

FCC Test Report

Report No.: AGC10540211102FE06

FCC ID : ARS-WPT1S1

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION : WPS Dongle

BRAND NAME : N/A

MODEL NAME : AS-WPT1S1

APPLICANT : Top Victory Electronics (Taiwan) Co Ltd

DATE OF ISSUE : Dec. 08, 2021

STANDARD(S) : FCC Part 15.407

TEST PROCEDURE(S) : KDB 789033 D02 v02r01

REPORT VERSION : V1.0

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec. 08, 2021	Valid	Initial Release

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1. VERIFICATION OF CONFORMITY

Applicant	Top Victory Electronics (Taiwan) Co Ltd
Address	10F., No.230, Liancheng Rd., Zhonghe City, Taipei County, 23553 Taiwan
Manufacturer	Top Victory Electronics (Taiwan) Co Ltd
Address	10F., No.230, Liancheng Rd., Zhonghe City, Taipei County, 23553 Taiwan
Factory	TPV Electronics (Fujian) Co., Ltd
Address	Rongqiao Economic and Technological Development Zone, Fuqing City, Fujian Province, P.R.China
Product Designation	WPS Dongle
Brand Name	NA
Test Model	AS-WPT1S1
Date of test	Nov. 30, 2021 to Dec. 08, 2021
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	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.

Prepared By



Kelly Cheng
(Project Engineer)

Dec. 08, 2021

Reviewed By



Calvin Liu
(Reviewer)

Dec. 08, 2021

Approved By



Max Zhang
(Authorized Officer)

Dec. 08, 2021

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as “WPS Dongle”. 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

Equipment Type	<input type="checkbox"/> Outdoor access points <input type="checkbox"/> Fixed P2P access points	<input type="checkbox"/> Indoor access points <input checked="" type="checkbox"/> Client devices
Operation Frequency	<input checked="" type="checkbox"/> U-NII 1:5150MHz~5250MHz <input type="checkbox"/> U-NII 2C:5470MHz~5725MHz	<input type="checkbox"/> U-NII 2A: 5250MHz~5350MHz <input checked="" type="checkbox"/> U-NII 3: 5725MHz~5850MHz
DFS Design Type	<input type="checkbox"/> Master <input type="checkbox"/> Slave with radar detection	<input checked="" type="checkbox"/> Slave without radar detection
TPC Function	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Test Frequency Range:	For 802.11a/n-HT20/ac-VHT20: 5180~5240MHz, 5260~5320MHz, 5500~5720MHz, 5745~5825MHz For 802.11n-HT40/ac-VHT40: 5190~5230MHz, 5270~5310MHz, 5510~5710MHz, 5755~5795MHz For 802.11ac-VHT80: 5210MHz, 5290MHz, 5530~5610MHz, 5775MHz	
Output Power	IEEE 802.11a:14.29dBm; IEEE 802.11n-HT20:14.33dBm; IEEE 802.11n-HT40:13.50dBm; IEEE 802.11ac-VHT20:13.10dBm; IEEE 802.11ac-VHT40:13.33dBm; IEEE 802.11ac-VHT80:12.22dBm	
Modulation	802.11a/n:(64-QAM, 16-QAM, QPSK, BPSK) OFDM 802.11ac :(256-QAM, 64-QAM, 16-QAM, QPSK, BPSK) OFDM	
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.6Mbps	
Number of channels	7 channels of U-NII-1 Band 8 channels of U-NII-3 Band	
Hardware Version	SDP03C-V1.1	
Software Version	1.0.2.0715	
Antenna Designation	PIFA Antenna (Comply with requirements of the FCC part 15.203)	
Antenna Gain	3.0dBi	
Power Supply	DC 5V by USB	

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2.2. TABLE OF CARRIER FREQUENCIES

For 5180~5240MHz:

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
42	5210 MHz	--	--

For 5745~5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz	--	--

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
155	5775 MHz	--	--

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

This submittal(s) (test report) is intended for **FCC ID: ARS-WPT1S1** 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 $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

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	$U_c = \pm 2 \%$
Uncertainty of Occupied Channel Bandwidth	$U_c = \pm 2 \%$

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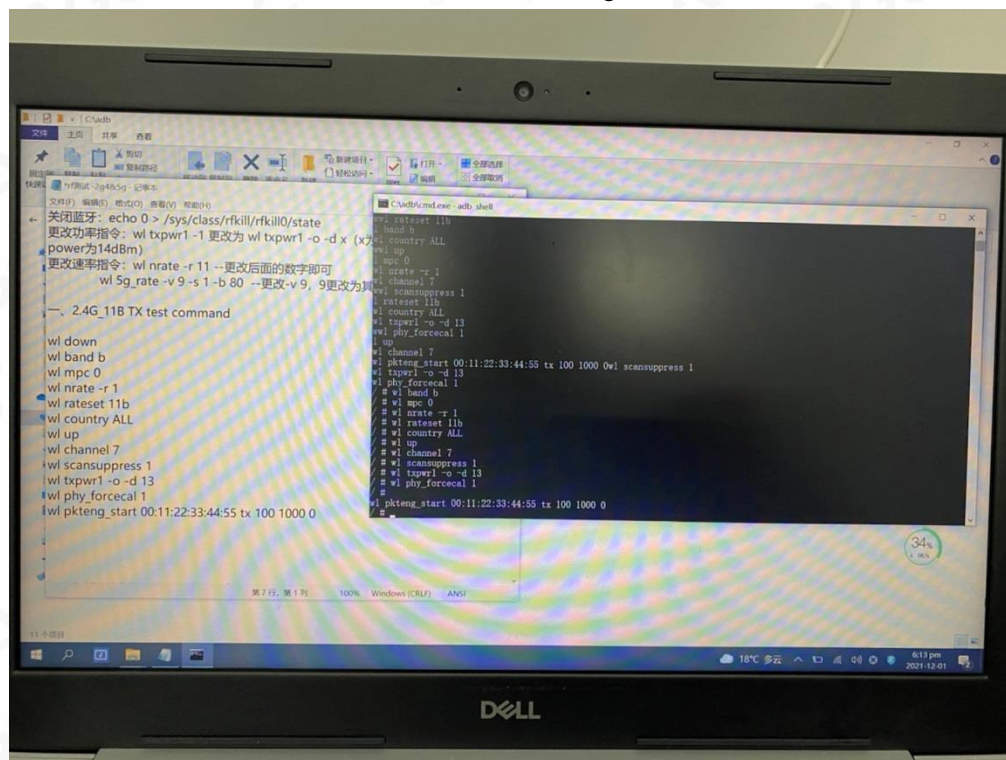
4. DESCRIPTION OF TEST MODES

Mode	Available channel	Tested channel	Modulation	Date rate (Mbps)
802.11a/n/ac20	36,40,44,48, 149,153,157,161,165	36,40,48, 149,157,165	OFDM	6Mbps/MCS0
802.11n/ac40	38,46,151,159	38,46, 151,159	OFDM	MCS0
802.11ac80	42, 155	42, 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.

Software Setting



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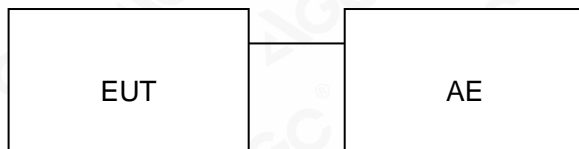
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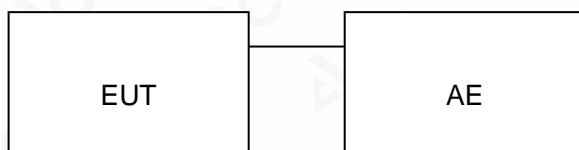
5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Radiated Emission Configure:



Conducted Emission Configure:



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	WPS Dongle	AS-WPT1S1	ARS-WPT1S1	EUT
2	PC	Nbl-WAQ9R	N/A	AE
3	PC adapter	HW-200200CP1	N/A	AE

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.407	6dB Bandwidth	Compliant
§15.407	Emission Bandwidth	Compliant
§15.407	Maximum conducted output power	Compliant
§15.407	Conducted Spurious Emission	Compliant
§15.407	Maximum Conducted Output Power Density	Compliant
§15.209	Radiated Emission	Compliant
§15.407	Band Edges	Compliant
§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
Power sensor	Aglient	U2021XA	MY54110007	Mar. 23, 2020	Mar. 22, 2022
5GHz Fliter	EM Electronics	5150-5880MHz	N/A	Sep. 03, 2020	Sep. 02, 2022
Attenuator	ZHINAN	E-002	N/A	Sep. 03, 2020	Sep. 02, 2022
Horn antenna	SCHWARZBECK	BBHA 9170	#768	May 22, 2020	May 21, 2022
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Apr. 23, 2021	Apr. 22, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Sep. 03, 2020	Sep. 02, 2022
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08, 2020	Jan. 07, 2023
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A

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7. MAXIMUM CONDUCTED OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

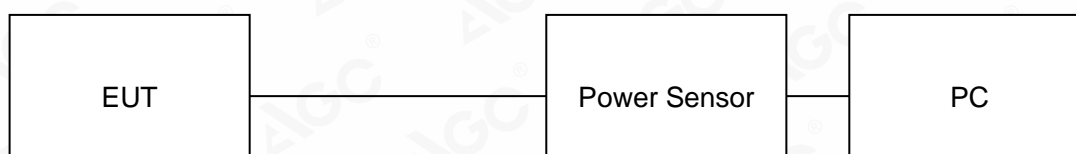
For average power test:

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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7.3. LIMITS AND MEASUREMENT RESULT

Test Data of Conducted Output Power for band 5.15-5.25 GHz				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5180	13.31	23.98	Pass
	5200	13.38	23.98	Pass
	5240	12.39	23.98	Pass
802.11n20	5180	13.37	23.98	Pass
	5200	13.33	23.98	Pass
	5240	12.34	23.98	Pass
802.11n40	5190	11.56	23.98	Pass
	5230	11.11	23.98	Pass
802.11ac20	5180	11.61	23.98	Pass
	5200	11.38	23.98	Pass
	5240	10.43	23.98	Pass
802.11ac40	5190	11.84	23.98	Pass
	5230	11.14	23.98	Pass
802.11ac80	5210	11.09	23.98	Pass

Test Data of Conducted Output Power for band 5.725-5.85 GHz				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5745	14.29	30	Pass
	5785	13.57	30	Pass
	5825	10.30	30	Pass
802.11n20	5745	14.33	30	Pass
	5785	13.51	30	Pass
	5825	10.38	30	Pass
802.11n40	5755	13.50	30	Pass
	5795	12.14	30	Pass
802.11ac20	5745	13.10	30	Pass
	5785	12.38	30	Pass
	5825	9.33	30	Pass
802.11ac40	5755	13.33	30	Pass
	5795	12.13	30	Pass
802.11ac80	5775	12.22	30	Pass

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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 $\geq 3 \times$ RBW. Detector = Peak. Trace mode = max hold.
5. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.

99% occupied bandwidth:

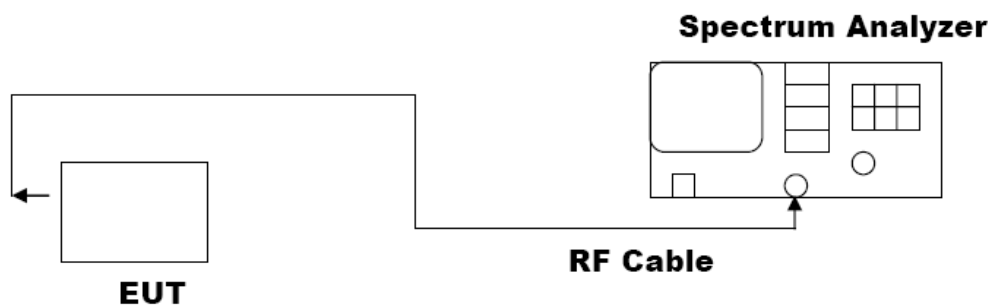
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set Span = approximately 1.5 to 5 times the OBW, centered on a nominal channel
The nominal IF filter bandwidth (3 dB RBW) shall 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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8.3. LIMITS AND MEASUREMENT RESULTS

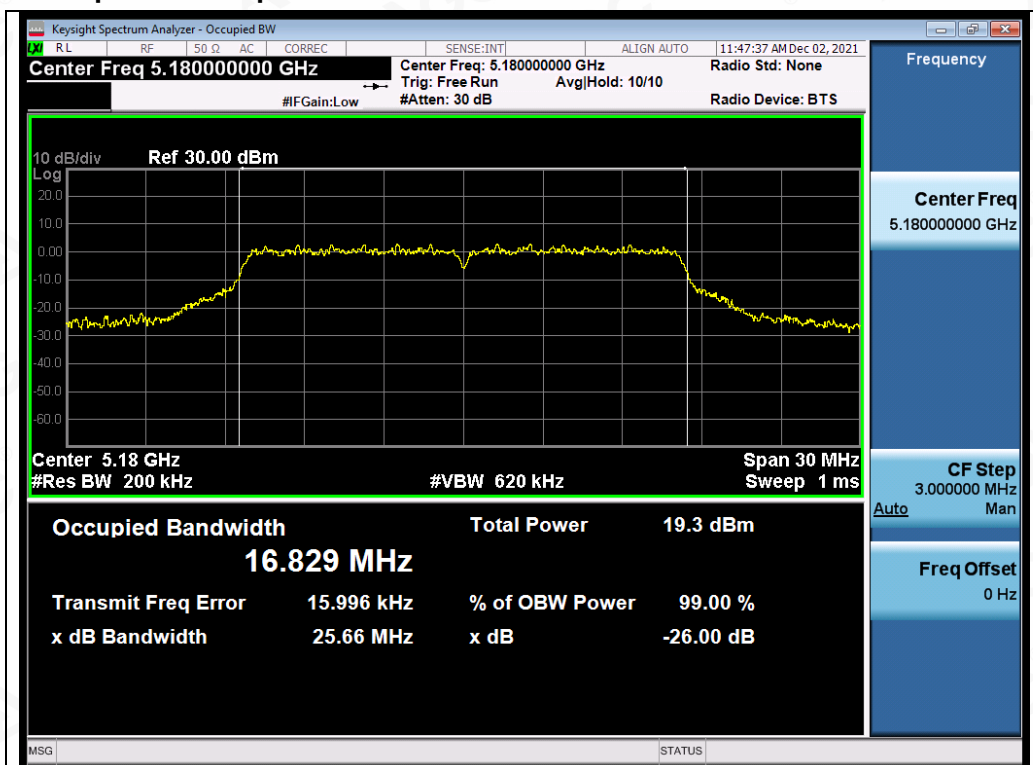
Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5180	16.829	25.66	N/A	Pass
	5200	16.771	22.45	N/A	Pass
	5240	16.726	21.43	N/A	Pass
802.11n20	5180	17.959	28.01	N/A	Pass
	5200	17.925	24.60	N/A	Pass
	5240	17.881	21.43	N/A	Pass
802.11n40	5190	36.310	39.95	N/A	Pass
	5230	36.261	39.97	N/A	Pass
802.11ac20	5180	17.896	21.62	N/A	Pass
	5200	17.852	21.48	N/A	Pass
	5240	17.866	21.59	N/A	Pass
802.11ac40	5190	36.290	40.28	N/A	Pass
	5230	36.267	39.94	N/A	Pass
802.11ac80	5210	75.673	80.95	N/A	Pass

Test Data of Occupied 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
802.11a	5745	16.870	16.37	0.5	Pass
	5785	16.889	16.35	0.5	Pass
	5825	16.876	16.38	0.5	Pass
802.11n20	5745	17.960	17.60	0.5	Pass
	5785	17.969	17.60	0.5	Pass
	5825	18.086	17.59	0.5	Pass
802.11n40	5755	36.345	36.36	0.5	Pass
	5795	36.364	35.97	0.5	Pass
802.11ac20	5745	17.891	17.59	0.5	Pass
	5785	17.903	17.60	0.5	Pass
	5825	17.980	17.59	0.5	Pass
802.11ac40	5755	36.315	36.36	0.5	Pass
	5795	36.368	36.07	0.5	Pass
802.11ac80	5775	75.659	75.74	0.5	Pass

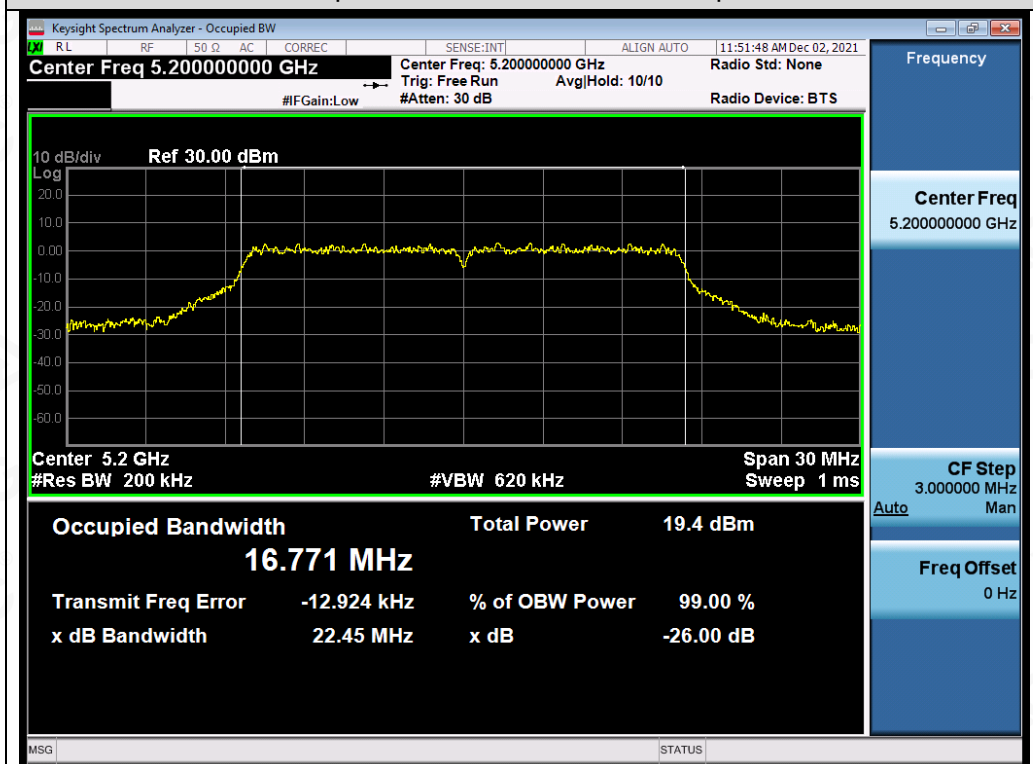
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Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz



Test_Graph_802.11a_ANT1_5180_6Mbps_OBW

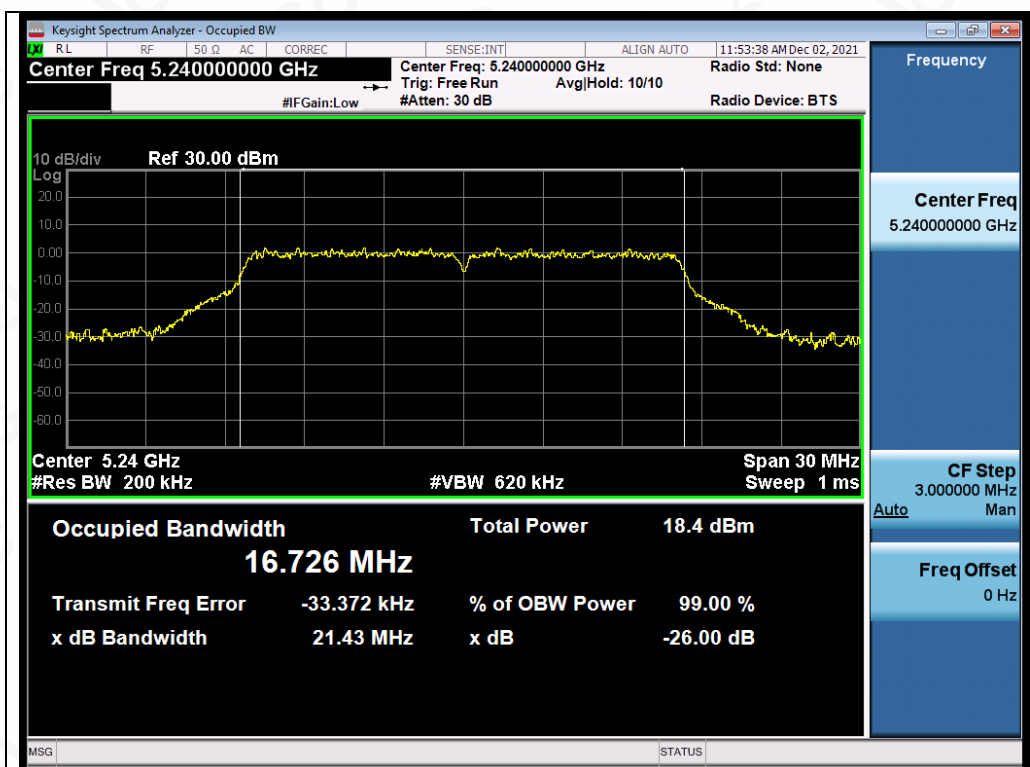


Test_Graph_802.11a_ANT1_5200_6Mbps_OBW

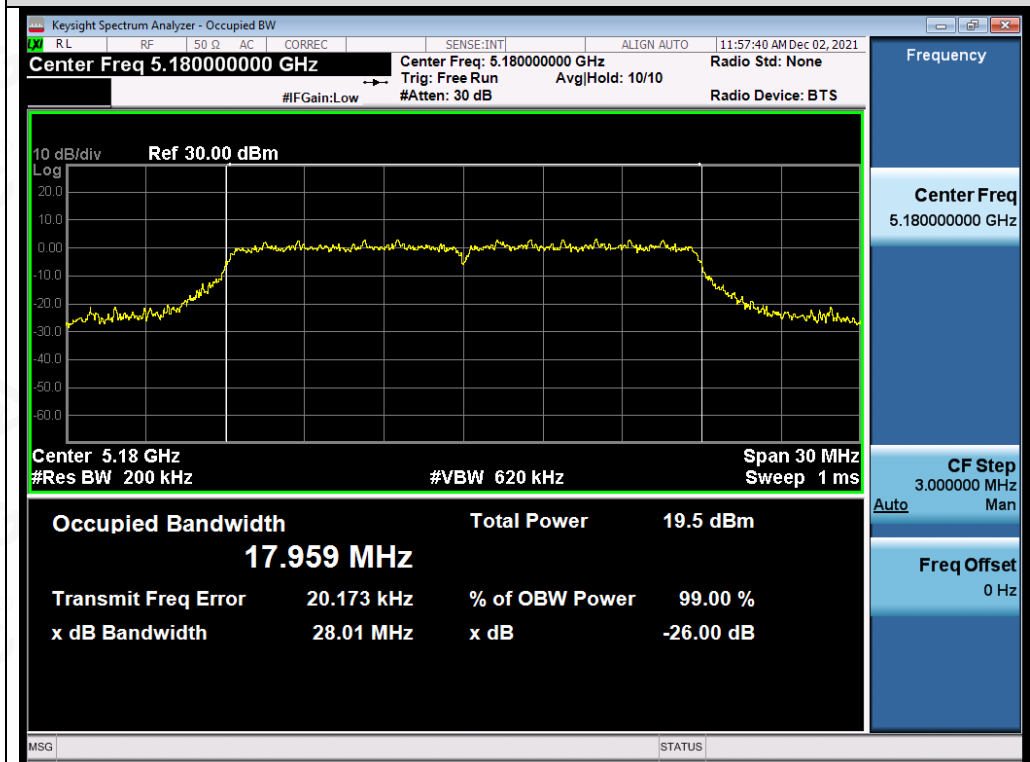
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Test_Graph_802.11a_ANT1_5240_6Mbps_OBW

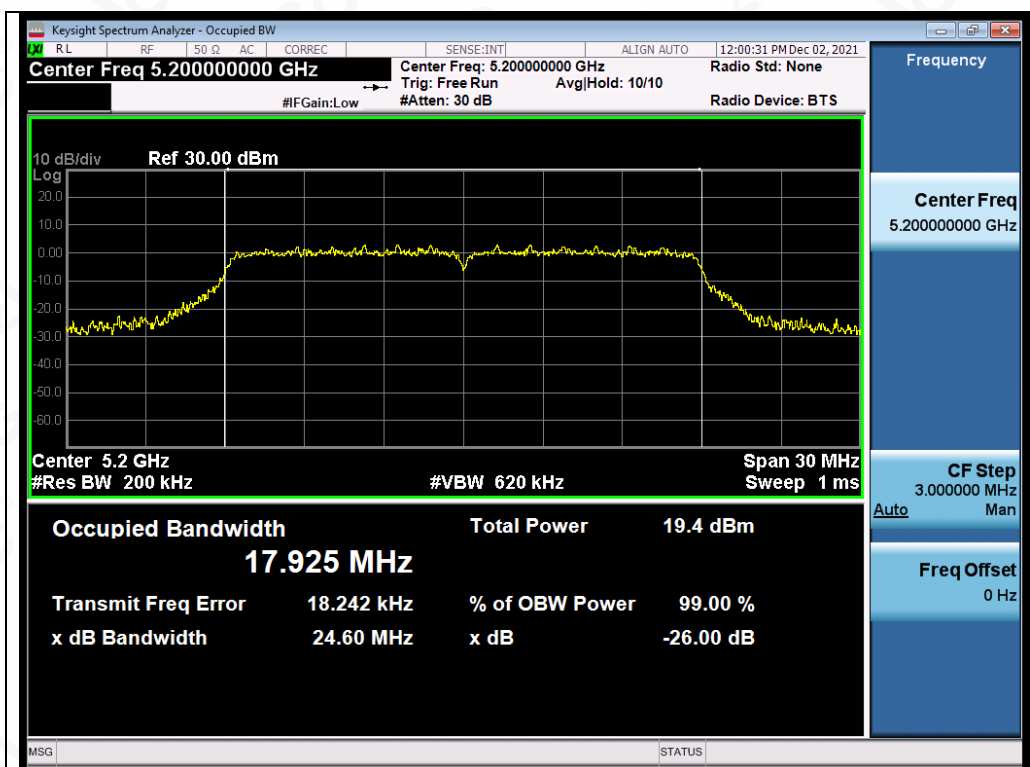


Test_Graph_802.11n20_ANT1_5180_MCS0_OBW

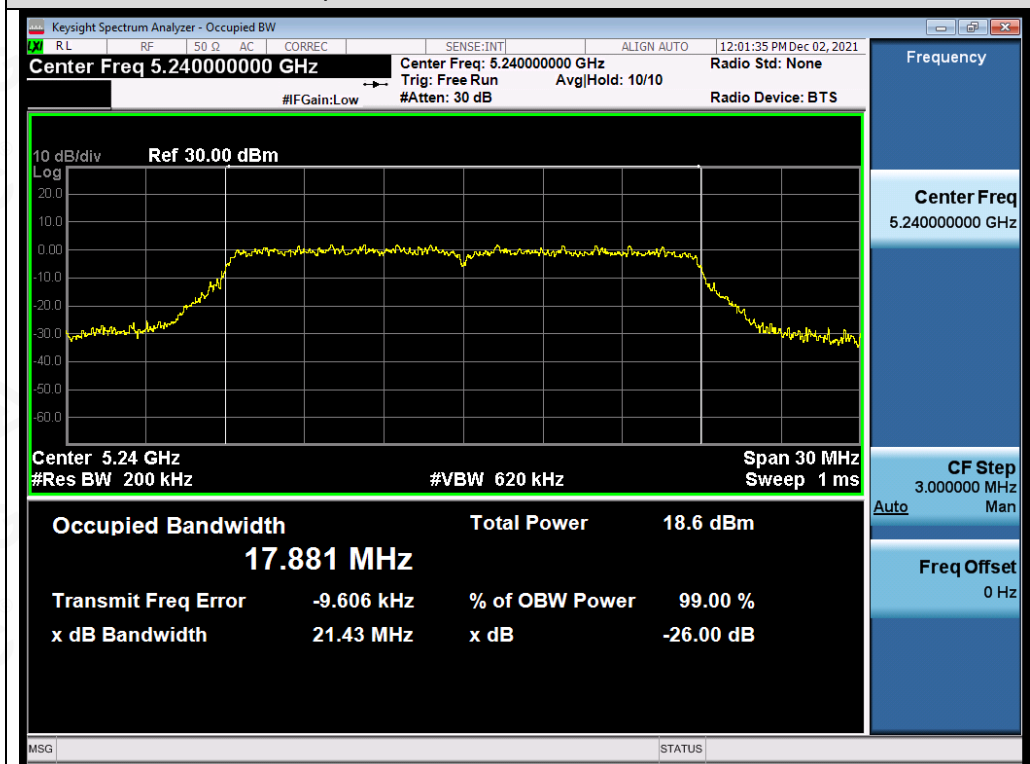
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Test_Graph_802.11n20_ANT1_5200_MCS0_OBW

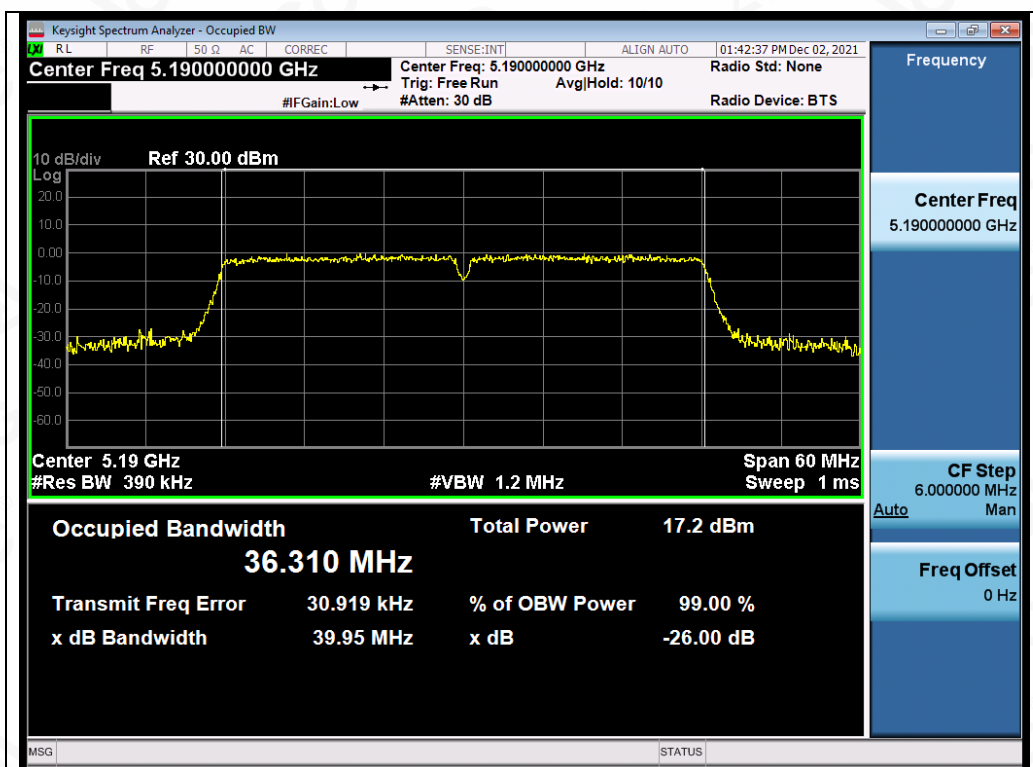


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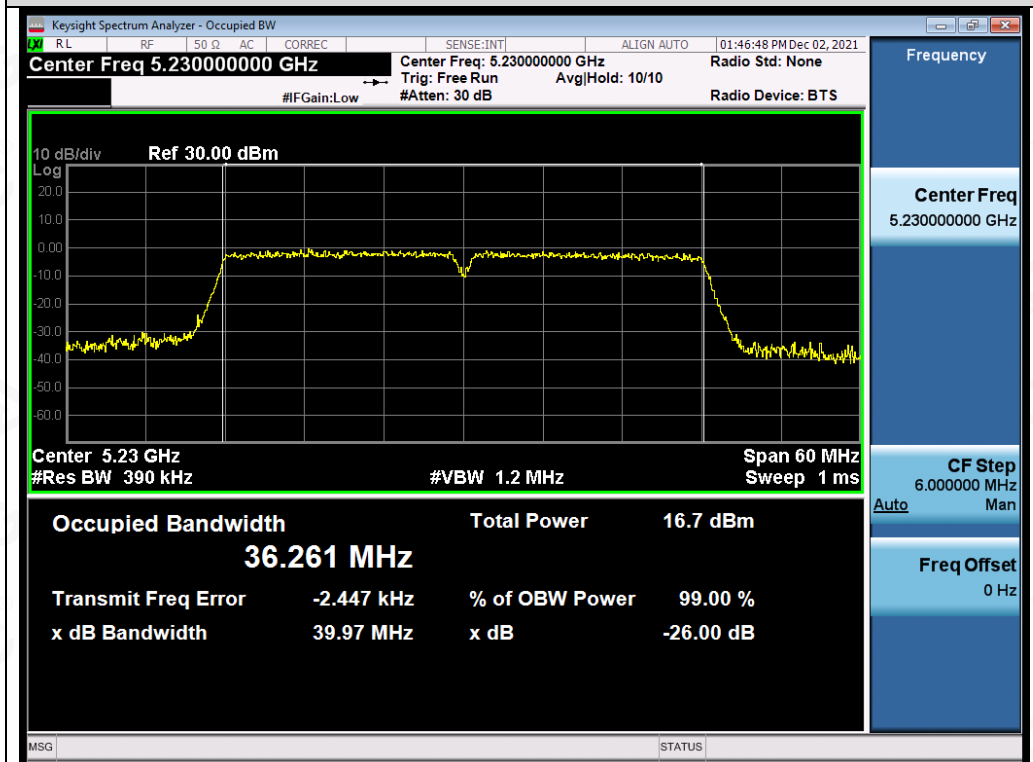
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Test_Graph_802.11n40_ANT1_5190_MCS0_OBW

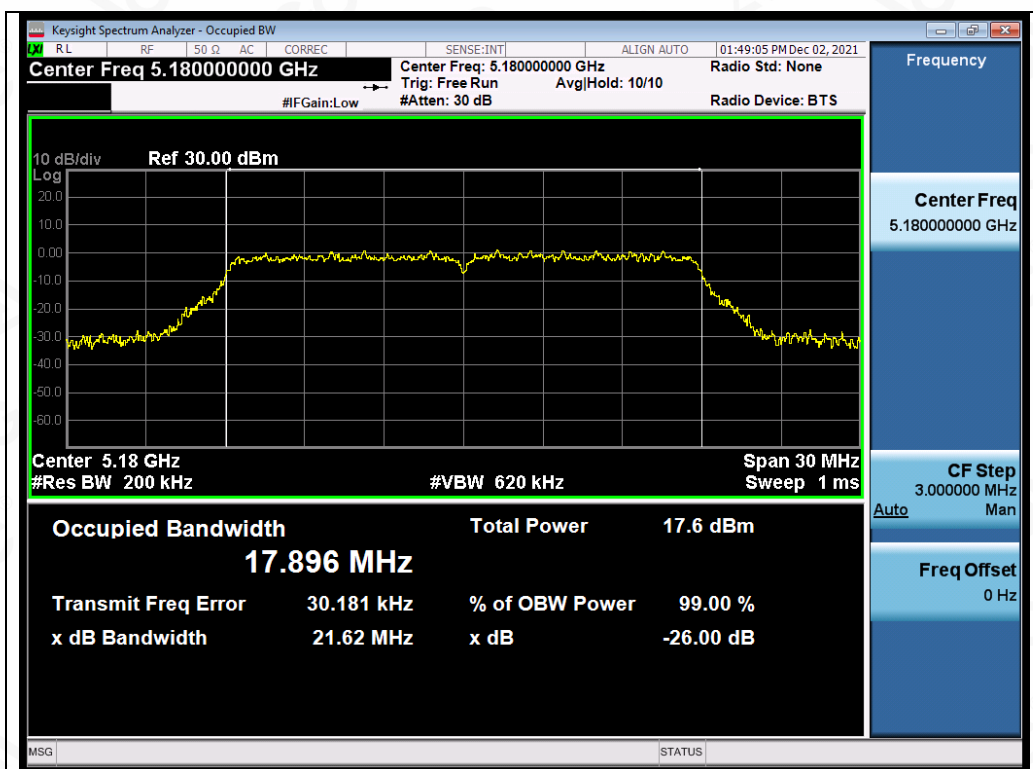


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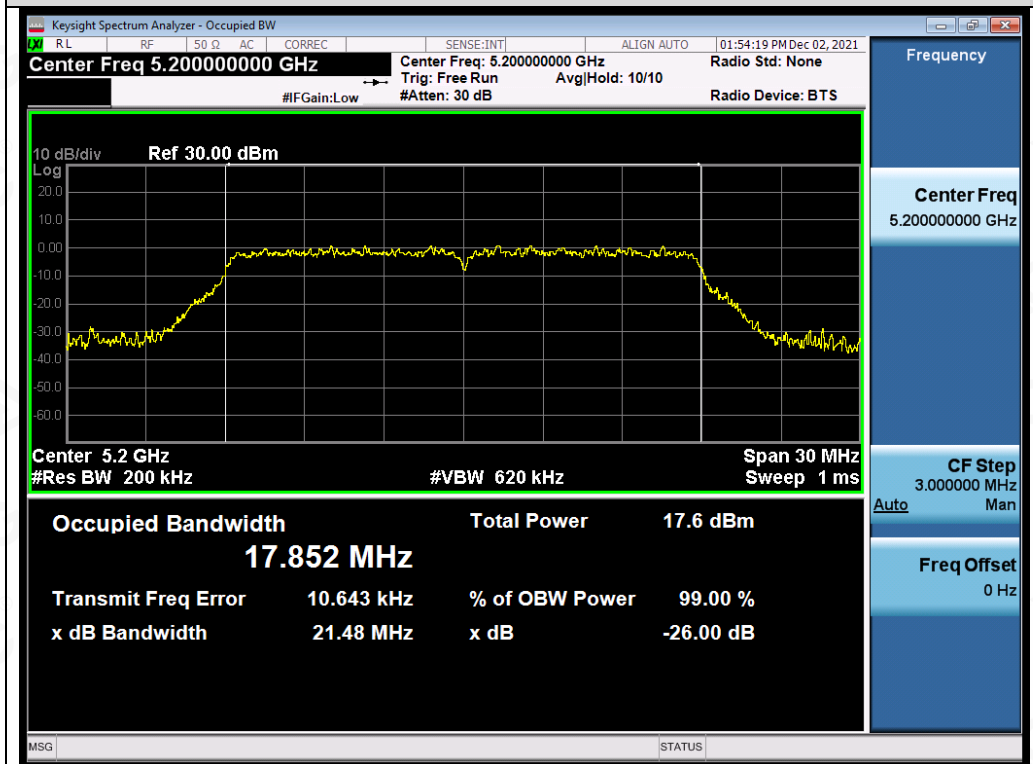
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Test_Graph_802.11ac20_ANT1_5180_MCS0_OBW

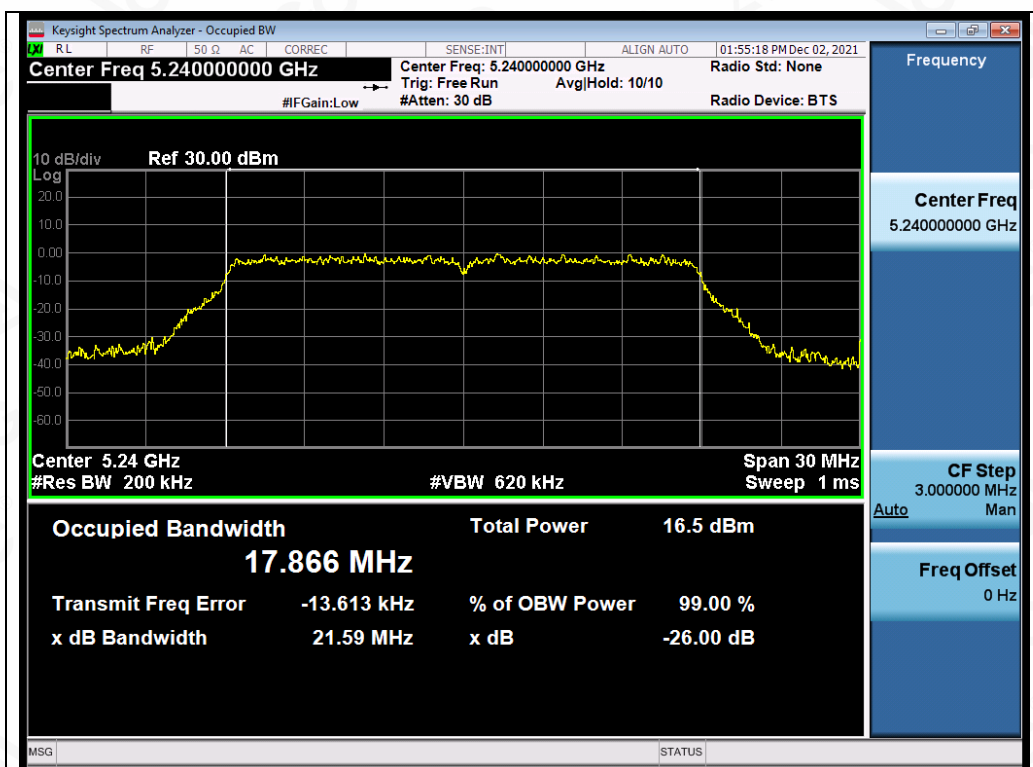


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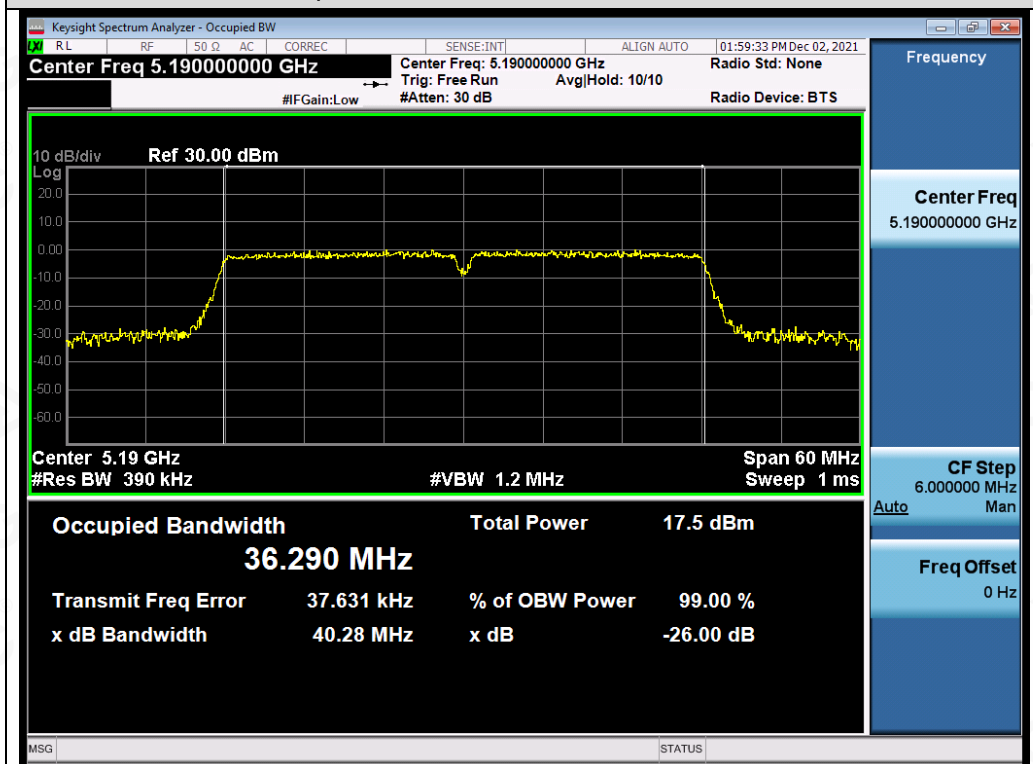
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Test_Graph_802.11ac20_ANT1_5240_MCS9_OBW

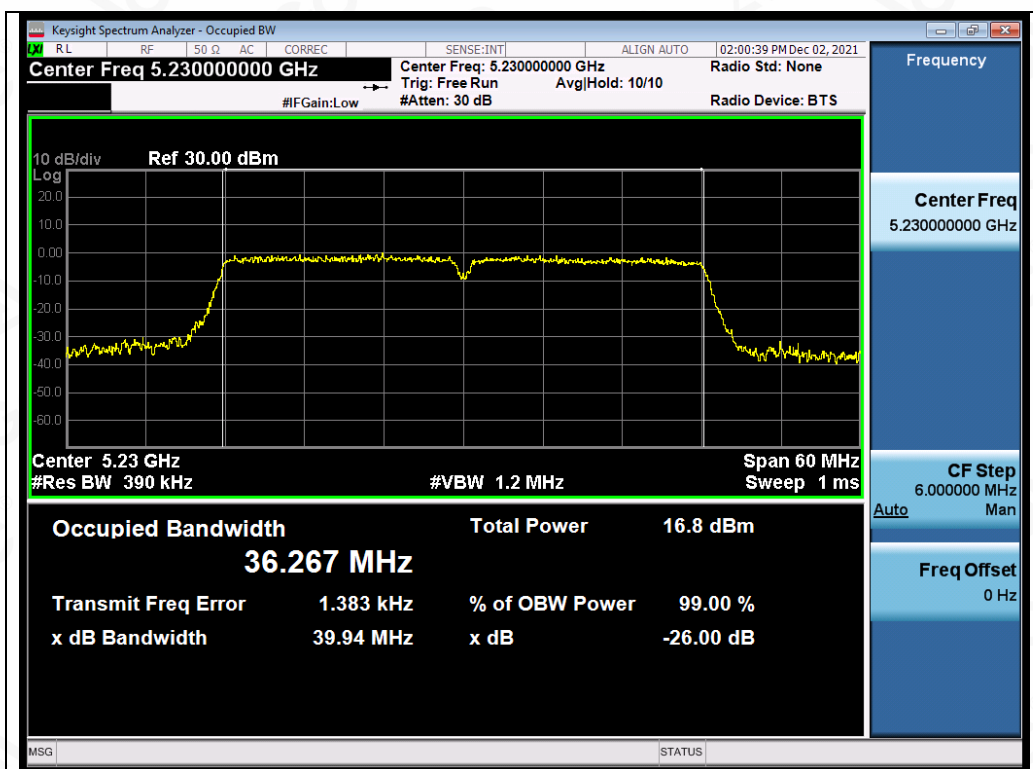


Test_Graph_802.11ac40_ANT1_5190_MCS9_OBW

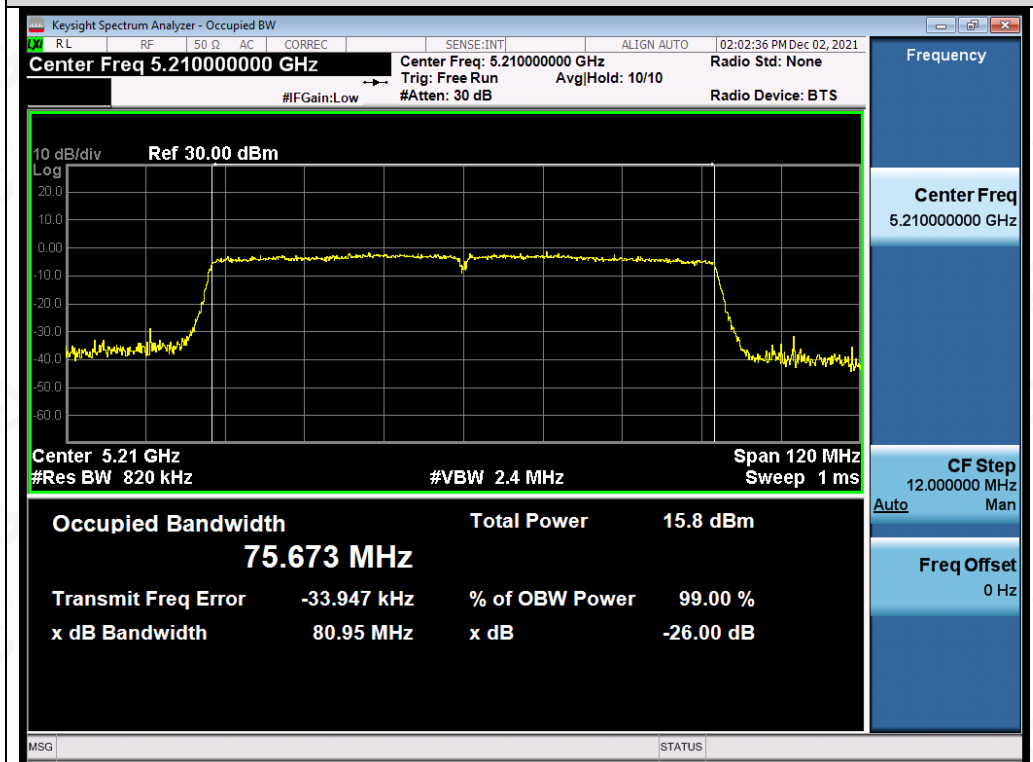
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Test_Graph_802.11ac40_ANT1_5230_MCS9_OBW



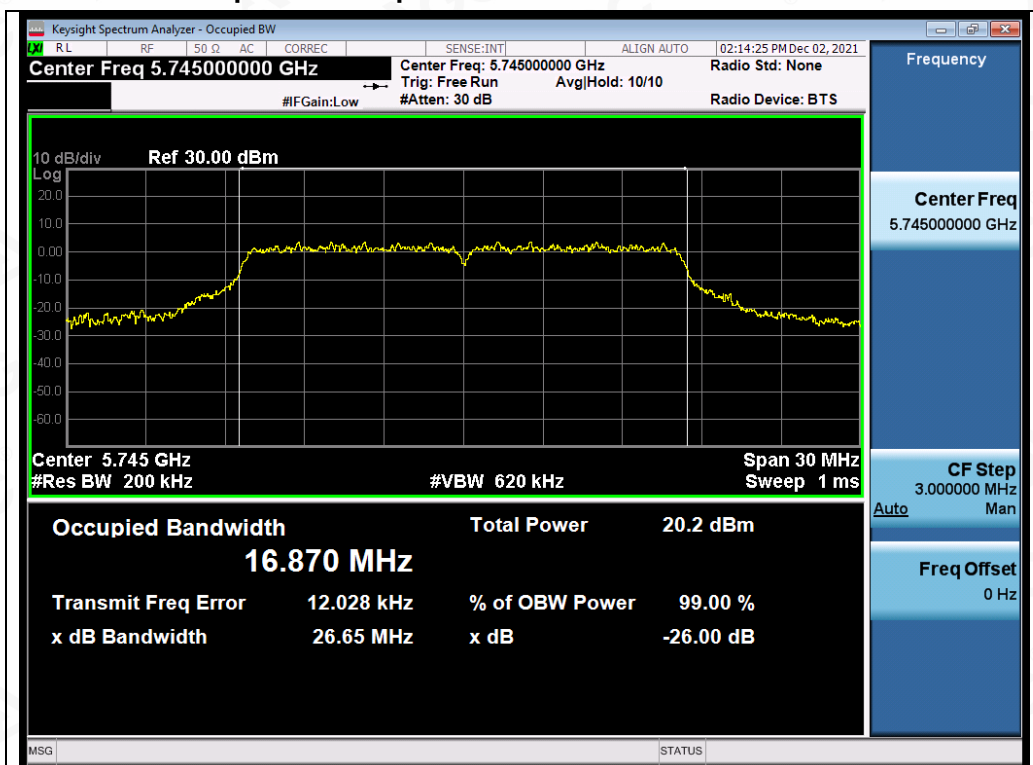
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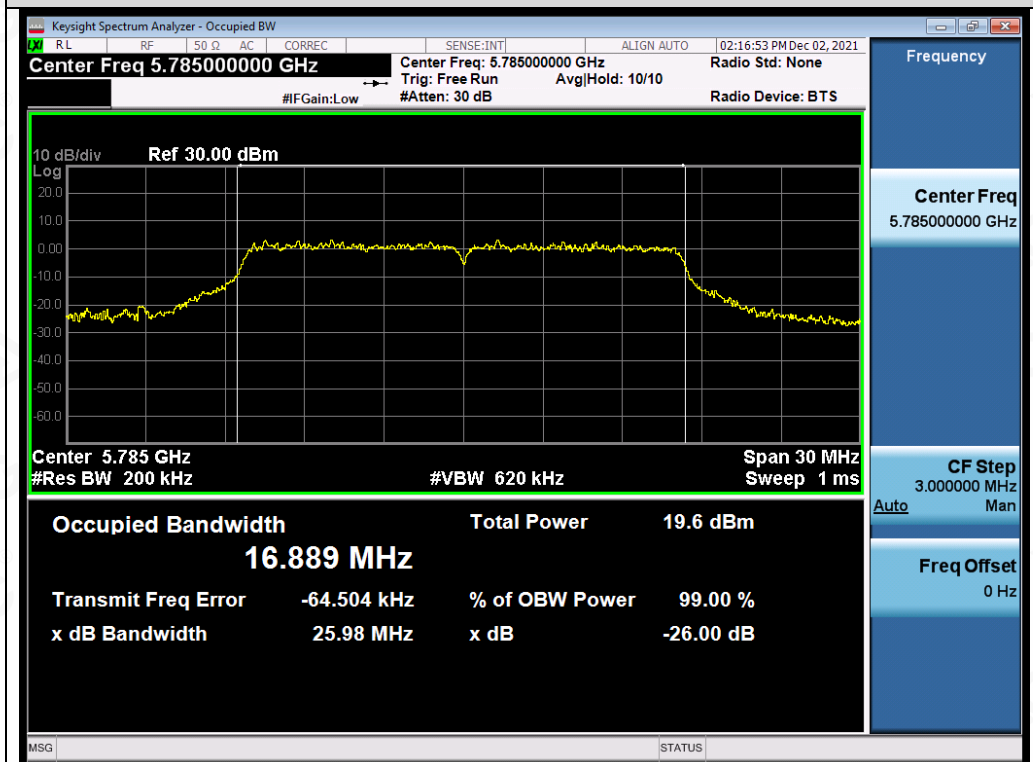
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Test Graphs of Occupied Bandwidth for band 5.725-5.85 GHz



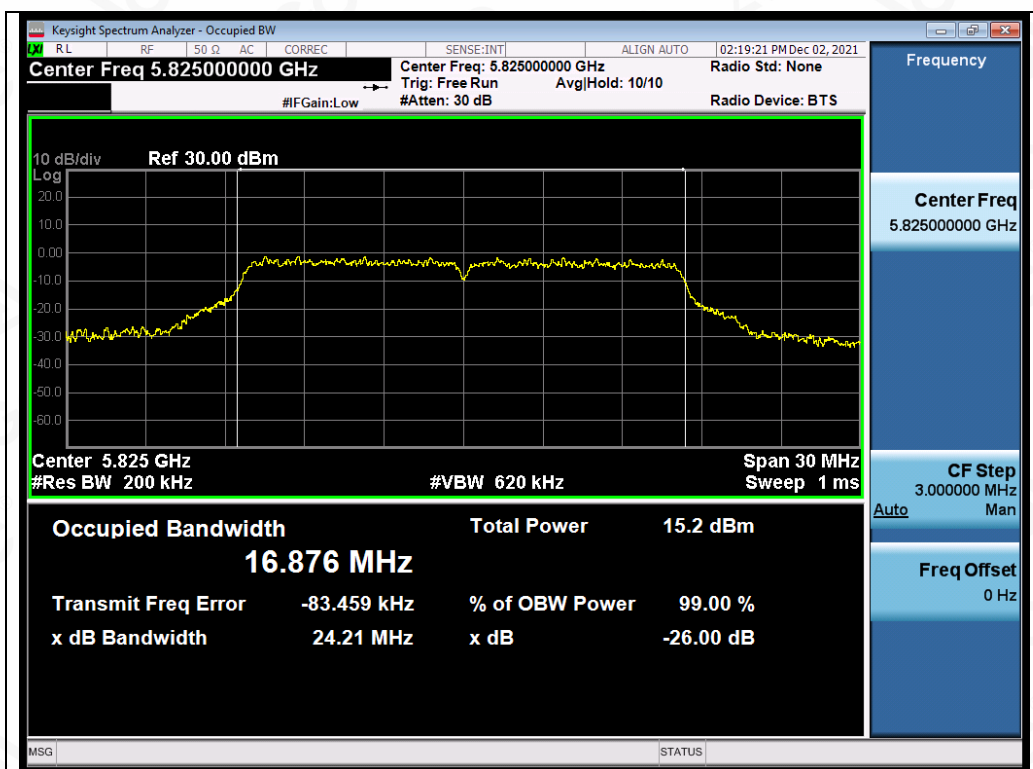
Test_Graph_802.11a_ANT1_5745_6Mbps_OBW



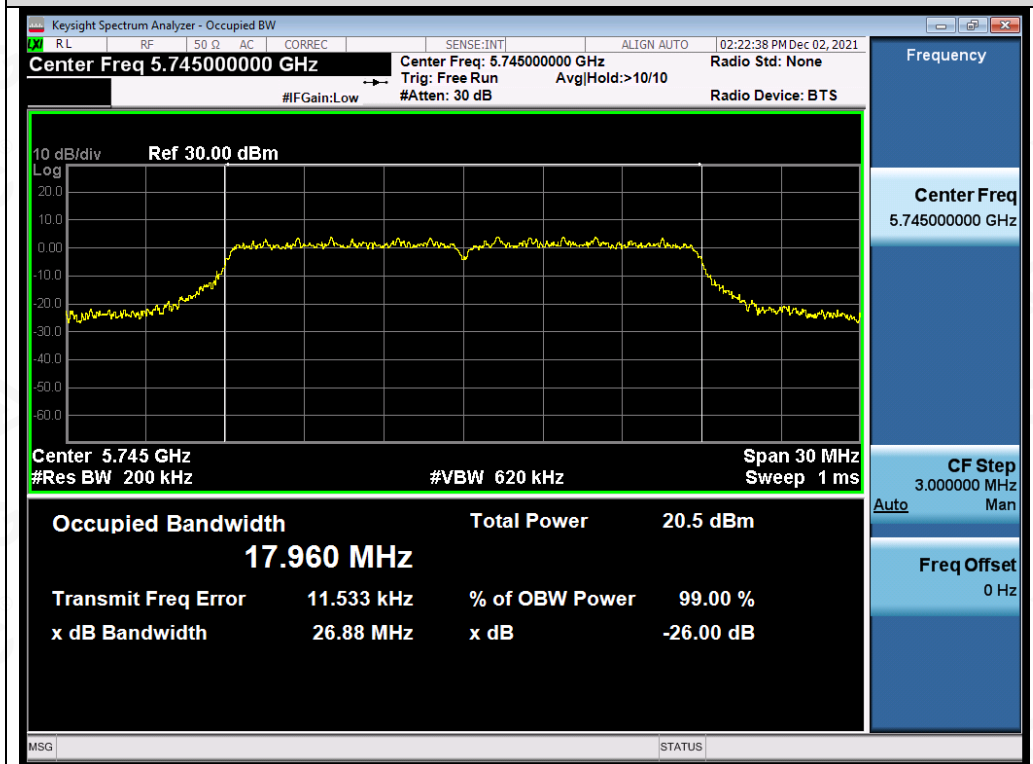
Test_Graph_802.11a_ANT1_5785_6Mbps_OBW

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Test_Graph_802.11a_ANT1_5825_6Mbps_OBW

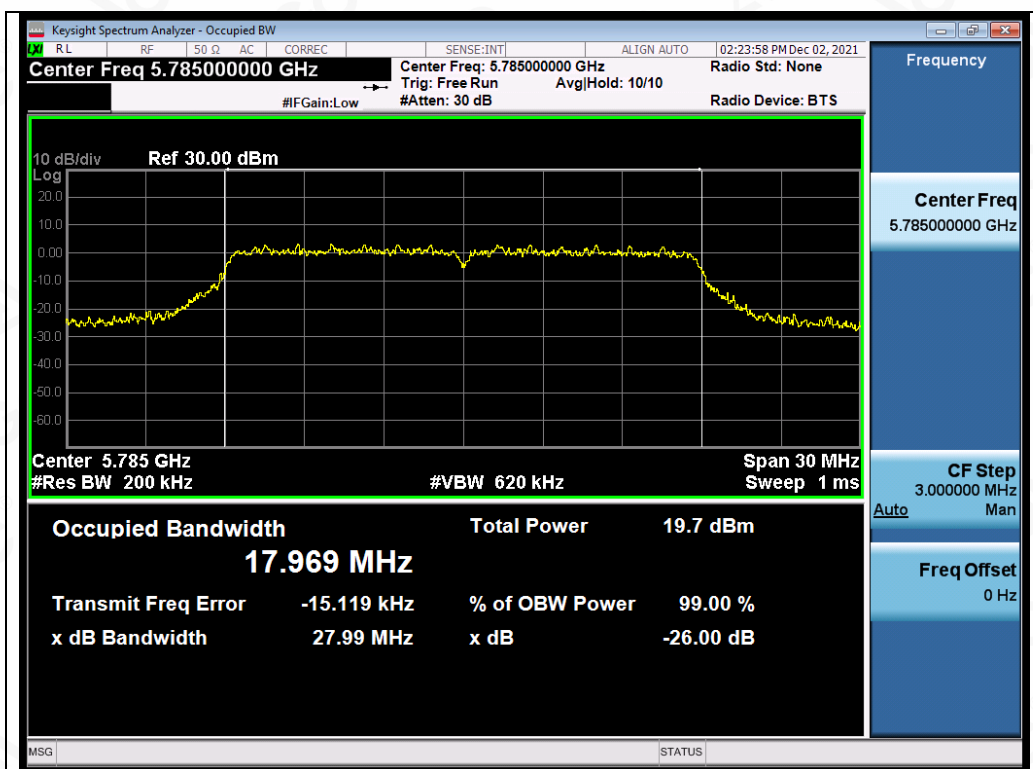


Test_Graph_802.11n20_ANT1_5745_MCS0_OBW

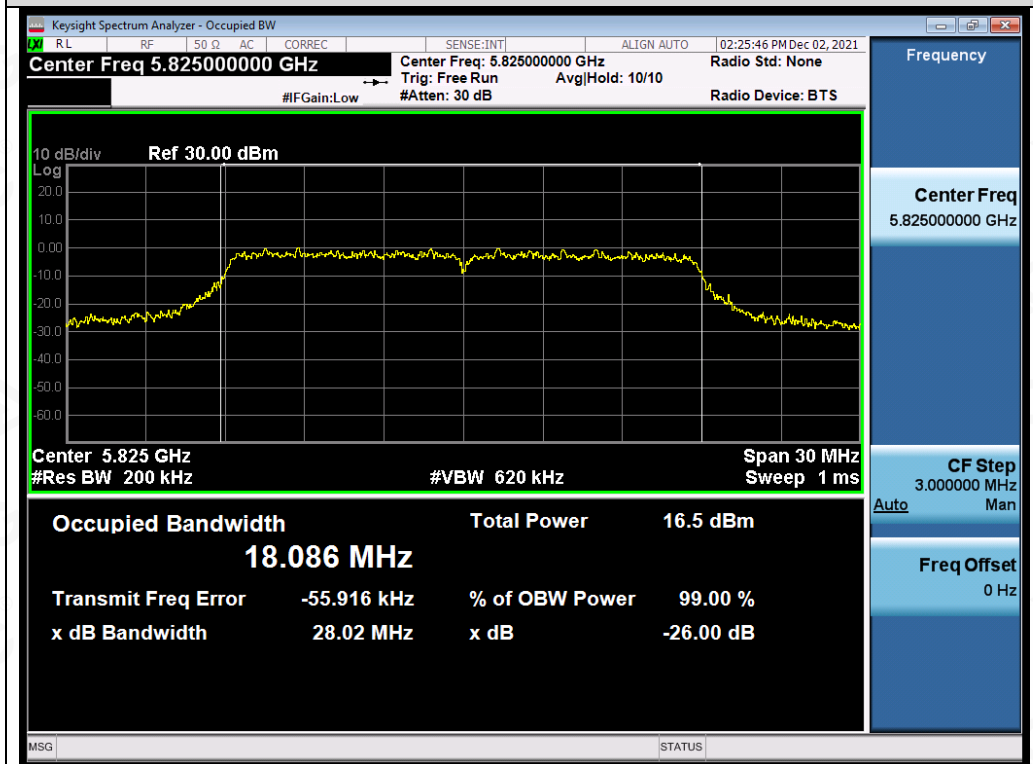
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Test_Graph_802.11n20_ANT1_5785_MCS0_OBW

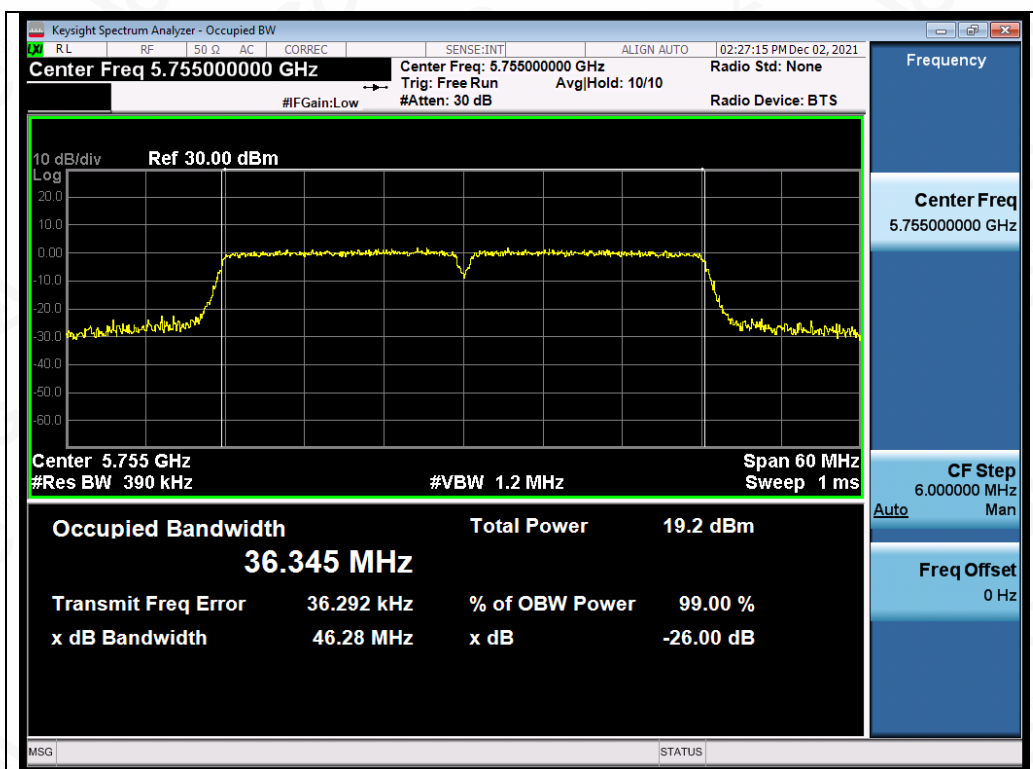


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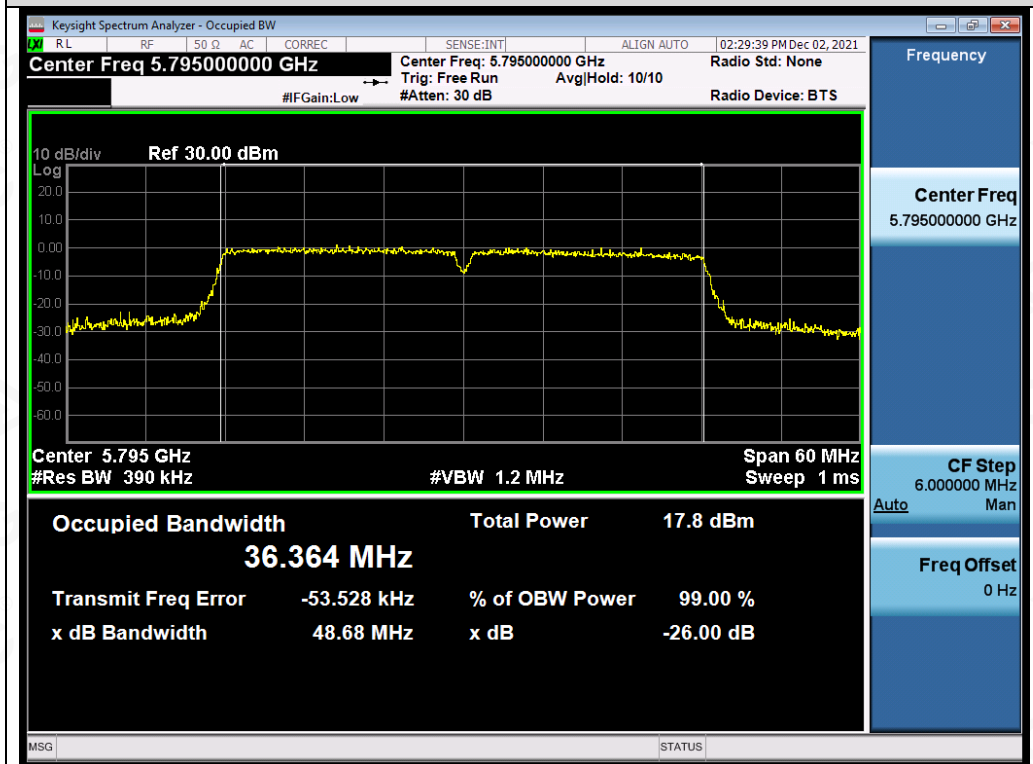
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Test_Graph_802.11n40_ANT1_5755_MCS0_OBW

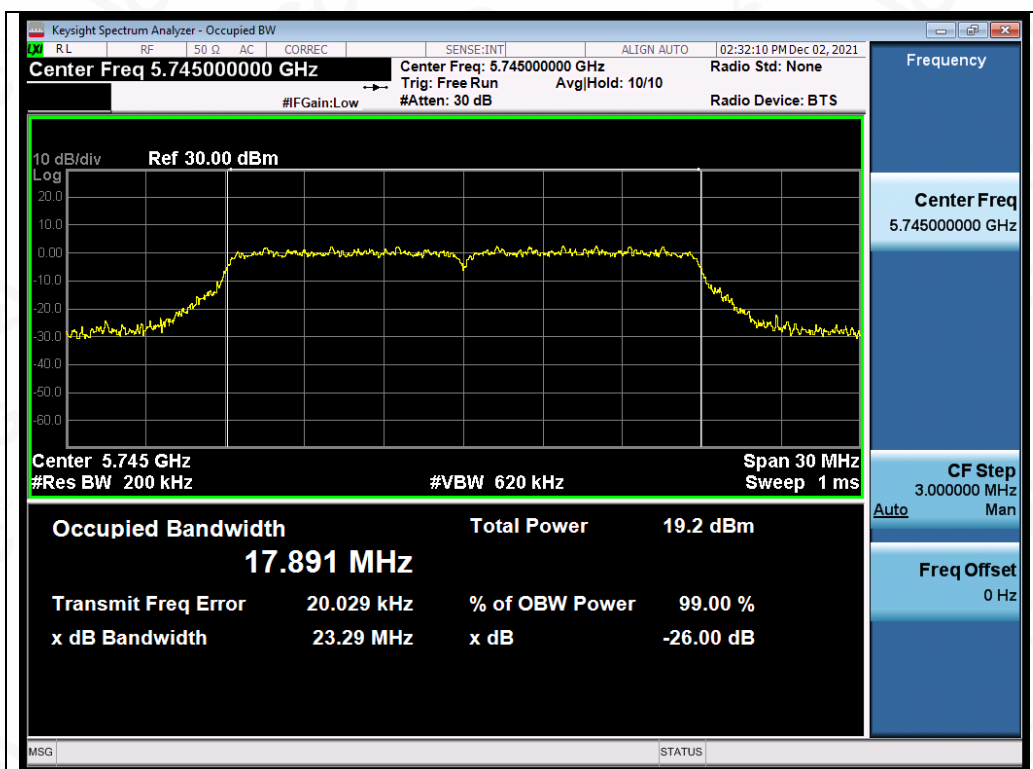


Test_Graph_802.11n40_ANT1_5795_MCS0_OBW

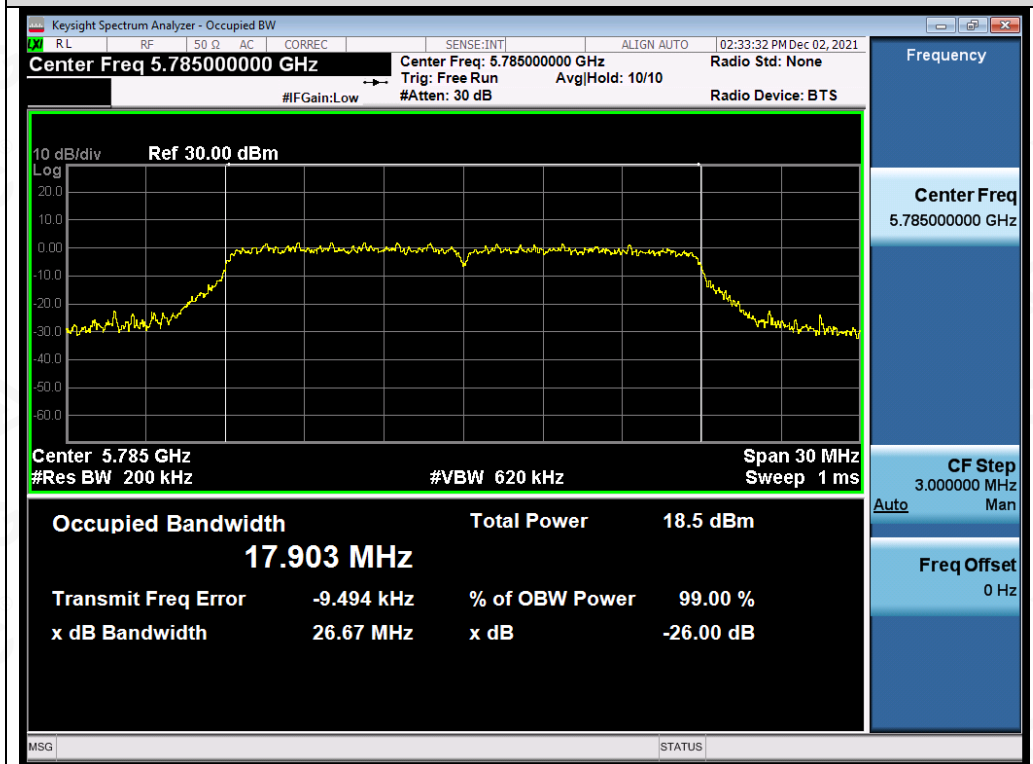
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Test_Graph_802.11ac20_ANT1_5745_MCS0_OBW

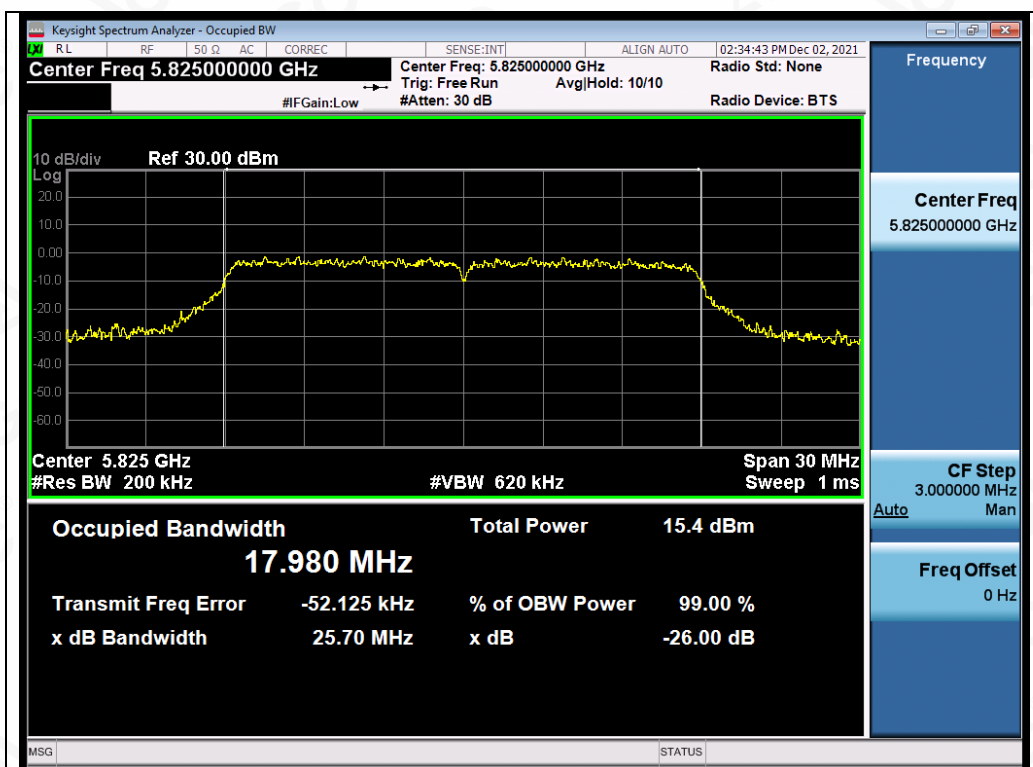


Test_Graph_802.11ac20_ANT1_5785_MCS0_OBW

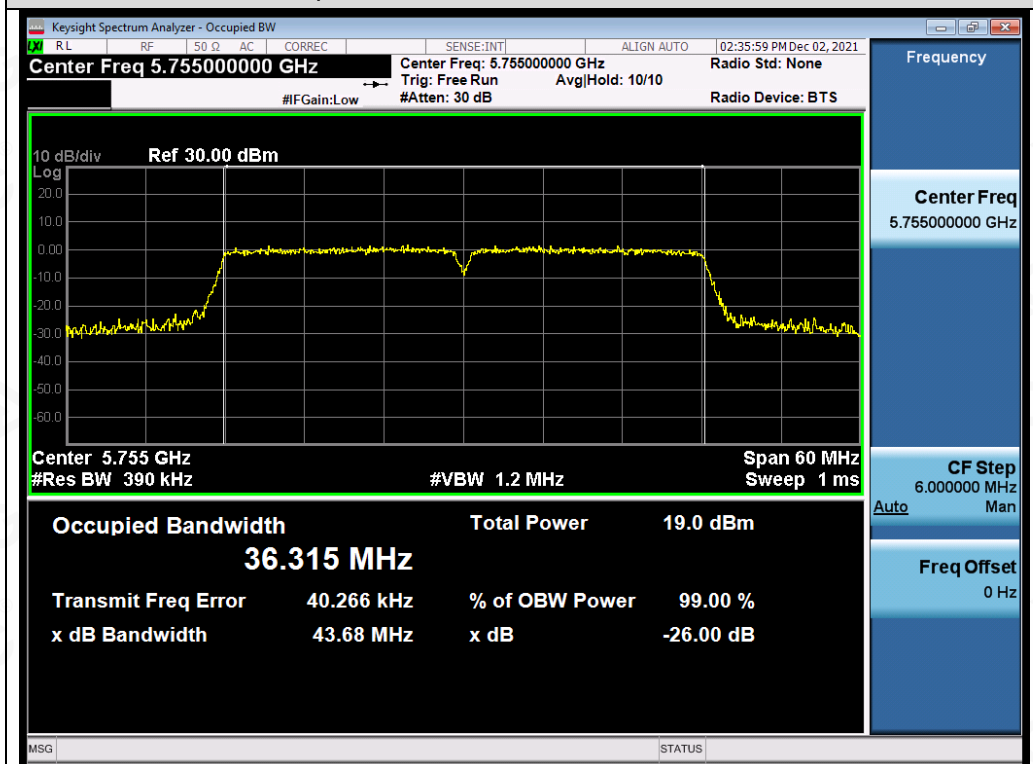
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Test_Graph_802.11ac20_ANT1_5825_MCS9_OBW

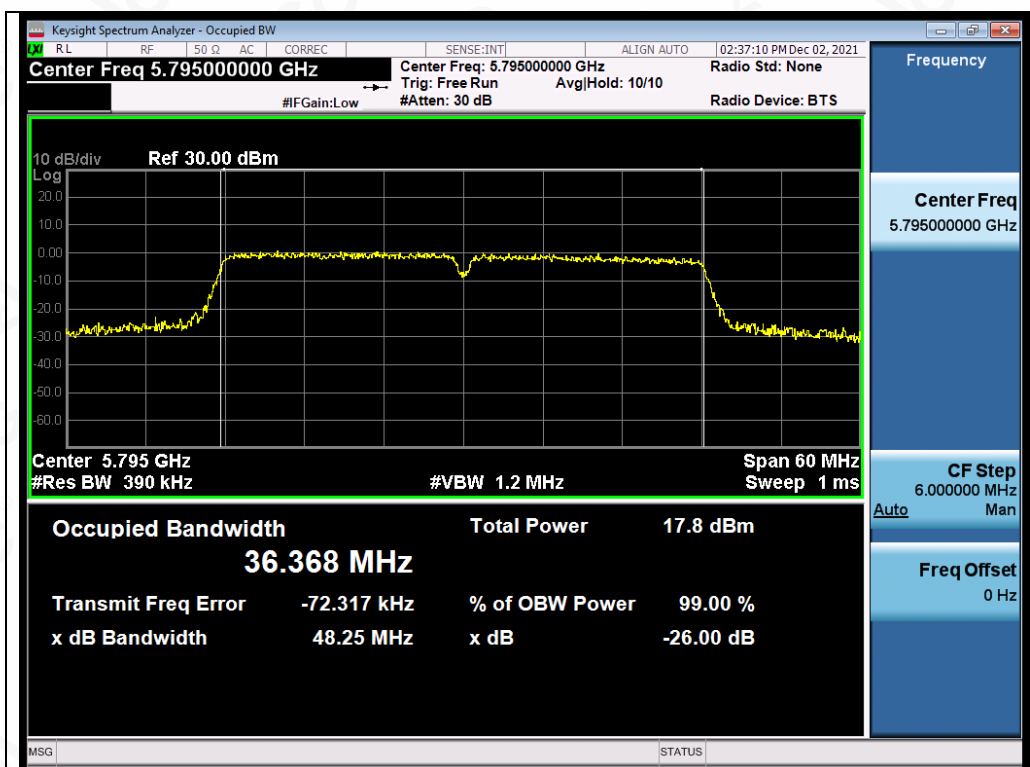


Test_Graph_802.11ac40_ANT1_5755_MCS9_OBW

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Test_Graph_802.11ac40_ANT1_5795_MCS9_OBW



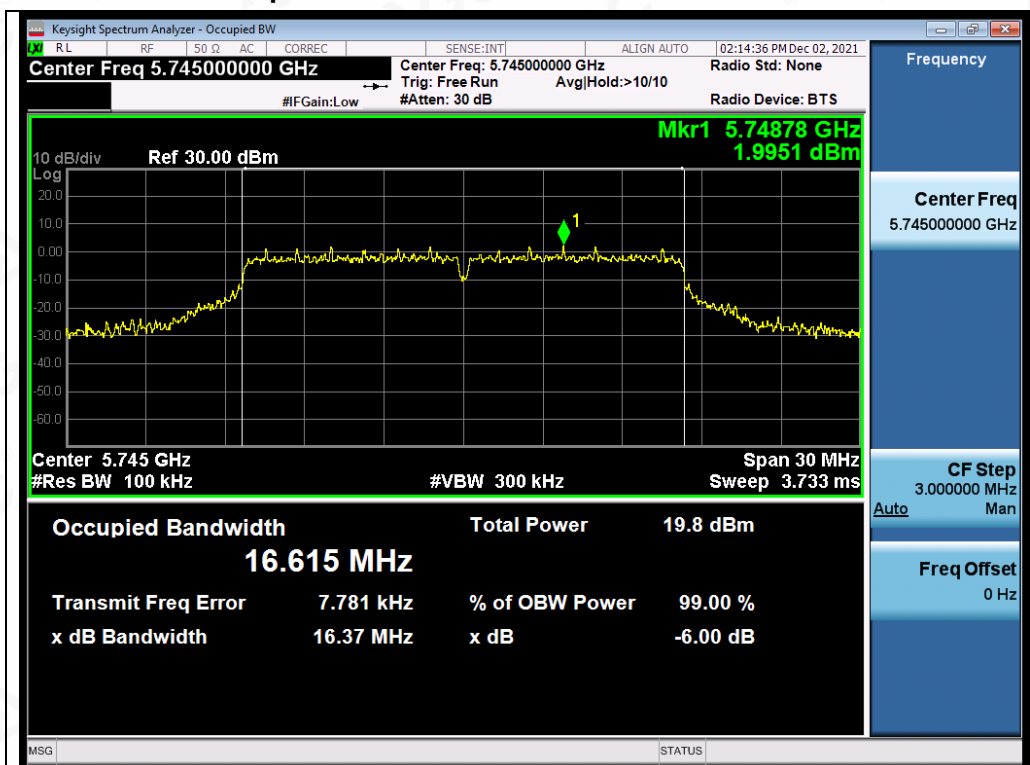
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Test Graphs of DTS Bandwidth for band 5.725-5.85 GHz



Test_Graph_802.11a_ANT1_5745_6Mbps_DTSBW



Test_Graph_802.11a_ANT1_5785_6Mbps_DTSBW

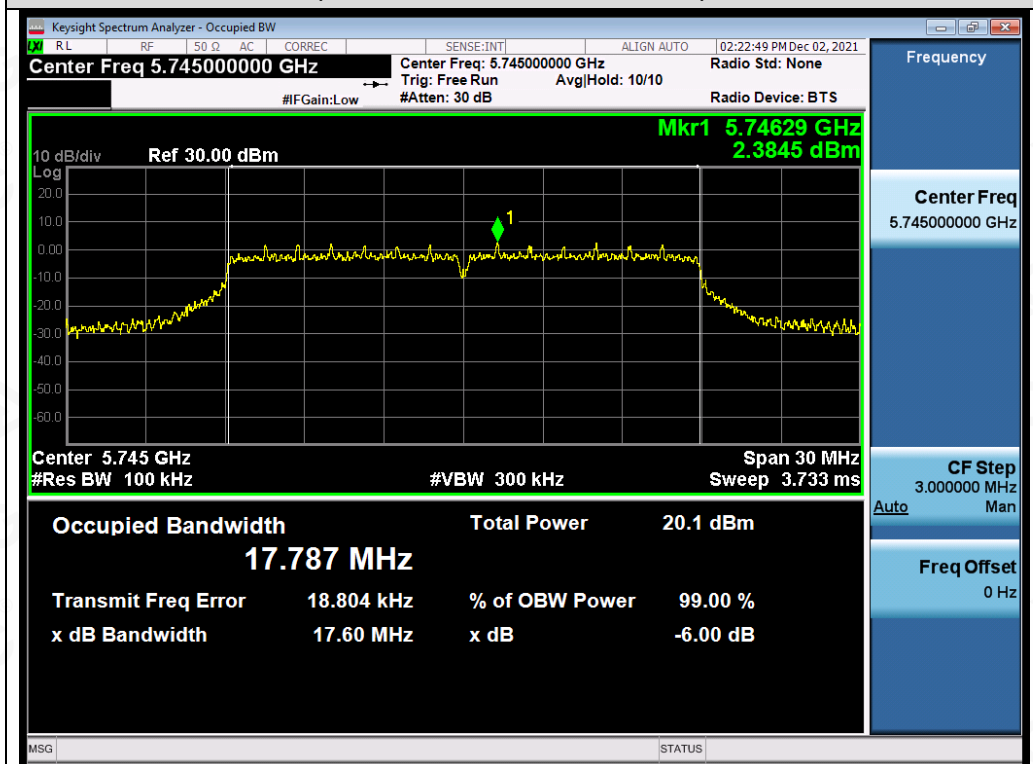
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Test_Graph_802.11a_ANT1_5825_6Mbps_DTSBW

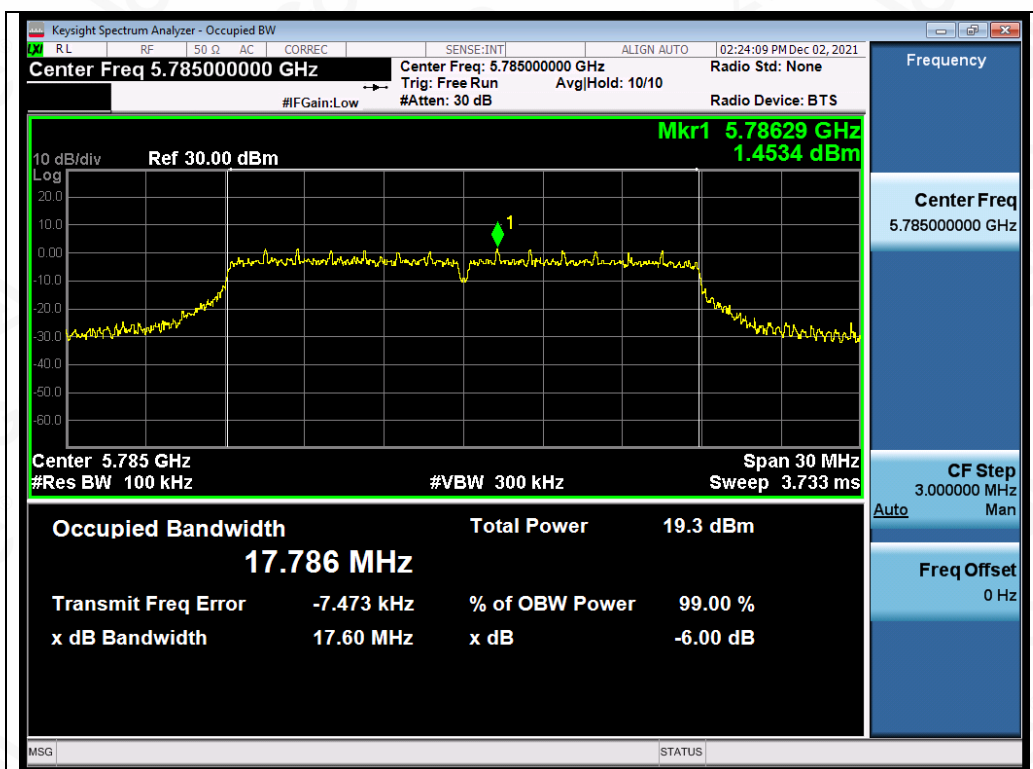


Test_Graph_802.11n20_ANT1_5745_MCS0_DTSBW

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Test_Graph_802.11n20_ANT1_5785_MCS0_DTSBW

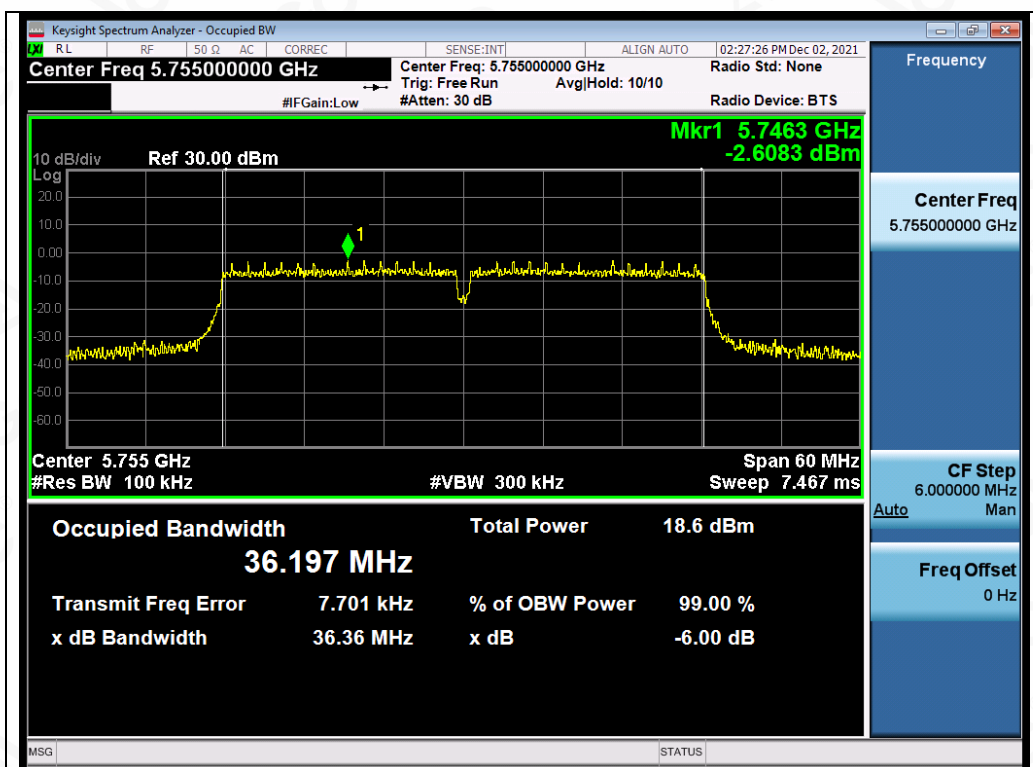


Test_Graph_802.11n20_ANT1_5825_MCS0_DTSBW

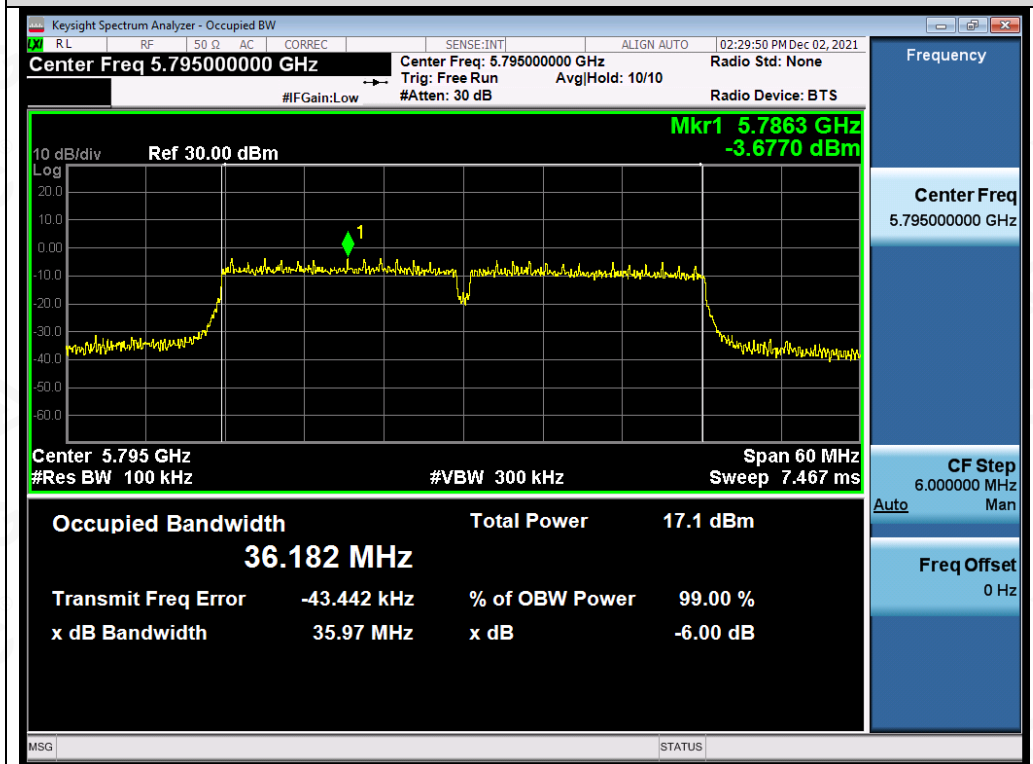
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Test_Graph_802.11n40_ANT1_5755_MCS0_DTSBW



Test_Graph_802.11n40_ANT1_5795_MCS0_DTSBW

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