

# FCC Test Report

Client Name : Grastron Technology CO., LTD  
Address : 4A Building NO.B, Dingxin Science and Technology Park,  
Honglangbei NO.2 Road, Xin'an street, Baoan district,  
Shenzhen, China  
Product Name : Wireless Presentation System  
Date : Jan. 28, 2021



**Shenzhen Anbotek Compliance Laboratory Limited**



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# TEST REPORT

Applicant : Grastron Technology CO., LTD  
Manufacturer : Grastron Technology CO., LTD  
Product Name : Wireless Presentation System  
Model No. : WMT-C1, WMT-C10, WMT-C11, WMT-C12, WMT-C13, WMT-C14, WMT-C15,  
WMT-C16, WMT-C17, WMT-C18, WMT-C19, WMT-C1X  
Trade Mark : N.A.  
Rating(s) : Input: DC 5V, 700mA

**Test Standard(s) : FCC Part15 Subpart E 2019, Paragraph 15.407  
ANSI C63.10: 2013,**

**Test Method(s) : KDB 789033 D02 General UNII Test Procedures New Rules v02r01  
KDB662911 D01 Multiple Transmitter Output v02r01**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart E requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt

Jan. 07, 2021

Date of Test

Jan. 07~26, 2021

Prepared By

*Yilia Zhong*

(Engineer / Yilia Zhong)

Reviewer

*Bibo Zhang*

(Supervisor / Bibo Zhang)

Approved & Authorized Signer

*Kingkong Jin*

(Manager / Kingkong Jin)

# 1. General Information

## 1.1. Client Information

Applicant	:	Grastron Technology CO., LTD
Address	:	4A Building NO.B, Dingxin Science and Technology Park, Honglangbei NO.2 Road, Xin'an street, Baoan district, Shenzhen, China
Manufacturer	:	Grastron Technology CO., LTD
Address	:	4A Building NO.B, Dingxin Science and Technology Park, Honglangbei NO.2 Road, Xin'an street, Baoan district, Shenzhen, China
Factory	:	Grastron Technology CO., LTD
Address	:	4A Building NO.B, Dingxin Science and Technology Park, Honglangbei NO.2 Road, Xin'an street, Baoan district, Shenzhen, China

## 1.2. Description of Device (EUT)

Product Name	:	Wireless Presentation System
Model No.	:	WMT-C1, WMT-C10, WMT-C11, WMT-C12, WMT-C13, WMT-C14, WMT-C15, WMT-C16, WMT-C17, WMT-C18, WMT-C19, WMT-C1X (Note: All samples are the same except the model number, so we prepare "WMT-C1" for test only.)
Trade Mark	:	N.A.
Test Power Supply	:	DC 5V from PC
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)
Product Description	Operation Frequency:	WiFi 2.4G: 802.11b/ g/ n(HT20) 2412-2462MHz 802.11n(HT40) 2422-2452MHz WiFi 5.1G: 5180MHz~5240MHz WiFi 5.8G: 5745MHz~5825MHz
	Number of Channel:	WiFi 2.4G: 11 Channels for 802.11b/ g/ n(HT20) 7 Channels for 802.11n(HT40) WiFi 5.1G: 4 Channels for 802.11a 4 Channels for 802.11n(HT20) 4 Channels for 802.11ac(HT20) 2 Channels for 802.11n(HT40) 2 Channels for 802.11ac(HT40) 1 Channels for 802.11ac(HT80) WiFi 5.8G: 5 Channels for 802.11a 5 Channels for 802.11n(HT20) 5 Channels for 802.11ac(HT20) 2 Channels for 802.11n(HT40)



		2 Channels for 802.11ac(HT40) 1 Channels for 802.11ac(HT80)
	Modulation Type:	WiFi 2.4G: 802.11b CCK; 802.11g/n OFDM WiFi 5.1G: OFDM with BPSK/QPSK/16QAM/64QAM/256QAM WiFi 5.8G: OFDM with BPSK/QPSK/16QAM/64QAM/256QAM
	Antenna Type:	Ceramic Antenna
	Antenna Gain(Peak):	WiFi 2.4G: ANT A & ANT B 3.81 dBi WiFi 5.1G&WiFi 5.8G: ANT A & ANT B 2.65 dBi
	Directional Gain:	WiFi 2.4G: 6.82 dBi WiFi 5.1G&WiFi 5.8G: 5.66 dBi
<p>Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.</p> <p>2) This report is for Wifi 5.8G module.</p> <p>3) All modes support MIMO.</p>		

### 1.3. Auxiliary Equipment Used During Test

AppleMacBook	:	Model: A1708 Input: 20.3V/3A CMIIT ID:2016AJ5746
Adapter	:	Input: AC 100-240V, 1.5A, 50-60Hz Output: 20.3V/3A (USB PD) or 9V/3A(USB PD) or 5.2V/2.4A

### 1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Mode	Test channel	Frequency (MHz)
OFDM(802.11a/n20/ac20)	CH 149	5745MHz
	CH 157	5785MHz
	CH 165	5825MHz
OFDM(802.11n40/ac40)	CH 151	5755MHz
	CH 159	5795MHz
OFDM(802.11ac80)	CH 155	5775MHz

**Note:**

1. The measurements are performed at the highest, middle, lowest available channels.
2. The EUT has been tested as an independent unit. And Continual Transmitting in maximum power.
3. For the relevant Conducted Measurement, the temporary antenna connector is used during the measurement. Antenna Connector Impedance: 50Ω, Cable Loss: 1.0 dB
4. The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is more than 98%

**1.5. List of channels**

## 802.11a/n20/ac20

Channel	Freq. (MHz)	Channel	Freq. (MHz)
149	5745	153	5765
157	5785	161	5805
165	5825		

## 802.11n40/ac40

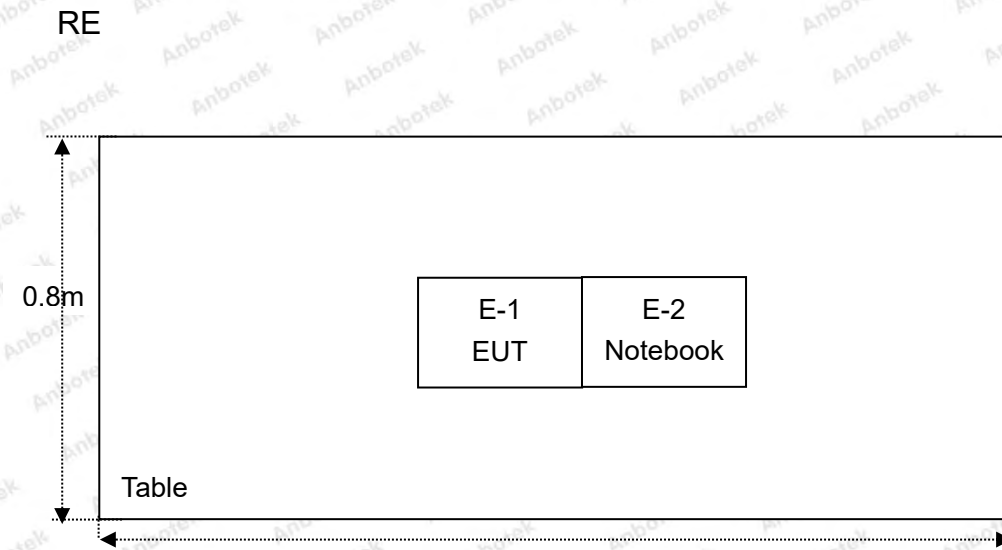
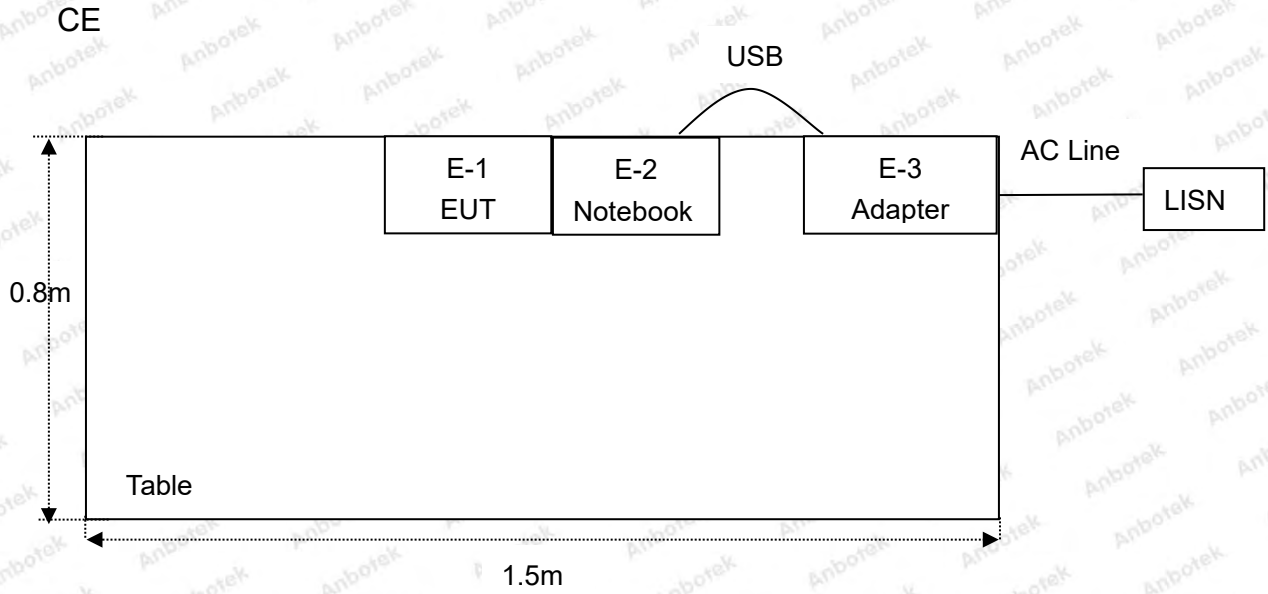
Channel	Freq. (MHz)	Channel	Freq. (MHz)
151	5755	159	5795

## 802.11ac80

Channel	Freq. (MHz)
155	5775



## 1.6. Description Of Test Setup





## 1.7. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Oct. 26, 2020	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 26, 2020	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 26, 2020	1 Year
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 26, 2020	1 Year
5.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 26, 2020	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30 D	KD17503	Oct. 26, 2020	1 Year
7.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 02, 2020	2 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 02, 2020	2 Year
9.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Nov. 02, 2020	2 Year
10.	Horn Antenna	A-INFO	LB-180400- KF	J211060628	Nov. 02, 2020	2 Year
11.	Pre-amplifier	SONOMA	310N	186860	Oct. 26, 2020	1 Year
12.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
13.	RF Test Control System	YIHENG	YH3000	2017430	Oct. 26, 2020	1 Year
14.	Power Sensor	DAER	RPR3006W	15I00041SN045	Oct. 26, 2020	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN046	Oct. 26, 2020	1 Year
16.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 26, 2020	1 Year
17.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 26, 2020	1 Year
18.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 26, 2020	1 Year
19.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 26, 2020	1 Year
20.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80 B	N/A	Oct. 26, 2020	1 Year

### 1.8. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 3.9 dB (Horizontal)
		Ur = 3.8 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4 dB

### 1.9. Description of Test Facility

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

#### FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111, September 30, 2020.

#### ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A, September 30, 2020.

#### Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102



## 2. Summary of Test Results

Standard	Test Type	Result
15.207 & 15.407	Conducted Emission	PASS
15.205/15.209	Spurious Emission	PASS
15.407(b)	Band Edge	PASS
15.407(a)(5)&15.407(e)	Occupy Bandwidth	PASS
15.407(a)(3)	Maximum Conducted Output Power	PASS
15.407(a)(1)(3)	Peak Power Spectral Density	PASS
15.203	Antenna Requirement	PASS
15.407(g)	Frequency Stability	PASS

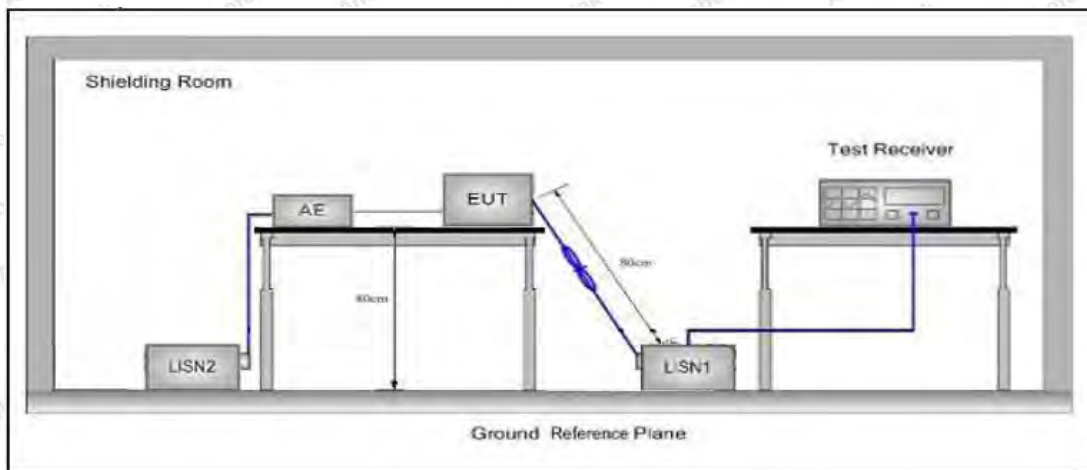
## 3. Conducted Emission Test

### 3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207&15.407		
Test Limit	Frequency	Maximum RF Line Voltage (dBuV)	
		Quasi-peak Level	Average Level
	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
	500kHz~5MHz	56	46
5MHz~30MHz	60	50	

**Remark:** (1) \*Decreasing linearly with logarithm of the frequency.  
 (2) The lower limit shall apply at the transition frequency.

### 3.2. Test Setup



### 3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2013 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

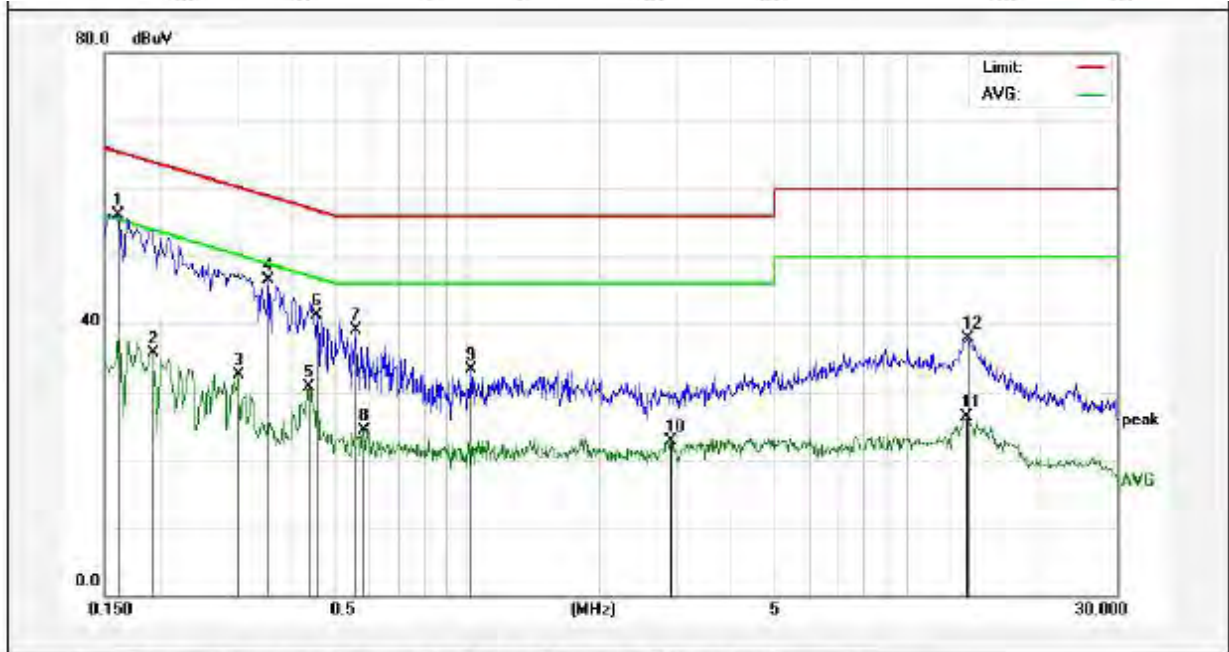
### 3.4. Test Data

During the test, pre-scan all modes, and found the 802.11n40 CH 151 which is the worst case, only the worst case is recorded in the report.



### Conducted Emission Test Data

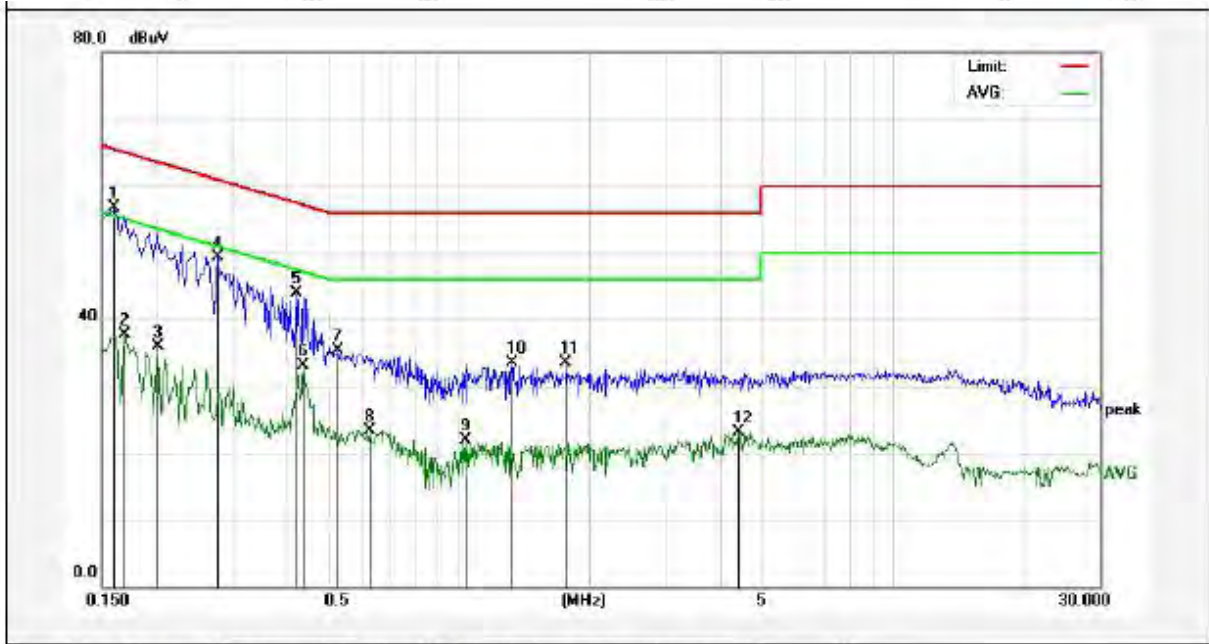
Test Site: 1# Shielded Room  
 Operating Condition: 802.11n40 CH 151  
 Test Specification: DC 5V from PC  
 Comment: Live Line  
 Tem.: 23.3°C Hum.: 56%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1620	36.28	19.90	56.18	65.36	-9.18	QP	
2	0.1940	15.89	19.90	35.79	53.86	-18.07	AVG	
3	0.3019	12.54	19.89	32.43	50.19	-17.76	AVG	
4	0.3537	26.66	19.91	46.57	58.87	-12.30	QP	
5	0.4380	10.69	19.95	30.64	47.10	-16.46	AVG	
6	0.4580	21.37	19.96	41.33	56.73	-15.40	QP	
7	0.5620	19.12	20.00	39.12	56.00	-16.88	QP	
8	0.5817	4.22	20.00	24.22	46.00	-21.78	AVG	
9	1.0260	13.13	20.12	33.25	56.00	-22.75	QP	
10	2.9140	2.61	20.16	22.77	46.00	-23.23	AVG	
11	13.6859	6.04	20.28	26.32	50.00	-23.68	AVG	
12	13.7019	17.61	20.28	37.89	60.00	-22.11	QP	

### Conducted Emission Test Data

Test Site: 1# Shielded Room  
 Operating Condition: 802.11n40 CH 151  
 Test Specification: DC 5V from PC  
 Comment: Neutral Line  
 Tem.: 23.3°C Hum.: 56%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1607	36.73	19.90	56.63	65.42	-8.79	QP	
2	0.1700	17.90	19.90	37.80	54.96	-17.16	AVG	
3	0.2020	16.06	19.90	35.96	53.52	-17.56	AVG	
4	0.2779	29.47	19.89	49.36	60.88	-11.52	QP	
5	0.4218	23.87	19.94	43.81	57.41	-13.60	QP	
6	0.4380	13.21	19.95	33.16	47.10	-13.94	AVG	
7	0.5262	15.28	19.99	35.27	56.00	-20.73	QP	
8	0.6219	3.33	20.02	23.35	46.00	-22.65	AVG	
9	1.0420	1.73	20.12	21.85	46.00	-24.15	AVG	
10	1.3260	13.29	20.13	33.42	56.00	-22.58	QP	
11	1.7660	13.39	20.14	33.53	56.00	-22.47	QP	
12	4.4218	2.86	20.19	23.05	46.00	-22.95	AVG	



## 4. Radiation Spurious Emission and Band Edge

### 4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209, 15.205 and 15.407				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
-		68.2	Peak	3	

**Remark:**

- (1)The lower limit shall apply at the transition frequency.
- (2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.
- (3)Above 1GHz limit: $E[dBuV/m] = EIRP[dBm] + 95.2 = 68.2 dBuV/m$ , for  $EIPR[dBm] = -27dBm$ .

### 4.2. Test Setup

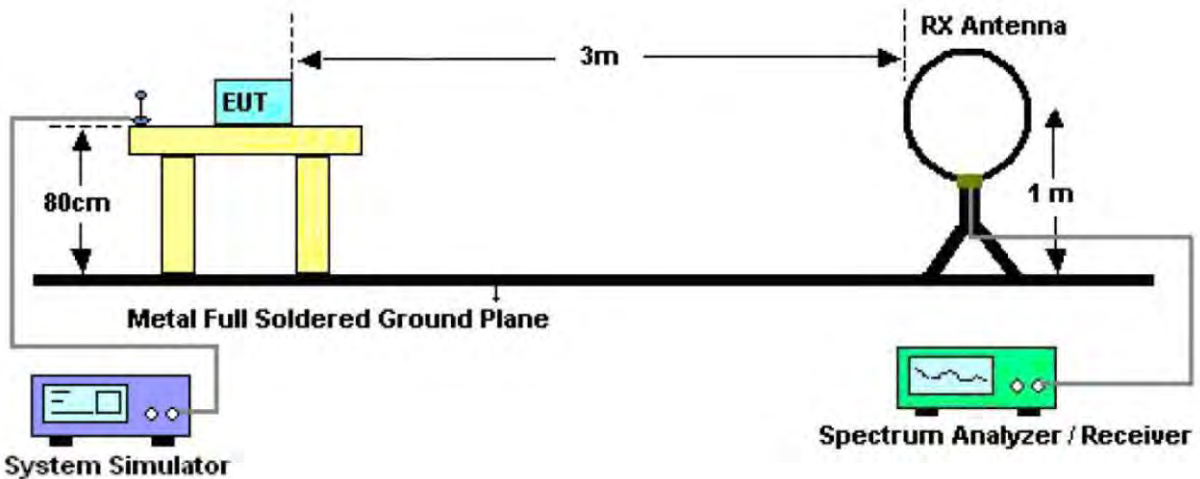


Figure 1. Below 30MHz

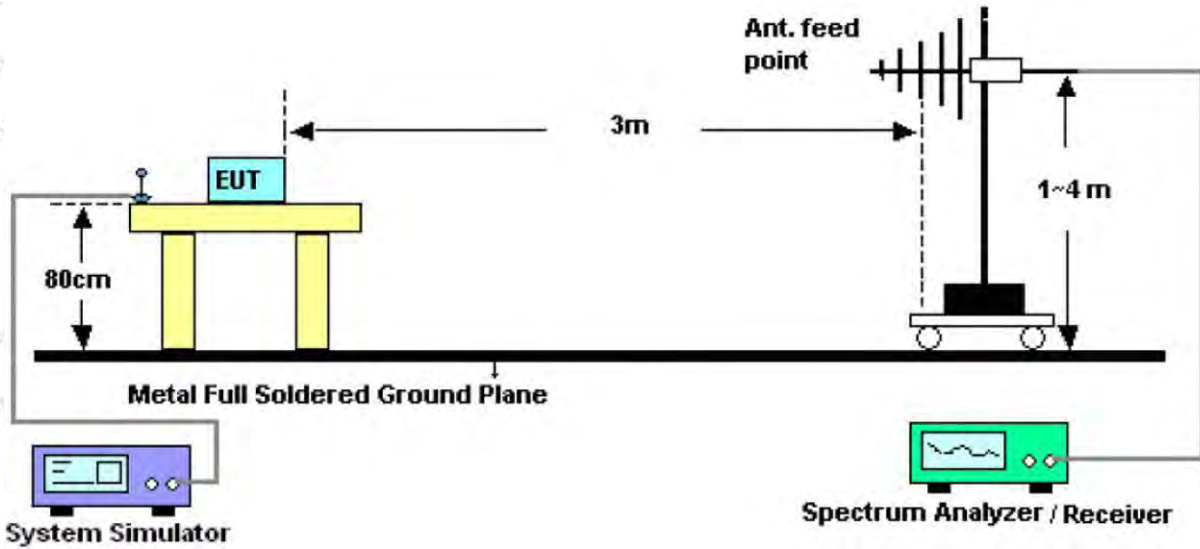


Figure 2. 30MHz to 1GHz

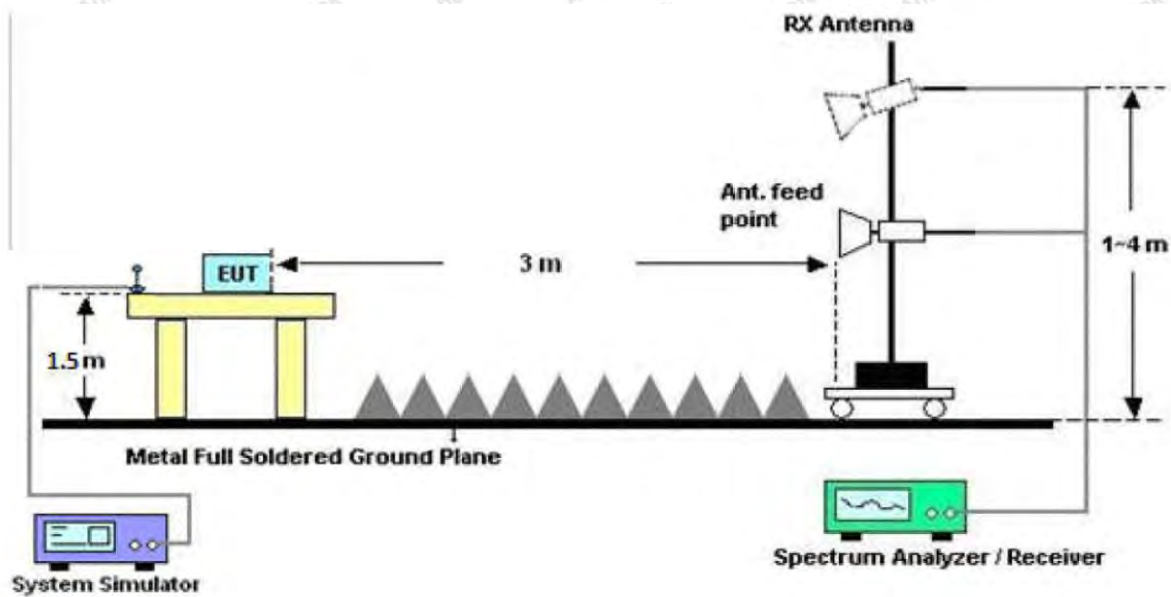


Figure 3. Above 1 GHz

### 4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.

For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.

The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9\*6\*6 Chamber. The device is evaluated in xyz orientation.

For the radiated emission test above 1GHz:

**Shenzhen Anbotek Compliance Laboratory Limited**

Code:AB-RF-05-a

Address: 1/F., Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.

Hotline  
400-003-0500  
www.anbotek.com

Tel:(86) 755-26066440 Fax: (86) 755-26014772 Email: service@anbotek.com



Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

For 9kHz to 150kHz, Set the spectrum analyzer as:

RBW = 200Hz, VBW = 1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:

RBW = 9kHz, VBW = 30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:

RBW = 100kHz, VBW = 300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For above 1GHz, Set the spectrum analyzer as:

RBW = 1MHz, VBW = 1MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.

RBW = 1MHz, VBW = 10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

#### 4.4. Test Data

##### PASS

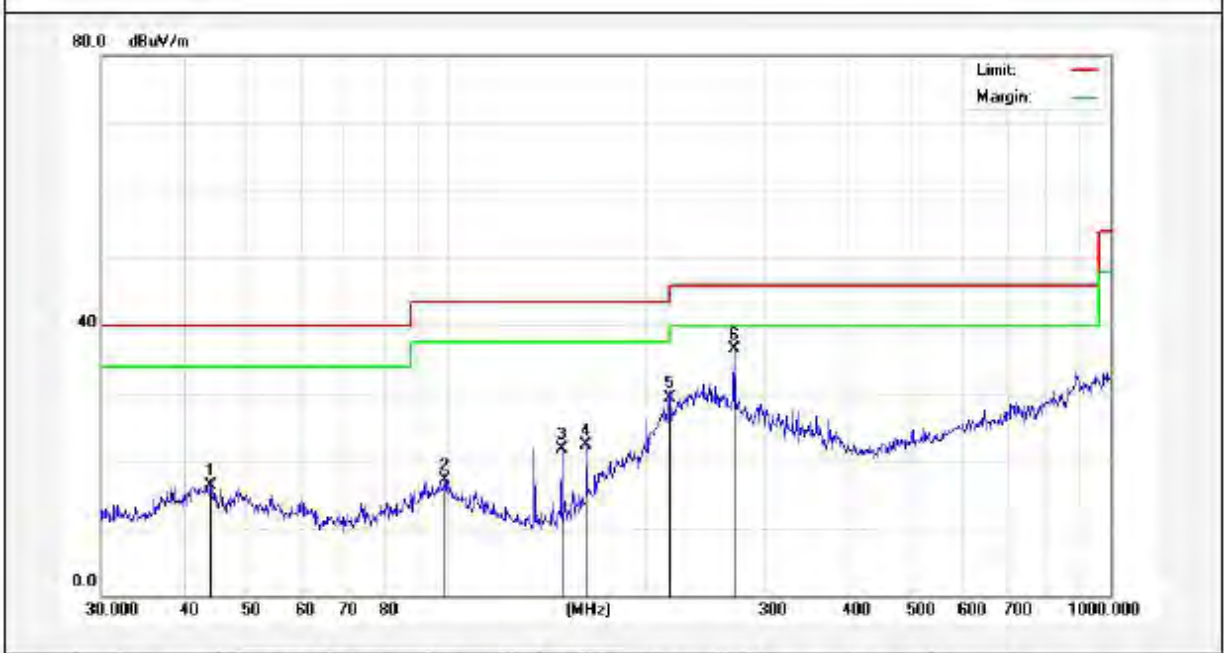
The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.

During the test, pre-scan all modes, and found the 802.11n40 CH 151 which is the worst case, only the worst case is recorded in the report.



**Test Results (30~1000MHz)**

Job No.: 18220WC10003503      Temp.(°C)/Hum.(%RH): 22.3°C/46%RH  
 Standard: FCC PART 15E      Power Source: DC 5V from PC  
 Test Mode: 802.11n40 CH 151      Polarization: Horizontal

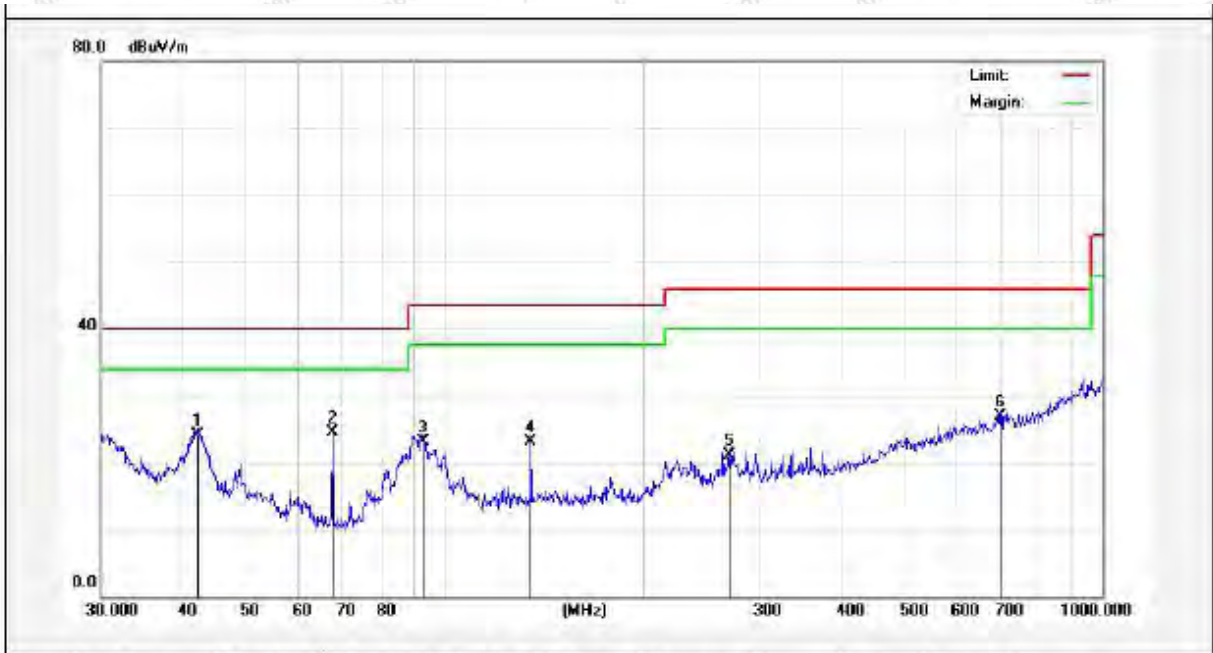


No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	43.9658	30.70	-14.42	16.28	40.00	-23.72	QP	100	0	
2	99.1797	36.47	-19.45	17.02	43.50	-26.48	QP	100	360	
3	148.4410	42.44	-20.71	21.73	43.50	-21.77	QP	100	0	
4	162.0414	43.91	-21.70	22.21	43.50	-21.29	QP	100	360	
5	216.0240	48.87	-19.54	29.33	46.00	-16.67	QP	100	0	
6	270.3748	53.52	-16.98	36.54	46.00	-9.46	QP	100	360	



**Test Results (30~1000MHz)**

Job No.: 18220WC10003503      Temp.(°C)/Hum.(%RH): 22.3°C/46%RH  
 Standard: FCC PART 15E      Power Source: DC 5V from PC  
 Test Mode: 802.11n40 CH 151      Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	42.0065	37.94	-13.79	24.15	40.00	-15.85	QP	100	0	
2	67.4381	42.68	-18.25	24.43	40.00	-15.57	QP	100	360	
3	92.7871	38.64	-15.54	23.10	43.50	-20.40	QP	100	0	
4	135.0319	42.80	-19.73	23.07	43.50	-20.43	QP	100	360	
5	270.3747	35.63	-14.50	21.13	46.00	-24.87	QP	100	0	
6	699.3046	32.85	-6.01	26.84	46.00	-19.16	QP	100	360	

**Test Results (Above 1000MHz)**

**ANT A:**

Test mode:	IEEE 802.11a	Test channel:	Low CH
------------	--------------	---------------	--------

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	40.14	31.98	17.08	33.91	55.29	68.20	-12.91	V
17235.00	41.39	32.65	20.03	34.85	59.22	68.20	-8.98	V
11490.00	41.27	31.98	17.08	33.91	56.42	68.20	-11.78	H
17235.00	39.02	32.65	20.03	34.85	56.85	68.20	-11.35	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	27.53	31.98	17.08	33.91	42.68	54.00	-11.32	V
17235.00	29.44	32.65	20.03	34.85	47.27	54.00	-6.73	V
11490.00	29.23	31.98	17.08	33.91	44.38	54.00	-9.62	H
17235.00	29.33	32.65	20.03	34.85	47.16	54.00	-6.84	H

Test mode:	IEEE 802.11a	Test channel:	Mid CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	39.66	32.44	17.18	33.91	55.37	68.20	-12.83	V
17355.00	40.88	32.78	20.12	34.86	58.92	68.20	-9.28	V
11570.00	40.62	32.44	17.18	33.91	56.33	68.20	-11.87	H
17355.00	41.62	32.78	20.12	34.86	59.66	68.20	-8.54	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	27.60	32.44	17.18	33.91	43.31	54.00	-10.69	V
17355.00	28.98	32.78	20.12	34.86	47.02	54.00	-6.98	V
11570.00	29.96	32.44	17.18	33.91	45.67	54.00	-8.33	H
17355.00	27.23	32.78	20.12	34.86	45.27	54.00	-8.73	H



Test mode:	IEEE 802.11a	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	41.37	32.59	18.02	33.92	58.06	68.20	-10.14	V
17475.00	39.15	32.87	20.15	34.88	57.29	68.20	-10.91	V
11650.00	39.89	32.59	18.02	33.92	56.58	68.20	-11.62	H
17475.00	40.56	32.87	20.15	34.88	58.70	68.20	-9.50	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	28.74	32.59	18.02	33.92	45.43	54.00	-8.57	V
17475.00	28.48	32.87	20.15	34.88	46.62	54.00	-7.38	V
11650.00	28.32	32.59	18.02	33.92	45.01	54.00	-8.99	H
17475.00	28.10	32.87	20.15	34.88	46.24	54.00	-7.76	H

Test mode:	IEEE 802.11n(HT20)	Test channel:	Low CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	40.15	31.98	17.08	33.91	55.30	68.20	-12.90	V
17235.00	41.37	32.65	20.03	34.85	59.20	68.20	-9.00	V
11490.00	41.56	31.98	17.08	33.91	56.71	68.20	-11.49	H
17235.00	39.80	32.65	20.03	34.85	57.63	68.20	-10.57	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	29.64	31.98	17.08	33.91	44.79	54.00	-9.21	V
17235.00	27.57	32.65	20.03	34.85	45.40	54.00	-8.60	V
11490.00	28.01	31.98	17.08	33.91	43.16	54.00	-10.84	H
17235.00	27.64	32.65	20.03	34.85	45.47	54.00	-8.53	H

Test mode:	IEEE 802.11n(HT20)	Test channel:	Mid CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	41.69	32.44	17.18	33.91	57.40	68.20	-10.80	V
17355.00	39.17	32.78	20.12	34.86	57.21	68.20	-10.99	V
11570.00	39.25	32.44	17.18	33.91	54.96	68.20	-13.24	H
17355.00	40.64	32.78	20.12	34.86	58.68	68.20	-9.52	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	29.32	32.44	17.18	33.91	45.03	54.00	-8.97	V
17355.00	27.53	32.78	20.12	34.86	45.57	54.00	-8.43	V
11570.00	29.75	32.44	17.18	33.91	45.46	54.00	-8.54	H
17355.00	29.99	32.78	20.12	34.86	48.03	54.00	-5.97	H

Test mode:	IEEE 802.11n(HT20)	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	39.76	32.59	18.02	33.92	56.45	68.20	-11.75	V
17475.00	41.01	32.87	20.15	34.88	59.15	68.20	-9.05	V
11650.00	40.56	32.59	18.02	33.92	57.25	68.20	-10.95	H
17475.00	39.34	32.87	20.15	34.88	57.48	68.20	-10.72	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	28.26	32.59	18.02	33.92	44.95	54.00	-9.05	V
17475.00	28.47	32.87	20.15	34.88	46.61	54.00	-7.39	V
11650.00	28.22	32.59	18.02	33.92	44.91	54.00	-9.09	H
17475.00	28.48	32.87	20.15	34.88	46.62	54.00	-7.38	H



Test mode:	IEEE 802.11ac(HT20)	Test channel:	Low CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	41.26	31.98	17.08	33.91	56.41	68.20	-11.79	V
17235.00	41.85	32.65	20.03	34.85	59.68	68.20	-8.52	V
11490.00	39.61	31.98	17.08	33.91	54.76	68.20	-13.44	H
17235.00	40.89	32.65	20.03	34.85	58.72	68.20	-9.48	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	28.27	31.98	17.08	33.91	43.42	54.00	-10.58	V
17235.00	27.19	32.65	20.03	34.85	45.02	54.00	-8.98	V
11490.00	28.60	31.98	17.08	33.91	43.75	54.00	-10.25	H
17235.00	28.26	32.65	20.03	34.85	46.09	54.00	-7.91	H

Test mode:	IEEE 802.11ac(HT20)	Test channel:	Mid CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	40.82	32.44	17.18	33.91	56.53	68.20	-11.67	V
17355.00	39.09	32.78	20.12	34.86	57.13	68.20	-11.07	V
11570.00	41.79	32.44	17.18	33.91	57.50	68.20	-10.70	H
17355.00	39.42	32.78	20.12	34.86	57.46	68.20	-10.74	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	28.56	32.44	17.18	33.91	44.27	54.00	-9.73	V
17355.00	29.99	32.78	20.12	34.86	48.03	54.00	-5.97	V
11570.00	28.44	32.44	17.18	33.91	44.15	54.00	-9.85	H
17355.00	29.45	32.78	20.12	34.86	47.49	54.00	-6.51	H

Test mode:	IEEE 802.11ac(HT20)	Test channel:	High CH
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## Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	41.82	32.59	18.02	33.92	58.51	68.20	-9.69	V
17475.00	39.67	32.87	20.15	34.88	57.81	68.20	-10.39	V
11650.00	41.42	32.59	18.02	33.92	58.11	68.20	-10.09	H
17475.00	40.23	32.87	20.15	34.88	58.37	68.20	-9.83	H

## Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	27.53	32.59	18.02	33.92	44.22	54.00	-9.78	V
17475.00	28.36	32.87	20.15	34.88	46.50	54.00	-7.50	V
11650.00	28.70	32.59	18.02	33.92	45.39	54.00	-8.61	H
17475.00	27.76	32.87	20.15	34.88	45.90	54.00	-8.10	H

Test mode:	IEEE 802.11n(HT40)	Test channel:	Low CH
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## Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11510.00	41.93	31.98	17.08	33.91	57.08	68.20	-11.12	V
17265.00	40.08	32.65	20.03	34.85	57.91	68.20	-10.29	V
11510.00	41.82	31.98	17.08	33.91	56.97	68.20	-11.23	H
17265.00	41.32	32.65	20.03	34.85	59.15	68.20	-9.05	H

## Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11510.00	29.43	31.98	17.08	33.91	44.58	54.00	-9.42	V
17265.00	29.02	32.65	20.03	34.85	46.85	54.00	-7.15	V
11510.00	29.14	31.98	17.08	33.91	44.29	54.00	-9.71	H
17265.00	28.91	32.65	20.03	34.85	46.74	54.00	-7.26	H



Test mode:	IEEE 802.11n(HT40)	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11590.00	41.06	32.59	18.02	33.92	57.75	68.20	-10.45	V
17385.00	41.47	32.87	20.15	34.88	59.61	68.20	-8.59	V
11590.00	41.47	32.59	18.02	33.92	58.16	68.20	-10.04	H
17385.00	41.60	32.87	20.15	34.88	59.74	68.20	-8.46	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11590.00	28.72	32.59	18.02	33.92	45.41	54.00	-8.59	V
17385.00	27.13	32.87	20.15	34.88	45.27	54.00	-8.73	V
11590.00	29.05	32.59	18.02	33.92	45.74	54.00	-8.26	H
17385.00	27.33	32.78	20.12	34.86	45.37	54.00	-8.63	H

Test mode:	IEEE 802.11ac(HT40)	Test channel:	Low CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11510.00	39.90	31.98	17.08	33.91	55.05	68.20	-13.15	V
17265.00	40.09	32.65	20.03	34.85	57.92	68.20	-10.28	V
11510.00	39.11	31.98	17.08	33.91	54.26	68.20	-13.94	H
17265.00	41.17	32.65	20.03	34.85	59.00	68.20	-9.20	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11510.00	29.05	31.98	17.08	33.91	44.20	54.00	-9.80	V
17265.00	28.71	32.65	20.03	34.85	46.54	54.00	-7.46	V
11510.00	28.00	31.98	17.08	33.91	43.15	54.00	-10.85	H
17265.00	29.62	32.65	20.03	34.85	47.45	54.00	-6.55	H

Test mode:	IEEE 802.11ac(HT40)	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11590.00	40.86	32.59	18.02	33.92	57.55	68.20	-10.65	V
17385.00	39.82	32.87	20.15	34.88	57.96	68.20	-10.24	V
11590.00	39.05	32.59	18.02	33.92	55.74	68.20	-12.46	H
17385.00	39.58	32.87	20.15	34.88	57.72	68.20	-10.48	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11590.00	28.93	32.59	18.02	33.92	45.62	54.00	-8.38	V
17385.00	28.84	32.87	20.15	34.88	46.98	54.00	-7.02	V
11590.00	28.61	32.59	18.02	33.92	45.30	54.00	-8.70	H
17385.00	30.00	32.78	20.12	34.86	48.04	54.00	-5.96	H

Test mode:	IEEE 802.11ac(HT80)	Test channel:	
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11550.00	39.42	32.44	17.18	33.91	55.13	68.20	-13.07	V
17325.00	39.61	32.78	20.12	34.86	57.65	68.20	-10.55	V
11550.00	39.40	32.44	17.18	33.91	55.11	68.20	-13.09	H
17325.00	41.48	32.78	20.12	34.86	59.52	68.20	-8.68	H

Average value:

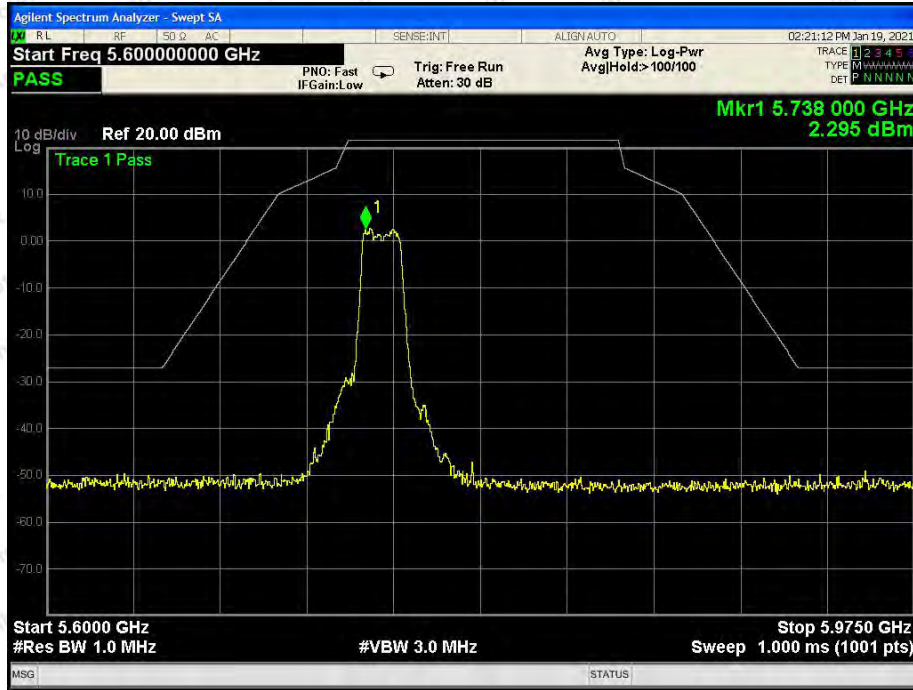
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11550.00	29.46	32.44	17.18	33.91	45.17	54.00	-8.83	V
17325.00	27.03	32.78	20.12	34.86	45.07	54.00	-8.93	V
11550.00	29.50	32.44	17.18	33.91	45.21	54.00	-8.79	H
17325.00	29.04	32.78	20.12	34.86	47.08	54.00	-6.92	H

Note:

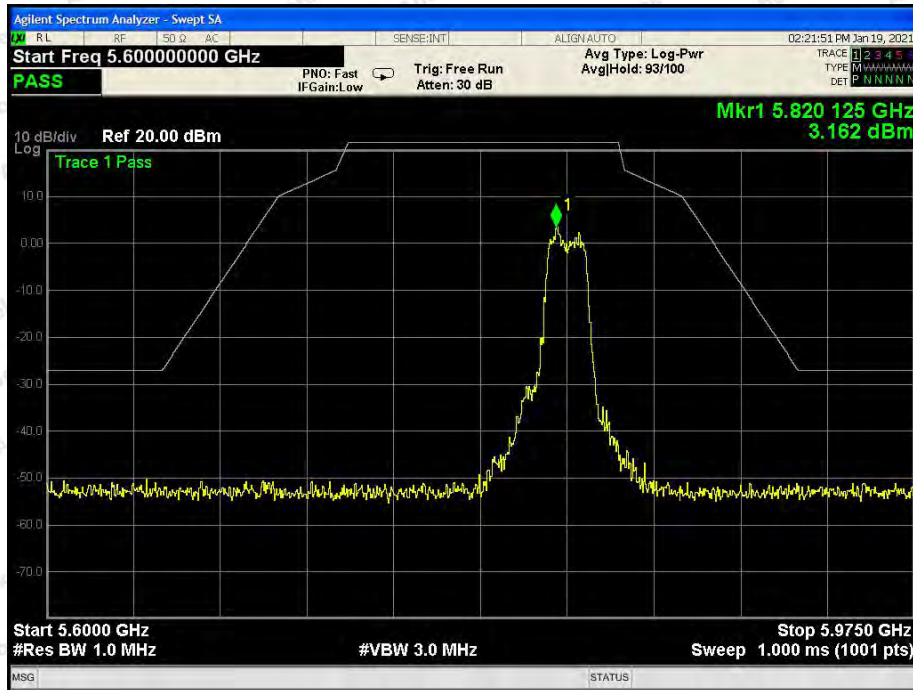
1. Final Level =Receiver Read level + Antenna Factor + Cable Loss–Preamplifier Factor



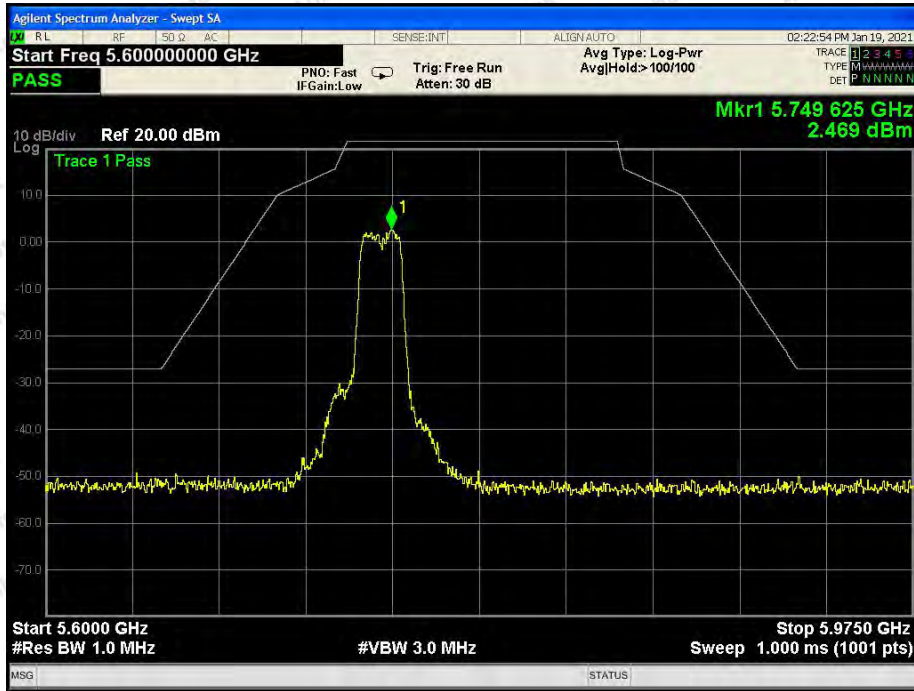
**Band Edge test:**



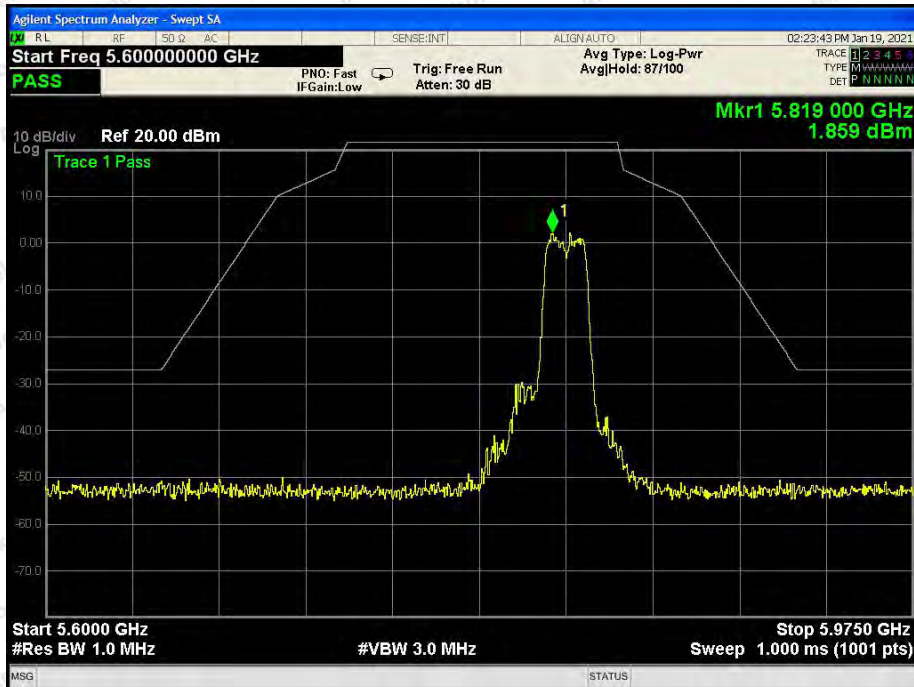
802.11a: Band Edge, Left Side



802.11a: Band Edge, Right Side

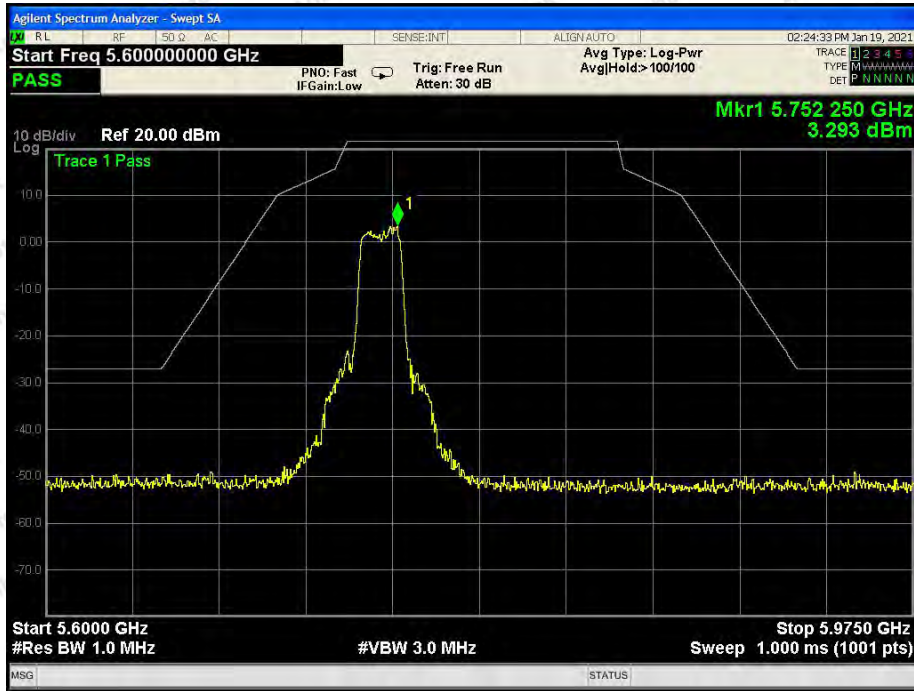


802.11n(20): Band Edge, Left Side

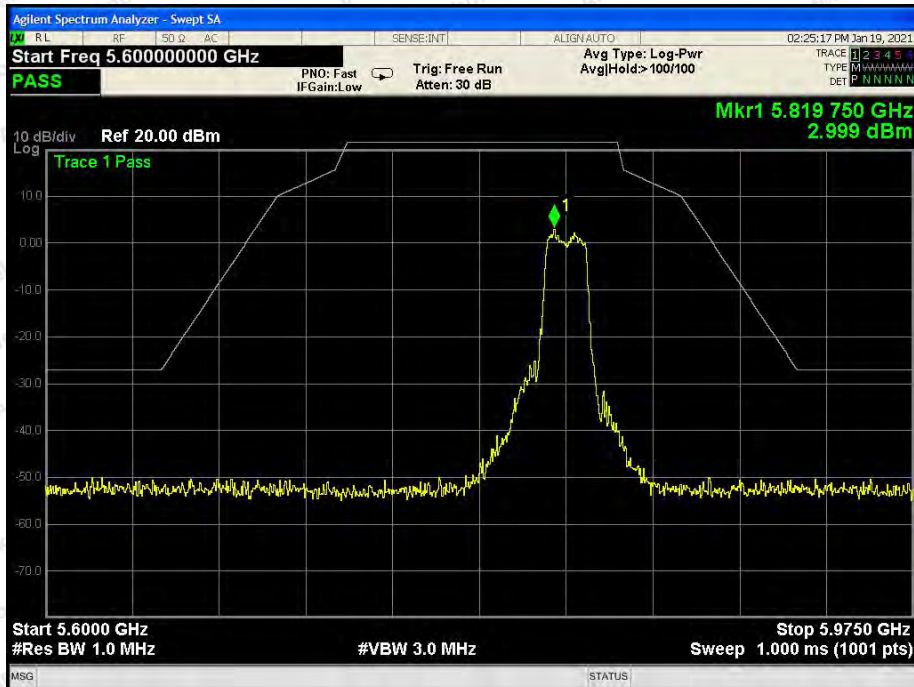


802.11n(20): Band Edge, Right Side

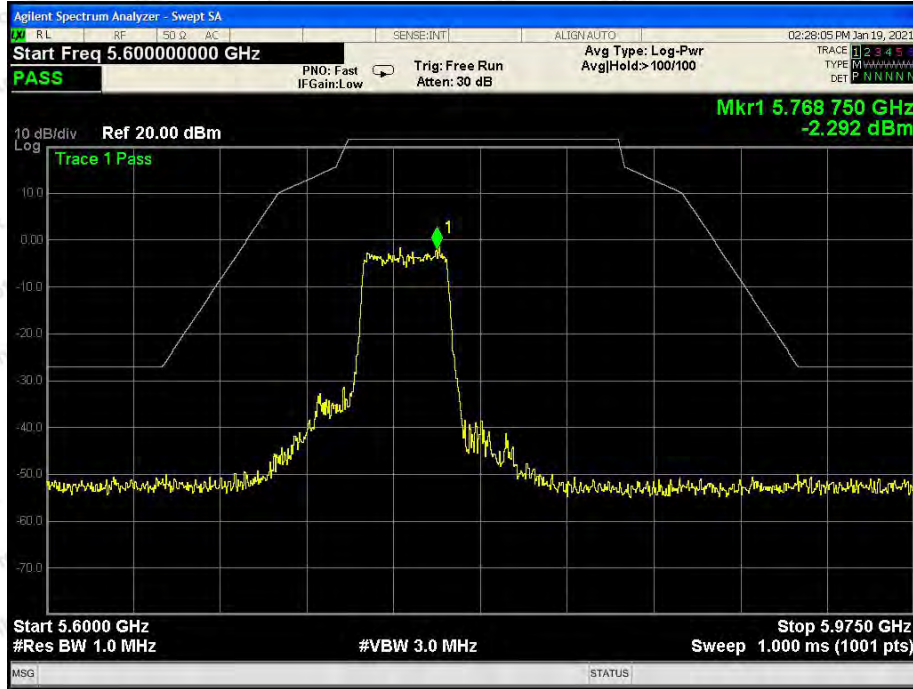




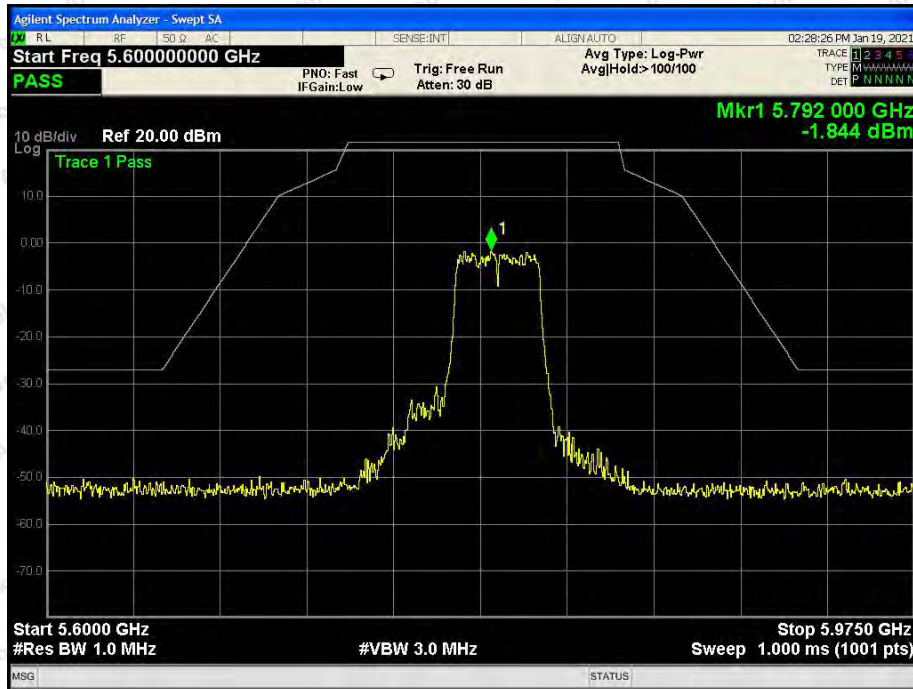
802.11ac(20): Band Edge, Left Side



802.11ac(20): Band Edge, Right Side

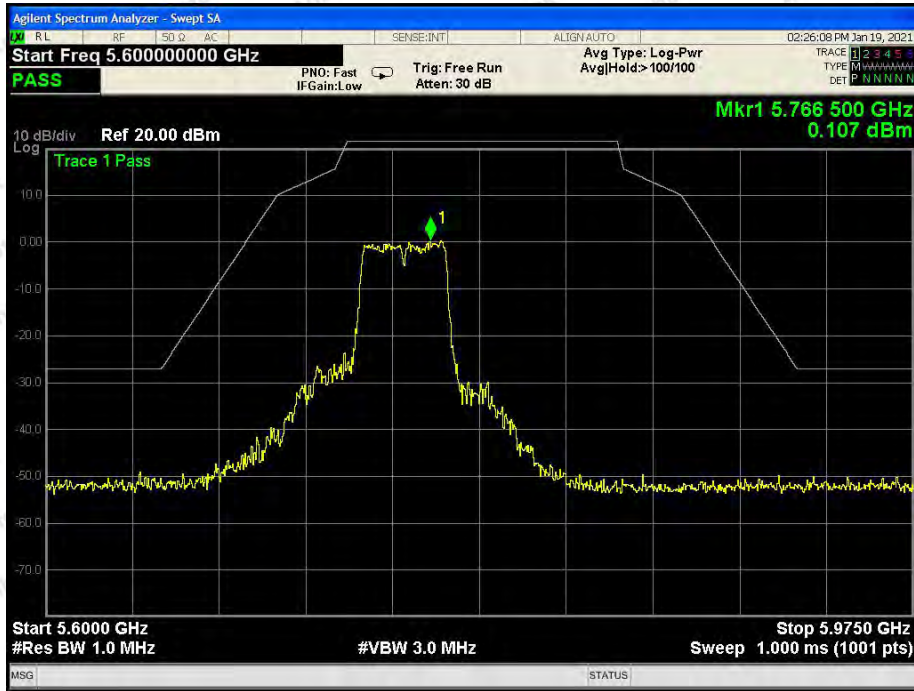


802.11n(40): Band Edge, Left Side

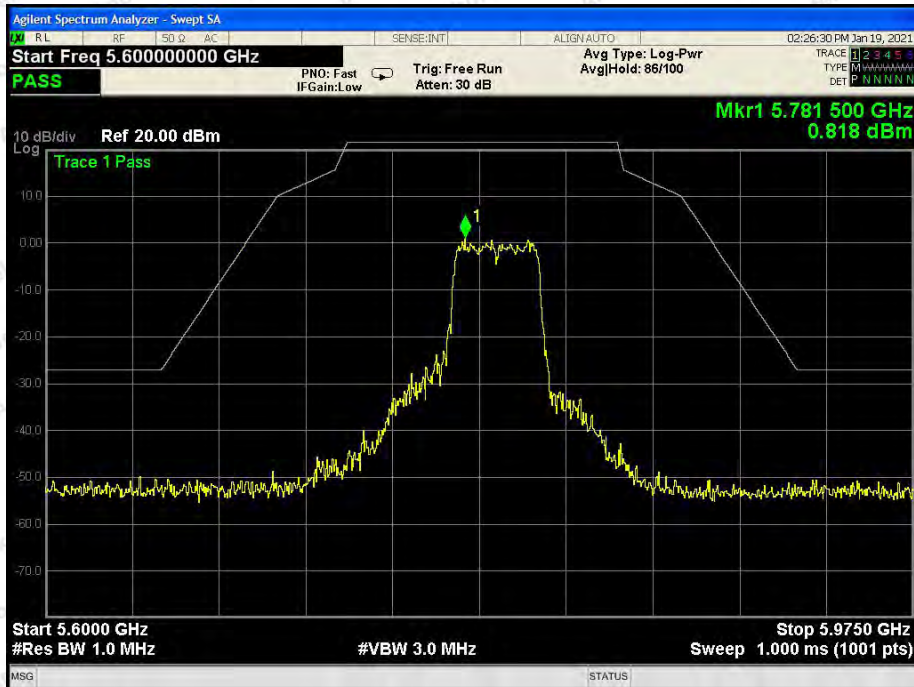


802.11n(40): Band Edge, Right Side





802.11ac(40): Band Edge, Left Side



802.11ac(40): Band Edge, Right Side



802.11ac(80): Band Edge



**Test Results (Above 1000MHz)**

**ANT B:**

Test mode:	IEEE 802.11a	Test channel:	Low CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	39.30	31.98	17.08	33.91	54.45	68.20	-13.75	V
17235.00	39.57	32.65	20.03	34.85	57.40	68.20	-10.80	V
11490.00	40.91	31.98	17.08	33.91	56.06	68.20	-12.14	H
17235.00	40.47	32.65	20.03	34.85	58.30	68.20	-9.90	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	27.55	31.98	17.08	33.91	42.70	54.00	-11.30	V
17235.00	28.77	32.65	20.03	34.85	46.60	54.00	-7.40	V
11490.00	29.37	31.98	17.08	33.91	44.52	54.00	-9.48	H
17235.00	28.94	32.65	20.03	34.85	46.77	54.00	-7.23	H

Test mode:	IEEE 802.11a	Test channel:	Mid CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	39.45	32.44	17.18	33.91	55.16	68.20	-13.04	V
17355.00	40.38	32.78	20.12	34.86	58.42	68.20	-9.78	V
11570.00	39.49	32.44	17.18	33.91	55.20	68.20	-13.00	H
17355.00	39.43	32.78	20.12	34.86	57.47	68.20	-10.73	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	29.83	32.44	17.18	33.91	45.54	54.00	-8.46	V
17355.00	27.18	32.78	20.12	34.86	45.22	54.00	-8.78	V
11570.00	28.62	32.44	17.18	33.91	44.33	54.00	-9.67	H
17355.00	27.91	32.78	20.12	34.86	45.95	54.00	-8.05	H

Test mode:	IEEE 802.11a	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	39.34	32.59	18.02	33.92	56.03	68.20	-12.17	V
17475.00	40.02	32.87	20.15	34.88	58.16	68.20	-10.04	V
11650.00	40.32	32.59	18.02	33.92	57.01	68.20	-11.19	H
17475.00	39.94	32.87	20.15	34.88	58.08	68.20	-10.12	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	29.02	32.59	18.02	33.92	45.71	54.00	-8.29	V
17475.00	27.05	32.87	20.15	34.88	45.19	54.00	-8.81	V
11650.00	28.68	32.59	18.02	33.92	45.37	54.00	-8.63	H
17475.00	29.54	32.87	20.15	34.88	47.68	54.00	-6.32	H

Test mode:	IEEE 802.11n(HT20)	Test channel:	Low CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	41.79	31.98	17.08	33.91	56.94	68.20	-11.26	V
17235.00	41.18	32.65	20.03	34.85	59.01	68.20	-9.19	V
11490.00	39.11	31.98	17.08	33.91	54.26	68.20	-13.94	H
17235.00	39.48	32.65	20.03	34.85	57.31	68.20	-10.89	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	29.94	31.98	17.08	33.91	45.09	54.00	-8.91	V
17235.00	29.81	32.65	20.03	34.85	47.64	54.00	-6.36	V
11490.00	29.32	31.98	17.08	33.91	44.47	54.00	-9.53	H
17235.00	29.24	32.65	20.03	34.85	47.07	54.00	-6.93	H



Test mode:	IEEE 802.11n(HT20)	Test channel:	Mid CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	40.40	32.44	17.18	33.91	56.11	68.20	-12.09	V
17355.00	41.97	32.78	20.12	34.86	60.01	68.20	-8.19	V
11570.00	39.20	32.44	17.18	33.91	54.91	68.20	-13.29	H
17355.00	40.30	32.78	20.12	34.86	58.34	68.20	-9.86	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	29.45	32.44	17.18	33.91	45.16	54.00	-8.84	V
17355.00	29.26	32.78	20.12	34.86	47.30	54.00	-6.70	V
11570.00	29.20	32.44	17.18	33.91	44.91	54.00	-9.09	H
17355.00	27.15	32.78	20.12	34.86	45.19	54.00	-8.81	H

Test mode:	IEEE 802.11n(HT20)	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	41.45	32.59	18.02	33.92	58.14	68.20	-10.06	V
17475.00	41.96	32.87	20.15	34.88	60.10	68.20	-8.10	V
11650.00	39.51	32.59	18.02	33.92	56.20	68.20	-12.00	H
17475.00	40.06	32.87	20.15	34.88	58.20	68.20	-10.00	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	29.58	32.59	18.02	33.92	46.27	54.00	-7.73	V
17475.00	27.20	32.87	20.15	34.88	45.34	54.00	-8.66	V
11650.00	28.85	32.59	18.02	33.92	45.54	54.00	-8.46	H
17475.00	28.23	32.87	20.15	34.88	46.37	54.00	-7.63	H

Test mode:	IEEE 802.11ac(HT20)	Test channel:	Low CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	39.34	31.98	17.08	33.91	54.49	68.20	-13.71	V
17235.00	39.21	32.65	20.03	34.85	57.04	68.20	-11.16	V
11490.00	40.79	31.98	17.08	33.91	55.94	68.20	-12.26	H
17235.00	41.66	32.65	20.03	34.85	59.49	68.20	-8.71	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	28.28	31.98	17.08	33.91	43.43	54.00	-10.57	V
17235.00	27.61	32.65	20.03	34.85	45.44	54.00	-8.56	V
11490.00	29.50	31.98	17.08	33.91	44.65	54.00	-9.35	H
17235.00	29.79	32.65	20.03	34.85	47.62	54.00	-6.38	H

Test mode:	IEEE 802.11ac(HT20)	Test channel:	Mid CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	40.09	32.44	17.18	33.91	55.80	68.20	-12.40	V
17355.00	40.82	32.78	20.12	34.86	58.86	68.20	-9.34	V
11570.00	40.09	32.44	17.18	33.91	55.80	68.20	-12.40	H
17355.00	41.55	32.78	20.12	34.86	59.59	68.20	-8.61	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	27.63	32.44	17.18	33.91	43.34	54.00	-10.66	V
17355.00	29.17	32.78	20.12	34.86	47.21	54.00	-6.79	V
11570.00	29.69	32.44	17.18	33.91	45.40	54.00	-8.60	H
17355.00	27.15	32.78	20.12	34.86	45.19	54.00	-8.81	H



Test mode:	IEEE 802.11ac(HT20)	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	41.85	32.59	18.02	33.92	58.54	68.20	-9.66	V
17475.00	41.40	32.87	20.15	34.88	59.54	68.20	-8.66	V
11650.00	40.02	32.59	18.02	33.92	56.71	68.20	-11.49	H
17475.00	40.33	32.87	20.15	34.88	58.47	68.20	-9.73	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	29.01	32.59	18.02	33.92	45.70	54.00	-8.30	V
17475.00	27.46	32.87	20.15	34.88	45.60	54.00	-8.40	V
11650.00	28.03	32.59	18.02	33.92	44.72	54.00	-9.28	H
17475.00	27.62	32.87	20.15	34.88	45.76	54.00	-8.24	H

Test mode:	IEEE 802.11n(HT40)	Test channel:	Low CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11510.00	40.43	31.98	17.08	33.91	55.58	68.20	-12.62	V
17265.00	40.69	32.65	20.03	34.85	58.52	68.20	-9.68	V
11510.00	40.00	31.98	17.08	33.91	55.15	68.20	-13.05	H
17265.00	40.06	32.65	20.03	34.85	57.89	68.20	-10.31	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11510.00	29.77	31.98	17.08	33.91	44.92	54.00	-9.08	V
17265.00	27.07	32.65	20.03	34.85	44.90	54.00	-9.10	V
11510.00	28.96	31.98	17.08	33.91	44.11	54.00	-9.89	H
17265.00	27.04	32.65	20.03	34.85	44.87	54.00	-9.13	H

Test mode:	IEEE 802.11n(HT40)	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11590.00	41.89	32.59	18.02	33.92	58.58	68.20	-9.62	V
17385.00	39.26	32.87	20.15	34.88	57.40	68.20	-10.80	V
11590.00	41.38	32.59	18.02	33.92	58.07	68.20	-10.13	H
17385.00	39.75	32.87	20.15	34.88	57.89	68.20	-10.31	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11590.00	29.78	32.59	18.02	33.92	46.47	54.00	-7.53	V
17385.00	28.10	32.87	20.15	34.88	46.24	54.00	-7.76	V
11590.00	27.90	32.59	18.02	33.92	44.59	54.00	-9.41	H
17385.00	27.73	32.78	20.12	34.86	45.77	54.00	-8.23	H

Test mode:	IEEE 802.11ac(HT40)	Test channel:	Low CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11510.00	39.39	31.98	17.08	33.91	54.54	68.20	-13.66	V
17265.00	40.92	32.65	20.03	34.85	58.75	68.20	-9.45	V
11510.00	41.02	31.98	17.08	33.91	56.17	68.20	-12.03	H
17265.00	41.30	32.65	20.03	34.85	59.13	68.20	-9.07	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11510.00	28.67	31.98	17.08	33.91	43.82	54.00	-10.18	V
17265.00	29.15	32.65	20.03	34.85	46.98	54.00	-7.02	V
11510.00	27.18	31.98	17.08	33.91	42.33	54.00	-11.67	H
17265.00	27.29	32.65	20.03	34.85	45.12	54.00	-8.88	H



Test mode:	IEEE 802.11ac(HT40)	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11590.00	41.36	32.59	18.02	33.92	58.05	68.20	-10.15	V
17385.00	40.01	32.87	20.15	34.88	58.15	68.20	-10.05	V
11590.00	39.03	32.59	18.02	33.92	55.72	68.20	-12.48	H
17385.00	41.14	32.87	20.15	34.88	59.28	68.20	-8.92	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11590.00	27.10	32.59	18.02	33.92	43.79	54.00	-10.21	V
17385.00	27.98	32.87	20.15	34.88	46.12	54.00	-7.88	V
11590.00	27.90	32.59	18.02	33.92	44.59	54.00	-9.41	H
17385.00	27.44	32.78	20.12	34.86	45.48	54.00	-8.52	H

Test mode:	IEEE 802.11ac(HT80)	Test channel:	
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11550.00	40.06	32.44	17.18	33.91	55.77	68.20	-12.43	V
17325.00	40.96	32.78	20.12	34.86	59.00	68.20	-9.20	V
11550.00	39.77	32.44	17.18	33.91	55.48	68.20	-12.72	H
17325.00	40.76	32.78	20.12	34.86	58.80	68.20	-9.40	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11550.00	28.13	32.44	17.18	33.91	43.84	54.00	-10.16	V
17325.00	27.67	32.78	20.12	34.86	45.71	54.00	-8.29	V
11550.00	28.03	32.44	17.18	33.91	43.74	54.00	-10.26	H
17325.00	28.34	32.78	20.12	34.86	46.38	54.00	-7.62	H

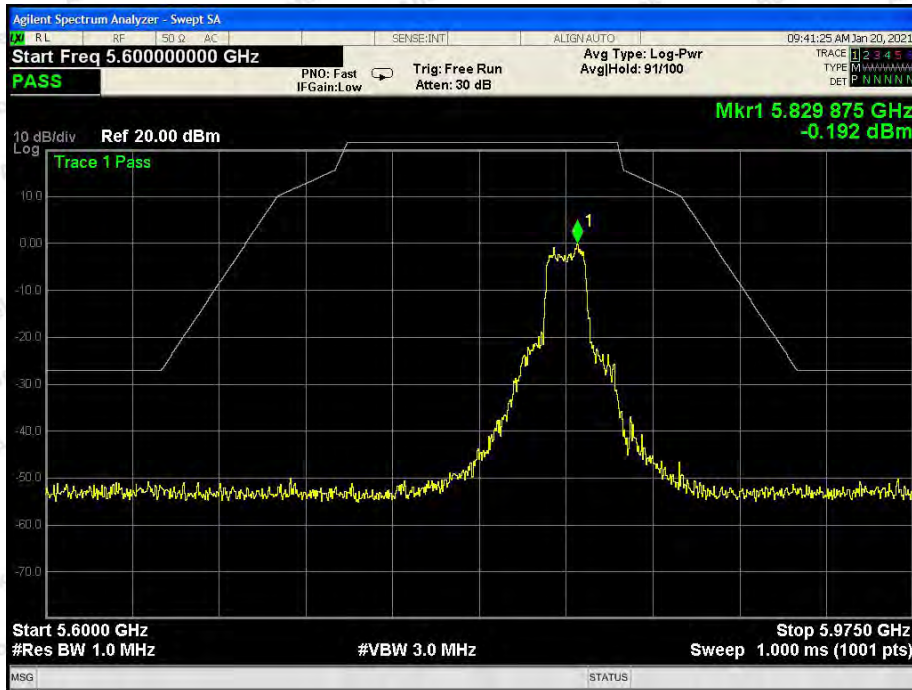
Note:

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss–Preamplifier Factor

**Band Edge test:**

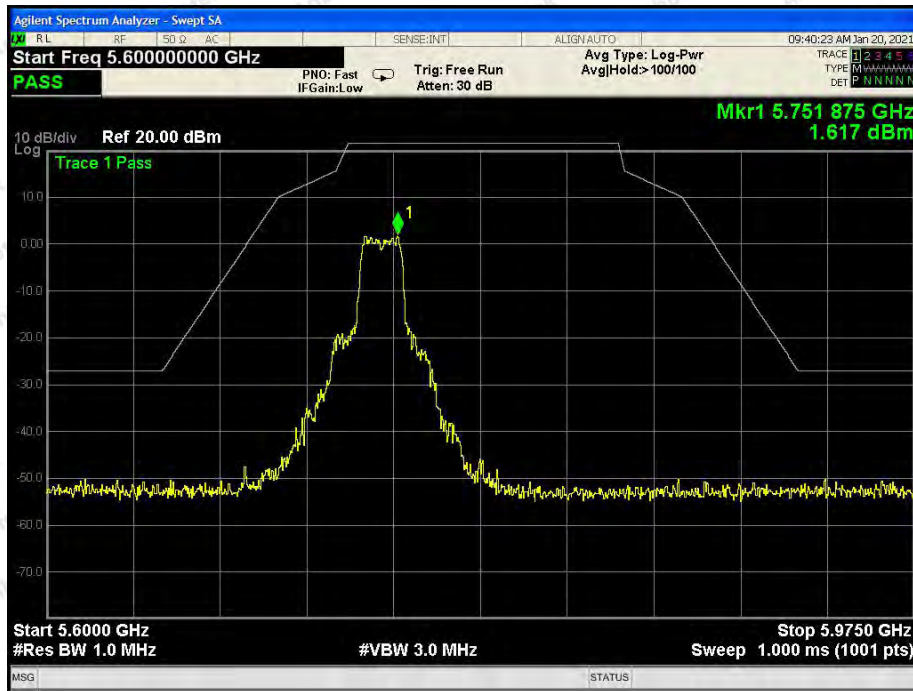


802.11a: Band Edge, Left Side

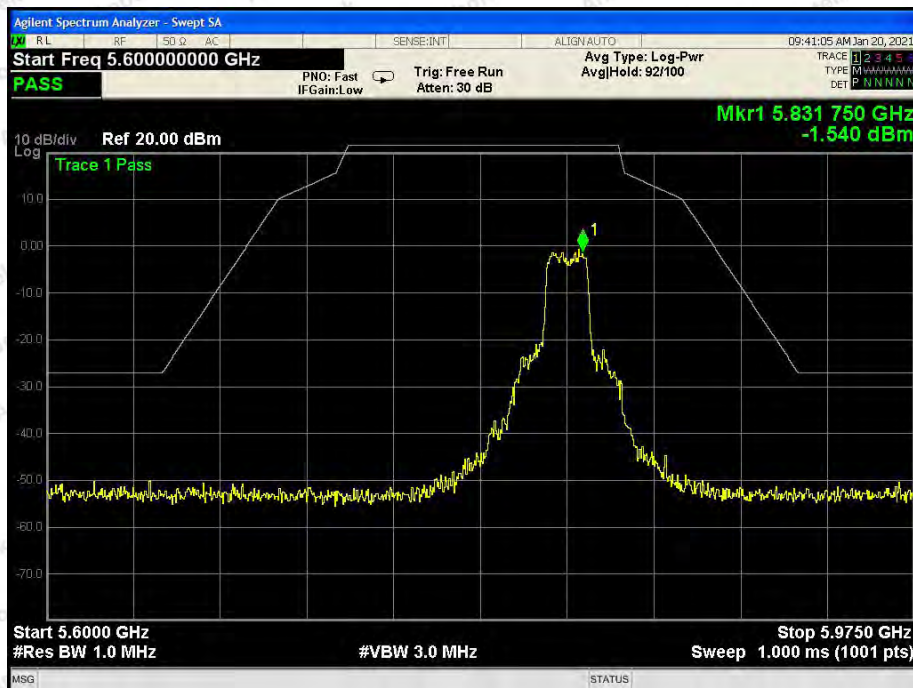


802.11a: Band Edge, Right Side

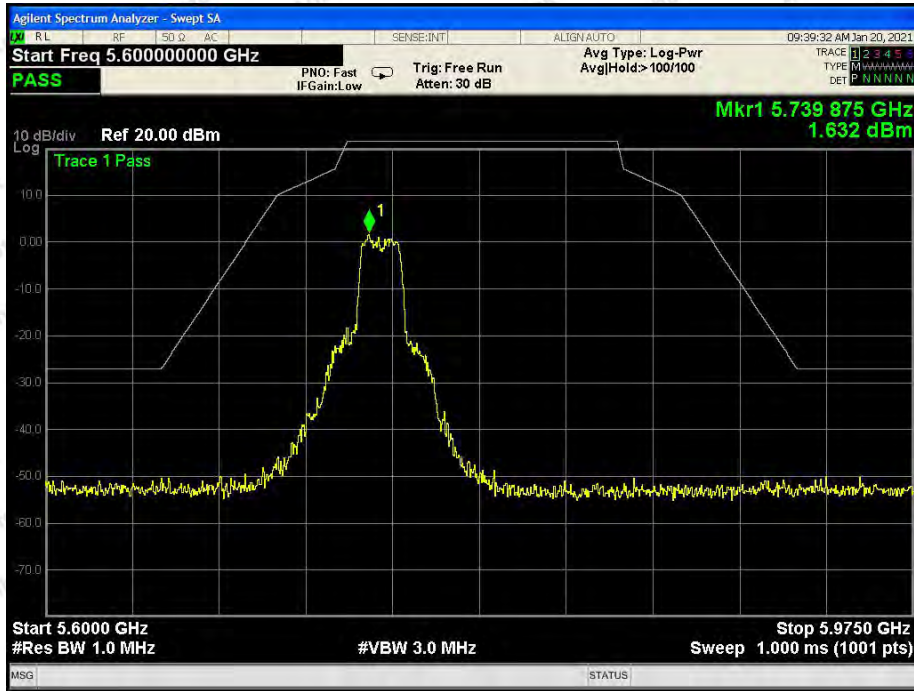




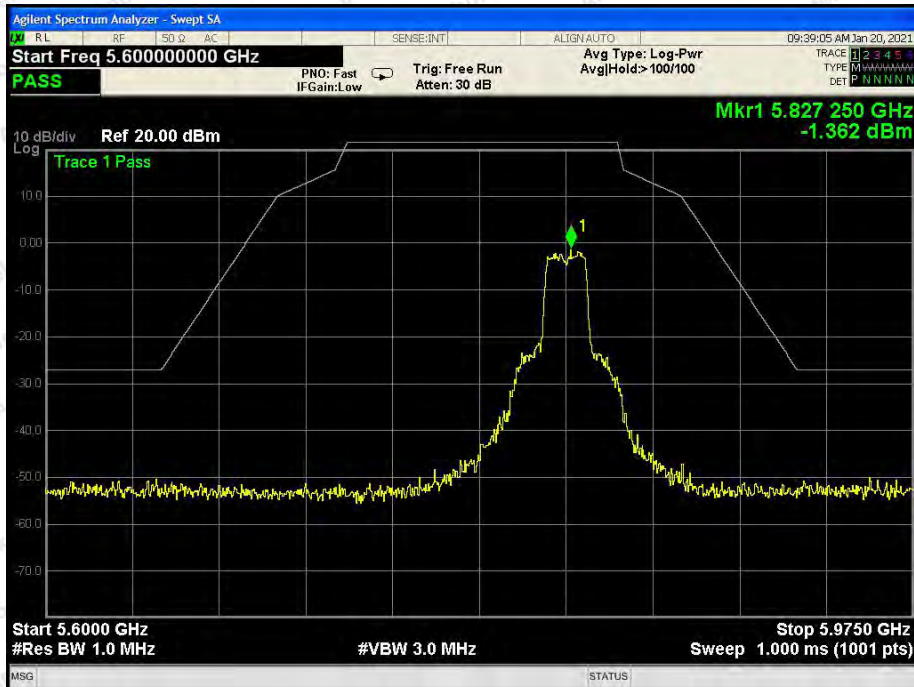
802.11n(20): Band Edge, Left Side



802.11n(20): Band Edge, Right Side

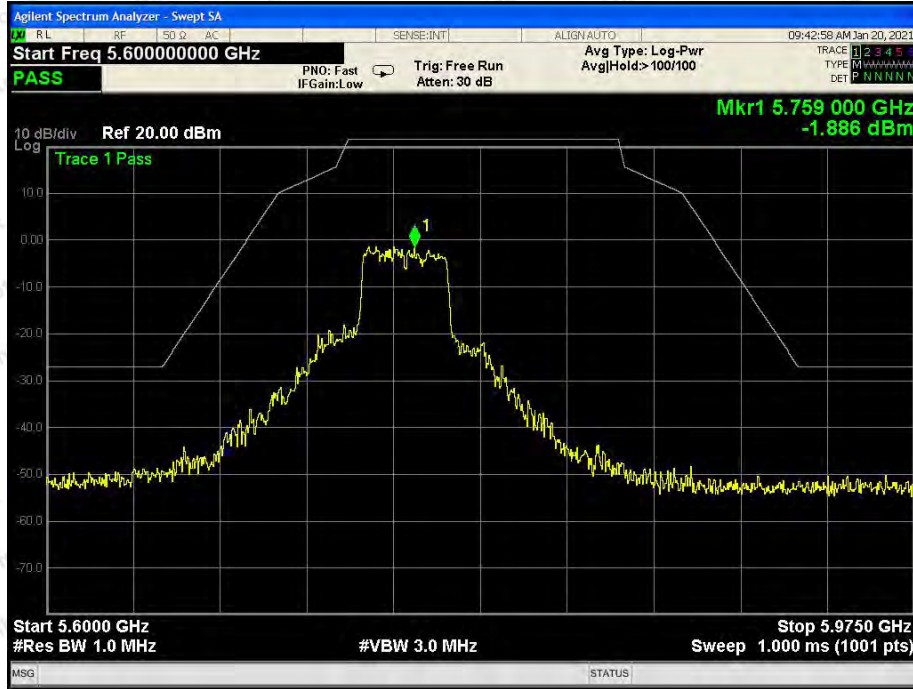


802.11ac(20): Band Edge, Left Side



802.11ac(20): Band Edge, Right Side

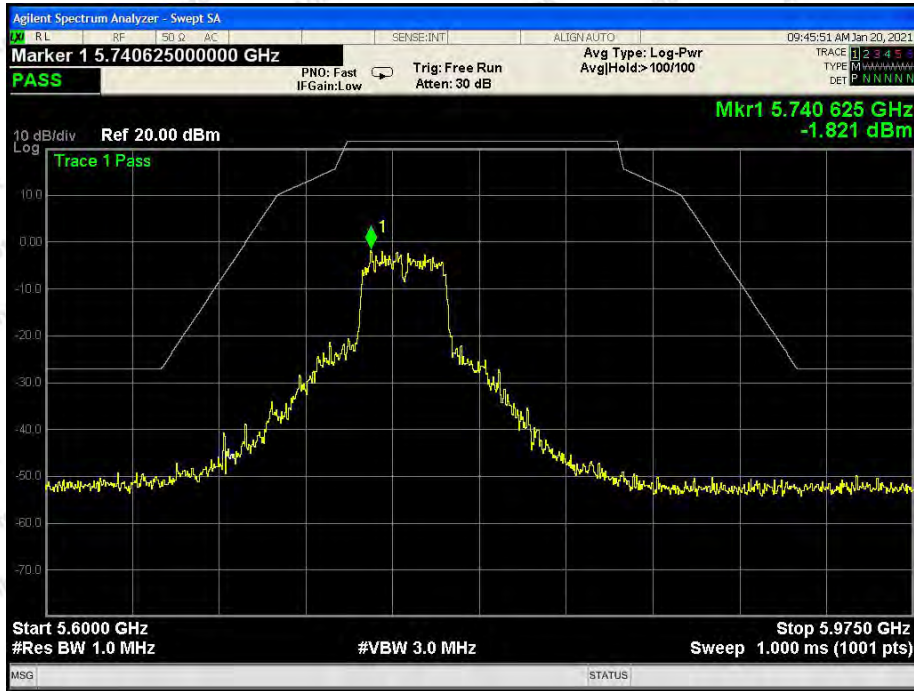




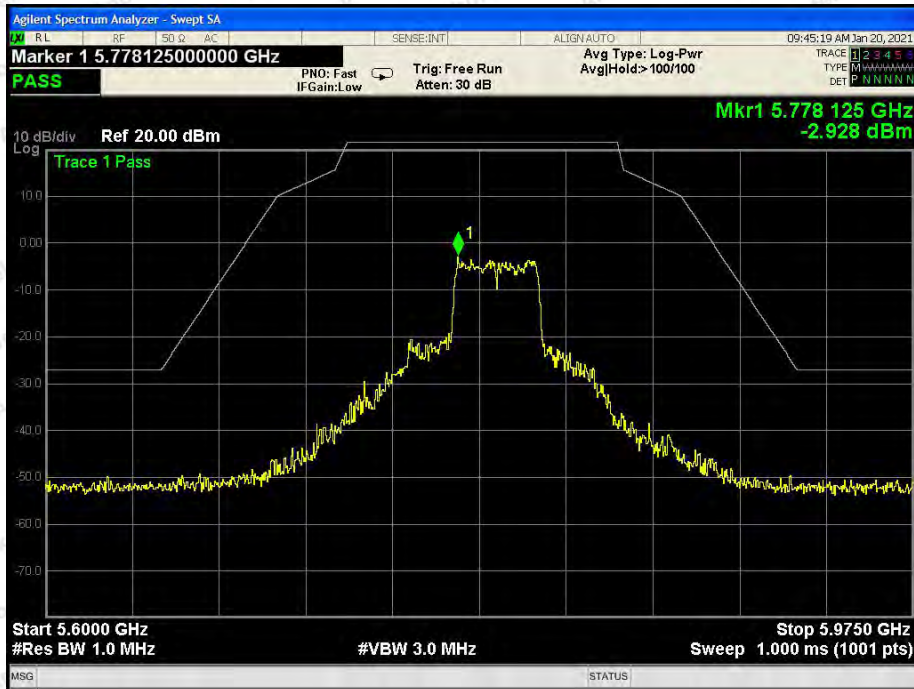
802.11n(40): Band Edge, Left Side



802.11n(40): Band Edge, Right Side



802.11ac(40): Band Edge, Left Side



802.11ac(40): Band Edge, Right Side





802.11ac(80): Band Edge

**Test Results (Above 1000MHz)**

**ANT A+B:**

Test mode:	IEEE 802.11a	Test channel:	Low CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	41.84	31.98	17.08	33.91	56.99	68.20	-11.21	V
17235.00	40.11	32.65	20.03	34.85	57.94	68.20	-10.26	V
11490.00	40.87	31.98	17.08	33.91	56.02	68.20	-12.18	H
17235.00	41.86	32.65	20.03	34.85	59.69	68.20	-8.51	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	30.80	31.98	17.08	33.91	45.95	54.00	-8.05	V
17235.00	28.63	32.65	20.03	34.85	46.46	54.00	-7.54	V
11490.00	29.13	31.98	17.08	33.91	44.28	54.00	-9.72	H
17235.00	30.02	32.65	20.03	34.85	47.85	54.00	-6.15	H

Test mode:	IEEE 802.11a	Test channel:	Mid CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	41.75	32.44	17.18	33.91	57.46	68.20	-10.74	V
17355.00	41.58	32.78	20.12	34.86	59.62	68.20	-8.58	V
11570.00	42.71	32.44	17.18	33.91	58.42	68.20	-9.78	H
17355.00	40.67	32.78	20.12	34.86	58.71	68.20	-9.49	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	28.04	32.44	17.18	33.91	43.75	54.00	-10.25	V
17355.00	30.75	32.78	20.12	34.86	48.79	54.00	-5.21	V
11570.00	28.29	32.44	17.18	33.91	44.00	54.00	-10.00	H
17355.00	29.79	32.78	20.12	34.86	47.83	54.00	-6.17	H



Test mode:	IEEE 802.11a	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	40.10	32.59	18.02	33.92	56.79	68.20	-11.41	V
17475.00	40.58	32.87	20.15	34.88	58.72	68.20	-9.48	V
11650.00	42.86	32.59	18.02	33.92	59.55	68.20	-8.65	H
17475.00	40.66	32.87	20.15	34.88	58.80	68.20	-9.40	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	30.50	32.59	18.02	33.92	47.19	54.00	-6.81	V
17475.00	28.08	32.87	20.15	34.88	46.22	54.00	-7.78	V
11650.00	29.66	32.59	18.02	33.92	46.35	54.00	-7.65	H
17475.00	30.64	32.87	20.15	34.88	48.78	54.00	-5.22	H

Test mode:	IEEE 802.11n(HT20)	Test channel:	Low CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	42.17	31.98	17.08	33.91	57.32	68.20	-10.88	V
17235.00	42.47	32.65	20.03	34.85	60.30	68.20	-7.90	V
11490.00	41.76	31.98	17.08	33.91	56.91	68.20	-11.29	H
17235.00	42.49	32.65	20.03	34.85	60.32	68.20	-7.88	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	30.70	31.98	17.08	33.91	45.85	54.00	-8.15	V
17235.00	28.52	32.65	20.03	34.85	46.35	54.00	-7.65	V
11490.00	28.92	31.98	17.08	33.91	44.07	54.00	-9.93	H
17235.00	30.55	32.65	20.03	34.85	48.38	54.00	-5.62	H

Test mode:	IEEE 802.11n(HT20)	Test channel:	Mid CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	41.91	32.44	17.18	33.91	57.62	68.20	-10.58	V
17355.00	40.04	32.78	20.12	34.86	58.08	68.20	-10.12	V
11570.00	42.69	32.44	17.18	33.91	58.40	68.20	-9.80	H
17355.00	40.31	32.78	20.12	34.86	58.35	68.20	-9.85	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	29.83	32.44	17.18	33.91	45.54	54.00	-8.46	V
17355.00	29.24	32.78	20.12	34.86	47.28	54.00	-6.72	V
11570.00	30.37	32.44	17.18	33.91	46.08	54.00	-7.92	H
17355.00	29.10	32.78	20.12	34.86	47.14	54.00	-6.86	H

Test mode:	IEEE 802.11n(HT20)	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	40.31	32.59	18.02	33.92	57.00	68.20	-11.20	V
17475.00	40.67	32.87	20.15	34.88	58.81	68.20	-9.39	V
11650.00	41.66	32.59	18.02	33.92	58.35	68.20	-9.85	H
17475.00	42.46	32.87	20.15	34.88	60.60	68.20	-7.60	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	28.58	32.59	18.02	33.92	45.27	54.00	-8.73	V
17475.00	29.10	32.87	20.15	34.88	47.24	54.00	-6.76	V
11650.00	28.33	32.59	18.02	33.92	45.02	54.00	-8.98	H
17475.00	28.42	32.87	20.15	34.88	46.56	54.00	-7.44	H



Test mode:	IEEE 802.11ac(HT20)	Test channel:	Low CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	40.92	31.98	17.08	33.91	56.07	68.20	-12.13	V
17235.00	40.98	32.65	20.03	34.85	58.81	68.20	-9.39	V
11490.00	40.96	31.98	17.08	33.91	56.11	68.20	-12.09	H
17235.00	40.70	32.65	20.03	34.85	58.53	68.20	-9.67	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11490.00	29.95	31.98	17.08	33.91	45.10	54.00	-8.90	V
17235.00	28.13	32.65	20.03	34.85	45.96	54.00	-8.04	V
11490.00	29.21	31.98	17.08	33.91	44.36	54.00	-9.64	H
17235.00	30.22	32.65	20.03	34.85	48.05	54.00	-5.95	H

Test mode:	IEEE 802.11ac(HT20)	Test channel:	Mid CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	41.17	32.44	17.18	33.91	56.88	68.20	-11.32	V
17355.00	40.46	32.78	20.12	34.86	58.50	68.20	-9.70	V
11570.00	40.66	32.44	17.18	33.91	56.37	68.20	-11.83	H
17355.00	41.62	32.78	20.12	34.86	59.66	68.20	-8.54	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11570.00	28.13	32.44	17.18	33.91	43.84	54.00	-10.16	V
17355.00	28.58	32.78	20.12	34.86	46.62	54.00	-7.38	V
11570.00	30.31	32.44	17.18	33.91	46.02	54.00	-7.98	H
17355.00	30.92	32.78	20.12	34.86	48.96	54.00	-5.04	H

Test mode:	IEEE 802.11ac(HT20)	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	41.35	32.59	18.02	33.92	58.04	68.20	-10.16	V
17475.00	41.40	32.87	20.15	34.88	59.54	68.20	-8.66	V
11650.00	41.92	32.59	18.02	33.92	58.61	68.20	-9.59	H
17475.00	40.06	32.87	20.15	34.88	58.20	68.20	-10.00	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11650.00	28.22	32.59	18.02	33.92	44.91	54.00	-9.09	V
17475.00	28.13	32.87	20.15	34.88	46.27	54.00	-7.73	V
11650.00	30.06	32.59	18.02	33.92	46.75	54.00	-7.25	H
17475.00	28.02	32.87	20.15	34.88	46.16	54.00	-7.84	H

Test mode:	IEEE 802.11n(HT40)	Test channel:	Low CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11510.00	41.81	31.98	17.08	33.91	56.96	68.20	-11.24	V
17265.00	40.64	32.65	20.03	34.85	58.47	68.20	-9.73	V
11510.00	40.84	31.98	17.08	33.91	55.99	68.20	-12.21	H
17265.00	42.95	32.65	20.03	34.85	60.78	68.20	-7.42	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11510.00	28.92	31.98	17.08	33.91	44.07	54.00	-9.93	V
17265.00	28.92	32.65	20.03	34.85	46.75	54.00	-7.25	V
11510.00	30.59	31.98	17.08	33.91	45.74	54.00	-8.26	H
17265.00	28.81	32.65	20.03	34.85	46.64	54.00	-7.36	H



Test mode:	IEEE 802.11n(HT40)	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11590.00	40.54	32.59	18.02	33.92	57.23	68.20	-10.97	V
17385.00	40.59	32.87	20.15	34.88	58.73	68.20	-9.47	V
11590.00	42.79	32.59	18.02	33.92	59.48	68.20	-8.72	H
17385.00	42.41	32.87	20.15	34.88	60.55	68.20	-7.65	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11590.00	29.81	32.59	18.02	33.92	46.50	54.00	-7.50	V
17385.00	29.73	32.87	20.15	34.88	47.87	54.00	-6.13	V
11590.00	30.10	32.59	18.02	33.92	46.79	54.00	-7.21	H
17385.00	29.64	32.78	20.12	34.86	47.68	54.00	-6.32	H

Test mode:	IEEE 802.11ac(HT40)	Test channel:	Low CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11510.00	40.13	31.98	17.08	33.91	55.28	68.20	-12.92	V
17265.00	42.35	32.65	20.03	34.85	60.18	68.20	-8.02	V
11510.00	40.47	31.98	17.08	33.91	55.62	68.20	-12.58	H
17265.00	42.12	32.65	20.03	34.85	59.95	68.20	-8.25	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11510.00	28.38	31.98	17.08	33.91	43.53	54.00	-10.47	V
17265.00	30.02	32.65	20.03	34.85	47.85	54.00	-6.15	V
11510.00	29.52	31.98	17.08	33.91	44.67	54.00	-9.33	H
17265.00	29.53	32.65	20.03	34.85	47.36	54.00	-6.64	H

Test mode:	IEEE 802.11ac(HT40)	Test channel:	High CH
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11590.00	41.64	32.59	18.02	33.92	58.33	68.20	-9.87	V
17385.00	41.64	32.87	20.15	34.88	59.78	68.20	-8.42	V
11590.00	42.05	32.59	18.02	33.92	58.74	68.20	-9.46	H
17385.00	42.73	32.87	20.15	34.88	60.87	68.20	-7.33	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11590.00	29.57	32.59	18.02	33.92	46.26	54.00	-7.74	V
17385.00	30.49	32.87	20.15	34.88	48.63	54.00	-5.37	V
11590.00	29.84	32.59	18.02	33.92	46.53	54.00	-7.47	H
17385.00	29.91	32.78	20.12	34.86	47.95	54.00	-6.05	H

Test mode:	IEEE 802.11ac(HT80)	Test channel:	
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11550.00	40.66	32.44	17.18	33.91	56.37	68.20	-11.83	V
17325.00	41.53	32.78	20.12	34.86	59.57	68.20	-8.63	V
11550.00	40.07	32.44	17.18	33.91	55.78	68.20	-12.42	H
17325.00	41.33	32.78	20.12	34.86	59.37	68.20	-8.83	H

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.
11550.00	28.71	32.44	17.18	33.91	44.42	54.00	-9.58	V
17325.00	28.80	32.78	20.12	34.86	46.84	54.00	-7.16	V
11550.00	28.01	32.44	17.18	33.91	43.72	54.00	-10.28	H
17325.00	29.54	32.78	20.12	34.86	47.58	54.00	-6.42	H

Note:

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss–Preamplifier Factor

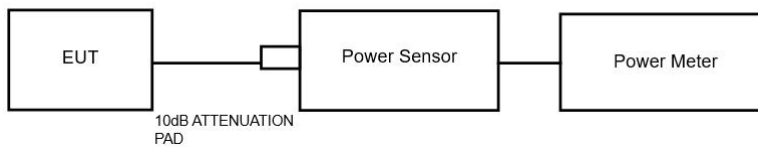


## 5. Maximum Peak Output Power Test

### 5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.407 (a) (3)
Test Limit	30dBm

### 5.2. Test Setup



### 5.3. Test Procedure

1. The Transmitter output (antenna port) was connected to the power meter.
2. Turn on the EUT and power meter and then record the power value.
3. Repeat above procedures on all channels needed to be tested.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

### 5.4. Test Data

Test Item	:	Max. peak output power
Test Voltage	:	DC 5V from PC
Test Result	:	PASS

Test Mode	:	CH Low ~ CH High
Temperature	:	23°C
Humidity	:	55%RH

**ANT A:**

Mode	Channel Frequency (MHz)	Peak Power output (dBm)	Correctional Limit (dBm)	Results
802.11a	5745	11.53	30	PASS
	5785	11.60	30	PASS
	5825	10.42	30	PASS
802.11n20	5745	11.04	30	PASS
	5785	11.35	30	PASS
	5825	10.52	30	PASS
802.11ac20	5745	11.27	30	PASS
	5785	11.37	30	PASS
	5825	10.79	30	PASS
802.11n40	5755	11.61	30	PASS
	5795	<b>11.84</b>	30	PASS
802.11ac40	5755	11.81	30	PASS
	5795	11.33	30	PASS
802.11ac80	5775	10.95	30	PASS



**ANT B:**

Mode	Channel Frequency (MHz)	Peak Power output (dBm)	Correctional Limit (dBm)	Results
802.11a	5745	8.88	30	PASS
	5785	7.26	30	PASS
	5825	7.03	30	PASS
802.11n20	5745	9.44	30	PASS
	5785	8.55	30	PASS
	5825	7.27	30	PASS
802.11ac20	5745	9.42	30	PASS
	5785	8.01	30	PASS
	5825	7.32	30	PASS
802.11n40	5755	9.93	30	PASS
	5795	8.45	30	PASS
802.11ac40	5755	<b>9.99</b>	30	PASS
	5795	8.02	30	PASS
802.11ac80	5775	9.17	30	PASS

**ANT A+B:**

Mode	Channel Frequency (MHz)	Peak Power output (dBm)	Correctional Limit (dBm)	Results
802.11a	5745	13.41	30	PASS
	5785	12.96	30	PASS
	5825	12.06	30	PASS
802.11n20	5745	13.32	30	PASS
	5785	13.18	30	PASS
	5825	12.20	30	PASS
802.11ac20	5745	13.45	30	PASS
	5785	13.02	30	PASS
	5825	12.40	30	PASS
802.11n40	5755	13.86	30	PASS
	5795	13.48	30	PASS
802.11ac40	5755	<b>14.00</b>	30	PASS
	5795	12.99	30	PASS
802.11ac80	5775	13.16	30	PASS

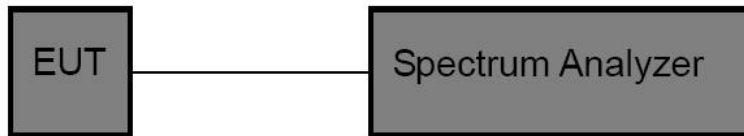


## 6. Occupy Bandwidth Test

### 6.1. Test Standard

Test Standard	FCC Part15 C Section 15.407 (a)(5)&15.407(e)
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### 6.2. Test Setup



### 6.3. Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

3. Set the spectrum analyzer as:

#### 26 dB & 99% bandwidth

RBW = approximately 1% of the emission bandwidth;

Set the VBW > RBW;

Detector= Peak

Trace mode= Max hold.

Sweep- auto couple.

#### 6 dB bandwidth

RBW = 100kHz;

Set the video bandwidth (VBW)  $\geq 3$  RBW;

Detector= Peak

Trace mode= Max hold.

Sweep- auto couple.

4. Measure the maximum width of the emission that is 26dB /6dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer.

5. Repeat until all the rest channels are investigated.

### 6.4. Test Data

Test Item	: 6dB &26dB BW	Test Mode	: CH Low ~ CH High
Test Voltage	: DC 5V from PC	Temperature	: 23°C
Test Result	: PASS	Humidity	: 55%RH

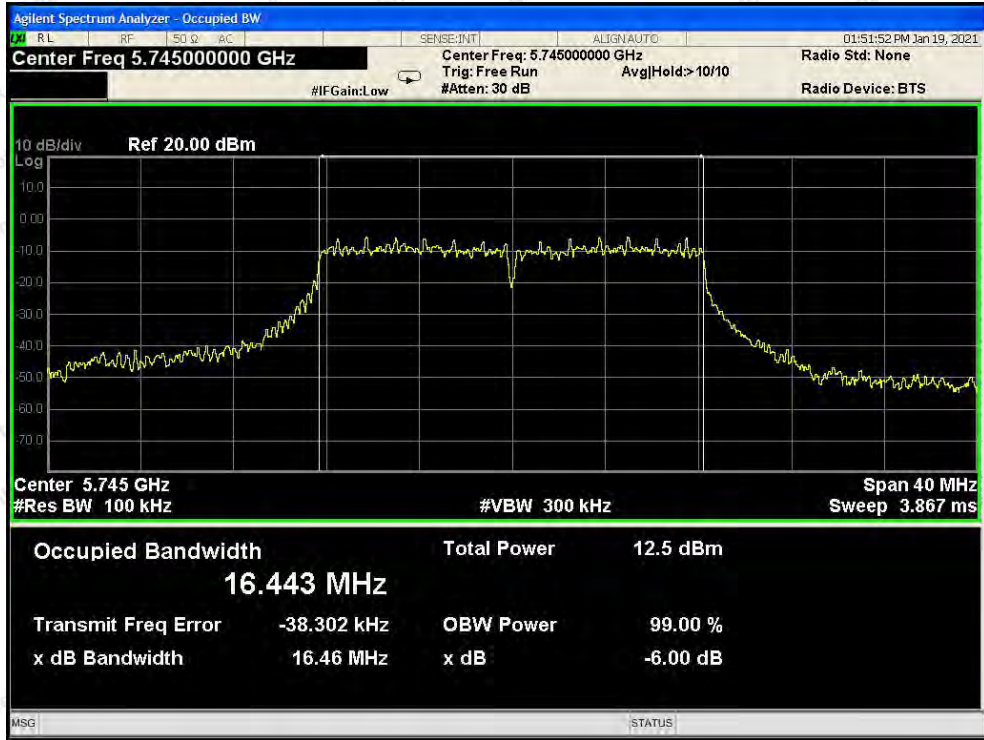
**ANT A:**

Mode	Channel Frequency (MHz)	6dB BW(MHz)	Limit	Results
802.11a	5745	16.46	>0.5MHz	PASS
	5785	16.42		PASS
	5825	16.42		PASS
802.11n20	5745	17.47		PASS
	5785	17.08		PASS
	5825	17.02		PASS
802.11ac20	5745	16.56		PASS
	5785	16.73		PASS
	5825	16.87		PASS
802.11n40	5755	35.99		PASS
	5795	36.00		PASS
802.11ac40	5755	35.78		PASS
	5795	35.63		PASS
802.11ac80	5775	75.30		PASS

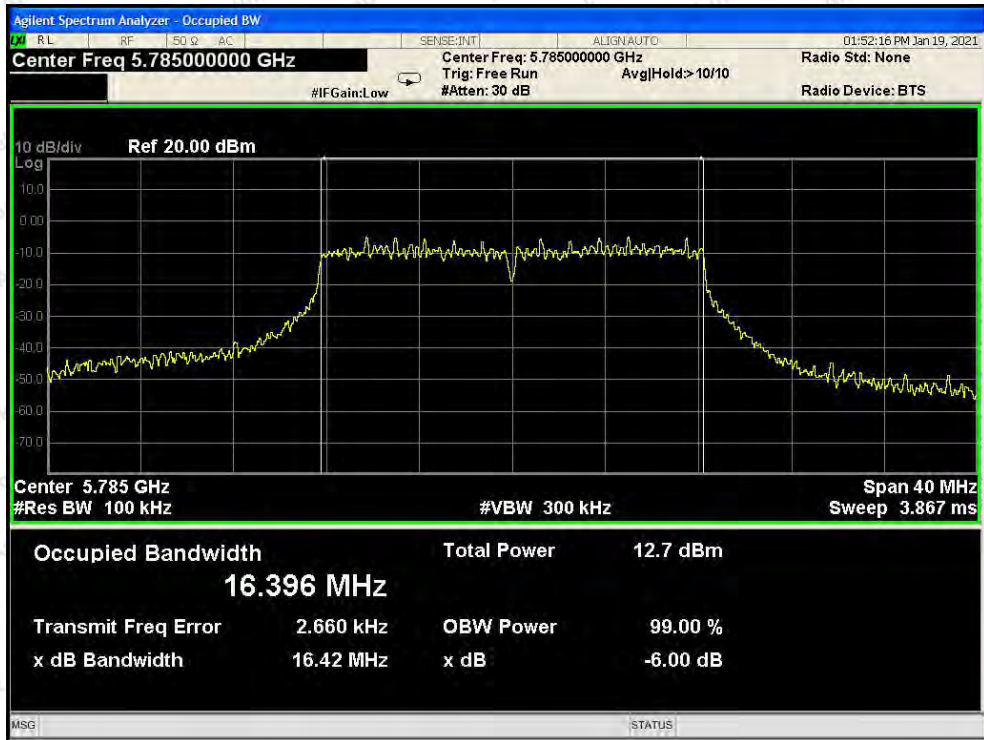
Mode	Channel Frequency (MHz)	26dB BW(MHz)	99% Bandwidth (MHz)
802.11a	5745	19.63	16.643
	5785	19.36	16.451
	5825	20.14	16.603
802.11n20	5745	20.23	17.634
	5785	20.72	17.666
	5825	19.91	17.643
802.11ac20	5745	20.81	17.657
	5785	20.64	17.656
	5825	20.23	17.576
802.11n40	5755	42.10	36.423
	5795	41.76	36.443
802.11ac40	5755	42.46	36.405
	5795	42.37	36.387
802.11ac80	5775	113.3	75.848



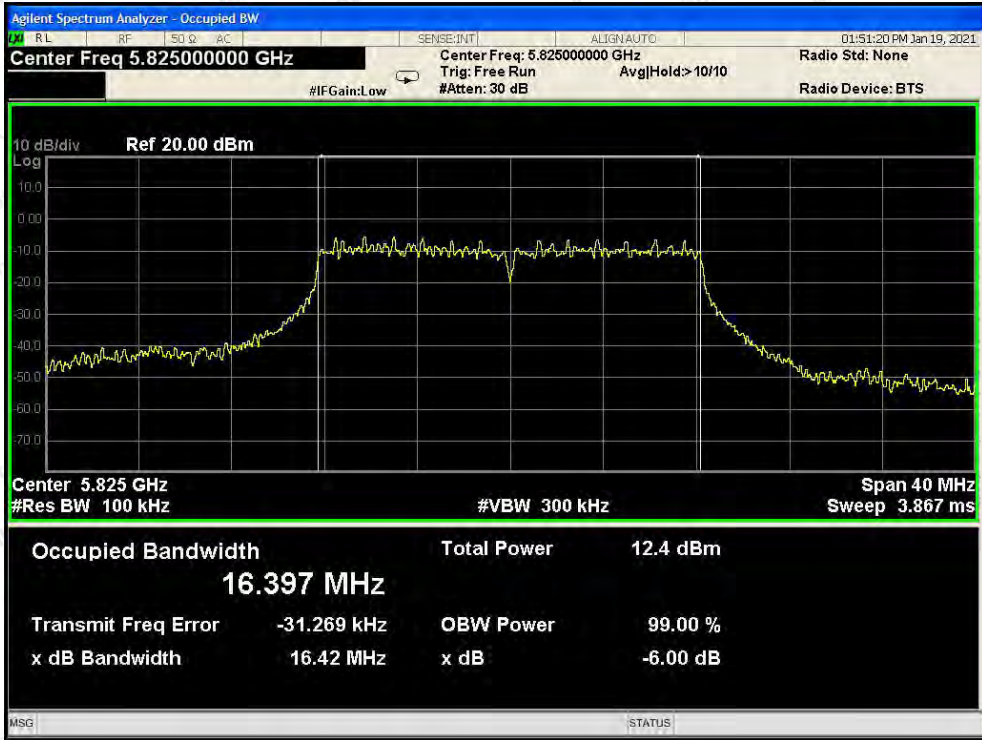
**6dB Bandwidth**



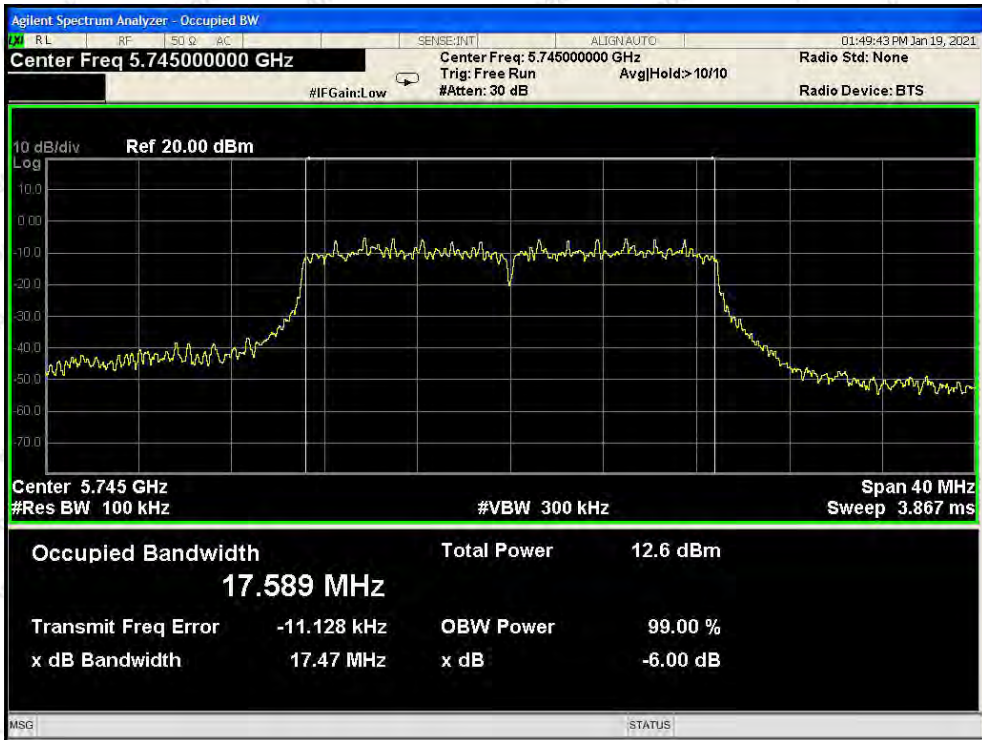
Test Mode: 802.11a--Low



Test Mode: 802.11a---Middle

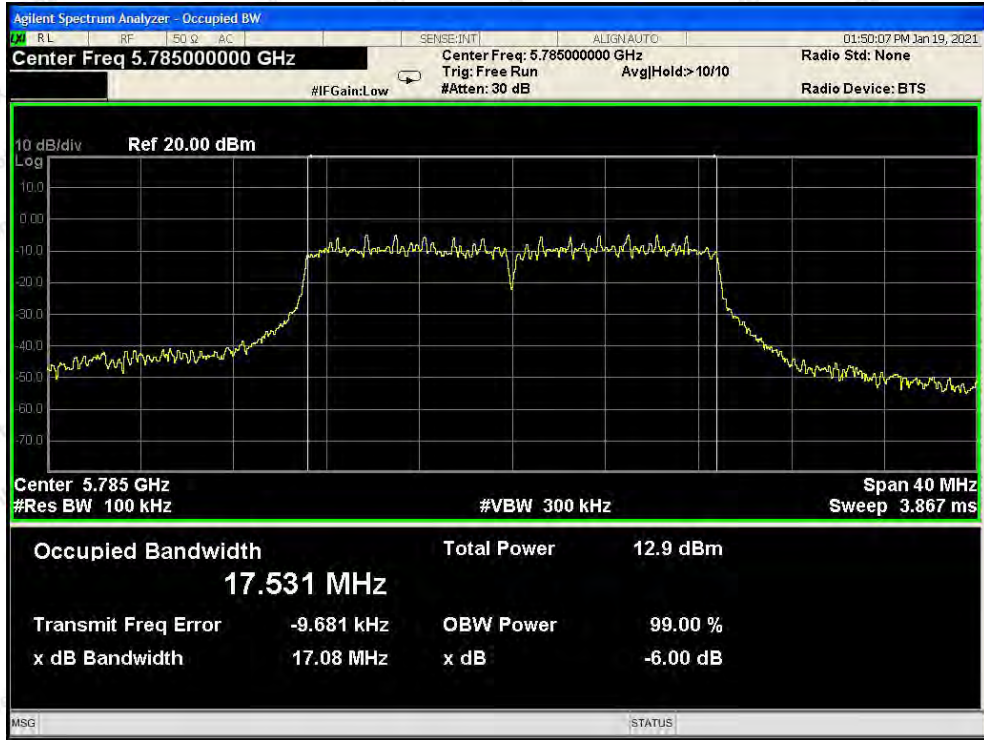


Test Mode: 802.11a---High

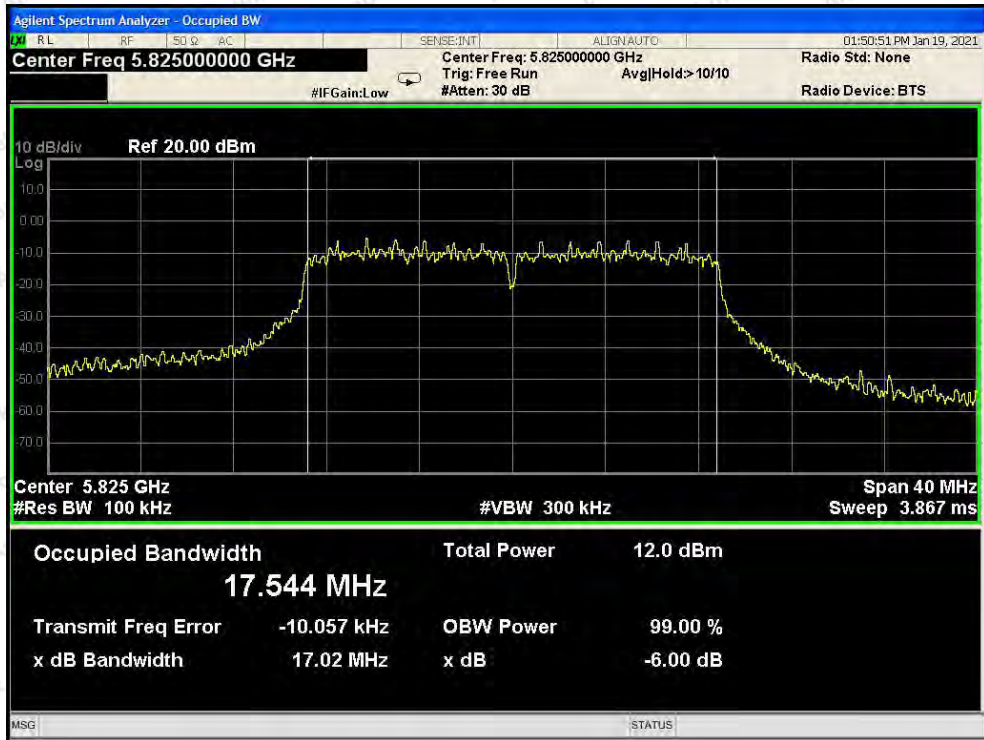


Test Mode: 802.11n20---Low

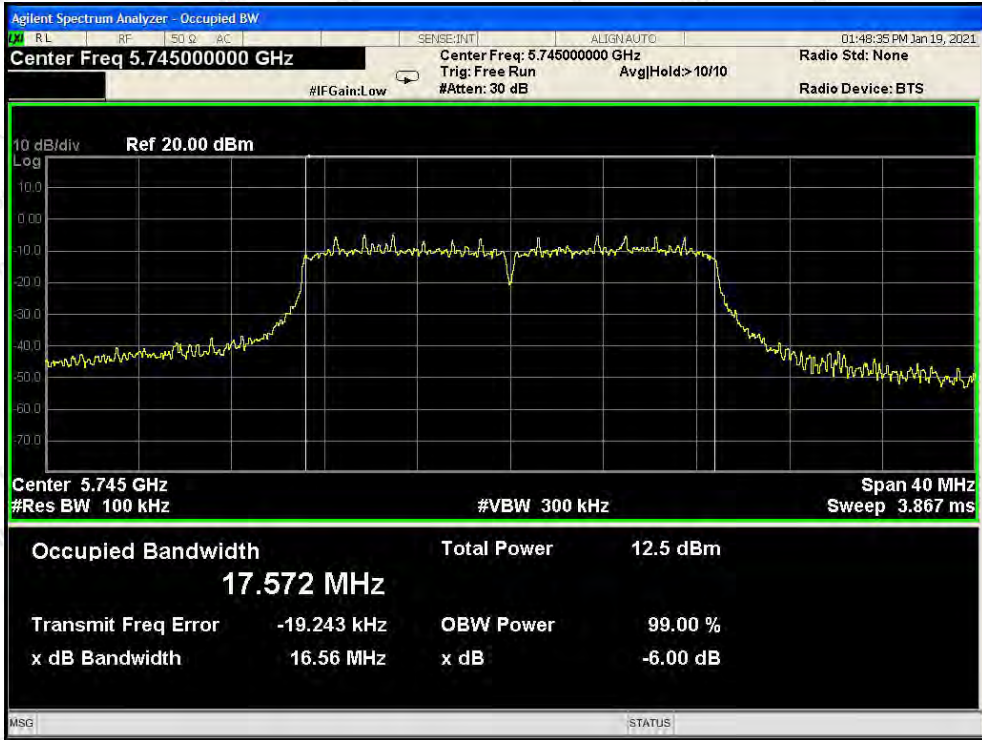




Test Mode: 802.11n20---Middle



Test Mode: 802.11n20---High

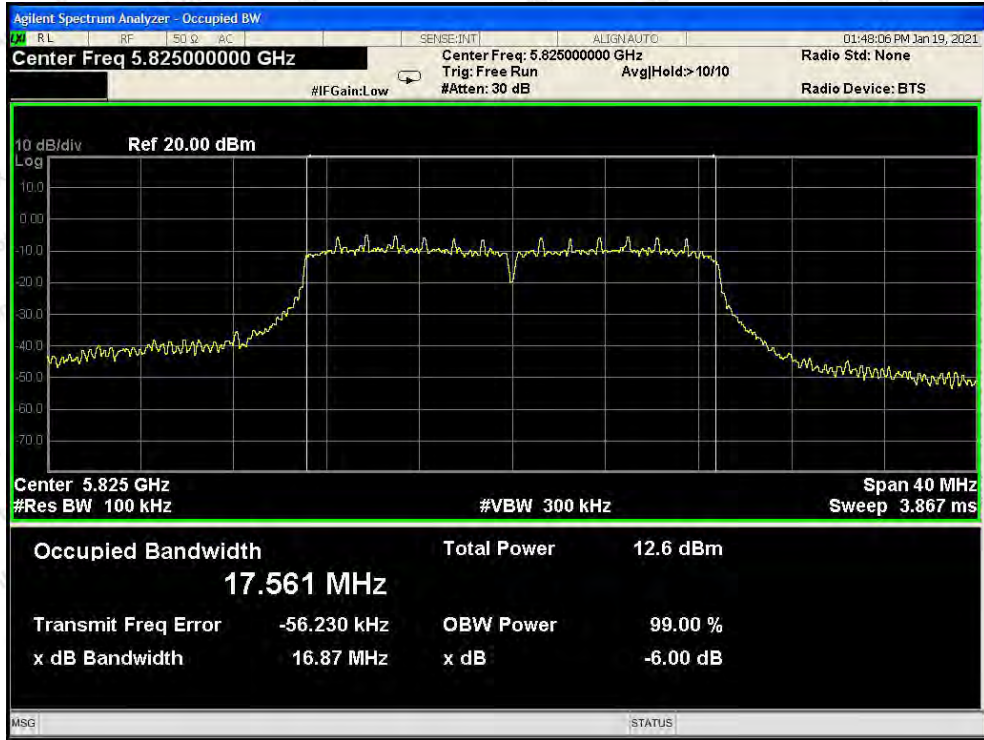


Test Mode: 802.11ac20--Low

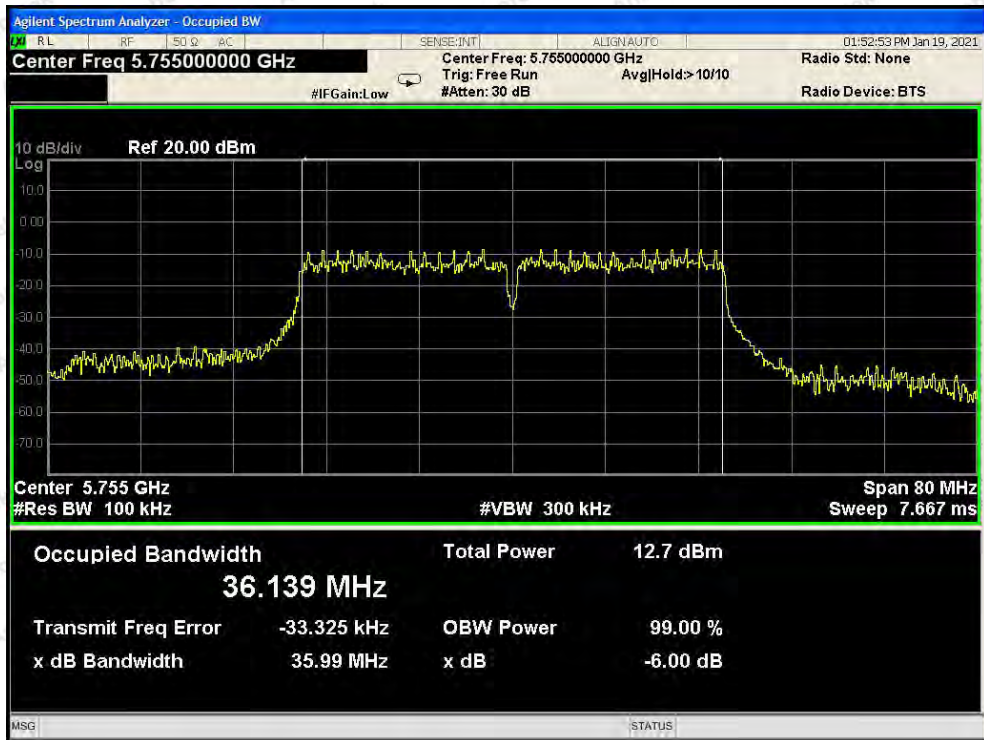


Test Mode: 802.11ac20---Middle

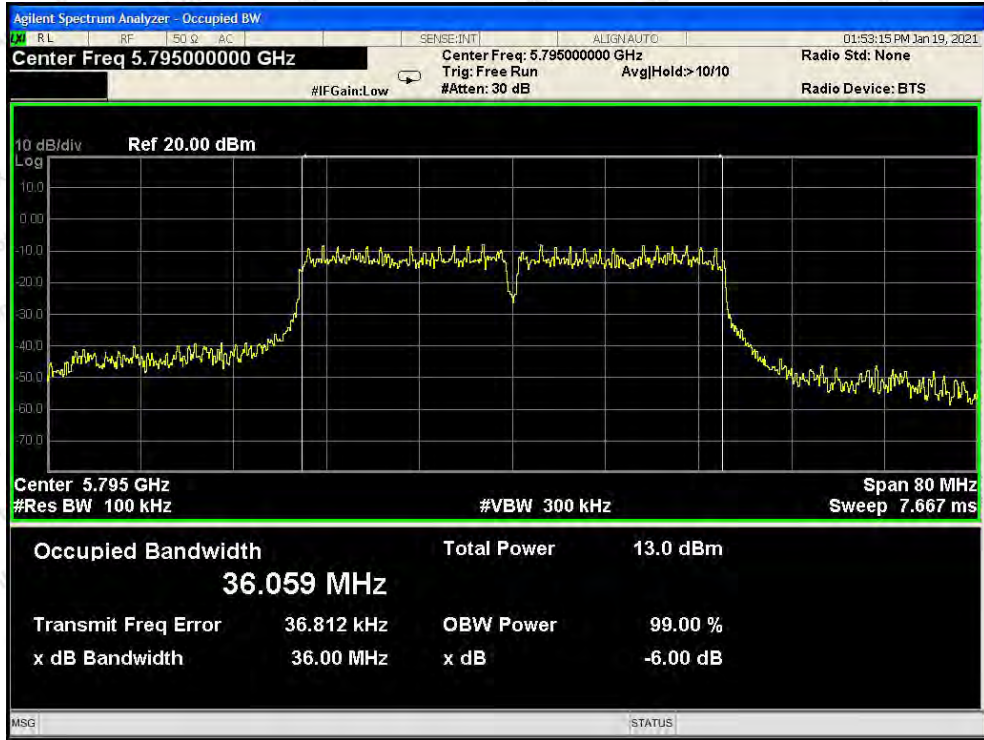




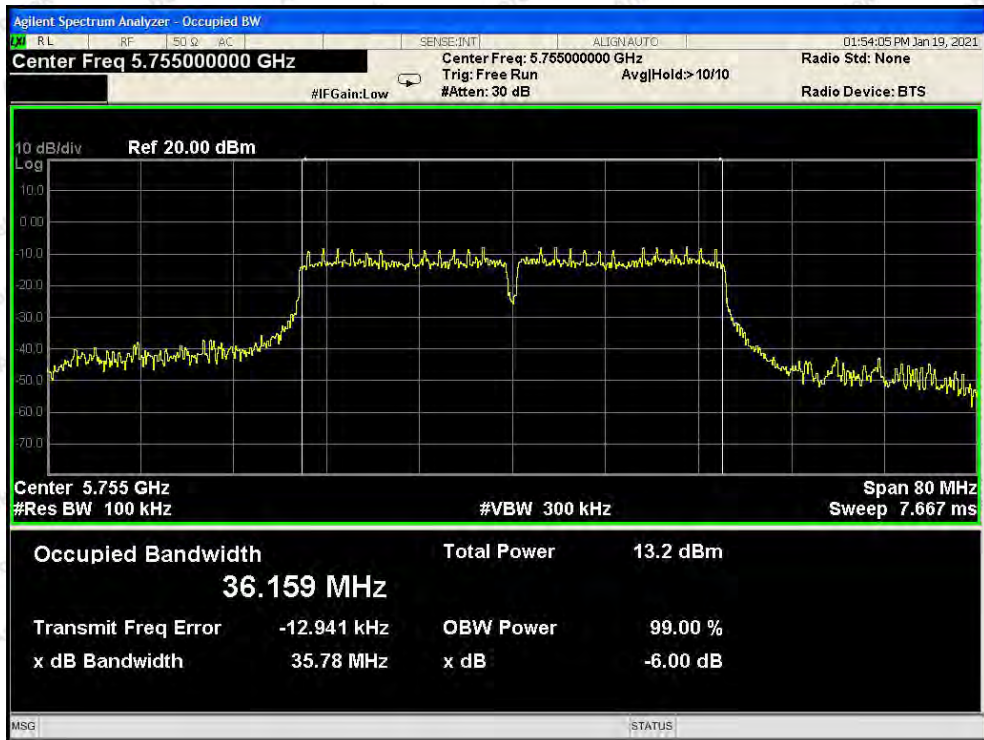
Test Mode: 802.11ac20---High



Test Mode: 802.11n40---Low

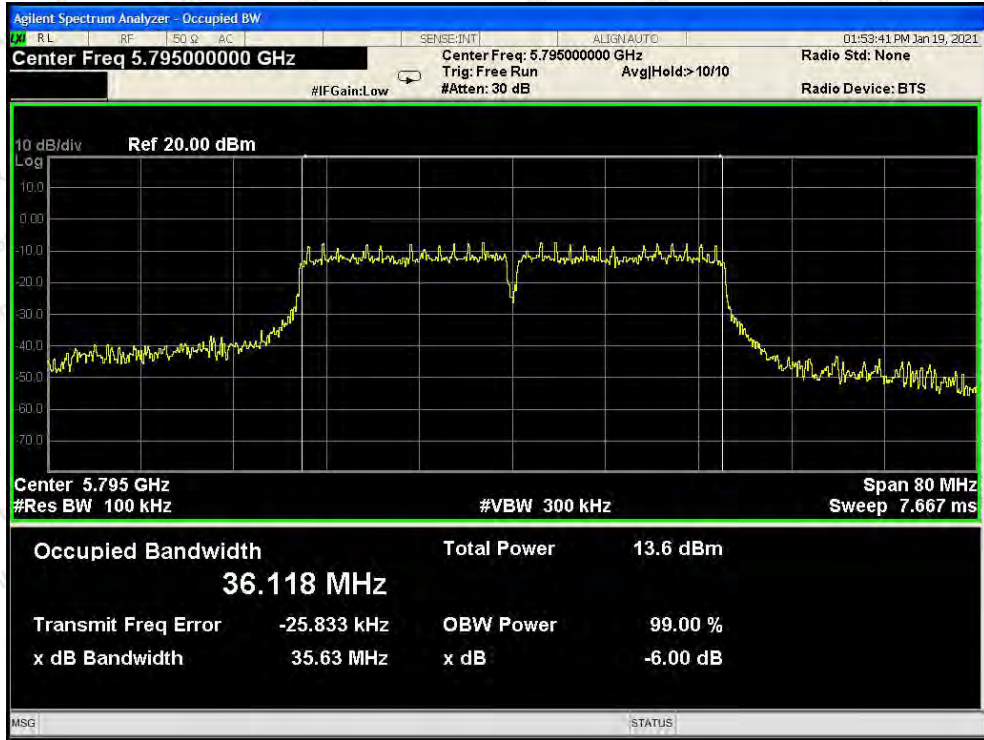


Test Mode: 802.11n40---High

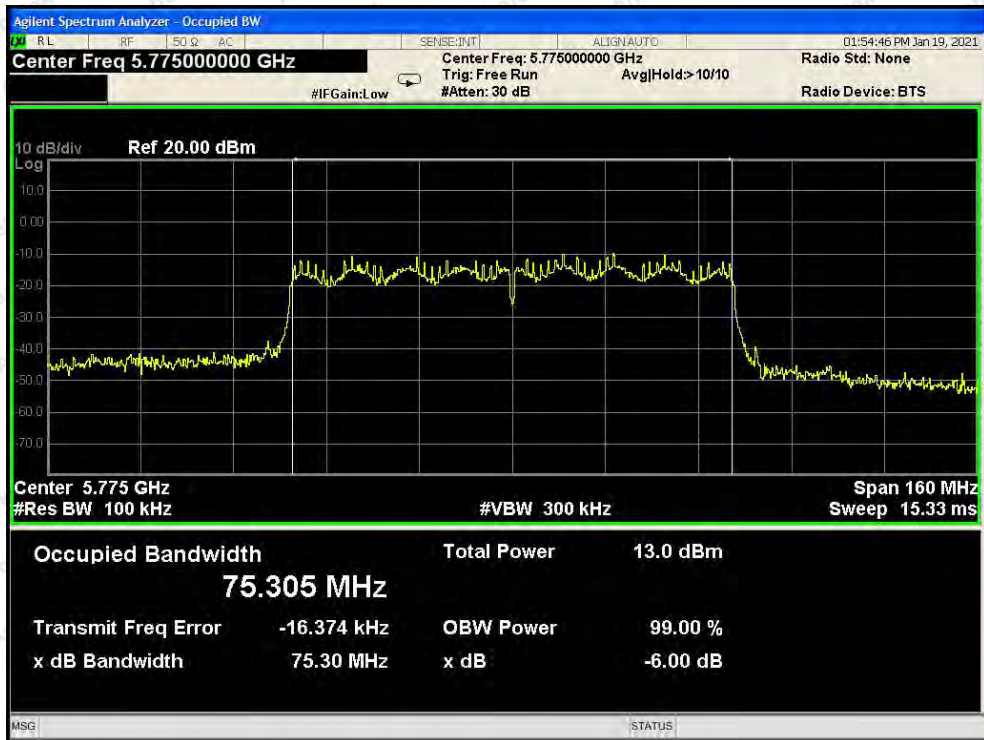


Test Mode: 802.11ac40---Low



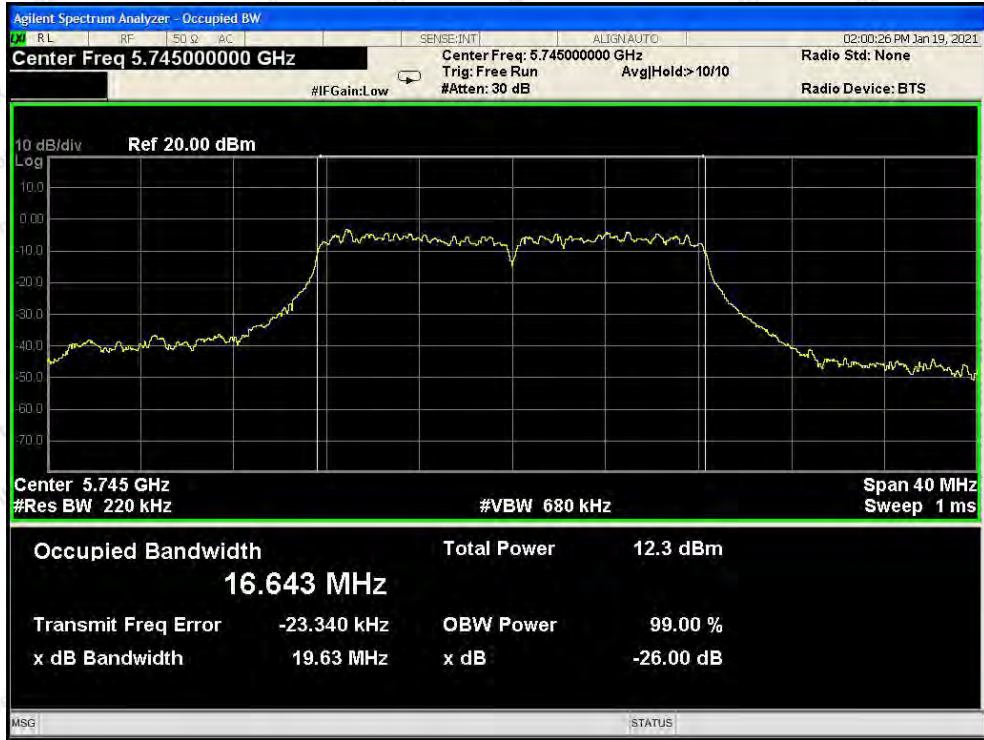


Test Mode: 802.11ac40---High

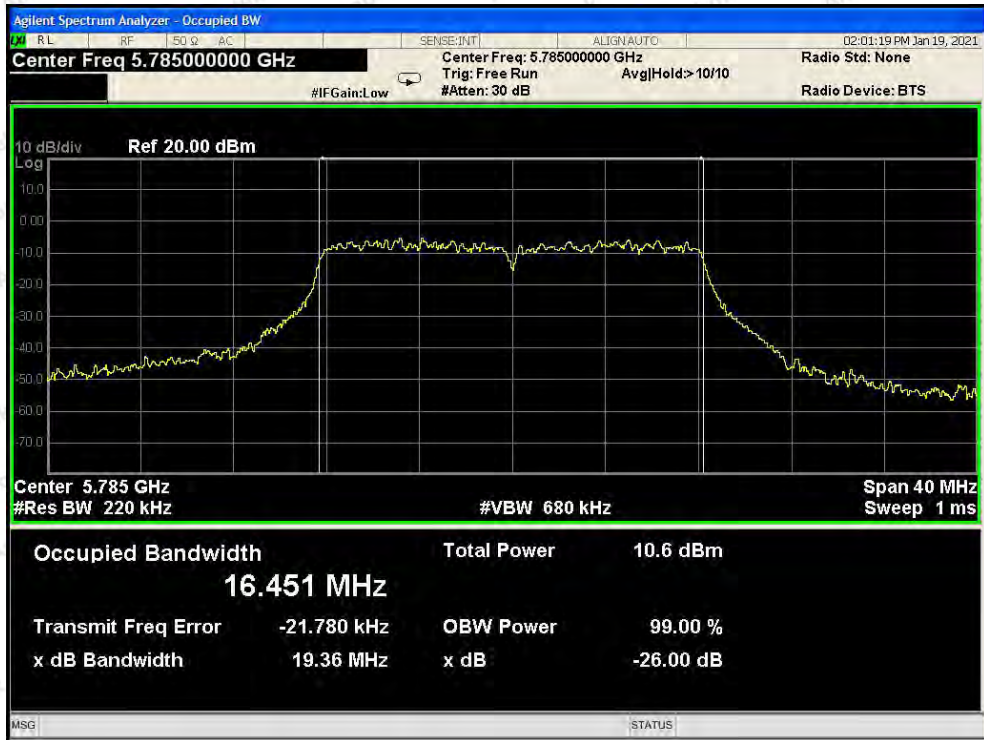


Test Mode: 802.11ac80

**26dB & 99% Bandwidth**



Test Mode: 802.11a--Low

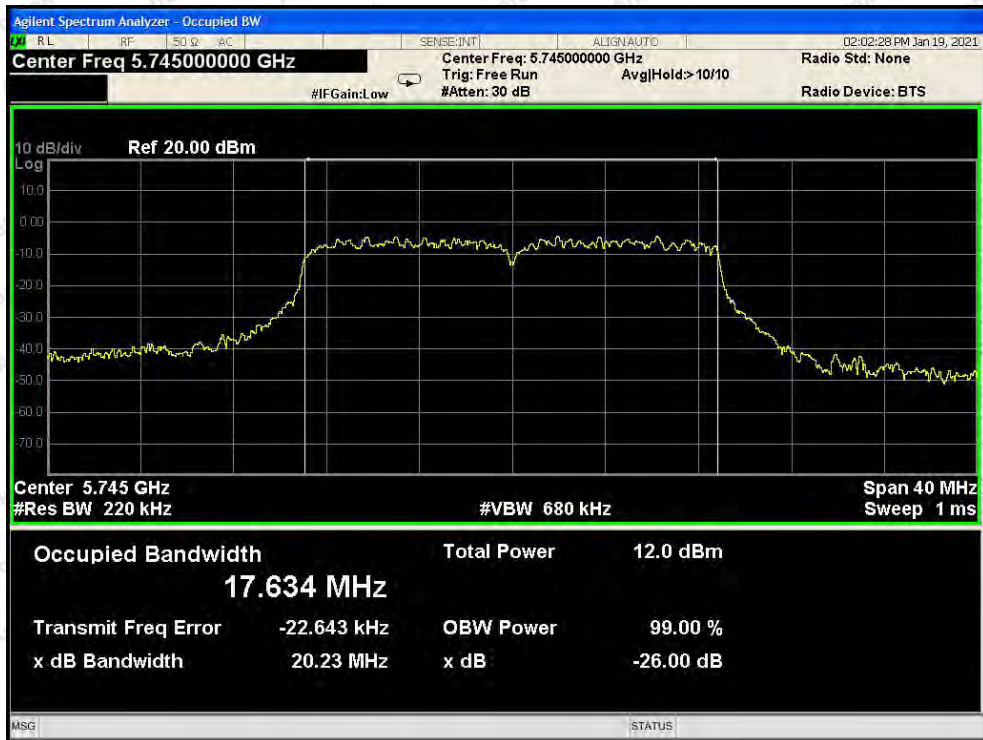


Test Mode: 802.11a---Middle

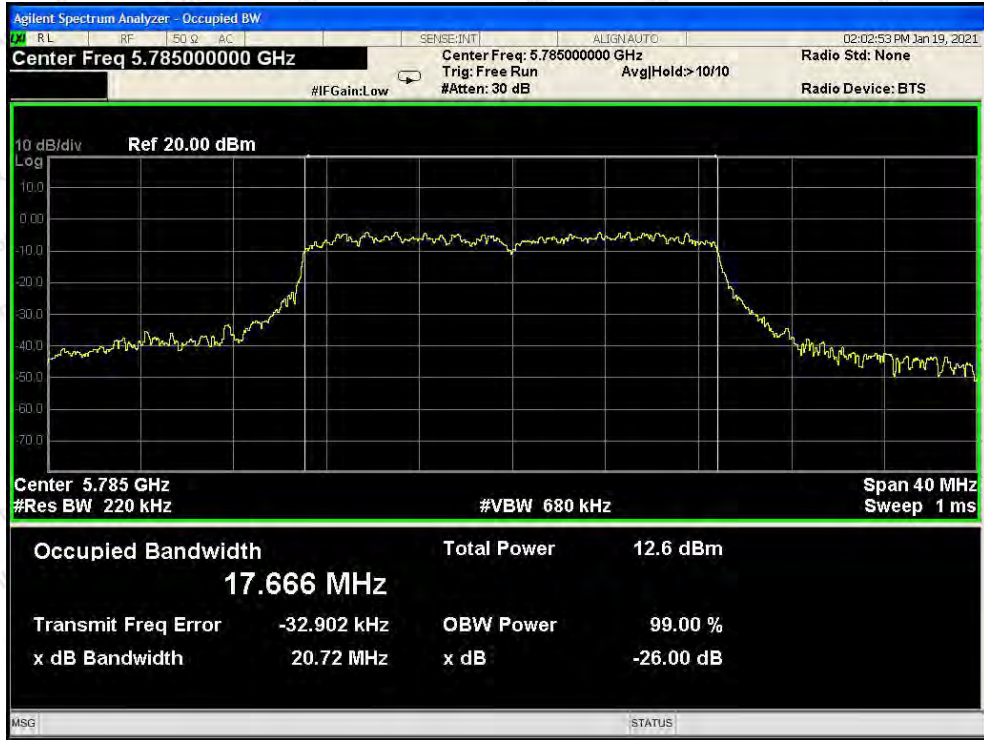




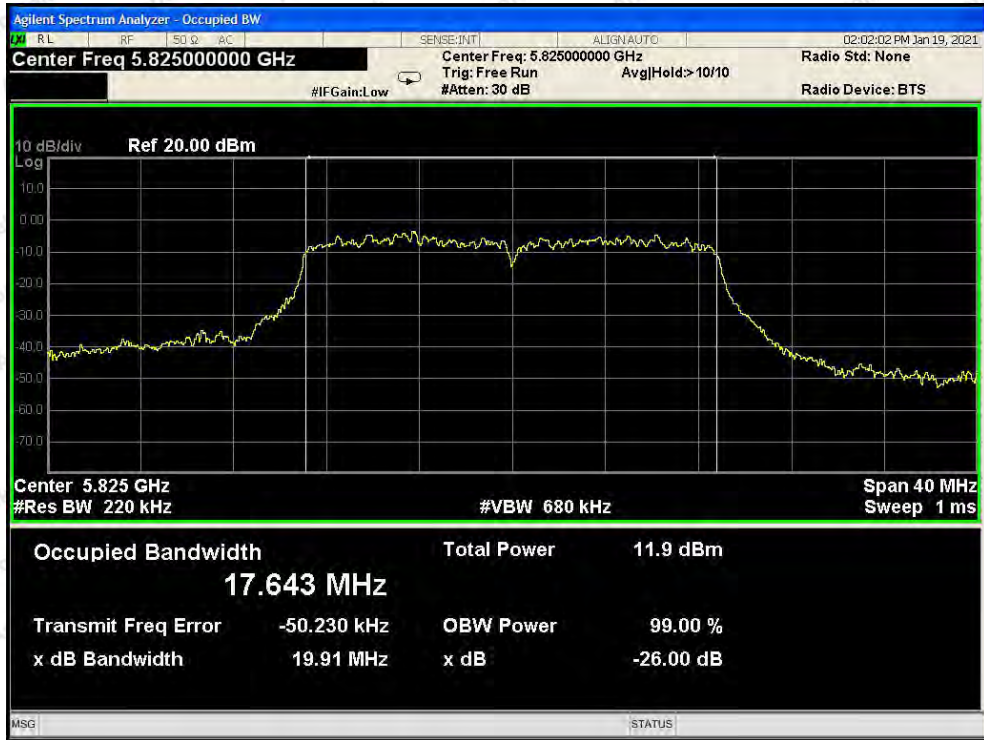
Test Mode: 802.11a---High



Test Mode: 802.11n20---Low

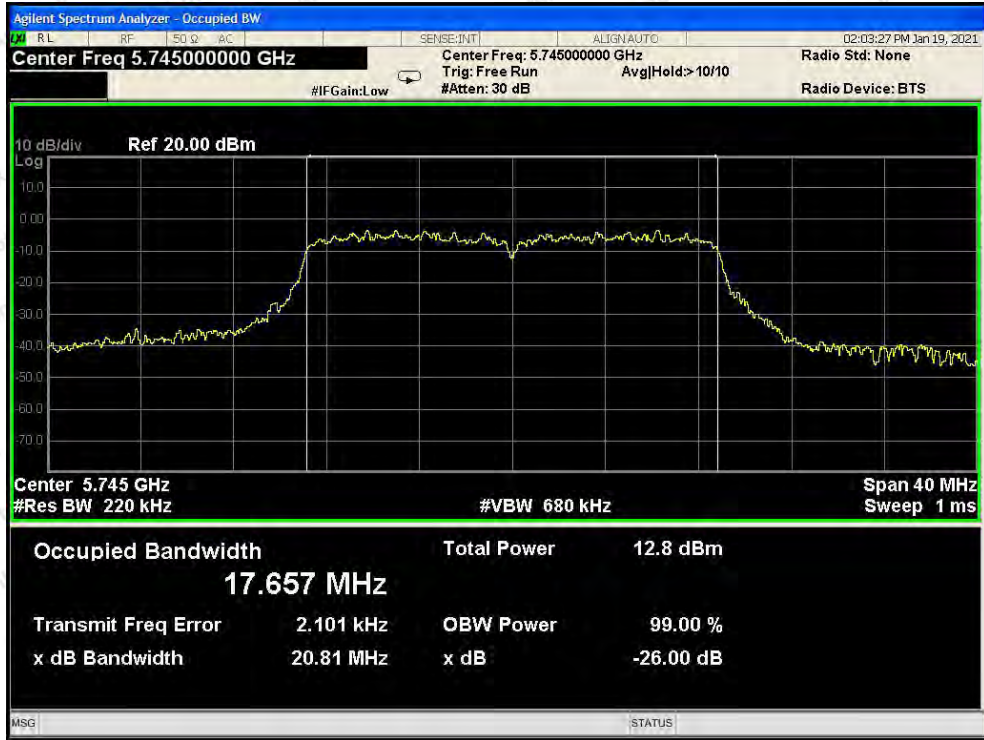


Test Mode: 802.11n20---Middle



Test Mode: 802.11n20---High

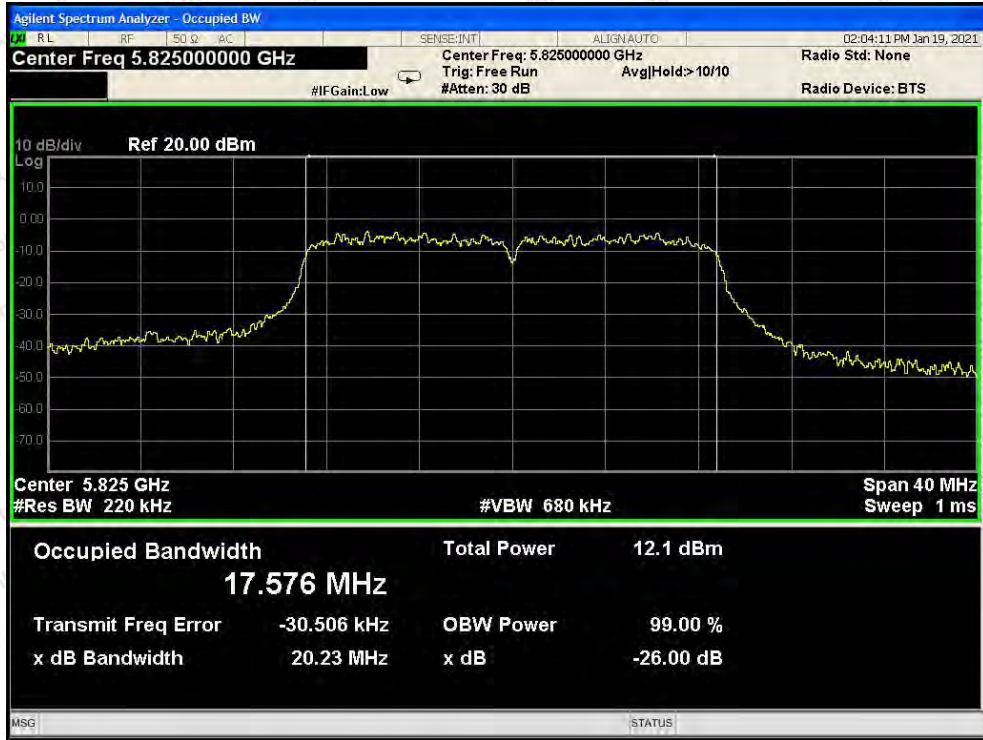




Test Mode: 802.11ac20--Low



Test Mode: 802.11ac20---Middle

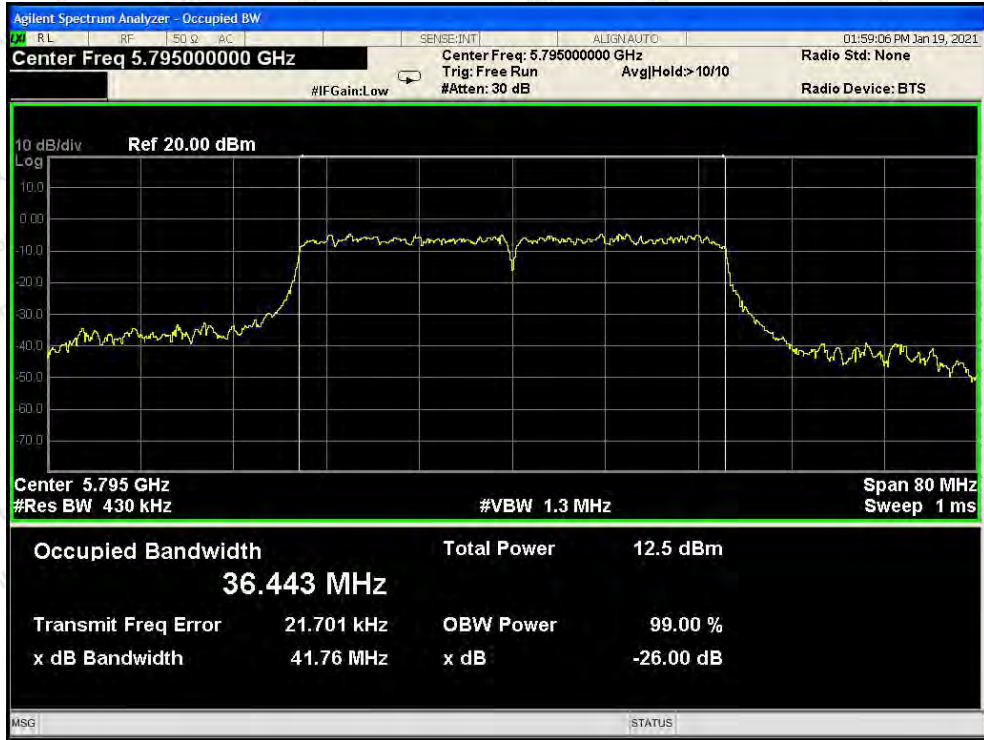


Test Mode: 802.11ac20---High



Test Mode: 802.11n40---Low





Test Mode: 802.11n40---High



Test Mode: 802.11ac40---Low



Test Mode: 802.11ac40---High



Test Mode: 802.11ac80

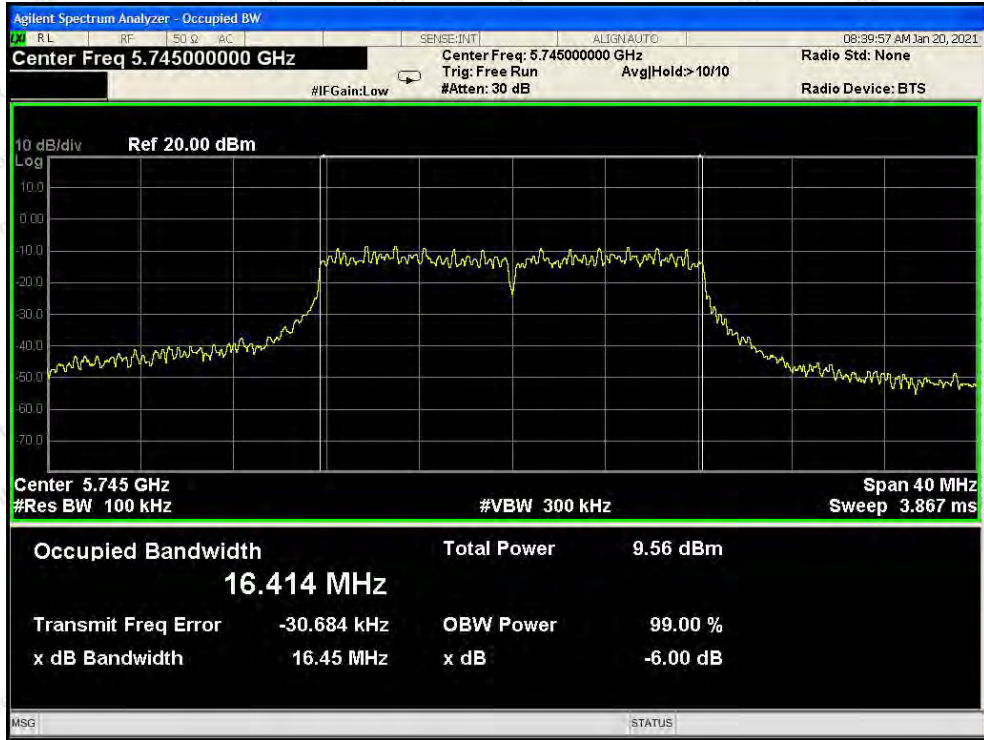


**ANT B:**

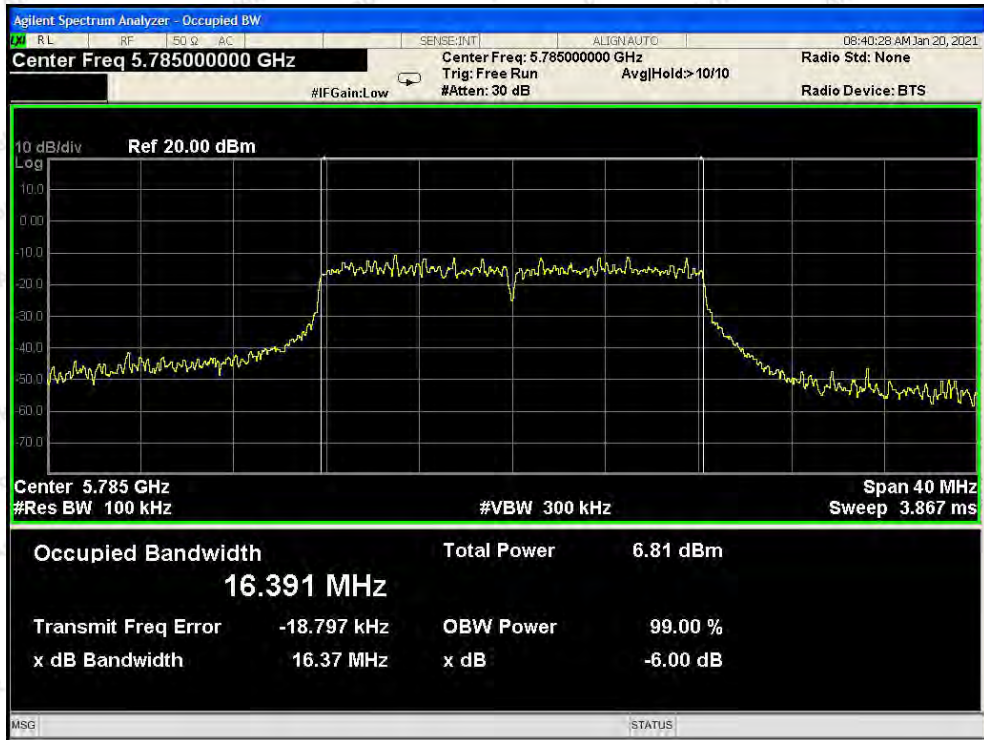
Mode	Channel Frequency (MHz)	6dB BW(MHz)	Limit	Results
802.11a	5745	16.45	>0.5MHz	PASS
	5785	16.37		PASS
	5825	16.25		PASS
802.11n20	5745	17.34		PASS
	5785	17.21		PASS
	5825	17.36		PASS
802.11ac20	5745	16.43		PASS
	5785	17.14		PASS
	5825	16.76		PASS
802.11n40	5755	36.04		PASS
	5795	35.85		PASS
802.11ac40	5755	35.80		PASS
	5795	35.63		PASS
802.11ac80	5775	75.20		PASS

Mode	Channel Frequency (MHz)	26dB BW(MHz)	99% Bandwidth (MHz)
802.11a	5745	19.94	16.561
	5785	20.00	16.512
	5825	20.14	16.525
802.11n20	5745	20.71	17.596
	5785	20.65	17.588
	5825	20.54	17.650
802.11ac20	5745	20.90	17.664
	5785	20.68	17.714
	5825	20.74	17.689
802.11n40	5755	61.36	36.623
	5795	61.84	36.807
802.11ac40	5755	58.90	37.029
	5795	60.77	37.159
802.11ac80	5775	135.7	81.874

**6dB Bandwidth**

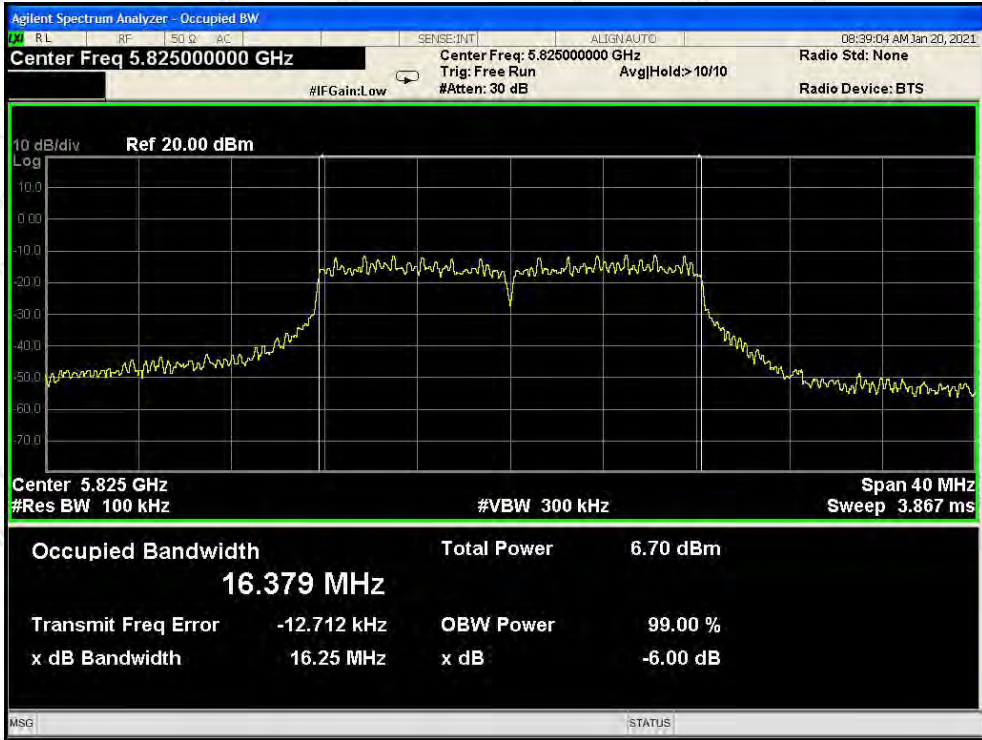


Test Mode: 802.11a--Low

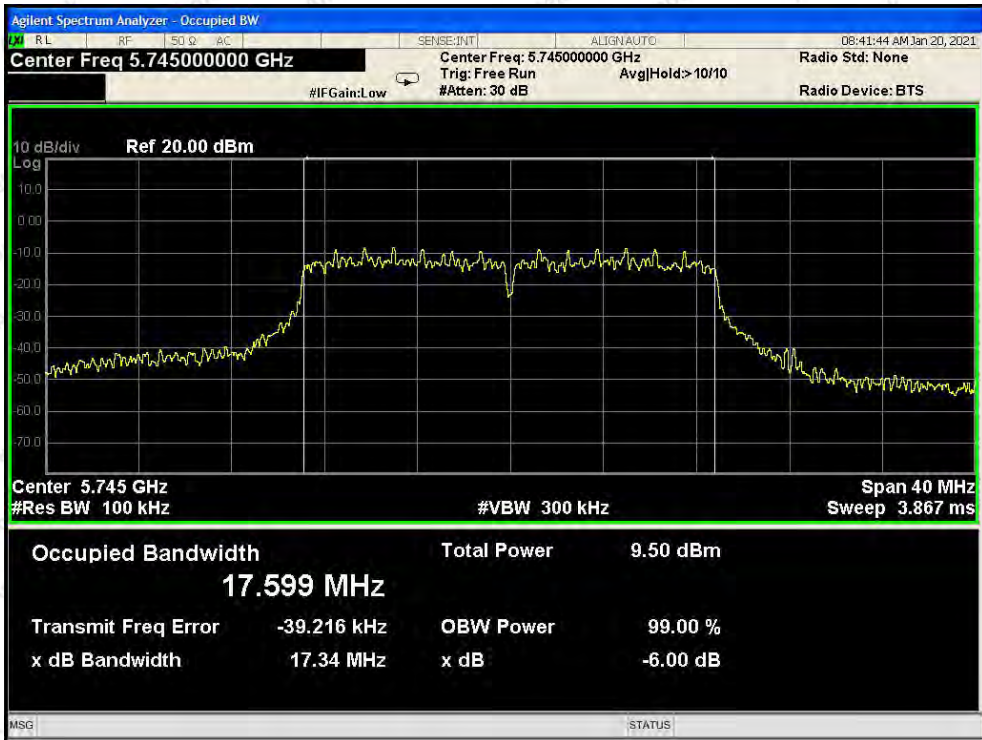


Test Mode: 802.11a---Middle

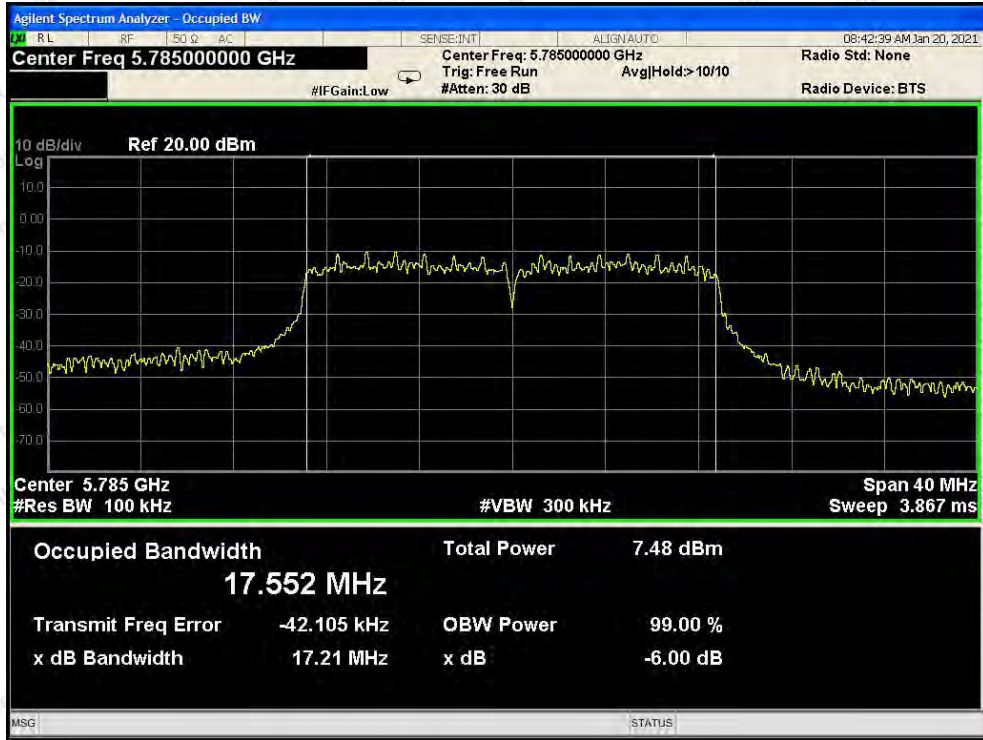




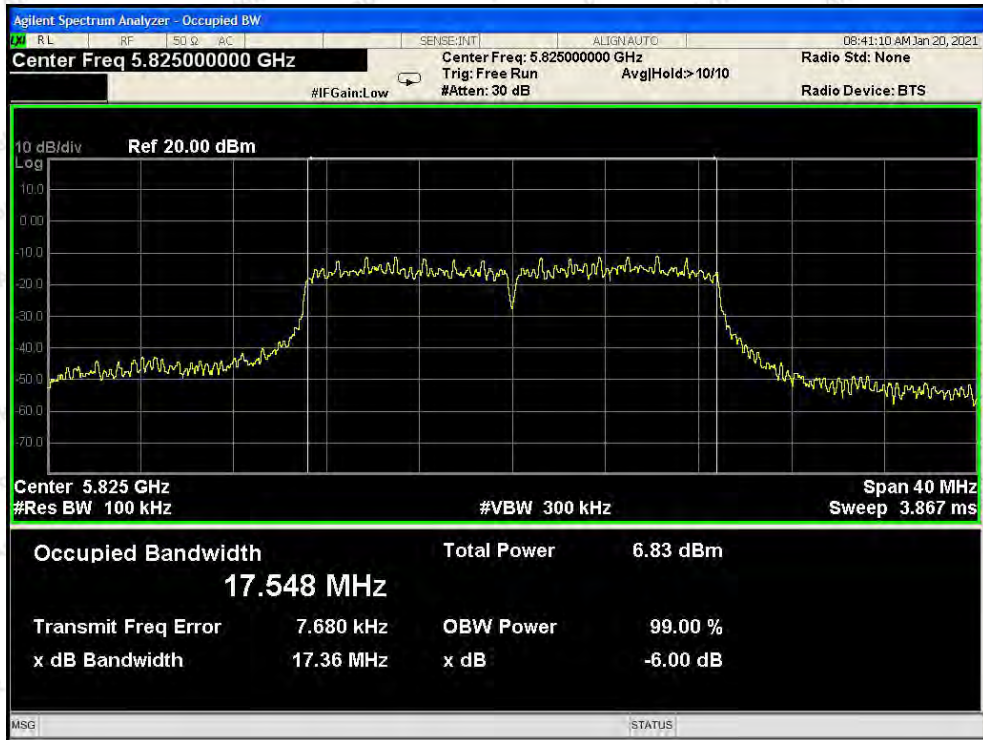
Test Mode: 802.11a---High



Test Mode: 802.11n20---Low

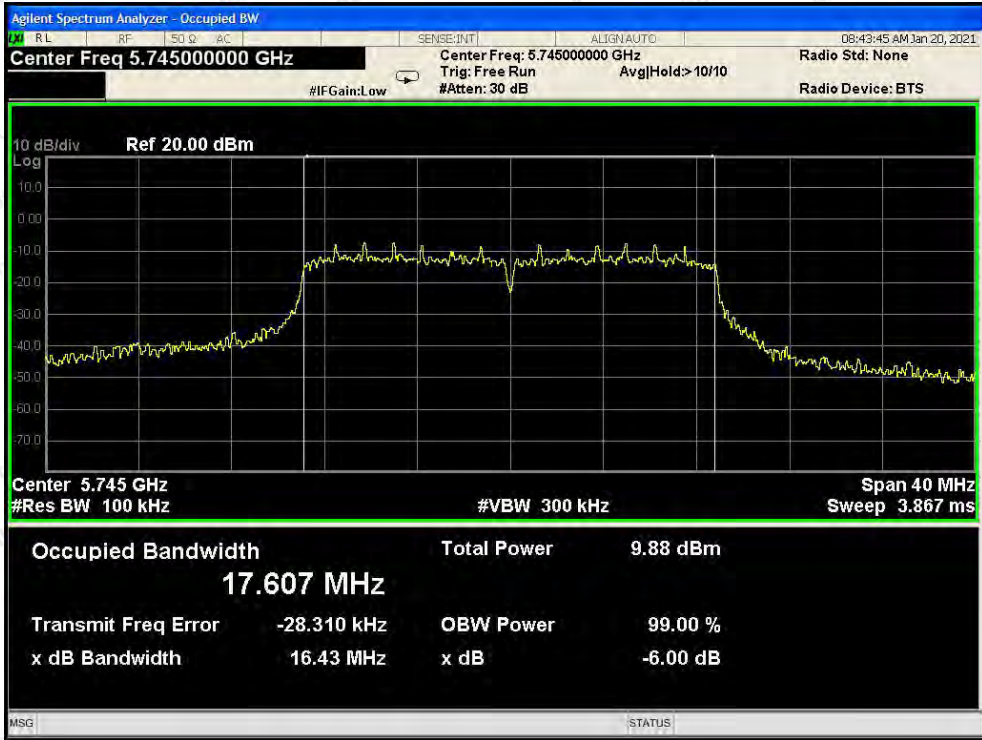


Test Mode: 802.11n20---Middle

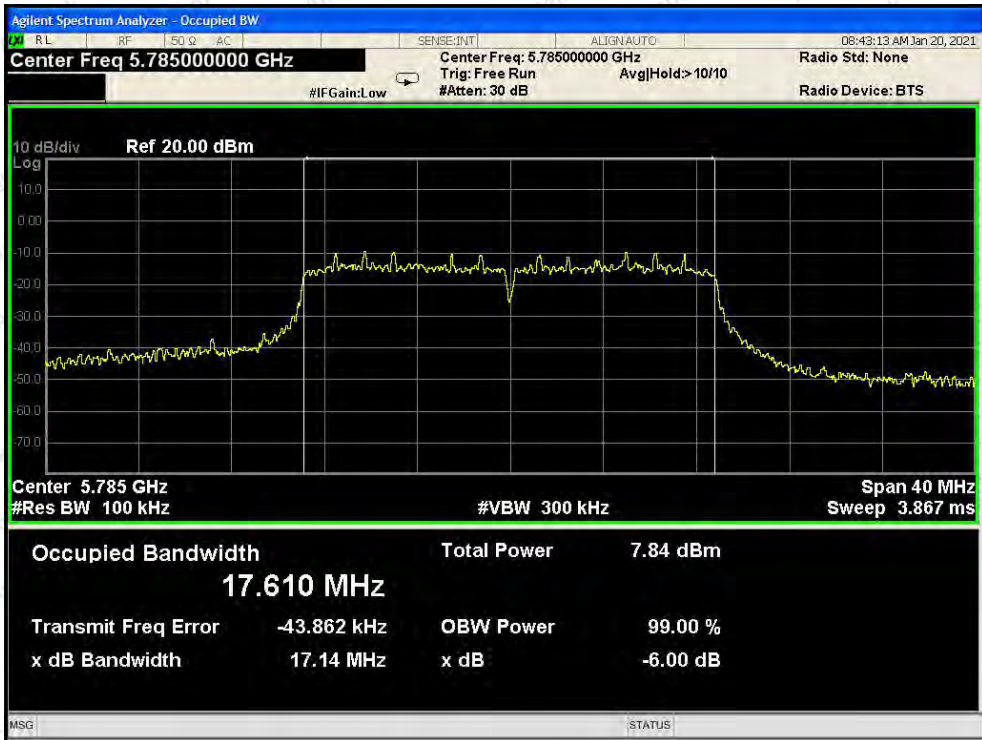


Test Mode: 802.11n20---High

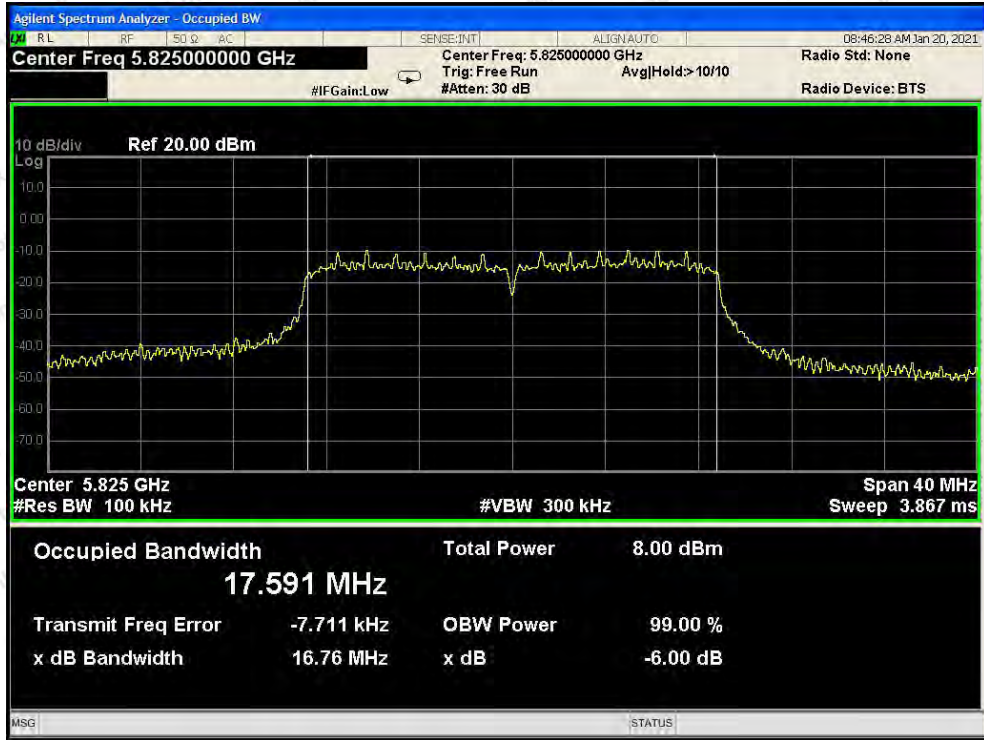




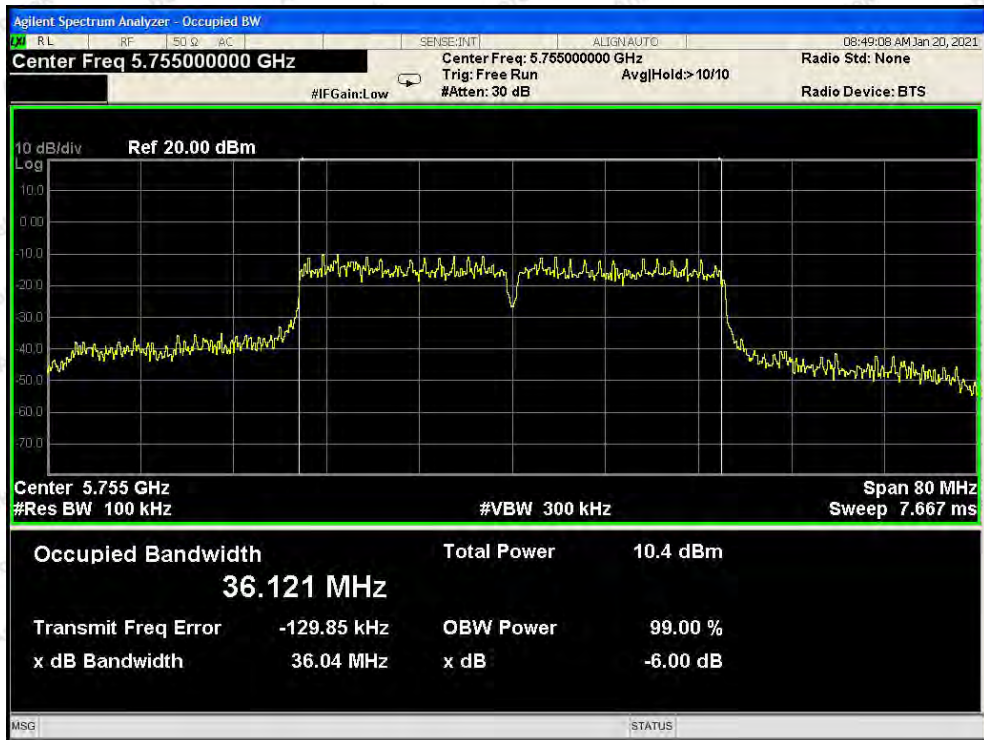
Test Mode: 802.11ac20--Low



Test Mode: 802.11ac20---Middle

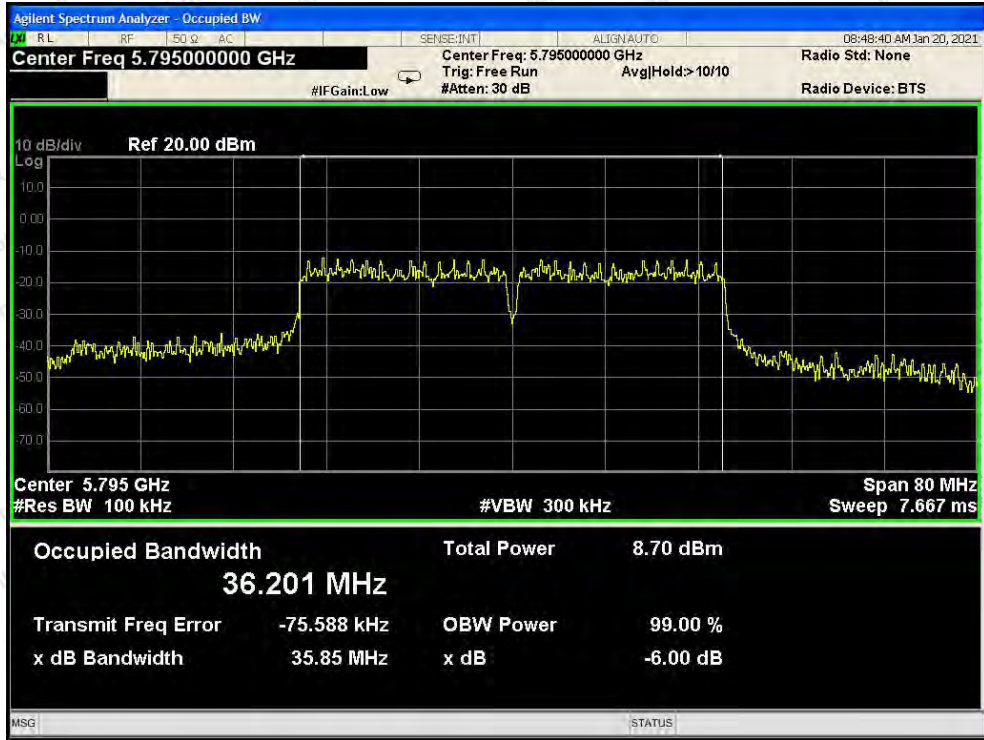


Test Mode: 802.11ac20---High

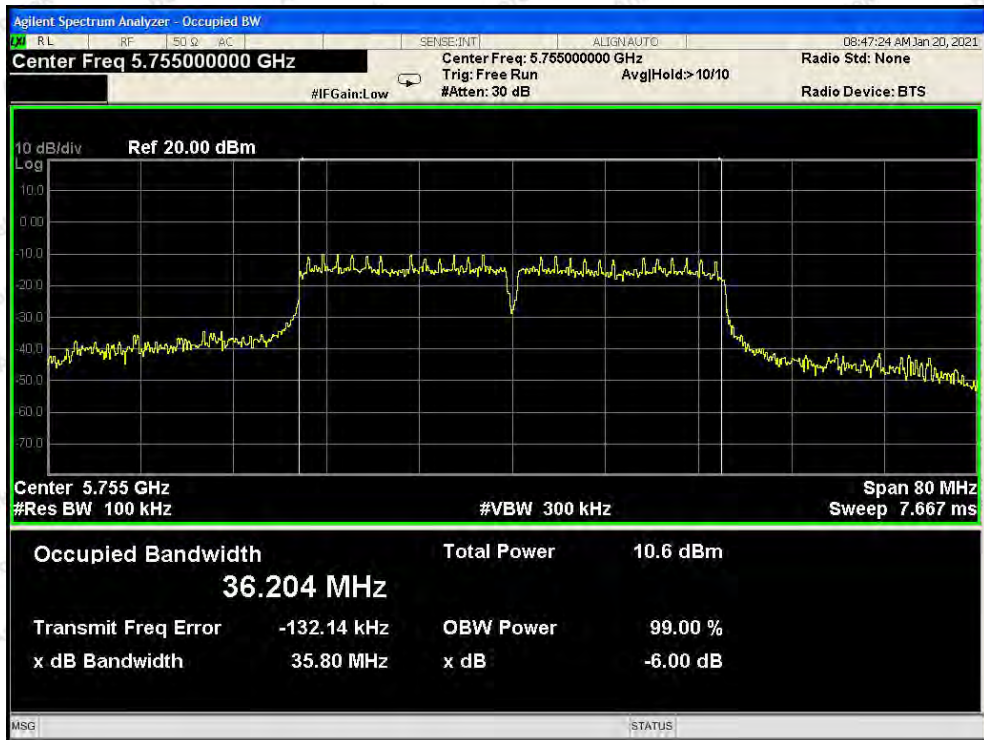


Test Mode: 802.11n40---Low

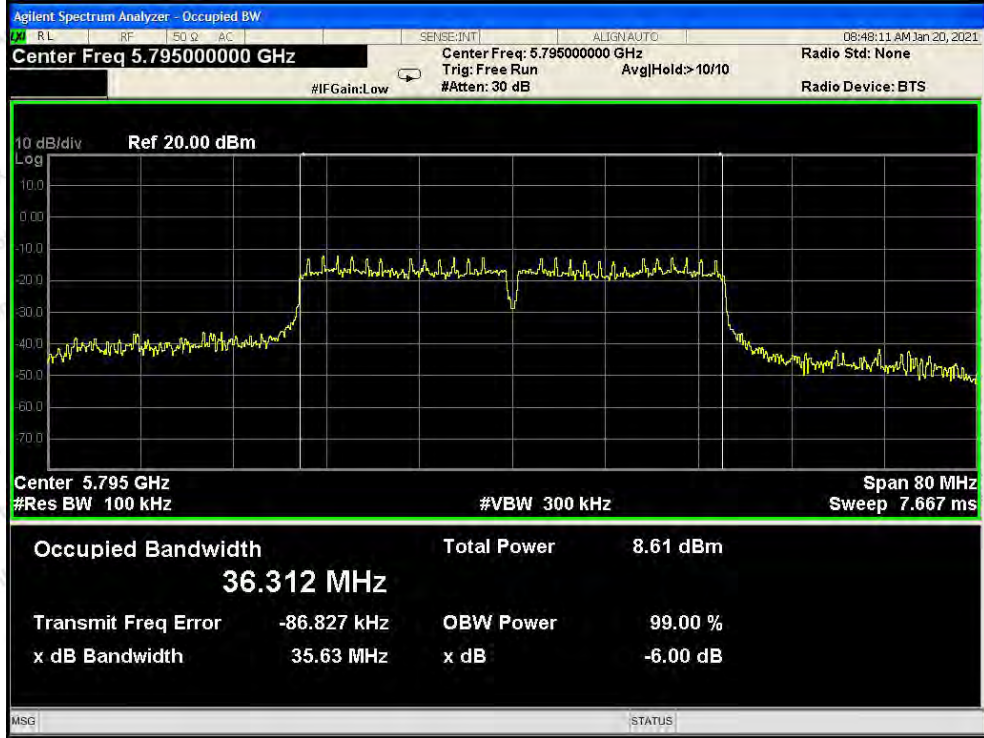




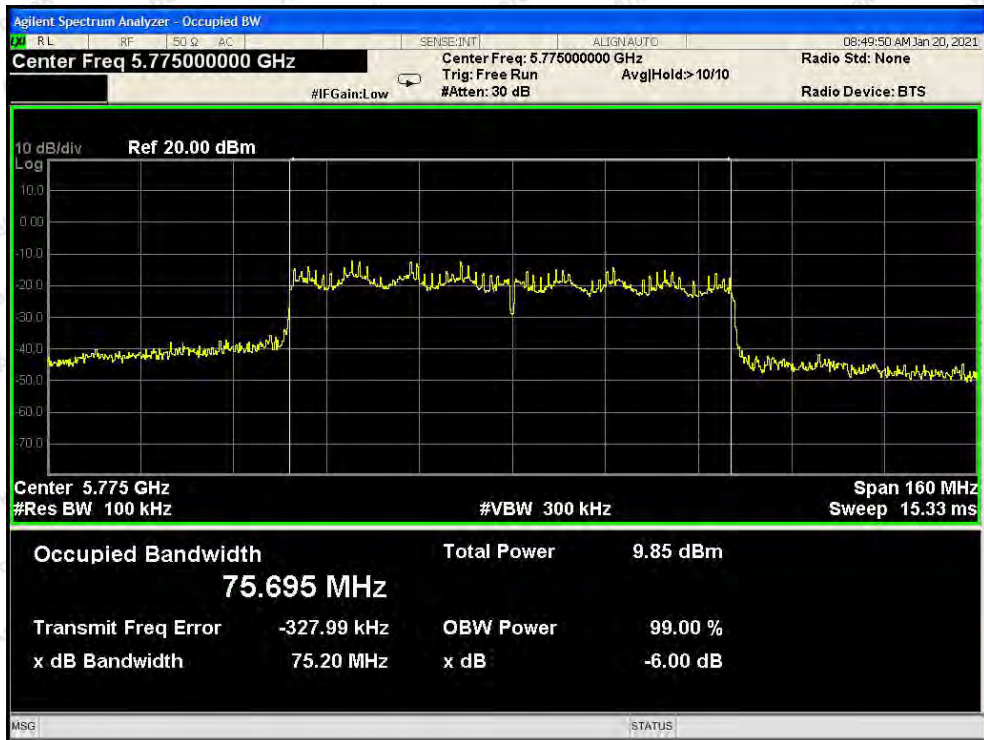
Test Mode: 802.11n40---High



Test Mode: 802.11ac40---Low



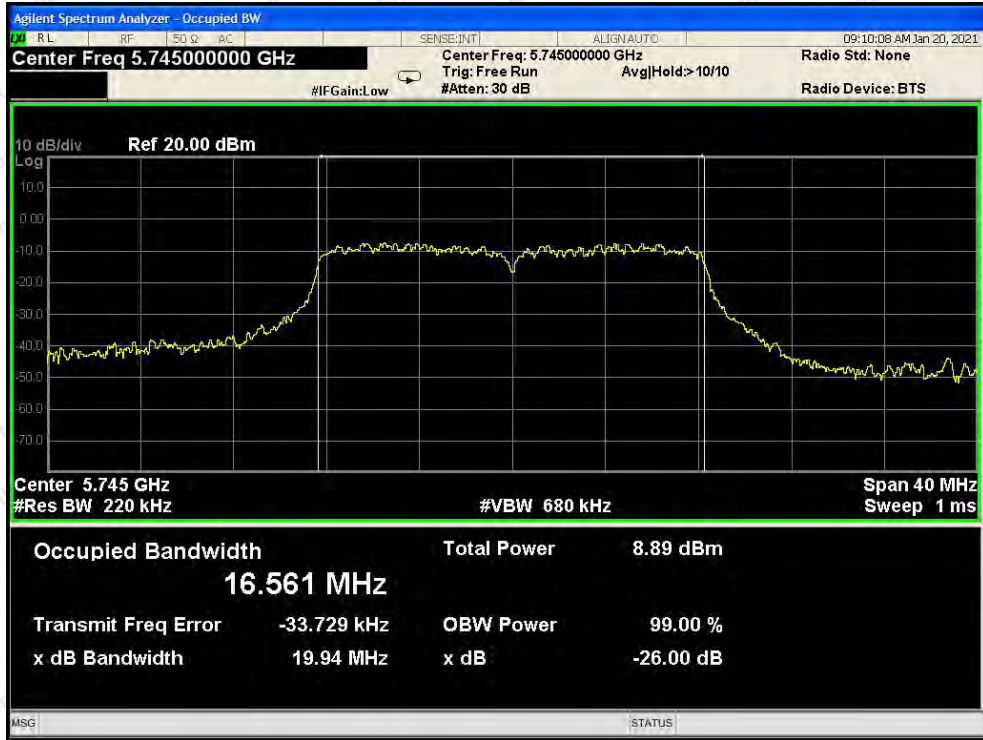
Test Mode: 802.11ac40---High



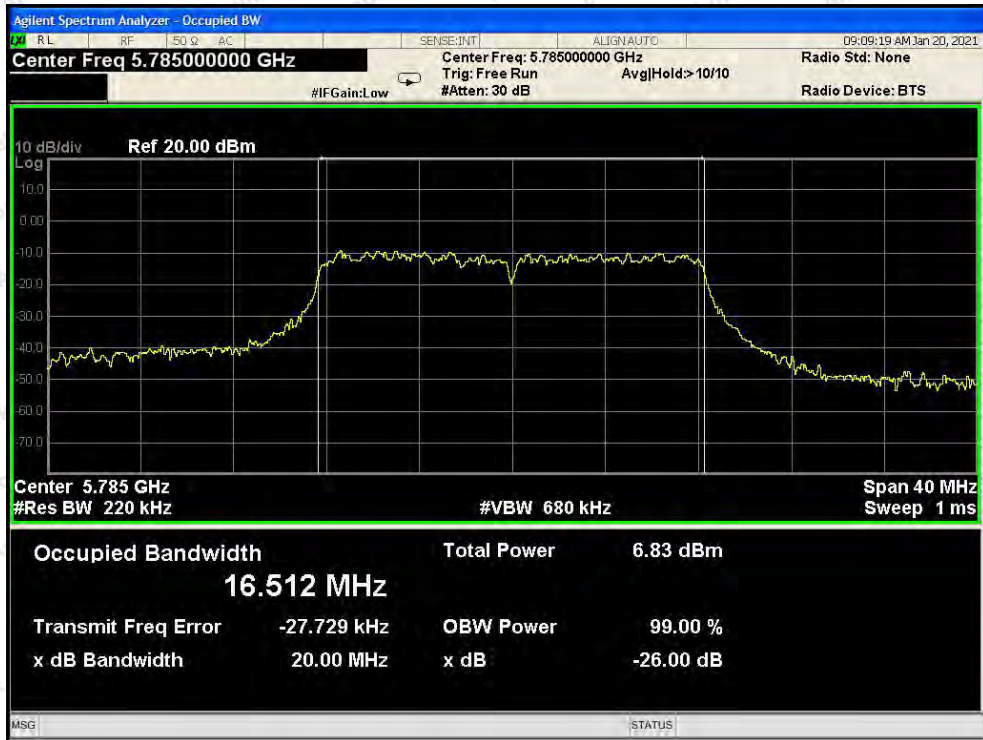
Test Mode: 802.11ac80



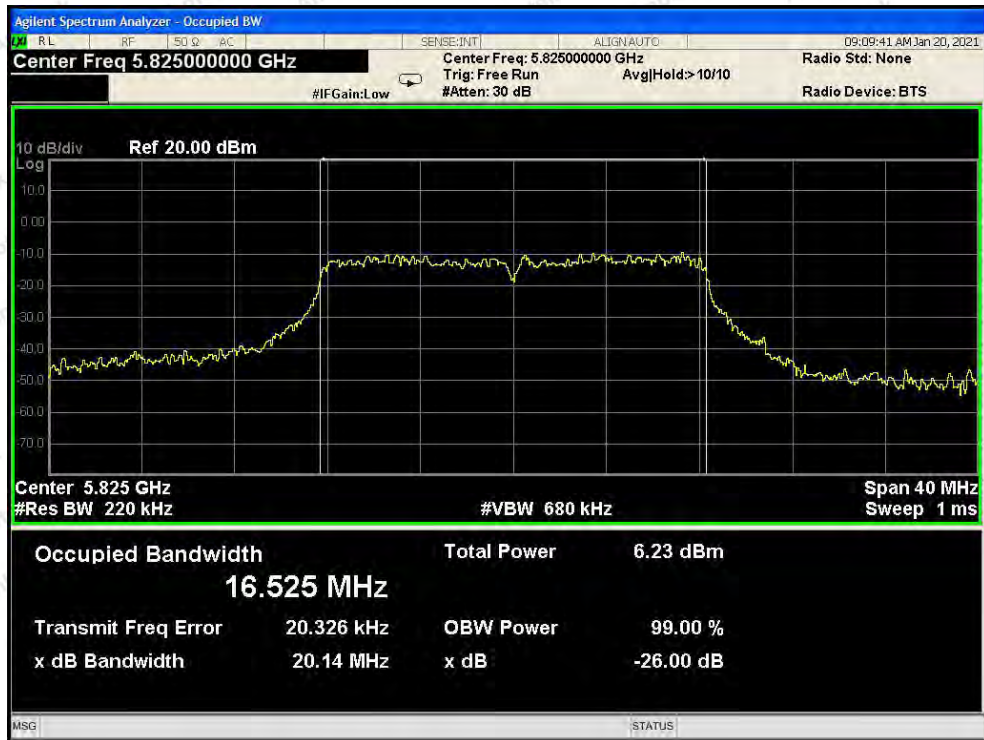
**26dB & 99% Bandwidth**



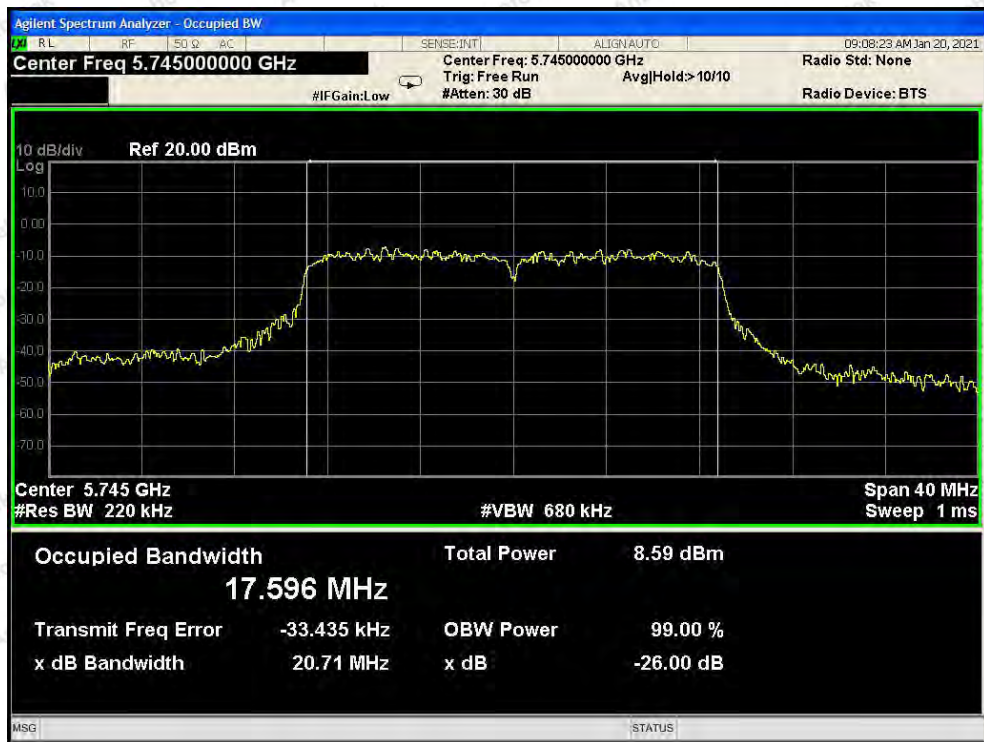
Test Mode: 802.11a--Low



Test Mode: 802.11a---Middle

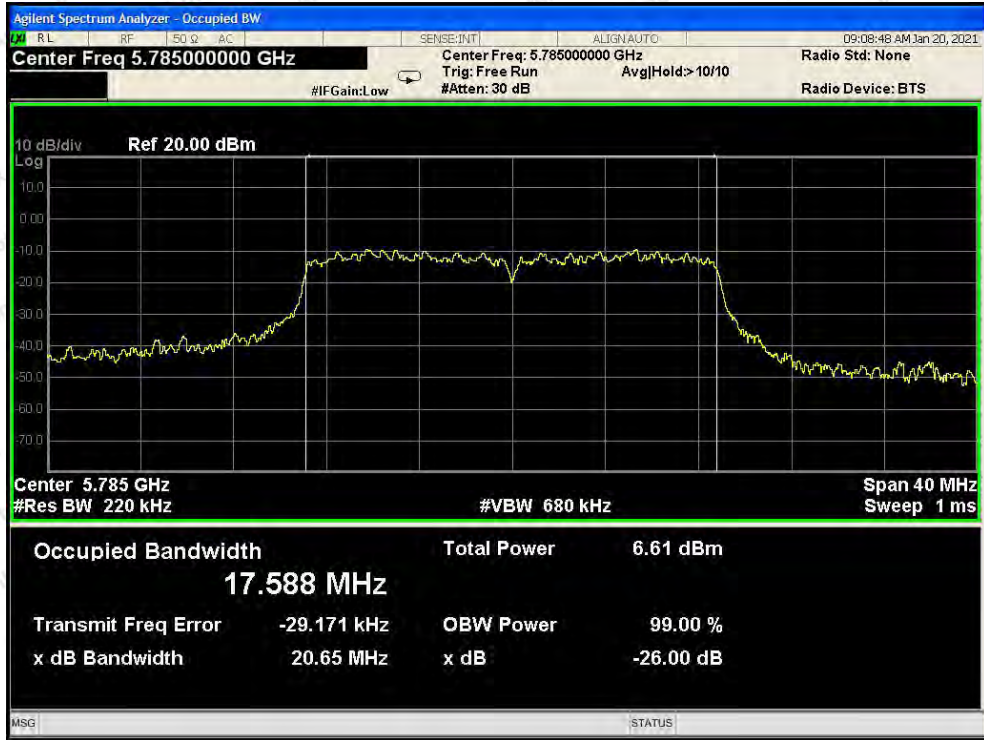


Test Mode: 802.11a---High



Test Mode: 802.11n20---Low

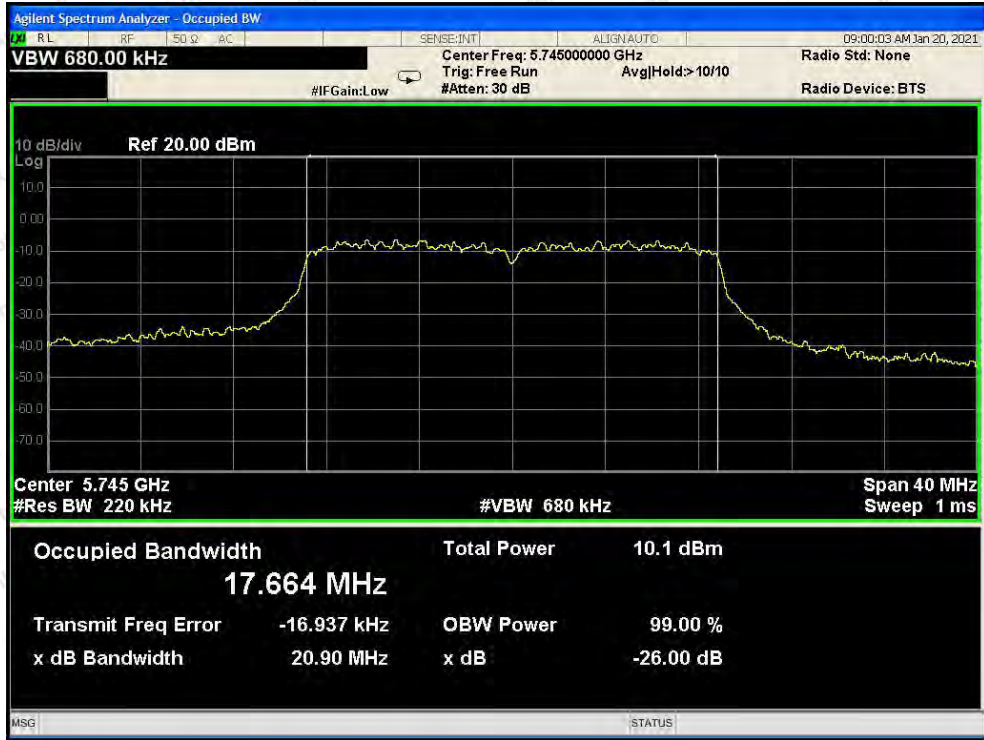




Test Mode: 802.11n20---Middle



Test Mode: 802.11n20---High

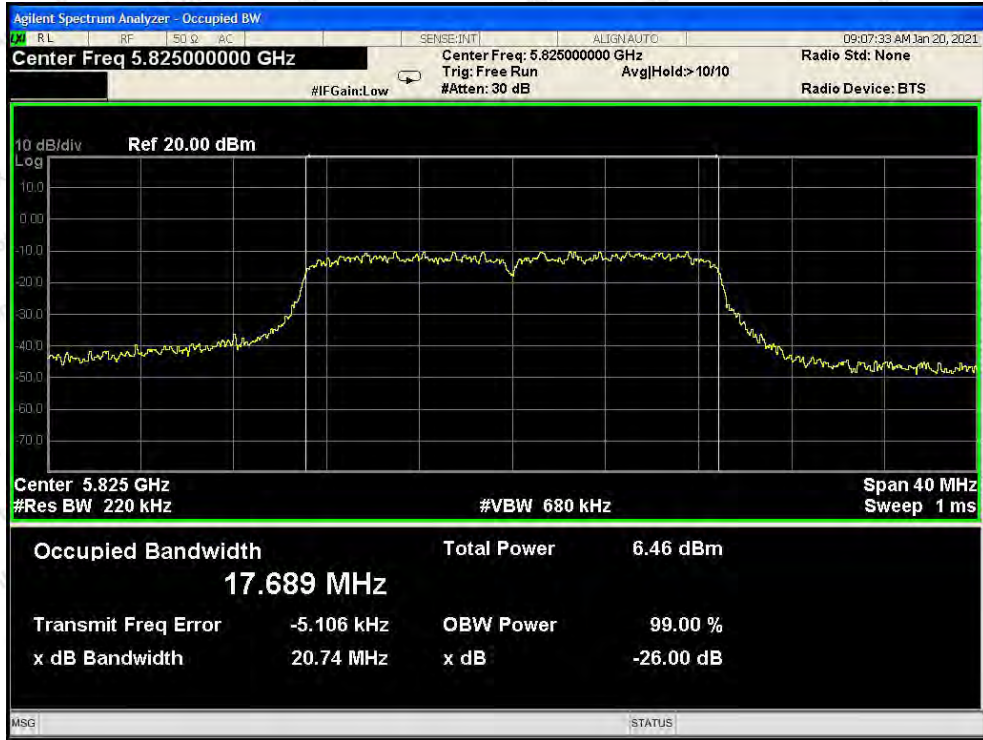


Test Mode: 802.11ac20--Low



Test Mode: 802.11ac20---Middle





Test Mode: 802.11ac20---High



Test Mode: 802.11n40---Low



Test Mode: 802.11n40---High



Test Mode: 802.11ac40---Low



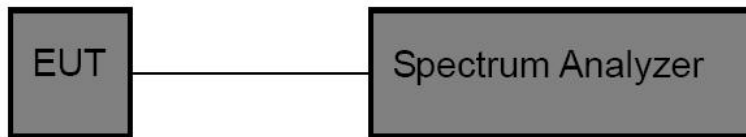


## 7. Power Spectral Density Test

### 7.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.407 (a) (3)
Test Limit	30 dBm/500KHz

### 7.2. Test Setup



### 7.3. Test Procedure

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz).

1. The EUT is directly connected to the spectrum analyzer;
2. Set RBW =1MHz;
3. Set VBW  $\geq$  3 RBW=3MHz;
3. Set the span to encompass the entire emissions bandwidth (EBW) of the signal;
5. Detector=RMS;
6. Sweep time= auto couple;
7. Trace mode=max. hold;

### 7.4. Test Data



Test Item : Power Spectral Density  
 Test Voltage : DC 5V from PC  
 Test Result : PASS

Test Mode : CH Low ~ CH High  
 Temperature : 23°C  
 Humidity : 55%RH

**ANT A:**

Mode	Channel Frequency (MHz)	Test Power Spectral Density (dBm/510KHz)	Final Power Spectral Density (dBm/500KHz)	Limit	Results
802.11a	5745	-0.265	-0.351	30	PASS
	5785	0.010	-0.076	30	PASS
	5825	-0.640	-0.726	30	PASS
802.11n20	5745	-0.962	-1.048	30	PASS
	5785	-0.376	-0.462	30	PASS
	5825	-0.965	-1.051	30	PASS
802.11ac20	5745	-0.906	-0.992	30	PASS
	5785	1.323	1.237	30	PASS
	5825	0.056	-0.030	30	PASS
802.11n40	5755	-3.677	-3.763	30	PASS
	5795	-3.508	-3.594	30	PASS
802.11ac40	5755	-2.972	-3.058	30	PASS
	5795	-1.785	-1.871	30	PASS
802.11ac80	5775	-5.520	-5.606	30	PASS

Remark: Final Power Spectral Density=Test Power Spectral Density+10log10(500/510)

**ANT B:**

Mode	Channel Frequency (MHz)	Test Power Spectral Density (dBm/510KHz)	Final Power Spectral Density (dBm/500KHz)	Limit	Results
802.11a	5745	-0.346	-0.432	30	PASS
	5785	-3.020	-3.106	30	PASS
	5825	-2.046	-2.132	30	PASS
802.11n20	5745	-0.227	-0.313	30	PASS
	5785	-1.372	-1.458	30	PASS

	5825	-2.686	-2.772	30	PASS
802.11ac20	5745	-1.028	-1.114	30	PASS
	5785	--3.429	3.343	30	PASS
	5825	-1.827	-1.913	30	PASS
802.11n40	5755	-3.055	-3.141	30	PASS
	5795	-3.488	-3.574	30	PASS
802.11ac40	5755	-3.213	-3.299	30	PASS
	5795	-5.219	-5.305	30	PASS
802.11ac80	5775	-4.380	-4.466	30	PASS

Remark: Final Power Spectral Density=Test Power Spectral Density+10log10(500/510)

**ANT A+B:**

Mode	Channel Frequency (MHz)	Final Power Spectral Density (dBm/510KHz)	Final Power Spectral Density (dBm/500KHz)	Limit	Results
802.11a	5745	2.705	2.619	30	PASS
	5785	1.764	1.678	30	PASS
	5825	1.724	1.638	30	PASS
802.11n20	5745	2.431	2.345	30	PASS
	5785	2.165	2.079	30	PASS
	5825	1.269	1.183	30	PASS
802.11ac20	5745	2.044	1.958	30	PASS
	5785	5.513	5.427	30	PASS
	5825	2.226	2.140	30	PASS
802.11n40	5755	-0.345	-0.431	30	PASS
	5795	-0.488	-0.574	30	PASS
802.11ac40	5755	-0.081	-0.167	30	PASS
	5795	-0.161	-0.247	30	PASS
802.11ac80	5775	-1.902	-1.988	30	PASS

Remark: Final Power Spectral Density=Test Power Spectral Density+10log10(500/510)



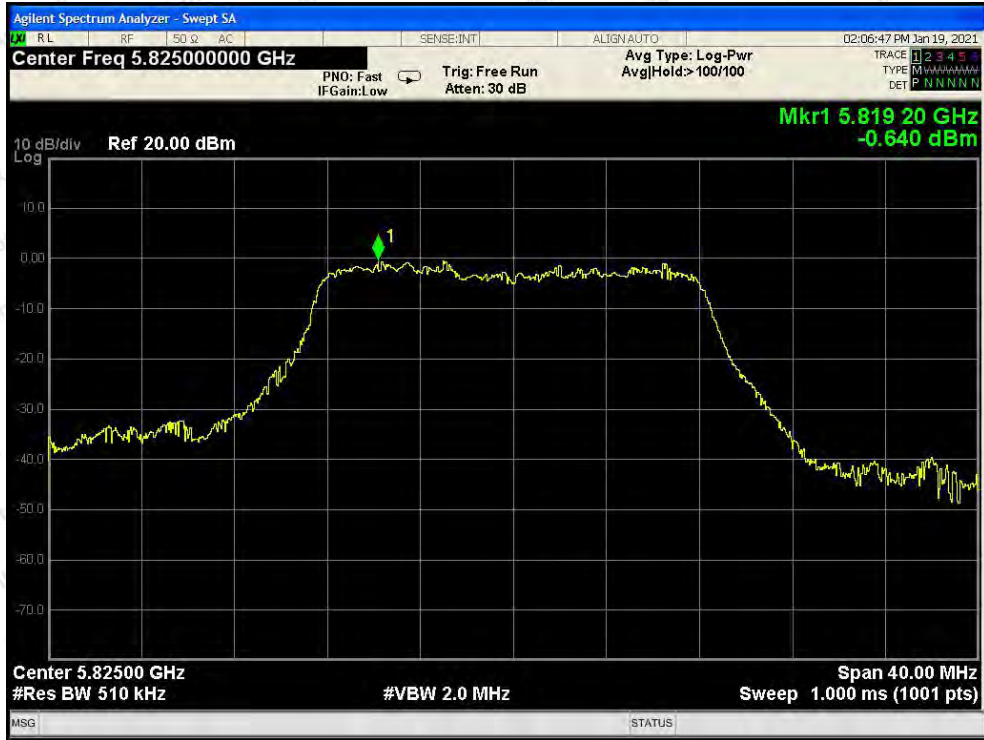
ANT A



Test Mode: 802.11a--Low



Test Mode: 802.11a---Middle



Test Mode: 802.11a---High



Test Mode: 802.11n20---Low





Test Mode: 802.11n20---Middle



Test Mode: 802.11n20---High



Test Mode: 802.11ac20--Low



Test Mode: 802.11ac20---Middle





Test Mode: 802.11ac20---High



Test Mode: 802.11n40---Low



Test Mode: 802.11n40---High



Test Mode: 802.11ac40---Low





Test Mode: 802.11ac40---High



Test Mode: 802.11ac80

ANT B



Test Mode: 802.11a--Low



Test Mode: 802.11a---Middle





Test Mode: 802.11a---High



Test Mode: 802.11n20---Low



Test Mode: 802.11n20---Middle



Test Mode: 802.11n20---High





Test Mode: 802.11ac20--Low



Test Mode: 802.11ac20---Middle



Test Mode: 802.11ac20---High



Test Mode: 802.11n40---Low





Test Mode: 802.11n40---High



Test Mode: 802.11ac40---Low



Test Mode: 802.11ac40---High



Test Mode: 802.11ac80



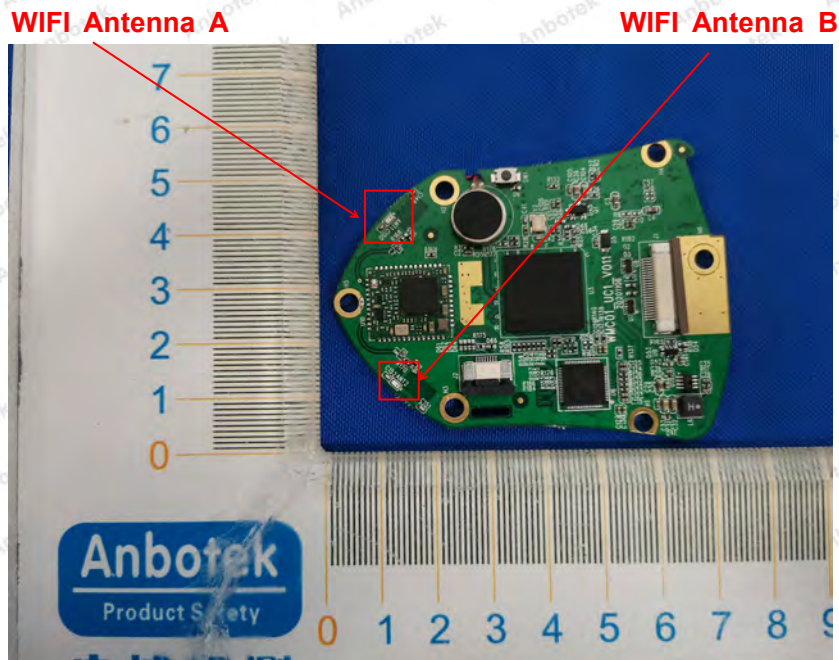
## 8. Antenna Requirement

### 8.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /15.407
Requirement	<p>1) 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.</p> <p>2) 15.407 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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.</p>

## 8.2. Antenna Connected Construction

The antenna is a Ceramic Antenna which permanently attached, and the best case gain of the antenna is 3 dBi. It complies with the standard requirement.





## 9. Frequency Stability

According to the manufacturer, under any normal operating conditions, the working frequency of the product is in the range of 5725-5850MHz.



## APPENDIX I -- PHOTOGRAPH

Reference to the test report 18220WC10003501.

----- End of Report -----