MEASUREMENT REPORT

FCC PART 15.407 WLAN 802.11a/n/ac

FCC ID:	TK4WPJ428
APPLICANT:	Compex Systems Pte Ltd
Application Type:	Class II Permissible Change
Product:	Wireless Access Point
Model No.:	WPJ428HV
Serial Model:	WPJ428LV, WPJ418LV, WPJ418HV, MMS428LV, MMS428HV, MMS418LV, MMS418HV
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 D02v01r04, KDB 662911 D01v02r01, KDB 644545 D03v01
Test Date:	April 08 ~ June 22, 2017

Reviewed By : Jame Yuan
(Jame Yuan)

Approved By : Marlin Chen
(Marlin Chen)

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

Revision History

Report No.	Version	Description	Issue Date	Note
1704RSU00205	Rev. 01	Initial report	06-25-2017	Valid

CONTENTS

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, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
MRT Registration No.:	809388
FCC Rule Part(s):	Part 15.407
FCC ID:	TK4WPJ428
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering

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.**

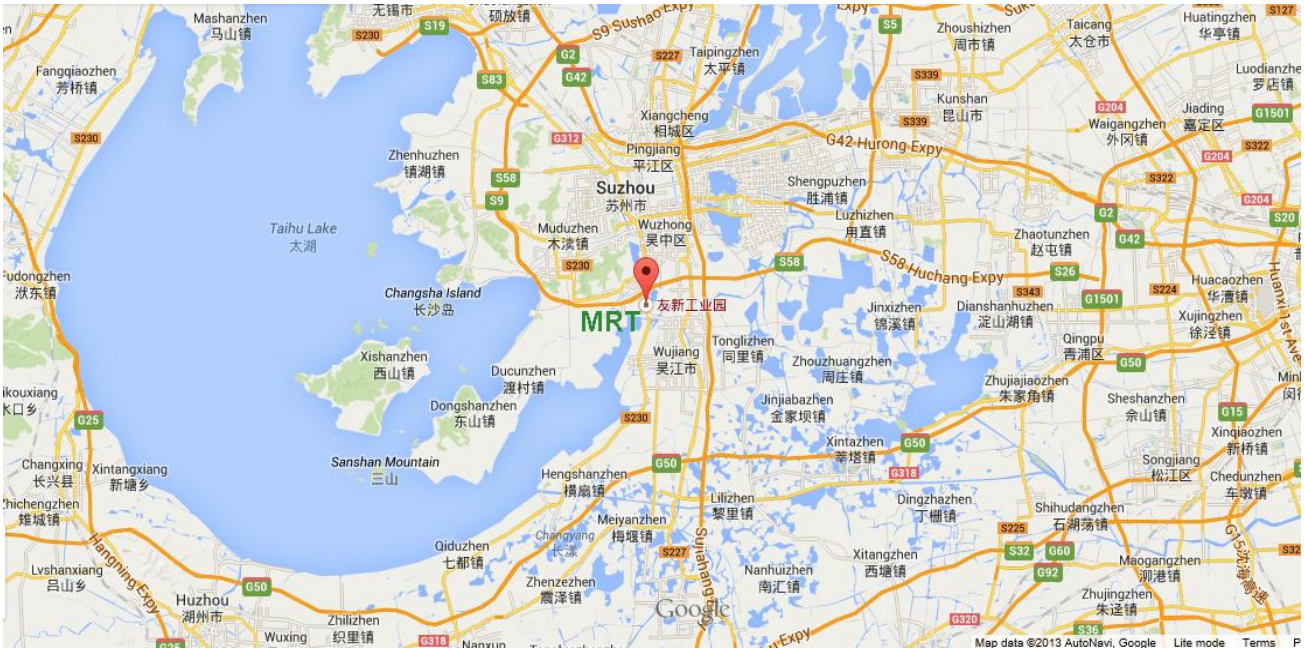
1. INTRODUCTION

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, 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 Access Point
Model No.:	WPJ428HV
Serial Model:	WPJ428LV, WPJ418LV, WPJ418HV, MMS428LV, MMS428HV, MMS418LV, MMS418HV
Brand Name:	COMPEX
Wi-Fi Specification:	802.11a/b/g/n/ac

2.2. Product Specification Subjective to this Report

Frequency Range:	For 802.11a/n-HT20/ac-VHT20: 5260~5320MHz, 5500~5720MHz For 802.11n-HT40/ac-VHT40: 5270~5310MHz, 5510~5710MHz For 802.11ac-VHT80: 5290MHz, 5530MHz, 5610MHz, 5690MHz
Channel Number:	802.11a/ n-HT20/ac-VHT20: 16 802.11n-HT40/ac-VHT40: 8 802.11ac-VHT80: 4
Type of Modulation:	802.11a/n/ac: OFDM
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.6Mbps
Maximum Average Output Power:	802.11a: 17.32dBm 802.11n-HT20: 19.37dBm 802.11n-HT40: 19.40dBm 802.11ac-VHT20: 19.47dBm 802.11ac-VHT40: 19.52dBm 802.11ac-VHT80: 19.42dBm

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

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

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

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

2.4. Description of Available Antennas

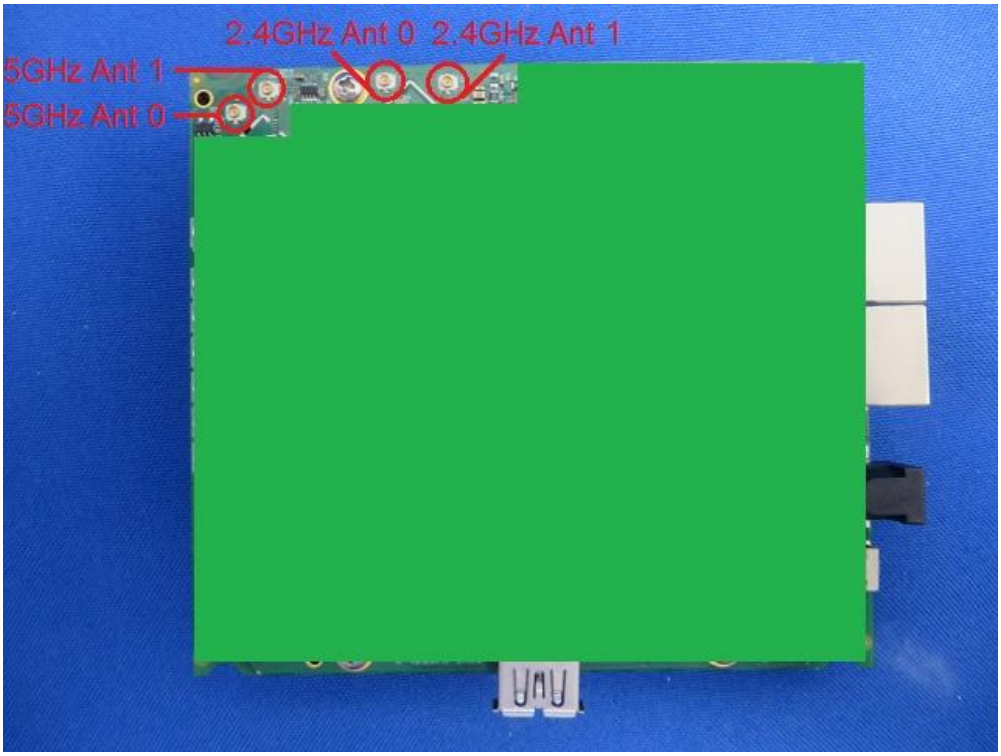
Antenna Type	Frequency Band (MHz)	TX Paths	Per Chain Max Antenna Gain (dBi)	
			Ant 0	Ant 1
Panel Antenna	2412 ~ 2462	1	8	--
		2	8	8
	5180 ~ 5825	1	10	--
		2	10	10

Note 1: The device didn't support beam-forming technology and Cyclic Delay Diversity (CDD) technology, and the transmit signals are uncorrected, so no add array gain to the band power and band PSD.Note 2: For SISO mode, only the Ant 0 chain can transmit. 11a&11b&11g mode support SISO mode, 11n mode support MIMO mode.

Note 3: When the device working on UNII-2A & UNII-2C bands, only the panel antenna (antenna gain less than 10dBi) can be used.

2.5. Description of Antenna RF Port

Antenna RF Port				
--	2.4GHz RF Port		5GHz RF Port	
Software Control Port for 1Tx	Ant 0	--	Ant 0	--
Software Control Port for 2Tx	Ant 0	Ant 1	Ant 0	Ant 1



2.6. Test Mode

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

2.7. Description of Test Software

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

Power Parameter Value

1TX_Ant 0

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value	Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value
802.11a	52	5260	16.0	802.11 n-HT20	52	5260	16.0
	60	5300	16.0		60	5300	16.0
	64	5320	16.0		64	5320	16.0
	100	5500	16.0		100	5500	16.0
	120	5600	16.0		120	5600	16.0
	140	5700	16.0		140	5700	16.0
	144	5720	16.0		144	5720	16.0
802.11n-HT40	54	5270	16.0	802.11ac-VHT20	52	5260	16.0
	62	5310	16.0		60	5300	16.0
	102	5510	12.5		64	5320	16.0
	118	5590	16.0		100	5500	16.0
	134	5670	16.0		120	5600	16.0
	142	5710	16.0		140	5700	15.5
802.11ac-VHT40	54	5270	16.0		144	5720	16.0
	62	5310	15.5	802.11ac-VHT80	58	5290	16.0
	102	5510	12.5		106	5530	11.5
	118	5590	16.0		122	5610	16.0
	134	5670	16.0		138	5690	16.0
	142	5710	16.0		--	--	--

2TX_Ant 0+1

Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value	Test Mode	Test Channel No.	Test Frequency (MHz)	Power Parameter Value
802.11 n-HT20	52	5260	14.5	802.11ac-VHT20	52	5260	14.5
	60	5300	15.0		60	5300	15.0
	64	5320	15.0		64	5320	15.0
	100	5500	15.0		100	5500	15.0
	120	5600	14.0		120	5600	14.0
	140	5700	14.5		140	5700	14.0
	144	5720	14.5		144	5720	15.0
802.11n-HT40	54	5270	14.5	802.11ac-VHT40	54	5270	14.5
	62	5310	13.0		62	5310	12.0
	102	5510	10.5		102	5510	9.5
	118	5590	15.0		118	5590	15.5
	134	5670	16.0		134	5670	14.5
	142	5710	16.0		142	5710	16.0
802.11ac-VHT80	42	5210	5.0	--			
	58	5290	12.0				
	106	5530	8.5				
	122	5610	16.0				
	138	5690	16.0				
	155	5775	14.0				

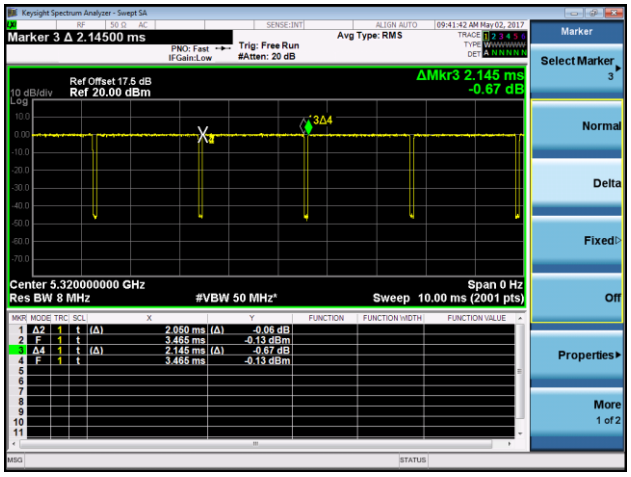
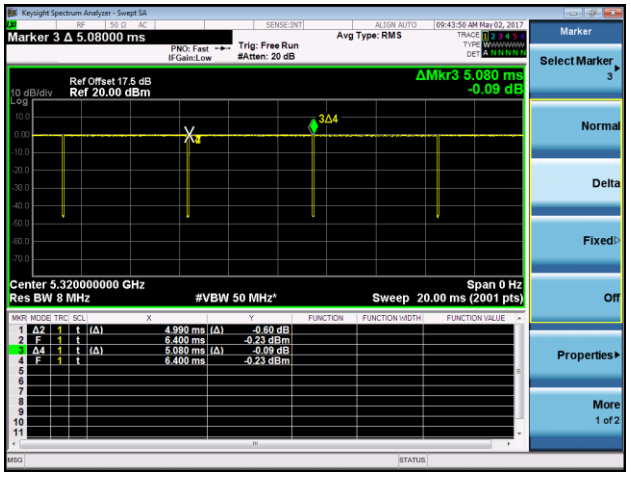
2.8. Device Capabilities

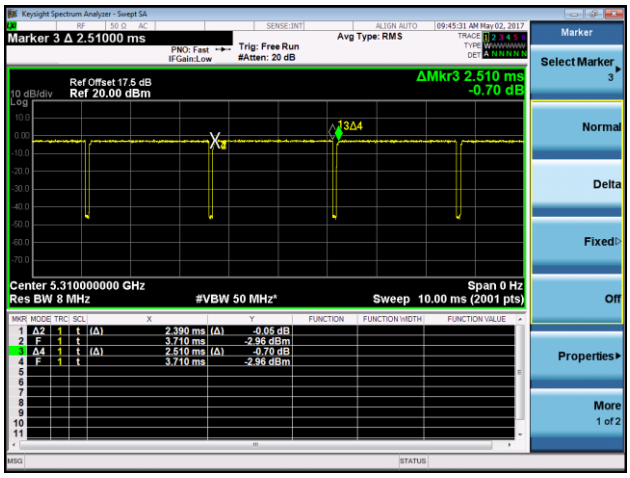
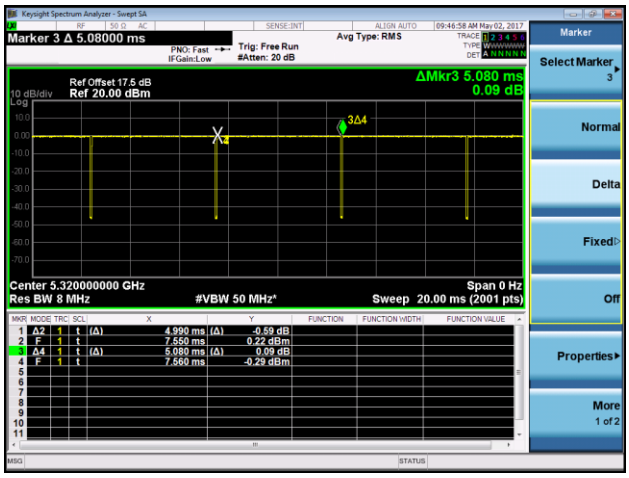
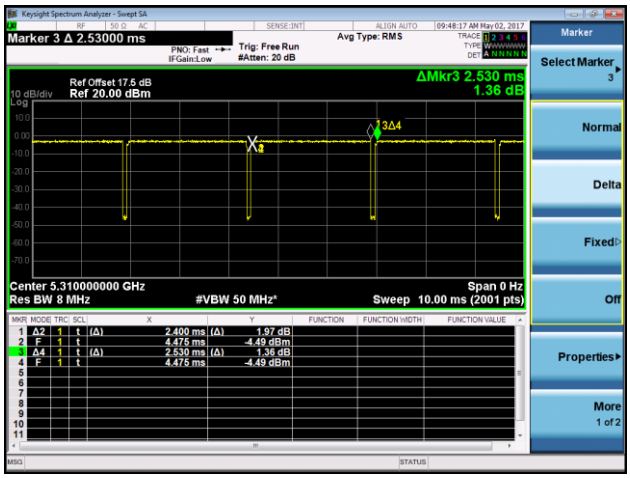
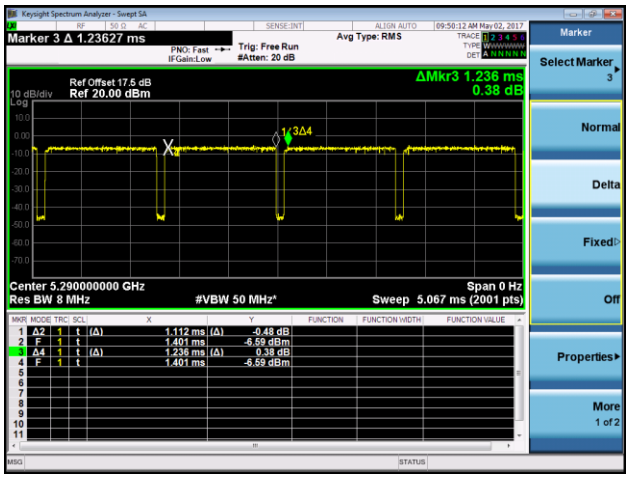
This device contains the following capabilities:

2.4GHz WLAN (DTS) and 5GHz WLAN (NII)

Note: 5GHz (NII) operation is possible in 20MHz, 40MHz and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = average per the guidance of Section B)2)b) of KDB 789033 D02v01r04. 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	95.57 %
802.11n-HT20	98.23 %
802.11n-HT40	95.22 %
802.11ac-VHT20	98.23 %
802.11ac-VHT40	94.86 %
802.11ac-VHT80	89.97 %

802.11a	802.11n-HT20
	

802.11n-HT40	802.11ac-VHT20
	
802.11ac-VHT40	**802.11ac-VHT80**
	

2.9. Test Configuration

The **Wireless Access Point** was tested per the guidance of KDB 789033 D02v01r04. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and 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 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 D02v01r04 were used in the measurement of the **Wireless Access Point.**

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 7.8.

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 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 Access Point** uses a unique (IPEX) connector.

Conclusion:

The **Wireless Access Point** unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emission - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2017/06/20
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2017/06/20
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2017/06/20
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06181	1 year	2017/12/20
Shielding Anechoic Chamber	Mikebang	Chamber-SR2	MRTSUE06214	1 year	2017.05.10
					2018.05.10

Radiated Spurious Emission and Radiated Restricted Band Edge - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cal. Due Date
Spectrum Analyzer	Agilent	N9020A	MRTSUE06124	1 year	2017/06/23
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2017/06/21
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2018/03/28
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2018/04/16
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2017/11/21
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2017/12/10
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06023	1 year	2017/12/10
Broadband Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06024	1 year	2018/01/04
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06183	1 year	2017/12/20
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2017.05.10
					2018.05.10

Conducted Test Equipment - TR3

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MRTSUE06124	1 year	2017/06/23
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2017/12/06
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06180	1 year	2017/12/20

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 - SR2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 25GHz: 4.76dB
Spurious Emissions, Conducted - TR3
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.78dB
Output Power - TR3
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.13dB
Power Spectrum Density - TR3
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.15dB
Occupied Bandwidth - TR3
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.28%

7. TEST RESULT

7.1. Summary

Product Name: **Wireless Access Point**

FCC ID: **TK4WPJ428**

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

Data Rate / MCS Tested: **6Mbps for 802.11a;**
MCS0 for 802.11n-HT20MHz;
MCS0 for 802.11n-HT40MHz;
MCS0 for 802.11ac-VHT20MHz;
MCS0 for 802.11ac-VHT40MHz;
MCS0 for 802.11ac-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(a)(2)	Maximum Conducted Output Power	≤ 24 dBm U-NII-2A & 2C		Pass	Section 7.3
15.407(a)(2), (5)	Peak Power Spectral Density	≤ 11 dBm/MHz U-NII-2A&2C		Pass	Section 7.4
15.407(g)	Frequency Stability	N/A		Pass	Section 7.5
15.407(b)(2), (3)	Undesirable Emissions	≤ -27dBm/MHz EIRP	Radiated	Pass	Section 7.6 & 7.7
15.205, 15.209 15.407(b)(5), (6), (7)	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		Pass	
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.8

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

7.2. 26dB Bandwidth Measurement

7.2.1. Test Limit

N/A

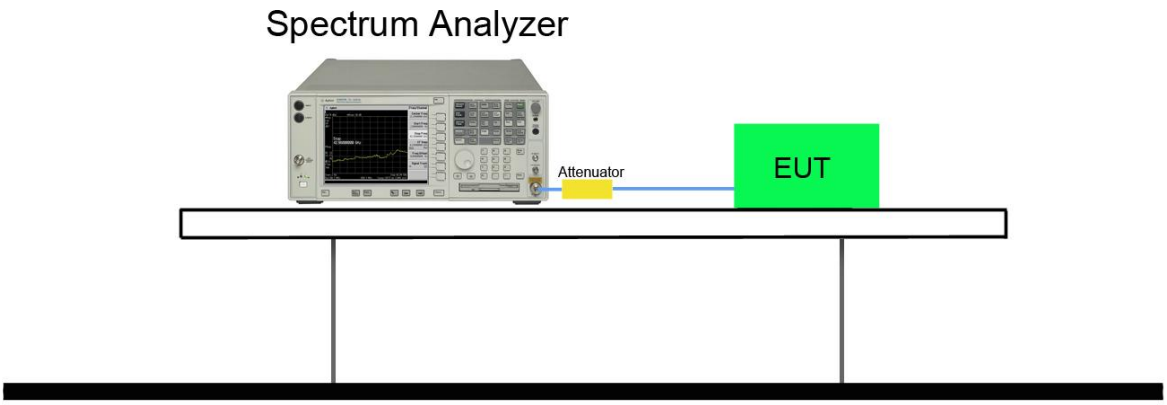
7.2.2. Test Procedure used

KDB 789033 D02v01r04 - 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

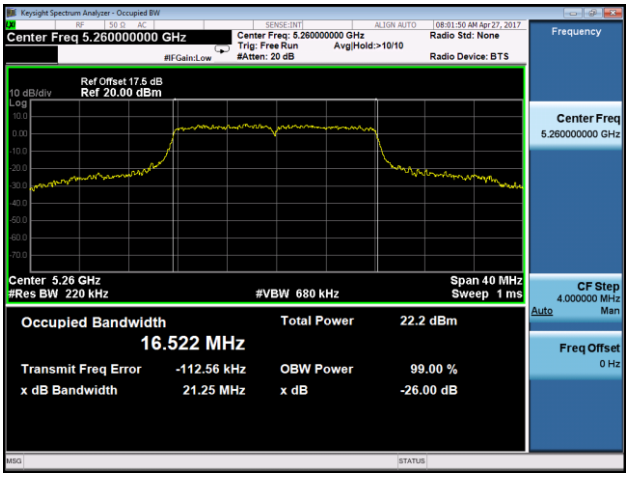
Product	Wireless Access Point	Temperature	22°C
Test Engineer	Bruce Wang	Relative Humidity	54%
Test Site	TR3	Test Date	2017/05/06

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Ant 0					
802.11a	6	52	5260	21.25	16.52
802.11a	6	60	5300	21.77	16.52
802.11a	6	64	5320	21.22	16.52
802.11a	6	100	5500	23.45	16.55
802.11a	6	120	5600	27.48	16.70
802.11a	6	140	5700	24.25	16.55
802.11a	6	144	5720	27.57	16.72
802.11n-HT20	6.5	52	5260	22.76	17.68
802.11n-HT20	6.5	60	5300	21.40	17.68
802.11n-HT20	6.5	64	5320	22.78	17.68
802.11n-HT20	6.5	100	5500	22.95	17.70
802.11n-HT20	6.5	120	5600	27.24	17.79
802.11n-HT20	6.5	140	5700	25.76	17.72
802.11n-HT20	6.5	144	5720	25.92	17.77
802.11n-HT40	13.5	54	5270	49.74	36.12
802.11n-HT40	13.5	62	5310	47.57	36.09
802.11n-HT40	13.5	102	5510	39.66	35.99
802.11n-HT40	13.5	118	5590	65.65	36.44
802.11n-HT40	13.5	134	5670	56.42	36.25
802.11n-HT40	13.5	142	5710	64.58	36.33
802.11ac-VHT20	6.5	52	5260	22.09	17.67
802.11ac-VHT20	6.5	60	5300	21.86	17.68
802.11ac-VHT20	6.5	64	5320	21.58	17.69
802.11ac-VHT20	6.5	100	5500	25.17	17.71
802.11ac-VHT20	6.5	120	5600	27.54	17.77
802.11ac-VHT20	6.5	140	5700	21.84	17.67
802.11ac-VHT20	6.5	144	5720	26.00	17.75

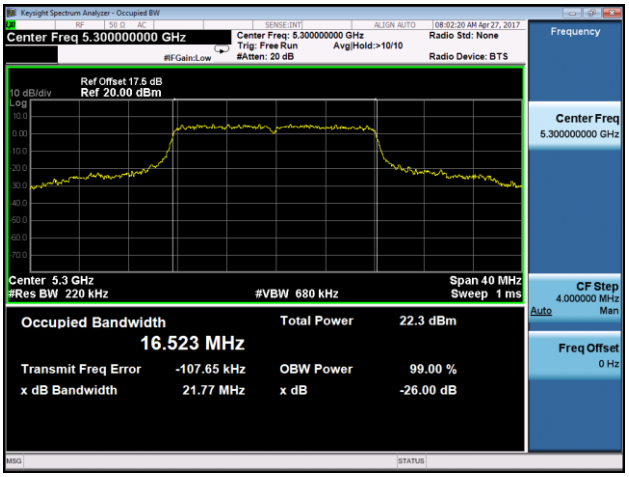
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Ant 0					
802.11ac-VHT40	13.5	54	5270	47.12	36.07
802.11ac-VHT40	13.5	62	5310	47.71	36.11
802.11ac-VHT40	13.5	102	5510	39.55	35.98
802.11ac-VHT40	13.5	118	5590	64.84	36.36
802.11ac-VHT40	13.5	134	5670	58.77	36.25
802.11ac-VHT40	13.5	142	5710	43.06	36.08
802.11ac-VHT80	29.3	58	5290	97.94	76.00
802.11ac-VHT80	29.3	106	5530	83.55	75.90
802.11ac-VHT80	29.3	122	5610	108.9	76.07
802.11ac-VHT80	29.3	138	5690	98.81	76.12

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

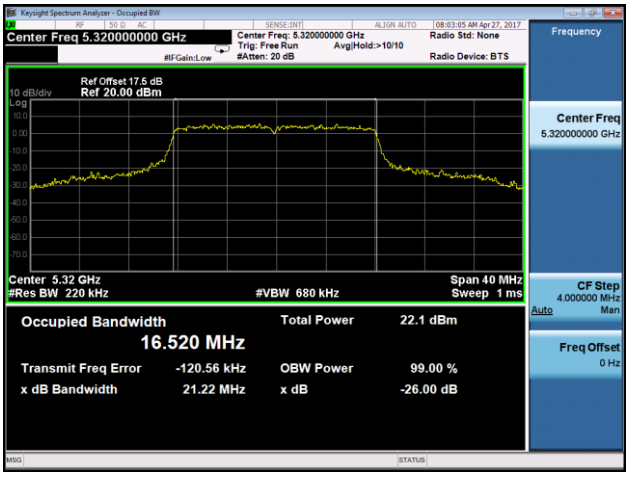
Channel 52 (5260MHz)



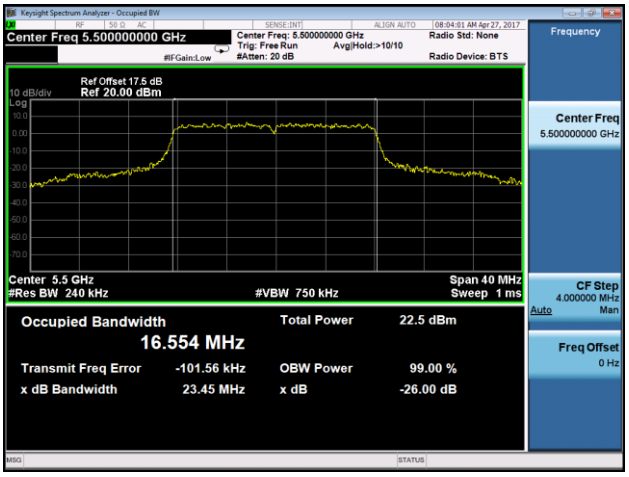
Channel 60 (5300MHz)



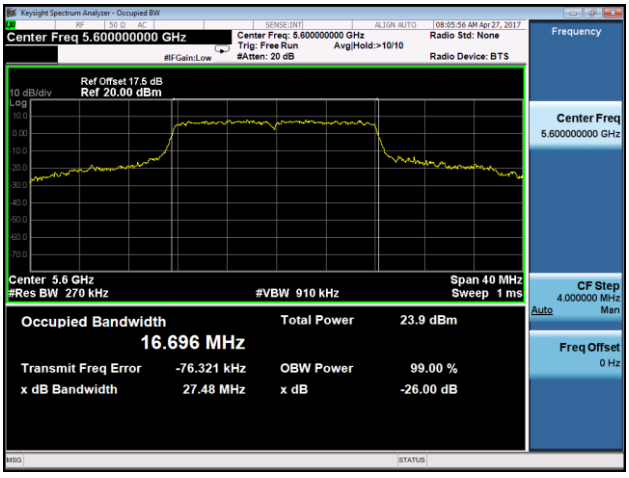
Channel 64 (5320MHz)



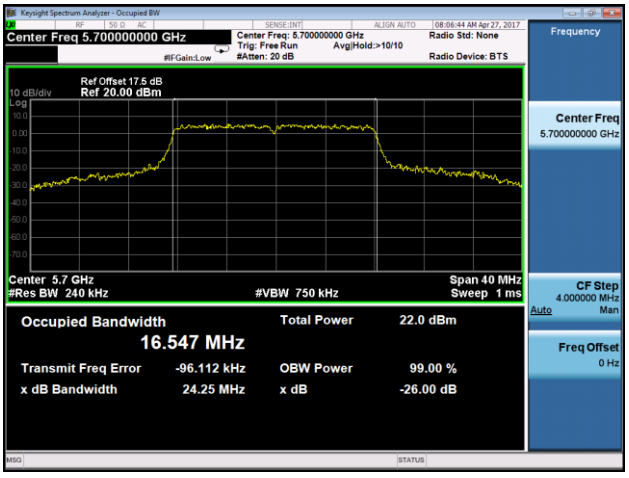
Channel 100 (5500MHz)

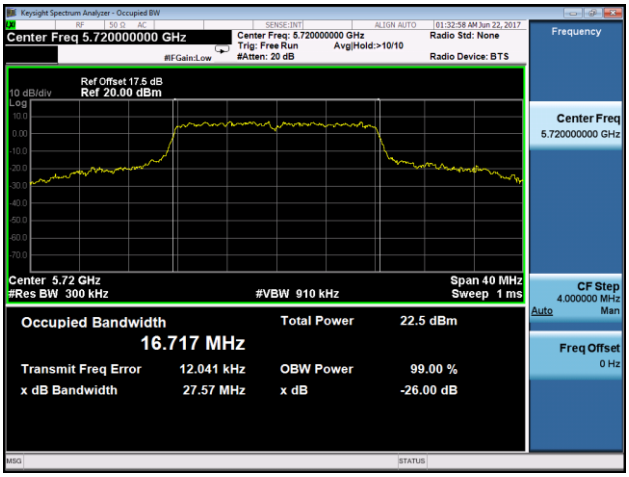


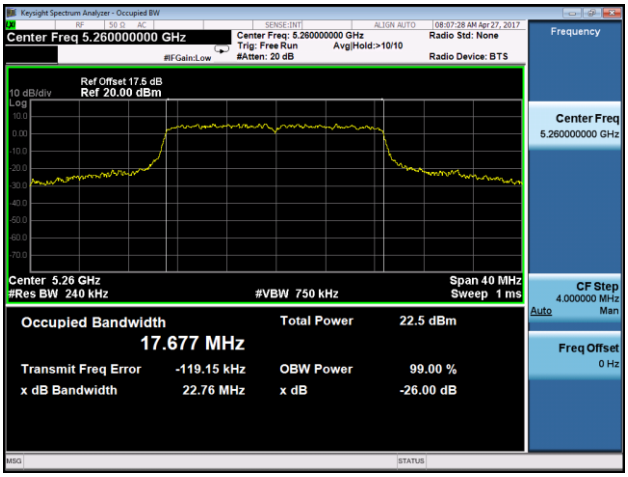
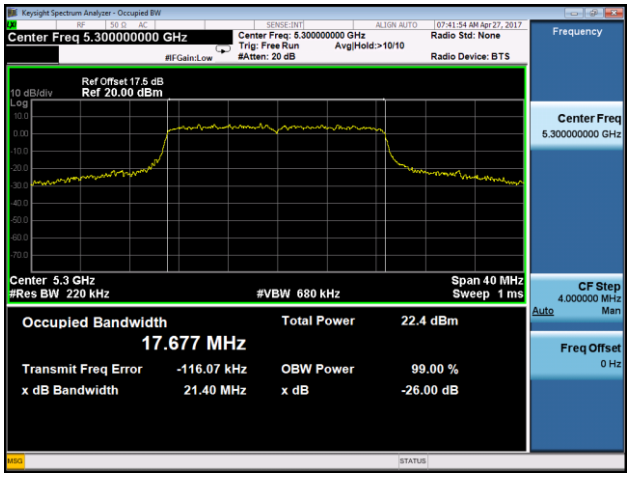
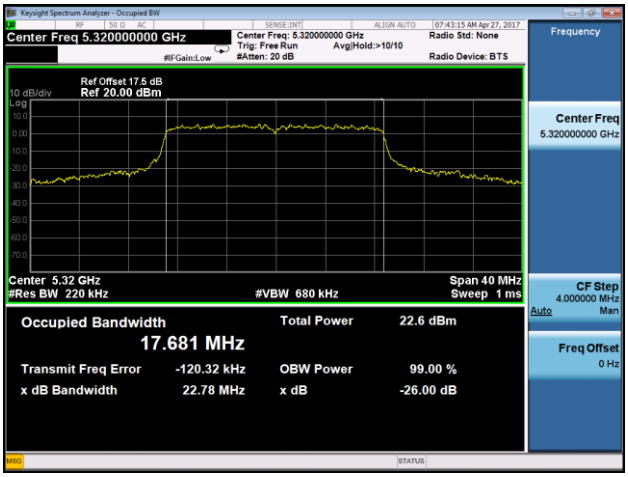
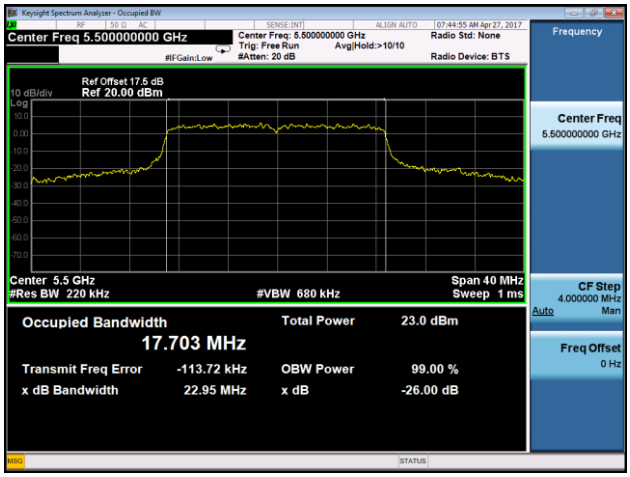
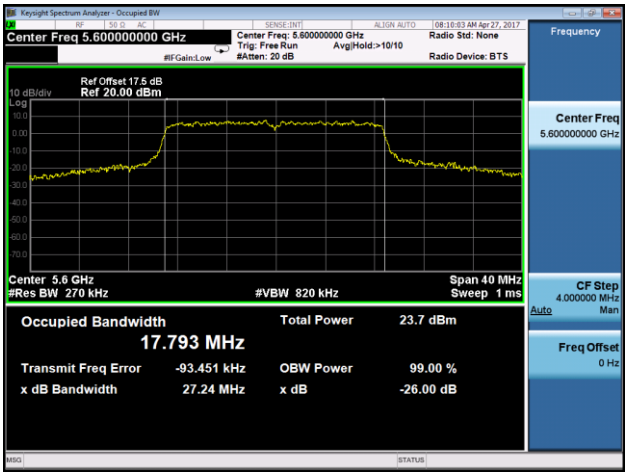
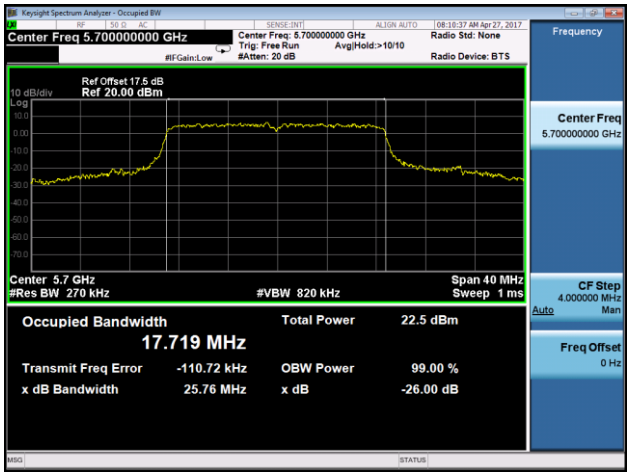
Channel 120 (5600MHz)

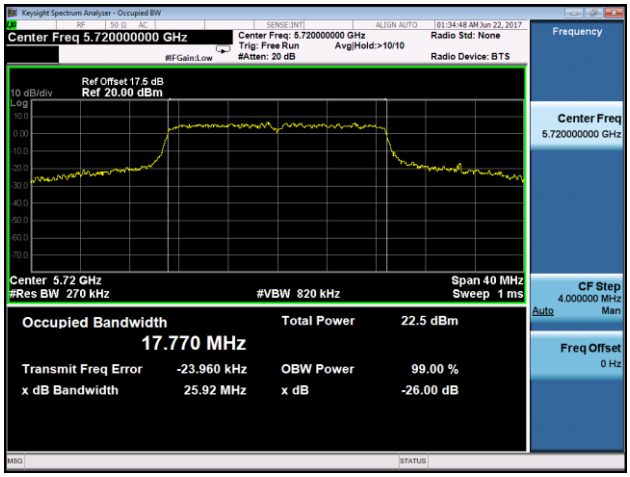


Channel 140 (5700MHz)



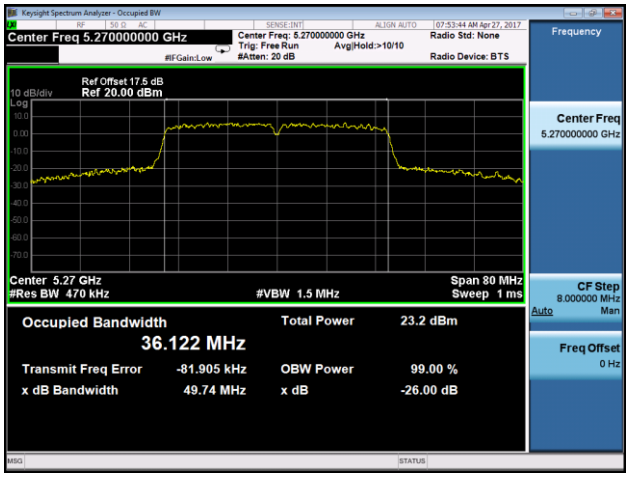
Channel 144 (5720MHz)	
	

802.11n-HT20 26dB Bandwidth & 99% Bandwidth - Ant 0	
Channel 52 (5260MHz)	**Channel 60 (5300MHz)**
	
Channel 64 (5320MHz)	**Channel 100 (5500MHz)**
	
Channel 120 (5600MHz)	**Channel 140 (5700MHz)**
	

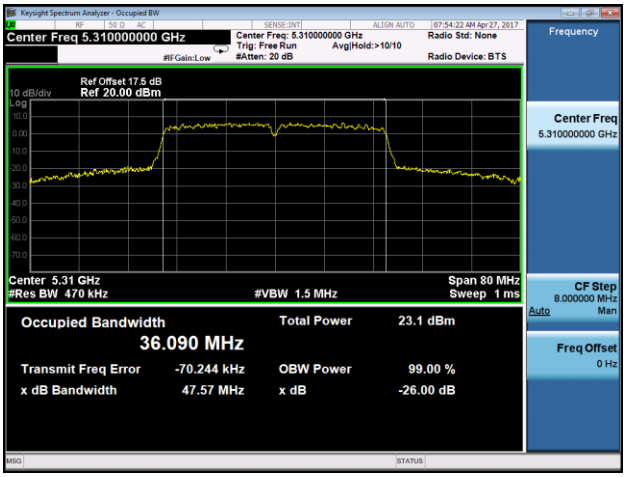
Channel 144 (5720MHz)	
	

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

Channel 54 (5270MHz)

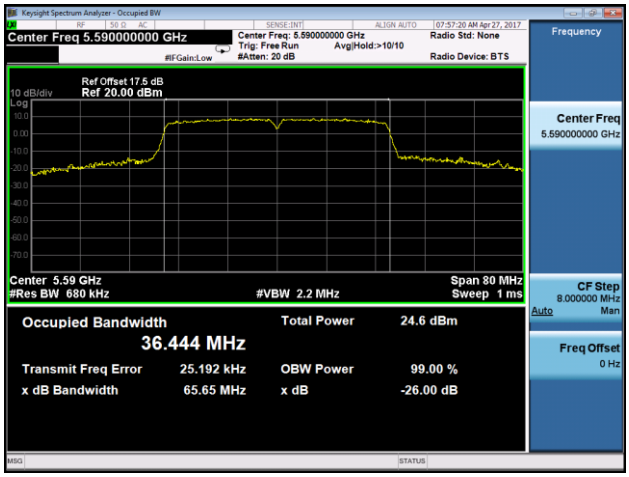


Channel 62 (5310MHz)

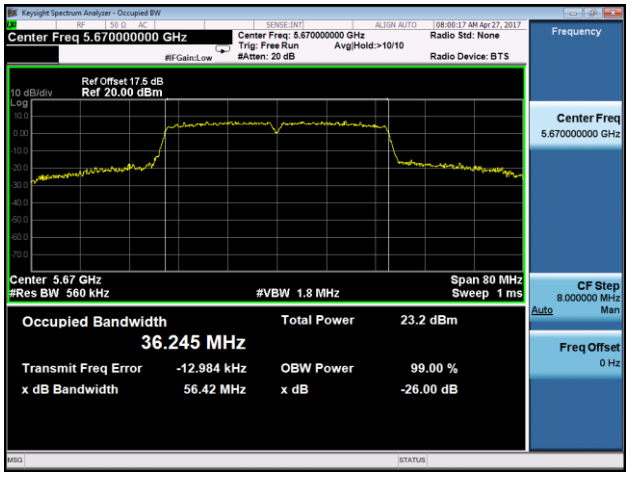


Channel 102 (5510MHz)

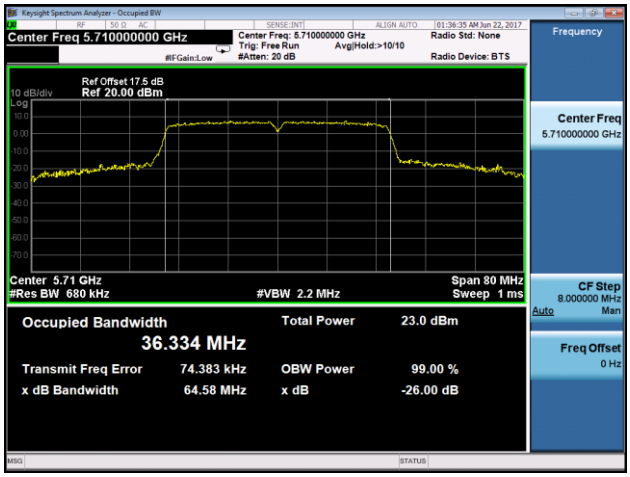
Channel 118 (5590MHz)

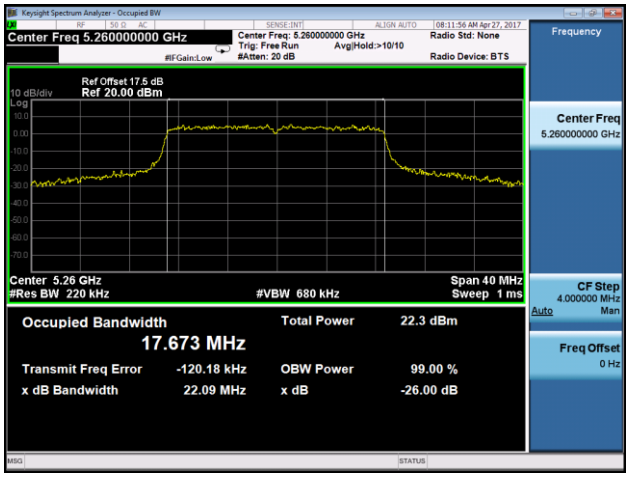
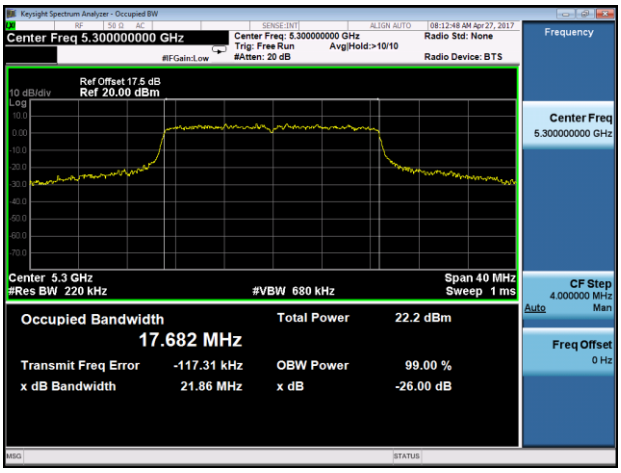
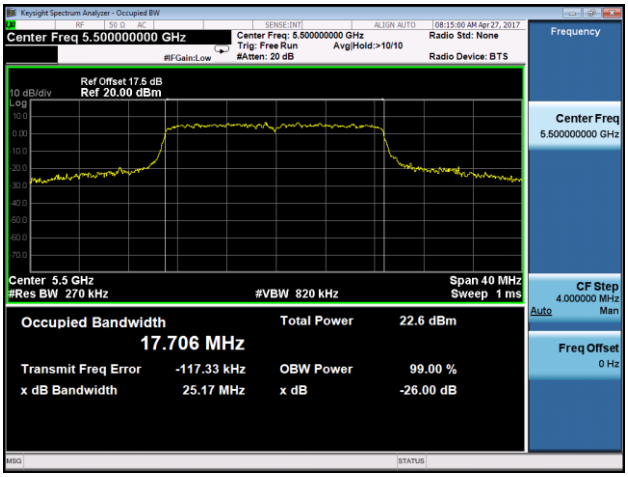
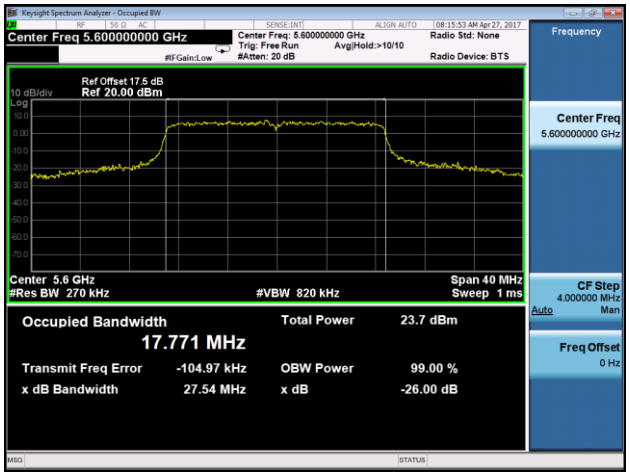


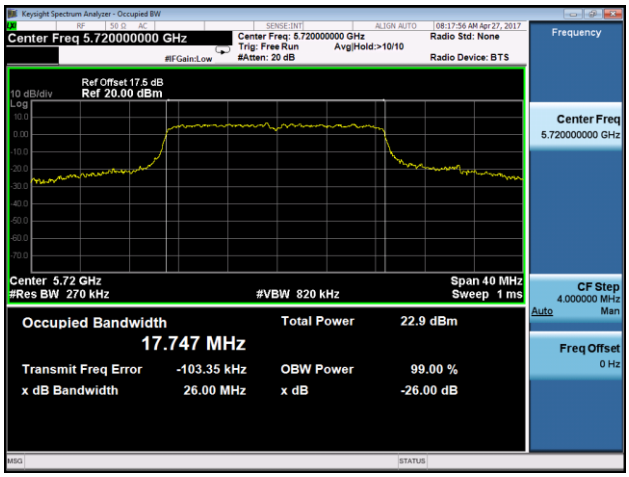
Channel 134 (5670MHz)



Channel 142 (5710MHz)

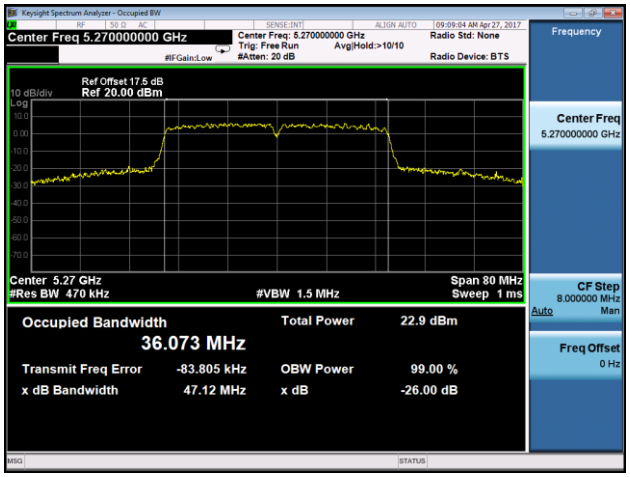


802.11ac-VHT20 26dB Bandwidth & 99% Bandwidth - Ant 0	
Channel 52 (5260MHz)	**Channel 60 (5300MHz)**
	
Channel 64 (5320MHz)	**Channel 100 (5500MHz)**
	
Channel 120 (5600MHz)	**Channel 140 (5700MHz)**
	

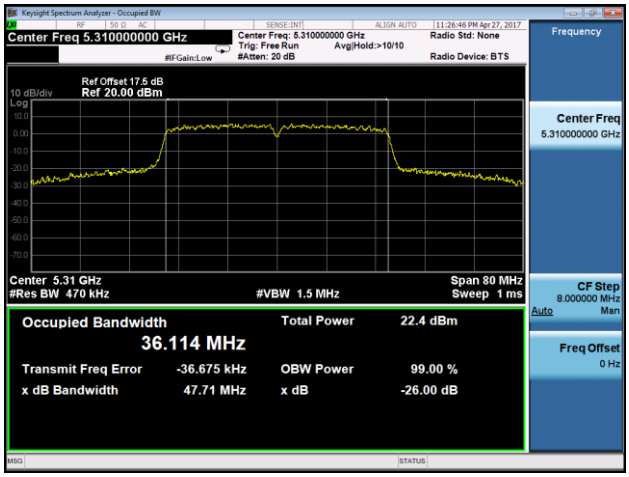
Channel 144 (5720MHz)	
	

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

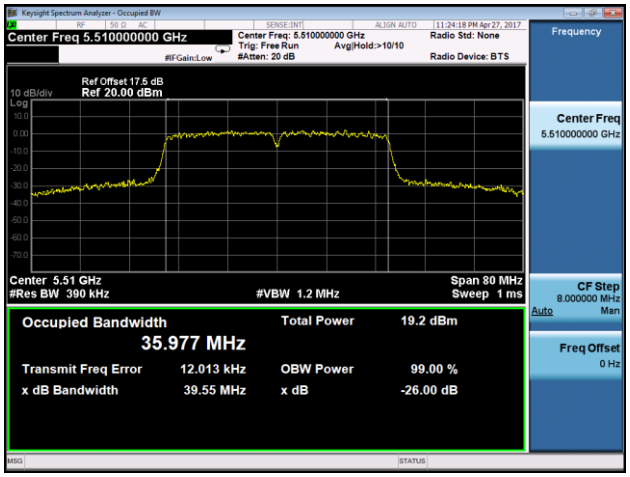
Channel 54 (5270MHz)



Channel 62 (5310MHz)

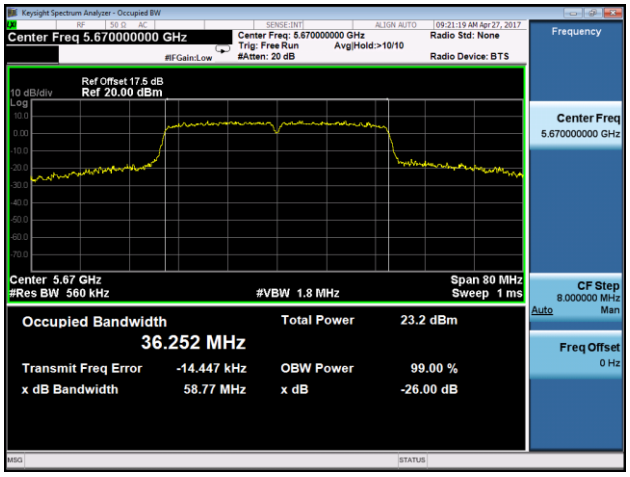


Channel 102 (5510MHz)

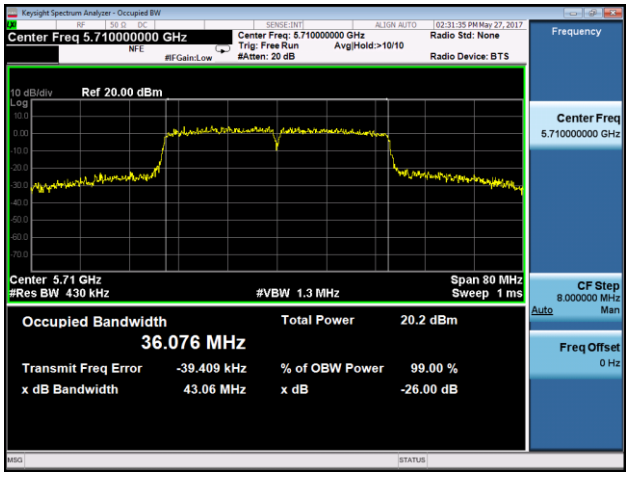


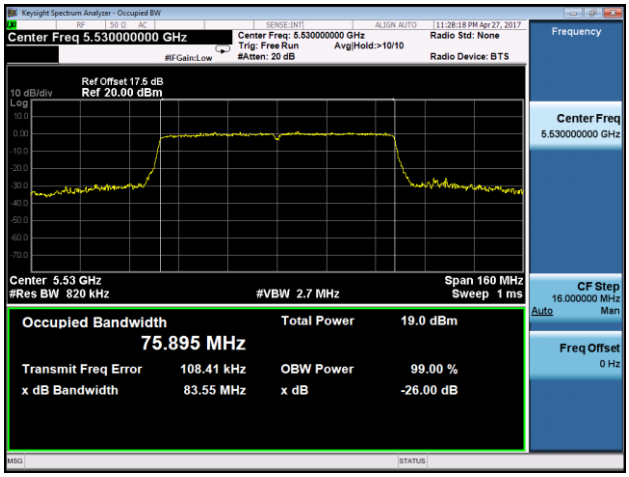
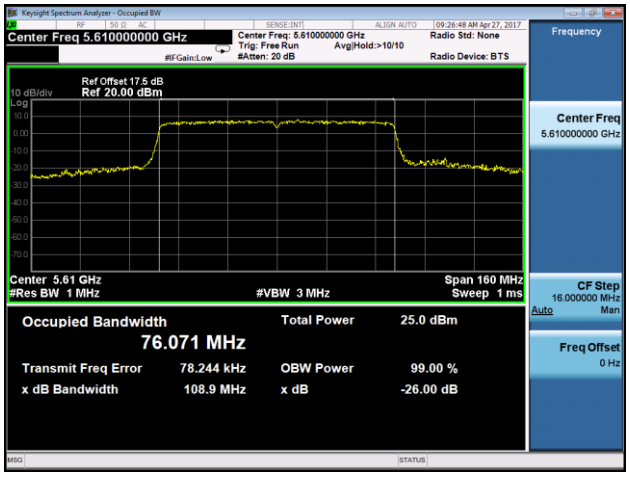
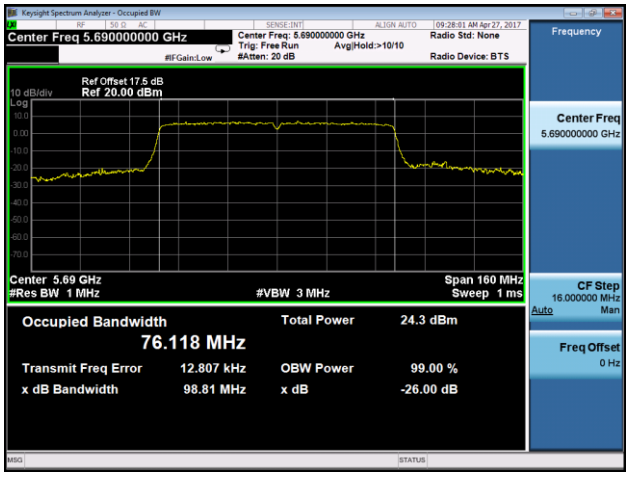
Channel 118 (5590MHz)

Channel 134 (5670MHz)



Channel 142 (5710MHz)



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

7.3. Output Power Measurement

7.3.1. Test Limit

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).

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

5250~5350MHz: Limit (dBm) = 23.98dBm - (10dBi - 6dBi) = 19.98dBm

5470~5725MHz: Limit (dBm) = 23.98dBm - (10dBi - 6dBi) = 19.98dBm

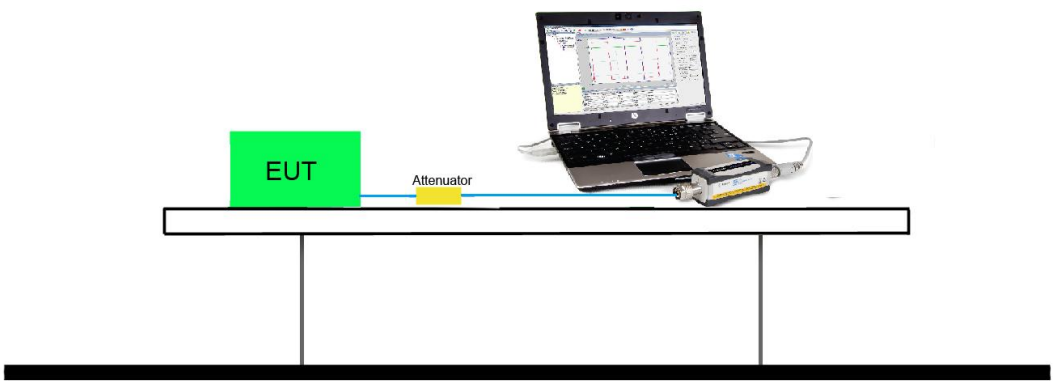
7.3.2. Test Procedure Used

KDB 789033 D02v01r04 - Section E) 3) b) Method PM-G

7.3.3. 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.

7.3.4. Test Setup



7.3.5. Test Result

Power output test was verified over all data rates of each mode shown as below table.

For Ant 0 port:

Test Mode	Bandwidth	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)
802.11a	20	60	5300	6	17.13
				24	17.02
				54	16.76
802.11n	20	60	5300	6.5	17.13
				7.2	17.07
				26.0	16.74
				28.9	16.69
				65.0	16.47
				72.0	16.42
802.11n	40	62	5310	13.5	17.52
				15.0	17.48
				54.0	17.23
				60.0	17.19
				135.0	16.75
				150.0	16.59
802.11ac	20	60	5300	6.5	17.15
				7.2	17.09
				39.0	16.63
				43.3	16.55
				78.0	16.26
				86.7	16.14
802.11ac	40	62	5310	13.5	17.02
				15.0	16.96
				108.0	16.71
				120.0	16.68
				180.0	16.46
				200.0	16.38

802.11ac	80	58	5290	29.3	17.09
				32.5	16.68
				234.0	16.35
				260.0	16.32
				390.0	16.11
				433.3	16.03

Product	Wireless Access Point	Temperature	25°C
Test Engineer	Bruce Wang	Relative Humidity	54%
Test Site	TR3	Test Date	2017/04/20

1Tx_Ant 0

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Average Power (dBm)	Limit (dBm)	Result
11a	6	52	5260	17.32	≤ 19.98	Pass
11a	6	60	5300	17.13	≤ 19.98	Pass
11a	6	64	5320	16.96	≤ 19.98	Pass
11a	6	100	5500	16.21	≤ 19.98	Pass
11a	6	120	5600	16.82	≤ 19.98	Pass
11a	6	140	5700	15.34	≤ 19.98	Pass
11a	6	144	5720	15.86	≤ 19.98	Pass
11n-HT20	6.5	52	5260	17.35	≤ 19.98	Pass
11n-HT20	6.5	60	5300	17.13	≤ 19.98	Pass
11n-HT20	6.5	64	5320	16.99	≤ 19.98	Pass
11n-HT20	6.5	100	5500	16.26	≤ 19.98	Pass
11n-HT20	6.5	120	5600	16.87	≤ 19.98	Pass
11n-HT20	6.5	140	5700	15.37	≤ 19.98	Pass
11n-HT20	6.5	144	5720	15.91	≤ 19.98	Pass
11n-HT40	13.5	54	5270	17.68	≤ 19.98	Pass
11n-HT40	13.5	62	5310	17.52	≤ 19.98	Pass
11n-HT40	13.5	102	5510	13.10	≤ 19.98	Pass
11n-HT40	13.5	118	5590	17.38	≤ 19.98	Pass
11n-HT40	13.5	134	5670	16.30	≤ 19.98	Pass
11n-HT40	13.5	142	5710	16.43	≤ 19.98	Pass
11ac-VHT20	6.5	52	5260	17.32	≤ 19.98	Pass
11ac-VHT20	6.5	60	5300	17.15	≤ 19.98	Pass
11ac-VHT20	6.5	64	5320	17.02	≤ 19.98	Pass
11ac-VHT20	6.5	100	5500	16.27	≤ 19.98	Pass
11ac-VHT20	6.5	120	5600	16.91	≤ 19.98	Pass
11ac-VHT20	6.5	140	5700	14.98	≤ 19.98	Pass
11ac-VHT20	6.5	144	5720	15.46	≤ 19.98	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Average Power (dBm)	Limit (dBm)	Result
11ac-VHT40	13.5	54	5270	17.74	≤ 19.98	Pass
11ac-VHT40	13.5	62	5310	17.02	≤ 19.98	Pass
11ac-VHT40	13.5	102	5510	13.08	≤ 19.98	Pass
11ac-VHT40	13.5	118	5590	17.37	≤ 19.98	Pass
11ac-VHT40	13.5	134	5670	16.31	≤ 19.98	Pass
11ac-VHT40	13.5	142	5710	15.75	≤ 19.98	Pass
11ac-VHT80	29.3	58	5290	17.09	≤ 19.98	Pass
11ac-VHT80	29.3	106	5530	11.91	≤ 19.98	Pass
11ac-VHT80	29.3	122	5610	16.76	≤ 19.98	Pass
11ac-VHT80	29.3	138	5690	15.56	≤ 19.98	Pass

2TX

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Average Power (dBm)		Total Average Power (dBm)	Limit (dBm)	Result
				Ant 0	Ant 0			
11n-HT20	13	52	5260	15.78	16.43	19.13	≤ 19.98	Pass
11n-HT20	13	60	5300	16.01	16.69	19.37	≤ 19.98	Pass
11n-HT20	13	64	5320	15.95	16.26	19.12	≤ 19.98	Pass
11n-HT20	13	100	5500	15.33	14.98	18.17	≤ 19.98	Pass
11n-HT20	13	120	5600	14.86	14.39	17.64	≤ 19.98	Pass
11n-HT20	13	140	5700	13.90	13.32	16.63	≤ 19.98	Pass
11n-HT20	13	144	5720	14.51	13.82	17.19	≤ 19.98	Pass
11n-HT40	27	54	5270	16.11	16.66	19.40	≤ 19.98	Pass
11n-HT40	27	62	5310	14.48	14.86	17.68	≤ 19.98	Pass
11n-HT40	27	102	5510	10.94	11.02	13.99	≤ 19.98	Pass
11n-HT40	27	118	5590	15.96	15.71	18.85	≤ 19.98	Pass
11n-HT40	27	134	5670	16.28	15.93	19.12	≤ 19.98	Pass
11n-HT40	27	142	5710	16.08	15.65	18.88	≤ 19.98	Pass
11ac-VHT20	13	52	5260	15.92	16.40	19.18	≤ 19.98	Pass
11ac-VHT20	13	60	5300	16.19	16.72	19.47	≤ 19.98	Pass
11ac-VHT20	13	64	5320	15.60	16.33	18.99	≤ 19.98	Pass
11ac-VHT20	13	100	5500	14.97	15.13	18.06	≤ 19.98	Pass
11ac-VHT20	13	120	5600	14.95	14.51	17.75	≤ 19.98	Pass
11ac-VHT20	13	140	5700	13.56	12.79	16.20	≤ 19.98	Pass
11ac-VHT20	13	144	5720	14.15	13.78	16.98	≤ 19.98	Pass
11ac-VHT40	27	54	5270	16.21	16.71	19.48	≤ 19.98	Pass
11ac-VHT40	27	62	5310	13.50	13.79	16.66	≤ 19.98	Pass
11ac-VHT40	27	102	5510	10.06	9.94	13.01	≤ 19.98	Pass
11ac-VHT40	27	118	5590	16.72	16.29	19.52	≤ 19.98	Pass
11ac-VHT40	27	134	5670	14.69	14.45	17.58	≤ 19.98	Pass
11ac-VHT40	27	142	5710	15.81	15.36	18.60	≤ 19.98	Pass
11ac-VHT80	58.6	58	5290	13.12	13.52	16.33	≤ 19.98	Pass
11ac-VHT80	58.6	106	5530	9.05	8.76	11.92	≤ 19.98	Pass
11ac-VHT80	58.6	122	5610	16.58	16.24	19.42	≤ 19.98	Pass
11ac-VHT80	58.6	138	5690	15.57	15.26	18.43	≤ 19.98	Pass

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

7.4. Transmit Power Control

7.4.1. 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.

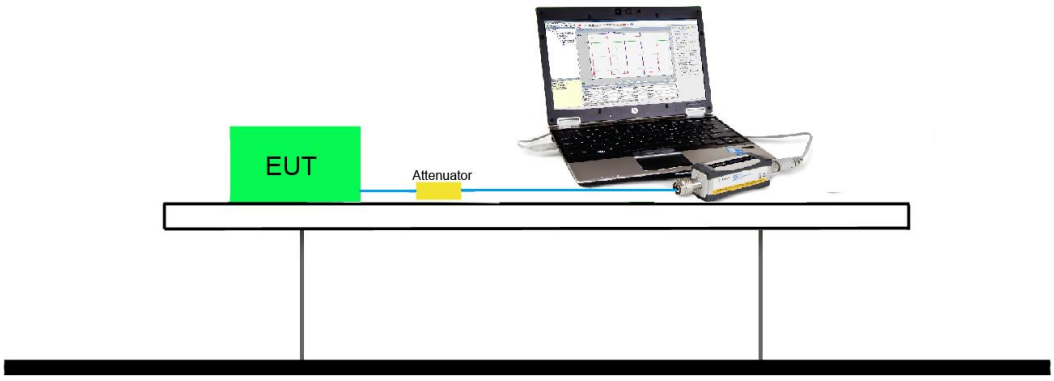
7.4.2. Test Procedure Used

KDB 789033 D02v01 - 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

Product	Wireless Access Point	Temperature	25°C
Test Engineer	Bruce Wang	Relative Humidity	54%
Test Site	TR3	Test Date	2017/04/20

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	TPC Power (dBm)	EIRP TPC Power (dBm)	Limit (dBm)	Result
Ant 0							
802.11a	6	52	5260	13.56	23.56	≤ 24	Pass
802.11a	6	60	5300	13.53	23.53	≤ 24	Pass
802.11a	6	64	5320	13.90	23.90	≤ 24	Pass
802.11a	6	100	5500	13.87	23.87	≤ 24	Pass
802.11a	6	120	5600	13.57	23.57	≤ 24	Pass
802.11a	6	140	5700	13.73	23.73	≤ 24	Pass
802.11a	6	144	5720	13.65	23.65	≤ 24	Pass
802.11n-HT20	6.5	52	5260	13.64	23.64	≤ 24	Pass
802.11n-HT20	6.5	60	5300	13.47	23.47	≤ 24	Pass
802.11n-HT20	6.5	64	5320	13.88	23.88	≤ 24	Pass
802.11n-HT20	6.5	100	5500	13.94	23.94	≤ 24	Pass
802.11n-HT20	6.5	120	5600	13.56	23.56	≤ 24	Pass
802.11n-HT20	6.5	140	5700	13.72	23.72	≤ 24	Pass
802.11n-HT20	6.5	144	5720	13.55	23.55	≤ 24	Pass
802.11n-HT40	13.5	54	5270	13.86	23.86	≤ 24	Pass
802.11n-HT40	13.5	62	5310	13.65	23.65	≤ 24	Pass
802.11n-HT40	13.5	102	5510	13.14	23.14	≤ 24	Pass
802.11n-HT40	13.5	118	5590	13.88	23.88	≤ 24	Pass
802.11n-HT40	13.5	134	5670	13.85	23.85	≤ 24	Pass
802.11n-HT40	13.5	142	5710	13.46	23.46	≤ 24	Pass
802.11ac-VHT20	6.5	52	5260	13.59	23.59	≤ 24	Pass
802.11ac-VHT20	6.5	60	5300	13.41	23.41	≤ 24	Pass
802.11ac-VHT20	6.5	64	5320	13.87	23.87	≤ 24	Pass
802.11ac-VHT20	6.5	100	5500	13.87	23.87	≤ 24	Pass
802.11ac-VHT20	6.5	120	5600	13.51	23.51	≤ 24	Pass
802.11ac-VHT20	6.5	140	5700	13.68	23.68	≤ 24	Pass
802.11ac-VHT20	6.5	144	5720	13.81	23.81	≤ 24	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	TPC Power (dBm)	EIRP TPC Power (dBm)	Limit (dBm)	Result
Ant 0							
802.11ac-VHT40	13.5	54	5270	13.72	23.72	≤ 24	Pass
802.11ac-VHT40	13.5	62	5310	13.62	23.62	≤ 24	Pass
802.11ac-VHT40	13.5	102	5510	13.10	23.10	≤ 24	Pass
802.11ac-VHT40	13.5	118	5590	13.90	23.90	≤ 24	Pass
802.11ac-VHT40	13.5	134	5670	13.78	23.78	≤ 24	Pass
802.11ac-VHT40	13.5	142	5710	13.90	23.90	≤ 24	Pass
802.11ac-VHT80	29.3	58	5290	13.81	23.81	≤ 24	Pass
802.11ac-VHT80	29.3	106	5530	11.89	21.89	≤ 24	Pass
802.11ac-VHT80	29.3	122	5610	13.74	23.74	≤ 24	Pass
802.11ac-VHT80	29.3	138	5690	13.62	23.62	≤ 24	Pass

Note: EIRP TPC Power (dBm) = TPC Power (dBm) + Antenna Gain (dBi).

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								
802.11n-HT20	13	52	5260	10.68	11.01	23.86	≤ 24	Pass
802.11n-HT20	13	60	5300	10.78	10.86	23.83	≤ 24	Pass
802.11n-HT20	13	64	5320	10.72	10.83	23.79	≤ 24	Pass
802.11n-HT20	13	100	5500	11.00	10.64	23.83	≤ 24	Pass
802.11n-HT20	13	120	5600	11.06	10.83	23.96	≤ 24	Pass
802.11n-HT20	13	140	5700	10.78	10.26	23.54	≤ 24	Pass
802.11n-HT20	13	144	5720	10.65	10.14	23.41	≤ 24	Pass
802.11n-HT40	27	54	5270	10.62	10.90	23.77	≤ 24	Pass
802.11n-HT40	27	62	5310	10.54	10.75	23.66	≤ 24	Pass
802.11n-HT40	27	102	5510	10.90	10.49	23.71	≤ 24	Pass
802.11n-HT40	27	118	5590	10.87	10.29	23.60	≤ 24	Pass
802.11n-HT40	27	134	5670	10.75	10.62	23.70	≤ 24	Pass
802.11n-HT40	27	142	5710	10.54	10.45	23.51	≤ 24	Pass
802.11ac-VHT20	13	52	5260	10.75	10.60	23.69	≤ 24	Pass
802.11ac-VHT20	13	60	5300	10.73	10.50	23.63	≤ 24	Pass
802.11ac-VHT20	13	64	5320	10.51	10.42	23.48	≤ 24	Pass
802.11ac-VHT20	13	100	5500	11.10	10.65	23.89	≤ 24	Pass
802.11ac-VHT20	13	120	5600	11.04	10.72	23.89	≤ 24	Pass
802.11ac-VHT20	13	140	5700	10.96	10.56	23.77	≤ 24	Pass
802.11ac-VHT20	13	144	5720	11.02	10.42	23.74	≤ 24	Pass
802.11ac-VHT40	27	54	5270	11.00	10.64	23.83	≤ 24	Pass
802.11ac-VHT40	27	62	5310	10.80	10.45	23.64	≤ 24	Pass
802.11ac-VHT40	27	102	5510	10.18	9.78	22.99	≤ 24	Pass
802.11ac-VHT40	27	118	5590	10.90	10.02	23.49	≤ 24	Pass
802.11ac-VHT40	27	134	5670	10.80	10.42	23.62	≤ 24	Pass
802.11ac-VHT40	27	142	5710	10.98	10.50	23.76	≤ 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
802.11ac-VHT80	58.6	58	5290	10.76	10.73	23.76	≤ 24	Pass
802.11ac-VHT80	58.6	106	5530	8.92	8.32	21.64	≤ 24	Pass
802.11ac-VHT80	58.6	122	5610	10.96	10.53	23.76	≤ 24	Pass
802.11ac-VHT80	58.6	138	5690	11.13	10.52	23.85	≤ 24	Pass

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

7.5. Power Spectral Density Measurement

7.5.1. Test Limit

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.

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

5250~5350MHz: Limit (dBm/MHz) = 11dBm/MHz - (10dBi - 6dBi) = 7dBm/MHz

5470~5725MHz: Limit (dBm/MHz) = 11dBm/MHz - (10dBi - 6dBi) = 7dBm/MHz

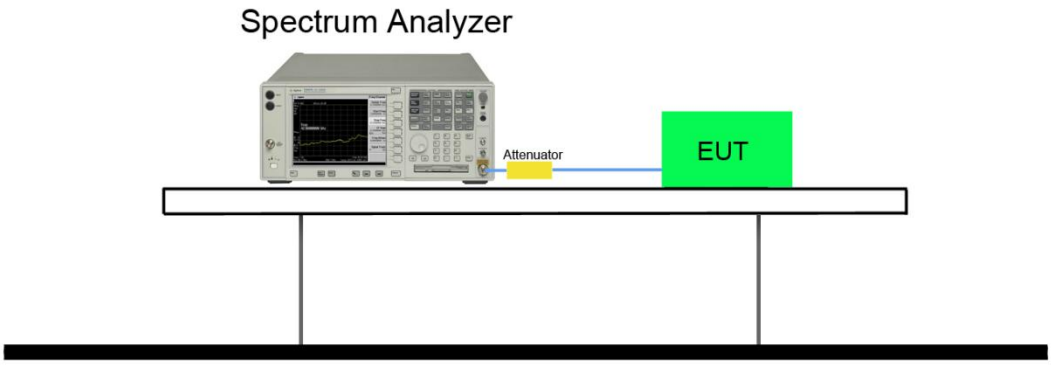
7.5.2. Test Procedure Used

KDB 789033 D02v01r04 - Section F

7.5.3. 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.
11. When the measurement bandwidth of Maximum PSD is specified in 500 kHz, add a constant factor 10*log(500kHz/100kHz) = 7 dB to the measured result

7.5.4. Test Setup



7.5.5. Test Result

Product	Wireless Access Point	Temperature	22°C
Test Engineer	Bruce Wang	Relative Humidity	54%
Test Site	TR3	Test Date	2017/04/29

1TX_Ant 0

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	PSD (dBm/ MHz)	Duty Cycle (%)	Final PSD (dBm/ MHz)	PSD Limit (dBm/MHz)	Result
11a	6	52	5260	4.91	95.57	5.11	≤ 7.00	Pass
11a	6	60	5300	4.65	95.57	4.85	≤ 7.00	Pass
11a	6	64	5320	4.78	95.57	4.98	≤ 7.00	Pass
11a	6	100	5500	4.02	95.57	4.22	≤ 7.00	Pass
11a	6	120	5600	6.53	95.57	6.73	≤ 7.00	Pass
11a	6	140	5700	5.29	95.57	5.49	≤ 7.00	Pass
11a	6	144	5720	4.72	95.57	4.92	≤ 7.00	Pass
11n-HT20	6.5	52	5260	4.69	98.23	4.69	≤ 7.00	Pass
11n-HT20	6.5	60	5300	4.78	98.23	4.78	≤ 7.00	Pass
11n-HT20	6.5	64	5320	4.57	98.23	4.57	≤ 7.00	Pass
11n-HT20	6.5	100	5500	4.60	98.23	4.60	≤ 7.00	Pass
11n-HT20	6.5	120	5600	6.04	98.23	6.04	≤ 7.00	Pass
11n-HT20	6.5	140	5700	5.06	98.23	5.06	≤ 7.00	Pass
11n-HT20	6.5	144	5720	4.31	98.23	4.39	≤ 7.00	Pass
11n-HT40	13.5	54	5270	2.53	95.22	2.74	≤ 7.00	Pass
11n-HT40	13.5	62	5310	2.29	95.22	2.50	≤ 7.00	Pass
11n-HT40	13.5	102	5510	-1.28	95.22	-1.07	≤ 7.00	Pass
11n-HT40	13.5	118	5590	3.71	95.22	3.92	≤ 7.00	Pass
11n-HT40	13.5	134	5670	3.07	95.22	3.28	≤ 7.00	Pass
11n-HT40	13.5	142	5710	1.76	95.22	1.97	≤ 7.00	Pass
11ac-VHT20	6.5	52	5260	4.91	98.23	4.91	≤ 7.00	Pass
11ac-VHT20	6.5	60	5300	4.98	98.23	4.98	≤ 7.00	Pass
11ac-VHT20	6.5	64	5320	4.75	98.23	4.75	≤ 7.00	Pass
11ac-VHT20	6.5	100	5500	4.77	98.23	4.77	≤ 7.00	Pass
11ac-VHT20	6.5	120	5600	5.96	98.23	5.96	≤ 7.00	Pass
11ac-VHT20	6.5	140	5700	4.73	98.23	4.73	≤ 7.00	Pass
11ac-VHT20	6.5	144	5720	5.22	98.23	5.22	≤ 7.00	Pass

Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	PSD (dBm/ MHz)	Duty Cycle (%)	Final PSD (dBm/ MHz)	PSD Limit (dBm/MHz)	Result
11ac-VHT40	13.5	54	5270	2.54	94.86	2.77	≤ 7.00	Pass
11ac-VHT40	13.5	62	5310	1.86	94.86	2.09	≤ 7.00	Pass
11ac-VHT40	13.5	102	5510	-1.19	94.86	-0.96	≤ 7.00	Pass
11ac-VHT40	13.5	118	5590	3.65	94.86	3.88	≤ 7.00	Pass
11ac-VHT40	13.5	134	5670	3.12	94.86	3.35	≤ 7.00	Pass
11ac-VHT40	13.5	142	5710	2.71	94.86	2.94	≤ 7.00	Pass
11ac-VHT80	29.3	58	5290	-1.44	89.97	-0.98	≤ 7.00	Pass
11ac-VHT80	29.3	106	5530	-5.89	89.97	-5.43	≤ 7.00	Pass
11ac-VHT80	29.3	122	5610	-0.07	89.97	0.39	≤ 7.00	Pass
11ac-VHT80	29.3	138	5690	-0.91	89.97	-0.45	≤ 7.00	Pass

Note 1: When EUT duty cycle ≥ 98%, the Final PSD (dBm/MHz) = PSD (dBm/MHz).

Note 2: When EUT duty cycle < 98%, the Final PSD (dBm/MHz) = PSD (dBm/MHz) + 10*log(1/Duty Cycle).

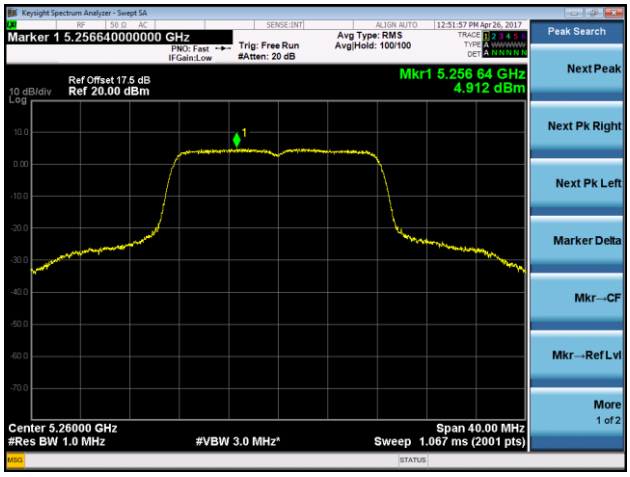
2TX_Ant 0+1

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
11n-HT20	13	52	5260	3.30	3.73	98.23	6.53	≤ 7.00	Pass
11n-HT20	13	60	5300	3.31	3.90	98.23	6.63	≤ 7.00	Pass
11n-HT20	13	64	5320	3.52	3.67	98.23	6.61	≤ 7.00	Pass
11n-HT20	13	100	5500	4.00	3.77	98.23	6.90	≤ 7.00	Pass
11n-HT20	13	120	5600	3.92	3.62	98.23	6.78	≤ 7.00	Pass
11n-HT20	13	140	5700	3.35	3.10	98.23	6.23	≤ 7.00	Pass
11n-HT20	13	144	5720	3.46	3.00	98.23	6.32	≤ 7.00	Pass
11n-HT40	27	54	5270	0.81	1.01	95.22	4.14	≤ 7.00	Pass
11n-HT40	27	62	5310	-0.66	-0.53	95.22	2.63	≤ 7.00	Pass
11n-HT40	27	102	5510	-3.24	-3.24	95.22	-0.02	≤ 7.00	Pass
11n-HT40	27	118	5590	2.39	2.21	95.22	5.52	≤ 7.00	Pass
11n-HT40	27	134	5670	2.96	2.12	95.22	5.78	≤ 7.00	Pass
11n-HT40	27	142	5710	1.98	2.04	95.22	5.23	≤ 7.00	Pass
11ac-VHT20	13	52	5260	3.25	3.99	98.23	6.64	≤ 7.00	Pass
11ac-VHT20	13	60	5300	3.68	3.89	98.23	6.80	≤ 7.00	Pass
11ac-VHT20	13	64	5320	3.32	3.88	98.23	6.62	≤ 7.00	Pass
11ac-VHT20	13	100	5500	3.57	3.79	98.23	6.69	≤ 7.00	Pass
11ac-VHT20	13	120	5600	3.99	3.80	98.23	6.90	≤ 7.00	Pass
11ac-VHT20	13	140	5700	3.53	3.78	98.23	6.67	≤ 7.00	Pass
11ac-VHT20	13	144	5720	4.05	3.32	98.23	6.71	≤ 7.00	Pass
11ac-VHT40	27	54	5270	0.76	1.59	94.86	4.43	≤ 7.00	Pass
11ac-VHT40	27	62	5310	-1.81	-1.30	94.86	1.69	≤ 7.00	Pass
11ac-VHT40	27	102	5510	-4.34	-4.44	94.86	-1.15	≤ 7.00	Pass
11ac-VHT40	27	118	5590	3.23	2.68	94.86	6.20	≤ 7.00	Pass
11ac-VHT40	27	134	5670	1.04	0.71	94.86	4.12	≤ 7.00	Pass
11ac-VHT40	27	142	5710	2.28	1.81	94.86	5.29	≤ 7.00	Pass
11ac-VHT80	58.6	58	5290	-5.72	-5.30	89.97	-2.04	≤ 7.00	Pass
11ac-VHT80	58.6	106	5530	-9.12	-8.77	89.97	-5.47	≤ 7.00	Pass
11ac-VHT80	58.6	122	5610	-0.31	-0.65	89.97	2.99	≤ 7.00	Pass
11ac-VHT80	58.6	138	5690	-1.24	-1.84	89.97	1.94	≤ 7.00	Pass

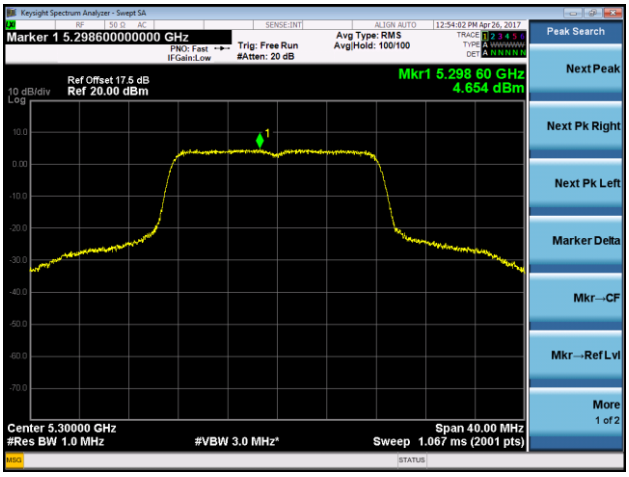
Note 1: When EUT duty cycle ≥ 98%, the Total PSD (dBm/MHz) = $10*\log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\}$.
Note 2: When EUT duty cycle < 98%, the Total PSD (dBm/MHz) = $10*\log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\}$ + 10*log(1/Duty Cycle).

802.11a Power Spectral Density - Ant 0

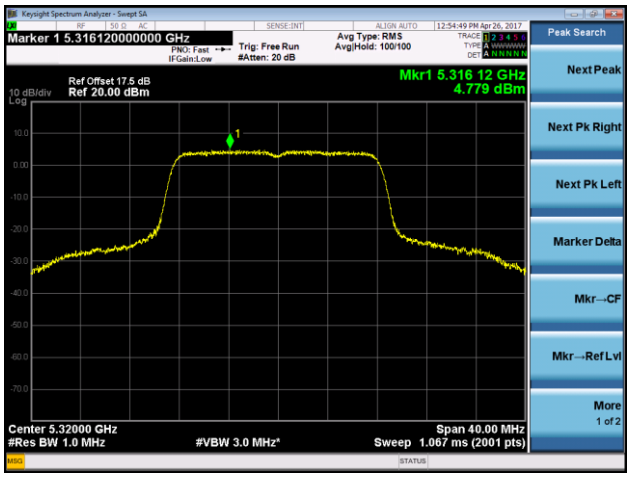
Channel 52 (5260MHz)



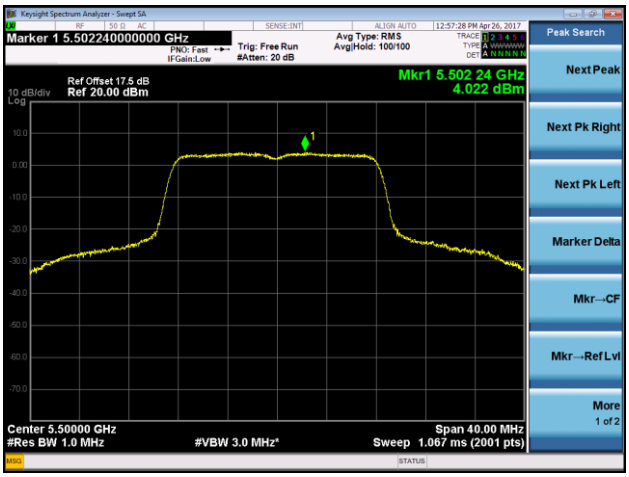
Channel 60 (5300MHz)



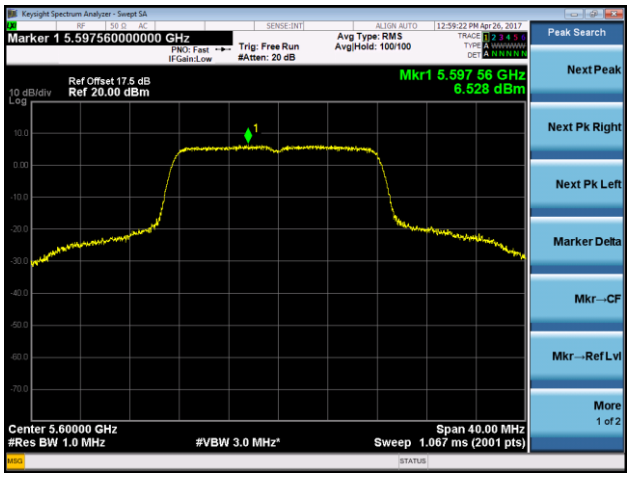
Channel 64 (5320MHz)



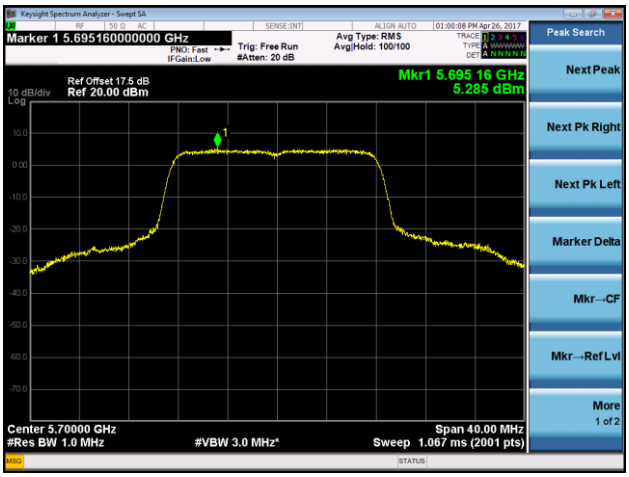
Channel 100 (5500MHz)



Channel 120 (5600MHz)



Channel 140 (5700MHz)



Channel 144 (5720MHz)