TCT 通测检测 TESTING CENTRE TECHNOLOGY

TEST REPORT

FCC ID: 2AOKI-WFM68AUWF1

Product: WiFi Module

Model No.: WF-M68A-UWF1

Additional Model No.: N/A

Trade Mark: N/A

Report No.: TCT191030E039

Issued Date: Dec. 10, 2019

Issued for:

Sichuan AI-Link Technology Co., Ltd.

Anzhou, Industrial park, Mianyang, Sichuan, China

Issued By:

Shenzhen Tongce Testing Lab.

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

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Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

1. Test Certification

Product:	WiFi Module
Model No.:	WF-M68A-UWF1
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:	Oct. 31, 2019 – Dec. 09, 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:	***Rleo***	***Date:***	***Dec. 09, 2019***
Reviewed By:	***Beryl Zhao***	***Date:***	***Dec. 10, 2019***
Approved By:	***Tomsin***	***Date:***	***Dec. 10, 2019***

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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)	PASS
6dB Emission Bandwidth	§15.407(a)	PASS
26dB Emission Bandwidth& 99% Occupied Bandwidth	§15.407(a)	PASS
Power Spectral Density	§15.407(a)	PASS
Restricted Bands around fundamental frequency	§15.407(a)	PASS
Radiated Emission	§15.407(a)	PASS
Frequency Stability	§15.407(g)	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.

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3. EUT Description

Product:	WiFi Module
Model No.:	WF-M68A-UWF1
Additional Model No.:	N/A
Trade Mark:	**N/A**
Hardware Version:	JUI7.820.0536-2
Software Version:	customer_package_UIv1.88_DLLv3.87_20170918_WinDriverV.0.0.4.31_FWv.69237
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:	Internal Antenna
Antenna Gain:	2dBi
Power Supply:	DC 3.3V

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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

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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
/	/	/	/	/

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.

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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 ± 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	±2.56dB
2	RF power, conducted	±0.12dB
3	Spurious emissions, conducted	±0.11dB
4	All emissions, radiated(<1G)	±3.92dB
5	All emissions, radiated(>1G)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%

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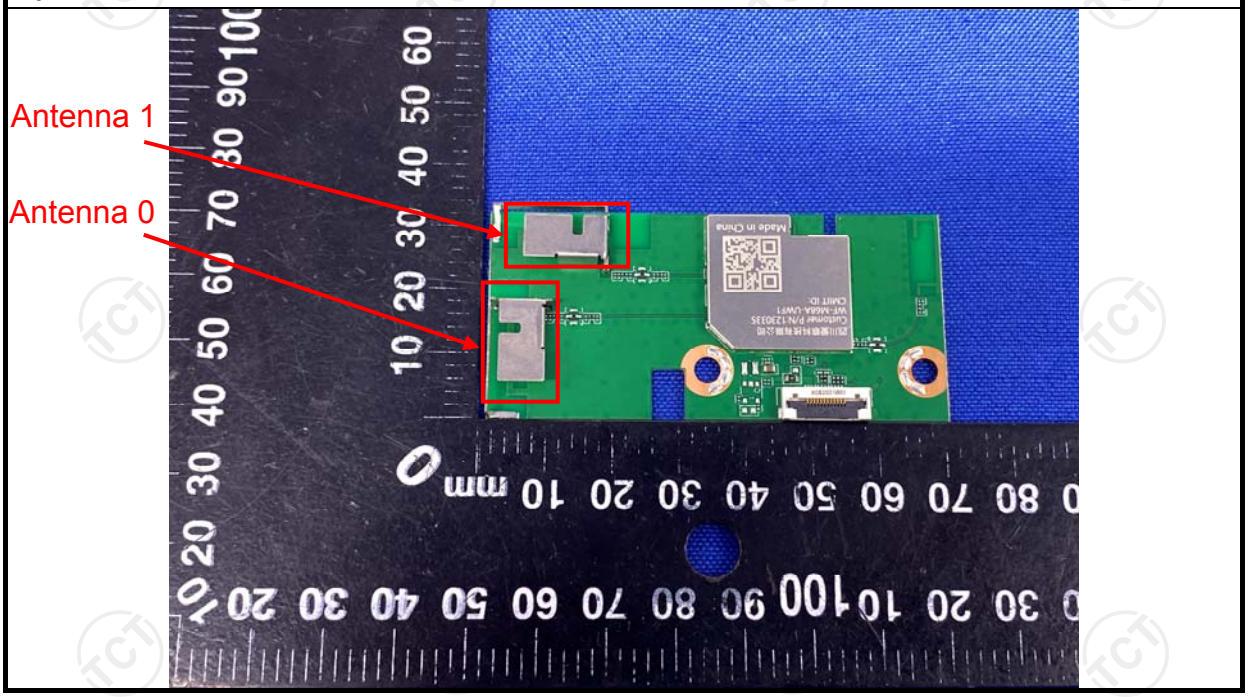
6. Test Results and Measurement Data

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 internal antennas, and the best case gains of the both antennas are 2dBi.	



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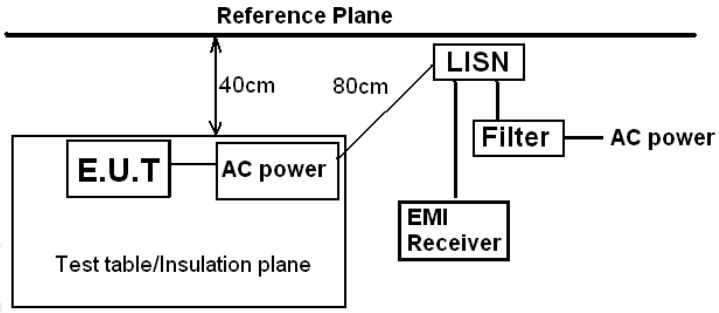
6.2. Conducted Emission

6.2.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Frequency Range:</td><td>150 kHz to 30 MHz</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9 kHz, VBW=30 kHz, Sweep time=auto</td></tr>
<tr><td>Limits:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></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>
</td></tr>
<tr><td>Test Setup:</td><td> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Mode:</td><td>Tx Mode</td></tr>
<tr><td>Test Procedure:</td><td>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.</td></tr>
<tr><td>Test Result:</td><td>PASS</td></tr>
</table>

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. 29, 2020
LISN	Schwarzbeck	NSLK 8126	8126453	Sep. 11, 2020
Coax cable (9KHz-30MHz)	TCT	CE-05	N/A	Sep. 08, 2020
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).*

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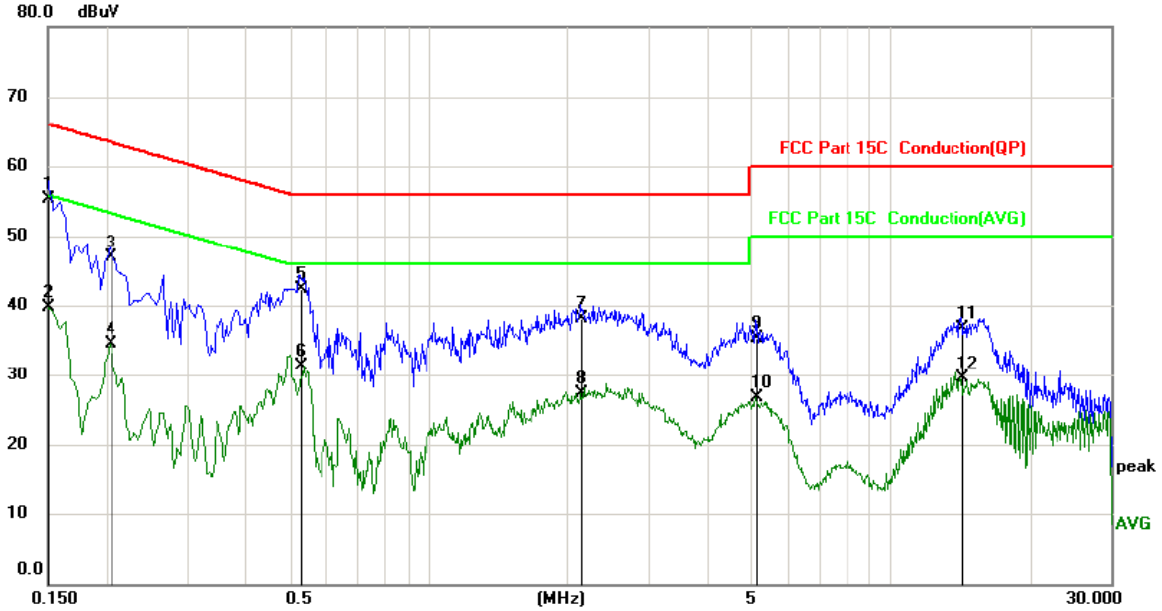
6.2.3. Test data

Please refer to following diagram for individual

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



Site | Phase: L1 | Temperature: 25

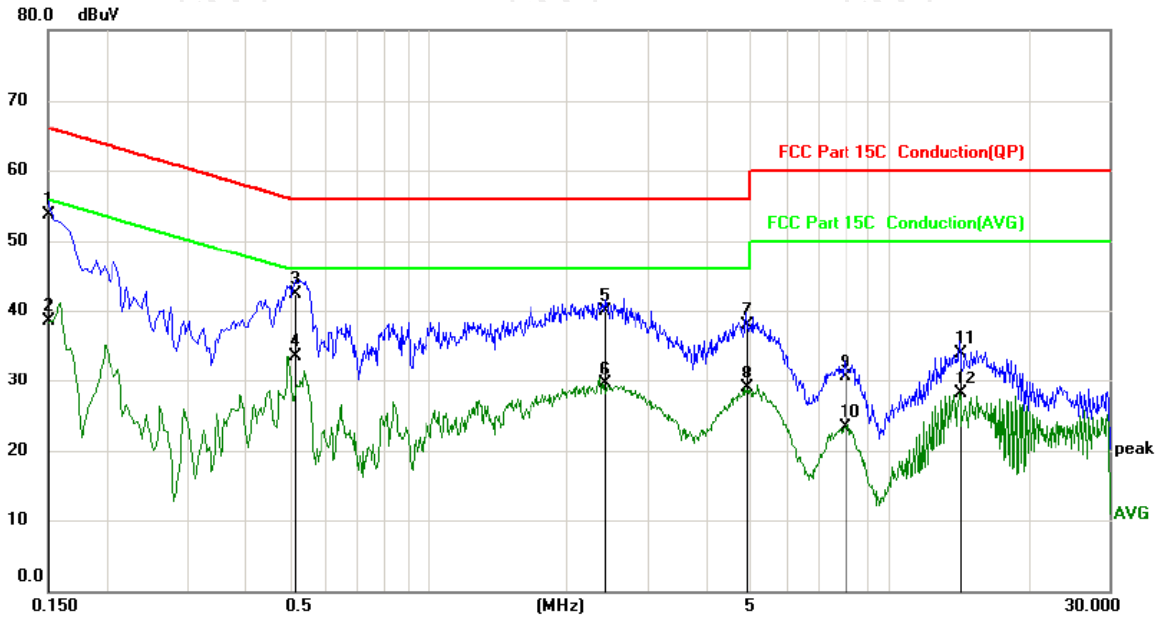
Limit: FCC Part 15C Conduction(QP) | Power: | Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1500	45.23	10.12	55.35	66.00	-10.65	QP	
2		0.1500	29.55	10.12	39.67	56.00	-16.33	AVG	
3		0.2040	36.85	10.13	46.98	63.45	-16.47	QP	
4		0.2040	24.38	10.13	34.51	53.45	-18.94	AVG	
5		0.5280	32.14	10.13	42.27	56.00	-13.73	QP	
6		0.5280	21.09	10.13	31.22	46.00	-14.78	AVG	
7		2.1435	27.89	10.12	38.01	56.00	-17.99	QP	
8		2.1435	17.24	10.12	27.36	46.00	-18.64	AVG	
9		5.1180	25.16	10.13	35.29	60.00	-24.71	QP	
10		5.1180	16.63	10.13	26.76	50.00	-23.24	AVG	
11		14.2620	26.46	10.17	36.63	60.00	-23.37	QP	
12		14.2620	19.38	10.17	29.55	50.00	-20.45	AVG	

Note:

Freq. = Emission frequency in MHz
Reading level (dBµV) = Receiver reading
Corr. Factor (dB) = LISN 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: FCC Part 15C Conduction(QP)	Power:		Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1500	43.56	10.12	53.68	66.00	-12.32	QP	
2		0.1500	28.37	10.12	38.49	56.00	-17.51	AVG	
3		0.5144	32.14	10.13	42.27	56.00	-13.73	QP	
4		0.5144	23.45	10.13	33.58	46.00	-12.42	AVG	
5		2.4135	29.78	10.12	39.90	56.00	-16.10	QP	
6		2.4135	19.34	10.12	29.46	46.00	-16.54	AVG	
7		4.9110	27.85	10.13	37.98	56.00	-18.02	QP	
8		4.9110	18.68	10.13	28.81	46.00	-17.19	AVG	
9		8.0115	20.46	10.14	30.60	60.00	-29.40	QP	
10		8.0115	13.16	10.14	23.30	50.00	-26.70	AVG	
11		14.2620	23.65	10.17	33.82	60.00	-26.18	QP	
12		14.2620	17.84	10.17	28.01	50.00	-21.99	AVG	

Note:

Freq. = Emission frequency in MHz
Reading level (dBμV) = Receiver reading
Corr. Factor (dB) = LISN 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.*

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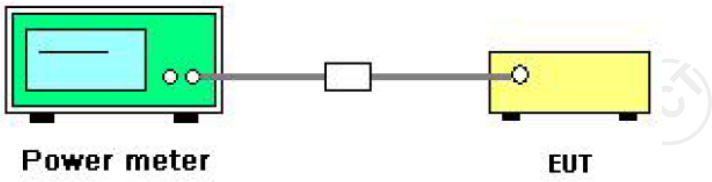
6.3. Maximum Conducted Output Power

6.3.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 E Section 15.407(a)& Part 2 J Section 2.1046</td></tr>
<tr><td>Test Method:</td><td>KDB662911 D01 Multiple Transmitter Output v02r01r01
KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency Band (MHz)</td><td>Limit</td></tr>
<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>
</table>
</td></tr>
<tr><td>Test Setup:</td><td> 
</td></tr>
<tr><td>Test Mode:</td><td>Transmitting mode with modulation</td></tr>
<tr><td>Test Procedure:</td><td>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.</td></tr>
<tr><td>Test Result:</td><td>PASS</td></tr>
<tr><td>Remark:</td><td>Conducted output power= measurement power +10log(1/x) X is duty cycle=1, so 10log(1/1)=0
Conducted output power= measurement power</td></tr>
</table>

6.3.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2020
Power Meter	Agilent	E4418B	GB43312526	Sep. 08, 2020
Power Sensor	Agilent	E9301A	MY41497725	Sep. 08, 2020
RF Cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 08, 2020
Antenna Connector	TCT	RFC-03	N/A	Sep. 08, 2020

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	16.01	15.52	/	24	PASS
11a	CH40	15.91	15.30	/	24	PASS
11a	CH48	15.77	14.99	/	24	PASS
11n(HT20)	CH36	14.91	14.41	17.68	24	PASS
11n(HT20)	CH40	14.73	14.26	17.51	24	PASS
11n(HT20)	CH48	14.39	13.73	17.08	24	PASS
11n(HT40)	CH38	13.91	13.36	16.65	24	PASS
11n(HT40)	CH46	13.35	13.37	16.37	24	PASS
11ac(VHT20)	CH36	15.05	14.60	17.84	24	PASS
11ac(VHT20)	CH40	15.04	14.53	17.80	24	PASS
11ac(VHT20)	CH48	14.77	13.97	17.40	24	PASS
11ac(VHT40)	CH38	13.36	13.61	16.50	24	PASS
11ac(VHT40)	CH46	12.73	13.23	16.00	24	PASS
11ac(VHT80)	CH42	13.63	13.87	16.76	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	15.23	15.54	/	19.07	23.80	23.80	PASS
11a	CH60	15.93	15.92	/	19.25	23.84	23.84	PASS
11a	CH64	16.20	16.19	/	19.10	23.81	23.81	PASS
11n(HT20)	CH52	14.13	14.25	17.20	19.71	23.95	23.95	PASS
11n(HT20)	CH60	14.87	14.65	17.77	19.67	23.94	23.94	PASS
11n(HT20)	CH64	14.92	14.88	17.91	19.88	23.98	23.98	PASS
11n(HT40)	CH54	13.53	13.49	16.52	39.07	26.92	24.00	PASS
11n(HT40)	CH62	13.44	14.41	16.96	39.23	26.94	24.00	PASS
11ac(VHT20)	CH52	14.43	14.32	17.39	19.75	23.96	23.96	PASS
11ac(VHT20)	CH60	15.02	14.92	17.98	19.88	23.98	23.98	PASS
11ac(VHT20)	CH64	15.18	15.01	18.11	19.75	23.96	23.96	PASS
11ac(VHT40)	CH54	12.66	13.72	16.23	39.02	26.91	24.00	PASS
11ac(VHT40)	CH62	12.87	14.33	16.67	39.03	26.91	24.00	PASS
11ac(VHT80)	CH58	13.46	14.40	16.97	78.94	29.97	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	15.23	15.28	/	19.05	23.80	23.80	PASS
11a	CH120	15.51	15.60	/	19.18	23.83	23.83	PASS
11a	CH144	14.75	15.40	/	23.98	24.80	24.00	PASS
11n(HT20)	CH100	14.19	14.13	17.17	19.67	23.94	23.94	PASS
11n(HT20)	CH120	14.31	14.36	17.35	19.58	23.92	23.92	PASS
11n(HT20)	CH144	13.65	14.25	16.97	20.33	24.08	24.00	PASS
11n(HT40)	CH102	13.75	13.62	16.70	39.31	26.95	24.00	PASS
11n(HT40)	CH118	13.70	13.73	16.73	39.64	26.98	24.00	PASS
11n(HT40)	CH142	13.10	13.90	16.53	39.69	26.99	24.00	PASS
11ac(VHT20)	CH100	14.41	14.36	17.40	19.90	23.99	23.99	PASS
11ac(VHT20)	CH120	14.65	14.60	17.64	19.59	23.92	23.92	PASS
11ac(VHT20)	CH144	14.75	14.36	17.57	19.96	24.00	24.00	PASS
11ac(VHT40)	CH102	13.27	13.36	16.33	39.08	26.92	24.00	PASS
11ac(VHT40)	CH118	12.45	13.74	16.15	39.53	26.97	24.00	PASS
11ac(VHT40)	CH142	13.64	13.69	16.68	39.73	26.99	24.00	PASS
11ac(VHT80)	CH106	13.58	14.09	16.85	79.07	29.98	24.00	PASS
11ac(VHT80)	CH138	13.49	14.41	16.98	79.14	29.98	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

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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	14.73	15.07	/	30	PASS
11a	CH157	15.01	14.99	/	30	PASS
11a	CH165	15.63	15.43	/	30	PASS
11n(HT20)	CH149	13.45	13.84	16.66	30	PASS
11n(HT20)	CH157	14.96	13.83	17.44	30	PASS
11n(HT20)	CH165	14.41	14.29	17.36	30	PASS
11n(HT40)	CH151	12.64	13.27	15.98	30	PASS
11n(HT40)	CH159	13.06	13.56	16.33	30	PASS
11ac(VHT20)	CH149	14.69	13.95	17.35	30	PASS
11ac(VHT20)	CH157	15.06	14.01	17.58	30	PASS
11ac(VHT20)	CH165	14.60	14.31	17.47	30	PASS
11ac(VHT40)	CH151	12.41	12.99	15.72	30	PASS
11ac(VHT40)	CH159	11.80	13.37	15.67	30	PASS
11ac(VHT80)	CH155	12.40	13.05	15.75	30	PASS

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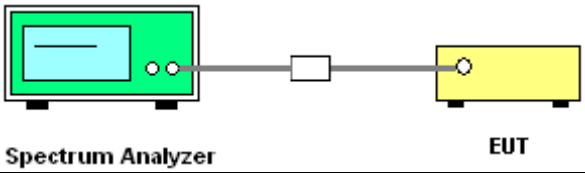
6.4. 6dB Emission Bandwidth

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:	
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

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2020
RF Cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 08, 2020
Antenna Connector	TCT	RFC-03	N/A	Sep. 08, 2020

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	16.39	0.5	PASS
11a	CH157	5785	16.34	0.5	PASS
11a	CH165	5825	16.41	0.5	PASS
11n(HT20)	CH149	5745	17.30	0.5	PASS
11n(HT20)	CH157	5785	17.27	0.5	PASS
11n(HT20)	CH165	5825	17.28	0.5	PASS
11n(HT40)	CH151	5755	36.31	0.5	PASS
11n(HT40)	CH159	5795	36.39	0.5	PASS
11ac(VHT20)	CH149	5745	17.23	0.5	PASS
11ac(VHT20)	CH157	5785	17.60	0.5	PASS
11ac(VHT20)	CH165	5825	17.34	0.5	PASS
11ac(VHT40)	CH151	5755	36.08	0.5	PASS
11ac(VHT40)	CH159	5795	36.44	0.5	PASS
11ac(VHT80)	CH155	5775	76.47	0.5	PASS

ANT 1

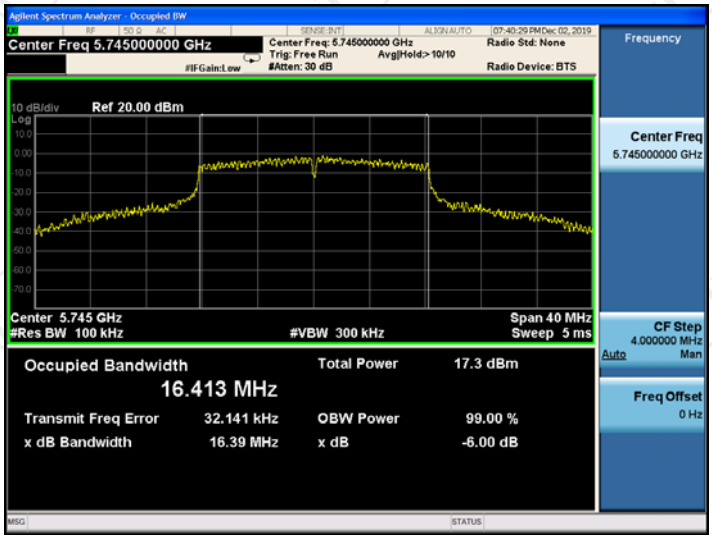
Band 3 (5745 - 5825 MHz)					
Mode	Test channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
11a	CH149	5745	16.34	0.5	PASS
11a	CH157	5785	16.43	0.5	PASS
11a	CH165	5825	16.38	0.5	PASS
11n(HT20)	CH149	5745	17.63	0.5	PASS
11n(HT20)	CH157	5785	17.30	0.5	PASS
11n(HT20)	CH165	5825	17.62	0.5	PASS
11n(HT40)	CH151	5755	36.43	0.5	PASS
11n(HT40)	CH159	5795	36.46	0.5	PASS
11ac(VHT20)	CH149	5745	17.67	0.5	PASS
11ac(VHT20)	CH157	5785	17.65	0.5	PASS
11ac(VHT20)	CH165	5825	17.55	0.5	PASS
11ac(VHT40)	CH151	5755	36.32	0.5	PASS
11ac(VHT40)	CH159	5795	36.39	0.5	PASS
11ac(VHT80)	CH155	5775	76.36	0.5	PASS

Test plots as follows:

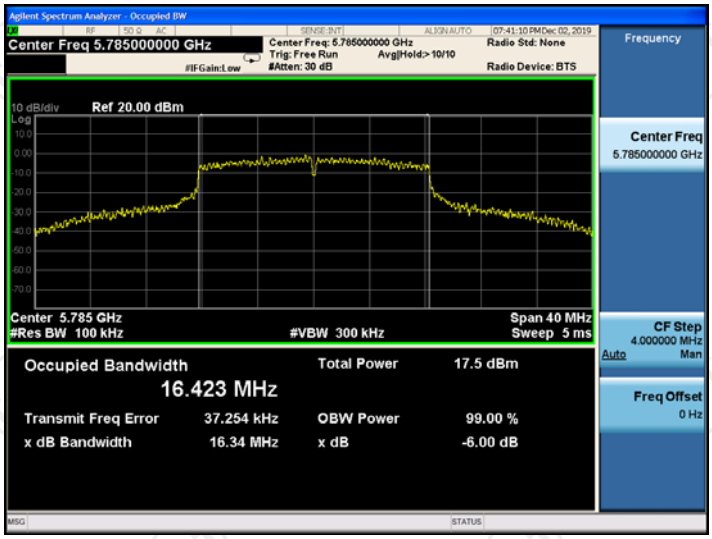
ANT 0
Band 3 (5745 – 5825 MHz)

11a

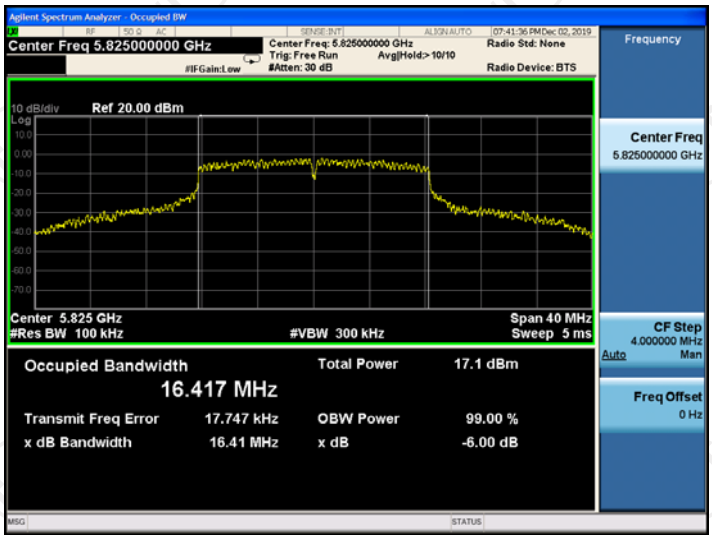
CH149



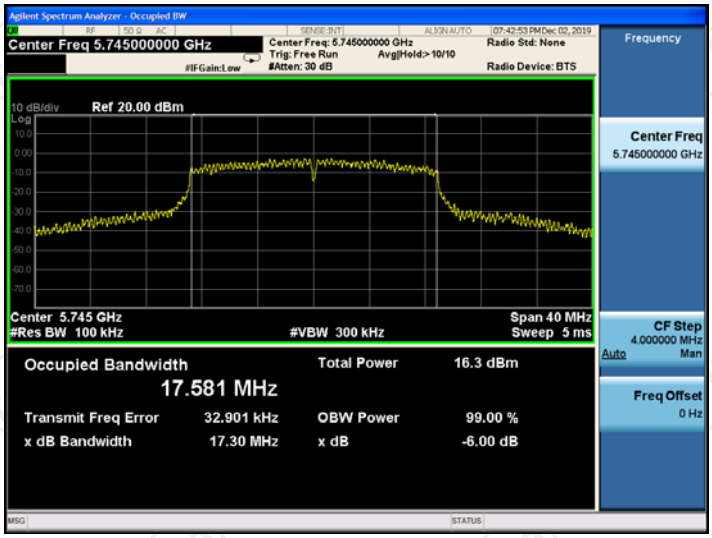
CH157



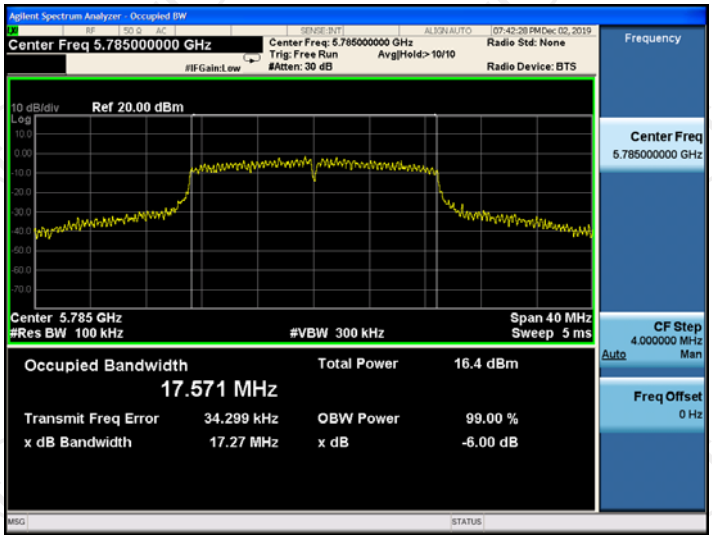
CH165



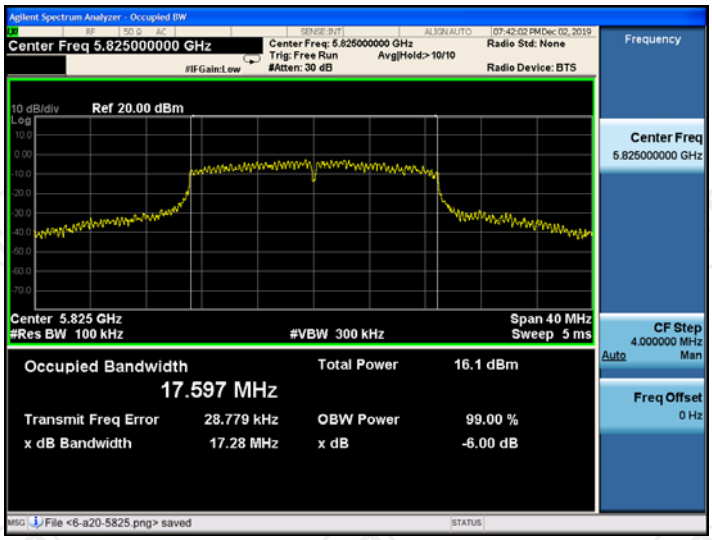
11n(HT20) CH149



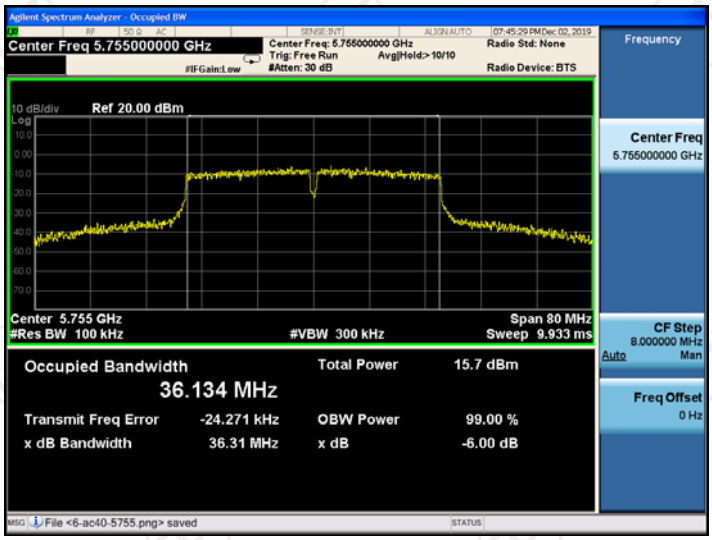
CH157



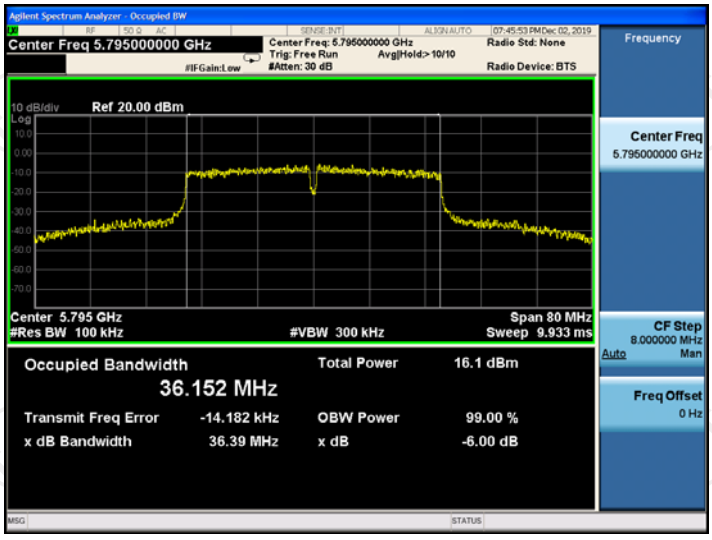
CH165



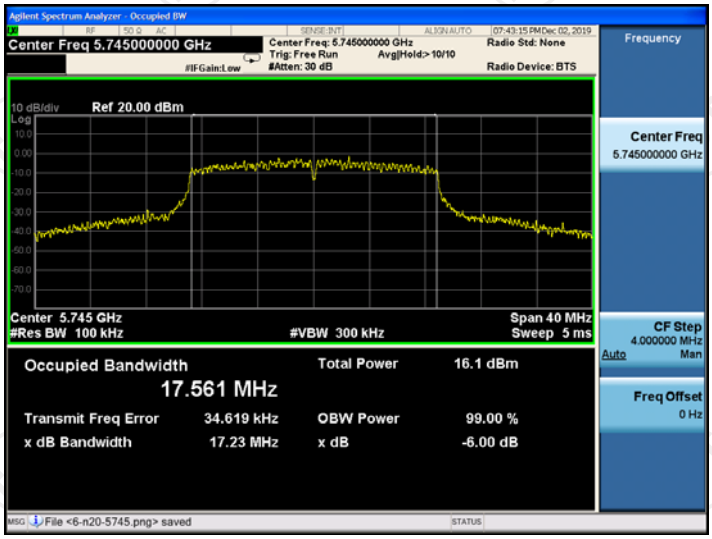
11n(HT40) CH151



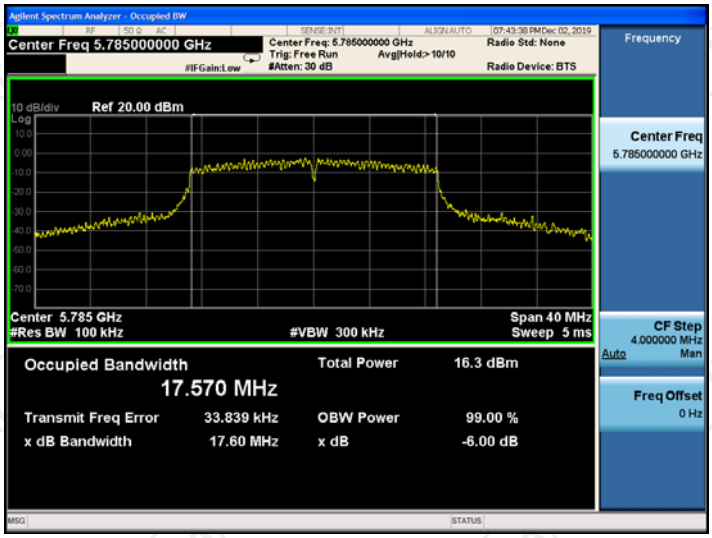
CH159



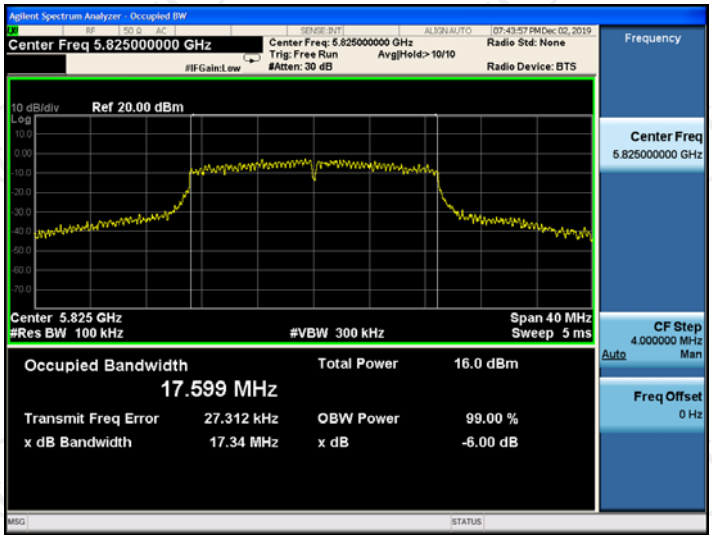
11ac(VHT20) CH149



CH157

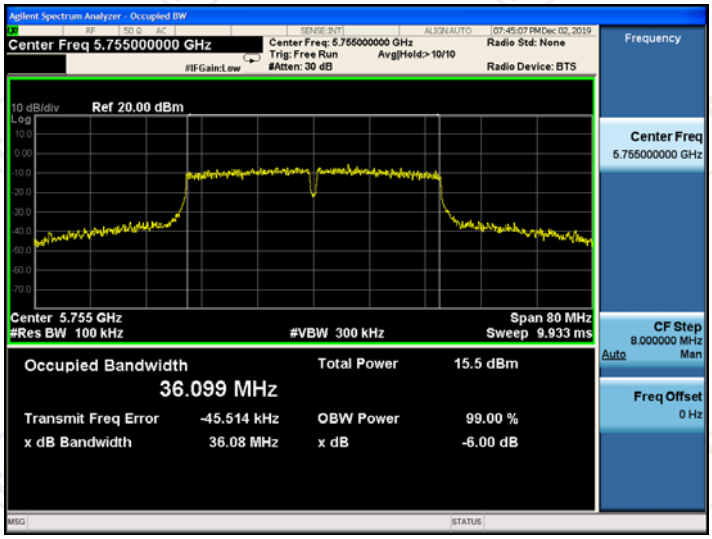


CH165



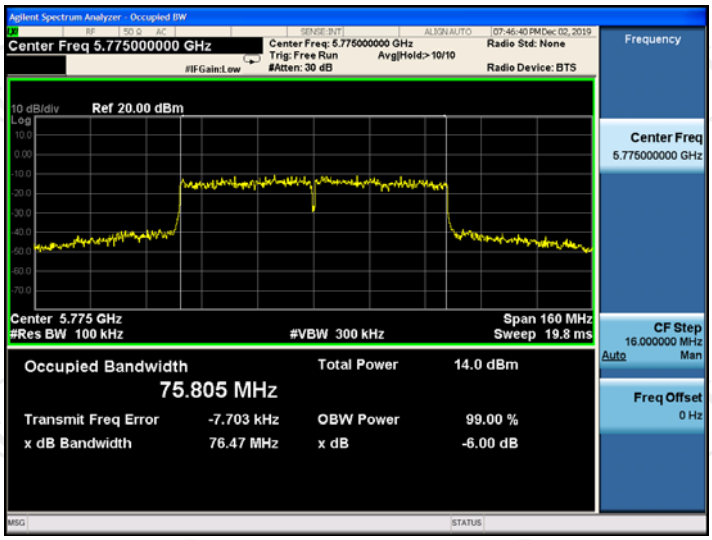
11ac(VHT40)

CH151



CH159

11ac(VHT80) CH155

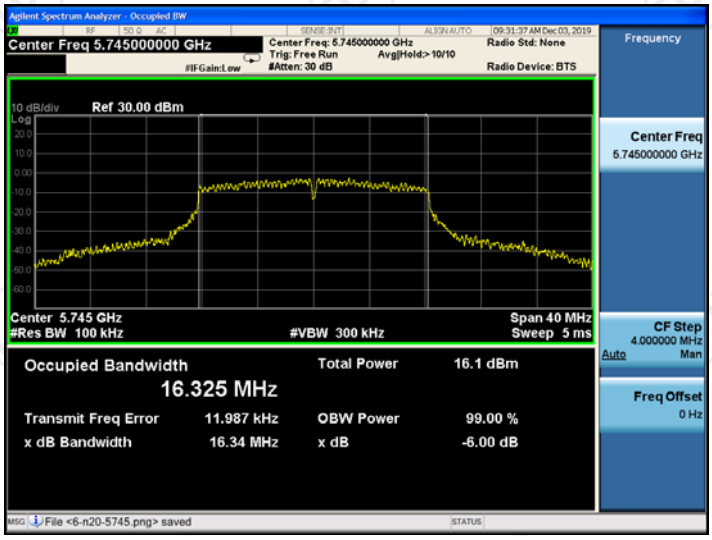


ANT 1

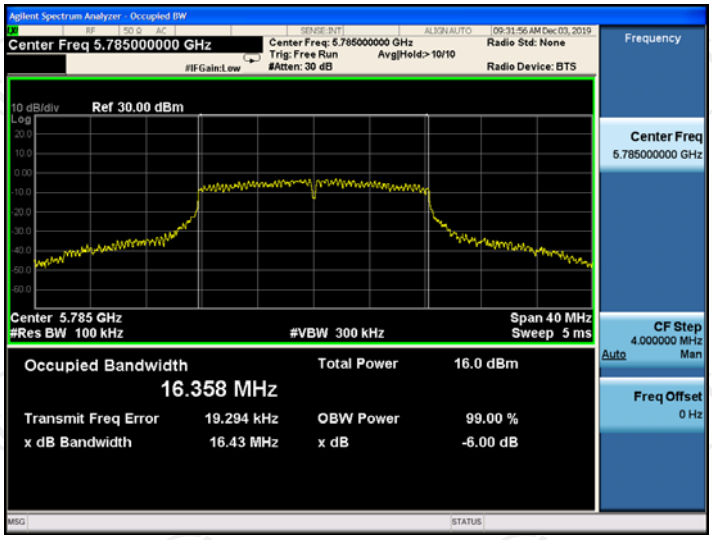
Band 3 (5745 – 5825 MHz)

11a

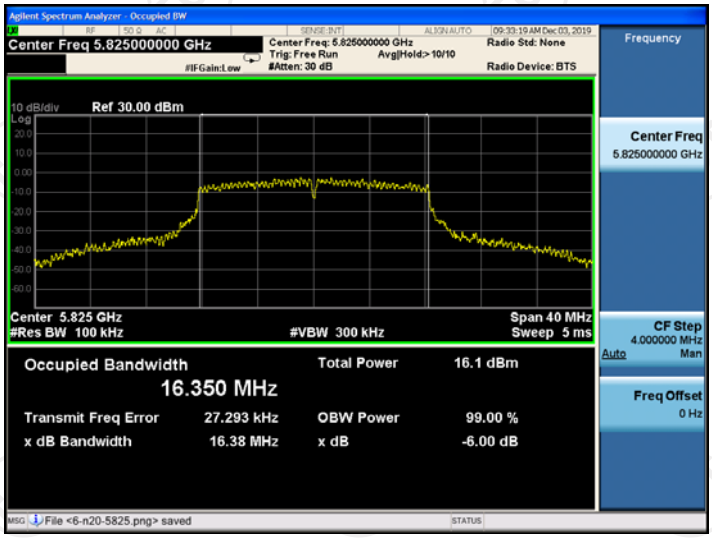
CH149



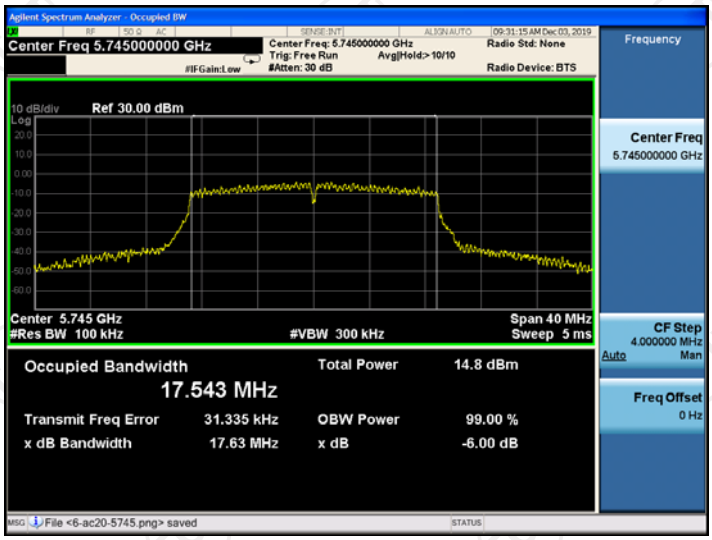
CH157



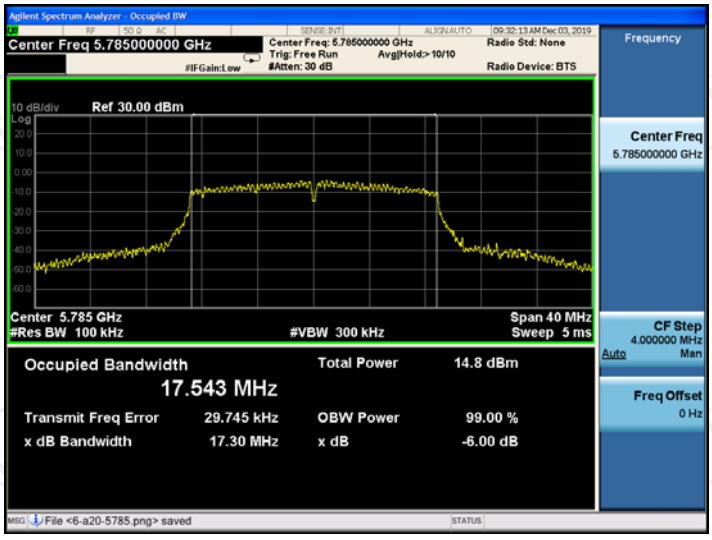
CH165



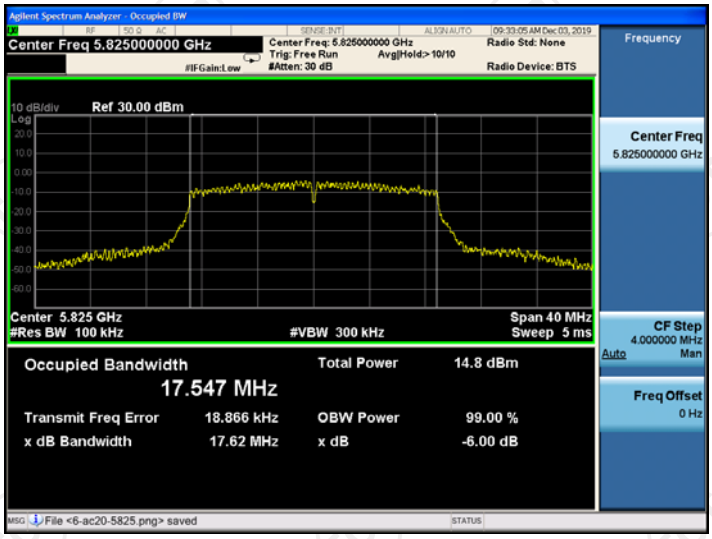
11n(HT20) CH149



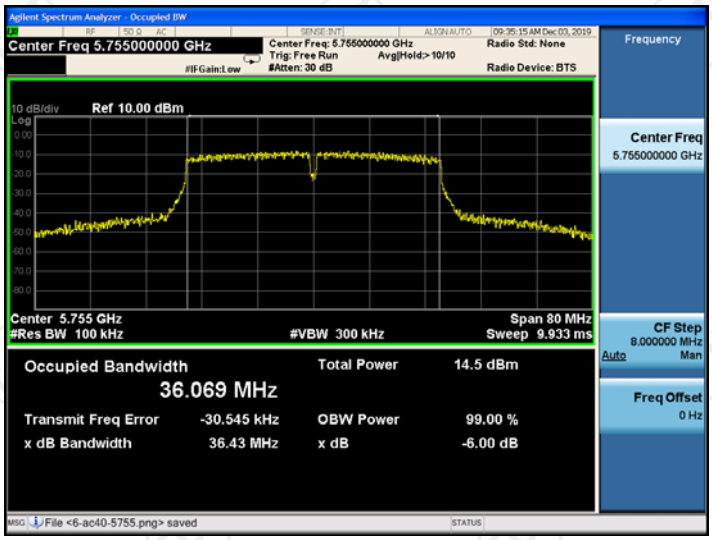
CH157



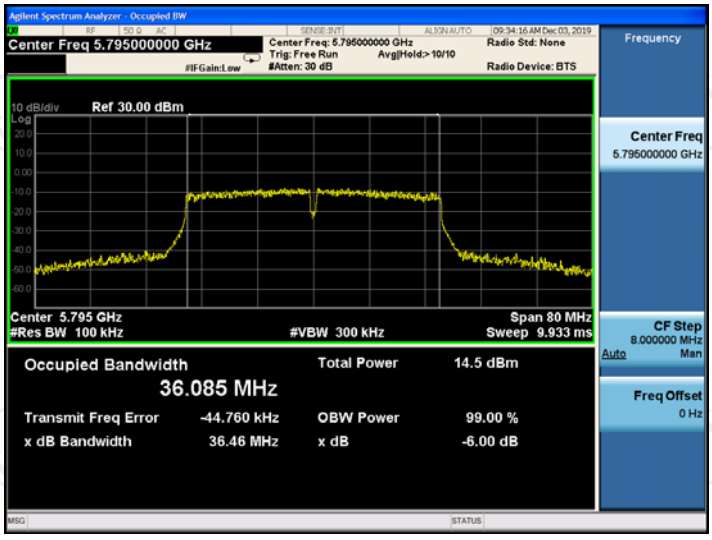
CH165



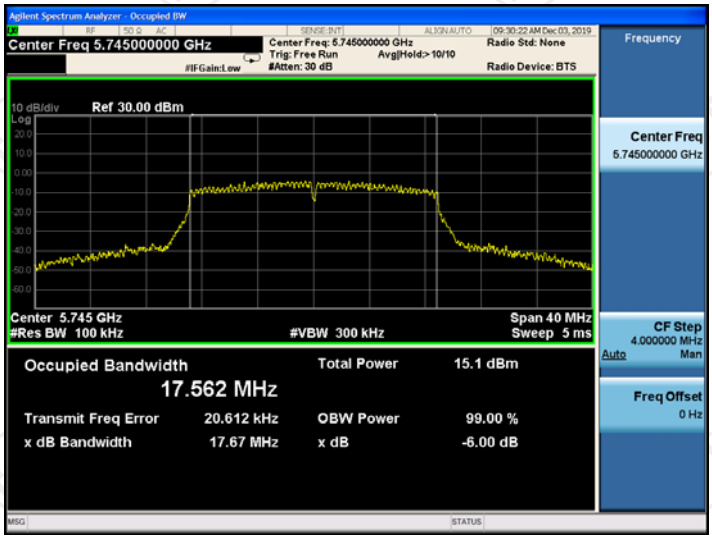
11n(HT40) CH151



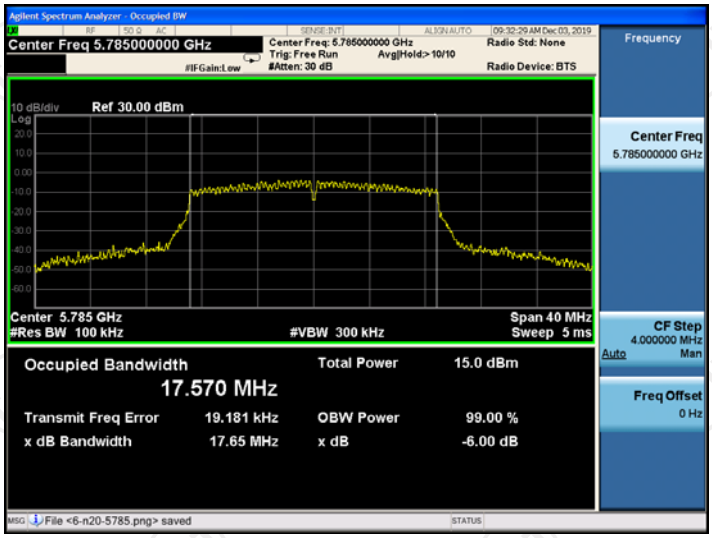
CH159



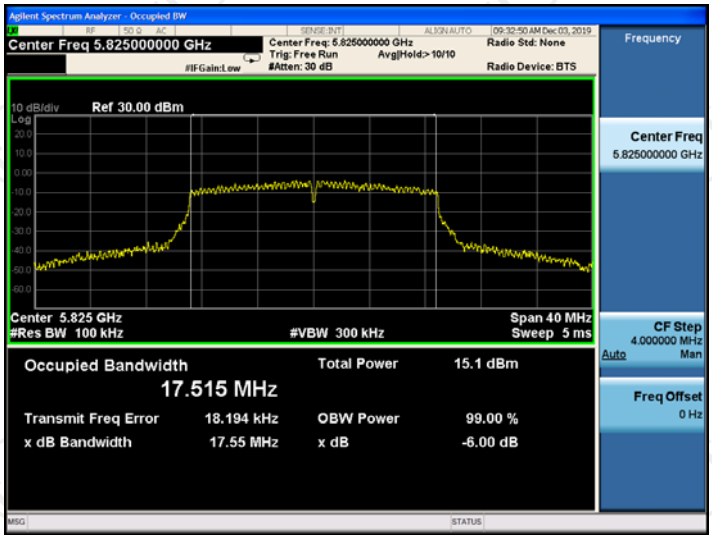
11ac(VHT20) CH149



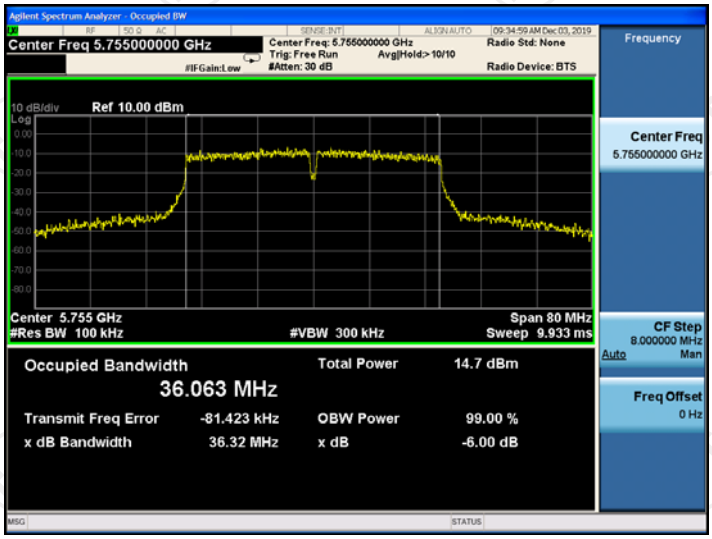
CH157



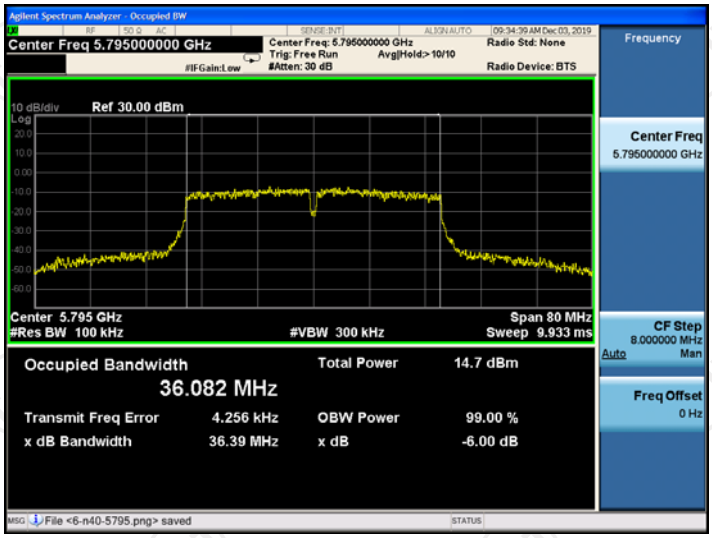
CH165



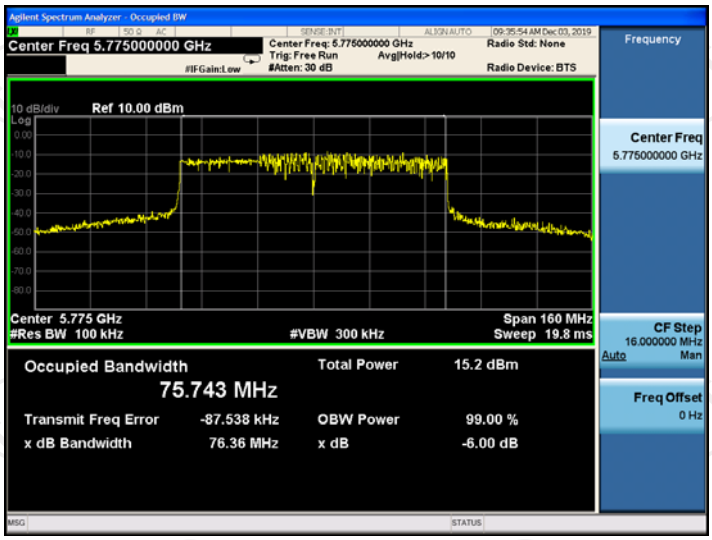
11ac(VHT40) CH151



CH159

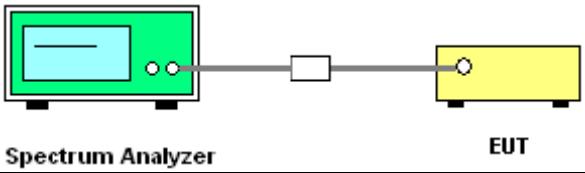


11ac(VHT80) CH155



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:	
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

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2020
RF Cable (9KHz-26.5GHz)	TCT	RE-high-02	N/A	Sep. 08, 2020
Antenna Connector	TCT	RFC-03	N/A	Sep. 08, 2020

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	19.45	16.403
11a	CH40	5200	19.36	16.372
11a	CH48	5240	19.45	16.389
11n(HT20)	CH36	5180	19.59	17.546
11n(HT20)	CH40	5200	19.59	17.581
11n(HT20)	CH48	5240	19.40	17.566
11n(HT40)	CH38	5190	39.13	36.138
11n(HT40)	CH46	5230	38.99	36.069
11ac(VHT20)	CH36	5180	19.59	17.519
11ac(VHT20)	CH40	5200	19.69	17.613
11ac(VHT20)	CH48	5240	19.72	17.558
11ac(VHT40)	CH38	5190	39.03	36.090
11ac(VHT40)	CH46	5230	39.00	36.067
11ac(VHT80)	CH42	5210	79.39	75.706

Band 2A

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH52	5260	19.07	16.367
11a	CH60	5300	19.25	16.379
11a	CH64	5320	19.10	16.385
11n(HT20)	CH52	5260	19.71	17.571
11n(HT20)	CH60	5300	19.67	17.570
11n(HT20)	CH64	5320	19.88	17.557
11n(HT40)	CH54	5270	39.07	36.106
11n(HT40)	CH62	5310	39.23	35.994
11ac(VHT20)	CH52	5260	19.75	17.560
11ac(VHT20)	CH60	5300	19.88	17.582
11ac(VHT20)	CH64	5320	19.75	17.595
11ac(VHT40)	CH54	5270	39.02	36.043
11ac(VHT40)	CH62	5310	39.03	36.132
11ac(VHT80)	CH58	5290	78.94	75.815

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Band 2C

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH100	5500	19.05	16.392
11a	CH120	5600	19.18	16.385
11a	CH144	5720	23.98	16.466
11n(HT20)	CH100	5500	19.67	17.549
11n(HT20)	CH120	5600	19.58	17.538
11n(HT20)	CH144	5720	20.33	17.607
11n(HT40)	CH102	5510	39.31	36.083
11n(HT40)	CH118	5590	39.64	36.128
11n(HT40)	CH142	5710	39.69	36.208
11ac(VHT20)	CH100	5500	19.90	17.554
11ac(VHT20)	CH120	5600	19.59	17.497
11ac(VHT20)	CH144	5720	19.96	17.619
11ac(VHT40)	CH102	5510	39.08	36.048
11ac(VHT40)	CH118	5590	39.53	36.147
11ac(VHT40)	CH142	5710	39.73	36.110
11ac(VHT80)	CH106	5530	79.07	75.950
11ac(VHT80)	CH138	5690	79.14	75.872

Band 3

Mode	Test channel	Frequency (MHz)	99% Bandwidth (MHz)
11a	CH149	5745	16.444
11a	CH157	5785	16.489
11a	CH165	5825	16.493
11n(HT20)	CH149	5745	17.645
11n(HT20)	CH157	5785	17.622
11n(HT20)	CH165	5825	17.634
11n(HT40)	CH151	5755	36.135
11n(HT40)	CH159	5795	36.247
11ac(VHT20)	CH149	5745	17.613
11ac(VHT20)	CH157	5785	17.636
11ac(VHT20)	CH165	5825	17.644
11ac(VHT40)	CH151	5755	36.154
11ac(VHT40)	CH159	5795	36.167
11ac(VHT80)	CH155	5775	76.102

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ANT 1
Band 1

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH36	5180	19.00	16.357
11a	CH40	5200	19.08	16.359
11a	CH48	5240	19.15	16.399
11n(HT20)	CH36	5180	19.84	17.576
11n(HT20)	CH40	5200	19.51	17.583
11n(HT20)	CH48	5240	19.57	17.564
11n(HT40)	CH38	5190	39.07	36.091
11n(HT40)	CH46	5230	39.53	36.110
11ac(VHT20)	CH36	5180	19.70	17.559
11ac(VHT20)	CH40	5200	19.60	17.546
11ac(VHT20)	CH48	5240	19.39	17.566
11ac(VHT40)	CH38	5190	38.92	36.064
11ac(VHT40)	CH46	5230	39.33	36.055
11ac(VHT80)	CH42	5210	79.39	75.918

Band 2A

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH52	5260	19.29	16.365
11a	CH60	5300	19.54	16.398
11a	CH64	5320	19.55	16.401
11n(HT20)	CH52	5260	19.54	17.556
11n(HT20)	CH60	5300	19.73	17.575
11n(HT20)	CH64	5320	19.97	17.578
11n(HT40)	CH54	5270	39.11	36.139
11n(HT40)	CH62	5310	38.93	36.006
11ac(VHT20)	CH52	5260	19.74	17.596
11ac(VHT20)	CH60	5300	19.88	17.530
11ac(VHT20)	CH64	5320	19.58	17.598
11ac(VHT40)	CH54	5270	39.14	36.106
11ac(VHT40)	CH62	5310	39.11	36.053
11ac(VHT80)	CH58	5290	79.32	75.976

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Band 2C

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH100	5500	19.59	16.419
11a	CH120	5600	19.20	16.410
11a	CH144	5720	19.30	16.412
11n(HT20)	CH100	5500	19.93	17.595
11n(HT20)	CH120	5600	19.87	17.605
11n(HT20)	CH144	5720	19.71	17.579
11n(HT40)	CH102	5510	39.37	36.077
11n(HT40)	CH118	5590	39.42	36.082
11n(HT40)	CH142	5710	39.49	36.122
11ac(VHT20)	CH100	5500	19.78	17.577
11ac(VHT20)	CH120	5600	19.97	17.583
11ac(VHT20)	CH144	5720	19.74	17.585
11ac(VHT40)	CH102	5510	39.78	36.078
11ac(VHT40)	CH118	5590	39.38	36.111
11ac(VHT40)	CH142	5710	39.44	36.019
11ac(VHT80)	CH106	5530	79.49	75.983
11ac(VHT80)	CH138	5690	79.28	75.764

Band 3

Mode	Test channel	Frequency (MHz)	99% Bandwidth (MHz)
11a	CH149	5745	16.420
11a	CH157	5785	16.385
11a	CH165	5825	16.397
11n(HT20)	CH149	5745	17.555
11n(HT20)	CH157	5785	17.628
11n(HT20)	CH165	5825	17.591
11n(HT40)	CH151	5755	36.131
11n(HT40)	CH159	5795	36.112
11ac(VHT20)	CH149	5745	17.590
11ac(VHT20)	CH157	5785	17.554
11ac(VHT20)	CH165	5825	17.584
11ac(VHT40)	CH151	5755	36.136
11ac(VHT40)	CH159	5795	36.108
11ac(VHT80)	CH155	5775	75.871

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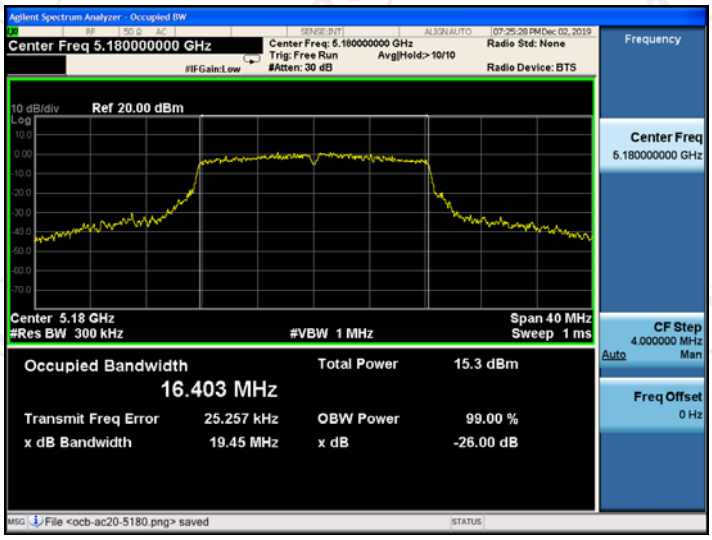
Test plots as follows:

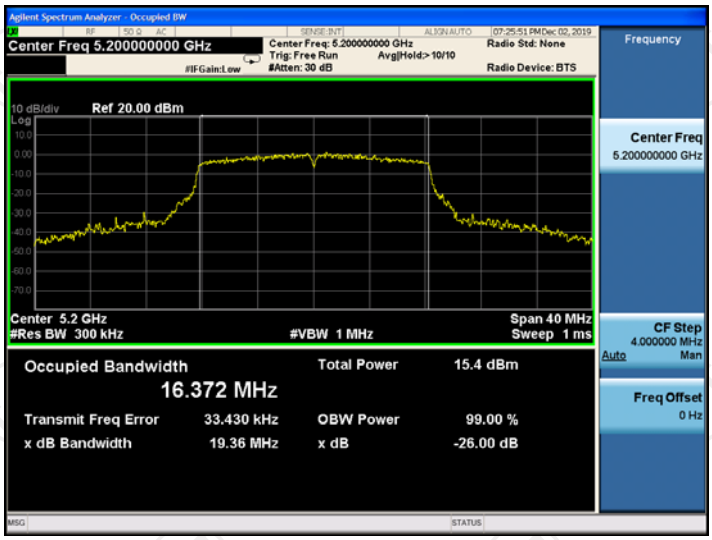
ANT 0 Band 1 (5180-5240 MHz)

11a

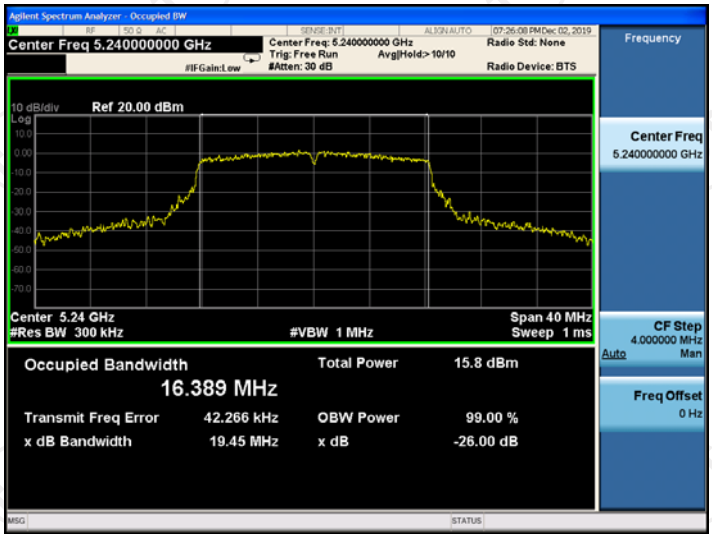
CH36



CH40

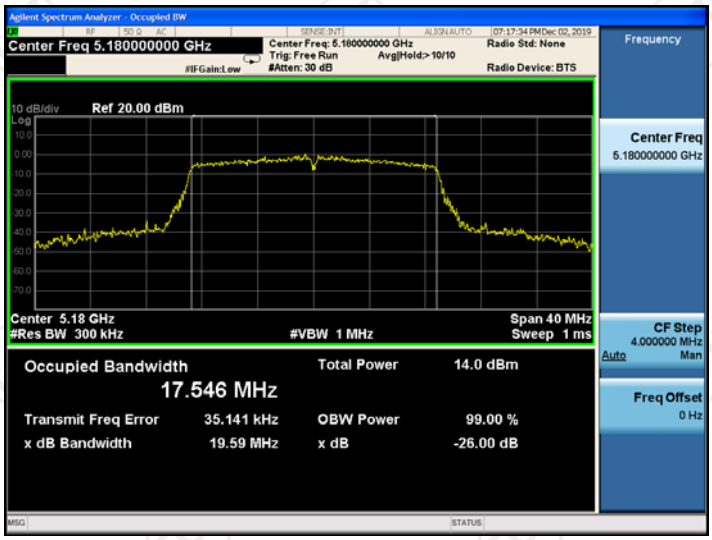


CH48

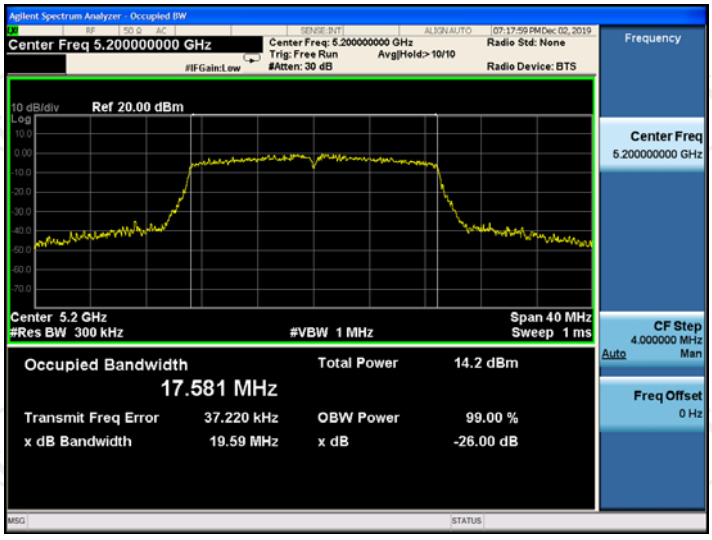


11n(HT20)

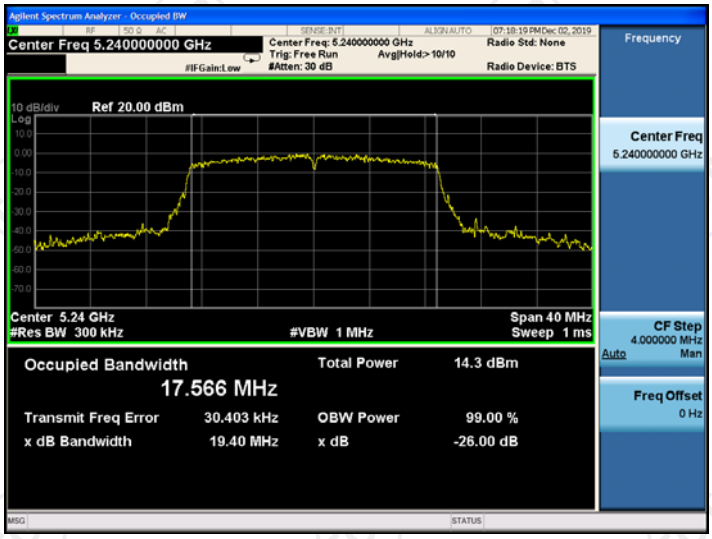
CH36



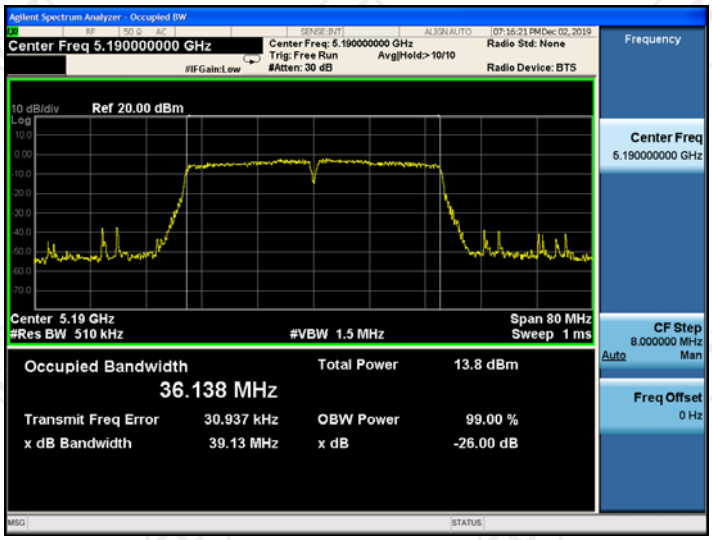
CH40



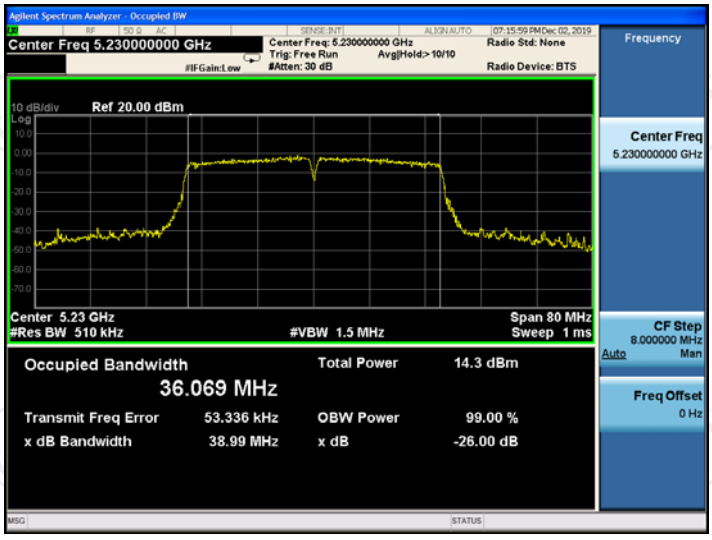
CH48



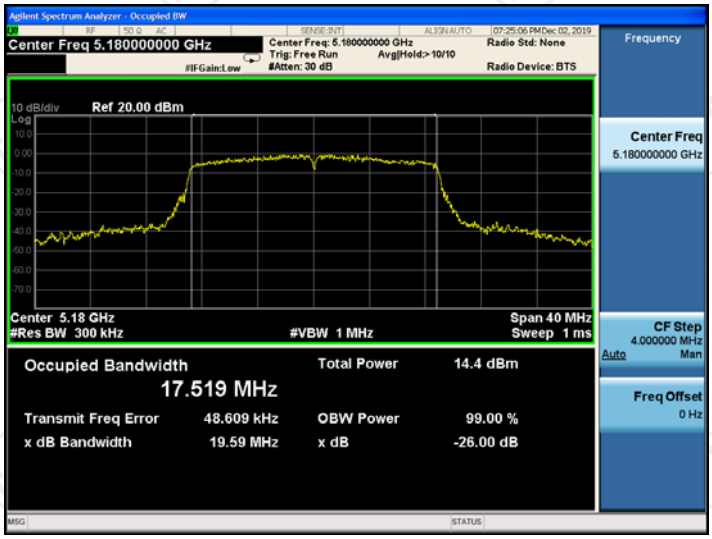
11n(HT40) CH38



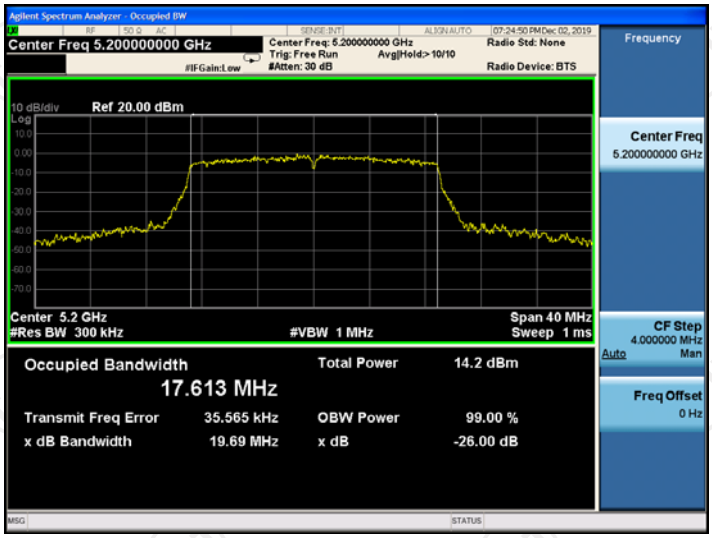
CH46



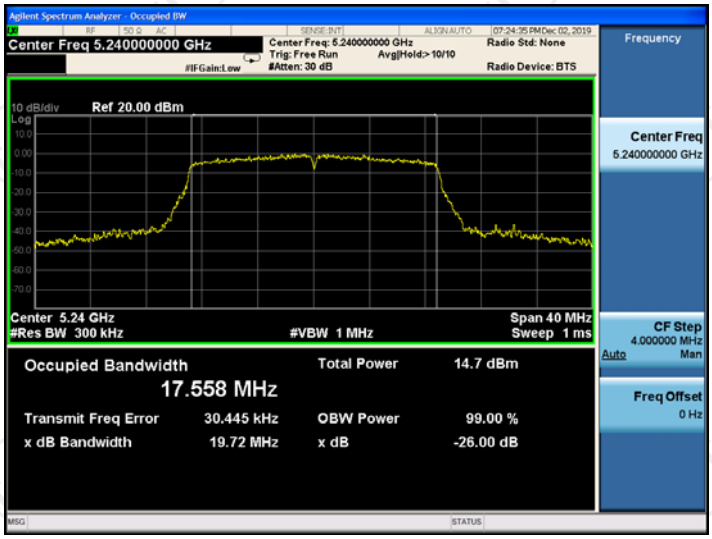
11ac(VHT20) CH36



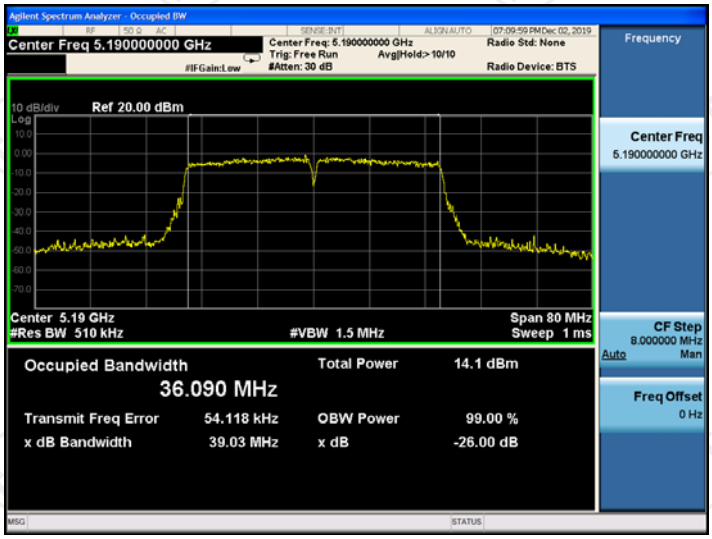
CH40



CH48

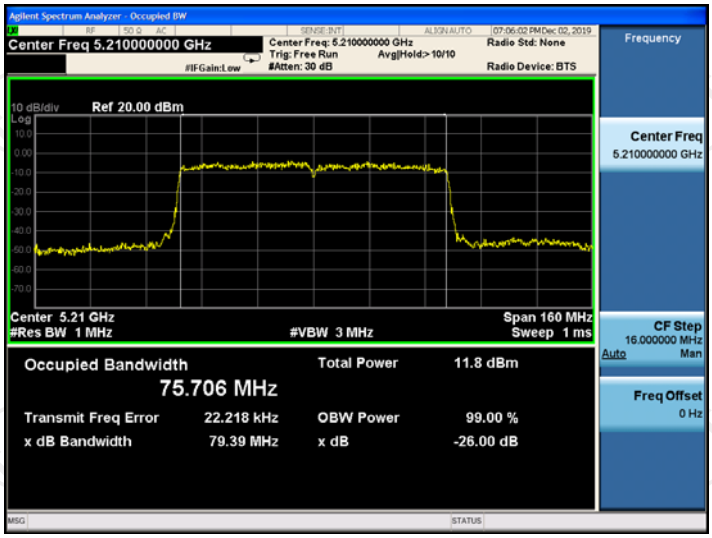


11ac(VHT40) CH38



CH46

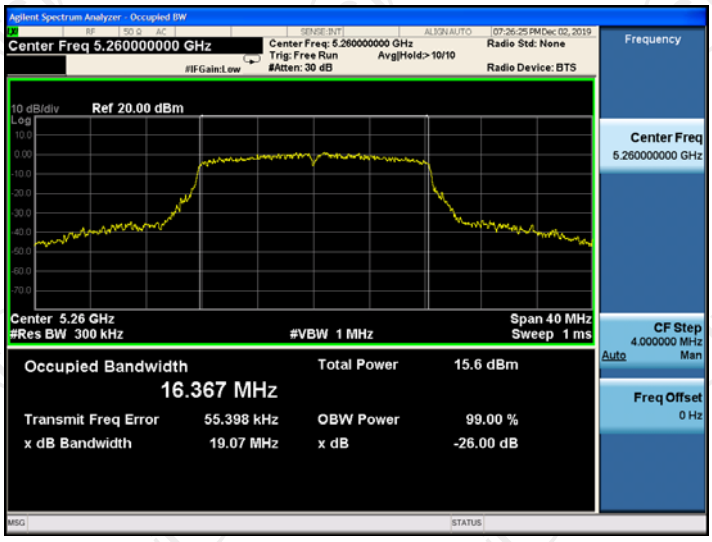
11ac(VHT80) CH42



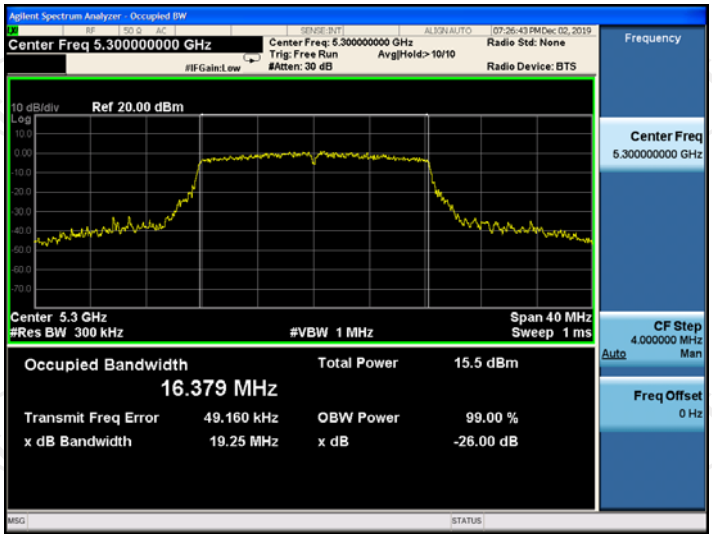
Band 2A(5260-5320MHz)

11a

CH52



CH60



CH64