MEASUREMENT REPORT

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

FCC ID:	2A38RDAP640
APPLICANT:	Belden Hirschmann Industries (Suzhou) Ltd.
Application Type:	Certification
Product:	HIT Dragonfly Access Point
Model No.:	DAP640-RW, DAP640-US, DAP640-ME, DAP640-JP
Brand Name:	HIRSCHMANN IT
FCC Classification:	Unlicensed National Information Infrastructure (NII)
FCC Rule Part(s):	Part15 Subpart E (Section 15.407)
Test Procedure(s):	ANSI C63.10-2013, KDB 789033 D02v02r01, KDB 662911 D01v02r01
Test Date:	September 30, 2019 ~ Feburary 03, 2020

Reviewed By: Sunny Sun

Approved By: Robin Wu

The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 789033. 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
2201RSU008-U3	Rev. 01	Initial Report	04-26-2022	Valid

Note: This is a copy report based on MRT original report (report No.: 1909RSU036-U3). It changed the information of the applicant and the product. The hardware and software of the product are the same.
DAP640-RW corresponds to the first configured test model in the original report. Only a slight change in appearance, which has no impact on the test results.

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General Information

Applicant:	Belden Hirschmann Industries (Suzhou) Ltd.
Applicant Address:	333 Yanhu Road, Huaqiao Town, Kunshan City, Jiangsu Province, P. R. China
Manufacturer:	Belden Hirschmann Industries (Suzhou) Ltd.
Manufacturer Address:	333 Yanhu Road, Huaqiao Town, Kunshan City, Jiangsu Province, P. R. China
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 (A2LACert. No.3628.01) in EMC, Telecommunications, Radioand 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.

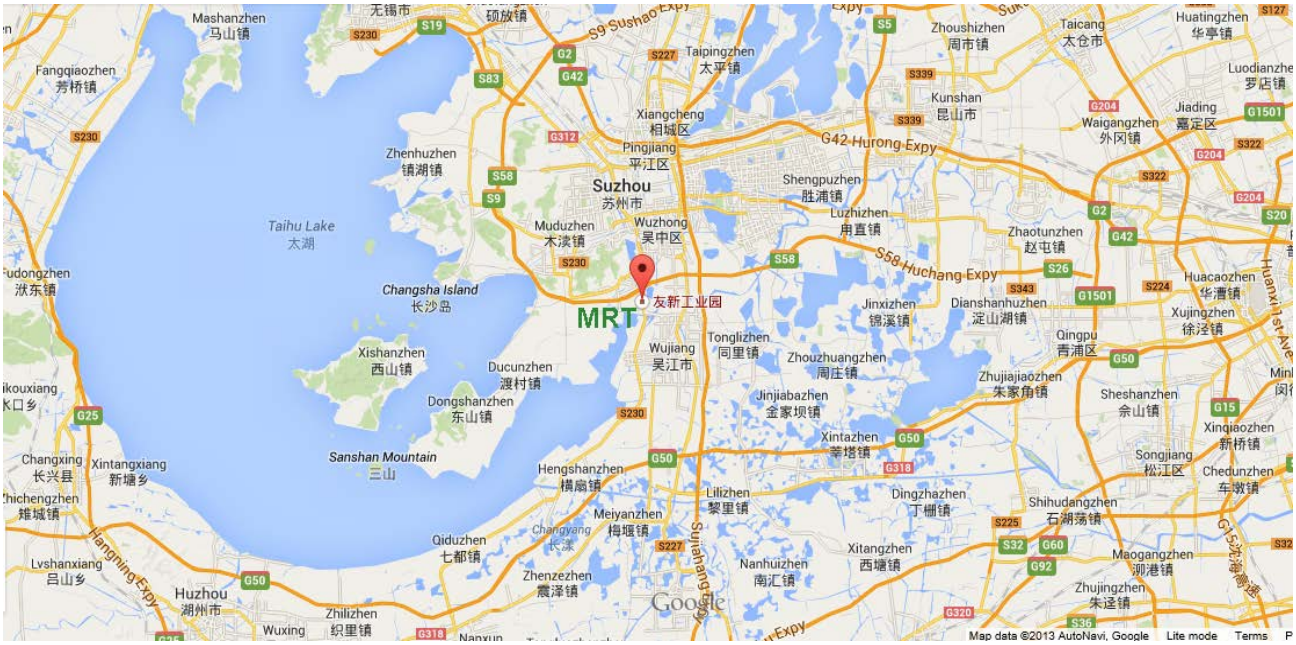
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The 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:	HIT Dragonfly Access Point
Model No.:	DAP640-RW, DAP640-US, DAP640-ME, DAP640-JP
Brand Name:	HIRSCHMANN IT
Wi-Fi Specification:	802.11a/b/g/n/ac/ax
Bluetooth Specification:	V5.1
Operating Temperature:	0 ~ 50 °C
Power Type:	PoE input or AC adapter input
Operating Environment:	Indoor Use
Accessories	
Adapter 1#:	Model No.: ADP-30HR B Input Power: 100 - 240V ~ 50/60Hz, 1.0A Output Power: 48VDC/0.66A
Adapter 2#:	Model No.: PD-9001 25GR/AC Input Power: 100 - 240V ~ 50/60Hz, 1.5A Output Power: 55VDC/0.63A

Remark:

1. AC Power Adapter and PoE Injector are not sold with the product.
2. Different models are only market requirements, all hardware and software are consistent.
3. The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.
4. Adapter 1# was used for all RF testing.

2.2. Product Specification Subjective to this Report

Frequency Range	For 802.11a/n-HT20/ac-VHT20/ax-HE20: 5180~5240MHz, 5745~5825MHz 802.11n-HT40/ac-VHT40/ax-HE40: 5190~5230 MHz, 5755~5795 MHz For 802.11ac-VHT80/ax-HE80: 5210MHz, 5775MHz
Type of Modulation	802.11a/n/ac: OFDM; 802.11ax: OFDMA
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps 802.11ax: up to 2402Mbps
Scan Antenna	
Frequency Range	For 802.11a: 5180~5240MHz, 5745~5825MHz
Type of Modulation	802.11a: OFDM
Data Rate	802.11a: 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 for this report

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

Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz
48	5240 MHz	149	5745 MHz	153	5765 MHz
157	5785 MHz	161	5805 MHz	165	5825 MHz

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

Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	151	5755 MHz
159	5795 MHz	--	--	--	--

802.11ac-VHT80/ax-HE80

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	155	5775 MHz	--	--

2.4. Description of Available Antenna

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	3.5	3.5	--	--	3.5	6.51
	5150 ~ 5850	4	20	3.2	3.6	3.7	3.5	3.7	9.52
			40						
			80						

Bluetooth Internal Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	3.2

Scan Internal Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	3.5
	5150 ~ 5850	3.5

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

Note 2: The EUT also supports Beam Forming technology for 802.11n/ac/ax.

Note 3: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are 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,

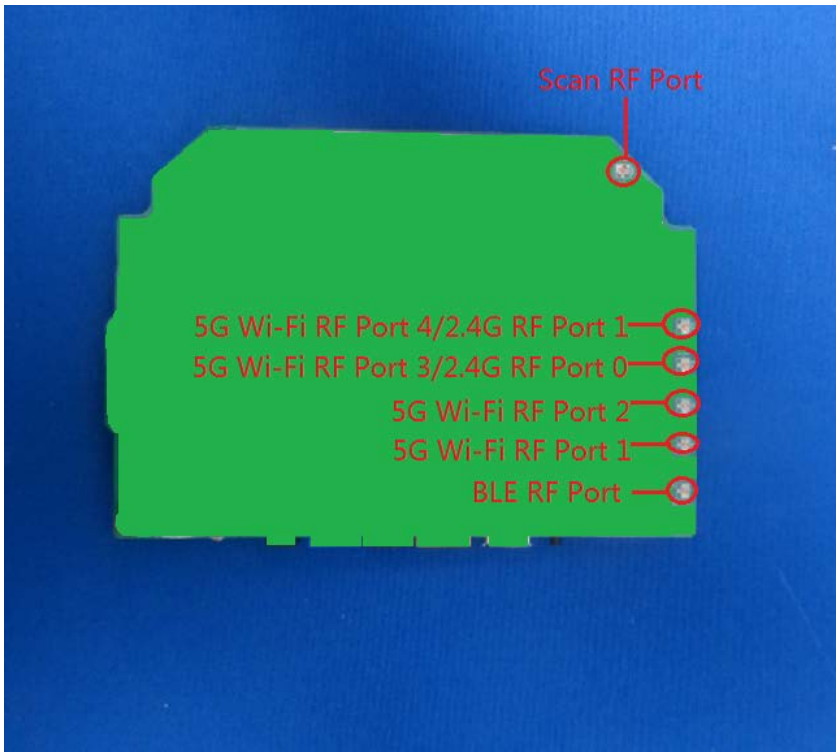
  Array Gain = 0 dB for $N_{ANT} \leq 4$;

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 4: The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac/ax, not include 802.11a/b/g. The directional gain = $10*\log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/N_{ANT}]$dBi.

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 1	Ant 2	Ant 3	Ant 4	Ant 0	Ant 0



2.6. Test Mode

Test Mode	Mode 1: Transmit by 802.11a (6Mbps)
	Mode 2: Transmit by 802.11n-HT20 (MSC0)
	Mode 3: Transmit by 802.11n-HT40 (MSC0)
	Mode 4: Transmit by 802.11ax-HE20 (MSC0)
	Mode 5: Transmit by 802.11ax-HE40 (MSC0)
	Mode 6: Transmit by 802.11ax-HE80 (MSC0)

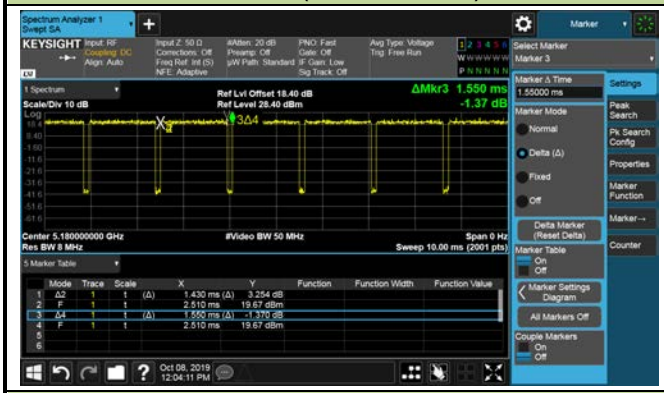
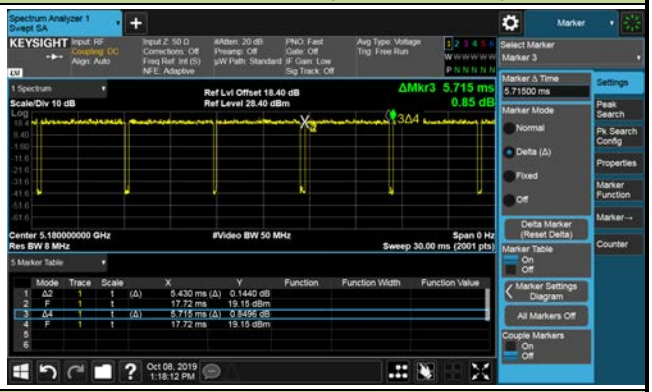
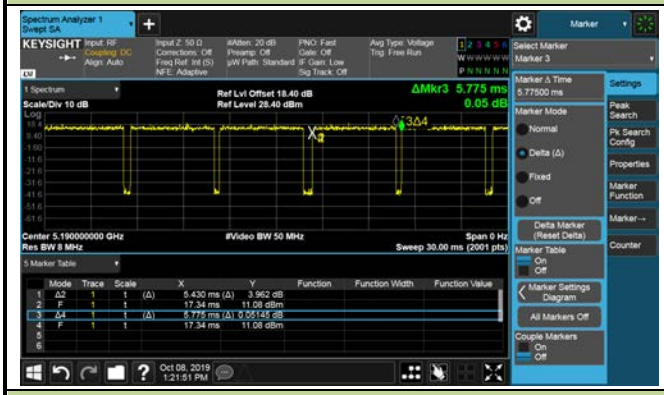
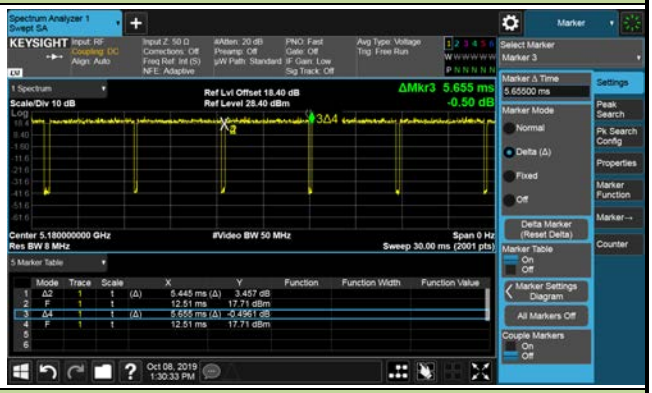
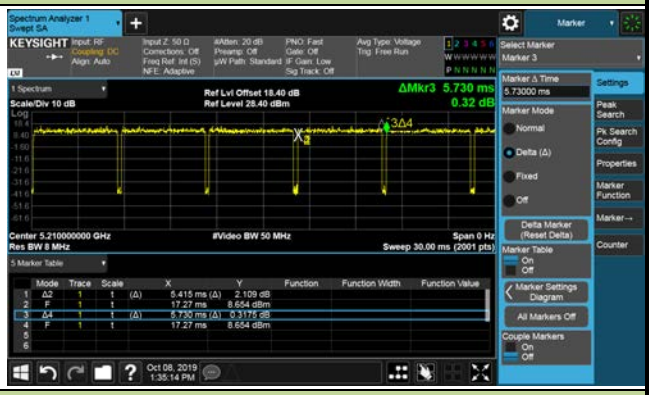
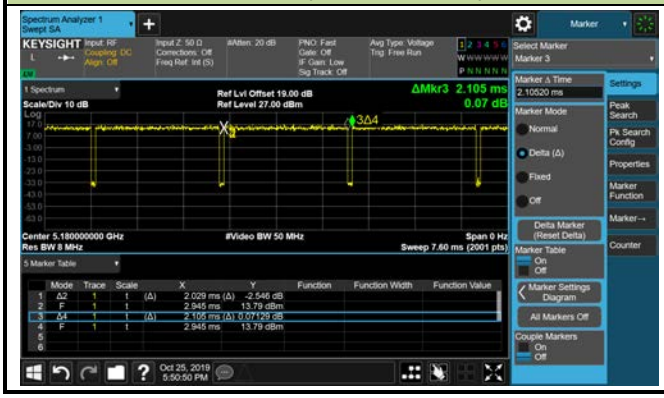
2.7. Description of Test Software

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

2.8. Duty Cycle

5GHz (NII) operation is possible in 20MHz, 40MHzand 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = average. 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
Wi-Fi Mode	802.11a	92.26%
	802.11n-HT20	95.01%
	802.11n-HT40	94.03%
	802.11ax-HE20	96.29%
	802.11ax-HE40	95.53%
	802.11ax-HE80	94.50%
Scan Antenna	802.11a	96.39%

Duty Cycle (T = Transmission Duration)	
802.11a(T = 1.430ms)	802.11n-HT20 (T = 5.430ms)
	
802.11n-HT40 (T = 5.430ms)	802.11ax-HE20 (T = 5.445ms)
	
802.11ax-HE40 (T = 5.445ms)	802.11ax-HE80 (T = 5.415ms)
	
Duty Cycle (T = Transmission Duration) – Scan Antenna	
802.11a (T = 2.029ms)	
	

2.9. Test Configuration

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

2.10. EMI Suppression Device(s)/Modifications

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

2.11. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013), and the guidance provided in KDB 789033 D02v02r01 were used in the measurement.

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

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, 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. An80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated 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."

- There are no provisions for special connection to an external antenna.

Conclusion:

The unit complies 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	2019/11/13
				1 year	2020/11/13
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2020/03/31
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2019/10/13
				1 year	2020/10/13
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2019/12/17
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2019/11/15
				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	2019/11/13
				1 year	2020/11/13
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2019/10/13
				1 year	2020/10/13
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2019/10/27
				1 year	2020/10/27
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2019/12/17
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2019/11/15
				1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2020/06/11
Temperature/Humidity Meter	Minggao	ETH529	MRTSUE06170	1 year	2019/12/13
				1 year	2020/12/13
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2020/04/30

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
15.407(a)	26dB Bandwidth	N/A	Conducted	Pass	Section7.2
15.407(e)	6dB Bandwidth	≥ 500kHz		Pass	Section 7.3
15.407(a)(1)(ii), (3)	Maximum Conducted Output Power	Refer to Section 7.5		Pass	Section 7.5
15.407(h)(1)	Transmit Power Control	≤ 24 dBm		N/A	Section 7.6
15.407(a)(1)(ii), (3), (5)	Peak Power Spectral Density	Refer to Section 7.7		Pass	Section 7.7
15.407(g)	Frequency Stability	± 20 ppm		Pass	Section 7.8
15.407(b)(1), (4)	Undesirable Emissions	Refer to Section 7.9 & 7.10	Radiated	Pass	Section 7.9 & 7.10
15.205, 15.209 15.407(b)(5), (6), (7)	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in15.209		Pass	
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.11

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 “26dB Bandwidth”, “99% Bandwidth”, “6dB Bandwidth” have been assessed MIMO transmission, and showed the worst test data in this report.
4) Test Item “Radiated Spurious Emission” have been showed the worst beam-forming test data in this report.
5) We have evaluated 802.11a/n/ac/ax mode and showed the test data of 802.11a/n/ax mode.
6) The power setting of CDD & Beam-Forming mode are the same.

7.2. 26dB Bandwidth Measurement

7.2.1.Test Limit

N/A

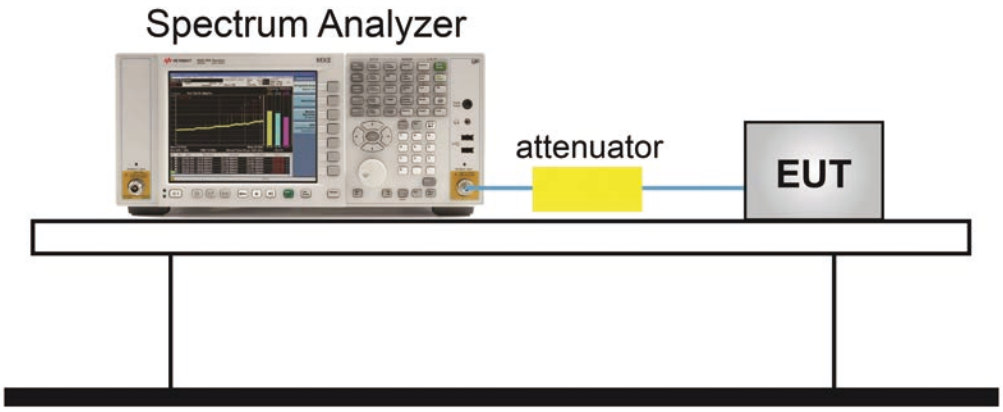
7.2.2.Test Procedure used

KDB 789033 D02v02r01-Section C.1

7.2.3.Test Setting

1. The analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 26. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediated power nulls in the fundamental emission.
2. RBW = approximately 1% of the emission bandwidth.
3. VBW ≥ 3×RBW.
4. Detector = Peak.
5. Trace mode = max hold.

7.2.4.Test Setup



7.2.5.Test Result

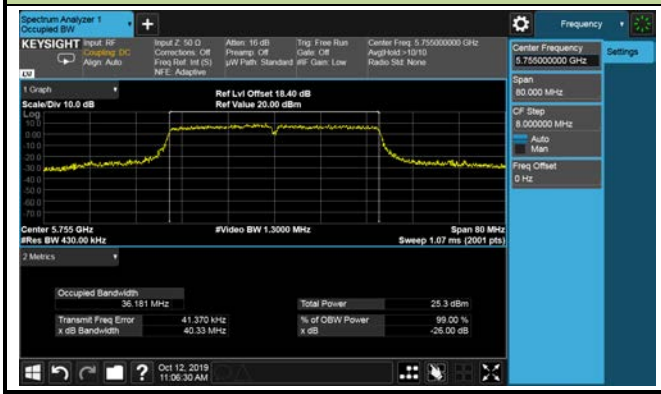
Product	HIT Dragonfly Access Point	Temperature	24°C
Test Engineer	Messiah Li	Relative Humidity	59%
Test Site	TR3	Test Date	2019/10/12
Configuration	WI-FI MODE	Test Item	26dB Bandwidth

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)
Ant 1 / Ant 1 + 2 + 3 + 4				
802.11a	6Mbps	36	5180	18.41
802.11a	6Mbps	44	5220	18.30
802.11a	6Mbps	48	5240	18.43
802.11a	6Mbps	149	5745	19.17
802.11a	6Mbps	157	5785	19.11
802.11a	6Mbps	165	5825	20.93
802.11n-HT20	MCS0	36	5180	19.78
802.11n-HT20	MCS0	44	5220	19.75
802.11n-HT20	MCS0	48	5240	20.19
802.11n-HT20	MCS0	149	5745	20.01
802.11n-HT20	MCS0	157	5785	20.52
802.11n-HT20	MCS0	165	5825	20.73
802.11n-HT40	MCS0	38	5190	39.12
802.11n-HT40	MCS0	46	5230	39.93
802.11n-HT40	MCS0	151	5755	40.33
802.11n-HT40	MCS0	159	5795	40.11

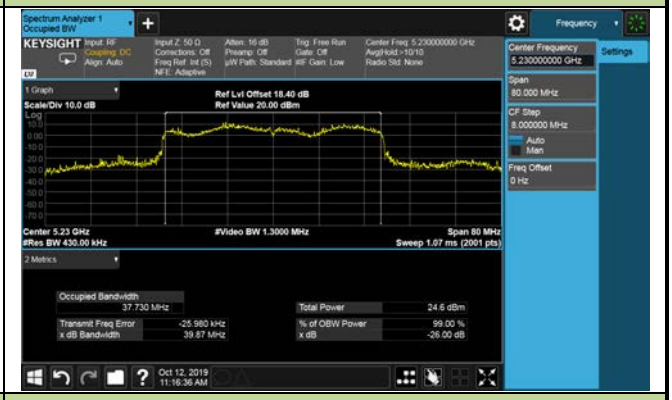
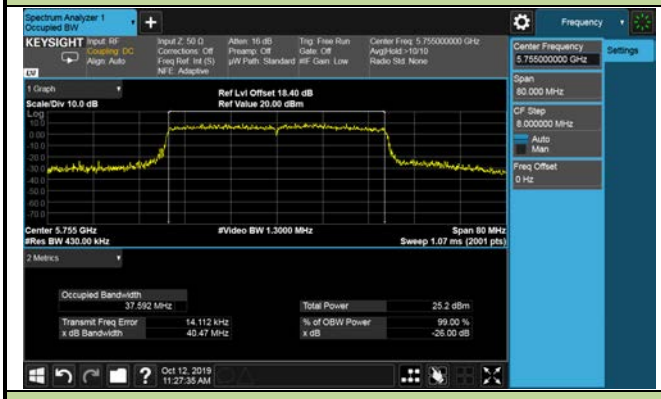
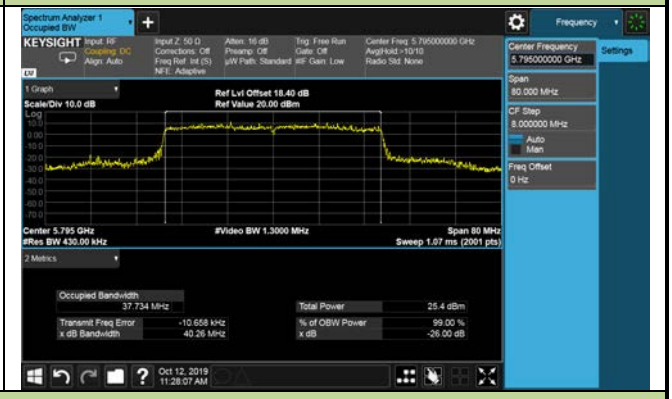
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)
Ant 1 / Ant 1 + 2 + 3 + 4				
802.11ax-HE20	MCS0	36	5180	20.32
802.11ax-HE20	MCS0	44	5220	20.62
802.11ax-HE20	MCS0	48	5240	20.35
802.11ax-HE20	MCS0	149	5745	20.78
802.11ax-HE20	MCS0	157	5785	22.48
802.11ax-HE20	MCS0	165	5825	21.95
802.11ax-HE40	MCS0	38	5190	39.95
802.11ax-HE40	MCS0	46	5230	39.87
802.11ax-HE40	MCS0	151	5755	40.47
802.11ax-HE40	MCS0	159	5795	40.26
802.11ax-HE80	MCS0	42	5210	80.54
802.11ax-HE80	MCS0	155	5775	81.91
Scan Antenna				
802.11a	6Mbps	36	5180	23.84
802.11a	6Mbps	44	5220	22.78
802.11a	6Mbps	48	5240	25.08
802.11a	6Mbps	149	5745	23.42
802.11a	6Mbps	157	5785	23.26
802.11a	6Mbps	165	5825	22.86

802.11a 26dB Bandwidth - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
Channel 48 (5240MHz)	Channel 149 (5745MHz)
Channel 157 (5785MHz)	Channel 165 (5825MHz)

802.11n-HT20 26dB Bandwidth - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
Channel 48 (5240MHz)	Channel 149 (5745MHz)
Channel 157 (5785MHz)	Channel 165 (5825MHz)

802.11n-HT40 26dB Bandwidth - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
Channel 151 (5755MHz)	Channel 159 (5795MHz)
	

802.11ax-HE20 26dB Bandwidth - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
Channel 48 (5240MHz)	Channel 149 (5745MHz)
Channel 157 (5785MHz)	Channel 165 (5825MHz)

802.11ax-HE40 26dB Bandwidth - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
	
Channel 151 (5755MHz)	Channel 159 (5795MHz)
	

802.11ax-HE80 26dB Bandwidth - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 42 (5210MHz)	Channel 155 (5775MHz)

802.11a 26dB Bandwidth – Scan Antenna	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
Channel 48 (5240MHz)	Channel 149 (5745MHz)
Channel 157 (5785MHz)	Channel 165 (5825MHz)

7.3. 6dB Bandwidth Measurement

7.3.1.Test Limit

The minimum 6dBbandwidth shall be at least 500 kHz.

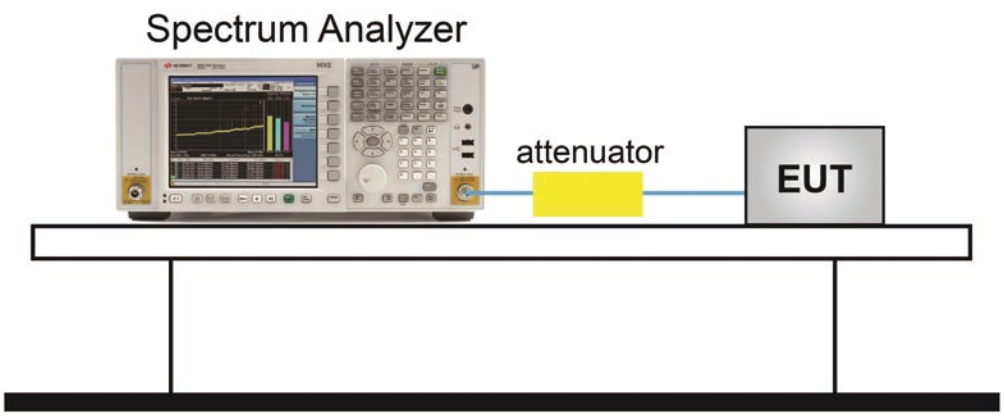
7.3.2.Test Procedure used

KDB 789033 D02v02r01 - Section C.2

7.3.3.Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 100 kHz.
3. VBW≧ 3 × RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

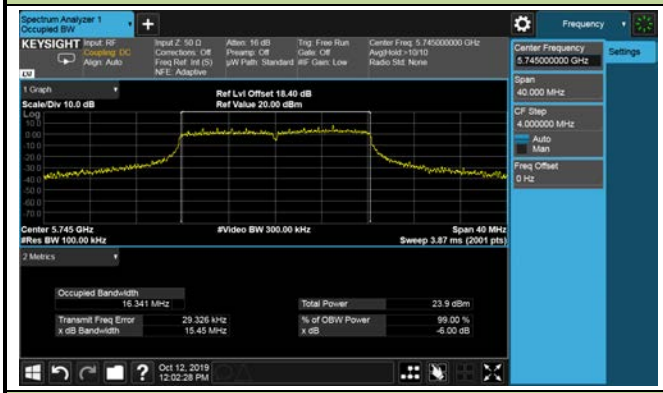
7.3.4.Test Setup



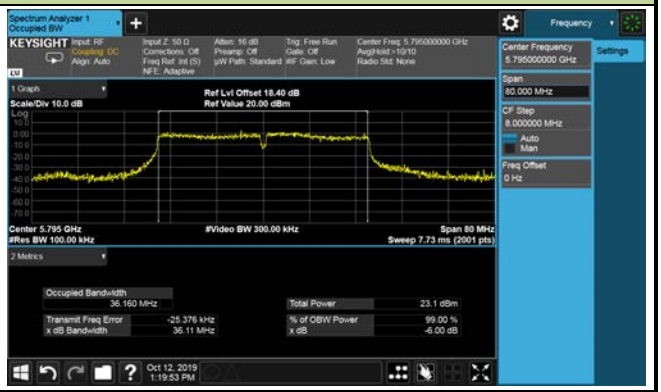
7.3.5.Test Result

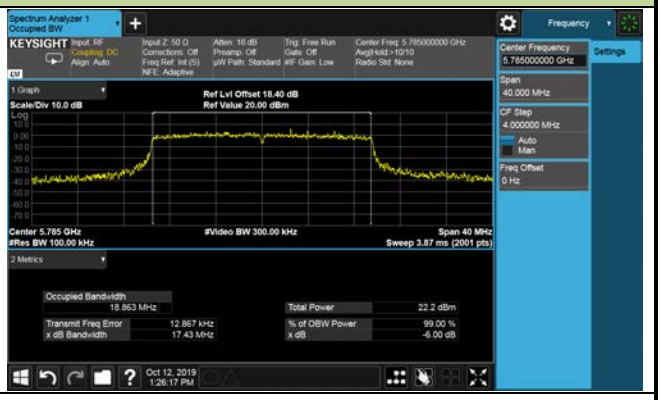
Product	HIT Dragonfly Access Point	Temperature	24°C
Test Engineer	Messiah Li	Relative Humidity	59%
Test Site	TR3	Test Date	2019/10/12
Configuration	WI-FI MODE	Test Item	6dB Bandwidth

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)
Ant 1 / Ant 1 + 2 + 3 + 4				
802.11a	6Mbps	149	5745	15.45
802.11a	6Mbps	157	5785	13.79
802.11a	6Mbps	165	5825	14.67
802.11n-HT20	MCS0	149	5745	16.15
802.11n-HT20	MCS0	157	5785	17.18
802.11n-HT20	MCS0	165	5825	16.55
802.11n-HT40	MCS0	151	5755	24.81
802.11n-HT40	MCS0	159	5795	36.11
802.11ax-HE20	MCS0	149	5745	18.84
802.11ax-HE20	MCS0	157	5785	17.43
802.11ax-HE20	MCS0	165	5825	18.96
802.11ax-HE40	MCS0	151	5755	34.71
802.11ax-HE40	MCS0	159	5795	38.09
802.11ax-HE80	MCS0	155	5775	73.05
Scan Antenna				
802.11a	6Mbps	149	5745	16.32
802.11a	6Mbps	157	5785	16.33
802.11a	6Mbps	165	5825	16.36

802.11a 6dB Bandwidth - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 149 (5745MHz)	Channel 157 (5785MHz)
	
Channel 165 (5825MHz)	

802.11n-HT20 6dB Bandwidth - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 149 (5745MHz)	Channel 157 (5785MHz)
Channel 165 (5825MHz)	

802.11n-HT40 6dB Bandwidth - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 151 (5755MHz)	Channel 159 (5795MHz)
	

802.11ax-HE20 6dB Bandwidth - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 149 (5745MHz)	Channel 157 (5785MHz)
	
Channel 165 (5825MHz)	

802.11ax-HE40 6dB Bandwidth - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 151 (5755MHz)	Channel 159 (5795MHz)
802.11ax-HE80 6dB Bandwidth - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 155 (5775MHz)	

802.11a 6dB Bandwidth – Scan Antenna	
Channel 149 (5745MHz)	Channel 157 (5785MHz)
Channel 165 (5825MHz)	

7.4. Output Power Measurement

7.4.1.Test Limit

For an indoor access point operating in the band 5.15-5.25GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm).

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

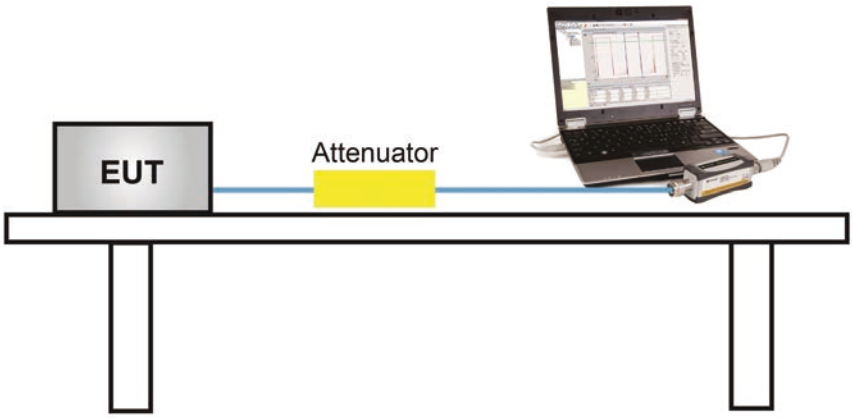
7.4.2.Test Procedure Used

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

7.4.3.Test Setting

Average power measurements were perform only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

7.4.4.Test Setup



7.4.5.Test Result

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.

Output power at various data rates for Ant 1 / Ant 1 + 2 + 3 + 4 port:

Test Mode	Bandwidth	Channel	Frequency (MHz)	Data Rate/ MCS	Average Power (dBm)
802.11a	20	36	5180	6Mbps	16.68
				24Mbps	16.39
				54Mbps	16.11
802.11n	20	36	5180	MCS0	17.28
				MCS4	17.03
				MCS8	16.77
802.11n	40	38	5190	MCS0	14.36
				MCS4	14.10
				MCS9	13.87
802.11ax	20	36	5180	MCS0	16.75
				MCS5	16.51
				MCS11	16.28
802.11ax	40	38	5190	MCS0	13.79
				MCS5	13.52
				MCS11	13.28
802.11ax	80	42	5210	MCS0	11.63
				MCS5	11.38
				MCS11	11.12

Product	HIT Dragonfly Access Point	Temperature	24°C
Test Engineer	Messiah Li	Relative Humidity	59%
Test Site	TR3	Test Date	2019/10/20
Configuration	WI-FI MODE	Test Item	Output Power

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Ant 4 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 1 + 2 + 3 + 4										
11a	6Mbps	36	5180	16.68	16.69	16.41	15.46	22.36	≤ 30.00	Pass
11a	6Mbps	44	5220	16.41	16.62	16.68	14.07	22.09	≤ 30.00	Pass
11a	6Mbps	48	5240	15.94	16.13	16.62	14.35	21.86	≤ 30.00	Pass
11a	6Mbps	149	5745	18.47	19.07	19.04	18.48	24.80	≤ 30.00	Pass
11a	6Mbps	157	5785	18.13	18.58	19.15	17.58	24.42	≤ 30.00	Pass
11a	6Mbps	165	5825	18.22	18.42	19.03	16.99	24.25	≤ 30.00	Pass
11n-HT20	MCS0	36	5180	17.28	17.34	17.38	15.01	22.88	≤ 30.00	Pass
11n-HT20	MCS0	44	5220	16.16	17.19	16.68	14.93	22.34	≤ 30.00	Pass
11n-HT20	MCS0	48	5240	16.55	17.12	16.17	14.59	22.22	≤ 30.00	Pass
11n-HT20	MCS0	149	5745	18.75	18.95	19.41	17.75	24.78	≤ 30.00	Pass
11n-HT20	MCS0	157	5785	18.06	18.75	18.48	17.78	24.30	≤ 30.00	Pass
11n-HT20	MCS0	165	5825	18.41	18.83	18.83	16.95	24.34	≤ 30.00	Pass
11n-HT40	MCS0	38	5190	14.36	14.59	14.73	12.24	20.11	≤ 30.00	Pass
11n-HT40	MCS0	46	5230	18.31	18.78	18.71	16.29	24.15	≤ 30.00	Pass
11n-HT40	MCS0	151	5755	17.93	18.58	18.46	17.34	24.13	≤ 30.00	Pass
11n-HT40	MCS0	159	5795	17.64	18.64	18.47	17.31	24.07	≤ 30.00	Pass
11ax-HE20	MCS0	36	5180	16.75	16.87	16.72	14.93	22.41	≤ 30.00	Pass
11ax-HE20	MCS0	44	5220	17.04	17.45	17.24	16.15	23.02	≤ 30.00	Pass
11ax-HE20	MCS0	48	5240	17.15	17.06	17.14	15.29	22.75	≤ 30.00	Pass
11ax-HE20	MCS0	149	5745	17.95	18.61	18.62	17.15	24.14	≤ 30.00	Pass
11ax-HE20	MCS0	157	5785	17.67	18.34	18.02	17.08	23.82	≤ 30.00	Pass
11ax-HE20	MCS0	165	5825	17.87	18.15	18.87	17.53	24.15	≤ 30.00	Pass
11ax-HE40	MCS0	38	5190	13.79	13.87	14.01	11.59	19.44	≤ 30.00	Pass
11ax-HE40	MCS0	46	5230	18.01	18.53	18.03	16.32	23.82	≤ 30.00	Pass
11ax-HE40	MCS0	151	5755	17.89	18.61	18.29	16.98	24.00	≤ 30.00	Pass
11ax-HE40	MCS0	159	5795	17.63	18.56	18.73	17.65	24.19	≤ 30.00	Pass

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Ant 4 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 1 + 2 + 3 + 4										
11ax-HE80	MCS0	42	5210	11.63	11.69	11.89	9.44	17.29	≤ 30.00	Pass
11ax-HE80	MCS0	155	5775	17.45	17.68	17.79	16.18	23.34	≤ 30.00	Pass

Note: Total Average Power (dBm) = $10*\log\{10^{(\text{Ant 1 Average Power}/10)} + 10^{(\text{Ant 2 Average Power}/10)} + 10^{(\text{Ant 3 Average Power}/10)} + 10^{(\text{Ant 4 Average Power}/10)}\}$.

Product	HIT Dragonfly Access Point	Temperature	23°C
Test Engineer	Andy Zhu	Relative Humidity	54%
Test Site	TR3	Test Date	2019/10/05
Configuration	Scan Mode	Test Item	Output Power

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Average Power (dBm)	Limit (dBm)	Result
11a	6Mbps	36	5180	10.50	≤ 30.00	Pass
11a	6Mbps	44	5220	10.30	≤ 30.00	Pass
11a	6Mbps	48	5240	10.20	≤ 30.00	Pass
11a	6Mbps	149	5745	10.00	≤ 30.00	Pass
11a	6Mbps	157	5785	9.90	≤ 30.00	Pass
11a	6Mbps	165	5825	10.80	≤ 30.00	Pass

7.5. Transmit Power Control

7.5.1.Test Limit

The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30dBm.

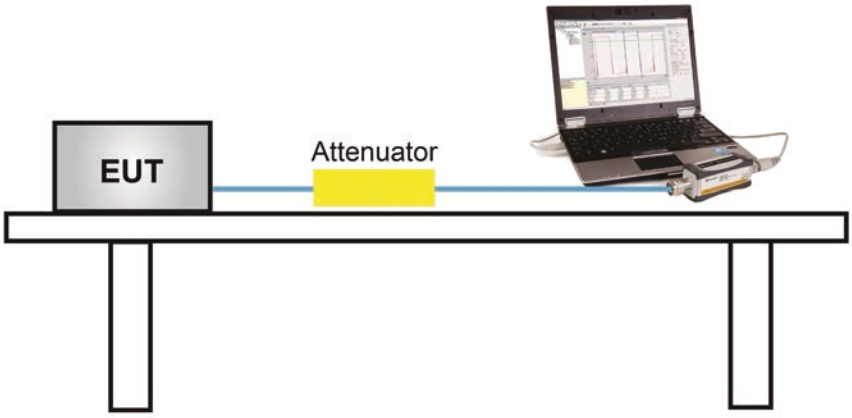
7.5.2.Test Procedure Used

KDB 789033 D02v01- Section E)3)b) Method PM-G

7.5.3.Test Setting

Average power measurements were perform only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

7.5.4.Test Setup



7.5.5.Test Result

A TPC mechanism is not required for systems operating in frequency band 5150 ~ 5250 MHz & 5725 ~ 5850 MHz.

7.6. Power Spectral Density Measurement

7.6.1.Test Limit

For the band 5.15-5.25 GHz, the e.i.r.p. spectral density shall not exceed 17dBm in any 1.0 MHz band.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

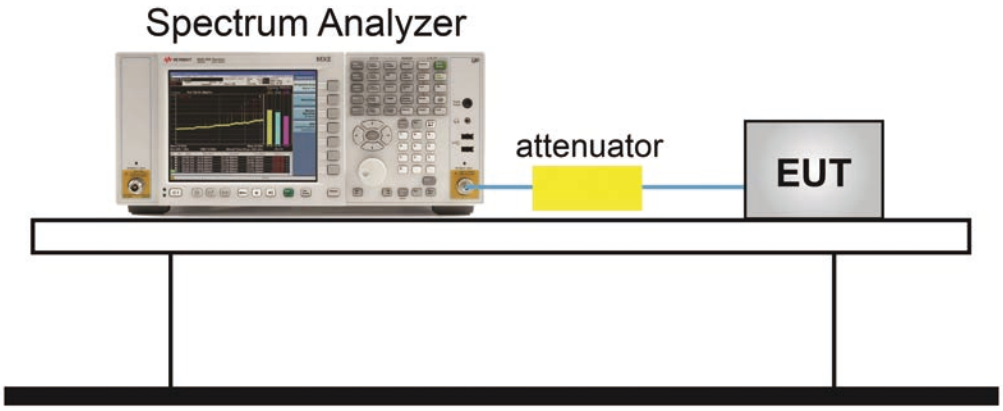
7.6.2.Test Procedure Used

KDB 789033 D02v02r01 - Section F

7.6.3.Test Setting

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz, if measurement bandwidth of Maximum PSD is specified in 500 kHz, RBW = 100 kHz
4. VBW = 3MHz
5. Number of sweep points ≥ 2 × (span / RBW)
6. Detector = power averaging (Average)
7. Sweep time = auto
8. Trigger = free run
9. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
10. Add 10*log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add 10*log(1/0.25) = 6 dB if the duty cycle is 25 percent.
11. When the measurement bandwidth of Maximum PSD is specified in 500 kHz, add a constant factor 10*log(500kHz/100kHz) = 6.99 dB to the measured result.

7.6.4.Test Setup



7.6.5.Test Result

Product	HIT Dragonfly Access Point	Temperature	22°C
Test Engineer	Messiah Li	Relative Humidity	54%
Test Site	TR3	Test Date	2019/10/12
Configuration	WI-FI MODE	Test Item	Power Spectral Density

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 1 PSD (dBm/ MHz)	Ant 2 PSD (dBm/ MHz)	Ant 3 PSD (dBm/ MHz)	Ant 4 PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/MHz)	Result
11a	6Mbps	36	5180	5.91	7.56	6.55	5.71	92.26	12.87	≤ 13.48	Pass
11a	6Mbps	44	5220	6.42	8.07	6.07	5.78	92.26	13.05	≤ 13.48	Pass
11a	6Mbps	48	5240	5.97	6.64	8.14	4.11	92.26	12.82	≤ 13.48	Pass
11n-HT20	MCS0	36	5180	6.91	7.45	6.96	4.12	95.01	12.78	≤ 13.48	Pass
11n-HT20	MCS0	44	5220	5.09	7.82	7.73	5.05	95.01	12.87	≤ 13.48	Pass
11n-HT20	MCS0	48	5240	5.42	6.62	7.59	4.01	95.01	12.35	≤ 13.48	Pass
11n-HT40	MCS0	38	5190	-0.04	1.45	2.49	-0.28	94.03	7.34	≤ 13.48	Pass
11n-HT40	MCS0	46	5230	4.48	6.24	6.28	3.24	94.03	11.53	≤ 13.48	Pass
11ax-HE20	MCS0	36	5180	5.98	7.75	6.58	6.06	96.29	12.83	≤ 13.48	Pass
11ax-HE20	MCS0	44	5220	6.31	7.18	7.90	5.28	96.29	12.96	≤ 13.48	Pass
11ax-HE20	MCS0	48	5240	6.11	7.99	7.89	4.76	96.29	13.07	≤ 13.48	Pass
11ax-HE40	MCS0	38	5190	-0.05	1.55	2.58	-0.75	95.53	7.25	≤ 13.48	Pass
11ax-HE40	MCS0	46	5230	4.35	6.67	6.39	3.73	95.53	11.69	≤ 13.48	Pass
11ax-HE80	MCS0	42	5210	-4.95	-3.78	-3.45	-5.61	94.50	1.91	≤ 13.48	Pass

Note 1: When EUT duty cycle ≥ 98%, the total PSD (dBm/MHz) = $10*\log\{10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} + 10^{(\text{Ant 4 PSD}/10)}\}$ (dBm/MHz).

Note 2: When EUT duty cycle < 98%, the total PSD (dBm/MHz) = $10*\log\{10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)} + 10^{(\text{Ant 4 PSD}/10)}\}$ (dBm/MHz) + 10*log(1/duty cycle)

Note 3: PSD Limit (dBm/MHz) = 17dBm/MHz - (9.52dBi - 6dBi) = 13.48dBm/MHz.

Product	HIT Dragonfly Access Point	Temperature	22°C
Test Engineer	Messiah Li	Relative Humidity	54%
Test Site	TR3	Test Date	2019/10/12
Configuration	WI-FI MODE	Test Item	Power Spectral Density

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 1 PSD (dBm/ 100kHz)	Ant 2 PSD (dBm/ 100kHz)	Ant 3 PSD (dBm/ 100kHz)	Ant 4 PSD (dBm/ 100kHz)	Duty Cycle (%)	Constant Factor	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
11a	6Mbps	149	5745	-1.95	-2.16	-2.19	-2.21	92.26	6.99	11.24	≤26.48	Pass
11a	6Mbps	157	5785	-2.42	-3.05	-1.36	-2.12	92.26	6.99	11.17	≤26.48	Pass
11a	6Mbps	165	5825	-1.97	-2.44	-1.85	-1.67	92.26	6.99	11.39	≤26.48	Pass
11n-HT20	MCS0	149	5745	-2.29	-2.52	-3.26	-2.34	95.01	6.99	10.64	≤26.48	Pass
11n-HT20	MCS0	157	5785	-3.21	-2.50	-2.67	-2.18	95.01	6.99	10.61	≤26.48	Pass
11n-HT20	MCS0	165	5825	-2.66	-2.53	-2.84	-2.17	95.01	6.99	10.69	≤26.48	Pass
11n-HT40	MCS0	151	5755	-5.28	-5.27	-5.51	-5.56	94.03	6.99	7.87	≤26.48	Pass
11n-HT40	MCS0	159	5795	-5.99	-5.91	-5.96	-5.83	94.03	6.99	7.36	≤26.48	Pass
11ax-HE20	MCS0	149	5745	-2.99	-3.38	-2.80	-2.76	96.29	6.99	10.20	≤26.48	Pass
11ax-HE20	MCS0	157	5785	-3.50	-4.10	-3.44	-2.93	96.29	6.99	9.70	≤26.48	Pass
11ax-HE20	MCS0	165	5825	-3.52	-3.74	-3.93	-4.06	96.29	6.99	9.37	≤26.48	Pass
11ax-HE40	MCS0	151	5755	-5.74	-5.66	-5.83	-6.09	95.53	6.99	7.38	≤26.48	Pass
11ax-HE40	MCS0	159	5795	-6.59	-6.39	-6.68	-6.76	95.53	6.99	6.61	≤26.48	Pass
11ax-HE80	MCS0	155	5775	-9.85	-9.94	-9.45	-9.31	94.50	6.99	3.62	≤26.48	Pass

Note 1: When EUT duty cycle ≥ 98%, the total PSD (dBm/500KHz) = 10*log {$10^{(\text{Ant 1 PSD/10})}$ + $10^{(\text{Ant 2 PSD/10})}$ + $10^{(\text{Ant 3 PSD/10})}$ + $10^{(\text{Ant 4 PSD/10})}$} (dBm/100KHz) + Constant Factor.

Note 2: When EUT duty cycle < 98%, the total PSD (dBm/500KHz) = 10*log {$10^{(\text{Ant 1 PSD/10})}$ + $10^{(\text{Ant 2 PSD/10})}$ + $10^{(\text{Ant 3 PSD/10})}$ + $10^{(\text{Ant 4 PSD/10})}$} (dBm/100KHz) + Constant Factor + 10*log (1/Duty Cycle).

Note 3: PSD Limit (dBm/500kHz) = 30dBm/500kHz - (9.52dBi - 6dBi) =26.48dBm/500kHz.

Product	HIT Dragonfly Access Point	Temperature	22°C
Test Engineer	Messiah Li	Relative Humidity	54%
Test Site	TR3	Test Date	2019/10/12
Configuration	Scan Mode	Test Item	Power Spectral Density

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	AVGPSD (dBm / MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/MHz)	Result
11a	6Mbps	36	5180	1.11	96.39	1.27	≤ 17	Pass
11a	6Mbps	44	5220	0.32	96.39	0.48	≤ 17	Pass
11a	6Mbps	48	5240	0.11	96.39	0.27	≤ 17	Pass

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

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

Product	HIT Dragonfly Access Point	Temperature	22°C
Test Engineer	Messiah Li	Relative Humidity	54%
Test Site	TR3	Test Date	2019/10/12
Configuration	Scan Mode	Test Item	Power Spectral Density

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	AVGPSD (dBm / 100kHz)	Duty Cycle (%)	Constant Factor	Total AVGPSD (dBm / 500kHz)	Limit (dBm / 500kHz)	Result
11a	6Mbps	149	5745	-11.46	96.39	6.99	-4.31	≤ 30	Pass
11a	6Mbps	157	5785	-10.33	96.39	6.99	-3.18	≤ 30	Pass
11a	6Mbps	165	5825	-9.68	96.39	6.99	-2.53	≤ 30	Pass

Note 1: When EUT duty cycle ≥ 98%, Total PSD (dBm/500kHz) = AVGPSD (dBm / 100kHz) + Constant Factor.

Note 2: When EUT duty cycle < 98%, Total PSD (dBm/500kHz) = AVGPSD (dBm / 100kHz) + 10*log(1/duty cycle) + Constant Factor.

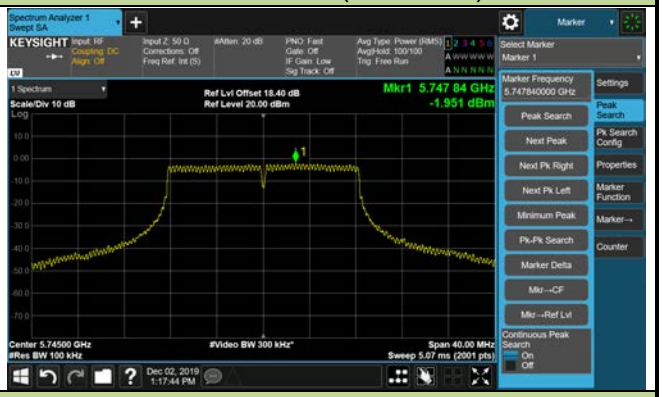
802.11a Power Spectral Density - Ant 1 / Ant 1 + 2 + 3 + 4

Channel 36 (5180MHz)

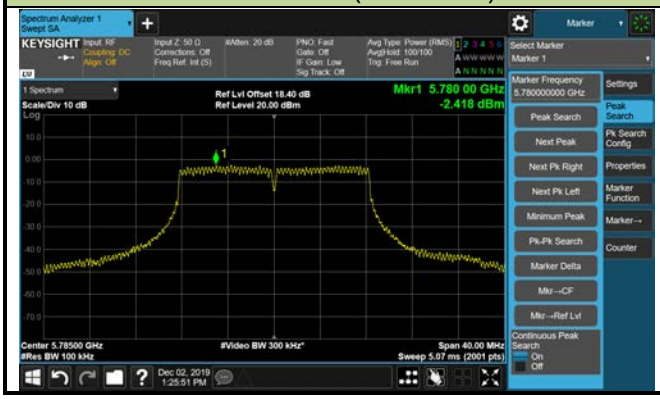
Channel 44 (5220MHz)

Channel 48 (5240MHz)

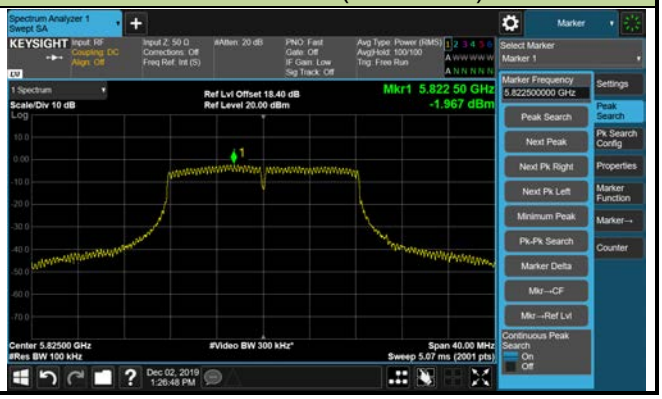
Channel 149 (5745MHz)

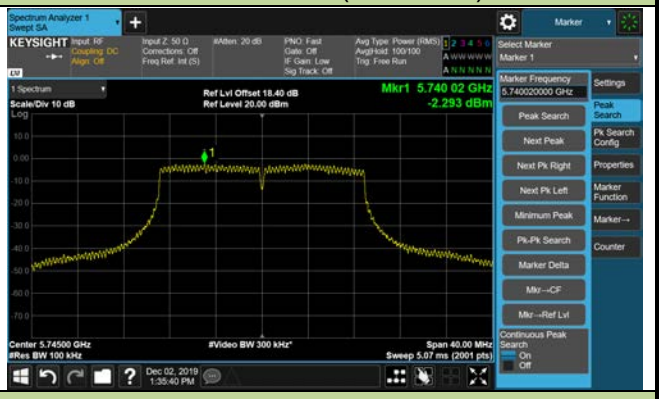
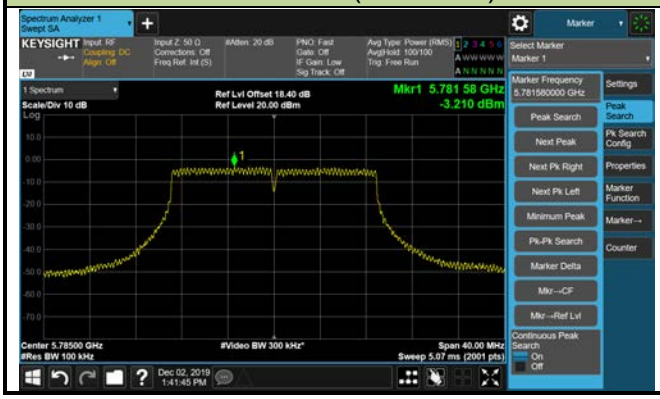
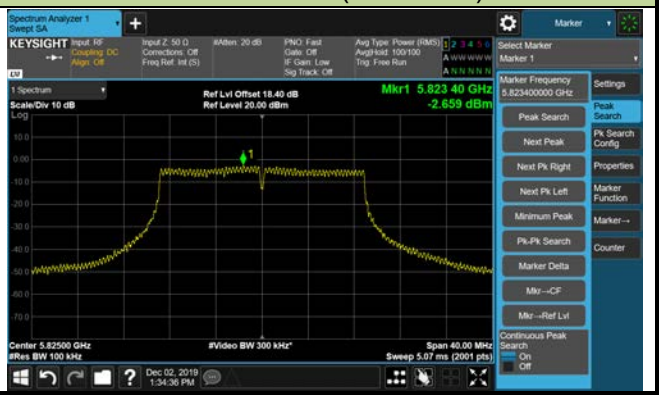


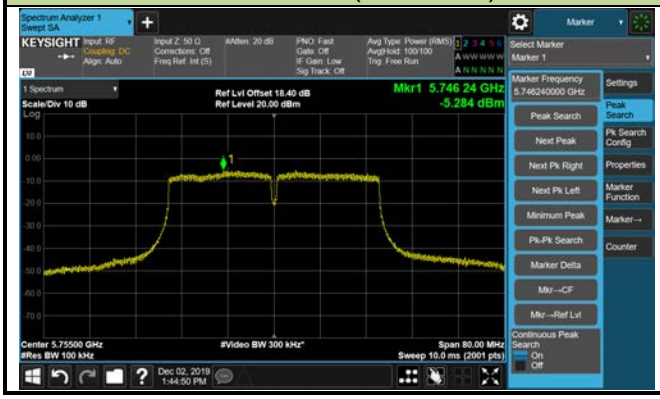
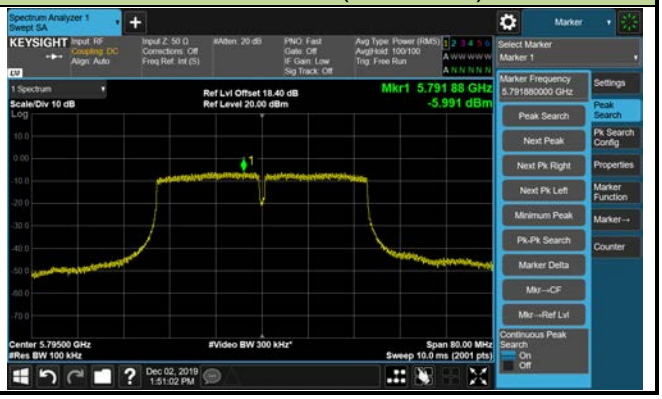
Channel 157 (5785MHz)

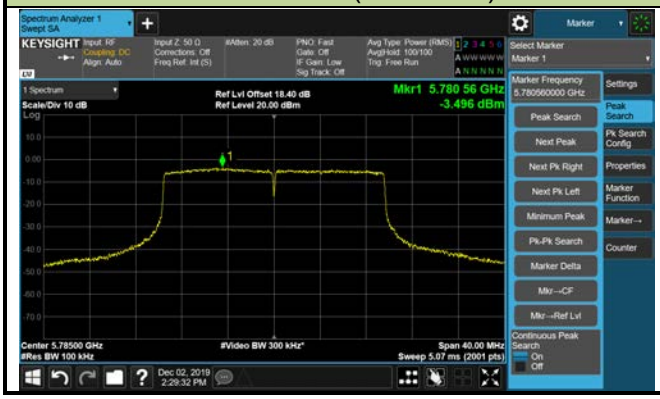


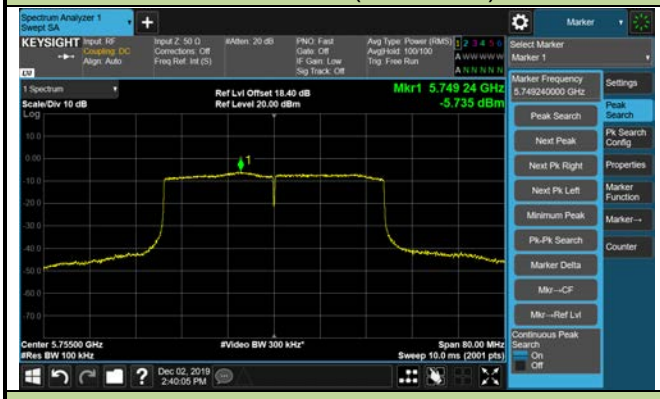
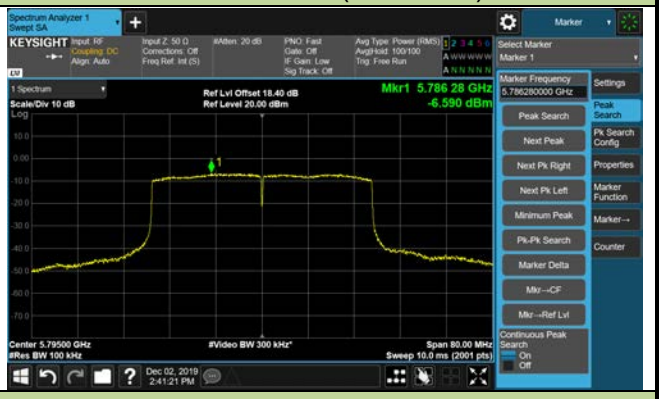
Channel 165 (5825MHz)



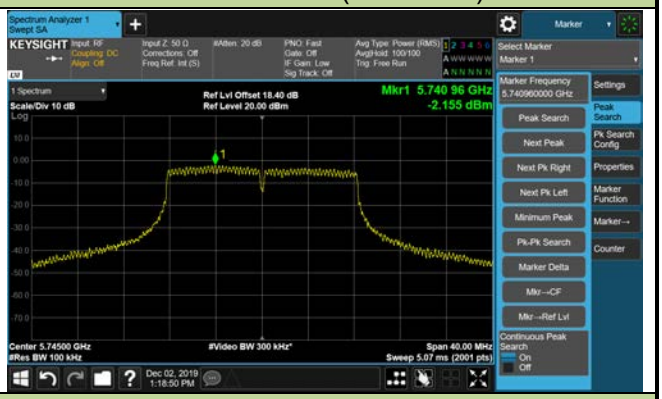
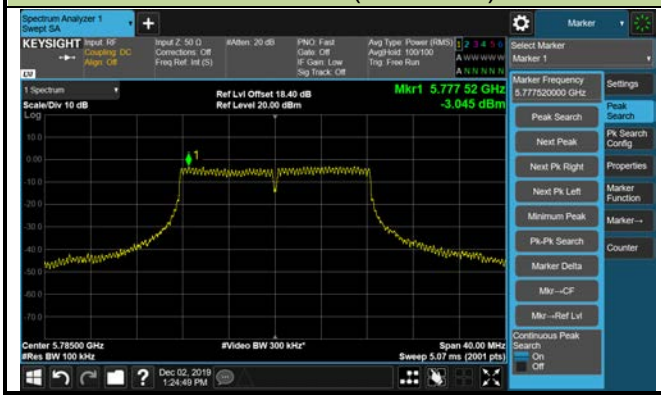
802.11n-HT20 Power Spectral Density - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
Channel 48 (5240MHz)	Channel 149 (5745MHz)
	
Channel 157 (5785MHz)	Channel 165 (5825MHz)
	

802.11n-HT40 Power Spectral Density - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
Channel 151 (5755MHz)	Channel 159 (5795MHz)
	

802.11ax-HE20 Power Spectral Density - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
Channel 48 (5240MHz)	Channel 149 (5745MHz)
Channel 157 (5785MHz)	Channel 165 (5825MHz)
	

802.11ax-HE40 Power Spectral Density - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
Channel 151 (5755MHz)	Channel 159 (5795MHz)
	

802.11ax-HE80 Power Spectral Density - Ant 1 / Ant 1 + 2 + 3 + 4	
Channel 42 (5210MHz)	Channel 155 (5775MHz)

802.11a Power Spectral Density - Ant 2 / Ant 1 + 2 + 3 + 4	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
Channel 48 (5240MHz)	Channel 149 (5745MHz)
	
Channel 157 (5785MHz)	Channel 165 (5825MHz)
	

802.11n-HT20 Power Spectral Density - Ant 2 / Ant 1 + 2 + 3 + 4

Channel 36 (5180MHz)

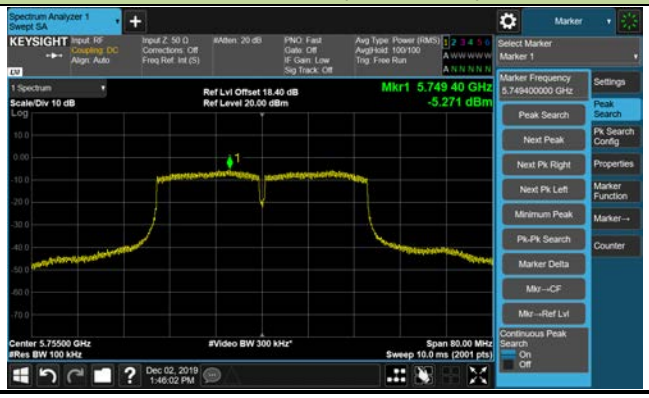
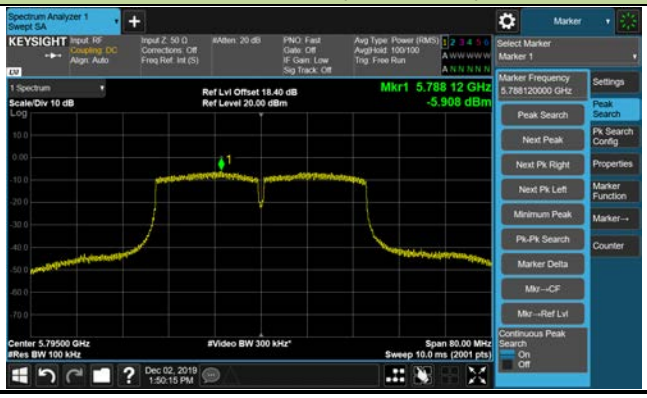
Channel 44 (5220MHz)

Channel 48 (5240MHz)

Channel 149 (5745MHz)

Channel 157 (5785MHz)

Channel 165 (5825MHz)

802.11n-HT40 Power Spectral Density - Ant 2 / Ant 1 + 2 + 3 + 4	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
Channel 151 (5755MHz)	Channel 159 (5795MHz)
	

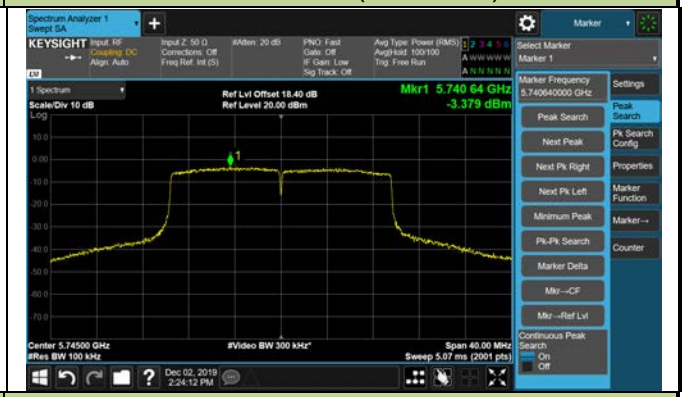
802.11ax-HE20 Power Spectral Density - Ant 2 / Ant 1 + 2 + 3 + 4

Channel 36 (5180MHz)

Channel 44 (5220MHz)

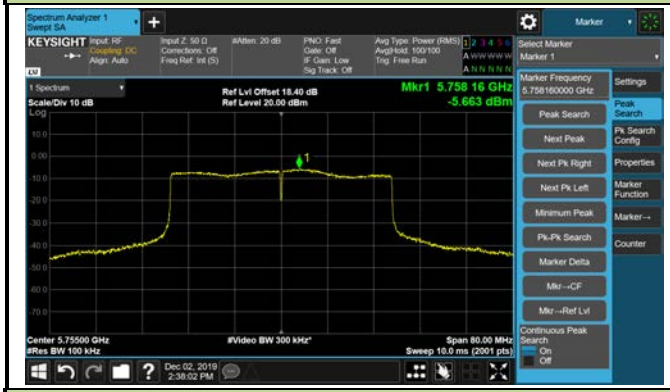
Channel 48 (5240MHz)

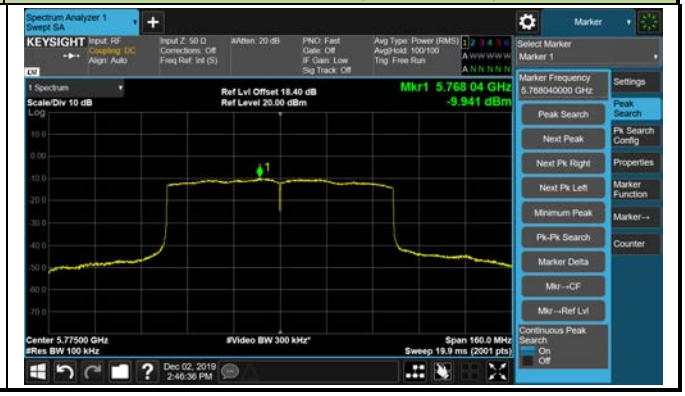
Channel 149 (5745MHz)

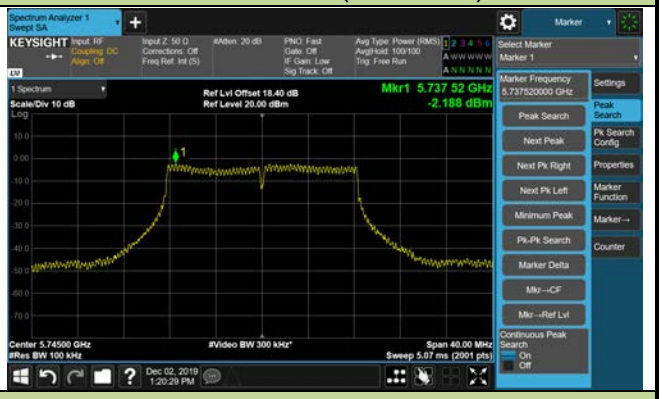
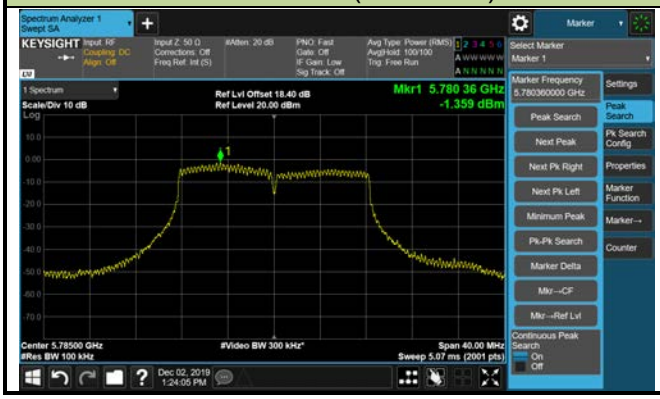


Channel 157 (5785MHz)

Channel 165 (5825MHz)

802.11ax-HE40 Power Spectral Density - Ant 2 / Ant 1 + 2 + 3 + 4	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
Channel 151 (5755MHz)	Channel 159 (5795MHz)
	

802.11ax-HE80 Power Spectral Density - Ant 2 / Ant 1 + 2 + 3 + 4	
Channel 42 (5210MHz)	Channel 155 (5775MHz)
	

802.11a Power Spectral Density - Ant 3 / Ant 1 + 2 + 3 + 4	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
Channel 48 (5240MHz)	Channel 149 (5745MHz)
	
Channel 157 (5785MHz)	Channel 165 (5825MHz)
	

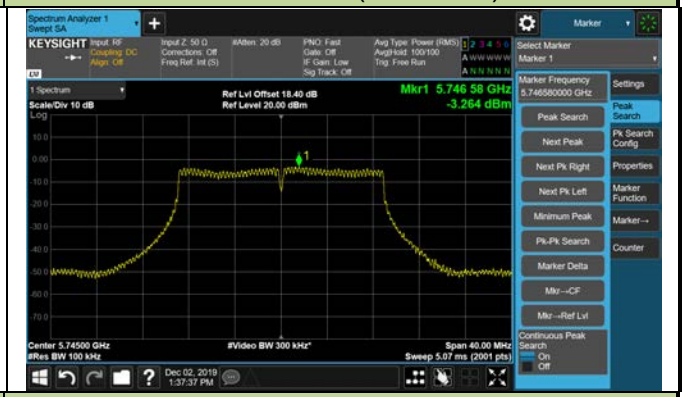
802.11n-HT20 Power Spectral Density - Ant 3 / Ant 1 + 2 + 3 + 4

Channel 36 (5180MHz)

Channel 44 (5220MHz)

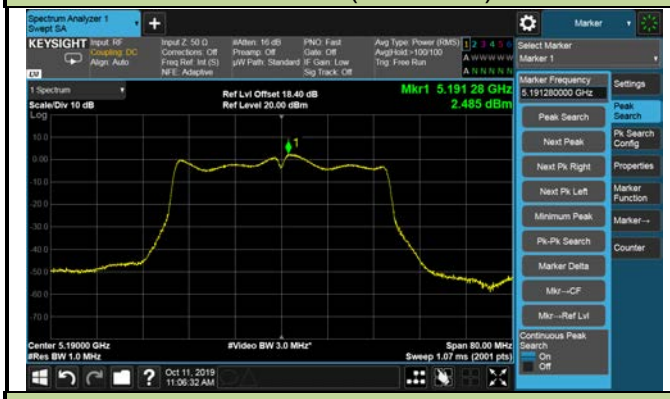
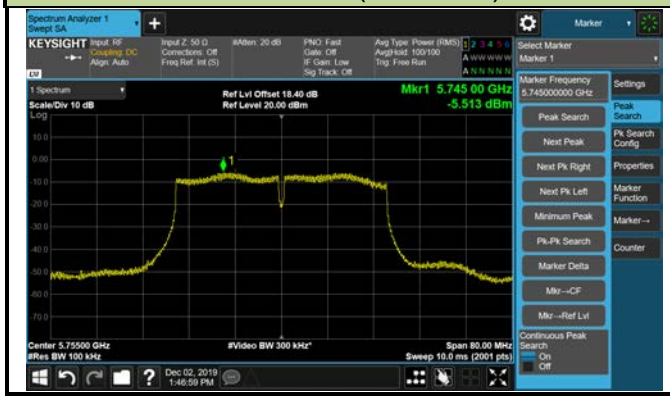
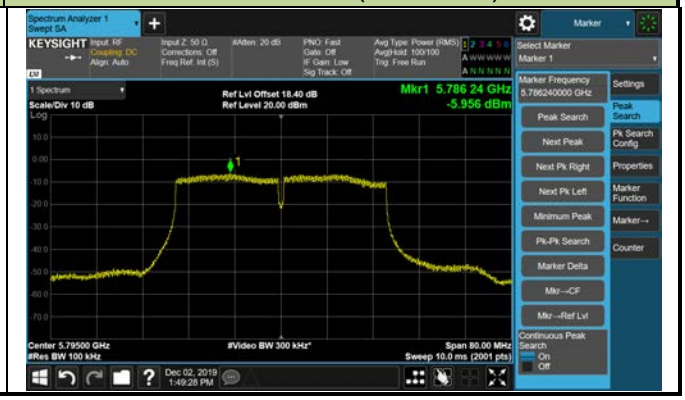
Channel 48 (5240MHz)

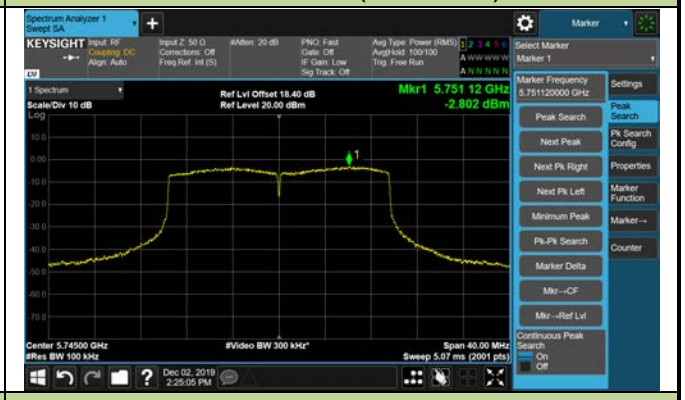
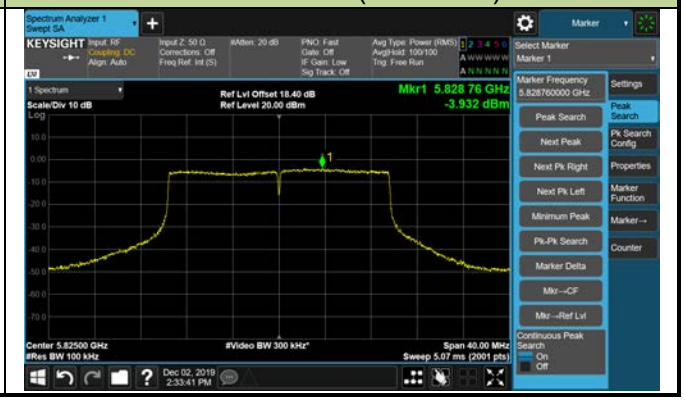
Channel 149 (5745MHz)

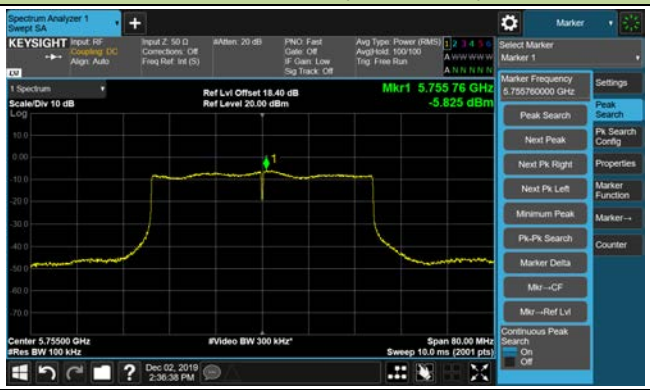
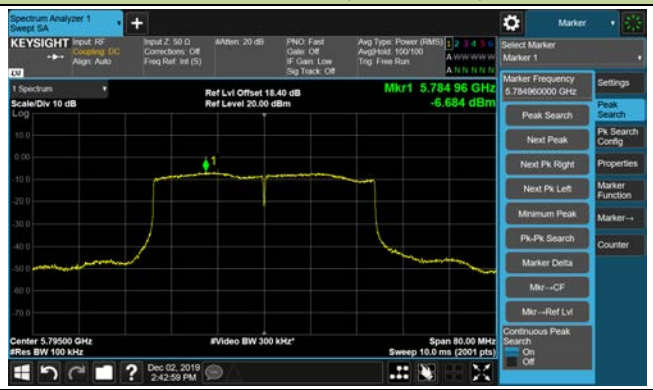


Channel 157 (5785MHz)

Channel 165 (5825MHz)

802.11n-HT40 Power Spectral Density - Ant 3 / Ant 1 + 2 + 3 + 4	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
	
Channel 151 (5755MHz)	Channel 159 (5795MHz)
	

802.11ax-HE20 Power Spectral Density - Ant 3 / Ant 1 + 2 + 3 + 4	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
Channel 48 (5240MHz)	Channel 149 (5745MHz)
	
Channel 157 (5785MHz)	Channel 165 (5825MHz)
	

802.11ax-HE40 Power Spectral Density - Ant 3 / Ant 1 + 2 + 3 + 4	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
Channel 151 (5755MHz)	Channel 159 (5795MHz)
	
802.11ax-HE80 Power Spectral Density - Ant 3 / Ant 1 + 2 + 3 + 4	
Channel 42 (5210MHz)	Channel 155 (5775MHz)