MEASUREMENT REPORT

FCC PART 15.247 WLAN 802.11b/g/n/ax

FCC ID:	2AI9TOAW-AP136X
APPLICANT:	ALE USA INC.
Application Type:	Certification
Product:	OmniAccess Stellar
Model No.:	OAW-AP1361, OAW-AP1361D, OAW-AP1362
Brand Name:	Alcatel·Lucent Enterprise
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part 15 Subpart C (Section 15.247)
Test Procedure(s):	ANSI C63.10-2013, KDB 558074 D01v05r02; KDB 662911 D01v02r01
Test Date:	November 05, 2019 ~ March 01, 2020

Reviewed By: (Sunny Sun)

Approved By: (Robin Wu)

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.
The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
1912RSU073-U2	Rev. 01	Initial Report	03-18-2020	Invalid
1912RSU073-U2	Rev. 02	Updated some description with TCB's comment	03-28-2020	Valid

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Appendix A - Test Setup Photograph 512

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General Information

Applicant:	ALE USA INC.
Applicant Address:	26801 WEST AGOURA ROAD, CALABASAS, CA 91301, USA
Manufacturer:	ALE USA INC.
Manufacturer Address:	26801 WEST AGOURA ROAD, CALABASAS, CA 91301, USA
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
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 accredited (MRT Designation No. CN1166) test facility with the site description report on file and has met all the requirements specified in ANSI C63.4-2014.**
- **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-20025, G-20034, C-20020, T-20020) 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, Radio and SAR testing.**

ilac-MRA A2LA

Accredited Laboratory

A2LA has accredited

MRT TECHNOLOGY (SUZHOU) CO., LTD.

Suzhou, Jiangsu, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

Presented this 24th day of July 2018.

President and CEO
For the Accreditation Council
Certificate Number 3628.01
Valid to August 31, 2020

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

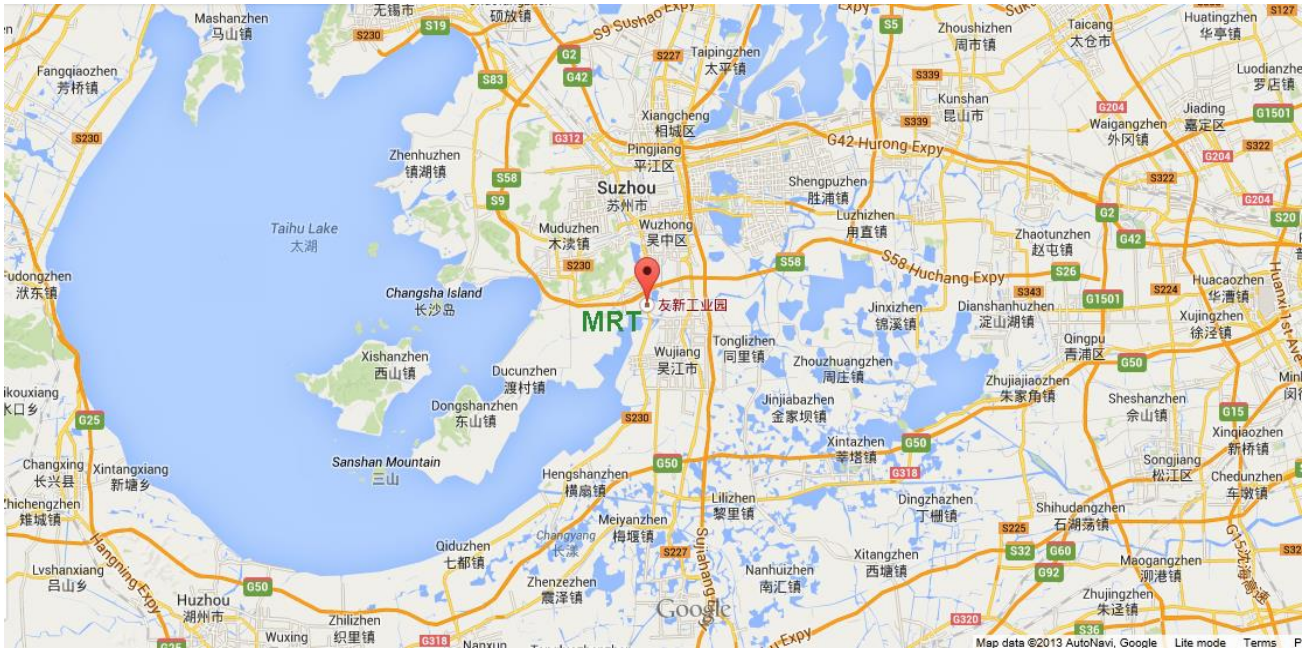
INTRODUCTION

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 Innovation, Science and Economic Development Canada.

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 measurement facility compliant with the test site requirements specified in ANSI C63.4-2014.



2. PRODUCT INFORMATION

2.1. Feature of Equipment under Test

Product Name:	OmniAccess Stellar
Model No.:	OAW-AP1361, OAW-AP1361D, OAW-AP1362
Brand Name:	Alcatel·Lucent Enterprise
Wi-Fi Specification:	802.11a/b/g/n/ac/ax
Bluetooth Specification:	V5.1
Operating Temperature:	-40 ~ 65 °C
Power Type:	PoE input
Operating Environment:	Outdoor Use
Accessories	
Adapter	Model No.: PD-9501GC/AC Input Power: 100 - 240V ~ 50/60Hz, 1.5A Output Power: 55VDC/1.1A

Note 1: The difference between models is that EUT use different antennas and appearances, other hardware and software are the same.

Note 2: The adapters not market with AP.

2.2. Product Specification Subjective to this Report

Frequency Range:	802.11b/g/n-HT20/VHT20/ax-HE20: 2412 ~ 2462 MHz 802.11n-HT40/VHT40/ax-HE40: 2422 ~ 2452 MHz
Channel Number:	802.11b/g/n-HT20/VHT20/ax-HE20: 11 802.11n-HT40/VHT40/ax-HE40: 7
Type of Modulation:	802.11b: DSSS; 802.11g/n/VHT: 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 300Mbps 802.11VHT: up to 400Mbps 802.11ax: up to 574Mbps
Scan Antenna	
Frequency Range:	802.11b/g: 2412 ~ 2462 MHz
Channel Number:	802.11b/g: 11
Type of Modulation:	802.11b: DSSS; 802.11g: OFDM
Data Rate:	802.11b: 1/2/5.5/11Mbps; 802.11g: 6/9/12/18/24/36/48/54Mbps

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

2.3. Working Frequencies to this report

802.11b/g/n-HT20/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/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

Model No.: OAW-AP1361

Antenna Type	Frequency Band (GHz)	T_X Paths	Bandwidth (MHz)	Max Peak Gain (dBi)				Directional Gain (dBi)	
				Ant 0	Ant 1	Ant 2	Ant 3	CDD	Beamforming
Wi-Fi Internal Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)									
Omni Antenna	2400 ~ 2483.5	2	20, 40	4.72	4.85	--	--	4.85	7.86
	5150 ~ 5850	4	20, 40, 80	6.48	6.31	6.26	6.12	6.48	12.50
	5150 ~ 5250 30° elevation angle	4	20, 40, 80	-5.46	-4.22	-2.90	-3.84	--	

Bluetooth Internal Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	4.64

Scan Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	4.58
	5150 ~ 5850	6.00
	5150 ~ 5250 30° elevation angle	-5.83

Model No.: OAW-AP1361D

Antenna Type	Frequency Band (GHz)	T_X Paths	Bandwidth (MHz)	Max Peak Gain (dBi)				Directional Gain (dBi)	
				Ant 0	Ant 1	Ant 2	Ant 3	CDD	Beamforming
Wi-Fi Internal Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)									
Directional Antenna	2400 ~ 2483.5	2	20, 40	7.5	7.0	--	--	7.5	10.51
	5150 ~ 5850	4	20, 40, 80	7.4	7.0	6.9	7.2	7.4	13.42
	5150 ~ 5250 30° elevation angle	4	20, 40, 80	3.99	4.13	3.90	4.31	--	

Bluetooth Internal Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	3.30

Scan Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	7.20
	5150 ~ 5850	9.40
	5150 ~ 5250 30° elevation angle	4.02

Model No.: OAW-AP1362

Antenna Type	Frequency Band (GHz)	T_X Paths	Bandwidth (MHz)	Max Peak Gain (dBi)	Directional Gain (dBi)	
					CDD	Beamforming
Wi-Fi Internal Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)						
Omni Antenna	2400 ~ 2483.5	2	20, 40	5	5	8.01
	5150 ~ 5850	4	20, 40, 80	7	7	13.02
	5150 ~ 5250 30° elevation angle	4	20, 40, 80	-0.3	--	

Bluetooth Internal Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	4.06

Scan Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	4.58
	5150 ~ 5850	6.00
	5150 ~ 5250 30° elevation angle	4.02

Note 1: The EUT supports Cyclic Delay Diversity (CDD) technology for 802.11a/b/g/n/ac/ax and Beam Forming technology for 802.11n/ac/ax.

Note 2: When the EUT supports Cyclic Delay Diversity (CDD) and it is correlated.

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

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

  Array Gain = 10 log (N_{ANT}/ N_{SS}) dB = 3.01;

- For power measurements on IEEE 802.11 devices,

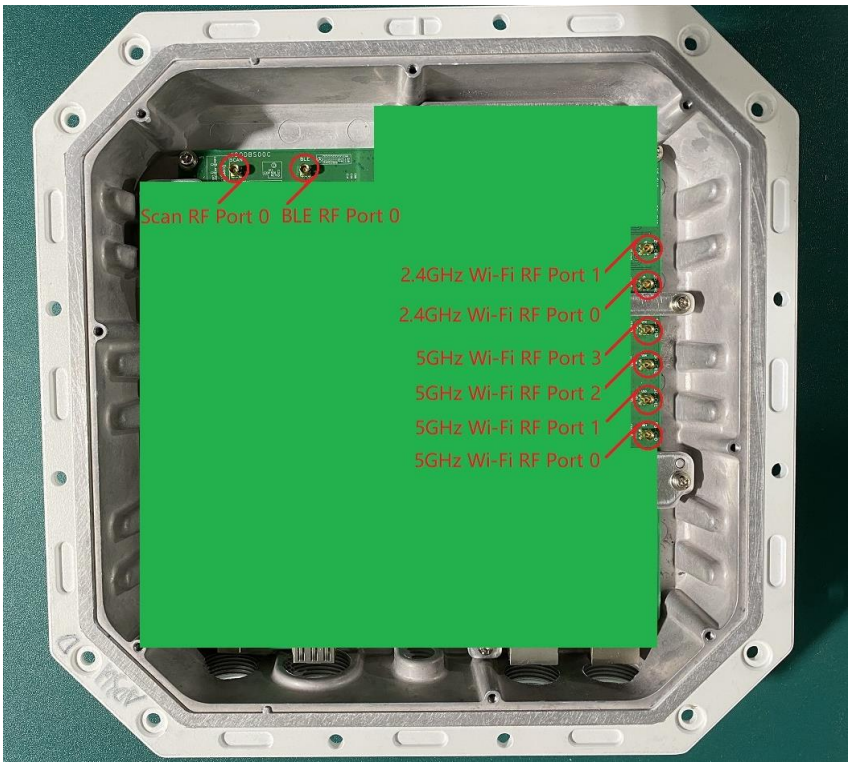
  Array Gain = 0 dB for $N_{ANT} \leq 4$;

If antenna gains are not equal, Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Note 3: The EUT also supports Beam Forming mode, Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi, Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

2.5. Description of Antenna RF Port

Antenna RF Port								
--	2.4GHz RF Port		5GHz RF Port				Scan RF Port	BLE RF Port
Software Control Port	Ant 0	Ant 1	Ant 0	Ant 1	Ant 2	Ant 3	Ant 0	Ant 0



2.6. Test Mode

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

2.4GHz Test Mode	CDD	Beamforming Mode
802.11b	√	×
802.11g	√	×
802.11n-HT20	√	√
802.11n-HT40	√	√
802.11VHT20	√	√
802.11VHT40	√	√
802.11ax-HE20	√	√
802.11ax-HE40	√	√

2.7. Test Software

The test utility software used during testing was “QSPR”, and the version was “v50-00170”.

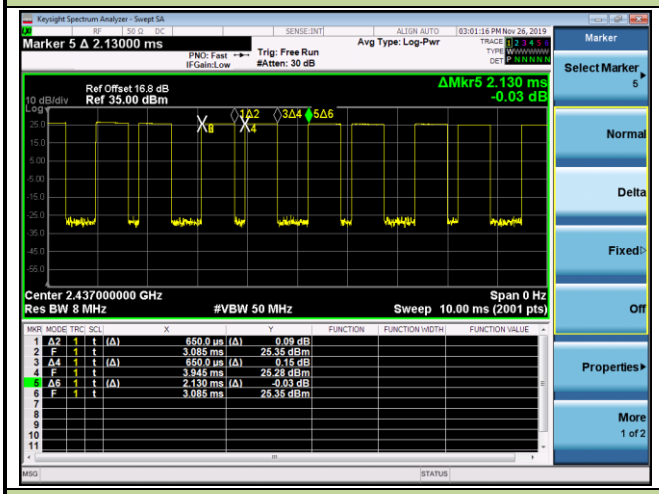
2.8. Duty Cycle

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, and detector = peak. 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:

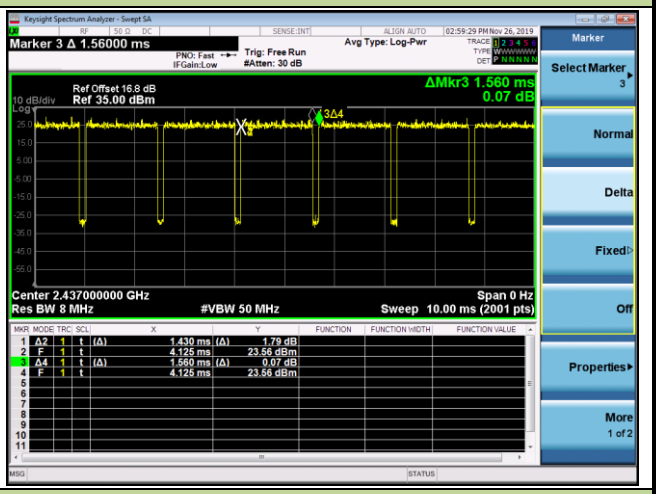
Test Mode	Duty Cycle		
	OAW-AP1361 & OAW-AP1362	OAW-AP1361D	Scan Antenna
802.11b	61.03%	61.42%	99.35%
802.11g	91.67%	91.72%	96.02%
802.11n-HT20	95.01%	94.76%	--
802.11n-HT40	91.58%	95.15%	--
802.11VHT20	96.28%	96.10%	--
802.11VHT40	93.49%	91.82%	--
802.11ax-HE20	94.78%	95.18%	--
802.11ax-HE40	95.26%	95.15%	--

Duty Cycle (T = Transmission Duration) - OAW-AP1361 & OAW-AP1362

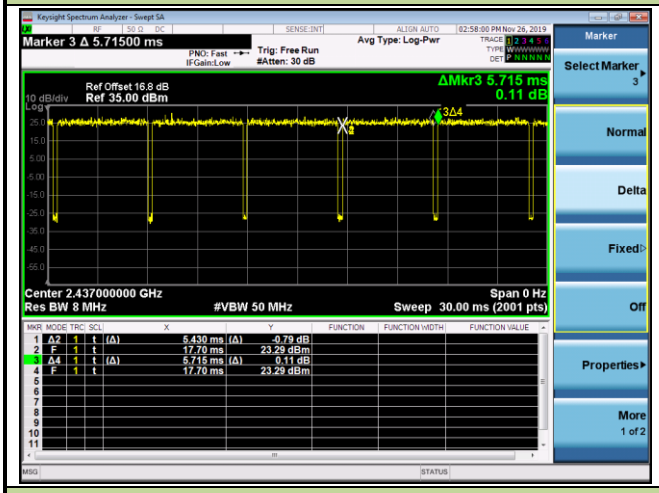
802.11b (T = 1.300 ms)



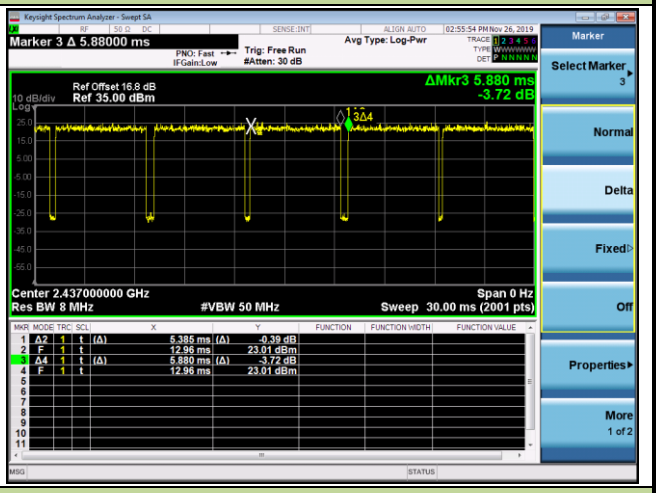
802.11g (T = 1.430 ms)



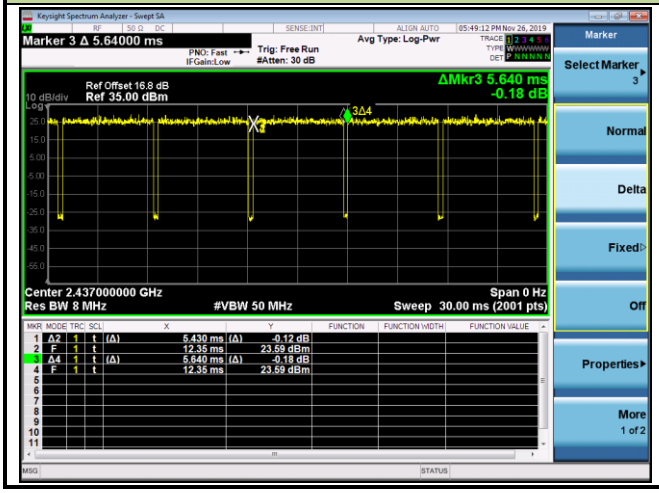
802.11n-HT20 (T = 5.430 ms)



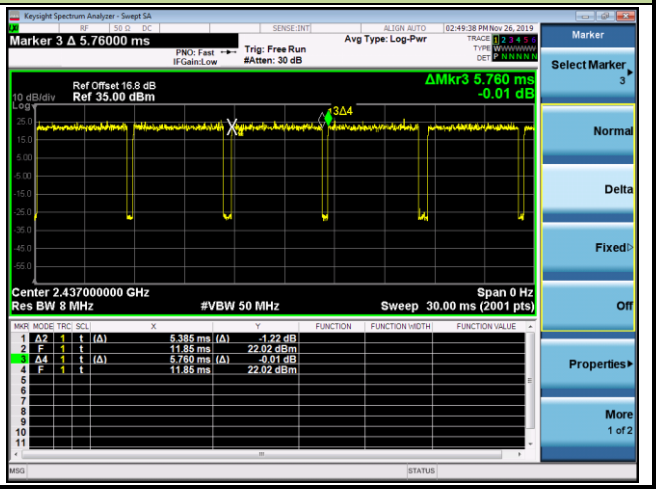
802.11n-HT40 (T = 5.385 ms)

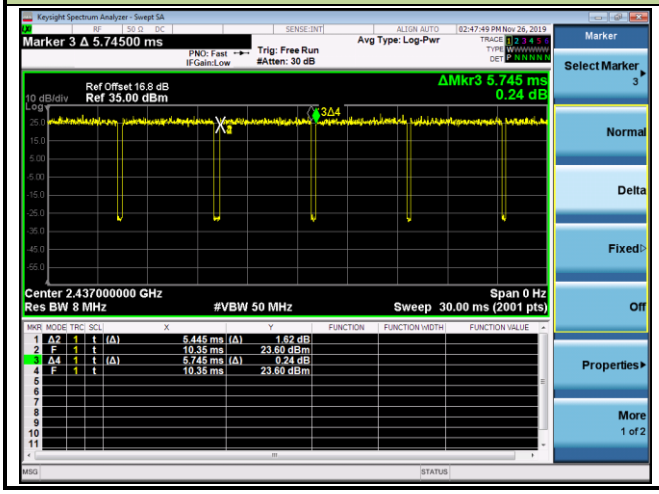
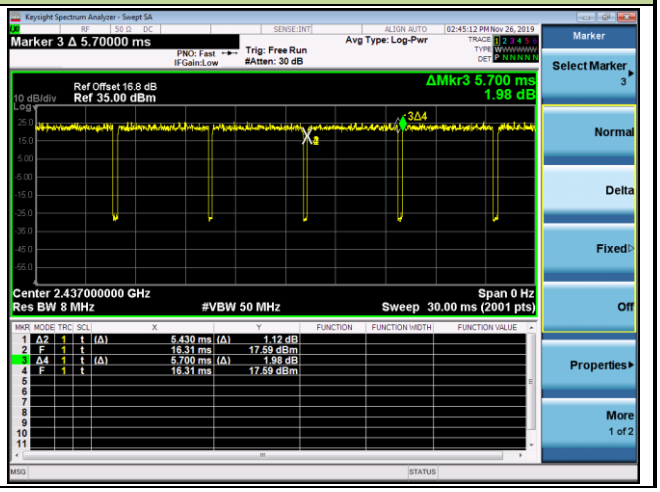


802.11VHT20 (T = 5.430 ms)



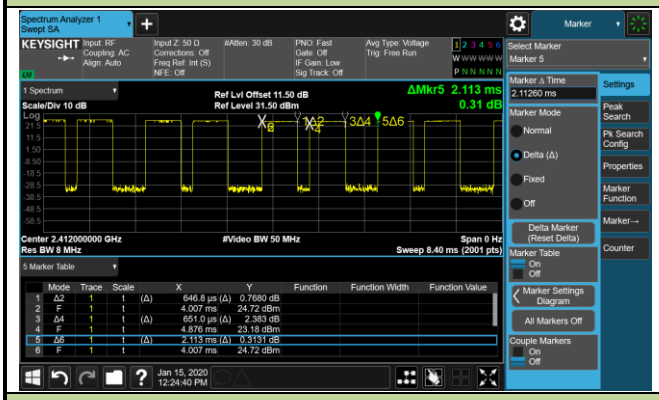
802.11VHT40 (T = 5.385 ms)



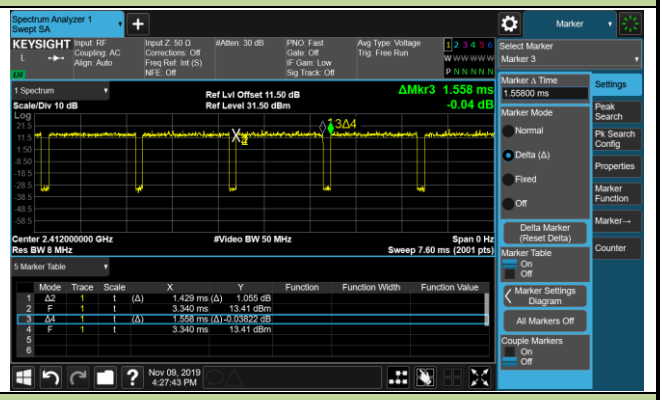
802.11ax-HE20 (T = 5.445 ms)	802.11ax-HE40 (T = 5.430 ms)
	

Duty Cycle (T = Transmission Duration) - OAW-AP1361D

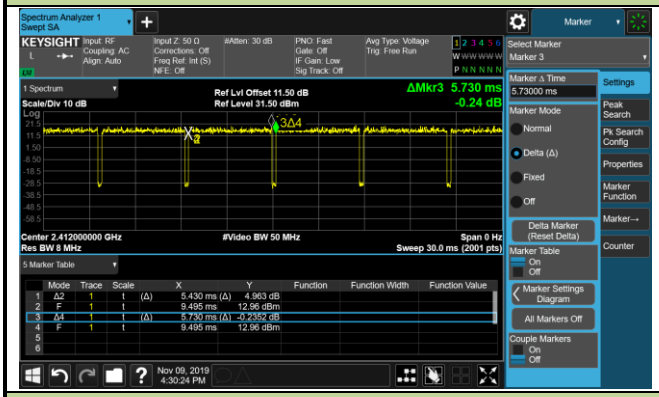
802.11b (T = 1.298 ms)



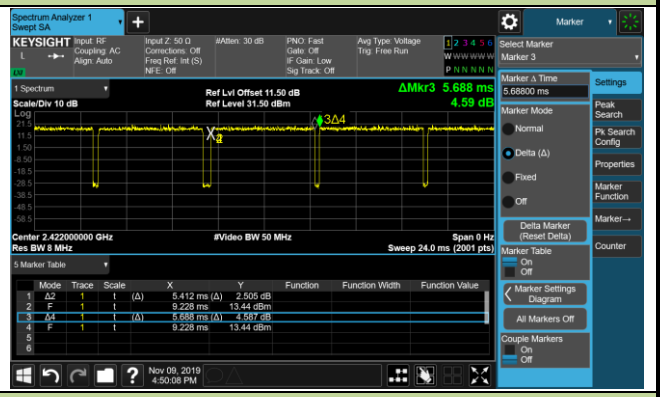
802.11g (T = 1.429 ms)



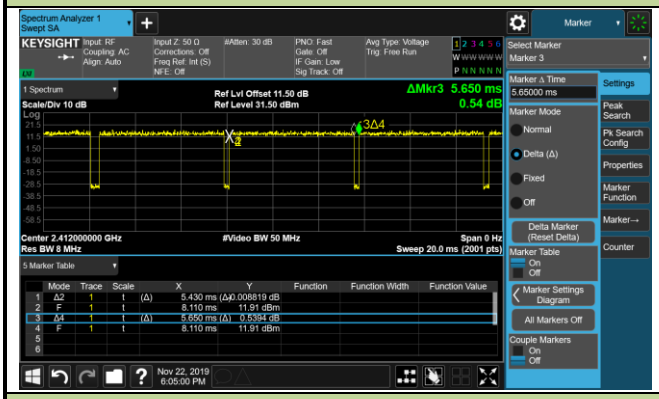
802.11n-HT20 (T = 5.430 ms)



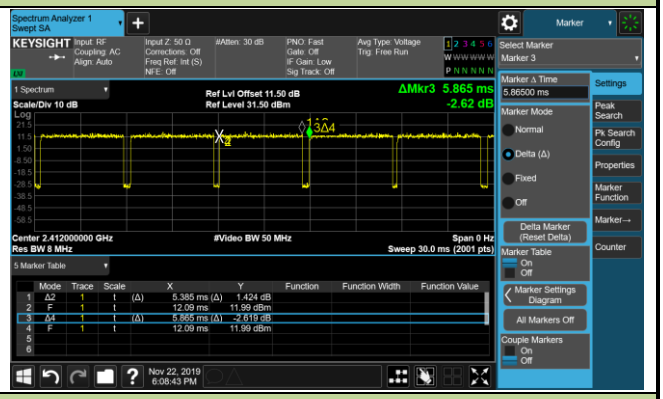
802.11n-HT40 (T = 5.412 ms)



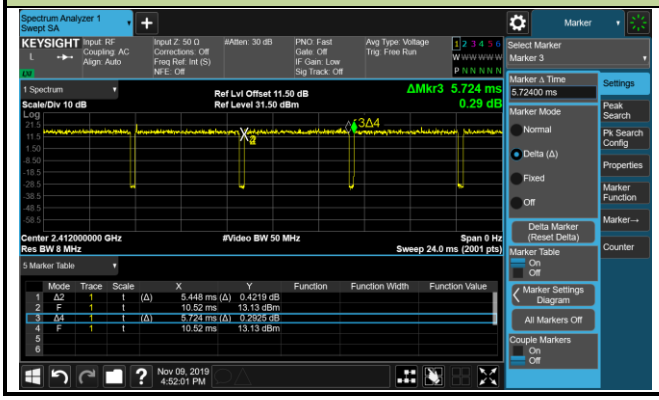
802.11VHT20 (T = 5.430 ms)



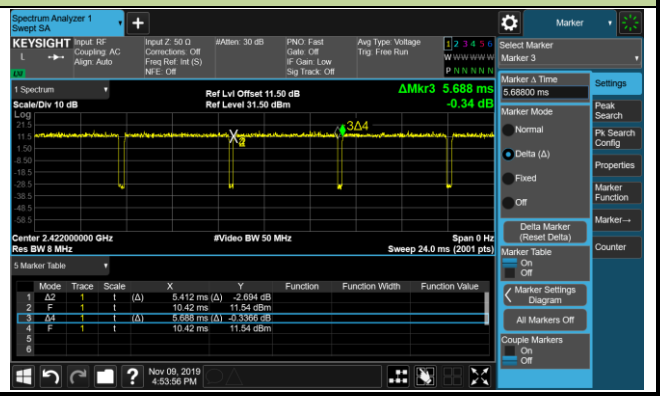
802.11VHT40 (T = 5.385 ms)

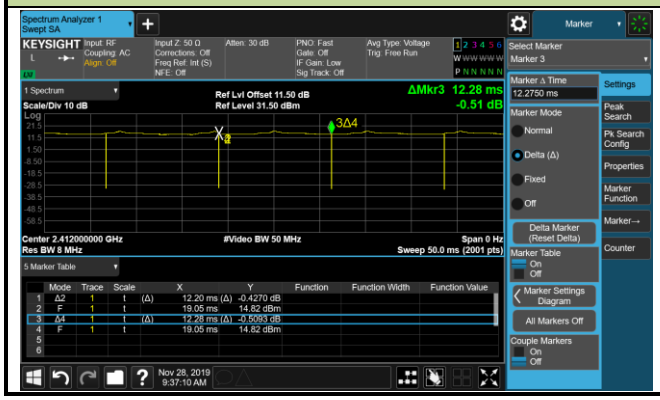
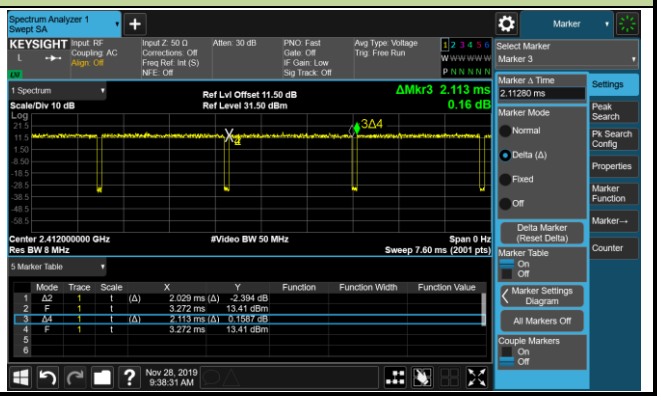


802.11ax-HE20 (T = 5.448 ms)



802.11ax-HE40 (T = 5.412 ms)



Duty Cycle (T = Transmission Duration) - Scan Antenna	
802.11b (T = 12.200 ms)	802.11g (T = 2.029 ms)
	

2.9. EMI Suppression Device(s)/Modifications

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

2.10. Labeling Requirements

<u>Per 2.1074 & 15.19; Docket 95-19</u>

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 procedure described in the document titled “American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices” (ANSI C63.10-2013) was used in the measurement.

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."

Conclusion:

The product is defined as the professional installation of equipment by the manufacturer, there is no necessary to comply with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2020/04/15
Two-Line V-Network	R&S	ENV 216	MRTSUE06002	1 year	2020/06/13
Two-Line V-Network	R&S	ENV 216	MRTSUE06003	1 year	2020/06/13
Thermohygrometer	Testo	608-H1	MRTSUE06404	1 year	2020/08/08
Shielding Room	MIX-BEP	Chamber-SR2	MRTSUE06215	N/A	N/A

Radiated Emissions - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2020/08/01
PXA Signal Analyzer	Keysight	9030B	MRTSUE06395	1 year	2020/09/03
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/10
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2020/03/31
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2020/10/13
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2020/12/17
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2020/06/11
Thermohygrometer	Testo	608-H1	MRTSUE06403	1 year	2020/08/08
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2020/04/30

Radiated Emission - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Keysight	N9038A	MRTSUE06125	1 year	2020/08/01
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/10
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2020/10/13
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2020/10/27
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2020/12/17
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2020/06/11
Temperature/Humidity Meter	Minggao	ETH529	MRTSUE06170	1 year	2020/12/13
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2020/04/30

Conducted Test Equipment - TR3

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2020/04/15
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06452	1 year	2020/07/11
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2020/04/15
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2020/11/18
USB wideband power sensor	Keysight	U2021XA	MRTSUE06446	1 year	2020/06/30
USB wideband power sensor	Keysight	U2021XA	MRTSUE06447	1 year	2020/06/30
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2020/06/13
Audio Analyzer	Agilent	U8903B	MRTSUE06143	1 year	2020/06/13
Modulation Analyzer	HP	8901A	MRTSUE06098	1 year	2020/10/10
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2020/11/07
DC Power Supply	GWINSTEK	DPS-3303C	MRTSUE06064	N/A	N/A
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2020/11/07
Thermohygrometer	testo	608-H1	MRTSUE06401	1 year	2020/08/08

Software	Version	Function
EMI Software	V3	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.

Conducted Emission Measurement - SR2
The maximum measurement uncertainty is evaluated as: 9kHz~150kHz: 3.84dB 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC1
The maximum measurement uncertainty is evaluated as: Horizontal: 30MHz~300MHz: 4.07dB 300MHz~1GHz: 3.63dB 1GHz~18GHz: 4.16dB Vertical: 30MHz~300MHz: 4.18dB 300MHz~1GHz: 3.60dB 1GHz~18GHz: 4.76dB
Radiated Emission Measurement - AC2
The maximum measurement uncertainty is evaluated as: Horizontal: 30MHz~300MHz: 3.75dB 300MHz~1GHz: 3.53dB 1GHz~18GHz: 4.28dB Vertical: 30MHz~300MHz: 3.86dB 300MHz~1GHz: 3.53dB 1GHz~18GHz: 4.33dB

7. TEST RESULT

7.1. Summary

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) The difference between models is that EUT use different antennas and appearances, other hardware and software are the same, so we only use the OAW-AP1361D to perform all conducted tests. Test Items “6dB Bandwidth” & “Band Edge / Out-of-Band Emissions” have been assessed MIMO transmission, and showed the worst test data in this report.
4) The beamforming gain has slight differences between the three models, so the test reports have been showed the highest antenna gain (OAW-AP1361D).

7.2. 6dB Bandwidth Measurement

7.2.1.Test Limit

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

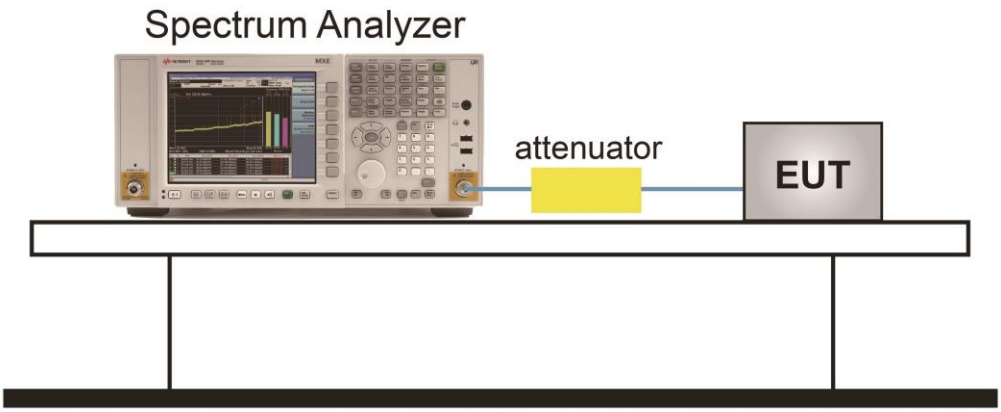
7.2.2.Test Procedure used

ANSI C63.10-2013 - Section 11.8.2 Option 2

7.2.3.Test Setting

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

7.2.4.Test Setup



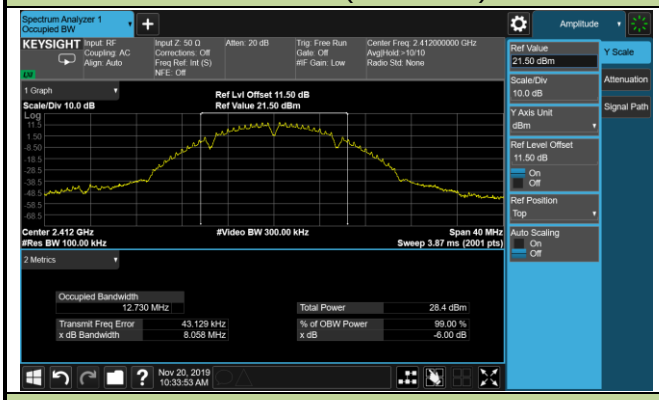
7.2.5.Test Result

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Eric Xu	Relative Humidity	46 ~ 54%
Test Site	TR3	Test Date	2019/11/20 ~ 2019/12/04
Model No.	OAW-AP1361D		

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant 0 / Ant 0 + 1						
802.11b	1Mbps	01	2412	8.06	≥ 0.5	Pass
802.11b	1Mbps	06	2437	8.05	≥ 0.5	Pass
802.11b	1Mbps	11	2462	8.06	≥ 0.5	Pass
802.11g	6Mbps	01	2412	15.92	≥ 0.5	Pass
802.11g	6Mbps	06	2437	16.33	≥ 0.5	Pass
802.11g	6Mbps	11	2462	16.09	≥ 0.5	Pass
802.11n-HT20	MCS0	01	2412	16.30	≥ 0.5	Pass
802.11n-HT20	MCS0	06	2437	17.17	≥ 0.5	Pass
802.11n-HT20	MCS0	11	2462	16.38	≥ 0.5	Pass
802.11n-HT40	MCS0	03	2422	35.35	≥ 0.5	Pass
802.11n-HT40	MCS0	06	2437	35.76	≥ 0.5	Pass
802.11n-HT40	MCS0	09	2452	35.71	≥ 0.5	Pass
802.11VHT20	MCS0	01	2412	16.75	≥ 0.5	Pass
802.11VHT20	MCS0	06	2437	17.21	≥ 0.5	Pass
802.11VHT20	MCS0	11	2462	16.70	≥ 0.5	Pass
802.11VHT40	MCS0	03	2422	35.14	≥ 0.5	Pass
802.11VHT40	MCS0	06	2437	35.94	≥ 0.5	Pass
802.11VHT40	MCS0	09	2452	35.75	≥ 0.5	Pass
802.11ax-HE20	MCS0	01	2412	18.52	≥ 0.5	Pass
802.11ax-HE20	MCS0	06	2437	18.84	≥ 0.5	Pass
802.11ax-HE20	MCS0	11	2462	18.78	≥ 0.5	Pass
802.11ax-HE40	MCS0	03	2422	37.74	≥ 0.5	Pass
802.11ax-HE40	MCS0	06	2437	37.92	≥ 0.5	Pass
802.11ax-HE40	MCS0	09	2452	37.74	≥ 0.5	Pass

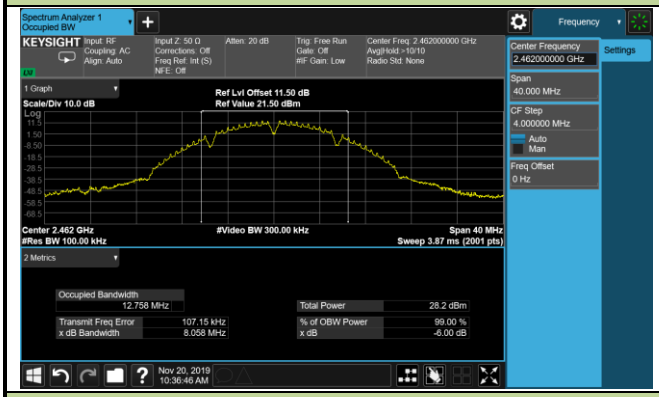
802.11b 6dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 01 (2412MHz)



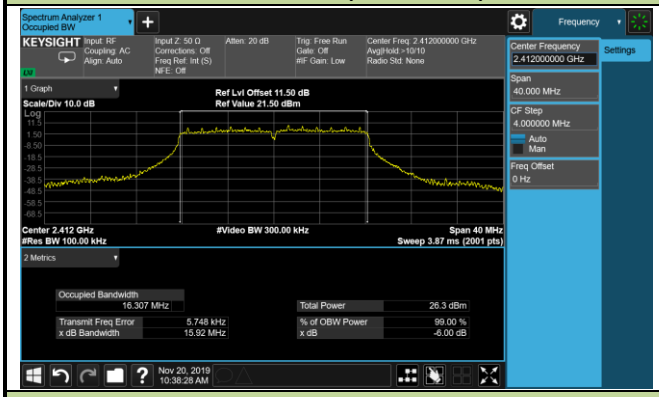
Channel 06 (2437MHz)

Channel 11 (2462MHz)

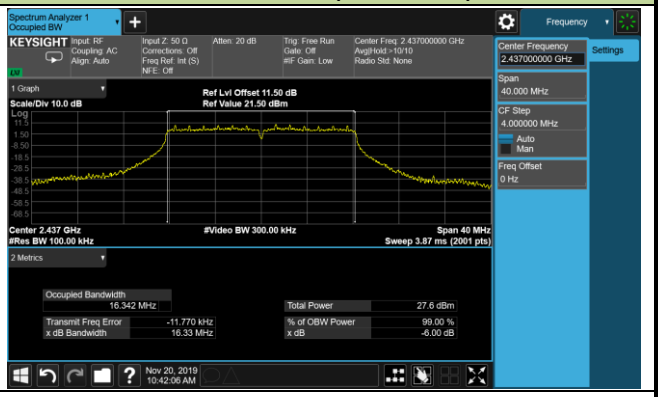


802.11g 6dB Bandwidth - Ant 0 / Ant 0 + 1

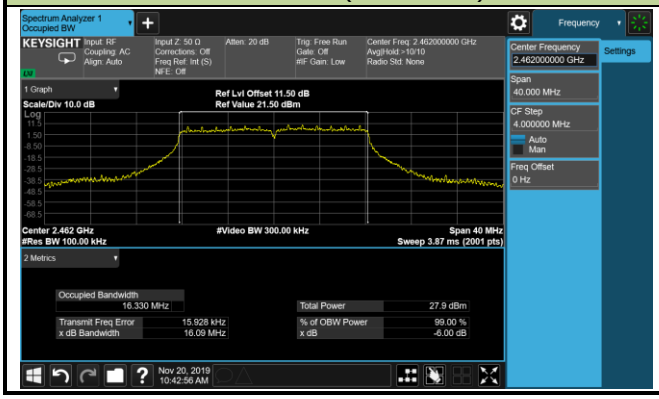
Channel 01 (2412MHz)



Channel 06 (2437MHz)

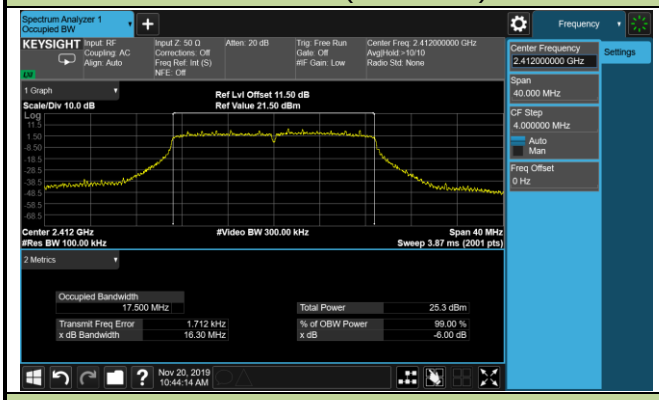


Channel 11 (2462MHz)

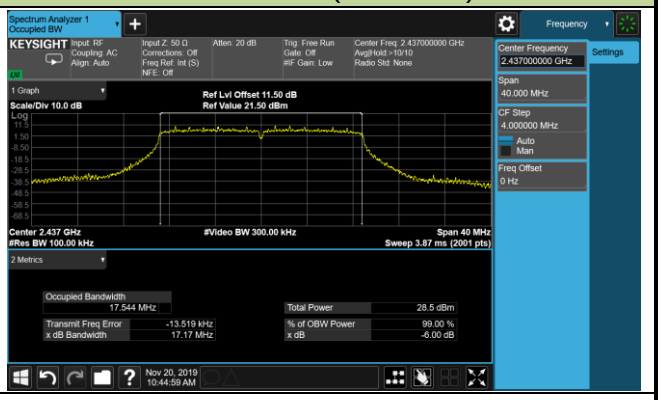


802.11n-HT20 6dB Bandwidth - Ant 0 / Ant 0 + 1

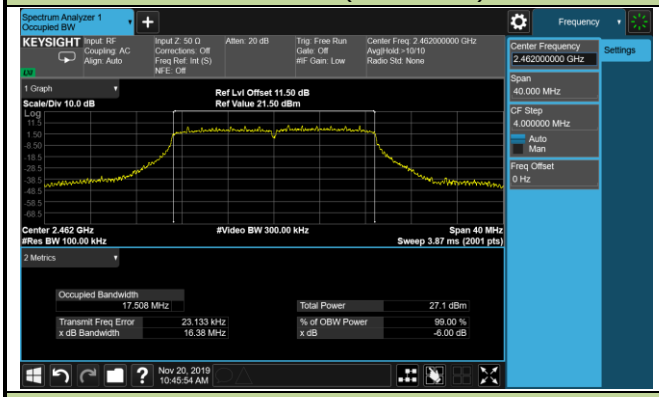
Channel 01 (2412MHz)



Channel 06 (2437MHz)

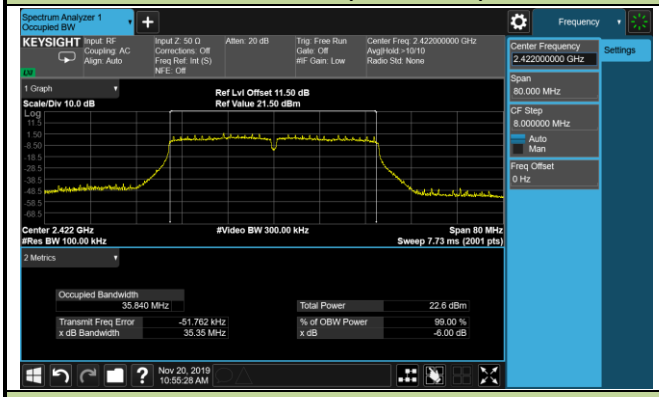


Channel 11 (2462MHz)

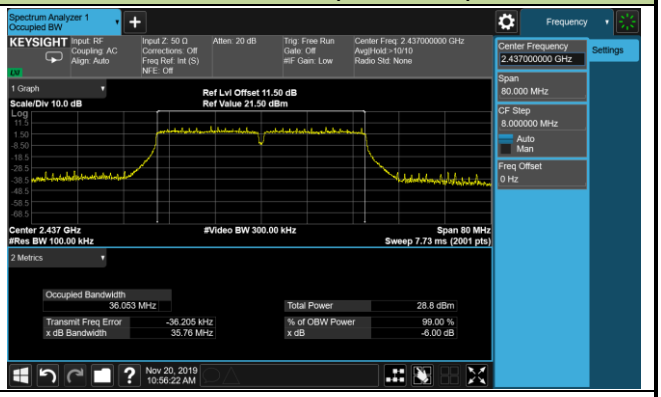


802.11n-HT40 6dB Bandwidth - Ant 0 / Ant 0 + 1

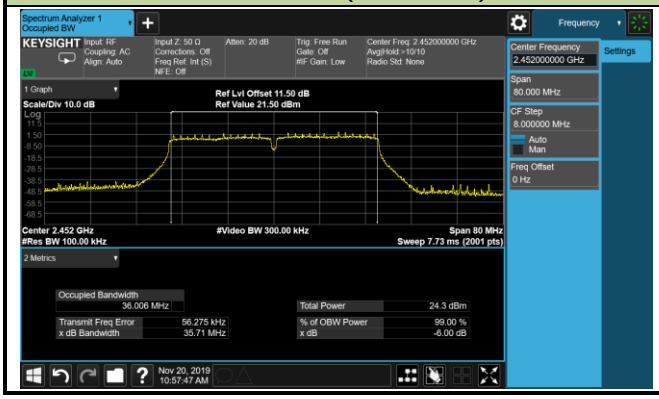
Channel 03 (2422MHz)



Channel 06 (2437MHz)

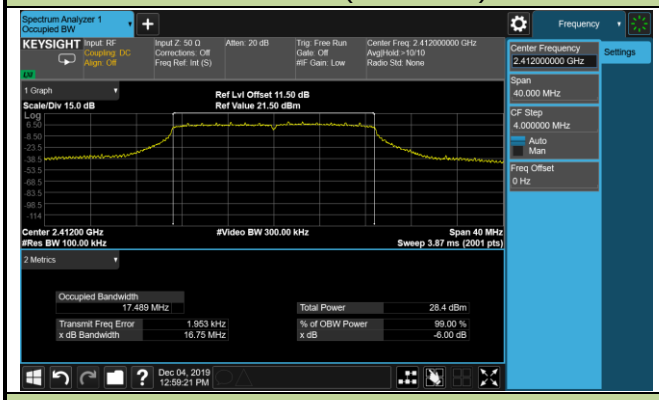


Channel 09 (2452MHz)



802.11VHT20 6dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 01 (2412MHz)

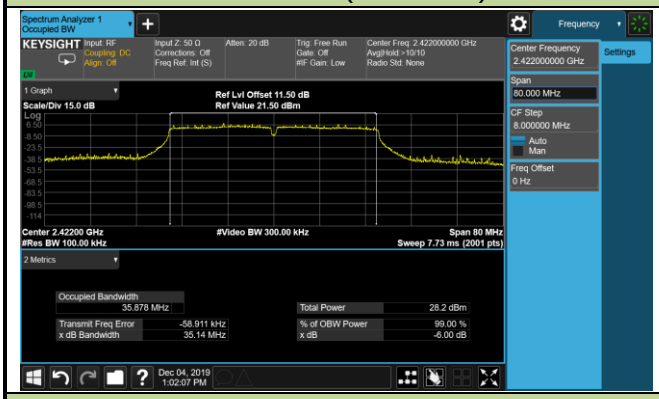


Channel 06 (2437MHz)

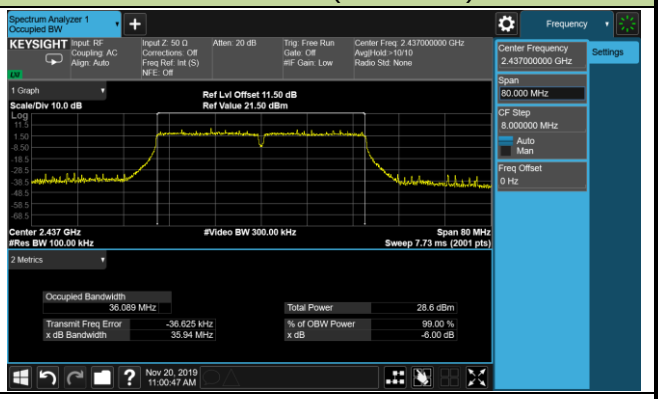
Channel 11 (2462MHz)

802.11VHT40 6dB Bandwidth - Ant 0 / Ant 0 + 1

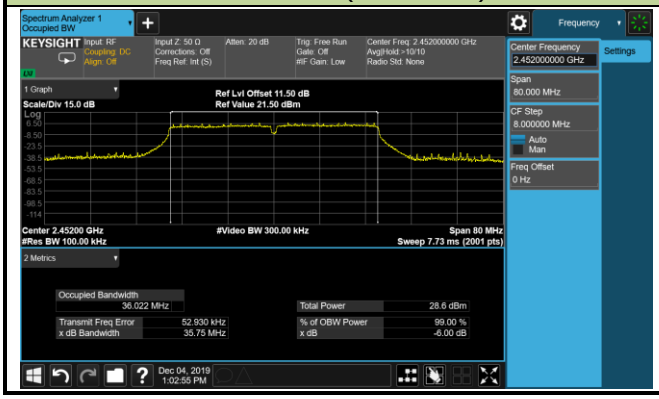
Channel 03 (2422MHz)



Channel 06 (2437MHz)

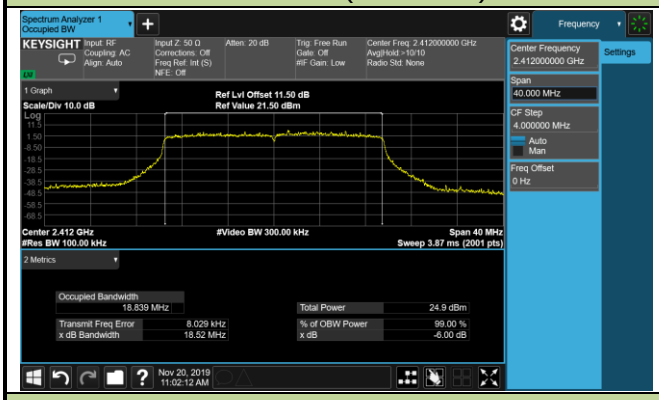


Channel 09 (2452MHz)



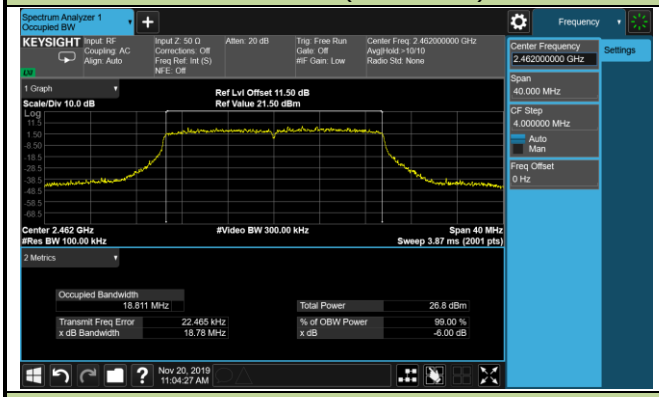
802.11ax-HE20 6dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 01 (2412MHz)



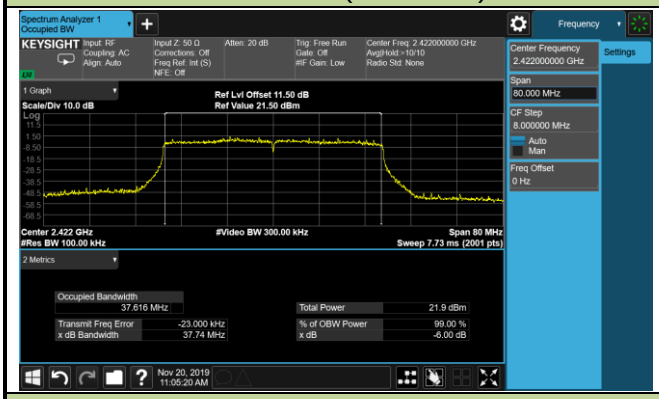
Channel 06 (2437MHz)

Channel 11 (2462MHz)

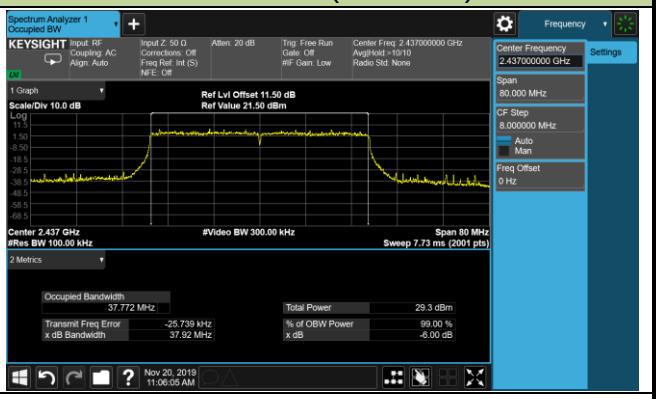


802.11ax-HE40 6dB Bandwidth - Ant 0 / Ant 0 + 1

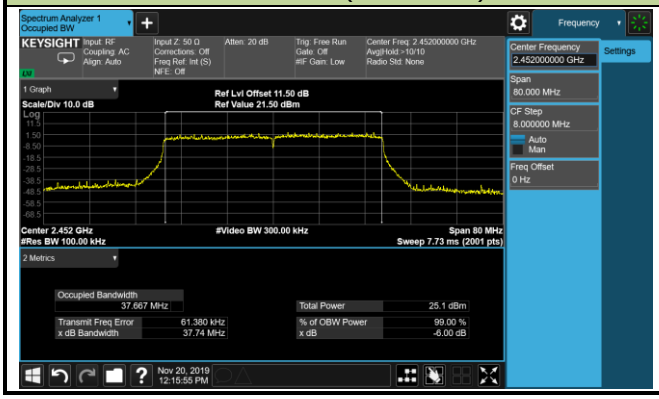
Channel 03 (2422MHz)



Channel 06 (2437MHz)



Channel 09 (2452MHz)



Product	OmniAccess Stellar	Temperature	25°C
Test Engineer	Eric Xu	Relative Humidity	52%
Test Site	TR3	Test Date	2019/11/28
Model No.	OAW-AP1361D - Scan Antenna		

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
802.11b	1Mbps	01	2412	7.10	≥ 0.5	Pass
802.11b	1Mbps	06	2437	7.09	≥ 0.5	Pass
802.11b	1Mbps	11	2462	7.10	≥ 0.5	Pass
802.11g	6Mbps	01	2412	16.33	≥ 0.5	Pass
802.11g	6Mbps	06	2437	16.34	≥ 0.5	Pass
802.11g	6Mbps	11	2462	16.30	≥ 0.5	Pass

802.11b 6dB Bandwidth

Channel 01 (2412MHz)

Channel 06 (2437MHz)

Channel 11 (2462MHz)

802.11g 6dB Bandwidth	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
Channel 11 (2462MHz)	

7.3. Output Power Measurement

7.3.1.Test Limit

The maximum out 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.

Mode No.	Directional Gain (dBi)		Output Power Limit (dBm)	
	CDD	Beamforming	CDD	Beamforming
OAW-AP1361	4.85	7.86	30.00	28.14
OAW-AP1361D	7.50	10.51	28.50	25.49
OAW-AP1362	5.00	8.01	30.00	27.99

7.3.2.Test Procedure Used

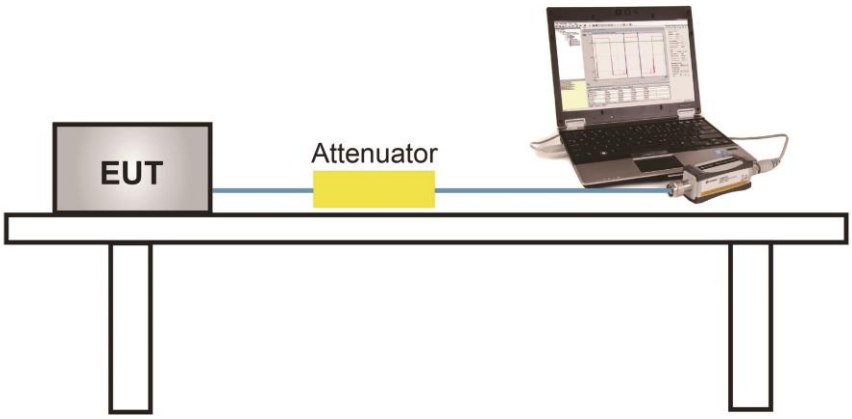
ANSI C63.10-2013 - Section 11.9.2.3

7.3.3.Test Setting

Method AVGPM-G (Measurement using a gated RF average-reading power meter)

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

7.3.4.Test Setup



7.3.5.Test Result of Output Power

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

Output power at various data rates for OAW-AP1361D Ant 0 / Ant 0+1 port:

Test Mode	Bandwidth (MHz)	Channel No.	Frequency (MHz)	Data Rate/ MCS	Average Power (dBm)
802.11b	20	6	2437	1Mbps	21.78
				5.5Mbps	21.54
				11Mbps	21.34
802.11g	20	6	2437	6Mbps	21.26
				24Mbps	21.07
				54Mbps	20.86
802.11n	20	6	2437	MCS0	22.25
				MCS3	22.06
				MCS7	21.89
802.11n	40	6	2437	MCS0	22.10
				MCS3	21.97
				MCS7	21.74
802.11VHT	20	6	2437	MCS0	22.25
				MCS4	22.01
				MCS9	21.85
802.11VHT	40	6	2437	MCS0	22.12
				MCS4	21.90
				MCS9	21.73
802.11ax	20	6	2437	MCS0	21.35
				MCS5	21.02
				MCS11	20.83
802.11ax	40	6	2437	MCS0	22.23
				MCS5	22.09
				MCS11	21.84

Output power at various data rates for Scan Antenna:

Test Mode	Bandwidth (MHz)	Channel No.	Frequency (MHz)	Data Rate/ MCS	Average Power (dBm)
802.11b	20	6	2437	1Mbps	11.36
				5.5Mbps	11.07
				11Mbps	11.85
802.11g	20	6	2437	6Mbps	10.55
				24Mbps	10.37
				54Mbps	10.18

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Eric Xu	Relative Humidity	44 ~ 52%
Test Site	TR3	Test Date	2019/11/18 ~ 2019/12/21
Model No.	OAW-AP1361 & OAW-AP1362 (CDD Mode)		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power (dBm)	Limit (dBm)	Result
11b	1Mbps	01	2412	21.31	21.01	24.17	≤ 30.00	Pass
11b	1Mbps	06	2437	21.46	21.38	24.43	≤ 30.00	Pass
11b	1Mbps	11	2462	22.07	21.69	24.89	≤ 30.00	Pass
11g	6Mbps	01	2412	20.64	19.88	23.29	≤ 30.00	Pass
11g	6Mbps	06	2437	21.73	21.78	24.77	≤ 30.00	Pass
11g	6Mbps	11	2462	21.28	20.65	23.99	≤ 30.00	Pass
11n-HT20	MCS0	01	2412	18.37	17.89	21.15	≤ 30.00	Pass
11n-HT20	MCS0	06	2437	21.64	21.43	24.55	≤ 30.00	Pass
11n-HT20	MCS0	11	2462	20.95	20.57	23.77	≤ 30.00	Pass
11n-HT40	MCS0	03	2422	14.51	14.05	17.30	≤ 30.00	Pass
11n-HT40	MCS0	06	2437	21.46	21.48	24.48	≤ 30.00	Pass
11n-HT40	MCS0	09	2452	18.86	18.67	21.78	≤ 30.00	Pass
11VHT20	MCS0	01	2412	19.27	18.83	22.07	≤ 30.00	Pass
11VHT20	MCS0	06	2437	21.42	21.48	24.46	≤ 30.00	Pass
11VHT20	MCS0	11	2462	21.83	21.49	24.67	≤ 30.00	Pass
11VHT40	MCS0	03	2422	15.37	14.92	18.16	≤ 30.00	Pass
11VHT40	MCS0	06	2437	21.45	21.59	24.53	≤ 30.00	Pass
11VHT40	MCS0	09	2452	19.33	19.16	22.26	≤ 30.00	Pass
11ax-HE20	MCS0	01	2412	18.63	17.93	21.30	≤ 30.00	Pass
11ax-HE20	MCS0	06	2437	21.77	21.86	24.83	≤ 30.00	Pass
11ax-HE20	MCS0	11	2462	20.34	19.82	23.10	≤ 30.00	Pass
11ax-HE40	MCS0	03	2422	15.56	15.20	18.39	≤ 30.00	Pass
11ax-HE40	MCS0	06	2437	21.61	21.55	24.59	≤ 30.00	Pass
11ax-HE40	MCS0	09	2452	18.87	18.83	21.86	≤ 30.00	Pass

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

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Eric Xu	Relative Humidity	44 ~ 52%
Test Site	TR3	Test Date	2019/11/18 ~ 2019/12/21
Model No.	OAW-AP1361D (CDD Mode)		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power (dBm)	Limit (dBm)	Result
11b	1Mbps	01	2412	21.43	21.18	24.32	≤ 28.50	Pass
11b	1Mbps	06	2437	21.78	21.79	24.80	≤ 28.50	Pass
11b	1Mbps	11	2462	21.38	21.01	24.21	≤ 28.50	Pass
11g	6Mbps	01	2412	20.01	19.86	22.95	≤ 28.50	Pass
11g	6Mbps	06	2437	21.26	21.68	24.49	≤ 28.50	Pass
11g	6Mbps	11	2462	21.20	21.25	24.24	≤ 28.50	Pass
11n-HT20	MCS0	01	2412	18.94	18.72	21.84	≤ 28.50	Pass
11n-HT20	MCS0	06	2437	22.25	22.35	25.31	≤ 28.50	Pass
11n-HT20	MCS0	11	2462	20.05	20.18	23.13	≤ 28.50	Pass
11n-HT40	MCS0	03	2422	14.26	14.46	17.37	≤ 28.50	Pass
11n-HT40	MCS0	06	2437	22.10	22.41	25.27	≤ 28.50	Pass
11n-HT40	MCS0	09	2452	16.52	16.80	19.67	≤ 28.50	Pass
11VHT20	MCS0	01	2412	17.70	17.51	20.62	≤ 28.50	Pass
11VHT20	MCS0	06	2437	22.25	22.46	25.37	≤ 28.50	Pass
11VHT20	MCS0	11	2462	19.56	19.24	22.41	≤ 28.50	Pass
11VHT40	MCS0	03	2422	14.50	14.25	17.39	≤ 28.50	Pass
11VHT40	MCS0	06	2437	22.12	22.50	25.32	≤ 28.50	Pass
11VHT40	MCS0	09	2452	17.06	17.20	20.14	≤ 28.50	Pass
11ax-HE20	MCS0	01	2412	18.21	18.01	21.12	≤ 28.50	Pass
11ax-HE20	MCS0	06	2437	21.35	21.56	24.47	≤ 28.50	Pass
11ax-HE20	MCS0	11	2462	19.86	19.76	22.82	≤ 28.50	Pass
11ax-HE40	MCS0	03	2422	14.32	14.37	17.36	≤ 28.50	Pass
11ax-HE40	MCS0	06	2437	22.23	22.57	25.41	≤ 28.50	Pass
11ax-HE40	MCS0	09	2452	17.01	18.04	20.57	≤ 28.50	Pass

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

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Eric Xu	Relative Humidity	44 ~ 52%
Test Site	TR3	Test Date	2019/11/18 ~ 2019/12/21
Model No.	OAW-AP1361D (Beamforming Mode)		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power (dBm)	Limit (dBm)	Result
11n-HT20	MCS0	01	2412	18.94	18.72	21.84	≤ 25.49	Pass
11n-HT20	MCS0	06	2437	22.25	22.35	25.31	≤ 25.49	Pass
11n-HT20	MCS0	11	2462	20.05	20.18	23.13	≤ 25.49	Pass
11n-HT40	MCS0	03	2422	14.26	14.46	17.37	≤ 25.49	Pass
11n-HT40	MCS0	06	2437	22.10	22.41	25.27	≤ 25.49	Pass
11n-HT40	MCS0	09	2452	16.52	16.80	19.67	≤ 25.49	Pass
11VHT20	MCS0	01	2412	17.70	17.51	20.62	≤ 25.49	Pass
11VHT20	MCS0	06	2437	22.25	22.46	25.37	≤ 25.49	Pass
11VHT20	MCS0	11	2462	19.56	19.24	22.41	≤ 25.49	Pass
11VHT40	MCS0	03	2422	14.50	14.25	17.39	≤ 25.49	Pass
11VHT40	MCS0	06	2437	22.12	22.50	25.32	≤ 25.49	Pass
11VHT40	MCS0	09	2452	17.06	17.20	20.14	≤ 25.49	Pass
11ax-HE20	MCS0	01	2412	18.21	18.01	21.12	≤ 25.49	Pass
11ax-HE20	MCS0	06	2437	21.35	21.56	24.47	≤ 25.49	Pass
11ax-HE20	MCS0	11	2462	19.86	19.76	22.82	≤ 25.49	Pass
11ax-HE40	MCS0	03	2422	14.32	14.37	17.36	≤ 25.49	Pass
11ax-HE40	MCS0	06	2437	22.23	22.57	25.41	≤ 25.49	Pass
11ax-HE40	MCS0	09	2452	17.01	18.04	20.57	≤ 25.49	Pass

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

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Eric Xu	Relative Humidity	44 ~ 52%
Test Site	TR3	Test Date	2019/11/18 ~ 2019/12/21
Model No.	OAW-AP1361D - Scan Antenna		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Average Power (dBm)	Limit (dBm)	Result
11b	1Mbps	01	2412	11.92	≤ 28.80	Pass
11b	1Mbps	06	2437	11.36	≤ 28.80	Pass
11b	1Mbps	11	2462	11.63	≤ 28.80	Pass
11g	6Mbps	01	2412	10.58	≤ 28.80	Pass
11g	6Mbps	06	2437	10.55	≤ 28.80	Pass
11g	6Mbps	11	2462	10.85	≤ 28.80	Pass

7.4. Power Spectral Density Measurement

7.4.1.Test Limit

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

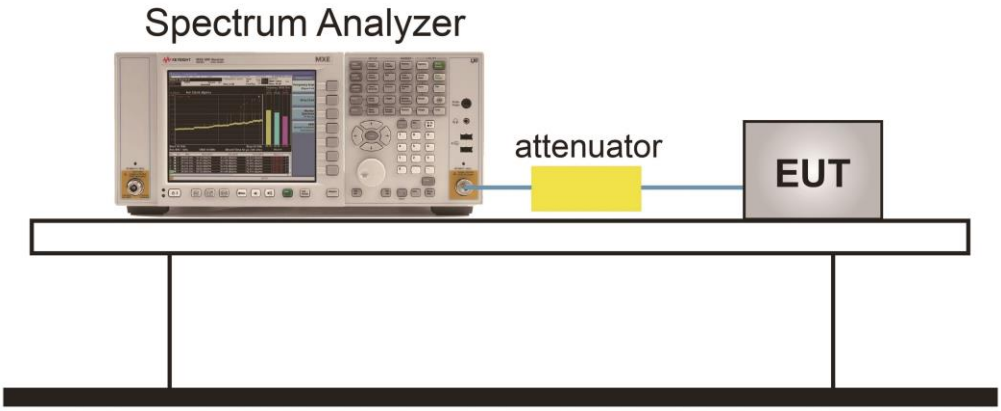
7.4.2.Test Procedure Used

ANSI C63.10 Section 11.10.6

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 = 10kHz
5. VBW = 30kHz
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

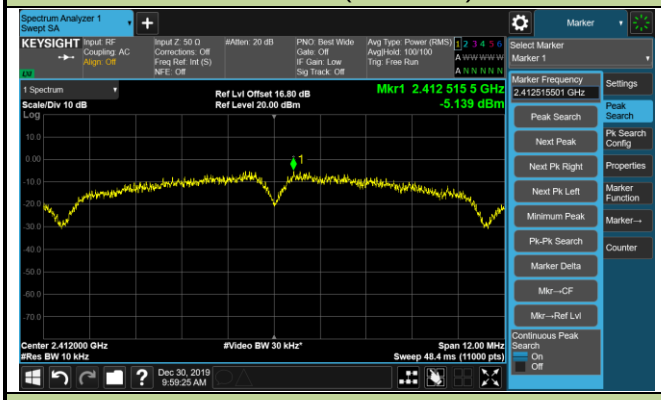
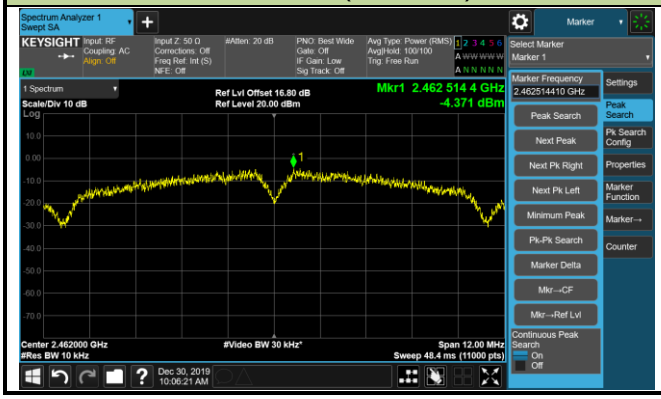


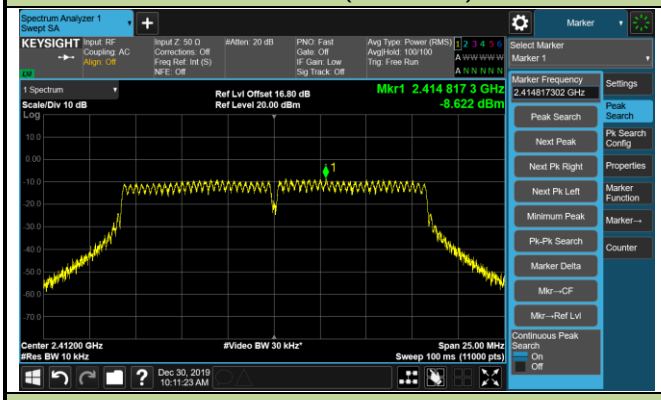
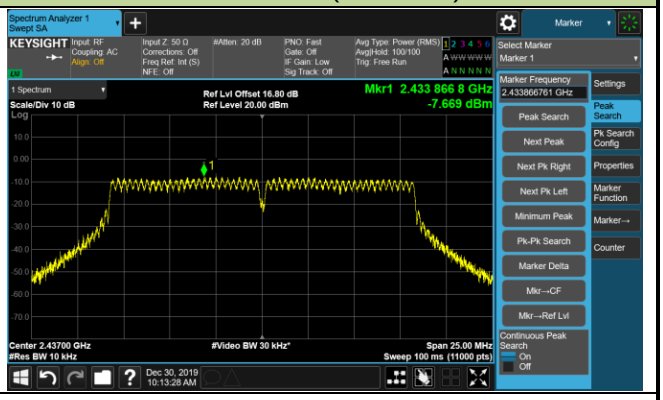
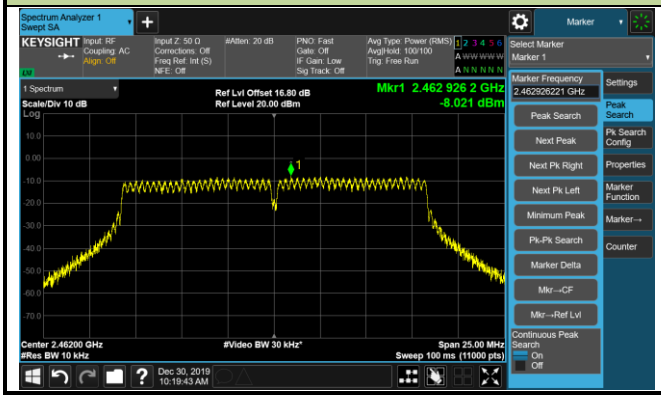
7.4.5.Test Result

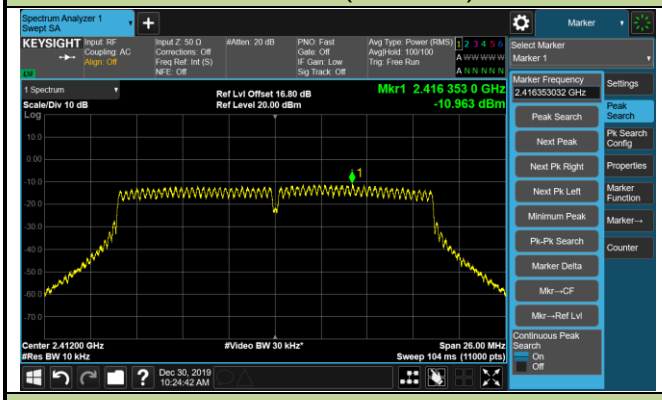
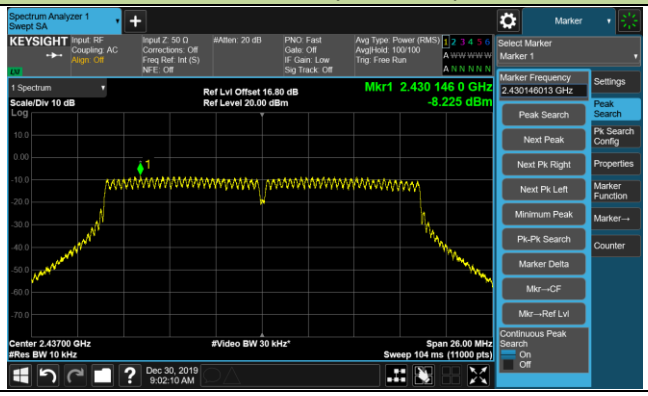
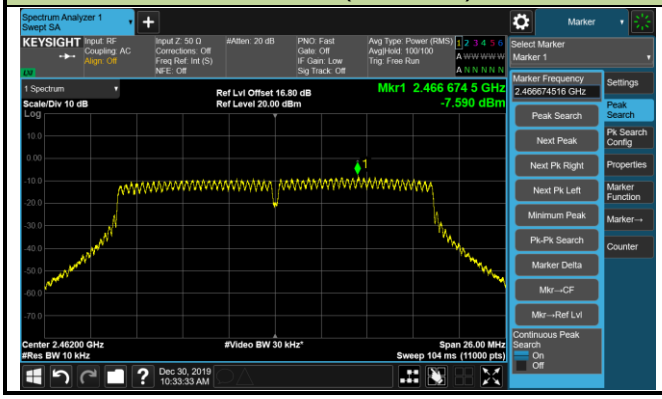
Product	OmniAccess Stellar	Temperature	25°C
Test Engineer	Eric Xu	Relative Humidity	52%
Test Site	TR3	Test Date	2019/12/30
Model No.	OAW-AP1361 & OAW-AP1362		

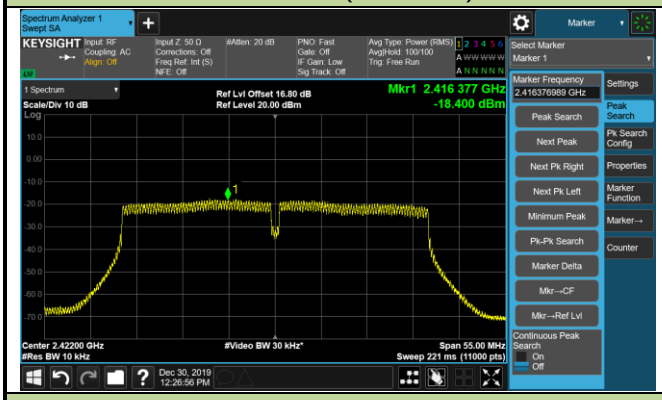
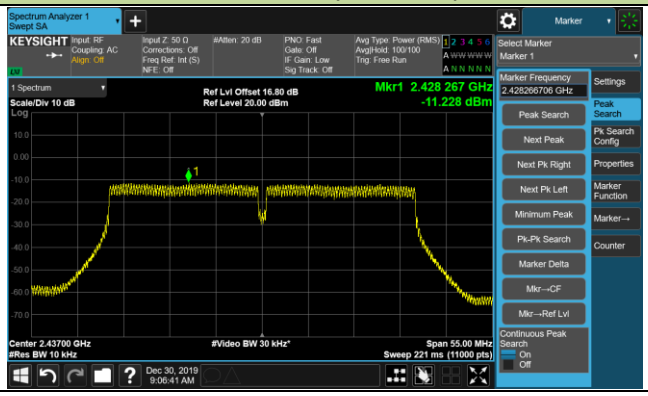
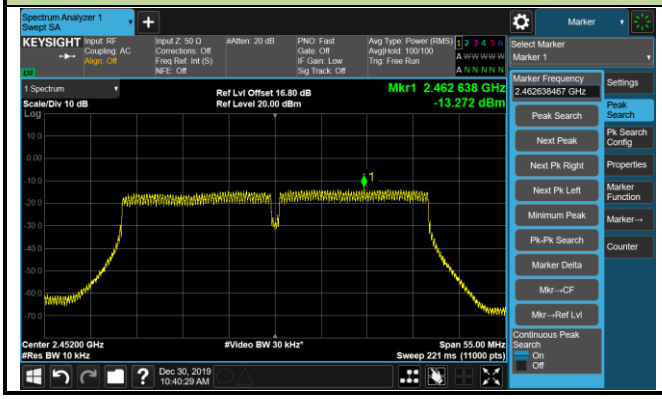
Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 AVGPSD (dBm / 10kHz)	Ant 1 AVGPSD (dBm / 10kHz)	Duty Cycle (%)	Constant Factor (dB)	Total AVGPSD (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
11b	1Mbps	01	2412	-5.14	-5.38	61.03	-5.23	-5.33	≤ 6.14	Pass
11b	1Mbps	06	2437	-4.88	-4.76	61.03	-5.23	-4.89	≤ 6.14	Pass
11b	1Mbps	11	2462	-4.37	-4.72	61.03	-5.23	-4.62	≤ 6.14	Pass
11g	6Mbps	01	2412	-8.62	-8.93	91.67	-5.23	-10.61	≤ 6.14	Pass
11g	6Mbps	06	2437	-7.67	-7.67	91.67	-5.23	-9.51	≤ 6.14	Pass
11g	6Mbps	11	2462	-8.02	-8.37	91.67	-5.23	-10.03	≤ 6.14	Pass
11n-HT20	MCS0	01	2412	-10.96	-11.52	95.01	-5.23	-13.23	≤ 6.14	Pass
11n-HT20	MCS0	06	2437	-8.23	-8.15	95.01	-5.23	-10.19	≤ 6.14	Pass
11n-HT20	MCS0	11	2462	-7.59	-8.92	95.01	-5.23	-10.20	≤ 6.14	Pass
11n-HT40	MCS0	03	2422	-18.40	-18.25	91.58	-5.23	-20.16	≤ 6.14	Pass
11n-HT40	MCS0	06	2437	-11.23	-10.77	91.58	-5.23	-12.83	≤ 6.14	Pass
11n-HT40	MCS0	09	2452	-13.27	-14.12	91.58	-5.23	-15.51	≤ 6.14	Pass
11VHT20	MCS0	01	2412	-10.02	-10.30	96.28	-5.23	-12.21	≤ 6.14	Pass
11VHT20	MCS0	06	2437	-8.04	-7.73	96.28	-5.23	-9.94	≤ 6.14	Pass
11VHT20	MCS0	11	2462	-7.86	-8.01	96.28	-5.23	-9.99	≤ 6.14	Pass
11VHT40	MCS0	03	2422	-16.72	-17.13	93.49	-5.23	-18.85	≤ 6.14	Pass
11VHT40	MCS0	06	2437	-11.07	-10.97	93.49	-5.23	-12.95	≤ 6.14	Pass
11VHT40	MCS0	09	2452	-13.07	-13.50	93.49	-5.23	-15.21	≤ 6.14	Pass
11ax-HE20	MCS0	01	2412	-11.45	-12.64	94.78	-5.23	-13.99	≤ 6.14	Pass
11ax-HE20	MCS0	06	2437	-8.84	-9.06	94.78	-5.23	-10.94	≤ 6.14	Pass
11ax-HE20	MCS0	11	2462	-10.09	-10.59	94.78	-5.23	-12.32	≤ 6.14	Pass
11ax-HE40	MCS0	03	2422	-17.63	-17.55	95.26	-5.23	-19.60	≤ 6.14	Pass
11ax-HE40	MCS0	06	2437	-11.92	-11.95	95.26	-5.23	-13.94	≤ 6.14	Pass
11ax-HE40	MCS0	09	2452	-14.46	-14.83	95.26	-5.23	-16.65	≤ 6.14	Pass

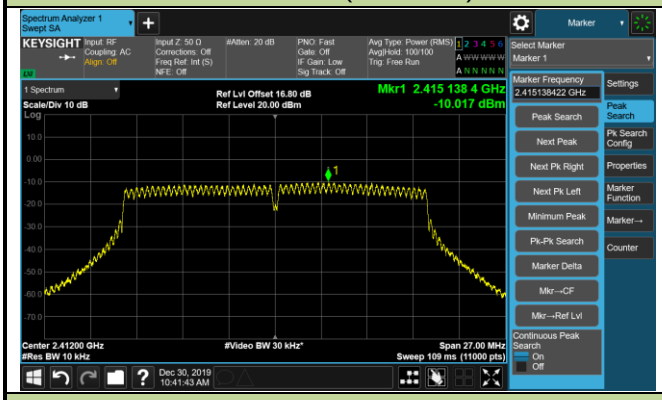
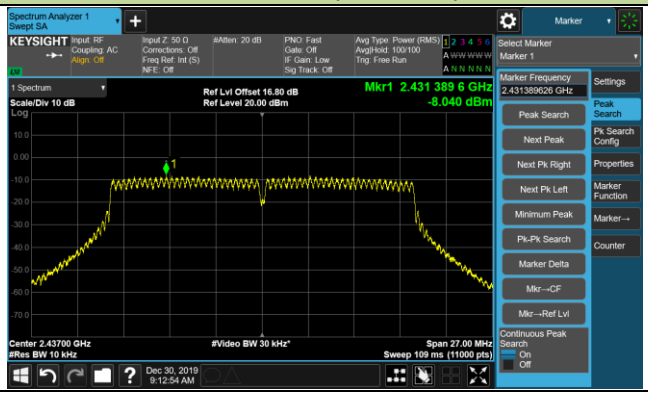
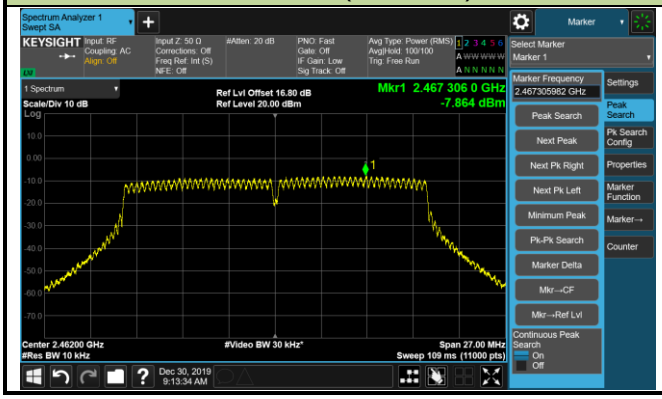
Note: When EUT duty cycle < 98%, Total AVGPSD = 10*log {$10^{(\text{Ant 0 AVGPSD}/10)}$ + $10^{(\text{Ant 1 AVGPSD}/10)}$} + 10*log (1/duty cycle) + Constant Factor (dB).

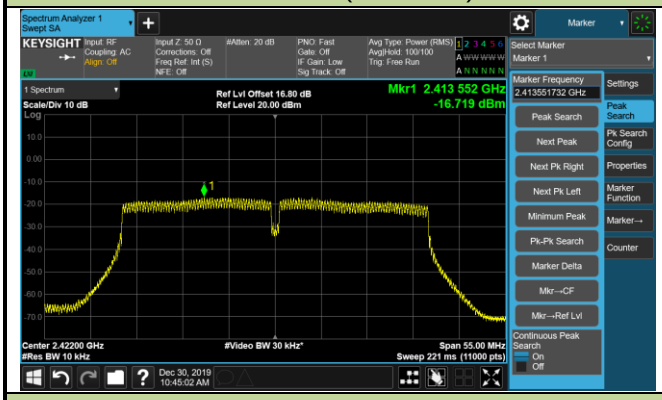
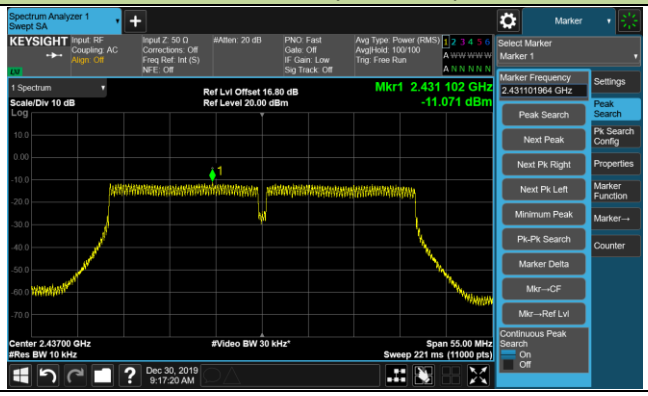
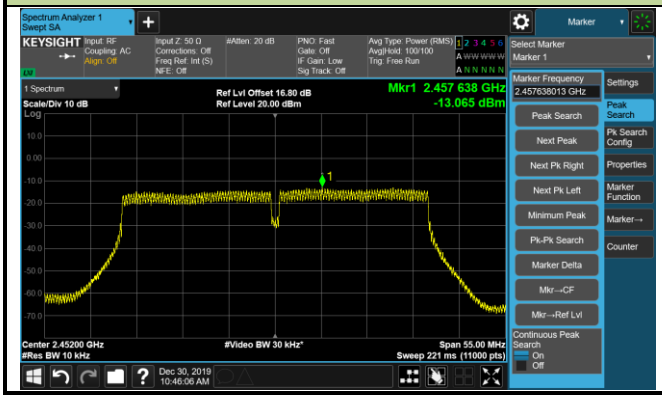
802.11b PSD - Ant 0 / Ant 0 + 1	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

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

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

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

802.11VHT20 PSD - Ant 0 / Ant 0 + 1	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11VHT40 PSD - Ant 0 / Ant 0 + 1	
Channel 03 (2422MHz)	Channel 06 (2437MHz)
	
Channel 09 (2452MHz)