15.209 Radiated Spurious Emissions**  
Work Order #: **102802** Date: 3/19/2020  
Test Type: **Maximized Emissions** Time: 13:15:16  
Tested By: Matthew Harrison Sequence#: 9  
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: 5150-4350 MHz Frequency tested: 5180, 5240 MHz Firmware power setting: 14 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11a, 20MHz BW, 6Mbps(worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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
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**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	Heliac	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
T4	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T5	AN03540	Preamplifier	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	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	T5 dB	T6 dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	5145.840M	39.3	+32.9	+4.3	+0.9	+0.0	+0.0	44.3	54.0	-9.7	Horiz
	Ave		-33.6	+0.5							
^	5145.840M	64.8	+32.9	+4.3	+0.9	+0.0	+0.0	69.8	74.0	-4.2	Horiz
			-33.6	+0.5							
3	5150.000M	38.6	+32.9	+4.3	+0.9	+0.0	+0.0	43.6	54.0	-10.4	Horiz
	Ave		-33.6	+0.5							
^	5150.000M	58.0	+32.9	+4.3	+0.9	+0.0	+0.0	63.0	74.0	-11.0	Horiz
			-33.6	+0.5							
5	5350.000M	36.4	+33.3	+4.4	+0.9	+0.0	+0.0	41.9	54.0	-12.1	Horiz
	Ave		-33.6	+0.5							
^	5350.000M	48.5	+33.3	+4.4	+0.9	+0.0	+0.0	54.0	74.0	-20.0	Horiz
			-33.6	+0.5							
7	5239.010M	104.4	+33.1	+4.3	+0.9	+0.0	+0.0	109.6	125.2	-15.6	Horiz
			-33.6	+0.5			300				180
8	5178.560M	104.1	+33.0	+4.3	+0.9	+0.0	+0.0	109.2	125.2	-16.0	Horiz
			-33.6	+0.5			300				180



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
 Customer: **Nalloy, LLC.**  
 Specification: **15.407(b)(1) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **102802** Date: 3/19/2020  
 Test Type: **Maximized Emissions** Time: 14:08:52  
 Tested By: Matthew Harrison Sequence#: 10  
 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: 5150-4350 MHz Frequency tested: 5180, 5240 MHz Firmware power setting: 14 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11n, 20MHz BW, MCS8 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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	Heliac	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
T4	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T5	AN03540	Preamplifier	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 MHz	Rdng dBμV	T1 T5 dB	T2 T6 dB	T3 dB	T4 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5150.000M	39.1	+32.9	+4.3	+0.9	+0.0	+0.0	44.1	54.0	-9.9	Horiz
	Ave		-33.6	+0.5							
^	5150.000M	60.5	+32.9	+4.3	+0.9	+0.0	+0.0	65.5	74.0	-8.5	Horiz
			-33.6	+0.5							
3	5350.000M	36.4	+33.3	+4.4	+0.9	+0.0	+0.0	41.9	54.0	-12.1	Horiz
	Ave		-33.6	+0.5							
^	5350.000M	49.3	+33.3	+4.4	+0.9	+0.0	+0.0	54.8	74.0	-19.2	Horiz
			-33.6	+0.5							
5	5181.030M	105.6	+33.0	+4.3	+0.9	+0.0	+0.0	110.7	125.2	-14.5	Horiz
			-33.6	+0.5			302				180
6	5241.200M	105.5	+33.1	+4.3	+0.9	+0.0	+0.0	110.7	125.2	-14.5	Horiz
			-33.6	+0.5							



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
Customer: **Nalloy, LLC.**  
Specification: **15.407(b)(1) / 15.209 Radiated Spurious Emissions**  
Work Order #: **102802** Date: 3/19/2020  
Test Type: **Maximized Emissions** Time: 15:15:29  
Tested By: Matthew Harrison Sequence#: 13  
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: 5150-5350 MHz Frequency tested: 5190, 5230 MHz Firmware power setting: 14 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11ac, 40MHz BW, MCS0 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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
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**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	Heliac	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
T4	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T5	AN03540	Preamplifier	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 MHz	Rdng dBμV	T1 T5 dB	T2 T6 dB	T3 dB	T4 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5150.000M	44.6	+32.9	+4.3	+0.9	+0.0	+0.0	49.6	54.0	-4.4	Horiz
	Ave		-33.6	+0.5							
^	5150.000M	62.4	+32.9	+4.3	+0.9	+0.0	+0.0	67.4	74.0	-6.6	Horiz
			-33.6	+0.5							
3	5350.000M	37.0	+33.3	+4.4	+0.9	+0.0	+0.0	42.5	54.0	-11.5	Horiz
	Ave		-33.6	+0.5							
^	5350.000M	48.8	+33.3	+4.4	+0.9	+0.0	+0.0	54.3	74.0	-19.7	Horiz
			-33.6	+0.5							
5	5234.605M	104.7	+33.1	+4.3	+0.9	+0.0	+0.0	109.9	125.2	-15.3	Horiz
			-33.6	+0.5			302				185
6	5184.060M	103.7	+33.0	+4.3	+0.9	+0.0	+0.0	108.8	125.2	-16.4	Horiz
			-33.6	+0.5							



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
Customer: **Nalloy, LLC.**  
Specification: **15.407(b)(1) / 15.209 Radiated Spurious Emissions**  
Work Order #: **102802** Date: 3/19/2020  
Test Type: **Maximized Emissions** Time: 14:59:28  
Tested By: Matthew Harrison Sequence#: 12  
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: 5150-5350 MHz Frequency tested: 5190, 5230 MHz Firmware power setting: 14 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11n, 40MHz BW, MCS8 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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
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**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	Heliac	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
T4	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T5	AN03540	Preamplifier	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	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	T5 dB	T6 dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	5150.000M	42.8	+32.9	+4.3	+0.9	+0.0	+0.0	47.8	54.0	-6.2	Horiz
	Ave		-33.6	+0.5							
^	5150.000M	57.2	+32.9	+4.3	+0.9	+0.0	+0.0	62.2	74.0	-11.8	Horiz
			-33.6	+0.5							
3	5350.000M	36.9	+33.3	+4.4	+0.9	+0.0	+0.0	42.4	54.0	-11.6	Horiz
	Ave		-33.6	+0.5							
^	5350.000M	48.1	+33.3	+4.4	+0.9	+0.0	+0.0	53.6	74.0	-20.4	Horiz
			-33.6	+0.5							
5	5226.700M	104.4	+33.1	+4.3	+0.9	+0.0	+0.0	109.6	125.2	-15.6	Horiz
			-33.6	+0.5							
6	5186.750M	104.2	+33.0	+4.3	+0.9	+0.0	+0.0	109.3	125.2	-15.9	Horiz
			-33.6	+0.5			302				185



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362  
Customer: **Nalloy, LLC.**  
Specification: **15.407(b)(1) / 15.209 Radiated Spurious Emissions**  
Work Order #: **102802** Date: 3/19/2020  
Test Type: **Maximized Emissions** Time: 15:34:03  
Tested By: Matthew Harrison Sequence#: 14  
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: 5150-5350 MHz Frequency tested: 5210 MHz Firmware power setting: 13 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11ac, 80MHz BW, MCS0 (worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 dBi.  Duty Cycle: 100% Modulated  Test Method: ANSI C63.10: 2013 KDB 789033 v02r01 December 14, 2017) 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
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**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	Heliac	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliac	8/23/2019	8/23/2021
T4	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T5	AN03540	Preamplifier	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 dB	T2 T6 dB	T3 dB	T4 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5150.000M	42.4	+32.9	+4.3	+0.9	+0.0	+0.0	47.4	54.0	-6.6	Horiz
	Ave		-33.6	+0.5							
^	5150.000M	58.8	+32.9	+4.3	+0.9	+0.0	+0.0	63.8	74.0	-10.2	Horiz
			-33.6	+0.5							
3	5350.000M	36.1	+33.3	+4.4	+0.9	+0.0	+0.0	41.6	54.0	-12.4	Horiz
			-33.6	+0.5							
4	5226.190M	100.6	+33.1	+4.3	+0.9	+0.0	+0.0	105.8	125.2	-19.4	Horiz
			-33.6	+0.5							
5	5350.000M	47.1	+33.3	+4.4	+0.9	+0.0	+0.0	52.6	74.0	-21.4	Horiz
			-33.6	+0.5							

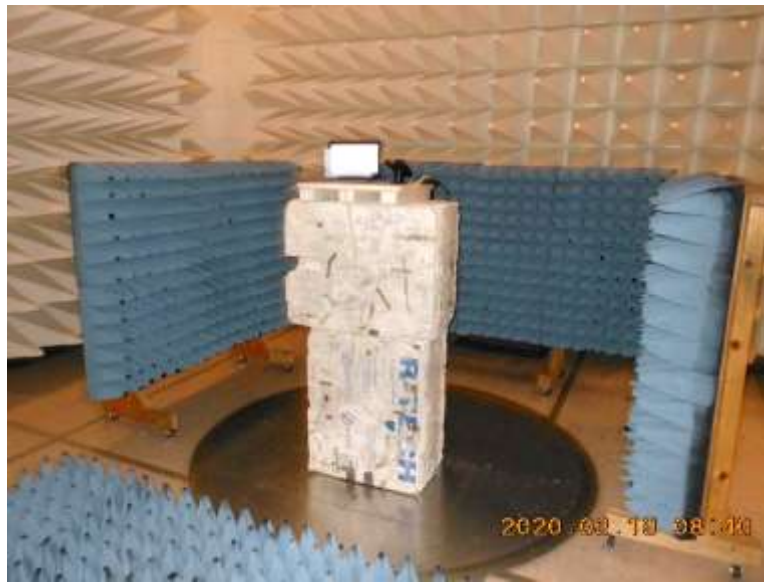
**Test Setup Photo(s)**



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: 07:52:37  
 Tested By: Matthew Harrison Sequence#: 86  
 Software: EMITest 5.03.12 120V 60Hz

#### Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

#### Support Equipment:

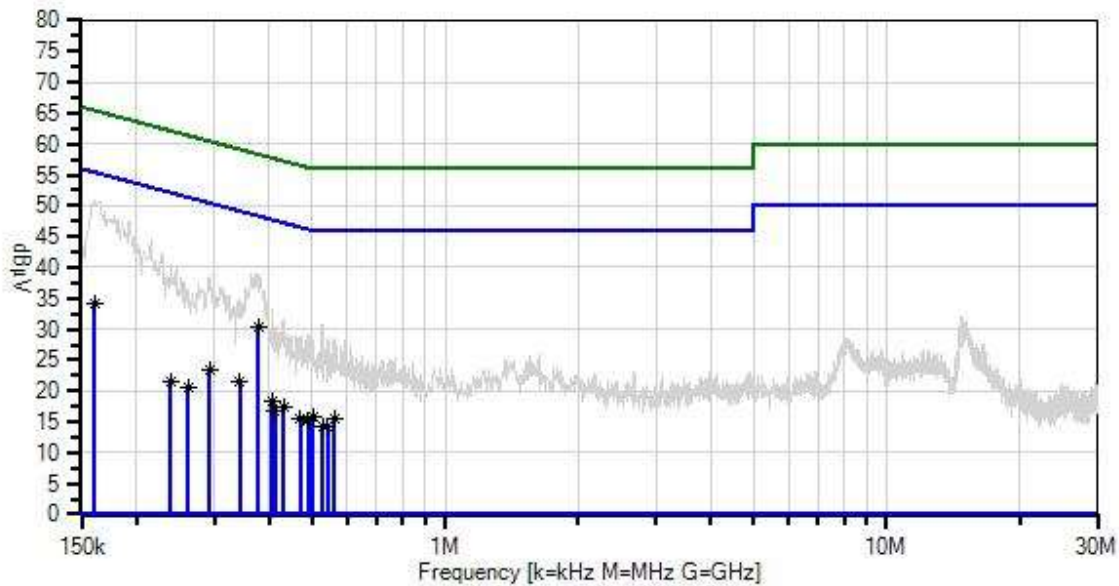
Device	Manufacturer	Model #	S/N
Configuration 1			

#### Test Conditions / Notes:

Environmental Conditions:  
 Temperature: 22° C  
 Humidity: 28%  
 Pressure: 101.3 kPa  
  
 Frequency Range: 150kHz-30MHz  
 Frequency tested: 5180 MHz  
 Firmware power setting: 14 dBm  
 EUT Firmware:  
 Protocol /MCS/Modulation: 802.11a, 20MHz BW, 6Mbps(worst-case)  
  
 Antenna type: Linear Polarized  
 Antenna Gain: 5.9 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.  
  
 All modes, channels, and data rates investigated, worst-case provided.



Nalloy, LLC. WO#: 102802 Sequence#: 86 Date: 4/1/2020  
15.207 AC Mains - Average Test Lead: 120V 60Hz Line



— Sweep Data  
× QP Readings  
Software Version: 5.03.20  
— Readings  
\* Average Readings  
— 1 - 15.207 AC Mains - Average  
○ Peak Readings  
▼ Ambient  
— 2 - 15.207 AC Mains - Quasi-peak

**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	Heliac	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliac	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 MHz	Rdng dB $\mu$ V	T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	376.887k	20.5	+9.1	+0.0	+0.0	-0.6	+0.0	30.4	48.3	-17.9	Line
	Ave		+0.2								
^	376.887k	30.4	+9.1	+0.0	+0.0	-0.6	+0.0	40.3	48.3	-8.0	Line
			+0.2								
3	160.907k	22.6	+9.1	+0.0	+0.0	-1.7	+0.0	34.0	55.4	-21.4	Line
	Ave		+0.6								
^	160.907k	43.0	+9.1	+0.0	+0.0	-1.7	+0.0	54.4	55.4	-1.0	Line
			+0.6								
5	293.259k	13.6	+9.1	+0.0	+0.0	-0.7	+0.0	23.5	50.4	-26.9	Line
	Ave		+0.1								
^	293.258k	30.2	+9.1	+0.0	+0.0	-0.7	+0.0	40.1	50.4	-10.3	Line
			+0.1								
7	342.709k	11.8	+9.1	+0.0	+0.0	-0.6	+0.0	21.6	49.1	-27.5	Line
	Ave		+0.1								
^	342.708k	26.3	+9.1	+0.0	+0.0	-0.6	+0.0	36.1	49.1	-13.0	Line
			+0.1								
9	405.248k	8.4	+9.1	+0.0	+0.0	-0.5	+0.0	18.2	47.7	-29.5	Line
	Ave		+0.2								
^	405.248k	24.4	+9.1	+0.0	+0.0	-0.5	+0.0	34.2	47.7	-13.5	Line
			+0.2								
11	430.701k	7.5	+9.1	+0.1	+0.0	-0.5	+0.0	17.4	47.2	-29.8	Line
	Ave		+0.2								
^	430.700k	22.7	+9.1	+0.1	+0.0	-0.5	+0.0	32.6	47.2	-14.6	Line
			+0.2								
13	501.239k	6.0	+9.1	+0.0	+0.0	-0.4	+0.0	15.7	46.0	-30.3	Line
	Ave		+0.2								
^	501.239k	19.5	+9.1	+0.0	+0.0	-0.4	+0.0	29.2	46.0	-16.8	Line
			+0.2								
15	561.598k	5.6	+9.1	+0.0	+0.0	-0.4	+0.0	15.4	46.0	-30.6	Line
	Ave		+0.3								
^	561.597k	19.6	+9.1	+0.0	+0.0	-0.4	+0.0	29.4	46.0	-16.6	Line
			+0.3								
17	239.445k	11.1	+9.1	+0.0	+0.0	-1.0	+0.0	21.4	52.1	-30.7	Line
	Ave		+0.2								
^	239.445k	32.2	+9.1	+0.0	+0.0	-1.0	+0.0	42.5	52.1	-9.6	Line
			+0.2								
19	261.262k	10.4	+9.1	+0.0	+0.0	-0.8	+0.0	20.5	51.4	-30.9	Line
	Ave		+0.2								
^	261.261k	28.0	+9.1	+0.0	+0.0	-0.8	+0.0	38.1	51.4	-13.3	Line
			+0.2								
21	470.697k	5.7	+9.1	+0.1	+0.0	-0.5	+0.0	15.6	46.5	-30.9	Line
	Ave		+0.2								
^	470.696k	20.1	+9.1	+0.1	+0.0	-0.5	+0.0	30.0	46.5	-16.5	Line
			+0.2								
23	412.520k	6.9	+9.1	+0.0	+0.0	-0.5	+0.0	16.7	47.6	-30.9	Line
	Ave		+0.2								
^	412.520k	21.8	+9.1	+0.0	+0.0	-0.5	+0.0	31.6	47.6	-16.0	Line
			+0.2								

25	490.331k	5.5	+9.1	+0.0	+0.0	-0.4	+0.0	15.2	46.2	-31.0	Line
	Ave		+0.2								
^	490.331k	20.2	+9.1	+0.0	+0.0	-0.4	+0.0	29.9	46.2	-16.3	Line
			+0.2								
27	526.692k	4.4	+9.1	+0.0	+0.0	-0.4	+0.0	14.2	46.0	-31.8	Line
	Ave		+0.3								
^	526.691k	21.9	+9.1	+0.0	+0.0	-0.4	+0.0	31.7	46.0	-14.3	Line
			+0.3								
29	541.963k	4.3	+9.1	+0.0	+0.0	-0.4	+0.0	14.1	46.0	-31.9	Line
	Ave		+0.3								
^	541.963k	19.5	+9.1	+0.0	+0.0	-0.4	+0.0	29.3	46.0	-16.7	Line
			+0.3								



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: 08:00:30  
Tested By: Matthew Harrison Sequence#: 87  
Software: EMITest 5.03.12 120V 60Hz

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

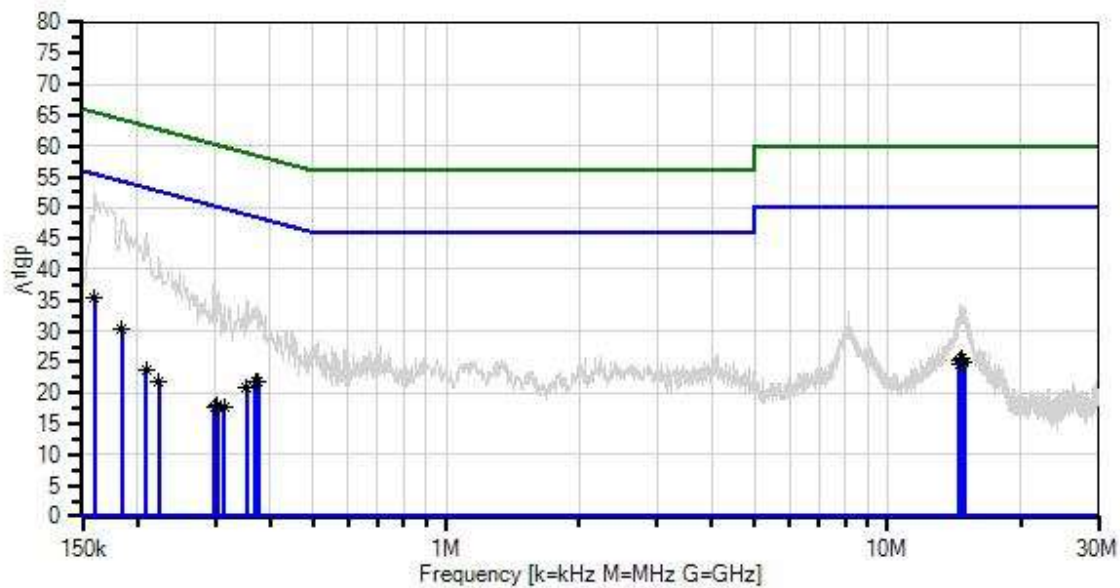
***Support Equipment:***

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: 5180 MHz Firmware power setting: 14 dBm EUT Firmware: Protocol /MCS/Modulation: 802.11a, 20MHz BW, 6Mbps(worst-case)  Antenna type: Linear Polarized Antenna Gain: 5.9 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.  All modes, channels, and data rates investigated, worst-case provided.
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Nalloy, LLC. WO#: 102802 Sequence#: 87 Date: 4/1/2020  
15.207 AC Mains - Average Test Lead: 120V 60Hz Neutral



— Sweep Data  
× QP Readings  
Software Version: 5.03.20  
— Readings  
\* Average Readings  
— 1 - 15.207 AC Mains - Average  
○ Peak Readings  
▼ Ambient  
— 2 - 15.207 AC Mains - Quasi-peak

**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	Heliac	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliac	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	dB $\mu$ V	dB	dB	dB	dB	Table	dB $\mu$ V	dB $\mu$ V	dB	Ant
1	160.180k	24.1	+9.1	+0.0	+0.0	-1.6	+0.0	35.4	55.5	-20.1	Neutr
	Ave		+0.6								
^	160.179k	44.4	+9.1	+0.0	+0.0	-1.6	+0.0	55.7	55.5	+0.2	Neutr
			+0.6								
3	184.178k	19.5	+9.1	+0.0	+0.0	-1.3	+0.0	30.3	54.3	-24.0	Neutr
	Ave		+0.4								
^	184.177k	40.0	+9.1	+0.0	+0.0	-1.3	+0.0	50.8	54.3	-3.5	Neutr
			+0.4								
5	14.770M	15.3	+9.1	+0.2	+0.1	-0.6	+0.0	25.5	50.0	-24.5	Neutr
	Ave		+0.2								
^	14.770M	25.3	+9.1	+0.2	+0.1	-0.6	+0.0	35.5	50.0	-14.5	Neutr
			+0.2								
7	14.643M	15.2	+9.1	+0.2	+0.1	-0.6	+0.0	25.4	50.0	-24.6	Neutr
	Ave		+0.2								
^	14.643M	25.0	+9.1	+0.2	+0.1	-0.6	+0.0	35.2	50.0	-14.8	Neutr
			+0.2								
9	14.607M	15.1	+9.1	+0.2	+0.1	-0.6	+0.0	25.3	50.0	-24.7	Neutr
	Ave		+0.2								
^	14.607M	24.8	+9.1	+0.2	+0.1	-0.6	+0.0	35.0	50.0	-15.0	Neutr
			+0.2								
11	14.923M	14.8	+9.1	+0.2	+0.1	-0.6	+0.0	25.0	50.0	-25.0	Neutr
	Ave		+0.2								
^	14.923M	24.9	+9.1	+0.2	+0.1	-0.6	+0.0	35.1	50.0	-14.9	Neutr
			+0.2								
13	14.526M	14.5	+9.1	+0.2	+0.1	-0.6	+0.0	24.7	50.0	-25.3	Neutr
	Ave		+0.2								
^	14.526M	25.2	+9.1	+0.2	+0.1	-0.6	+0.0	35.4	50.0	-14.6	Neutr
			+0.2								
15	375.433k	11.9	+9.1	+0.0	+0.0	-0.6	+0.0	21.8	48.4	-26.6	Neutr
	Ave		+0.2								
^	375.432k	25.7	+9.1	+0.0	+0.0	-0.6	+0.0	35.6	48.4	-12.8	Neutr
			+0.2								
17	370.342k	11.8	+9.1	+0.0	+0.0	-0.6	+0.0	21.7	48.5	-26.8	Neutr
	Ave		+0.2								
^	370.342k	25.1	+9.1	+0.0	+0.0	-0.6	+0.0	35.0	48.5	-13.5	Neutr
			+0.2								
19	353.617k	11.2	+9.1	+0.0	+0.0	-0.6	+0.0	21.0	48.9	-27.9	Neutr
	Ave		+0.1								
^	353.616k	26.7	+9.1	+0.0	+0.0	-0.6	+0.0	36.5	48.9	-12.4	Neutr
			+0.1								
21	209.630k	13.3	+9.1	+0.0	+0.0	-1.1	+0.0	23.7	53.2	-29.5	Neutr
	Ave		+0.2								
^	209.629k	37.7	+9.1	+0.0	+0.0	-1.1	+0.0	48.1	53.2	-5.1	Neutr
			+0.2								
23	223.447k	11.5	+9.1	+0.0	+0.0	-1.0	+0.0	21.9	52.7	-30.8	Neutr
	Ave		+0.3								
^	223.446k	33.6	+9.1	+0.0	+0.0	-1.0	+0.0	44.0	52.7	-8.7	Neutr
			+0.3								

25	315.075k	7.9	+9.1	+0.0	+0.0	-0.7	+0.0	17.8	49.8	-32.0	Neutr
	Ave		+0.1								
^	315.074k	25.8	+9.1	+0.0	+0.0	-0.7	+0.0	35.7	49.8	-14.1	Neutr
			+0.1								
27	303.439k	8.0	+9.1	+0.0	+0.0	-0.7	+0.0	17.9	50.1	-32.2	Neutr
	Ave		+0.1								
^	303.439k	27.5	+9.1	+0.0	+0.0	-0.7	+0.0	37.4	50.1	-12.7	Neutr
			+0.1								
29	298.349k	7.9	+9.1	+0.0	+0.0	-0.7	+0.0	17.8	50.3	-32.5	Neutr
	Ave		+0.1								
^	298.349k	29.4	+9.1	+0.0	+0.0	-0.7	+0.0	39.3	50.3	-11.0	Neutr
			+0.1								

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  $\text{dB}\mu\text{V}/\text{m}$ , the spectrum analyzer reading in  $\text{dB}\mu\text{V}$  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	( $\text{dB}\mu\text{V}$ )
+	Antenna Factor	( $\text{dB}/\text{m}$ )
+	Cable Loss	( $\text{dB}$ )
-	Distance Correction	( $\text{dB}$ )
-	Preamplifier Gain	( $\text{dB}$ )
=	Corrected Reading	( $\text{dB}\mu\text{V}/\text{m}$ )

#### 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.