

TEST REPORT

DT&C Co., Ltd. 42, Yurim-ro, 154Beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea Tel : 031-321-2664, Fax : 031-321-1664	Report No : DRTFCC1601-0023 Pages:(1) / (444) page	
1. Customer • Name : LG Electronics USA, Inc. • Address : 1000 Sylvan Avenue, Englewood Cliffs, New Jersey 07632 2. Use of Report : FCC & IC Original Grant 3. Product Name (FCC ID / IC): Notebook Computer (BEJNT-LG14Z96 / 2703H-LG14Z96) 4. Date of Test : 2015-11-16 ~ 2016-01-07 5. Test Method Used: FCC Part 15.407 Subpart E, RSS-GEN Issue 4 (2014-11) 6. Testing Environment : See appended test report 7. Test Result : ☒ Pass ☐ Fail The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full.		
Affirmation	Tested by Name : Inhee Bae  (Signature)	Technical Manager Name : GeunKi Son  (Signature)
2016. 01. 19 DT&C Co., Ltd.		

Test Report Version

Test Report No.	Date	Description
DRTFCC1601-0023	Jan. 19, 2016	Initial issue



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1. EUT DESCRIPTION 4

1. EUT DESCRIPTION

FCC Equipment Class	Unlicensed National Information Infrastructure (UNII)
Product	Notebook Computer
Model Name	LG14Z96
Add Model Name	14Z960, 14ZD960
Software version	1.0
Hardware version	1.0
Power Supply	AC 120 V
Frequency Range	U-NII 1(5150 ~ 5250 MHz) ▪ 802.11a/n(HT20): 5180 ~ 5240 MHz ▪ 802.11n(HT40): 5190 ~ 5230 MHz ▪ 802.11ac(VHT80): 5210 MHz U-NII 2A(5250 ~ 5350 MHz) ▪ 802.11a/n(HT20): 5260 ~ 5320 MHz ▪ 802.11n(HT40): 5270 ~ 5310 MHz ▪ 802.11ac(VHT80): 5290 MHz U-NII 2C(5470 ~ 5725 MHz) ▪ 802.11a/n(HT20): 5500 ~ 5700 MHz ▪ 802.11n(HT40): 5510 ~ 5670 MHz ▪ 802.11ac(VHT80): 5530 MHz ▪ 802.11ac(VHT20): 5720 MHz ▪ 802.11ac(VHT40): 5710 MHz ▪ 802.11ac(VHT80): 5690 MHz U-NII 3(5725 ~ 5850MHz) ▪ 802.11a/n(HT20): 5745 ~ 5825 MHz ▪ 802.11n(HT40): 5755 ~ 5795 MHz ▪ 802.11ac(VHT80): 5775 MHz U-NII 2C & U-NII 3 ▪ 802.11ac(VHT20): 5720 MHz ▪ 802.11ac(VHT40): 5710 MHz ▪ 802.11ac(VHT80): 5690 MHz
Modulation type	OFDM
Antenna Specification	Antenna type: Internal Antenna Antenna gain ▪ U-NII 1 band: ANT 1: 0.48 dBi & ANT 2: 0.34 dBi ▪ U-NII 2A band: ANT 1: 0.48 dBi & ANT 2: 0.34 dBi ▪ U-NII 2C band: ANT 1: 0.48 dBi & ANT 2: 0.34 dBi ▪ U-NII 3 band: ANT 1: 1.03 dBi & ANT 2: -0.62 dBi Antenna Configuration ▪ 802.11a: Single Transmitting (ANT 1 or ANT 2) ▪ 802.11n(MCS 0 ~ 7, HT20/40) : Single Transmitting (ANT 1 or ANT 2) ▪ 802.11n(MCS 8 ~ 15, HT20/40) : Multiple Transmitting (ANT 1 and ANT 2) ▪ 802.11ac(NSS1 MCS 0 ~ 8, VHT20) : Single Transmitting (ANT 1 or ANT 2) ▪ 802.11ac(NSS2 MCS 0 ~ 8, VHT20) : Multiple Transmitting (ANT 1 and ANT 2) ▪ 802.11ac(NSS1 MCS 0 ~ 9, VHT40/80) : Single Transmitting (ANT 1 or ANT 2) ▪ 802.11ac(NSS2 MCS 0 ~ 9, VHT40/80) : Multiple Transmitting (ANT 1 and ANT 2)

Note: This device does not used TDWR band.

2. Information about test items

2.1 Test mode / Channel Information

5GHz Band	Mode	Data Rate	
		Single transmitting	Multiple transmitting
U-NII 1	802.11a	6Mbps	NA
	802.11n(HT20)	MCS 0	MCS 8
	802.11n(HT40)	MCS 0	MCS 8
	802.11ac(VHT80)	NSS1 MCS 0	NSS2 MCS 0
U-NII 2A	802.11a	6Mbps	NA
	802.11n(HT20)	MCS 0	MCS 8
	802.11n(HT40)	MCS 0	MCS 8
	802.11ac(VHT80)	NSS1 MCS 0	NSS2 MCS 0
U-NII 2C	802.11a	6Mbps	NA
	802.11n(HT20)	MCS 0	MCS 8
	802.11n(HT40)	MCS 0	MCS 8
	802.11ac(VHT20)	NSS1 MCS 0	NSS2 MCS 0
	802.11ac(VHT40)	NSS1 MCS 0	NSS2 MCS 0
	802.11ac(VHT80)	NSS1 MCS 0	NSS2 MCS 0
U-NII 3	802.11a	6Mbps	NA
	802.11n(HT20)	MCS 0	MCS 8
	802.11n(HT40)	MCS 0	MCS 8
	802.11ac(VHT80)	NSS1 MCS 0	NSS2 MCS 0

Note 1: The worst case data rate is determined as above test mode according to the power measurements.
And all test items were performed at the worst case data rate.

2.2 Tested Channel Information

5GHz Band	802.11a/n(HT20)		802.11n(HT40)		802.11ac(VHT80)	
	Channel	Frequency [MHz]	Channel	Frequency [MHz]	Channel	Frequency [MHz]
U-NII 1	36	5180	38	5190	-	-
	40	5200	-	-	42	5210
	48	5240	46	5230	-	-
U-NII 2A	52	5260	54	5270	-	-
	60	5300	-	-	58	5290
	64	5320	62	5310	-	-
U-NII 2C	100	5500	102	5510	-	-
	116	5580	110	5550	106	5530
	140	5700	134	5670	-	-
U-NII 3	149	5745	151	5755	-	-
	157	5785	-	-	155	5775
	165	5825	159	5795	-	-

5GHz Band	802.11ac(VHT20)		802.11ac(VHT40)		802.11ac(VHT80)	
	Channel	Frequency [MHz]	Channel	Frequency [MHz]	Channel	Frequency [MHz]
U-NII 2C & U-NII 3	144	5720	142	5710	138	5690

2.3 Auxiliary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
-	-	-	-	-

2.4 Tested environment

Temperature	: 21 °C ~ 24 °C
Relative humidity content	: 40 % ~ 42 % R.H.
Details of power supply	: AC 120 V

2.5 EMI Suppression Device(s)/Modifications

EMI suppression device(s) added and/or modifications made during testing

→ None

3. SUMMARY OF TESTS

FCC Part Section(s)	RSS Std.	Parameter	Limit	Test Condition	Status Note 1
I. Transmitter Mode (TX)					
15.407(a)	-	Emission Bandwidth (26 dB Bandwidth)	N/A	Conducted	C
15.407(e)	RSS-247[6.2.4]	Minimum Emission Bandwidth (6 dB Bandwidth)	> 500 kHz in 5725 ~ 5850 MHz		C
-	RSS GEN[6.6]	Occupied Bandwidth (99%)	N/A		
15.407(a)	RSS-247[6.2]	Maximum Conducted Output Power	5150 ~ 5250 MHz : < 30 dBm or < 23.97 dBm (FCC) < 200 mW or 10 + 10log10(B) dBm whichever power is less. (IC) 5250 ~ 5350 & 5470 ~ 5725 MHz : <250 mW or < 11 + 10 log10(B) dBm, whichever power is less. (FCC & IC) 5725 ~ 5850 MHz : < 30 dBm (FCC & IC) Note: B is the 99 % BW(IC) or 26dB BW(FCC).		C Note 3
15.407(a)	RSS-247[6.2]	Peak Power Spectral Density	5150 ~ 5250 MHz : 11 dBm/MHz or 17 dBm/MHz(FCC) 5150 ~ 5250 MHz: < 10 dBm/MHz 5250 ~ 5350 & 5470 ~ 5725 MHz: 11 dBm/MHz (FCC & IC) 5725 ~ 5850 MHz: 30 dBm/500kHz(FCC & IC)		C Note 4
15.407(g)	RSS GEN[6.11]	Frequency Stability	N/A		C
15.407(b)	RSS-247[6.2]	Undesirable Emissions	5150 ~ 5725 MHz: < -27 dBm/MHz EIRP 5725 ~ 5850 MHz: < -17 dBm/MHz EIRP or < -27 dBm/MHz EIRP	Radiated	C Note 5
15.205 15.209 15.407(b)	RSS-247[6.2] RSS-GEN[8.9] RSS-GEN[8.10]	General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		C Note 6
15.407(h)	RSS-247[6.3]	Dynamic Frequency Selection	FCC 15.407(h)	Conducted	C Note 7
15.207	RSS-GEN[8.8]	AC Conducted Emissions	FCC 15.207	AC Line Conducted	C
15.203	-	Antenna Requirements	FCC 15.203	-	C

Note 1: **C** = Comply **NC** = Not Comply **NT** = Not Tested **NA** = Not Applicable

Note 2: The test items were performed according to the KDB789033 D02 V01 and ANSI C63.10-2013

Note 3: (i) For access point operating in the band 5.15 - 5.25 GHz: < 30 dBm

(ii) For mobile and portable client devices in the 5.15 - 5.25 GHz band: < 23.97 dBm

Note 4: (i) For access point operating in the band 5.15 - 5.25 GHz: < 17 dBm/MHz

(ii) For mobile and portable client devices in the 5.15 - 5.25 GHz band: < 11 dBm/MHz

Note 5: For transmitters operating in the 5.725 - 5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz

Note 6: These test items were performed in each axis and the worst case data was reported.

Note 7: Refer to the DFS test report.

4. TEST METHODOLOGY

Generally the tests were performed according to the KDB789033 D02 v01. And ANSI C63.10-2013 was used to reference appropriate EUT setup and maximizing procedures of radiated spurious emission and AC line conducted emission testing

4.1 EUT configuration

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

4.2 EUT exercise

The EUT was operated in the test mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart C.

4.3 General test procedures

Conducted Emissions

The power-line conducted emission test procedure is not described on the KDB789033 D02 v01. So this test was fulfilled with the requirements in Section 6.2 of ANSI C63.10-2013.

The EUT is placed on the wooden table, which is 0.8 m above ground plane and the conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and Average detector.

Radiated Emissions

Basically the radiated tests were performed with KDB789033 D02 v01. But some requirements and procedures like test site requirements, EUT setup and maximizing procedure were fulfilled with the requirements in Section 5 and 6 of the ANSI C63.10-2013 as stated on KDB789033 D02 v01.

The EUT is placed on a non-conductive table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m 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 highest emission, the relative positions of the EUT were rotated through three orthogonal axis.

4.4 Description of test modes

A test program is used to control the EUT for staying in continuous transmitting mode with maximum fixed duty cycle.

5. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

6. FACILITIES AND ACCREDITATIONS

6.1 Facilities

The open area test site(OATS) or semi anechoic chamber and conducted measurement facility used to collect the radiated and conducted test data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935. The site is constructed in conformance with the requirements.

- Semi anechoic chamber registration Number: 165783 (FCC) & 5740A-3 (IC)

6.2 Equipment

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and peak, quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

7. ANTENNA REQUIREMENTS

7.1 According to FCC 47 CFR §15.203:

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The EUT used two non standard antenna connectors.

Therefore this module Complies with the requirement of §15.203

7.2 Directional antenna gain(Worst case):

Bands	ANT 1 [dBi]	ANT 2 [dBi]	Directional Gain [dBi]
U-NII 1	0.48	0.34	0.41 Note 2.
U-NII 2A	0.48	0.34	0.41 Note 2.
U-NII 2C	0.48	0.34	0.41 Note 2.
U-NII 3	1.03	-0.62	0.28 Note 2.

Note 1. Directional gain(correlated signal with unequal antenna gain and equal transmit power)

$$10 \log [(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N^{ANT}] \text{ dBi}$$

Note 2. Directional gain(completely uncorrelated signal with unequal antenna gain and equal transmit power)

$$10 \log [(10^{G_1/10} + 10^{G_2/10} + \dots + 10^{G_N/10}) / N^{ANT}] \text{ dBi}$$

Note 3. Directional gain(spatial multiplexing)

$$G_{ANT \text{ MAX}} + 10 \log (N_{ANT} / N_{SS}) \text{ dBi}$$

8. TEST RESULT

8.1 Emission Bandwidth (26 dB Bandwidth)

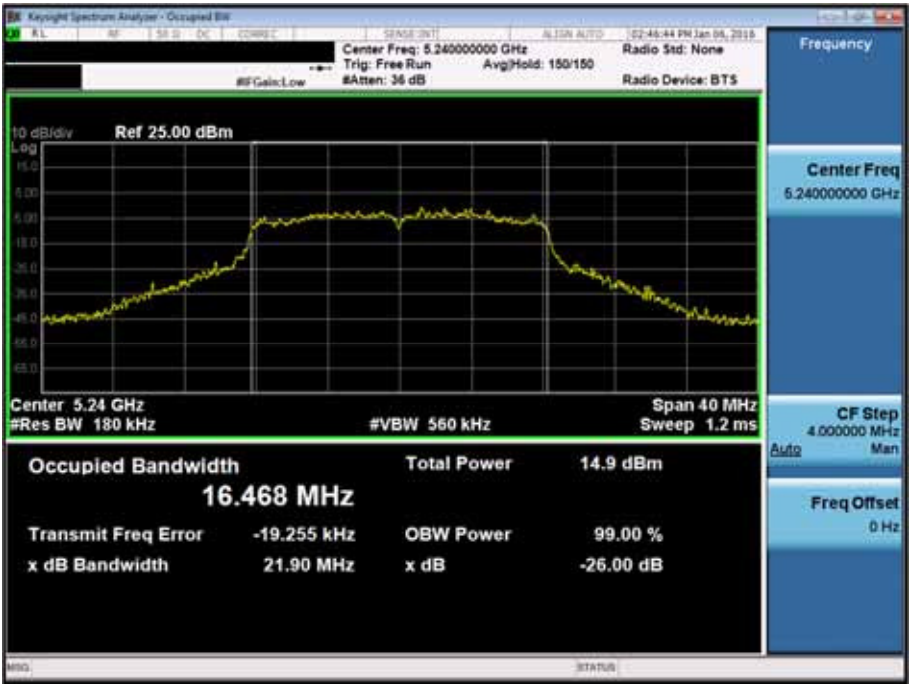
Multiple Transmit

Mode	Band	Channel	Frequency [MHz]	Test Result [MHz]	
				ANT 1	ANT 2
802.11n (HT20)	U-NII 1	36	5180	23.030	22.410
		40	5200	23.090	21.350
		48	5240	21.880	21.110
	U-NII 2A	52	5260	21.360	21.430
		60	5300	21.010	21.160
		64	5320	24.210	21.950
	U-NII 2C	100	5500	22.210	22.010
		116	5580	22.170	23.150
		140	5700	22.030	22.030
802.11n (HT40)	U-NII 1	38	5190	44.110	41.140
		46	5230	43.000	41.480
	U-NII 2A	54	5270	43.010	40.860
		62	5310	43.460	42.380
	U-NII 2C	102	5510	41.800	40.020
		110	5550	44.050	43.990
		134	5670	46.720	43.140
802.11ac (VHT80)	U-NII 1	42	5210	80.410	80.340
		-	-	-	-
	U-NII 2A	58	5290	80.950	80.630
		-	-	-	-
	U-NII 2C	106	5530	80.660	80.320
802.11ac (HT20)	Cross Band	144	5720	15.506	15.463
		-	-	-	-
802.11ac(HT40)	Cross Band	142	5710	36.530	37.880
		-	-	-	-
802.11ac (VHT80)	Cross Band	138	5690	76.800	74.620
		-	-	-	-



26 dB Bandwidth

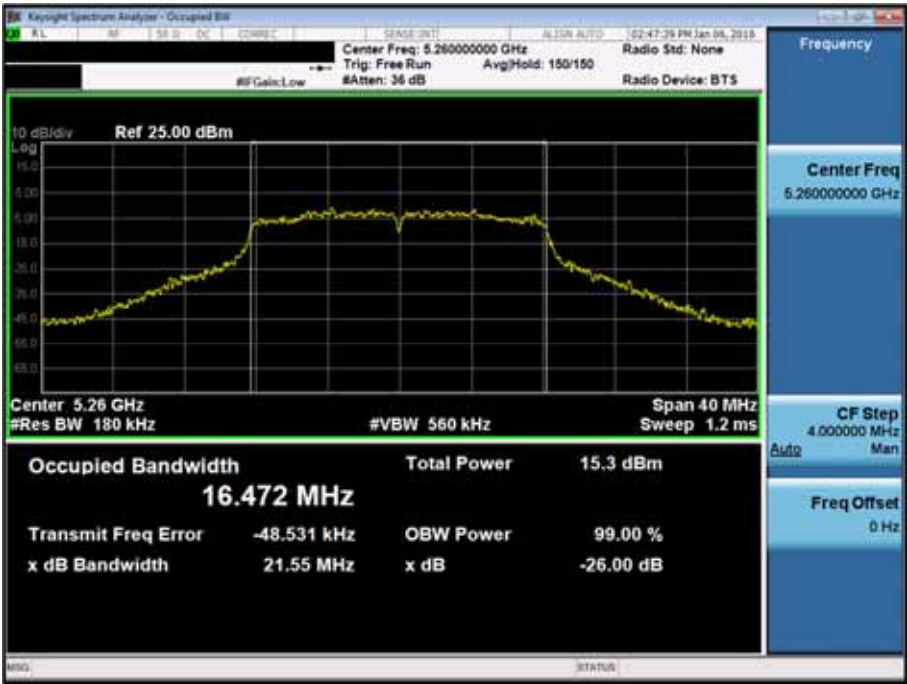
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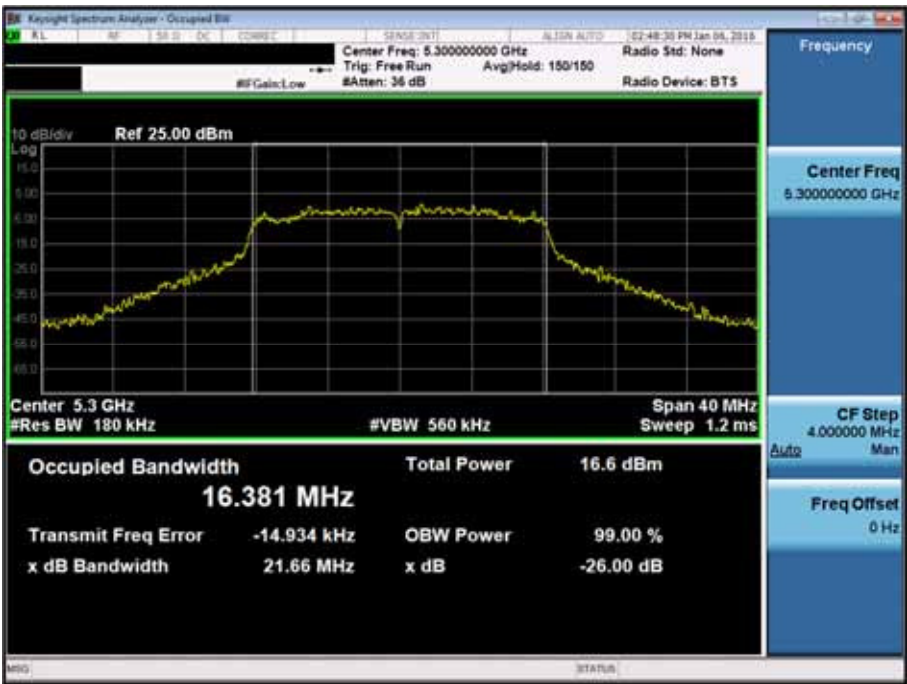
26 dB Bandwidth

Test Mode: 802.11a & ANT 1 & Ch.52



26 dB Bandwidth

Test Mode: 802.11a & ANT 1 & Ch.60





26 dB Bandwidth

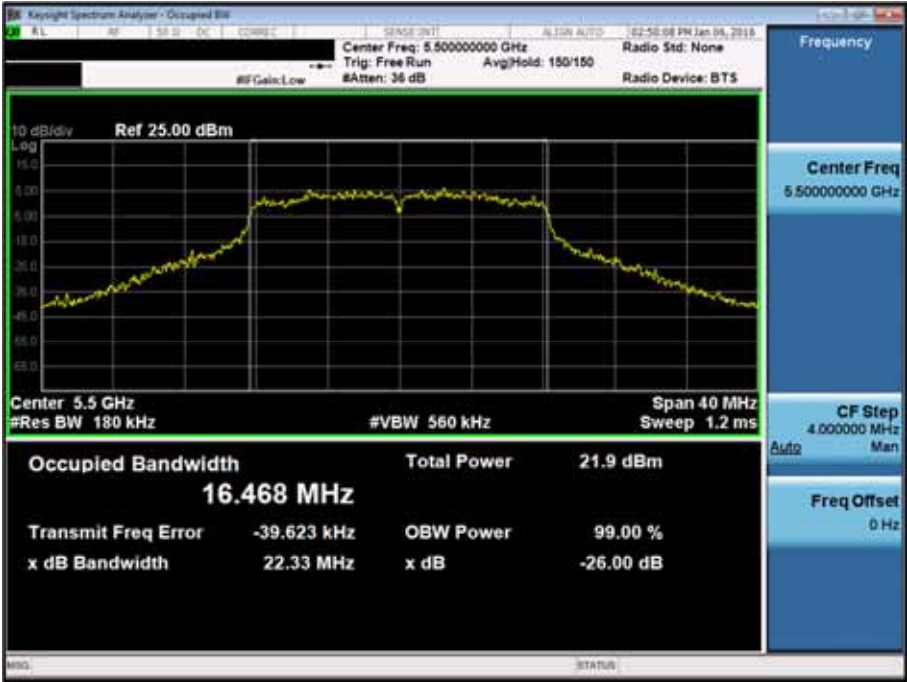
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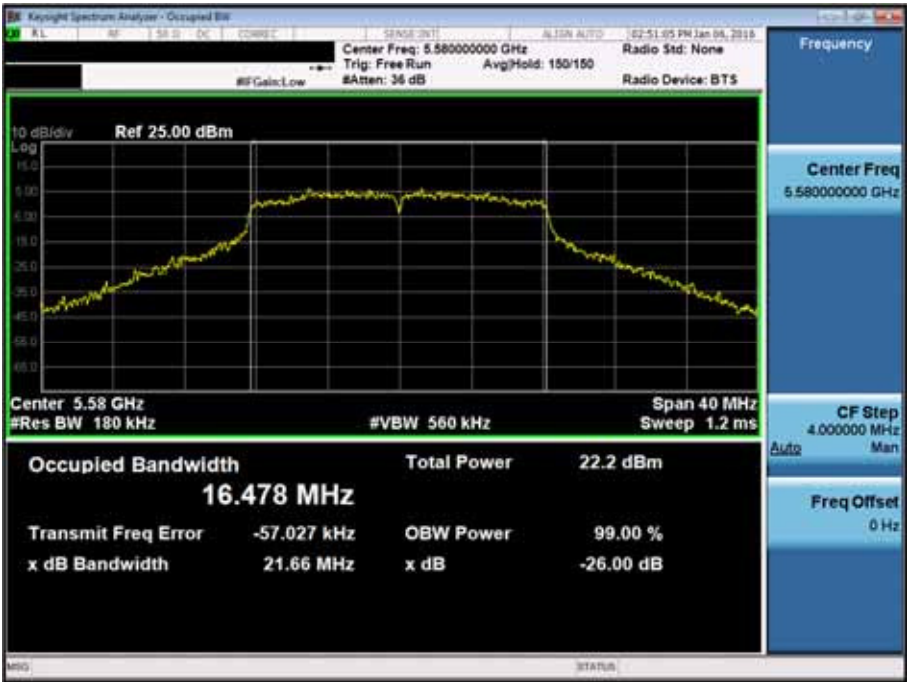
26 dB Bandwidth

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26 dB Bandwidth

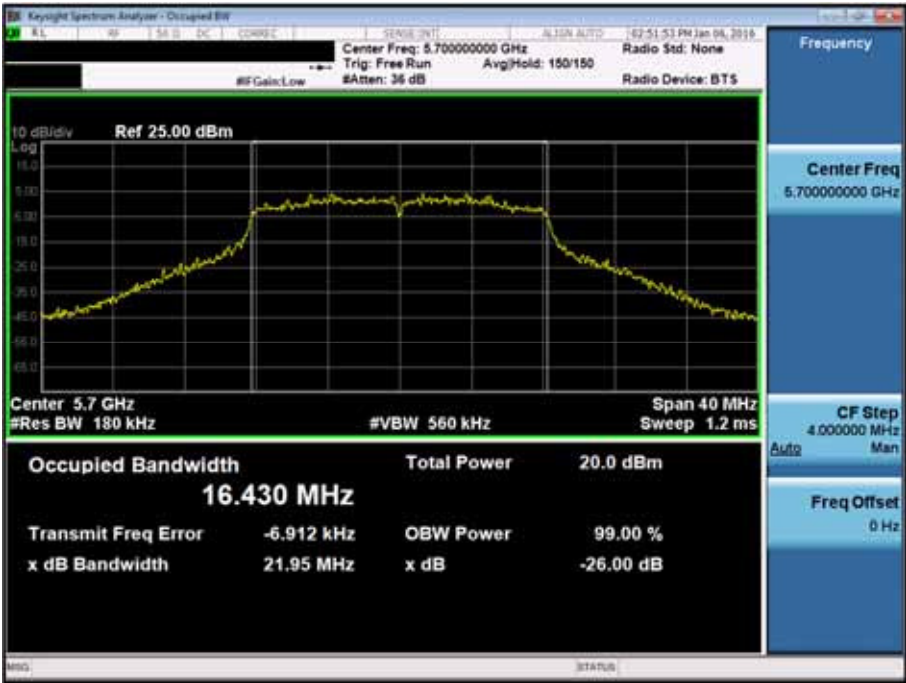
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26 dB Bandwidth

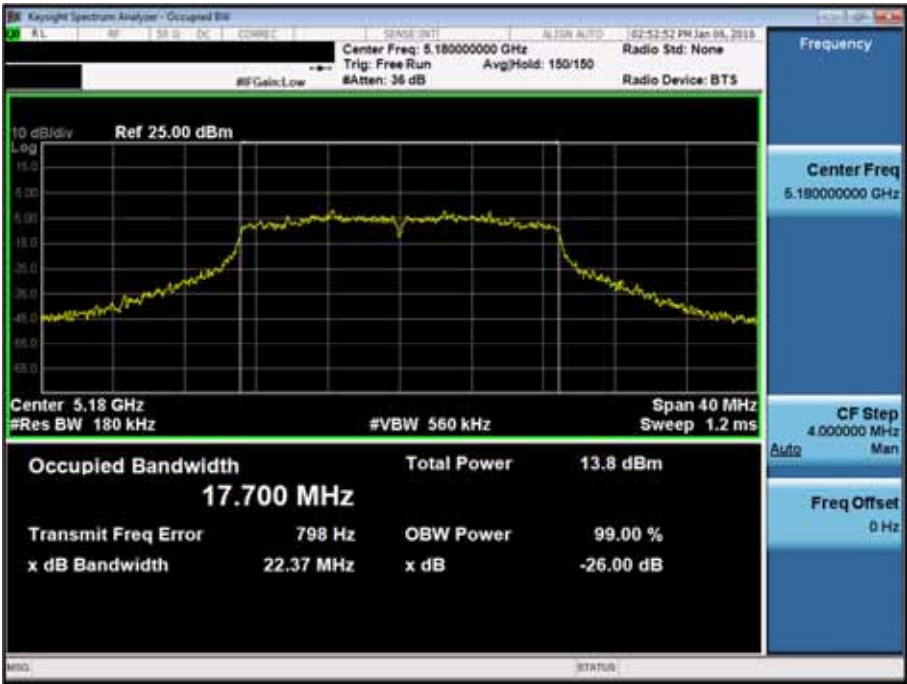
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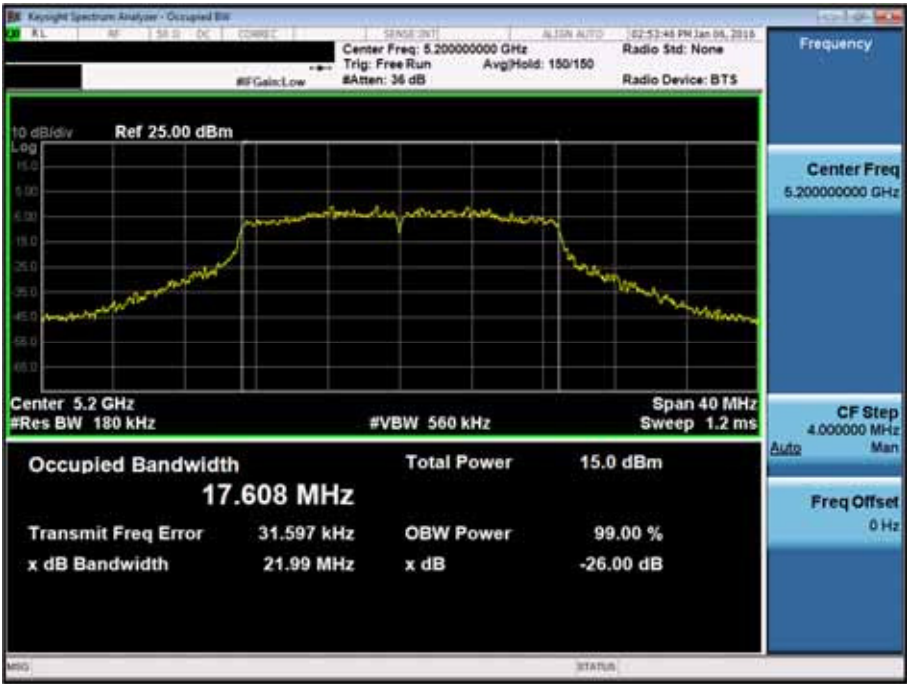
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26 dB Bandwidth

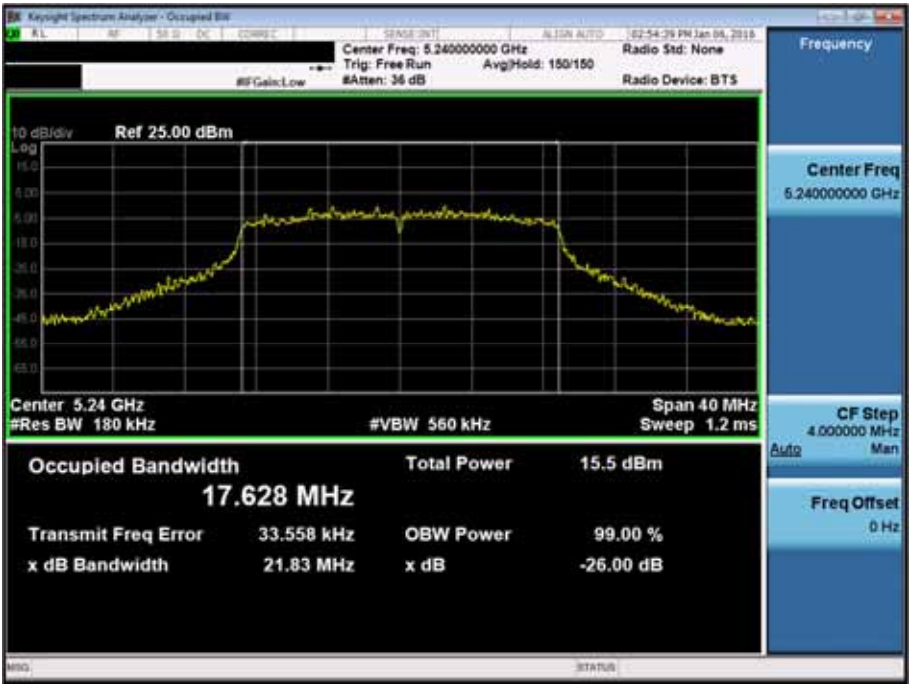
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26 dB Bandwidth

Test Mode: 802.11n(HT20) & ANT 1 & Ch.48





26 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 1 & Ch.52



26 dB Bandwidth

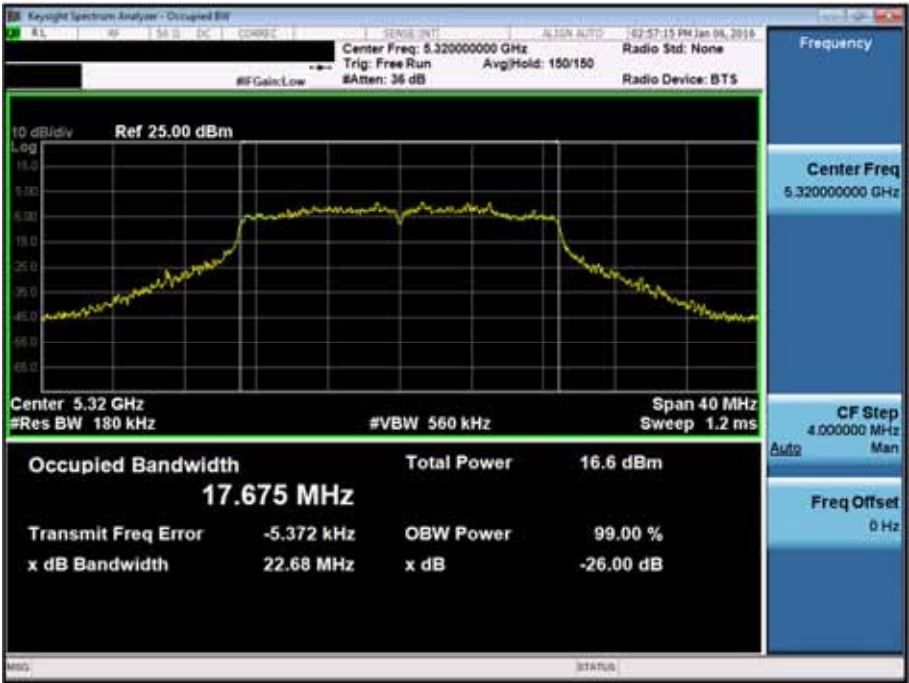
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26 dB Bandwidth

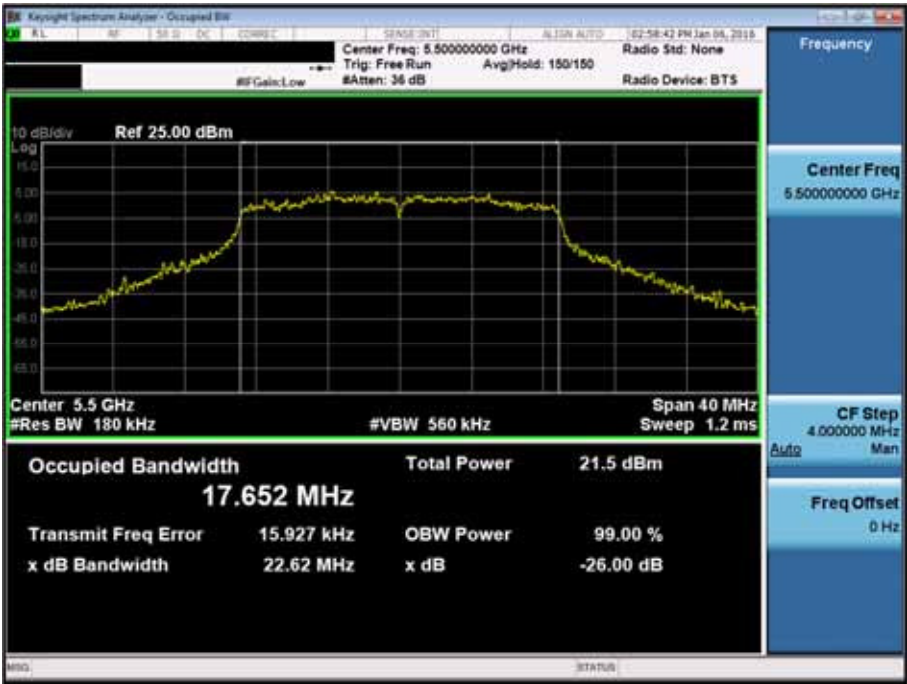
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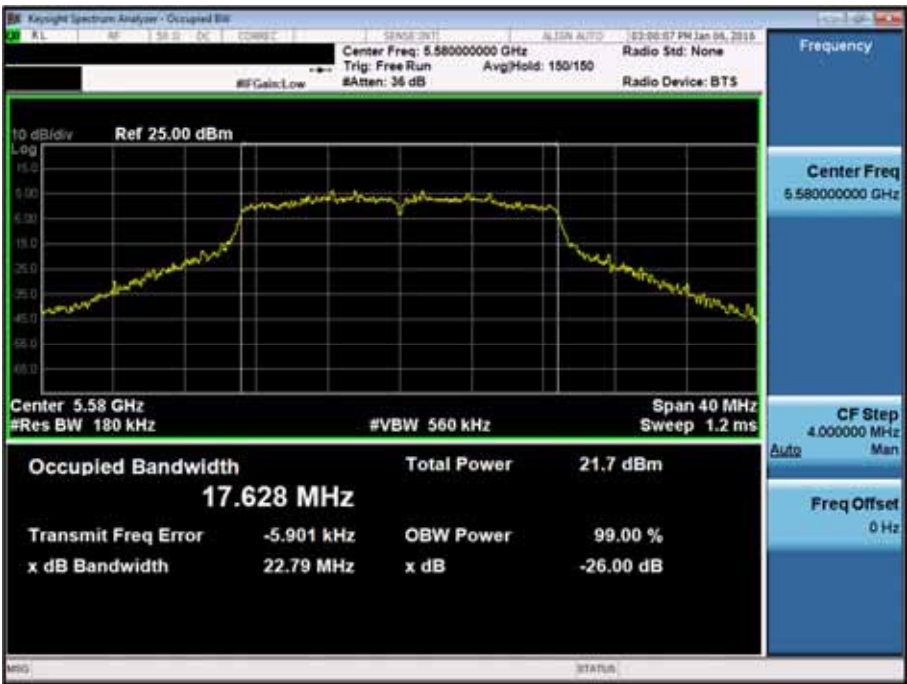
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26 dB Bandwidth

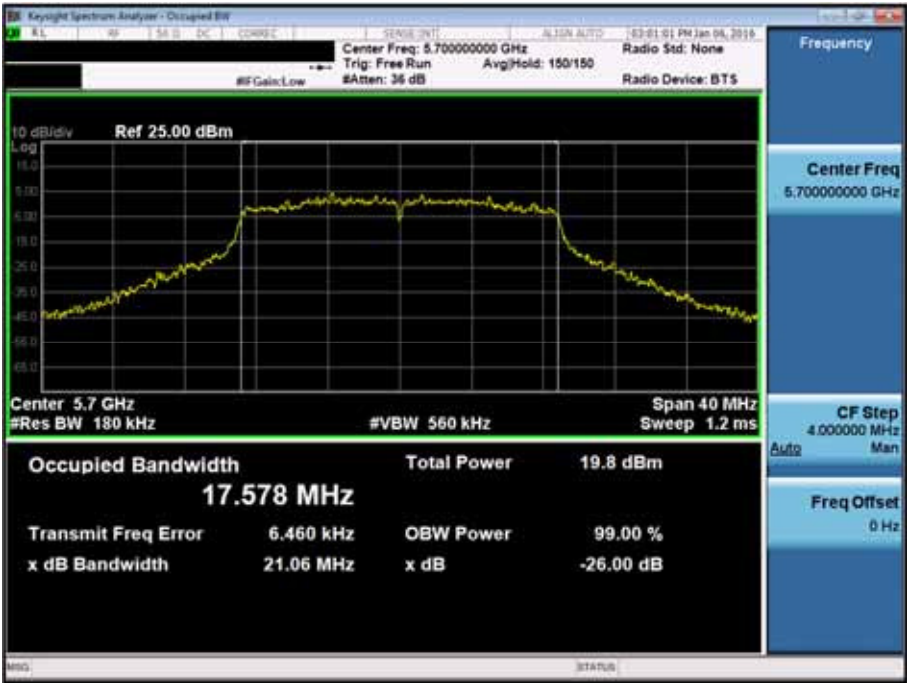
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26 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 1 & Ch.140





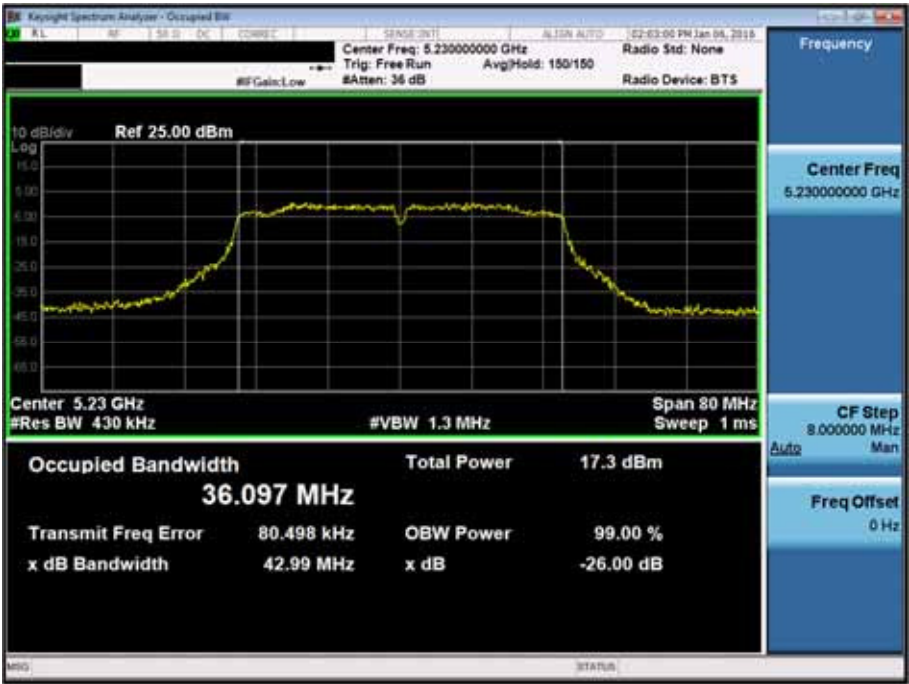
26 dB Bandwidth

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26 dB Bandwidth

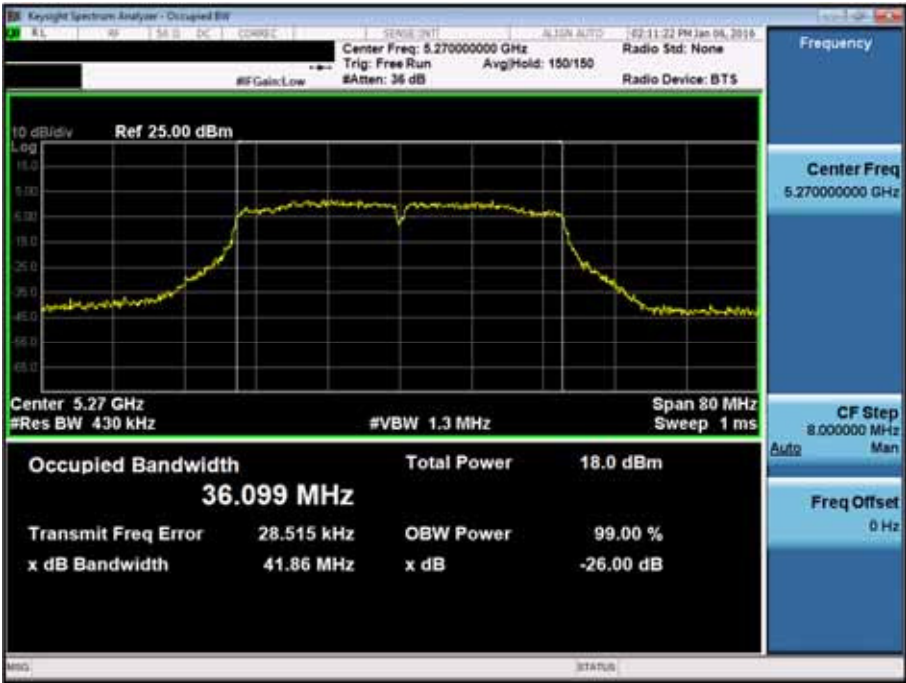
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26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 1 & Ch.54



26 dB Bandwidth

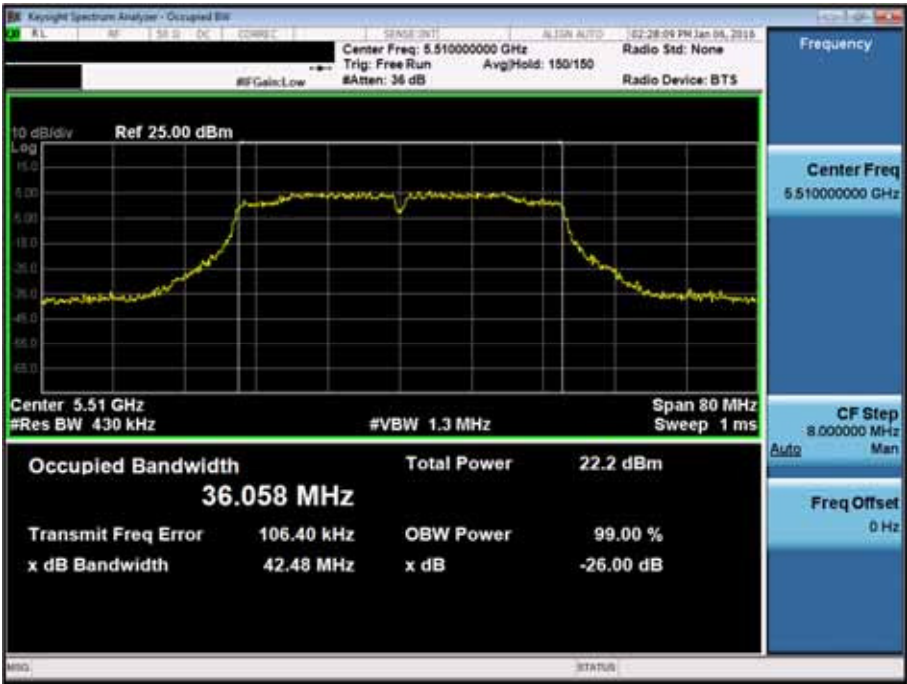
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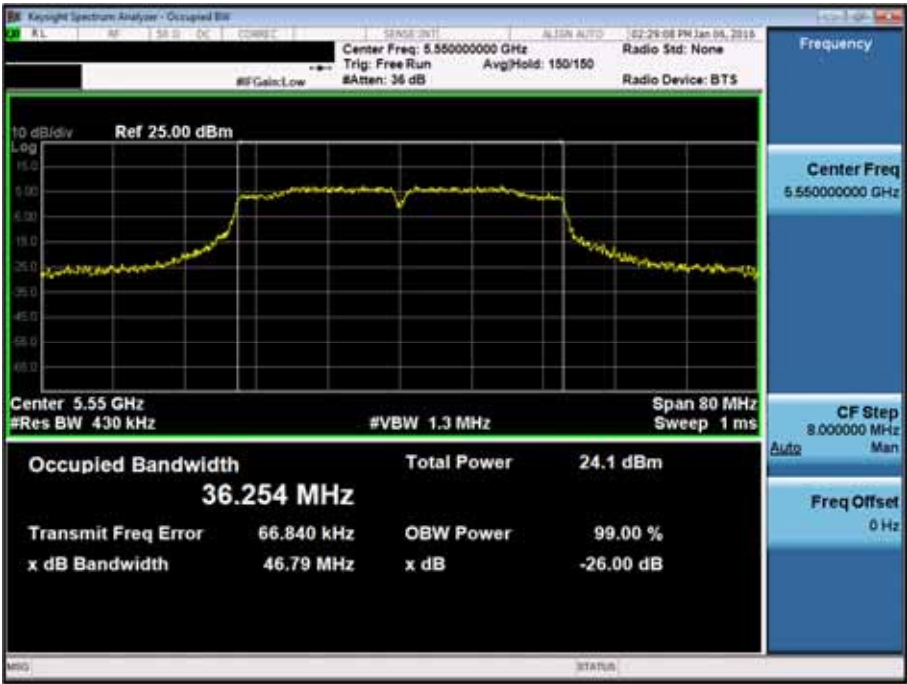
26 dB Bandwidth

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26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 1 & Ch.110





26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 1 & Ch.134





26 dB Bandwidth

Test Mode: 802.11ac(VHT80) & ANT 1 & Ch.42



26 dB Bandwidth

Test Mode: 802.11ac(VHT80) & ANT 1 & Ch.58





26 dB Bandwidth

Test Mode: 802.11ac(VHT80) & ANT 1 & Ch.106



26 dB Bandwidth

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.144



26 dB Bandwidth

Test Mode: 802.11ac VHT40 & ANT 1 & Ch.142





26 dB Bandwidth

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.138





26 dB Bandwidth

Test Mode: 802.11a & ANT 2 & Ch.36



26 dB Bandwidth

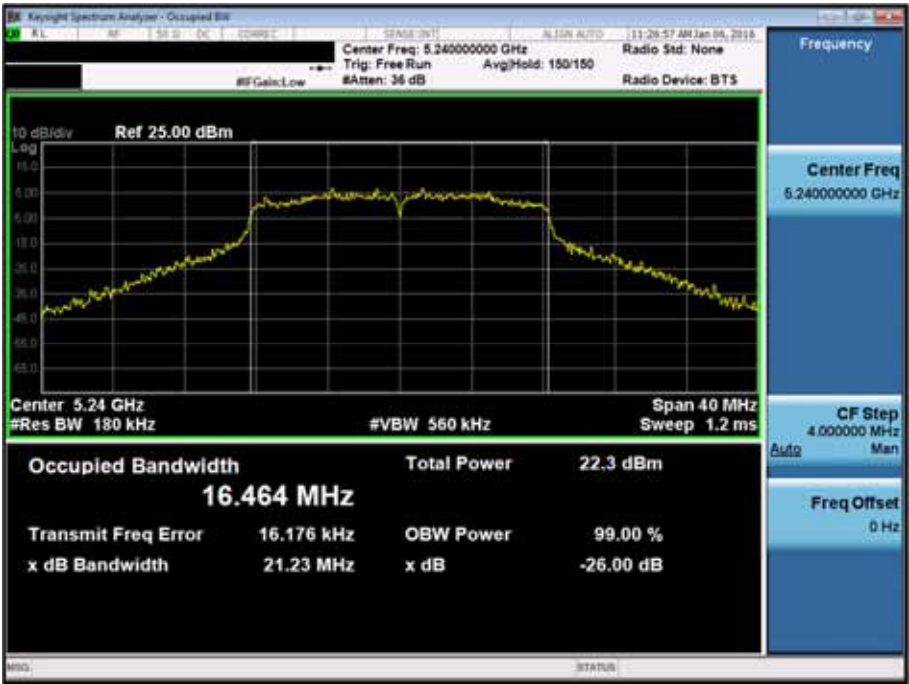
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26 dB Bandwidth

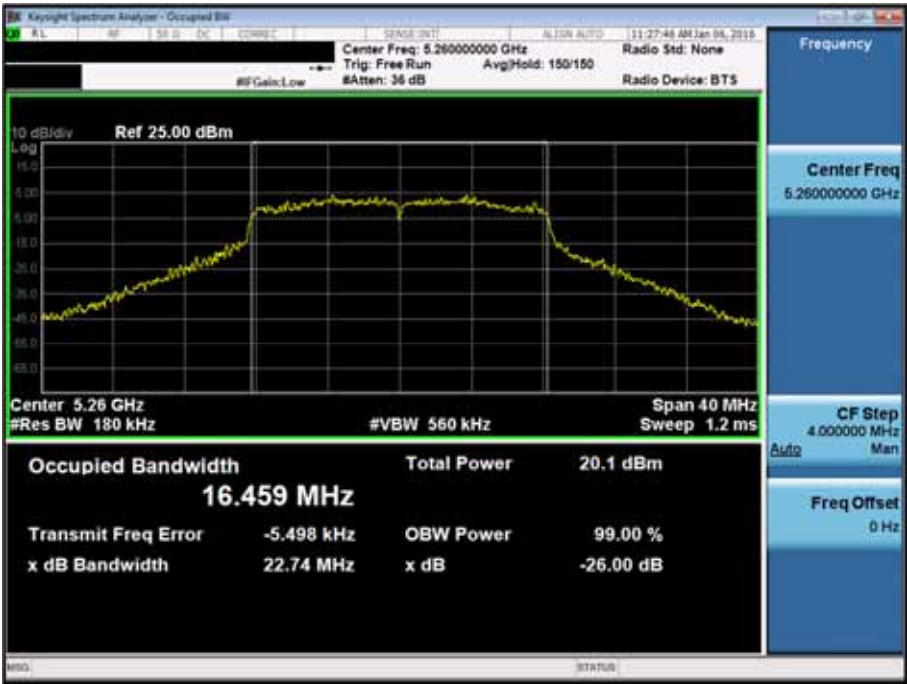
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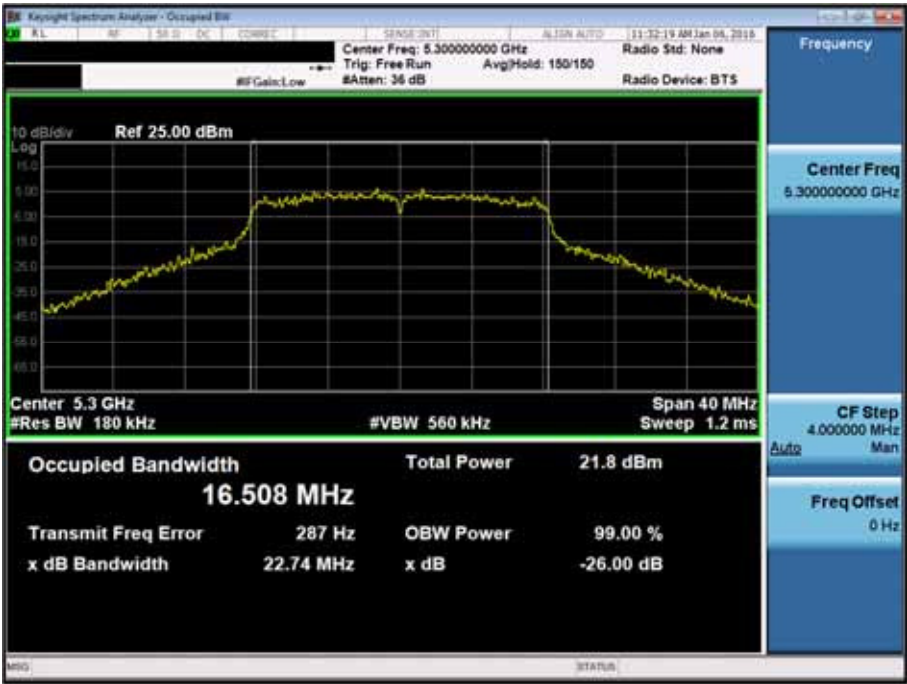
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Test Mode: 802.11a & ANT 2 & Ch.52



26 dB Bandwidth

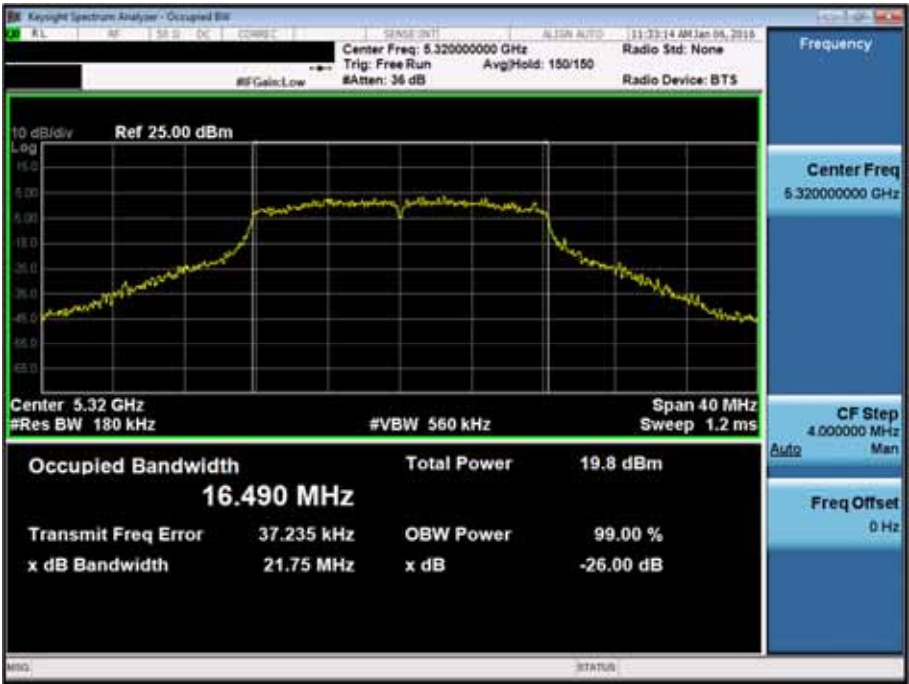
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26 dB Bandwidth

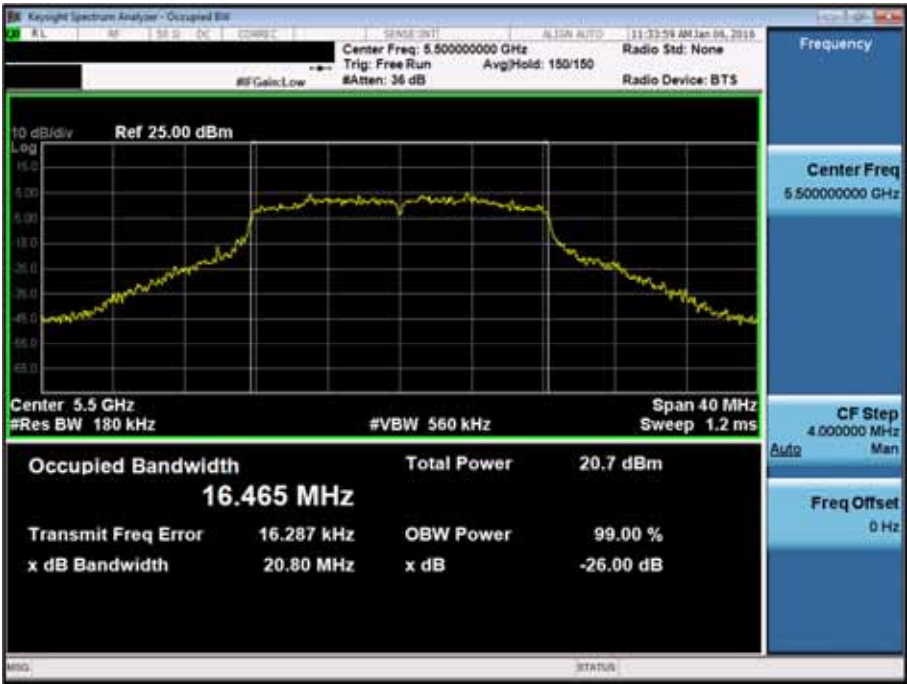
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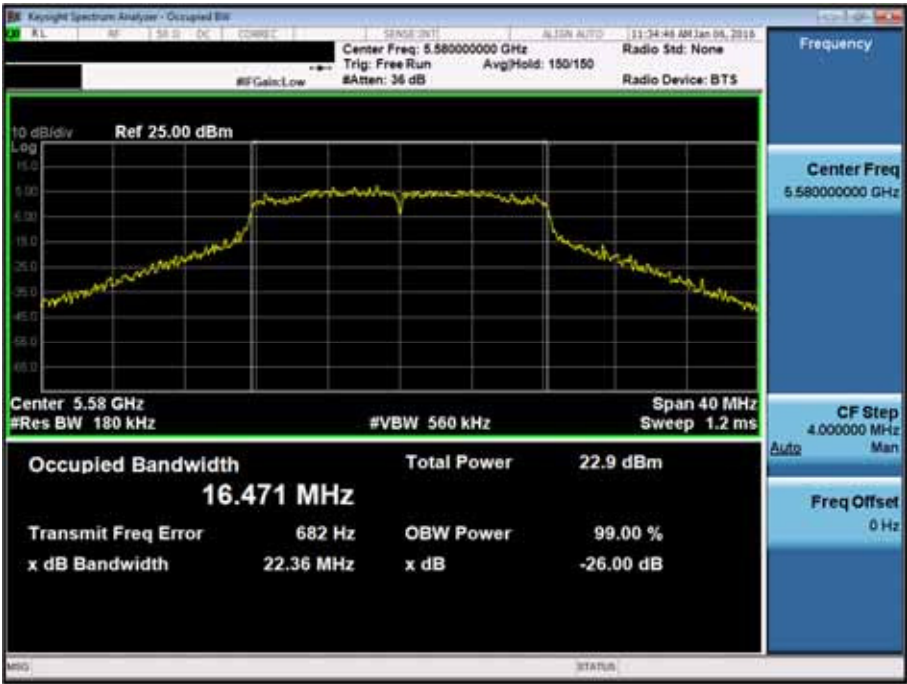
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26 dB Bandwidth

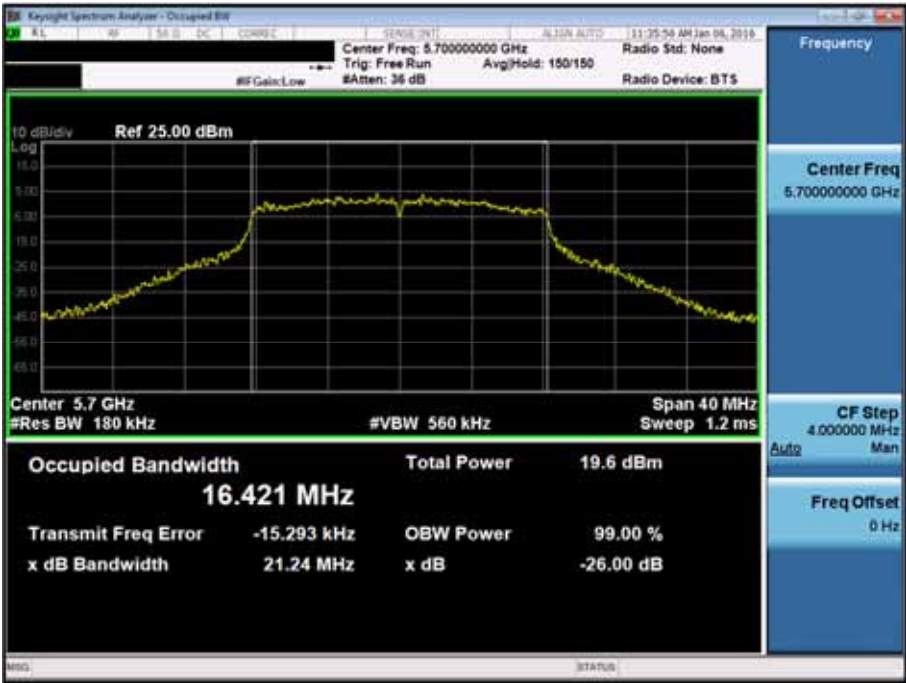
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26 dB Bandwidth

Test Mode: 802.11a & ANT 2 & Ch.140





26 dB Bandwidth

Test Mode: 802.11n(HT20) & ANT 2 & Ch.36



26 dB Bandwidth

Test Mode: 802.11n(HT20) & ANT 2 & Ch.40





26 dB Bandwidth

Test Mode: 802.11n(HT20) & ANT 2 & Ch.48





26 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 2 & Ch.52



26 dB Bandwidth

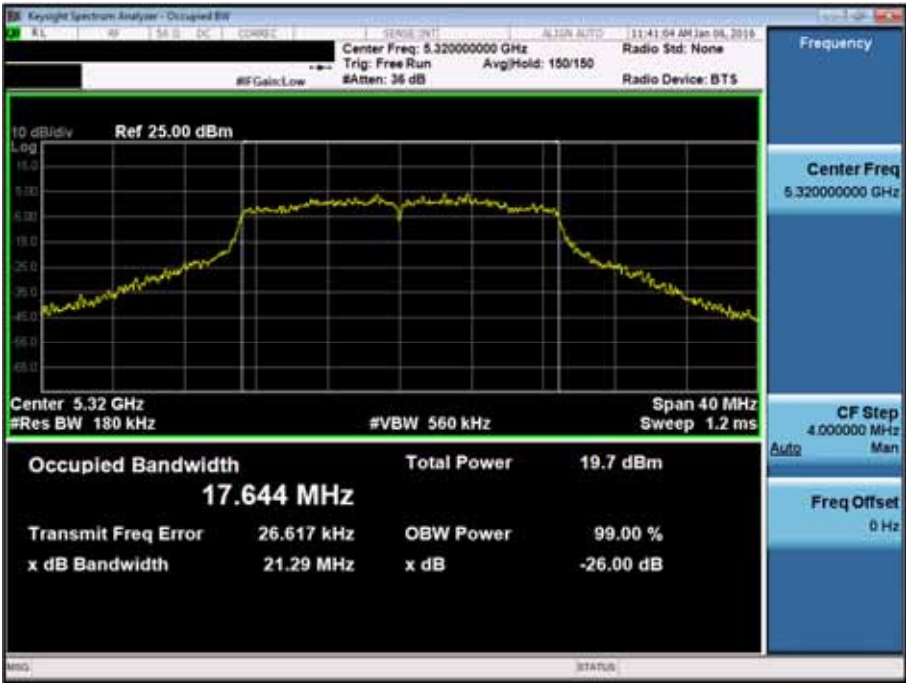
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26 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 2 & Ch.64





26 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 2 & Ch.100



26 dB Bandwidth

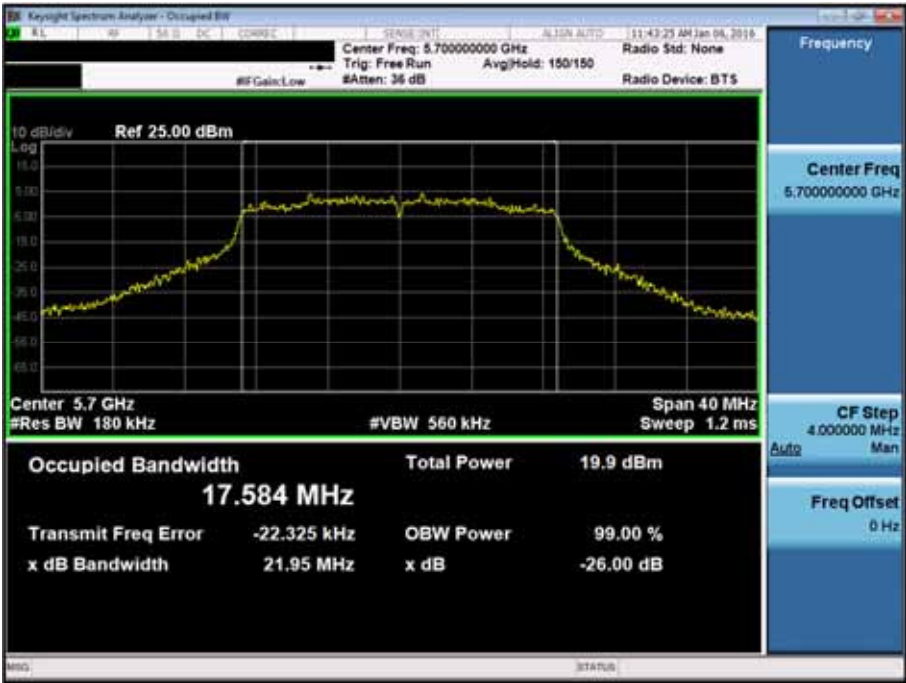
Test Mode: 802.11n HT20 & ANT 2 & Ch.116





26 dB Bandwidth

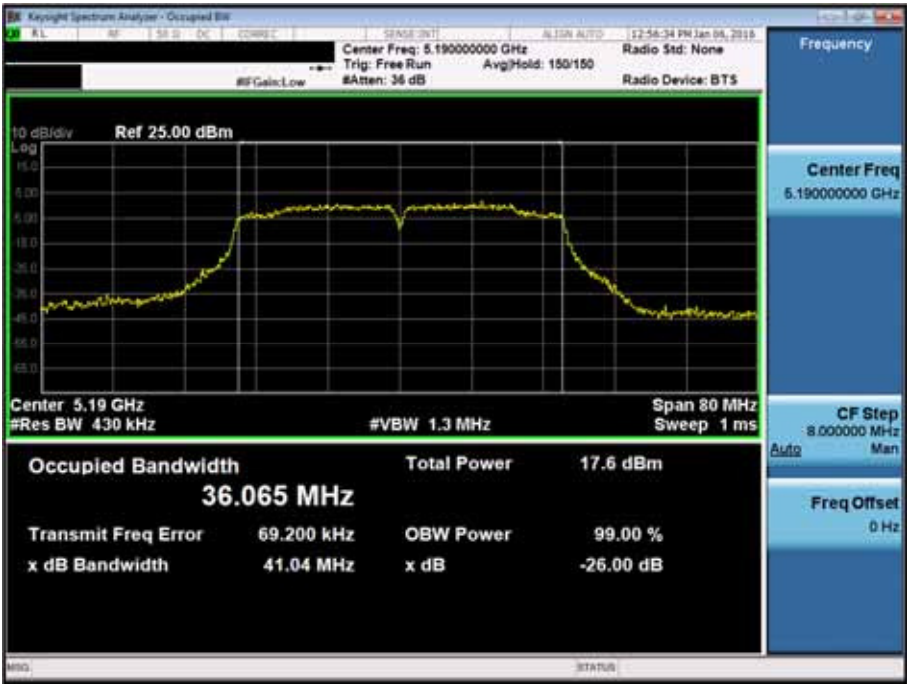
Test Mode: 802.11n HT20 & ANT 2 & Ch.140





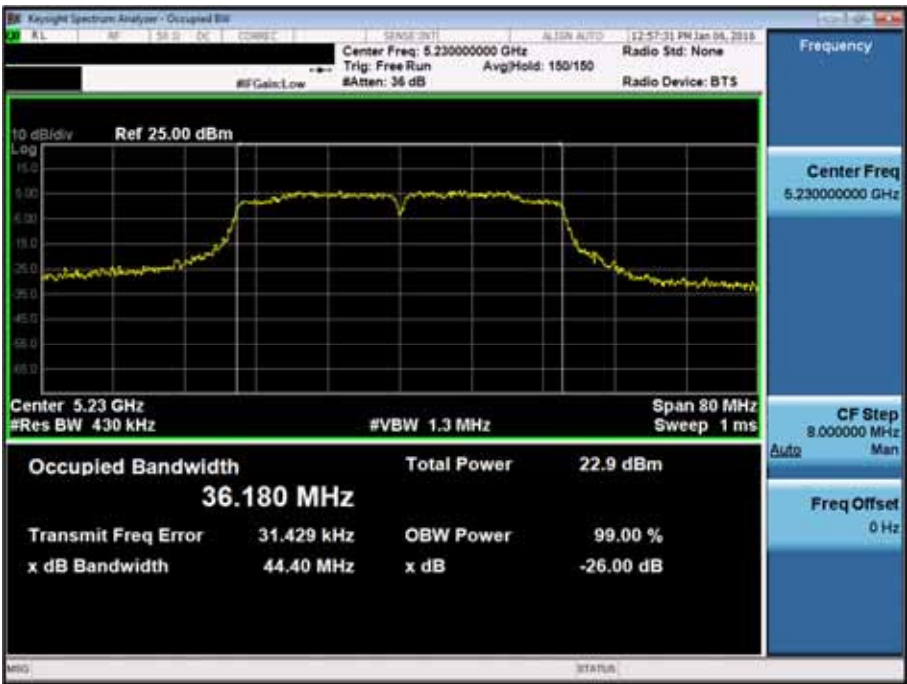
26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 2 &Ch.38



26 dB Bandwidth

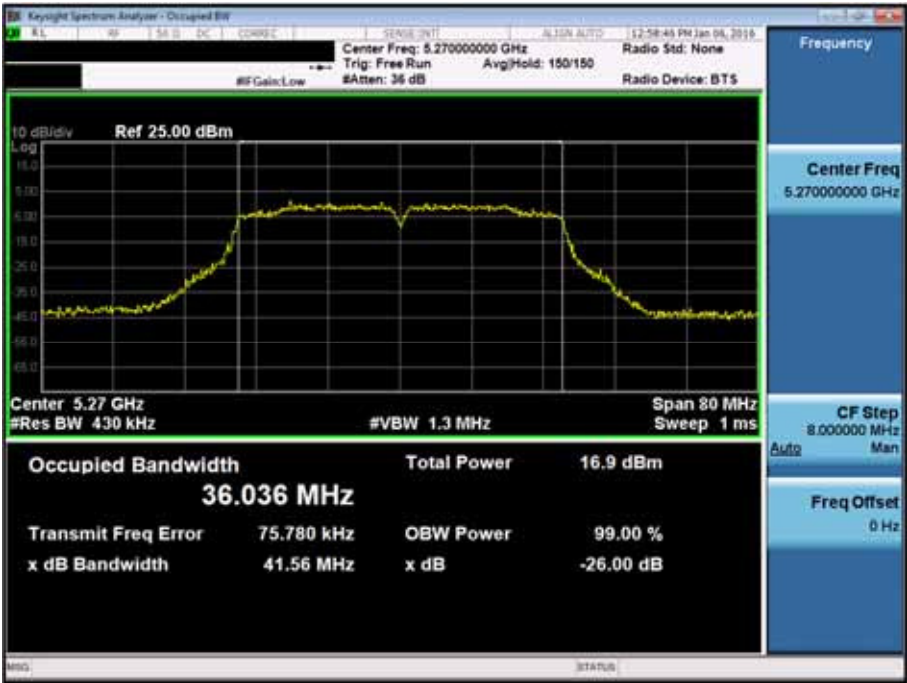
Test Mode: 802.11n HT40 & ANT 2 &Ch.46





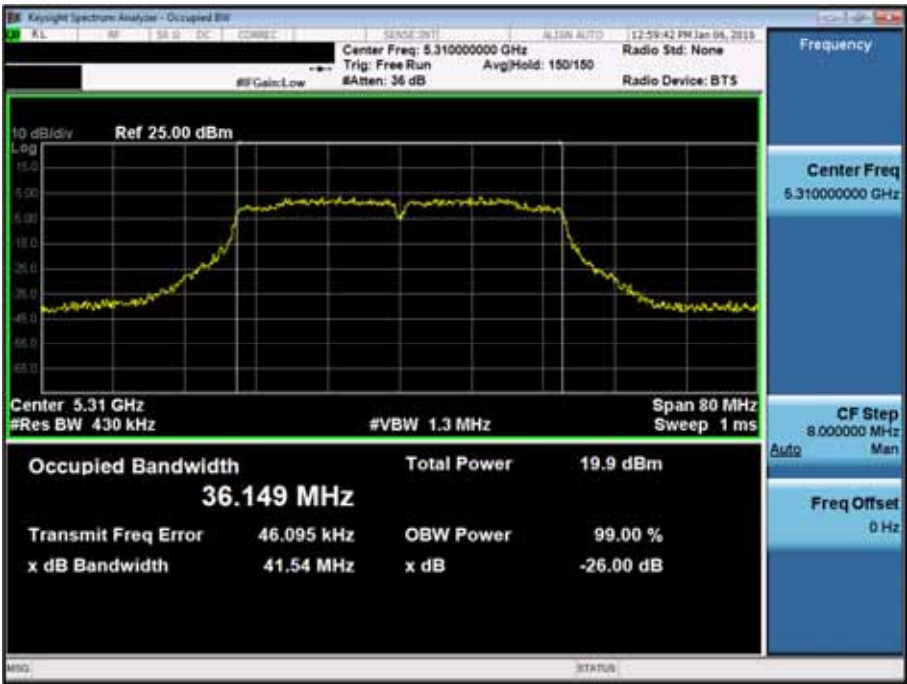
26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 2 & Ch.54



26 dB Bandwidth

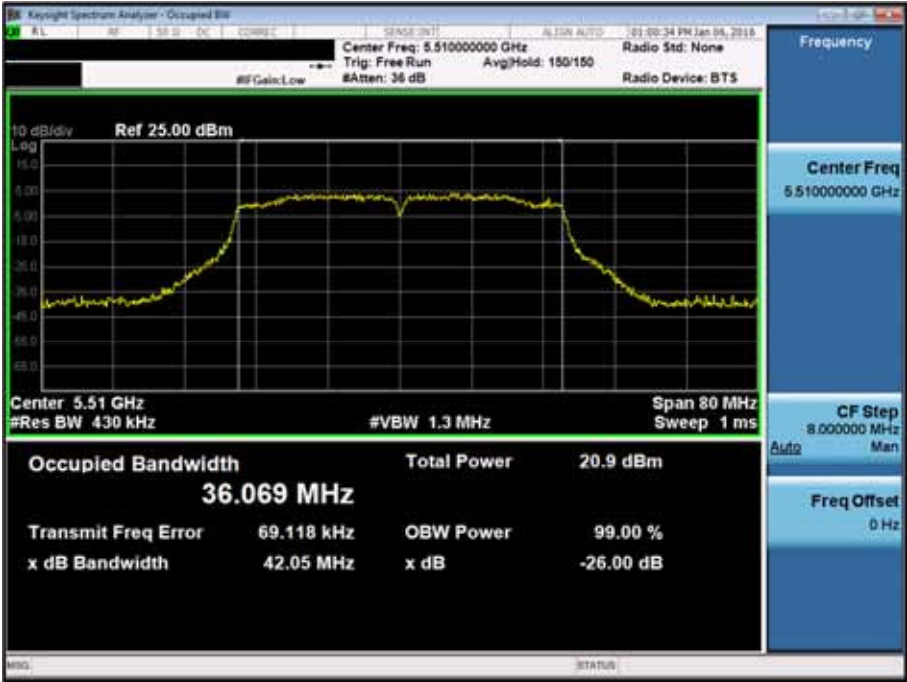
Test Mode: 802.11n HT40 & ANT 2 & Ch.62





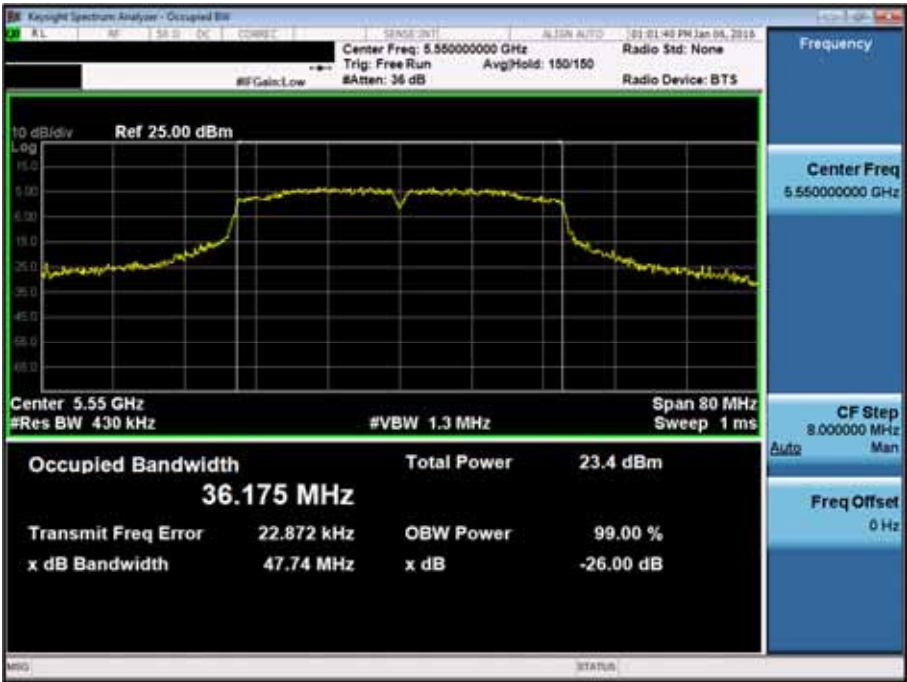
26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 2 & Ch.102



26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 2 & Ch.110





26 dB Bandwidth

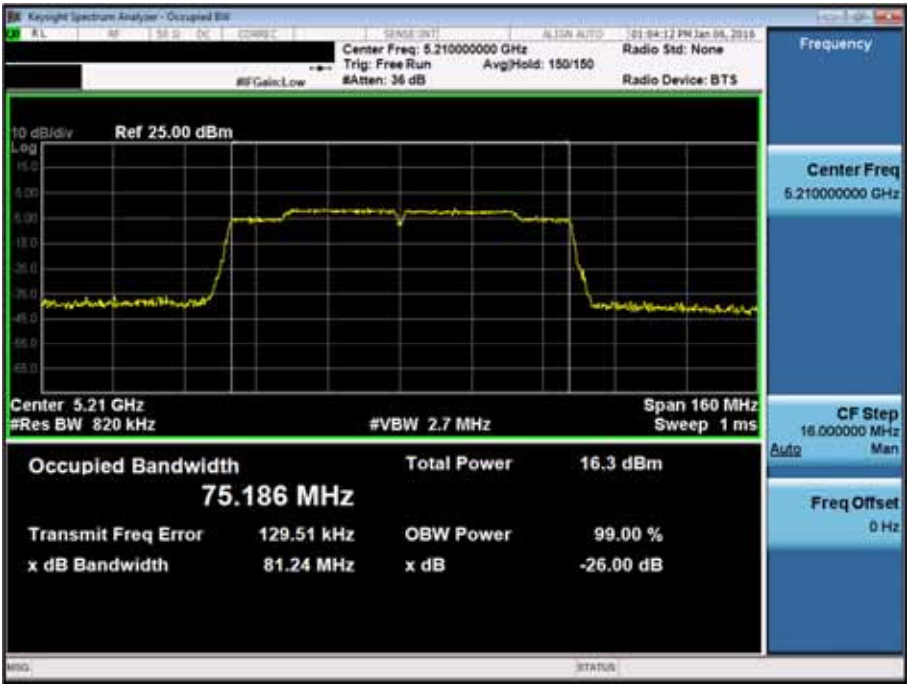
Test Mode: 802.11n HT40 & ANT 2 & Ch.134





26 dB Bandwidth

Test Mode: 802.11ac(VHT80) & ANT 2 & Ch.42



26 dB Bandwidth

Test Mode: 802.11ac(VHT80) & ANT 2 & Ch.58





26 dB Bandwidth

Test Mode: 802.11ac(VHT80) & ANT 2 & Ch.106



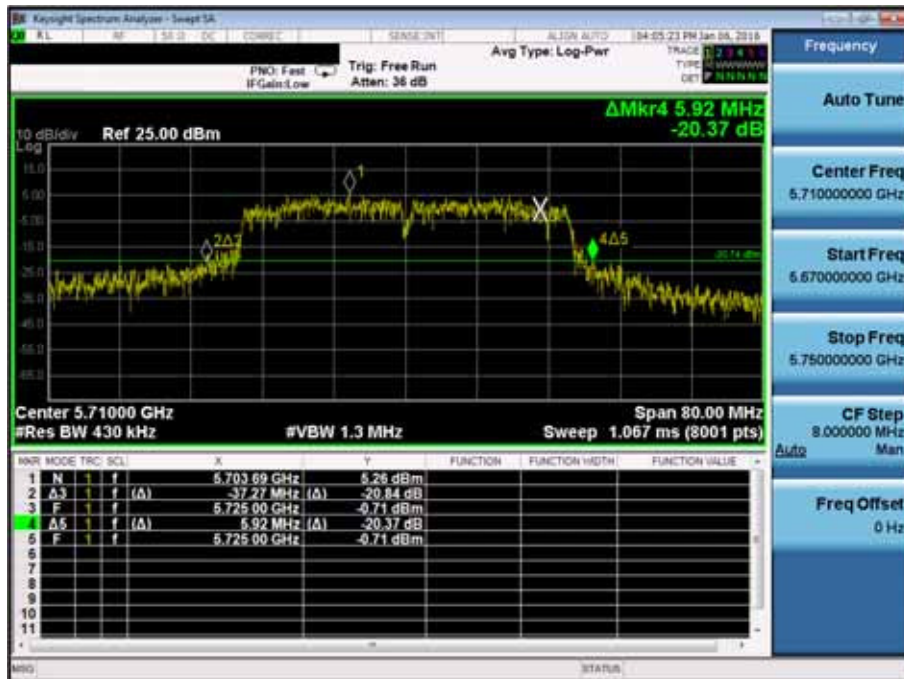
26 dB Bandwidth

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.144



26 dB Bandwidth

Test Mode: 802.11ac VHT40 & ANT 2 & Ch.142





26 dB Bandwidth

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.138





26 dB Bandwidth

Test Mode: 802.11n(HT20) & ANT 1 & Ch.48





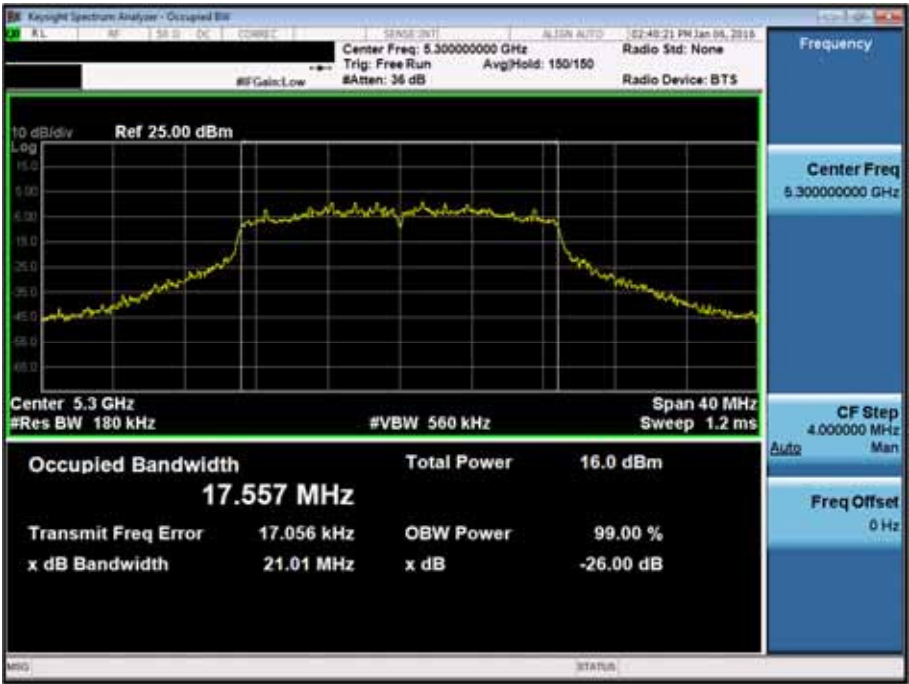
26 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 1 & Ch.52



26 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 1 & Ch.60





26 dB Bandwidth

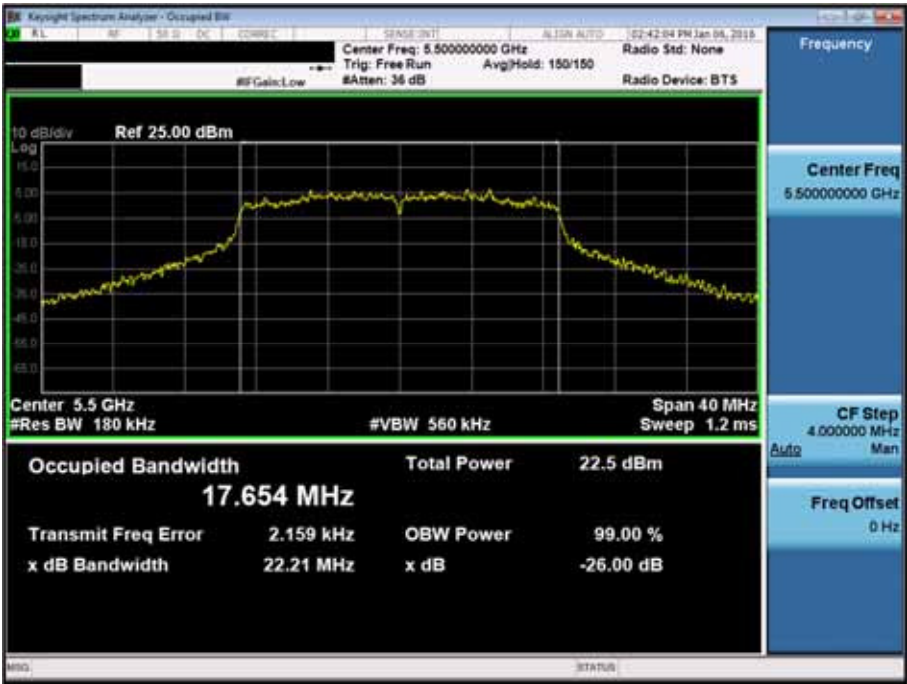
Test Mode: 802.11n HT20 & ANT 1 & Ch.64





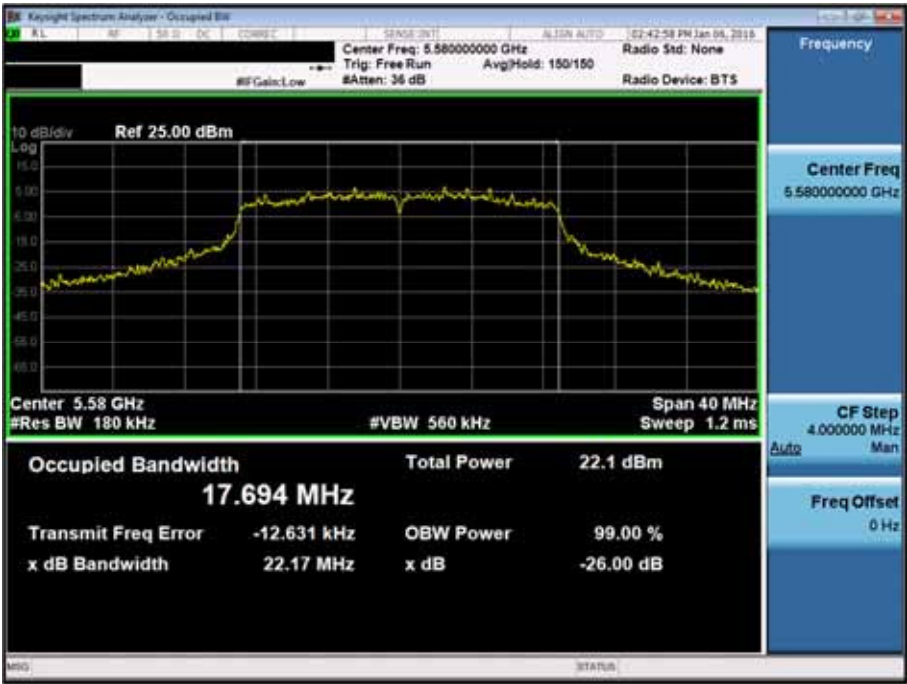
26 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 1 & Ch.100



26 dB Bandwidth

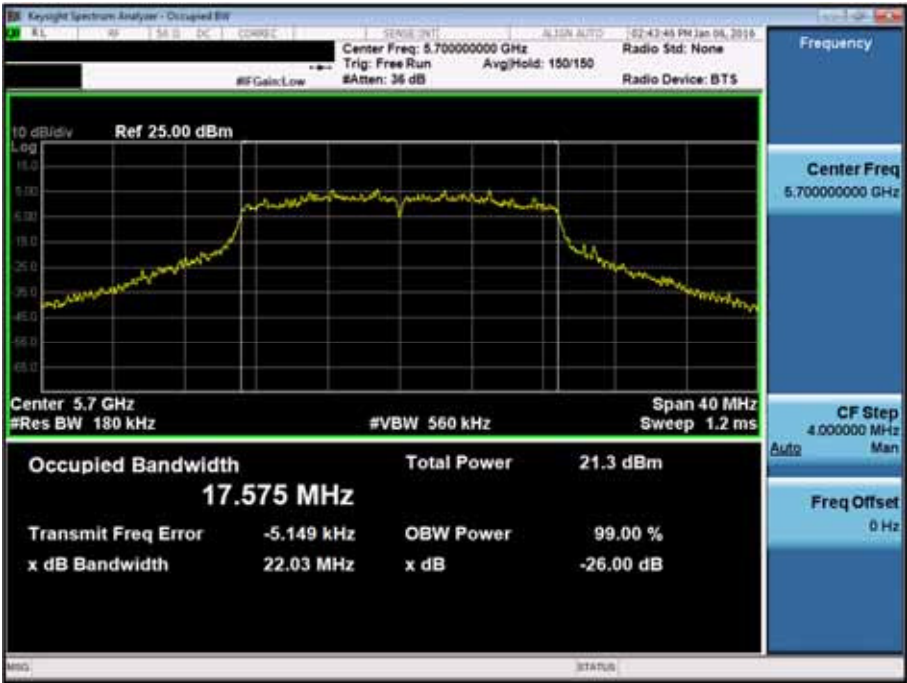
Test Mode: 802.11n HT20 & ANT 1 & Ch.116





26 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 1 & Ch.140





26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 1 &Ch.38



26 dB Bandwidth

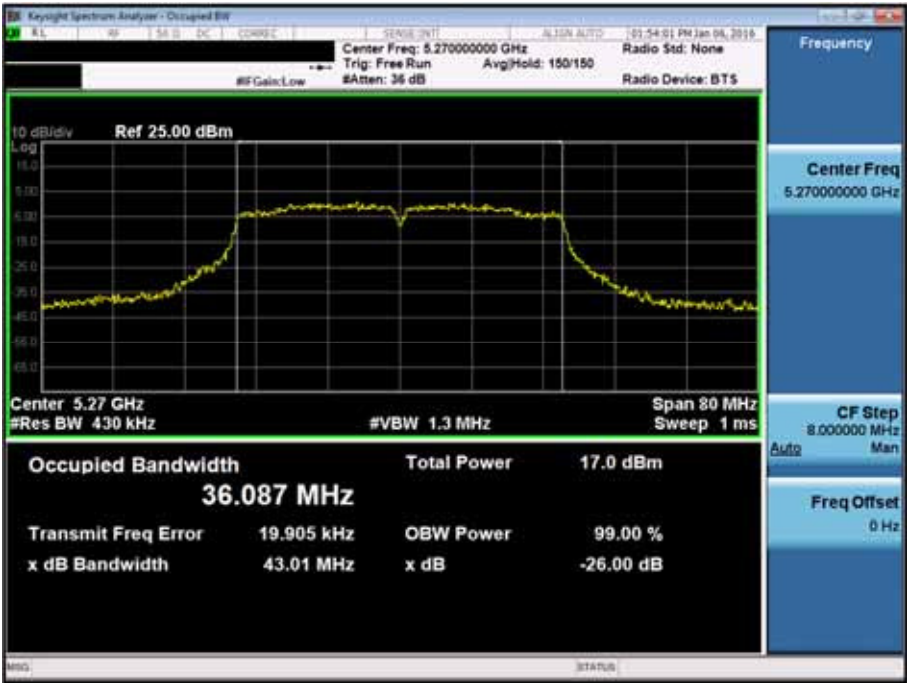
Test Mode: 802.11n HT40 & ANT 1 &Ch.46





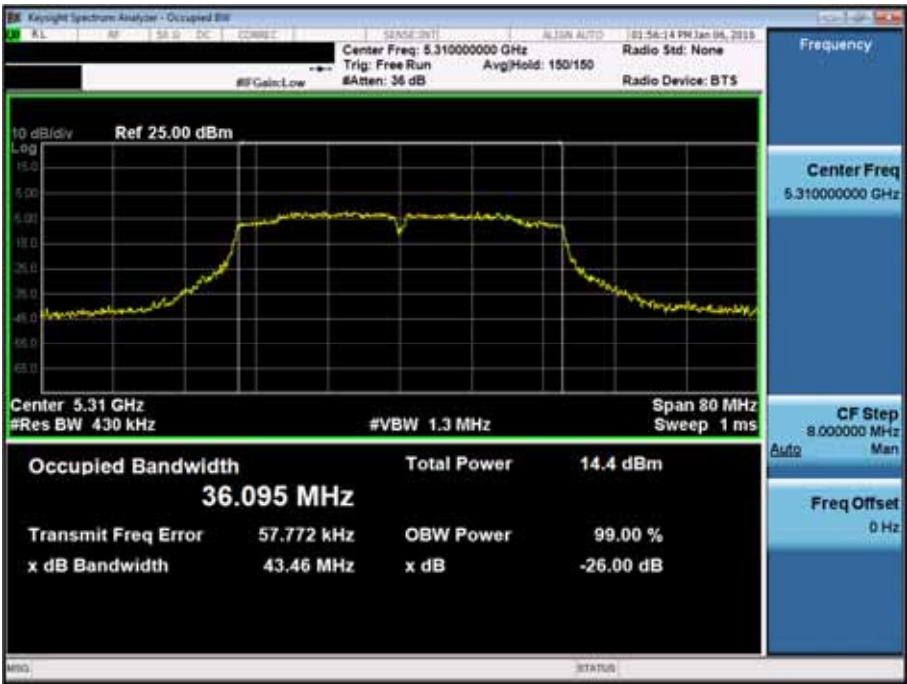
26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 1 & Ch.54



26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 1 & Ch.62





26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 1 & Ch.102



26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 1 & Ch.110





26 dB Bandwidth

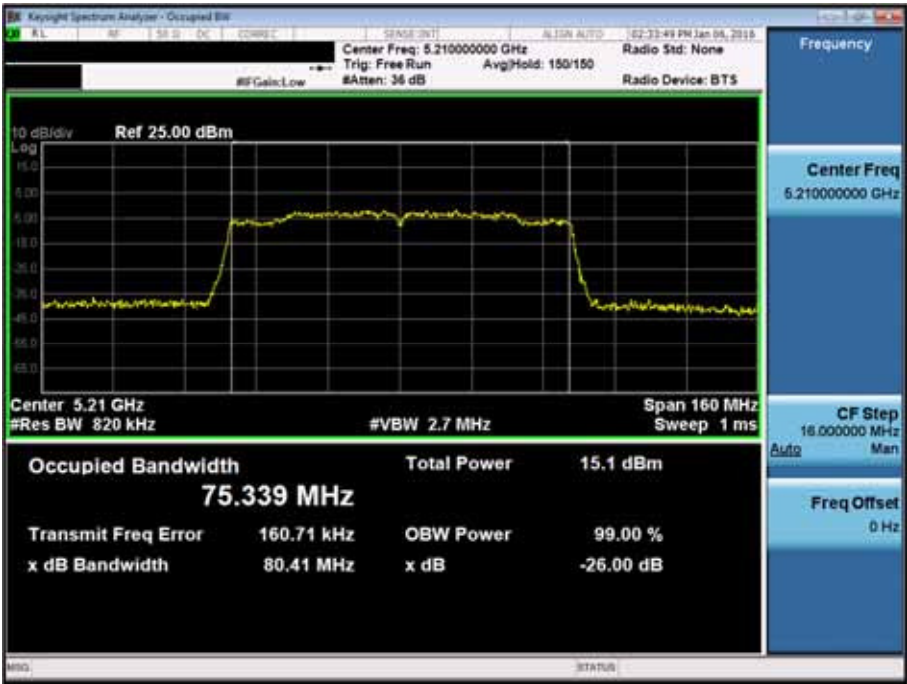
Test Mode: 802.11n HT40 & ANT 1 & Ch.134





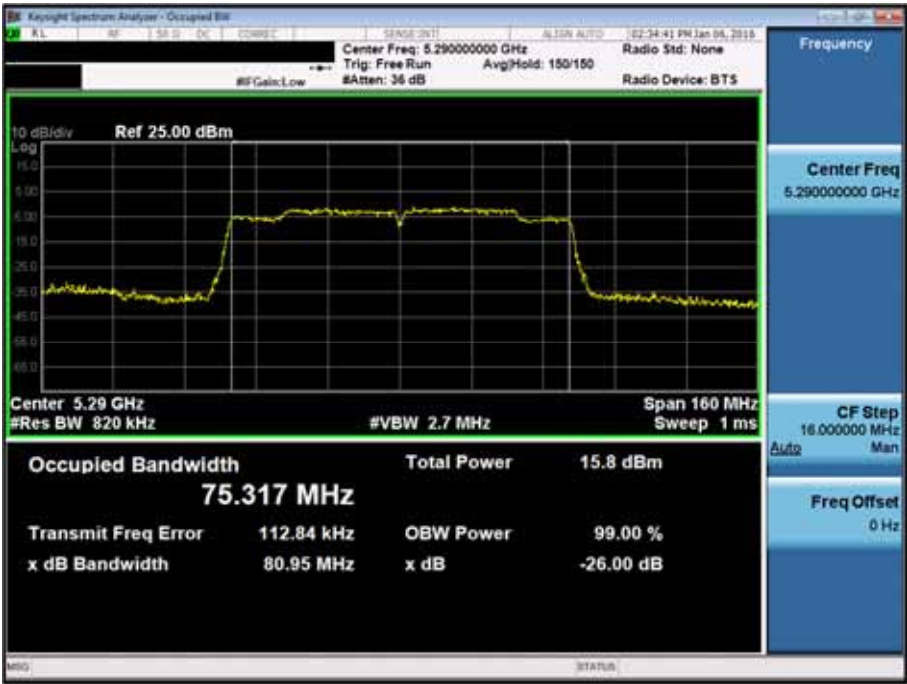
26 dB Bandwidth

Test Mode: 802.11ac(VHT80) & ANT 1 & Ch.42



26 dB Bandwidth

Test Mode: 802.11ac(VHT80) & ANT 1 & Ch.58





26 dB Bandwidth

Test Mode: 802.11ac(VHT80) & ANT 1 & Ch.106



26 dB Bandwidth

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.144



26 dB Bandwidth

Test Mode: 802.11ac VHT40 & ANT 1 & Ch.142





26 dB Bandwidth

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.138





26 dB Bandwidth

Test Mode: 802.11n(HT20) & ANT 2 & Ch.36



26 dB Bandwidth

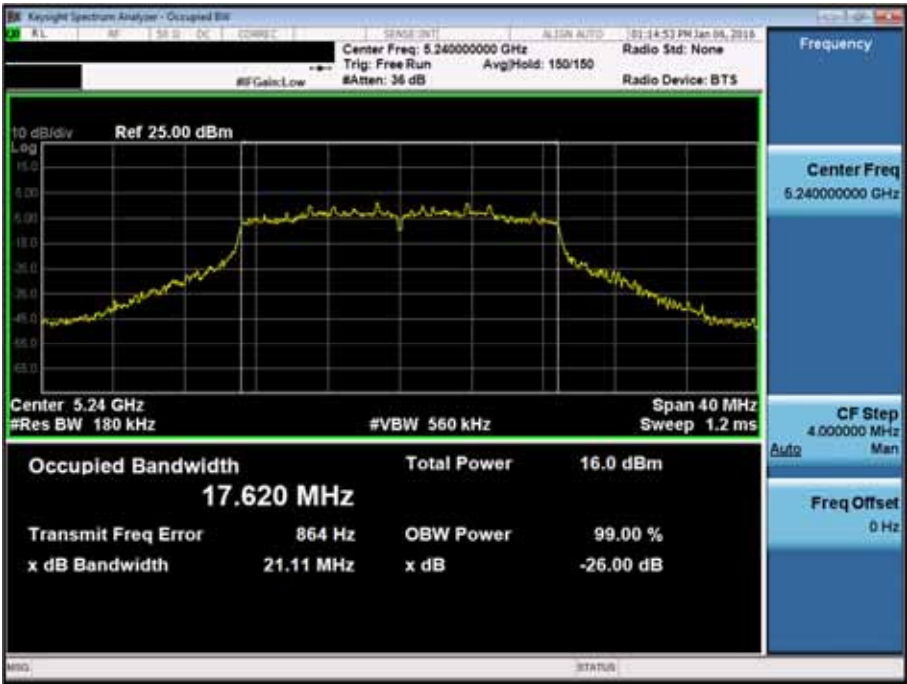
Test Mode: 802.11n(HT20) & ANT 2 & Ch.40





26 dB Bandwidth

Test Mode: 802.11n(HT20) & ANT 2 & Ch.48





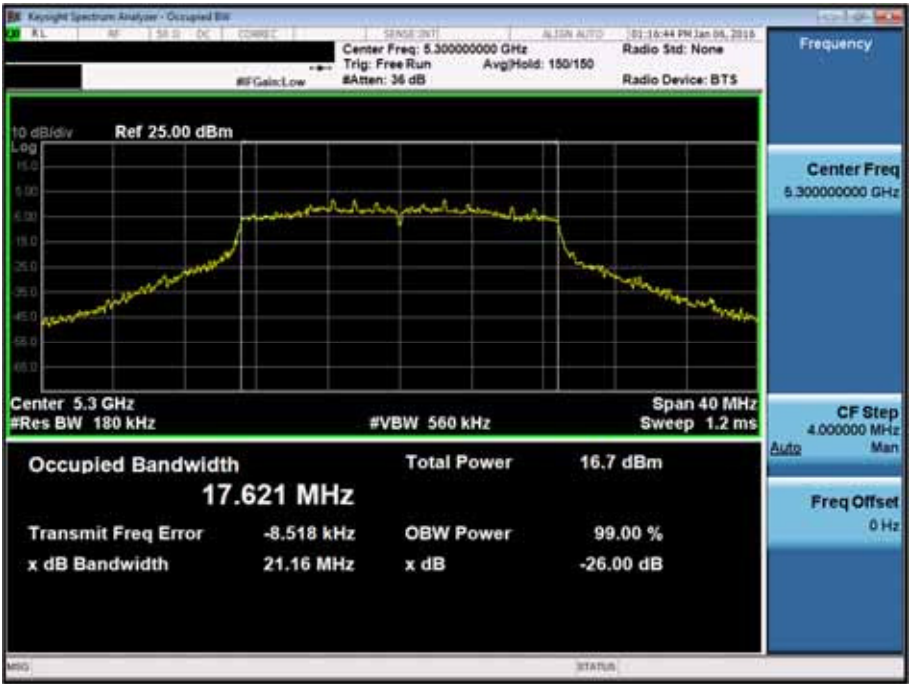
26 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 2 & Ch.52



26 dB Bandwidth

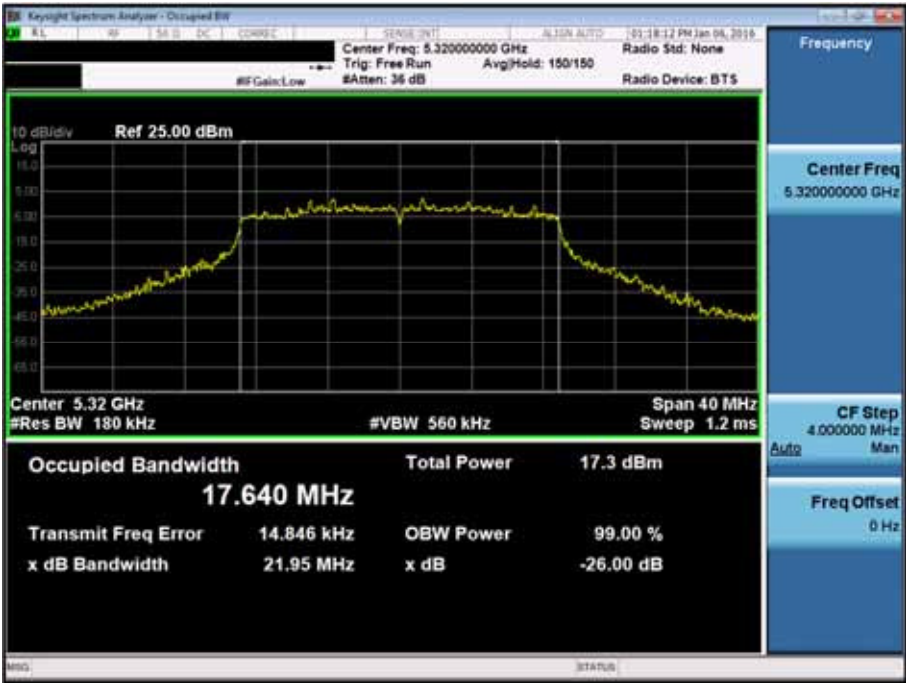
Test Mode: 802.11n HT20 & ANT 2 & Ch.60





26 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 2 & Ch.64



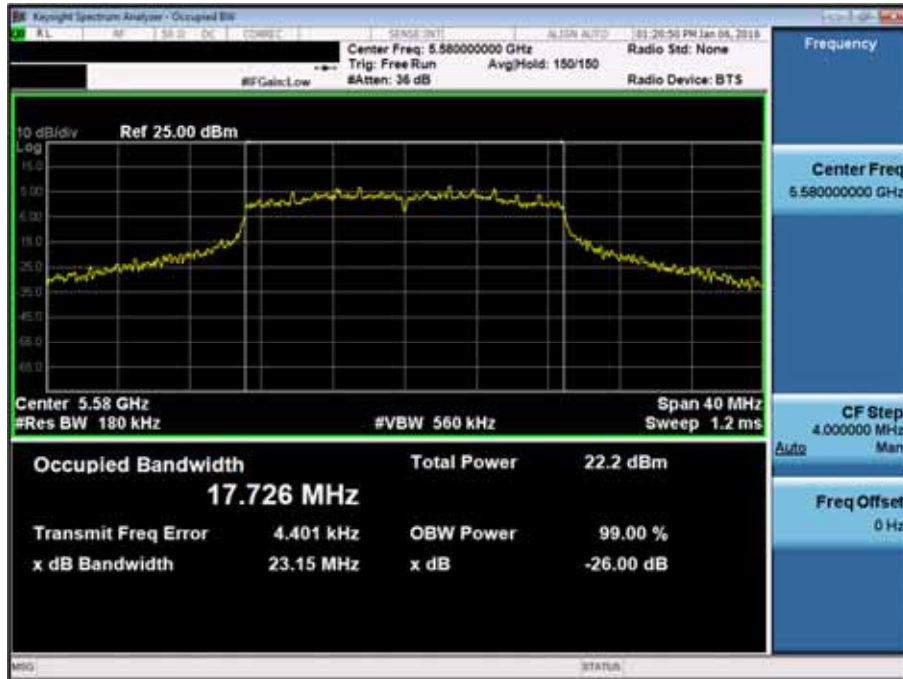
26 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 2 & Ch.100



26 dB Bandwidth

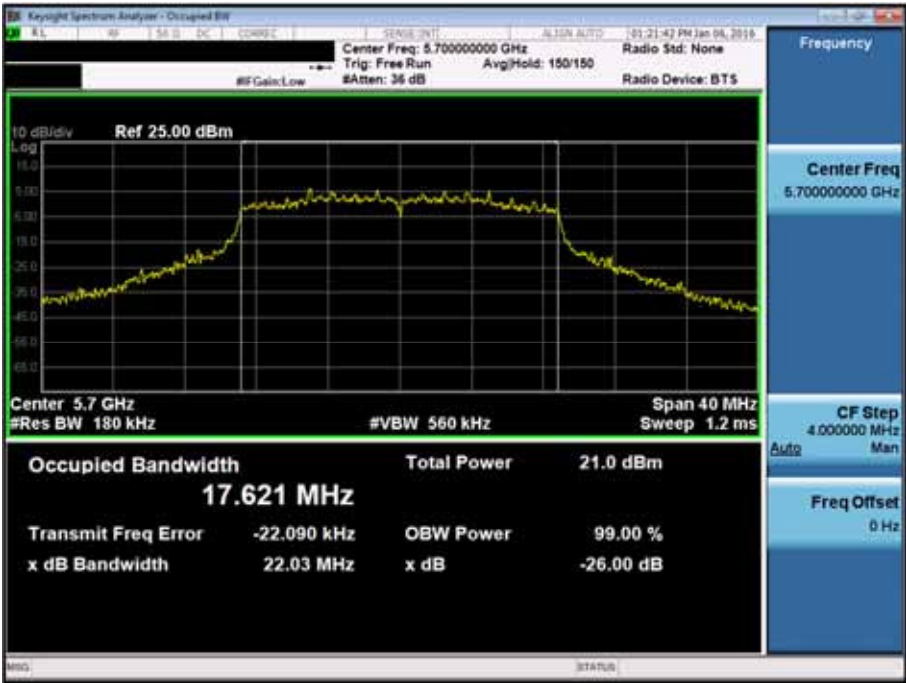
Test Mode: 802.11n HT20 & ANT 2 & Ch.116





26 dB Bandwidth

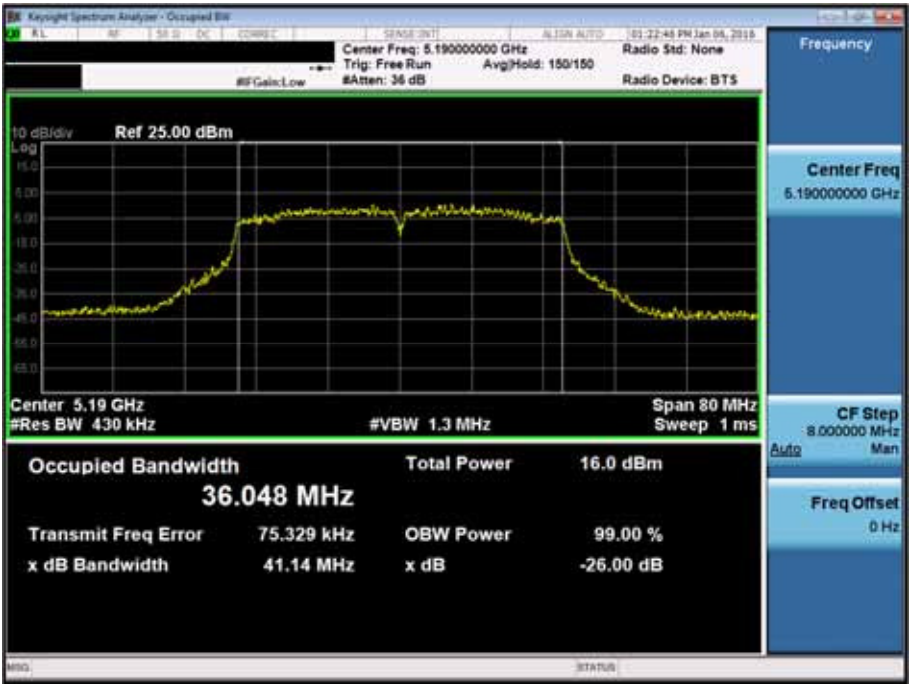
Test Mode: 802.11n HT20 & ANT 2 & Ch.140





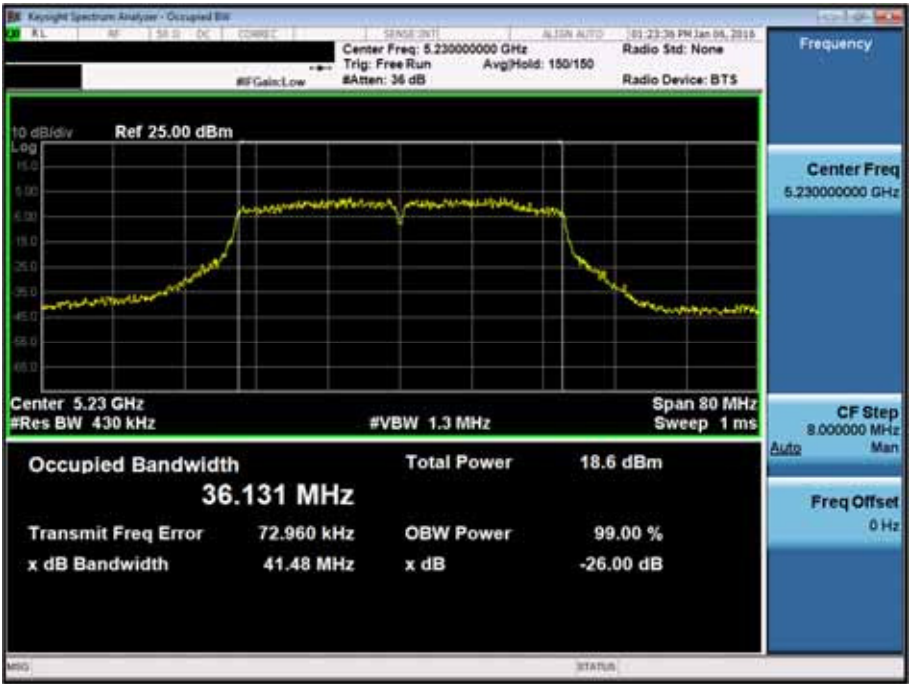
26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 2 &Ch.38



26 dB Bandwidth

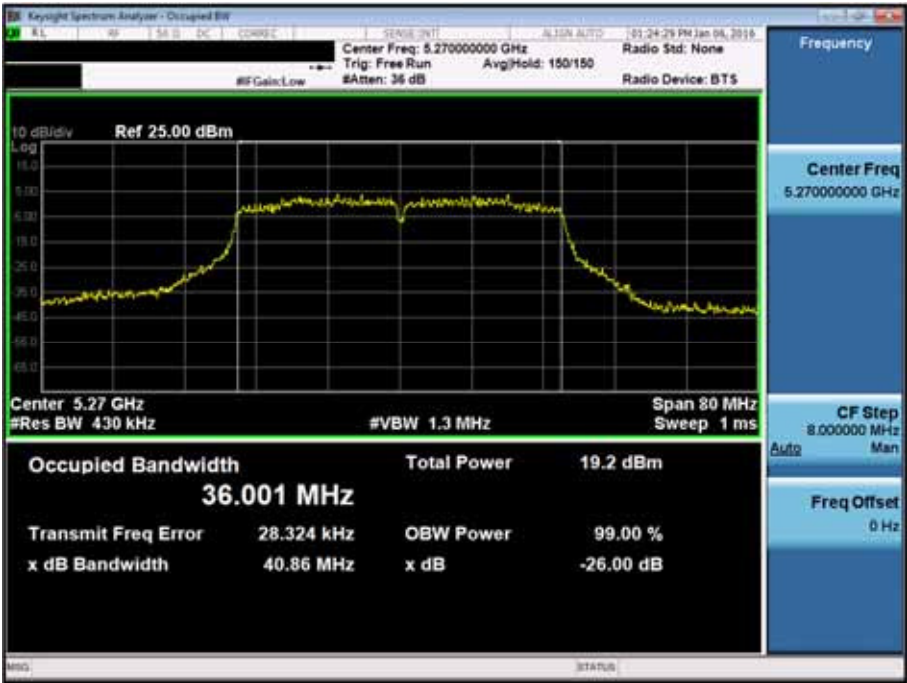
Test Mode: 802.11n HT40 & ANT 2 &Ch.46





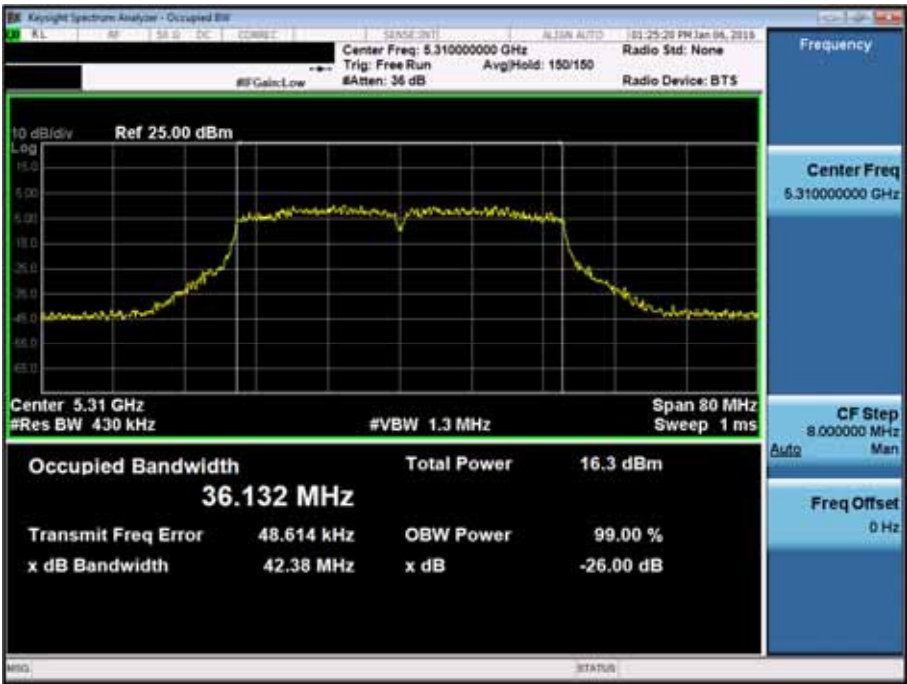
26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 2 & Ch.54



26 dB Bandwidth

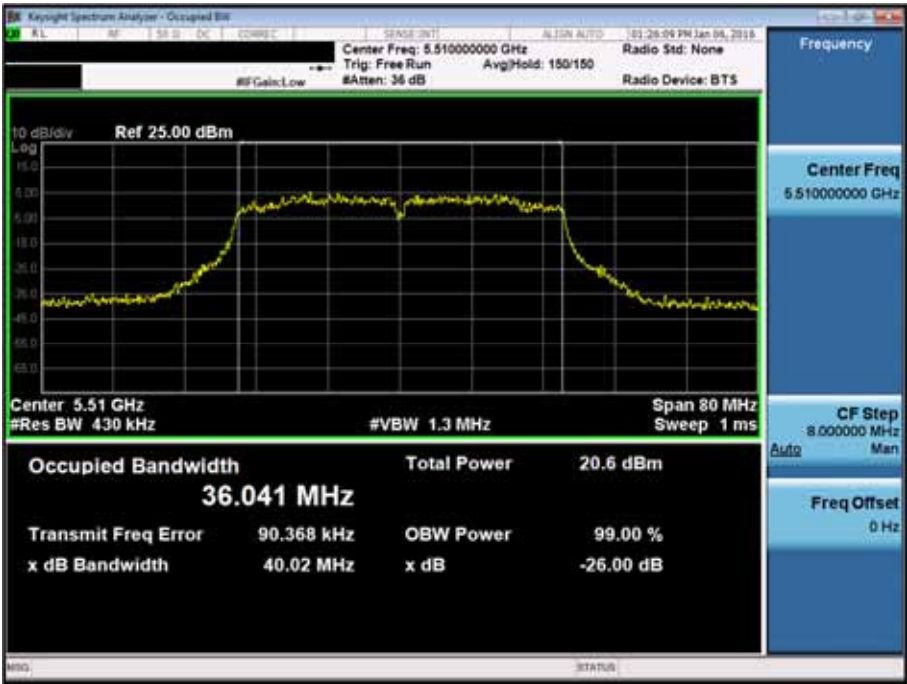
Test Mode: 802.11n HT40 & ANT 2 & Ch.62





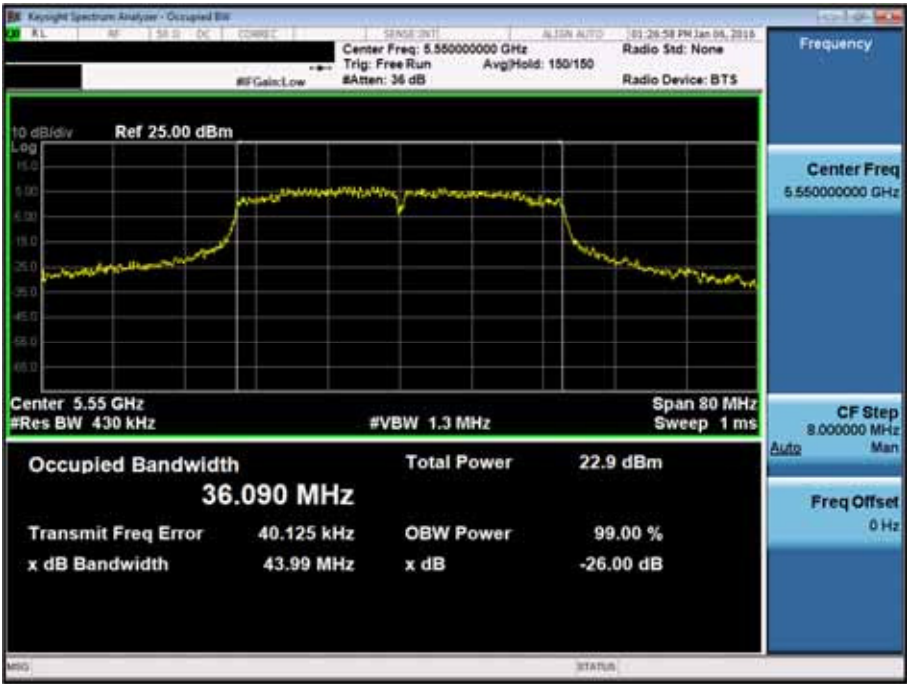
26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 2 & Ch.102



26 dB Bandwidth

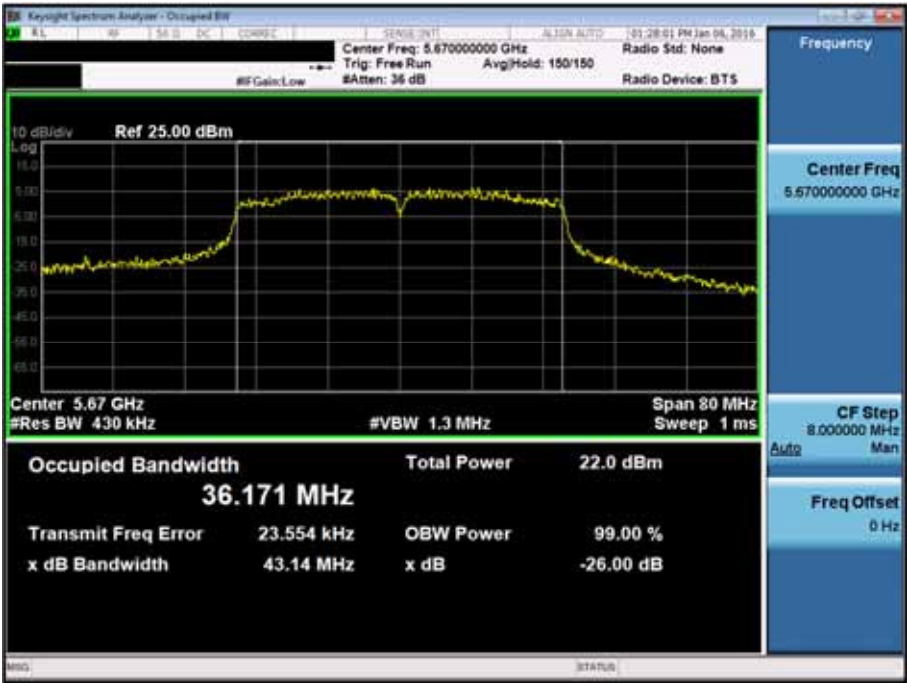
Test Mode: 802.11n HT40 & ANT 2 & Ch.110





26 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 2 & Ch.134





26 dB Bandwidth

Test Mode: 802.11ac(VHT80) & ANT 2 & Ch.42



26 dB Bandwidth

Test Mode: 802.11ac(VHT80) & ANT 2 & Ch.58





26 dB Bandwidth

Test Mode: 802.11ac(VHT80) & ANT 2 & Ch.106



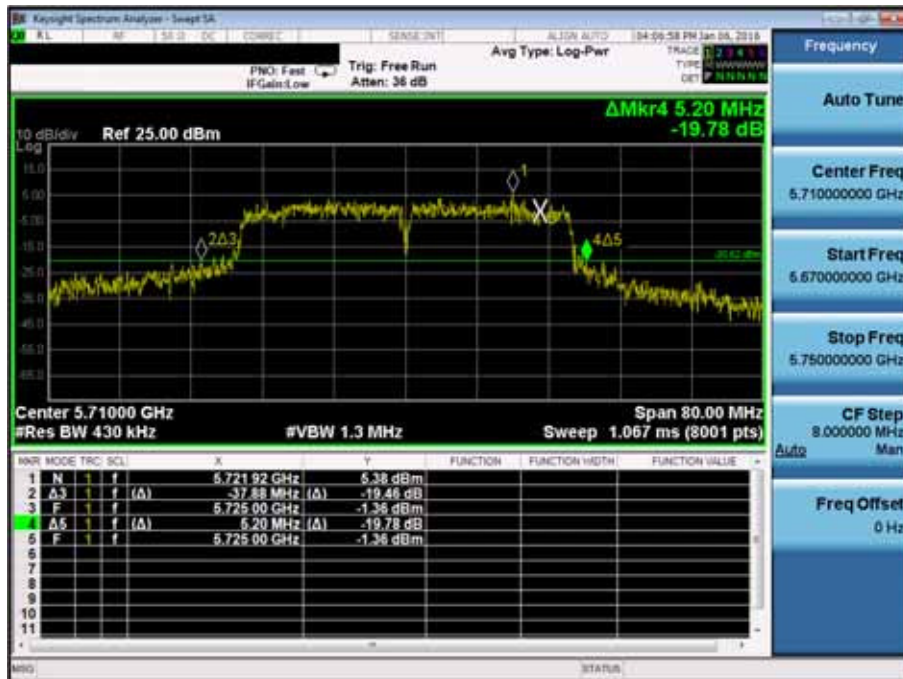
26 dB Bandwidth

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.144



26 dB Bandwidth

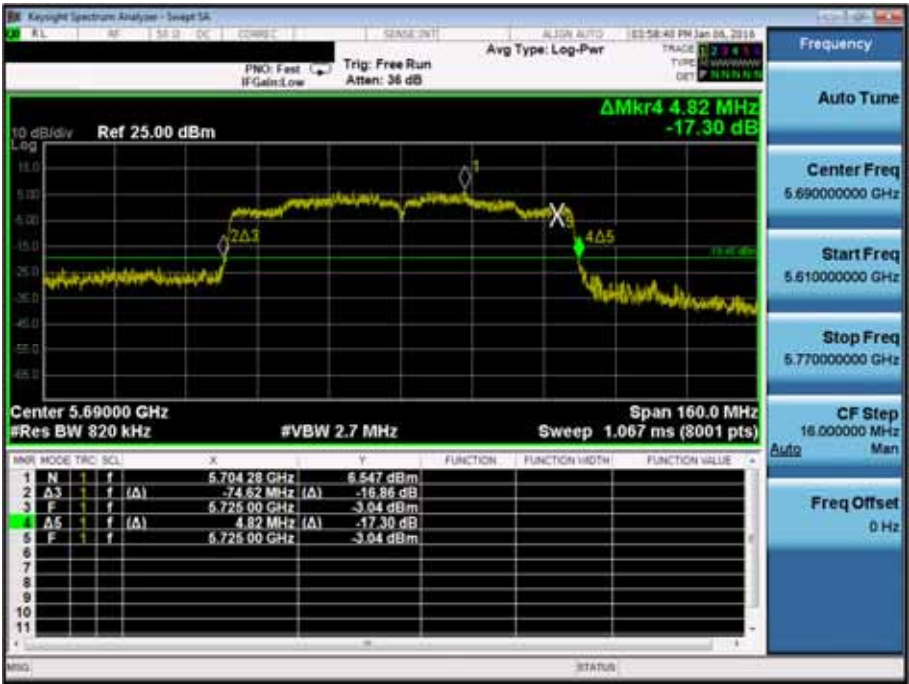
Test Mode: 802.11ac VHT40 & ANT 2 & Ch.142





26 dB Bandwidth

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.138



8.2 Minimum Emission Bandwidth (6 dB Bandwidth)

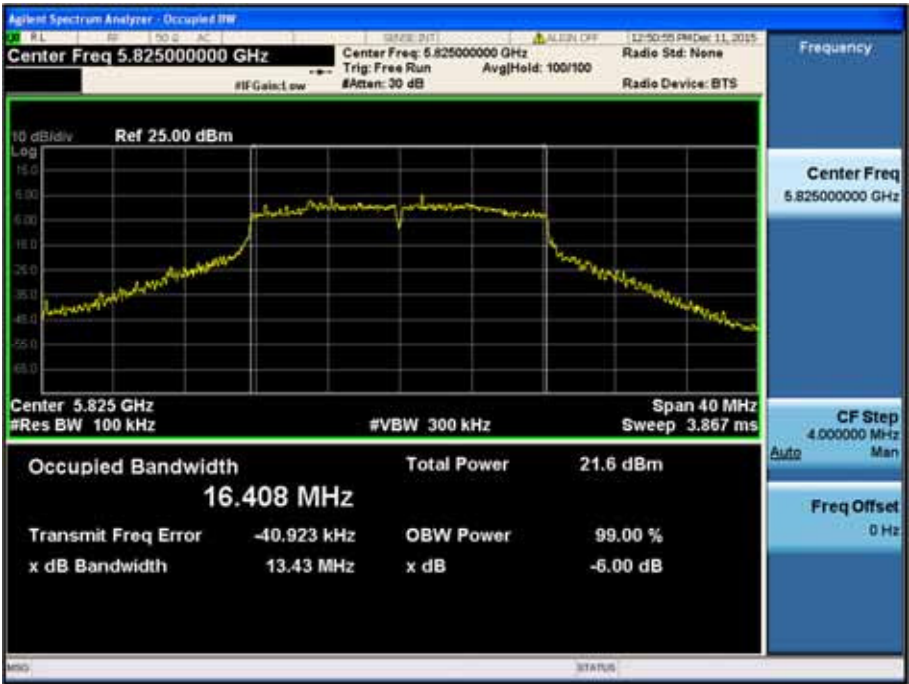
Multiple Transmit

Mode	Band	Channel	Frequency [MHz]	Test Result [MHz]	
				ANT 1	ANT 2
802.11n (HT20)	U-NII 3	149	5745	13.230	15.120
		157	5785	15.140	15.050
		165	5825	15.090	15.060
802.11n (HT40)	U-NII 3	151	5755	35.060	35.100
		159	5795	33.900	35.170
802.11ac (VHT80)	U-NII 3	155	5775	75.340	75.300
802.11ac (VHT20)	Cross Band	144	5720	2.760	2.741
802.11ac (VHT40)	Cross Band	142	5710	2.565	2.558
802.11ac (VHT80)	Cross Band	138	5690	1.440	2.655



6 dB Bandwidth

Test Mode: 802.11a & ANT 1 & Ch.165





6 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 1 & Ch.149



6 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 1 & Ch.157





6 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 1 & Ch.165





6 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 1 & Ch.151



6 dB Bandwidth

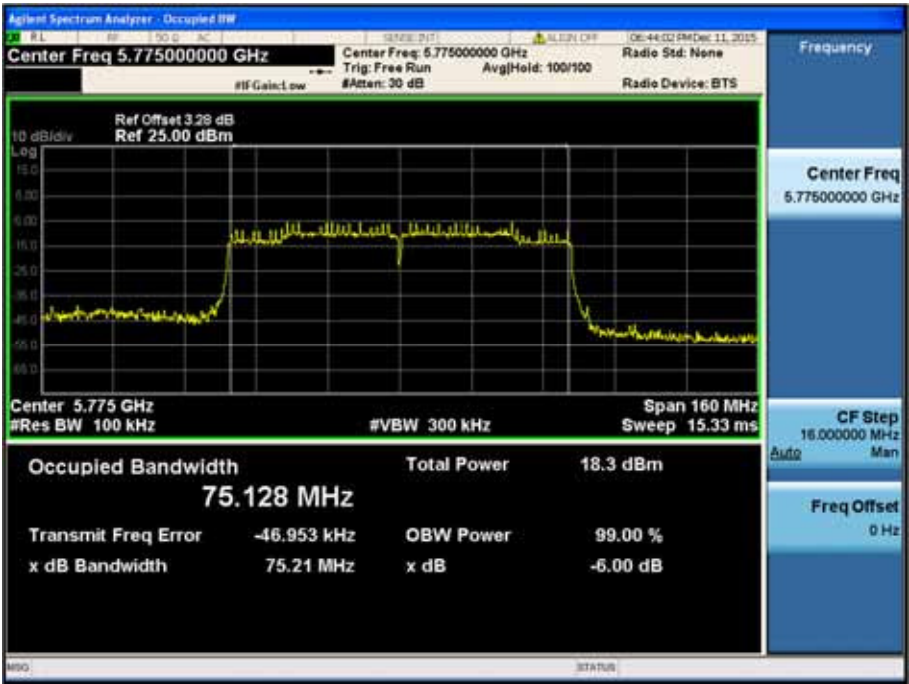
Test Mode: 802.11n HT40 & ANT 1 & Ch.159





6 dB Bandwidth

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.155





6 dB Bandwidth

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.144



6 dB Bandwidth

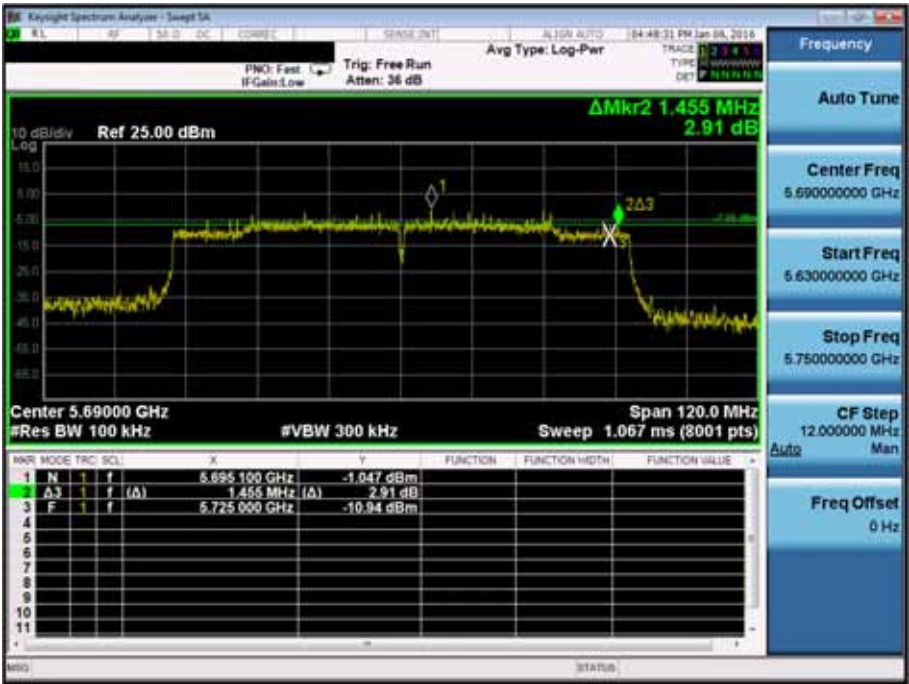
Test Mode: 802.11ac VHT40 & ANT 1 & Ch.142





6 dB Bandwidth

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.138





6 dB Bandwidth

Test Mode: 802.11a & ANT 2 & Ch.149



6 dB Bandwidth

Test Mode: 802.11a & ANT 2 & Ch.157





6 dB Bandwidth

Test Mode: 802.11a & ANT 2 & Ch.165





6 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 2 & Ch.149



6 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 2 & Ch.157





6 dB Bandwidth

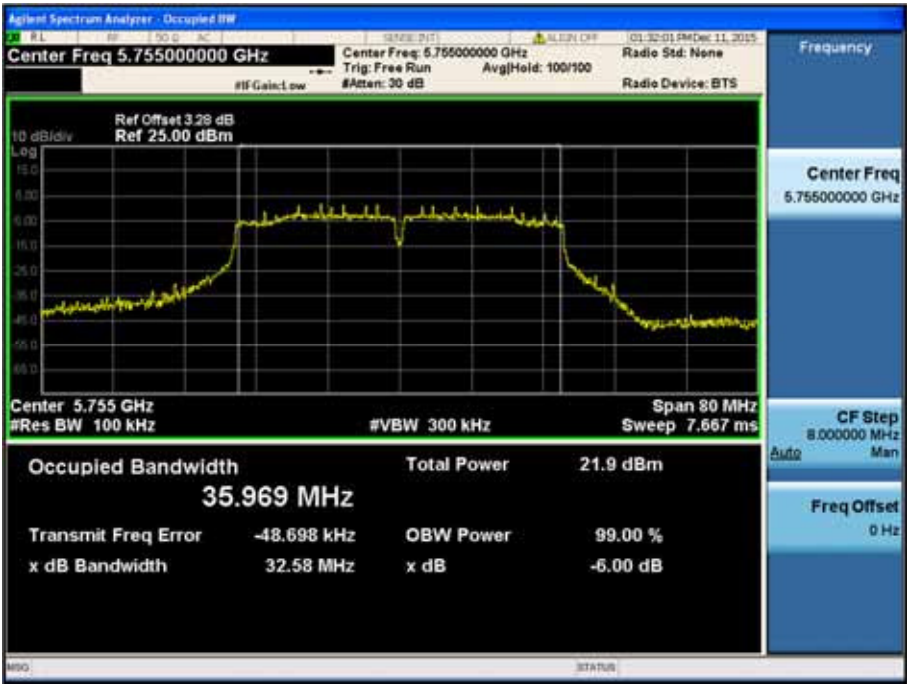
Test Mode: 802.11n HT20 & ANT 2 & Ch.165





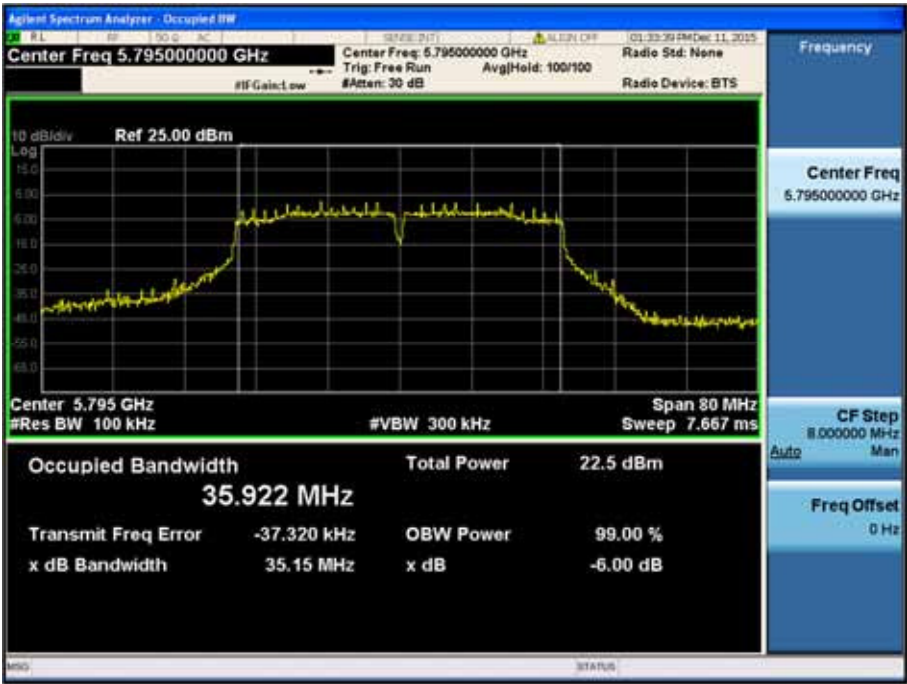
6 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 2 & Ch.151



6 dB Bandwidth

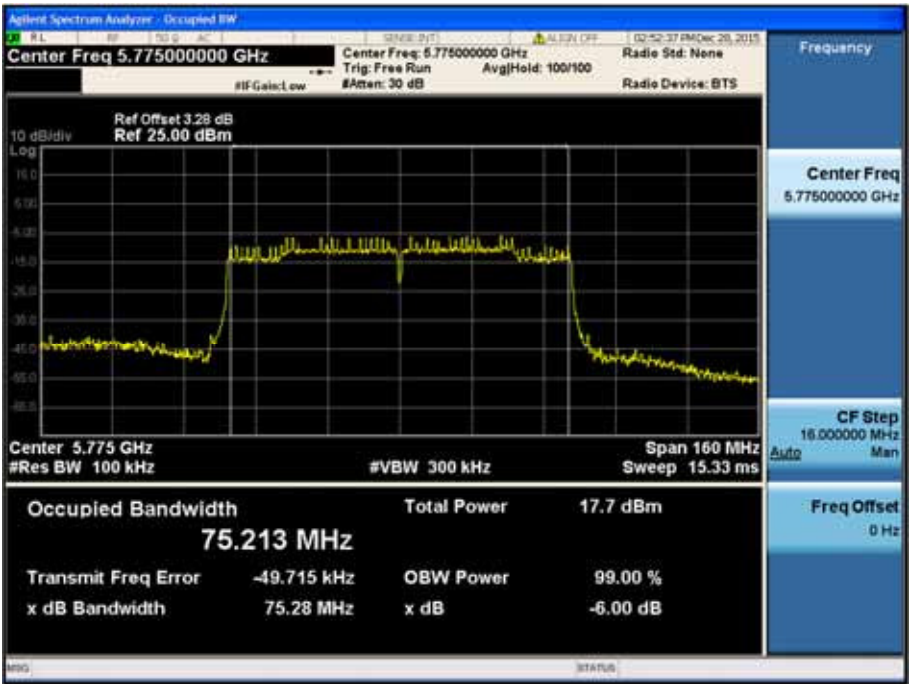
Test Mode: 802.11n HT40 & ANT 2 & Ch.159





6 dB Bandwidth

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.155





6 dB Bandwidth

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.144



6 dB Bandwidth

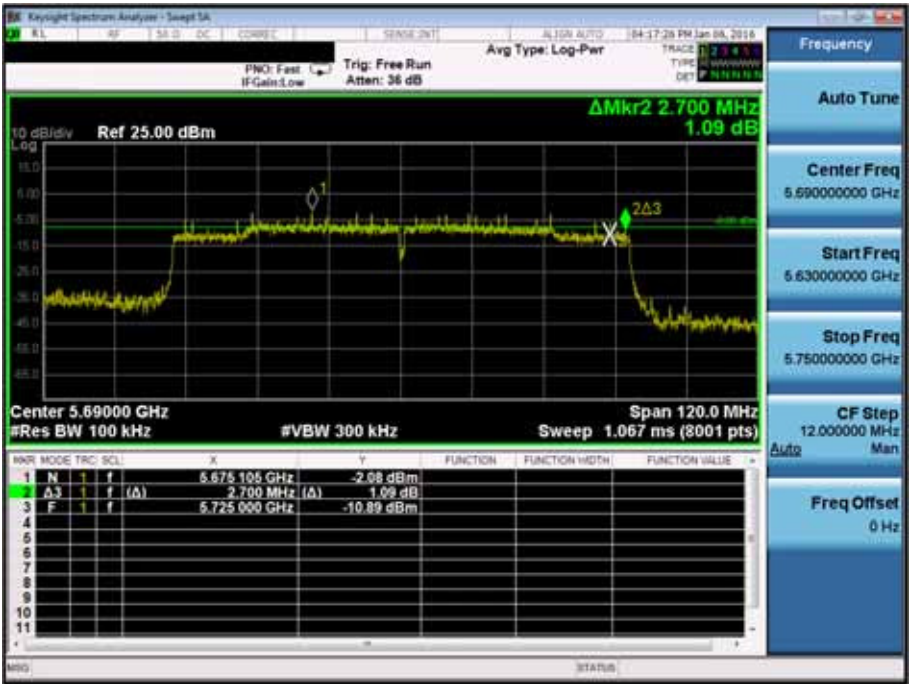
Test Mode: 802.11ac VHT40 & ANT 2 & Ch.142





6 dB Bandwidth

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.138





6 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 1 & Ch.165





6 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 1 & Ch.151



6 dB Bandwidth

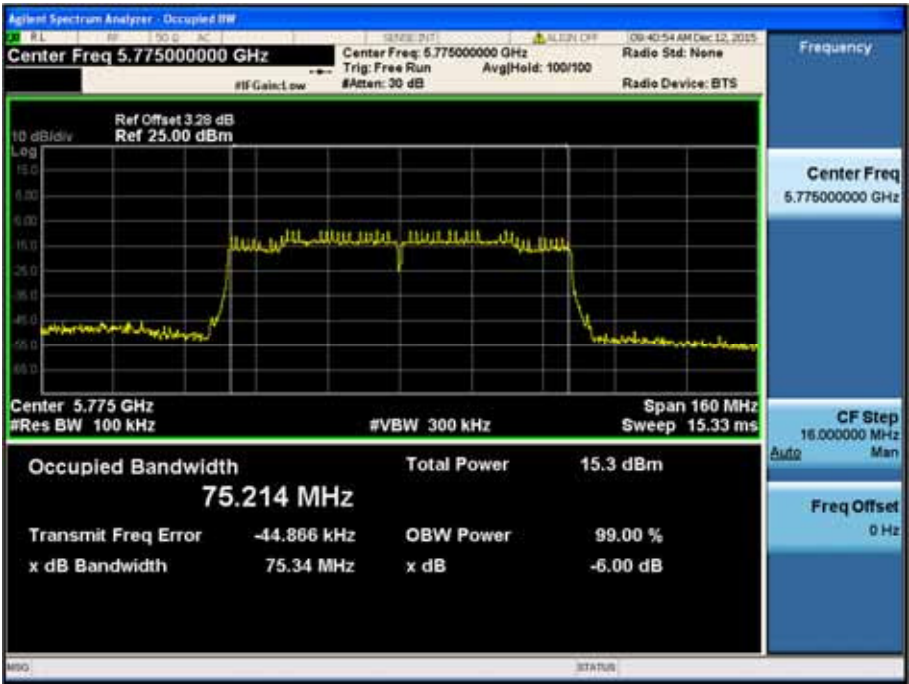
Test Mode: 802.11n HT40 & ANT 1 & Ch.159





6 dB Bandwidth

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.155





6 dB Bandwidth

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.144



6 dB Bandwidth

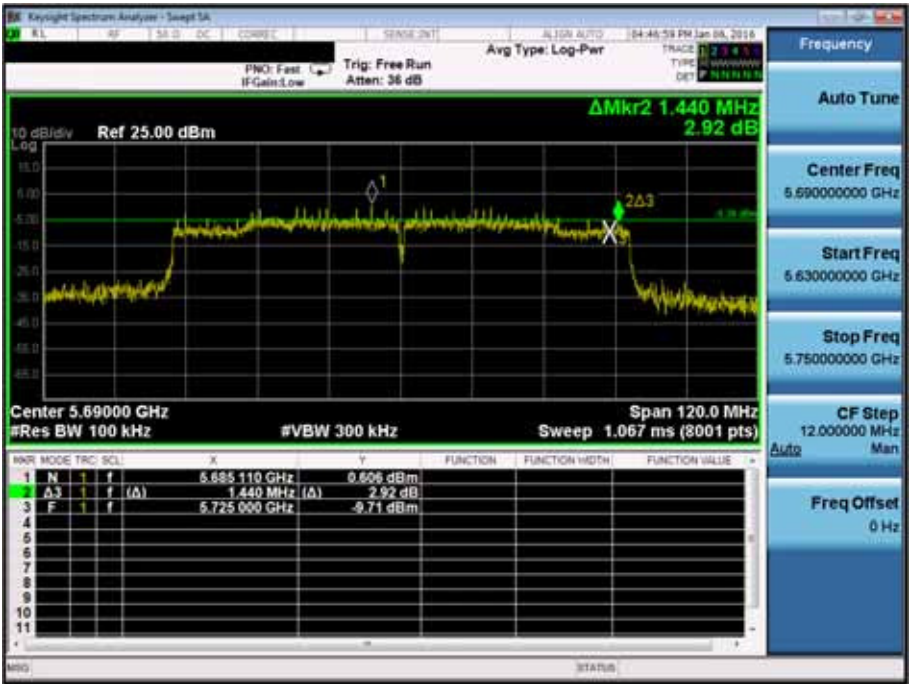
Test Mode: 802.11ac VHT40 & ANT 1 & Ch.142





6 dB Bandwidth

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.138





6 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 2 & Ch.149



6 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 2 & Ch.157





6 dB Bandwidth

Test Mode: 802.11n HT20 & ANT 2 & Ch.165





6 dB Bandwidth

Test Mode: 802.11n HT40 & ANT 2 & Ch.151



6 dB Bandwidth

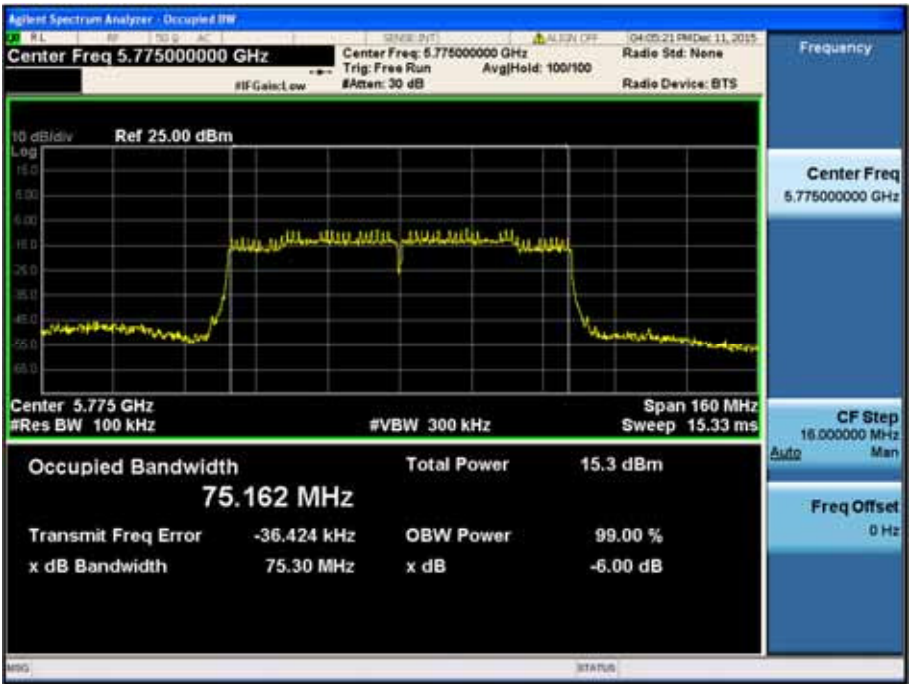
Test Mode: 802.11n HT40 & ANT 2 & Ch.159





6 dB Bandwidth

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.155





6 dB Bandwidth

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.144



6 dB Bandwidth

Test Mode: 802.11ac VHT40 & ANT 2 & Ch.142





6 dB Bandwidth

Test Mode: 802.11ac VHT80) & ANT 2 & Ch.138



8.3 Maximum Conducted Output Power

- Output power Limit Calculation(FCC)

Bands	Mode	Power Limit [mW]	Calculated Limit [dBm]	Antenna Gain (Worst case)	Determined Limit [dBm]
U-NII 1	802.11a	250	23.97	0.48	23.97
	802.11n(HT20)				
	802.11n(HT40)				
	802.11ac(VHT80)				

Bands	Mode	Power Limit [mW]	Calculated Limit [dBm]	Antenna Gain (Worst case)	Determined Limit [dBm]
		Least 26 dBc BW ^{Note*} [MHz]			
U-NII 2A	802.11a	250	23.97	0.48	23.97
		21.55	24.33		
	802.11n(HT20)	250	23.97		23.97
		22.33	24.48		
	802.11n(HT40)	250	23.97		23.97
		41.86	27.21		
	802.11ac(VHT80)	250	23.97		23.97
		80.94	30.08		
U-NII 2C	802.11a	250	23.97	0.48	23.97
		21.66	24.35		
	802.11n(HT20)	250	23.97		23.97
		21.06	24.23		
	802.11n(HT40)	250	23.97		23.97
		42.48	27.28		
	802.11ac(VHT80)	250	23.97		23.97
		80.94	30.08		

Bands	Mode	Power Limit [mW]	Calculated Limit [dBm]	Antenna Gain (Worst case)	Determined Limit [dBm]
		Least 26 dBc BW ^{Note*} [MHz]			
U-NII 2C (band-crossing channels)	802.11ac(VHT20)	250	23.97	0.48	22.89
		15.46	22.89		
	802.11ac(VHT40)	250	23.97		23.97
		36.53	26.63		
	802.11ac(VHT80)	250	23.97		23.97
		74.62	29.73		

Bands	Mode	Power Limit [mW]	Calculated Limit [dBm]	Antenna Gain (Worst case)	Determined Limit [dBm]
U-NII 3	802.11a	1000	30.00	1.03	30.00
	802.11n(HT20)				
	802.11n(HT40)				
	802.11ac(VHT80)				

RSS-247[6.11]**(1) For band 5150 - 5250 MHz**

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99 % emission bandwidth in MHz.

(2) For band 5250 - 5350 MHz

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever power is less.

The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99 % emission bandwidth in MHz.

(3) For band 5470 - 5600 MHz and 5650 - 5725 MHz

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever power is less.

The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99 % emission bandwidth in MHz.

(4) For band 5725 - 5850 MHz

The maximum conducted output power shall not exceed 1 W.

-Output power Limit Calculation(IC)

Band	Mode	Power Limit [mW]	Calculated Limit [dBm]	Antenna Gain (Worst case)	Determined Limit [dBm]
		Least 99 % BW ^{Note*} [MHz]			
U-NII 1	802.11a	200	23.01	0.48	22.17
		16.47	22.17		
	802.11n(HT20)	200	23.01		22.46
		17.62	22.46		
	802.11n(HT40)	200	23.01		23.01
		36.02	25.57		
U-NII 2A	802.11a	200	23.01	0.48	23.01
		75.16	28.76		
	802.11n(HT20)	250	23.97		23.97
		16.46	29.16		
	802.11n(HT40)	250	23.97		23.97
		17.62	29.46		
U-NII 2C	802.11n(HT40)	250	23.97	0.48	23.97
		36.03	32.57		
	802.11ac(VHT80)	250	23.97		23.97
		75.36	35.77		
	802.11a	250	23.97		23.97
		16.45	29.16		
U-NII 2C	802.11n(HT20)	250	23.97	0.48	23.97
		17.63	29.46		
	802.11n(HT40)	250	23.97		23.97
		36.03	32.57		
	802.11ac(VHT80)	250	23.97		23.97
		75.21	35.76		

Bands	Mode	Power Limit [mW]	Calculated Limit [dBm]	Antenna Gain (Worst case)	Determined Limit [dBm]
		Least 99 % BW ^{Note*} [MHz]			
U-NII 2C (band-crossing channels)	802.11ac(VHT20)	200	23.01	0.48	22.50
		17.77	22.50		
	802.11ac(VHT40)	200	23.01		23.97
		36.24	25.59		
	802.11ac(VHT80)	200	23.01		23.97
		75.30	28.77		

Band	Mode	Power Limit [mW]	Calculated Limit [dBm]	Antenna Gain (Worst case)	Determined Limit [dBm]
U-NII 3	802.11a	1000	30.00	1.03	30.00
	802.11n(HT20)				
	802.11n(HT40)				
	802.11ac(VHT80)				

Mode	CH	Freq. [MHz]	Test Result [dBm]		
			ANT 1	ANT 2	SUM
802.11n(HT20) (Multiple Transmit)	36	5180	8.830	9.020	11.936
	40	5200	9.870	10.370	13.137
	48	5240	10.780	10.620	13.711
	52	5260	11.230	10.030	13.682
	60	5300	12.420	11.700	15.085
	64	5320	13.080	12.120	15.637
	100	5500	16.530	16.650	19.601
	116	5580	16.770	16.750	19.770
	140	5700	15.720	15.490	18.617
	149	5745	15.440	15.020	18.245
	157	5785	15.880	14.950	18.450
	165	5825	14.250	14.850	17.571

Mode	CH	Freq. [MHz]	Test Result [dBm]	
			ANT 1	ANT 2
802.11n(HT40) (Single Transmit)	38	5190	11.510	12.120
	46	5230	12.070	16.380
	54	5270	13.250	11.040
	62	5310	13.780	13.500
	102	5510	13.820	13.750
	110	5550	16.110	16.510
	134	5670	16.250	16.250
	151	5755	15.240	14.470
	159	5795	15.150	15.010

Mode	CH	Freq. [MHz]	Test Result [dBm]		
			ANT 1	ANT 2	SUM
802.11n(HT40) (Multiple Transmit)	38	5190	8.950	9.430	12.207
	46	5230	12.120	12.610	15.382
	54	5270	14.790	12.710	16.884
	62	5310	11.450	10.640	14.074
	102	5510	13.720	14.220	16.987
	110	5550	15.510	17.020	19.341
	134	5670	17.180	16.420	19.827
	151	5755	13.550	13.250	16.413
	159	5795	15.050	14.890	17.981

Mode	CH	Freq. [MHz]	Test Result [dBm]	
			ANT 1	ANT 2
802.11ac(VHT80) (Single Transmit)	42	5210	13.020	10.110
	58	5290	12.990	9.630
	106	5530	13.540	11.590
	155	5775	10.680	9.320

Mode	CH	Freq. [MHz]	Test Result [dBm]		
			ANT 1	ANT 2	SUM
802.11ac(VHT80) (Multiple Transmit)	42	5210	8.920	9.330	12.140
	58	5290	9.450	9.550	12.511
	106	5530	10.220	11.380	13.849
	155	5775	7.96	7.84	10.911

Band-Crossing Channels (U-NII 2C)

Mode	CH	Freq. [MHz]	Reading value [dBm]		DCF [dB]	Test Result [dBm]	
			ANT 1	ANT 2		ANT 1	ANT 2
802.11ac(VHT20) (Single Transmit)	144	5720	12.809	13.138	0.060	12.869	13.198
802.11ac(VHT40) (Single Transmit)	142	5710	16.212	15.787	0.130	16.342	15.917
802.11ac(VHT80) (Single Transmit)	138	5690	15.027	13.832	0.260	15.287	14.092

Mode	CH	Freq. [MHz]	Reading value [dBm]			DCF [dB]	Test Result [dBm]
			ANT 1	ANT 2	SUM		
802.11ac(VHT20) (Multiple Transmit)	144	5720	13.674	13.904	16.800	0.120	16.920
802.11ac(VHT40) (Multiple Transmit)	142	5710	14.702	14.499	17.610	0.230	17.840
802.11ac(VHT80) (Multiple Transmit)	138	5690	15.345	15.413	18.390	0.430	18.820

Note: Please refer to Appendix II for the duty correction factor

Band-Crossing Channels (U-NII 3)

Mode	CH	Freq. [MHz]	Reading value [dBm]		DCF [dB]	Test Result [dBm]	
			ANT 1	ANT 2		ANT 1	ANT 2
802.11ac(VHT20) (Single Transmit)	144	5720	4.110	5.612	0.060	4.170	5.672
802.11ac(VHT40) (Single Transmit)	142	5710	2.687	2.393	0.130	2.817	2.523
802.11ac(VHT80) (Single Transmit)	138	5690	-4.473	-2.865	0.260	-4.213	-2.605

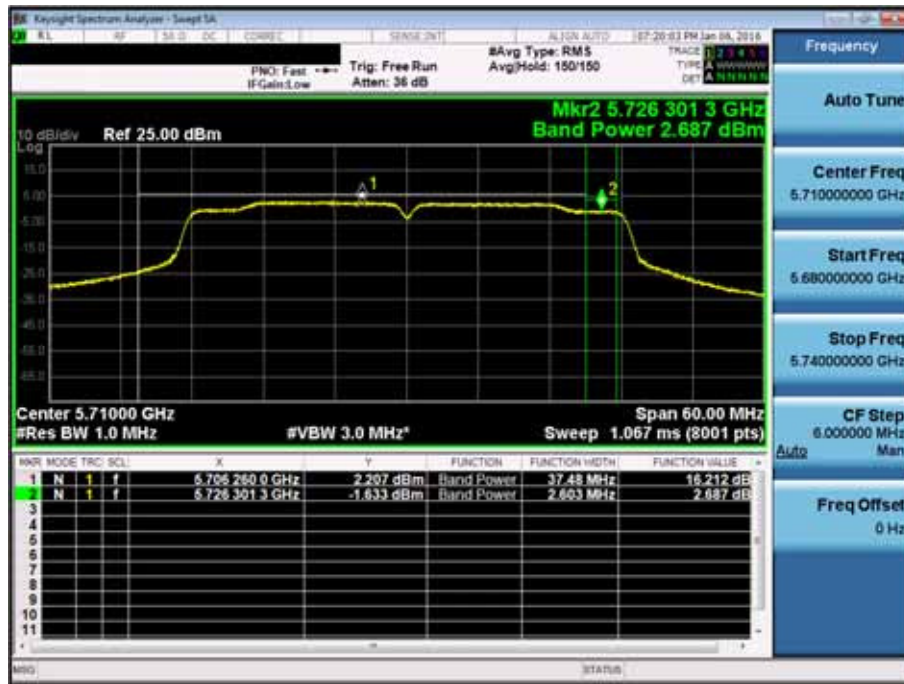
Mode	CH	Freq. [MHz]	Reading value [dBm]			DCF [dB]	Test Result [dBm]
			ANT 1	ANT 2	SUM		
802.11ac(VHT20) (Multiple Transmit)	144	5720	5.259	5.668	8.480	0.120	8.600
802.11ac(VHT40) (Multiple Transmit)	142	5710	0.953	1.261	4.120	0.230	4.350
802.11ac(VHT80) (Multiple Transmit)	138	5690	-4.476	-1.185	0.480	0.430	0.910

Note1: See next pages for actual measured spectrum plots.

Note2: Please refer to Appendix II for the duty correction factor

Maximum Conducted Output Power

Test Mode: 802.11ac VHT40 & Ch.142 & ANT 1

**Maximum Conducted Output Power**

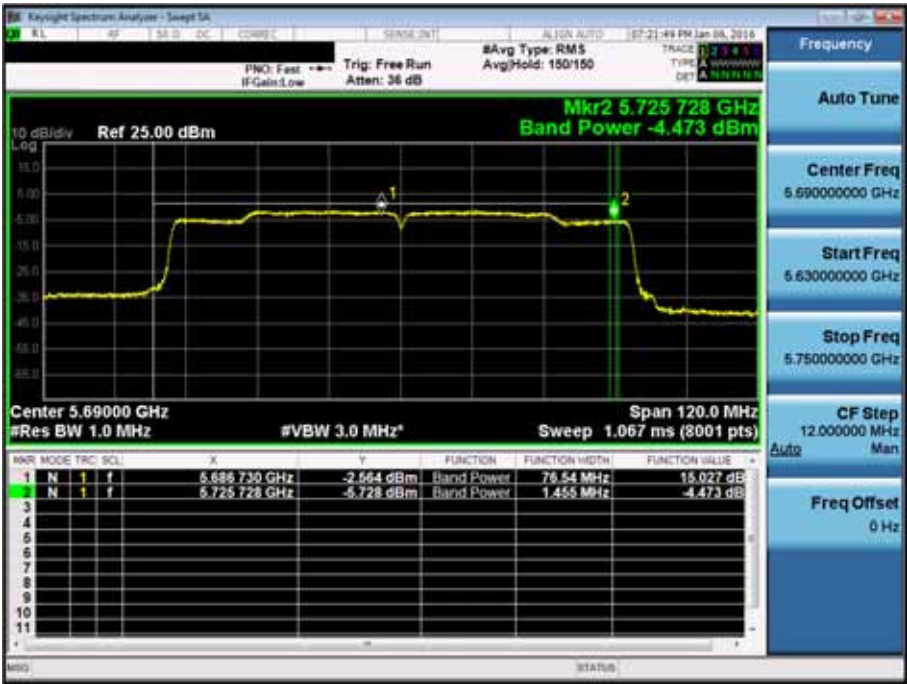
Test Mode: 802.11 ac VHT40 & Ch.142 & ANT 2





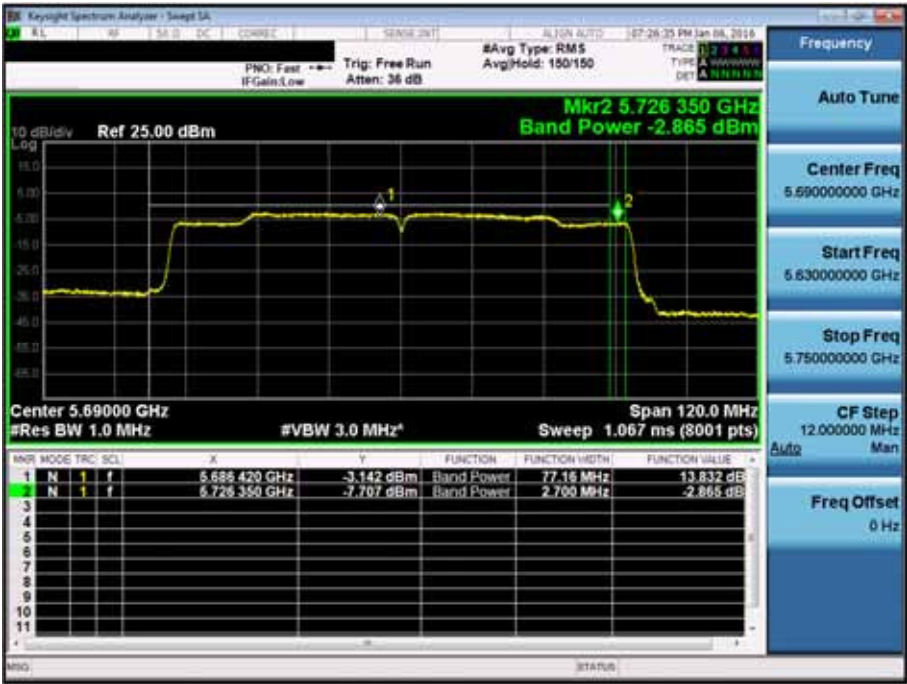
Maximum Conducted Output Power

Test Mode: 802.11ac VHT80 & Ch.138 & ANT 1



Maximum Conducted Output Power

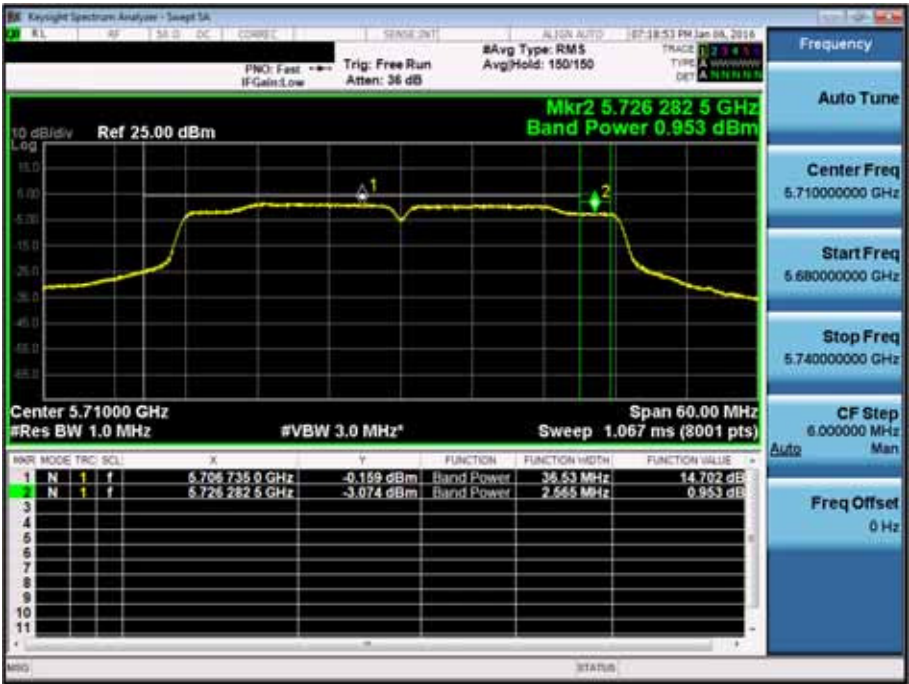
Test Mode: 802.11 ac VHT80 & Ch.138 & ANT 2





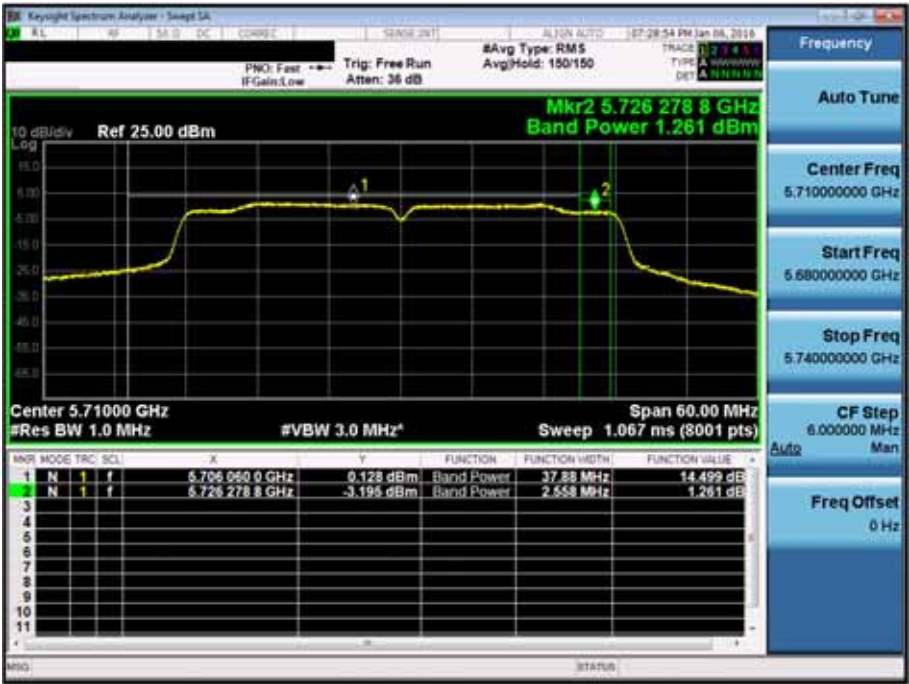
Maximum Conducted Output Power

Test Mode: 802.11ac VHT40 & Ch.142 & ANT 1



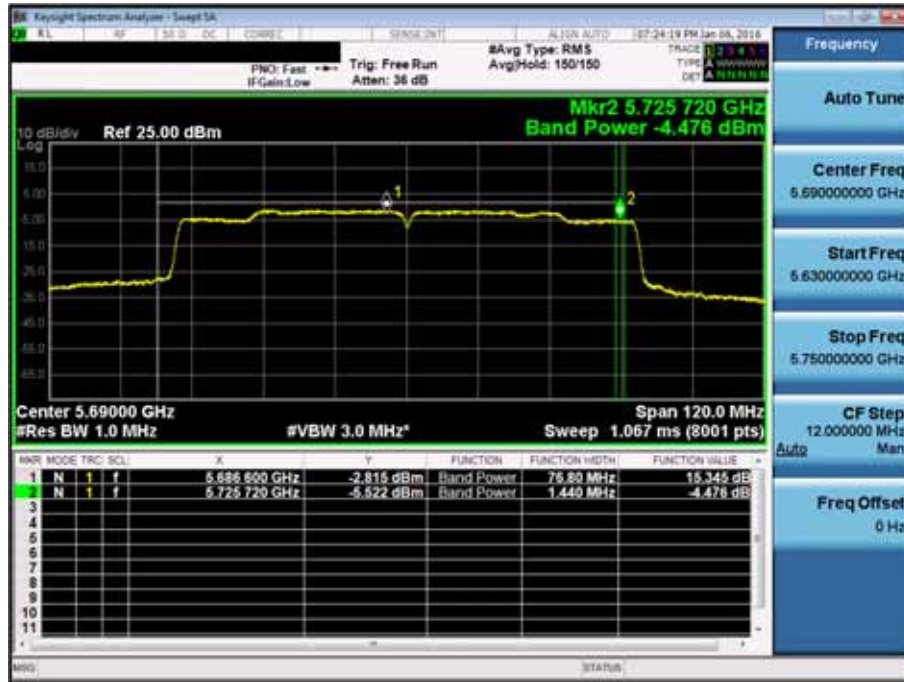
Maximum Conducted Output Power

Test Mode: 802.11 ac VHT40 & Ch.142 & ANT 2



Maximum Conducted Output Power

Test Mode: 802.11ac VHT80 & Ch.138 & ANT 1



Maximum Conducted Output Power

Test Mode: 802.11 ac VHT80 & Ch.138 & ANT 2

