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Report No.: 1608RSU02002
Report Version: V01
Issue Date: 09-03-2016

MEASUREMENT REPORT
FCC PART 15.407 WLAN 802.11a/n

FCC ID:	TK4WLE200NX
APPLICANT:	Compex Systems Pte Ltd
Application Type:	Certification
Product:	WIRELESS-ABGN 2X2 NETWORK MINIPCIE ADAPTER
Model No.:	WLE200NX, WLE200NX-I
Brand Name:	COMPEX
FCC Classification:	Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s):	Part 15.407
Test Procedure(s):	ANSI C63.10-2013, KDB 789033 D02v01r03, KDB 662911 D01v02r01, KDB 644545 D03v01
Test Date:	August 20 ~ 31, 2016

Reviewed By Manager : Robin Wu
(Robin Wu)

Approved By CEO : 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 D02v01r03. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date	Note
1608RSU02002	Rev. 01	Initial report	09-03-2016	Valid

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Description Page

§2.1033 General Information

Applicant:	Compex Systems Pte Ltd
Applicant Address:	No:9 Harrison Road, Harrison Industrial Building, #05-01, Singapore 369651
Manufacturer:	Compex Systems Pte Ltd
Manufacturer Address:	No:9 Harrison Road, Harrison Industrial Building, #05-01, Singapore 369651
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
FCC Registration No.:	809388
FCC Rule Part(s):	Part 15.407
Model No.:	WLE200NX, WLE200NX-I
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.**

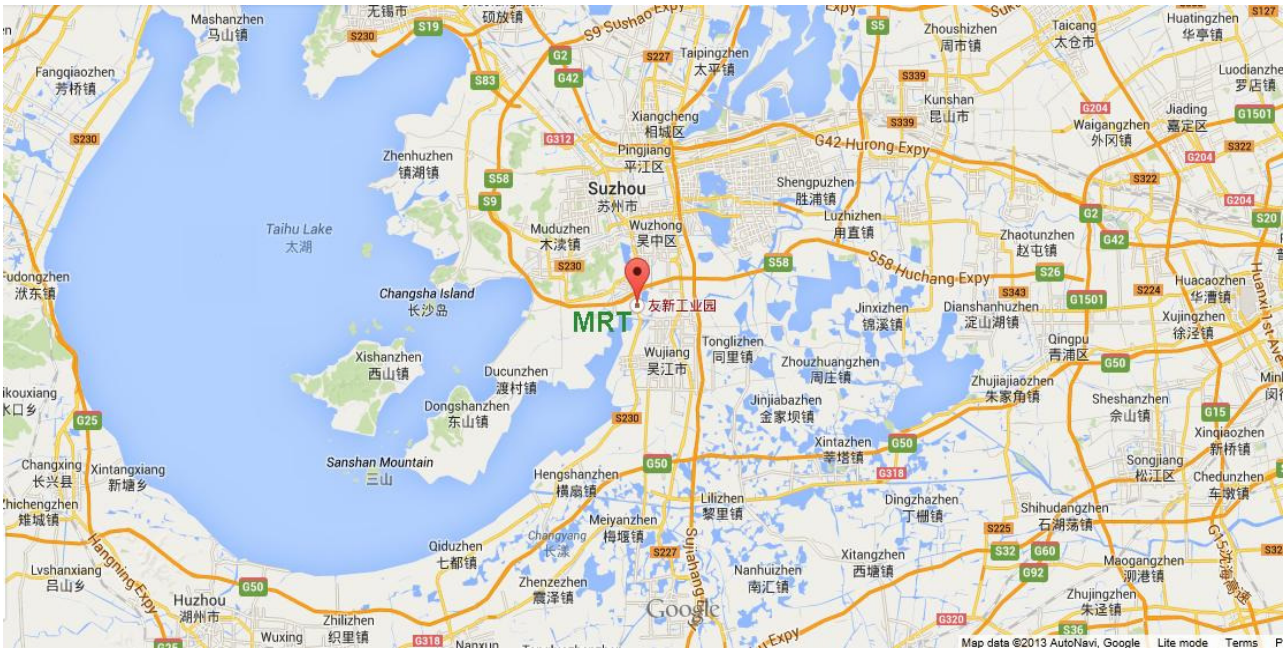
1. INTRODUCTION

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	WIRELESS-ABGN 2X2 NETWORK MINIPCIE ADAPTER
Model No.	WLE200NX, WLE200NX-I
Wi-Fi Specification	802.11a/b/g/n
Frequency Range	**2.4GHz:** For 802.11b/g/n-HT20: 2412 ~ 2462 MHz For 802.11n-HT40: 2422 ~ 2452 MHz **5GHz:** For 802.11a/n-HT20: 5180~5320MHz, 5500~5700MHz, 5745~5825MHz For 802.11n-HT40: 5190~5310MHz, 5510~5670MHz, 5755~5795MHz
Maximum Average Output Power	802.11a: 21.96dBm 802.11n-HT20: 22.29dBm 802.11n-HT40: 22.48dBm
Type of Modulation	802.11a/n: OFDM

2.2. Working Frequencies for this Report

Channel List for 802.11a/n-HT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz
48	5240 MHz	52	5260 MHz	56	5280 MHz
60	5300 MHz	64	5320 MHz	100	5500 MHz
104	5520 MHz	108	5540 MHz	112	5560 MHz
120	5600 MHz	124	5620 MHz	128	5640 MHz
132	5660 MHz	136	5680 MHz	140	5700 MHz
149	5745 MHz	153	5765 MHz	157	5785 MHz
161	5805 MHz	165	5825 MHz	--	--

Channel List for 802.11n-HT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	54	5270 MHz
62	5310 MHz	102	5510 MHz	110	5550 MHz
118	5590 MHz	126	5630 MHz	134	5670 MHz
151	5755 MHz	159	5795 MHz	--	--

2.3. Description of Available Antennas

Antenna Type	Frequency Band (GHz)	Manufacturer	Tx Paths	Max Peak Gain (dBi)	Directional Gain (dBi)	
					For Power	For PSD
Dipole Antenna	2.4	Compex Systems Pte Ltd	2	2	2	5.01
	5		2	2	2	5.01
Panel Antenna	2.4	SMARTANT Inc.	2	4.5	4.5	7.51
	5		2	7	7	10.01

Note 1: The EUT supports Cyclic Delay Diversity (CDD) technology, and CDD signals are correlated.

For CDD transmissions, directional gain is calculated as follows, $N_{ANT} = 2$, $N_{SS} = 1$.

If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,

  Array Gain = 10 log (N_{ANT}/ N_{SS}) dB = 3.01;
- For power measurements on IEEE 802.11 devices,

  Array Gain = 0 dB for $N_{ANT} \leq 4$;

Note 2: 802.11n mode support CDD technology, not include 802.11a/b/g.

2.4. Description of Antenna RF Port

Antenna RF Port		
---	5GHz RF Port	
Software Control Port	Ant 0	Ant 1

2.5. Test Mode

Test Mode	Mode 1: Transmit by 802.11a
	Mode 2: Transmit by 802.11n-HT20
	Mode 3: Transmit by 802.11n-HT40

2.6. Test Software

The test utility software used during testing was “ART”.

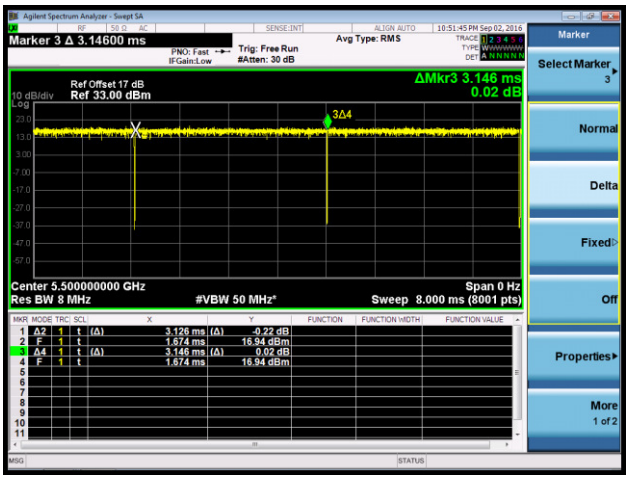
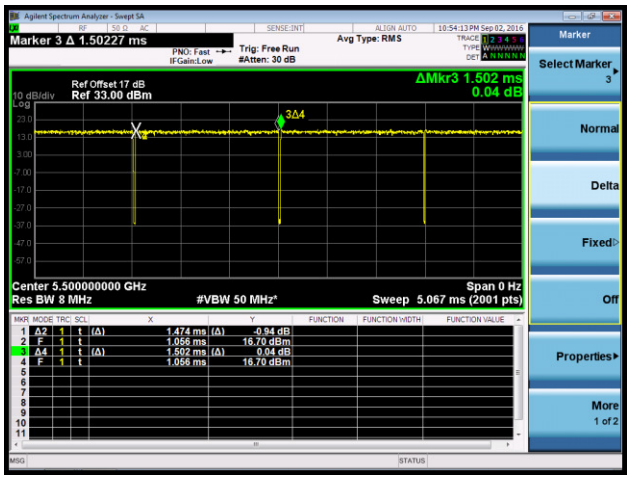
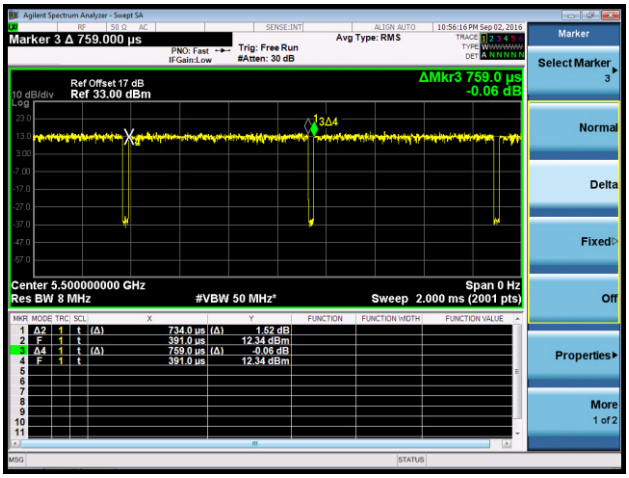
2.7. Device Capabilities

This device contains the following capabilities:

2.4GHz WLAN (DTS) and 5GHz WLAN (UNII).

Note: 5GHz (UNII) 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 = 1MHz, VBW = 3MHz, and detector = average per the guidance of Section B)2)b) of KDB 789033 D02v01r03. 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:

Test Mode	Duty Cycle
802.11a	99.36%
802.11n-HT20	98.14%
802.11n-HT40	96.71%

802.11a	802.11n-HT20
	
802.11n-HT40	
	

2.8. Test Configuration

The **WIRELESS-ABGN 2X2 NETWORK MINIPCIE ADAPTER FCC ID: TK4WLE200NX** was tested per the guidance of KDB 789033 D02v01r03. ANSI C63.10-2013 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 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 C63.10-2013), and the guidance provided in KDB 789033 D02v01r03 were used in the measurement of the **WIRELESS-ABGN 2X2 NETWORK MINIPCIE ADAPTER FCC ID: TK4WLE200NX.**

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 C63.10-2013.

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. A 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 for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 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 **WIRELESS-ABGN 2X2 NETWORK MINIPCIE ADAPTER** uses a unique connector.

Antenna Type	Antenna Connector Type
Dipole Antenna	IPEX connector
Panel Antenna	IPEX connector

Conclusion:

The **WIRELESS-ABGN 2X2 NETWORK MINIPCIE ADAPTER FCC ID: TK4WLE200NX** unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	101209	1 year	2016/11/03
Two-Line V-Network	R&S	ENV216	101683	1 year	2016/11/03
Two-Line V-Network	R&S	ENV216	101684	1 year	2016/11/03
Temperature/Humidity Meter	Yuhuaze	HTC-2	N/A	1 year	2016/12/20
Shielding Anechoic Chamber	Mikebang	Chamber-SR2	N/A	1 year	2017/05/10

Radiated Emissions - AC2

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210182	1 year	2017/08/03
EMI Test Receiver	R&S	ESR7	101209	1 year	2016/11/03
Preamplifier	Schwarzbeck	BBV 9721	9721-008	1 year	2017/04/16
Loop Antenna	Schwarzbeck	FMZB1519	1519-041	1 year	2016/12/15
TRILOG Antenna	Schwarzbeck	VULB9168	662	1 year	2016/11/07
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1167	1 year	2016/11/07
Broadband Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170549	1 year	2016/11/07
Digital Thermometer & Hygrometer	Minggao	N/A	N/A	1 year	2016/11/30
Anechoic Chamber	RIKEN	Chamber-AC2	N/A	1 year	2017/05/10

Conducted Test Equipment - TR3

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MY52090106	1 year	2017/05/08
Spectrum Analyzer	Agilent	E4447A	MY45300136	1 year	2016/12/08
USB Wideband Power Sensor	Boonton	55006	8911	1 year	2017/05/08
Temperature/Humidity Meter	Yuhuaze	HTC-2	N/A	1 year	2016/12/20

Software	Version	Function
e3	V8.3.5	EMI Test Software

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 - SR2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 25GHz: 4.76dB

7. TEST RESULT

7.1. Summary

Company Name: **WIRELESS-ABGN 2X2 NETWORK MINIPCIE ADAPTER**

FCC ID: **TK4WLE200NX**

Data Rate(s) Tested: **6Mbps ~ 54Mbps (a);**
13/14.4Mbps ~ 130/144.4Mbps (n-HT20);
27/30Mbps ~ 270/300Mbps (n-HT40);
58.6/65Mbps ~ 780/866.6Mbps (ac-VHT80MHz)

FCC 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)(iv), (2), (3)	Maximum Conducted Output Power	≤ 24 dBm U-NII-1 ≤ 30 dBm U-NII-2A&2C ≤ 30 dBm U-NII-3		Pass	Section 7.4
15.407(h)(1)	Transmit Power Control	≤ 24 dBm		Pass	Section 7.5
15.407(a)(1)(iv), (2), (3), (5)	Peak Power Spectral Density	≤ 11 dBm/MHz U-NII-1 & U-NII-2A&2C ≤ 30 dBm/500kHz U-NII-3		Pass	Section 7.6
15.407(g)	Frequency Stability	N/A		Pass	Section 7.7
15.407(b)(1), (2), (3), (4)(i)	Undesirable Emissions	≤ -27dBm/MHz EIRP Detail see section 7.8	Radiated	Pass	Section 7.8 & 7.9
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 limaits detailed in 15.209		Pass	
15.207	AC Conducted Emissions	< FCC 15.207 limits	Line Conducted	Pass	Section 7.10

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

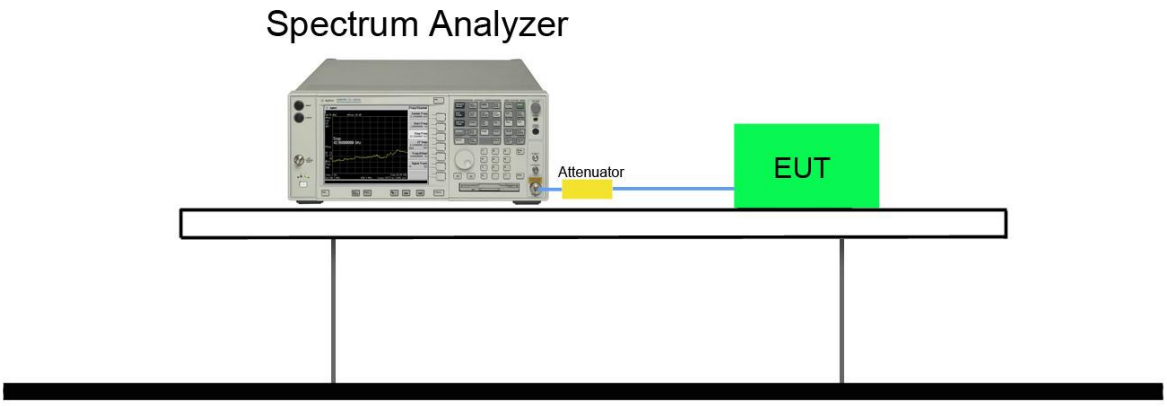
7.2.2. Test Procedure used

KDB 789033 D02v01r03 - 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

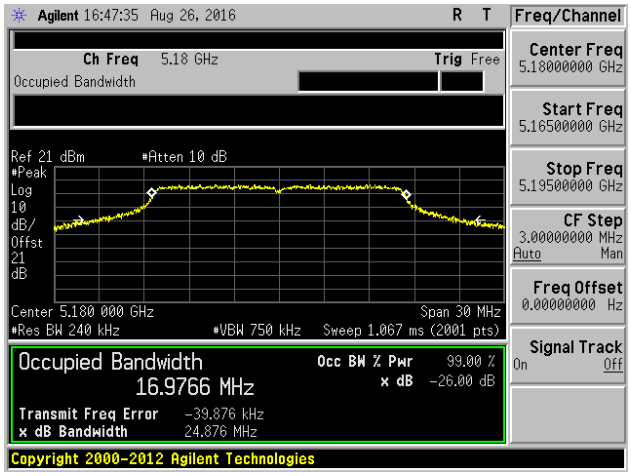
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Ant 0						
802.11a	6	36	5180	24.88	16.98	Pass
802.11a	6	44	5220	25.55	16.99	Pass
802.11a	6	48	5240	24.78	16.98	Pass
802.11a	6	52	5260	25.47	16.95	Pass
802.11a	6	60	5300	24.72	16.98	Pass
802.11a	6	64	5320	25.01	16.97	Pass
802.11a	6	100	5500	27.32	17.01	Pass
802.11a	6	120	5600	27.93	17.11	Pass
802.11a	6	140	5700	28.20	17.04	Pass
802.11a	6	149	5745	27.38	17.07	Pass
802.11a	6	157	5785	27.51	17.05	Pass
802.11a	6	165	5825	27.55	17.55	Pass
Ant 1						
802.11a	6	36	5180	24.61	16.93	Pass
802.11a	6	44	5220	25.31	16.93	Pass
802.11a	6	48	5240	24.47	16.97	Pass
802.11a	6	52	5260	24.62	17.00	Pass
802.11a	6	60	5300	24.48	16.95	Pass
802.11a	6	64	5320	24.99	16.90	Pass
802.11a	6	100	5500	25.31	17.00	Pass
802.11a	6	120	5600	24.16	17.03	Pass
802.11a	6	140	5700	24.75	16.97	Pass
802.11a	6	149	5745	24.46	16.96	Pass
802.11a	6	157	5785	24.88	16.98	Pass
802.11a	6	165	5825	25.75	17.01	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Ant 0 / Ant 0 + 1						
802.11n-HT20	13	36	5180	27.45	18.16	Pass
802.11n-HT20	13	44	5220	28.63	18.07	Pass
802.11n-HT20	13	48	5240	28.58	18.11	Pass
802.11n-HT20	13	52	5260	26.98	18.08	Pass
802.11n-HT20	13	60	5300	25.59	18.07	Pass
802.11n-HT20	13	64	5320	25.42	18.05	Pass
802.11n-HT20	13	100	5500	27.17	18.11	Pass
802.11n-HT20	13	120	5600	27.81	18.13	Pass
802.11n-HT20	13	140	5700	28.38	18.14	Pass
802.11n-HT20	13	149	5745	27.81	18.11	Pass
802.11n-HT20	13	157	5785	28.23	18.11	Pass
802.11n-HT20	13	165	5825	26.46	18.14	Pass
802.11n-HT40	27	38	5190	49.39	36.54	Pass
802.11n-HT40	27	46	5230	49.46	36.50	Pass
802.11n-HT40	27	54	5270	47.84	36.44	Pass
802.11n-HT40	27	62	5310	48.85	36.45	Pass
802.11n-HT40	27	102	5510	49.28	36.57	Pass
802.11n-HT40	27	118	5590	47.20	36.49	Pass
802.11n-HT40	27	134	5670	47.26	36.52	Pass
802.11n-HT40	27	151	5755	47.38	36.52	Pass
802.11n-HT40	27	159	5795	46.37	36.50	Pass

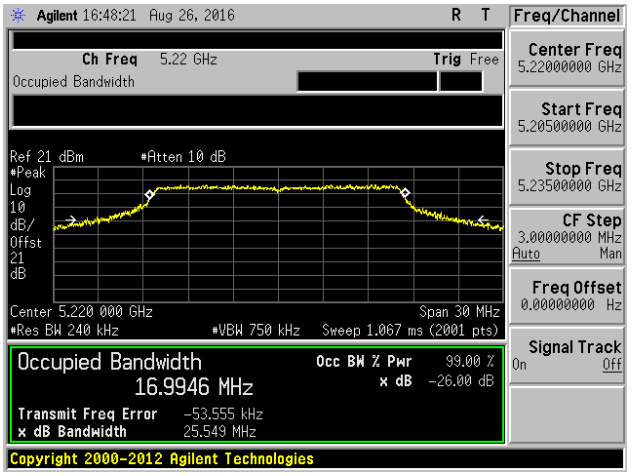
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Ant 1 / Ant 0 + 1						
802.11n-HT20	13	36	5180	27.26	17.97	Pass
802.11n-HT20	13	44	5220	26.12	17.97	Pass
802.11n-HT20	13	48	5240	25.01	17.98	Pass
802.11n-HT20	13	52	5260	25.14	17.96	Pass
802.11n-HT20	13	60	5300	24.98	17.97	Pass
802.11n-HT20	13	64	5320	24.97	18.02	Pass
802.11n-HT20	13	100	5500	25.37	18.04	Pass
802.11n-HT20	13	120	5600	24.68	18.00	Pass
802.11n-HT20	13	140	5700	26.18	17.99	Pass
802.11n-HT20	13	149	5745	26.15	18.00	Pass
802.11n-HT20	13	157	5785	26.49	17.99	Pass
802.11n-HT20	13	165	5825	24.64	18.02	Pass
802.11n-HT40	27	38	5190	47.19	36.56	Pass
802.11n-HT40	27	46	5230	46.68	36.51	Pass
802.11n-HT40	27	54	5270	46.79	36.47	Pass
802.11n-HT40	27	62	5310	47.00	36.42	Pass
802.11n-HT40	27	102	5510	47.94	36.52	Pass
802.11n-HT40	27	118	5590	47.23	36.55	Pass
802.11n-HT40	27	134	5670	48.48	36.51	Pass
802.11n-HT40	27	151	5755	46.22	36.50	Pass
802.11n-HT40	27	159	5795	45.23	36.47	Pass

802.11a 26dB Bandwidth & 99% Bandwidth - Ant 0

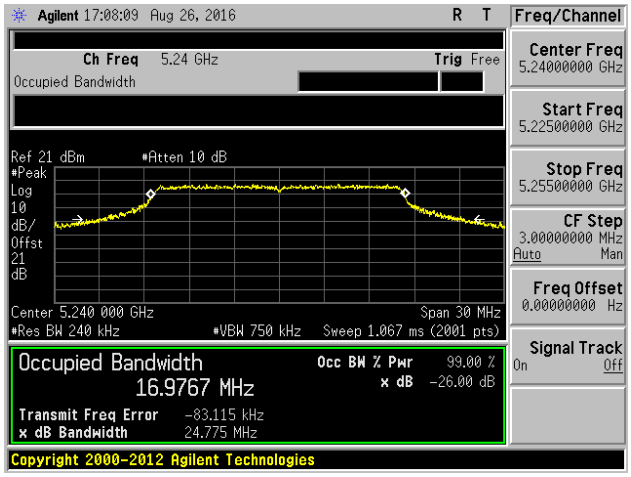
Channel 36 (5180MHz)



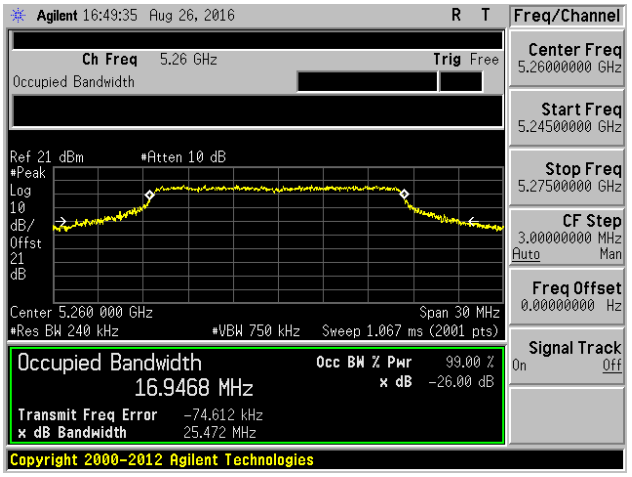
Channel 44 (5220MHz)



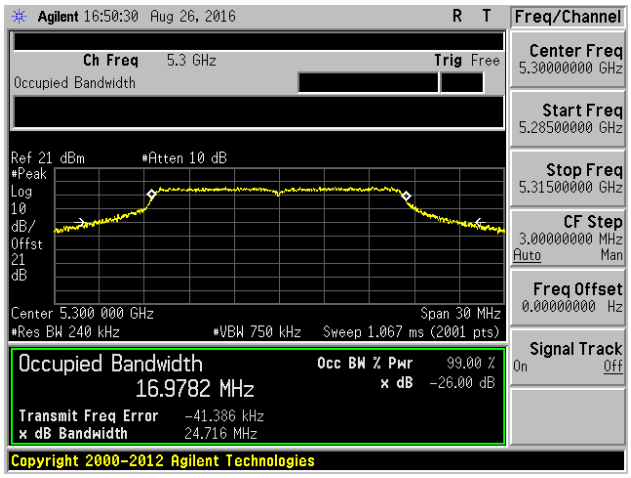
Channel 48 (5240MHz)



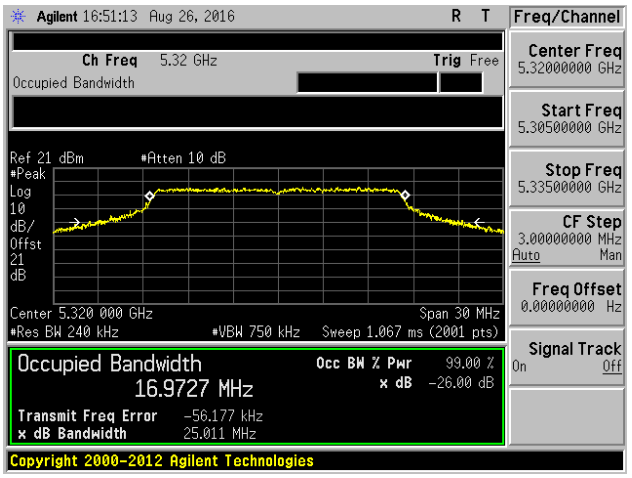
Channel 52 (5260MHz)



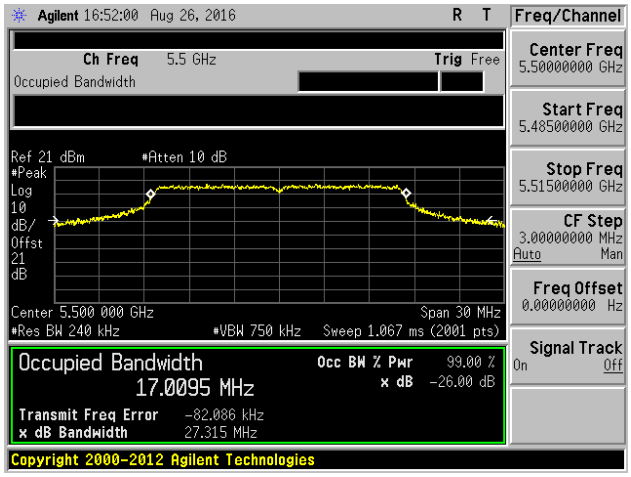
Channel 60 (5300MHz)



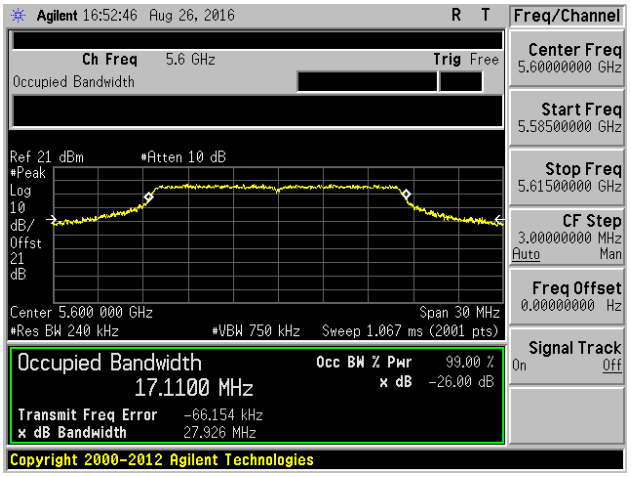
Channel 64 (5320MHz)



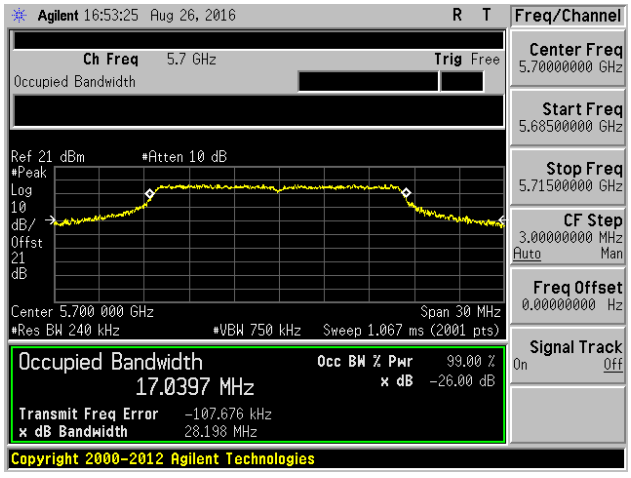
Channel 100 (5500MHz)



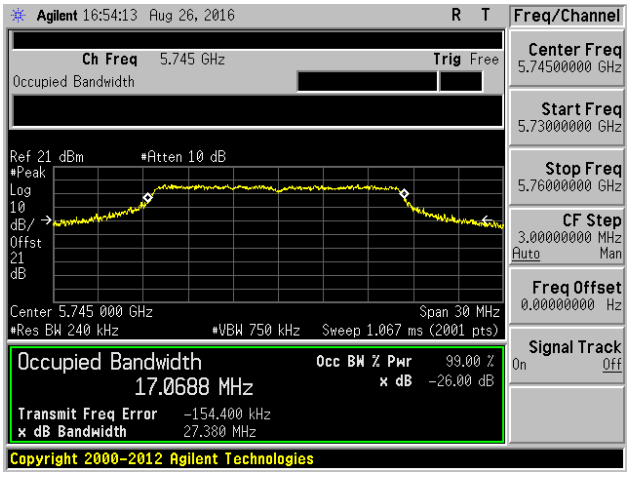
Channel 120 (5600MHz)



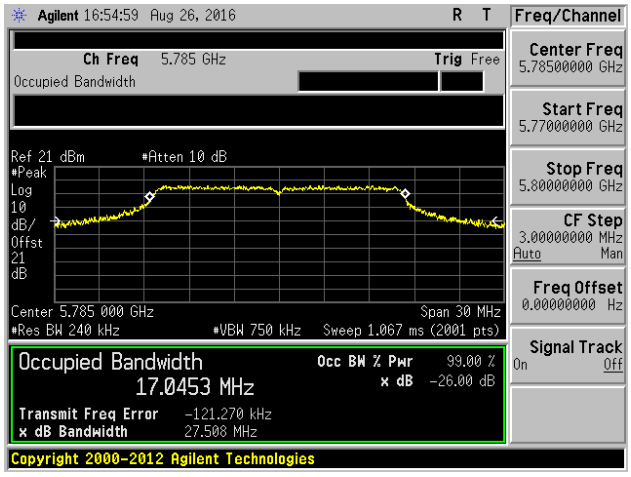
Channel 140 (5700MHz)



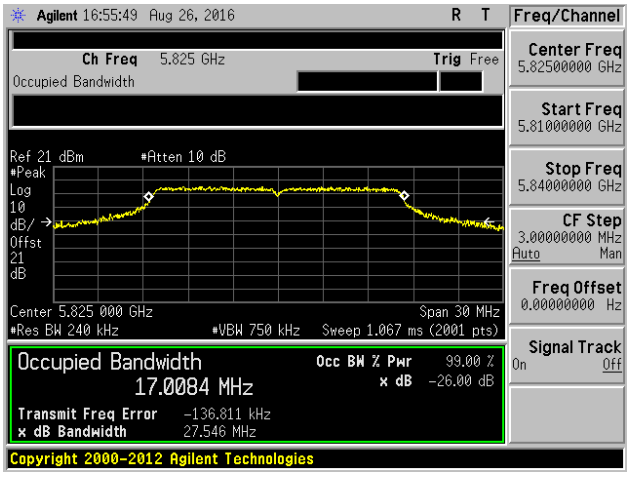
Channel 149 (5745MHz)



Channel 157 (5785MHz)

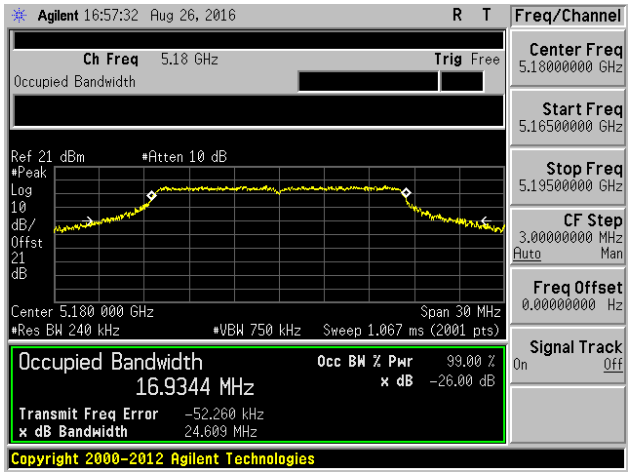


Channel 165 (5825MHz)

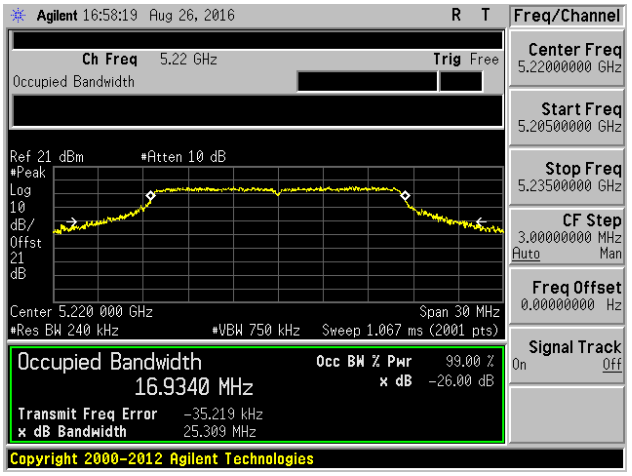


802.11a 26dB Bandwidth & 99% Bandwidth - Ant 1

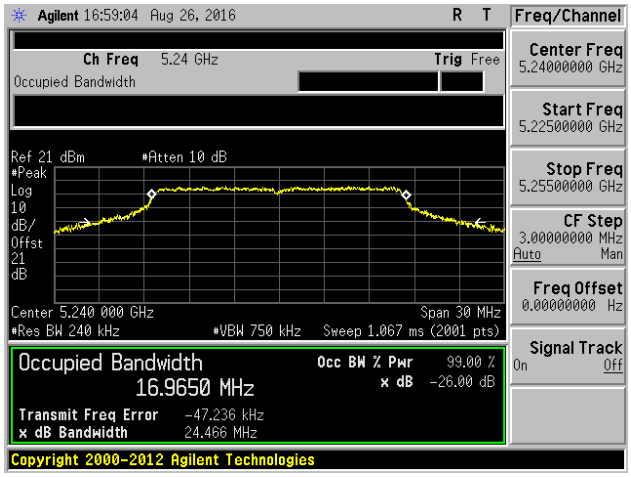
Channel 36 (5180MHz)



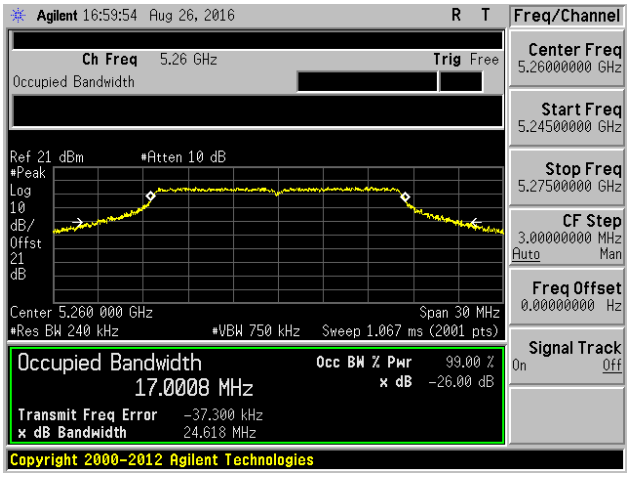
Channel 44 (5220MHz)



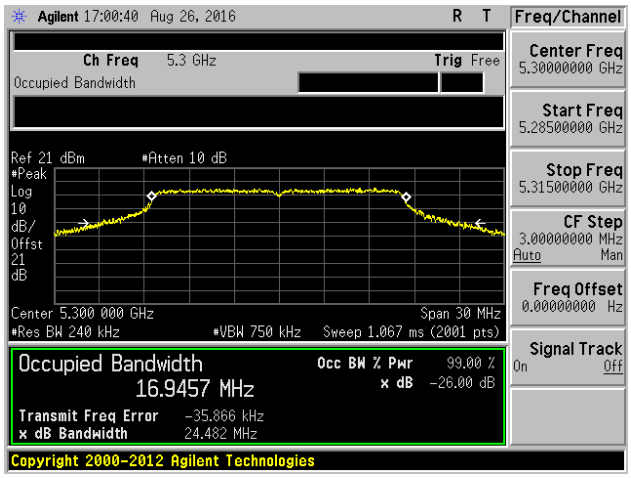
Channel 48 (5240MHz)



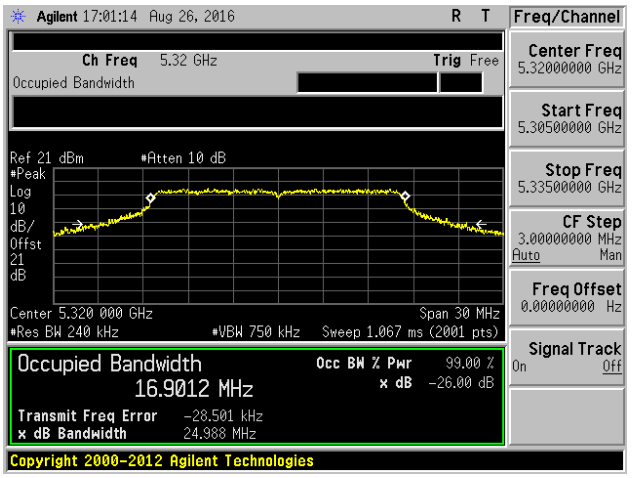
Channel 52 (5260MHz)



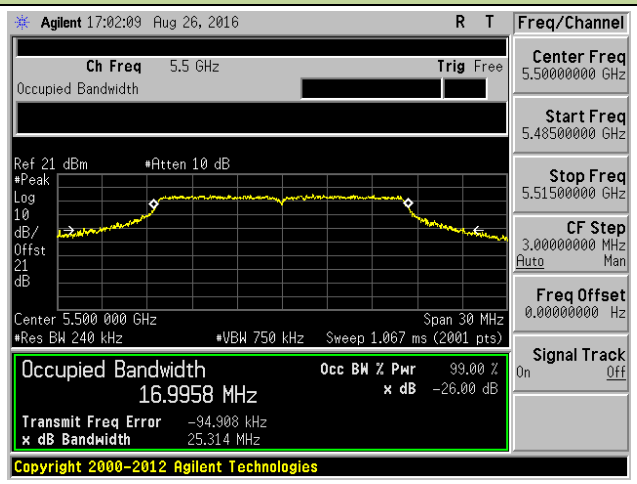
Channel 60 (5300MHz)



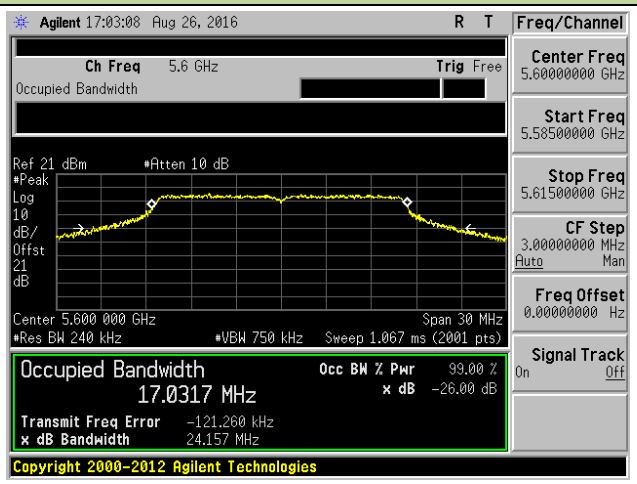
Channel 64 (5320MHz)



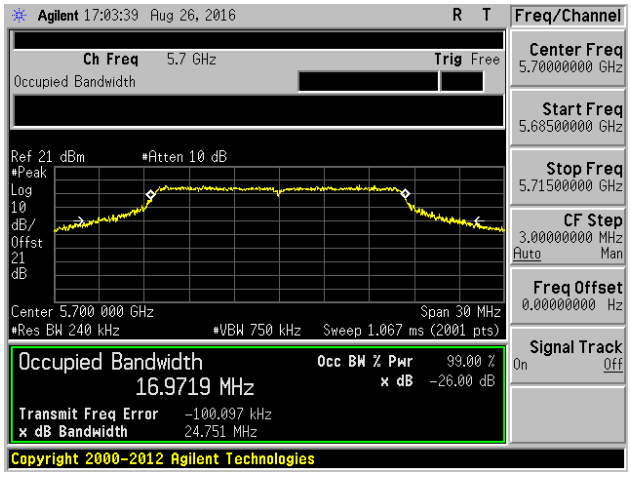
Channel 100 (5500MHz)



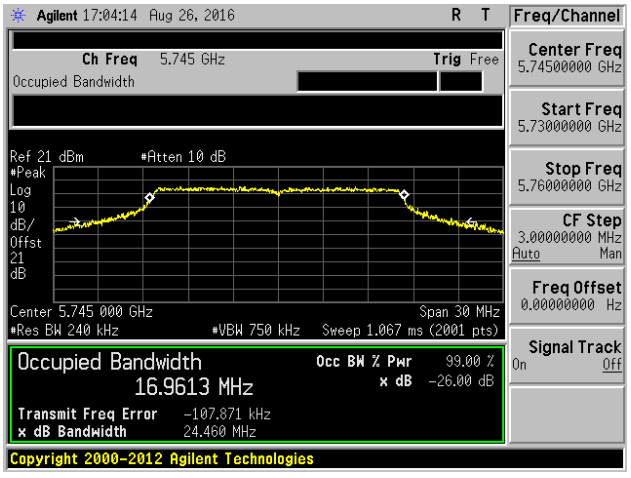
Channel 120 (5600MHz)



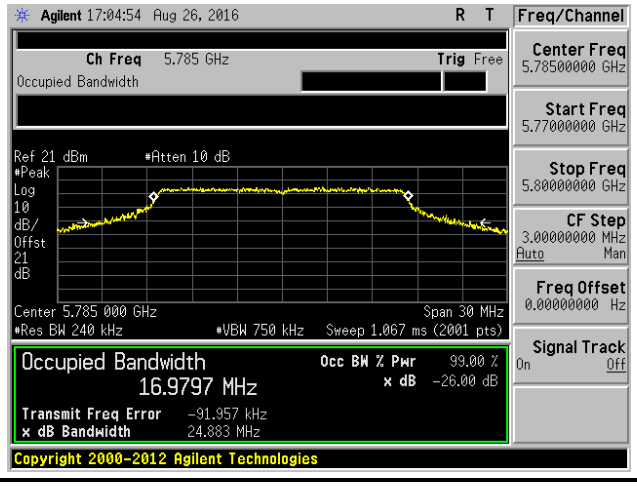
Channel 140 (5700MHz)



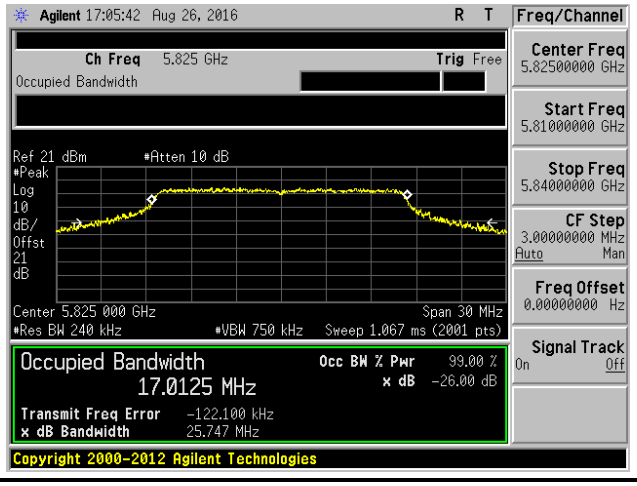
Channel 149 (5745MHz)



Channel 157 (5785MHz)

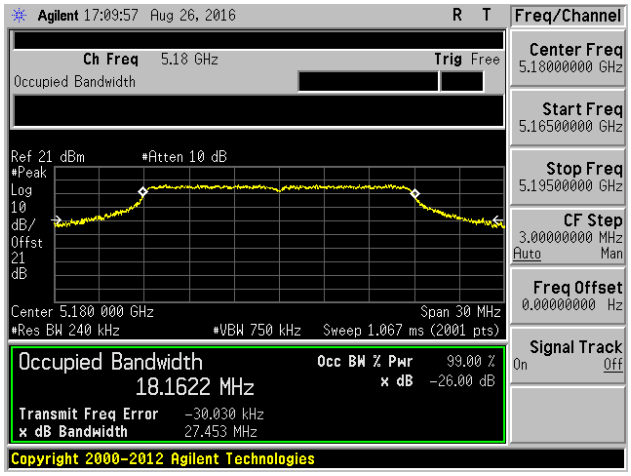


Channel 165 (5825MHz)

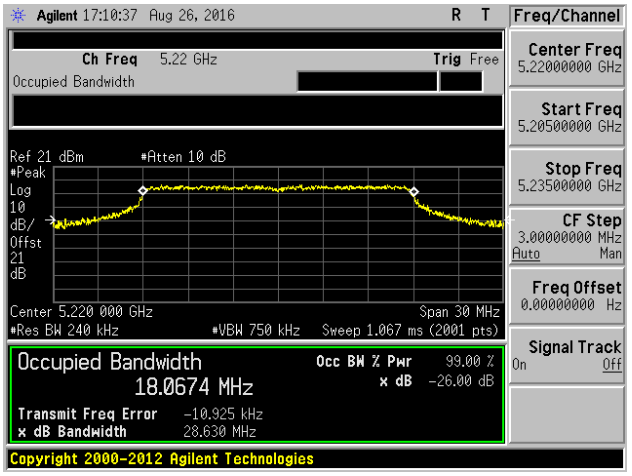


802.11n-HT20 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1

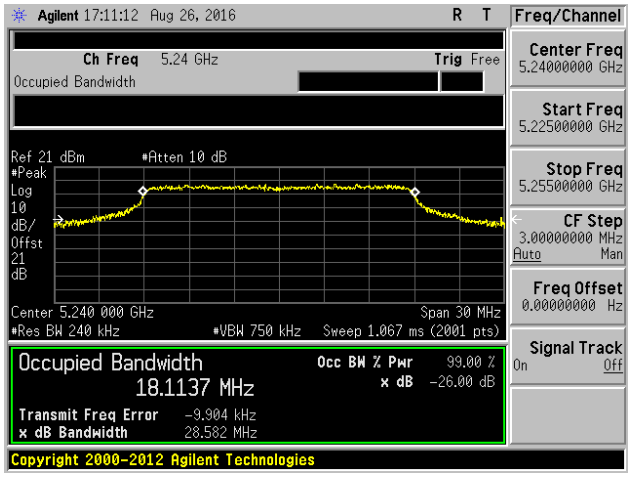
Channel 36 (5180MHz)



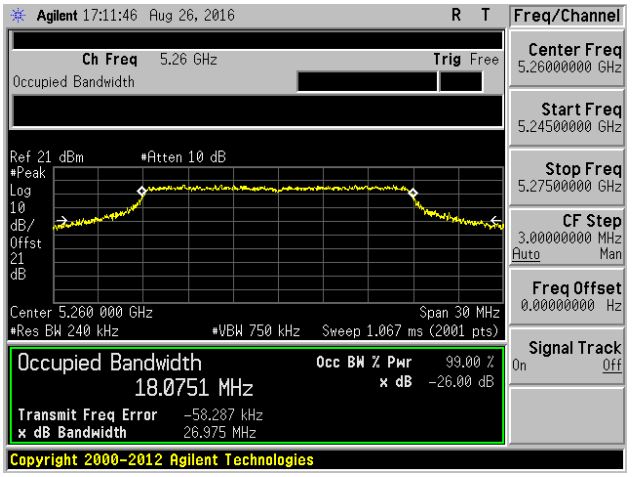
Channel 44 (5220MHz)



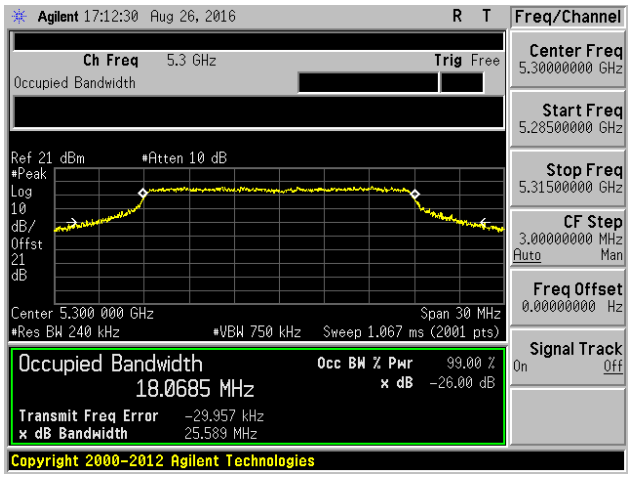
Channel 48 (5240MHz)



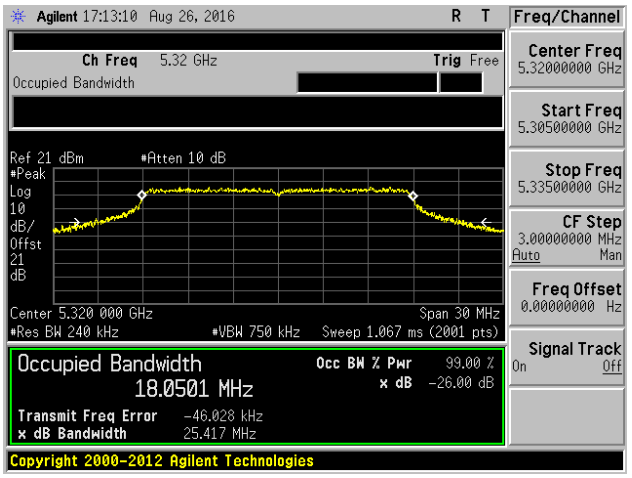
Channel 52 (5260MHz)



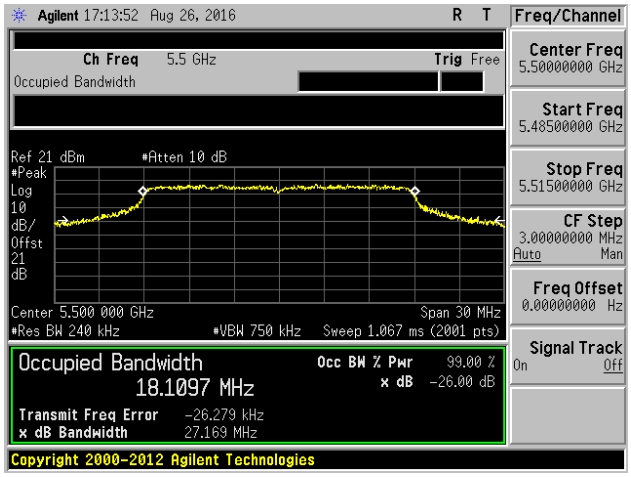
Channel 60 (5300MHz)



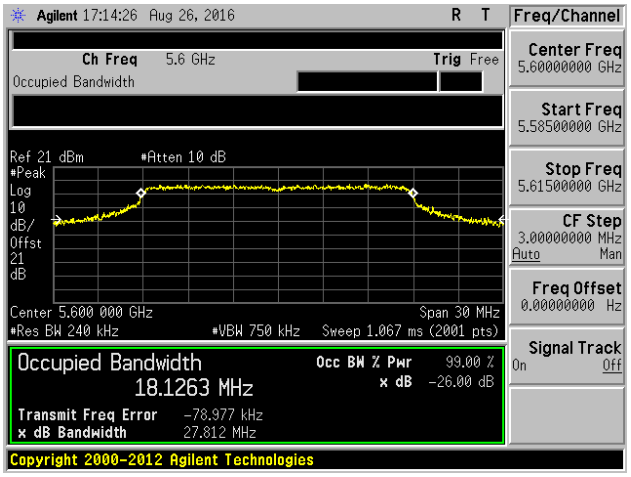
Channel 64 (5320MHz)



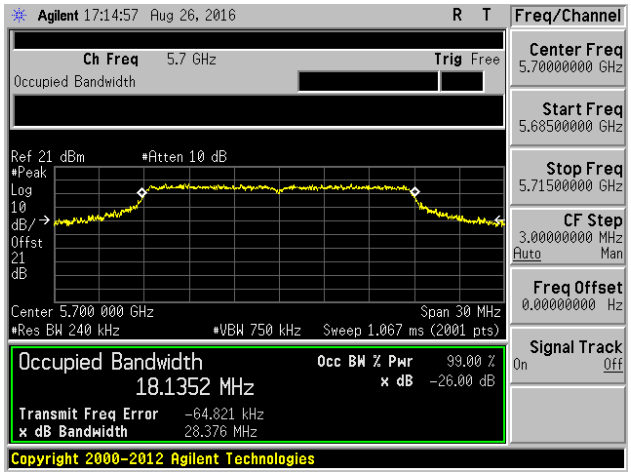
Channel 100 (5500MHz)



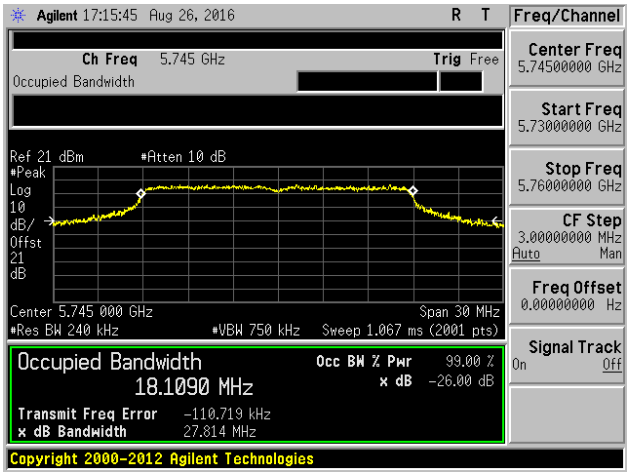
Channel 120 (5600MHz)



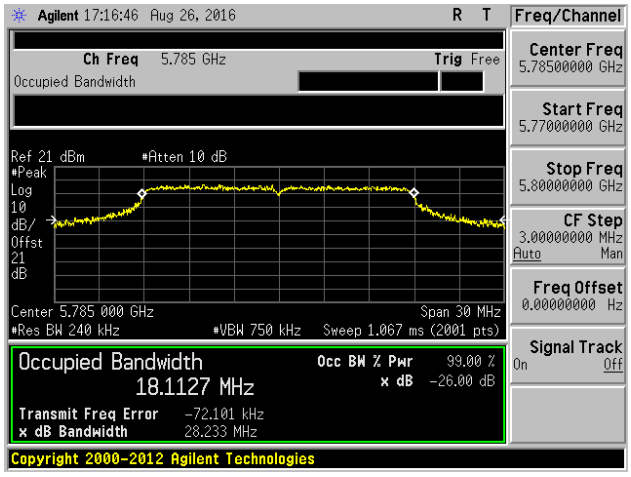
Channel 140 (5700MHz)



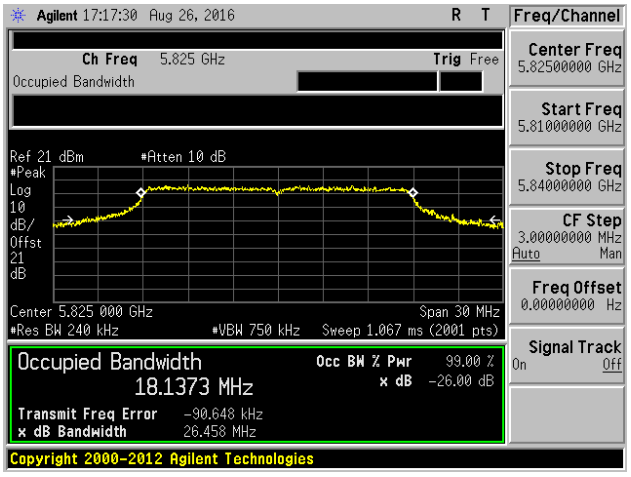
Channel 149 (5745MHz)



Channel 157 (5785MHz)

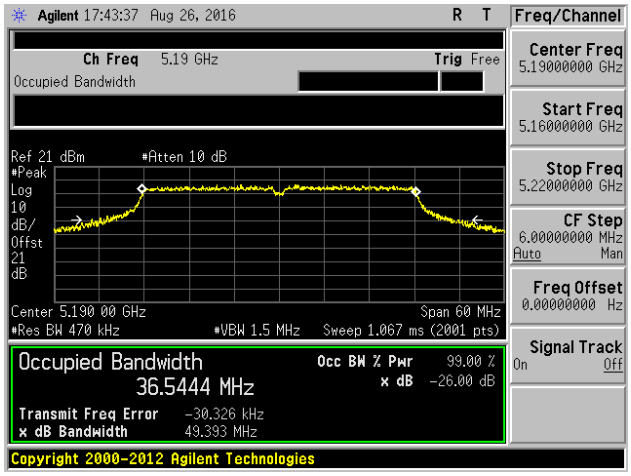


Channel 165 (5825MHz)

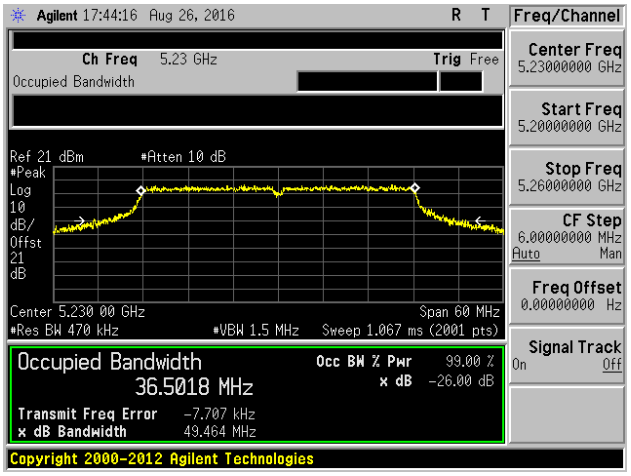


802.11n-HT40 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1

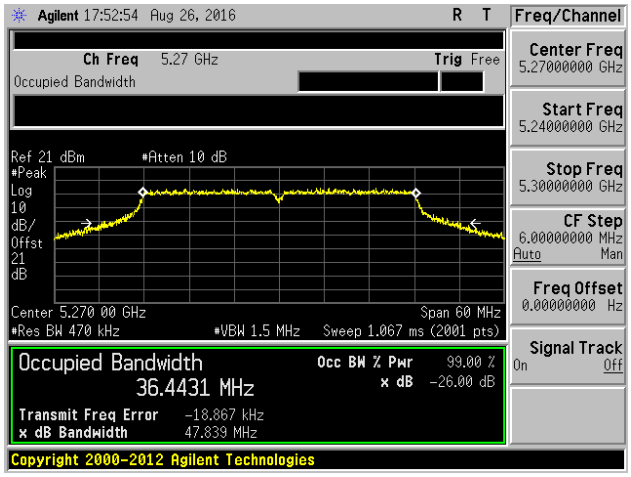
Channel 38 (5190MHz)



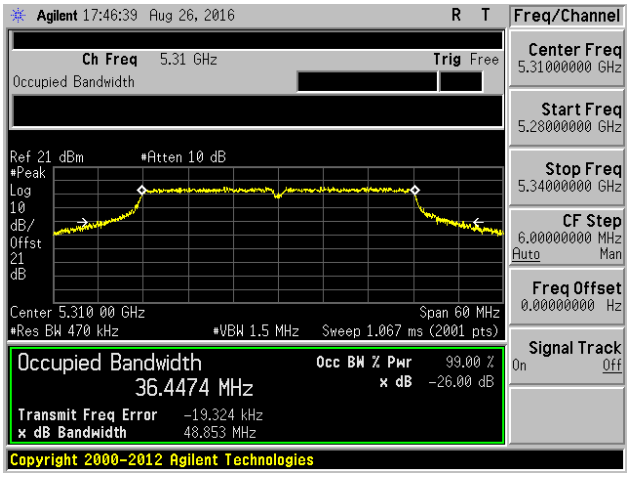
Channel 46 (5230MHz)



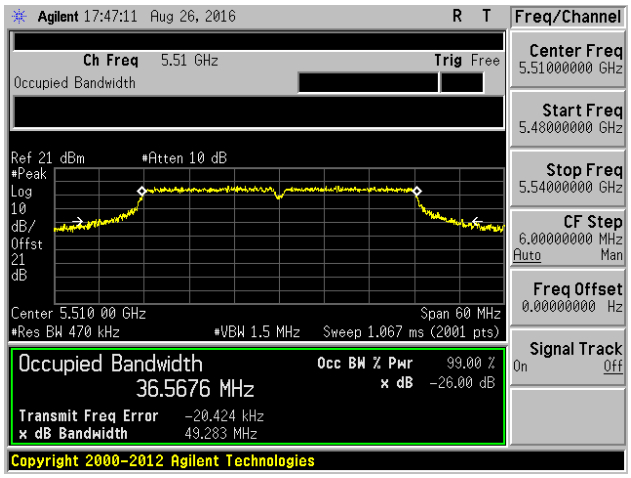
Channel 54 (5270MHz)



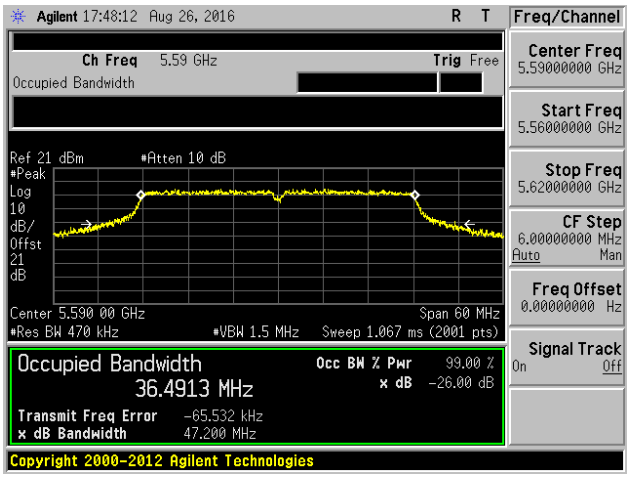
Channel 62 (5310MHz)



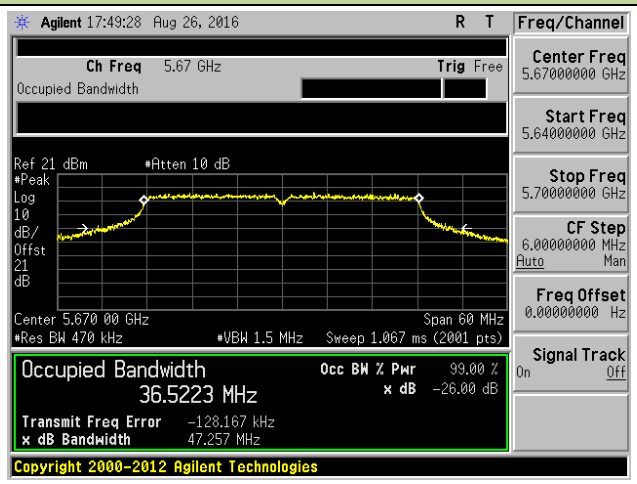
Channel 62 (5510MHz)



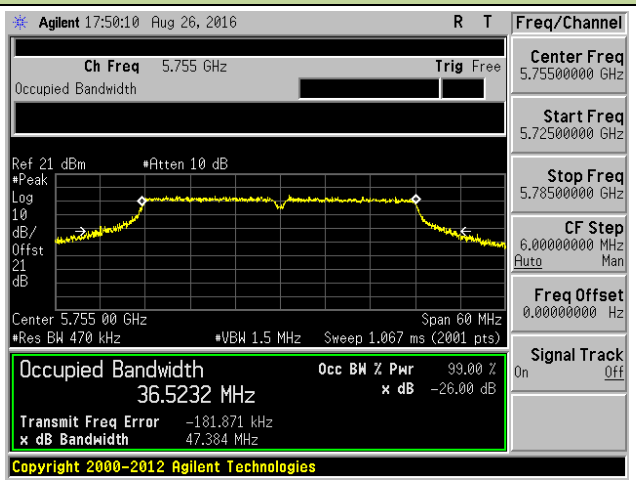
Channel 102 (5590MHz)



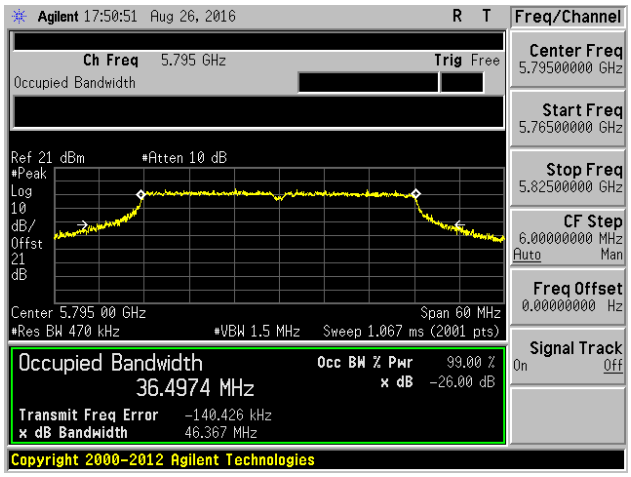
Channel 134 (5670MHz)



Channel 151 (5755MHz)

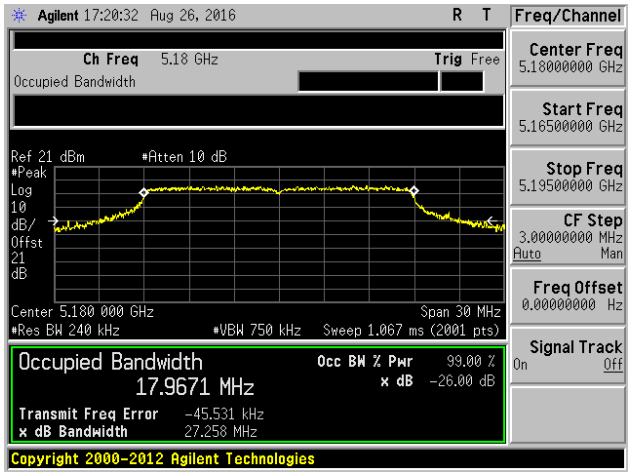


Channel 159 (5795MHz)

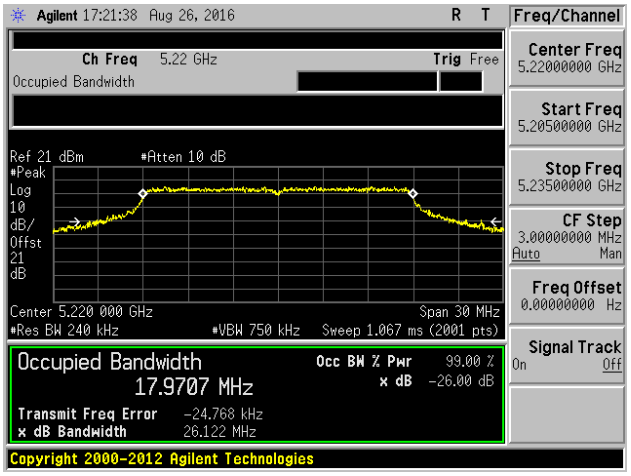


802.11n-HT20 26dB Bandwidth & 99% Bandwidth - Ant 1 / Ant 0 + 1

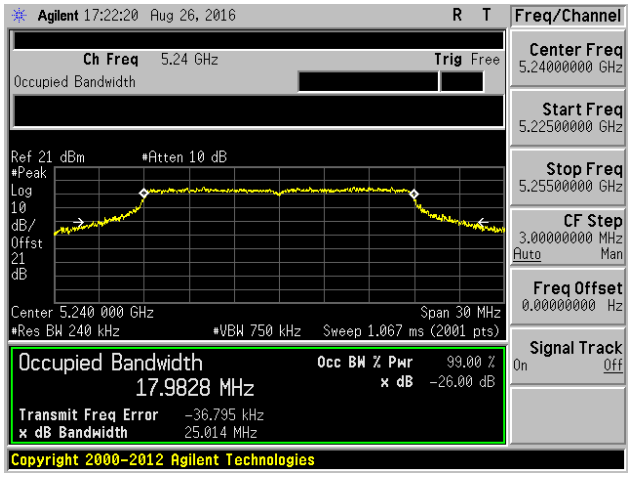
Channel 36 (5180MHz)



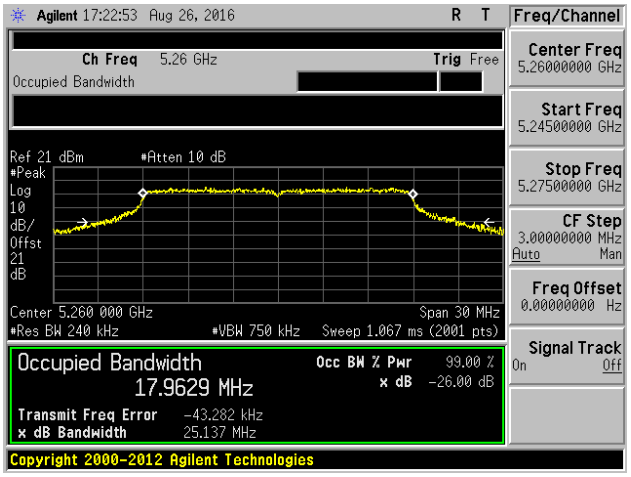
Channel 44 (5220MHz)



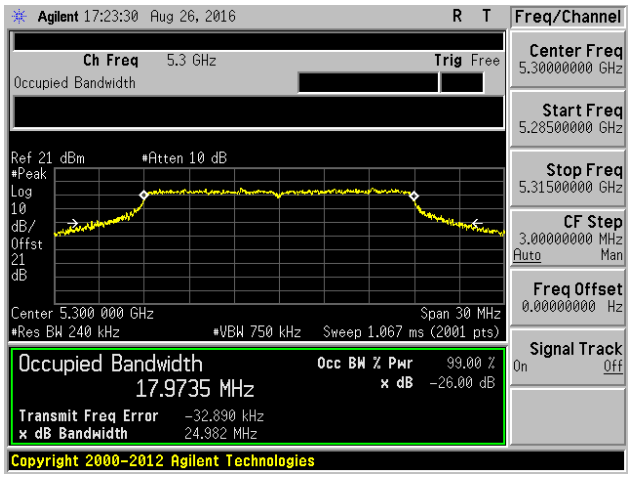
Channel 48 (5240MHz)



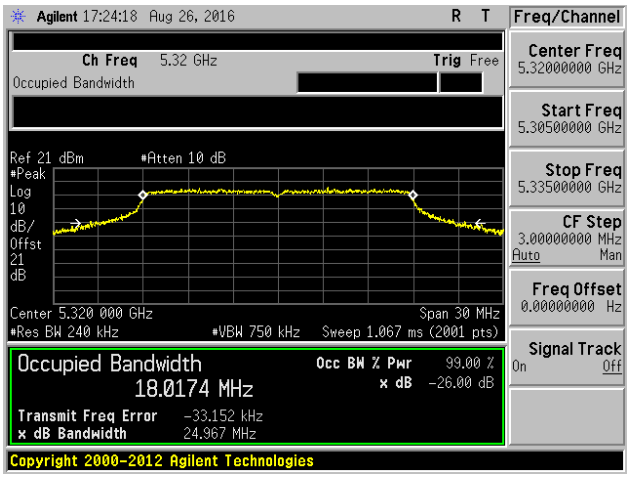
Channel 52 (5260MHz)



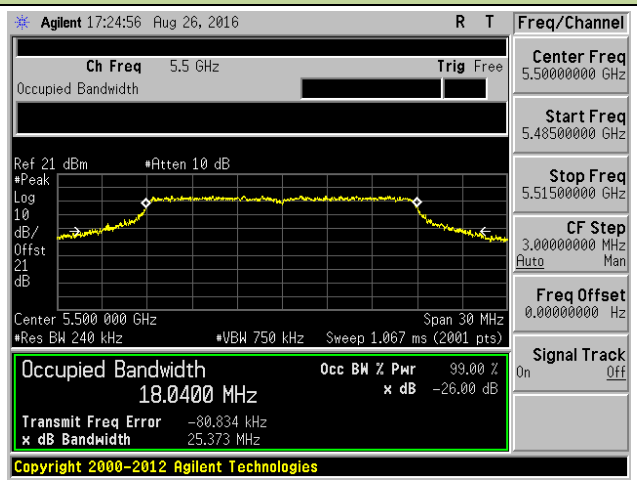
Channel 60 (5300MHz)



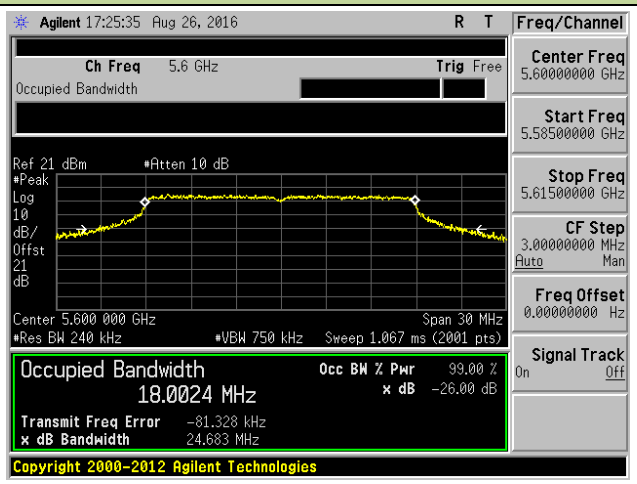
Channel 64 (5320MHz)



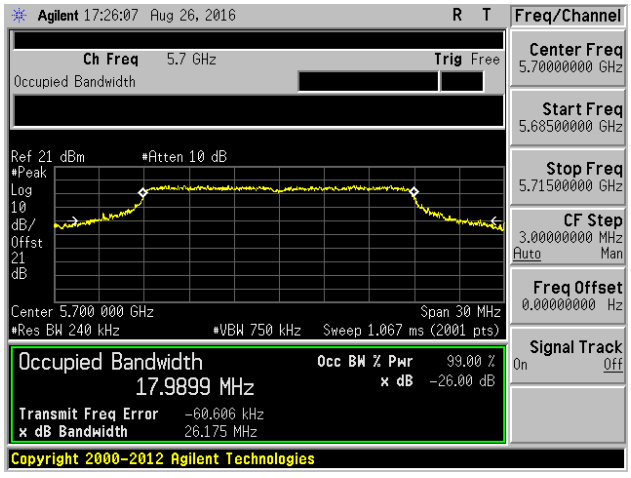
Channel 100 (5500MHz)



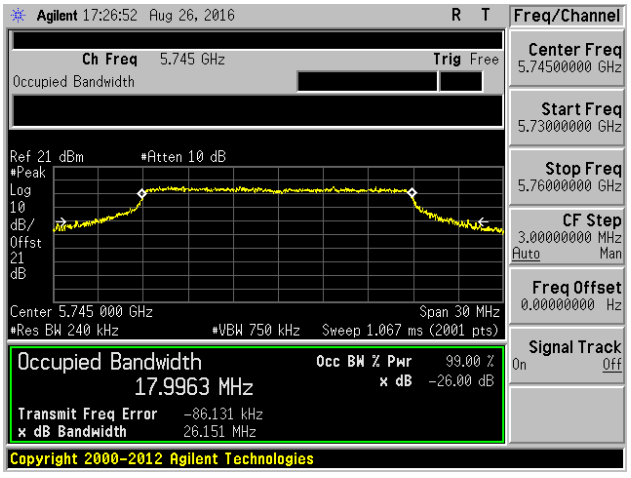
Channel 120 (5600MHz)



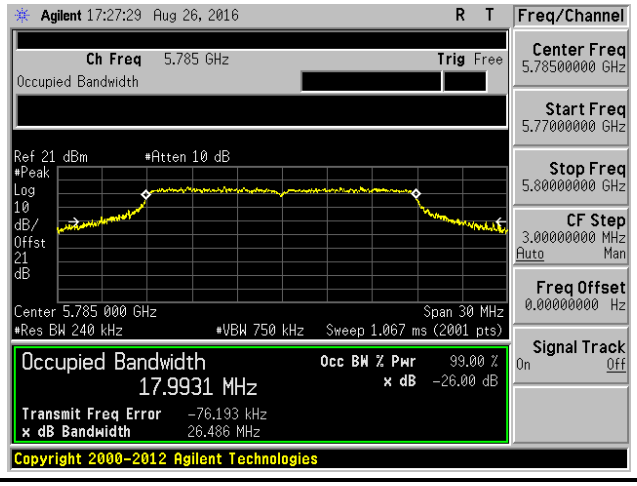
Channel 140 (5700MHz)



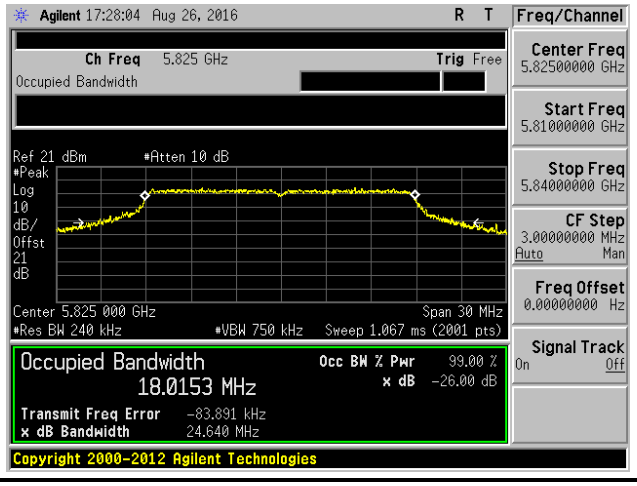
Channel 149 (5745MHz)



Channel 157 (5785MHz)

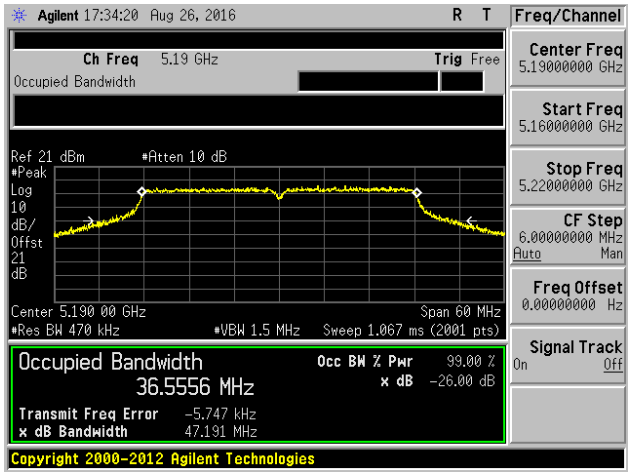


Channel 165 (5825MHz)

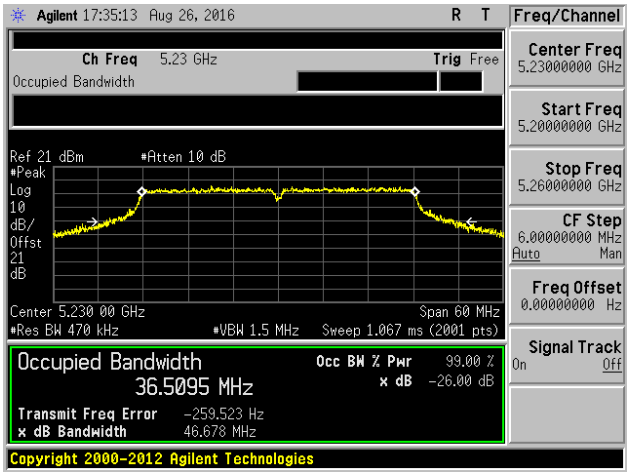


802.11n-HT40 26dB Bandwidth & 99% Bandwidth - Ant 1 / Ant 0 + 1

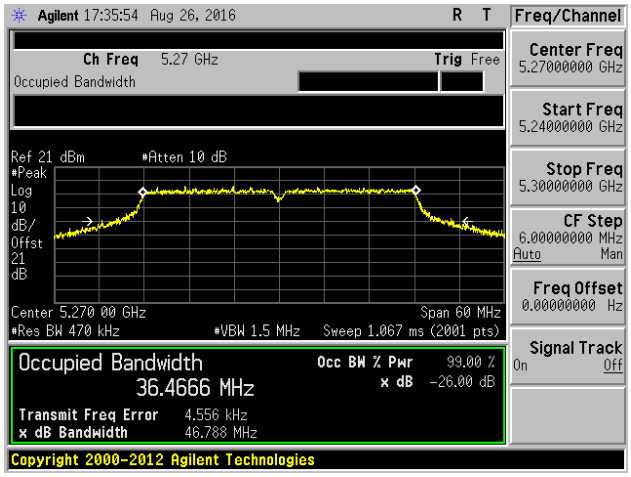
Channel 38 (5190MHz)



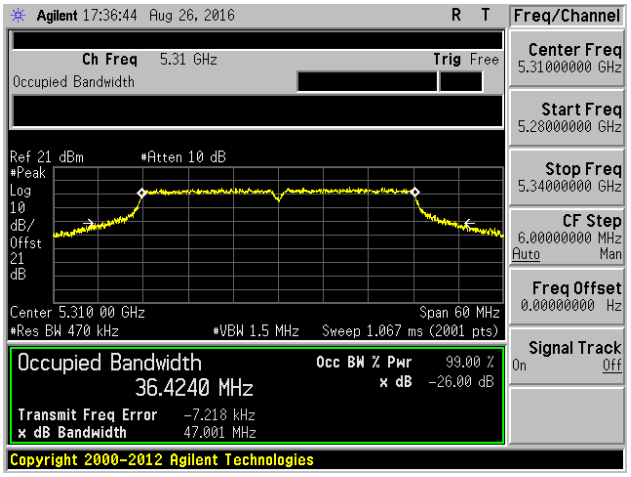
Channel 46 (5230MHz)



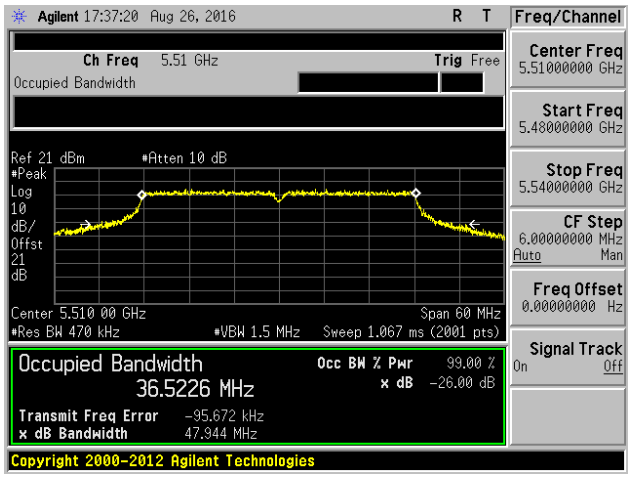
Channel 54 (5270MHz)



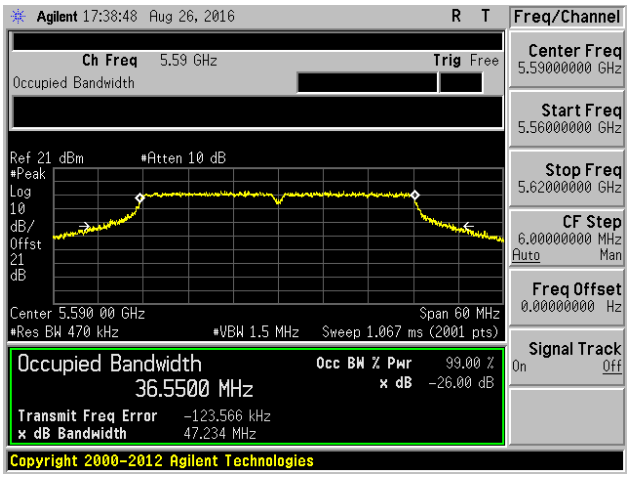
Channel 62 (5310MHz)

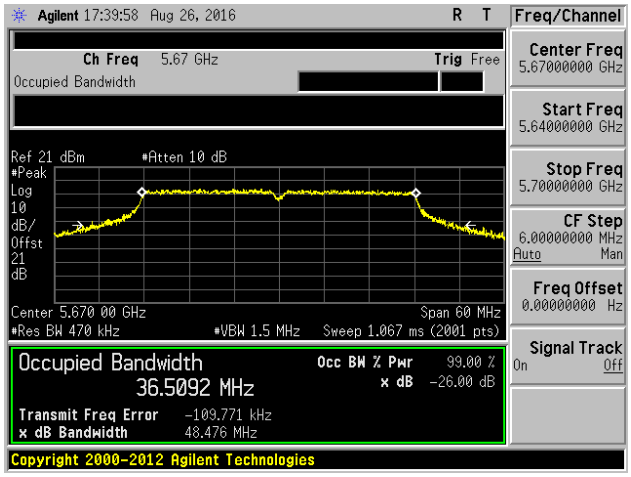
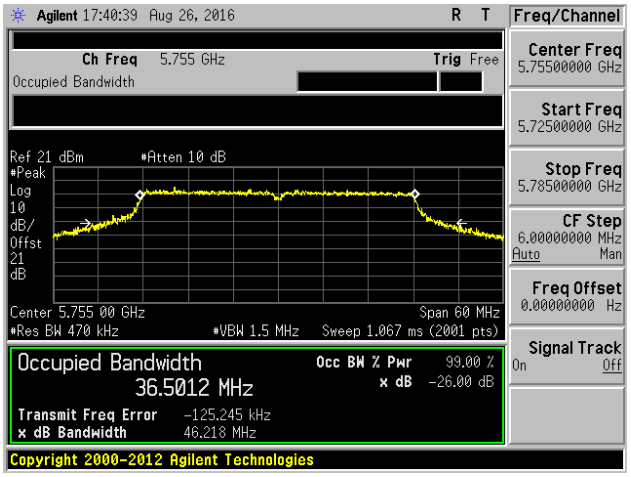
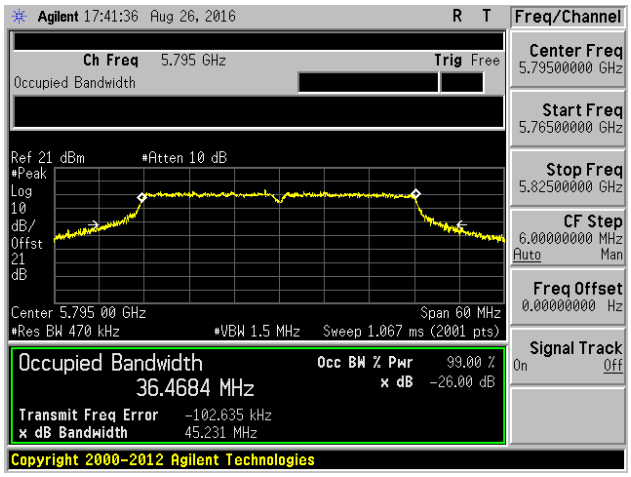


Channel 62 (5510MHz)



Channel 102 (5590MHz)



Channel 134 (5670MHz)	Channel 151 (5755MHz)
	
Channel 159 (5795MHz)	
	

7.3. 6dB Bandwidth Measurement

7.3.1. Test Limit

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

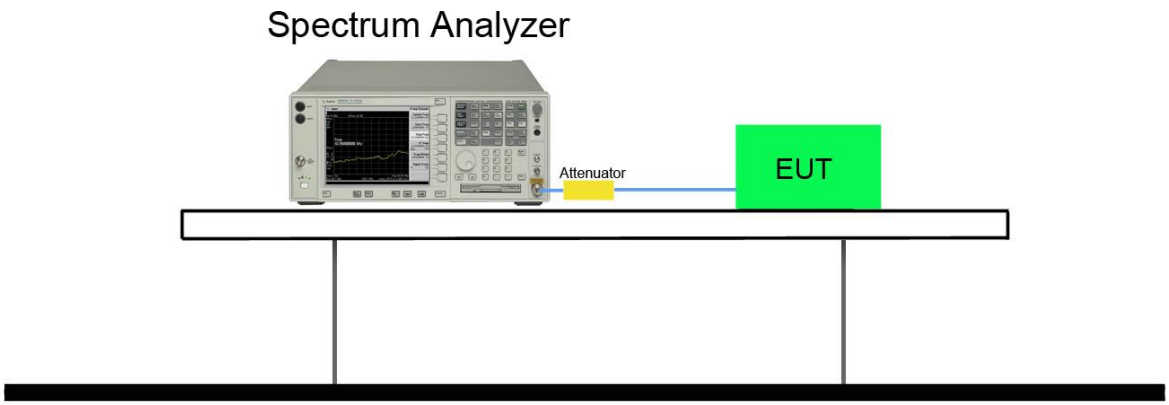
7.3.2. Test Procedure used

KDB 789033 D02v01r03 - 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

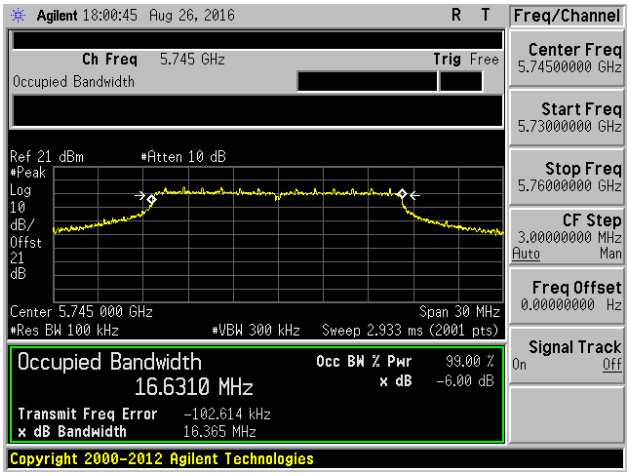


7.3.5. Test Result

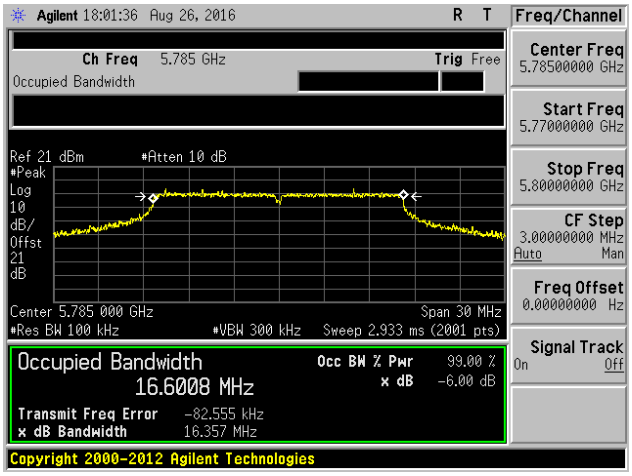
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant 0						
802.11a	6	149	5745	16.37	≥ 0.5	Pass
802.11a	6	157	5785	16.36	≥ 0.5	Pass
802.11a	6	165	5825	16.38	≥ 0.5	Pass
Ant 1						
802.11a	6	149	5745	16.39	≥ 0.5	Pass
802.11a	6	157	5785	16.39	≥ 0.5	Pass
802.11a	6	165	5825	16.38	≥ 0.5	Pass
Ant 0 / Ant 0 + 1						
802.11n-HT20	13	149	5745	17.55	≥ 0.5	Pass
802.11n-HT20	13	157	5785	17.65	≥ 0.5	Pass
802.11n-HT20	13	165	5825	17.59	≥ 0.5	Pass
802.11n-HT40	27	151	5755	35.96	≥ 0.5	Pass
802.11n-HT40	27	159	5795	35.72	≥ 0.5	Pass
Ant 1 / Ant 0 + 1						
802.11n-HT20	13	149	5745	17.58	≥ 0.5	Pass
802.11n-HT20	13	157	5785	17.58	≥ 0.5	Pass
802.11n-HT20	13	165	5825	17.62	≥ 0.5	Pass
802.11n-HT40	27	151	5755	36.10	≥ 0.5	Pass
802.11n-HT40	27	159	5795	36.36	≥ 0.5	Pass

802.11a 6dB Bandwidth - Ant 0

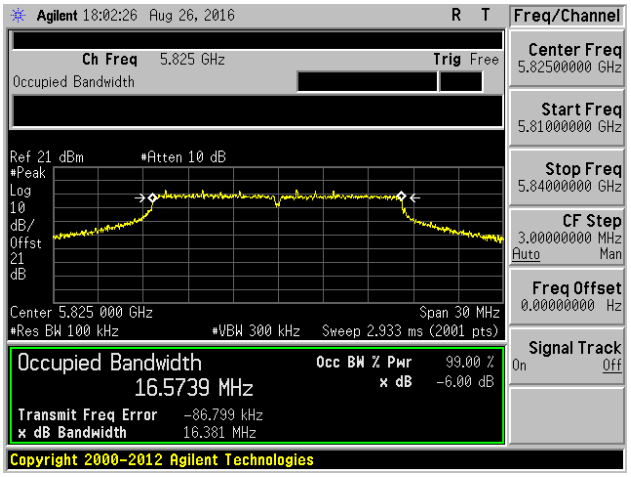
Channel 149 (5745MHz)



Channel 157 (5785MHz)

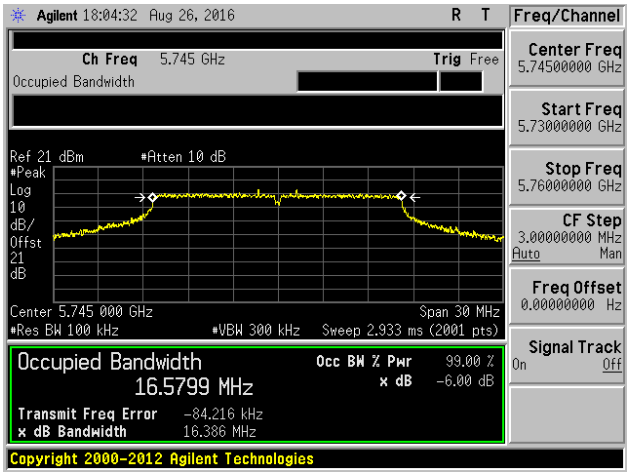


Channel 165 (5825MHz)

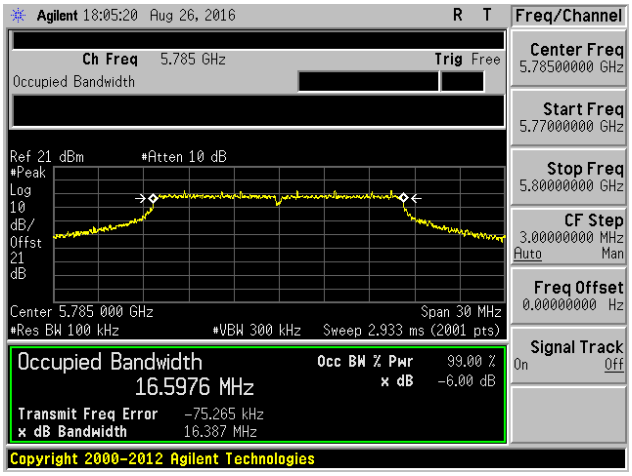


802.11a 6dB Bandwidth - Ant 1

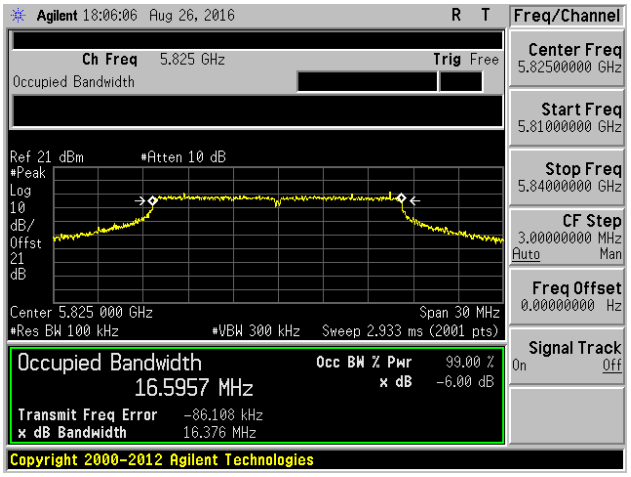
Channel 149 (5745MHz)



Channel 157 (5785MHz)

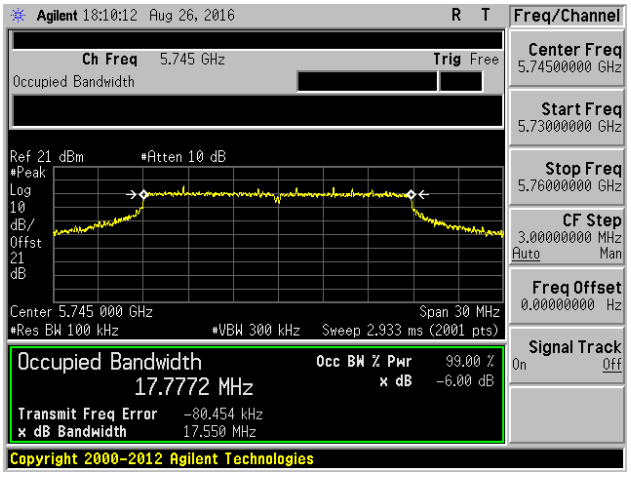


Channel 165 (5825MHz)

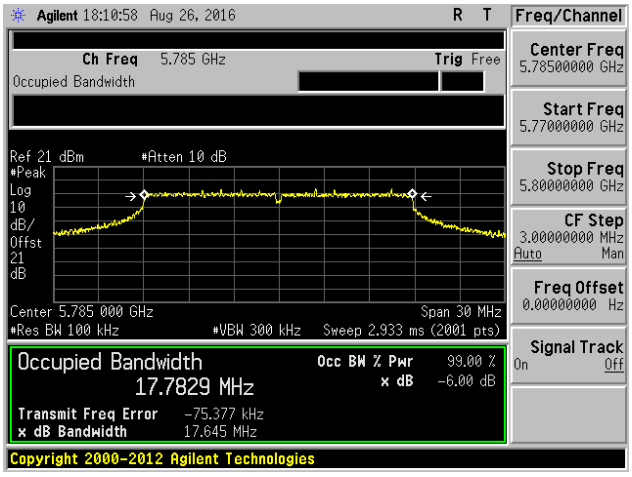


802.11n-HT20 6dB Bandwidth - Ant 0 / Ant 0 + 1

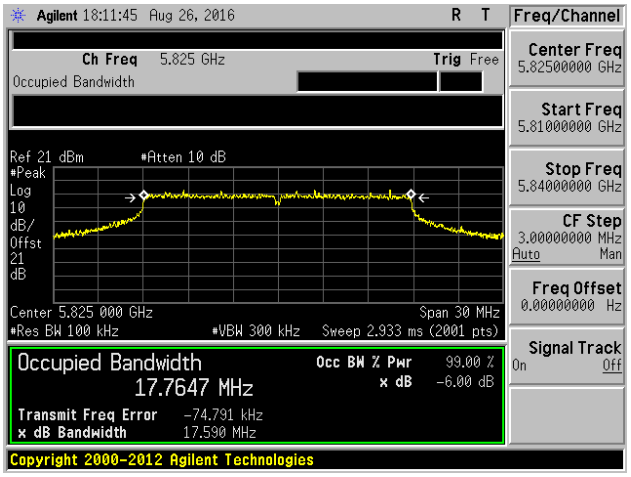
Channel 149 (5745MHz)



Channel 157 (5785MHz)

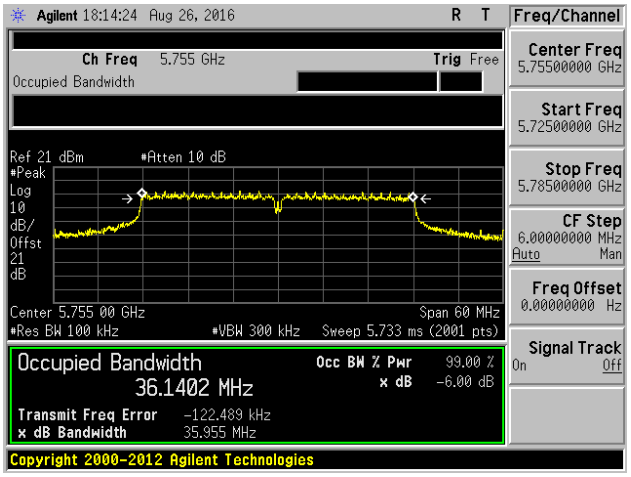


Channel 165 (5825MHz)

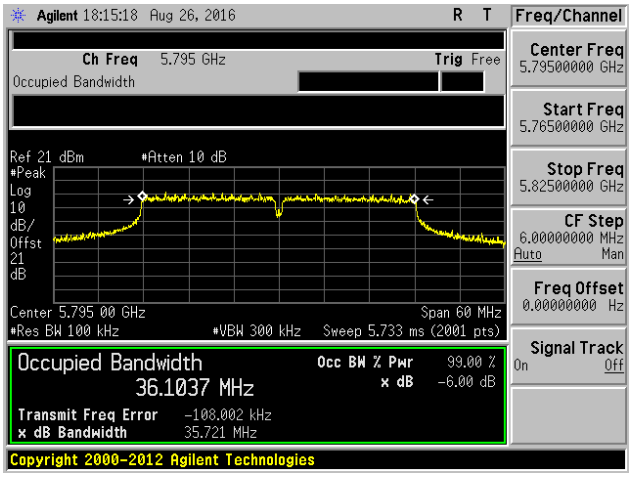


802.11n-HT40 6dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 151 (5755MHz)

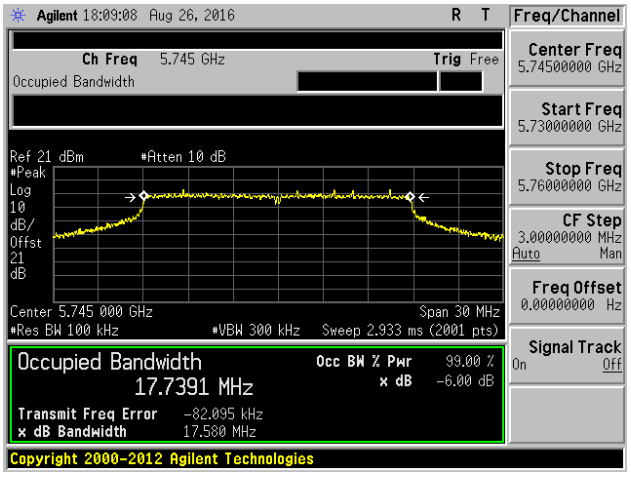


Channel 159 (5795MHz)

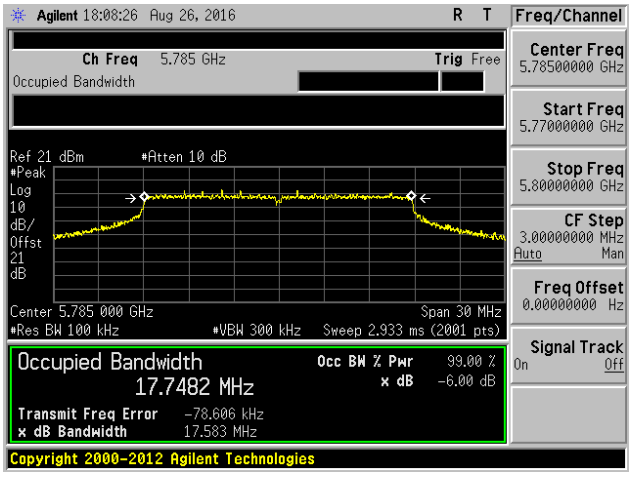


802.11n-HT20 6dB Bandwidth - Ant 1 / Ant 0 + 1

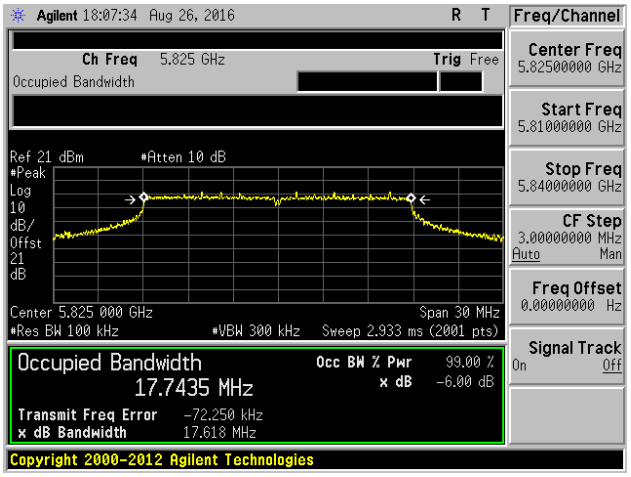
Channel 149 (5745MHz)



Channel 157 (5785MHz)

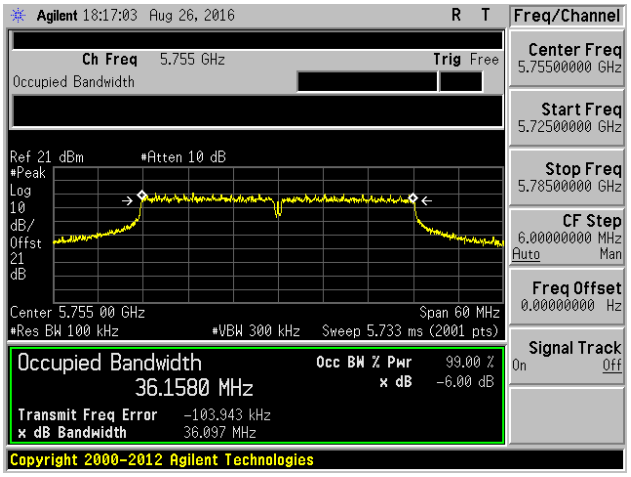


Channel 165 (5825MHz)

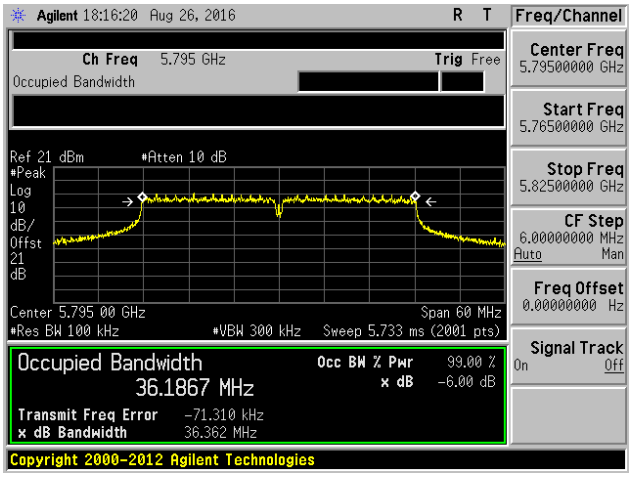


802.11n-HT40 6dB Bandwidth - Ant 1 / Ant 0 + 1

Channel 151 (5755MHz)



Channel 159 (5795MHz)



7.4. Output Power Measurement

7.4.1. Test Limit

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

5150~5250MHz: Limit (dBm) = 24dBm - (7dBi - 6dBi) = 23dBm

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (23.98dBm) or 11dBm +10 log (26dB BW).

5250~5350MHz: Limit (dBm) = 24dBm - (7dBi - 6dBi) = 23dBm

5470~5725MHz: Limit (dBm) = 24dBm - (7dBi - 6dBi) = 23dBm

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm).

5725~5850MHz: Limit (dBm) = 30dBm - (7dBi - 6dBi) = 29dBm

If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

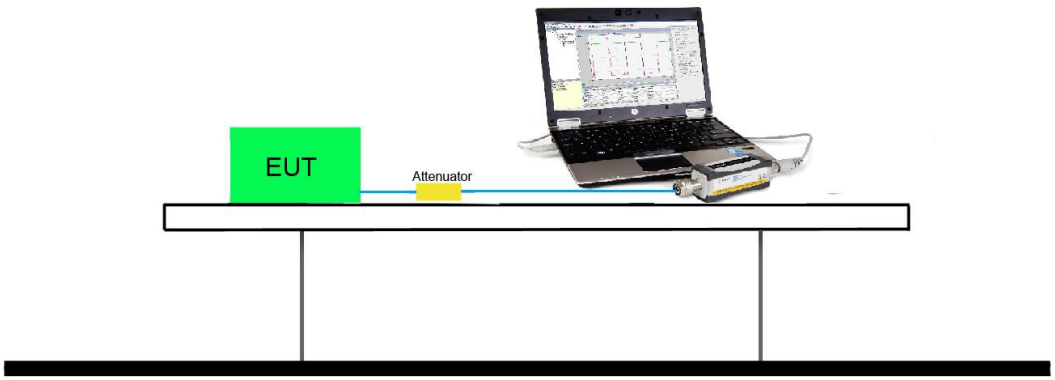
7.4.2. Test Procedure Used

KDB 789033 D02v01r03 - Section E) 3) b) Method PM-G

7.4.3. Test Setting

Average power measurements were perform only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

7.4.4. Test Setup



7.4.5. Test Result

Power output test was verified over all data rates of each mode shown as below, and then choose the maximum power output (yellow marker) for final test of each channel.

N_{Tx}	802.11a	MCS Index for 802.11n	Data Rate (Mbps)			
			20MHz Bandwidth		40MHz Bandwidth	
			800ns GI	400ns GI	800ns GI	400ns GI
1	6	0	--	--	--	--
1	9	1	--	--	--	--
1	12	2	--	--	--	--
1	18	3	--	--	--	--
1	24	4	--	--	--	--
1	36	5	--	--	--	--
1	48	6	--	--	--	--
1	54	7	--	--	--	--

N_{Tx}	802.11a	MCS Index for 802.11n	Data Rate (Mbps)			
			20MHz Bandwidth		40MHz Bandwidth	
			800ns GI	400ns GI	800ns GI	400ns GI
2	--	8	13	14.4	27	30
2	--	9	26	28.9	54	60
2	--	10	39	43.3	81	90
2	--	11	52	57.8	108	120
2	--	12	78	86.7	162	180
2	--	13	104	115.6	216	240
2	--	14	117	130	243	270
2	--	15	130	144.4	270	300

Note: Power output test was verified over all data rates of each mode shown as above, and then choose the maximum power output (yellow marker) for final test of each channel.

Output power at various data rates for Ant 0:

Test Mode	Bandwidth (MHz)	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)
802.11a	20	60	5180	6	20.29
				24	20.13
				54	20.01
802.11n	20	60	5180	13	19.20
				14.4	19.11
				78	19.03
				86.7	18.94
				130	18.90
				144.4	18.82
802.11n	40	62	5190	27	14.85
				30	14.81
				162	14.79
				180	14.68
				270	14.62
				300	14.53

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0								
11a	6	36	5180	20.29	--	20.29	≤ 23	Pass
11a	6	44	5220	21.54	--	21.54	≤ 23	Pass
11a	6	48	5240	21.82	--	21.82	≤ 23	Pass
11a	6	52	5260	21.68	--	21.68	≤ 23	Pass
11a	6	60	5300	21.96	--	21.96	≤ 23	Pass
11a	6	64	5320	19.59	--	19.59	≤ 23	Pass
11a	6	100	5500	18.82	--	18.82	≤ 23	Pass
11a	6	120	5600	19.92	--	19.92	≤ 23	Pass
11a	6	140	5700	16.94	--	16.94	≤ 23	Pass
11a	6	149	5745	19.96	--	19.96	≤ 29	Pass
11a	6	157	5785	19.55	--	19.55	≤ 29	Pass
11a	6	165	5825	18.72	--	18.72	≤ 29	Pass
Ant 1								
11a	6	36	5180	--	19.81	19.81	≤ 23	Pass
11a	6	44	5220	--	21.66	21.66	≤ 23	Pass
11a	6	48	5240	--	21.68	21.68	≤ 23	Pass
11a	6	52	5260	--	21.64	21.64	≤ 23	Pass
11a	6	60	5300	--	21.58	21.58	≤ 23	Pass
11a	6	64	5320	--	18.84	18.84	≤ 23	Pass
11a	6	100	5500	--	18.59	18.59	≤ 23	Pass
11a	6	120	5600	--	20.96	20.96	≤ 23	Pass
11a	6	140	5700	--	16.41	16.41	≤ 23	Pass
11a	6	149	5745	--	19.32	19.32	≤ 29	Pass
11a	6	157	5785	--	19.08	19.08	≤ 29	Pass
11a	6	165	5825	--	18.33	18.33	≤ 29	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0 + 1								
11n-HT20	13	36	5180	19.20	19.18	22.20	≤ 23	Pass
11n-HT20	13	44	5220	19.39	18.89	22.16	≤ 23	Pass
11n-HT20	13	48	5240	19.29	18.87	22.10	≤ 23	Pass
11n-HT20	13	52	5260	19.34	18.86	22.12	≤ 23	Pass
11n-HT20	13	60	5300	19.47	18.77	22.14	≤ 23	Pass
11n-HT20	13	64	5320	13.96	13.93	16.96	≤ 23	Pass
11n-HT20	13	100	5500	16.98	17.84	20.44	≤ 23	Pass
11n-HT20	13	120	5600	18.96	19.58	22.29	≤ 23	Pass
11n-HT20	13	140	5700	14.01	15.15	17.63	≤ 23	Pass
11n-HT20	13	149	5745	17.98	19.20	21.64	≤ 29	Pass
11n-HT20	13	157	5785	17.58	18.29	20.96	≤ 29	Pass
11n-HT20	13	165	5825	16.73	17.87	20.35	≤ 29	Pass
11n-HT40	27	38	5190	14.85	15.16	18.02	≤ 23	Pass
11n-HT40	27	46	5230	19.54	19.25	22.41	≤ 23	Pass
11n-HT40	27	54	5270	19.78	19.13	22.48	≤ 23	Pass
11n-HT40	27	62	5310	14.47	14.22	17.36	≤ 23	Pass
11n-HT40	27	102	5510	12.02	13.01	15.55	≤ 23	Pass
11n-HT40	27	118	5590	19.06	19.68	22.39	≤ 23	Pass
11n-HT40	27	134	5670	17.10	17.39	20.26	≤ 23	Pass
11n-HT40	27	151	5755	17.49	18.61	21.10	≤ 29	Pass
11n-HT40	27	159	5795	17.22	18.00	20.64	≤ 29	Pass

Note: The Total Average Power (dBm) = $10*\log\{10^{(\text{Ant 0 Average Power }/10)} + 10^{(\text{Ant 1 Average Power }/10)}\}$.

7.5. Transmit Power Control

7.5.1. Test Limit

The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm.

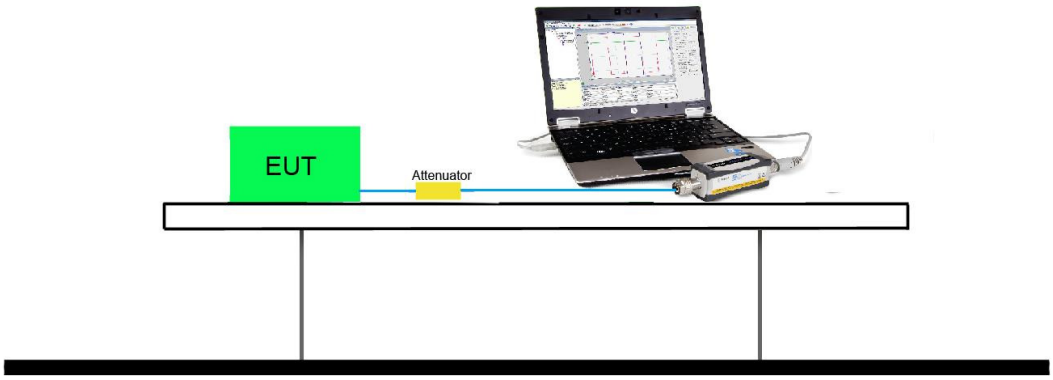
7.5.2. Test Procedure Used

KDB 789033 D02v01r03 - Section E) 3) b) Method PM-G

7.5.3. Test Setting

Average power measurements were perform only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

7.5.4. Test Setup



7.5.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 TPC Power (dBm)	Ant 1 TPC Power (dBm)	Total EIRP TPC Power (dBm)	Limit (dBm)	Result
Ant 0								
11a	6	52	5260	15.32	--	22.32	≤ 24	Pass
11a	6	60	5300	15.47	--	22.47	≤ 24	Pass
11a	6	64	5320	13.17	--	20.17	≤ 24	Pass
11a	6	100	5500	12.63	--	19.63	≤ 24	Pass
11a	6	120	5600	13.91	--	20.91	≤ 24	Pass
11a	6	140	5700	10.51	--	17.51	≤ 24	Pass
11a	6	149	5745	13.52	--	20.52	≤ 24	Pass
11a	6	157	5785	13.03	--	20.03	≤ 24	Pass
11a	6	165	5825	12.31	--	19.31	≤ 24	Pass
Ant 1								
11a	6	52	5260	--	15.07	22.07	≤ 24	Pass
11a	6	60	5300	--	14.78	21.78	≤ 24	Pass
11a	6	64	5320	--	12.77	19.77	≤ 24	Pass
11a	6	100	5500	--	12.27	19.27	≤ 24	Pass
11a	6	120	5600	--	14.38	21.38	≤ 24	Pass
11a	6	140	5700	--	9.60	16.60	≤ 24	Pass
11a	6	149	5745	--	12.98	19.98	≤ 24	Pass
11a	6	157	5785	--	12.98	19.98	≤ 24	Pass
11a	6	165	5825	--	11.62	18.62	≤ 24	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 TPC Power (dBm)	Ant 1 TPC Power (dBm)	Total EIRP TPC Power (dBm)	Limit (dBm)	Result
Ant 0 + 1								
11n-HT20	13	52	5260	12.67	12.22	22.46	≤ 24	Pass
11n-HT20	13	60	5300	12.73	12.17	22.47	≤ 24	Pass
11n-HT20	13	64	5320	7.85	7.92	17.90	≤ 24	Pass
11n-HT20	13	100	5500	10.55	11.29	20.94	≤ 24	Pass
11n-HT20	13	120	5600	12.63	12.75	22.70	≤ 24	Pass
11n-HT20	13	140	5700	7.16	8.89	18.12	≤ 24	Pass
11n-HT20	13	149	5745	11.14	12.56	21.92	≤ 24	Pass
11n-HT20	13	157	5785	11.18	11.78	21.50	≤ 24	Pass
11n-HT20	13	165	5825	10.68	11.09	20.90	≤ 24	Pass
11n-HT40	27	54	5270	13.32	12.76	23.06	≤ 24	Pass
11n-HT40	27	62	5310	7.76	7.53	17.66	≤ 24	Pass
11n-HT40	27	102	5510	5.35	6.99	16.26	≤ 24	Pass
11n-HT40	27	118	5590	12.81	12.84	22.84	≤ 24	Pass
11n-HT40	27	134	5670	10.50	11.14	20.84	≤ 24	Pass
11n-HT40	27	151	5755	11.31	12.17	21.77	≤ 24	Pass
11n-HT40	27	159	5795	10.61	11.75	21.23	≤ 24	Pass

Note: Total EIRP TPC Power (dBm) = $10*\log\{10^{(\text{Ant 0 TPC Power }/10)} + 10^{(\text{Ant 1 TPC Power }/10)}\}$ + Directional Antenna Gain (dBi).

7.6. Power Spectral Density Measurement

7.6.1. Test Limit

For portable client devices operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For 802.11a mode:

5150~5250MHz: Limit (dBm/MHz) = 11dBm - (7dBi - 6dBi) = 10.00dBm/MHz

For 802.11n mode:

5150~5250MHz: Limit (dBm/MHz) = 11dBm - (10.01dBi - 6dBi) = 6.99dBm/MHz

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For 802.11a mode:

5250~5350MHz: Limit (dBm/MHz) = 11dBm/MHz - (7dBi - 6dBi) = 10.00dBm/MHz

5470~5725MHz: Limit (dBm/MHz) = 11dBm/MHz - (7dBi - 6dBi) = 10.00dBm/MHz

For 802.11n mode:

5250~5350MHz: Limit (dBm/MHz) = 11dBm/MHz - (10.01dBi - 6dBi) = 6.99dBm/MHz

5470~5725MHz: Limit (dBm/MHz) = 11dBm/MHz - (10.01dBi - 6dBi) = 6.99dBm/MHz

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

For 802.11a mode:

5725~5850MHz: Limit (dBm/500KHz) = 30dBm/KHz - (7dBi - 6dBi) = 29.00dBm/500KHz

For 802.11n mode:

5725~5850MHz: Limit (dBm/500KHz) = 30dBm/KHz - (10.01dBi - 6dBi) = 25.99dBm/500KHz

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

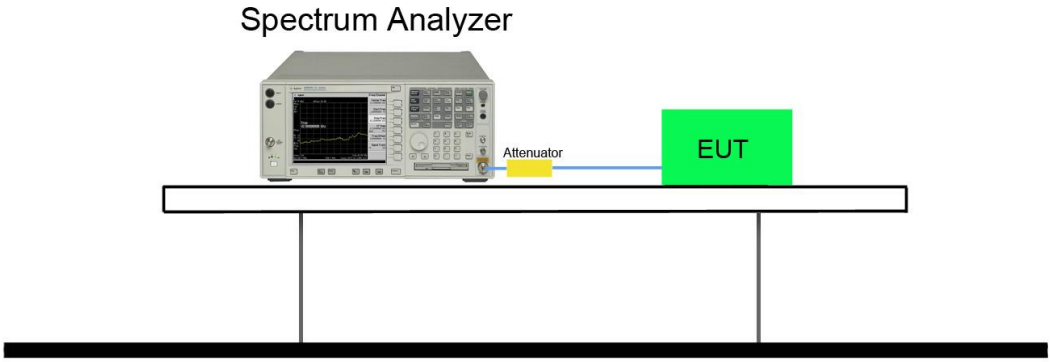
7.6.2. Test Procedure Used

KDB 789033 D02v01r03 - Section F

7.6.3. Test Setting

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz, if measurement bandwidth of Maximum PSD is specified in 500 kHz, RBW = 100 kHz
4. VBW = 3MHz
5. Number of sweep points ≥ 2 × (span / RBW)
6. Detector = power averaging (Average)
7. Sweep time = auto
8. Trigger = free run
9. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
10. Add 10*log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add 10*log(1/0.25) = 6 dB if the duty cycle is 25 percent.

7.6.4. Test Setup



7.6.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ MHz)	Ant 1 PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/MHz)	Result
Ant 0									
11a	6	36	5180	6.99	--	99.36	6.99	≤ 10.00	Pass
11a	6	44	5220	8.45	--	99.36	8.45	≤ 10.00	Pass
11a	6	48	5240	8.43	--	99.36	8.43	≤ 10.00	Pass
11a	6	52	5260	8.49	--	99.36	8.49	≤ 10.00	Pass
11a	6	60	5300	8.92	--	99.36	8.92	≤ 10.00	Pass
11a	6	64	5320	6.51	--	99.36	6.51	≤ 10.00	Pass
11a	6	100	5500	6.13	--	99.36	6.13	≤ 10.00	Pass
11a	6	120	5600	8.24	--	99.36	8.24	≤ 10.00	Pass
11a	6	140	5700	5.13	--	99.36	5.13	≤ 10.00	Pass
Ant 1									
11a	6	36	5180	--	6.49	99.36	6.49	≤ 10.00	Pass
11a	6	44	5220	--	8.32	99.36	8.32	≤ 10.00	Pass
11a	6	48	5240	--	8.47	99.36	8.47	≤ 10.00	Pass
11a	6	52	5260	--	8.63	99.36	8.63	≤ 10.00	Pass
11a	6	60	5300	--	8.66	99.36	8.66	≤ 10.00	Pass
11a	6	64	5320	--	6.46	99.36	6.46	≤ 10.00	Pass
11a	6	100	5500	--	6.67	99.36	6.67	≤ 10.00	Pass
11a	6	120	5600	--	9.04	99.36	9.04	≤ 10.00	Pass
11a	6	140	5700	--	4.65	99.36	4.65	≤ 10.00	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ MHz)	Ant 1 PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/MHz)	Result
Ant 0 + 1									
11n-HT20	6.5	36	5180	3.05	3.76	98.14	6.43	≤ 6.99	Pass
11n-HT20	6.5	44	5220	2.68	3.74	98.14	6.25	≤ 6.99	Pass
11n-HT20	6.5	48	5240	2.95	3.96	98.14	6.49	≤ 6.99	Pass
11n-HT20	6.5	52	5260	3.12	3.67	98.14	6.41	≤ 6.99	Pass
11n-HT20	6.5	60	5300	3.45	3.28	98.14	6.38	≤ 6.99	Pass
11n-HT20	6.5	64	5320	1.09	1.04	98.14	4.08	≤ 6.99	Pass
11n-HT20	6.5	100	5500	2.72	3.88	98.14	6.35	≤ 6.99	Pass
11n-HT20	6.5	120	5600	2.56	3.86	98.14	6.27	≤ 6.99	Pass
11n-HT20	6.5	140	5700	2.83	3.64	98.14	6.26	≤ 6.99	Pass
11n-HT40	13.5	38	5190	-2.33	-1.36	96.71	1.34	≤ 6.99	Pass
11n-HT40	13.5	46	5230	3.53	3.24	96.71	6.54	≤ 6.99	Pass
11n-HT40	13.5	54	5270	3.49	3.11	96.71	6.46	≤ 6.99	Pass
11n-HT40	13.5	62	5310	-1.58	-1.50	96.71	1.62	≤ 6.99	Pass
11n-HT40	13.5	102	5510	-3.68	-1.22	96.71	0.88	≤ 6.99	Pass
11n-HT40	13.5	118	5590	2.86	3.63	96.71	6.42	≤ 6.99	Pass
11n-HT40	13.5	134	5670	2.73	2.28	96.71	5.67	≤ 6.99	Pass

Note 1: When EUT duty cycle ≥ 98%, the Total PSD (dBm/MHz) = $10*\log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\}$.

Note 2: When EUT duty cycle < 98%, the Total PSD (dBm/MHz) = $10*\log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\}$ + 10*log(1/Duty Cycle).

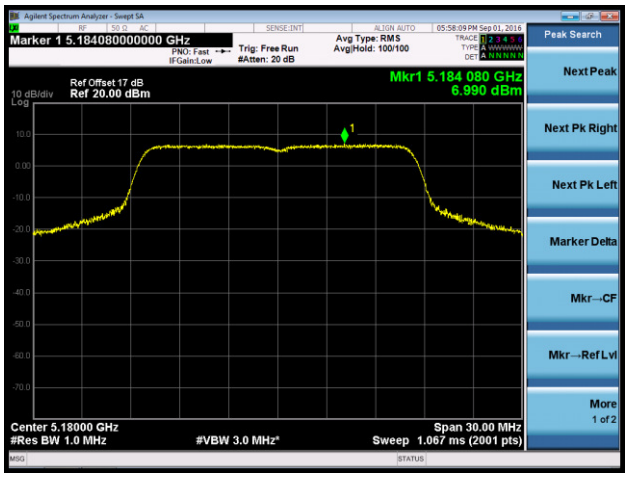
Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ MHz)	Ant 1 PSD (dBm/ MHz)	Duty Cycle (%)	Constant Factor	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
Ant 0										
11a	6	149	5745	-0.36	--	99.36	7.00	6.64	≤ 29.00	Pass
11a	6	157	5785	-1.19	--	99.36	7.00	5.81	≤ 29.00	Pass
11a	6	165	5825	-1.69	--	99.36	7.00	5.31	≤ 29.00	Pass
Ant 1										
11a	6	149	5745	--	-0.60	99.36	7.00	6.40	≤ 29.00	Pass
11a	6	157	5785	--	3.20	99.36	7.00	10.20	≤ 29.00	Pass
11a	6	165	5825	--	-1.36	99.36	7.00	5.64	≤ 29.00	Pass
Ant 0 + 1										
11n-HT20	13	149	5745	-2.79	1.85	98.14	7.00	10.28	≤25.99	Pass
11n-HT20	13	157	5785	-2.79	-1.82	98.14	7.00	7.88	≤25.99	Pass
11n-HT20	13	165	5825	-3.47	-1.96	98.14	7.00	7.51	≤25.99	Pass
11n-HT40	27	151	5755	-5.30	-4.32	96.71	7.00	5.37	≤25.99	Pass
11n-HT40	27	159	5795	-6.04	-4.66	96.71	7.00	4.86	≤25.99	Pass

Note 1: When EUT duty cycle ≥ 98%, the Total PSD (dBm/MHz) = $10*\log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\}$ + Constant Factor.

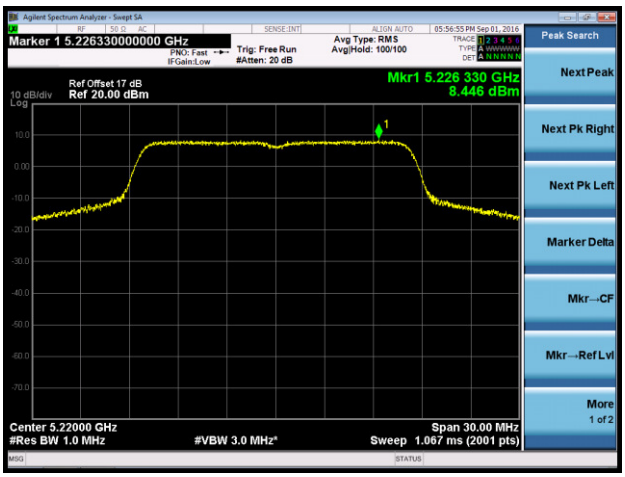
Note 2: When EUT duty cycle < 98%, the Total PSD (dBm/MHz) = $10*\log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\}$ + $10*\log(1/\text{Duty Cycle})$ + Constant Factor.

802.11a Power Spectral Density - Ant 0

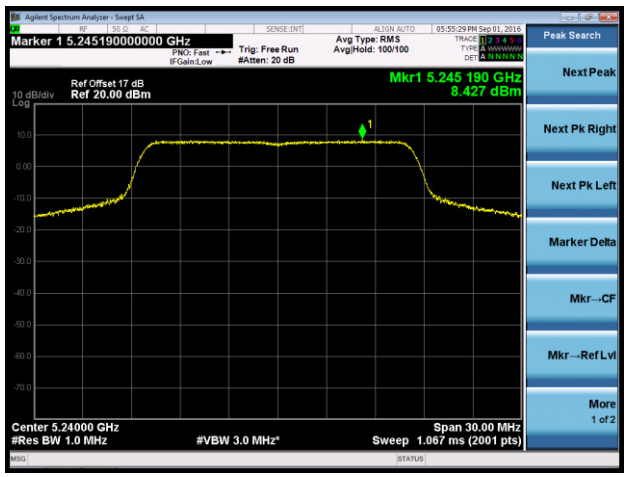
Channel 36 (5180MHz)



Channel 44 (5220MHz)

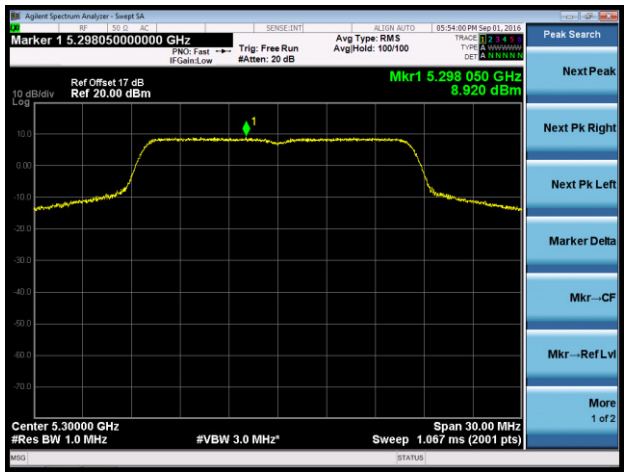


Channel 48 (5240MHz)

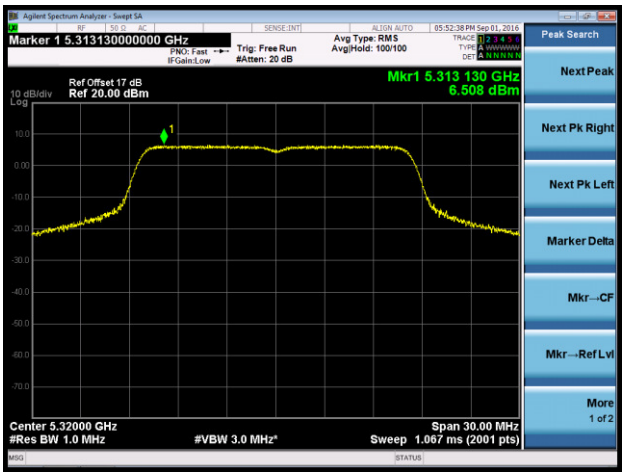


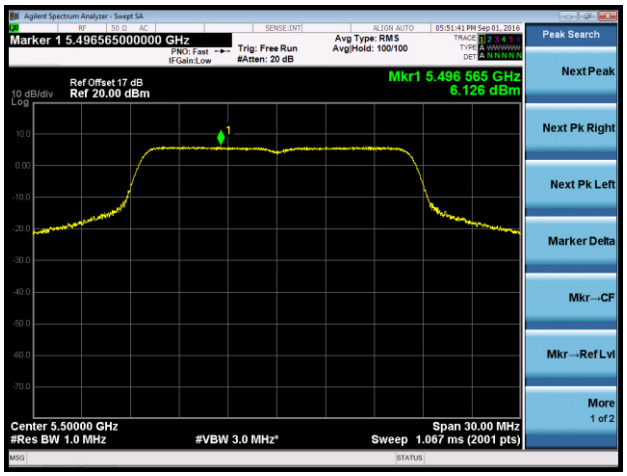
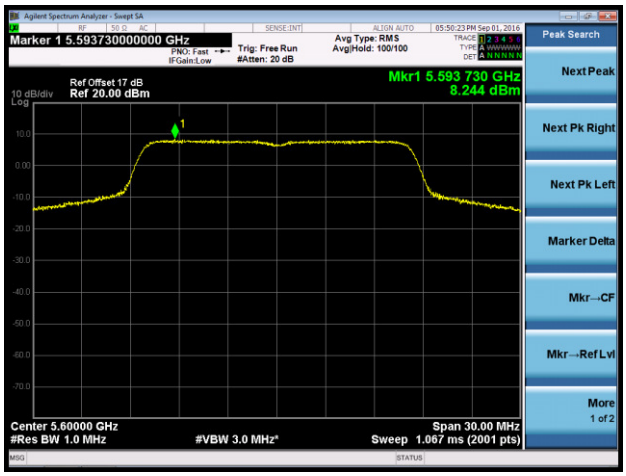
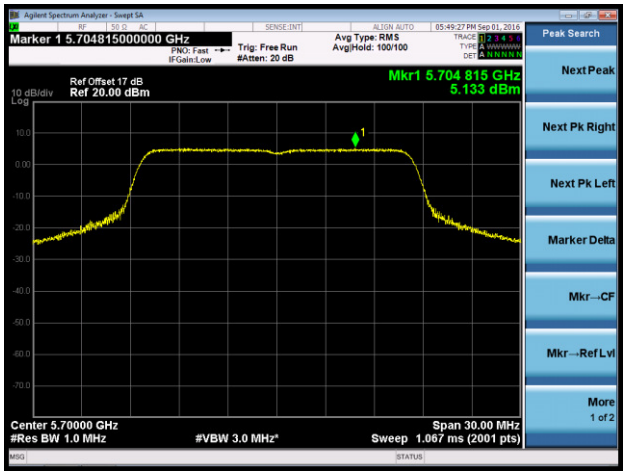
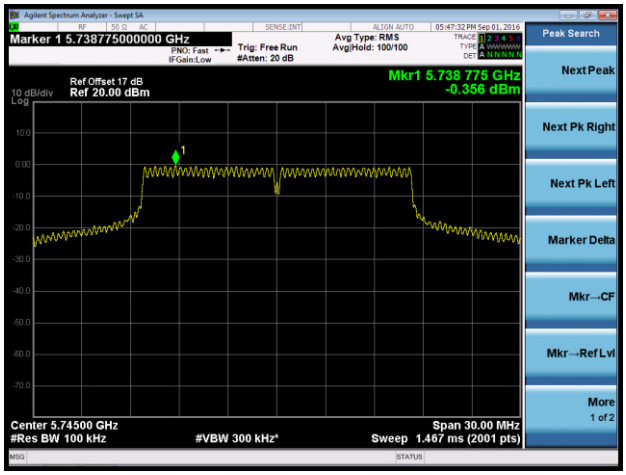
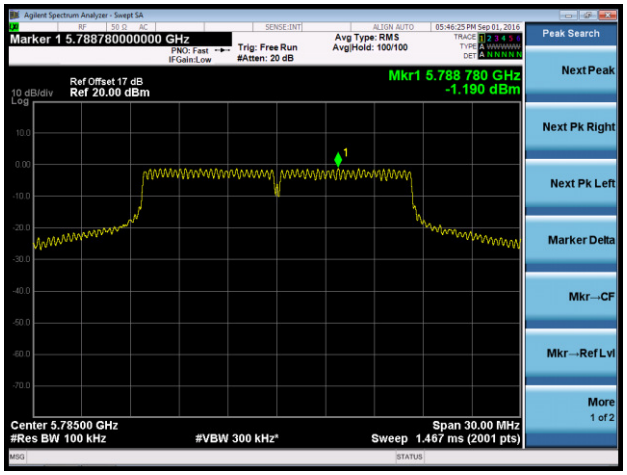
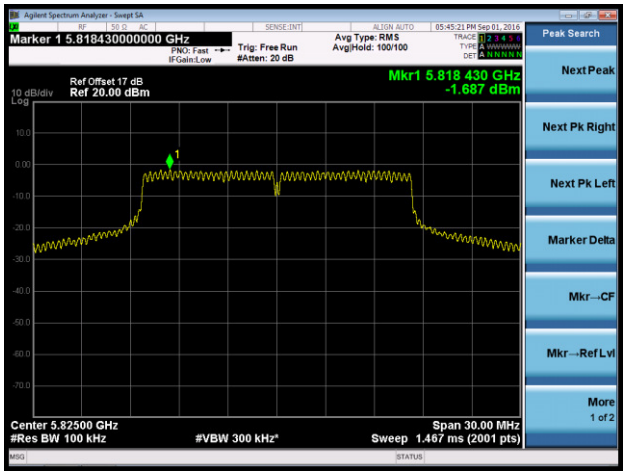
Channel 52 (5260MHz)

Channel 60 (5300MHz)



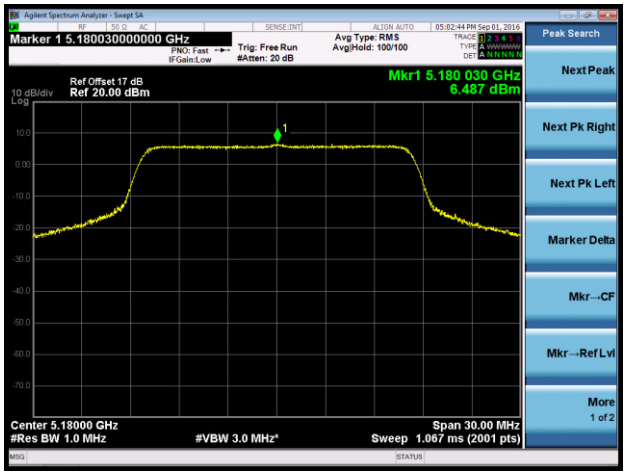
Channel 64 (5320MHz)



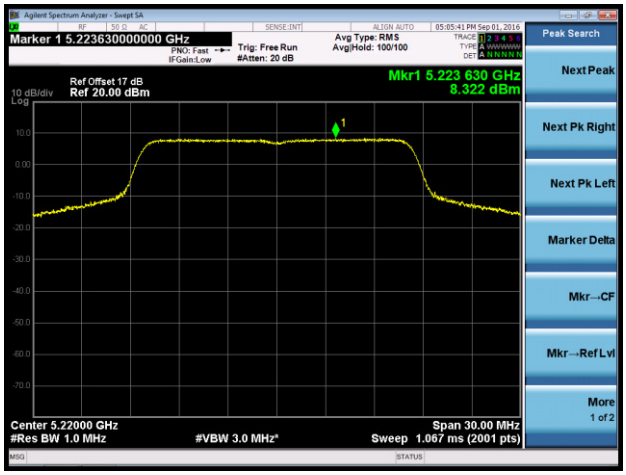
Channel 100 (5500MHz)	Channel 120 (5600MHz)
	
Channel 140 (5700MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

802.11a Power Spectral Density - Ant 1

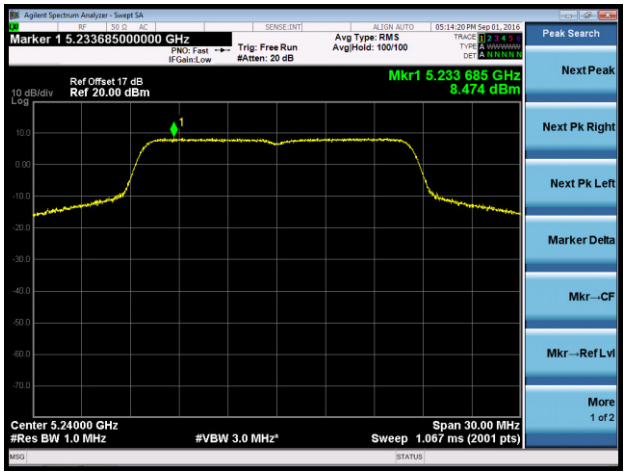
Channel 36 (5180MHz)



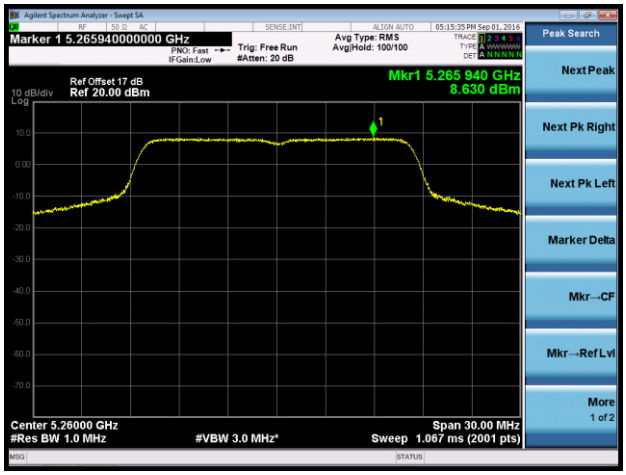
Channel 44 (5220MHz)



Channel 48 (5240MHz)

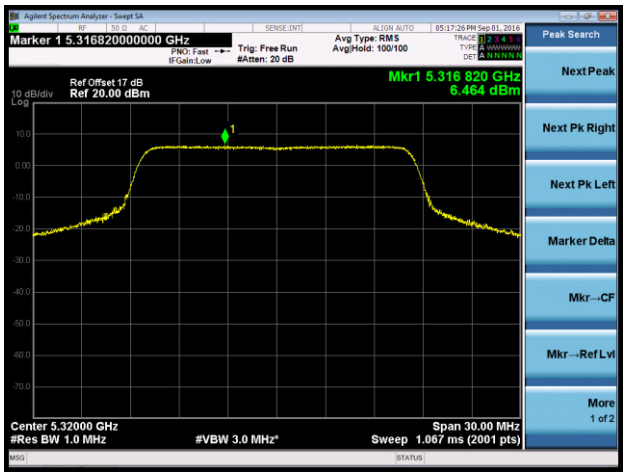


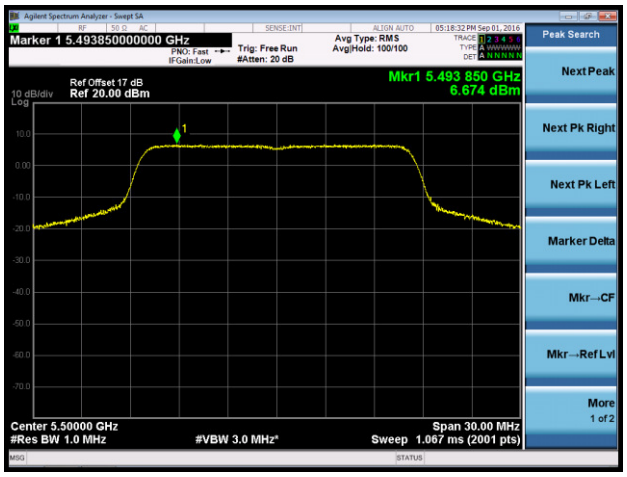
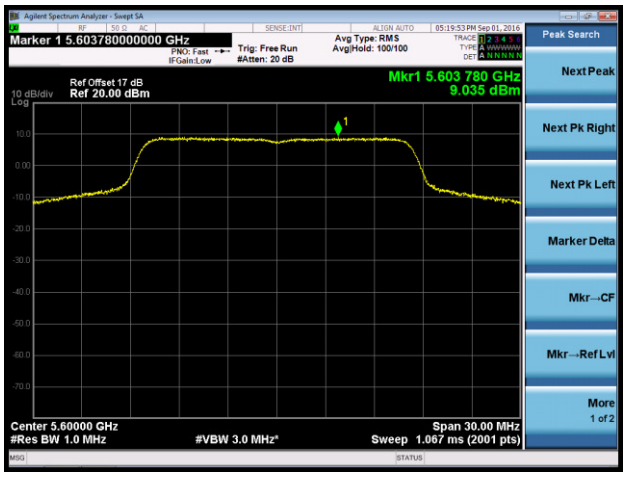
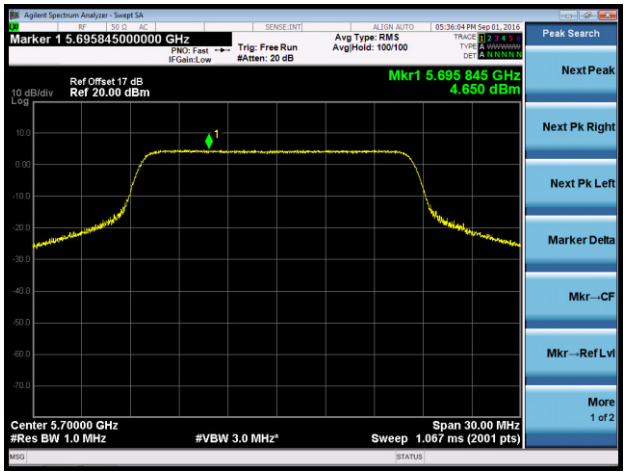
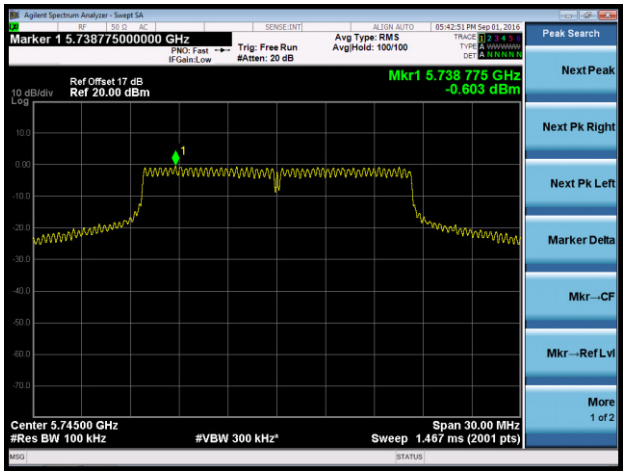
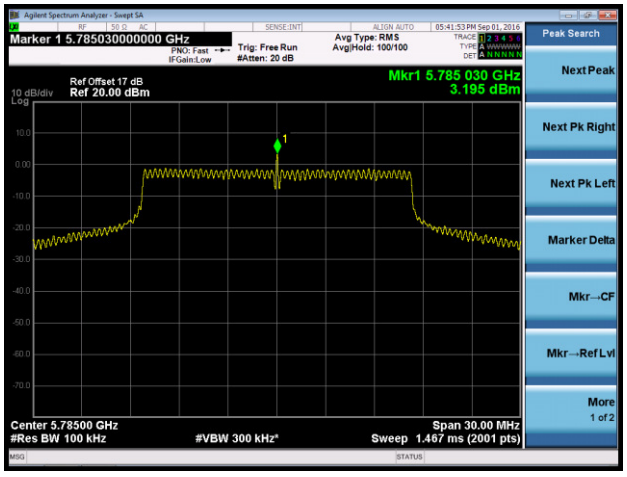
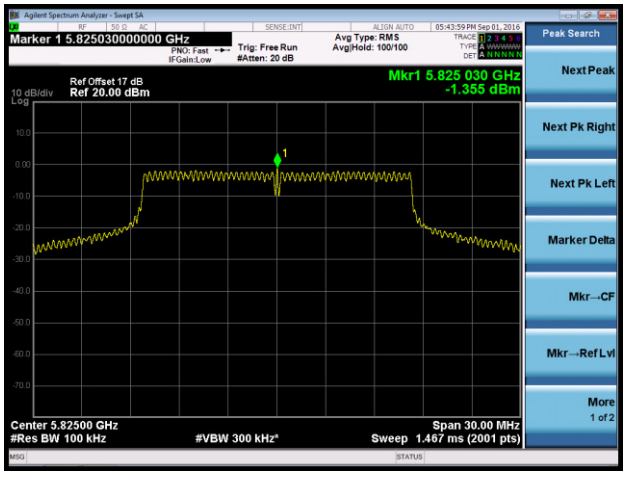
Channel 52 (5260MHz)



Channel 60 (5300MHz)

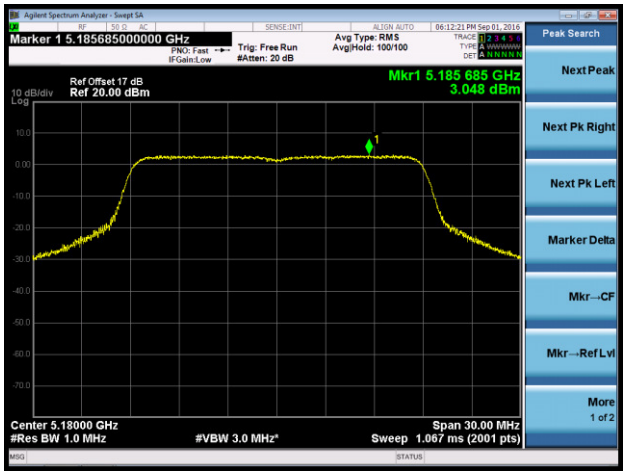
Channel 64 (5320MHz)



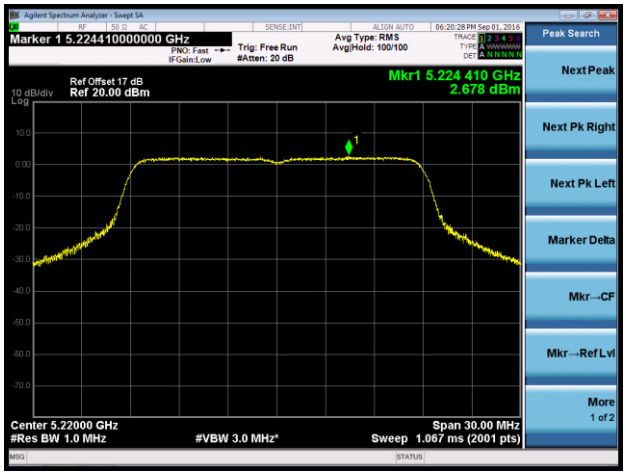
Channel 100 (5500MHz)	Channel 120 (5600MHz)
	
Channel 140 (5700MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

802.11n-HT20 Power Spectral Density - Ant 0 / Ant 0 + 1

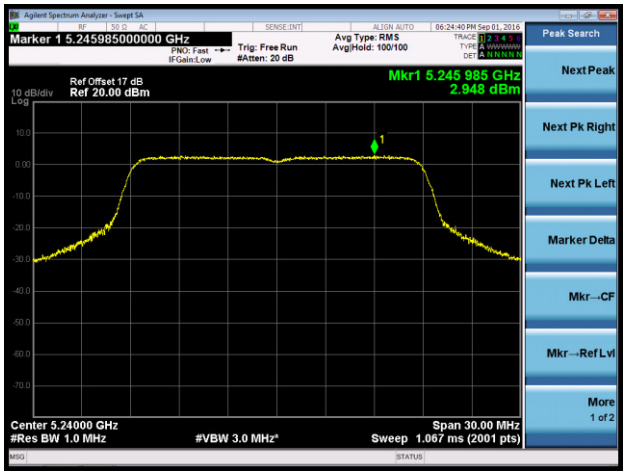
Channel 36 (5180MHz)



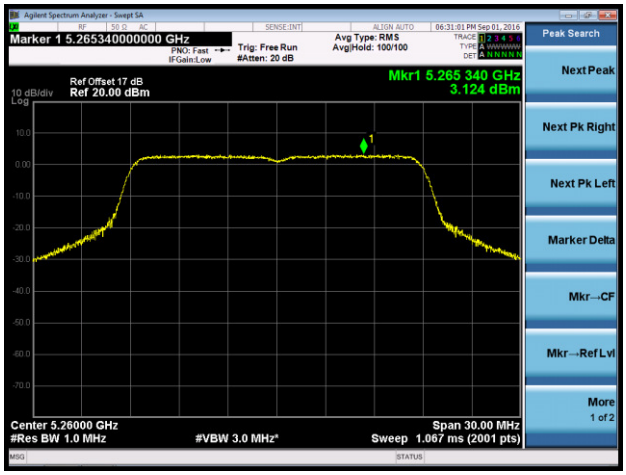
Channel 44 (5220MHz)



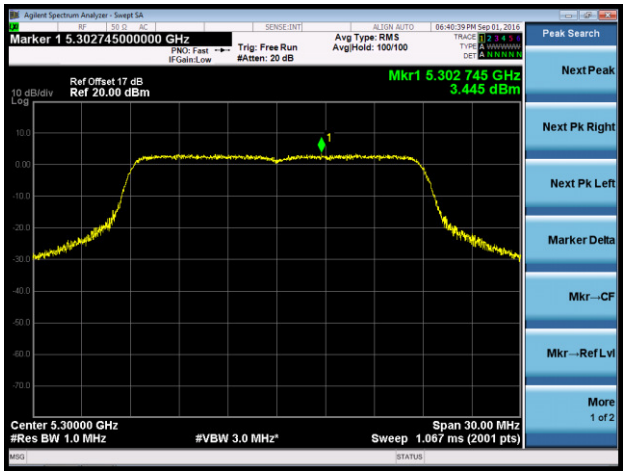
Channel 48 (5240MHz)



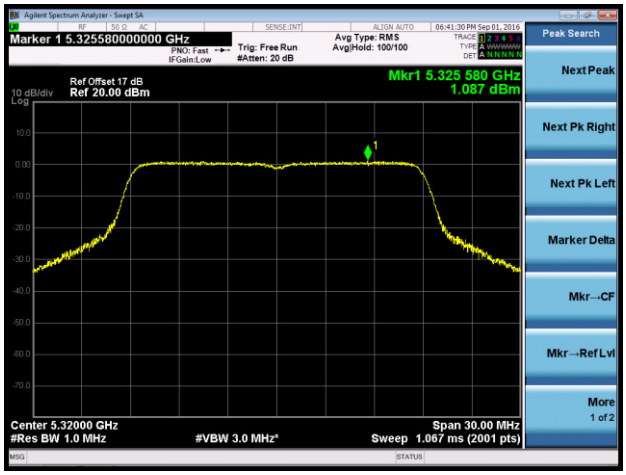
Channel 52 (5260MHz)

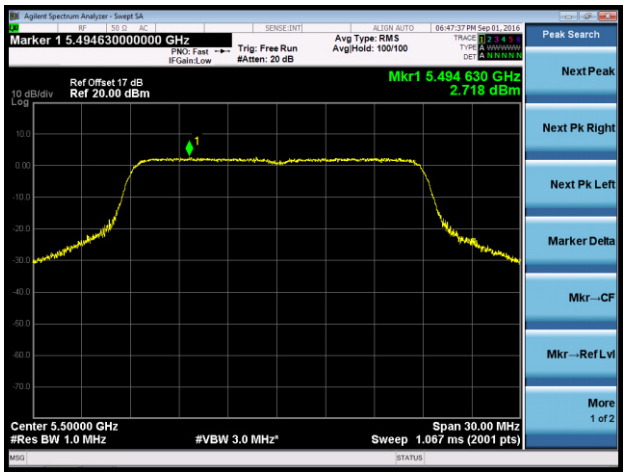
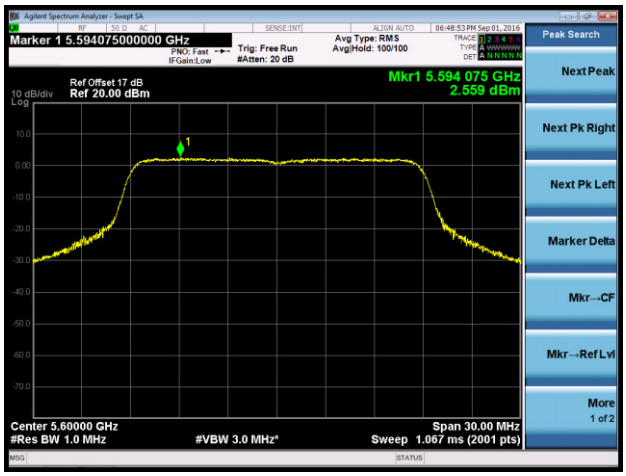
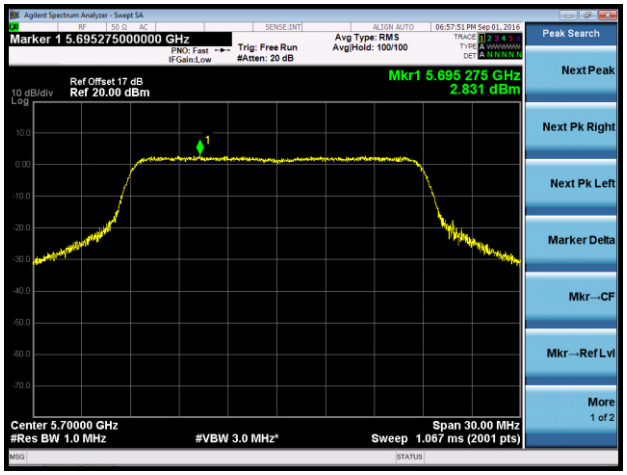
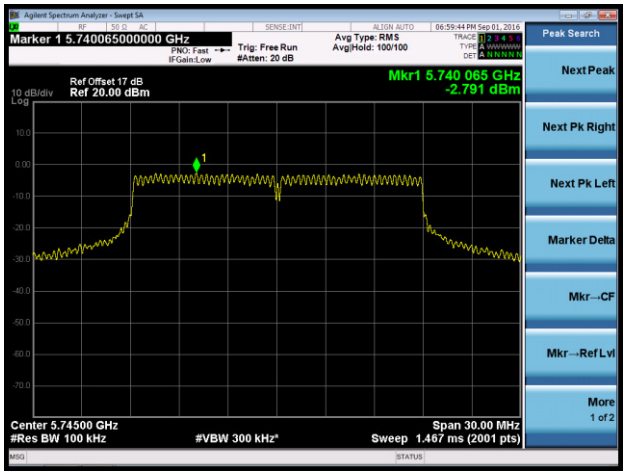
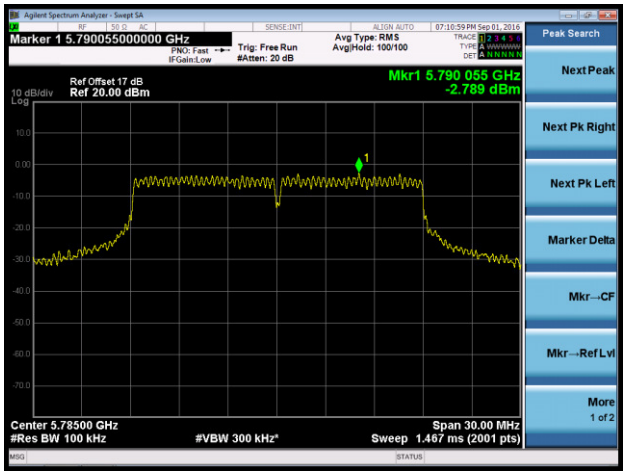
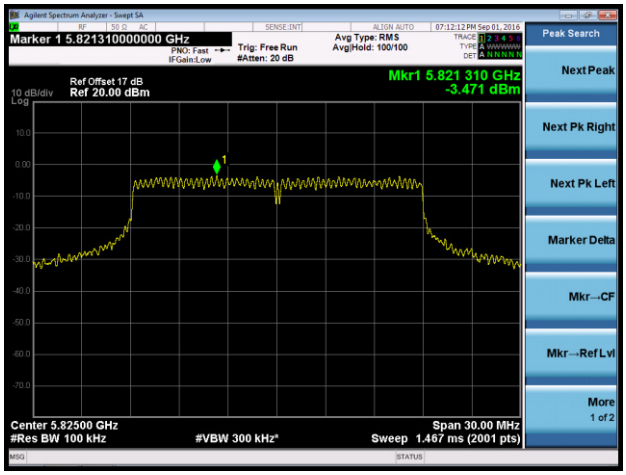


Channel 60 (5300MHz)



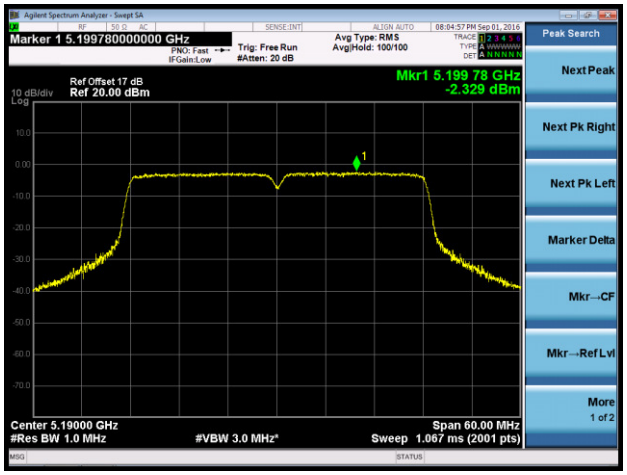
Channel 64 (5320MHz)



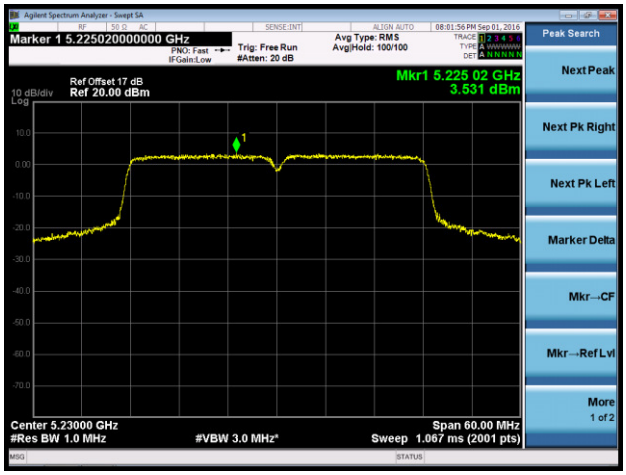
Channel 100 (5500MHz)	Channel 120 (5600MHz)
	
Channel 140 (5700MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

802.11n-HT40 Power Spectral Density - Ant 0 / Ant 0 + 1

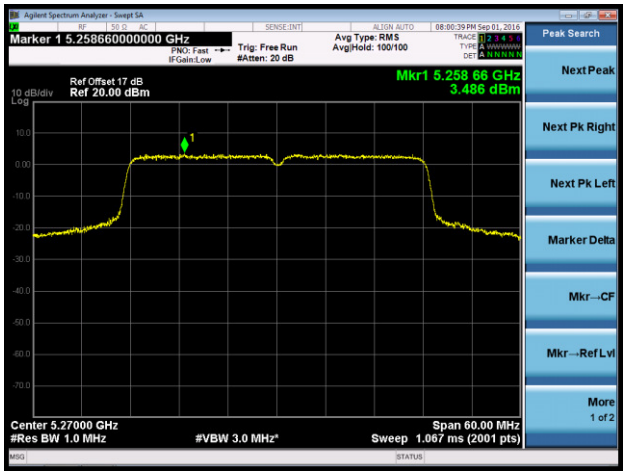
Channel 38 (5190MHz)



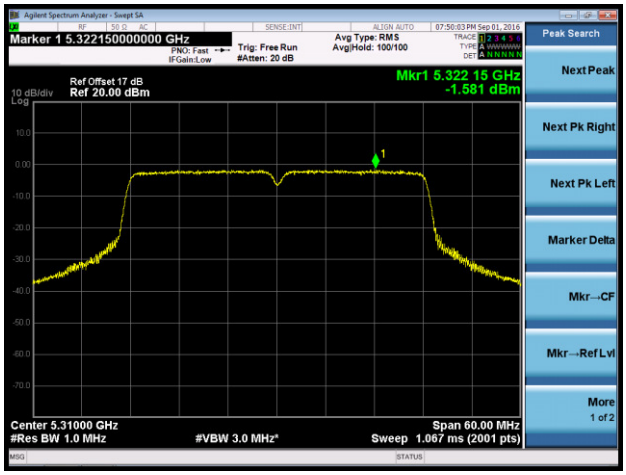
Channel 46 (5230MHz)



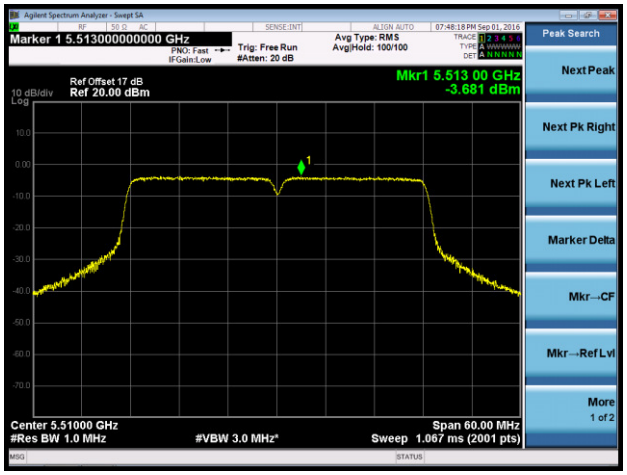
Channel 54 (5270MHz)



Channel 62 (5310MHz)



Channel 102 (5510MHz)



Channel 110 (5590MHz)