

Nalloy, LLC

REVISED TEST REPORT TO 102802-24A

Model: PFAY0H

Tested to The Following Standards:

FCC Part 15 Subpart E Section(s)

15.207 & 15.407
(NII 5.725-5.85GHz)

Report No.: 102802-24B

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:

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Seattle, WA 98108

REPORT PREPARED BY:

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Mariposa, CA 95338

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

Project Number: 102802

DATE OF EQUIPMENT RECEIPT:

March 20, 2020

DATE(S) OF TESTING:

April 1, 2 and 6-8, 2020

Revision History

Original: Testing of the Model: PFAY0H, to FCC Part 15 Subpart E Section(s) 15.207 & 15.407 (NII 5.725-5.85GHz).

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 B: To replace 15.207 AC Conducted Emissions data.

Report Authorization

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



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

Test Facility Information



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

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

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.12

Site Registration & Accreditation Information

Location	*NIST CB #	FCC	Japan
Canyon Park, Bothell, WA	US0081	US1022	A-0136
Brea, CA	US0060	US1025	A-0136
Fremont, CA	US01082	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
15.407(e)	6dB Bandwidth	NA	Pass
15.407(a)	Output Power	NA	Pass
15.407(a)	Power Spectral Density	NA	Pass
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

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:

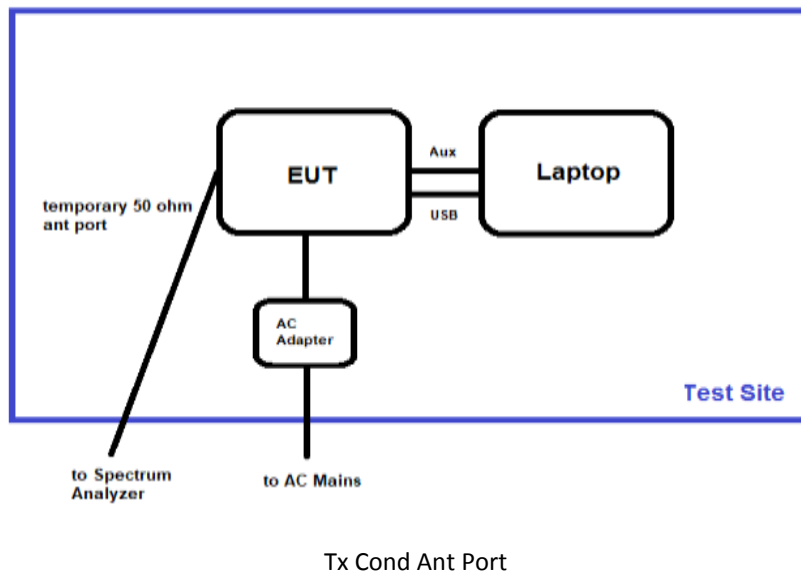
Device	Manufacturer	Model #	S/N
PC	Lenovo	81KT	YD07YGLG
PC PSU	Lenovo	ADL45WCC	NA
EUT PSU	Delta Electronics	MDS-030AAC15	24QW96P00CS

General Product Information:

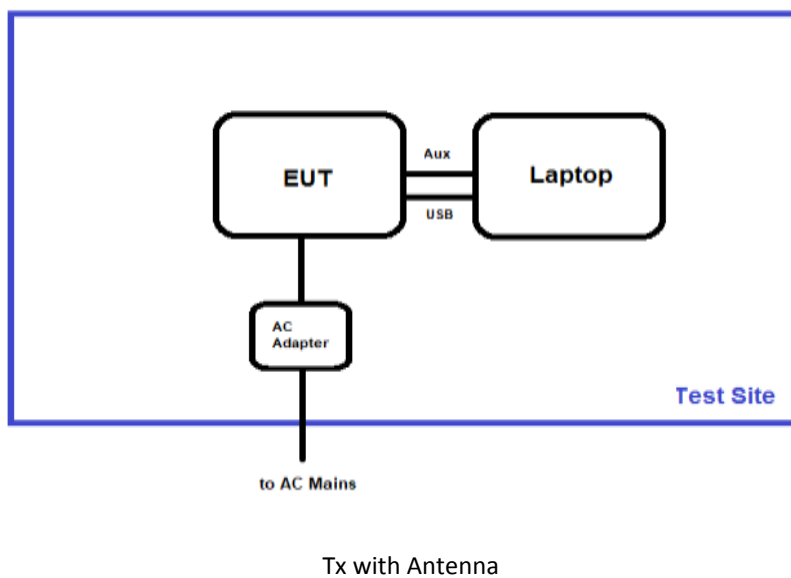
Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Type of Wideband System:	802.11a, ac, n
Operating Frequency Range:	5.725-5.85GHz
Modulation Type(s):	BPSK, QPSK, 16-QAM, 64-QAM
Maximum Duty Cycle:	100% Modulated (Tested Worst-Case)
Number of TX Chains:	1
Antenna 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



Test Setup Block Diagram



FCC Part 15 Subpart E

15.407(e) 6dB 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):	4/7/2020
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

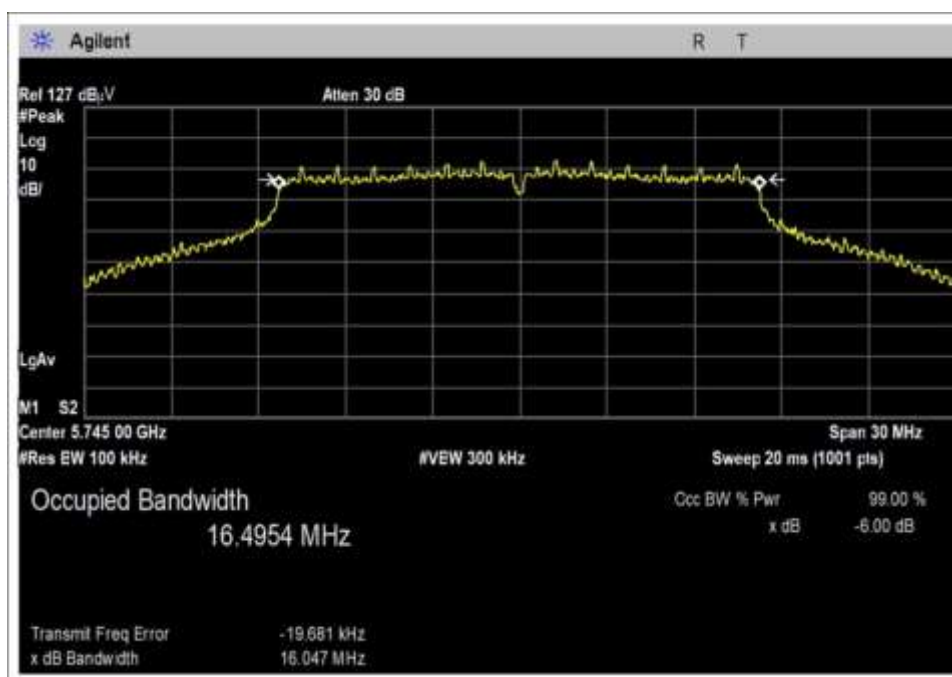
6dB Occupied Bandwidth

Test Data Summary					
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)	Results
5745	0	802.11a	16047	≥500	Pass
5785	0	802.11a	16267	≥500	Pass
5825	0	802.11a	16289	≥500	Pass
5745	1	802.11a	16295	≥500	Pass
5785	1	802.11a	16312	≥500	Pass
5825	1	802.11a	15896	≥500	Pass
5745	0	802.11n20	16957	≥500	Pass
5785	0	802.11n20	16201	≥500	Pass
5825	0	802.11n20	16279	≥500	Pass
5745	1	802.11n20	16401	≥500	Pass
5785	1	802.11n20	16698	≥500	Pass
5825	1	802.11n20	16807	≥500	Pass
5755	0	802.11n40	36415	≥500	Pass
5795	0	802.11n40	35941	≥500	Pass
5755	1	802.11n40	35314	≥500	Pass
5795	1	802.11n40	35426	≥500	Pass
5745	0	802.11ac20	17111	≥500	Pass
5785	0	802.11ac20	16712	≥500	Pass
5825	0	802.11ac20	17140	≥500	Pass
5745	1	802.11ac20	16961	≥500	Pass
5785	1	802.11ac20	16684	≥500	Pass
5825	1	802.11ac20	16804	≥500	Pass
5755	0	802.11ac40	35599	≥500	Pass
5795	0	802.11ac40	35711	≥500	Pass
5755	1	802.11ac40	35581	≥500	Pass
5795	1	802.11ac40	35547	≥500	Pass
5775	0	802.11ac80	75269	≥500	Pass
5775	1	802.11ac80	75236	≥500	Pass

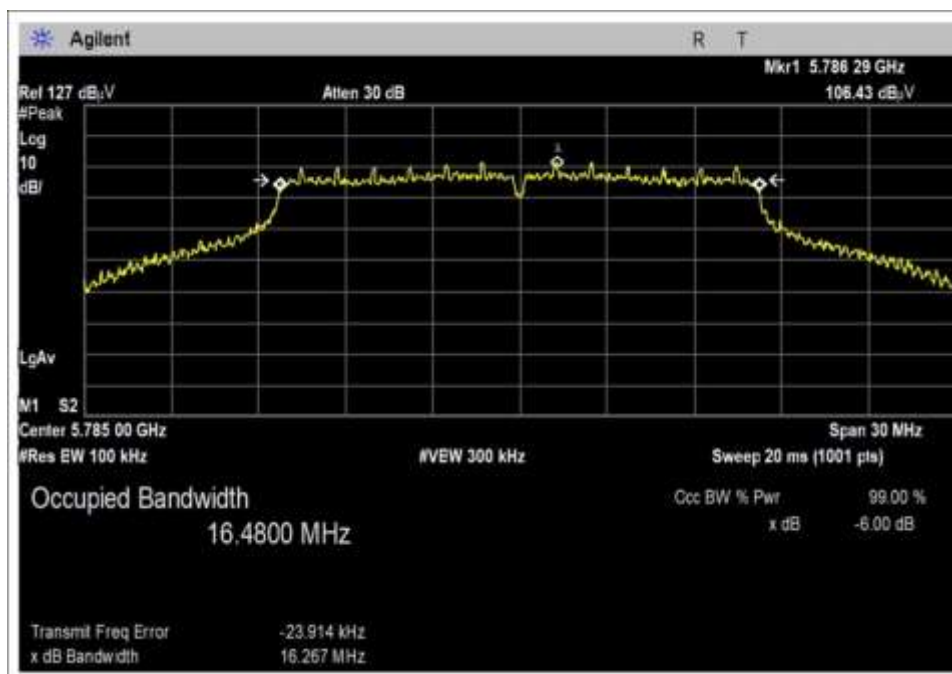
99% Occupied Bandwidth

Test Data Summary					
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)	Results
5745	0	802.11a	16840.2	None	Pass
5785	0	802.11a	16873.1		
5825	0	802.11a	16868.9		
5745	1	802.11a	16788.5	None	Pass
5785	1	802.11a	16777.2		
5825	1	802.11a	16779.1		
5745	0	802.11n20	17948.4	None	Pass
5785	0	802.11n20	17962.8		
5825	0	802.11n20	17935.9		
5745	1	802.11n20	17983.3	None	Pass
5785	1	802.11n20	18079.7		
5825	1	802.11n20	18035.3		
5755	0	802.11n40	36226.7	None	Pass
5795	0	802.11n40	36287.3		
5755	1	802.11n40	36205.2	None	Pass
5795	1	802.11n40	36253.9		
5745	0	802.11ac20	18059.5	None	Pass
5785	0	802.11ac20	18032.6		
5825	0	802.11ac20	17890.9		
5745	1	802.11ac20	17968.4	None	Pass
5785	1	802.11ac20	17955.6		
5825	1	802.11ac20	18002.4		
5755	0	802.11ac40	36178.2	None	Pass
5795	0	802.11ac40	36205.4		
5755	1	802.11ac40	36327.4	None	Pass
5795	1	802.11ac40	36339.3		
5775	0	802.11ac80	75582.3	None	Pass
5775	1	802.11ac80	75580.0	None	Pass

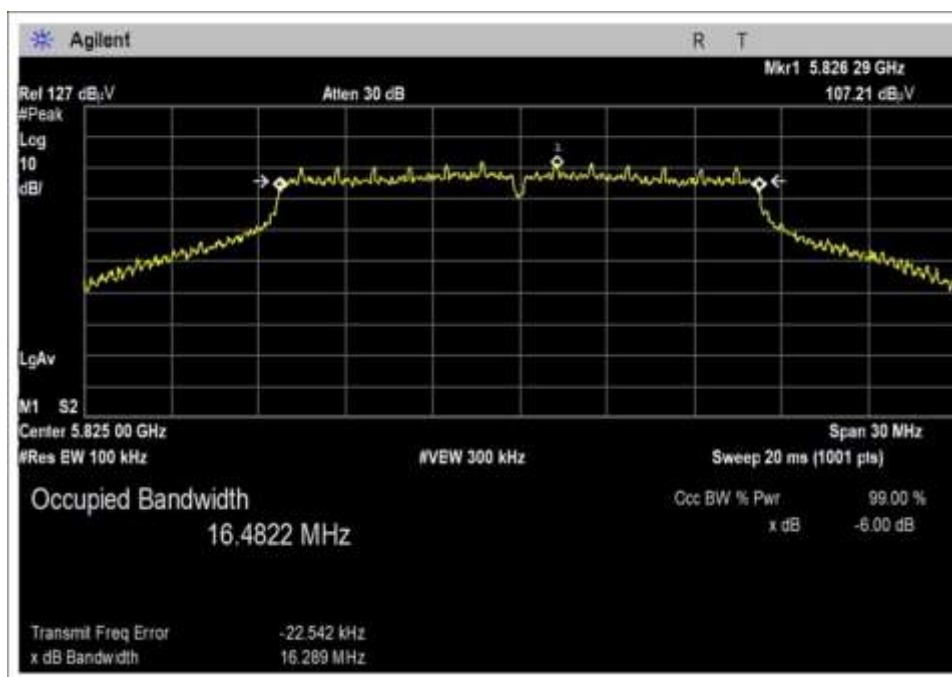
802.11a Plot(s)



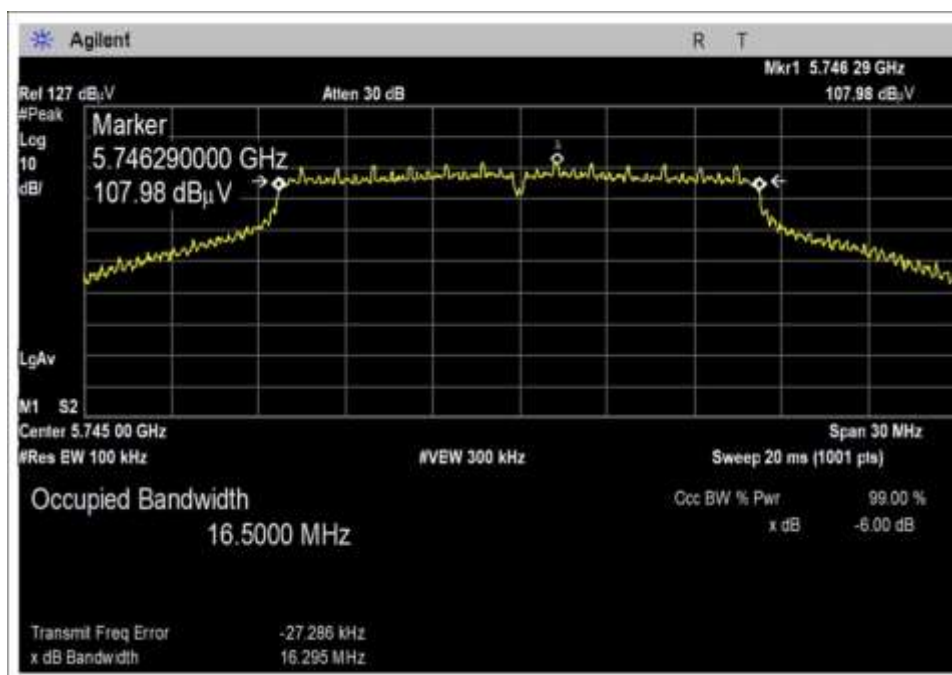
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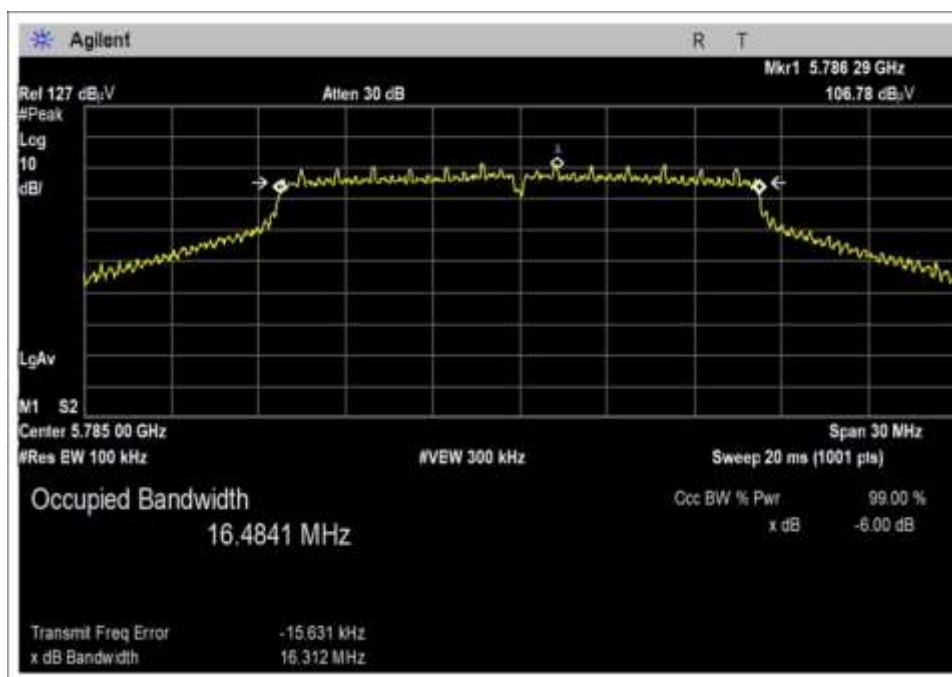
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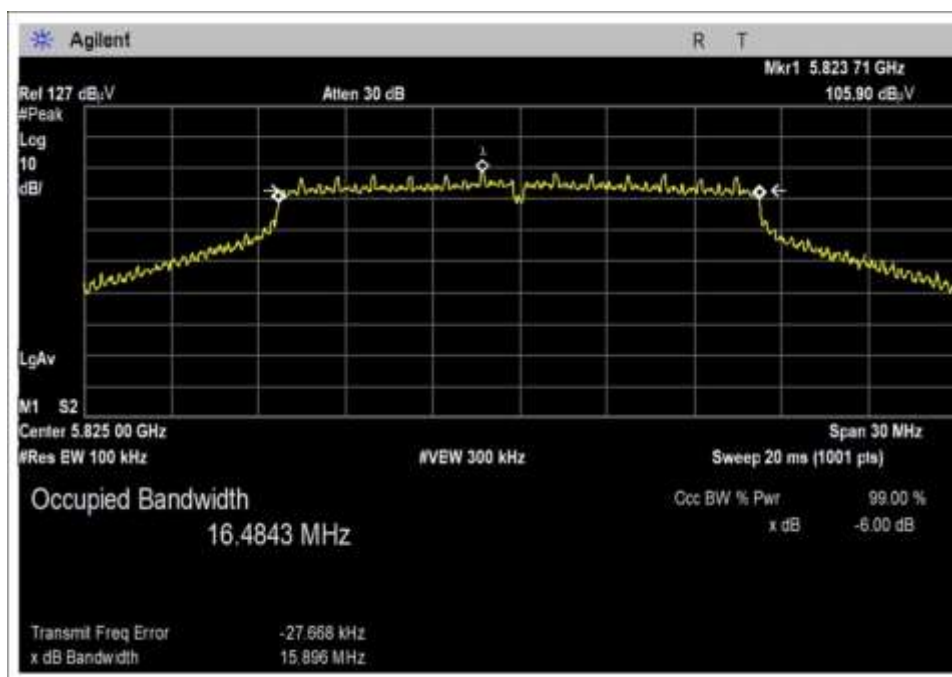
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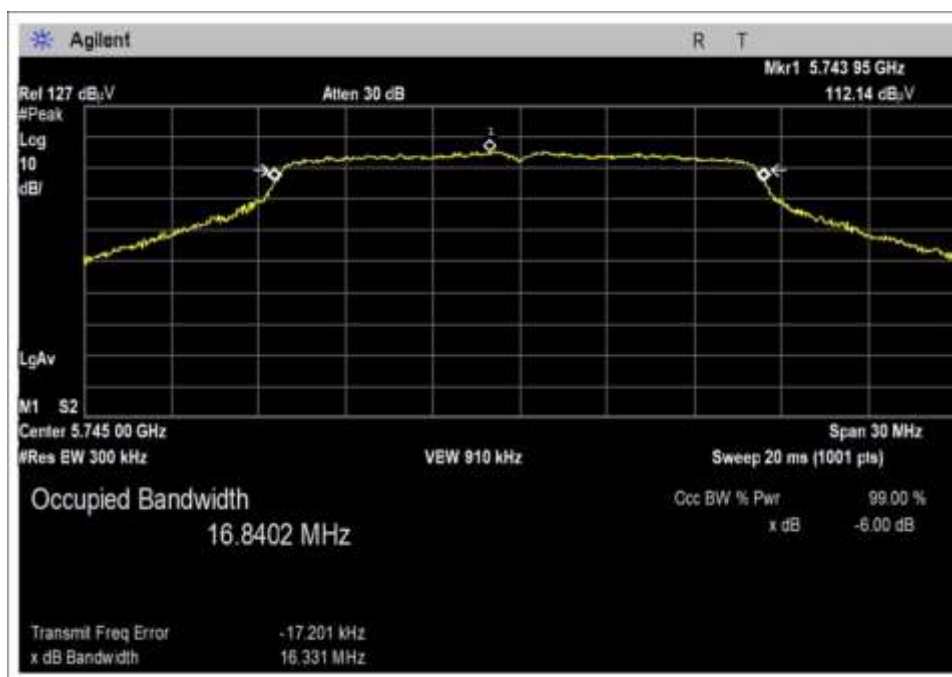
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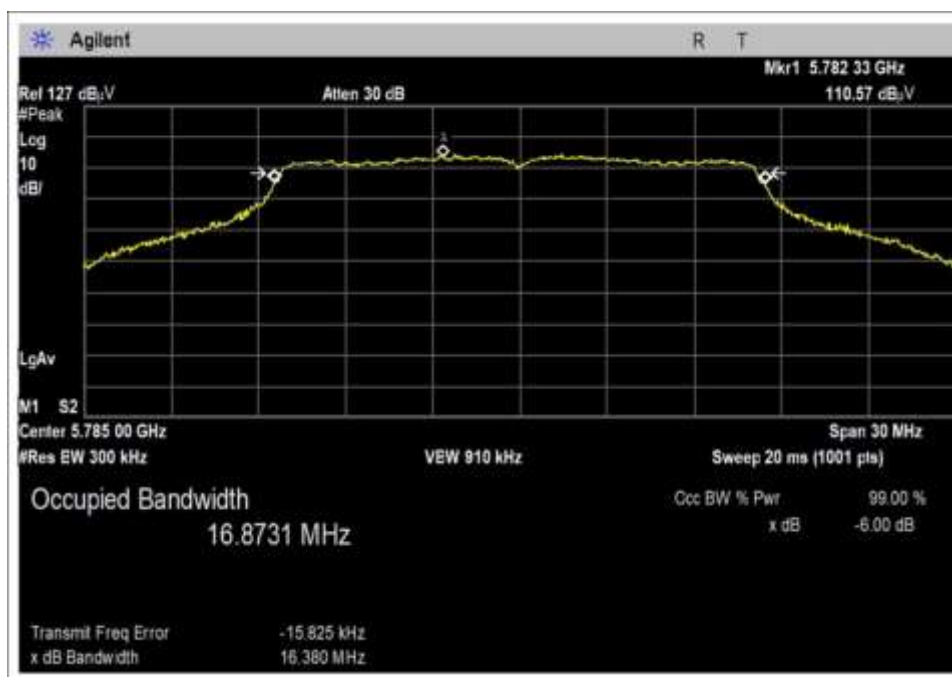
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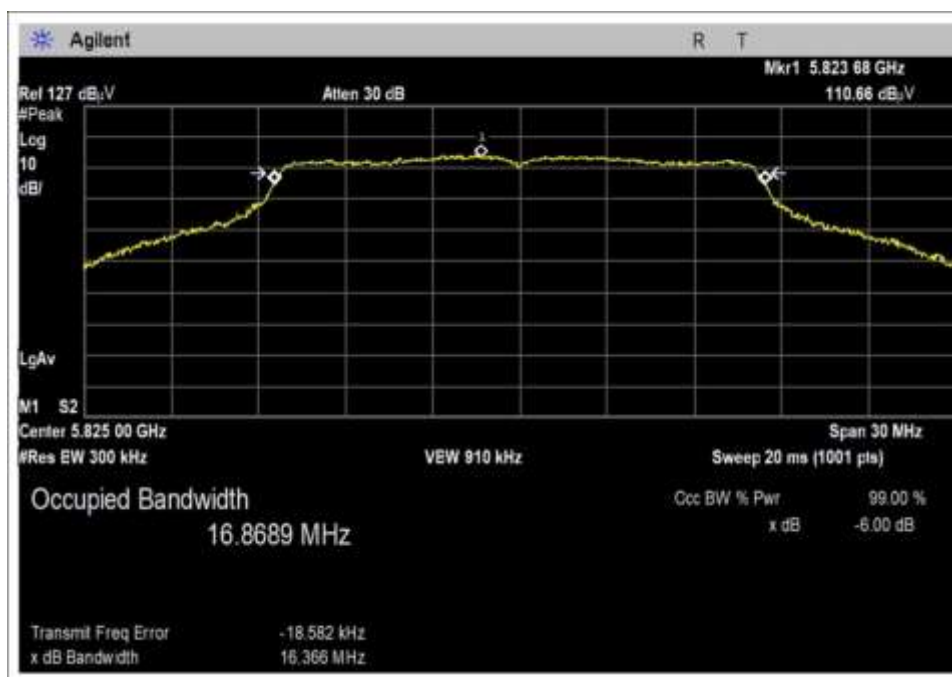
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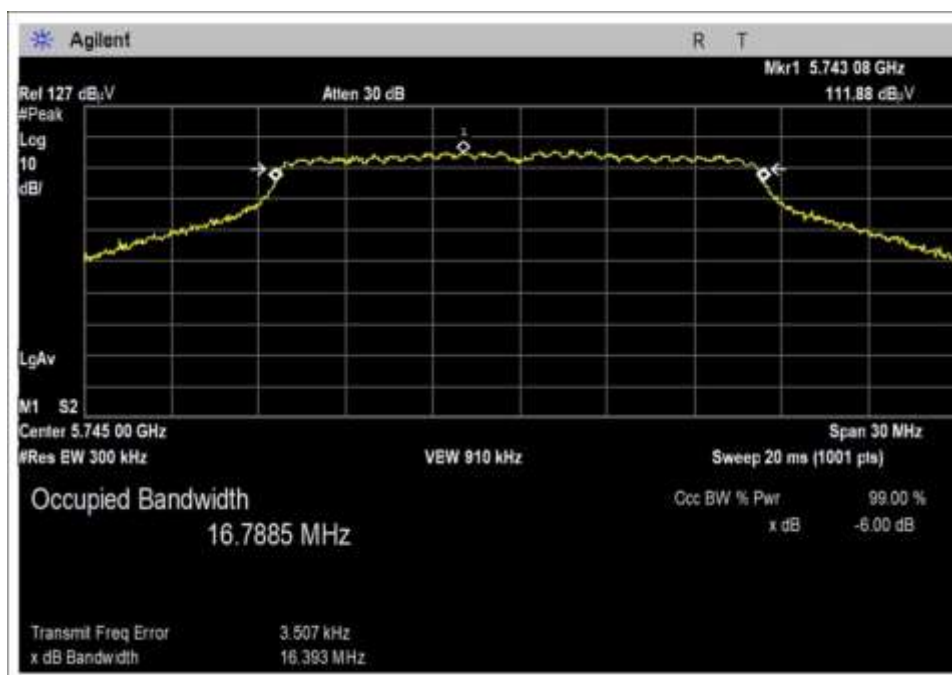
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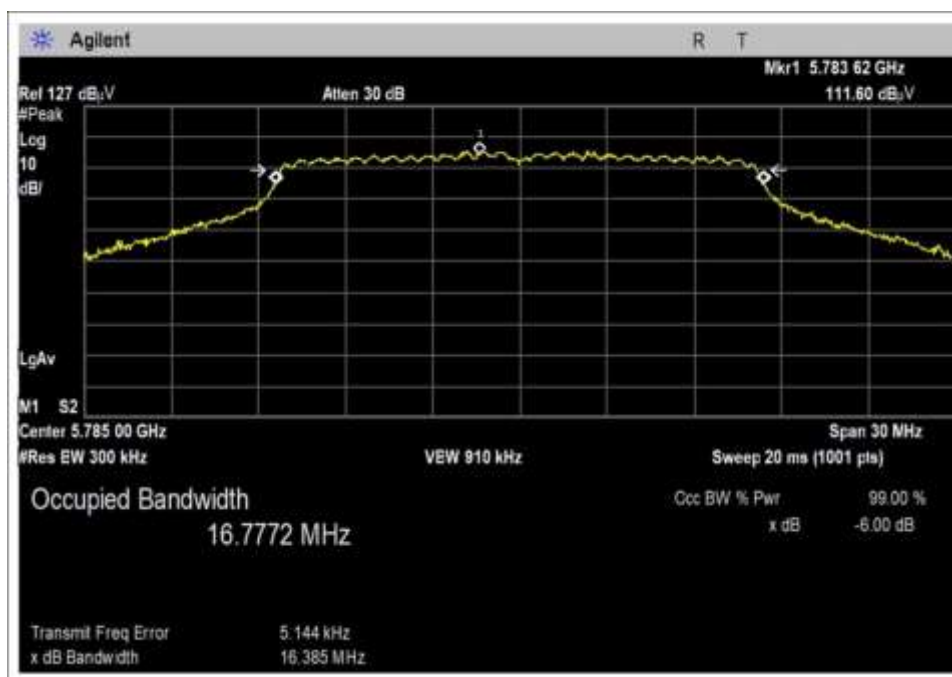
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99% OBW AP0 High Channel



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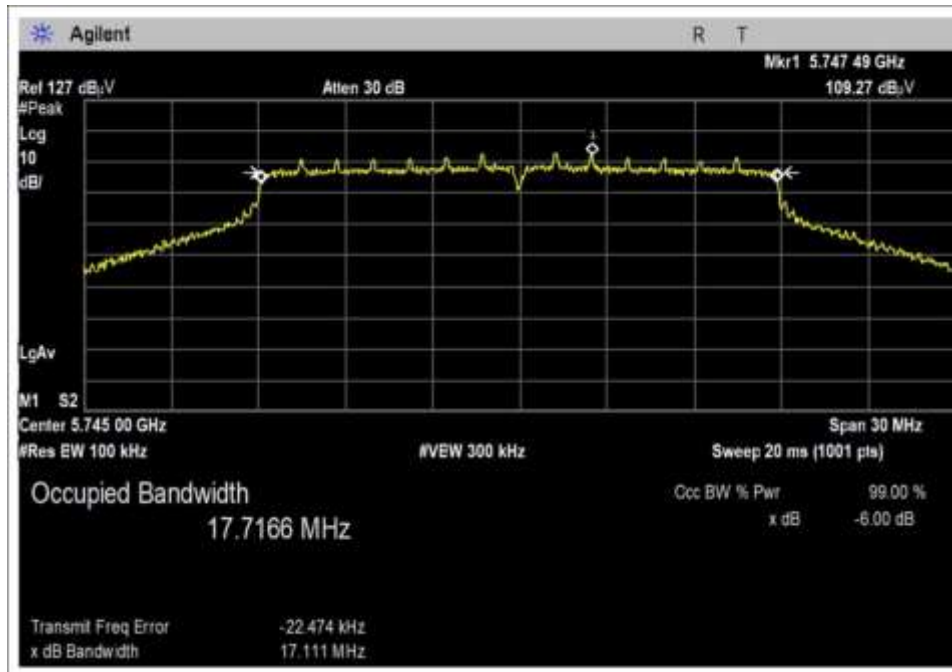


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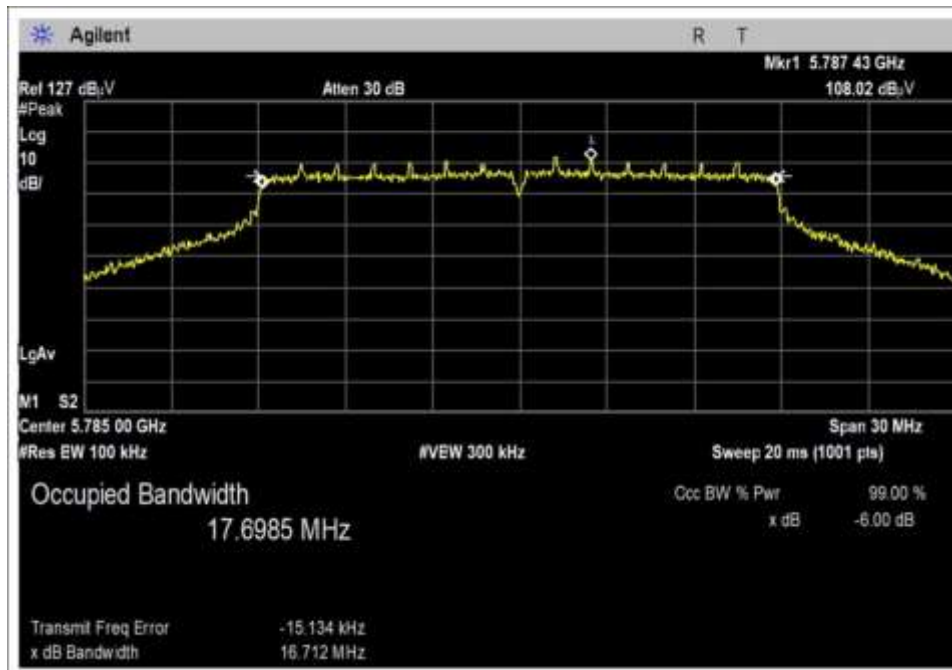


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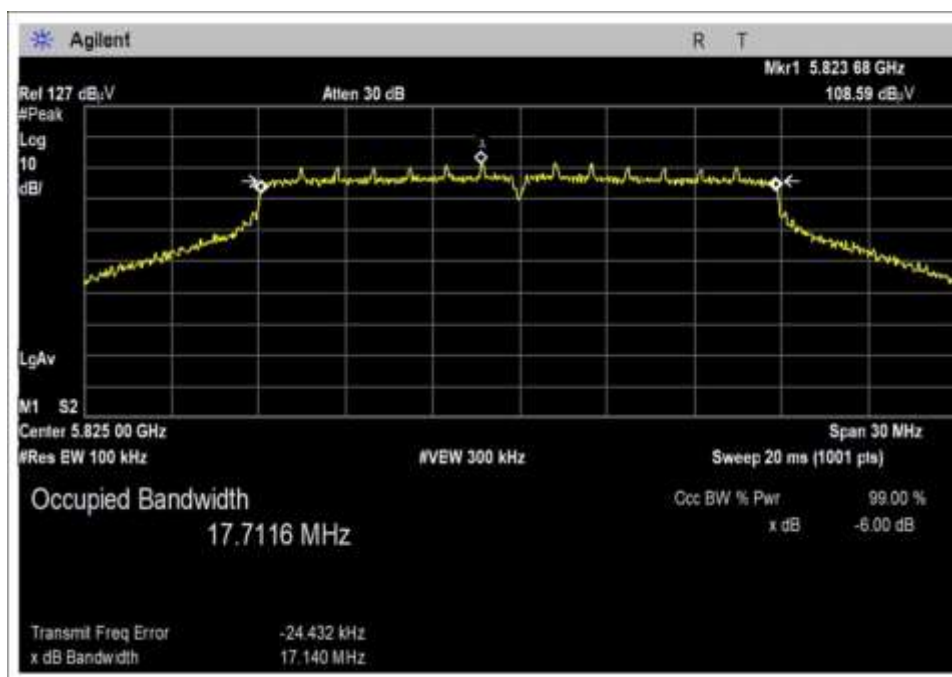
802.11ac20 Plot(s)



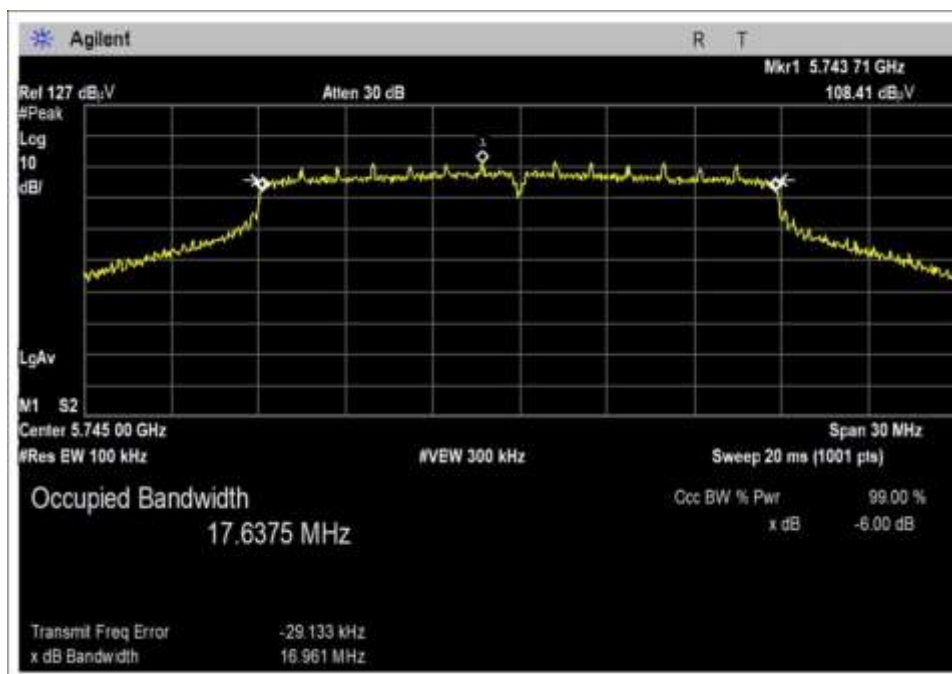
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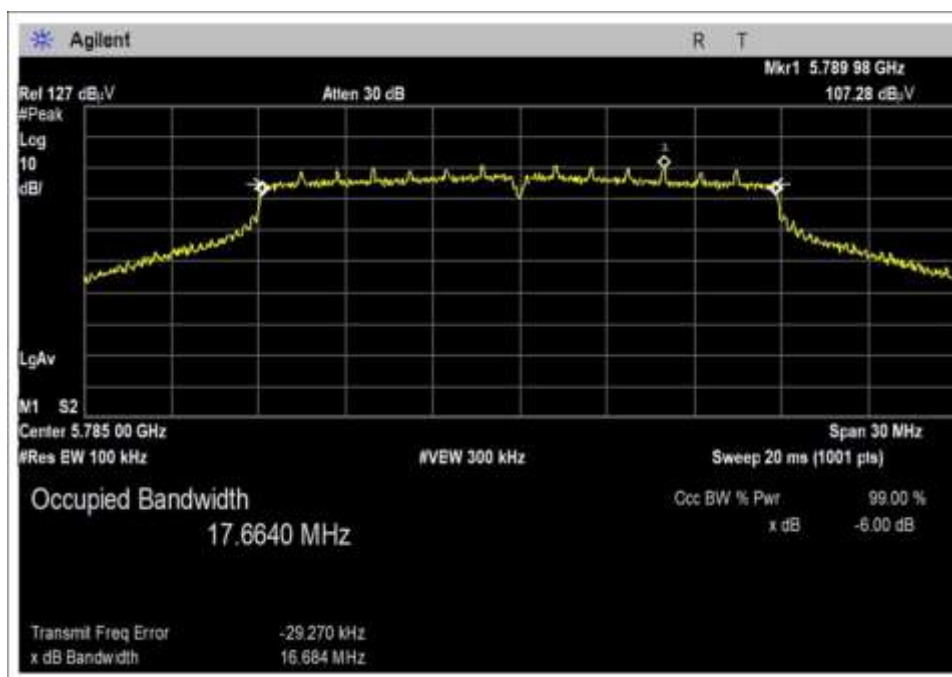
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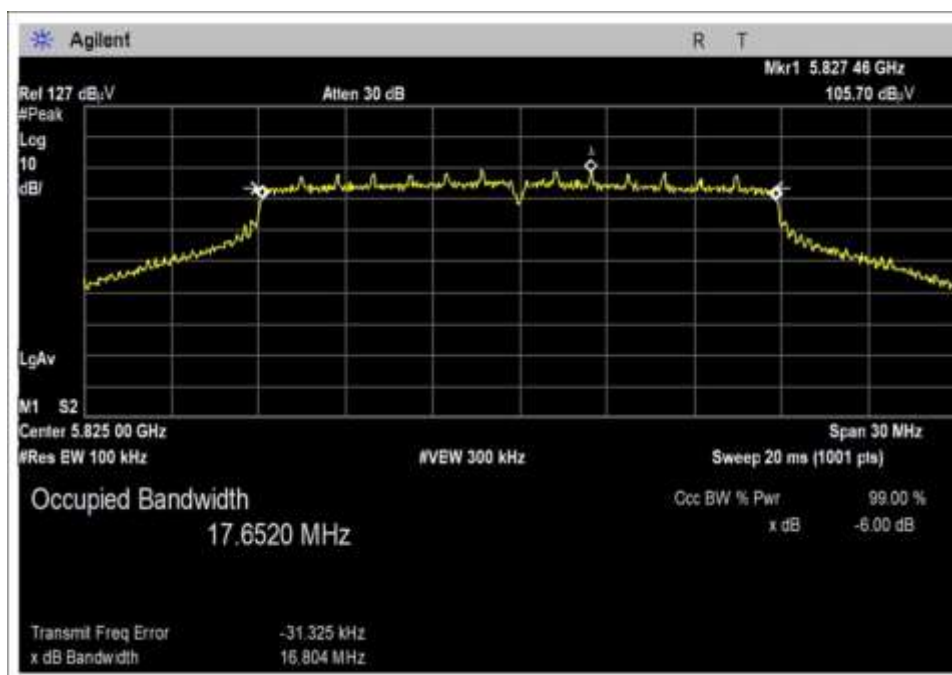
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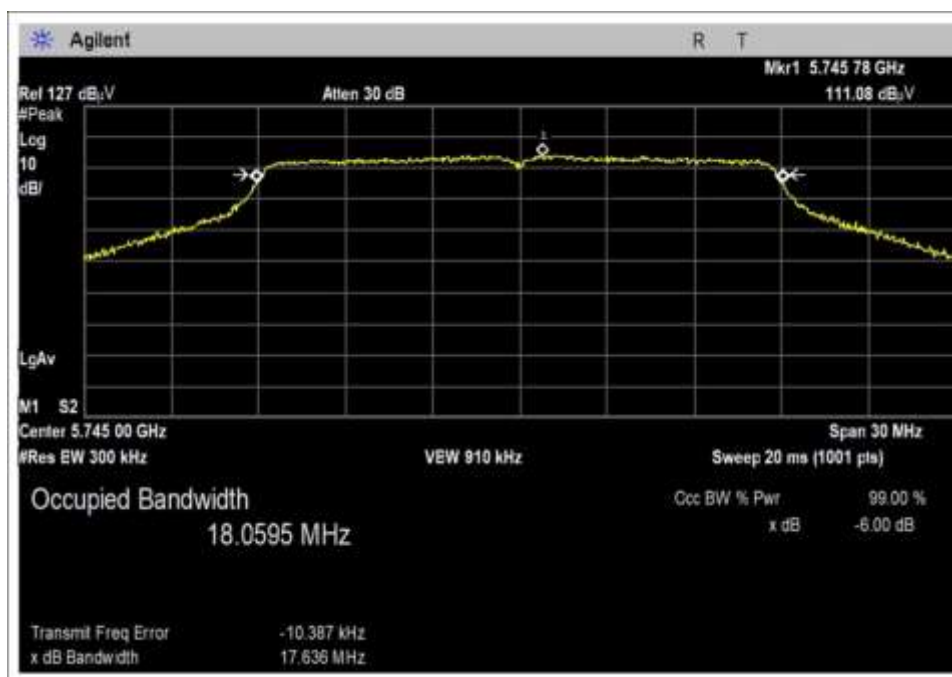
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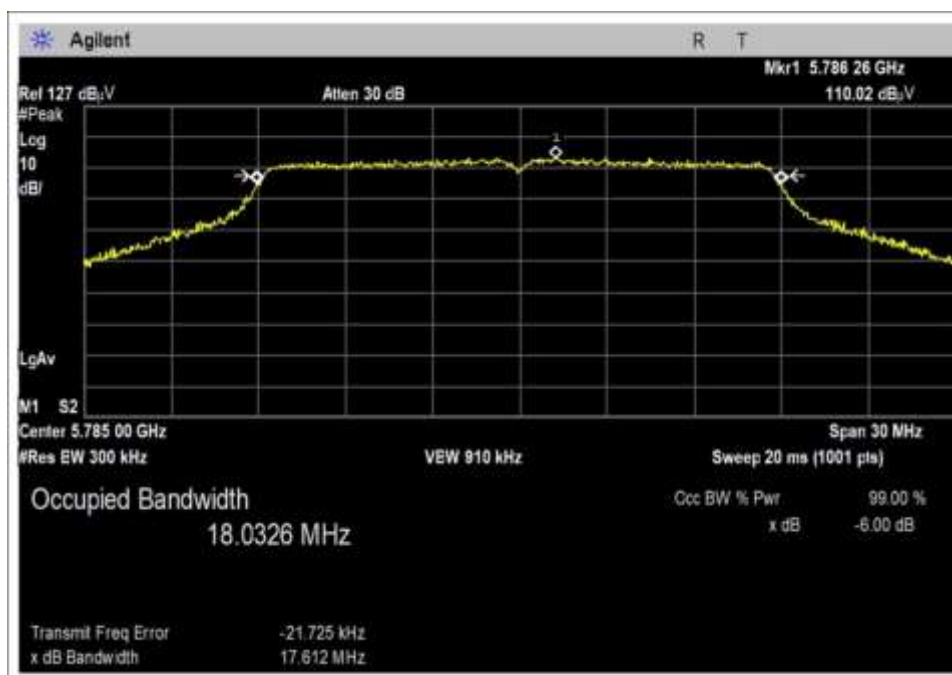
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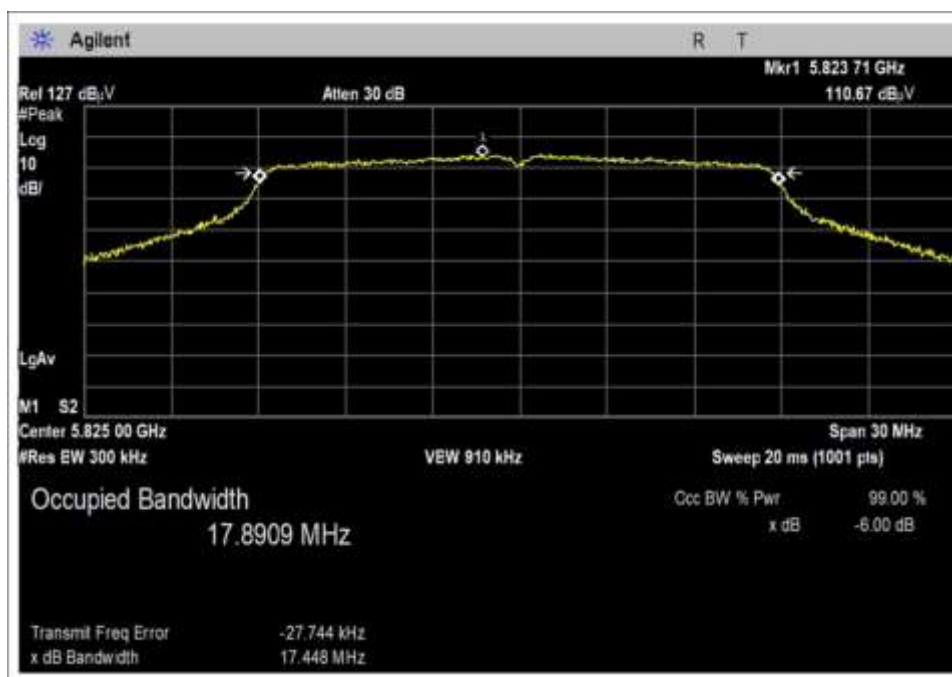
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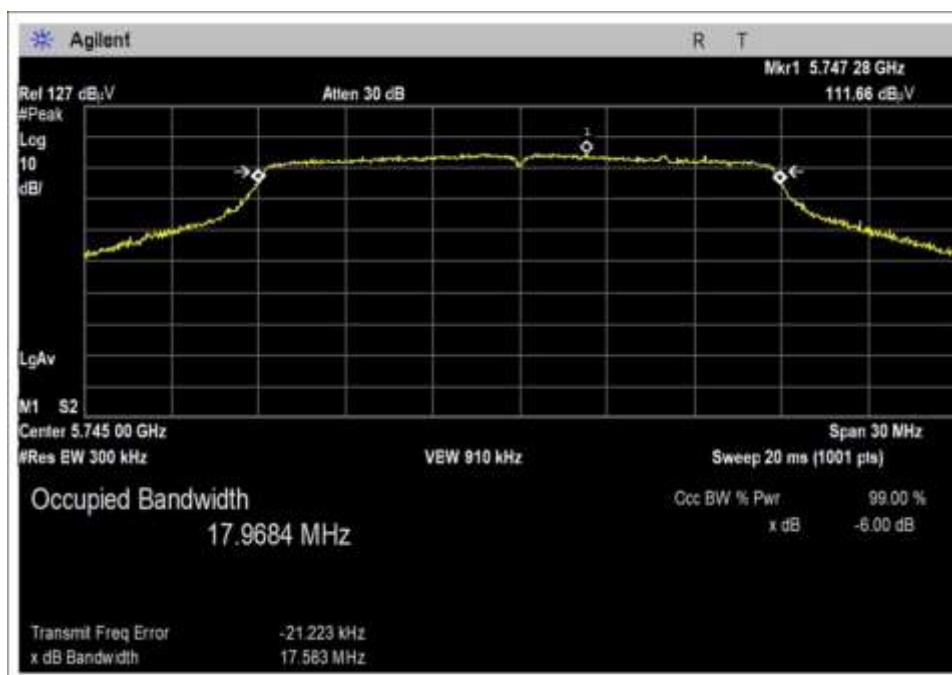
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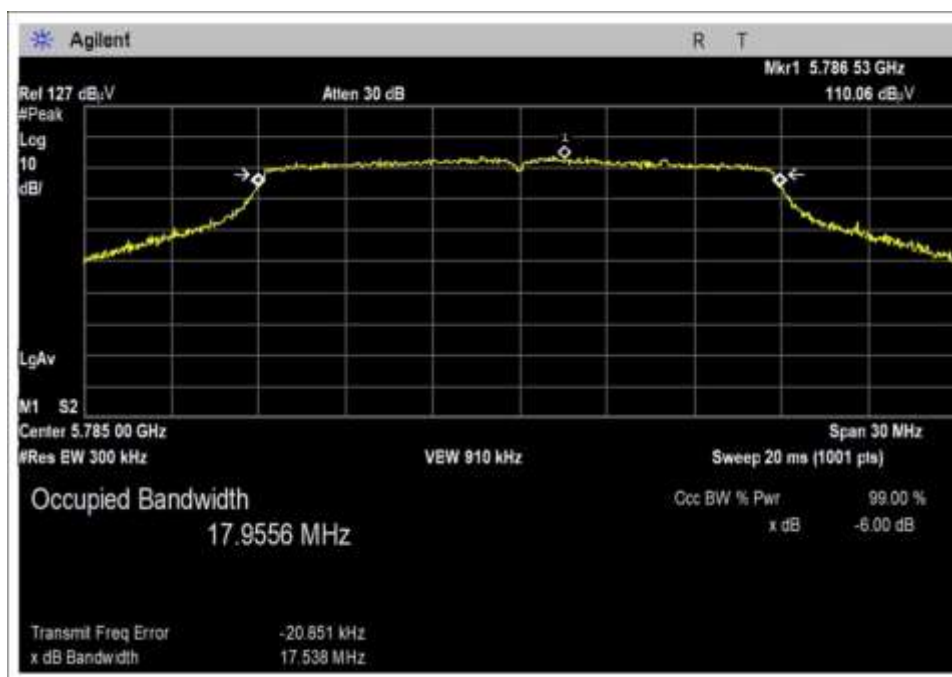
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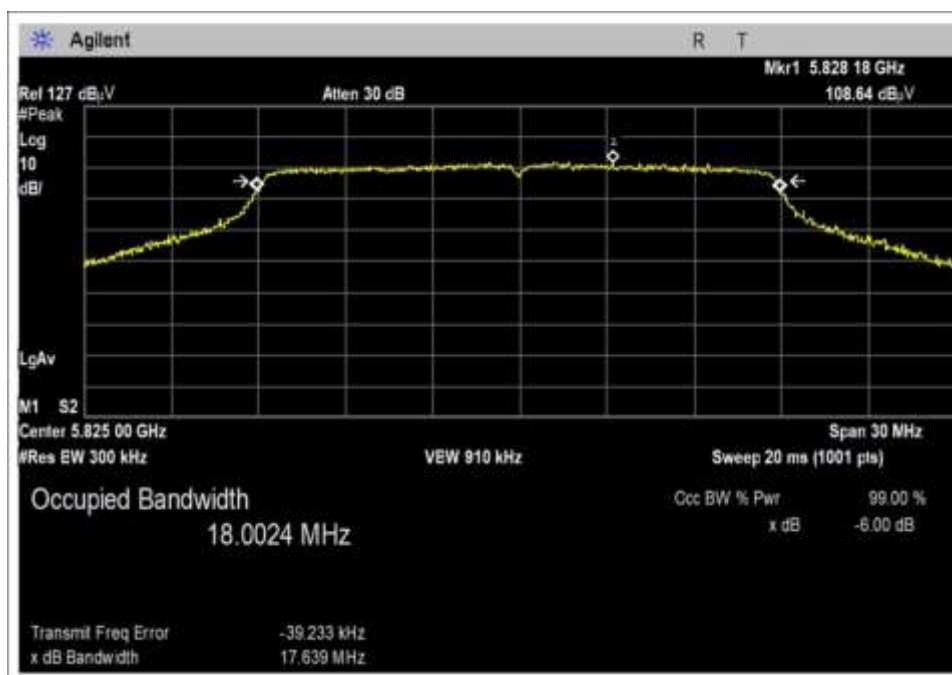
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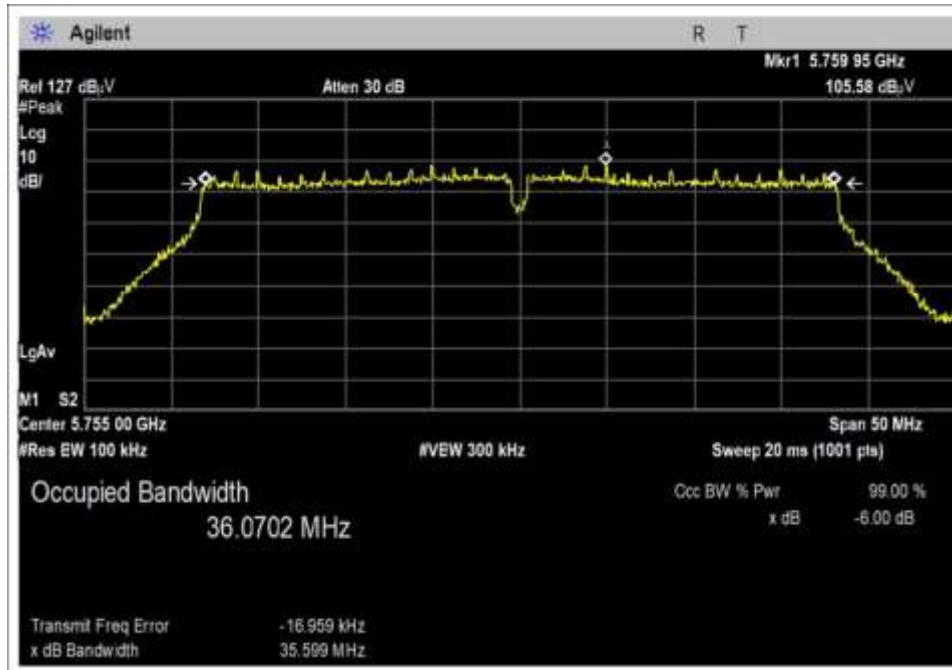


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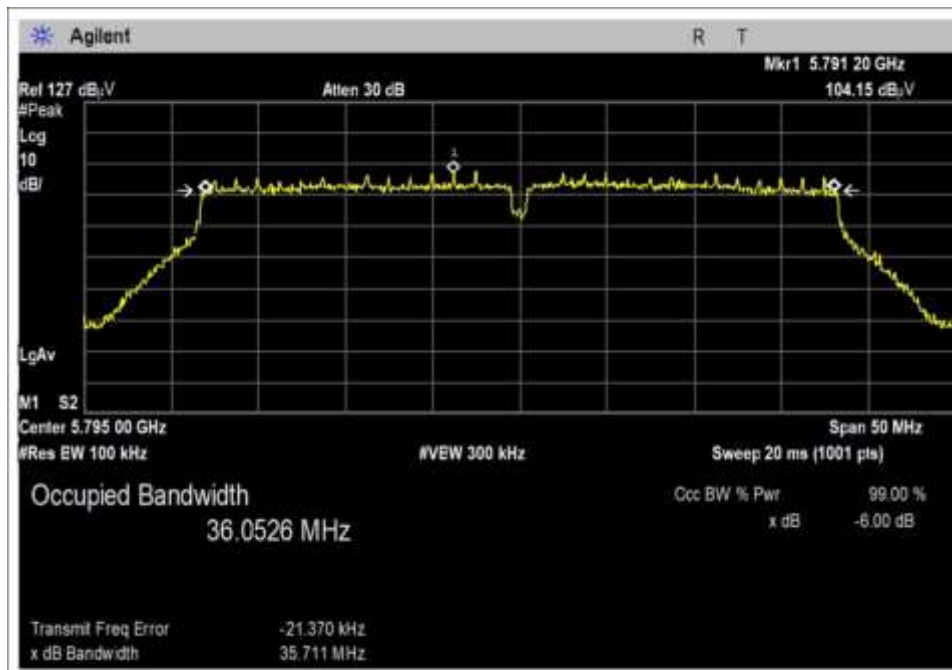


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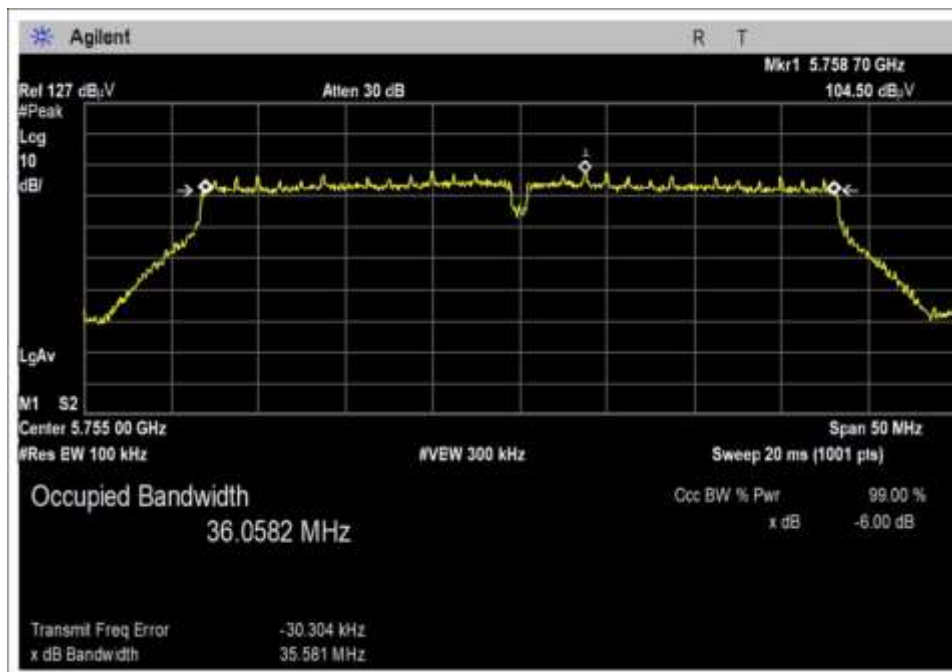
802.11ac40Plot(s)



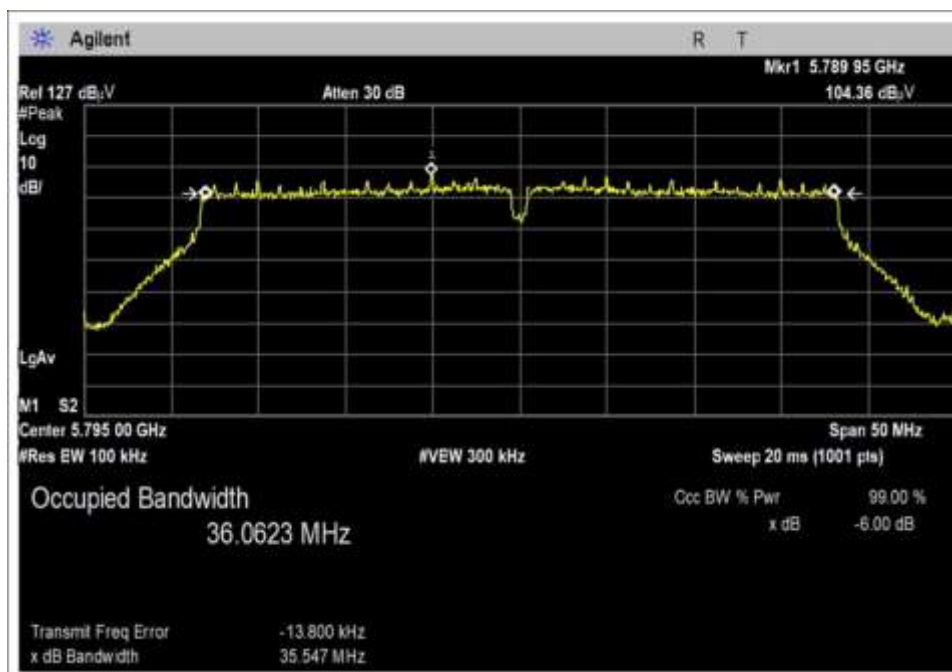
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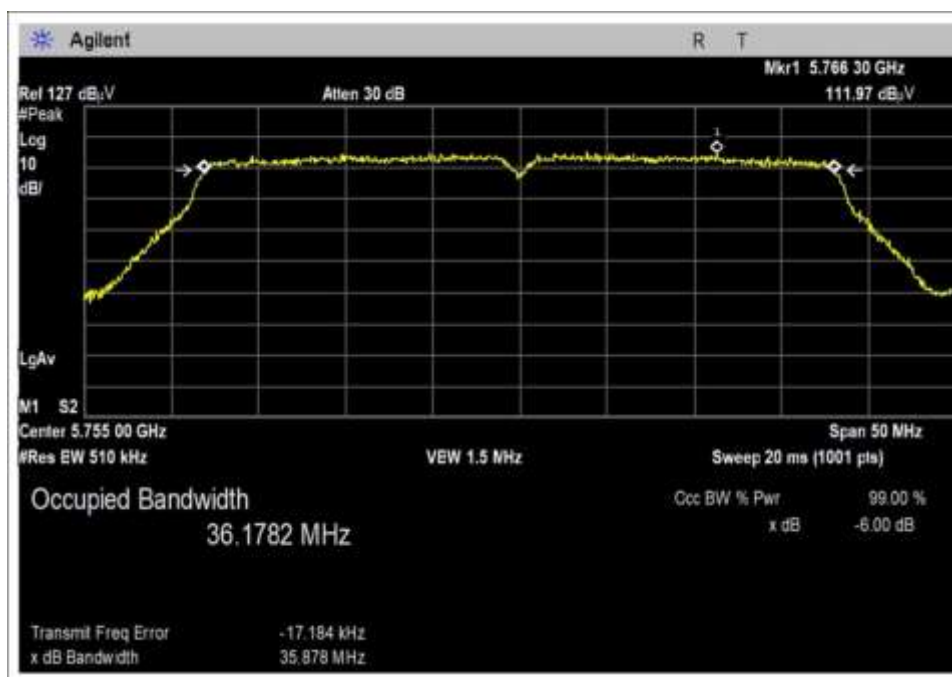
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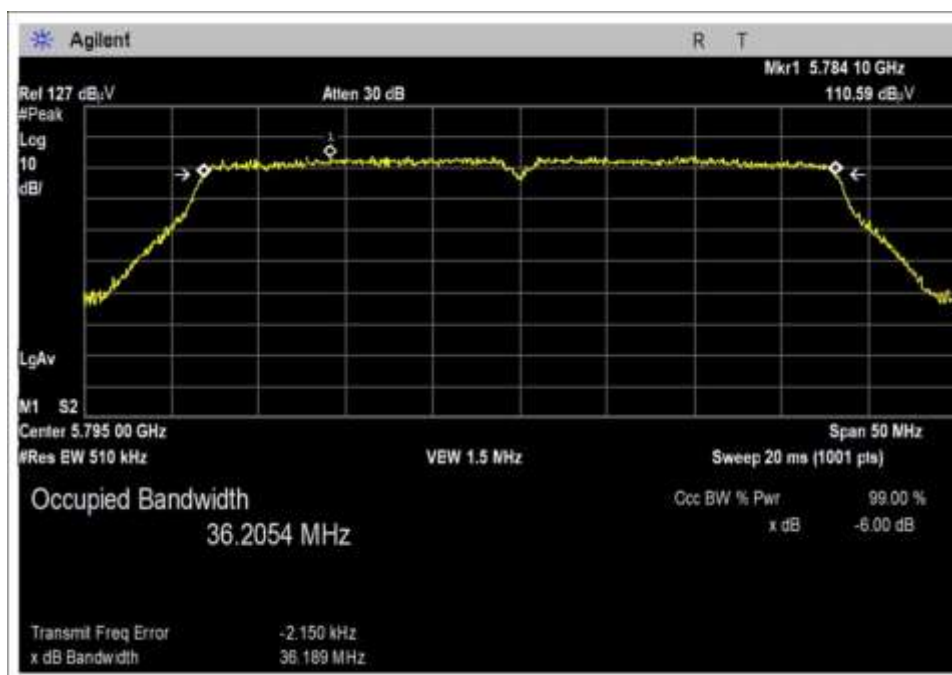
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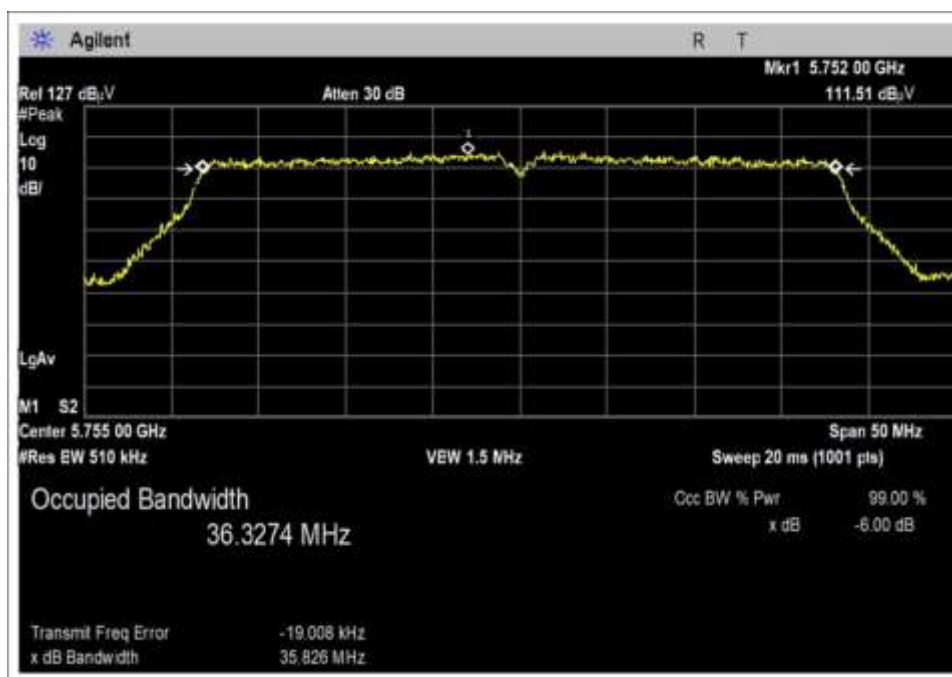
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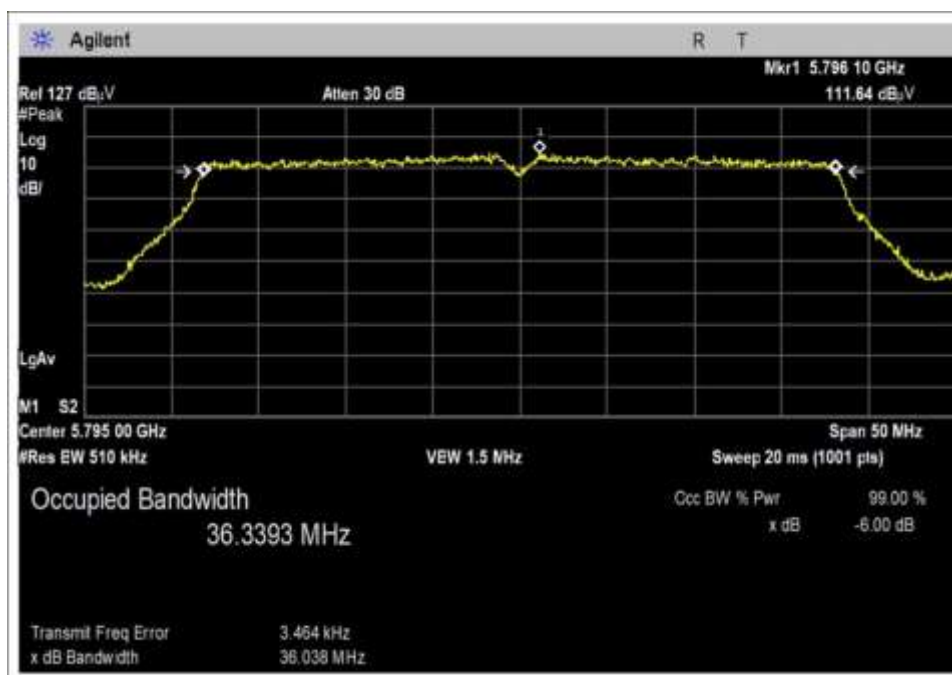
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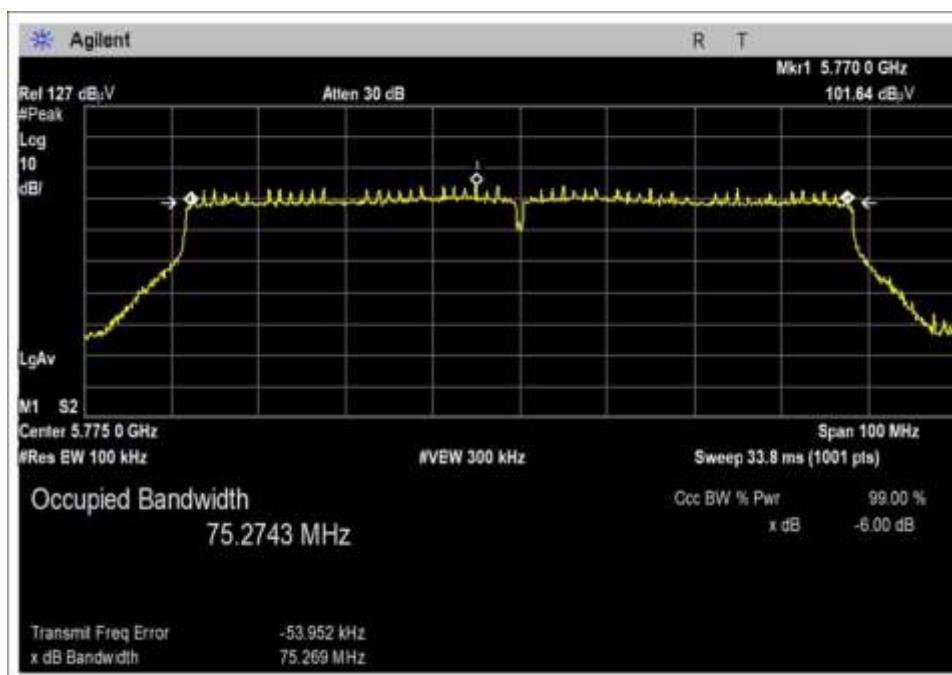


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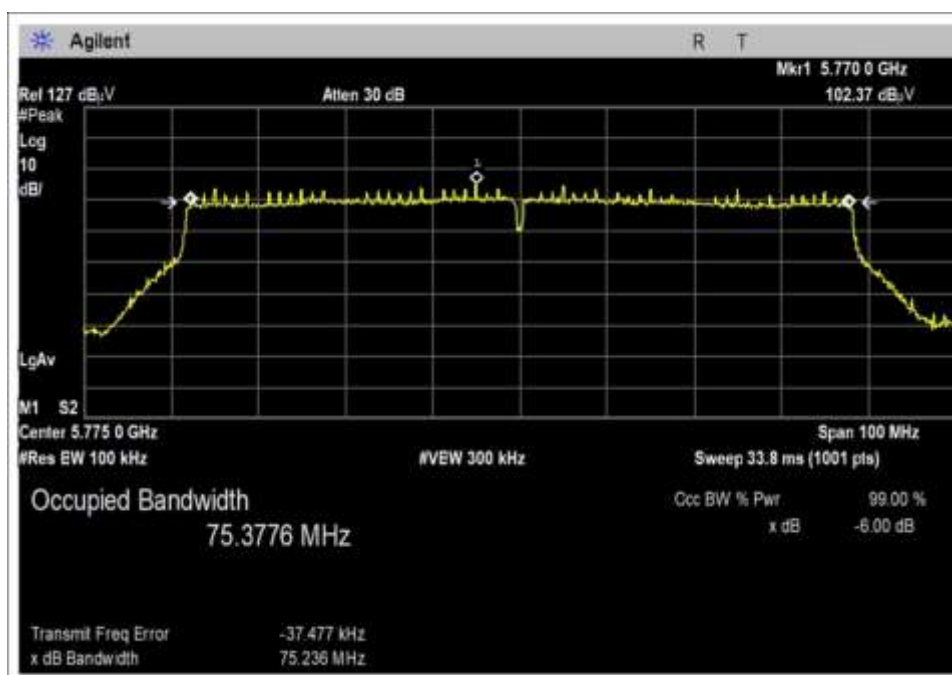


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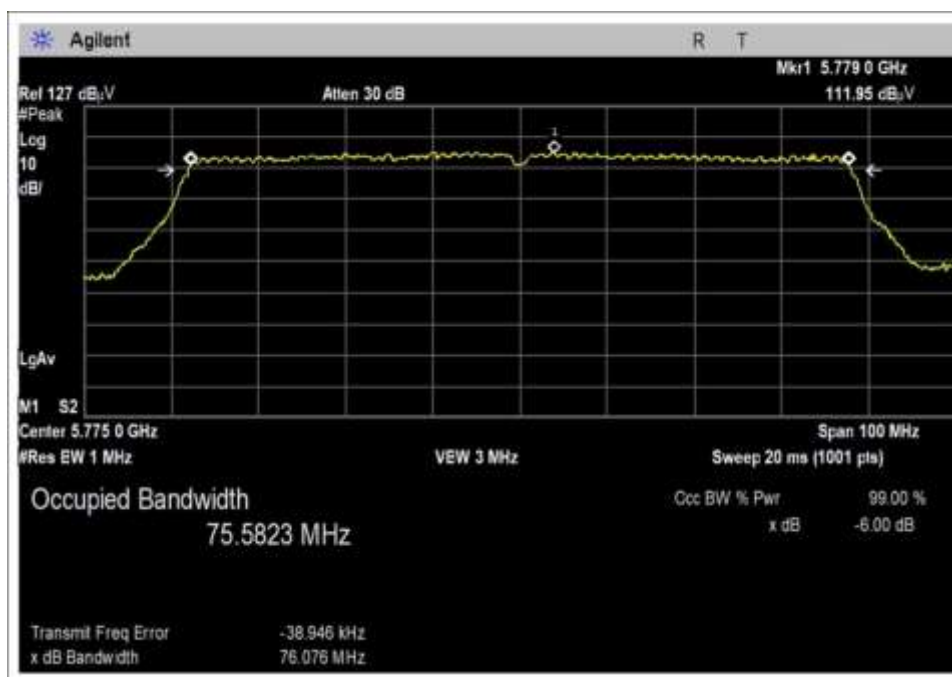
802.11ac80 Plot(s)



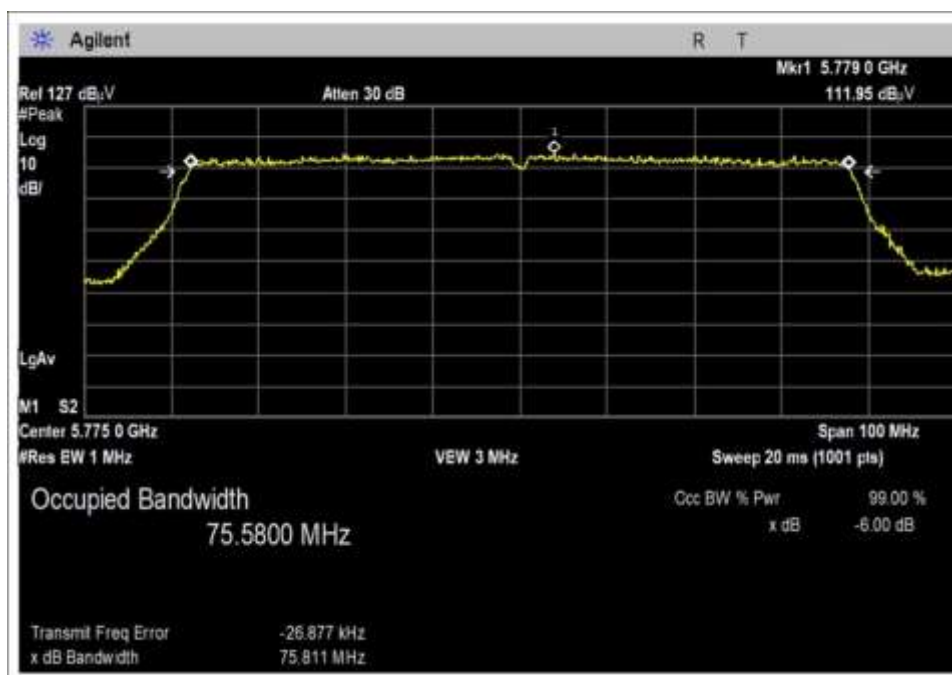
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6dB BW AP1

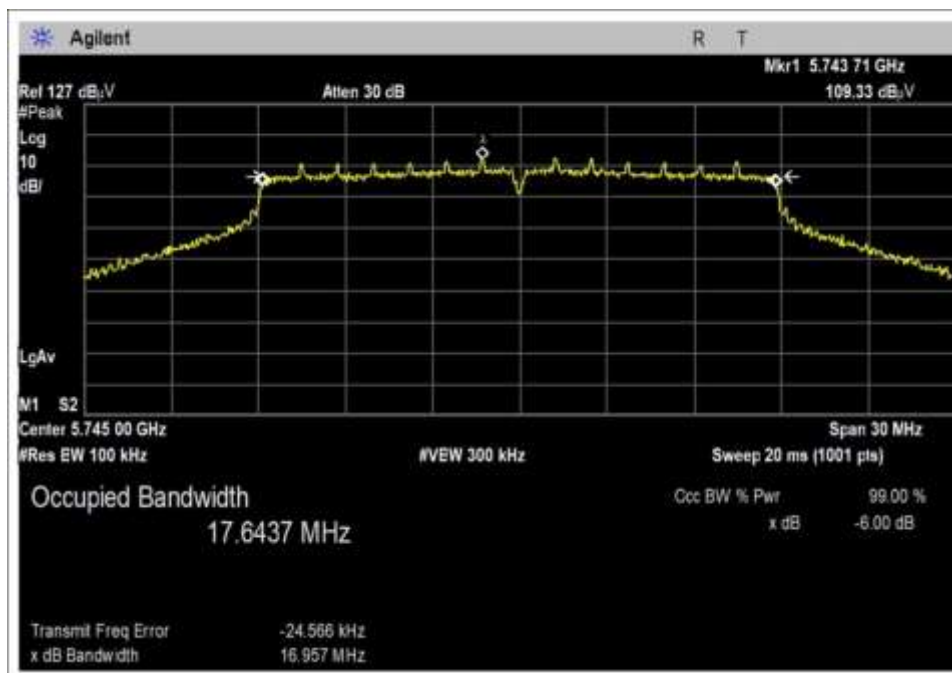


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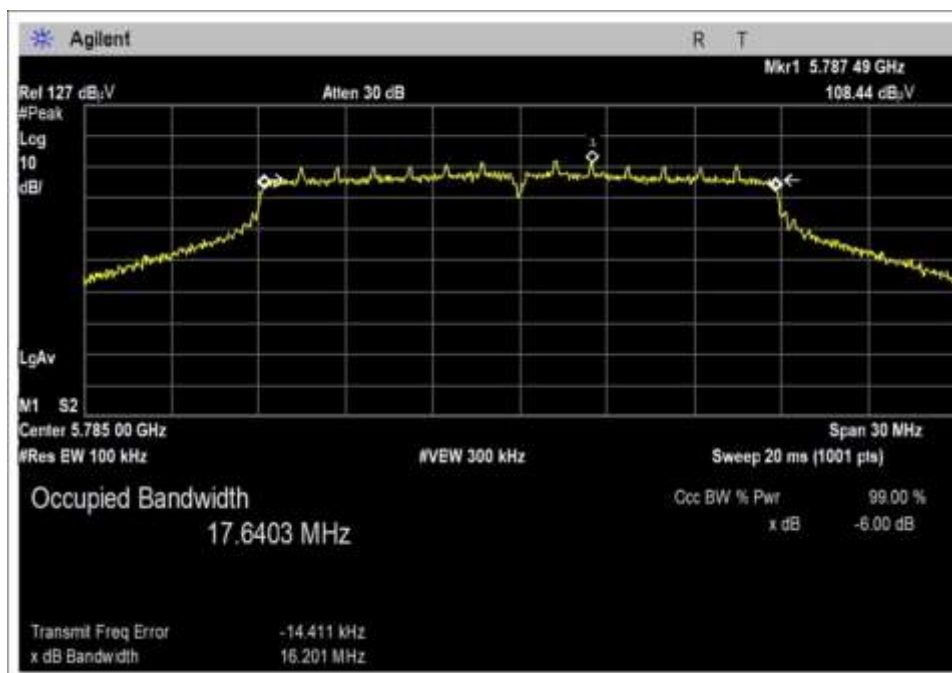


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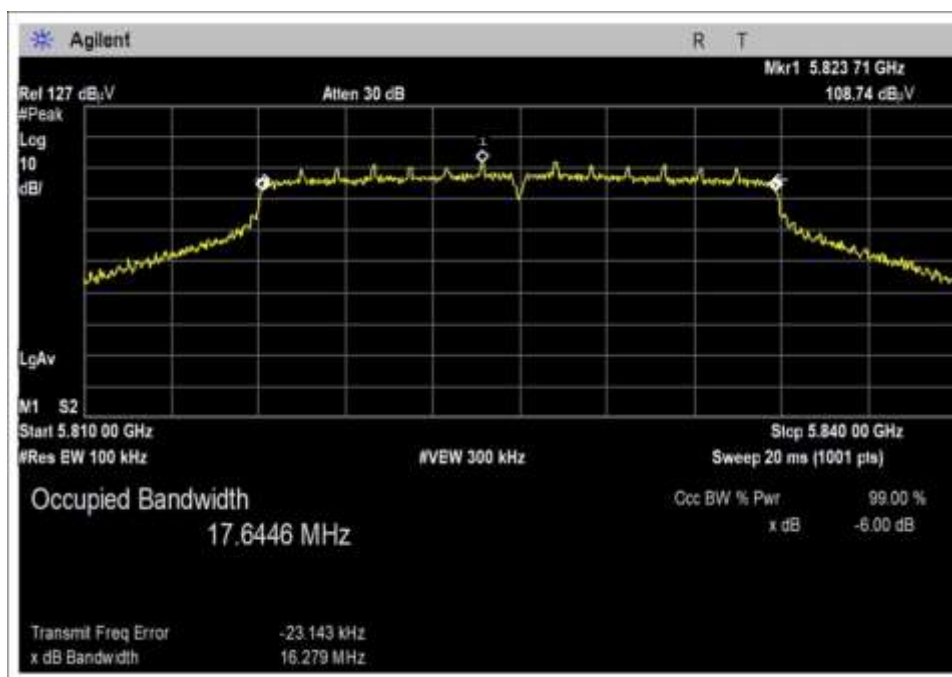
802.11n20 Plot(s)



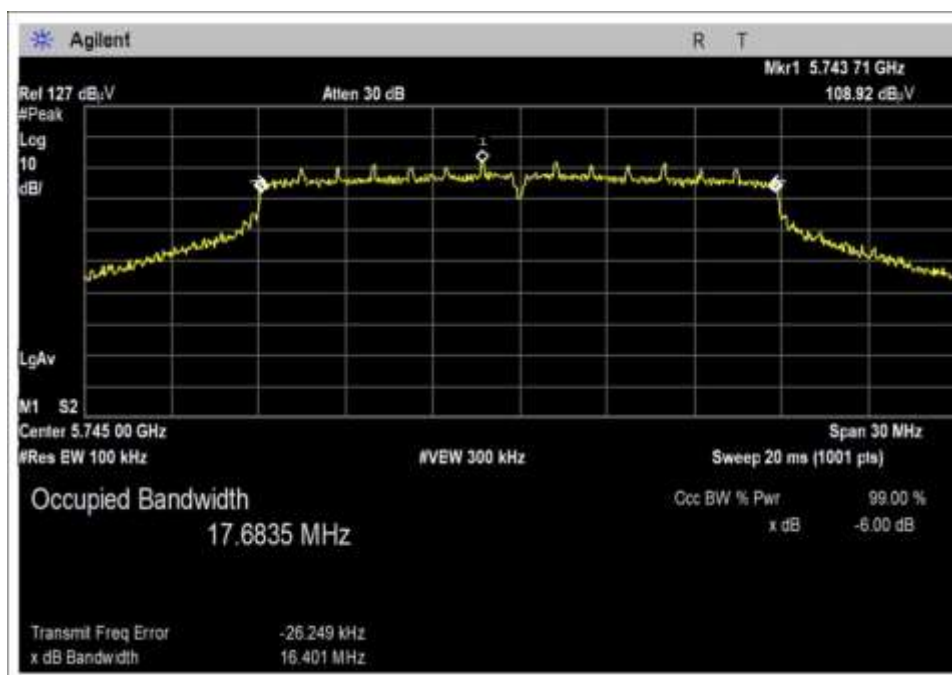
6dB BW AP0 Low Channel



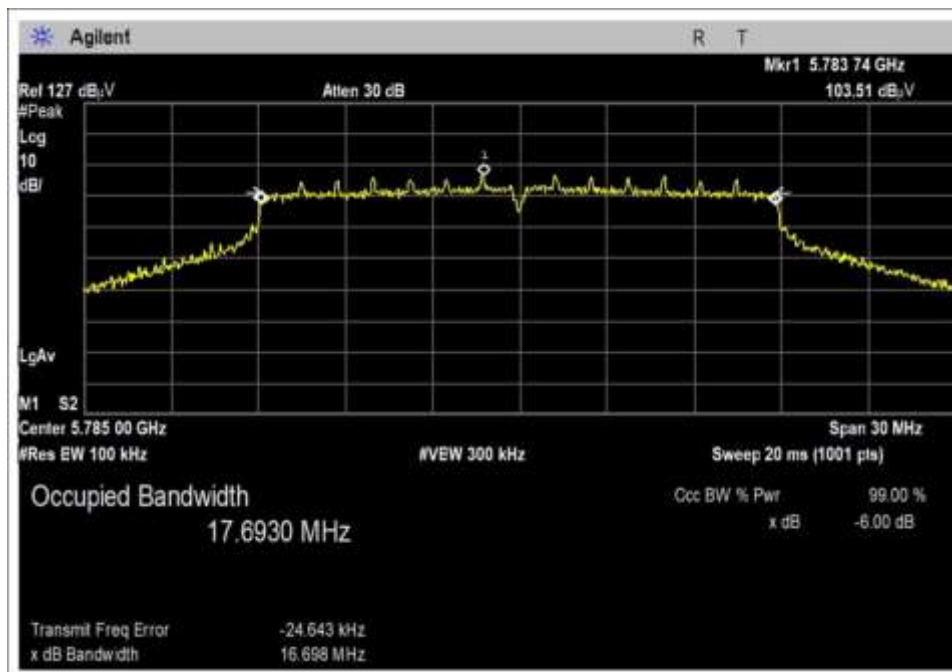
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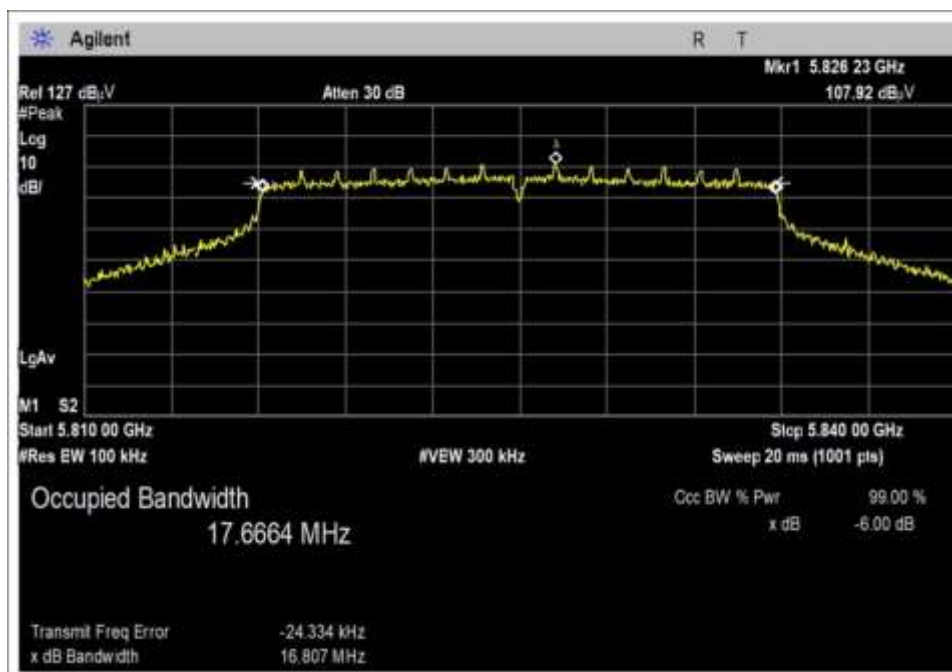
6dB BW AP0 High Channel



6dB BW AP1 Low Channel



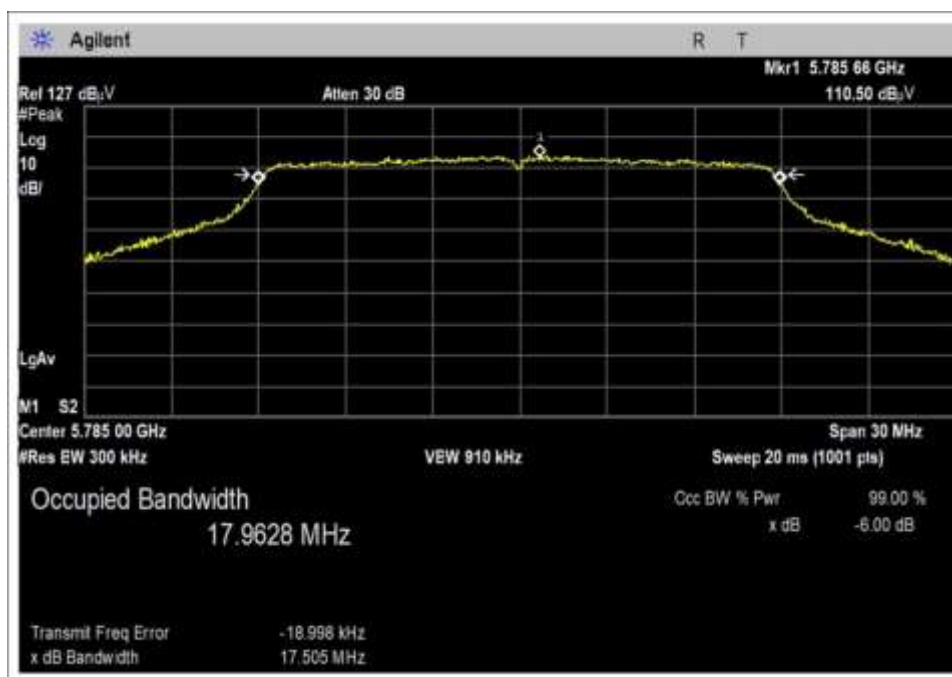
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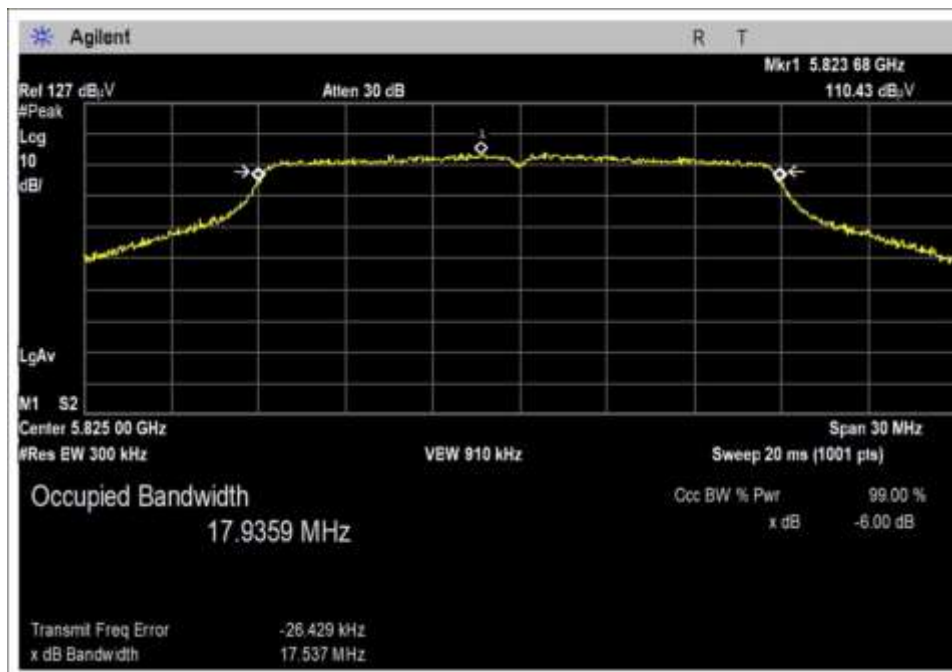
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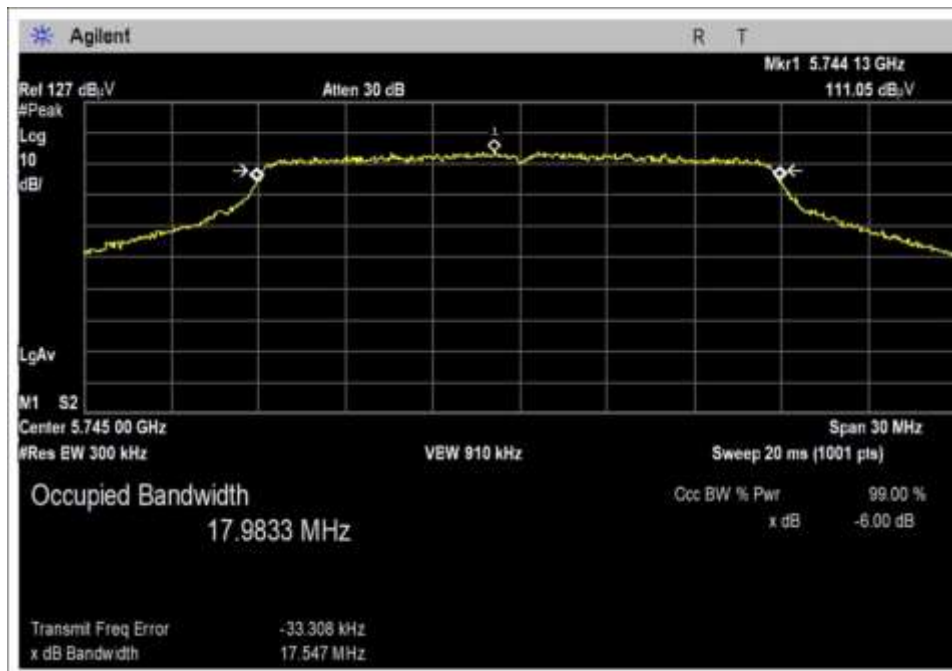
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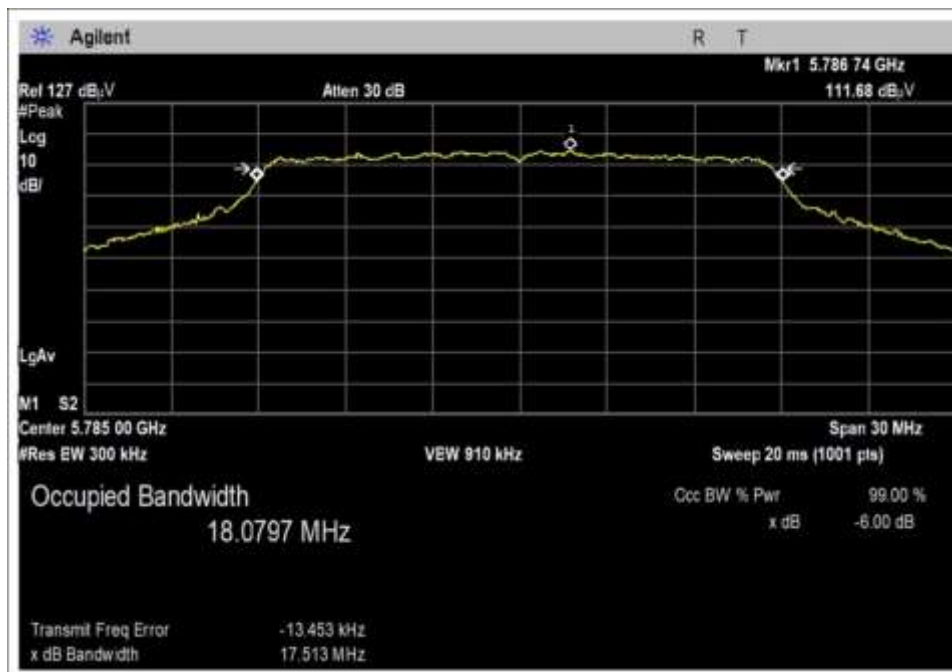
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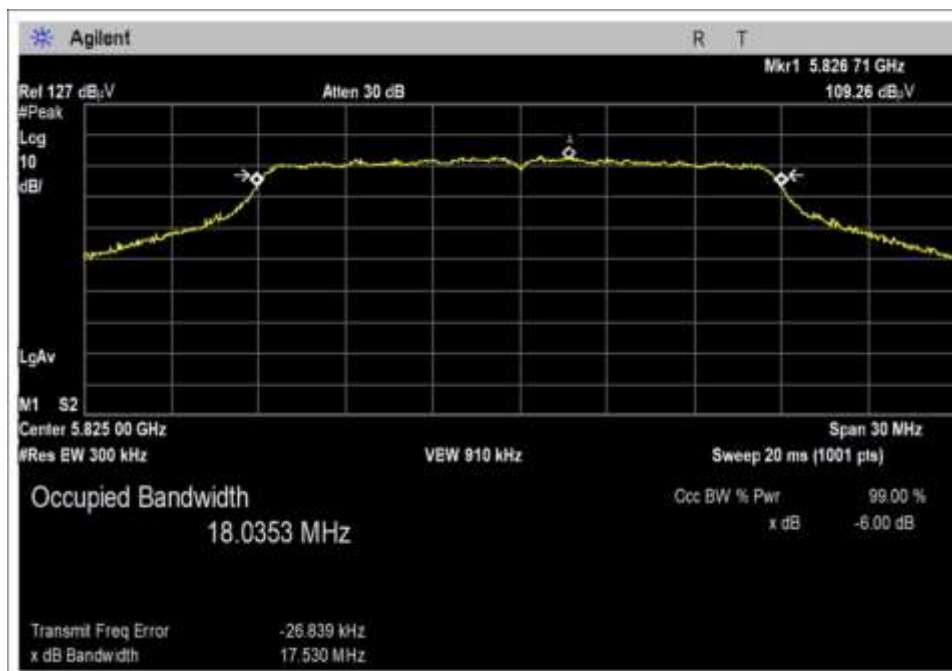
99% OBW AP0 High Channel



99% OBW AP1 Low Channel

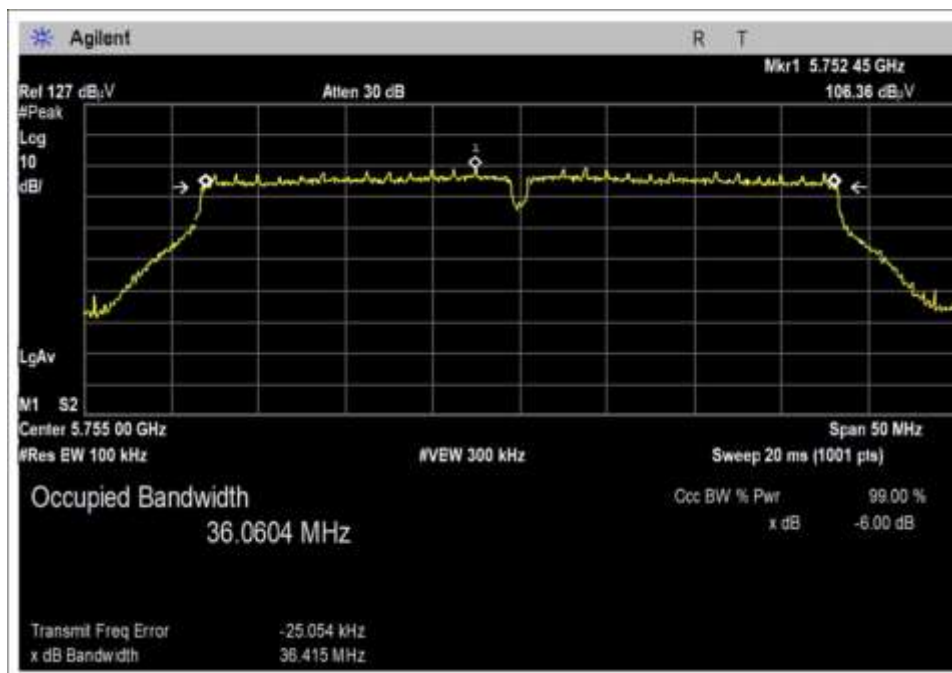


99% OBW AP1 Middle Channel

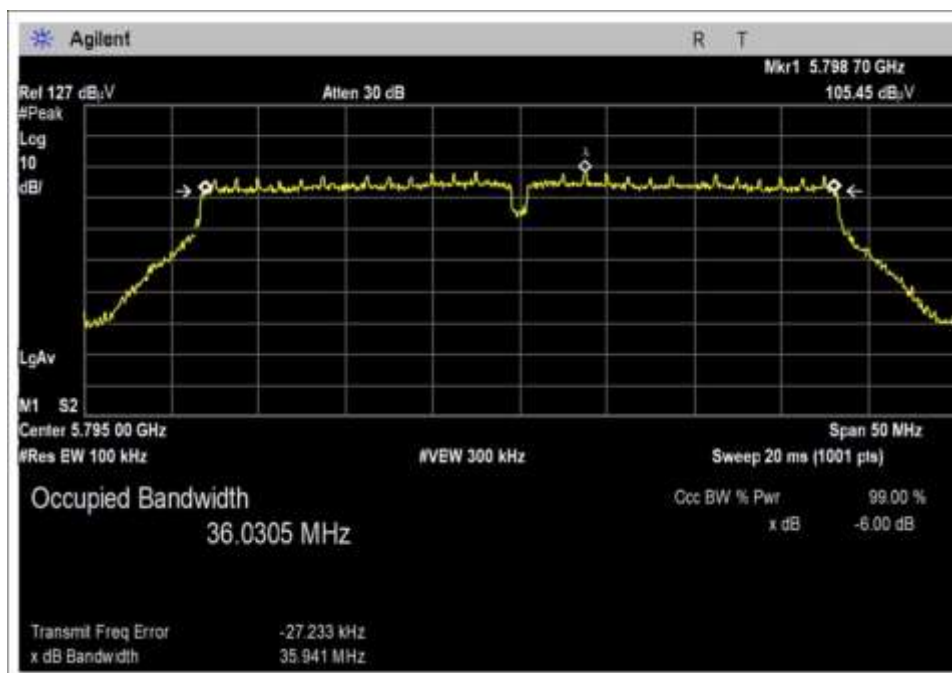


99% OBW AP1 High Channel

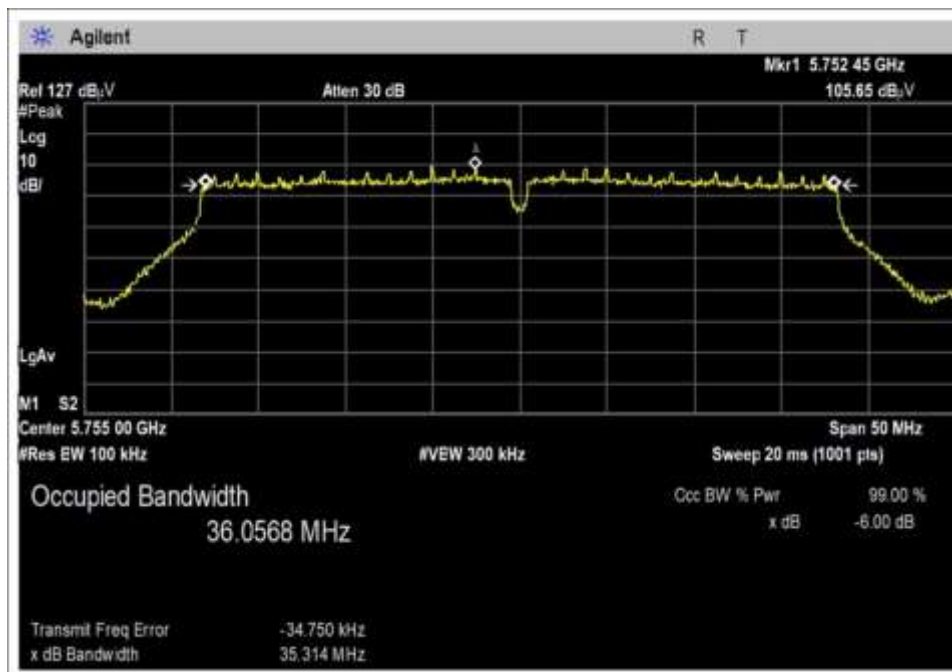
802.11n40 Plot(s)



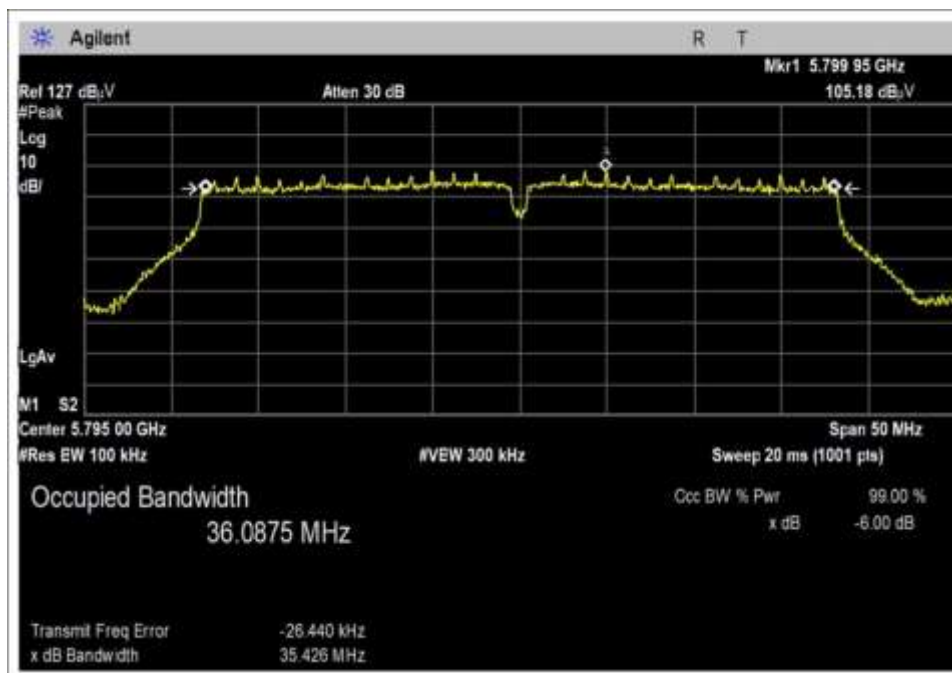
6dB BW AP0 Low Channel



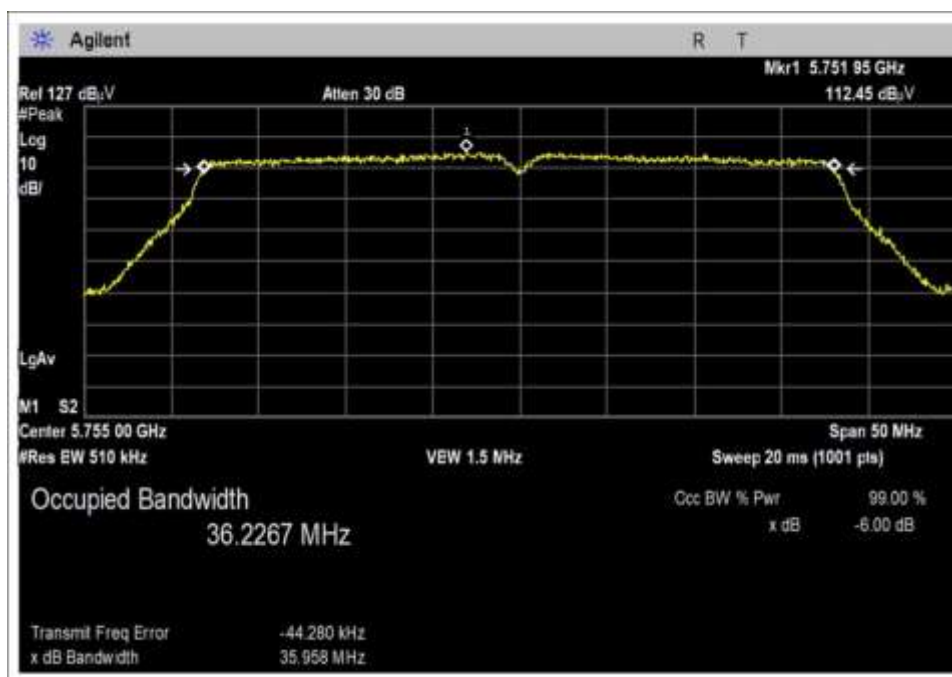
6dB BW AP0 High Channel



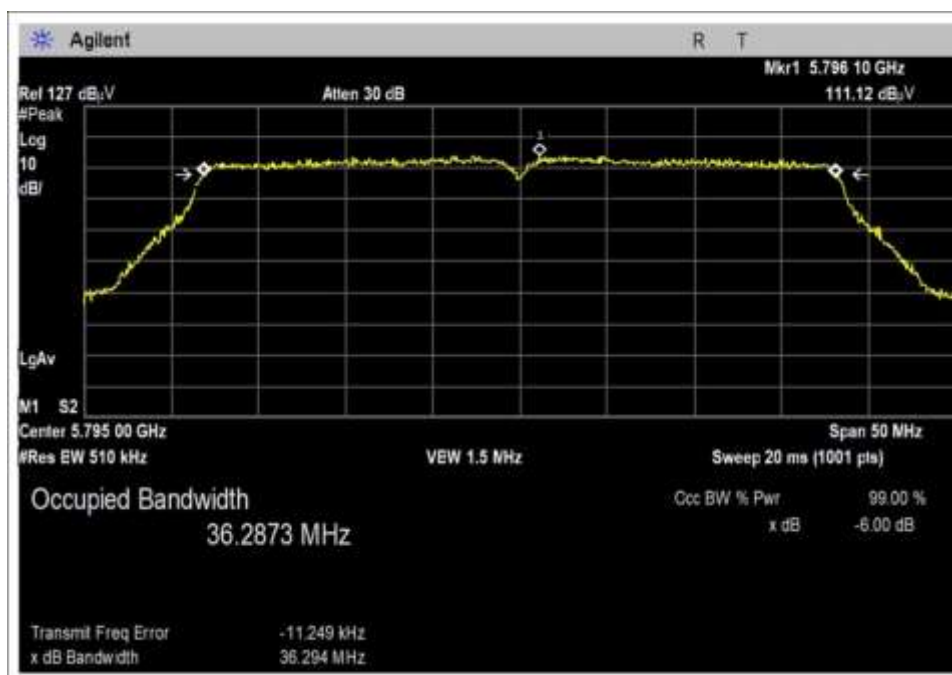
6dB BW AP1 Low Channel



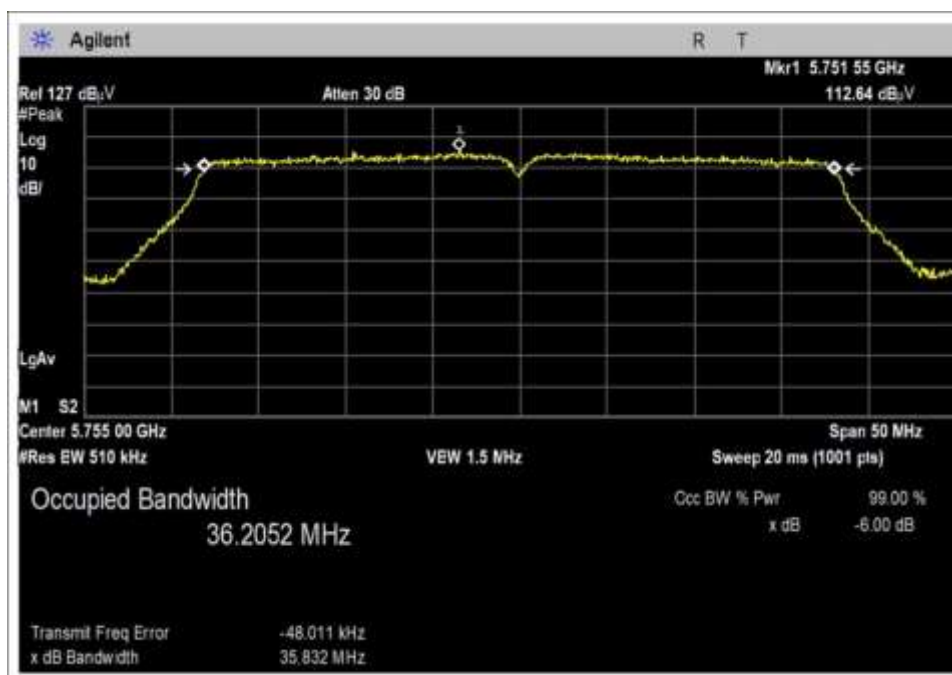
6dB BW AP1 High Channel



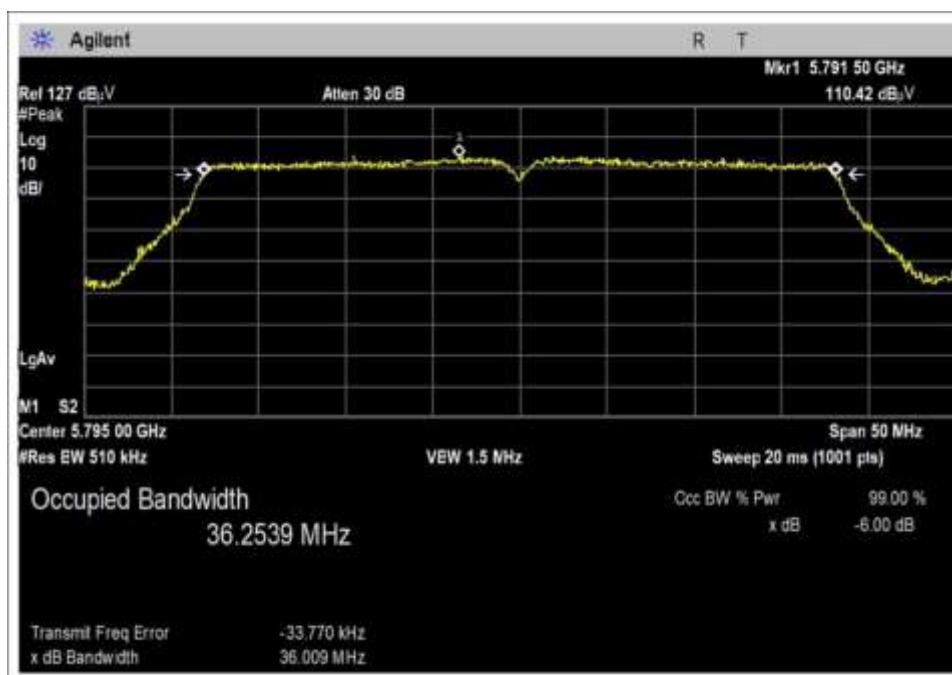
99% OBW AP0 Low Channel



99% OBW AP0 High Channel



99% OBW AP1 Low Channel



99% OBW AP1 High Channel

Test Setup Photo(s)



15.407(a) Output Power

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):	4/6/2020
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 – RF Conducted Measurement					
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 _{Minimum} (dBm)	V _{Nominal} (dBm)	V _{Maximum} (dBm)	Max Deviation from V _{Nominal} (dB)
5745	802.11a / 0	12.2	12.2	12.2	0
5785	802.11a / 0	11.6	11.6	11.6	0
5825	802.11a / 0	11.8	11.8	11.8	0
5745	802.11a / 1	12.5	12.5	12.5	0
5785	802.11a / 1	12.4	12.4	12.4	0
5825	802.11a / 1	11.6	11.6	11.6	0
5745	802.11n20 / 0	12	12	12	0
5785	802.11n20 / 0	11.4	11.4	11.4	0
5825	802.11n20 / 0	11.9	11.9	11.9	0
5745	802.11n20 / 1	12.5	12.5	12.5	0
5785	802.11n20 / 1	12.7	12.7	12.7	0
5825	802.11n20 / 1	11.9	11.9	11.9	0
5755	802.11n40 / 0	12.5	12.5	12.5	0
5795	802.11n40 / 0	11.8	11.9	11.9	0.1
5755	802.11n40 / 1	12.2	12.3	12.2	0.1
5795	802.11n40 / 1	12.1	12.1	12.1	0
5745	802.11ac20 / 0	12.1	12.1	12.1	0
5785	802.11ac20 / 0	11.3	11.3	11.3	0
5825	802.11ac20 / 0	11.4	11.4	11.4	0
5745	802.11ac20 / 1	12.5	12.5	12.5	0
5785	802.11ac20 / 1	12.3	12.3	12.3	0
5825	802.11ac20 / 1	11.6	11.6	11.6	0
5755	802.11ac40 / 0	11.5	11.5	11.5	0
5795	802.11ac40 / 0	10.6	10.7	10.7	0.1
5755	802.11ac40 / 1	11.7	11.7	11.7	0
5795	802.11ac40 / 1	11.1	11.1	11.1	0
5775	802.11ac80 / 0	10.4	10.4	10.4	0
5775	802.11ac80 / 1	10.5	10.5	10.6	0.1

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

Parameter Definitions:

Measurements performed at input voltage V_{Nominal} ± 15%.

Parameter	Value
V _{Nominal} :	120
V _{Minimum} :	102
V _{Maximum} :	138

Test Data Summary - RF Conducted Measurement

Measurement Option: AVGPM

Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Limit (dBm)	Results
5745	802.11a / 0	Linear Polarized / 5.3	12.2	≤30	Pass
5785	802.11a / 0	Linear Polarized / 5.3	11.6	≤30	Pass
5825	802.11a / 0	Linear Polarized / 5.3	11.8	≤30	Pass
5745	802.11a / 1	Linear Polarized / 5.9	12.5	≤30	Pass
5785	802.11a / 1	Linear Polarized / 5.9	12.4	≤30	Pass
5825	802.11a / 1	Linear Polarized / 5.9	11.6	≤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
5745	802.11n20 / 0	Linear Polarized / 5.3	12	15.3	≤30	Pass
5745	802.11n20 / 1	Linear Polarized / 5.9	12.5			
5785	802.11n20 / 0	Linear Polarized / 5.3	11.4	15.1	≤30	Pass
5785	802.11n20 / 1	Linear Polarized / 5.9	12.7			
5825	802.11n20 / 0	Linear Polarized / 5.3	11.9	14.9	≤30	Pass
5825	802.11n20 / 1	Linear Polarized / 5.9	11.9			
5755	802.11n40 / 0	Linear Polarized / 5.3	12.5	15.4	≤30	Pass
5755	802.11n40 / 1	Linear Polarized / 5.9	12.3			
5795	802.11n40 / 0	Linear Polarized / 5.3	11.9	15.0	≤30	Pass
5795	802.11n40 / 1	Linear Polarized / 5.9	12.1			

Test Data Summary - RF Conducted Measurement

Measurement Option: AVGPM

Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Summed Power (dBm)	Limit (dBm)	Results
5745	802.11ac20 / 0	Linear Polarized / 5.3	12.1	15.3	≤30	Pass
5745	802.11ac20 / 1	Linear Polarized / 5.9	12.5			
5785	802.11ac20 / 0	Linear Polarized / 5.3	11.3	14.8	≤30	Pass
5785	802.11ac20 / 1	Linear Polarized / 5.9	12.3			
5825	802.11ac20 / 0	Linear Polarized / 5.3	11.4	14.5	≤30	Pass
5825	802.11ac20 / 1	Linear Polarized / 5.9	11.6			
5755	802.11ac40 / 0	Linear Polarized / 5.3	11.5	14.6	≤30	Pass
5755	802.11ac40 / 1	Linear Polarized / 5.9	11.7			
5795	802.11ac40 / 0	Linear Polarized / 5.3	10.7	13.9	≤30	Pass
5795	802.11ac40 / 1	Linear Polarized / 5.9	11.1			
5775	802.11ac80 / 0	Linear Polarized / 5.3	10.4	13.5	≤30	Pass
5775	802.11ac80 / 1	Linear Polarized / 5.9	10.5			

For equipment using antennas other than in fixed point-to-point applications, the limit is calculated in accordance with 15.407(a)(3):

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

For equipment using antennas in fixed point-to-point applications, the limit is calculated in accordance with 15.407(a)(3):

$$\text{Limit} = 30$$

Test Setup Photo(s)



15.407(a) 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)	21	Relative Humidity (%):	43

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/500kHz)	Limit (dBm/500kHz)	Results
5745	802.11a / 0	Linear Polarized / 5.3	-1.22	≤30	Pass
5785	802.11a / 0	Linear Polarized / 5.3	-2.18	≤30	Pass
5825	802.11a / 0	Linear Polarized / 5.3	-1.68	≤30	Pass
5745	802.11a / 1	Linear Polarized / 5.9	-1.35	≤30	Pass
5785	802.11a / 1	Linear Polarized / 5.9	-1.46	≤30	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
5745	802.11n20 / 0	Linear Polarized / 5.3	-1.85	1.5	≤30	Pass
5745	802.11n20 / 1	Linear Polarized / 5.9	-1.28			
5785	802.11n20 / 0	Linear Polarized / 5.3	-2.81	0.3	≤30	Pass
5785	802.11n20 / 1	Linear Polarized / 5.9	-2.64			
5825	802.11n20 / 0	Linear Polarized / 5.3	-2.77	0.3	≤30	Pass
5825	802.11n20 / 1	Linear Polarized / 5.9	-2.75			
5755	802.11n40 / 0	Linear Polarized / 5.3	-4.84	-1.8	≤30	Pass
5755	802.11n40 / 1	Linear Polarized / 5.9	-4.71			
5795	802.11n40 / 0	Linear Polarized / 5.3	-5.57	-2.5	≤30	Pass
5795	802.11n40 / 1	Linear Polarized / 5.9	-5.54			

Test Data Summary - RF Conducted Measurement

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

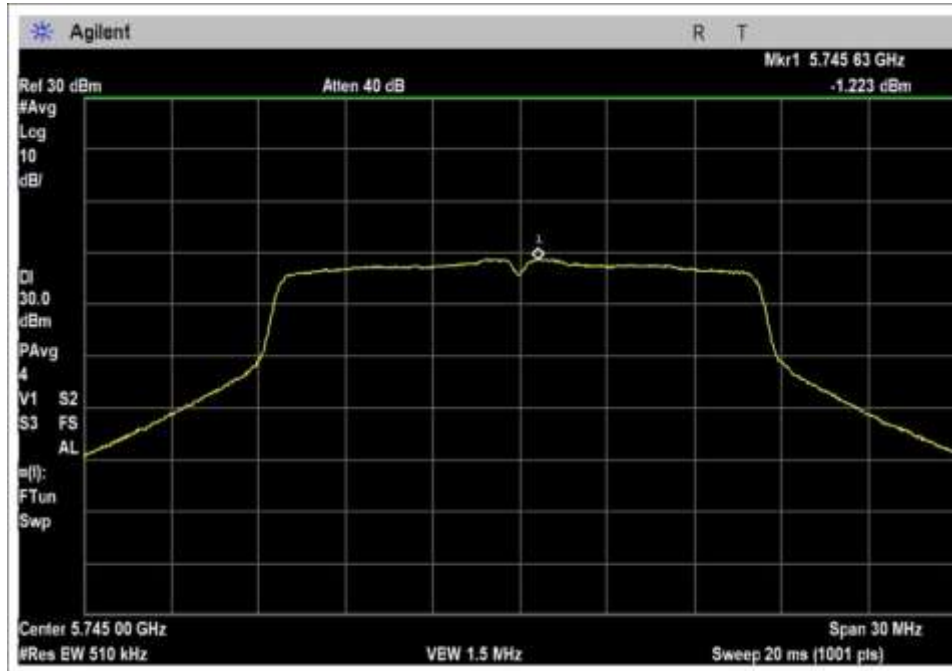
Measurement Option: AVGPM

Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Summed Power (dBm)	Limit (dBm)	Results
5745	802.11ac20 / 0	Linear Polarized / 5.3	-2.19	1.4	≤30	Pass
5745	802.11ac20 / 1	Linear Polarized / 5.9	-1.09			
5785	802.11ac20 / 0	Linear Polarized / 5.3	-2.99	0.6	≤30	Pass
5785	802.11ac20 / 1	Linear Polarized / 5.9	-1.87			
5825	802.11ac20 / 0	Linear Polarized / 5.3	-3.02	0.3	≤30	Pass
5825	802.11ac20 / 1	Linear Polarized / 5.9	-2.46			
5755	802.11ac40 / 0	Linear Polarized / 5.3	-4.55	-1.4	≤30	Pass
5755	802.11ac40 / 1	Linear Polarized / 5.9	-4.24			
5795	802.11ac40 / 0	Linear Polarized / 5.3	-5.69	-2.3	≤30	Pass
5795	802.11ac40 / 1	Linear Polarized / 5.9	-4.97			
5775	802.11ac80 / 0	Linear Polarized / 5.3	-8.95	-5.8	≤30	Pass
5775	802.11ac80 / 1	Linear Polarized / 5.9	-8.7			

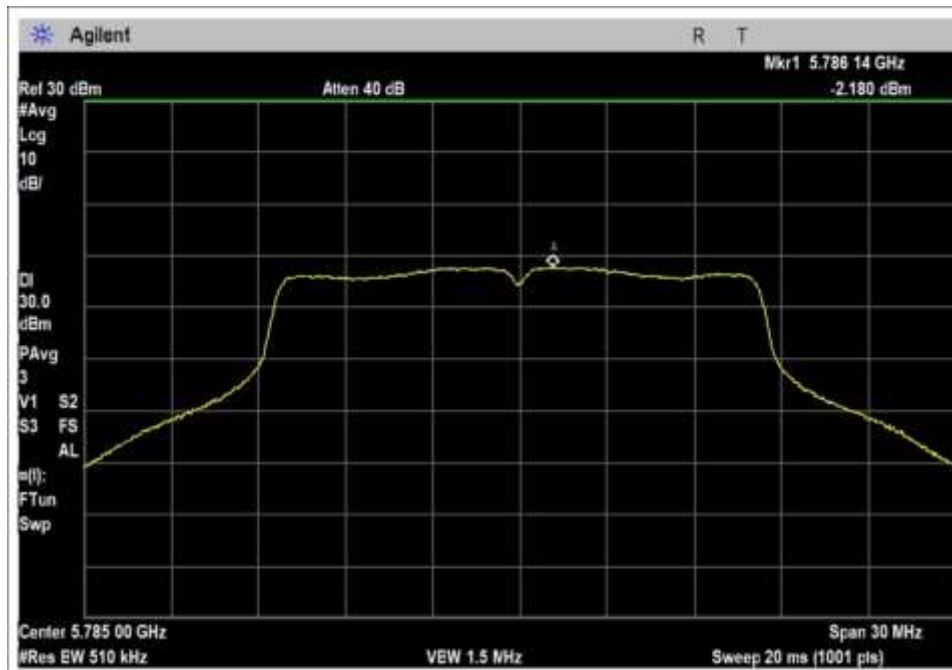
Note: 26dB BW is greater than 500kHz; therefore, 500kHz RBW was used.

RF Conducted Measurement

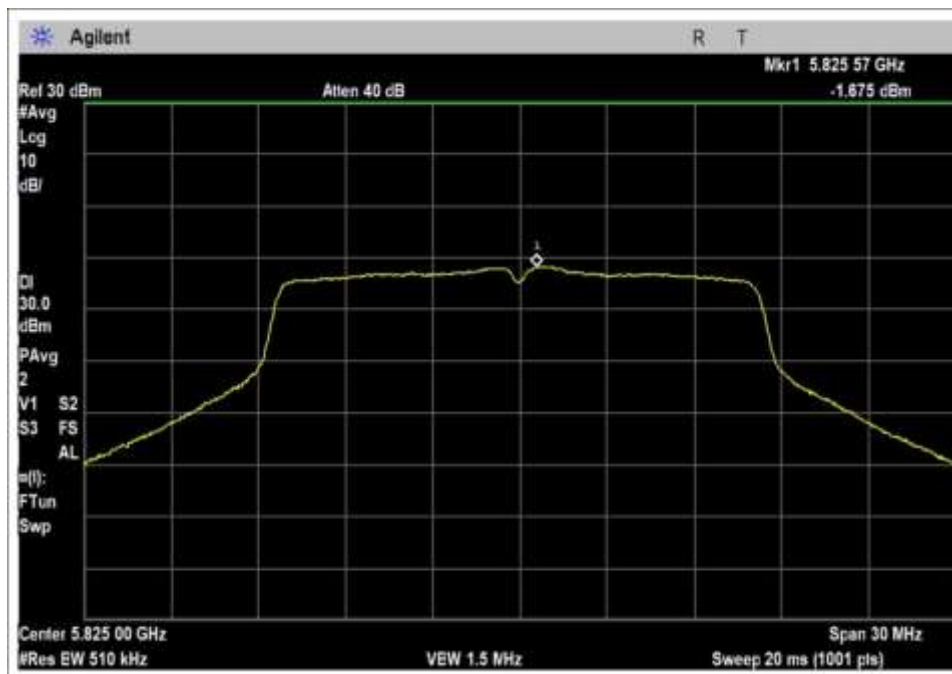
802.11a Test Data



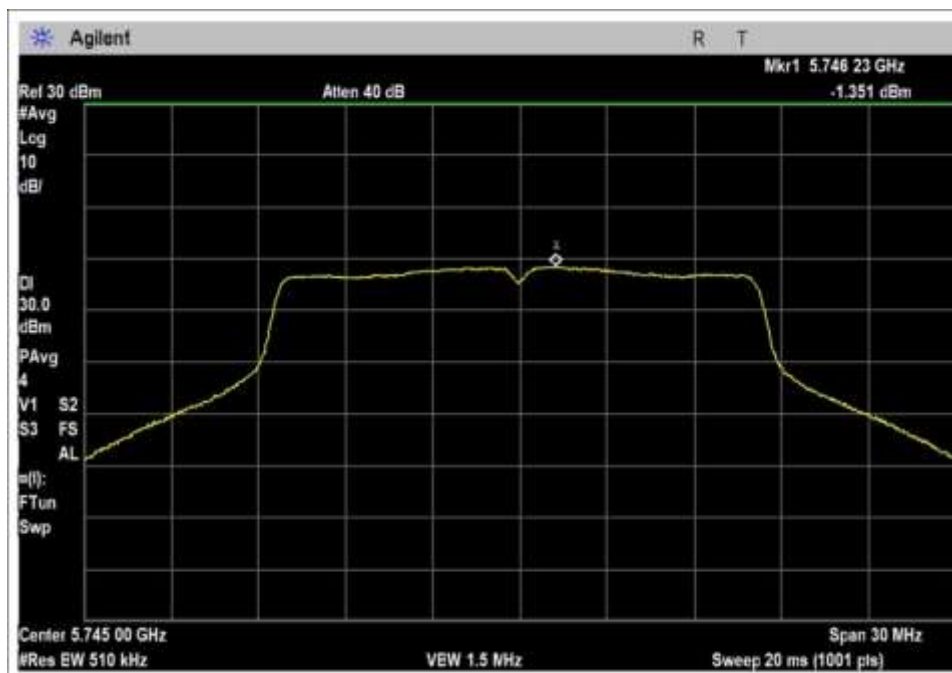
APO Low Channel



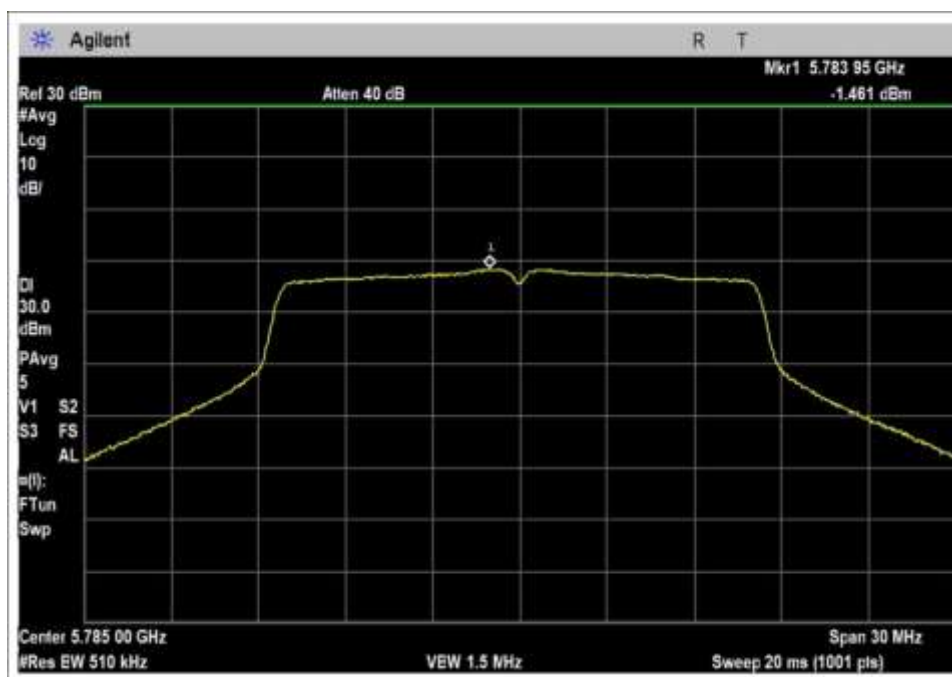
APO Middle Channel



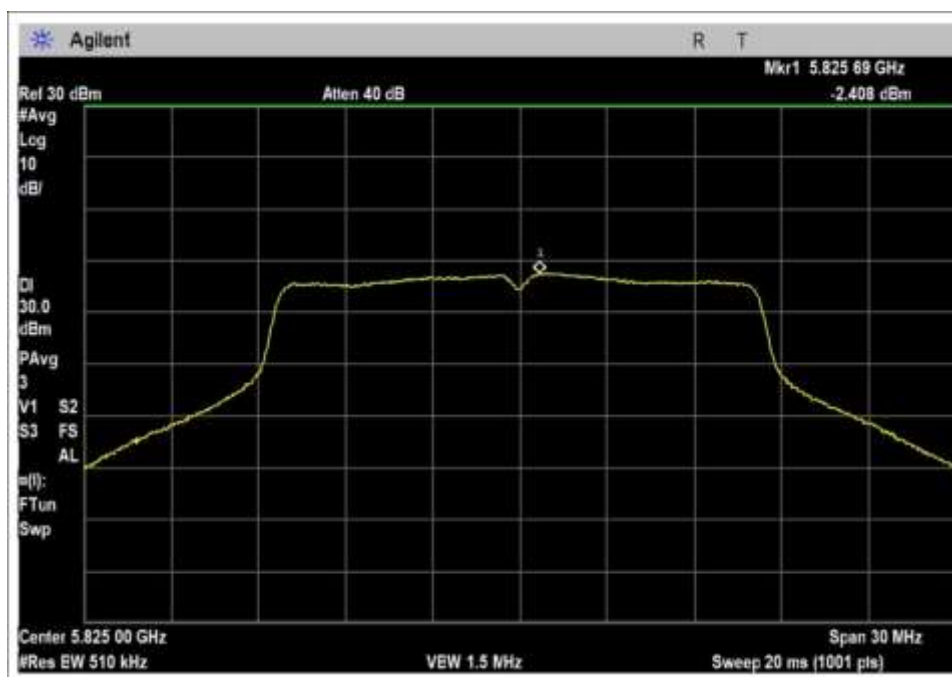
APO High Channel



AP1 Low Channel

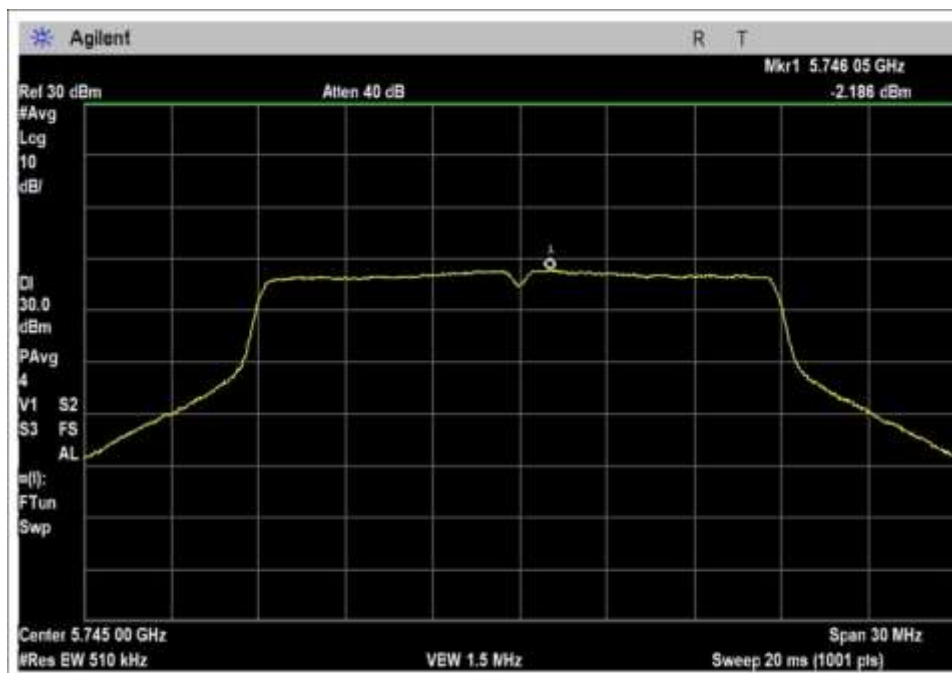


AP1 Middle Channel

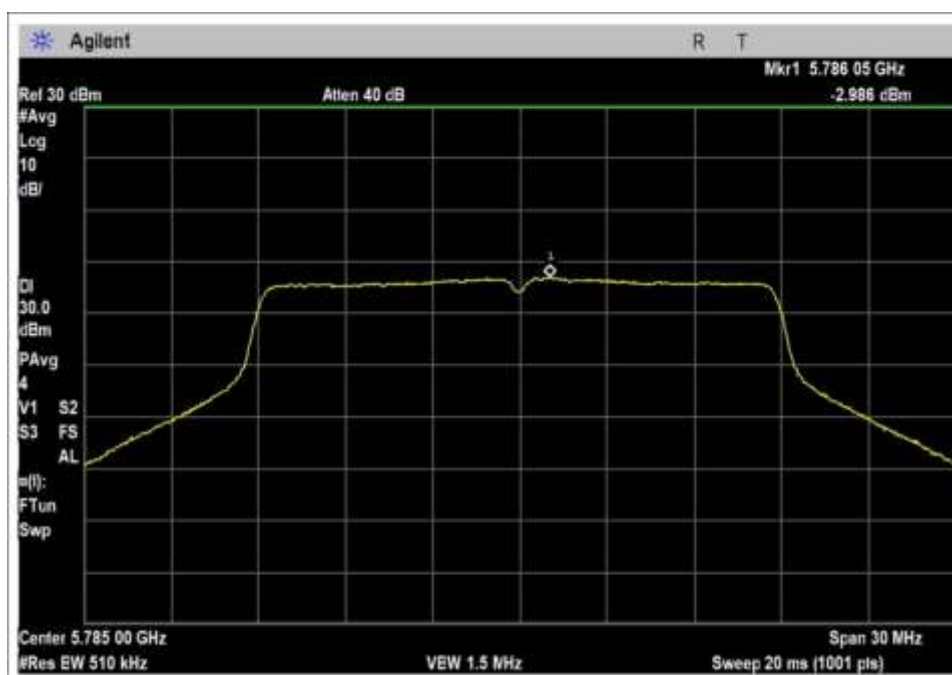


AP1 High Channel

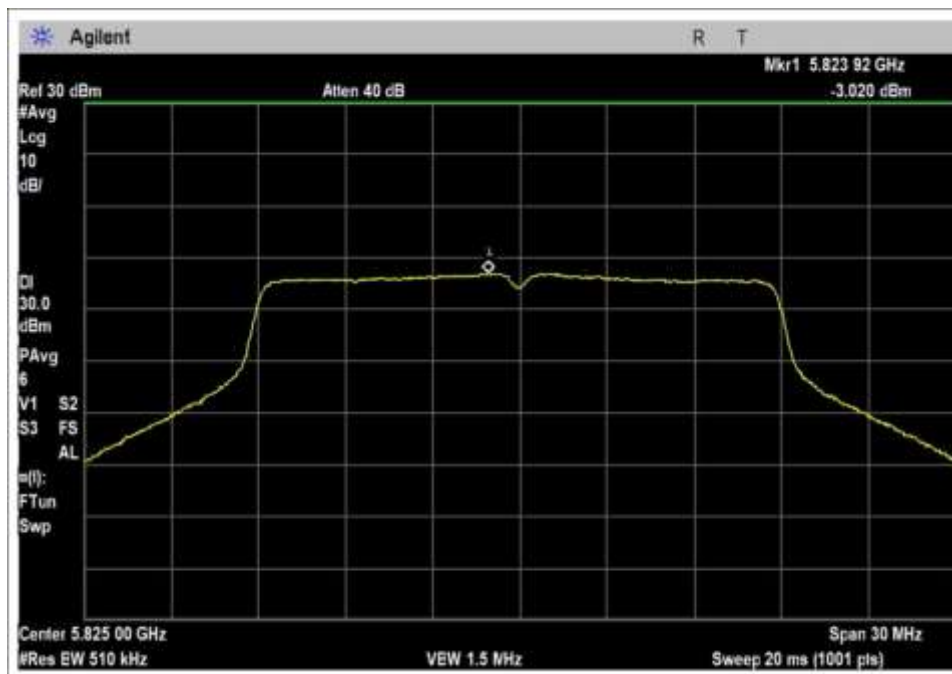
802.11ac20 Test Data



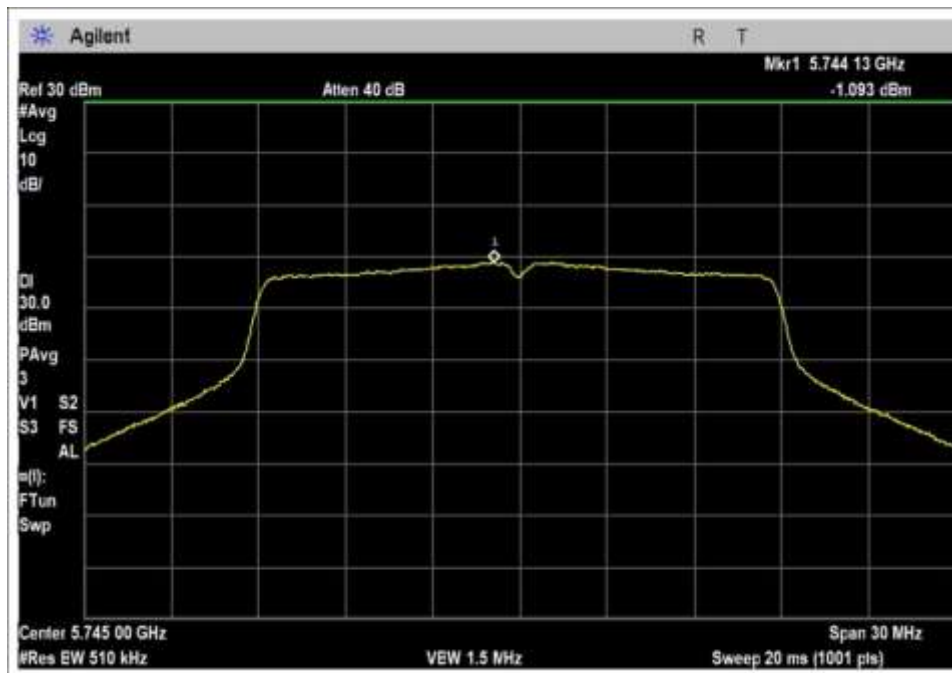
AP0 Low Channel



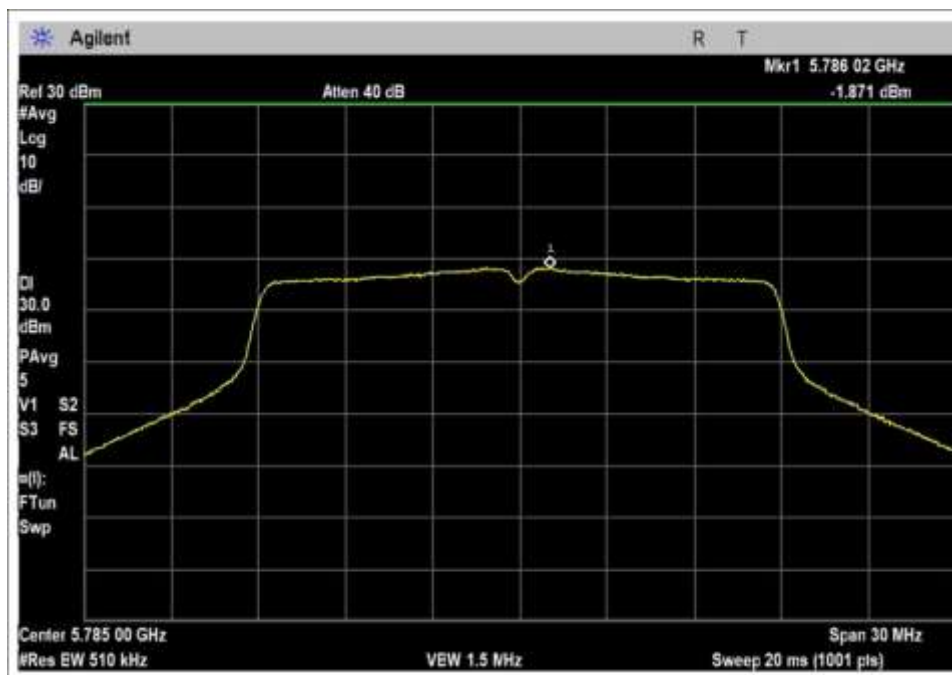
AP0 Middle Channel



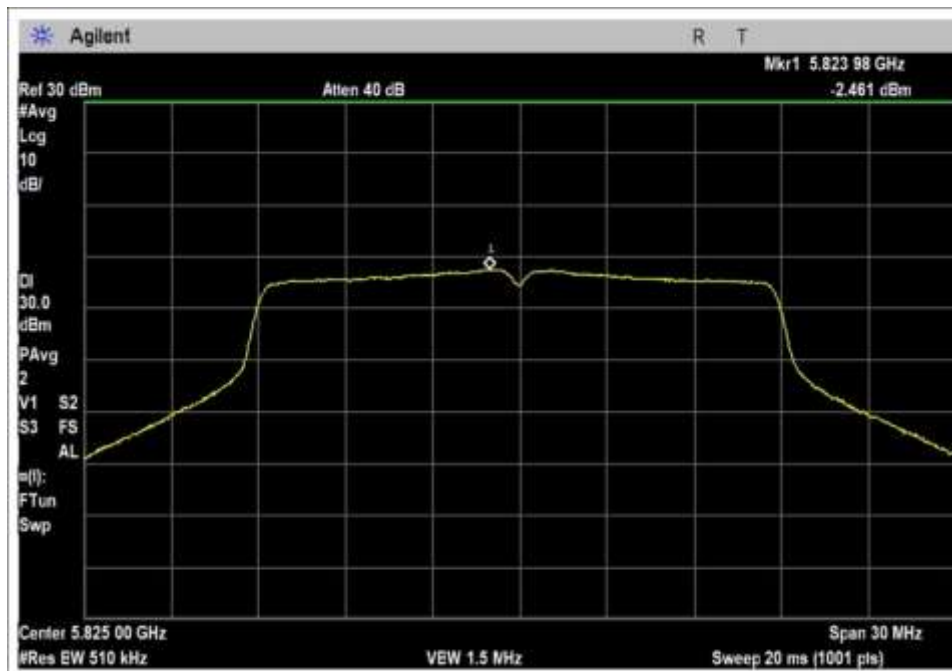
AP0 High Channel



AP1 Low Channel

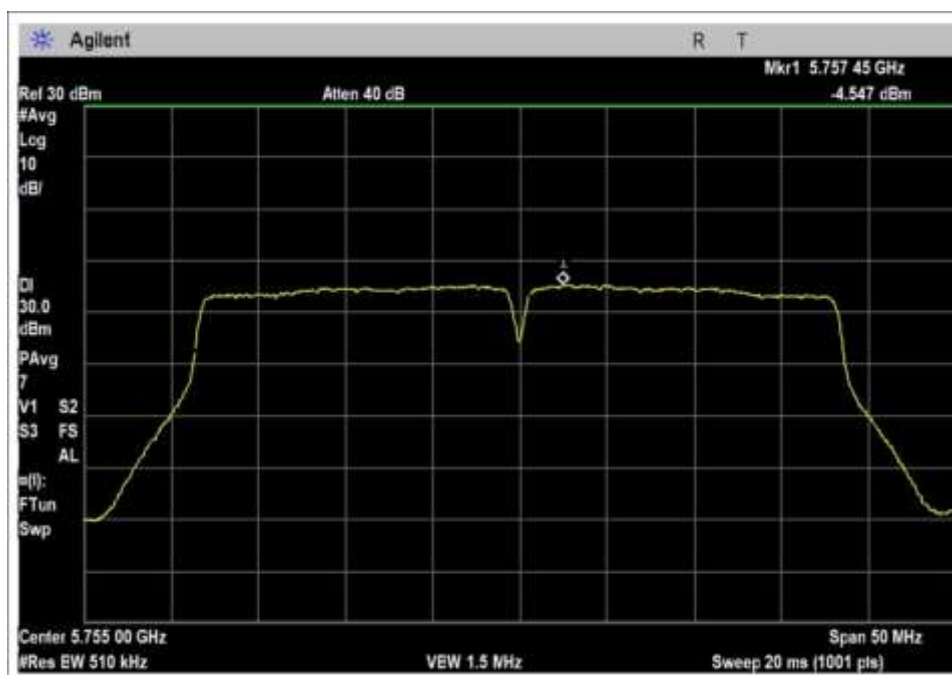


AP1 Middle Channel

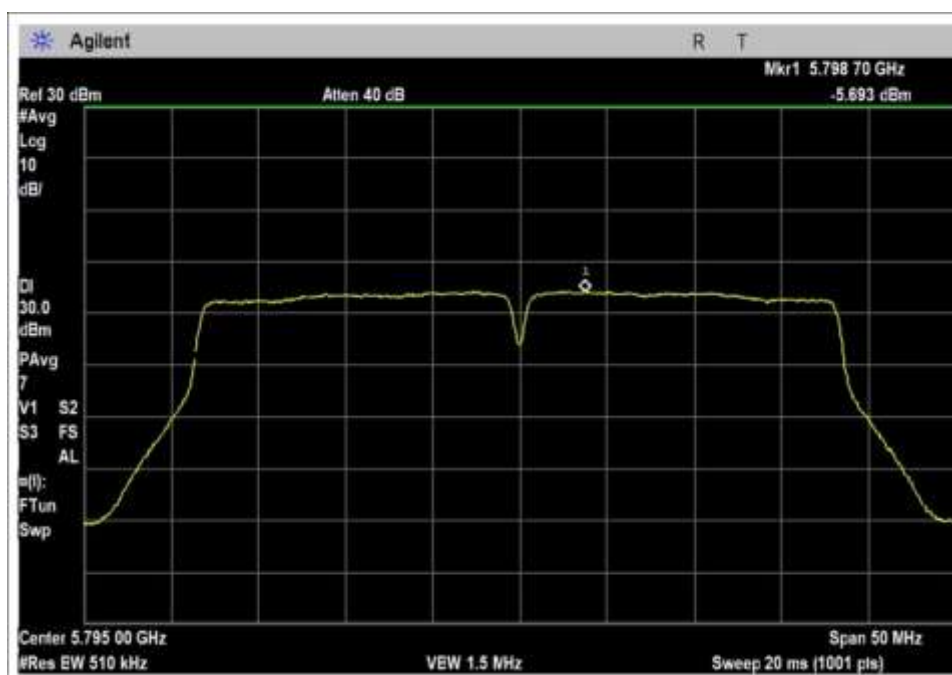


AP1 High Channel

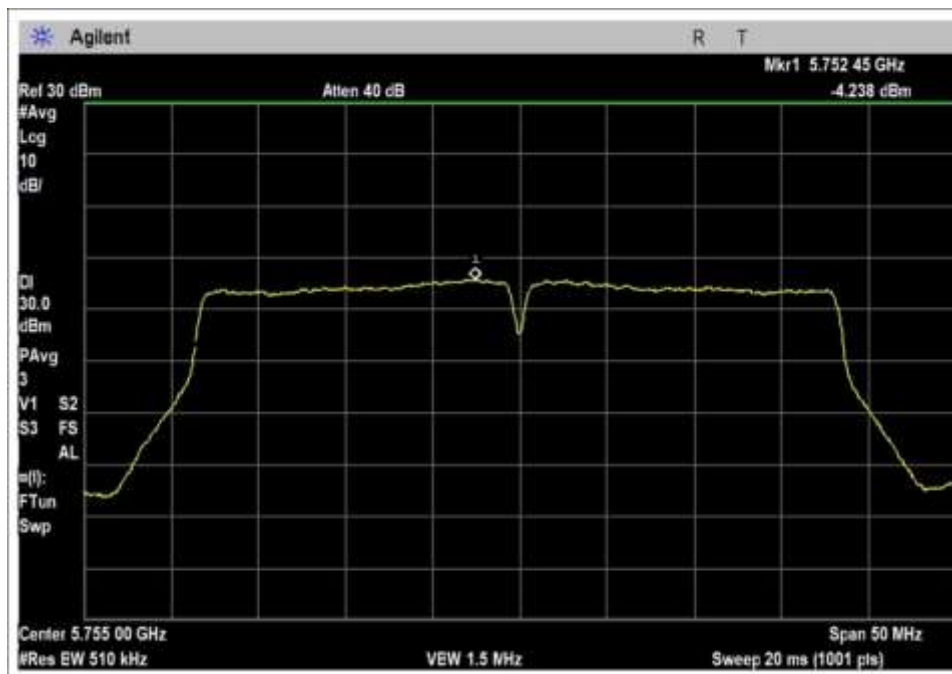
802.11ac40 Test Data



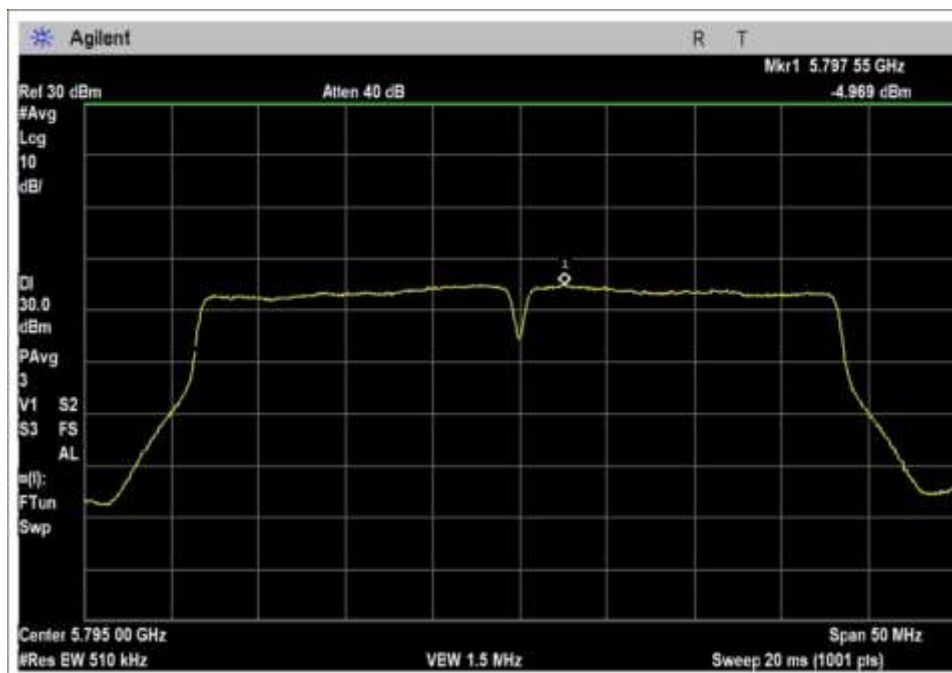
AP0 Low Channel



AP0 High Channel

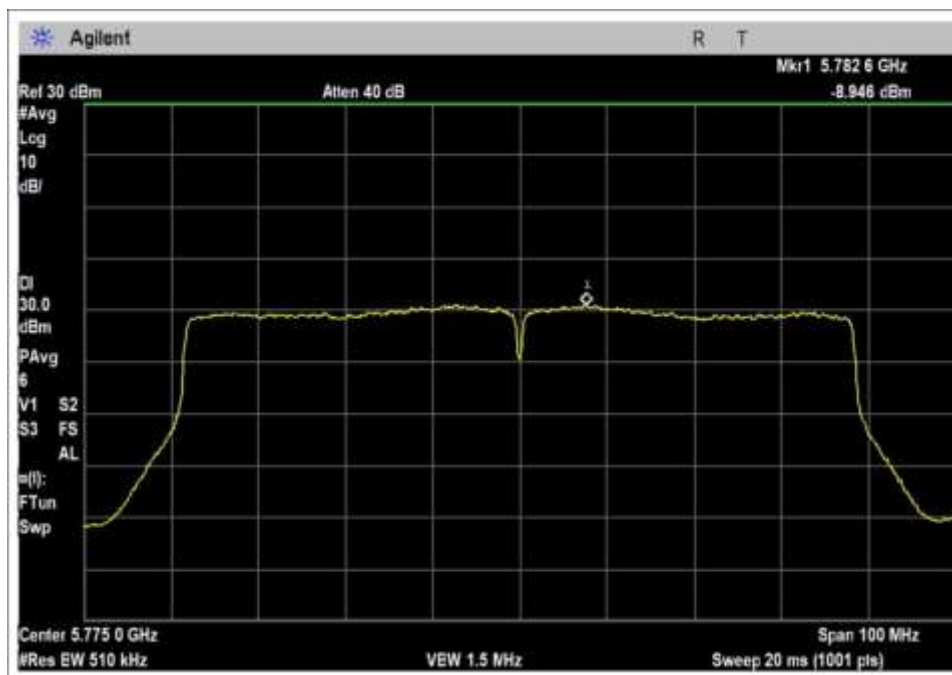


AP1 Low Channel

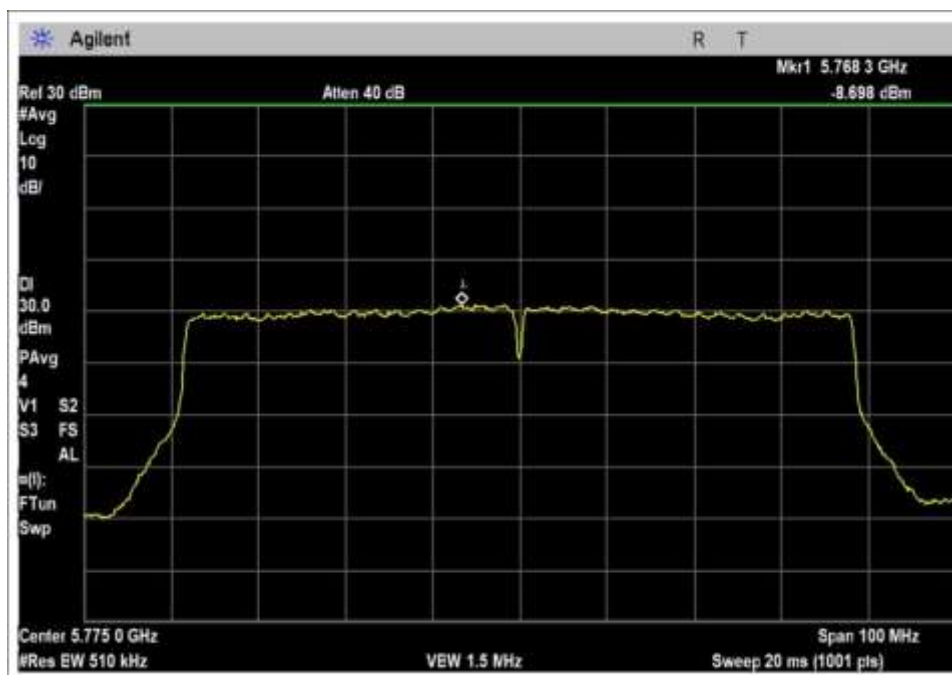


AP1 High Channel

802.11ac80 Test Data

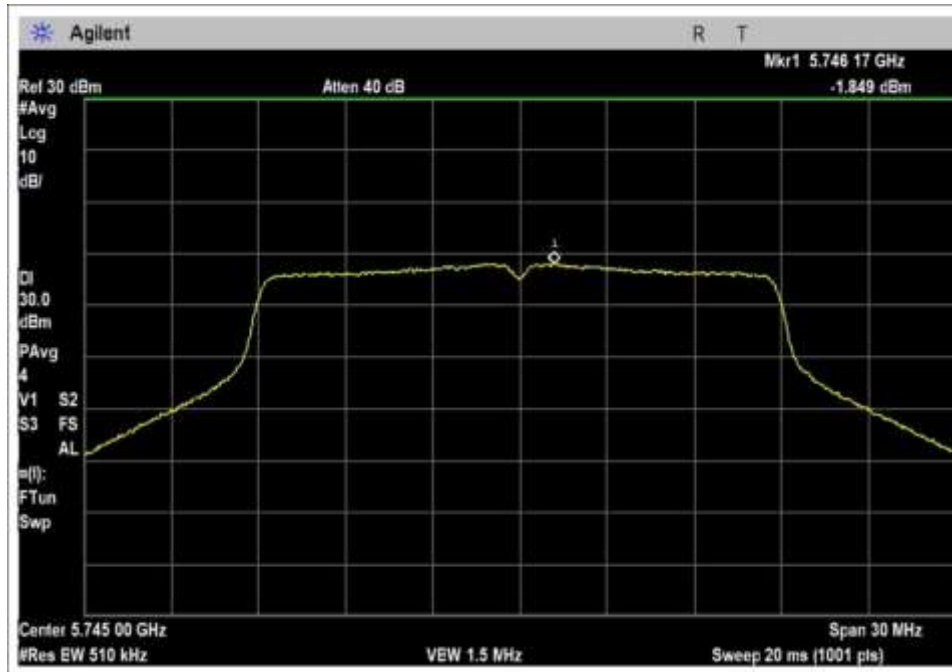


APO

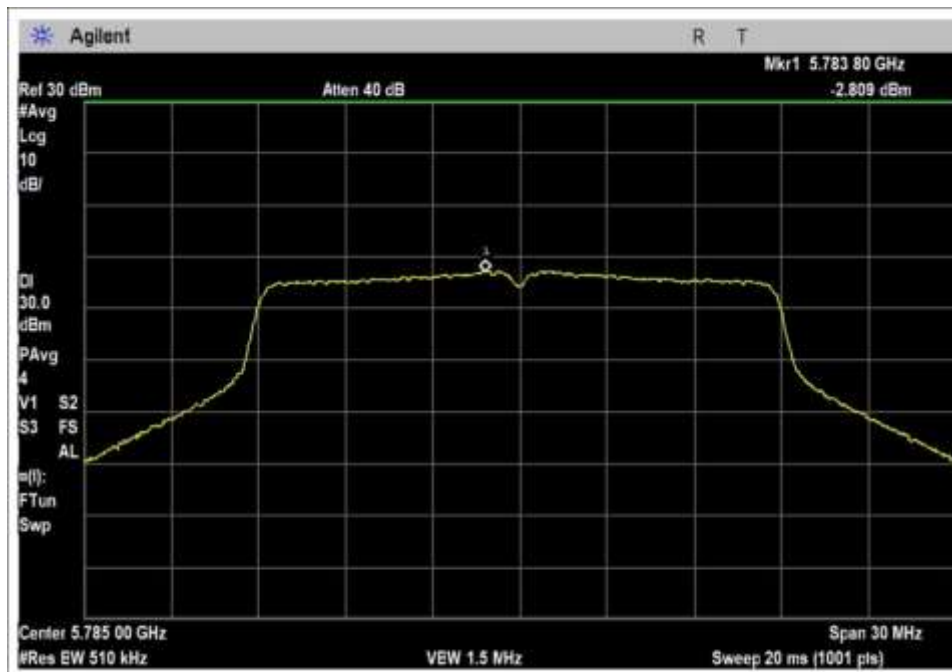


AP1

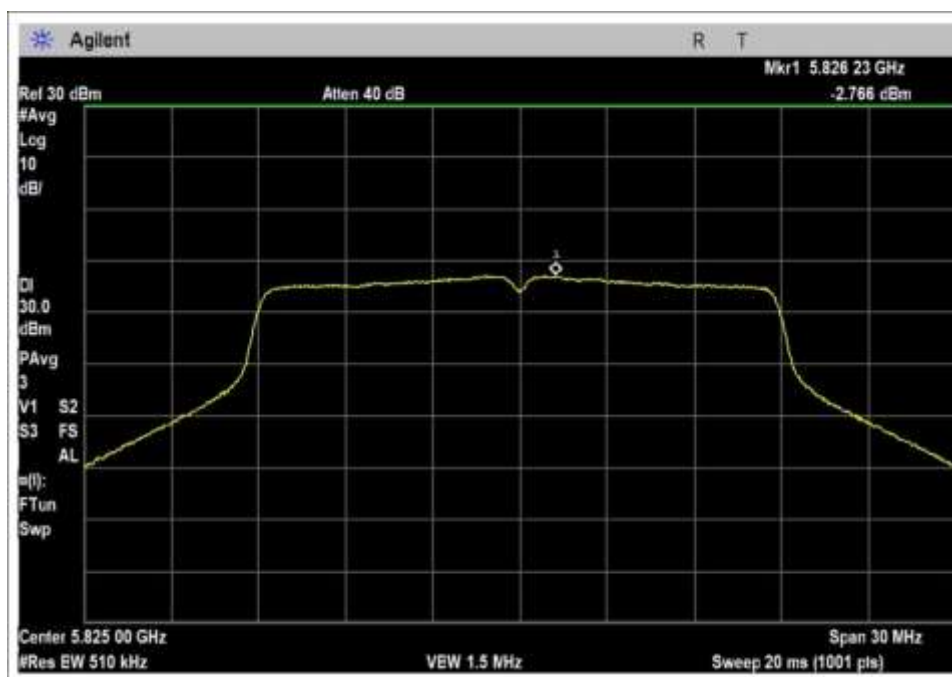
802.11n20 Test Data



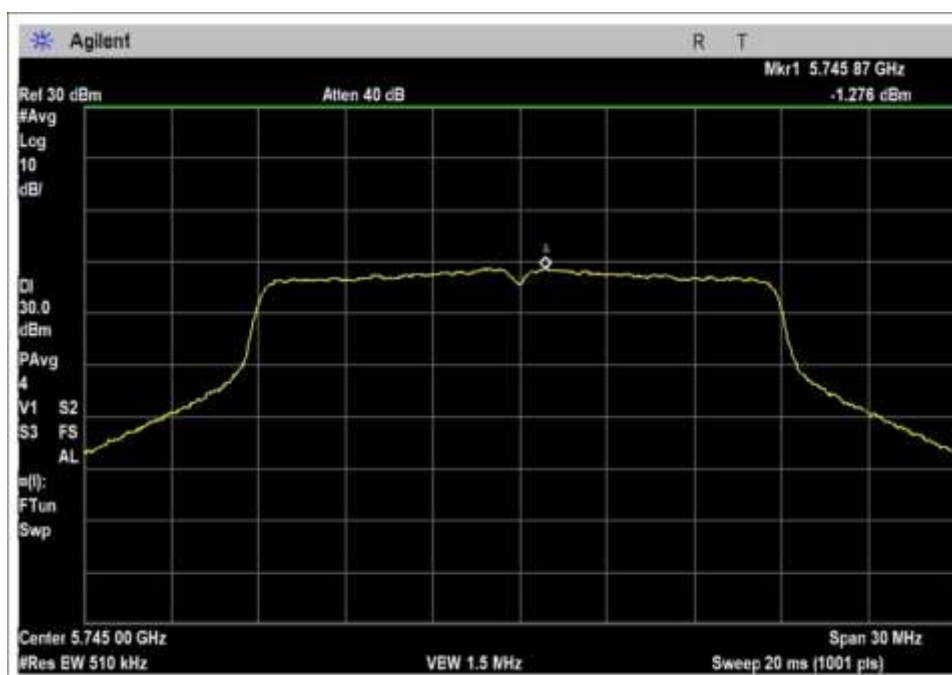
AP0 Low Channel



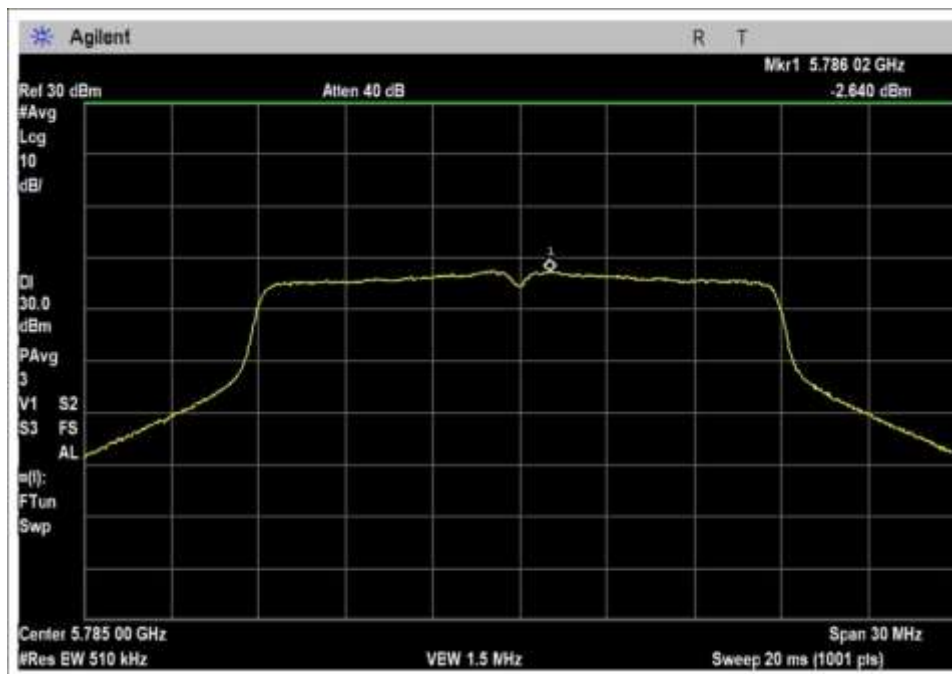
AP0 Middle Channel



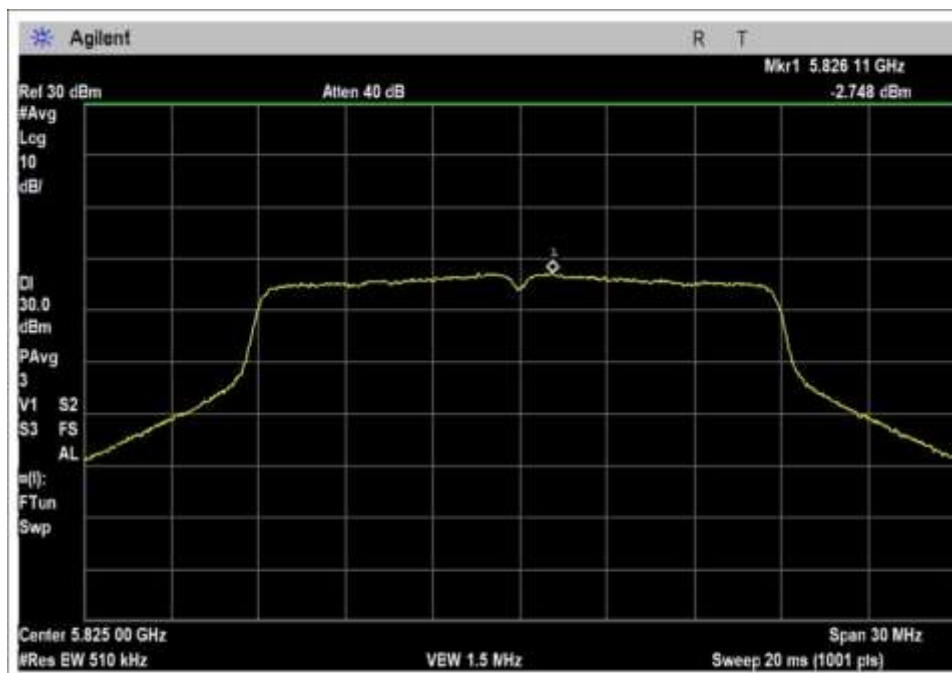
AP0 High Channel



AP1 Low Channel

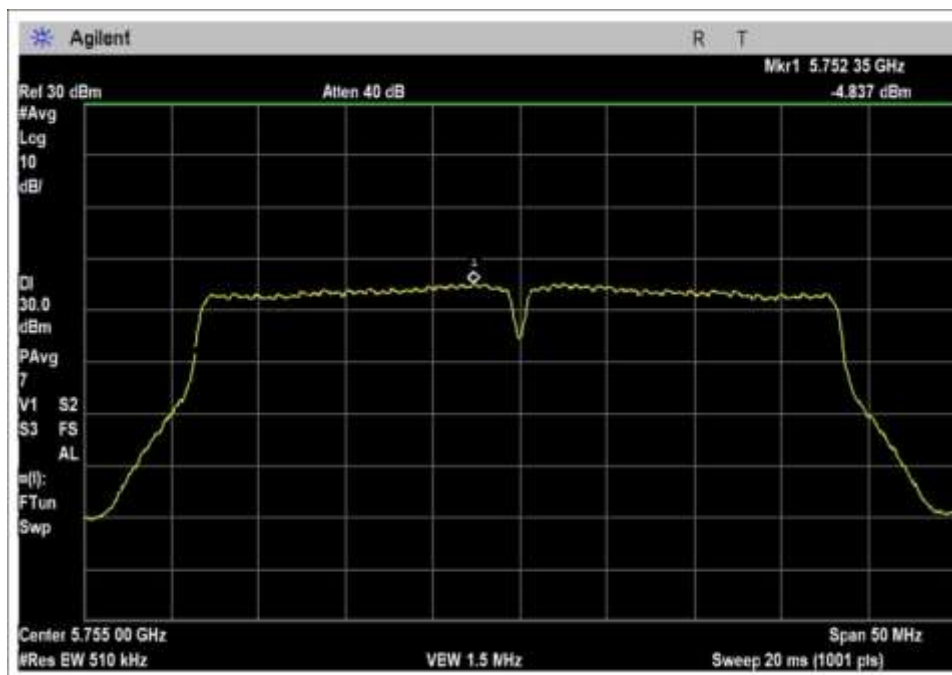


AP1 Middle Channel

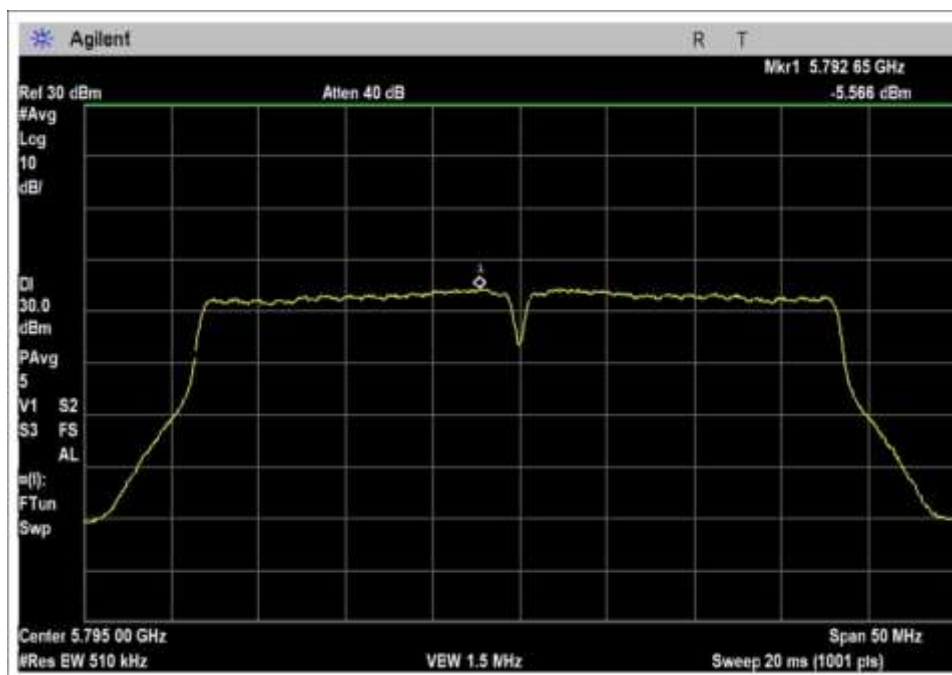


AP1 High Channel

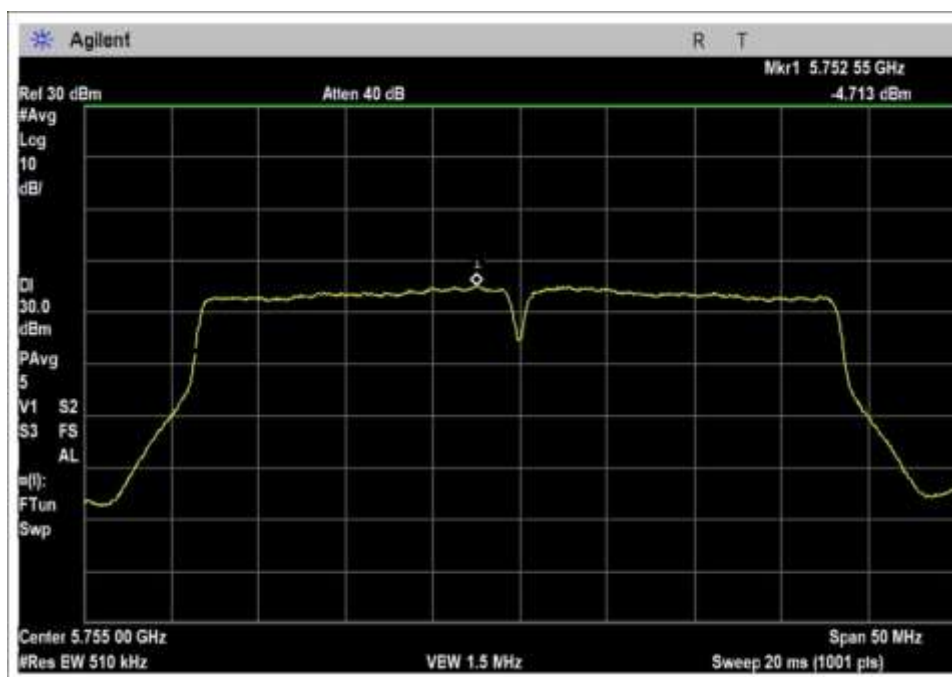
802.11n40 Test Data



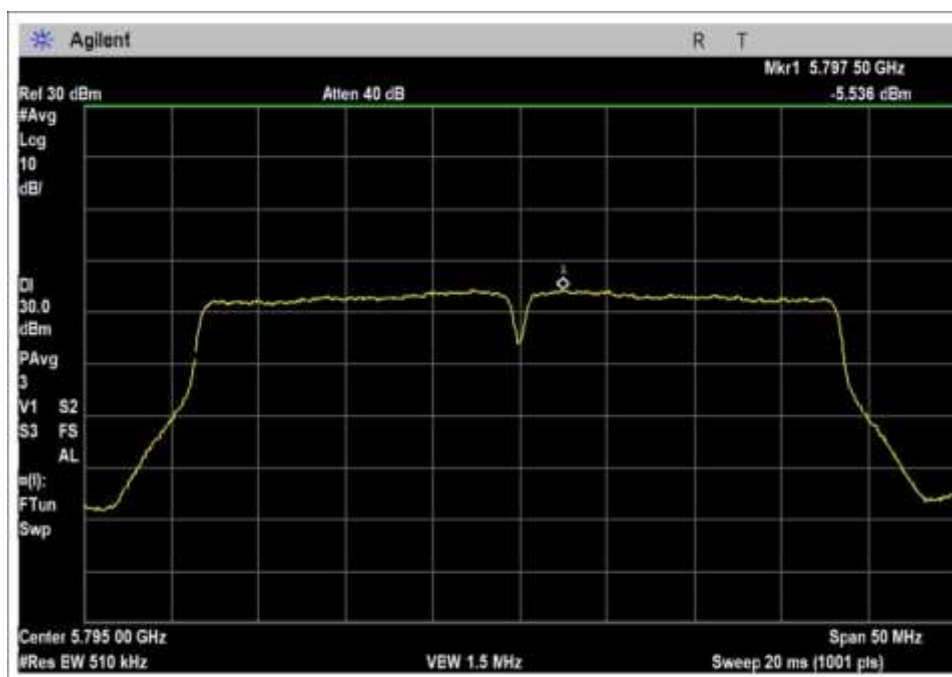
AP0 Low Channel



AP0 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>$E[dB\mu V/m] = EIRP[dBm] + 95.2$, for $d = 3$ m</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: 15:45:25
 Tested By: Matthew Harrison Sequence#: 24
 Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

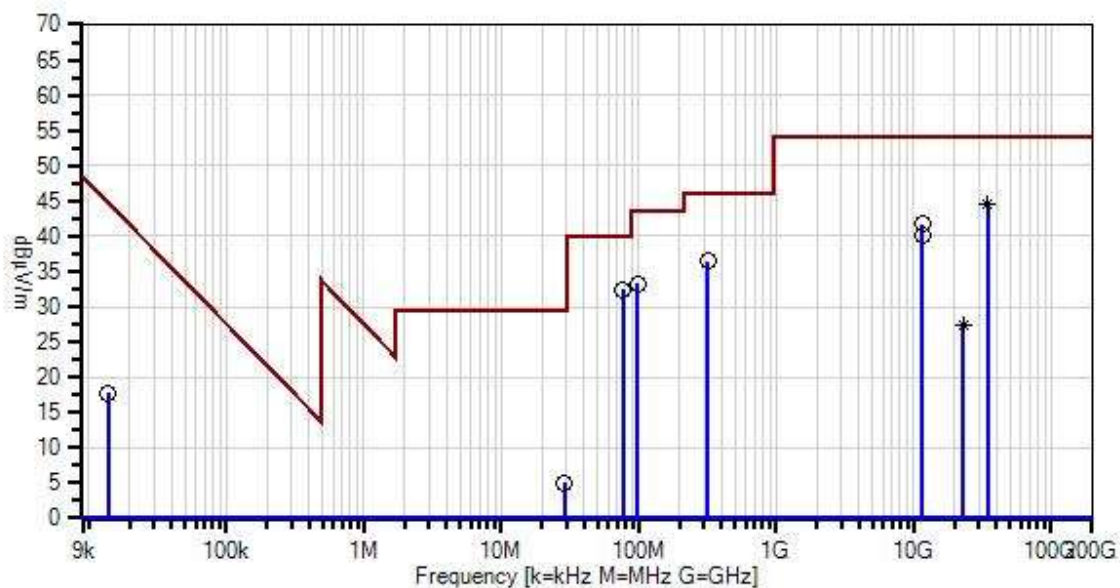
Support Equipment:

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: 5745, 5785, 5825 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. Modifications Added: None Setup: EUT is connected to a Laptop via USB and Audio cable. All data rates investigated, worst-case provided
--

Nalloy, LLC. WO#: 102802 Sequence#: 24 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	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
T9	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
T10	AN02743	Active Horn Antenna	AMFW-5F-260400-33-8P	4/26/2019	4/26/2021
T11	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
T12	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T13	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T14	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T15	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T16	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T17	AN00052	Loop Antenna	6502	5/7/2018	5/7/2020

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9 T13 T17	T2 T6 T10 T14	T3 T7 T11 T15	T4 T8 T12 T16	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	76.400M	46.5	+0.0 +0.0 +0.0 +6.9 +0.0	+0.1 +0.0 +0.0 +5.8	+0.0 +0.0 +0.0 +0.4	+0.0 +0.0 -27.8 +0.5	+0.0	32.4	40.0	-7.6	Vert
2	34470.000 M Ave	24.4	+0.0 +0.0 +0.0 +0.0 +0.0	+0.0 +12.3 +2.1 +0.0	+0.0 +1.2 +3.1 +0.0	+0.0 +1.5 +0.0 +0.0	+0.0	44.6	54.0	-9.4	Horiz

^	34470.000 M	39.6	+0.0	+0.0	+0.0	+0.0	+0.0	59.8	54.0	+5.8	Horiz
			+0.0	+12.3	+1.2	+1.5					
			+0.0	+2.1	+3.1	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
4	317.600M	41.6	+0.0	+0.2	+0.0	+0.0	+0.0	36.5	46.0	-9.5	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	-27.1					
			+14.0	+5.8	+0.9	+1.1					
			+0.0								
5	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					
			+0.0	+0.0	+0.0	-27.7					
			+8.0	+5.8	+0.5	+0.6					
			+0.0								
6	11645.650 M	46.6	+6.7	+1.7	-13.3	+0.0	+0.0	41.7	54.0	-12.3	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
7	11570.240 M	46.7	+6.6	+1.6	-13.2	+0.0	+0.0	41.7	54.0	-12.3	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
8	11490.240 M	45.2	+6.6	+1.6	-13.2	+0.0	+0.0	40.2	54.0	-13.8	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
9	28.896M	18.8	+0.3	+0.1	+0.0	+0.0	-20.0	5.1	29.5	-24.4	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+5.9								

10	22980.000	29.9	+0.0	+0.0	+0.0	-15.8	+0.0	27.4	54.0	-26.6	Horiz
	M		+1.7	+9.5	+0.8	+1.3					
	Ave		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	22980.000	46.5	+0.0	+0.0	+0.0	-15.8	+0.0	44.0	54.0	-10.0	Horiz
	M		+1.7	+9.5	+0.8	+1.3					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
12	13.794k	44.6	+0.0	+0.0	+0.0	+0.0	-40.0	17.7	44.8	-27.1	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
			+13.1								



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: 15:40:13
 Tested By: Matthew Harrison Sequence#: 23
 Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

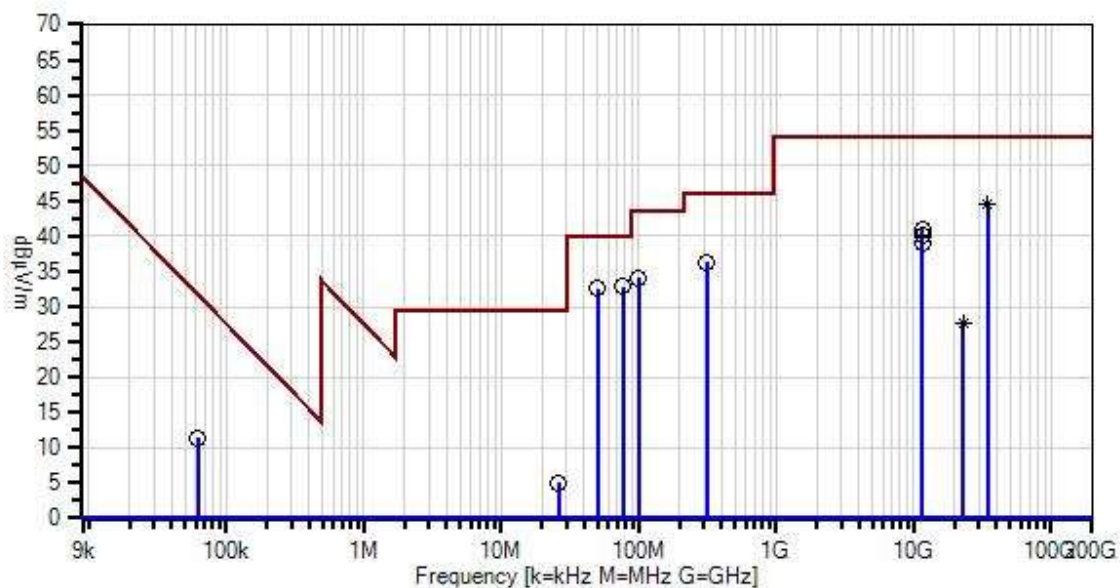
Support Equipment:

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: 5745, 5785, 5825 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
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Nalloy, LLC. WO#: 102802 Sequence#: 23 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
T9	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
T10	AN02743	Active Horn Antenna	AMFW-5F-260400-33-8P	4/26/2019	4/26/2021
T11	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
T12	AN02307	Preamplifier	8447D	1/10/2020	1/10/2022
T13	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T14	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T15	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T16	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T17	AN00052	Loop Antenna	6502	5/7/2018	5/7/2020

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
			T9	T10	T11	T12					
			T13	T14	T15	T16					
			T17								
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	76.400M	47.0	+0.0	+0.1	+0.0	+0.0	+0.0	32.9	40.0	-7.1	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	-27.8					
			+6.9	+5.8	+0.4	+0.5					
			+0.0								

2	50.300M	46.5	+0.0	+0.1	+0.0	+0.0	+0.0	32.6	40.0	-7.4	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	-27.9					
			+7.3	+5.8	+0.4	+0.4					
			+0.0								
3	34470.000 M Ave	24.4	+0.0	+0.0	+0.0	+0.0	+0.0	44.6	54.0	-9.4	Horiz
			+0.0	+12.3	+1.2	+1.5					
			+0.0	+2.1	+3.1	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	34470.000 M	38.2	+0.0	+0.0	+0.0	+0.0	+0.0	58.4	54.0	+4.4	Horiz
			+0.0	+12.3	+1.2	+1.5					
			+0.0	+2.1	+3.1	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
5	100.500M	46.6	+0.0	+0.1	+0.0	+0.0	+0.0	34.0	43.5	-9.5	Vert
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	-27.7					
			+8.1	+5.8	+0.5	+0.6					
			+0.0								
6	314.700M	41.6	+0.0	+0.2	+0.0	+0.0	+0.0	36.3	46.0	-9.7	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	-27.1					
			+13.8	+5.8	+0.9	+1.1					
			+0.0								
7	11649.280 M	45.9	+6.7	+1.7	-13.3	+0.0	+0.0	41.0	54.0	-13.0	Horiz
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
8	11570.870 M	45.1	+6.6	+1.6	-13.2	+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	+0.0	+0.0					
			+0.0								
9	11492.790 M	43.9	+6.6	+1.6	-13.2	+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	+0.0	+0.0					
			+0.0								
10	62.439k	41.7	+0.0	+0.0	+0.0	+0.0	-40.0	11.4	31.7	-20.3	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+9.7								

11	26.149M	18.0	+0.3	+0.1	+0.0	+0.0	-20.0	5.1	29.5	-24.4	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+6.7								
12	22980.000	30.1	+0.0	+0.0	+0.0	-15.8	+0.0	27.6	54.0	-26.4	Horiz
	M		+1.7	+9.5	+0.8	+1.3					
	Ave		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	22980.000	43.6	+0.0	+0.0	+0.0	-15.8	+0.0	41.1	54.0	-12.9	Horiz
	M		+1.7	+9.5	+0.8	+1.3					
			+0.0	+0.0	+0.0	+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: 15:37:10
 Tested By: Matthew Harrison Sequence#: 22
 Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

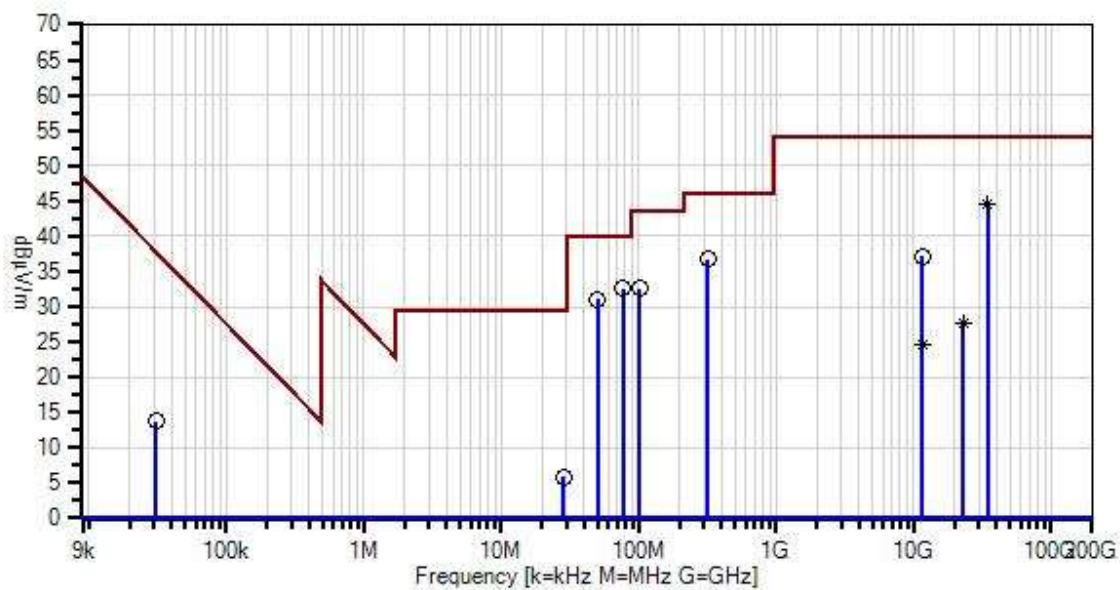
Support Equipment:

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: 5755, 5795 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
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Nalloy, LLC. WO#: 102802 Sequence#: 22 Date: 4/2/2020
15.209 Radiated Emissions Test Distance: 3 Meters Horiz



— 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	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
T9	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
T10	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
T11	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T12	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T13	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T14	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T15	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T16	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 T15	T4 T8 T12 T16	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	76.400M	46.7	+0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.4	+0.0 +0.0 -27.8 +0.5	+0.0 +0.0 +6.9 +0.0	+0.0	32.6	40.0	-7.4	Vert
2	50.300M	45.0	+0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.4	+0.0 +0.0 -27.9 +0.4	+0.0 +0.0 +7.3 +0.0	+0.0	31.1	40.0	-8.9	Vert
3	318.600M	41.9	+0.0 +0.0 +0.0 +5.8	+0.2 +0.0 +0.0 +0.9	+0.0 +0.0 -27.1 +1.1	+0.0 +0.0 +14.0 +0.0	+0.0	36.8	46.0	-9.2	Horiz
4	34530.000 M Ave	24.5	+0.0 +0.0 +2.1 +0.0	+0.0 +12.3 +3.1 +0.0	+0.0 +1.2 +0.0 +0.0	+0.0 +1.5 +0.0 +0.0	+0.0	44.7	54.0	-9.3	Horiz
^	34530.000 M	38.6	+0.0 +0.0 +2.1 +0.0	+0.0 +12.3 +3.1 +0.0	+0.0 +1.2 +0.0 +0.0	+0.0 +1.5 +0.0 +0.0	+0.0	58.8	54.0	+4.8	Horiz
6	101.400M	45.2	+0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.5	+0.0 +0.0 -27.7 +0.6	+0.0 +0.0 +8.1 +0.0	+0.0	32.6	43.5	-10.9	Vert
7	11590.000 M	42.1	+6.6 +0.0 +0.0 +0.0	+1.6 +0.0 +0.0 +0.0	-13.2 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0	37.1	54.0	-16.9	Horiz
8	28.269M	19.4	+0.3 +0.0 +0.0 +0.0	+0.1 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +6.1	-20.0	5.9	29.5	-23.6	Horiz
9	30.996k	42.8	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +10.9	-40.0	13.7	37.8	-24.1	Horiz

10	23020.000	30.1	+0.0	+0.0	+0.0	-15.7	+0.0	27.7	54.0	-26.3	Horiz
	M		+1.7	+9.5	+0.8	+1.3					
	Ave		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
^	23020.000	45.5	+0.0	+0.0	+0.0	-15.7	+0.0	43.1	54.0	-10.9	Horiz
	M		+1.7	+9.5	+0.8	+1.3					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
12	11529.700	29.7	+6.6	+1.6	-13.2	+0.0	+0.0	24.7	54.0	-29.3	Horiz
	M		+0.0	+0.0	+0.0	+0.0					
	Ave		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
^	11529.700	40.8	+6.6	+1.6	-13.2	+0.0	+0.0	35.8	54.0	-18.2	Horiz
	M		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+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: 15:34:09
 Tested By: Matthew Harrison Sequence#: 21
 Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

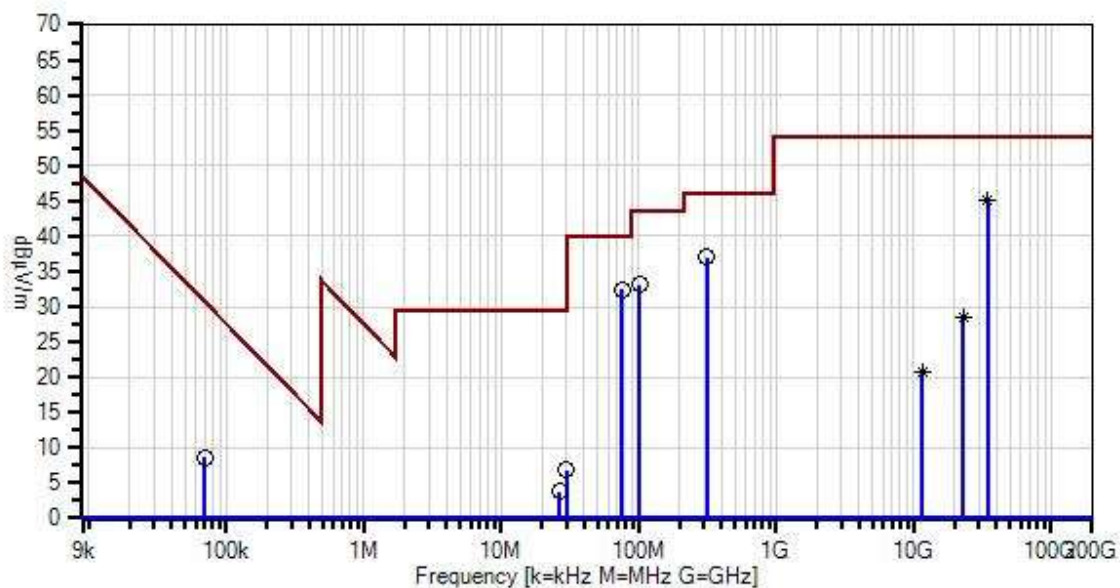
Support Equipment:

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: 5775 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
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Nalloy, LLC. WO#: 102802 Sequence#: 21 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
T9	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
T10	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
T11	AN02307	Preamplifier	8447D	1/10/2020	1/10/2022
T12	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T13	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T14	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T15	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T16	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 T15	T4 T8 T12 T16	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	75.400M	46.4	+0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.4	+0.0 +0.0 -27.8 +0.5	+0.0 +0.0 +7.0 +0.0	+0.0	32.4	40.0	-7.6	Vert
2	34650.000 M Ave	24.7	+0.0 +0.0 +2.3 +0.0	+0.0 +12.4 +3.1 +0.0	+0.0 +1.2 +0.0 +0.0	+0.0 +1.5 +0.0 +0.0	+0.0	45.2	54.0	-8.8	Horiz
^	34650.000 M	39.2	+0.0 +0.0 +2.3 +0.0	+0.0 +12.4 +3.1 +0.0	+0.0 +1.2 +0.0 +0.0	+0.0 +1.5 +0.0 +0.0	+0.0	59.7	54.0	+5.7	Horiz
4	313.800M	42.3	+0.0 +0.0 +0.0 +5.8	+0.2 +0.0 +0.0 +0.9	+0.0 +0.0 -27.1 +1.1	+0.0 +0.0 +13.8 +0.0	+0.0	37.0	46.0	-9.0	Horiz
5	101.400M	45.8	+0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.5	+0.0 +0.0 -27.7 +0.6	+0.0 +0.0 +8.1 +0.0	+0.0	33.2	43.5	-10.3	Vert
6	69.771k	39.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +9.6	-40.0	8.6	30.7	-22.1	Perp
7	29.940M	20.8	+0.3 +0.0 +0.0 +0.0	+0.1 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +5.6	-20.0	6.8	29.5	-22.7	Perp
8	23100.000 M Ave	30.6	+0.0 +1.7 +0.0 +0.0	+0.0 +9.5 +0.0 +0.0	+0.0 +0.8 +0.0 +0.0	-15.5 +1.3 +0.0 +0.0	+0.0	28.4	54.0	-25.6	Horiz
^	23100.000 M	43.8	+0.0 +1.7 +0.0 +0.0	+0.0 +9.5 +0.0 +0.0	+0.0 +0.8 +0.0 +0.0	-15.5 +1.3 +0.0 +0.0	+0.0	41.6	54.0	-12.4	Horiz

10	26.448M	16.8	+0.3	+0.1	+0.0	+0.0	-20.0	3.8	29.5	-25.7	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+6.6					
11	11568.700	25.8	+6.6	+1.6	-13.2	+0.0	+0.0	20.8	54.0	-33.2	Horiz
	M		+0.0	+0.0	+0.0	+0.0					
	Ave		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
^	11568.700	40.1	+6.6	+1.6	-13.2	+0.0	+0.0	35.1	54.0	-18.9	Horiz
	M		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+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: 15:48:47
 Tested By: Matthew Harrison Sequence#: 25
 Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

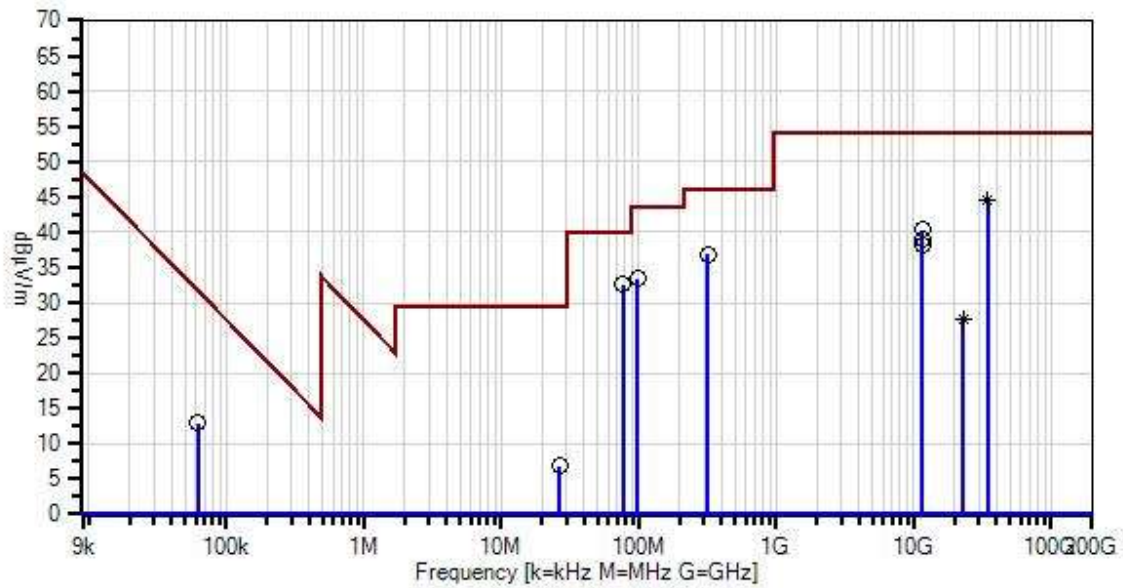
Support Equipment:

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: 5745, 5785, 5825 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

Nalloy, LLC. WO#: 102802 Sequence#: 25 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
T9	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
T10	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
T11	AN02307	Preamplifier	8447D	1/10/2020	1/10/2022
T12	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T13	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T14	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T15	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T16	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 T15	T4 T8 T12 T16	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	76.400M	46.7	+0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.4	+0.0 +0.0 -27.8 +0.5	+0.0 +0.0 +6.9 +0.0	+0.0	32.6	40.0	-7.4	Vert
2	316.700M	42.1	+0.0 +0.0 +0.0 +5.8	+0.2 +0.0 +0.0 +0.9	+0.0 +0.0 -27.1 +1.1	+0.0 +0.0 +13.9 +0.0	+0.0	36.9	46.0	-9.1	Horiz
3	34470.000 M Ave	24.4	+0.0 +0.0 +2.1 +0.0	+0.0 +12.3 +3.1 +0.0	+0.0 +1.2 +0.0 +0.0	+0.0 +1.5 +0.0 +0.0	+0.0	44.6	54.0	-9.4	Horiz
^	34470.000 M	40.1	+0.0 +0.0 +2.1 +0.0	+0.0 +12.3 +3.1 +0.0	+0.0 +1.2 +0.0 +0.0	+0.0 +1.5 +0.0 +0.0	+0.0	60.3	54.0	+6.3	Horiz
5	98.500M	46.1	+0.0 +0.0 +0.0 +5.8	+0.1 +0.0 +0.0 +0.5	+0.0 +0.0 -27.7 +0.6	+0.0 +0.0 +8.0 +0.0	+0.0	33.4	43.5	-10.1	Vert
6	11652.040 M	45.2	+6.7 +0.0 +0.0 +0.0	+1.7 +0.0 +0.0 +0.0	-13.3 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0	40.3	54.0	-13.7	Horiz
7	11572.340 M	44.1	+6.6 +0.0 +0.0 +0.0	+1.6 +0.0 +0.0 +0.0	-13.2 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0	39.1	54.0	-14.9	Horiz
8	11491.830 M	43.2	+6.6 +0.0 +0.0 +0.0	+1.6 +0.0 +0.0 +0.0	-13.2 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0	38.2	54.0	-15.8	Horiz
9	62.580k	43.2	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +9.7	-40.0	12.9	31.7	-18.8	Perp

10	26.478M	19.8	+0.3	+0.1	+0.0	+0.0	-20.0	6.8	29.5	-22.7	Perp
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+6.6					
11	22980.000	30.1	+0.0	+0.0	+0.0	-15.8	+0.0	27.6	54.0	-26.4	Horiz
	M		+1.7	+9.5	+0.8	+1.3					
	Ave		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
^	22980.000	44.7	+0.0	+0.0	+0.0	-15.8	+0.0	42.2	54.0	-11.8	Horiz
	M		+1.7	+9.5	+0.8	+1.3					
			+0.0	+0.0	+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: 15:51:58
 Tested By: Matthew Harrison Sequence#: 26
 Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

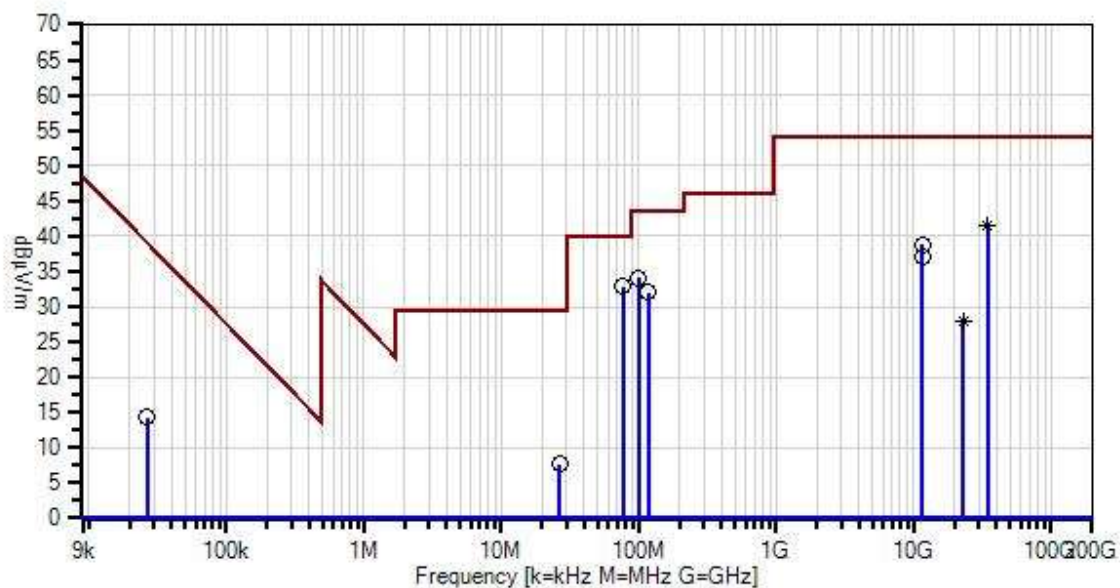
Support Equipment:

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: 5755, 5795 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

Nalloy, LLC. WO#: 102802 Sequence#: 26 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	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
T9	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
T10	AN02307	Preamp	8447D	1/10/2020	1/10/2022
T11	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T12	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T13	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T14	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T15	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 T15	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	76.400M	46.9	+0.0 +0.0 +0.0 +0.4	+0.1 +0.0 -27.8 +0.5	+0.0 +0.0 +6.9 +0.0	+0.0 +0.0 +5.8	+0.0	32.8	40.0	-7.2	Horiz
2	100.500M	46.7	+0.0 +0.0 +0.0 +0.5	+0.1 +0.0 -27.7 +0.6	+0.0 +0.0 +8.1 +0.0	+0.0 +0.0 +5.8	+0.0	34.1	43.5	-9.4	Horiz
3	117.900M	44.6	+0.0 +0.0 +0.0 +0.5	+0.1 +0.0 -27.6 +0.6	+0.0 +0.0 +8.0 +0.0	+0.0 +0.0 +5.8	+0.0	32.0	43.5	-11.5	Horiz
4	34530.000 M Ave	24.5	+0.0 +0.0 +2.1 +0.0	+0.0 +12.3 +0.0 +0.0	+0.0 +1.2 +0.0 +0.0	+0.0 +1.5 +0.0	+0.0	41.6	54.0	-12.4	Horiz
^	34530.000 M	40.3	+0.0 +0.0 +2.1 +0.0	+0.0 +12.3 +0.0 +0.0	+0.0 +1.2 +0.0 +0.0	+0.0 +1.5 +0.0	+0.0	57.4	54.0	+3.4	Horiz
6	11590.100 M	43.8	+6.6 +0.0 +0.0 +0.0	+1.6 +0.0 +0.0 +0.0	-13.2 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0	38.8	54.0	-15.2	Horiz
7	11497.400 M	42.0	+6.6 +0.0 +0.0 +0.0	+1.6 +0.0 +0.0 +0.0	-13.2 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0	37.0	54.0	-17.0	Horiz
8	26.657M	20.7	+0.3 +0.0 +0.0 +0.0	+0.1 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +6.5	+0.0 +0.0 +0.0	-20.0	7.6	29.5	-21.9	Perp
9	26.625k	43.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +0.0	+0.0 +0.0 +0.0 +11.3	+0.0 +0.0 +0.0	-40.0	14.3	39.1	-24.8	Perp
10	23020.000 M Ave	30.3	+0.0 +1.7 +0.0 +0.0	+0.0 +9.5 +0.0 +0.0	+0.0 +0.8 +0.0 +0.0	-15.7 +1.3 +0.0	+0.0	27.9	54.0	-26.1	Horiz
^	23020.000 M	45.3	+0.0 +1.7 +0.0 +0.0	+0.0 +9.5 +0.0 +0.0	+0.0 +0.8 +0.0 +0.0	-15.7 +1.3 +0.0	+0.0	42.9	54.0	-11.1	Horiz

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)(4) Radiated Spurious Emissions**
 Work Order #: **102802** Date: 4/2/2020
 Test Type: **Maximized Emissions** Time: 15:45:25
 Tested By: Matthew Harrison Sequence#: 24
 Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

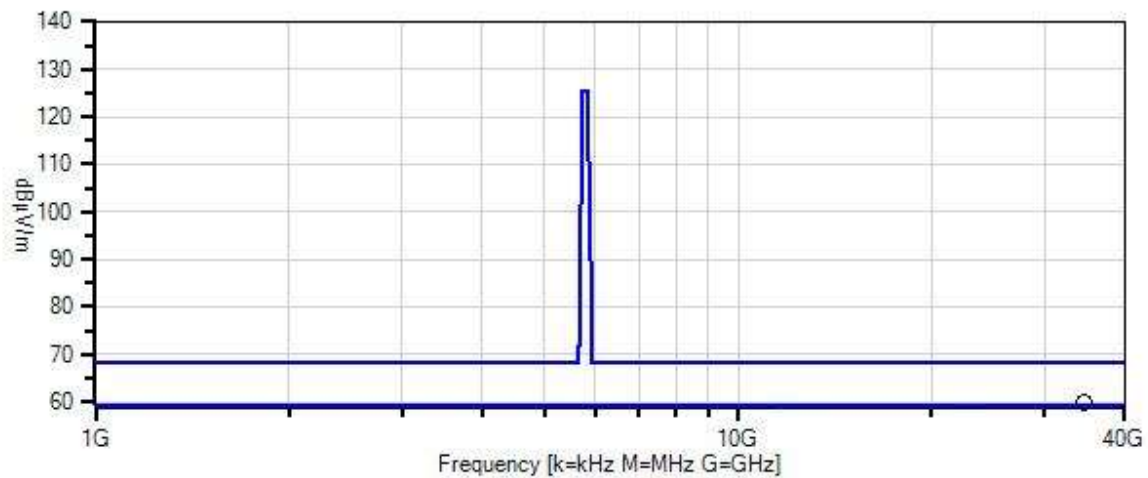
Support Equipment:

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: 5745, 5785, 5825 MHz $E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2$, for $d = 3 \text{ m}$ 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. Modifications Added: None Setup: EUT is connected to a Laptop via USB and Audio cable. All data rates investigated, worst-case provided

Nalloy, LLC. WO#: 102802 Sequence#: 24 Date: 4/2/2020
15.407(b)(4) 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)(4) 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
T9	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
T10	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 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	34470.000 M	39.6	+0.0 +0.0 +2.1	+0.0 +12.3 +3.1	+0.0 +1.2	+0.0 +1.5	+0.0	59.8	68.2	-8.4	Horiz
2	22980.000 M	46.5	+0.0 +1.7 +0.0	+0.0 +9.5 +0.0	+0.0 +0.8	-15.8 +1.3	+0.0	44.0	68.2	-24.2	Horiz
3	11645.650 M	46.6	+6.7 +0.0 +0.0	+1.7 +0.0 +0.0	-13.3 +0.0	+0.0 +0.0	+0.0	41.7	68.2	-26.5	Horiz
4	11570.240 M	46.7	+6.6 +0.0 +0.0	+1.6 +0.0 +0.0	-13.2 +0.0	+0.0 +0.0	+0.0	41.7	68.2	-26.5	Horiz
5	11490.240 M	45.2	+6.6 +0.0 +0.0	+1.6 +0.0 +0.0	-13.2 +0.0	+0.0 +0.0	+0.0	40.2	68.2	-28.0	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362
 Customer: **Nalloy, LLC.**
 Specification: **15.407(b)(4) Radiated Spurious Emissions**
 Work Order #: **102802** Date: 4/2/2020
 Test Type: **Maximized Emissions** Time: 15:40:13
 Tested By: Matthew Harrison Sequence#: 23
 Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

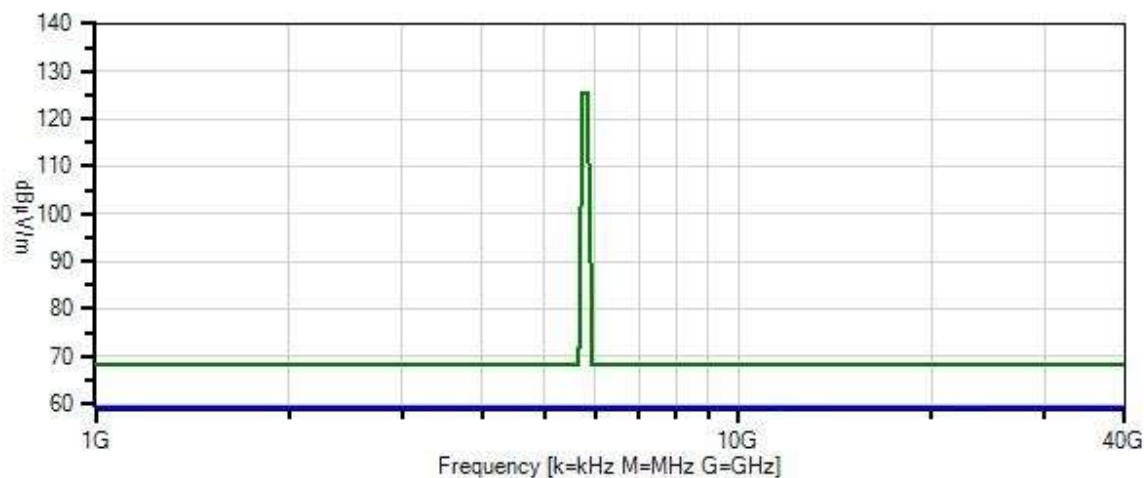
Support Equipment:

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: 5745, 5785, 5825 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
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Nalloy, LLC. WO#: 102802 Sequence#: 23 Date: 4/2/2020
15.407(b)(4) 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)(4) 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
T9	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
T10	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 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	34470.000 M	38.2	+0.0 +0.0 +2.1	+0.0 +12.3 +3.1	+0.0 +1.2	+0.0 +1.5	+0.0	58.4	68.2	-9.8	Horiz
2	22980.000 M	43.6	+0.0 +1.7 +0.0	+0.0 +9.5 +0.0	+0.0 +0.8	-15.8 +1.3	+0.0	41.1	68.2	-27.1	Horiz
3	11649.280 M	45.9	+6.7 +0.0 +0.0	+1.7 +0.0 +0.0	-13.3 +0.0	+0.0 +0.0	+0.0	41.0	68.2	-27.2	Horiz
4	11570.870 M	45.1	+6.6 +0.0 +0.0	+1.6 +0.0 +0.0	-13.2 +0.0	+0.0 +0.0	+0.0	40.1	68.2	-28.1	Horiz
5	11492.790 M	43.9	+6.6 +0.0 +0.0	+1.6 +0.0 +0.0	-13.2 +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)(4) Radiated Spurious Emissions**
 Work Order #: **102802** Date: 4/2/2020
 Test Type: **Maximized Emissions** Time: 15:37:10
 Tested By: Matthew Harrison Sequence#: 22
 Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

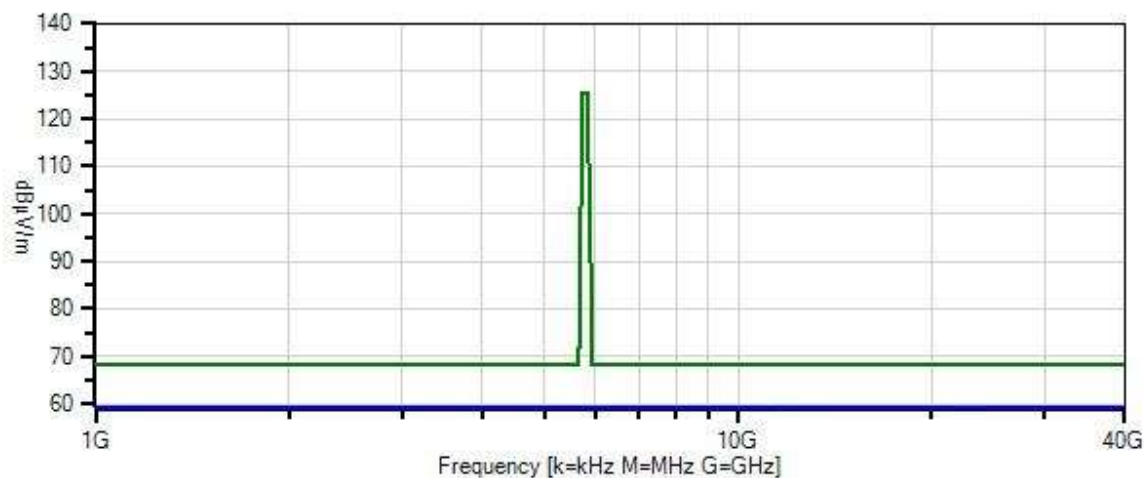
Support Equipment:

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: 5755, 5795 MHz $E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2$, for $d = 3 \text{ m}$ 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

Nalloy, LLC. W/O#: 102802 Sequence#: 22 Date: 4/2/2020
 15.407(b)(4) Radiated Spurious Emissions - Client Devices Test Distance: 3 Meters Horiz



— Sweep Data
 — Readings
 ○ Peak Readings
 × QP Readings
 * Average Readings
 ▼ Ambient
 Software Version: 5.03.12
 — 1 - 15.407(b)(4) 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
T9	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
T10	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 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	34530.000 M	38.6	+0.0 +0.0 +2.1	+0.0 +12.3 +3.1	+0.0 +1.2	+0.0 +1.5	+0.0	58.8	68.2	-9.4	Horiz
2	23020.000 M	45.5	+0.0 +1.7 +0.0	+0.0 +9.5 +0.0	+0.0 +0.8	-15.7 +1.3	+0.0	43.1	68.2	-25.1	Horiz
3	11590.000 M	42.1	+6.6 +0.0 +0.0	+1.6 +0.0 +0.0	-13.2 +0.0	+0.0 +0.0	+0.0	37.1	68.2	-31.1	Horiz
4	11529.700 M	40.8	+6.6 +0.0 +0.0	+1.6 +0.0 +0.0	-13.2 +0.0	+0.0 +0.0	+0.0	35.8	68.2	-32.4	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362
 Customer: **Nalloy, LLC.**
 Specification: **15.407(b)(4) Radiated Spurious Emissions**
 Work Order #: **102802** Date: 4/2/2020
 Test Type: **Maximized Emissions** Time: 15:34:09
 Tested By: Matthew Harrison Sequence#: 21
 Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

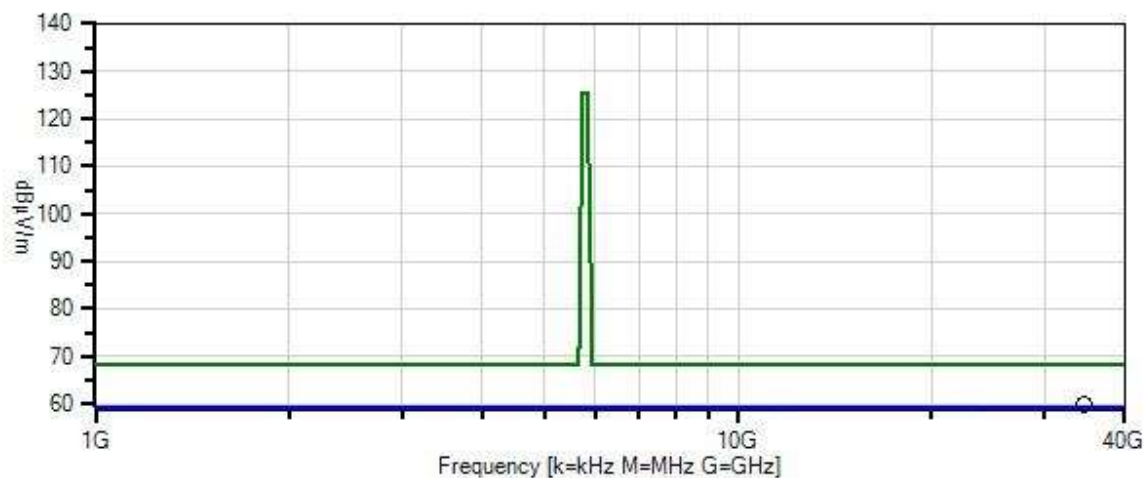
Support Equipment:

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: 5775 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
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Nalloy, LLC. WO#: 102802 Sequence#: 21 Date: 4/2/2020
15.407(b)(4) 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)(4) 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
T9	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
T10	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 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	34650.000 M	39.2	+0.0 +0.0 +2.3	+0.0 +12.4 +3.1	+0.0 +1.2	+0.0 +1.5	+0.0	59.7	68.2	-8.5	Horiz
2	23100.000 M	43.8	+0.0 +1.7 +0.0	+0.0 +9.5 +0.0	+0.0 +0.8	-15.5 +1.3	+0.0	41.6	68.2	-26.6	Horiz
3	11568.700 M	40.1	+6.6 +0.0 +0.0	+1.6 +0.0 +0.0	-13.2 +0.0	+0.0 +0.0	+0.0	35.1	68.2	-33.1	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362
 Customer: **Nalloy, LLC.**
 Specification: **15.407(b)(4) Radiated Spurious Emissions**
 Work Order #: **102802** Date: 4/2/2020
 Test Type: **Maximized Emissions** Time: 15:48:47
 Tested By: Matthew Harrison Sequence#: 25
 Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

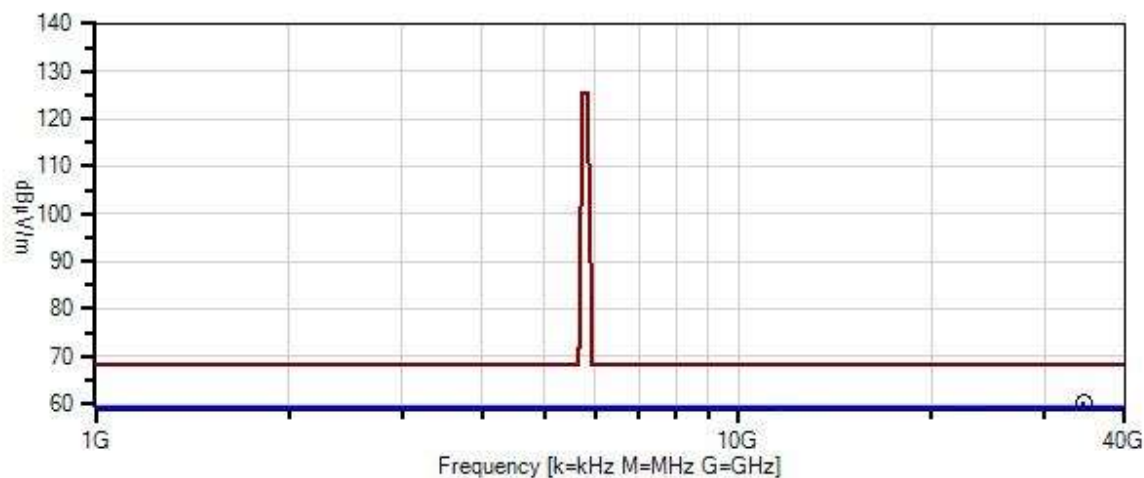
Support Equipment:

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: 5745, 5785, 5825 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

Nalloy, LLC. WO#: 102802 Sequence#: 25 Date: 4/2/2020
15.407(b)(4) 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)(4) 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
T9	AN02743	Active Horn Antenna	AMFW-5F- 260400-33-8P	4/26/2019	4/26/2021
T10	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 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	34470.000 M	40.1	+0.0 +0.0 +2.1	+0.0 +12.3 +3.1	+0.0 +1.2	+0.0 +1.5	+0.0	60.3	68.2	-7.9	Horiz
2	22980.000 M	44.7	+0.0 +1.7 +0.0	+0.0 +9.5 +0.0	+0.0 +0.8	-15.8 +1.3	+0.0	42.2	68.2	-26.0	Horiz
3	11652.040 M	45.2	+6.7 +0.0 +0.0	+1.7 +0.0 +0.0	-13.3 +0.0	+0.0 +0.0	+0.0	40.3	68.2	-27.9	Horiz
4	11572.340 M	44.1	+6.6 +0.0 +0.0	+1.6 +0.0 +0.0	-13.2 +0.0	+0.0 +0.0	+0.0	39.1	68.2	-29.1	Horiz
5	11491.830 M	43.2	+6.6 +0.0 +0.0	+1.6 +0.0 +0.0	-13.2 +0.0	+0.0 +0.0	+0.0	38.2	68.2	-30.0	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362
 Customer: **Nalloy, LLC.**
 Specification: **15.407(b)(4) Radiated Spurious Emissions**
 Work Order #: **102802** Date: 4/2/2020
 Test Type: **Maximized Emissions** Time: 15:51:58
 Tested By: Matthew Harrison Sequence#: 26
 Software: EMITest 5.03.12

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

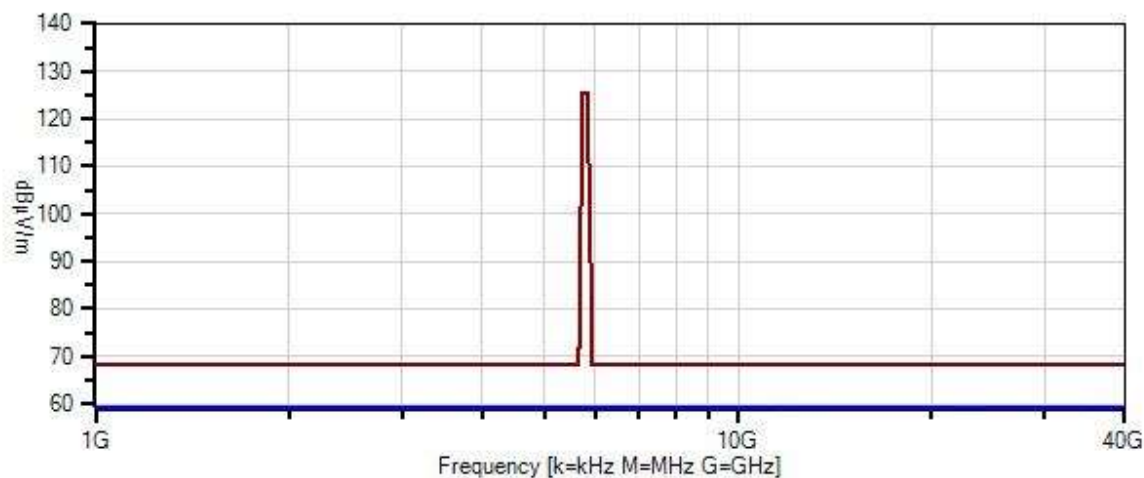
Support Equipment:

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: 5755, 5795 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
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Nalloy, LLC. WO#: 102802 Sequence#: 26 Date: 4/2/2020
15.407(b)(4) 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)(4) 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
T9	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.

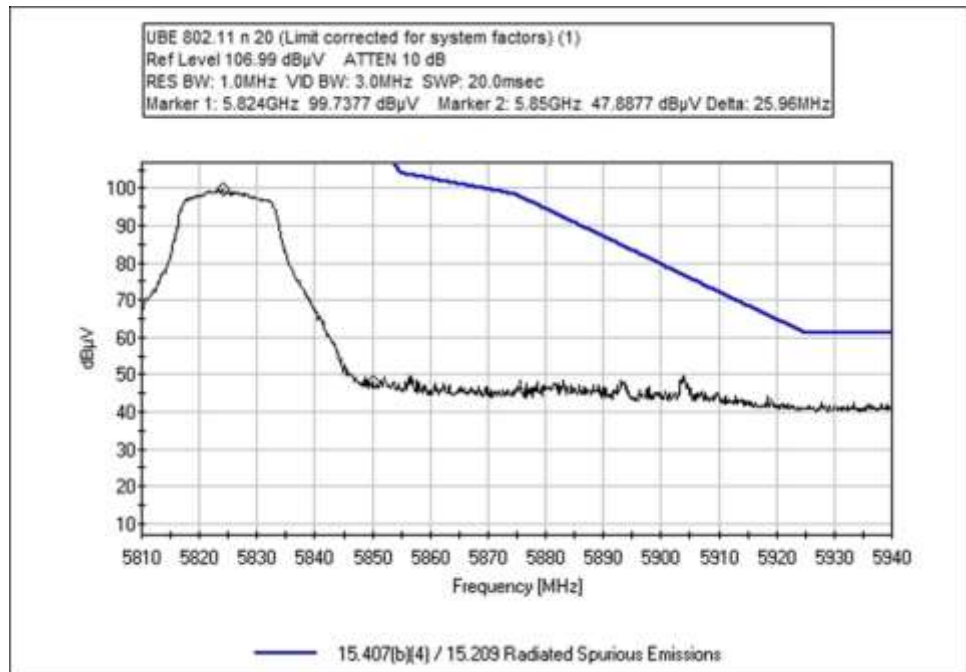
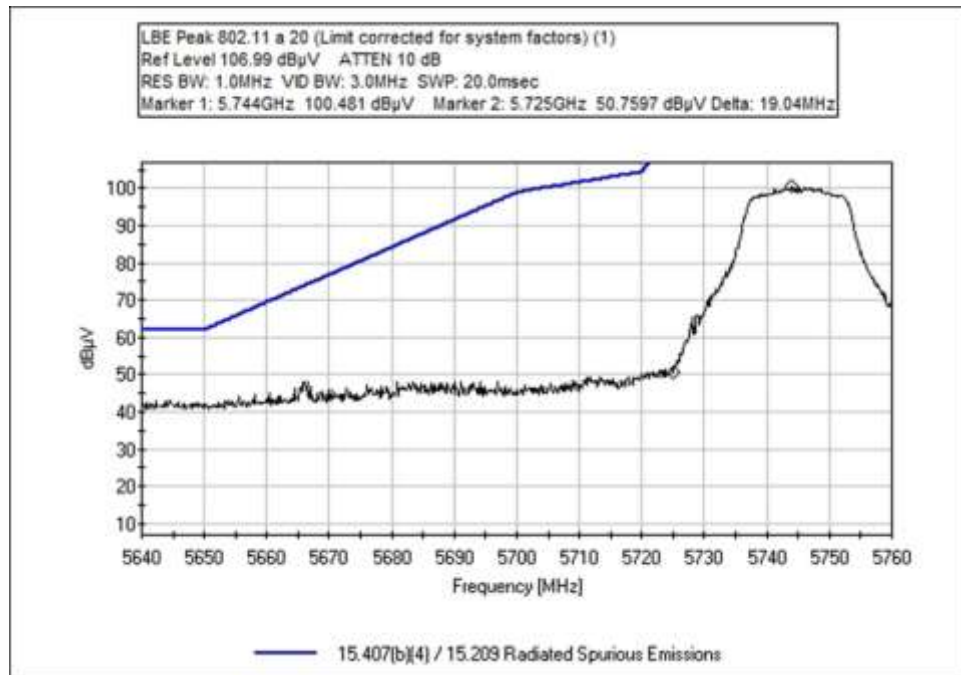
Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	34530.000 M	40.3	+0.0 +0.0 +2.1	+0.0 +12.3	+0.0 +1.2	+0.0 +1.5	+0.0	57.4	68.2	-10.8	Horiz
2	23020.000 M	45.3	+0.0 +1.7 +0.0	+0.0 +9.5	+0.0 +0.8	-15.7 +1.3	+0.0	42.9	68.2	-25.3	Horiz
3	11590.100 M	43.8	+6.6 +0.0 +0.0	+1.6 +0.0	-13.2 +0.0	+0.0 +0.0	+0.0	38.8	68.2	-29.4	Horiz
4	11497.400 M	42.0	+6.6 +0.0 +0.0	+1.6 +0.0	-13.2 +0.0	+0.0 +0.0	+0.0	37.0	68.2	-31.2	Horiz

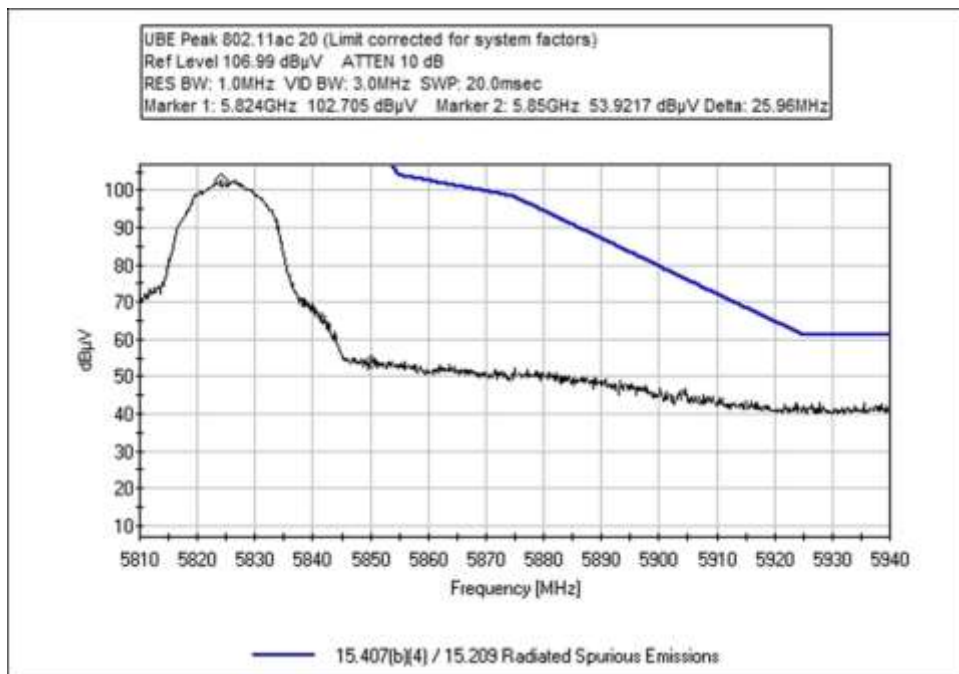
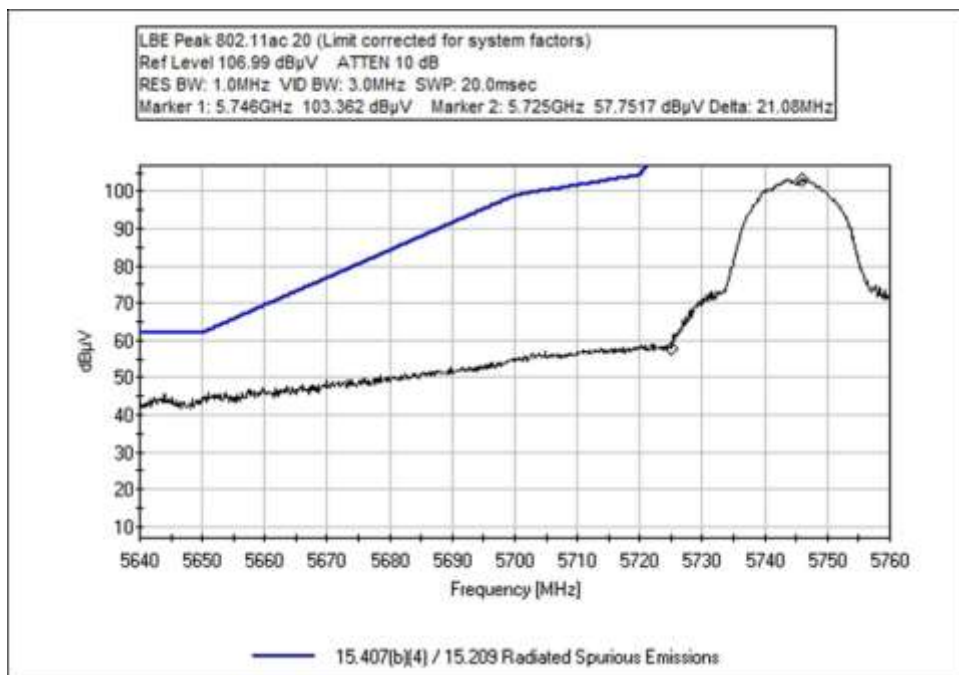
Band Edge Summary					
Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
5725	802.11a	Linear Polarized / 5.9dBi	57.2	<122.2	Pass
5850	802.11a	Linear Polarized / 5.9dBi	54.6	<122.2	Pass
5725	802.11n20	Linear Polarized / 5.9dBi	61.9	<122.2	Pass
5850	802.11n20	Linear Polarized / 5.9dBi	59.3	<122.2	Pass
5725	802.11n40	Linear Polarized / 5.9dBi	63.7	<122.2	Pass
5850	802.11n40	Linear Polarized / 5.9dBi	61.9	<122.2	Pass
5725	802.11ac20	Linear Polarized / 5.9dBi	64.2	<122.2	Pass
5850	802.11ac20	Linear Polarized / 5.9dBi	60.6	<122.2	Pass
5725	802.11ac40	Linear Polarized / 5.9dBi	64	<122.2	Pass
5850	802.11ac40	Linear Polarized / 5.9dBi	61.3	<122.2	Pass
5725	802.11ac80	Linear Polarized / 5.9dBi	64	<122.2	Pass
5850	802.11ac80	Linear Polarized / 5.9dBi	63.6	<122.2	Pass

Band Edge

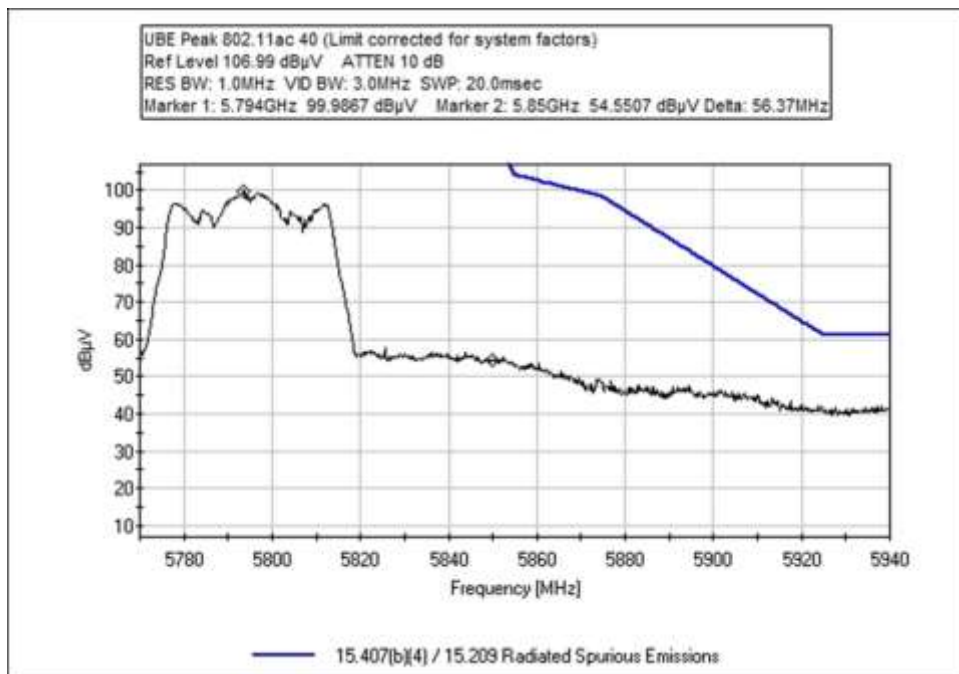
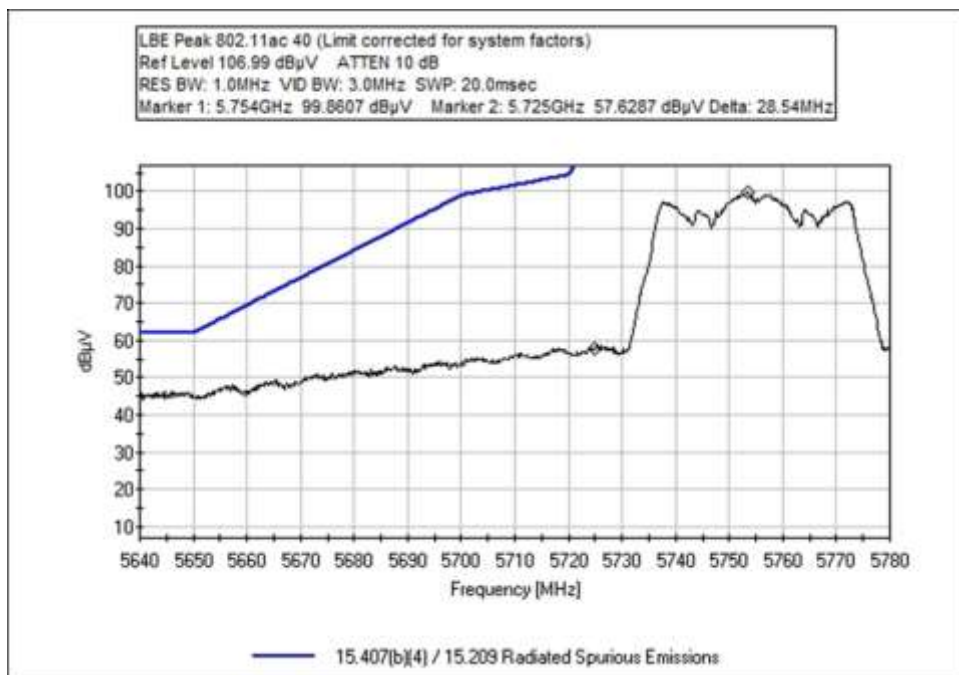
802.11a Plots



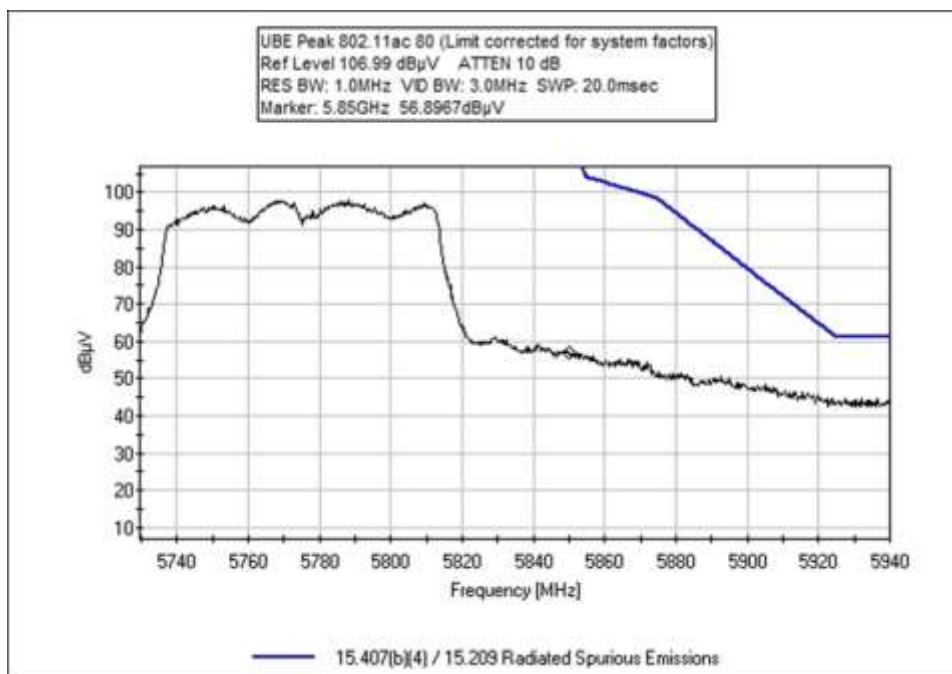
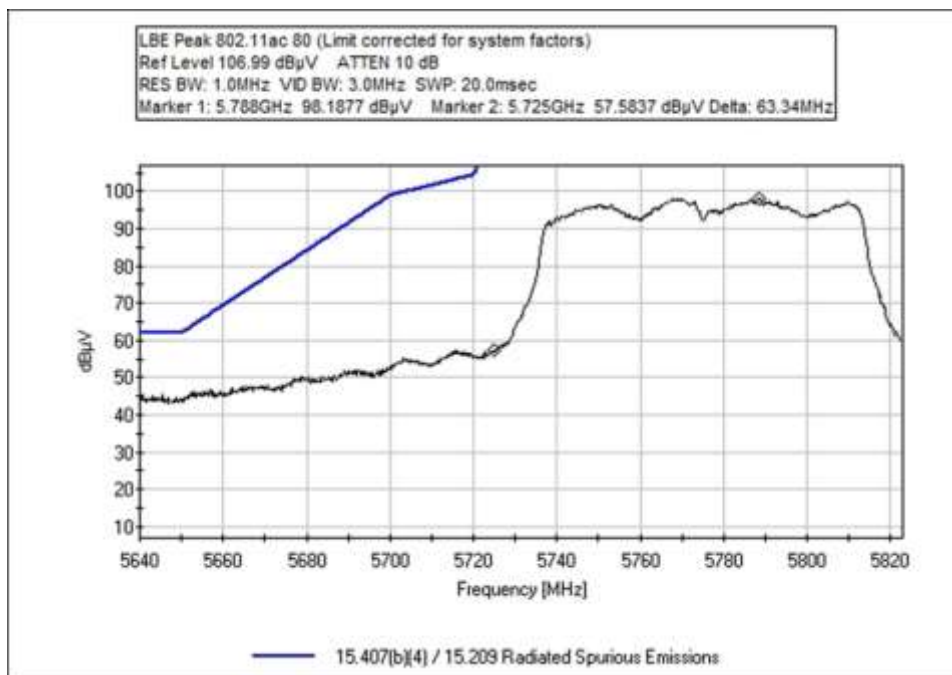
802.11ac20 Plots



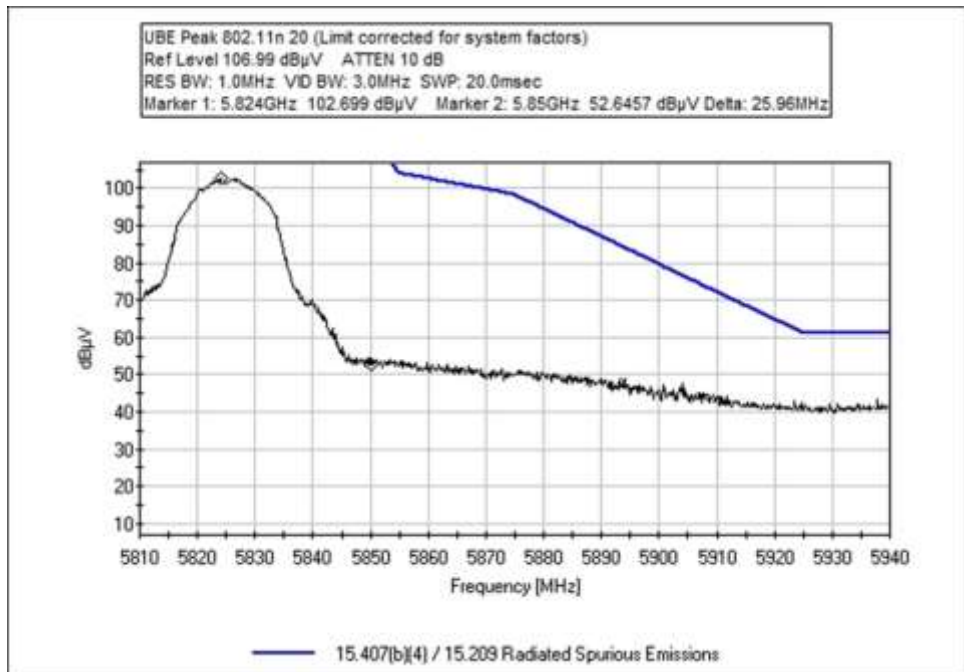
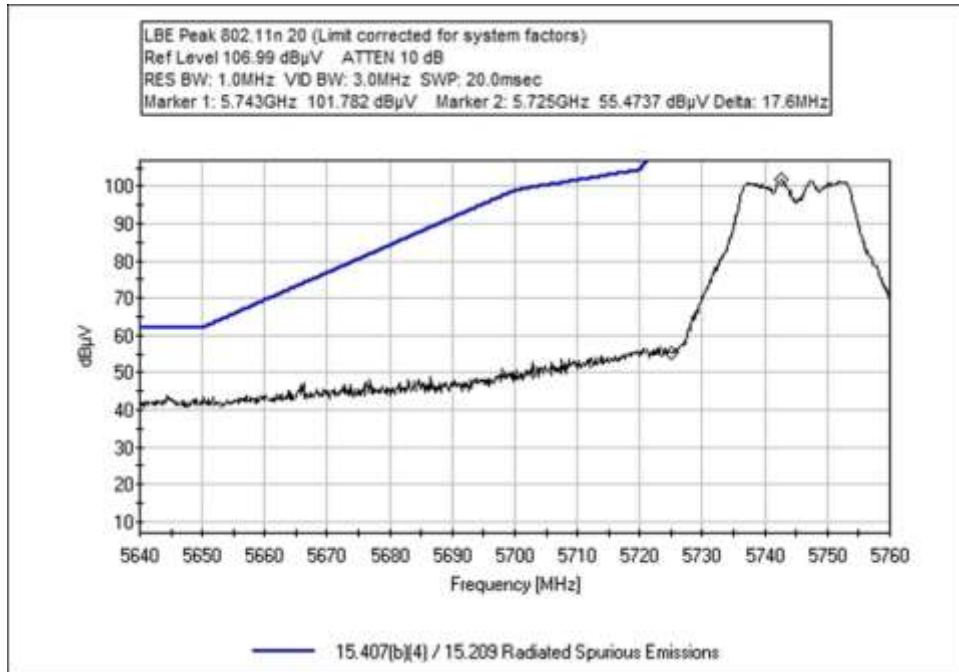
802.11ac40 Plots



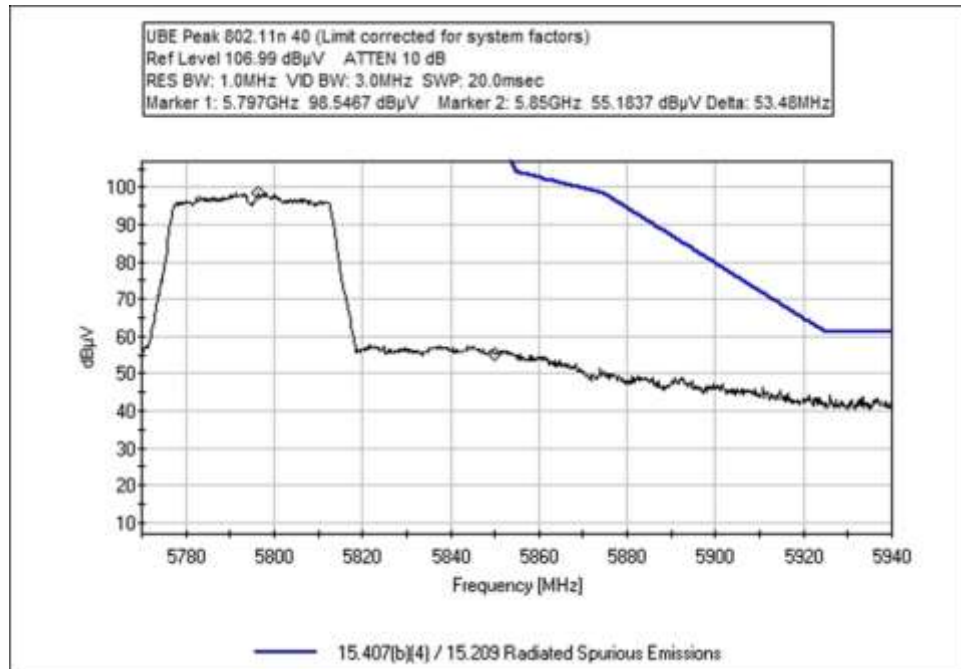
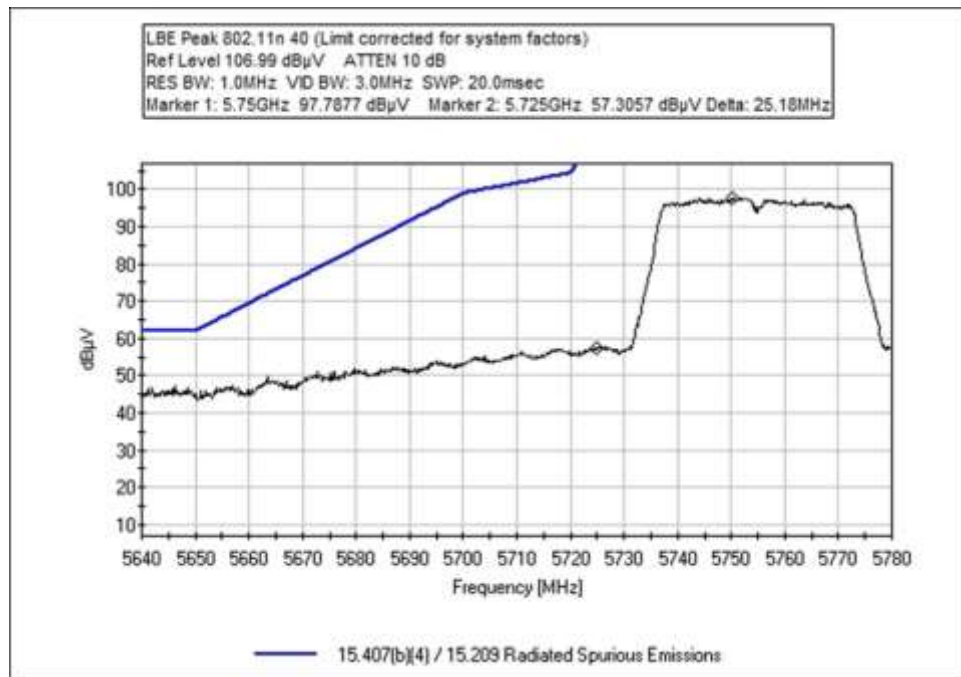
802.11ac80 Plots



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)(4) / 15.209 Radiated Spurious Emissions**
 Work Order #: **102802** Date: 3/20/2020
 Test Type: **Maximized Emissions** Time: 08:16:40
 Tested By: Matthew Harrison Sequence#: 15
 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: 5640-5940 MHz Frequency tested: 5745, 5825 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	Heliast	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliast	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	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	5743.920M	100.7	+34.1 -33.7	+4.5 +0.5	+1.0	+0.0	+0.0 265	107.1	131.2	-24.1	Horiz 180
2	5824.040M	99.7	+34.4 -33.8	+4.6 +0.5	+1.0	+0.0	+0.0 260	106.4	131.2	-24.8	Horiz 180
3	5725.000M	50.8	+34.1 -33.7	+4.5 +0.5	+1.0	+0.0	+0.0	57.2	122.2	-65.0	Horiz
4	5850.000M	47.9	+34.4 -33.8	+4.6 +0.5	+1.0	+0.0	+0.0	54.6	122.2	-67.6	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362
 Customer: **Nalloy, LLC.**
 Specification: **15.407(b)(4) / 15.209 Radiated Spurious Emissions**
 Work Order #: **102802** Date: 3/20/2020
 Test Type: **Maximized Emissions** Time: 09:32:13
 Tested By: Matthew Harrison Sequence#: 17
 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: 5640-5940 MHz Frequency tested: 5745, 5825 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

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	Heliast	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliast	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T4	AN03540	Preamplifier	83017A	5/13/2019	5/13/2021
T5	ANP07504	Cable	CLU40- KMKM-02.00F	1/17/2019	1/17/2021

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	5746.080M	103.4	+34.2 +0.5	+4.6	+1.0	-33.7	+0.0	110.0	131.2	-21.2	Horiz
2	5824.040M	102.7	+34.4 +0.5	+4.6	+1.0	-33.8	+0.0	109.4	131.2	-21.8	Horiz
3	5725.000M	57.8	+34.1 +0.5	+4.5	+1.0	-33.7	+0.0	64.2	122.2	-58.0	Horiz
4	5850.000M	53.9	+34.4 +0.5	+4.6	+1.0	-33.8	+0.0	60.6	122.2	-61.6	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362
 Customer: **Nalloy, LLC.**
 Specification: **15.407(b)(4) / 15.209 Radiated Spurious Emissions**
 Work Order #: **102802** Date: 3/20/2020
 Test Type: **Maximized Emissions** Time: 09:53:34
 Tested By: Matthew Harrison Sequence#: 18
 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: 5640-5940 MHz Frequency tested: 5755, 5795 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. 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	Heliast	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliast	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T4	AN03540	Preamplifier	83017A	5/13/2019	5/13/2021
T5	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 dB	T3 dB	T4 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5793.630M	100.0	+34.3 +0.5	+4.6	+1.0	-33.8	+0.0	106.6	131.2	-24.6	Horiz
2	5753.540M	99.9	+34.2 +0.5	+4.6	+1.0	-33.7	+0.0	106.5	131.2	-24.7	Horiz
3	5725.000M	57.6	+34.1 +0.5	+4.5	+1.0	-33.7	+0.0	64.0	122.2	-58.2	Horiz
4	5850.000M	54.6	+34.4 +0.5	+4.6	+1.0	-33.8	+0.0	61.3	122.2	-60.9	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362
 Customer: **Nalloy, LLC.**
 Specification: **15.407(b)(4) / 15.209 Radiated Spurious Emissions**
 Work Order #: **102802** Date: 3/20/2020
 Test Type: **Maximized Emissions** Time: 10:41:39
 Tested By: Matthew Harrison Sequence#: 20
 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: 5640-5940 MHz Frequency tested: 5775 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

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	5788.340M	98.2	+34.3 -33.8	+4.6 +0.5	+1.0	+0.0	+0.0 125	104.8	131.2	-26.4	Horiz 200
2	5725.000M	57.6	+34.1 -33.7	+4.5 +0.5	+1.0	+0.0	+0.0	64.0	122.2	-58.2	Horiz
3	5850.000M	56.9	+34.4 -33.8	+4.6 +0.5	+1.0	+0.0	+0.0	63.6	122.2	-58.6	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362
 Customer: **Nalloy, LLC.**
 Specification: **15.407(b)(4) / 15.209 Radiated Spurious Emissions**
 Work Order #: **102802** Date: 3/20/2020
 Test Type: **Maximized Emissions** Time: 09:08:05
 Tested By: Matthew Harrison Sequence#: 16
 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: 5640-5940 MHz Frequency tested: 5745, 5825 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
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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	Heliast	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliast	8/23/2019	8/23/2021
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T4	AN03540	Preamplifier	83017A	5/13/2019	5/13/2021
T5	ANP07504	Cable	CLU40- KMKM-02.00F	1/17/2019	1/17/2021

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	5824.040M	102.7	+34.4 +0.5	+4.6	+1.0	-33.8	+0.0	109.4	131.2	-21.8	Horiz
2	5742.600M	101.8	+34.1 +0.5	+4.5	+1.0	-33.7	+0.0	108.2	131.2	-23.0	Horiz
3	5725.000M	55.5	+34.1 +0.5	+4.5	+1.0	-33.7	+0.0	61.9	122.2	-60.3	Horiz
4	5850.000M	52.6	+34.4 +0.5	+4.6	+1.0	-33.8	+0.0	59.3	122.2	-62.9	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362
 Customer: **Nalloy, LLC.**
 Specification: **15.407(b)(4) / 15.209 Radiated Spurious Emissions**
 Work Order #: **102802** Date: 3/20/2020
 Test Type: **Maximized Emissions** Time: 10:06:43
 Tested By: Matthew Harrison Sequence#: 19
 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: 5640-5940 MHz Frequency tested: 5755, 5795 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
	AN02872	Spectrum Analyzer	E4440A	11/18/2019	11/18/2021
T4	AN03540	Preamp	83017A	5/13/2019	5/13/2021
T5	ANP07504	Cable	CLU40-KMKM-02.00F	1/17/2019	1/17/2021

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	5796.520M	98.5	+34.3 +0.5	+4.6	+1.0	-33.8	+0.0	105.1	131.2	-26.1	Horiz
2	5750.180M	97.8	+34.2 +0.5	+4.6	+1.0	-33.7	+0.0	104.4	131.2	-26.8	Horiz
3	5725.000M	57.3	+34.1 +0.5	+4.5	+1.0	-33.7	+0.0	63.7	122.2	-58.5	Horiz
4	5850.000M	55.2	+34.4 +0.5	+4.6	+1.0	-33.8	+0.0	61.9	122.2	-60.3	Horiz

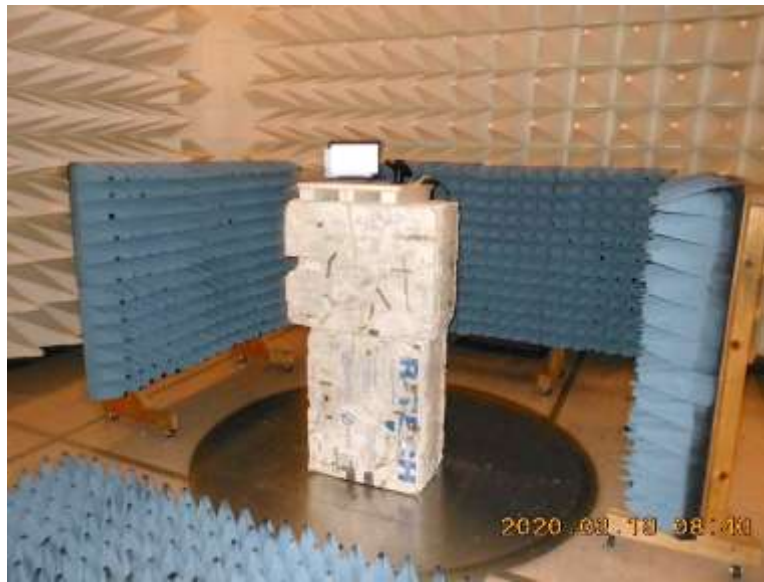
Test Setup Photo(s)



Below 1GHz



Below 1GHz



Above 1GHz



Above 1GHz

15.207 AC Conducted Emissions

Test 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: 08:08:31
 Tested By: Matthew Harrison Sequence#: 88
 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: 5745 MHz
 Firmware power setting: 14 dBm
 EUT Firmware:
 Protocol /MCS/Modulation: 802.11a, 20MHz BW, 6Mbps(worst-case)

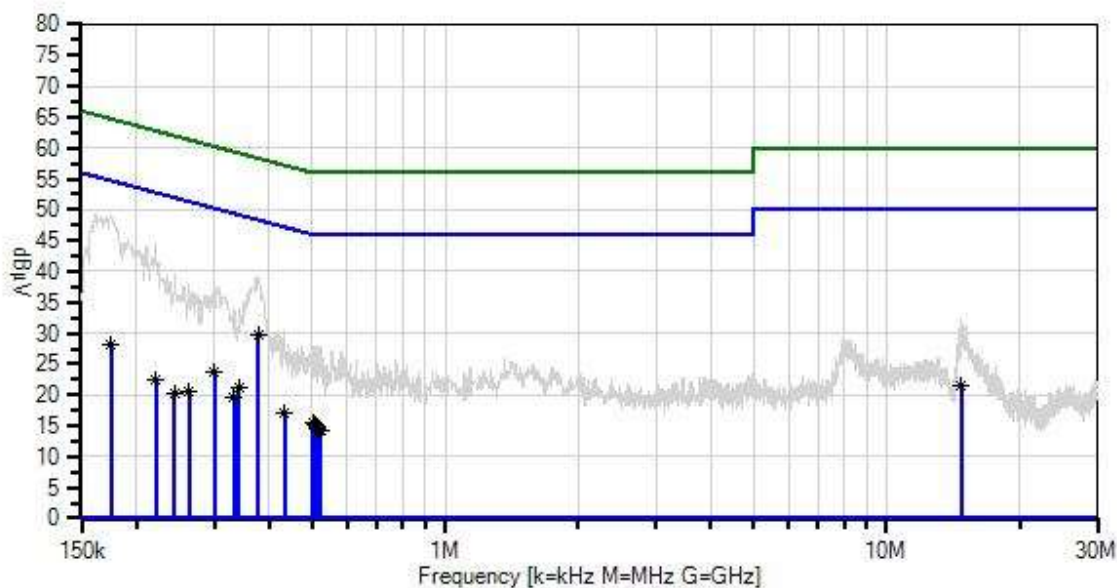
Antenna type: Linear Polarized
 Antenna Gain: 5.9 dBi.

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#: 88 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	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V	dB μ V	dB	Ant
1	378.343k	19.7	+9.1	+0.0	+0.0	-0.6	+0.0	29.6	48.3	-18.7	Line
	Ave		+0.2								
^	378.342k	30.4	+9.1	+0.0	+0.0	-0.6	+0.0	40.3	48.3	-8.0	Line
			+0.2								
3	299.804k	13.9	+9.1	+0.0	+0.0	-0.7	+0.0	23.8	50.2	-26.4	Line
	Ave		+0.1								
^	299.804k	31.8	+9.1	+0.0	+0.0	-0.7	+0.0	41.7	50.2	-8.5	Line
			+0.1								
5	174.725k	17.0	+9.1	+0.0	+0.0	-1.5	+0.0	28.0	54.7	-26.7	Line
	Ave		+0.4								
^	174.725k	41.1	+9.1	+0.0	+0.0	-1.5	+0.0	52.1	54.7	-2.6	Line
			+0.4								
7	341.255k	11.5	+9.1	+0.0	+0.0	-0.6	+0.0	21.3	49.2	-27.9	Line
	Ave		+0.1								
^	341.255k	25.3	+9.1	+0.0	+0.0	-0.6	+0.0	35.1	49.2	-14.1	Line
			+0.1								
9	14.725M	11.2	+9.1	+0.2	+0.1	-0.6	+0.0	21.4	50.0	-28.6	Line
	Ave		+0.2								
^	14.725M	23.2	+9.1	+0.2	+0.1	-0.6	+0.0	33.4	50.0	-16.6	Line
			+0.2								
11	332.529k	9.8	+9.1	+0.0	+0.0	-0.6	+0.0	19.6	49.4	-29.8	Line
	Ave		+0.1								
^	332.528k	25.6	+9.1	+0.0	+0.0	-0.6	+0.0	35.4	49.4	-14.0	Line
			+0.1								
13	432.156k	7.3	+9.1	+0.1	+0.0	-0.5	+0.0	17.2	47.2	-30.0	Line
	Ave		+0.2								
^	432.155k	21.4	+9.1	+0.1	+0.0	-0.5	+0.0	31.3	47.2	-15.9	Line
			+0.2								
15	221.266k	12.0	+9.1	+0.0	+0.0	-1.1	+0.0	22.5	52.8	-30.3	Line
	Ave		+0.3								
^	221.266k	36.3	+9.1	+0.0	+0.0	-1.1	+0.0	46.8	52.8	-6.0	Line
			+0.3								
17	501.968k	5.9	+9.1	+0.0	+0.0	-0.4	+0.0	15.6	46.0	-30.4	Line
	Ave		+0.2								
^	501.967k	19.0	+9.1	+0.0	+0.0	-0.4	+0.0	28.7	46.0	-17.3	Line
			+0.2								
19	507.785k	5.6	+9.1	+0.0	+0.0	-0.4	+0.0	15.3	46.0	-30.7	Line
	Ave		+0.2								
^	507.785k	19.1	+9.1	+0.0	+0.0	-0.4	+0.0	28.8	46.0	-17.2	Line
			+0.2								
21	262.717k	10.4	+9.1	+0.0	+0.0	-0.8	+0.0	20.5	51.3	-30.8	Line
	Ave		+0.2								
^	262.716k	29.4	+9.1	+0.0	+0.0	-0.8	+0.0	39.5	51.3	-11.8	Line
			+0.2								
23	515.785k	4.9	+9.1	+0.0	+0.0	-0.4	+0.0	14.6	46.0	-31.4	Line
	Ave		+0.2								

24	243.810k	10.1	+9.1 +0.2	+0.0	+0.0	-0.9	+0.0	20.3	52.0	-31.7	Line
^	243.809k	31.3	+9.1 +0.2	+0.0	+0.0	-0.9	+0.0	41.5	52.0	-10.5	Line
26	518.693k	4.6	+9.1 +0.2	+0.0	+0.0	-0.4	+0.0	14.3	46.0	-31.7	Line
^	515.784k	19.0	+9.1 +0.2	+0.0	+0.0	-0.4	+0.0	28.7	46.0	-17.3	Line
28	522.329k	4.5	+9.1 +0.2	+0.0	+0.0	-0.4	+0.0	14.2	46.0	-31.8	Line
^	522.329k	19.0	+9.1 +0.2	+0.0	+0.0	-0.4	+0.0	28.7	46.0	-17.3	Line
^	518.693k	18.6	+9.1 +0.2	+0.0	+0.0	-0.4	+0.0	28.3	46.0	-17.7	Line



Test Location: CKC Laboratories, Inc. • 22116 23rd Dr SE • Bothell, WA 98021 • 800-500-4362
 Customer: **Nalloy, LLC.**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **102802** Date: 4/1/2020
 Test Type: **Conducted Emissions** Time: 08:16:45
 Tested By: Matthew Harrison Sequence#: 89
 Software: EMITest 5.03.12 120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

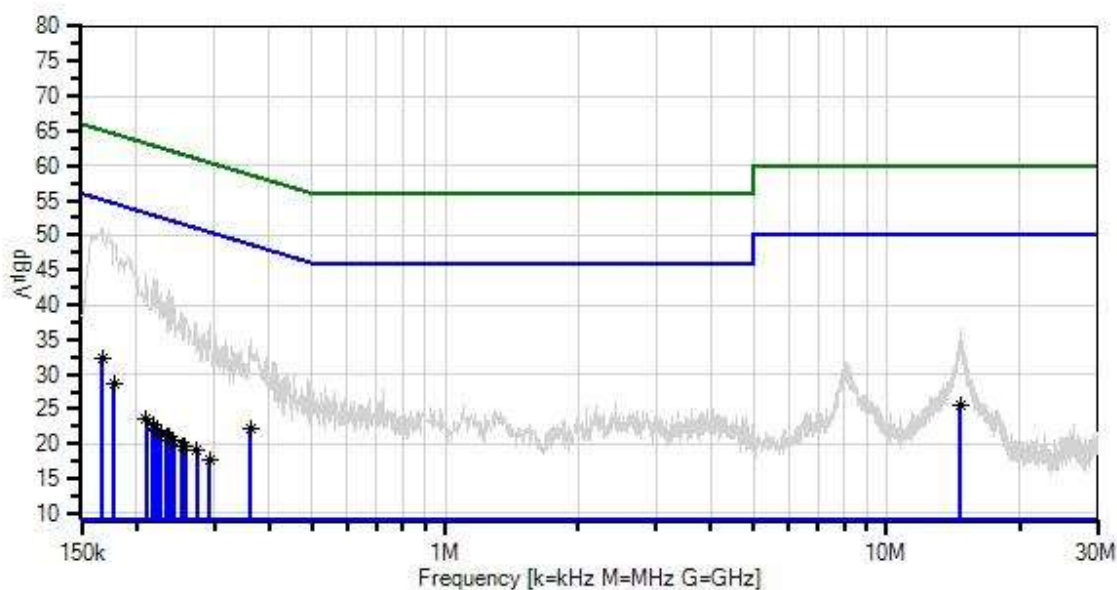
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 22° C Humidity: 28% Frequency Range: 150kHz-30MHz Frequency tested: 5745 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#: 89 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 MHz	Rdng dB μ V	T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	167.452k	21.4	+9.1	+0.0	+0.0	-1.5	+0.0	32.4	55.1	-22.7	Neutr
	Ave		+0.4								
^	167.451k	43.1	+9.1	+0.0	+0.0	-1.5	+0.0	54.1	55.1	-1.0	Neutr
			+0.4								
3	14.716M	15.3	+9.1	+0.2	+0.1	-0.6	+0.0	25.5	50.0	-24.5	Neutr
	Ave		+0.2								
^	14.716M	27.6	+9.1	+0.2	+0.1	-0.6	+0.0	37.8	50.0	-12.2	Neutr
			+0.2								
5	177.633k	17.9	+9.1	+0.0	+0.0	-1.4	+0.0	28.8	54.6	-25.8	Neutr
	Ave		+0.4								
^	177.632k	40.6	+9.1	+0.0	+0.0	-1.4	+0.0	51.5	54.6	-3.1	Neutr
			+0.4								
7	362.343k	12.4	+9.1	+0.0	+0.0	-0.6	+0.0	22.2	48.7	-26.5	Neutr
	Ave		+0.1								
^	362.343k	26.5	+9.1	+0.0	+0.0	-0.6	+0.0	36.3	48.7	-12.4	Neutr
			+0.1								
9	210.357k	13.1	+9.1	+0.0	+0.0	-1.1	+0.0	23.6	53.2	-29.6	Neutr
	Ave		+0.3								
^	210.357k	36.2	+9.1	+0.0	+0.0	-1.1	+0.0	46.7	53.2	-6.5	Neutr
			+0.3								
11	218.356k	12.1	+9.1	+0.0	+0.0	-1.1	+0.0	22.6	52.9	-30.3	Neutr
	Ave		+0.3								
12	221.992k	11.4	+9.1	+0.0	+0.0	-1.0	+0.0	21.8	52.7	-30.9	Neutr
	Ave		+0.3								
^	218.356k	35.5	+9.1	+0.0	+0.0	-1.1	+0.0	46.0	52.9	-6.9	Neutr
			+0.3								
^	221.992k	35.2	+9.1	+0.0	+0.0	-1.0	+0.0	45.6	52.7	-7.1	Neutr
			+0.3								
15	237.264k	10.9	+9.1	+0.0	+0.0	-0.9	+0.0	21.1	52.2	-31.1	Neutr
	Ave		+0.2								
16	234.355k	10.9	+9.1	+0.0	+0.0	-0.9	+0.0	21.1	52.3	-31.2	Neutr
	Ave		+0.2								
^	237.263k	33.9	+9.1	+0.0	+0.0	-0.9	+0.0	44.1	52.2	-8.1	Neutr
			+0.2								
^	234.354k	32.9	+9.1	+0.0	+0.0	-0.9	+0.0	43.1	52.3	-9.2	Neutr
			+0.2								
19	227.083k	10.9	+9.1	+0.0	+0.0	-1.0	+0.0	21.3	52.6	-31.3	Neutr
	Ave		+0.3								
^	227.082k	33.1	+9.1	+0.0	+0.0	-1.0	+0.0	43.5	52.6	-9.1	Neutr
			+0.3								
21	242.354k	10.3	+9.1	+0.0	+0.0	-0.9	+0.0	20.5	52.0	-31.5	Neutr
	Ave		+0.2								
^	242.354k	32.9	+9.1	+0.0	+0.0	-0.9	+0.0	43.1	52.0	-8.9	Neutr
			+0.2								

23	258.353k	9.6	+9.1	+0.0	+0.0	-0.8	+0.0	19.7	51.5	-31.8	Neutr
	Ave		+0.2								
^	258.352k	29.7	+9.1	+0.0	+0.0	-0.8	+0.0	39.8	51.5	-11.7	Neutr
			+0.2								
25	273.624k	9.2	+9.1	+0.0	+0.0	-0.8	+0.0	19.2	51.0	-31.8	Neutr
	Ave		+0.1								
^	273.624k	29.0	+9.1	+0.0	+0.0	-0.8	+0.0	39.0	51.0	-12.0	Neutr
			+0.1								
27	253.262k	9.6	+9.1	+0.0	+0.0	-0.8	+0.0	19.7	51.6	-31.9	Neutr
	Ave		+0.2								
^	253.262k	30.4	+9.1	+0.0	+0.0	-0.8	+0.0	40.5	51.6	-11.1	Neutr
			+0.2								
29	292.531k	7.9	+9.1	+0.0	+0.0	-0.7	+0.0	17.8	50.5	-32.7	Neutr
	Ave		+0.1								
^	292.531k	28.8	+9.1	+0.0	+0.0	-0.7	+0.0	38.7	50.5	-11.8	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	(dB/m)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(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.