

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E AND INDUSTRY CANADA RSS 247 REQUIREMENT

OF

FCC Applicant: Huawei Technologies Co., Ltd.
Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, China

IC Applicant: Huawei Technologies Co., Ltd.
Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, China (Peoples Republic Of)

Product Name: HUAWEI MateBook

Brand Name: HUAWEI

Model No.: VLT-W10, VLT-W50, VLT-W60

Model Difference: For Marketing Purpose

FCC ID: QISVLT-WX0

IC: 6369A-VLTWX0

Report Number: E2/2018/10026

FCC Rule Part: §15.407, Cat: NII

IC Rule: RSS-247 issue 2 Feb. 2017

Issue Date: Mar. 02, 2018

Date of Test: Jan. 10, 2018 ~ Feb. 23, 2018

Date of EUT Received: Jan. 10, 2018

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Karen Huang
Prepared By: _____
Karen Huang / Clerk



Jim Chang
Approved By: _____
Jim Chang / Manager

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Revision History

Report Number	Revision	Description	Issue Date
E2/2018/10026	Rev.00	Initial creation of document	Mar. 02, 2018

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1 GENERAL INFORMATION

1.1 Product Description

General:

Product Name:	HUAWEI MateBook	
Brand Name:	HUAWEI	
Model No.:	VLT-W10,VLT-W50,VLT-W60	
Model Difference:	For Marketing Purpose	
Product SW/HW version:	1.3.0.5(C001) / B2B	
Radio SW/HW version:	Wi-Fi Component: 20.0 / Wi-Fi Component: 8265	
Test SW Version:	N/A	
RF power setting in TEST SW:	N/A	
Power Supply:	7.6Vdc from Rechargeable Li-ion Battery or 5Vdc / 9Vdc / 12Vdc / 15Vdc / 20Vdc from AC/DC Adapter.	
	Battery:	Model No.: HB4593R1ECW, Supplier: HUAWEI
	Adapter:	Model No.: HW-200325UP0, Supplier: HUAWEI

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FCC WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Avg. Power (dBm)	Modulation Technology
11a_20	5150~5250	4	14.97	OFDM
	5250~5350	4	14.97	
	5470~5725	12	13.96	
	5725~5850	5	13.96	
11n_HT / ac_VHT 20M	5150~5250	4	HT: 14.98	OFDM
	5250~5350	4	HT: 14.99	
	5470~5725	12	HT: 13.99	
	5725~5850	5	HT: 13.97	
11n_HT / ac_VHT 40M	5150~5250	2	HT: 14.97	OFDM
	5250~5350	2	HT: 14.99	
	5470~5725	6	HT: 13.99	
	5725~5850	2	HT: 13.98	
11ac VHT80M	5150~5250	1	13.91	OFDM
	5250~5350	1	11.96	
	5470~5725	3	13.92	
	5725~5850	1	13.89	
Antenna Designation:	PIFA Antenna, Main Antenna: 5150~5250MHz Peak Gain: 1.8dBi 5250~5350MHz Peak Gain: 1.8dBi 5470~5725MHz Peak Gain: 1.84dBi 5725~5850MHz Peak Gain: 1.84dBi Aux Antenna: 5150~5250MHz Peak Gain: -0.55dBi 5250~5350MHz Peak Gain: 1.34dBi 5470~5725MHz Peak Gain: 1.46dBi 5725~5850MHz Peak Gain: 1.46dBi			

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IC WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Avg. or EIRP	Rated Power(dBm)	Modulation Technology
11a	5180~5240	4	EIRP	19.68	OFDM
	5260~5320	4	Avg.	14.97	
	5500~5580	5	Avg.	13.96	
	5660~5700	3	Avg.	13.92	
	5745~5825	5	Avg.	13.96	
11n_HT / ac_VHT 20M	5180~5240	4	EIRP	HT: 19.70	OFDM
	5260~5320	4	Avg.	HT: 14.99	
	5500~5580	5	Avg.	HT: 13.99	
	5660~5720	4	Avg.	HT: 13.94	
	5745~5825	5	Avg.	HT: 13.97	
11n_HT / ac_VHT 40M	5190~5230	2	EIRP	HT: 19.75	OFDM
	5270~5310	2	Avg.	HT: 14.99	
	5510~5550	2	Avg.	HT: 13.96	
	5670~5710	2	Avg.	HT: 13.99	
	5755~5795	2	Avg.	HT: 13.98	
11ac VHT80M	5210~5210	1	EIRP	18.66	OFDM
	5290~5290	1	Avg.	11.96	
	5530~5530	1	Avg.	13.92	
	5690~5690	1	Avg.	13.72	
	5775~5775	1	Avg.	13.89	
Modulation type		64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 802.11ac only			
Transition Rate:		802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 144.4Mbps 802.11 n_40MHz: 13.5 - 300.0Mbps 802.11 ac_20MHz: 6.5 –144.4Mbps 802.11 ac_40MHz: 13.5 -300.0Mbps 802.11 ac_80MHz: 29.3 – 650Mbps			

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1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

FCC KDB 789033 D02 General UNII Test Procedures New Rules

KDB 789033 D02 v01r04 General UNII Test Procedures New Rules

KDB 644545 D03 v01 Guidance for IEEE 802.11ac

RSS-247 issue 2 Feb. 2017

RSS-Gen issue4 Nov. 2014

ANSI C63.10:2013

Note: All test items have been performed and record as per the above standards.

1.3 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd.,
Guishan District, Taoyuan City, Taiwan 333 (TAF code 0513)

FCC Registration Numbers are: 735305 / TW0002

Canada Registration Number: 4620A-5

1.4 Special Accessories

There are no special accessories used while test was conducted.

1.5 Equipment Modifications

There was no modification incorporated into the EUT.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz,. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plan. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna.

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2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Following shows an offset computation example with cable loss and attenuator.

SISO offset = RF cable loss (dB)+ attenuation factor(dB)=11.5(dB)

MIMO offset = RF cable loss (dB)+ attenuation factor(dB)=14.5(dB)

2.5 Configuration of Tested System

Fig. 2-1 Radiated Emission Configuration



Fig.2-3 Conducted Emission (Antenna Port) Configuration



Fig. 2-2 Conducted Emission (AC Power Line) Configuration

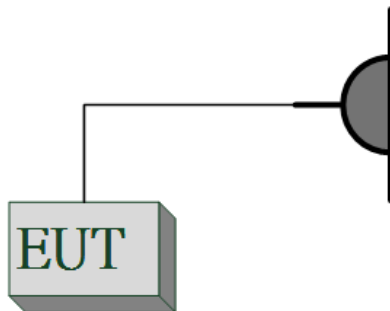


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1	WLAN Test Software	N/A	N/A	N/A	N/A	N/A

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3 SUMMARY OF TEST RESULT

FCC Rules	IC Rules	Description Of Test	Result
§15.207	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.403(i) §15.407(e)	RSS-247 §6.2.1~ 4 (1) RSS-Gen §6.6	26 dB & 6dB & 99% Emission Bandwidth	Compliant
§15.407(a)	RSS-247 §6.2.1~ 4 (1)	Maximum Conducted Output Power	Compliant
§15.407(a)	RSS-247 §6.2.1~ 4 (1)	Power Spectral Density	Compliant
§15.407(b)	RSS-247 §6.2.1~ 4 (2)	Undesirable Radiated Emissions	Compliant
§15.407(c)	RSS-247 §6.4	Transmission in case of Absence of Information	Compliant
§15.407(g)	RSS-Gen §6.11	Frequency Stability	Compliant
§15.203 §15.407(a)	RSS- Gen §6.7 RSS- Gen §8.3	Antenna Requirement	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 Operated in U-NII Bands

Operated band in 5150 MHz ~5250 MHz:

4 channels are provided for 802.11a, 802.11n_HT20, 802.11ac_VHT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n_HT40, 802.11ac_VHT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac_VHT80

CHANNEL	FREQUENCY
42	5210 MHz

Operated band in 5250 MHz ~5350 MHz:

4 channels are provided for 802.11a, 802.11n_HT20, 802.11ac_VHT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

2 channels are provided for 802.11n_HT40, 802.11ac_VHT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac_VHT80

CHANNEL	FREQUENCY
58	5290 MHz

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Operated band in 5470 MHz ~5725 MHz:

11 channels are provided for 802.11a, 802.11n_HT20, 802.11ac_VHT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz	144	5720 MHz

5 channels are provided for 802.11n_HT40, 802.11ac_VHT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz	142	5710 MHz

3 channels are provided for 802.11ac_VHT80

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
106	5530 MHz	138	5690 MHz
122	5610 MHz		

Operated band in 5725 MHz ~5850 MHz:

5 channels are provided for 802.11a, 802.11n_HT20, 802.11ac_VHT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

2 channels are provided for 802.11n_HT40, 802.11ac_VHT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac_VHT80

CHANNEL	FREQUENCY
155	5775 MHz

Remark: The device will not operate in 5600~5650MHz band for IC.

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4.2 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Test program used to control the EUT for staying in continuous transmitting mode is programmed.
3. Investigation has been done on all the possible configurations for searching the worst case.
4. The given UE is pre-scanned among 802.11n and ac modes, and 802.11n yields the highest reading that generates the highest emission.
5. The given UE is pre-scanned among SISO Main, SISO Aux and MIMO modes, and SISO Main mode yields the highest reading that generates the highest emission. Therefore, 802.11ac+SISO Main as the mode of radiated test configuration is chosen to carry out the relevantly mandatory test items.

RADIATED EMISSION TEST:

RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	MAIN
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	MAIN
802.11a	5500~5720	100 to 140	100,116,140	OFDM	6	MAIN
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	MAIN
RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	MAIN
802.11n_HT20				OFDM	MCS8	MAIN
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS8	MAIN
802.11ac_VHT80	5210	42	42	OFDM	MCS8	MAIN
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	MAIN
802.11n_HT20				OFDM	MCS8	MAIN
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS8	MAIN
802.11ac_VHT80	5290	58	58	OFDM	MCS8	MAIN

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MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5500~5720	100 to 144	100,116,140	OFDM	6	MAIN
802.11n_HT20				OFDM	MCS8	MAIN
802.11n_HT40	5510~5710	102 to 142	102,110,134	OFDM	MCS8	MAIN
802.11ac_VHT80	5530~5690	106 to 138	106,122,138	OFDM	MCS8	MAIN
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	MAIN
802.11n_HT20				OFDM	MCS8	MAIN
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS8	MAIN
802.11ac_VHT80	5775	155	155	OFDM	MCS8	MAIN

Note:

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11a/n/ac WLAN Transmitter for channel Low, Mid and High, the worst case H position was reported.

ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	MAIN
802.11n_HT20 802.11ac_VHT20				OFDM	MCS8	MAIN
802.11n_HT40 802.11ac_VHT40	5190~5230	38 to 46	38,46	OFDM	MCS8	MAIN
802.11ac_VHT80	5210	42	42	OFDM	MCS8	MAIN
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	MAIN
802.11n_HT20 802.11ac_VHT20				OFDM	MCS8	MAIN
802.11n_HT40 802.11ac_VHT40	5270~5310	54 to 62	54,62	OFDM	MCS8	MAIN
802.11ac_VHT80	5290	58	58	OFDM	MCS8	MAIN
802.11a	5500~5720	100 to 144	100,116,140,144	OFDM	6	MAIN
802.11n_HT20 802.11ac_VHT20				OFDM	MCS8	MAIN
802.11n_HT40 802.11ac_VHT40	5510~5710	102 to 142	102,110,134,142	OFDM	MCS8	MAIN
802.11ac_VHT80	5530~5690	106 to 138	106,122,138	OFDM	MCS8	MAIN
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	MAIN
802.11n_HT20 802.11ac_VHT20				OFDM	MCS8	MAIN
802.11n_HT40 802.11ac_VHT40	5755~5795	151 to 159	151,159	OFDM	MCS8	MAIN
802.11ac_VHT80	5775	155	155	OFDM	MCS8	MAIN

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
26dB & 6dB Emission Bandwidth	+/- 123.36 Hz
The Maximum Output Power Measurement	+/- 0.96 dB
Peak Power Spectral Density Measurement	+/- 1.67 dB
Frequency Stability	+/- 123.36 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%

Radiated Spurious Emission:

Measurement uncertainty (Polarization : Vertical)	9kHz-30MHz: +/-2.87dB
	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

Measurement uncertainty (Polarization : Horizontal)	9kHz-30MHz: +/-2.87dB
	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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6 CONDUCTED EMISSION TEST

6.1 Standard Applicable

Frequency range within 150 kHz to 30 MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note

- 1.The lower limit shall apply at the transition frequencies
- 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

6.2 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI 7	100950	12/24/2017	12/23/2018
Coaxial Cables	N/A	N30N30-1042-1 50cm	N/A	08/30/2017	08/29/2018
LISN	Schwarzbeck	NSLK 8127	8127-648	06/18/2017	06/17/2018
Test Software	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

6.3 EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The LISN was connected with 120Vac/60Hz power source.

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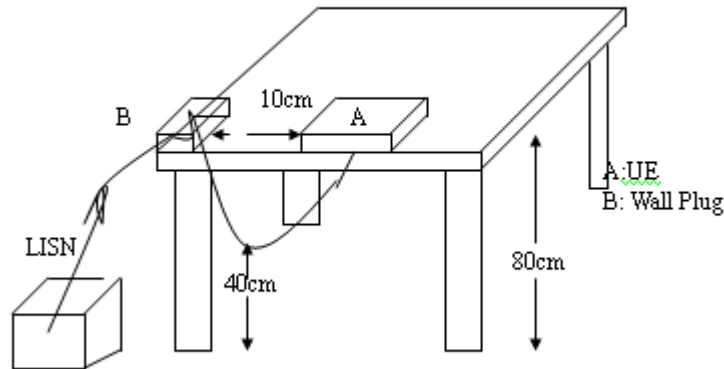
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6.4 Test SET-UP



6.5 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all phases of power being supplied by given UE are completed.

6.6 Measurement Result

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that closet to the limit

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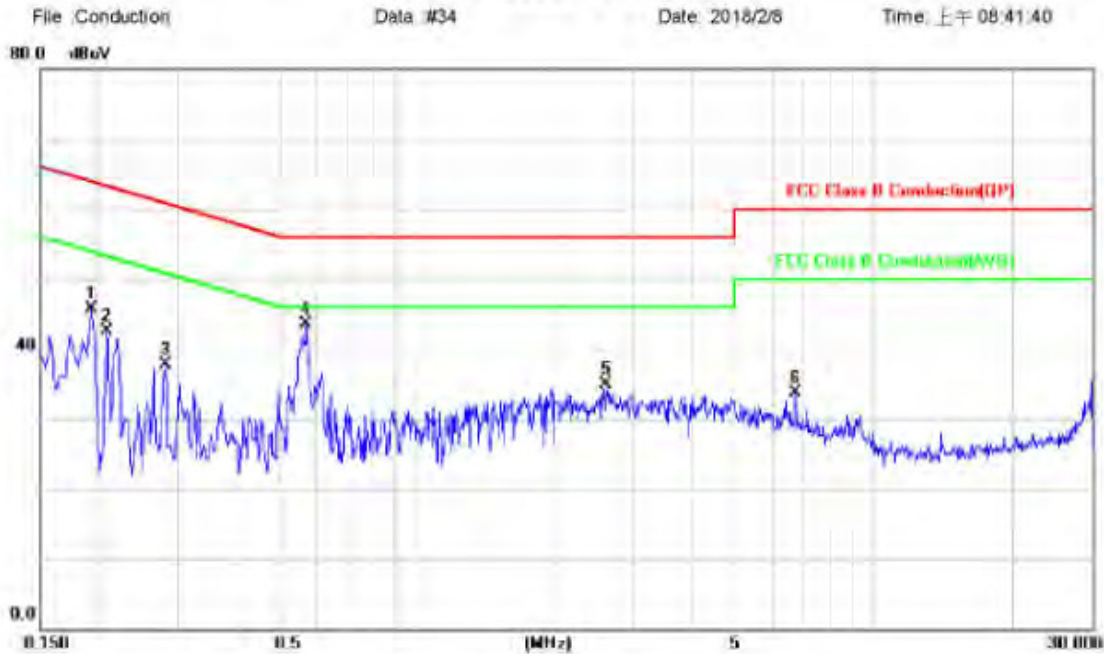
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode: Operation mode	Test By: Pony
--------------------------------	---------------

Site : Conduction Room	Phase: L1	Temperature: 16 °C
Limit: FCC Class B Conduction(QP)	Power: AC 120V/60Hz	Humidity: 63 %
Mode:		
Note:		

Conducted Emission



No	Mk	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1940	26.02	19.69	45.71	63.86	-18.15	peak	
2		0.2100	22.76	19.71	42.47	63.21	-20.74	peak	
3		0.2820	17.89	19.83	37.72	60.76	-23.04	peak	
4 *		0.5740	23.33	20.15	43.48	56.00	-12.52	peak	
5		2.5980	14.40	20.58	34.98	56.00	-21.02	peak	
6		6.7620	13.46	20.34	33.80	60.00	-26.20	peak	

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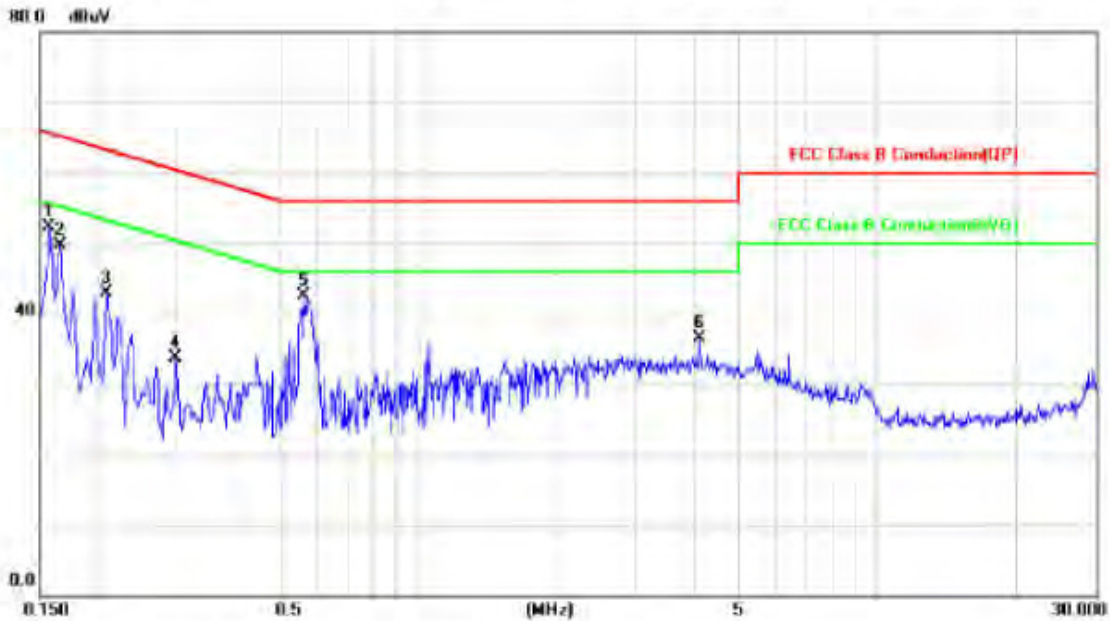
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Site : Conduction Room Phase: **N** Temperature: 16 ℃
 Limit: FCC Class B Conduction(QP) Power: AC 120V/60Hz Humidity: 47 %
 Mode:
 Note:

Conducted Emission

File :Conduction Data :#36 Date: 2018/2/8 Time: 上午 08:44:28



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1580	32.64	19.68	52.32	65.57	-13.25	peak	
2		0.1660	30.03	19.68	49.71	65.16	-15.45	peak	
3		0.2100	23.25	19.69	42.94	63.21	-20.27	peak	
4		0.2980	13.81	19.83	33.64	60.30	-26.66	peak	
5		0.5660	22.36	20.12	42.48	56.00	-13.52	peak	
6		4.0980	16.12	20.29	36.41	56.00	-19.59	peak	

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7 DUTY CYCLE TEST SIGNAL

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

Formula:

$$\text{Duty Cycle} = \text{Ton} / (\text{Ton} + \text{Toff})$$

Measurement Procedure:

1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

Duty Cycle:

Mode	Duty Cycle (%)	Duty Factor (dB) =10*log (1/Duty Cycle
802.11a	94.91	0.23
802.11n_20	95.59	0.20
802.11ac_20	95.61	0.20
802.11n_40	84.33	0.74
802.11ac_40	84.48	0.73
802.11ac_80	84.01	0.76

$$\text{Duty Cycle Factor: } 10 * \log(1/0.949074074074074) = 0.23$$

$$\text{Duty Cycle Factor: } 10 * \log(1/0.955911823647294) = 0.2$$

$$\text{Duty Cycle Factor: } 10 * \log(1/0.956087824351297) = 0.2$$

$$\text{Duty Cycle Factor: } 10 * \log(1/0.843282236248873) = 0.74$$

$$\text{Duty Cycle Factor: } 10 * \log(1/0.844762757385855) = 0.73$$

$$\text{Duty Cycle Factor: } 10 * \log(1/0.840095029239766) = 0.76$$

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DUTY CYCLE TEST SIGNAL Measurement Result 802.11a



802.11n HT20



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802.11n HT 40



802.11 ac VHT 80



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8 26DB & 6DB EMISSION BANDWIDTH MEASUREMENT

8.1 Standard Applicable

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C.

The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

8.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules .
3. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
 - a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW Sweep=auto, Detector = Peak, Trace Mode = Max Hold, Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.
 - b. Mark the peak frequency and -26dB (upper and lower) frequency.
4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.
5. Minimum Emission Bandwidth for the band 5.725-5.850GHz.
 - a. Set the spectrum analyzer as RBW = 100 kHz, VBW = 3*RBW, Span = 30M/50MHz, Detector=Peak, Sweep=auto
 - b. Mark the peak frequency and -6dB (upper and lower) frequency.
6. Repeat above procedures until all test default channel measured were complete.

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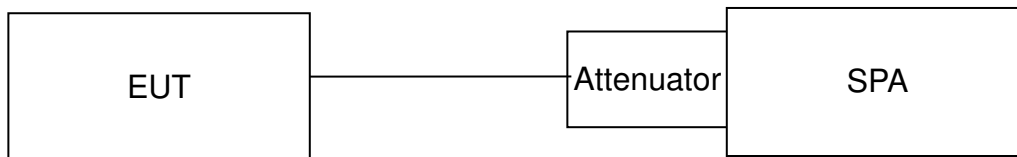
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8.3 Measurement Equipment Used

SGS Conducted Room					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/20/2017	06/19/2018
Coaxial Cable 30cm	WOKEN	00100A1F1A195C	RF01	12/24/2017	12/23/2018
DC Block	PASTERNAK	PE8210	RF29	12/24/2017	12/23/2018
Attenuator	WOKEN	218FS-10	RF23	12/24/2017	12/23/2018
DC Power Supply	Agilent	E3640A	MY53140006	05/02/2017	05/01/2018

8.4 Test Set-up



8.5 Measurement Result

26dB and 6dB Bandwidth

802.11a_Main

802.11a_Aux1

Frequency (MHz)	26dB BW (MHz)	Offset	10 Log (B) (dB)	Frequency (MHz)	26dB BW (MHz)	Offset	10 Log (B) (dB)
5180	22.78	11.50	13.575	5180	23.68	11.50	13.743
5220	23.79	11.50	13.764	5220	23.12	11.50	13.641
5240	22.44	11.50	13.510	5240	22.62	11.50	13.546
5260	23.60	11.50	13.729	5260	21.72	11.50	13.369
5300	21.97	11.50	13.419	5300	21.55	11.50	13.335
5320	22.30	11.50	13.482	5320	22.52	11.50	13.526
5500	22.38	11.50	13.498	5500	23.60	11.50	13.729
5580	23.41	11.50	13.694	5580	22.24	11.50	13.472
5700	21.48	11.50	13.321	5700	23.06	11.50	13.629

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802.11a_Main

802.11a_Aux1

Frequency (MHz)	6dB BW (MHz)	Offset	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	Offset	10 Log (B) (dB)
5745	16.07	11.50	12.060	5745	16.34	11.50	12.133
5785	13.61	11.50	11.340	5785	14.84	11.50	11.715
5825	16.36	11.50	12.137	5825	16.37	11.50	12.141

802.11n_HT20_Main

802.11n_HT20_Aux1

Frequency (MHz)	26dB BW (MHz)	Offset	10 Log (B) (dB)	Frequency (MHz)	26dB BW (MHz)	Offset	10 Log (B) (dB)
5180	23.54	11.50	13.718	5180	22.98	11.50	13.613
5220	22.90	11.50	13.598	5220	23.15	11.50	13.646
5240	23.51	11.50	13.712	5240	22.71	11.50	13.563
5260	23.21	11.50	13.657	5260	22.56	11.50	13.533
5300	23.02	11.50	13.622	5300	22.18	11.50	13.460
5320	22.57	11.50	13.536	5320	23.07	11.50	13.630
5500	23.44	11.50	13.700	5500	24.13	11.50	13.825
5580	23.84	11.50	13.774	5580	23.51	11.50	13.713
5700	22.18	11.50	13.459	5700	22.45	11.50	13.512
5720 (band 3)	16.00	12.00	12.041	5720 (band 3)	15.44	12.00	11.886
5720 (band 4)	4.83	12.00	6.842	5720 (band 4)	4.66	12.00	6.687

802.11n_HT20_Main

802.11n_HT20_Aux1

Frequency (MHz)	6dB BW (MHz)	Offset	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	Offset	10 Log (B) (dB)
5745	12.68	11.50	11.031	5745	17.57	11.50	12.447
5785	13.34	11.50	11.253	5785	11.80	11.50	10.718
5825	16.24	11.50	12.106	5825	13.82	11.50	11.406

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802.11n_HT40_Main

802.11n_HT40_Aux1

Frequency (MHz)	26dB BW (MHz)	Offset	10 Log (B) (dB)	Frequency (MHz)	26dB BW (MHz)	Offset	10 Log (B) (dB)
5190	44.83	11.50	16.516	5190	44.45	11.50	16.479
5230	44.73	11.50	16.506	5230	44.32	11.50	16.466
5270	44.42	11.50	16.476	5270	44.68	11.50	16.501
5310	45.49	11.50	16.579	5310	46.01	11.50	16.629
5510	45.43	11.50	16.574	5510	44.66	11.50	16.499
5550	44.48	11.50	16.481	5550	44.66	11.50	16.499
5670	45.26	11.50	16.557	5670	45.99	11.50	16.627
5710 (band 3)	39.86	12.00	16.006	5710 (band 3)	40.33	12.00	16.057
5710 (band 4)	4.78	12.00	6.793	5710 (band 4)	4.84	12.00	6.844

802.11n_HT40_Main

802.11n_HT40_Aux1

Frequency (MHz)	6dB BW (MHz)	Offset	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	Offset	10 Log (B) (dB)
5755	35.13	11.50	15.456	5755	33.88	11.50	15.300
5795	35.12	11.50	15.456	5795	33.89	11.50	15.301

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802.11ac_VHT80_Main

802.11ac_VHT80_Aux1

Frequency (MHz)	26dB BW (MHz)	Offset	10 Log (B) (dB)	Frequency (MHz)	26dB BW (MHz)	Offset	10 Log (B) (dB)
5210	86.17	11.50	19.354	5210	86.03	11.50	19.347
5290	84.93	11.50	19.291	5290	85.34	11.50	19.311
5530	85.45	11.50	19.317	5530	85.88	11.50	19.339
5610	84.50	11.50	19.268	5610	85.86	11.50	19.338

802.11ac_VHT80_Main

802.11ac_VHT80_Aux1

Frequency (MHz)	6dB BW (MHz)	Offset	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	Offset	10 Log (B) (dB)
5690(band 3)	78.97	12.00	18.974	5690(band 3)	79.14	12.00	18.984
5690(band 4)	4.26	12.00	6.297	5690(band 4)	4.27	12.00	6.306
5775	70.15	11.50	18.460	5775	72.55	11.50	18.606

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99% Bandwidth

802.11a_Main

Frequency (MHz)	99% BW (MHz)	Offset	10 Log (B) (dB)
5180	16.606	11.500	12.203
5220	16.580	11.500	12.196
5240	16.589	11.500	12.198
5260	16.597	11.500	12.200
5300	16.534	11.500	12.184
5320	16.587	11.500	12.198
5500	16.529	11.500	12.182
5580	16.617	11.500	12.206
5700	16.571	11.500	12.193

802.11a_Aux1

Frequency (MHz)	99% BW (MHz)	Offset	10 Log (B) (dB)
5180	16.591	11.500	12.199
5220	16.609	11.500	12.203
5240	16.579	11.500	12.196
5260	16.565	11.500	12.192
5300	16.553	11.500	12.189
5320	16.607	11.500	12.203
5500	16.607	11.500	12.203
5580	16.677	11.500	12.221
5700	16.525	11.500	12.181

802.11a_Main

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5240	5248.25	< 5250
5745	5736.78	> 5725

802.11a_Aux1

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5240	5248.25	< 5250
5745	5736.72	> 5725

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802.11n_HT20_Main

Frequency (MHz)	99% BW (MHz)	Offset	10 Log (B) (dB)
5180	17.748	11.500	12.491
5220	17.803	11.500	12.505
5240	17.708	11.500	12.482
5260	17.768	11.500	12.496
5300	17.762	11.500	12.495
5320	17.740	11.500	12.490
5500	17.699	11.500	12.479
5580	17.707	11.500	12.481
5700	17.741	11.500	12.490
5720 (band 3)	13.628	12.000	11.344
5720 (band 4)	4.117	12.000	6.146
5720	17.713	12.000	12.483

802.11n_HT20_Aux1

Frequency (MHz)	99% BW (MHz)	Offset	10 Log (B) (dB)
5180	17.716	11.500	12.484
5220	17.696	11.500	12.479
5240	17.752	11.500	12.492
5260	17.738	11.500	12.489
5300	17.760	11.500	12.494
5320	17.748	11.500	12.491
5500	17.716	11.500	12.484
5580	17.738	11.500	12.489
5700	17.676	11.500	12.474
5720 (band 3)	13.634	12.000	11.346
5720 (band 4)	4.119	12.000	6.148
5720	17.739	12.000	12.489

802.11n_HT20_Main

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5240	5248.85	< 5250
5745	5736.12	> 5725

802.11n_HT20_Aux1

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5240	5248.85	< 5250
5745	5736.15	> 5725

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802.11n_HT40_Main

Frequency (MHz)	99% BW (MHz)	Offset	10 Log (B) (dB)
5190	36.100	11.500	15.575
5230	36.038	11.500	15.568
5270	36.066	11.500	15.571
5310	36.100	11.500	15.575
5510	36.045	11.500	15.568
5550	36.052	11.500	15.569
5670	36.050	11.500	15.569
5710 (band 3)	32.168	12.000	15.074
5710 (band 4)	3.856	12.000	5.862

802.11n_HT40_Aux1

Frequency (MHz)	99% BW (MHz)	Offset	10 Log (B) (dB)
5190	36.127	11.500	15.578
5230	36.059	11.500	15.570
5270	36.074	11.500	15.572
5310	36.092	11.500	15.574
5510	36.080	11.500	15.573
5550	36.091	11.500	15.574
5670	36.114	11.500	15.577
5710 (band 3)	32.178	12.000	15.076
5710 (band 4)	3.858	12.000	5.863

802.11n_HT40_Main
802.11n_HT40_Aux1

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)	Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5230	5248.05	< 5250	5230	5248.05	< 5250
5755	5736.95	> 5725	5755	5736.90	> 5725

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802.11ac_VHT80_Main

Frequency (MHz)	99% BW (MHz)	Offset	10 Log (B) (dB)
5210	75.022	11.500	18.752
5290	74.997	11.500	18.750
5530	74.940	11.500	18.747
5610	74.891	11.500	18.744
5690 (band 3)	71.064	12.000	18.516
5690 (band 4)	3.836	12.000	5.839

802.11ac_VHT80_Aux1

Frequency (MHz)	99% BW (MHz)	Offset	10 Log (B) (dB)
5210	75.042	11.500	18.753
5290	74.922	11.500	18.746
5530	75.030	11.500	18.752
5610	74.837	11.500	18.741
5690 (band 3)	71.091	12.000	18.518
5690 (band 4)	3.838	12.000	5.841

802.11ac_VHT80_Main

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5210	5247.50	< 5250
5775	5737.50	> 5725

802.11n_HT80_Aux1

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5210	5247.40	< 5250
5775	5737.50	> 5725

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台灣檢驗科技股份有限公司

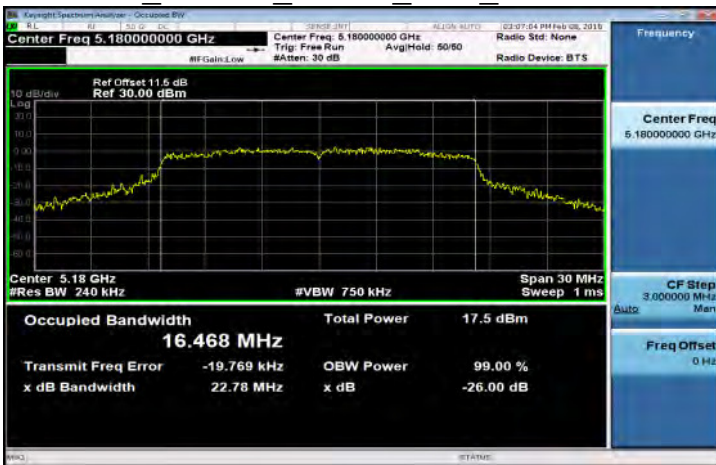
t (886-2) 2299-3279

f (886-2) 2298-0488

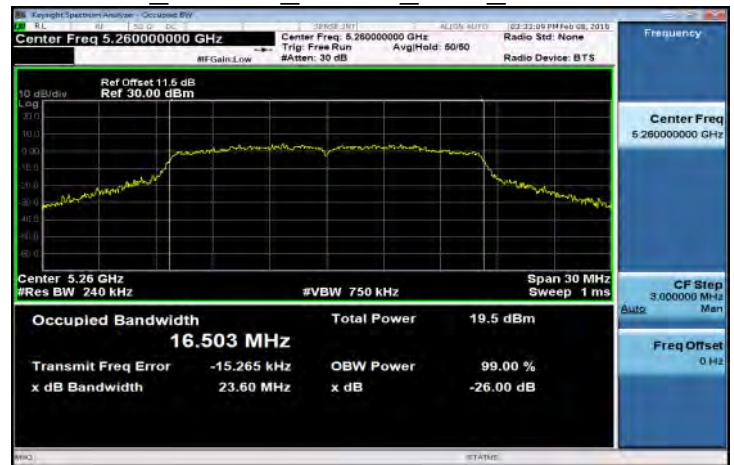
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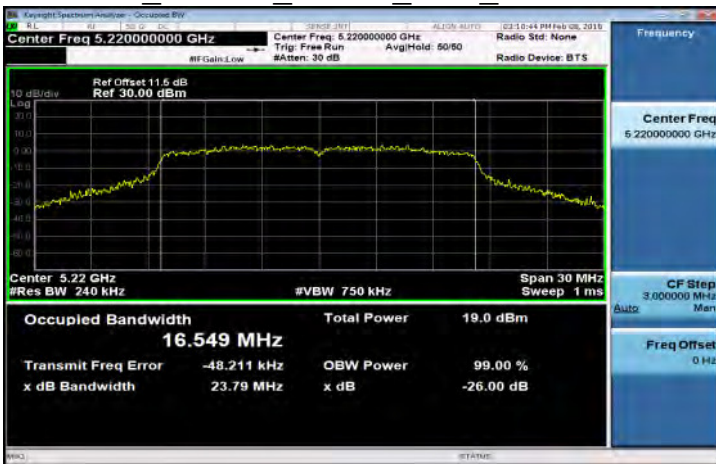
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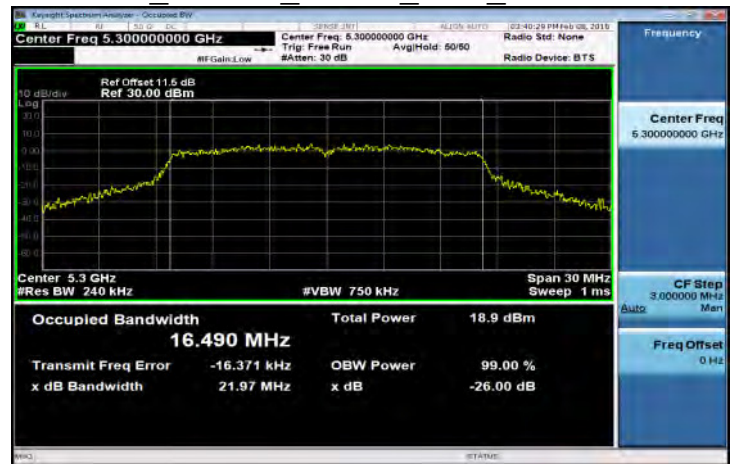
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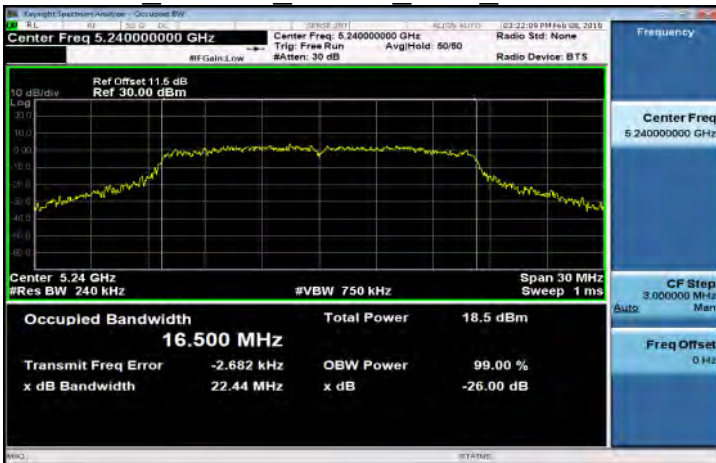
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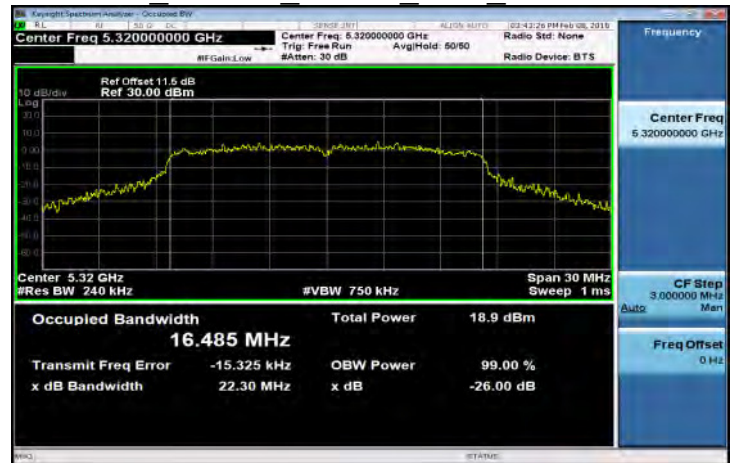
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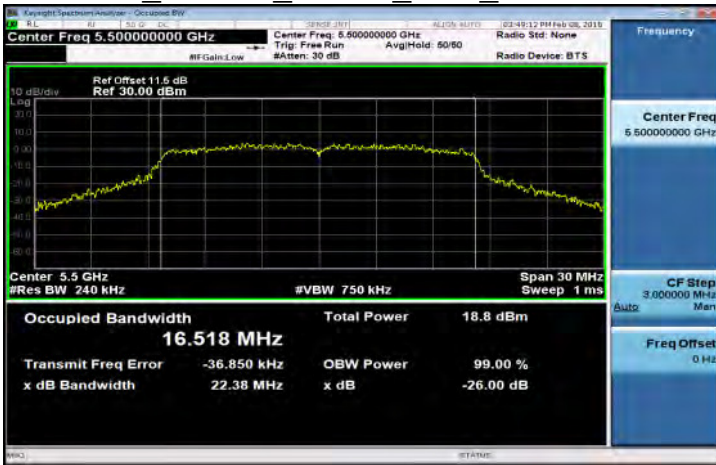


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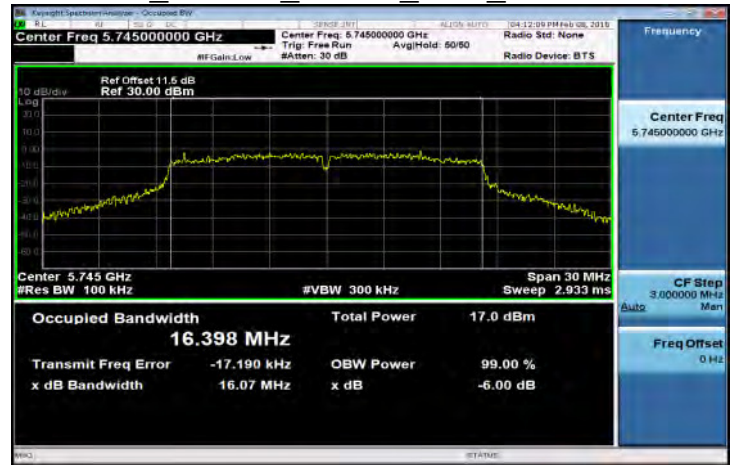
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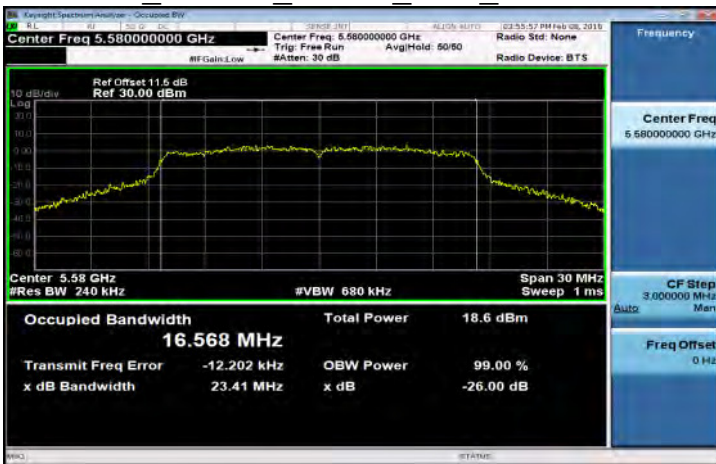
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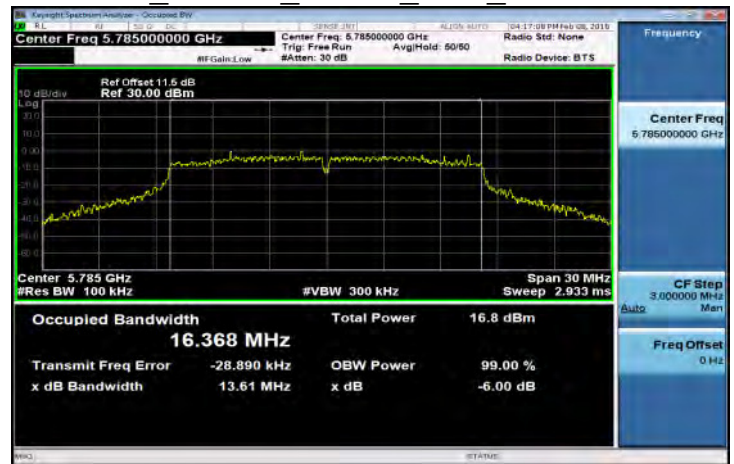
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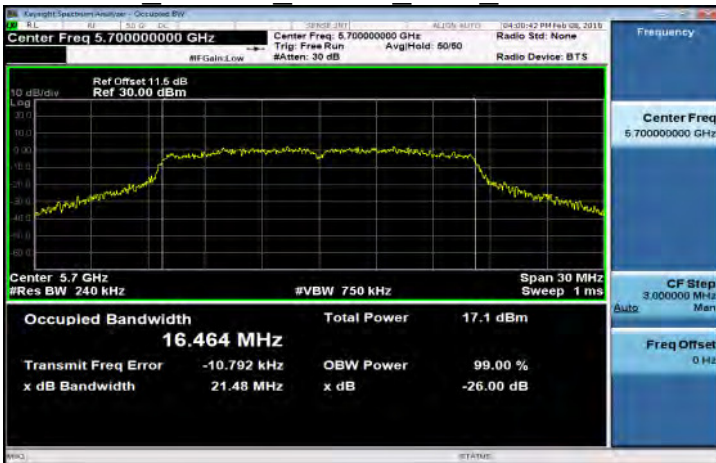
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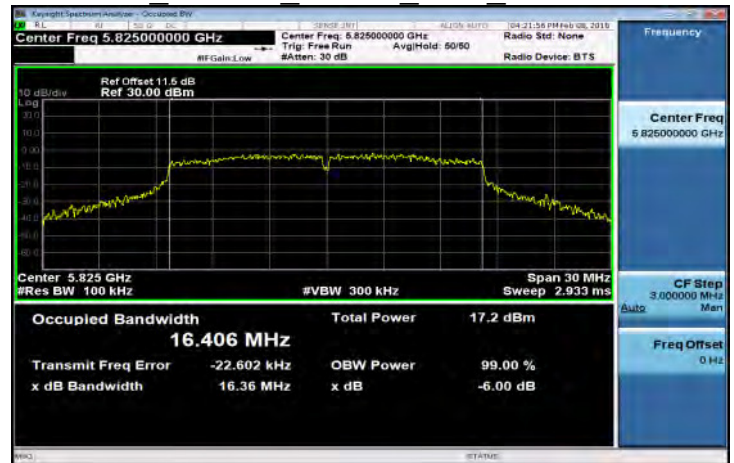
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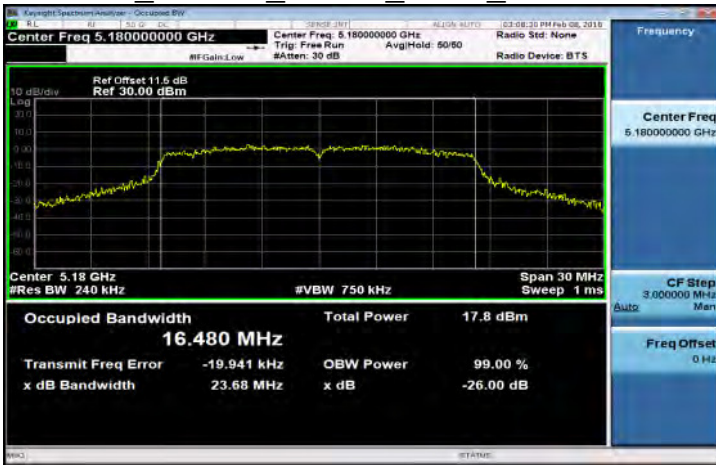
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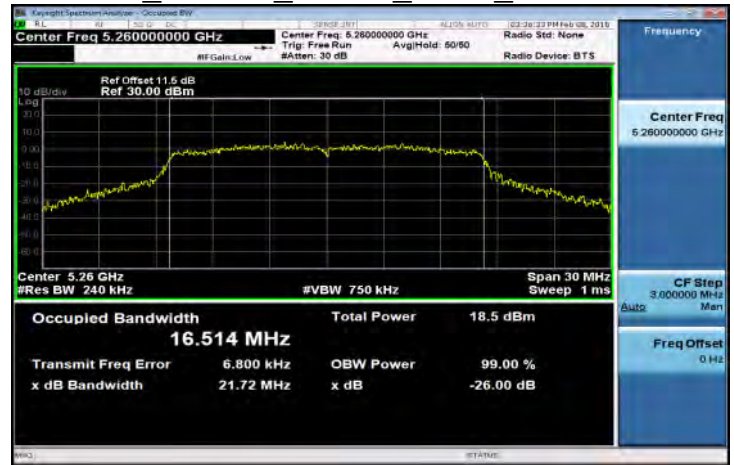
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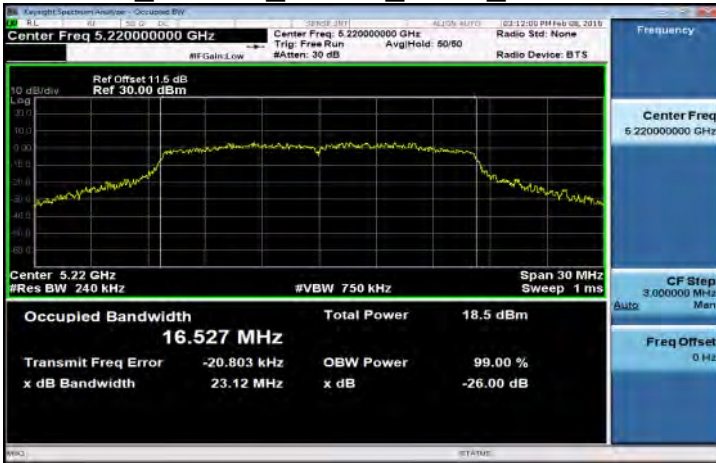
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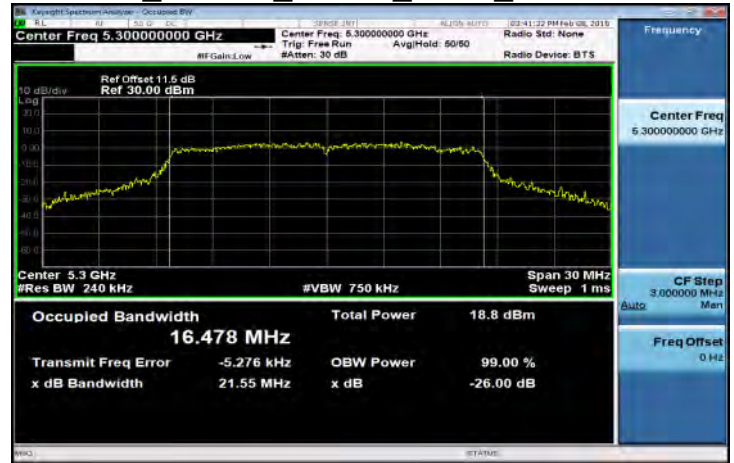
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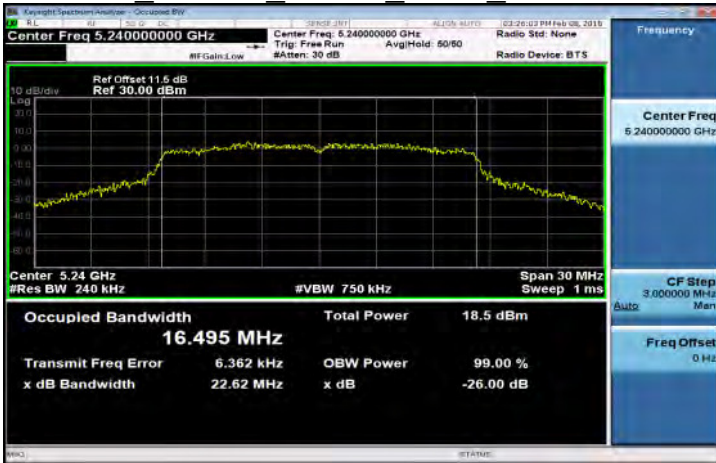
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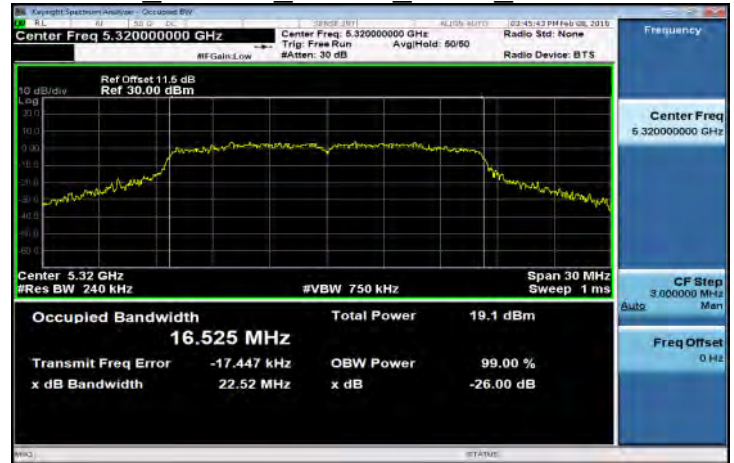
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FCC 802.11a 20MHz_AUX1_5240MHz



FCC 802.11a 20MHz_AUX1_5320MHz

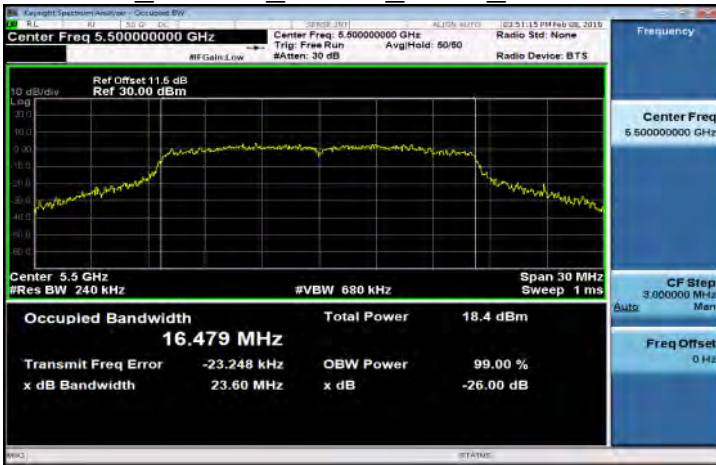


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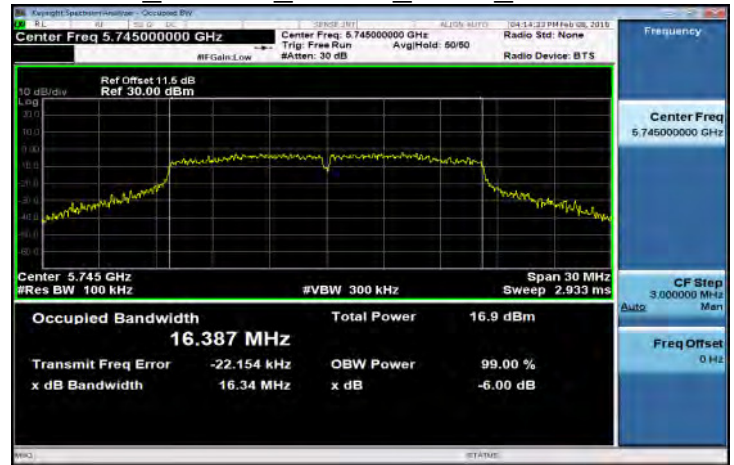
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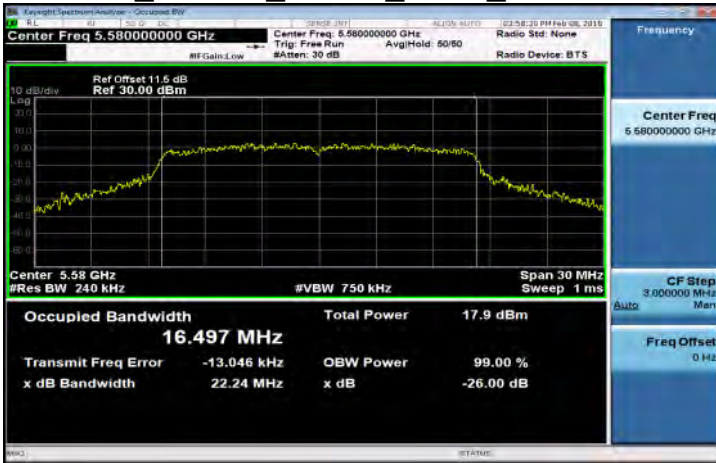
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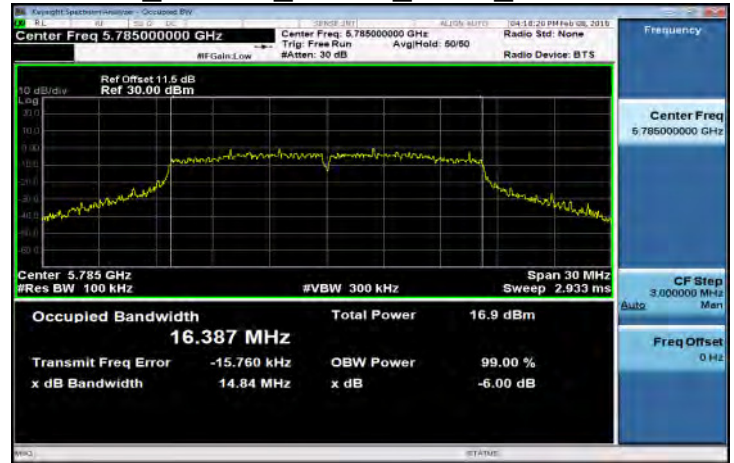
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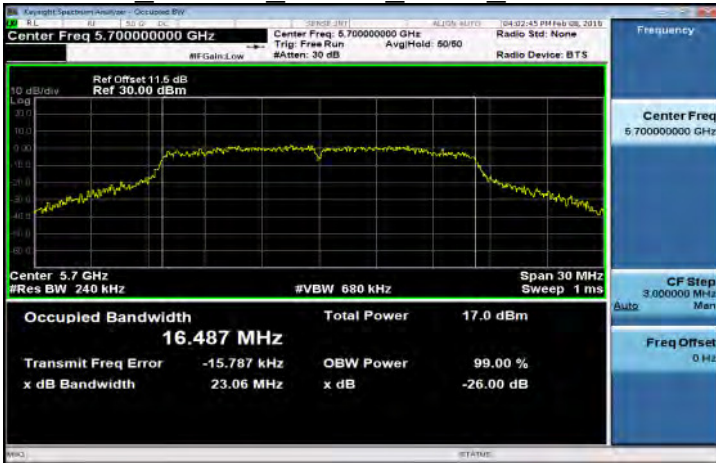
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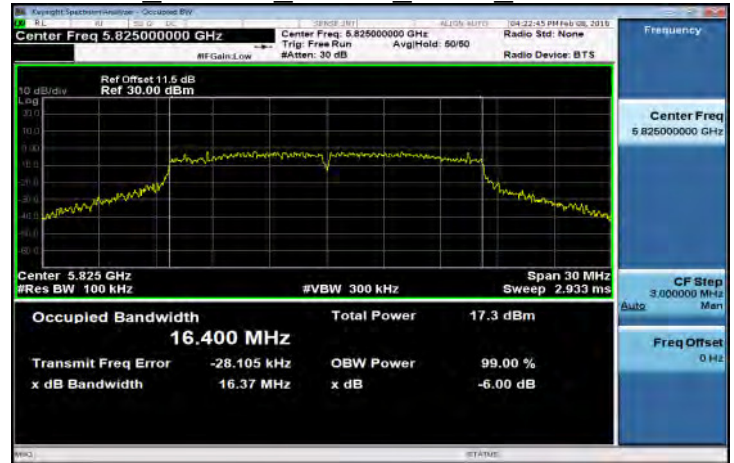
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FCC 802.11a 20MHz_AUX1_5700MHz



FCC 802.11a 20MHz_AUX1_5825MHz

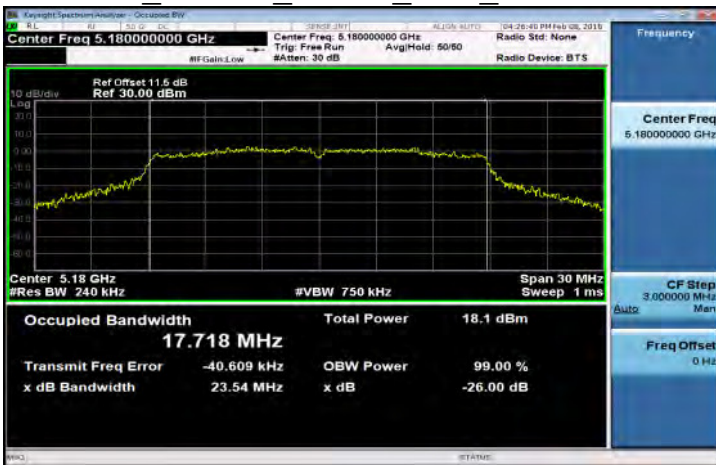


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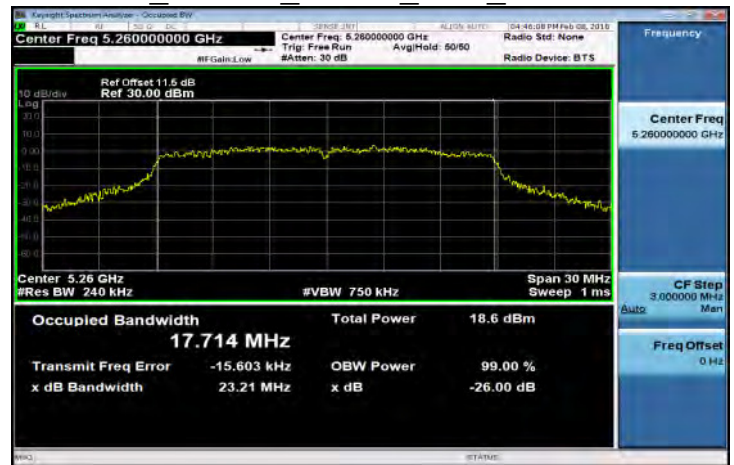
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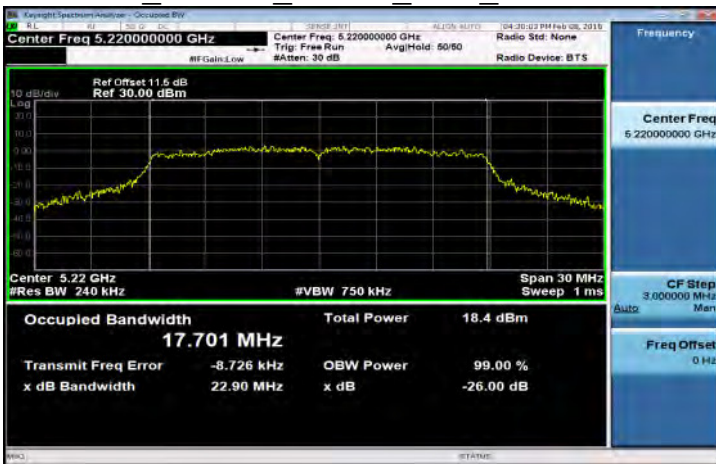
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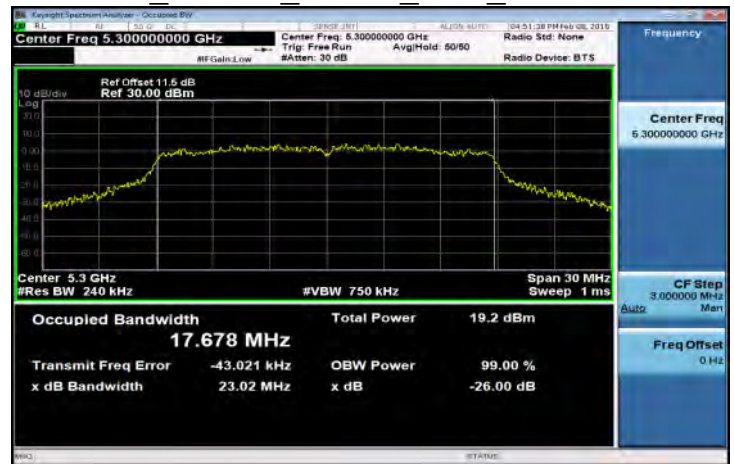
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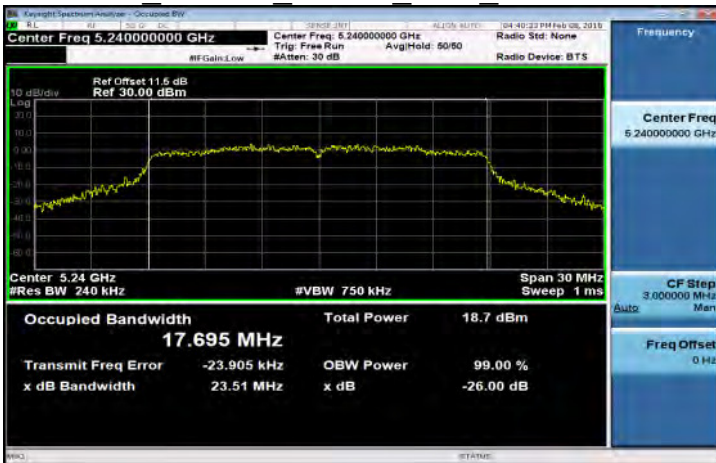
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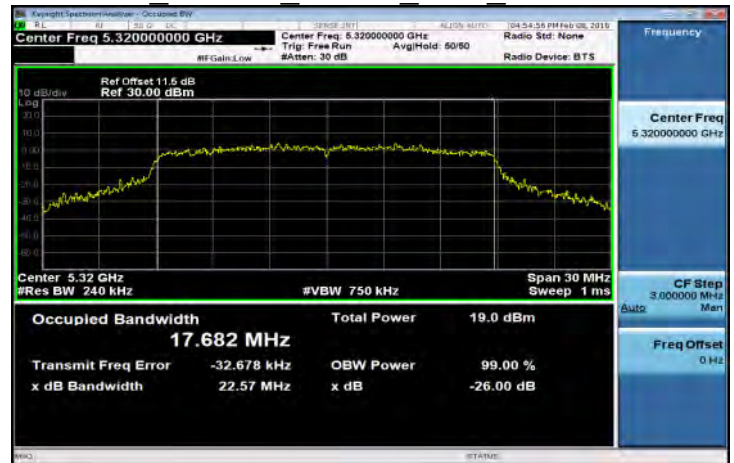
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FCC 802.11n 20MHz Main 5240MHz



FCC 802.11n 20MHz Main 5320MHz

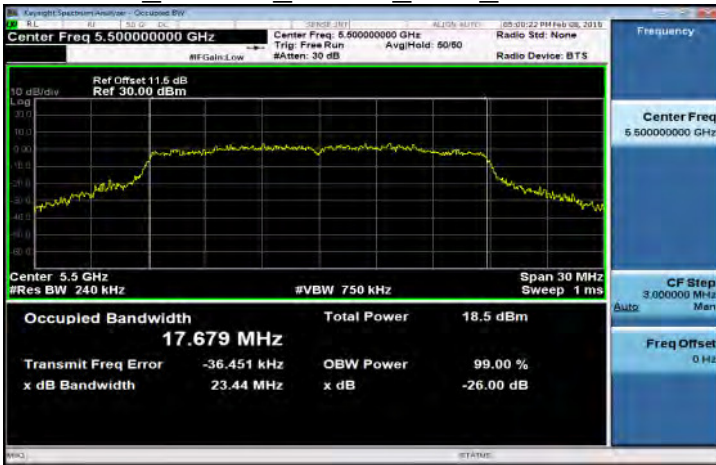


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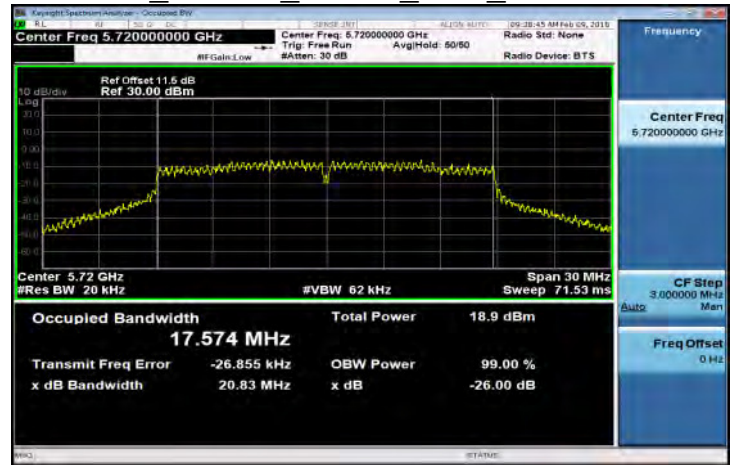
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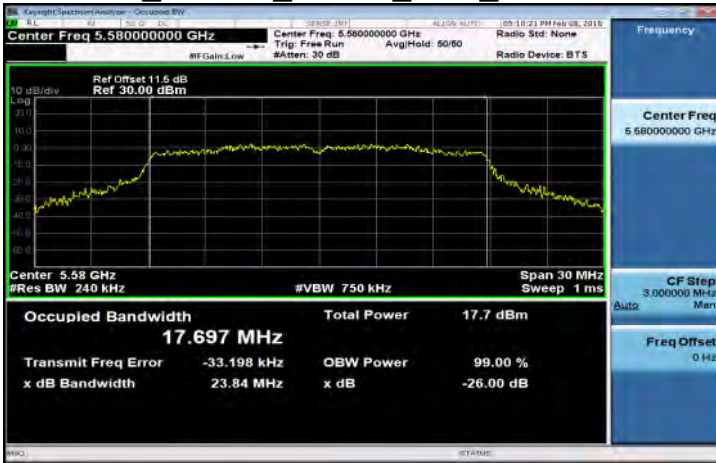
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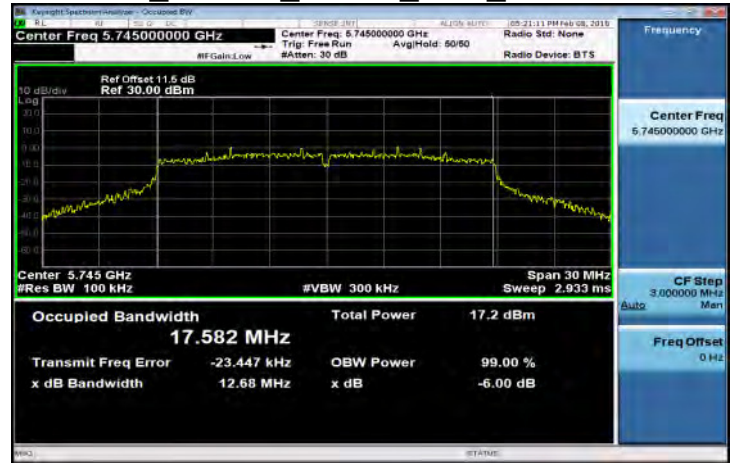
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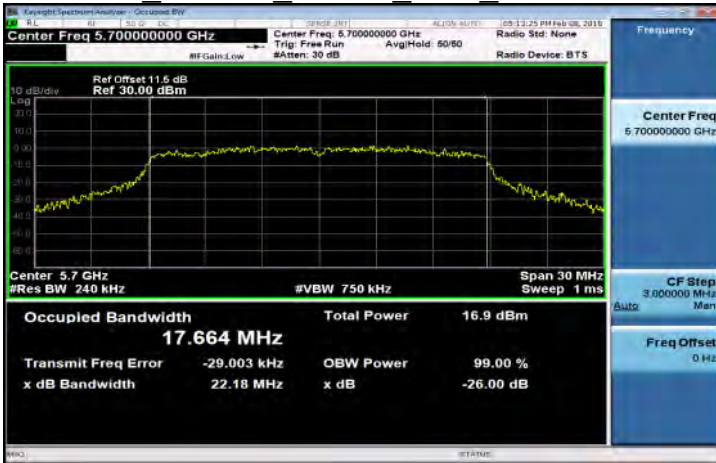
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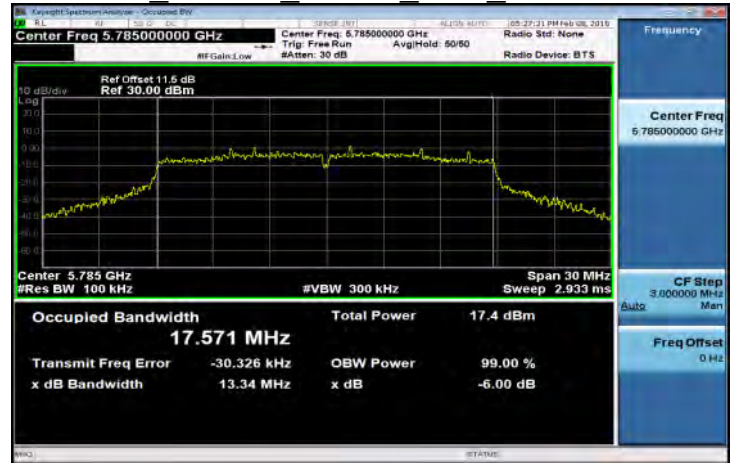
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FCC 802.11n 20MHz Main 5700MHz



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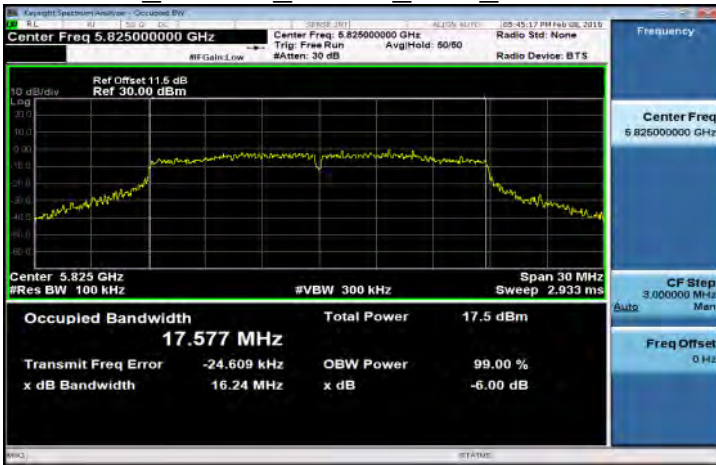


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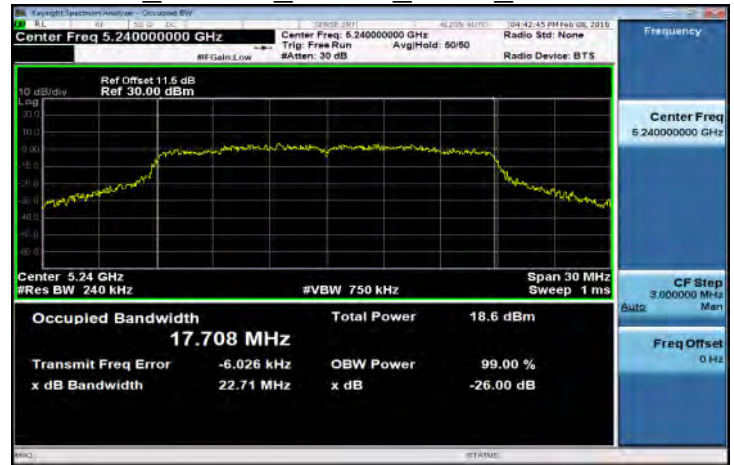
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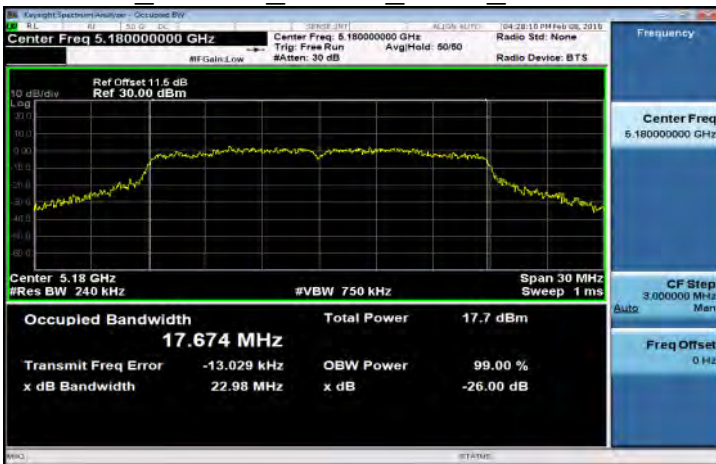
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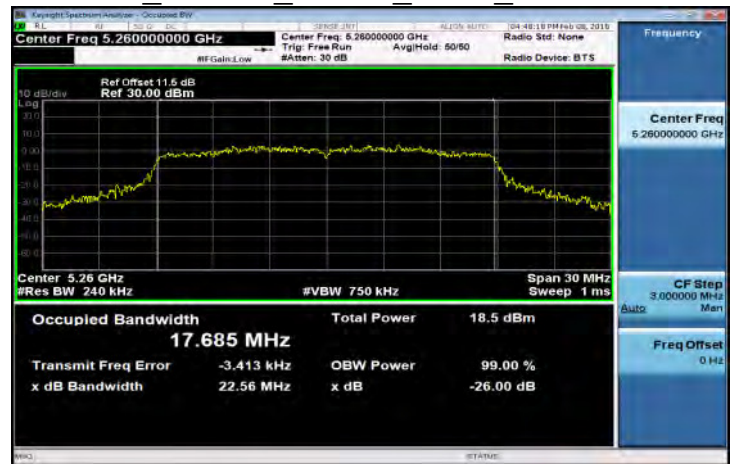
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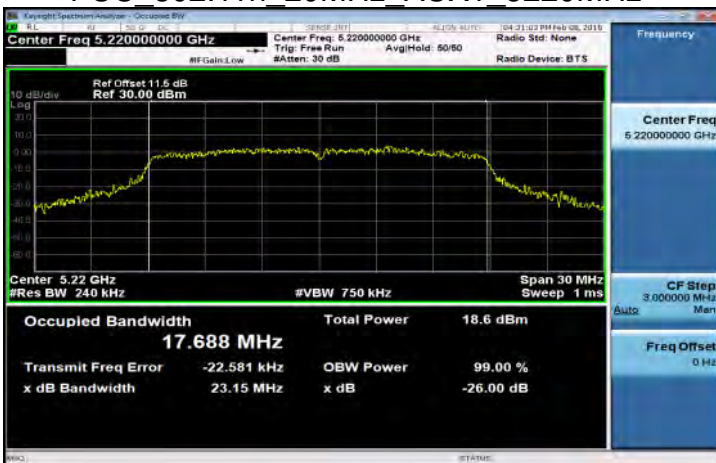
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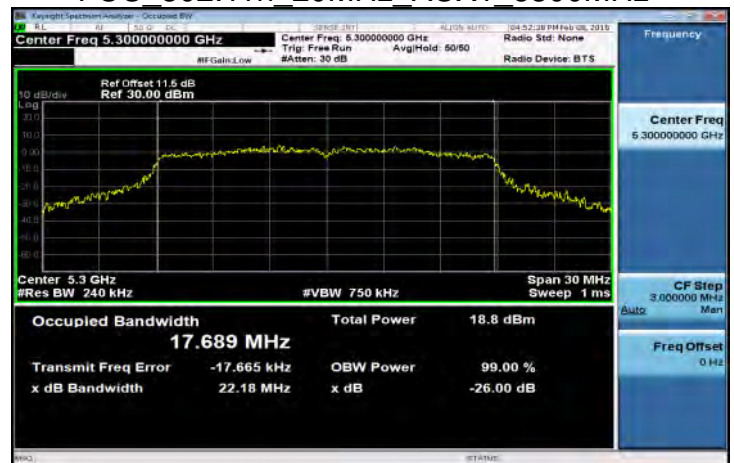
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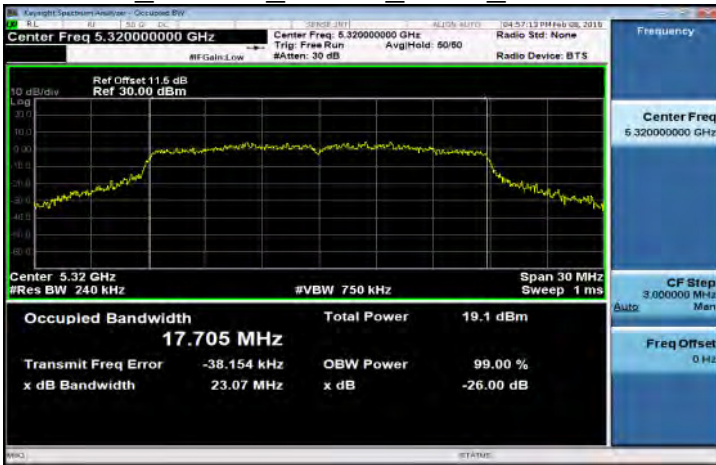


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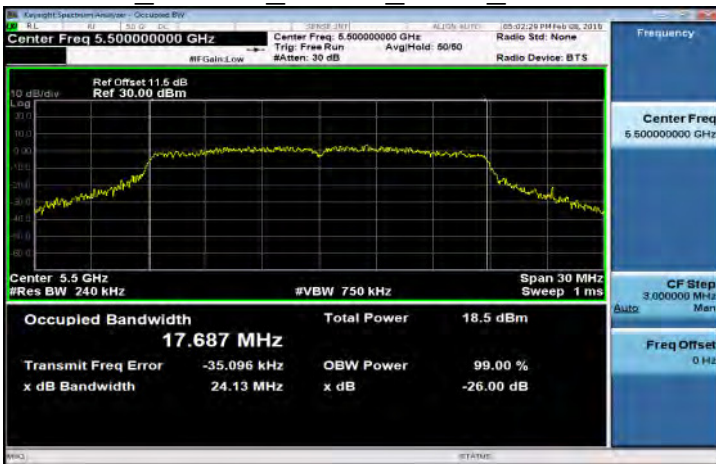
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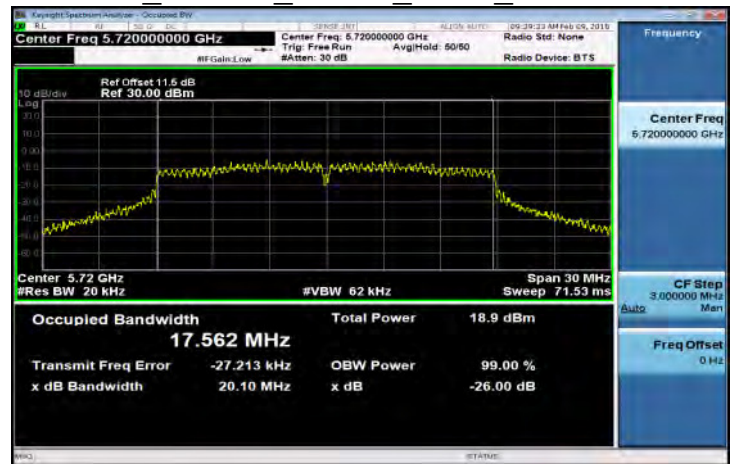
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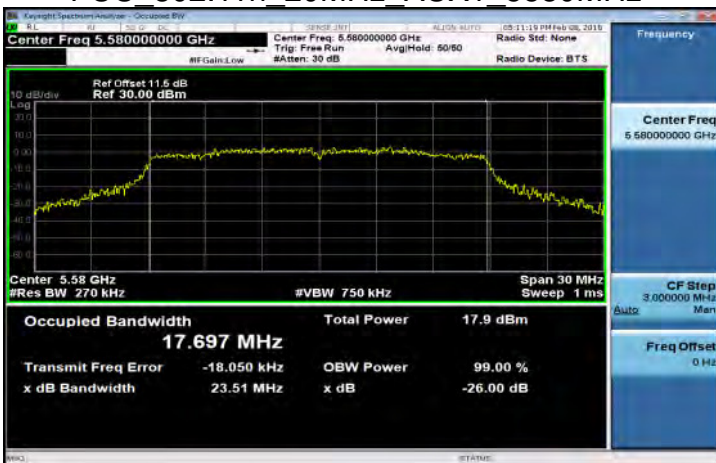
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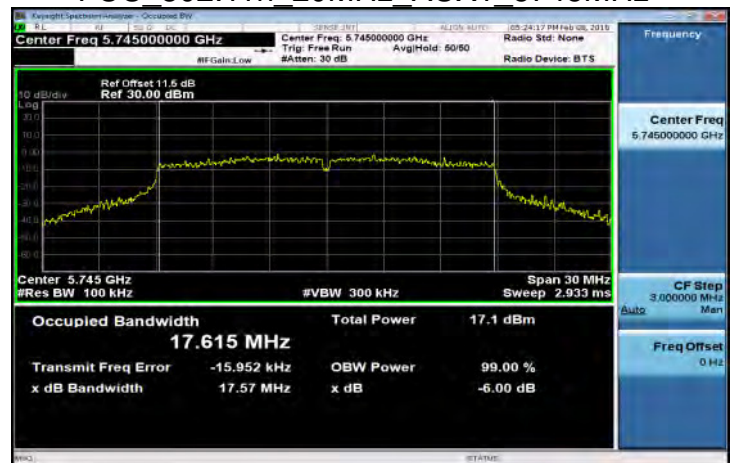
FCC 802.11n 20MHz_AUX1_5720MHz



FCC 802.11n 20MHz_AUX1_5580MHz



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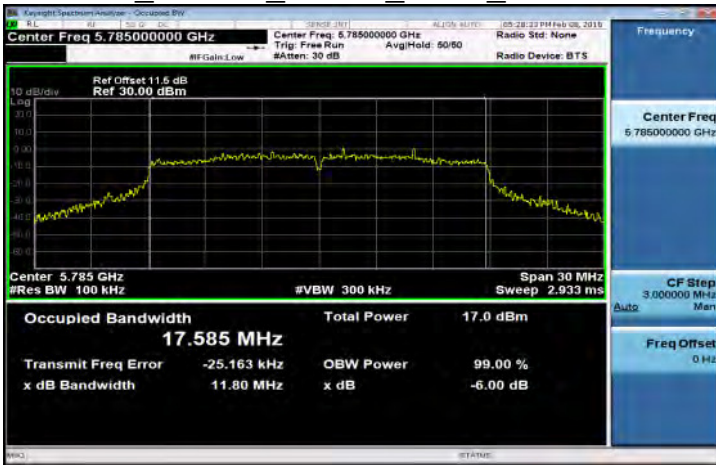


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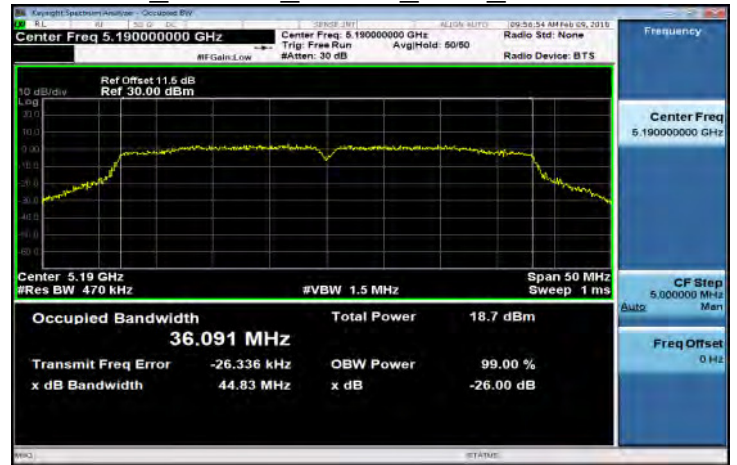
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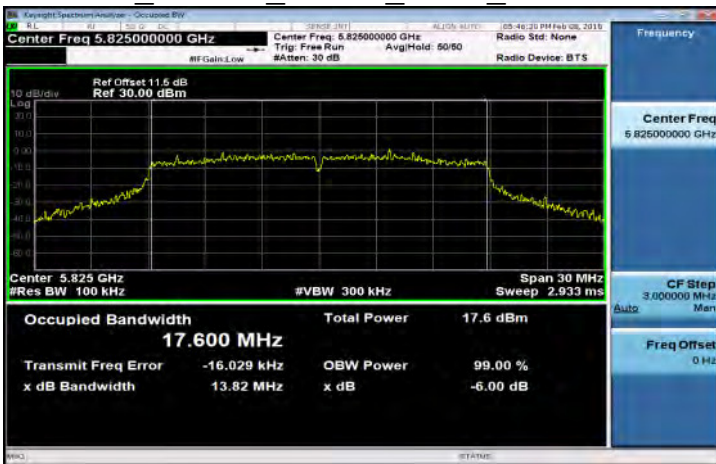
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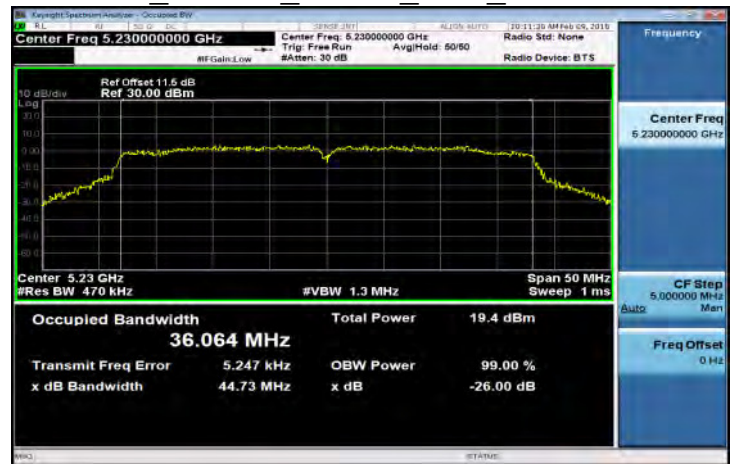
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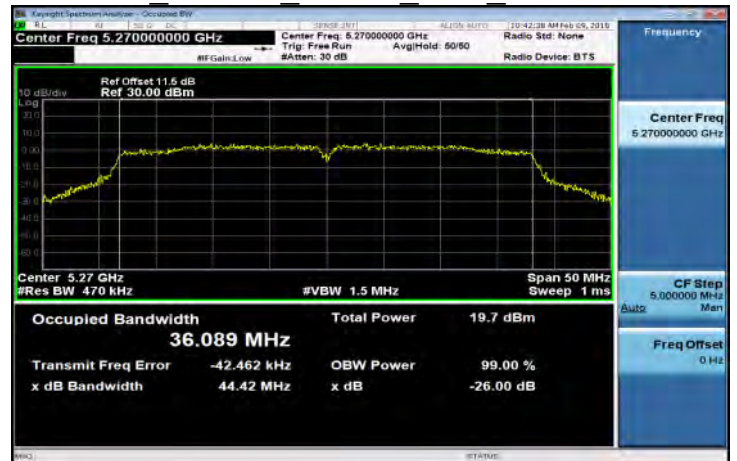
FCC 802.11n 20MHz AUX1 5825MHz



FCC 802.11n 40MHz Main 5230MHz



FCC 802.11n 40MHz Main 5270MHz

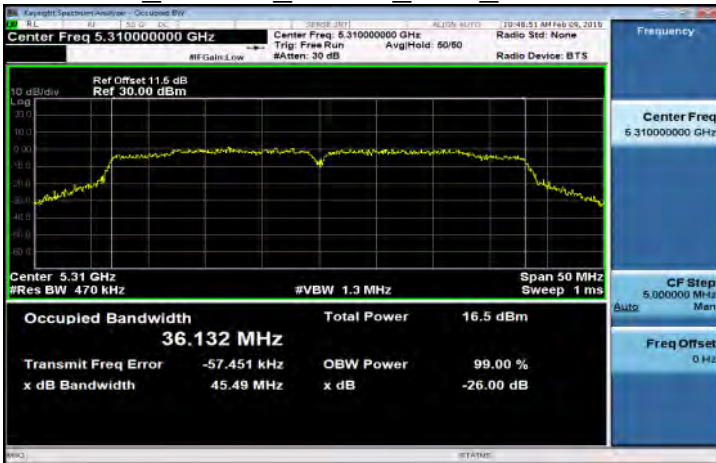


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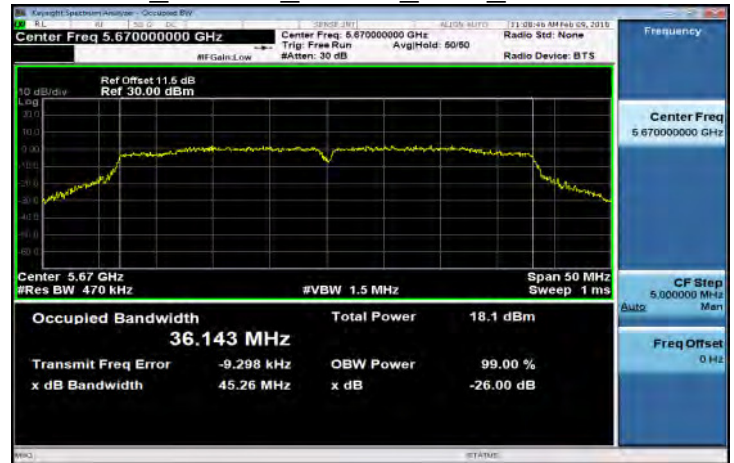
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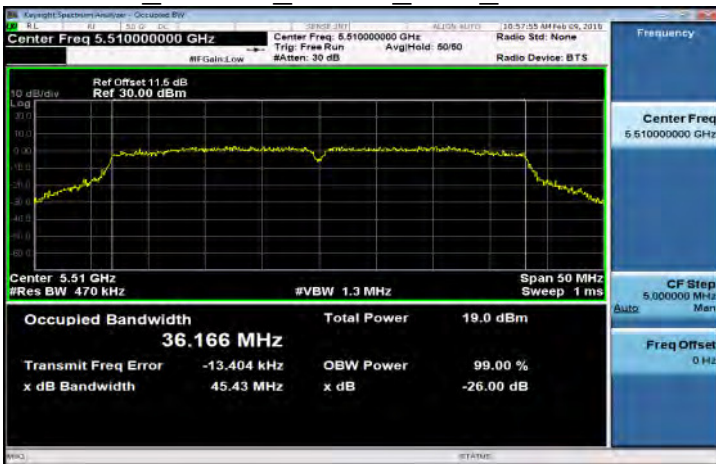
FCC 802.11n 40MHz Main 5310MHz



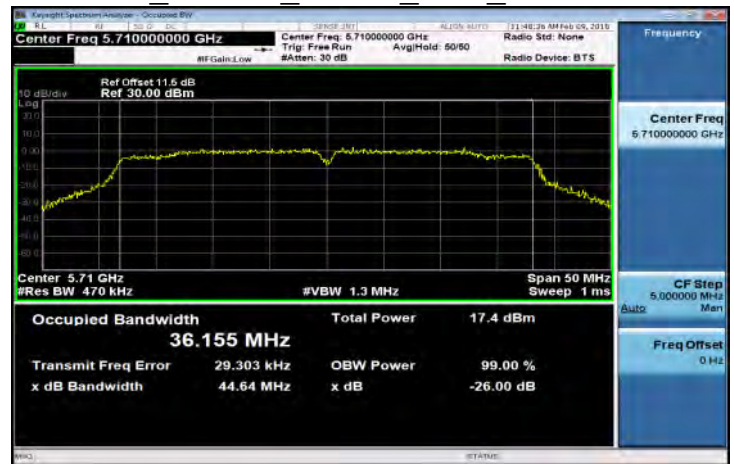
FCC 802.11n 40MHz Main 5670MHz



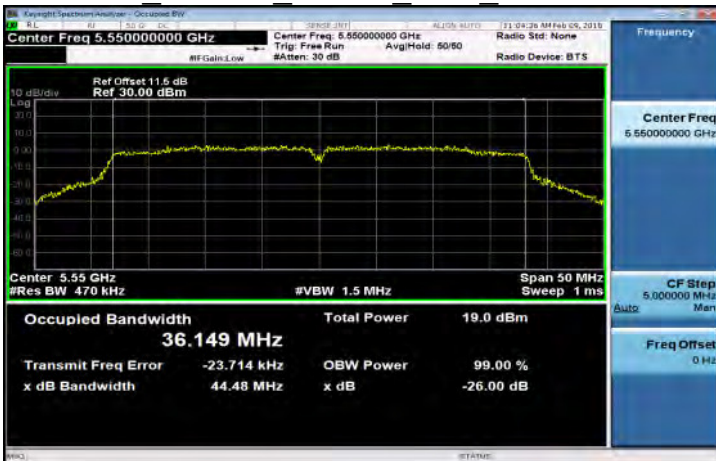
FCC 802.11n 40MHz Main 5510MHz



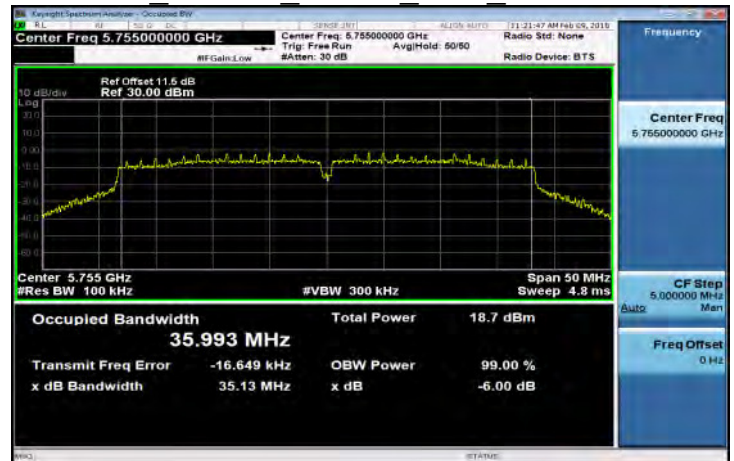
FCC 802.11n 40MHz Main 5710MHz



FCC 802.11n 40MHz Main 5550MHz



FCC 802.11n 40MHz Main 5755MHz

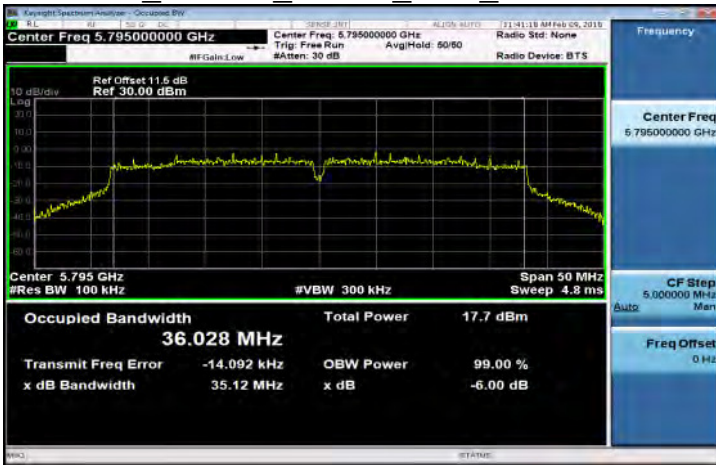


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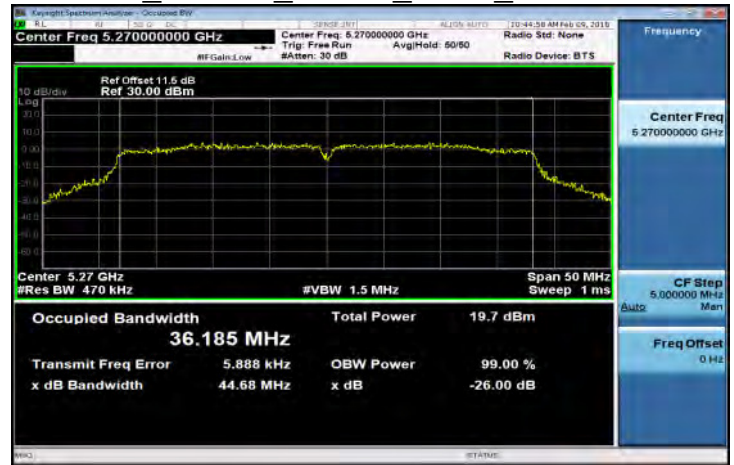
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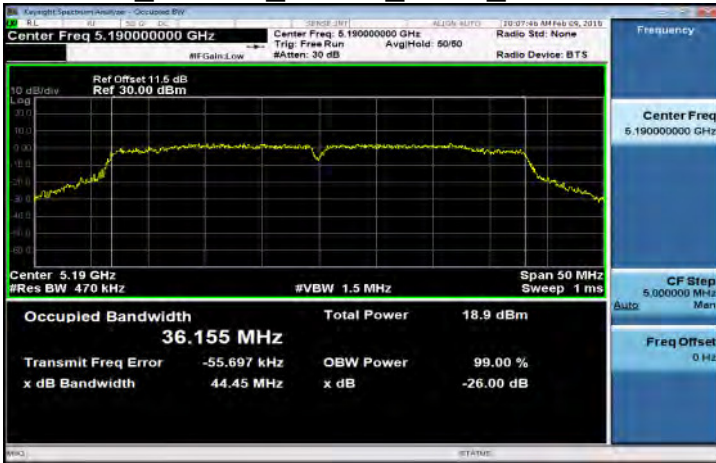
FCC 802.11n 40MHz Main 5795MHz



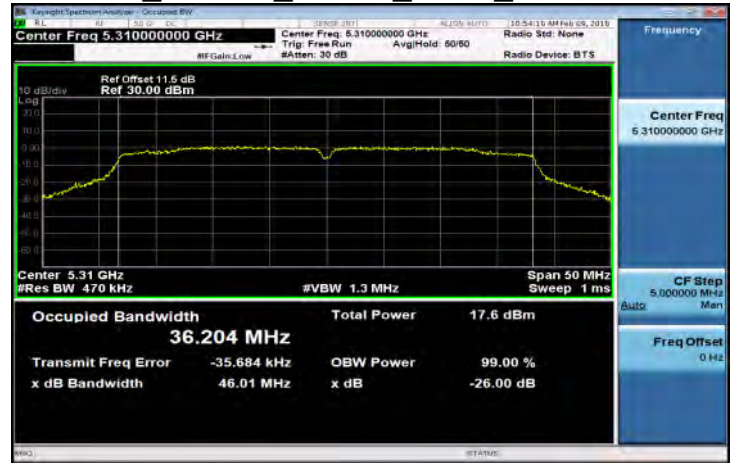
FCC 802.11n 40MHz_AUX1_5270MHz



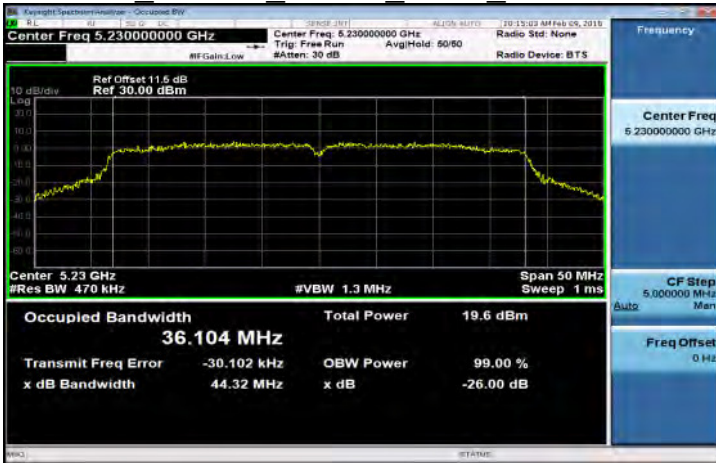
FCC 802.11n 40MHz_AUX1_5190MHz



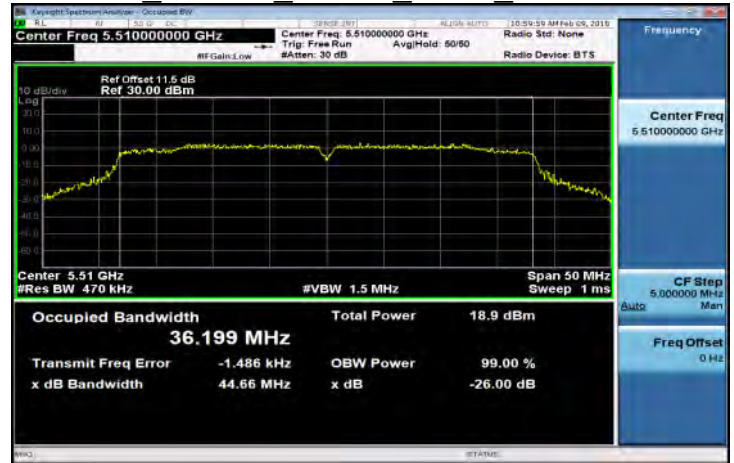
FCC 802.11n 40MHz_AUX1_5310MHz



FCC 802.11n 40MHz_AUX1_5230MHz



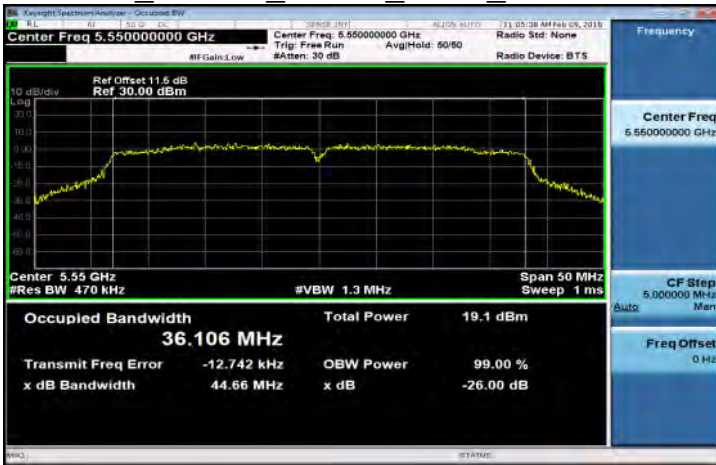
FCC 802.11n 40MHz_AUX1_5510MHz



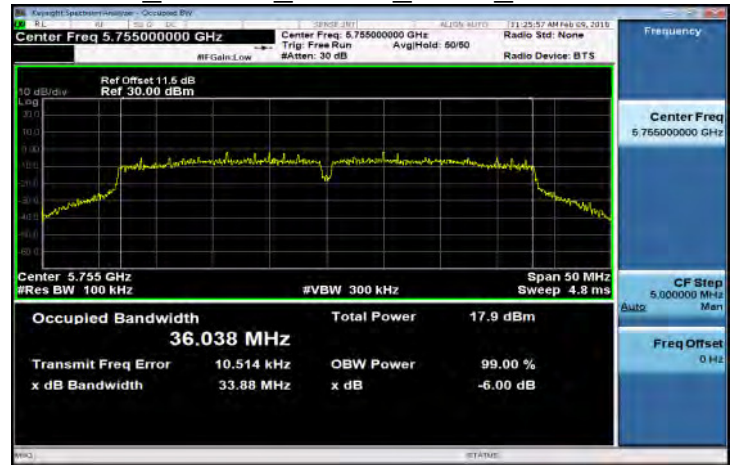
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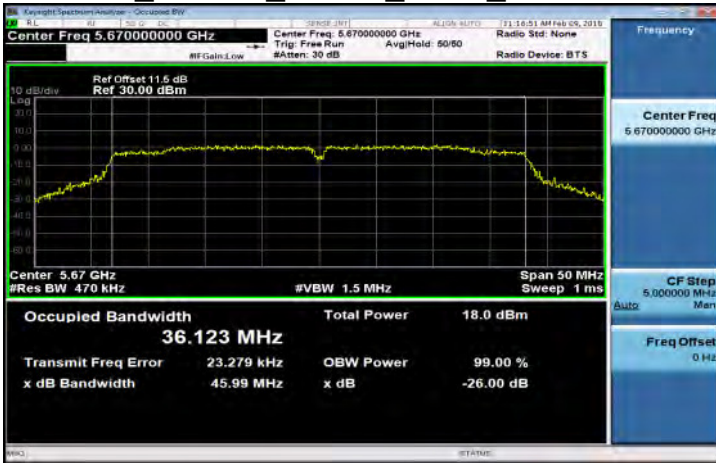
FCC 802.11n 40MHz_AUX1_5550MHz



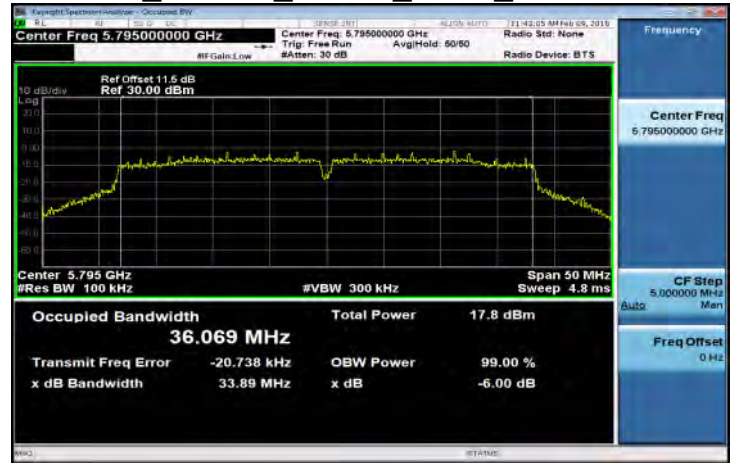
FCC 802.11n 40MHz_AUX1_5755MHz



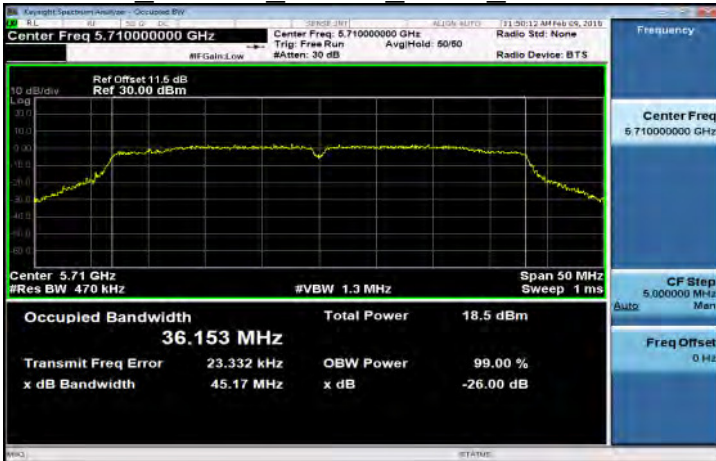
FCC 802.11n 40MHz_AUX1_5670MHz



FCC 802.11n 40MHz_AUX1_5795MHz



FCC 802.11n 40MHz_AUX1_5710MHz

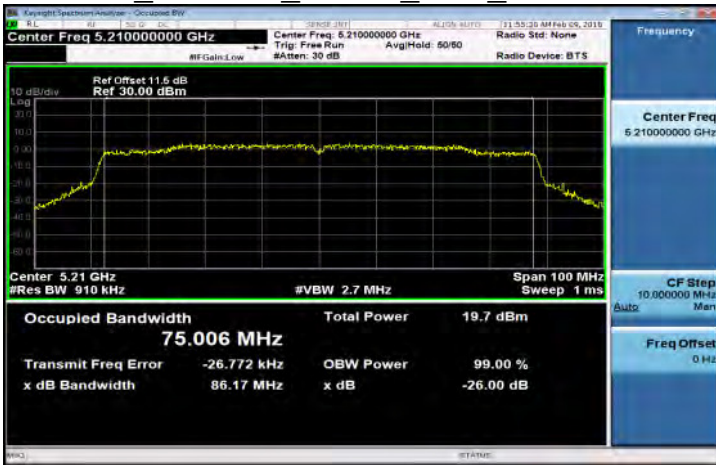


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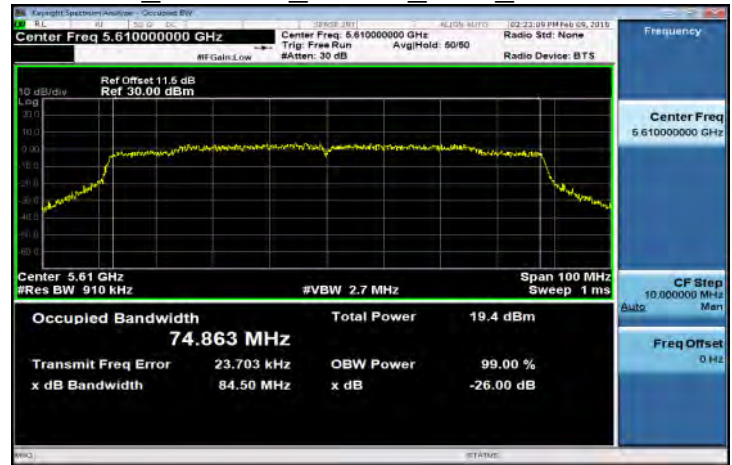
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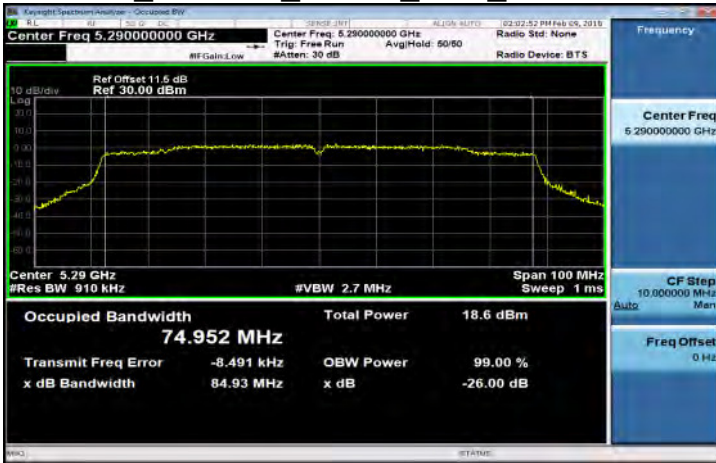
FCC 802.11ac 80MHz Main 5210MHz



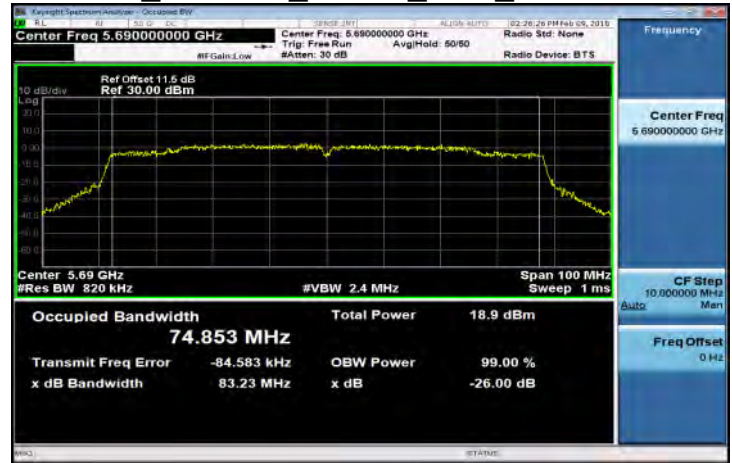
FCC 802.11ac 80MHz Main 5610MHz



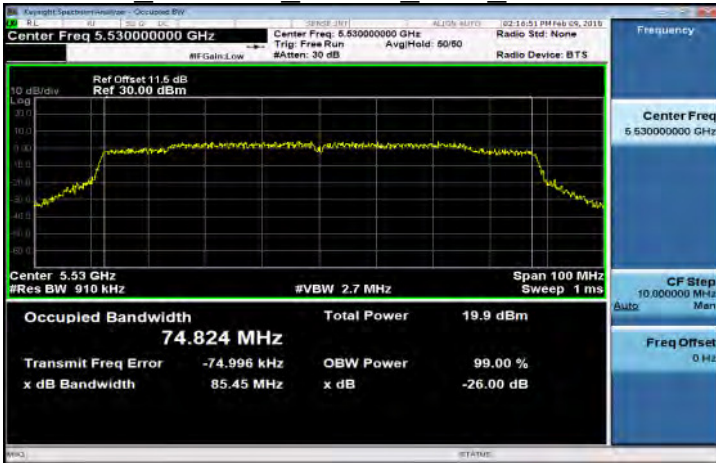
FCC 802.11ac 80MHz Main 5290MHz



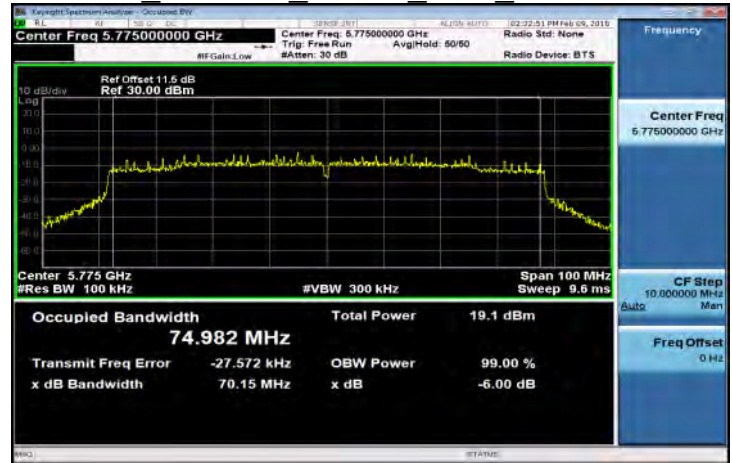
FCC 802.11ac 80MHz Main 5690MHz



FCC 802.11ac 80MHz Main 5530MHz



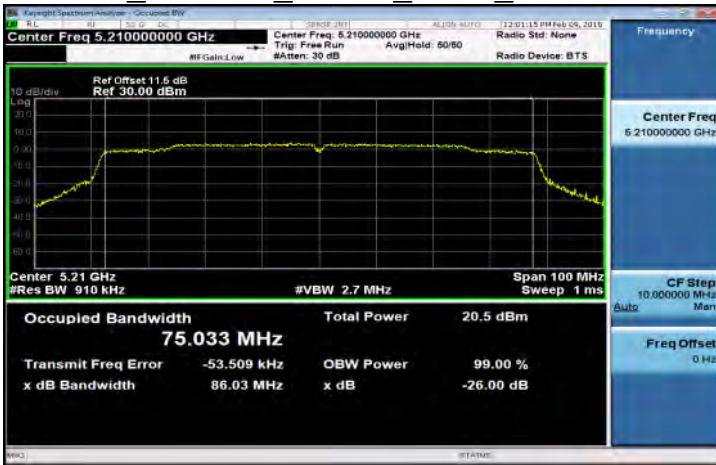
FCC 802.11ac 80MHz Main 5775MHz



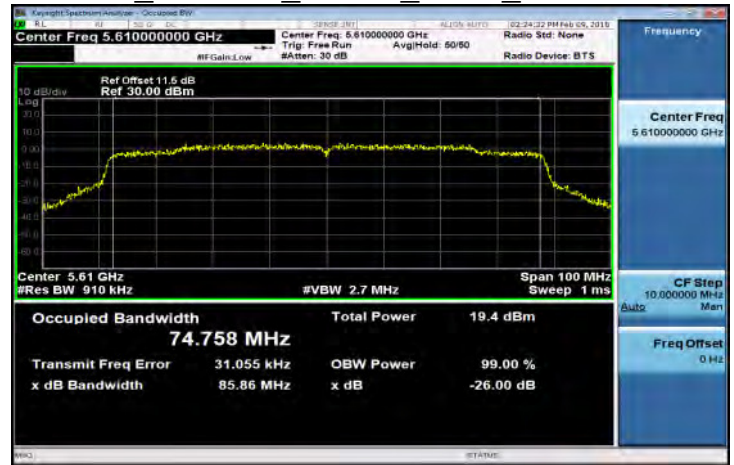
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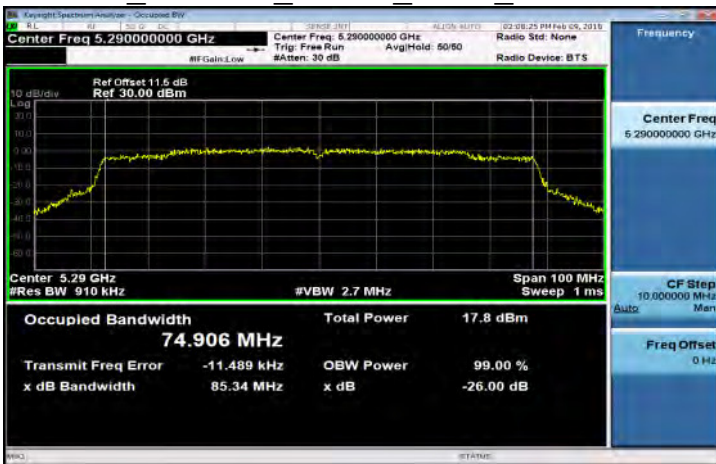
FCC 802.11ac 80MHz AUX1 5210MHz



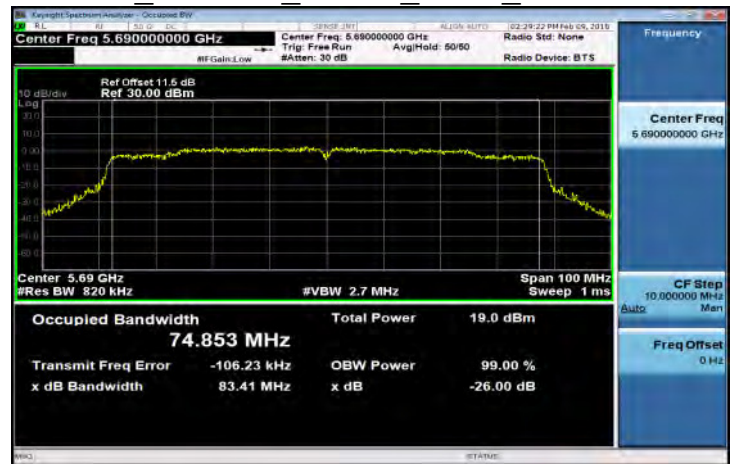
FCC 802.11ac 80MHz AUX1 5610MHz



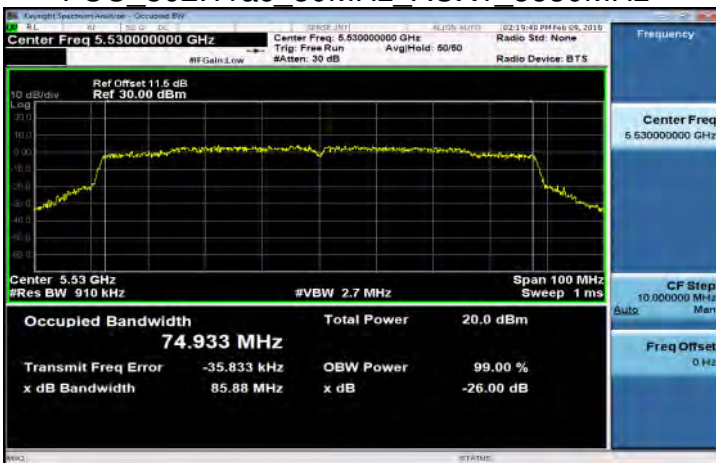
FCC 802.11ac 80MHz AUX1 5290MHz



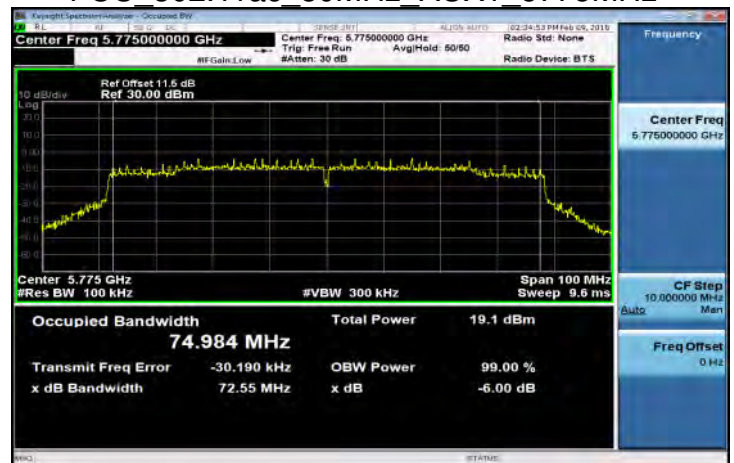
FCC 802.11ac 80MHz AUX1 5690MHz



FCC 802.11ac 80MHz AUX1 5530MHz



FCC 802.11ac 80MHz AUX1 5775MHz



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99% BW to prove that all signals in band I is no over band U-NII-1

802.11a_5240MHz (Main)



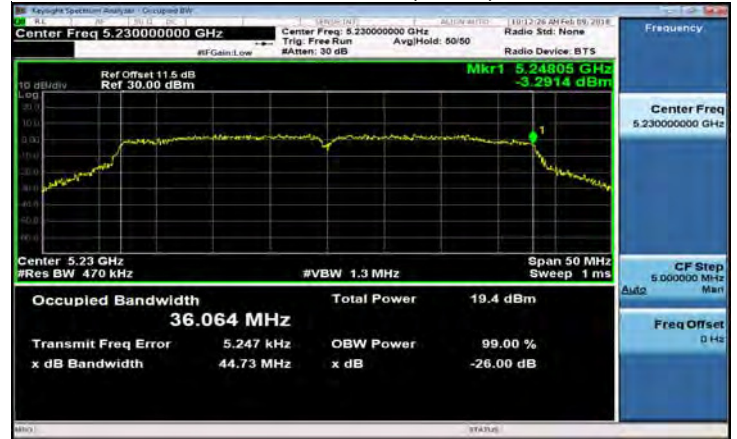
802.11n_20MHz_5240MHz (Aux)



802.11a_5240MHz (Aux)



802.11n_40MHz_5230MHz (Main)



802.11n_20MHz_5240MHz (Main)



802.11n_40MHz_5230MHz (Aux)

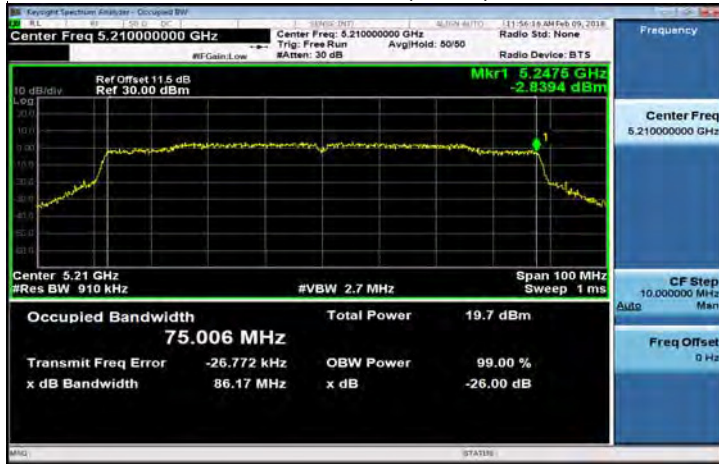


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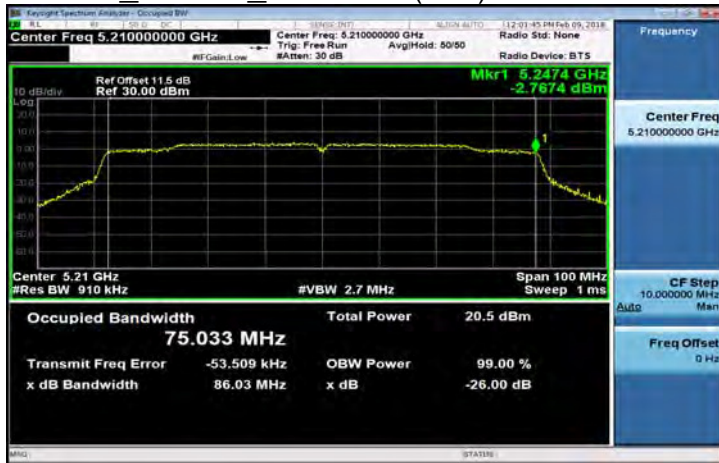
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802.11n_80MHz_5210MHz (Main)



802.11n_80MHz_5210MHz (Aux)



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99% BW to prove that all signals in band I is no over band U-NII-3
802.11a_5745MHz (Main)



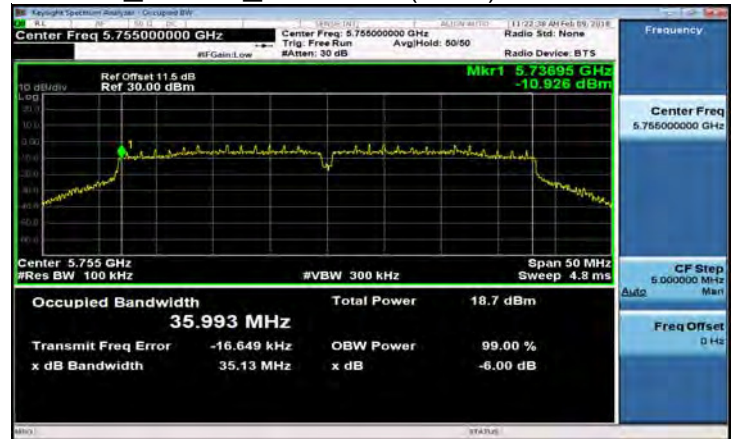
802.11n_20MHz_5745MHz (Aux)



802.11a_5745MHz (Aux)



802.11n_40MHz_5775MHz (Main)



802.11n_20MHz_5745MHz (Main)



802.11n_40MHz_5775MHz (Aux)

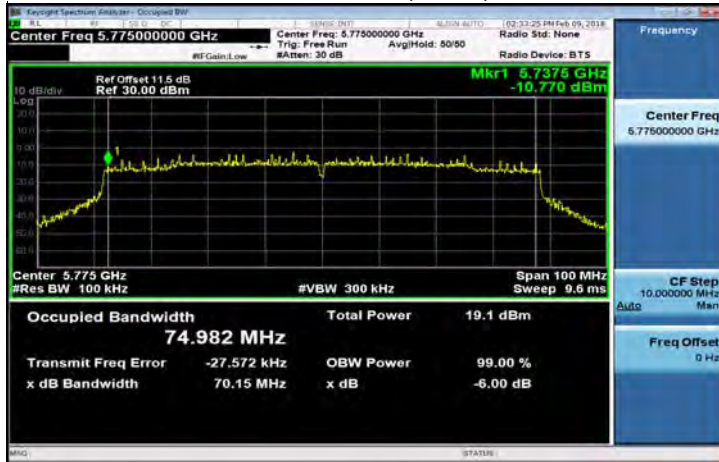


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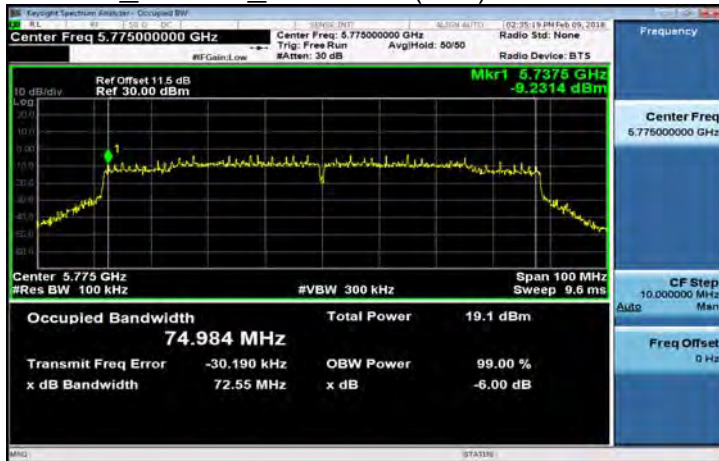
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802.11n_80MHz_5775MHz (Main)



802.11n_80MHz_5775MHz (Aux)



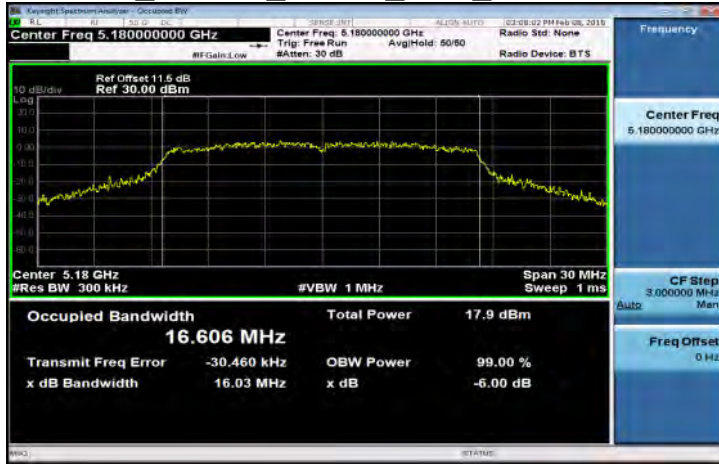
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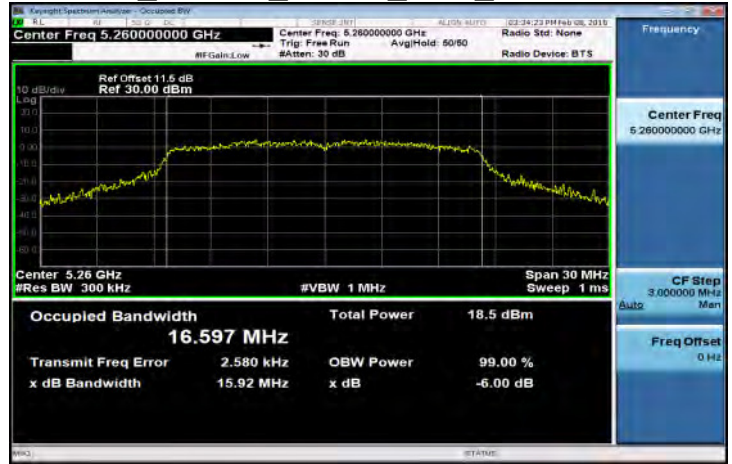
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For 99%,

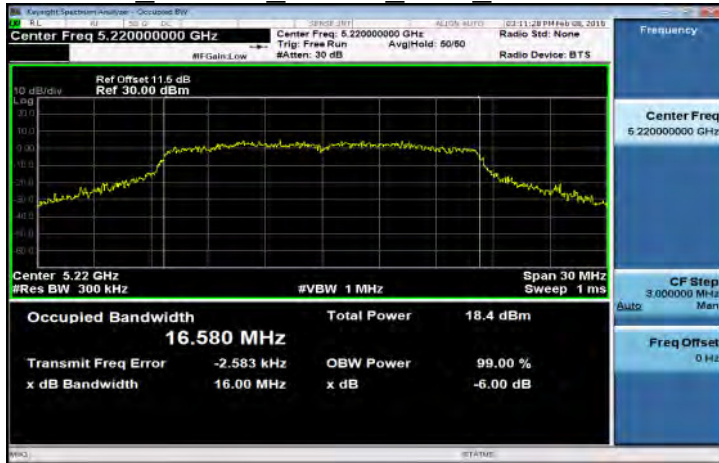
IC 802.11a 20MHz Main 5180MHz



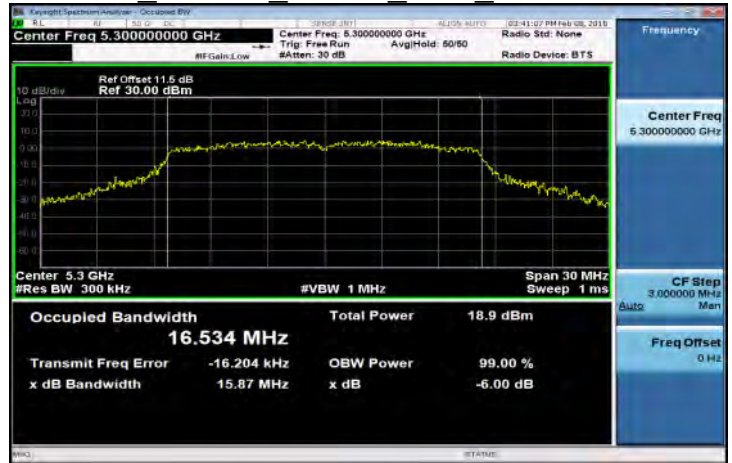
IC 802.11a 20MHz Main 5260MHz



IC 802.11a 20MHz Main 5220MHz



IC 802.11a 20MHz Main 5300MHz



IC 802.11a 20MHz Main 5240MHz



IC 802.11a 20MHz Main 5320MHz

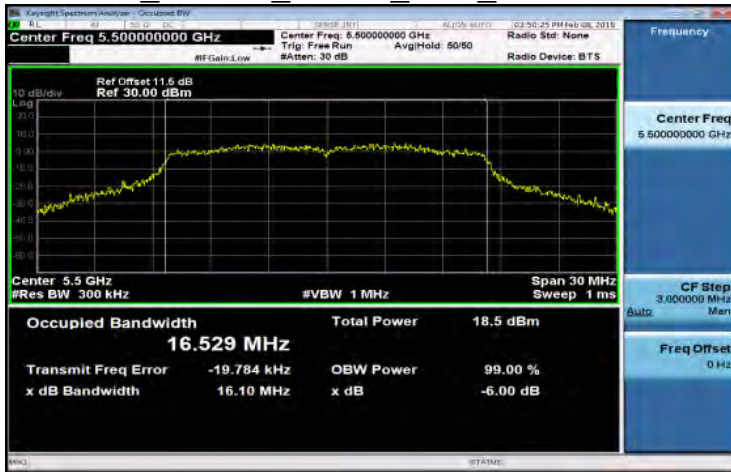


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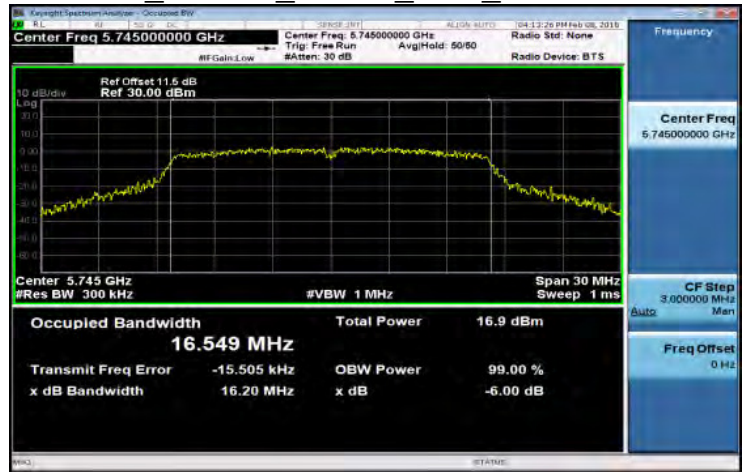
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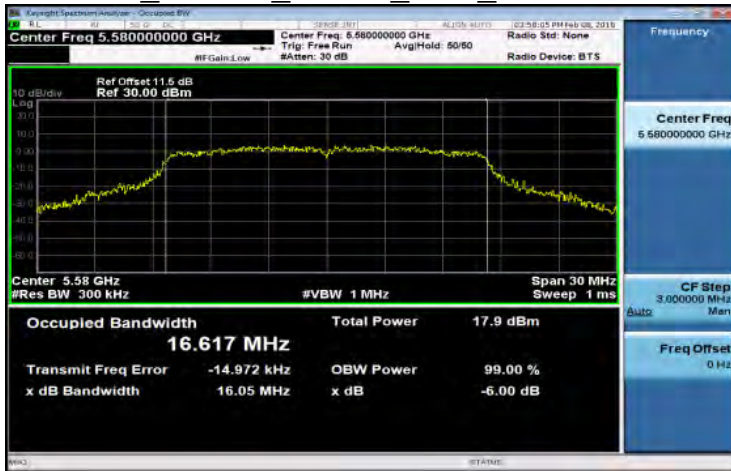
IC 802.11a_20MHz_Main_5500MHz



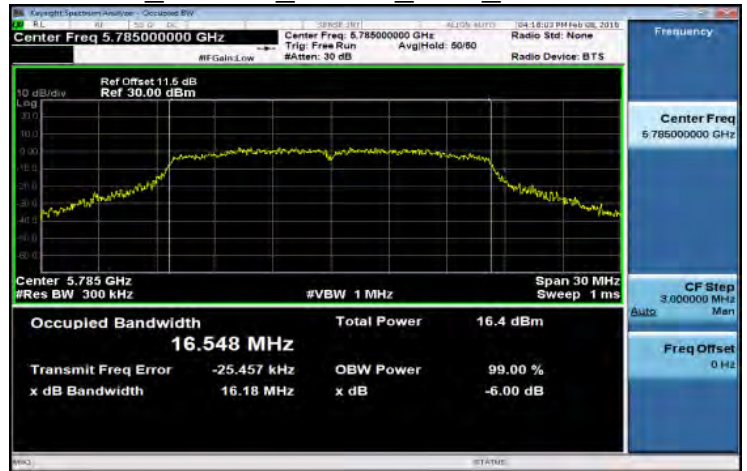
IC 802.11a_20MHz_Main_5745MHz



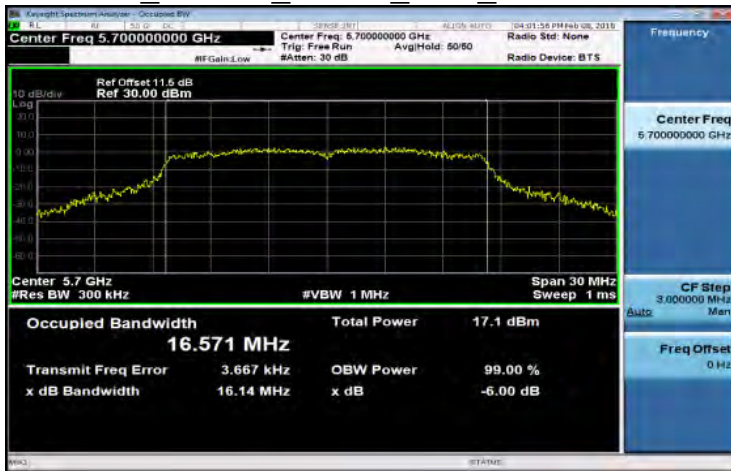
IC 802.11a_20MHz_Main_5580MHz



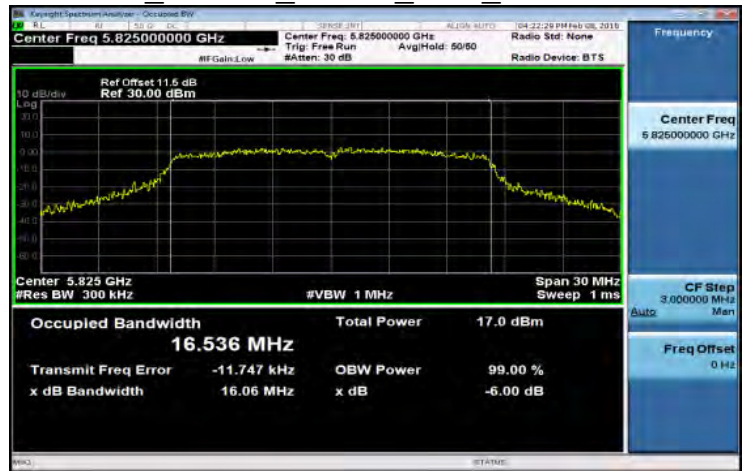
IC 802.11a_20MHz_Main_5785MHz



IC 802.11a_20MHz_Main_5700MHz



IC 802.11a_20MHz_Main_5825MHz

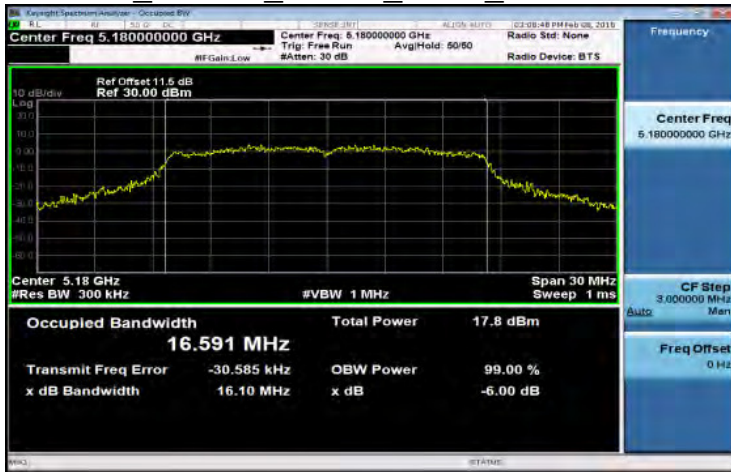


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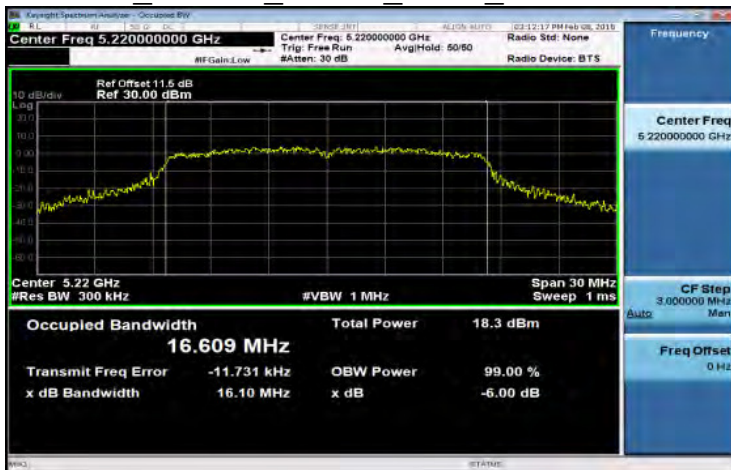
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IC_802.11a_20MHz_AUX1_5260MHz



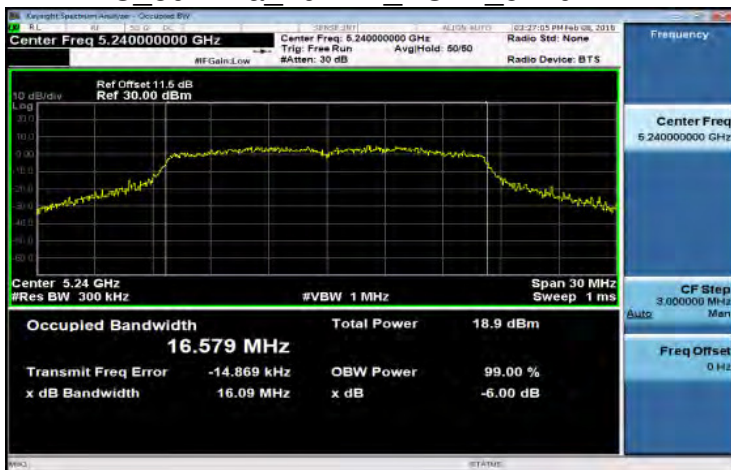
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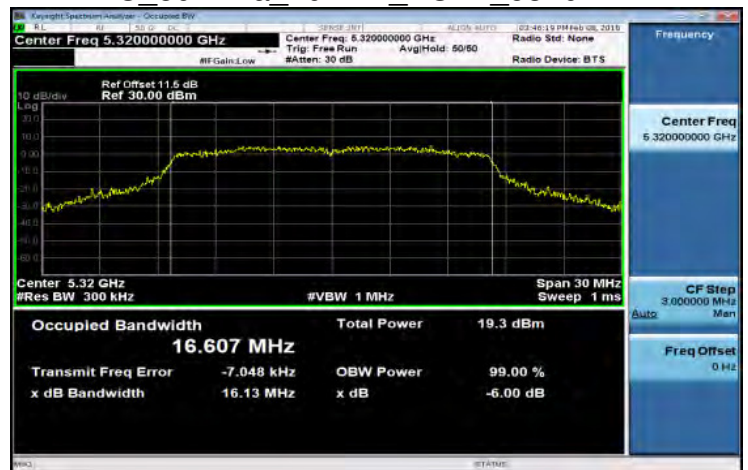
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IC_802.11a_20MHz_AUX1_5240MHz



IC_802.11a_20MHz_AUX1_5320MHz

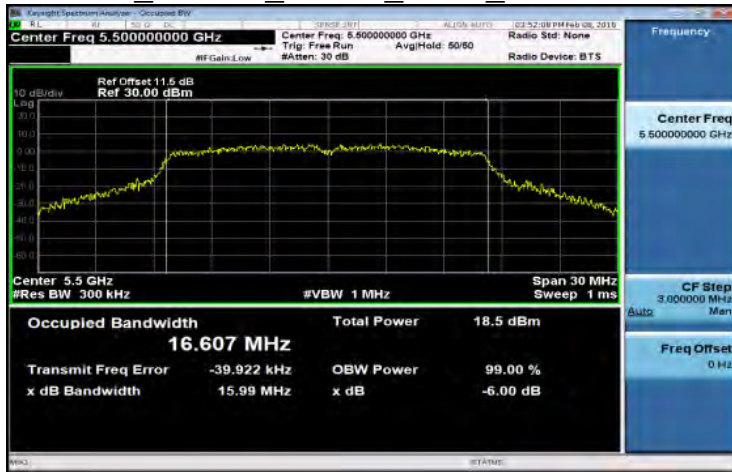


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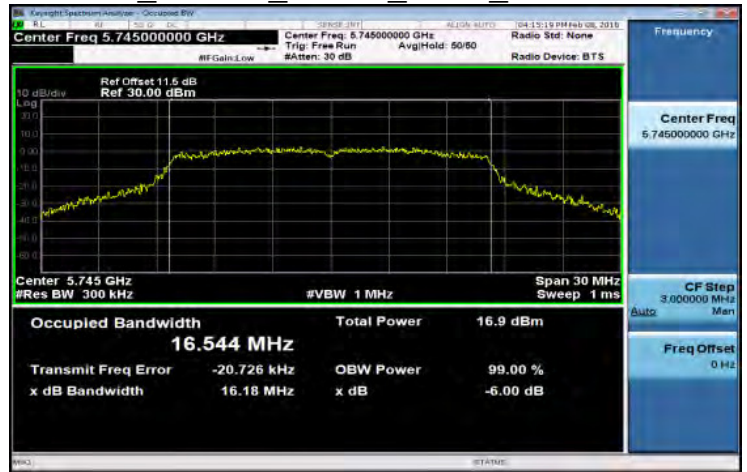
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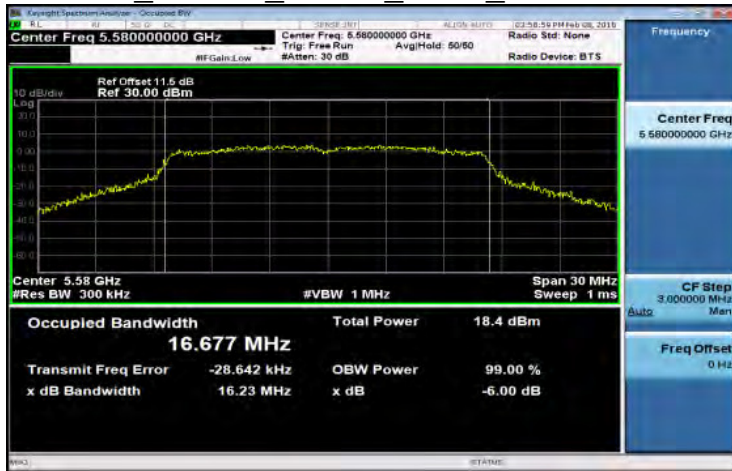
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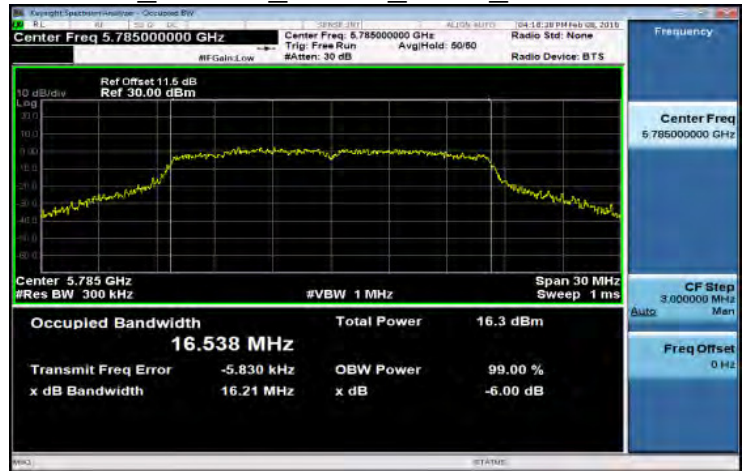
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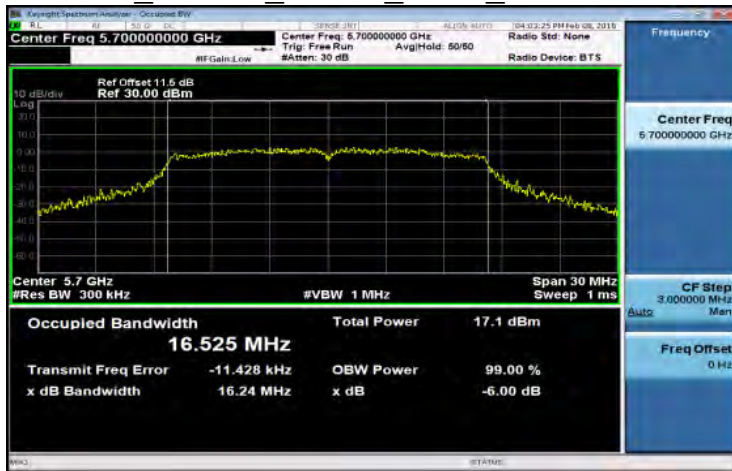
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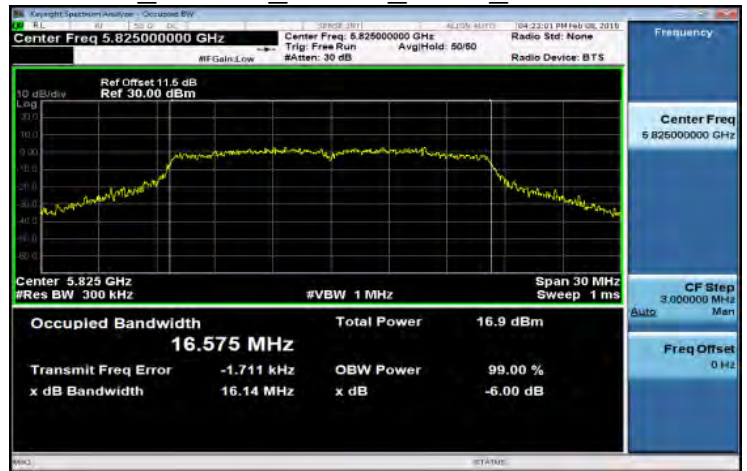
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IC_802.11a_20MHz_AUX1_5700MHz



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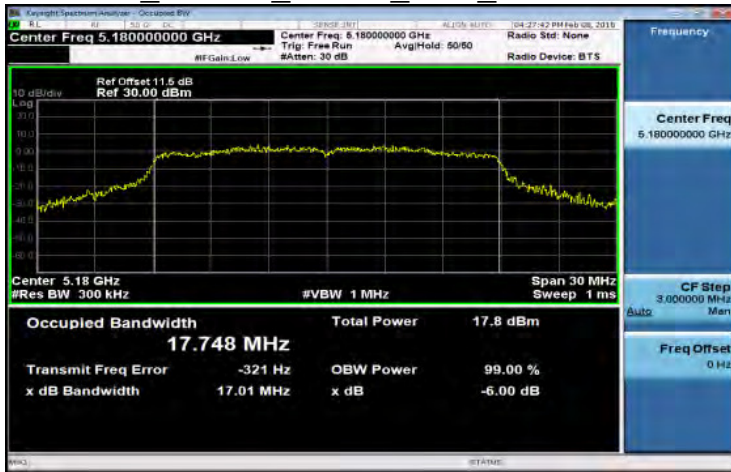


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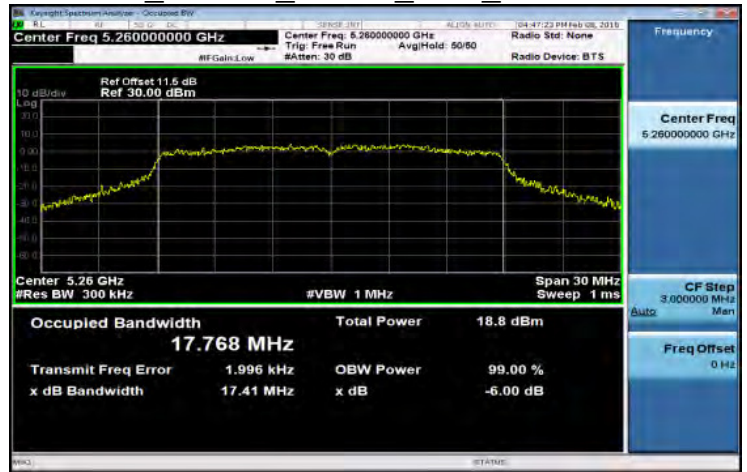
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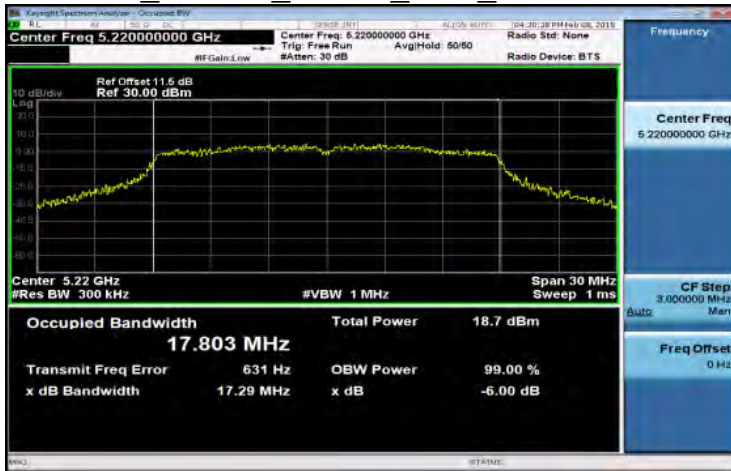
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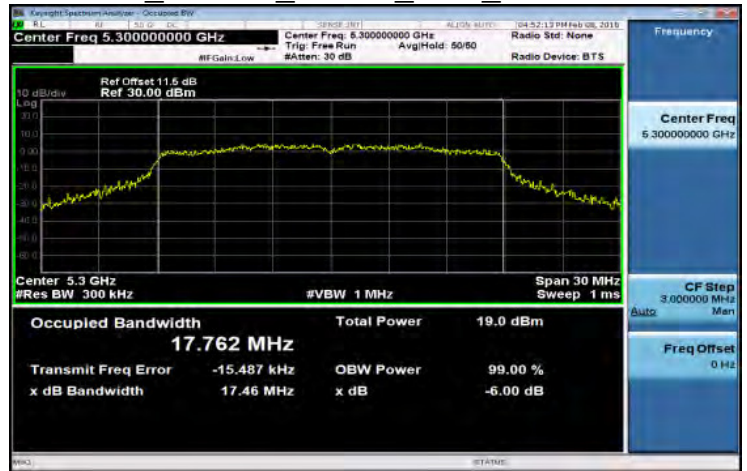
IC 802.11n_20MHz_Main_5260MHz



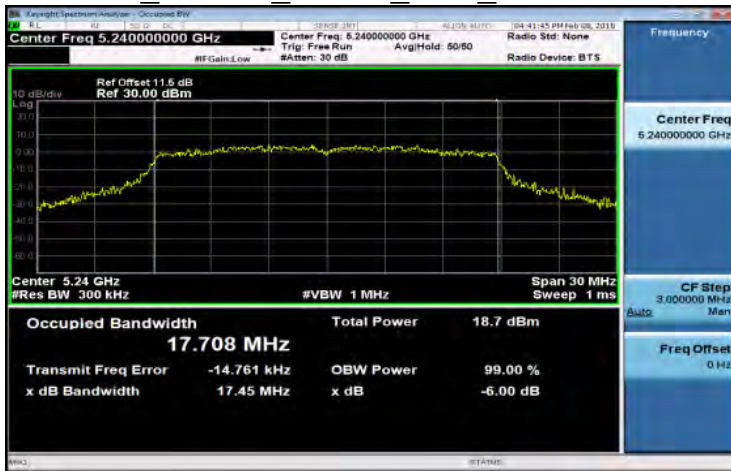
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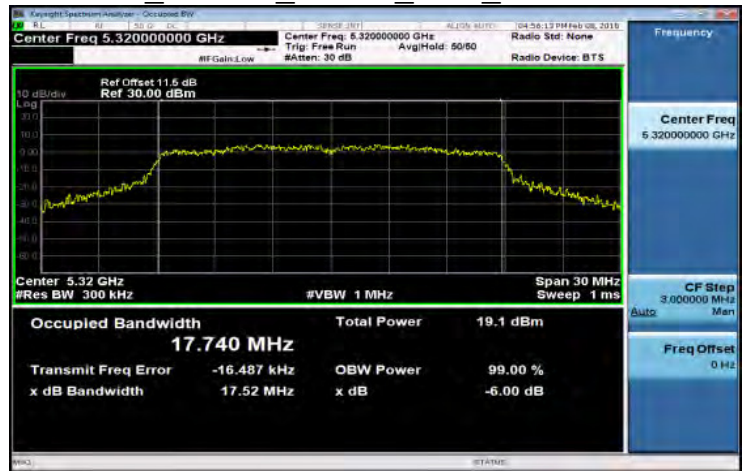
IC 802.11n_20MHz_Main_5300MHz



IC 802.11n_20MHz_Main_5240MHz



IC 802.11n_20MHz_Main_5320MHz

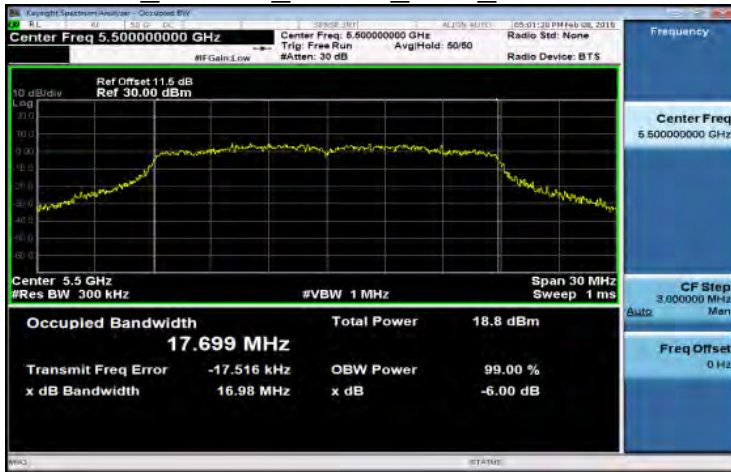


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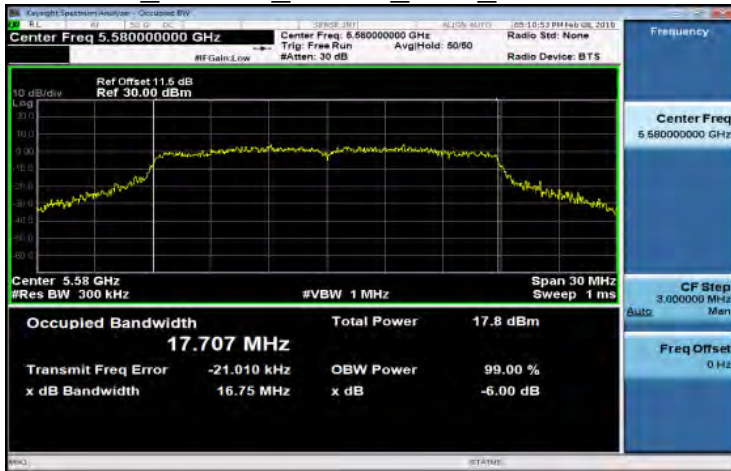
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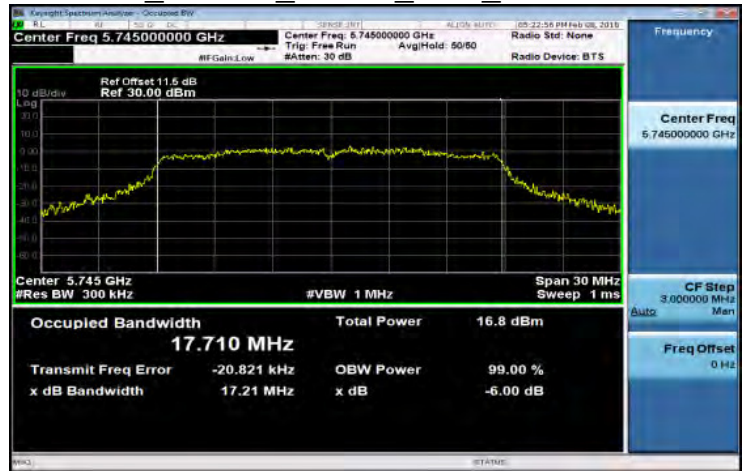
IC 802.11n_20MHz_Main_5720MHz



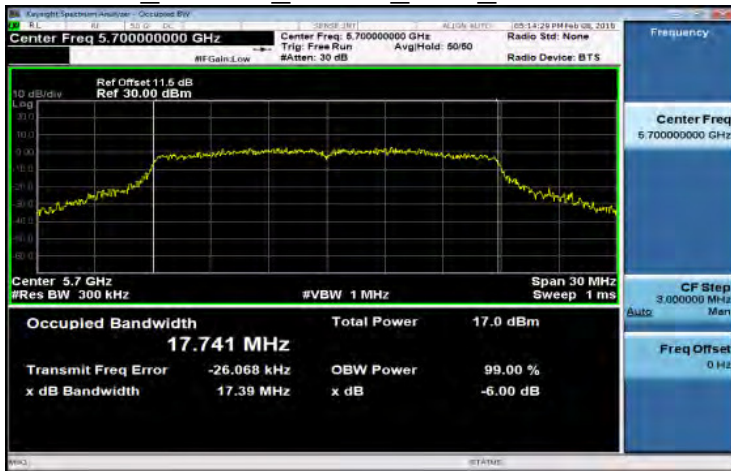
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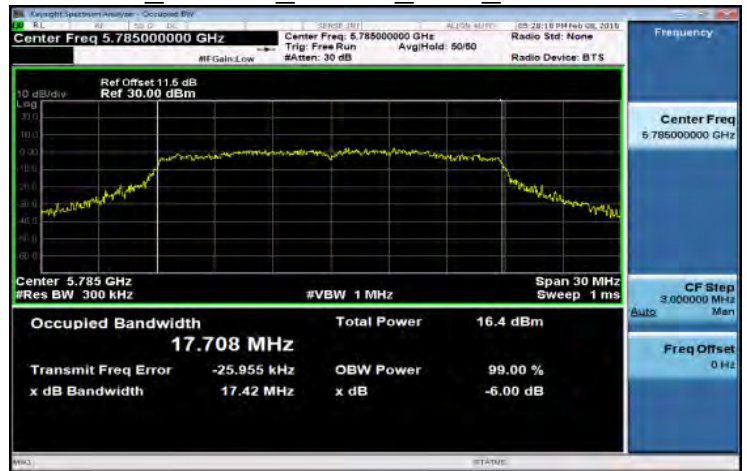
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IC 802.11n_20MHz_Main_5700MHz



IC 802.11n_20MHz_Main_5785MHz

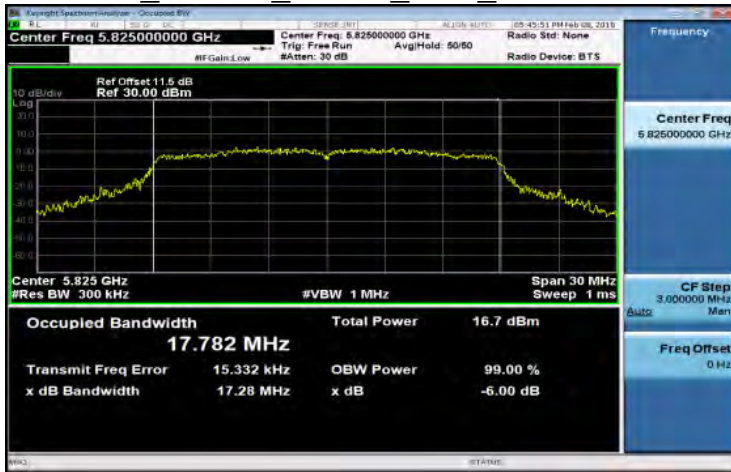


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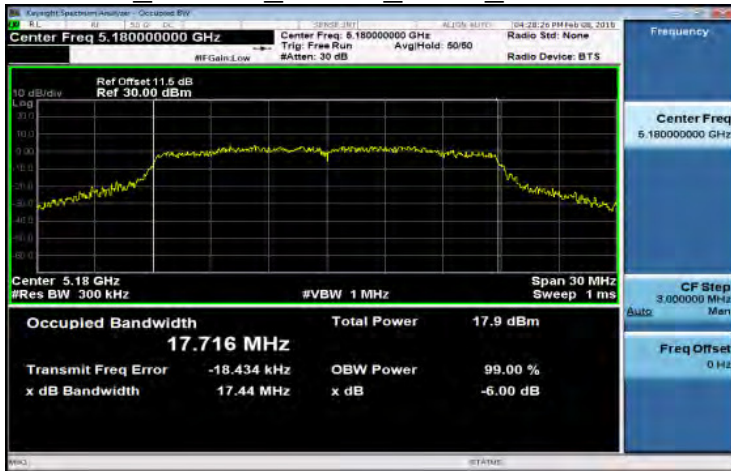
IC 802.11n 20MHz Main 5825MHz



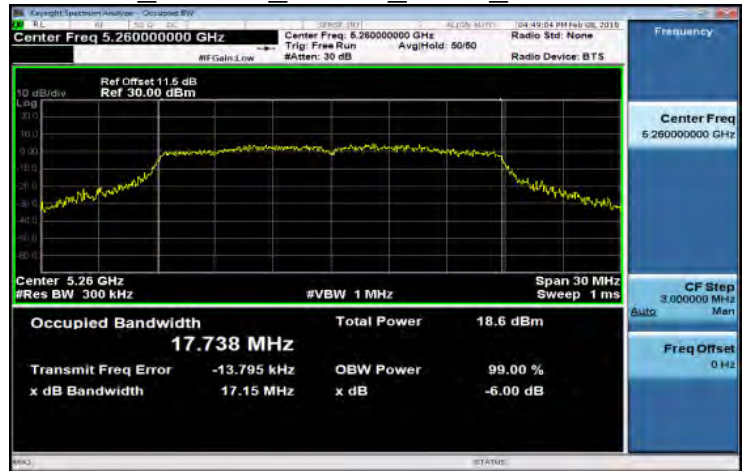
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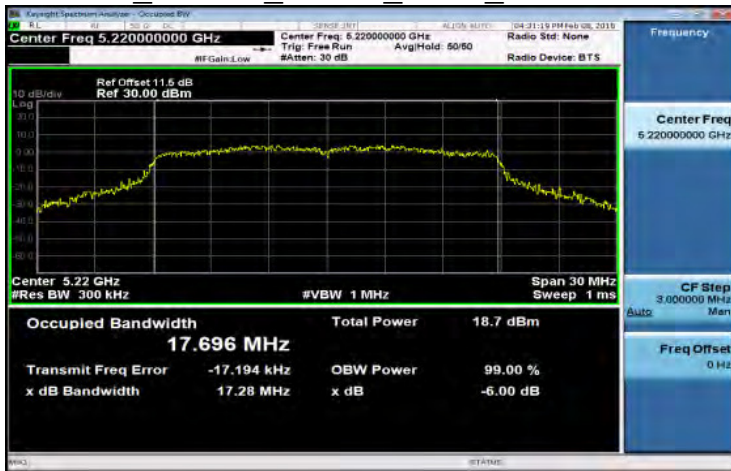
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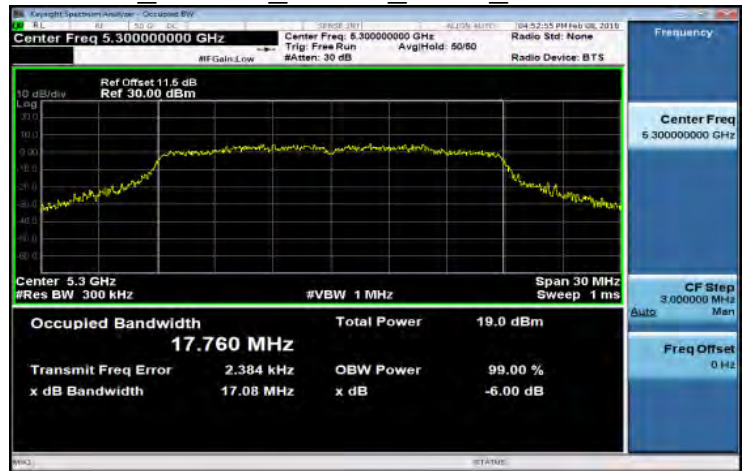
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IC 802.11n 20MHz AUX1 5220MHz



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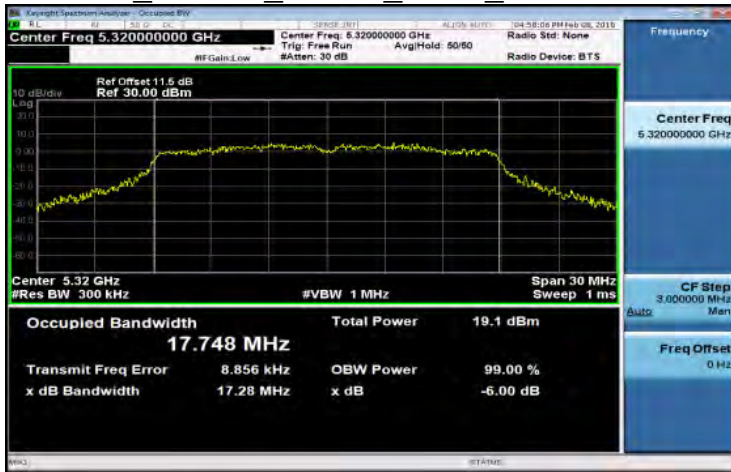


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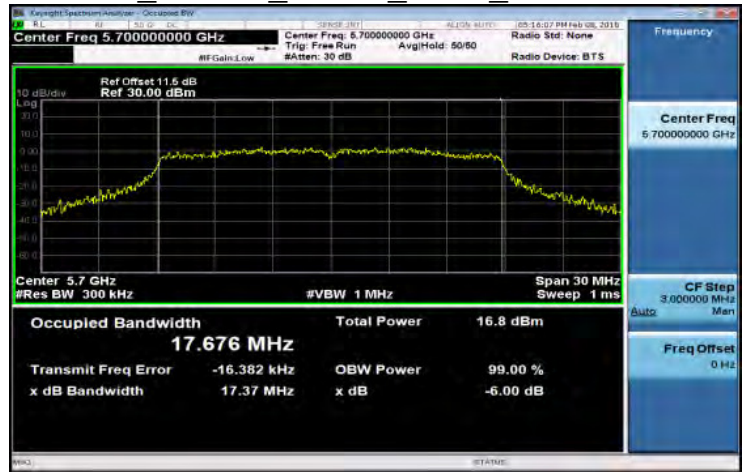
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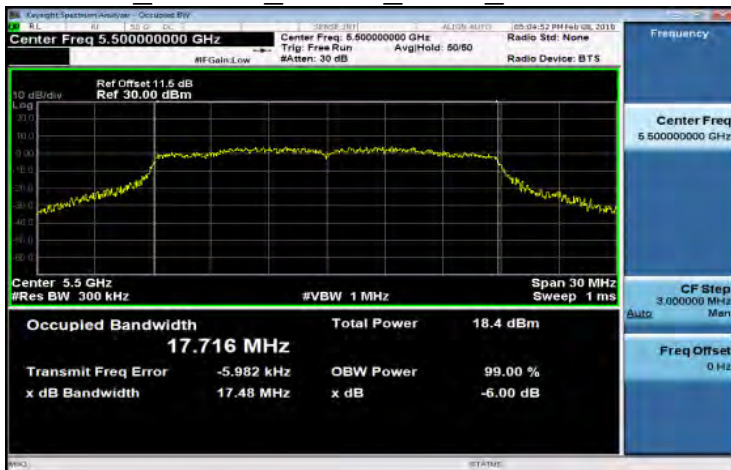
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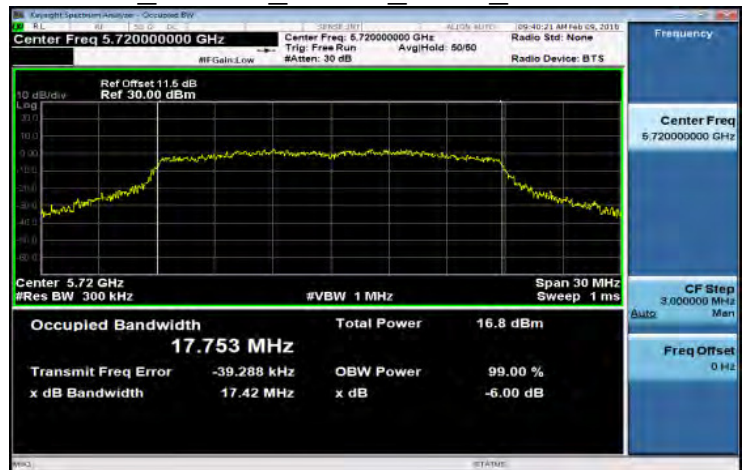
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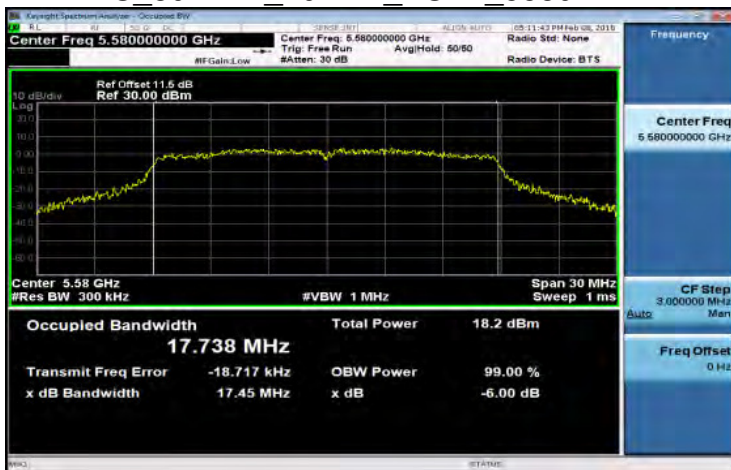
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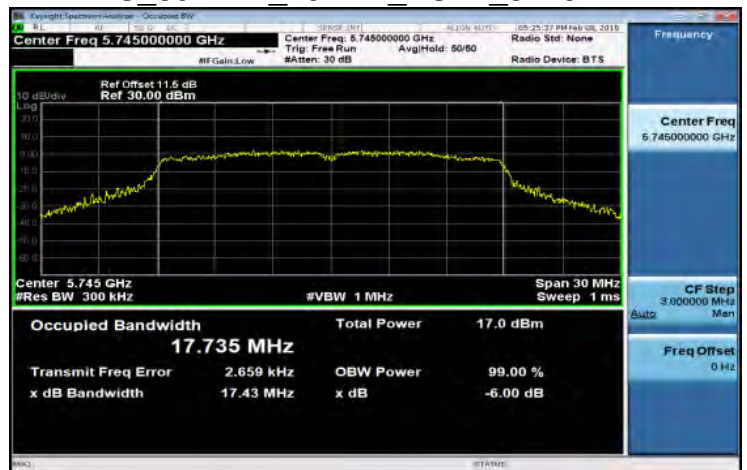
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IC_802.11n_20MHz_AUX1_5580MHz



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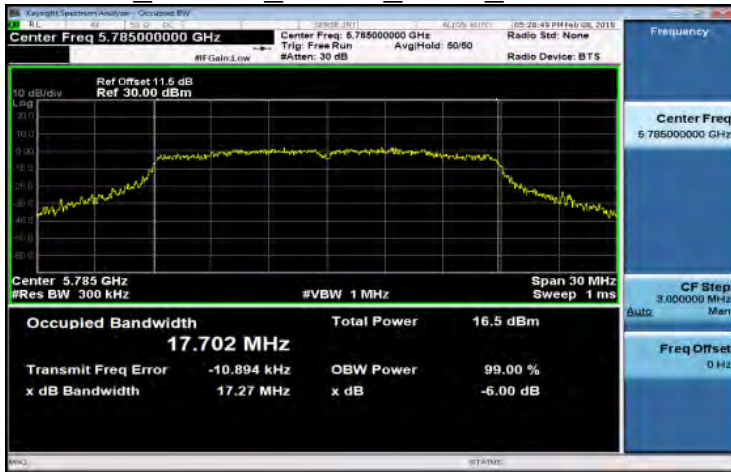


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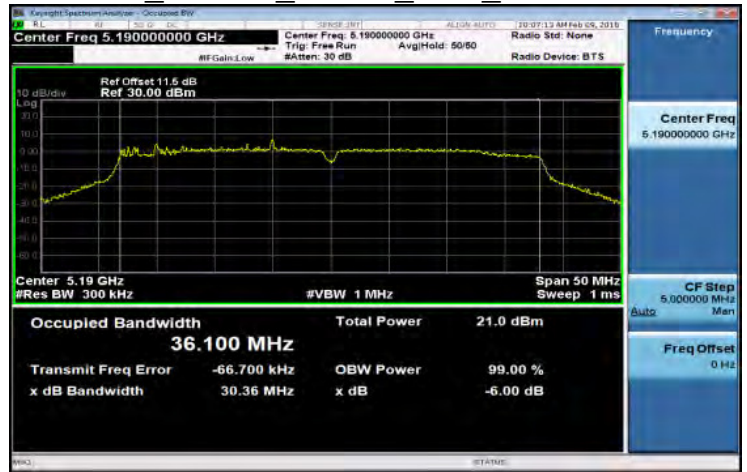
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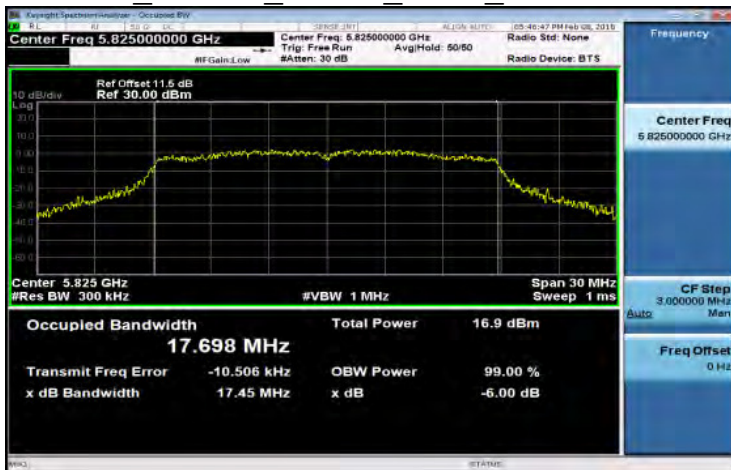
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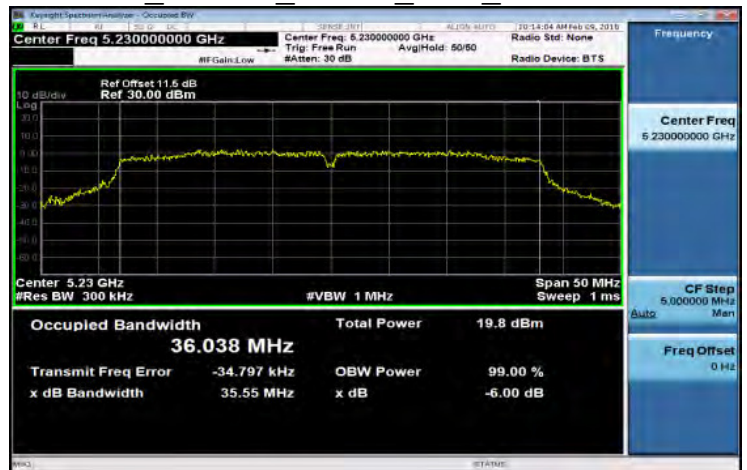
IC_802.11n_40MHz_Main_5190MHz



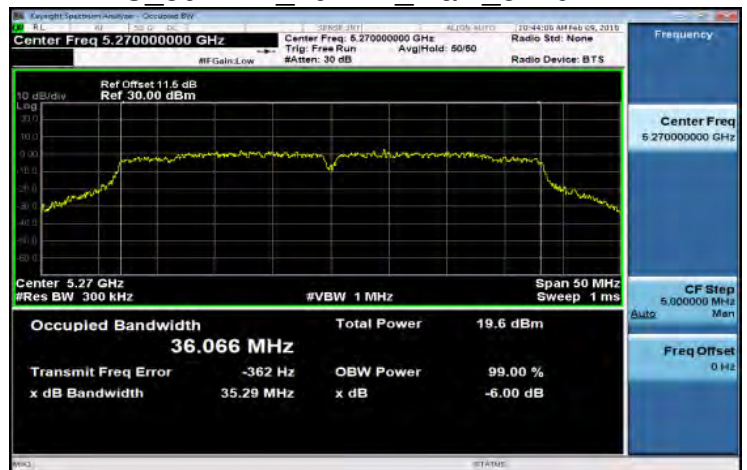
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IC_802.11n_40MHz_Main_5230MHz



IC_802.11n_40MHz_Main_5270MHz

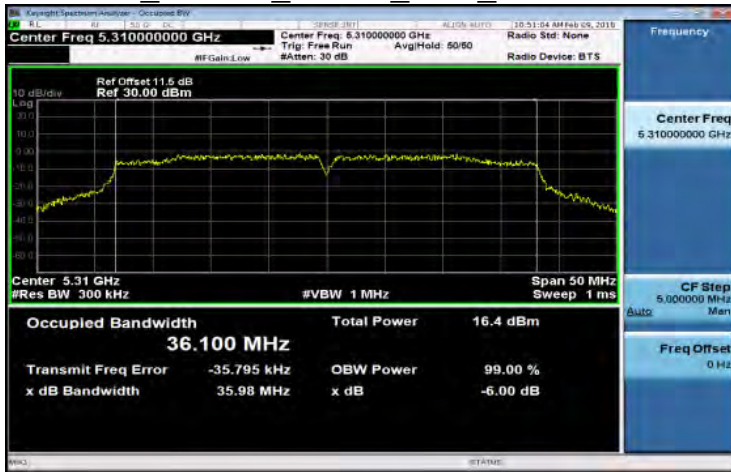


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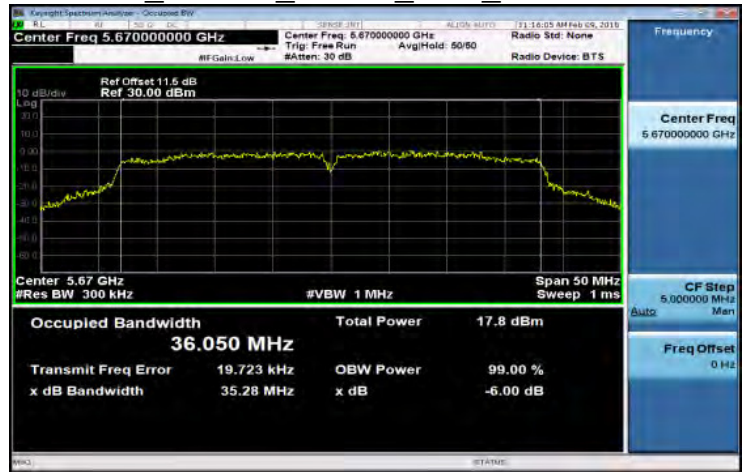
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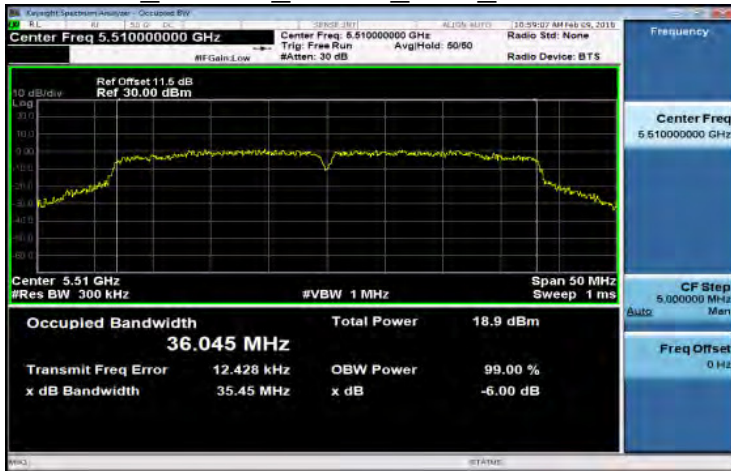
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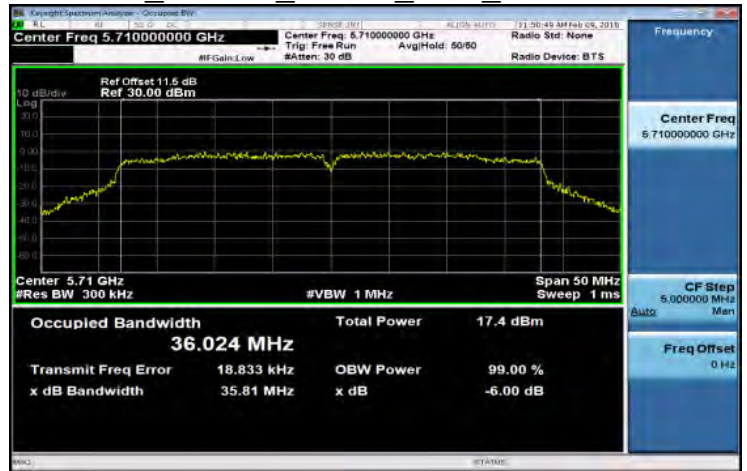
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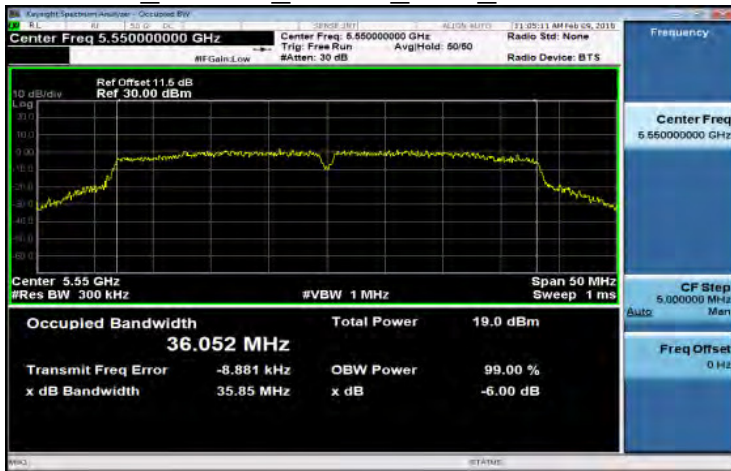
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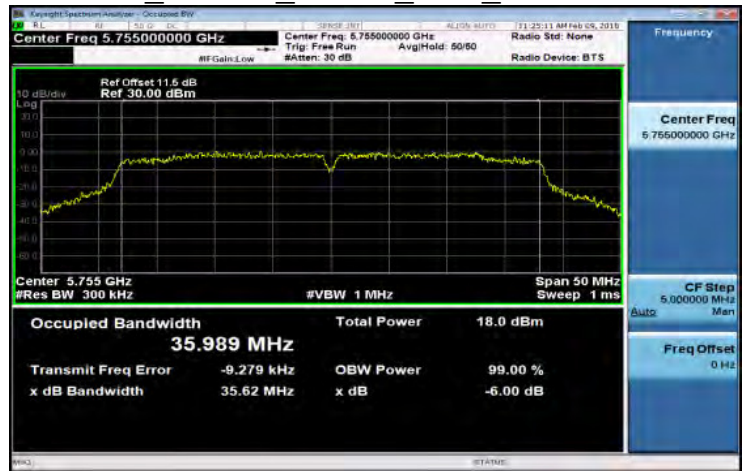
IC 802.11n_40MHz_Main_5710MHz



IC 802.11n_40MHz_Main_5550MHz



IC 802.11n_40MHz_Main_5755MHz

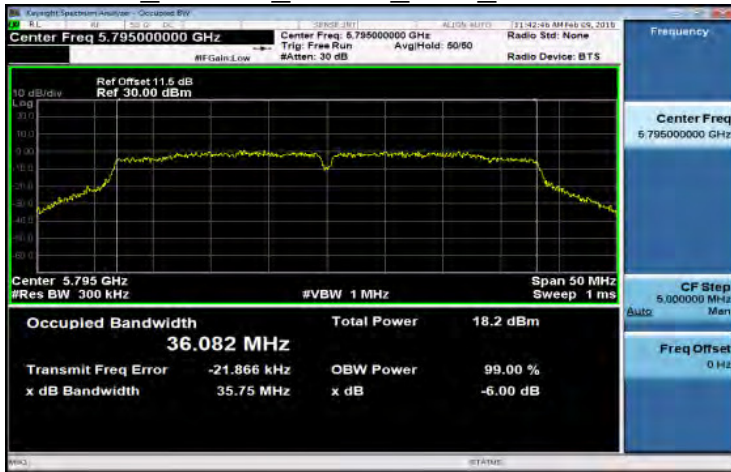


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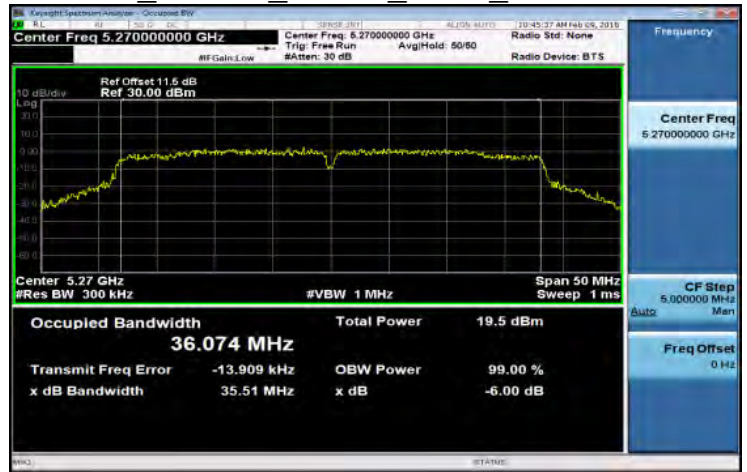
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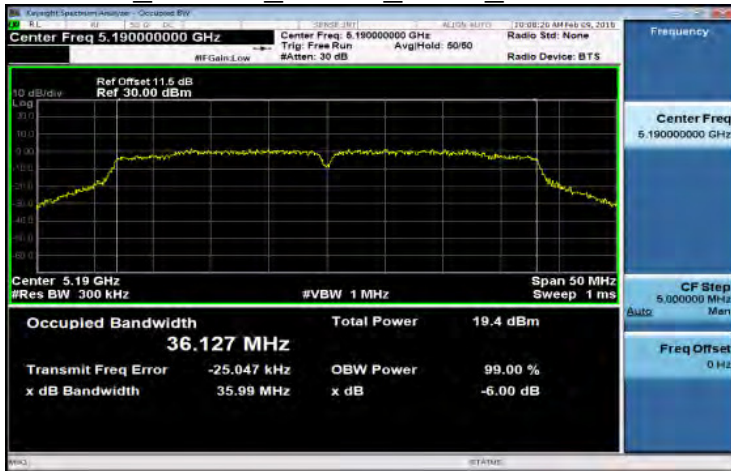
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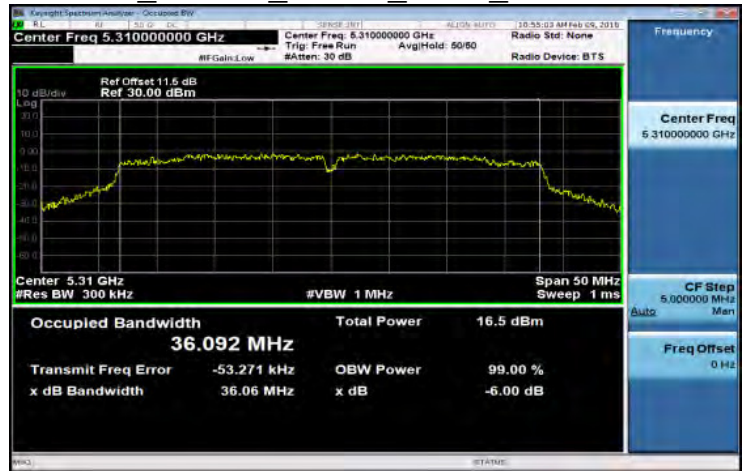
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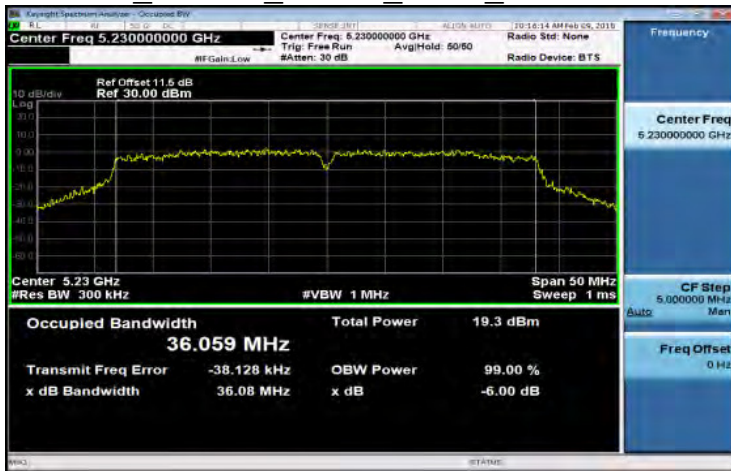
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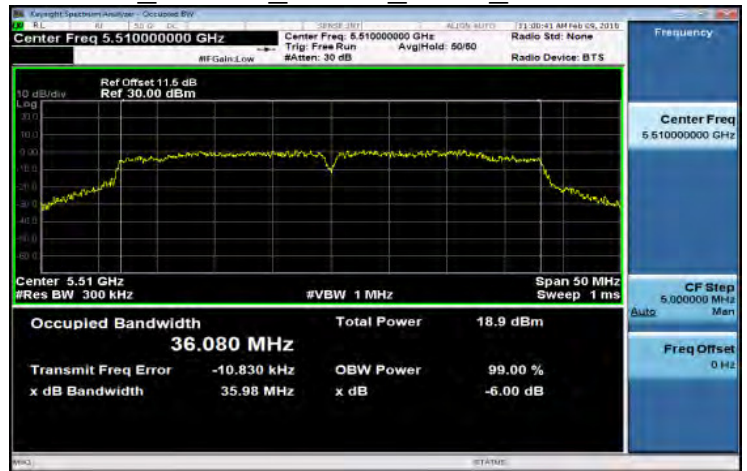
IC_802.11n_40MHz_AUX1_5310MHz



IC_802.11n_40MHz_AUX1_5230MHz



IC_802.11n_40MHz_AUX1_5510MHz

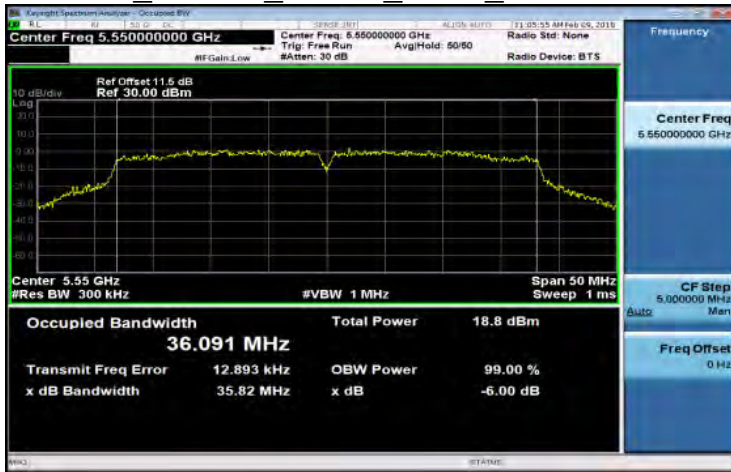


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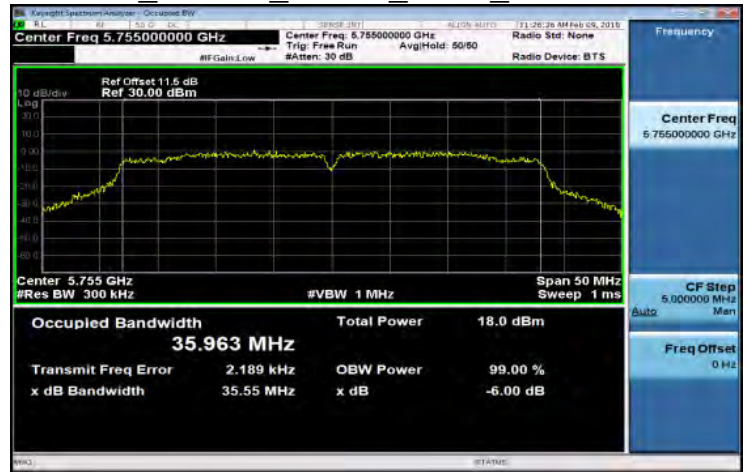
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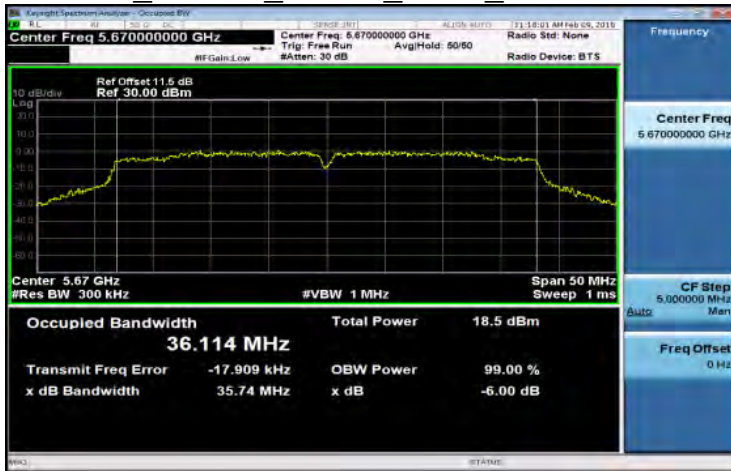
IC 802.11n 40MHz_AUX1_5550MHz



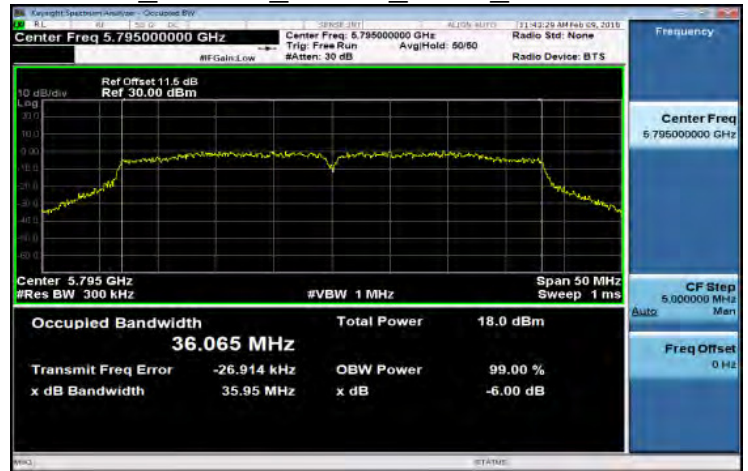
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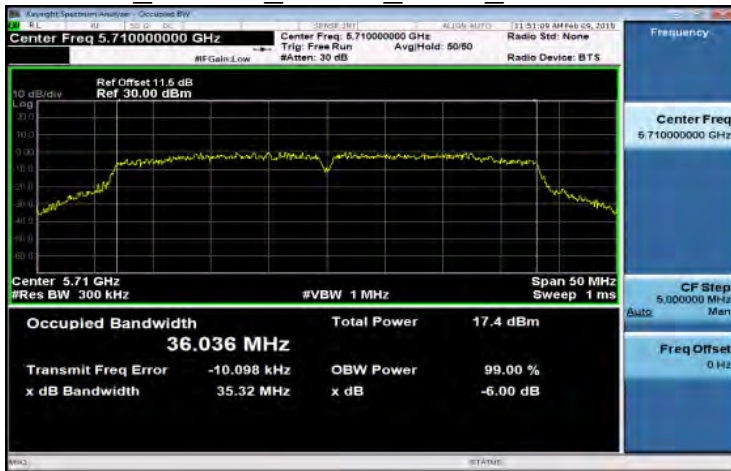
IC 802.11n 40MHz_AUX1_5670MHz



IC 802.11n 40MHz_AUX1_5795MHz



IC 802.11n 40MHz_AUX1_5710MHz

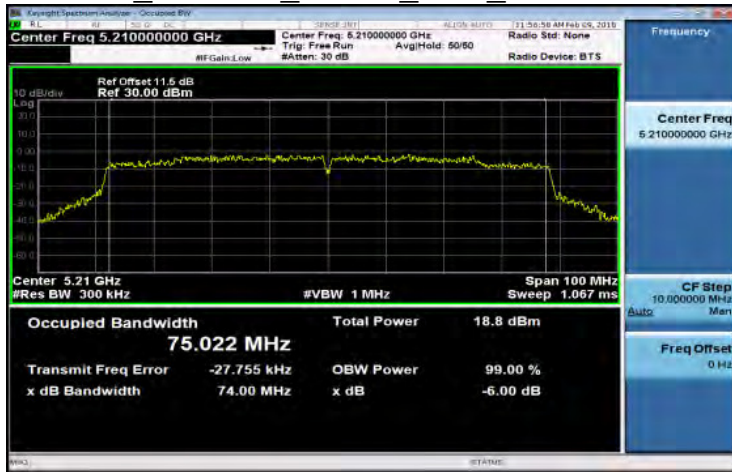


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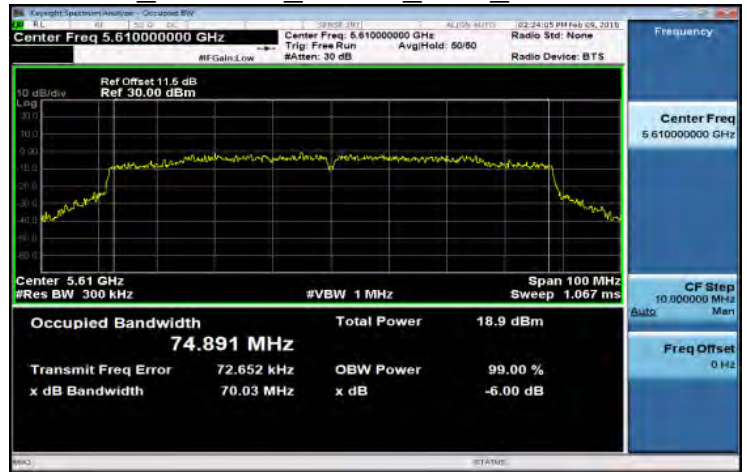
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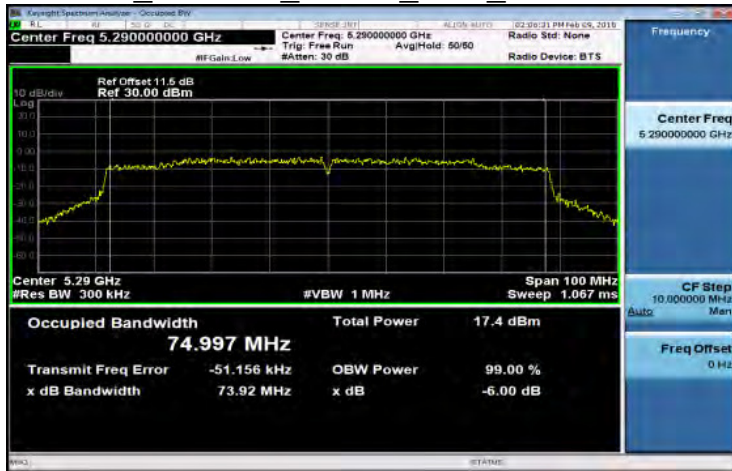
IC_802.11ac_80MHz_Main_5210MHz



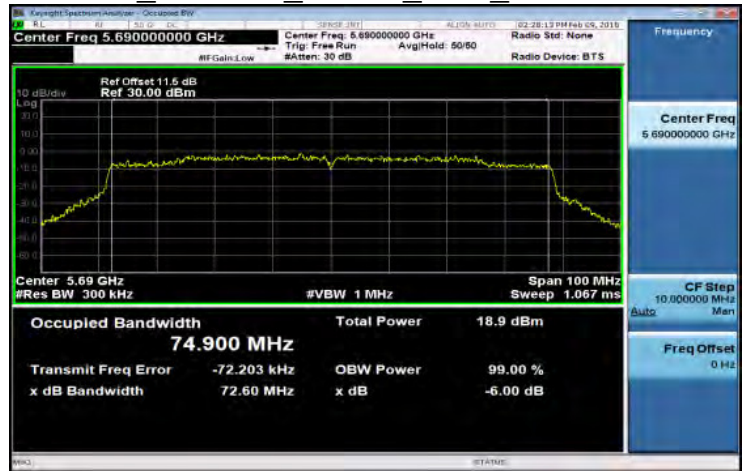
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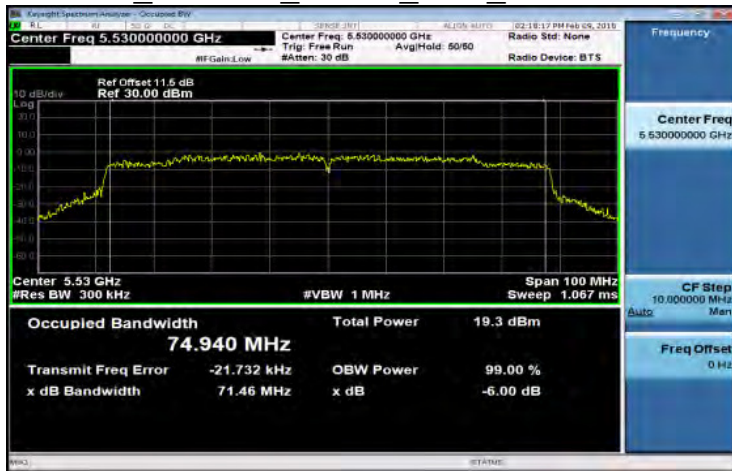
IC_802.11ac_80MHz_Main_5290MHz



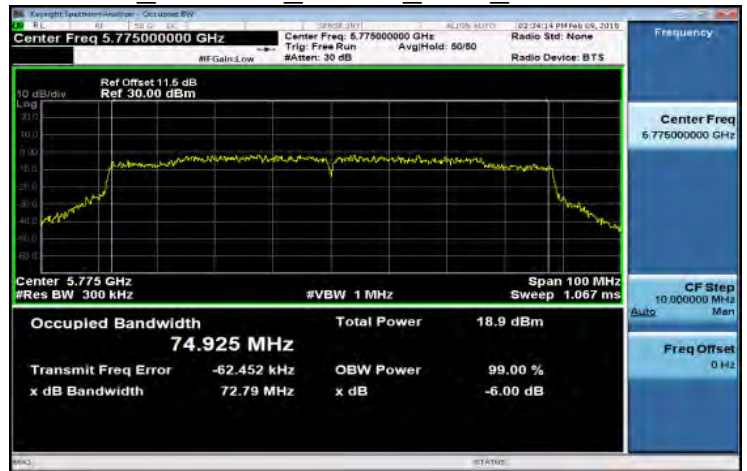
IC_802.11ac_80MHz_Main_5690MHz



IC_802.11ac_80MHz_Main_5530MHz



IC_802.11ac_80MHz_Main_5775MHz

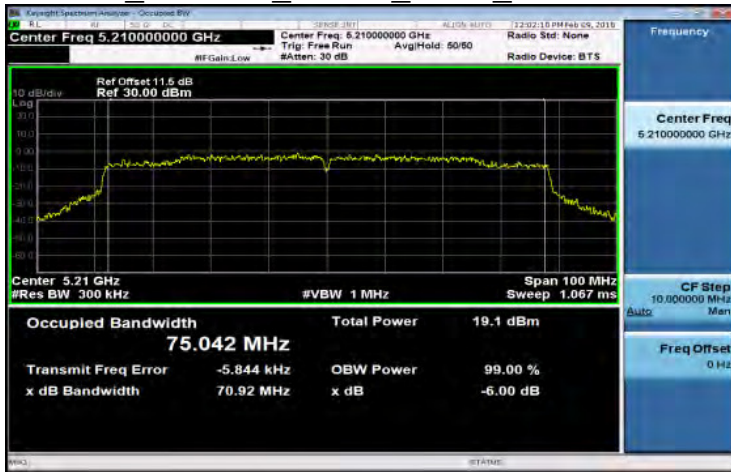


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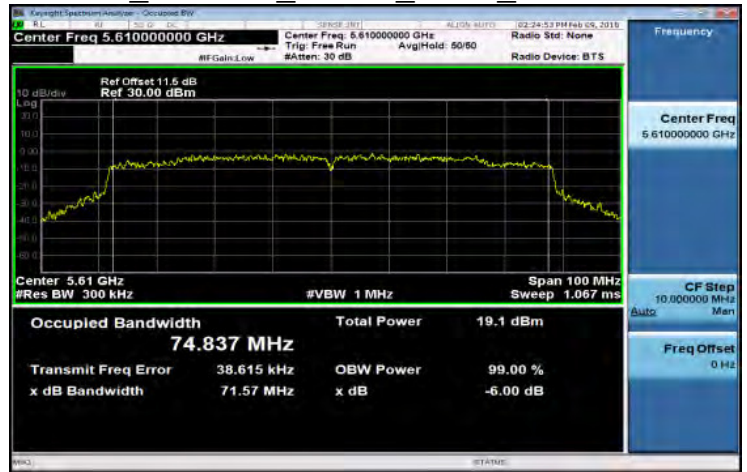
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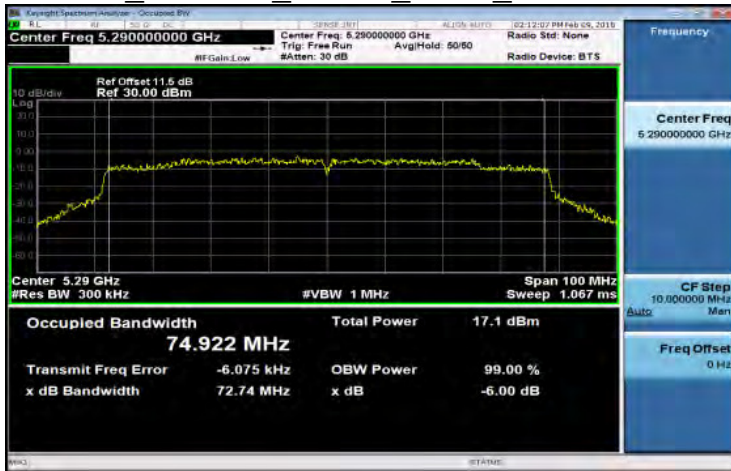
IC 802.11ac_80MHz_AUX1_5210MHz



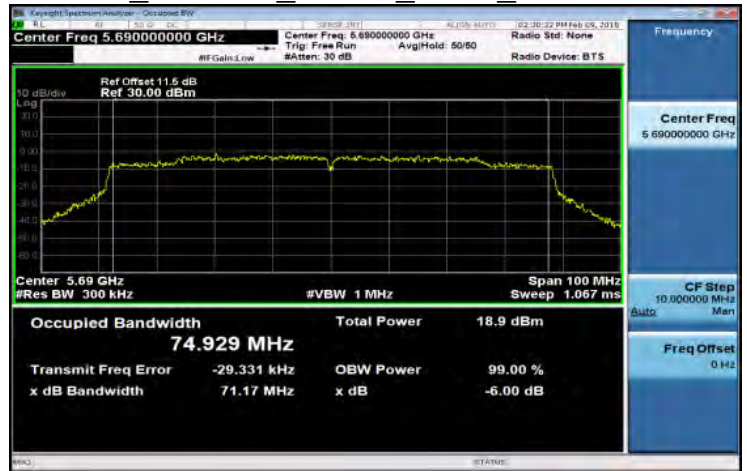
IC 802.11ac_80MHz_AUX1_5610MHz



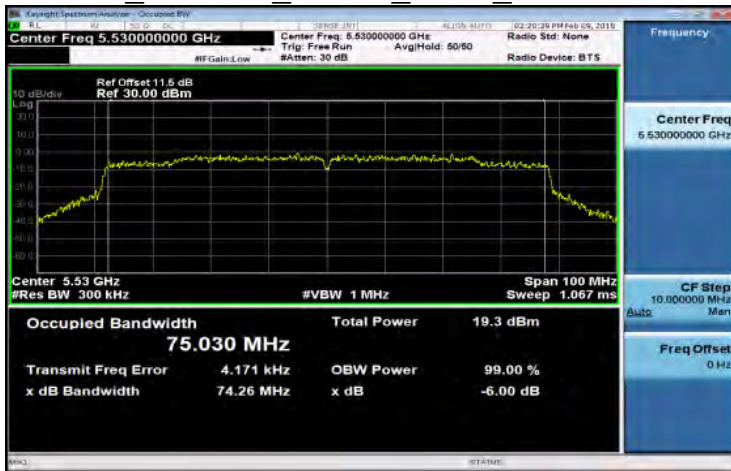
IC 802.11ac_80MHz_AUX1_5290MHz



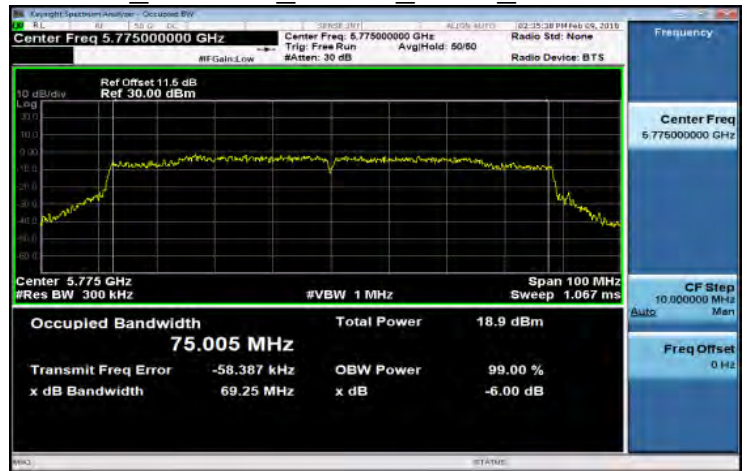
IC 802.11ac_80MHz_AUX1_5690MHz



IC 802.11ac_80MHz_AUX1_5530MHz



IC 802.11ac_80MHz_AUX1_5775MHz



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9 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

9.1 Standard Applicable

FCC

OPERZTION Band	EUT CATEGORY		LIMIT
U-NII-1		Access Point (Mater device)	1 Watt(30dBm)
		Fixed point-to-point Access Ponit	1 Watt(30dBm)
	√	Mobile and portable clinet device	250mW(23.98dBm)
U-NII-2A	√		250mW(23.98dBm) or 11dBm+10 log B
U-NII-2C	√		250mW(23.98dBm) or 11dBm+10 log B
U-NII-3	√		1 Watt(30dBm)

IC

OPERZTION FREQUENCY BAND	LIMIT
5150~5250 MHz	EIRP shall not exceed 200 mW or 10 + 10 log ₁₀ B, dBm
5250~5350 MHz	Conducted output power shall not exceed 250 mW or 11 +10 log ₁₀ B EIRP shall not exceed 1.0 W or 17 + 10 log ₁₀ B, dBm
5470-5600 MHz and 5650-5725 MHz	Conducted output power shall not exceed 250 mW or 11 +10 log ₁₀ B EIRP shall not exceed 1.0 W or 17 + 10 log ₁₀ B, dBm
5725~5850 MHz	Conducted output power shall not exceed 1 W

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the direction-al gain of the antenna exceeds 6 dBi.

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Note: 5.15-5.25G

Antenna1 Gain: 1.8 dBi

Antenna2 Gain: -0.55 dBi

Number Antenna: 2 pcs

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi) = 4.81 dBi

Limit: 23.98dBm

Note: 5.25-5.35G

Antenna1 Gain: 1.8 dBi

Antenna2 Gain: 1.34 dBi

Number Antenna: 2 pcs

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi) = 4.81 dBi

Limit: 23.98dBm

Note: 5.47-5.725G

Antenna1 Gain: 1.84 dBi

Antenna2 Gain: 1.46 dBi

Number Antenna: 2 pcs

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi) = 4.85 dBi

Limit: 23.968dBm

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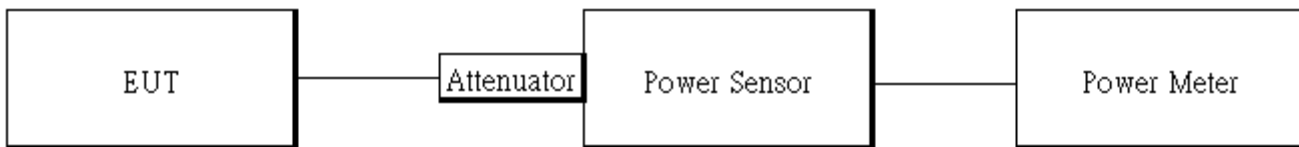
9.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
4. Power Meter is used as the auxiliary test equipment to conduct the output power measurement.
5. Record the max. reading and add 10 log(1/duty cycle).
6. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

9.3 Measurement Equipment Used

SGS Conducted Room					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Power Meter	Anritsu	ML2496A	1326001	06/23/2017	06/22/2018
Power Sensor	Anritsu	MA2411B	1315048	06/23/2017	06/22/2018
Power Sensor	Anritsu	MA2411B	1315049	06/23/2017	06/22/2018
Coaxial Cable 30cm	WOKEN	00100A1F1A195C	RF01	12/24/2017	12/23/2018
DC Block	PASTERNAK	PE8210	RF29	12/24/2017	12/23/2018
Attenuator	WOKEN	218FS-10	RF23	12/24/2017	12/23/2018
DC Power Supply	Agilent	E3640A	MY53140006	05/02/2017	05/01/2018

9.4 Test Set-up



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9.5 Measurement Result

Conducted output power (FCC)

802.11a_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	6	14.97	31.383	23.98	PASS
44	5220	6	14.96	31.311	23.98	PASS
48	5240	6	14.91	30.953	23.98	PASS
52	5260	6	14.93	31.096	23.98 or $11+10\log(B) = 24.73$	PASS
60	5300	6	14.97	31.383	23.98 or $11+10\log(B) = 24.42$	PASS
64	5320	6	14.94	31.167	23.98 or $11+10\log(B) = 24.48$	PASS
100	5500	6	13.93	24.700	23.98 or $11+10\log(B) = 24.50$	PASS
116	5580	6	13.96	24.871	23.98 or $11+10\log(B) = 24.69$	PASS
140	5700	6	13.92	24.643	23.98 or $11+10\log(B) = 24.32$	PASS
149	5745	6	13.95	24.814	30	PASS
157	5785	6	13.96	24.871	30	PASS
165	5825	6	13.94	24.757	30	PASS

802.11a_Aux1

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	6	14.93	31.096	23.98	PASS
44	5220	6	14.85	30.528	23.98	PASS
48	5240	6	14.89	30.811	23.98	PASS
52	5260	6	14.93	31.096	23.98 or $11+10\log(B) = 24.37$	PASS
60	5300	6	14.86	30.598	23.98 or $11+10\log(B) = 24.33$	PASS
64	5320	6	14.91	30.953	23.98 or $11+10\log(B) = 24.53$	PASS
100	5500	6	13.94	24.757	23.98 or $11+10\log(B) = 24.73$	PASS
116	5580	6	13.84	24.194	23.98 or $11+10\log(B) = 24.47$	PASS
140	5700	6	13.92	24.643	23.98 or $11+10\log(B) = 24.63$	PASS
149	5745	6	13.95	24.814	30	PASS
157	5785	6	13.85	24.249	30	PASS
165	5825	6	13.91	24.587	30	PASS

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802.11a_MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)		RESULT
			CH 0	CH 1					
36	5180	6	11.72	11.53	14.86	29.083		23.98	PASS
44	5220	6	11.67	11.6	14.87	29.144		23.98	PASS
48	5240	6	11.62	11.52	14.81	28.712		23.98	PASS
52	5260	6	11.73	11.59	14.90	29.315	23.98	or $11+10\log(B) = 24.37$	PASS
60	5300	6	11.8	11.37	14.83	28.844	23.98	or $11+10\log(B) = 24.33$	PASS
64	5320	6	11.83	11.37	14.84	28.949	23.98	or $11+10\log(B) = 24.48$	PASS
100	5500	6	10.81	10.48	13.89	23.219	23.98	or $11+10\log(B) = 24.50$	PASS
116	5580	6	10.84	10.43	13.88	23.175	23.98	or $11+10\log(B) = 24.47$	PASS
140	5700	6	10.83	10.5	13.91	23.326	23.98	or $11+10\log(B) = 24.32$	PASS
149	5745	6	10.84	10.46	13.89	23.251		30	PASS
157	5785	6	10.8	10.45	13.87	23.114		30	PASS
165	5825	6	10.71	10.51	13.85	23.022		30	PASS

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802.11n_HT20_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	MCS0	14.97	31.375	23.98	PASS
44	5220	MCS0	14.98	31.447	23.98	PASS
48	5240	MCS0	14.96	31.303	23.98	PASS
52	5260	MCS0	14.97	31.375	23.98 or $11+10\log(B) = 24.66$	PASS
60	5300	MCS0	14.99	31.520	23.98 or $11+10\log(B) = 24.62$	PASS
64	5320	MCS0	14.93	31.087	23.98 or $11+10\log(B) = 24.54$	PASS
100	5500	MCS0	13.95	24.807	23.98 or $11+10\log(B) = 24.70$	PASS
116	5580	MCS0	13.99	25.037	23.98 or $11+10\log(B) = 24.77$	PASS
140	5700	MCS0	13.94	24.750	23.98 or $11+10\log(B) = 24.46$	PASS
144	5720 (band 3)	MCS0	12.83	19.184	23.98 or $11+10\log(B) = 23.04$	PASS
144	5720 (band 4)	MCS0	1.35	1.363	23.98 or $11+10\log(B) = 17.84$	PASS
149	5745	MCS0	13.93	24.693	30	PASS
157	5785	MCS0	13.93	24.693	30	PASS
165	5825	MCS0	13.97	24.922	30	PASS

802.11n_HT20_Aux1

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	MCS0	14.88	30.731	23.98	PASS
44	5220	MCS0	14.87	30.661	23.98	PASS
48	5240	MCS0	14.84	30.450	23.98	PASS
52	5260	MCS0	14.88	30.731	23.98 or $11+10\log(B) = 24.53$	PASS
60	5300	MCS0	14.92	31.016	23.98 or $11+10\log(B) = 24.46$	PASS
64	5320	MCS0	14.86	30.590	23.98 or $11+10\log(B) = 24.63$	PASS
100	5500	MCS0	13.87	24.355	23.98 or $11+10\log(B) = 24.83$	PASS
116	5580	MCS0	13.90	24.523	23.98 or $11+10\log(B) = 24.71$	PASS
140	5700	MCS0	13.86	24.299	23.98 or $11+10\log(B) = 24.51$	PASS
144	5720 (band 3)	MCS0	12.77	18.921	23.98 or $11+10\log(B) = 22.89$	PASS
144	5720 (band 4)	MCS0	1.35	1.363	23.98 or $11+10\log(B) = 17.69$	PASS
149	5745	MCS0	13.81	24.021	30	PASS
157	5785	MCS0	13.84	24.187	30	PASS
165	5825	MCS0	13.85	24.243	30	PASS

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802.11n_HT20_MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)		RESULT
			CH 0	CH 1					
36	5180	MCS8	11.7	11.59	14.85	29.212	23.98		PASS
44	5220	MCS8	11.69	11.63	14.87	29.312	23.98		PASS
48	5240	MCS8	11.7	11.66	14.89	29.447	23.98		PASS
52	5260	MCS8	11.75	11.62	14.89	29.483	23.98	or 11+10log(B) = 24.53	PASS
60	5300	MCS8	11.93	11.43	14.89	29.495	23.98	or 11+10log(B) = 24.46	PASS
64	5320	MCS8	11.92	11.52	14.93	29.750	23.98	or 11+10log(B) = 24.54	PASS
100	5500	MCS8	10.86	10.48	13.88	23.359	23.98	or 11+10log(B) = 24.70	PASS
116	5580	MCS8	10.79	10.53	13.87	23.293	23.98	or 11+10log(B) = 24.71	PASS
140	5700	MCS8	10.76	10.58	13.88	23.341	23.98	or 11+10log(B) = 24.46	PASS
144	5720 (band 3)	MCS8	9.66	9.45	12.77	18.072	23.98	or 11+10log(B) = 17.69	PASS
144	5720 (band 4)	MCS8	1.15	1.15	4.36	2.606	23.98	or 11+11log(B) = 11.00	PASS
149	5745	MCS8	10.86	10.47	13.88	23.333	30		PASS
157	5785	MCS8	10.86	10.52	13.90	23.462	30		PASS
165	5825	MCS8	10.75	10.61	13.89	23.393	30		PASS

802.11ac_VHT20_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)		RESULT
36	5180	MCS0	14.90	30.868	23.98		PASS
44	5220	MCS0	14.88	30.726	23.98		PASS
48	5240	MCS0	14.89	30.797	23.98		PASS
52	5260	MCS0	14.89	30.797	23.98	or 11+10log(B) = 24.66	PASS
60	5300	MCS0	14.90	30.868	23.98	or 11+10log(B) = 24.62	PASS
64	5320	MCS0	14.83	30.374	23.98	or 11+10log(B) = 24.54	PASS
100	5500	MCS0	13.87	24.350	23.98	or 11+10log(B) = 24.70	PASS
116	5580	MCS0	13.89	24.463	23.98	or 11+10log(B) = 24.77	PASS
140	5700	MCS0	13.87	24.350	23.98	or 11+10log(B) = 24.46	PASS
149	5745	MCS0	13.84	24.183	30		PASS
157	5785	MCS0	13.82	24.071	30		PASS
165	5825	MCS0	13.87	24.350	30		PASS

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802.11ac VHT20 Aux1

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)		RESULT
36	5180	MCS0	14.78	30.026	23.98		PASS
44	5220	MCS0	14.80	30.165	23.98		PASS
48	5240	MCS0	14.77	29.957	23.98		PASS
52	5260	MCS0	14.78	30.026	23.98	or $11+10\log(B) = 24.53$	PASS
60	5300	MCS0	14.81	30.234	23.98	or $11+10\log(B) = 24.46$	PASS
64	5320	MCS0	14.78	30.026	23.98	or $11+10\log(B) = 24.63$	PASS
100	5500	MCS0	13.80	23.961	23.98	or $11+10\log(B) = 24.83$	PASS
116	5580	MCS0	13.78	23.851	23.98	or $11+10\log(B) = 24.71$	PASS
140	5700	MCS0	13.75	23.687	23.98	or $11+10\log(B) = 24.51$	PASS
149	5745	MCS0	13.72	23.524	30		PASS
157	5785	MCS0	13.73	23.578	30		PASS
165	5825	MCS0	13.76	23.741	30		PASS

802.11ac VHT20 MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)		RESULT
			CH 0	CH 1					
36	5180	MCS8	11.62	11.48	14.76	28.582	23.98		PASS
44	5220	MCS8	11.59	11.51	14.76	28.579	23.98		PASS
48	5240	MCS8	11.63	11.58	14.81	28.943	23.98		PASS
52	5260	MCS8	11.66	11.51	14.79	28.813	23.98	or $11+10\log(B) = 24.53$	PASS
60	5300	MCS8	11.83	11.33	14.79	28.824	23.98	or $11+10\log(B) = 24.46$	PASS
64	5320	MCS8	11.81	11.41	14.82	29.006	23.98	or $11+10\log(B) = 24.54$	PASS
100	5500	MCS8	10.76	10.36	13.77	22.777	23.98	or $11+10\log(B) = 24.70$	PASS
116	5580	MCS8	10.69	10.45	13.78	22.814	23.98	or $11+10\log(B) = 24.71$	PASS
140	5700	MCS8	10.67	10.47	13.78	22.811	23.98	or $11+10\log(B) = 24.46$	PASS
149	5745	MCS8	10.78	10.35	13.78	22.807	30		PASS
157	5785	MCS8	10.76	10.43	13.80	22.953	30		PASS
165	5825	MCS8	10.66	10.49	13.78	22.836	30		PASS

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802.11n_HT40_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
38	5190	MCS0	14.97	31.407	23.98	PASS
46	5230	MCS0	14.94	31.191	23.98	PASS
54	5270	MCS0	14.99	31.552	23.98 or $11+10\log(B) = 27.48$	PASS
62	5310	MCS0	11.97	15.741	23.98 or $11+10\log(B) = 27.58$	PASS
102	5510	MCS0	13.96	24.890	23.98 or $11+10\log(B) = 27.57$	PASS
110	5550	MCS0	13.95	24.833	23.98 or $11+10\log(B) = 27.48$	PASS
134	5670	MCS0	13.99	25.063	23.98 or $11+10\log(B) = 27.56$	PASS
142	5710 (band 3)	MCS0	13.50	22.380	23.98 or $11+10\log(B) = 27.01$	PASS
142	5710 (band 4)	MCS0	1.23	1.327	23.98 or $11+10\log(B) = 17.79$	PASS
151	5755	MCS0	13.98	25.005	30	PASS
159	5795	MCS0	13.95	24.833	30	PASS

802.11n_HT40_Aux1

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
38	5190	MCS0	14.87	30.692	23.98	PASS
46	5230	MCS0	14.83	30.411	23.98	PASS
54	5270	MCS0	14.90	30.905	23.98 or $11+10\log(B) = 27.50$	PASS
62	5310	MCS0	11.87	15.383	23.98 or $11+10\log(B) = 27.63$	PASS
102	5510	MCS0	13.86	24.324	23.98 or $11+10\log(B) = 27.50$	PASS
110	5550	MCS0	13.88	24.436	23.98 or $11+10\log(B) = 27.50$	PASS
134	5670	MCS0	13.91	24.605	23.98 or $11+10\log(B) = 27.63$	PASS
142	5710 (band 3)	MCS0	13.47	22.226	23.98 or $11+10\log(B) = 27.06$	PASS
142	5710 (band 4)	MCS0	1.23	1.327	23.98 or $11+10\log(B) = 17.84$	PASS
151	5755	MCS0	13.90	24.549	30	PASS
159	5795	MCS0	13.84	24.212	30	PASS

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802.11n_HT40_MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)		RESULT
			CH 0	CH 1					
38	5190	MCS8	11.23	11.14	14.94	26.276		23.98	PASS
46	5230	MCS8	11.22	11.11	14.92	26.156		23.98	PASS
54	5270	MCS8	11.32	11.02	14.92	26.199	23.98	or 11+10log(B) = 27.48	PASS
62	5310	MCS8	8.54	7.77	11.92	13.129	23.98	or 11+10log(B) = 27.58	PASS
102	5510	MCS8	10.32	10.03	13.93	20.834	23.98	or 11+10log(B) = 27.50	PASS
110	5550	MCS8	10.31	10.02	13.92	20.786	23.98	or 11+10log(B) = 27.48	PASS
134	5670	MCS8	10.27	10.06	13.92	20.781	23.98	or 11+10log(B) = 27.56	PASS
142	5710 (band 3)	MCS8	9.78	9.63	13.45	18.682	23.98	or 11+10log(B) = 27.01	PASS
142	5710 (band 4)	MCS8	0.49	0.49	4.24	2.239	23.98	or 11+10log(B) = 17.79	PASS
151	5755	MCS8	10.32	10.04	13.93	20.857		30	PASS
159	5795	MCS8	10.27	10.02	13.90	20.688		30	PASS

802.11ac_VHT40_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)		RESULT
38	5190	MCS0	14.86	30.638		23.98	PASS
46	5230	MCS0	14.82	30.357		23.98	PASS
54	5270	MCS0	14.87	30.709	23.98	or 11+10log(B) = 27.48	PASS
62	5310	MCS0	11.86	15.356	23.98	or 11+10log(B) = 27.58	PASS
102	5510	MCS0	13.87	24.393	23.98	or 11+10log(B) = 27.57	PASS
110	5550	MCS0	13.86	24.337	23.98	or 11+10log(B) = 27.48	PASS
151	5755	MCS0	13.89	24.506		30	PASS
159	5795	MCS0	13.85	24.281		30	PASS

802.11ac_VHT40_Aux1

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)		RESULT
38	5190	MCS0	14.74	29.803		23.98	PASS
46	5230	MCS0	14.71	29.598		23.98	PASS
54	5270	MCS0	14.79	30.148	23.98	or 11+10log(B) = 27.50	PASS
62	5310	MCS0	11.77	15.041	23.98	or 11+10log(B) = 27.63	PASS
102	5510	MCS0	13.74	23.674	23.98	or 11+10log(B) = 27.50	PASS
110	5550	MCS0	13.75	23.728	23.98	or 11+10log(B) = 27.50	PASS
151	5755	MCS0	13.77	23.838		30	PASS
159	5795	MCS0	13.75	23.728		30	PASS

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802.11ac_VHT40_MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)		RESULT
			CH 0	CH 1					
38	5190	MCS8	11.13	11.03	14.82	25.648	23.98		PASS
46	5230	MCS8	11.14	11.03	14.83	25.678	23.98		PASS
54	5270	MCS8	11.25	10.92	14.83	25.695	23.98	or 11+10log(B) = 27.48	PASS
62	5310	MCS8	8.46	7.68	11.83	12.876	23.98	or 11+10log(B) = 27.58	PASS
102	5510	MCS8	10.21	9.91	13.81	20.290	23.98	or 11+10log(B) = 27.50	PASS
110	5550	MCS8	10.21	9.92	13.81	20.313	23.98	or 11+10log(B) = 27.48	PASS
151	5755	MCS8	10.24	9.93	13.83	20.408	30		PASS
159	5795	MCS8	10.15	9.94	13.79	20.214	30		PASS

802.11ac_VHT80_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)		RESULT
42	5210	MCS0	13.91	24.585	23.98		PASS
58	5290	MCS0	11.96	15.692	23.98	or 11+10log(B) = 30.29	PASS
106	5530	MCS0	13.92	24.642	23.98	or 11+10log(B) = 30.32	PASS
122	5610	MCS0	13.88	24.416	23.98	or 11+10log(B) = 30.27	PASS
138	5690 (band 3)	MCS0	13.72	23.542	23.98	or 11+10log(B) = 29.97	PASS
138	5690 (band 4)	MCS0	0.99	1.255	23.98	or 11+10log(B) = 17.30	PASS
155	5775	MCS0	13.88	24.416	30		PASS

802.11ac_VHT80_Aux1

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)		RESULT
42	5210	MCS0	13.90	24.529	23.98		PASS
58	5290	MCS0	11.92	15.548	23.98	or 11+10log(B) = 30.31	PASS
106	5530	MCS0	13.89	24.472	23.98	or 11+10log(B) = 30.34	PASS
122	5610	MCS0	13.89	24.472	23.98	or 11+10log(B) = 30.34	PASS
138	5690 (band 3)	MCS0	13.72	23.542	23.98	or 11+10log(B) = 29.98	PASS
138	5690 (band 4)	MCS0	0.99	1.255	23.98	or 11+10log(B) = 17.31	PASS
155	5775	MCS0	13.89	24.472	30		PASS

802.11ac_VHT80_MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)		RESULT
			CH 0	CH 1					
42	5210	MCS8	9.91	10.25	13.85	20.387	23.98		PASS
58	5290	MCS8	8.25	8.08	11.93	13.110	23.98	or 11+10log(B) = 30.29	PASS
106	5530	MCS8	10.16	9.98	13.84	20.329	23.98	or 11+10log(B) = 30.32	PASS
122	5610	MCS8	10.37	9.81	13.87	20.461	23.98	or 11+10log(B) = 30.27	PASS
138	5690 (band 3)	MCS8	10.14	9.62	13.66	19.497	23.98	or 11+11log(B) = 29.97	PASS
138	5690 (band 4)	MCS8	0.23	0.23	4.00	2.109	23.98	or 11+12log(B) = 17.30	PASS
155	5775	MCS8	10.43	9.79	13.89	20.569	30		PASS

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Conducted output power (IC)

802.11a_Main

CH	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
52	5260	14.93	31.096	23.98 or $11+10\log(B) = 23.20$	PASS
60	5300	14.97	31.383	23.98 or $11+10\log(B) = 23.18$	PASS
64	5320	14.94	31.167	23.98 or $11+10\log(B) = 23.20$	PASS
100	5500	13.93	24.700	23.98 or $11+10\log(B) = 23.18$	PASS
116	5580	13.96	24.871	23.98 or $11+10\log(B) = 23.21$	PASS
140	5700	13.92	24.643	23.98 or $11+10\log(B) = 23.19$	PASS
149	5745	13.95	24.814	30	PASS
157	5785	13.96	24.871	30	PASS
165	5825	13.94	24.757	30	PASS

802.11a_Aux1

CH	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
52	5260	14.93	31.096	23.98 or $11+10\log(B) = 23.19$	PASS
60	5300	14.86	30.598	23.98 or $11+10\log(B) = 23.19$	PASS
64	5320	14.91	30.953	23.98 or $11+10\log(B) = 23.20$	PASS
100	5500	13.94	24.757	23.98 or $11+10\log(B) = 23.20$	PASS
116	5580	13.84	24.194	23.98 or $11+10\log(B) = 23.22$	PASS
140	5700	13.92	24.643	23.98 or $11+10\log(B) = 23.18$	PASS
149	5745	13.95	24.814	30	PASS
157	5785	13.85	24.249	30	PASS
165	5825	13.91	24.587	30	PASS

802.11a_MIMO

CH	Frequency (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CH 0	CH 1				
52	5260	11.73	11.59	14.90	29.315	23.98 or $11+10\log(B) = 23.19$	PASS
60	5300	11.8	11.37	14.83	28.844	23.98 or $11+10\log(B) = 23.18$	PASS
64	5320	11.83	11.37	14.84	28.949	23.98 or $11+10\log(B) = 23.20$	PASS
100	5500	10.81	10.48	13.89	23.219	23.98 or $11+10\log(B) = 23.18$	PASS
116	5580	10.84	10.43	13.88	23.175	23.98 or $11+10\log(B) = 23.21$	PASS
140	5700	10.83	10.5	13.91	23.326	23.98 or $11+10\log(B) = 23.18$	PASS
149	5745	10.84	10.46	13.89	23.251	30	PASS
157	5785	10.8	10.45	13.87	23.114	30	PASS
165	5825	10.71	10.51	13.85	23.022	30	PASS

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802.11n_HT20_Main

CH	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
52	5260	14.97	31.375	23.98 or 11+10log(B) = 23.50	PASS
60	5300	14.99	31.520	23.98 or 11+10log(B) = 23.49	PASS
64	5320	14.93	31.087	23.98 or 11+10log(B) = 23.49	PASS
100	5500	13.95	24.807	23.98 or 11+10log(B) = 23.48	PASS
116	5580	13.99	25.037	23.98 or 11+10log(B) = 23.48	PASS
140	5700	13.94	24.750	23.98 or 11+10log(B) = 23.49	PASS
144	5720 (band 3)	12.83	19.19	23.98 or 11+10log(B) = 22.34	PASS
144	5720 (band 4)	1.35	1.36	23.98 or 11+10log(B) = 17.15	PASS
149	5745	13.93	24.693	30	PASS
157	5785	13.93	24.693	30	PASS
165	5825	13.97	24.922	30	PASS

802.11n_HT20_Aux1

CH	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
52	5260	14.88	30.731	23.98 or 11+10log(B) = 23.49	PASS
60	5300	14.92	31.016	23.98 or 11+10log(B) = 23.49	PASS
64	5320	14.86	30.590	23.98 or 11+10log(B) = 23.49	PASS
100	5500	13.87	24.355	23.98 or 11+10log(B) = 23.48	PASS
116	5580	13.90	24.523	23.98 or 11+10log(B) = 23.49	PASS
140	5700	13.86	24.299	23.98 or 11+10log(B) = 23.47	PASS
144	5720 (band 3)	12.77	18.92	23.98 or 11+10log(B) = 22.35	PASS
144	5720 (band 4)	1.15	1.35	23.98 or 11+10log(B) = 17.15	PASS
149	5745	13.81	24.021	30	PASS
157	5785	13.84	24.187	30	PASS
165	5825	13.85	24.243	30	PASS

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802.11n_HT20_MIMO

CH	Frequency (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CH 0	CH 1				
52	5260	11.75	11.62	14.89	29.483	23.98 or $11+10\log(B) = 23.49$	PASS
60	5300	11.93	11.43	14.89	29.495	23.98 or $11+10\log(B) = 23.49$	PASS
64	5320	11.92	11.52	14.93	29.750	23.98 or $11+10\log(B) = 23.49$	PASS
100	5500	10.86	10.48	13.88	23.359	23.98 or $11+10\log(B) = 23.48$	PASS
116	5580	10.79	10.53	13.87	23.293	23.98 or $11+10\log(B) = 23.48$	PASS
140	5700	10.76	10.58	13.88	23.341	23.98 or $11+10\log(B) = 23.47$	PASS
144	5720 (band 3)	9.66	9.45	12.77	18.072	23.98 or $11+10\log(B) = 22.34$	PASS
144	5720 (band 4)	1.15	1.15	4.36	2.606	23.98 or $11+10\log(B) = 17.15$	PASS
149	5745	10.86	10.47	13.88	23.333	30	PASS
157	5785	10.86	10.52	13.90	23.462	30	PASS
165	5825	10.75	10.61	13.89	23.393	30	PASS

802.11ac_VHT20_Main

CH	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
52	5260	14.89	30.797	23.98 or $11+10\log(B) = 23.50$	PASS
60	5300	14.90	30.868	23.98 or $11+10\log(B) = 23.49$	PASS
64	5320	14.83	30.374	23.98 or $11+10\log(B) = 23.49$	PASS
100	5500	13.87	24.350	23.98 or $11+10\log(B) = 23.48$	PASS
116	5580	13.89	24.463	23.98 or $11+10\log(B) = 23.48$	PASS
140	5700	13.87	24.350	23.98 or $11+10\log(B) = 23.49$	PASS
149	5745	13.84	24.183	30	PASS
157	5785	13.82	24.071	30	PASS
165	5825	13.87	24.350	30	PASS

802.11ac_VHT20_Aux1

CH	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
52	5260	14.78	30.026	23.98 or $11+10\log(B) = 23.49$	PASS
60	5300	14.81	30.234	23.98 or $11+10\log(B) = 23.49$	PASS
64	5320	14.78	30.026	23.98 or $11+10\log(B) = 23.49$	PASS
100	5500	13.80	23.961	23.98 or $11+10\log(B) = 23.48$	PASS
116	5580	13.78	23.851	23.98 or $11+10\log(B) = 23.49$	PASS
140	5700	13.75	23.687	23.98 or $11+10\log(B) = 23.47$	PASS
149	5745	13.72	23.524	30	PASS
157	5785	13.73	23.578	30	PASS
165	5825	13.76	23.741	30	PASS

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802.11ac_VHT20_MIMO

CH	Frequency (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CH 0	CH 1				
52	5260	11.66	11.51	14.79	28.813	23.98 or 11+10log(B) = 23.49	PASS
60	5300	11.83	11.33	14.79	28.824	23.98 or 11+10log(B) = 23.49	PASS
64	5320	11.81	11.41	14.82	29.006	23.98 or 11+10log(B) = 23.49	PASS
100	5500	10.76	10.36	13.77	22.777	23.98 or 11+10log(B) = 23.48	PASS
116	5580	10.69	10.45	13.78	22.814	23.98 or 11+10log(B) = 23.48	PASS
140	5700	10.67	10.47	13.78	22.811	23.98 or 11+10log(B) = 23.47	PASS
149	5745	10.78	10.35	13.78	22.807	30	PASS
157	5785	10.76	10.43	13.80	22.953	30	PASS
165	5825	10.66	10.49	13.78	22.836	30	PASS

802.11n_HT40_Main

CH	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
54	5270	14.99	31.552	23.98 or 11+10log(B) = 26.57	PASS
62	5310	11.97	15.741	23.98 or 11+10log(B) = 26.58	PASS
102	5510	13.96	24.890	23.98 or 11+10log(B) = 26.57	PASS
110	5550	13.95	24.833	23.98 or 11+10log(B) = 26.57	PASS
134	5670	13.99	25.063	23.98 or 11+10log(B) = 26.57	PASS
142	5710 (band 3)	13.50	22.39	23.98 or 11+10log(B) = 26.07	PASS
142	5710 (band 4)	1.23	1.33	23.98 or 11+10log(B) = 16.86	PASS
151	5755	13.98	25.005	30	PASS
159	5795	13.95	24.833	30	PASS

802.11n_HT40_Aux1

CH	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
54	5270	14.90	30.905	23.98 or 11+10log(B) = 26.57	PASS
62	5310	11.87	15.383	23.98 or 11+10log(B) = 26.57	PASS
102	5510	13.86	24.324	23.98 or 11+10log(B) = 26.57	PASS
110	5550	13.88	24.436	23.98 or 11+10log(B) = 26.57	PASS
134	5670	13.91	24.605	23.98 or 11+10log(B) = 26.58	PASS
142	5710 (band 3)	13.47	22.23	23.98 or 11+10log(B) = 26.08	PASS
142	5710 (band 4)	1.23	1.33	23.98 or 11+10log(B) = 16.86	PASS
151	5755	13.90	24.549	30	PASS
159	5795	13.84	24.212	30	PASS

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802.11n_HT40_MIMO

CH	Frequency (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CH 0	CH 1				
54	5270	11.32	11.02	14.92	26.199	23.98 or 11+10log(B) = 26.57	PASS
62	5310	8.54	7.77	11.92	13.129	23.98 or 11+10log(B) = 26.57	PASS
102	5510	10.32	10.03	13.93	20.834	23.98 or 11+10log(B) = 26.57	PASS
110	5550	10.31	10.02	13.92	20.786	23.98 or 11+10log(B) = 26.57	PASS
134	5670	10.27	10.06	13.92	20.781	23.98 or 11+10log(B) = 26.57	PASS
142	5710 (band 3)	9.78	9.63	13.45	18.682	23.98 or 11+10log(B) = 26.07	PASS
142	5710 (band 4)	0.49	0.49	4.24	2.239	23.98 or 11+10log(B) = 16.86	PASS
151	5755	10.32	10.04	13.93	20.857	30	PASS
159	5795	10.27	10.02	13.90	20.688	30	PASS

802.11ac_VHT40_Main

CH	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
54	5270	14.87	30.709	23.98 or 11+10log(B) = 26.57	PASS
62	5310	11.86	15.356	23.98 or 11+10log(B) = 26.58	PASS
102	5510	13.87	24.393	23.98 or 11+10log(B) = 26.57	PASS
110	5550	13.86	24.337	23.98 or 11+10log(B) = 26.57	PASS
134	5670	13.88	24.449	23.98 or 11+10log(B) = 26.57	PASS
151	5755	13.89	24.506	30	PASS
159	5795	13.85	24.281	30	PASS

802.11ac_VHT40_Aux1

CH	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
54	5270	14.79	30.148	23.98 or 11+10log(B) = 26.57	PASS
62	5310	11.77	15.041	23.98 or 11+10log(B) = 26.57	PASS
102	5510	13.74	23.674	23.98 or 11+10log(B) = 26.57	PASS
110	5550	13.75	23.728	23.98 or 11+10log(B) = 26.57	PASS
134	5670	13.81	24.058	23.98 or 11+10log(B) = 26.58	PASS
151	5755	13.77	23.838	30	PASS
159	5795	13.75	23.728	30	PASS

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802.11ac_VHT40_MIMO

CH	Frequency (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CH 0	CH 1				
54	5270	11.25	10.92	14.83	25.695	23.98 or 11+10log(B) = 26.57	PASS
62	5310	8.46	7.68	11.83	12.876	23.98 or 11+10log(B) = 26.57	PASS
102	5510	10.21	9.91	13.81	20.290	23.98 or 11+10log(B) = 26.57	PASS
110	5550	10.21	9.92	13.81	20.313	23.98 or 11+10log(B) = 26.57	PASS
134	5670	10.19	9.95	13.81	20.333	23.98 or 11+10log(B) = 26.57	PASS
151	5755	10.24	9.93	13.83	20.408	30	PASS
159	5795	10.15	9.94	13.79	20.214	30	PASS

802.11ac_VHT80_Main

CH	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
58	5290	11.96	15.692	23.98 or 11+10log(B) = 29.75	PASS
106	5530	13.92	24.642	23.98 or 11+10log(B) = 29.75	PASS
138	5690 (band 3)	13.72	23.55	23.98 or 11+12log(B) = 29.52	PASS
138	5690 (band 4)	0.99	1.26	23.98 or 11+13log(B) = 16.84	PASS
155	5775	13.88	24.416	30	PASS

802.11ac_VHT80_Aux1

CH	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
58	5290	11.92	15.548	23.98 or 11+10log(B) = 29.75	PASS
106	5530	13.89	24.472	23.98 or 11+10log(B) = 29.75	PASS
138	5690 (band 3)	13.72	23.55	23.98 or 11+12log(B) = 29.52	PASS
138	5690 (band 4)	0.99	1.26	23.98 or 11+13log(B) = 16.84	PASS
155	5775	13.89	24.472	30	PASS

802.11ac_VHT80_MIMO

CH	Frequency (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CH 0	CH 1				
58	5290	8.25	8.08	11.93	13.110	23.98 or 11+10log(B) = 29.75	PASS
106	5530	10.16	9.98	13.84	20.329	23.98 or 11+10log(B) = 29.75	PASS
138	5690 (band 3)	10.14	9.62	13.66	19.497	23.98 or 11+12log(B) = 29.52	PASS
138	5690 (band 4)	0.23	0.23	4.00	2.109	23.98 or 11+13log(B) = 16.84	PASS
155	5775	10.43	9.79	13.89	20.569	30	PASS

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EIRP
802.11a_Main

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	14.97	1.800	16.77	47.501	23.01 or 10+10log(B)= 22.20	PASS
44	5220	14.96	1.800	16.76	47.391	23.01 or 10+10log(B)= 22.20	PASS
48	5240	14.91	1.800	16.71	46.849	23.01 or 10+10log(B)= 22.20	PASS
52	5260	14.93	1.800	16.73	47.065	30 or 17+10log(B)= 29.20	PASS
60	5300	14.97	1.800	16.77	47.501	30 or 17+10log(B)= 29.18	PASS
64	5320	14.94	1.800	16.74	47.174	30 or 17+10log(B)= 29.20	PASS
100	5500	13.93	1.840	15.77	37.731	30 or 17+10log(B)= 29.18	PASS
116	5580	13.96	1.840	15.80	37.993	30 or 17+10log(B)= 29.21	PASS
140	5700	13.92	1.840	15.76	37.644	30 or 17+10log(B)= 29.19	PASS

802.11a_Aux1

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	14.93	-0.55	14.38	27.397	23.01 or 10+10log(B)= 22.20	PASS
44	5220	14.85	-0.55	14.30	26.897	23.01 or 10+10log(B)= 22.20	PASS
48	5240	14.89	-0.55	14.34	27.146	23.01 or 10+10log(B)= 22.20	PASS
52	5260	14.93	1.34	16.27	42.335	30 or 17+10log(B)= 29.19	PASS
60	5300	14.86	1.34	16.20	41.658	30 or 17+10log(B)= 29.19	PASS
64	5320	14.91	1.34	16.25	42.141	30 or 17+10log(B)= 29.20	PASS
100	5500	13.94	1.46	15.40	34.650	30 or 17+10log(B)= 29.20	PASS
116	5580	13.84	1.46	15.30	33.861	30 or 17+10log(B)= 29.22	PASS
140	5700	13.92	1.46	15.38	34.491	30 or 17+10log(B)= 29.18	PASS

802.11a_MIMO

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	14.86	4.810	19.67	92.754	23.01 or 10+10log(B)= 22.20	PASS
44	5220	14.87	4.810	19.68	92.949	23.01 or 10+10log(B)= 22.20	PASS
48	5240	14.81	4.810	19.62	91.571	23.01 or 10+10log(B)= 22.20	PASS
52	5260	14.90	4.810	19.71	93.495	30 or 17+10log(B)= 29.19	PASS
60	5300	14.83	4.810	19.64	91.994	30 or 17+10log(B)= 29.18	PASS
64	5320	14.84	4.810	19.65	92.329	30 or 17+10log(B)= 29.20	PASS
100	5500	13.89	4.850	18.74	74.738	30 or 17+10log(B)= 29.18	PASS
116	5580	13.88	4.850	18.73	74.596	30 or 17+10log(B)= 29.21	PASS
140	5700	13.91	4.850	18.76	75.083	30 or 17+10log(B)= 29.18	PASS

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802.11n_HT20_Main

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	14.97	1.800	16.77	47.488	23.01 or 10+10log(B)= 22.49	PASS
44	5220	14.98	1.800	16.78	47.597	23.01 or 10+10log(B)= 22.50	PASS
48	5240	14.96	1.800	16.76	47.379	23.01 or 10+10log(B)= 22.48	PASS
52	5260	14.97	1.800	16.77	47.488	30 or 17+10log(B)= 29.50	PASS
60	5300	14.99	1.800	16.79	47.707	30 or 17+10log(B)= 29.49	PASS
64	5320	14.93	1.800	16.73	47.052	30 or 17+10log(B)= 29.49	PASS
100	5500	13.95	1.840	15.79	37.895	30 or 17+10log(B)= 29.48	PASS
116	5580	13.99	1.840	15.83	38.246	30 or 17+10log(B)= 29.48	PASS
140	5700	13.94	1.840	15.78	37.808	30 or 17+10log(B)= 29.49	PASS

802.11n_HT20_Aux1

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	14.88	-0.55	14.33	27.076	23.01 or 10+10log(B)= 22.48	PASS
44	5220	14.87	-0.55	14.32	27.014	23.01 or 10+10log(B)= 22.48	PASS
48	5240	14.84	-0.55	14.29	26.828	23.01 or 10+10log(B)= 22.49	PASS
52	5260	14.88	1.34	16.22	41.839	30 or 17+10log(B)= 29.49	PASS
60	5300	14.92	1.34	16.26	42.226	30 or 17+10log(B)= 29.49	PASS
64	5320	14.86	1.34	16.20	41.647	30 or 17+10log(B)= 29.49	PASS
100	5500	13.87	1.46	15.33	34.086	30 or 17+10log(B)= 29.48	PASS
116	5580	13.90	1.46	15.36	34.323	30 or 17+10log(B)= 29.49	PASS
140	5700	13.86	1.46	15.32	34.008	30 or 17+10log(B)= 29.47	PASS

802.11n_HT20_MIMO

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	14.85	4.810	19.66	92.501	23.01 or 10+10log(B)= 22.48	PASS
44	5220	14.87	4.810	19.68	92.816	23.01 or 10+10log(B)= 22.48	PASS
48	5240	14.89	4.810	19.70	93.243	23.01 or 10+10log(B)= 22.48	PASS
52	5260	14.89	4.810	19.70	93.360	30 or 17+10log(B)= 29.49	PASS
60	5300	14.89	4.810	19.70	93.397	30 or 17+10log(B)= 29.49	PASS
64	5320	14.93	4.810	19.74	94.205	30 or 17+10log(B)= 29.49	PASS
100	5500	13.88	4.850	18.73	74.650	30 or 17+10log(B)= 29.48	PASS
116	5580	13.87	4.850	18.72	74.440	30 or 17+10log(B)= 29.48	PASS
140	5700	13.88	4.850	18.73	74.594	30 or 17+10log(B)= 29.47	PASS

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802.11n_HT40_Main

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)		RESULT
38	5190	14.97	1.800	16.77	47.536	23.01	or 10+10log(B)= 25.58	PASS
46	5230	14.94	1.800	16.74	47.209	23.01	or 10+10log(B)= 25.57	PASS
54	5270	14.99	1.800	16.79	47.756	30	or 17+10log(B)= 32.57	PASS
62	5310	11.97	1.800	13.77	23.825	30	or 17+10log(B)= 32.58	PASS
102	5510	13.96	1.840	15.80	38.021	30	or 17+10log(B)= 32.57	PASS
110	5550	13.95	1.840	15.79	37.934	30	or 17+10log(B)= 32.57	PASS
134	5670	13.99	1.840	15.83	38.285	30	or 17+10log(B)= 32.57	PASS

802.11n_HT40_Aux1

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)		RESULT
38	5190	14.87	-0.55	14.32	27.041	23.01	or 10+10log(B)= 25.58	PASS
46	5230	14.83	-0.55	14.28	26.793	23.01	or 10+10log(B)= 25.57	PASS
54	5270	14.90	1.34	16.24	42.075	30	or 17+10log(B)= 32.57	PASS
62	5310	11.87	1.34	13.21	20.942	30	or 17+10log(B)= 32.57	PASS
102	5510	13.86	1.46	15.32	34.043	30	or 17+10log(B)= 32.57	PASS
110	5550	13.88	1.46	15.34	34.200	30	or 17+10log(B)= 32.57	PASS
134	5670	13.91	1.46	15.37	34.437	30	or 17+10log(B)= 32.58	PASS

802.11n_HT40_MIMO

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)		RESULT
38	5190	14.94	4.810	19.75	94.315	23.01	or 10+10log(B)= 25.58	PASS
46	5230	14.92	4.810	19.73	93.884	23.01	or 10+10log(B)= 25.57	PASS
54	5270	14.92	4.810	19.73	94.041	30	or 17+10log(B)= 32.57	PASS
62	5310	11.92	4.810	16.73	47.126	30	or 17+10log(B)= 32.57	PASS
102	5510	13.93	4.850	18.78	75.474	30	or 17+10log(B)= 32.57	PASS
110	5550	13.92	4.850	18.77	75.301	30	or 17+10log(B)= 32.57	PASS
134	5670	13.92	4.850	18.77	75.281	30	or 17+10log(B)= 32.57	PASS

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802.11ac_VHT80_Main

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)	RESULT
42	5210	13.91	1.800	15.71	37.211	23.01 or $10+10\log(B)=28.75$	PASS
58	5290	11.96	1.800	13.76	23.750	30 or $17+10\log(B)=35.75$	PASS
106	5530	13.92	1.840	15.76	37.642	30 or $17+10\log(B)=35.75$	PASS

802.11ac_VHT80_Aux1

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)	RESULT
42	5210	13.90	-0.55	13.35	21.611	23.01 or $10+10\log(B)=28.75$	PASS
58	5290	11.92	1.34	13.26	21.168	30 or $17+10\log(B)=35.75$	PASS
106	5530	13.89	1.46	15.35	34.251	30 or $17+10\log(B)=35.75$	PASS

802.11ac_VHT80_MIMO

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)	RESULT
42	5210	13.85	4.810	18.66	73.457	23.01 or $10+10\log(B)=28.75$	PASS
58	5290	11.93	4.810	16.74	47.237	30 or $17+10\log(B)=35.75$	PASS
106	5530	13.84	4.850	18.69	73.926	30 or $17+10\log(B)=35.75$	PASS

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10 PEAK POWER SPECTRAL DENSITY

10.1 Standard Applicable

FCC

OPERZTION Band	EUT CATEGORY		LIMIT
U-NII-1		Access Point (Mater device)	17dBm/ MHz
		Fixed point-to-point Acss Ponit	
	√	Mobile and portable clinet device	11dBm/ MHz
U-NII-2A	√		11dBm/ MHz
U-NII-2C	√		11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

IC

OPERZTION FREQUENCY BAND	LIMIT
5150~5250 MHz	EIRP spectral density 10 dBm / MHz
5250~5350 MHz	11dBm / MHz
5470-5600 MHz and 5650-5725 MHz	11dBm / MHz
5725~5850 MHz	30dBm / 500 kHz

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note: 5.15-5.25G

Antenna1 Gain: 1.8 dBi

Antenna2 Gain: -0.55 dBi

Number Antenna: 2 pcs

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi) = 4.81 dBi

Limit: 11dBm

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10.2 Measurement Procedure

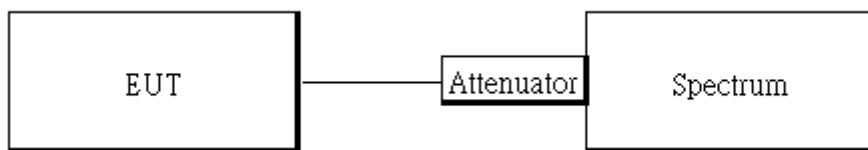
1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
4. **For U-NII1, U-NII-2A, U-NII-2C Band:**
Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
For U-NII-3 Band:
Set RBW=500 kHz, VBW≥ 3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
5. Use the cursor on spectrum to peak search the highest level of trace
6. Record the max. reading and add 10 log(1/duty cycle).
7. Repeat above procedures until all default test channel (low, middle, and high) was complete.

Note: For the test of PSD at MIMO mode, the highest emission of worst case employing Measure and add 10 log (N) technical is reported on this report after the comparison between Main Antenna at single transmitting mode and Aux that yields the higher value. The MIMO transmitting mode produces higher value of outcome

10.3 Measurement Equipment Used

SGS Conducted Room					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/20/2017	06/19/2018
Coaxial Cable 30cm	WOKEN	00100A1F1A195C	RF01	12/24/2017	12/23/2018
DC Block	PASTERNAK	PE8210	RF29	12/24/2017	12/23/2018
Attenuator	WOKEN	218FS-10	RF23	12/24/2017	12/23/2018
DC Power Supply	Agilent	E3640A	MY53140006	05/02/2017	05/01/2018

10.4 Test Set-up



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10.5 Measurement Result

POWER DENSITY 802.11a MODE					
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5180	-0.42	0.23	-0.19	11	-11.19
5220	0.11	0.23	0.34	11	-10.66
5240	1.90	0.23	2.13	11	-8.87
5260	0.54	0.23	0.77	11	-10.23
5300	1.05	0.23	1.28	11	-9.72
5320	2.11	0.23	2.34	11	-8.66
5500	1.60	0.23	1.83	11	-9.17
5580	-0.49	0.23	-0.26	11	-11.26
5700	-1.30	0.23	-1.07	11	-12.07
5745	5.05	0.23	5.05	30	-24.95
5785	4.93	0.23	4.93	30	-25.07
5825	5.22	0.23	5.22	30	-24.78

POWER DENSITY 802.11n HT20 MODE					
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5180	-1.89	0.20	-1.69	11	-12.69
5220	-0.10	0.20	0.10	11	-10.90
5240	0.51	0.20	0.71	11	-10.29
5260	1.69	0.20	1.89	11	-9.11
5300	-0.20	0.20	0.00	11	-11.00
5320	1.55	0.20	1.75	11	-9.25
5500	1.17	0.20	1.37	11	-9.63
5580	-0.80	0.20	-0.60	11	-11.60
5700	-2.16	0.20	-1.96	11	-12.96
5720 (band 3)	9.74	0.20	9.94	11	-1.06
5720 (band 4)	8.18	0.20	8.38	11	-2.62
5745	4.54	0.20	4.54	30	-25.46
5785	3.79	0.20	3.79	30	-26.21
5825	4.84	0.20	4.84	30	-25.16

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POWER DENSITY 802.11n HT40 MODE					
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5190	-8.82	0.74	-8.08	11	-19.08
5230	-8.4	0.74	-7.66	11	-18.66
5270	-9.46	0.74	-8.72	11	-19.72
5310	-9.84	0.74	-9.10	11	-20.10
5510	-7.23	0.74	-6.49	11	-17.49
5550	-8.25	0.74	-7.51	11	-18.51
5670	-9.63	0.74	-8.89	11	-19.89
5710 (band 3)	6.19	0.74	6.93	11	-4.07
5710 (band 4)	1.37	0.73	2.10	11	-8.90
5755	2.99	0.74	2.99	30	-27.01
5795	2.07	0.74	2.07	30	-27.93

POWER DENSITY 802.11ac VHT80 MODE					
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5210	-10.18	0.76	-9.42	11	-20.42
5290	-13.02	0.76	-12.26	11	-23.26
5530	-10.17	0.76	-9.41	11	-20.41
5610	-10.01	0.76	-9.25	11	-20.25
5690 (band 3)	3.92	0.76	4.67	11	-6.33
5690 (band 4)	-1.79	0.00	-1.79	11	-12.79
5775	0.09	0.76	0.09	30	-29.91

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EIRP spectral density 802.11a MODE					
Freq. (MHz)	PPSD (dBm)	Ant. Gain (dBi)	EIRP SD (dBm)	Limit (dBm)	Margin (dB)
5180	-0.19	1.80	1.61	10	-10.19
5220	0.34	1.80	2.14	10	-9.66
5240	2.13	1.80	3.93	10	-7.87

EIRP spectral density 802.11n HT20 MODE						EIRP spectral density 802.11ac VHT20 MODE					
Freq. (MHz)	PPSD (dBm)	Ant. Gain (dBi)	EIRP SD (dBm)	Limit (dBm)	Margin (dB)	Freq. (MHz)	PPSD (dBm)	Ant. Gain (dBi)	EIRP SD (dBm)	Limit (dBm)	Margin (dB)
5180	-1.69	1.80	0.11	10	-11.69	5180	0.20	1.80	2.00	10	-9.80
5220	0.10	1.80	1.90	10	-9.90	5220	0.20	1.80	2.00	10	-9.80
5240	0.71	1.80	2.51	10	-9.29	5240	0.20	1.80	2.00	10	-9.80

EIRP spectral density 802.11n HT40 MODE						EIRP spectral density 802.11ac VHT40 MODE					
Freq. (MHz)	PPSD (dBm)	Ant. Gain (dBi)	EIRP SD (dBm)	Limit (dBm)	Margin (dB)	Freq. (MHz)	PPSD (dBm)	Ant. Gain (dBi)	EIRP SD (dBm)	Limit (dBm)	Margin (dB)
5180	-8.08	1.80	-6.28	10	-18.08	5190	0.73	1.80	2.53	10	-9.27
5220	-7.66	1.80	-5.86	10	-17.66	5230	0.73	1.80	2.53	10	-9.27

EIRP spectral density 802.11ac VHT80 MODE					
Freq. (MHz)	PPSD (dBm)	Ant. Gain (dBi)	EIRP SD (dBm)	Limit (dBm)	Margin (dB)
5210	-9.42	1.80	-7.62	10	-19.42

Note:

SISO offset= 11.5 dB
 MIMO offset= 14.5 dB

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802.11a_20MHz_5180MHz



802.11a_20MHz_5260MHz



802.11a_20MHz_5220MHz



802.11a_20MHz_5300MHz



802.11a_20MHz_5240MHz



802.11a_20MHz_5320MHz



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802.11a_20MHz_5500MHz



802.11a_20MHz_5745MHz



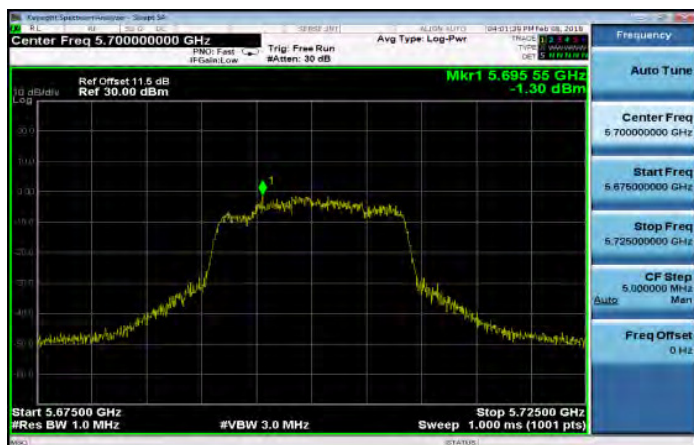
802.11a_20MHz_5580MHz



802.11a_20MHz_5785MHz



802.11a_20MHz_5700MHz



802.11a_20MHz_5825MHz



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802.11n_20MHz_5180MHz



802.11n_20MHz_5260MHz



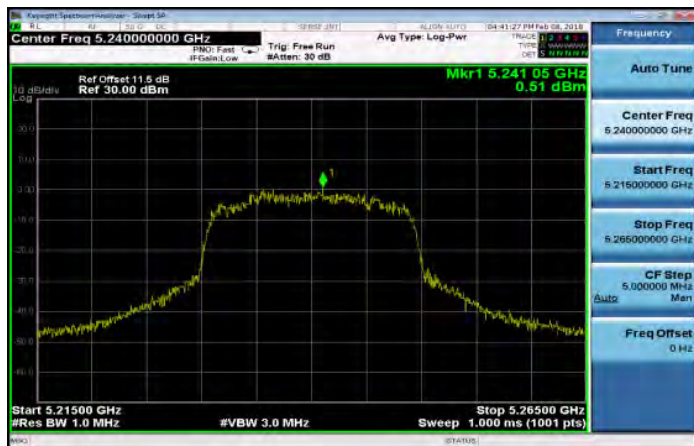
802.11n_20MHz_5220MHz



802.11n_20MHz_5300MHz



802.11n_20MHz_5240MHz



802.11n_20MHz_5320MHz



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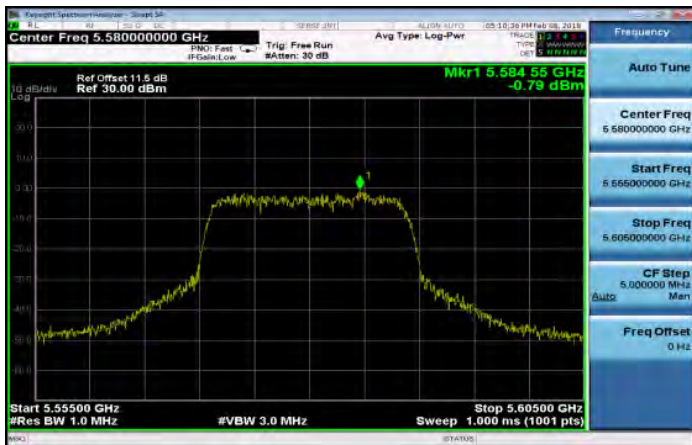
802.11n_20MHz_5500MHz



802.11n_20MHz_5720MHz



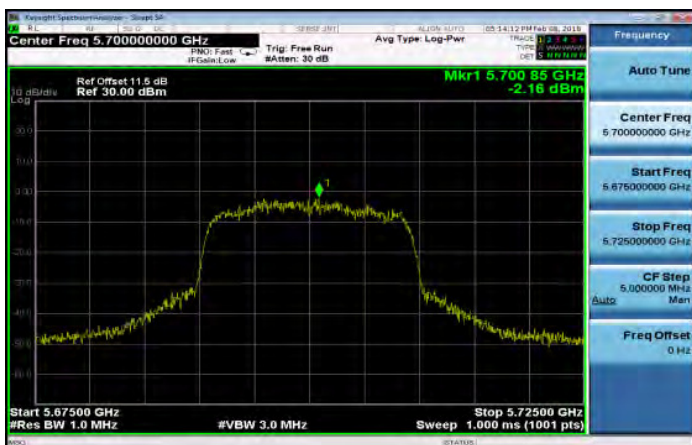
802.11n_20MHz_5580MHz



802.11n_20MHz_5745MHz



802.11n_20MHz_5700MHz



802.11n_20MHz_5785MHz



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802.11n_20MHz_5825MHz



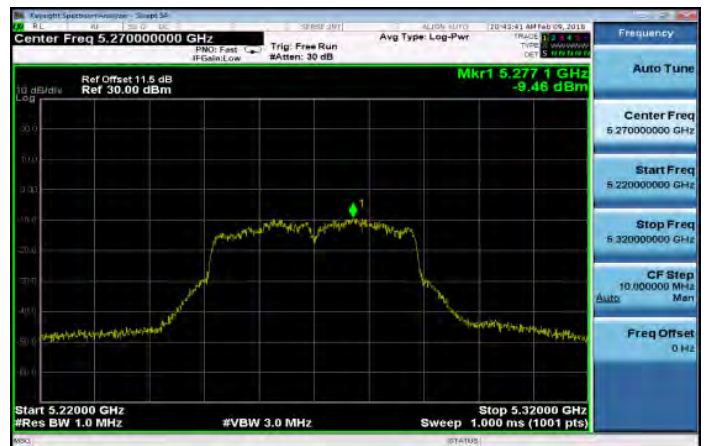
802.11n_40MHz_5190MHz



802.11n_40MHz_5230MHz



802.11n_40MHz_5270MHz



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