MEASUREMENT REPORT

FCC PART 15 Subpart C WLAN 802.11b/g/n/ac/ax

FCC ID:	TE7AX11000
APPLICANT:	TP-Link Technologies Co., Ltd.
Application Type:	Certification
Product:	AX11000 MU-MIMO Tri-Band Gaming Router
Model No.:	Archer AX11000
Brand Name:	tp-link
FCC Classification:	Part15 Subpart C (Section 15.247)
FCC Rule Part(s):	ANSI C63.10-2013, KDB 558074 D01v05 KDB 662911 D01v02r01
Test Procedure(s):	ANSI C63.10-2013
Test Date:	November 23 ~ December 05, 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 measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date	Note
1811TW0112-U3	Rev. 01	Initial report	12-05-2018	Valid

CONTENTS

Description Page

§2.1033 General Information 5

1. INTRODUCTION 6

1.1. Scope 6
1.2. MRT Test Location 6

2. PRODUCT INFORMATION 7

2.1. Feature of Equipment under Test 7
2.2. Product Specification Subjective to this Report 7
2.3. Working Frequencies for this report 8
2.4. Description of Available Antennas 8
2.5. Description of Antenna RF Port 9
2.6. Test Mode 10
2.7. Description of Test Software 11
2.8. Device Capabilities 12
2.9. Test Configuration 14
2.10. EMI Suppression Device(s)/Modifications 14
2.11. Labeling Requirements 14

3. DESCRIPTION of TEST 15

3.1. Evaluation Procedure 15
3.2. AC Line Conducted Emissions 15
3.3. Radiated Emissions 16

4. ANTENNA REQUIREMENTS 17

5. TEST EQUIPMENT CALIBRATION DATE 18

6. MEASUREMENT UNCERTAINTY 19

7. TEST RESULT 20

7.1. Summary 20
7.2. 6dB Bandwidth Measurement 21
7.2.1. Test Limit 21
7.2.2. Test Procedure used 21
7.2.3. Test Setting 21
7.2.4. Test Setup 21
7.2.5. Test Result 22
7.3. Output Power Measurement 31
7.3.1. Test Limit 31

7.3.2. Test Procedure Used 31
7.3.3. Test Setting 31
7.3.4. Test Setup 31
7.3.5. Test Result 32
7.4. Power Spectral Density Measurement 36
7.4.1. Test Limit 36
7.4.2. Test Procedure Used 36
7.4.3. Test Setting 36
7.4.4. Test Setup 37
7.4.5. Test Result 38
7.5. Conducted Band Edge and Out-of-Band Emissions 88
7.5.1. Test Limit 88
7.5.2. Test Procedure Used 88
7.5.3. Test Setting 88
7.5.4. Test Setup 89
7.5.5. Test Result 90
7.6. Radiated Spurious Emission Measurement 107
7.6.1. Test Limit 107
7.6.2. Test Procedure Used 107
7.6.3. Test Setting 107
7.6.4. Test Setup 109
7.6.5. Test Result 111
7.7. Radiated Restricted Band Edge Measurement 149
7.7.1. Test Limit 149
7.7.2. Test Procedure Used 150
7.7.3. Test Setting 150
7.7.4. Test Setup 151
7.7.5. Test Result 152
7.8. AC Conducted Emissions Measurement 464
7.8.1. Test Limit 464
7.8.2. Test Setup 464
7.8.3. Test Result 465
8. CONCLUSION 467
Appendix A - Test Setup Photograph 468
Appendix B - EUT Photograph 469

§2.1033 General Information

Applicant:	TP-Link Technologies Co., Ltd.
Applicant Address:	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China
Manufacturer:	TP-Link Technologies Co., Ltd.
Manufacturer Address:	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China
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.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering

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.**

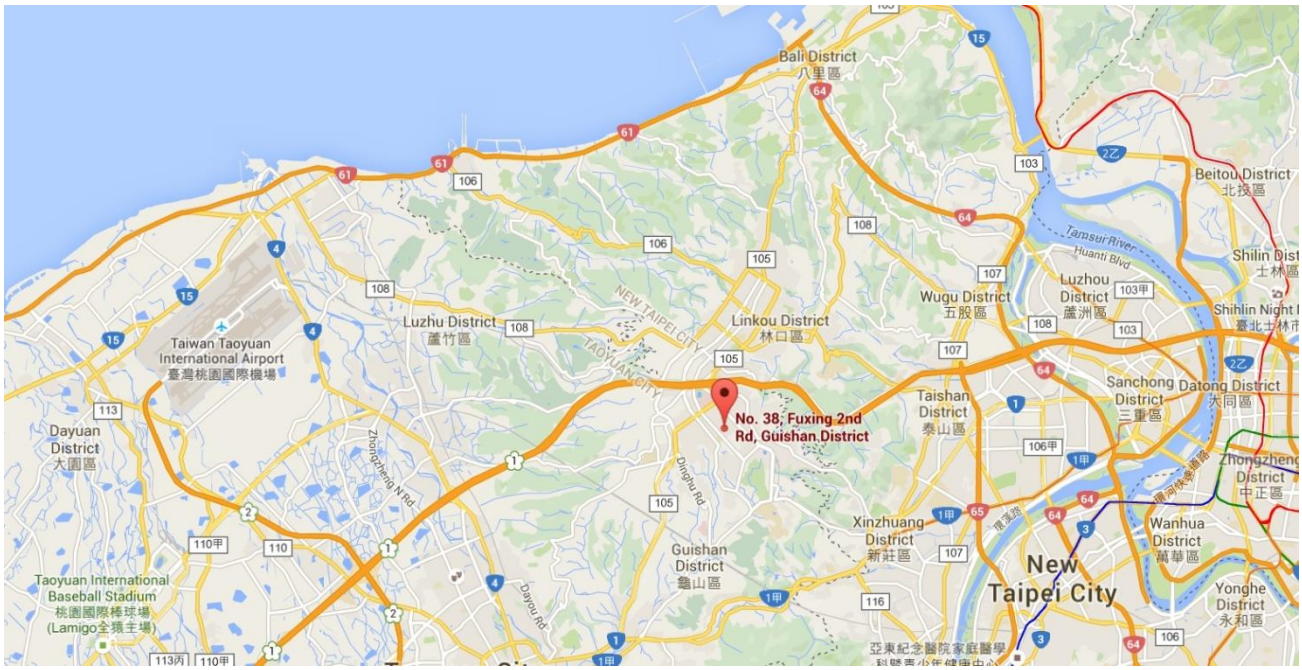
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices 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 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. Feature of Equipment under Test

Product Name:	AX11000 MU-MIMO Tri-Band Gaming Router
Model No.:	Archer AX11000
Brand Name:	tp-link
Wi-Fi Specification:	802.11a/b/g/n/ac/ax
Bluetooth Specification:	v4.1 dual mode
Accessories	
Adapter:	MODEL: S065PQ1200500 INPUT: 100 - 240V ~ 50/60Hz 1800mA OUTPUT: DC 12.0V 5000mA

2.2. Product Specification Subjective to this Report

Frequency Range:	802.11b/g/n-HT20/ac-VHT20/ax-HE20: 2412 ~ 2462MHz 802.11n-HT40/ac-VHT40/ax-HE40: 2422 ~ 2452MHz
Channel Number:	802.11b/g/n-HT20/ac-VHT20/ax-HE20: 11 802.11n-HT40/ac-VHT40/ax-HE40: 7
Type of Modulation:	802.11b: DSSS 802.11g/n/ac: OFDM 802.11ax:OFDMA
Data Rate:	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1000Mbps 802.11ax: up to 1148Mbps

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

2.3. Working Frequencies for this report

802.11b/g/n-HT20/ac-VHT20/ax-HE20

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

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

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

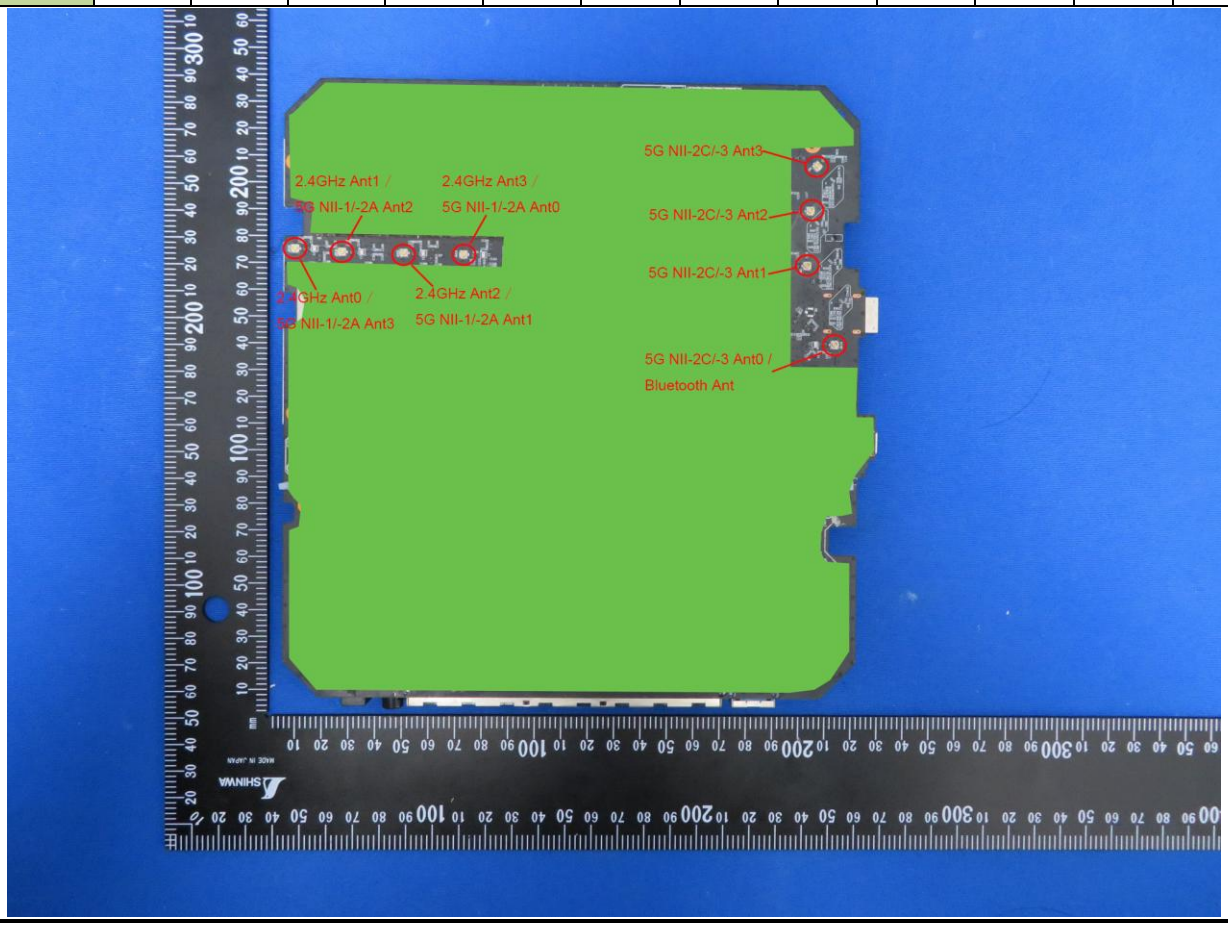
2.4. Description of Available Antennas

Antenna Type	Frequency Band (MHz)	TX Paths	Max Antenna Gain (dBi)	BF Directional Gain (dBi)	CDD Directional Gain (dBi)	
					For Power	For PSD
Wi-Fi External Antenna						
Dipole Antenna	2400 ~ 2500	4	1.8	7.82	1.8	7.82
	5150 ~ 5850	4	1.8	7.82	1.8	7.82
Bluetooth Internal Antenna						
Dipole Antenna	2400 ~ 2500	1	1.8	--	--	--

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 $N_{ANT} \leq 4$;
2. The EUT also supports Beam Forming mode, and the Beam Forming support 802.11ac/ax, not include 802.11a/b/g/n. BF Directional gain = G_{ANT} + 10 log (N_{ANT}).

2.5. Description of Antenna RF Port

Antenna RF Port												
Software Control Port	2.4GHz RF Port				5GHz RF Port (NII-1 & NII-2A)				Bluetooth & 5GHz RF Port (NII-2C & NII-3)			
	Ant 0	Ant 1	Ant 2	Ant 3	Ant 0	Ant 1	Ant 2	Ant 3	Ant 0 / BT	Ant 1	Ant 2	Ant 3
												

2.6. Test Mode

Test Mode	Mode 1: Transmit by 802.11b (1Mbps) (CDD Mode)
	Mode 2: Transmit by 802.11g (6Mbps) (CDD Mode)
	Mode 3: Transmit by 802.11n-HT20 (MCS0) (CDD Mode)
	Mode 4: Transmit by 802.11n-HT40 (MCS0) (CDD Mode)
	Mode 5: Transmit by 802.11ac-VHT20 (MCS0) (CDD Mode)
	Mode 6: Transmit by 802.11ac-VHT40 (MCS0) (CDD Mode)
	Mode 7: Transmit by 802.11ax-HE20 (MCS0) (CDD Mode)
	Mode 8: Transmit by 802.11ax-HE40 (MCS0) (CDD Mode)
	Mode 9: Transmit by 802.11ac-VHT20 (MCS0) (BF Mode)
	Mode 10: Transmit by 802.11ac-VHT40 (MCS0) (BF Mode)
	Mode 11: Transmit by 802.11ax-HE20 (MCS0) (BF Mode)
	Mode 12: Transmit by 802.11ax-HE40 (MCS0) (BF Mode)

2.7. Description of Test Software

The test utility software used during testing was “accessMTool”, and the version was “v3.1.0.1”.

Power Parameter Value

Test Mode	Test Frequency (MHz)	Power Parameter Value Ant 0 + 1 + 2 +3	Test Mode	Test Frequency (MHz)	Power Parameter Value Ant 0 + 1 + 2 +3	
					CDD Mode	Beam-Forming Mode
11b	2412	87	11ac-VHT20	2412	77	74
	2417	91		2417	88	84
	2422	91		2422	90	84
	2437	91		2437	90	84
	2447	91		2452	90	84
	2452	91		2457	86	84
	2462	91		2462	73	80
11g	2412	76	11ac-VHT40	2422	63	68
	2417	90		2427	72	72
	2422	91		2437	80	78
	2437	91		2447	72	67
	2452	91		2452	68	66
	2457	89	11ax-HE20	2412	68	71
	2462	76		2417	84	82
11n-HT20	2412	74		2422	89	83
	2417	91		2437	89	82
	2422	91		2452	88	82
	2437	91		2457	83	80
	2452	91		2462	69	72
	2457	88	11ax-HE40	2422	63	68
	2462	76		2427	70	71
11n-HT40	2422	66		2437	76	77
	2427	73		2447	68	68
	2437	80		2452	66	66
	2447	71	--	--	--	--
	2452	69	--	--	--	--

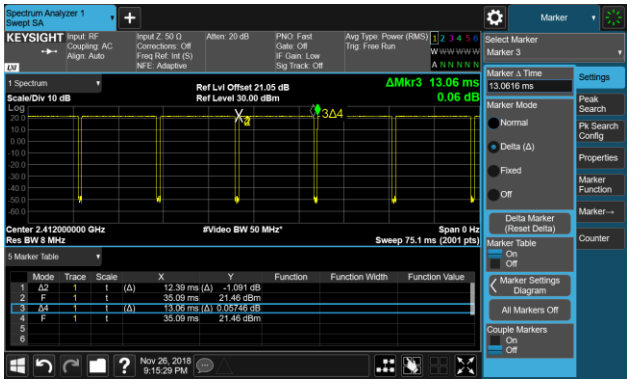
2.8. Device Capabilities

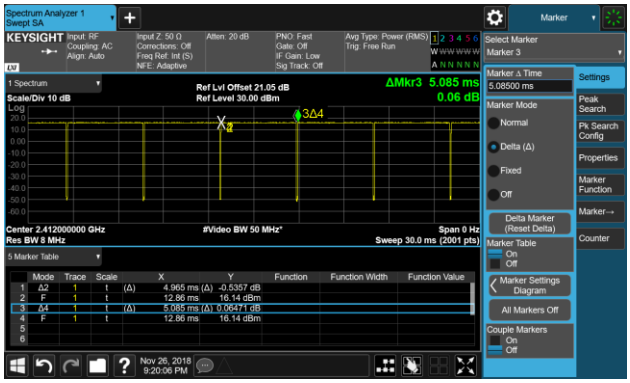
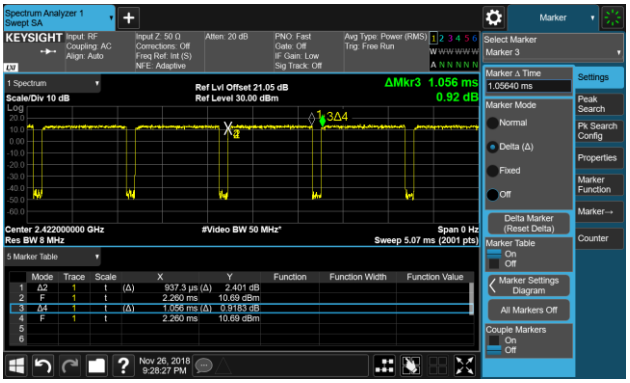
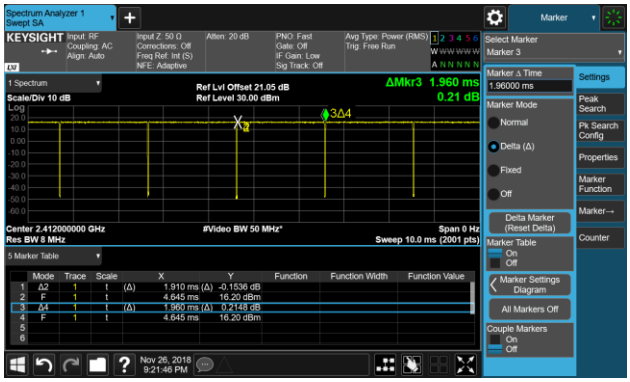
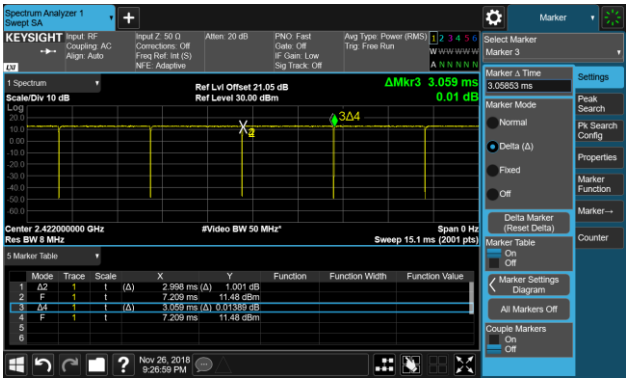
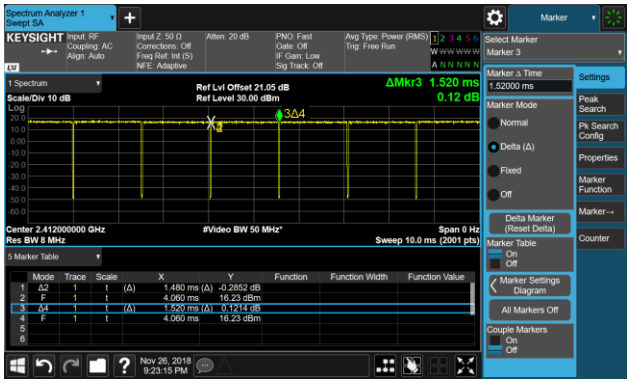
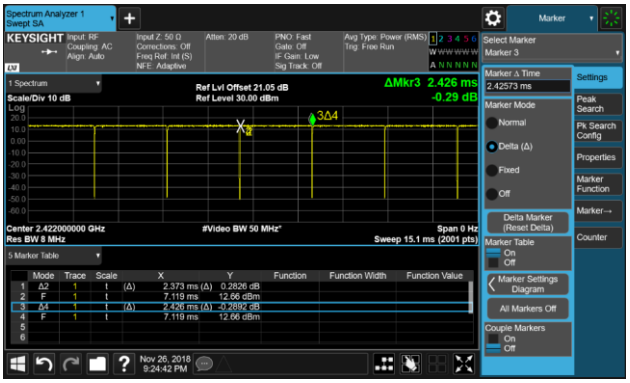
This device contains the following capabilities:

2.4GHz WLAN (DTS), 5GHz WLAN (UNII), Bluetooth v4.1 (Dual mode)

Note: 2.4GHz WLAN (DTS) operation is possible in 20MHz and 40MHz 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. 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
Archer AX11000	802.11b	94.87%
	802.11g	97.53%
	802.11n-HT20	97.64%
	802.11n-HT40	88.76%
	802.11ac-VHT20	97.45%
	802.11ac-VHT40	98.01%
	802.11ax-HE20	97.37%
	802.11ax-HE40	97.82%

Duty Cycle (T = Transmission Duration)	
802.11b (T = 12.390ms)	802.11g (T = 5.340ms)
	

Duty Cycle (T = Transmission Duration)	
802.11n-HT20 (T = 4.965ms)	802.11n-HT40 (T = 937.3us)
	
802.11ac-VHT20 (T = 1.910ms)	802.11ac-VHT40 (T = 2.998ms)
	
802.11ax-HE20 (T = 1.480ms)	802.11ax-HE40 (T = 2.373ms)
	

2.9. Test Configuration

The **AX11000 MU-MIMO Tri-Band Gaming Router** was tested per the guidance of ANSI C63.10-2013. 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 was used in the measurement of the **AX11000 MU-MIMO Tri-Band Gaming Router.**

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.

3.3. Radiated Emissions

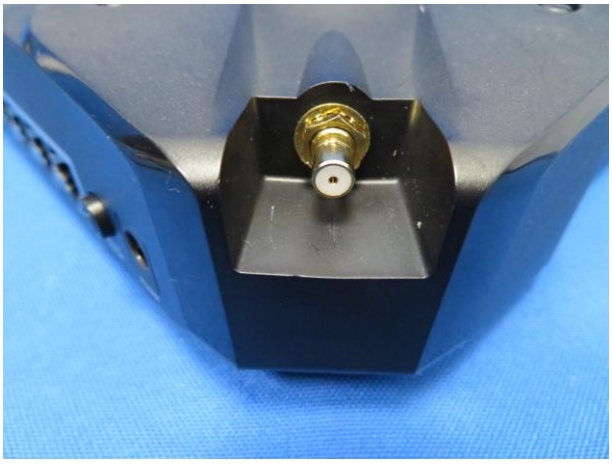
The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers 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.

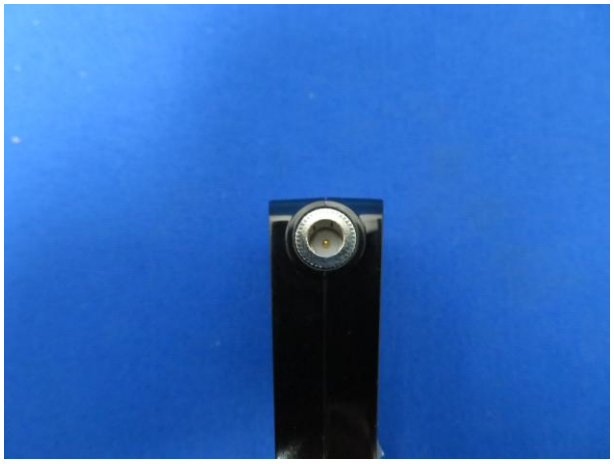
4. ANTENNA REQUIREMENTS

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 **AX11000 MU-MIMO Tri-Band Gaming Router** uses a unique 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
Two-Line V-Network	R&S	ENV216	MRTTWA00019	1 year	2019/3/20
Two-Line V-Network	R&S	ENV216	MRTTWA00020	1 year	2019/3/20
8-Wire ISN (T8)	R&S	ENY81	MRTTWA00018	1 year	2019/4/24
EMI Test Receiver	R&S	ESR3	MRTTWA00045	1 year	2019/5/14
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2019/5/21

Radiated Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Acitve Loop Antenna	SCHWARZBECK	FMZB 1519B	MRTTWA00002	1 year	2019/4/24
Broadband TRILOG Antenna	SCHWARZBECK	VULB 9162	MRTTWA00001	1 year	2019/5/22
Broadband Hornantenna	SCHWARZBECK	BBHA 9120D	MRTTWA00003	1 year	2019/4/24
Breitband Hornantenna	SCHWARZBECK	BBHA 9170	MRTTWA00004	1 year	2019/4/23
Broadband Preamplifier	SCHWARZBECK	BBV 9718	MRTTWA00005	1 year	2019/4/23
Broadband Amplifier	SCHWARZBECK	BBV 9721	MRTTWA00006	1 year	2019/4/23
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2019/3/19
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2019/7/30
Antenna Cable	HUBERSUHNER	SF106	MRTTWE00010	1 year	2019/5/18
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00032	1 year	2019/5/21

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2019/7/30
EXA Signal Analyzer	KEYSIGHT	N9010B	MRTSUE06457	1 year	2019/7/19
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00014	1 year	2019/4/24
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00032	1 year	2019/5/21

Software	**Version**	**Function**
e3	9.160520a	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: 2.53dB
Radiated Emission Measurement - AC1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: 4.25dB 1GHz ~ 25GHz: 4.45dB
Spurious Emissions, Conducted - SR1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 2.65dB
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: **AX11000 MU-MIMO Tri-Band Gaming Router**

FCC ID: **TE7AX11000**

FCC Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	6dB Bandwidth	≥ 500kHz	Conducted	Pass	Section 7.2
15.247(b)(3)	Output Power	≤ 30dBm		Pass	Section 7.3
15.247(e)	Power Spectral Density	≤ 8dBm/3kHz		Pass	Section 7.4
15.247(d)	Band Edge / Out-of-Band Emissions	≥ 30dBc(Average)		Pass	Section 7.5
15.205 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 7.6 & 7.7
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) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.
3) Test Items “6dB Bandwidth” & “Band Edge / Out-of-Band Emissions” have been assessed MIMO transmission, and showed the worst test data in this report.

7.2. 6dB Bandwidth Measurement

7.2.1.Test Limit

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

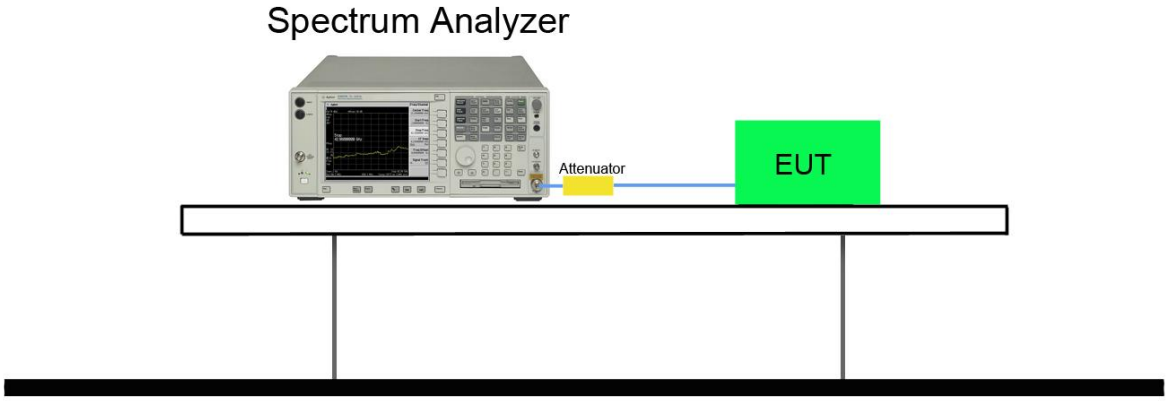
7.2.2.Test Procedure used

ANSI C63.10 Section 11.8

7.2.3.Test Setting

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

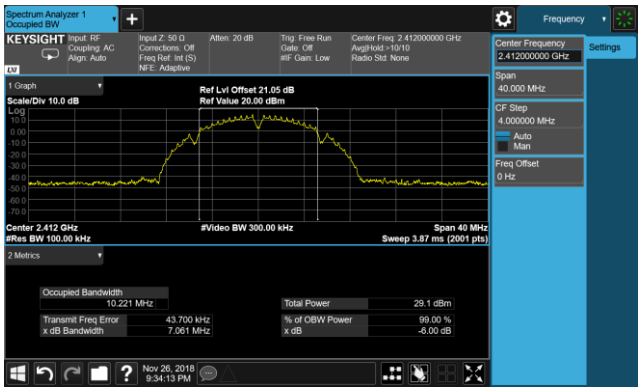
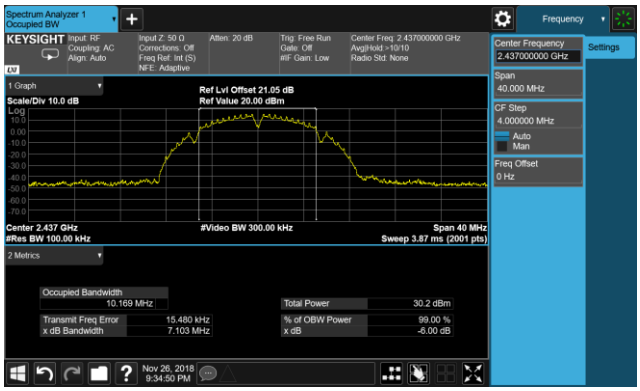
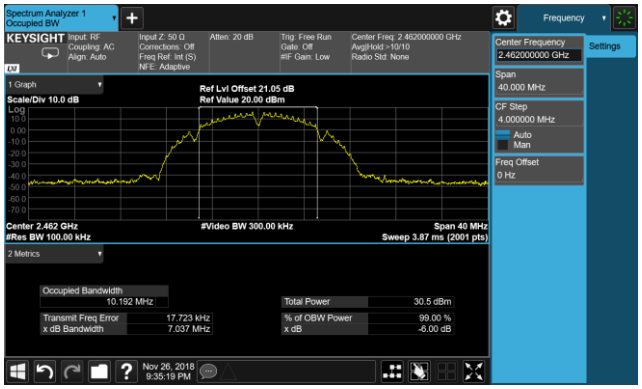
7.2.4.Test Setup

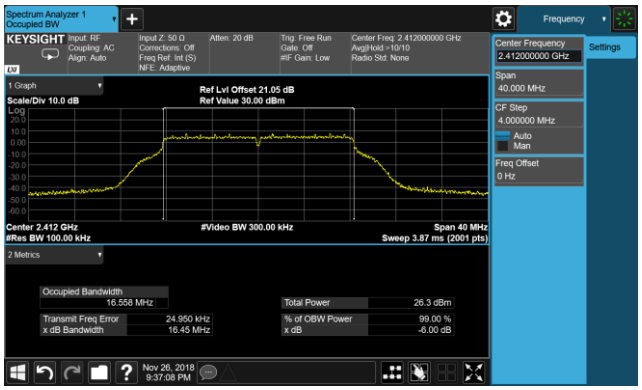
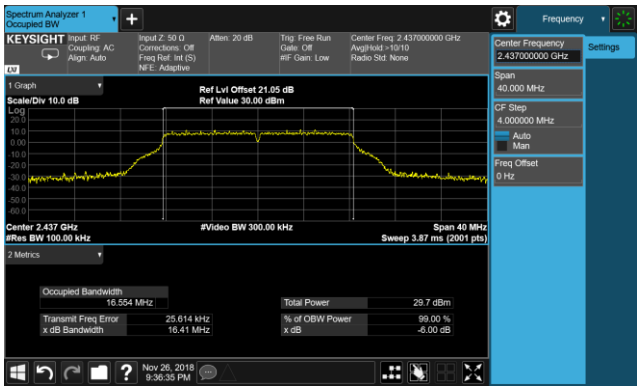


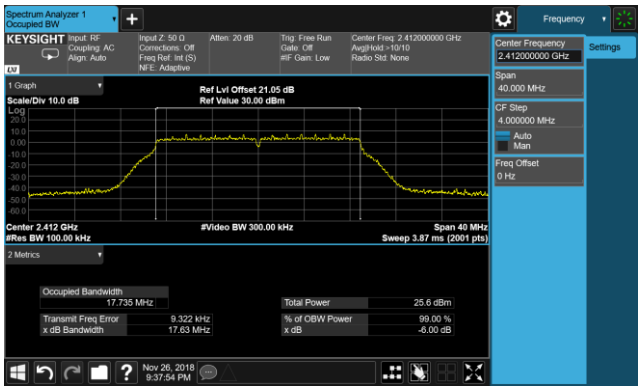
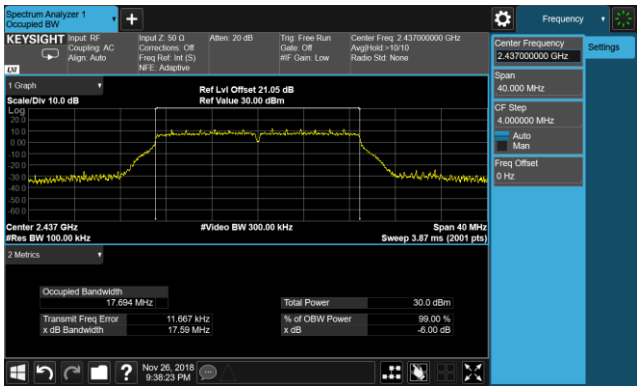
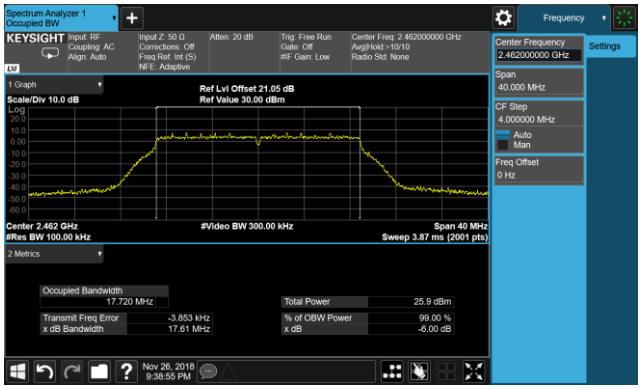
7.2.5.Test Result

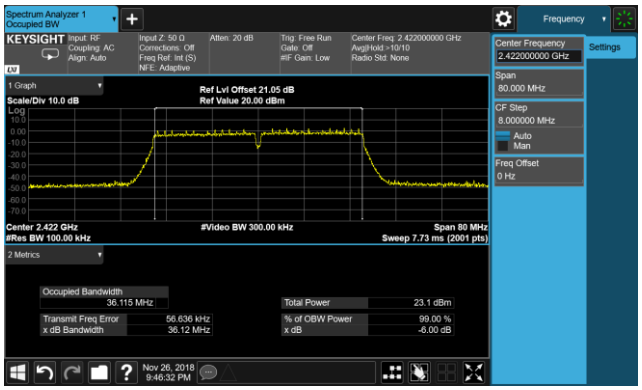
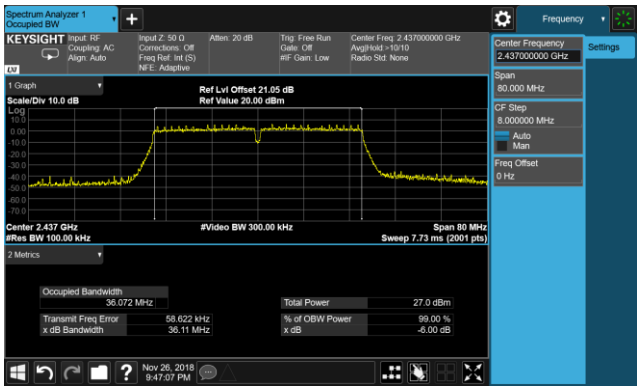
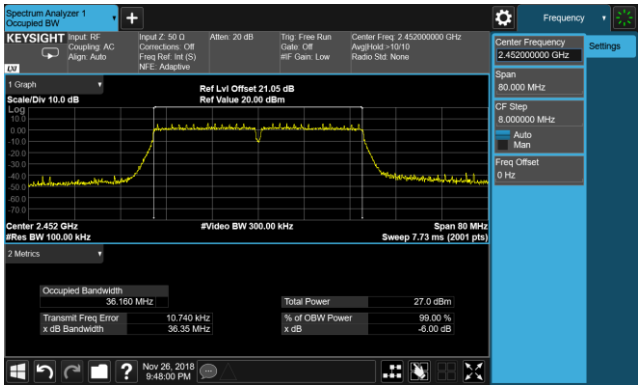
Product	AX11000 MU-MIMO Tri-Band Gaming Router	Temperature	25°C
Test Engineer	Kevin Ker	Relative Humidity	54%
Test Site	SR1	Test Date	2018/11/26
Test Item	6dB Bandwidth		

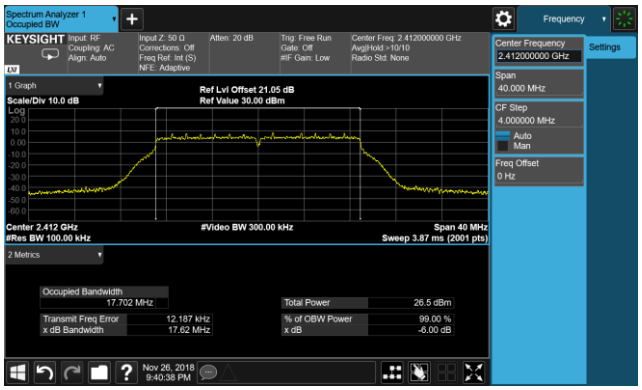
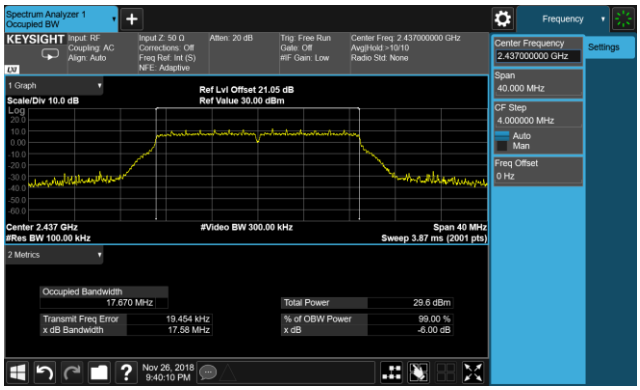
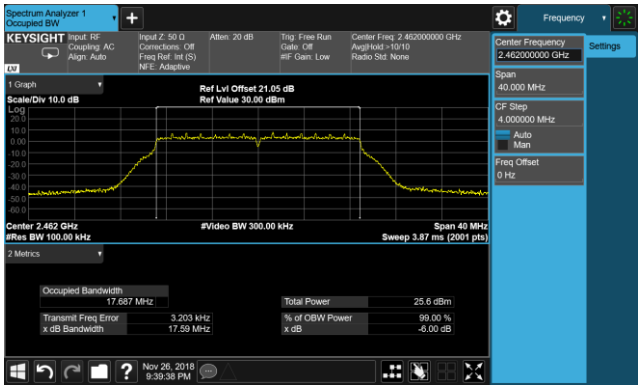
Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
CDD Mode: Ant 0 / Ant 0 + 1 +2 + 3						
802.11b	1Mbps	01	2412	7.06	≥ 0.5	Pass
802.11b	1Mbps	06	2437	7.10	≥ 0.5	Pass
802.11b	1Mbps	11	2462	7.04	≥ 0.5	Pass
802.11g	6Mbps	01	2412	16.45	≥ 0.5	Pass
802.11g	6Mbps	06	2437	16.41	≥ 0.5	Pass
802.11g	6Mbps	11	2462	16.41	≥ 0.5	Pass
802.11n-HT20	MCS0	01	2412	17.63	≥ 0.5	Pass
802.11n-HT20	MCS0	06	2437	17.59	≥ 0.5	Pass
802.11n-HT20	MCS0	11	2462	17.61	≥ 0.5	Pass
802.11n-HT40	MCS0	03	2422	36.12	≥ 0.5	Pass
802.11n-HT40	MCS0	06	2437	36.11	≥ 0.5	Pass
802.11n-HT40	MCS0	09	2452	36.35	≥ 0.5	Pass
802.11ac-VHT20	MCS0	01	2412	17,62	≥ 0.5	Pass
802.11ac-VHT20	MCS0	06	2437	17.58	≥ 0.5	Pass
802.11ac-VHT20	MCS0	11	2462	17.59	≥ 0.5	Pass
802.11ac-VHT40	MCS0	03	2422	35.97	≥ 0.5	Pass
802.11ac-VHT40	MCS0	06	2437	36.37	≥ 0.5	Pass
802.11ac-VHT40	MCS0	09	2452	36.35	≥ 0.5	Pass
802.11ax-HE20	MCS0	01	2412	18.96	≥ 0.5	Pass
802.11ax-HE20	MCS0	06	2437	18.74	≥ 0.5	Pass
802.11ax-HE20	MCS0	11	2462	18.99	≥ 0.5	Pass
802.11ax-HE40	MCS0	03	2422	37.63	≥ 0.5	Pass
802.11ax-HE40	MCS0	06	2437	37.23	≥ 0.5	Pass
802.11ax-HE40	MCS0	09	2452	37.54	≥ 0.5	Pass

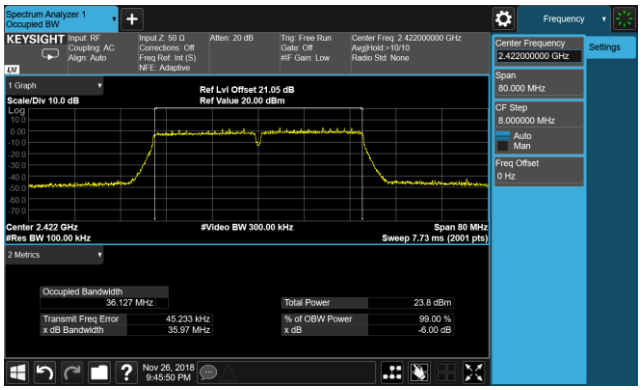
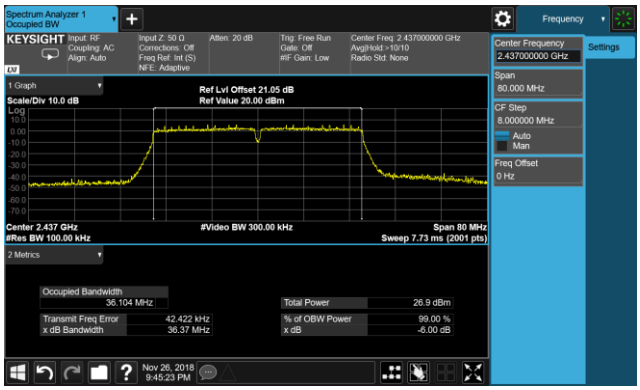
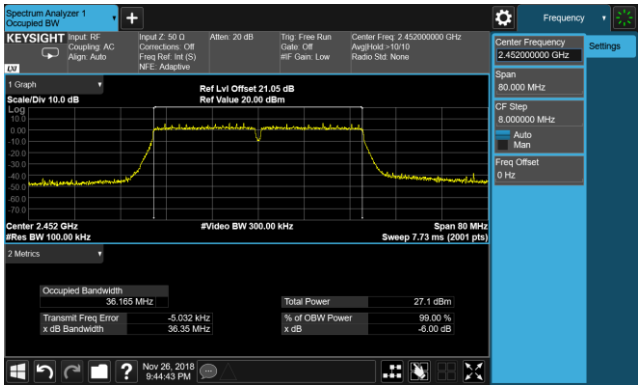
802.11b 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

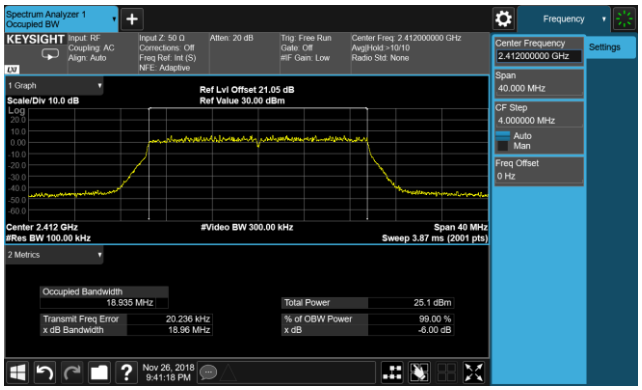
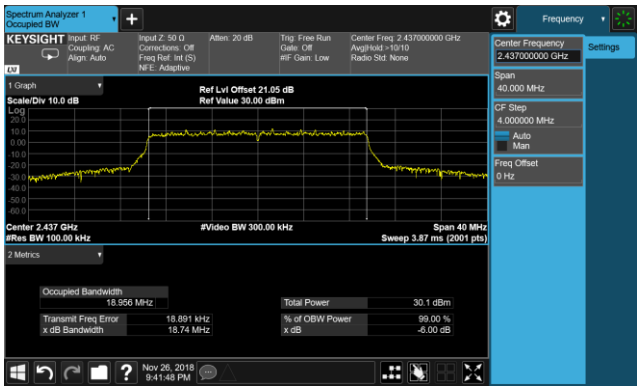
802.11g 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

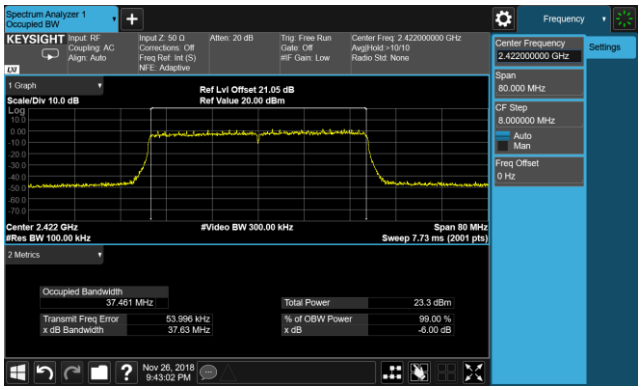
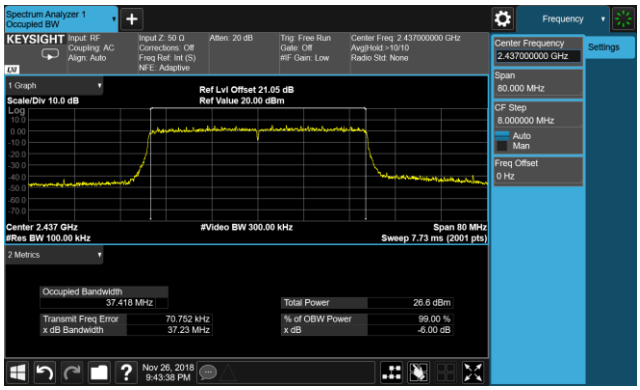
802.11n-HT20 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11n-HT40 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 03 (2422MHz)	Channel 06 (2437MHz)
	
Channel 09 (2452MHz)	
	

802.11ac-VHT20 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11ac-VHT40 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 03 (2422MHz)	Channel 06 (2437MHz)
	
Channel 09 (2452MHz)	
	

802.11ax-HE20 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11ax-HE40 6dB Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3	
Channel 03 (2422MHz)	Channel 06 (2437MHz)
	
Channel 09 (2452MHz)	
	

7.3. Output Power Measurement

7.3.1.Test Limit

The maximum output power shall be less 1 Watt (30dBm).

The conducted output power limit specified in paragraph FCC Part 15.247(b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs FCC Part 15.247(b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.3.2.Test Procedure Used

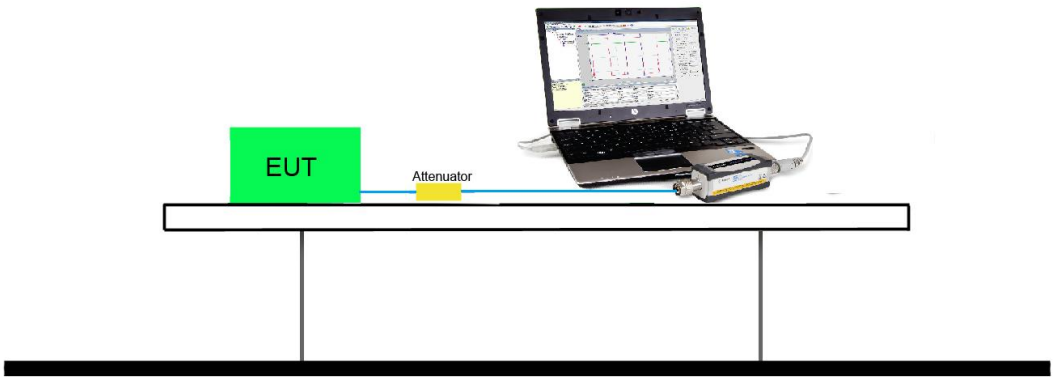
ANSI C63.10 Section 11.9.2.3

7.3.3.Test Setting

Average Power Measurement

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.

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, and then choose the maximum power output (gray marker) for final test of each channel.

For Ant 0 / Ant 0 + 1 +2 + 3 port

Test Mode	Bandwidth (MHz)	Channel No.	Frequency (MHz)	Data Rate/ MCS	Average Power (dBm)
802.11b	20	6	2437	1Mbps	24.35
				5.5Mbps	24.12
				11Mbps	23.88
802.11g	20	6	2437	6Mbps	24.18
				24Mbps	24.01
				54Mbps	23.89
802.11n	20	6	2437	MCS0	24.04
				MCS3	23.79
				MCS7	23.60
802.11n	40	6	2437	MCS0	21.26
				MCS3	20.95
				MCS7	20.68
802.11ac	20	6	2437	MCS0	23.98
				MCS4	23.69
				MCS8	23.45
802.11ac	40	6	2437	MCS0	21.33
				MCS5	21.13
				MCS9	20.90
802.11ax	20	6	2437	MCS0	24.07
				MCS5	23.89
				MCS11	23.66
802.11ax	40	6	2437	MCS0	20.47
				MCS5	20.24
				MCS11	20.10

Product	AX11000 MU-MIMO Tri-Band Gaming Router	Temperature	25°C
Test Engineer	Kevin Ker	Relative Humidity	54%
Test Site	SR1	Test Date	2018/11/24
Test Item	Output Power		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Limit (dBm)	Result
CDD Mode										
802.11b	1Mbps	01	2412	23.18	22.56	22.01	23.01	28.73	≤ 30.00	Pass
802.11b	1Mbps	02	2417	24.11	23.06	23.55	24.23	29.78	≤ 30.00	Pass
802.11b	1Mbps	03	2422	24.02	23.31	23.51	24.17	29.79	≤ 30.00	Pass
802.11b	1Mbps	06	2437	24.35	23.26	23.02	24.03	29.72	≤ 30.00	Pass
802.11b	1Mbps	09	2447	24.10	23.10	23.38	24.53	29.84	≤ 30.00	Pass
802.11b	1Mbps	10	2452	24.08	23.19	23.46	24.41	29.83	≤ 30.00	Pass
802.11b	1Mbps	11	2462	24.53	23.38	23.20	24.08	29.85	≤ 30.00	Pass
802.11g	6Mbps	01	2412	20.45	19.80	19.65	20.56	26.15	≤ 30.00	Pass
802.11g	6Mbps	02	2417	23.91	22.91	23.37	23.88	29.56	≤ 30.00	Pass
802.11g	6Mbps	03	2422	24.18	23.39	23.57	24.16	29.86	≤ 30.00	Pass
802.11g	6Mbps	06	2437	24.18	23.57	23.16	24.02	29.77	≤ 30.00	Pass
802.11g	6Mbps	09	2452	24.12	23.19	23.45	24.19	29.78	≤ 30.00	Pass
802.11g	6Mbps	10	2457	23.49	22.56	22.75	23.76	29.19	≤ 30.00	Pass
802.11g	6Mbps	11	2462	20.46	19.70	19.51	20.28	26.03	≤ 30.00	Pass
802.11n-HT20	MCS0	01	2412	19.80	19.24	19.02	19.75	25.49	≤ 30.00	Pass
802.11n-HT20	MCS0	02	2417	23.90	23.17	23.51	23.88	29.65	≤ 30.00	Pass
802.11n-HT20	MCS0	03	2422	24.01	23.16	23.37	23.98	29.67	≤ 30.00	Pass
802.11n-HT20	MCS0	06	2437	24.04	23.38	22.94	24.03	29.64	≤ 30.00	Pass
802.11n-HT20	MCS0	09	2452	23.83	22.83	23.33	24.00	29.54	≤ 30.00	Pass
802.11n-HT20	MCS0	10	2457	23.12	22.45	22.53	23.53	28.95	≤ 30.00	Pass
802.11n-HT20	MCS0	11	2462	20.42	19.58	19.29	20.25	25.93	≤ 30.00	Pass
802.11n-HT40	MCS0	03	2422	17.50	16.97	16.57	17.22	23.10	≤ 30.00	Pass
802.11n-HT40	MCS0	04	2427	19.19	18.39	18.99	19.67	25.10	≤ 30.00	Pass
802.11n-HT40	MCS0	06	2437	21.26	20.35	20.16	21.07	26.76	≤ 30.00	Pass
802.11n-HT40	MCS0	08	2447	18.15	17.62	18.32	18.88	24.29	≤ 30.00	Pass
802.11n-HT40	MCS0	09	2452	18.63	17.72	17.36	18.15	24.01	≤ 30.00	Pass

802.11ac-VHT20	MCS0	01	2412	20.76	20.06	19.82	20.67	26.37	≤ 30.00	Pass
802.11ac-VHT20	MCS0	02	2417	23.21	22.37	22.68	23.38	28.95	≤ 30.00	Pass
802.11ac-VHT20	MCS0	03	2422	23.57	22.86	23.04	23.79	29.35	≤ 30.00	Pass
802.11ac-VHT20	MCS0	06	2437	23.98	23.02	22.69	23.57	29.36	≤ 30.00	Pass
802.11ac-VHT20	MCS0	09	2452	23.56	22.74	23.12	23.88	29.37	≤ 30.00	Pass
802.11ac-VHT20	MCS0	10	2457	22.54	21.78	21.90	22.91	28.33	≤ 30.00	Pass
802.11ac-VHT20	MCS0	11	2462	19.72	19.02	18.56	19.43	25.22	≤ 30.00	Pass
802.11ac-VHT40	MCS0	03	2422	16.86	16.26	16.12	16.85	22.56	≤ 30.00	Pass
802.11ac-VHT40	MCS0	04	2427	18.74	17.86	18.52	19.21	24.63	≤ 30.00	Pass
802.11ac-VHT40	MCS0	06	2437	21.33	20.47	20.20	21.25	26.86	≤ 30.00	Pass
802.11ac-VHT40	MCS0	08	2447	18.65	17.88	18.57	19.31	24.65	≤ 30.00	Pass
802.11ac-VHT40	MCS0	09	2452	18.17	17.47	17.14	17.89	23.71	≤ 30.00	Pass
802.11ax-HE20	MCS0	01	2412	18.73	17.97	17.69	18.68	24.31	≤ 30.00	Pass
802.11ax-HE20	MCS0	02	2417	22.61	21.73	22.11	22.85	28.37	≤ 30.00	Pass
802.11ax-HE20	MCS0	03	2422	23.78	23.03	23.40	24.03	29.60	≤ 30.00	Pass
802.11ax-HE20	MCS0	06	2437	24.07	23.29	22.87	23.84	29.56	≤ 30.00	Pass
802.11ax-HE20	MCS0	09	2452	23.55	22.75	22.97	23.93	29.35	≤ 30.00	Pass
802.11ax-HE20	MCS0	10	2457	22.29	21.43	21.74	22.61	28.06	≤ 30.00	Pass
802.11ax-HE20	MCS0	11	2462	19.11	17.95	17.91	18.67	24.46	≤ 30.00	Pass
802.11ax-HE40	MCS0	03	2422	17.14	16.62	16.50	17.13	22.88	≤ 30.00	Pass
802.11ax-HE40	MCS0	04	2427	18.65	18.22	18.01	18.52	24.38	≤ 30.00	Pass
802.11ax-HE40	MCS0	06	2437	20.47	19.74	19.42	20.13	25.98	≤ 30.00	Pass
802.11ax-HE40	MCS0	08	2447	18.52	17.44	17.38	17.94	23.87	≤ 30.00	Pass
802.11ax-HE40	MCS0	09	2452	18.07	17.26	16.77	17.68	23.49	≤ 30.00	Pass

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Limit (dBm)	Result
Beam-Forming Mode										
802.11ac-VHT20	MCS0	01	2412	19.77	19.43	19.05	19.65	25.50	≤ 28.18	Pass
802.11ac-VHT20	MCS0	02	2417	22.20	21.56	21.29	22.24	27.86	≤ 28.18	Pass
802.11ac-VHT20	MCS0	06	2437	22.34	21.65	21.31	22.13	27.90	≤ 28.18	Pass
802.11ac-VHT20	MCS0	10	2457	22.39	21.48	21.19	22.06	27.83	≤ 28.18	Pass
802.11ac-VHT20	MCS0	11	2462	21.69	20.47	20.28	21.10	26.94	≤ 28.18	Pass
802.11ac-VHT40	MCS0	03	2422	18.01	17.75	17.13	17.88	23.73	≤ 28.18	Pass
802.11ac-VHT40	MCS0	04	2427	19.05	18.44	18.20	18.42	24.56	≤ 28.18	Pass
802.11ac-VHT40	MCS0	06	2437	20.78	19.88	19.77	20.40	26.25	≤ 28.18	Pass
802.11ac-VHT40	MCS0	08	2447	18.05	17.29	16.77	17.32	23.40	≤ 28.18	Pass
802.11ac-VHT40	MCS0	09	2452	17.73	16.95	16.68	17.02	23.13	≤ 28.18	Pass
802.11ax-HE20	MCS0	01	2412	19.43	18.91	18.42	19.16	25.02	≤ 28.18	Pass
802.11ax-HE20	MCS0	02	2417	22.34	21.73	21.24	21.88	27.84	≤ 28.18	Pass
802.11ax-HE20	MCS0	03	2422	22.55	21.91	21.52	22.29	28.11	≤ 28.18	Pass
802.11ax-HE20	MCS0	06	2437	22.34	21.57	21.37	22.03	27.86	≤ 28.18	Pass
802.11ax-HE20	MCS0	09	2452	22.45	21.64	21.14	21.88	27.82	≤ 28.18	Pass
802.11ax-HE20	MCS0	10	2457	22.1	20.91	20.62	21.41	27.32	≤ 28.18	Pass
802.11ax-HE20	MCS0	11	2462	19.77	19.09	18.73	19.29	25.26	≤ 28.18	Pass
802.11ax-HE40	MCS0	03	2422	18.31	17.72	17.34	17.99	23.88	≤ 28.18	Pass
802.11ax-HE40	MCS0	04	2427	19.03	18.40	18.02	18.76	24.59	≤ 28.18	Pass
802.11ax-HE40	MCS0	06	2437	20.61	19.83	19.51	20.16	26.07	≤ 28.18	Pass
802.11ax-HE40	MCS0	08	2447	18.09	17.48	17.23	17.82	23.69	≤ 28.18	Pass
802.11ax-HE40	MCS0	09	2452	17.64	17.09	16.43	17.32	23.16	≤ 28.18	Pass

Note 1: Total Average Power (dBm) = $10*\log \{10^{(\text{Ant 0 Average Power }/10)} + 10^{(\text{Ant 1 Average Power }/10)} + 10^{(\text{Ant 2 Average Power }/10)} + 10^{(\text{Ant 3 Average Power }/10)}\}$ (dBm).

Note 2: For CDD Mode, Average Power Limit (dBm) = 30dBm

For Beam-Forming Mode, Average Power Limit (dBm) = 30 dBm - (7.82 dBi - 6 dBi) = 28.18dBm.

7.4. Power Spectral Density Measurement

7.4.1.Test Limit

The maximum permissible power spectral density is 8dBm in any 3 kHz band.

The same method of determining the conducted output power shall be used to determine the power spectral density.

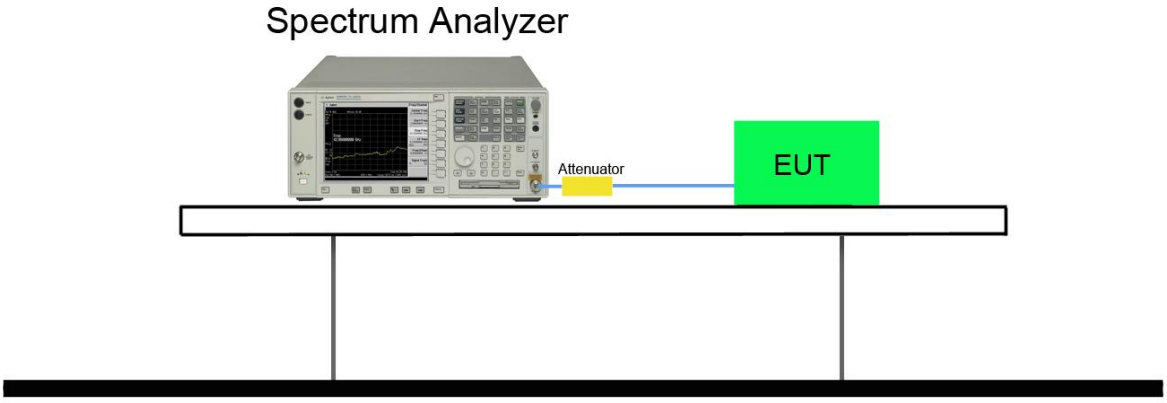
7.4.2.Test Procedure Used

ANSI C63.10 Section 11.10.5

7.4.3.Test Setting

1. Measure the duty cycle (x) of the transmitter output signal.
2. Set instrument center frequency to DTS channel center frequency.
3. Set span to at least 1.5 times the OBW.
4. RBW = 10 kHz.
5. VBW = 30 kHz.
6. Detector = RMS.
7. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
8. Sweep time = auto couple.
9. Don’t use sweep triggering. Allow sweep to “free run”.
10. Employ trace averaging (RMS) mode over a minimum of 100 traces.
11. Use the peak marker function to determine the maximum amplitude level.
12. Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.
13. Add Constant Factor = 10*log(3kHz / 10kHz) = -5.23.

7.4.4.Test Setup



7.4.5.Test Result

Product	AX11000 MU-MIMO Tri-Band Gaming Router	Temperature	25°C
Test Engineer	Kevin Ker	Relative Humidity	54%
Test Site	SR1	Test Date	2018/11/29
Test Item	Power Spectral Density		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ 10kHz)	Ant 1 PSD (dBm/ 10kHz)	Ant 2 PSD (dBm/ 10kHz)	Ant 3 PSD (dBm/ 10kHz)	Duty Cycle (%)	Constant Factor (dBm)	Total PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Result
CDD Mode												
802.11b	1Mbps	01	2412	-2.08	-2.70	-3.33	-2.73	94.87	-5.23	-1.90	≤ 6.18	Pass
802.11b	1Mbps	06	2437	-1.48	-2.23	-2.24	-1.50	94.87	-5.23	-1.06	≤ 6.18	Pass
802.11b	1Mbps	11	2462	-0.78	-1.84	-1.69	-1.21	94.87	-5.23	-0.57	≤ 6.18	Pass
802.11g	6Mbps	01	2412	-8.46	-8.57	-9.30	-8.27	97.53	-5.23	-7.84	≤ 6.18	Pass
802.11g	6Mbps	06	2437	-4.07	-5.35	-5.61	-4.82	97.53	-5.23	-4.13	≤ 6.18	Pass
802.11g	6Mbps	11	2462	-8.23	-8.88	-8.70	-8.63	97.53	-5.23	-7.81	≤ 6.18	Pass
802.11n-HT20	MCS0	01	2412	-8.01	-8.76	-8.87	-8.56	97.64	-5.23	-7.74	≤ 6.18	Pass
802.11n-HT20	MCS0	06	2437	-4.41	-4.67	-5.02	-4.54	97.64	-5.23	-3.86	≤ 6.18	Pass
802.11n-HT20	MCS0	11	2462	-7.77	-8.42	-8.92	-8.14	97.64	-5.23	-7.50	≤ 6.18	Pass
802.11n-HT40	MCS0	03	2422	-12.60	-13.47	-13.05	-12.91	88.76	-5.23	-12.20	≤ 6.18	Pass
802.11n-HT40	MCS0	06	2437	-9.00	-10.21	-10.06	-8.78	88.76	-5.23	-8.67	≤ 6.18	Pass
802.11n-HT40	MCS0	09	2452	-11.79	-12.32	-13.47	-12.26	88.76	-5.23	-11.63	≤ 6.18	Pass
802.11ac-VHT20	MCS0	01	2412	-7.93	-8.04	-8.30	-7.88	97.45	-5.23	-7.24	≤ 6.18	Pass
802.11ac-VHT20	MCS0	06	2437	-3.84	-4.88	-5.38	-4.04	97.45	-5.23	-3.70	≤ 6.18	Pass
802.11ac-VHT20	MCS0	11	2462	-8.42	-9.41	-9.44	-9.08	97.45	-5.23	-8.28	≤ 6.18	Pass
802.11ac-VHT40	MCS0	03	2422	-13.69	-14.47	-15.17	-14.81	98.01	-5.23	-13.71	≤ 6.18	Pass
802.11ac-VHT40	MCS0	06	2437	-9.72	-11.19	-11.33	-10.20	98.01	-5.23	-9.77	≤ 6.18	Pass
802.11ac-VHT40	MCS0	09	2452	-13.06	-13.91	-14.31	-13.61	98.01	-5.23	-12.91	≤ 6.18	Pass
802.11ax-HE20	MCS0	01	2412	-11.33	-11.73	-12.08	-11.32	97.37	-5.23	-10.81	≤ 6.18	Pass
802.11ax-HE20	MCS0	06	2437	-5.91	-6.76	-7.24	-6.00	97.37	-5.23	-5.65	≤ 6.18	Pass
802.11ax-HE20	MCS0	11	2462	-11.14	-11.96	-11.58	-11.21	97.37	-5.23	-10.67	≤ 6.18	Pass
802.11ax-HE40	MCS0	03	2422	-15.00	-14.92	-15.43	-15.43	97.82	-5.23	-14.40	≤ 6.18	Pass
802.11ax-HE40	MCS0	06	2437	-11.83	-12.73	-12.55	-11.87	97.82	-5.23	-11.43	≤ 6.18	Pass
802.11ax-HE40	MCS0	09	2452	-14.24	-14.97	-15.05	-14.90	97.82	-5.23	-13.99	≤ 6.18	Pass

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ 10kHz)	Ant 1 PSD (dBm/ 10kHz)	Ant 2 PSD (dBm/ 10kHz)	Ant 3 PSD (dBm/ 10kHz)	Duty Cycle (%)	Constant Factor (dBm)	Total PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Result
Beam-Forming Mode												
802.11ac-VHT20	MCS0	01	2412	-8.61	-8.83	-8.52	-8.27	97.45	-5.23	-7.76	≤ 6.18	Pass
802.11ac-VHT20	MCS0	06	2437	-5.68	-6.45	-6.87	-5.38	97.45	-5.23	-5.26	≤ 6.18	Pass
802.11ac-VHT20	MCS0	11	2462	-6.91	-7.44	-8.19	-6.85	97.45	-5.23	-6.52	≤ 6.18	Pass
802.11ac-VHT40	MCS0	03	2422	-11.90	-12.49	-12.97	-12.50	98.01	-5.23	-11.65	≤ 6.18	Pass
802.11ac-VHT40	MCS0	06	2437	-9.59	-10.12	-10.15	-9.22	98.01	-5.23	-8.96	≤ 6.18	Pass
802.11ac-VHT40	MCS0	09	2452	-12.50	-13.40	-13.75	-13.31	98.01	-5.23	-12.42	≤ 6.18	Pass
802.11ax-HE20	MCS0	01	2412	-9.87	-10.56	-10.38	-9.84	97.37	-5.23	-9.36	≤ 6.18	Pass
802.11ax-HE20	MCS0	06	2437	-6.52	-7.57	-7.17	-6.59	97.37	-5.23	-6.15	≤ 6.18	Pass
802.11ax-HE20	MCS0	11	2462	-8.72	-10.31	-9.47	-9.63	97.37	-5.23	-8.70	≤ 6.18	Pass
802.11ax-HE40	MCS0	03	2422	-13.04	-13.36	-13.59	-13.42	97.82	-5.23	-12.56	≤ 6.18	Pass
802.11ax-HE40	MCS0	06	2437	-10.61	-11.07	-11.29	-10.80	97.82	-5.23	-10.14	≤ 6.18	Pass
802.11ax-HE40	MCS0	09	2452	-13.45	-14.06	-14.70	-14.05	97.82	-5.23	-13.25	≤ 6.18	Pass

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

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

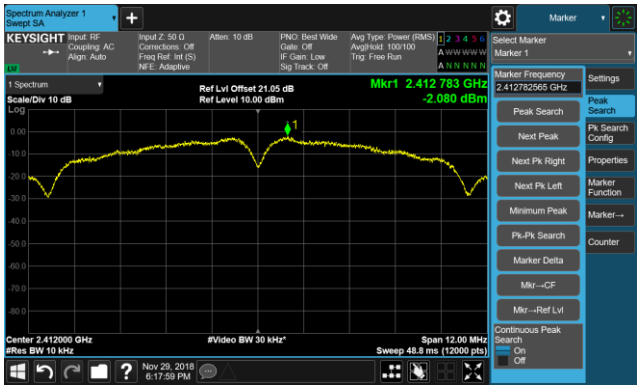
Note 3: For CDD Mode, PSD Limit = 8 dBm/3kHz - (7.82 dBi - 6.00 dBi) = 6.18 dBm/3kHz

For Beam-Forming Mode, PSD Limit = 8 dBm/3kHz - (7.82 dBi - 6.00 dBi) = 6.18 dBm/3kHz.

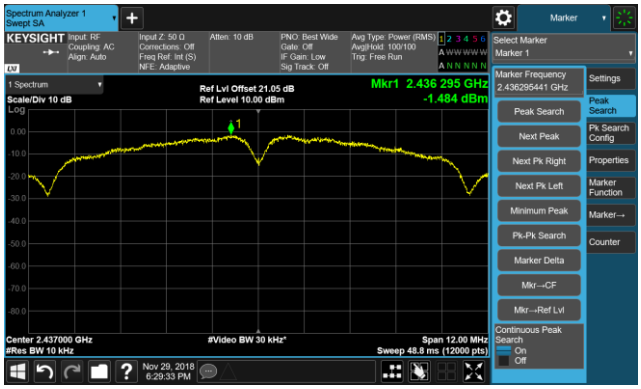
Product	AX11000 MU-MIMO Tri-Band Gaming Router	Temperature	25°C
Test Engineer	Kevin Ker	Relative Humidity	54%
Test Site	SR1	Test Date	2018/11/29
Test Mode	CDD Mode		

802.11b AVGPSD - Ant 0 / Ant 0 + 1 +2 + 3

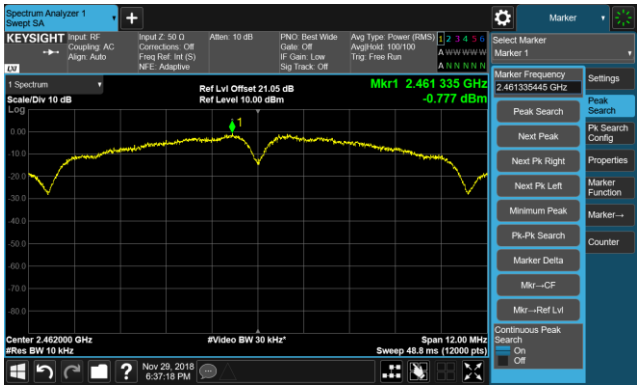
Channel 01 (2412MHz)

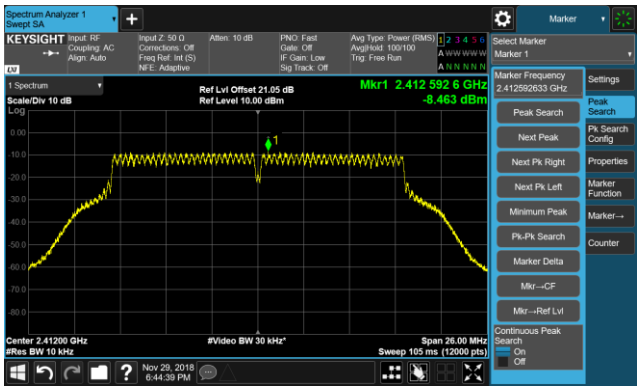
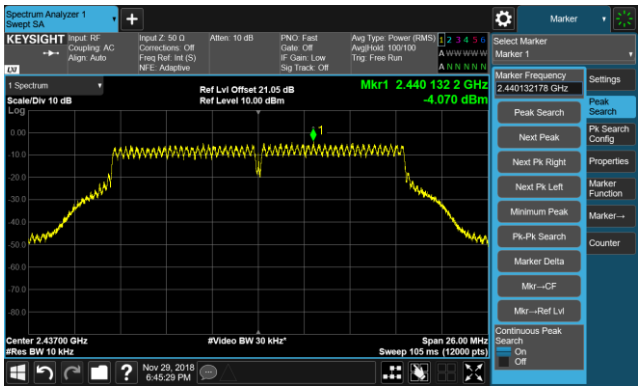
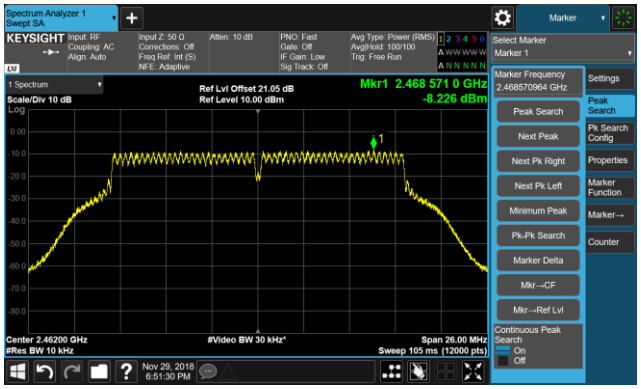


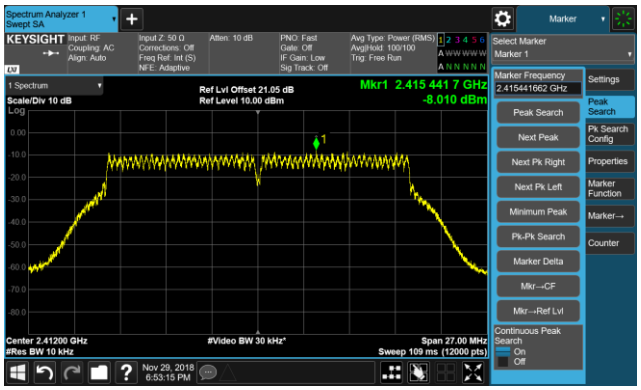
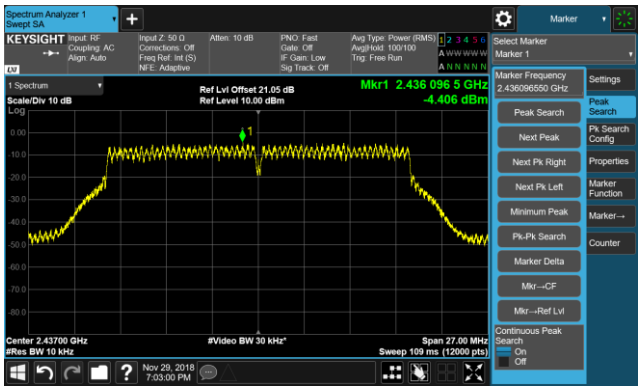
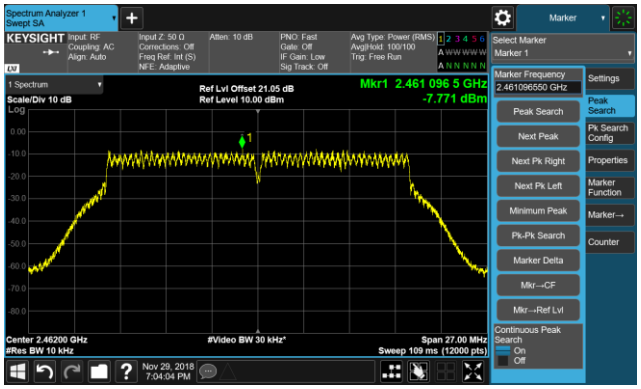
Channel 06 (2437MHz)

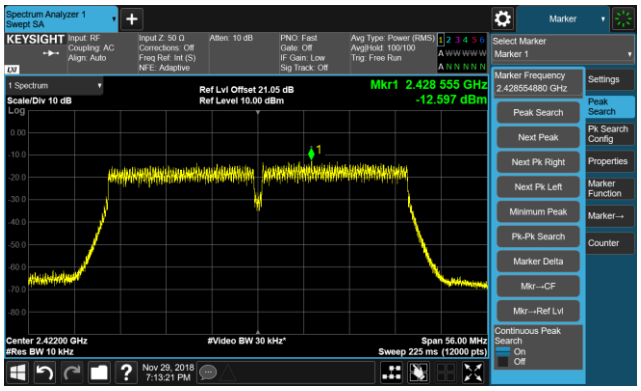
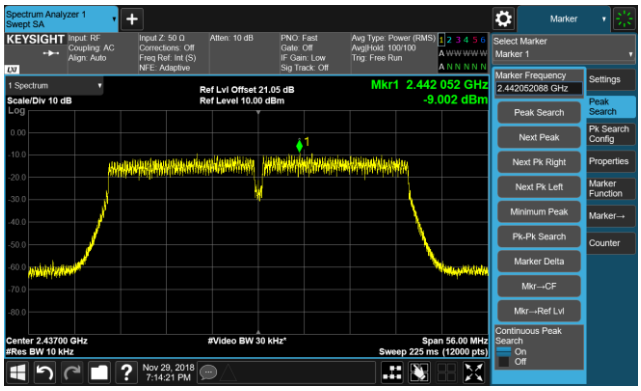
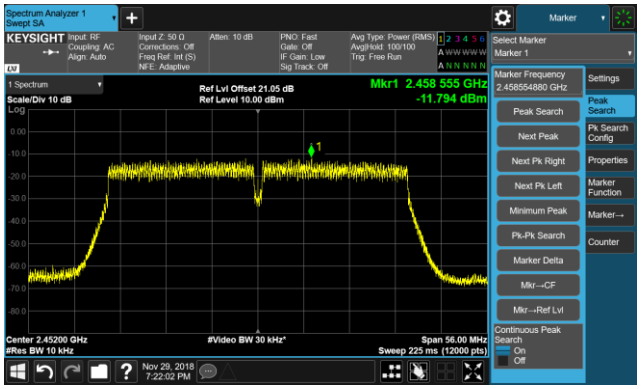


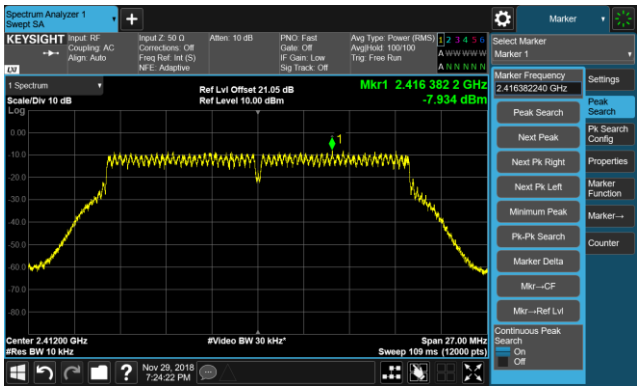
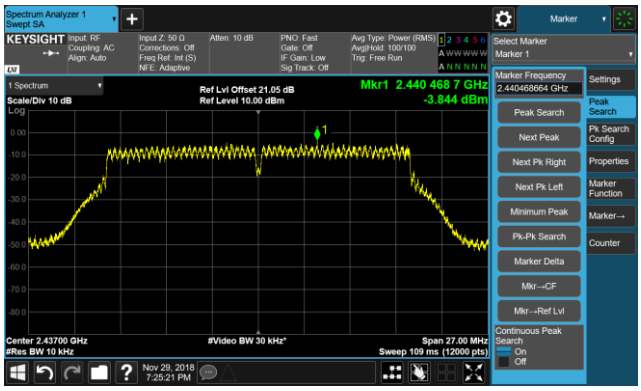
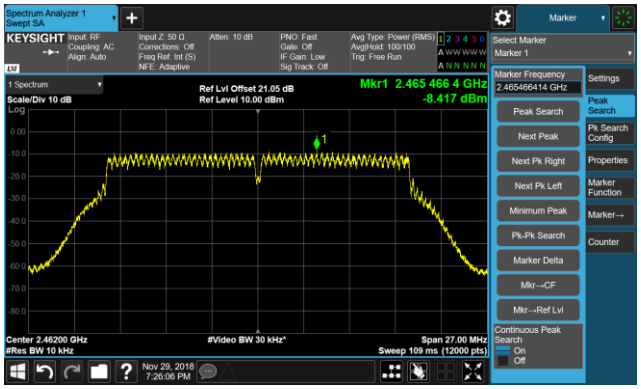
Channel 11 (2462MHz)

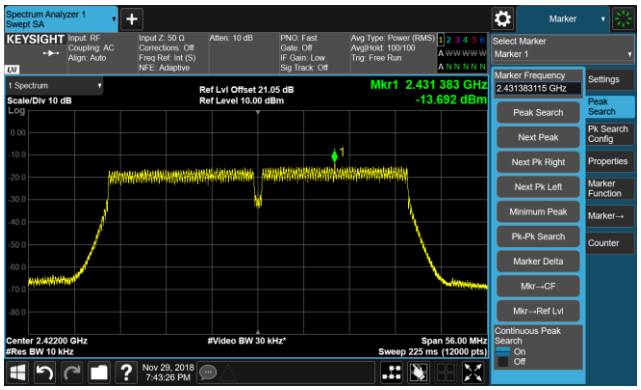
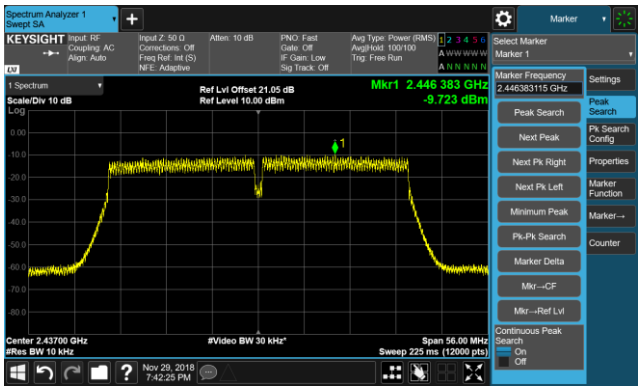
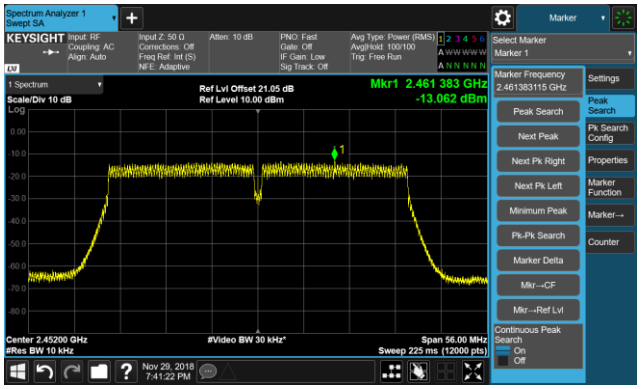


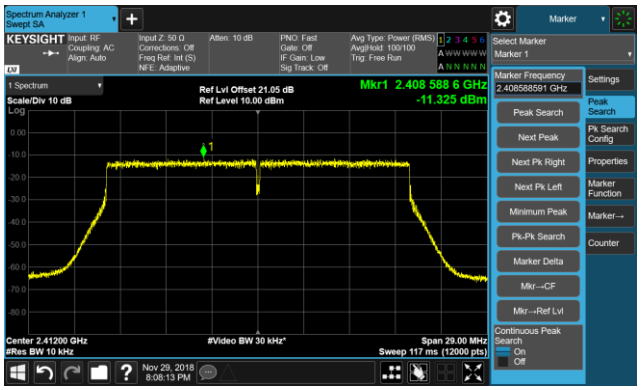
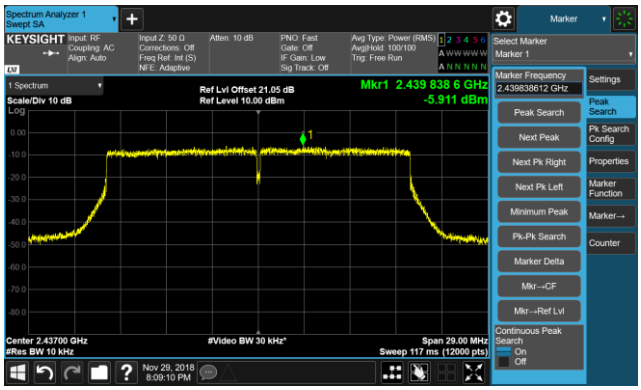
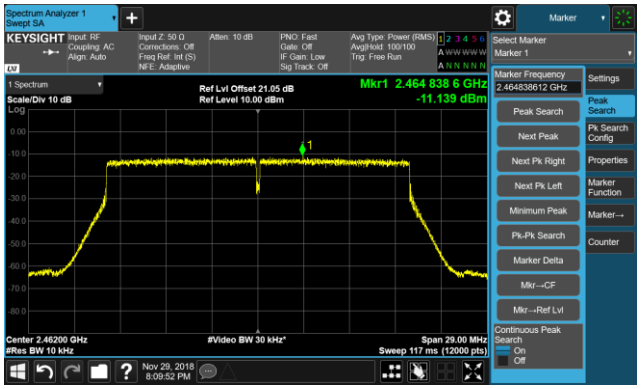
802.11g AVGPSD - Ant 0 / Ant 0 + 1 +2 + 3	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

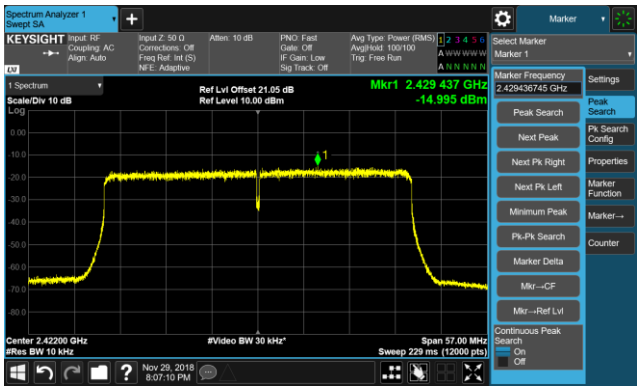
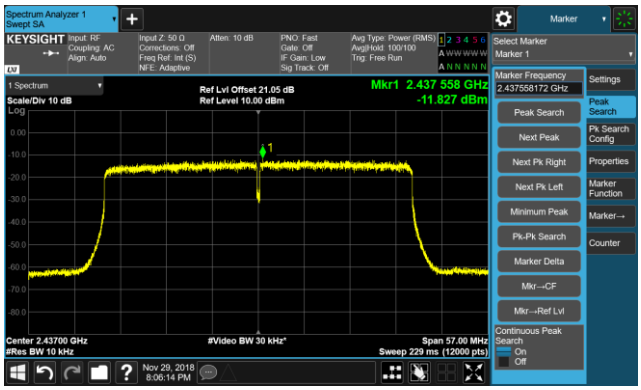
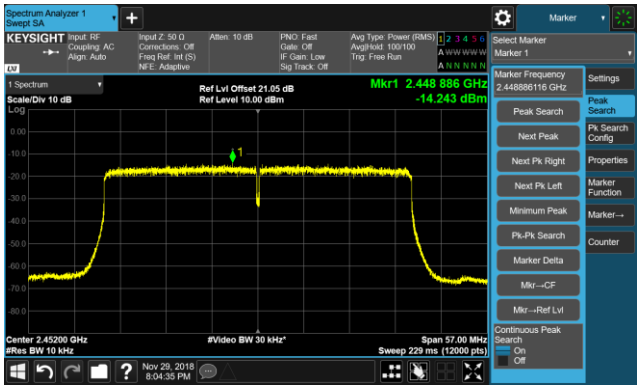
802.11n-HT20 AVGPSD - Ant 0 / Ant 0 + 1 +2 + 3	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

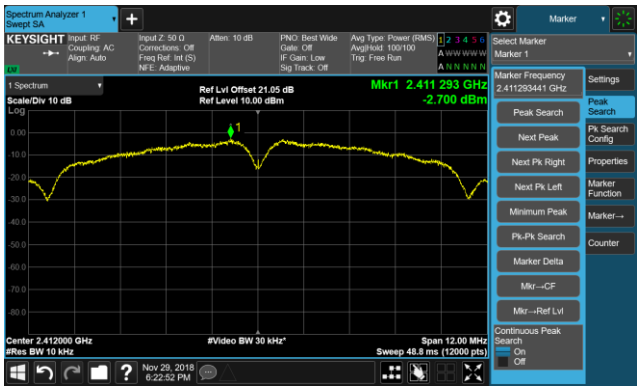
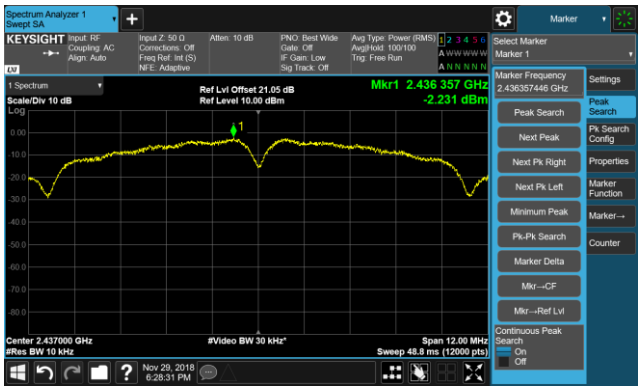
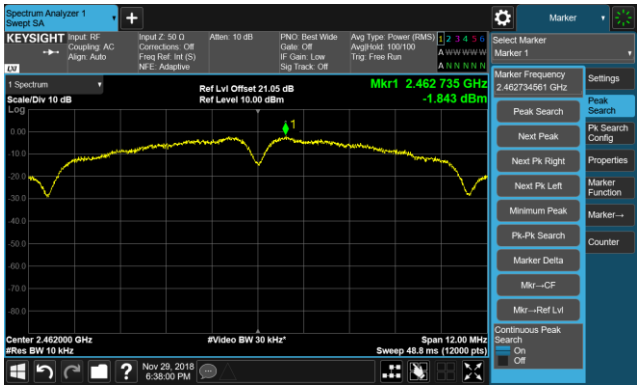
802.11n-HT40 AVGPSD - Ant 0 / Ant 0 + 1 +2 + 3	
Channel 03 (2422MHz)	Channel 06 (2437MHz)
	
Channel 09 (2452MHz)	
	

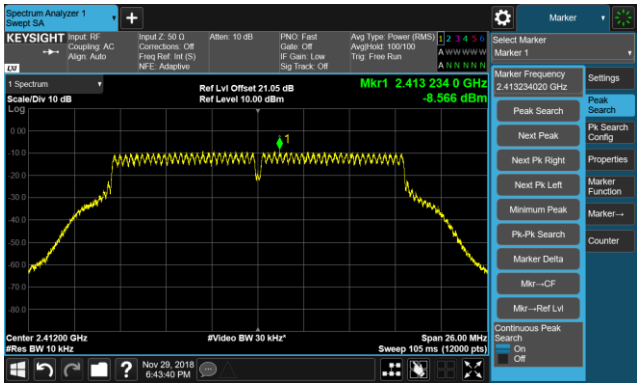
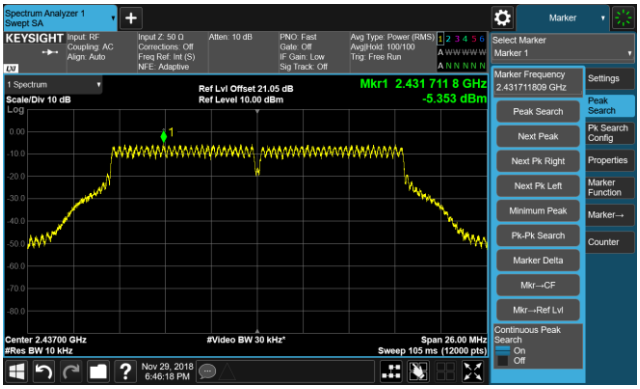
802.11ac-VHT20 AVGPSD - Ant 0 / Ant 0 + 1 +2 + 3	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11ac-VHT40 AVGPSD - Ant 0 / Ant 0 + 1 +2 + 3	
Channel 03 (2422MHz)	Channel 06 (2437MHz)
	
Channel 09 (2452MHz)	
	

802.11ax-HE20 AVGPSD - Ant 0 / Ant 0 + 1 +2 + 3	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11ax-HE40 AVGPSD - Ant 0 / Ant 0 + 1 +2 + 3	
Channel 03 (2422MHz)	Channel 06 (2437MHz)
	
Channel 09 (2452MHz)	
	

802.11b AVGPSD - Ant 1 / Ant 0 + 1 +2 + 3	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11g AVGPSD - Ant 1 / Ant 0 + 1 +2 + 3	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)