

FCC Test Report

Report No.: AGC11563210602FE06

FCC ID 2ATFO-CM800

APPLICATION PURPOSE **Original Equipment**

PRODUCT DESIGNATION **Smart Touch Screen Terminal**

BRAND NAME N/A

> CM800, CP800, CM800E, CM800HW, CP800, CP800HW, CT800, RP800, RM800, RT800, RP80, RP90, TM500E, TM500, TP500, VHD-CP800, VHD-CM800, VHD-CM800E,

MODEL NAME VHD-CM800HW, VHD-CP800, VHD-CP800HW, VHD-CT800,

VHD-RP800, VHD-RM800, VHD-RT800, VHD-RP80, VHD-RP90, VHD-TM500E, VHD-TM500, VHD-TP500

APPLICANT ValueHD Corporation

DATE OF ISSUE Jul. 22, 2021

STANDARD(S) FCC Part 15.407

KDB 789033 D02 v02r01 **TEST PROCEDURE(S)**

REPORT VERSION

Attestation of Global Compliance (Shenzhen) Co., Ltd

compliance



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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jul. 22, 2021	Valid	Initial Release

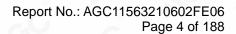
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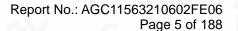
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1. VERIFICATION OF CONFORMITY

ValueHD Corporation
2-3/F, No. 2, Honghui Industrial Park, Xin'an Street, Bao'an District, Shenzhen, 518101, China
ValueHD Corporation
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ValueHD Corporation
2-3/F, No. 2, Honghui Industrial Park, Xin'an Street, Bao'an District, Shenzhen, 518101, China
Smart Touch Screen Terminal
N/A
CM800
CP800, CM800E, CM800HW, CP800, CP800HW, CT800, RP800, RM800, RT800, RP80, RP90, TM500E, TM500, TP500, VHD-CP800, VHD-CM800, VHD-CM800E, VHD-CM800HW, VHD-CP800, VHD-CP800HW, VHD-CT800, VHD-RP800, VHD-RM800, VHD-RP80, VHD-RP90, VHD-TM500E, VHD-TM500, VHD-TP500
All the series models are the same as the test model except for the model names.
Jun. 16, 2021 to Jul. 22, 2021
No any deviation from the test method
Normal
Pass
AGCRT-US-BGN/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with requirement of FCC Part 15 Rules requirement.

Reviewed By

Kelly Cheng
(Project Engineer)

Max Zhang
(Reviewer)

Approved By

Forrest Lei
(Authorized Officer)

Jul. 22, 2021

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Inspection he test results he test report.

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as "Smart Touch Screen Terminal". It is designed by way of utilizing the OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	5150 MHz~5250MHz; ; 5250 MHz~5350MHz, 5470 MHz~5725MHz; 5725 MHz~5850MHz			
Output Power	IEEE 802.11a20:13.80dBm; IEEE 802.11n(20):13.31dBm; IEEE802.11n(40):13.09dBm; IEEE 802.11ac(20):14.58dBm; IEEE 802.11ac(40):14.13dBm; IEEE 802.11ac(80):12.19dBm			
Modulation	BPSK, QPSK, 16QAM, 64QAM, 128QAM, 256QAM, OFDM			
Number of channels	39			
Hardware Version	1.0			
Software Version	1.0			
Antenna Designation	FPC Antenna (Comply with requirements of the FCC part 15.203)			
Antenna Gain	1.45dBi			
Power Supply DC 12V by PC				

Note:

- 1. The EUT is designed as client devices without radar detection.
- 2. The device do not support TPC.

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2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency	Frequency Band	Channel Number	Frequency
	36	5180 MHz		112	5560 MHz
	38	5190 MHz	30 .6	116	5580 MHz
	40	5200 MHz		118	5590 MHz
5150 MHz~ 5250MHz	42	5210 MHz	8	120	5600 MHz
3230WII 12	44	5220 MHz	- 60	122	5610 MHz
	46	5230 MHz	5470 MHz∼	124	5620 MHz
	48	5240 MHz	5725MHz	126	5630 MHz
60	52	5260 MHz		128	5640 MHz
	54	5270 MHz		132	5660 MHz
8	56	5280 MHz		134	5670 MHz
5250 MHz~ 5350MHz	58	5290 MHz		136	5680 MHz
2300W112	60	5300 MHz		140	5700 MHz
	62	5310 MHz	- G	149	5745 MHz
100	64	5320 MHz		151	5755 MHz
	100	5500 MHz	· ·	153	5765 MHz
©	102	5510 MHz	5725 MHz∼ 5850MHz	155	5775 MHz
5470 MHz∼	104	5520 MHz		157	5785 MHz
5725MHz	106	5530 MHz		159	5795 MHz
2.C	108	5540 MHz		165	5825MHz
100	110	5550 MHz		60	0

Note: For 20MHZ bandwidth system use Channel 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 149, 153, 157, 161, 165; For 40MHZ bandwidth system use Channel 38, 46, 54, 62, 102, 110, 118, 126, 134, 151, 159; For 80MHZ bandwidth system use Channel 42, 58, 106, 122, 155

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2.3. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2ATFO-CM800** filing to comply with the FCC Part 15 requirements.

2.4. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters.

Others testing (listed at item 5.3) was performed according to the procedures in FCC Part 15.407 rules KDB 789033 D02

2.5. SPECIAL ACCESSORIES

Refer to section 5.2.

2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.7. ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device. For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.

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3. MEASUREMENT UNCERTAINTY

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

Item	Measurement Uncertainty		
Uncertainty of Conducted Emission for AC Port	$U_c = \pm 3.1 \text{ dB}$		
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 4.0 \text{ dB}$		
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.8 \text{ dB}$		
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$		
Uncertainty of RF power density, conducted	$U_c = \pm 2.6 \text{ dB}$		
Uncertainty of spurious emissions, conducted	U _c = ±2 %		
Uncertainty of Occupied Channel Bandwidth	U _c = ±2 %		

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4. DESCRIPTION OF TEST MODES

Mode	Available channel	Tested channel	Modulation	Date
				rate(Mbps)
802.11a/n20	36, 40, 44, 48, 52, 56, 60, 64, 100, 104,	36, 40, 48, 52, 60, 64,	OFDM	6Mbps/MCS0
-GC	108, 112, 116, 120, 124, 128, 132, 136,	100, 120, 140, 149,		8
	140, 149, 153, 157, 161, 165	157, 165		
802.11n40	38, 46, 54, 62, 102, 110, 118, 126, 134,	38, 46, 54, 62, 102,	OFDM	MCS0
60	151, 159;	118, 134, 151, 159	®	
802.11ac80	42, 58, 106, 122, 155	42, 58, 106, 122, 155	OFDM	MCS0

Note:

- 1. The EUT has been set to operate continuously on tested channel individually, and the EUT is operating at its maximum duty cycle>or equal 98%.
- 2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.
- 3. The test software is the adb which can set the EUT into the individual test modes.

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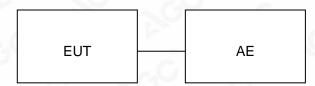


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5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure 1:



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Smart Touch Screen Terminal	CM800	2ATFO-CM800	EUT
2	Adapter	TS-A036-120030L	Input:100-240, 50-60Hz, 1.2A Output:12V, 3A	AE
3	Earphone	AM116	N/A	AE

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT	
§15.407	§15.407 6dB Bandwidth		
§15.407	Emission Bandwidth	Compliant	
§15.407	Maximum conducted output power	Compliant	
§15.407	Conducted Spurious Emission	Compliant	
§15.407	5.407 Maximum Conducted Output Power Density		
§15.209 Radiated Emission		Compliant	
§15.407	§15.407 Band Edges		
§15.207	Line Conduction Emission	Compliant	

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6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd			
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China			
Designation Number	CN1259			
FCC Test Firm Registration Number	975832			
A2LA Cert. No.	5054.02			
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA			

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	May 15, 2021	May 14, 2022
LISN	R&S	ESH2-Z5	100086	Jun. 09, 2021	Jun. 08, 2022
Test software	R&S	ES-K1 (Ver V1.71)	N/A	N/A	N/A

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2021	May 14, 2022
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 07, 2020	Dec. 06, 2021
5GHz Fliter	EM Electronics	5150-5880MHz	N/A	Mar. 23, 2020	Mar. 22, 2022
Attenuator	ZHINAN	E-002	N/A	Sep. 03, 2020	Sep. 02, 2022
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep.21, 2019	Sep. 20, 2021
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2022
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Sep. 20, 2019	Sep. 19, 2021
Test software	FARA	EZ-EMC (Ver RA-03A)	N/A	N/A	N/A

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7. MAXIMUM CONDUCTED OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

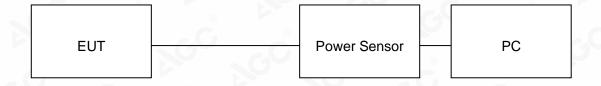
For average power test:

- 1. Connect EUT RF output port to power sensor through an RF attenuator.
- 2. Connect the power sensor to the PC.
- 3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 4. Record the maximum power from the software.

Note: The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

7.2. TEST SET-UP

AVERAGE POWER SETUP



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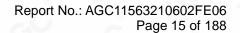
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7.3. LIMITS AND MEASUREMENT RESULT

Test Data of Conducted Output Power for band 5.15-5.25 GHz					
Test Mode	Test Channel (MHz)	<u> </u>		Pass or Fail	
C	5180	11.40	23.98	Pass	
802.11a	5200	11.61	23.98	Pass	
	5240	13.19	23.98	Pass	
802.11n20	5180	12.04	23.98	Pass	
	5200	12.18	23.98	Pass	
	5240	12.86	23.98	Pass	
000 44 = 40	5190	12.09	23.98	Pass	
802.11n40	5230	12.80	23.98	Pass	
10	5180	11.54	23.98	Pass	
802.11ac20	5200	11.50	23.98	Pass	
	5240	12.47	23.98	Pass	
802.11ac40	5190	12.33	23.98	Pass	
	5230	14.13	23.98	Pass	
802.11ac80	5210	9.44	23.98	Pass	

Test Data of Conducted Output Power for band 5.25-5.35 GHz					
Test Mode	Test Channel (MHz)	9		Pass or Fail	
	5260	12.47	23.98	Pass	
802.11a	5300	11.67	23.98	Pass	
	5320	12.01	23.98	Pass	
	5260	13.08	23.98	Pass	
802.11n20	5300	12.28	23.98	Pass	
8	5320	11.66	23.98	Pass	
000 44 = 40	5270	11.94	23.98	Pass	
802.11n40	5310	11.88	23.98	Pass	
	5260	12.60	23.98	Pass	
802.11ac20	5300	11.48	23.98	Pass	
	5320	10.89	23.98	Pass	
000 44 40	5270	12.47	23.98	Pass	
802.11ac40	5310	11.63	23.98	Pass	
802.11ac80	5290	10.93	23.98	Pass	

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		ed Output Power for band 5.4		
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fai
	5500	13.02	23.98	Pass
802.11a	5600	13.58	23.98	Pass
	5700	12.55	23.98	Pass
	5500	12.42	23.98	Pass
802.11n20	5600	13.28	23.98	Pass
	5700	12.19	23.98	Pass
- GO	5510	12.18	23.98	Pass
802.11n40	5590	12.89	23.98	Pass
	5670	12.14	23.98	Pass
6.0	5500	11.47	23.98	Pass
802.11ac20	5600	12.35	23.98	Pass
	5700	11.49	23.98	Pass
-C	5510	10.75	23.98	Pass
802.11ac40	5590	12.59	23.98	Pass
	5670	11.79	23.98	Pass
000 44 00	5530	9.60	23.98	Pass
802.11ac80	5610	9.73	23.98	Pass

Test Data of Conducted Output Power for band 5.725-5.85 GHz						
Test Mode	Test Channel Average Power (MHz) (dBm)		Limits (dBm)	Pass or Fail		
	5745	13.80	30	Pass		
802.11a	5782	13.70	30	Pass		
	5825	13.58	30	Pass		
N 10	5745	13.31	30	Pass		
802.11n20	5782	13.17	30	Pass		
	5825	13.09	30	Pass		
000 44 = 40	5755	13.09	30	Pass		
802.11n40	5795	13.09	30	Pass		
8	5745	13.40	30	Pass		
802.11ac20	5785	14.58	30	Pass		
	5825	12.60	30	Pass		
000 44 = - 40	5755	11.34	30	Pass		
802.11ac40	5795	11.21	30	Pass		
802.11ac80	5775	12.19	30	Pass		



8. BANDWIDTH

8.1. MEASUREMENT PROCEDURE

-6dB bandwidth (DTS bandwidth):

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the EUT Work on operation frequency individually.
- 3. Set RBW = 100kHz.
- 4. Set the VBW ≥3*RBW. Detector = Peak. Trace mode = max hold.
- Measure the maximum width of the emission that is 6 dB down from the peak of the emission.

99% occupied bandwidth:

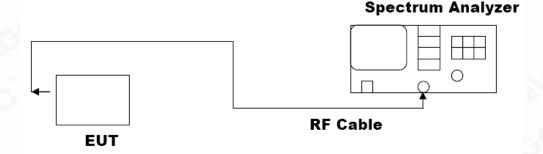
- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set Span = approximately 1.5 to 5 times the OBW, centered on a nominal channel
 The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video
 bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
- 4. Set SPA Trace 1 Max hold, then View.

-26dB Bandwidth:

- 1. Set RBW = approximately 1% of the emission bandwidth.
- 2. Set the VBW > RBW.
- 3. Detector = Peak.
- 4. Trace mode = max hold.
- 5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

Note: The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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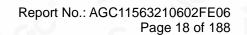
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8.3. LIMITS AND MEASUREMENT RESULTS

Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
-C	5180	16.553	20.98	N/A	Pass
802.11a	5200	16.564	20.96	N/A	Pass
	5240	16.575	20.78	N/A	Pass
6	5180	17.739	21.22	N/A	Pass
802.11n20	5200	17.731	21.17	N/A	Pass
	5240	17.716	21.54	N/A	Pass
000 44 40	5190	36.146	39.41	N/A	Pass
802.11n40	5230	36.144	39.36	N/A	Pass
10	5180	17.710	21.11	N/A	Pass
802.11ac20	5200	17.708	21.05	N/A	Pass
	5240	17.692	20.89	N/A	Pass
000 44 40	5190	36.376	39.62	N/A	Pass
802.11ac40	5230	36.391	39.77	N/A	Pass
802.11ac80	5210	75.436	80.16	N/A	Pass

Test	Data of Occupied B	Sandwidth and -26dE	Bandwidth for ban	d 5.25-5.35	GHz
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
	5260	16.544	21.03	N/A	Pass
802.11a	5300	16.582	20.86	N/A	Pass
	5320	16.560	20.87	N/A	Pass
10	5260	17.729	21.34	N/A	Pass
802.11n20	5300	17.719	21.44	N/A	Pass
	5320	17.749	21.44	N/A	Pass
000 44 - 40	5270	36.144	40.43	N/A	Pass
802.11n40	5310	36.171	39.61	N/A	Pass
®	5260	17.703	21.18	N/A	Pass
802.11ac20	5300	17.728	21.15	N/A	Pass
	5320	17.695	21.22	N/A	Pass
000 44 40	5270	36.409	42.85	N/A	Pass
802.11ac40	5310	36.443	39.70	N/A	Pass
802.11ac80	5290	75.590	80.37	N/A	Pass

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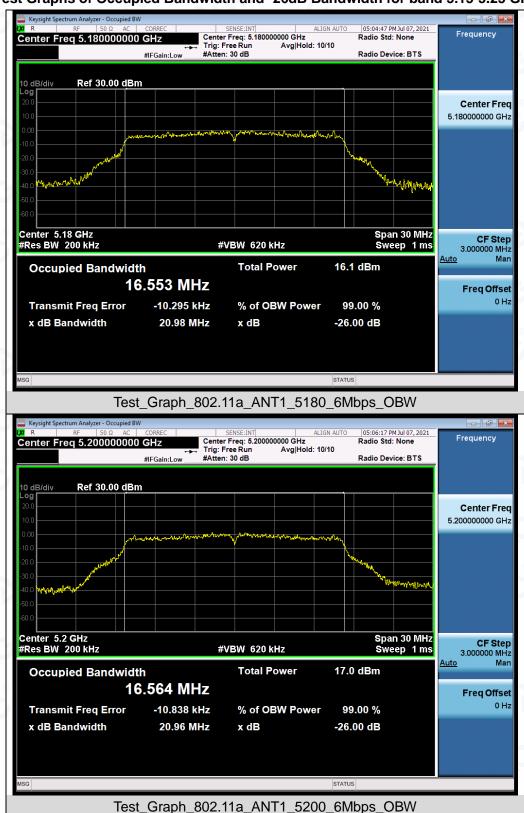


Test D	ata of Occupied B	andwidth and -26dB	Bandwidth for band	1 5.47-5.725	GHz
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
	5500	16.593	21.27	N/A	Pass
802.11a	5600	16.584	21.06	N/A	Pass
	5700	16.586	21.20	N/A	Pass
	5500	17.699	21.41	N/A	Pass
802.11n20	5600	17.775	21.43	N/A	Pass
	5700	17.742	21.14	N/A	Pass
100	5510	36.147	39.65	N/A	Pass
802.11n40	5590	36.176	39.53	N/A	Pass
	5670	36.131	39.43	N/A	Pass
60	5500	17.697	21.06	N/A	Pass
802.11ac20	5600	17.707	20.89	N/A	Pass
	5700	17.710	20.98	N/A	Pass
z.C	5510	36.408	42.80	N/A	Pass
802.11ac40	5590	36.377	39.92	N/A	Pass
	5670	36.357	43.08	N/A	Pass
000 4400	5530	75.569	80.56	N/A	Pass
802.11ac80	5610	75.634	80.54	N/A	Pass

Test	Data of Occupied E	Bandwidth and DTS	Bandwidth for band	5.725-5.85	GHz
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	Limits (MHz)	Pass or Fail
	5745	16.628	16.31	0.5	Pass
802.11a	5785	16.623	16.30	0.5	Pass
	5825	16.619	16.32	0.5	Pass
	5745	17.746	17.55	0.5	Pass
802.11n20	5785	17.749	17.54	0.5	Pass
	5825	17.727	17.27	0.5	Pass
000 44 = 40	5755	36.184	36.02	0.5	Pass
802.11n40	5795	36.201	35.80	0.5	Pass
8	5745	17.754	17.48	0.5	Pass
802.11ac20	5785	17.738	17.68	0.5	Pass
	5825	17.748	17.63	0.5	Pass
902 44 5540	5755	36.422	36.30	0.5	Pass
802.11ac40	5795	36.397	36.40	0.5	Pass
802.11ac80	5775	75.708	75.72	0.5	Pass

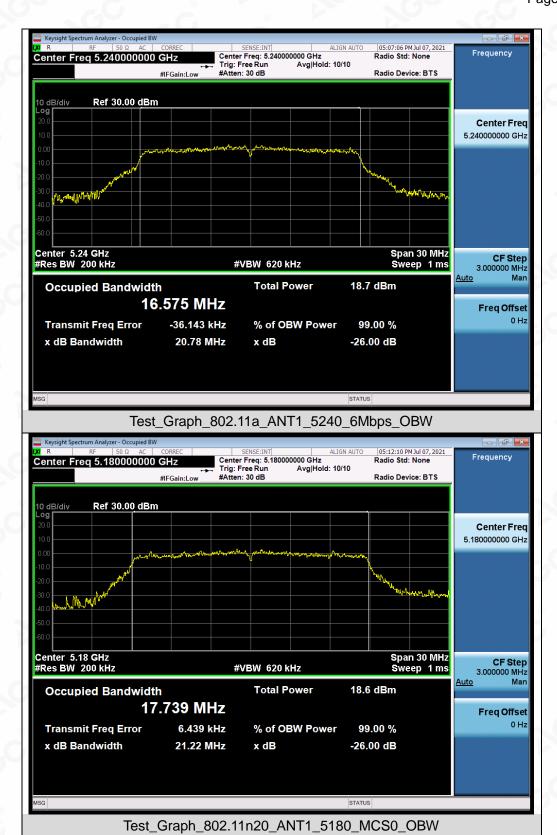


Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz

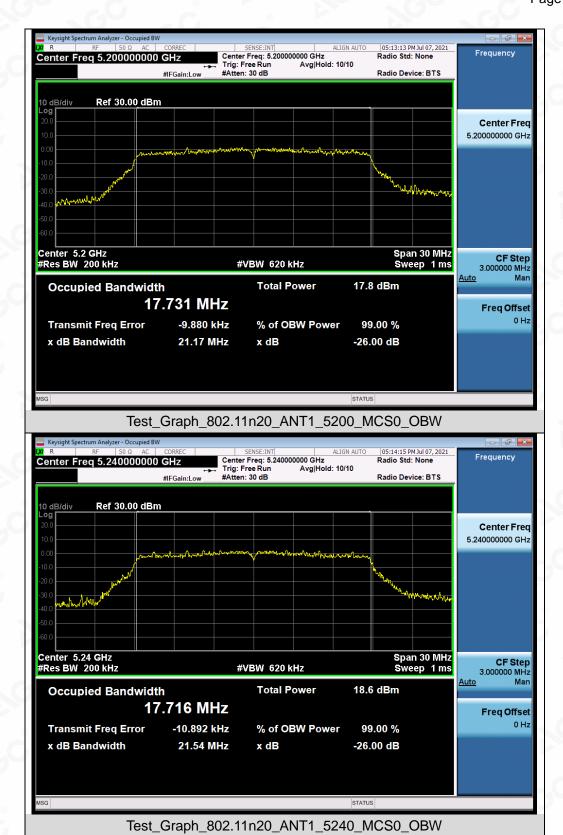


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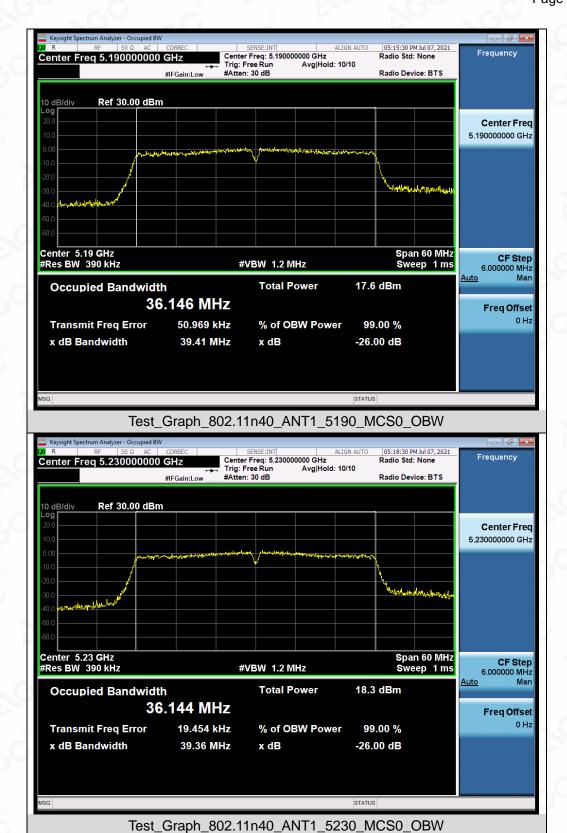










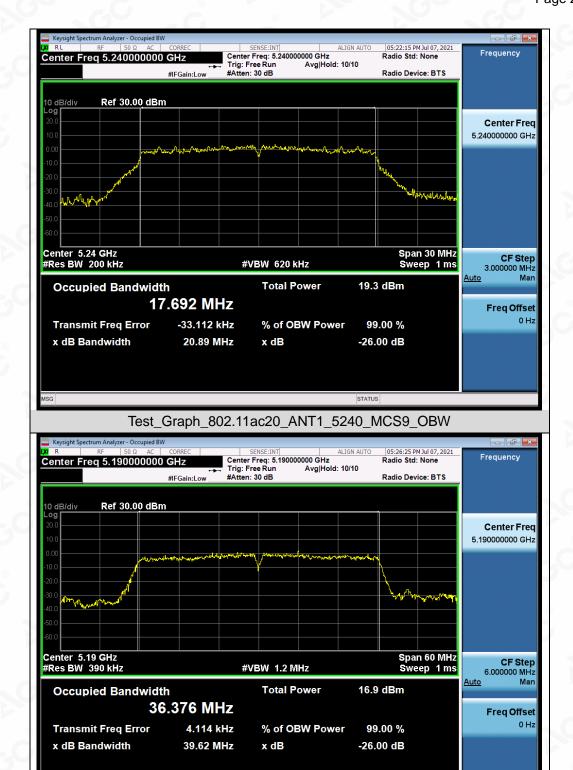






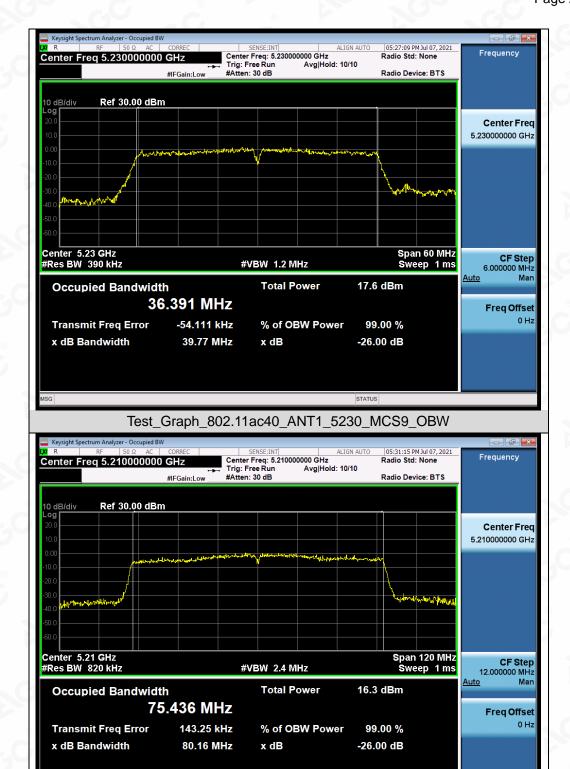
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Test_Graph_802.11ac40_ANT1_5190_MCS9_OBW



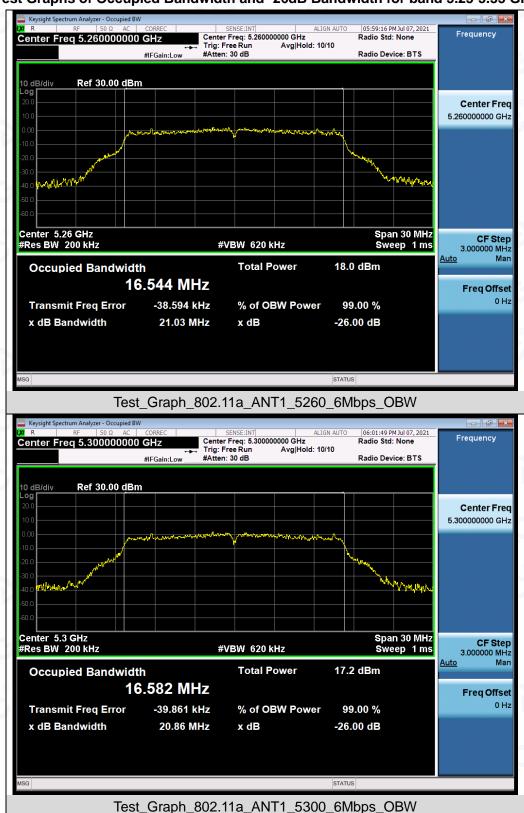


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Test_Graph_802.11ac80_ANT1_5210_MCS9_OBW

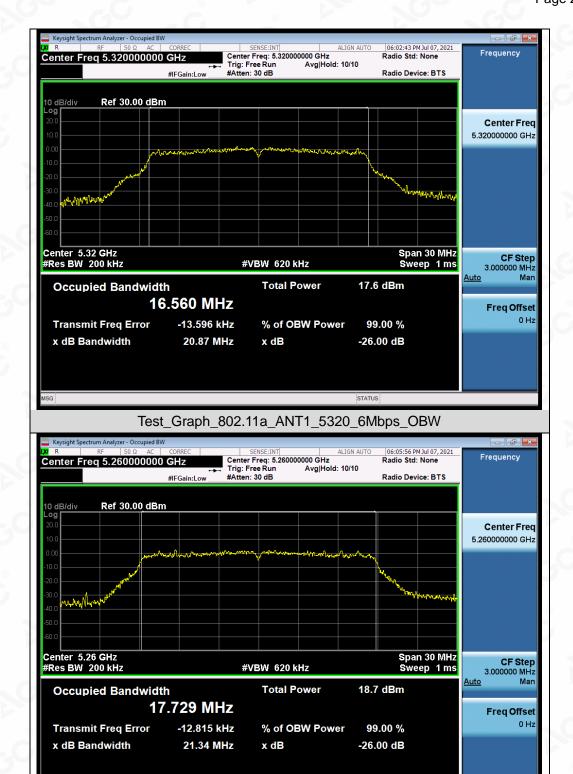


Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.25-5.35 GHz



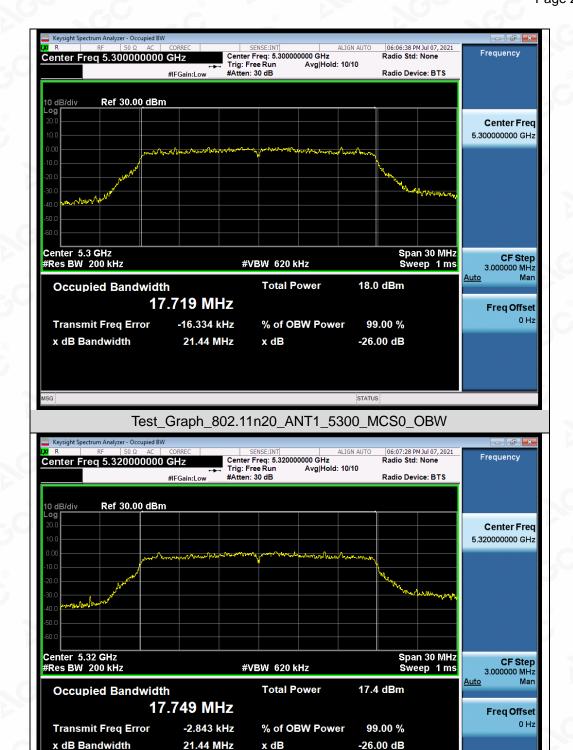
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Test_Graph_802.11n20_ANT1_5260_MCS0_OBW



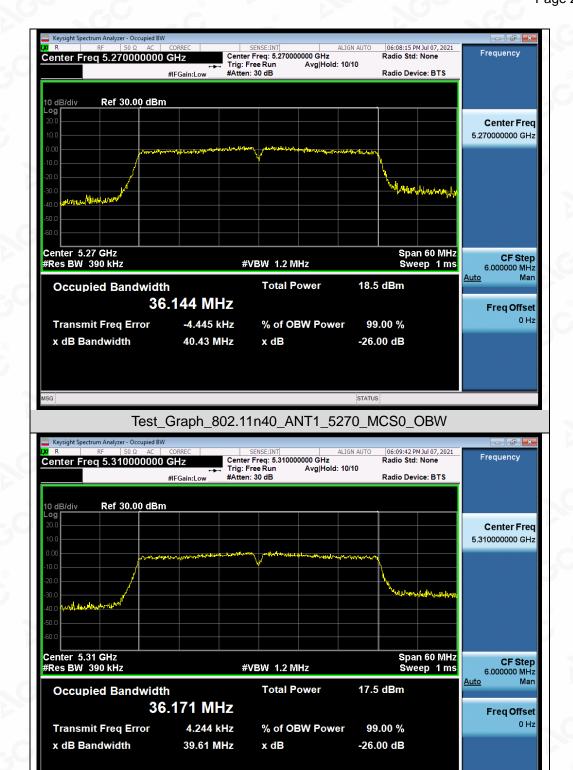


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21.44 MHz

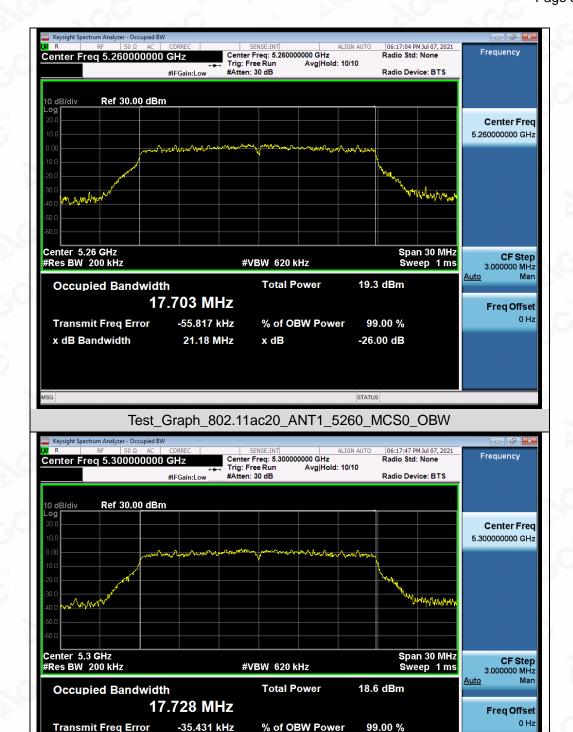
x dB Bandwidth





Test_Graph_802.11n40_ANT1_5310_MCS0_OBW





21.15 MHz

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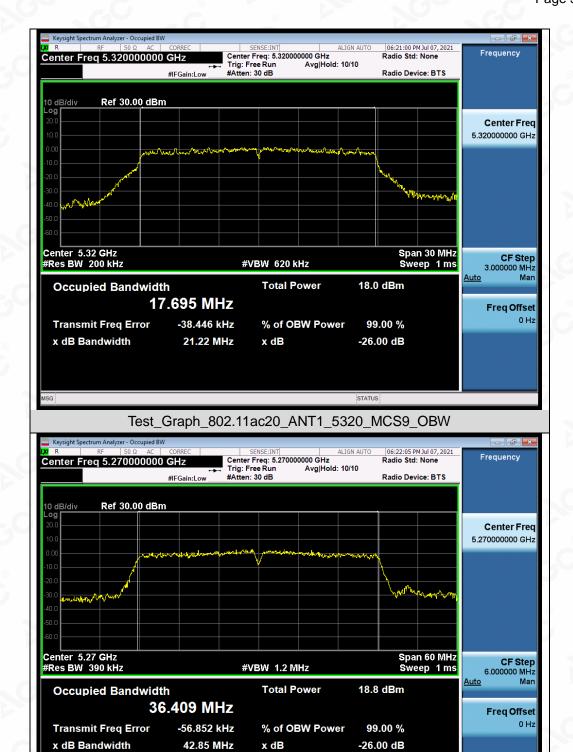
x dB

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-26.00 dB

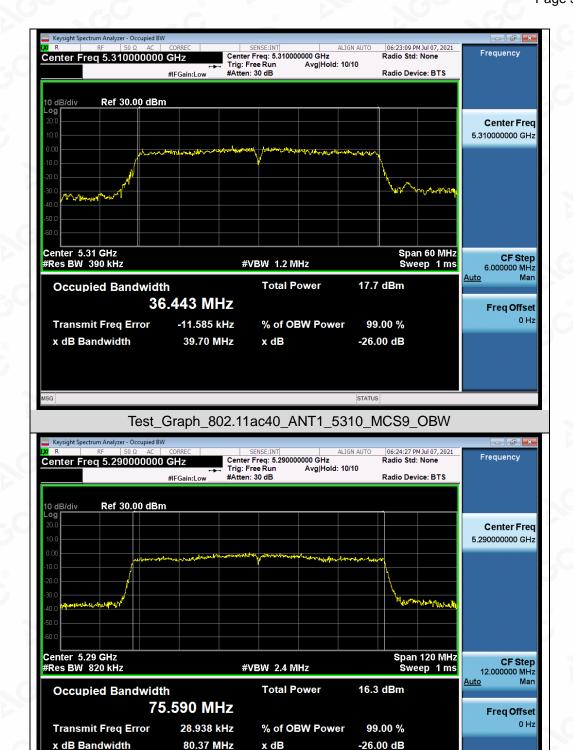
x dB Bandwidth





Test_Graph_802.11ac40_ANT1_5270_MCS9_OBW





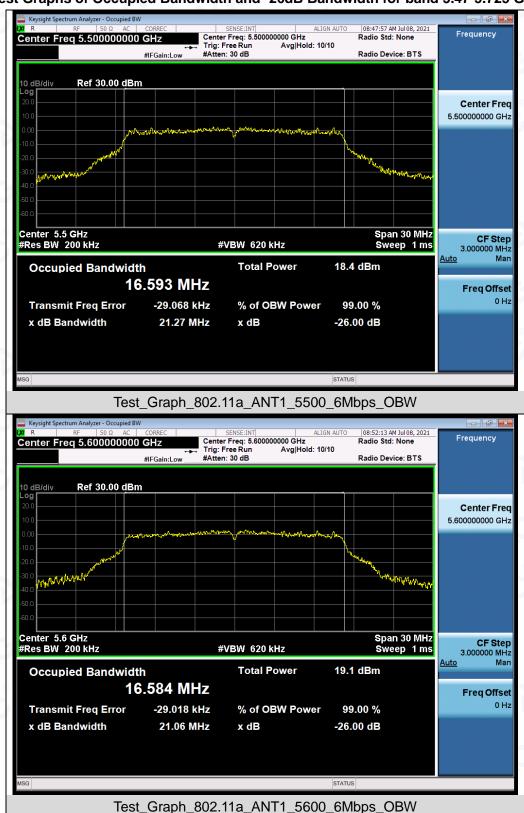
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80.37 MHz

x dB Bandwidth

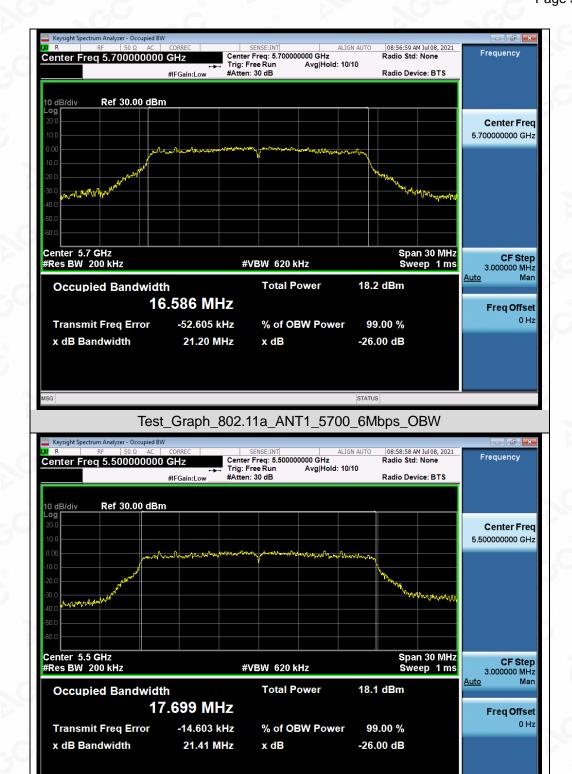


Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.47-5.725 GHz



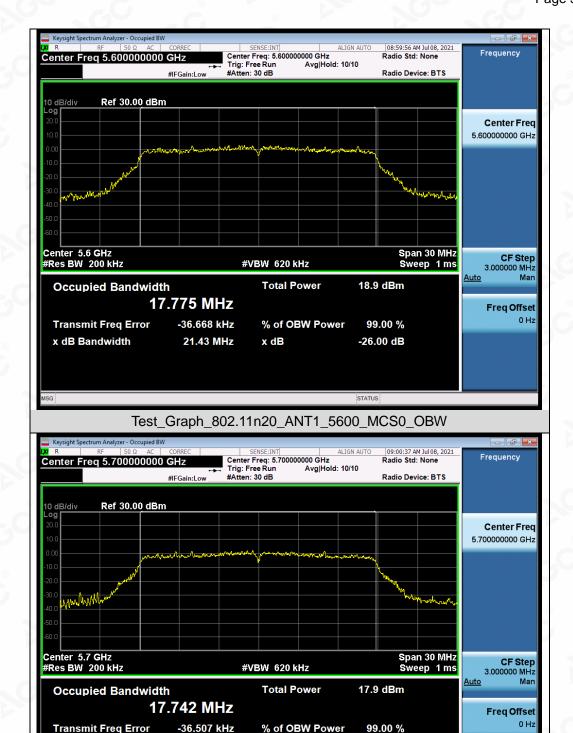
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Test_Graph_802.11n20_ANT1_5500_MCS0_OBW





Test_Graph_802.11n20_ANT1_5700_MCS0_OBW

x dB

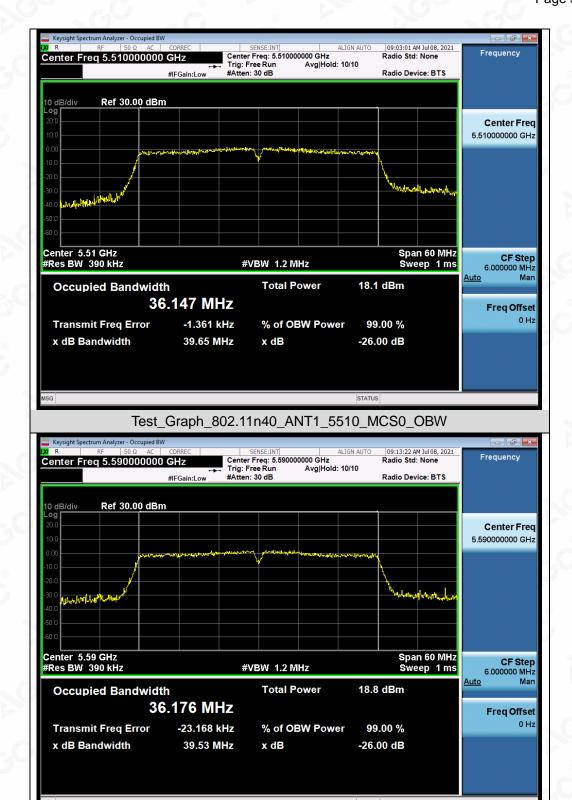
21.14 MHz

-26.00 dB

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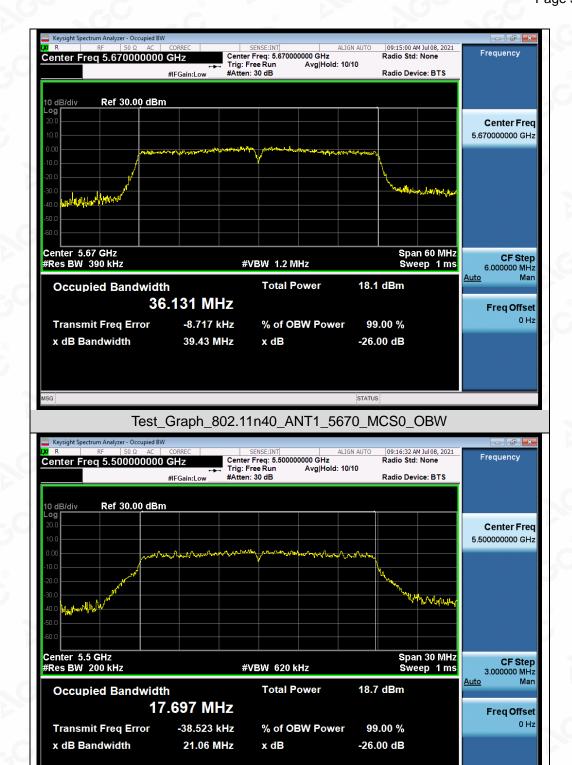
x dB Bandwidth





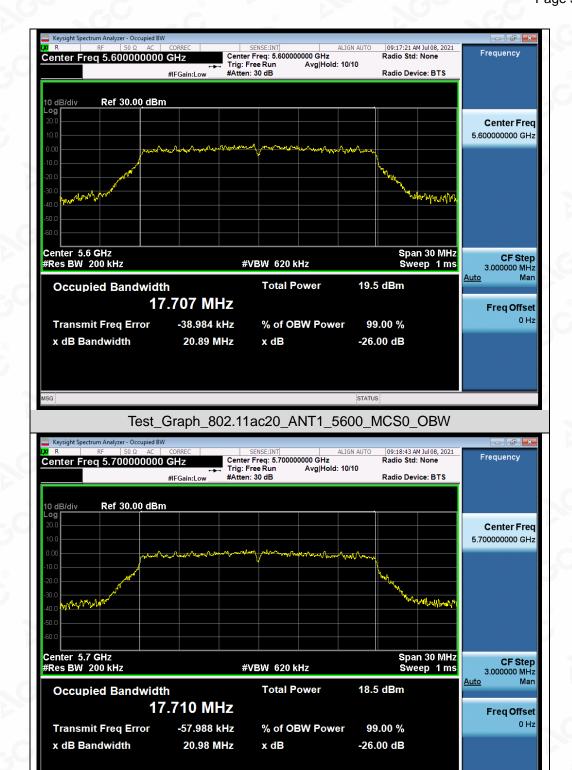
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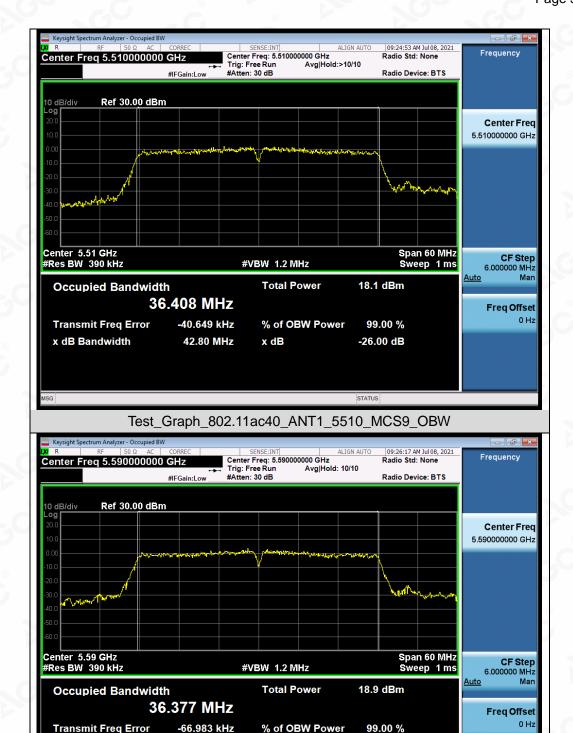
Test_Graph_802.11ac20_ANT1_5500_MCS0_OBW





Test_Graph_802.11ac20_ANT1_5700_MCS9_OBW





x dB

Test_Graph_802.11ac40_ANT1_5590_MCS9_OBW

39.92 MHz

-26.00 dB

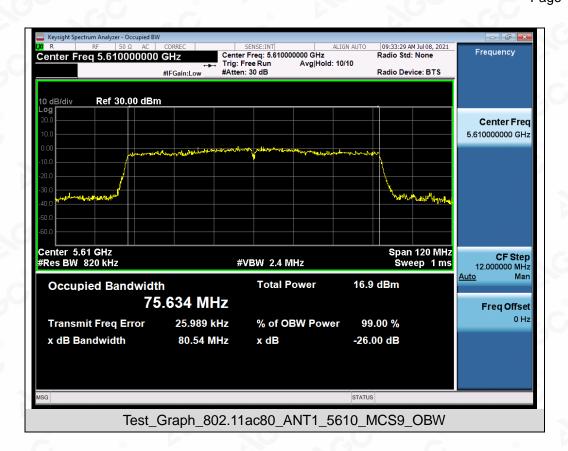
x dB Bandwidth





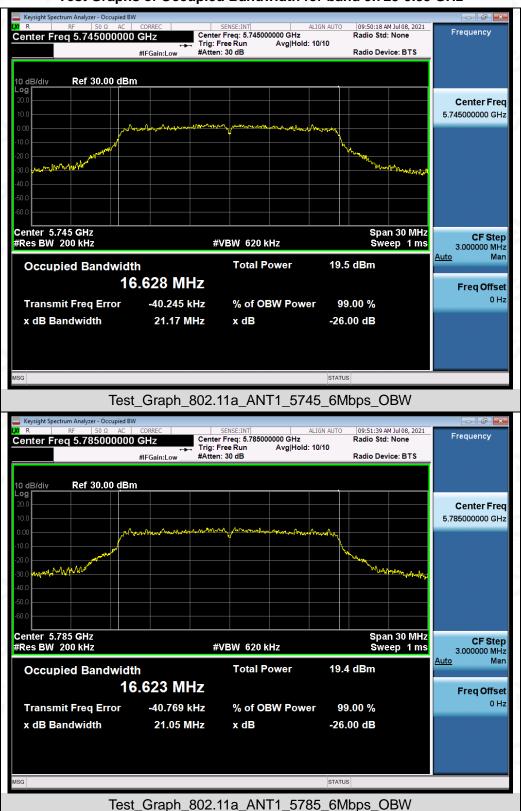








Test Graphs of Occupied Bandwidth for band 5.725-5.85 GHz



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