

TEST REPORT

FCC ID: 2AOKI-WIFI2Q379UWP1

Product: WiFi Module

Model No.: WIFI-2-Q379UWP1

Additional Model No.: N/A

Trade Mark: N/A

Report No.: TCT190312E044

Issued Date: Apr. 18, 2019

Issued for:

Sichuan AI-Link Technology Co., Ltd.

Anzhou, Industrial park, Mianyang, Sichuan, China

Issued By:

Shenzhen Tongce Testing Lab.

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Appendix A: Photographs of Test Setup

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1. Test Certification

Product:	WiFi Module
Model No.:	WIFI-2-Q379UWP1
Additional Model No.:	N/A
Trade Mark:	N/A
Applicant:	Sichuan AI-Link Technology Co., Ltd.
Address:	Anzhou, Industrial park, Mianyang, Sichuan, China
Manufacturer:	Sichuan AI-Link Technology Co., Ltd.
Address:	Anzhou, Industrial park, Mianyang, Sichuan, China
Date of Test:	Mar. 13, 2019 – Apr. 17, 2019
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407: 2016 KDB662911 D01 Multiple Transmitter Output v02r01r01 KDB789033 D02 General U-NII Test Procedures New Rules v02r01r01

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:



Brews Xu

Date:

Apr. 17, 2019

Reviewed By:



Beryl Zhao

Date:

Apr. 18, 2019

Approved By:



Tomsin

Date:

Apr. 18, 2019

2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Maximum Conducted Output Power	§15.407(a) §2.1046	PASS
6dB Emission Bandwidth	§15.407(a) §2.1049	PASS
26dB Emission Bandwidth & 99% Occupied Bandwidth	§15.407(a) §2.1049	PASS
Power Spectral Density	§15.407(a)	PASS
Restricted Bands around fundamental frequency	§15.407(a)	PASS
Radiated Emission	§15.407(a) §2.1053	PASS
Frequency Stability	§15.407(g) §2.1055	PASS

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

3. EUT Description

Product:	WiFi Module
Model No.:	WIFI-2-Q379UWP1
Additional Model No.:	N/A
Trade Mark:	N/A
Hardware Version:	JUI7.820.0195-5
Software Version:	QDART_WPSP.WIN.1.0 Installer-00004.3
Operation Frequency:	Band 1: 5180 MHz -5240 MHz Band 2A: 5260 MHz -5320 MHz Band 2C: 5500 MHz -5720 MHz Band 3: 5745 MHz -5825 MHz
Channel Bandwidth:	802.11a: 20MHz 802.11n: 20MHz, 40MHz 802.11ac: 20MHz, 40MHz, 80MHz
Modulation Technology:	Orthogonal Frequency Division Multiplexing(OFDM)
Modulation Type	256QAM, 64QAM, 16QAM, BPSK, QPSK
Antenna Type:	Integral Antenna
Antenna Gain:	2dBi
Power Supply:	DC 5V

Test Frequency each of channel

Band 1

20MHz		40MHz		80MHz	
Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180	38	5190	42	5210
40	5200	46	5230		
48	5240				

Band 2A

20MHz		40MHz		80MHz	
Channel	Frequency	Channel	Frequency	Channel	Frequency
52	5260	54	5270	58	5290
60	5300	62	5310		
64	5320				

Band 2C

20MHz		40MHz		80MHz	
Channel	Frequency	Channel	Frequency	Channel	Frequency
100	5500	102	5510	106	5530
120	5600	118	5590	138	5690
144	5720	142	5710		

Band 3

20MHz		40MHz		80MHz	
Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745	151	5755	155	5775
157	5785	159	5795		
165	5825				

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

4. General Information

4.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 100%)
The sample was placed 0.8m/1.5m for blow/above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	Data rate
802.11a	6 Mbps
802.11n(HT20)	6.5 Mbps
802.11n(HT40)	13.5 Mbps
802.11ac(VHT20)	6.5 Mbps
802.11ac(VHT40)	13.5 Mbps
802.11ac(VHT80)	29.3 Mbps
Final Test Mode:	
Operation mode:	Keep the EUT in continuous transmitting with modulation

4.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Notebook	G485	LB00402300	/	Lenovo

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. For conducted measurements (Output Power, Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

5. Facilities and Accreditations

5.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

5.2. Location

Shenzhen Tongce Testing Lab

Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

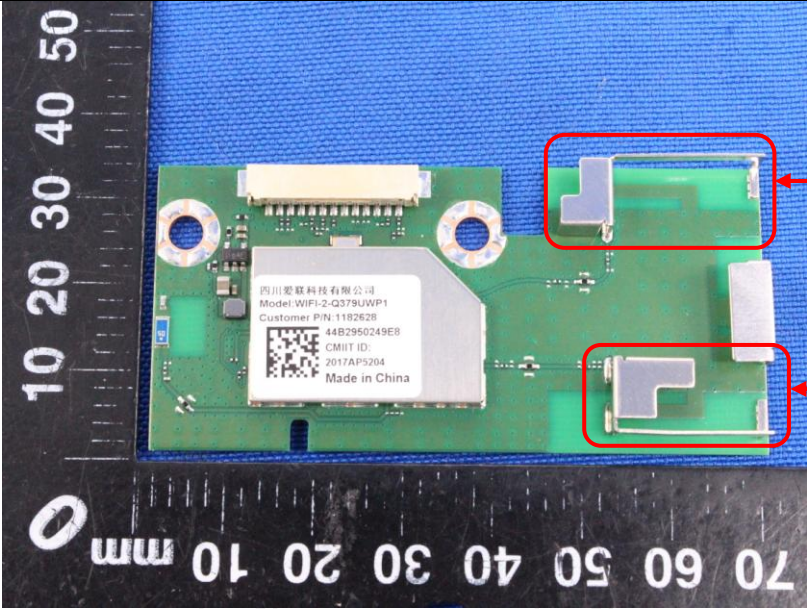
5.3. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	$\pm 2.56\text{dB}$
2	RF power, conducted	$\pm 0.12\text{dB}$
3	Spurious emissions, conducted	$\pm 0.11\text{dB}$
4	All emissions, radiated(<1G)	$\pm 3.92\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^{\circ}\text{C}$
7	Humidity	$\pm 1.0\%$

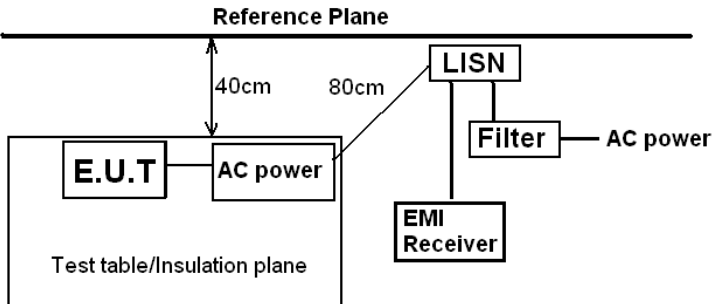
6. Test Results and Measurement Data

6.1. Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
E.U.T Antenna:	
The EUT has two Integral antennas, and the best case gains of the both antennas are 2dBi.	
	

6.2. Conducted Emission

6.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.10:2013														
Frequency Range:	150 kHz to 30 MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limits:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
Test Setup:	Reference Plane  Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m														
Test Mode:	Tx Mode														
Test Procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.														
Test Result:	PASS														

6.2.2. Test Instruments

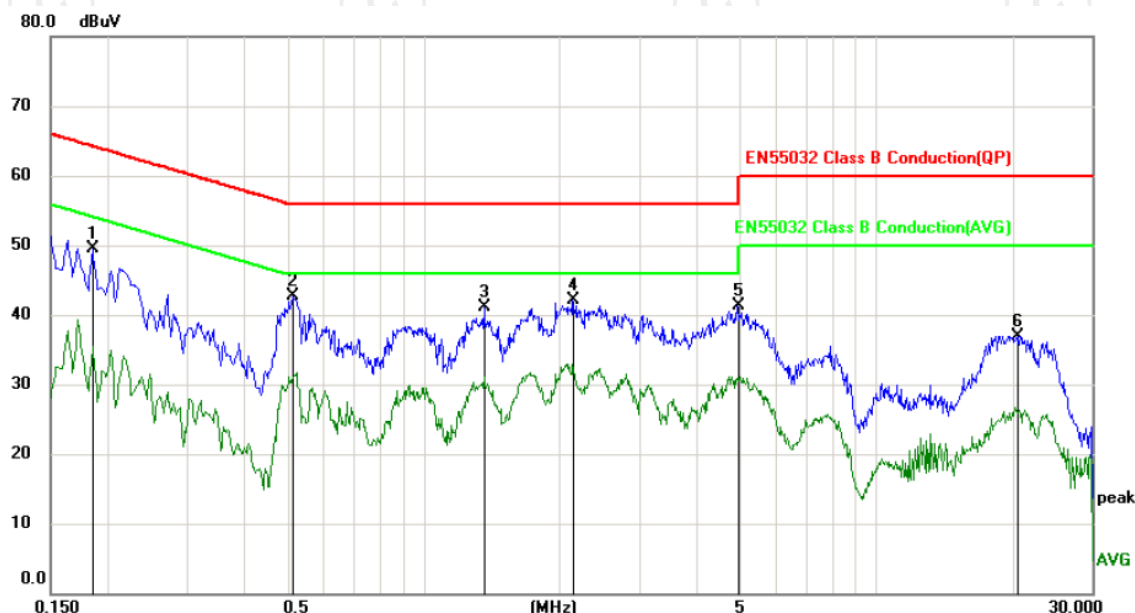
Conducted Emission Shielding Room Test Site (843)				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	R&S	ESPI	101402	Jul. 17, 2019
LISN	Schwarzbeck	NSLK 8126	8126453	Sep. 20, 2019
Coax cable (9KHz-30MHz)	TCT	CE-05	N/A	Sep. 16, 2019
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.2.3. Test data

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site: Limit: EN55032 Class B Conduction(QP) Phase: **L1** Temperature: 25
Power: Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBμV	Correct Factor dB	Measure- ment dBμV	Limit dBμV	Over dB	Detector	Comment
1		0.1859	49.32	0.22	49.54	64.22	-14.68	peak	
2	*	0.5144	42.41	0.22	42.63	56.00	-13.37	peak	
3		1.3604	40.70	0.39	41.09	56.00	-14.91	peak	
4		2.1389	41.62	0.45	42.07	56.00	-13.93	peak	
5		4.9424	40.79	0.48	41.27	56.00	-14.73	peak	
6		20.4989	35.84	1.07	36.91	60.00	-23.09	peak	

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

Margin (dB) = Measurement (dBμV) – Limits (dBμV)

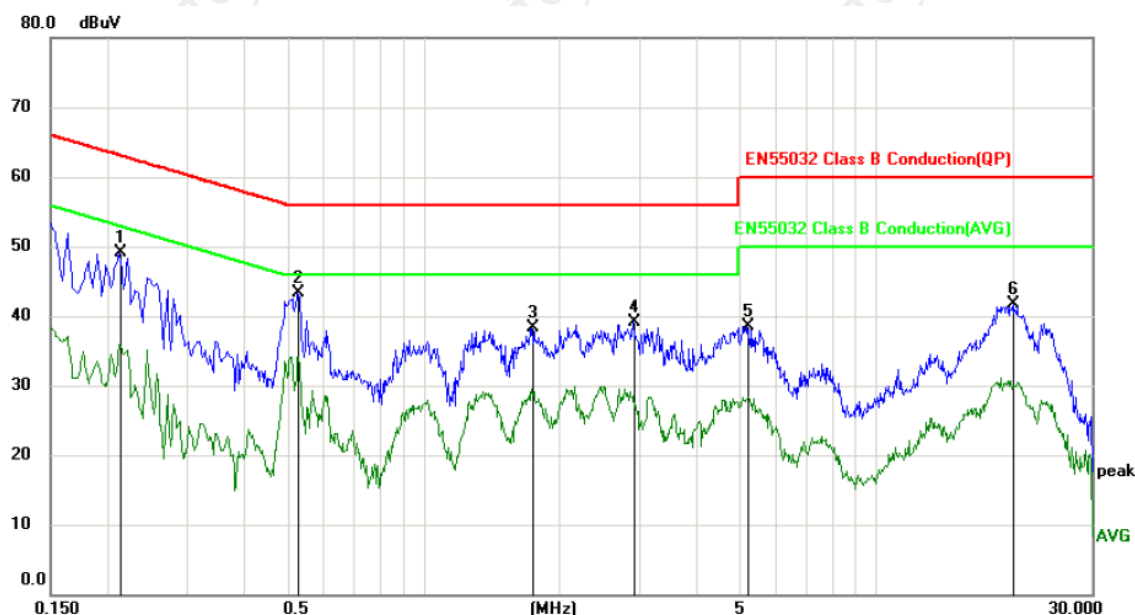
Q.P. =Quasi-Peak

AVG =average

Any value more than 10dB below limit have not been specifically reported.

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site: Phase: **N** Temperature: 25
Limit: EN55032 Class B Conduction(QP) Power: Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2129	48.85	0.23	49.08	63.09	-14.01	peak	
2	*	0.5279	43.02	0.22	43.24	56.00	-12.76	peak	
3		1.7428	37.88	0.43	38.31	56.00	-17.69	peak	
4		2.9038	38.70	0.46	39.16	56.00	-16.84	peak	
5		5.2169	38.00	0.48	38.48	60.00	-21.52	peak	
6		20.0670	40.54	1.07	41.61	60.00	-18.39	peak	

Note:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

Margin (dB) = Measurement (dBuV) – Limits (dBuV)

Q.P. =Quasi-Peak

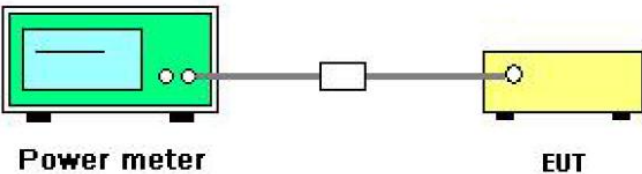
AVG =average

Any value more than 10dB below limit have not been specifically reported.

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

6.3. Maximum Conducted Output Power

6.3.1. Test Specification

Test Requirement:	FCC Part15 E Section 15.407(a)& Part 2 J Section 2.1046										
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E										
Limit:	<table border="1"> <thead> <tr> <th>Frequency Band (MHz)</th><th>Limit</th></tr> </thead> <tbody> <tr> <td>5180 - 5240</td><td>24dBm(250mW) for client device</td></tr> <tr> <td>5260 - 5320</td><td>24dBm(250mW) or 11 dBm + 10 log B, B is the 26 dB emission bandwidth in megahertz</td></tr> <tr> <td>5470 - 5725</td><td>24dBm(250mW) or 11 dBm + 10 log B, B is the 26 dB emission bandwidth in megahertz</td></tr> <tr> <td>5745 - 5825</td><td>30dBm(1W)</td></tr> </tbody> </table>	Frequency Band (MHz)	Limit	5180 - 5240	24dBm(250mW) for client device	5260 - 5320	24dBm(250mW) or 11 dBm + 10 log B, B is the 26 dB emission bandwidth in megahertz	5470 - 5725	24dBm(250mW) or 11 dBm + 10 log B, B is the 26 dB emission bandwidth in megahertz	5745 - 5825	30dBm(1W)
Frequency Band (MHz)	Limit										
5180 - 5240	24dBm(250mW) for client device										
5260 - 5320	24dBm(250mW) or 11 dBm + 10 log B, B is the 26 dB emission bandwidth in megahertz										
5470 - 5725	24dBm(250mW) or 11 dBm + 10 log B, B is the 26 dB emission bandwidth in megahertz										
5745 - 5825	30dBm(1W)										
Test Setup:	 The diagram illustrates the test setup. On the left is a green rectangular box labeled 'Power meter'. A cable connects it to a small white rectangular box labeled 'Attenuator'. Another cable connects the attenuator to a yellow rectangular box labeled 'EUT' (Equipment Under Test).										
Test Mode:	Transmitting mode with modulation										
Test Procedure:	1. The testing follows the Measurement Procedure of KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E, 3, a 2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement. 3. Set to the maximum power setting and enable the EUT transmit continuously. 5. Measure the conducted output power and record the results in the test report.										
Test Result:	PASS										
Remark:	Conducted output power= measurement power +10log(1/x) X is duty cycle=1, so 10log(1/1)=0 Conducted output power= measurement power										

6.3.2. Test Instruments

RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 20, 2019
Power Meter	Agilent	E4418B	GB43312526	Sep. 16, 2019
Power Sensor	Agilent	E9301A	MY41497725	Sep. 16, 2019
RF Cable (9KHz-40GHz)	TCT	RE-03	N/A	Sep. 20, 2019
Antenna Connector	TCT	RFC-03	N/A	Sep. 20, 2019

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.3.3. Test Data

Configuration Band 1 (5180 - 5240 MHz) / Antenna 0+Antenna 1						
Mode	Test channel	Maximum Conducted (Average) Output Power (dBm)			Limit (dBm)	Result
		Ant0	Ant1	Total		
11a	CH36	15.73	15.68	/	24	PASS
11a	CH40	14.84	15.10	/	24	PASS
11a	CH48	15.25	14.65	/	24	PASS
11n(HT20)	CH36	13.94	14.65	17.32	24	PASS
11n(HT20)	CH40	13.97	13.85	16.92	24	PASS
11n(HT20)	CH48	13.66	13.48	16.58	24	PASS
11n(HT40)	CH38	13.02	11.28	15.25	24	PASS
11n(HT40)	CH46	12.19	11.36	14.81	24	PASS
11ac(VHT20)	CH36	13.17	14.29	16.78	24	PASS
11ac(VHT20)	CH40	13.24	13.78	16.53	24	PASS
11ac(VHT20)	CH48	13.46	13.18	16.33	24	PASS
11ac(VHT40)	CH38	12.67	11.41	15.10	24	PASS
11ac(VHT40)	CH46	12.86	11.47	15.23	24	PASS
11ac(VHT80)	CH42	11.13	10.49	13.83	24	PASS

Configuration Band 2A (5260 - 5320 MHz) / Antenna 0+Antenna 1

Mode	Test channel	Maximum Conducted (Average) Output Power (dBm)			26 dB Bandwidth (MHz)	11dBm+ 10logB (dBm)	Limit (dBm)	Result
		Ant0	Ant1	Total				
11a	CH52	15.41	15.13	/	19.51	23.90	23.90	PASS
11a	CH60	15.45	15.28	/	19.41	23.88	23.88	PASS
11a	CH64	15.68	14.95	/	19.04	23.80	23.80	PASS
11n(HT20)	CH52	14.38	13.53	16.99	19.89	23.99	23.99	PASS
11n(HT20)	CH60	14.33	13.77	17.07	19.93	24.00	24.00	PASS
11n(HT20)	CH64	13.83	13.62	16.74	19.76	23.96	23.96	PASS
11n(HT40)	CH54	13.80	12.97	16.42	40.77	27.10	24.00	PASS
11n(HT40)	CH62	13.28	12.20	15.78	42.47	27.28	24.00	PASS
11ac(VHT20)	CH52	13.58	13.52	16.56	20.30	24.07	24.00	PASS
11ac(VHT20)	CH60	14.06	13.64	16.87	20.35	24.09	24.00	PASS
11ac(VHT20)	CH64	13.67	13.51	16.60	19.75	23.96	23.96	PASS
11ac(VHT40)	CH54	13.82	12.02	16.02	40.73	27.10	24.00	PASS
11ac(VHT40)	CH62	13.34	12.21	15.82	40.69	27.09	24.00	PASS
11ac(VHT80)	CH58	11.57	10.48	14.07	80.59	30.06	24.00	PASS

Note : The maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz

Configuration Band 2C (5500 - 5720 MHz) / Antenna 0+Antenna 1

Mode	Test channel	Maximum Conducted (Average) Output Power (dBm)			26 dB Bandwidth (MHz)	11dBm+10logB (dBm)	Limit (dBm)	Result
		Ant0	Ant1	Total				
11a	CH100	15.11	14.67	/	19.34	23.86	23.86	PASS
11a	CH120	15.24	14.48	/	19.21	23.84	23.84	PASS
11a	CH144	15.25	14.82	/	19.18	23.83	23.83	PASS
11n(HT20)	CH100	13.60	14.17	16.90	20.05	24.02	24.00	PASS
11n(HT20)	CH120	12.75	14.13	16.50	20.20	24.05	24.00	PASS
11n(HT20)	CH144	12.76	14.60	16.79	19.97	24.00	24.00	PASS
11n(HT40)	CH102	13.70	11.77	15.85	42.02	27.23	24.00	PASS
11n(HT40)	CH118	13.28	11.21	15.38	42.61	27.30	24.00	PASS
11n(HT40)	CH142	13.78	12.88	16.36	40.45	27.07	24.00	PASS
11ac(VHT20)	CH100	13.54	13.47	16.52	20.32	24.08	24.00	PASS
11ac(VHT20)	CH120	12.78	13.11	15.96	20.00	24.01	24.00	PASS
11ac(VHT20)	CH144	12.75	13.86	16.35	19.92	23.99	23.99	PASS
11ac(VHT40)	CH102	12.77	11.78	15.31	40.59	27.08	24.00	PASS
11ac(VHT40)	CH118	12.11	11.24	14.71	40.42	27.07	24.00	PASS
11ac(VHT40)	CH142	12.18	12.86	15.54	40.54	27.08	24.00	PASS
11ac(VHT80)	CH106	11.82	10.83	14.36	81.14	30.09	24.00	PASS
11ac(VHT80)	CH138	12.07	11.43	14.77	80.52	30.06	24.00	PASS

Note : The maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz

Configuration Band 3 (5745 - 5825 MHz) / Antenna 0+Antenna 1

Mode	Test channel	Maximum Conducted (Average) Output Power (dBm)			Limit (dBm)	Result
		Ant0	Ant1	Total		
11a	CH149	15.73	14.69	/	30	PASS
11a	CH157	15.62	14.86	/	30	PASS
11a	CH165	15.39	15.05	/	30	PASS
11n(HT20)	CH149	12.79	13.16	15.99	30	PASS
11n(HT20)	CH157	13.19	12.87	16.04	30	PASS
11n(HT20)	CH165	14.04	13.26	16.68	30	PASS
11n(HT40)	CH151	13.61	12.54	16.12	30	PASS
11n(HT40)	CH159	13.29	11.98	15.69	30	PASS
11ac(VHT20)	CH149	12.61	12.83	15.73	30	PASS
11ac(VHT20)	CH157	13.63	13.30	16.48	30	PASS
11ac(VHT20)	CH165	14.13	13.74	16.95	30	PASS
11ac(VHT40)	CH151	12.68	12.46	15.58	30	PASS
11ac(VHT40)	CH159	12.15	11.96	15.07	30	PASS
11ac(VHT80)	CH155	11.77	10.60	14.23	30	PASS

6.4. 6dB Emission Bandwidth

6.4.1. Test Specification

Test Requirement:	FCC CFR47 Part 15 Section 15.407(e)& Part 2 J Section 2.1049
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C
Limit:	>500kHz
Test Setup:	 Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz. 4. Measure and record the results in the test report.
Test Result:	PASS

6.4.2. Test Instruments

RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 20, 2019
RF Cable (9KHz-40GHz)	TCT	RE-03	N/A	Sep. 20, 2019
Antenna Connector	TCT	RFC-03	N/A	Sep. 20, 2019

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.4.3. Test data

ANT 0

Band 3 (5745 - 5825 MHz)					
Mode	Test channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
11a	CH149	5745	15.14	0.5	PASS
11a	CH157	5785	15.15	0.5	PASS
11a	CH165	5825	15.19	0.5	PASS
11n(HT20)	CH149	5745	15.12	0.5	PASS
11n(HT20)	CH157	5785	15.17	0.5	PASS
11n(HT20)	CH165	5825	15.18	0.5	PASS
11n(HT40)	CH151	5755	35.15	0.5	PASS
11n(HT40)	CH159	5795	35.16	0.5	PASS
11ac(VHT20)	CH149	5745	15.17	0.5	PASS
11ac(VHT20)	CH157	5785	15.14	0.5	PASS
11ac(VHT20)	CH165	5825	15.18	0.5	PASS
11ac(VHT40)	CH151	5755	35.16	0.5	PASS
11ac(VHT40)	CH159	5795	35.11	0.5	PASS
11ac(VHT80)	CH155	5775	74.00	0.5	PASS

ANT 1

Band 3 (5745 - 5825 MHz)					
Mode	Test channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
11a	CH149	5745	15.18	0.5	PASS
11a	CH157	5785	15.17	0.5	PASS
11a	CH165	5825	15.34	0.5	PASS
11n(HT20)	CH149	5745	15.17	0.5	PASS
11n(HT20)	CH157	5785	15.17	0.5	PASS
11n(HT20)	CH165	5825	15.17	0.5	PASS
11n(HT40)	CH151	5755	35.14	0.5	PASS
11n(HT40)	CH159	5795	35.16	0.5	PASS
11ac(VHT20)	CH149	5745	15.09	0.5	PASS
11ac(VHT20)	CH157	5785	15.17	0.5	PASS
11ac(VHT20)	CH165	5825	15.17	0.5	PASS
11ac(VHT40)	CH151	5755	35.13	0.5	PASS
11ac(VHT40)	CH159	5795	35.17	0.5	PASS
11ac(VHT80)	CH155	5775	72.66	0.5	PASS

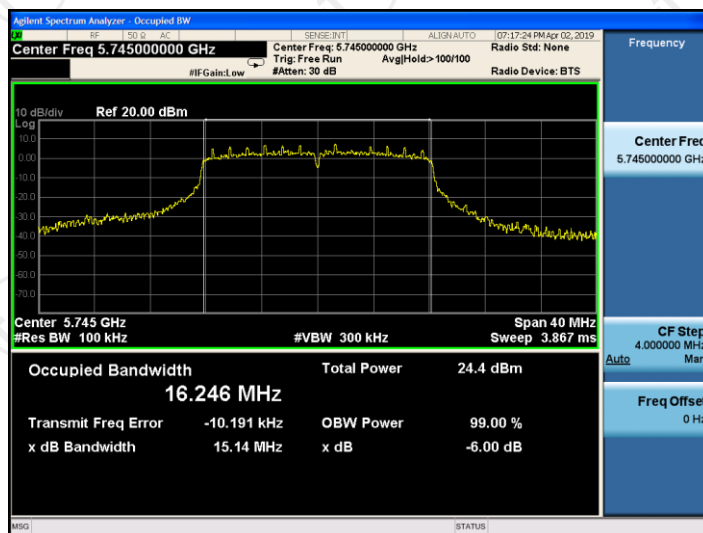
Test plots as follows:

ANT 0

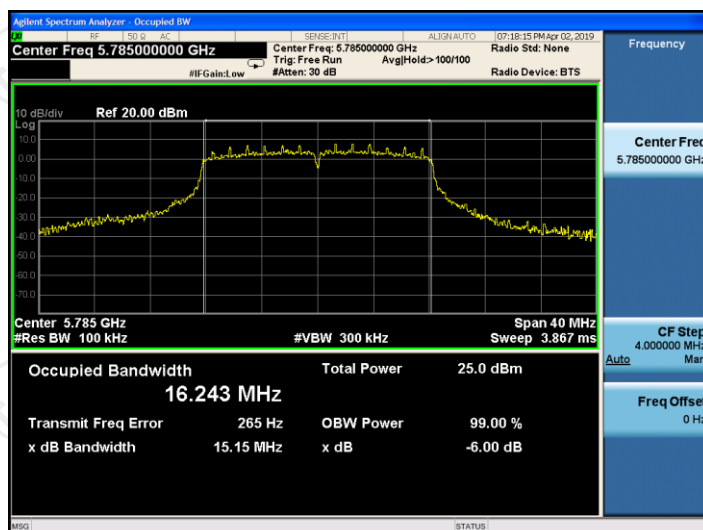
Band 3 (5725 – 5850 MHz)

11a

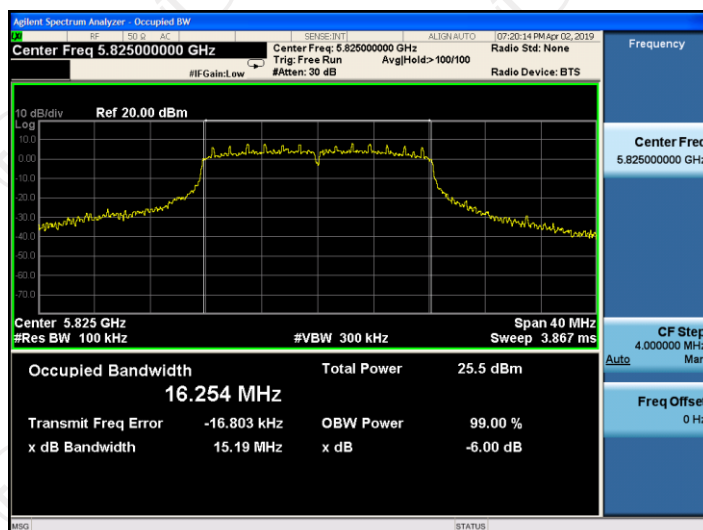
CH149



CH157

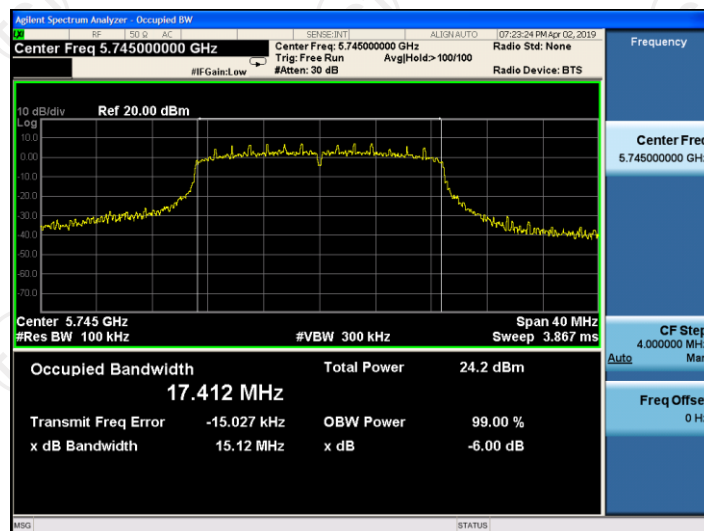


CH165

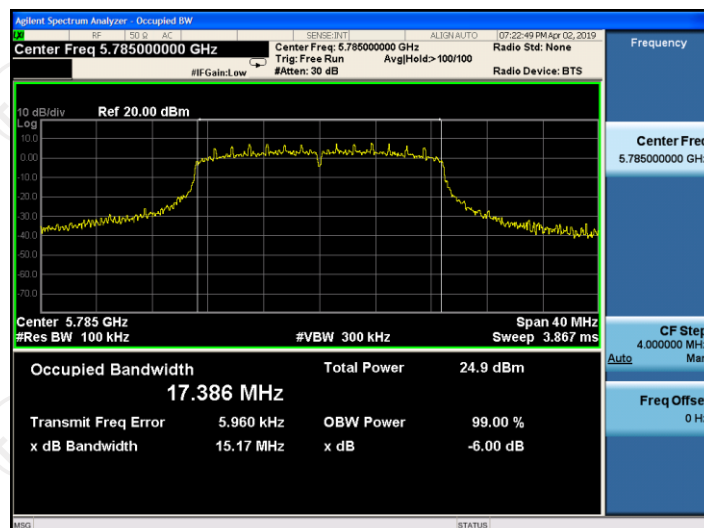


11n(HT20)

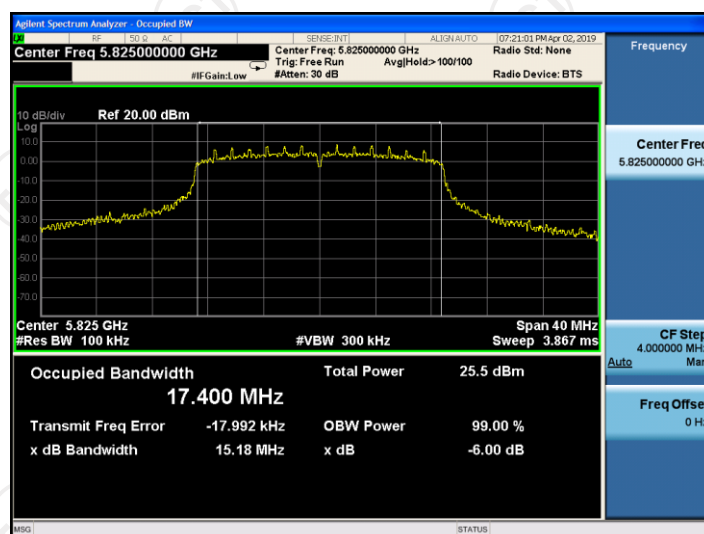
CH149



CH157

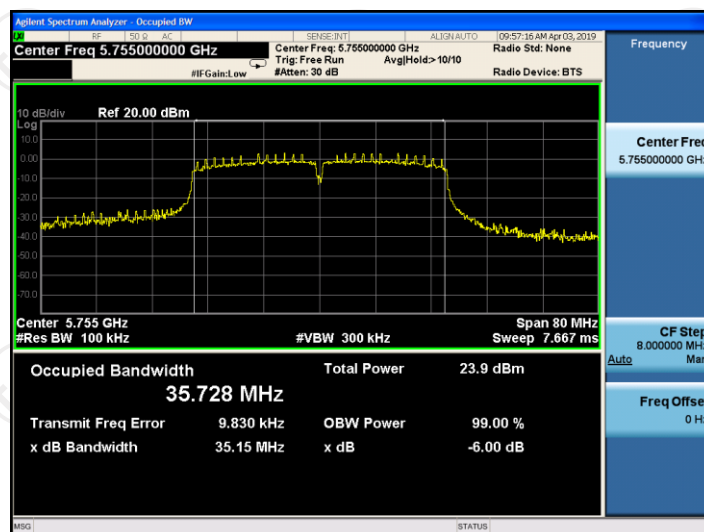


CH165

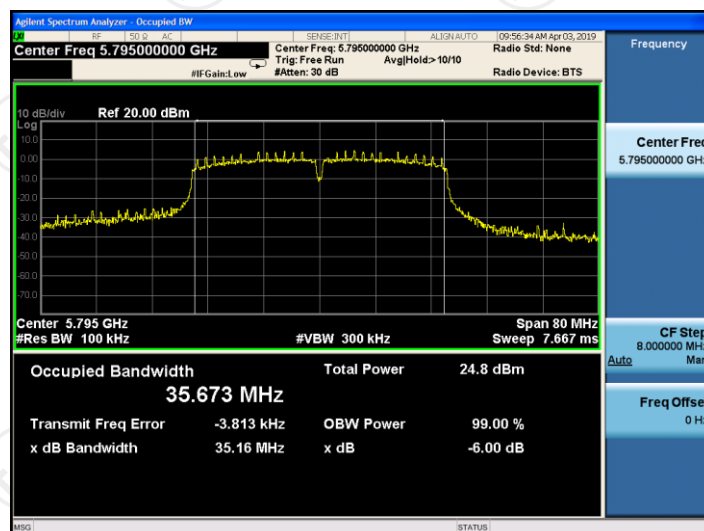


11n(HT40)

CH151

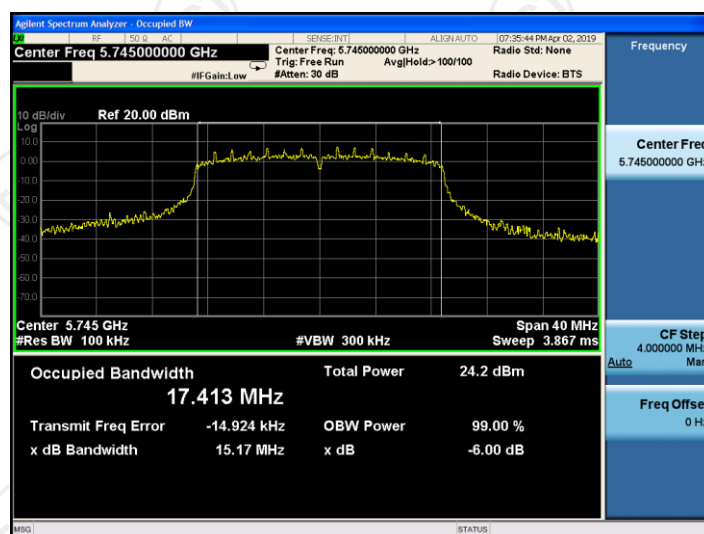


CH159

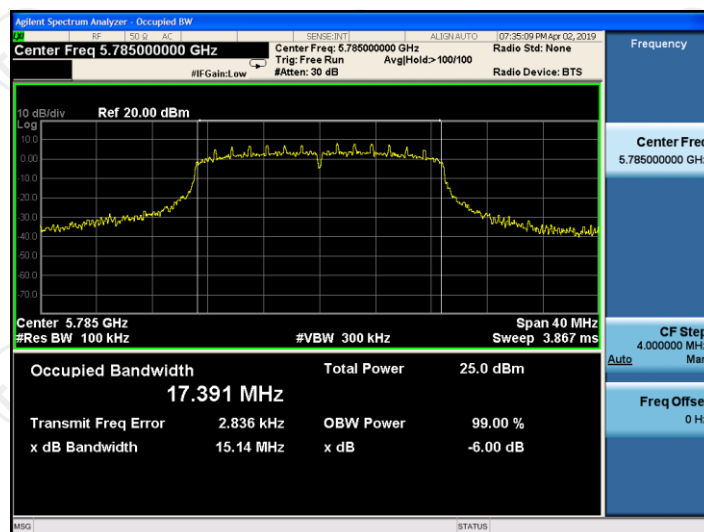


11ac(VHT20)

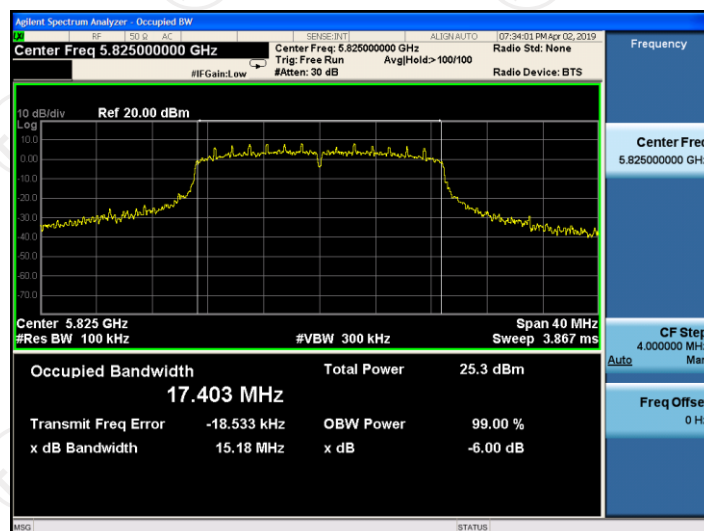
CH149



CH157

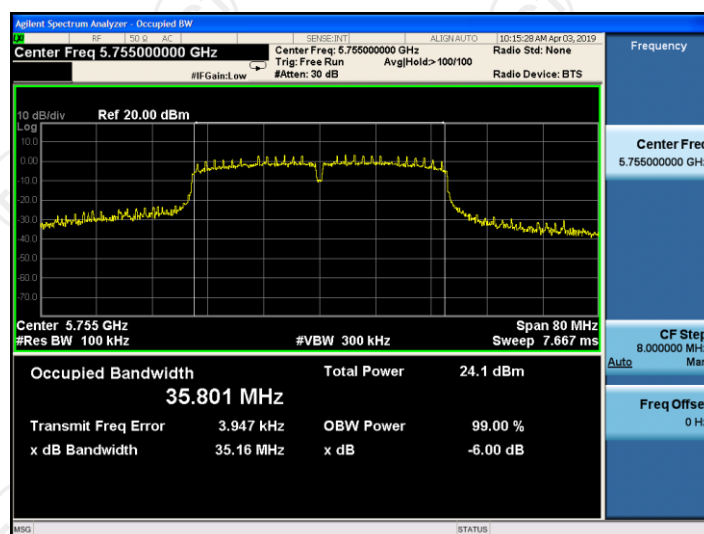


CH165

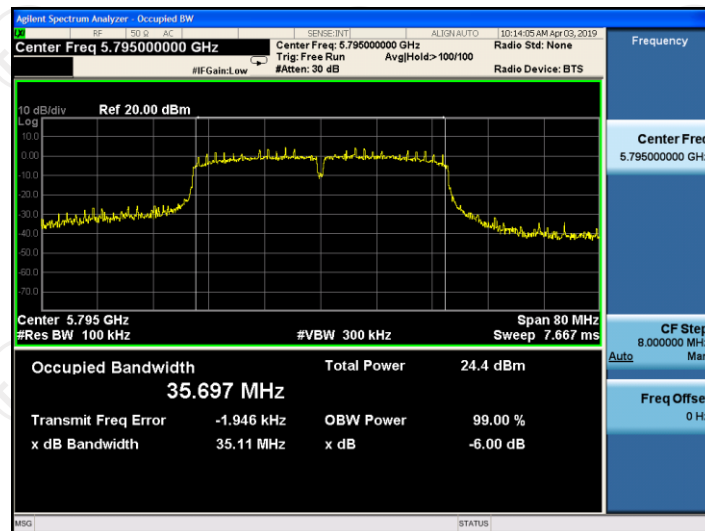


11ac(VHT40)

CH151

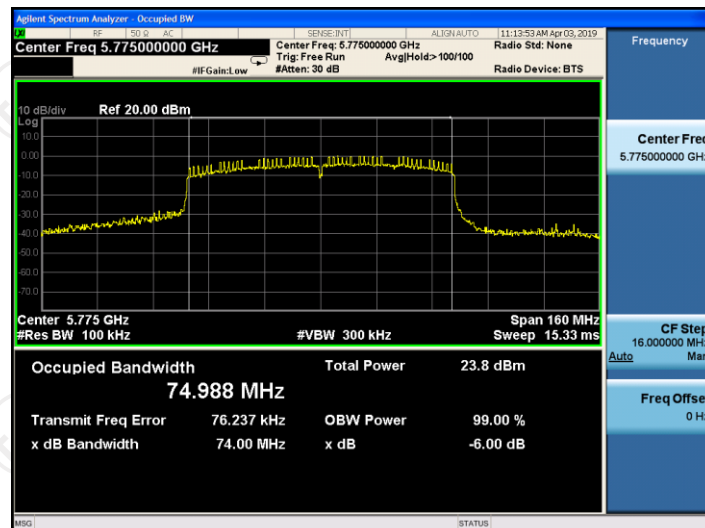


CH159



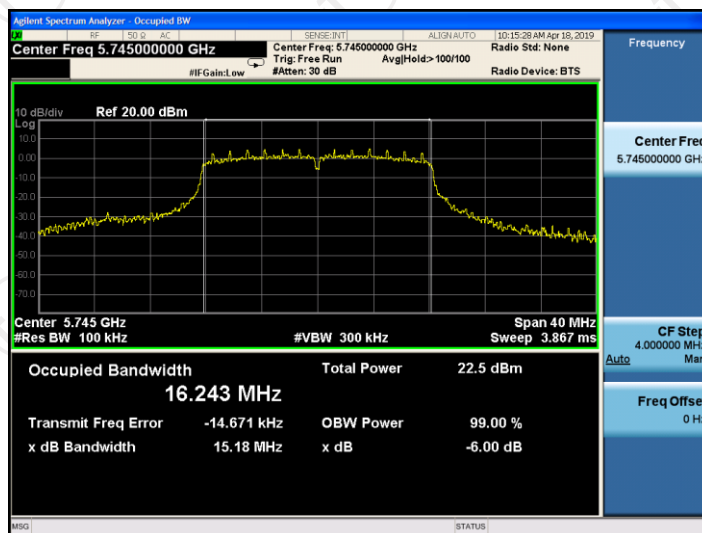
11ac(VHT80)

CH155

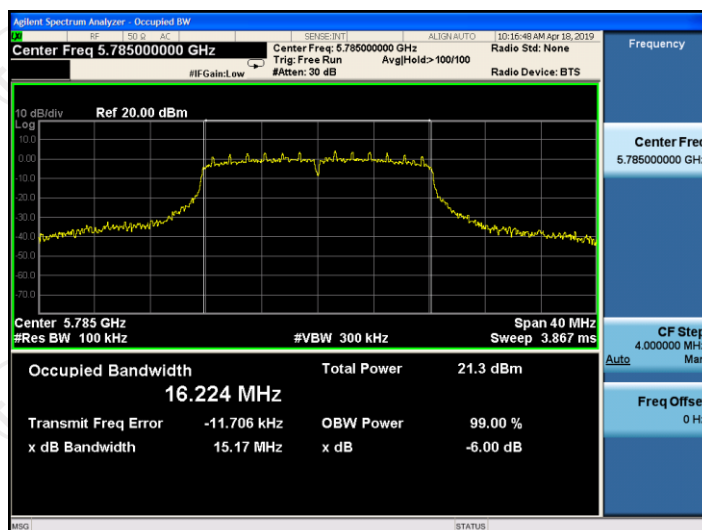


ANT 1
Band 3 (5725 – 5850 MHz)
11a

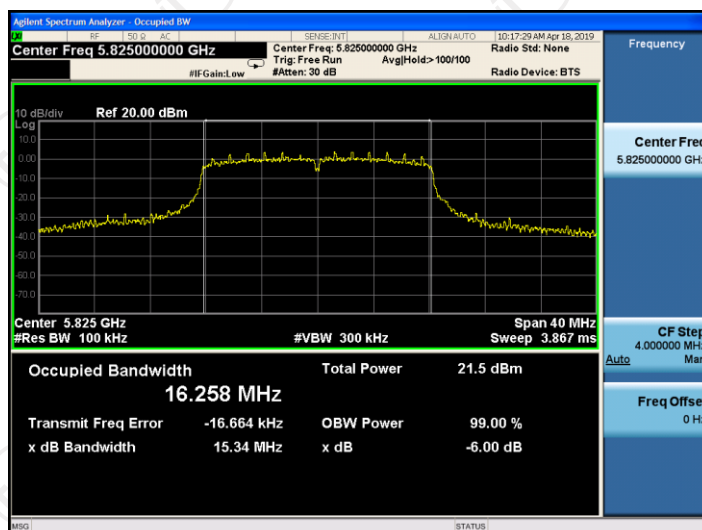
CH149



CH157

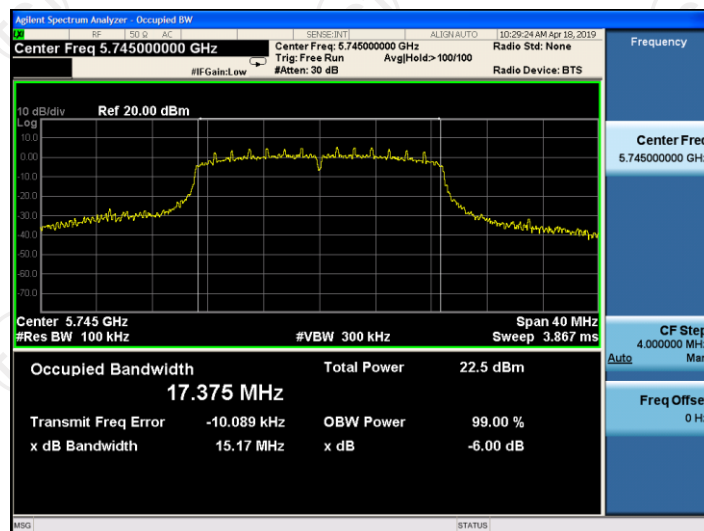


CH165

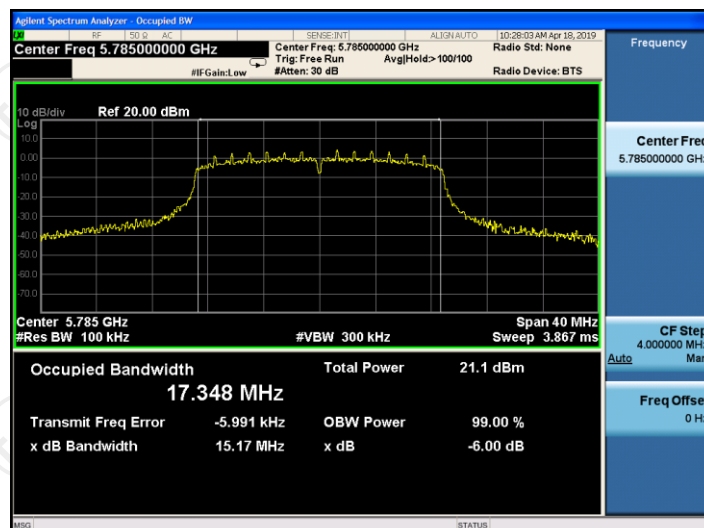


11n(HT20)

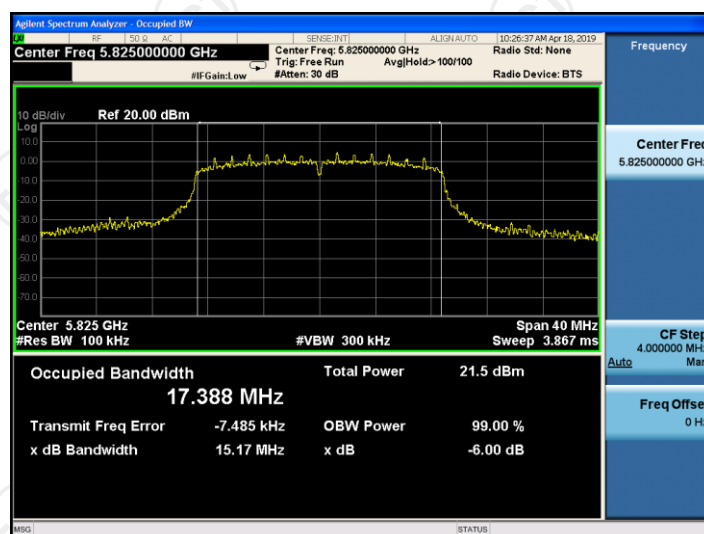
CH149



CH157

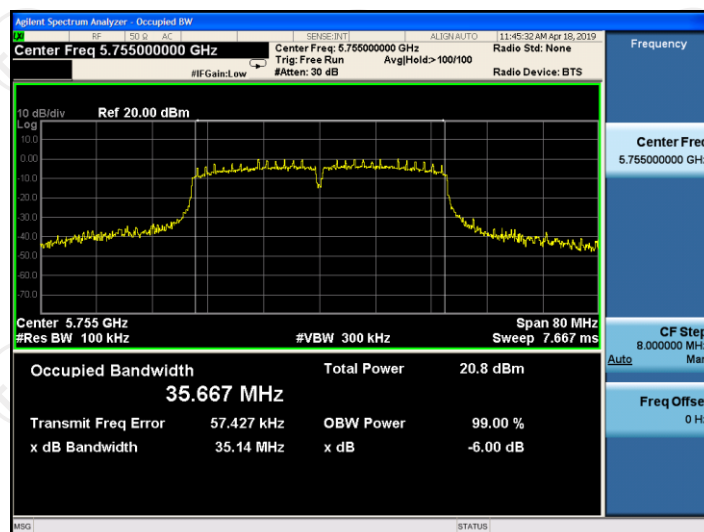


CH165

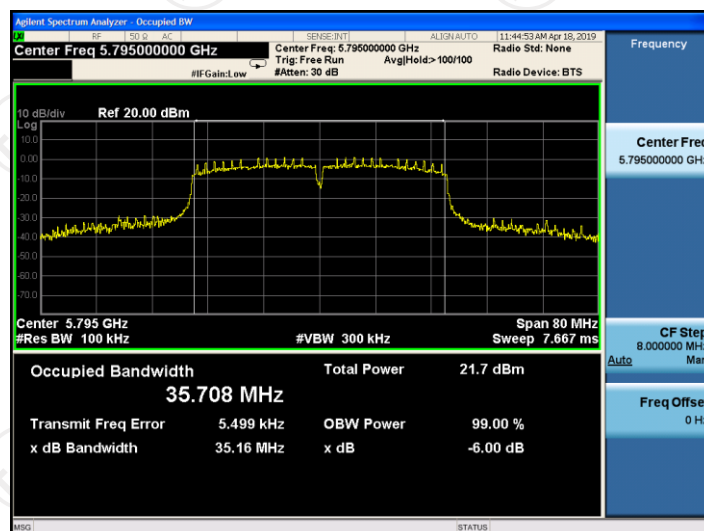


11n(HT40)

CH151

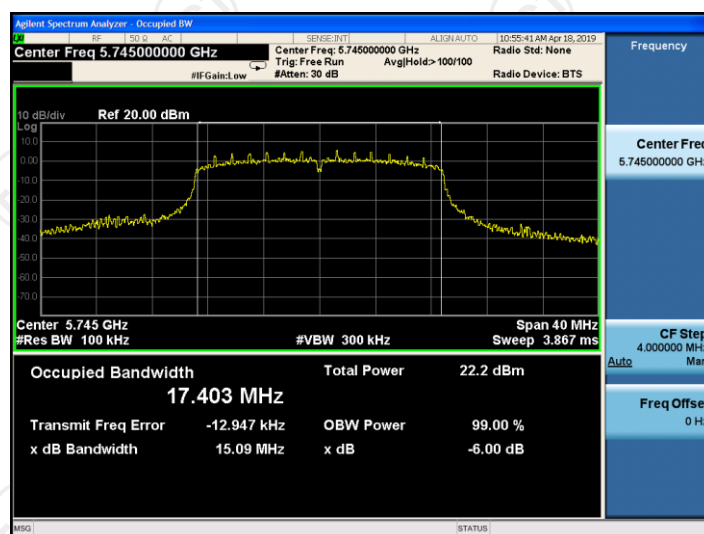


CH159

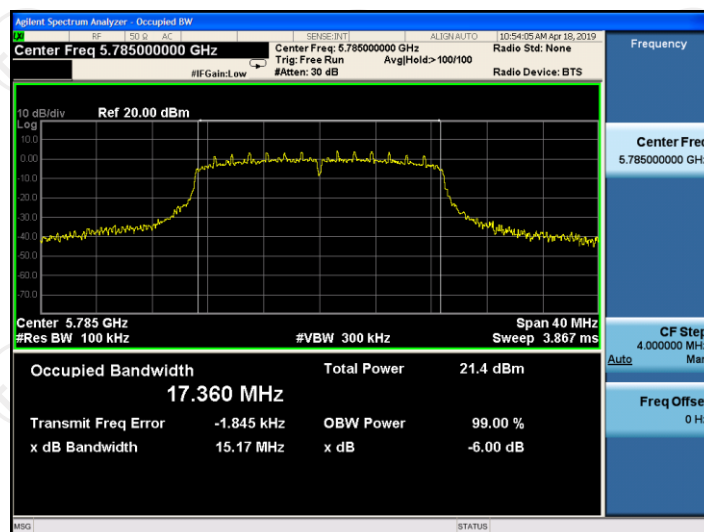


11ac(VHT20)

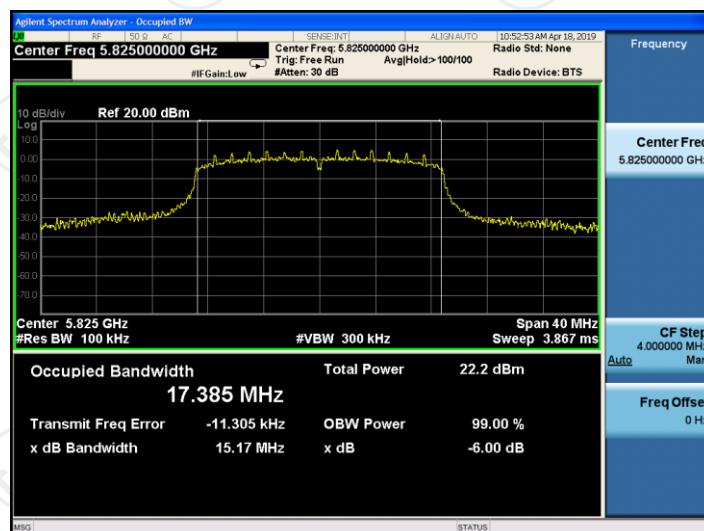
CH149



CH157

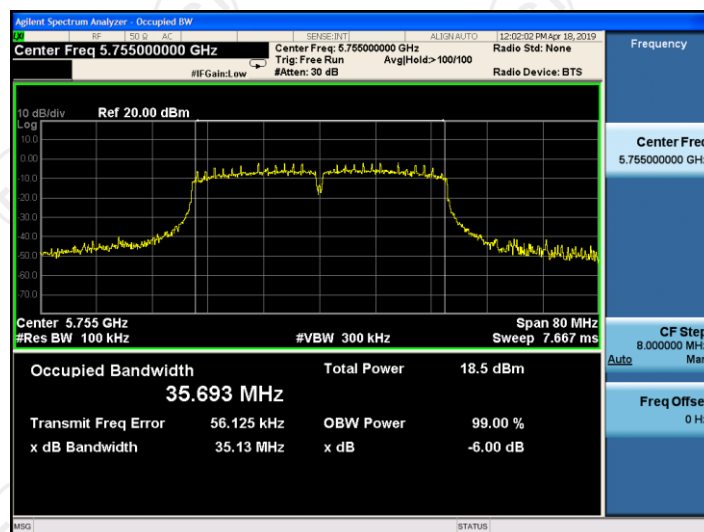


CH165

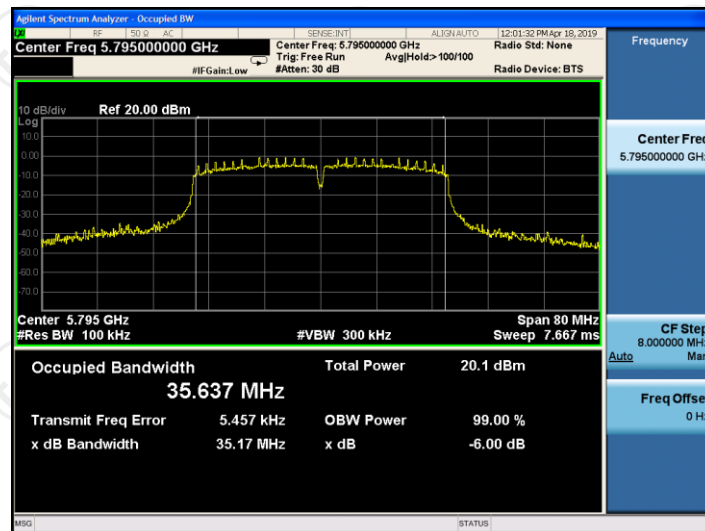


11ac(VHT40)

CH151

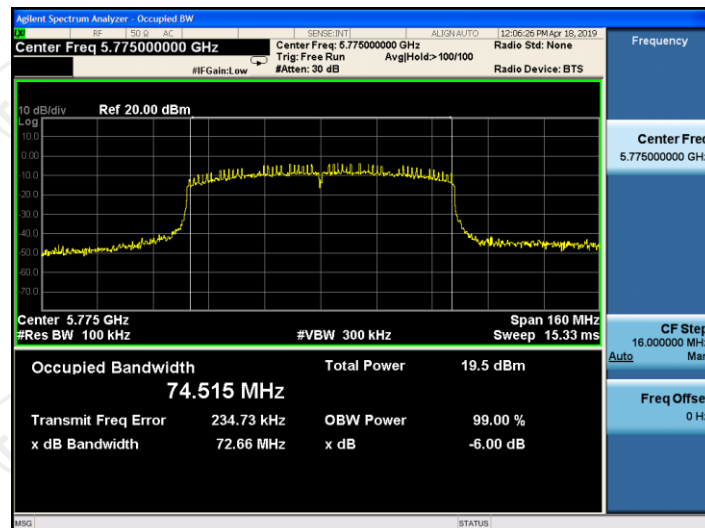


CH159



11ac(VHT80)

CH155



6.5. 26dB Bandwidth and 99% Occupied Bandwidth

6.5.1. Test Specification

Test Requirement:	47 CFR Part 15C Section 15.407 (a)& Part 2 J Section 2.1049
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section D
Limit:	No restriction limits
Test Setup:	 Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section D 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. 4. Measure and record the results in the test report.
Test Result:	PASS

6.5.2. Test Instruments

RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 20, 2019
RF Cable (9KHz-26.5GHz)	TCT	RE-06	N/A	Sep. 20, 2019
Antenna Connector	TCT	RFC-01	N/A	Sep. 20, 2019

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.5.3. Test data

ANT 0 Band 1

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH36	5180	19.26	16.312
11a	CH40	5200	19.22	16.291
11a	CH48	5240	19.02	16.294
11n(HT20)	CH36	5180	20.19	17.431
11n(HT20)	CH40	5200	20.90	17.463
11n(HT20)	CH48	5240	20.18	17.443
11n(HT40)	CH38	5190	41.32	35.875
11n(HT40)	CH46	5230	41.01	35.899
11ac(VHT20)	CH36	5180	20.99	17.435
11ac(VHT20)	CH40	5200	20.64	17.438
11ac(VHT20)	CH48	5240	20.86	17.431
11ac(VHT40)	CH38	5190	42.24	35.883
11ac(VHT40)	CH46	5230	40.71	35.890
11ac(VHT80)	CH42	5210	82.97	74.726

Band 2A

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH52	5260	20.23	16.282
11a	CH60	5300	19.83	16.339
11a	CH64	5320	20.14	16.321
11n(HT20)	CH52	5260	20.81	17.466
11n(HT20)	CH60	5300	21.04	17.463
11n(HT20)	CH64	5320	20.84	17.448
11n(HT40)	CH54	5270	42.58	35.894
11n(HT40)	CH62	5310	41.73	35.941
11ac(VHT20)	CH52	5260	20.75	17.440
11ac(VHT20)	CH60	5300	21.50	17.463
11ac(VHT20)	CH64	5320	20.62	17.442
11ac(VHT40)	CH54	5270	41.71	35.913
11ac(VHT40)	CH62	5310	41.23	35.888
11ac(VHT80)	CH58	5290	82.61	74.727

Band 2C

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH100	5500	19.44	16.293
11a	CH120	5600	19.82	16.314
11a	CH144	5720	19.43	16.282
11n(HT20)	CH100	5500	20.74	17.434
11n(HT20)	CH120	5600	20.36	17.431
11n(HT20)	CH144	5720	20.50	17.421
11n(HT40)	CH102	5510	44.34	35.933
11n(HT40)	CH118	5590	40.94	35.966
11n(HT40)	CH142	5710	40.60	35.918
11ac(VHT20)	CH100	5500	20.76	17.429
11ac(VHT20)	CH120	5600	20.52	17.425
11ac(VHT20)	CH144	5720	20.40	17.434
11ac(VHT40)	CH102	5510	45.20	35.894
11ac(VHT40)	CH118	5590	42.29	35.889
11ac(VHT40)	CH142	5710	42.56	35.880
11ac(VHT80)	CH106	5530	81.94	74.664
11ac(VHT80)	CH138	5690	82.82	74.935

Band 3

Mode	Test channel	Frequency (MHz)	99% Bandwidth (MHz)
11a	CH149	5745	16.290
11a	CH157	5785	16.280
11a	CH165	5825	16.310
11n(HT20)	CH149	5745	17.408
11n(HT20)	CH157	5785	17.412
11n(HT20)	CH165	5825	17.419
11n(HT40)	CH151	5755	36.014
11n(HT40)	CH159	5795	35.896
11ac(VHT20)	CH149	5745	17.411
11ac(VHT20)	CH157	5785	17.419
11ac(VHT20)	CH165	5825	17.427
11ac(VHT40)	CH151	5755	35.893
11ac(VHT40)	CH159	5795	35.807
11ac(VHT80)	CH155	5775	74.741

ANT 1 Band 1

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH36	5180	18.78	16.288
11a	CH40	5200	19.44	16.362
11a	CH48	5240	19.20	16.359
11n(HT20)	CH36	5180	26.89	17.535
11n(HT20)	CH40	5200	20.51	17.423
11n(HT20)	CH48	5240	19.89	17.410
11n(HT40)	CH38	5190	43.25	35.892
11n(HT40)	CH46	5230	40.97	35.842
11ac(VHT20)	CH36	5180	26.42	17.563
11ac(VHT20)	CH40	5200	20.41	17.428
11ac(VHT20)	CH48	5240	20.30	17.409
11ac(VHT40)	CH38	5190	40.20	35.866
11ac(VHT40)	CH46	5230	41.36	35.874
11ac(VHT80)	CH42	5210	82.52	74.688

Band 2A

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH52	5260	19.51	16.316
11a	CH60	5300	19.41	16.324
11a	CH64	5320	19.04	16.310
11n(HT20)	CH52	5260	19.89	17.437
11n(HT20)	CH60	5300	19.93	17.431
11n(HT20)	CH64	5320	19.76	17.414
11n(HT40)	CH54	5270	40.77	35.908
11n(HT40)	CH62	5310	42.47	35.822
11ac(VHT20)	CH52	5260	20.30	17.447
11ac(VHT20)	CH60	5300	20.35	17.426
11ac(VHT20)	CH64	5320	19.75	17.399
11ac(VHT40)	CH54	5270	40.73	35.813
11ac(VHT40)	CH62	5310	40.69	35.840
11ac(VHT80)	CH58	5290	80.59	74.778

Band 2C

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH100	5500	19.34	16.344
11a	CH120	5600	19.21	16.307
11a	CH144	5720	19.18	16.310
11n(HT20)	CH100	5500	20.05	17.454
11n(HT20)	CH120	5600	20.20	17.422
11n(HT20)	CH144	5720	19.97	17.431
11n(HT40)	CH102	5510	42.02	35.819
11n(HT40)	CH118	5590	42.61	35.921
11n(HT40)	CH142	5710	40.45	35.893
11ac(VHT20)	CH100	5500	20.32	17.479
11ac(VHT20)	CH120	5600	20.00	17.408
11ac(VHT20)	CH144	5720	19.92	17.411
11ac(VHT40)	CH102	5510	40.59	35.788
11ac(VHT40)	CH118	5590	40.42	35.874
11ac(VHT40)	CH142	5710	40.54	35.818
11ac(VHT80)	CH106	5530	81.14	74.776
11ac(VHT80)	CH138	5690	80.52	74.575

Band 3

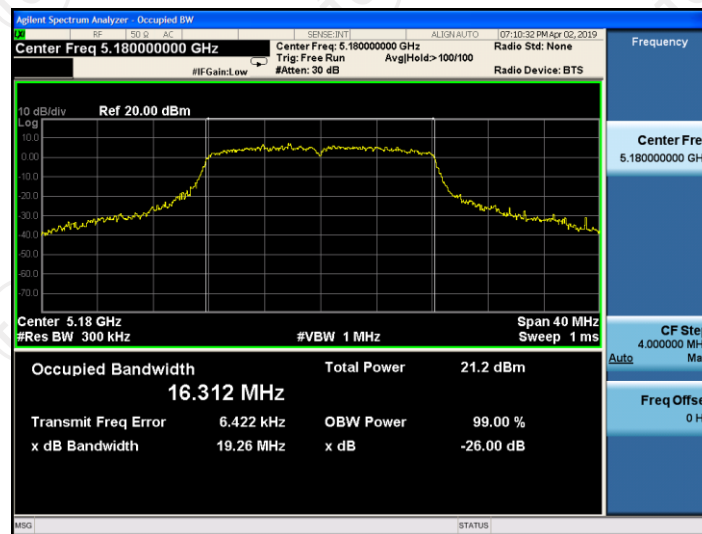
Mode	Test channel	Frequency (MHz)	99% Bandwidth (MHz)
11a	CH149	5745	16.291
11a	CH157	5785	16.308
11a	CH165	5825	16.314
11n(HT20)	CH149	5745	17.407
11n(HT20)	CH157	5785	17.412
11n(HT20)	CH165	5825	17.429
11n(HT40)	CH151	5755	35.838
11n(HT40)	CH159	5795	35.881
11ac(VHT20)	CH149	5745	17.410
11ac(VHT20)	CH157	5785	17.439
11ac(VHT20)	CH165	5825	17.437
11ac(VHT40)	CH151	5755	35.782
11ac(VHT40)	CH159	5795	35.791
11ac(VHT80)	CH155	5775	74.486

Test plots as follows:

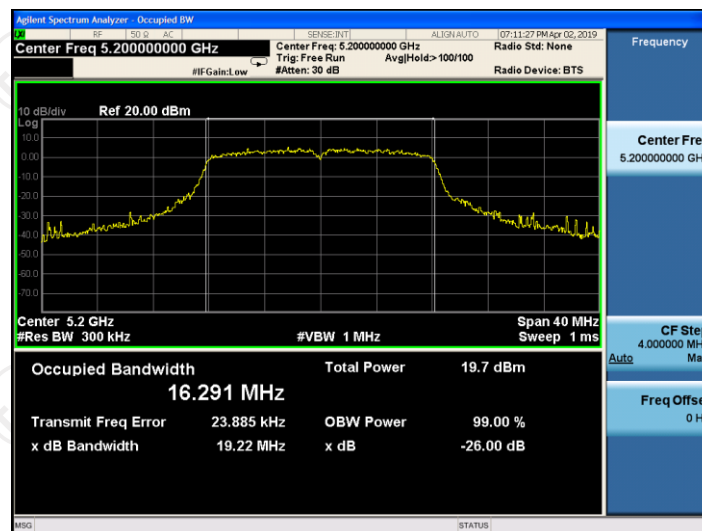
ANT 0 Band 1 (5180-5240 MHz)

11a

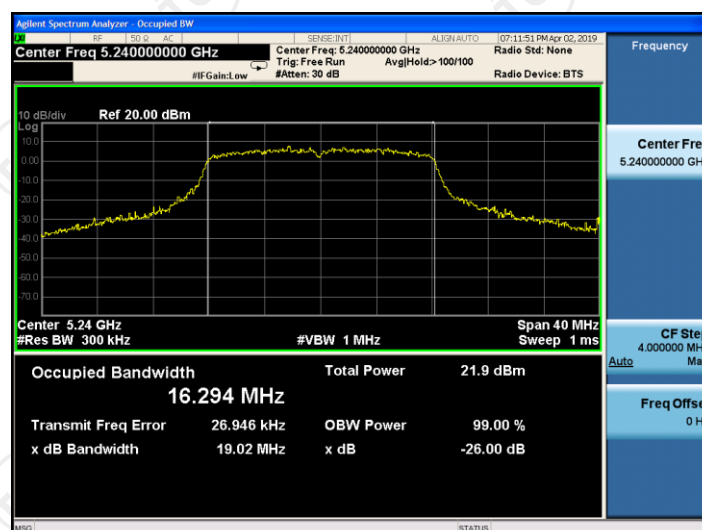
CH36



CH40

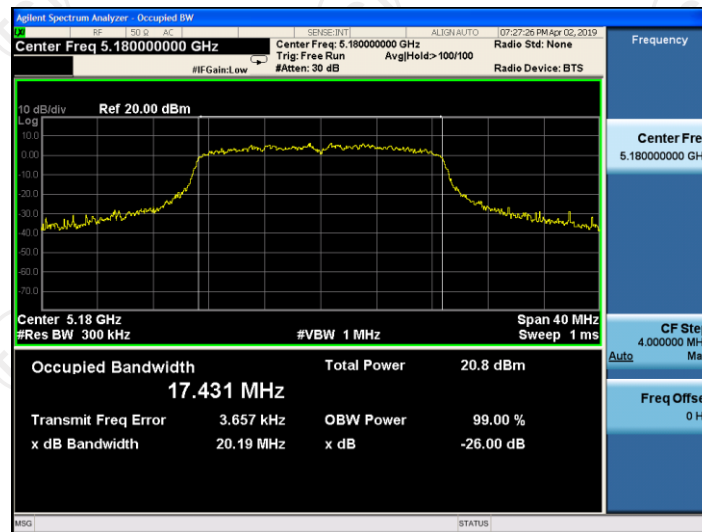


CH48

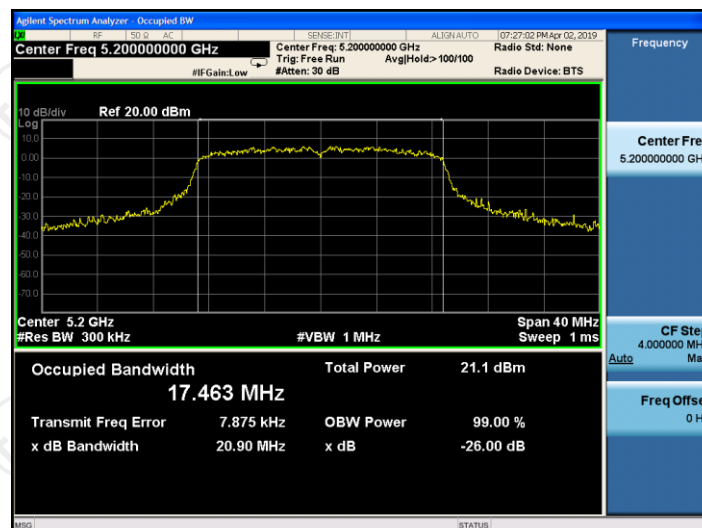


11n(HT20)

CH36



CH40



CH48

