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Report No.: 1412RSU01502
Report Version: V02
Issue Date: 01-23-2015

MEASUREMENT REPORT
FCC PART 15.407 WLAN 802.11a/n/ac

FCC ID:	NCY-A600
APPLICANT:	Trango Systems, Inc.
Application Type:	Certification
Product:	Altum AC600
Model No.:	A600-25-US, A600-19-US, A600-EXT-US
Brand Name:	Trango
FCC Classification:	Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s):	Part 15.407
Test Procedure(s):	KDB 789033 D02v01, KDB 662911 D01v02r01 KDB 644545 D03v01
Test Date:	Jul. 30 ~ Dec. 22, 2014

Reviewed By : Robin Wu
(Robin Wu)

Approved By : Marlin Chen
(Marlin Chen)

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 789033 D02v01. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date
1412RSU01502	Rev. 01	Initial report	12-23-2014
1412RSU01502	Rev. 02	Update some emission limit and correct some frequency detector method	01-23-2014

CONTENTS

Description Page

§2.1033 General Information

Applicant:	Trango Systems, Inc
Applicant Address:	14118 Stowe Dr, Suite B, Poway, CA 92064 USA
Manufacturer:	Trango Systems, Inc
Manufacturer Address:	14118 Stowe Dr, Suite B, Poway, CA 92064 USA
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
MRT FCC Registration No.:	809388
FCC Rule Part(s):	Part 15.407
Model No.:	A600-25-US, A600-19-US, A600-EXT-US
FCC ID:	NCY-A600
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering
FCC Classification:	Unlicensed National Information Infrastructure (UNII)

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- **MRT facility is a FCC registered (MRT Reg. No. 809388) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.**
- **MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.**
- **MRT facility is a VCCI registered (R-4179, G-814, C-4664, T-2206) test laboratory with the site description on file at VCCI Council.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications and Radio testing for FCC, Industry Canada, EU and TELEC Rules.**

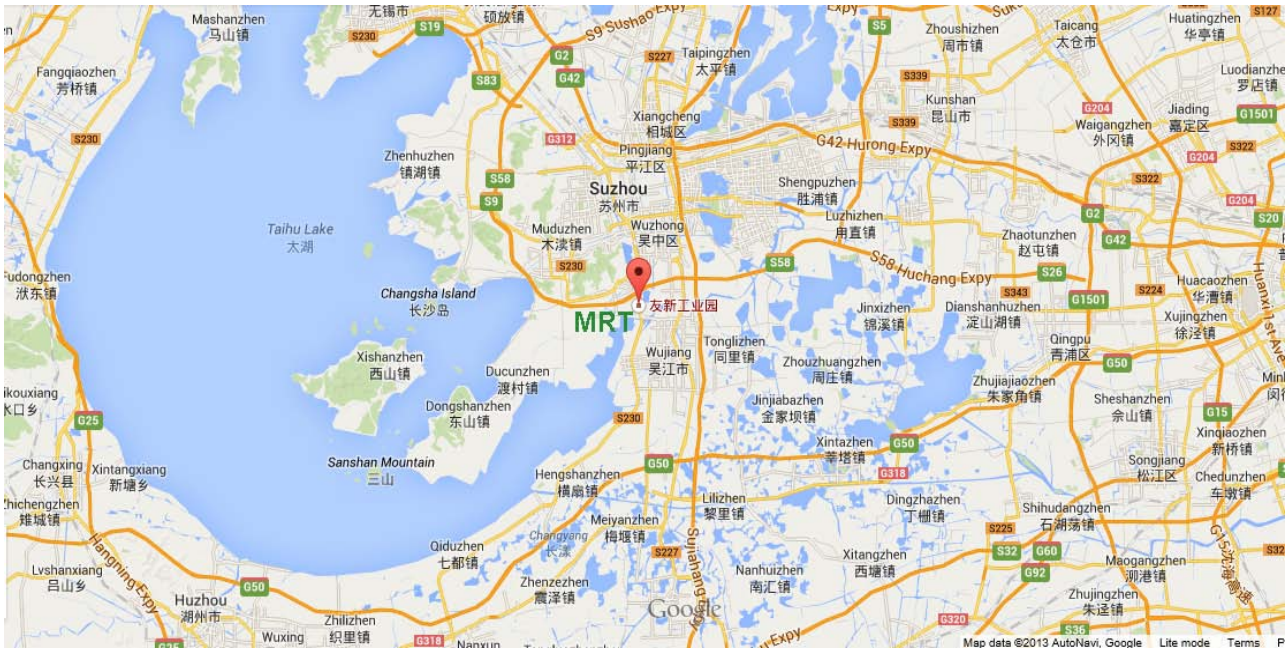
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on September 30, 2013.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	Altum AC600
Model No.	A600-25-US, A600-19-US, A600-EXT-US
Brand Name:	Trango
Wi-Fi Specification	802.11a/b/g/n/ac
Power Type	POE input
Adapter	Power Over Ethernet (Gigabit) M/N: HS36-2401250US Input: 100-240V ~ 50/60Hz 1.0A Output: +24.0V ~ 1250mA

Note: The difference of models is that the product uses the different antennas.

2.2. Product Specification Subjective to this Report

Frequency Range	For 802.11a/n-HT20/ac-VHT20: 5180~5240MHz, 5745~5825MHz For 802.11n-HT40/ac-VHT40: 5190~5230MHz, 5755~5795MHz For 802.11ac-VHT80: 5210MHz; 5775MHz
Channel Number	802.11a/n-HT20/ac-VHT20: 9 802.11n-HT40/ac-VHT40: 4 802.11ac-VHT80: 2
Type of Modulation	802.11a/n/ac: OFDM
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.6Mbps

Note: For other features of this EUT, test report will be issued separately.

2.3. Operation Frequency / Channel List

802.11a/n-HT20/ ac-VHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz
48	5240 MHz	149	5745 MHz	153	5765 MHz
157	5785 MHz	161	5805 MHz	165	5825 MHz

802.11n-HT40/ ac-VHT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	151	5755 MHz
159	5795 MHz	--	--	--	--

802.11ac-VHT80

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	155	5775 MHz	--	--

2.4. Description of Available Antennas

Antenna Type	Frequency Band (GHz)	Manufacturer	Tx Paths	Max Directional Gain (dBi)
Panel Antenna 1#	2.45	SANNY TELECOM CO., LTD	2	9
Panel Antenna 2#	5.1 ~ 5.8	Trango Systems, Inc	2	25
Panel Antenna 3#	5.1 ~ 5.8	Trango Systems, Inc	2	19

Note1: The device didn't support transmit beam-forming mode and Cyclic Delay Diversity (CDD) mode, and the transmit signals are uncorrected, so no add array gain to the band power and band PSD.

Note2: We selected the panel antenna 2# for radiated emission testing in UNII report.

2.5. Test Mode

Test Mode	Mode 1: Transmit by 802.11a
	Mode 2: Transmit by 802.11n-HT20
	Mode 3: Transmit by 802.11ac-VHT20
	Mode 4: Transmit by 802.11n-HT40
	Mode 5: Transmit by 802.11ac-VHT40
	Mode 6: Transmit by 802.11ac-VHT80

2.6. Test Software

The test utility software used during testing was “ART2-GUI Version: 2.3”.

Final Power Parameter Value of the test software.

Test Mode	Test Frequency	Power Parameter Value		
		Ant 0	Ant 1	Ant 0 + 1
802.11a	5180	12.0	12.0	--
	5220	12.5	12.0	--
	5240	12.5	12.5	--
	5745	25.0	24.5	--
	5785	27.5	28.0	--
	5825	26.0	25.0	--
802.11n-HT20	5180	12.0	12.0	11.5
	5220	12.5	12.0	11.5
	5240	12.5	12.5	11.5
	5745	25.0	24.5	24.5
	5785	28.0	28.0	26.5
	5825	25.5	25.0	25.0
802.11ac-VHT20	5180	12.0	12.0	11.5
	5220	12.5	12.0	11.5
	5240	12.5	12.0	12.0
	5745	25.0	24.5	24.5
	5785	28.0	28.0	26.5
	5825	25.5	24.5	24.5
802.11n-HT40	5190	11.5	11.0	11.0
	5230	12.0	11.5	11.0
	5755	24.5	24.0	25.0
	5795	26.0	25.5	25.0
802.11ac-VHT40	5190	11.0	11.5	11.0
	5230	11.5	11.5	11.00
	5755	24.0	24.5	24.00
	5795	25.0	25.0	25.00
802.11ac-VHT80	5210	12.0	12.0	11.00
	5775	24.0	24.0	24.00

2.7. Device Capabilities

This device contains the following capabilities:
2.4GHz WLAN (DTS) and 5GHz WLAN (UNII).
Note: 5GHz (NII) operation is possible in 20MHz, 40MHz and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak per the guidance of Section B)2)b) of KDB 789033 D02v01. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

- 802.11a 20MHz Bandwidth – 96.7%
- 802.11n 20MHz Bandwidth – 96.4%
- □ 802.11n 40MHz Bandwidth – 88.7%
- 802.11ac 20MHz Bandwidth – 95.7%
- 802.11ac 40MHz Bandwidth – 88.4%
- 802.11ac 80MHz Bandwidth – 83.6%

2.8. Test Configuration

The **Altum AC600 FCC ID: NCY-A600** was tested per the guidance of KDB 789033 D02v01. ANSI C63.4-2009 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.9. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.10. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19
The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.4-2009), and the guidance provided in KDB 789033 D02v01 were used in the measurement of the **Altum AC600 FCC ID: NCY-A600.**

Deviation from measurement procedure…….....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.4-2009 at Clause 4.3.

Line conducted emissions test results are shown in Section 7.10.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 0.8 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"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 antenna of the **Altum AC600** uses a unique connector**.**

Antenna Type	Antenna Connector Type
Panel Antenna 1#	Inverted threaded connector
Panel Antenna 2#	MCX connector
Panel Antenna 3#	MCX connector

Conclusion:

The **Altum AC600 FCC ID: NCY-A600** unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	101209	1 year	2015/11/07
Two-Line V-Network	R&S	ENV216	101683	1 year	2015/11/07
Two-Line V-Network	R&S	ENV216	101684	1 year	2015/11/07
Temperature/ Meter Humidity	Anymetre	TH101B	SR2-01	1 year	2015/11/14

Radiated Emission

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	E4447A	MY45300136	1 year	2015/10/09
EMI Test Receiver	R&S	ESR7	101209	1 year	2015/11/07
Preamplifier	MRT	AP01G18	1310002	1 year	2015/12/13
Preamplifier	MRT	AP18G40	1310001	1 year	2015/10/06
Loop Antenna	Schwarzbeck	FMZB1519	1519-041	1 year	2015/11/08
TRILOG Antenna	Schwarzbeck	VULB9162	9162-047	1 year	2015/11/08
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1167	1 year	2015/11/08
Broadband Horn Antenna	Schwarzbeck	BBHA9170	9170-549	1 year	2015/12/11
Temperature/Humidity Meter	Anymetre	TH101B	AC1-01	1 year	2015/11/14

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MY52090106	1 year	2015/04/23
Power Sensor	Agilent	U2021XA	MY52450003	1 year	2015/12/09
Temperature & Humidity Chamber	BAOYT	BYH-1500L	1309W043	1 year	2015/12/10
Temperature/Humidity Meter	Anymetre	TH101B	TR3-01	1 year	2015/11/14

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

AC Conducted Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: ± 3.46dB
Radiated Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: ± 4.18dB 1GHz ~ 40GHz: ± 4.76dB

7. TEST RESULT

7.1. Summary

Product Name: **Altum AC600**

FCC ID: **NCY-A600**

FCC Classification: **Unlicensed National Information Infrastructure (UNII)**

Data Rate(s) Tested: **6Mbps ~ 54Mbps (a);**
13/14.4Mbps ~ 130/144.4Mbps (n-HT20MHz BW);
27/30Mbps ~ 270/300Mbps (n-HT40MHz BW);
13/14.4Mbps ~ 156/173.4Mbps (ac-VHT20MHz BW);
27/30Mbps ~ 360/400Mbps (ac-VHT40MHz BW);
58.6/65Mbps ~ 780/866.6Mbps (ac-VHT80MHz BW)

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.407(a)	26dB Bandwidth	N/A	Conducted	Pass	Section 7.2
15.407(e)	6dB Bandwidth	≥ 500kHz		Pass	Section 7.3
15.407(a)(1)(iii), (3)	Maximum Conducted Output Power	< 28 dBm U-NII-1 < 30 dBm U-NII-3		Pass	Section 7.4
15.407(a)(1)(iii), (3), (5)	Peak Power Spectral Density	< 15 dBm/MHz U-NII-1 < 30 dBm/500kHz U-NII-3		Pass	Section 7.5
15.407(g)	Frequency Stability	N/A		Pass	Section 7.6
15.407(b)(1), (4)	Undesirable Emissions	< -27dBm/MHz EIRP < -17dBm/MHz EIRP	Radiated	Pass	Section 7.7 & 7.8
15.205, 15.209 15.407(b)(5), (6), (7)	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		Pass	
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.9

Notes:

1) All channels, modes, and modulations/data rates were investigated among all UNII bands. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.
2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.

7.2. 26dB Bandwidth Measurement

7.2.1. Test Limit

N/A

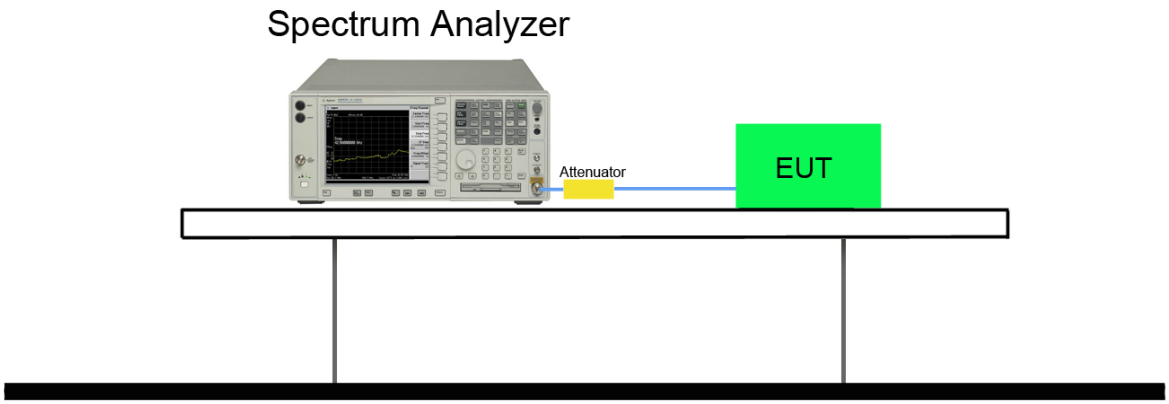
7.2.2. Test Procedure used

KDB 789033 D02v01 – Section C.1

7.2.3. Test Setting

1. The analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 26. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediated power nulls in the fundamental emission.
2. RBW = approximately 1% of the emission bandwidth.
3. VBW ≥ 3 × RBW.
4. Detector = Peak.
5. Trace mode = max hold.

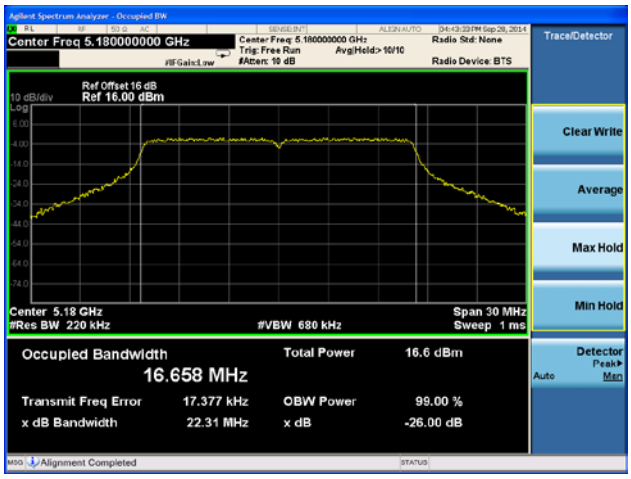
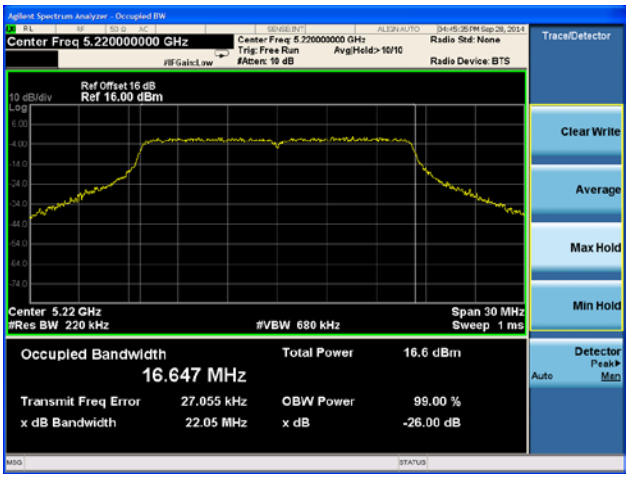
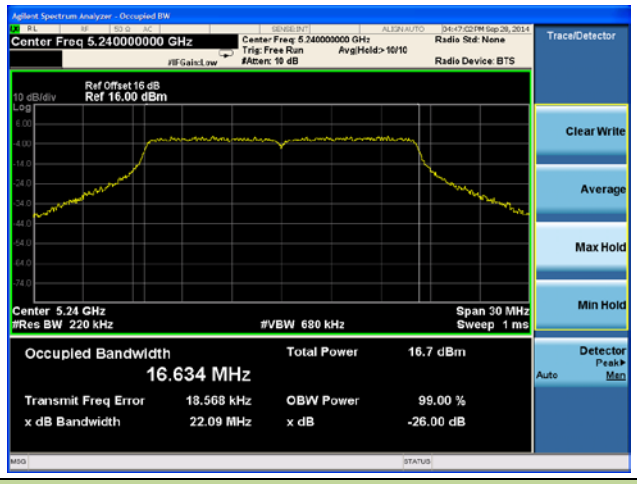
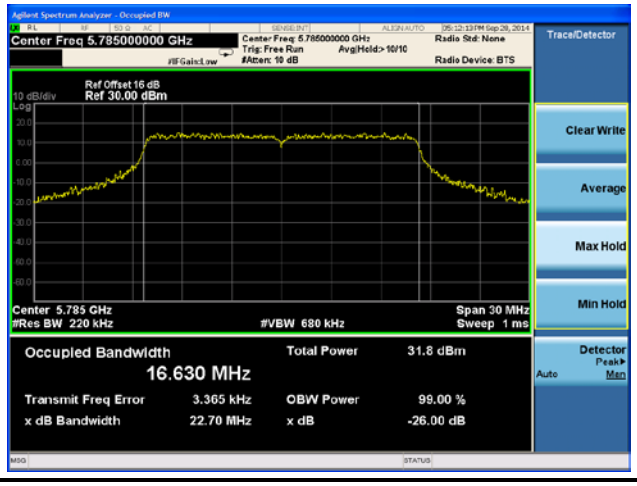
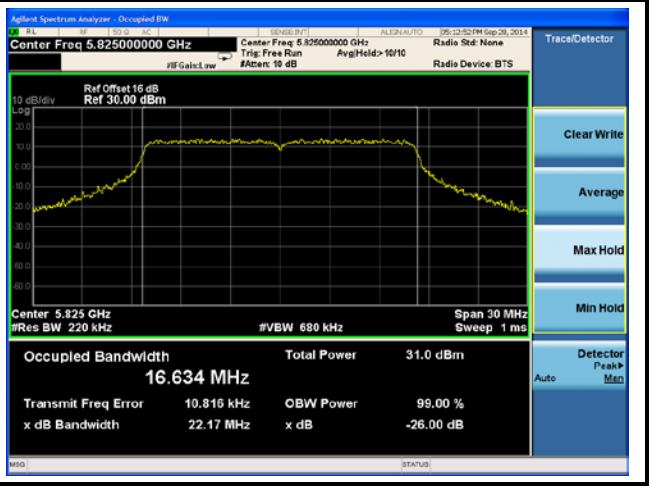
7.2.4. Test Setup

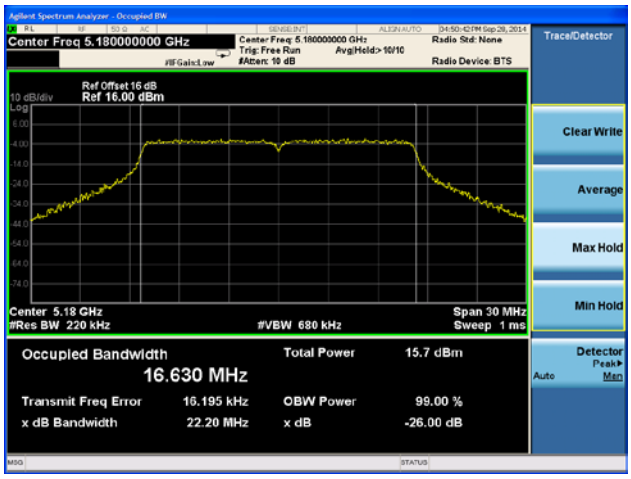
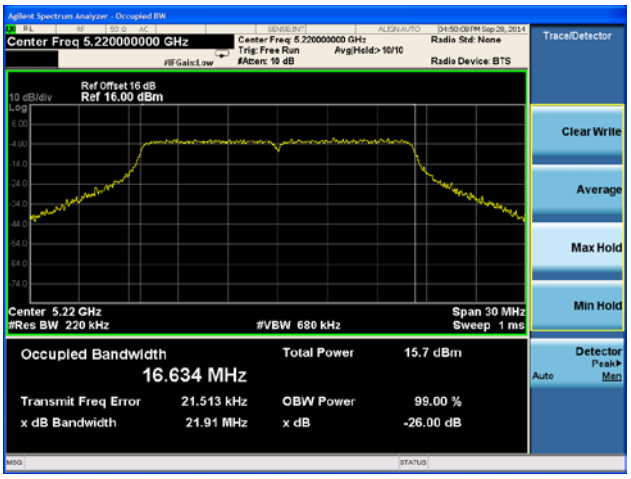
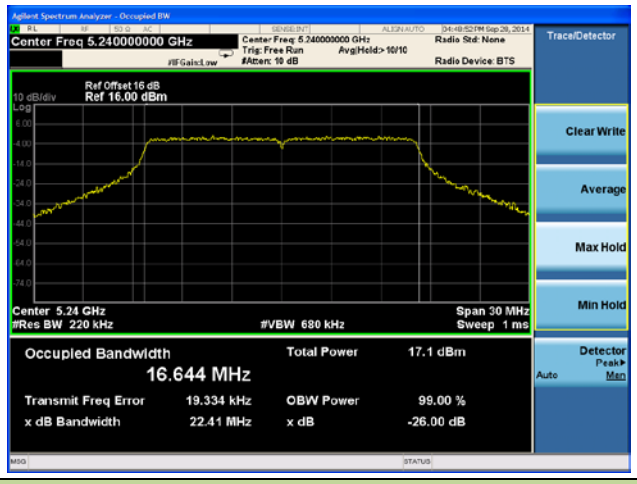
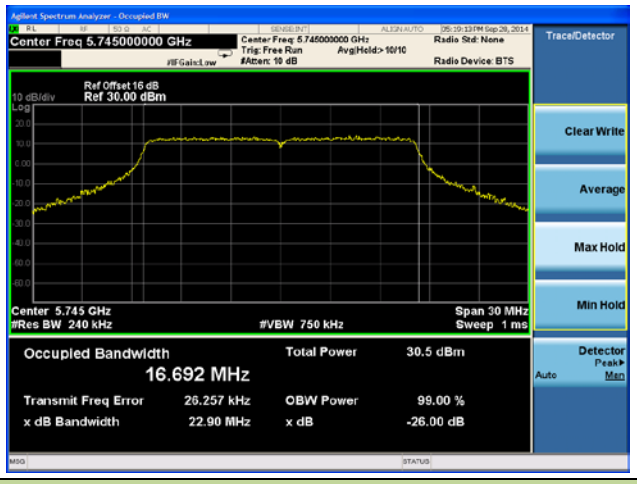
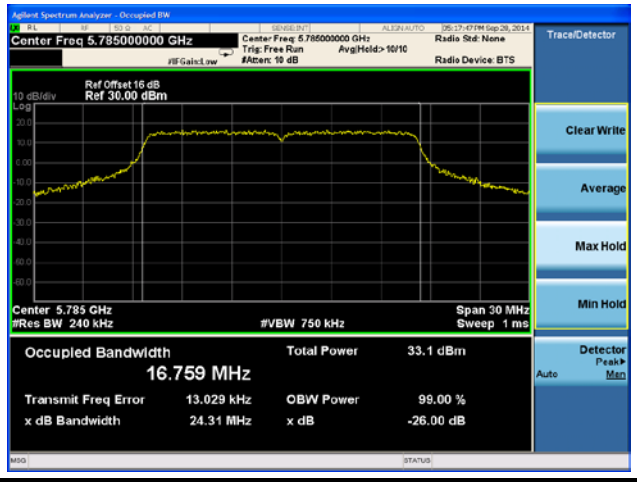
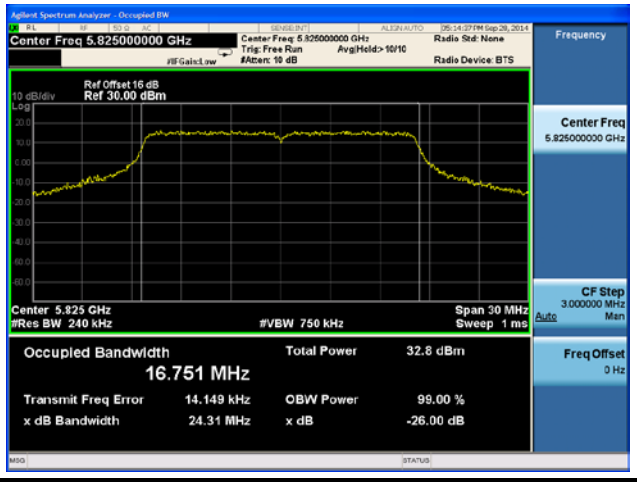


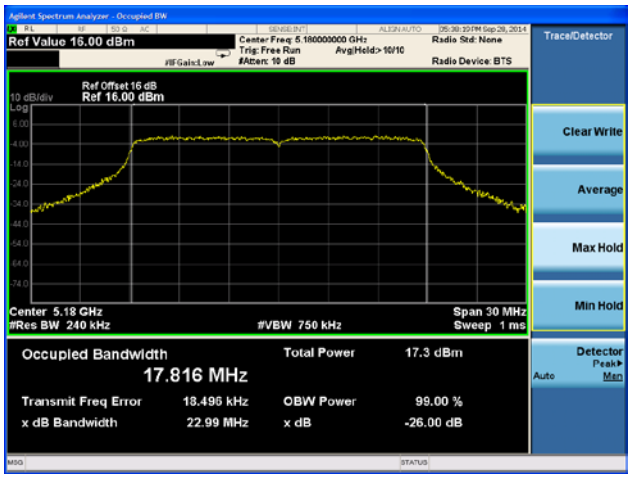
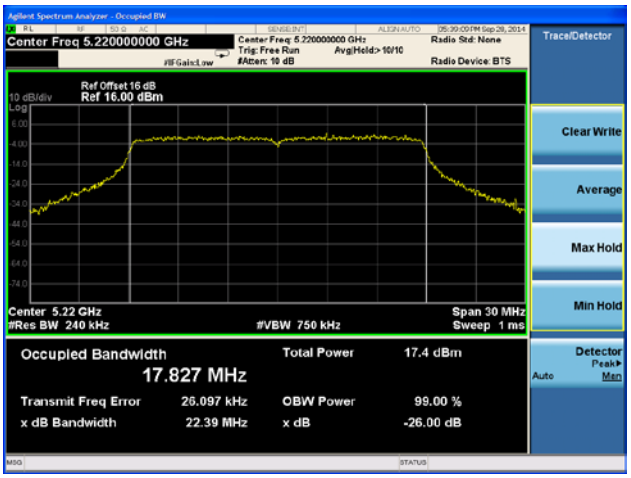
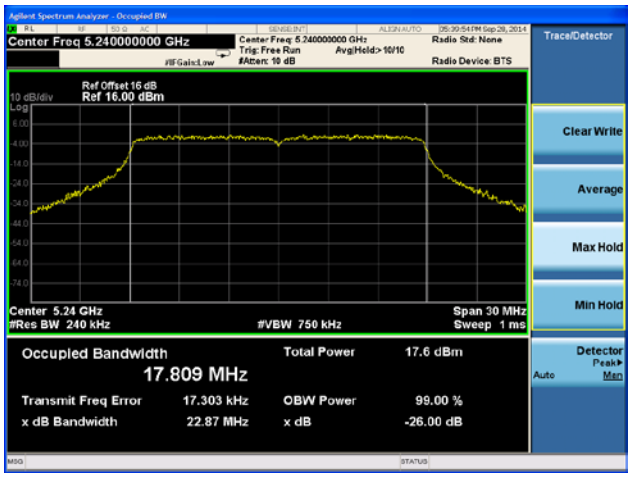
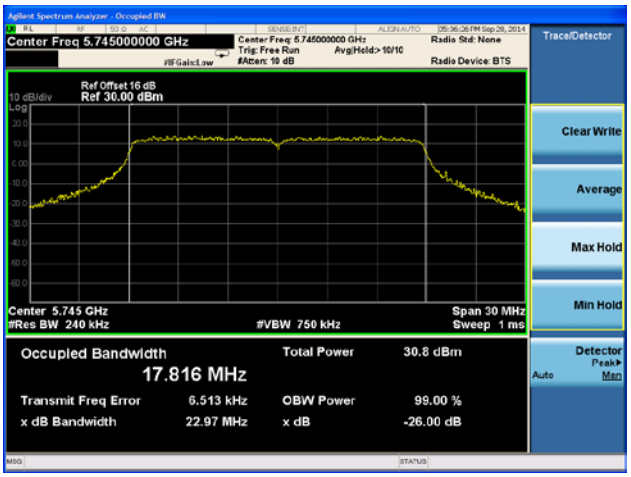
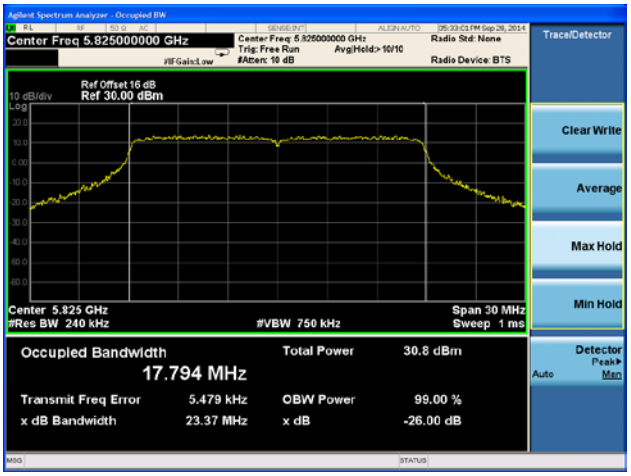
7.2.5. Test Result

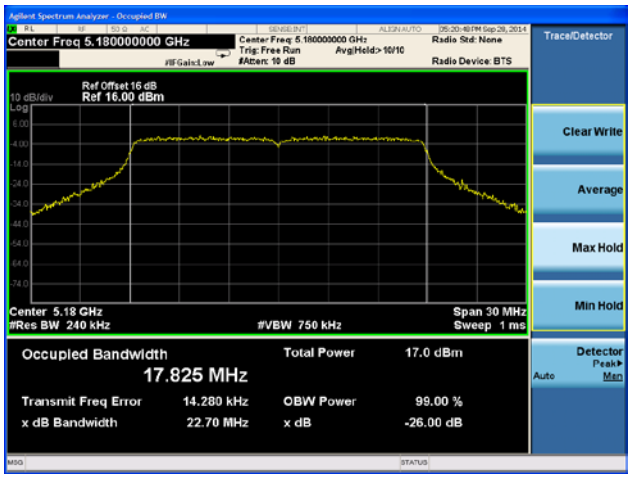
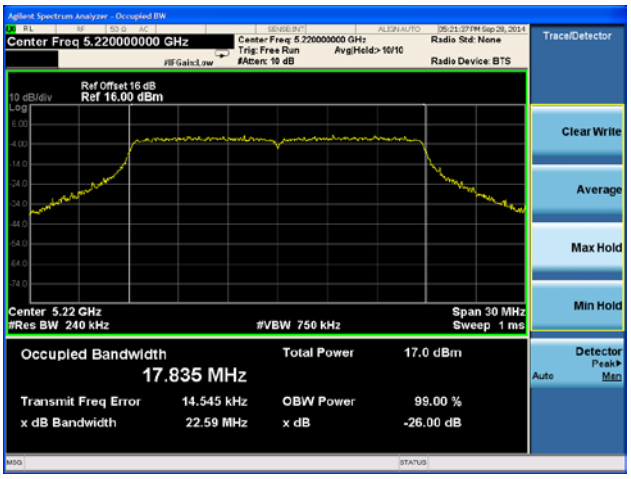
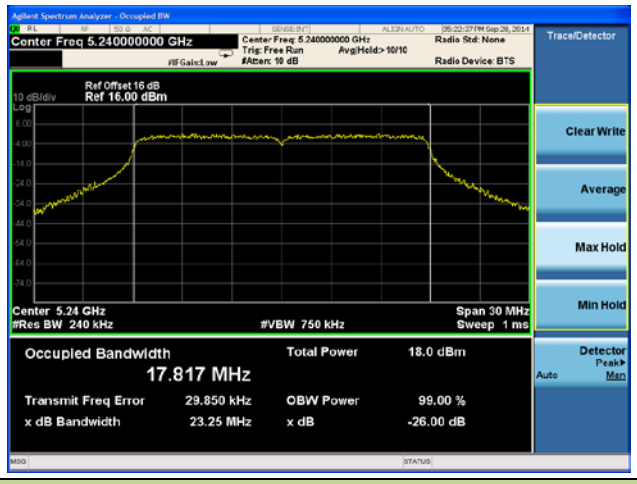
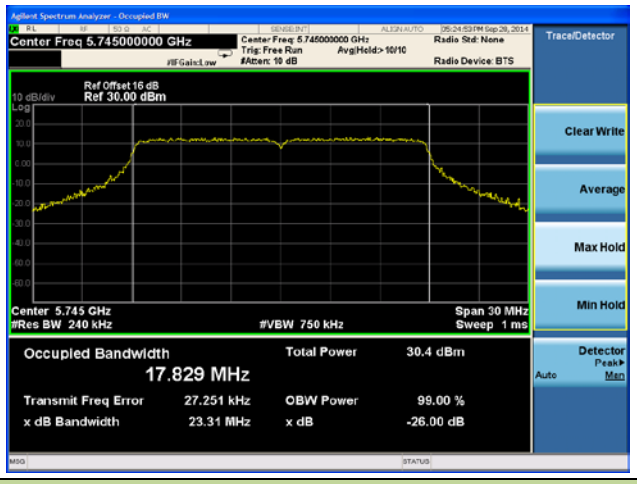
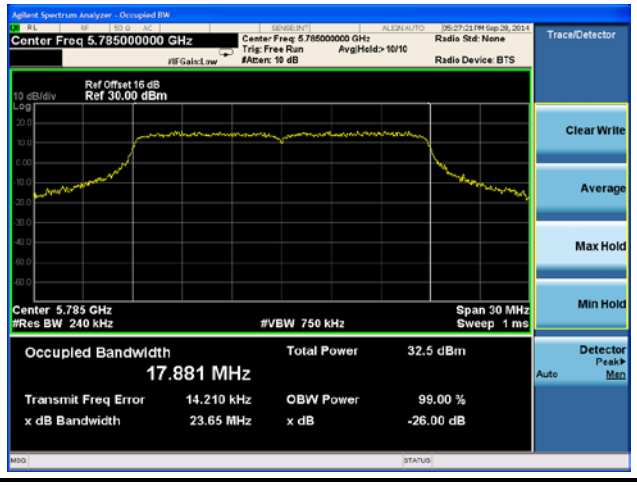
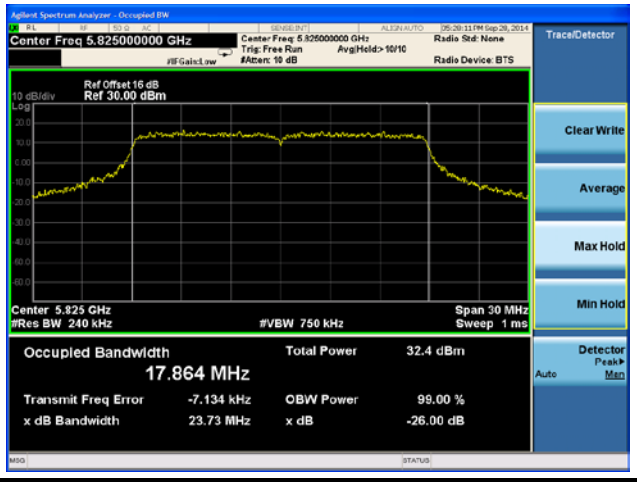
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Ant 0						
11a	6	36	5180	22.31	16.66	Pass
11a	6	44	5220	22.05	16.65	Pass
11a	6	48	5240	22.09	16.63	Pass
11a	6	149	5745	22.13	16.64	Pass
11a	6	157	5785	22.70	16.63	Pass
11a	6	165	5825	22.17	16.63	Pass
11n-HT20	6.5	36	5180	22.99	17.82	Pass
11n-HT20	6.5	44	5220	22.39	17.83	Pass
11n-HT20	6.5	48	5240	22.87	17.81	Pass
11n-HT20	6.5	149	5745	22.97	17.82	Pass
11n-HT20	6.5	157	5785	23.92	17.81	Pass
11n-HT20	6.5	165	5825	23.37	17.79	Pass
11ac-VHT20	6.5	36	5180	23.14	17.83	Pass
11ac-VHT20	6.5	44	5220	22.31	17.80	Pass
11ac-VHT20	6.5	48	5240	23.26	17.81	Pass
11ac-VHT20	6.5	149	5745	22.45	17.84	Pass
11ac-VHT20	6.5	157	5785	23.15	17.78	Pass
11ac-VHT20	6.5	165	5825	23.30	17.81	Pass
11n-HT40	13.5	38	5190	43.93	36.42	Pass
11n-HT40	13.5	46	5230	44.21	36.37	Pass
11n-HT40	13.5	151	5755	44.59	36.42	Pass
11n-HT40	13.5	159	5795	45.23	36.43	Pass
11ac-VHT40	13.5	38	5190	44.79	36.42	Pass
11ac-VHT40	13.5	46	5230	43.79	36.45	Pass
11ac-VHT40	13.5	151	5755	44.78	36.46	Pass
11ac-VHT40	13.5	159	5795	43.50	36.36	Pass
11ac-VHT80	29.3	42	5210	95.19	76.00	Pass
11ac-VHT80	29.3	155	5775	99.93	76.02	Pass
Ant 1						
11a	6	36	5180	22.20	16.63	Pass
11a	6	44	5220	21.91	16.63	Pass

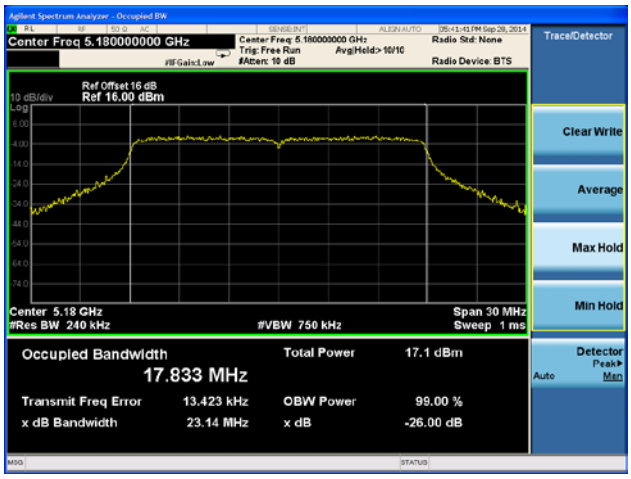
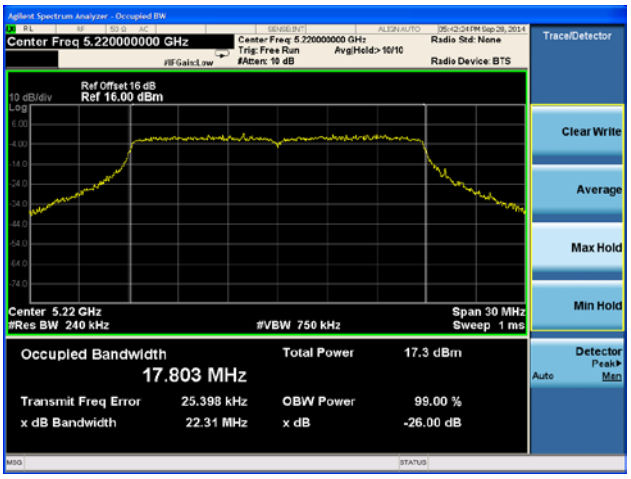
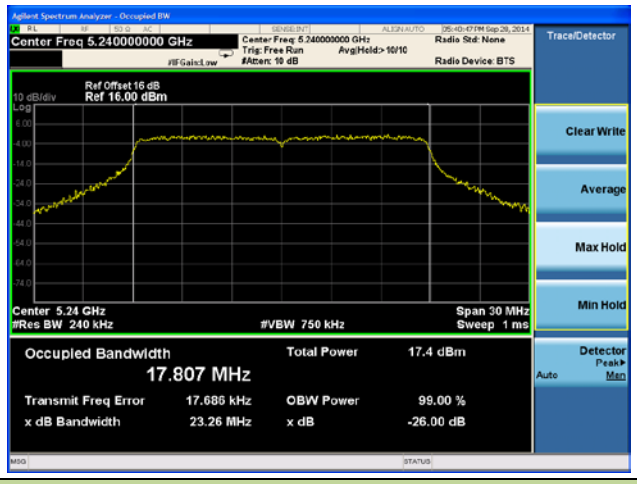
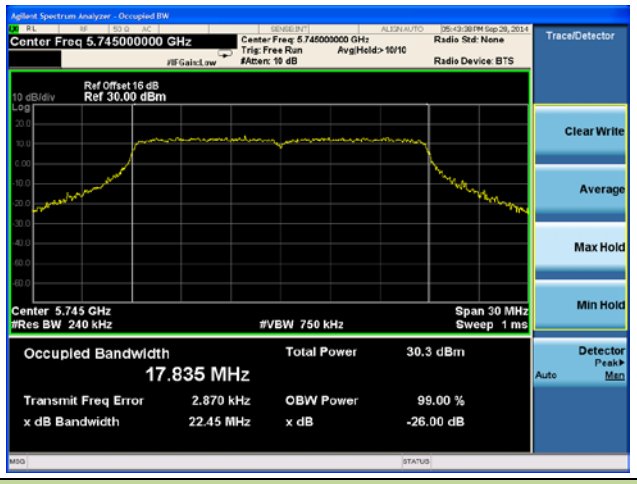
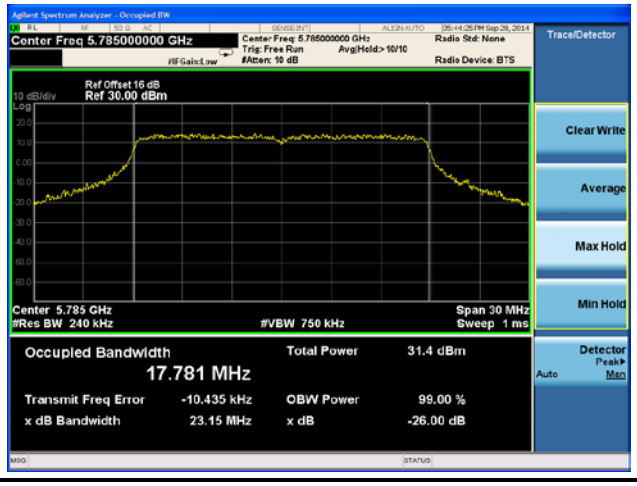
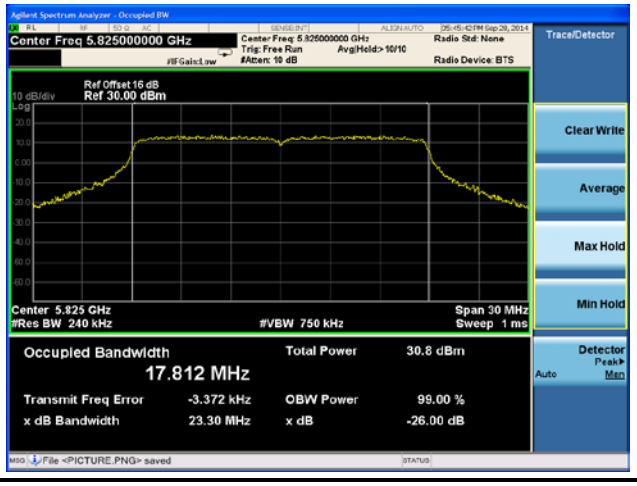
11a	6	48	5240	22.41	16.64	Pass
11a	6	149	5745	22.90	16.69	Pass
11a	6	157	5785	24.31	16.76	Pass
11a	6	165	5825	24.31	16.75	Pass
11n-HT20	6.5	36	5180	22.70	17.83	Pass
11n-HT20	6.5	44	5220	22.59	17.84	Pass
11n-HT20	6.5	48	5240	23.25	17.82	Pass
11n-HT20	6.5	149	5745	23.31	17.83	Pass
11n-HT20	6.5	157	5785	23.65	17.88	Pass
11n-HT20	6.5	165	5825	23.73	17.86	Pass
11ac-VHT20	6.5	36	5180	22.73	17.81	Pass
11ac-VHT20	6.5	44	5220	22.26	17.82	Pass
11ac-VHT20	6.5	48	5240	23.60	17.81	Pass
11ac-VHT20	6.5	149	5745	23.55	17.79	Pass
11ac-VHT20	6.5	157	5785	23.87	17.84	Pass
11ac-VHT20	6.5	165	5825	23.65	17.86	Pass
11n-HT40	13.5	38	5190	46.37	36.54	Pass
11n-HT40	13.5	46	5230	45.45	36.53	Pass
11n-HT40	13.5	151	5755	44.02	36.36	Pass
11n-HT40	13.5	159	5795	45.73	36.45	Pass
11ac-VHT40	13.5	38	5190	44.42	36.50	Pass
11ac-VHT40	13.5	46	5230	44.64	36.44	Pass
11ac-VHT40	13.5	151	5755	43.22	36.40	Pass
11ac-VHT40	13.5	159	5795	48.12	36.53	Pass
11ac-VHT80	29.3	42	5210	91.97	76.10	Pass
11ac-VHT80	29.3	155	5775	99.99	76.37	Pass

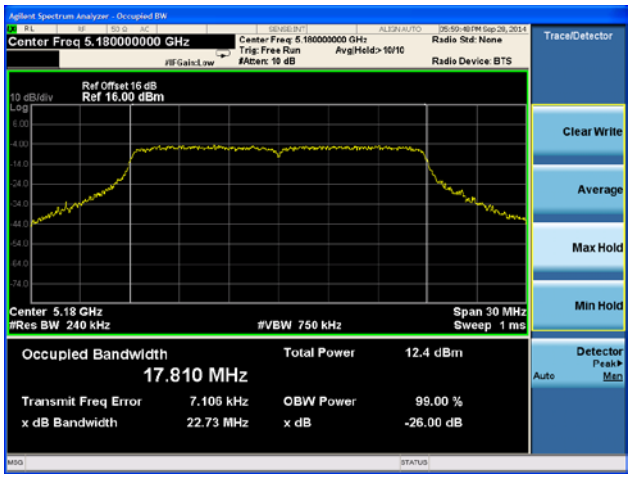
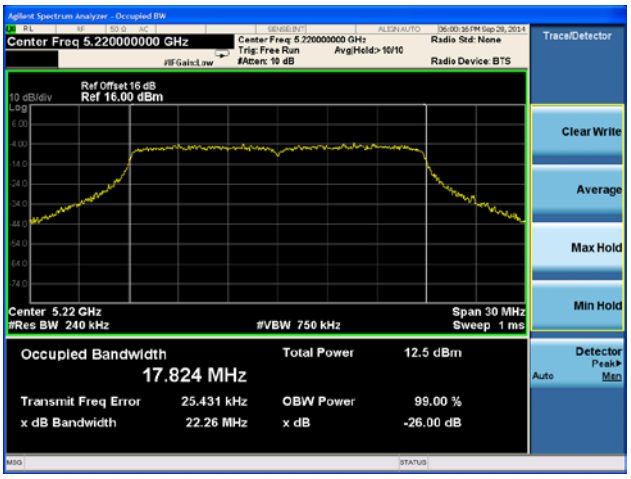
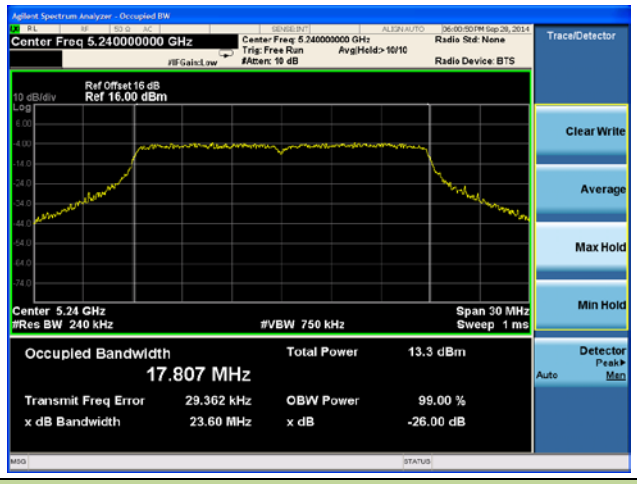
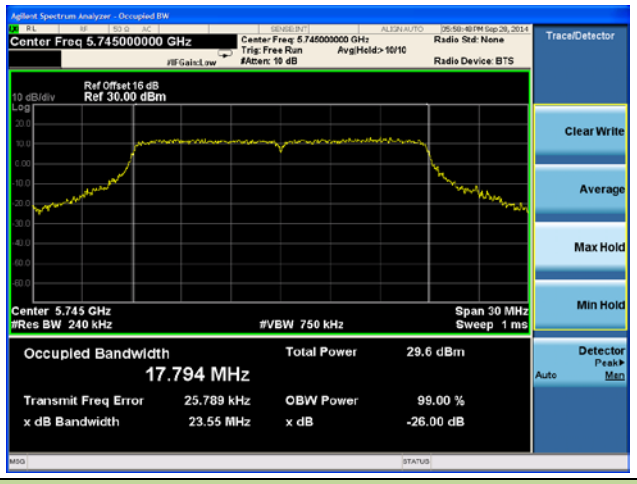
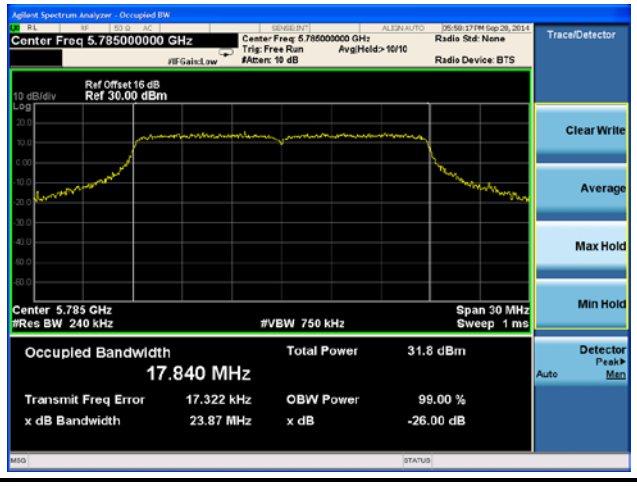
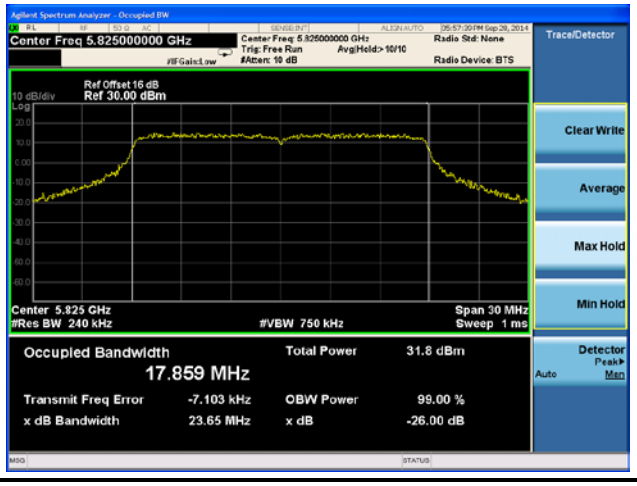
802.11a 26dB Bandwidth & 99% Bandwidth - Ant 0	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

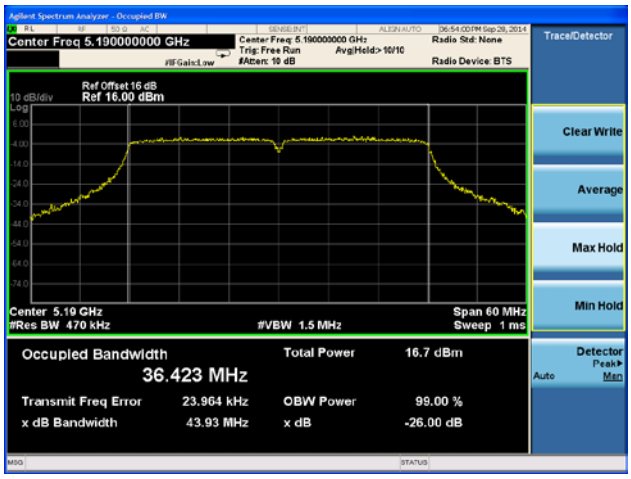
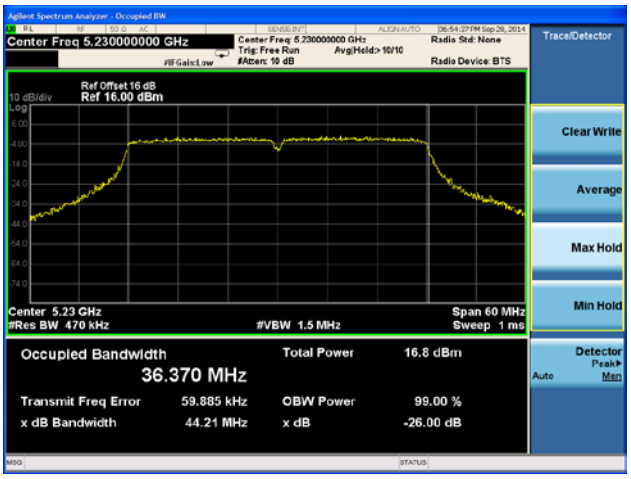
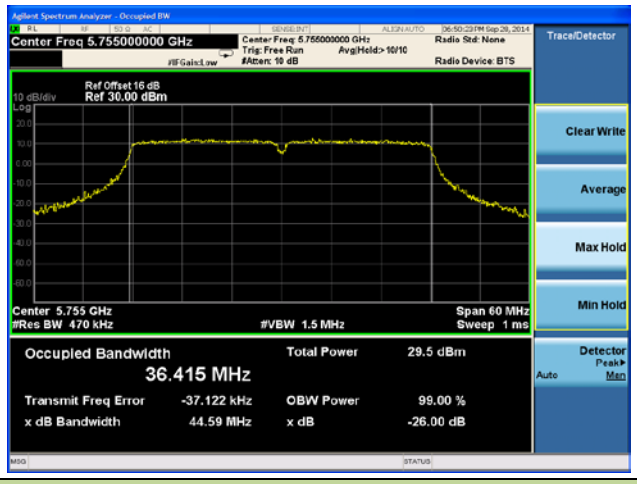
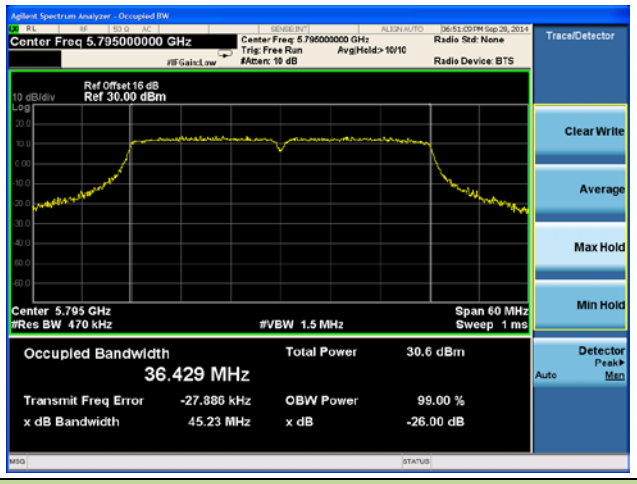
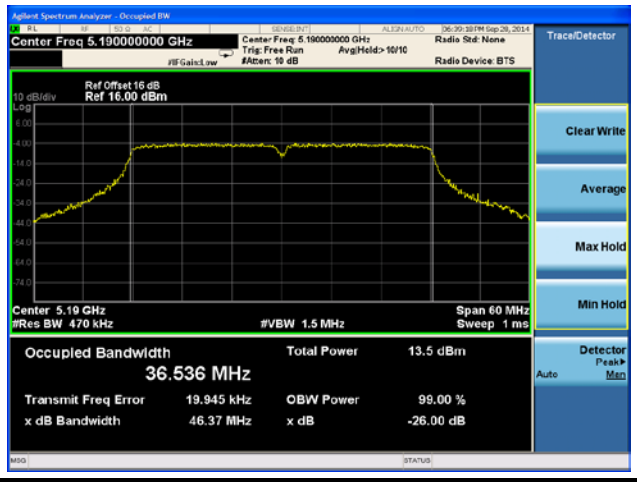
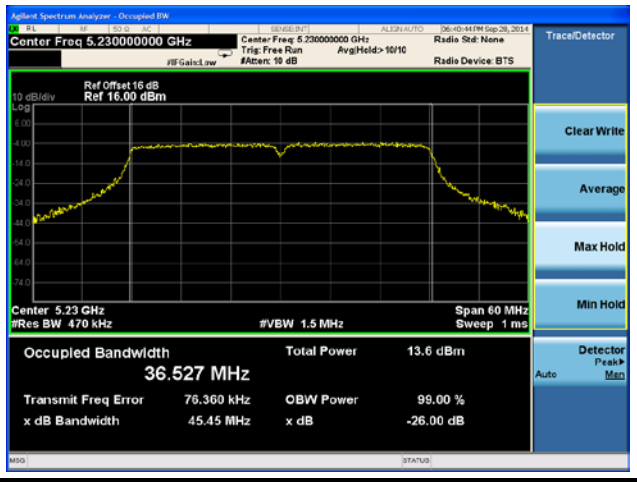
802.11a 26dB Bandwidth & 99% Bandwidth - Ant 1	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

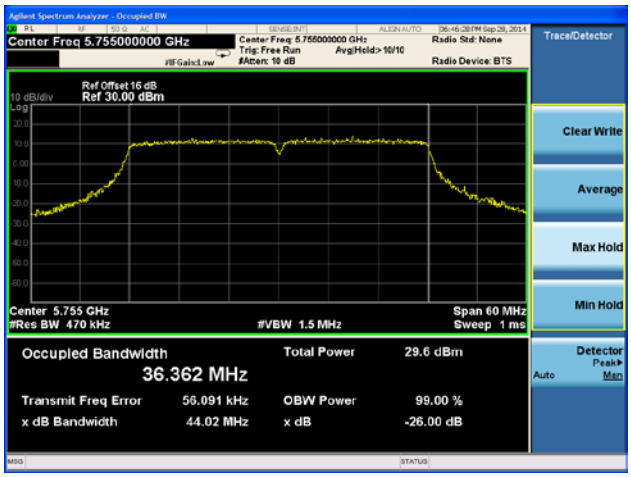
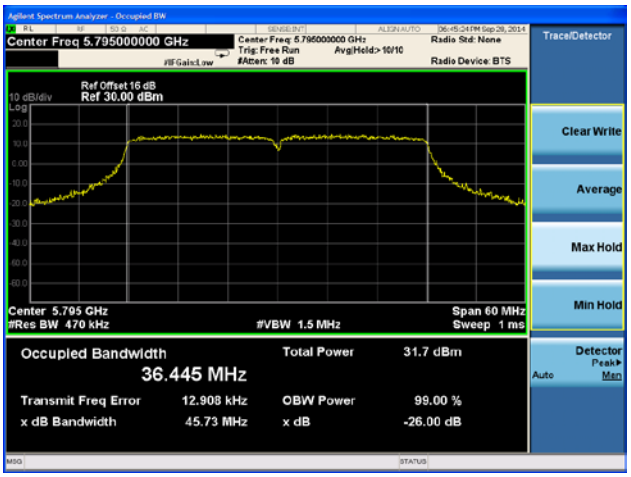
802.11n-HT20 26dB Bandwidth & 99% Bandwidth - Ant 0	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

802.11n-HT20 26dB Bandwidth & 99% Bandwidth - Ant 1	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

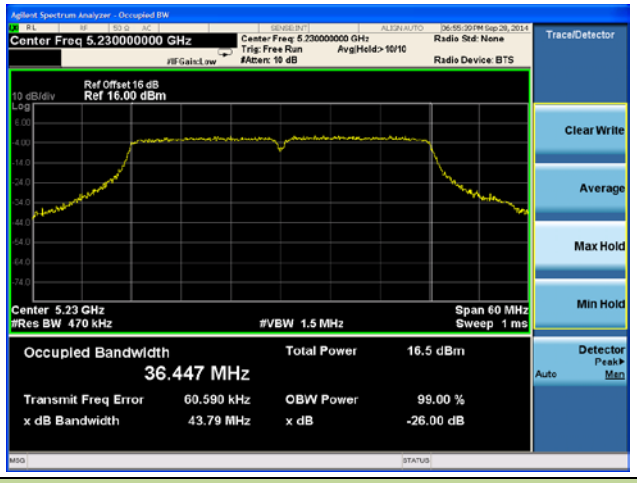
802.11ac-VHT20 26dB Bandwidth & 99% Bandwidth - Ant 0	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

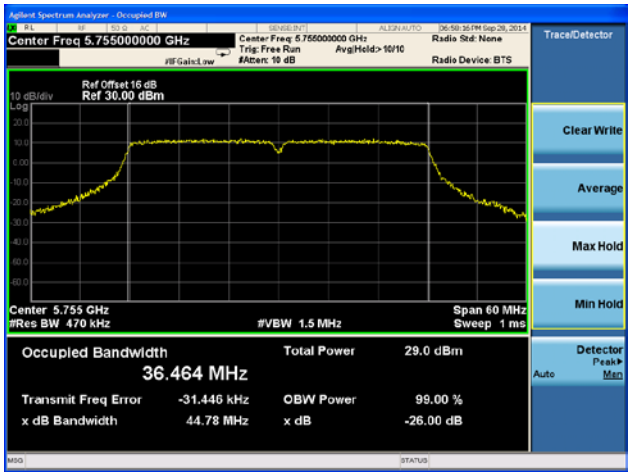
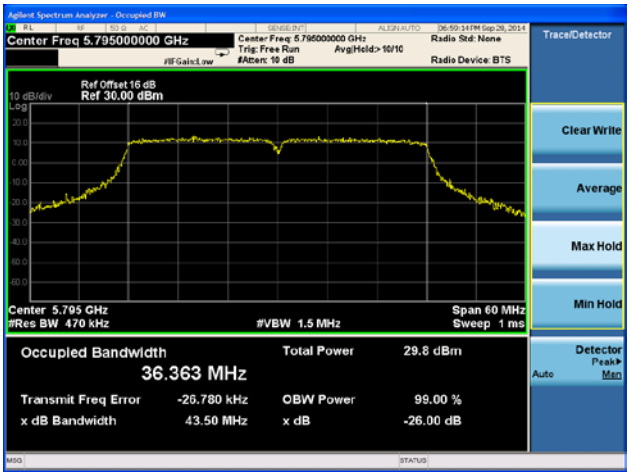
802.11ac-VHT20 26dB Bandwidth & 99% Bandwidth - Ant 1	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

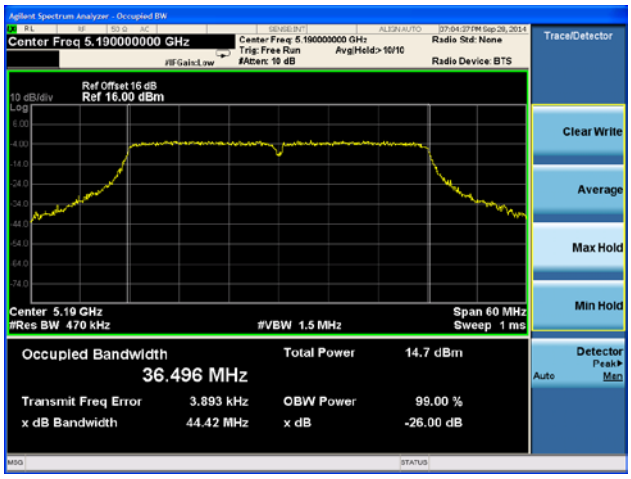
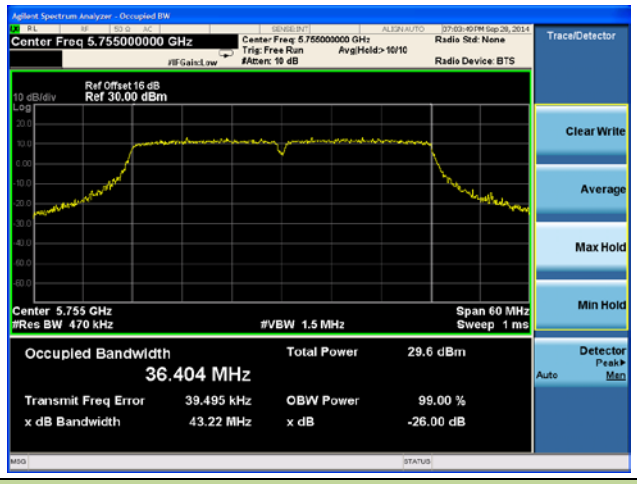
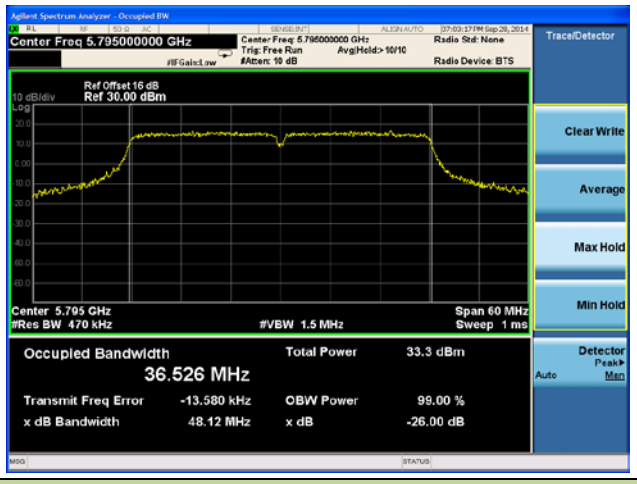
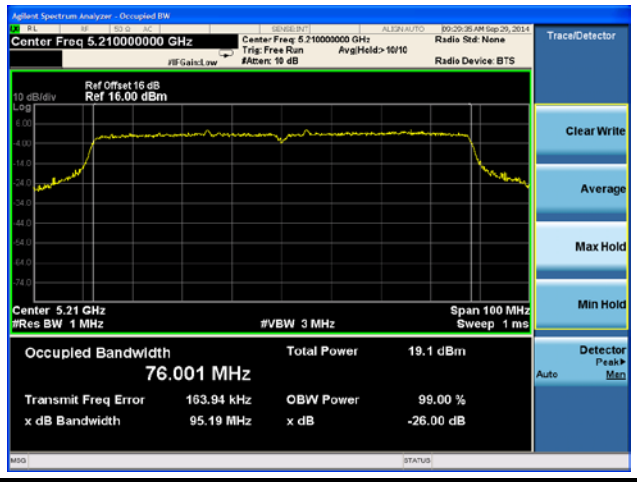
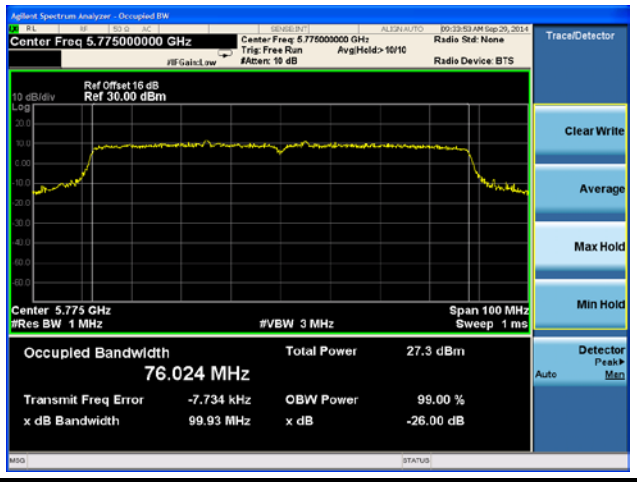
802.11n-HT40 26dB Bandwidth & 99% Bandwidth - Ant 0	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
Channel 151 (5755MHz)	**Channel 159 (5795MHz)**
	
802.11n-HT40 26dB Bandwidth & 99% Bandwidth - Ant 1	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	

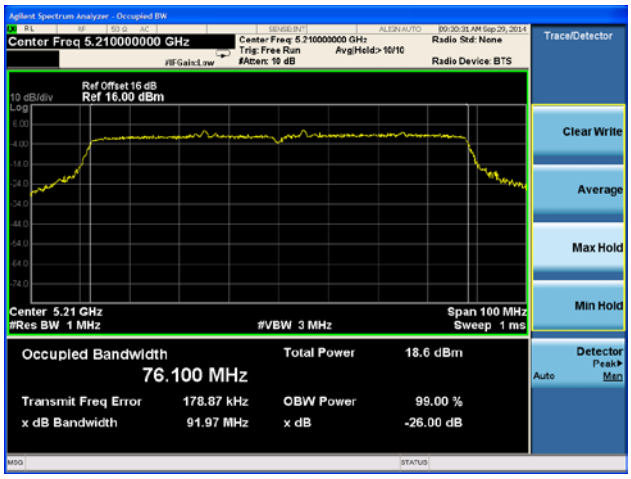
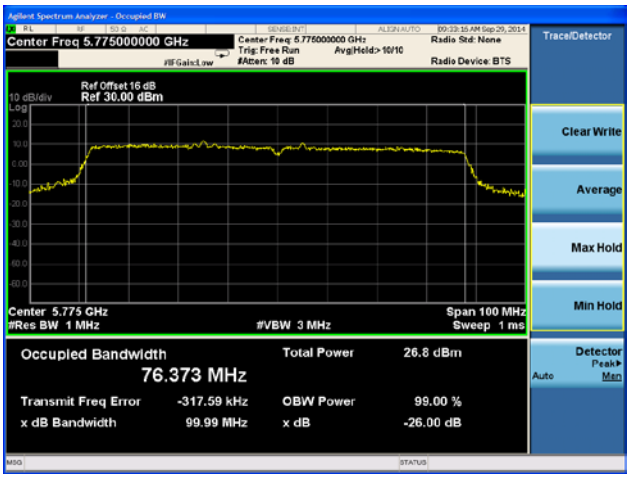
Channel 151 (5755 MHz)	Channel 159 (5795 MHz)
	

802.11ac-VHT40 26dB Bandwidth & 99% Bandwidth - Ant 0

Channel 38 (5190MHz)	Channel 46 (5230MHz)
	

Channel 151 (5755MHz)	Channel 159 (5795MHz)
	

802.11ac-VHT40 26dB Bandwidth & 99% Bandwidth - Ant 1	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
Channel 151 (5755 MHz)	**Channel 159 (5795 MHz)**
	
802.11ac-VHT80 26dB Bandwidth & 99% Bandwidth - Ant 0	
Channel 42 (5210MHz)	**Channel 155 (5775MHz)**
	

802.11ac-VHT80 26dB Bandwidth & 99% Bandwidth - Ant 1	
Channel 42 (5210MHz)	**Channel 155 (5775MHz)**
	

7.3. 6dB Bandwidth Measurement

7.3.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

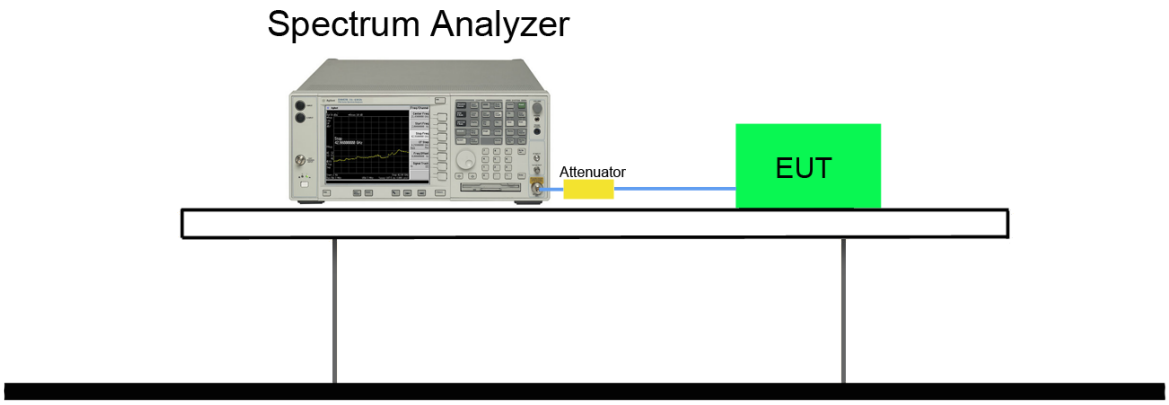
7.3.2. Test Procedure used

KDB 789033 D02v01 – Section C.2

7.3.3. Test Setting

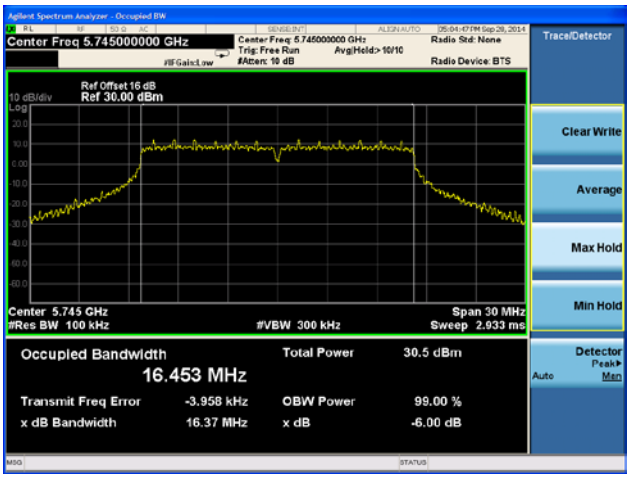
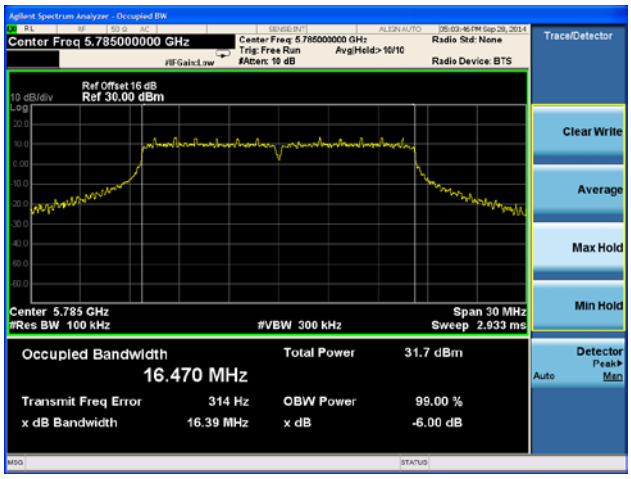
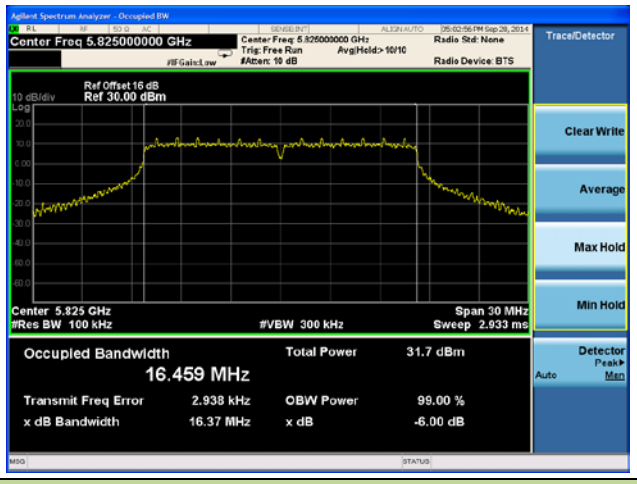
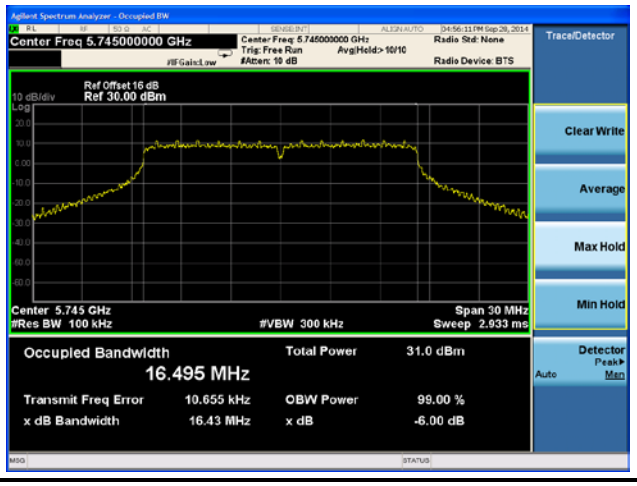
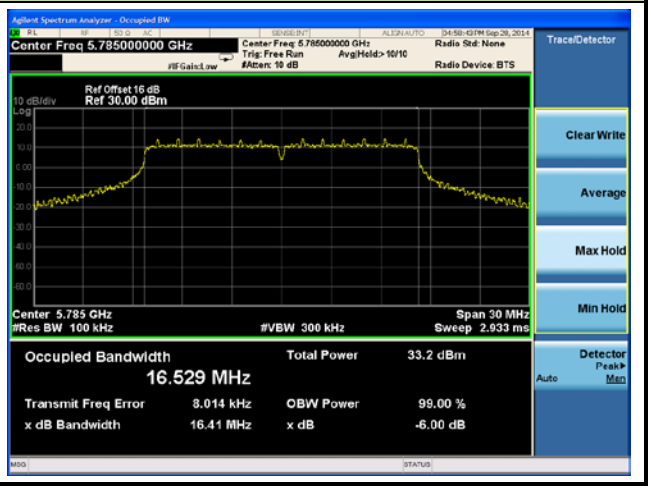
1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 100 kHz.
3. VBW ≧ 3 × RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

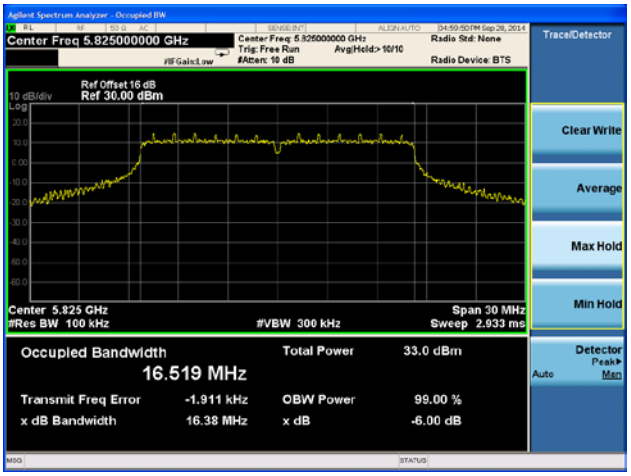
7.3.4. Test Setup

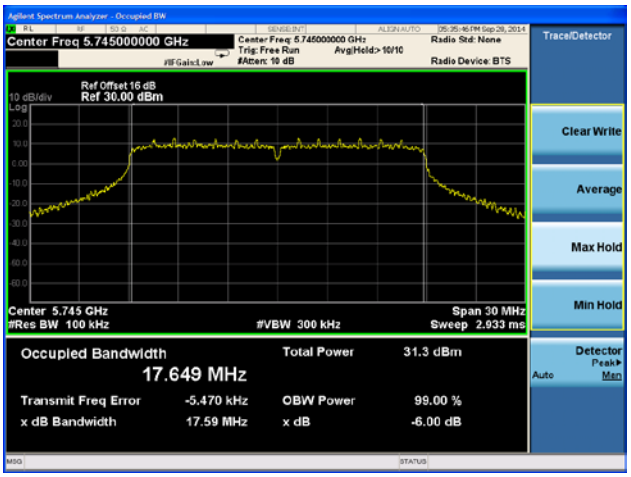
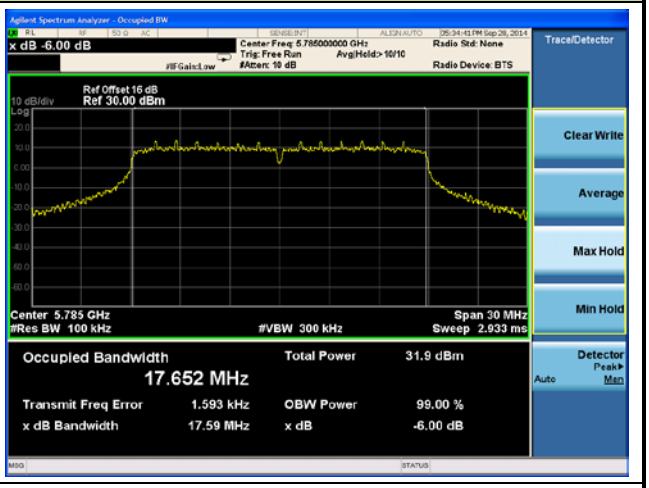


7.3.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant 0						
11a	6	149	5745	16.37	≥ 0.5	Pass
11a	6	157	5785	16.39	≥ 0.5	Pass
11a	6	165	5825	16.37	≥ 0.5	Pass
11n-HT20	13	149	5745	17.59	≥ 0.5	Pass
11n-HT20	13	157	5785	17.59	≥ 0.5	Pass
11n-HT20	13	165	5825	17.60	≥ 0.5	Pass
11ac-VHT20	13	149	5745	17.61	≥ 0.5	Pass
11ac-VHT20	13	157	5785	17.58	≥ 0.5	Pass
11ac-VHT20	13	165	5825	17.60	≥ 0.5	Pass
11n-HT40	27	151	5755	36.32	≥ 0.5	Pass
11n-HT40	27	159	5795	35.92	≥ 0.5	Pass
11ac-VHT40	27	151	5755	35.98	≥ 0.5	Pass
11ac-VHT40	27	159	5795	36.10	≥ 0.5	Pass
11ac-VHT80	27	155	5775	73.18	≥ 0.5	Pass
Ant 1						
11a	6	149	5745	16.43	≥ 0.5	Pass
11a	6	157	5785	16.41	≥ 0.5	Pass
11a	6	165	5825	16.38	≥ 0.5	Pass
11n-HT20	13	149	5745	17.64	≥ 0.5	Pass
11n-HT20	13	157	5785	17.60	≥ 0.5	Pass
11n-HT20	13	165	5825	17.60	≥ 0.5	Pass
11ac-VHT20	13	149	5745	17.63	≥ 0.5	Pass
11ac-VHT20	13	157	5785	17.63	≥ 0.5	Pass
11ac-VHT20	13	165	5825	17.61	≥ 0.5	Pass
11n-HT40	27	151	5755	36.34	≥ 0.5	Pass
11n-HT40	27	159	5795	36.11	≥ 0.5	Pass
11ac-VHT40	27	151	5755	36.15	≥ 0.5	Pass
11ac-VHT40	27	159	5795	36.32	≥ 0.5	Pass
11ac-VHT80	27	155	5775	72.97	≥ 0.5	Pass

802.11a 6dB Bandwidth - Ant 0	
Channel 149 (5745MHz)	**Channel 157 (5785MHz)**
	
Channel 165 (5825MHz)	
	
802.11a 6dB Bandwidth - Ant 1	
Channel 149 (5745MHz)	**Channel 157 (5785MHz)**
	

Channel 165 (5825MHz)	
	

802.11n-HT20 6dB Bandwidth - Ant 0	
Channel 149 (5745MHz)	**Channel 157 (5785MHz)**
	
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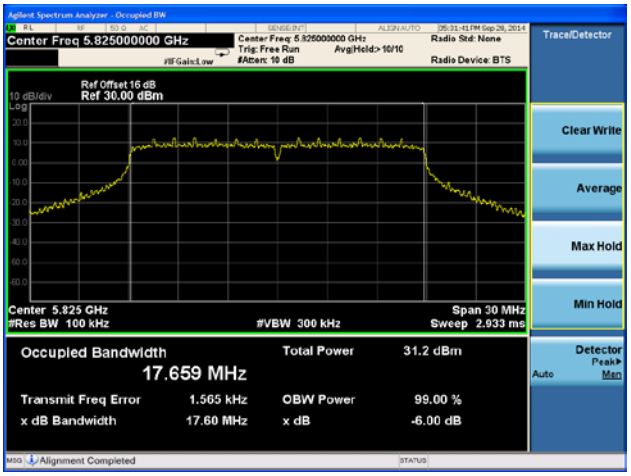
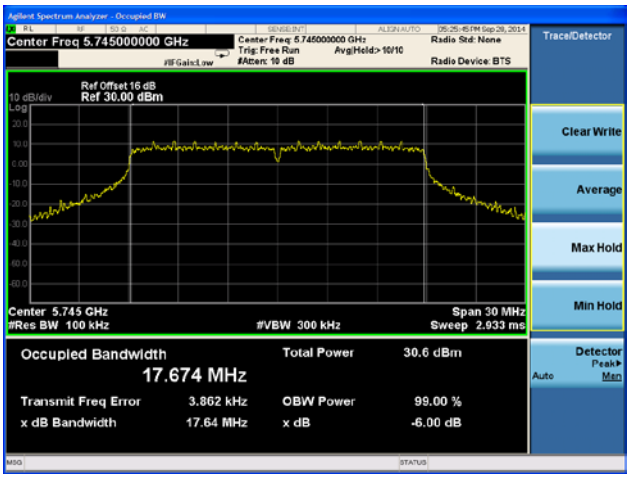
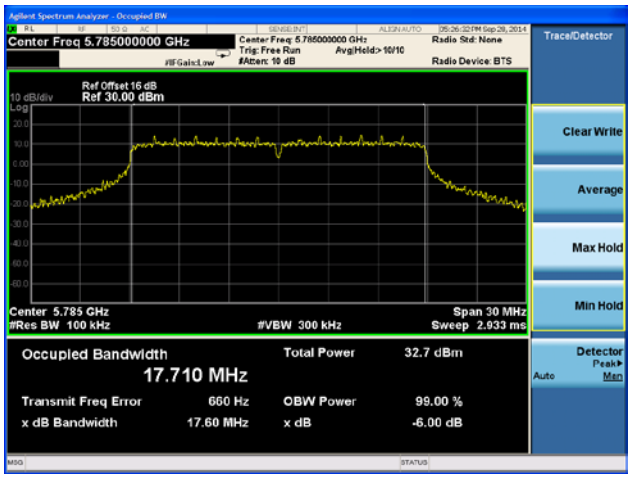
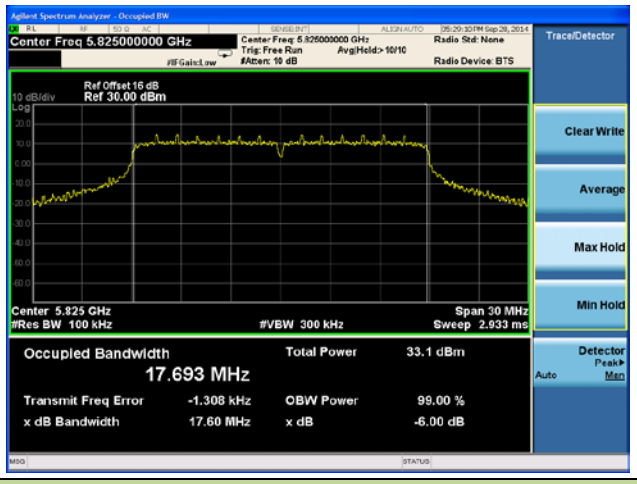
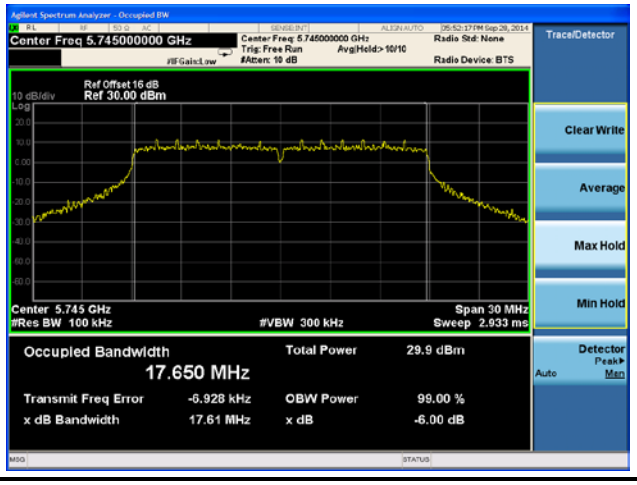
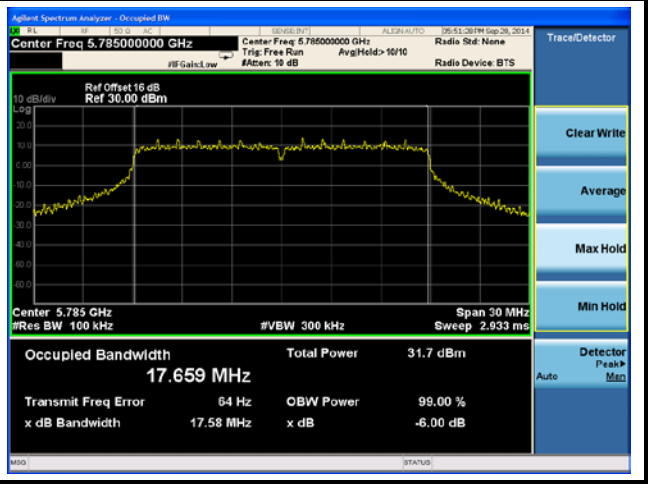
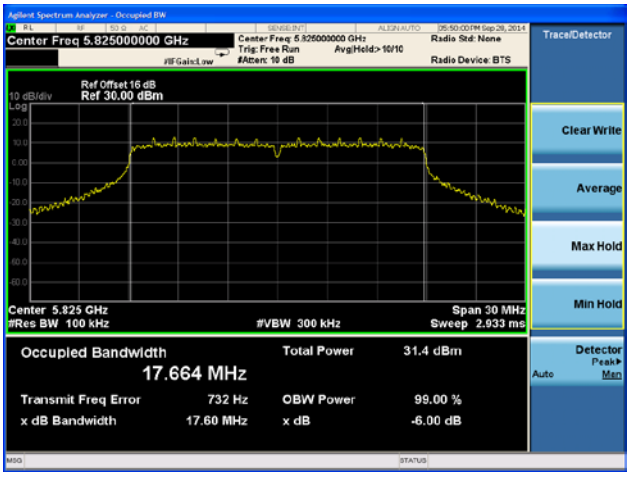
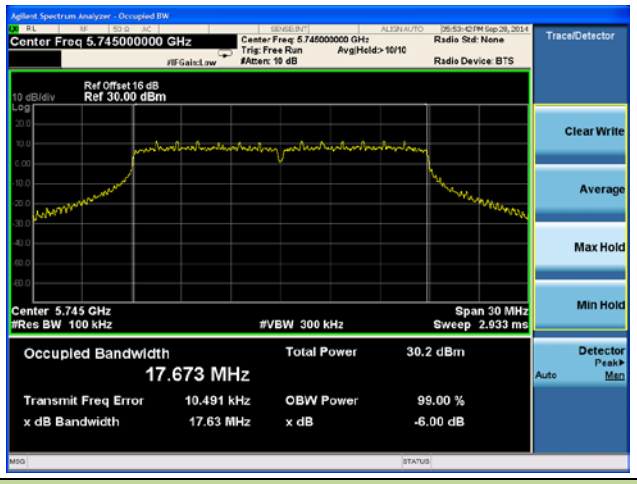
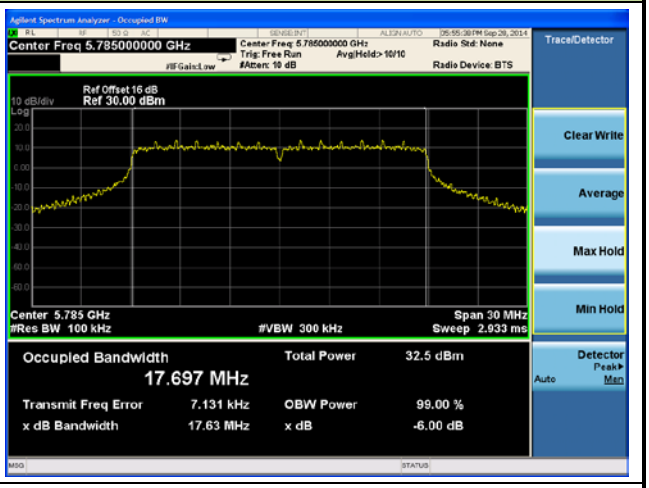
	

802.11n-HT20 6dB Bandwidth - Ant 1	
Channel 149 (5745MHz)	**Channel 157 (5785MHz)**
	
Channel 165 (5825MHz)	
	
802.11ac-VHT20 6dB Bandwidth - Ant 0	
Channel 149 (5745MHz)	**Channel 157 (5785MHz)**
	

Channel 165 (5825MHz)	
	

802.11ac-VHT20 6dB Bandwidth - Ant 1	
Channel 149 (5745MHz)	**Channel 157 (5785MHz)**
	
Channel 165 (5825MHz)