

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

OF

Product Name: WLAN/BT USB Module
Brand Name: WIESON
FCC Model No.: WM2020CU, WM2020CU-XX (X=0~9 or A~Z)
IC Model No.: WM2020CU
Model Difference: Different models for market segmentation.
FCC ID: 2AAK6WM2020CU
IC: 20126-WM2020CU
Report No.: ER/2017/20142
Issue Date: Mar. 29, 2017
FCC Rule Part: §15.407
IC Rule Part: RSS-247 issue 2 Feb. 2017
Prepared for: WIESON INTERNATIONAL CO., LTD.
6F, No.276-1, Sec.1, Datong Rd., Xizhi Dist.,
New Taipei City 221, Taiwan, R.O.C.
Prepared by: SGS Taiwan Ltd.
Electronics & Communication Laboratory
No.134, Wu Kung Road, New Taipei Industrial
Park, Wuku District, New Taipei City, Taiwan
24803



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t (886-2) 2299-3279

f (886-2) 2298-0488

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VERIFICATION OF COMPLIANCE

Applicant for: WIESON INTERNATIONAL CO., LTD.
6F, No.276-1, Sec.1, Datong Rd., Xizhi Dist., New Taipei City 221,
Taiwan, R.O.C.

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Brand Name: WIESON

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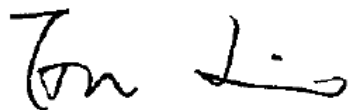
Date of Test: Mar. 09, 2017 ~ Mar. 22, 2017

Date of EUT Received: Mar. 09, 2017

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.

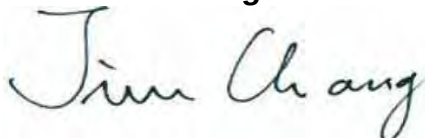
The test results of this report relate only to the tested sample identified in this report.

Test By:**Date:**

Mar. 29, 2017

Tin Lin / Engineer**Prepared By:****Date:**

Mar. 29, 2017

Violetta Tang / Clerk**Approved By:****Date:**

Mar. 29, 2017

Jim Chang / Asst. Manager

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t (886-2) 2299-3279

f (886-2) 2298-0488

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Revision History

Report Number	Revision	Description	Issue Date
ER/2017/20142	Rev.00	Initial creation of document	Mar. 29, 2017

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1. GENERAL INFORMATION

1.1 Product Description

General:

Product Name:	WLAN/BT USB Module
Brand Name:	WIESON
FCC Model No.:	WM2020CU, WM2020CU-XX (X=0~9 or A~Z)
IC Model No.:	WM2020CU
Model Difference:	Different models for market segmentation.
Product SW/HW version:	v1.0 / v1.0
Radio SW/HW version:	N/A / N/A
Test SW Version:	N/A
RF power setting in TEST SW:	N/A
Power Supply:	3.3V from DC Power Supply

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WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Avg.) / (EIRP)	Type of Emission	Modulation Technology
11a	5150~5250	4	12.64dBm / 17.91dBm	16M3D1D	OFDM
	5250~5350	4	12.65dBm / 17.92dBm	16M3D1D	
	5470~5725	12	12.55dBm / 17.82dBm	16M4D1D	
	5725~5850	5	12.58dBm	16M2D1D	
11n / ac_20M	HT20 / VHT20 5150~5250	4	HT: 11.92dBm / 20.20dBm (Worst Case)	17M5D1D	OFDM
	HT20 / VHT20 5250~5350	4	HT: 11.92dBm / 20.20dBm (Worst Case)	17M5D1D	
	HT20 / VHT20 5470~5725	12	HT: 11.83dBm / 20.11dBm (Worst Case)	17M4D1D	
	HT20 / VHT20 5725~5850	5	HT: 11.76dBm (Worst Case)	17M4D1D	
11n / ac_40M	HT40 / VHT40 5150~5250	2	HT: 11.96dBm / 20.24dBm (Worst Case)	36M1D1D	OFDM
	HT40 / VHT40 5250~5350	2	HT: 11.86dBm / 20.14dBm (Worst Case)	36M1D1D	
	HT40 / VHT40 5470~5725	5	HT: 11.99dBm / 20.27dBm (Worst Case)	36M3D1D	
	HT40 / VHT40 5725~5850	2	HT: 11.71dBm (Worst Case)	36M3D1D	
11ac_80M	VHT80 5150~5250	1	9.68dBm / 17.96dBm	75M5D1D	OFDM
	VHT80 5250~5350	1	9.93dBm / 18.21dBm	75M1D1D	
	VHT80 5470~5725	2	9.94dBm / 17.96dBm	74M3D1D	
	VHT80 5725~5850	1	9.91dBm	75M8D1D	

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Antenna Designation:	1. Dipole Antenna, Part No.: N/A Supplier: WIESON INTERNATIONAL CO., LTD. Antenna Gain: 1.75dBi (5150~5250MHz) Antenna Gain: 2.13dBi (5250~5350MHz) Antenna Gain: 2.13dBi (5470~5725MHz) Antenna Gain: 2.13dBi (5725~5850MHz) 2. PCB Antenna, Part No.: N/A, Supplier: PEGATRON Antenna Gain: 2.67dBi (5150~5250MHz) Antenna Gain: 2.96dBi (5250~5350MHz) Antenna Gain: 3.41dBi (5470~5725MHz) Antenna Gain: 3.75dBi (5725~5850MHz) 3. PCB Antenna, Part No.: 290-30552 / 290-30553 Supplier: PEGATRON ANT1 / ANT2 Gain: 3.89dBi / 2.62dBi (5150~5250MHz) ANT1 / ANT2 Gain: 2.94dBi / 2.62dBi (5250~5350MHz) ANT1 / ANT2 Gain: 2.21dBi / 2.62dBi (5470~5725MHz) ANT1 / ANT2 Gain: 3.89dBi / 2.62dBi (5725~5850MHz) 4. PCB Antenna, Antenna Gain: 5.16dBi (5150~5850MHz) Part No.: ALX17P-221XX0-01, Supplier: LYNwave 5. PCB Antenna: ANT1 Gain: 5.27dBi / ANT2 Gain: 5.09dBi (5150~5850MHz) Part No.: ALX17P-221XX1-A, Supplier: LYNwave
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 – 300Mbps 802.11 ac_20MHz: 6.5 – 144.4Mbps 802.11 ac_40MHz: 13.5 – 300Mbps 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

FCC KDB 662911 D01 Multiple Transmitter Output

FCC KDB 644545 D03 Guidance for IEEE 802.11ac v01

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.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 (TAF code 0513)

FCC Registration Numbers are: 509634

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 placed on a 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 30 MHz. 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 placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. 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.

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 2.2dB, and 10dB attenuator (SISO) and cable loss 5.2dB, and 10dB attenuator (MIMO).

SISO mode offset = RF cable loss (dB)+ attenuation factor(dB)=12.2(dB)

MIMO mode offset = RF cable loss (dB)+ attenuation factor(dB)+ 10 log(N_{ANT}) dB
=15.2(dB)

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2.5 Configuration of Tested System

Fig. 2-1 Radiated & AC Power Line & Conducted (Antenna Port) Emission

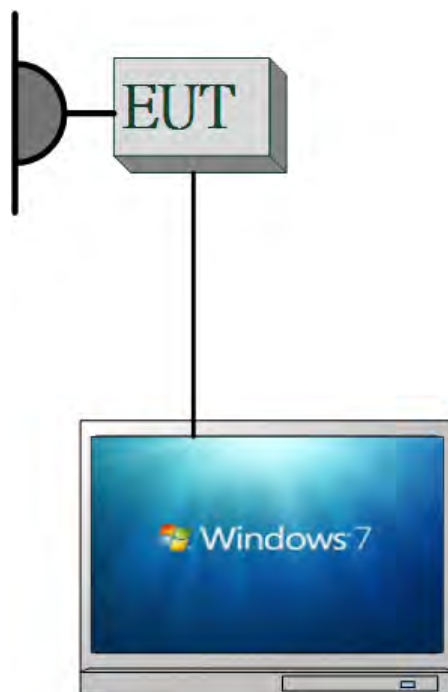


Table 2-1 Equipment Used in Tested System

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
2.	Notebook	Lenovo	L420	LR-7HXZA	Shielded	Un-shielded

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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)	--	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		

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		

2 channels are provided for 802.11ac_VHT80

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
106	5530 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

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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. Therefore, 802.11n as the mode of 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
802.11ac_VHT80	5210	42	42	OFDM	MCS8	MIMO
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	MAIN
802.11ac_VHT80	5290	58	58	OFDM	MCS8	MIMO
802.11a	5500~5700	100 to 140	100,116,140	OFDM	6	MAIN
802.11ac_VHT80	5530~5610	106 to 122	106,122	OFDM	MCS8	MIMO
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	MAIN
802.11ac_VHT80	5775	155	155	OFDM	MCS8	MIMO
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	MIMO
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS8	MIMO
802.11ac_VHT80	5210	42	42	OFDM	MCS8	MIMO
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	MAIN
802.11n_HT20				OFDM	MCS8	MIMO
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS8	MIMO
802.11ac_VHT80	5290	58	58	OFDM	MCS8	MIMO

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MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5500~5700	100 to 140	100,116,140	OFDM	6	MAIN
802.11n_HT20				OFDM	MCS8	MIMO
802.11n_HT40	5510~5670	102 to 134	102,110,134	OFDM	MCS8	MIMO
802.11ac_VHT80	5530~5610	106 to 122	106,122	OFDM	MCS8	MIMO
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	MAIN
802.11n_HT20				OFDM	MCS8	MIMO
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS8	MIMO
802.11ac_VHT80	5775	155	155	OFDM	MCS8	MIMO

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.

Pre-scanned was done on Dipole antenna & PCB antenna set 290-30552 / 290-30553, ALX17P-221XX0-01 and ALX17P-221XX1-A. The Dipole & PCB antenna ALX17P-221XX1-A results higher emission at 5GHz. Therefore, the completed set of measurement was done on both antennas to be presented on this test report.

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

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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
802.11ac_HT20				OFDM	MCS8	MIMO
802.11ac_HT40	5190~5230	38 to 46	38,46	OFDM	MCS8	MIMO
802.11ac_VHT80	5210	42	42	OFDM	MCS8	MIMO
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	MAIN
802.11ac_HT20				OFDM	MCS8	MIMO
802.11ac_HT40	5270~5310	54 to 62	54,62	OFDM	MCS8	MIMO
802.11ac_VHT80	5290	58	58	OFDM	MCS8	MIMO
802.11a	5500~5700	100 to 140	100,116,140	OFDM	6	MAIN
802.11ac_HT20				OFDM	MCS8	MIMO
802.11ac_HT40	5510~5670	102 to 134	102,110,134	OFDM	MCS8	MIMO
802.11ac_VHT80	5530~5610	106 to 122	106,122	OFDM	MCS8	MIMO
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	MAIN
802.11ac_HT20				OFDM	MCS8	MIMO
802.11ac_HT40	5755~5795	151 to 159	151,159	OFDM	MCS8	MIMO
802.11ac_VHT80	5775	155	155	OFDM	MCS8	MIMO

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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	ESC17	100760	05/10/2016	05/09/2017
LISN	SCHWARZBECK	NSLK 8127	8127-649	05/16/2016	05/15/2017
LISN	MESS TEC	FCC-LISN-50/250 -25-2-01	4034	05/16/2016	05/15/2017
Coaxial Cables	N/A	WK CE Cable	N/A	11/26/2016	11/25/2017

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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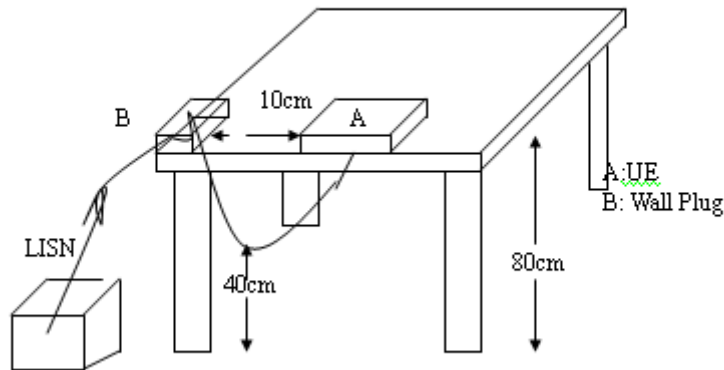
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6.4. Test SET-UP



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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AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation mode			Test By:	Curry
Temperature:	26	Humidity:	60 %	Phase:	L1 / N

Site: ConductionRoom Phase: **L1** Temperature: 26 °C
 Limit: FCC Class B Conduction(QP) Power: AC 120V/60Hz Humidity: 60%
 Mode: Operationmode
 Note:

ConductedEmission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1500	49.44	0.16	49.60	66.00	-16.40	peak	
2		0.2200	39.09	0.16	39.25	62.82	-23.57	peak	
3		0.5700	32.62	0.17	32.79	56.00	-23.21	peak	
4		2.8200	34.01	0.23	34.24	56.00	-21.76	peak	
5		6.7200	32.30	0.31	32.61	60.00	-27.39	peak	
6		17.6800	42.32	0.42	42.74	60.00	-17.26	peak	

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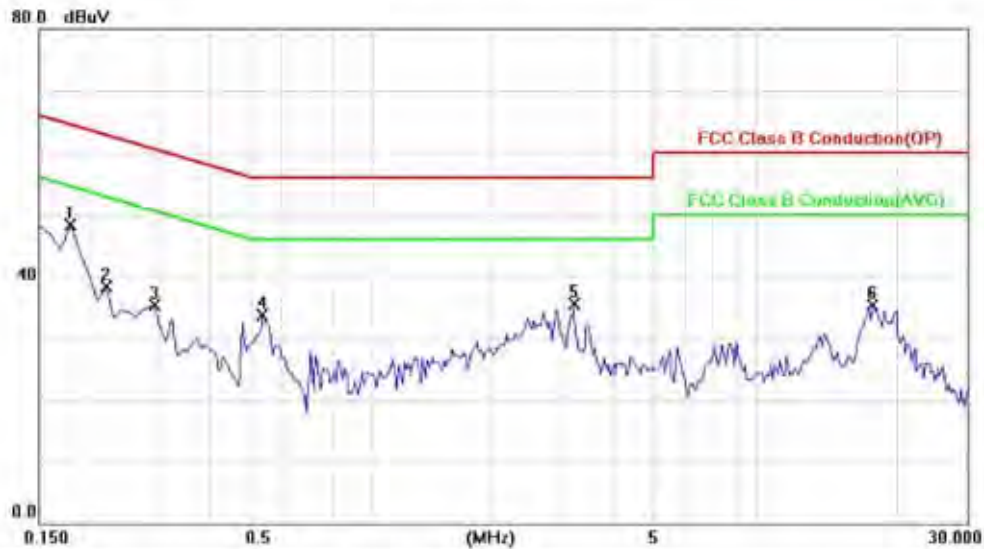
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Site: ConductionRoom Phase: **N** Temperature: 25 °C
 Limit: FCC Class B Conduction(OP) Power: AC 120V/60Hz Humidity: 60%
 Mode: Operationmode
 Note:

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1800	48.07	0.19	48.26	64.49	-16.23	peak	
2		0.2200	38.05	0.19	38.24	62.82	-24.58	peak	
3		0.2900	35.07	0.20	35.27	60.52	-25.25	peak	
4		0.5400	33.57	0.19	33.76	56.00	-22.24	peak	
5		3.1800	35.13	0.28	35.41	56.00	-20.59	peak	
6		17.5200	34.68	0.53	35.21	60.00	-24.79	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) = $10 \cdot \log (1/\text{Duty Cycle})$
802.11a	96.17	0.17
802.11n_20	92.44	0.34
802.11n_40	92.15	0.36
802.11ac_80	77.53	1.11

$$\text{Duty Cycle Factor: } 10 \cdot \log(1/0.9617) = 0.17$$

$$\text{Duty Cycle Factor: } 10 \cdot \log(1/0.9244) = 0.34$$

$$\text{Duty Cycle Factor: } 10 \cdot \log(1/0.9215) = 0.36$$

$$\text{Duty Cycle Factor: } 10 \cdot \log(1/0.7753) = 1.11$$

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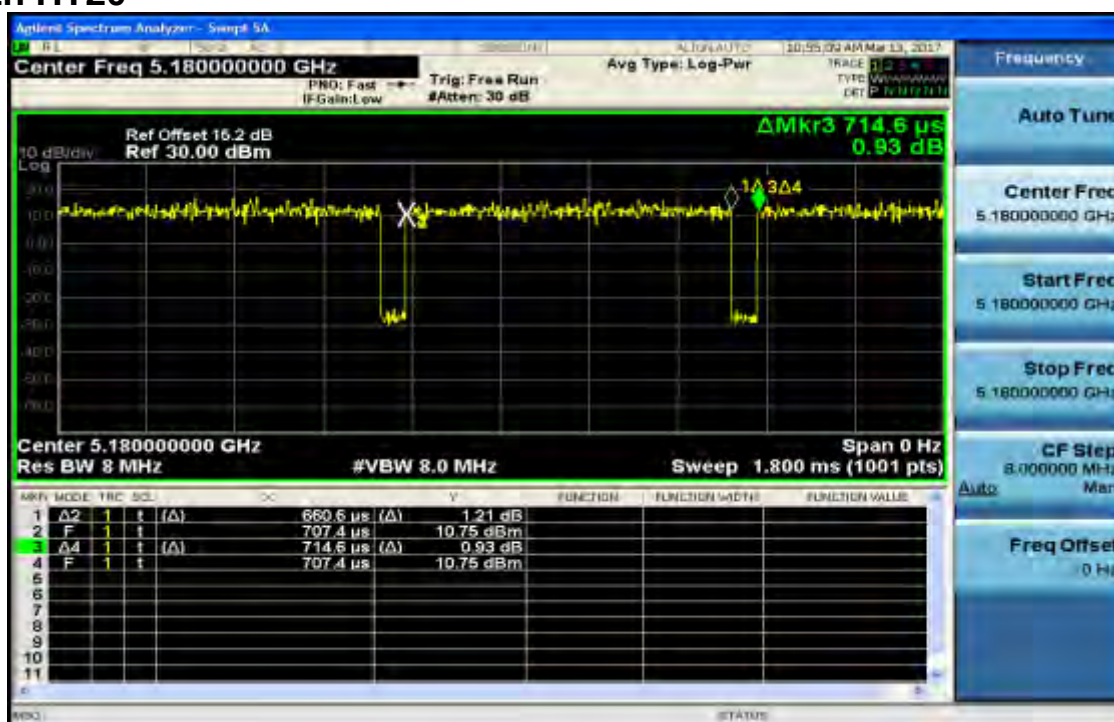
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DUTY CYCLE TEST SIGNAL Measurement Result

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 v01r01.
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.

Note: For the overlapped channels between U-NII-2C and U-NII-3 bands, and according to FCC KDB 644545 D03, the boundary frequency between the bands is used as one edge for defining the portion of the 26dB BW that falls within a particular U-NII band. This rule is only applicable for the 26dB BW and for those channels marked as overlapped.

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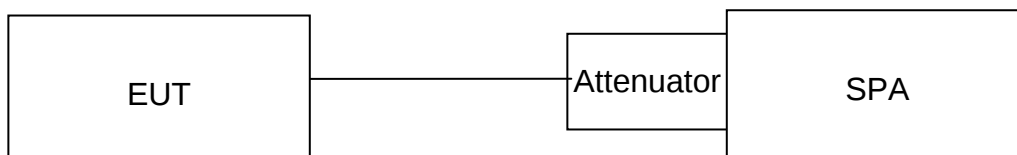
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8.3 Measurement Equipment Used

SGS Conducted Room					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2017	02/25/2018
DC Block	Mini-Circuits	BLK-18-S+	1	01/05/2017	01/04/2018
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/05/2017	01/04/2018
Attenuator	Mini-Circuit	BW-S10W2+	2	01/05/2017	01/04/2018
Splitter	Agilent	11636B	N/A	01/05/2017	01/04/2018
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017
Temperature Chamber	TERCHY	MHG-120LF	911009	05/17/2016	05/16/2017

8.4 Test Set-up



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8.5 Measurement Result

26dB Bandwidth

802.11a_Main

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	16.54	12.186
5220	16.54	12.186
5240	16.55	12.187
5260	16.54	12.185
5300	16.54	12.186
5320	16.55	12.187
5500	16.54	12.184
5580	16.53	12.184
5700	16.54	12.184

802.11n_HT20_Main

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	17.66	12.469
5220	17.63	12.462
5240	17.64	12.465
5260	17.65	12.467
5300	17.64	12.465
5320	17.65	12.468
5500	17.65	12.468
5580	17.64	12.465
5700	17.65	12.467

802.11n_HT20_Aux1

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	17.60	12.454
5220	17.65	12.466
5240	17.63	12.462
5260	17.64	12.464
5300	17.63	12.462
5320	17.65	12.466
5500	17.61	12.457
5580	17.62	12.461
5700	17.63	12.462

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802.11n_HT40_Main

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	36.13	15.578
5230	36.39	15.610
5270	36.40	15.610
5310	36.36	15.607
5510	36.38	15.609
5550	36.38	15.608
5670	36.37	15.608

802.11n_HT40_Aux1

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	36.15	15.581
5230	36.15	15.581
5270	36.18	15.584
5310	36.17	15.583
5510	36.15	15.581
5550	36.15	15.581
5670	36.17	15.583

802.11ac_VHT80_Main

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	75.53	18.781
5290	75.51	18.780
5530	75.53	18.781
5610	75.49	18.779

802.11ac_VHT80_Aux1

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	75.40	18.774
5290	75.48	18.778
5530	75.38	18.773
5610	75.44	18.776

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99% Bandwidth

802.11a_Main

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5180	16.327	12.129
5220	16.229	12.103
5240	16.276	12.115
5260	16.301	12.122
5300	16.233	12.104
5320	15.972	12.034
5500	16.374	12.142
5580	16.071	12.060
5700	16.133	12.077

802.11n_HT20_Main

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5180	16.705	12.228
5220	17.259	12.370
5240	17.226	12.362
5260	17.134	12.339
5300	17.018	12.309
5320	17.529	12.438
5500	17.235	12.364
5580	17.073	12.323
5700	17.300	12.380

802.11n_HT20_Aux1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5180	17.239	12.365
5220	17.063	12.321
5240	17.450	12.418
5260	17.411	12.408
5300	16.809	12.255
5320	17.494	12.429
5500	17.383	12.401
5580	17.329	12.388
5700	17.325	12.387

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802.11n_HT40_Main

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5190	36.074	15.572
5230	35.535	15.507
5270	35.828	15.542
5310	34.989	15.439
5510	35.690	15.525
5550	36.307	15.600
5670	36.011	15.564

802.11n_HT40_Aux1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5190	35.957	15.558
5230	35.291	15.477
5270	35.129	15.457
5310	36.062	15.570
5510	36.102	15.575
5550	34.862	15.424
5670	34.956	15.435

802.11ac_VHT80_Main

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5210	74.345	18.713
5290	72.750	18.618
5530	74.319	18.711

802.11ac_VHT80_Aux1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5210	75.468	18.778
5290	75.073	18.755
5530	74.304	18.710

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6dB Bandwidth (5725 MHz~ 5850 MHz) measure with Peak detector for FCC

802.11a_Main

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	16.54	12.185
5785	16.51	12.178
5825	16.54	12.185

802.11n_HT20_Main

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	17.68	12.475
5785	17.67	12.472
5825	17.69	12.478

802.11n_HT20_Aux1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	17.66	12.470
5785	17.67	12.472
5825	17.65	12.467

802.11n_HT40_Main

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	36.50	15.623
5795	36.51	15.624

802.11n_HT40_Aux1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	36.41	15.612
5795	36.41	15.612

802.11ac_VHT80_Main

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5775	76.39	18.830

802.11ac_VHT80_Aux1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5775	76.06	18.812

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6dB Bandwidth (5725 MHz~ 5850 MHz) measure with Average detector for IC

802.11a_Main

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	16.17	12.087
5785	16.19	12.093
5825	16.18	12.090

802.11n_HT20_Main

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	17.31	12.382
5785	16.16	12.084
5825	17.36	12.396

802.11n_HT20_Aux1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	16.92	12.283
5785	17.31	12.383
5825	17.18	12.349

802.11n_HT40_Main

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	36.27	15.596
5795	36.18	15.585

802.11n_HT40_Aux1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	35.88	15.548
5795	34.92	15.430

802.11ac_VHT80_Main

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5775	75.74	18.793

802.11ac_VHT80_Aux1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5775	74.33	18.712

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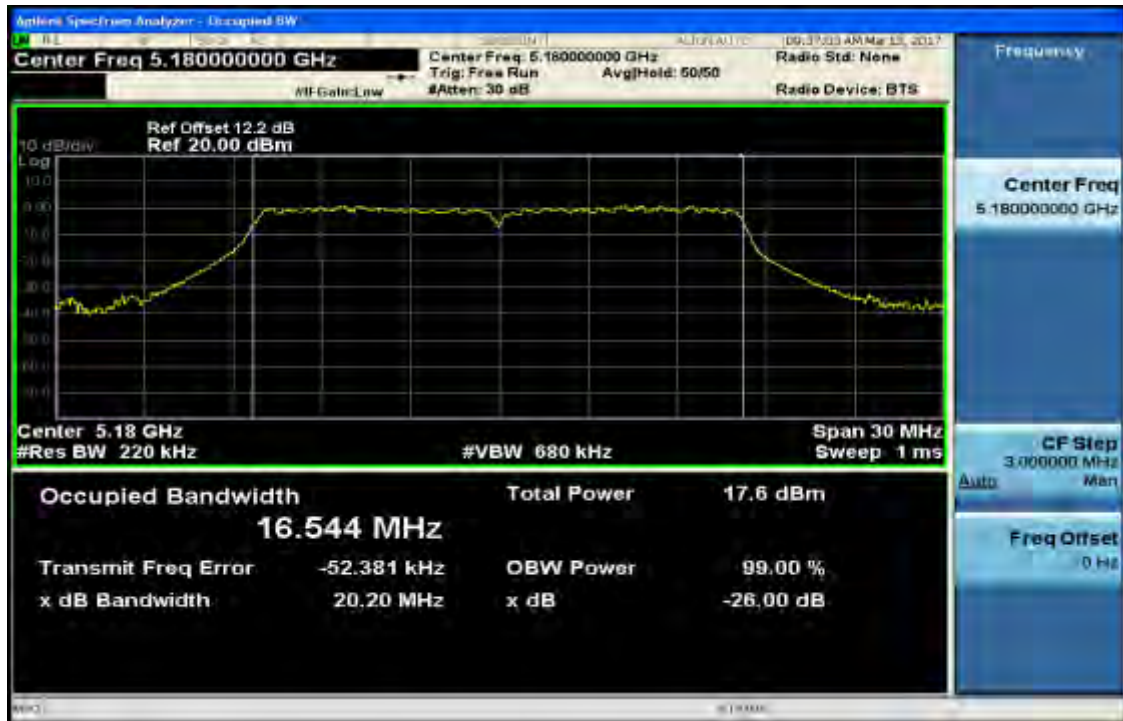
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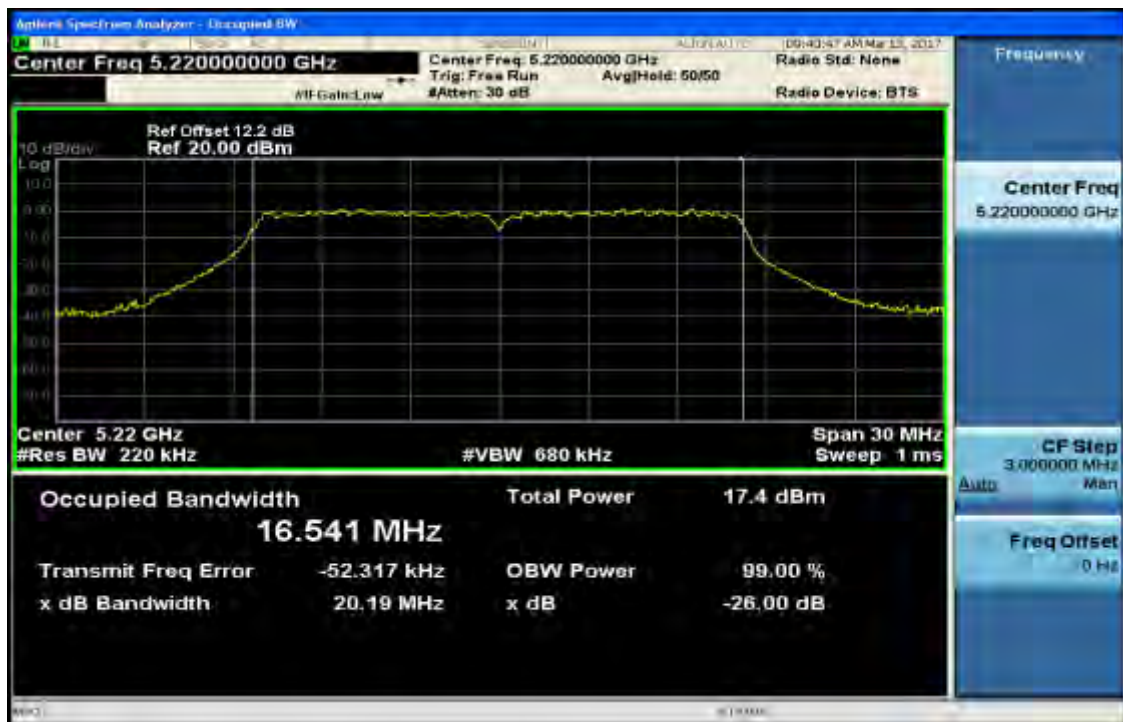
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802.11a, 5150~5250 MHz (Main) 26dB Band Width Test Data CH-Low (5180MHz)



26dB Band Width Test Data CH-Mid (5220MHz)



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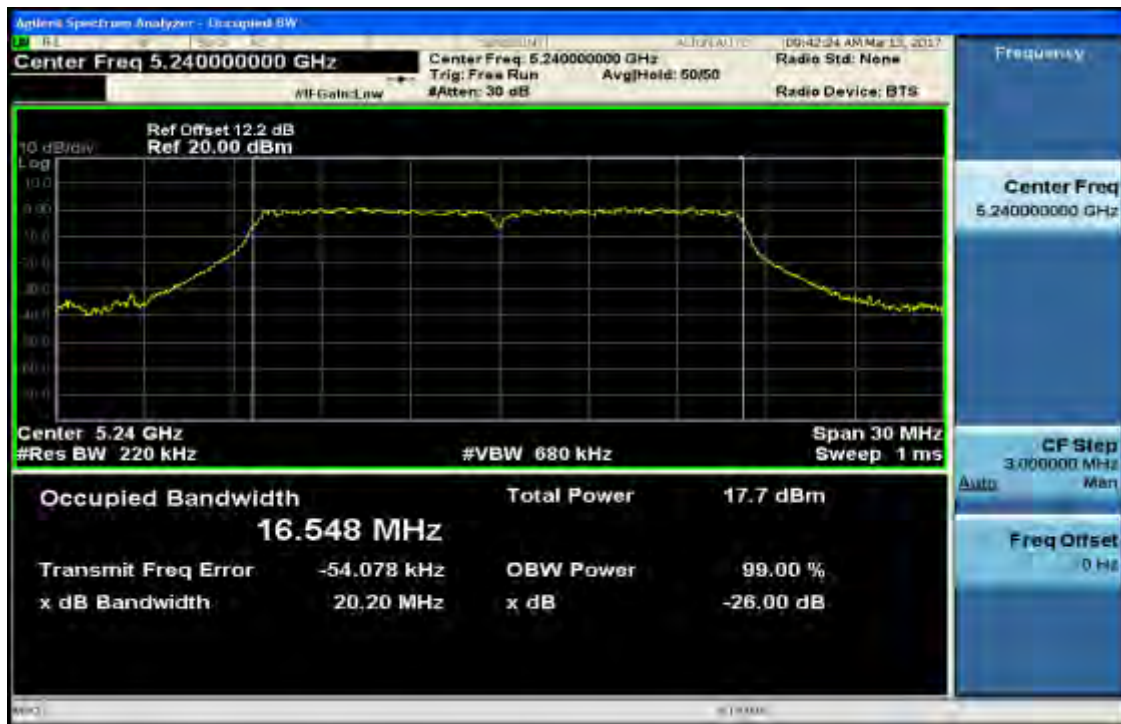
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26dB Band Width Test Data CH-High (5240MHz)



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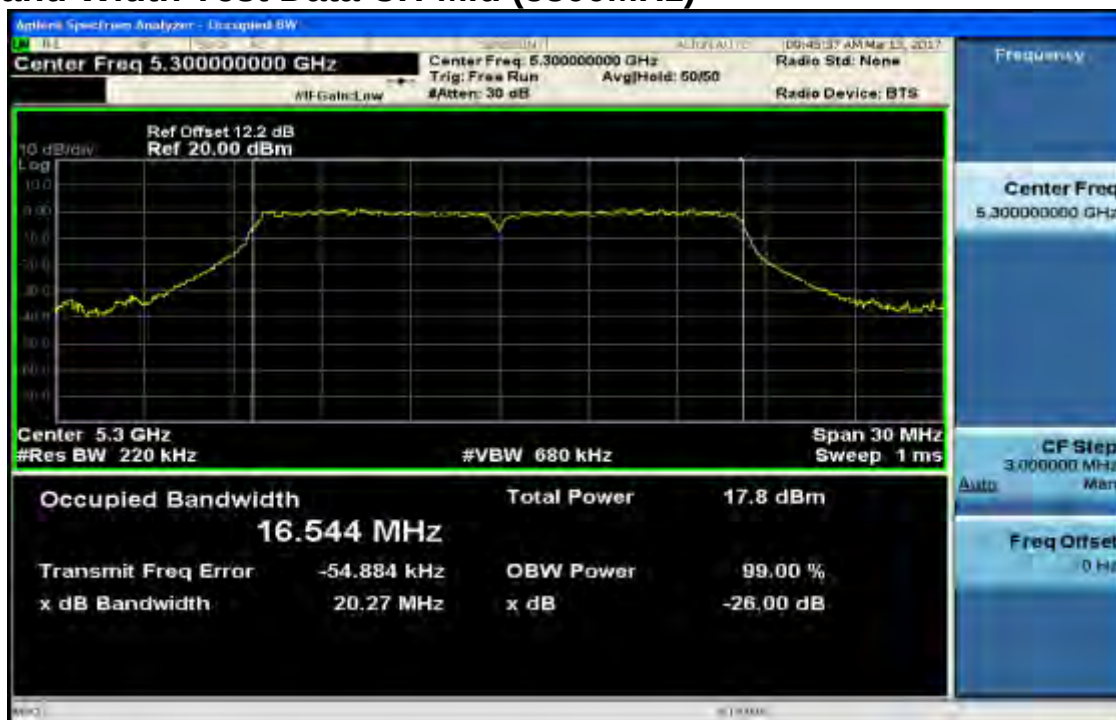
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802.11a, 5250~5350 MHz (Main)

26dB Band Width Test Data CH-Low (5260MHz)



26dB Band Width Test Data CH-Mid (5300MHz)



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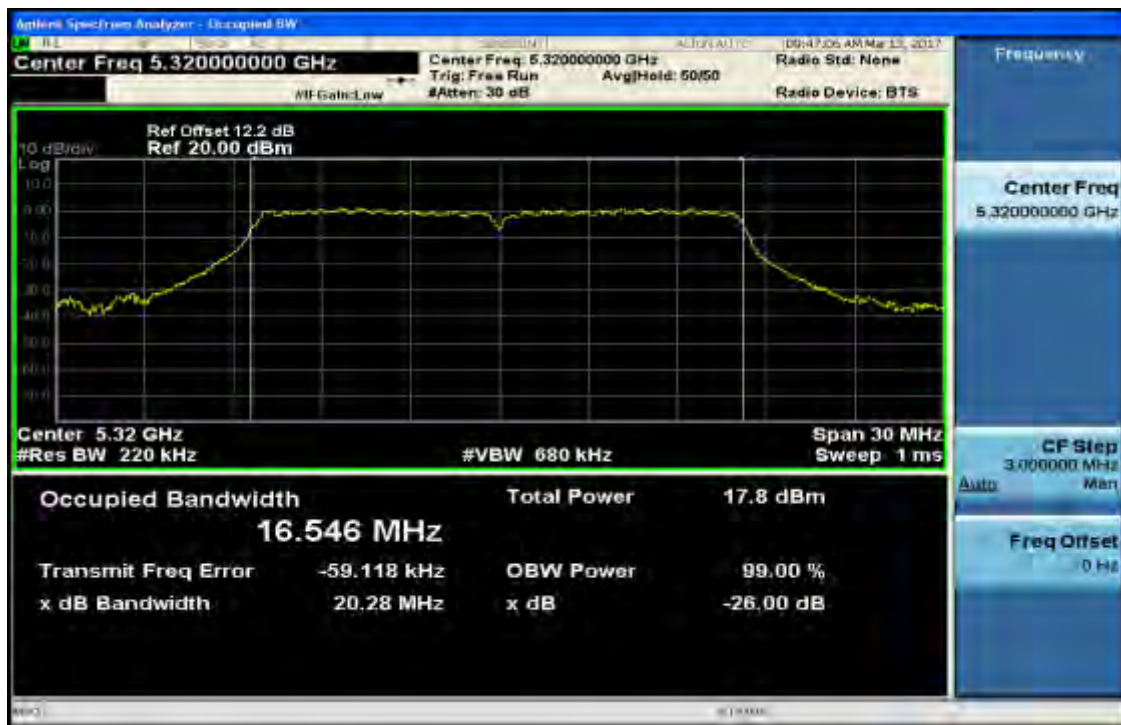
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26dB Band Width Test Data CH-High (5320MHz)



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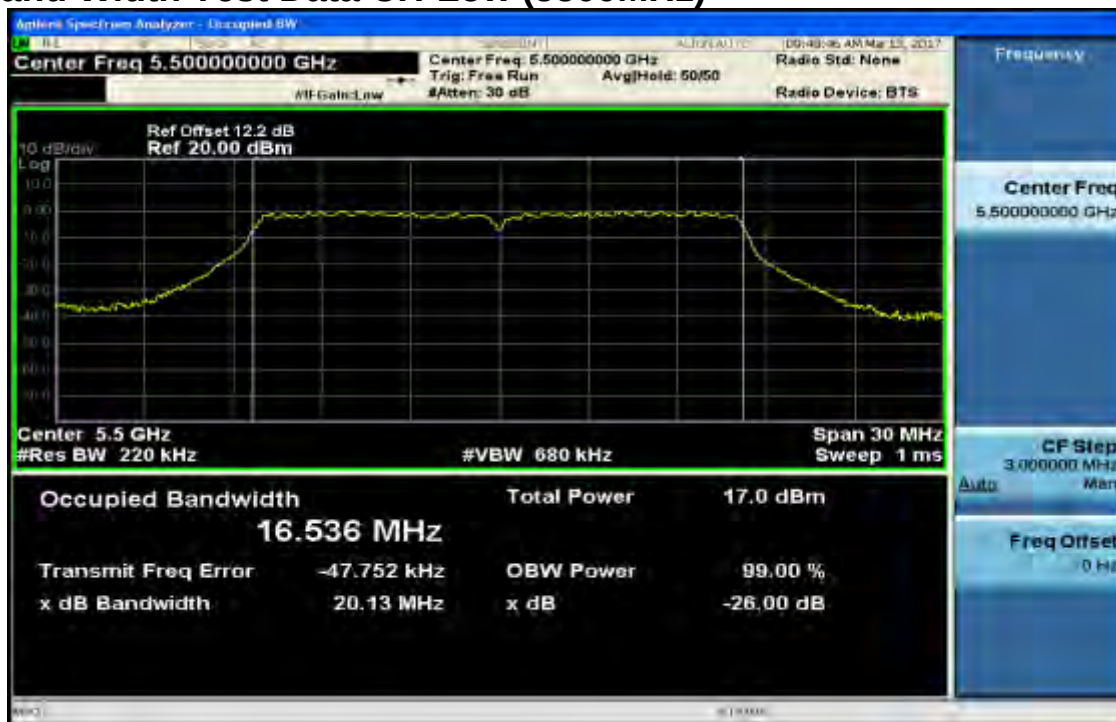
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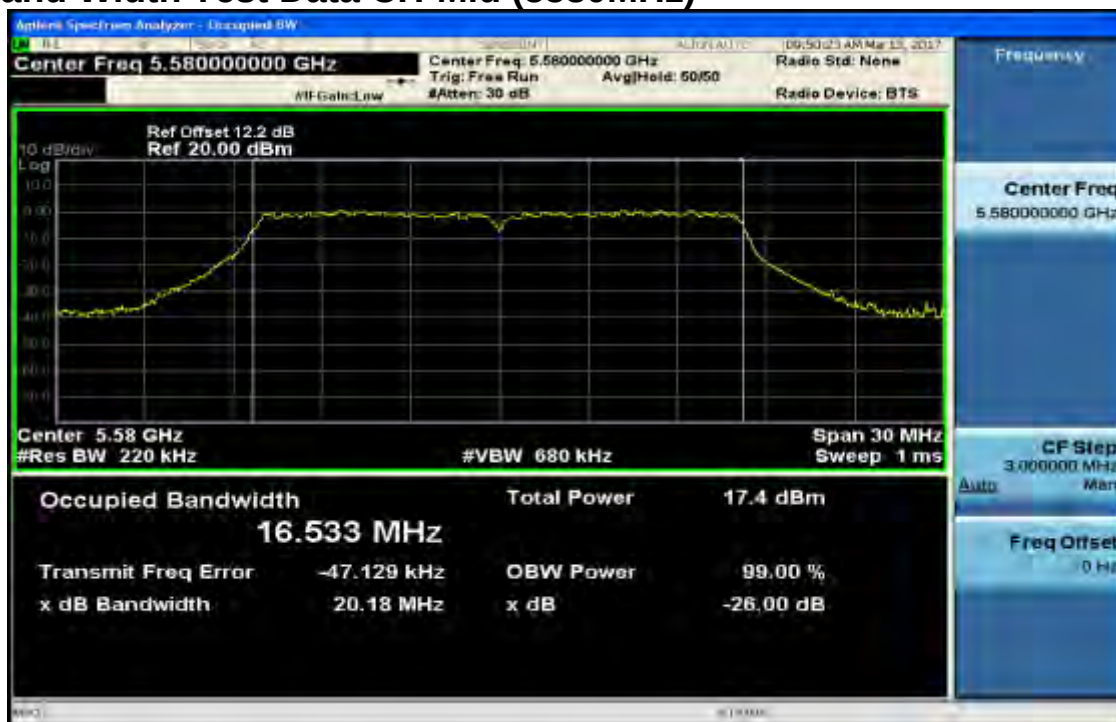
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802.11a, 5470~5725 MHz (Main)

26dB Band Width Test Data CH-Low (5500MHz)



26dB Band Width Test Data CH-Mid (5580MHz)



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26dB Band Width Test Data CH-High (5700MHz)



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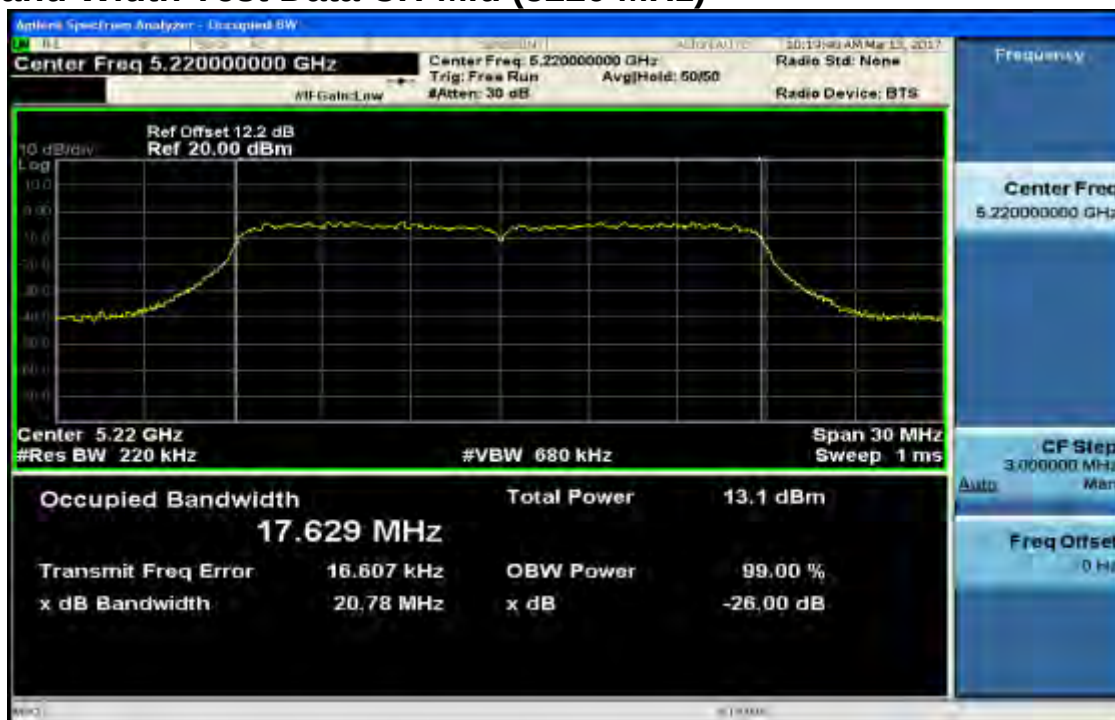
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802.11n HT20, 5150~5250 MHz (Main) 26dB Band Width Test Data CH-Low (5180 MHz)



26dB Band Width Test Data CH-Mid (5220 MHz)



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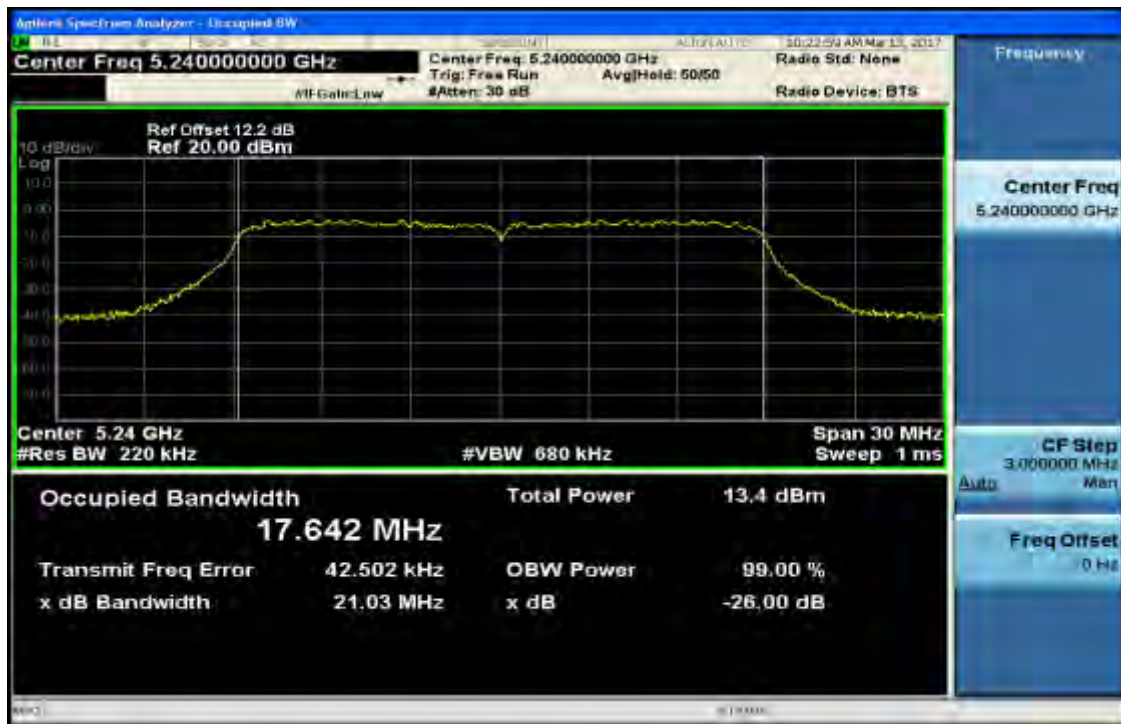
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26dB Band Width Test Data CH-High (5240 MHz)



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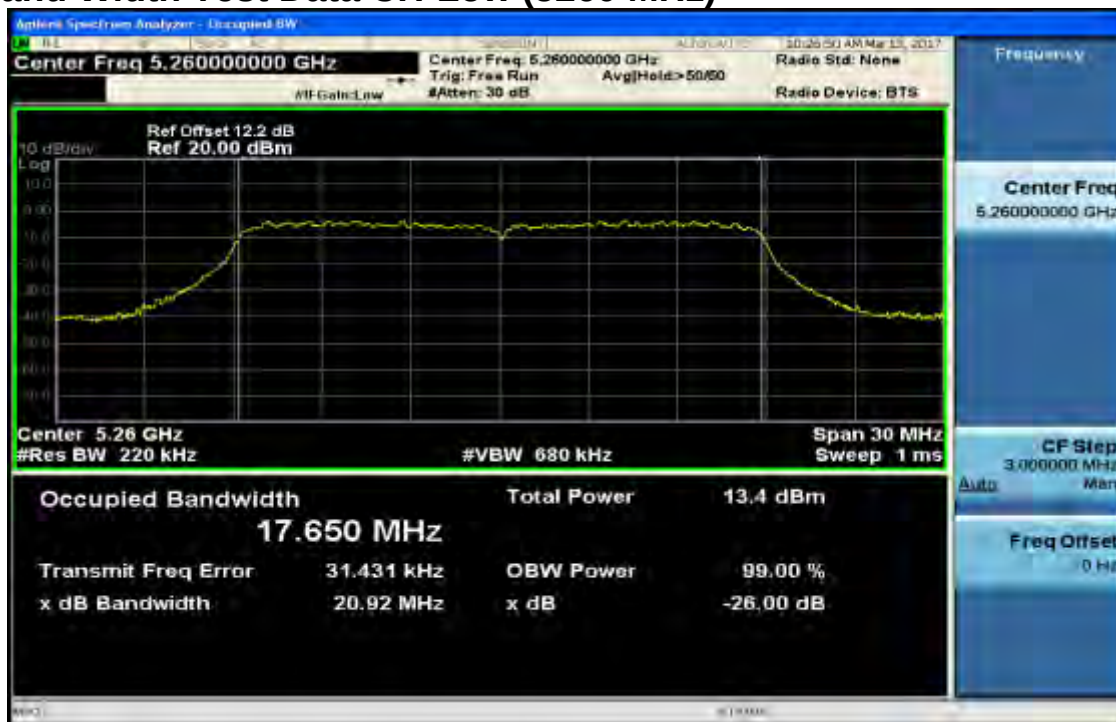
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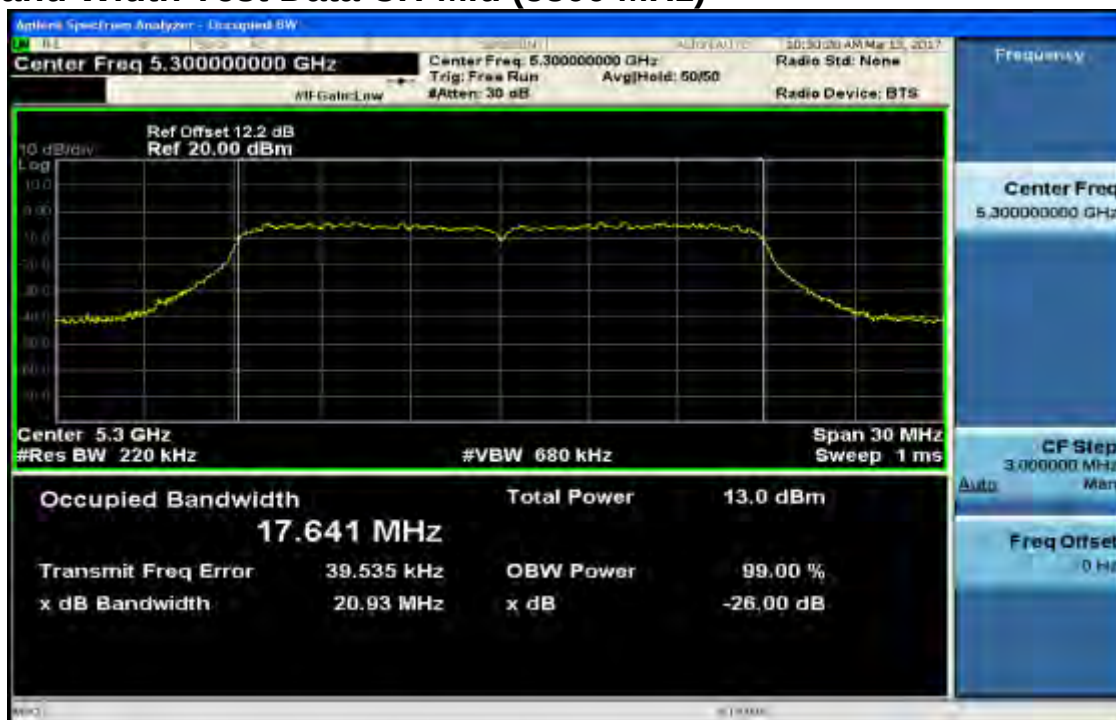
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802.11n HT20, 5250~5350 MHz (Main) 26dB Band Width Test Data CH-Low (5260 MHz)



26dB Band Width Test Data CH-Mid (5300 MHz)



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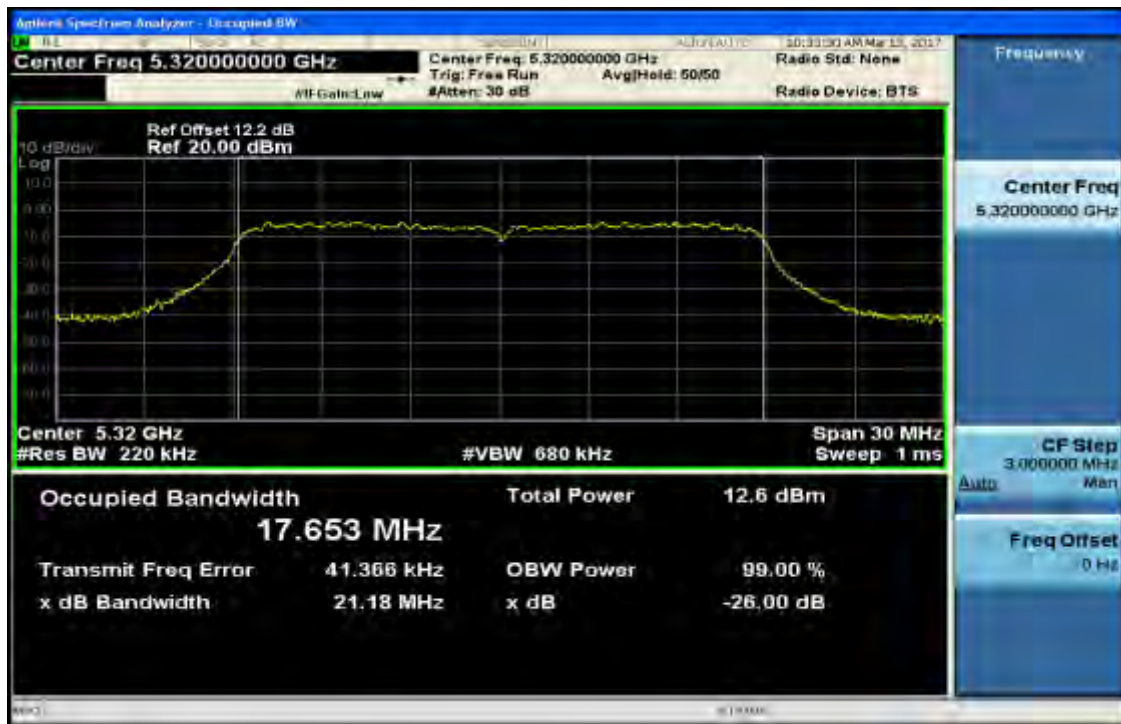
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26dB Band Width Test Data CH-High (5320 MHz)



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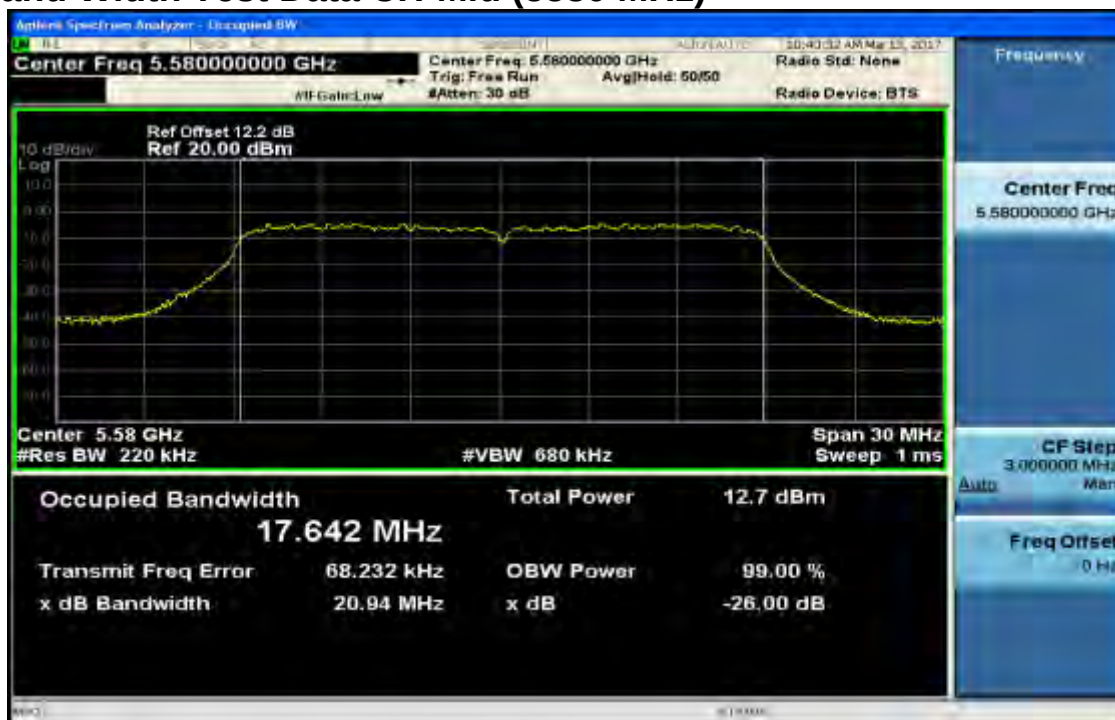
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802.11n HT20, 5470~5725 MHz (Main) 26dB Band Width Test Data CH-Low (5500 MHz)



26dB Band Width Test Data CH-Mid (5580 MHz)



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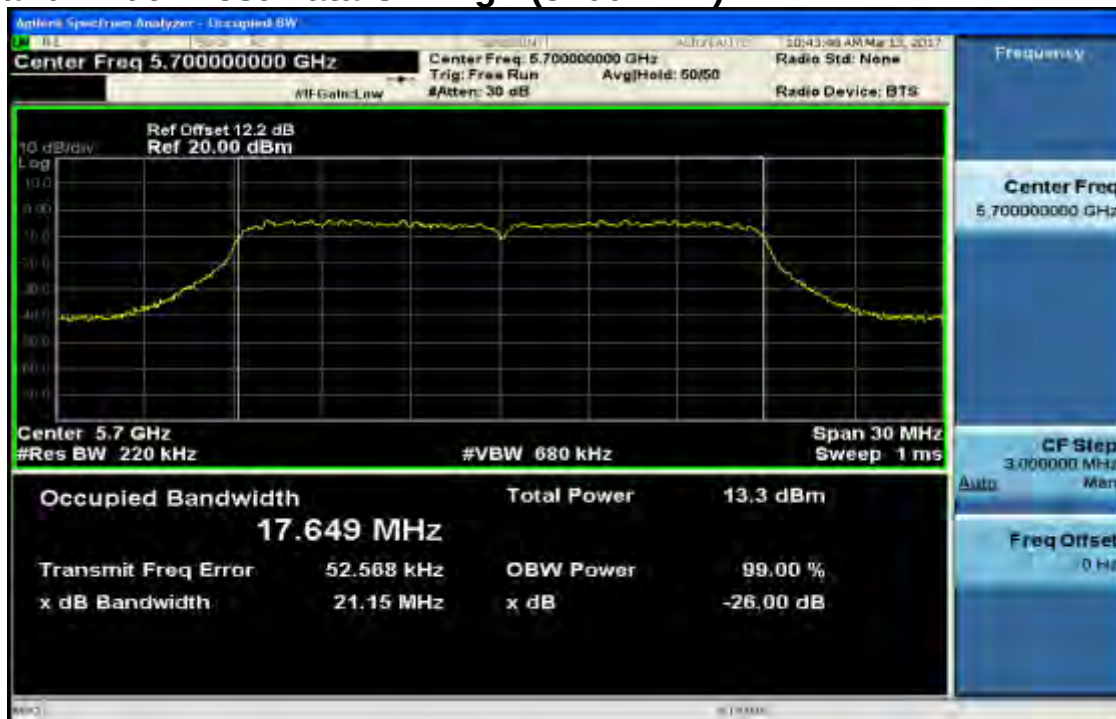
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26dB Band Width Test Data CH-High (5700 MHz)



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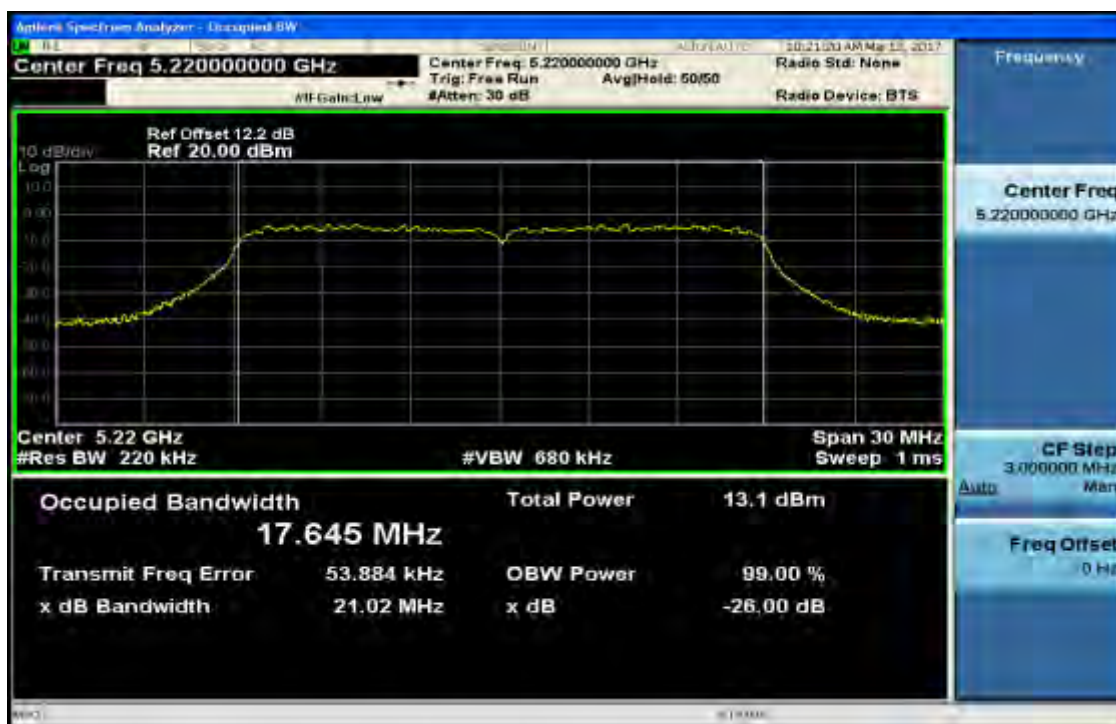
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802.11n HT20, 5150~5250 MHz (Aux) 26dB Band Width Test Data CH-Low (5180 MHz)



26dB Band Width Test Data CH-Mid (5220 MHz)



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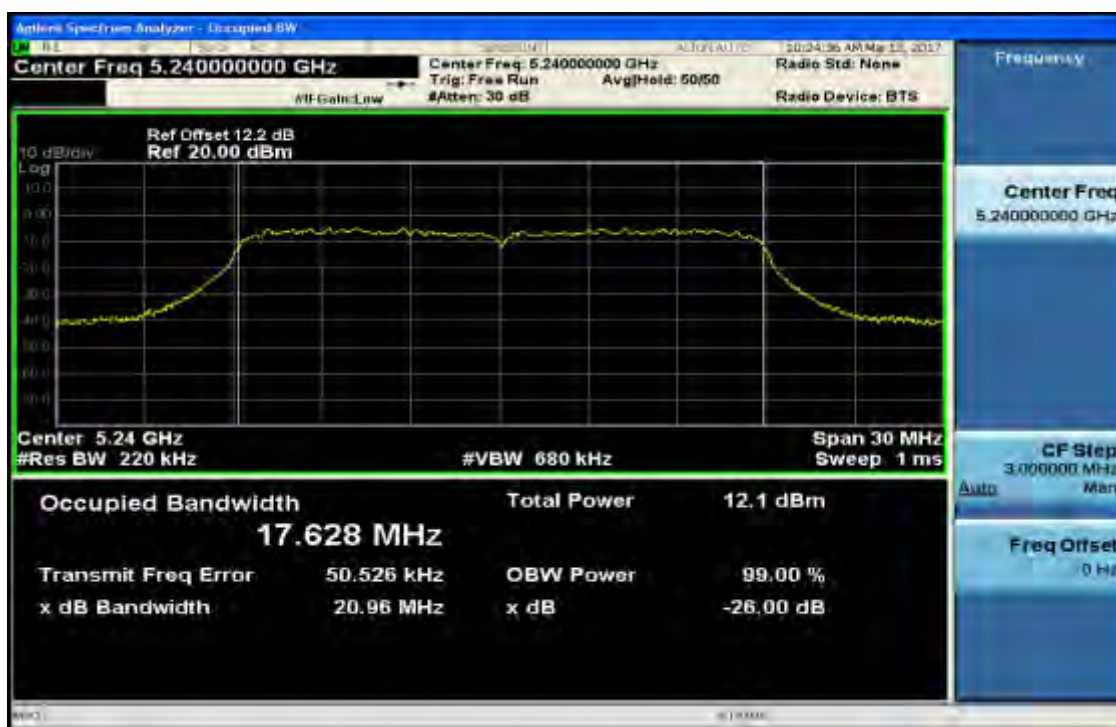
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26dB Band Width Test Data CH-High (5240 MHz)



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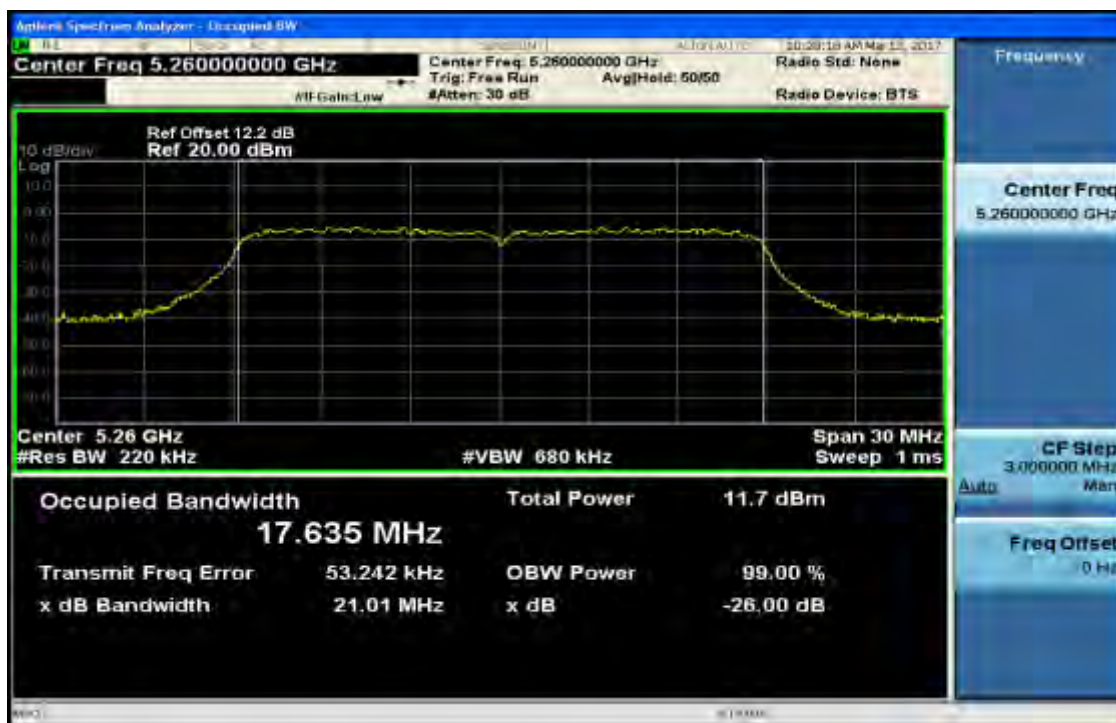
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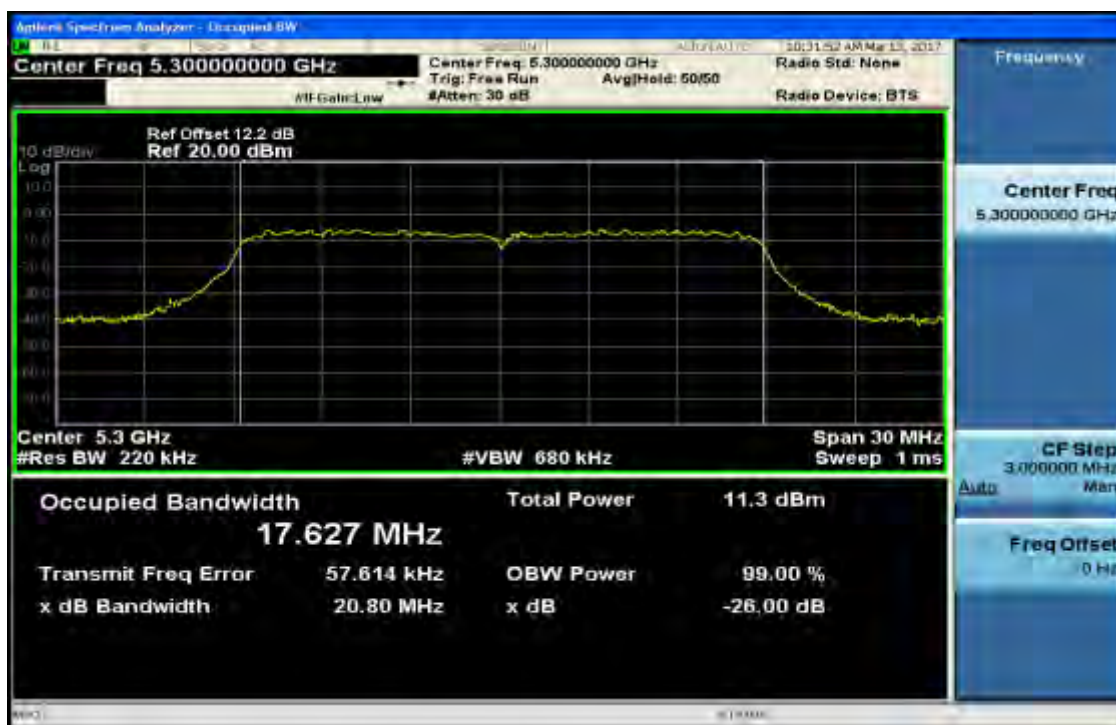
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802.11n HT20, 5250~5350 MHz (Aux) 26dB Band Width Test Data CH-Low (5260 MHz)



26dB Band Width Test Data CH-Mid (5300 MHz)



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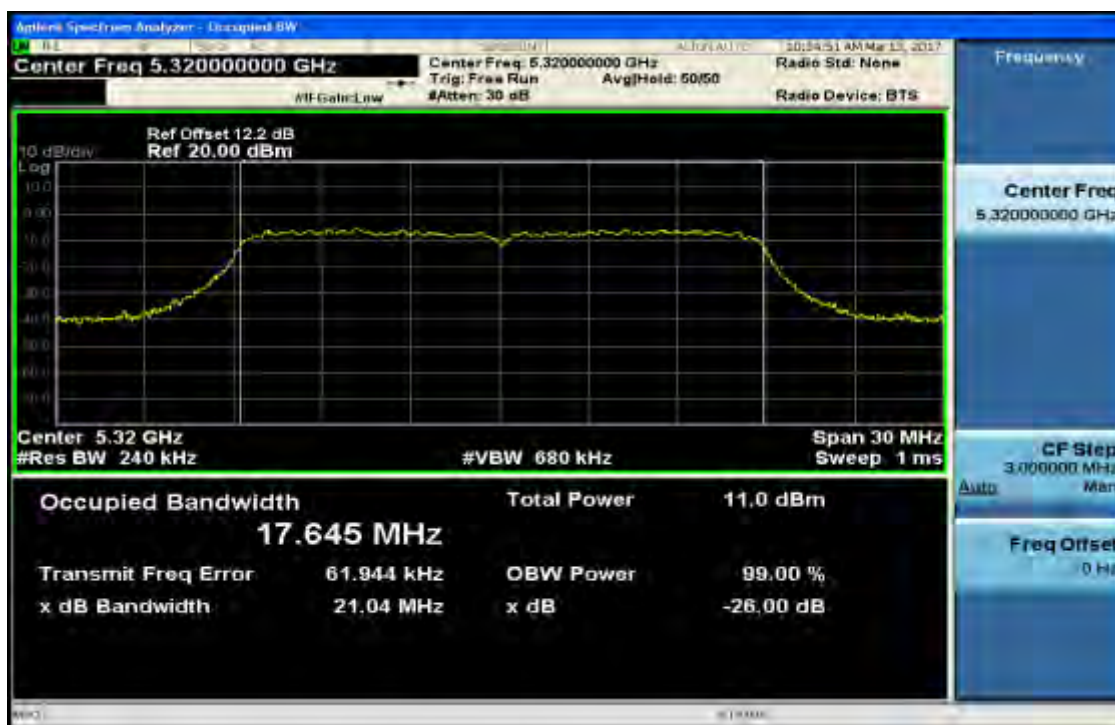
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26dB Band Width Test Data CH-High (5320 MHz)



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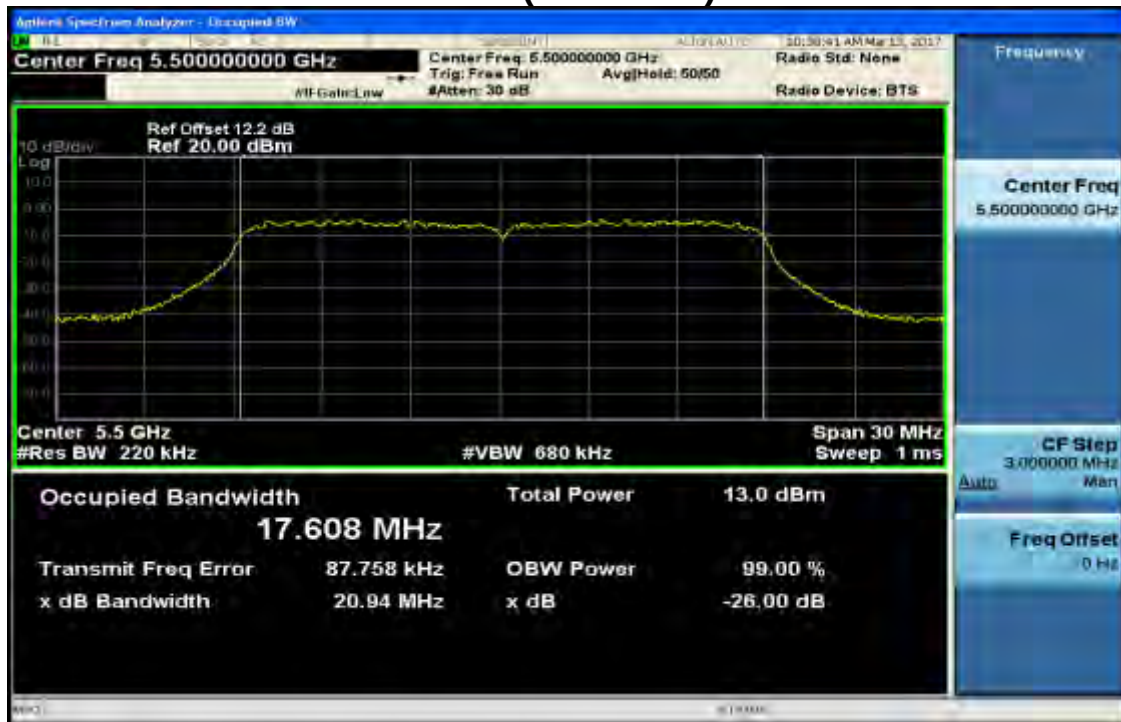
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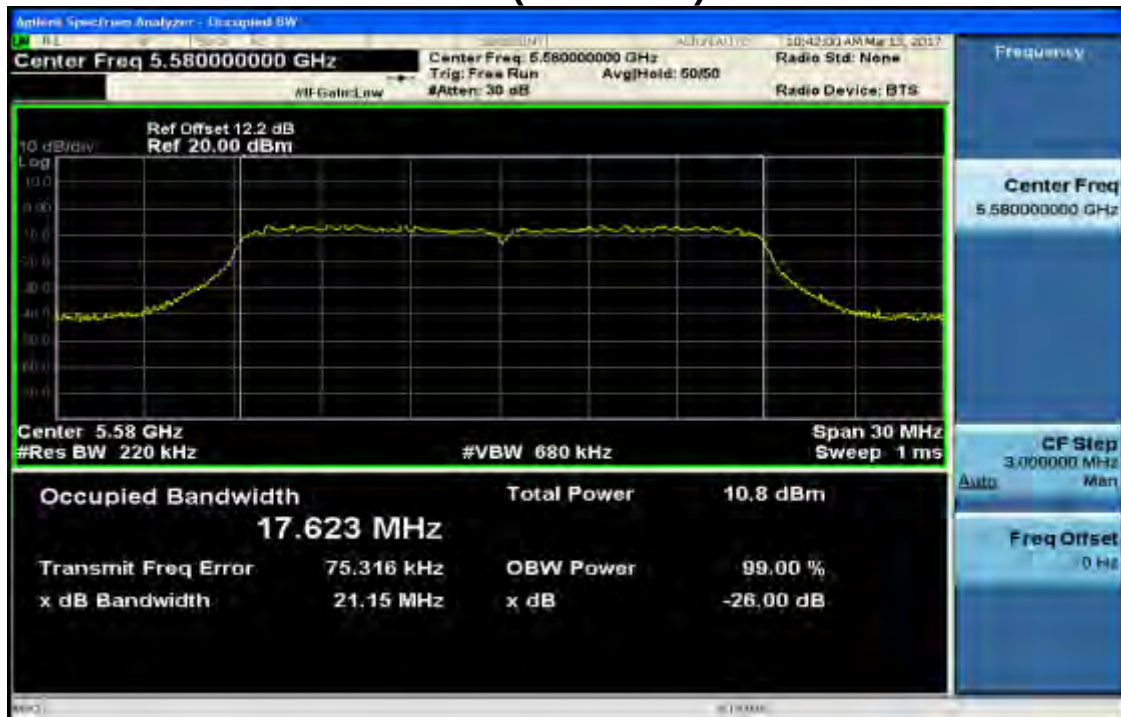
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802.11n HT20, 5470~5725 MHz (Aux) 26dB Band Width Test Data CH-Low (5500 MHz)



26dB Band Width Test Data CH-Mid (5580 MHz)



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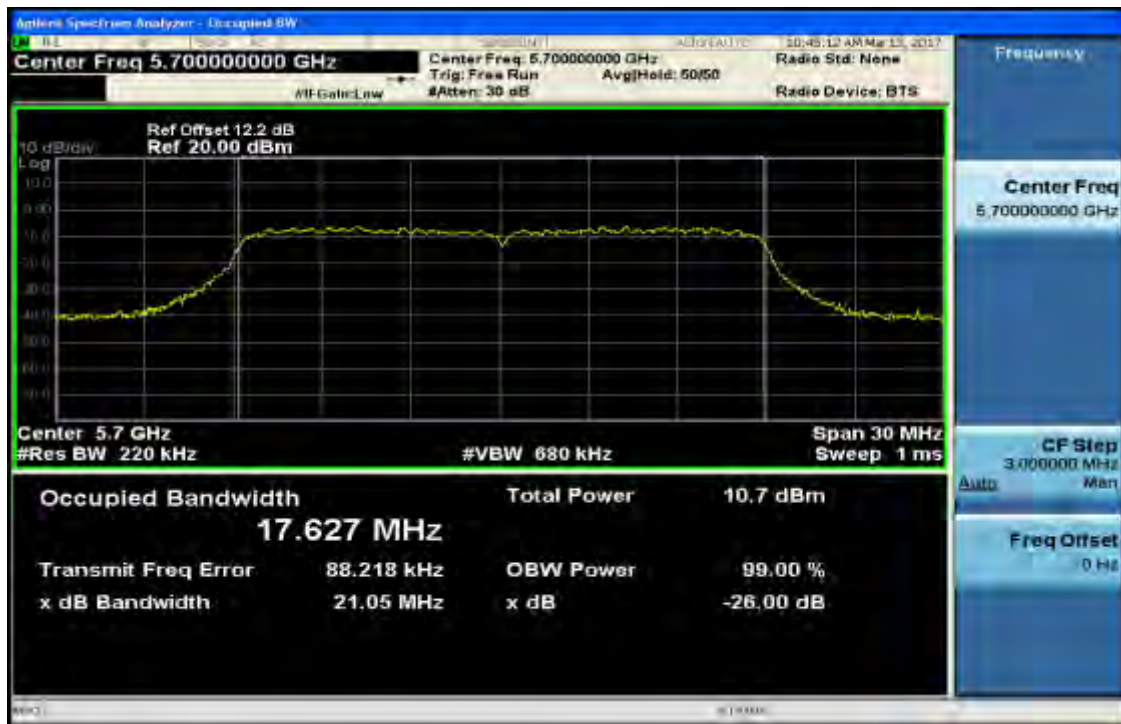
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26dB Band Width Test Data CH-High (5700 MHz)



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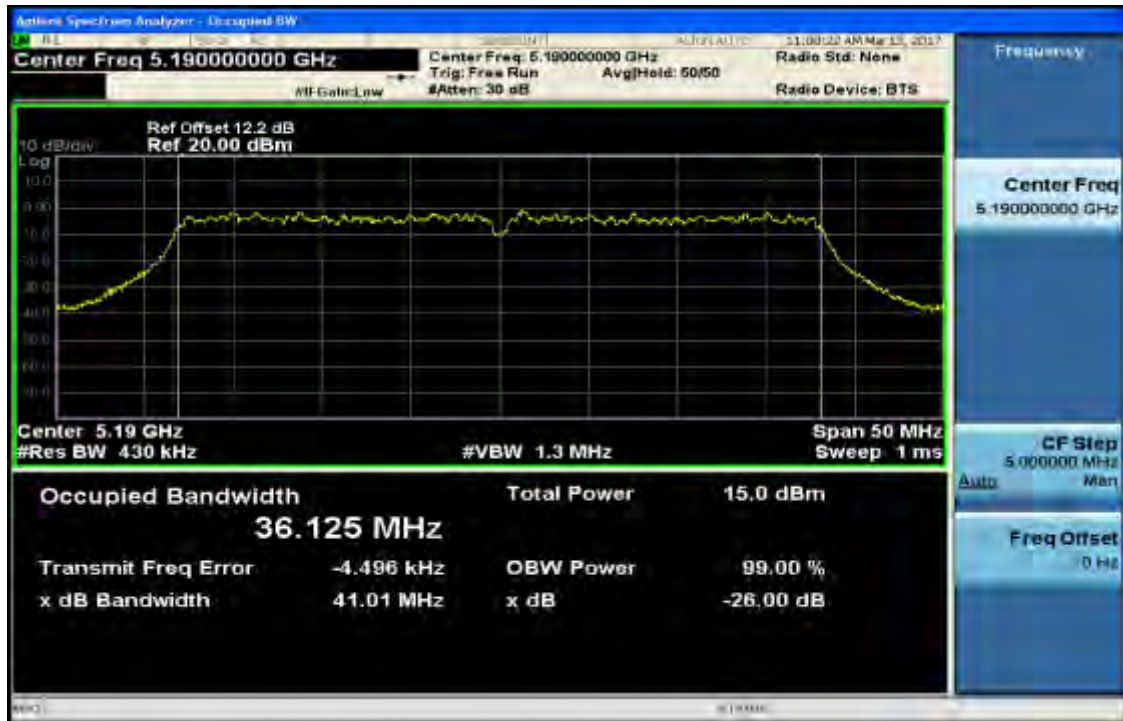
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802.11n HT40, 5150~5250 MHz (Main) 26dB Band Width Test Data CH-Low (5190 MHz)



26dB Band Width Test Data CH-High (5230 MHz)



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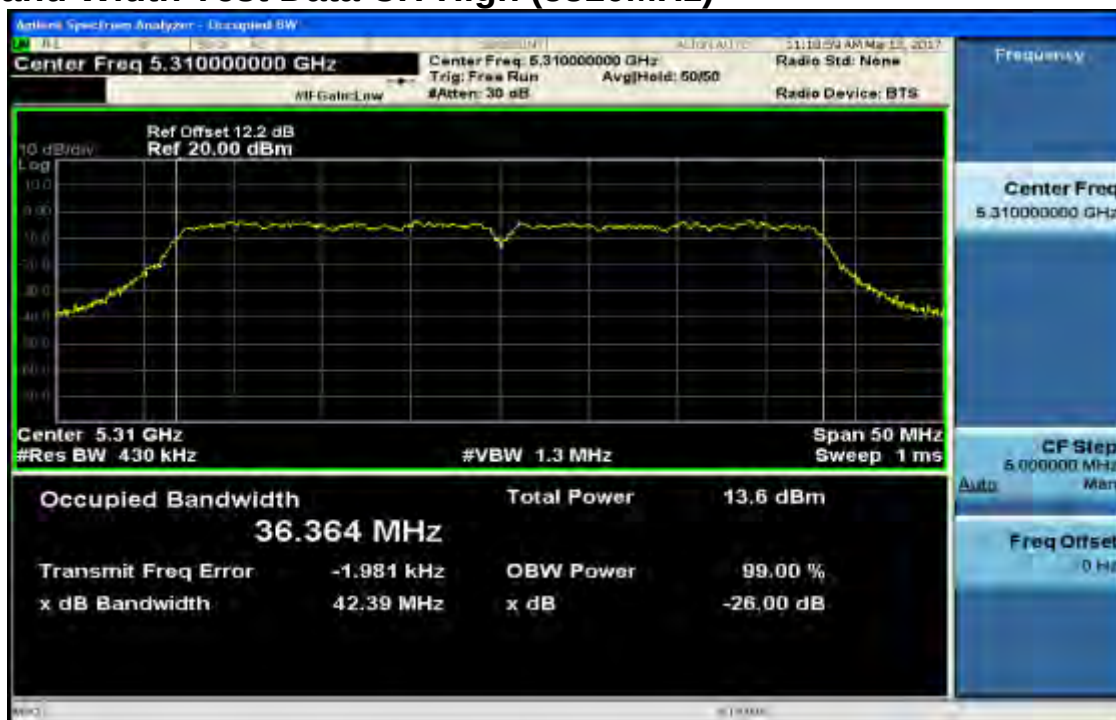
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802.11n HT40, 5250~5350 MHz (Main)

26dB Band Width Test Data CH-Low (5270 MHz)



26dB Band Width Test Data CH-High (5310MHz)



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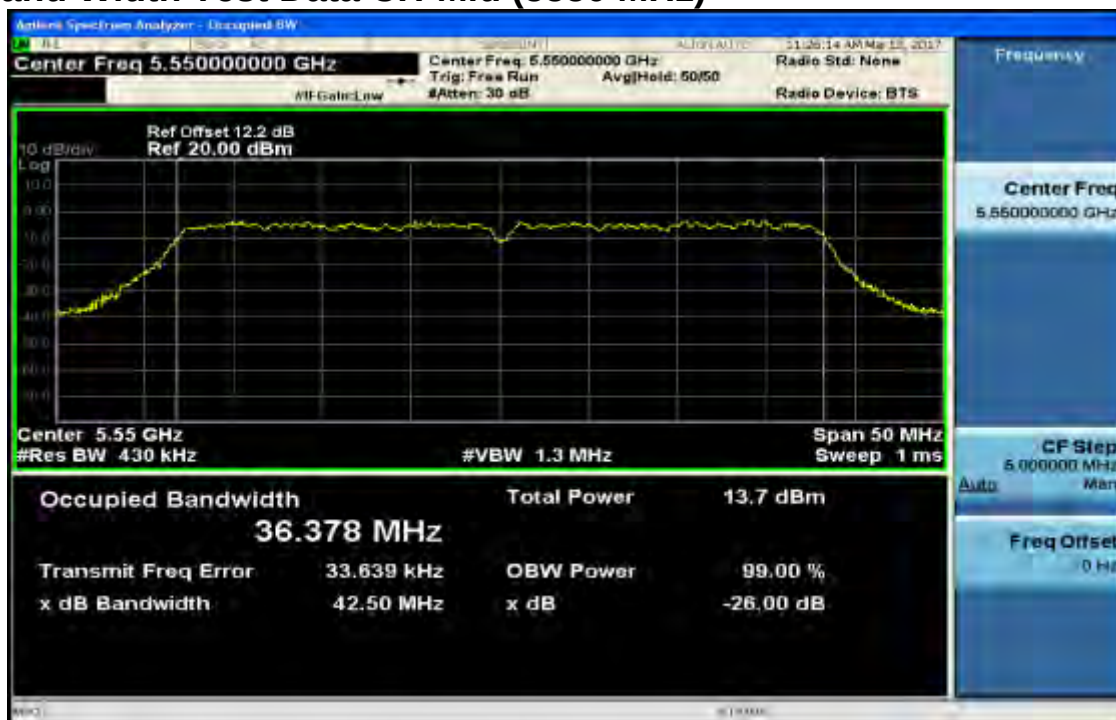
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802.11n HT40, 5470~5725 MHz (Main) 26dB Band Width Test Data CH-Low (5510 MHz)



26dB Band Width Test Data CH-Mid (5550 MHz)



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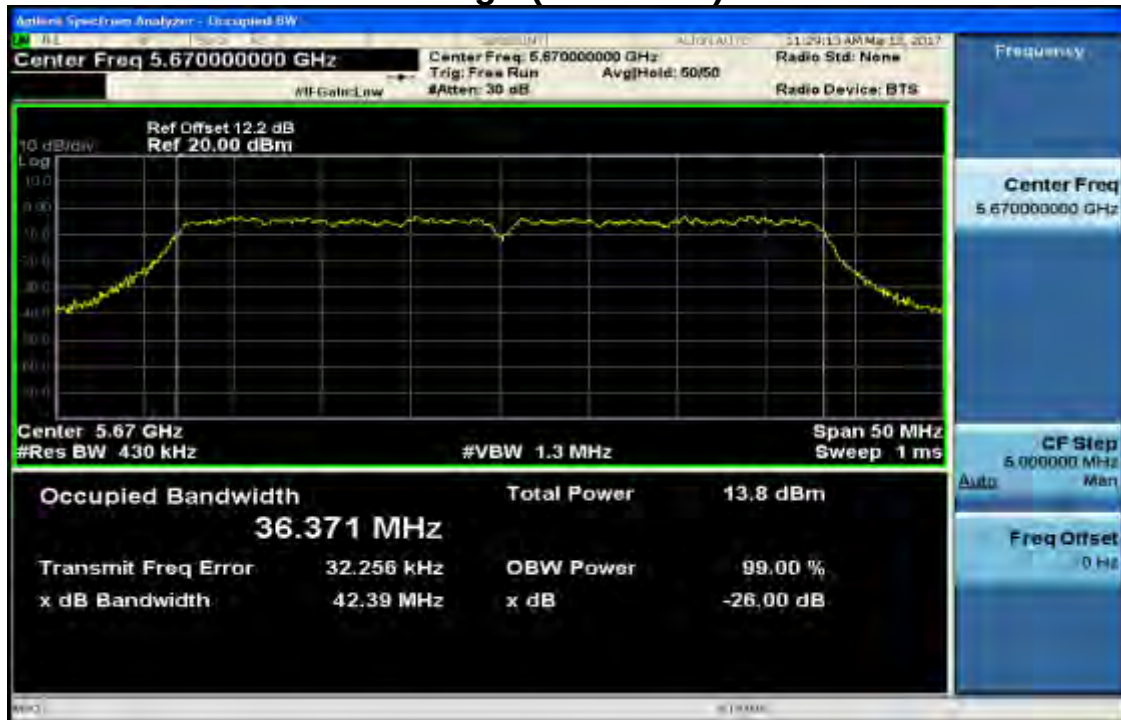
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26dB Band Width Test Data CH-High (5670 MHz)



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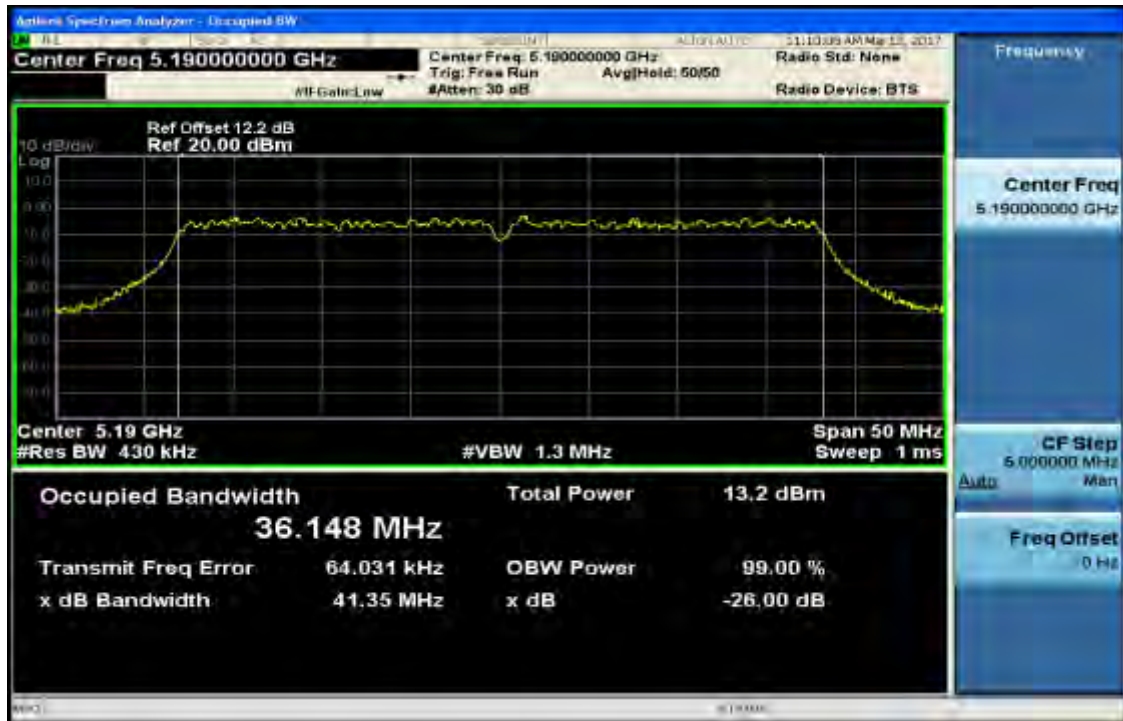
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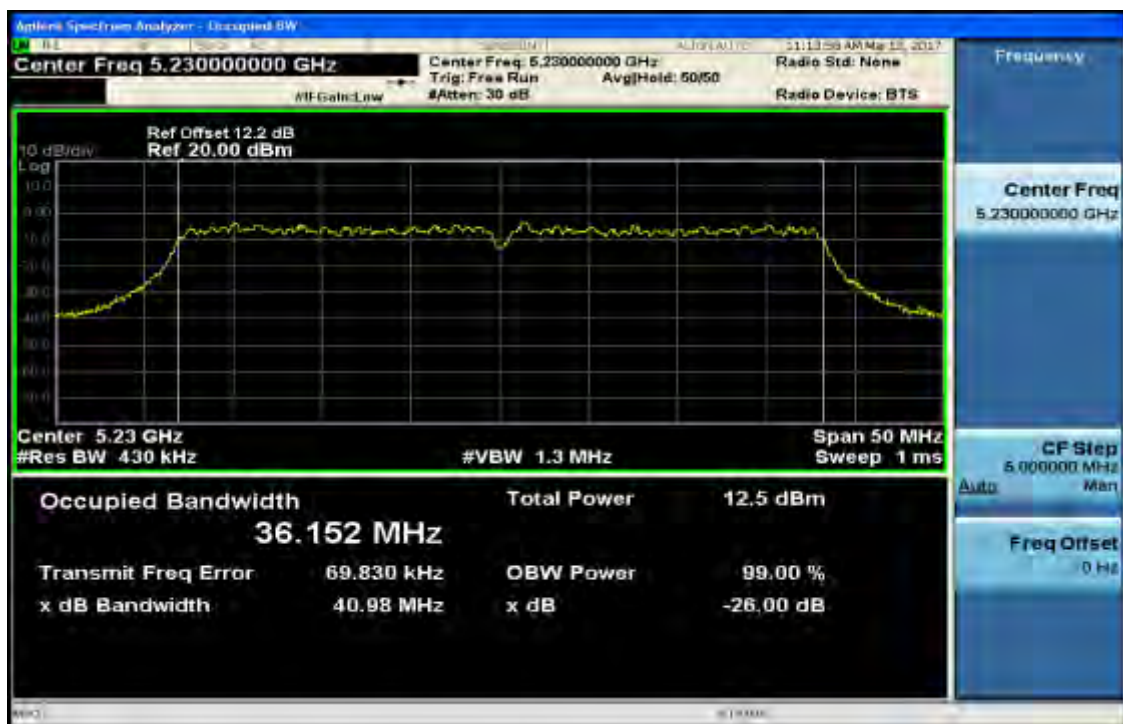
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26dB Band Width Test Data CH-High (5230 MHz)



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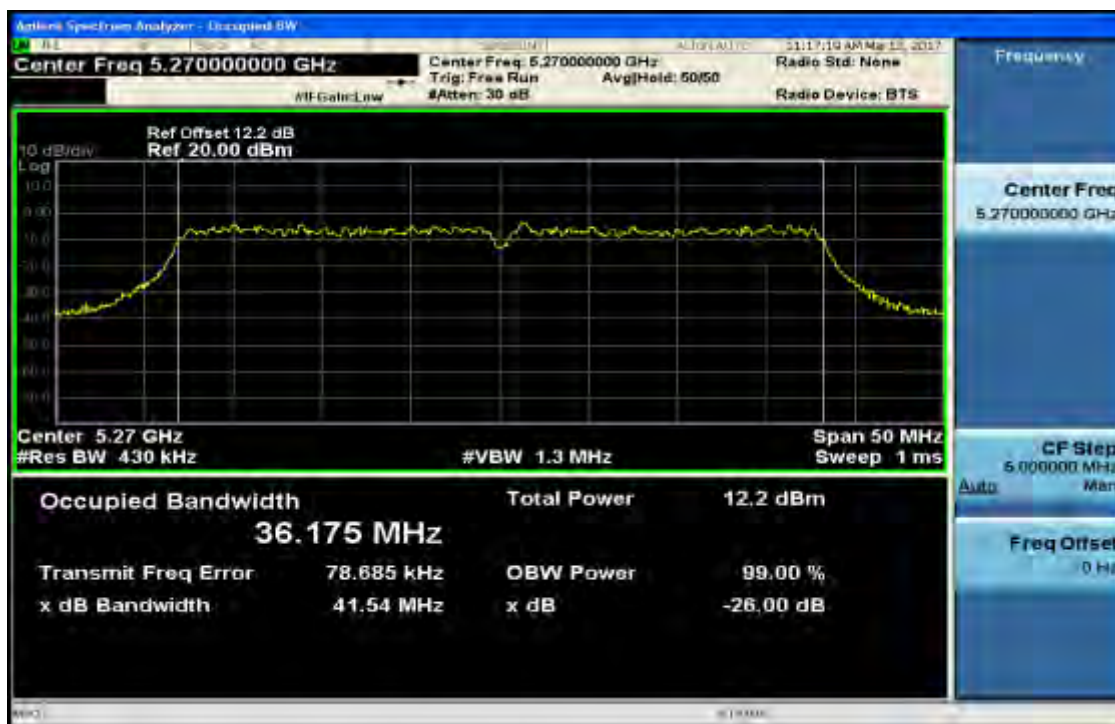
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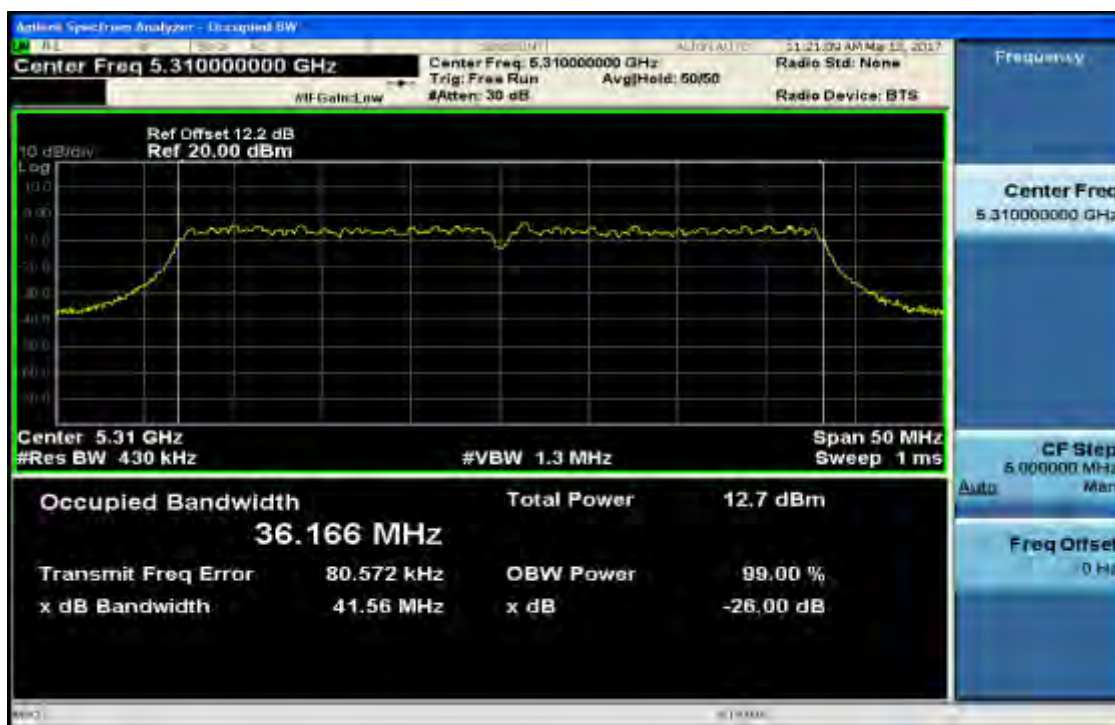
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802.11n HT40, 5250~5350 MHz (Aux) 26dB Band Width Test Data CH-Low (5270 MHz)



26dB Band Width Test Data CH-High (5310MHz)



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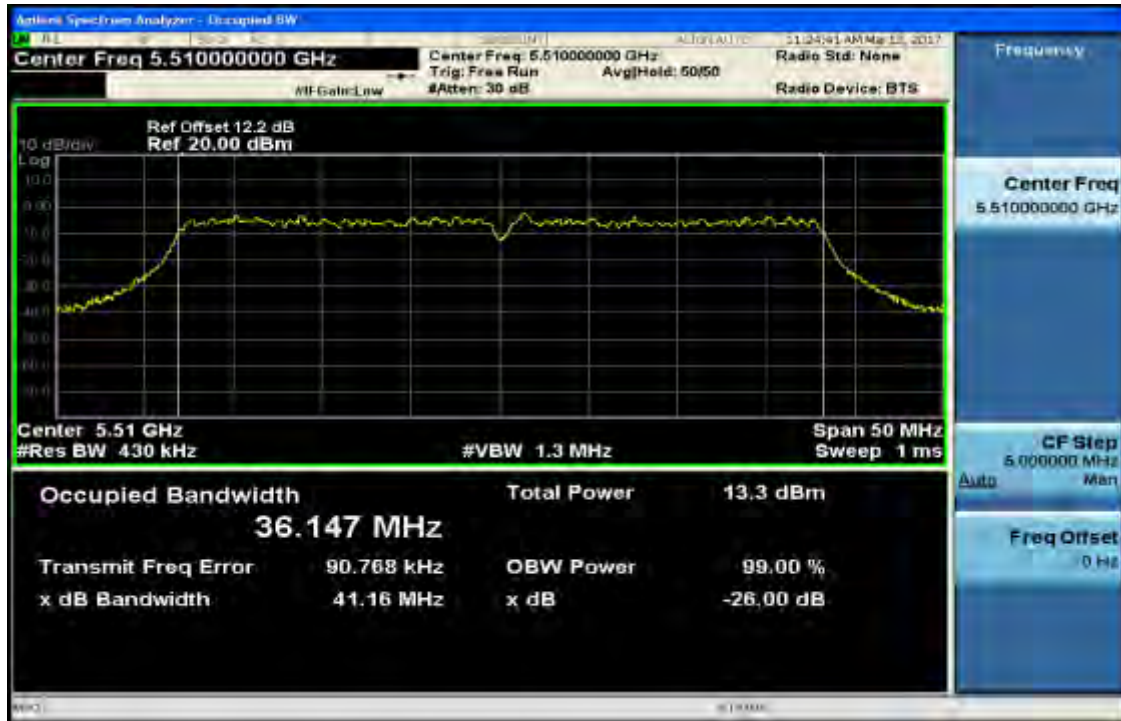
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802.11n HT40, 5470~5725 MHz (Aux) 26dB Band Width Test Data CH-Low (5510 MHz)



26dB Band Width Test Data CH-Mid (5550 MHz)



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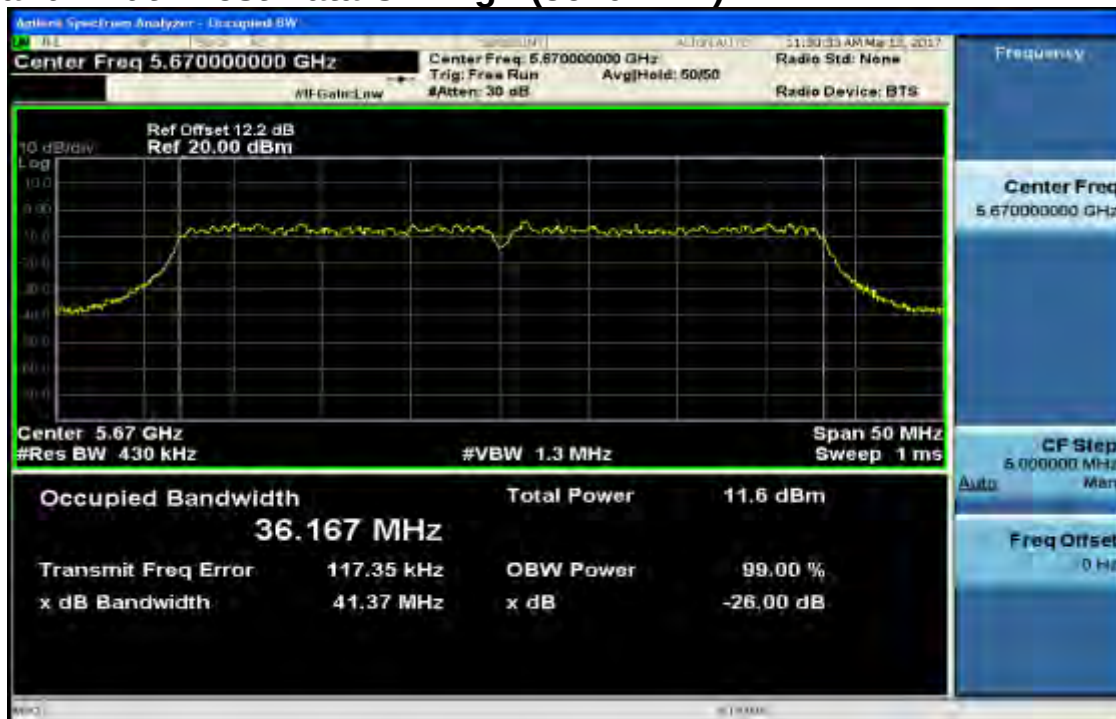
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26dB Band Width Test Data CH-High (5670 MHz)



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802.11ac VHT80, 5150~5250 MHz (Main) 26dB Band Width Test Data CH-Mid (5210 MHz)



802.11ac VHT80, 5250~5350 MHz 26dB Band Width Test Data CH-Mid (5290 MHz)



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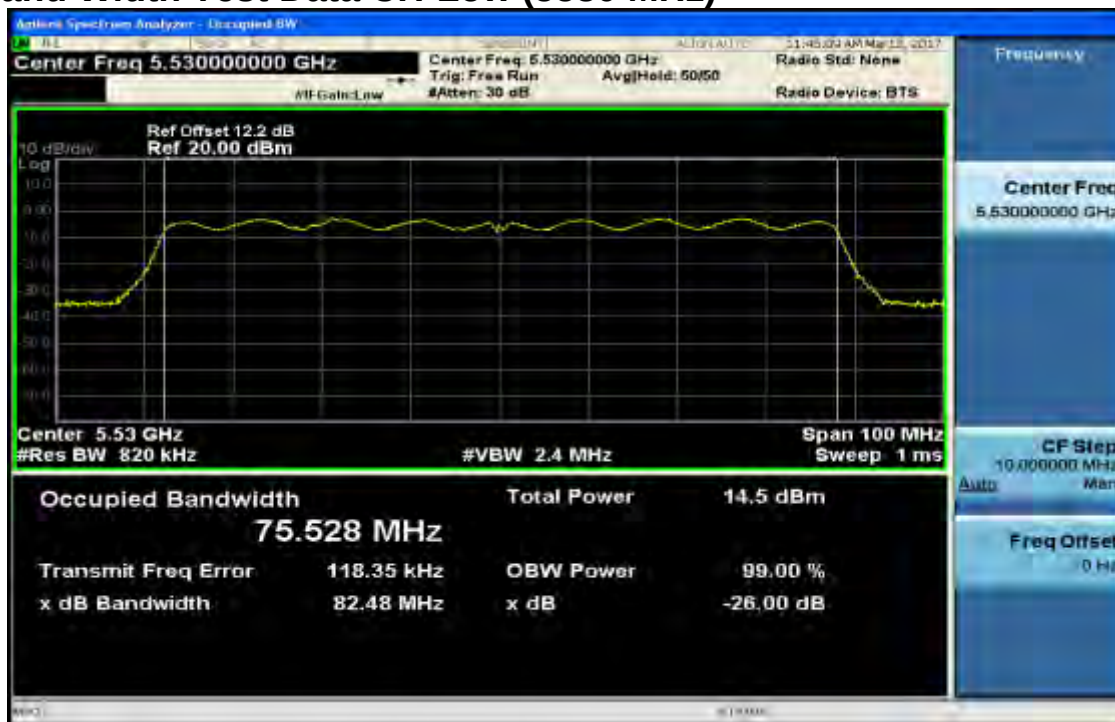
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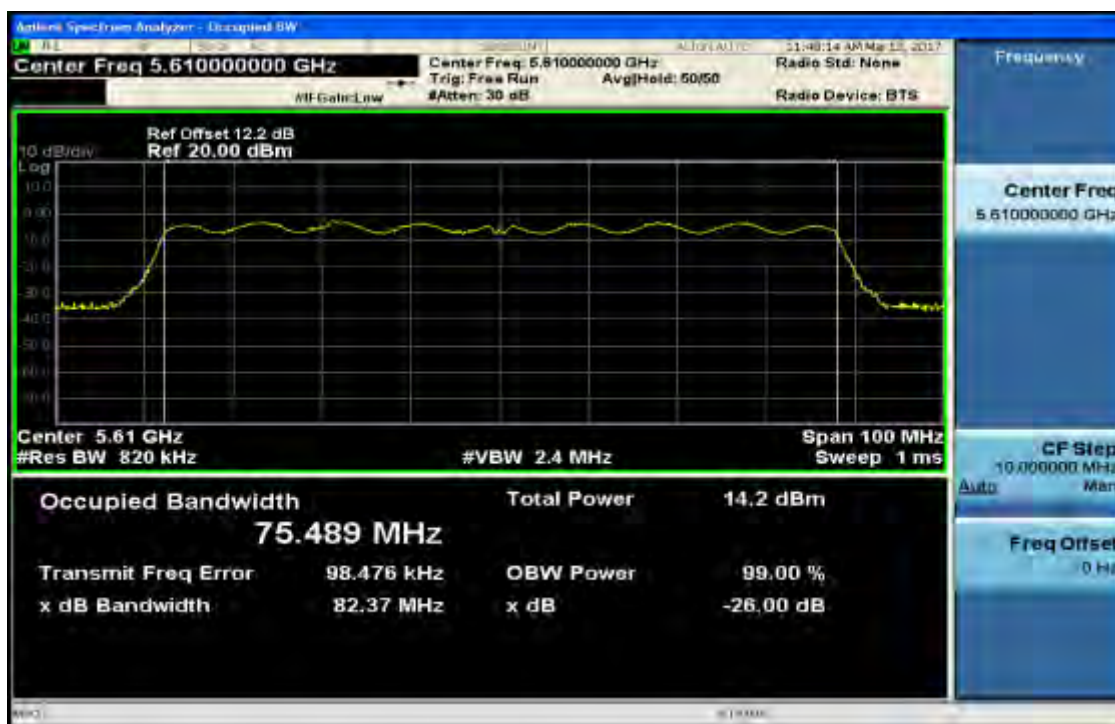
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802.11ac VHT80, 5470~5725 MHz (Main) 26dB Band Width Test Data CH-Low (5530 MHz)



26dB Band Width Test Data CH-Low (5610 MHz)



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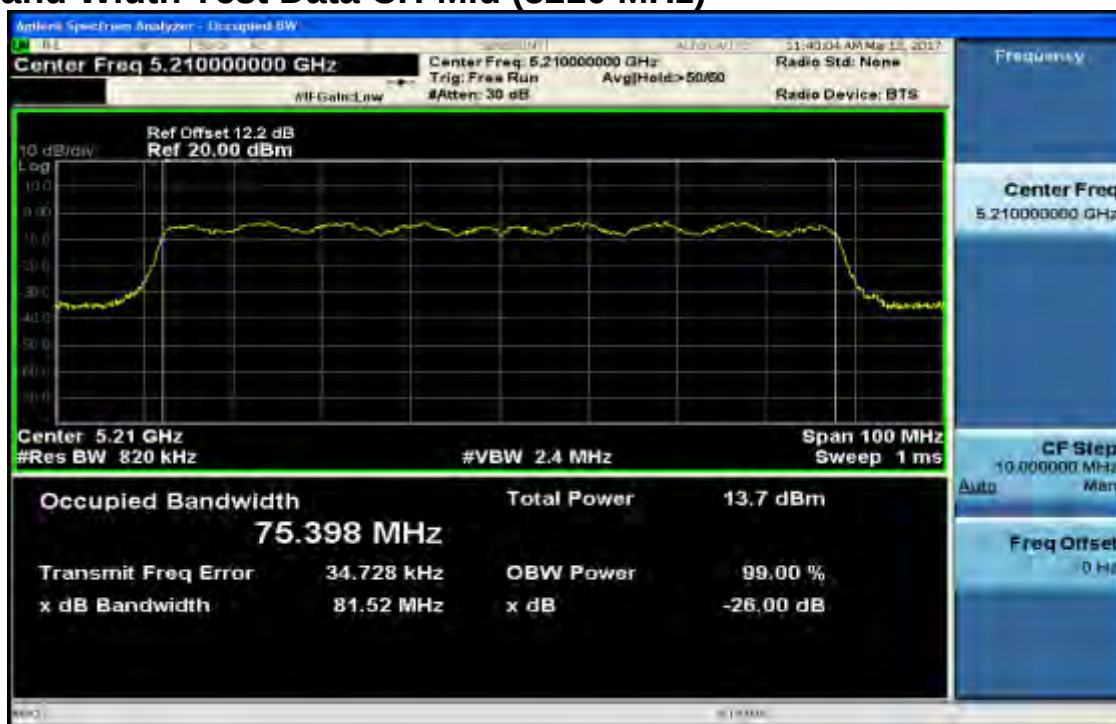
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802.11ac VHT80, 5150~5250 MHz (Aux) 26dB Band Width Test Data CH-Mid (5210 MHz)



802.11ac VHT80, 5250~5350 MHz 26dB Band Width Test Data CH-Mid (5290 MHz)



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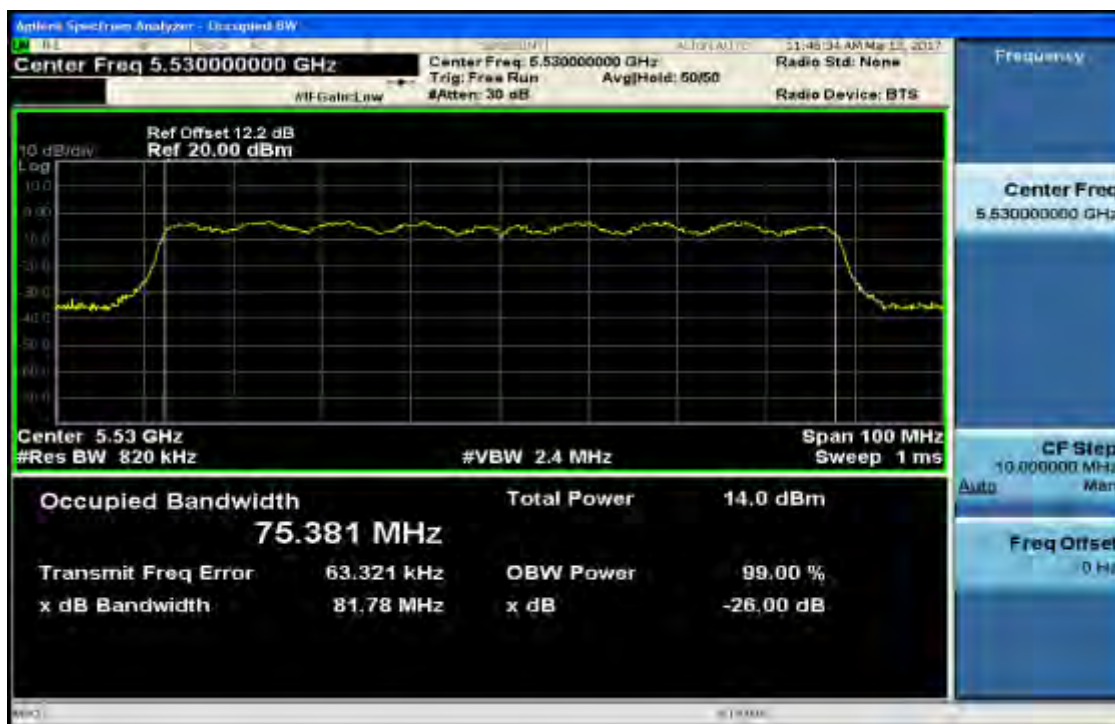
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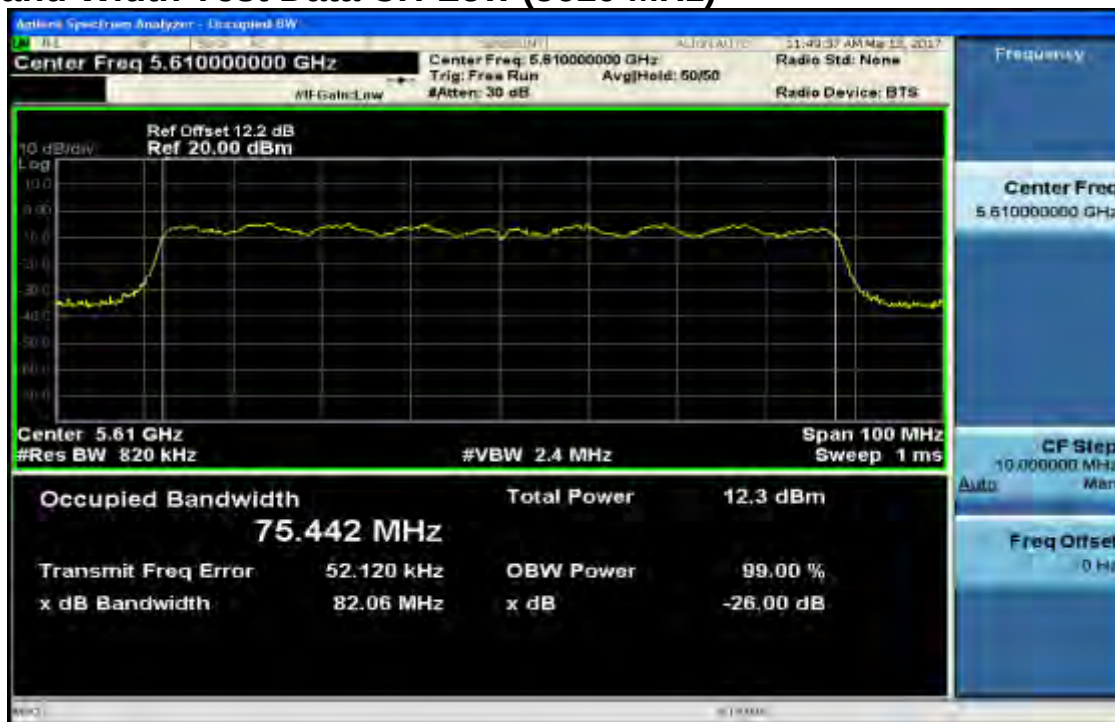
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802.11ac VHT80, 5470~5725 MHz (Aux) 26dB Band Width Test Data CH-Low (5530 MHz)



26dB Band Width Test Data CH-Low (5610 MHz)



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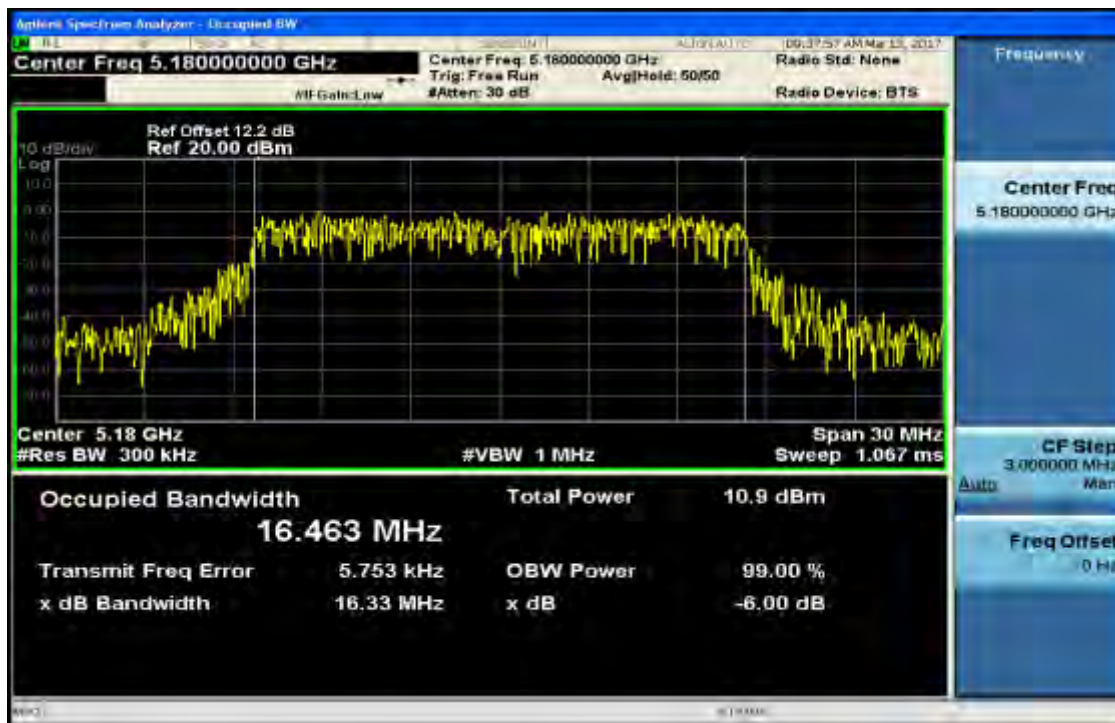
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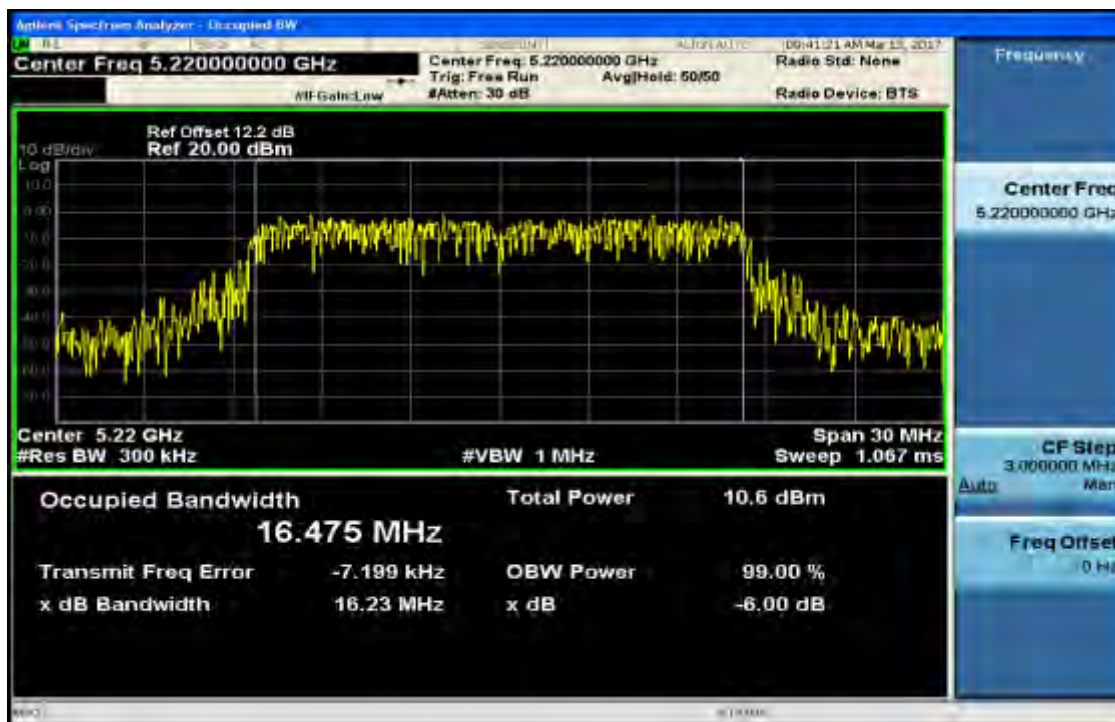
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802.11a, 5150~5250 MHz (Main)

99% Band Width Test Data CH-Low (5180MHz)



99% Band Width Test Data CH-Mid (5220MHz)



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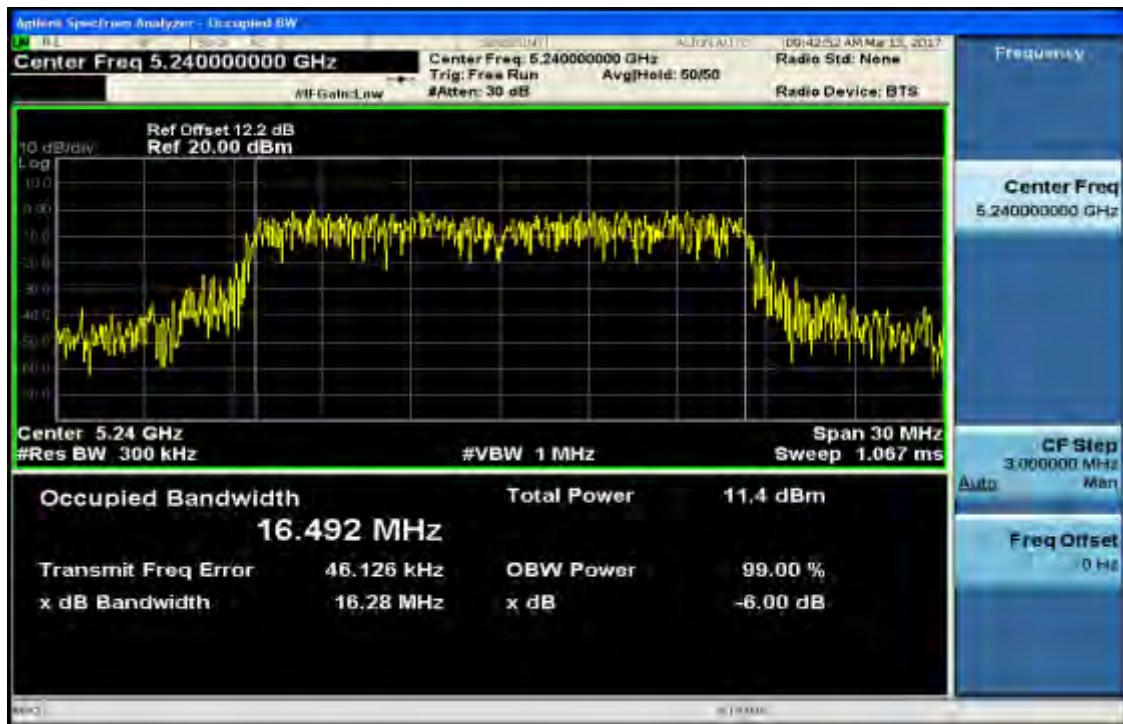
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99% Band Width Test Data CH-High (5240MHz)



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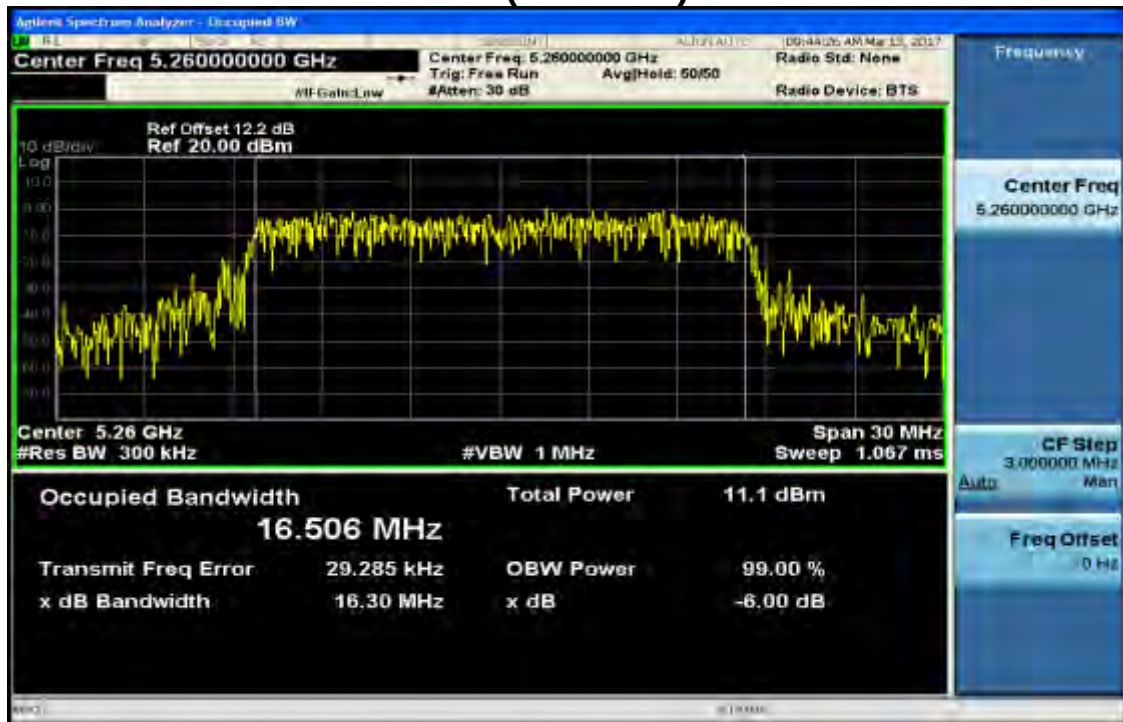
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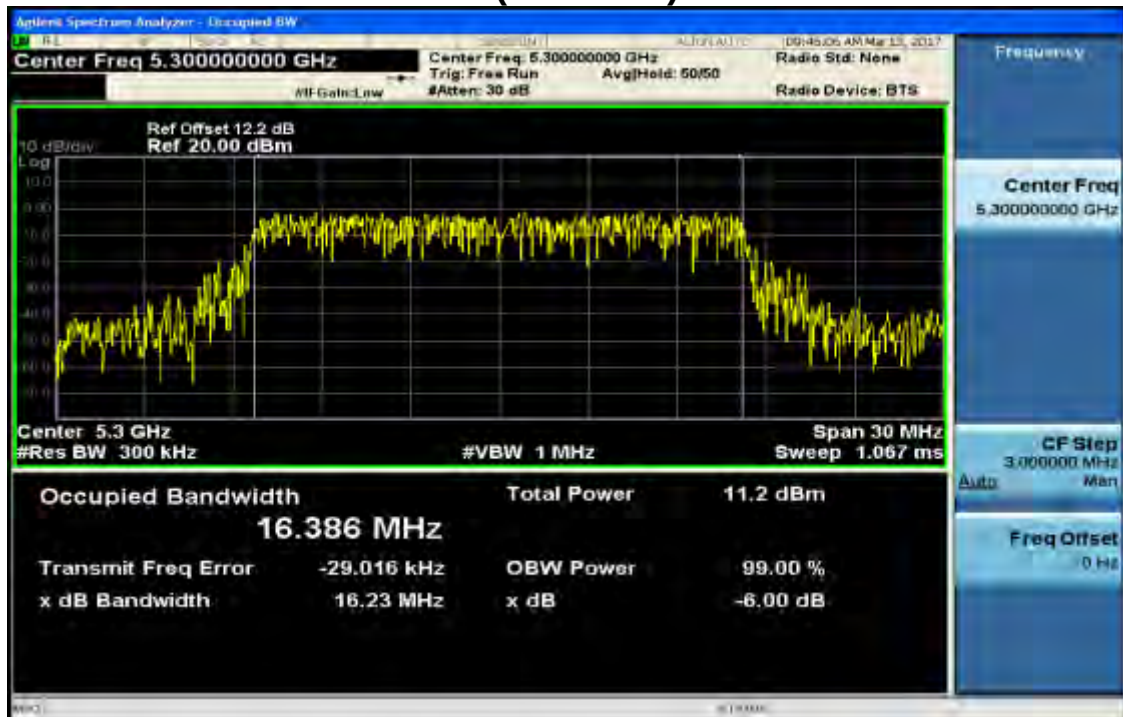
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802.11a, 5250~5350 MHz (Main) 99% Band Width Test Data CH-Low (5260MHz)



99% Band Width Test Data CH-Mid (5300MHz)



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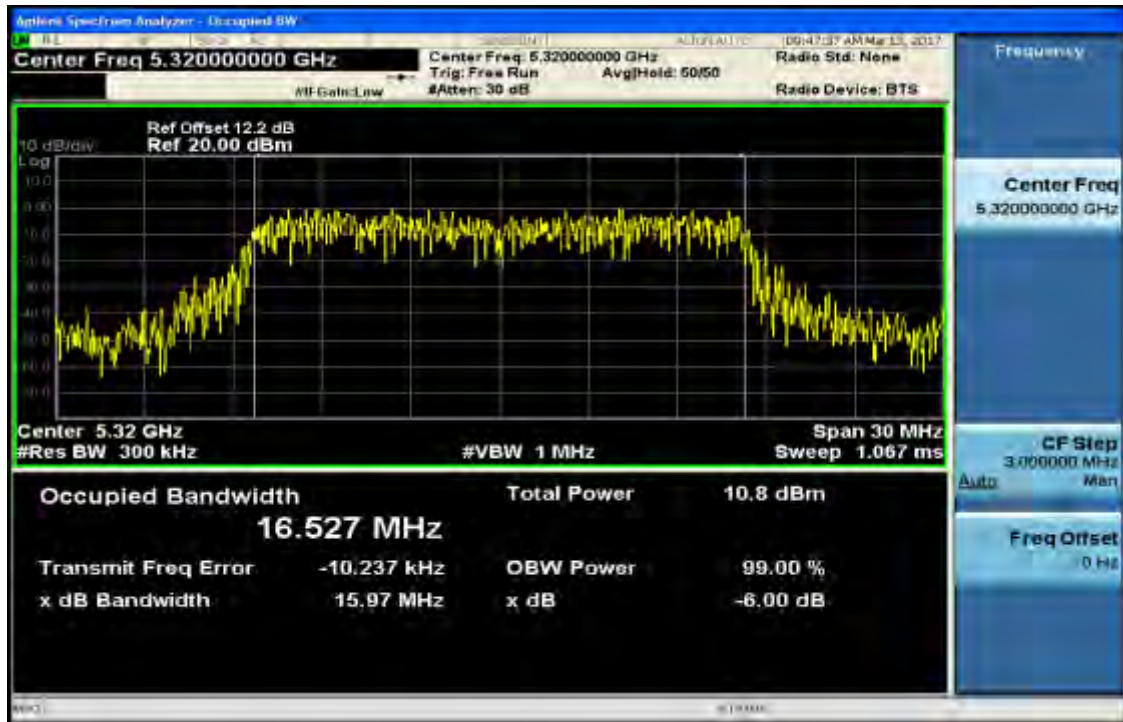
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99% Band Width Test Data CH-High (5320MHz)



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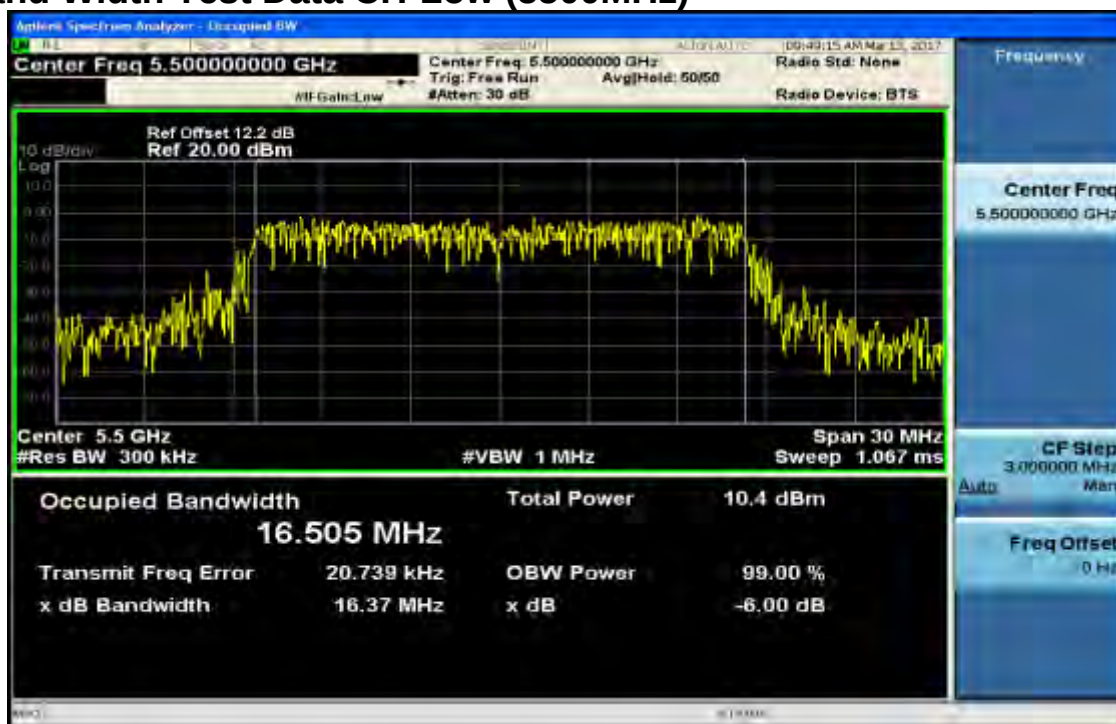
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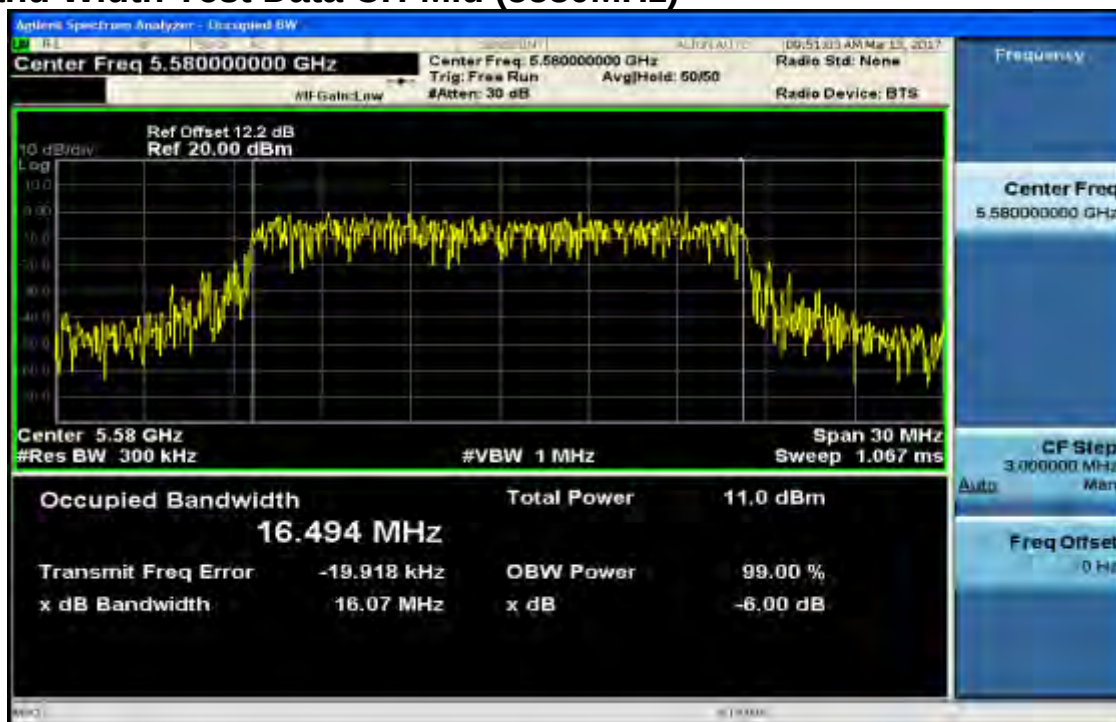
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802.11a, 5470~5725 MHz (Main) 99% Band Width Test Data CH-Low (5500MHz)



99% Band Width Test Data CH-Mid (5580MHz)



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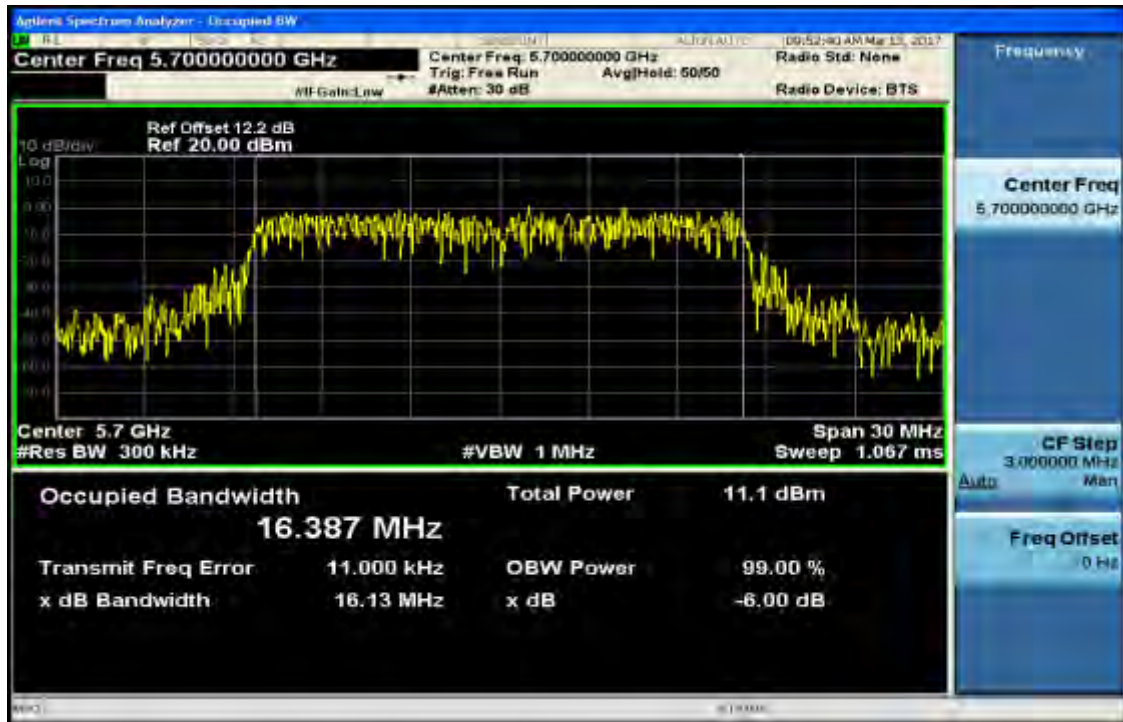
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99% Band Width Test Data CH-High (5700MHz)



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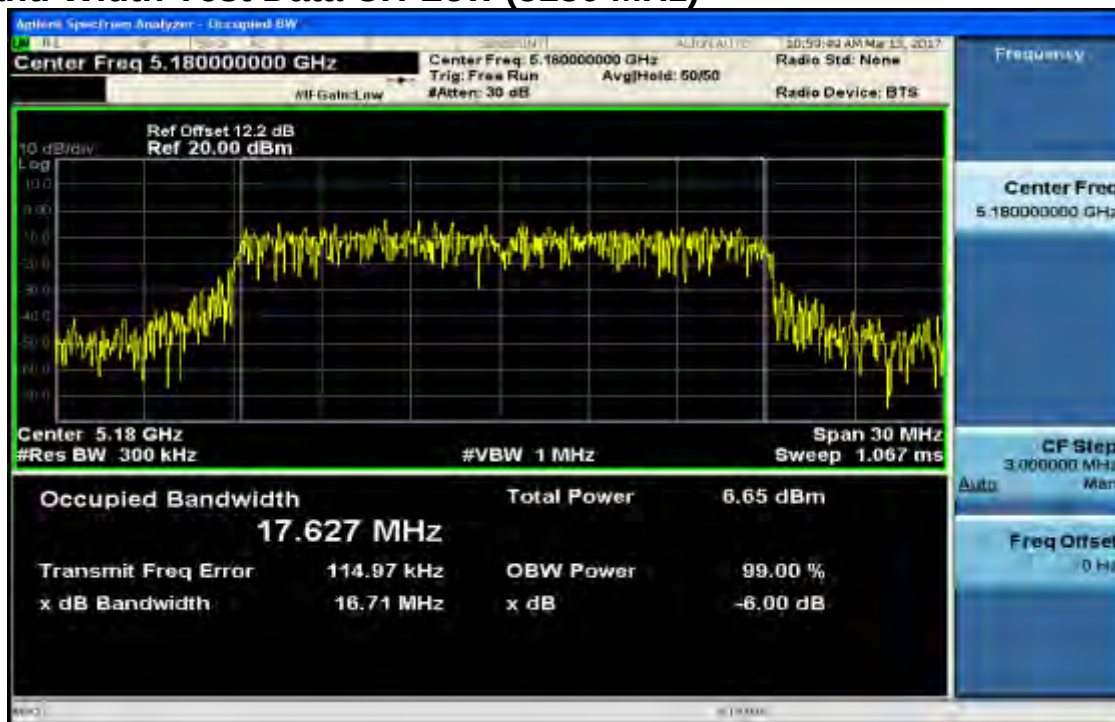
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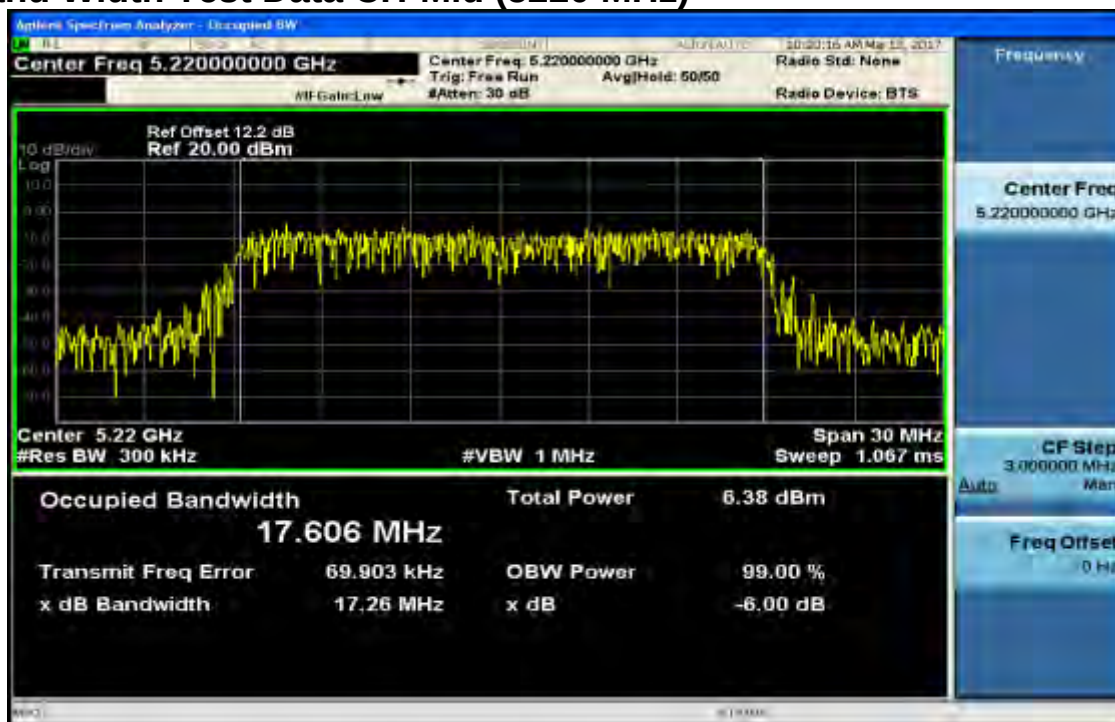
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802.11n HT20, 5150~5250 MHz (Main)

99% Band Width Test Data CH-Low (5180 MHz)



99% Band Width Test Data CH-Mid (5220 MHz)



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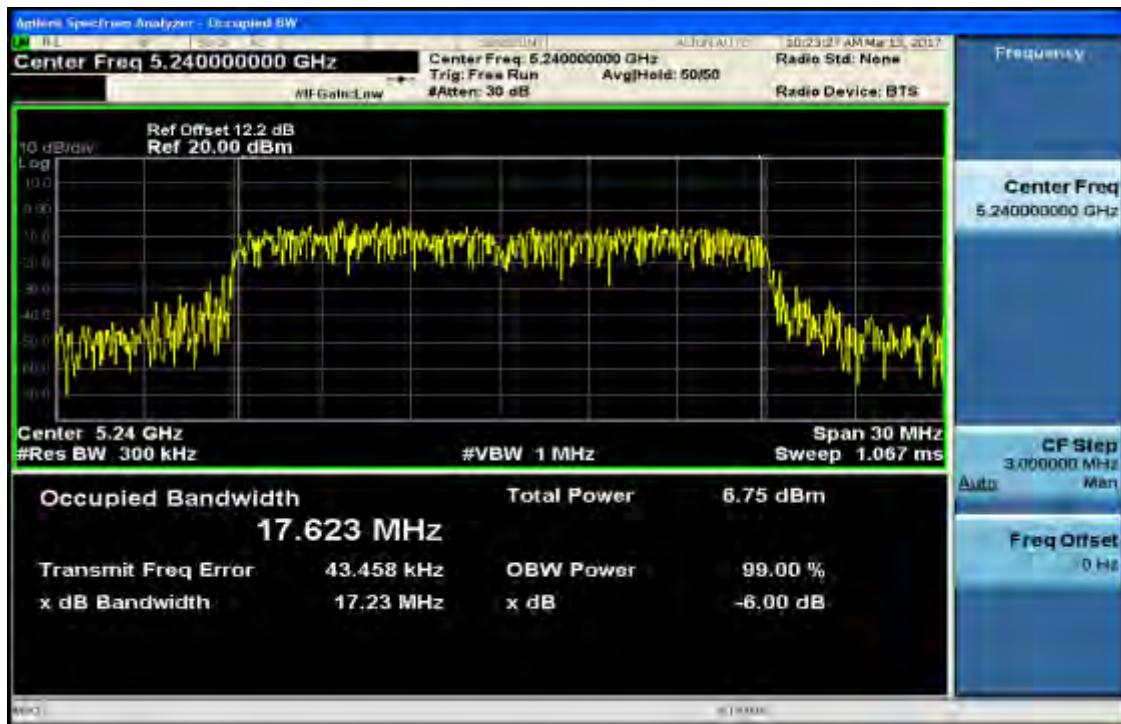
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99% Band Width Test Data CH-High (5240 MHz)



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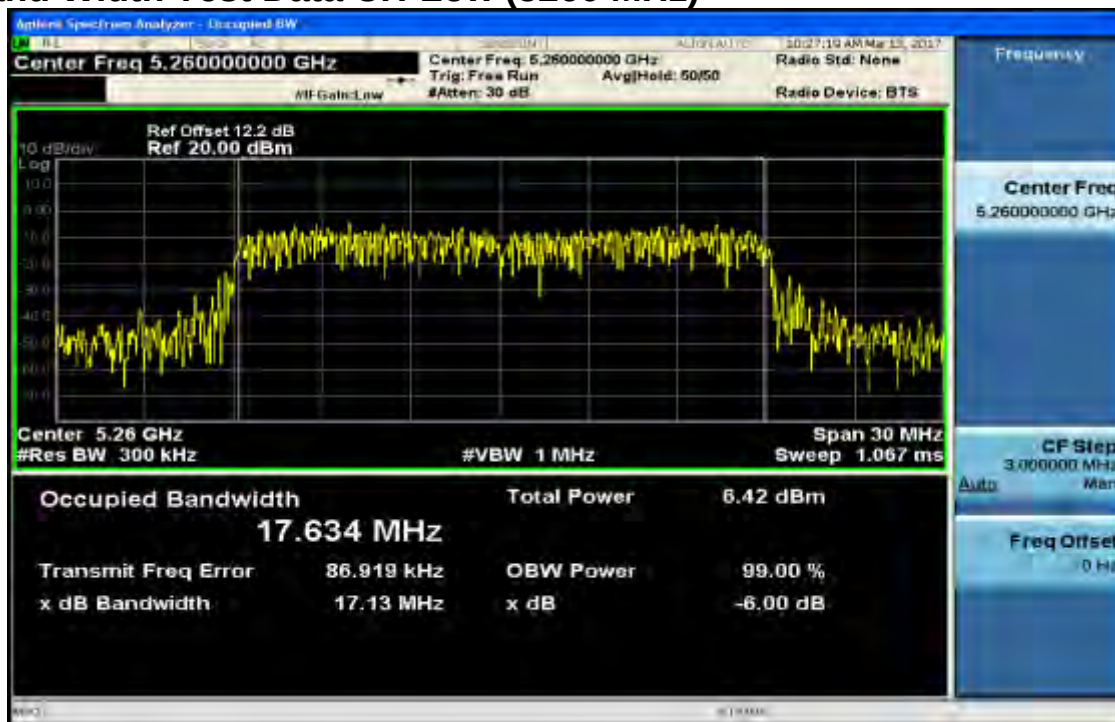
t (886-2) 2299-3279

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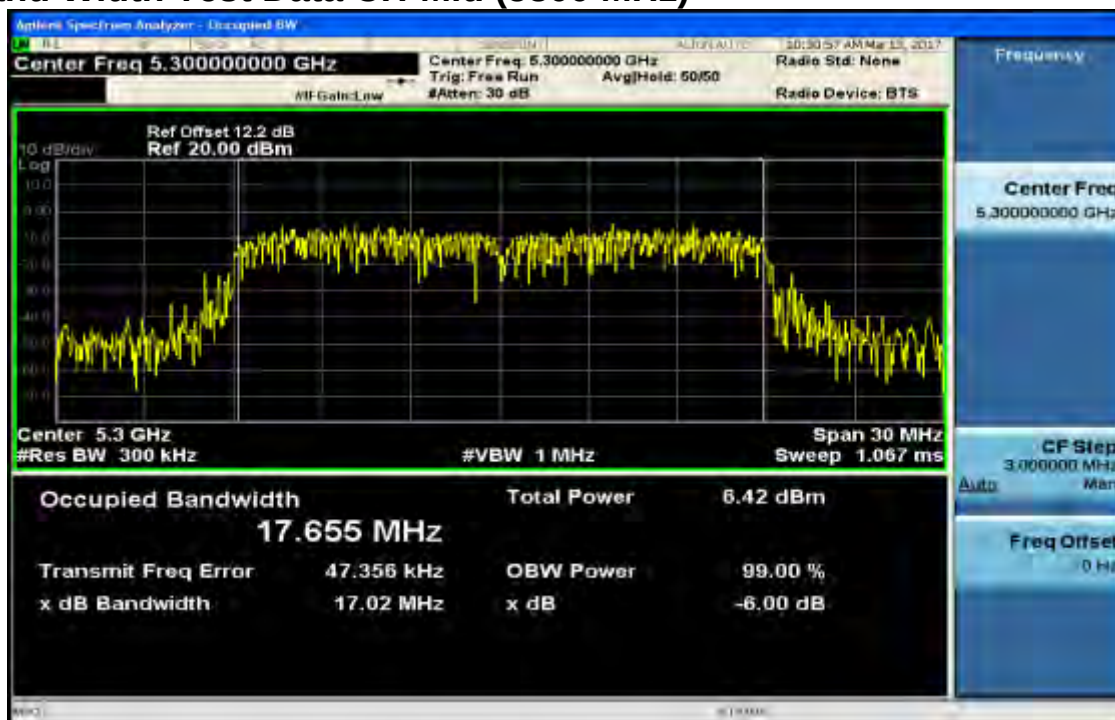
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802.11n HT20, 5250~5350 MHz (Main) 99% Band Width Test Data CH-Low (5260 MHz)



99% Band Width Test Data CH-Mid (5300 MHz)



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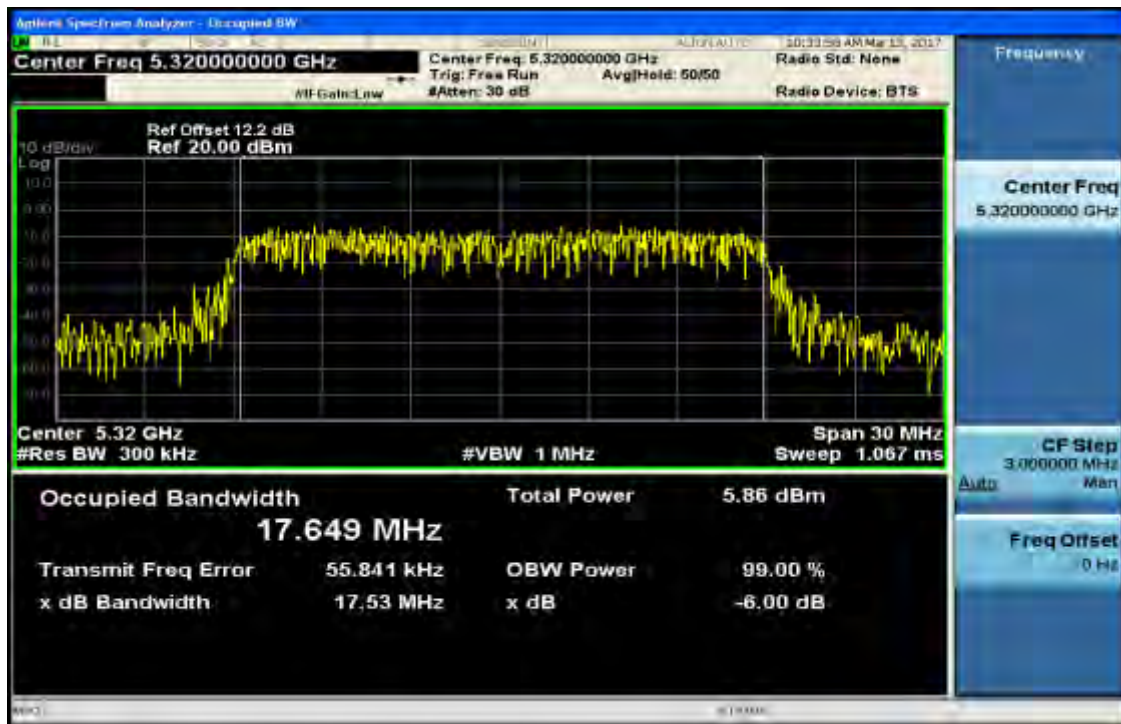
t (886-2) 2299-3279

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99% Band Width Test Data CH-High (5320 MHz)



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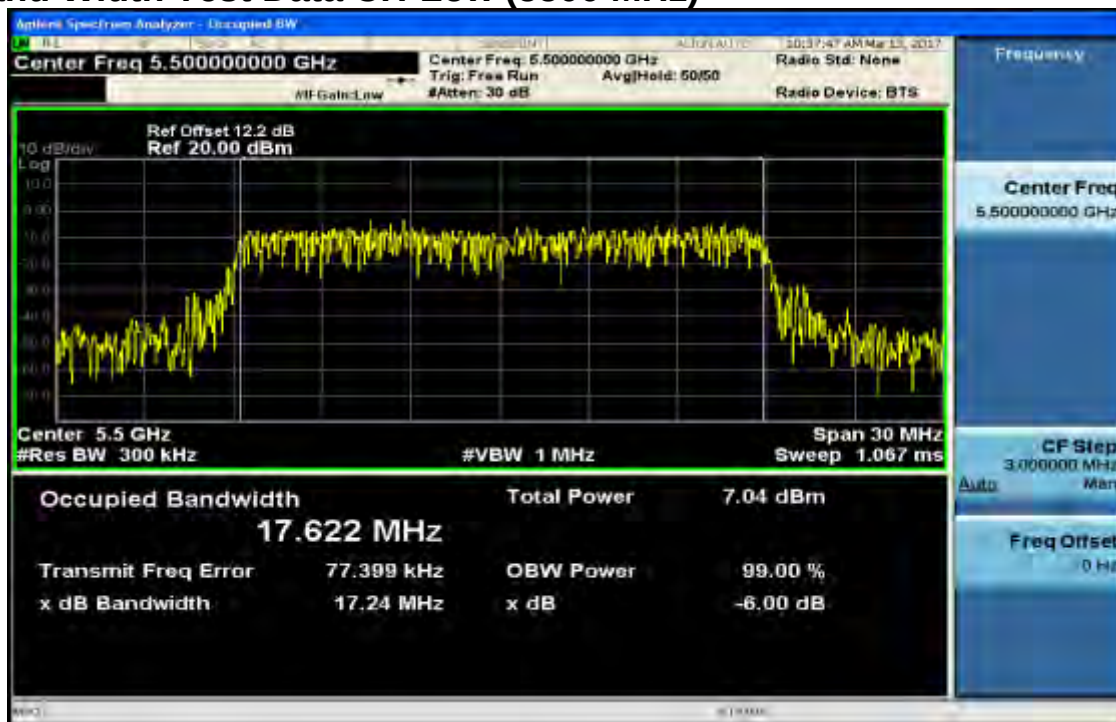
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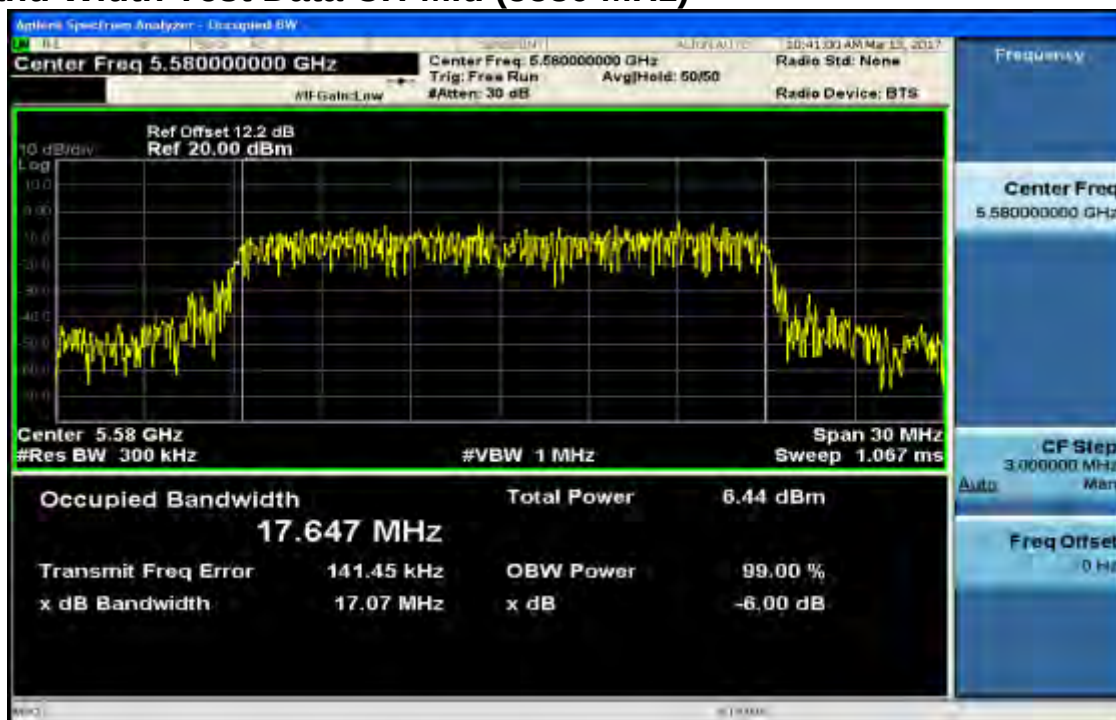
Member of SGS Group

802.11n HT20, 5470~5725 MHz (Main)

99% Band Width Test Data CH-Low (5500 MHz)



99% Band Width Test Data CH-Mid (5580 MHz)



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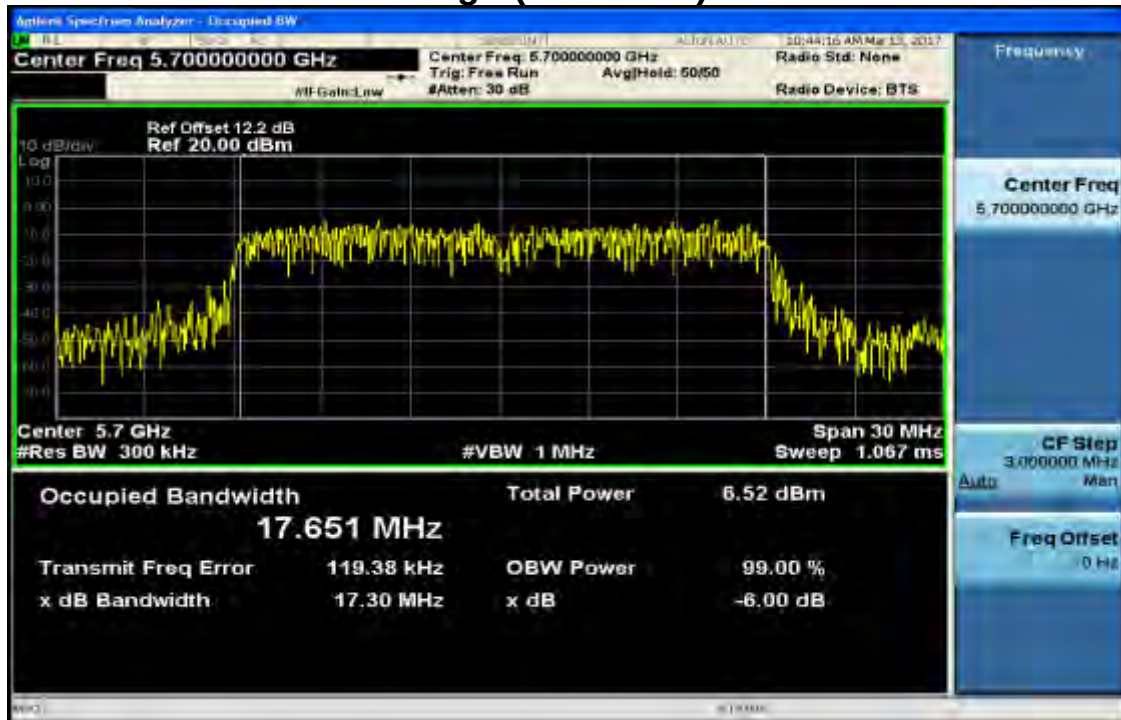
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99% Band Width Test Data CH-High (5700 MHz)



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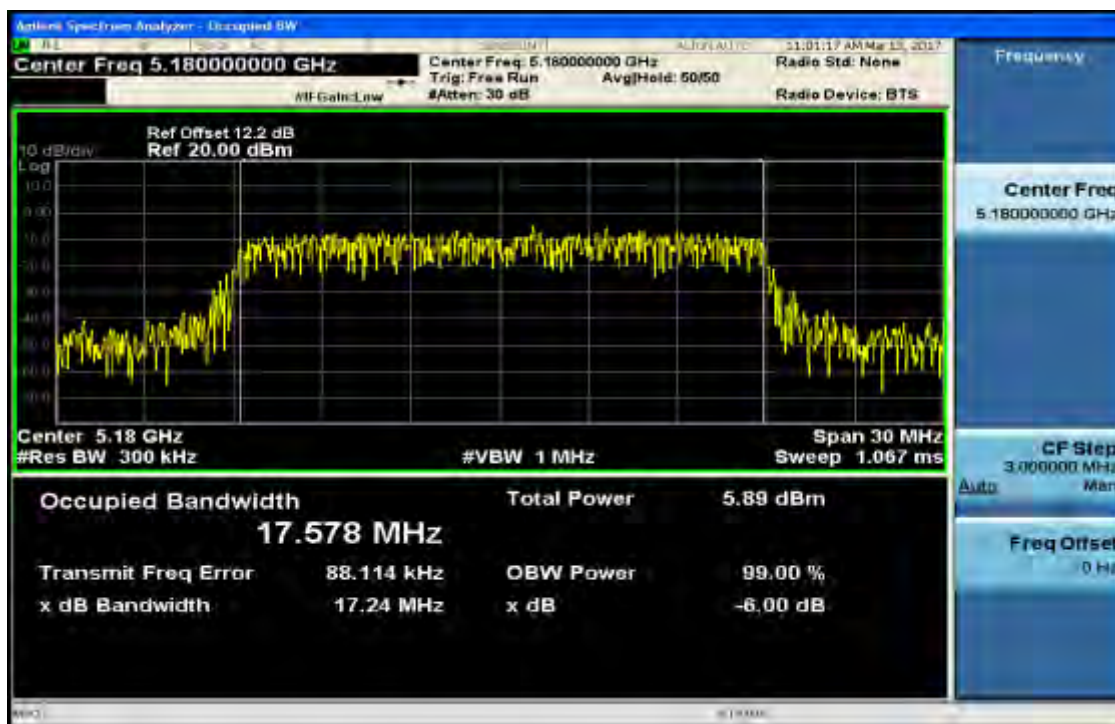
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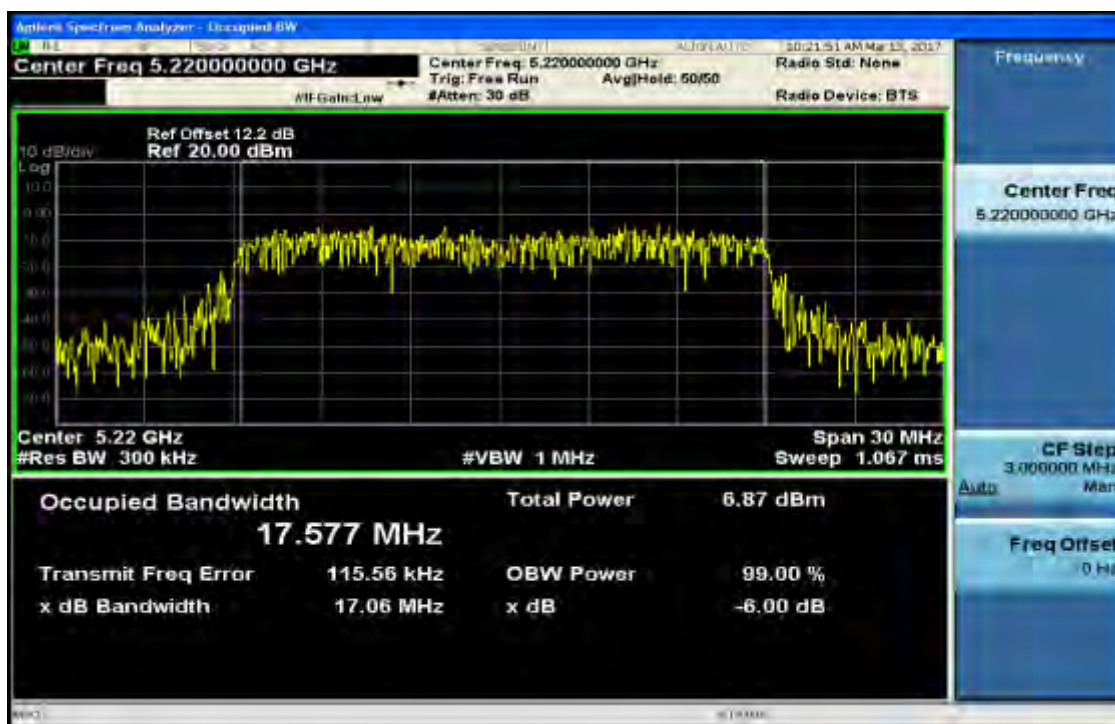
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Member of SGS Group

802.11n HT20, 5150~5250 MHz (Aux) 99% Band Width Test Data CH-Low (5180 MHz)



99% Band Width Test Data CH-Mid (5220 MHz)



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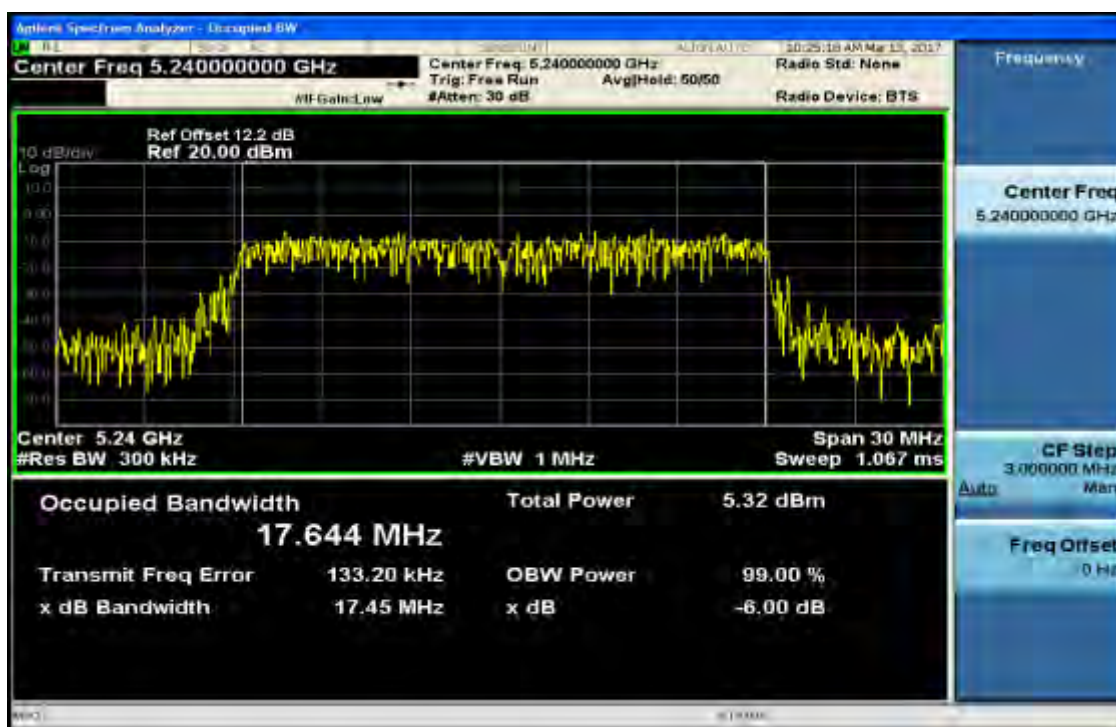
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99% Band Width Test Data CH-High (5240 MHz)



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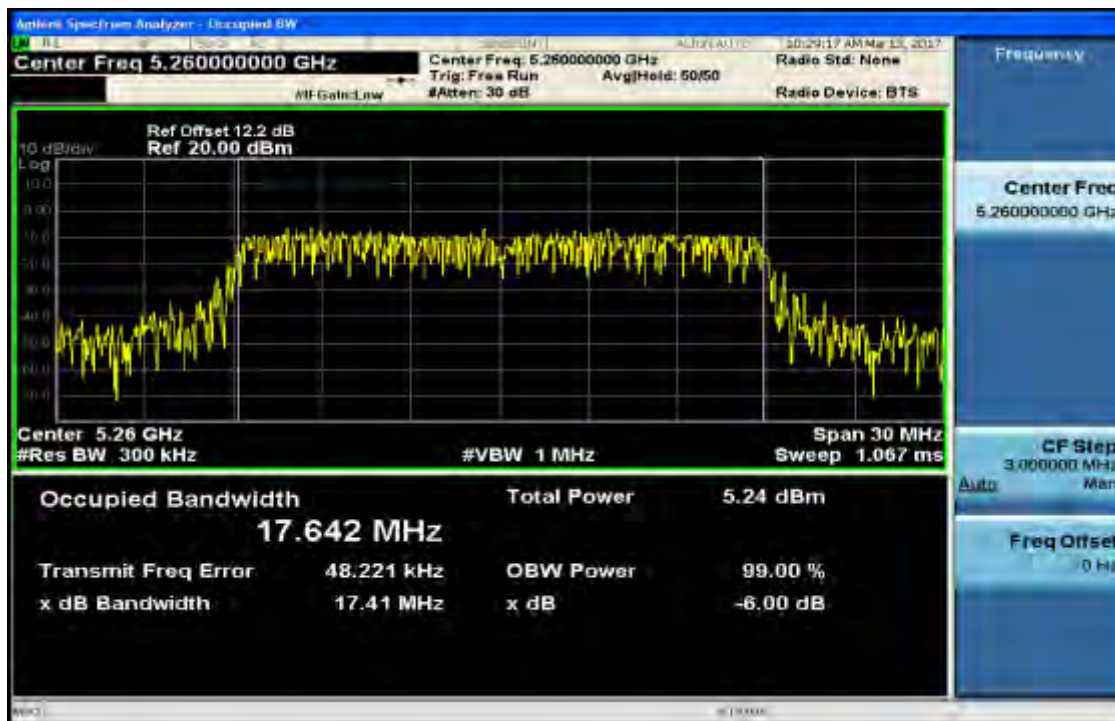
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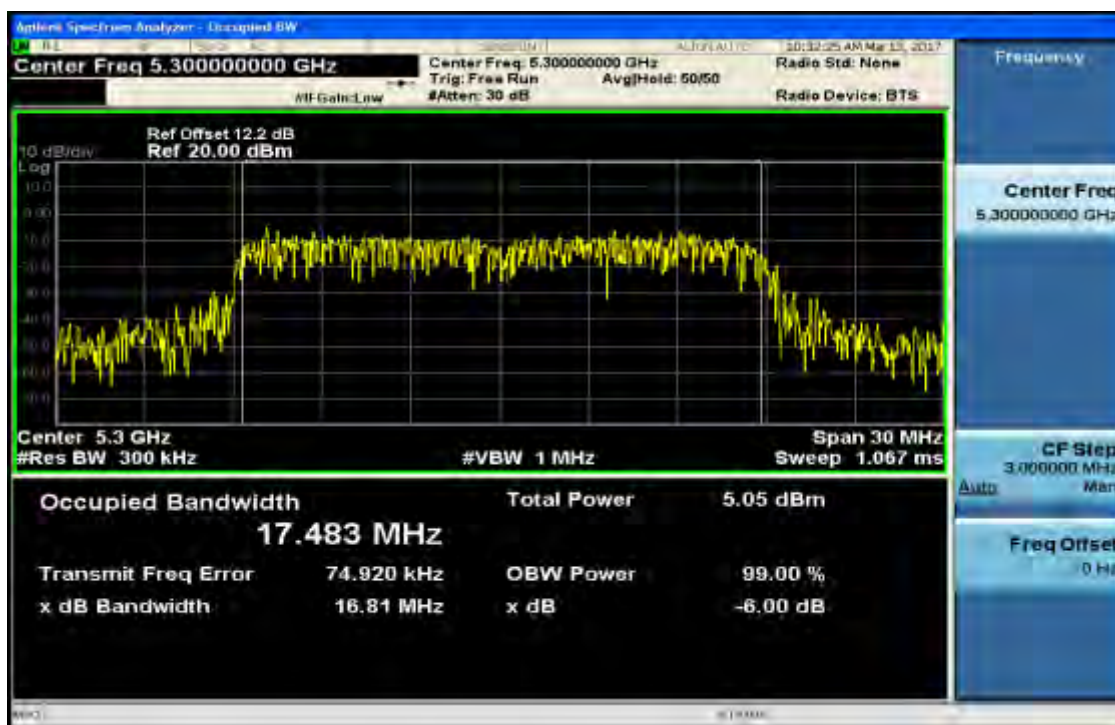
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802.11n HT20, 5250~5350 MHz (Aux) 99% Band Width Test Data CH-Low (5260 MHz)



99% Band Width Test Data CH-Mid (5300 MHz)



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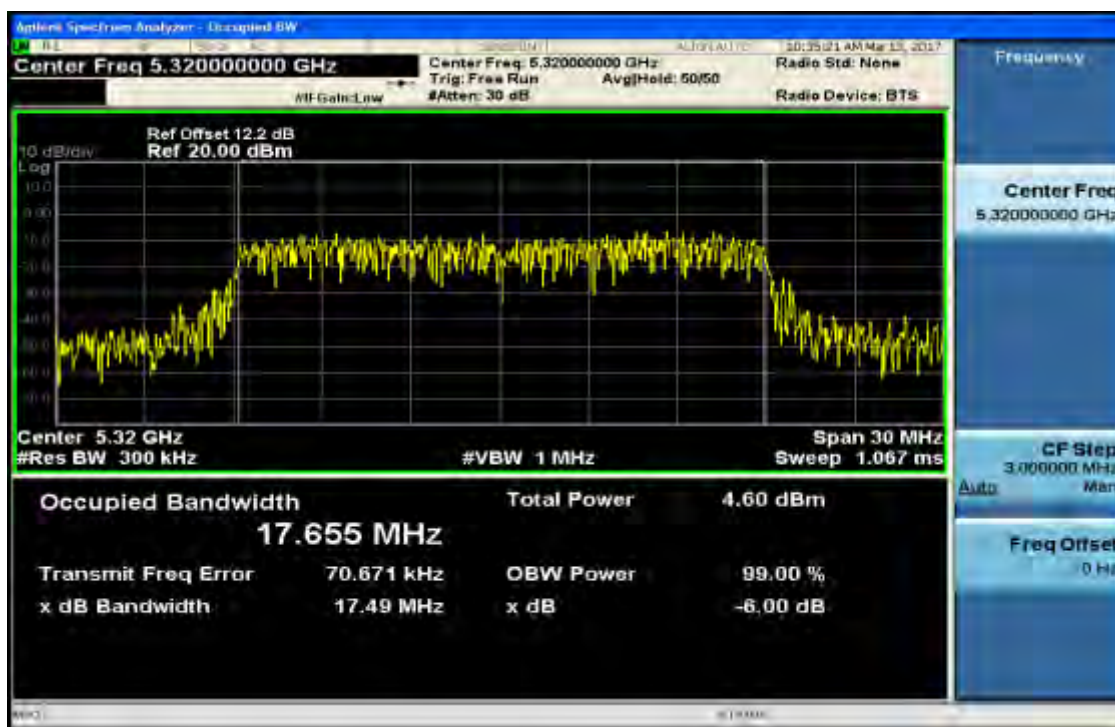
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99% Band Width Test Data CH-High (5320 MHz)



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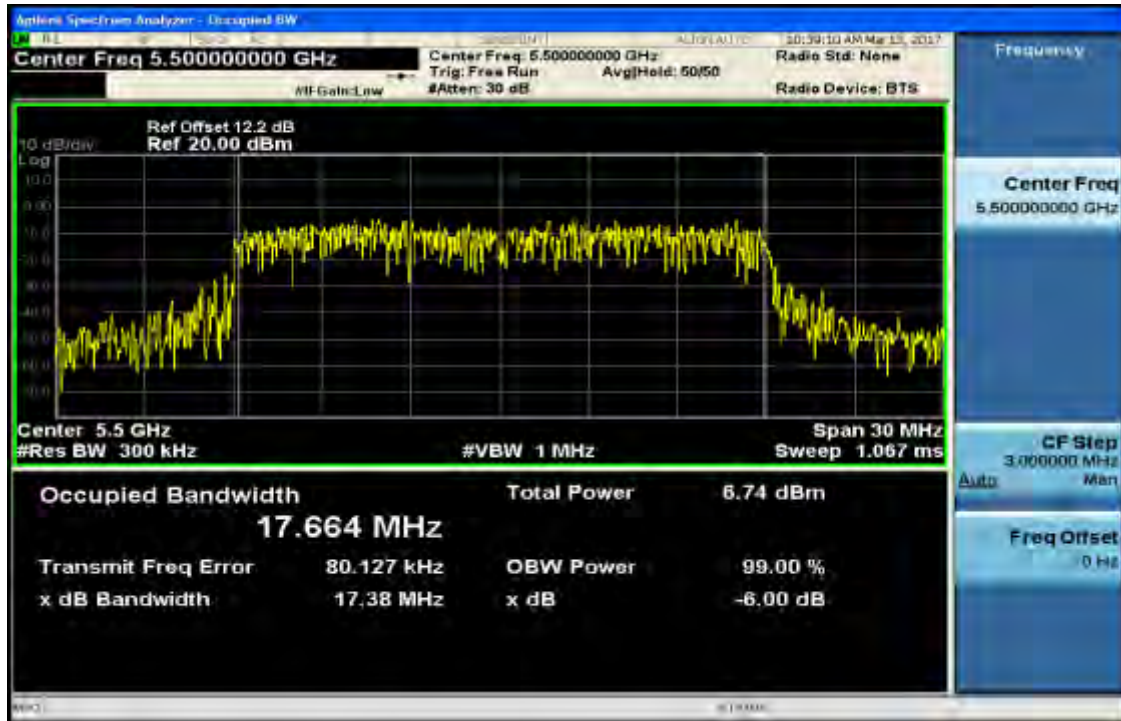
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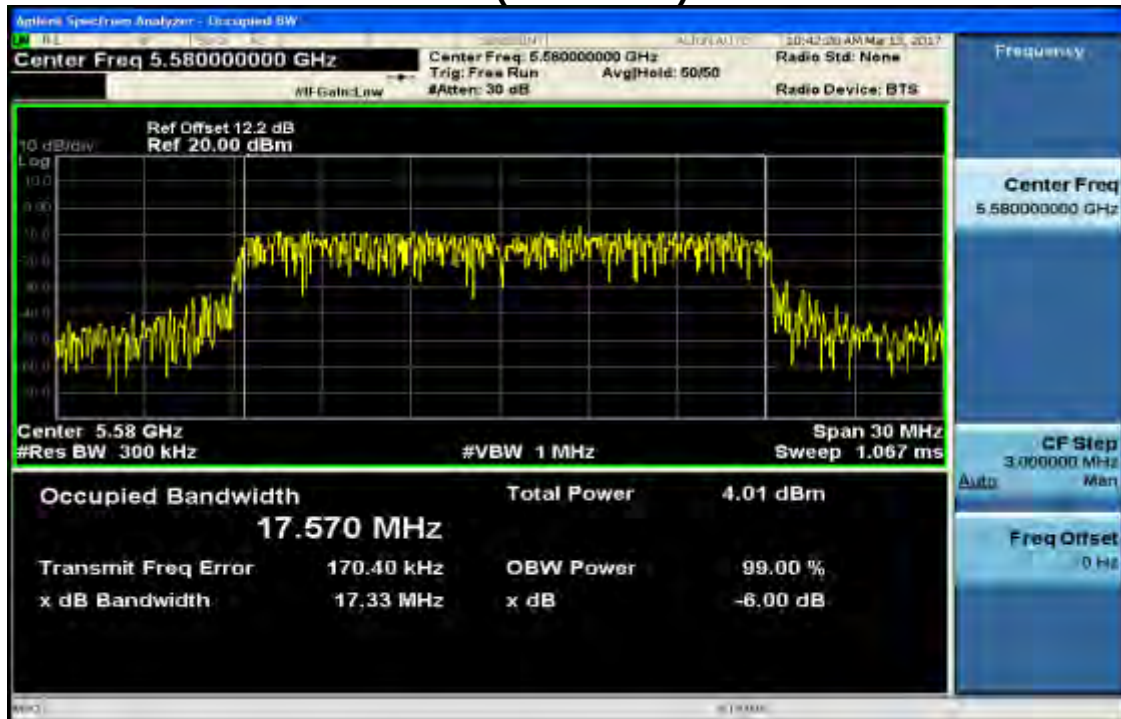
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802.11n HT20, 5470~5725 MHz (Aux) 99% Band Width Test Data CH-Low (5500 MHz)



99% Band Width Test Data CH-Mid (5580 MHz)



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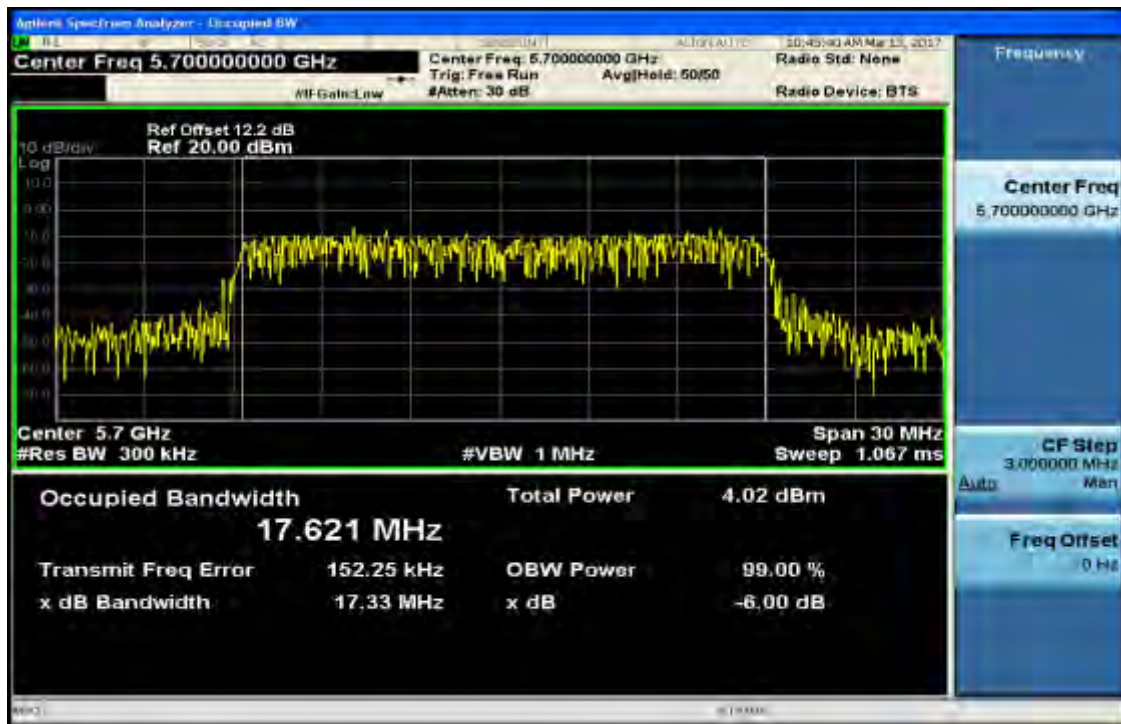
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99% Band Width Test Data CH-High (5700 MHz)



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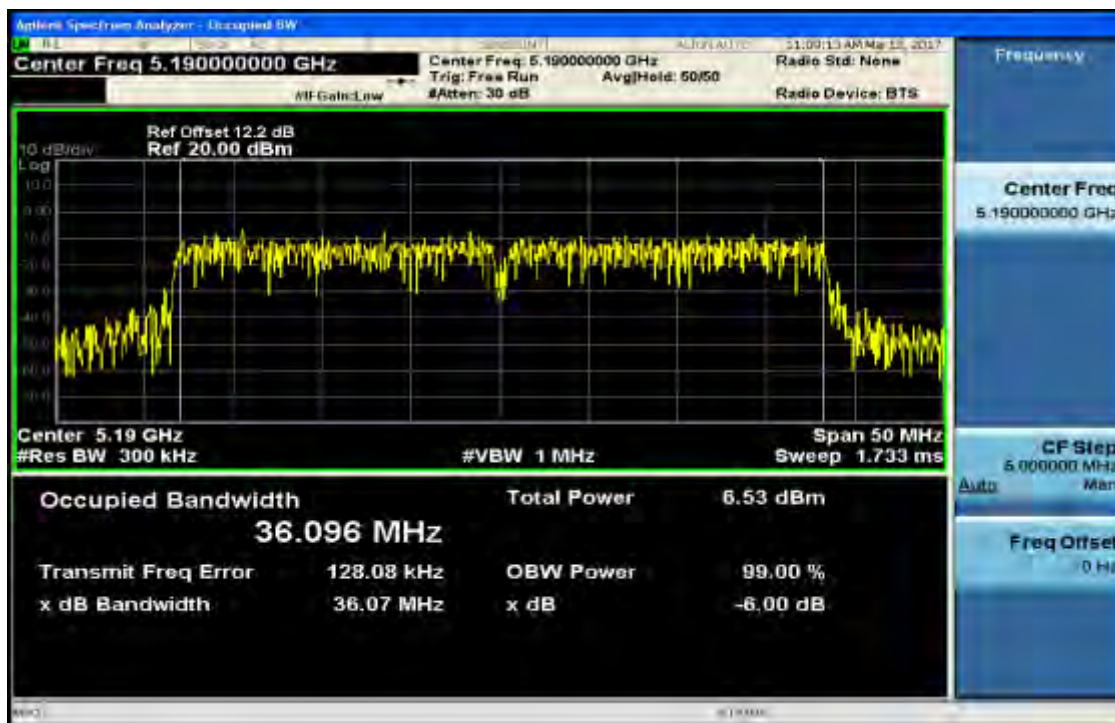
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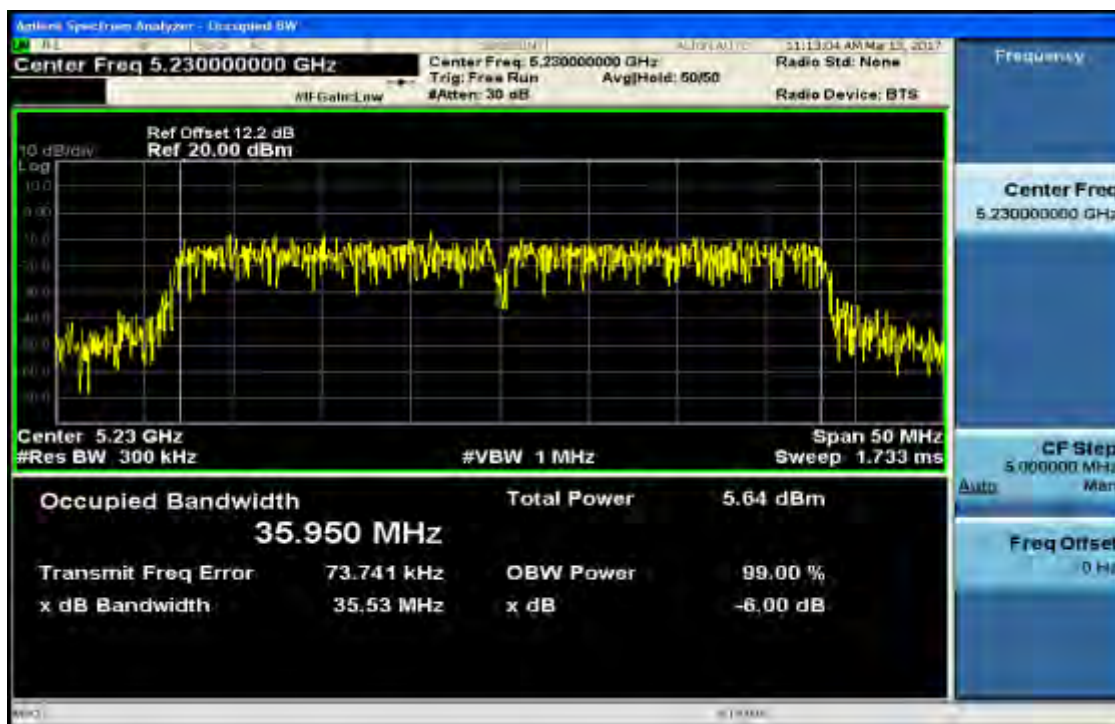
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802.11n HT40, 5150~5250 MHz (Main)

99% Band Width Test Data CH-Low (5190 MHz)



99% Band Width Test Data CH-High (5230 MHz)



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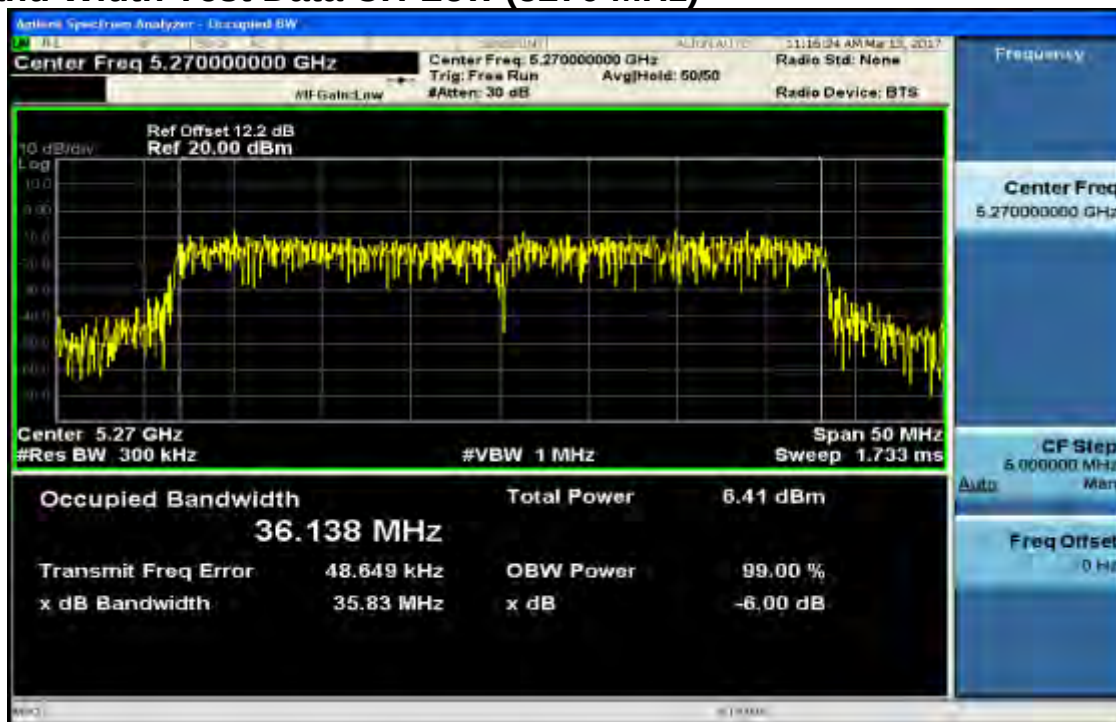
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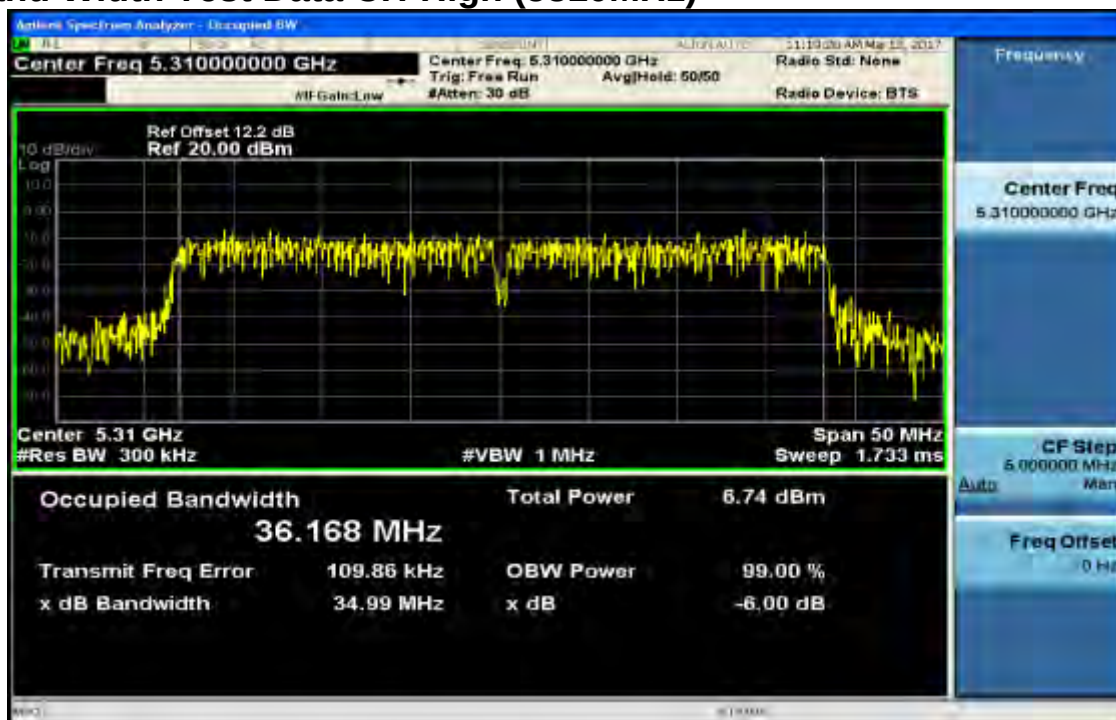
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802.11n HT40, 5250~5350 MHz (Main)

99% Band Width Test Data CH-Low (5270 MHz)



99% Band Width Test Data CH-High (5310MHz)



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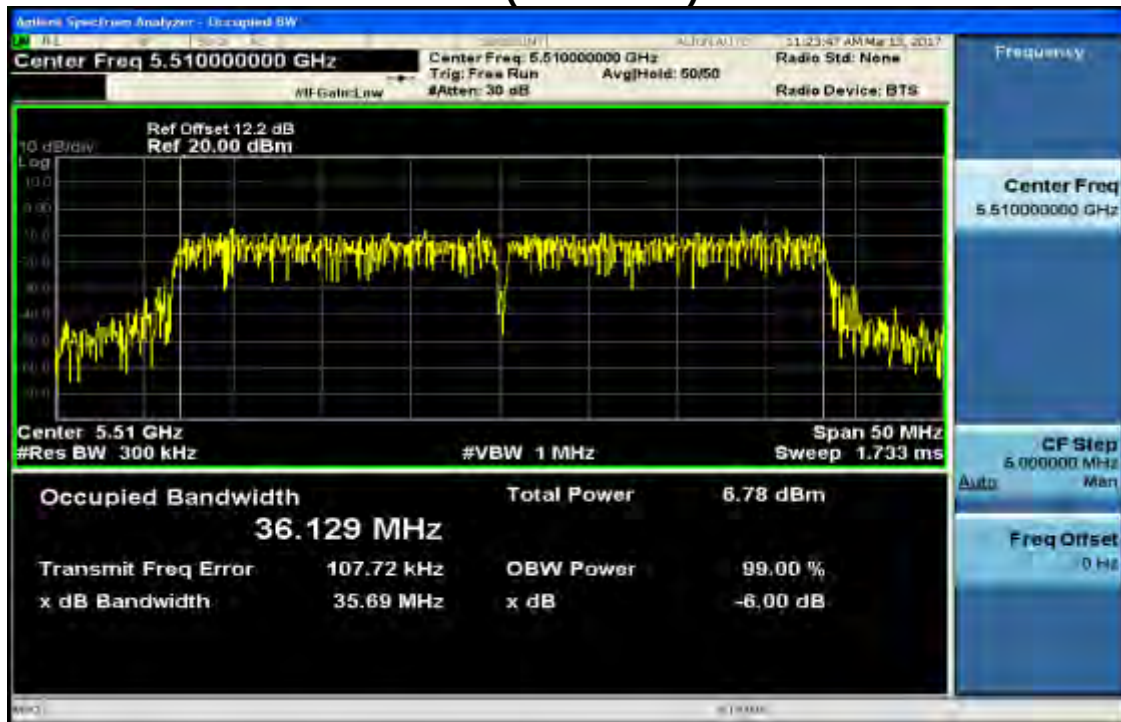
t (886-2) 2299-3279

f (886-2) 2298-0488

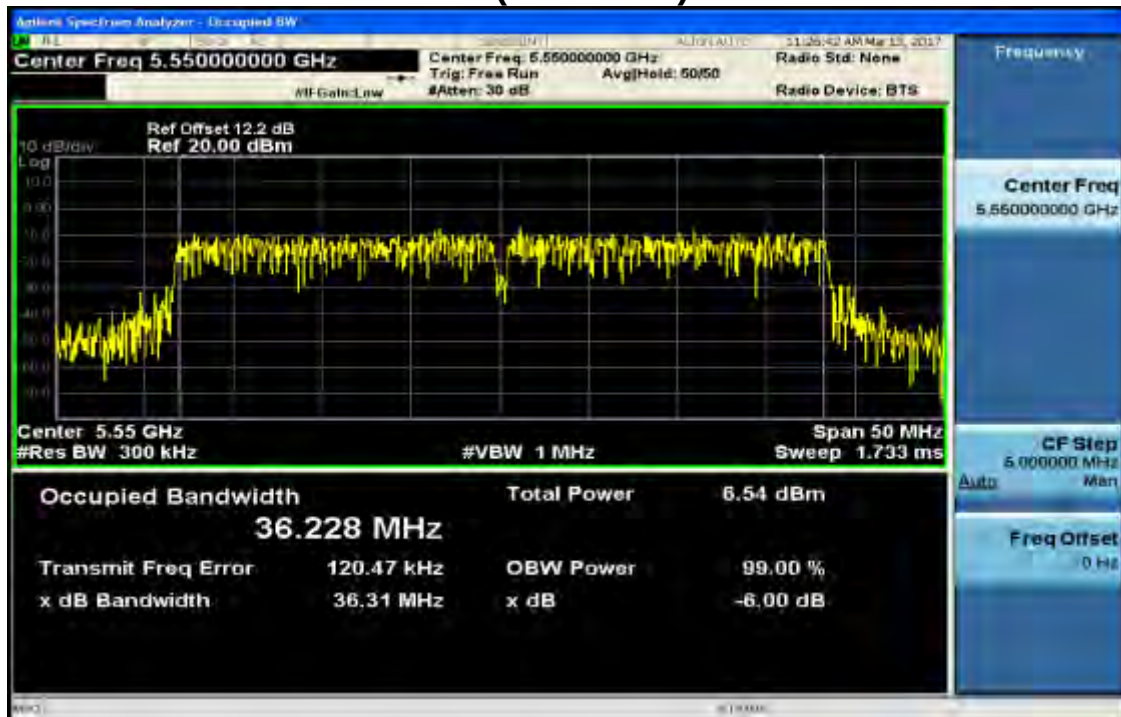
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802.11n HT40, 5470~5725 MHz (Main) 99% Band Width Test Data CH-Low (5510 MHz)



99% Band Width Test Data CH-Mid (5550 MHz)



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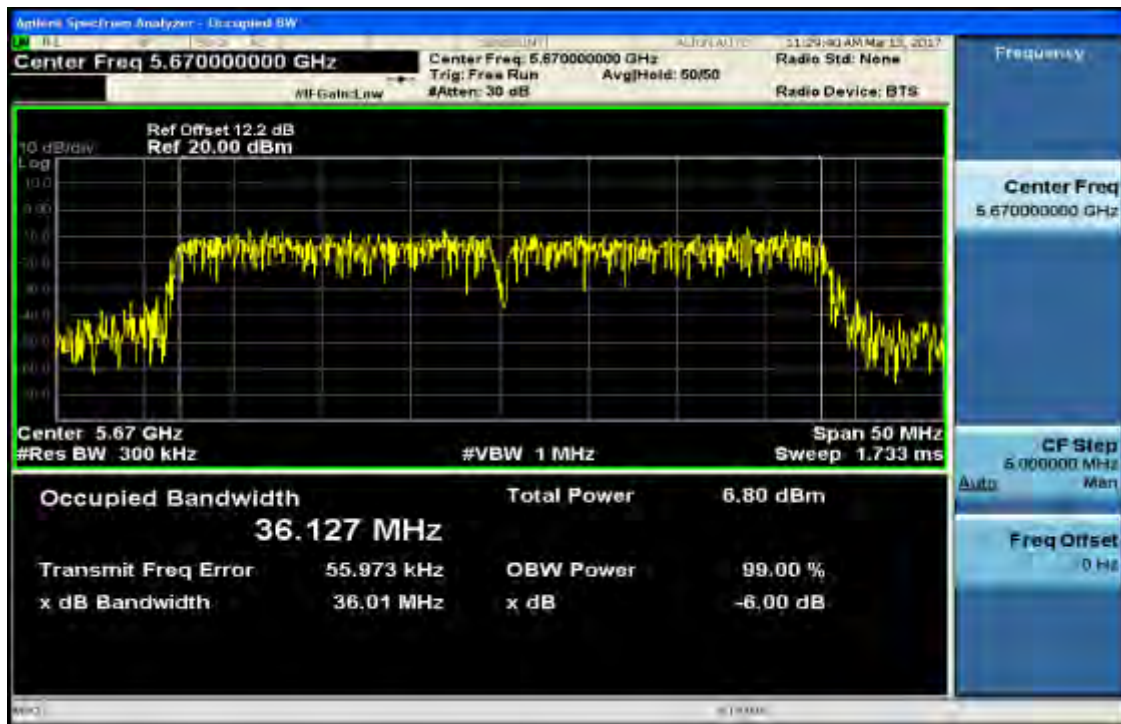
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99% Band Width Test Data CH-High (5670 MHz)



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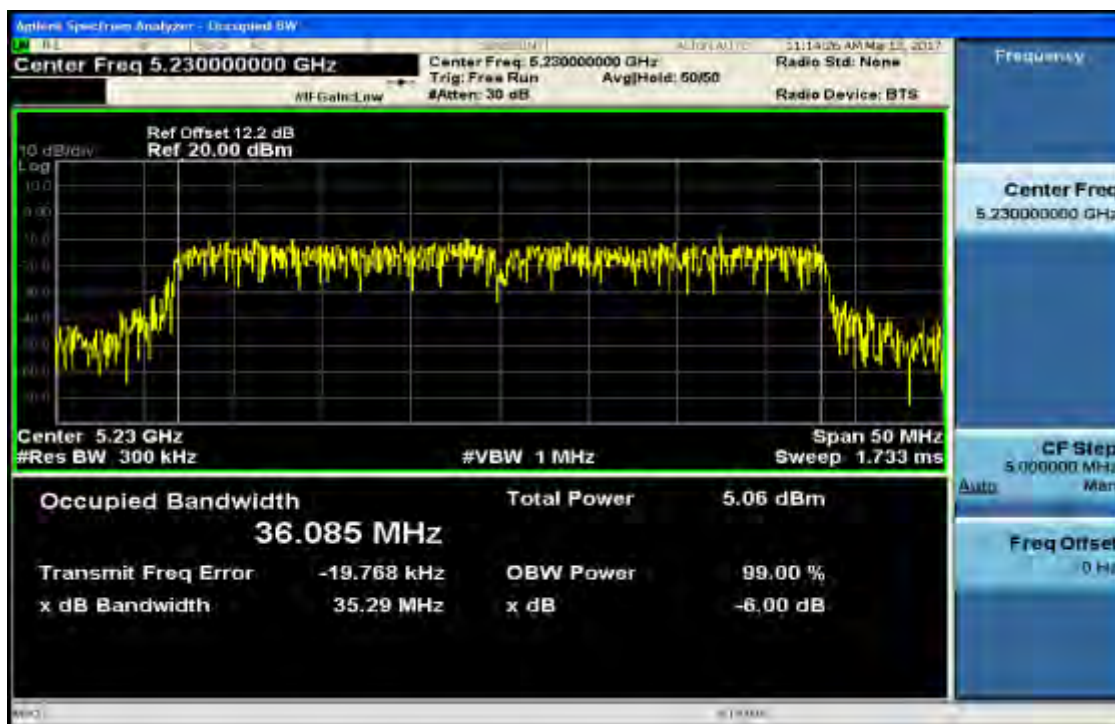
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802.11n HT40, 5150~5250 MHz (Aux)

99% Band Width Test Data CH-Low (5190 MHz)



99% Band Width Test Data CH-High (5230 MHz)



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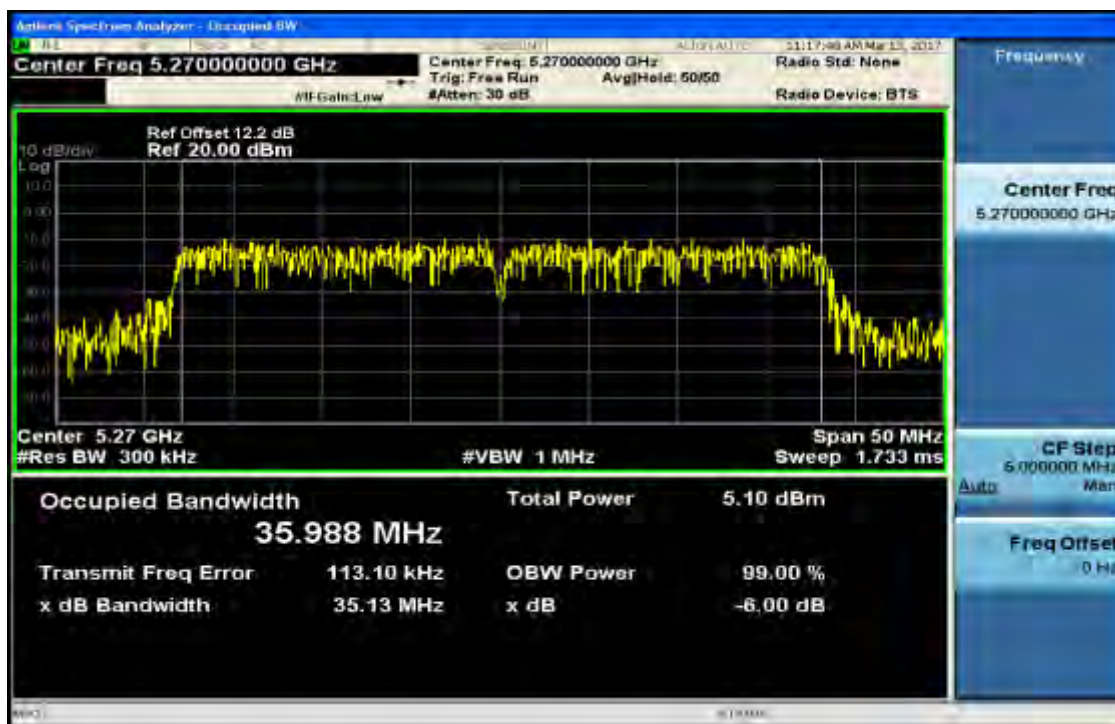
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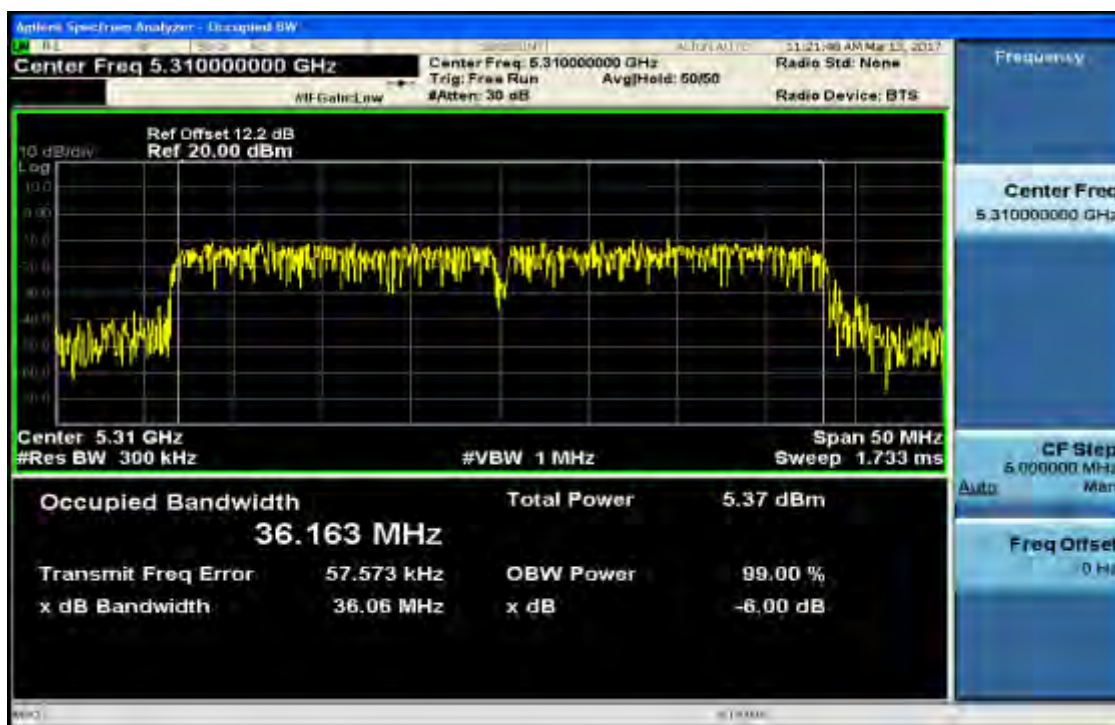
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802.11n HT40, 5250~5350 MHz (Aux) 99% Band Width Test Data CH-Low (5270 MHz)



99% Band Width Test Data CH-High (5310MHz)



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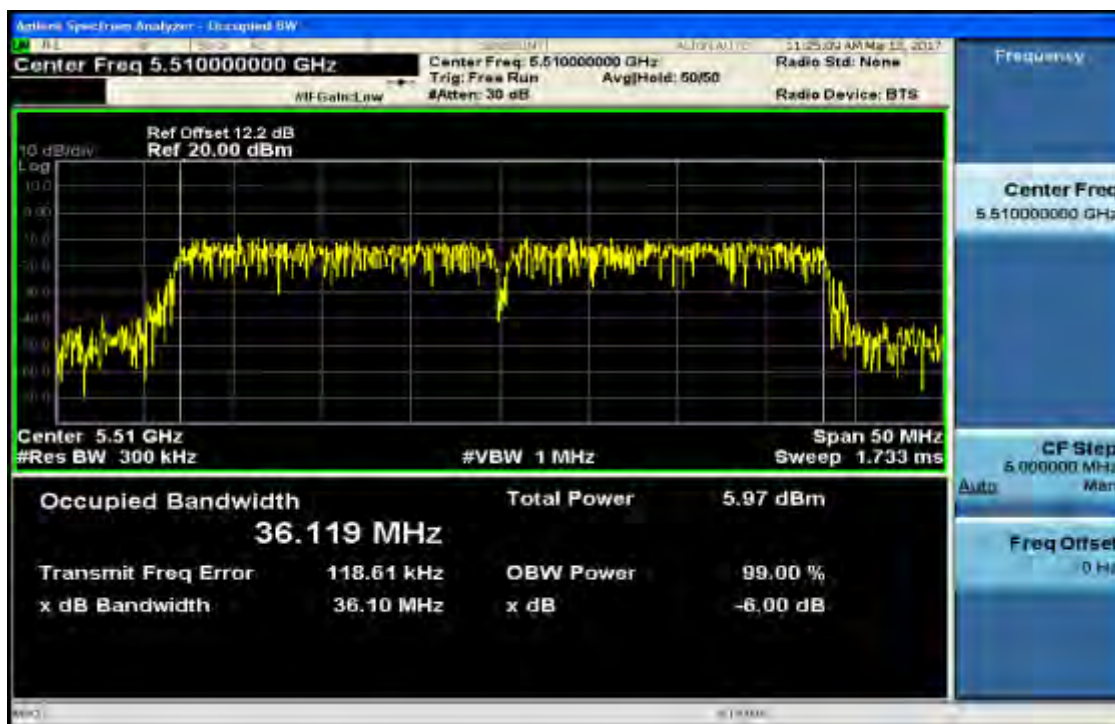
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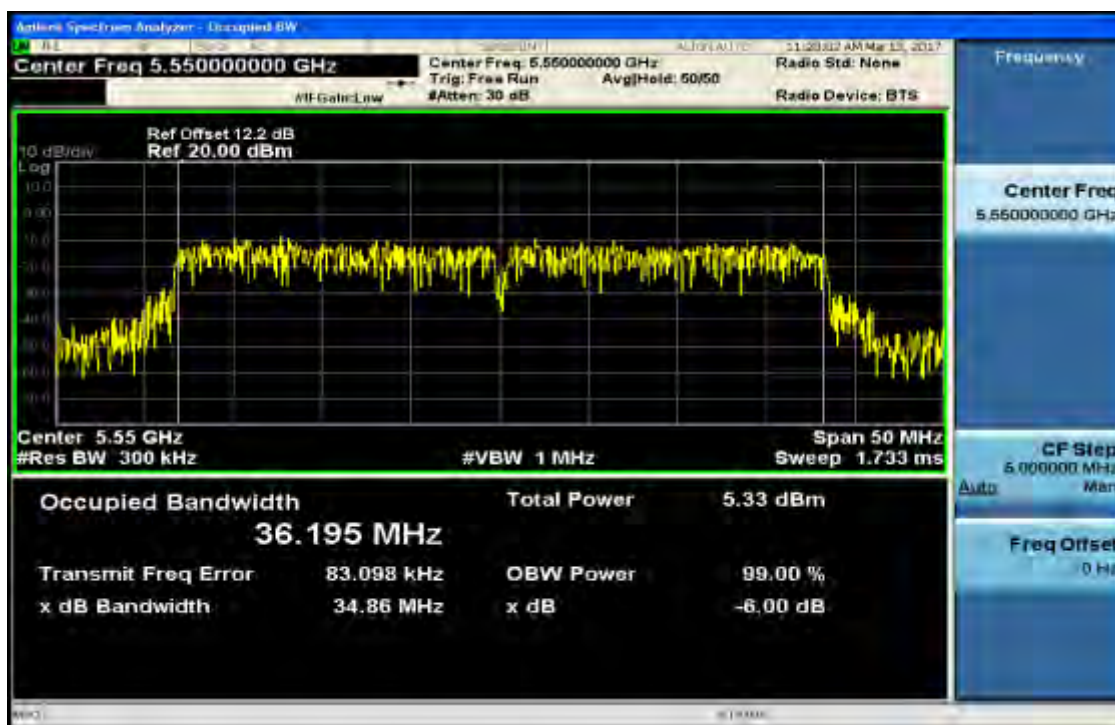
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802.11n HT40, 5470~5725 MHz (Aux) 99% Band Width Test Data CH-Low (5510 MHz)



99% Band Width Test Data CH-Mid (5550 MHz)



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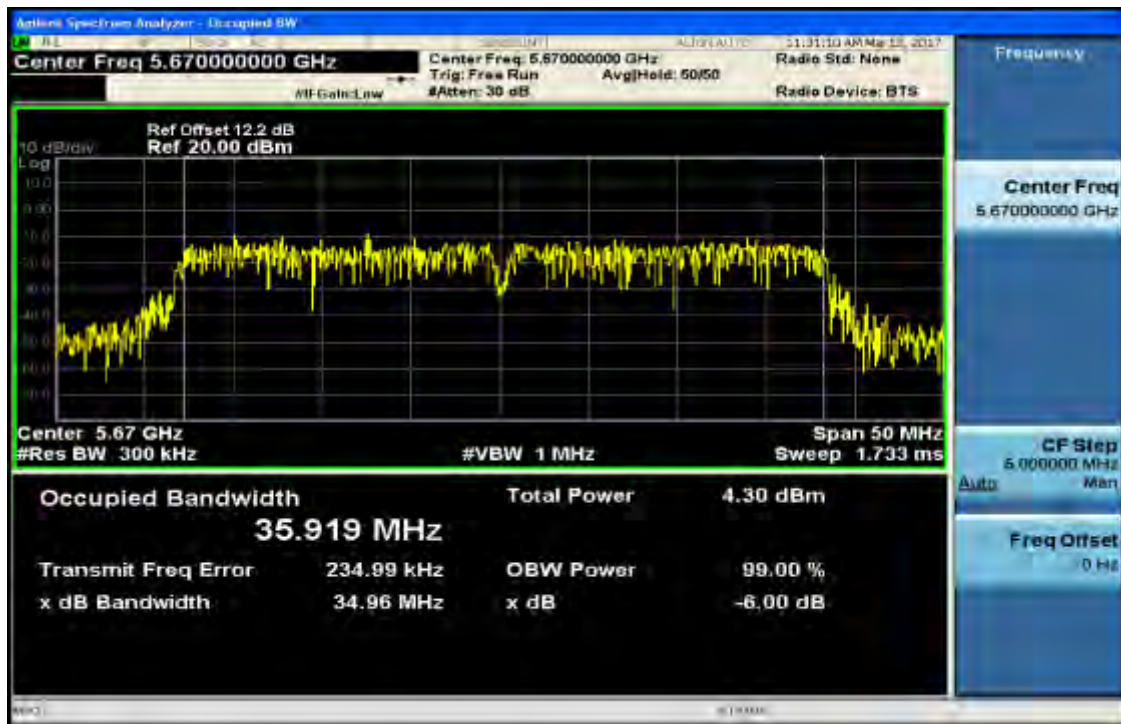
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99% Band Width Test Data CH-High (5670 MHz)



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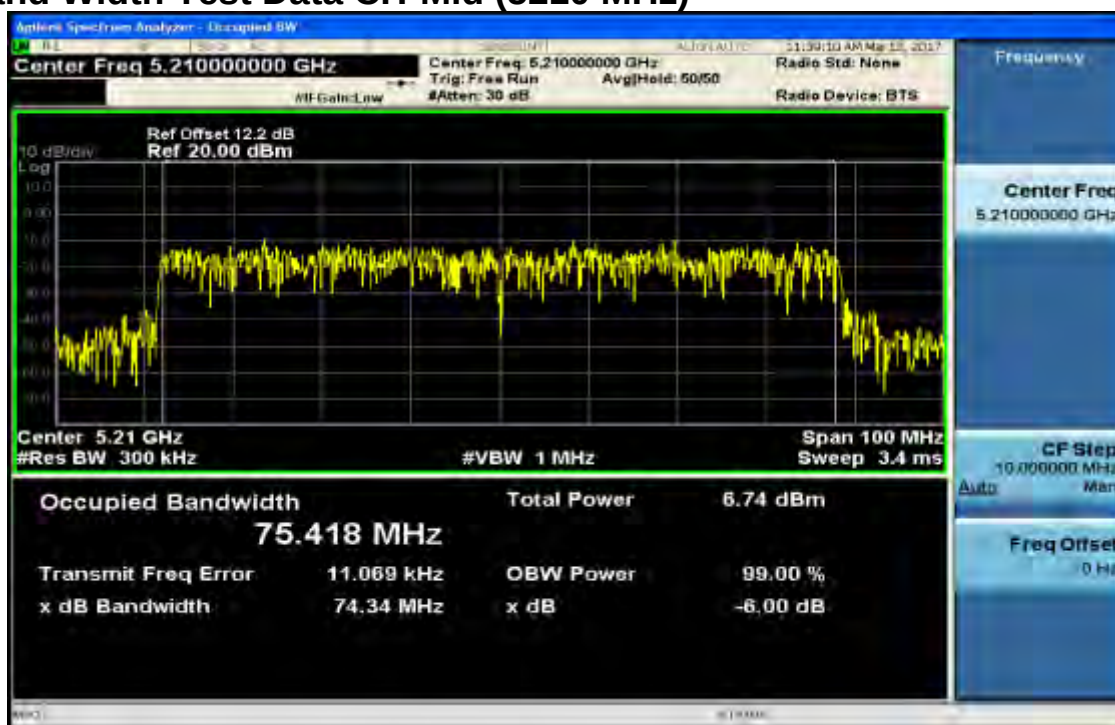
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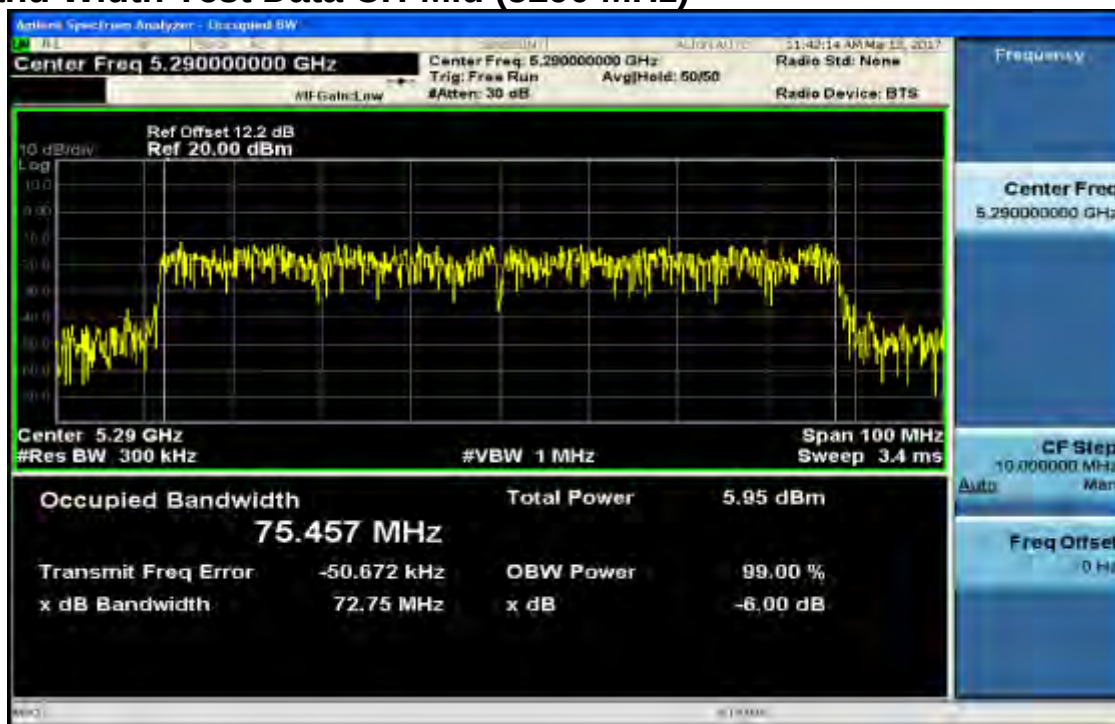
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802.11ac VHT80, 5150~5250 MHz (Main) 99% Band Width Test Data CH-Mid (5210 MHz)



802.11ac VHT80, 5250~5350 MHz 99% Band Width Test Data CH-Mid (5290 MHz)



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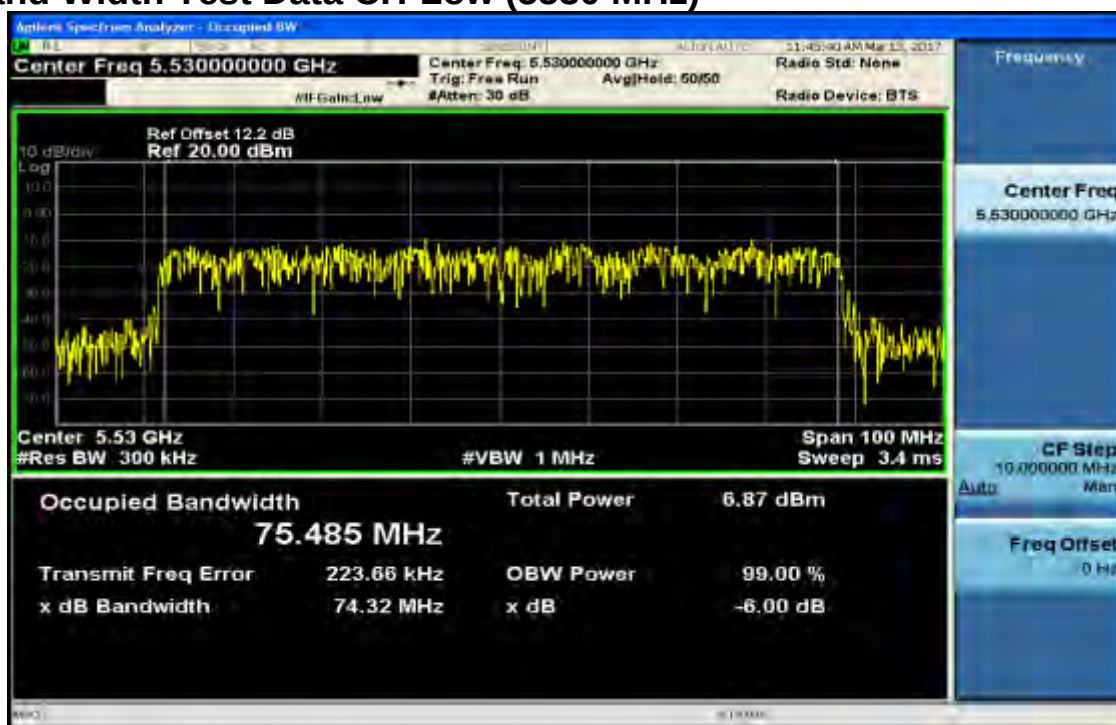
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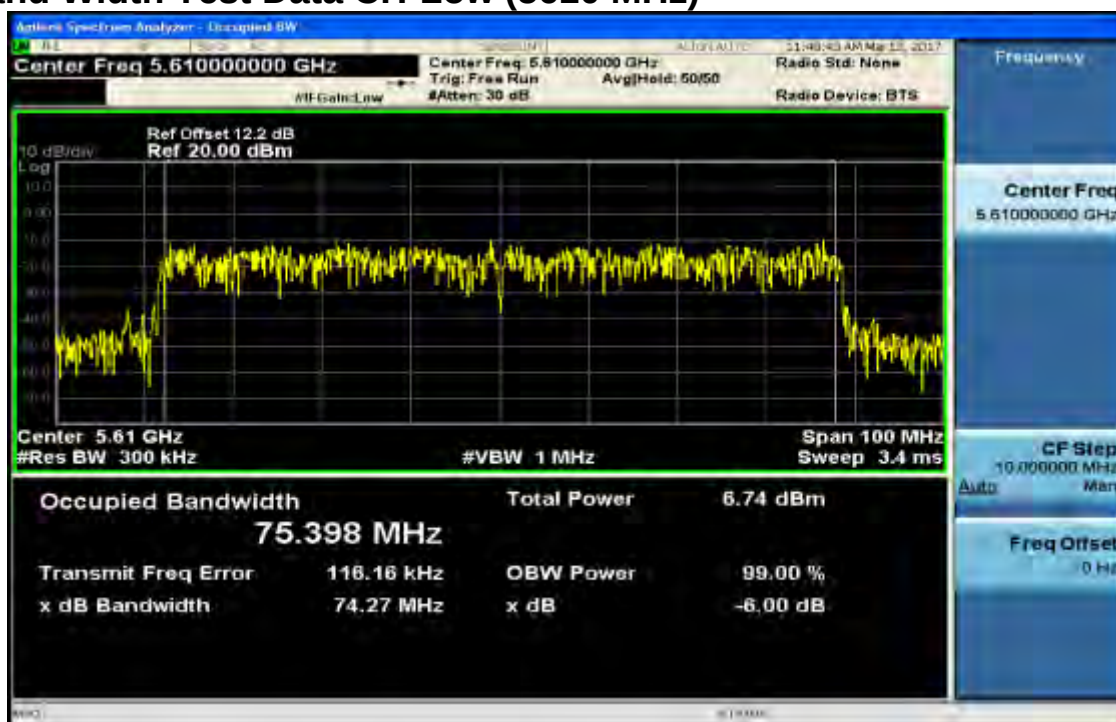
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802.11ac VHT80, 5470~5725 MHz (Main) 99% Band Width Test Data CH-Low (5530 MHz)



99% Band Width Test Data CH-Low (5610 MHz)



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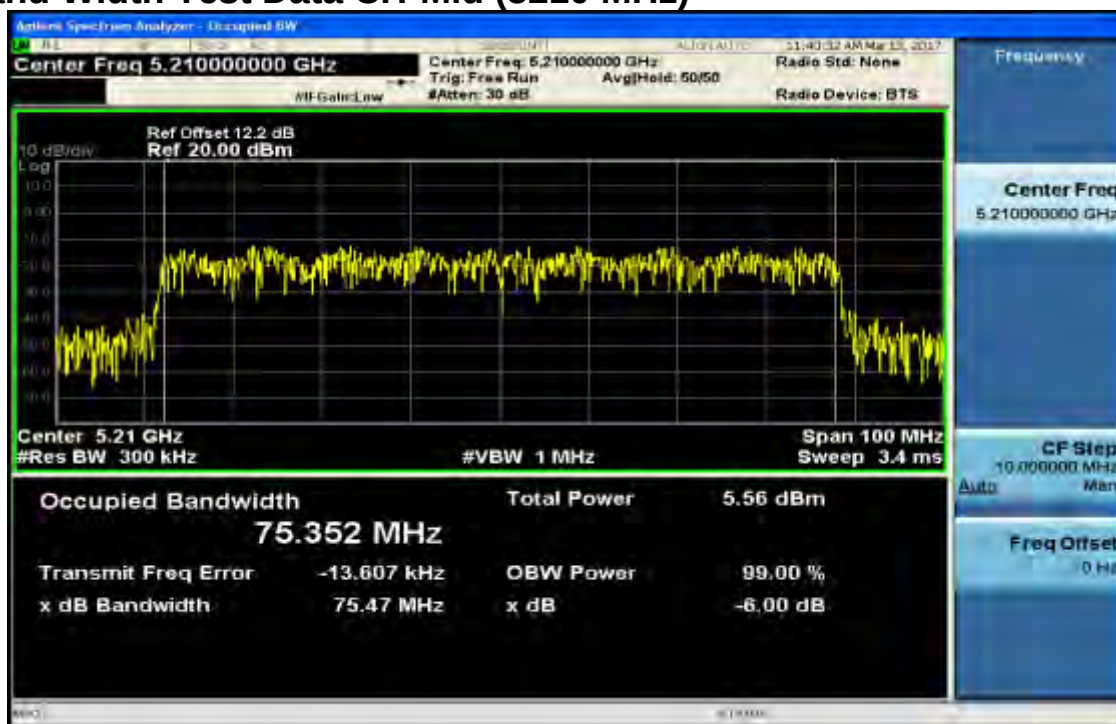
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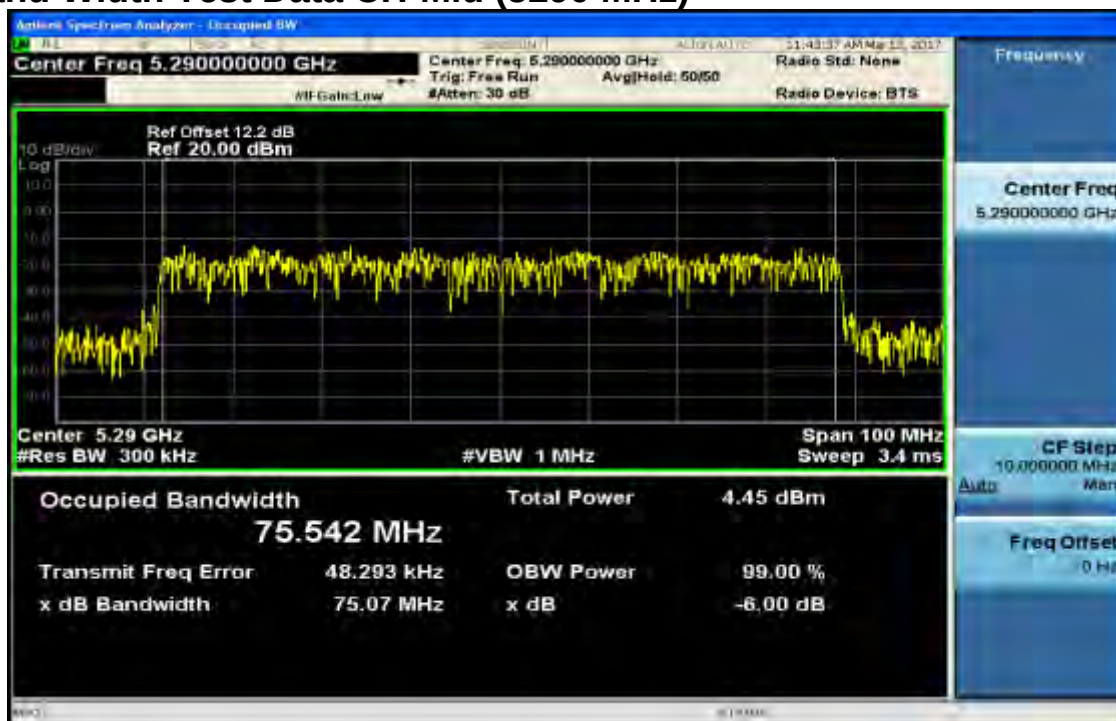
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802.11ac VHT80, 5150~5250 MHz (Aux) 99% Band Width Test Data CH-Mid (5210 MHz)



802.11ac VHT80, 5250~5350 MHz 99% Band Width Test Data CH-Mid (5290 MHz)



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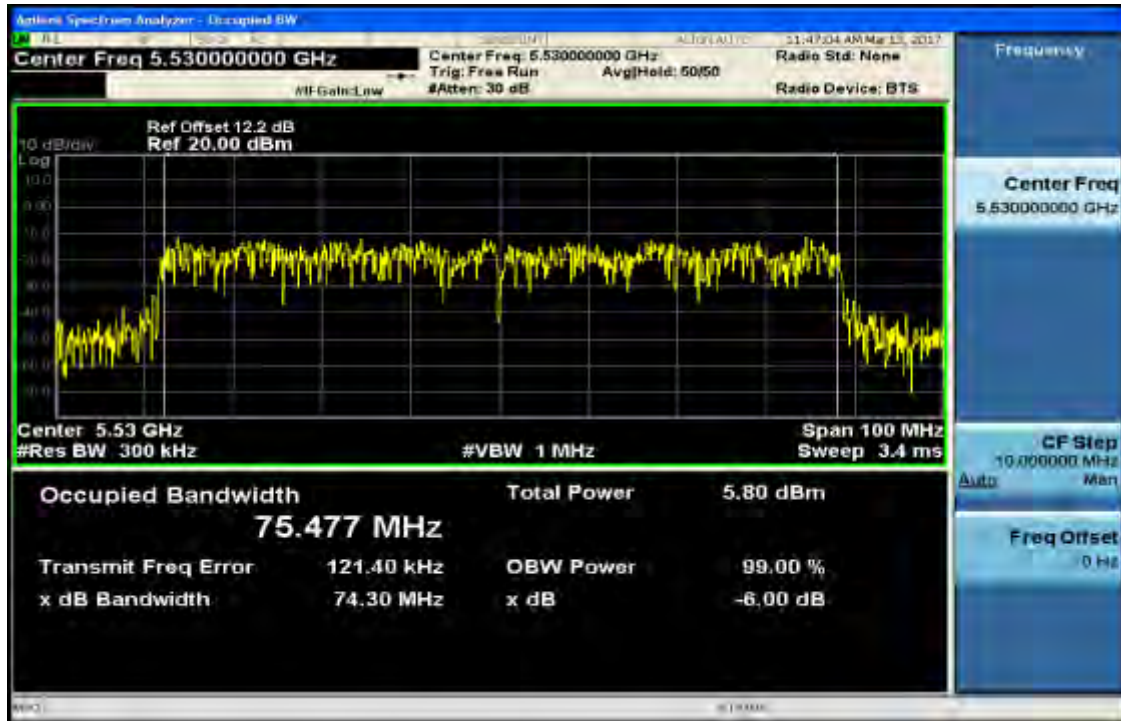
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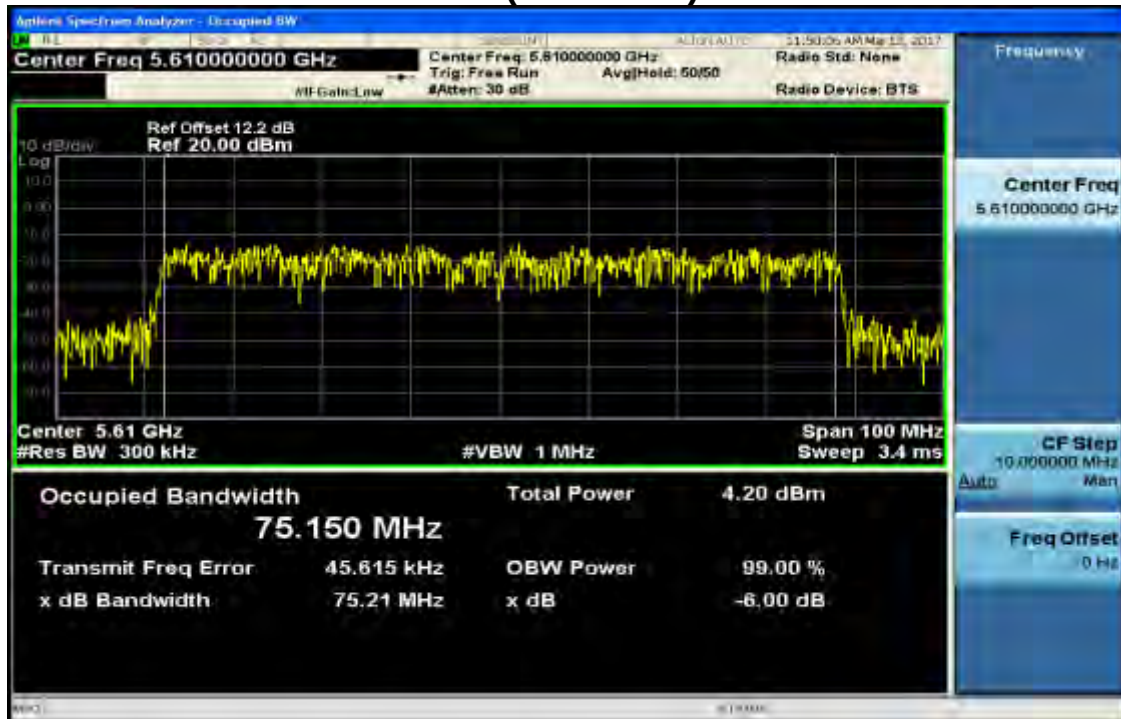
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802.11ac VHT80, 5470~5725 MHz (Aux) 99% Band Width Test Data CH-Low (5530 MHz)



99% Band Width Test Data CH-Low (5610 MHz)



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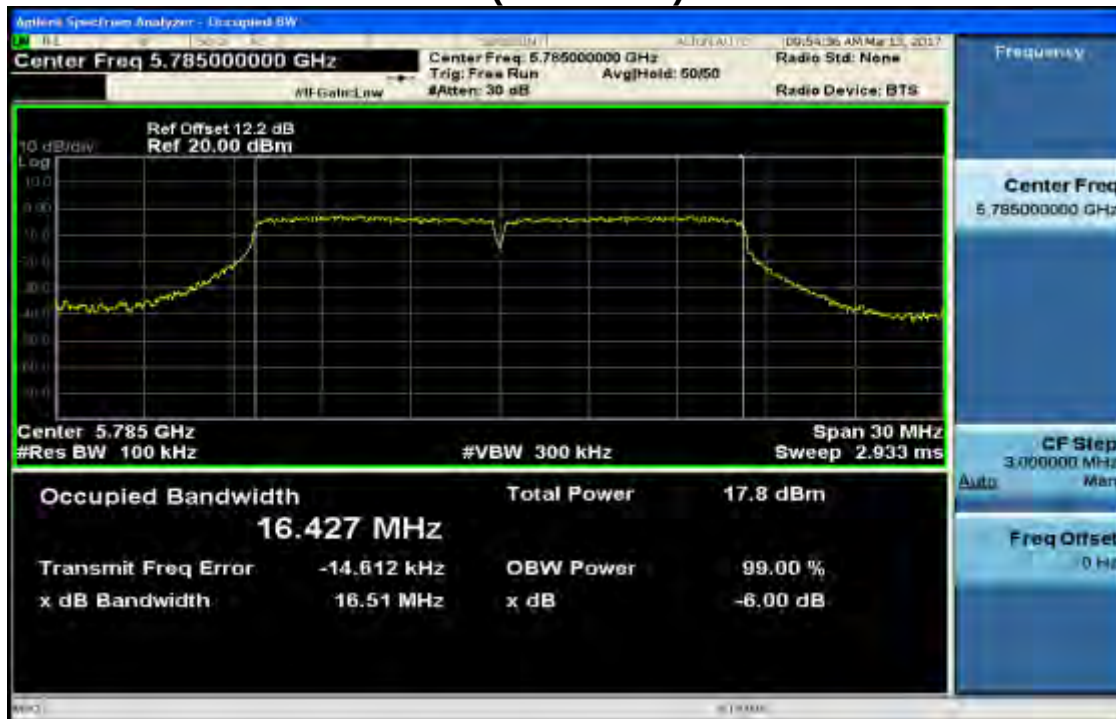
6dB Band Width measure with Peak detector for FCC

802.11a, 5725~5850 MHz (Main)

6dB Band Width Test Data CH-Low (5745 MHz)



6dB Band Width Test Data CH-Mid (5785 MHz)



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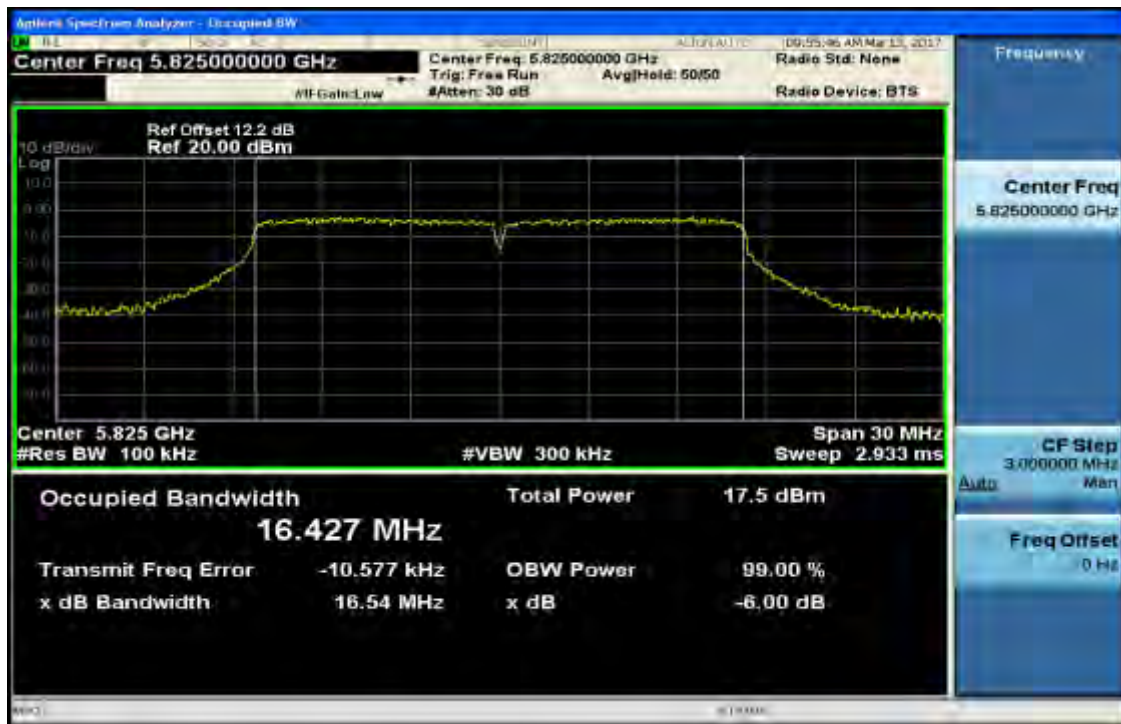
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6dB Band Width Test Data CH-High (5825 MHz)



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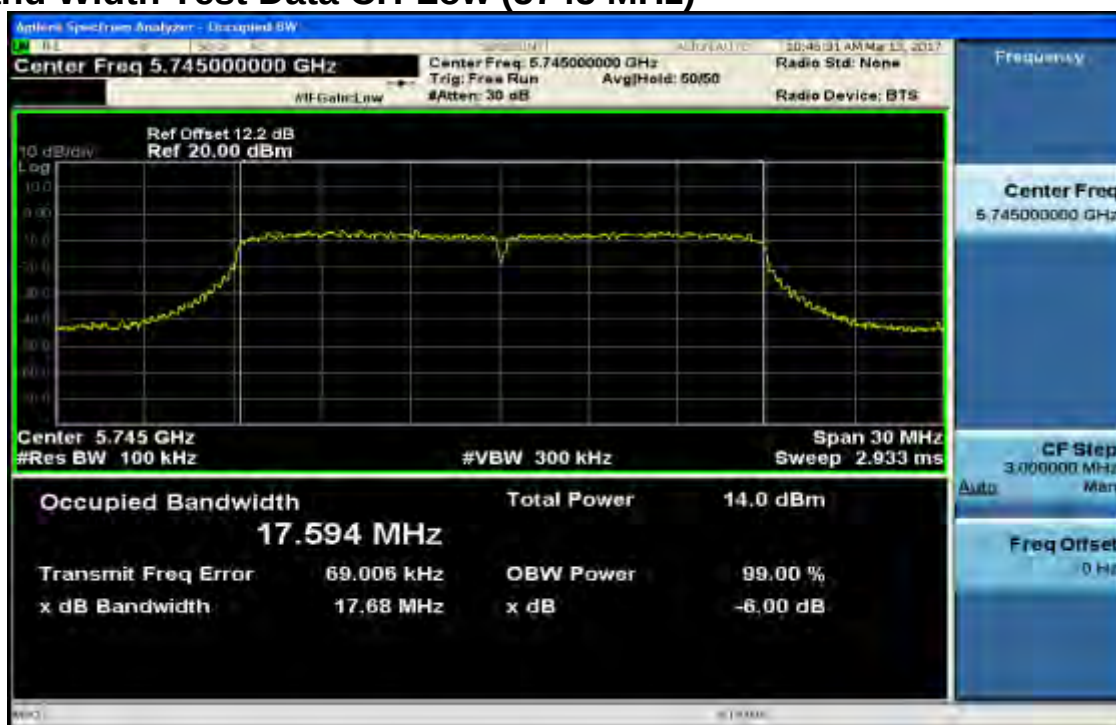
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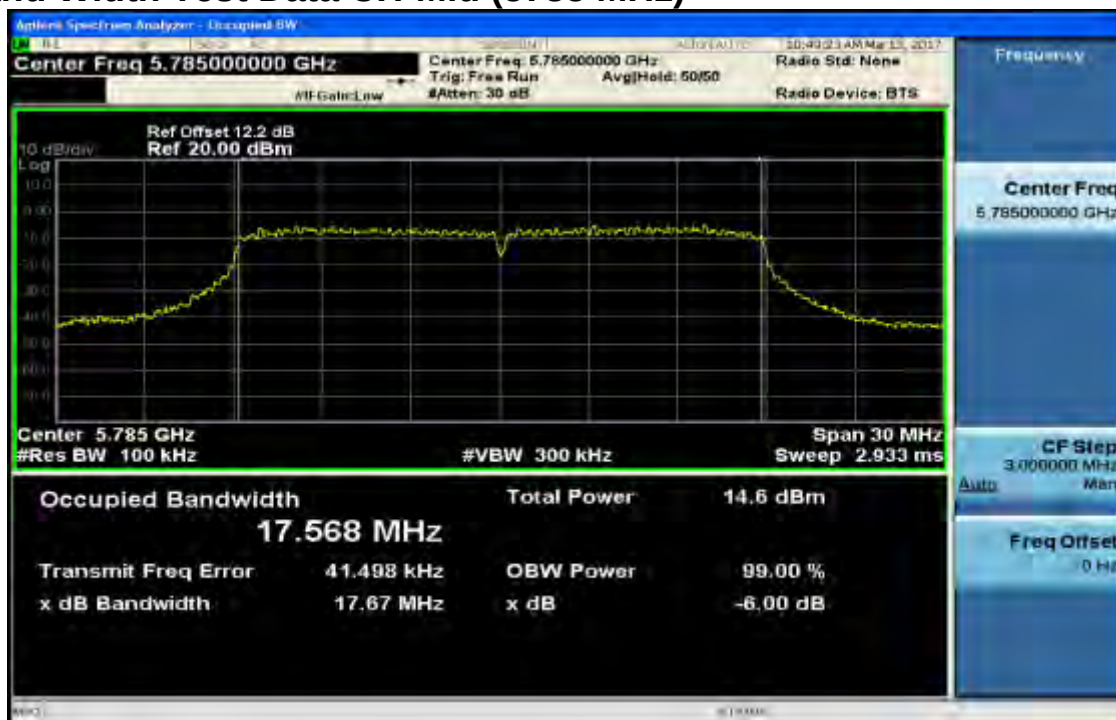
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802.11n_HT20, 5725~5850 MHz (Main) 6dB Band Width Test Data CH-Low (5745 MHz)



6dB Band Width Test Data CH-Mid (5785 MHz)



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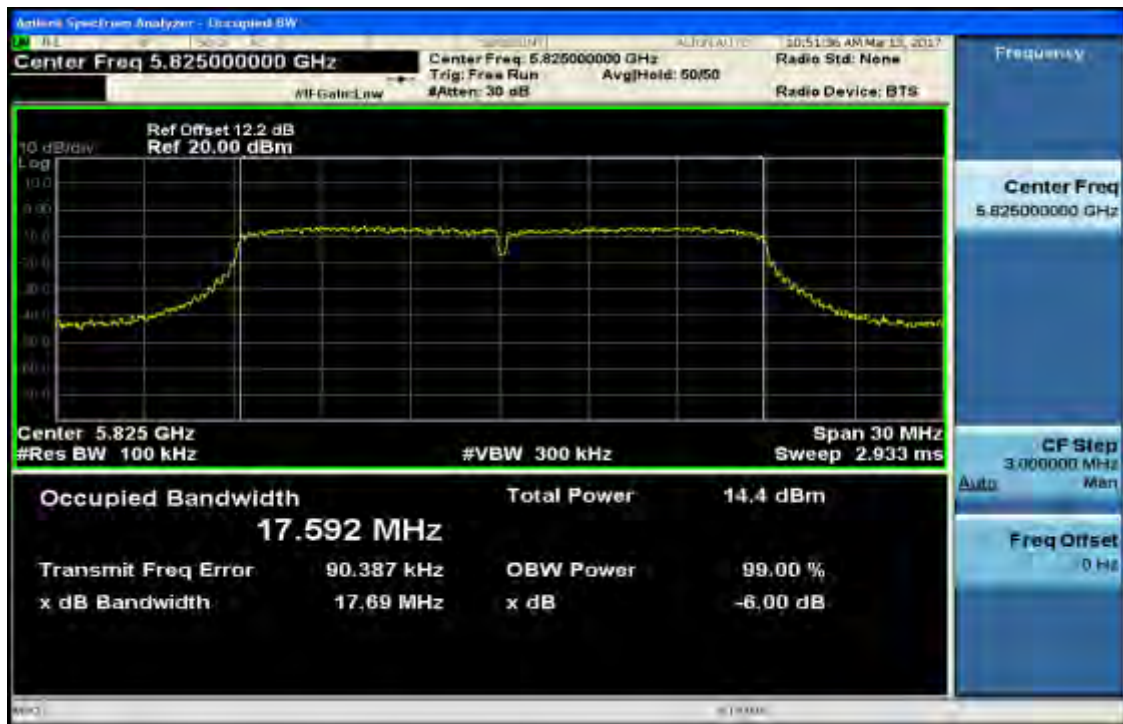
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6dB Band Width Test Data CH-High (5825 MHz)



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802.11n_HT20, 5725~5850 MHz (Aux) 6dB Band Width Test Data CH-Low (5745 MHz)



6dB Band Width Test Data CH-Mid (5785 MHz)



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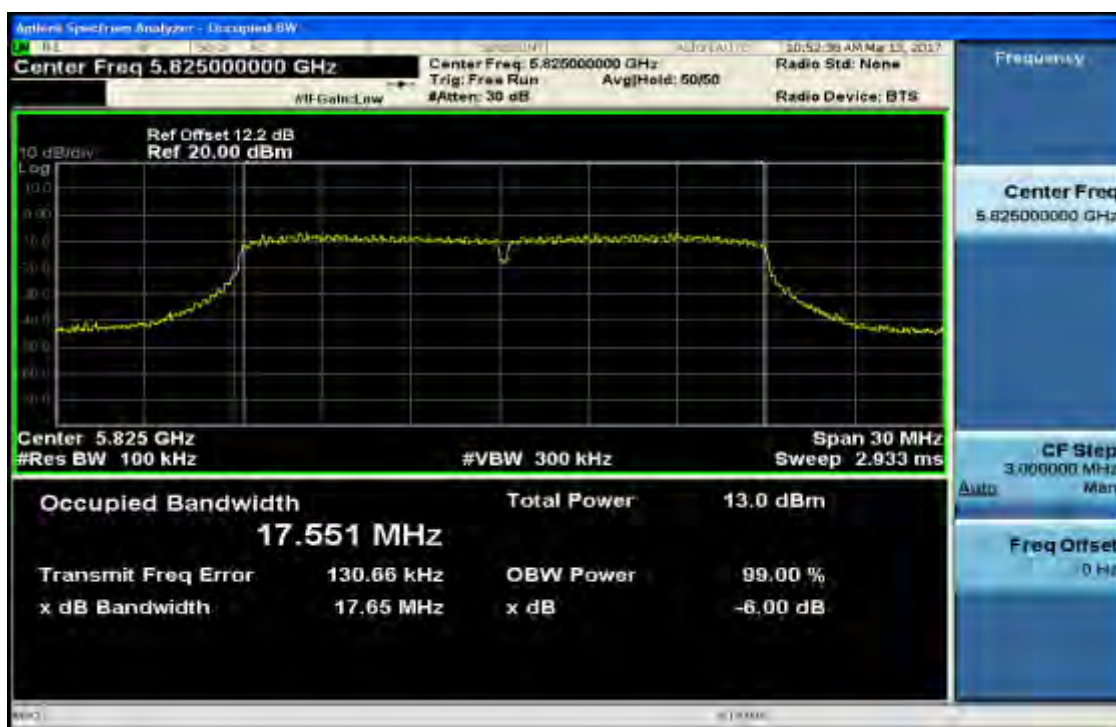
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6dB Band Width Test Data CH-High (5825 MHz)



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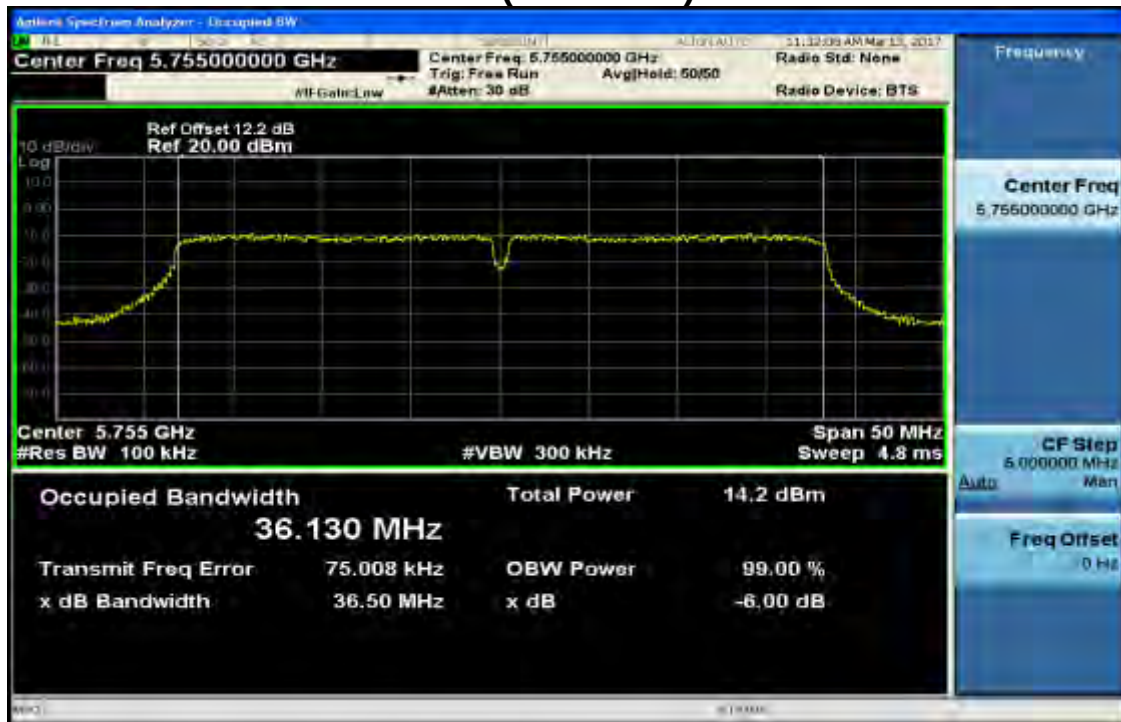
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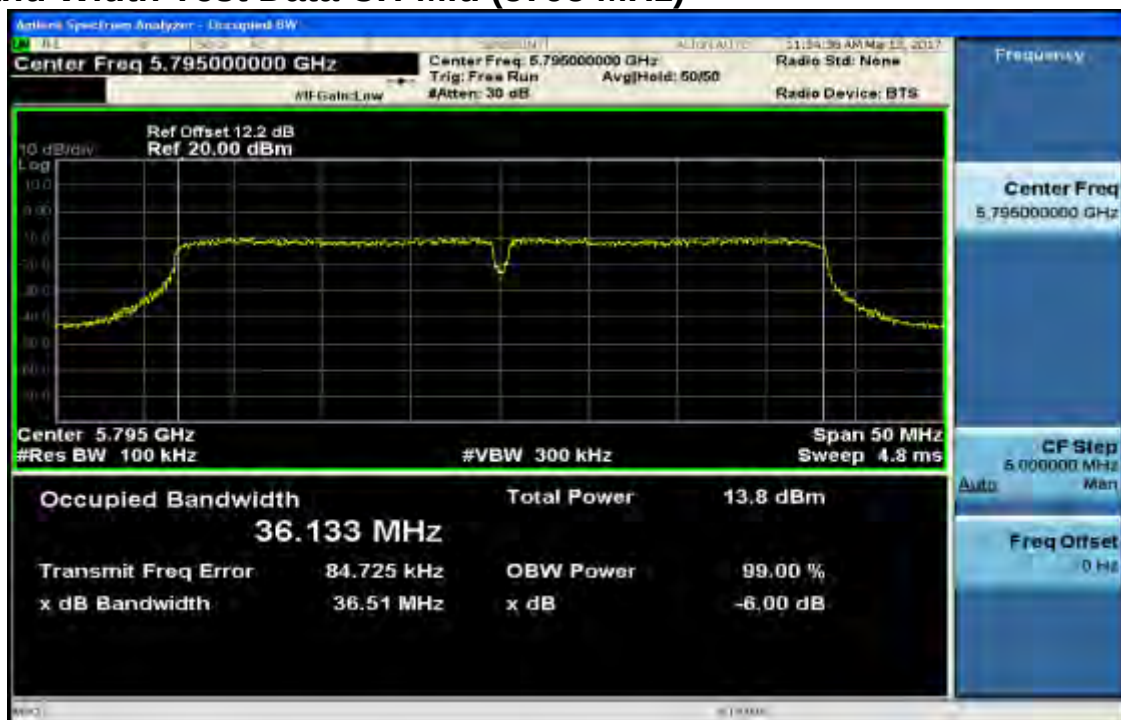
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802.11n_HT40, 5725~5850 MHz (Main) 6dB Band Width Test Data CH-Low (5755 MHz)



6dB Band Width Test Data CH-Mid (5795 MHz)



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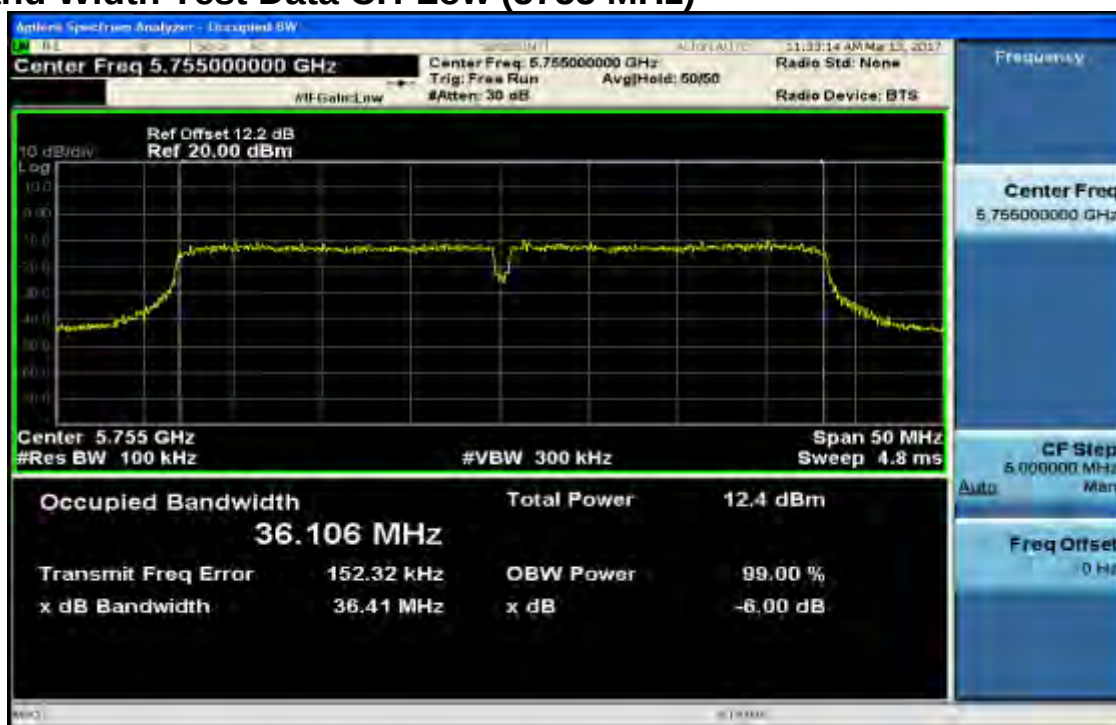
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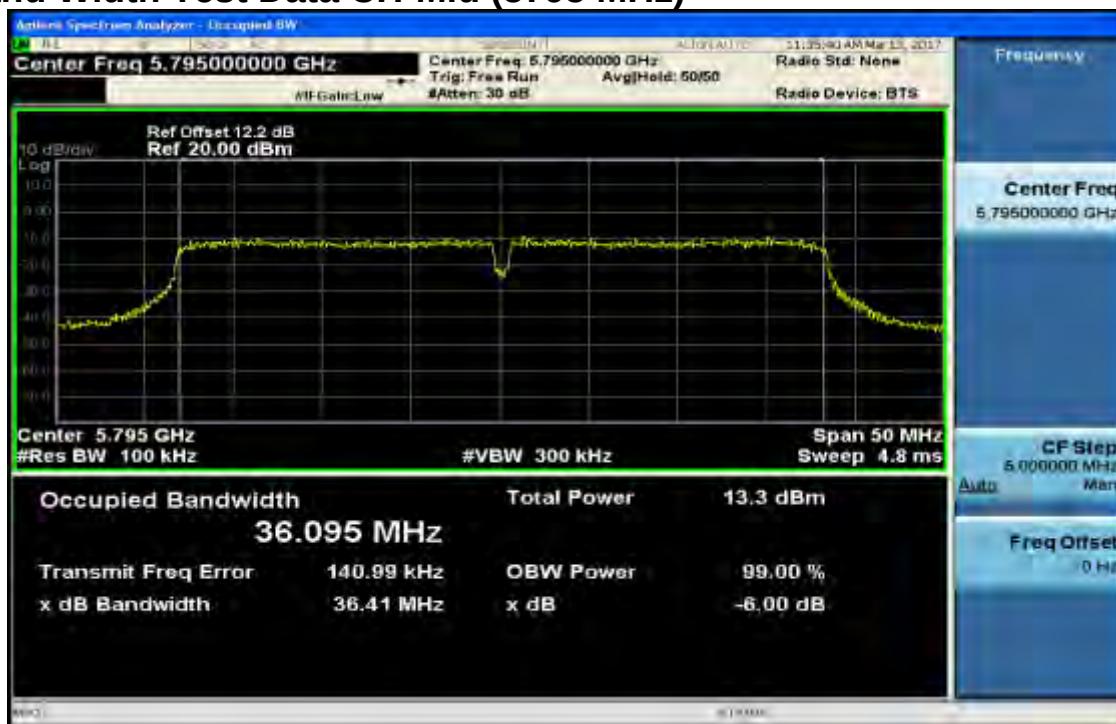
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802.11n_HT40, 5725~5850 MHz (Aux) 6dB Band Width Test Data CH-Low (5755 MHz)



6dB Band Width Test Data CH-Mid (5795 MHz)



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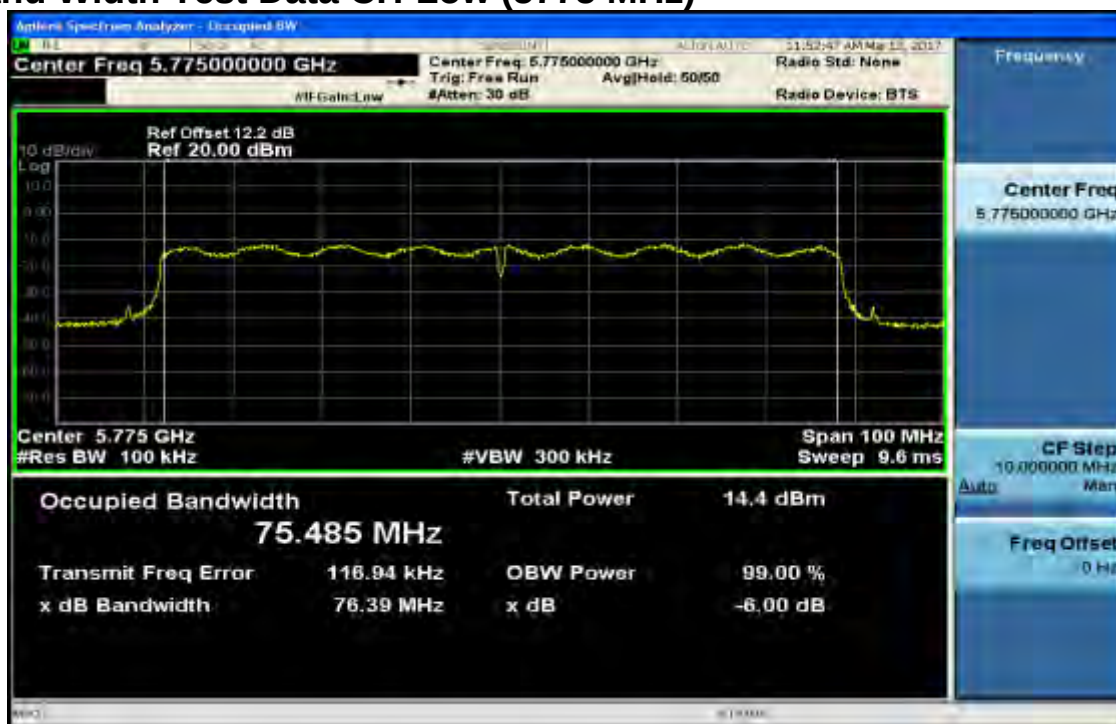
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802.11ac VHT80, 5725~5850 MHz (Main) 6dB Band Width Test Data CH-Low (5775 MHz)



802.11ac VHT80, 5725~5850 MHz (Aux) 6dB Band Width Test Data CH-Low (5775 MHz)



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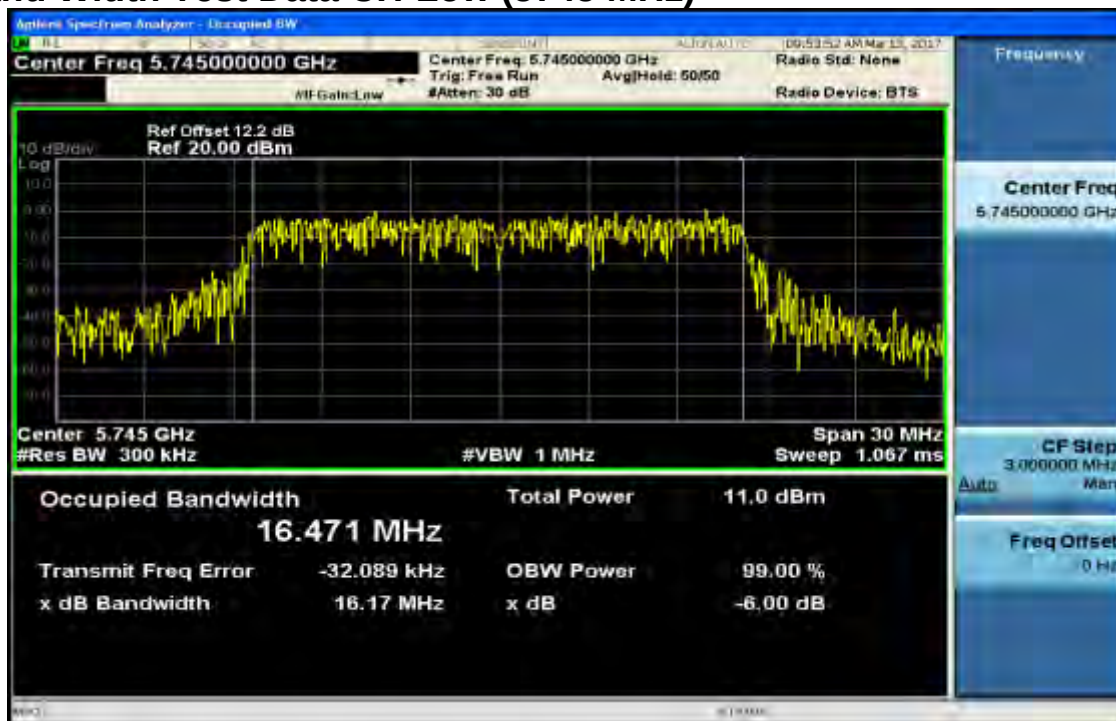
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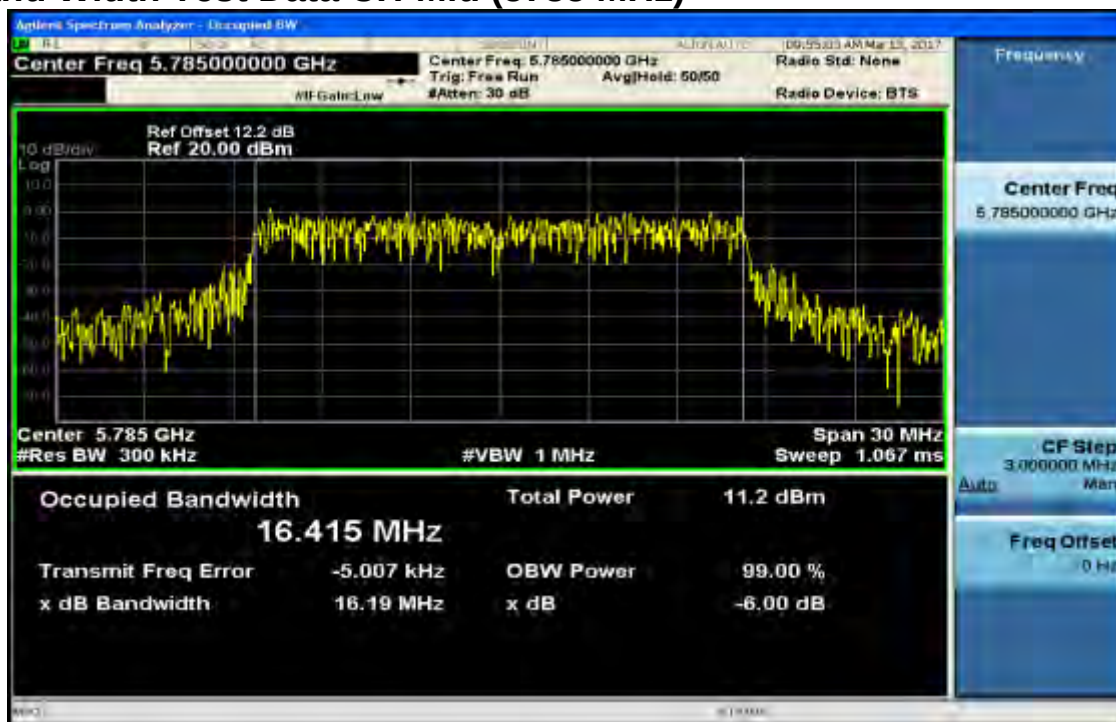
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6dB Band Width measure with Average detector for IC 802.11a, 5725~5850 MHz (Main)

6dB Band Width Test Data CH-Low (5745 MHz)



6dB Band Width Test Data CH-Mid (5785 MHz)



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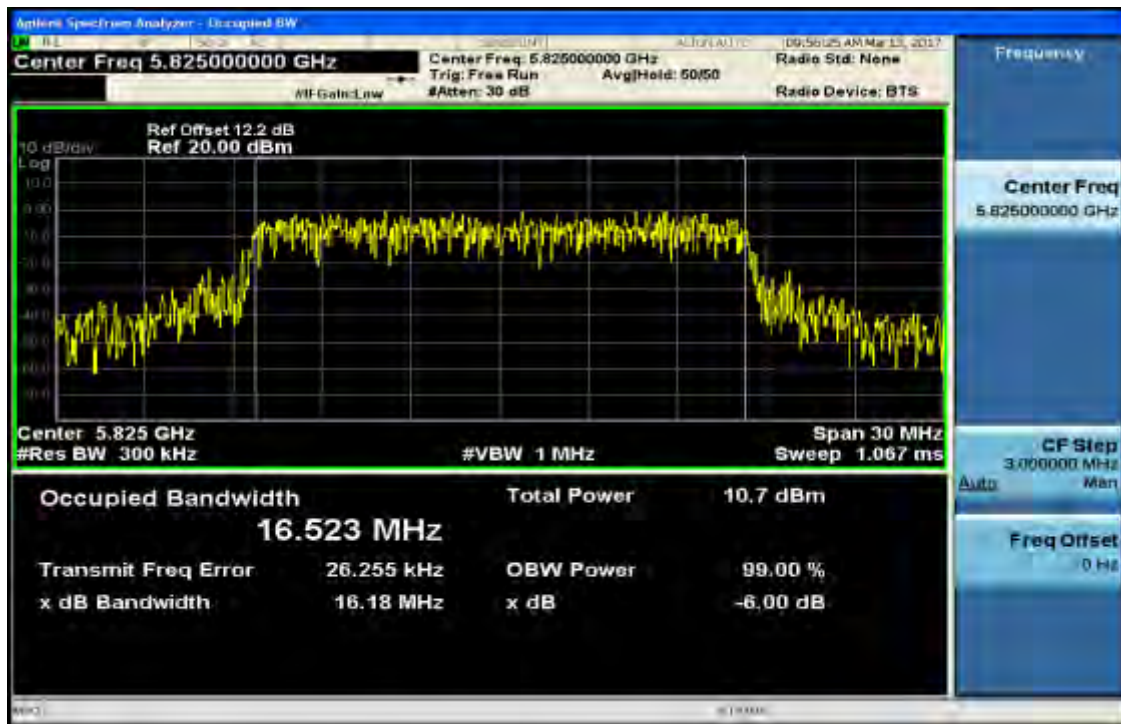
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6dB Band Width Test Data CH-High (5825 MHz)



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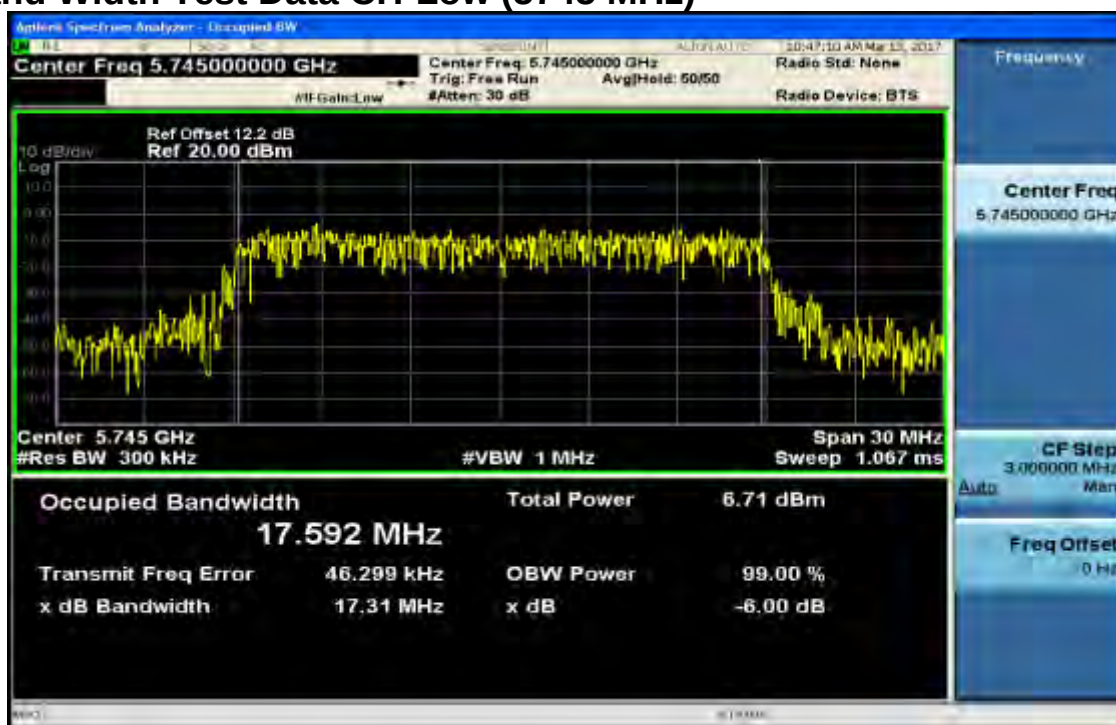
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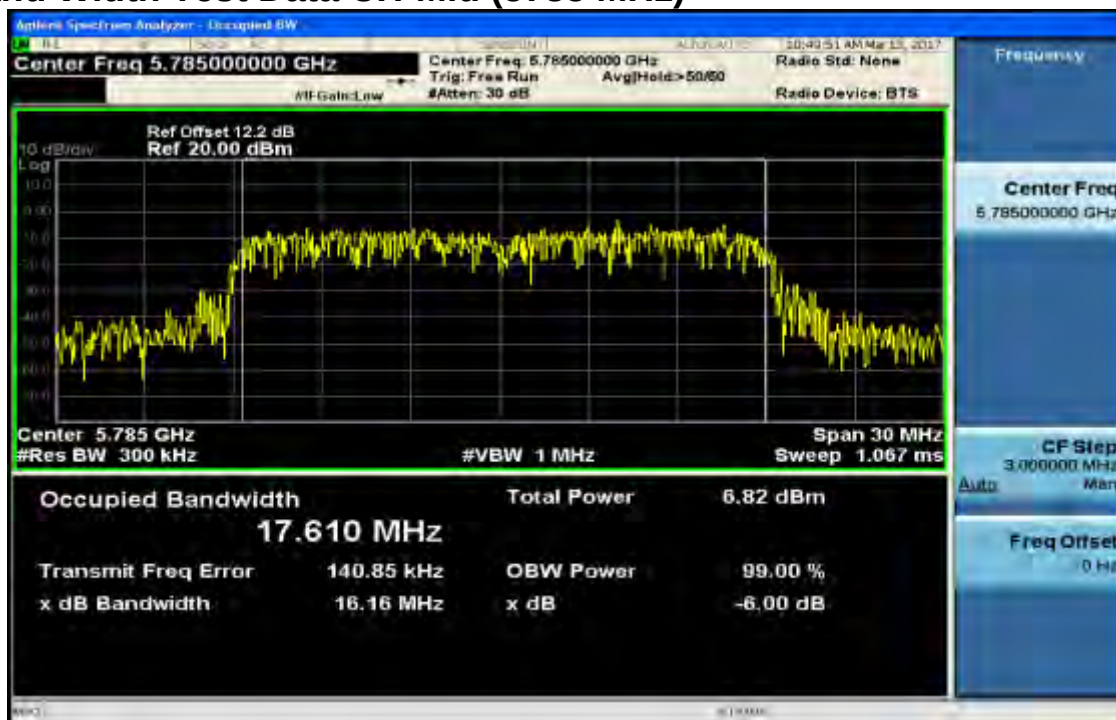
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802.11n_HT20, 5725~5850 MHz (Main) 6dB Band Width Test Data CH-Low (5745 MHz)



6dB Band Width Test Data CH-Mid (5785 MHz)



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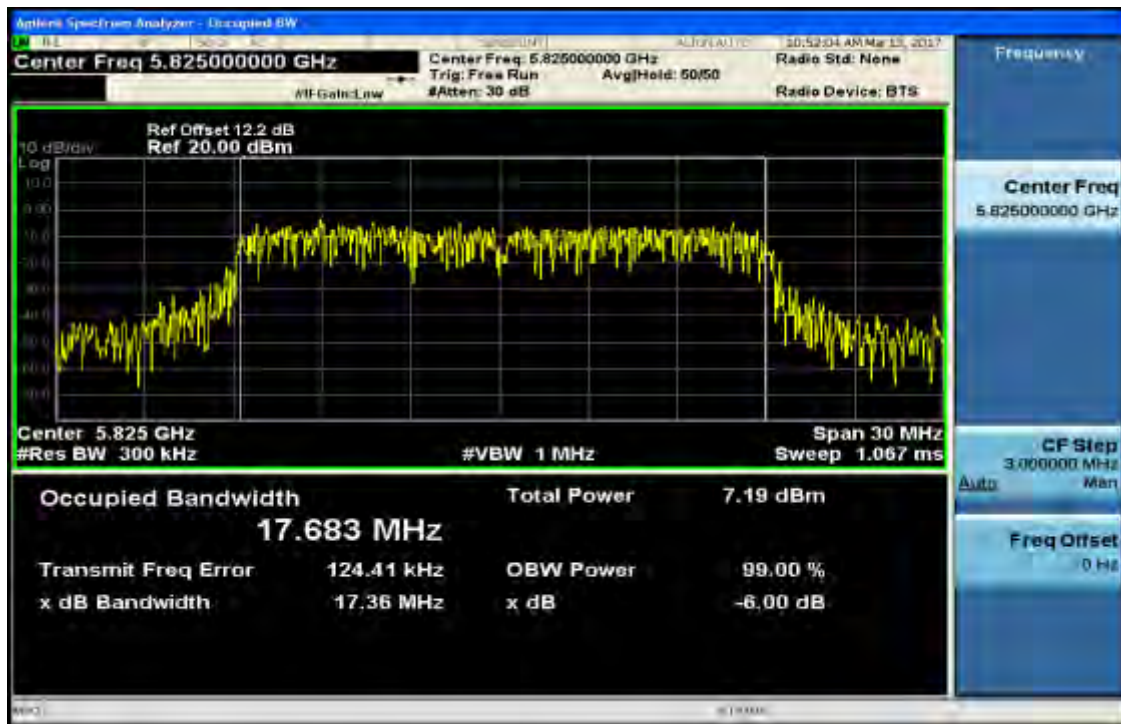
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6dB Band Width Test Data CH-High (5825 MHz)



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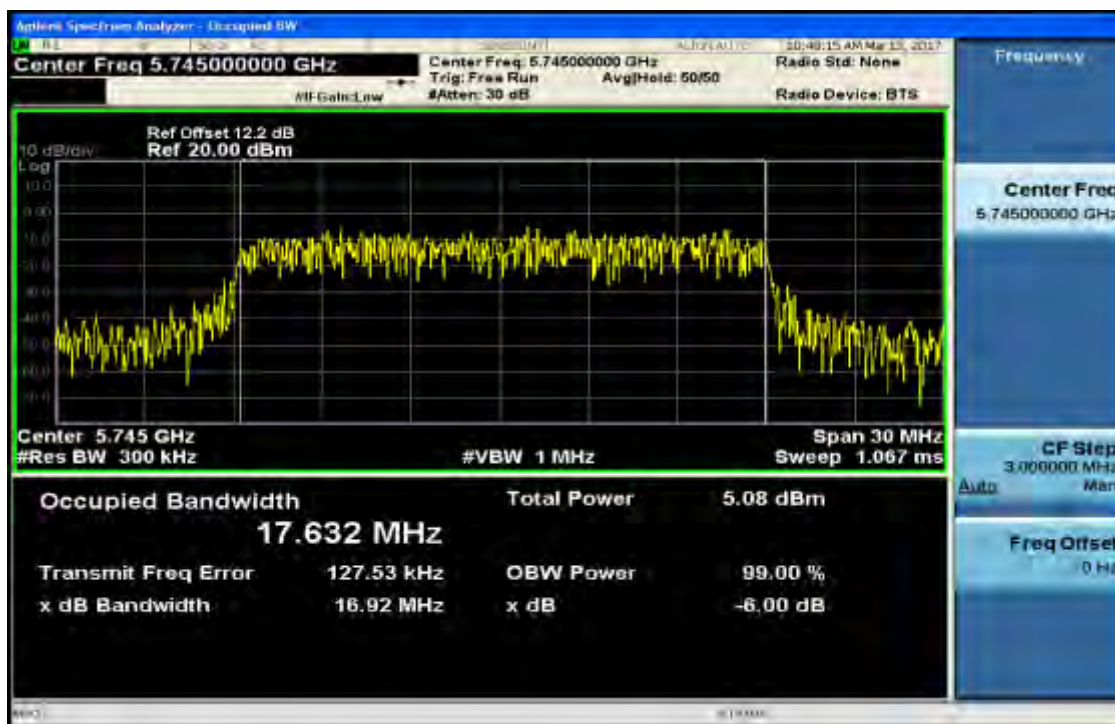
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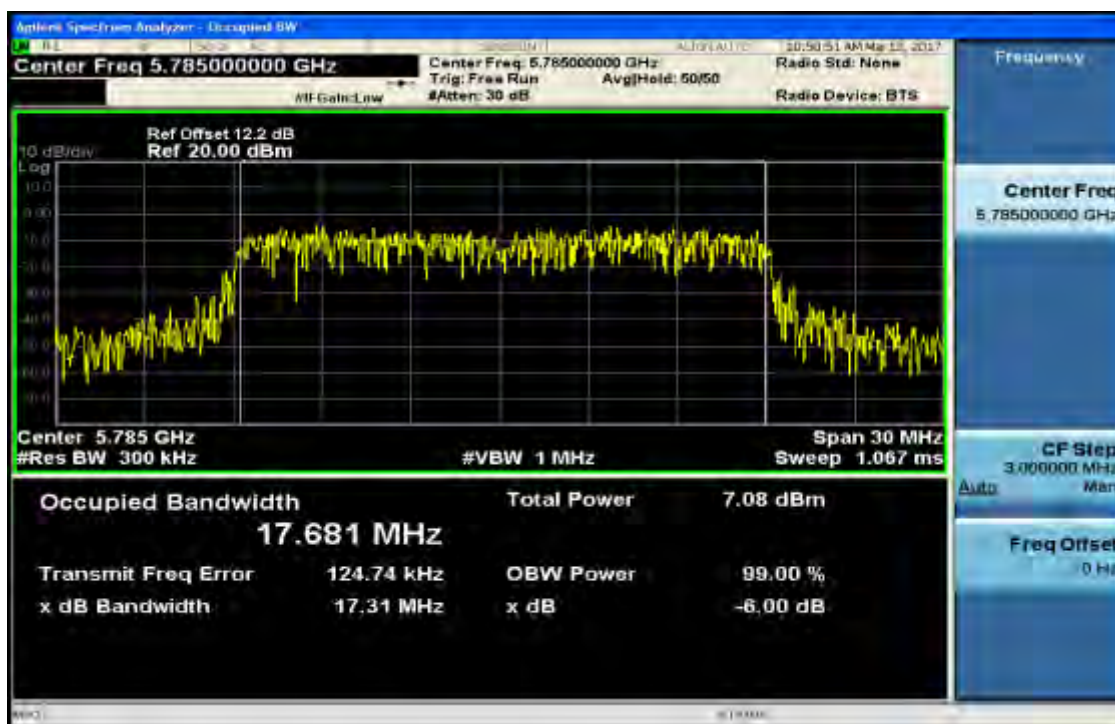
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802.11n_HT20, 5725~5850 MHz (Aux) 6dB Band Width Test Data CH-Low (5745 MHz)



6dB Band Width Test Data CH-Mid (5785 MHz)



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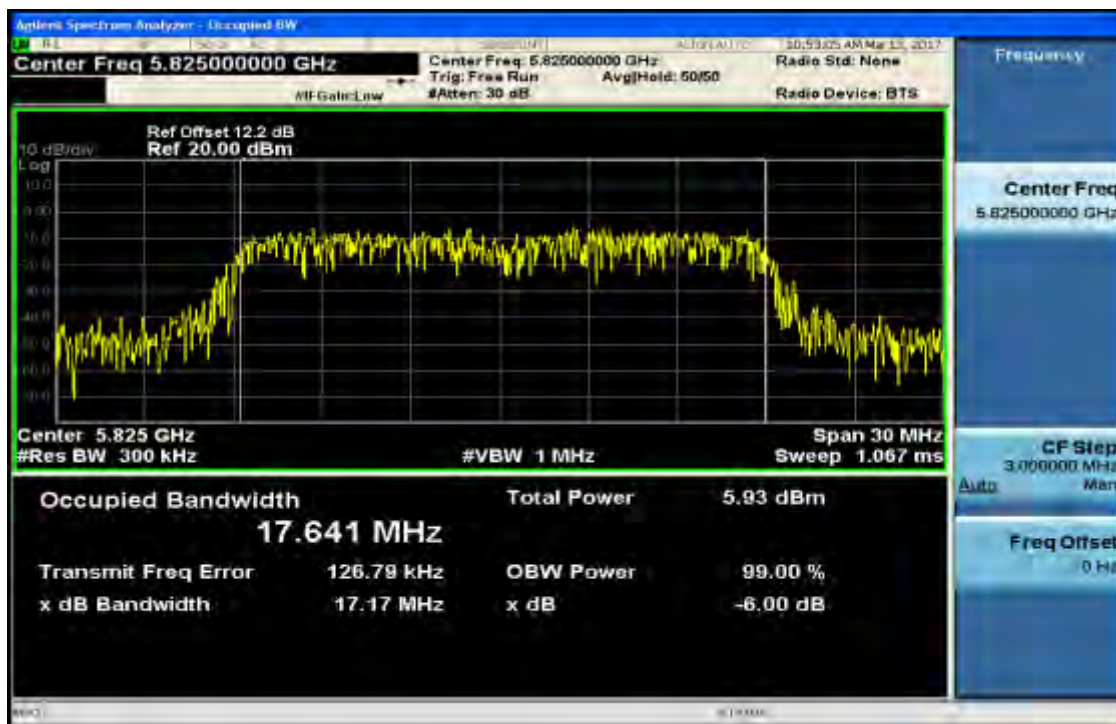
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6dB Band Width Test Data CH-High (5825 MHz)



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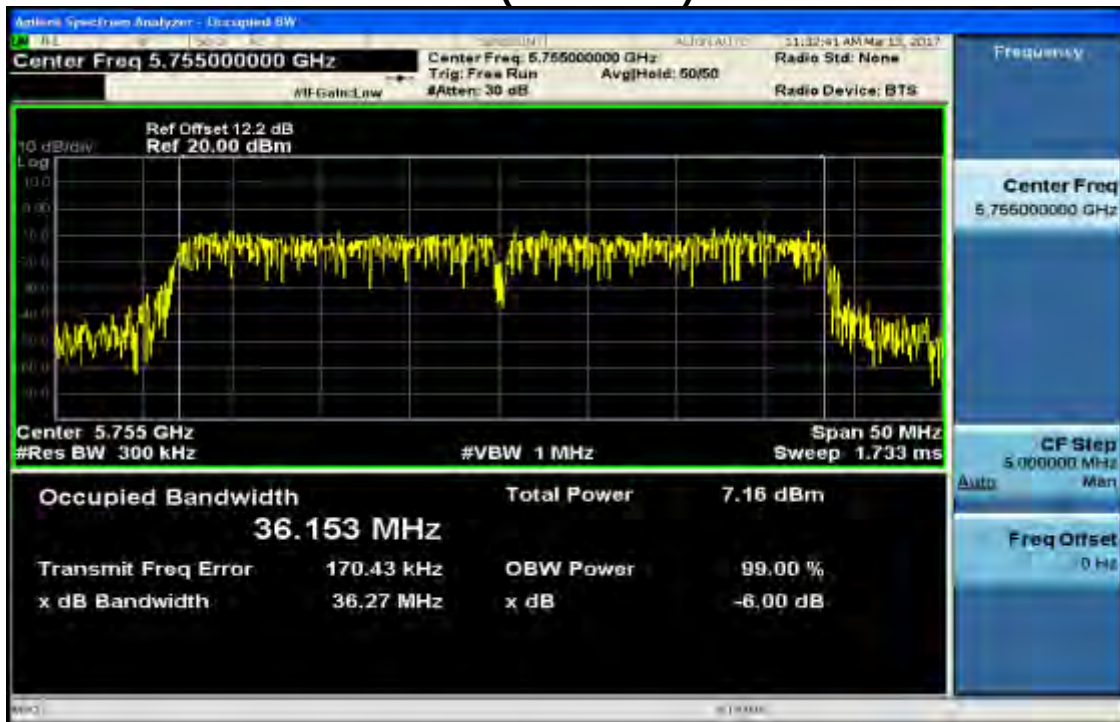
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f (886-2) 2298-0488

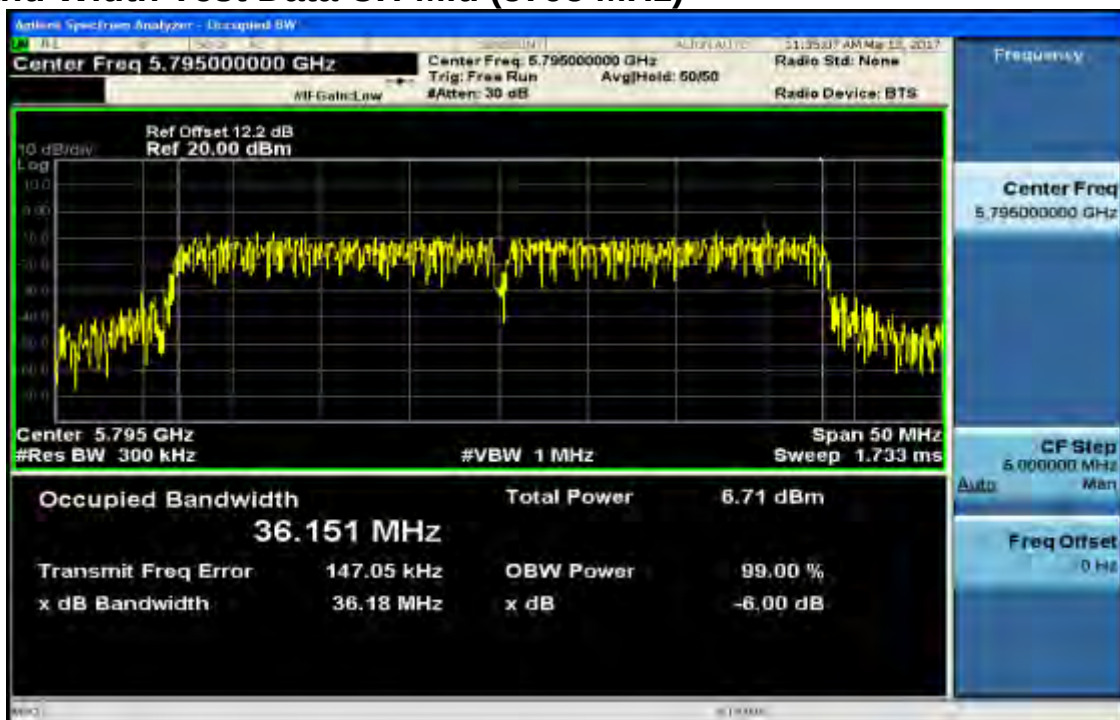
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802.11n_HT40, 5725~5850 MHz (Main) 6dB Band Width Test Data CH-Low (5755 MHz)



6dB Band Width Test Data CH-Mid (5795 MHz)



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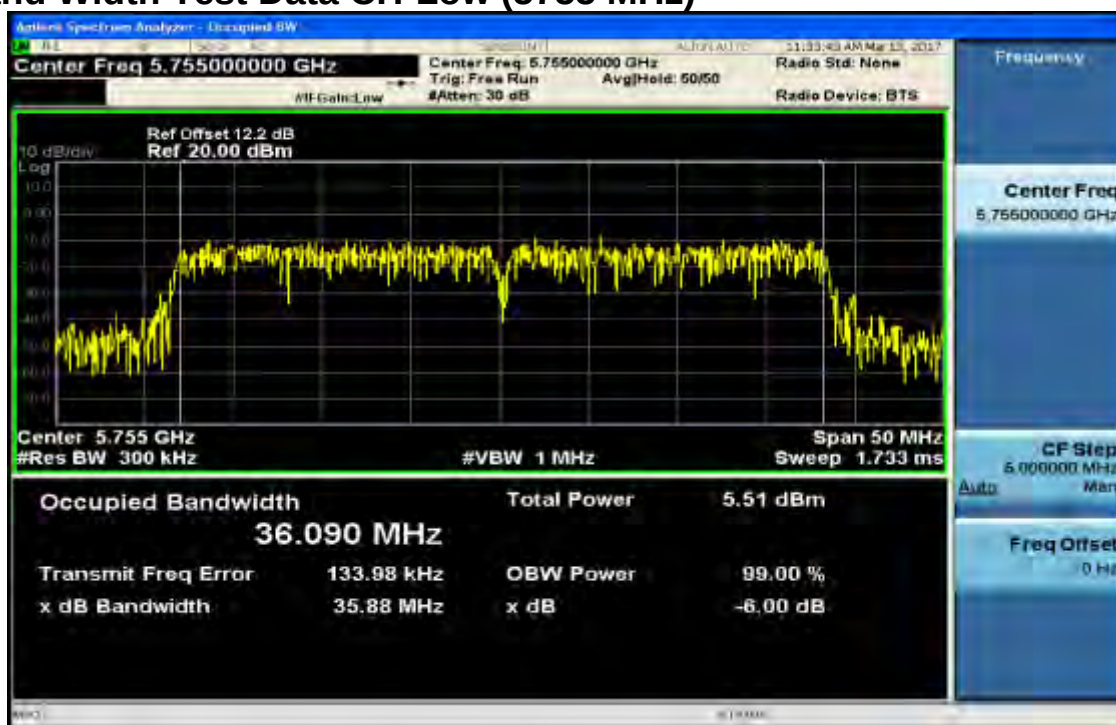
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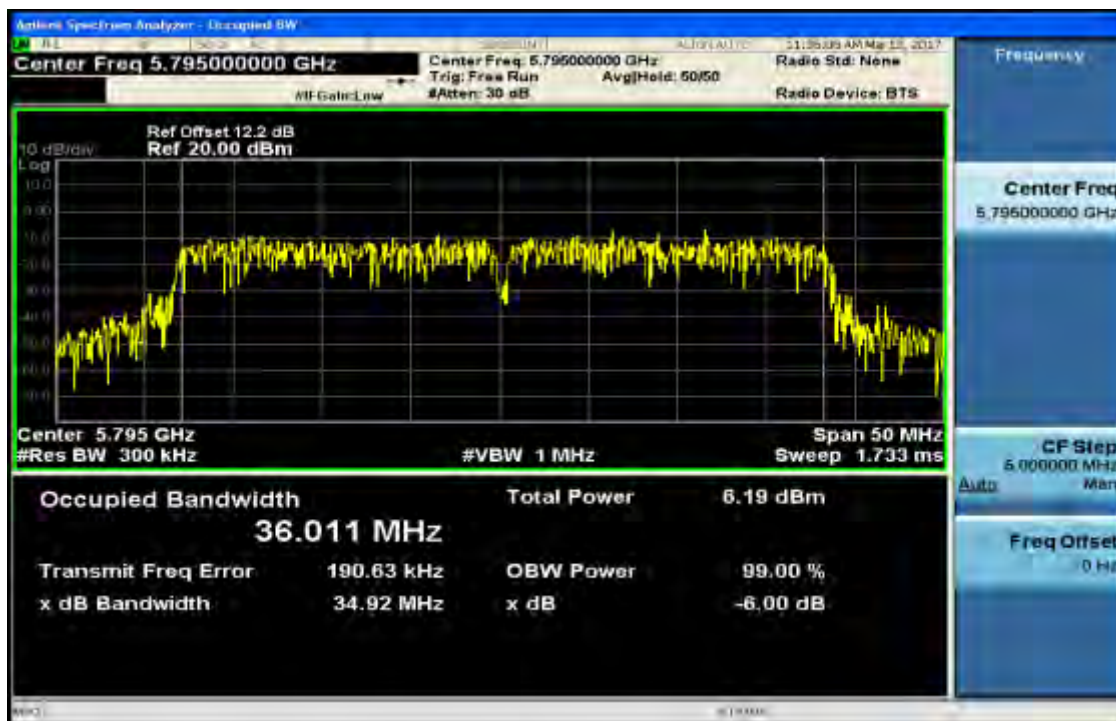
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802.11n_HT40, 5725~5850 MHz (Aux) 6dB Band Width Test Data CH-Low (5755 MHz)



6dB Band Width Test Data CH-Mid (5795 MHz)



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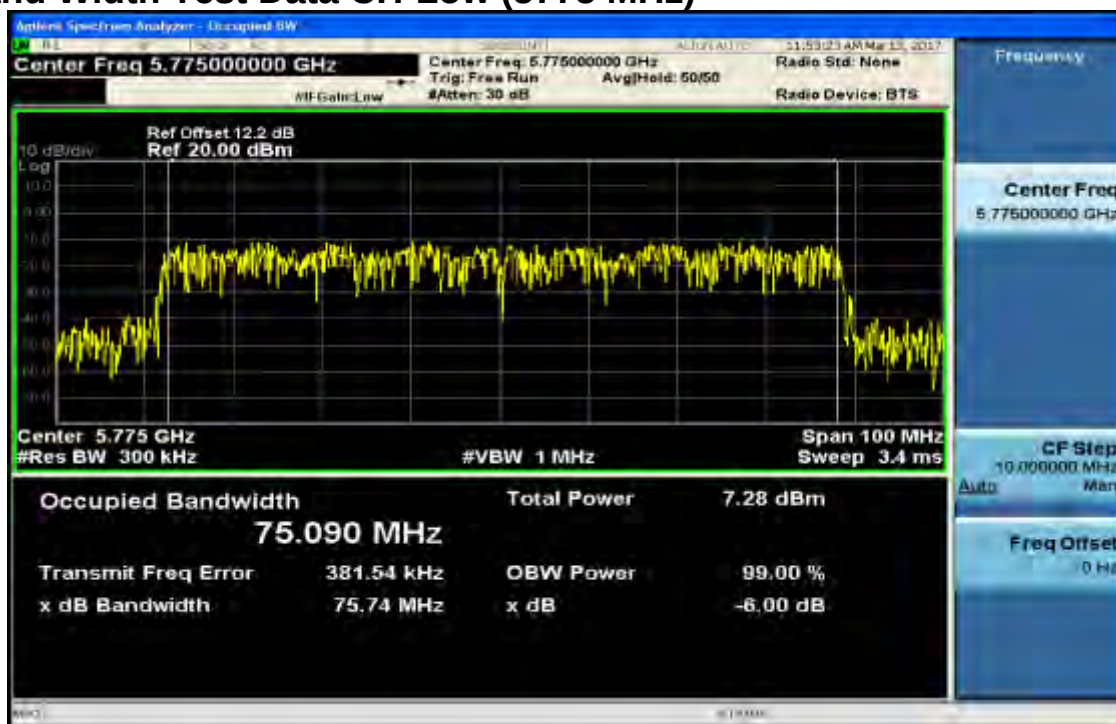
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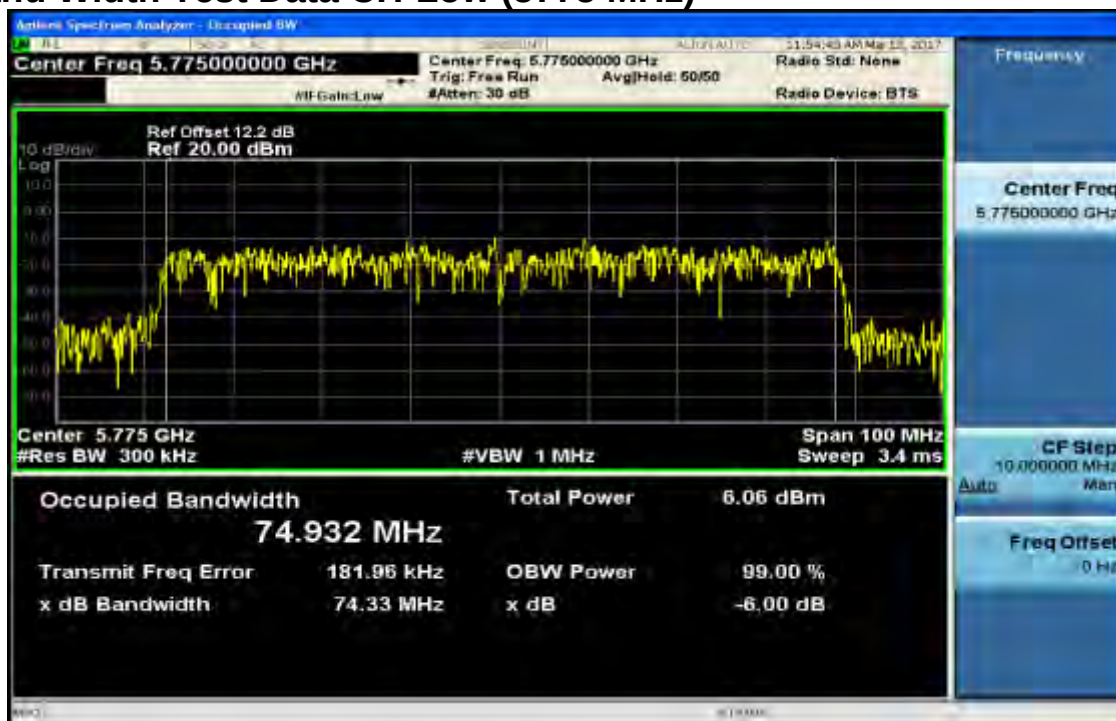
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802.11ac VHT80, 5725~5850 MHz (Main) 6dB Band Width Test Data CH-Low (5775 MHz)



802.11ac VHT80, 5725~5850 MHz (Aux) 6dB Band Width Test Data CH-Low (5775 MHz)



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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 Acess 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 directional gain of the antenna exceeds 6 dBi.

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The antenna gain is greater than 6 dBi in MIMO mode the limit reduce as below:

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

FCC

	Effective Legacy Gain (dBi)	Limit
UNII-2A	5.27+3.01=8.28dBi	23.98dBm – (8.28– 6 dBi) = 21.70dBm
U-NII-2C	5.27+3.01=8.28dBi	23.98dBm – (8.28– 6 dBi) = 21.70dBm

IC

	Effective Legacy Gain (dBi)	Limit
UNII-2A	5.27+3.01=8.28dBi	23.98dBm – (8.28– 6 dBi) = 21.70dBm
U-NII-2C	5.27+3.01=8.28dBi	23.98dBm – (8.28– 6 dBi) = 21.70dBm

Therefore the limit needs to reduce for the U-NII-2A and U-NII-2C band.

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.

Note: For the overlapped channels between U-NII-2C and U-NII-3, and according to FCC KDB 644545 D03 the power is computed based on the portion of the emission bandwidth contained within that band. This rule is only applicable for those channels marked as overlapped.

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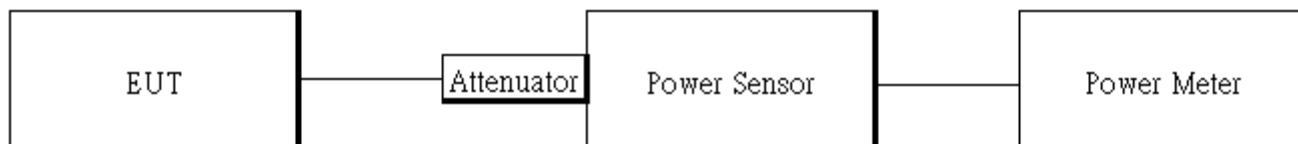
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9.3 Measurement Equipment Used

SGS Conducted Room					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2017	02/25/2018
DC Block	Mini-Circuits	BLK-18-S+	1	01/05/2017	01/04/2018
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/05/2017	01/04/2018
Attenuator	Mini-Circuit	BW-S10W2+	2	01/05/2017	01/04/2018
Splitter	Agilent	11636B	N/A	01/05/2017	01/04/2018
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017
Temperature Chamber	TERCHY	MHG-120LF	911009	05/17/2016	05/16/2017

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	6M	12.64	18.365	23.98	PASS
44	5220	6M	12.58	18.113	23.98	PASS
48	5240	6M	12.54	17.947	23.98	PASS
52	5260	6M	12.51	17.824	23.98 or $11+10\log(B) = 23.19$	PASS
60	5300	6M	12.51	17.824	23.98 or $11+10\log(B) = 23.19$	PASS
64	5320	6M	12.65	18.408	23.98 or $11+10\log(B) = 23.19$	PASS
100	5500	6M	12.55	17.989	23.98 or $11+10\log(B) = 23.18$	PASS
116	5580	6M	12.51	17.824	23.98 or $11+10\log(B) = 23.18$	PASS
140	5700	6M	12.54	17.947	23.98 or $11+10\log(B) = 23.18$	PASS
149	5745	6M	12.52	17.865	30	PASS
157	5785	6M	12.58	18.113	30	PASS
165	5825	6M	12.56	18.030	30	PASS

802.11n_HT20_MIMO

CH	Frequency (MHz)	Data Rate	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
			CH 0	CH 1				
36	5180	MCS8	9.34	8.44	11.92	15.572	21.7	PASS
44	5220	MCS8	9.16	8.56	11.88	15.419	21.7	PASS
48	5240	MCS8	9.11	8.16	11.67	14.693	21.7	PASS
52	5260	MCS8	8.45	8.66	11.57	14.344	21.70 or $11+10\log(B) = 23.46$	PASS
60	5300	MCS8	9.23	8.56	11.92	15.553	21.70 or $11+10\log(B) = 23.46$	PASS
64	5320	MCS8	9.27	8.43	11.88	15.419	21.70 or $11+10\log(B) = 23.47$	PASS
100	5500	MCS8	9.48	8.05	11.83	15.254	21.70 or $11+10\log(B) = 23.46$	PASS
116	5580	MCS8	9.32	8.15	11.78	15.082	21.70 or $11+10\log(B) = 23.46$	PASS
140	5700	MCS8	9.58	7.68	11.74	14.940	21.70 or $11+10\log(B) = 23.46$	PASS
149	5745	MCS8	9.86	7.25	11.76	14.992	27.72	PASS
157	5785	MCS8	9.43	7.42	11.55	14.291	27.72	PASS
165	5825	MCS8	9.77	7.38	11.75	14.954	27.72	PASS

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802.11n_HT40_MIMO

CH	Frequency (MHz)	Data Rate	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
			CH 0	CH 1				
38	5190	MCS8	9.23	8.35	11.82	15.214	21.7	PASS
46	5230	MCS8	9.33	8.53	11.96	15.699	21.7	PASS
54	5270	MCS8	9.15	8.23	11.72	14.875	21.70 or 11+10log(B) = 26.58	PASS
62	5310	MCS8	9.24	8.43	11.86	15.361	21.70 or 11+10log(B) = 26.58	PASS
102	5510	MCS8	9.48	8.12	11.86	15.358	21.70 or 11+10log(B) = 26.58	PASS
110	5550	MCS8	9.43	8.46	11.98	15.785	21.70 or 11+10log(B) = 26.58	PASS
134	5670	MCS8	9.73	8.06	11.99	15.795	21.70 or 11+10log(B) = 26.58	PASS
151	5755	MCS8	9.76	7.05	11.62	14.532	27.72	PASS
159	5795	MCS8	9.73	7.34	11.71	14.817	27.72	PASS

802.11ac_VHT80_MIMO

CH	Frequency (MHz)	Data Rate	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
			CH 0	CH 1				
42	5210	MCS0	7.82	5.11	9.68	9.297	21.7	PASS
58	5290	MCS0	7.99	5.49	9.93	9.835	21.70 or 11+10log(B) = 29.78	PASS
106	5530	MCS0	7.9	4.95	9.68	9.292	21.70 or 11+10log(B) = 29.77	PASS
122	5610	MCS0	8.03	5.46	9.94	9.869	21.70 or 11+10log(B) = 29.78	PASS
155	5775	MCS0	8.1	5.23	9.91	9.791	27.72	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	12.51	17.824	23.98 or $11+10\log(B) = 23.12$	PASS
60	5300	12.51	17.824	23.98 or $11+10\log(B) = 23.10$	PASS
64	5320	12.65	18.408	23.98 or $11+10\log(B) = 23.03$	PASS
100	5500	12.55	17.989	23.98 or $11+10\log(B) = 23.14$	PASS
116	5580	12.51	17.824	23.98 or $11+10\log(B) = 23.06$	PASS
140	5700	12.54	17.947	23.98 or $11+10\log(B) = 23.08$	PASS
149	5745	12.52	17.865	30	PASS
157	5785	12.58	18.113	30	PASS
165	5825	12.56	18.030	30	PASS

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	8.45	8.66	11.57	14.344	21.70 or $11+10\log(B) = 23.34$	PASS
60	5300	9.23	8.56	11.92	15.553	21.70 or $11+10\log(B) = 23.26$	PASS
64	5320	9.27	8.43	11.88	15.419	21.70 or $11+10\log(B) = 23.43$	PASS
100	5500	9.48	8.05	11.83	15.254	21.70 or $11+10\log(B) = 23.36$	PASS
116	5580	9.32	8.15	11.78	15.082	21.70 or $11+10\log(B) = 23.32$	PASS
140	5700	9.58	7.68	11.74	14.940	21.70 or $11+10\log(B) = 23.38$	PASS
149	5745	9.86	7.25	11.76	14.992	27.72	PASS
157	5785	9.43	7.42	11.55	14.291	27.72	PASS
165	5825	9.77	7.38	11.75	14.954	27.72	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	9.15	8.23	11.72	14.875	21.70 or 11+10log(B) = 26.46	PASS
62	5310	9.24	8.43	11.86	15.361	21.70 or 11+10log(B) = 26.44	PASS
102	5510	9.48	8.12	11.86	15.358	21.70 or 11+10log(B) = 26.53	PASS
110	5550	9.43	8.46	11.98	15.785	21.70 or 11+10log(B) = 26.42	PASS
134	5670	9.73	8.06	11.99	15.795	21.70 or 11+10log(B) = 26.44	PASS
151	5755	9.76	7.05	11.62	14.532	27.72	PASS
159	5795	9.73	7.34	11.71	14.817	27.72	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	7.99	5.49	9.93	9.835	21.70 or 11+10log(B) = 29.62	PASS
106	5530	7.9	4.95	9.68	9.292	21.70 or 11+10log(B) = 29.71	PASS
155	5775	8.1	5.23	9.91	9.791	27.72	PASS

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EIRP (IC)

802.11a_Main

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	12.64	5.270	17.91	61.802	23.01 or $10+10\log(B)=22.13$	PASS
44	5220	12.58	5.270	17.85	60.954	23.01 or $10+10\log(B)=22.10$	PASS
48	5240	12.54	5.270	17.81	60.395	23.01 or $10+10\log(B)=22.12$	PASS
52	5260	12.51	5.270	17.78	59.979	30 or $17+10\log(B)=29.12$	PASS
60	5300	12.51	5.270	17.78	59.979	30 or $17+10\log(B)=29.10$	PASS
64	5320	12.65	5.270	17.92	61.944	30 or $17+10\log(B)=29.03$	PASS
100	5500	12.55	5.270	17.82	60.534	30 or $17+10\log(B)=29.14$	PASS
116	5580	12.51	5.270	17.78	59.979	30 or $17+10\log(B)=29.06$	PASS
140	5700	12.54	5.270	17.81	60.395	30 or $17+10\log(B)=29.08$	PASS

802.11n_HT20_MIMO

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	11.92	8.280	20.20	104.799	23.01 or $10+10\log(B)=22.23$	PASS
44	5220	11.88	8.280	20.16	103.768	23.01 or $10+10\log(B)=22.32$	PASS
48	5240	11.67	8.280	19.95	98.883	23.01 or $10+10\log(B)=22.36$	PASS
52	5260	11.57	8.280	19.85	96.529	30 or $17+10\log(B)=29.34$	PASS
60	5300	11.92	8.280	20.20	104.670	30 or $17+10\log(B)=29.26$	PASS
64	5320	11.88	8.280	20.16	103.767	30 or $17+10\log(B)=29.43$	PASS
100	5500	11.83	8.280	20.11	102.657	30 or $17+10\log(B)=29.36$	PASS
116	5580	11.78	8.280	20.06	101.498	30 or $17+10\log(B)=29.32$	PASS
140	5700	11.74	8.280	20.02	100.540	30 or $17+10\log(B)=29.38$	PASS

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802.11n_HT40_MIMO

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)		RESULT
38	5190	11.82	8.280	20.10	102.389	23.01	or $10+10\log(B)=$ 25.56	PASS
46	5230	11.96	8.280	20.24	105.650	23.01	or $10+10\log(B)=$ 25.48	PASS
54	5270	11.72	8.280	20.00	100.106	30	or $17+10\log(B)=$ 32.46	PASS
62	5310	11.86	8.280	20.14	103.375	30	or $17+10\log(B)=$ 32.44	PASS
102	5510	11.86	8.280	20.14	103.355	30	or $17+10\log(B)=$ 32.53	PASS
110	5550	11.98	8.280	20.26	106.226	30	or $17+10\log(B)=$ 32.42	PASS
134	5670	11.99	8.280	20.27	106.294	30	or $17+10\log(B)=$ 32.44	PASS

802.11ac_VHT80_MIMO

CH	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)		REQUIRED LIMIT (dBm)		RESULT
42	5210	9.68	8.280	17.96	62.565	23.01	or $10+10\log(B)=$ 28.71	PASS
58	5290	9.93	8.280	18.21	66.187	30	or $17+10\log(B)=$ 35.62	PASS
106	5530	9.68	8.280	17.96	62.533	30	or $17+10\log(B)=$ 35.71	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 Acess 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.

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The antenna gain is greater than 6 dBi in MIMO mode the limit reduce as below:

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

FCC

	Effective Legacy Gain (dBi)	Limit
UNII-1	5.27+3.01=8.28dBi	11dBm – (8.28– 6 dBi) = 8.72dBm
UNII-2A	5.27+3.01=8.28dBi	11dBm – (8.28– 6 dBi) = 8.72dBm
U-NII-2C	5.27+3.01=8.28dBi	11dBm – (8.28– 6 dBi) = 8.72dBm
U-NII-3	5.27+3.01=8.28dBi	30dBm – (8.28– 6 dBi) = 27.72dBm

IC

	Effective Legacy Gain (dBi)	Limit
UNII-2A	5.27+3.01=8.28dBi	11dBm – (8.28– 6 dBi) = 8.72dBm
U-NII-2C	5.27+3.01=8.28dBi	11dBm – (8.28– 6 dBi) = 8.72dBm
U-NII-3	5.27+3.01=8.28dBi	30dBm – (8.28– 6 dBi) = 27.72dBm

Therefore the limit needs to reduce for the UNII-1, U-NII-2A, U-NII-2C and U-NII-3 band.

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.

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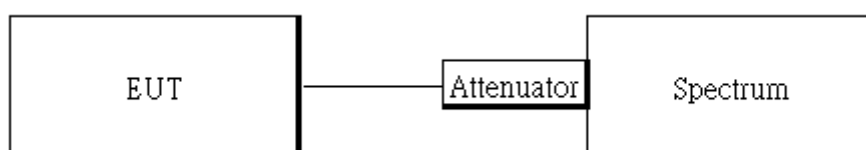
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Note: For the test of PSD at MIMO mode, the highest emission of worst case employing Measure and add 10 log (N) technical is reported on this report after the comparison between Main Antenna at single transmitting mode and Aux that yields the higher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

10.3 Measurement Equipment Used

SGS Conducted Room					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2017	02/25/2018
DC Block	Mini-Circuits	BLK-18-S+	1	01/05/2017	01/04/2018
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/05/2017	01/04/2018
Attenuator	Mini-Circuit	BW-S10W2+	2	01/05/2017	01/04/2018
Splitter	Agilent	11636B	N/A	01/05/2017	01/04/2018
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017
Temperature Chamber	TERCHY	MHG-120LF	911009	05/17/2016	05/16/2017

10.4 Test Set-up



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10.5 Measurement Result

POWER DENSITY 802.11a MODE			
Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5180	-1.31	11	-12.31
5220	-1.61	11	-12.61
5240	-1.44	11	-12.44
5260	-1.54	11	-12.54
5300	-1.69	11	-12.69
5320	-1.14	11	-12.14
5500	-1.27	11	-12.27
5580	-0.92	11	-11.92
5700	-1.15	11	-12.15
5745	5.22	30	-24.78
5785	5.85	30	-24.15
5825	5.53	30	-24.47

POWER DENSITY 802.11n HT20 MODE			
Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5180	-1.40	8.72	-10.12
5220	-2.37	8.72	-11.09
5240	-2.65	8.72	-11.37
5260	-2.68	8.72	-11.40
5300	-2.95	8.72	-11.67
5320	-3.19	8.72	-11.91
5500	-2.51	8.72	-11.23
5580	-3.16	8.72	-11.88
5700	-2.84	8.72	-11.56
5745	4.01	27.72	-23.71
5785	4.58	27.72	-23.14
5825	4.50	27.72	-23.22

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POWER DENSITY 802.11n HT40 MODE			
Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5190	-5.59	8.72	-14.31
5230	-6.43	8.72	-15.15
5270	-6.43	8.72	-15.15
5310	-6.17	8.72	-14.89
5510	-5.96	8.72	-14.68
5550	-5.88	8.72	-14.60
5670	-5.82	8.72	-14.54
5755	2.36	27.72	-25.36
5795	2.00	27.72	-25.72

POWER DENSITY 802.11ac VHT80 MODE			
Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5210	-8.04	8.72	-16.76
5290	-8.74	8.72	-17.46
5530	-7.91	8.72	-16.63
5610	-7.86	8.72	-16.58
5775	0.37	27.72	-27.35

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EIRP

EIRP spectral density 802.11a MODE					
Freq. (MHz)	PPSD (dBm)	Ant. Gain (dBi)	EIRP PSD (dBm)	Limit (dBm)	Margin (dB)
5180	-1.31	5.27	3.96	10	-6.04
5220	-1.61	5.27	3.66	10	-6.34
5240	-1.44	5.27	3.83	10	-6.17

EIRP spectral density 802.11n HT20 MODE					
Freq. (MHz)	PPSD (dBm)	Ant. Gain (dBi)	EIRP PSD (dBm)	Limit (dBm)	Margin (dB)
5180	-1.40	8.28	6.88	10	-3.12
5220	-2.37	8.28	5.91	10	-4.09
5240	-2.65	8.28	5.63	10	-4.37

EIRP spectral density 802.11n HT40 MODE					
Freq. (MHz)	PPSD (dBm)	Ant. Gain (dBi)	EIRP PSD (dBm)	Limit (dBm)	Margin (dB)
5180	-5.59	8.28	2.69	10	-7.31
5220	-6.43	8.28	1.85	10	-8.15

EIRP spectral density 802.11ac VHT80 MODE					
Freq. (MHz)	PPSD (dBm)	Ant. Gain (dBi)	EIRP PSD (dBm)	Limit (dBm)	Margin (dB)
5210	-8.04	8.28	0.24	10	-9.76

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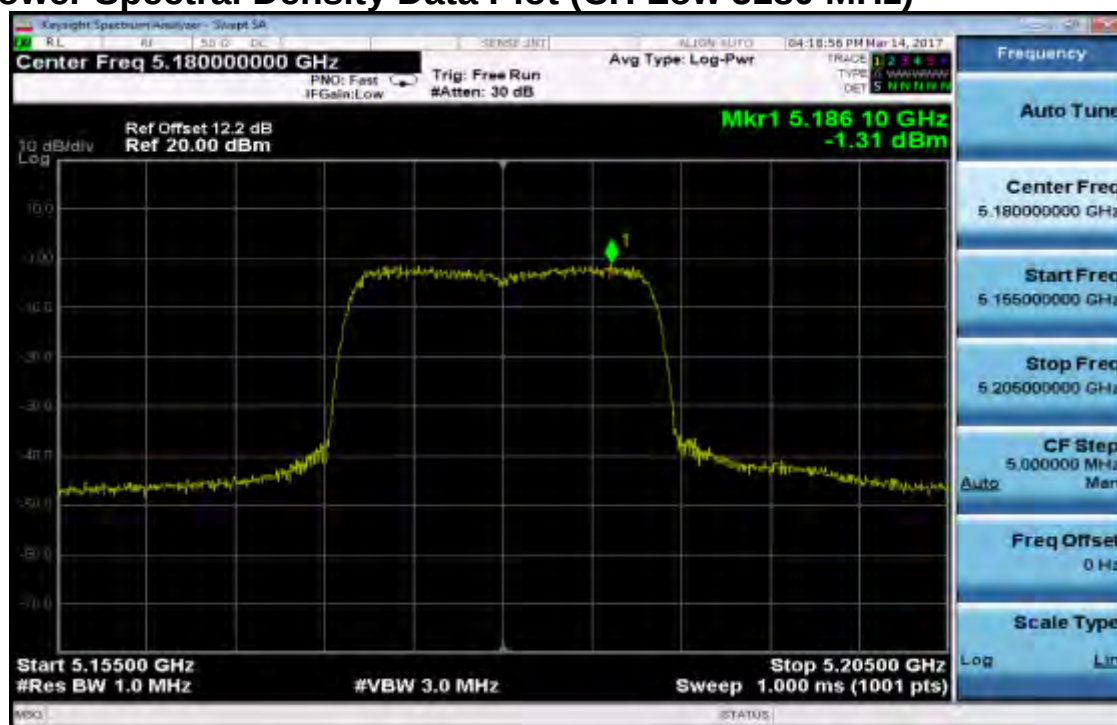
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Member of SGS Group

802.11a 5150~5250 MHz

Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



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Peak Power Spectral Density Data Plot (CH High 5240 MHz)



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802.11a 5250~5350 MHz

Peak Power Spectral Density Data Plot (CH Low 5260 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)



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Peak Power Spectral Density Data Plot (CH High 5320 MHz)



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Member of SGS Group

802.11a 5470~5725 MHz

Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5580 MHz)



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Peak Power Spectral Density Data Plot (CH High 5700 MHz)



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Member of SGS Group

802.11a 5725~5850 MHz

Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5785 MHz)



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Peak Power Spectral Density Data Plot (CH High 5825 MHz)



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802.11n HT20, 5150~5250 MHz

Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



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Peak Power Spectral Density Data Plot (CH High 5240 MHz)



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802.11n HT20, 5250~5350 MHz

Peak Power Spectral Density Data Plot (CH Low 5260MHz)



Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)



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Peak Power Spectral Density Data Plot (CH High 5320 MHz)



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802.11n HT20, 5470~5725 MHz

Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5580MHz)



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Peak Power Spectral Density Data Plot (CH High 5700 MHz)



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SGS Taiwan Ltd.

台灣檢驗科技股份有限公司

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

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