MEASUREMENT REPORT

FCC PART 15.407 WLAN 802.11a/n/ac/ax

FCC ID:	Q9DAPIN0514515
APPLICANT:	Hewlett Packard Enterprise Company
Application Type:	Class III Permissive Change
Product:	ACCESS POINT
Model No.:	APIN0514, APIN0515
Brand Name:	aruba a Hewlett Packard Enterprise company , Hewlett Packard Enterprise
FCC Classification:	Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s):	Part15 Subpart E (Section 15.407)
Test Procedure(s):	ANSI C63.10-2013, KDB 789033 D02v02r01, KDB 662911 D01v02r01
Test Date:	June 19 ~ August 10, 2018

Reviewed By: Paddy Chen
(Paddy Chen)

Approved By:
(Chenz Ker)

Testing Laboratory
3261

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 measurementreport and was tested in accordance with the measurement procedures specified in KDB 789033 D02v02r01. Test results reported hereinrelate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date	Note
1807TW0111-U8	Rev. 01	Initial Report	08-28-2018	Valid

CONTENTS

Description Page

§2.1033General Information

Applicant:	Hewlett Packard Enterprise Company
Applicant Address:	6280 America Center Drive, San Jose, CA 95002
Manufacturer:	Hewlett Packard Enterprise Company
Manufacturer Address:	6280 America Center Drive, San Jose, CA 95002
Test Site:	MRT Technology (Taiwan) Co., Ltd
Test Site Address:	No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)
FCC Registration No.:	291082
Test Device Serial No.:	APIN0514: Conducted Sample S/N: CS18640017 Radiated Sample S/N: CS1864005
	APIN0515: Conducted Sample S/N: CQK85T001C Radiated Sample S/N: CQK85T0003

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Fuxing Rd., Taoyuan, Taiwan (R.O.C)

- **MRT facility is a FCC registered (Reg. No. 153292 and 291082) test facility with the site description report on file and is designated by the FCC as an Accredited Test Firm.**
- **MRT facility is an IC registered (MRT Reg. No. 21723-1) test laboratory with the site description on file at Industry Canada.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (TAF) under the American Association for Laboratory Accreditation Program (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC, Industry Taiwan, EU and TELEC Rules.**

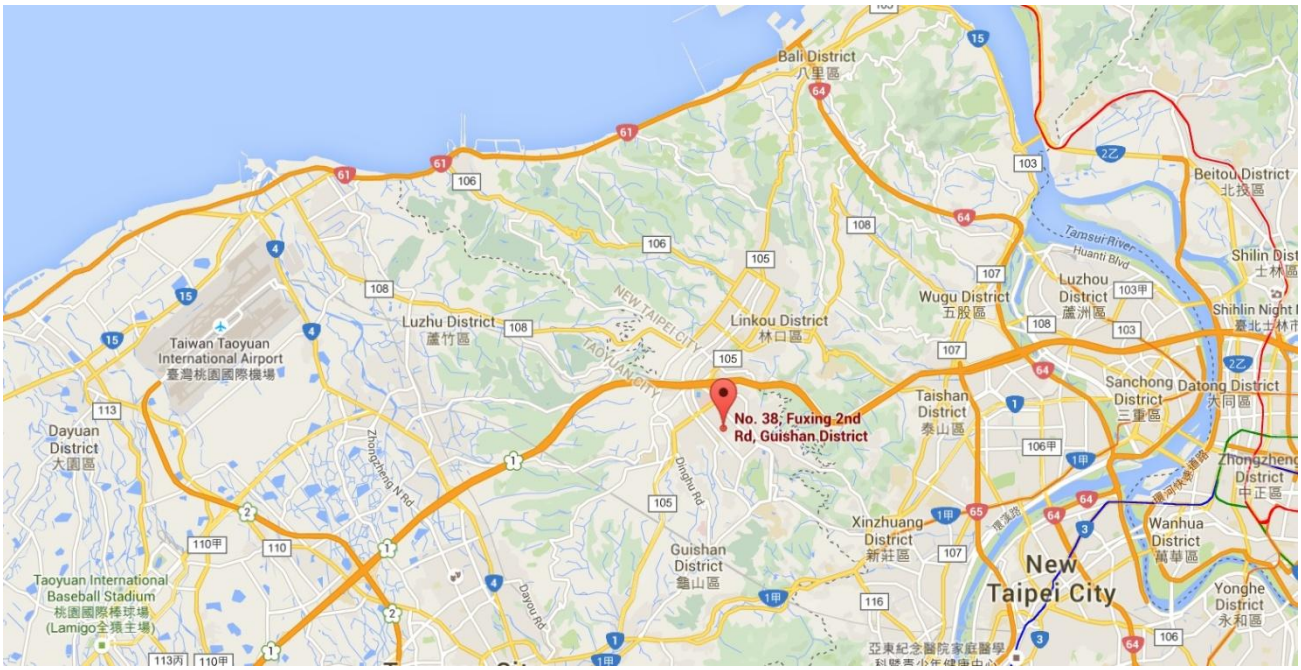
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices includingintentional and/or unintentional radiators for compliance with the technical rules and regulations of the FederalCommunications 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 Taoyuan City. These measurement tests were conducted at the MRT Technology (Taiwan) Co., Ltd. Facility located at No.38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan (R.O.C).



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	ACCESS POINT
Model No.	APIN0514, APIN0515
Brand Name:	aruba a Hewlett Packard Enterprise company , Hewlett Packard Enterprise
Wi-Fi Specification:	802.11a/b/g/n/ac/ax
Bluetooth Specification:	v4.2 single mode
ZigBee Specification:	802.15.4
Software Version:	F.0.8
Power Type:	0 ~ 50 °C
Operating Environment:	AC Adapter or POE input
Operating Environment:	Indoor Use

Note: The difference between models is that EUT use different antenna and appearance, APIN0514 use some external antennas, but APIN0515 use internal antenna, other hardware and software are the same. Besides, each model has its own power parameter value.

2.2. Product Specification Subjective to this Report

Frequency Range	For 802.11a/n-HT20/ac-VHT20/ax-HE20: 5260~5320MHz, 5500~5720MHz For 802.11n-HT40/ac-VHT40/ax-HE40: 5270~5310MHz, 5510~5710MHz For 802.11ac-VHT80/ax-HE80: 5290MHz, 5530MHz, 5610 MHz, 5690 MHz For 802.11ac-VHT160/ax-HE160: 5250MHz, 5570MHz
Type of Modulation	802.11a/n/ac: OFDM 802.11ax:OFDMA
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.2Mbps 802.11ax: up to 4804Mbps

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

2.3. Working Frequencies for this Report

802.11a/n-HT20/ac-VHT20/ax-HE20

Channel	Frequency	Channel	Frequency	Channel	Frequency
52	5260 MHz	56	5280 MHz	60	5300 MHz
64	5320 MHz	100	5500 MHz	104	5520 MHz
108	5540 MHz	112	5560 MHz	116	5580 MHz
120	5600 MHz	124	5620 MHz	128	5640 MHz
132	5660 MHz	136	5680 MHz	140	5700 MHz
144	5720 MHz	--	--	--	--

802.11n-HT40/ac-VHT40/ax-HE40

Channel	Frequency	Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz	102	5510 MHz
110	5550 MHz	118	5590 MHz	126	5630 MHz
134	5670 MHz	142	5710 MHz	--	--

802.11ac-VHT80/ax-HE80

Channel	Frequency	Channel	Frequency	Channel	Frequency
58	5290 MHz	106	5530 MHz	122	5610 MHz
138	5690 MHz	--	--	--	--

802.11ac-VHT160/ax-HE160

Channel	Frequency	Channel	Frequency	Channel	Frequency
50	5250 MHz	114	5570 MHz	--	--

2.4. Description of Available Antennas

Model No.: APIN0514

Antenna No.	Directionality	Frequency Band (GHz)	Model No.	Max Peak Gain (dBi)	BF Gain (dBi)	CDD Directional Gain (dBi)	
						For Power	For PSD
Wi-Fi External Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)							
1	Omni	2.4	AP-ANT-40	**4.0**	3.01	4.0	7.01
		5		5.0	6.02	5.0	11.02
2	Omni	2.4	AP-ANT-19	3.0	3.01	3.0	6.01
		5		**6.0**	6.02	6.0	12.02
3	Omni	2.4	AP-ANT-1W	3.8	3.01	3.8	6.81
		5		5.8	6.02	5.8	11.82
4	Omni	2.4	AP-ANT-13B	2.3	3.01	2.3	5.31
		5		4.0	6.02	4.0	10.02
5	Omni	2.4	AP-ANT-20W	**2.0**	3.01	2.0	5.01
		5		**2.0**	6.02	2.0	8.02
6 (Note 3)	Directional	2.4	AP-ANT-45	4.5	0.00	4.5	4.50
		5		5.5	3.01	5.5	8.51
7 (Note 3)	Directional	2.4	AP-ANT-48	**8.5**	0.00	8.5	8.5
		5		**8.5**	3.01	8.5	11.51
Bluetooth & ZigBee Internal Antenna							
PCB		2.4		4.9			

Model No.: APIN0515

Directionality	Frequency Band (GHz)	Max Peak Gain (dBi)	BF Gain (dBi)	CDD Directional Gain (dBi)	
				For Power	For PSD
Wi-Fi Internal Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)					
Omni	2.4	3.77	3.01	3.77	6.78
Omni	5	4.55	5.97	4.55	10.52
Bluetooth & ZigBee Internal Antenna					
PCB	2.4	3.5			

Note:

1. The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.
   For CDD transmissions, directional gain is calculated as follows, N_{ANT} = 4, 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 = 6.02;
   - For power measurements on IEEE 802.11 devices,
     Array Gain = 0 dB for N_{ANT} ≤ 4;
2. The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac/ax, not include 802.11a/b/g. Directional gain = G_{ANT} + BF Gain, BF Gain was declared by the applicant.
3. Two antennas have Cross-Polarized design, the detail see the antenna specification.
4. For model APIN0514, the antenna list shown as below table was selected to test.

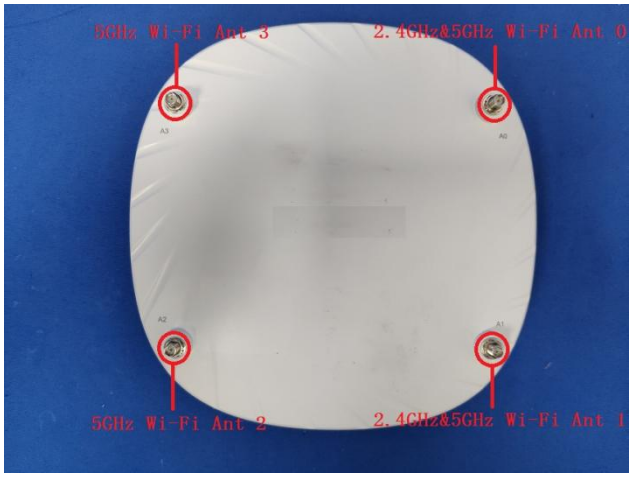
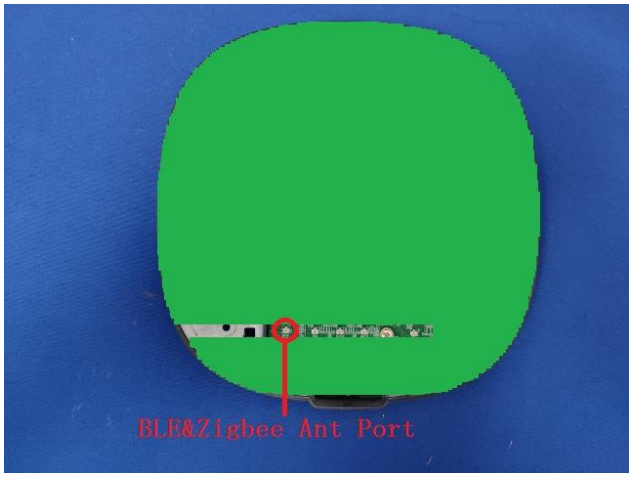
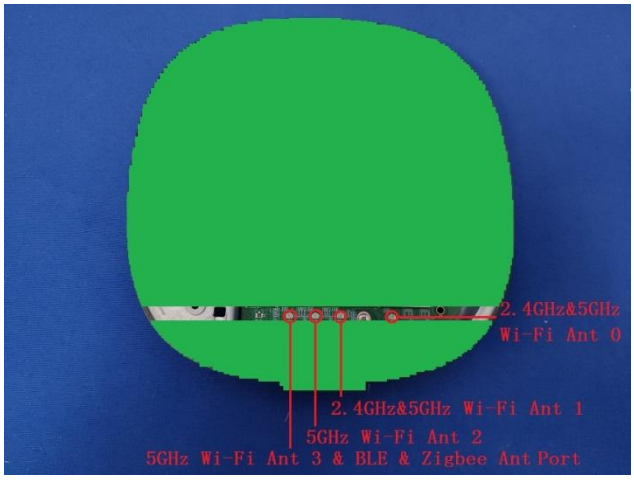
Antenna List	Conducted Testing	Radiated Testing
Omni Antenna 1# (Max 2.4GHz Omni ANT)	N/A	Yes
Omni Antenna 2# (Max 5GHz Omni ANT)	N/A	Yes
Omni Antenna 5# (Min 2.4&5GHz Omni ANT)	Yes (High Power Setting)	Yes
Directional Antenna 7# (Max 2.4&5GHz Directional ANT)	N/A	Yes

2.5. Test Mode

Test Mode	Mode 1: Transmit by 802.11a (6Mbps)
	Mode 2: Transmit by 802.11ac-VHT20 (MCS0)
	Mode 3: Transmit by 802.11ac-VHT40 (MCS0)
	Mode 4: Transmit by 802.11ac-VHT80 (MCS0)
	Mode 5: Transmit by 802.11ac-VHT160 (MCS0)
	Mode 6: Transmit by 802.11ax-HE20 (MCS0)
	Mode 7: Transmit by 802.11ax-HE40 (MCS0)
	Mode 8: Transmit by 802.11ax-HE80 (MCS0)
	Mode 9: Transmit by 802.11ax-HE160 (MCS0)

Note: Due to 802.11n and 802.11ac has same modulation type and power setting, we only show 802.11ac test mode in the report.

2.6. Description of Antenna RF Port

Antenna RF Port						
--	2.4GHz RF Port		5GHz RF Port			
Software Control Port	Ant 0	Ant 1	Ant 0	Ant 1	Ant 2	Ant 3
APIN0514						
						
APIN0515						
						

2.7. Description of Test Software

The test utility software used during testing was “accessMTool”, and the version was “v3.0.0.7”.

Power Parameter Value:

Test Mode	Test Frequency (MHz)	Power Parameter Value			
		APIN0514			APIN0515
		Omni Antenna (AP-ANT-20W)	Omni Antenna (AP-ANT-19)	Directional Antenna (AP-ANT-48)	
802.11a	5260	57	57	57	43
	5300	57	57	57	42
	5320	57	57	57	42
	5500	58	58	51	41
	5600	56	56	51	41
	5700	60	57	57	45
	5720	60	57	57	45
802.11ac-VHT20	5260	59	59	59	43
	5300	58	58	58	43
	5320	58	58	58	43
	5500	59	59	59	42
	5600	57	57	57	42
	5700	60	58	58	46
	5720	60	58	58	46
802.11ac-VHT40	5270	69	63	58	54
	5310	69	63	58	55
	5510	69	69	69	52
	5590	69	69	69	52
	5670	70	65	63	56
	5710	70	65	63	57
802.11ac-VHT80	5290	64	63	57	63
	5530	56	53	53	52
	5610	69	66	62	63
	5690	69	66	62	67
802.11ac-VHT160	5250	52	50	52	54
	5570	54	52	46	51

802.11ax-HE20	5260	58	58	58	43
	5300	58	58	58	43
	5320	58	58	58	43
	5500	59	59	59	43
	5600	57	57	57	42
	5700	60	60	51	46
	5720	60	60	51	46
802.11ax-HE40	5270	68	59	53	56
	5310	63	59	53	56
	5510	60	60	60	54
	5590	67	67	67	54
	5670	69	69	64	57
	5710	70	69	64	58
802.11ax-HE80	5290	64	60	64	63
	5530	61	61	61	55
	5610	70	66	60	64
	5690	72	66	60	67
802.11ax-HE160	5250	52	49	52	53
	5570	47	47	47	52

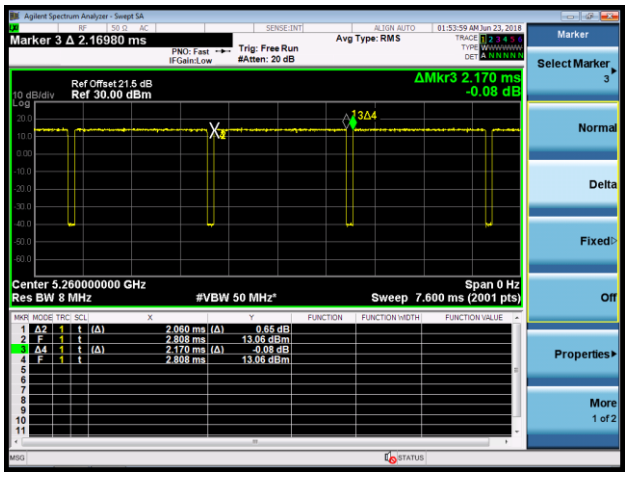
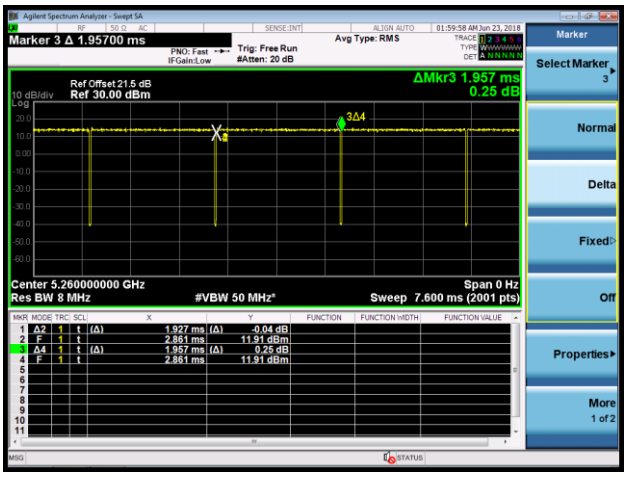
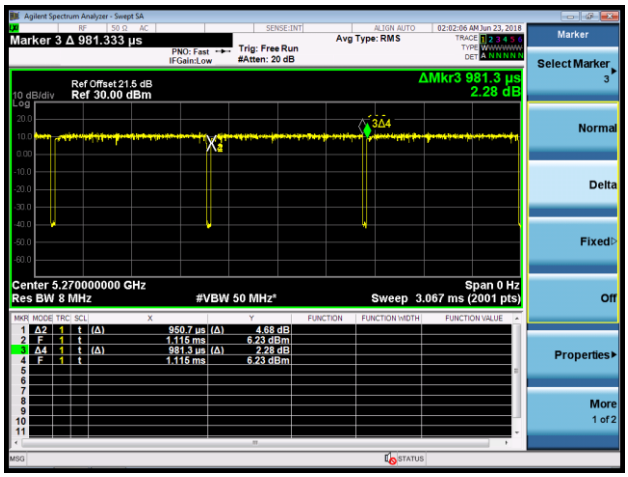
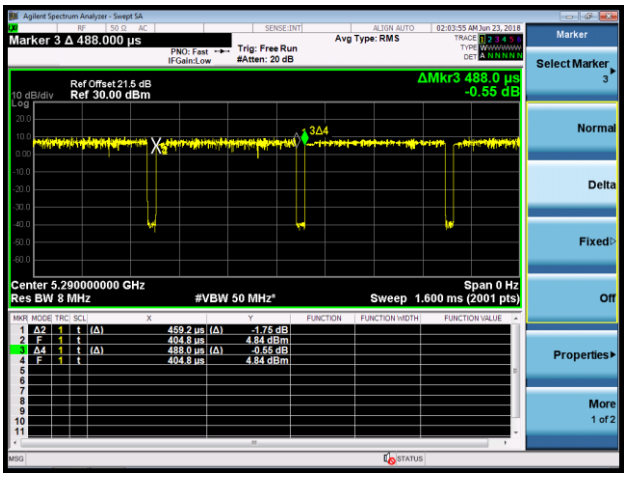
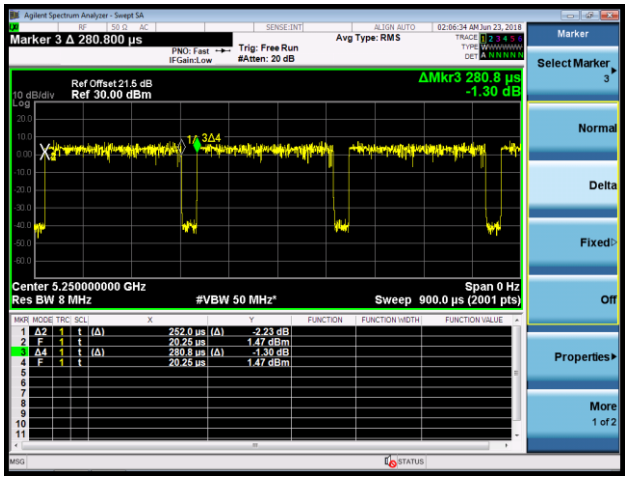
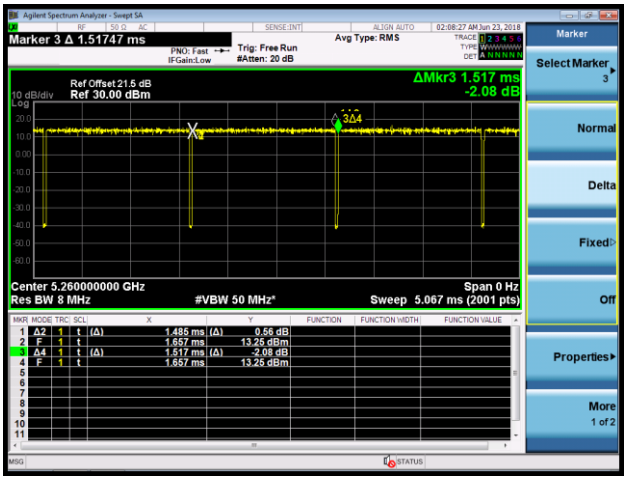
2.8. Device Capabilities

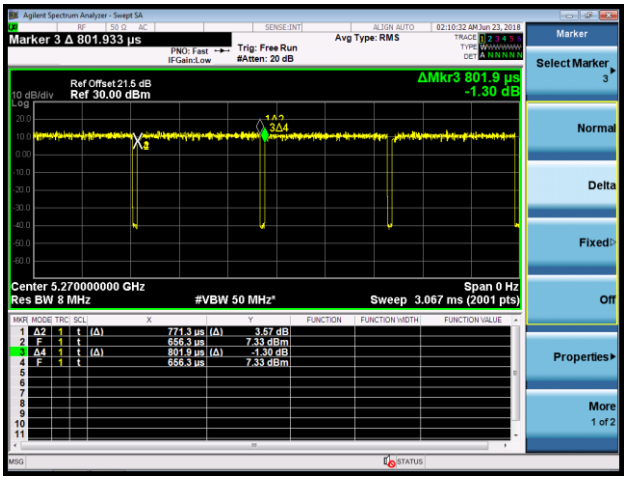
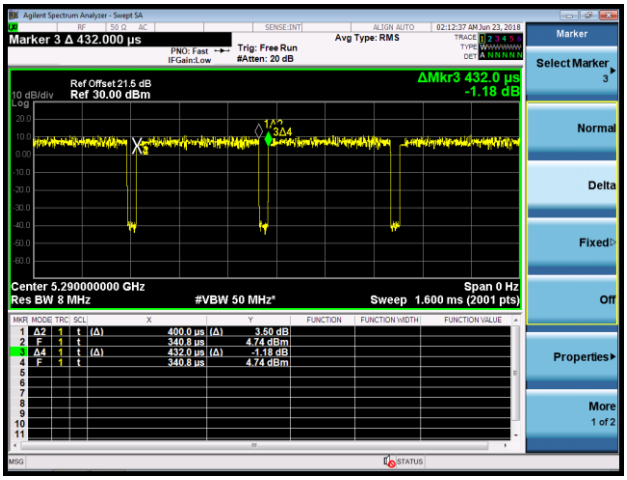
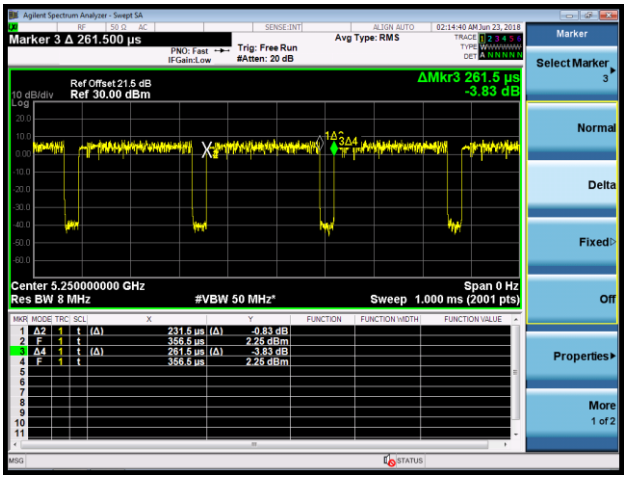
This device contains the following capabilities:

802.11a/b/g/n/ac/ax Wi-Fi and BT v4.2 single mode and Zigbee devices

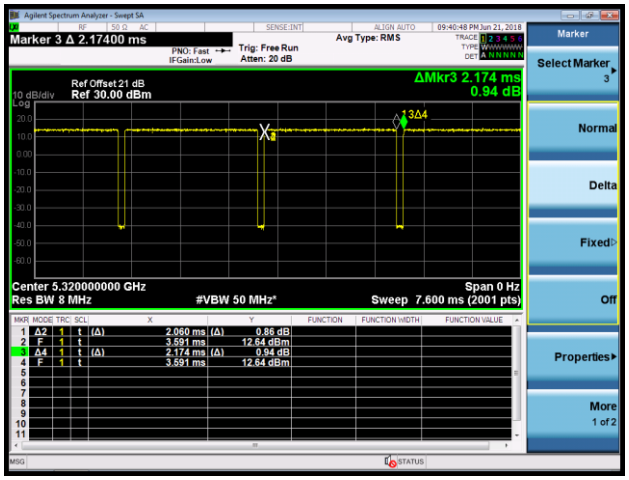
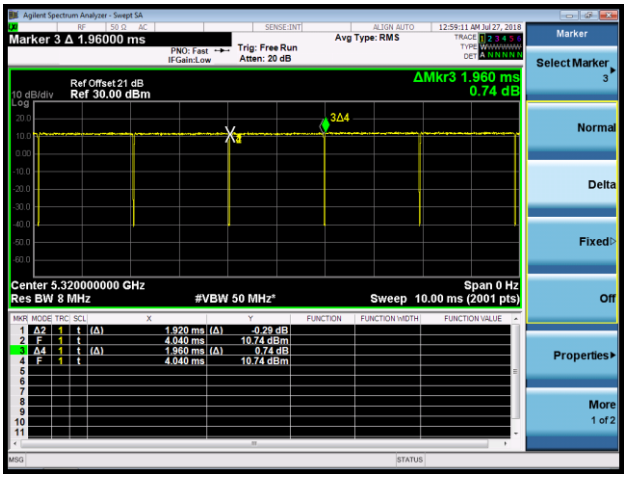
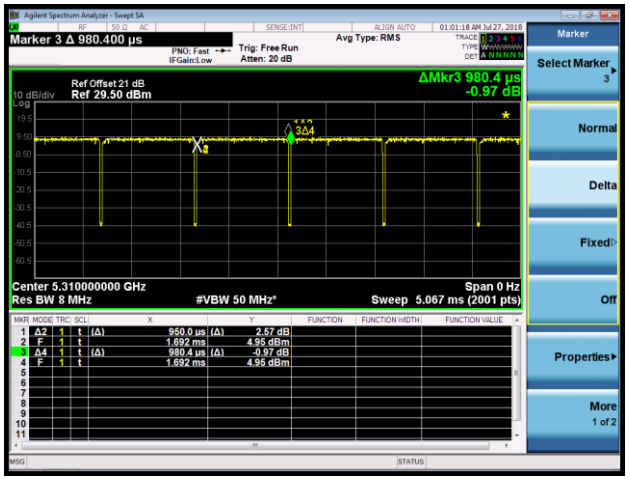
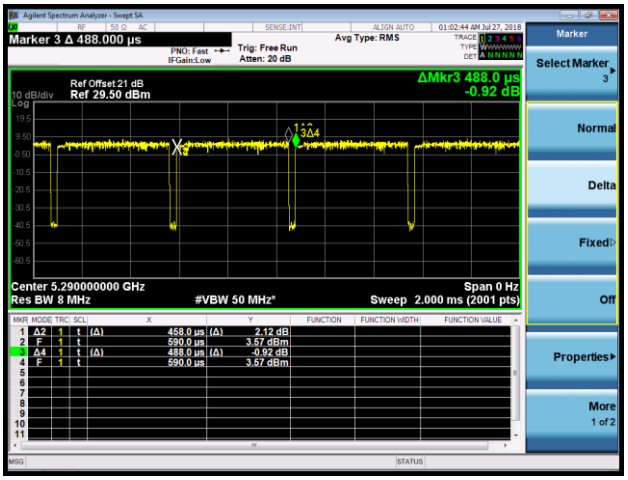
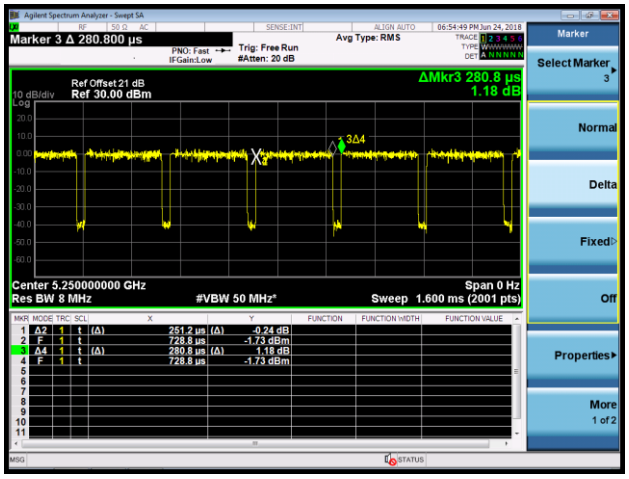
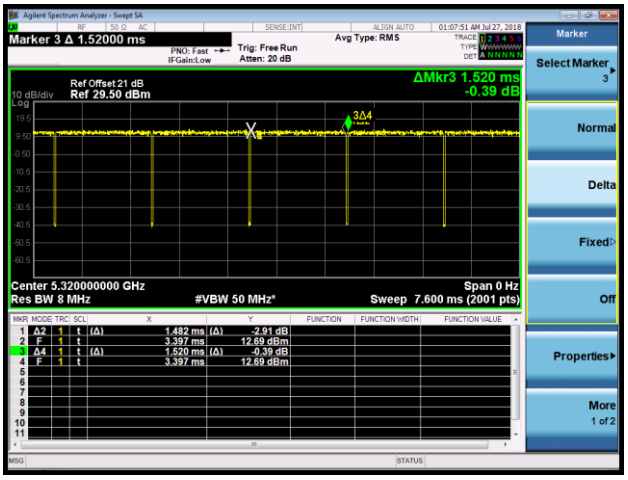
Note: 5GHz (NII) operation is possible in 20MHz, 40MHz, 80MHz and 160MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz per the guidance of Section B)2)b) of KDB 789033 D02v02r01. 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:

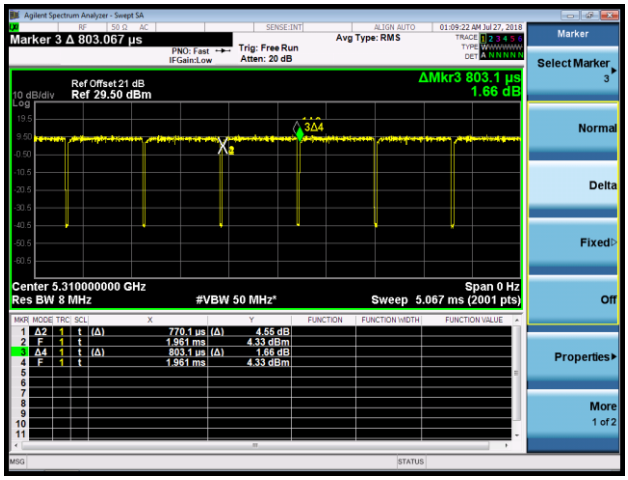
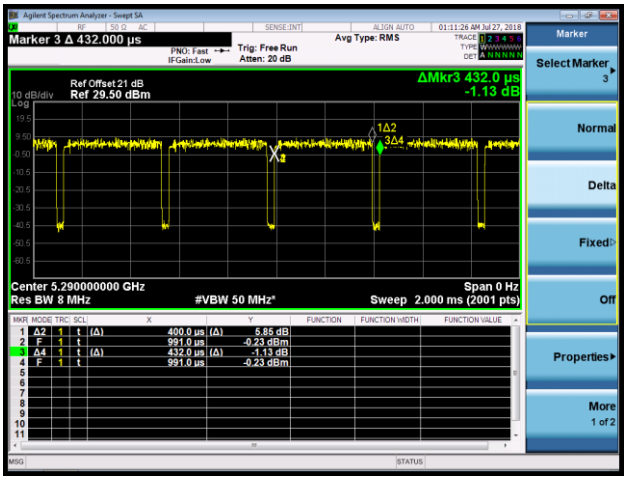
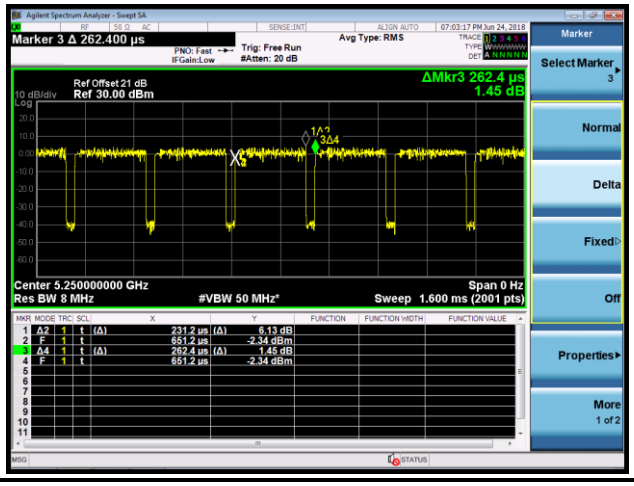
Model No.	Test Mode	Duty Cycle
APIN0514	802.11a	94.93%
	802.11ac-VHT20	98.47%
	802.11ac-VHT40	96.88%
	802.11ac-VHT80	94.10%
	802.11ac-VHT160	89.74%
	802.11ax-HE20	97.89%
	802.11ax-HE40	96.18%
	802.11ax-HE80	92.59%
	802.11ax-HE160	88.53%
APIN0515	802.11a	94.76%
	802.11ac-VHT20	97.96%
	802.11ac-VHT40	96.90%
	802.11ac-VHT80	93.85%
	802.11ac-VHT160	89.46%
	802.11ax-HE20	97.50%
	802.11ax-HE40	95.89%
	802.11ax-HE80	92.59%
	802.11ax-HE160	88.11%

Duty Cycle (T = Transmission Duration) - APIN0514	
802.11a (T = 2.060ms)	802.11ac-VHT20 (T = 1.927ms)
	
802.11ac-VHT40 (T = 950.7us)	802.11ac-VHT80 (T = 459.2us)
	
802.11ac-VHT160 (T = 252.0us)	802.11ax-HE20 (T = 1.485ms)
	

802.11ax-HE40 (T = 771.3us)	802.11ax-HE80 (T = 400.0us)
	
802.11ax-HE160 (T = 231.5us)	
	

Duty Cycle (T = Transmission Duration) - APIN0515

802.11a (T = 2.060ms)	802.11ac-VHT20 (T = 1.920ms)
	
802.11ac-VHT40 (T = 950.0us)	**802.11ac-VHT80 (T = 458.0us)**
	
802.11ac-VHT160 (T = 251.2us)	**802.11ax-HE20 (T = 1.482ms)**
	

802.11ax-HE40 (T = 770.1us)	802.11ax-HE80 (T = 400.0us)
	
802.11ax-HE160 (T = 231.2us)	
	

2.9. Test Configuration

The **ACCESS POINT** was tested per the guidance of KDB 789033 D02v02r01.ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testingand AC line conducted testing.

2.10. EMI Suppression Device(s)/Modifications

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

2.11. 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 pamphletsupplied to the user and be readily visible to the purchaser at the time of purchase. However, when the deviceis 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 andlabel location.

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed WirelessDevices (ANSI C63.10-2013), and the guidance provided in KDB 789033 D02v02r01 were used in themeasurement of the **ACCESS POINT.**

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

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an8'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.

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, remotecontrolled, 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. An80cm 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 tomaximize 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 theresponsible party can be used with the device. The use of a permanently attached antenna or of an antennathat uses a unique coupling to the intentional radiator shall be considered sufficient to comply with theprovisions of this section.”

For APIN0515

- The antenna of the ACCESS POINT is permanently attached.
- There are no provisions for connection to an external antenna.

For APIN0514

- The antenna of the ACCESS POINT uses a reversed SMA connector.

Conclusion:

The unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTTWA00045	1 year	2019/05/14
Two-Line V-Network	R&S	ENV216	MRTTWA00019	1 year	2019/03/20
Two-Line V-Network	R&S	ENV216	MRTTWA00020	1 year	2019/03/20
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2019/05/21

Radiated Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Signal Analyzer	R&S	FSV40	MRTTWA00007	1 year	2019/03/20
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2019/03/19
Broadband Preamplifier	SCHWARZBECK	BBV 9718	MRTTWA00005	1 year	2019/04/23
Broadband Amplifier	SCHWARZBECK	BBV 9721	MRTTWA00006	1 year	2019/04/23
Acitve Loop Antenna	SCHWARZBECK	FMZB 1519B	MRTTWA00002	1 year	2019/04/24
Broadband TRILOG Antenna	SCHWARZBECK	VULB 9162	MRTTWA00001	1 year	2019/05/22
Broadband Hornantenna	SCHWARZBECK	BBHA 9120D	MRTTWA00003	1 year	2019/04/24
Breitband Hornantenna	SCHWARZBECK	BBHA 9170	MRTTWA00004	1 year	2019/04/23
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00032	1 year	2019/05/21

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2018/07/30
				1 year	2019/07/30
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00014	1 year	2019/04/24
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00015	1 year	2019/03/20
Programmable Temperature & Humidity Chamber	TEN BILLION	TTH-B3UP	MRTTWA00036	1 year	2019/06/06
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2019/05/21

Software	**Version**	**Function**
e3	V 8.3.5	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 - SR1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: 2.53dB
Radiated Emission Measurement - AC1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: 4.25dB 1GHz ~ 40GHz: 4.45dB
Output Power - SR1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.84dB
Power Spectrum Density - SR1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 2.65dB
Occupied Bandwidth - SR1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 3.3%

7. TEST RESULT

7.1. Summary

Product Name: **ACCESS POINT**

FCC ID: **Q9DAPIN0514515**

FCC Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.407(a)	26dB Bandwidth	N/A	Conducted	Pass	Section7.2
15.407(a)(2)	Maximum Conducted Output Power	≤ 24 dBm		Pass	Section 7.3
15.407(h)(1)	Transmit Power Control	≤ 24 dBm		N/A	Section 7.4
15.407(a)(2), (5)	Peak Power Spectral Density	≤ 11 dBm/MHz		Pass	Section 7.5
15.407(g)	Frequency Stability	± 20 ppm		Pass	Section 7.6
15.407(b)(2), (3), (5)	Undesirable Emissions	≤ -27dBm/MHz EIRP	Radiated	Pass	Section 7.7 & 7.8
15.205, 15.209 15.407(b)(5), (6), (7)	General Field Strength Limits(Restricted Bands andRadiated Emission Limits)	Emissions in restrictedbands must meet theradiated limits detailed in15.209		Pass	
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.9

Notes:

1) 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 ofthe system to connect the EUT to the analyzer at all frequencies of interest.
2) Test Item “26dB Bandwidth” have been assessed MIMO transmission, and showed the worst test data in this report.

7.2. 26dB Bandwidth Measurement

7.2.1.Test Limit

N/A

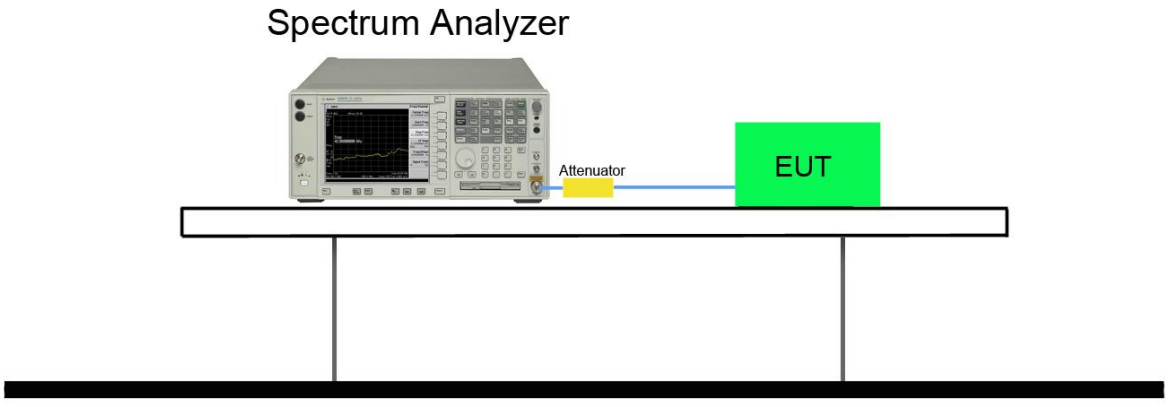
7.2.2.Test Procedure Used

KDB 789033 D02v02r01 - 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

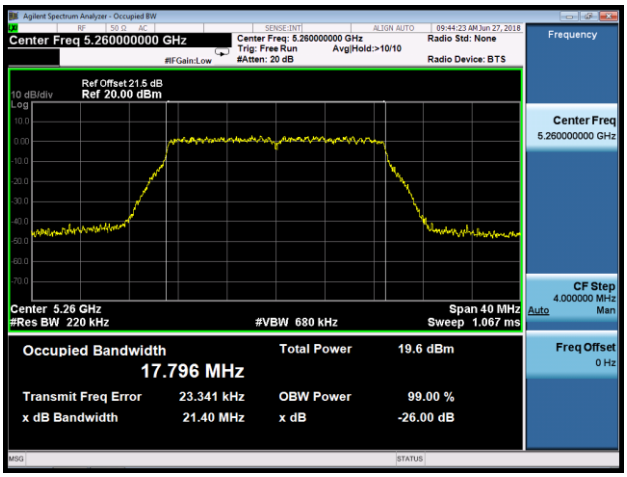
Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	59%
Test Site	SR1	Test Date	2018/06/27
Antenna Type	Omin Antenna (AP-ANT-20W)	Model	APIN0514

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Ant 0 / Ant 0 + 1 + 2 + 3					
802.11a	6Mbps	52	5260	21.40	17.80
802.11a	6Mbps	60	5300	21.46	17.78
802.11a	6Mbps	64	5320	21.32	17.78
802.11a	6Mbps	100	5500	21.28	17.80
802.11a	6Mbps	120	5600	21.36	17.80
802.11a	6Mbps	140	5700	21.39	17.80
802.11a	6Mbps	144	5720	21.37	17.76
802.11ac-VHT20	MCS0	52	5260	21.11	17.81
802.11ac-VHT20	MCS0	60	5300	21.27	17.83
802.11ac-VHT20	MCS0	64	5320	21.25	17.80
802.11ac-VHT20	MCS0	100	5500	21.27	17.81
802.11ac-VHT20	MCS0	120	5600	21.35	17.83
802.11ac-VHT20	MCS0	140	5700	21.31	17.78
802.11ac-VHT20	MCS0	144	5720	21.34	17.81
802.11ac-VHT40	MCS0	54	5270	39.81	36.30
802.11ac-VHT40	MCS0	62	5310	39.70	36.24
802.11ac-VHT40	MCS0	102	5510	39.15	36.28
802.11ac-VHT40	MCS0	118	5590	39.62	36.29
802.11ac-VHT40	MCS0	134	5670	39.55	36.27
802.11ac-VHT40	MCS0	142	5710	39.65	36.31
802.11ac-VHT80	MCS0	58	5290	80.62	75.66
802.11ac-VHT80	MCS0	106	5530	80.74	75.60
802.11ac-VHT80	MCS0	122	5610	80.79	75.74
802.11ac-VHT80	MCS0	138	5690	81.23	75.75
802.11ac-VHT160	MCS0	50	5250	162.80	153.80
802.11ac-VHT160	MCS0	114	5570	162.80	153.61

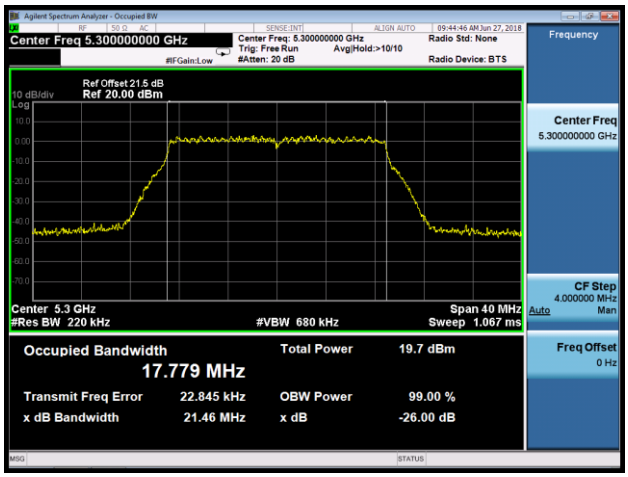
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
802.11ax-HE20	MCS0	52	5260	21.46	19.02
802.11ax-HE20	MCS0	60	5300	21.00	19.01
802.11ax-HE20	MCS0	64	5320	21.29	19.06
802.11ax-HE20	MCS0	100	5500	21.30	19.07
802.11ax-HE20	MCS0	120	5600	21.52	19.06
802.11ax-HE20	MCS0	140	5700	21.27	19.04
802.11ax-HE20	MCS0	144	5720	21.25	19.04
802.11ax-HE40	MCS0	54	5270	39.68	37.61
802.11ax-HE40	MCS0	62	5310	39.53	37.57
802.11ax-HE40	MCS0	102	5510	39.82	37.56
802.11ax-HE40	MCS0	118	5590	39.62	37.55
802.11ax-HE40	MCS0	134	5670	39.88	37.59
802.11ax-HE40	MCS0	142	5710	39.74	37.58
802.11ax-HE80	MCS0	58	5290	81.54	76.99
802.11ax-HE80	MCS0	106	5530	81.07	77.03
802.11ax-HE80	MCS0	122	5610	81.62	77.04
802.11ax-HE80	MCS0	138	5690	81.77	77.07
802.11ax-HE160	MCS0	50	5250	162.00	154.60
802.11ax-HE160	MCS0	114	5570	162.50	154.70

802.11a 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3

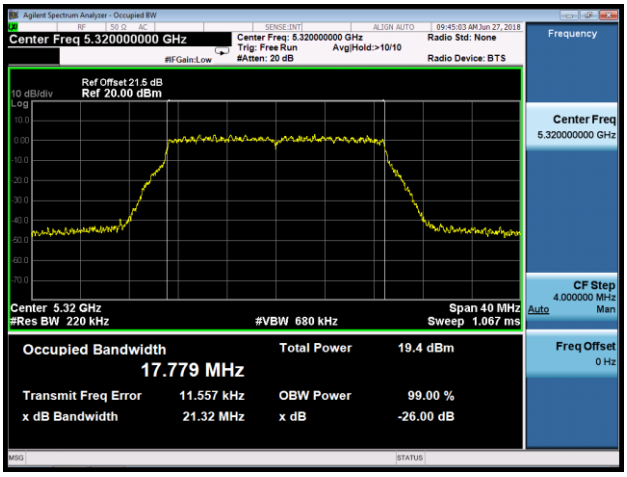
Channel 52 (5260MHz)



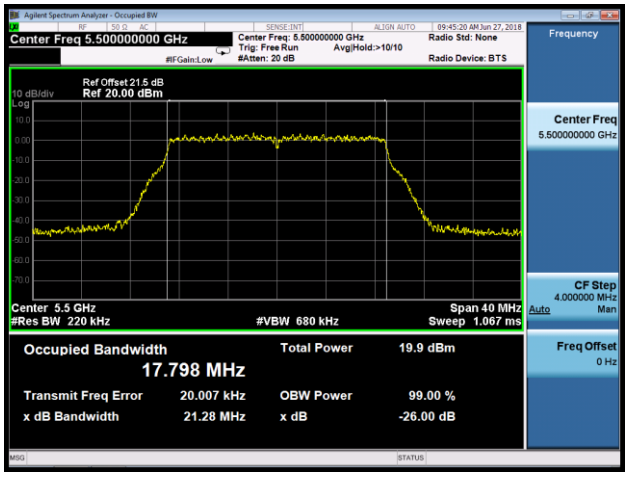
Channel 60 (5300MHz)



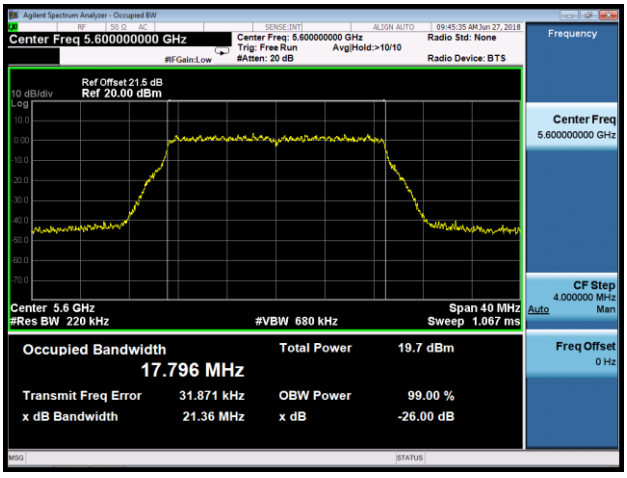
Channel 64 (5320MHz)



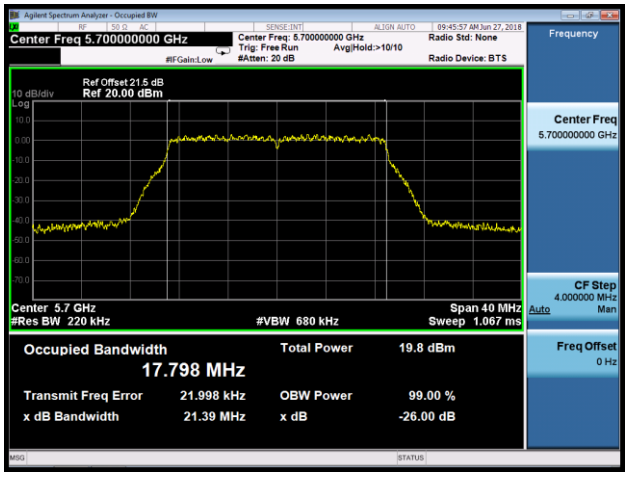
Channel 100 (5500MHz)

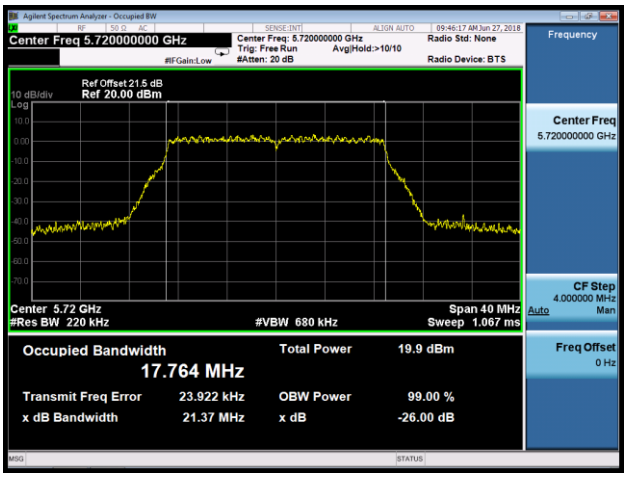


Channel 100 (5600MHz)



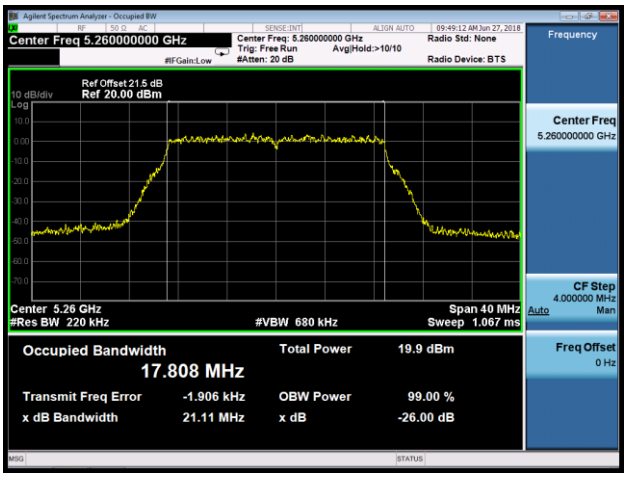
Channel 140 (5700MHz)



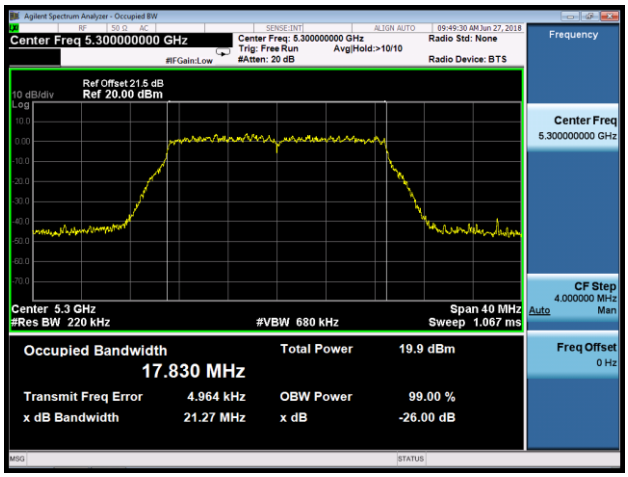
802.11a 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 144 (5720MHz)	
	

802.11ac-VHT20 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3

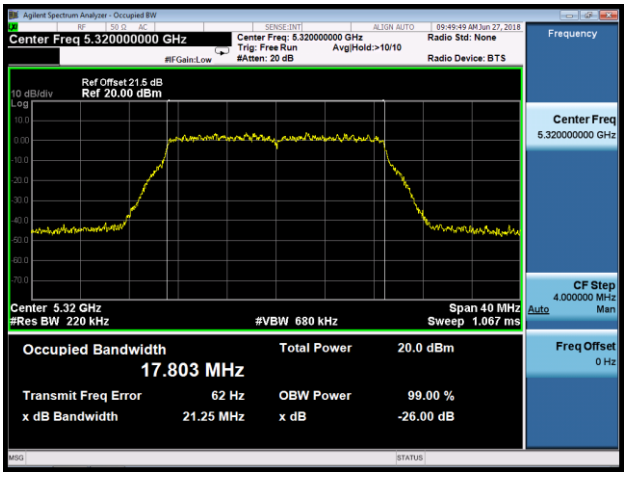
Channel 52 (5260MHz)



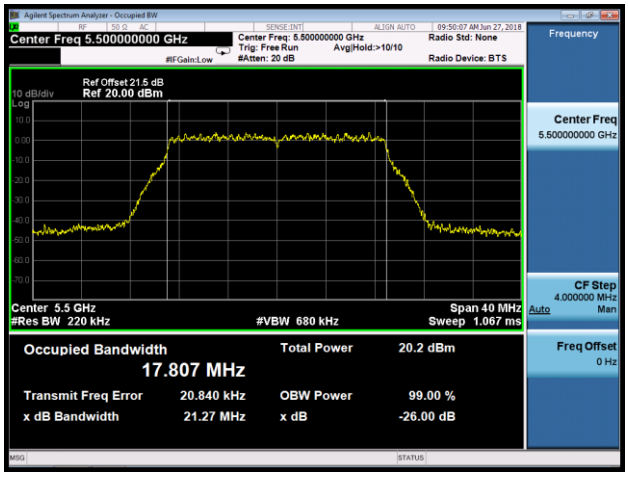
Channel 60 (5300MHz)



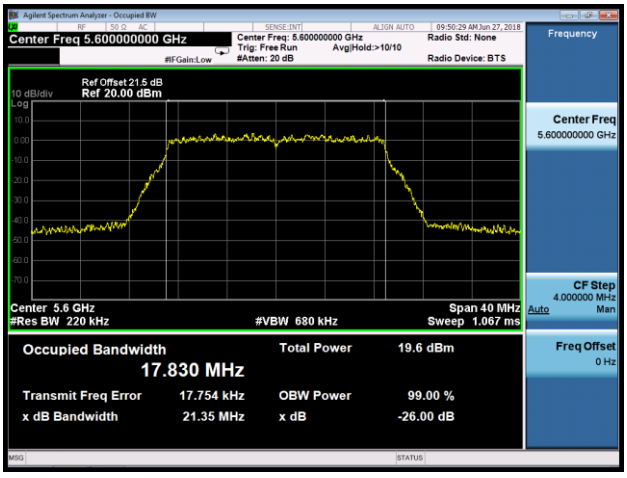
Channel 64 (5320MHz)



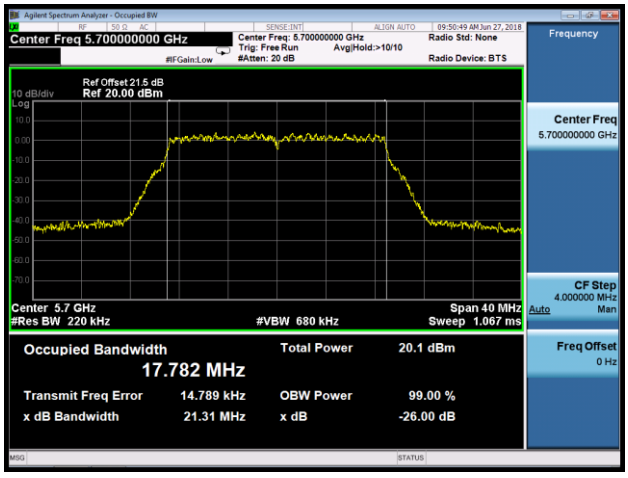
Channel 100 (5500MHz)

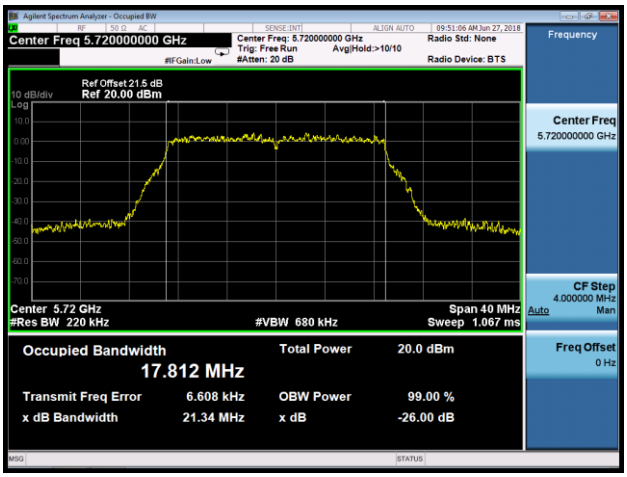


Channel 120 (5600MHz)



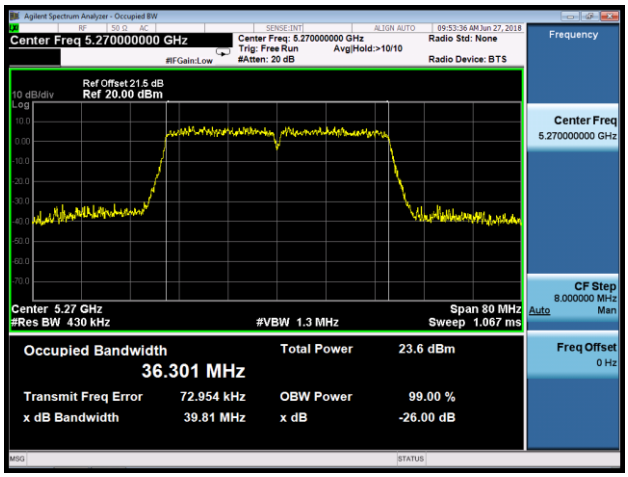
Channel 140 (5700MHz)



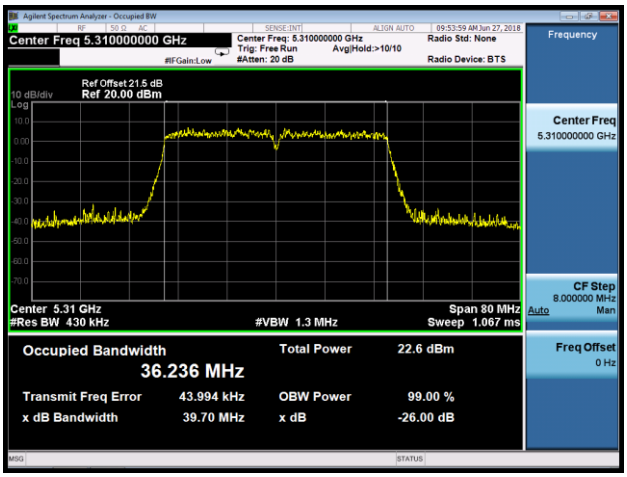
802.11ac-VHT20 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 144 (5720MHz)	
	

802.11ac-VHT40 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3

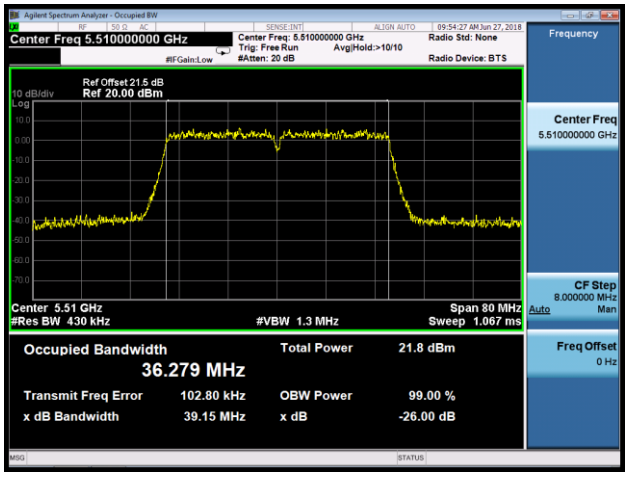
Channel 54 (5270MHz)



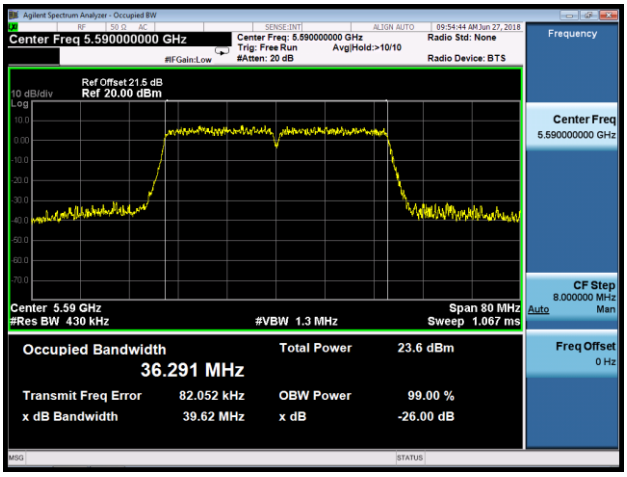
Channel 62 (5310MHz)



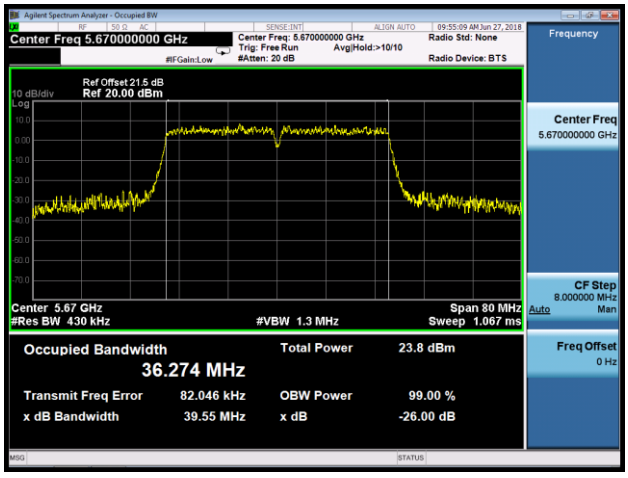
Channel 102 (5510MHz)



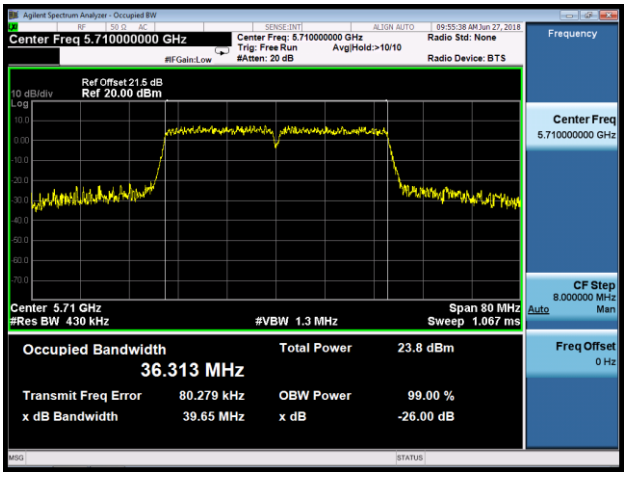
Channel 118 (5590MHz)

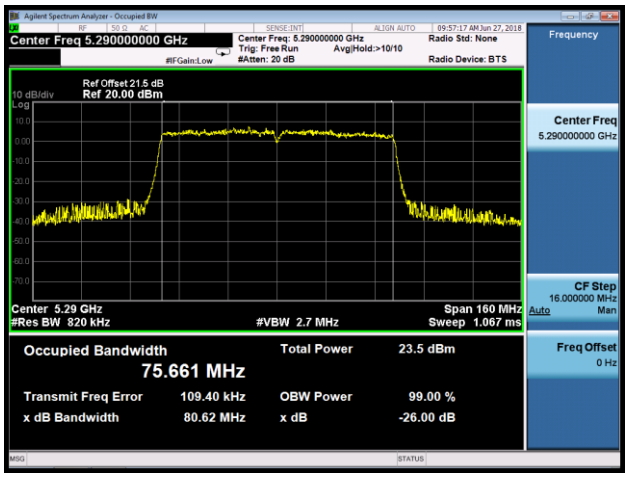
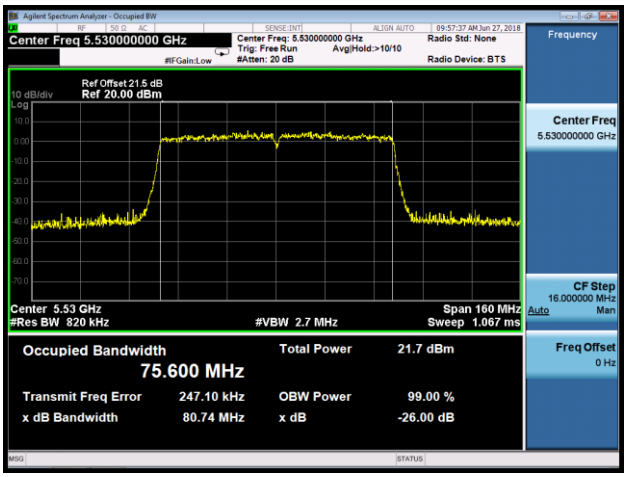
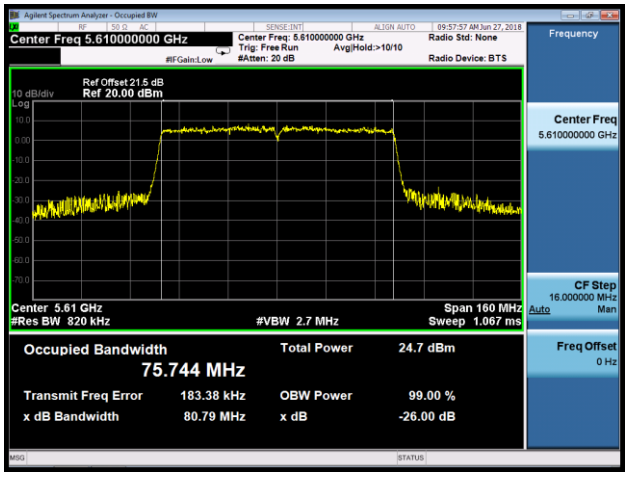
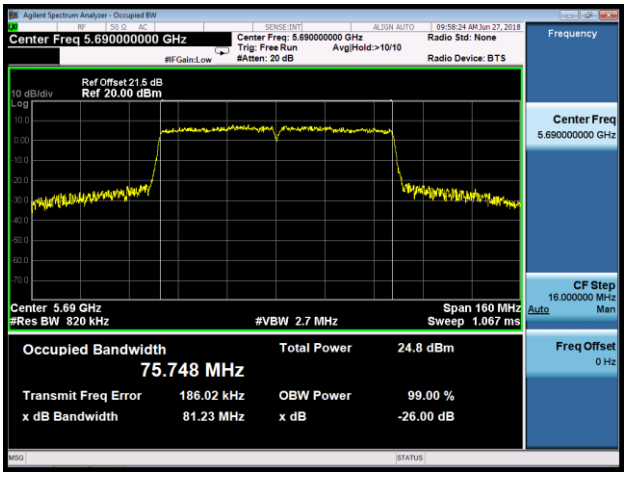


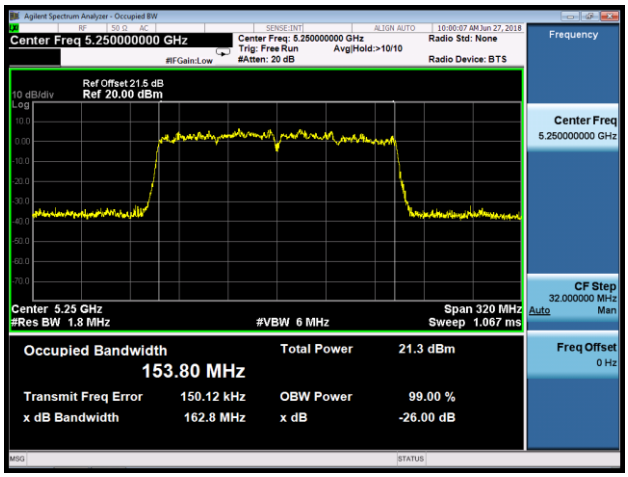
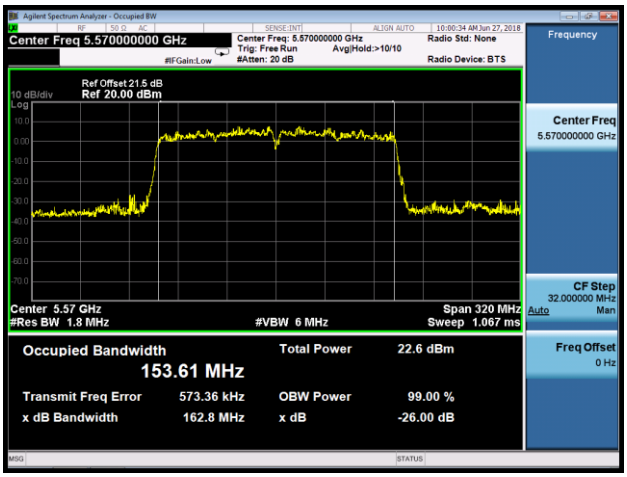
Channel 134 (5670MHz)



Channel 142 (5710MHz)

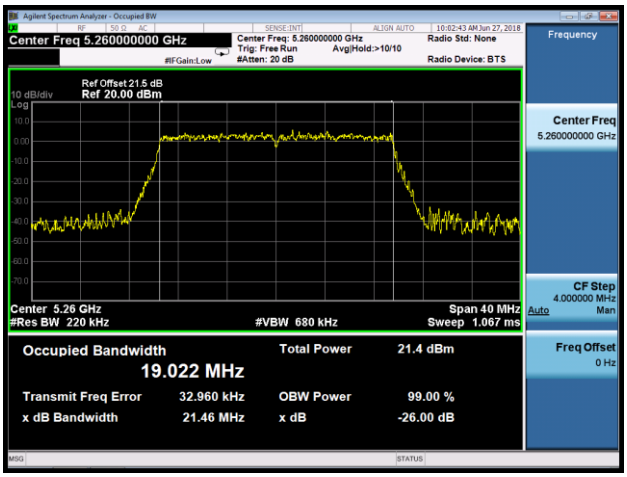


802.11ac-VHT80 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 58 (5290MHz)	**Channel 106 (5530MHz)**
	
Channel 122 (5610MHz)	**Channel 138 (5690MHz)**
	

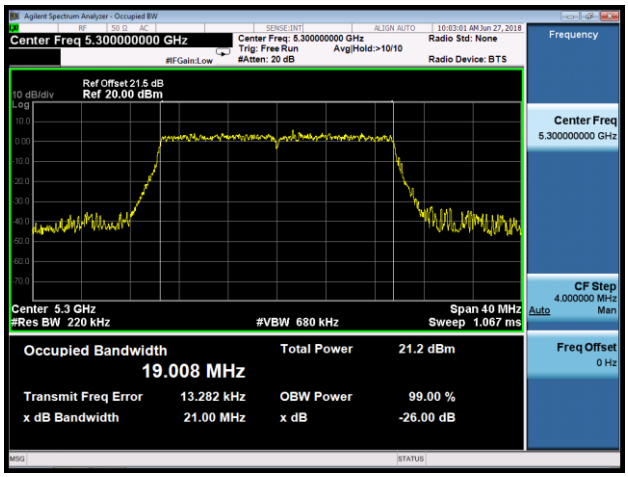
802.11ac-VHT160 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 50 (5250MHz)	**Channel 114 (5570MHz)**
	

802.11ax-HE20 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3

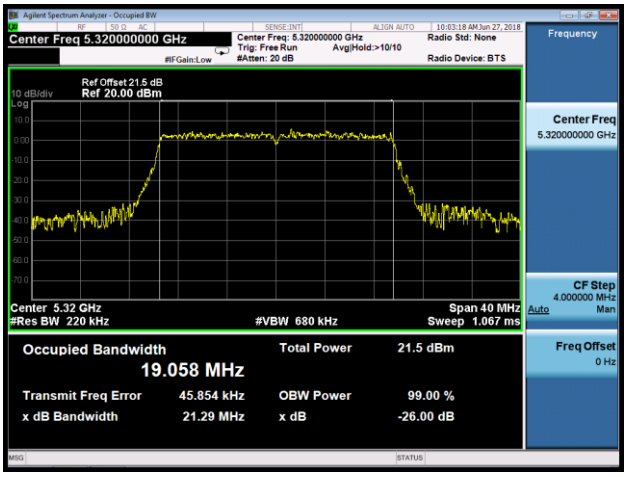
Channel 52 (5260MHz)



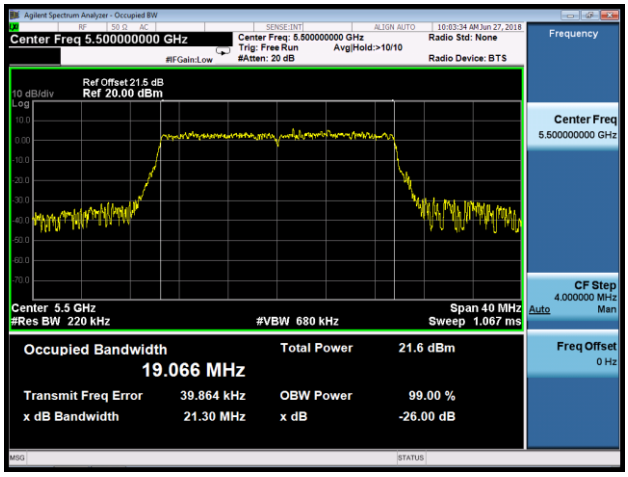
Channel 60 (5300MHz)



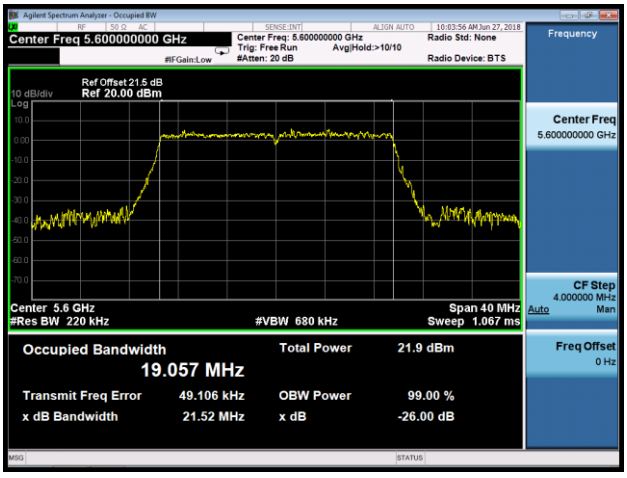
Channel 64 (5320MHz)



Channel 100 (5500MHz)



Channel 120 (5600MHz)



Channel 140 (5700MHz)