RF TEST REPORT

Report No.: FCC_SL17063001-RUC-018A1_W53W56
Supersede Report No.:

Applicant	:	Ruckus Wireless, Inc.
Product Name	:	T310 (C/D) 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 v01
FCC ID	:	S9GT310
IC ID	:	5912A-T310
Dates of test	:	08/21/2017-10/05/2017
Issue Date	:	10/06/2017
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

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-018A1_W53W56	None	Original	10/06/2017

2 Executive Summary

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

Company: Ruckus Wireless, Inc.
Product: T310 (C/D) 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 (C/D) Access Point
Model No.	T310
Trade Name	Ruckus
Serial No.	291706000098
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	08/20/2017
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	5260-5320MHz 5500-5720MHz	5260-5320MHz 5500-5720MHz	5270-5310MHz 5510-5710MHz	5290MHz, 5530MHz 5610MHz, 5690MHz
Modulation	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	20MHz	20MHz	40MHz	80MHz
Number of Channels	16	16	6	4
Antenna Type	PCB Antenna			
Antenna Gain (Peak)	5GHz: 3.5 dBi for Vertical 2 dBi for Horizontal			
Antenna Connector Type	U.FL			
Note	Two PCB antenna's, One dual band horizontal, and One dual band vertical antenna.			

Note: The AP supports Beamforming mode and the power setting for Beamforming and Non-Beamforming modes are the same.

EUT Power level setting

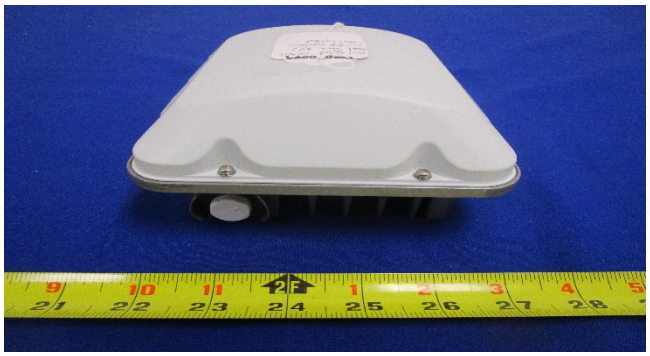
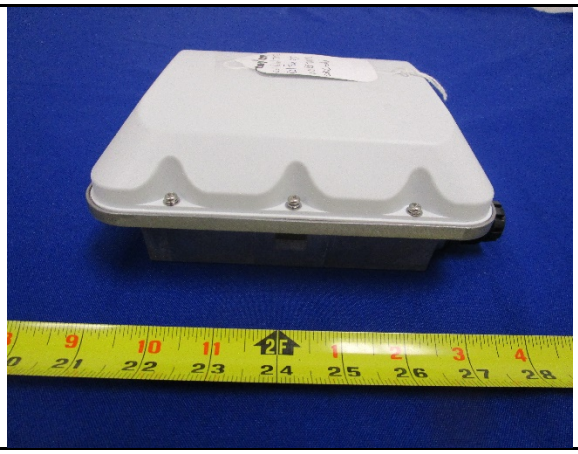
Mode	Frequency	Power Setting
802.11-a	5260	44
802.11-a	5280	44
802.11-a	5320	40
802.11-n-20	5260	44
802.11-n-20	5280	44
802.11-n-20	5320	39
802.11-n-40	5270	44
802.11-n-40	5310	34
802.11-ac-80	5290	33
802.11-a	5500	42
802.11-a	5580	42
802.11-a	5700	42
802.11-n-20	5500	42
802.11-n-20	5580	42
802.11-n-20	5700	42
802.11-n-40	5510	34
802.11-n-40	5590	41
802.11-n-40	5670	41
802.11-ac-80	5530	32
802.11-ac-80	5610	42

CROSS Band channels power setting

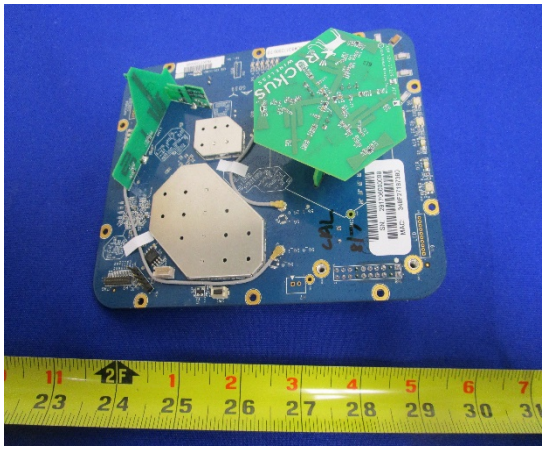
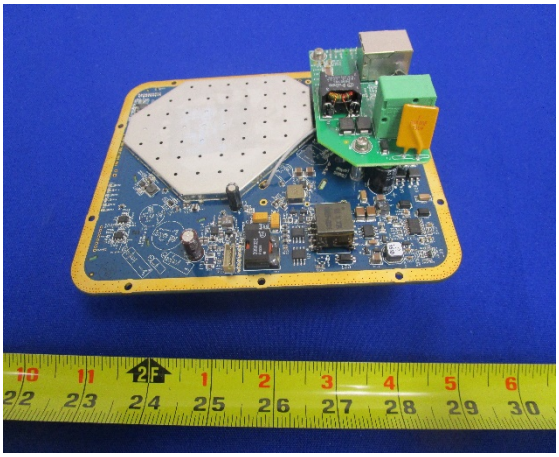
Mode	Frequency	Power Setting
802.11-a	5720	42
802.11-n-20	5720	42
802.11-n-40	5710	40
802.11-ac-80	5690	40

Note: All data rate has been verified and worst case was used for all test items.

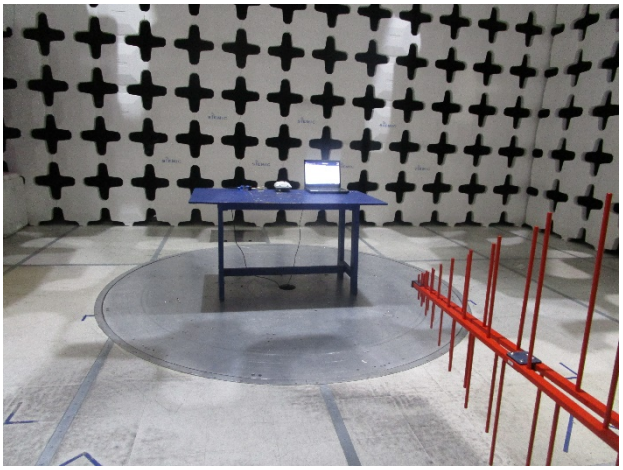
6.3 EUT Photos - External

Top View	Bottom View
	
Front View	Rear View
	
Right Side View	Left Side View

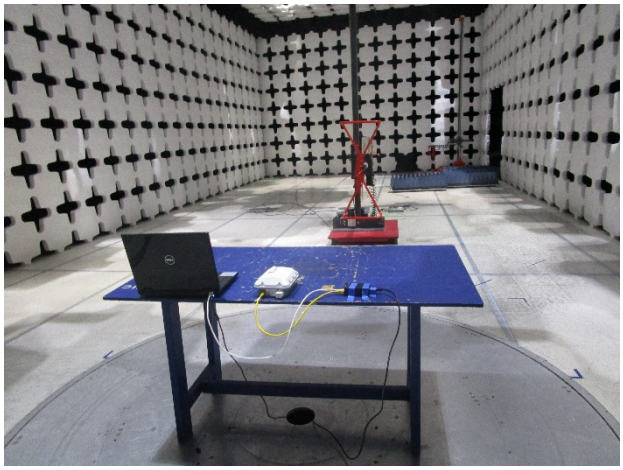
6.4 EUT Photos - Internal

	
EUT Case off View	Modem Board Top View
	
Modem Board Bottom View	

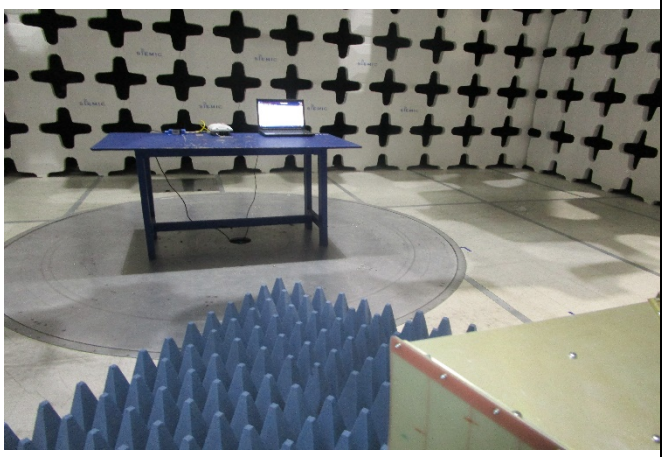
6.5 Test Setup Photos



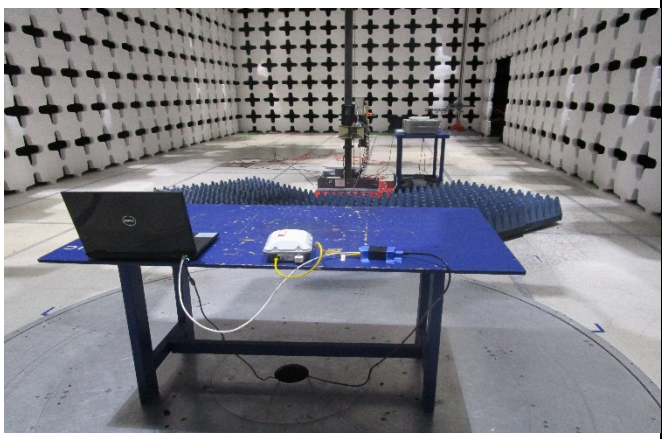
Radiated Emissions (<1GHz) – Front View



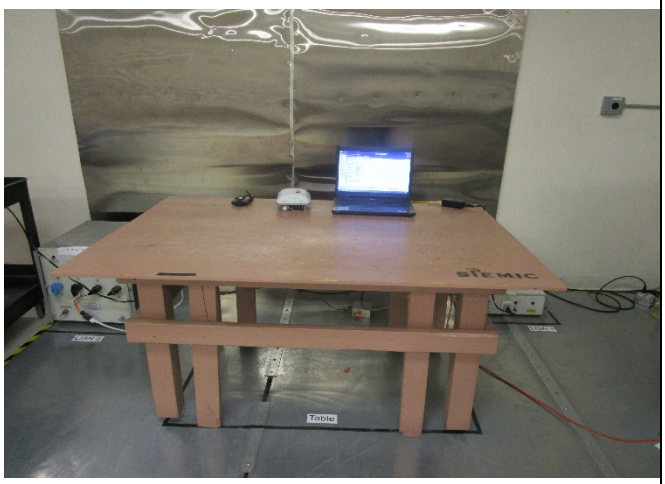
Radiated Emissions (<1GHz) – Rear View



Radiated Emissions (>1GHz) – Front View

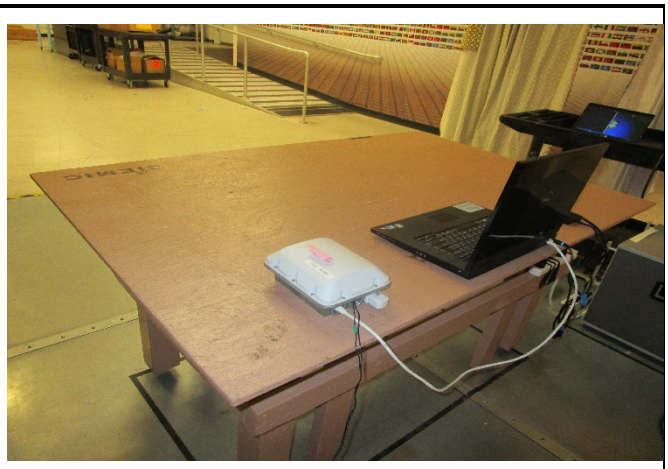


Radiated Emissions (>1GHz) – Rear View



Conducted Emissions - P.O.E Mode – Front View

Conducted Emissions - P.O.E Mode – Rear View

	
Conducted Emissions - Power Supply Mode – Front View	Conducted Emissions - Power Supply Mode – Rear View

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 mode

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 v01	☒ Pass ☐ N/A
AC Conducted Emissions Voltage	FCC	15.207(a)	ANSI C63.4 – 2014	☒ 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 v01	☒ Pass ☐ N/A
Maximum conducted Output Power	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☒ 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 v01	☒ Pass ☐ N/A
Power Spectral Density	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☒ 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

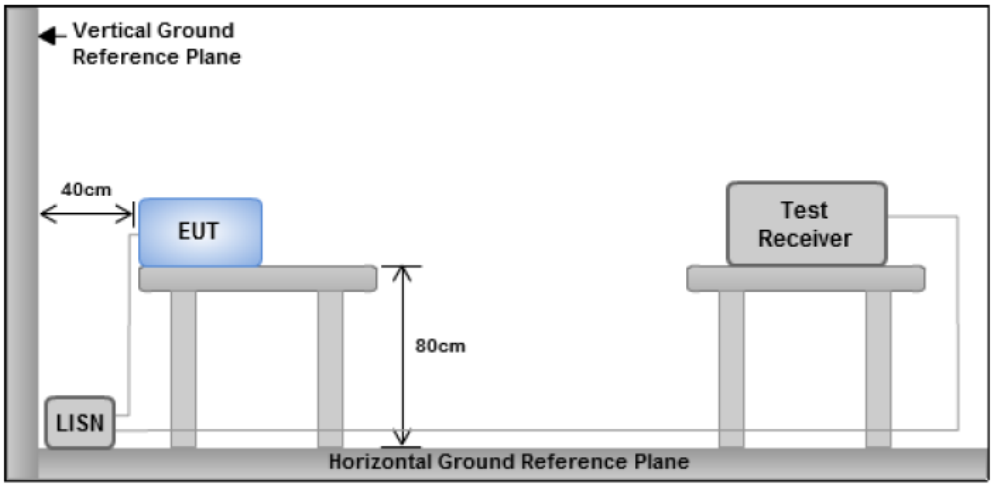
The total derived measurement uncertainty is +/- 0.95 dB.

10 Measurements, Examination and Derived Results

10.1 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 μH/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		

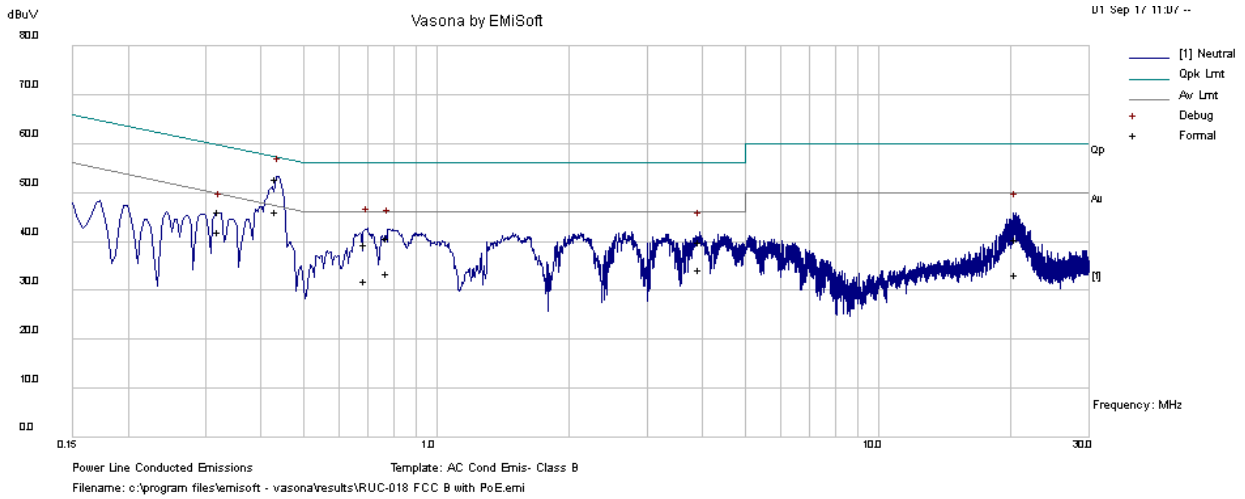
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Kushal Shastri at Conducted Emission test site.

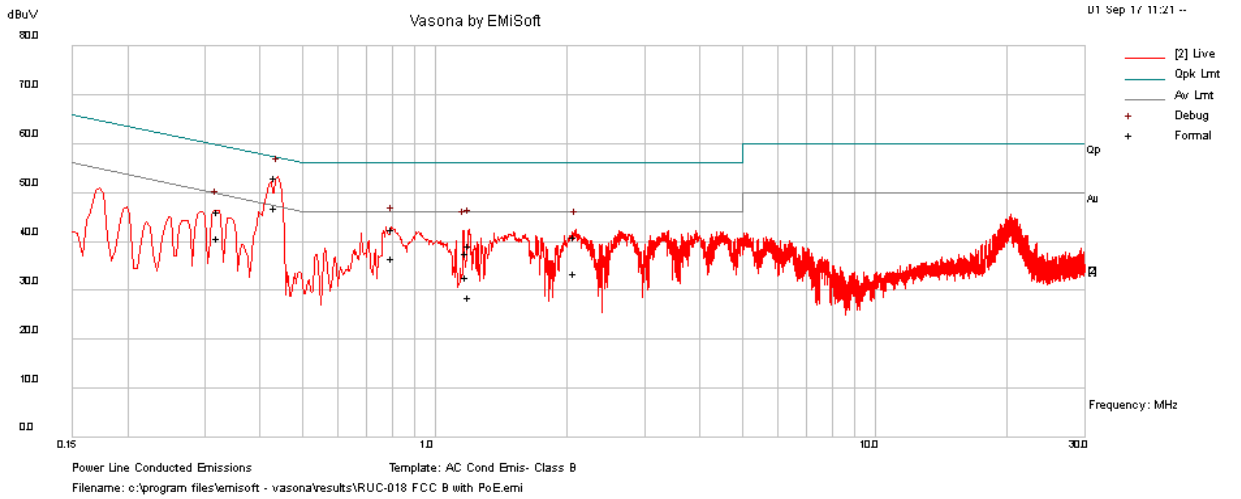
Conducted Emission Test Results

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	25.7	Result:	☒ Pass ☐ Fail
	Humidity (%):	43.3		
	Atmospheric(mbar):	1014.9		
Mains Power:	120Vac, 60Hz			
Tested by:	Kushal Shastri			
Test Date:	08/21/2017-10/05/2017			
Remarks	Neutral– P.O.E Mode			



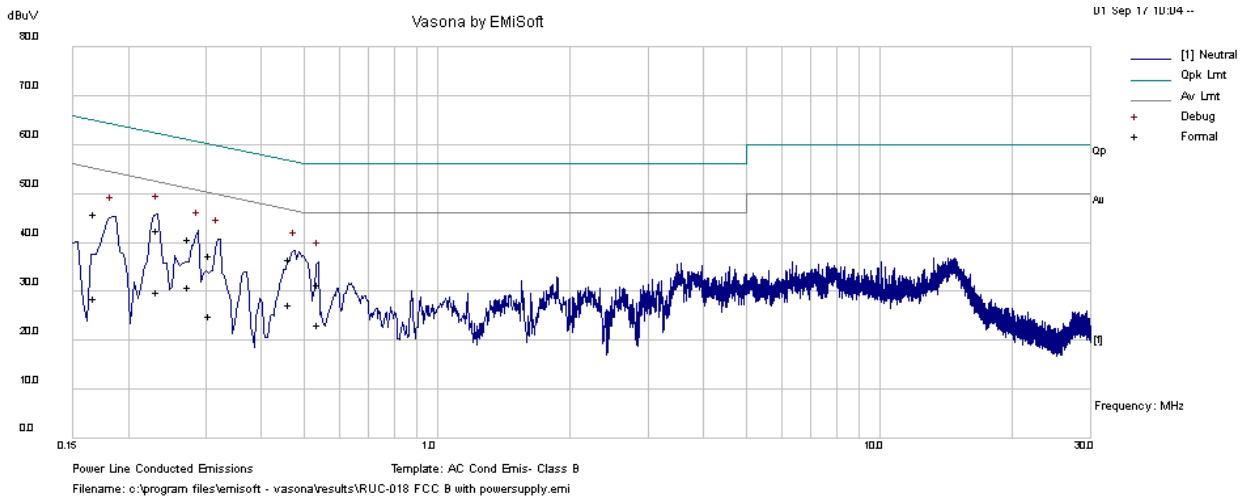
Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.432421	42.16	10.01	0.68	52.84	Quasi Peak	Neutral	57.21	-4.36	Pass
0.686549	28.78	10.01	0.56	39.35	Quasi Peak	Neutral	56	-16.65	Pass
0.771415	30.22	10.01	0.55	40.78	Quasi Peak	Neutral	56	-15.22	Pass
0.319527	35.24	10	0.81	46.06	Quasi Peak	Neutral	59.72	-13.66	Pass
3.932571	29.4	10.03	0.5	39.93	Quasi Peak	Neutral	56	-16.07	Pass
20.48071	29.82	10.07	0.67	40.56	Quasi Peak	Neutral	60	-19.44	Pass
0.432421	35.47	10.01	0.68	46.15	Average	Neutral	47.21	-1.06	Pass
0.686549	21.35	10.01	0.56	31.92	Average	Neutral	46	-14.08	Pass
0.771415	23.03	10.01	0.55	33.6	Average	Neutral	46	-12.4	Pass
0.319527	31.06	10	0.81	41.88	Average	Neutral	49.72	-7.84	Pass
3.932571	23.65	10.03	0.5	34.18	Average	Neutral	46	-11.82	Pass
20.48071	22.54	10.07	0.67	33.28	Average	Neutral	50	-16.72	Pass

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	25.7	Result:	☒ Pass ☐ Fail
	Humidity (%):	43.3		
	Atmospheric(mbar):	1014.9		
Mains Power:	120Vac, 60Hz			
Tested by:	Kushal Shastri			
Test Date:	08/21/2017-10/05/2017			
Remarks	Live - P.O.E Mode			



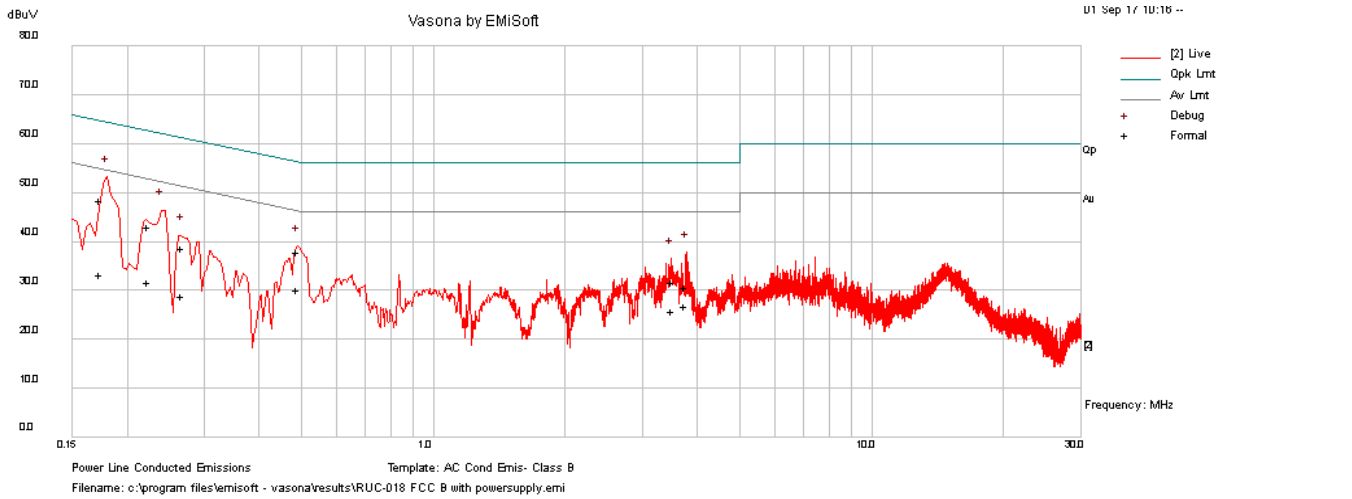
Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.432709	42.5	10.01	0.68	53.18	Quasi Peak	Live	57.2	-4.02	Pass
0.797327	32.02	10.01	0.55	42.58	Quasi Peak	Live	56	-13.42	Pass
0.320621	35.23	10	0.81	46.04	Quasi Peak	Live	59.69	-13.65	Pass
1.192701	28.73	10.02	0.52	39.27	Quasi Peak	Live	56	-16.73	Pass
2.080816	30.49	10.02	0.5	41.02	Quasi Peak	Live	56	-14.98	Pass
1.178802	27.07	10.02	0.52	37.6	Quasi Peak	Live	56	-18.4	Pass
0.432709	36.14	10.01	0.68	46.82	Average	Live	47.2	-0.38	Pass
0.797327	25.95	10.01	0.55	36.52	Average	Live	46	-9.48	Pass
0.320621	29.98	10	0.81	40.8	Average	Live	49.69	-8.89	Pass
1.192701	18.15	10.02	0.52	28.69	Average	Live	46	-17.31	Pass
2.080816	22.94	10.02	0.5	33.46	Average	Live	46	-12.54	Pass
1.178802	22.11	10.02	0.52	32.65	Average	Live	46	-13.35	Pass

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	25.7	Result:	☒ Pass ☐ Fail
	Humidity (%):	43.3		
	Atmospheric(mbar):	1014.9		
Mains Power:	120Vac, 60Hz			
Tested by:	Kushal Shastri			
Test Date:	08/21/2017-10/05/2017			
Remarks	Neutral– Power Supply			



Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.23281	31.49	10	1.08	42.58	Quasi Peak	Neutral	62.35	-19.77	Pass
0.463756	25.99	10.01	0.65	36.65	Quasi Peak	Neutral	56.63	-19.97	Pass
0.273752	29.75	10	0.93	40.68	Quasi Peak	Neutral	61	-20.32	Pass
0.168108	34.22	10	1.52	45.75	Quasi Peak	Neutral	65.05	-19.3	Pass
0.305904	26.39	10	0.84	37.23	Quasi Peak	Neutral	60.08	-22.85	Pass
0.536705	20.9	10.01	0.61	31.52	Quasi Peak	Neutral	56	-24.48	Pass
0.23281	18.74	10	1.08	29.82	Average	Neutral	52.35	-22.52	Pass
0.463756	16.74	10.01	0.65	27.4	Average	Neutral	46.63	-19.22	Pass
0.273752	19.99	10	0.93	30.91	Average	Neutral	51	-20.09	Pass
0.168108	17.16	10	1.52	28.69	Average	Neutral	55.05	-26.37	Pass
0.305904	14.22	10	0.84	25.06	Average	Neutral	50.08	-25.02	Pass
0.536705	12.69	10.01	0.61	23.31	Average	Neutral	46	-22.69	Pass

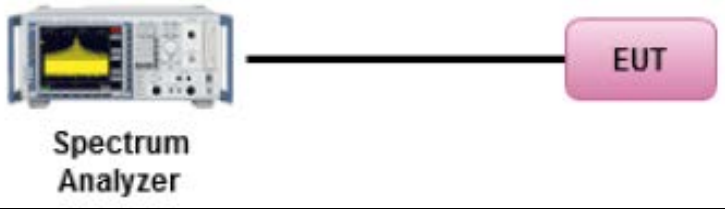
Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	25.7	Result:	☒ Pass ☐ Fail
	Humidity (%):	43.3		
	Atmospheric(mbar):	1014.9		
Mains Power:	120Vac, 60Hz			
Tested by:	Kushal Shastri			
Test Date:	08/21/2017-10/05/2017			
Remarks	Live– Power Supply			



Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.173242	37.05	10	1.47	48.52	Quasi Peak	Live	64.8	-16.28	Pass
0.223118	31.77	10	1.13	42.9	Quasi Peak	Live	62.7	-19.8	Pass
0.48802	27.3	10.01	0.64	37.95	Quasi Peak	Live	56.2	-18.25	Pass
3.762982	20.11	10.03	0.5	30.65	Quasi Peak	Live	56	-25.35	Pass
3.501415	21.29	10.03	0.5	31.82	Quasi Peak	Live	56	-24.18	Pass
0.267331	27.61	10	0.94	38.56	Quasi Peak	Live	61.2	-22.64	Pass
0.173242	21.71	10	1.47	33.18	Average	Live	54.8	-21.62	Pass
0.223118	20.52	10	1.13	31.65	Average	Live	52.7	-21.05	Pass
0.48802	19.45	10.01	0.64	30.1	Average	Live	46.2	-16.1	Pass
3.762982	16.34	10.03	0.5	26.87	Average	Live	46	-19.13	Pass
3.501415	15.15	10.03	0.5	25.68	Average	Live	46	-20.32	Pass
0.267331	17.79	10	0.94	28.74	Average	Live	51.2	-22.46	Pass

10.2 6dB & 26 dB Bandwidth

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	-	26 dB Emission BW: Report only for reference.	☒
		6 dB Emission BW: Report only for reference(Cross Band)	☒
	a) (2)	26 dB Emission BW: Report only for power limit calculation.	☐
Test Setup			
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01 26dB Emission bandwidth measurement procedure (Other than 5.725-5.85 GHz) - Use the spectrum analyzer built-in measurement function to determine the 26dB BW. o Set RBW = around 1% of emission bandwidth o Set VBW > RBW o Detector = Peak o Trace mode = max hold - Allow the trace to stabilize. - Capture the plot. - Repeat above steps for different test channel and other modulation type. - 6dB Emission bandwidth measurement procedure - Use the spectrum analyzer built-in measurement function to determine the 26dB BW. o Set RBW = 100kHz o Set VBW > 3RBW o Detector = Peak o Trace mode = max hold - Allow the trace to stabilize. - Capture the plot. - Repeat above steps for different test channel and other modulation type.		
Test Date	08/21/2017-10/05/2017	Environmental condition	Temperature 23ºC Relative Humidity 42% Atmospheric Pressure 1021mbar
Remark	N/A		
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 5.3GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)
26dB BW	802.11a	5260	Low	17.031
	802.11a	5280	Mid	16.589
	802.11a	5320	High	16.444
	802.11n-20	5260	Low	17.956
	802.11n-20	5280	Mid	17.999
	802.11n-20	5320	High	17.645
	802.11n-40	5270	Low	40.238
	802.11n-40	5310	High	35.987
	802.11ac-80	5290	Mid	75.662

26dB Bandwidth measurement result for 5.5GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)
26dB BW	802.11a	5500	Low	18.142
	802.11a	5580	Mid	16.941
	802.11a	5700	High	16.558
	802.11n-20	5500	Low	18.301
	802.11n-20	5580	Mid	18.351
	802.11n-20	5700	High	17.725
	802.11n-40	5510	Low	35.975
	802.11n-40	5590	Mid	36.504
	802.11n-40	5670	High	36.112
	802.11ac-80	5530	Low	75.640
	802.11ac-80	5610	High	77.077

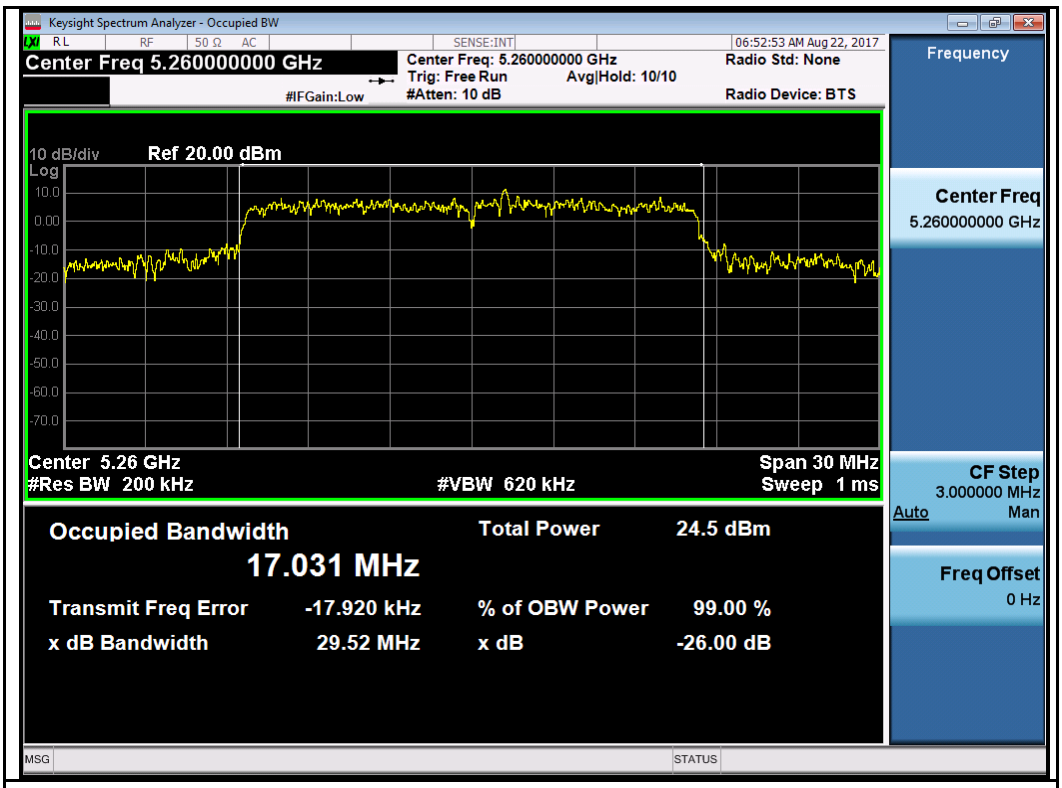
26dB Bandwidth measurement result for cross channels

Type	Test mode	Freq (MHz)	CH	Result (MHz)
26dB BW	802.11a	5720	CROSS	16.436
	802.11n-20	5720	CROSS	17.664
	802.11n-40	5710	CROSS	36.056
	802.11ac-80	5690	CROSS	75.790

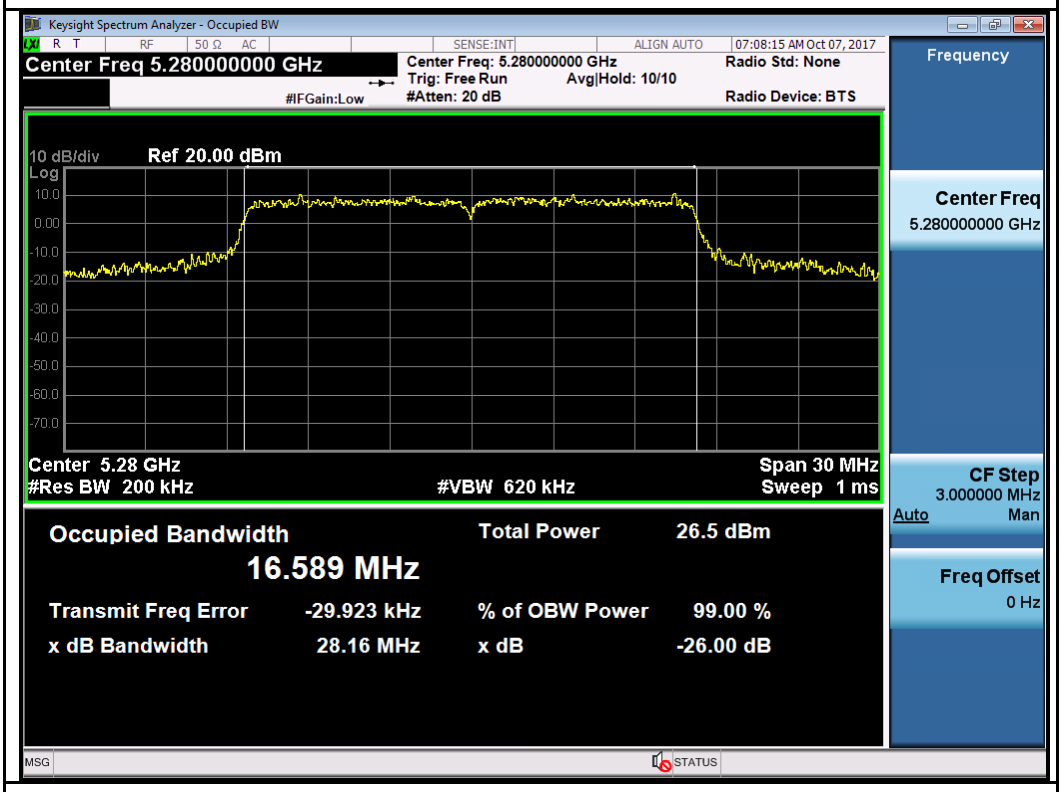
6 Bandwidth measurement result for cross channels

Type	Test mode	Freq (MHz)	CH	Result (MHz)
26dB BW	802.11a	5720	CROSS	16.459
	802.11n-20	5720	CROSS	17.695
	802.11n-40	5710	CROSS	35.275
	802.11ac-80	5690	CROSS	76.350

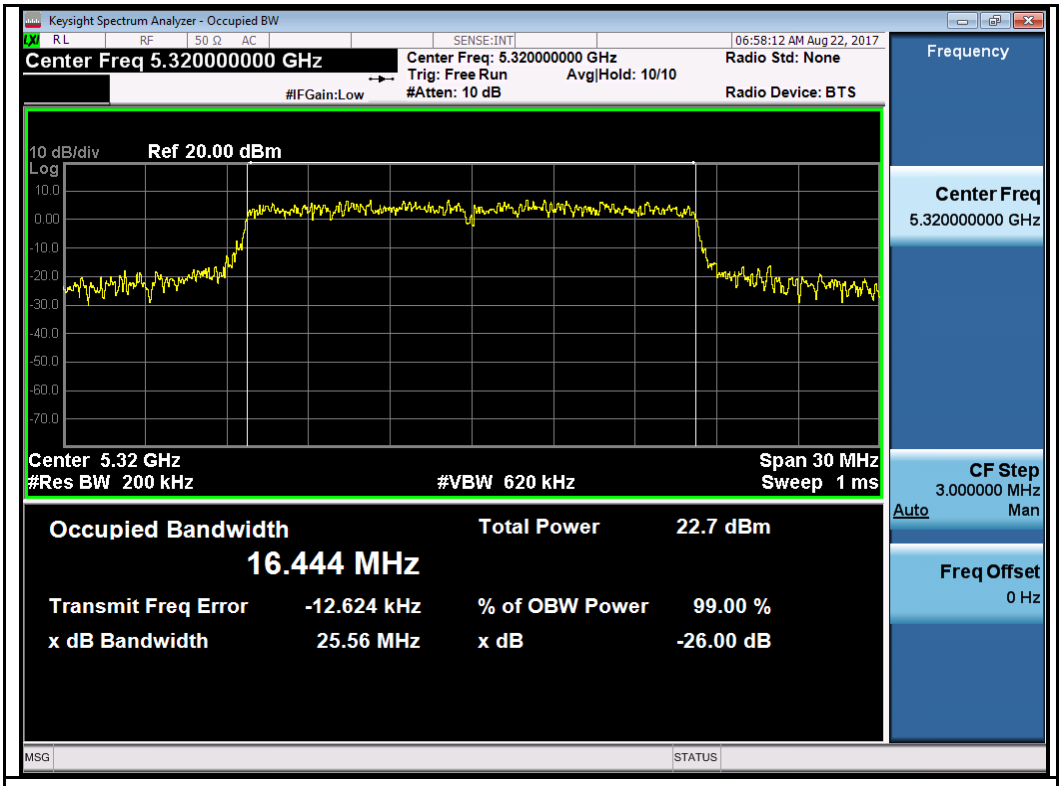
26dB Bandwidth Test Plots
W53:



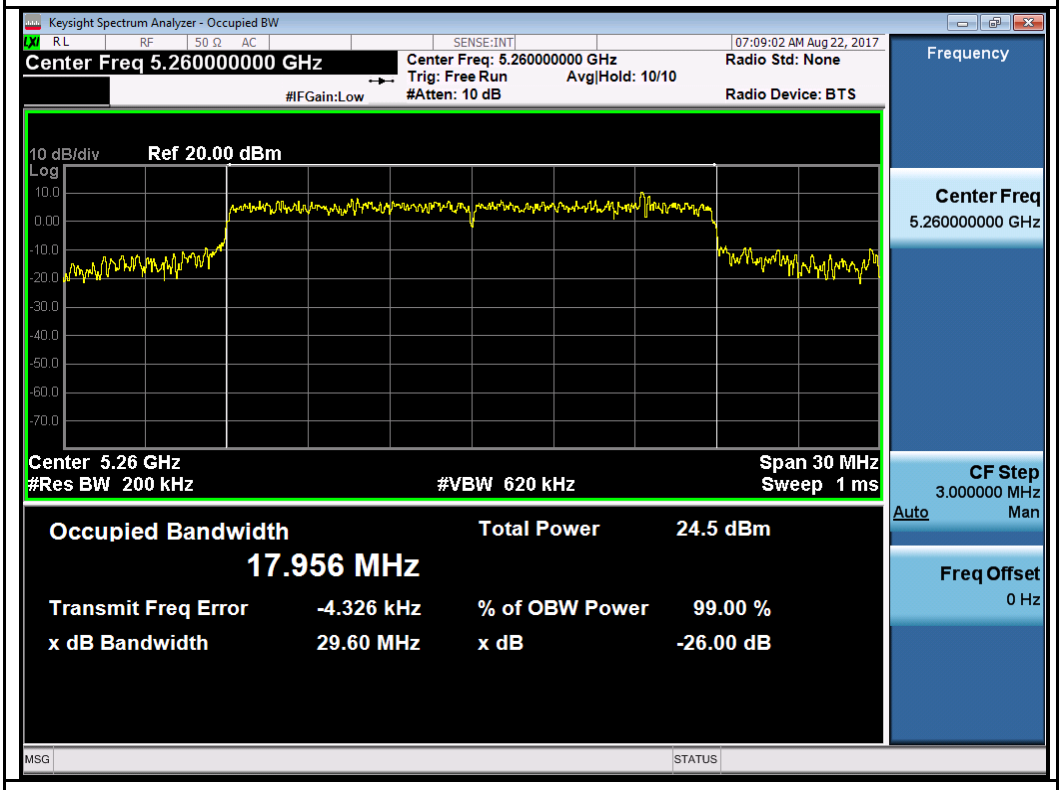
802.11a-5260MHz



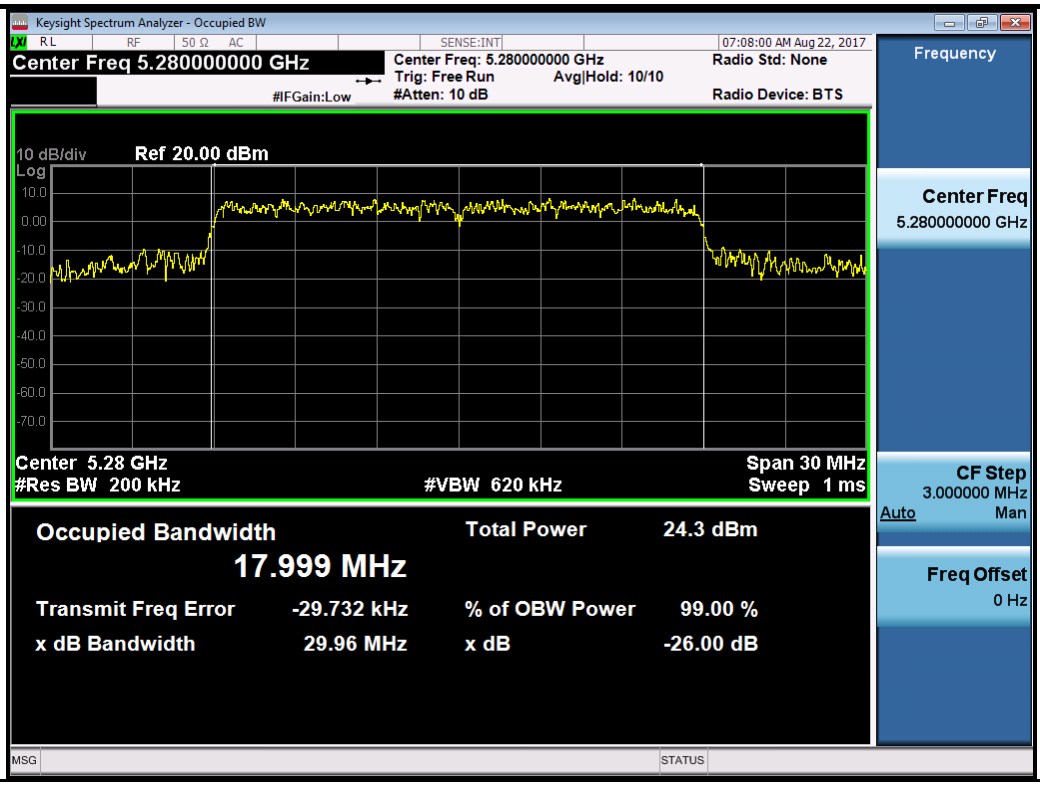
802.11a-5280MHz



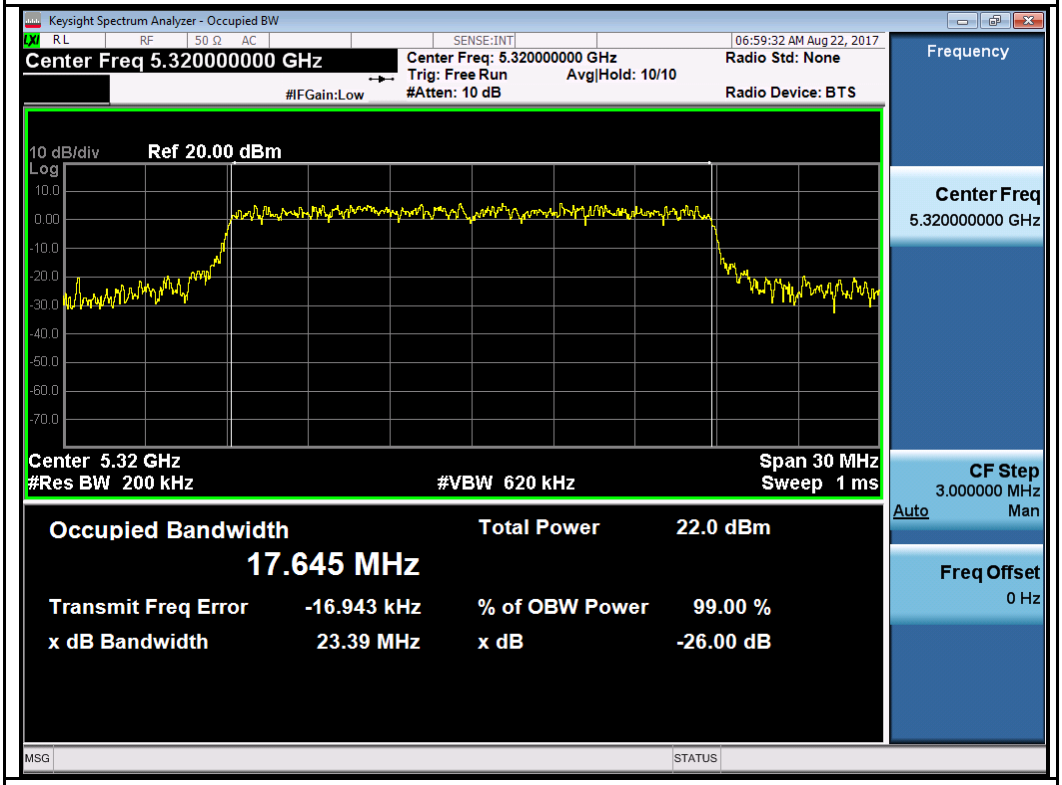
802.11a-5320MHz



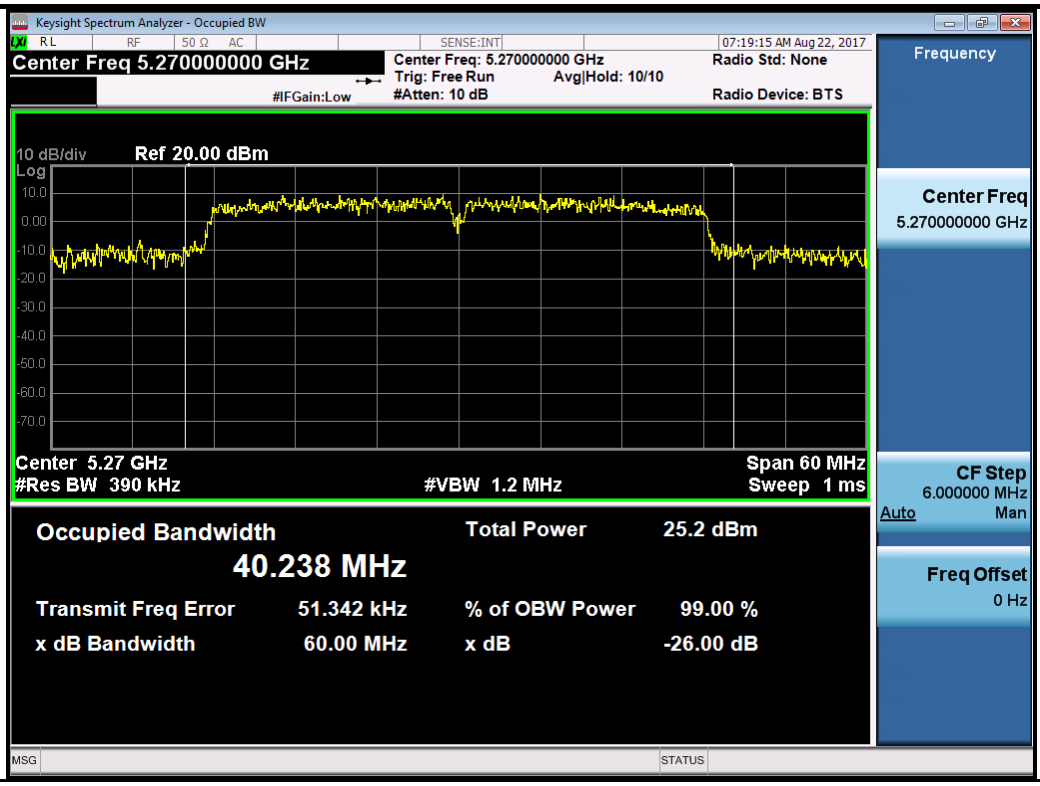
802.11n-HT20-5260MHz



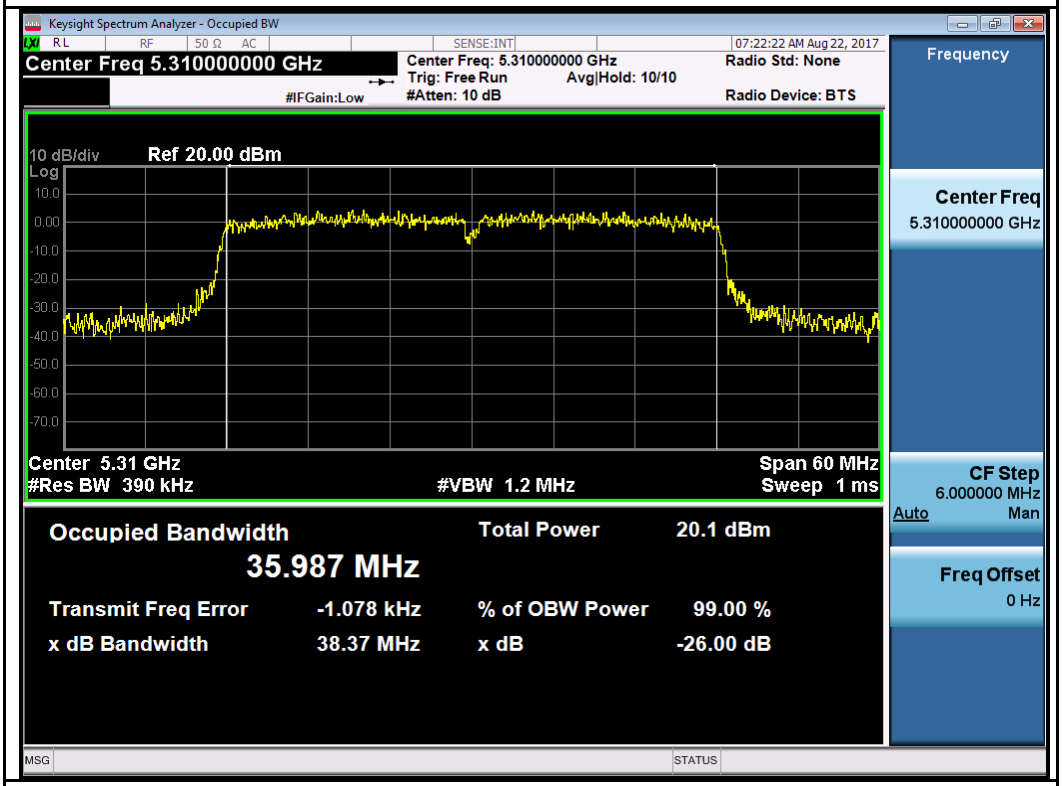
802.11n-HT20-5280MHz



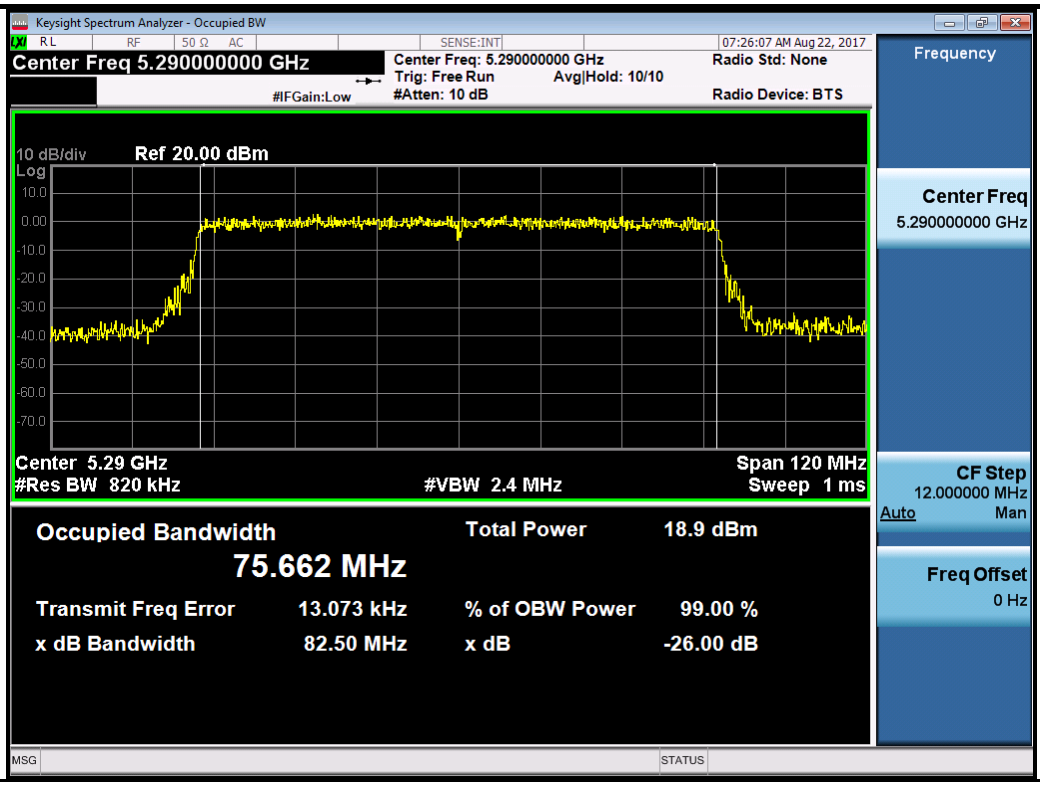
802.11n-HT20-5320MHz



802.11n-HT40-5270MHz

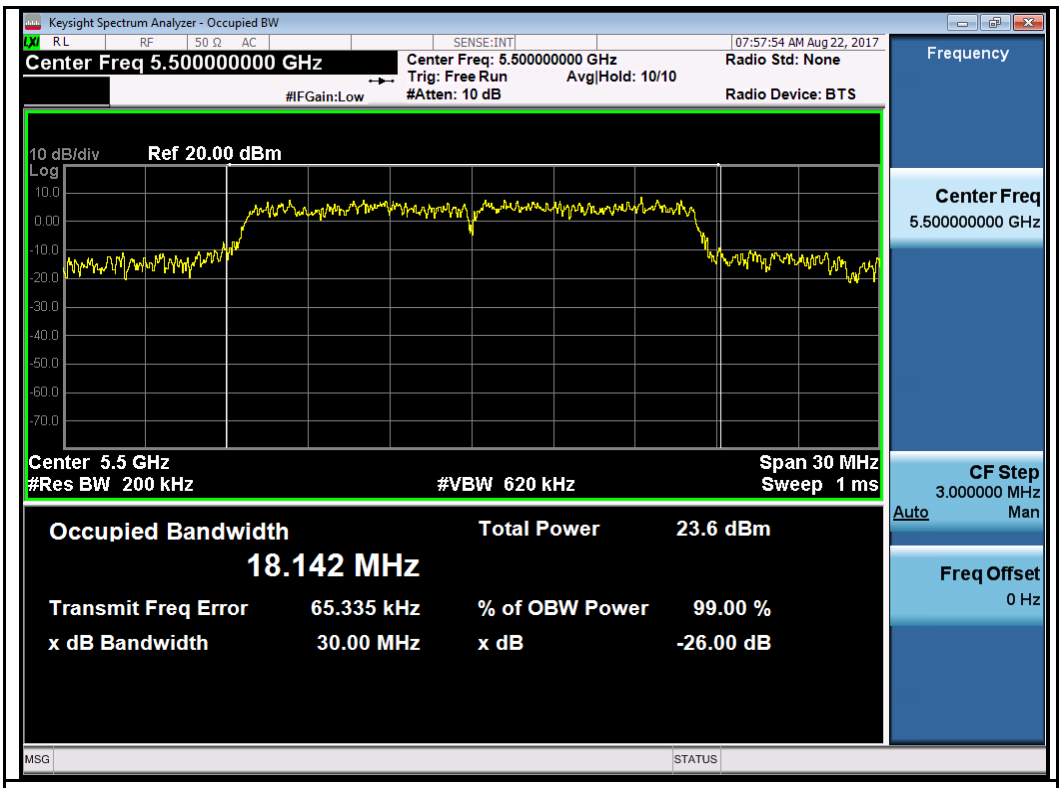


802.11n-HT40-5310MHz

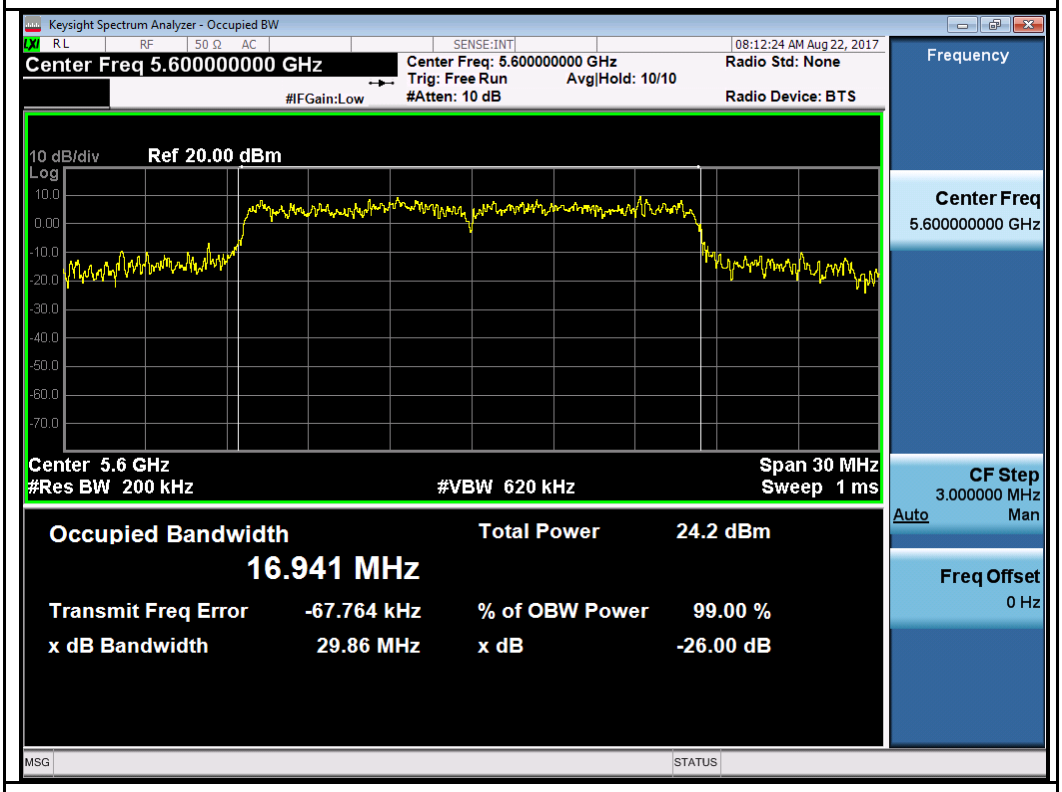


802.11ac-VHT80-5290MHz

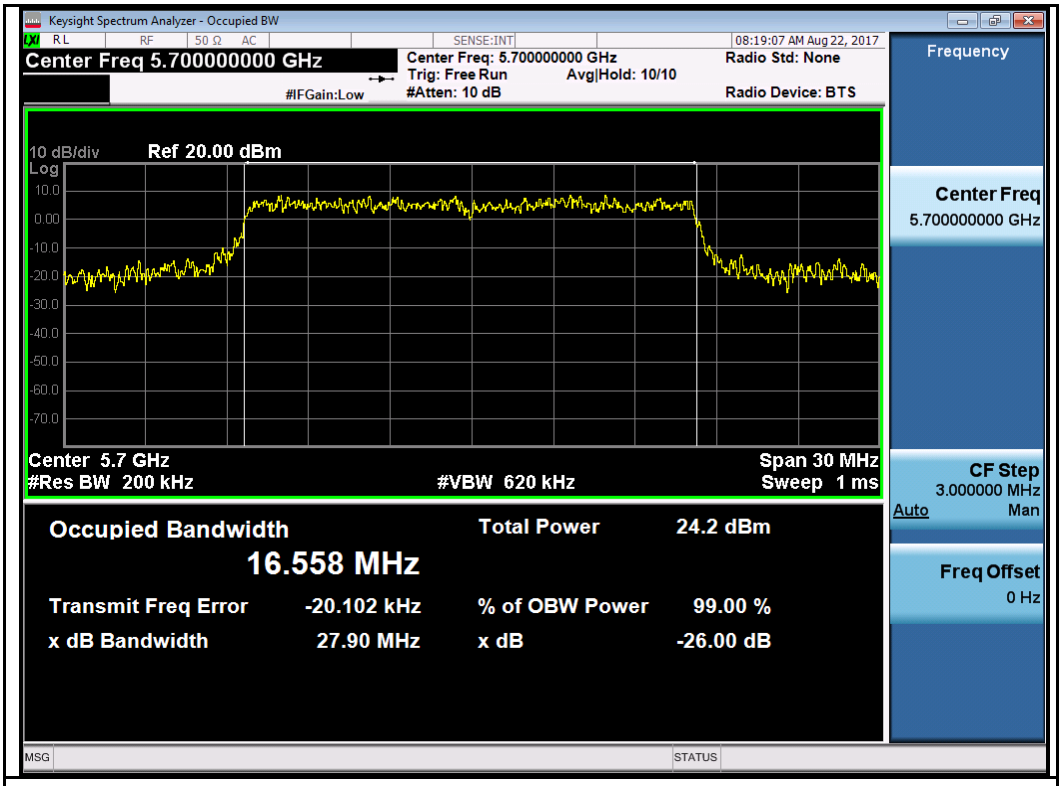
W56:



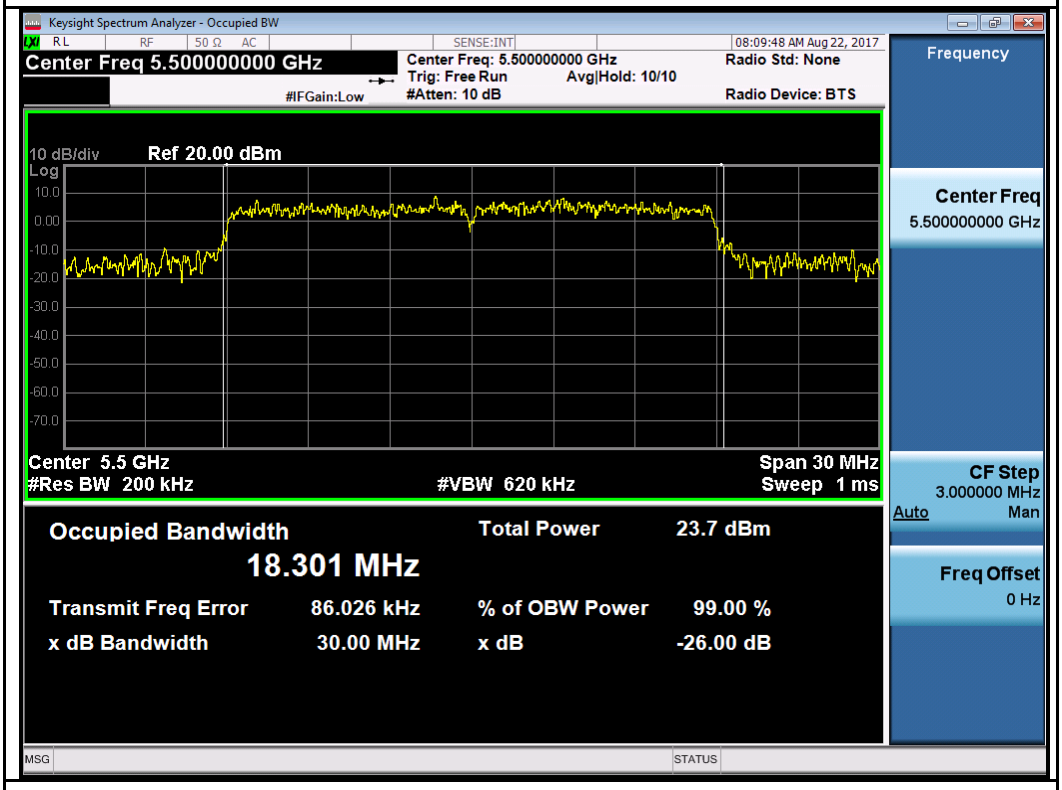
802.11a-5500MHz



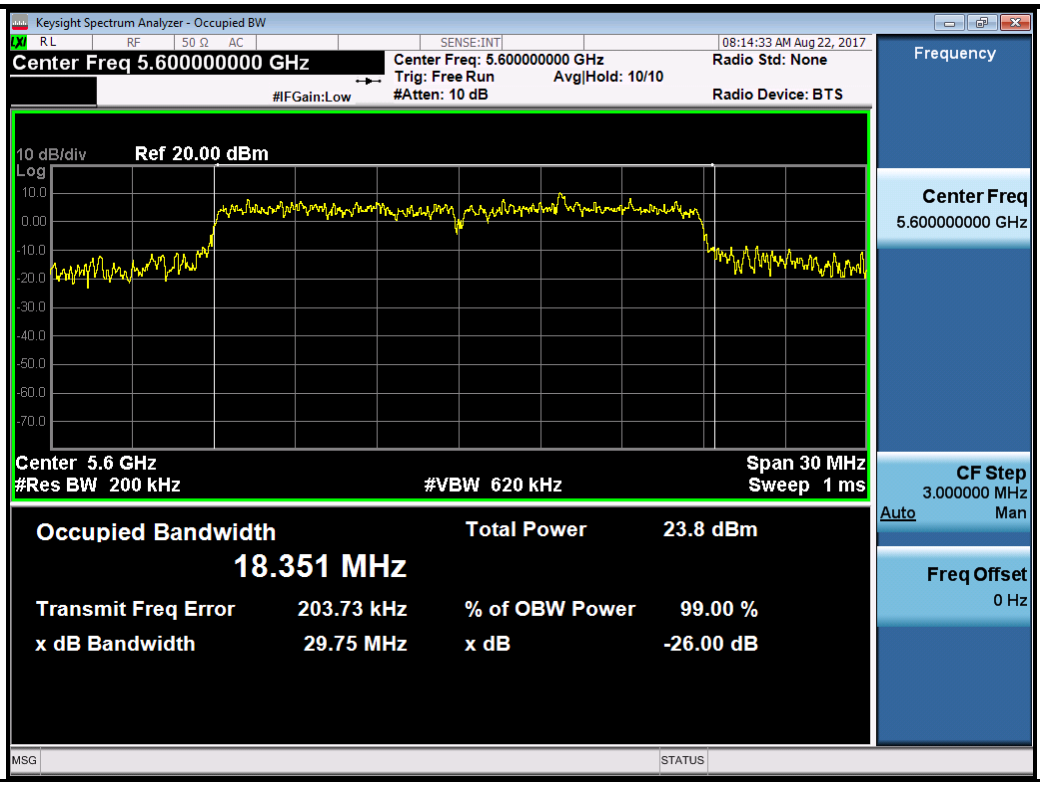
802.11a-5580MHz



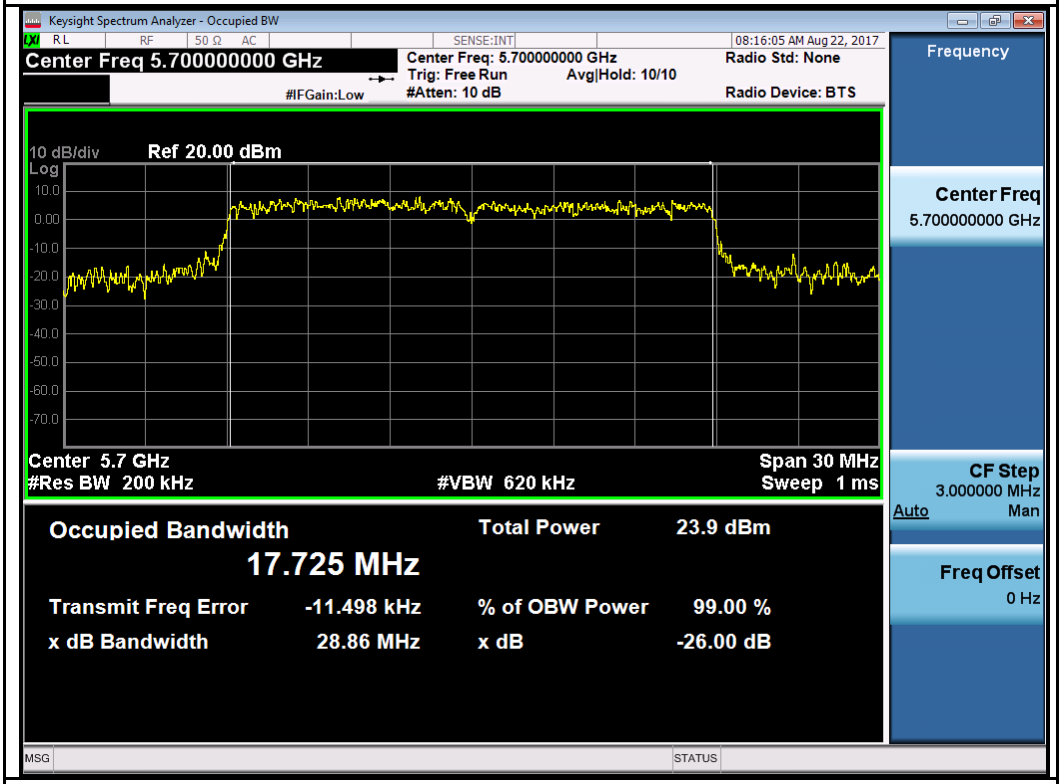
802.11a-5700MHz



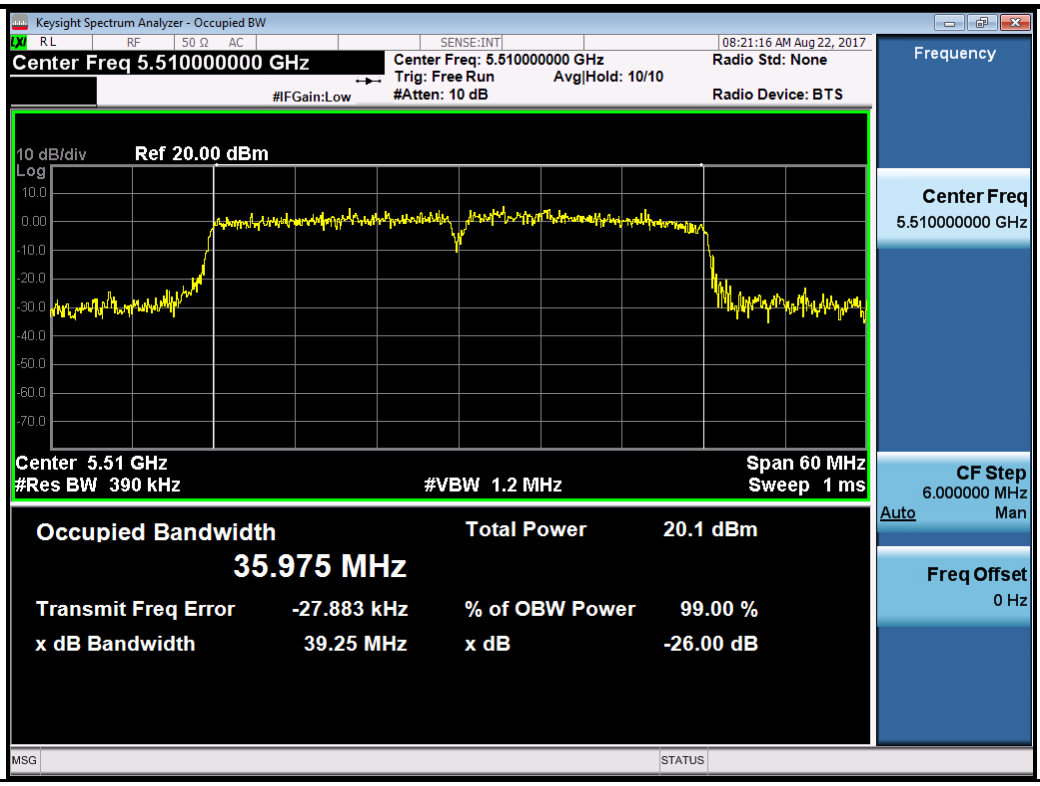
802.11n-HT20-5500MHz



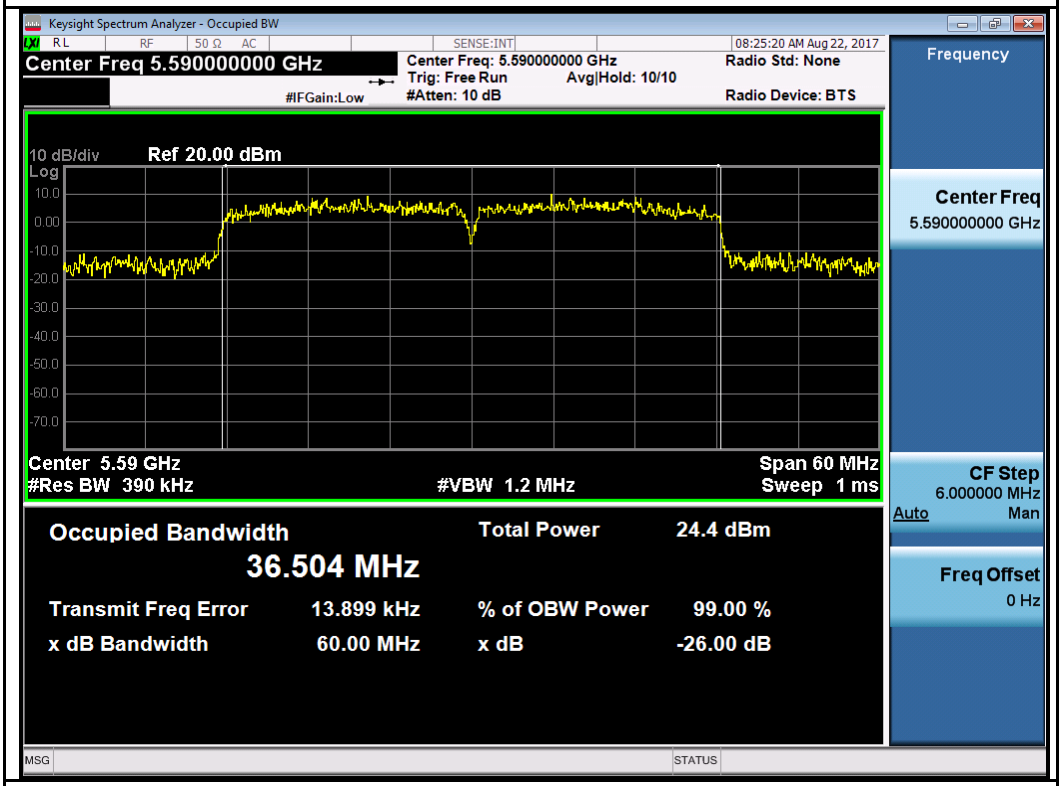
802.11n-HT20-5580MHz



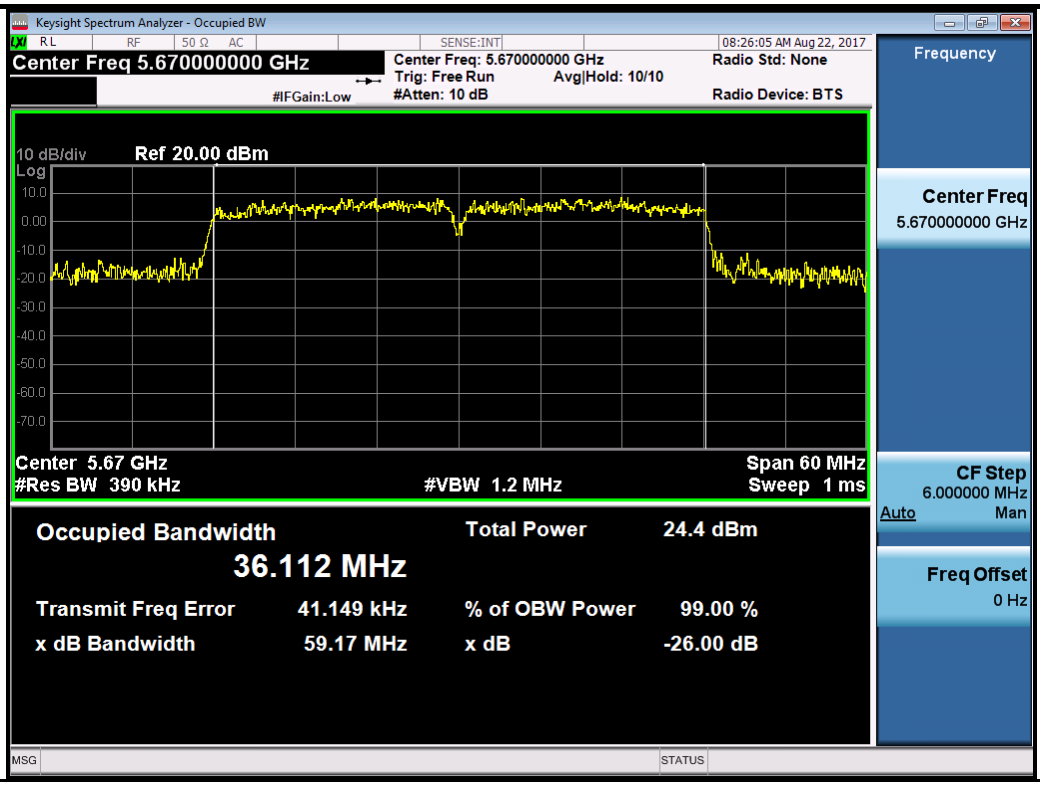
802.11n-HT20-5700MHz



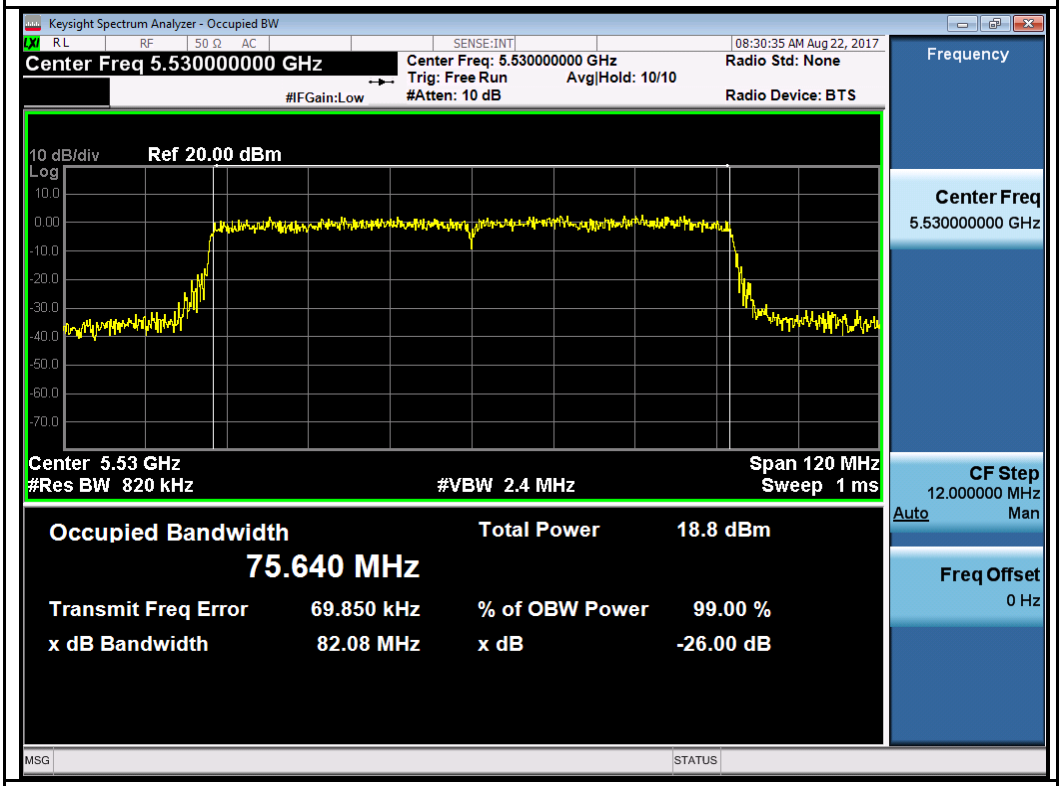
802.11n-HT40-5510MHz



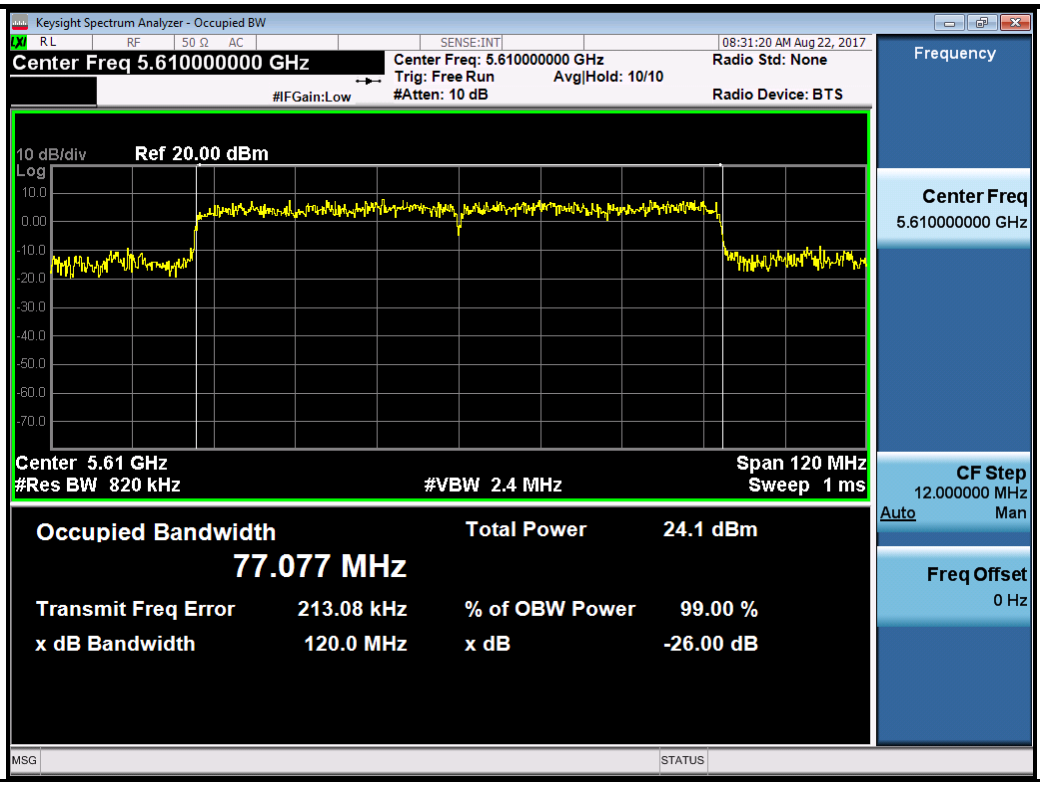
802.11n-HT40-5550MHz



802.11n-HT40-5670MHz

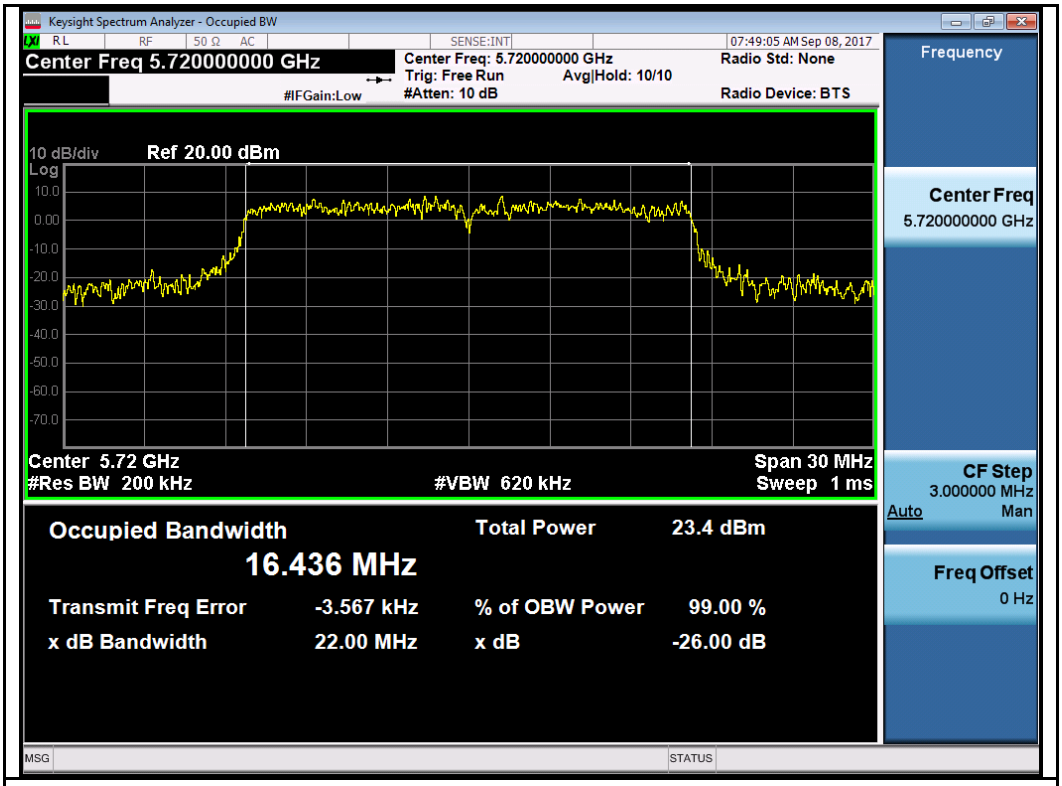


802.11ac-VHT80-5530MHz

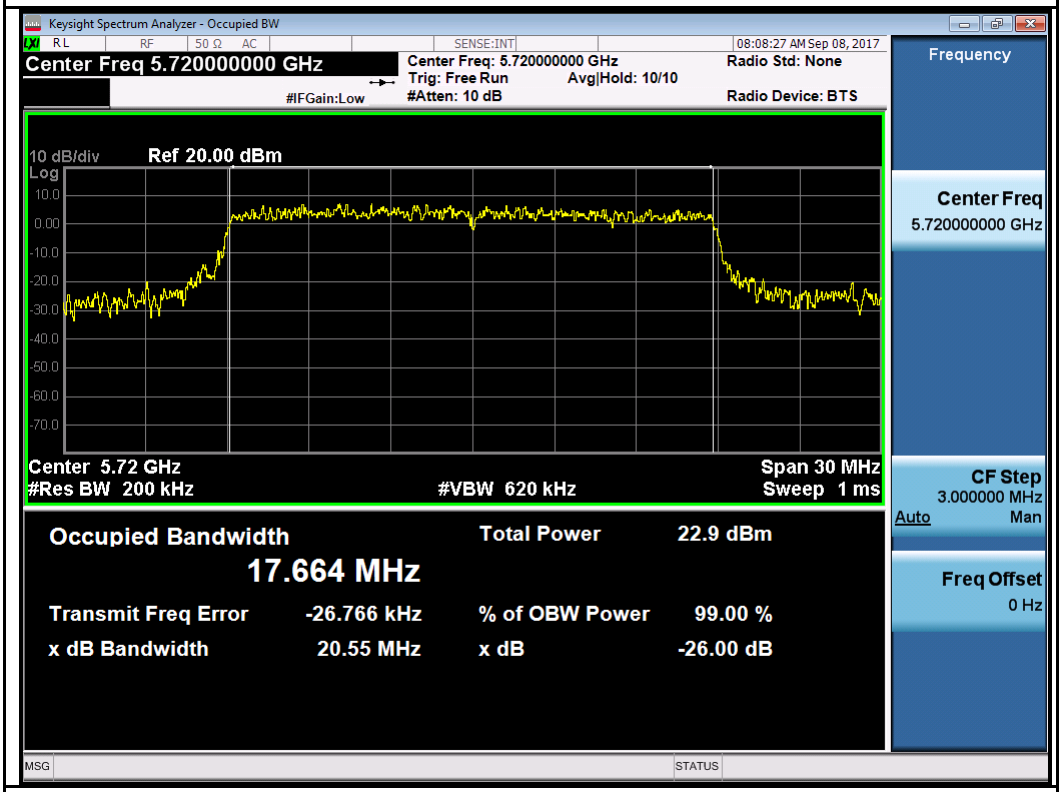


802.11ac-VHT80-5610MHz

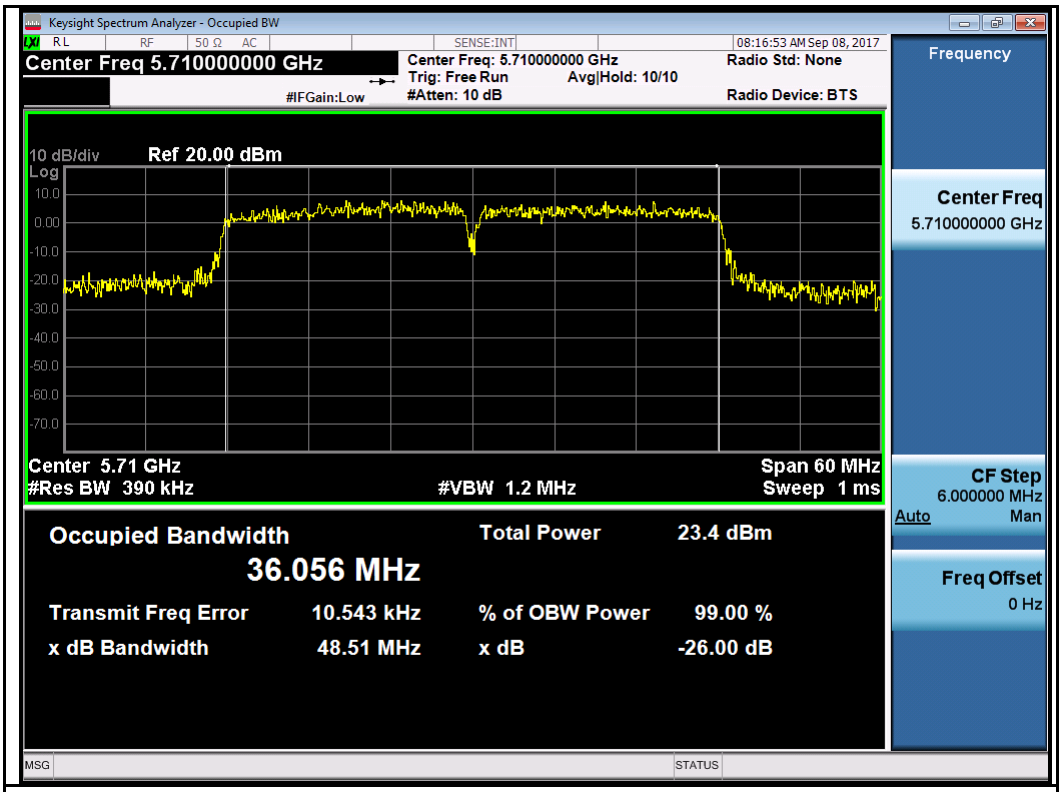
26dB BW Cross Band:



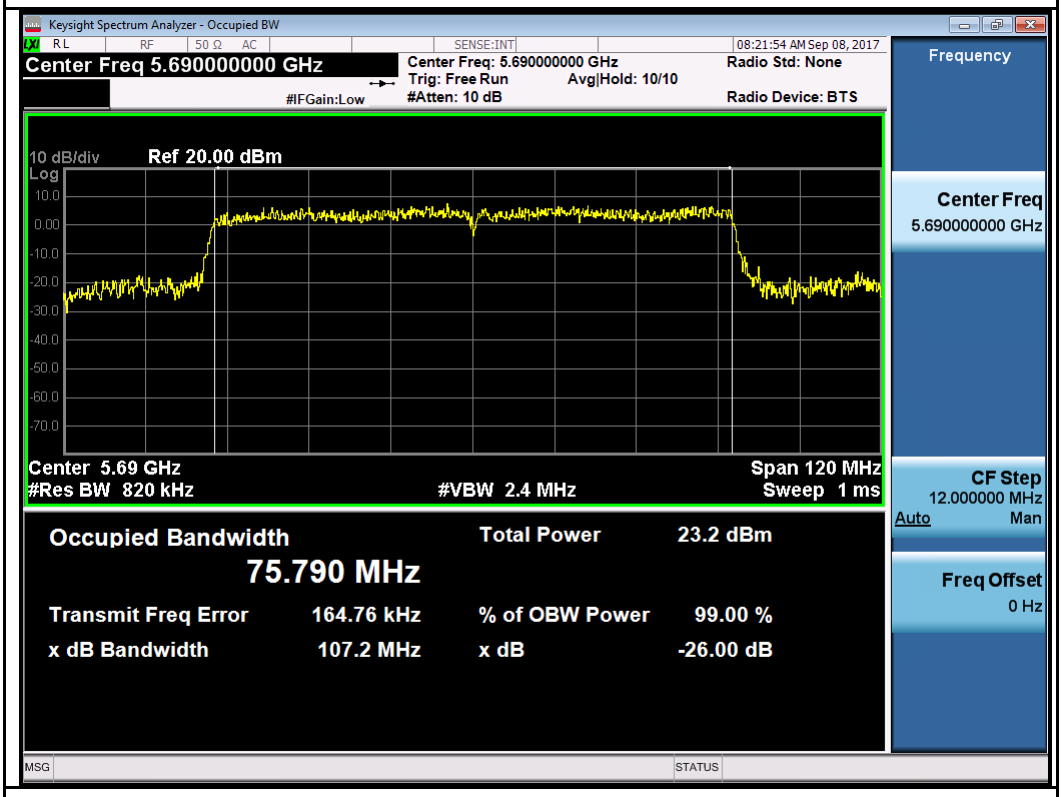
802.11a-5720MHz



802.11n-HT20 5720MHz

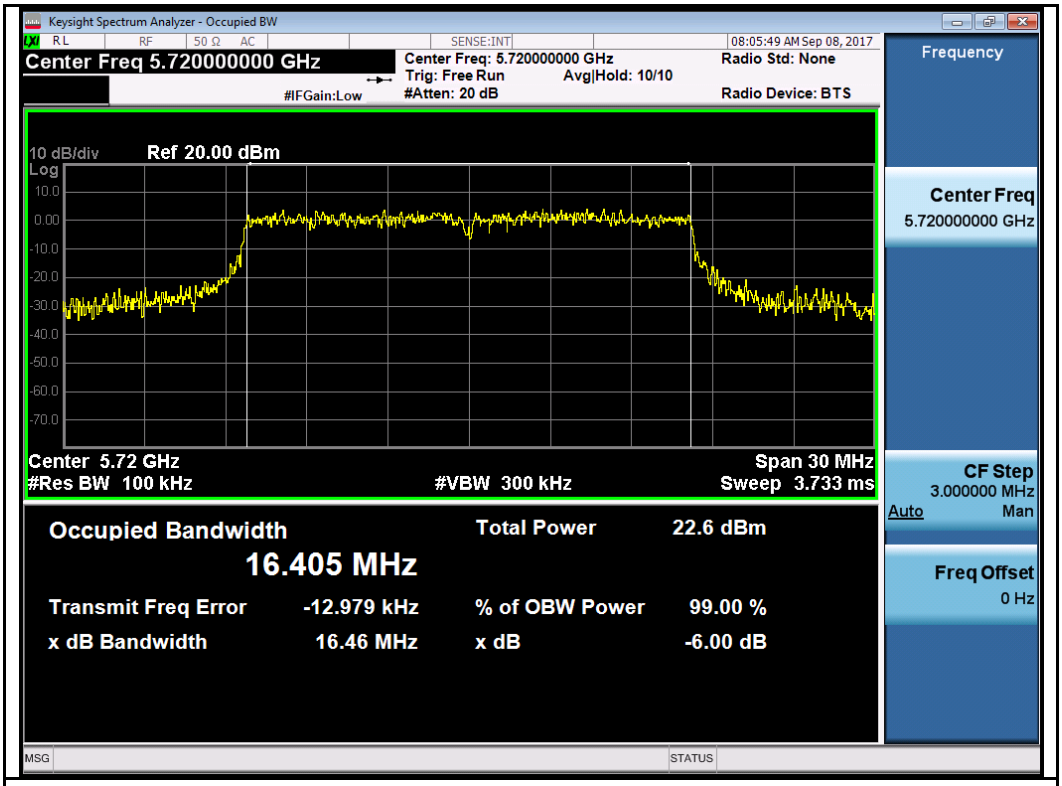


802.11n-HT40 5710MHz

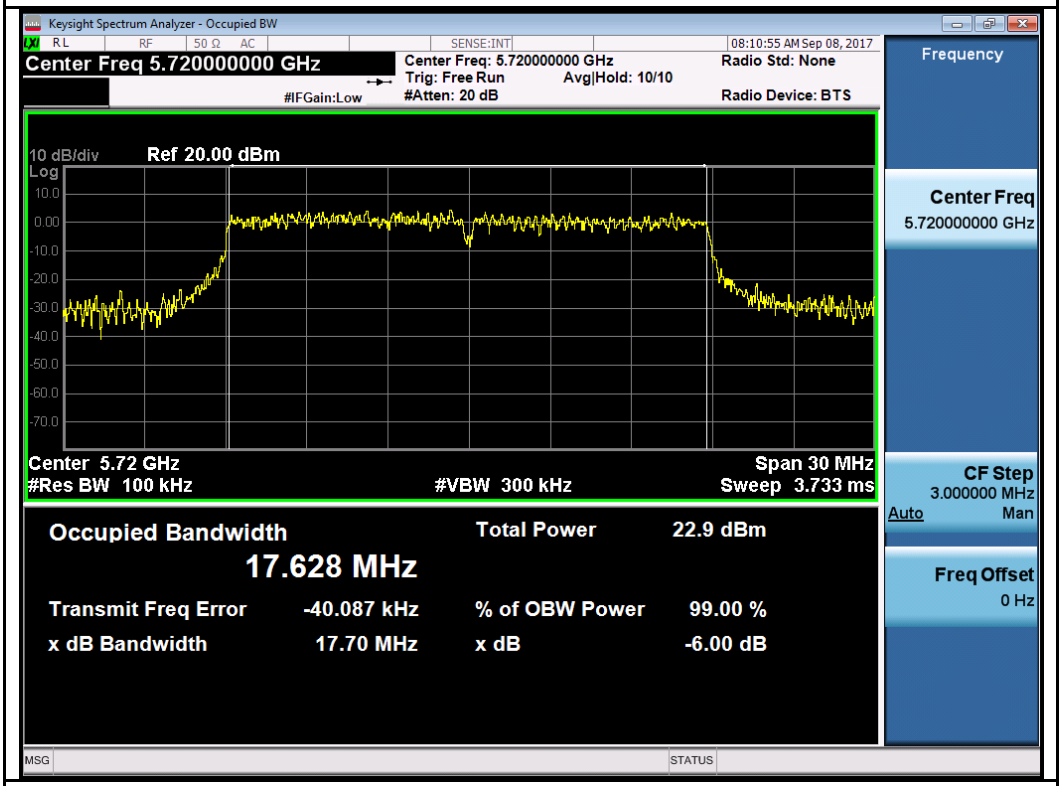


802.11n-HT20-5690MHz

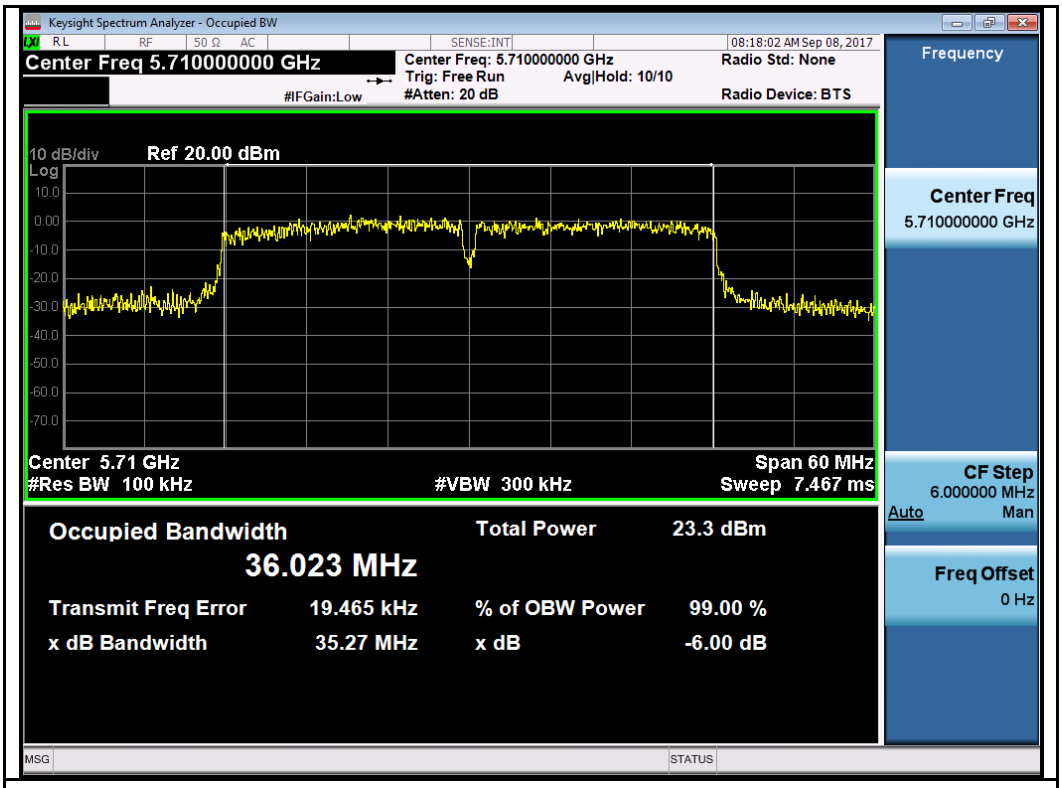
6dB BW Cross Band:



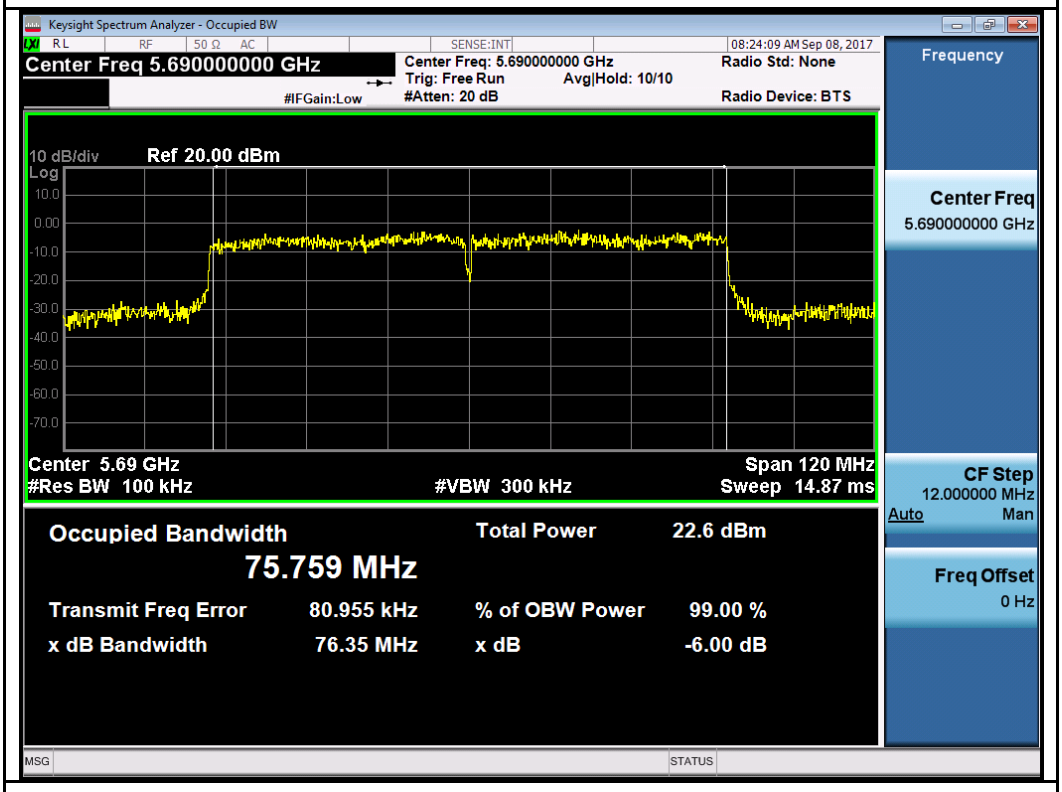
802.11a-5720MHz



802.11n-HT20 5720MHz



802.11n-HT40 5710MHz

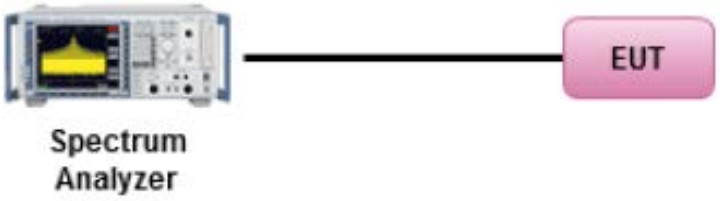


802.11ac-VHT80-5690MHz

10.3 Output Power

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	a)(2)	For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz.	☒
	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): - 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 - 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.) - Sweep time = auto. - Detector = power averaging (rms), if available. Otherwise, use sample detector mode. - 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." - Trace average at least 100 traces in power averaging (rms) mode. - 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	08/21/2017-10/05/2017
Environmental condition	Temperature 23ºC Relative Humidity 44% Atmospheric Pressure 1021mbar
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.