

# TEST REPORT

**FCC ID: 2ACOE-WG233**

**Product: WIFI module**

**Model No.: WG233**

**Additional Model No.: WG233E, WG233P**

**Trade Mark: N/A**

**Report No.: TCT200305E044**

**Issued Date: Apr. 10, 2020**

Issued for:

**Skylab M&C Technology Co., Ltd.  
6/F, Building 9, Lijincheng park, Gongye East Rd, Longhua St, Longhua  
District, Shenzhen 518109, China**

Issued By:

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**1. Test Certification**

<b>Product:</b>	WIFI module
<b>Model No.:</b>	WG233
<b>Additional Model No.:</b>	WG233E, WG233P
<b>Trade Mark:</b>	N/A
<b>Applicant:</b>	Skylab M&C Technology Co., Ltd.
<b>Address:</b>	6/F, Building 9, Lijincheng park, Gongye East Rd, Longhua St, Longhua District, Shenzhen 518109, China
<b>Manufacturer:</b>	Skylab M&C Technology Co., Ltd.
<b>Address:</b>	6/F, Building 9, Lijincheng park, Gongye East Rd, Longhua St, Longhua District, Shenzhen 518109, China
<b>Date of Test:</b>	Mar. 06, 2020 – Apr. 09, 2020
<b>Applicable Standards:</b>	FCC CFR Title 47 Part 15 Subpart E Section 15.407: 2016 KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General U-NII Test Procedures New Rules v02r01

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:

Apr. 09, 2020

Reviewed By:



Beryl Zhao

Date:

Apr. 10, 2020

Approved By:



Tomsin

Date:

Apr. 10, 2020

## 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.

### 3. EUT Description

<b>Product:</b>	WIFI module
<b>Model No.:</b>	WG233
<b>Additional Model No.:</b>	WG233E, WG233P
<b>Trade Mark:</b>	N/A
<b>Operation Frequency:</b>	Band 1: 5180 MHz -5240 MHz Band 3: 5745 MHz -5825 MHz
<b>Channel Bandwidth:</b>	802.11a: 20MHz 802.11n: 20MHz, 40MHz 802.11ac: 20MHz, 40MHz, 80MHz
<b>Modulation Technology:</b>	Orthogonal Frequency Division Multiplexing(OFDM)
<b>Modulation Type</b>	256QAM, 64QAM, 16QAM, BPSK, QPSK
<b>Antenna Type:</b>	External Antenna
<b>Antenna Gain:</b>	2dBi
<b>Power Supply:</b>	DC 3.3V
<b>Remark:</b>	All models above are identical in interior structure, electrical circuits and components, and just model names are different for the marketing requirement.

**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 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:		
Condition	Conducted Emission	Radiated Emission
Temperature:	25.0 °C	25.0 °C
Humidity:	55 % RH	55 % RH
Atmospheric Pressure:	1010 mbar	1010 mbar
Test Mode:		
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 100%)	
<p>The sample was placed 0.8m &amp; 1.5m for the measurement below &amp; 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 &amp; 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( Z axis) are shown in Test Results of the following pages.</p>		

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 Computer	XiaoXin CHAO5000	PF0WZYD9	/	Lenovo
WG203 TEST BOARD	/	/	/	/

**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

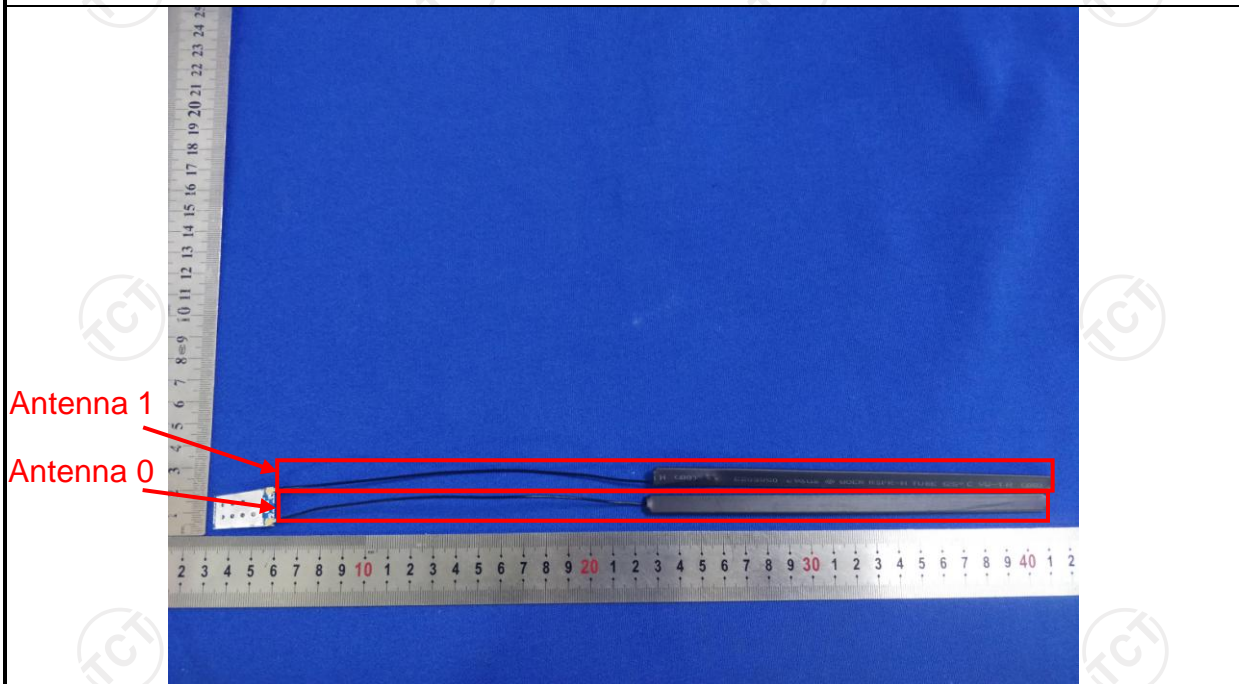
The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

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

<b>Standard requirement:</b>	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.	
<b>E.U.T Antenna:</b>	
The EUT has two external antennas, and the best case gains of the both antennas are 2dBi.	



## 6.2. Conducted Emission

### 6.2.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.207														
<b>Test Method:</b>	ANSI C63.10:2013														
<b>Frequency Range:</b>	150 kHz to 30 MHz														
<b>Receiver setup:</b>	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
<b>Limits:</b>	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <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> </tbody> </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													
<b>Test Setup:</b>	<p><i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>														
<b>Test Mode:</b>	Tx Mode														
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>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.</li> <li>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).</li> <li>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.</li> </ol>														
<b>Test Result:</b>	PASS														

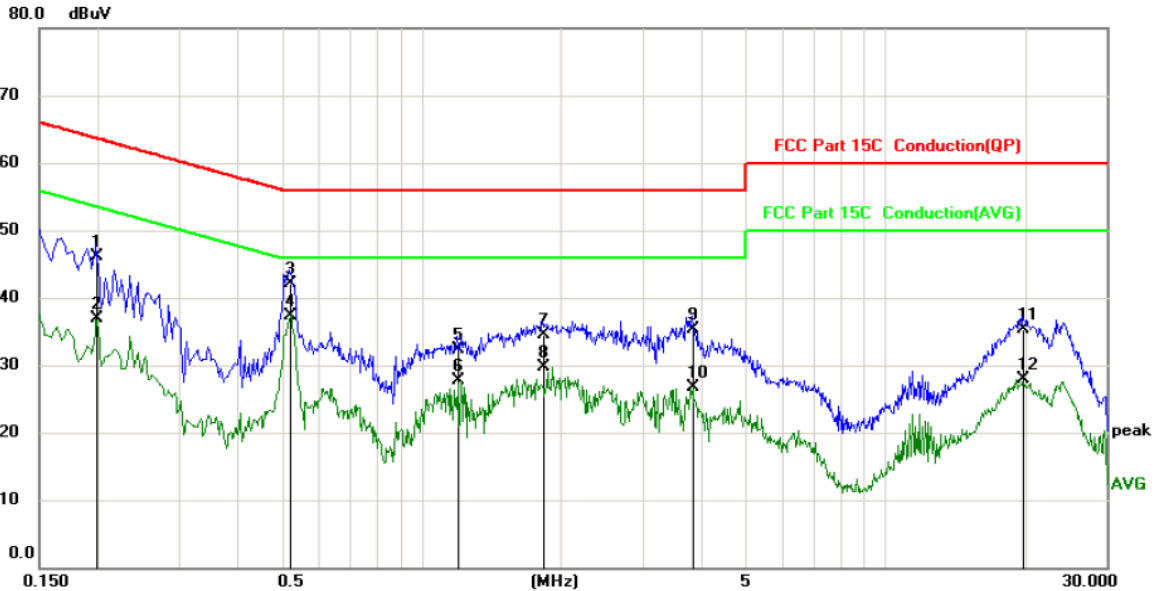
**6.2.2. Test Instruments**

Conducted Emission Shielding Room Test Site (843)				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	R&S	ESPI	101402	Jul. 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).

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)



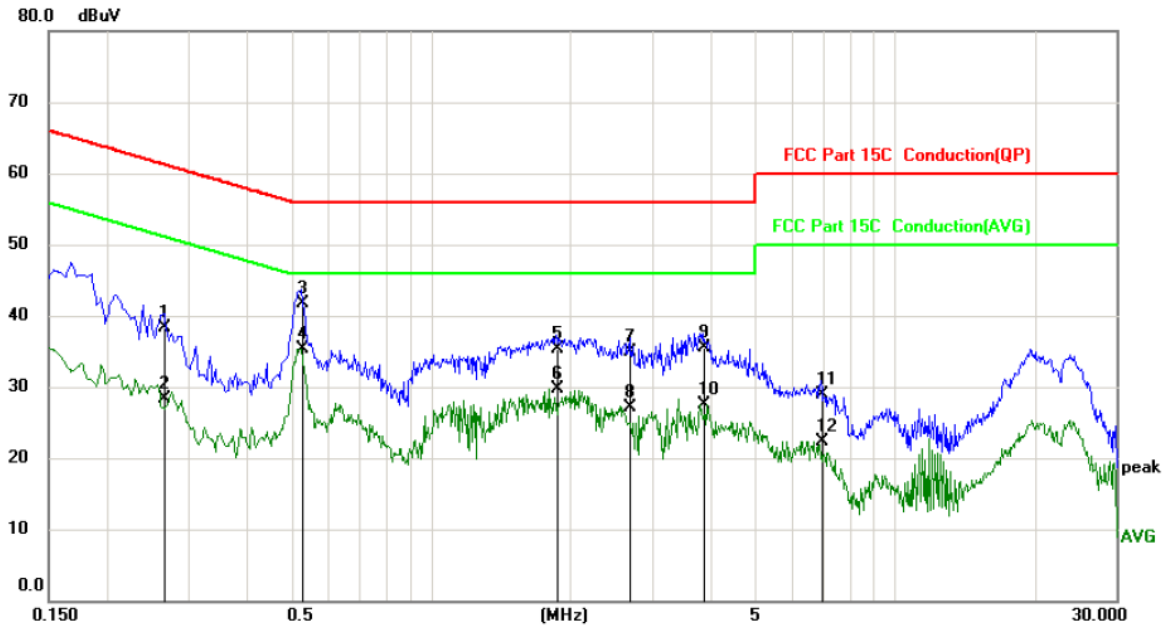
Site: \_\_\_\_\_ Phase: **L1** Temperature: 25  
Limit: FCC Part 15C Conduction(QP) Power: DC 3.3V Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1995	35.88	10.22	46.10	63.63	-17.53	QP	
2		0.1995	26.70	10.22	36.92	53.63	-16.71	AVG	
3		0.5190	31.96	10.22	42.18	56.00	-13.82	QP	
4	*	0.5190	27.18	10.22	37.40	46.00	-8.60	AVG	
5		1.1940	21.84	10.38	32.22	56.00	-23.78	QP	
6		1.1940	17.24	10.38	27.62	46.00	-18.38	AVG	
7		1.8240	24.07	10.43	34.50	56.00	-21.50	QP	
8		1.8240	19.29	10.43	29.72	46.00	-16.28	AVG	
9		3.8220	24.88	10.47	35.35	56.00	-20.65	QP	
10		3.8220	16.30	10.47	26.77	46.00	-19.23	AVG	
11		19.8194	24.25	11.06	35.31	60.00	-24.69	QP	
12		19.8194	16.80	11.06	27.86	50.00	-22.14	AVG	

**Note:**

- Freq. = Emission frequency in MHz
- Reading level (dBuV) = Receiver reading
- Corr. Factor (dB) = LISN 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
- \* 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: DC 3.3V Humidity: 55 %

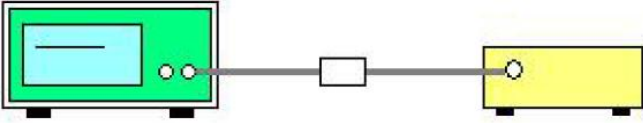
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2670	28.13	10.23	38.36	61.21	-22.85	QP	
2		0.2670	18.08	10.23	28.31	51.21	-22.90	AVG	
3		0.5280	31.42	10.22	41.64	56.00	-14.36	QP	
4	*	0.5280	25.09	10.22	35.31	46.00	-10.69	AVG	
5		1.8645	24.96	10.44	35.40	56.00	-20.60	QP	
6		1.8645	19.36	10.44	29.80	46.00	-16.20	AVG	
7		2.6790	24.52	10.45	34.97	56.00	-21.03	QP	
8		2.6790	16.74	10.45	27.19	46.00	-18.81	AVG	
9		3.8760	25.13	10.47	35.60	56.00	-20.40	QP	
10		3.8760	16.99	10.47	27.46	46.00	-18.54	AVG	
11		6.9405	18.40	10.51	28.91	60.00	-31.09	QP	
12		6.9405	11.71	10.51	22.22	50.00	-27.78	AVG	

**Note:**

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

<b>Test Requirement:</b>	FCC Part15 E Section 15.407(a)& Part 2 J Section 2.1046						
<b>Test Method:</b>	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E						
<b>Limit:</b>	<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>5745 - 5825</td> <td>30dBm(1W)</td> </tr> </tbody> </table>	Frequency Band (MHz)	Limit	5180 - 5240	24dBm(250mW) for client device	5745 - 5825	30dBm(1W)
Frequency Band (MHz)	Limit						
5180 - 5240	24dBm(250mW) for client device						
5745 - 5825	30dBm(1W)						
<b>Test Setup:</b>	 <p>The diagram illustrates the test setup. On the left is a green box labeled 'Power meter'. A cable connects it to a small white box labeled 'Attenuator'. Another cable connects the attenuator to a yellow box labeled 'EUT' (Equipment Under Test).</p>						
<b>Test Mode:</b>	Transmitting mode with modulation						
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The testing follows the Measurement Procedure of KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E, 3, a</li> <li>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.</li> <li>3. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>5. Measure the conducted output power and record the results in the test report.</li> </ol>						
<b>Test Result:</b>	PASS						
<b>Remark:</b>	<p>Conducted output power= measurement power +10log(1/x) X is duty cycle=1, so 10log(1/1)=0</p> <p>Conducted output power= measurement power</p>						

**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	9.79	9.66	/	24	PASS
11a	CH40	9.97	9.89	/	24	PASS
11a	CH48	9.69	10.56	/	24	PASS
11n(HT20)	CH36	8.79	8.68	11.75	24	PASS
11n(HT20)	CH40	9.10	8.87	12.00	24	PASS
11n(HT20)	CH48	8.95	9.32	12.15	24	PASS
11n(HT40)	CH38	8.23	8.09	11.17	24	PASS
11n(HT40)	CH46	8.14	8.30	11.23	24	PASS
11ac(VHT20)	CH36	8.76	8.62	11.70	24	PASS
11ac(VHT20)	CH40	8.97	8.99	11.99	24	PASS
11ac(VHT20)	CH48	8.81	9.26	12.05	24	PASS
11ac(VHT40)	CH38	8.19	9.12	11.69	24	PASS
11ac(VHT40)	CH46	9.12	9.36	12.25	24	PASS
11ac(VHT80)	CH42	8.00	7.87	10.95	24	PASS

**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	8.84	7.16	/	30	PASS
11a	CH157	8.71	7.14	/	30	PASS
11a	CH165	8.60	7.55	/	30	PASS
11n(HT20)	CH149	8.71	7.81	11.29	30	PASS
11n(HT20)	CH157	8.84	7.81	11.37	30	PASS
11n(HT20)	CH165	8.60	8.11	11.37	30	PASS
11n(HT40)	CH151	7.97	7.02	10.53	30	PASS
11n(HT40)	CH159	7.96	7.12	10.57	30	PASS
11ac(VHT20)	CH149	8.61	7.73	11.20	30	PASS
11ac(VHT20)	CH157	8.27	8.01	11.15	30	PASS
11ac(VHT20)	CH165	7.51	8.07	10.81	30	PASS
11ac(VHT40)	CH151	7.99	6.89	10.49	30	PASS
11ac(VHT40)	CH159	7.94	7.01	10.51	30	PASS
11ac(VHT80)	CH155	7.78	7.54	10.67	30	PASS

## 6.4. 6dB Emission Bandwidth

### 6.4.1. Test Specification

<b>Test Requirement:</b>	FCC CFR47 Part 15 Section 15.407(e)& Part 2 J Section 2.1049
<b>Test Method:</b>	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C
<b>Limit:</b>	>500kHz
<b>Test Setup:</b>	 <p style="text-align: center;">Spectrum Analyzer                      EUT</p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C</li> <li>2. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>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.</li> <li>4. Measure and record the results in the test report.</li> </ol>
<b>Test Result:</b>	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	16.55	0.5	PASS
11a	CH157	5785	16.55	0.5	PASS
11a	CH165	5825	16.53	0.5	PASS
11n(HT20)	CH149	5745	17.76	0.5	PASS
11n(HT20)	CH157	5785	17.77	0.5	PASS
11n(HT20)	CH165	5825	17.76	0.5	PASS
11n(HT40)	CH151	5755	36.54	0.5	PASS
11n(HT40)	CH159	5795	36.55	0.5	PASS
11ac(VHT20)	CH149	5745	17.77	0.5	PASS
11ac(VHT20)	CH157	5785	17.76	0.5	PASS
11ac(VHT20)	CH165	5825	17.77	0.5	PASS
11ac(VHT40)	CH151	5755	36.54	0.5	PASS
11ac(VHT40)	CH159	5795	36.54	0.5	PASS
11ac(VHT80)	CH155	5775	76.44	0.5	PASS

**ANT 1**

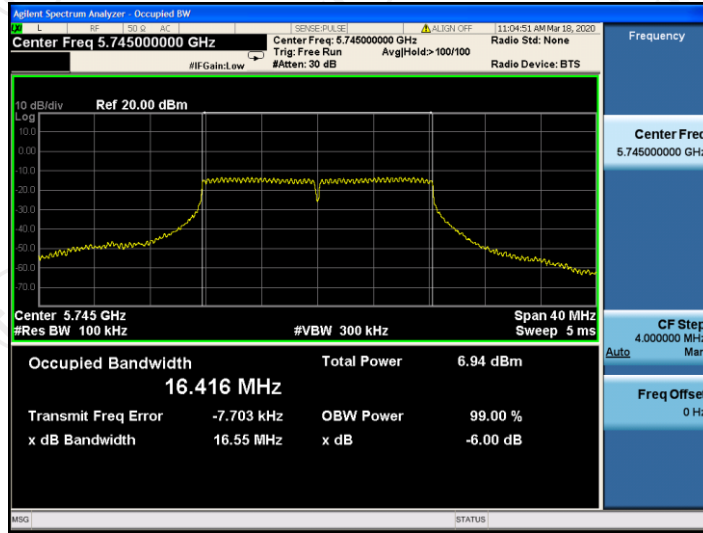
**Band 3 (5745 - 5825 MHz )**

Mode	Test channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
11a	CH149	5745	16.52	0.5	PASS
11a	CH157	5785	16.53	0.5	PASS
11a	CH165	5825	16.53	0.5	PASS
11n(HT20)	CH149	5745	17.72	0.5	PASS
11n(HT20)	CH157	5785	17.72	0.5	PASS
11n(HT20)	CH165	5825	17.73	0.5	PASS
11n(HT40)	CH151	5755	36.52	0.5	PASS
11n(HT40)	CH159	5795	36.53	0.5	PASS
11ac(VHT20)	CH149	5745	17.74	0.5	PASS
11ac(VHT20)	CH157	5785	17.73	0.5	PASS
11ac(VHT20)	CH165	5825	17.73	0.5	PASS
11ac(VHT40)	CH151	5755	36.53	0.5	PASS
11ac(VHT40)	CH159	5795	36.52	0.5	PASS
11ac(VHT80)	CH155	5775	76.39	0.5	PASS

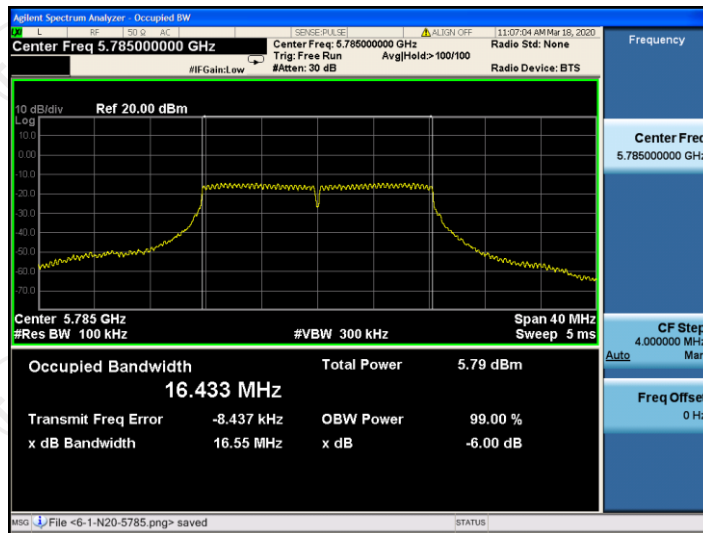
Test plots as follows:

ANT 0  
Band 3 (5745 – 5825 MHz)  
11a

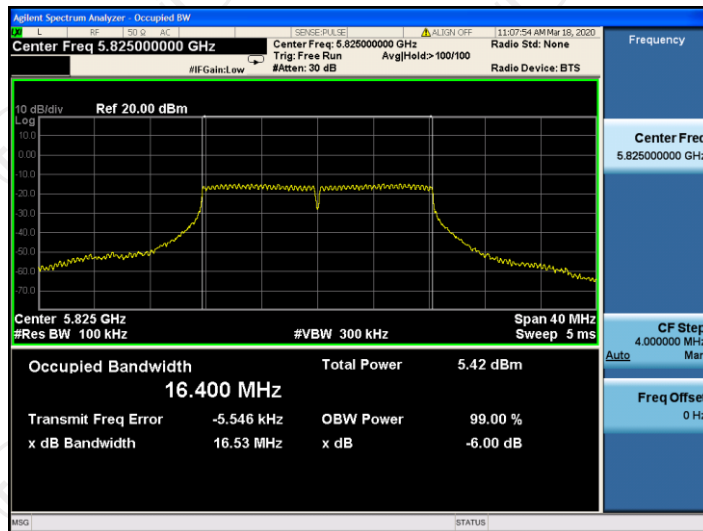
CH149



CH157

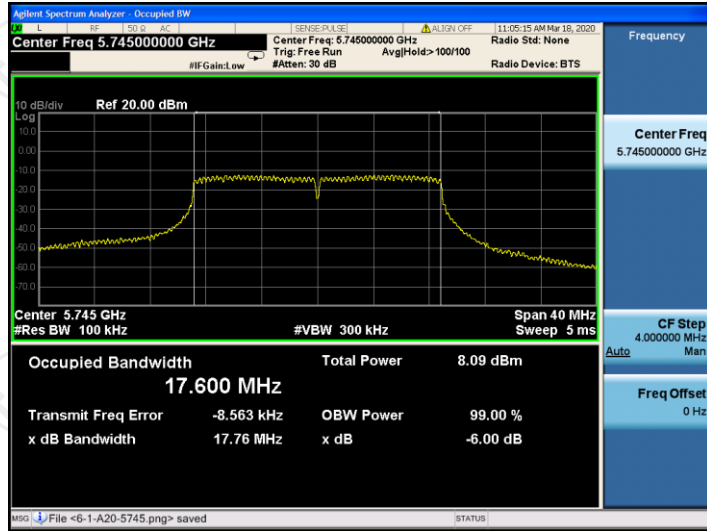


CH165

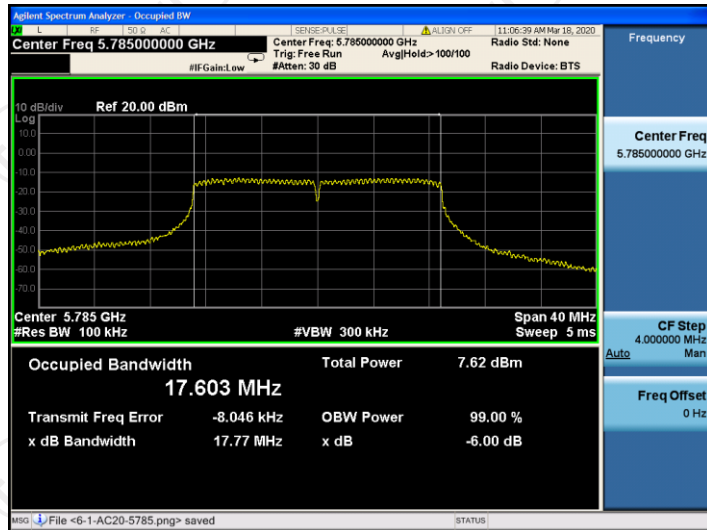


11n(HT20)

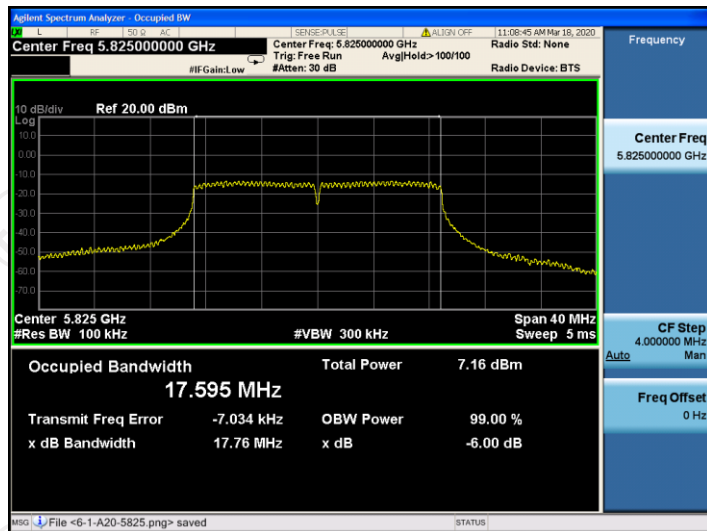
CH149



CH157

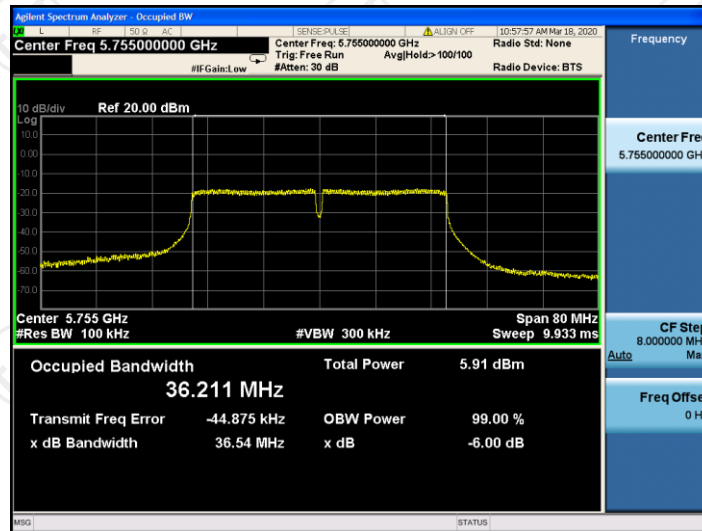


CH165

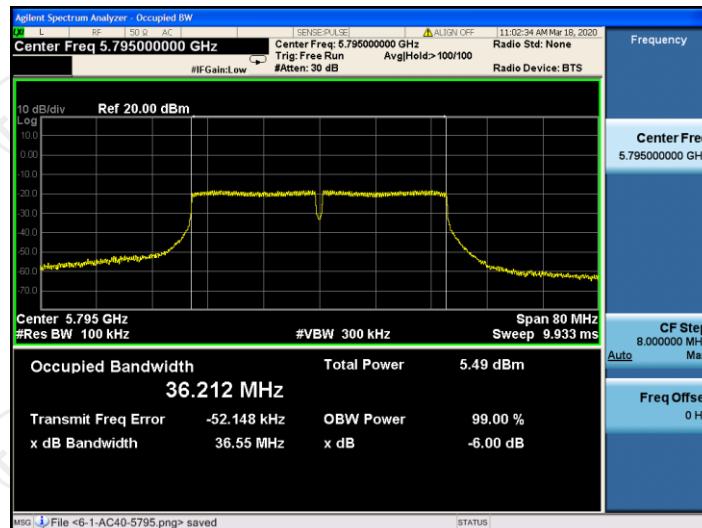


11n(HT40)

CH151

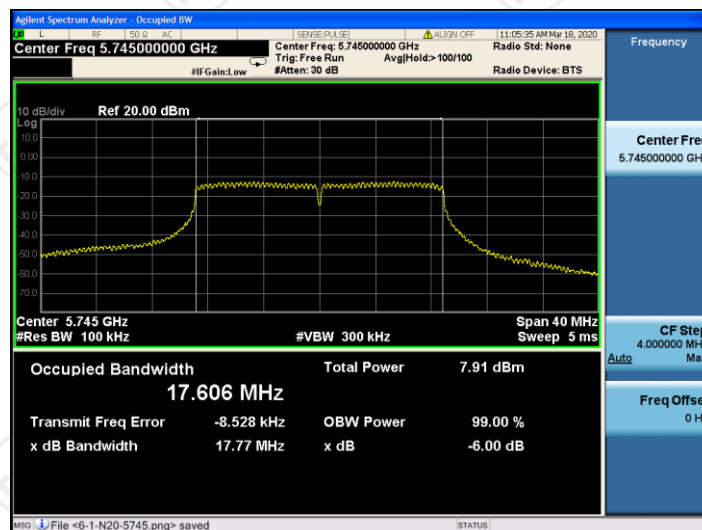


CH159



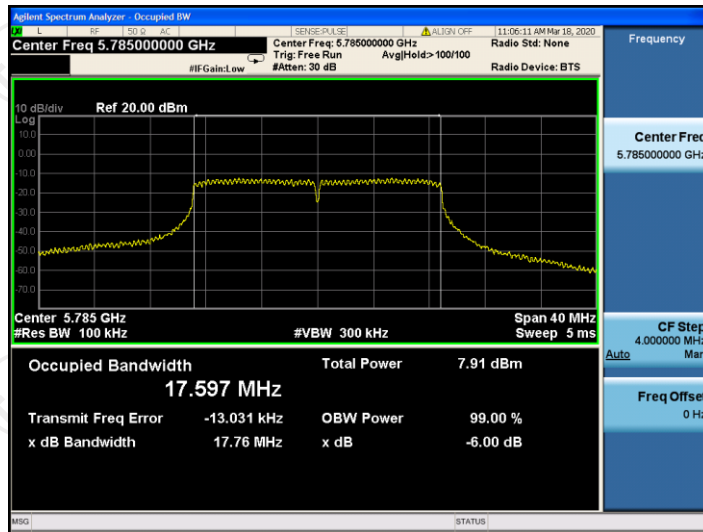
11ac(VHT20)

CH149

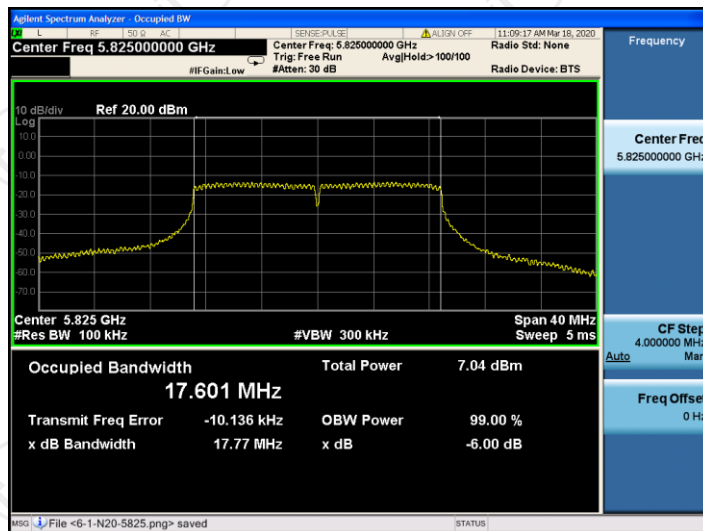




CH157

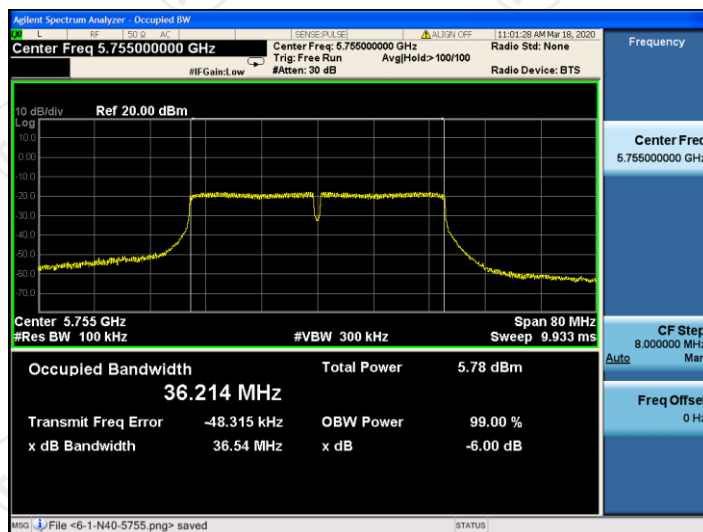


CH165

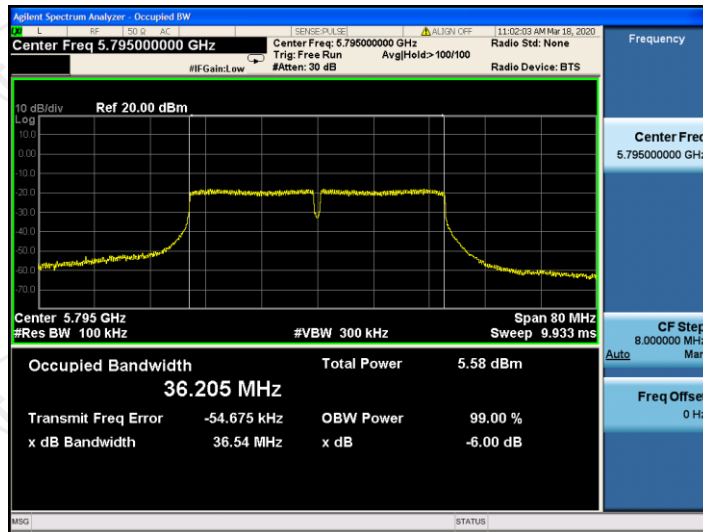


11ac(VHT40)

CH151

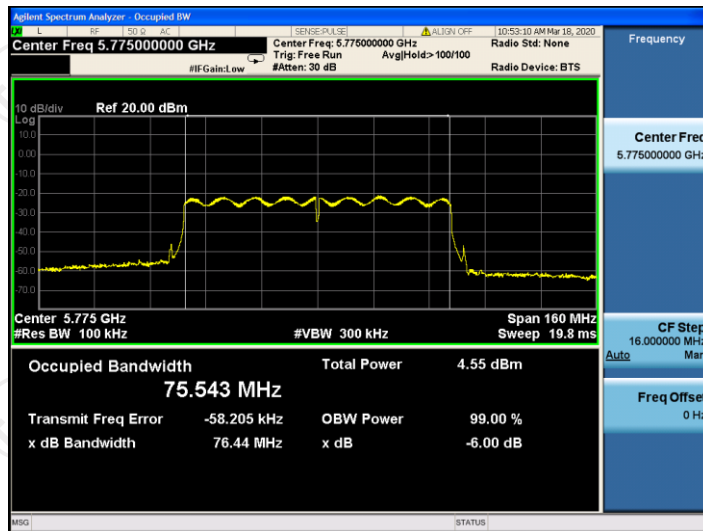


## CH159



## 11ac(VHT80)

## CH155

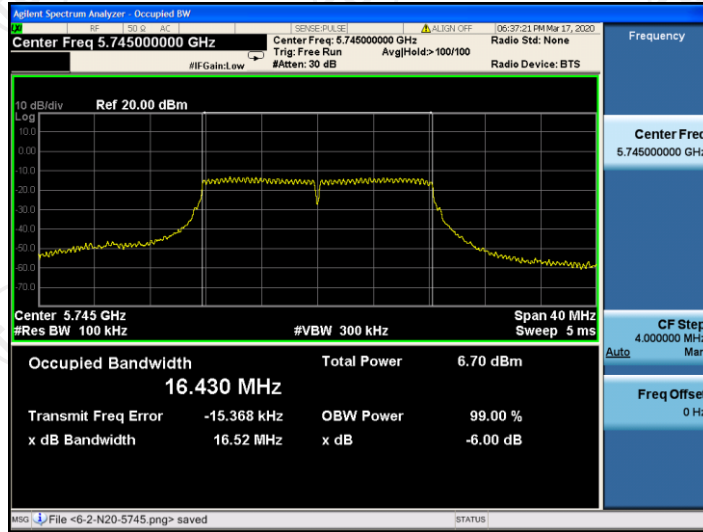


ANT 1

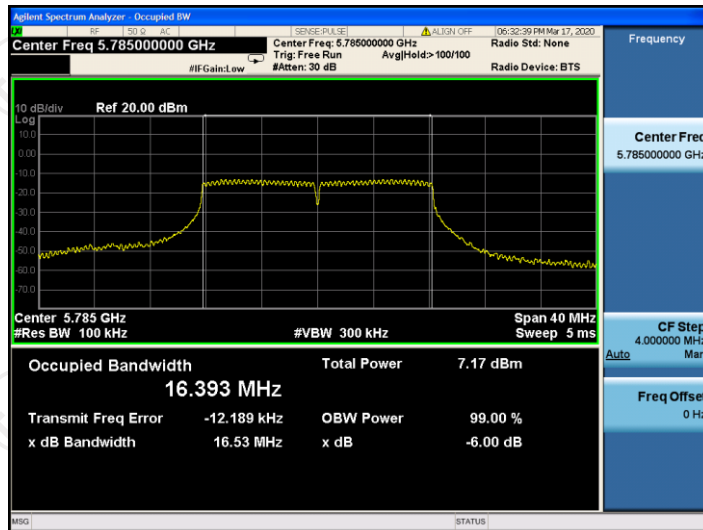
Band 3 (5745 – 5825 MHz)

11a

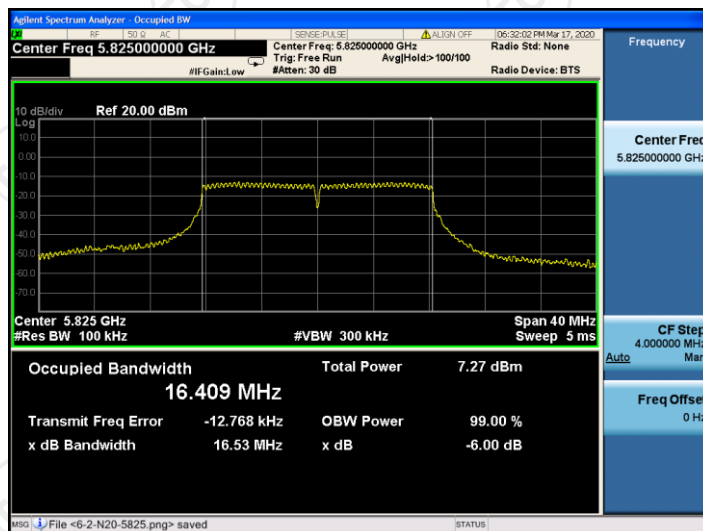
CH149



CH157

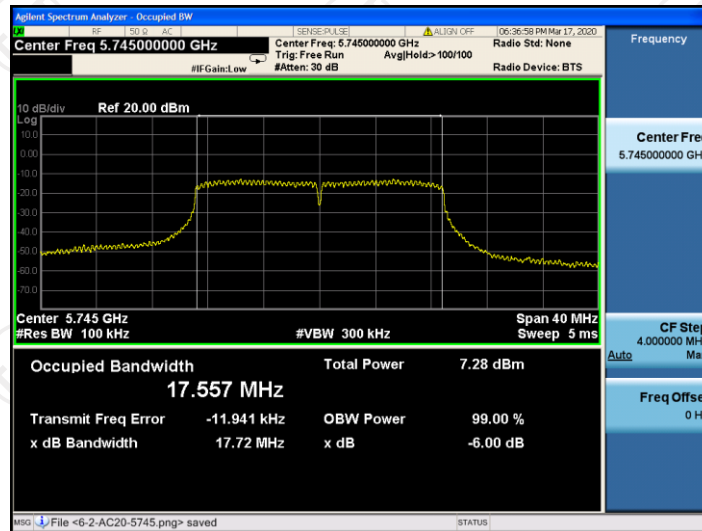


CH165

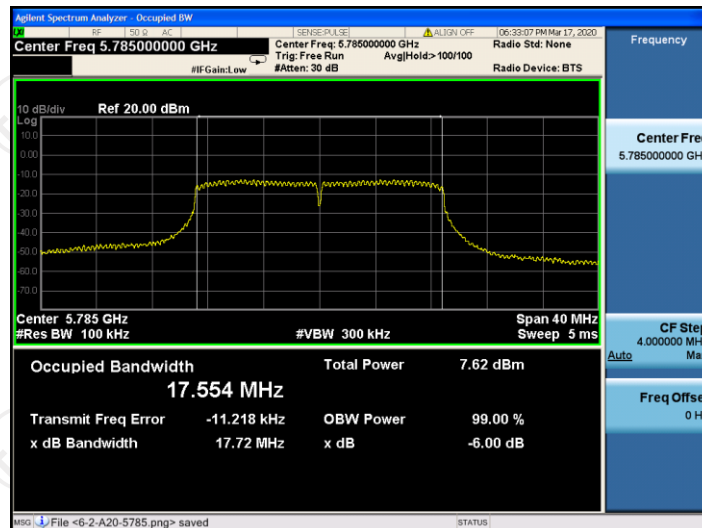


11n(HT20)

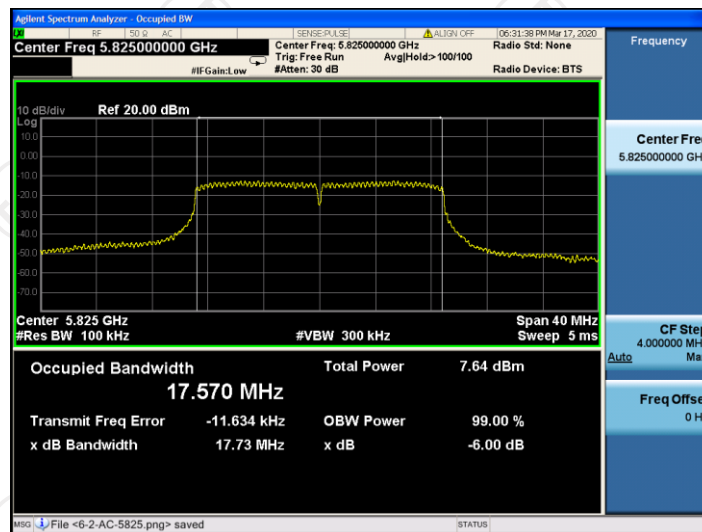
CH149



CH157

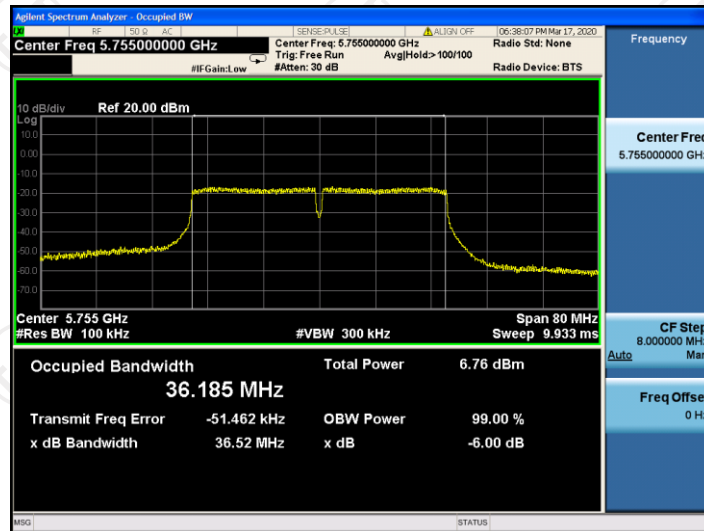


CH165

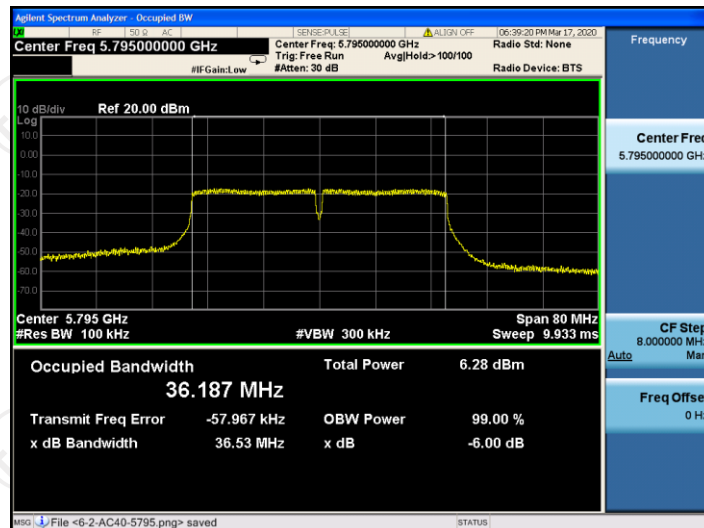


11n(HT40)

CH151

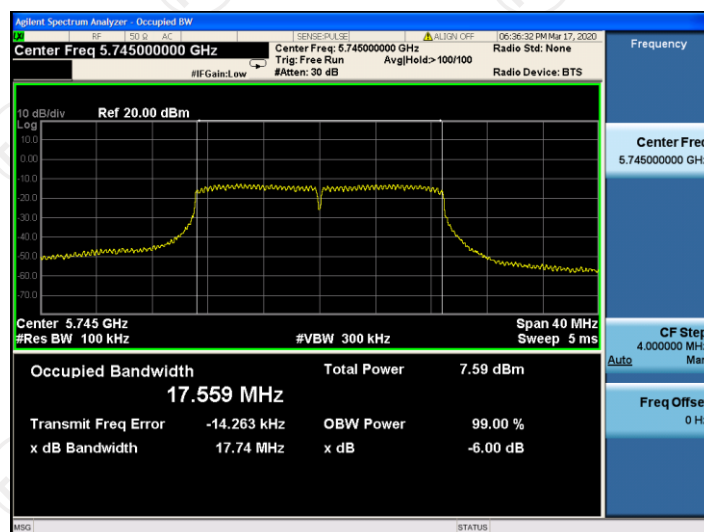


CH159

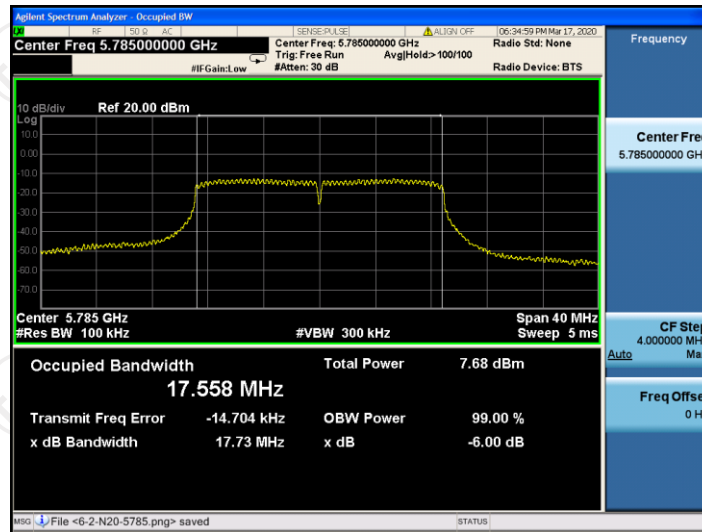


11ac(VHT20)

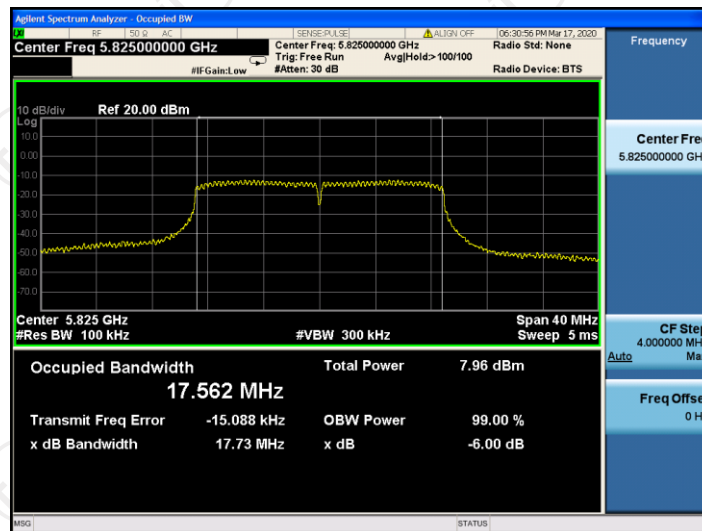
CH149



CH157

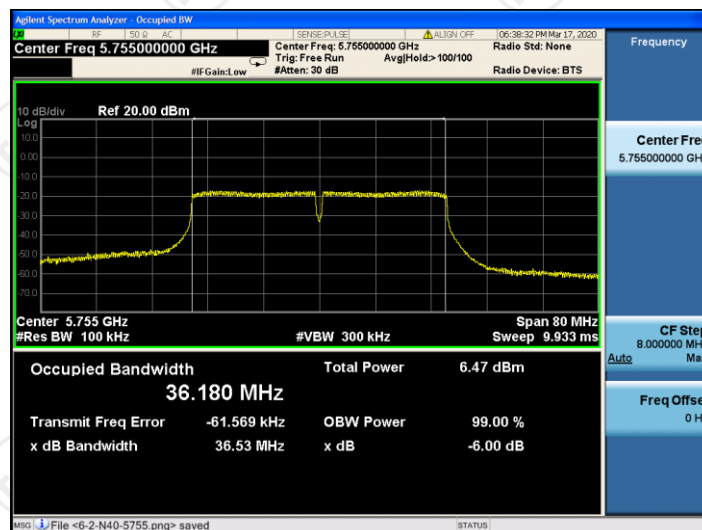


CH165

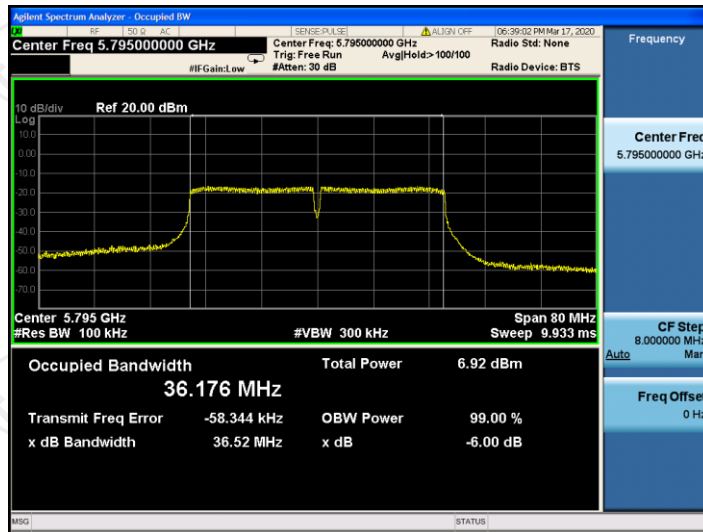


11ac(VHT40)

CH151

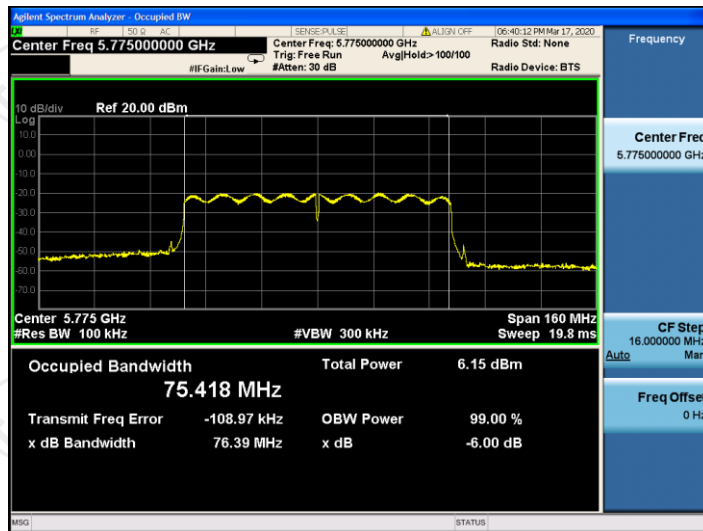


CH159




11ac(VHT80)

CH155



## 6.5. 26dB Bandwidth and 99% Occupied Bandwidth

### 6.5.1. Test Specification

<b>Test Requirement:</b>	47 CFR Part 15C Section 15.407 (a)& Part 2 J Section 2.1049
<b>Test Method:</b>	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section D
<b>Limit:</b>	No restriction limits
<b>Test Setup:</b>	 <p style="text-align: center;">Spectrum Analyzer                      EUT</p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section D</li> <li>2. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>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.</li> <li>4. Measure and record the results in the test report.</li> </ol>
<b>Test Result:</b>	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	19.59	16.532
11a	CH40	5200	19.58	16.503
11a	CH48	5240	19.61	16.489
11n(HT20)	CH36	5180	20.15	17.652
11n(HT20)	CH40	5200	20.15	17.647
11n(HT20)	CH48	5240	20.18	17.627
11n(HT40)	CH38	5190	39.89	36.279
11n(HT40)	CH46	5230	40.21	36.245
11ac(VHT20)	CH36	5180	20.23	17.649
11ac(VHT20)	CH40	5200	20.30	17.650
11ac(VHT20)	CH48	5240	20.21	17.654
11ac(VHT40)	CH38	5190	39.96	36.256
11ac(VHT40)	CH46	5230	40.10	36.248
11ac(VHT80)	CH42	5210	79.59	75.608

**Band 3**

Mode	Test channel	Frequency (MHz)	99% Bandwidth (MHz)
11a	CH149	5745	16.507
11a	CH157	5785	16.499
11a	CH165	5825	16.504
11n(HT20)	CH149	5745	17.666
11n(HT20)	CH157	5785	17.649
11n(HT20)	CH165	5825	17.655
11n(HT40)	CH151	5755	36.288
11n(HT40)	CH159	5795	36.277
11ac(VHT20)	CH149	5745	17.659
11ac(VHT20)	CH157	5785	17.671
11ac(VHT20)	CH165	5825	17.665
11ac(VHT40)	CH151	5755	36.268
11ac(VHT40)	CH159	5795	36.274
11ac(VHT80)	CH155	5775	75.649

**ANT 1  
Band 1**

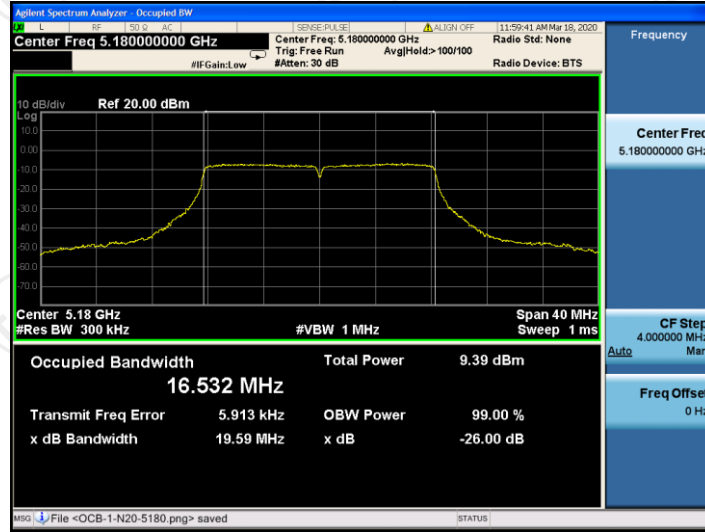
Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH36	5180	19.26	16.536
11a	CH40	5200	19.14	16.453
11a	CH48	5240	19.26	16.493
11n(HT20)	CH36	5180	19.79	17.589
11n(HT20)	CH40	5200	19.89	17.574
11n(HT20)	CH48	5240	19.80	17.589
11n(HT40)	CH38	5190	39.52	36.202
11n(HT40)	CH46	5230	39.79	36.194
11ac(VHT20)	CH36	5180	19.70	17.591
11ac(VHT20)	CH40	5200	19.77	17.593
11ac(VHT20)	CH48	5240	19.82	17.599
11ac(VHT40)	CH38	5190	39.77	36.201
11ac(VHT40)	CH46	5230	39.61	36.200
11ac(VHT80)	CH42	5210	79.35	75.489

**Band 3**

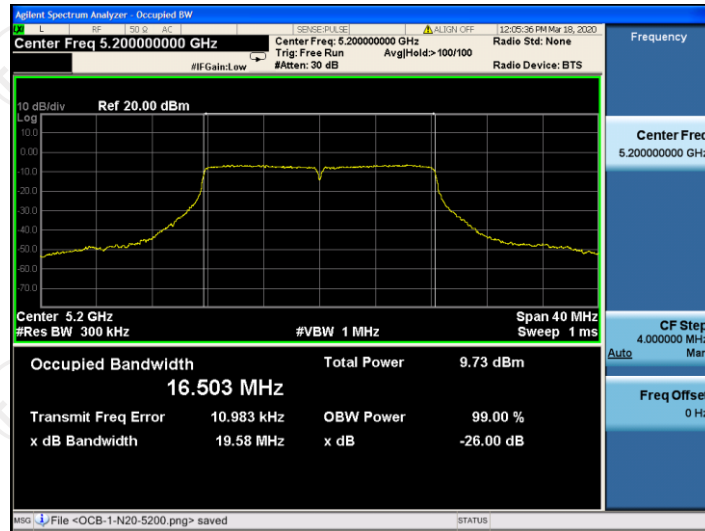
Mode	Test channel	Frequency (MHz)	99% Bandwidth (MHz)
11a	CH149	5745	16.464
11a	CH157	5785	16.502
11a	CH165	5825	16.475
11n(HT20)	CH149	5745	17.593
11n(HT20)	CH157	5785	17.594
11n(HT20)	CH165	5825	17.610
11n(HT40)	CH151	5755	36.223
11n(HT40)	CH159	5795	36.217
11ac(VHT20)	CH149	5745	17.605
11ac(VHT20)	CH157	5785	17.603
11ac(VHT20)	CH165	5825	17.619
11ac(VHT40)	CH151	5755	36.235
11ac(VHT40)	CH159	5795	36.226
11ac(VHT80)	CH155	5775	75.527

Test plots as follows:  
ANT 0 Band 1 (5180-5240 MHz)  
11a

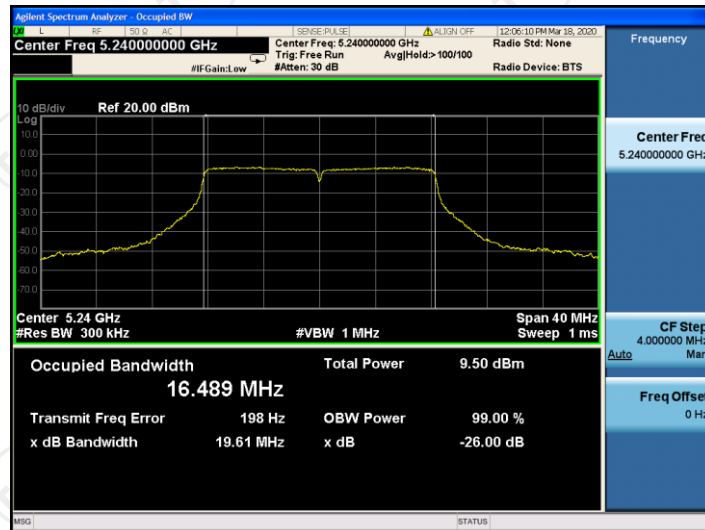
CH36



CH40

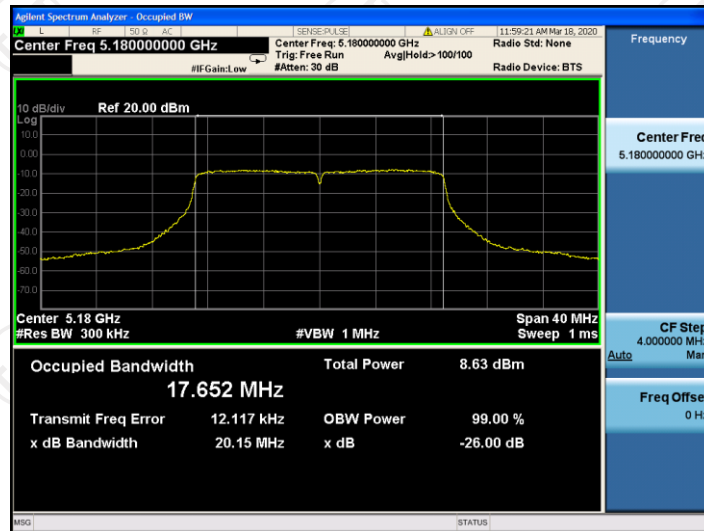


CH48

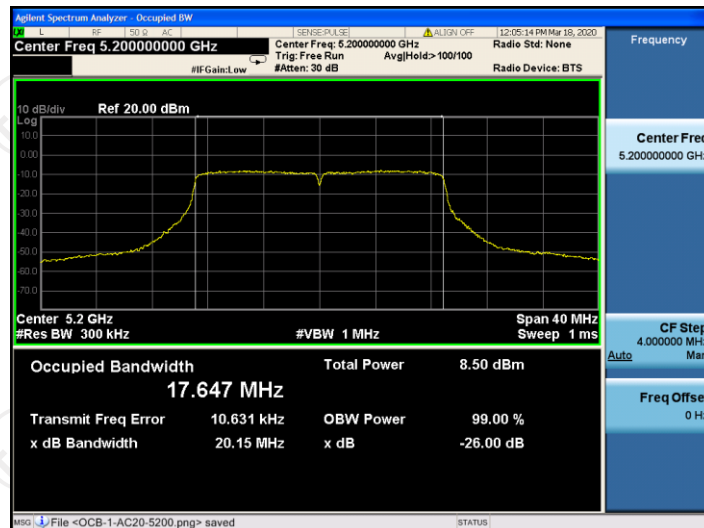


11n(HT20)

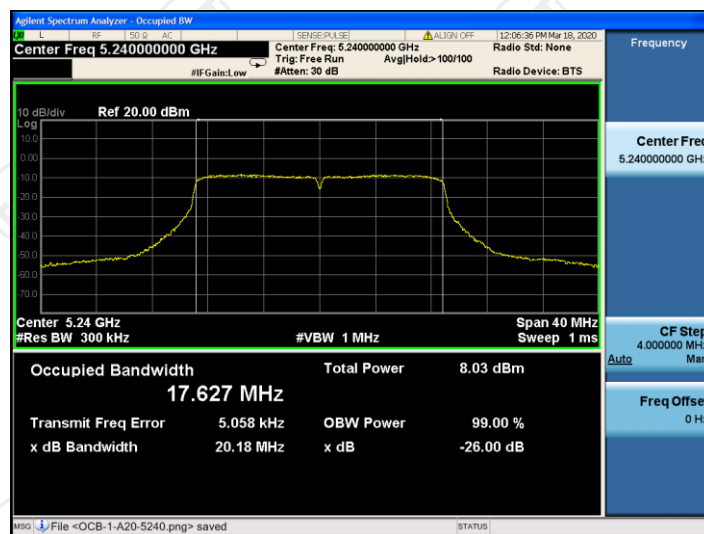
CH36



CH40

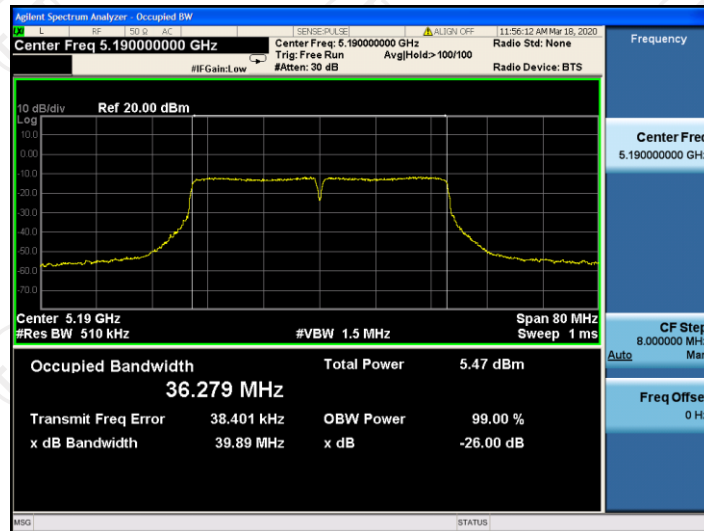


CH48

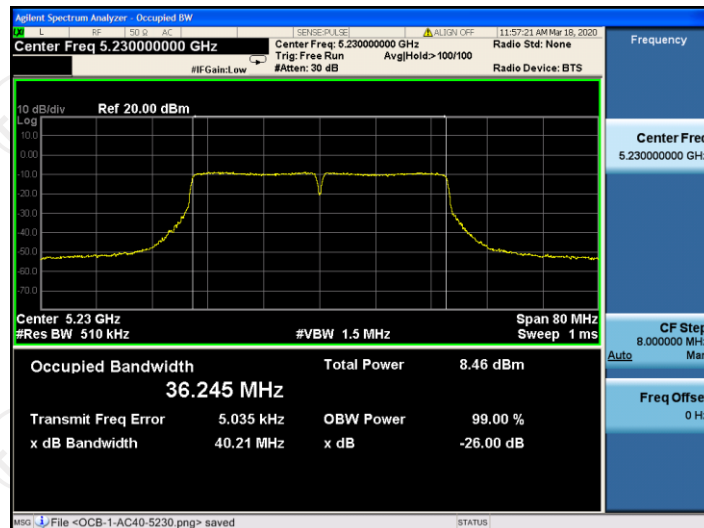


11n(HT40)

CH38

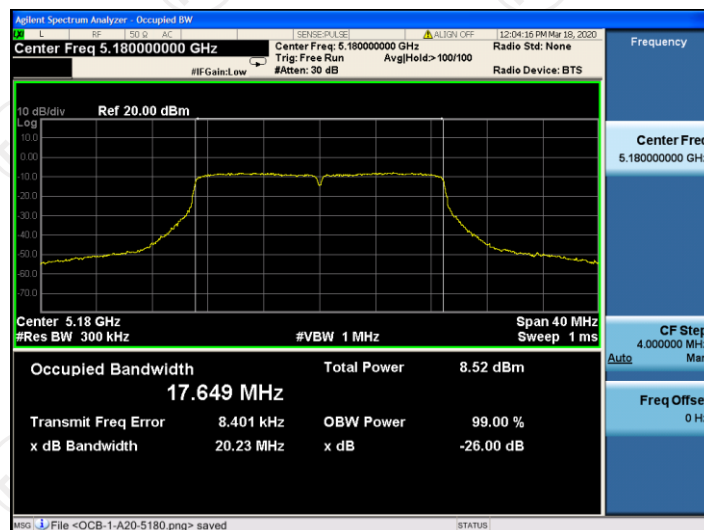


CH46

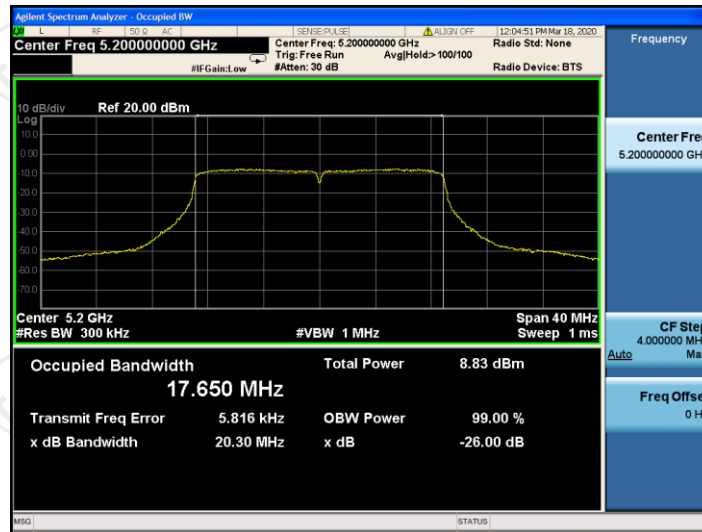


11ac(VHT20)

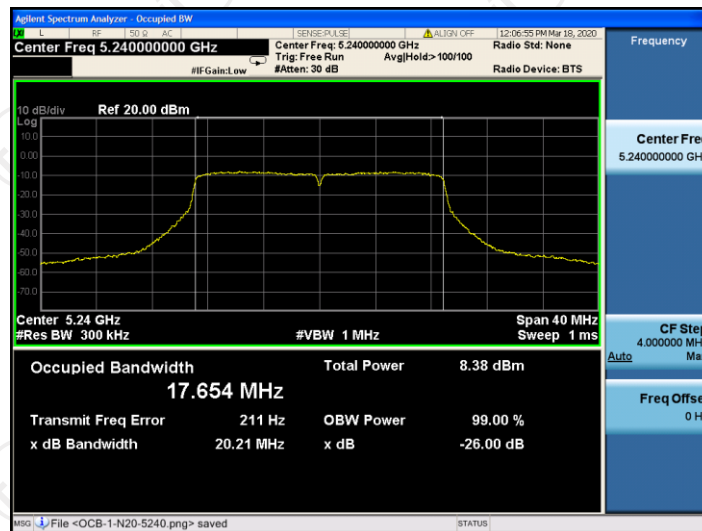
CH36



CH40

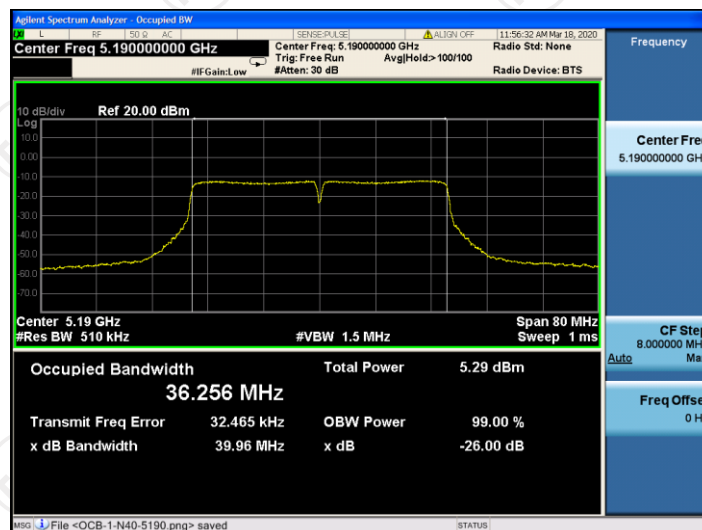


CH48

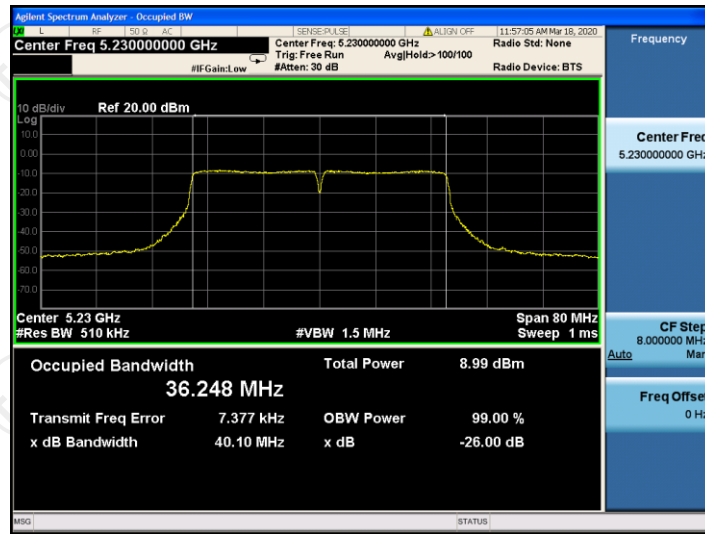


11ac(VHT40)

CH38

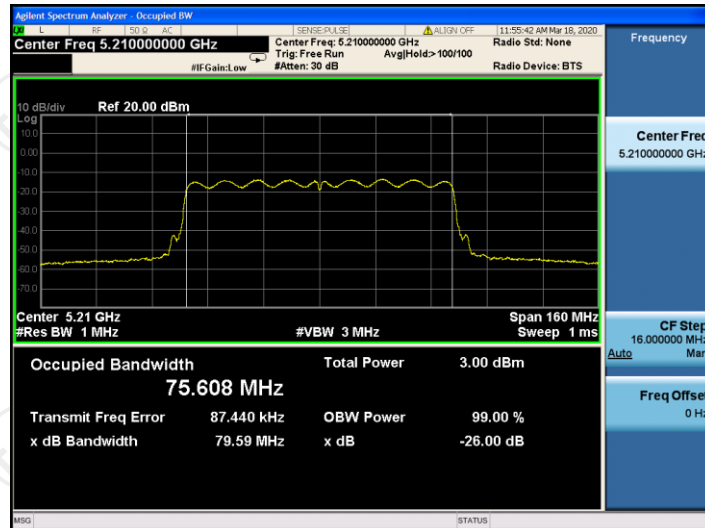


CH46



11ac(VHT80)

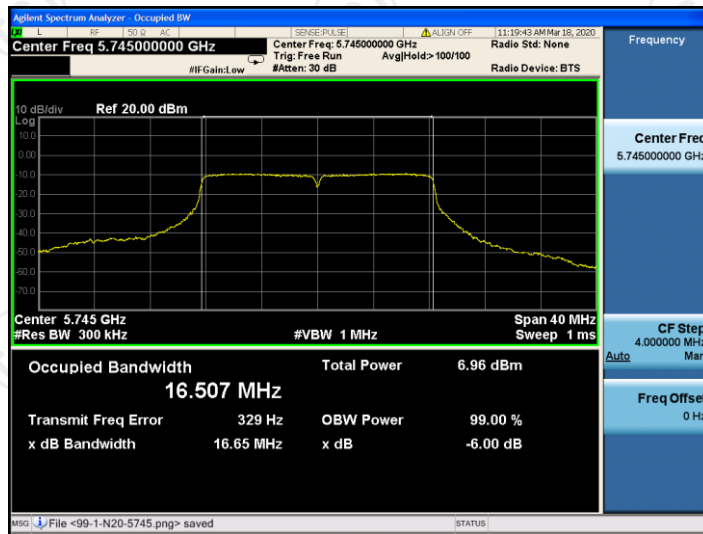
CH42



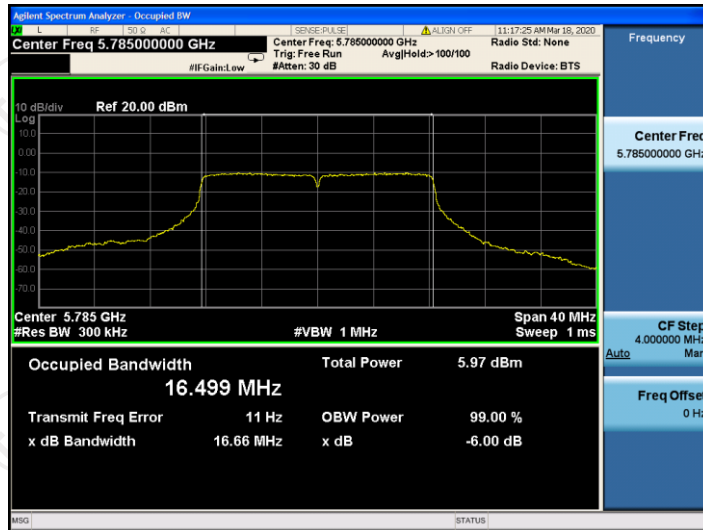
Band 3(5745-5825MHz)

11a

CH149



CH157



CH165

