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Report No.: 1408RSU00501
Report Version: V01
Issue Date: 08-06-2014

MEASUREMENT REPORT
FCC PART 15.247 WLAN 802.11a/b/g/n/ac

FCC ID:	2ABLK-8X4G-2
IC:	4009A-8X4G2
APPLICANT:	Calix Inc.
Application Type:	Certification
Product:	WIFI dual band 4 GE LAN GPON HGU
Model No.:	844G-2, 854G-2
Brand Name:	Calix
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part 15.247
IC Rule(s):	RSS-210 Issue 8
Test Procedure(s):	KDB 558074 D01v03r01, KDB 662911 D01v02r01, KDB 662911 D02v01
Test Date:	July 11 ~ 26, 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 558074 D01v03r01. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date
1408RSU00501	Rev. 01	Initial report	08-06-2014

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Description Page

§2.1033 General Information

Applicant:	Calix Inc.
Applicant Address:	1035 N. McDowell Blvd Petaluma, CA94954 U.S.A
Manufacturer:	Calix Inc.
Manufacturer Address:	1035 N. McDowell Blvd Petaluma, CA94954 U.S.A
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 Registration No.:	809388
MRT IC Registration No.:	11384A
FCC Rule Part(s):	Part 15.247
IC Rules(s):	RSS-210 Issue 8
Model No.:	844G-2, 854G-2
FCC ID:	2ABLK-8X4G-2
IC:	4009A-8X4G2
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering
FCC Classification:	Digital Transmission System (DTS)
Date(s) of Test:	July 11 ~ 26, 2014
Test Report S/N:	1408RSU00501

Test Facility / Accreditations

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

- **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.**
- **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 and Industry Canada (11384A-1).**
- **MRT facility is an IC registered (11384A-1) test laboratory with the site description on file at Industry Canada.**

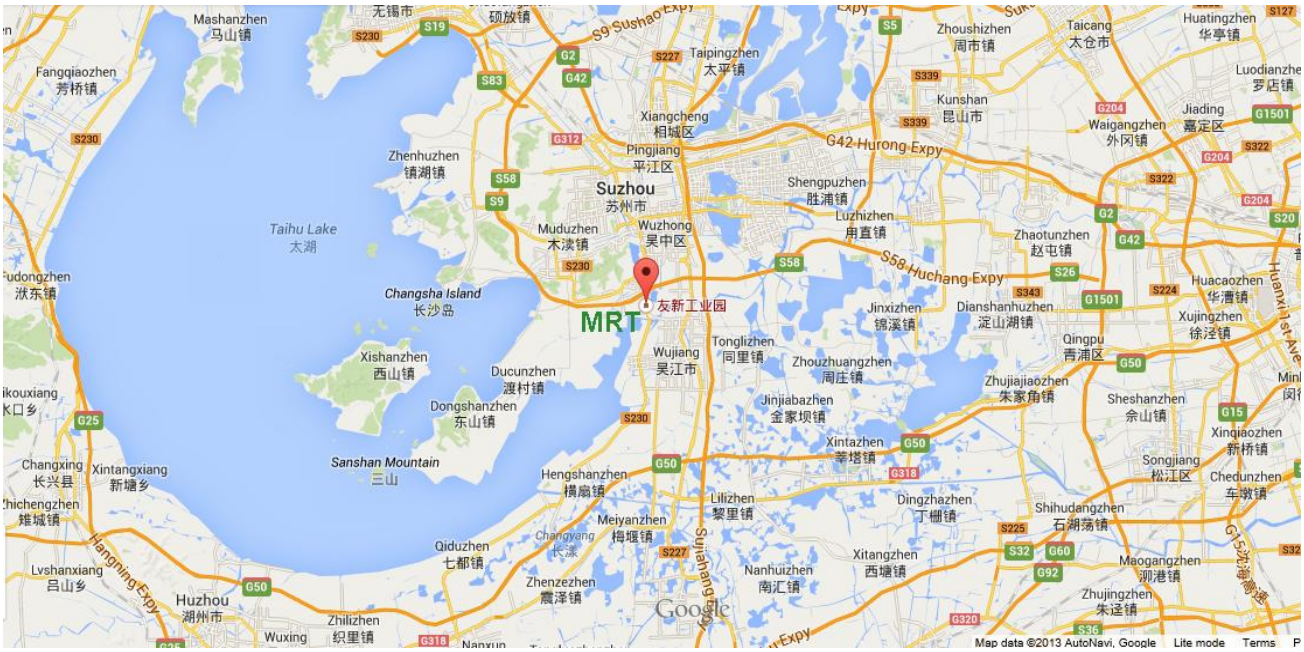
1. INTRODUCTION

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	WIFI dual band 4 GE LAN GPON HGU
Model No.	844G-2, 854G-2
Frequency Range	802.11b/g: 2412 ~ 2462 MHz 802.11a: 5745 ~ 5825 MHz 802.11n-HT20: 2412 ~ 2462 MHz, 5745 ~ 5825 MHz 802.11n-HT40: 2422 ~ 2452 MHz, 5755 ~ 5795 MHz 802.11ac-VHT20: 5745 ~ 5825 MHz 802.11ac-VHT40: 5755 ~ 5795 MHz 802.11ac-VHT80: 5775 MHz
Maximum Output Power	2.4G: 802.11b: 22.01dBm 802.11g: 24.88dBm 802.11n-HT20: 27.18dBm 802.11n-HT40: 26.89dBm 5.8G: 802.11a: 29.74dBm 802.11n-HT20: 29.60dBm 802.11ac-VHT20: 29.62dBm 802.11n-HT40: 29.73dBm 802.11ac-VHT40: 29.75dBm 802.11ac-VHT80: 29.53dBm
Type of Modulation	802.11b: DSSS 802.11a/g/n/ac: OFDM

Note: There are different Fiber modules of model number, and evaluated the different Fiber module in “FCC DOC report”.

2.2. Frequency / Channel Operation

Channel List for 802.11b/g/n-HT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10	2457 MHz	11	2462 MHz	N/A	N/A

Channel List for 802.11n-HT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
03	2422 MHz	04	2427 MHz	05	2432 MHz
06	2437 MHz	07	2442 MHz	08	2447 MHz
09	2452 MHz	N/A	N/A	N/A	N/A

Channel List for 802.11a/n-HT20/ac-VHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745 MHz	153	5765 MHz	157	5785 MHz
161	5805 MHz	165	5825 MHz	--	--

Channel List for 802.11n-HT40/ac-VHT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz	--	--

Channel List for 802.11ac-VHT80

Channel	Frequency	Channel	Frequency	Channel	Frequency
155	5775 MHz	--	--	--	--

2.3. Description of Available Antennas

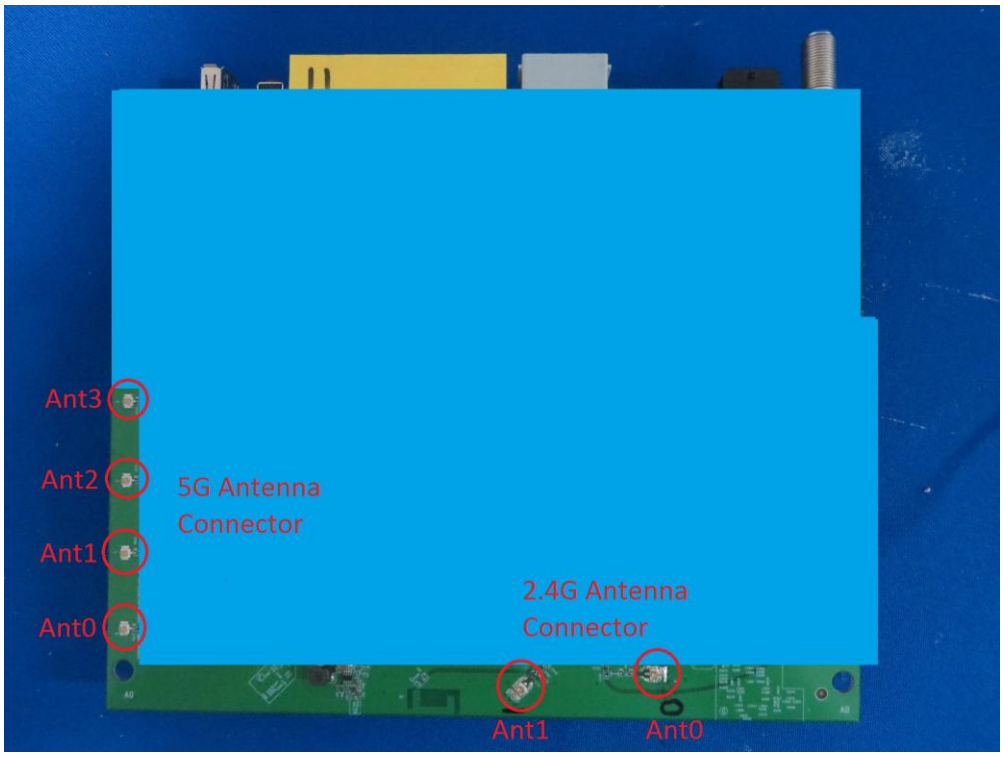
Antenna Type	Frequency Band (GHz)	T_X Paths	Directional Gain (dBi)	
			Non Beam Forming	Beam Forming
PCB Antenna	2.4	2	1.90	--
	5.2	4	2.17	8.04
	5.8	4	2.70	8.70

Note:

1. Transmit at 2.4GHz support two antennas, and support four antennas at 5GHz transmit.
2. The EUT supports Beam Forming mode, and the Beam Forming support 802.11n/ac, not include 802.11a.
3. Correlated signals include, but are not limited to, signals transmitted in any of the following modes:
   - Any transmit Beam Forming mode, whether fixed or adaptive (e.g., phased array modes, closed loop MIMO modes, Transmitter Adaptive Antenna modes, Maximum Ratio Transmission (MRT) modes, and Statistical Eigen Beam Forming (EBF) modes).
4. Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dBi
   - transmit signals are correlated, then
   - Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/N_{ANT}$] dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2.4. Description of Antenna RF Port

RF Port				
Test Mode	Software Control Port			
2.4G T_X	Ant 0	Ant 1	--	--
Test Mode	Software Control Port			
5G T_X	Ant 0	Ant 1	Ant 2	Ant 3



2.5. Device Capabilities

This device contains the following capabilities:

802.11a/b/g/n/ac WLAN (DTS)

Note: WLAN (DTS) 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 6.0 b) of KDB 558074 D01v03r01. 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	
	2.4G Band	5G Band
802.11b	95.1%	--
802.11g	94.2%	--
802.11a	--	98.9%
802.11n-HT20	94.1%	98.8%
802.11n-HT40	89.7%	97.6%
802.11ac-VHT20	--	98.6%
802.11ac-VHT40	--	97.9%
802.11ac-VHT80	--	94.5%

2.6. Test Configuration

The **WIFI dual band 4 GE LAN GPON HGU FCC ID: 2ABLK-8X4G-2** was tested per the guidance of KDB 558074 D01v03r01. KDB 558074 D01v03r01 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.7. EMI Suppression Device(s)/Modifications

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

2.8. 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.

2.9. Test Software

The test utility software used during testing was “MTool_2.0.0.7” for 2.4G and “Hyper Terminal” for 5.8G.

Power Parameter Value for $1T_X$

Test Mode	Test Frequency (MHz)	Power Parameter Value	
		Ant 0	Ant 1
802.11b	2412	15.00	N/A
	2437	15.00	
	2462	15.00	
802.11g	2412	15.00	N/A
	2437	15.00	
	2462	15.00	
802.11n-HT20	2412	15.00	15.00
	2437	15.00	15.00
	2462	15.00	15.00
802.11n-HT40	2422	15.00	15.00
	2437	15.00	15.00
	2452	15.00	15.00

Power Parameter Value for $2T_X$

Test Mode	Test Frequency (MHz)	Power Parameter Value
802.11n-HT20	2412	13.50
	2437	13.50
	2462	13.50
802.11n-HT40	2422	13.50
	2437	13.50
	2452	13.50

Power Parameter Value for $4T_X$ (Non-Beam Forming)

Test Mode	Test Frequency (MHz)	Power Parameter Value
802.11a	5745	16.00
	5785	17.00
	5825	17.00
802.11n-HT20	5745	16.00
	5785	16.00
	5825	16.00
802.11ac-VH20	5745	16.00
	5785	16.00
	5825	16.00
802.11n-HT40	5755	16.00
	5795	16.00
802.11ac-VHT40	5755	16.00
	5795	16.00
802.11ac-VHT80	5775	16.00

Power Parameter Value for $4T_X$ (Beam Forming)

Test Mode	Test Frequency (MHz)	Power Parameter Value
802.11n-HT20	5745	13.00
	5785	13.00
	5825	14.00
802.11ac-VH20	5745	13.00
	5785	13.00
	5825	14.00
802.11n-HT40	5755	13.00
	5795	13.00
802.11ac-VHT40	5755	14.00
	5795	13.00
802.11ac-VHT80	5775	13.00

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2009), and the guidance provided in KDB 558074 D01v03r01 were used in the measurement of the **WIFI dual band 4 GE LAN GPON HGU FCC ID: 2ABLK-8X4G-2.**
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 is 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 C63.10-2009 at Clause 4.3.
Line conducted emissions test results are shown in Section 7.8.

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 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 BeamWidth 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 **WIFI dual band 4 GE LAN GPON HGU** is **permanently attached.**
- There are no provisions for connection to an external antenna.

Conclusion:

The **WIFI dual band 4 GE LAN GPON HGU FCC ID: 2ABLK-8X4G-2** unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATA

Conducted Emissions

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	101209	1 year	2014/11/08
Two-Line V-Network	R&S	ENV216	101683	1 year	2014/11/08
Two-Line V-Network	R&S	ENV216	101684	1 year	2014/11/08
Temperature/ Meter Humidity	Anymetre	TH101B	SR2-01	1 year	2014/11/15

Radiated Emission

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MY5144016A	1 year	2015/01/04
Spectrum Analyzer	Agilent	E4447A	MY45300136	1 year	2014/11/08
Preamplifier	MRT	AP01G18	1310002	1 year	2014/10/07
Preamplifier	MRT	AP18G40	1310001	1 year	2014/10/07
Loop Antenna	Schwarzbeck	FMZB1519	1519-041	1 year	2014/11/24
TRILOG Antenna	Schwarzbeck	VULB9162	9162-047	1 year	2014/11/24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1167	1 year	2014/11/24
Broadband Horn Antenna	Schwarzbeck	BBHA9170	9170-549	1 year	2014/12/11
Temperature/Humidity Meter	Anymetre	TH101B	AC1-01	1 year	2014/11/15

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MY5144016A	1 year	2015/01/04
Spectrum Analyzer	Agilent	E4447A	MY45300136	1 year	2014/11/08
Wideband Peak Power Meter	Anritsu	ML2495A	0905006	1 year	2015/01/12
Power Sensor	Anritsu	MA2411B	0846014	1 year	2015/01/12
Temperature/Humidity Meter	Anymetre	TH101B	TR3-01	1 year	2014/11/15

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

Company Name: **Calix Inc.**

FCC ID: **2ABLK-8X4G-2**

FCC Classification: **Digital Transmission System (DTS)**

Data Rate(s) Tested: **1Mbps ~ 11Mbps (b); 6Mbps ~ 54Mbps (a)(g);**
6.5/7.2Mbps ~ 260/288.8Mbps (n-HT20MHz BW);
13.5/15.0Mbps ~ 540/600Mbps (n-HT40MHz BW);
6.5/7.2Mbps ~ 312/346.7Mbps (ac-VHT20MHz BW);
13.5/15Mbps ~ 720/800Mbps (ac-VHT40MHz BW);
29.3/32.5Mbps ~ 1560/1733.3Mbps (ac-VHT80MHz BW)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	RSS-210 [A8.2]	6dB Bandwidth	≥ 500kHz	Conducted	Pass	Section 7.2
15.247(b)(3)	RSS-210 [A8.4]	Output Power	Output Power ≤ 1Watt; E.I.R.P ≤ 36dBm		Pass	Section 7.3
15.247(e)	RSS-210 [A8.2]	Power Spectral Density	≤ 8dBm / 3kHz Band		Pass	Section 7.4
15.247(d)	RSS-210 [A8.5]	Band Edge / Out-of-Band Emissions	< 20dBc(Peak)		Pass	Section 7.5
15.205 15.209	RSS-210 [A8.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 & RSS-Gen [7.2.5]	Radiated	Pass	Section 7.6 & 7.7
15.207	RSS-Gen [7.2.4]	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits < RSS-Gen [7.2.4] limits	Line Conducted	Pass	Section 7.8

Notes:

1) All modes of operation and data rates were investigated. 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. 6dB Bandwidth Measurement *§15.247(a)(2); RSS-210[A8.2]*

7.2.1. Test Limit

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

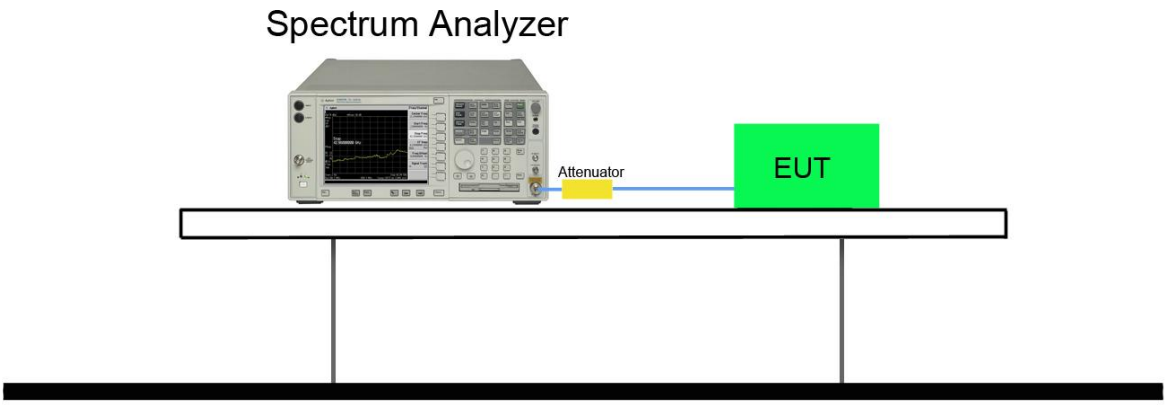
7.2.2. Test Procedure used

KDB 558074 D01v03r01 – Section 8.2 Option 2

7.2.3. Test Setting

1. The Spectrum's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. Set RBW = 100 kHz
3. VBW ≥ 3 × RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace was allowed to stabilize

7.2.4. Test Setup



7.2.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Ant 0						
802.11b	1	01	2412	8.10	10.09	Pass
802.11b	1	06	2437	8.09	10.09	Pass
802.11b	1	11	2462	8.08	10.09	Pass
802.11g	6	01	2412	15.12	16.29	Pass
802.11g	6	06	2437	15.07	16.29	Pass
802.11g	6	11	2462	15.12	16.28	Pass
802.11n-HT20	6.5	01	2412	15.11	17.42	Pass
802.11n-HT20	6.5	06	2437	15.12	17.41	Pass
802.11n-HT20	6.5	11	2462	15.11	17.42	Pass
802.11n-HT40	13.5	03	2422	35.09	36.10	Pass
802.11n-HT40	13.5	06	2437	35.16	36.14	Pass
802.11n-HT40	13.5	09	2452	35.16	36.13	Pass
Ant 1						
802.11n-HT20	6.5	01	2412	15.14	17.44	Pass
802.11n-HT20	6.5	06	2437	15.10	17.44	Pass
802.11n-HT20	6.5	11	2462	15.13	17.44	Pass
802.11n-HT40	13.5	03	2422	35.17	36.11	Pass
802.11n-HT40	13.5	06	2437	35.53	36.16	Pass
802.11n-HT40	13.5	09	2452	35.52	36.15	Pass

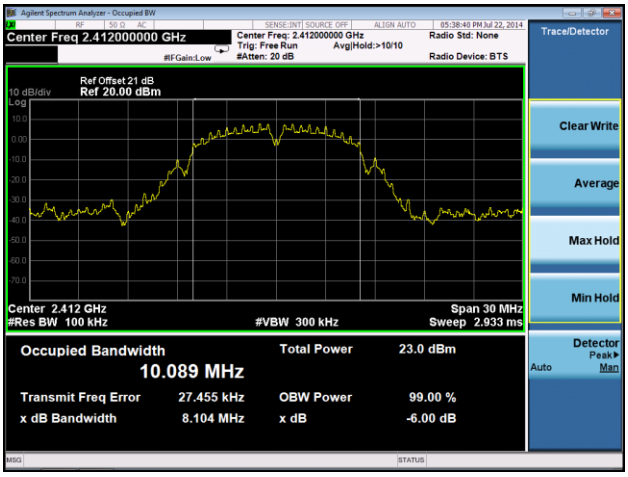
Ant 0 / Ant 0 + 1						
802.11n-HT20	6.5	01	2412	15.08	17.41	Pass
802.11n-HT20	6.5	06	2437	15.10	17.42	Pass
802.11n-HT20	6.5	11	2462	15.11	17.42	Pass
802.11n-HT40	13.5	03	2422	35.17	36.10	Pass
802.11n-HT40	13.5	06	2437	35.32	36.13	Pass
802.11n-HT40	13.5	09	2452	35.17	36.10	Pass
Ant 1 / Ant 0 + 1						
802.11n-HT20	6.5	01	2412	15.13	17.44	Pass
802.11n-HT20	6.5	06	2437	16.30	17.44	Pass
802.11n-HT20	6.5	11	2462	15.12	17.45	Pass
802.11n-HT40	13.5	03	2422	35.15	36.14	Pass
802.11n-HT40	13.5	06	2437	35.74	36.16	Pass
802.11n-HT40	13.5	09	2452	35.75	36.17	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Ant 0 / Ant 0 + 1 + 2 + 3						
802.11a	6	149	5745	16.42	16.51	Pass
802.11a	6	157	5785	16.47	16.50	Pass
802.11a	6	165	5825	16.42	16.51	Pass
802.11n-HT20	6.5	149	5745	17.65	17.77	Pass
802.11n-HT20	6.5	157	5785	17.64	17.75	Pass
802.11n-HT20	6.5	165	5825	17.63	17.76	Pass
802.11ac-VHT20	6.5	149	5745	17.64	17.75	Pass
802.11ac-VHT20	6.5	157	5785	17.64	17.77	Pass
802.11ac-VHT20	6.5	165	5825	17.65	17.75	Pass
802.11n-HT40	13.5	151	5755	36.41	36.21	Pass
802.11n-HT40	13.5	159	5795	36.42	36.21	Pass
802.11ac-VHT40	13.5	151	5755	36.42	36.22	Pass
802.11ac-VHT40	13.5	159	5795	36.41	36.22	Pass
802.11ac-VHT80	29.3	155	5775	75.26	75.15	Pass
Ant 1 / Ant 0 + 1 + 2 + 3						
802.11a	6	149	5745	16.49	16.59	Pass
802.11a	6	157	5785	16.42	16.58	Pass
802.11a	6	165	5825	16.46	16.59	Pass
802.11n-HT20	6.5	149	5745	17.66	17.75	Pass
802.11n-HT20	6.5	157	5785	17.65	17.75	Pass
802.11n-HT20	6.5	165	5825	17.66	17.75	Pass
802.11ac-VHT20	6.5	149	5745	17.66	17.75	Pass
802.11ac-VHT20	6.5	157	5785	17.65	17.76	Pass
802.11ac-VHT20	6.5	165	5825	17.68	17.76	Pass
802.11n-HT40	13.5	151	5755	36.40	36.24	Pass
802.11n-HT40	13.5	159	5795	36.38	36.23	Pass
802.11ac-VHT40	13.5	151	5755	36.40	36.24	Pass
802.11ac-VHT40	13.5	159	5795	36.39	36.26	Pass
802.11ac-VHT80	29.3	155	5775	75.20	75.12	Pass

Ant 2 / Ant 0 + 1 + 2 + 3						
802.11a	6	149	5745	16.43	16.50	Pass
802.11a	6	157	5785	16.57	16.52	Pass
802.11a	6	165	5825	16.43	16.50	Pass
802.11n-HT20	6.5	149	5745	17.64	17.70	Pass
802.11n-HT20	6.5	157	5785	17.68	17.71	Pass
802.11n-HT20	6.5	165	5825	17.67	17.71	Pass
802.11ac-VHT20	6.5	149	5745	17.65	17.70	Pass
802.11ac-VHT20	6.5	157	5785	17.68	17.72	Pass
802.11ac-VHT20	6.5	165	5825	17.66	17.71	Pass
802.11n-HT40	13.5	151	5755	36.40	36.20	Pass
802.11n-HT40	13.5	159	5795	36.40	36.22	Pass
802.11ac-VHT40	13.5	151	5755	36.39	36.21	Pass
802.11ac-VHT40	13.5	159	5795	36.39	36.21	Pass
802.11ac-VHT80	29.3	155	5775	75.25	75.12	Pass
Ant 3 / Ant 0 + 1 + 2 + 3						
802.11a	6	149	5745	16.44	16.54	Pass
802.11a	6	157	5785	16.46	16.55	Pass
802.11a	6	165	5825	16.45	16.54	Pass
802.11n-HT20	6.5	149	5745	17.66	17.72	Pass
802.11n-HT20	6.5	157	5785	17.66	17.72	Pass
802.11n-HT20	6.5	165	5825	17.67	17.72	Pass
802.11ac-VHT20	6.5	149	5745	17.67	17.71	Pass
802.11ac-VHT20	6.5	157	5785	17.67	17.71	Pass
802.11ac-VHT20	6.5	165	5825	17.67	17.71	Pass
802.11n-HT40	13.5	151	5755	36.37	36.20	Pass
802.11n-HT40	13.5	159	5795	36.39	36.20	Pass
802.11ac-VHT40	13.5	151	5755	36.37	36.19	Pass
802.11ac-VHT40	13.5	159	5795	36.39	36.20	Pass
802.11ac-VHT80	29.3	155	5775	75.22	75.10	Pass

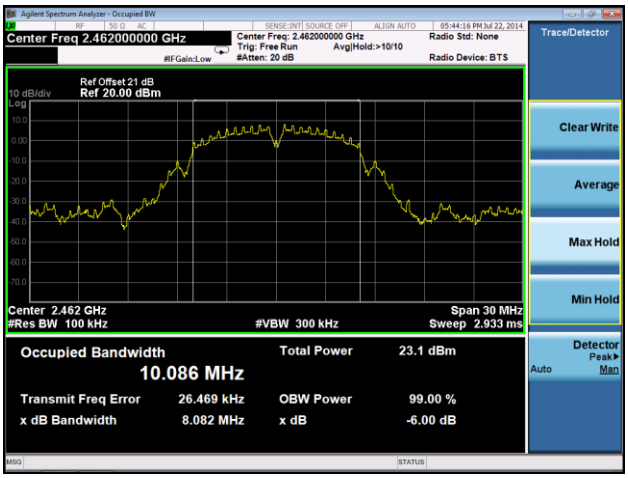
802.11b 6dB Bandwidth - Ant 0

Channel 01 (2412MHz)



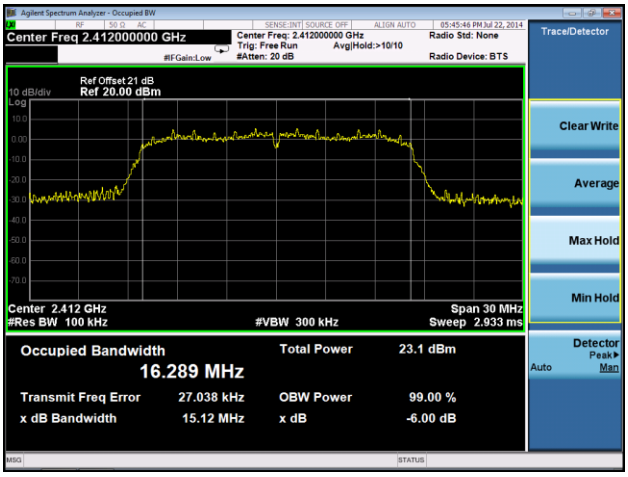
Channel 06 (2437MHz)

Channel 11 (2462MHz)

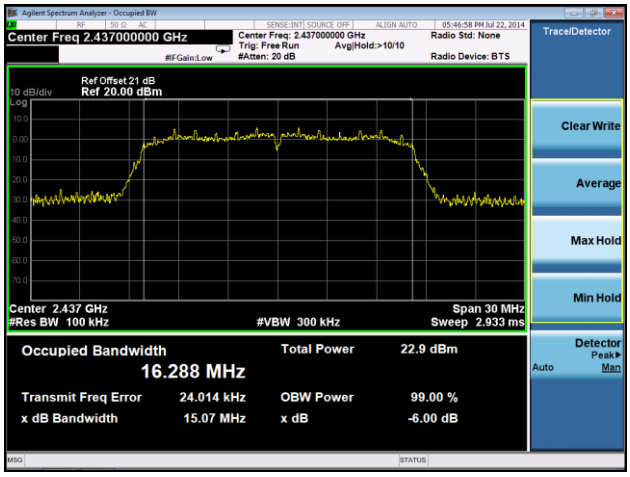


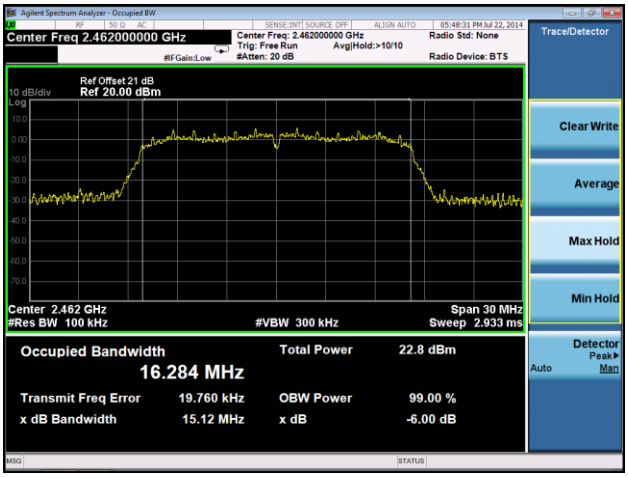
802.11g 6dB Bandwidth - Ant 0

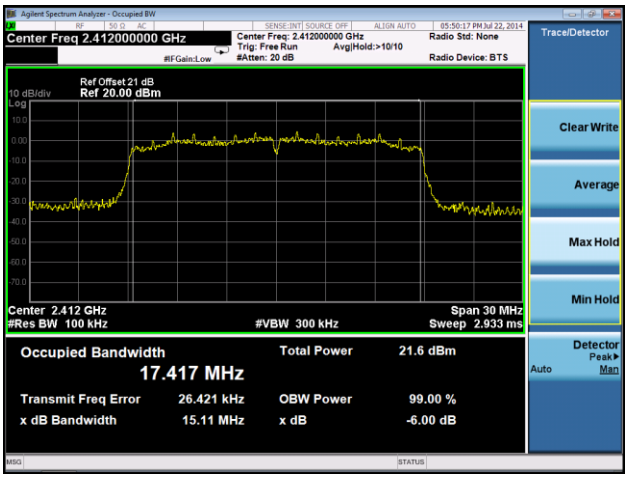
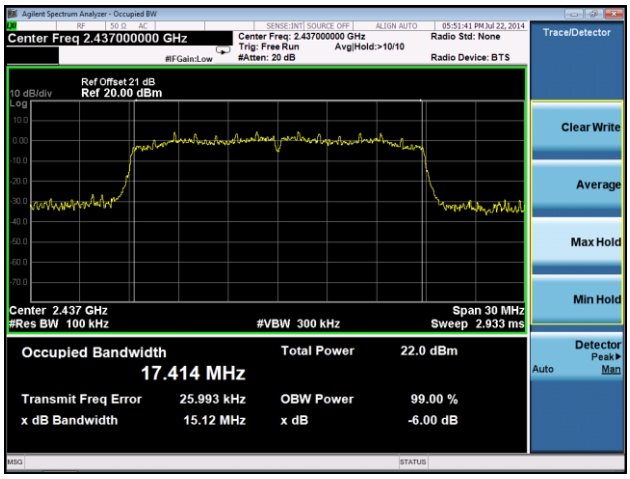
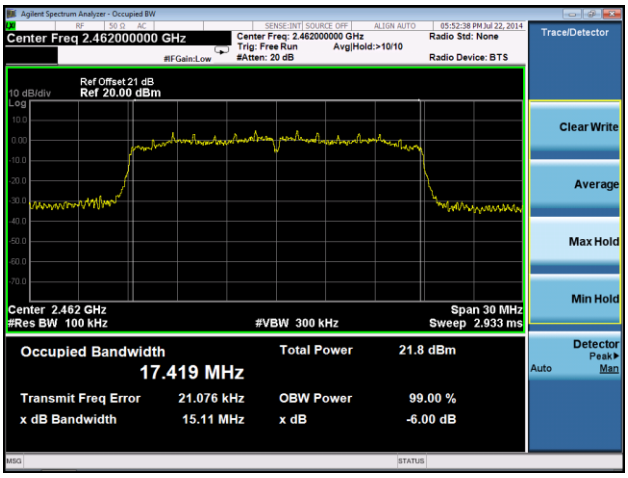
Channel 01 (2412MHz)

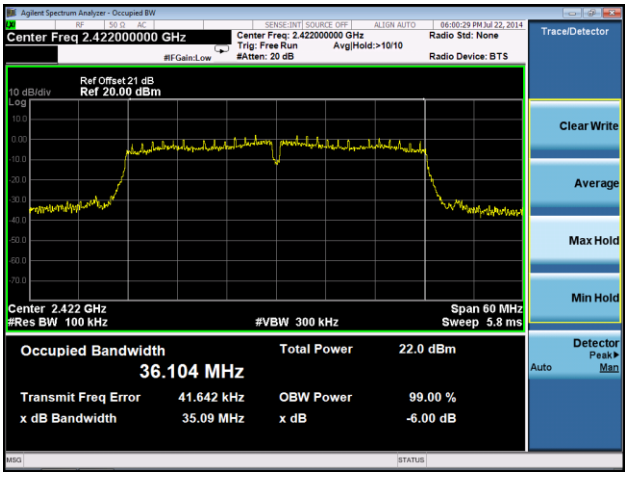
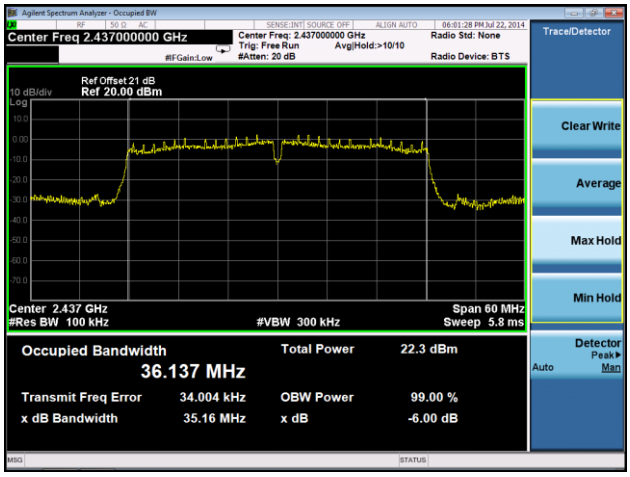
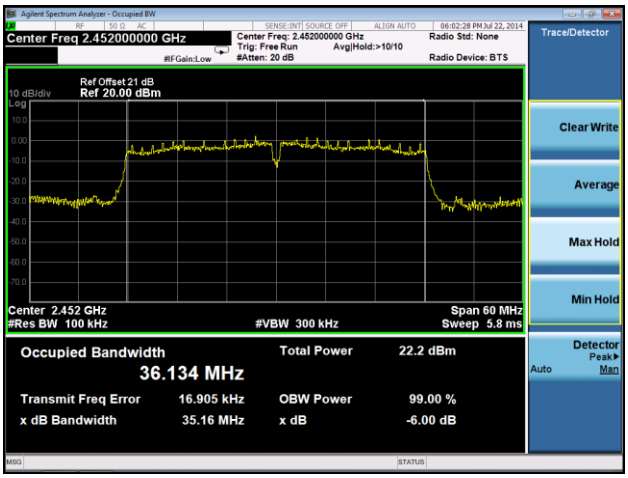


Channel 06 (2437MHz)



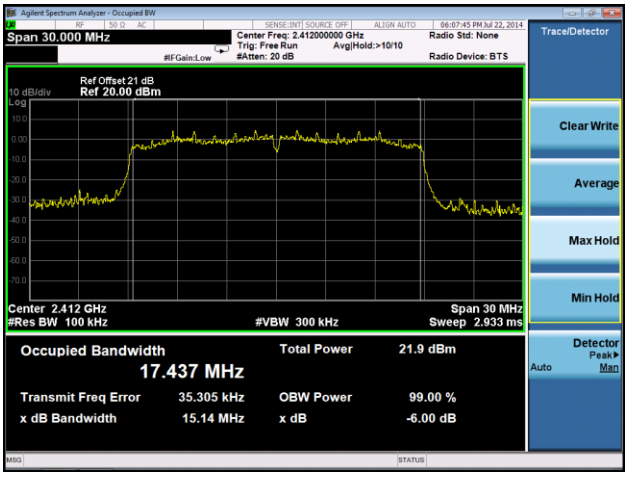
Channel 11 (2462MHz)	
	

802.11n-HT20 6dB Bandwidth - Ant 0	
Channel 01 (2412MHz)	**Channel 06 (2437MHz)**
	
Channel 11 (2462MHz)	
	

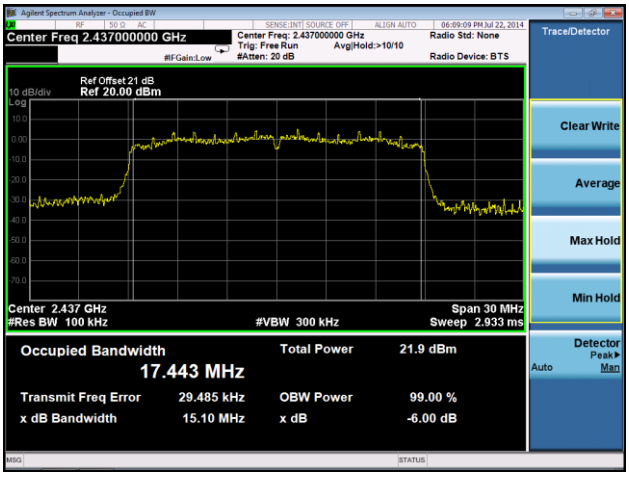
802.11n-HT40 6dB Bandwidth - Ant 0	
Channel 03 (2422MHz)	**Channel 06 (2437MHz)**
	
Channel 09 (2452MHz)	
	

802.11n-HT20 6dB Bandwidth - Ant 1

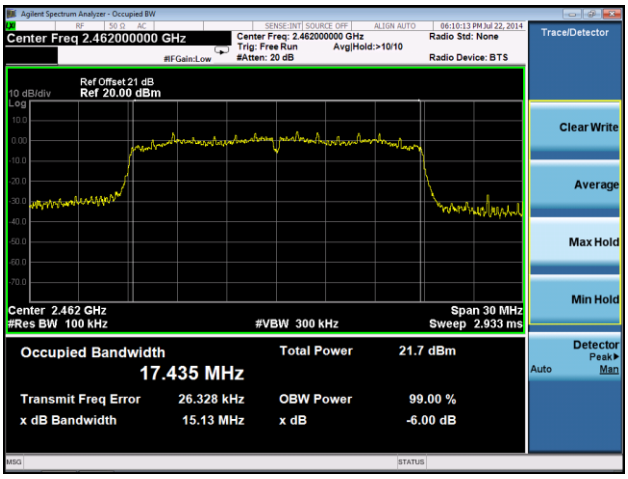
Channel 01 (2412MHz)



Channel 06 (2437MHz)

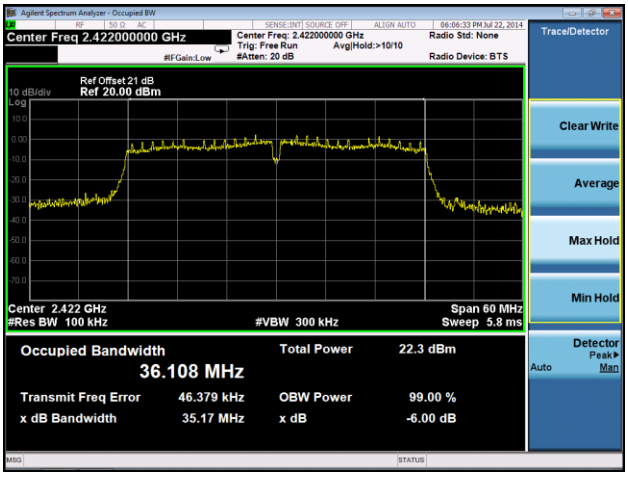


Channel 11 (2462MHz)

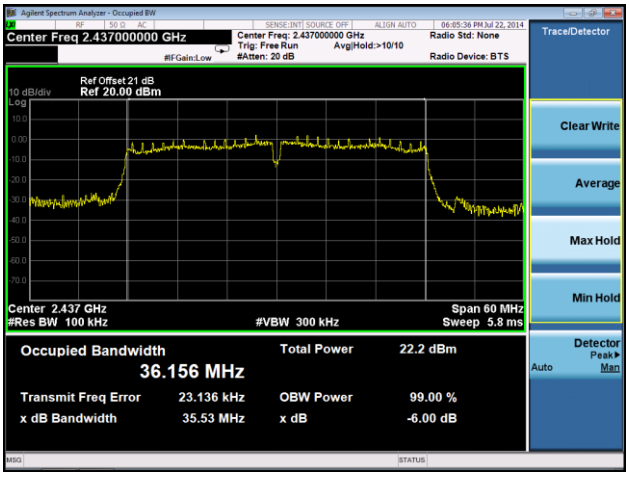


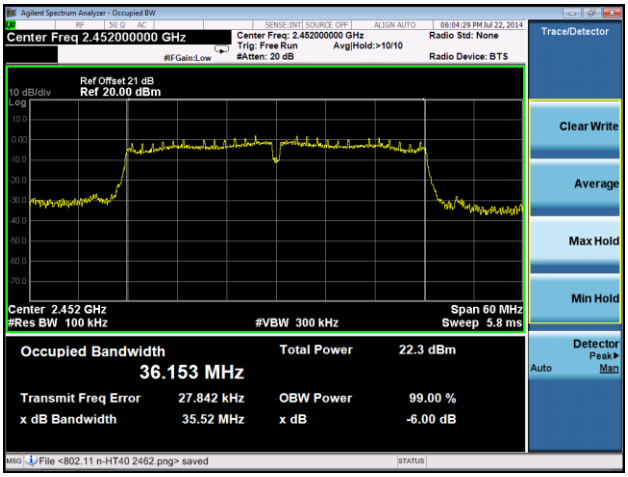
802.11n-HT40 6dB Bandwidth - Ant 1

Channel 03 (2422MHz)



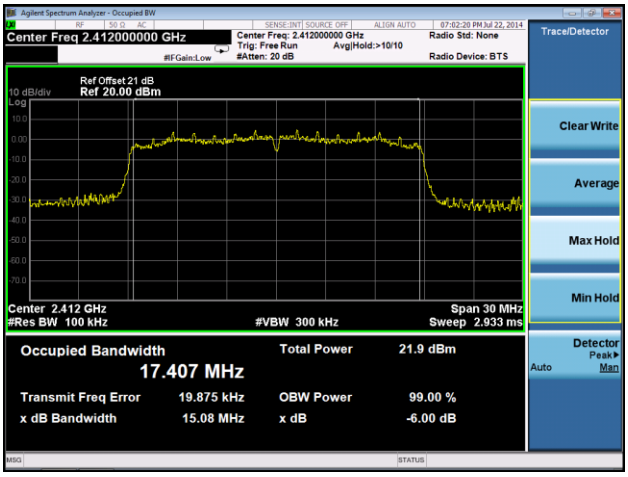
Channel 06 (2437MHz)



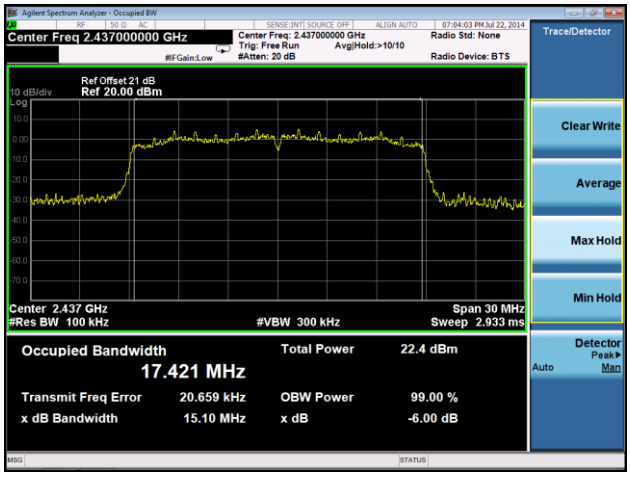
Channel 09 (2452MHz)	
	

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

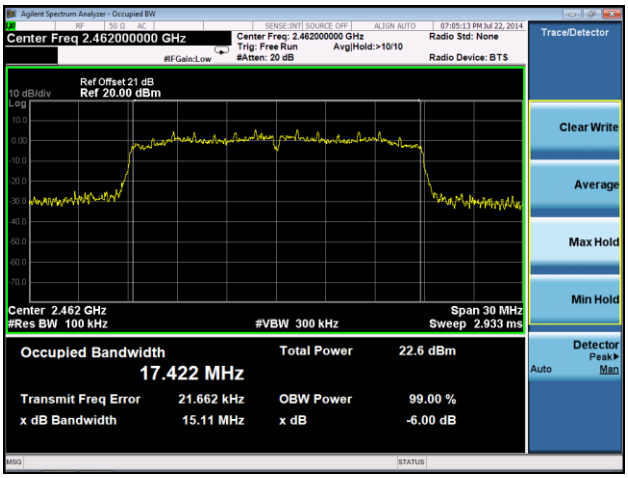
Channel 01 (2412MHz)



Channel 06 (2437MHz)

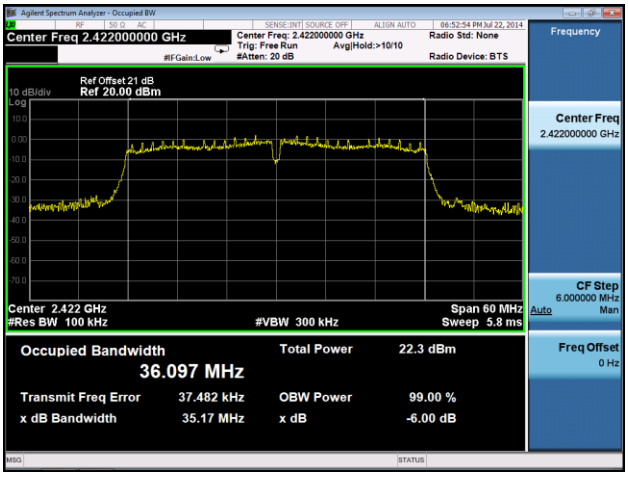


Channel 11 (2462MHz)

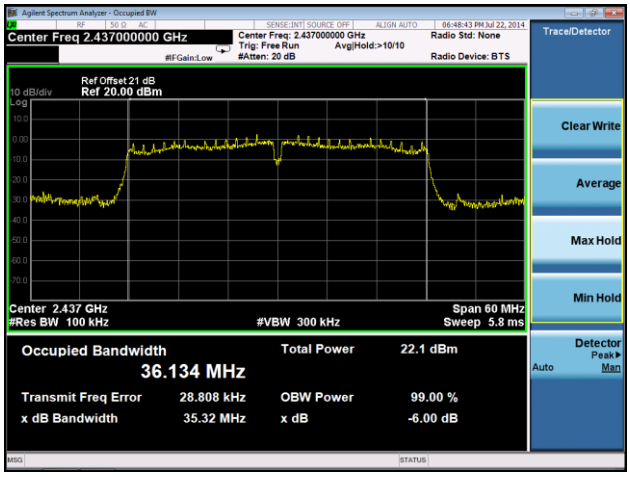


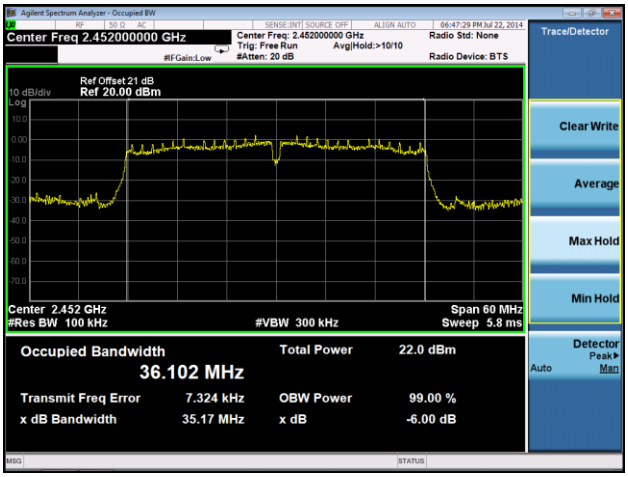
802.11n-HT40 6dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 03 (2422MHz)



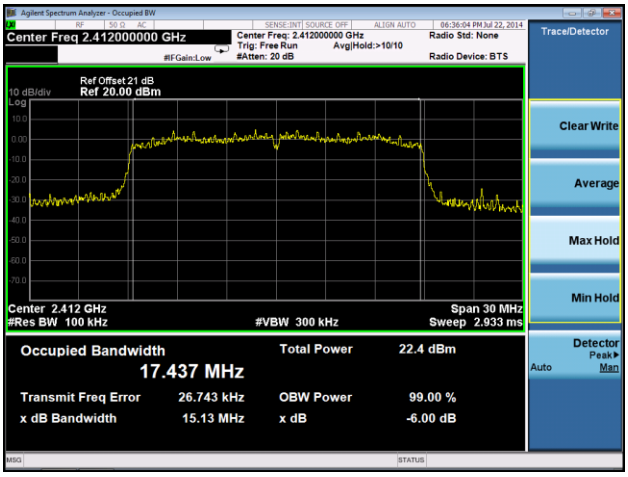
Channel 06 (2437MHz)



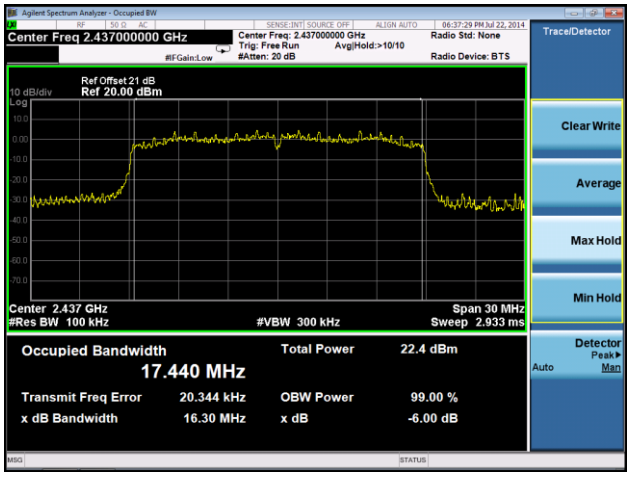
Channel 09 (2452MHz)	
	

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

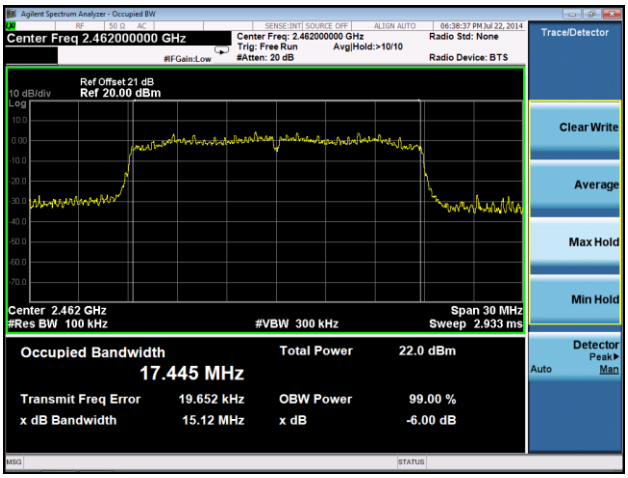
Channel 01 (2412MHz)



Channel 06 (2437MHz)

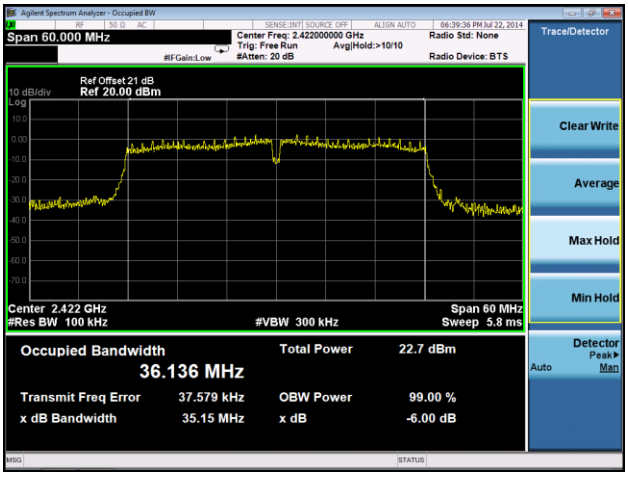


Channel 11 (2462MHz)

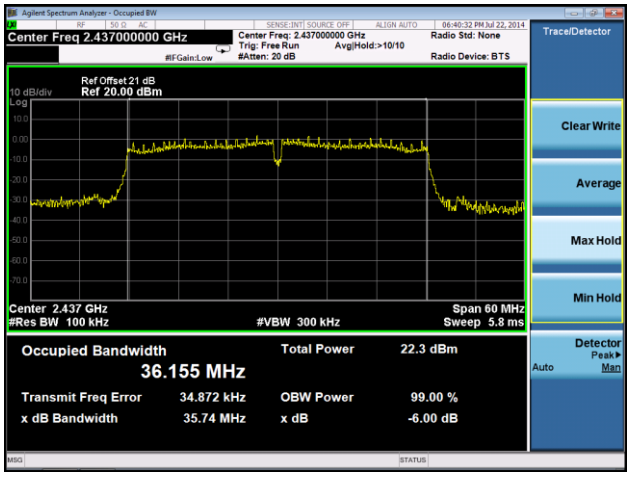


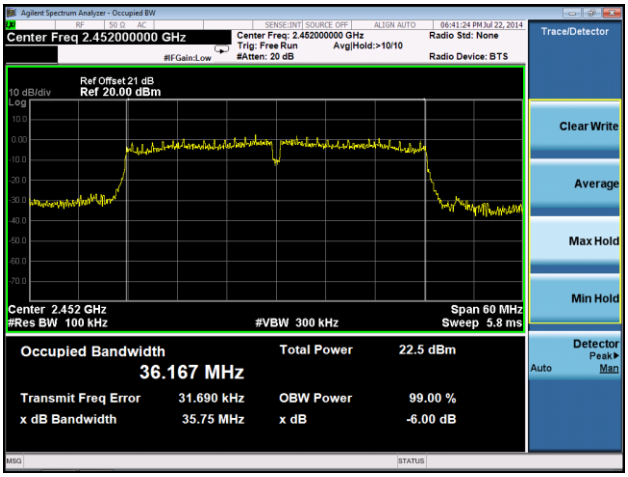
802.11n-HT40 6dB Bandwidth - Ant 1 / Ant 0 + 1

Channel 03 (2422MHz)



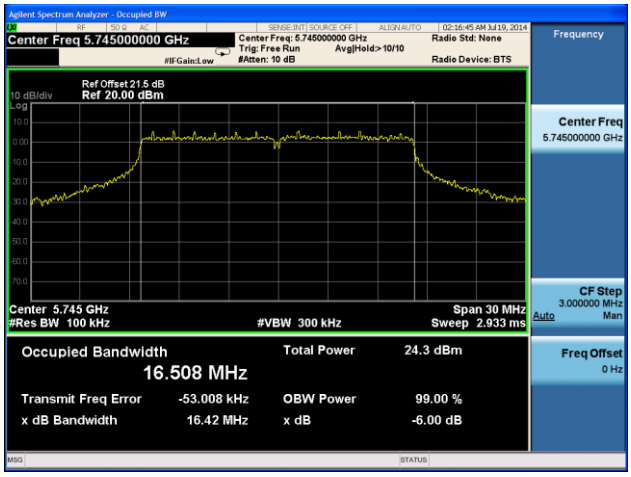
Channel 06 (2437MHz)



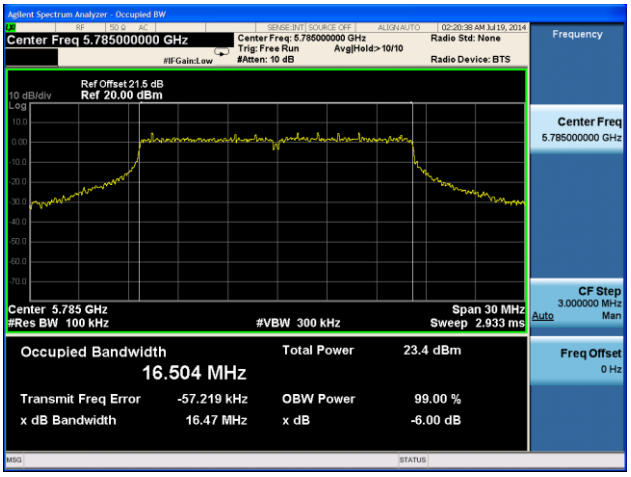
Channel 09 (2452MHz)	
	

802.11a 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3

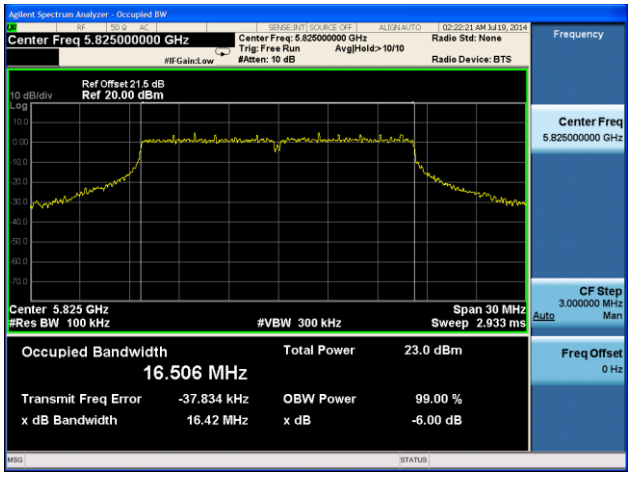
Channel 149 (5745MHz)



Channel 157 (5785MHz)

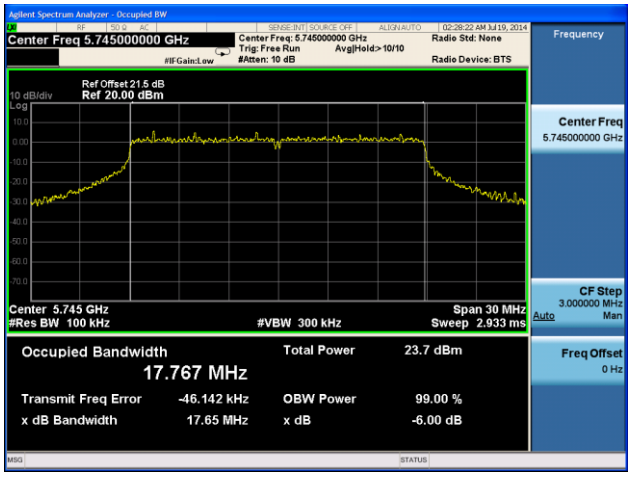


Channel 165 (5825MHz)

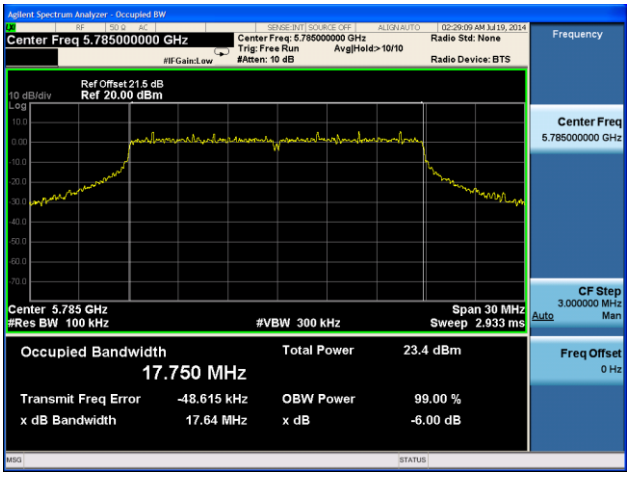


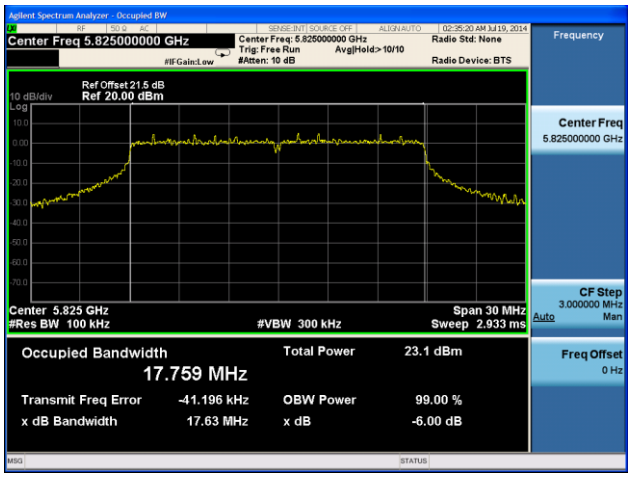
802.11n-HT20 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3

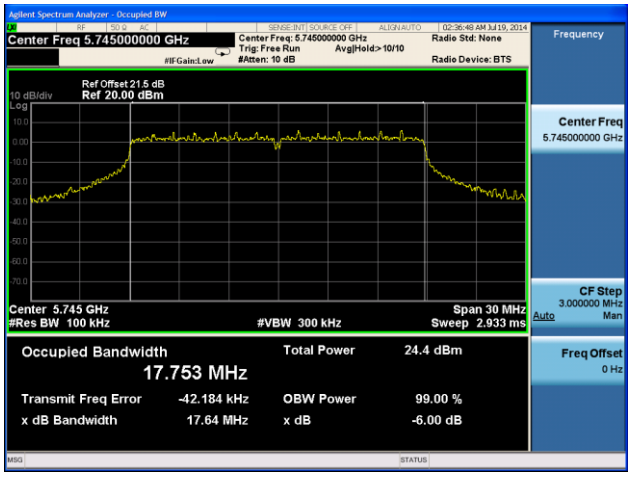
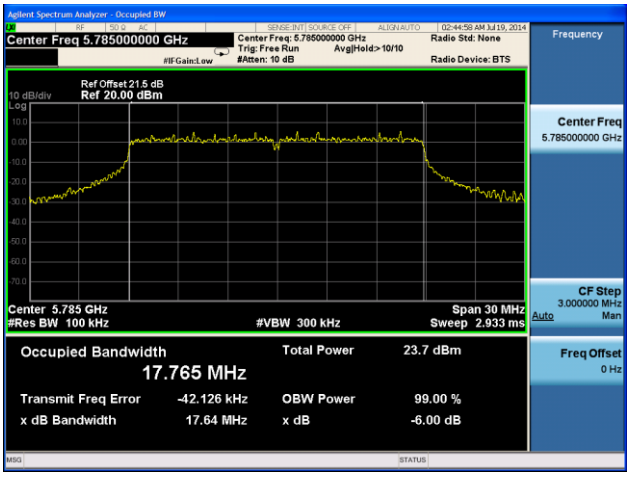
Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)	
	

802.11ac-VHT20 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 149 (5745MHz)	**Channel 157 (5785MHz)**
	

Channel 165 (5825MHz)