RF TEST REPORT

SIEMIC
A Bureau Veritas Group Company

Report No.: FCC_SL17063001-RUC-018A2_W52W58
Supersede Report No.:

Applicant	:	Ruckus Wireless, Inc.
Product Name	:	T310 (N/S) Access Point
Model No.	:	T310
Test Standard	:	47 CFR 15.407
Test Method	:	ANSI C63.4: 2014 789033 D02 General UNII Test Procedures New Rules v01r02
FCC ID	:	S9GT310NS
IC ID	:	5912A-T310NS
Dates of test	:	11/11/2017-11/21/2017
Issue Date	:	11/28/2017
Test Result	:	☒ Pass ☐ Fail
Equipment complied with the specification [X] Equipment did not comply with the specification [ ]		

This Test Report is Issued Under the Authority of:	
	
Cipher	Chen Ge
Test Engineer	Engineer Reviewer
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only	

Issued By:
SIEMIC Laboratories
775 Montague Expressway, Milpitas, 95035 CA

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ACCREDITED
TESTING CERT # 2742-01

Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC, RF/Wireless, Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless, Telecom
Taiwan	BSMI, NCC, NIST	EMC, RF, Telecom, Safety
Hong Kong	OFTA, NIST	RF/Wireless, Telecom
Australia	NATA, NIST	EMC, RF, Telecom, Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF, Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC, RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom, Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC, RF, Telecom
Canada	IC FCB, NIST	EMC, RF, Telecom
Singapore	iDA, NIST	EMC, RF, Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC (RCB 208)	RF, Telecom
Hong Kong	OFTA (US002)	RF, Telecom

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_SL17063001-RUC-018A2_W52W58	None	Original	11/28/2017

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: Ruckus Wireless, Inc.
Product: T310 (N/S) Access Point
Model: T310

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

Applicant Name	:	Ruckus Wireless, Inc.
Applicant Address	:	350 West Java Drive, Sunnyvale, California 94089 U.S.A
Manufacturer Name	:	Ruckus Wireless, Inc.
Manufacturer Address	:	350 West Java Drive, Sunnyvale, California 94089 U.S.A

4 Test site information

Lab performing tests	SIEMIC Laboratories
Lab Address	775 Montague Expressway, Milpitas, CA 95035
FCC Test Site No.	881796
IC Test Site No.	4842D-2
VCCI Test Site No.	A0133

5 Modification

Index	Item	Description	Note
-	-	-	-

6 EUT Information

6.1 EUT Description

Product Name	T310 (N/S) Access Point
Model No.	T310
Trade Name	Ruckus
Serial No.	431706000021
Host Model No.	N/A
Input Power	100-240VAC 50/60Hz
Power Adapter Manu/Model	HK-AD-120A100-US
Power Adapter SN	N/A
Date of EUT received	11/10/2017
Equipment Class/ Category	DTS, UNII
Port/Connectors	PoE, Ethernet

6.2 Radio Description

Radio Type	802.11a	802.11n-20M	802.11n-40M	802.11ac-80M
Operating Frequency	5180-5240MHz 5745-5825MHz	5180-5240MHz 5745-5825MHz	5190-5230MHz 5755-5795MHz	5210MHz 5775MHz
Modulation	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Channel Spacing	20MHz	20MHz	40MHz	80MHz
Number of Channels	9	9	4	2
Antenna Type	T310S: Internal dipole array T310N: Internal patch array			
Antenna Gain (Peak)	T310S: 5G: Highest Gain 8dBi T310N: 5G: 12.6dBi for Vertical 13.5dBi for Horizontal			
Antenna Connector Type	U.FL			
Note	T310S: Tow chains for 5G, both can be Vertical and Horizontal T310N: Tow chains for 5G, one for Vertical and one for Horizontal			

EUT Power level setting

T310N

Mode	Frequency	ART Power Setting
802.11-a	5180	39
802.11-a	5200	39
802.11-a	5240	39
802.11-n-20	5180	39
802.11-n-20	5200	39
802.11-n-20	5240	39
802.11-n-40	5190	36
802.11-n-40	5230	40
802.11-ac-80	5210	34
802.11-a	5745	38
802.11-a	5785	38
802.11-a	5825	40
802.11-n-20	5745	38
802.11-n-20	5785	39
802.11-n-20	5825	40
802.11-n-40	5755	35
802.11-n-40	5795	36
802.11-ac-80	5775	35

T310S

Mode	Frequency	ART Power Setting
802.11-a	5180	44
802.11-a	5200	44
802.11-a	5240	44
802.11-n-20	5180	44
802.11-n-20	5200	44
802.11-n-20	5240	44
802.11-n-40	5190	40
802.11-n-40	5230	40
802.11-ac-80	5210	40
802.11-a	5745	40
802.11-a	5785	40
802.11-a	5825	42
802.11-n-20	5745	40
802.11-n-20	5785	42
802.11-n-20	5825	42
802.11-n-40	5755	36
802.11-n-40	5795	40
802.11-ac-80	5775	36

T310S Beamforming Mode

Mode	Frequency	ART Power Setting
802.11-a	5180	43
802.11-n-20	5180	42
802.11-n-40	5190	38
802.11-ac-80	5210	39

Note:T310N power setting for Beamforming and Non-Beamforming modes are same,T310S power setting for Beamforming and Non-Beamforming modes just list 4 channels is different, other channels are same.

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	VOSTRO 1520	26543939185	Dell	-

7.2 Cabling Description

Item	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
1	EUT	RJ45	Power Over Ethernet Injector	RJ45	>3m	N/A	-
2	Laptop	RJ45	Power Over Ethernet Injector	RJ45	>3m	N/A	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Command prompt	Set the EUT to transmit continuously in diferent test modes and channels

8 Test Summary

Test Item	Test standard		Test Method/Procedure	Pass / Fail
Restricted Band of Operation	FCC	15.205	ANSI C63.4 – 2014 789033 D02 General UNII Test Procedures New Rules v01r02	☒ Pass ☐ N/A
AC Conducted Emissions Voltage	FCC	15.207(a)	ANSI C63.4 – 2014	☒ Pass ☐ N/A
Antenna requirement	FCC	15.203	15.203	☒ Pass ☐ N/A

Test Item	Test standard		Test Method/Procedure	Pass / Fail
26 & 6 dB Emission Bandwidth	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01r02	☒ Pass ☐ N/A
Maximum conducted Output Power	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01r02	☒ Pass ☐ N/A
Power reduction (Antenna Gain > 6 dBi)	FCC	15.407 (a) (2)	-	☐ Pass ☒ N/A
Band Edge and Radiated Spurious Emissions	FCC	15.407(b)(2), 15.407(b)(6)	ANSI C63.4 – 2014 789033 D02 General UNII Test Procedures New Rules v01r02	☒ Pass ☐ N/A
Power Spectral Density	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01r02	☒ Pass ☐ N/A
Frequency Stability	FCC	15.407 (g)	-	☐ Pass ☒ N/A
Transmit Power Control (TPC)	FCC	15.407 (h)(1)	-	☐ Pass ☒ N/A
User Manual	FCC	-	-	☒ Pass ☐ N/A
Remark	1. All measurement uncertainties are not taken into consideration for all presented test result. 2. The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual.			

9 Measurement Uncertainty

9.1 Conducted Emissions

The test is to measure the conducted emissions to the mains port of the EUT.
Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the LISN
- Uncertainty of cables
- Uncertainty due to the mismatches
- Etc, see the below table for details

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
LISN Insertion Loss	0.40	Normal	2	1	0.20
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch LISN - Receiver	0.25	U-Shape	1.414	1	0.1768033
LISN Impedance	2.5	Triangular	2.449	1	1.0208248
Combined Standard Uncertainty					1.928133
Expanded Uncertainty (K=2)					3.856266

The total derived measurement uncertainty is +/- 3.86 dB.

9.2 Radiated Emissions (30MHz to 1GHz)

The test is to measure the radiated emissions of the EUT.
Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- NSA Calibration
- Etc., details see the below table

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
Antenna Factor	0.65	Normal	2	1	0.325
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
NSA Calibration	4.0	U-Shape	1.414	1	2.8288543
Combined Standard Uncertainty					3.0059131
Expanded Uncertainty (K=2)					6.0118262

The total derived measurement uncertainty is +/- 6.00 dB.

9.3 Radiated Emissions (1GHz to 40GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- VSWR Calibration
- Etc., details see the below table

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.0692840
Cable Insertion Loss	0.21	Normal	2	1	0.1050000
Filter Insertion Loss	0.25	Normal	2	1	0.1250000
Antenna Factor	0.65	Normal	2	1	0.3250000
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.8660508
PRF Response	1.5	Rectangular	1.732	1	0.8660508
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
VSWR Calibration	2.0	U-Shape	1.414	1	1.4144272
Combined Standard Uncertainty					4.2363
Expanded Uncertainty (K=2)					8.4726

The total derived measurement uncertainty is +/- 8.47 dB.

9.4 RF conducted measurement

The test is to measure the RF output power from the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the Reference Level Uncertainty
- Uncertainty of variable attenuators
- Uncertainty of cables
- Uncertainty due to the mismatches

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Reference Level	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Attenuator	0.25	Normal	2	1	0.125
Mismatch	0.25	U-Shape	1.414	1	0.1768033
Combined Standard Uncertainty					0.476087
Expanded Uncertainty (K=2)					0.952174

The total derived measurement uncertainty is +/- 0.95 dB.

10 Measurements, Examination and Derived Results

10.1 Antenna Requirement

Spec	Requirement	Applicable
15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.	☒
Remark	N/A	
Result	☒ Pass ☐ Fail	

Test Data ☐ Yes ☒ N/A
Test Plot ☐ Yes (See below) ☒ N/A

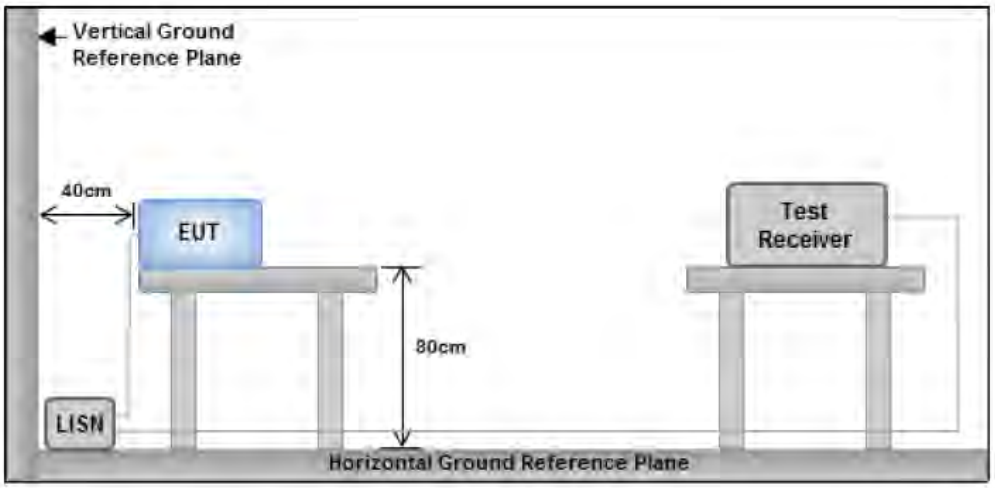
Antenna Connector Construction

Antenna Type	T310S: Internal dipole array T310N: Internal patch array
Antenna Gain (Peak)	T310S: 5G: Highest Gain 8dBi T310N: 5G: 12.6dBi for Vertical 13.5dBi for Horizontal
Antenna Connector Type	U.FL
Note	The antenna used U.FL antenna connectors which is a unique type which meet the requirement.

10.2 Conducted Emissions

Conducted Emission Limit

Frequency ranges (MHz)	Limit (dBuV)	
	QP	Average
0.15 ~ 0.5	66 – 56	56 – 46
0.5 ~ 5	56	46
5 ~ 30	60	50

Spec	Item	Requirement	Applicable
15.207(a)	a)	For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequency ranges.	☒
Test Setup	 Note: 1. Support units were connected to second LISN. 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes		
Procedure	- The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B. - The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains. - The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. - All other supporting equipment was powered separately from another main supply.		
Remark	EUT was tested in two modes of operations: (1) P.O.E Mode; (2) Power Supply Mode		
Result	☒ Pass ☐ Fail		

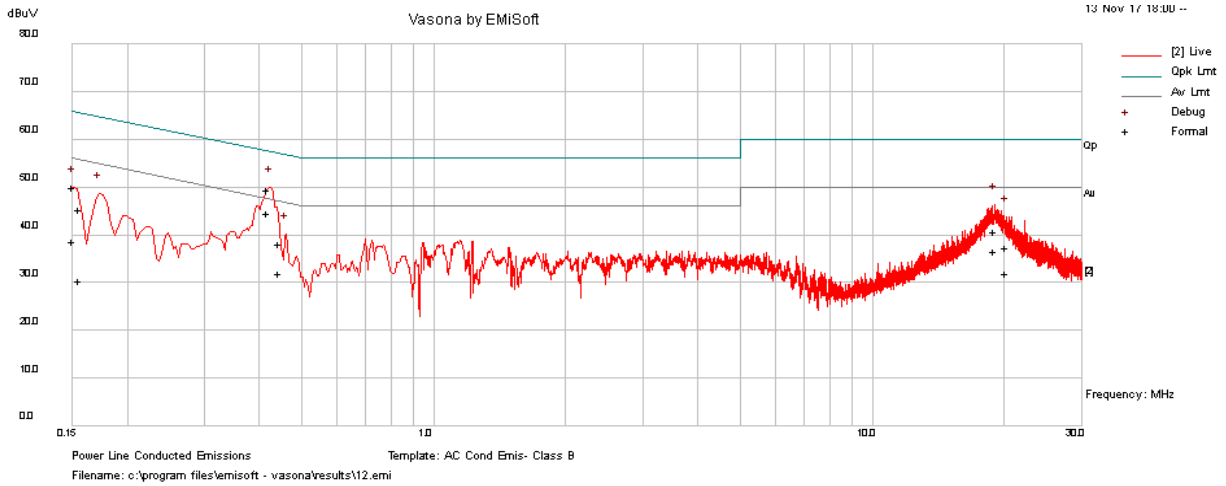
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Shuo Zhang at Conducted Emission test site.

Conducted Emission Test Results

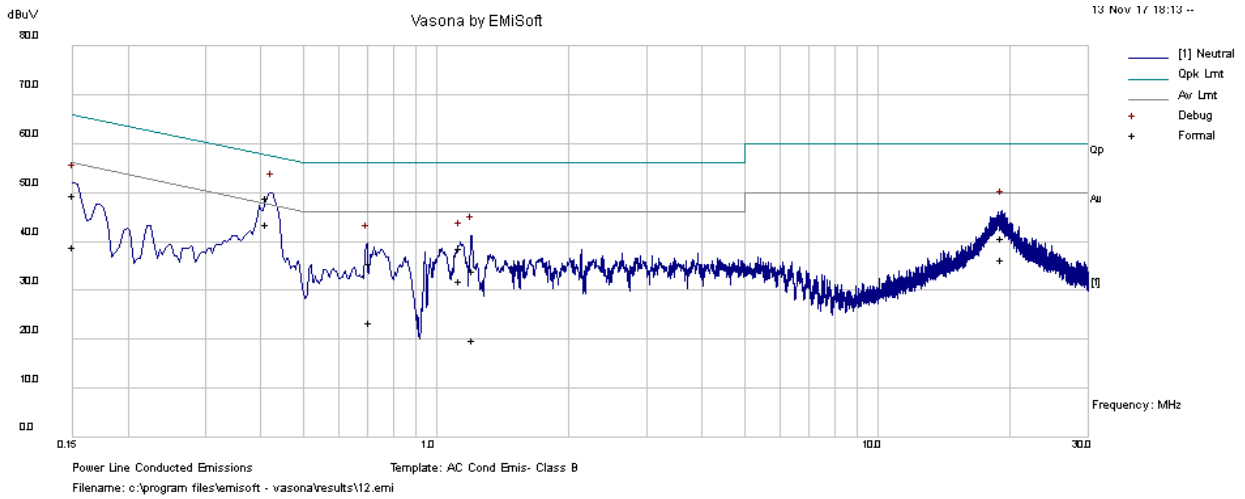
Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(° C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120Vac, 60Hz			
Tested by:	Shuo Zhang			
Test Date:	11/13/2017			
Remarks	Conducted @ Live – P.O.E Mode			



Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.42	39.36	9.33	0.69	49.37	Quasi Peak	Live	57.48	-8.11	Pass
19.08	30.78	9.38	0.64	40.81	Quasi Peak	Live	60	-19.19	Pass
0.15	38.78	9.33	1.74	49.84	Quasi Peak	Live	65.99	-16.15	Pass
0.16	34.22	9.33	1.67	45.22	Quasi Peak	Live	65.69	-20.47	Pass
20.24	27.4	9.39	0.66	37.45	Quasi Peak	Live	60	-22.55	Pass
0.44	28.08	9.33	0.67	38.08	Quasi Peak	Live	56.98	-18.91	Pass
0.42	34.58	9.33	0.69	44.59	Average	Live	47.48	-2.9	Pass
19.08	26.58	9.38	0.64	36.61	Average	Live	50	-13.39	Pass
0.15	27.59	9.33	1.74	38.65	Average	Live	55.99	-17.34	Pass
0.16	19.31	9.33	1.67	30.3	Average	Live	55.69	-25.39	Pass
20.24	21.81	9.39	0.66	31.86	Average	Live	50	-18.14	Pass
0.44	21.9	9.33	0.67	31.89	Average	Live	46.98	-15.09	Pass

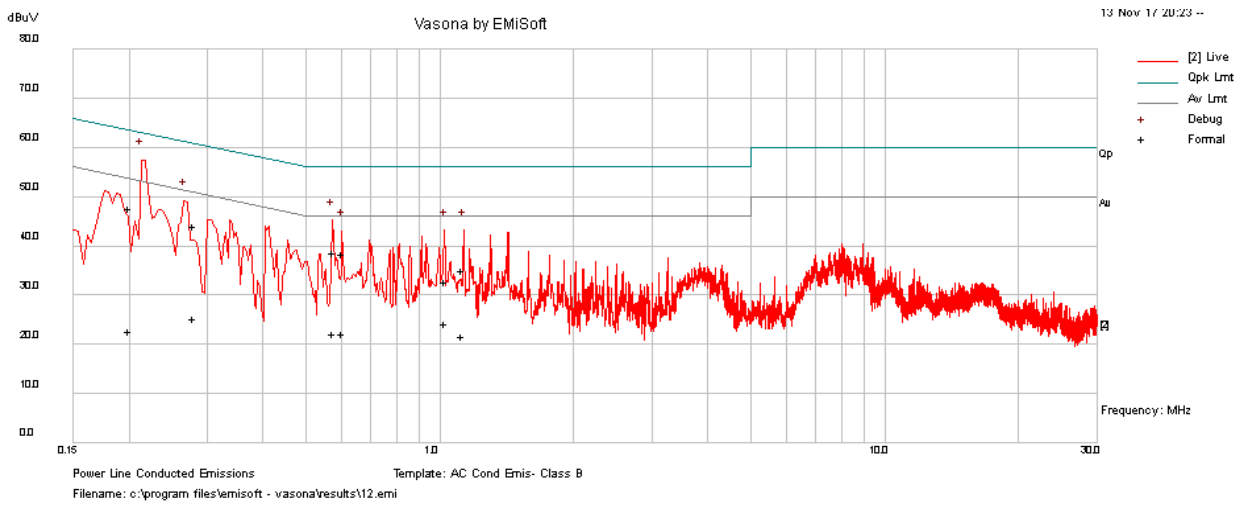
Conducted Emission Test Results

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(° C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120Vac, 60Hz			
Tested by:	Shuo Zhang			
Test Date:	11/13/2017			
Remarks	Conducted @ Neutral - P.O.E Mode			



Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.41	38.91	9.33	0.69	48.93	Quasi Peak	Neutral	57.61	-8.68	Pass
19.11	30.7	9.38	0.64	40.73	Quasi Peak	Neutral	60	-19.27	Pass
0.15	38.48	9.33	1.74	49.55	Quasi Peak	Neutral	66	-16.45	Pass
1.21	24.11	9.33	0.52	33.96	Quasi Peak	Neutral	56	-22.04	Pass
1.13	28.92	9.33	0.52	38.77	Quasi Peak	Neutral	56	-17.23	Pass
0.71	25.6	9.33	0.56	35.48	Quasi Peak	Neutral	56	-20.52	Pass
0.41	33.48	9.33	0.69	43.5	Average	Neutral	47.61	-4.11	Pass
19.11	26.41	9.38	0.64	36.44	Average	Neutral	50	-13.56	Pass
0.15	27.8	9.33	1.74	38.87	Average	Neutral	56	-17.13	Pass
1.21	10.04	9.33	0.52	19.9	Average	Neutral	46	-26.1	Pass
1.13	22.05	9.33	0.52	31.9	Average	Neutral	46	-14.1	Pass
0.71	13.63	9.33	0.56	23.52	Average	Neutral	46	-22.48	Pass

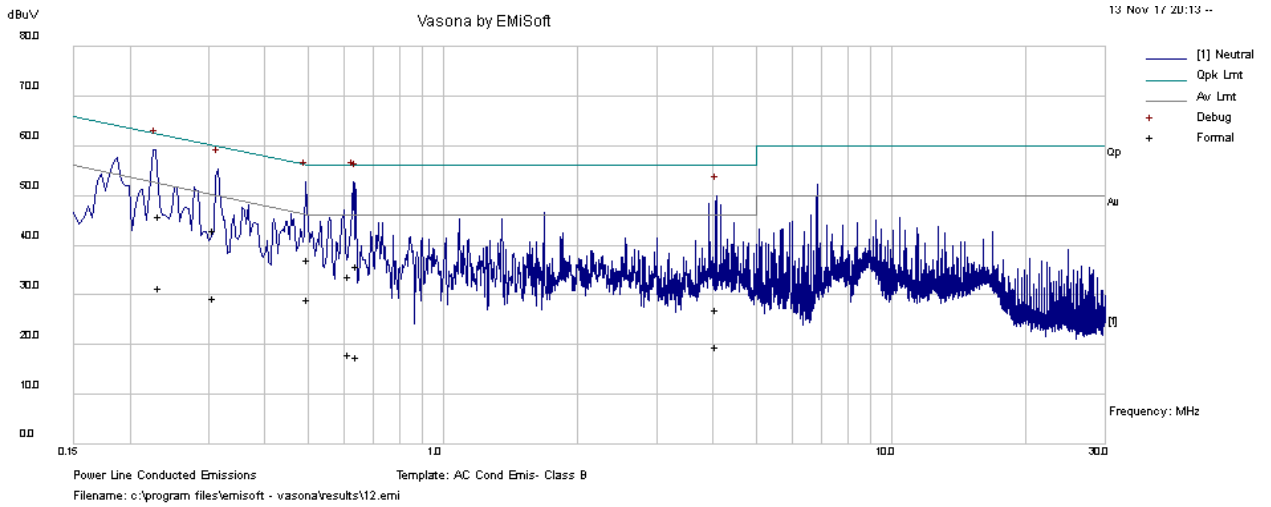
Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(° C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120Vac, 60Hz			
Tested by:	Shuo Zhang			
Test Date:	11/13/2017			
Remarks	Conducted @ Live – Power Supply Mode			



Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.20	37.07	9.32	1.25	47.64	Quasi Peak	Live	63.61	-15.97	Pass
0.58	28.71	9.33	0.6	38.64	Quasi Peak	Live	56	-17.36	Pass
0.28	33.7	9.32	0.91	43.93	Quasi Peak	Live	60.84	-16.9	Pass
1.03	22.74	9.33	0.53	32.6	Quasi Peak	Live	56	-23.4	Pass
1.13	25.31	9.33	0.52	35.17	Quasi Peak	Live	56	-20.83	Pass
0.61	28.34	9.33	0.59	38.26	Quasi Peak	Live	56	-17.74	Pass
0.20	12.19	9.32	1.25	22.76	Average	Live	53.61	-30.84	Pass
0.58	12.15	9.33	0.6	22.08	Average	Live	46	-23.92	Pass
0.28	14.95	9.32	0.91	25.18	Average	Live	50.84	-25.66	Pass
1.03	14.39	9.33	0.53	24.25	Average	Live	46	-21.75	Pass
1.13	11.75	9.33	0.52	21.6	Average	Live	46	-24.4	Pass
0.61	12.15	9.33	0.59	22.06	Average	Live	46	-23.94	Pass

Conducted Emission Test Results

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(° C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120Vac, 60Hz			
Tested by:	Shuo Zhang			
Test Date:	11/13/2017			
Remarks	Conducted @ Neutral - Power Supply Mode			



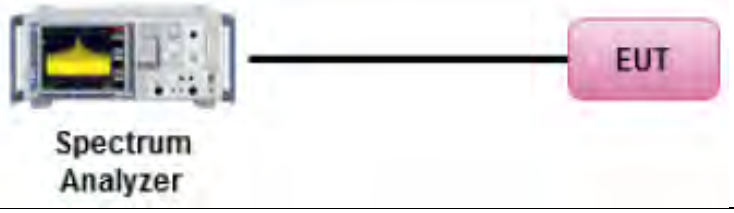
Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.23	35.39	9.32	1.08	45.79	Quasi Peak	Neutral	62.34	-16.54	Pass
0.50	27.17	9.33	0.63	37.12	Quasi Peak	Neutral	56.02	-18.9	Pass
0.62	23.9	9.33	0.58	33.82	Quasi Peak	Neutral	56	-22.18	Pass
0.64	25.91	9.33	0.58	35.82	Quasi Peak	Neutral	56	-20.18	Pass
0.31	32.81	9.32	0.84	42.97	Quasi Peak	Neutral	60.05	-17.08	Pass
4.06	17.26	9.34	0.5	27.1	Quasi Peak	Neutral	56	-28.9	Pass
0.23	20.99	9.32	1.08	31.39	Average	Neutral	52.34	-20.94	Pass
0.50	19.29	9.33	0.63	29.25	Average	Neutral	46.02	-16.77	Pass
0.62	8.22	9.33	0.58	18.14	Average	Neutral	46	-27.86	Pass
0.64	7.68	9.33	0.58	17.59	Average	Neutral	46	-28.41	Pass
0.31	19.22	9.32	0.84	29.38	Average	Neutral	50.05	-20.67	Pass
4.06	9.81	9.34	0.5	19.66	Average	Neutral	46	-26.34	Pass

10.3 26 dB Bandwidth & 6 dB Bandwidth

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	-	26 dB Emission BW: Report only for reference.	☒
	a) (2)	26 dB Emission BW: Report only for power limit calculation.	☐
	e)	Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.	☒

Test Setup



Test Procedure

789033 D02 General UNII Test Procedures New Rules v01r02

26dB Emission bandwidth measurement procedure (Other than 5.725-5.85 GHz)

- Allow the trace to stabilize.
- Use the spectrum analyzer built-in measurement function to determine the 26dB BW.
  - Set RBW = around 1% of emission bandwidth
  - Set VBW > RBW
  - Detector = Peak
  - Trace mode = max hold
- Capture the plot.
- Repeat above steps for different test channel and other modulation type.

6 dB Minimum emission bandwidth measurement procedure (for 5.725-5.85 GHz)

- Allow the trace to stabilize.
- Use the spectrum analyzer built-in measurement function to determine the 6dB BW.
  - Set RBW = 100 KHz
  - Set VBW ≥ 3 x RBW
  - Detector = Peak
  - Trace mode = max hold
  - Sweep = auto couple
- Capture the plot.
- Repeat above steps for different test channel and other modulation type.

Test Date	11/11/2017-11/21/2017	Environmental condition	Temperature 22°C Relative Humidity 38% Atmospheric Pressure 1020mbar
Remark	99% BW result is presented here to show the channels in 5.1GHz is not crossing to DFS channel since the 26 dB BW is too wide.		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes ☐ N/A

Test was done by Cipher at RF test site.

26dB Bandwidth measurement result for 5.2GHz

T310N

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)
26dB BW	802.11a	5180	Low	18.76	-
		5200	Mid	18.82	-
		5240	High	19.51	-
	802.11n-20	5180	Low	19.76	-
		5200	Mid	19.67	-
		5240	High	19.68	-
	802.11n-40	5190	Low	38.74	-
		5230	High	39.63	-
	802.11ac-80	5210	Mid	81.82	-

T310S

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)
26dB BW	802.11a	5180	Low	20.83	-
		5200	Mid	20.77	-
		5240	High	21.30	-
	802.11n-20	5180	Low	20.54	-
		5200	Mid	20.11	-
		5240	High	20.49	-
	802.11n-40	5190	Low	38.93	-
		5230	High	42.16	-
	802.11ac-80	5210	Mid	82.52	-

6dB Bandwidth measurement result for 5.8GHz

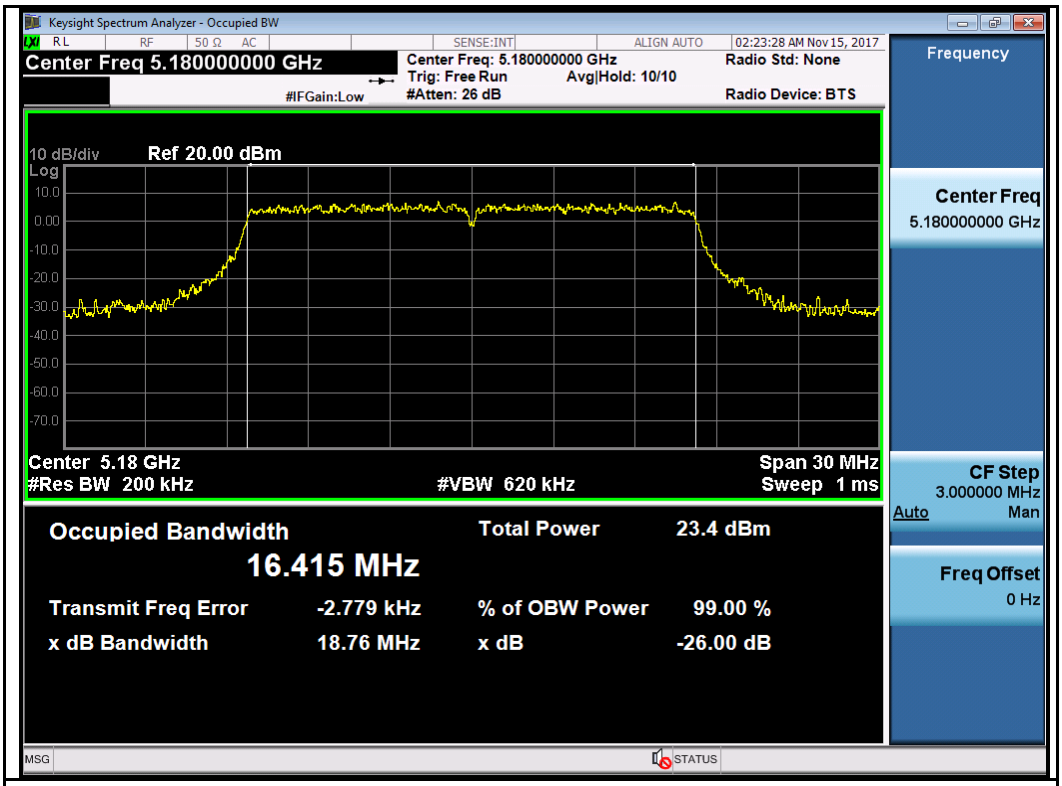
T310N

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)	Result
6dB BW	802.11a	5745	Low	16.40	≥0.5	Pass
		5785	Mid	16.35	≥0.5	Pass
		5825	High	16.36	≥0.5	Pass
	802.11n-20	5745	Low	17.62	≥0.5	Pass
		5785	Mid	17.63	≥0.5	Pass
		5825	High	17.61	≥0.5	Pass
	802.11n-40	5755	Low	35.11	≥0.5	Pass
		5795	High	35.35	≥0.5	Pass
	802.11ac-80	5775	Mid	76.29	≥0.5	Pass

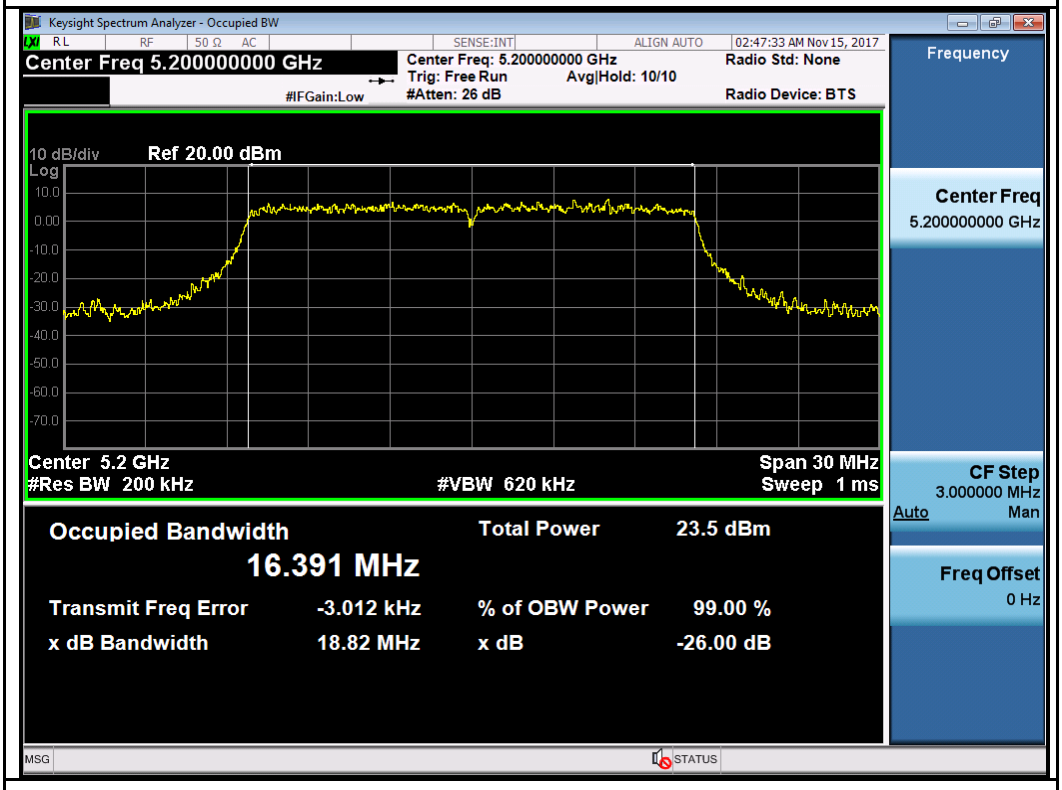
T310S

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)	Result
6dB BW	802.11a	5745	Low	16.31	≥0.5	Pass
		5785	Mid	16.37	≥0.5	Pass
		5825	High	16.36	≥0.5	Pass
	802.11n-20	5745	Low	17.63	≥0.5	Pass
		5785	Mid	17.57	≥0.5	Pass
		5825	High	17.58	≥0.5	Pass
	802.11n-40	5755	Low	35.08	≥0.5	Pass
		5795	High	35.33	≥0.5	Pass
	802.11ac-80	5775	Mid	76.27	≥0.5	Pass

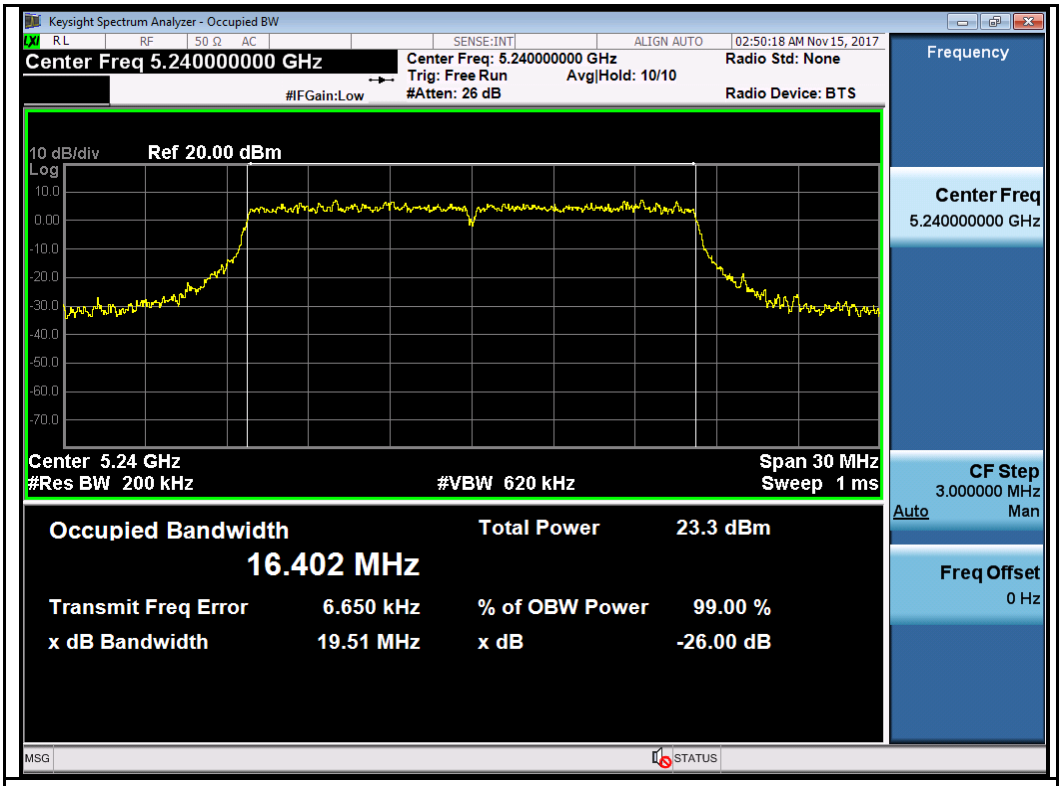
26dB Bandwidth Test Plots
T310N
W52:



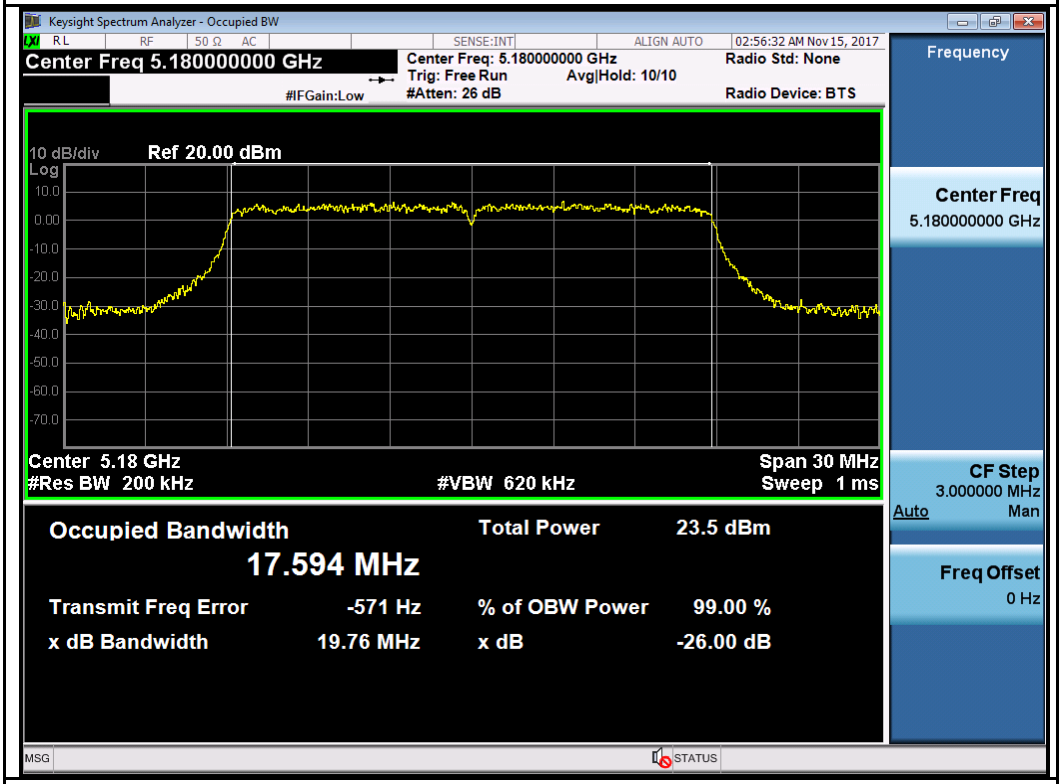
802.11a-5180MHz



802.11a-5200MHz

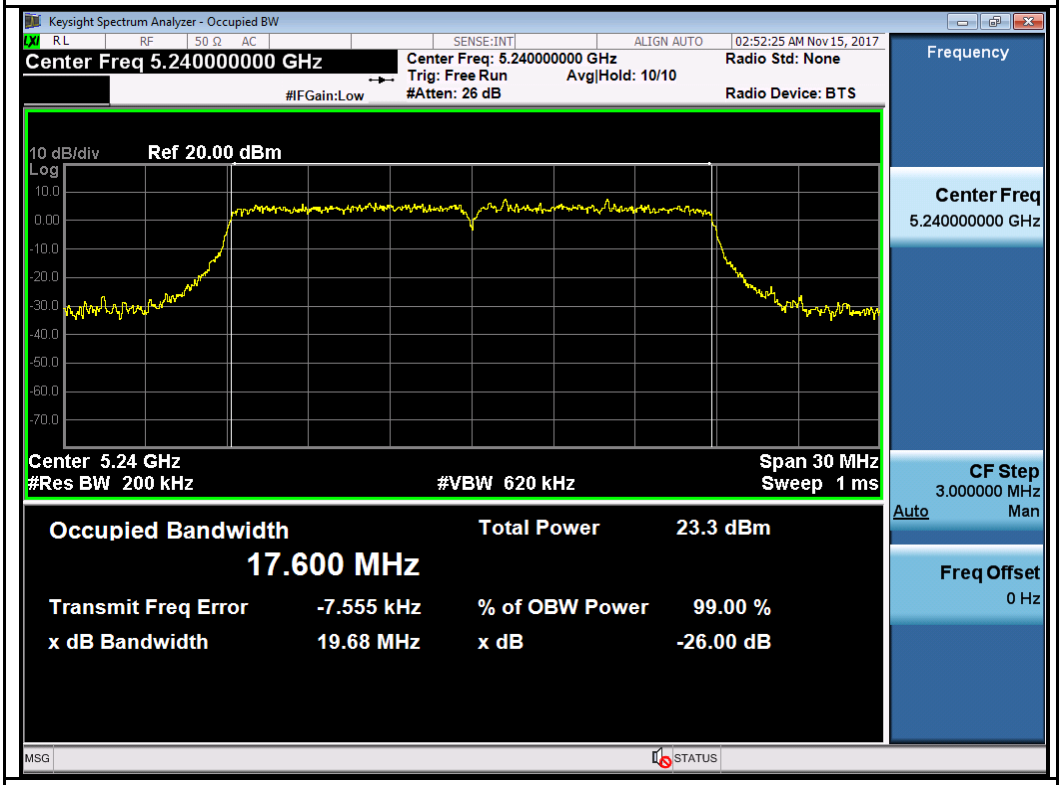


802.11a-5240MHz

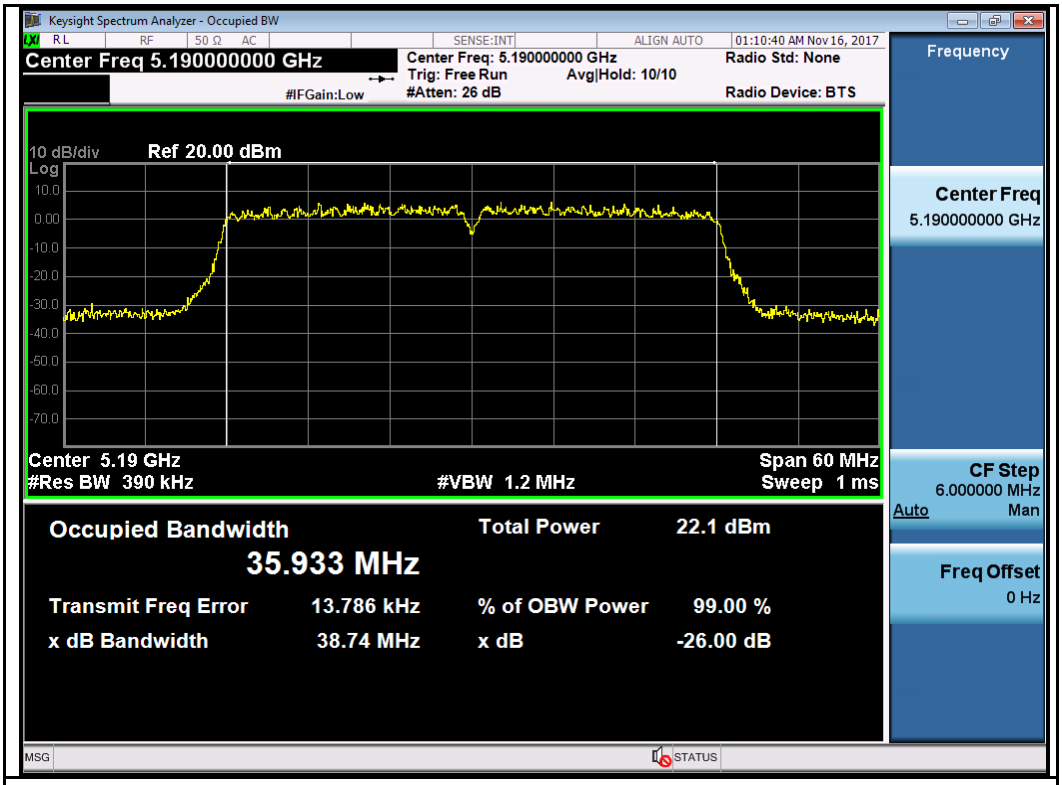


802.11n-HT20-5180MHz

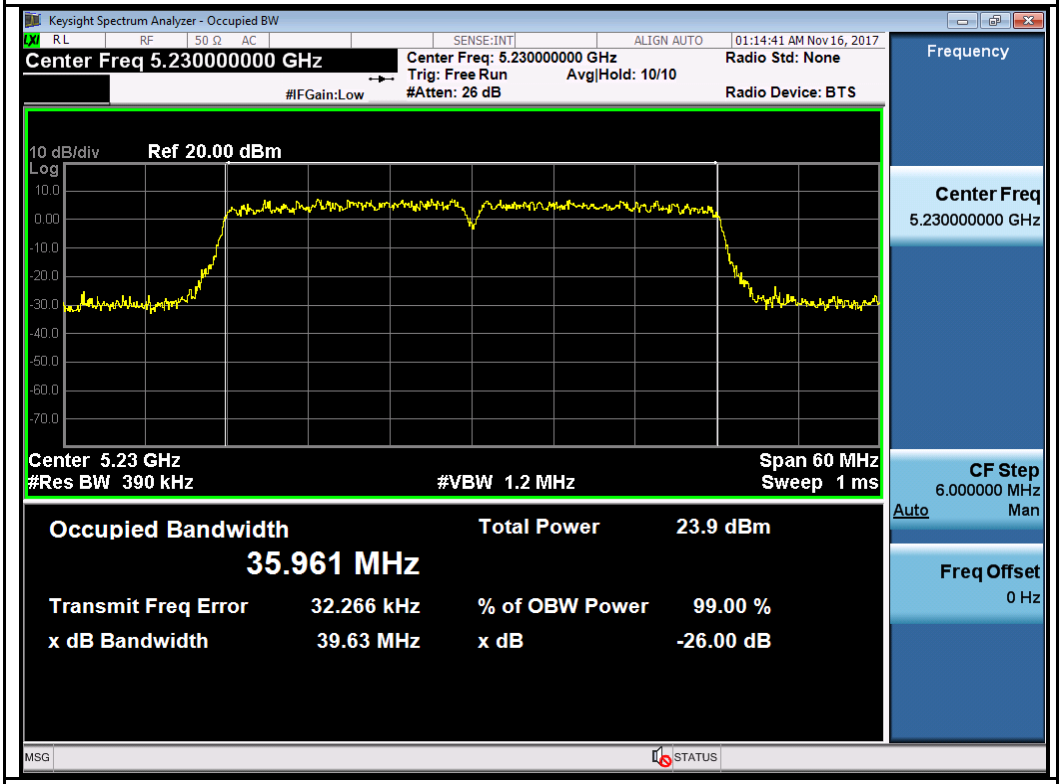
802.11n-HT20-5200MHz



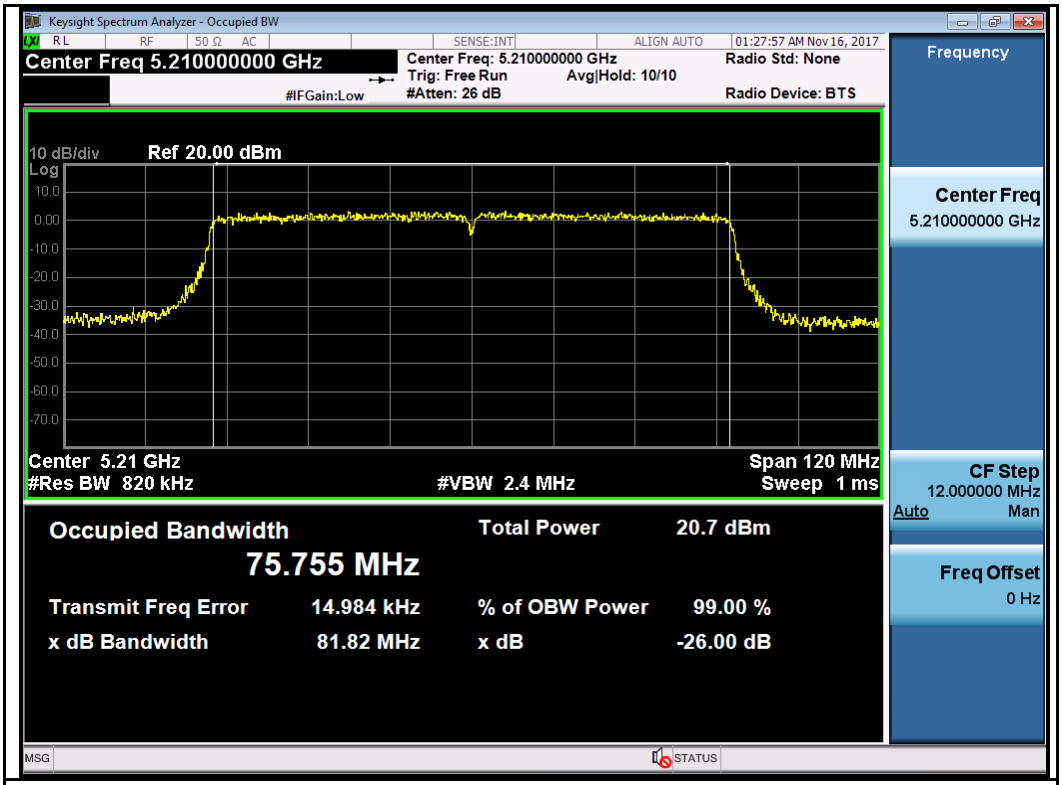
802.11n-HT20-5240MHz



802.11n-HT40-5190MHz

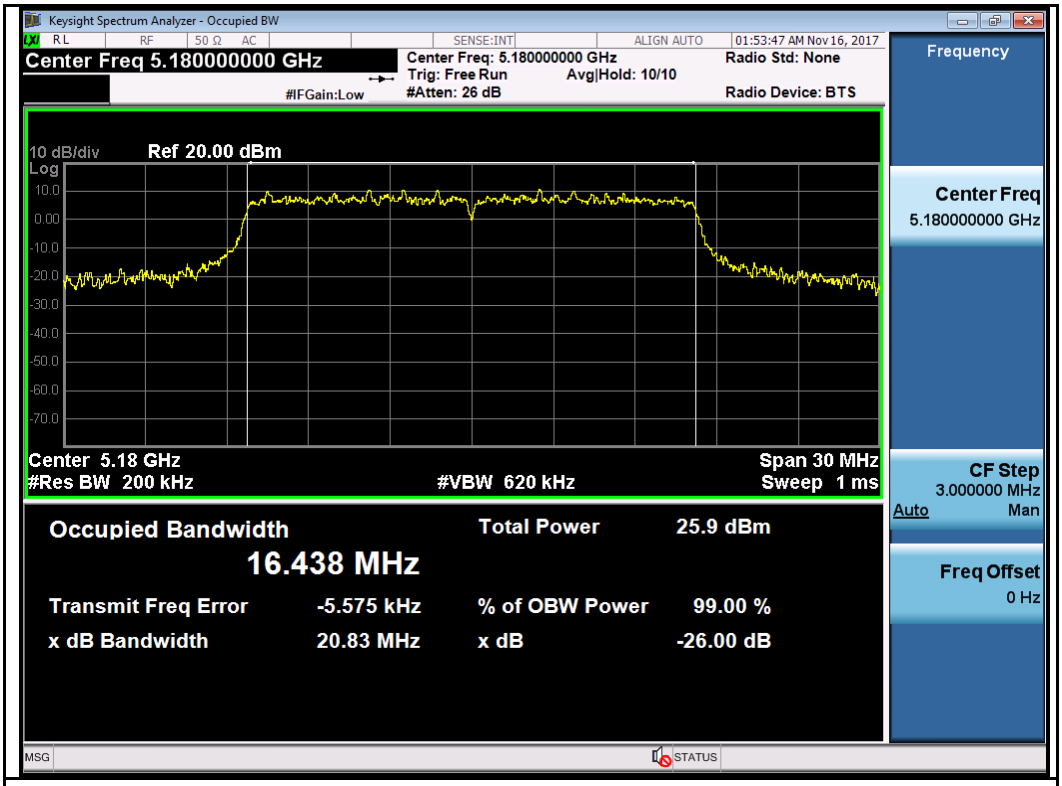


802.11n-HT40-5230MHz

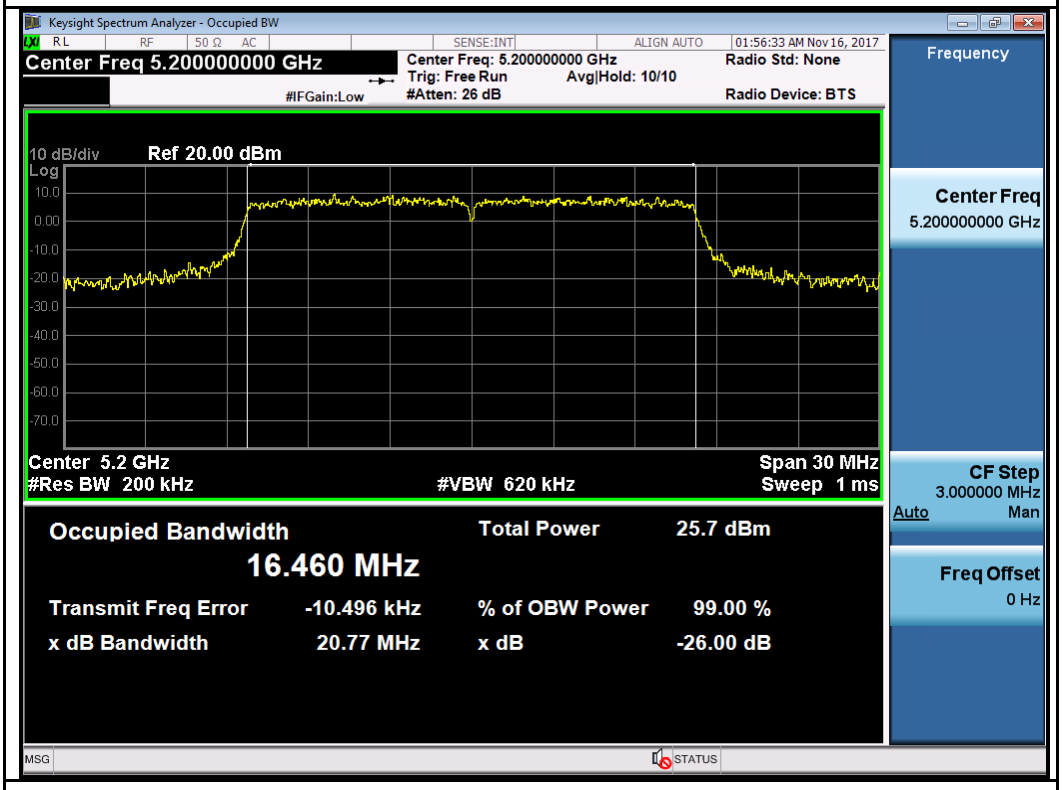


802.11ac-VHT80-5210MHz

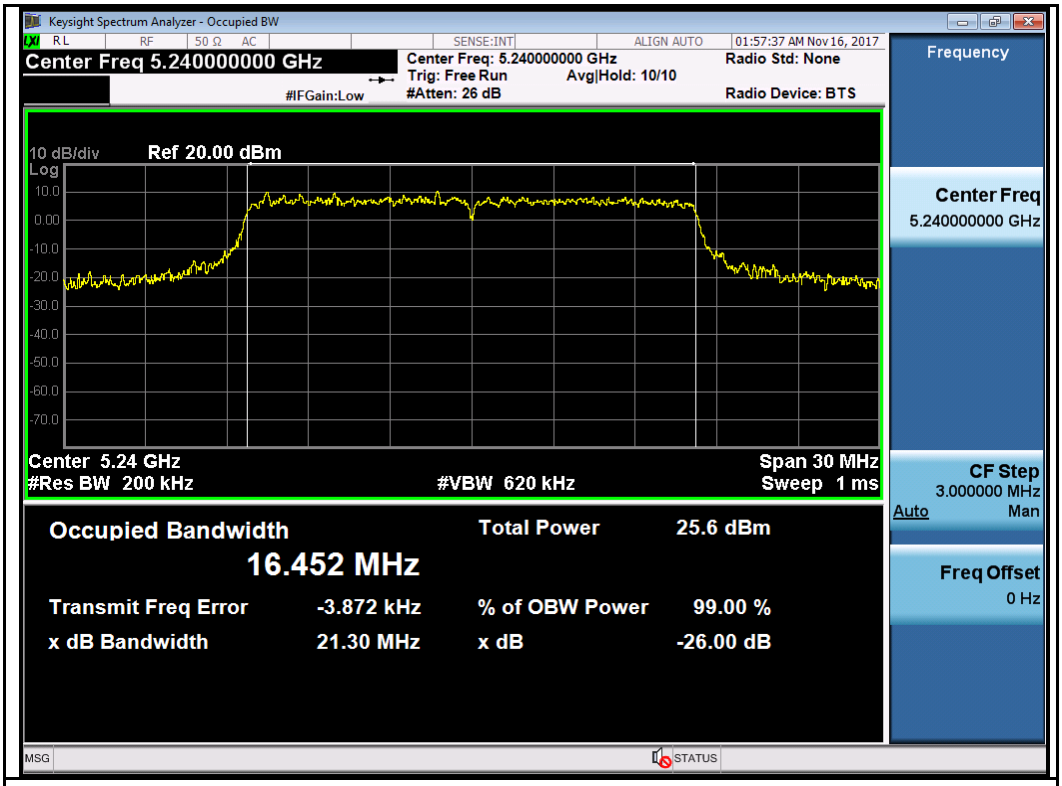
T310S
W52:



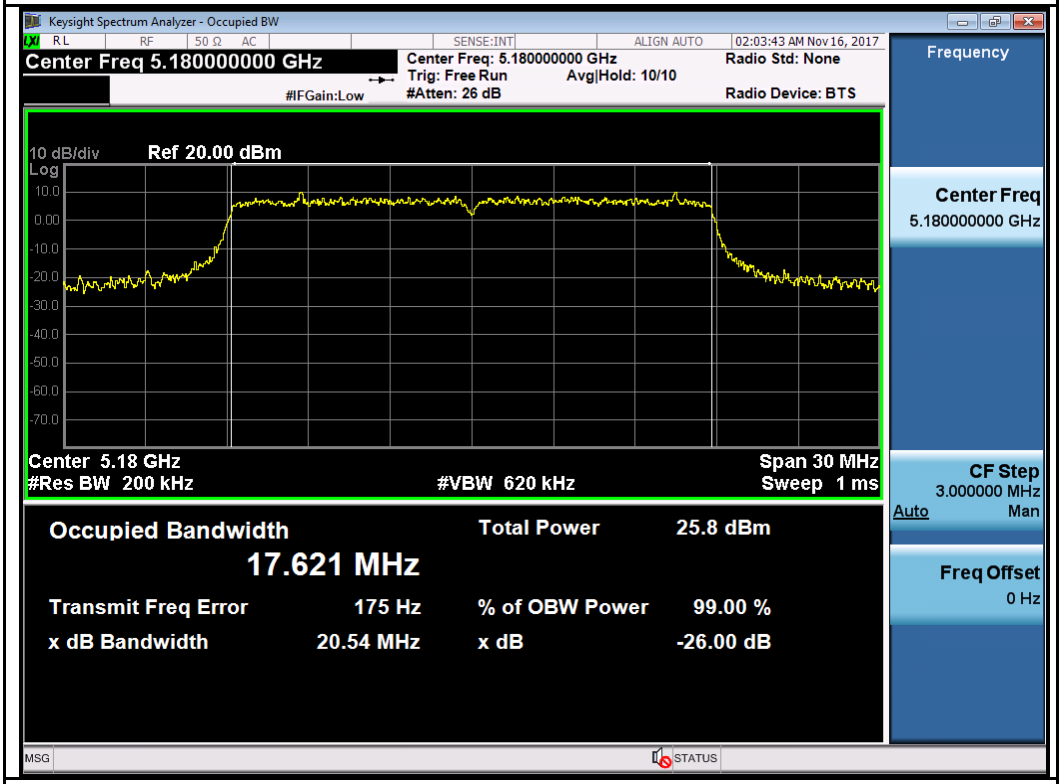
802.11a-5180MHz



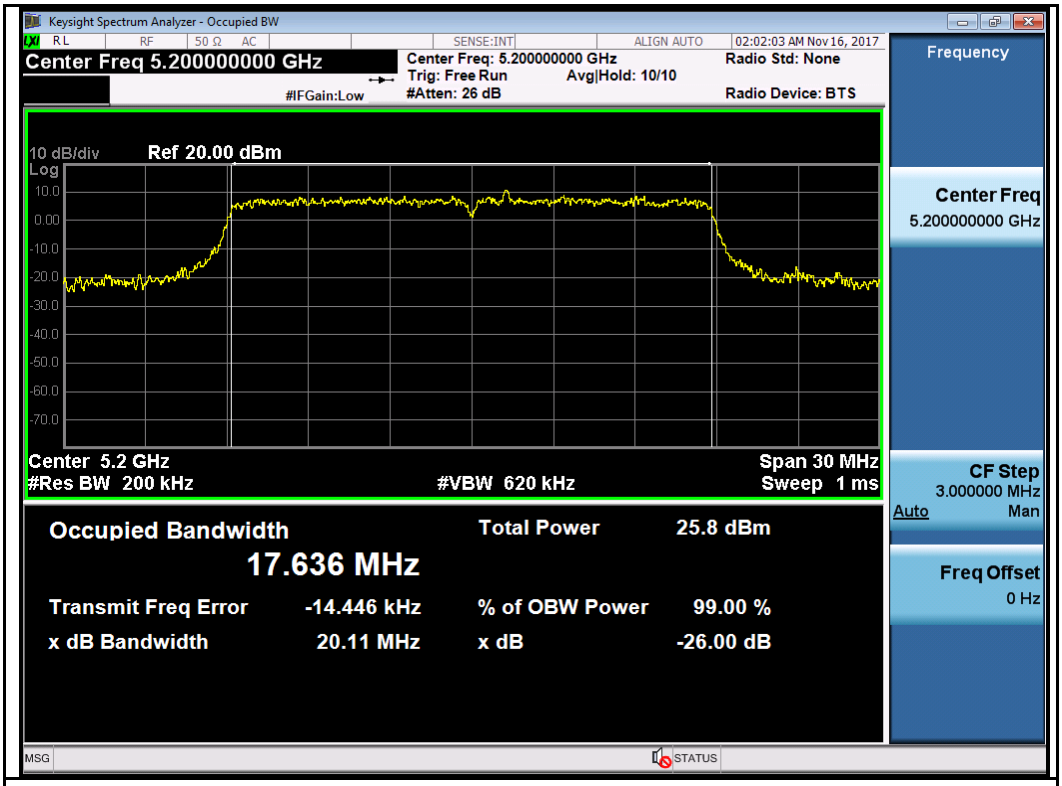
802.11a-5200MHz



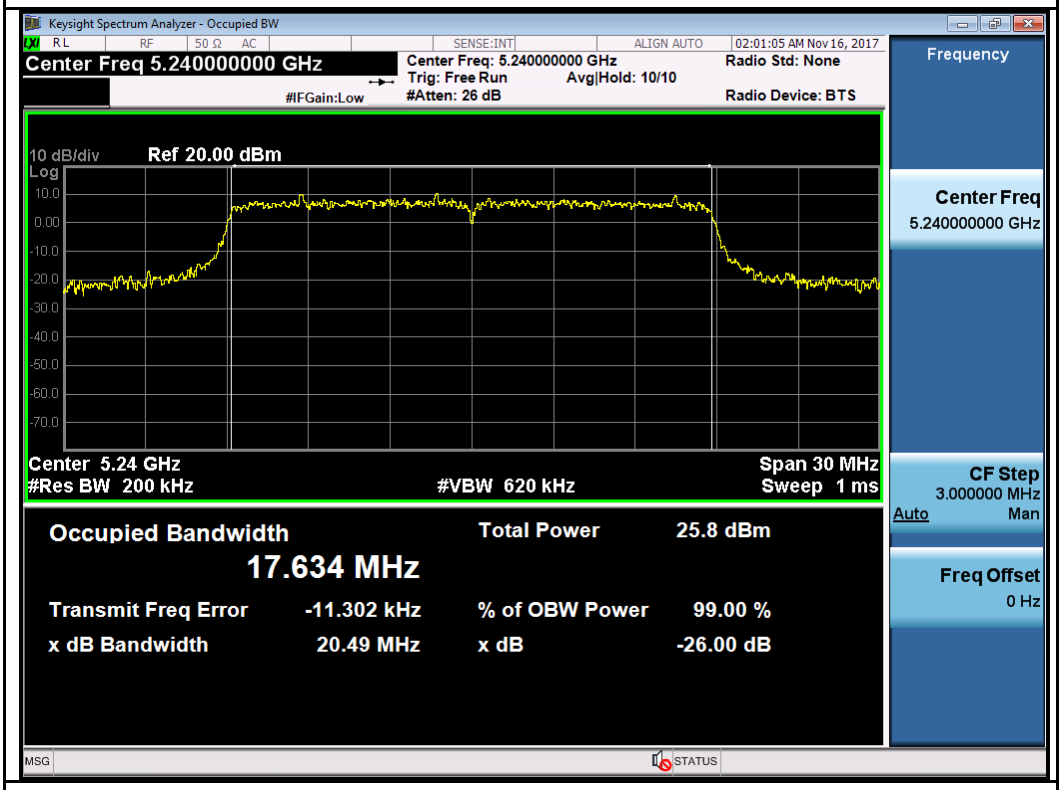
802.11a-5240MHz



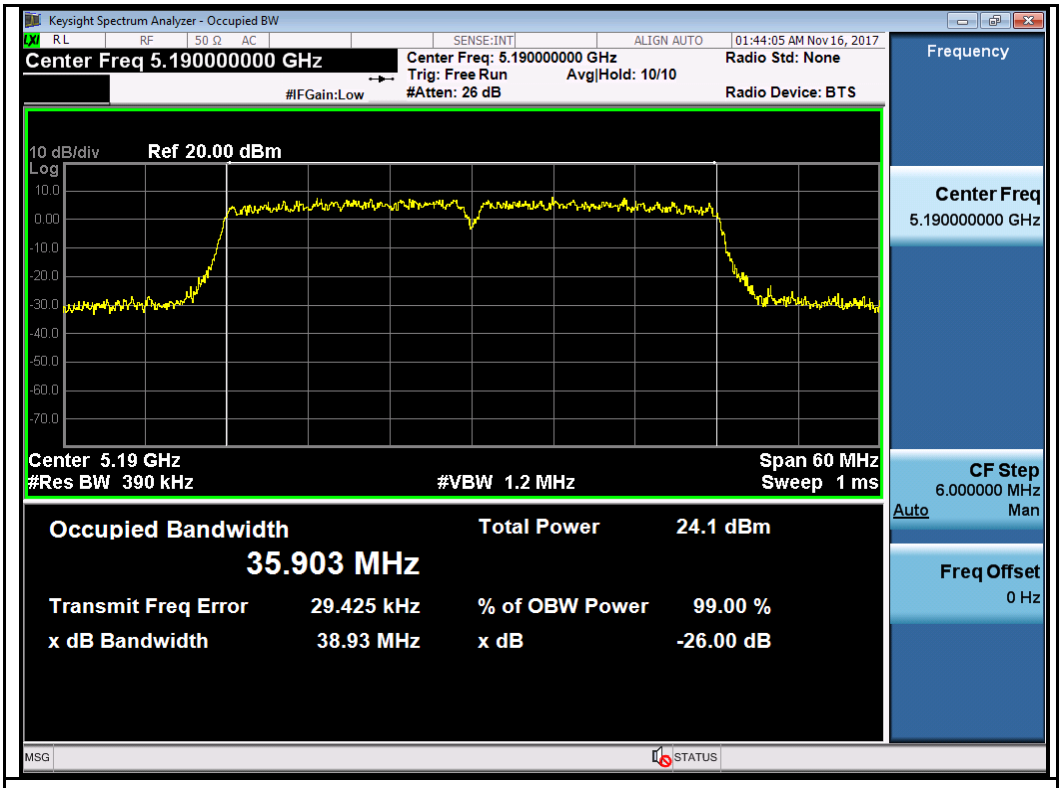
802.11n-HT20-5180MHz



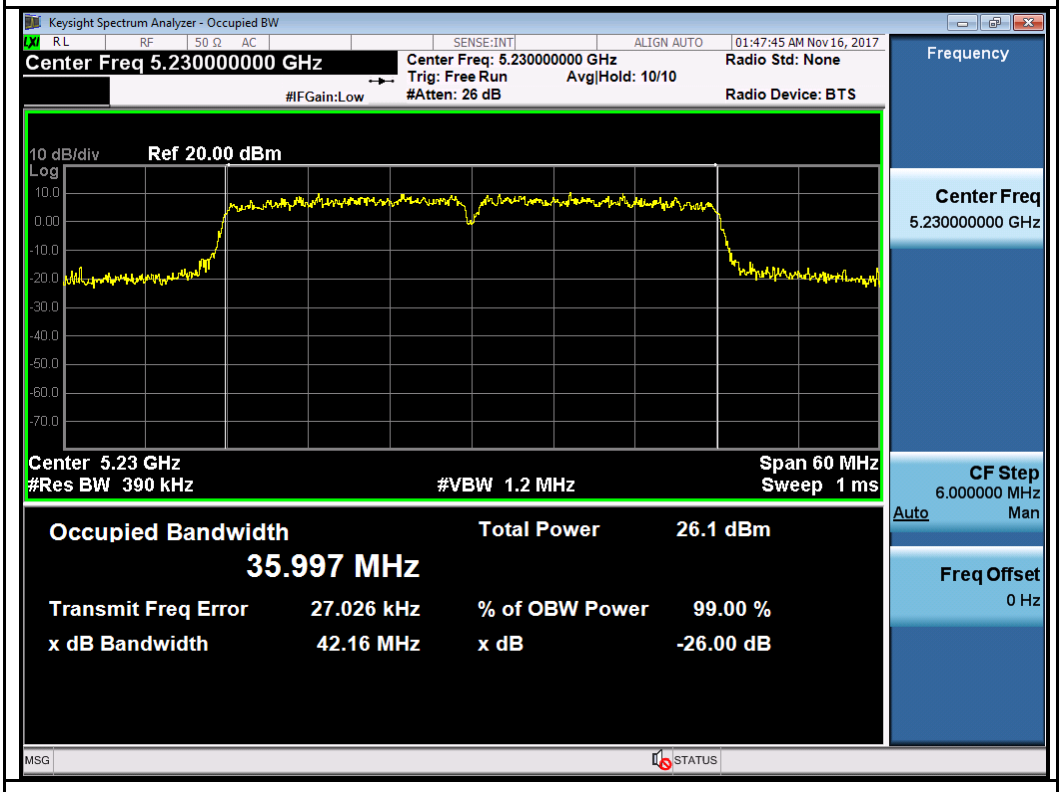
802.11n-HT20-5200MHz



802.11n-HT20-5240MHz



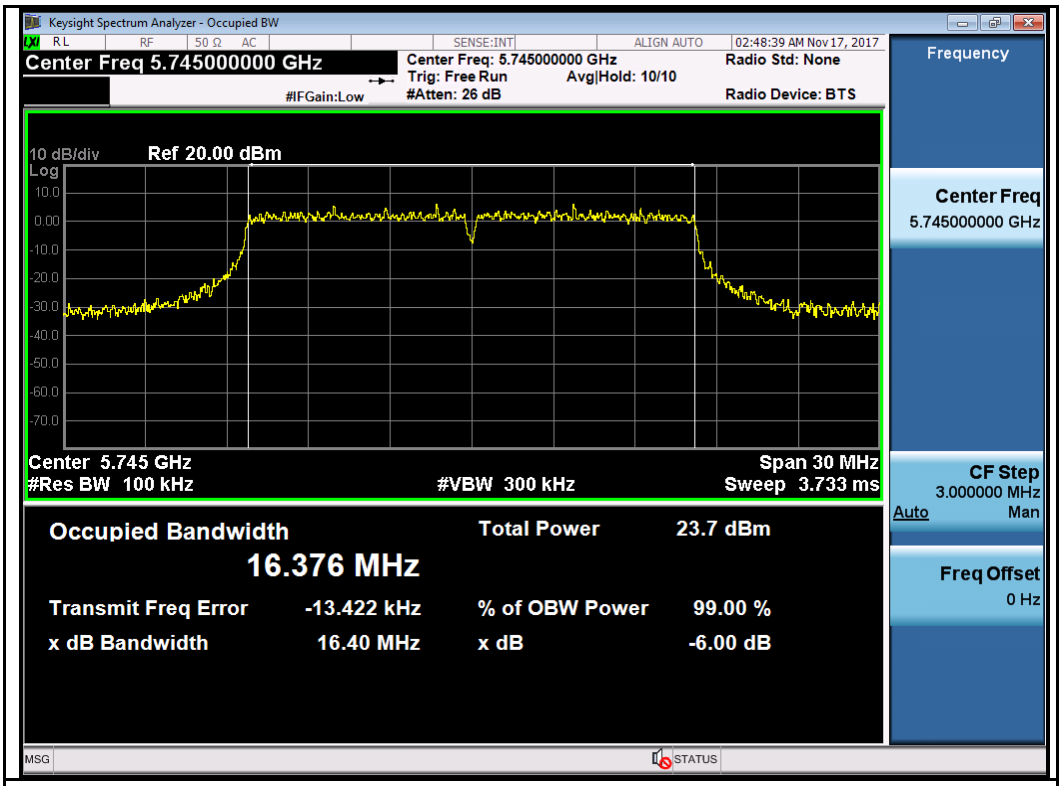
802.11n-HT40-5190MHz



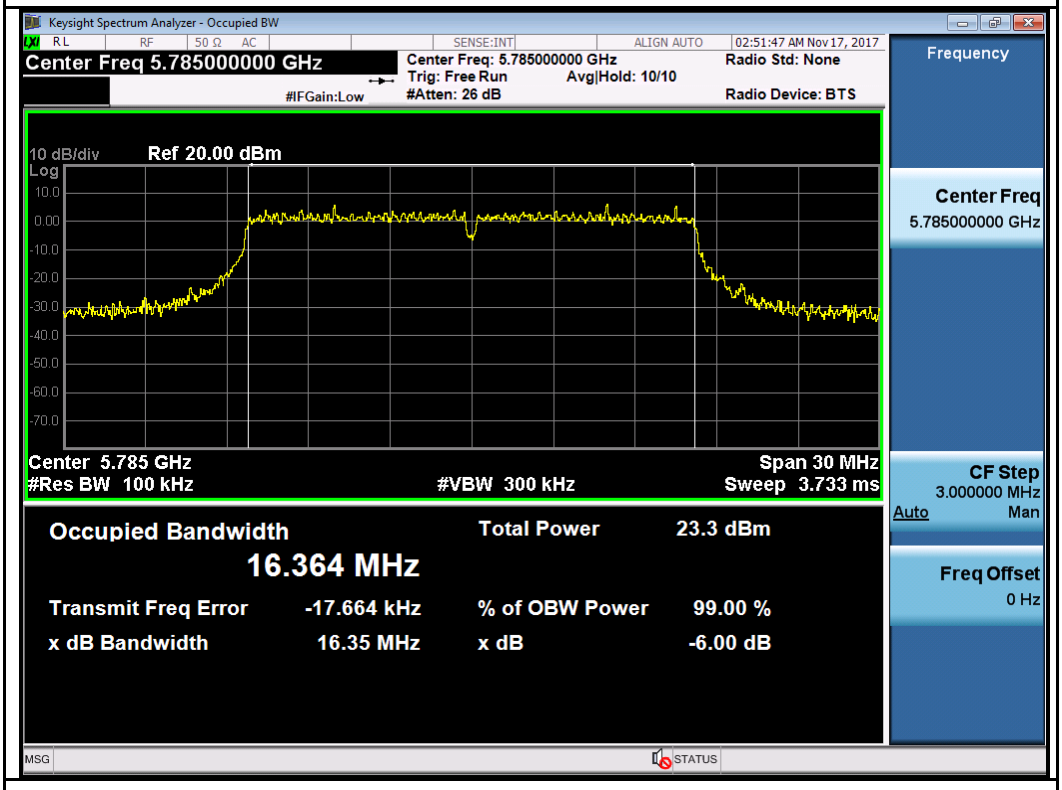
802.11n-HT40-5230MHz

802.11ac-VHT80-5210MHz

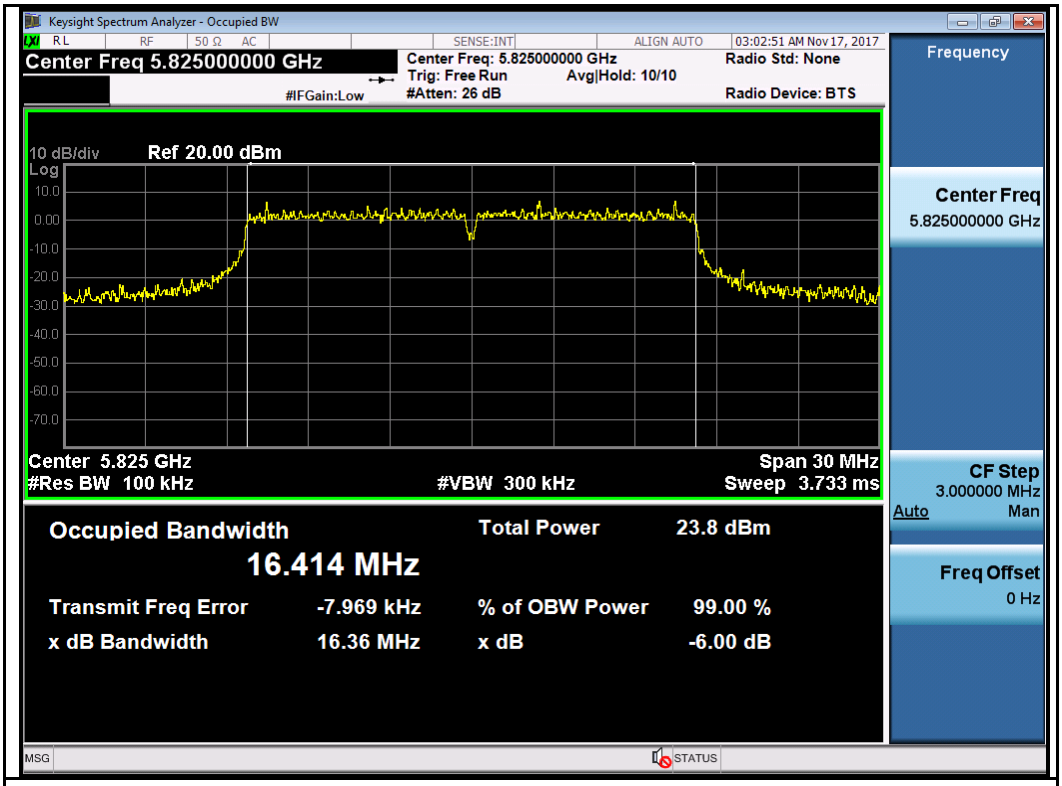
6dB Bandwidth Test Plots
T310N
W58:



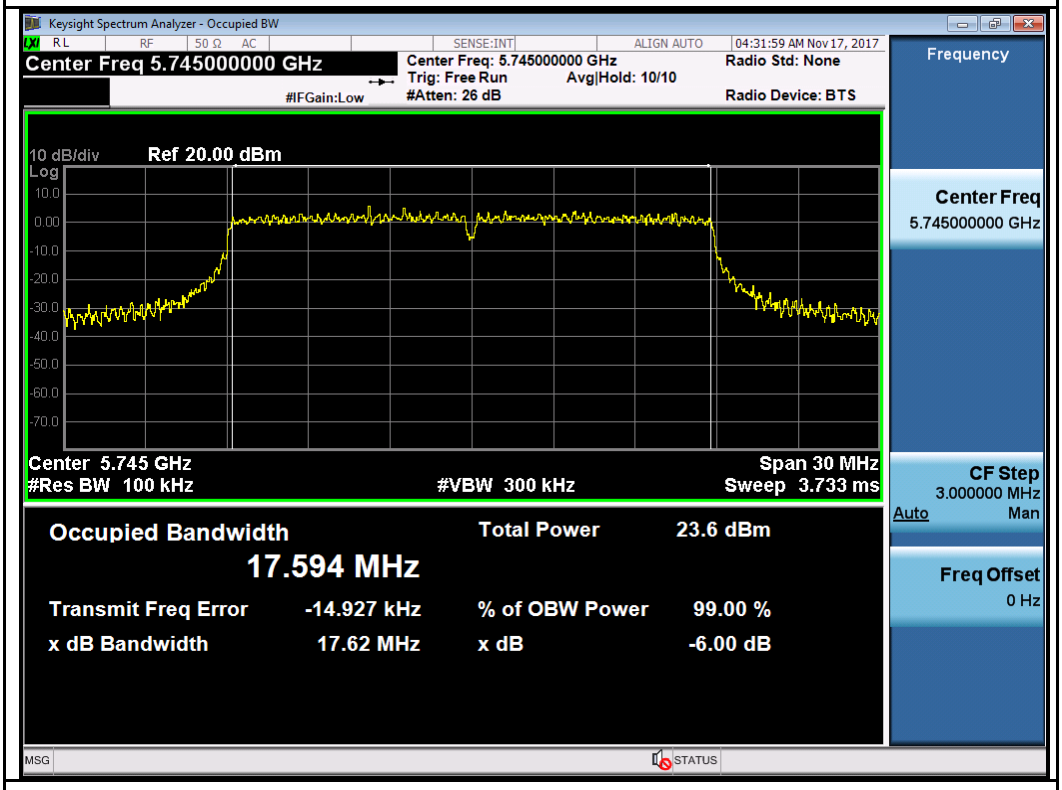
802.11a-5745MHz



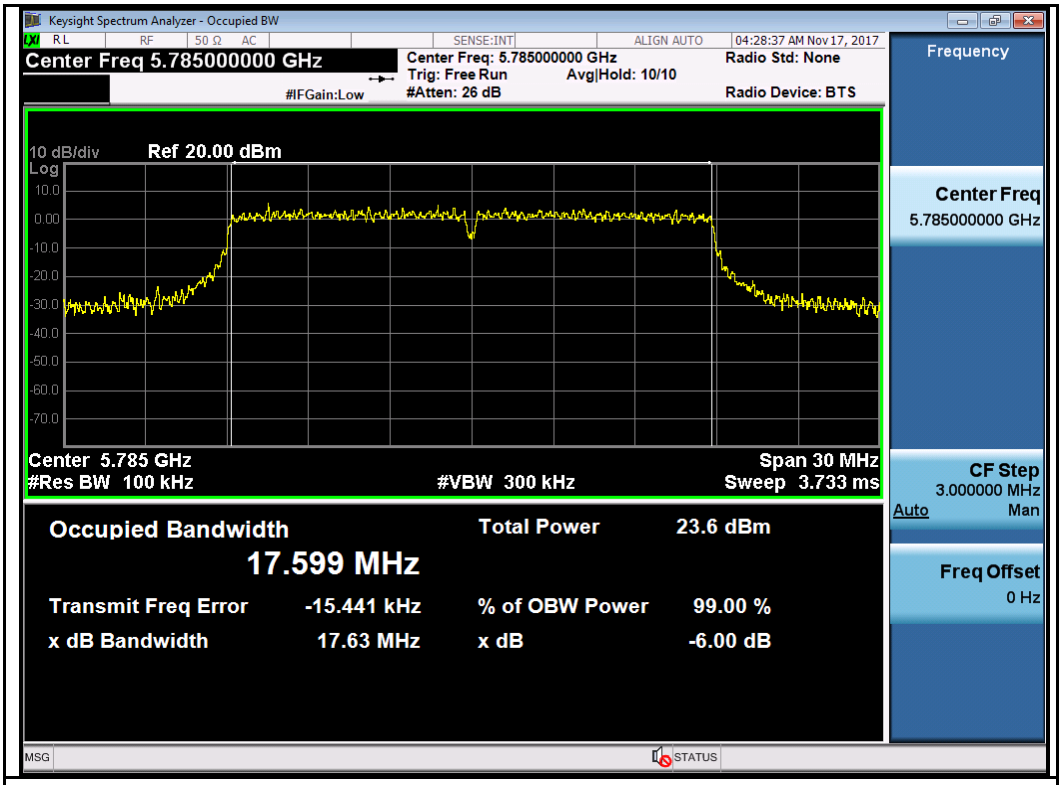
802.11a-5785MHz



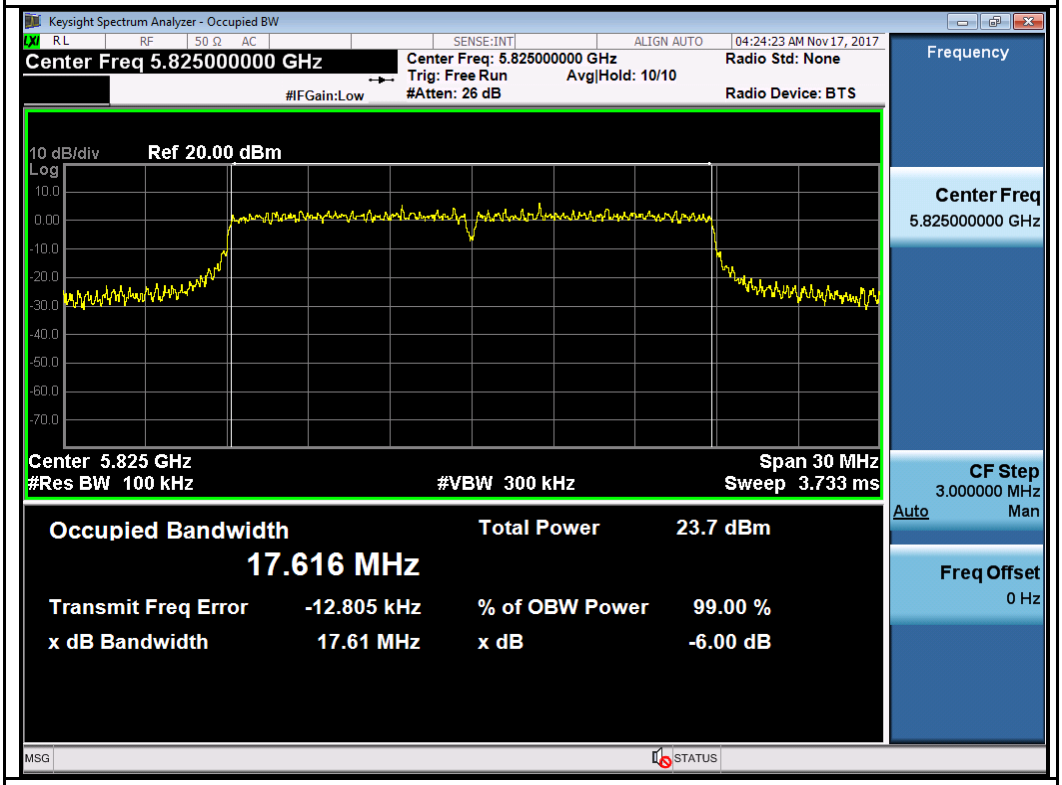
802.11a-5825MHz



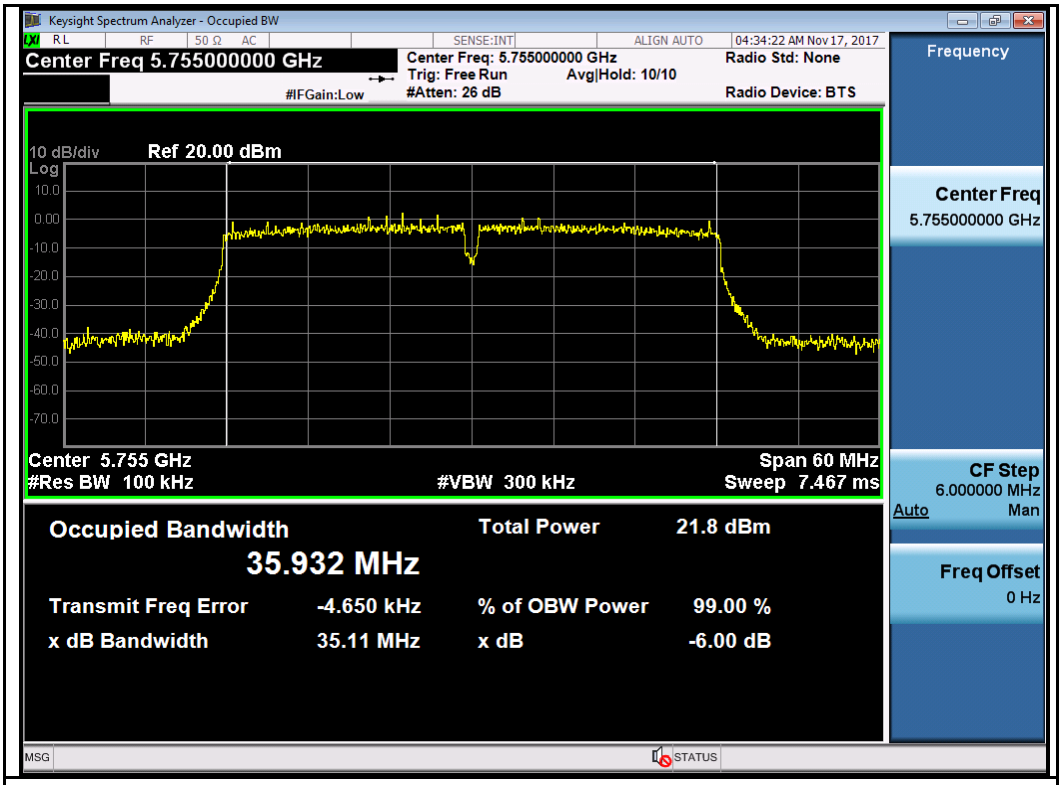
802.11n-HT20-5745MHz



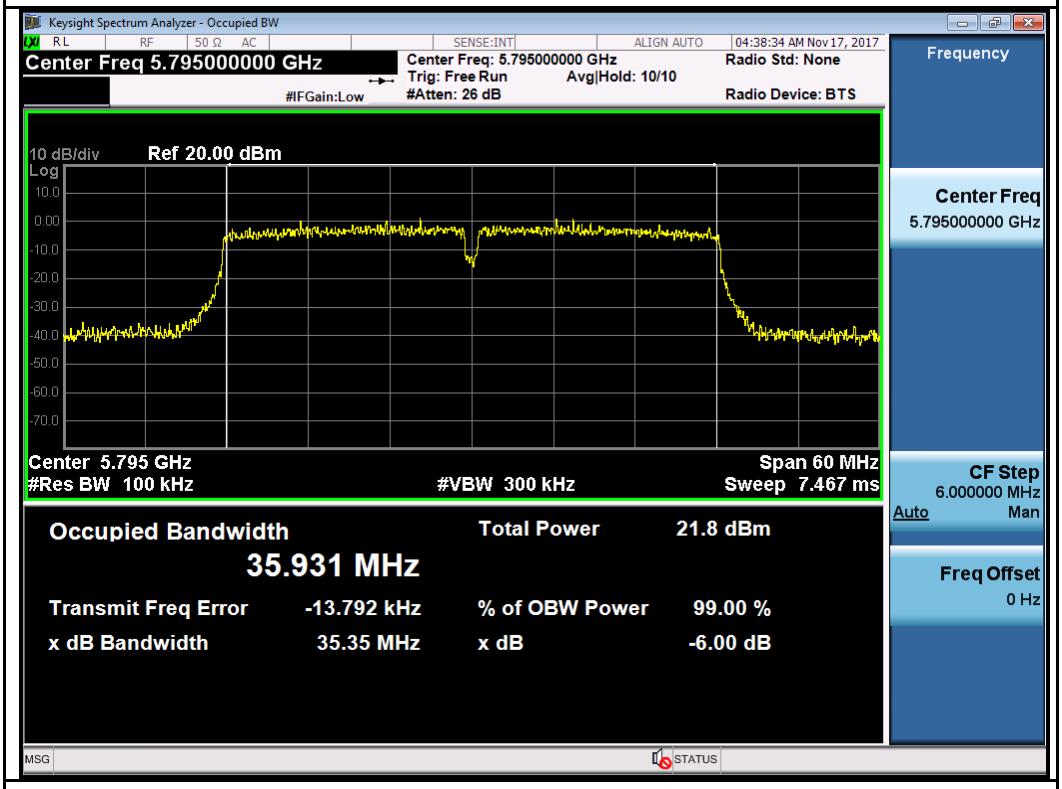
802.11n-HT20-5785MHz



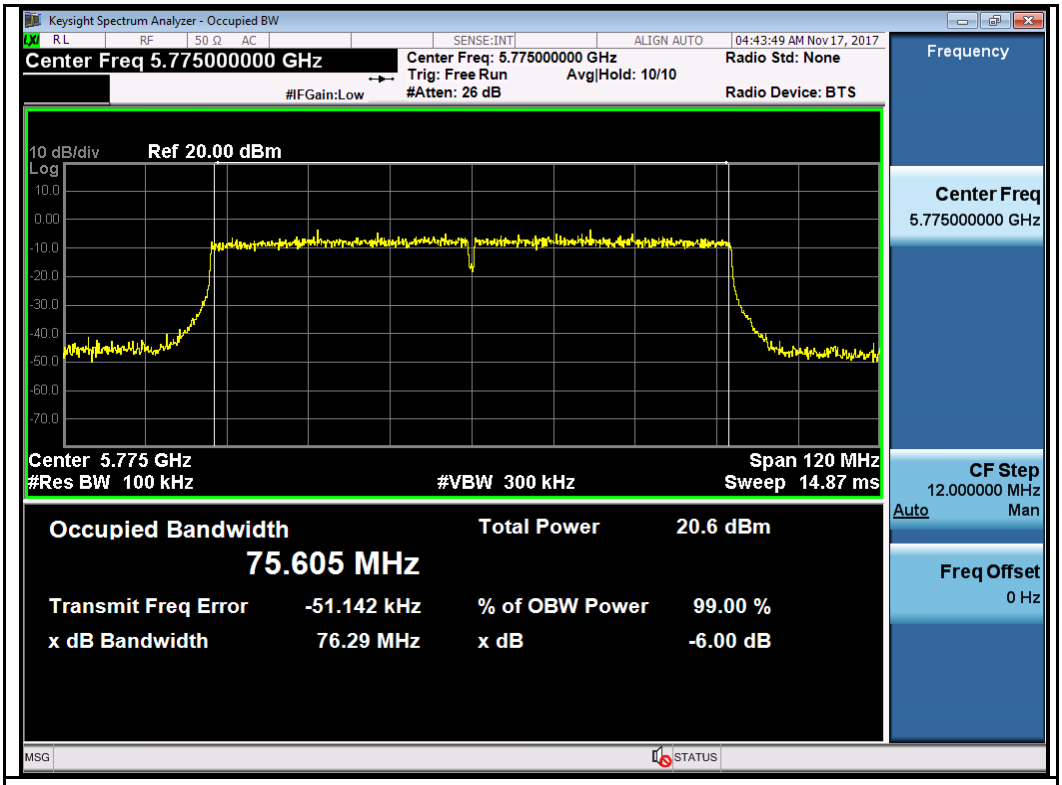
802.11n-HT20-5825MHz



802.11n-HT40-5755MHz

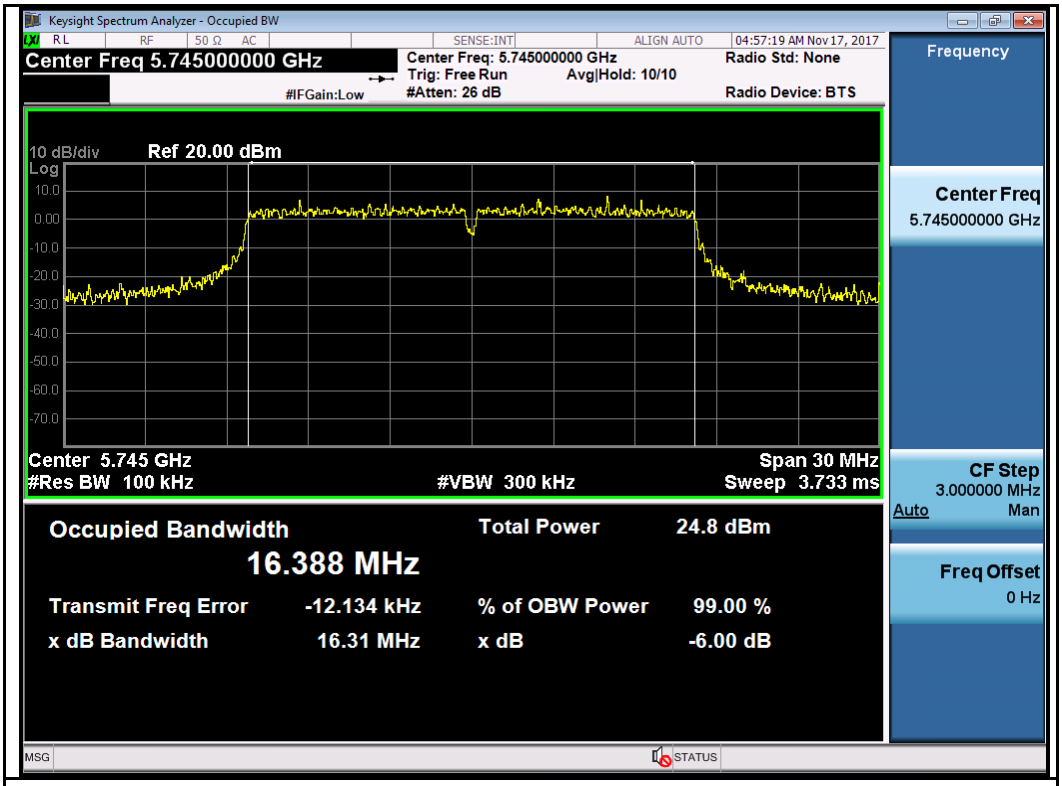


802.11n-HT40-5795MHz

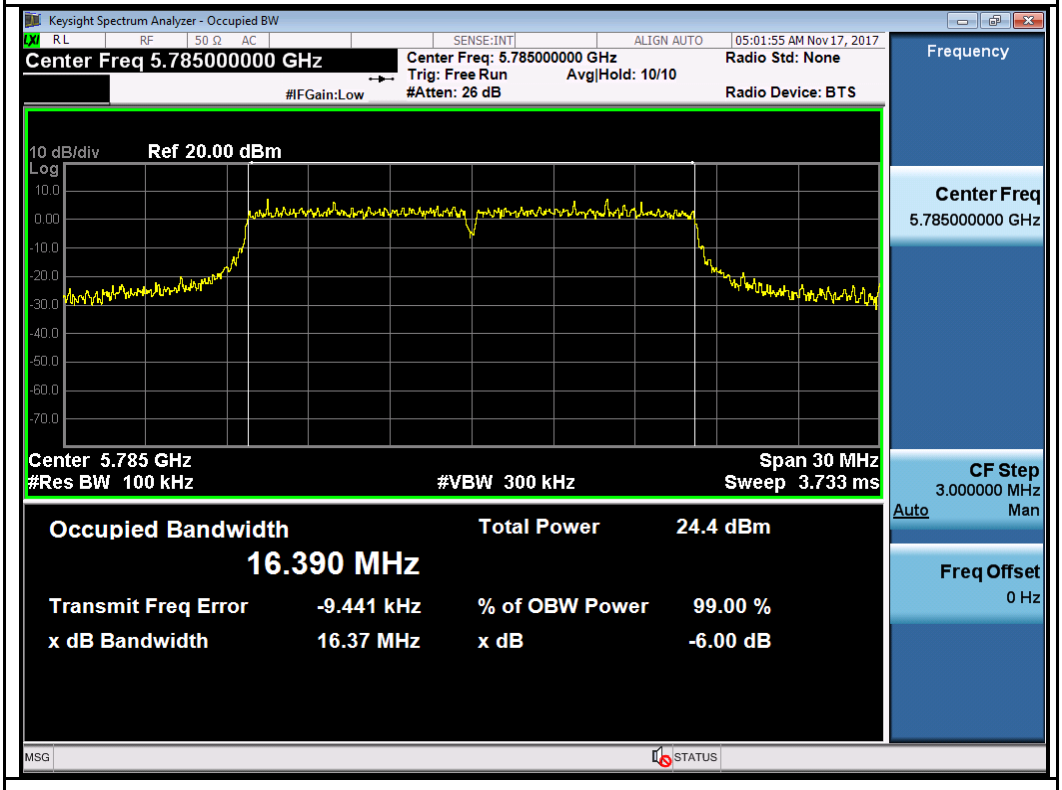


802.11ac-VHT80-5775MHz

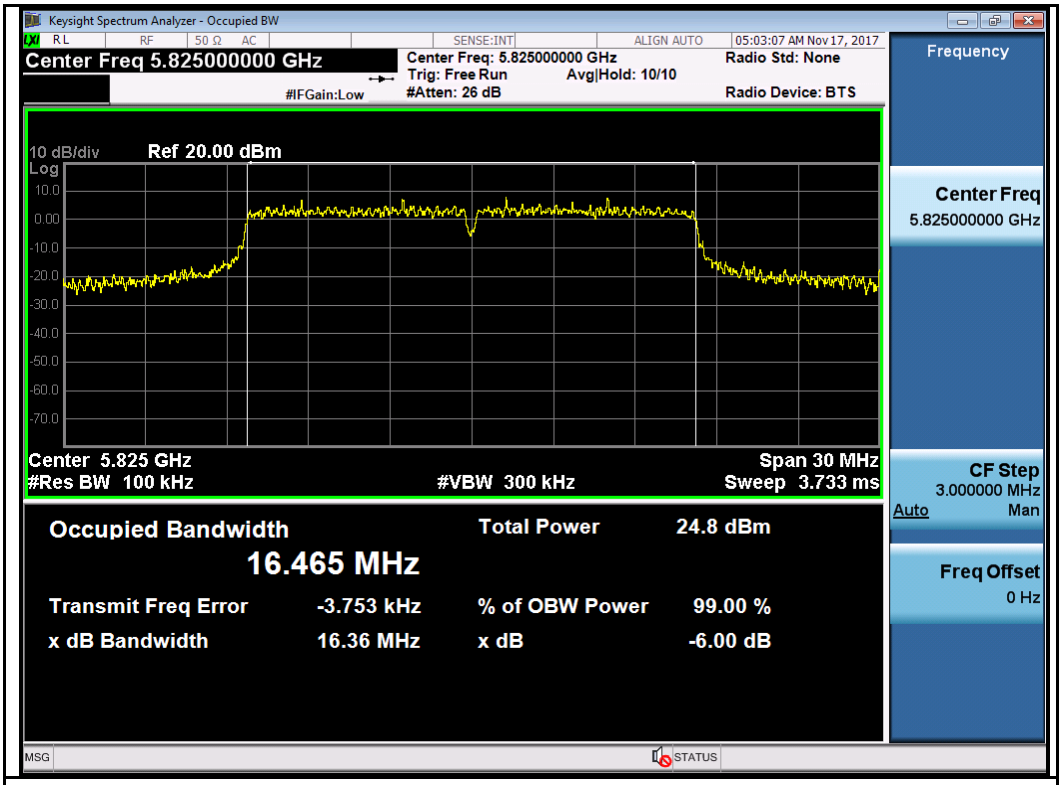
T310S
W58:



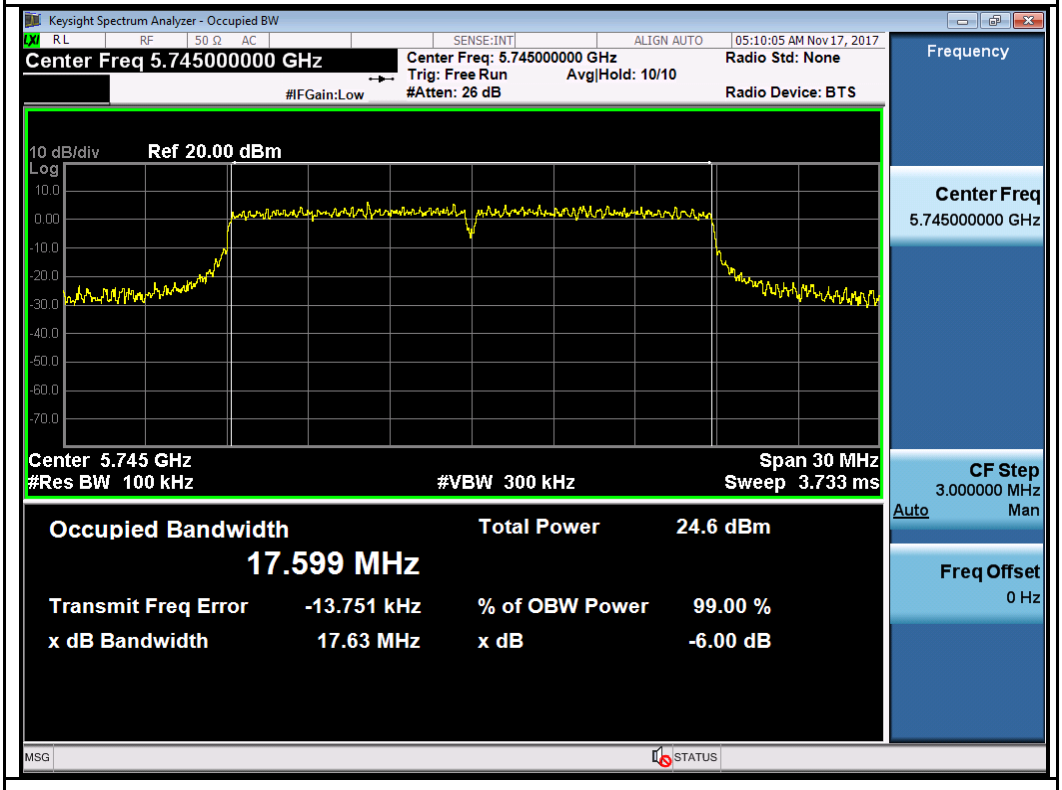
802.11a-5745MHz



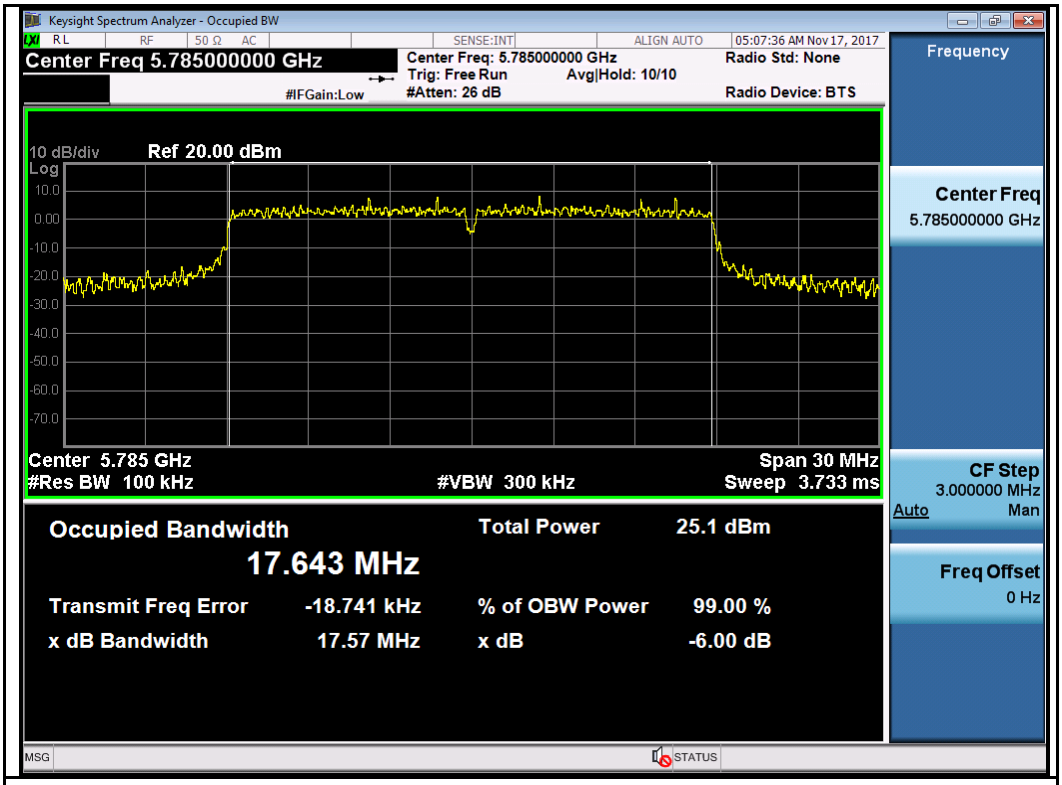
802.11a-5785MHz



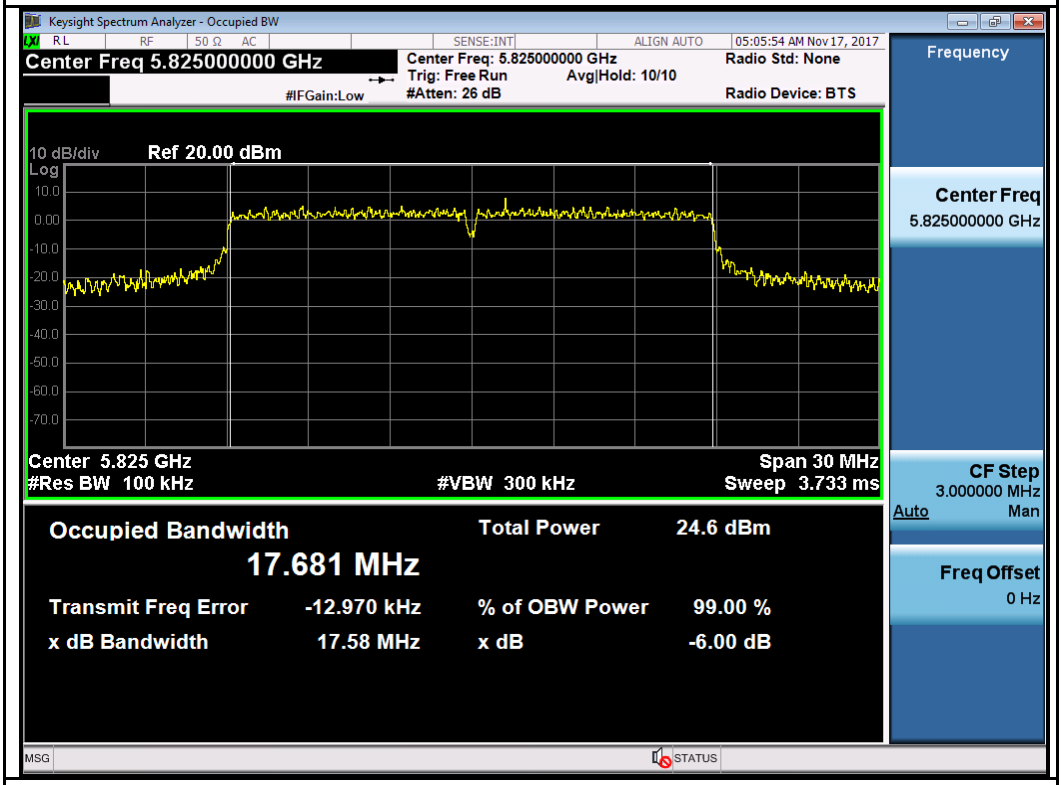
802.11a-5825MHz



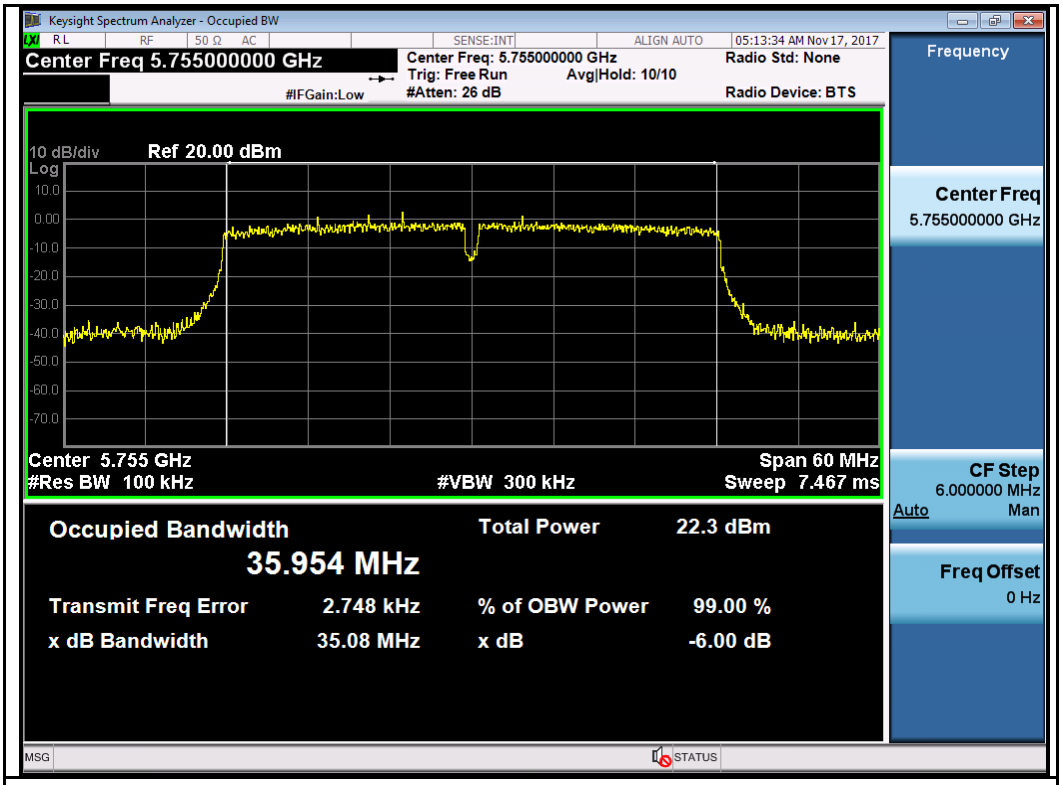
802.11n-HT20-5745MHz



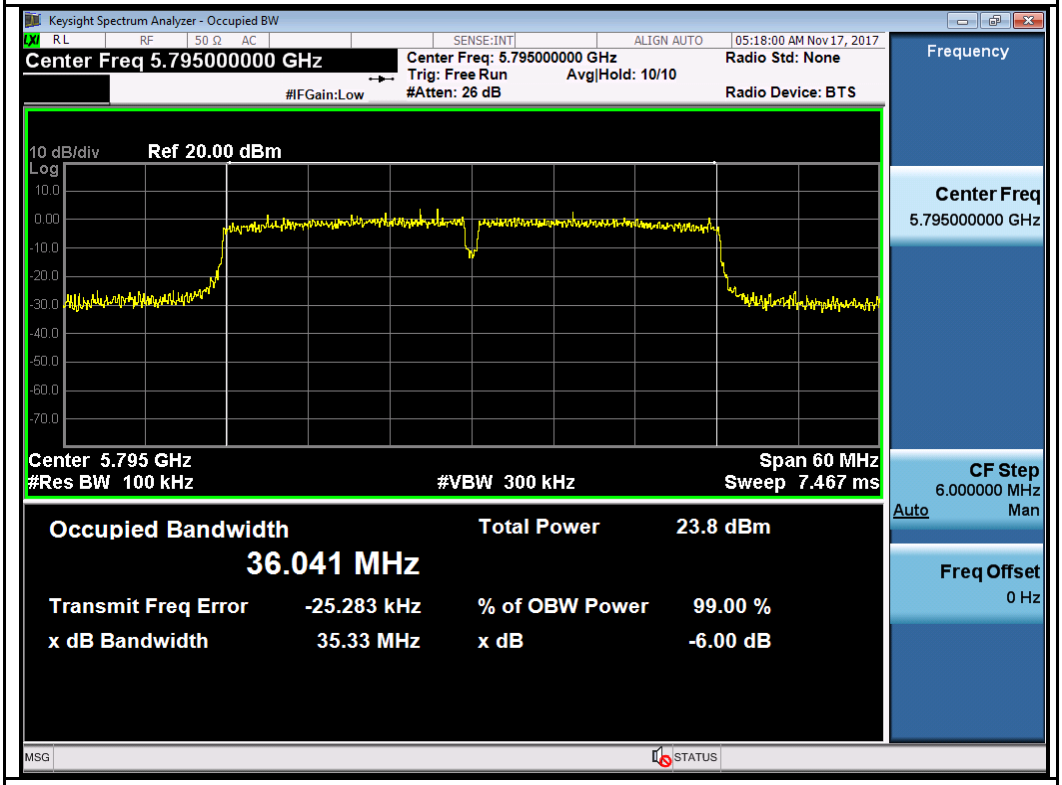
802.11n-HT20-5785MHz



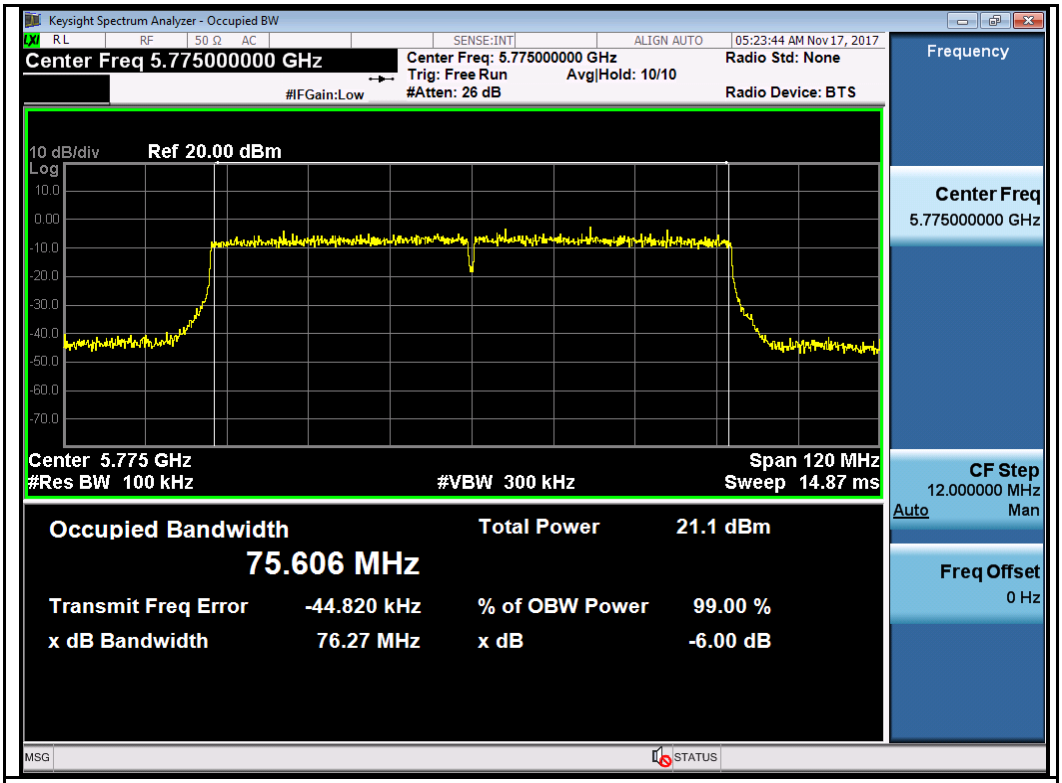
802.11n-HT20-5825MHz



802.11n-HT40-5755MHz



802.11n-HT40-5795MHz



802.11ac-VHT80-5775MHz

10.4 Output Power

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	a)(1)(ii)	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.	☒
	a)(3)	For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.	☒
Test Setup			
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01r02 Measurement using a Spectrum Analyzer or EMI Receiver (SA) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal. (ii) Set RBW = 1 MHz (iii) Set VBW = 3 MHz (iv) Number of points in sweep ≥ 2 × span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.) (v) Sweep time = auto. (vi) Detector = power averaging (rms), if available. Otherwise, use sample detector mode. (vii) If transmit duty cycle < 98%, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98%, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run." (viii) Trace average at least 100 traces in power averaging (rms) mode. (ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.		
Test Date	11/11/2017-11/21/2017	Environmental condition	Temperature 21°C Relative Humidity 40% Atmospheric Pressure 1019mbar
Remark	N/A		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Cipher at RF test site.

T310N

Output Power measurement result for 5.2GHz

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain0	Chain1	Combined Power		
Output Power	802.11a	5180	Low	18.16	18.40	21.29	22.5	Pass
	802.11a	5200	Mid	18.25	18.30	21.29	22.5	Pass
	802.11a	5240	High	18.17	18.13	21.16	22.5	Pass
	802.11n-20M	5180	Low	18.36	18.45	21.42	22.5	Pass
	802.11n-20M	5200	Mid	18.54	18.20	21.39	22.5	Pass
	802.11n-20M	5240	High	18.17	18.04	21.12	22.5	Pass
	802.11n-40M	5190	Low	17.03	16.85	19.95	22.5	Pass
	802.11n-40M	5230	Mid	18.73	18.45	21.60	22.5	Pass
	802.11ac-80M	5210	High	15.74	15.05	18.42	22.5	Pass

Output Power measurement result for 5.8GHz

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain0	Chain1	Combined Power		
Output Power	802.11a	5745	Low	18.47	18.30	21.40	22.5	Pass
	802.11a	5785	Mid	18.04	17.99	21.03	22.5	Pass
	802.11a	5825	High	18.57	18.52	21.56	22.5	Pass
	802.11n-20M	5745	Low	18.76	18.76	21.77	22.5	Pass
	802.11n-20M	5785	Mid	18.29	18.36	21.33	22.5	Pass
	802.11n-20M	5825	High	18.76	18.66	21.72	22.5	Pass
	802.11n-40M	5755	Low	16.93	16.96	19.95	22.5	Pass
	802.11n-40M	5795	Mid	17.11	16.81	19.98	22.5	Pass
	802.11ac-80M	5775	High	15.49	16.71	19.16	22.5	Pass

Note: Two antennas are cross polarized, the directional gain = individual antenna gain = 13.5 dBi, 13.5-6 = 7.5 dB limit adjustment is needed. All the mode transmission is MIMO.

T310S

Output Power measurement result for 5.2GHz

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain0	Chain1	Combined Power		
Output Power	802.11a	5180	Low	20.68	20.52	23.61	28	Pass
	802.11a	5200	Mid	20.44	20.69	23.58	28	Pass
	802.11a	5240	High	20.55	20.39	23.48	28	Pass
	802.11n-20M	5180	Low	20.70	20.74	23.73	28	Pass
	802.11n-20M	5200	Mid	20.73	20.49	23.62	28	Pass
	802.11n-20M	5240	High	20.63	20.65	23.65	28	Pass
	802.11n-40M	5190	Low	18.60	18.74	21.68	28	Pass
	802.11n-40M	5230	Mid	20.71	20.76	23.75	28	Pass
	802.11ac-80M	5210	High	18.34	17.39	20.90	28	Pass

Output Power measurement result for 5.8GHz

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain0	Chain1	Combined Power		
Output Power	802.11a	5745	Low	19.34	19.36	22.36	28	Pass
	802.11a	5785	Mid	19.18	18.99	22.10	28	Pass
	802.11a	5825	High	19.35	19.47	22.42	28	Pass
	802.11n-20M	5745	Low	19.72	19.73	22.73	28	Pass
	802.11n-20M	5785	Mid	19.55	20.08	22.83	28	Pass
	802.11n-20M	5825	High	19.35	19.37	22.37	28	Pass
	802.11n-40M	5755	Low	17.40	17.41	20.41	28	Pass
	802.11n-40M	5795	Mid	18.66	18.89	21.78	28	Pass
	802.11ac-80M	5775	High	16.39	16.97	19.70	28	Pass

Note: Two antennas are cross polarized, the directional gain = individual antenna gain = 8 dBi, 8-6 = 2 dB limit adjustment is needed.
All the mode transmission is MIMO.

T310S Beamforming Mode
Output Power measurement result for 5.2GHz

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain0	Chain1	Combined Power		
Output Power	802.11a	5180	Low	19.92	19.92	22.93	25	Pass
	802.11a	5200	Mid	20.44	20.69	23.58	25	Pass
	802.11a	5240	High	20.55	20.39	23.48	25	Pass
	802.11n-20M	5180	Low	19.80	19.70	22.76	25	Pass
	802.11n-20M	5200	Mid	20.73	20.49	23.62	25	Pass
	802.11n-20M	5240	High	20.63	20.65	23.65	25	Pass
	802.11n-40M	5190	Low	17.91	17.89	20.91	25	Pass
	802.11n-40M	5230	Mid	20.71	20.76	23.75	25	Pass
	802.11ac-80M	5210	High	18.18	17.03	20.66	25	Pass

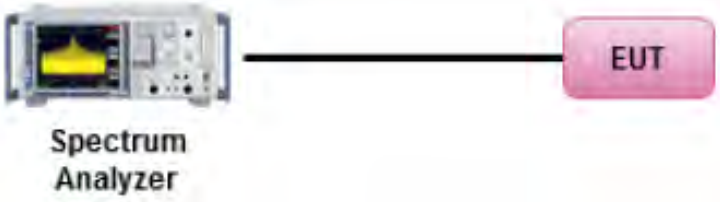
Output Power measurement result for 5.8GHz

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain0	Chain1	Combined Power		
Output Power	802.11a	5745	Low	19.34	19.36	22.36	25	Pass
	802.11a	5785	Mid	19.18	18.99	22.10	25	Pass
	802.11a	5825	High	19.35	19.47	22.42	25	Pass
	802.11n-20M	5745	Low	19.72	19.73	22.73	25	Pass
	802.11n-20M	5785	Mid	19.55	20.08	22.83	25	Pass
	802.11n-20M	5825	High	19.35	19.37	22.37	25	Pass
	802.11n-40M	5755	Low	17.40	17.41	20.41	25	Pass
	802.11n-40M	5795	Mid	18.66	18.89	21.78	25	Pass
	802.11ac-80M	5775	High	16.39	16.97	19.70	25	Pass

Note: Array gain is 10 log10(N_{ANT})=3dB, N_{ANT} = 2, highest individual gain is 8dBi, so max directional gain of the EUT is 11dBi. 11-6 = 5 dB limit adjustment is needed. All the mode transmission is MIMO.

10.5 Power Spectral Density

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	a)(1)(i)	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.	☒
	a)(3)	For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.	☒
Test Setup			
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01r02, II.F. Method SA-1 Maximum spectral density measurement procedure - Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal. - Set RBW = 1 MHz - Set VBW ≥ 3 MHz - Detector = RMS. - Sweep time = auto couple. - Trace mode = max hold. - Trace average at least 100 traces in power averaging - Use the peak marker function to determine the maximum amplitude level within the RBW. Apply correction to the result if different RBW is used.		
Test Date	11/11/2017-11/21/2017	Environmental condition	Temperature 22°C Relative Humidity 42% Atmospheric Pressure 1020mbar
Remark	N/A		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Cipher at RF test site.

T310N

PSD measurement result for 5.2GHz

Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/MHz)			Limit (dBm)	Result
				Chain0	Chain1	Combined Power		
PSD	802.11a	5180	Low	6.099	6.001	9.061	9.5	Pass
	802.11a	5200	Mid	6.104	6.143	9.134	9.5	Pass
	802.11a	5240	High	6.029	5.926	8.988	9.5	Pass
	802.11n-20M	5180	Low	6.084	5.974	9.040	9.5	Pass
	802.11n-20M	5200	Mid	5.871	6.040	8.967	9.5	Pass
	802.11n-20M	5240	High	5.856	5.758	8.818	9.5	Pass
	802.11n-40M	5190	Low	1.633	1.626	4.640	9.5	Pass
	802.11n-40M	5230	Mid	3.396	3.381	6.399	9.5	Pass
	802.11ac-80M	5210	High	-3.365	-3.145	-0.243	9.5	Pass

PSD measurement result for 5.8GHz

Test mode	Freq (MHz)	CH	Conducted PSD (dBm/100kHz)			Correction factor (dB)	PSD (dBm/500kHz)	Limit (dBm/500 kHz)	Result
			Chain0	Chain1	Combined				
802.11a	5745	Low	-1.294	-1.502	1.614	6.99	8.604	22.5	Pass
	5785	Mid	-1.773	-1.859	1.195	6.99	8.185	22.5	Pass
	5825	High	-1.540	-1.616	1.432	6.99	8.422	22.5	Pass
802.11n-20	5745	Low	-1.490	-1.460	1.535	6.99	8.525	22.5	Pass
	5785	Mid	-1.559	-1.323	1.571	6.99	8.561	22.5	Pass
	5825	High	-1.481	-1.422	1.559	6.99	8.549	22.5	Pass
802.11n-40	5755	Low	-6.183	-6.219	-3.191	6.99	3.799	22.5	Pass
	5795	High	-5.738	-6.085	-2.898	6.99	4.092	22.5	Pass
802.11ac-80	5775	Mid	-10.214	-9.941	-7.065	6.99	-0.075	22.5	Pass
Note	BW correction factor = 10log(500kHz/RBW), RBW was set to 100kHz during test.								

Correction factor=10*log(500/100)=6.99

Note: Two antennas are cross polarized, the directional gain = individual antenna gain = 13.5 dBi, 13.5-6 = 7.5 dB limit adjustment is needed. All the mode transmission is MIMO.

T310S

PSD measurement result for 5.2GHz

Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/MHz)			Limit (dBm)	Result
				Chain0	Chain1	Combined Power		
PSD	802.11a	5180	Low	8.501	8.344	11.434	15	Pass
	802.11a	5200	Mid	8.393	8.345	11.379	15	Pass
	802.11a	5240	High	8.322	8.329	11.336	15	Pass
	802.11n-20M	5180	Low	8.207	8.198	11.213	15	Pass
	802.11n-20M	5200	Mid	8.314	8.347	11.341	15	Pass
	802.11n-20M	5240	High	8.154	8.174	11.174	15	Pass
	802.11n-40M	5190	Low	3.391	3.378	6.395	15	Pass
	802.11n-40M	5230	Mid	5.520	5.577	8.559	15	Pass
	802.11ac-80M	5210	High	-0.606	-0.766	2.325	15	Pass

PSD measurement result for 5.8GHz

Test mode	Freq (MHz)	CH	Conducted PSD (dBm/100kHz)			Correction factor (dB)	PSD (dBm/500kHz)	Limit (dBm/500 kHz)	Result
			Chain0	Chain1	Combined				
802.11a	5745	Low	-0.335	-0.632	2.529	6.99	9.519	28	Pass
	5785	Mid	-1.061	-0.884	2.039	6.99	9.029	28	Pass
	5825	High	-0.533	-0.440	2.524	6.99	9.514	28	Pass
802.11n-20	5745	Low	-0.590	-0.593	2.419	6.99	9.409	28	Pass
	5785	Mid	-0.160	0.155	3.011	6.99	10.001	28	Pass
	5825	High	-0.704	-0.808	2.255	6.99	9.245	28	Pass
802.11n-40	5755	Low	-5.564	-5.613	-2.578	6.99	4.412	28	Pass
	5795	High	-3.974	-4.084	-1.018	6.99	5.972	28	Pass
802.11ac-80	5775	Mid	-9.312	-9.086	-6.187	6.99	0.803	28	Pass
Note	BW correction factor = 10log(500kHz/RBW), RBW was set to 100kHz during test.								

Correction factor=10*log(500/100)=6.99

Note: Two antennas are cross polarized, the directional gain = individual antenna gain = 8dBi. 8-6 = 2 dB limit adjustment is needed. All the mode transmission is MIMO.

T310S Beamforming Mode
PSD measurement result for 5.2GHz

Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/MHz)			Limit (dBm)	Result
				Chain0	Chain1	Combined Power		
PSD	802.11a	5180	Low	7.848	7.900	10.884	12	Pass
	802.11a	5200	Mid	8.393	8.345	11.379	12	Pass
	802.11a	5240	High	8.322	8.329	11.336	12	Pass
	802.11n-20M	5180	Low	7.218	7.153	10.196	12	Pass
	802.11n-20M	5200	Mid	8.314	8.347	11.341	12	Pass
	802.11n-20M	5240	High	8.154	8.174	11.174	12	Pass
	802.11n-40M	5190	Low	2.508	2.494	5.511	12	Pass
	802.11n-40M	5230	Mid	5.520	5.577	8.559	12	Pass
	802.11ac-80M	5210	High	-1.186	-1.190	1.822	12	Pass

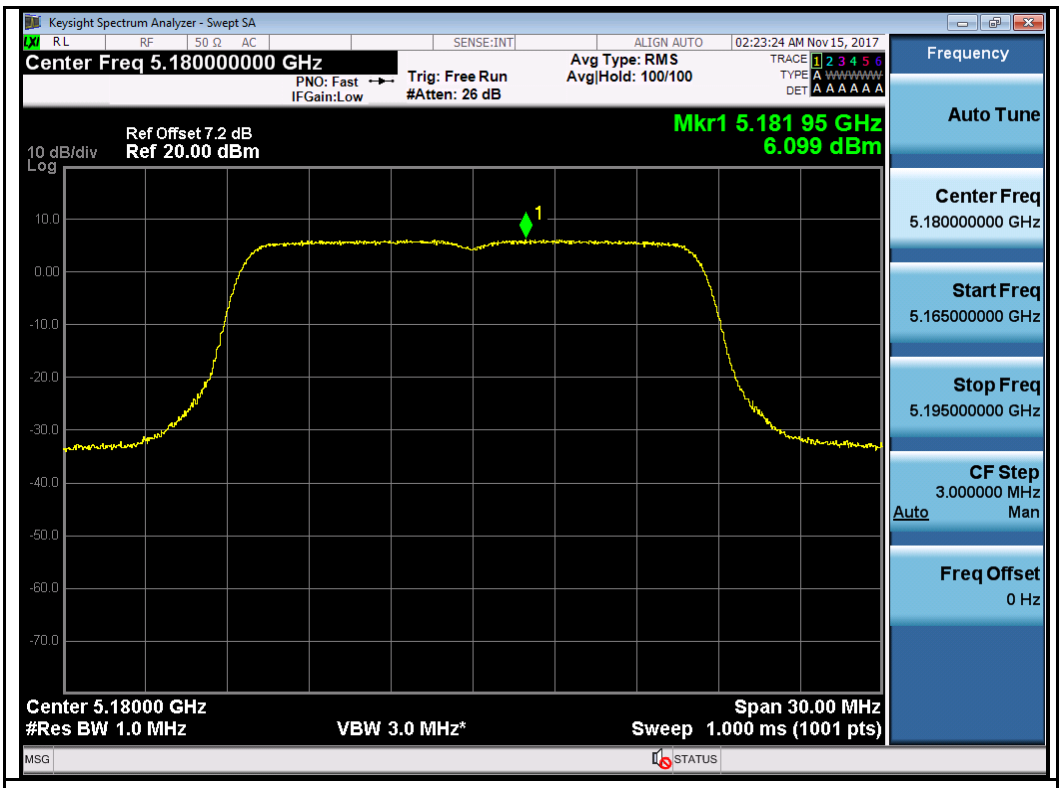
PSD measurement result for 5.8GHz

Test mode	Freq (MHz)	CH	Conducted PSD (dBm/100kHz)			Correction factor (dB)	PSD (dBm/500kHz)	Limit (dBm/500 kHz)	Result
			Chain0	Chain1	Combined				
802.11a	5745	Low	-0.335	-0.632	2.529	6.99	9.519	25	Pass
	5785	Mid	-1.061	-0.884	2.039	6.99	9.029	25	Pass
	5825	High	-0.533	-0.440	2.524	6.99	9.514	25	Pass
802.11n-20	5745	Low	-0.590	-0.593	2.419	6.99	9.409	25	Pass
	5785	Mid	-0.160	0.155	3.011	6.99	10.001	25	Pass
	5825	High	-0.704	-0.808	2.255	6.99	9.245	25	Pass
802.11n-40	5755	Low	-5.564	-5.613	-2.578	6.99	4.412	25	Pass
	5795	High	-3.974	-4.084	-1.018	6.99	5.972	25	Pass
802.11ac-80	5775	Mid	-9.312	-9.086	-6.187	6.99	0.803	25	Pass
Note	BW correction factor = 10log(500kHz/RBW), RBW was set to 100kHz during test.								

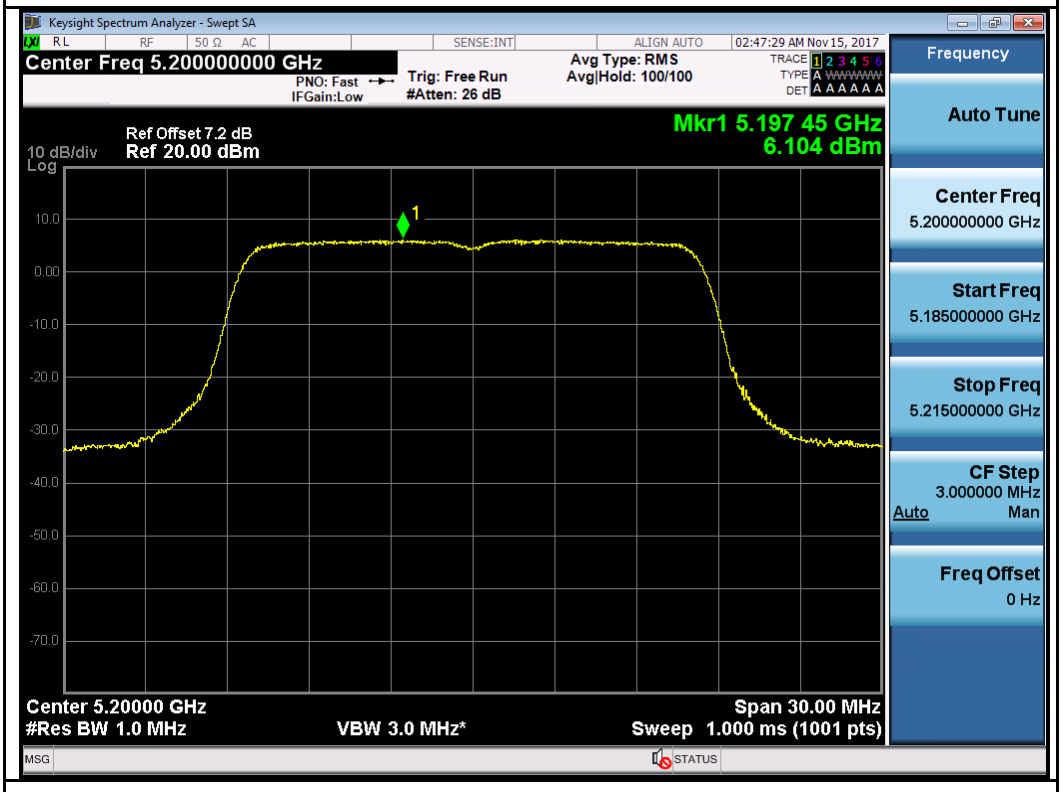
Correction factor=10*log(500/100)=6.99

Note: Array gain is 10 log10(N_{ANT})=3dB, N_{ANT} = 2, highest individual gain is 8dBi, so max directional gain of the EUT is 11dBi. 11-6 = 5 dB limit adjustment is needed. All the mode transmission is MIMO.

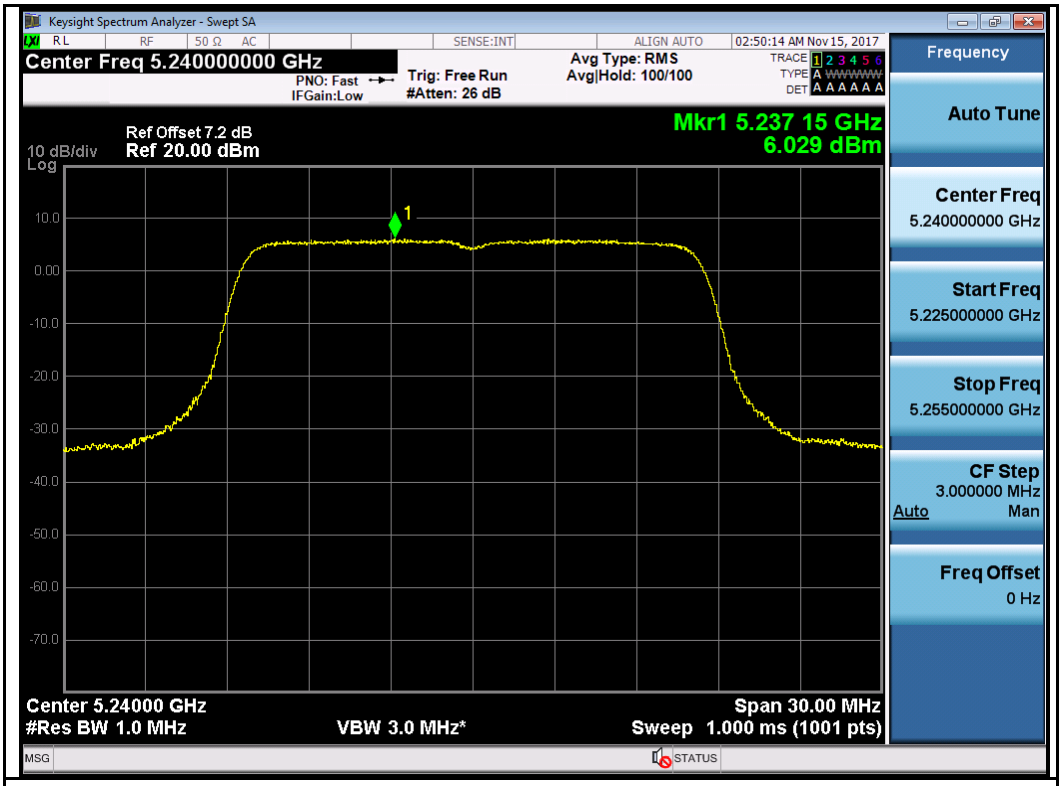
T310N
Test Plot for W52:
Chain 0:



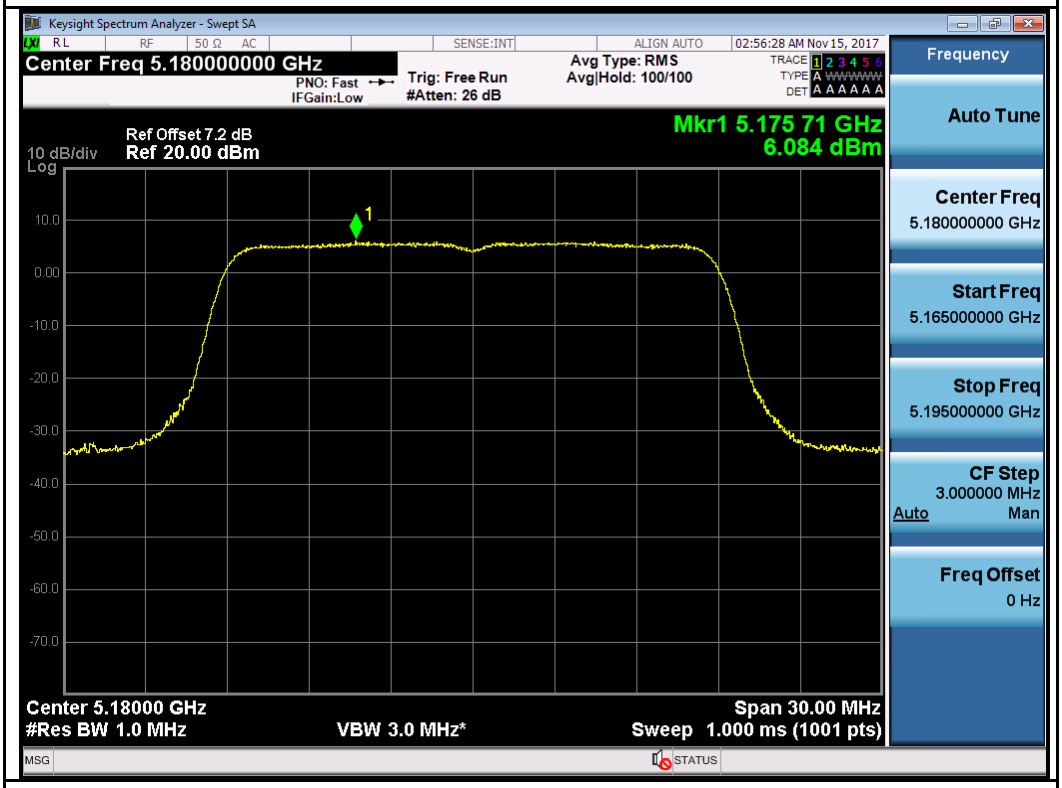
802.11a-5180MHz



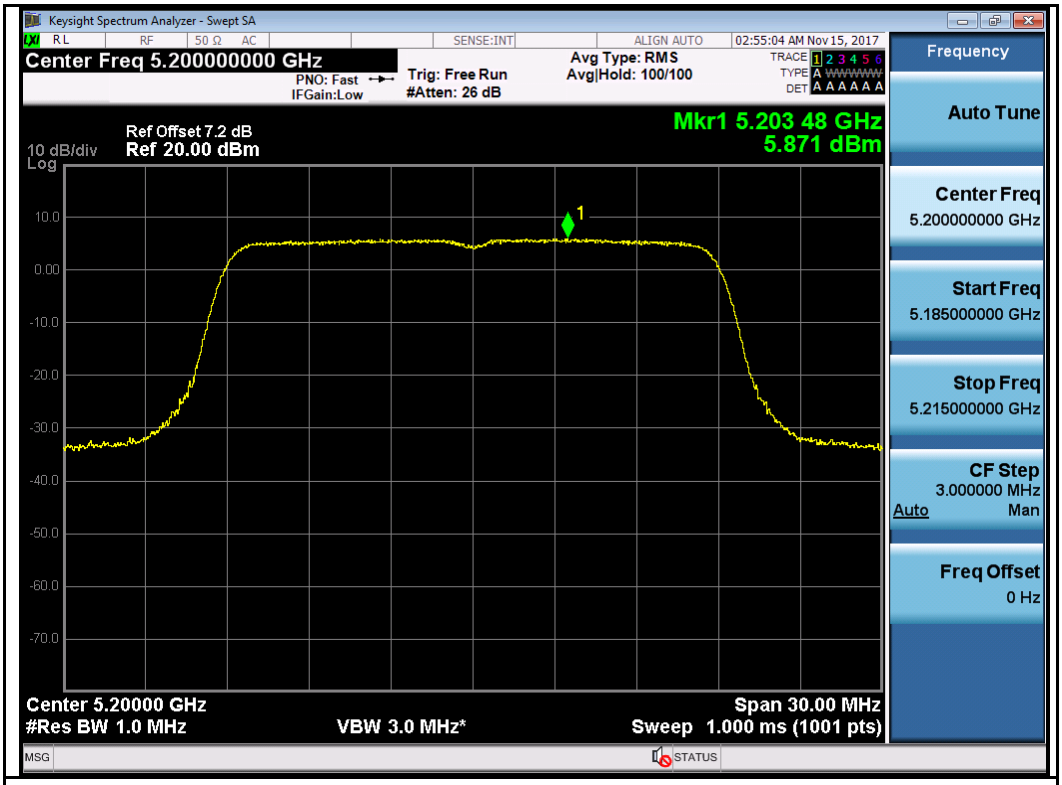
802.11a-5200MHz



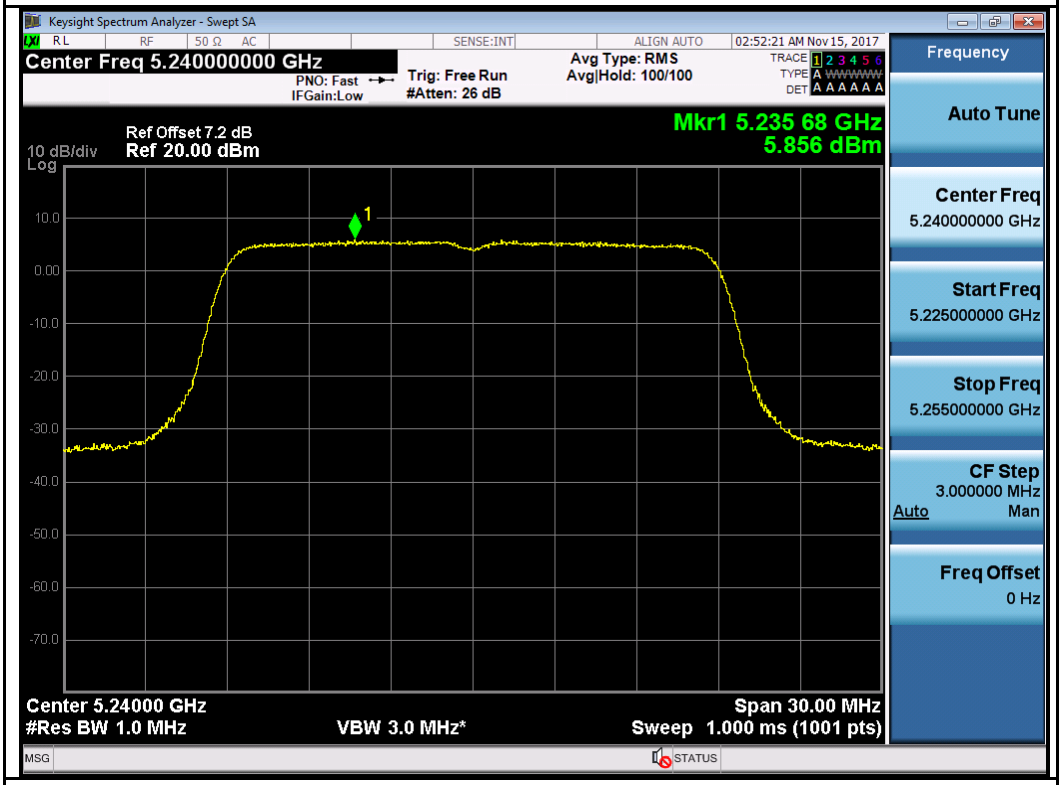
802.11a-5240MHz



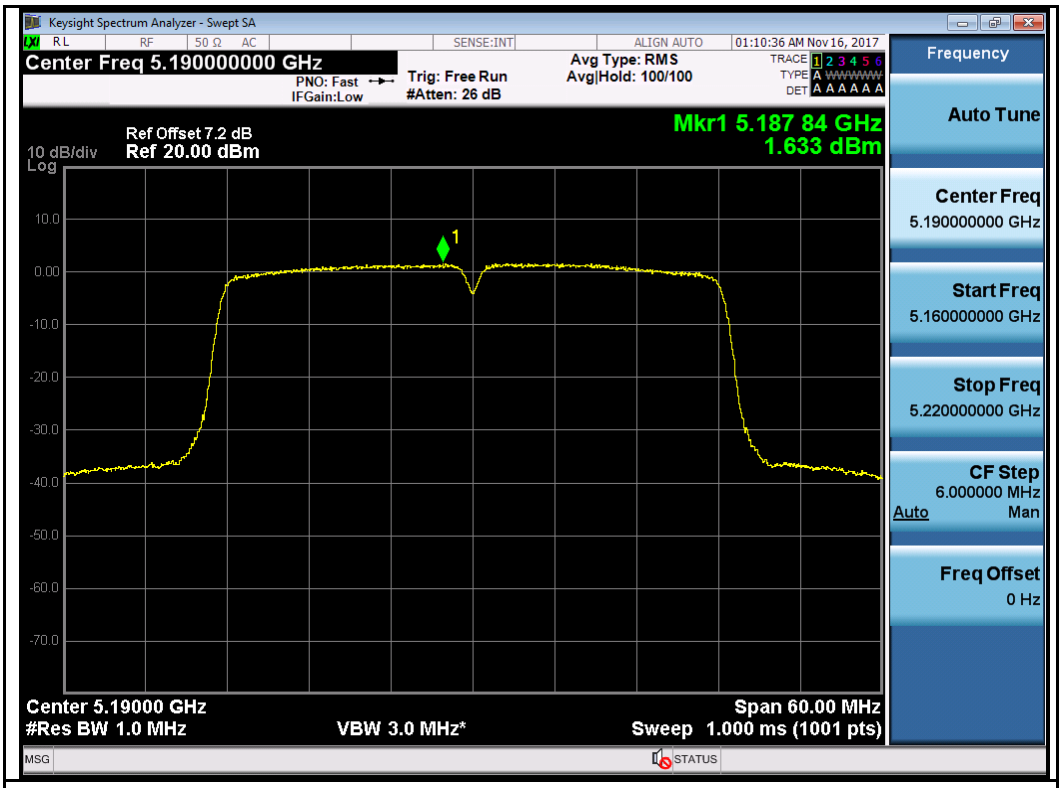
802.11n-HT20-5180MHz



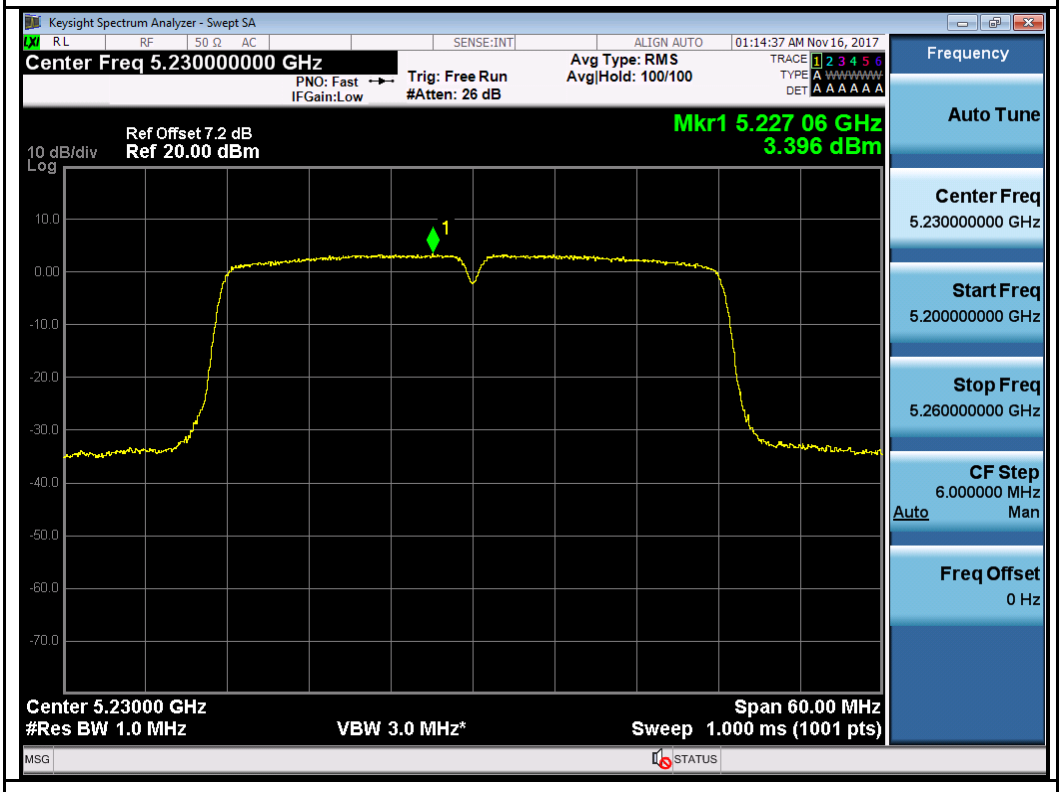
802.11n-HT20-5200MHz



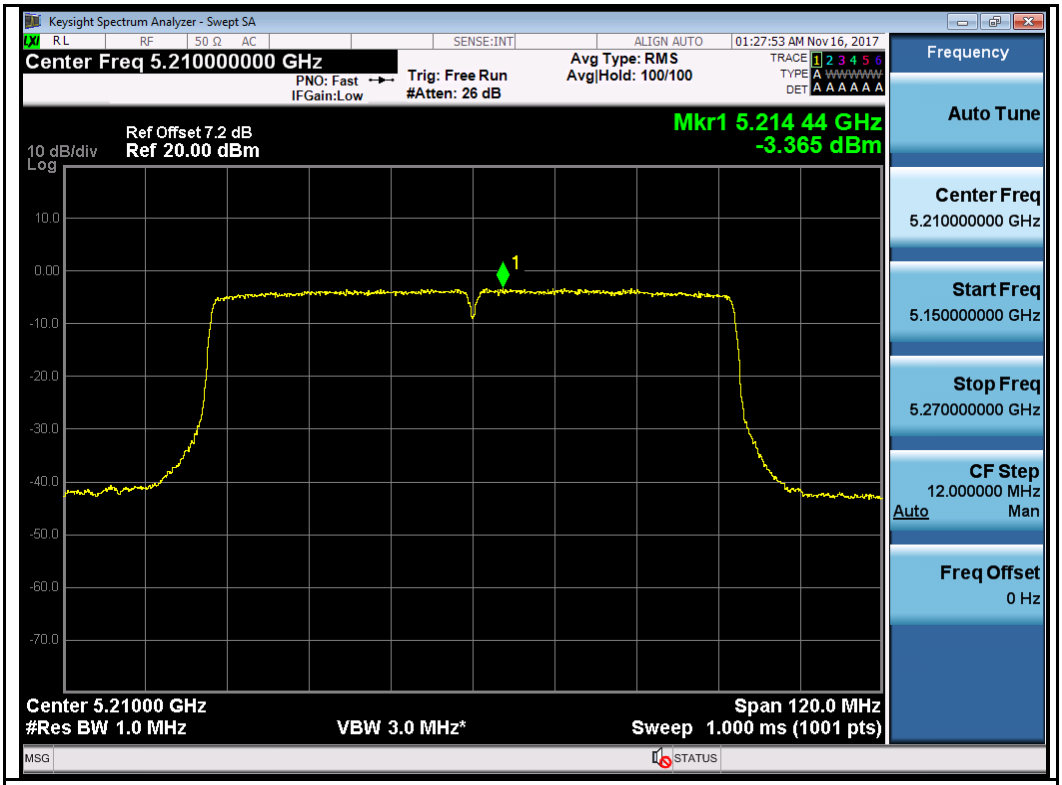
802.11n-HT20-5240MHz



802.11n-HT40-5190MHz

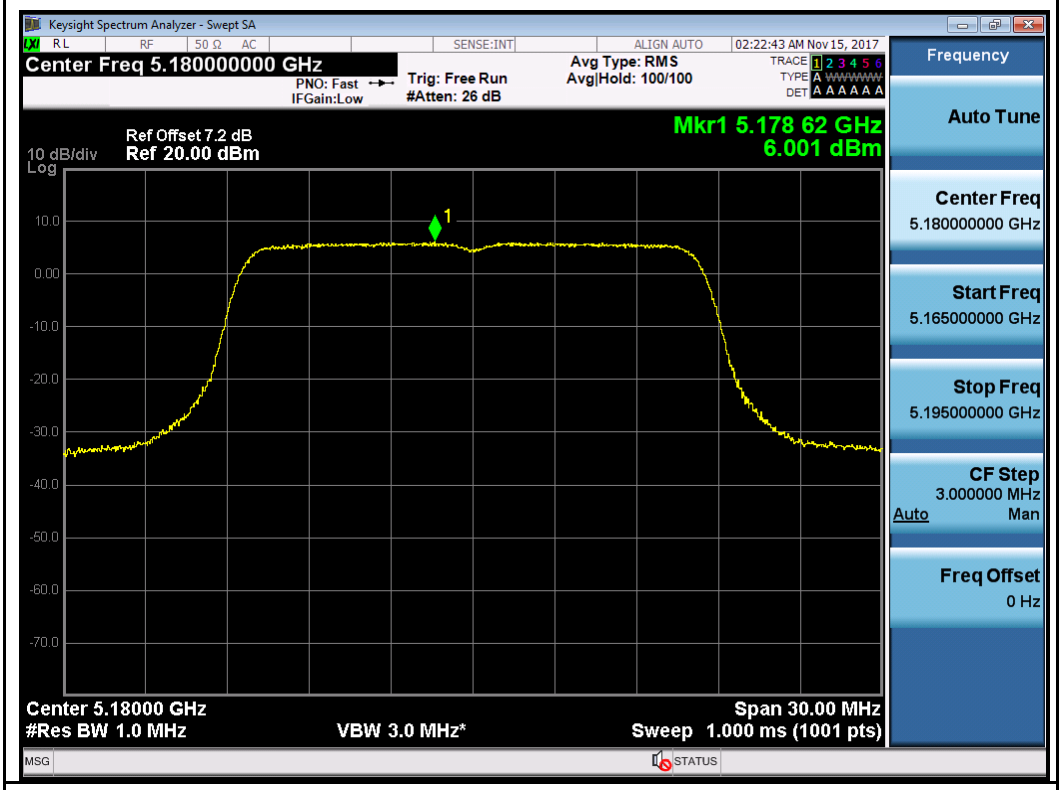


802.11n-HT40-5230MHz

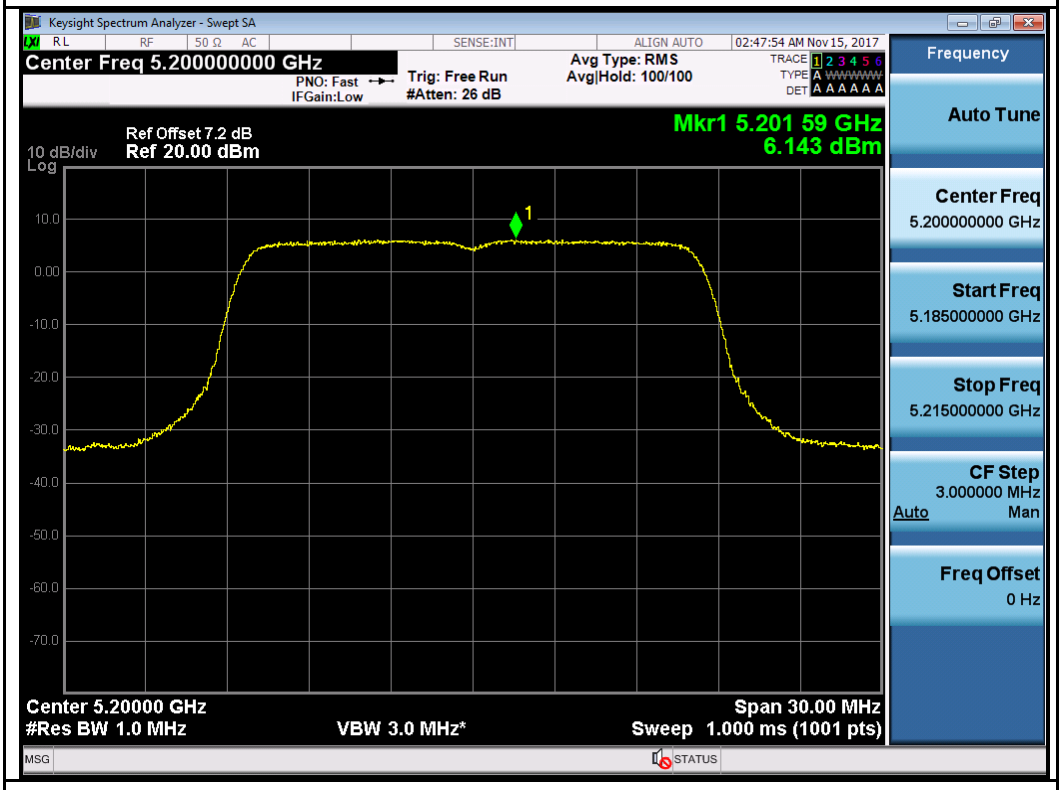


802.11ac-VHT80-5210MHz

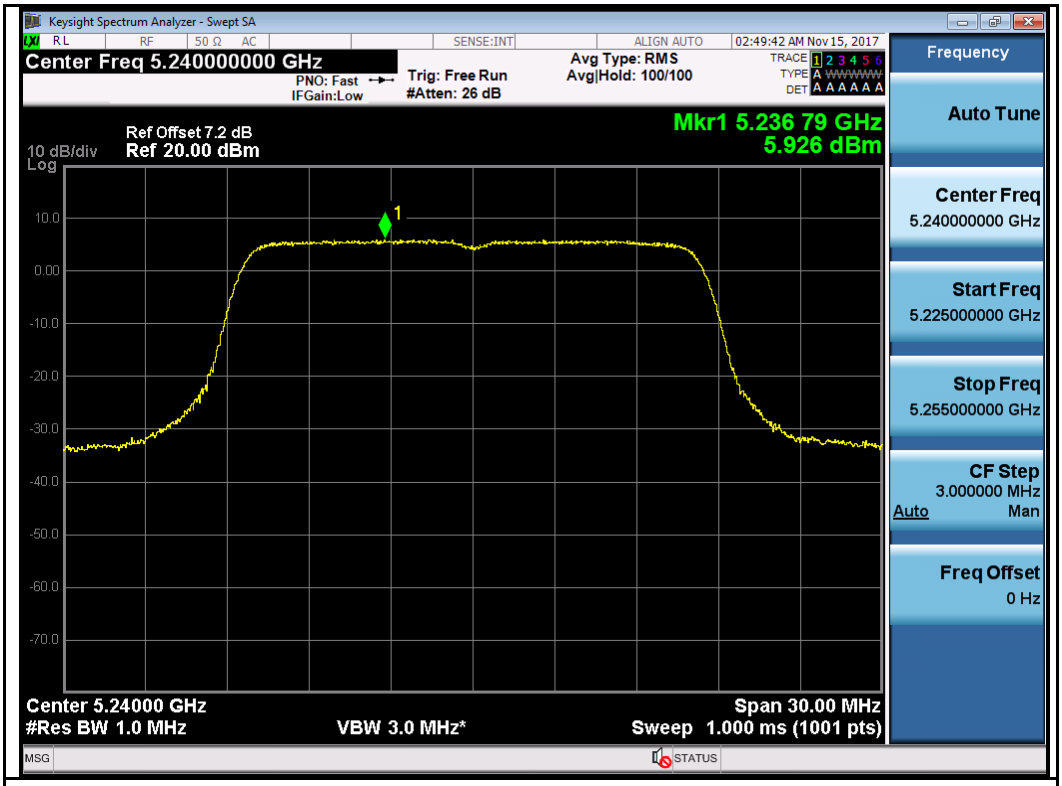
Chain 1:



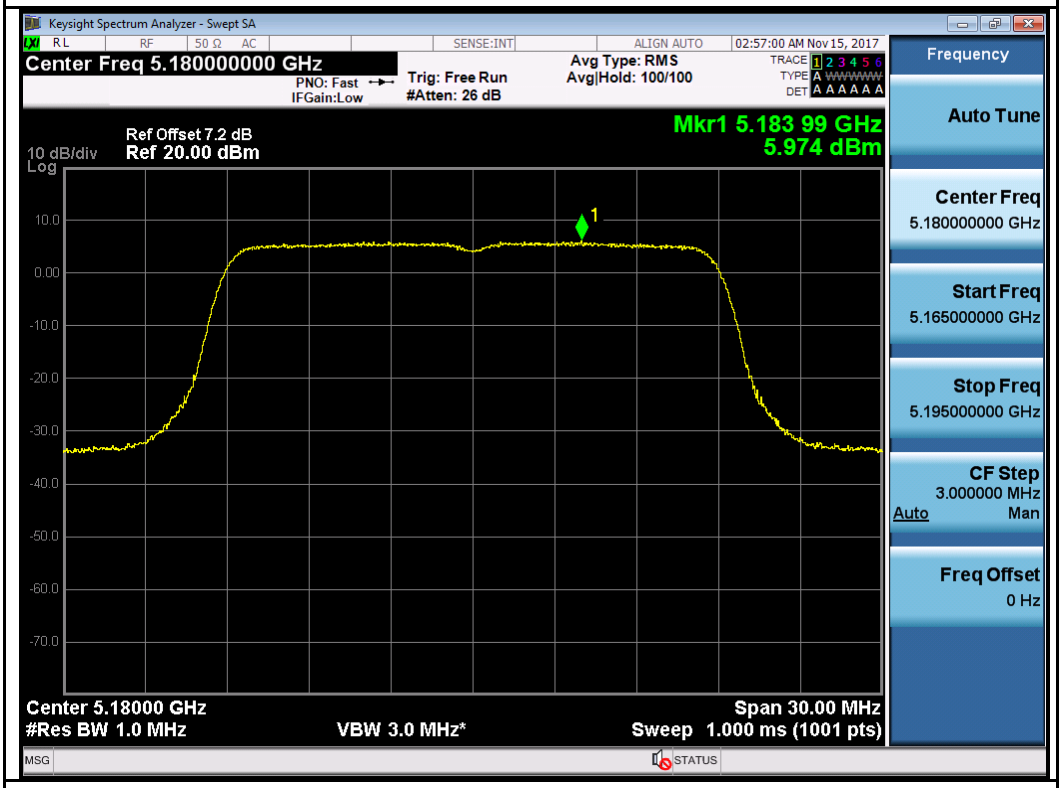
802.11a-5180MHz



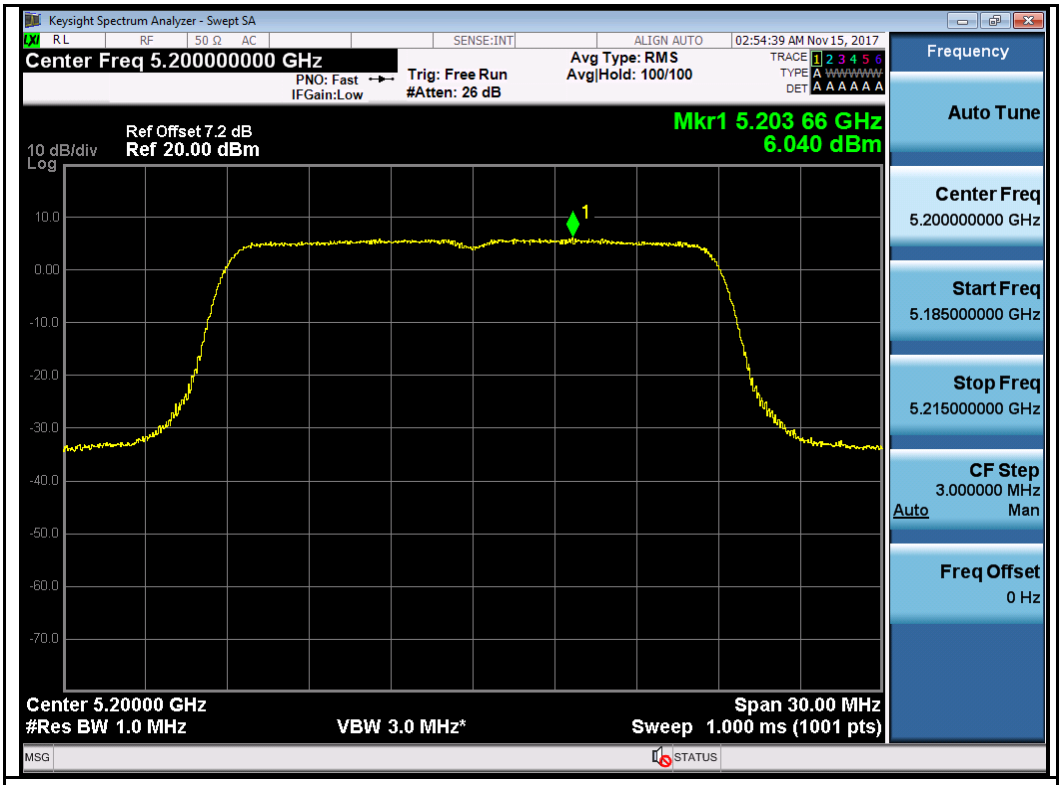
802.11a-5200MHz



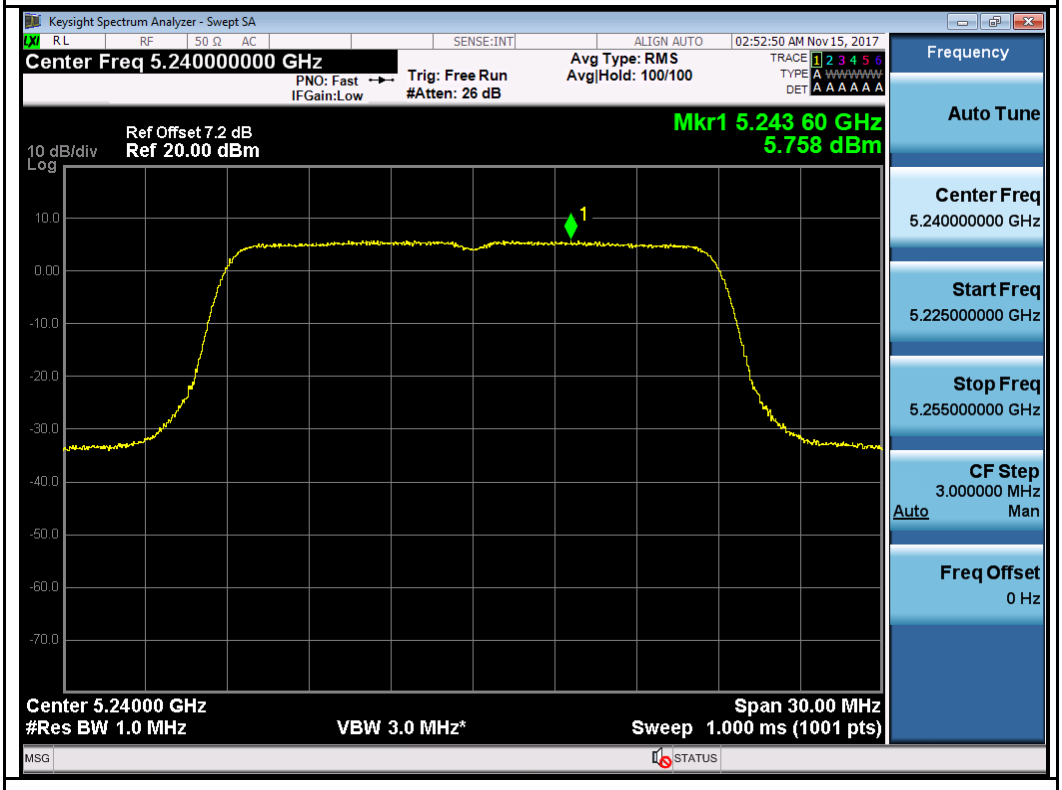
802.11a-5240MHz



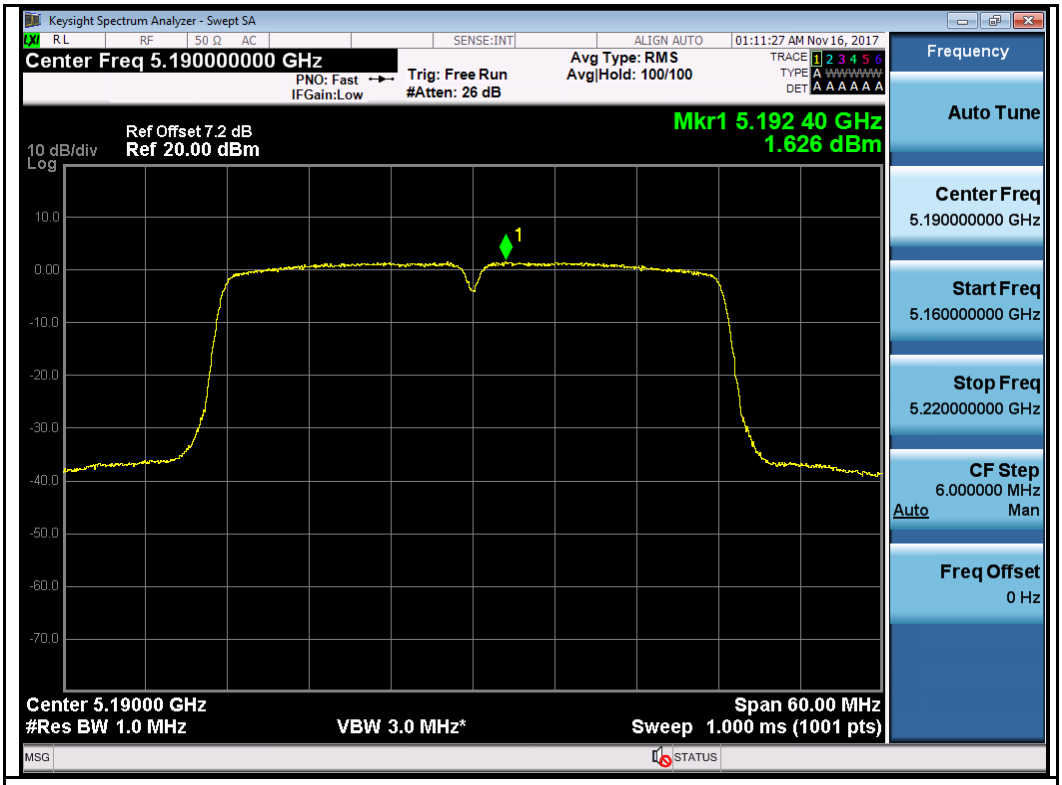
802.11n-HT20-5180MHz



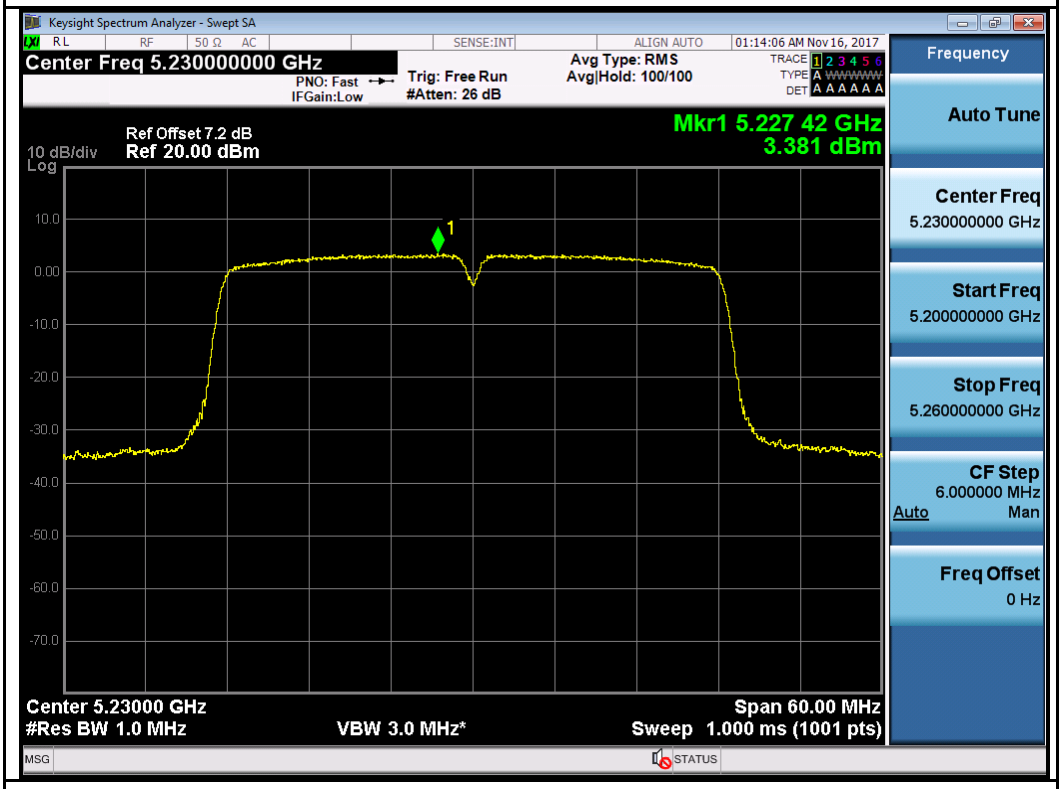
802.11n-HT20-5200MHz



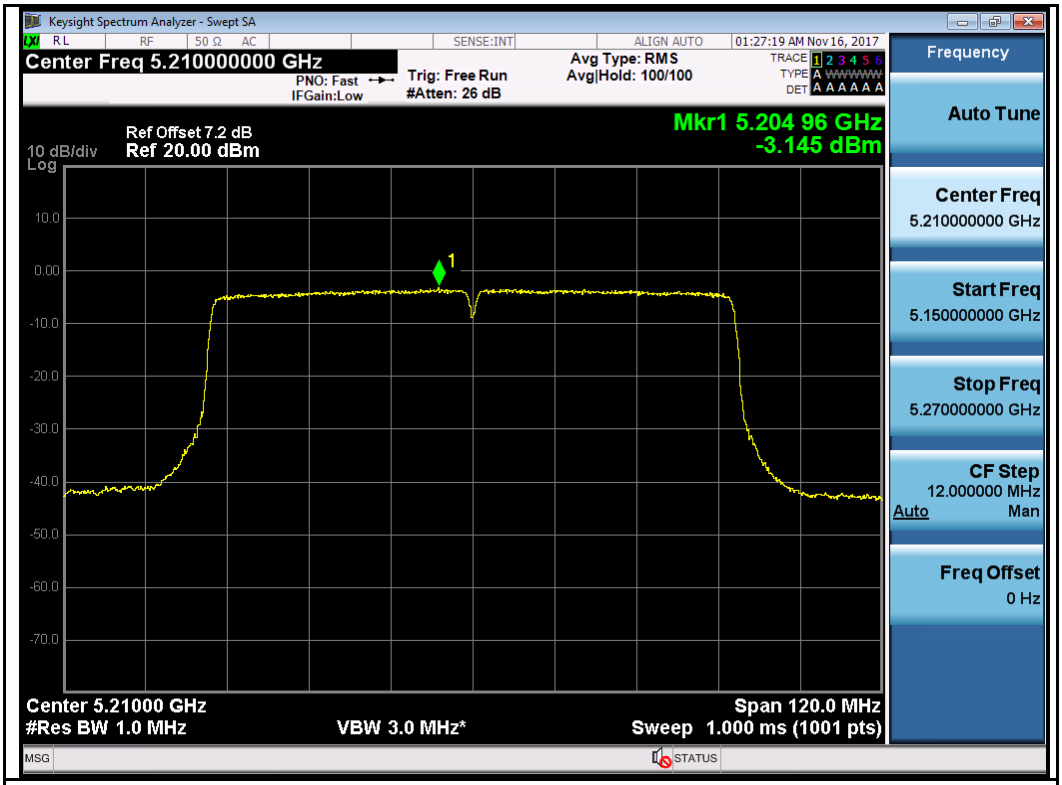
802.11n-HT20-5240MHz



802.11n-HT40-5190MHz



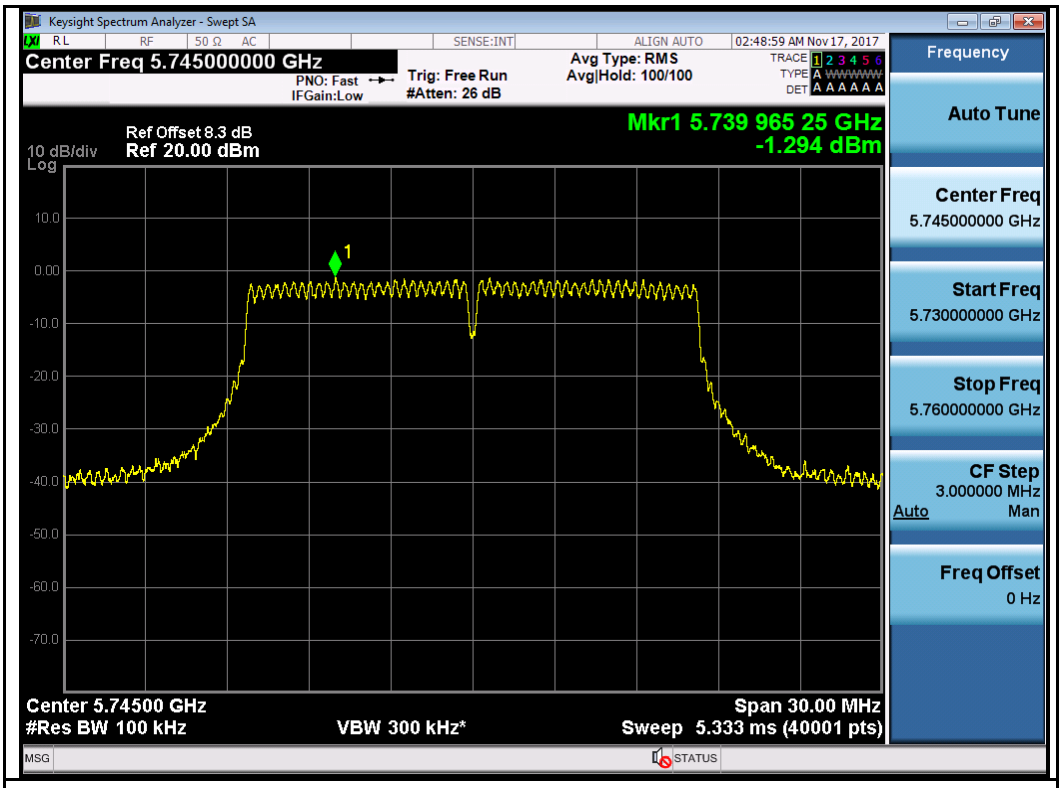
802.11n-HT40-5230MHz



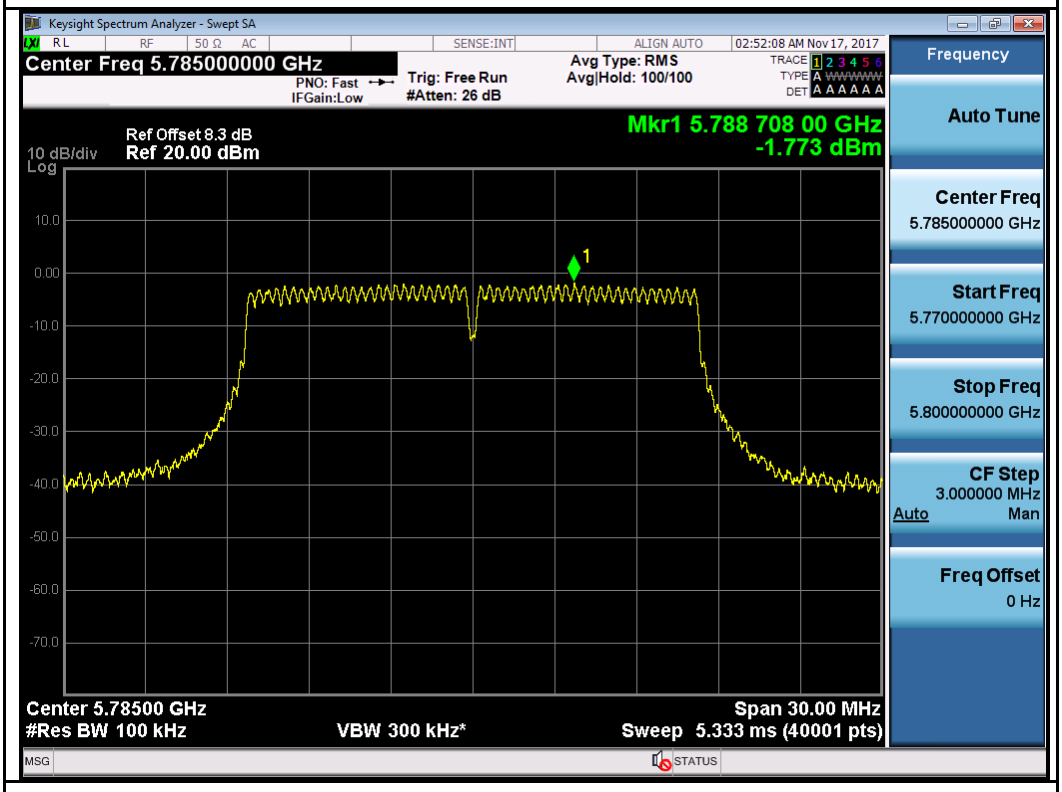
802.11ac-VHT80-5210MHz

Test Plot for W58:

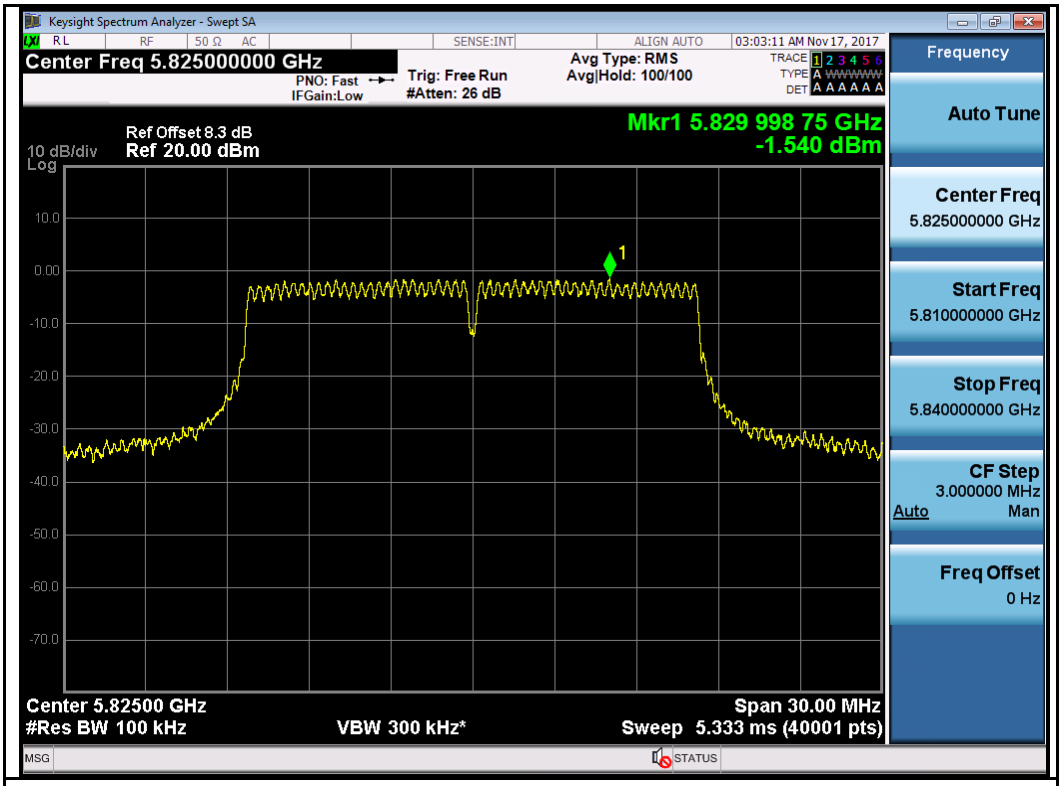
Chain 0:



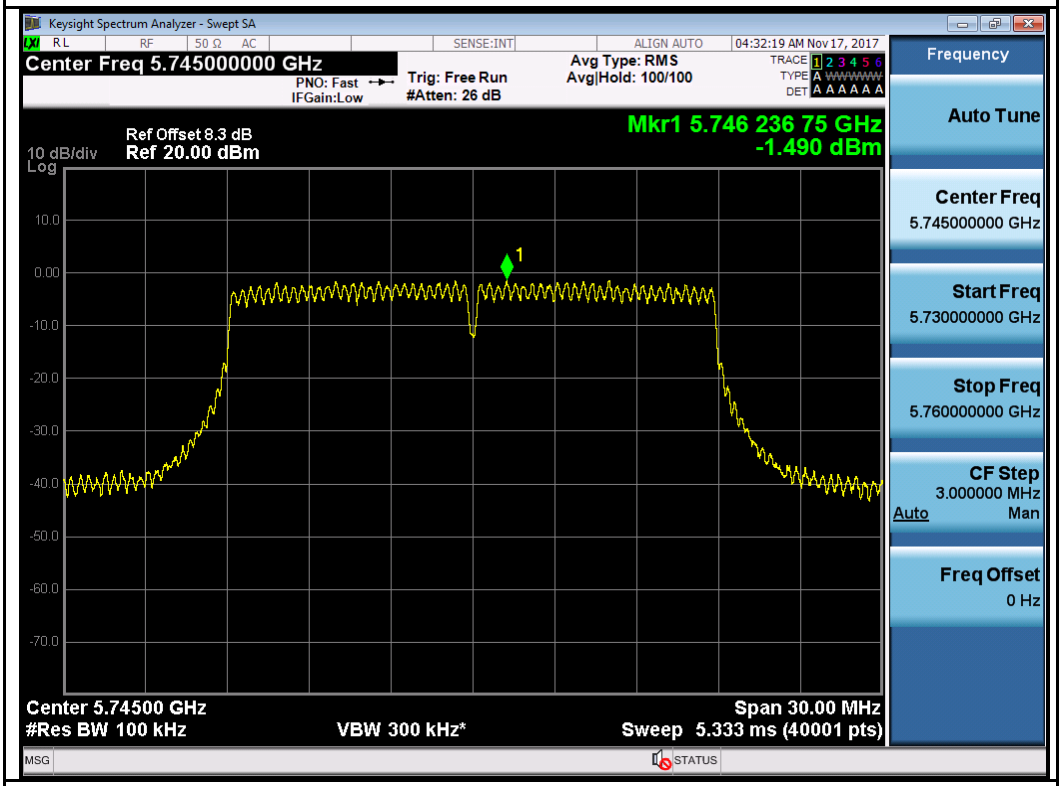
802.11a-5745MHz



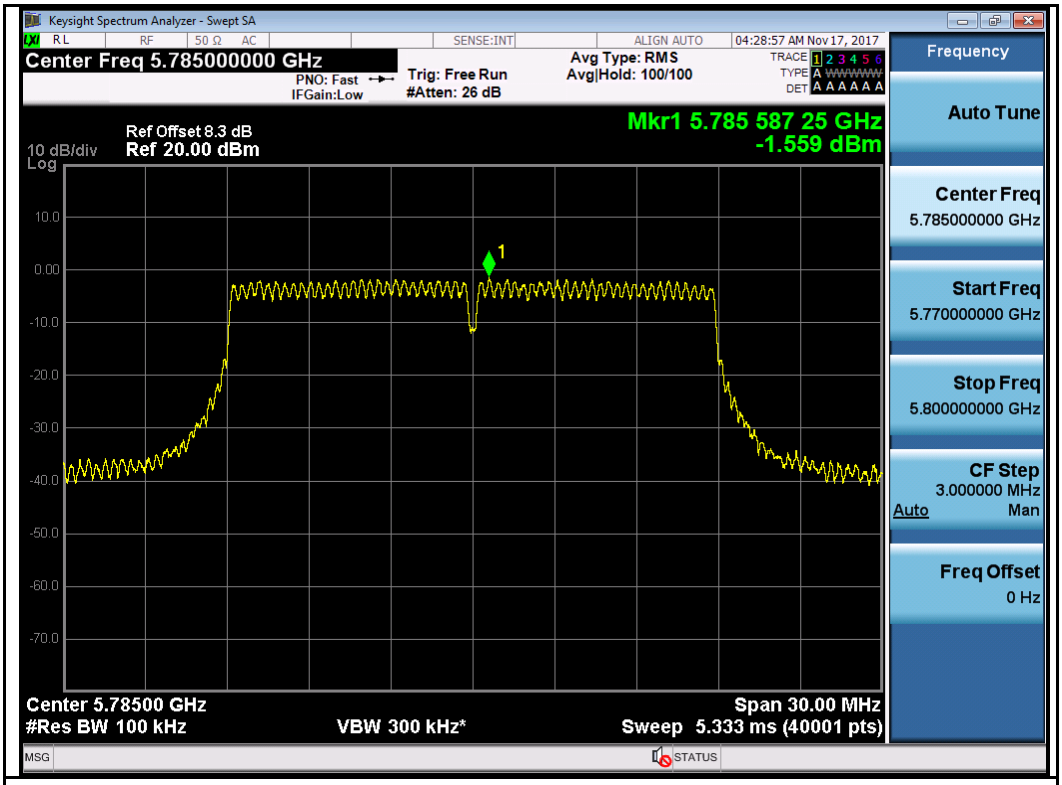
802.11a-5785MHz



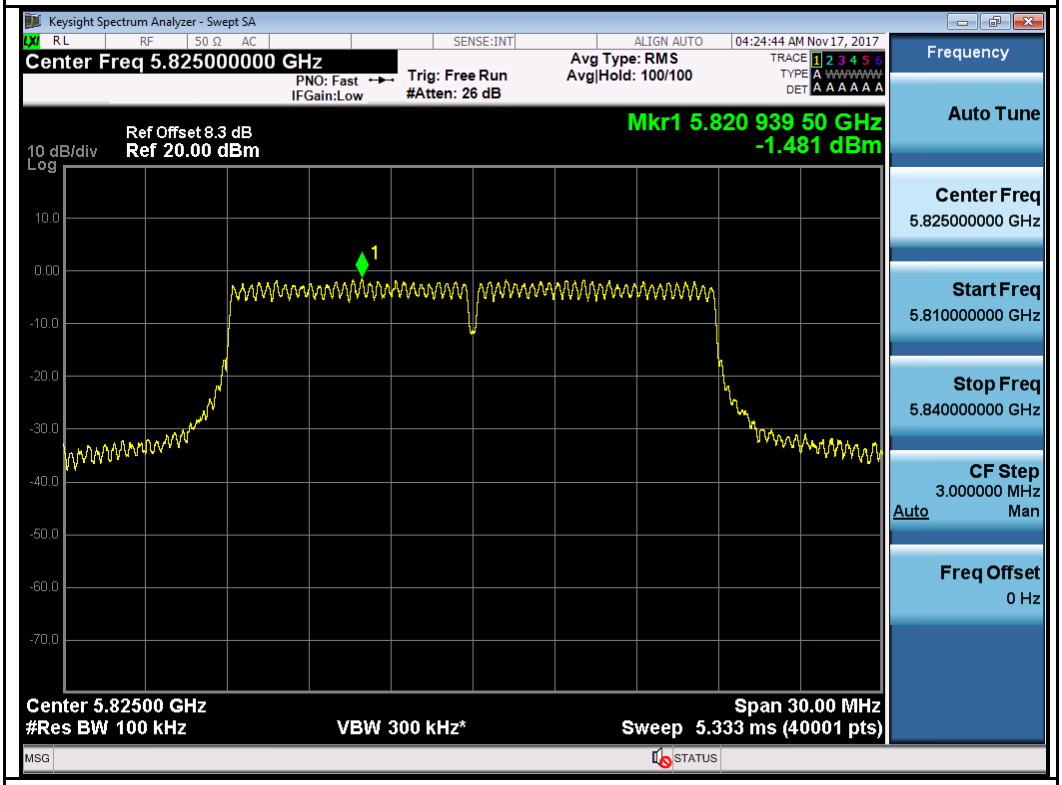
802.11a-5825MHz



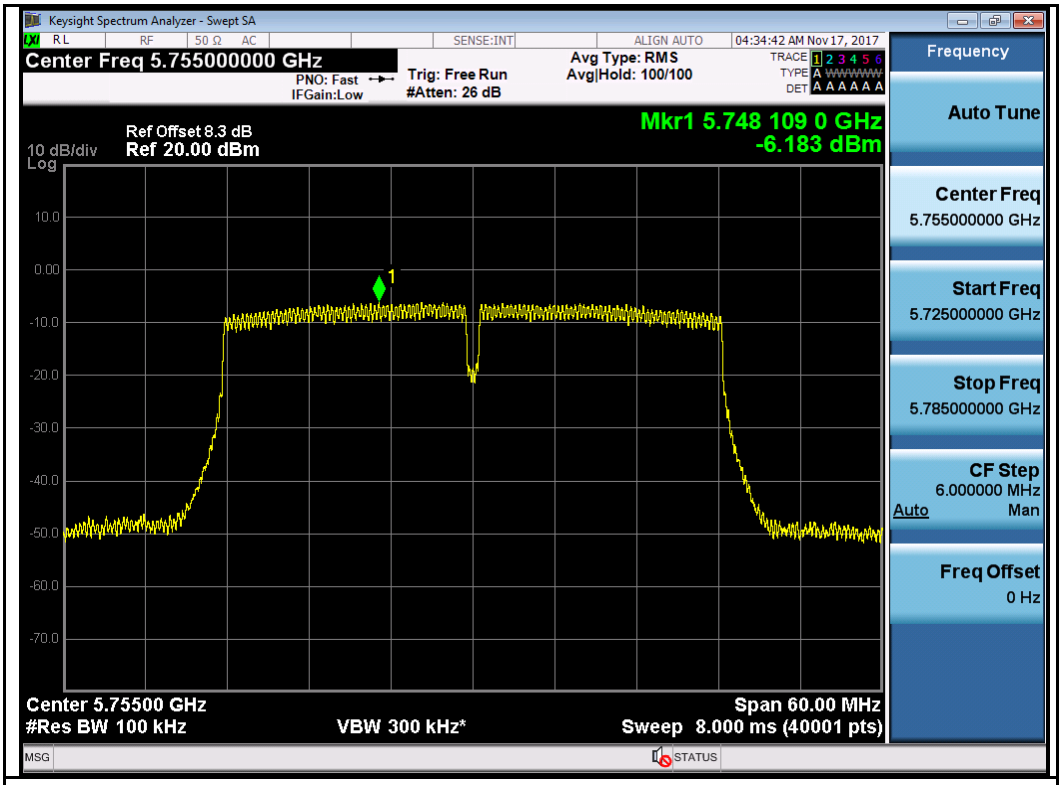
802.11n-HT20-5745MHz



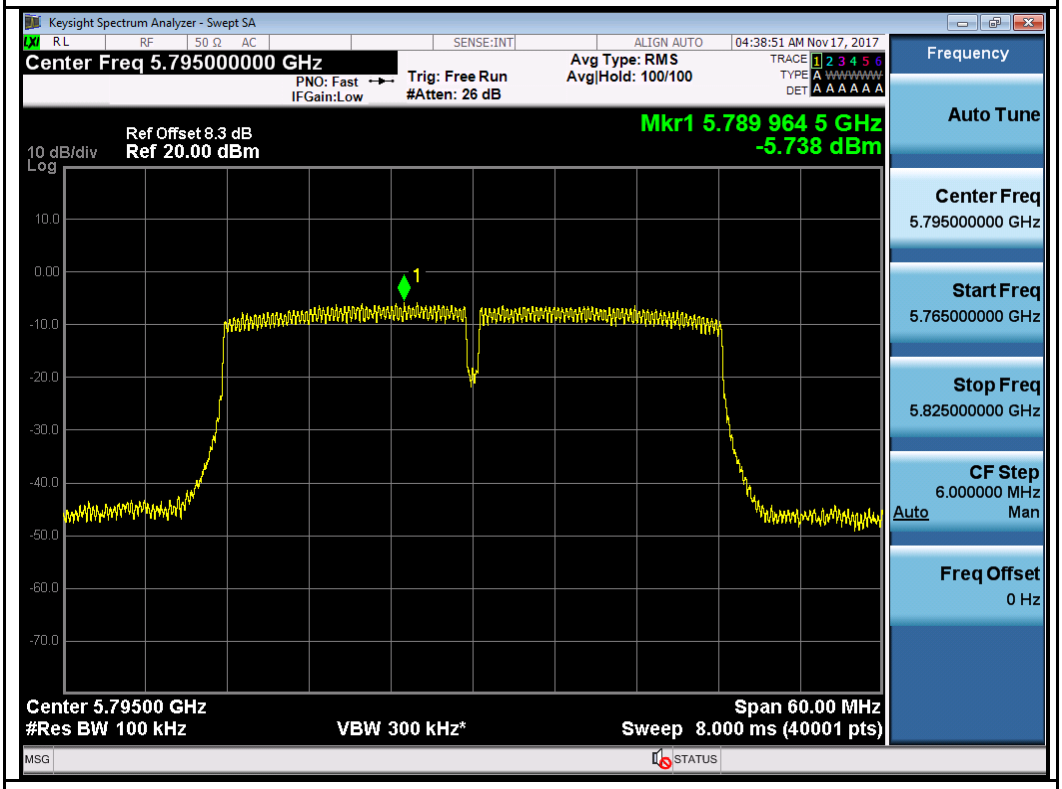
802.11n-HT20-5785MHz



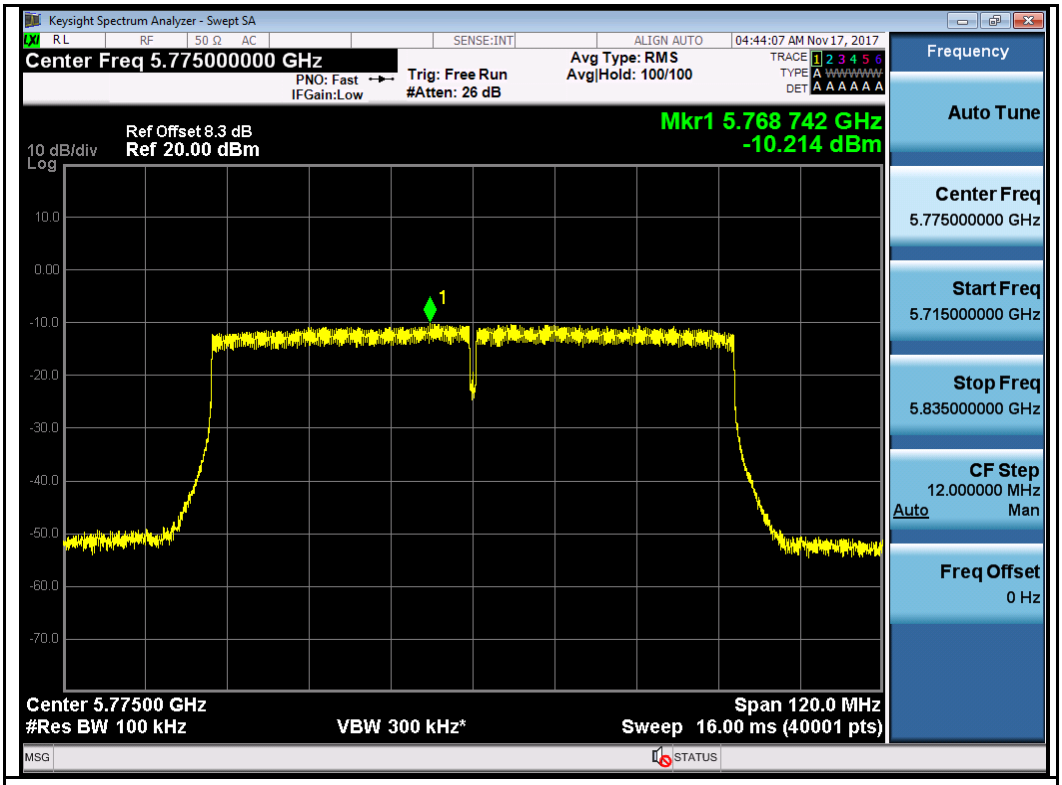
802.11n-HT20-5825MHz



802.11n-HT40-5755MHz

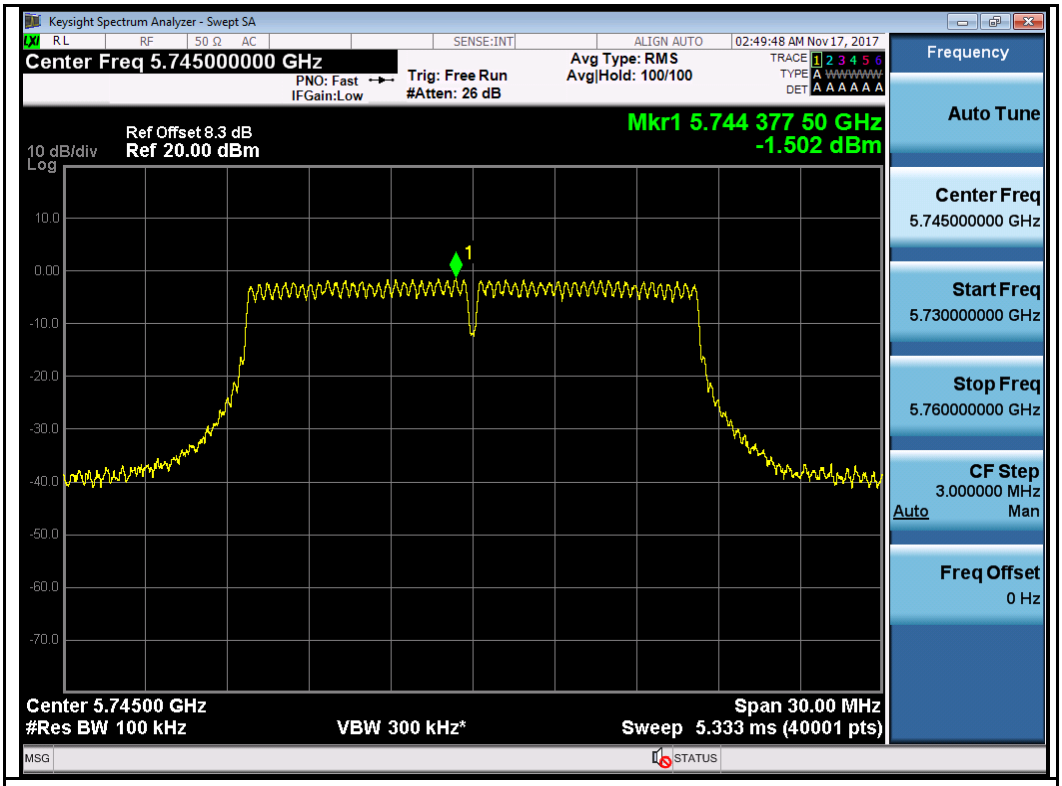


802.11n-HT40-5795MHz

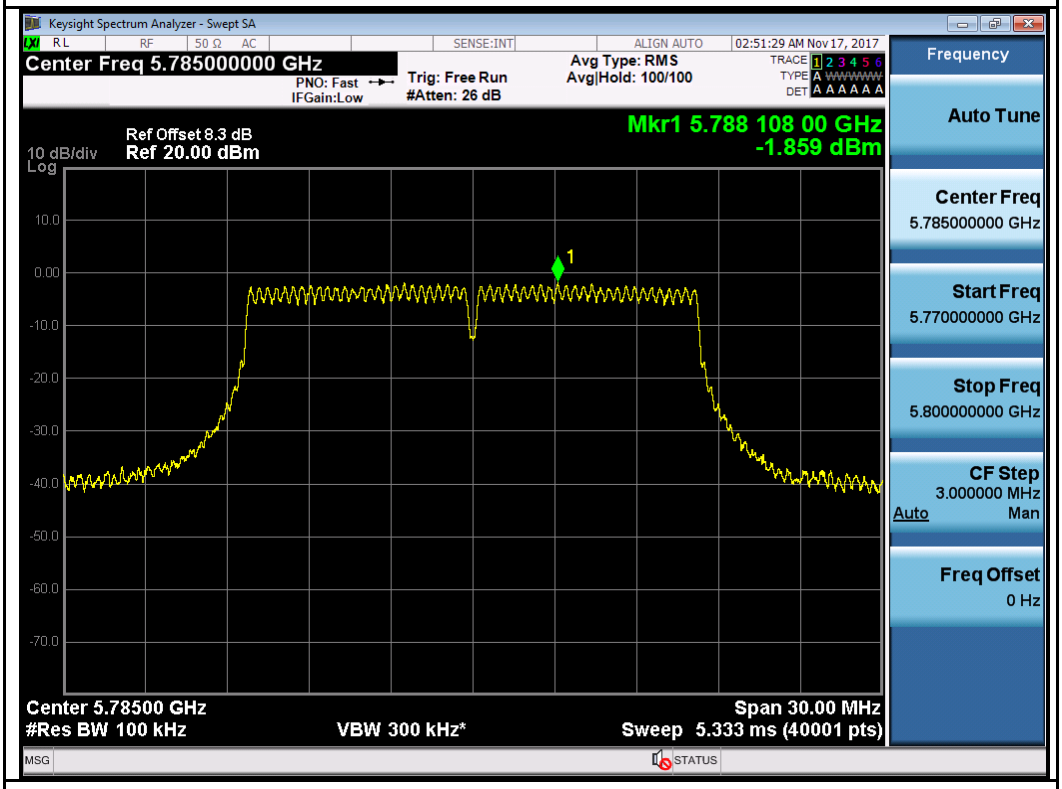


802.11ac-VHT80-5775MHz

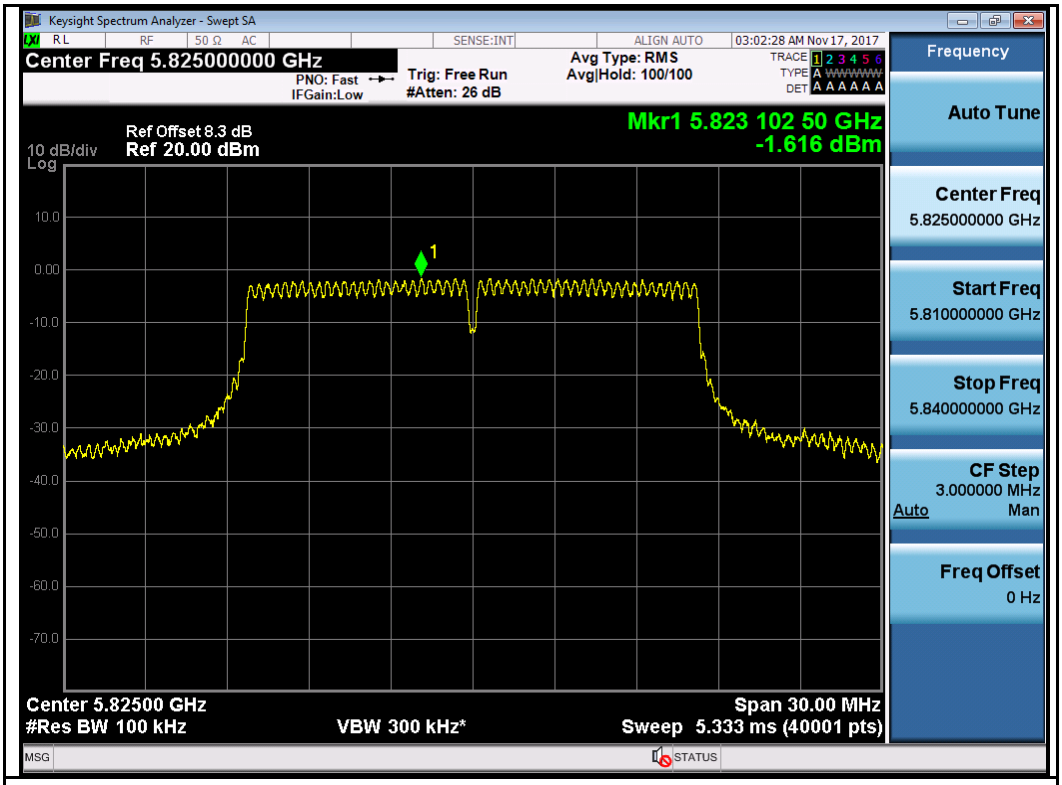
Chain 1:



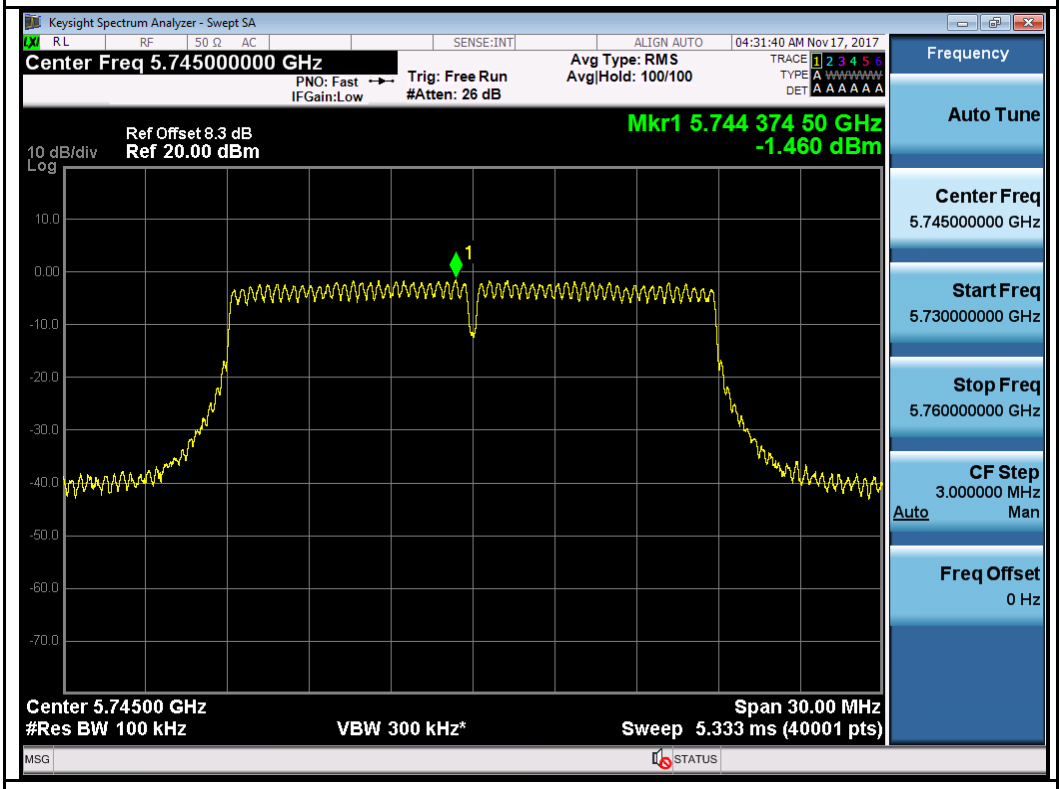
802.11a-5745MHz



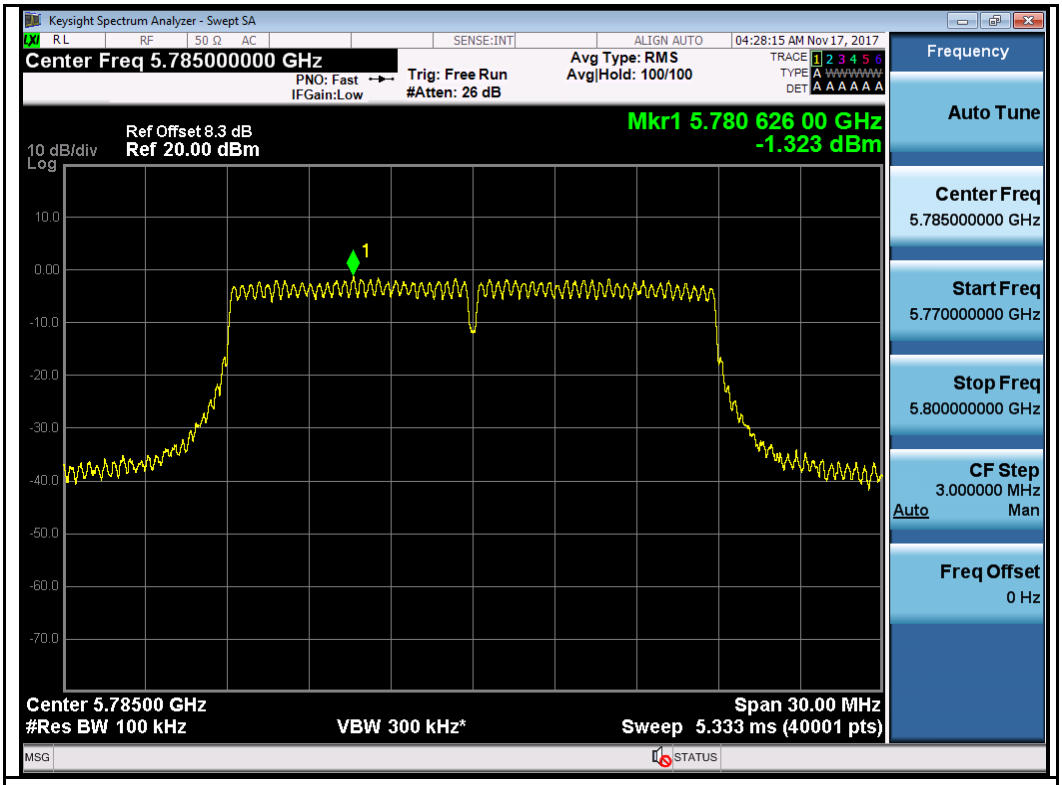
802.11a-5785MHz



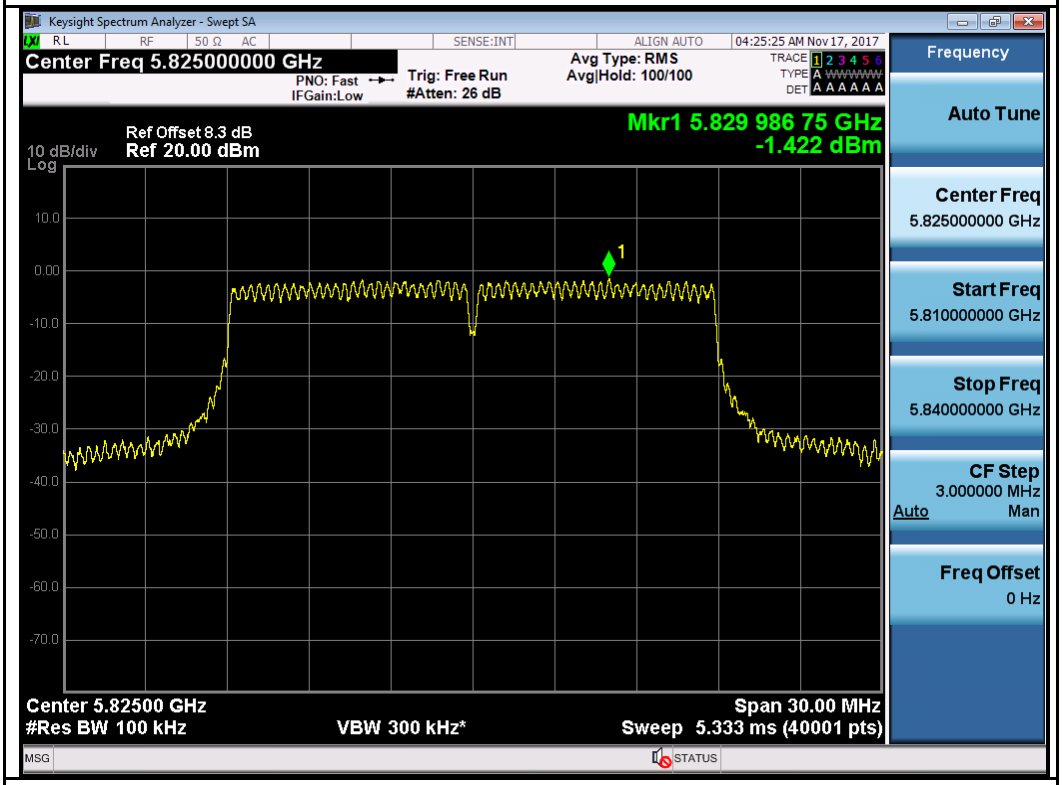
802.11a-5825MHz



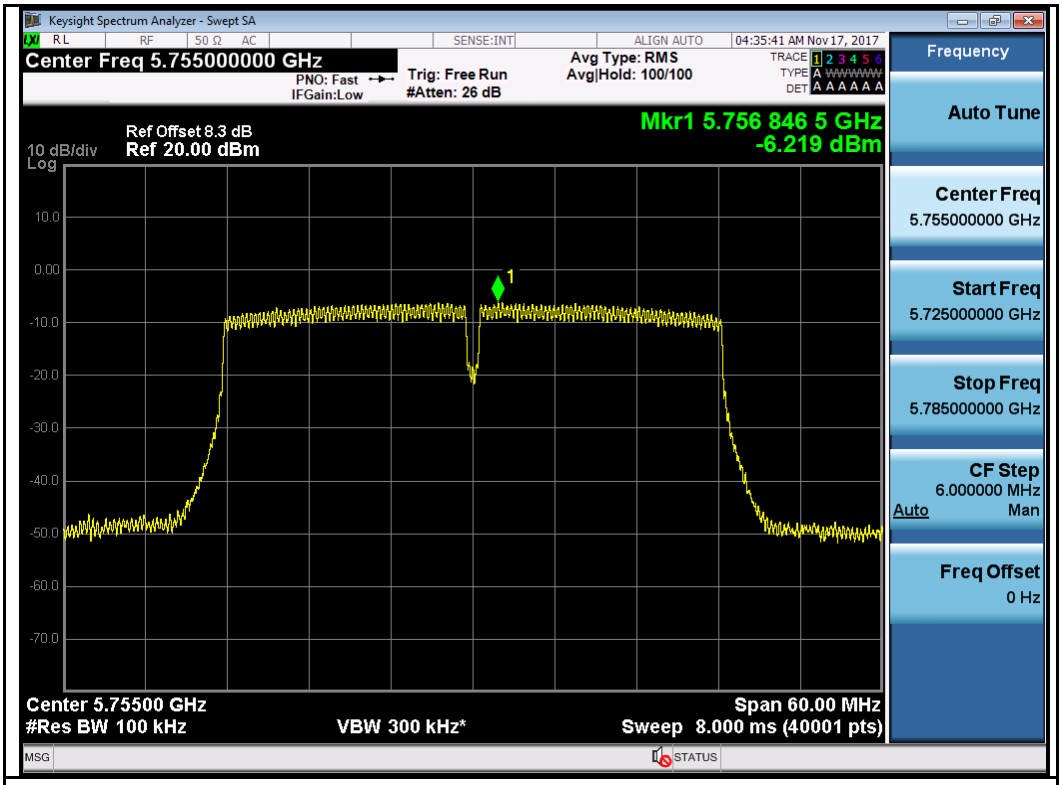
802.11n-HT20-5745MHz



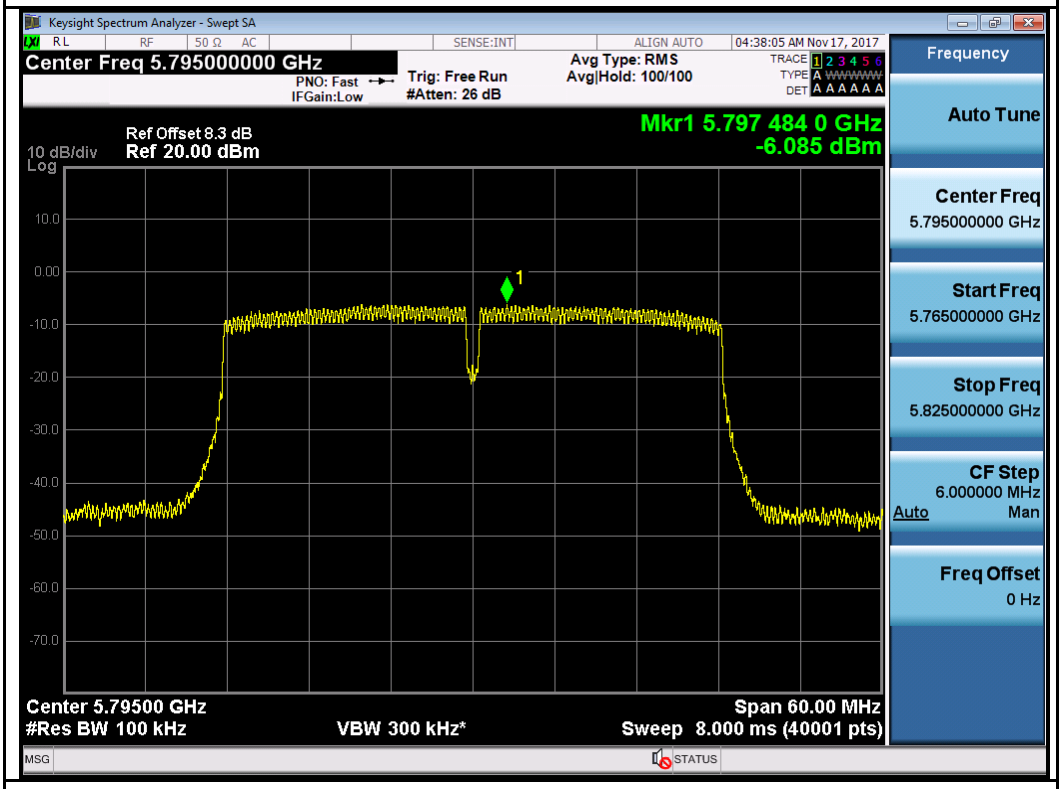
802.11n-HT20-5785MHz



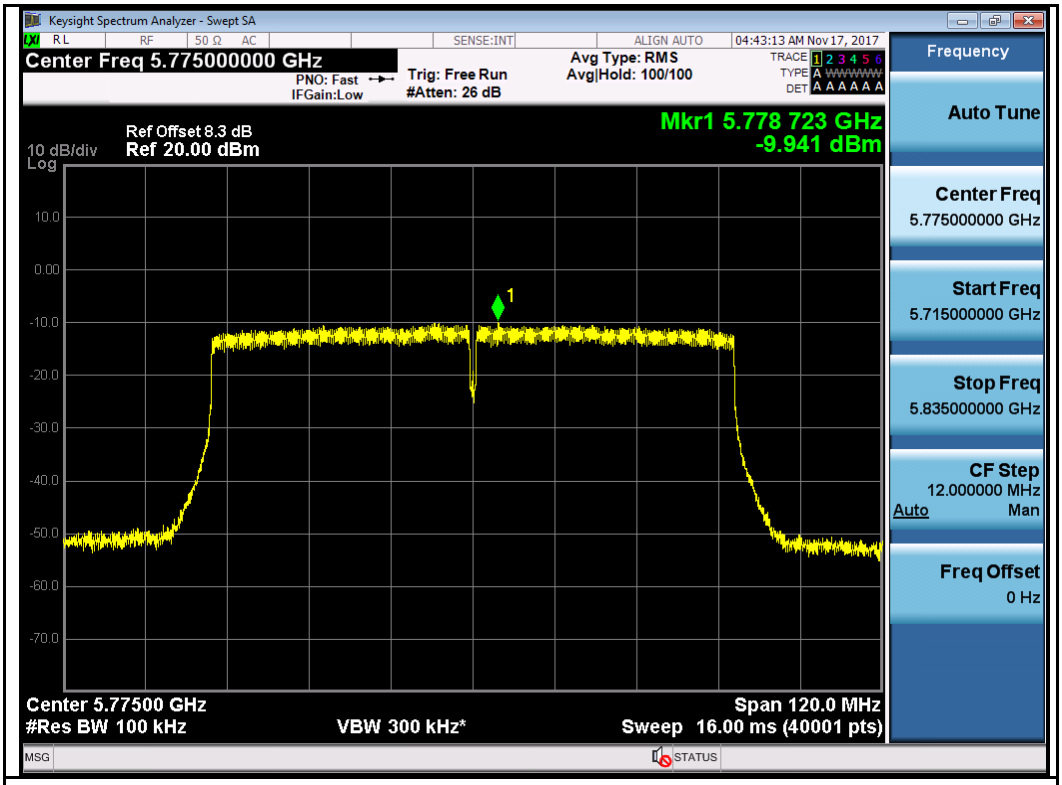
802.11n-HT20-5825MHz



802.11n-HT40-5755MHz

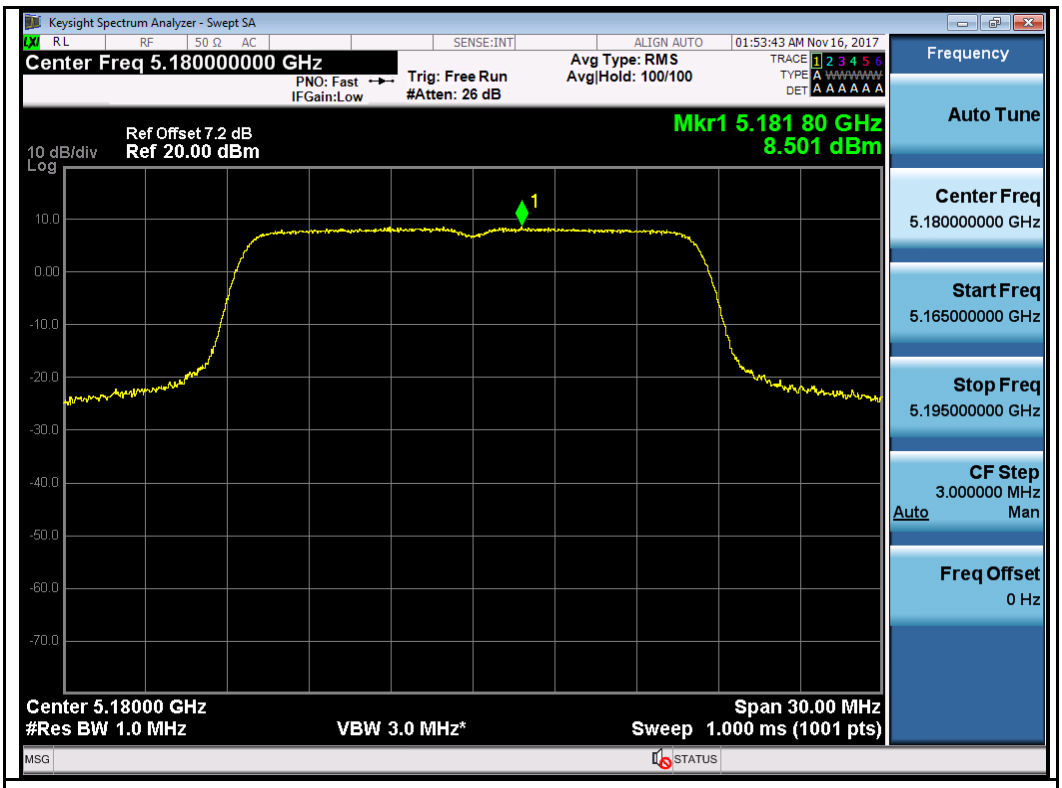


802.11n-HT40-5795MHz

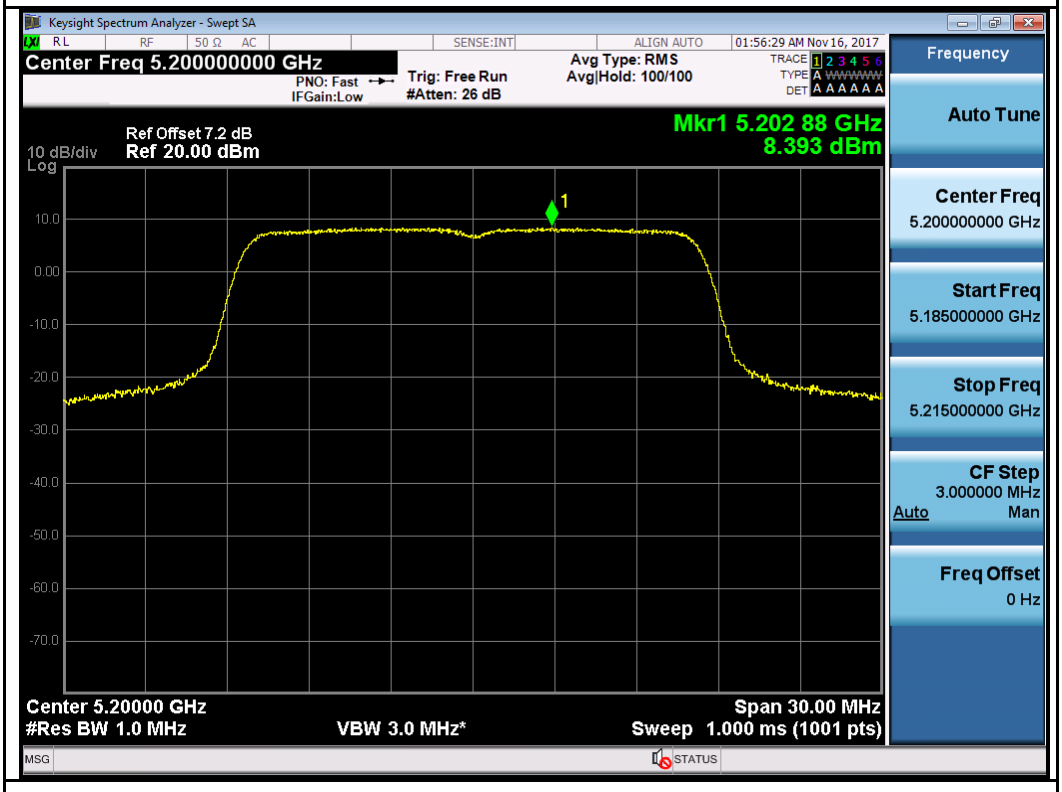


802.11ac-VHT80-5775MHz

T310S
Test Plot for W52:
Chain 0:



802.11a-5180MHz



802.11a-5200MHz