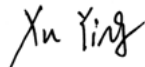


RF TEST REPORT

Applicant	Quectel Wireless Solutions Company Limited
FCC ID	XMR202309AF55C
Product	Wi-Fi & Bluetooth Module
Brand	Quectel
Model	AF55C
Report No.	R2308A0966-R3V2
Issue Date	December 15, 2023

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15E (2022)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.



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Approved by: Xu Kai

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Version	Revision Description	Issue Date
Rev.0	Initial issue of report.	December 8, 2023
Rev.1	Update information.	December 12, 2023
Rev.2	Update information.	December 15, 2023
<p>Note: This revised report (Report No.: R2308A0966-R3V2) supersedes and replaces the previously issued report (Report No.: R2308A0966-R3V1). Please discard or destroy the previously issued report and dispose of it accordingly.</p>		

Summary of measurement results

Number	Test Case	Clause in FCC rules	Verdict
1	Average output power	15.407(a)	PASS
2	Occupied bandwidth	15.407(e)	PASS
3	Frequency stability	15.407(g)	PASS
4	Power spectral density	15.407(a)	PASS
5	Unwanted Emissions	15.407(b)	PASS
6	Conducted Emissions	15.207	PASS
Date of Testing: September 20, 2023 ~ November 20, 2023 Date of Sample Received: September 11, 2023			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

1. Test Laboratory

1.1. Notes of the test report

This report shall not be reproduced in full or partial, without the written approval of **TA Technology (Shanghai) Co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
 Address: Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China
 City: Shanghai
 Post code: 201201
 Country: P. R. China
 Contact: Xu Kai
 Telephone: +86-021-50791141/2/3
 Fax: +86-021-50791141/2/3-8000
 Website: <http://www.ta-shanghai.com>
 E-mail: xukai@ta-shanghai.com

2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	Quectel Wireless Solutions Company Limited
Applicant address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China, 200233
Manufacturer	Quectel Wireless Solutions Company Limited
Manufacturer address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China, 200233

2.2. General information

EUT Description			
Model	AF55C		
SN	Conducted	P1C23GK0B001141	
	Radiated	P1C23GK0B000182	
Hardware Version	R1.0		
Software Version	NA		
Power Supply	External power supply		
Antenna Type	Dipole Antenna		
Antenna Connector	RP SMA Male antenna (meet with the standard FCC Part 15.203 requirement)		
Antenna Gain	U-NII-1: -0.9dBi U-NII-2A: -1.4dBi U-NII-2C: -0.3dBi U-NII-3: 0.4dBi		
Additional Beamforming Gain	NA		
Directional Gain	Power	U-NII-1	-0.9dBi
		U-NII-2A	-1.4dBi
		U-NII-2C	-0.3dBi
		U-NII-3	0.4dBi
	PSD	U-NII-1	2.11dBi
		U-NII-2A	1.61dBi
		U-NII-2C	2.71dBi
		U-NII-3	3.41dBi
Operating Frequency Range(s)	U-NII-1: 5150MHz-5250MHz U-NII-2A: 5250MHz -5350MHz U-NII-2C: 5470MHz-5600MHz, 5650MHz-5725MHz U-NII-3: 5725MHz -5850MHz		

Modulation Type	802.11a: OFDM 802.11n(HT20/HT40): OFDM 802.11ac(VHT20/VHT40/VHT80): OFDM 802.11ax (Support Full RU only) (HE20/HE40/HE80): OFDM
Max. Output Power	19.11 dBm
Testing temperature range	-30 ° C to 50° C
Operating temperature range	-40 ° C to 85 ° C
Operating voltage range	3 V to 3.8 V
State voltage	3.3 V
Auxiliary test equipment	
Switching Adapter	Manufacturer: Dong Guan City GangQi Electronic Co.Ltd Model: GQ36-120300-AX
<p>Note:</p> <ol style="list-style-type: none"> 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant. 2. This device support automatically discontinue transmission, while the device is not transmitting any information, the device can automatically discontinue transmission and become standby mode for power saving. The device can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission. 3. (a) Manufacturers implements security features in any digitally modulated devices capable of operating in any of the U-NII bands, so that third parties are not able to reprogram the device to operate outside the parameters for which the device was certified. The software prevents the user from operating the transmitter with operating frequencies, output power, modulation types or other radio frequency parameters outside those that were approved for the device. Manufacturers uses means including, but not limited to the use of a private network that allows only authenticated users to download software, electronic signatures in software or coding in hardware that is decoded by software to verify that new software can be legally loaded into a device to meet these requirements and must describe the methods in their application for equipment authorization. (b) Manufacturers take steps to ensure that DFS functionality cannot be disabled by the operator of the U-NII device. 	

3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

FCC CFR47 Part 15E (2022) Unlicensed National Information Infrastructure Devices

ANSI C63.10-2013

Reference standard:

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

4. Test Configuration

Test Mode

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The radiated emission was measured in the following position: EUT stand-up position (vertical), lie-down position (horizontal). The worst emission was found in stand-up position (vertical) and the worst case was recorded.

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate. Preliminary tests have been done on all the configuration for confirming worst case. Data rate below means worst-case rate of each test item.

Worst-case data rates are shown as following table.

Mode	Data Rate		
	Antenna 1	Antenna 2	MIMO
802.11a	6 Mbps	6 Mbps	/
802.11n HT20	MCS0	MCS0	MCS8
802.11n HT40	MCS0	MCS0	MCS8
802.11ac VHT20	MCS0	MCS0	MCS0
802.11ac VHT40	MCS0	MCS0	MCS0
802.11ac VHT80	MCS0	MCS0	MCS0
802.11ax HE20	MCS0	MCS0	MCS0
802.11ax HE40	MCS0	MCS0	MCS0
802.11ax HE80	MCS0	MCS0	MCS0

The worst case Antenna mode for each of the following tests for Wi-Fi:

Test Cases	Antenna 1	Antenna 2	MIMO
Average conducted output power	O	O	802.11n HT20/40 802.11ac VHT20/40/80 802.11ax HE20/40/80
Occupied bandwidth	--	802.11a	802.11n HT20/40 802.11ac VHT20/40/80 802.11ax HE20/40/80
Frequency stability	--	802.11a	--
Power Spectral Density	O	O	802.11n HT20/40 802.11ac VHT 20/40/80 802.11ax HE20/40/80
Unwanted Emissions	802.11a	--	802.11ac VHT 40/80 802.11ax HE80
Conducted Emissions	--	--	802.11ax HE40, Channel 118
Note: "O": test all bands			

Wireless Technology and Frequency Range

Wireless Technology		Bandwidth	Channel	Frequency	
Wi-Fi	U-NII-1	20 MHz	36	5180MHz	
			40	5200MHz	
			44	5220MHz	
			48	5240MHz	
		40 MHz	38	5190MHz	
			46	5230MHz	
			42	5210MHz	
		U-NII-2A	20 MHz	52	5260MHz
				56	5280MHz
	60			5300MHz	
	64			5320MHz	
	40 MHz		54	5270MHz	
			62	5310MHz	
			58	5290MHz	
	U-NII-2C		20 MHz	100	5500MHz
				104	5520MHz
		108		5540MHz	
		112		5560MHz	
		116		5580MHz	
		132		5660MHz	
		136		5680MHz	
		140		5700MHz	
		144		5720MHz	
		40 MHz	102	5510MHz	
			110	5550MHz	
			134	5670MHz	
			142	5710MHz	
		80 MHz	106	5530MHz	
			138	5690MHz	
	U-NII-3	20 MHz	149	5745MHz	
153			5765MHz		
157			5785MHz		
161			5805MHz		
165			5825MHz		
40 MHz		151	5755MHz		
		159	5795MHz		
80 MHz		155	5775MHz		
Does this device support TPC Function? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
Does this device support TDWR Band? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					

5. Test Case Results

5.1. Occupied Bandwidth

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable.

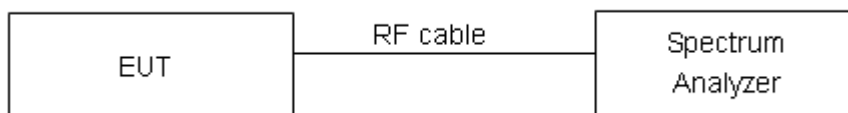
For U-NII-1/U-NII-2A/U-NII-2C, set RBW \approx 1% OCB kHz, VBW \geq 3 \times RBW, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

For U-NII-3, Set RBW = 100 kHz, VBW \geq 3 \times RBW, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

Use the 99 % power bandwidth function of the instrument

Test Setup



Limits

For U-NII-1/U-NII-2A/U-NII-2C

No specific occupied bandwidth requirements in Part 15.407.

For U-NII-3

Rule FCC Part §15.407(e)

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 936$ Hz.

Test Results:
U-NII-1

Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	5180	16.741	21.157	PASS
	5200	16.688	21.372	PASS
	5240	16.713	21.265	PASS
802.11n HT20	5180	17.836	21.161	PASS
	5200	17.834	21.205	PASS
	5240	17.762	21.117	PASS
802.11n HT40	5190	36.315	40.345	PASS
	5230	36.311	40.553	PASS
802.11ac VHT20	5180	17.786	21.147	PASS
	5200	17.839	21.246	PASS
	5240	17.808	21.406	PASS
802.11ac VHT40	5190	36.284	40.358	PASS
	5230	36.260	40.707	PASS
802.11ac VHT80	5210	75.703	81.360	PASS
802.11ax HE20	5180	19.052	21.432	PASS
	5200	19.045	21.212	PASS
	5240	19.042	21.473	PASS
802.11ax HE40	5190	37.606	39.943	PASS
	5230	37.622	40.489	PASS
802.11ax HE80	5210	77.108	81.386	PASS

U-NII-2A

Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	5260	16.735	20.973	PASS
	5300	16.732	21.333	PASS
	5320	16.770	21.388	PASS
802.11n HT20	5260	17.807	21.208	PASS
	5300	17.881	21.546	PASS
	5320	17.896	21.425	PASS
802.11n HT40	5270	36.338	40.897	PASS
	5310	36.306	40.275	PASS
802.11ac VHT20	5260	17.851	21.378	PASS
	5300	17.787	21.563	PASS
	5320	17.796	21.394	PASS
802.11ac VHT40	5270	36.306	40.502	PASS
	5310	36.322	40.352	PASS
802.11ac VHT80	5290	75.754	82.184	PASS
802.11ax HE20	5260	19.033	21.393	PASS
	5300	19.012	21.341	PASS
	5320	19.007	21.372	PASS
802.11ax HE40	5270	37.607	40.220	PASS
	5310	37.571	40.284	PASS
802.11ax HE80	5290	77.029	81.901	PASS

U-NII-2C

Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	5500	16.692	21.234	PASS
	5580	16.699	21.385	PASS
	5700	16.702	21.218	PASS
	5720	16.717	21.178	PASS
802.11n HT20	5500	17.787	21.271	PASS
	5580	17.834	21.204	PASS
	5700	17.856	21.568	PASS
	5720	17.843	21.274	PASS
802.11n HT40	5510	36.277	40.464	PASS
	5550	36.285	40.423	PASS
	5670	36.285	40.332	PASS
	5710	36.272	40.293	PASS
802.11ac VHT20	5500	17.822	21.296	PASS
	5580	17.876	21.372	PASS
	5700	17.857	21.283	PASS
	5720	17.849	21.580	PASS
802.11ac VHT40	5510	36.304	40.627	PASS
	5550	36.318	40.274	PASS
	5670	36.296	39.948	PASS
	5710	36.265	40.527	PASS
802.11ac VHT80	5530	75.795	81.669	PASS
	5690	75.762	81.854	PASS
802.11ax VHT20	5500	19.043	21.531	PASS
	5580	19.094	21.505	PASS
	5700	19.016	21.313	PASS
	5720	19.040	21.747	PASS
802.11ax HE40	5510	37.657	40.009	PASS
	5550	37.625	40.232	PASS
	5670	37.650	40.292	PASS
	5710	37.658	40.094	PASS
802.11ax HE80	5530	77.203	81.791	PASS
	5690	77.120	81.807	PASS

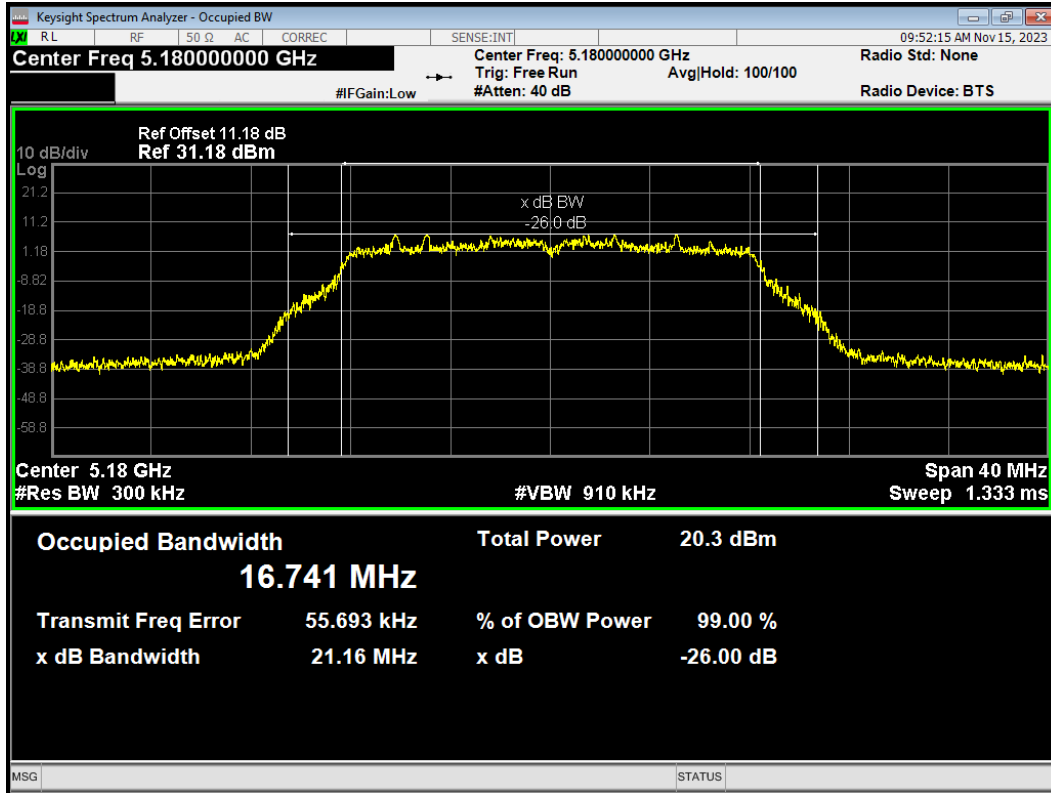
U-NII-3

Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11a	5720	16.644	13.824	500	PASS
	5745	16.754	15.110	500	PASS
	5785	16.673	15.147	500	PASS
	5825	16.738	15.107	500	PASS
802.11n HT20	5720	17.817	15.130	500	PASS
	5745	17.840	15.164	500	PASS
	5785	17.851	15.106	500	PASS
	5825	17.871	15.113	500	PASS
802.11n HT40	5710	36.281	36.289	500	PASS
	5755	36.332	36.059	500	PASS
	5795	36.219	35.118	500	PASS
802.11ac VHT20	5720	17.840	15.000	500	PASS
	5745	17.810	15.044	500	PASS
	5785	17.780	15.068	500	PASS
	5825	17.806	15.177	500	PASS
802.11ac VHT40	5710	36.332	35.441	500	PASS
	5755	36.322	35.513	500	PASS
	5795	36.296	35.323	500	PASS
802.11ac VHT80	5690	75.823	75.149	500	PASS
	5775	75.705	75.172	500	PASS
802.11ax HE20	5720	19.023	18.761	500	PASS
	5745	19.037	17.722	500	PASS
	5785	19.075	18.842	500	PASS
	5825	19.029	18.835	500	PASS
802.11ax HE40	5710	37.644	37.113	500	PASS
	5755	37.614	37.584	500	PASS
	5795	37.491	36.590	500	PASS
802.11ax HE80	5690	77.141	76.552	500	PASS
	5775	77.125	76.738	500	PASS

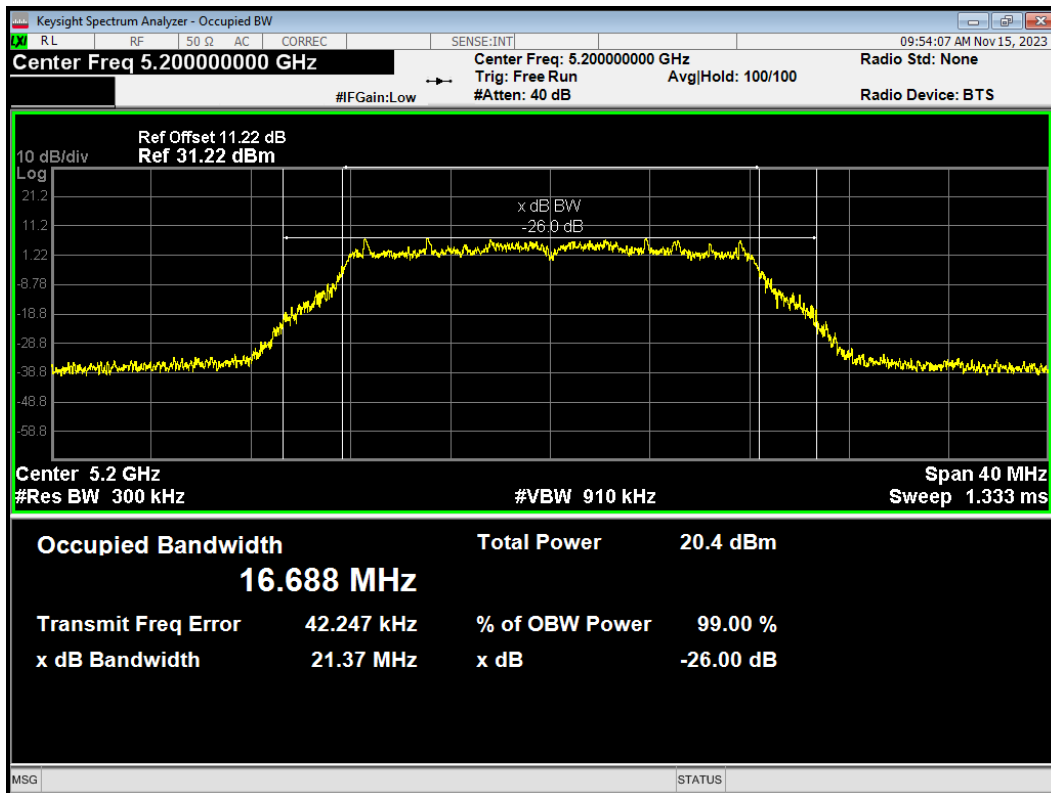
99% bandwidth

U-NII-1

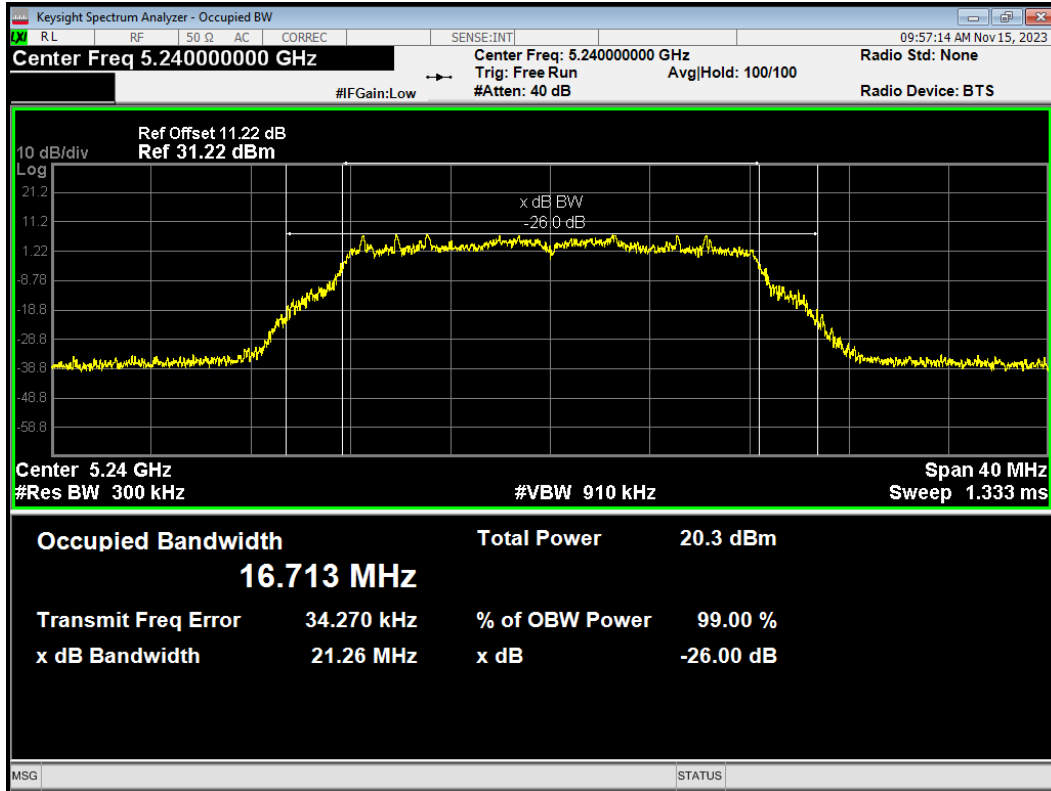
OBW 802.11a 5180MHz



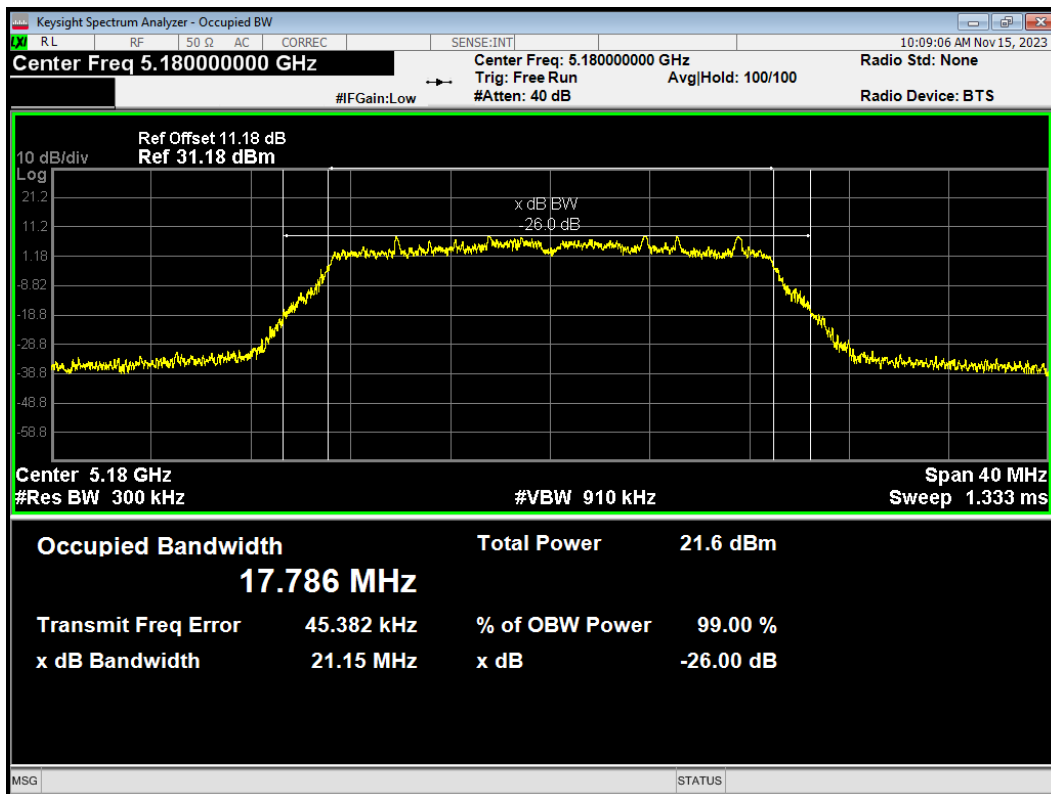
OBW 802.11a 5200MHz



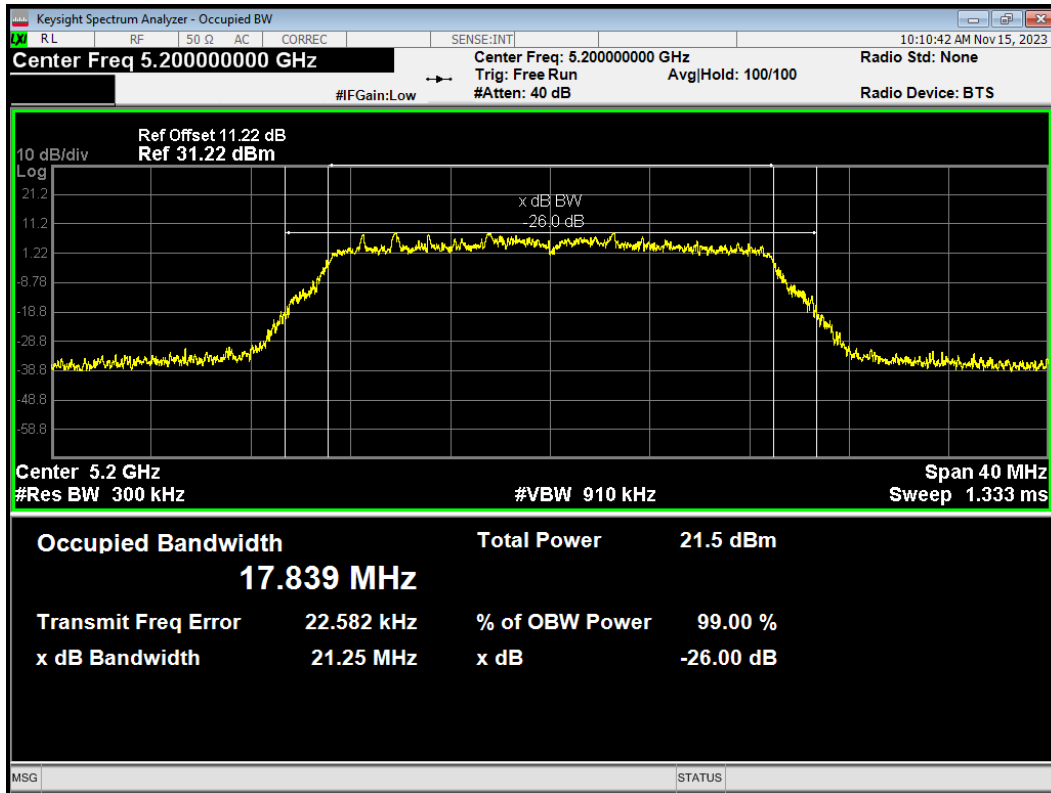
OBW 802.11a 5240MHz



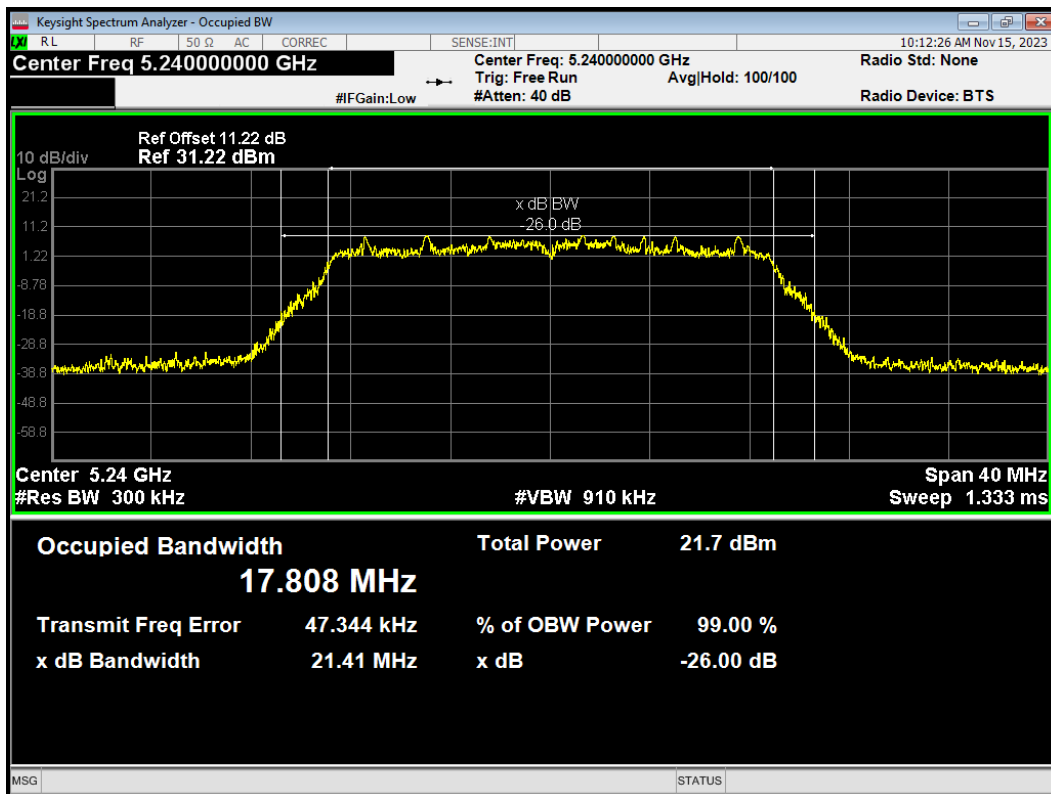
OBW 802.11ac(VHT20) 5180MHz



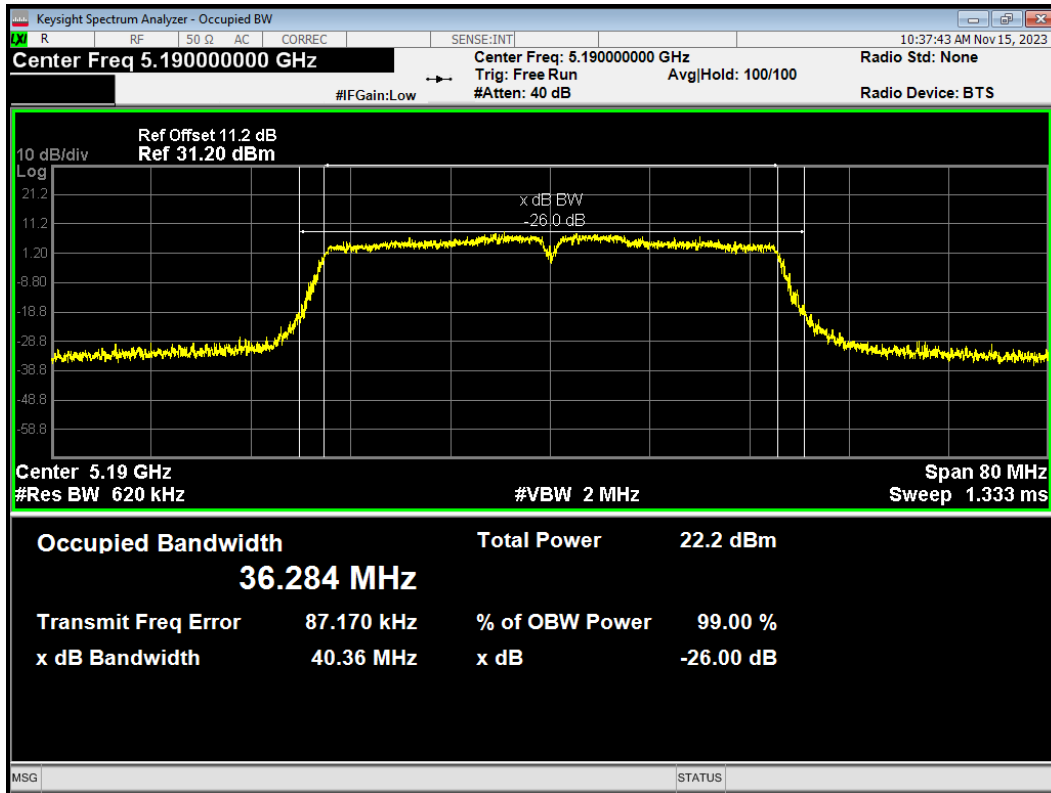
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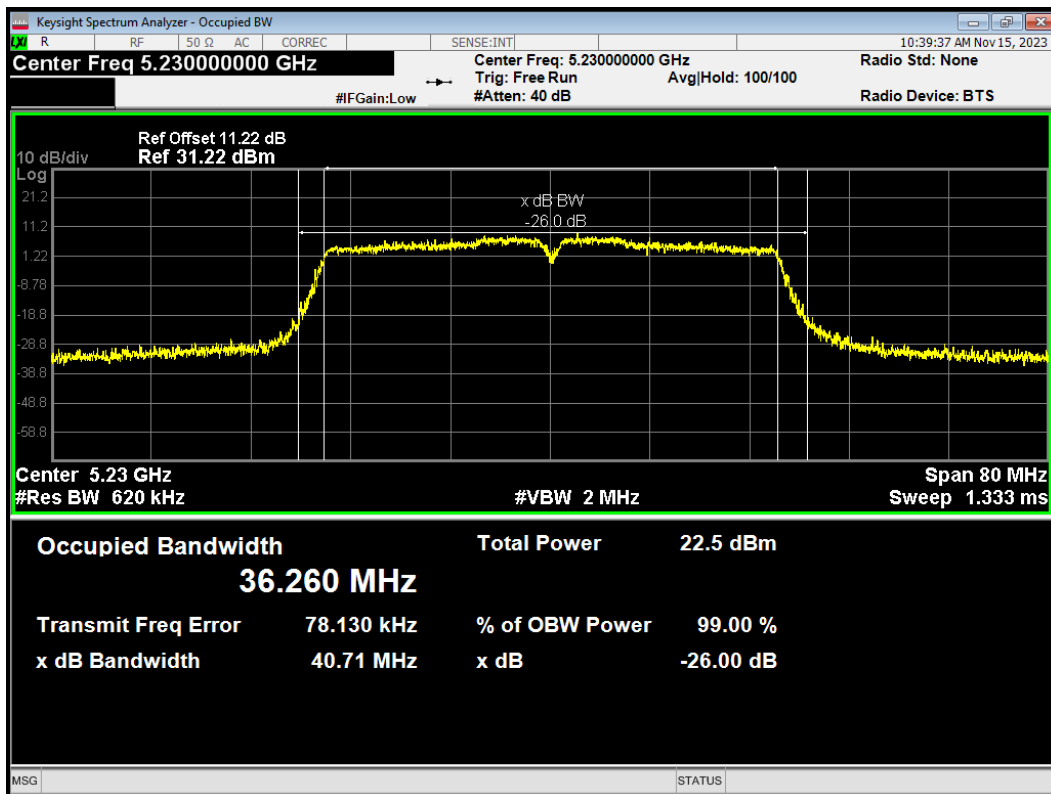
OBW 802.11ac(VHT20) 5240MHz



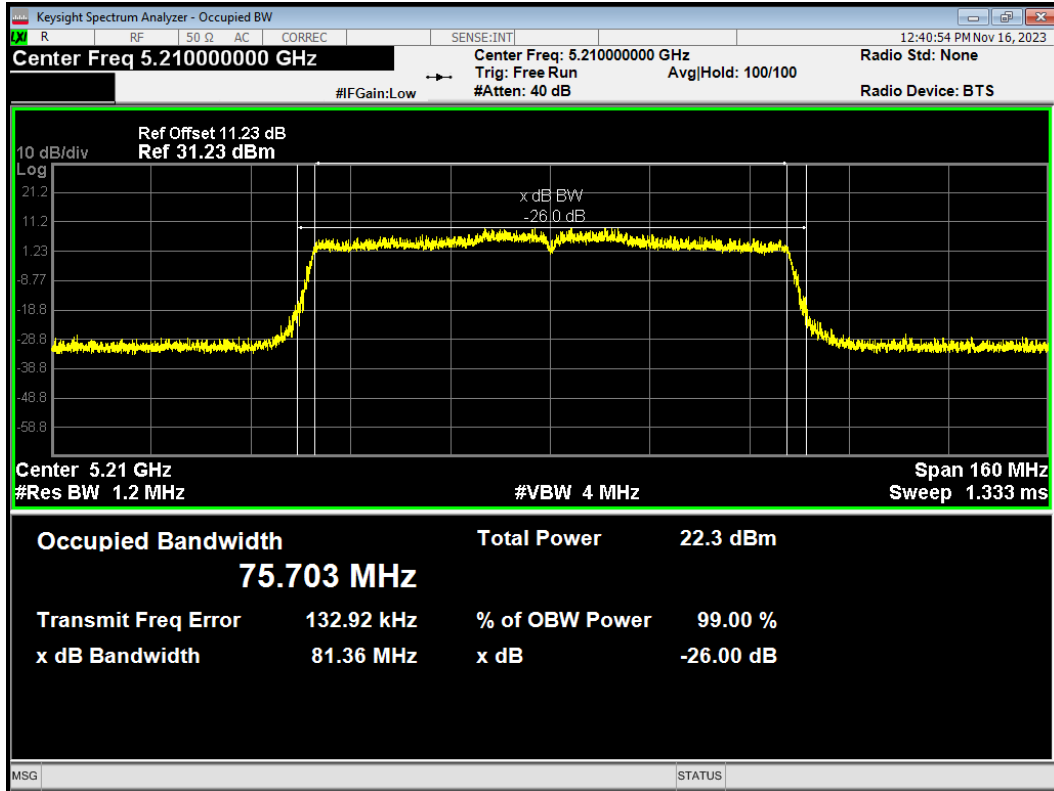
OBW 802.11ac(VHT40) 5190MHz



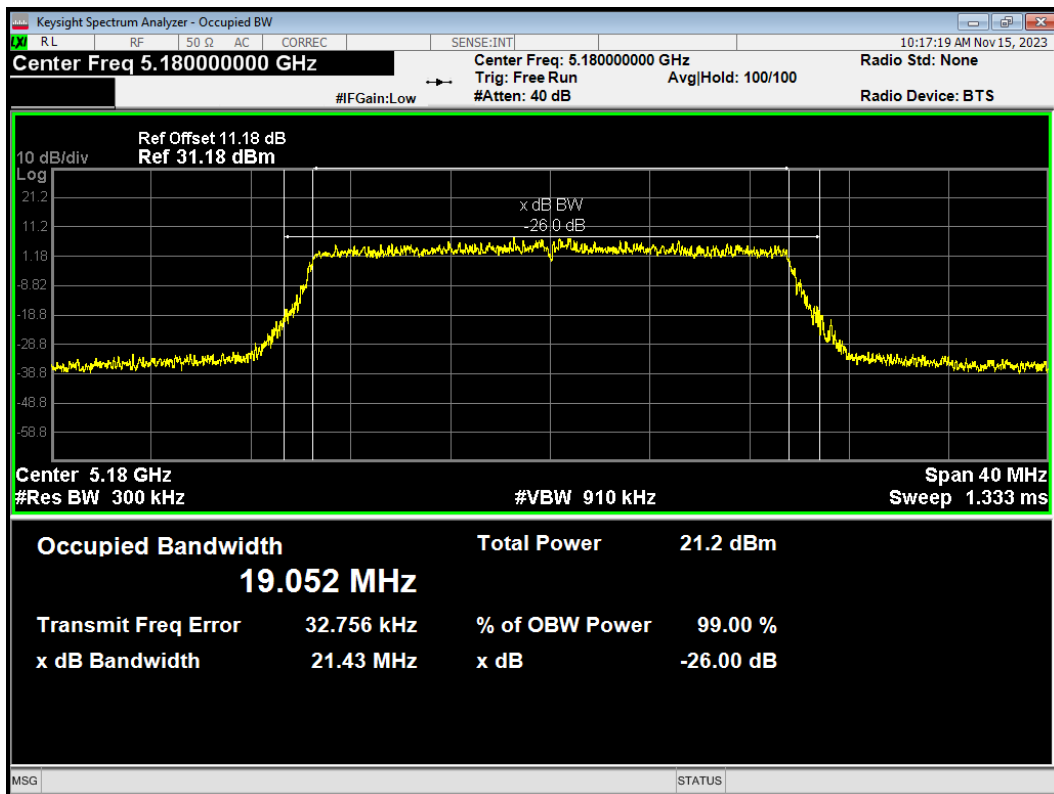
OBW 802.11ac(VHT40) 5230MHz



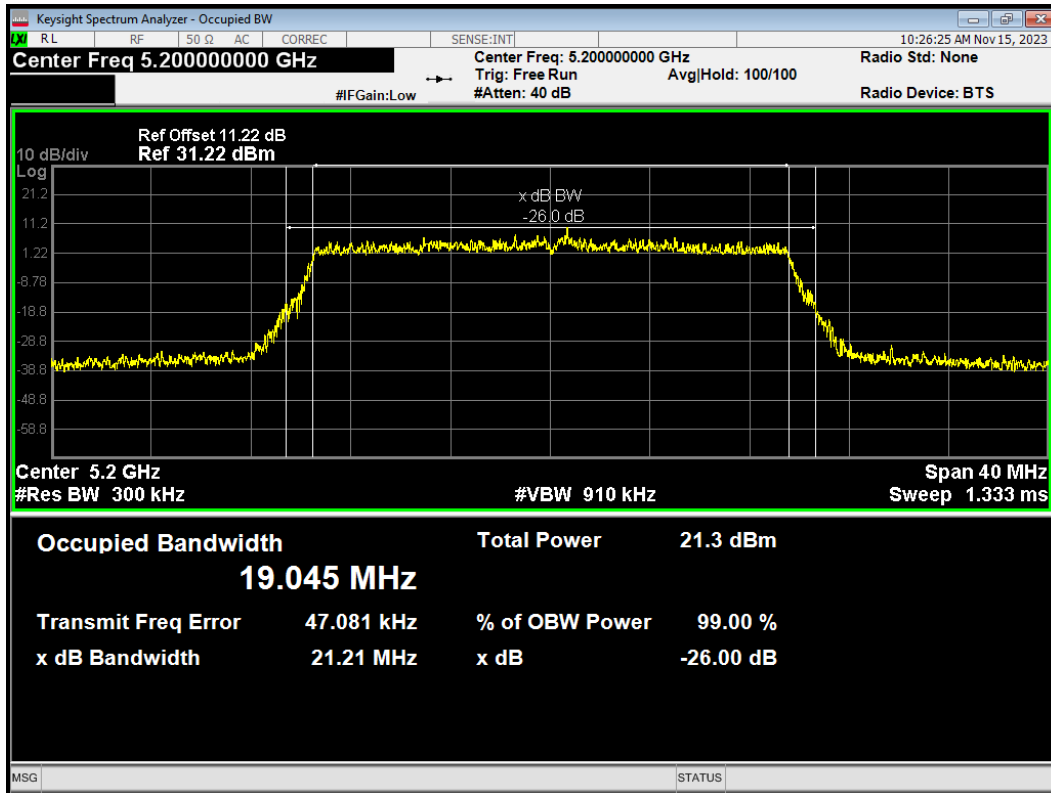
OBW 802.11ac(VHT80) 5210MHz



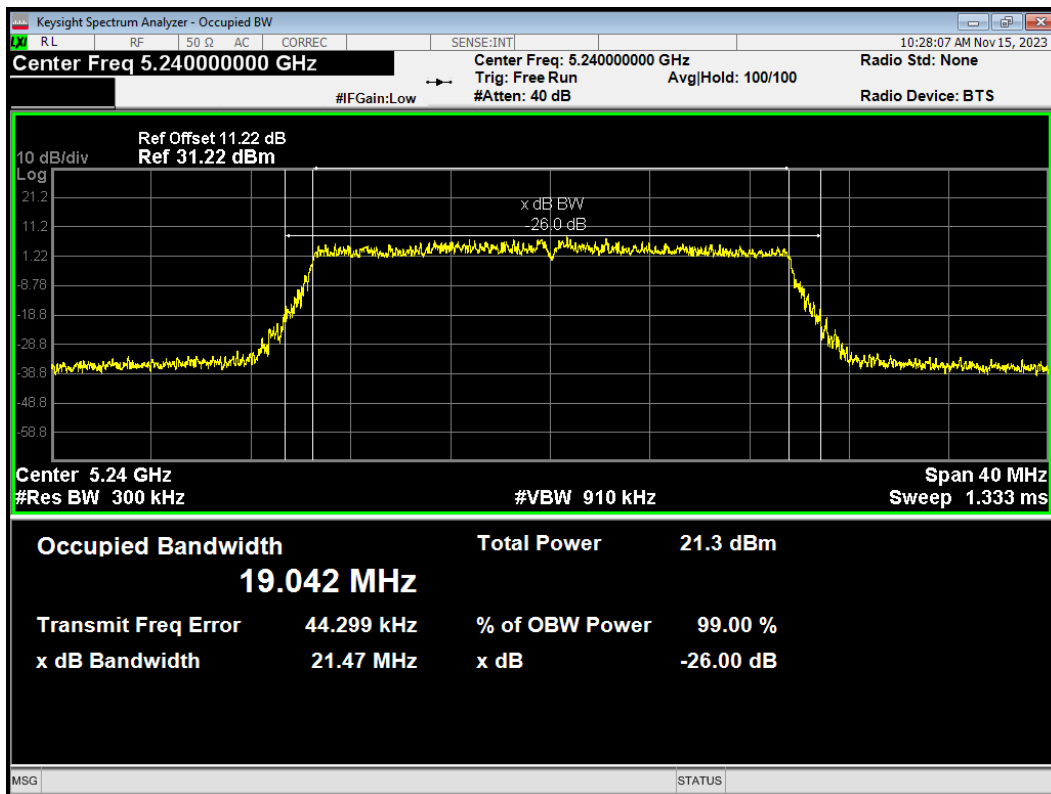
OBW 802.11ax(HE20) 5180MHz



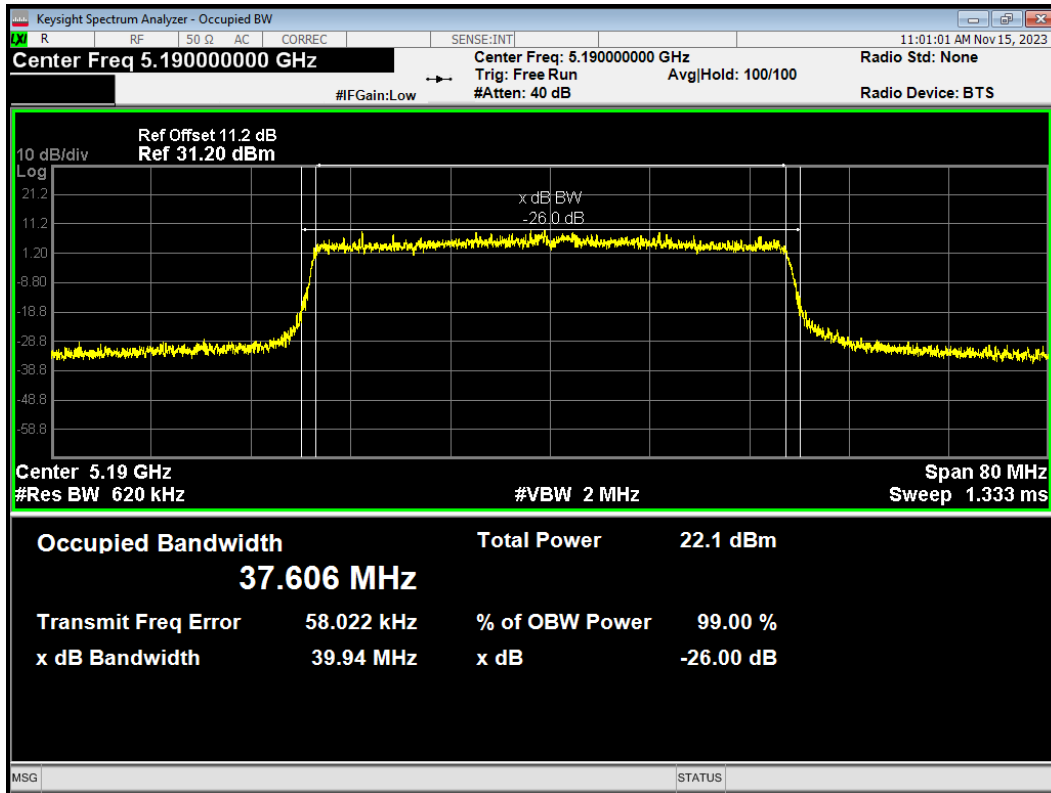
OBW 802.11ax(HE20) 5200MHz



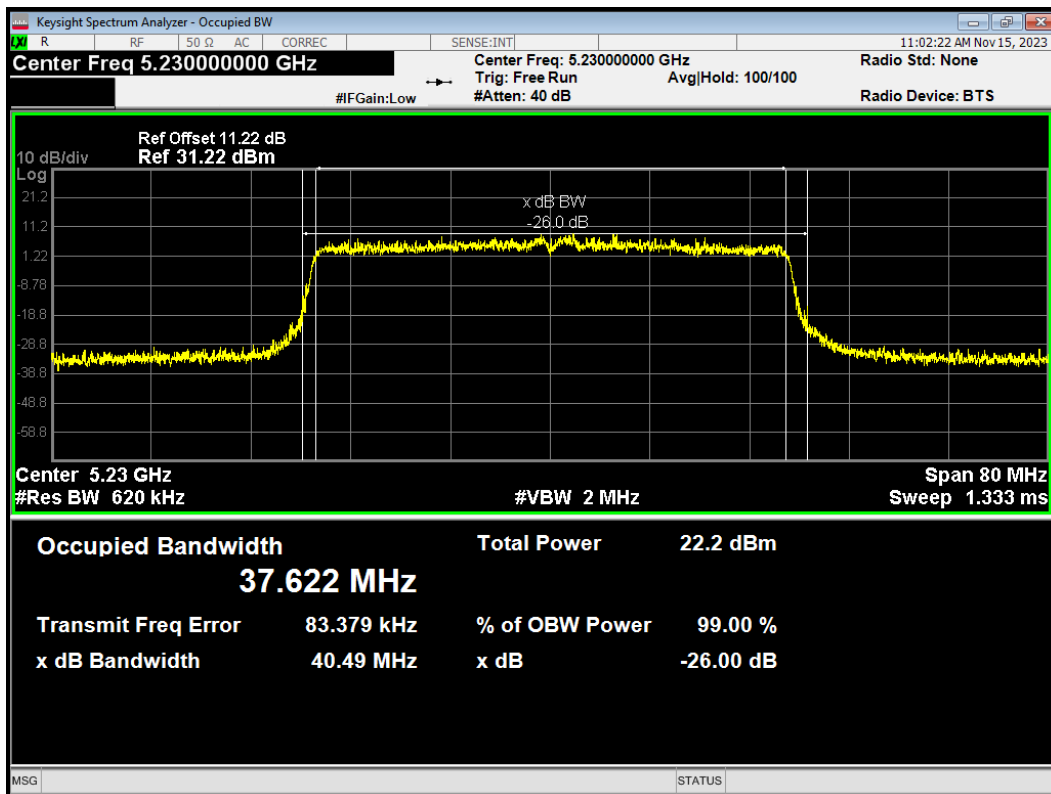
OBW 802.11ax(HE20) 5240MHz



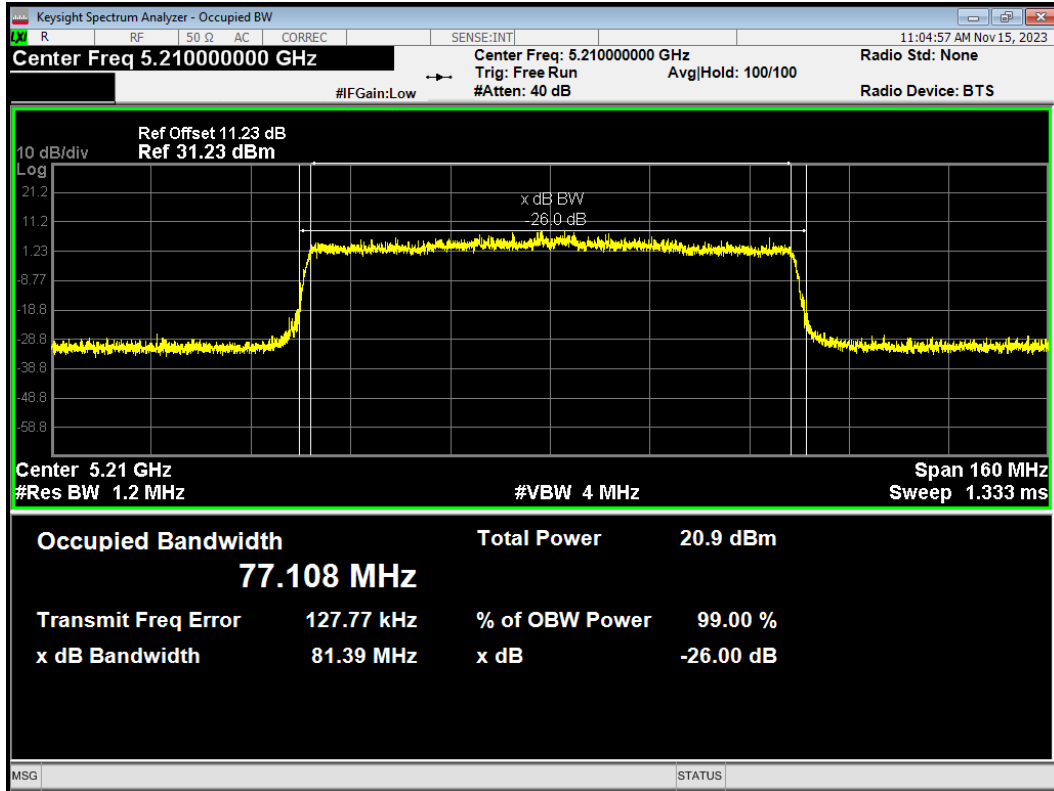
OBW 802.11ax(HE40) 5190MHz



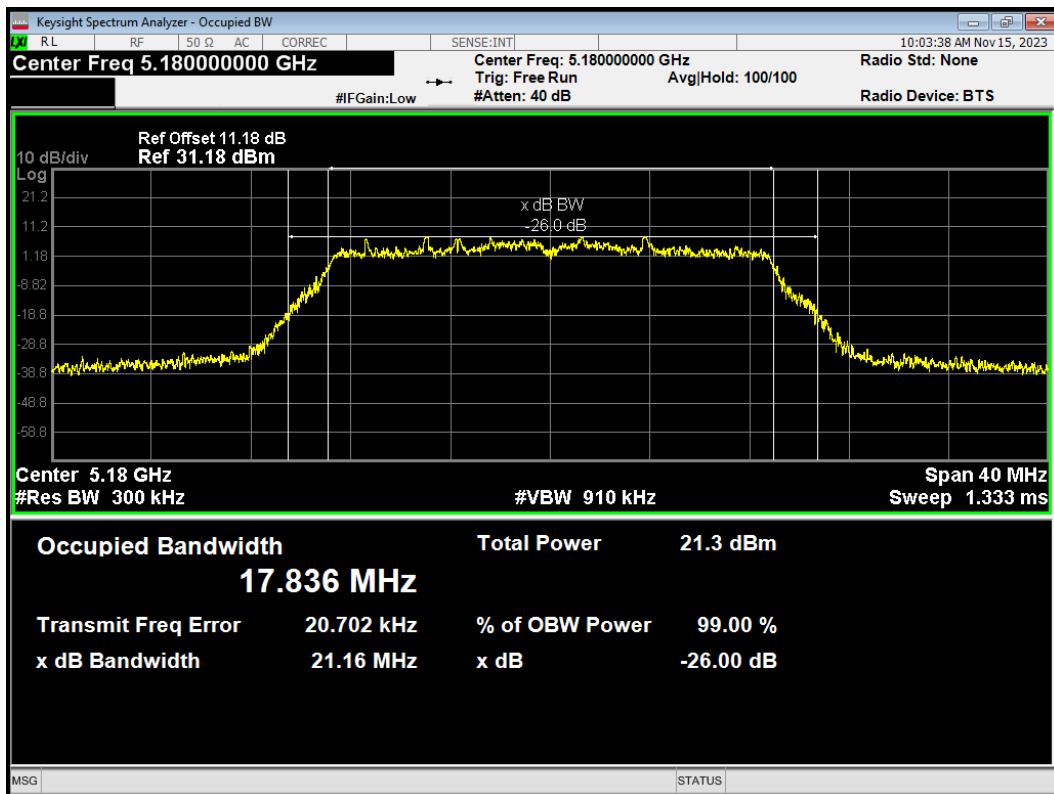
OBW 802.11ax(HE40) 5230MHz



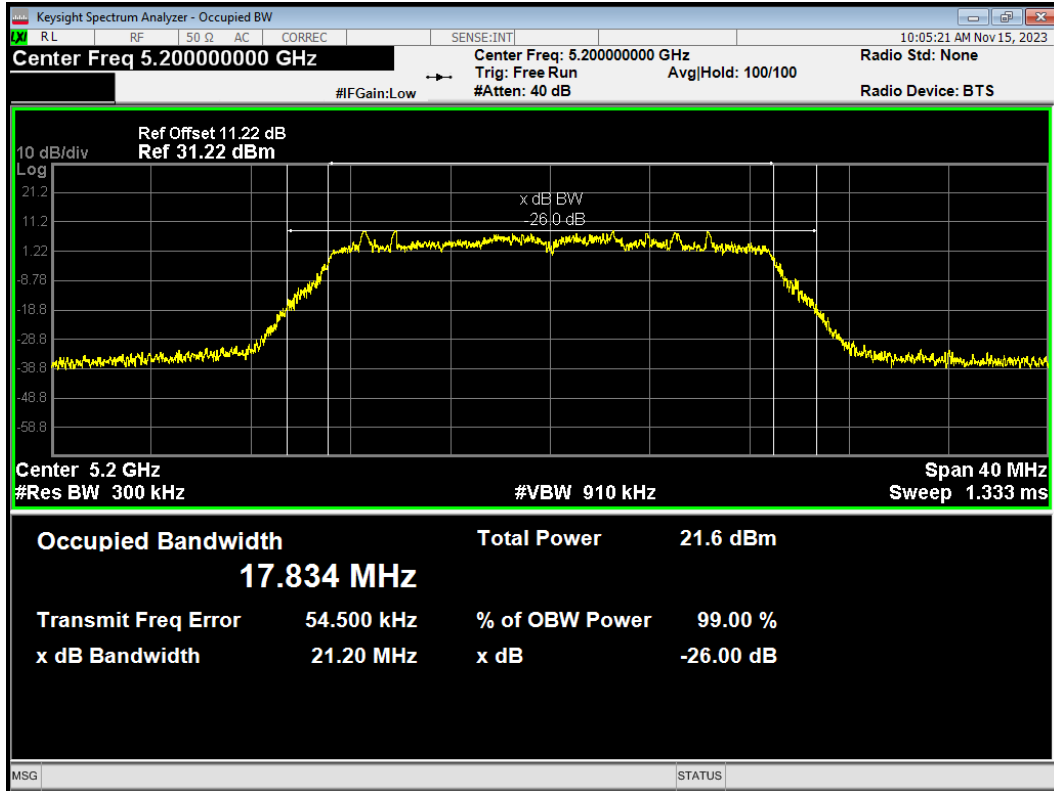
OBW 802.11ax(HE80) 5210MHz



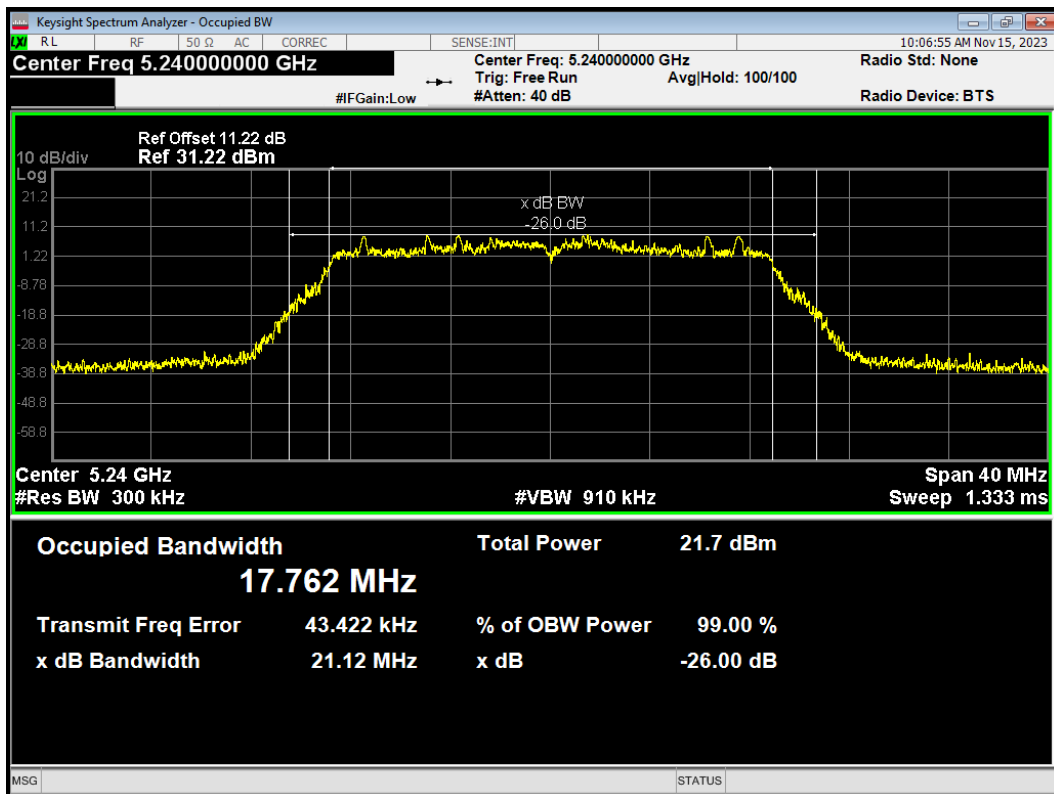
OBW 802.11n(HT20) 5180MHz



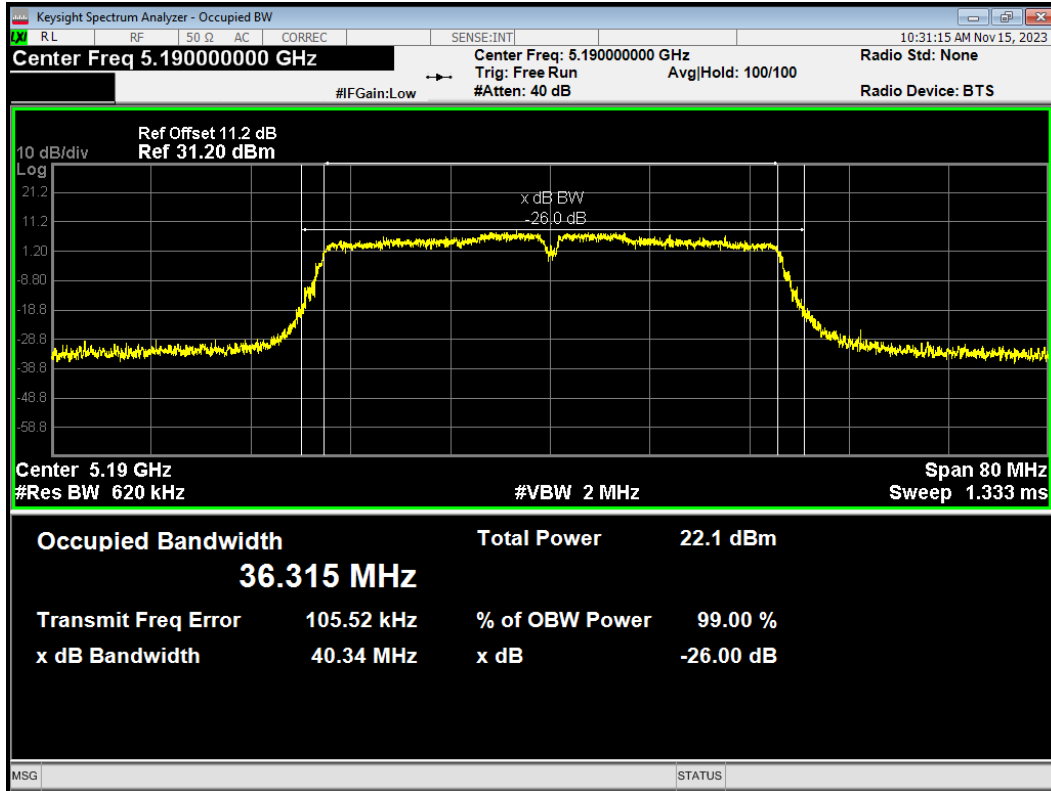
OBW 802.11n(HT20) 5200MHz



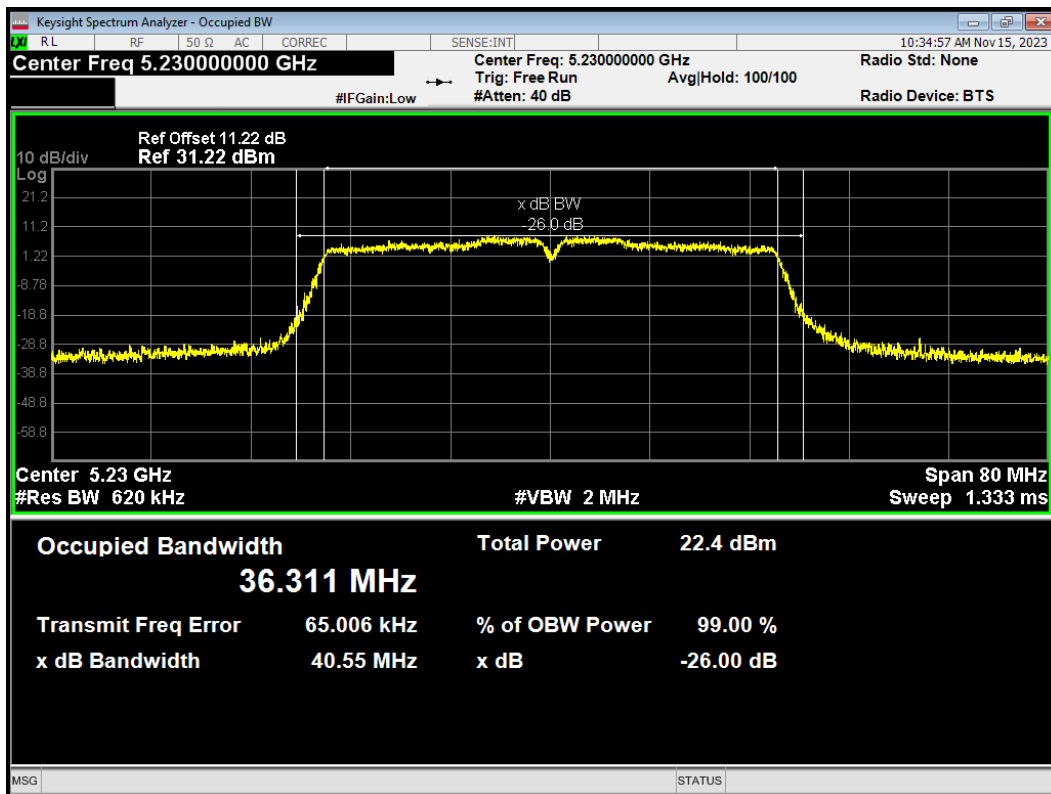
OBW 802.11n(HT20) 5240MHz



OBW 802.11n(HT40) 5190MHz

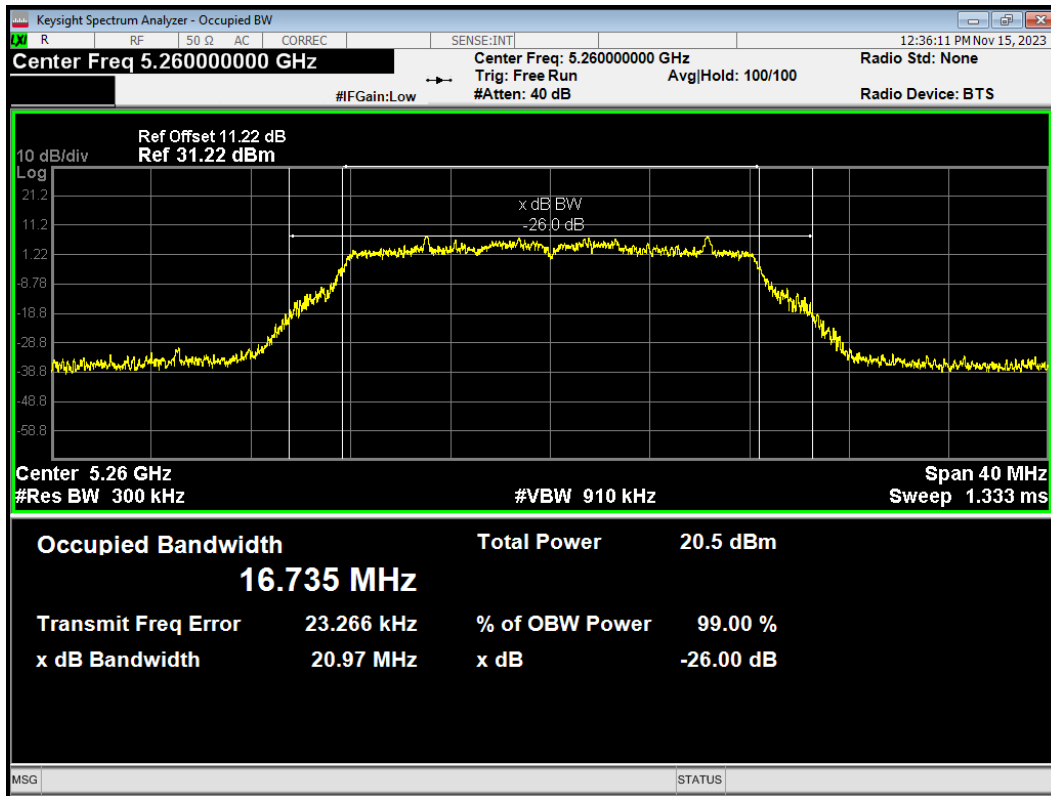


OBW 802.11n(HT40) 5230MHz

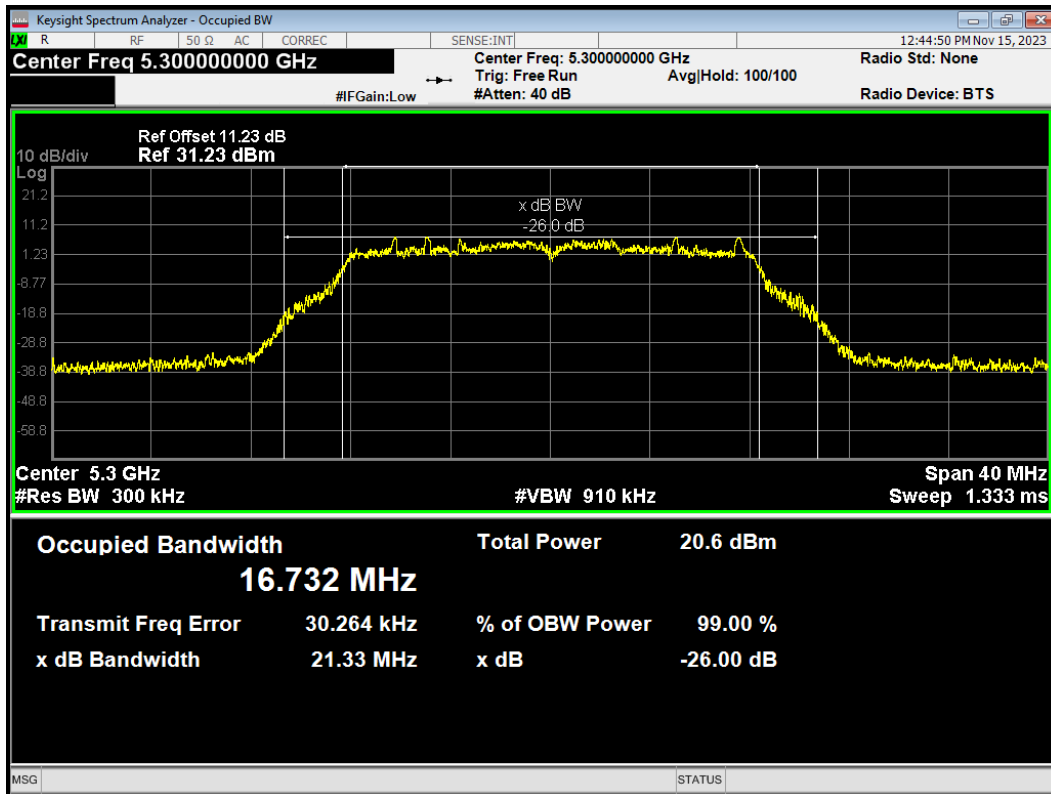


U-NII-2A

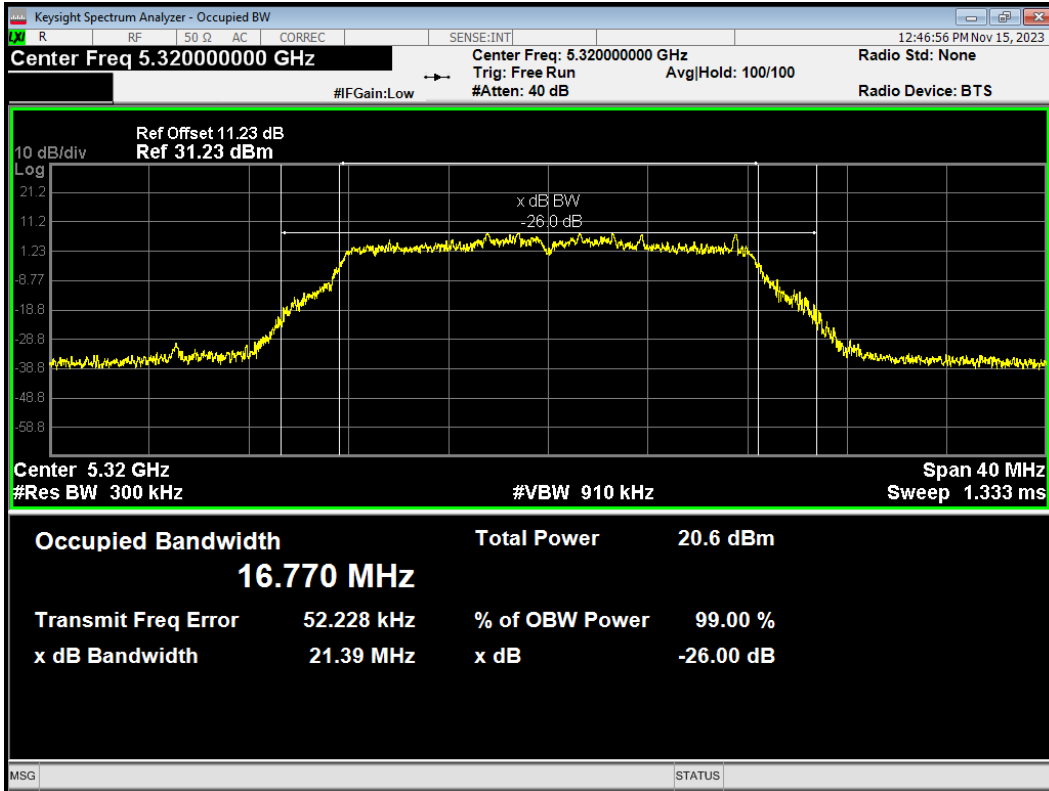
OBW 802.11a 5260MHz



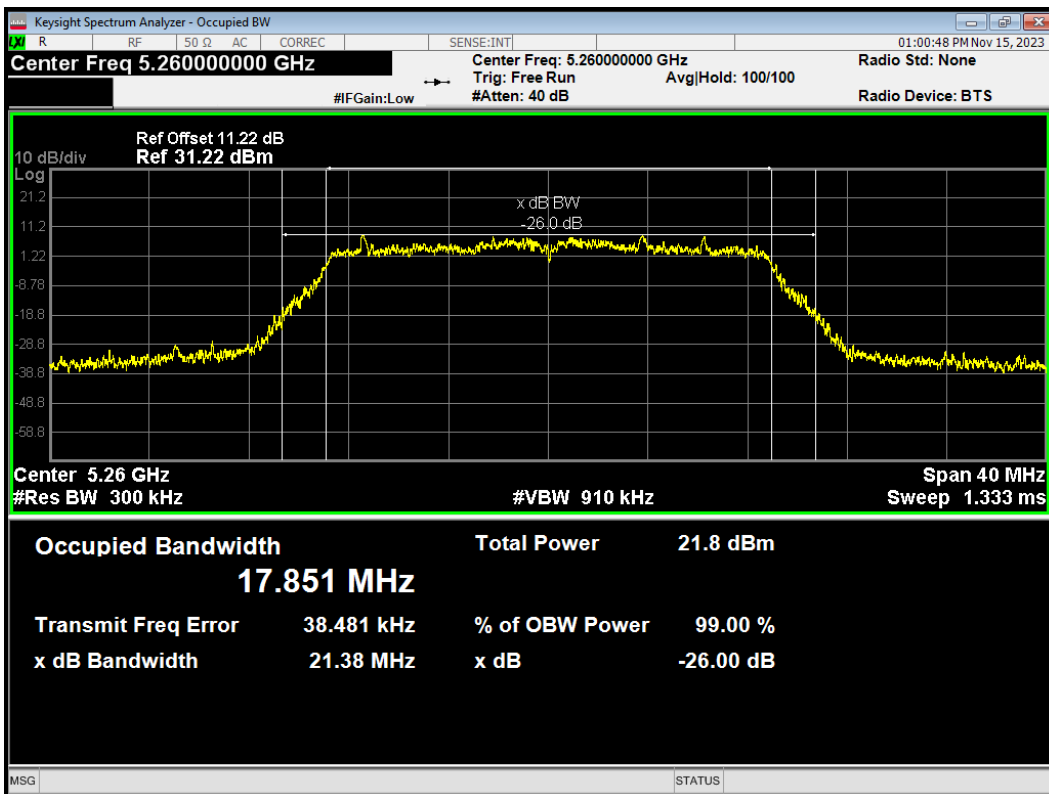
OBW 802.11a 5300MHz



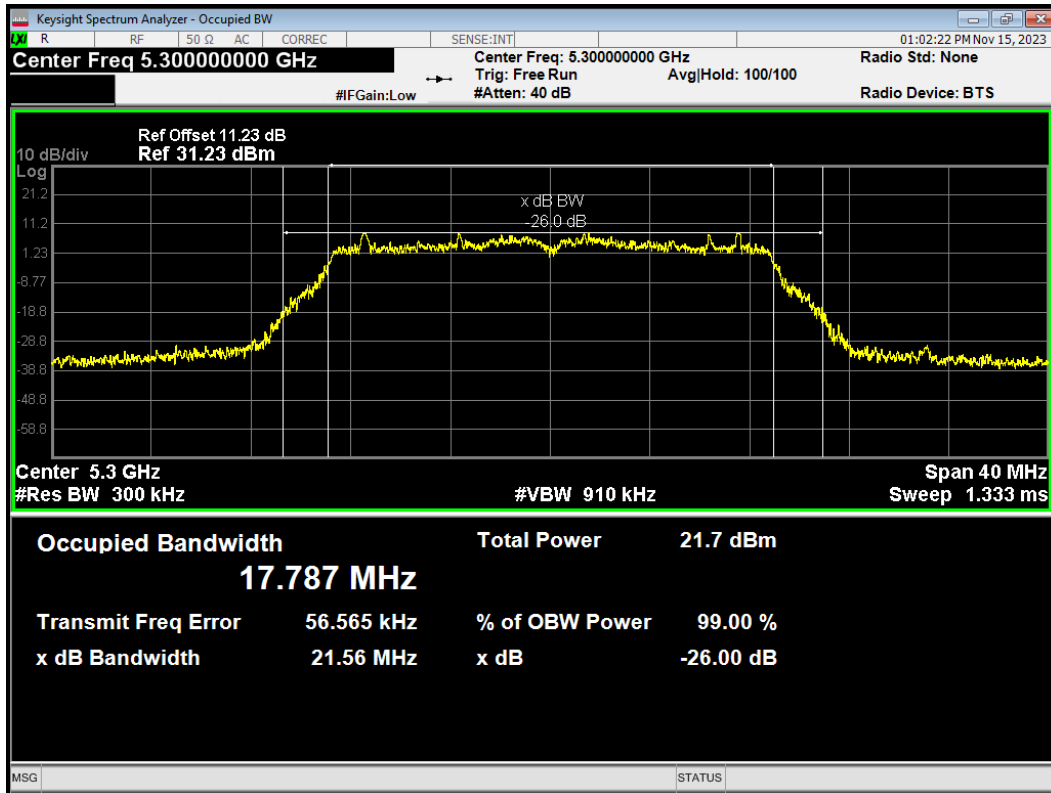
OBW 802.11a 5320MHz



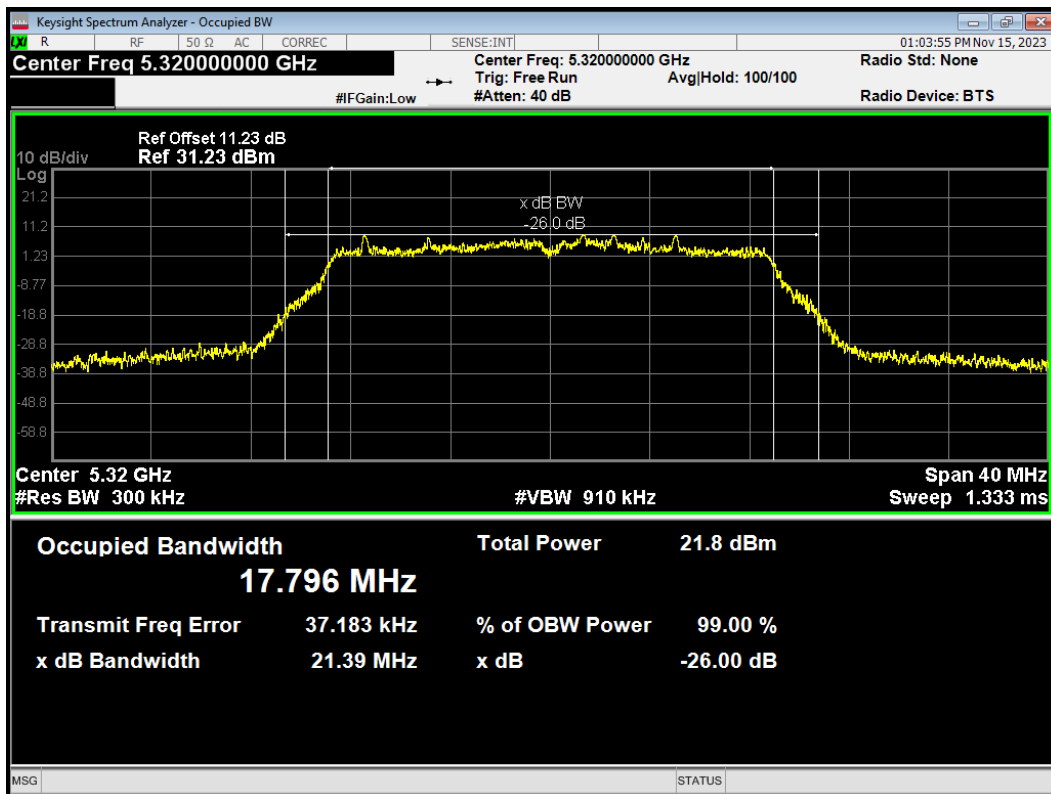
OBW 802.11ac(VHT20) 5260MHz



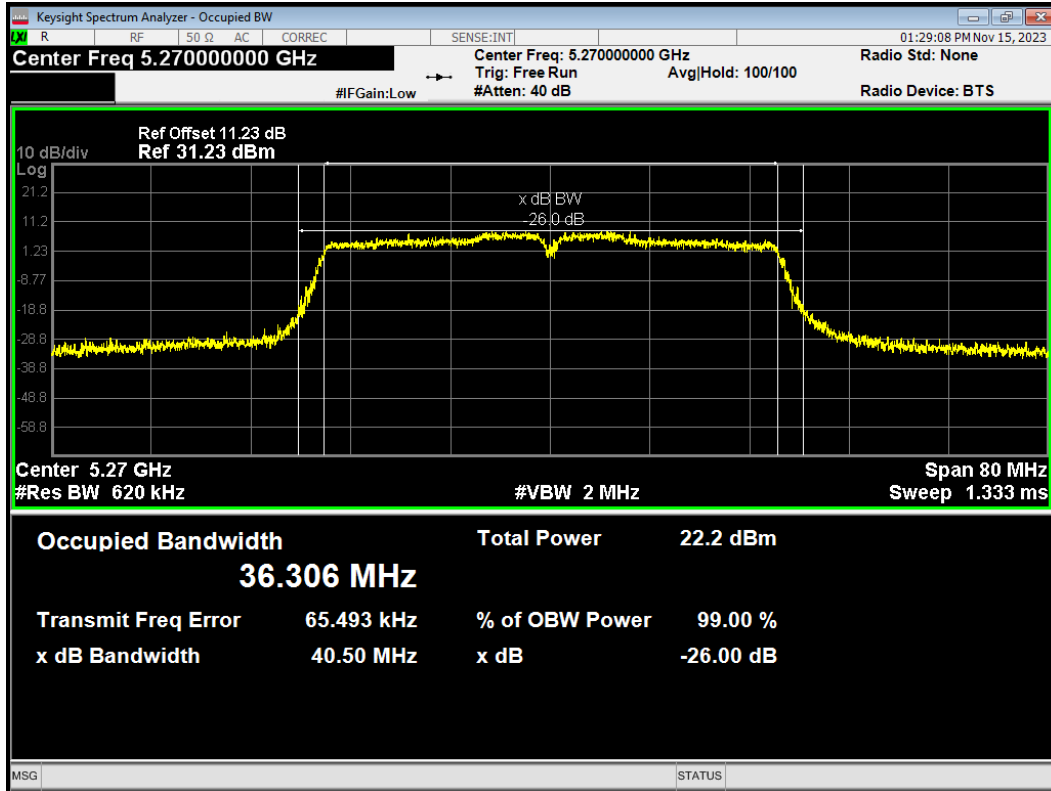
OBW 802.11ac(VHT20) 5300MHz



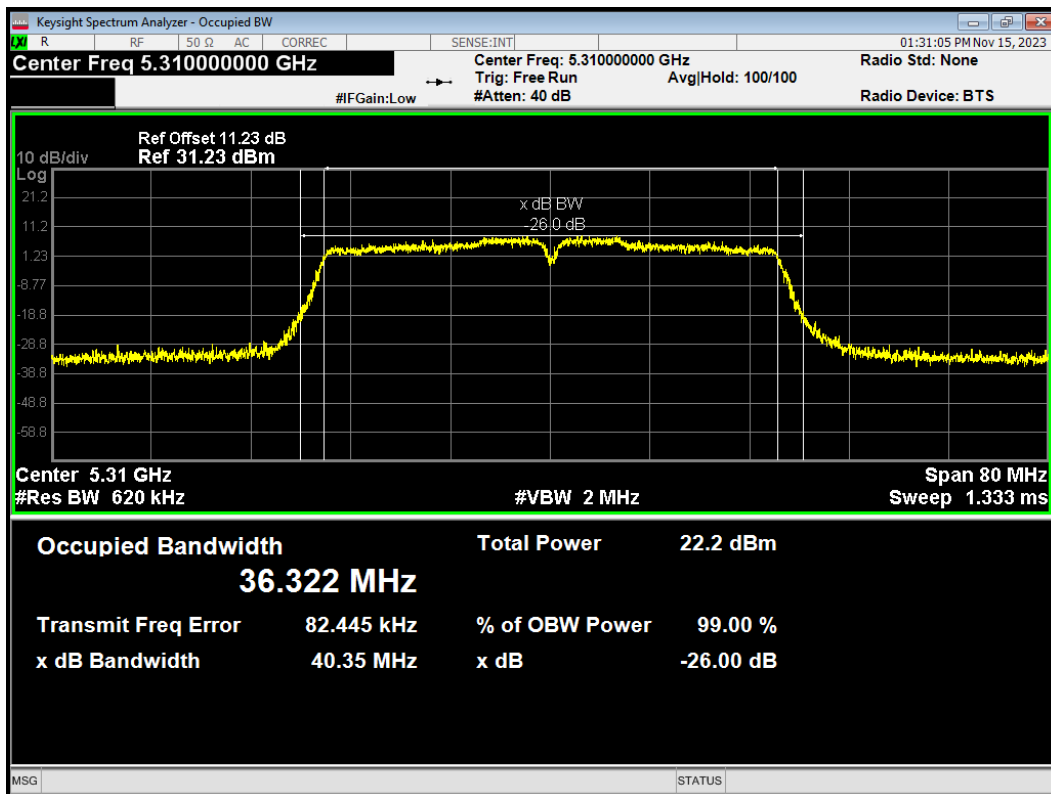
OBW 802.11ac(VHT20) 5320MHz



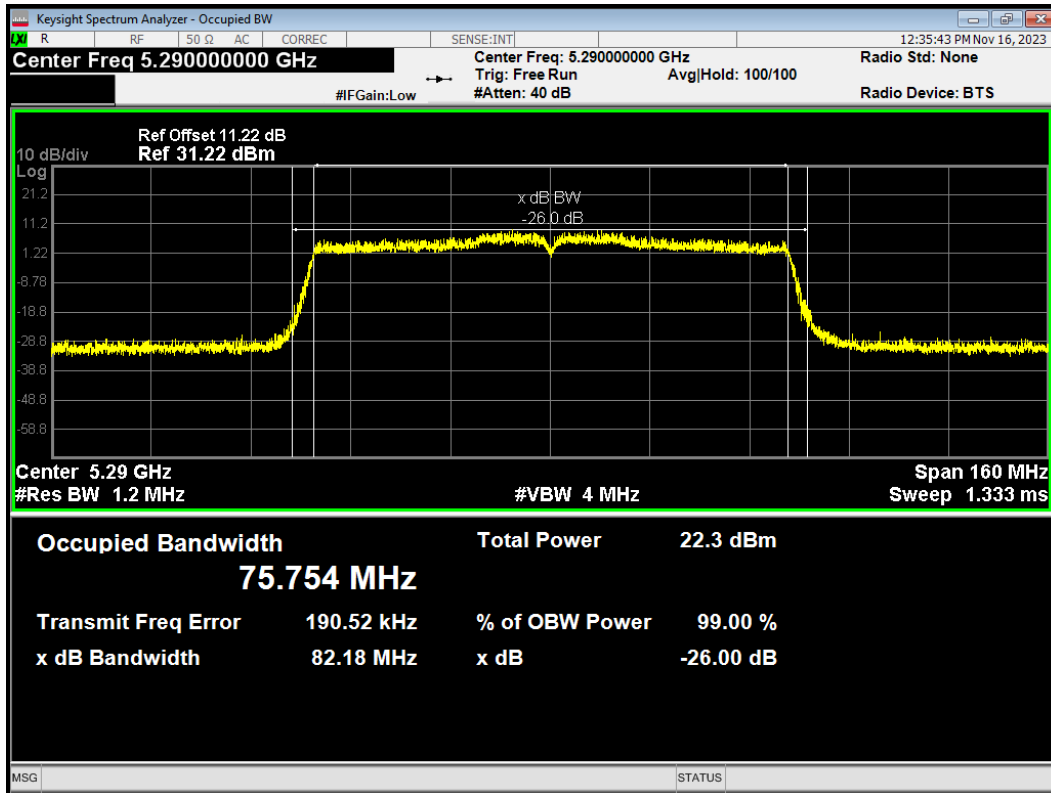
OBW 802.11ac(VHT40) 5270MHz



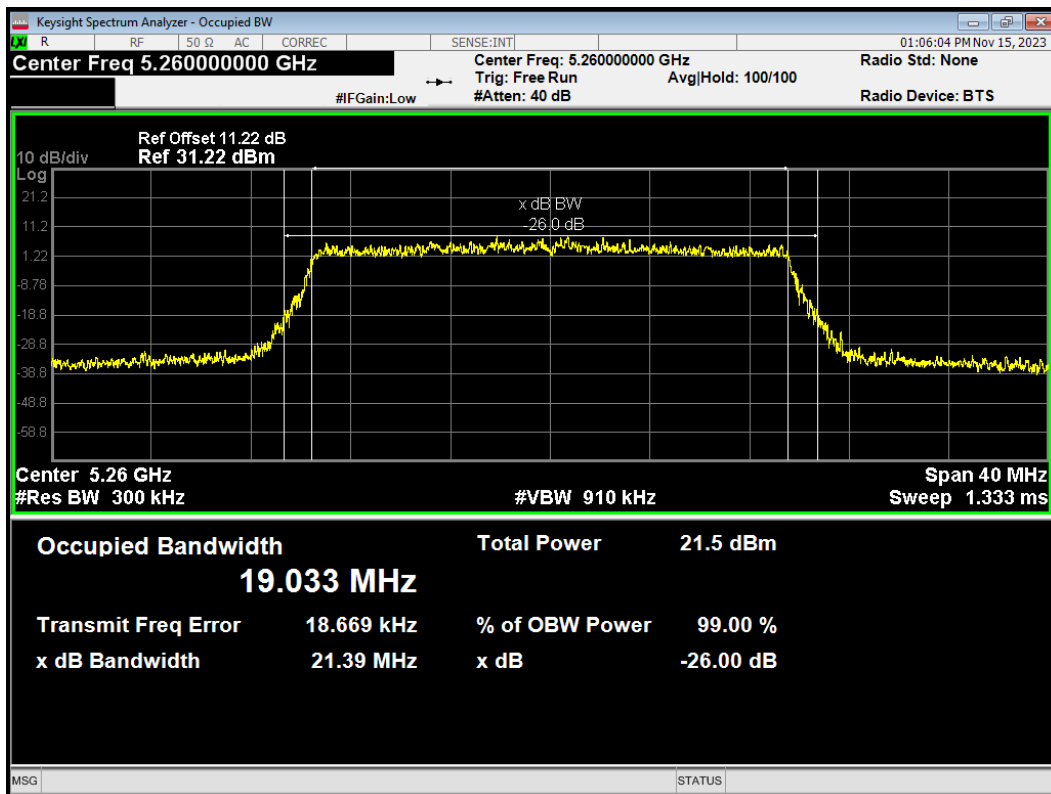
OBW 802.11ac(VHT40) 5310MHz



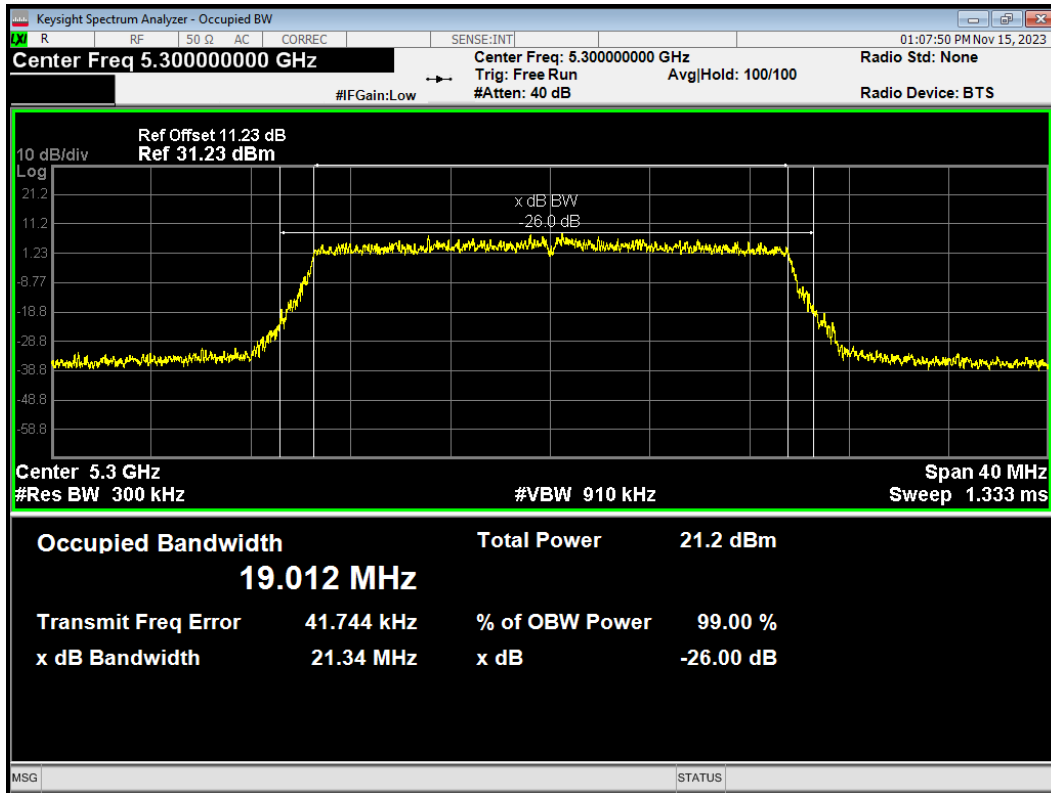
OBW 802.11ac(VHT80) 5290MHz



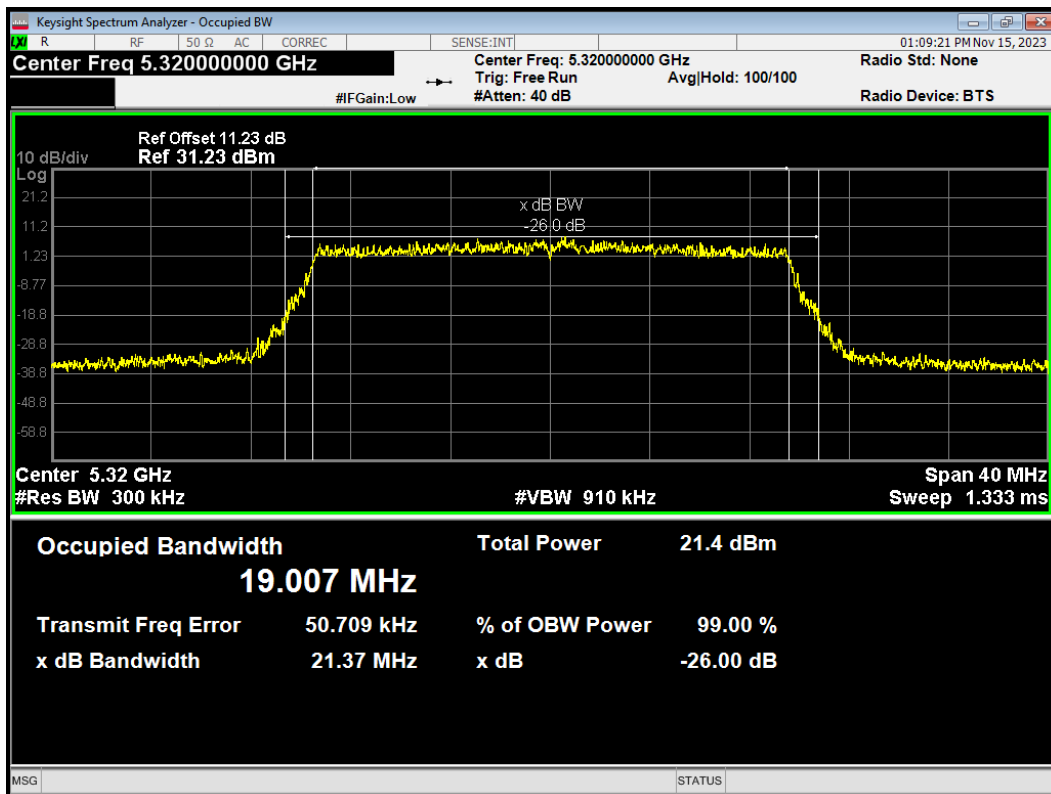
OBW 802.11ax(HE20) 5260MHz



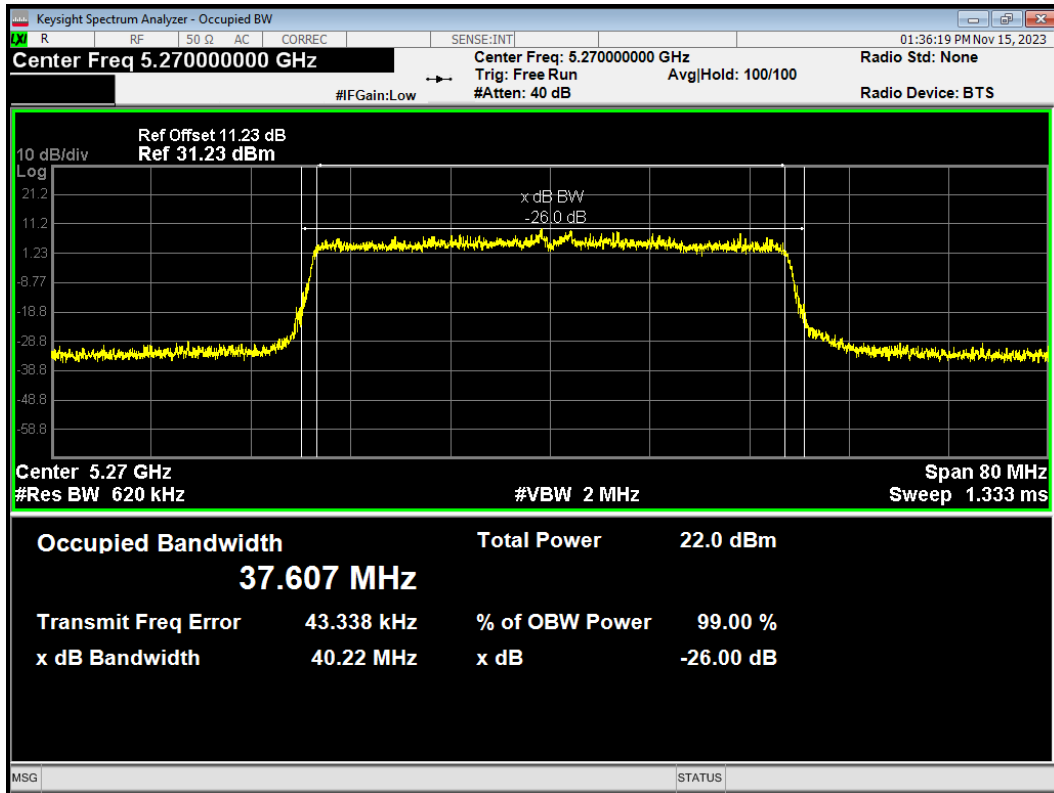
OBW 802.11ax(HE20) 5300MHz



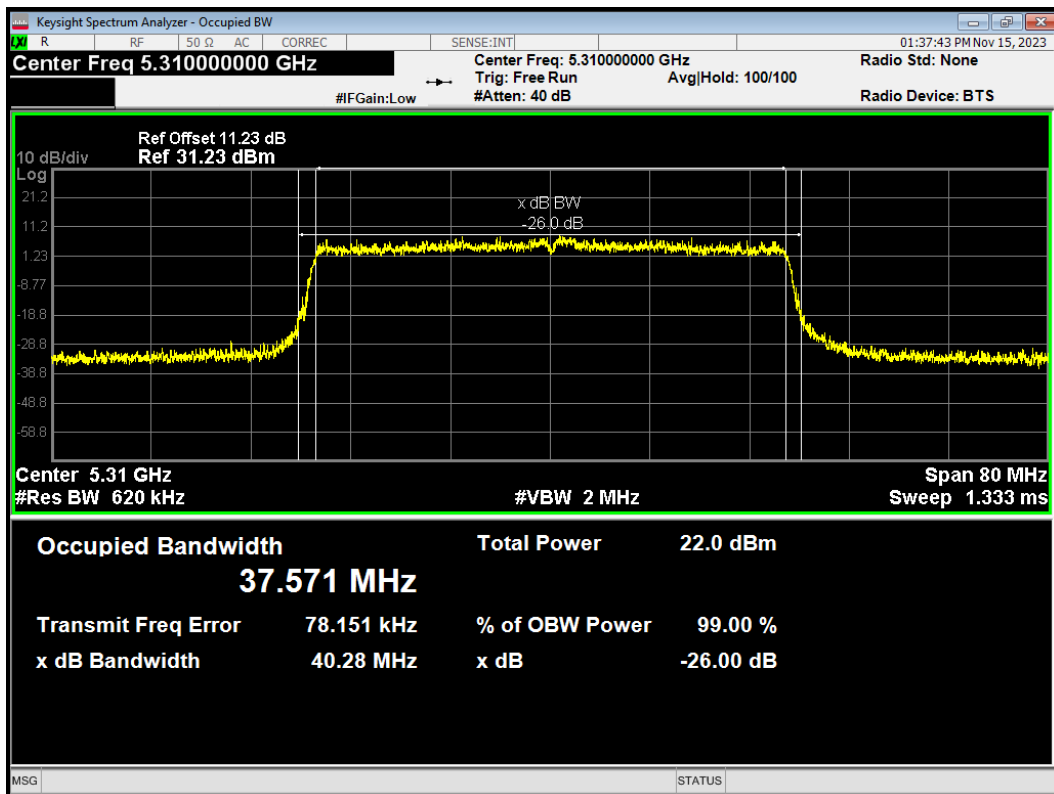
OBW 802.11ax(HE20) 5320MHz



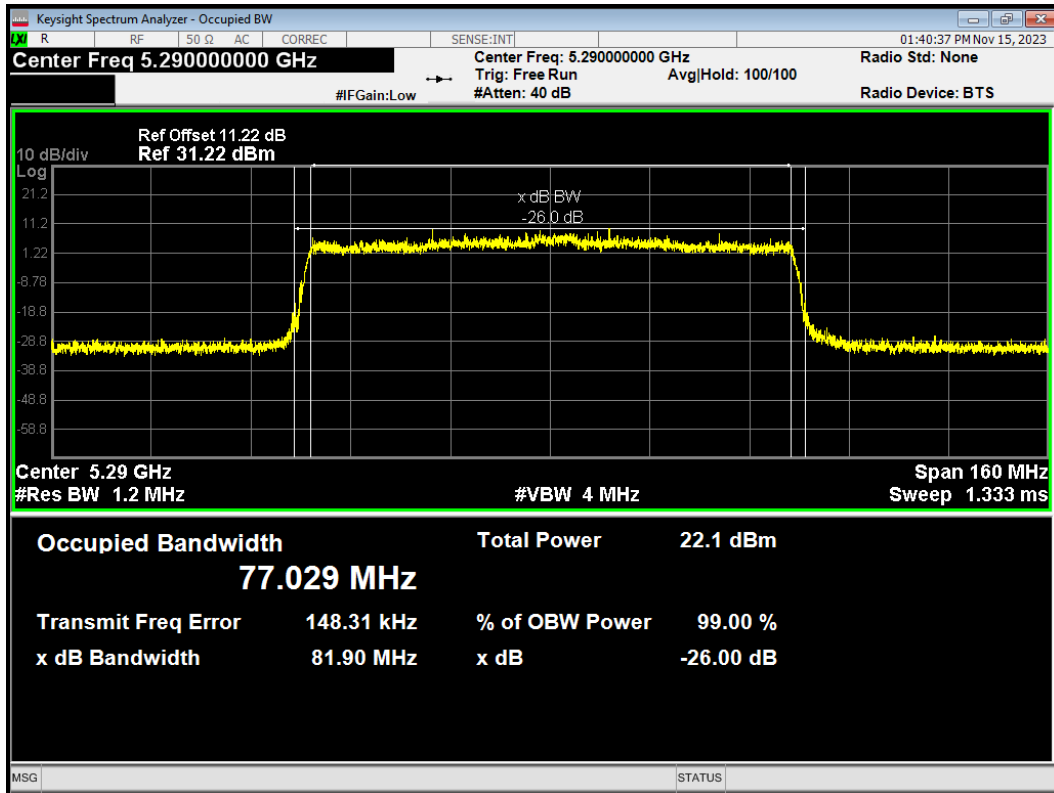
OBW 802.11ax(HE40) 5270MHz



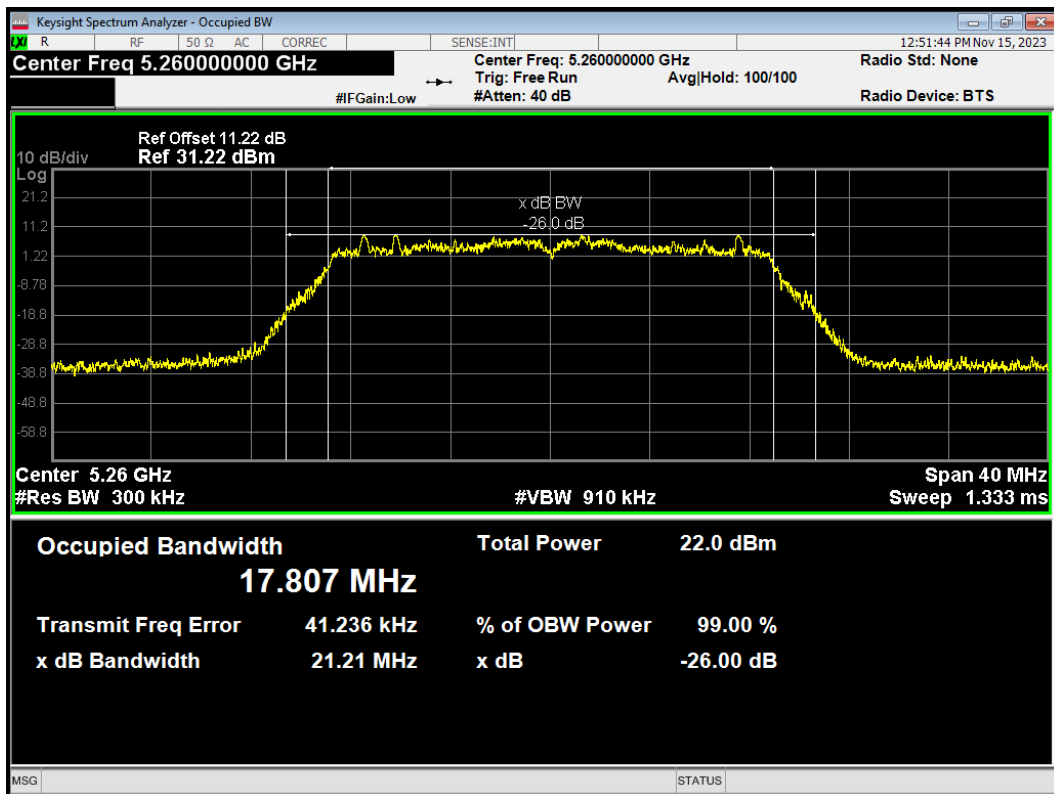
OBW 802.11ax(HE40) 5310MHz



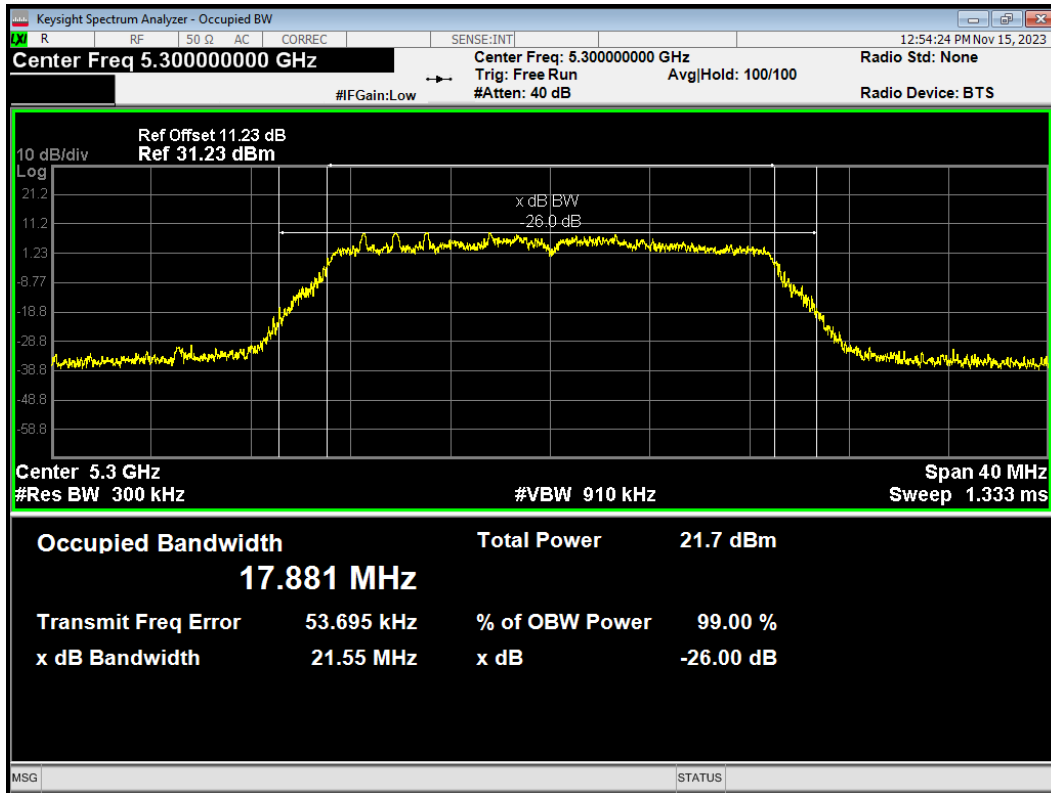
OBW 802.11ax(HE80) 5290MHz



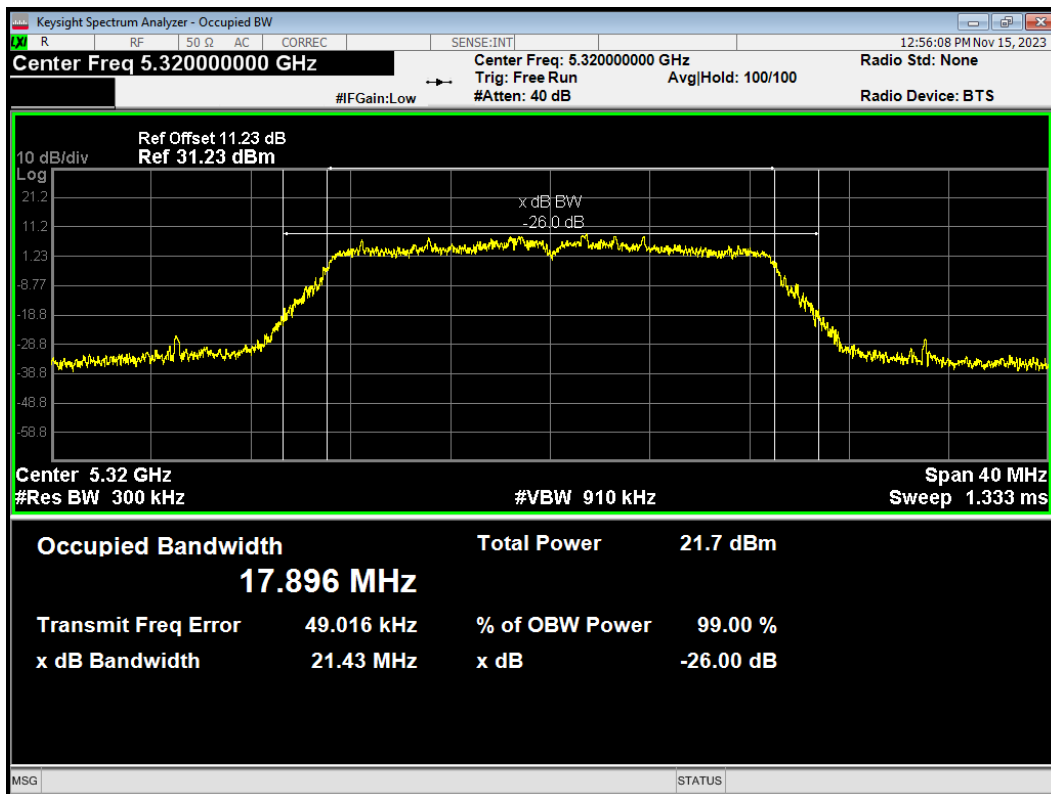
OBW 802.11n(HT20) 5260MHz



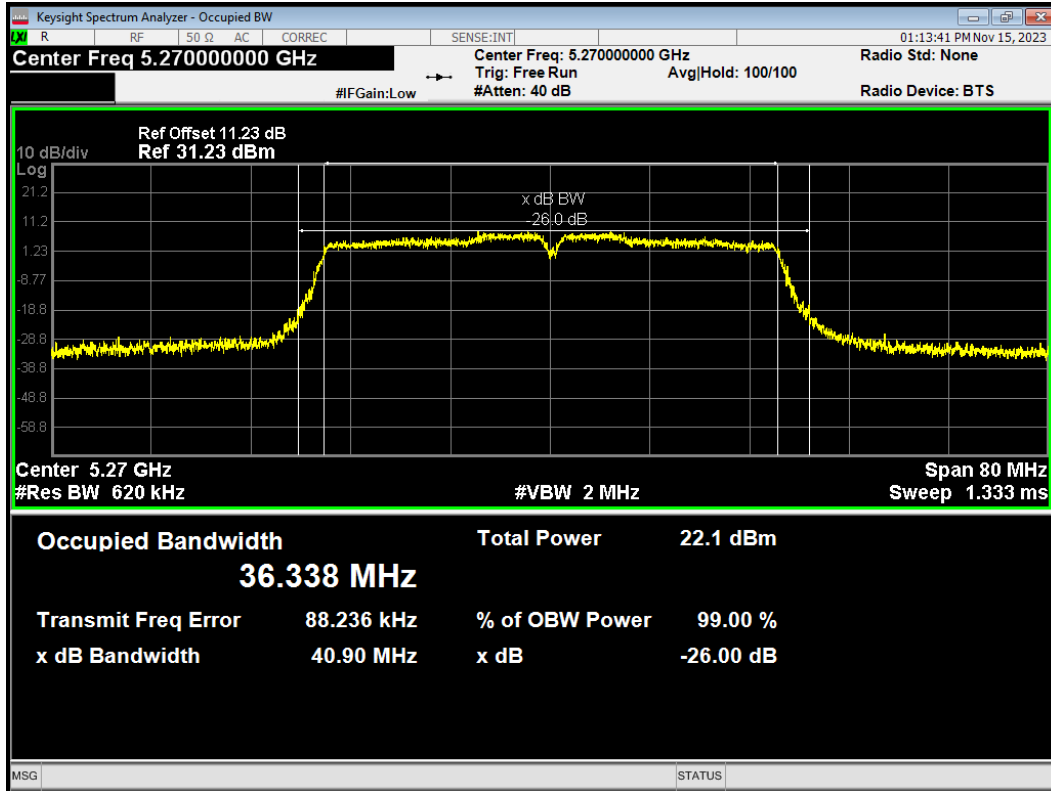
OBW 802.11n(HT20) 5300MHz



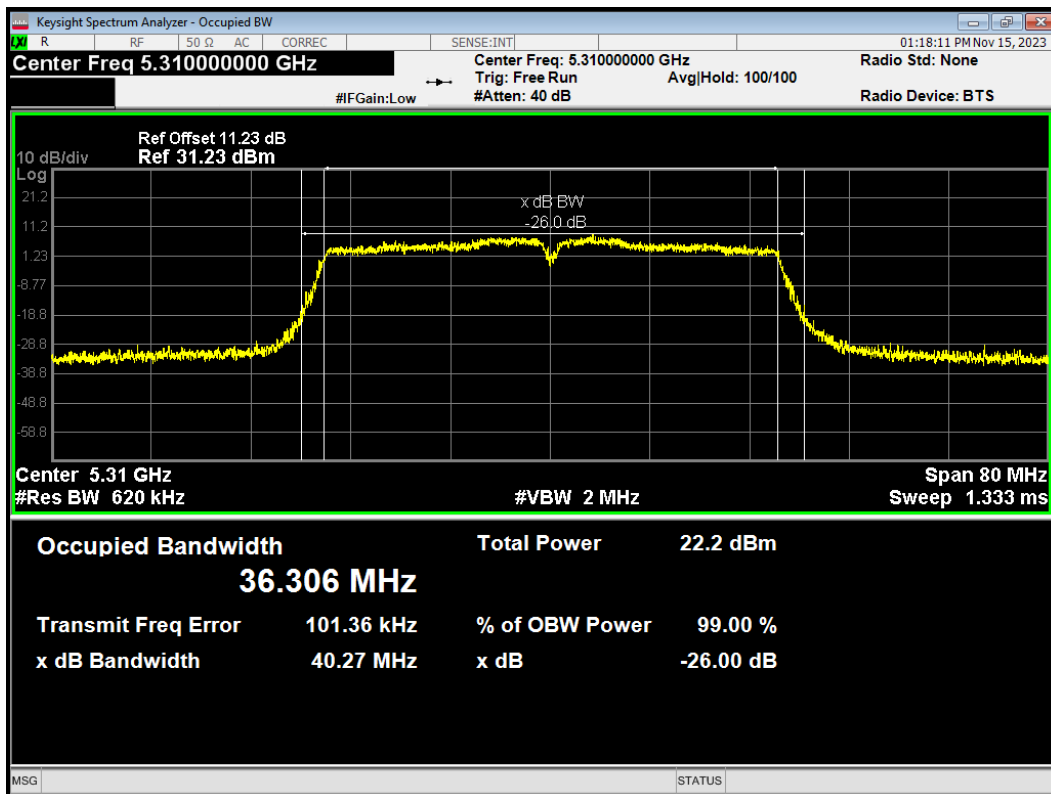
OBW 802.11n(HT20) 5320MHz



OBW 802.11n(HT40) 5270MHz

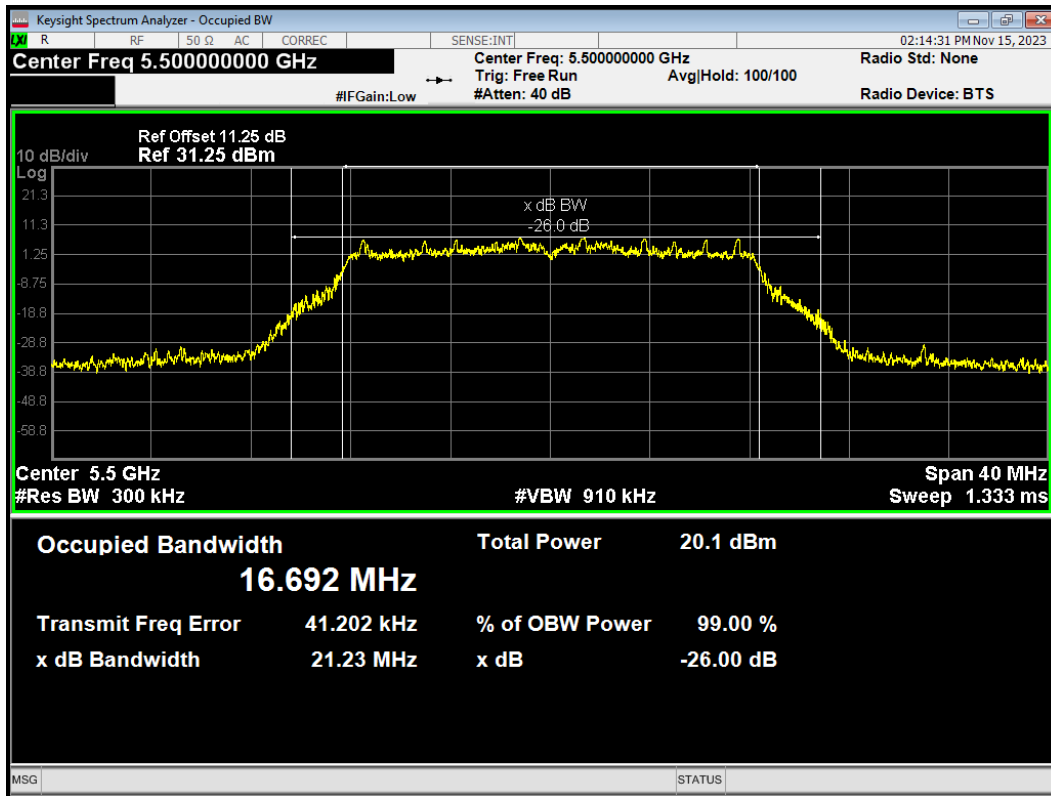


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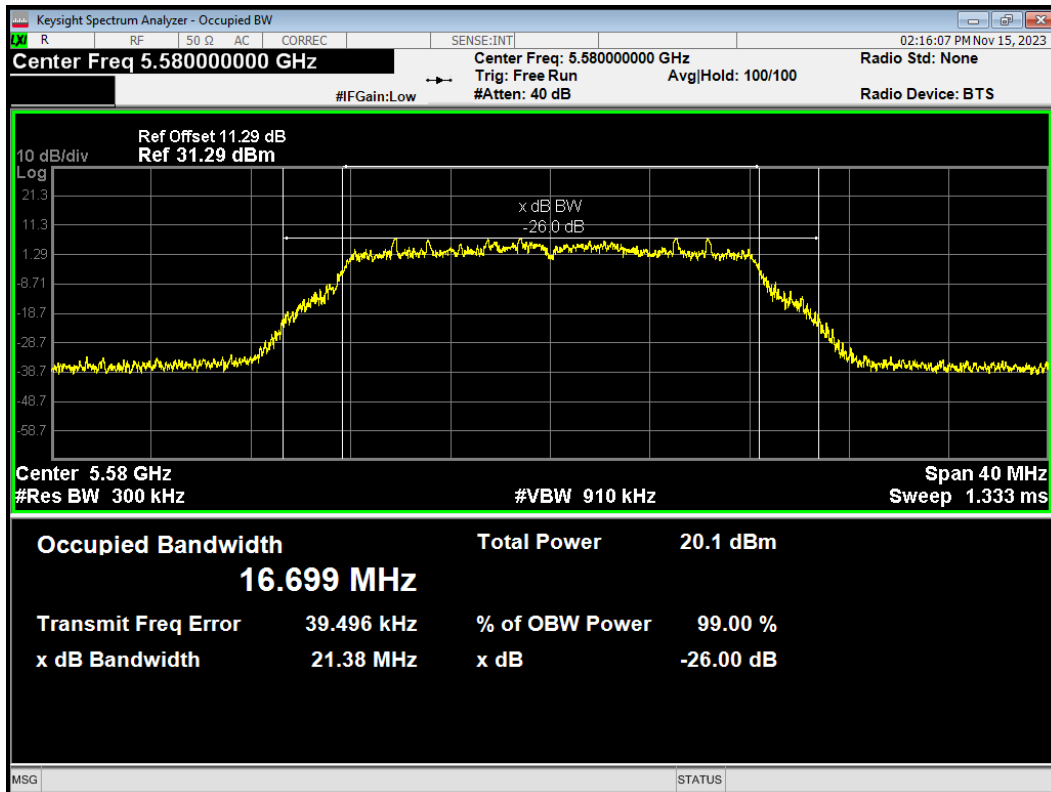


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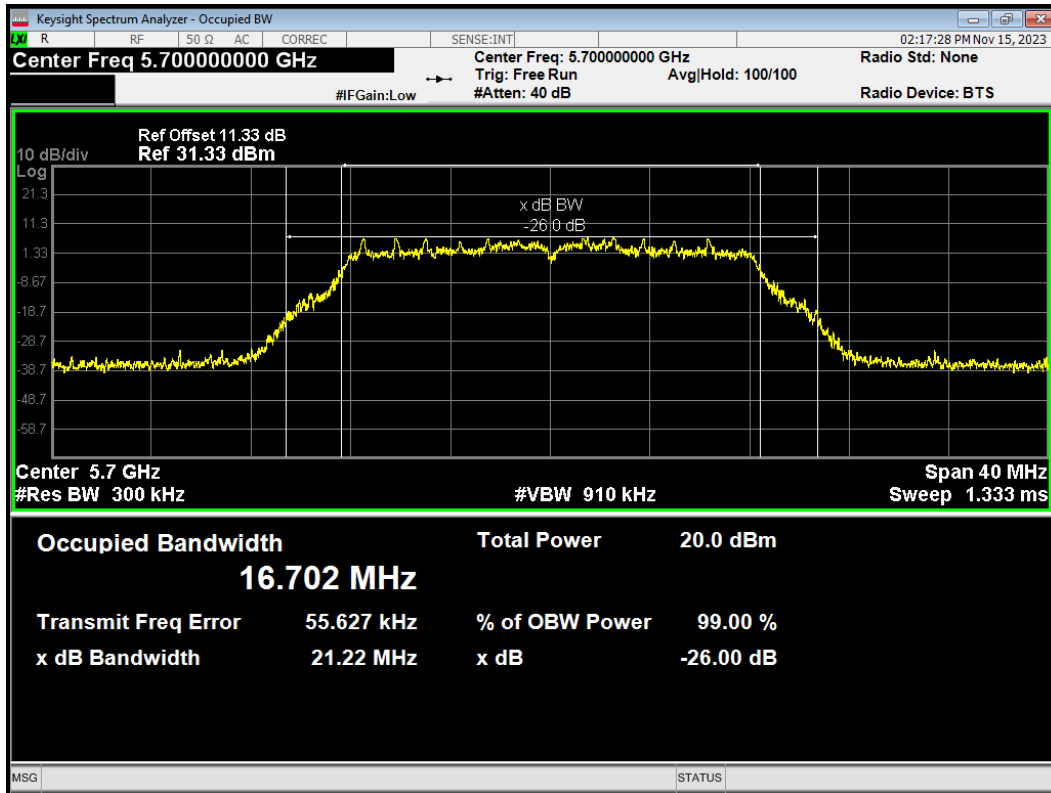
OBW 802.11a 5500MHz



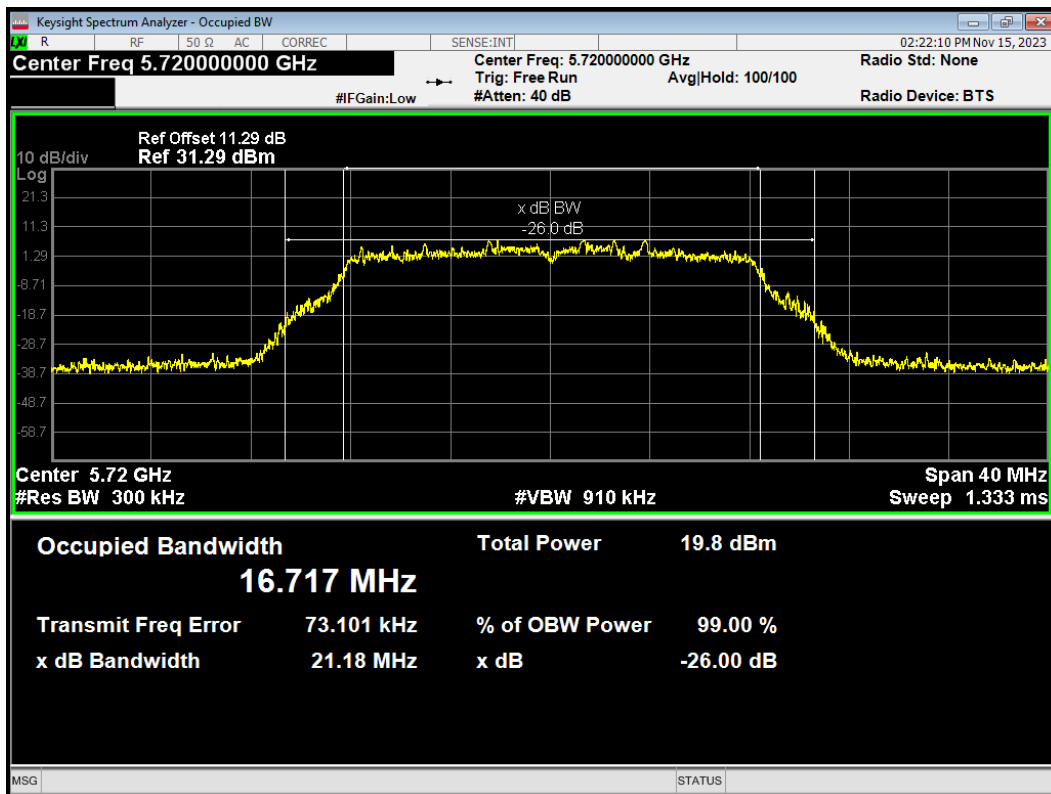
OBW 802.11a 5580MHz



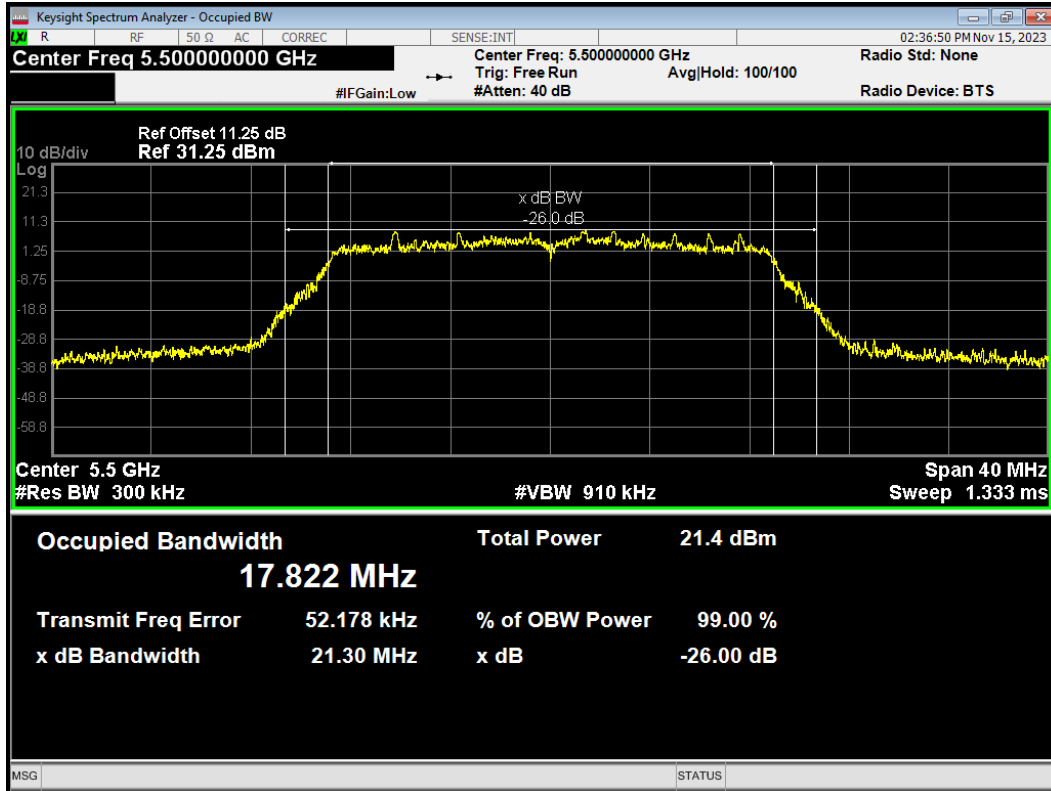
OBW 802.11a 5700MHz



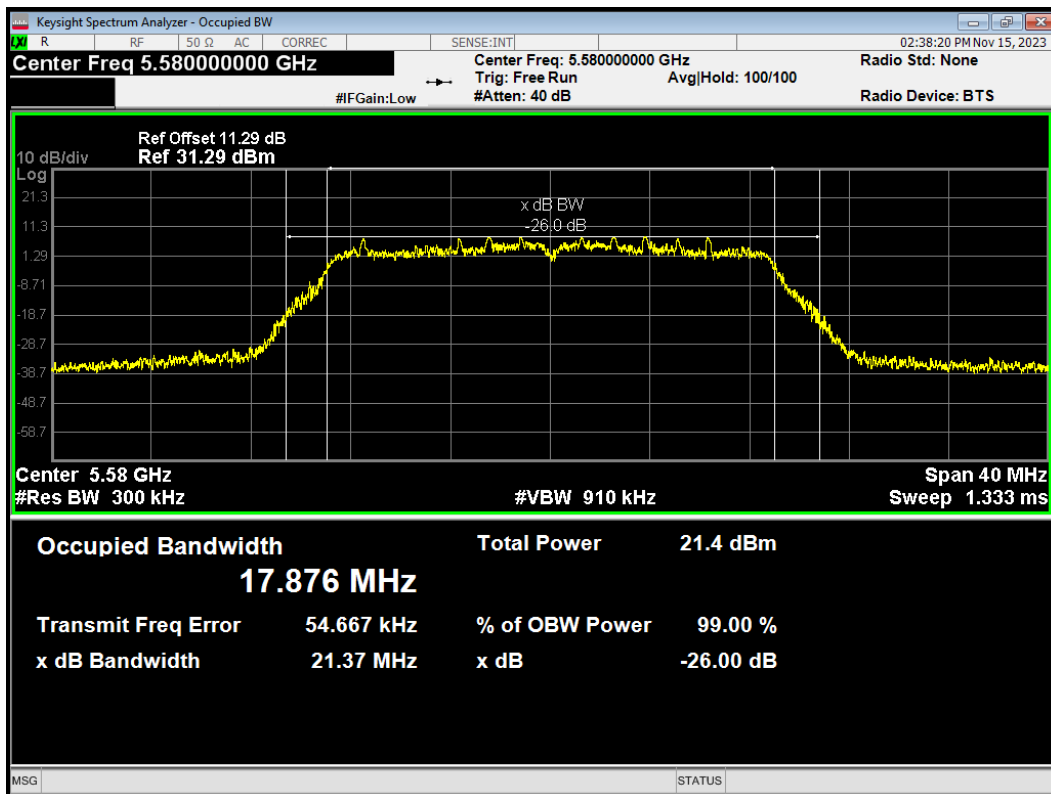
OBW 802.11a 5720MHz



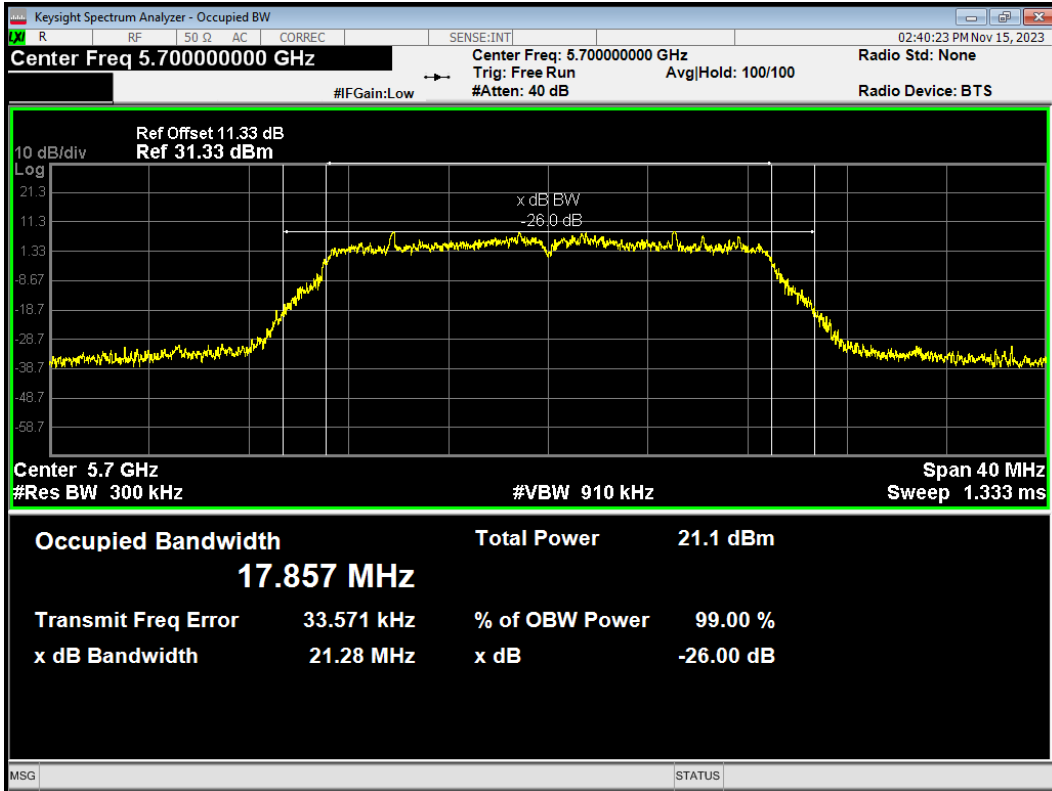
OBW 802.11ac(VHT20) 5500MHz



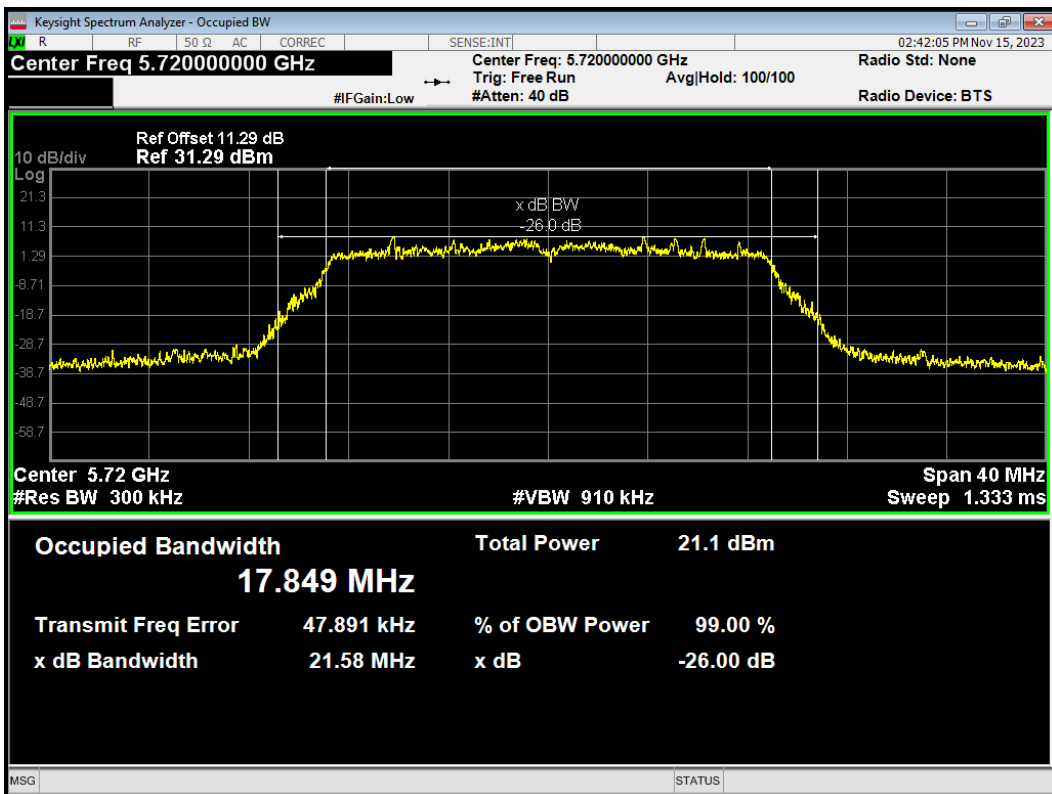
OBW 802.11ac(VHT20) 5580MHz



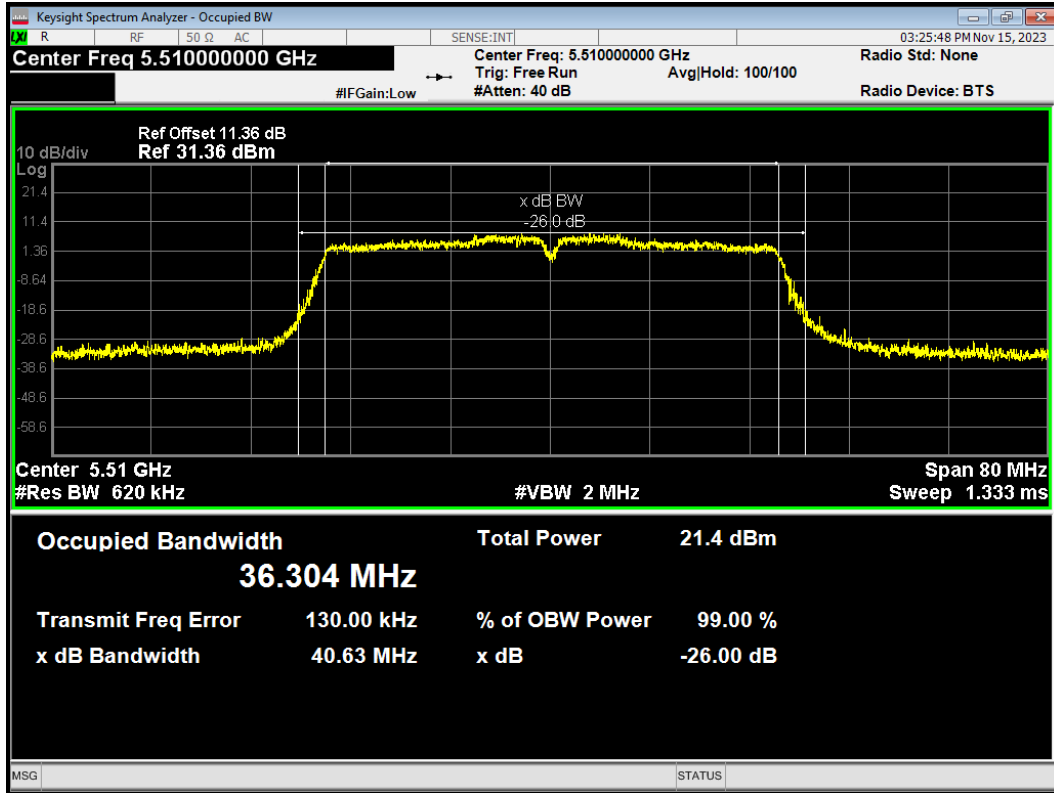
OBW 802.11ac(VHT20) 5700MHz



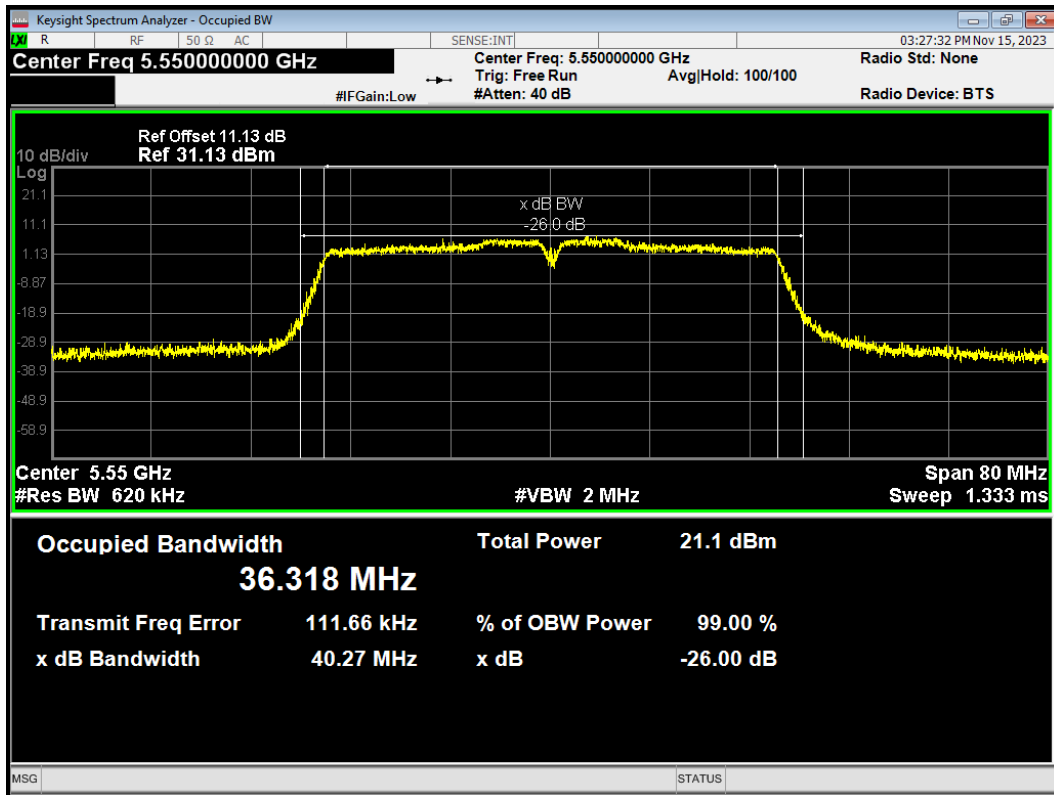
OBW 802.11ac(VHT20) 5720MHz



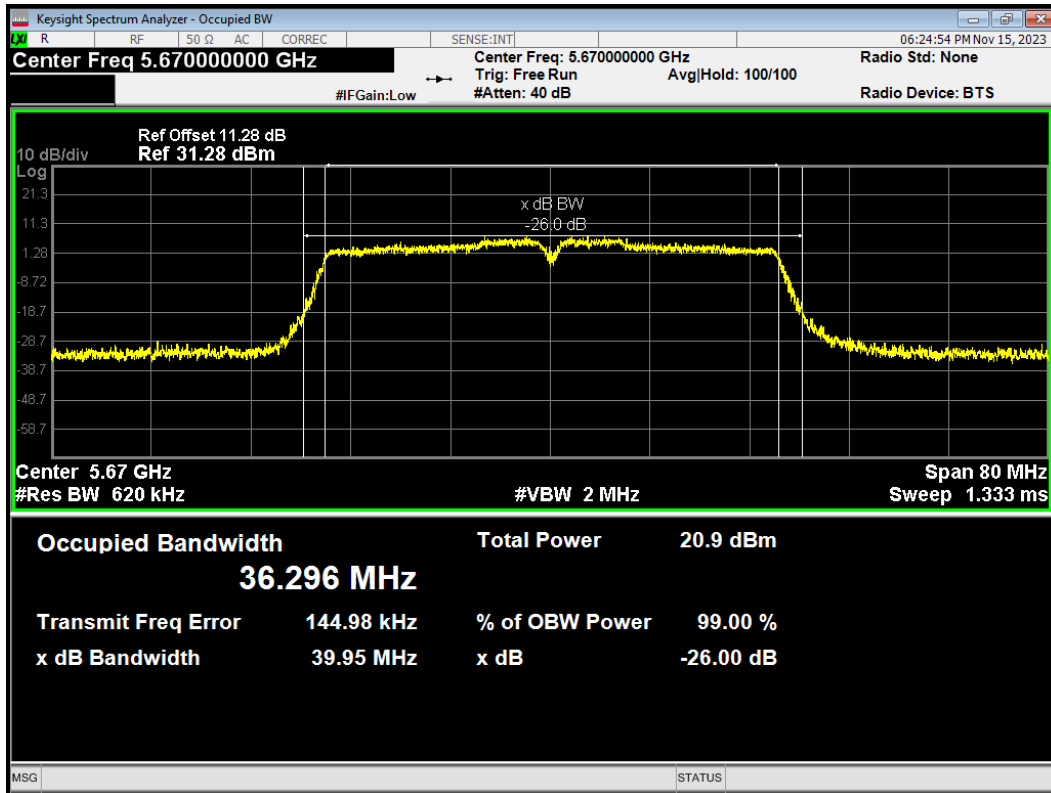
OBW 802.11ac(VHT40) 5510MHz



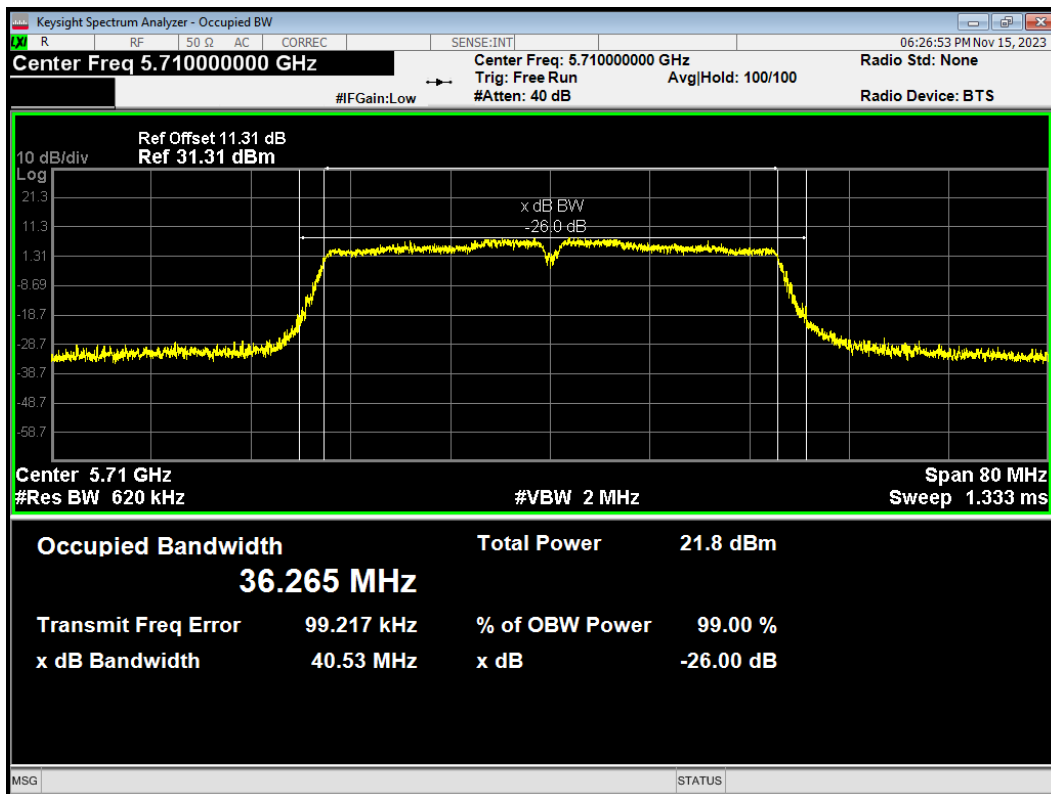
OBW 802.11ac(VHT40) 5550MHz



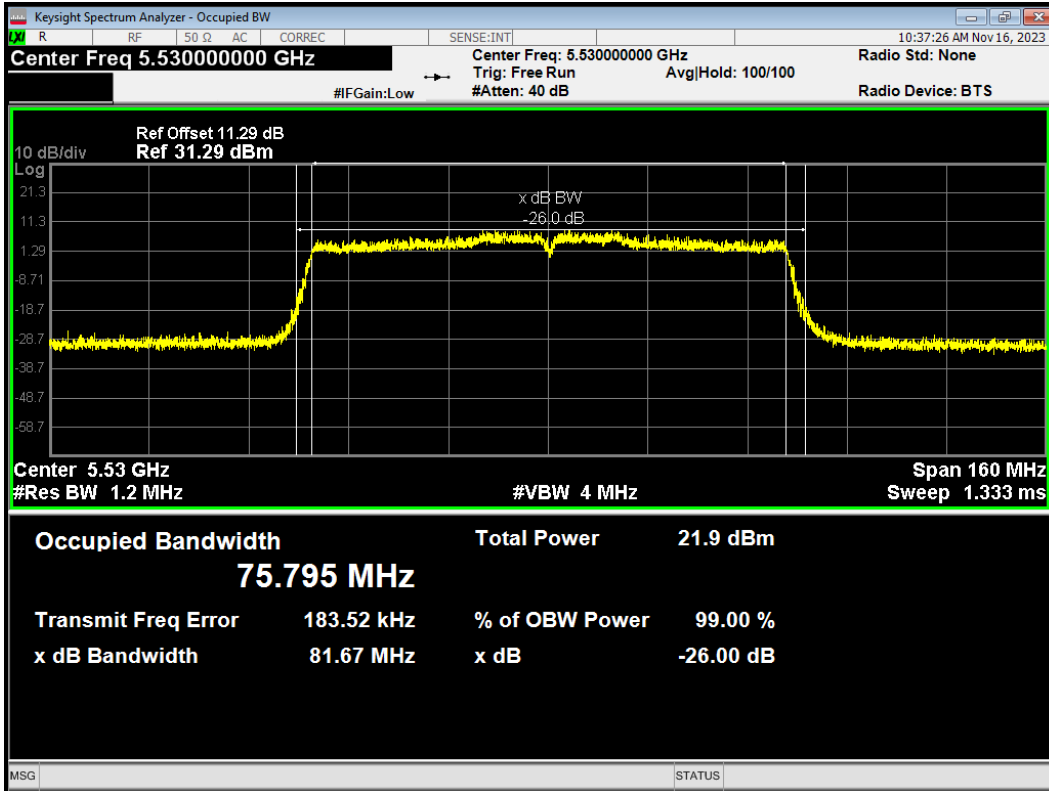
OBW 802.11ac(VHT40) 5670MHz



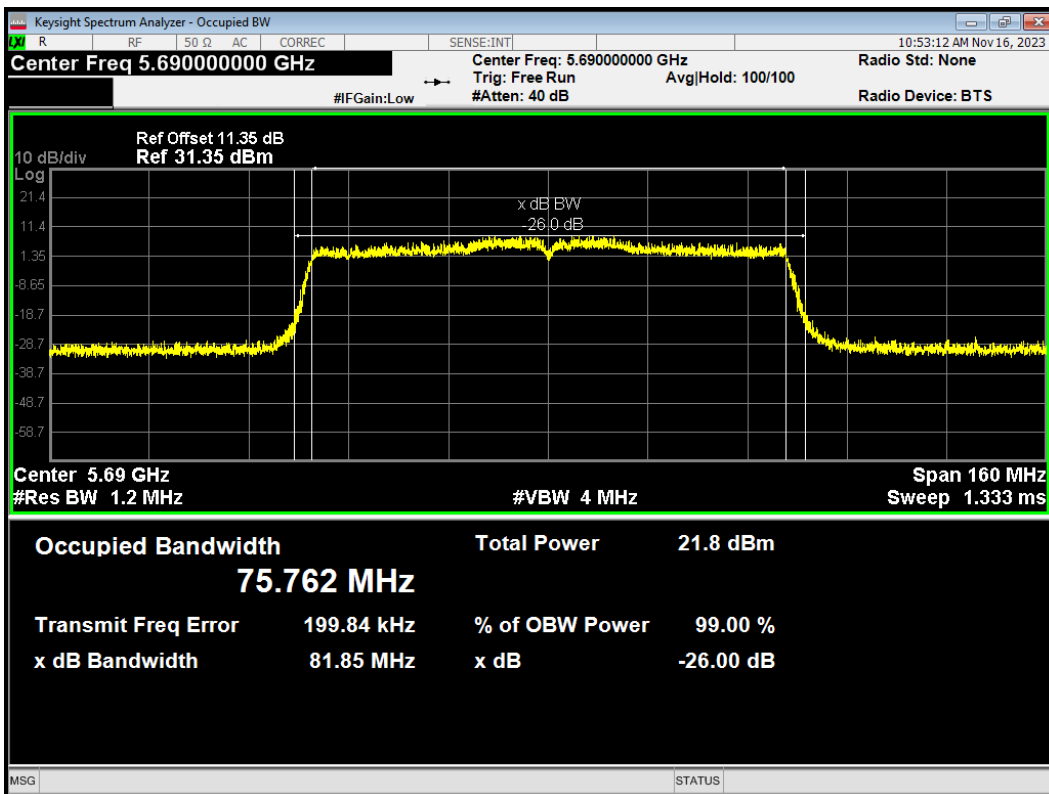
OBW 802.11ac(VHT40) 5710MHz



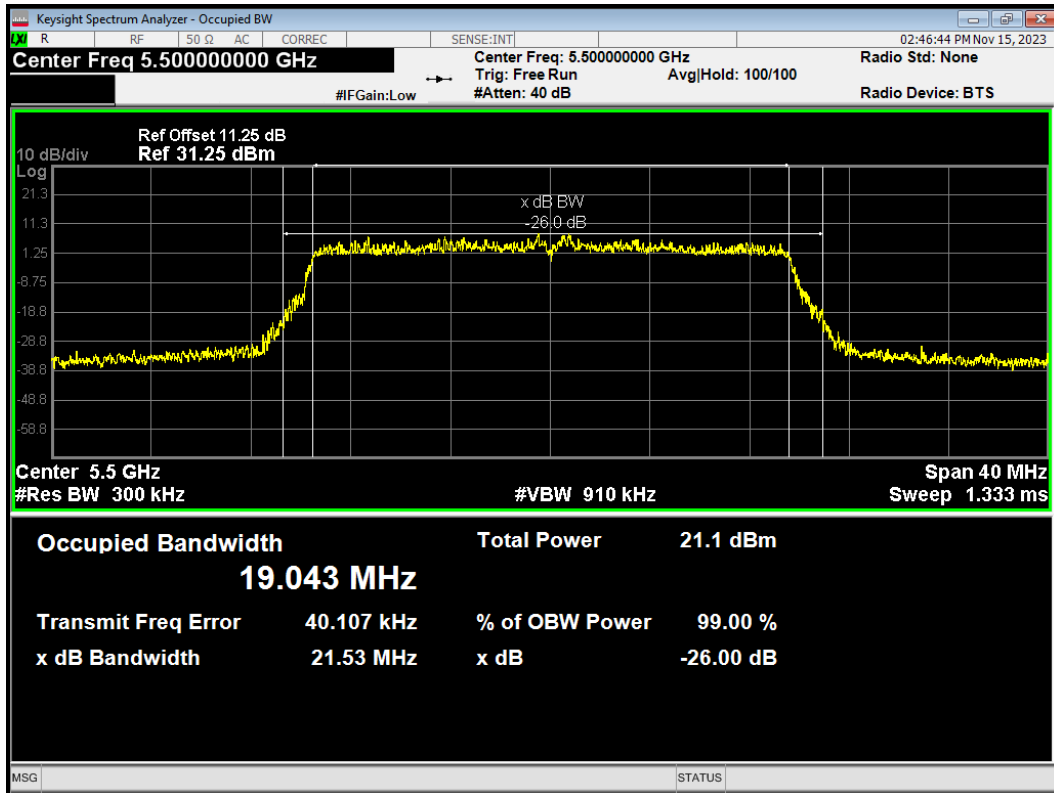
OBW 802.11ac(VHT80) 5530MHz



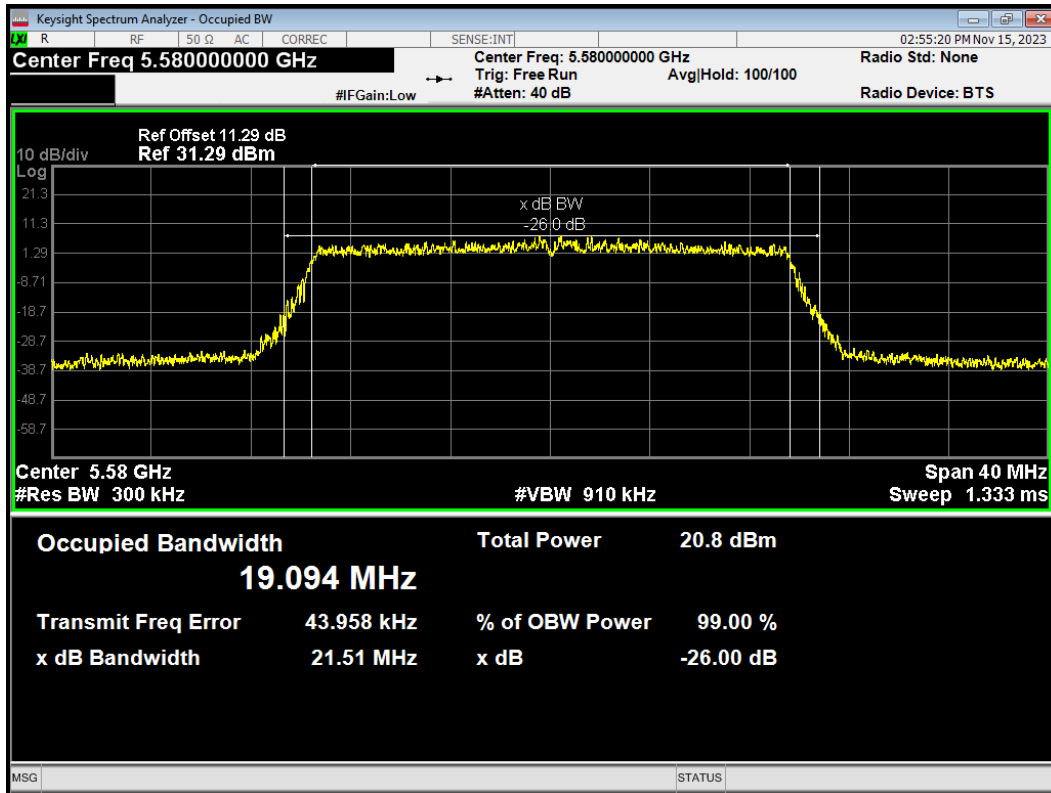
OBW 802.11ac(VHT80) 5690MHz



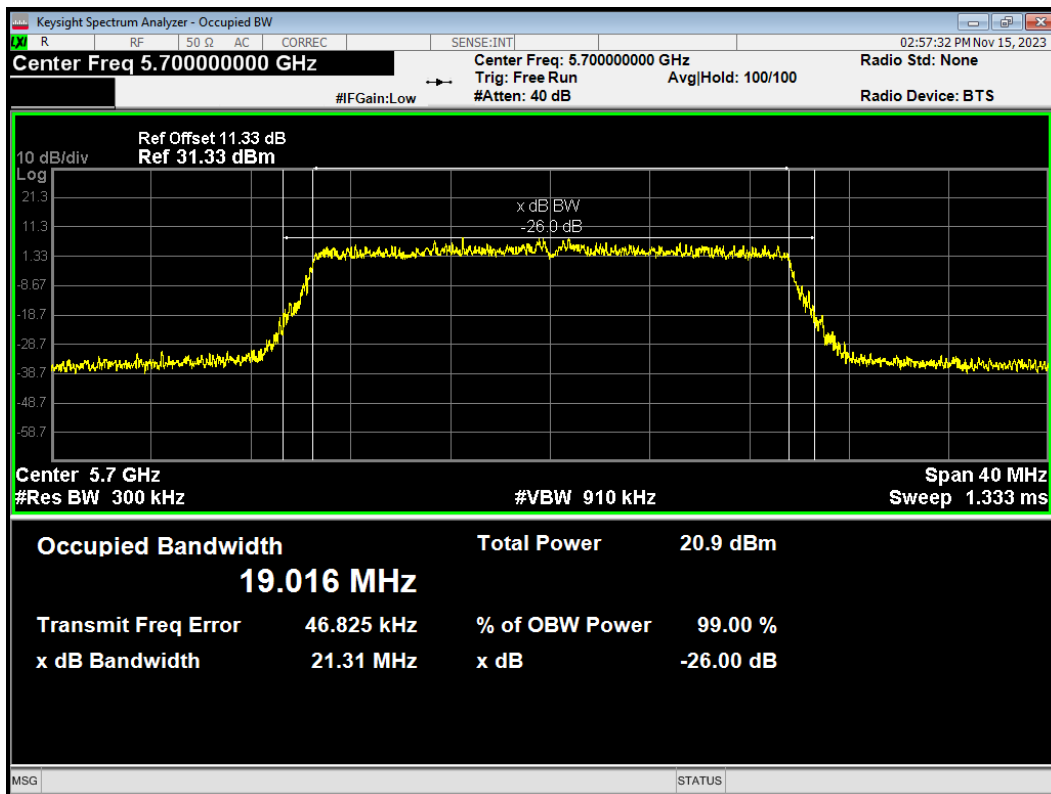
OBW 802.11ax(HE20) 5500MHz



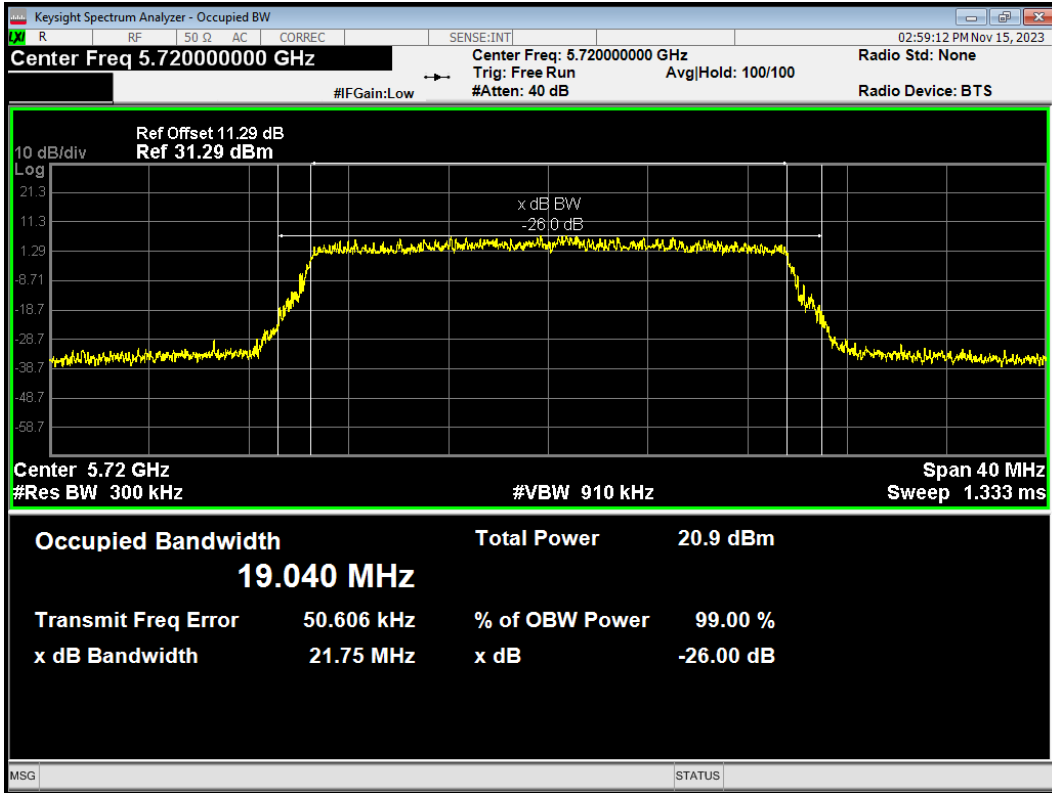
OBW 802.11ax(HE20) 5580MHz



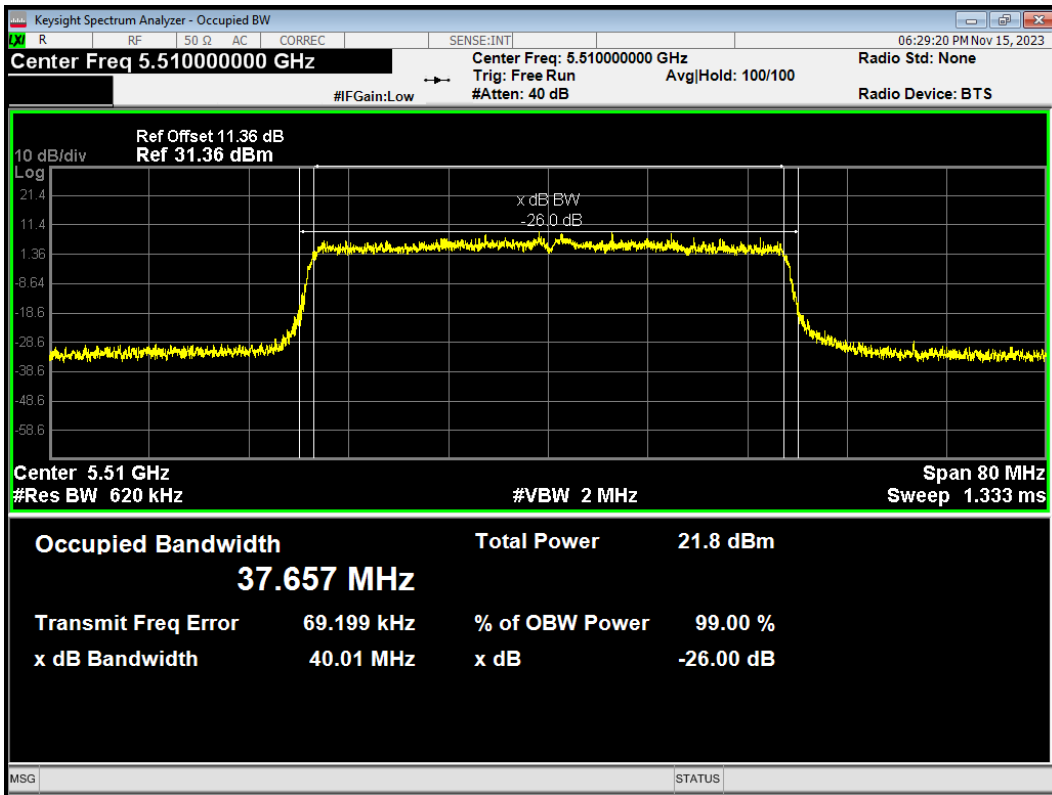
OBW 802.11ax(HE20) 5700MHz



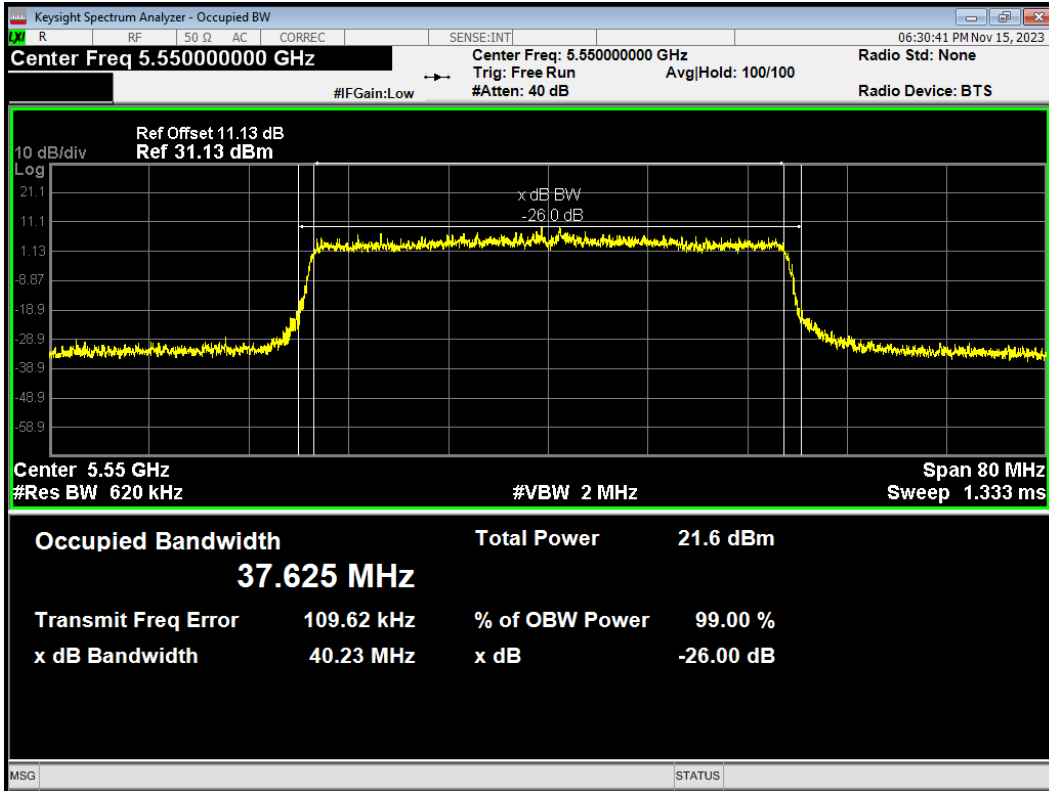
OBW 802.11ax(HE20) 5720MHz



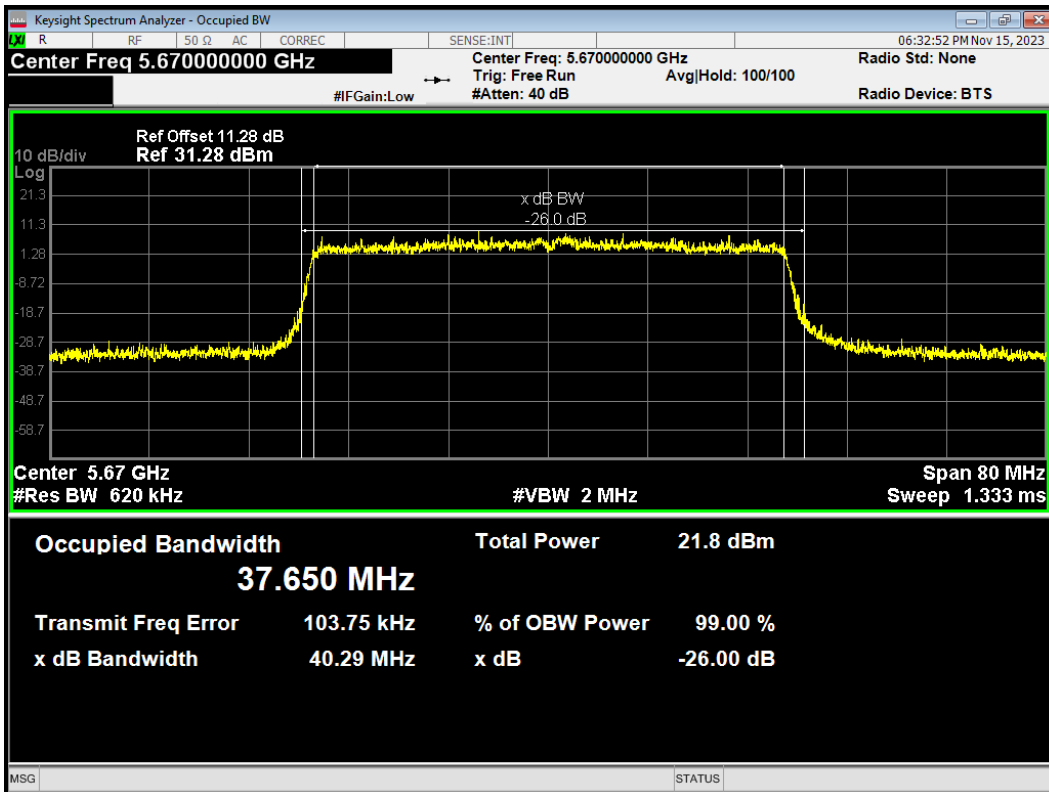
OBW 802.11ax(HE40) 5510MHz



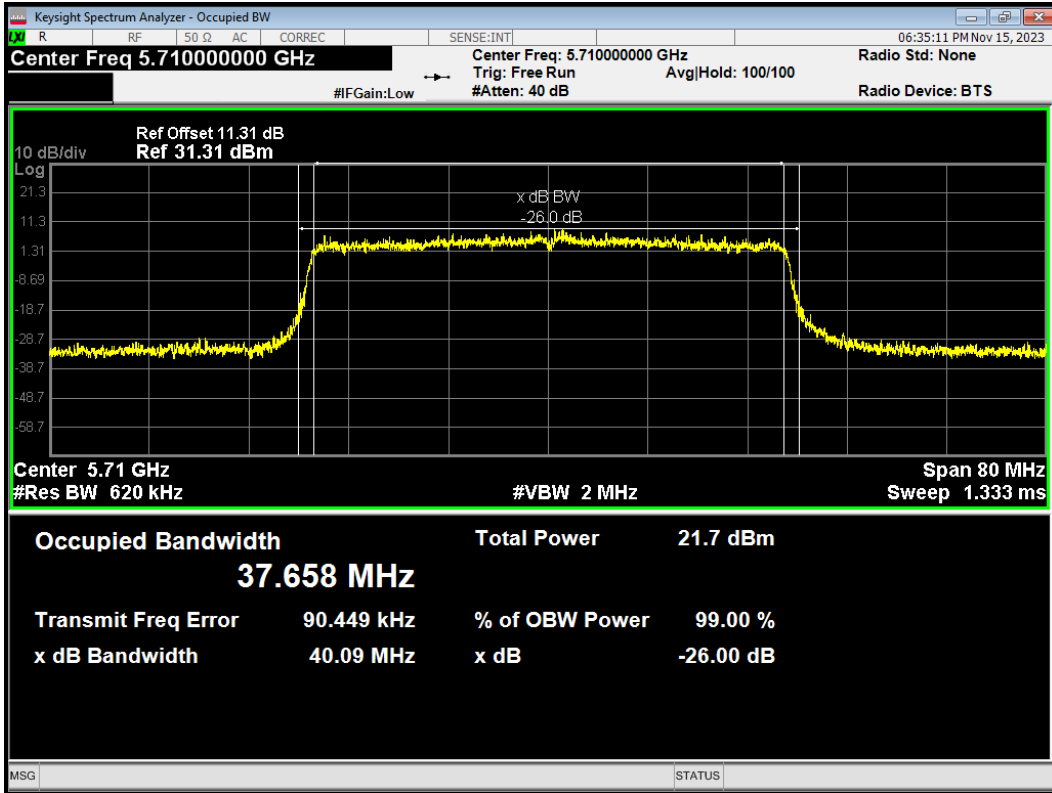
OBW 802.11ax(HE40) 5550MHz



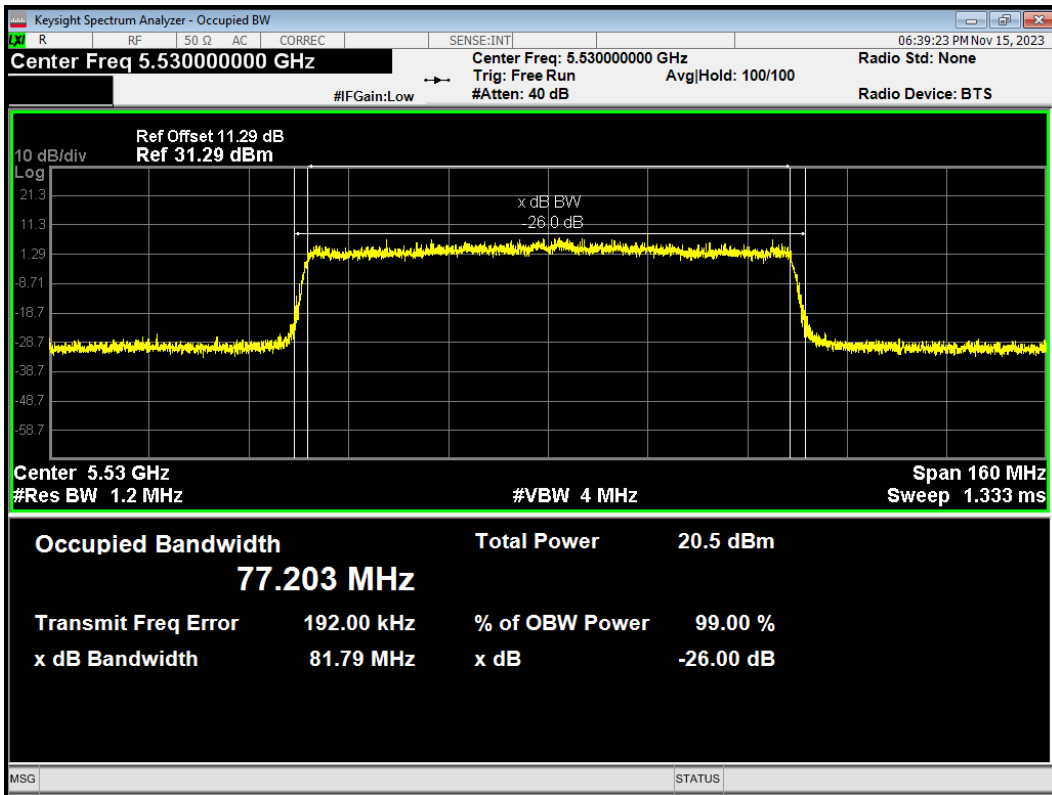
OBW 802.11ax(HE40) 5670MHz



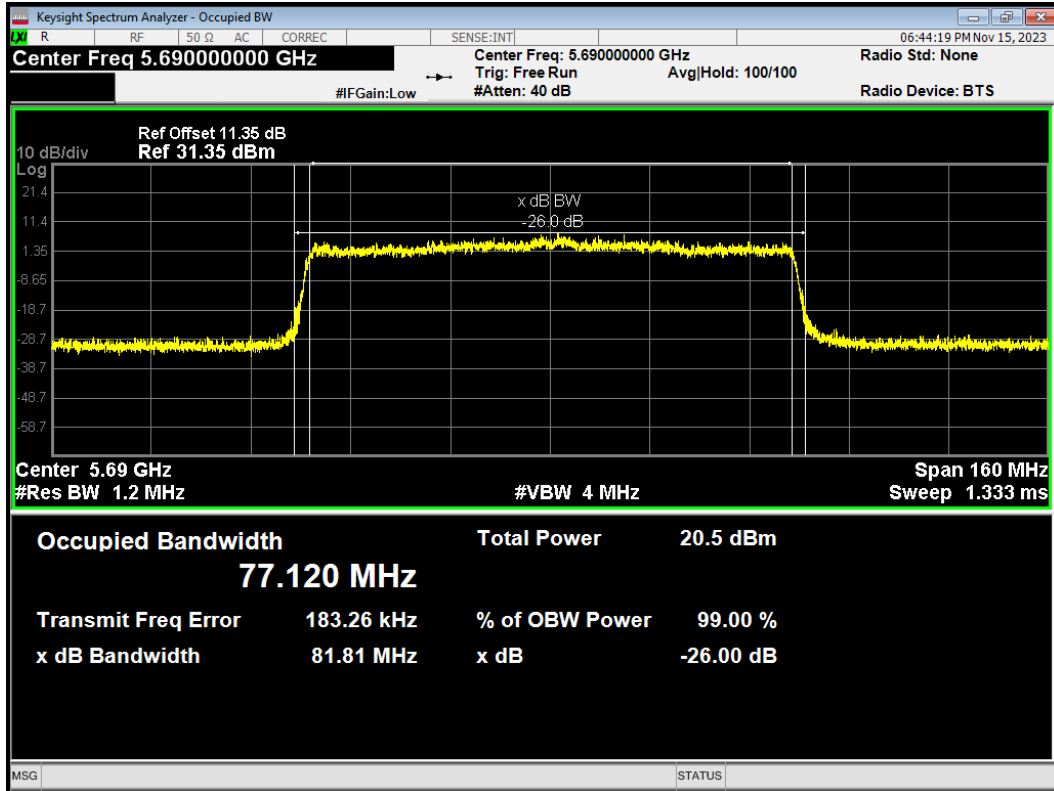
OBW 802.11ax(HE40) 5710MHz



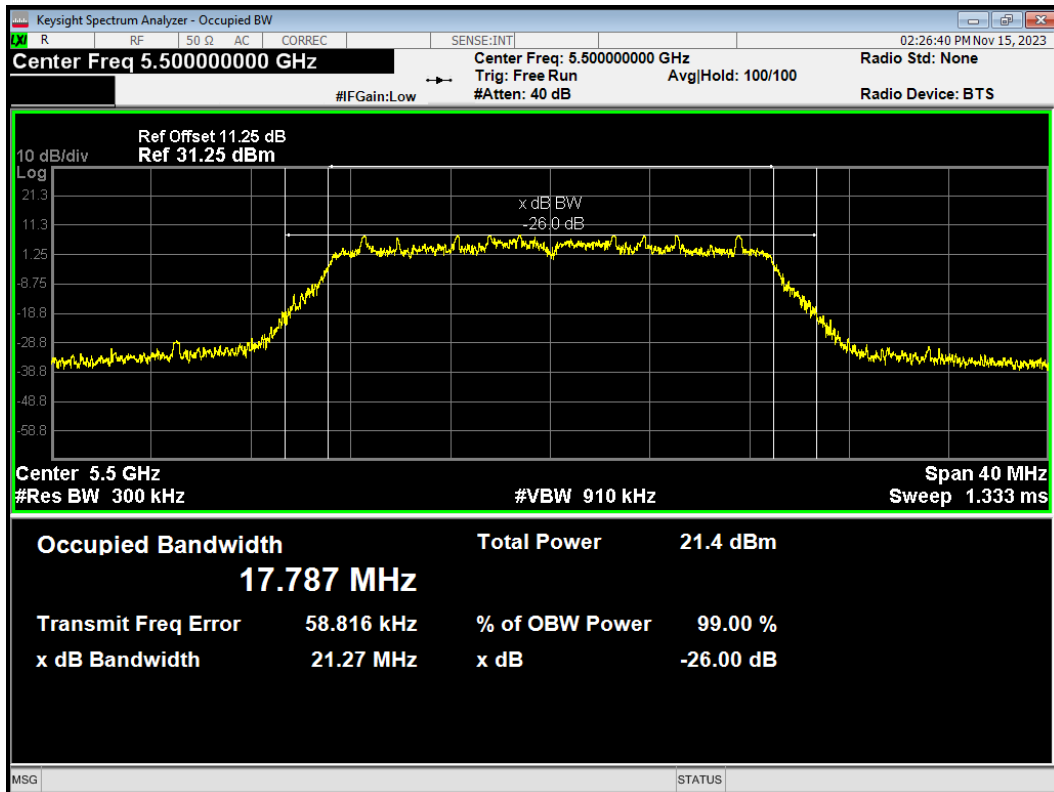
OBW 802.11ax(HE80) 5530MHz



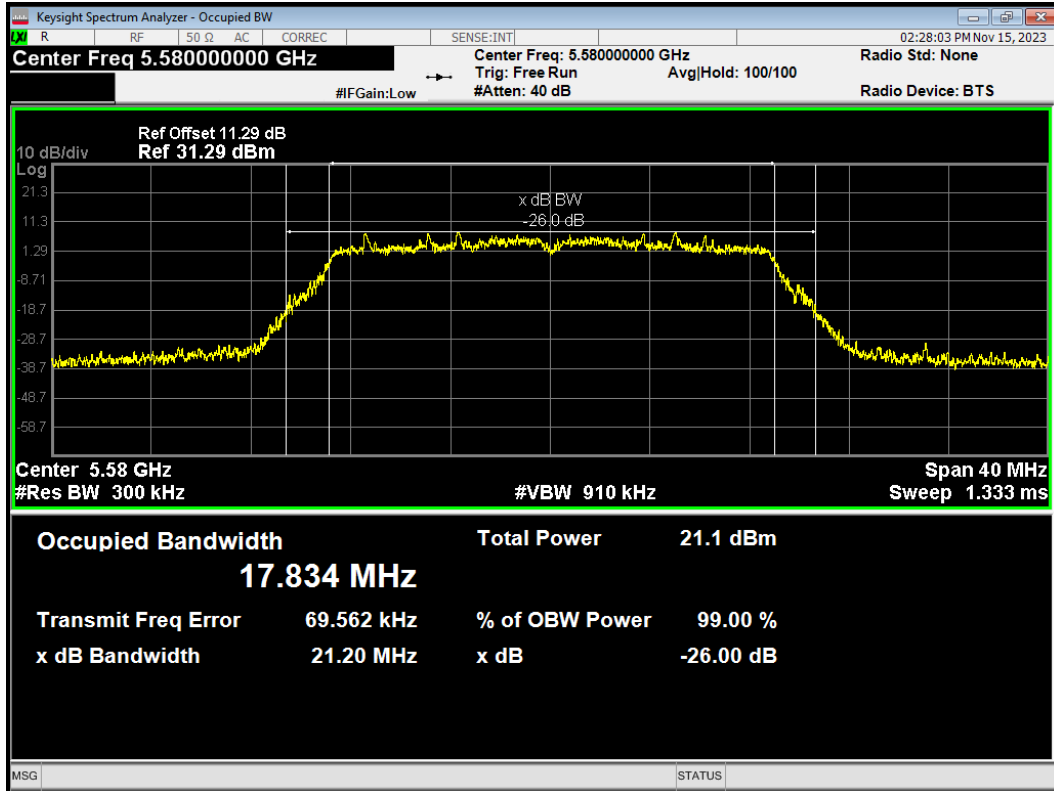
OBW 802.11ax(HE80) 5690MHz



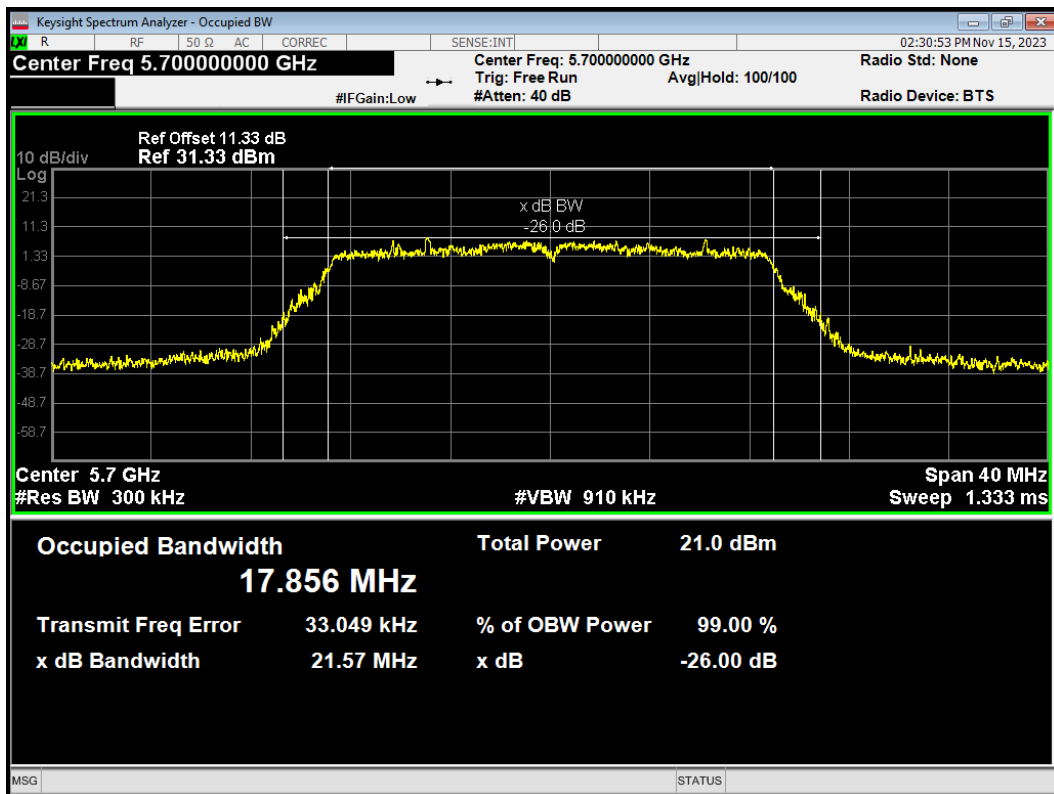
OBW 802.11n(HT20) 5500MHz



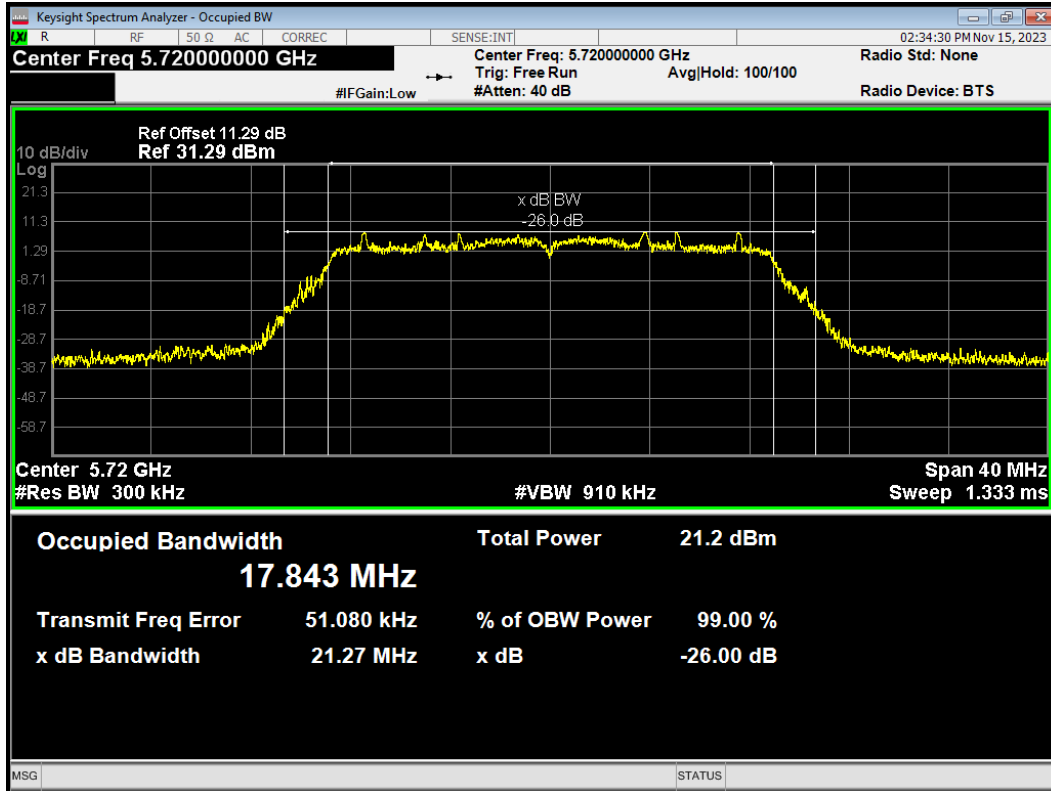
OBW 802.11n(HT20) 5580MHz



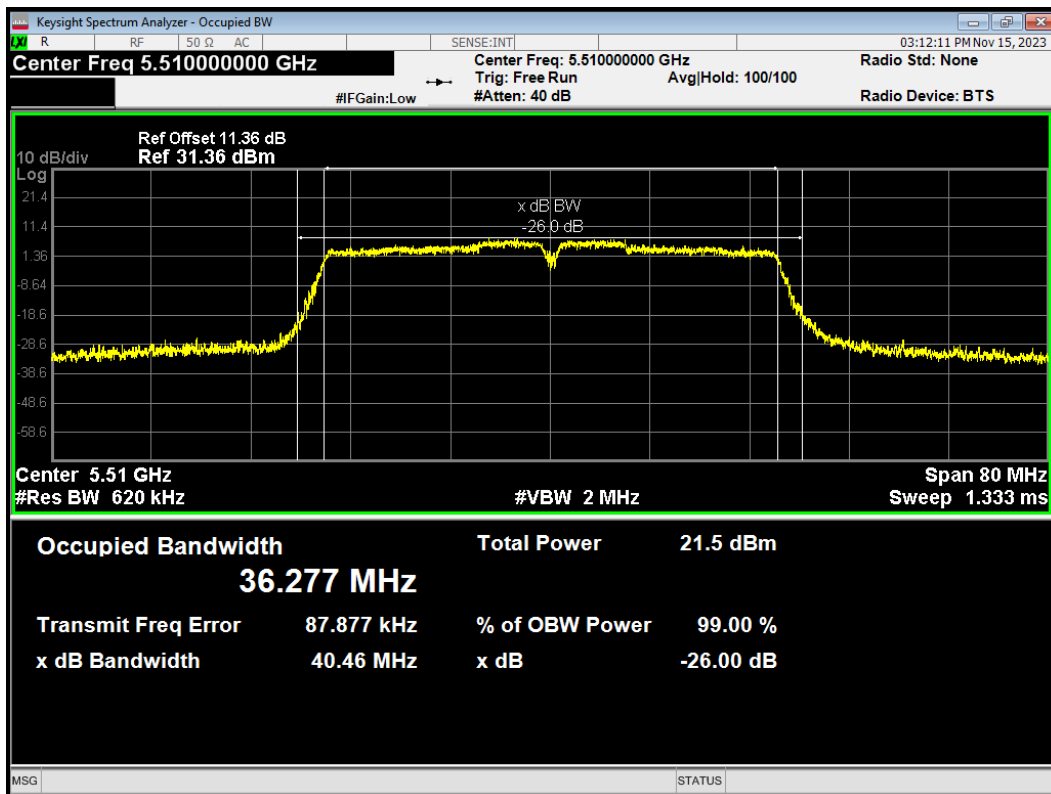
OBW 802.11n(HT20) 5700MHz



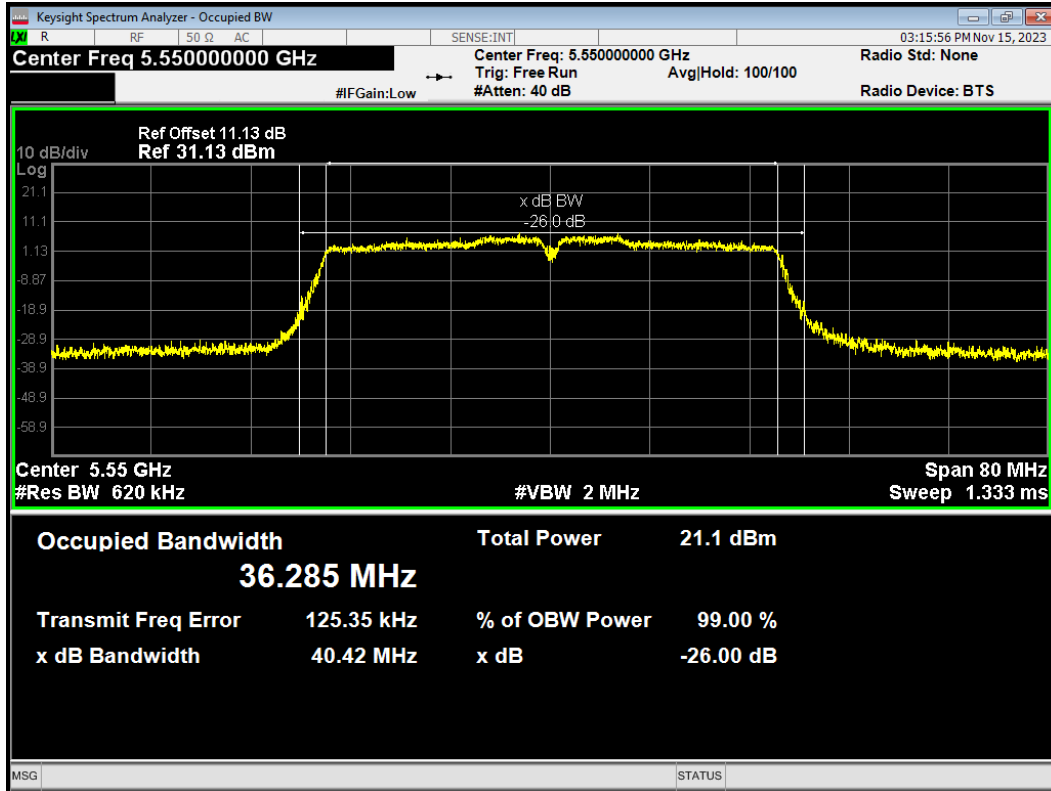
OBW 802.11n(HT20) 5720MHz



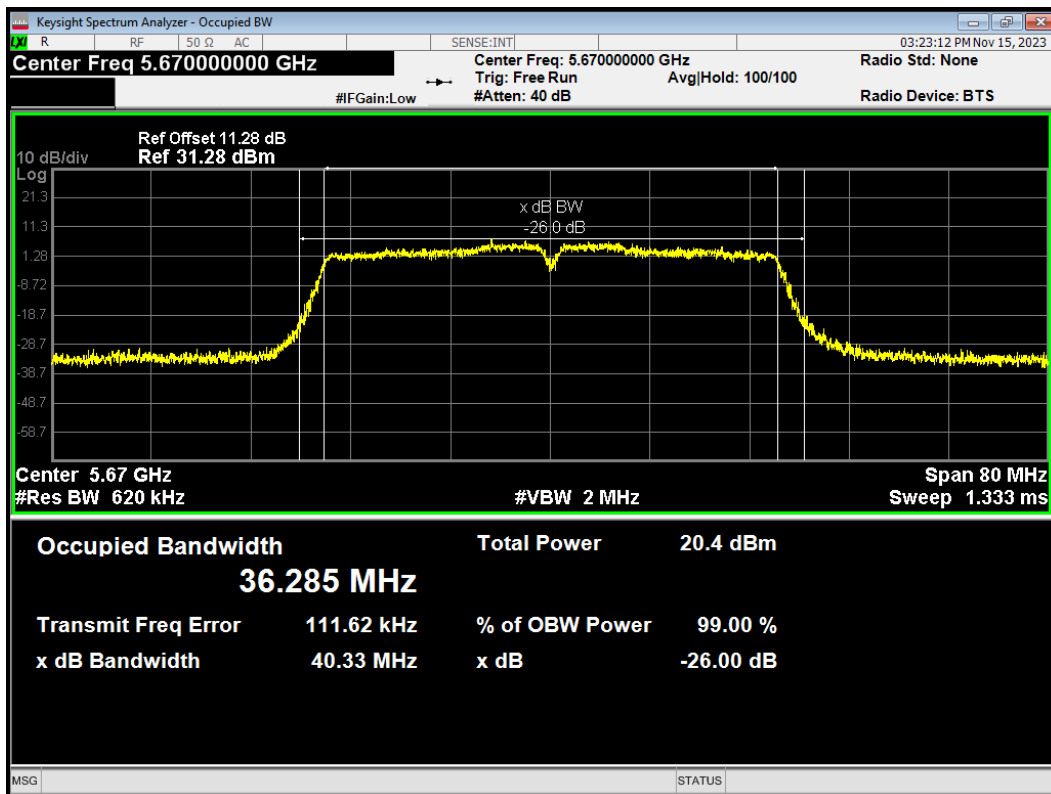
OBW 802.11n(HT40) 5510MHz



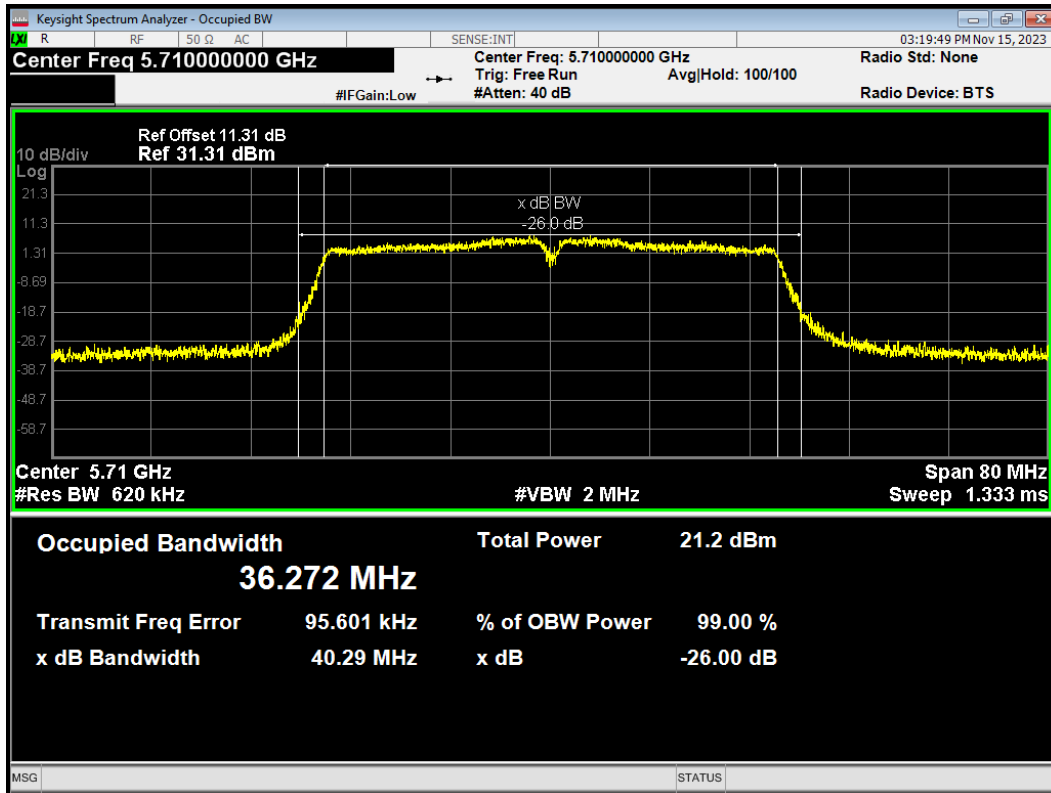
OBW 802.11n(HT40) 5550MHz



OBW 802.11n(HT40) 5670MHz

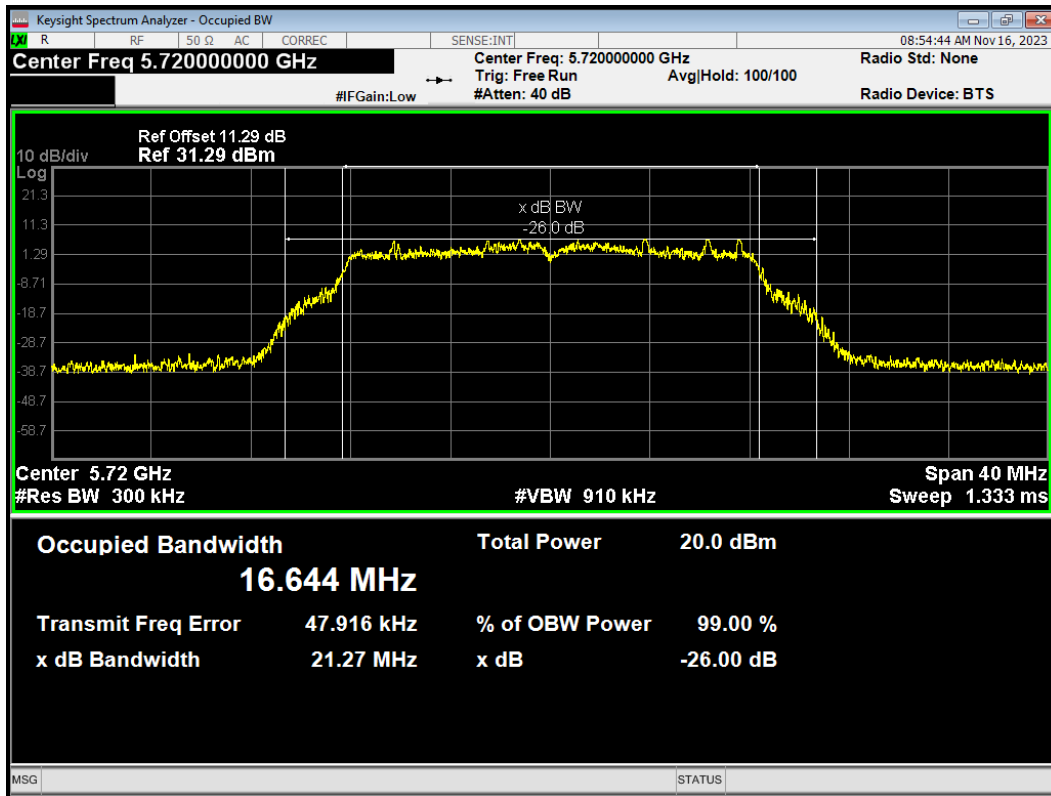


OBW 802.11n(HT40) 5710MHz

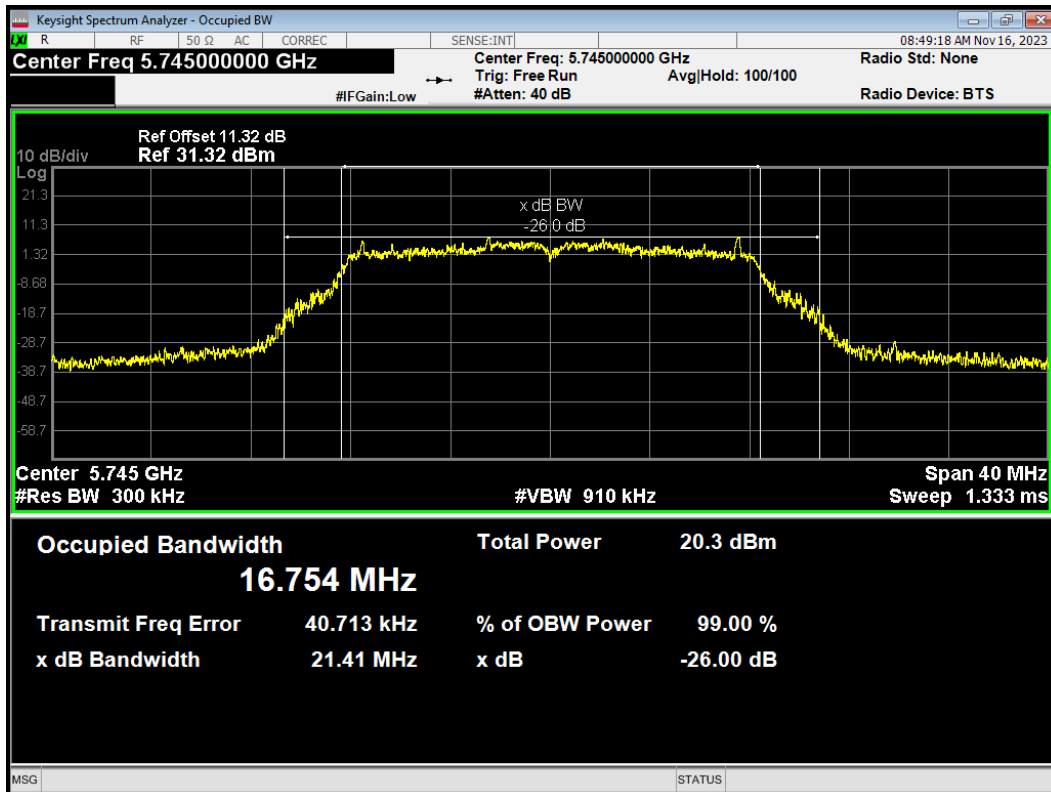


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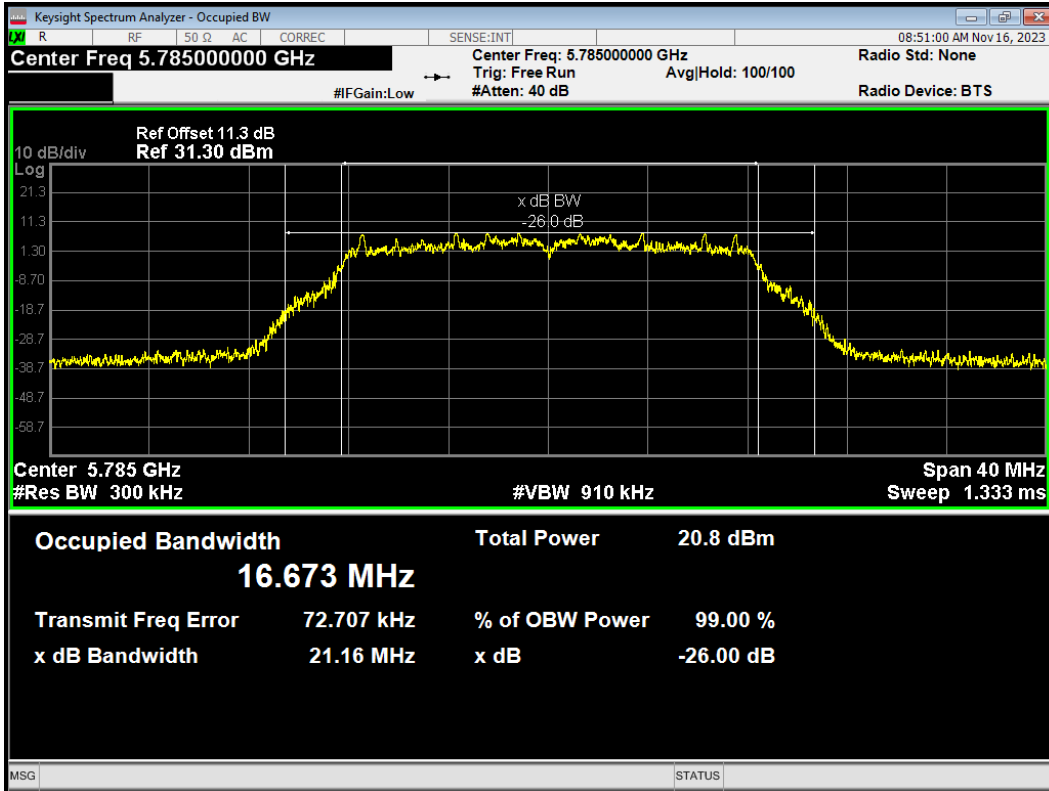
OBW 802.11a 5720MHz



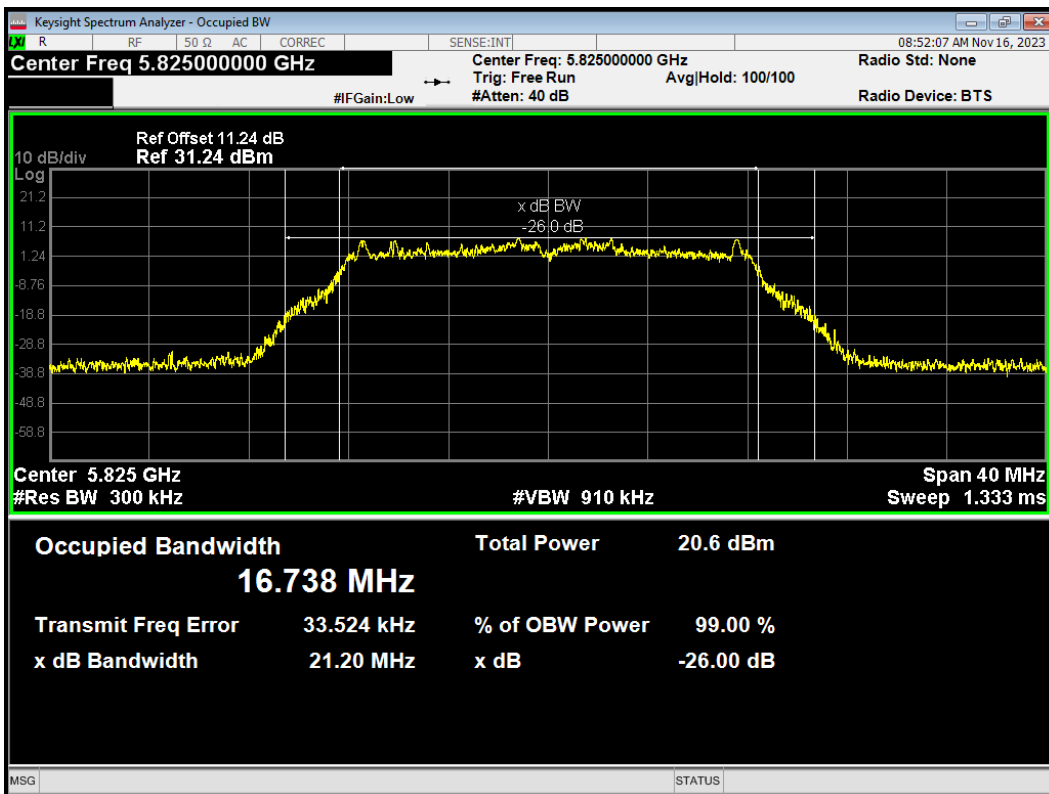
OBW 802.11a 5745MHz



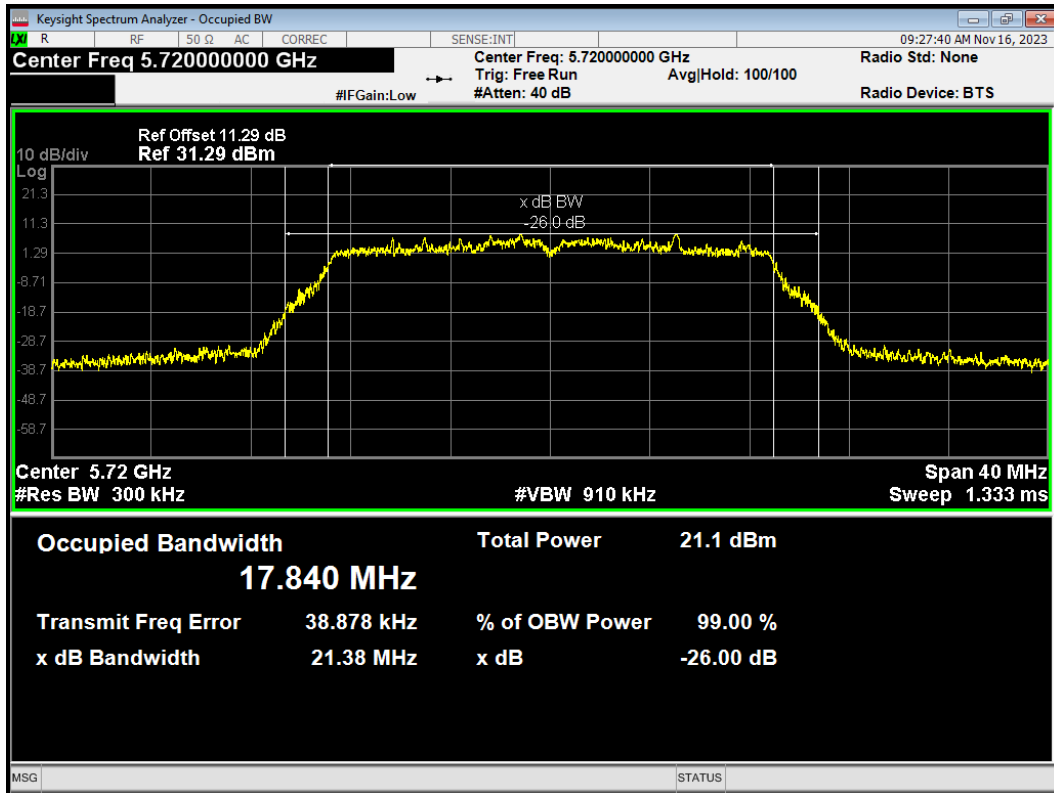
OBW 802.11a 5785MHz



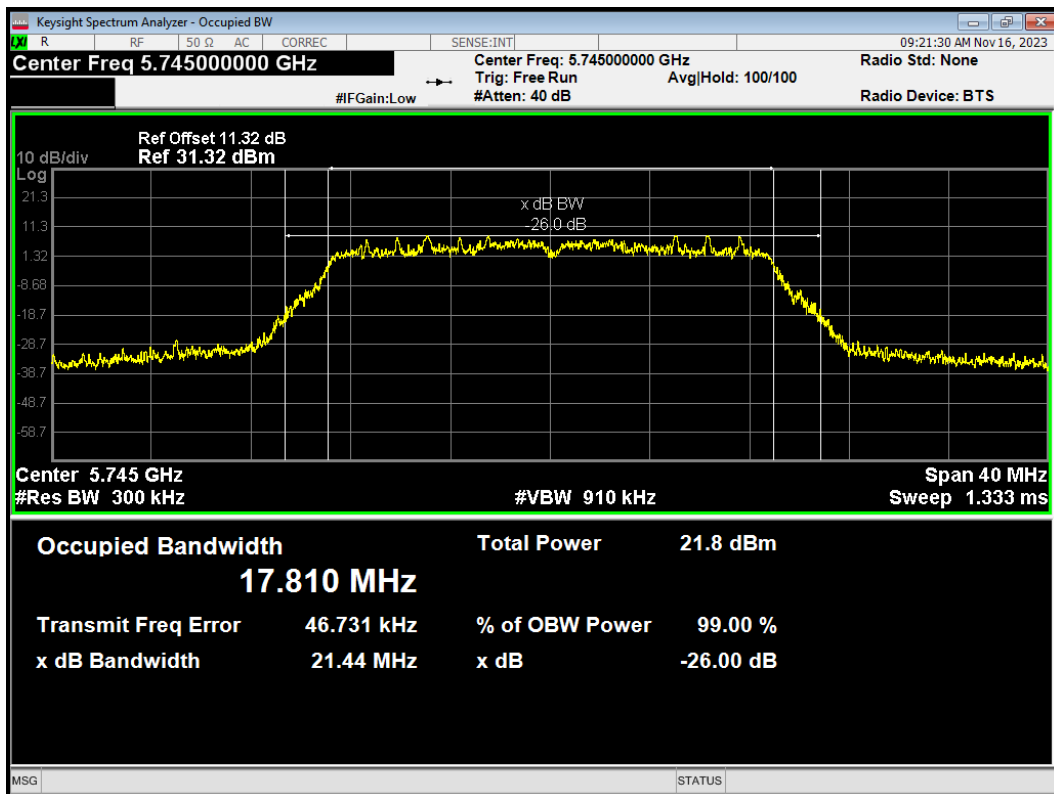
OBW 802.11a 5825MHz



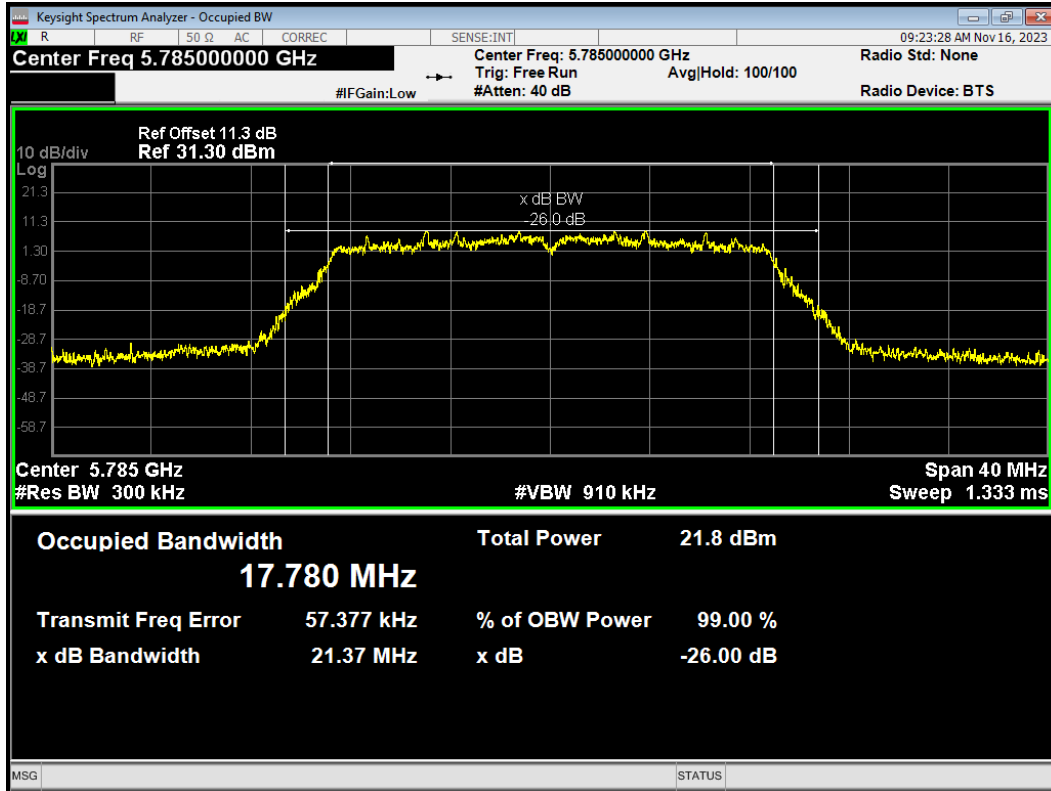
OBW 802.11ac(VHT20) 5720MHz



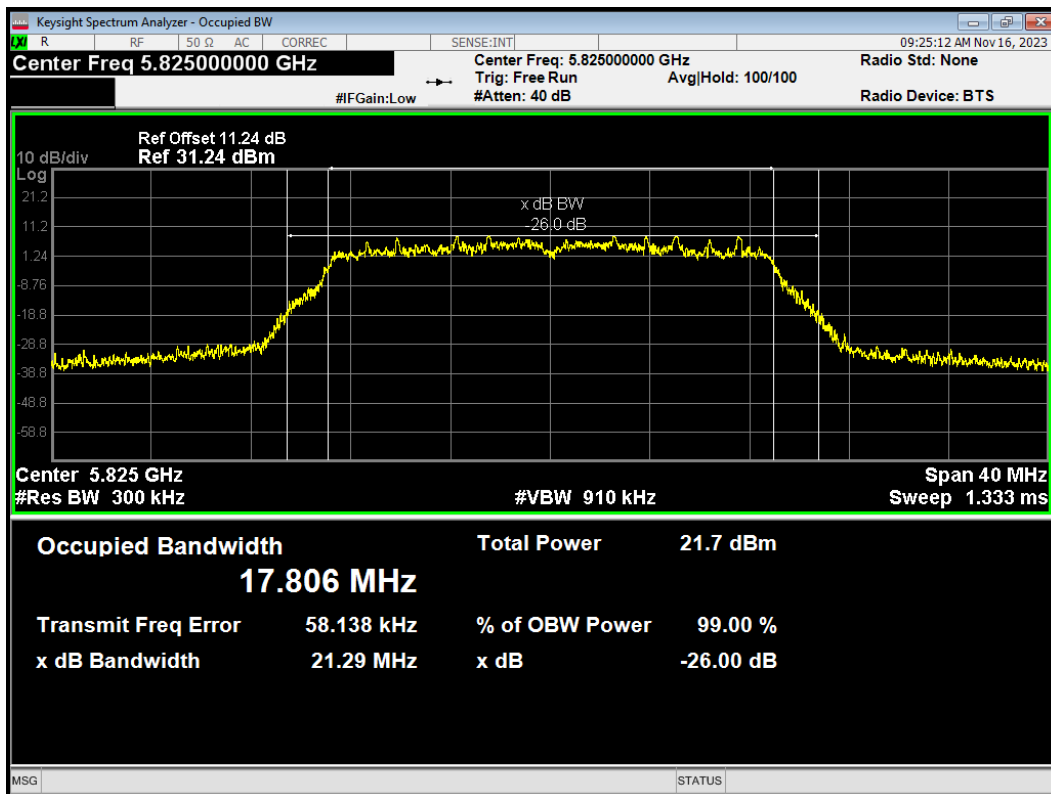
OBW 802.11ac(VHT20) 5745MHz



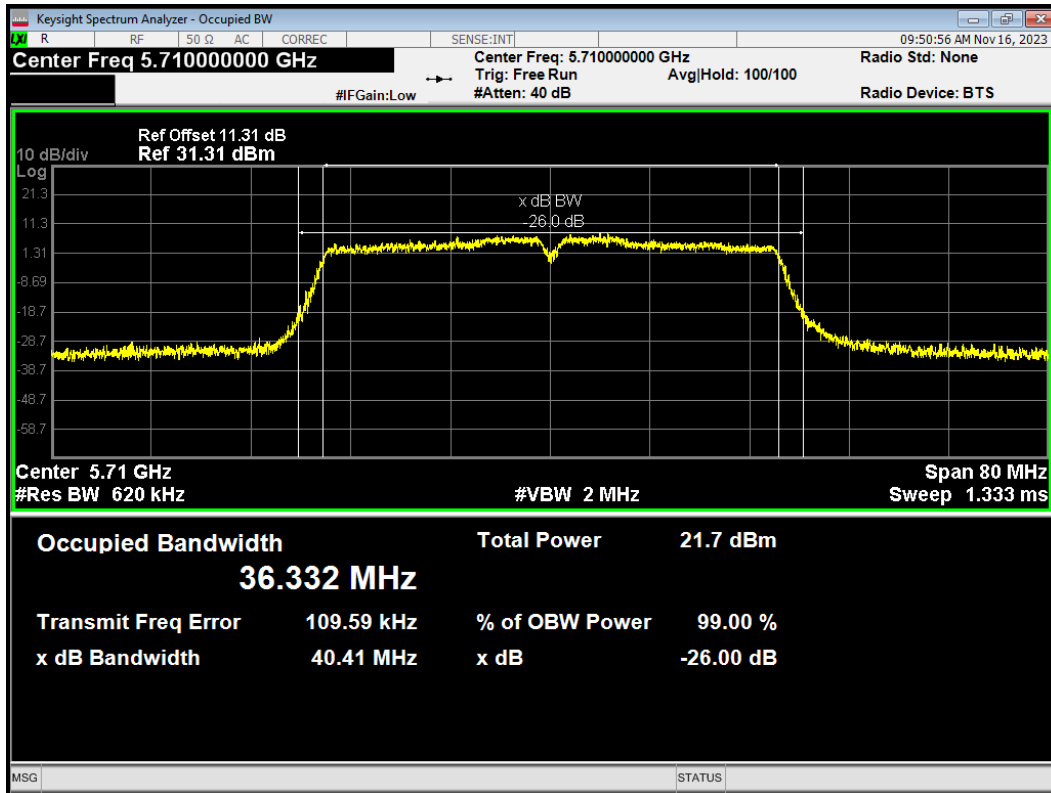
OBW 802.11ac(VHT20) 5785MHz



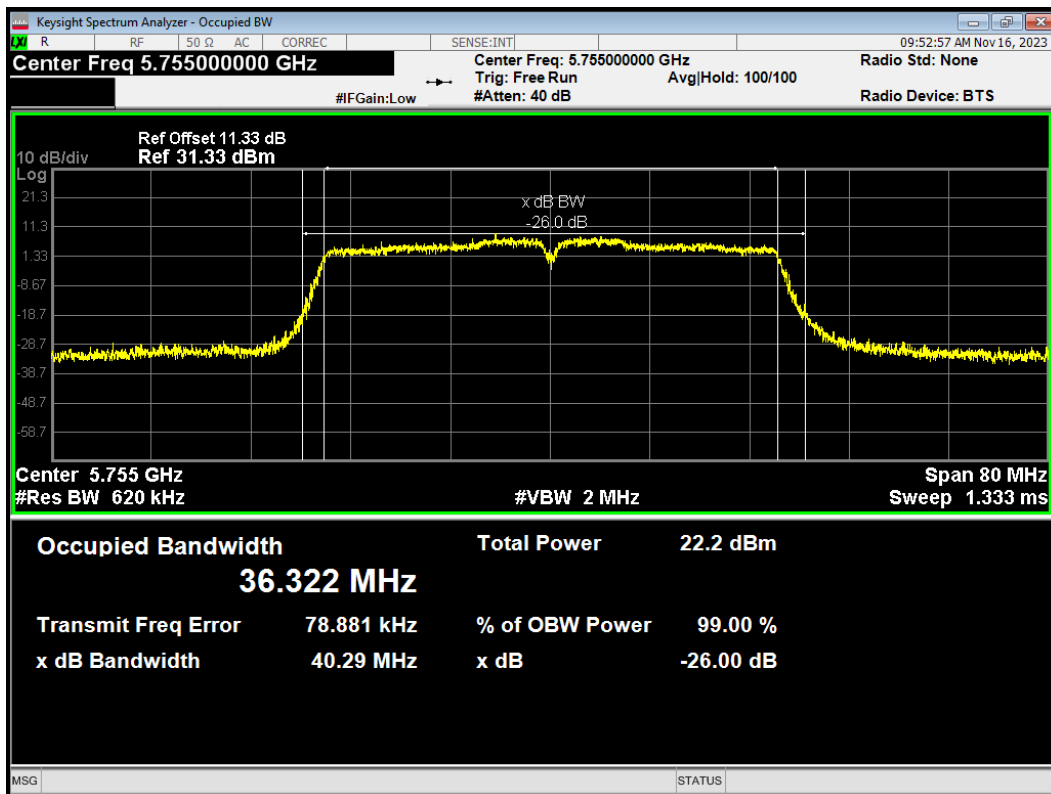
OBW 802.11ac(VHT20) 5825MHz



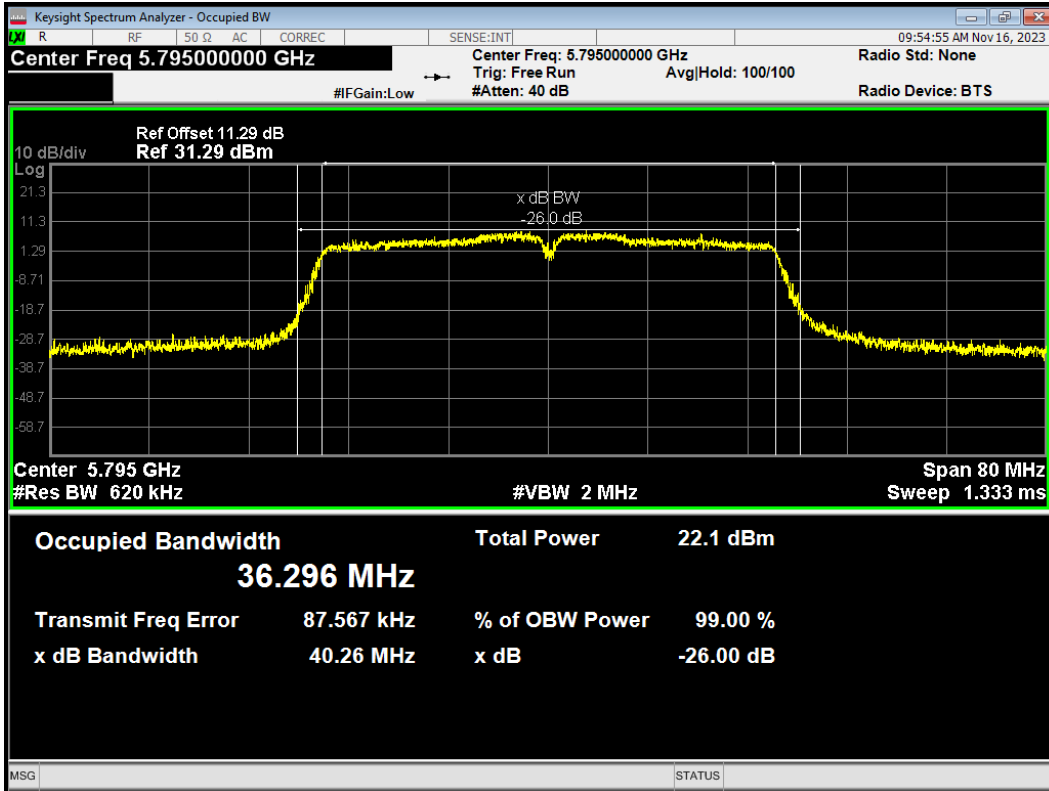
OBW 802.11ac(VHT40) 5710MHz



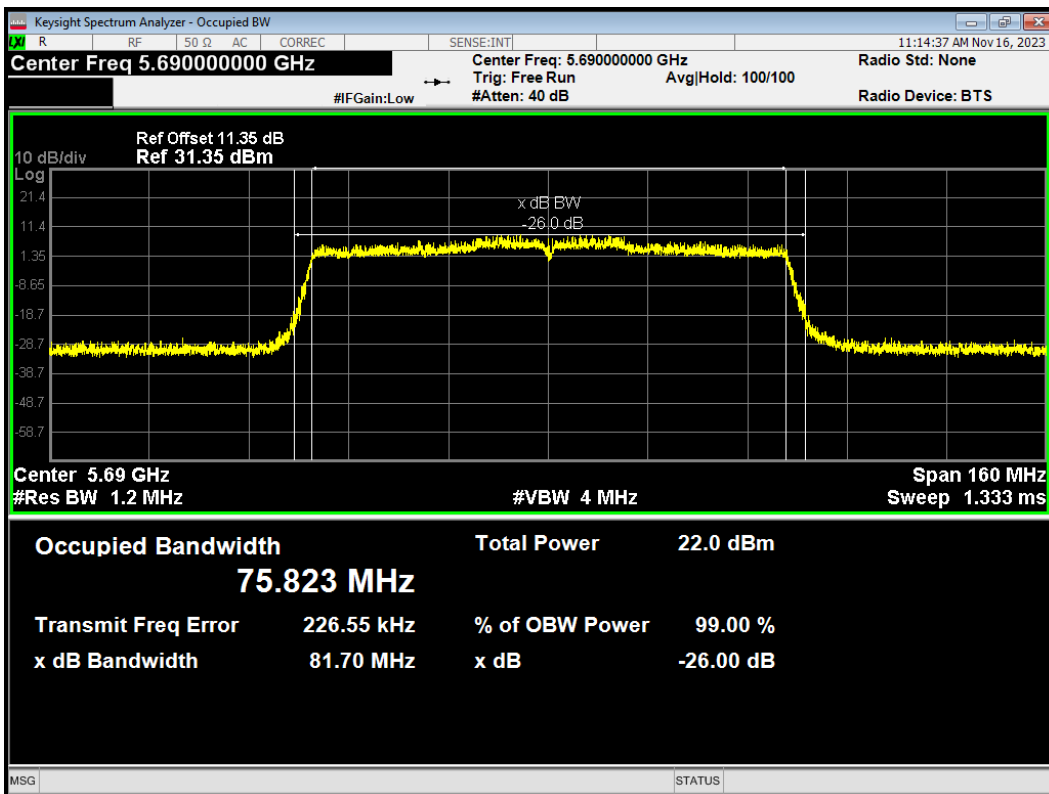
OBW 802.11ac(VHT40) 5755MHz



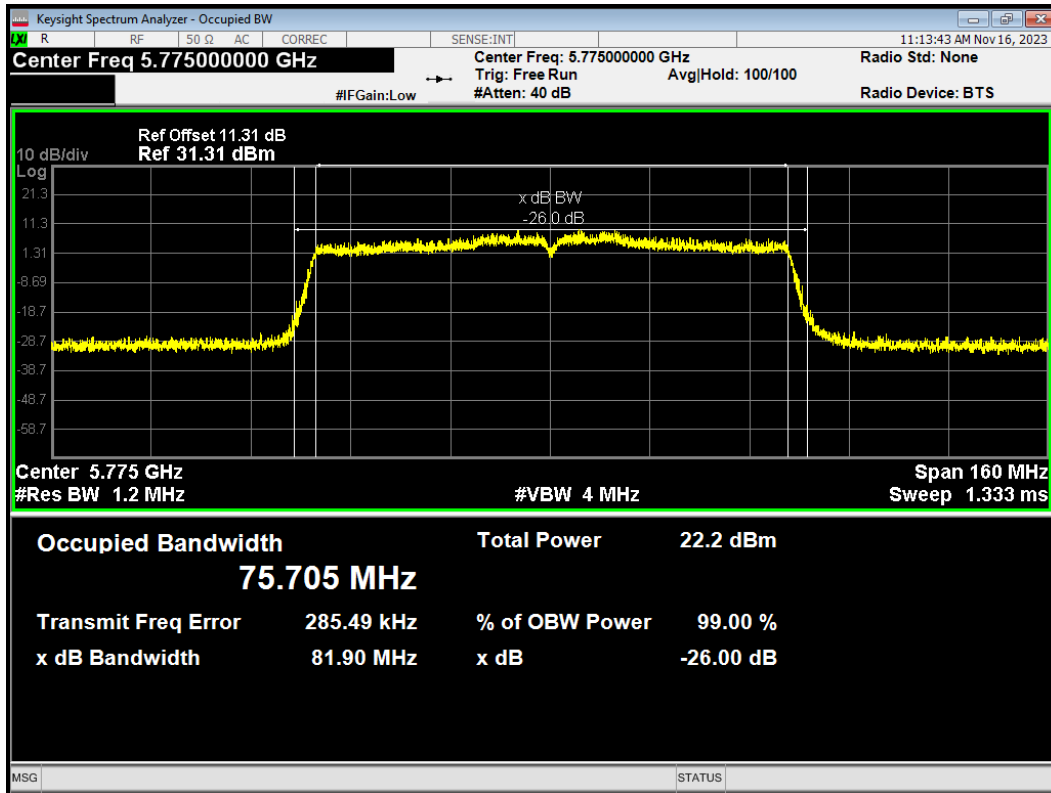
OBW 802.11ac(VHT40) 5795MHz



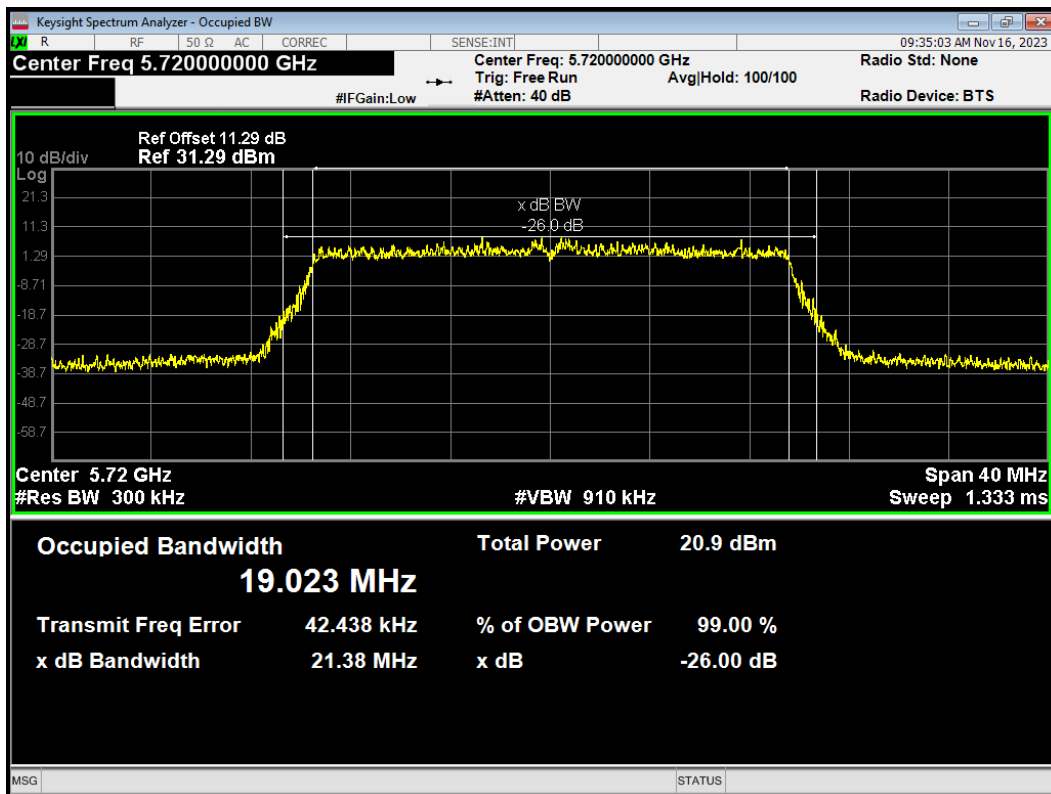
OBW 802.11ac(VHT80) 5690MHz



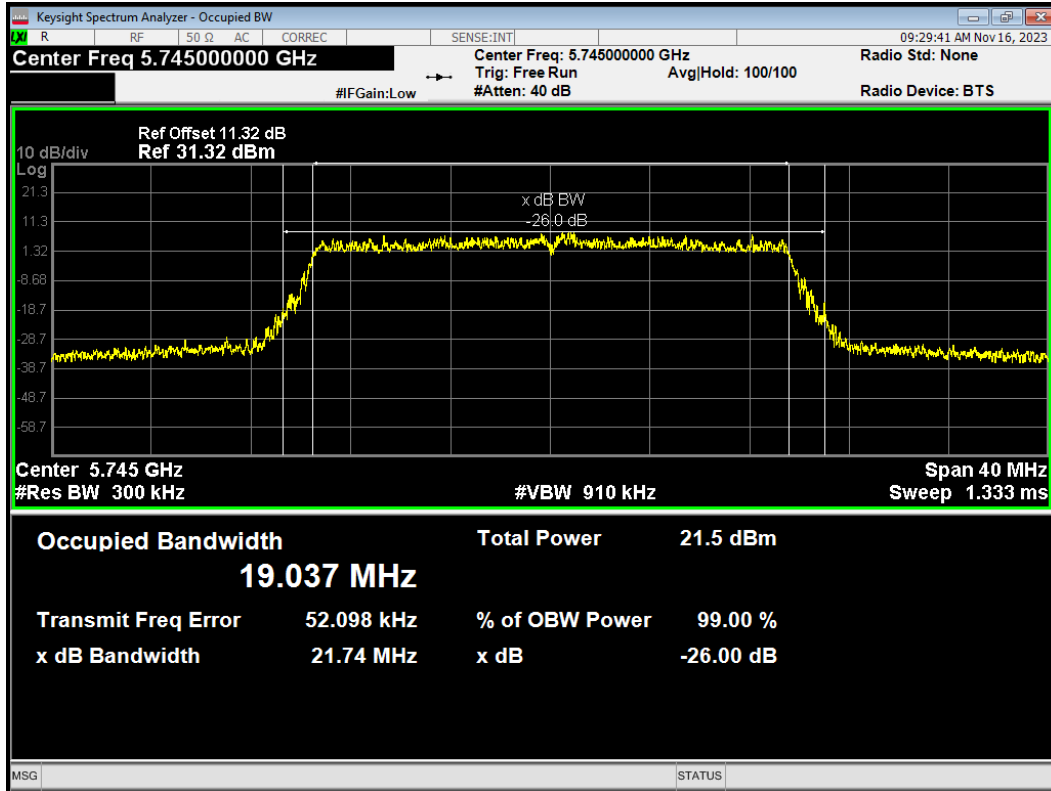
OBW 802.11ac(VHT80) 5775MHz



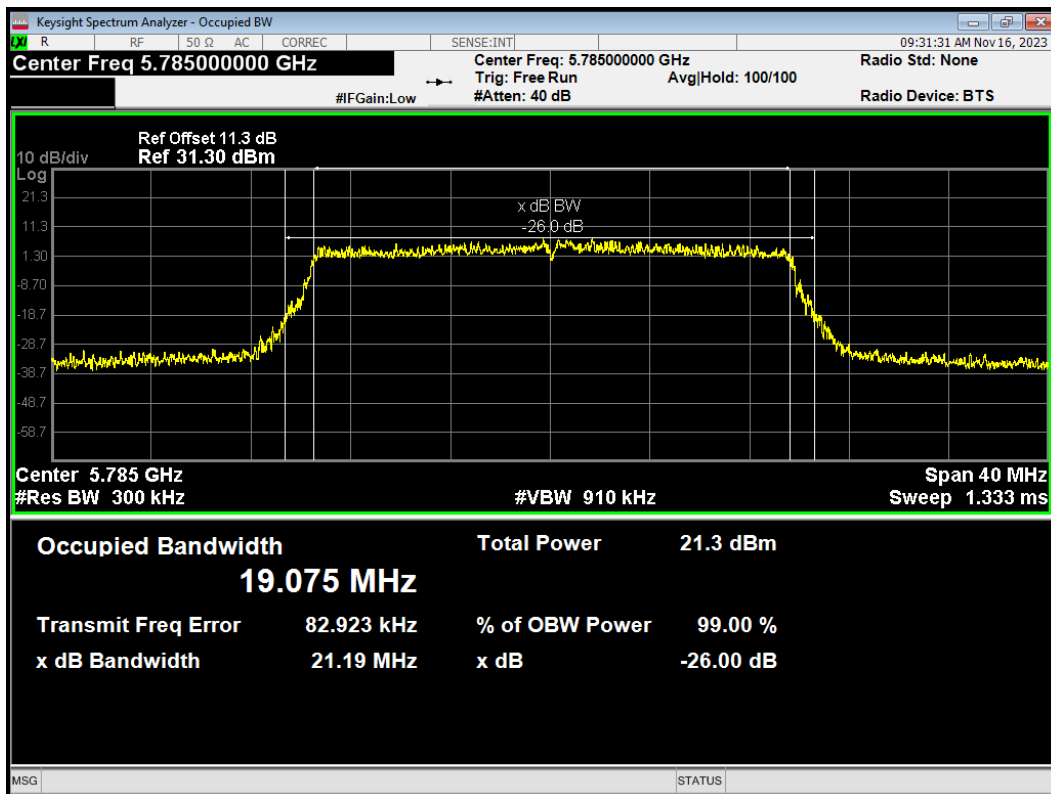
OBW 802.11ax(HE20) 5720MHz



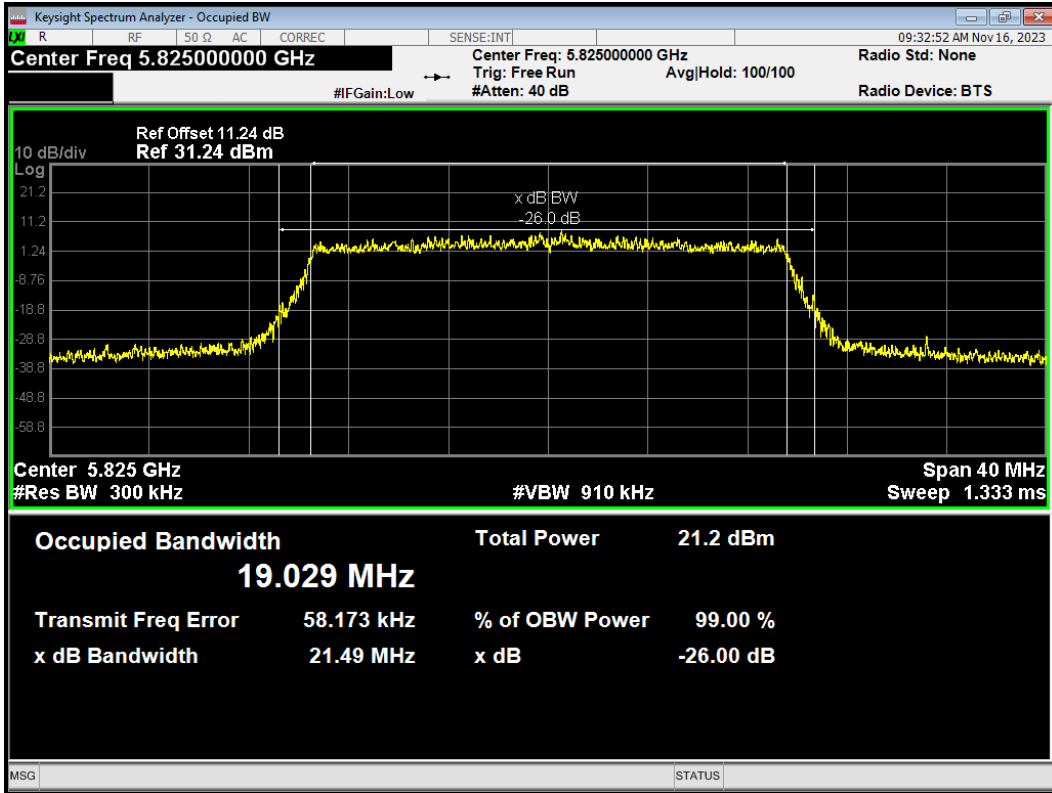
OBW 802.11ax(HE20) 5745MHz



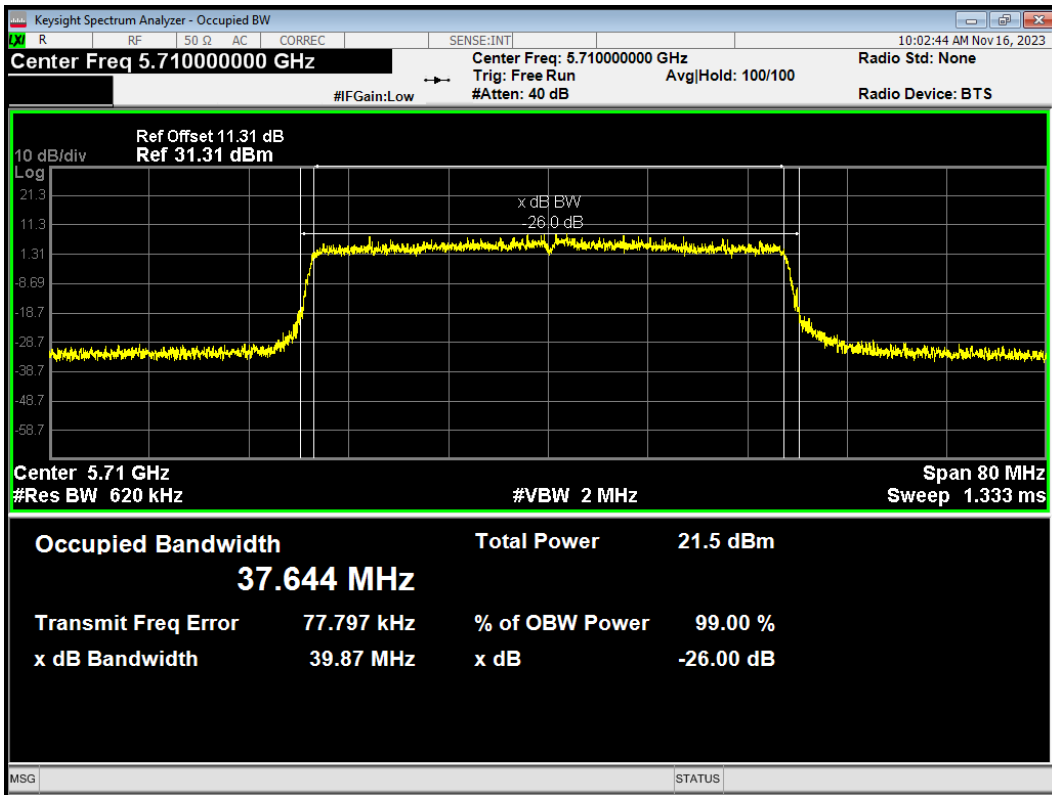
OBW 802.11ax(HE20) 5785MHz



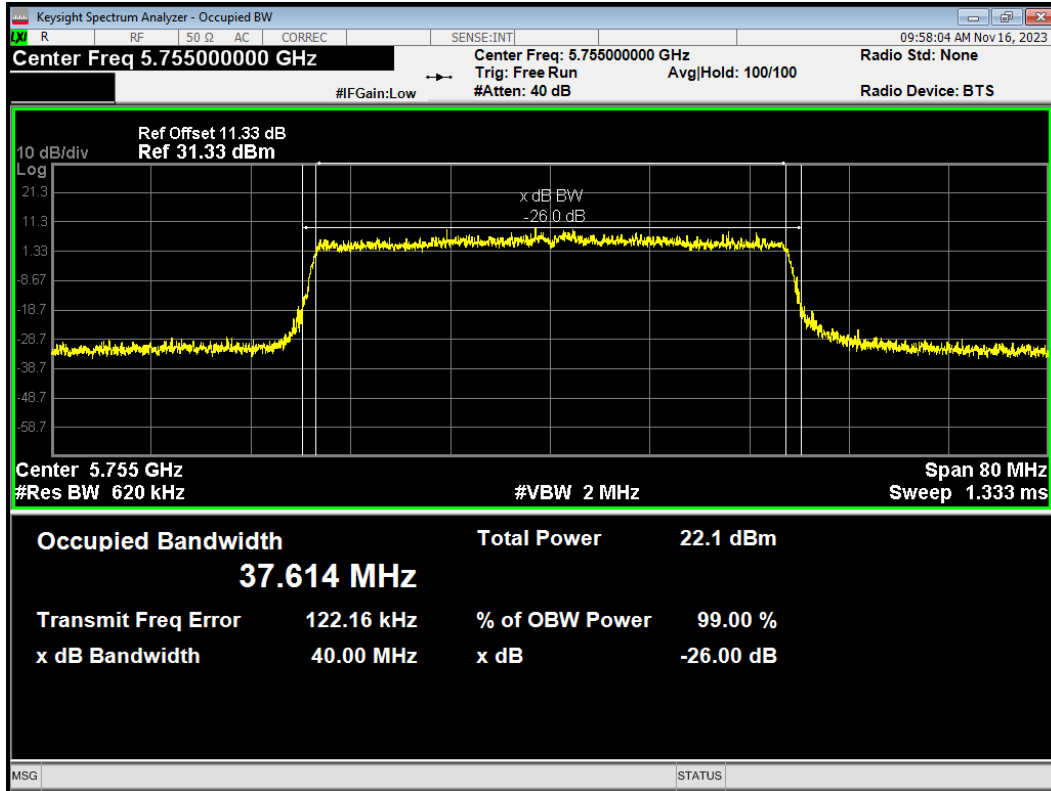
OBW 802.11ax(HE20) 5825MHz



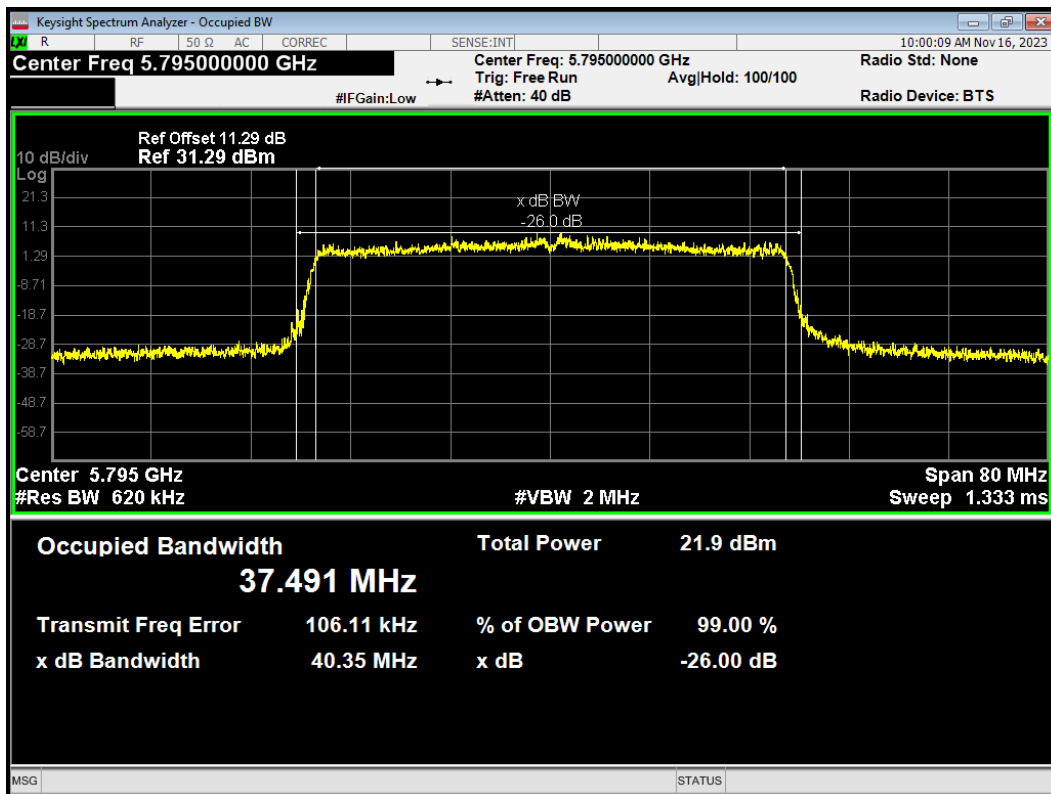
OBW 802.11ax(HE40) 5710MHz



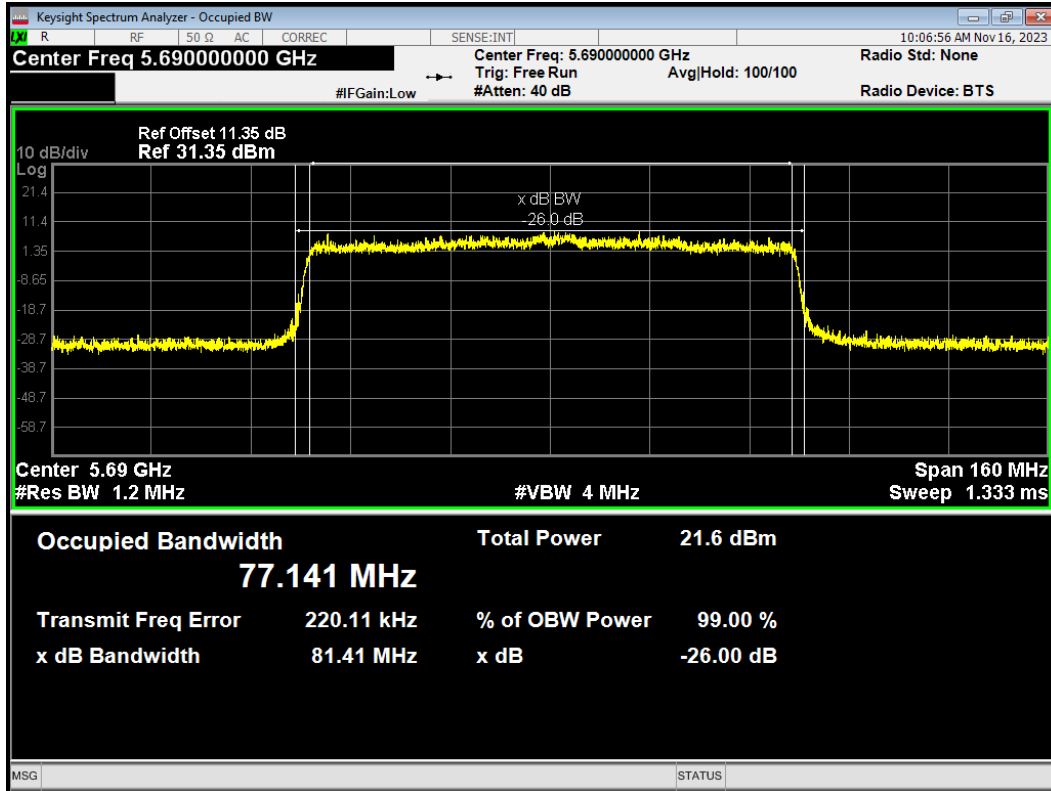
OBW 802.11ax(HE40) 5755MHz



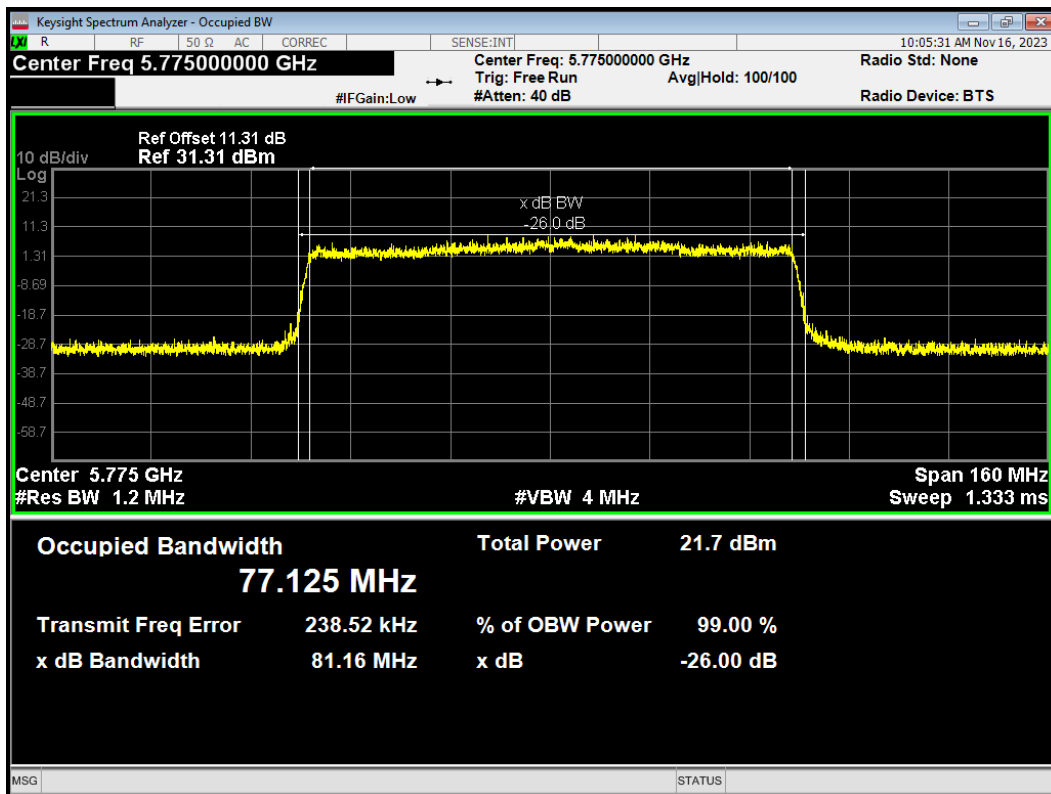
OBW 802.11ax(HE40) 5795MHz



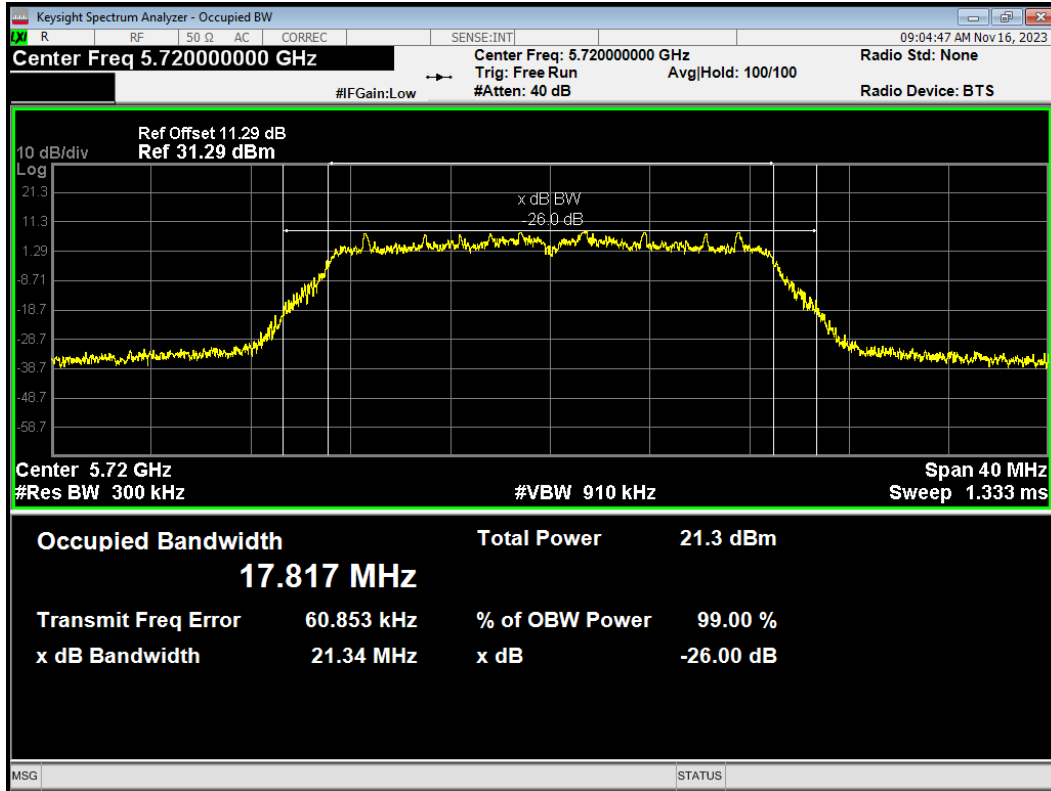
OBW 802.11ax(HE80) 5690MHz



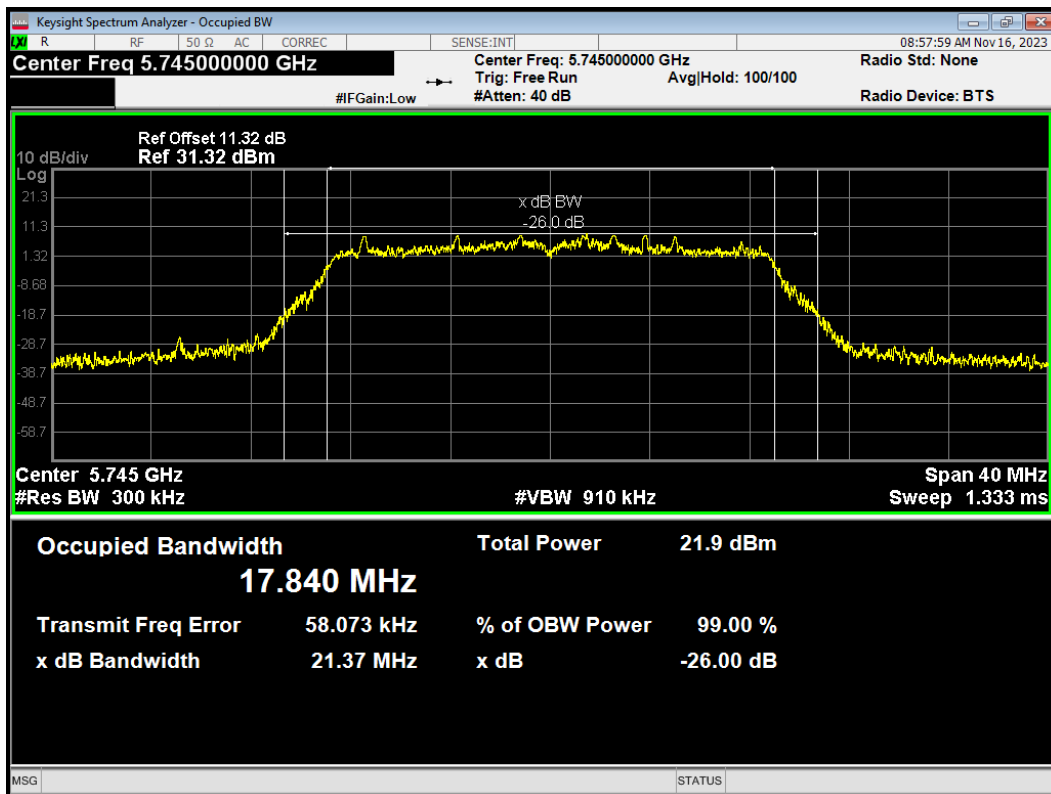
OBW 802.11ax(HE80) 5775MHz



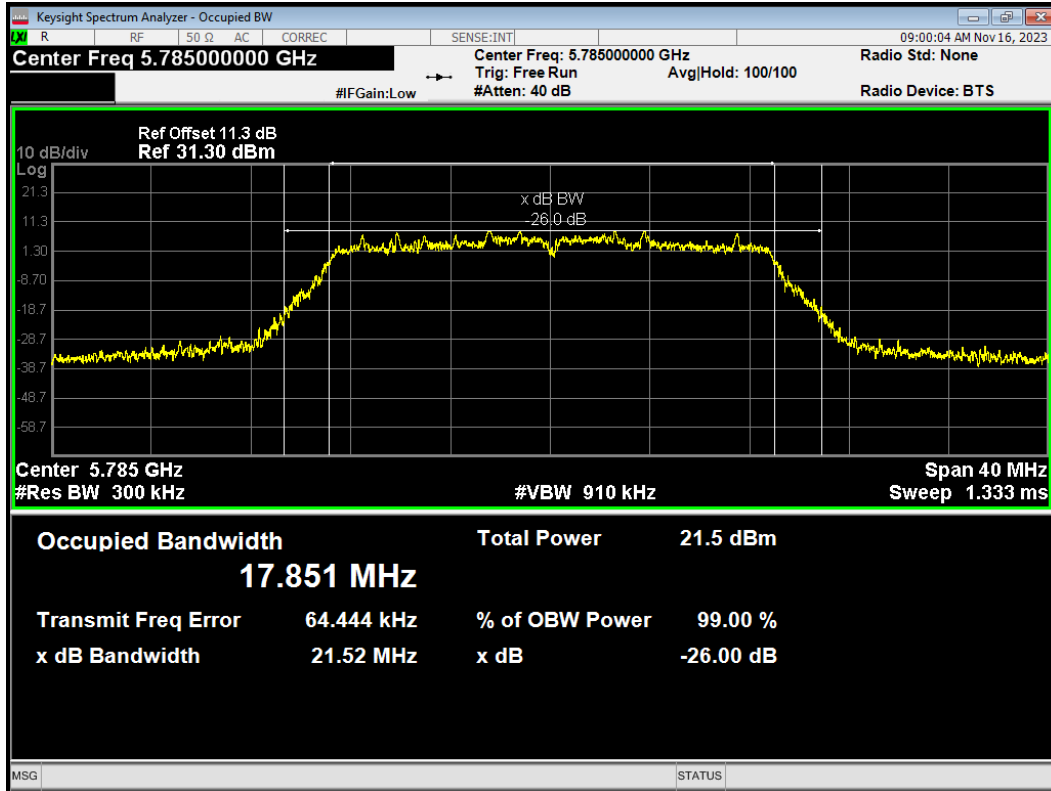
OBW 802.11n(HT20) 5720MHz



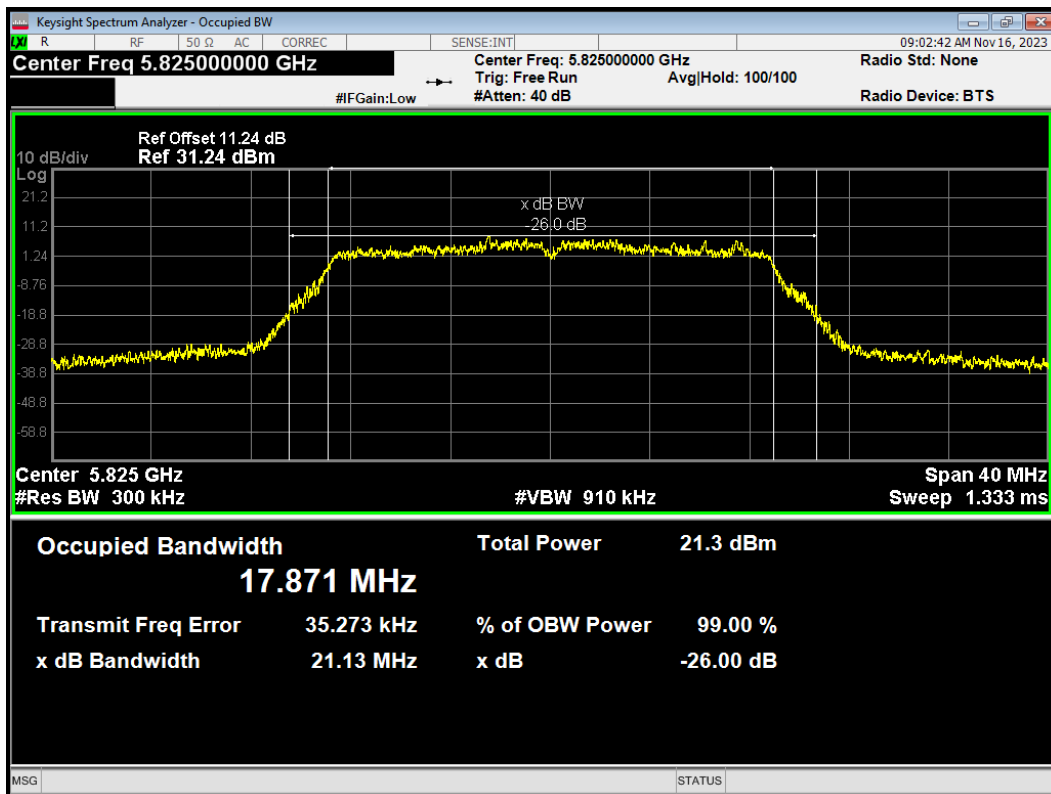
OBW 802.11n(HT20) 5745MHz



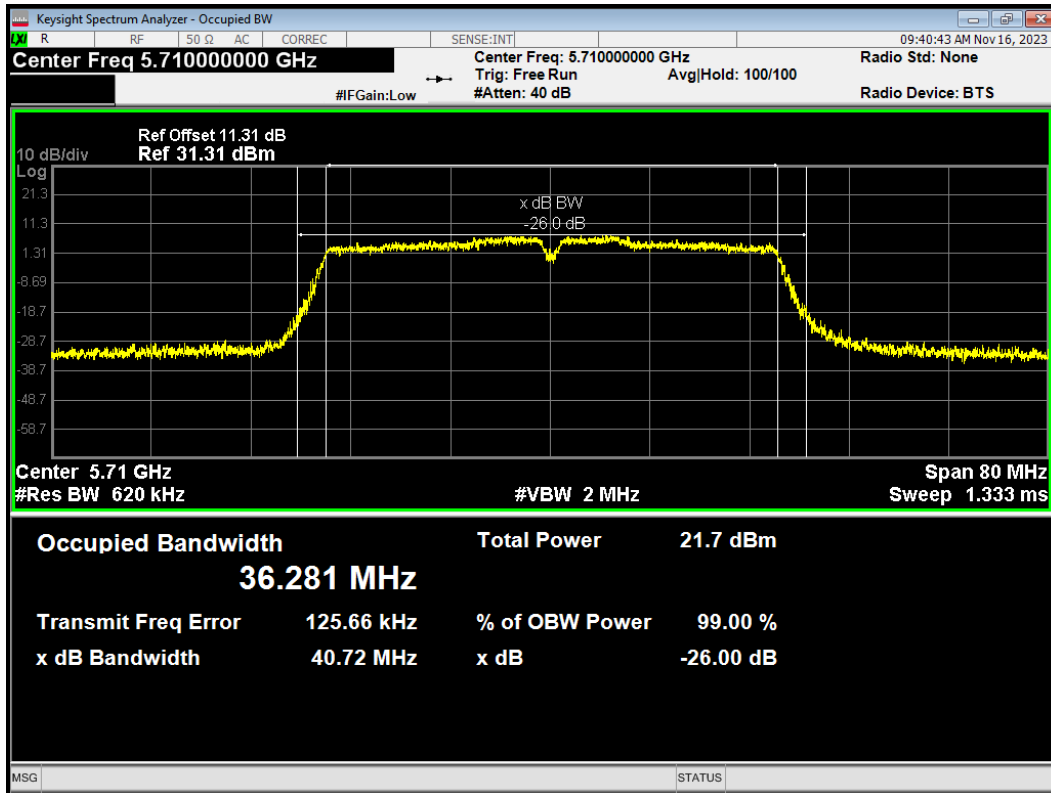
OBW 802.11n(HT20) 5785MHz



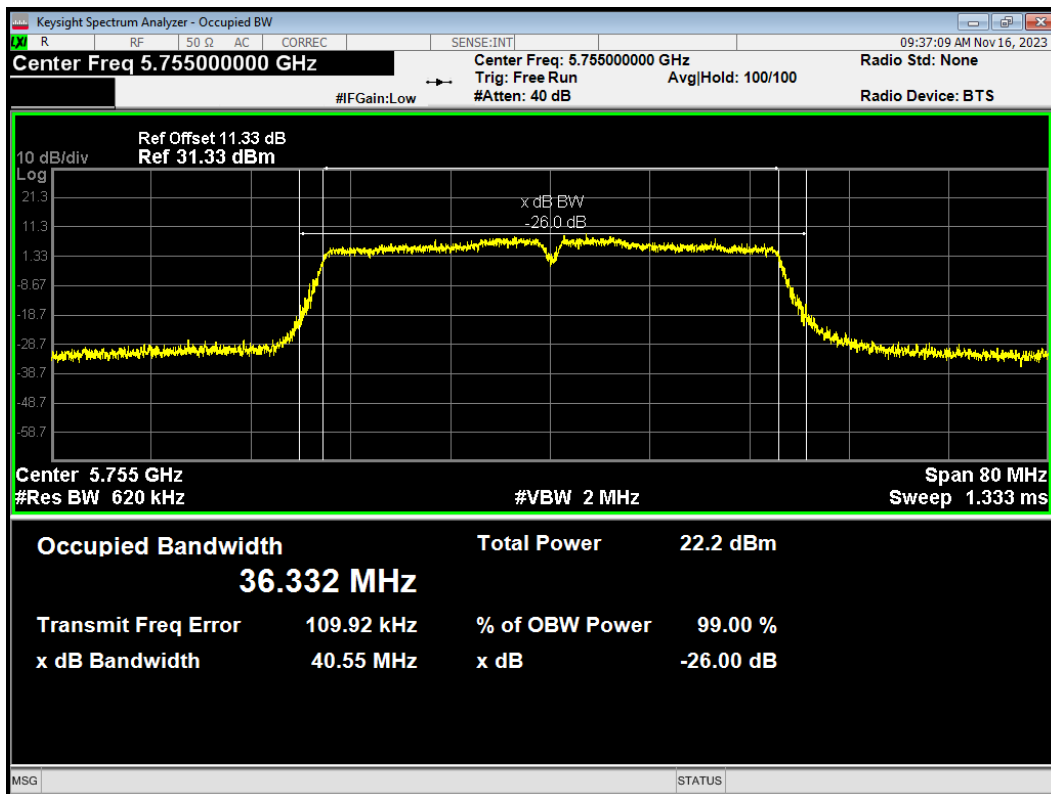
OBW 802.11n(HT20) 5825MHz



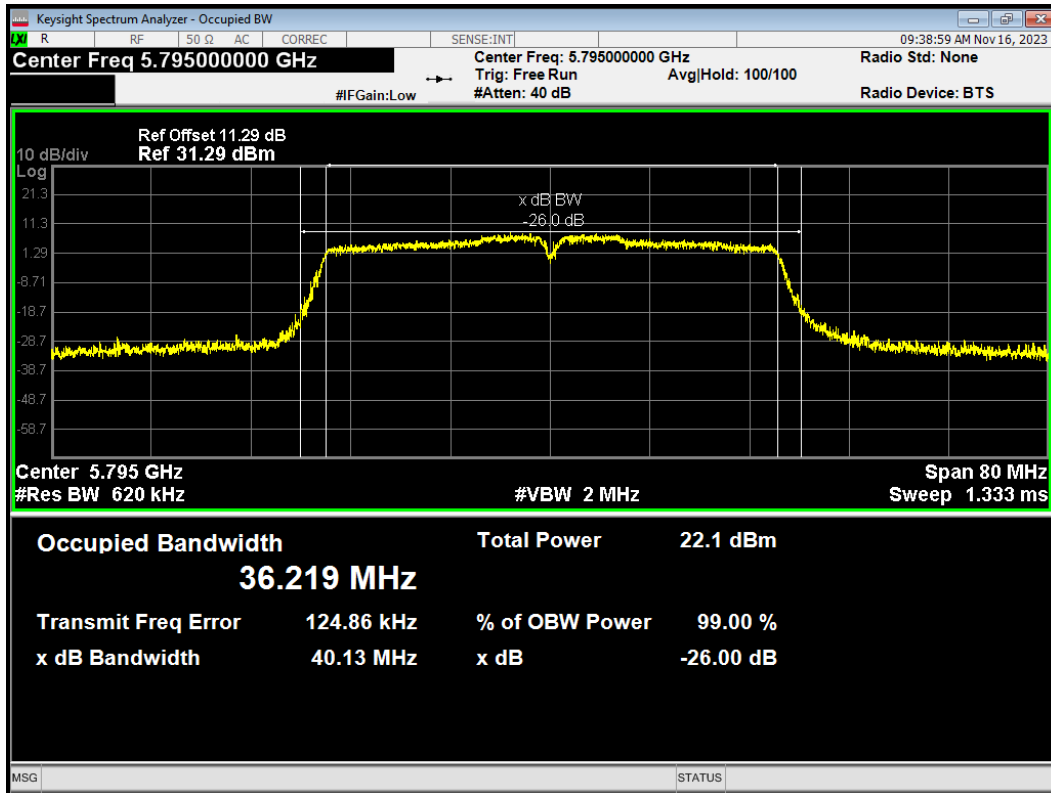
OBW 802.11n(HT40) 5710MHz



OBW 802.11n(HT40) 5755MHz



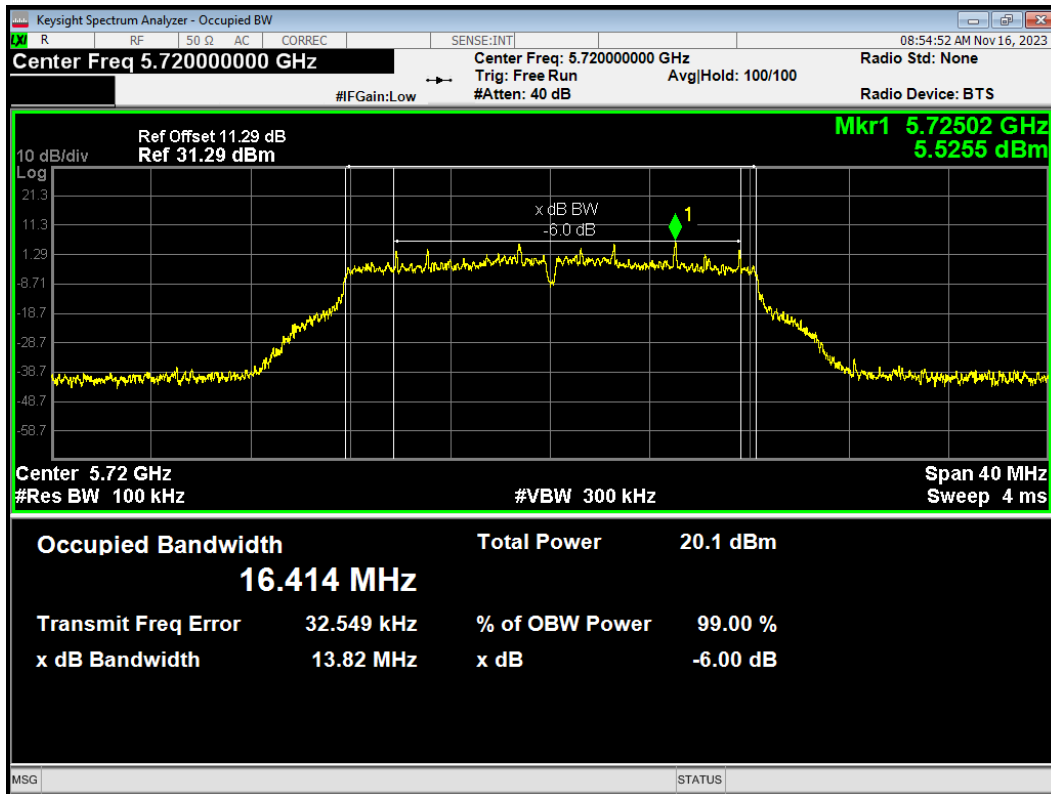
OBW 802.11n(HT40) 5795MHz



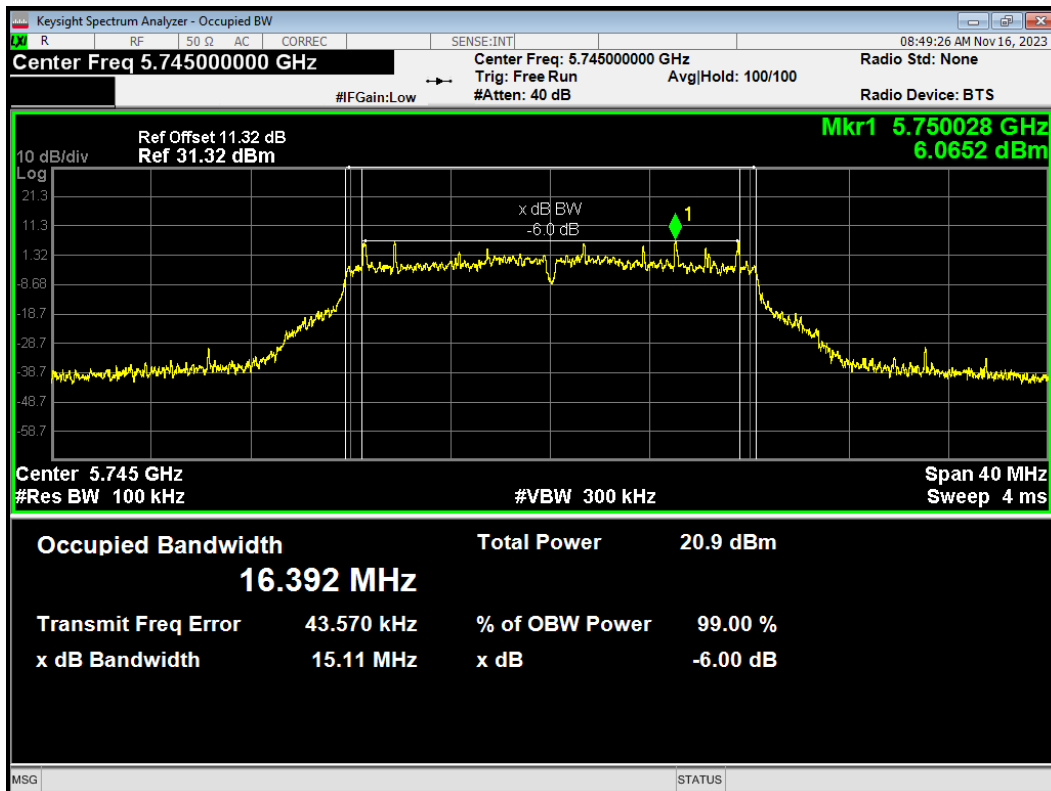
Minimum 6 dB bandwidth

U-NII-3

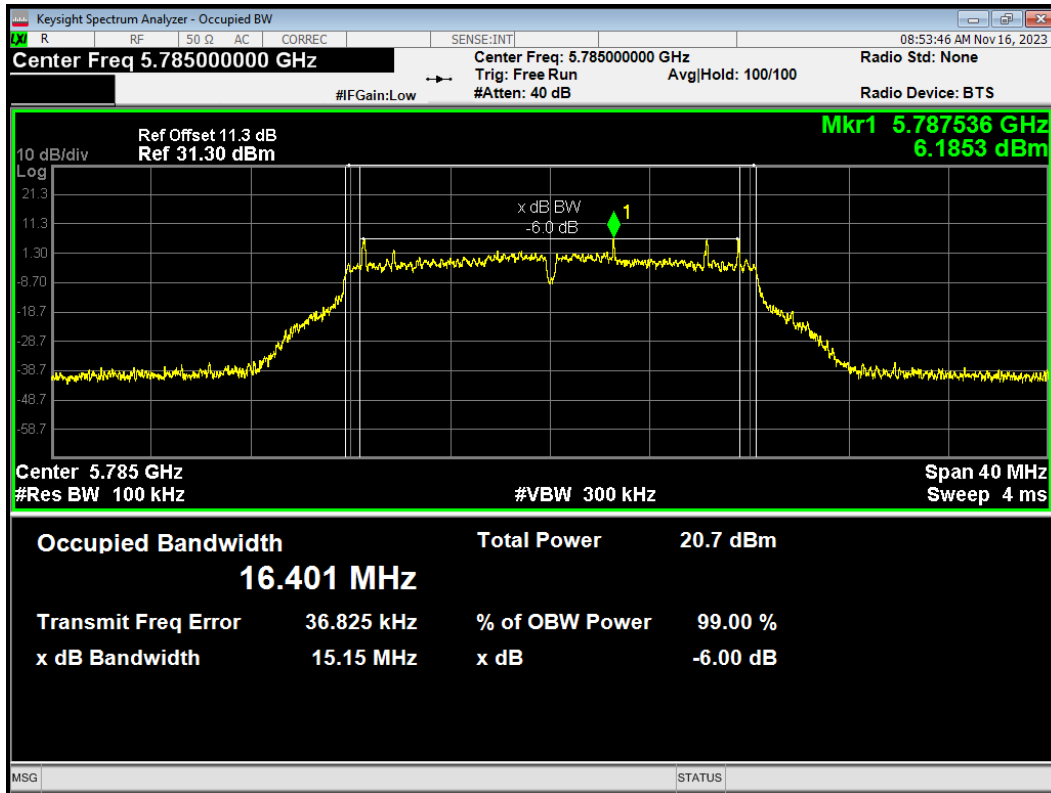
-6dB Bandwidth 802.11a 5720MHz



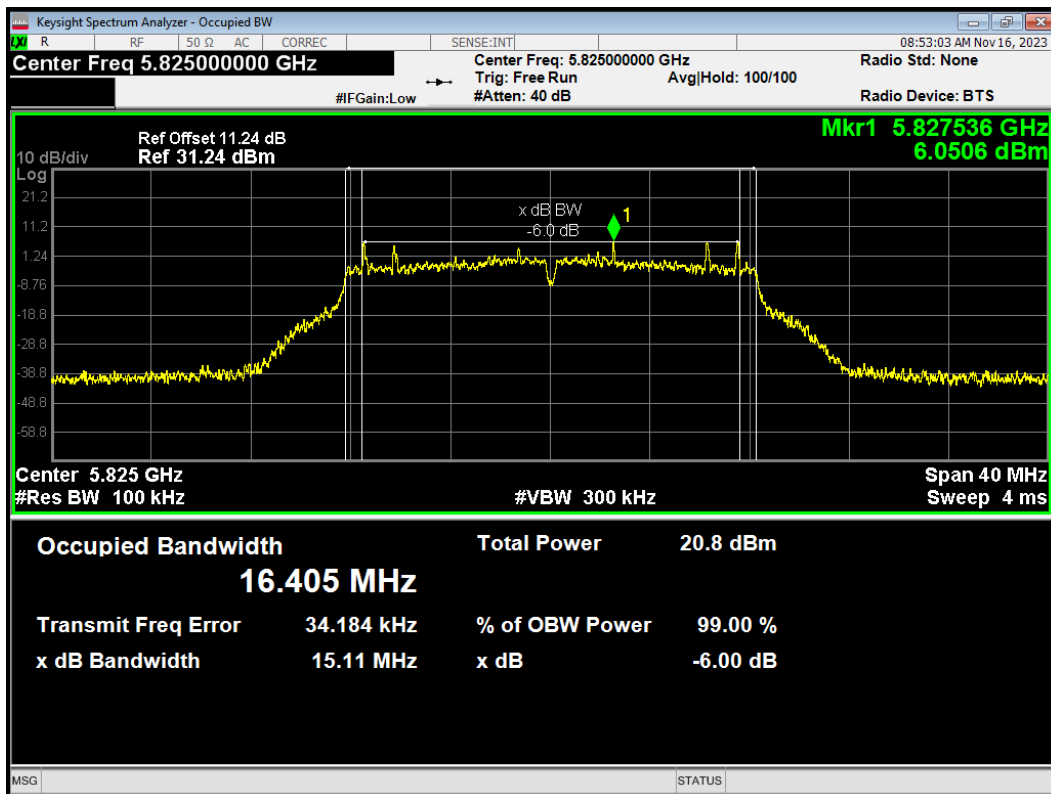
-6dB Bandwidth 802.11a 5745MHz



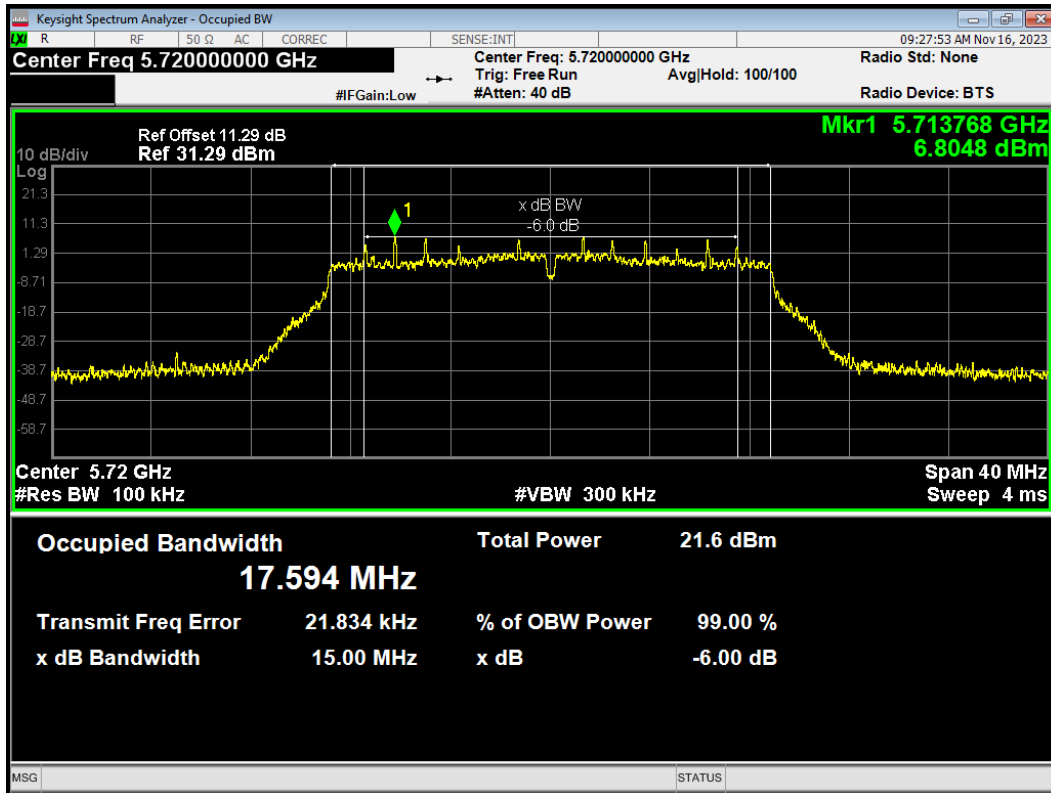
-6dB Bandwidth 802.11a 5785MHz



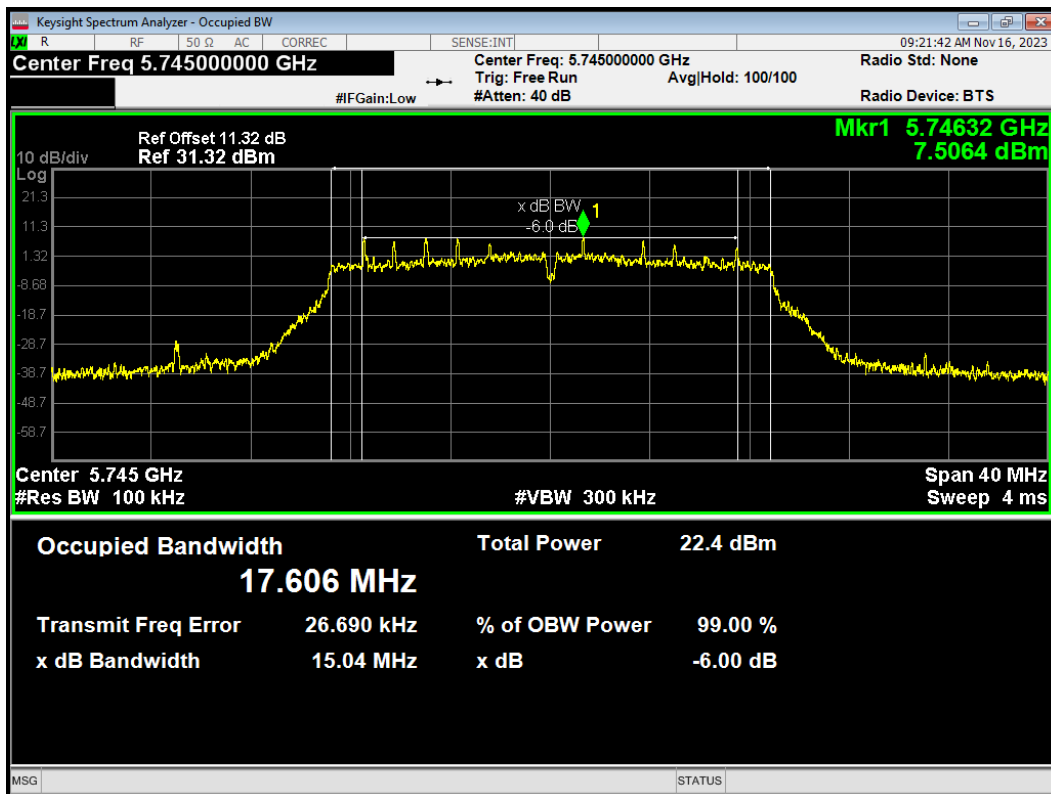
-6dB Bandwidth 802.11a 5825MHz



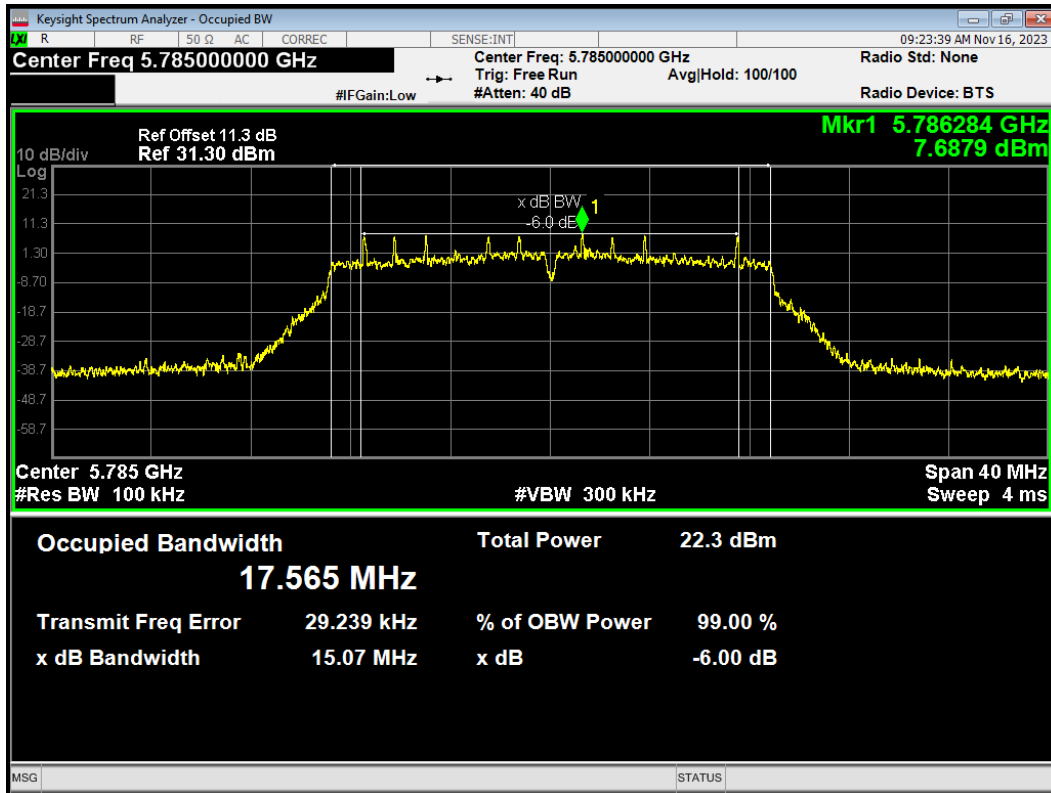
-6dB Bandwidth 802.11ac(VHT20) 5720MHz



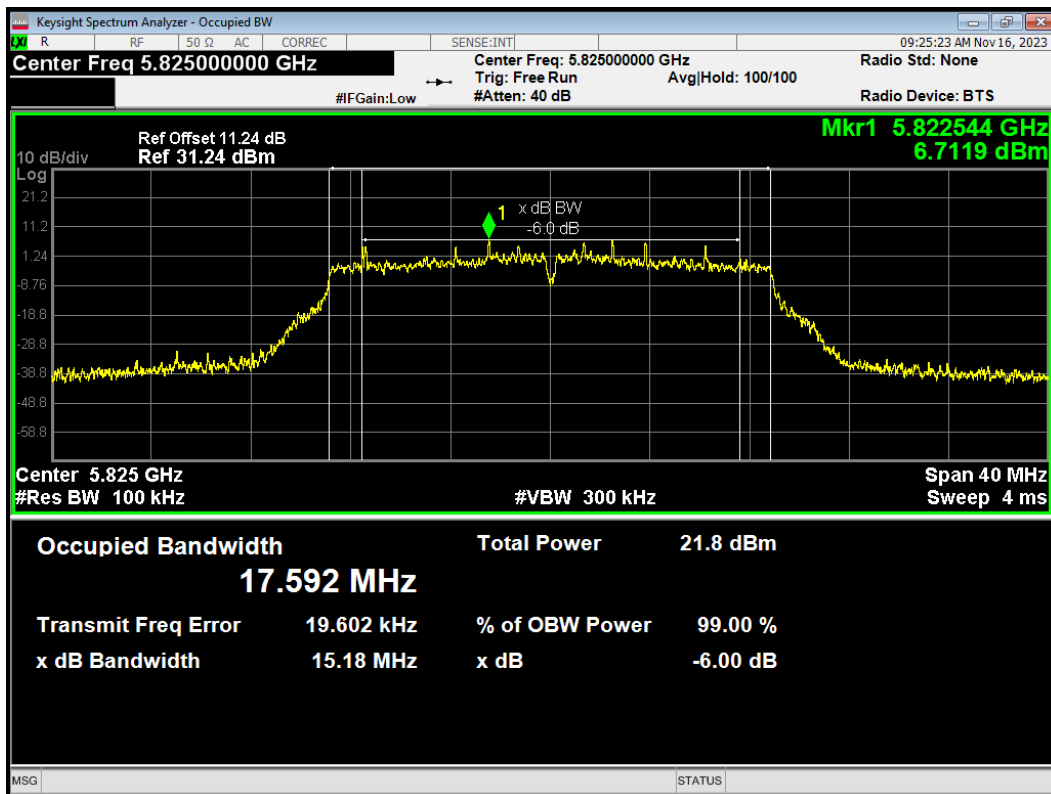
-6dB Bandwidth 802.11ac(VHT20) 5745MHz



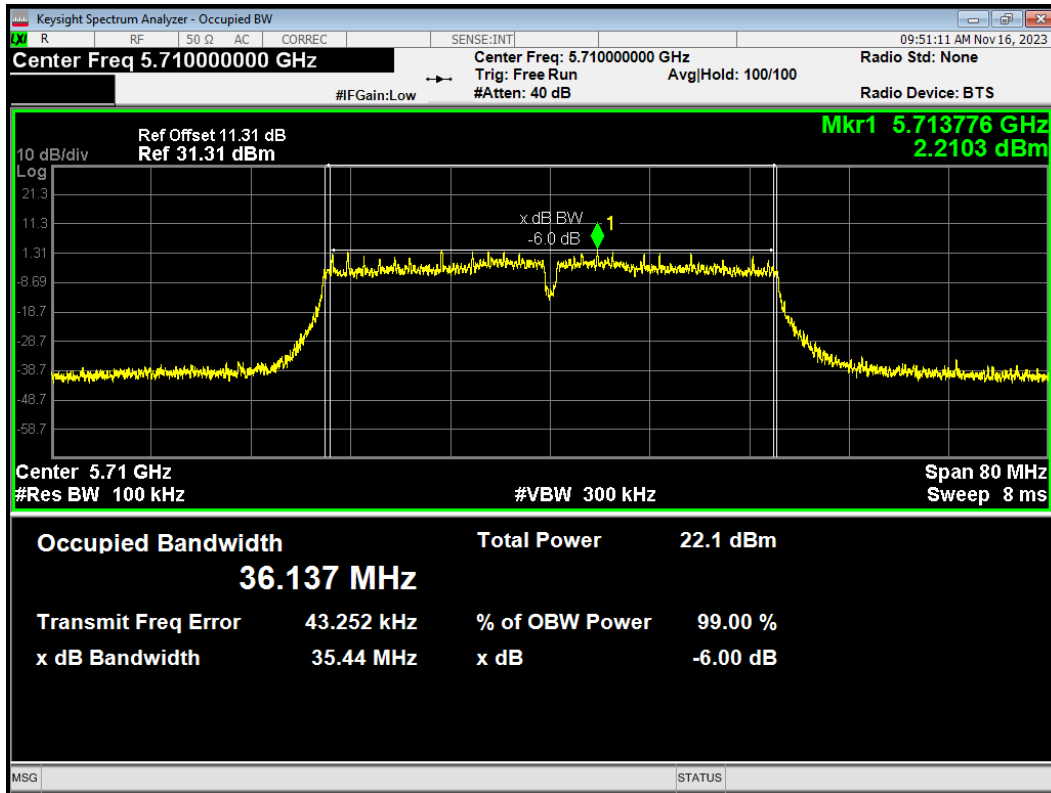
-6dB Bandwidth 802.11ac(VHT20) 5785MHz



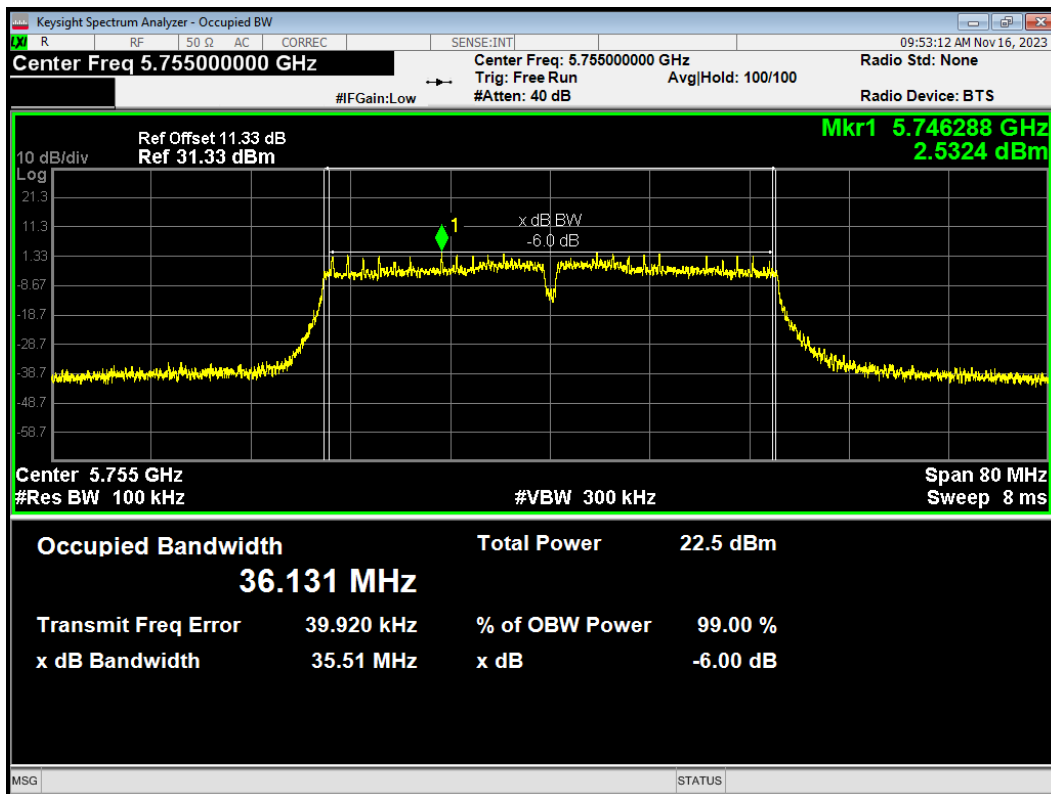
-6dB Bandwidth 802.11ac(VHT20) 5825MHz



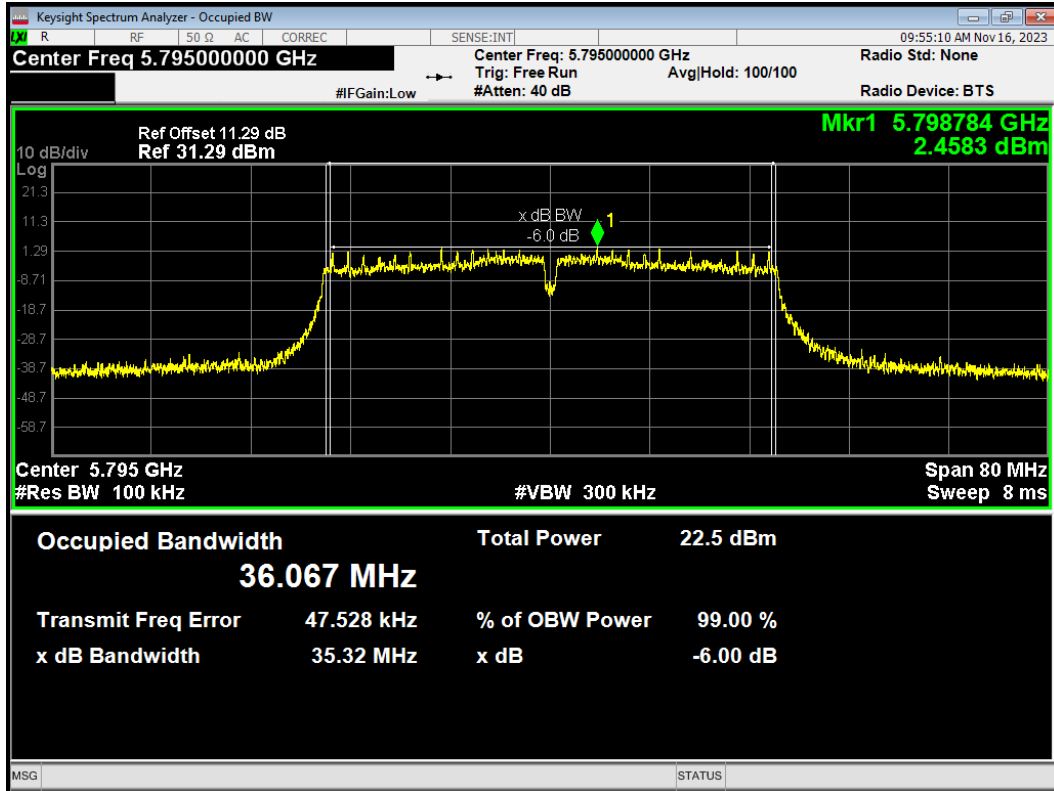
-6dB Bandwidth 802.11ac(VHT40) 5710MHz



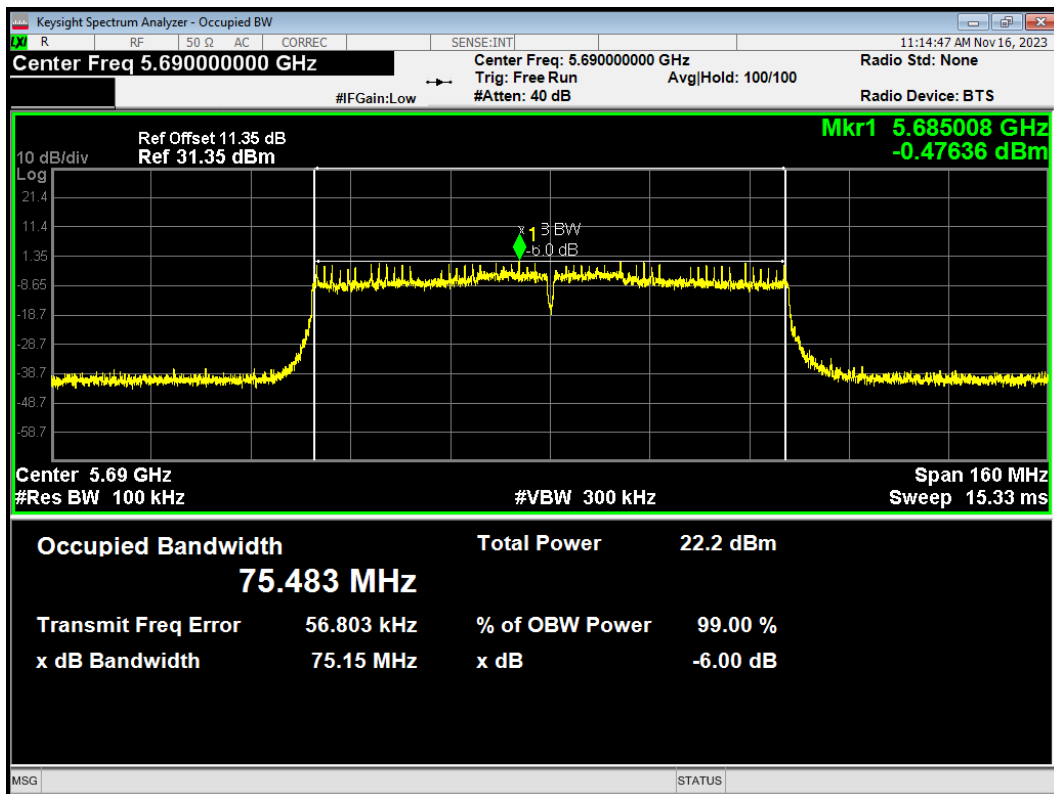
-6dB Bandwidth 802.11ac(VHT40) 5755MHz



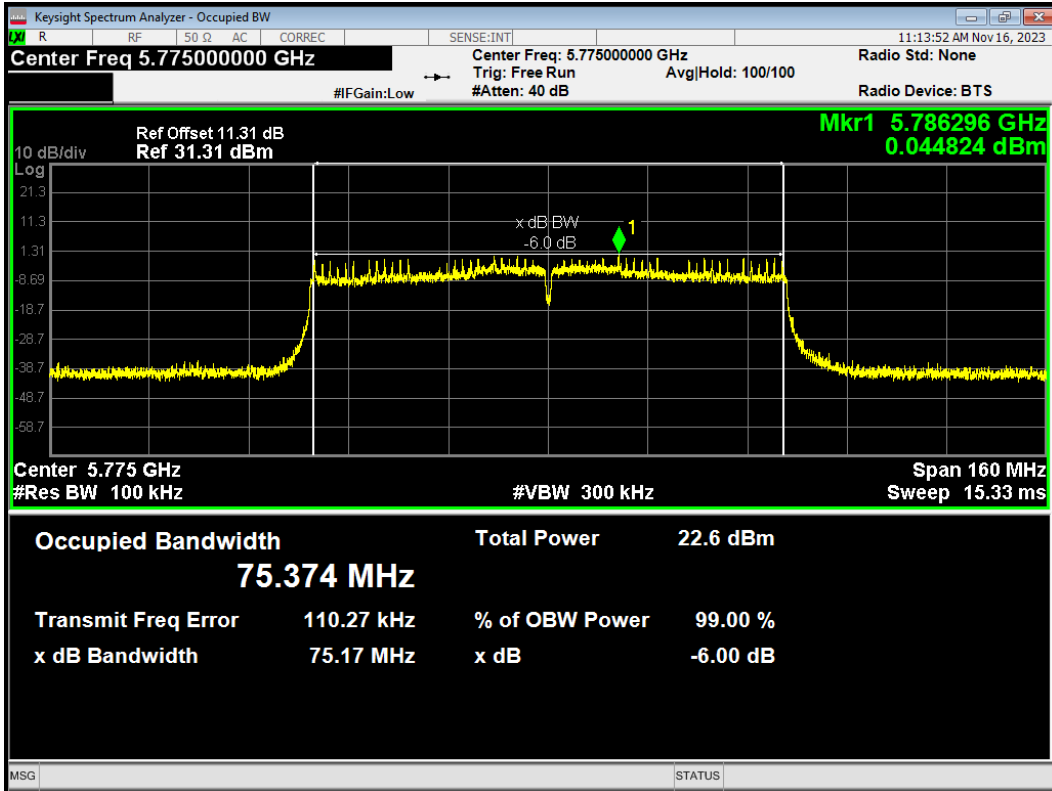
-6dB Bandwidth 802.11ac(VHT40) 5795MHz



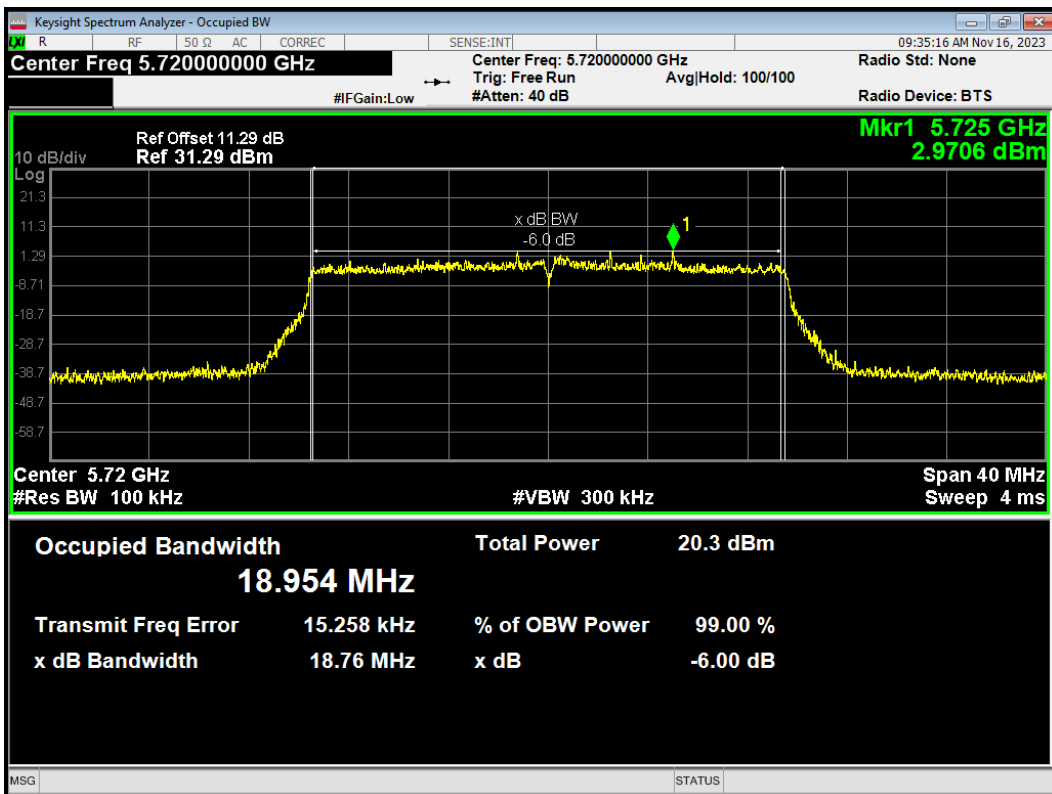
-6dB Bandwidth 802.11ac(VHT80) 5690MHz



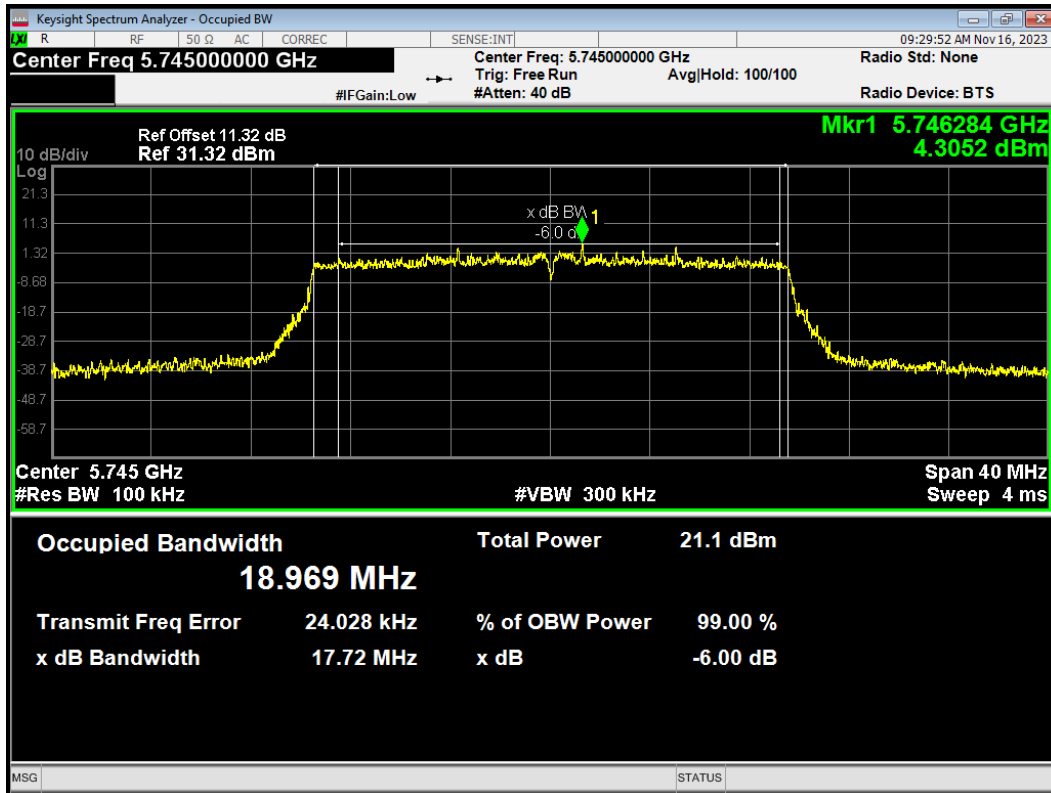
-6dB Bandwidth 802.11ac(VHT80) 5775MHz



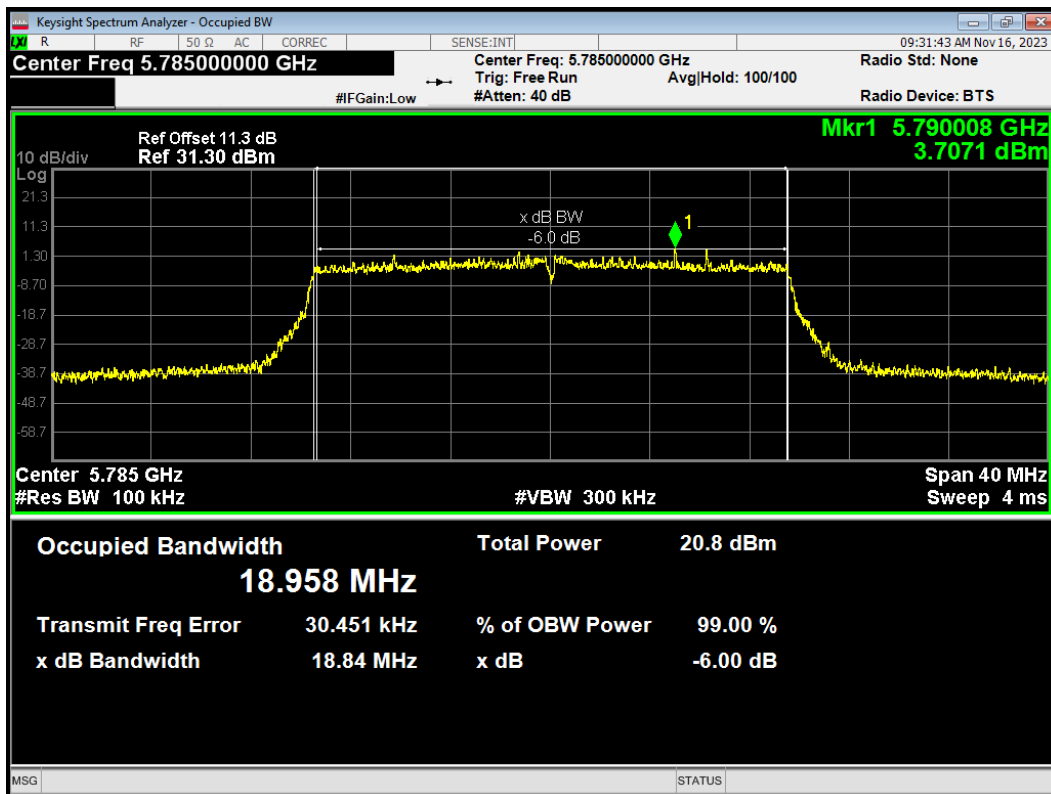
-6dB Bandwidth 802.11ax(HE20) 5720MHz



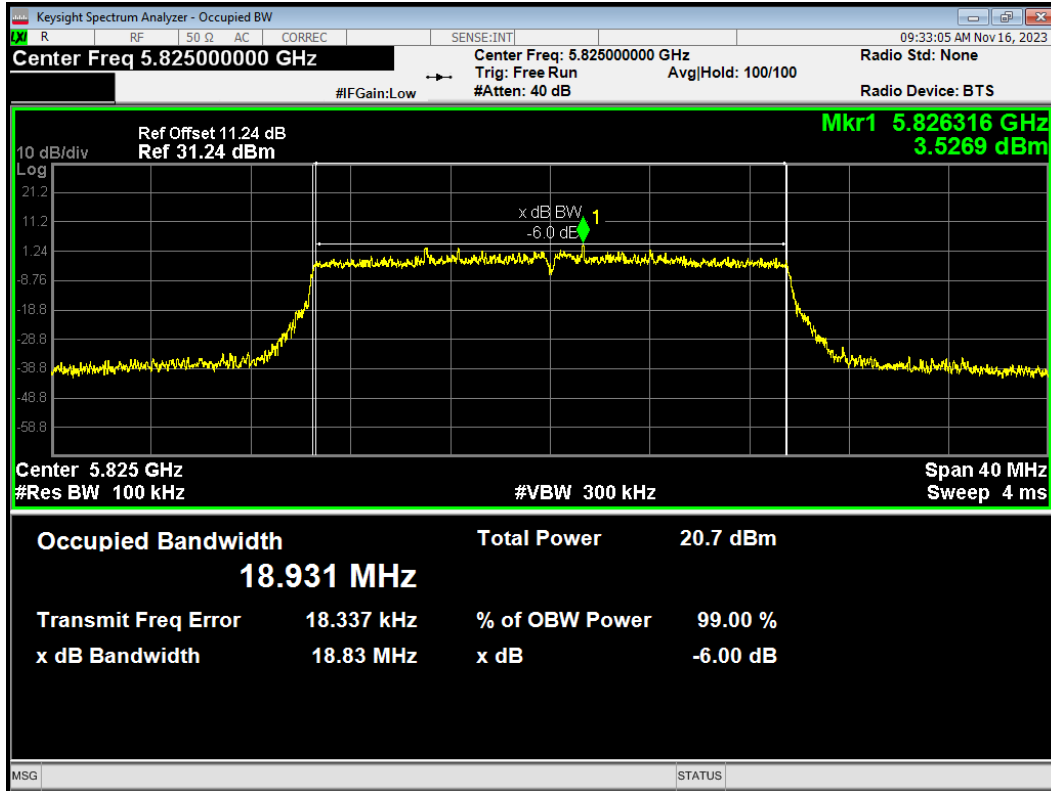
-6dB Bandwidth 802.11ax(HE20) 5745MHz



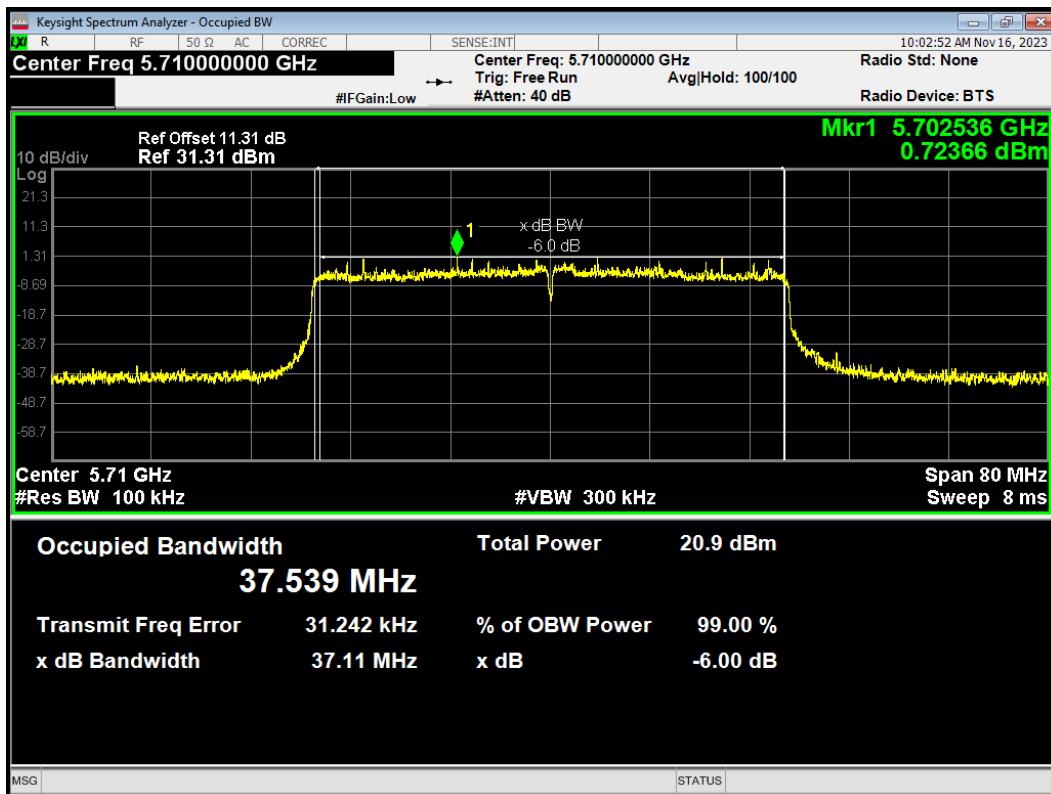
-6dB Bandwidth 802.11ax(HE20) 5785MHz



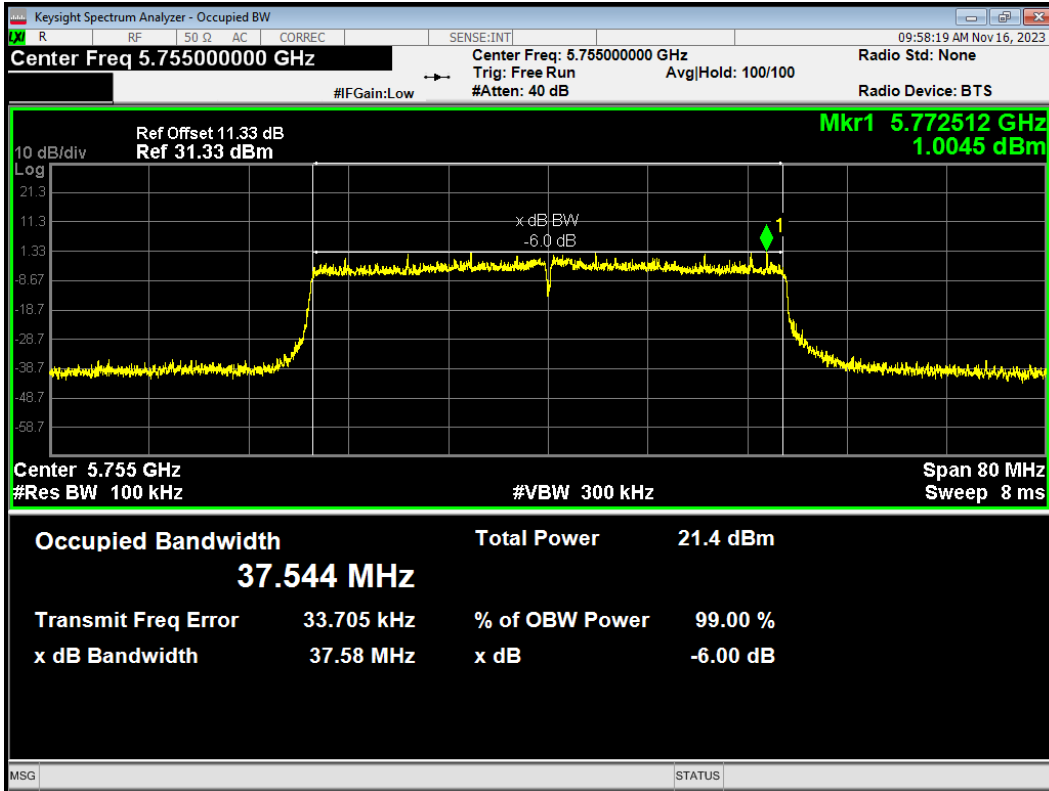
-6dB Bandwidth 802.11ax(HE20) 5825MHz



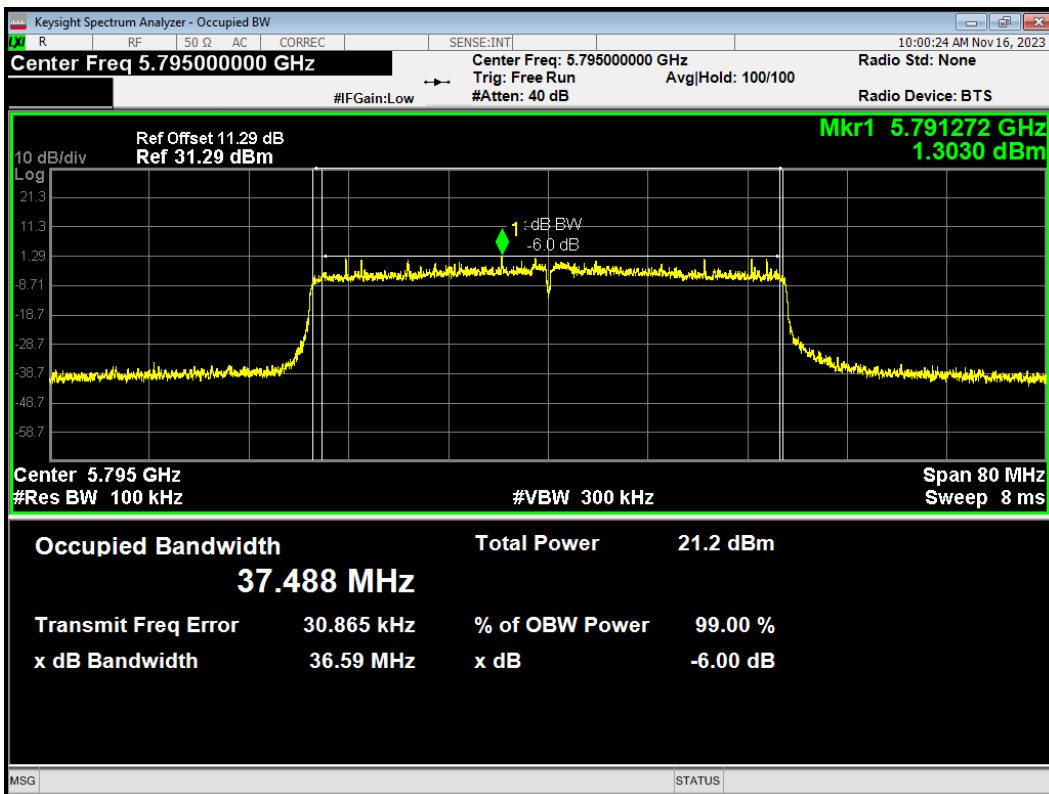
-6dB Bandwidth 802.11ax(HE40) 5710MHz



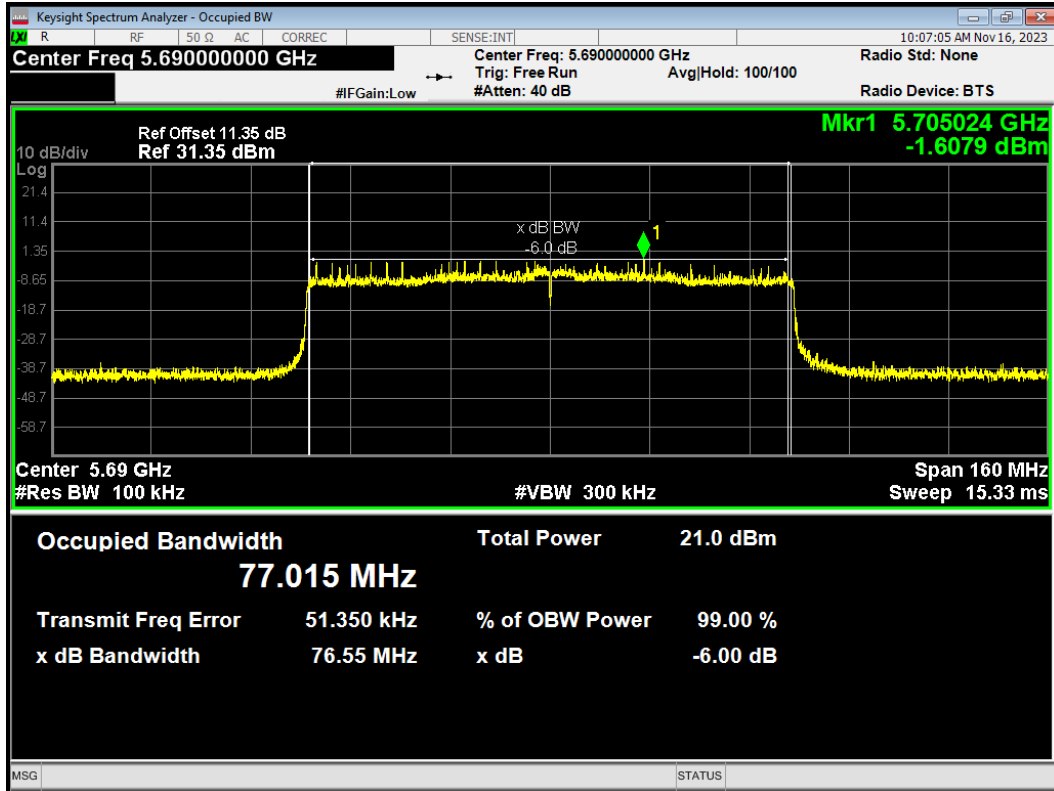
-6dB Bandwidth 802.11ax(HE40) 5755MHz



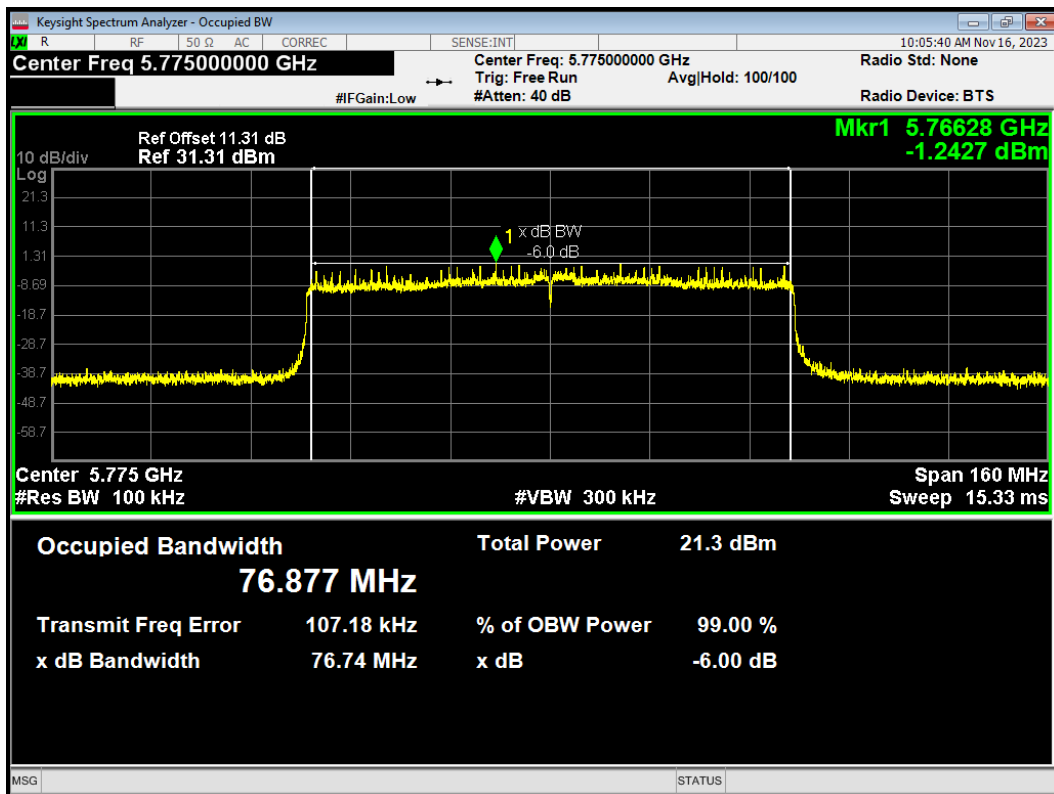
-6dB Bandwidth 802.11ax(HE40) 5795MHz



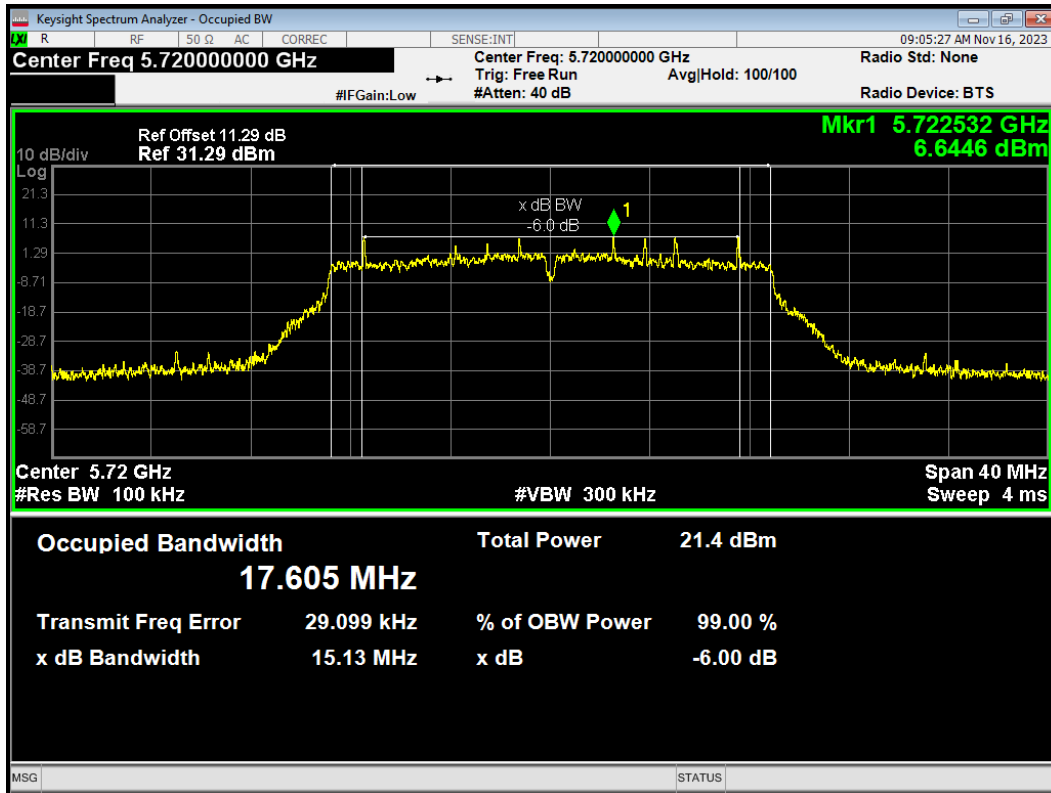
-6dB Bandwidth 802.11ax(HE80) 5690MHz



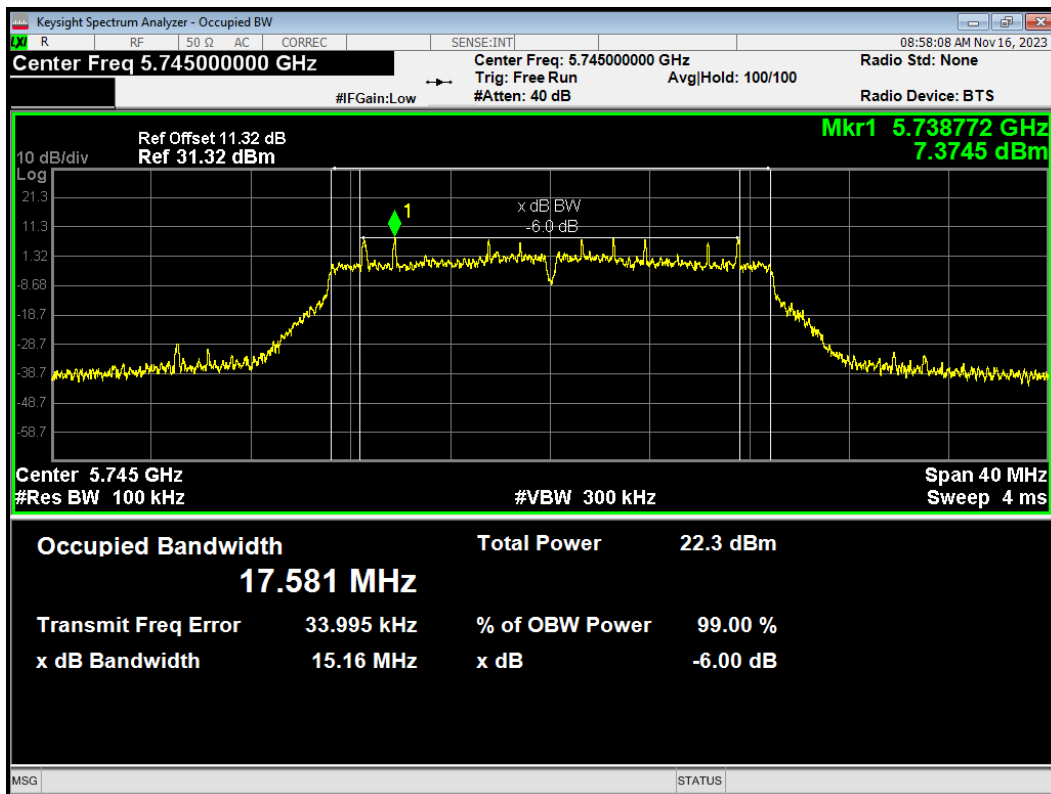
-6dB Bandwidth 802.11ax(HE80) 5775MHz



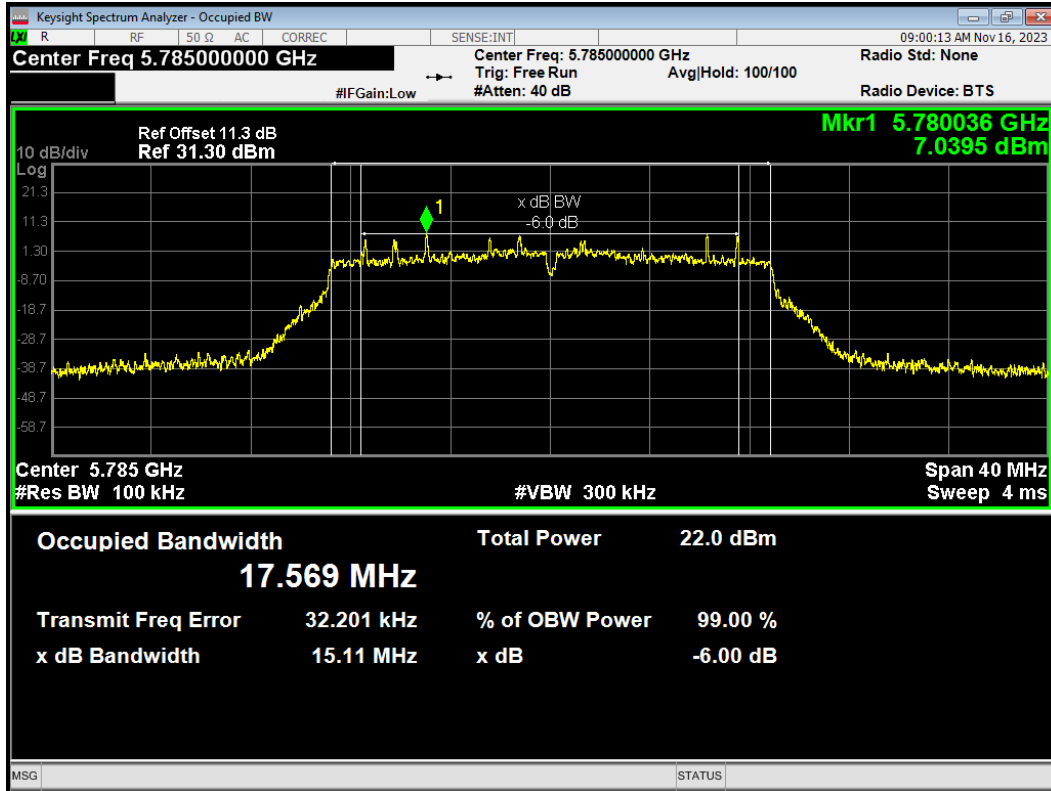
-6dB Bandwidth 802.11n(HT20) 5720MHz



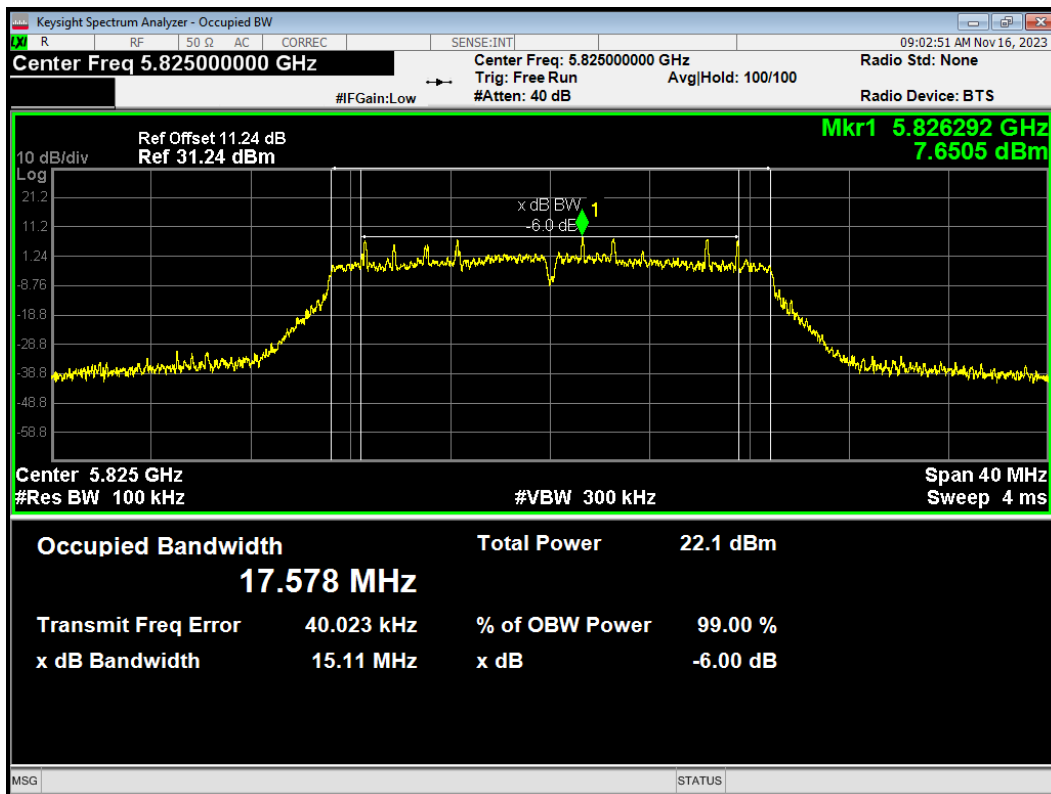
-6dB Bandwidth 802.11n(HT20) 5745MHz



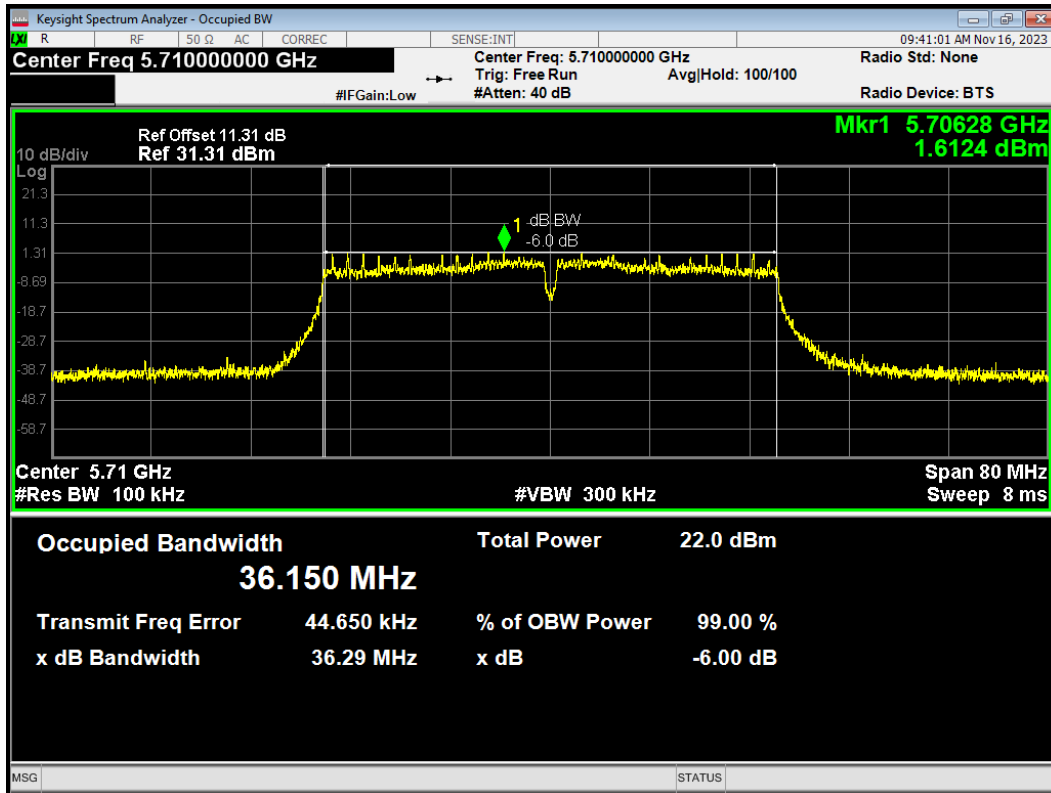
-6dB Bandwidth 802.11n(HT20) 5785MHz



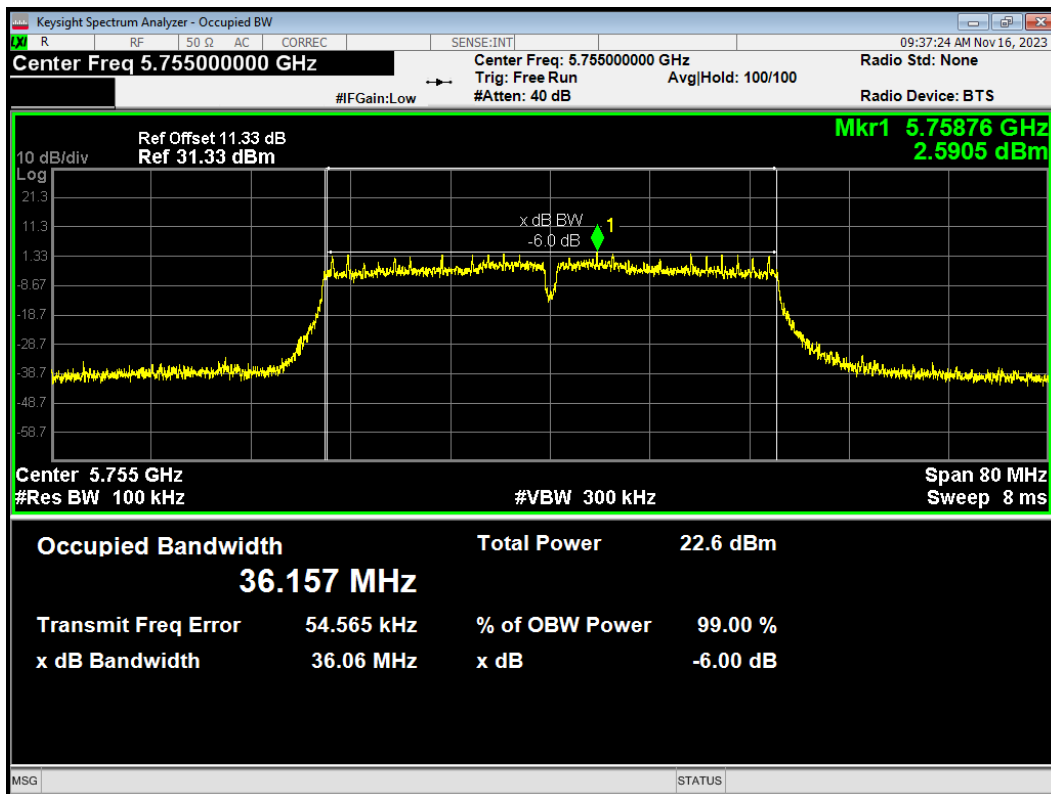
-6dB Bandwidth 802.11n(HT20) 5825MHz



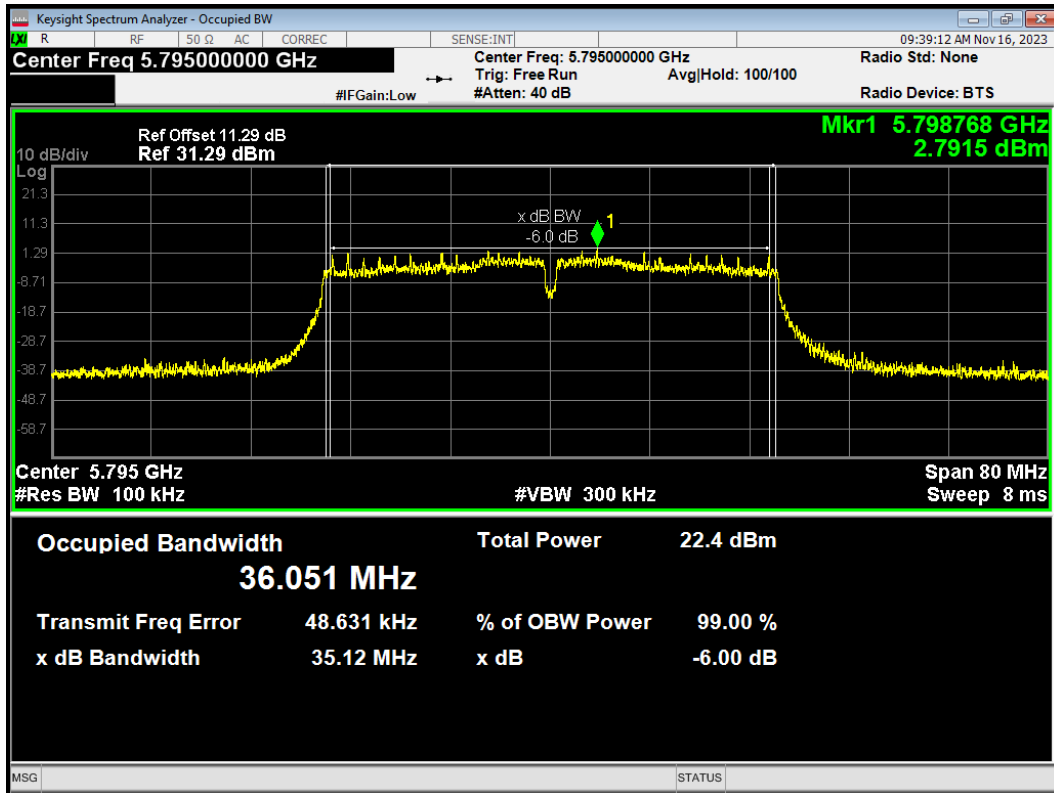
-6dB Bandwidth 802.11n(HT40) 5710MHz



-6dB Bandwidth 802.11n(HT40) 5755MHz



-6dB Bandwidth 802.11n(HT40) 5795MHz



5.2. Average Power Output

Ambient condition

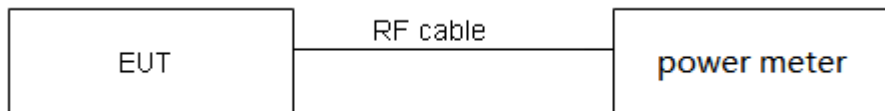
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT was connected to the average power meter through an external attenuator and a known loss cable. The EUT is max power transmission with proper modulation. We use Maximum average Conducted Output Power Level Method in KDB789033 for this test

The conducted Power is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

Test Setup



Limits

Rule FCC Part 15.407(a)(1) / FCC Part 15.407(a) (2) / FCC Part 15.407(a) (3)

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23

dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.44 \text{ dB}$.

Test Results

Mode	Duty cycle	Duty cycle correction Factor (dB)
802.11a	0.935	0.29
802.11n HT20	0.931	0.31
802.11n HT40	0.870	0.60
802.11ac VHT20	0.931	0.31
802.11ac VHT40	0.870	0.60
802.11ac VHT80	0.769	1.14
802.11ax HE20	0.975	0.11
802.11ax HE40	0.951	0.22
802.11ax HE80	0.906	0.43

Note: when Duty cycle ≥ 0.98 , Duty cycle correction Factor not required.

SISO Power Index											
Channel	802.11a	802.11n HT20	802.11ac VHT20	802.11ax HE20	Channel	802.11n HT40	802.11ac VHT40	802.11ax HE40	Channel	802.11ac VHT80	802.11ax HE80
CH36	15	16	16	15	CH38	16	16	15	CH42	16	14
CH40	15	16	16	15	CH46	16	16	15	/	/	/
CH48	15	16	16	15	/	/	/	/	/	/	/
CH52	15	16	16	15	CH54	16	16	15	CH58	16	15
CH60	15	16	16	15	CH62	16	16	15	/	/	/
CH64	15	16	16	15	/	/	/	/	/	/	/
CH100	15	16	16	15	CH102	16	16	15	CH106	16	14
CH116	15	16	16	15	CH110	16	16	15	CH138	16	15
CH140	15	16	16	15	CH134	15	15	15	/	/	/
CH144	15	16	16	15	CH142	16	16	15	/	/	/
CH149	15	16	16	15	CH151	16	16	15	CH155	16	15
CH157	15	16	16	15	CH159	16	16	15	/	/	/
CH165	15	16	16	15	/	/	/	/	/	/	/

MIMO Power Index										
Channel	802.11n HT20	802.11ac VHT20	802.11ax HE20	Channel	802.11n HT40	802.11ac VHT40	802.11ax HE40	Channel	802.11ac VHT80	802.11ax HE80
CH36	16	16	15	CH38	16	16	15	CH42	16	14
CH40	16	16	15	CH46	16	16	15	/	/	/
CH48	16	16	15	/	/	/		/	/	/
CH52	16	16	15	CH54	16	16	15	CH58	16	15
CH60	16	16	15	CH62	16	16	15	/	/	/
CH64	16	16	15	/	/	/	/	/	/	/
CH100	16	16	15	CH102	16	16	15	CH106	16	14
CH116	16	16	15	CH110	16	16	15	/	/	/
CH140	16	16	15	CH134	16	15	15	CH138	16	15
CH144	16	16	15	CH142	16	16	15	/	/	/
CH149	16	16	15	CH151	16	16	15	CH155	16	15
CH157	16	16	15	CH159	16	16	15	/	/	/
CH165	16	16	15	/	/	/	/	/	/	/

Test Mode		Channel/ Frequency (MHz)	B=26 dB bandwidth (MHz)	Limit 11 dBm + 10 log B (dBm)	Final Limit (dBm)
U-NII-2A	802.11a	52/5260	20.97	24.22>24	24
		60/5300	21.33	24.29>24	24
		64/5320	21.39	24.30>24	24
	802.11nHT20	52/5260	21.21	24.26>24	24
		60/5300	21.55	24.33>24	24
		64/5320	21.43	24.31>24	24
	802.11nHT40	54/5270	40.90	27.12>24	24
		62/5310	40.28	27.05>24	24
	802.11acVHT20	52/5260	21.38	24.30>24	24
		60/5300	21.56	24.34>24	24
		64/5320	21.39	24.30>24	24
	802.11acVHT40	54/5270	40.50	27.07>24	24
		62/5310	40.35	27.06>24	24
	802.11acVHT80	58/5290	82.18	30.15>24	24
	802.11axHE20	52/5260	21.39	24.30>24	24
60/5300		21.34	24.29>24	24	
64/5320		21.37	24.30>24	24	
802.11axHE40	54/5270	40.22	27.04>24	24	
	62/5310	40.28	27.05>24	24	
802.11axHE80	58/5290	81.90	30.13>24	24	
U-NII-2C	802.11a	100/5500	21.23	24.27>24	24
		116/5580	21.39	24.30>24	24
		140/5700	21.22	24.27>24	24
		144/5720	21.18	24.26>24	24
	802.11nHT20	100/5500	21.27	24.28>24	24
		116/5580	21.20	24.26>24	24
		140/5700	21.57	24.34>24	24
		144/5720	21.27	24.28>24	24
	802.11nHT40	102/5510	40.46	27.07>24	24
		110/5550	40.42	27.07>24	24
		134/5670	40.33	27.06>24	24
		142/5710	40.29	27.05>24	24
	802.11acVHT20	100/5500	21.30	24.28>24	24
		116/5580	21.37	24.30>24	24
		140/5700	21.28	24.28>24	24
		144/5720	21.58	24.34>24	24

	802.11acVHT40	102/5510	40.63	27.09>24	24	
		110/5550	40.27	27.05>24	24	
		134/5670	39.95	27.01>24	24	
		142/5710	40.53	27.08>24	24	
	802.11acVHT80	106/5530	81.67	30.12>24	24	
		138/5690	81.85	30.13>24	24	
	802.11axHE20	100/5500	21.53	24.33>24	24	
		116/5580	21.51	24.33>24	24	
		140/5700	21.31	24.29>24	24	
		144/5720	21.75	24.37>24	24	
	802.11axHE40	102/5510	40.01	27.02>24	24	
		110/5550	40.23	27.05>24	24	
		134/5670	40.29	27.05>24	24	
		142/5710	40.09	27.03>24	24	
	802.11axHE80	106/5530	81.79	30.13>24	24	
		138/5690	81.81	30.13>24	24	
	Note:250mW=24dBm					

SISO Antenna1**U-NII-1**

Test Mode	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	36/5180	14.20	14.49	24	PASS
	40/5200	14.14	14.43	24	PASS
	48/5240	14.15	14.44	24	PASS
802.11n HT20	36/5180	15.11	15.42	24	PASS
	40/5200	15.15	15.46	24	PASS
	48/5240	15.13	15.44	24	PASS
802.11n HT40	38/5190	15.55	16.15	24	PASS
	46/5230	15.89	16.49	24	PASS
802.11ac VHT20	36/5180	15.10	15.41	24	PASS
	40/5200	15.19	15.50	24	PASS
	48/5240	15.26	15.57	24	PASS
802.11ac VHT40	38/5190	15.63	16.23	24	PASS
	46/5230	15.83	16.43	24	PASS
802.11ac VHT80	42/5210	14.67	15.81	24	PASS
802.11ax HE20	36/5180	14.56	14.67	24	PASS
	40/5200	14.57	14.68	24	PASS
	48/5240	14.68	14.79	24	PASS
802.11ax HE40	38/5190	14.84	15.06	24	PASS
	46/5230	15.02	15.24	24	PASS
802.11ax HE80	42/5210	13.35	13.78	24	PASS

Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor

U-NII-2A

Test Mode	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	52/5260	13.75	14.04	24	PASS
	60/5300	13.73	14.02	24	PASS
	64/5320	13.82	14.11	24	PASS
802.11n HT20	52/5260	14.72	15.03	24	PASS
	60/5300	14.56	14.87	24	PASS
	64/5320	14.67	14.98	24	PASS
802.11n HT40	54/5270	14.98	15.58	24	PASS
	62/5310	15.19	15.79	24	PASS
802.11ac VHT20	52/5260	14.69	15.00	24	PASS
	60/5300	14.72	15.03	24	PASS
	64/5320	14.67	14.98	24	PASS
802.11ac VHT40	54/5270	14.93	15.53	24	PASS
	62/5310	14.98	15.58	24	PASS
802.11ac VHT80	58/5290	14.42	15.56	24	PASS
802.11ax HE20	52/5260	14.37	14.48	24	PASS
	60/5300	14.34	14.45	24	PASS
	64/5320	14.40	14.51	24	PASS
802.11ax HE40	54/5270	14.41	14.63	24	PASS
	62/5310	14.45	14.67	24	PASS
802.11ax HE80	58/5290	14.06	14.49	24	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

U-NII-2C

Test Mode	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	100/5500	13.56	13.85	24	PASS
	116/5580	13.60	13.89	24	PASS
	140/5700	13.53	13.82	24	PASS
	144/5720	12.84	13.13	24	PASS
802.11n HT20	100/5500	14.47	14.78	24	PASS
	116/5580	14.60	14.91	24	PASS
	140/5700	14.59	14.90	24	PASS
	144/5720	13.70	14.01	24	PASS
802.11n HT40	102/5510	15.04	15.64	24	PASS
	110/5550	14.71	15.31	24	PASS
	134/5670	14.06	14.66	24	PASS
	142/5710	14.71	15.31	24	PASS
802.11ac VHT20	100/5500	14.64	14.95	24	PASS
	116/5580	14.57	14.88	24	PASS
	140/5700	14.60	14.91	24	PASS
	144/5720	13.73	14.04	24	PASS
802.11ac VHT40	102/5510	15.02	15.62	24	PASS
	110/5550	14.85	15.45	24	PASS
	134/5670	14.10	14.70	24	PASS
	142/5710	14.77	15.37	24	PASS
802.11ac VHT80	106/5530	14.35	15.49	24	PASS
	138/5690	14.23	15.37	24	PASS
802.11ax HE20	100/5500	14.41	14.52	24	PASS
	116/5580	14.37	14.48	24	PASS
	140/5700	14.52	14.63	24	PASS
	144/5720	13.48	13.59	24	PASS
802.11ax HE40	102/5510	14.55	14.77	24	PASS
	110/5550	14.16	14.38	24	PASS
	134/5670	14.32	14.54	24	PASS
	142/5710	14.08	14.30	24	PASS
802.11ax HE80	106/5530	12.96	13.39	24	PASS
	138/5690	13.97	14.40	24	PASS

Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor

U-NII-3

Test Mode	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	144/5720	5.41	5.70	30	PASS
	149/5745	14.17	14.46	30	PASS
	157/5785	14.10	14.39	30	PASS
	165/5825	13.80	14.09	30	PASS
802.11n HT20	144/5720	6.89	7.20	30	PASS
	149/5745	15.38	15.69	30	PASS
	157/5785	15.00	15.31	30	PASS
	165/5825	14.99	15.30	30	PASS
802.11n HT40	142/5710	2.79	3.39	30	PASS
	151/5755	15.16	15.76	30	PASS
	159/5795	15.06	15.66	30	PASS
802.11ac VHT20	144/5720	6.75	7.06	30	PASS
	149/5745	15.14	15.45	30	PASS
	157/5785	14.88	15.19	30	PASS
	165/5825	14.67	14.98	30	PASS
802.11ac VHT40	142/5710	3.36	3.96	30	PASS
	151/5755	15.18	15.78	30	PASS
	159/5795	15.09	15.69	30	PASS
802.11ac VHT80	138/5690	-0.45	0.69	30	PASS
	155/5775	14.45	15.59	30	PASS
802.11ax HE20	144/5720	7.54	7.65	30	PASS
	149/5745	14.59	14.70	30	PASS
	157/5785	14.42	14.53	30	PASS
	165/5825	14.26	14.37	30	PASS
802.11ax HE40	142/5710	3.66	3.88	30	PASS
	151/5755	14.68	14.90	30	PASS
	159/5795	14.51	14.73	30	PASS
802.11ax HE80	138/5690	0.21	0.64	30	PASS
	155/5775	14.15	14.58	30	PASS

Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor

SISO Antenna2**U-NII-1**

Test Mode	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	36/5180	14.03	14.32	24	PASS
	40/5200	14.14	14.43	24	PASS
	48/5240	14.13	14.42	24	PASS
802.11n HT20	36/5180	15.08	15.39	24	PASS
	40/5200	15.10	15.41	24	PASS
	48/5240	15.10	15.41	24	PASS
802.11n HT40	38/5190	15.63	16.23	24	PASS
	46/5230	15.91	16.51	24	PASS
802.11ac VHT20	36/5180	15.20	15.51	24	PASS
	40/5200	15.23	15.54	24	PASS
	48/5240	15.27	15.58	24	PASS
802.11ac VHT40	38/5190	15.64	16.24	24	PASS
	46/5230	15.81	16.41	24	PASS
802.11ac VHT80	42/5210	14.71	15.85	24	PASS
802.11ax HE20	36/5180	14.68	14.79	24	PASS
	40/5200	14.67	14.78	24	PASS
	48/5240	14.71	14.82	24	PASS
802.11ax HE40	38/5190	15.00	15.22	24	PASS
	46/5230	15.24	15.46	24	PASS
802.11ax HE80	42/5210	13.38	13.81	24	PASS

Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor

U-NII-2A

Test Mode	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	52/5260	14.26	14.55	24	PASS
	60/5300	14.16	14.45	24	PASS
	64/5320	14.32	14.61	24	PASS
802.11n HT20	52/5260	15.60	15.91	24	PASS
	60/5300	15.47	15.78	24	PASS
	64/5320	15.48	15.79	24	PASS
802.11n HT40	54/5270	15.56	16.16	24	PASS
	62/5310	15.73	16.33	24	PASS
802.11ac VHT20	52/5260	15.45	15.76	24	PASS
	60/5300	15.47	15.78	24	PASS
	64/5320	15.49	15.80	24	PASS
802.11ac VHT40	54/5270	15.72	16.32	24	PASS
	62/5310	15.68	16.28	24	PASS
802.11ac VHT80	58/5290	14.79	15.93	24	PASS
802.11ax HE20	52/5260	14.70	14.81	24	PASS
	60/5300	14.64	14.75	24	PASS
	64/5320	14.72	14.83	24	PASS
802.11ax HE40	54/5270	14.99	15.21	24	PASS
	62/5310	15.05	15.27	24	PASS
802.11ax HE80	58/5290	14.53	14.96	24	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

U-NII-2C

Test Mode	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	100/5500	13.81	14.10	24	PASS
	116/5580	13.72	14.01	24	PASS
	140/5700	13.79	14.08	24	PASS
	144/5720	12.85	13.14	24	PASS
802.11n HT20	100/5500	14.95	15.26	24	PASS
	116/5580	14.87	15.18	24	PASS
	140/5700	14.87	15.18	24	PASS
	144/5720	14.05	14.36	24	PASS
802.11n HT40	102/5510	15.42	16.02	24	PASS
	110/5550	15.15	15.75	24	PASS
	134/5670	14.35	14.95	24	PASS
	142/5710	14.86	15.46	24	PASS
802.11ac VHT20	100/5500	14.98	15.29	24	PASS
	116/5580	14.97	15.28	24	PASS
	140/5700	14.82	15.13	24	PASS
	144/5720	14.05	14.36	24	PASS
802.11ac VHT40	102/5510	15.41	16.01	24	PASS
	110/5550	15.12	15.72	24	PASS
	134/5670	15.32	15.92	24	PASS
	142/5710	14.96	15.56	24	PASS
802.11ac VHT80	106/5530	14.34	15.48	24	PASS
	138/5690	14.21	15.35	24	PASS
802.11ax HE20	100/5500	14.33	14.44	24	PASS
	116/5580	14.22	14.33	24	PASS
	140/5700	14.31	14.42	24	PASS
	144/5720	13.28	13.39	24	PASS
802.11ax HE40	102/5510	14.74	14.96	24	PASS
	110/5550	14.48	14.70	24	PASS
	134/5670	14.65	14.87	24	PASS
	142/5710	14.21	14.43	24	PASS
802.11ax HE80	106/5530	12.98	13.41	24	PASS
	138/5690	13.88	14.31	24	PASS

Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor

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Test Mode	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	144/5720	5.68	5.97	30	PASS
	149/5745	14.26	14.55	30	PASS
	157/5785	14.21	14.50	30	PASS
	165/5825	14.27	14.56	30	PASS
802.11n HT20	144/5720	7.31	7.62	30	PASS
	149/5745	15.50	15.81	30	PASS
	157/5785	15.29	15.60	30	PASS
	165/5825	15.19	15.50	30	PASS
802.11n HT40	142/5710	3.47	4.07	30	PASS
	151/5755	15.67	16.27	30	PASS
	159/5795	15.60	16.20	30	PASS
802.11ac VHT20	144/5720	7.22	7.53	30	PASS
	149/5745	15.41	15.72	30	PASS
	157/5785	15.40	15.71	30	PASS
	165/5825	15.26	15.57	30	PASS
802.11ac VHT40	142/5710	3.52	4.12	30	PASS
	151/5755	15.67	16.27	30	PASS
	159/5795	15.60	16.20	30	PASS
802.11ac VHT80	138/5690	0.01	1.15	30	PASS
	155/5775	14.70	15.84	30	PASS
802.11ax HE20	144/5720	7.54	7.65	30	PASS
	149/5745	14.92	15.03	30	PASS
	157/5785	14.71	14.82	30	PASS
	165/5825	14.66	14.77	30	PASS
802.11ax HE40	142/5710	4.20	4.42	30	PASS
	151/5755	14.96	15.18	30	PASS
	159/5795	14.92	15.14	30	PASS
802.11ax HE80	138/5690	0.47	0.90	30	PASS
	155/5775	14.33	14.76	30	PASS

Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor

MIMO**U-NII-1**

Test Mode	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11n HT20	36/5180	15.50	15.81	15.15	15.46	18.65	24	PASS
	40/5200	15.46	15.77	15.41	15.72	18.75	24	PASS
	48/5240	15.12	15.43	15.87	16.18	18.84	24	PASS
802.11n HT40	38/5190	15.39	15.99	15.61	16.21	19.11	24	PASS
	46/5230	14.87	15.47	15.78	16.38	18.96	24	PASS
802.11ac VHT20	36/5180	15.27	15.58	14.99	15.30	18.45	24	PASS
	40/5200	15.30	15.61	15.20	15.51	18.57	24	PASS
	48/5240	14.99	15.30	15.35	15.66	18.49	24	PASS
802.11ac VHT40	38/5190	15.42	16.02	15.49	16.09	19.07	24	PASS
	46/5230	14.86	15.46	15.65	16.25	18.88	24	PASS
802.11ac VHT80	42/5210	14.37	15.51	14.43	15.57	18.55	24	PASS
802.11ax HE20	36/5180	14.57	14.68	14.64	14.75	17.72	24	PASS
	40/5200	14.75	14.86	14.77	14.88	17.88	24	PASS
	48/5240	15.57	15.68	14.95	15.06	18.39	24	PASS
802.11ax HE40	38/5190	14.87	15.09	14.96	15.18	18.14	24	PASS
	46/5230	15.25	15.47	15.09	15.31	18.40	24	PASS
802.11ax HE80	42/5210	14.29	14.72	14.26	14.69	17.71	24	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power = $10 \log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f(i): If all antennas have the same gain,

Directional gain = $G_{\text{ANT}} + \text{Array Gain}$,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{\text{ANT}} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{\text{ANT}}/N_{\text{SS}})$ dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{\text{ANT}} \geq 5$.

So directional gain = $G_{\text{ANT}} + \text{Array Gain} = -0.9 + 0 = -0.9$ dBi < 6dBi. So the power limit is 24dBm.

U-NII-2A

Test Mode	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11n HT20	52/5260	14.46	14.77	15.49	15.80	18.33	24	PASS
	60/5300	14.94	15.25	15.57	15.88	18.59	24	PASS
	64/5320	14.92	15.23	15.59	15.90	18.59	24	PASS
802.11n HT40	54/5270	14.97	15.57	15.25	15.85	18.73	24	PASS
	62/5310	14.96	15.56	15.38	15.98	18.78	24	PASS
802.11ac VHT20	52/5260	14.60	14.91	15.45	15.76	18.37	24	PASS
	60/5300	14.56	14.87	15.51	15.82	18.38	24	PASS
	64/5320	14.75	15.06	15.53	15.84	18.48	24	PASS
802.11ac VHT40	54/5270	14.84	15.44	15.23	15.83	18.65	24	PASS
	62/5310	14.86	15.46	15.32	15.92	18.71	24	PASS
802.11ac VHT80	58/5290	14.02	15.16	14.53	15.67	18.43	24	PASS
802.11ax HE20	52/5260	14.80	14.91	14.71	14.82	17.88	24	PASS
	60/5300	14.36	14.47	14.82	14.93	17.72	24	PASS
	64/5320	14.41	14.52	14.86	14.97	17.76	24	PASS
802.11ax HE40	54/5270	14.54	14.76	14.93	15.15	17.97	24	PASS
	62/5310	14.41	14.63	15.00	15.22	17.95	24	PASS
802.11ax HE80	58/5290	14.08	14.51	14.35	14.78	17.65	24	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power = $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)})$.

2. The manufacturer declared the transmitter output signals is CDD mode And $N_{SS}=2$. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(i): If all antennas have the same gain, Directional gain = $G_{ANT} + \text{Array Gain}$,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So directional gain = $G_{ANT} + \text{Array Gain} = -1.4 + 0 = -1.4 \text{ dBi} < 6 \text{ dBi}$. So the power limit is 24dBm.

U-NII-2C

Test Mode	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11n HT20	100/5500	14.71	15.02	14.95	15.26	18.15	24	PASS
	116/5580	14.51	14.82	15.06	15.37	18.12	24	PASS
	140/5700	14.71	15.02	15.12	15.43	18.24	24	PASS
	144/5720	14.08	14.39	13.66	13.97	17.20	24	PASS
802.11n HT40	102/5510	14.58	15.18	13.95	14.55	17.89	24	PASS
	110/5550	14.29	14.89	14.08	14.68	17.80	24	PASS
	134/5670	13.62	14.22	13.33	13.93	17.09	24	PASS
	142/5710	14.16	14.76	13.96	14.56	17.67	24	PASS
802.11ac VHT20	100/5500	14.47	14.78	13.88	14.19	17.50	24	PASS
	116/5580	14.30	14.61	14.20	14.51	17.57	24	PASS
	140/5700	14.17	14.48	14.25	14.56	17.53	24	PASS
	144/5720	13.46	13.77	13.45	13.76	16.77	24	PASS
802.11ac VHT40	102/5510	14.32	14.92	14.93	15.53	18.24	24	PASS
	110/5550	14.19	14.79	14.07	14.67	17.74	24	PASS
	134/5670	13.66	14.26	13.36	13.96	17.12	24	PASS
	142/5710	14.12	14.72	13.92	14.52	17.64	24	PASS
802.11ac VHT80	106/5530	13.61	14.75	13.00	14.14	17.47	24	PASS
	138/5690	14.27	14.85	13.07	14.21	17.55	24	PASS
802.11ax HE20	100/5500	14.08	14.38	13.39	13.50	16.97	24	PASS
	116/5580	14.60	14.19	13.71	13.82	17.02	24	PASS
	140/5700	13.28	14.71	13.81	13.92	17.34	24	PASS
	144/5720	14.26	13.39	12.75	12.86	16.14	24	PASS
802.11ax HE40	102/5510	13.98	14.48	13.72	13.94	17.23	24	PASS
	110/5550	14.33	14.20	13.73	13.95	17.09	24	PASS
	134/5670	13.67	14.55	13.96	14.18	17.38	24	PASS
	142/5710	12.71	13.89	13.56	13.78	16.85	24	PASS
802.11ax HE80	106/5530	13.72	13.14	12.01	12.44	15.81	24	PASS
	138/5690	14.51	14.15	13.13	13.56	16.88	24	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power = $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)})$.

2. The manufacturer declared the transmitter output signals is CDD mode And $N_{SS}=2$. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(i): If all antennas have the same gain, Directional gain = $G_{ANT} + \text{Array Gain}$, For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So directional gain = $G_{ANT} + \text{Array Gain} = -0.3 + 0 = -0.3$ dBi < 6dBi. So the power limit is 24dBm.

U-NII-3

Test Mode	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11n HT20	144/5720	7.19	7.50	6.86	7.17	10.34	30	PASS
	149/5745	15.20	15.51	15.00	15.31	18.42	30	PASS
	157/5785	15.13	15.44	15.13	15.44	18.45	30	PASS
	165/5825	14.85	15.16	15.04	15.35	18.27	30	PASS
802.11n HT40	142/5710	3.07	3.67	2.71	3.31	6.50	30	PASS
	151/5755	14.71	15.31	15.47	16.07	18.72	30	PASS
	159/5795	14.81	15.41	14.80	15.40	18.41	30	PASS
802.11ac VHT20	144/5720	6.80	7.11	6.41	6.72	9.93	30	PASS
	149/5745	15.20	15.51	14.68	14.99	18.27	30	PASS
	157/5785	14.95	15.26	14.99	15.30	18.29	30	PASS
	165/5825	14.79	15.10	14.79	15.10	18.11	30	PASS
802.11ac VHT40	142/5710	2.89	3.49	2.36	2.96	6.24	30	PASS
	151/5755	14.87	15.47	14.73	15.33	18.41	30	PASS
	159/5795	14.85	15.45	14.92	15.52	18.50	30	PASS
802.11ac VHT80	138/5690	0.17	1.31	-0.84	0.30	3.84	30	PASS
	155/5775	14.08	15.22	13.76	14.90	18.07	30	PASS
802.11ax HE20	144/5720	7.57	7.68	6.75	6.86	10.30	30	PASS
	149/5745	14.62	14.73	14.26	14.37	17.56	30	PASS
	157/5785	14.47	14.58	14.49	14.60	17.60	30	PASS
	165/5825	14.23	14.34	14.40	14.51	17.43	30	PASS
802.11ax HE40	142/5710	3.74	3.96	3.40	3.51	6.75	30	PASS
	151/5755	14.71	14.93	14.35	14.57	17.76	30	PASS
	159/5795	14.47	14.69	14.43	14.65	17.68	30	PASS
802.11ax HE80	138/5690	0.91	1.34	0.19	0.62	4.00	30	PASS
	155/5775	14.12	14.55	13.76	14.19	17.39	30	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power = $10 \log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)})$.

2. The manufacturer declared the transmitter output signals is CDD mode And $N_{SS}=2$. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(i): If all antennas have the same gain, Directional gain = $G_{ANT} + \text{Array Gain}$, For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So directional gain = $G_{ANT} + \text{Array Gain} = 0.4 + 0 = 0.4$ dBi < 6dBi. So the power limit is 30dBm.