RF TEST REPORT

Applicant	iRay Technology Co., Ltd.
FCC ID	2ACHK-03210006
Product	LUX HD 43 DETECTOR
Model	LUX HD 43
Report No.	R2407A0993-R3
Issue Date	December 13, 2024

Eurofins TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15E (2023)**. 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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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: August 28, 2024 ~ September 20, 2024 Date of Sample Received: August 1, 2024			
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 Eurofins 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 **Eurofins 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)

Eurofins 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)

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

1.3. Testing Location

Company:	Eurofins TA Technology (Shanghai) Co., Ltd.
Address:	Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China
City:	Shanghai
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Website:	https://www.eurofins.com/electrical-and-electronics
E-mail:	Kain.Xu@cpt.eurofinscn.com

2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	iRay Technology Co., Ltd.
Applicant address	RM 202, Building 7, No. 590, Ruiqing RD., Zhangjiang East, Pudong, 201201 Shanghai, P.R.China
Manufacturer	Carestream Health, Inc.
Manufacturer address	150 Verona Street Rochester, NY, USA 14608

2.2. General information

EUT Description			
Model	LUX HD 43		
Lab internal SN	R2407A0993/S01		
Hardware Version	FPGA MAIN: 2.81		
Software Version	SDK 4.1		
Power Supply	Battery / Adapter		
Antenna Type	Internal Antenna		
Antenna Connector	A permanently attached antenna (meet with the standard FCC Part 15.203 requirement)		
Antenna Gain	Band	Antenna 1 (dBi)	Antenna 2 (dBi)
	U-NII-1& U-NII-3	7.10	5.0
Directional Gain	Band	Power (dBi)	PSD (dBi)
	U-NII-1& U-NII-3	7.10	10.11
Operating Frequency Range(s)	U-NII-1: 5150MHz-5250MHz U-NII-3: 5725MHz -5850MHz		
Modulation Type	802.11a: OFDM 802.11n (HT20/HT40): OFDM 802.11ac (VHT20/VHT40/VHT80): OFDM 802.11ax (HE20/ HE40/ HE80): OFDMA		
Max. Output Power	18.24 dBm		
Operating temperature range	5 ° C to 35 ° C		
Testing temperature range	-30 ° C to 50° C		
Testing voltage range	102 V - 120 V - 138 V		
State DC voltage	18 V		
EUT Accessory			
Medical Switching Power	Manufacturer: Shenzhen Longxc Power Supply Co., LTD.		

Supply	Model: LXCP61-024300
Rechargeable Li-ion Battery Pack	Manufacturer: Carestream Health, Inc. Model: BATTERY-KX DC 11.55V, 4700mAh
CARESTREAM DRX-1	Manufacturer: Carestream Health, Inc. Model: DRX-TPC1 Input: 100-240V AC~50/60Hz 1.0A Output: 18V DC 2.0A
Control Box	Manufacturer: Carestream Health, Inc. Model: Control Box-WT

Note:

1. The EUT is sent from the applicant to Eurofins 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.

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 (2023) 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 (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) 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	--	802.11n HT20/40 802.11ac VHT20/40/80 802.11ax HE20/40/80
Power Spectral Density	O	O	802.11n HT20/40 802.11ac VHT20/40/80 802.11ax HE20/40/80
Unwanted Emissions	--	O	--
Conducted Emissions	--	802.11ax HE20	--
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
		80 MHz	42	5210MHz
	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? ☐Yes ☒No				

5. Test Case Results

5.1. Occupied Bandwidth

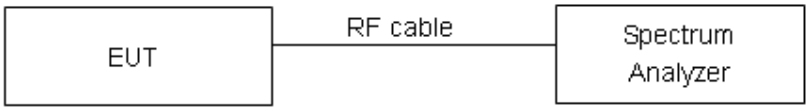
Ambient condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

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, set RBW ≈1% OCB kHz, VBW ≥ 3 × 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 ≥ 3 × 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
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	16.712	19.730	PASS
	5200	16.689	19.704	PASS
	5240	16.715	19.910	PASS
802.11n HT20	5180	17.711	20.017	PASS
	5200	17.676	20.240	PASS
	5240	17.682	19.984	PASS
802.11n HT40	5190	36.211	40.600	PASS
	5230	36.161	40.469	PASS
802.11ac VHT20	5180	17.665	20.201	PASS
	5200	17.696	20.076	PASS
	5240	17.684	20.411	PASS
802.11ac VHT40	5190	36.213	40.581	PASS
	5230	36.205	40.979	PASS
802.11ac VHT80	5210	76.187	81.952	PASS
802.11ax HE20	5180	18.788	20.391	PASS
	5200	18.809	20.232	PASS
	5240	18.796	20.340	PASS
802.11ax HE40	5190	37.606	40.420	PASS
	5230	37.560	40.032	PASS
802.11ax HE80	5210	77.743	80.842	PASS

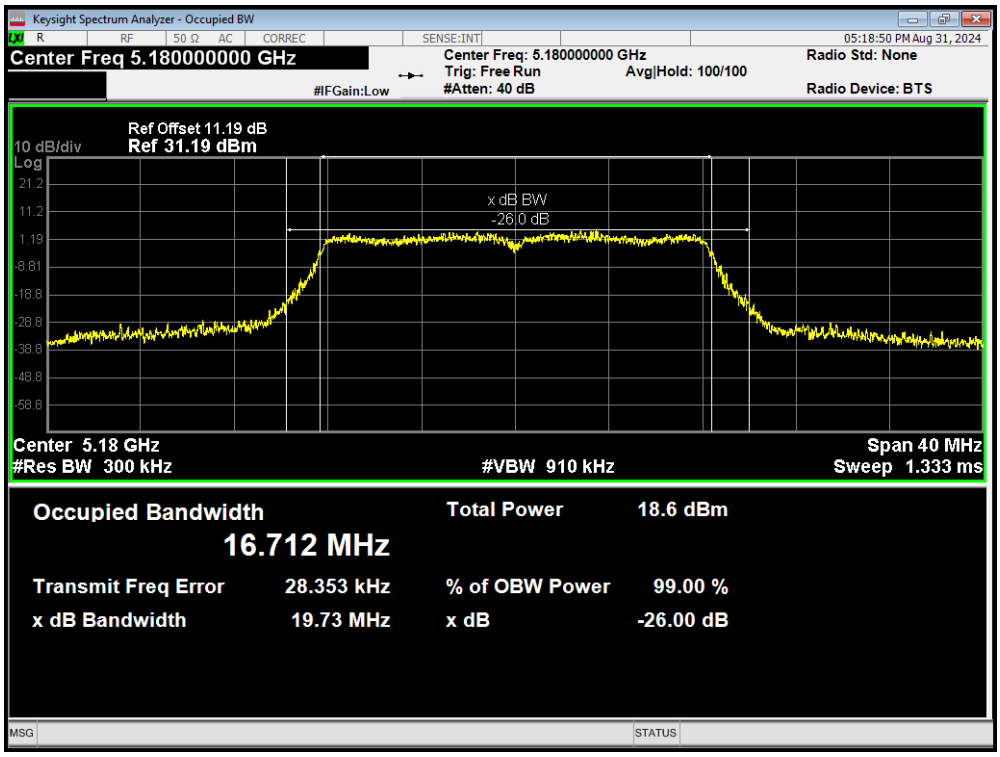
U-NII-3

Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11a	5745	16.691	16.374	500	PASS
	5785	16.715	16.340	500	PASS
	5825	16.720	16.520	500	PASS
802.11n HT20	5745	17.708	17.553	500	PASS
	5785	17.708	17.269	500	PASS
	5825	17.692	17.553	500	PASS
802.11n HT40	5755	36.288	35.658	500	PASS
	5795	36.197	35.488	500	PASS
802.11ac VHT20	5745	17.716	17.587	500	PASS
	5785	17.713	17.605	500	PASS
	5825	17.705	17.662	500	PASS
802.11ac VHT40	5755	36.240	36.277	500	PASS
	5795	36.226	35.734	500	PASS
802.11ac VHT80	5775	76.239	76.087	500	PASS
802.11ax HE20	5745	18.833	17.885	500	PASS
	5785	18.833	18.095	500	PASS
	5825	18.828	18.055	500	PASS
802.11ax HE40	5755	37.553	36.729	500	PASS
	5795	37.568	36.788	500	PASS
802.11ax HE80	5775	77.694	77.838	500	PASS

99% bandwidth

U-NII-1

OBW 802.11a 5180MHz



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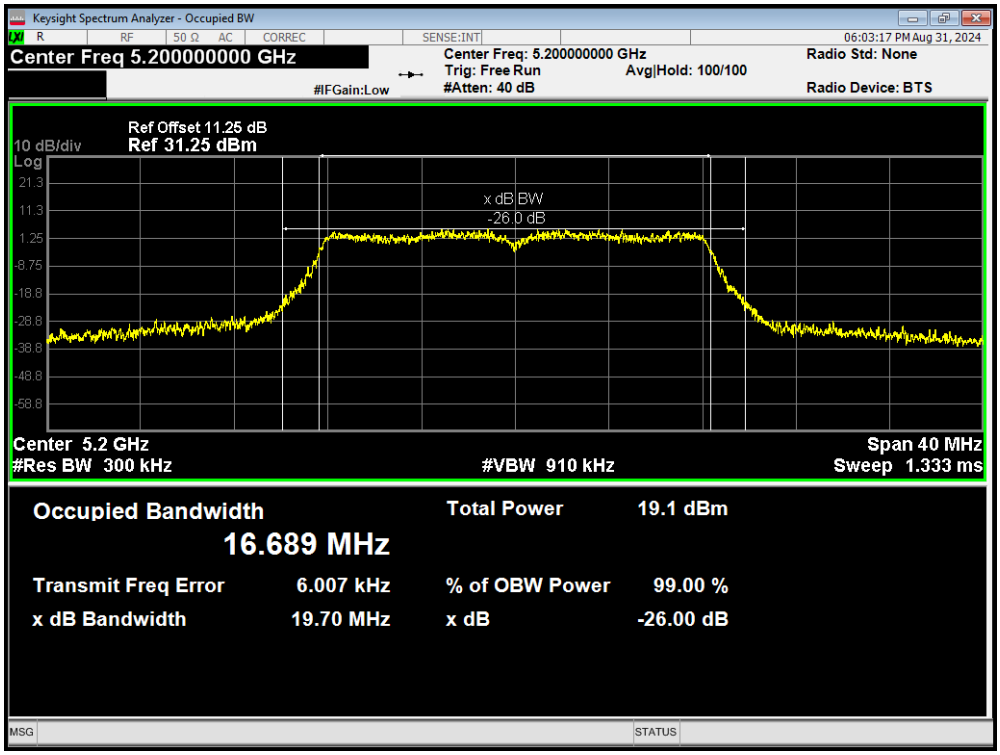

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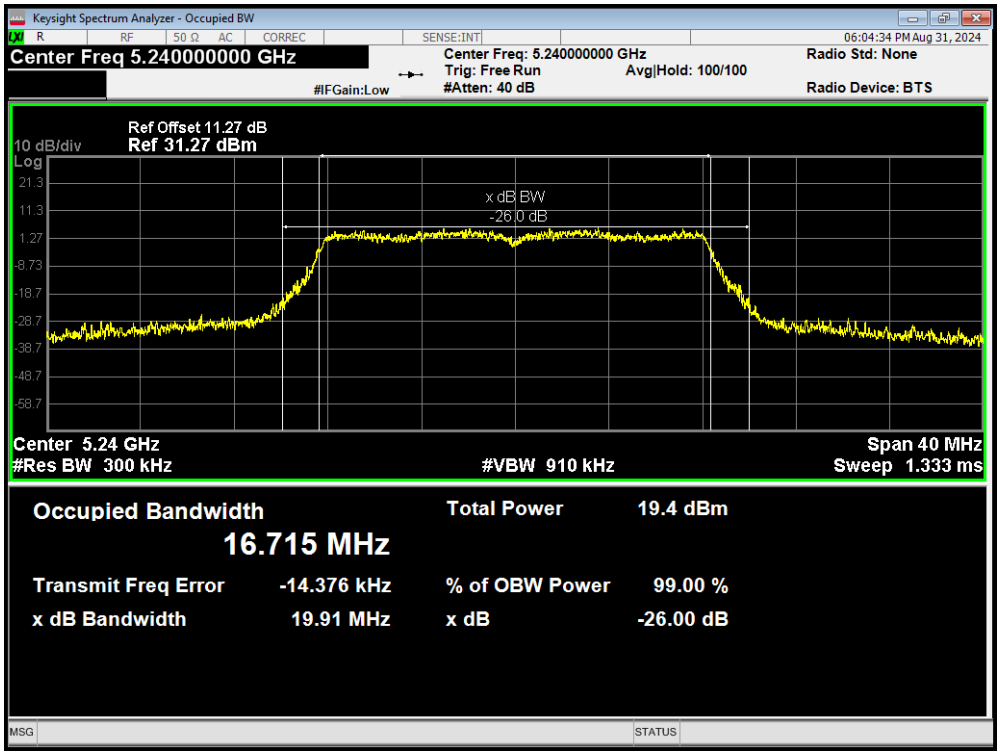

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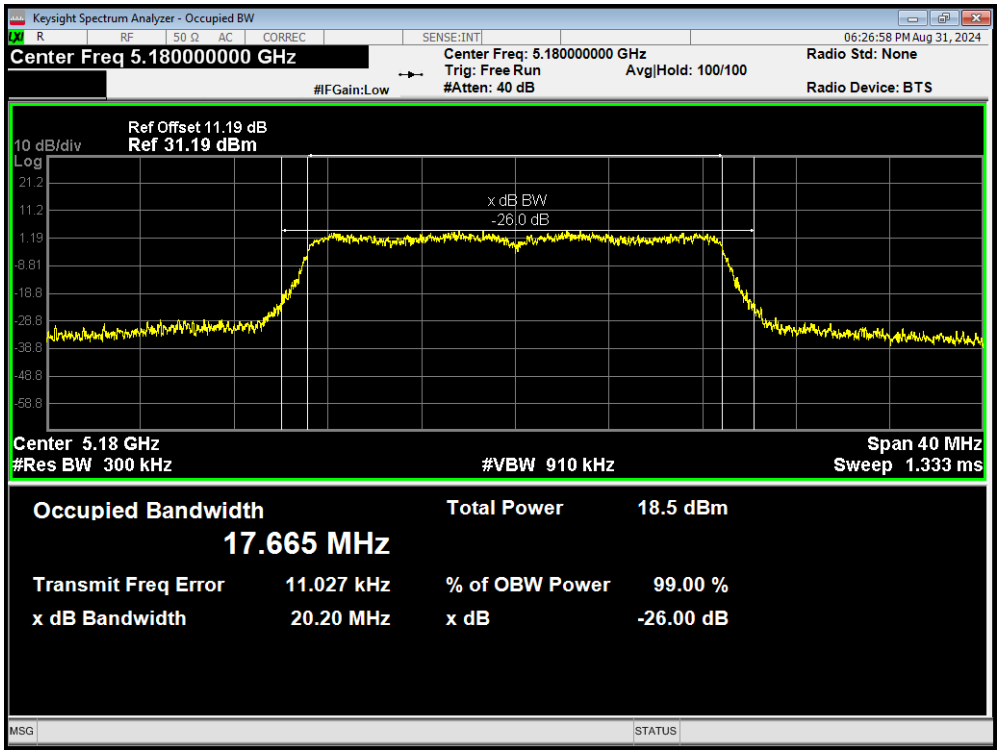

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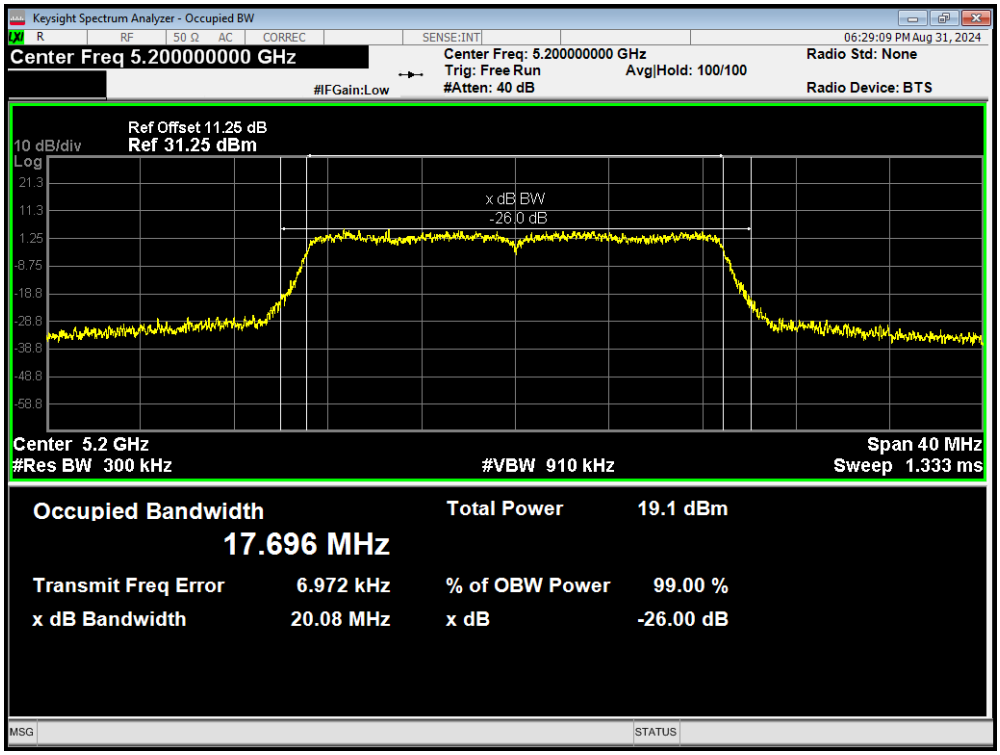

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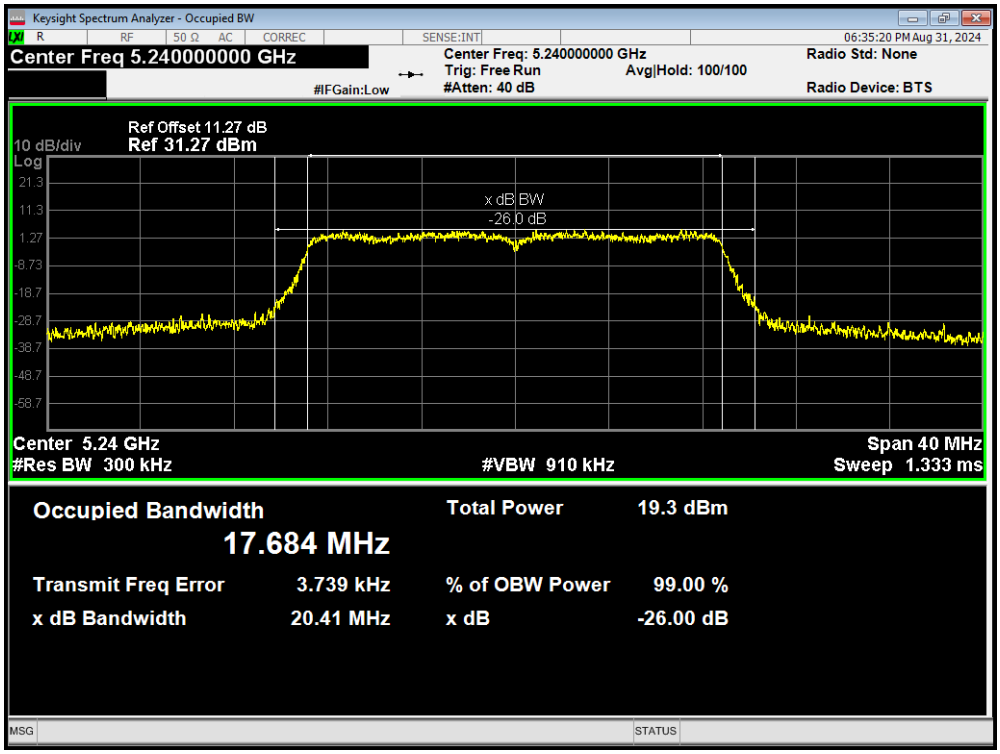

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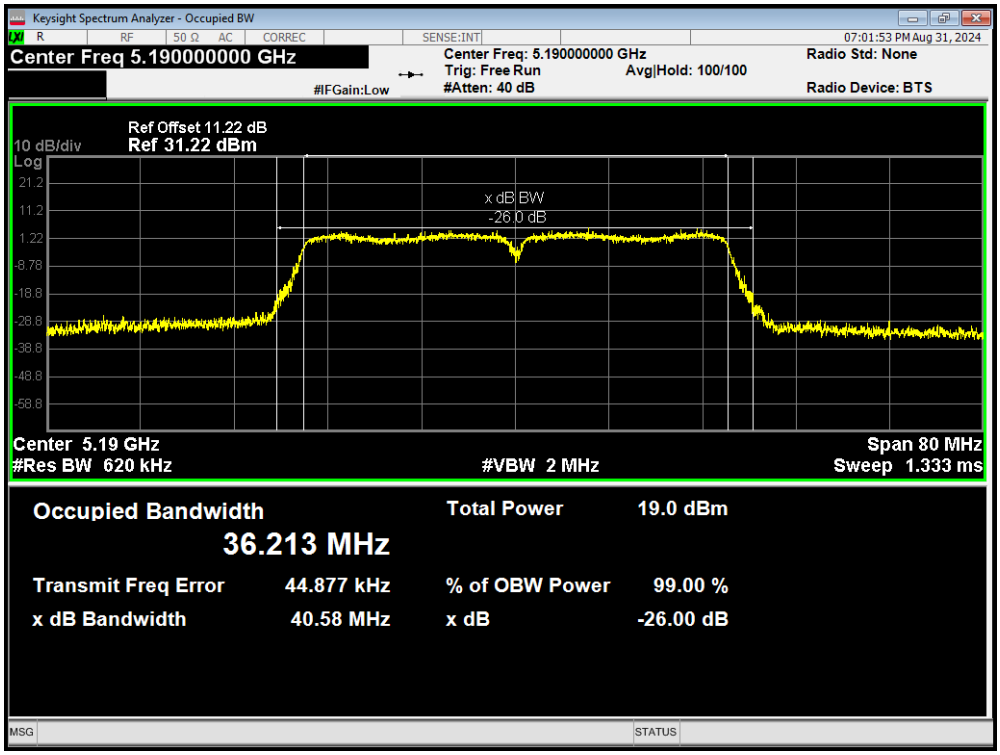

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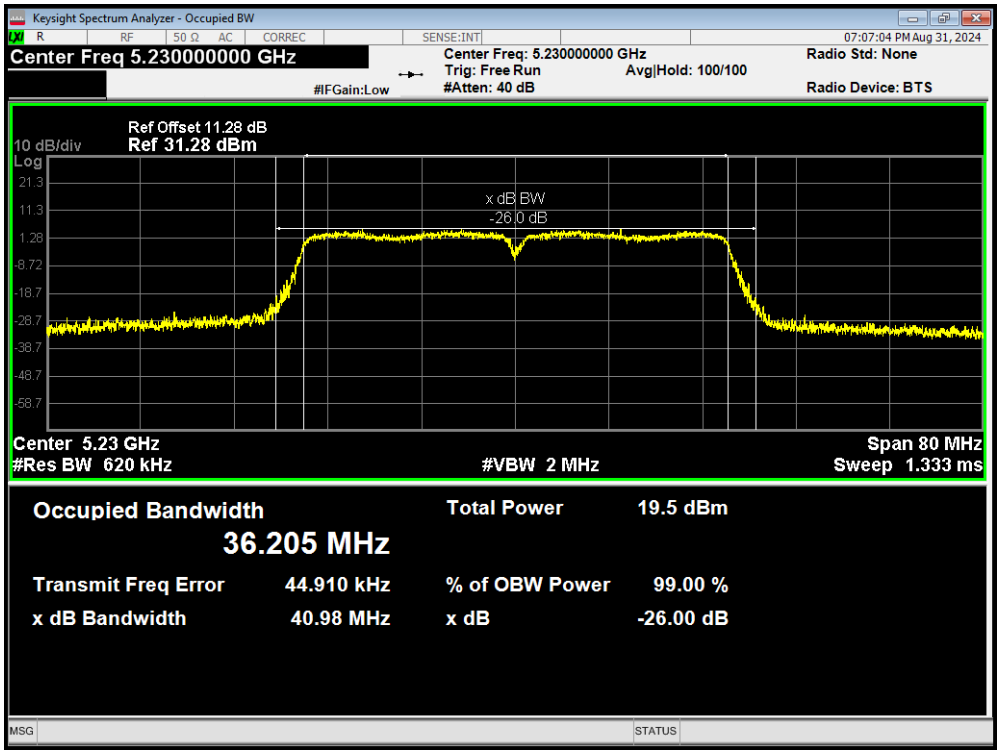

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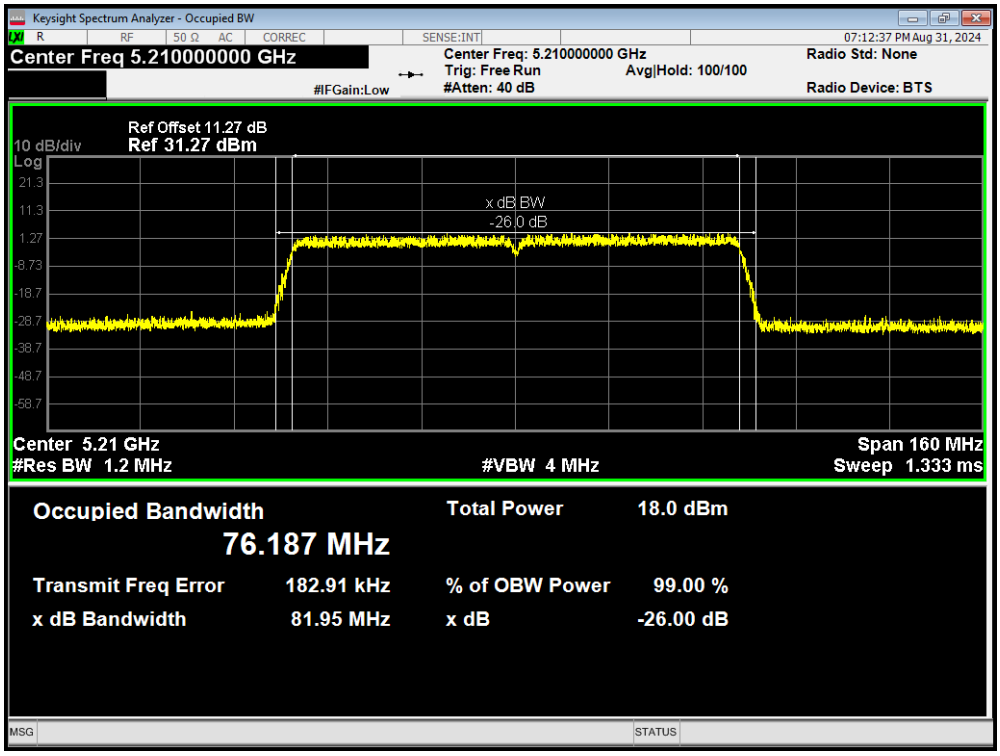

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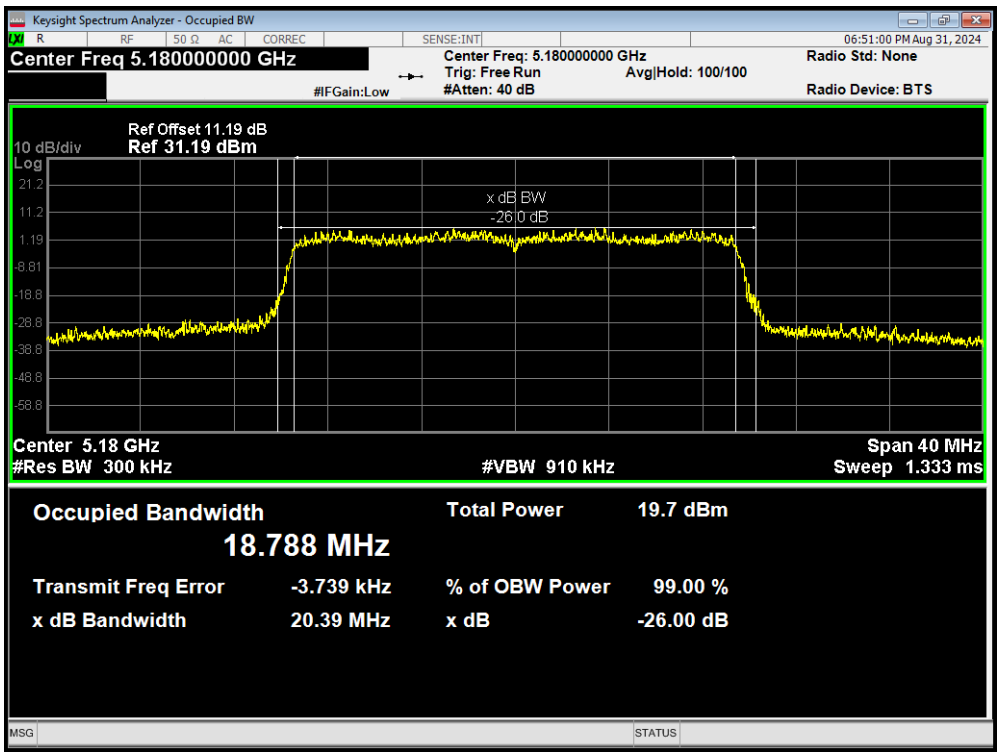

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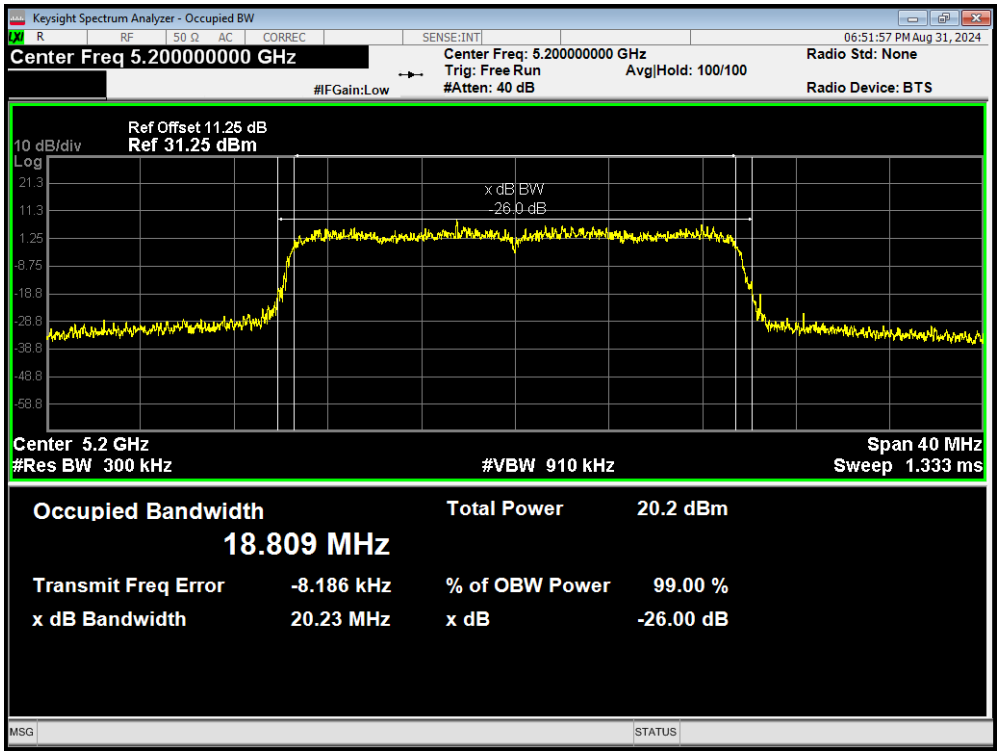

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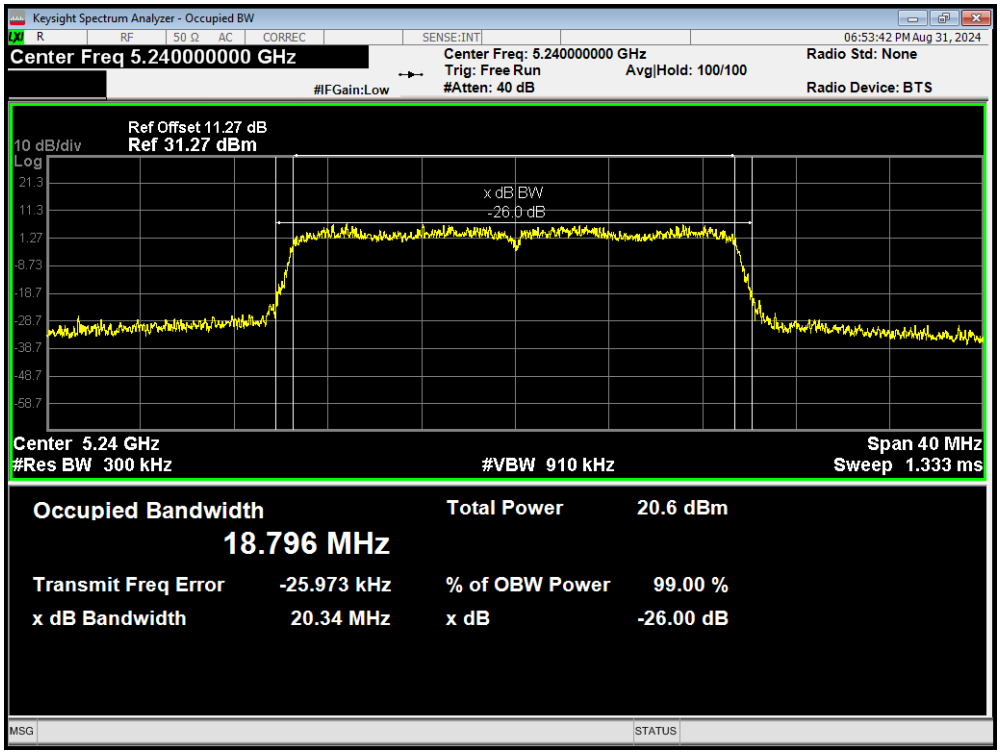

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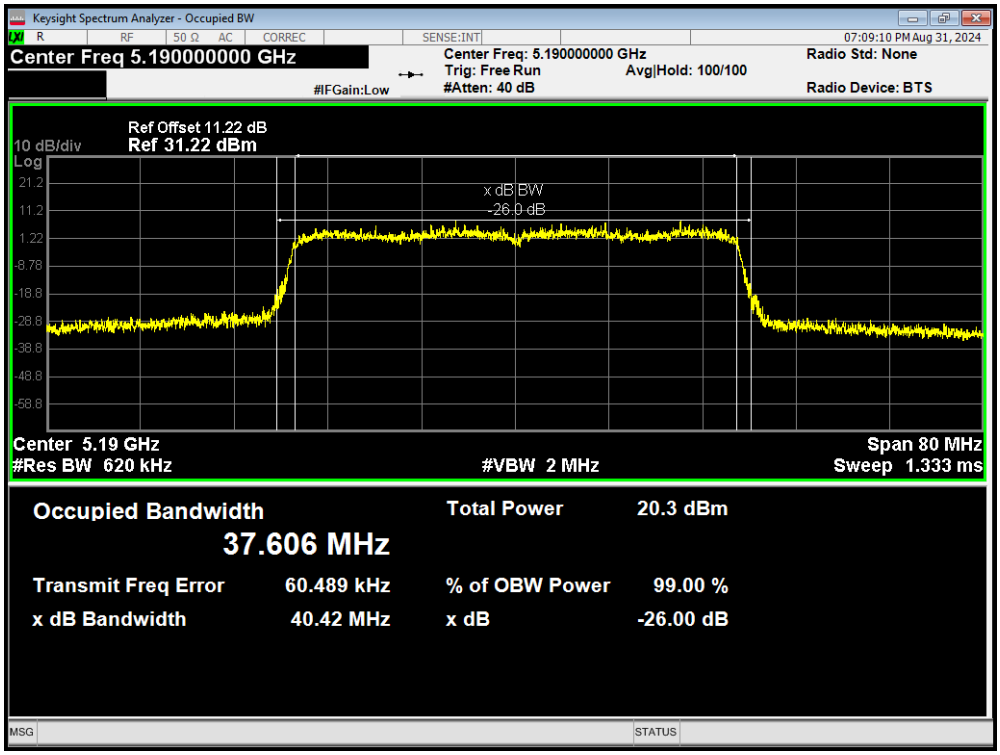

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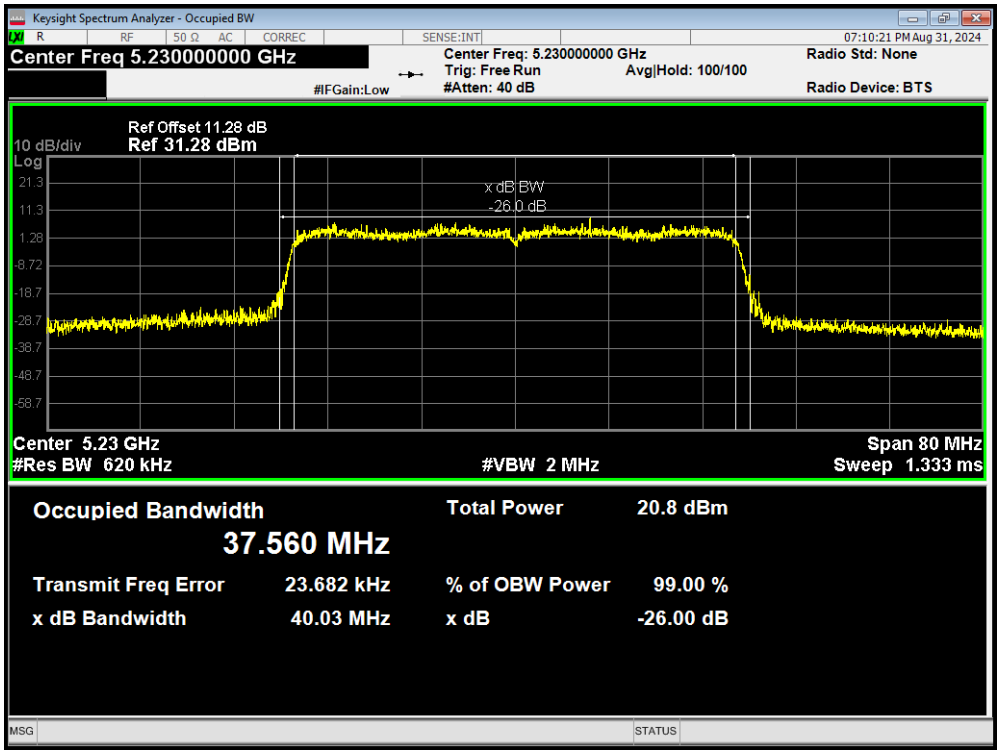

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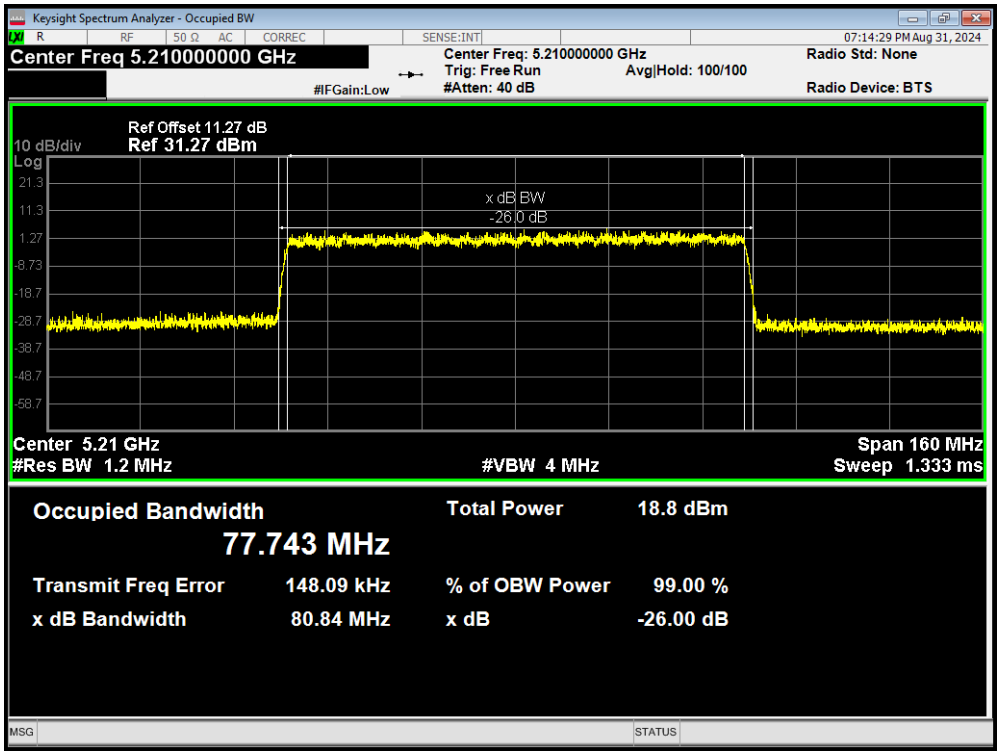

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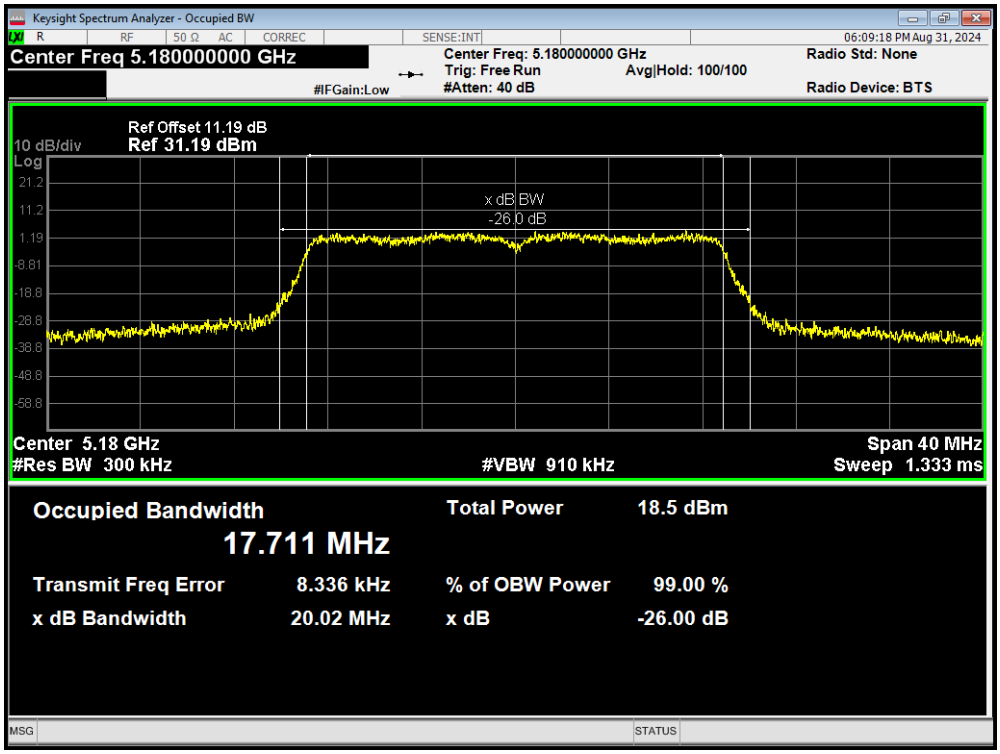

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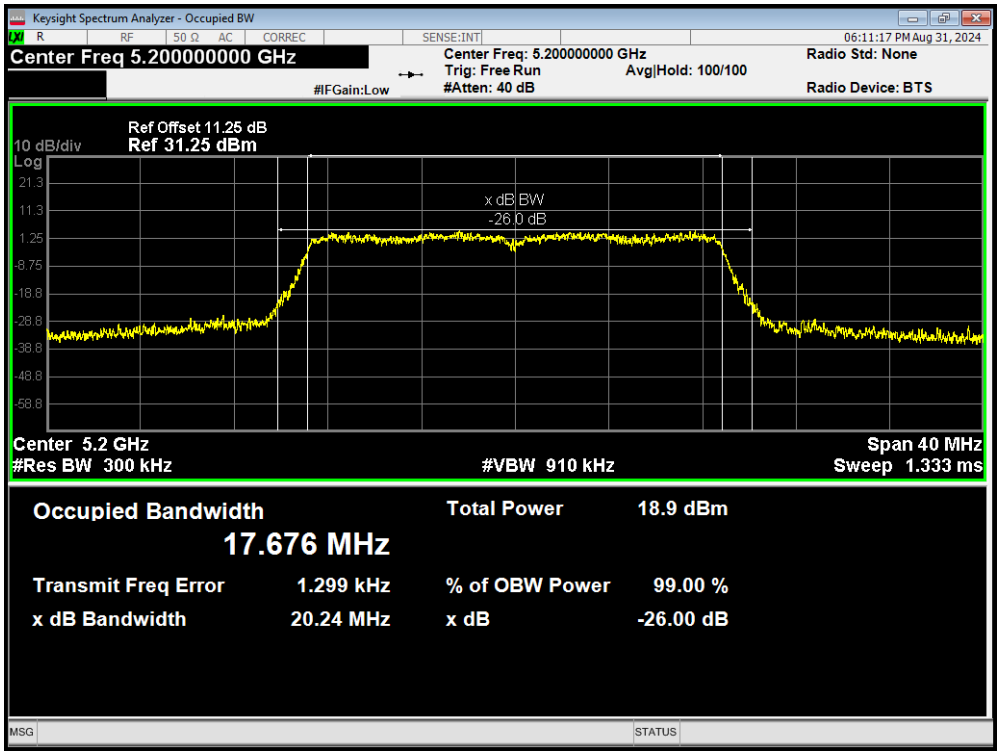

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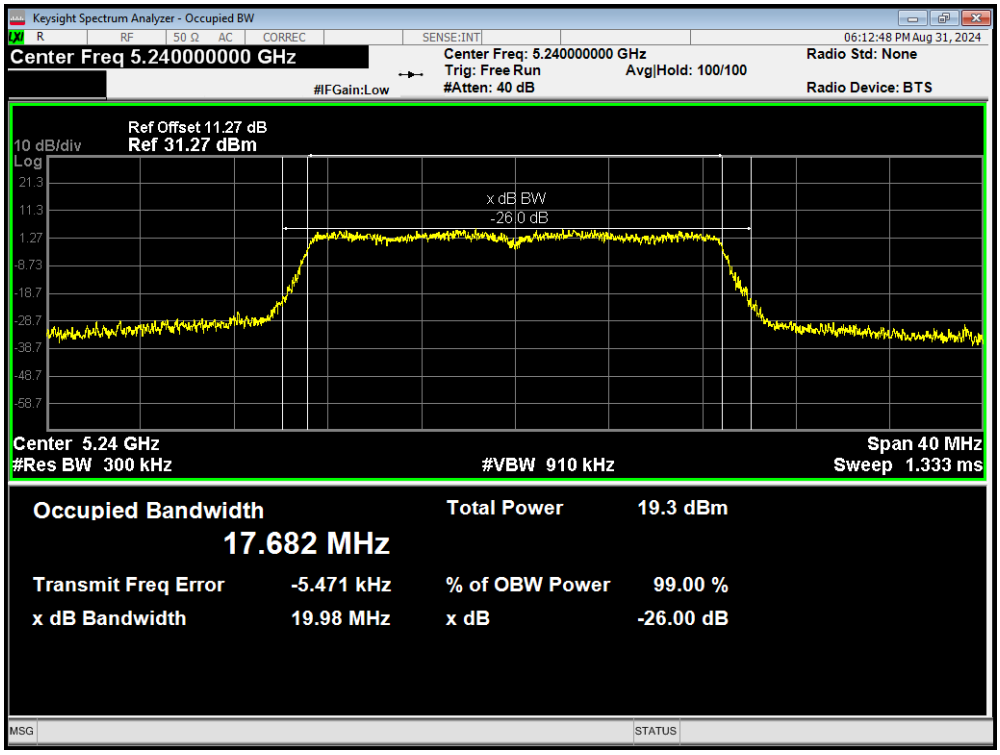

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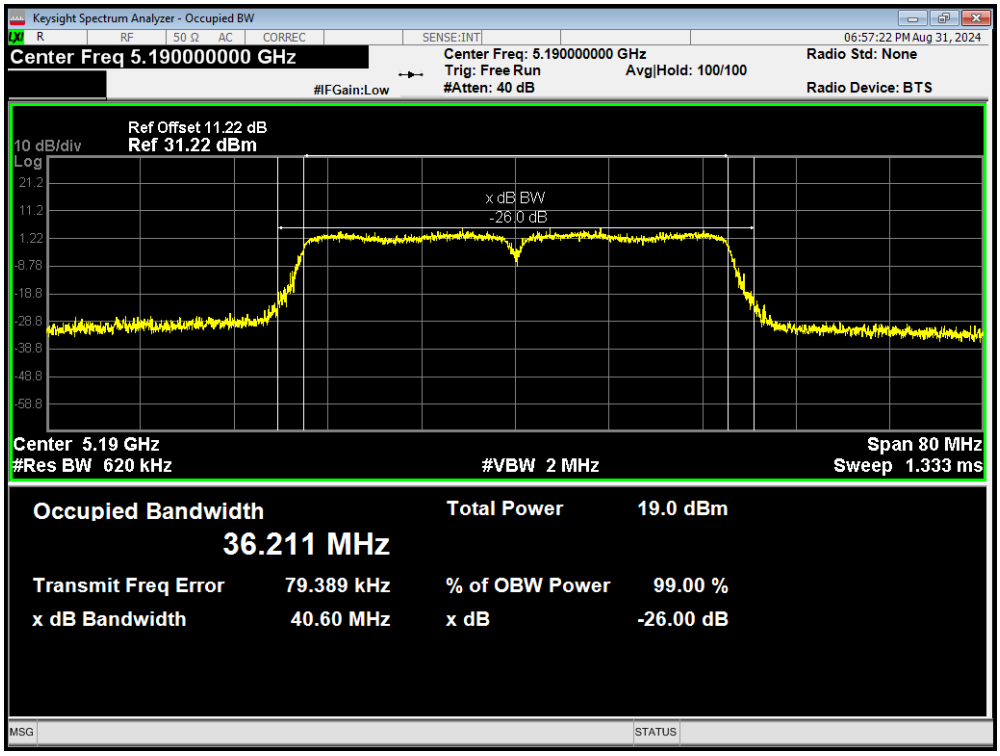

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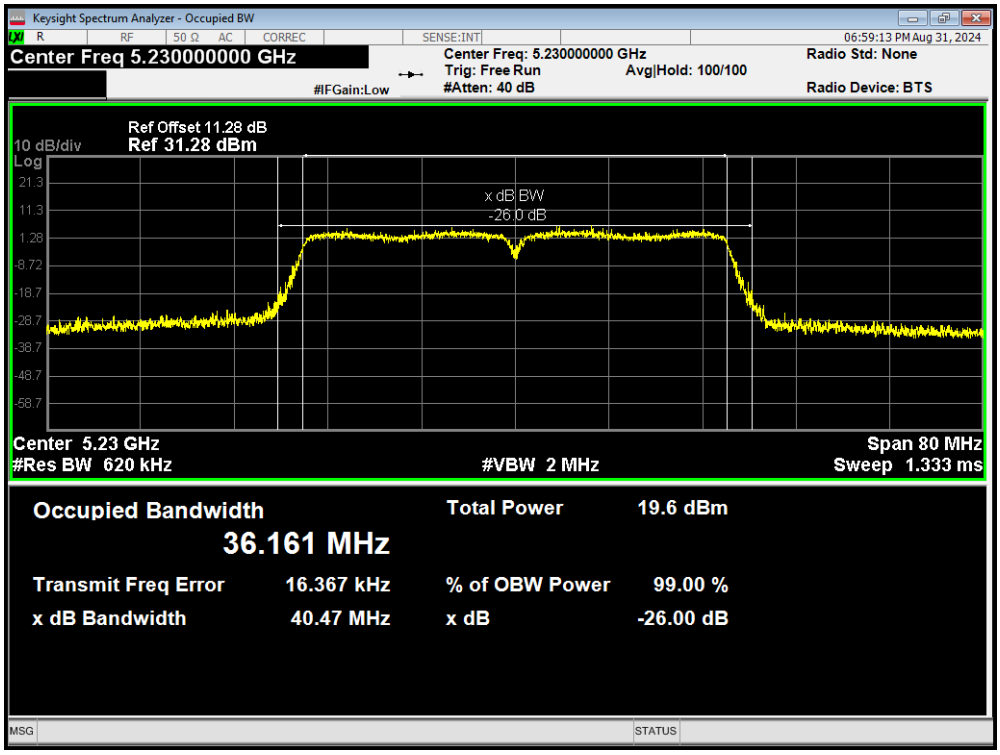
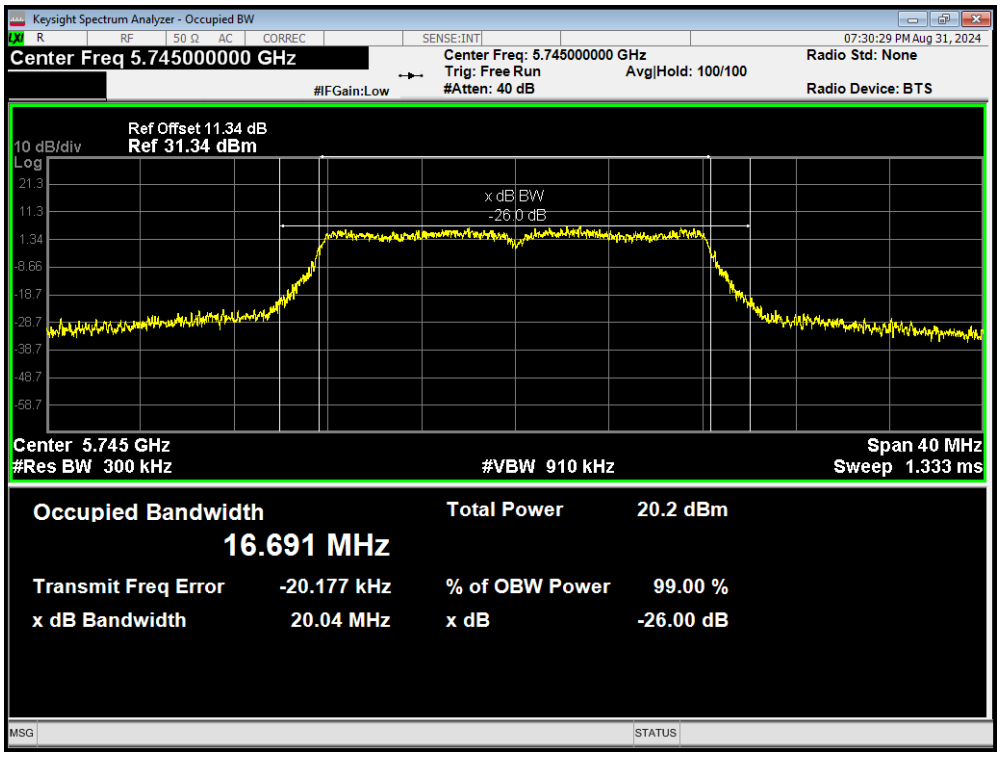


U-NII-3

OBW 802.11a 5745MHz



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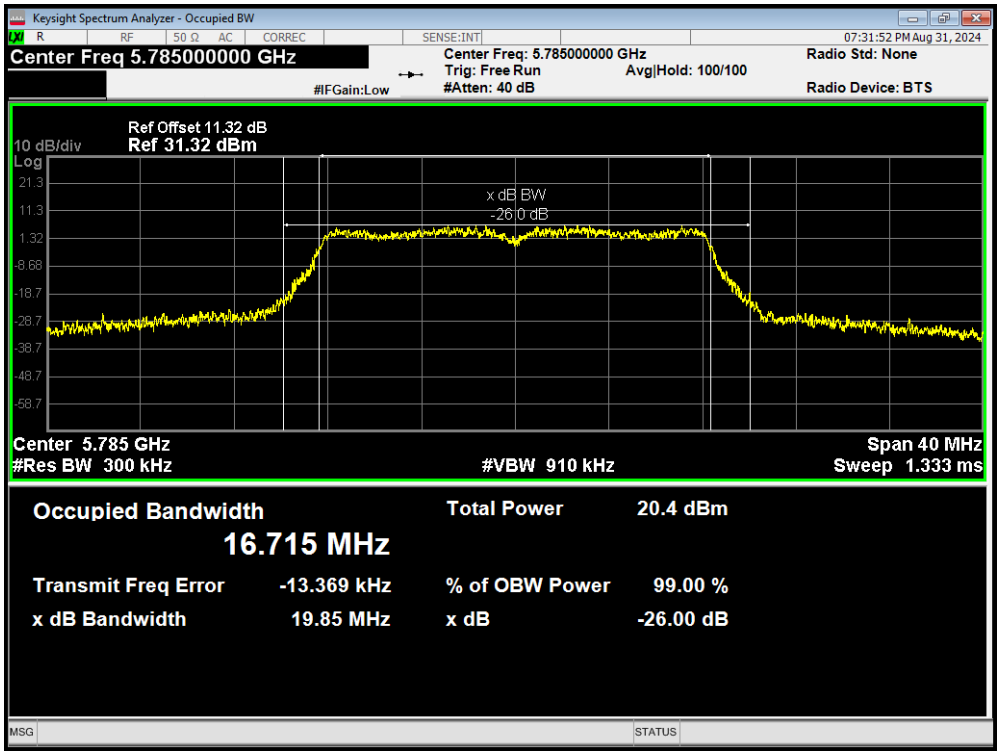

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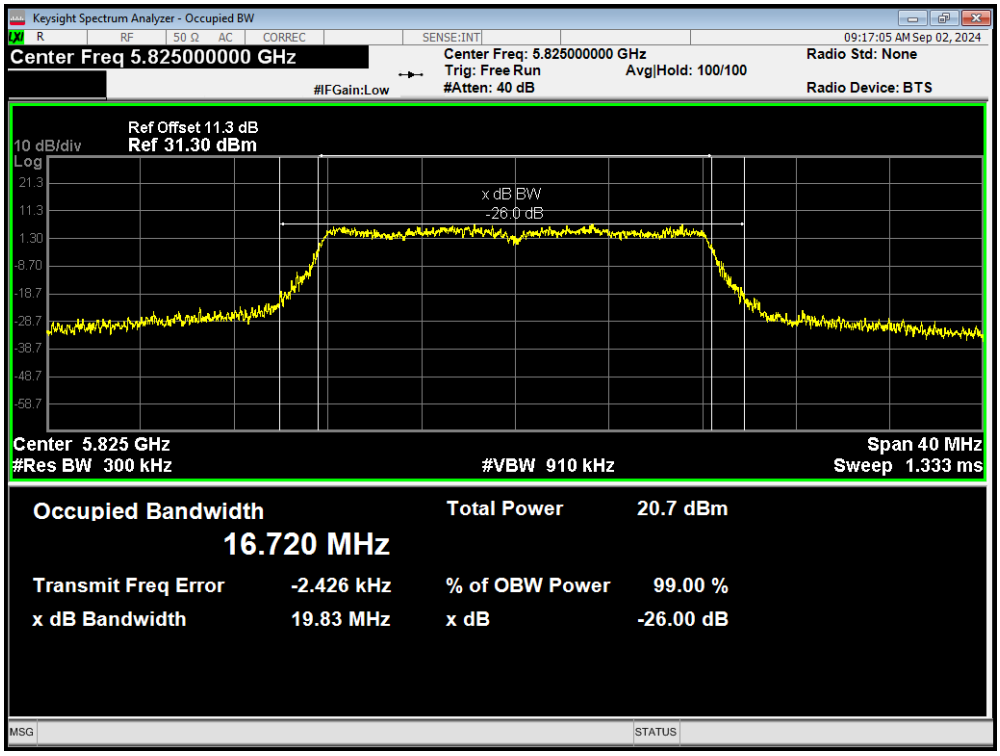

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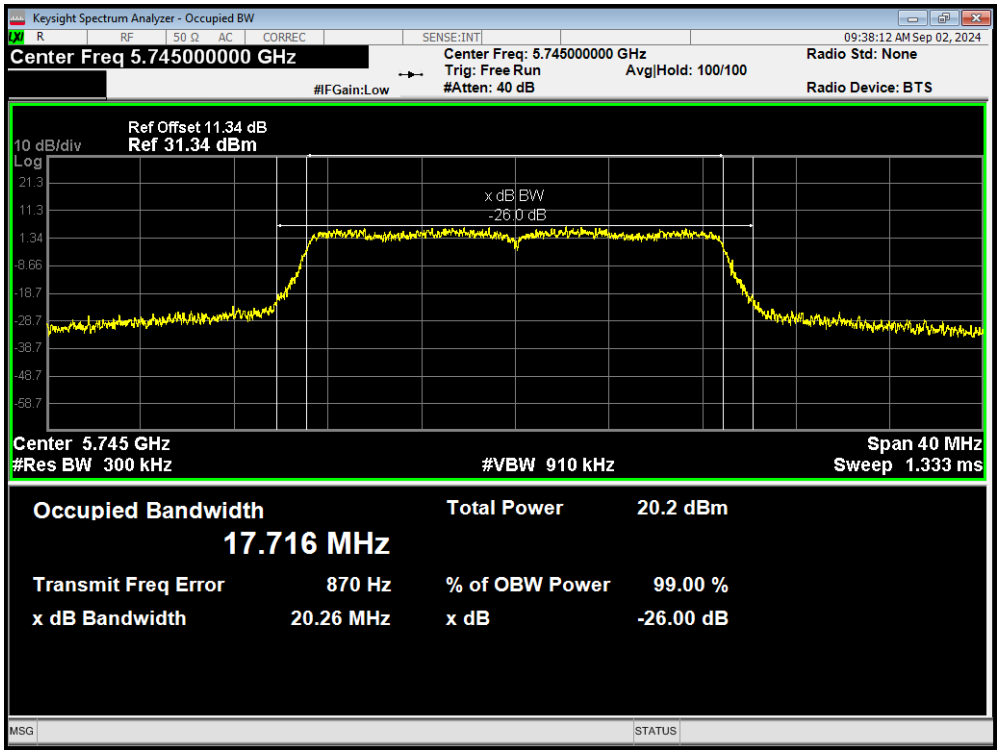

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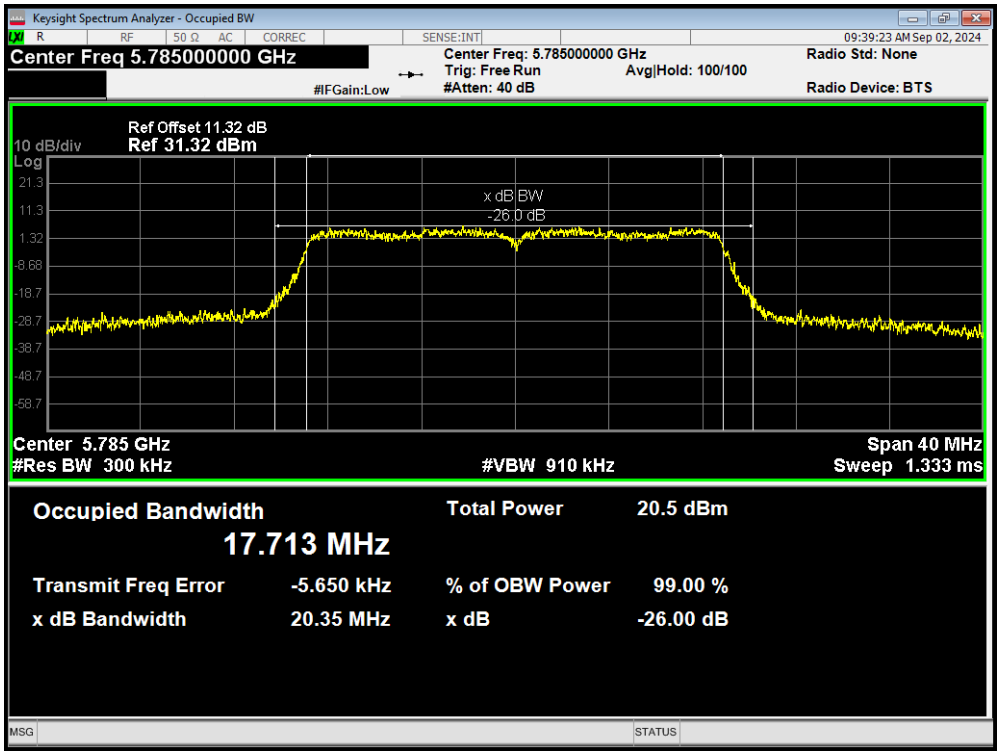

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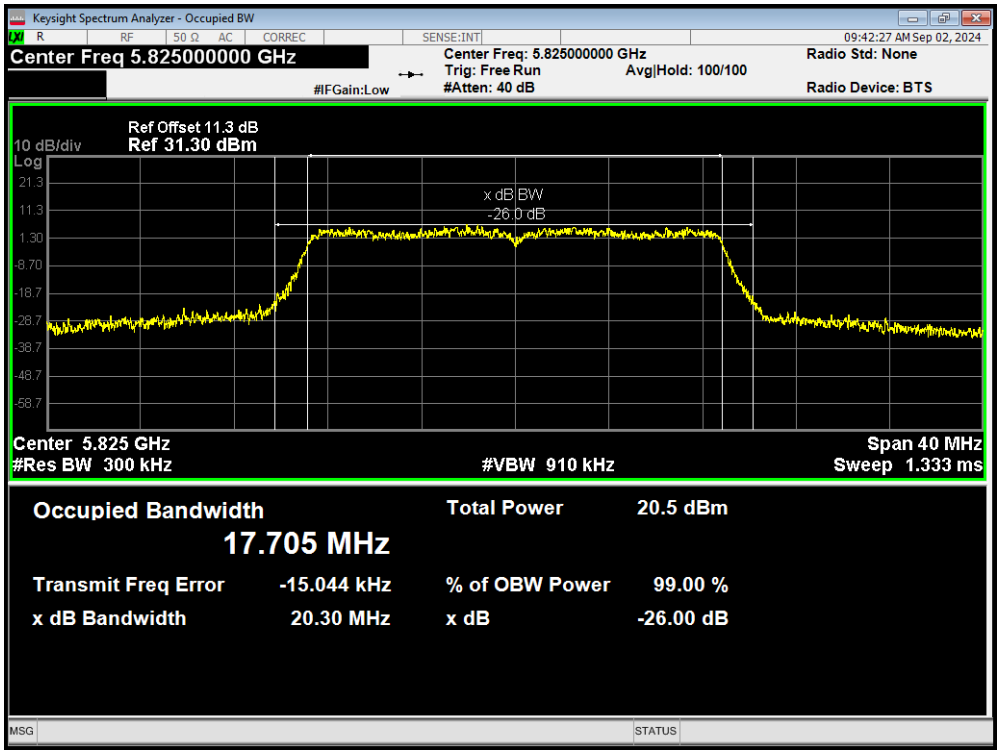

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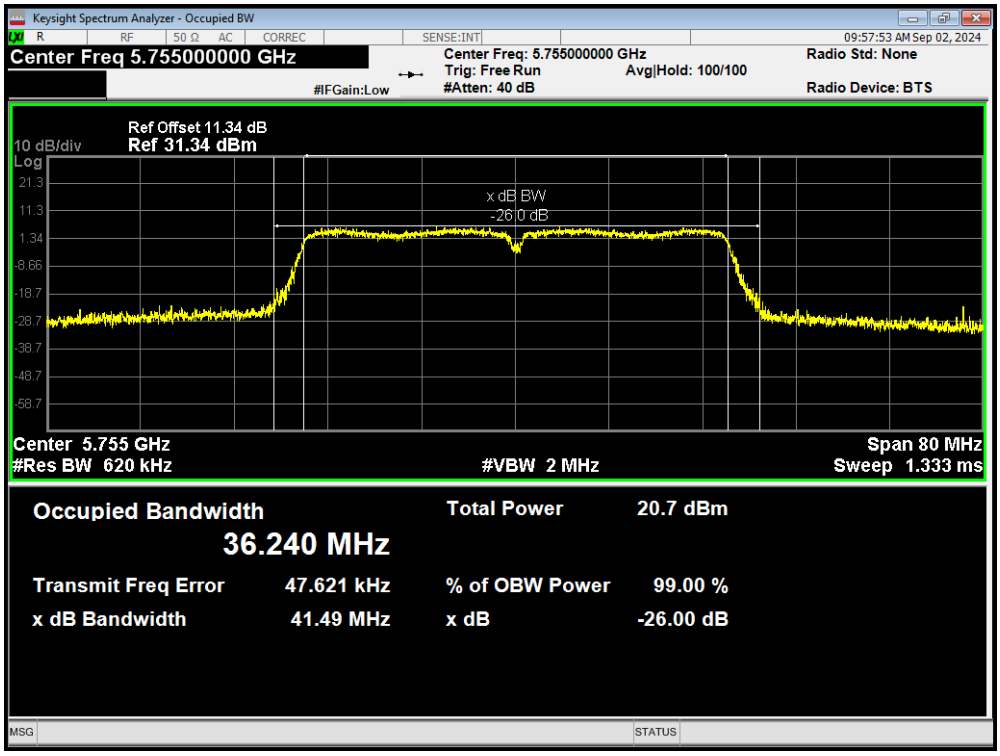

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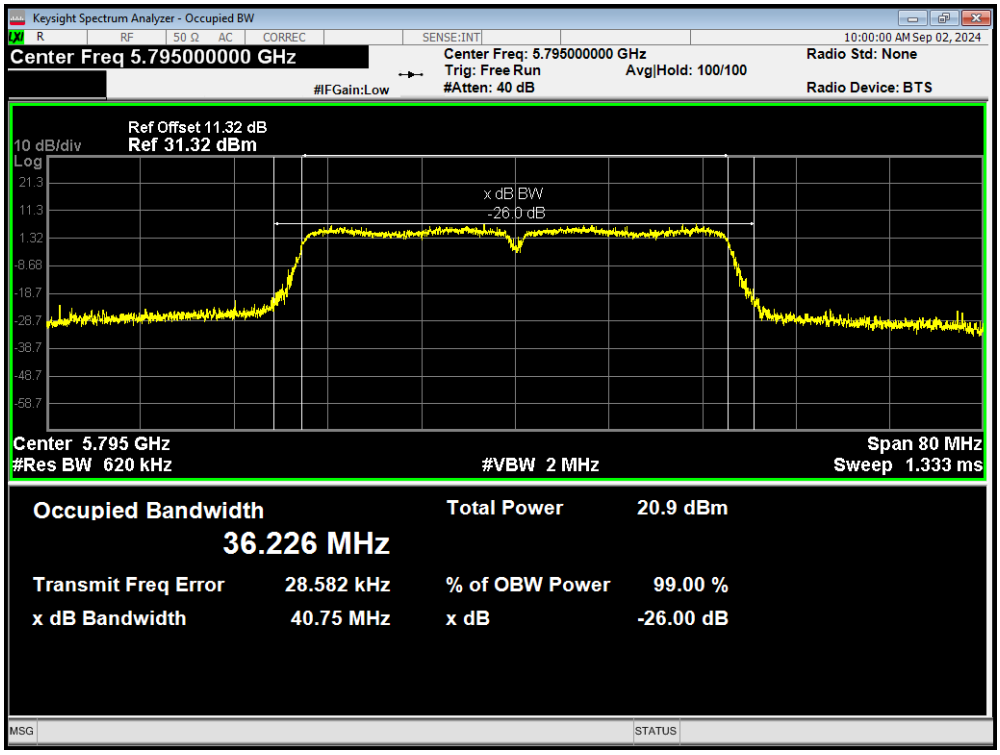
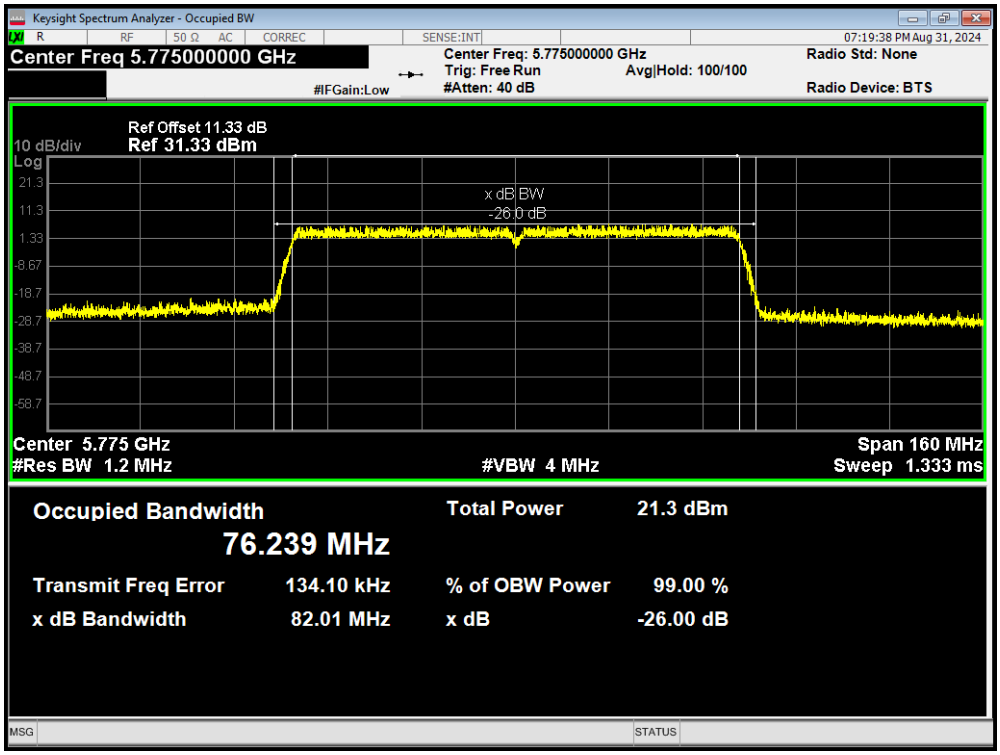
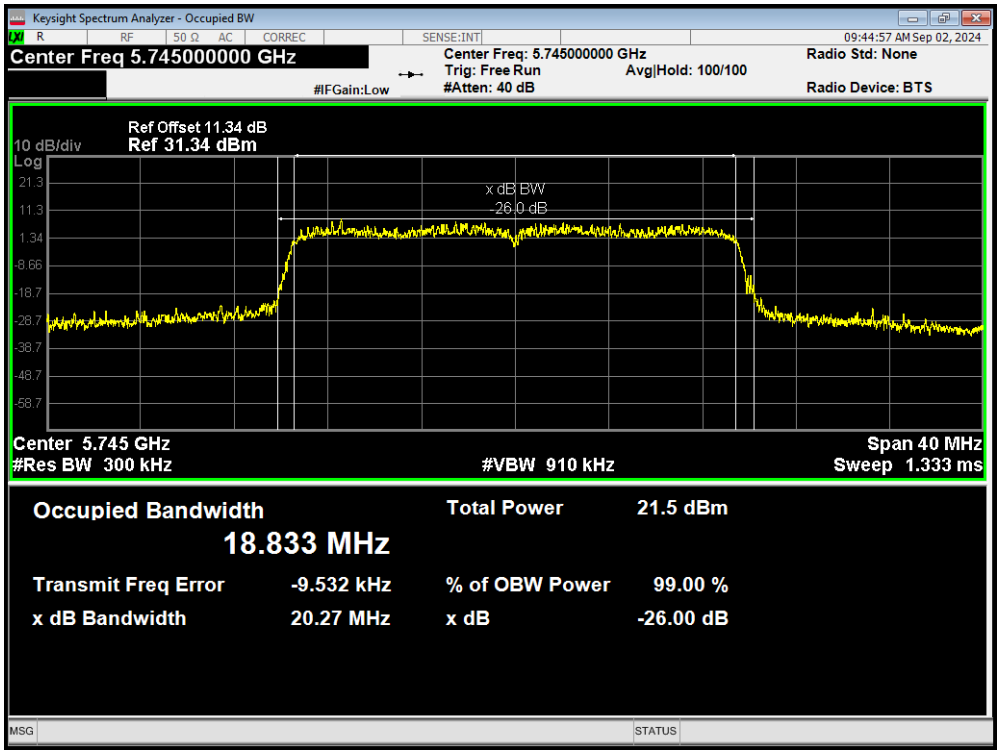


OBW 802.11ac(VHT80) 5775MHz



OBW 802.11ax(HE20) 5745MHz



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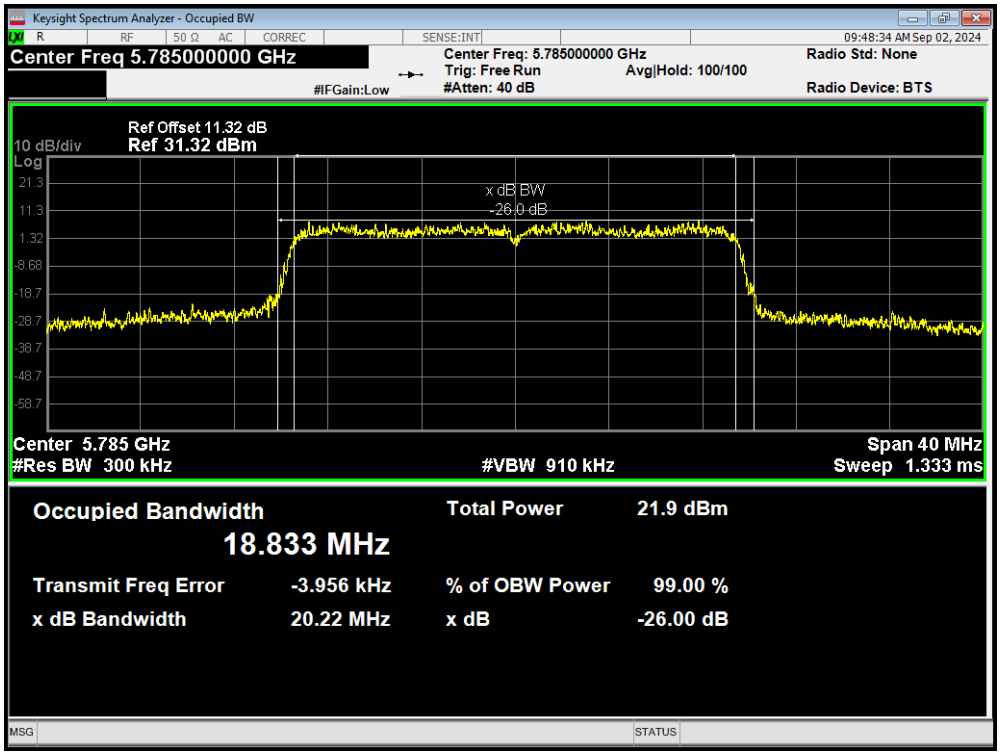
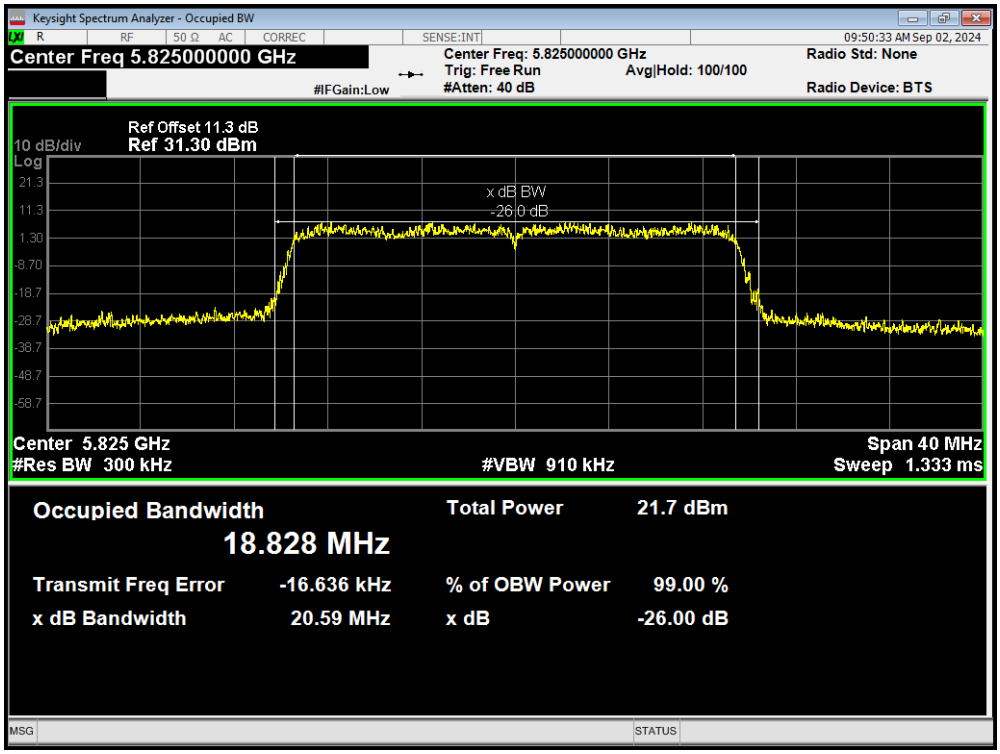
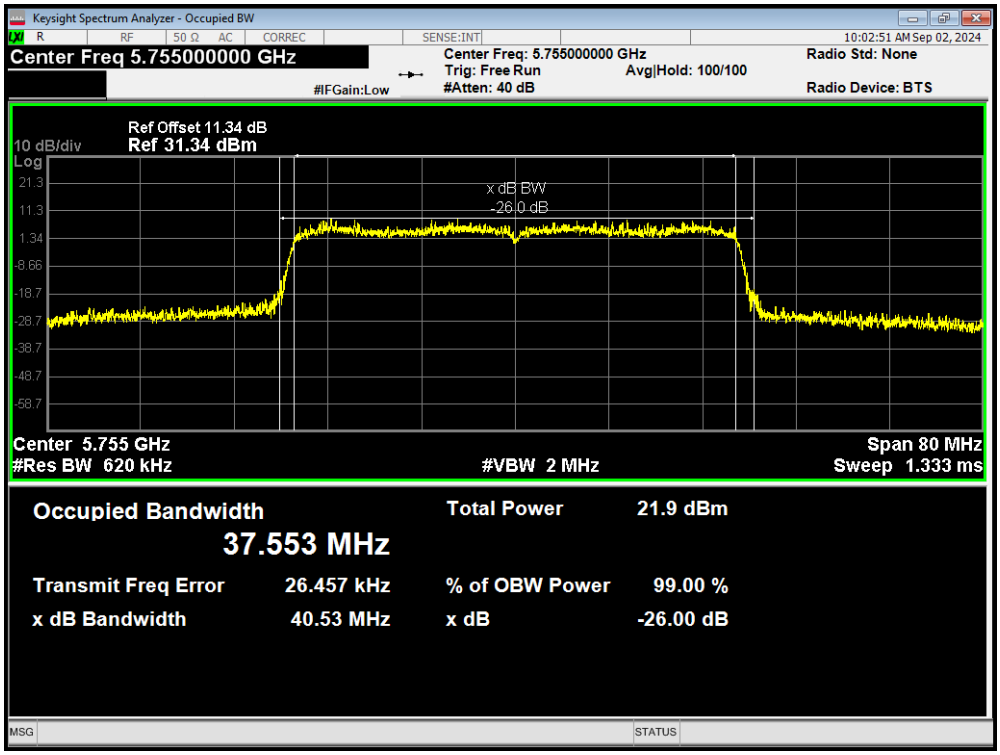


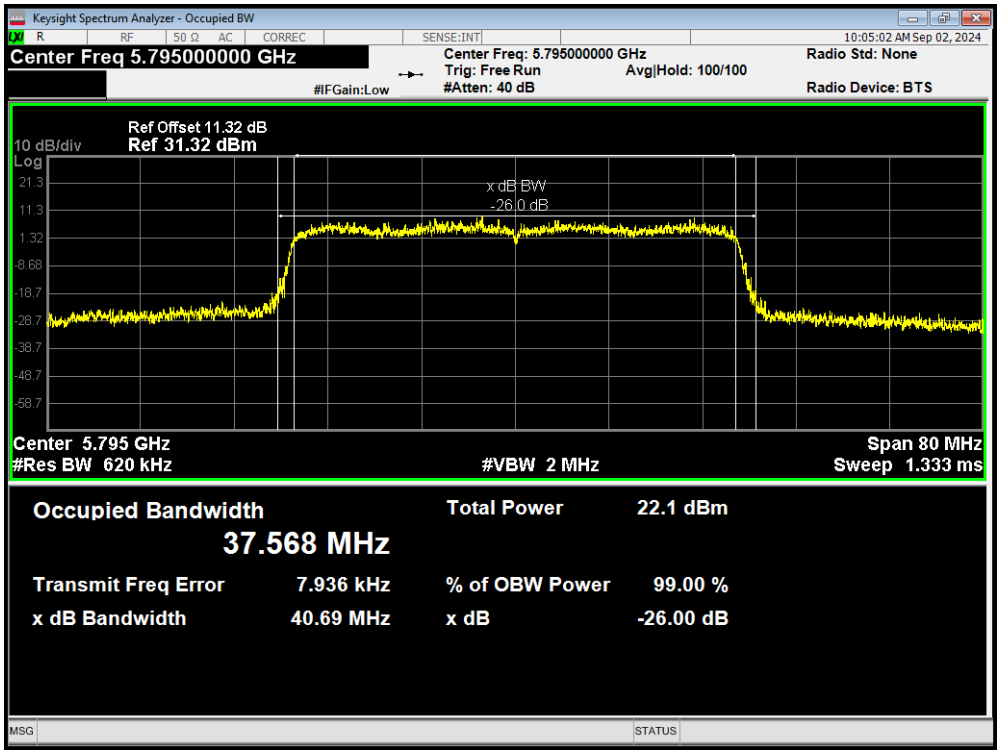
OBW 802.11ax(HE20) 5825MHz



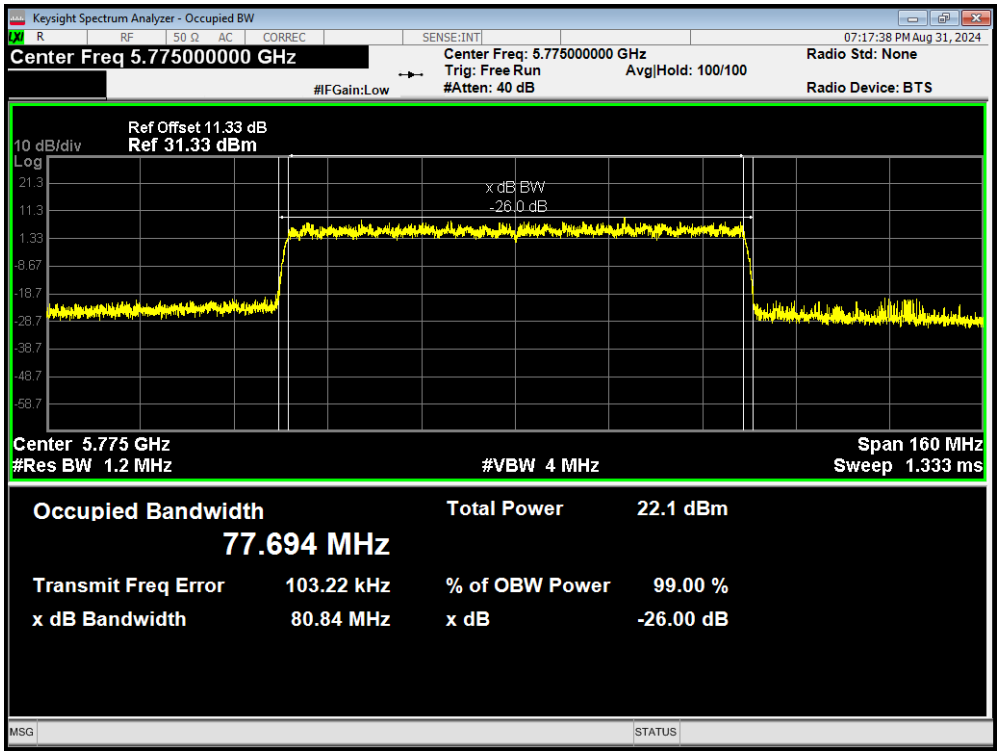
OBW 802.11ax(HE40) 5755MHz



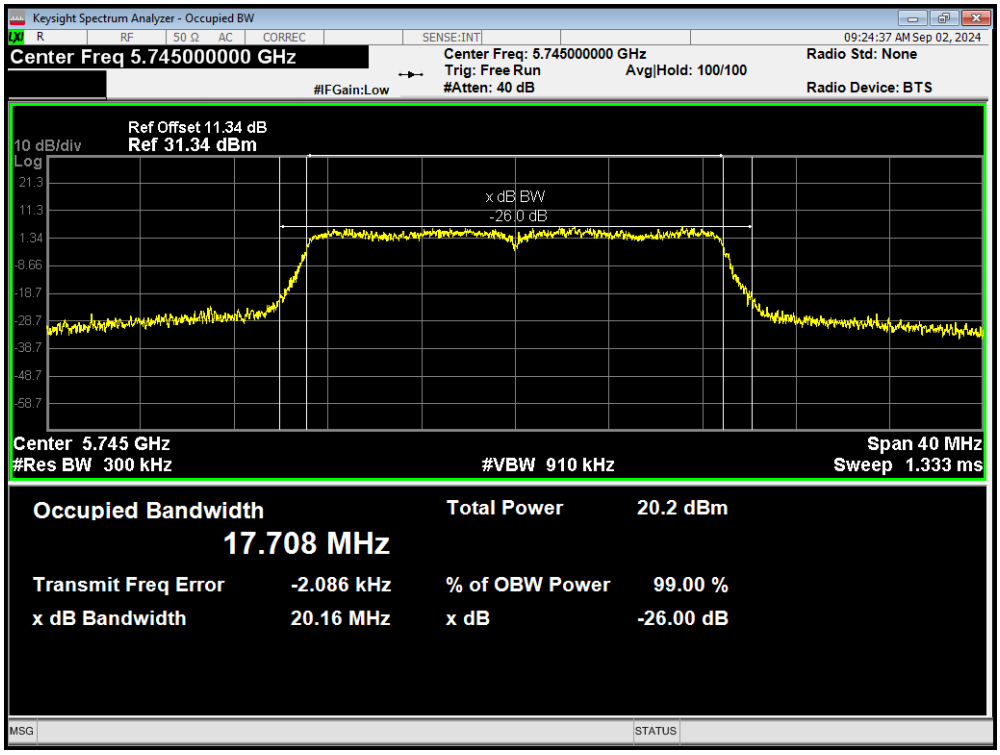
OBW 802.11ax(HE40) 5795MHz



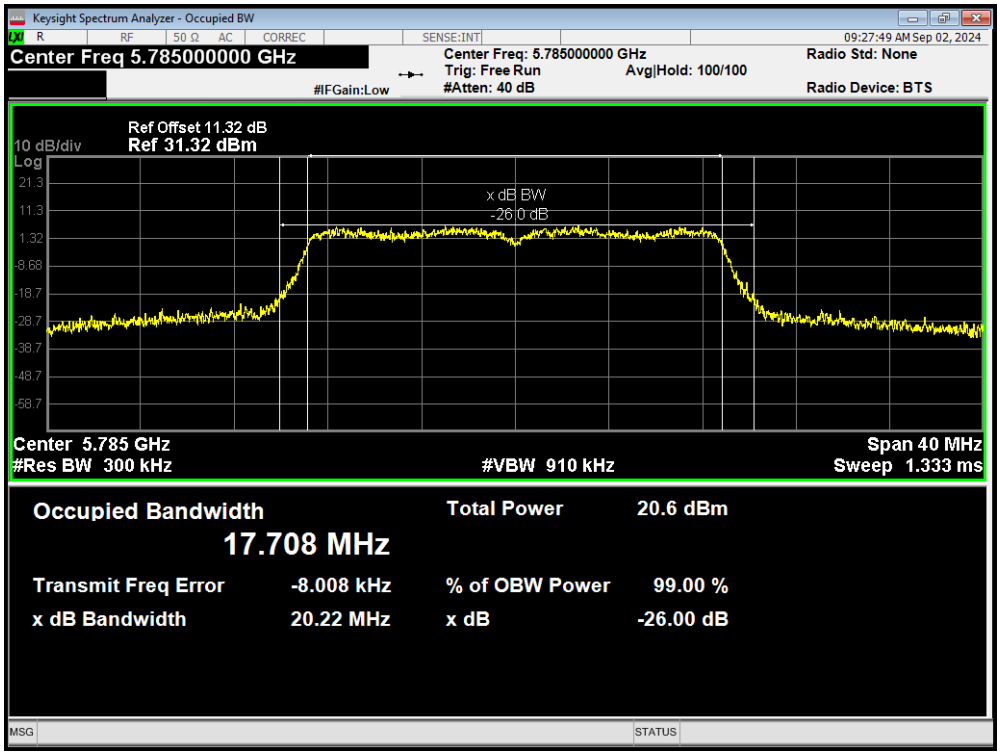
OBW 802.11ax(HE80) 5775MHz



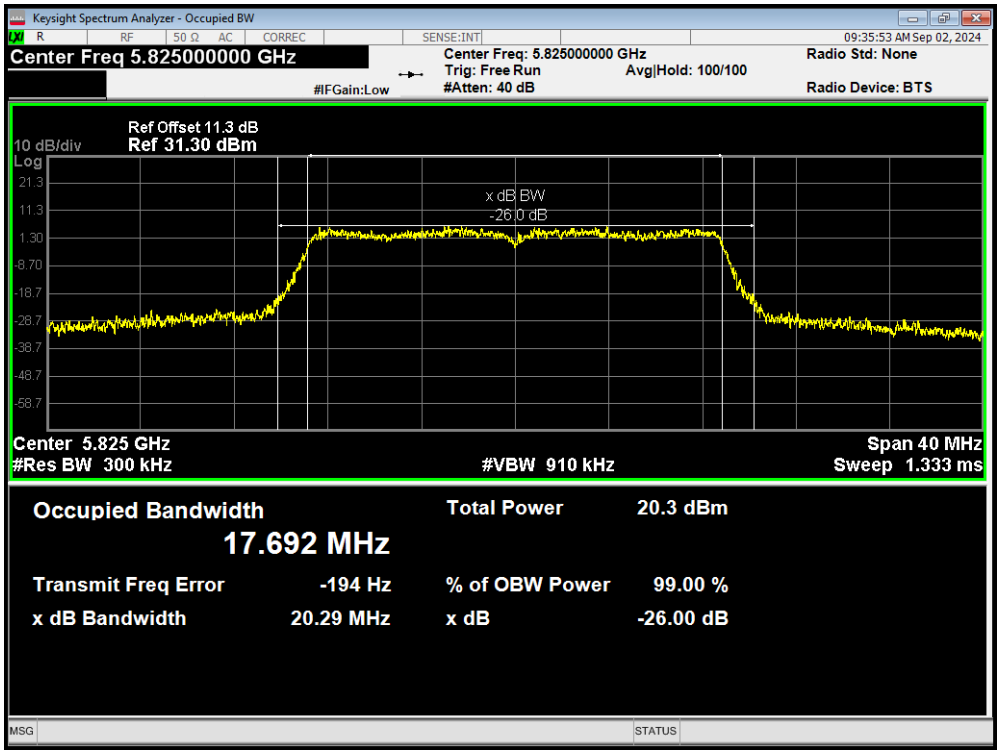
OBW 802.11n(HT20) 5745MHz



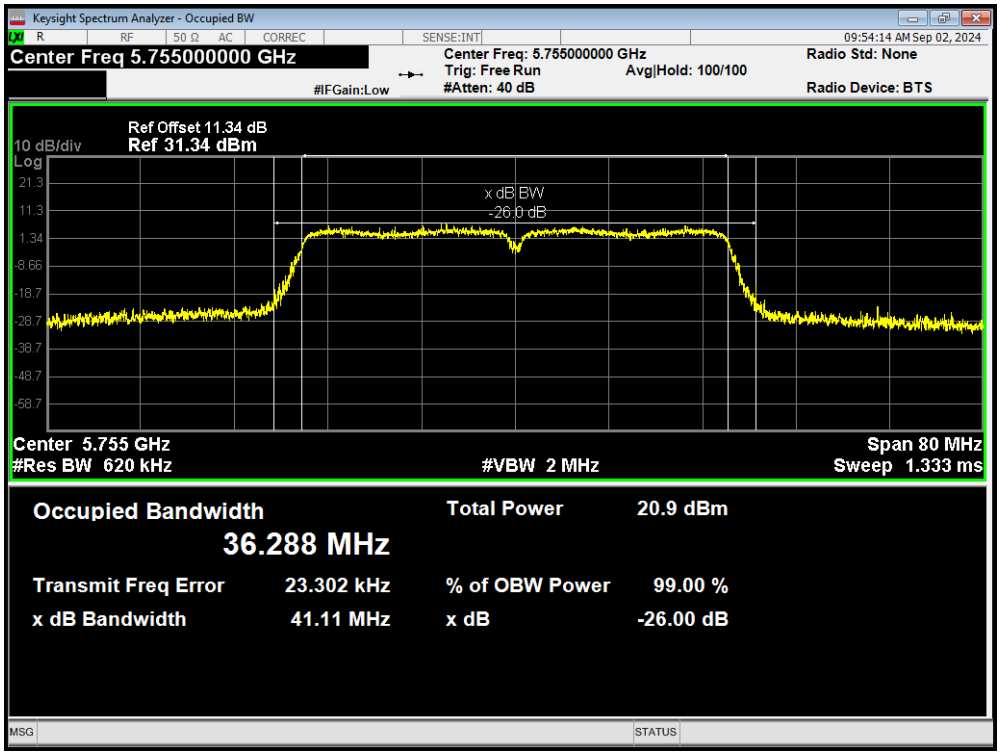
OBW 802.11n(HT20) 5785MHz



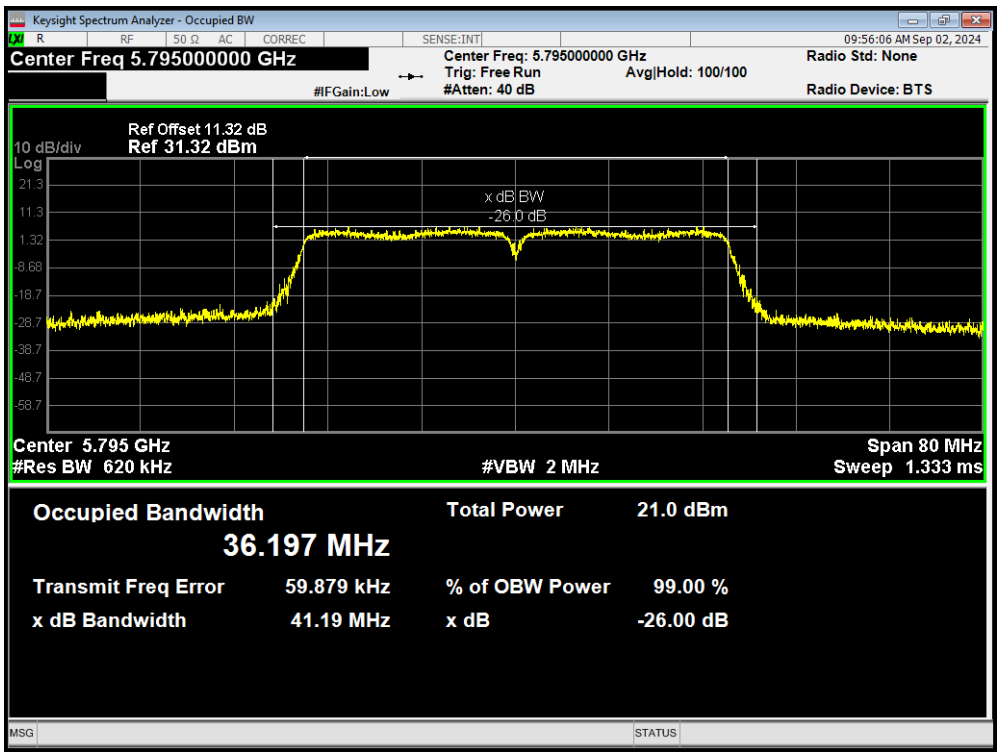
OBW 802.11n(HT20) 5825MHz



OBW 802.11n(HT40) 5755MHz



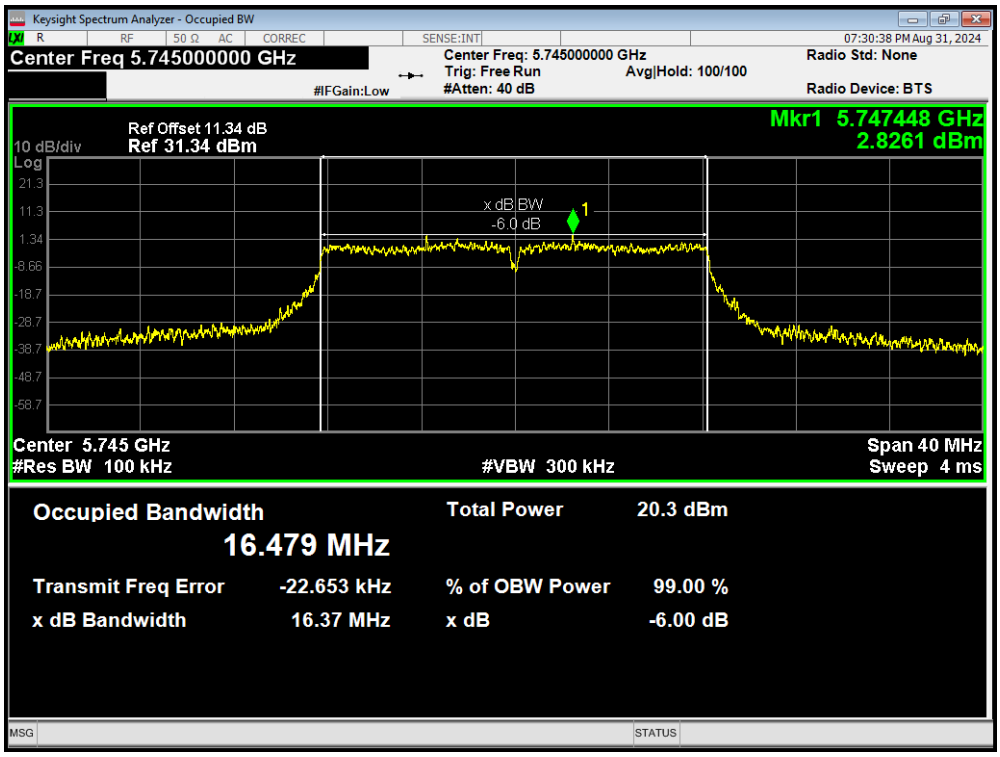
OBW 802.11n(HT40) 5795MHz



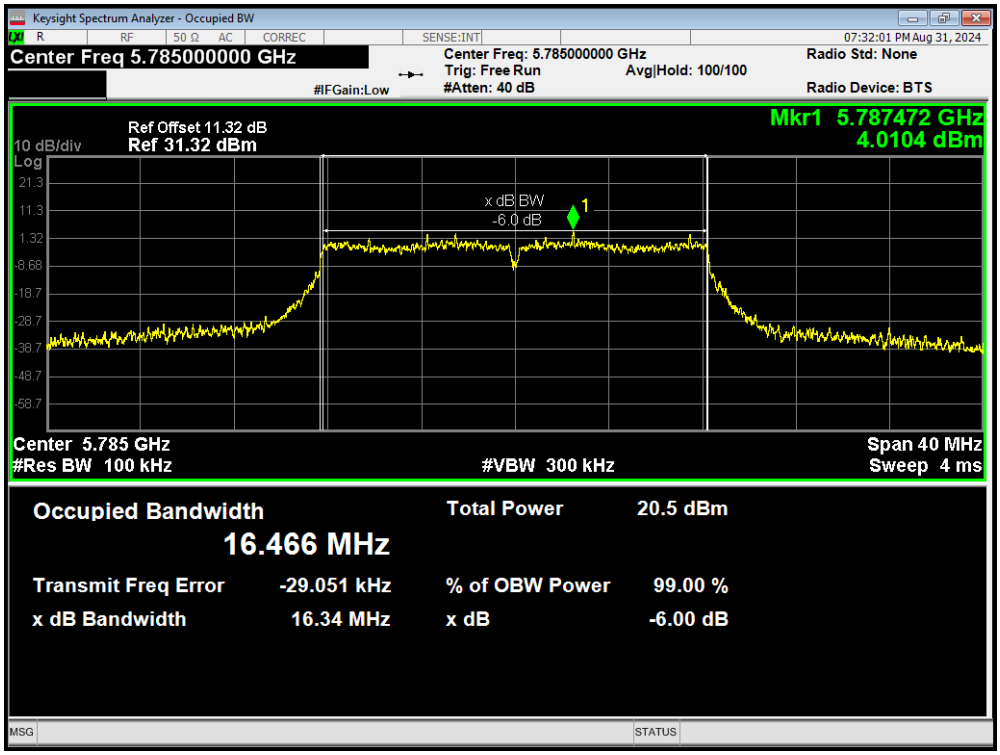
Minimum 6 dB bandwidth

U-NII-3

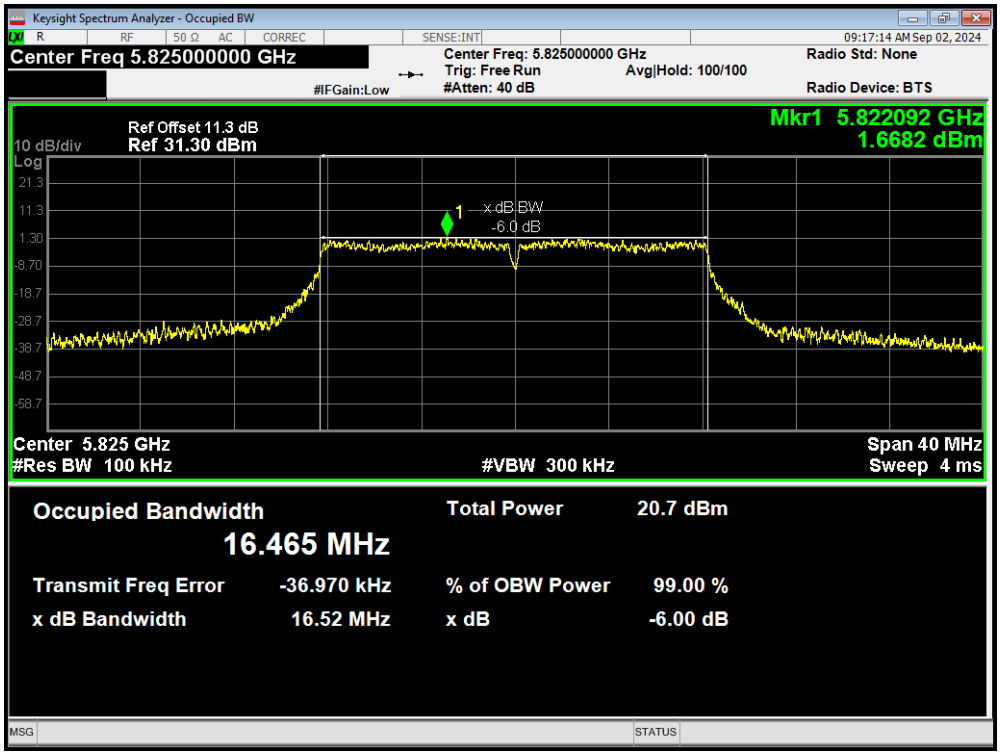
-6dB Bandwidth 802.11a 5745MHz



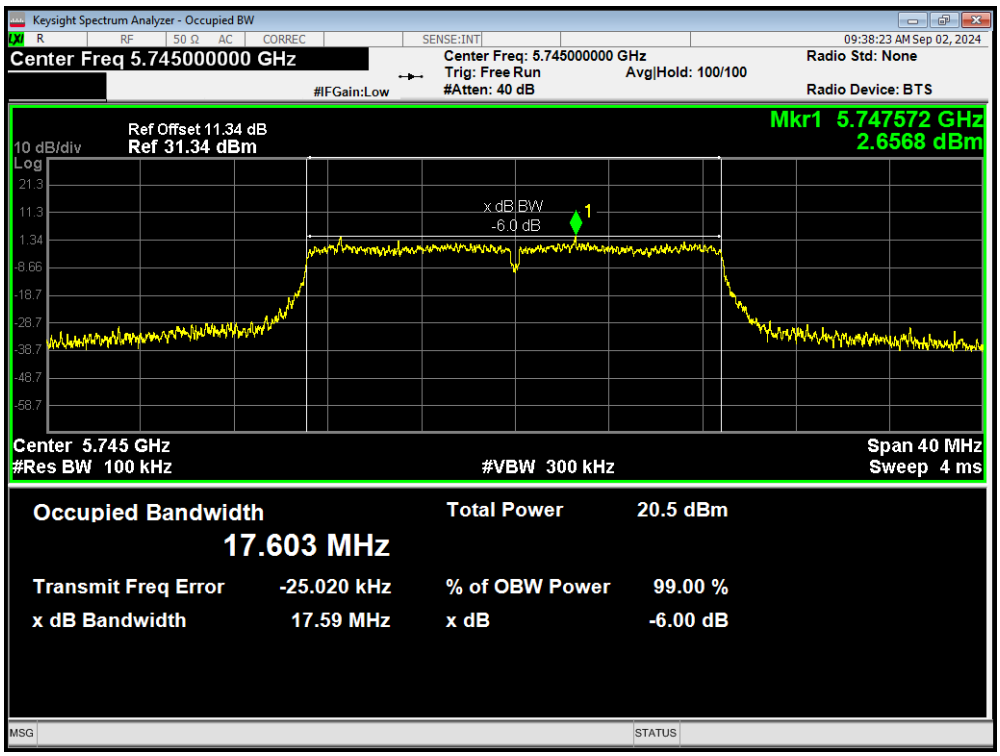
-6dB Bandwidth 802.11a 5785MHz



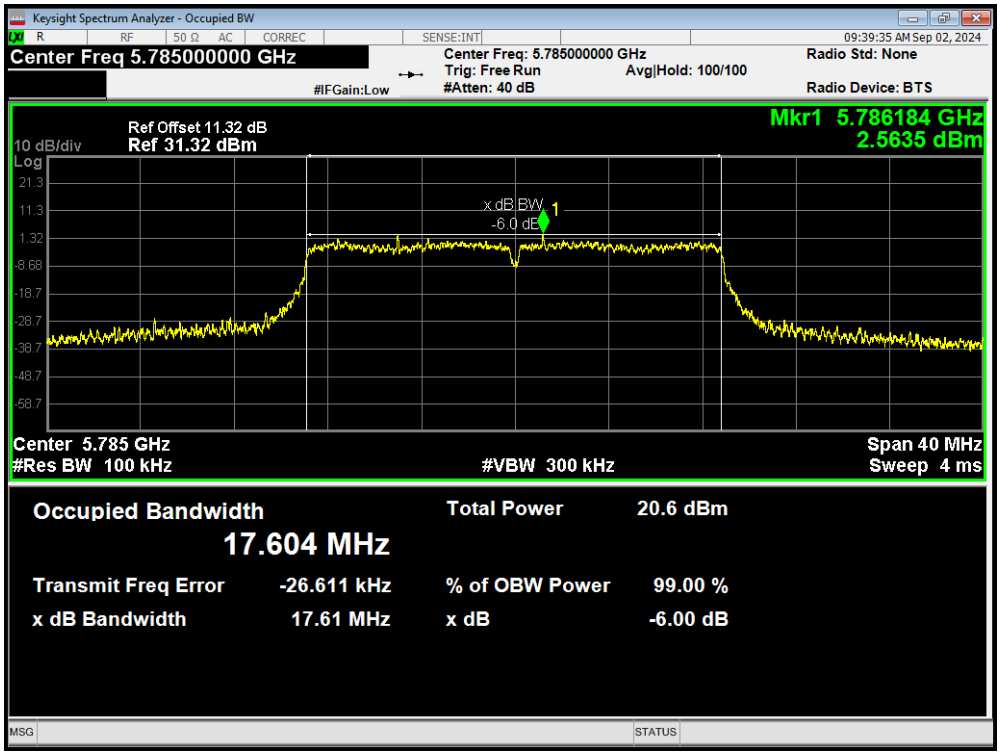
-6dB Bandwidth 802.11a 5825MHz



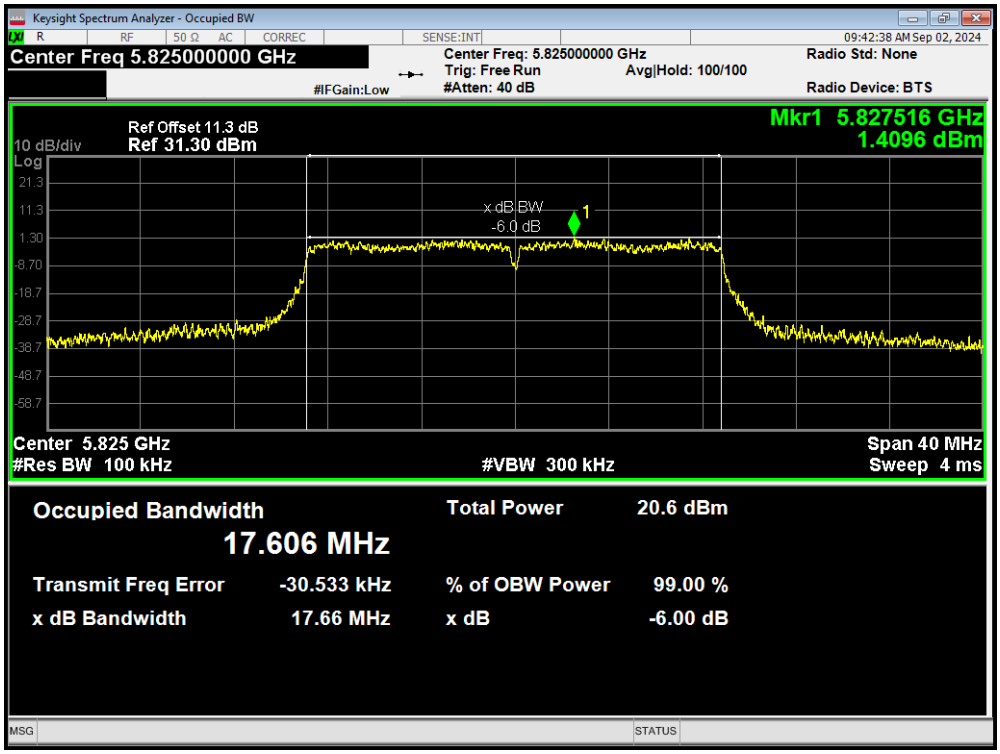
-6dB Bandwidth 802.11ac(VHT20) 5745MHz



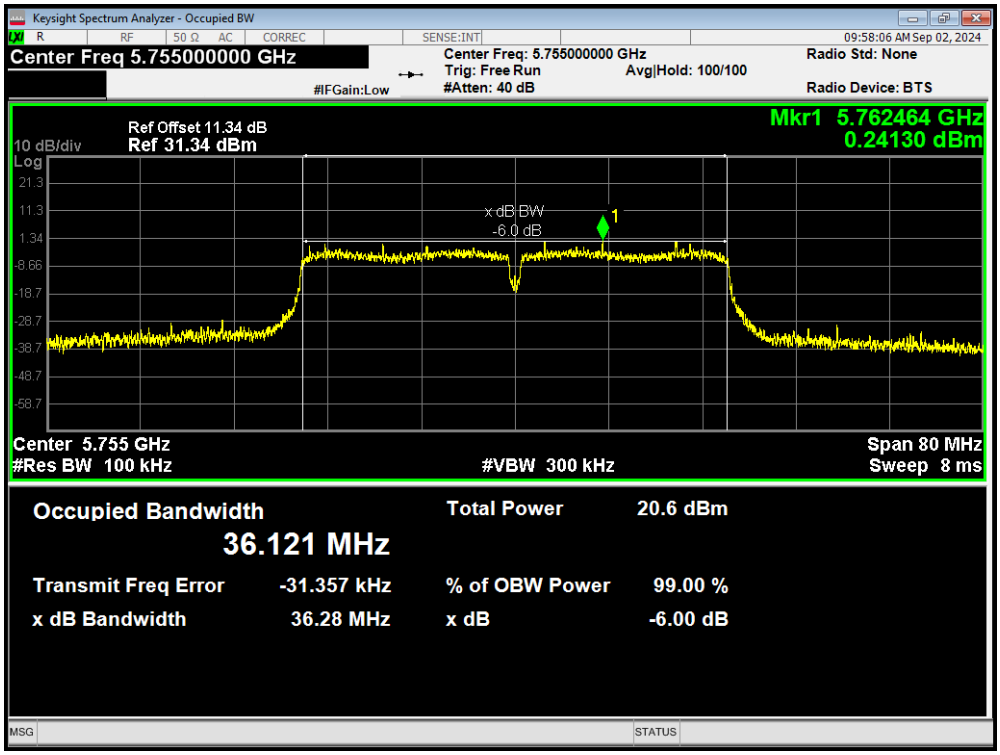
-6dB Bandwidth 802.11ac(VHT20) 5785MHz



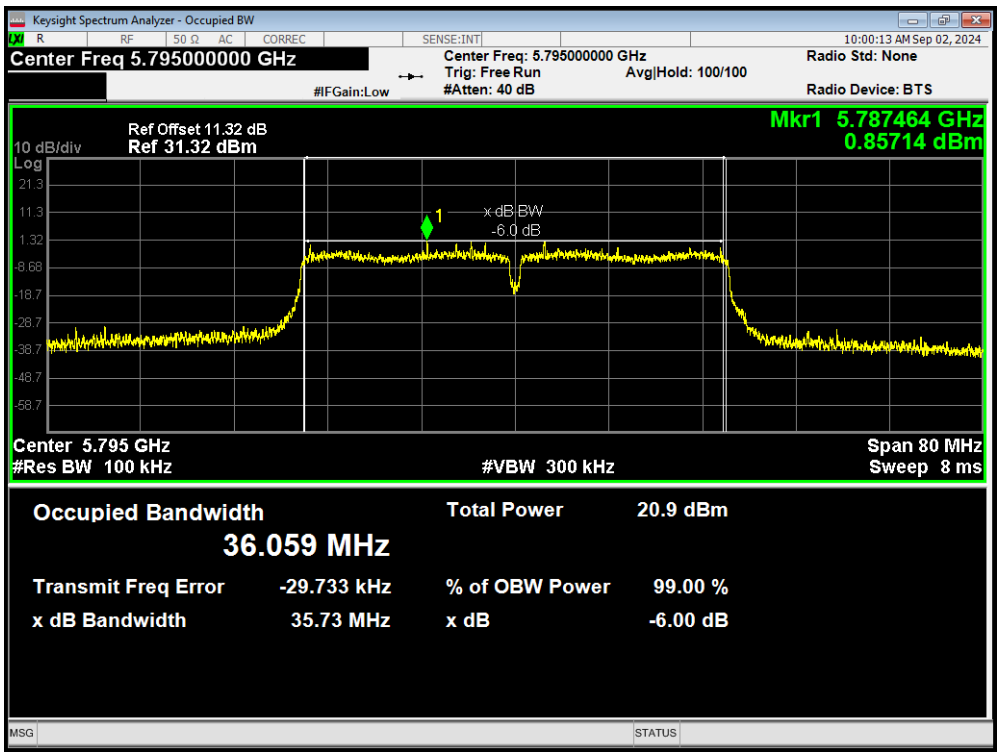
-6dB Bandwidth 802.11ac(VHT20) 5825MHz



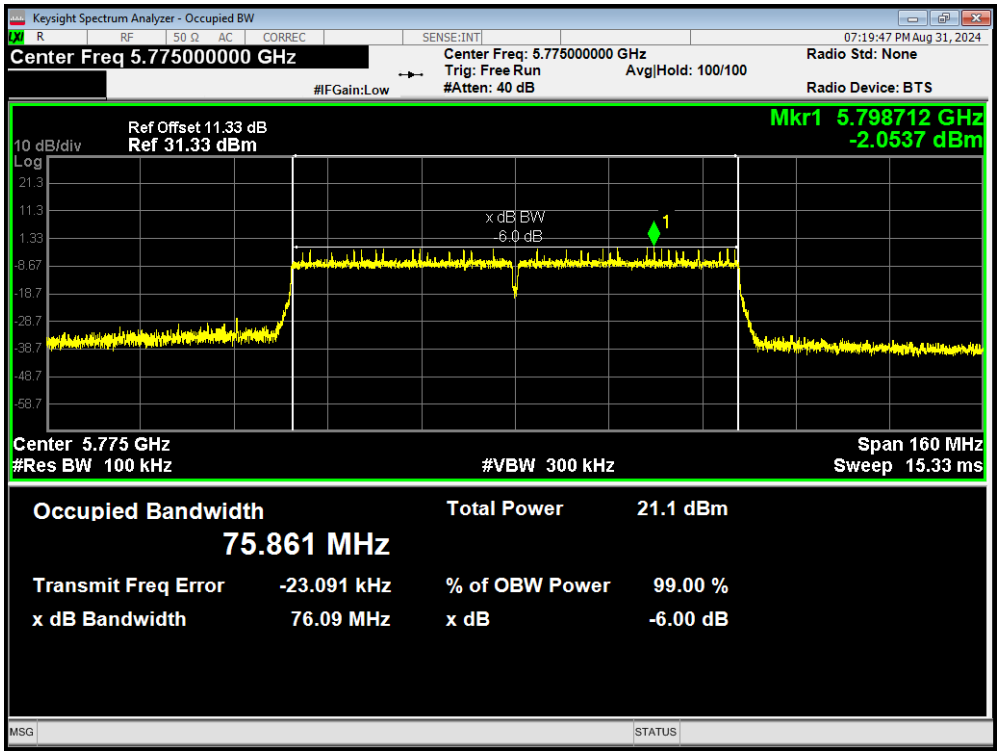
-6dB Bandwidth 802.11ac(VHT40) 5755MHz



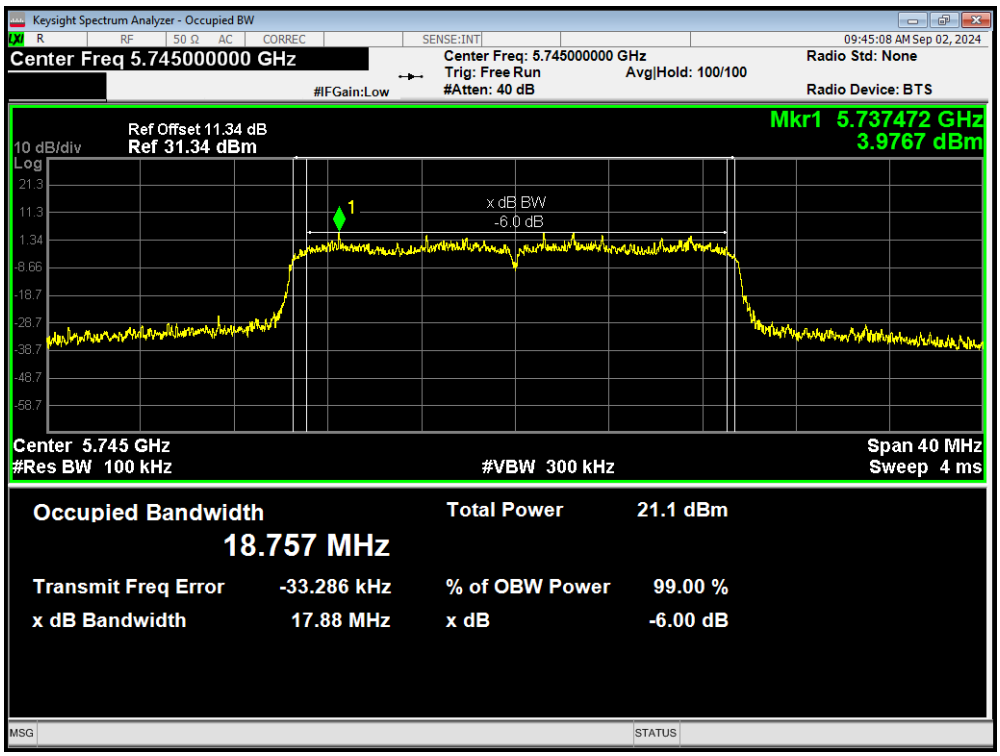
-6dB Bandwidth 802.11ac(VHT40) 5795MHz



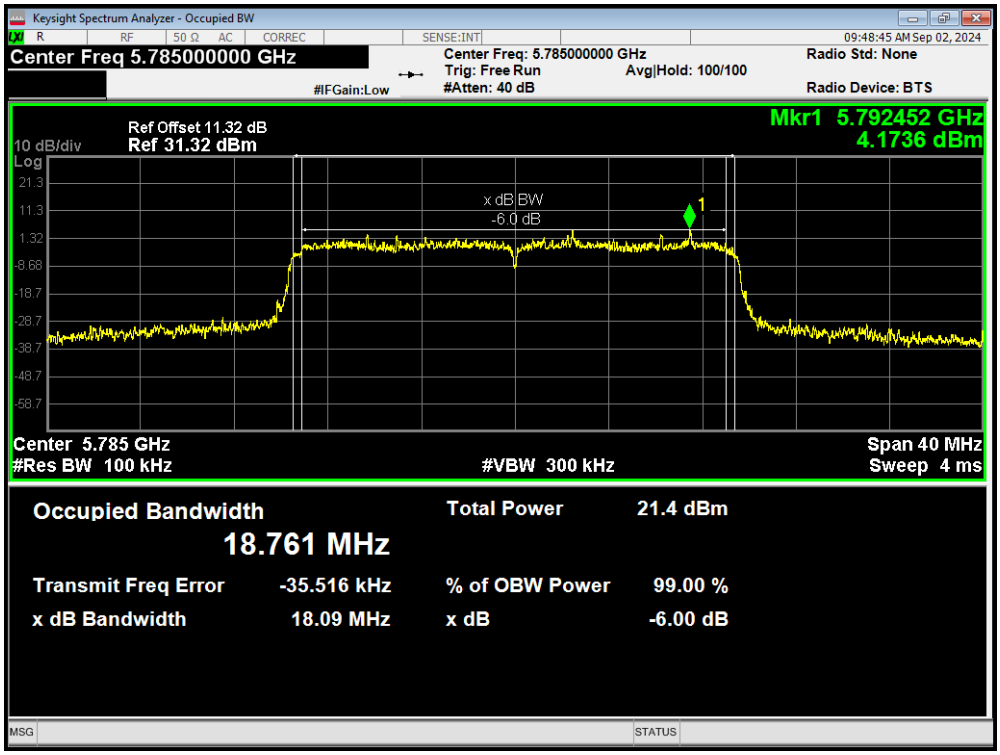
-6dB Bandwidth 802.11ac(VHT80) 5775MHz



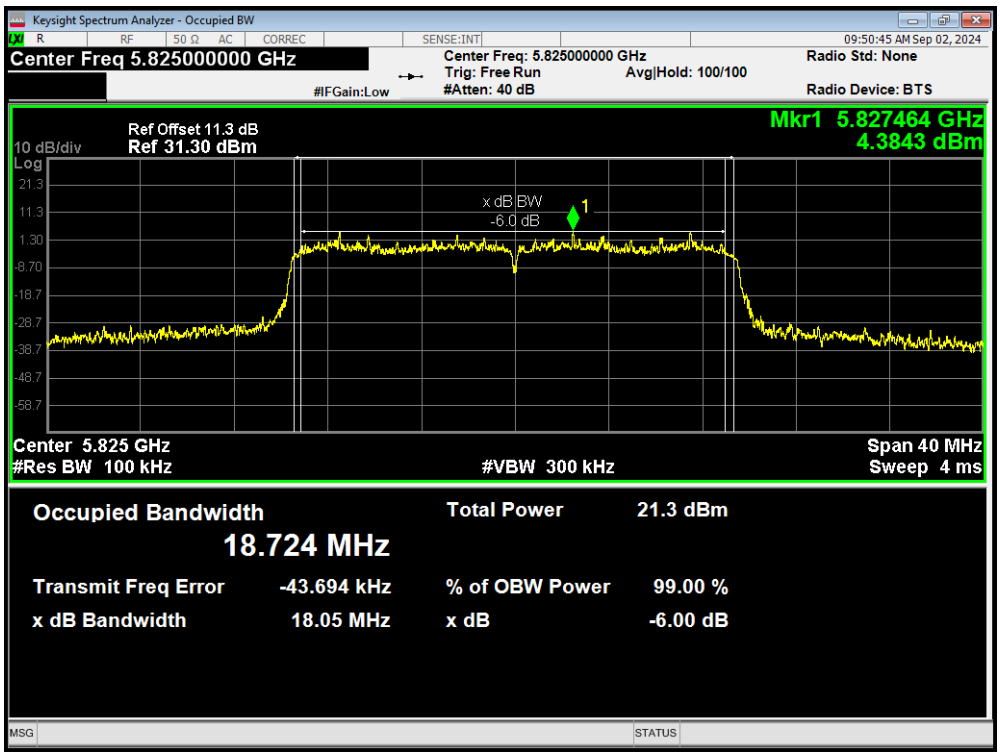
-6dB Bandwidth 802.11ax(HE20) 5745MHz



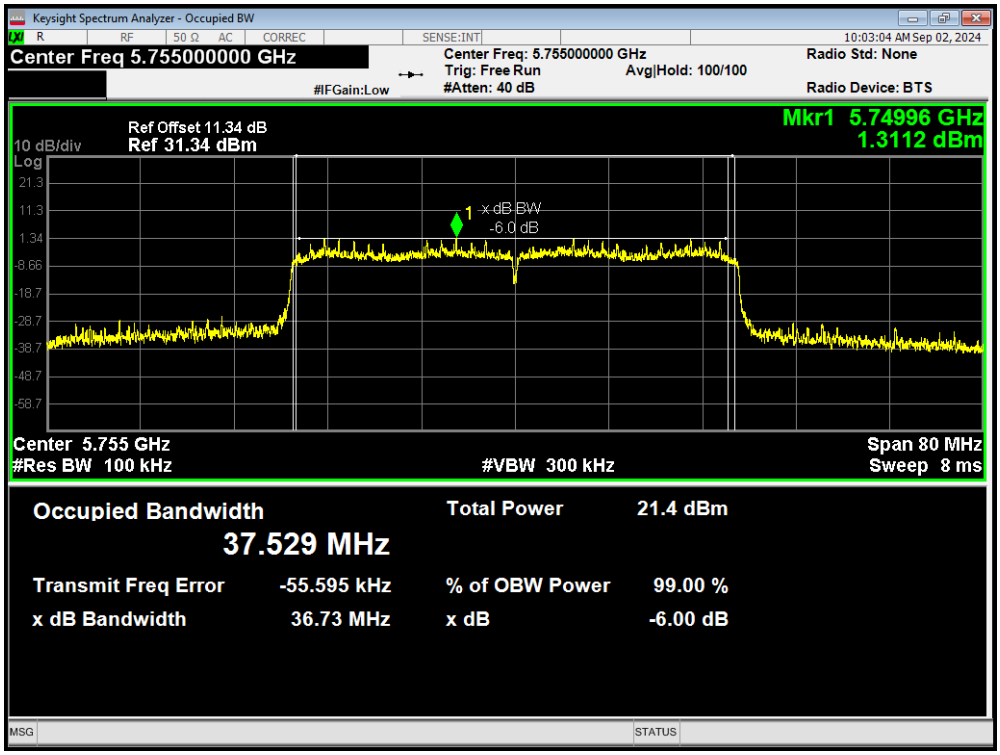
-6dB Bandwidth 802.11ax(HE20) 5785MHz



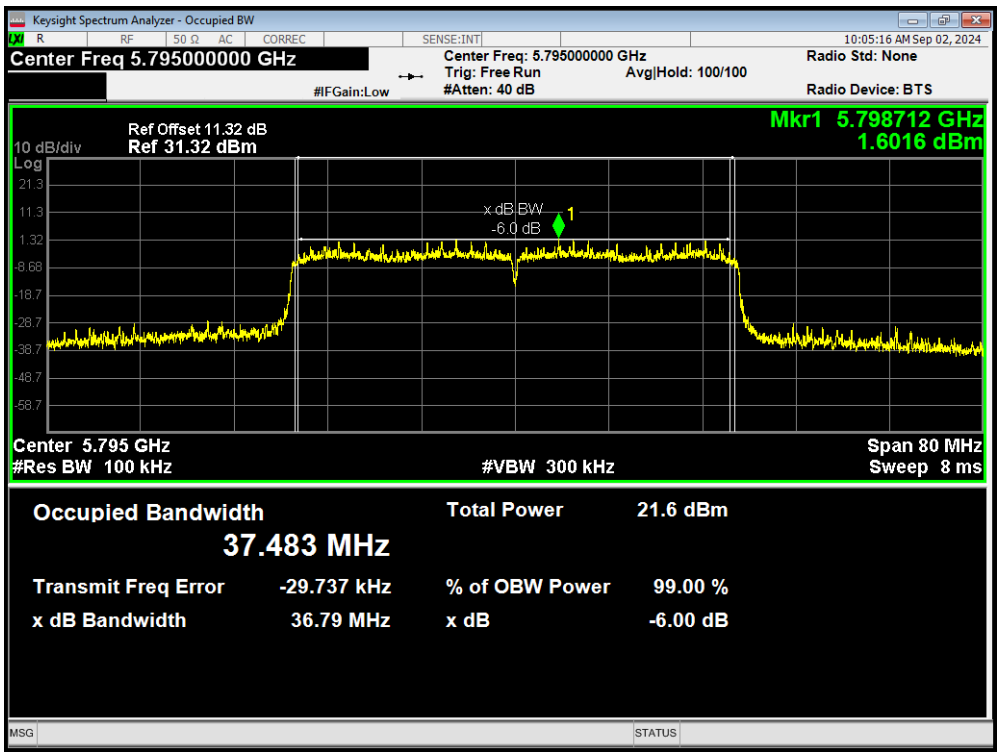
-6dB Bandwidth 802.11ax(HE20) 5825MHz



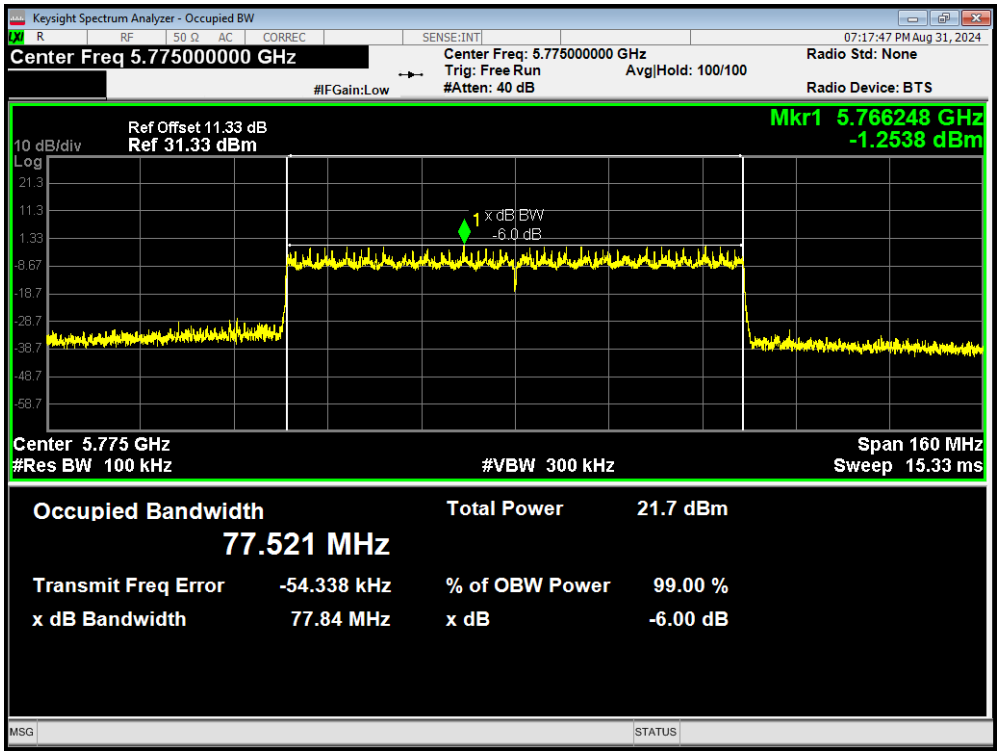
-6dB Bandwidth 802.11ax(HE40) 5755MHz



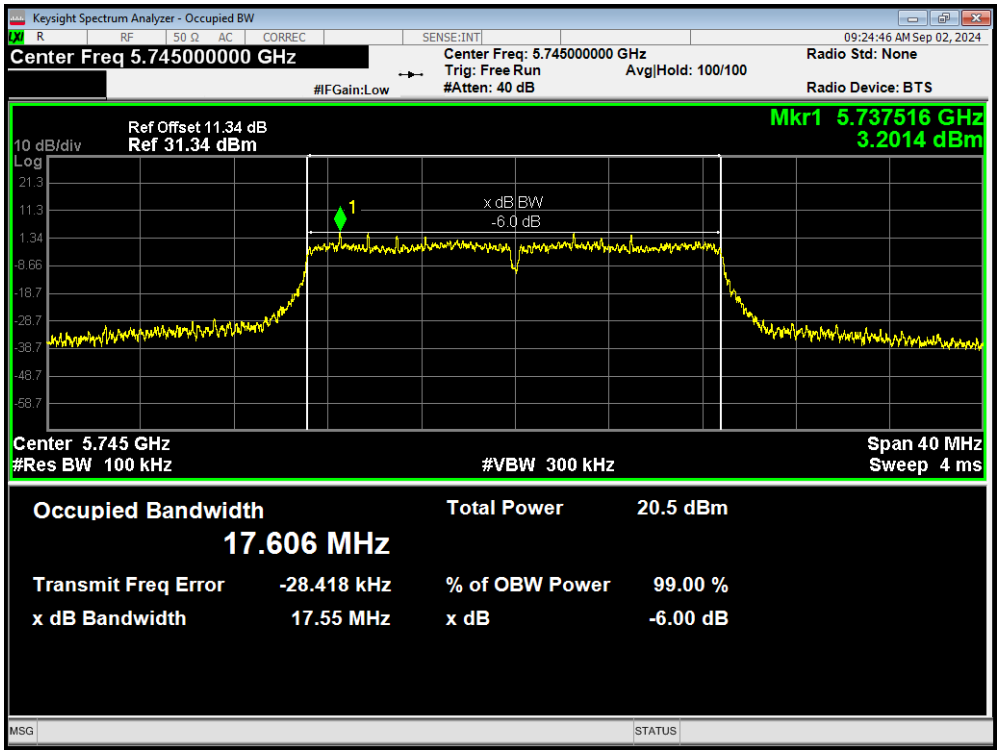
-6dB Bandwidth 802.11ax(HE40) 5795MHz



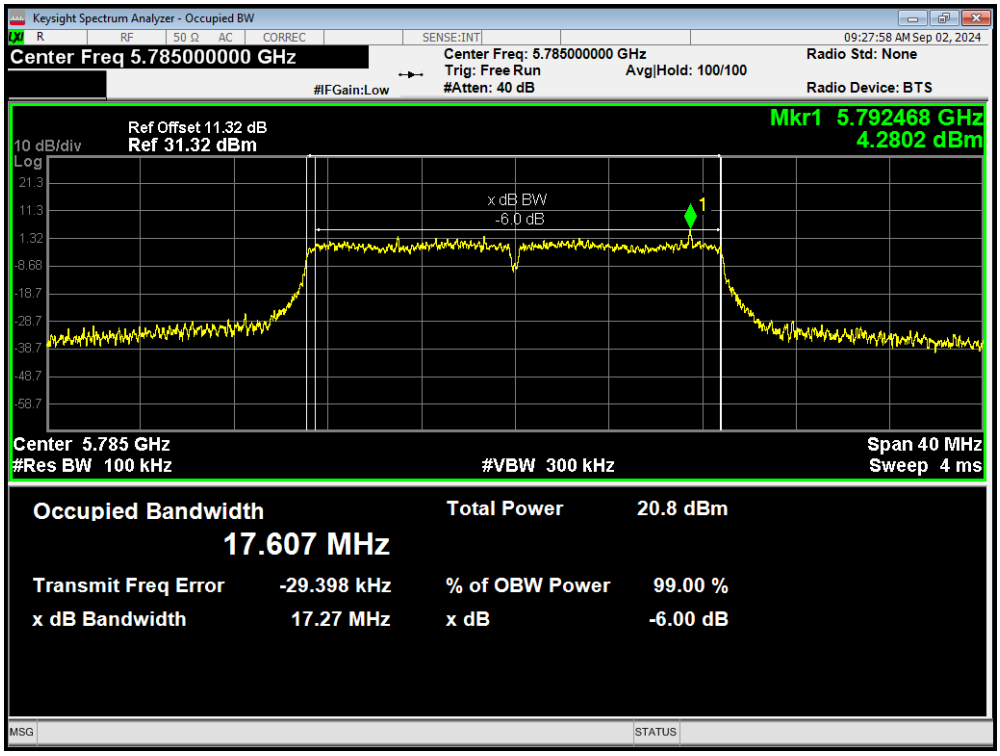
-6dB Bandwidth 802.11ax(HE80) 5775MHz



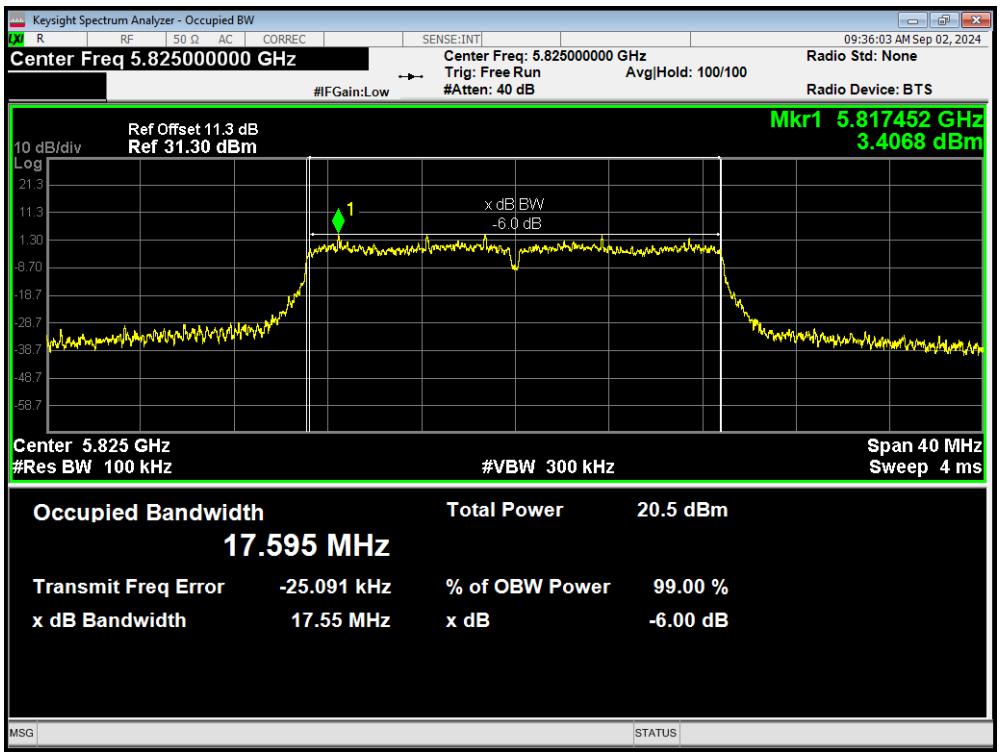
-6dB Bandwidth 802.11n(HT20) 5745MHz



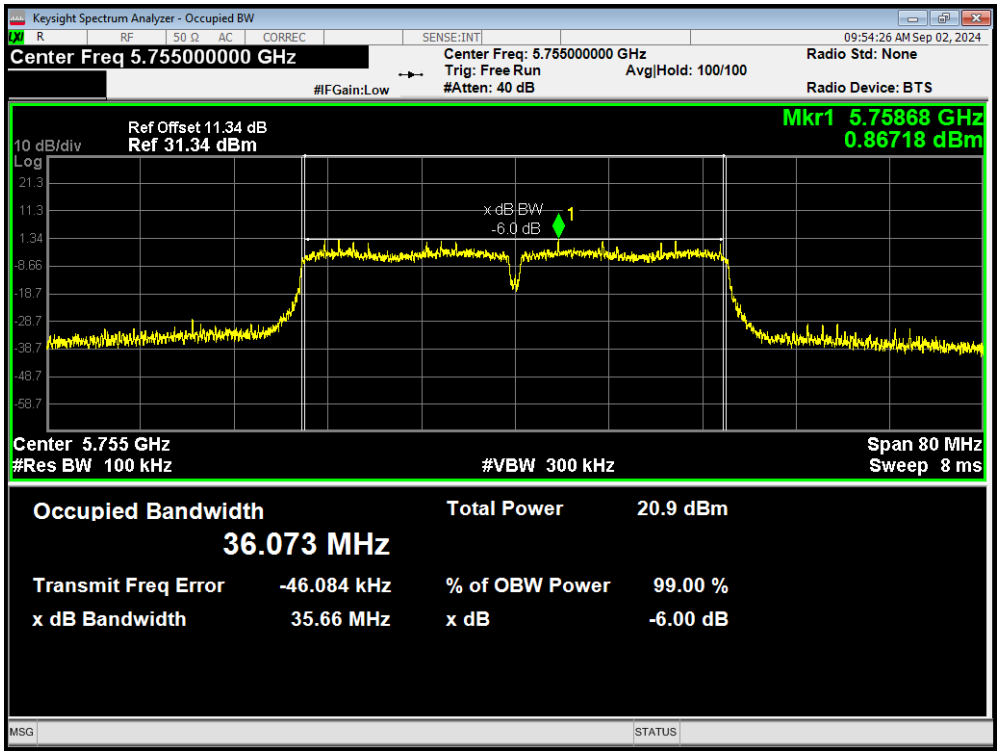
-6dB Bandwidth 802.11n(HT20) 5785MHz



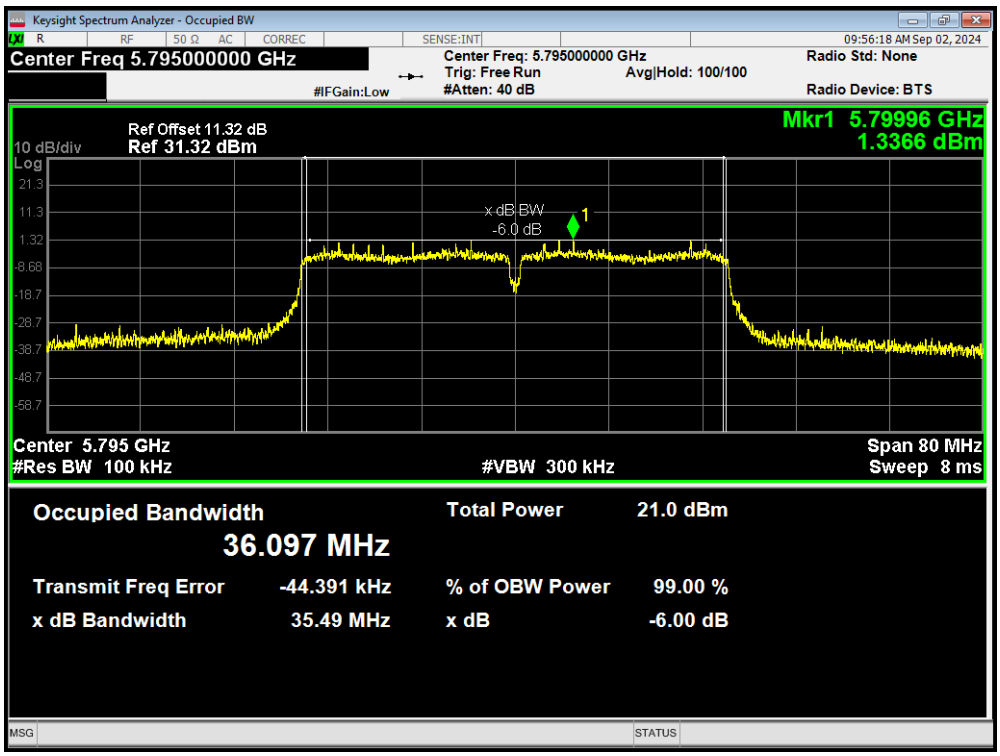
-6dB Bandwidth 802.11n(HT20) 5825MHz



-6dB Bandwidth 802.11n(HT40) 5755MHz



-6dB Bandwidth 802.11n(HT40) 5795MHz



5.2. Average Power Output

Ambient condition

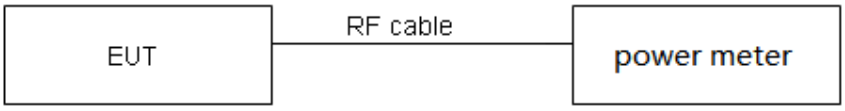
Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

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) (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.
(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 dB.

Test Results

Mode	Duty cycle	Duty cycle correction Factor (dB)
802.11a	0.969	0.140
802.11n HT20	0.979	0.090
802.11n HT40	0.959	0.180
802.11ac VHT20	0.979	0.090
802.11ac VHT40	0.959	0.180
802.11ac VHT80	0.916	0.380
802.11ax HE20	0.913	0.400
802.11ax HE40	0.846	0.730
802.11ax HE80	0.748	1.260
Note: when Duty cycle≥0.98, Duty cycle correction Factor not required.		

Power Index				
Test Mode	U-NII-1		U-NII-3	
	Channel/ Frequency (MHz)	SISO/MIMO Antenna	Channel/ Frequency (MHz)	SISO/MIMO Antenna
802.11a	36/5180	15	149/5745	15
	40/5200	15	157/5785	15
	48/5240	15	165/5825	15
802.11n HT20	36/5180	15	149/5745	15
	40/5200	15	157/5785	15
	48/5240	15	165/5825	15
802.11n HT40	38/5190	15	151/5755	15
	46/5230	15	159/5795	15
802.11ac VHT20	36/5180	15	149/5745	15
	40/5200	15	157/5785	15
	48/5240	15	165/5825	15
802.11ac VHT40	38/5190	15	151/5755	15
	46/5230	15	159/5795	15
802.11ac VHT80	42/5210	13	155/5775	15
802.11ax HE20	36/5180	15	149/5745	15
	40/5200	15	157/5785	15
	48/5240	15	165/5825	15
802.11ax HE40	38/5190	15	151/5755	15
	46/5230	15	159/5795	15
802.11ax HE80	42/5210	13	155/5775	15

SISO Antenna 1

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	14.57	14.71	22.90	PASS
	40/5200	14.77	14.91	22.90	PASS
	48/5240	15.10	15.24	22.90	PASS
802.11n HT20	36/5180	14.54	14.63	22.90	PASS
	40/5200	14.82	14.91	22.90	PASS
	48/5240	15.14	15.23	22.90	PASS
802.11n HT40	38/5190	14.71	14.89	22.90	PASS
	46/5230	15.02	15.20	22.90	PASS
802.11ac VHT20	36/5180	14.48	14.57	22.90	PASS
	40/5200	14.78	14.87	22.90	PASS
	48/5240	15.11	15.20	22.90	PASS
802.11ac VHT40	38/5190	14.80	14.98	22.90	PASS
	46/5230	15.11	15.29	22.90	PASS
802.11ac VHT80	42/5210	13.13	13.51	22.90	PASS
802.11ax HE20	36/5180	14.50	14.90	22.90	PASS
	40/5200	14.77	15.17	22.90	PASS
	48/5240	15.13	15.53	22.90	PASS
802.11ax HE40	38/5190	14.41	15.14	22.90	PASS
	46/5230	15.07	15.80	22.90	PASS
802.11ax HE80	42/5210	12.62	13.88	22.90	PASS
Note: 1. Average Power with duty factor = Average Power Measured +Duty cycle correction factor 2. Antenna Gain=7.10 dBi, So the power limit is 24-(directional gain-6 dBi) =24-(7.10-6) =22.90dBm					

U-NII-3

Test Mode	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	149/5745	15.88	16.02	28.90	PASS
	157/5785	15.36	15.50	28.90	PASS
	165/5825	15.75	15.89	28.90	PASS
802.11n HT20	149/5745	15.64	15.73	28.90	PASS
	157/5785	15.24	15.33	28.90	PASS
	165/5825	15.75	15.84	28.90	PASS
802.11n HT40	151/5755	15.27	15.45	28.90	PASS
	159/5795	15.10	15.28	28.90	PASS
802.11ac VHT20	149/5745	15.70	15.79	28.90	PASS
	157/5785	15.31	15.40	28.90	PASS
	165/5825	15.81	15.90	28.90	PASS
802.11ac VHT40	151/5755	15.37	15.55	28.90	PASS
	159/5795	15.17	15.35	28.90	PASS
802.11ac VHT80	155/5775	15.21	15.59	28.90	PASS
802.11ax HE20	149/5745	15.56	15.96	28.90	PASS
	157/5785	15.31	15.71	28.90	PASS
	165/5825	15.70	16.10	28.90	PASS
802.11ax HE40	151/5755	15.87	16.60	28.90	PASS
	159/5795	15.39	16.12	28.90	PASS
802.11ax HE80	155/5775	14.79	16.05	28.90	PASS

Note: 1. Average Power with duty factor = Average Power Measured +Duty cycle correction factor
2. Antenna Gain=7.10 dBi, So the power limit is 30-(directional gain-6 dBi) =30-(7.10-6) =28.90dBm

SISO Antenna 2

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	15.03	15.17	24	PASS
	40/5200	15.23	15.37	24	PASS
	48/5240	15.37	15.51	24	PASS
802.11n HT20	36/5180	15.14	15.23	24	PASS
	40/5200	15.49	15.58	24	PASS
	48/5240	15.61	15.70	24	PASS
802.11n HT40	38/5190	15.17	15.35	24	PASS
	46/5230	15.54	15.72	24	PASS
802.11ac VHT20	36/5180	15.17	15.26	24	PASS
	40/5200	15.37	15.46	24	PASS
	48/5240	15.62	15.71	24	PASS
802.11ac VHT40	38/5190	15.06	15.24	24	PASS
	46/5230	15.48	15.66	24	PASS
802.11ac VHT80	42/5210	13.01	13.39	24	PASS
802.11ax HE20	36/5180	15.10	15.50	24	PASS
	40/5200	15.41	15.81	24	PASS
	48/5240	15.60	16.00	24	PASS
802.11ax HE40	38/5190	14.95	15.68	24	PASS
	46/5230	15.49	16.22	24	PASS
802.11ax HE80	42/5210	12.52	13.78	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	149/5745	15.83	15.97	30	PASS
	157/5785	15.94	16.08	30	PASS
	165/5825	16.01	16.15	30	PASS
802.11n HT20	149/5745	15.87	15.96	30	PASS
	157/5785	16.00	16.09	30	PASS
	165/5825	16.00	16.09	30	PASS
802.11n HT40	151/5755	15.76	15.94	30	PASS
	159/5795	16.08	16.26	30	PASS
802.11ac VHT20	149/5745	15.84	15.93	30	PASS
	157/5785	15.96	16.05	30	PASS
	165/5825	16.02	16.11	30	PASS
802.11ac VHT40	151/5755	15.76	15.94	30	PASS
	159/5795	16.01	16.19	30	PASS
802.11ac VHT80	155/5775	15.76	16.14	30	PASS
802.11ax HE20	149/5745	15.87	16.27	30	PASS
	157/5785	16.08	16.48	30	PASS
	165/5825	16.02	16.42	30	PASS
802.11ax HE40	151/5755	15.70	16.43	30	PASS
	159/5795	15.97	16.70	30	PASS
802.11ax HE80	155/5775	15.32	16.58	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

MIMO

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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	14.24	14.33	14.71	14.80	17.58	22.90	PASS
	44/5220	14.02	14.11	14.43	14.52	17.33	22.90	PASS
	48/5240	14.11	14.20	14.56	14.65	17.44	22.90	PASS
802.11n HT40	38/5190	13.97	14.15	14.26	14.44	17.31	22.90	PASS
	46/5230	14.31	14.49	14.55	14.73	17.62	22.90	PASS
802.11ac VHT20	36/5180	13.37	13.46	13.86	13.95	16.72	22.90	PASS
	44/5220	13.55	13.64	13.91	14.00	16.84	22.90	PASS
	48/5240	13.63	13.72	14.03	14.12	16.94	22.90	PASS
802.11ac VHT40	38/5190	13.87	14.05	14.20	14.38	17.23	22.90	PASS
	46/5230	14.20	14.38	14.43	14.61	17.51	22.90	PASS
802.11ac VHT80	42/5210	12.47	12.85	12.18	12.56	15.72	22.90	PASS
802.11ax HE20	36/5180	13.66	14.06	14.12	14.52	17.31	22.90	PASS
	44/5220	13.95	14.35	14.23	14.63	17.50	22.90	PASS
	48/5240	13.79	14.19	14.22	14.62	17.42	22.90	PASS
802.11ax HE40	38/5190	13.81	14.54	14.09	14.82	17.69	22.90	PASS
	46/5230	14.19	14.92	14.42	15.15	18.05	22.90	PASS
802.11ax HE80	42/5210	12.29	13.55	11.98	13.24	16.41	22.90	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)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + 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 = $G_{ANT\ MAX}$ + Array Gain =7.10+0=7.10 dBi>6dBi.

So the power limit is 24-(directional gain-6 dBi) =24-(7.10-6) =22.90dBm

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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	149/5745	14.64	14.73	14.51	14.60	17.68	28.90	PASS
	157/5785	14.11	14.20	14.39	14.48	17.35	28.90	PASS
	165/5825	15.34	15.43	14.93	15.02	18.24	28.90	PASS
802.11n HT40	151/5755	14.41	14.59	14.44	14.62	17.61	28.90	PASS
	159/5795	14.13	14.31	14.41	14.59	17.46	28.90	PASS
802.11ac VHT20	149/5745	14.51	14.60	14.44	14.53	17.57	28.90	PASS
	157/5785	14.11	14.20	14.39	14.48	17.35	28.90	PASS
	165/5825	14.48	14.57	14.17	14.26	17.43	28.90	PASS
802.11ac VHT40	151/5755	13.95	14.13	14.00	14.18	17.16	28.90	PASS
	159/5795	13.79	13.97	14.14	14.32	17.15	28.90	PASS
802.11ac VHT80	155/5775	13.95	14.33	14.10	14.48	17.41	28.90	PASS
802.11ax HE20	149/5745	14.28	14.68	14.27	14.67	17.69	28.90	PASS
	157/5785	14.02	14.42	14.37	14.77	17.61	28.90	PASS
	165/5825	14.48	14.88	14.10	14.50	17.71	28.90	PASS
802.11ax HE40	151/5755	14.04	14.77	14.05	14.78	17.78	28.90	PASS
	159/5795	13.89	14.62	14.24	14.97	17.80	28.90	PASS
802.11ax HE80	155/5775	13.68	14.94	13.82	15.08	18.02	28.90	PASS

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

The Total Power $=10\log(10^{(\text{Power antenna 1 in dBm}/10)}+10^{(\text{Power antenna 2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + 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 = $G_{ANT\ MAX}$ + Array Gain =7.10+0=7.10 dBi>6dBi.

So the power limit is 30-(directional gain-6 dBi) =30-(7.10-6) =28.90dBm

5.3. Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Method of Measurement

1. Frequency stability with respect to ambient temperature

a) Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT. If possible, a dummy load shall be connected to the EUT because an antenna near the metallic walls of an environmental test chamber could affect the output frequency of the EUT. If the EUT is equipped with a permanently attached, adjustable-length antenna, then the EUT shall be placed in the center of the chamber with the antenna adjusted to the shortest length possible. Turn ON the EUT and tune it to one of the number of frequencies shown in 5.6.

b) Couple the unlicensed wireless device output to the measuring instrument by connecting an antenna to the measuring instrument with a suitable length of coaxial cable and placing the measuring antenna near the EUT (e.g., 15 cm away), or by connecting a dummy load to the measuring instrument, through an attenuator if necessary.

c) Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).

d) Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have oscillator heaters, energize only the heater circuit.

e) Set the temperature control on the chamber to the highest specified in the regulatory requirements for the type of device and allow the oscillator heater and the chamber temperature to stabilize.

f) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

g) Measure the frequency at each of frequencies specified in 5.6.

h) Switch OFF the EUT but do not switch OFF the oscillator heater.

i) Lower the chamber temperature by not more that 10°C, and allow the temperature inside the chamber to stabilize.

j) Repeat step f) through step i) down to the lowest specified temperature.

2. Frequency stability when varying supply voltage

Unless otherwise specified, these tests shall be made at ambient room temperature (+15°C to +25 °C). An antenna shall be connected to the antenna output terminals of the EUT if possible. If the EUT is equipped with or uses an adjustable-length antenna, then it shall be fully extended.

a) Supply the EUT with nominal voltage or install a new or fully charged battery in the EUT. Turn ON the EUT and couple its output to a frequency counter or other frequency-measuring instrument.

b) Tune the EUT to one of the number of frequencies required in 5.6. Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).
c) Measure the frequency at each of the frequencies specified in 5.6.
d) Repeat the above procedure at 85% and 115% of the nominal supply voltage.

Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

Measurement Uncertainty

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

Test Results

Voltage (V)	Temperature (°C)	U-NII-1 Test Results			
		5200MHz			
		1min	2min	5min	10min
120	-30	5199.996829	5199.989709	5199.986890	5199.982579
120	-20	5200.006157	5199.980500	5199.977996	5199.980837
120	-10	5200.007365	5199.974540	5199.973363	5199.973676
120	0	5200.000191	5199.975073	5199.972900	5199.979790
120	10	5199.999219	5199.970735	5199.968474	5199.976428
120	20	5199.998140	5199.967163	5199.959327	5199.969890
120	30	5199.992724	5199.963147	5199.949805	5199.963553
120	40	5199.987580	5199.961031	5199.944631	5199.957706
120	50	5199.979846	5199.957412	5199.936076	5199.951071
102	20	5199.970804	5199.948925	5199.932379	5199.949429
138	20	5199.962882	5199.941835	5199.932147	5199.943332
Max. ΔMHz		-0.037118	-0.058165	-0.067853	-0.056668
PPM		-7.138025	-11.185627	-13.048610	-10.897651

Voltage (V)	Temperature (°C)	U-NII-3 Test Results			
		5785MHz			
		1min	2min	5min	10min
120	-30	5784.994804	5784.985197	5784.984257	5784.982648
120	-20	5784.991459	5784.983259	5784.978066	5784.980654
120	-10	5784.991146	5784.979199	5784.972238	5784.980005
120	0	5784.990701	5784.977592	5784.972526	5784.976710
120	10	5784.990484	5784.977355	5784.971370	5784.967276
120	20	5784.990302	5784.975003	5784.963124	5784.962645
120	30	5784.985623	5784.974300	5784.958284	5784.954660
120	40	5784.982963	5784.971410	5784.952132	5784.948706
120	50	5784.976568	5784.968131	5784.945946	5784.938970
102	20	5784.972226	5784.966828	5784.943279	5784.929191
138	20	5784.965821	5784.963486	5784.943247	5784.921071
Max. ΔMHz		-0.034179	-0.036514	-0.056753	-0.078929
PPM		-5.908211	-6.311841	-9.810372	-13.643734

5.4. Power Spectral Density

Ambient condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

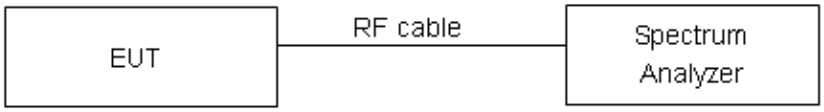
Method of Measurement

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

Set RBW = 1MHz, VBW =3MHz for the band 5.150-5.250GHz.
Set RBW = 470kHz, VBW =1.5MHz for the band 5.725-5.850GHz

The conducted PSD 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)(3)
For an indoor access point operating in the band 5.15-5.25 GHz, 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.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500kHz band. If transmittingantennas 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.

Frequency Bands/GHz	Limits
5.15-5.25	11dBm/MHz
5.725-5.85	30dBm/500kHz

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.75dB.

Test Results:

SISO Antenna 1

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Mode	Channel/ Frequency (MHz)	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	36/5180	4.28	4.42	9.90	PASS
	40/5200	4.69	4.83	9.90	PASS
	48/5240	5.05	5.19	9.90	PASS
802.11n HT20	36/5180	4.39	4.48	9.90	PASS
	40/5200	4.33	4.42	9.90	PASS
	48/5240	4.52	4.61	9.90	PASS
802.11n HT40	38/5190	1.37	1.55	9.90	PASS
	46/5230	1.66	1.84	9.90	PASS
802.11ac VHT20	36/5180	4.04	4.13	9.90	PASS
	40/5200	4.18	4.27	9.90	PASS
	48/5240	4.84	4.93	9.90	PASS
802.11ac VHT40	38/5190	1.37	1.55	9.90	PASS
	46/5230	1.71	1.89	9.90	PASS
802.11ac VHT80	42/5210	-3.68	-3.30	9.90	PASS
802.11ax HE20	36/5180	3.77	4.17	9.90	PASS
	40/5200	4.28	4.68	9.90	PASS
	48/5240	4.60	5.00	9.90	PASS
802.11ax HE40	38/5190	0.92	1.65	9.90	PASS
	46/5230	1.61	2.34	9.90	PASS
802.11ax HE80	42/5210	-3.51	-2.25	9.90	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor
2. Antenna Gain=7.10 dBi, so the PSD Limit is 9.90 dBm

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Mode	Channel /Frequency (MHz)	Read Value (dBm/470kHz)	Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)	Conclusion
802.11a	149/5745	2.48	2.89	28.90	PASS
	157/5785	1.88	2.29	28.90	PASS
	165/5825	2.30	2.71	28.90	PASS
802.11n HT20	149/5745	1.82	2.18	28.90	PASS
	157/5785	1.25	1.61	28.90	PASS
	165/5825	1.90	2.26	28.90	PASS
802.11n HT40	151/5755	-1.71	-1.26	28.90	PASS
	159/5795	-1.92	-1.47	28.90	PASS
802.11ac VHT20	149/5745	1.72	2.08	28.90	PASS
	157/5785	1.37	1.73	28.90	PASS
	165/5825	1.88	2.24	28.90	PASS
802.11ac VHT40	151/5755	-1.65	-1.20	28.90	PASS
	159/5795	-1.79	-1.34	28.90	PASS
802.11ac VHT80	155/5775	-5.55	-4.90	28.90	PASS
802.11ax HE20	149/5745	1.56	2.23	28.90	PASS
	157/5785	1.26	1.93	28.90	PASS
	165/5825	1.73	2.40	28.90	PASS
802.11ax HE40	151/5755	-1.24	-0.24	28.90	PASS
	159/5795	-1.39	-0.39	28.90	PASS
802.11ax HE80	155/5775	-4.89	-3.36	28.90	PASS
Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor 2. Antenna Gain=7.10 dBi, so the PSD Limit is 28.90 dBm					

SISO Antenna 2

U-NII-1

Mode	Channel/ Frequency (MHz)	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	36/5180	4.74	4.88	11	PASS
	40/5200	5.01	5.15	11	PASS
	48/5240	5.13	5.27	11	PASS
802.11n HT20	36/5180	4.52	4.61	11	PASS
	40/5200	4.89	4.98	11	PASS
	48/5240	4.83	4.92	11	PASS
802.11n HT40	38/5190	1.55	1.73	11	PASS
	46/5230	2.32	2.50	11	PASS
802.11ac VHT20	36/5180	4.60	4.69	11	PASS
	40/5200	4.83	4.92	11	PASS
	48/5240	4.87	4.96	11	PASS
802.11ac VHT40	38/5190	1.70	1.88	11	PASS
	46/5230	1.85	2.03	11	PASS
802.11ac VHT80	42/5210	-4.02	-3.64	11	PASS
802.11ax HE20	36/5180	4.49	4.89	11	PASS
	40/5200	4.57	4.97	11	PASS
	48/5240	5.13	5.53	11	PASS
802.11ax HE40	38/5190	1.58	2.31	11	PASS
	46/5230	1.96	2.69	11	PASS
802.11ax HE80	42/5210	-4.03	-2.77	11	PASS
Note: Power Spectral Density =Read Value+Duty cycle correction factor					

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Mode	Channel /Frequency (MHz)	Read Value (dBm/470kHz)	Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)	Conclusion
802.11a	149/5745	2.09	2.50	30	PASS
	157/5785	2.48	2.89	30	PASS
	165/5825	2.33	2.74	30	PASS
802.11n HT20	149/5745	2.16	2.52	30	PASS
	157/5785	1.97	2.33	30	PASS
	165/5825	2.17	2.53	30	PASS
802.11n HT40	151/5755	-1.12	-0.67	30	PASS
	159/5795	-0.77	-0.32	30	PASS
802.11ac VHT20	149/5745	2.16	2.52	30	PASS
	157/5785	2.23	2.59	30	PASS
	165/5825	2.09	2.45	30	PASS
802.11ac VHT40	151/5755	-0.95	-0.50	30	PASS
	159/5795	-0.66	-0.21	30	PASS
802.11ac VHT80	155/5775	-4.64	-3.99	30	PASS
802.11ax HE20	149/5745	2.03	2.70	30	PASS
	157/5785	2.71	3.38	30	PASS
	165/5825	2.22	2.89	30	PASS
802.11ax HE40	151/5755	-1.25	-0.25	30	PASS
	159/5795	-0.75	0.25	30	PASS
802.11ax HE80	155/5775	-4.18	-2.65	30	PASS
Note: PSD=Read Value+Duty cycle correction factor +10*log(500/470)					

MIMO

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Mode	Channel/ Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD (dBm/MHz)		
		Read Value (dBm/MHz)	PSD (dBm/MHz)	Read Value (dBm/MHz)	PSD (dBm/MHz)			
802.11n HT20	36/5180	3.27	3.36	3.56	3.65	6.52	6.89	PASS
	40/5200	3.40	3.49	3.91	4.00	6.76	6.89	PASS
	48/5240	3.50	3.59	3.86	3.95	6.78	6.89	PASS
802.11n HT40	38/5190	0.19	0.37	0.40	0.58	3.49	6.89	PASS
	46/5230	0.46	0.64	0.93	1.11	3.89	6.89	PASS
802.11ac VHT20	36/5180	3.06	3.15	3.58	3.67	6.43	6.89	PASS
	40/5200	3.18	3.27	3.48	3.57	6.43	6.89	PASS
	48/5240	3.19	3.28	3.71	3.80	6.56	6.89	PASS
802.11ac VHT40	38/5190	0.30	0.48	0.65	0.83	3.67	6.89	PASS
	46/5230	0.55	0.73	1.05	1.23	4.00	6.89	PASS
802.11ac VHT80	42/5210	-4.53	-4.15	-4.57	-4.19	-1.16	6.89	PASS
802.11ax HE20	36/5180	2.98	3.38	3.72	4.12	6.78	6.89	PASS
	40/5200	3.11	3.51	3.80	4.20	6.88	6.89	PASS
	48/5240	3.00	3.40	3.66	4.06	6.75	6.89	PASS
802.11ax HE40	38/5190	0.23	0.96	0.40	1.13	4.06	6.89	PASS
	46/5230	0.63	1.36	0.78	1.51	4.45	6.89	PASS
802.11ax HE80	42/5210	-4.35	-3.09	-4.48	-3.22	-0.14	6.89	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor

2. For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a),

the power spectral density=$10\log(10^{(\text{PSD antenna 1 in dBm/10})}+10^{(\text{PSD antenna 2 in dBm/10})})$

3. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

so directional gain=$G_{ANT\ MAX}$ +Array Gain=7.10+10log(2/1)=10.11>6 dBi.

So the PSD limit is 11-(directional gain-6 dBi) =11-(10.11-6) =6.89dBm.

U-NII-3

Mode	Channel/ Frequency (MHz)	Power Spectral Density					Limit (dBm/ 500kHz)	Conclusion
		Antenna 1		Antenna 2		Total Power (dBm/ 500kHz)		
		Read Value (dBm/ 470kHz)	PSD (dBm/ 500kHz)	Read Value (dBm/ 470kHz)	PSD (dBm/ 500kHz)			
802.11n HT20	149/5745	0.56	0.92	0.38	0.74	3.84	25.89	PASS
	157/5785	0.13	0.49	0.44	0.80	3.66	25.89	PASS
	165/5825	1.16	1.52	1.07	1.43	4.49	25.89	PASS
802.11n HT40	151/5755	-2.85	-2.40	-2.69	-2.24	0.69	25.89	PASS
	159/5795	-3.06	-2.61	-2.82	-2.37	0.52	25.89	PASS
802.11ac VHT20	149/5745	0.46	0.82	0.55	0.91	3.88	25.89	PASS
	157/5785	0.13	0.49	0.62	0.98	3.75	25.89	PASS
	165/5825	0.66	1.02	0.48	0.84	3.94	25.89	PASS
802.11ac VHT40	151/5755	-3.04	-2.59	-2.71	-2.26	0.59	25.89	PASS
	159/5795	-2.98	-2.53	-2.63	-2.18	0.66	25.89	PASS
802.11ac VHT80	155/5775	-6.96	-6.31	-6.43	-5.78	-3.03	25.89	PASS
802.11ax HE20	149/5745	0.63	1.30	0.58	1.25	4.29	25.89	PASS
	157/5785	0.24	0.91	0.65	1.32	4.13	25.89	PASS
	165/5825	0.49	1.16	0.38	1.05	4.12	25.89	PASS
802.11ax HE40	151/5755	-2.91	-1.91	-2.67	-1.67	1.22	25.89	PASS
	159/5795	-3.01	-2.01	-2.58	-1.58	1.22	25.89	PASS
802.11ax HE80	155/5775	-6.15	-4.62	-5.83	-4.30	-1.45	25.89	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor +10*log(500/470).

2. For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a),

the power spectral density=$10\log(10^{(\text{PSD antenna 1 in dBm/10})}+10^{(\text{PSD antenna 2 in dBm/10})})$

3. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

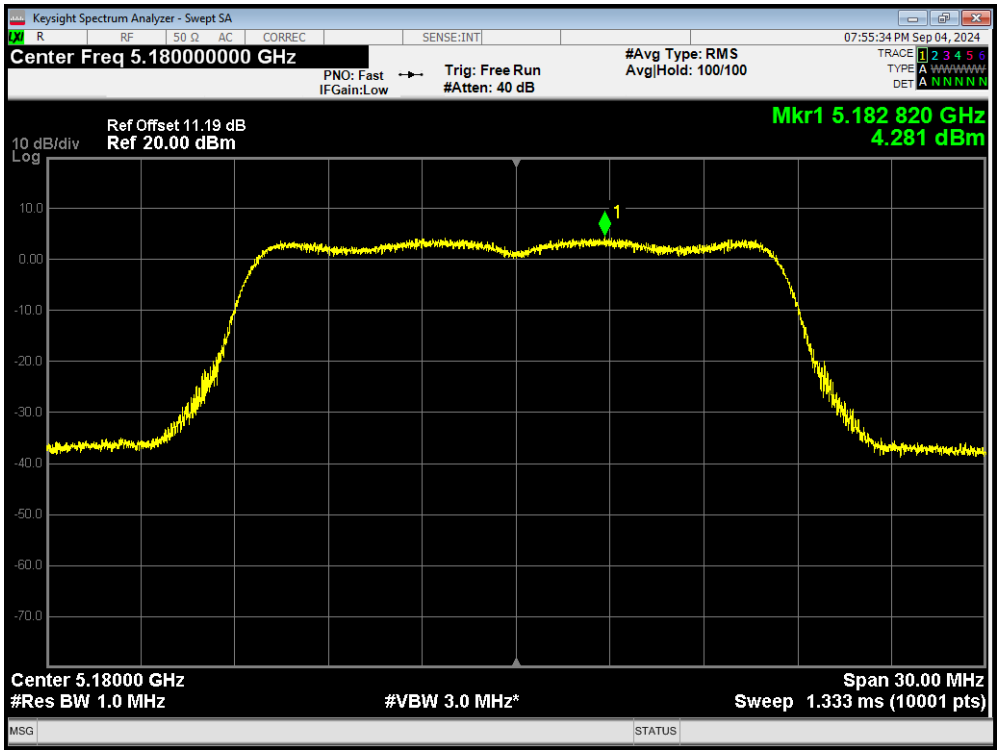
so directional gain=$G_{ANT\ MAX}$ +Array Gain=7.10+10log(2/1)=10.11>6 dBi.

So the PSD limit is 30-(directional gain-6 dBi) =30-(10.11-6) =29.95dBm.

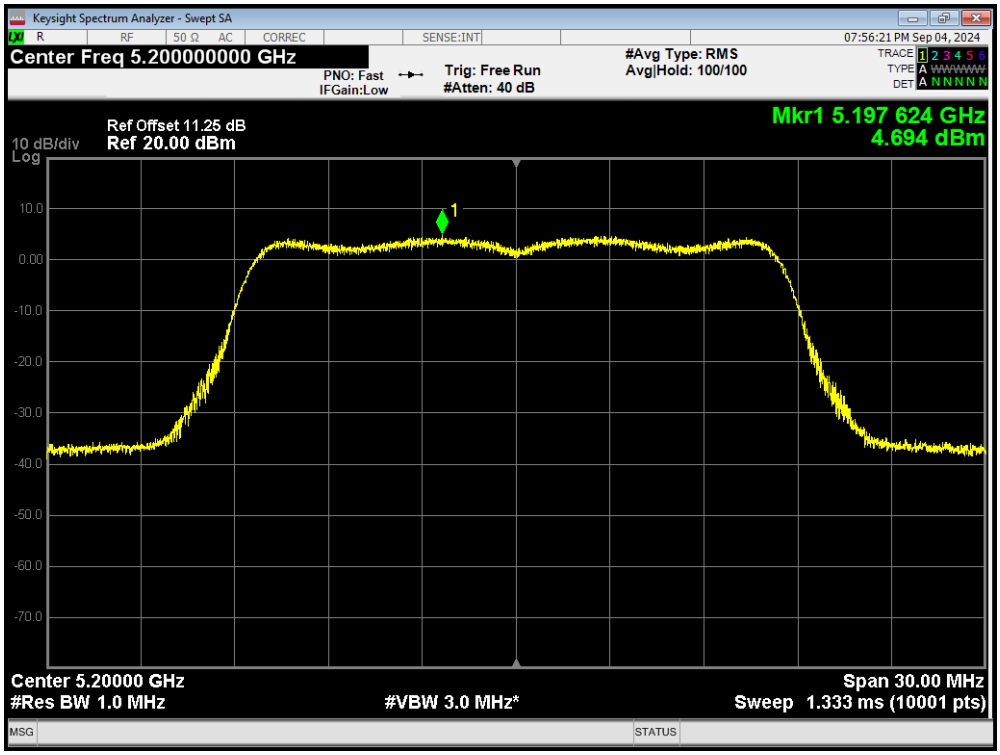
SISO Antenna 1

U-NII-1

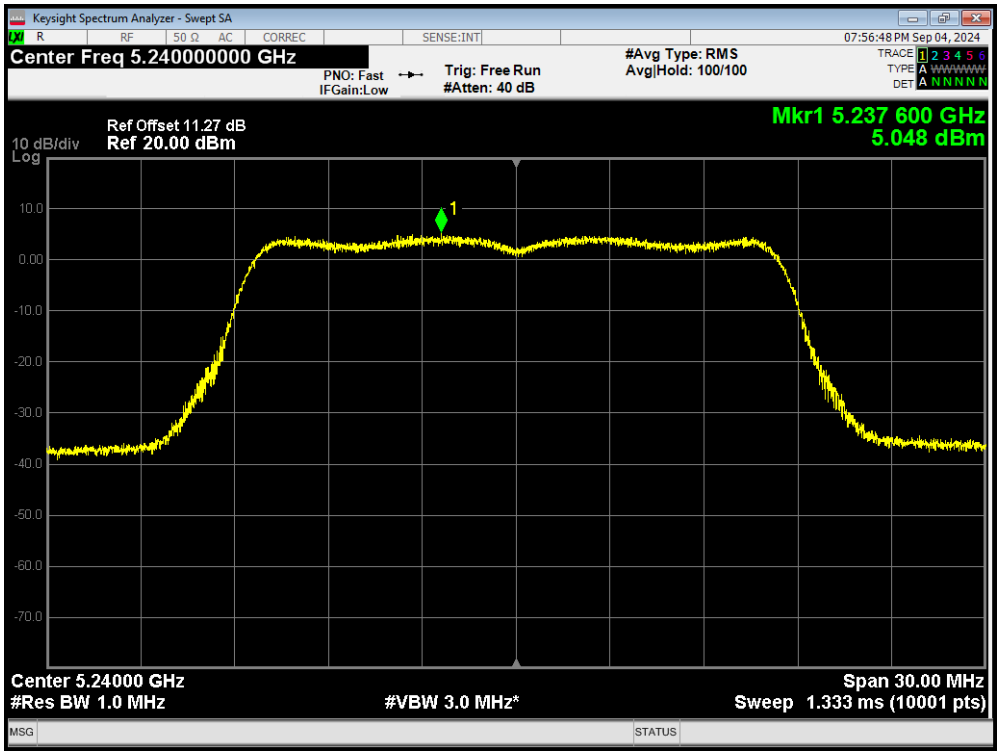
PSD 802.11a 5180MHz



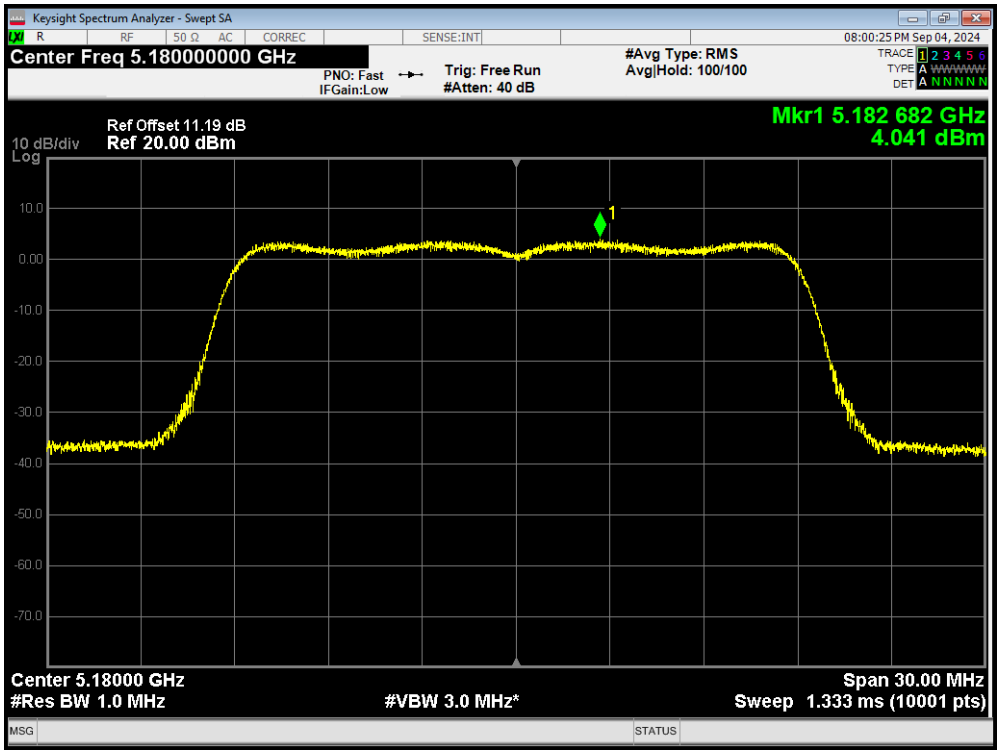
PSD 802.11a 5200MHz



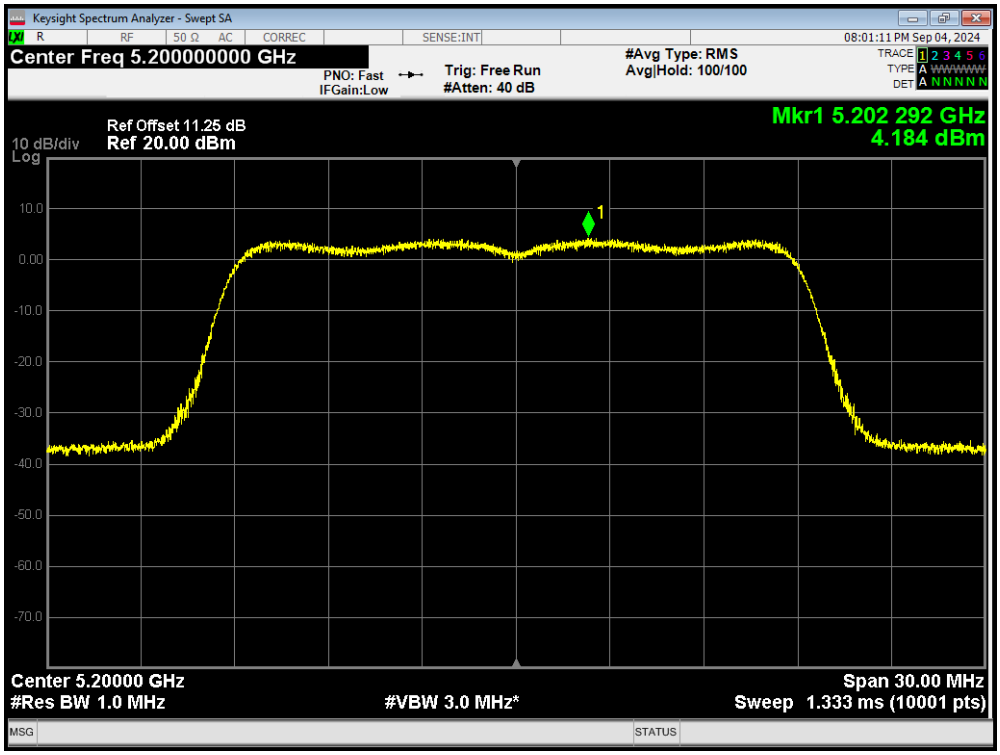
PSD 802.11a 5240MHz



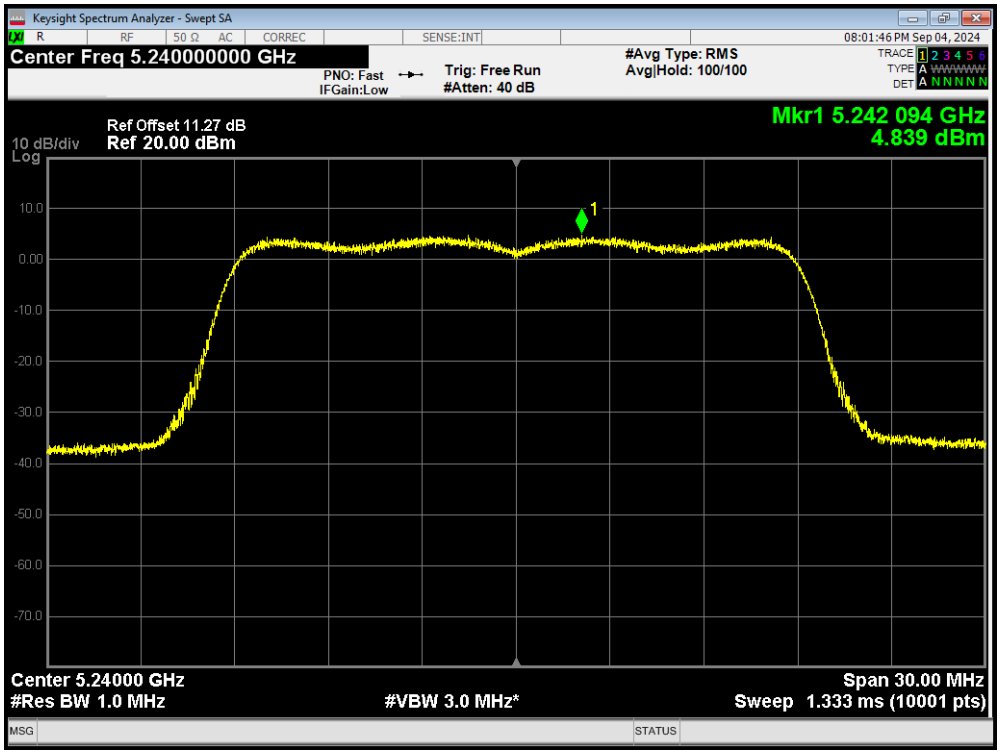
PSD 802.11ac(VHT20) 5180MHz



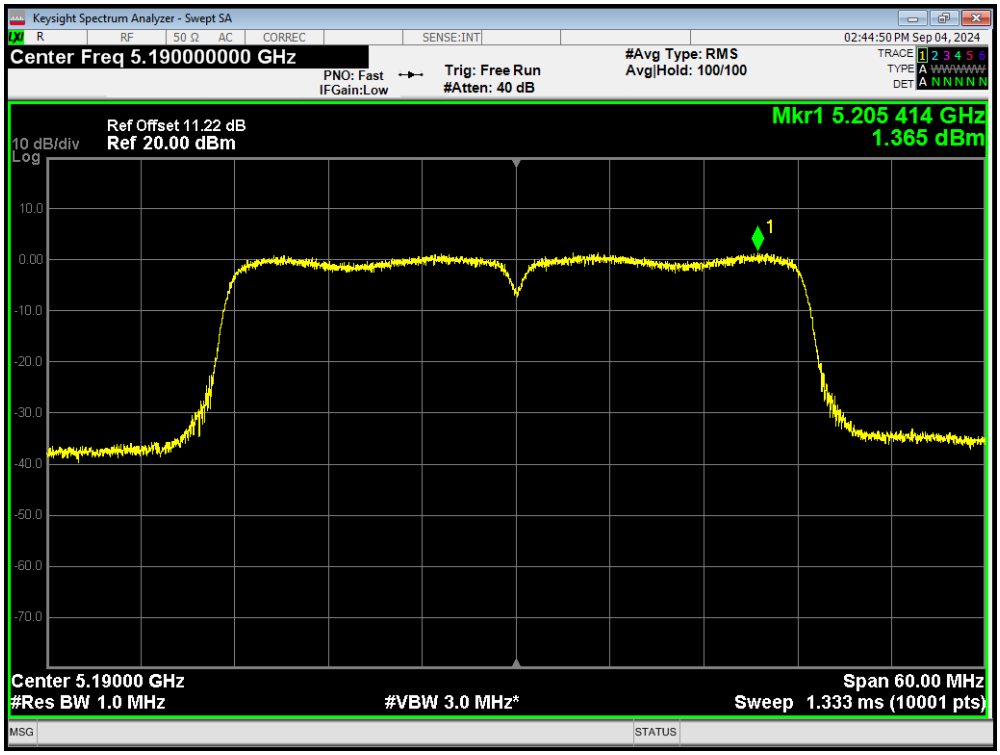
PSD 802.11ac(VHT20) 5200MHz



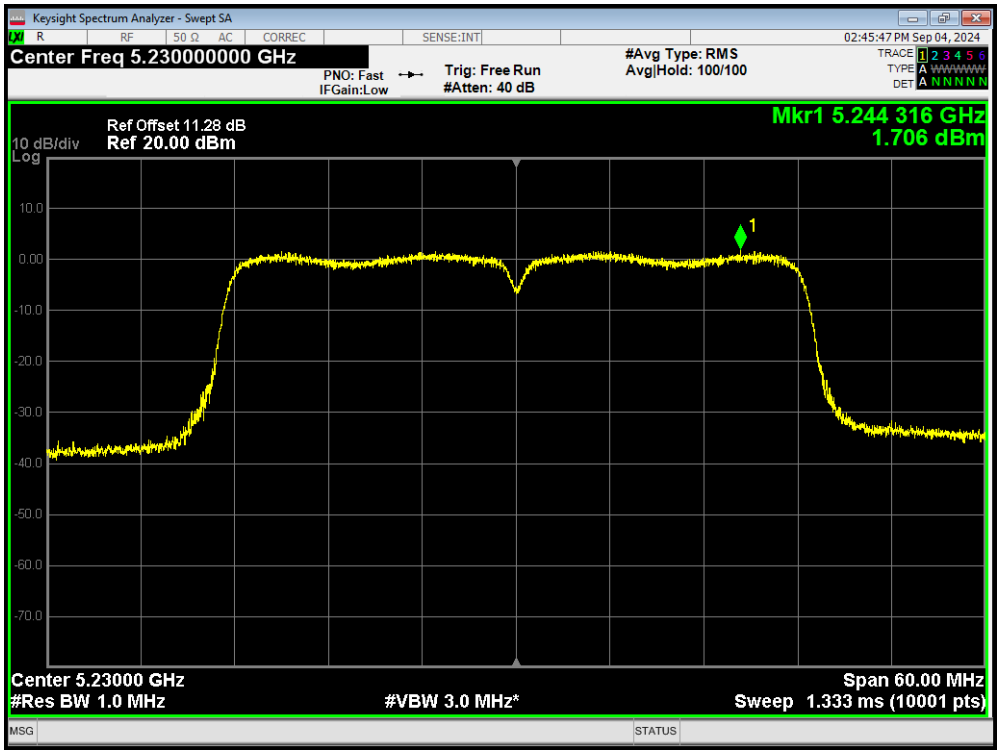
PSD 802.11ac(VHT20) 5240MHz



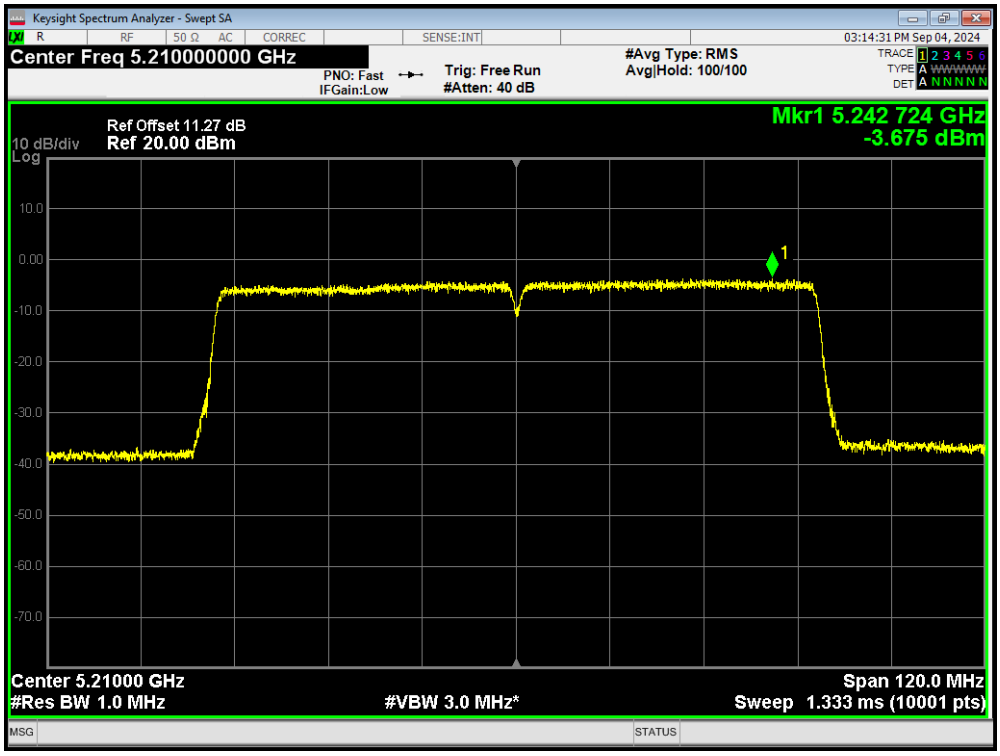
PSD 802.11ac(VHT40) 5190MHz



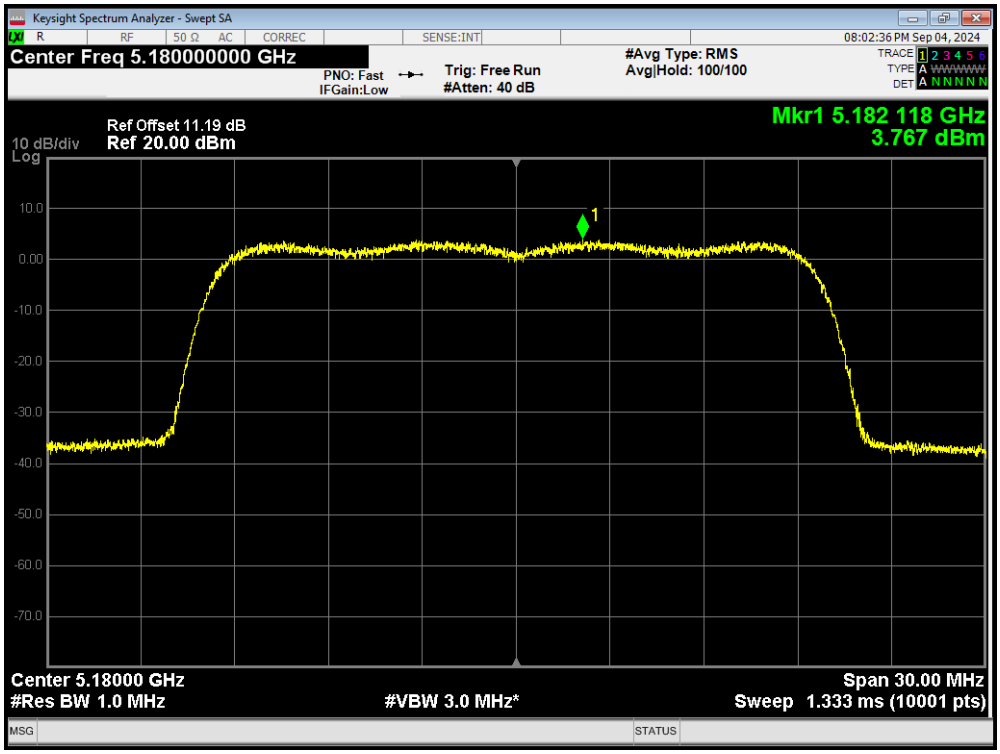
PSD 802.11ac(VHT40) 5230MHz



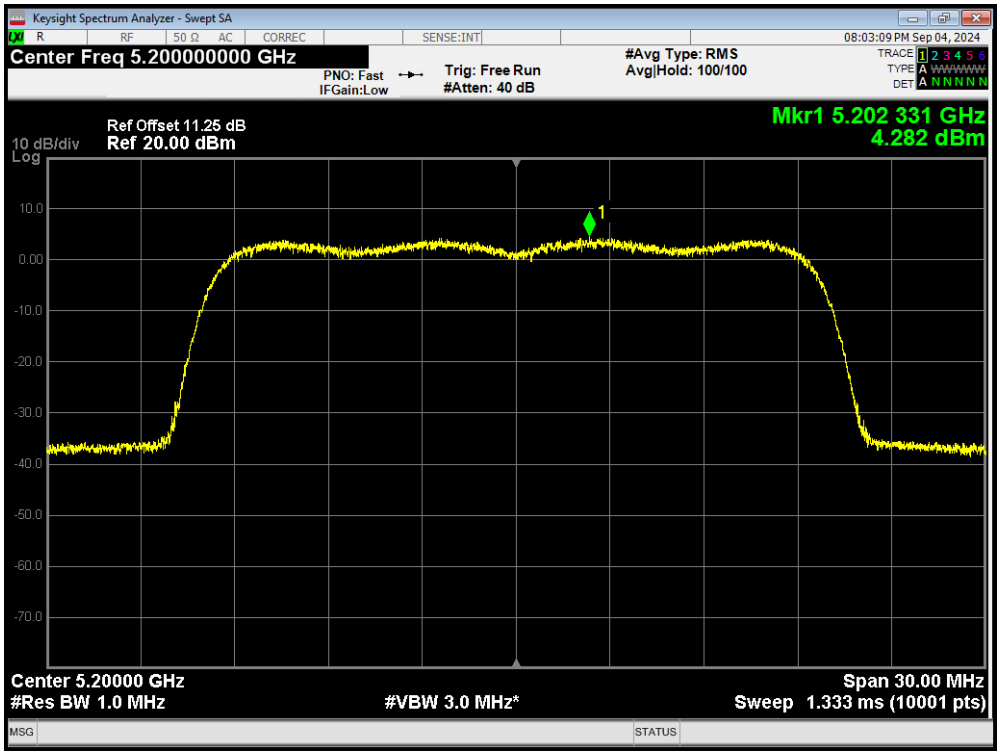
PSD 802.11ac(VHT80) 5210MHz



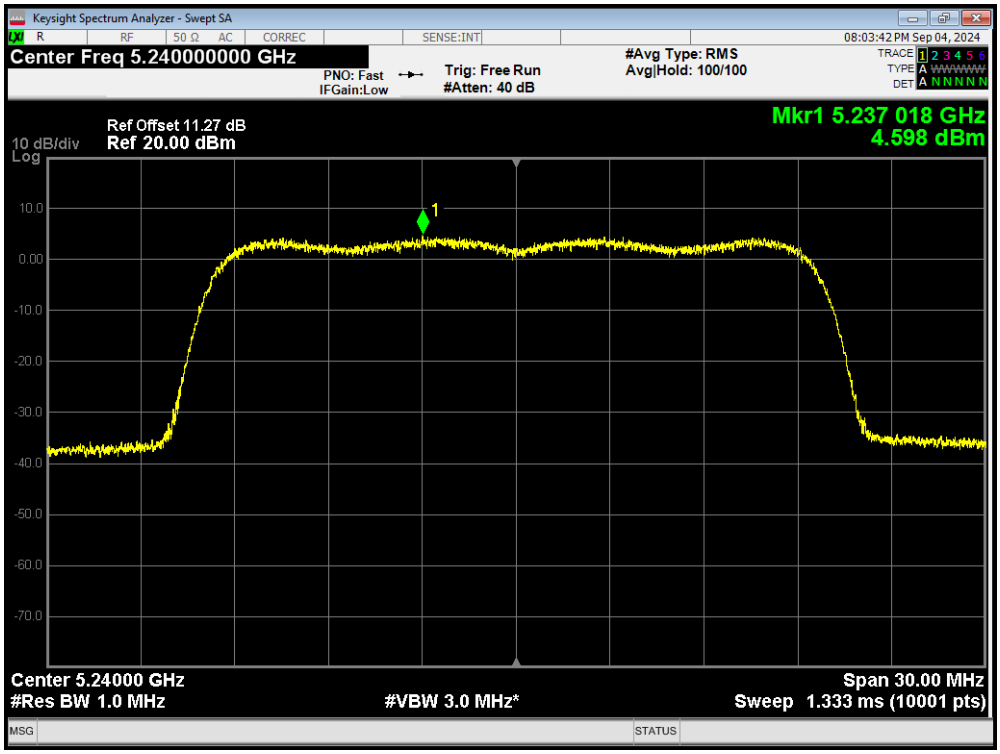
PSD 802.11ax(HE20) 5180MHz



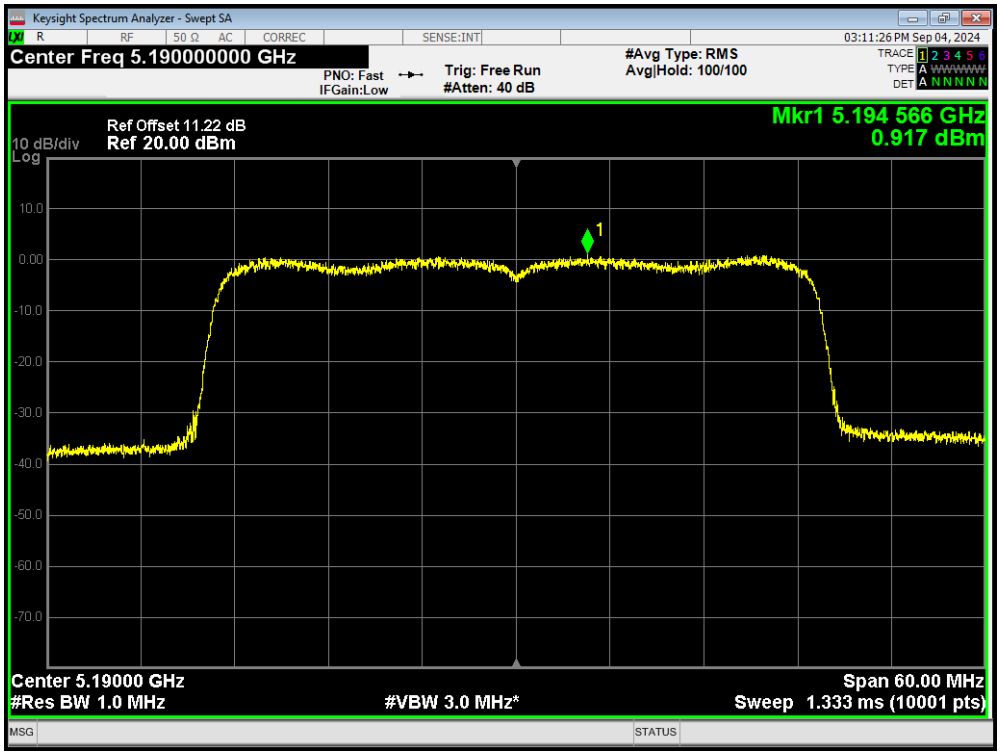
PSD 802.11ax(HE20) 5200MHz



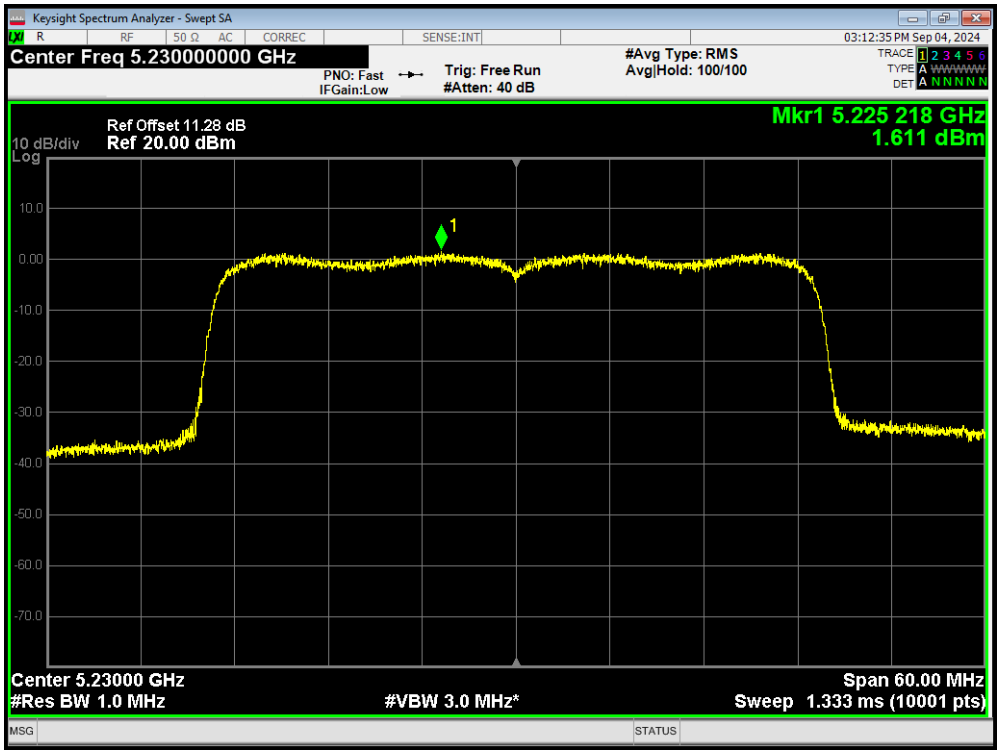
PSD 802.11ax(HE20) 5240MHz



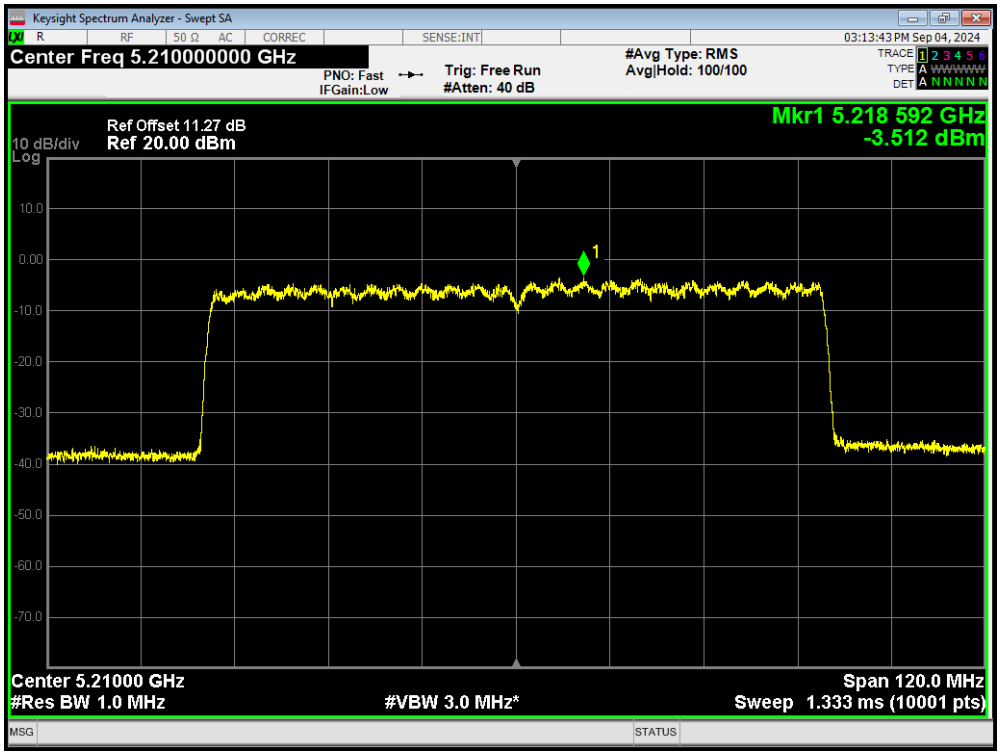
PSD 802.11ax(HE40) 5190MHz



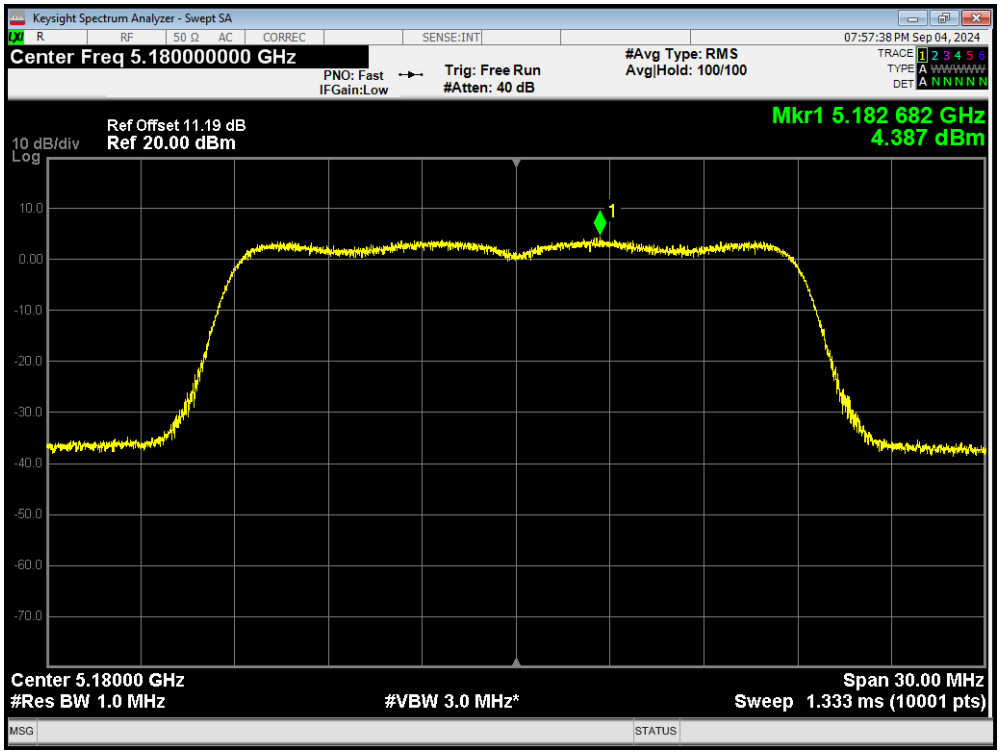
PSD 802.11ax(HE40) 5230MHz



PSD 802.11ax(HE80) 5210MHz



PSD 802.11n(HT20) 5180MHz



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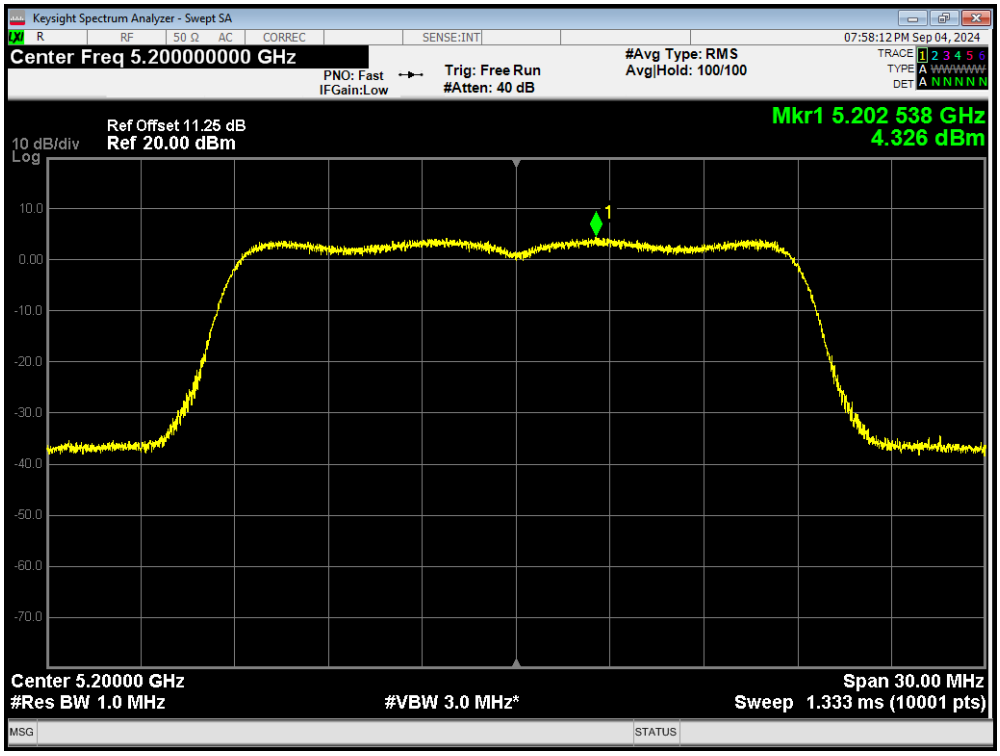
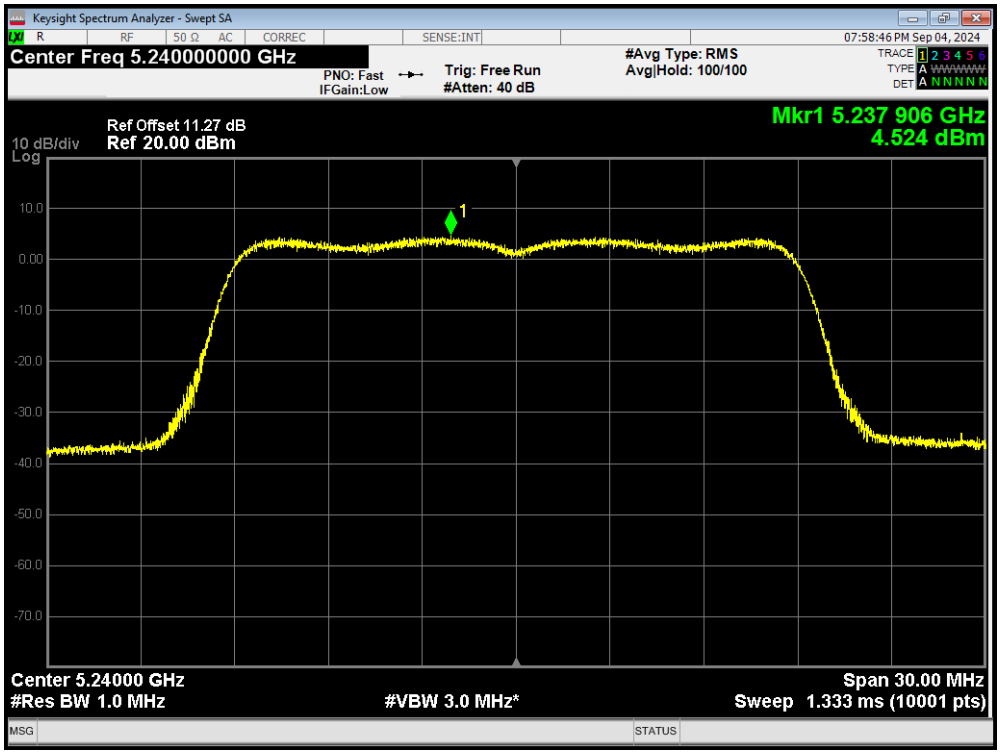
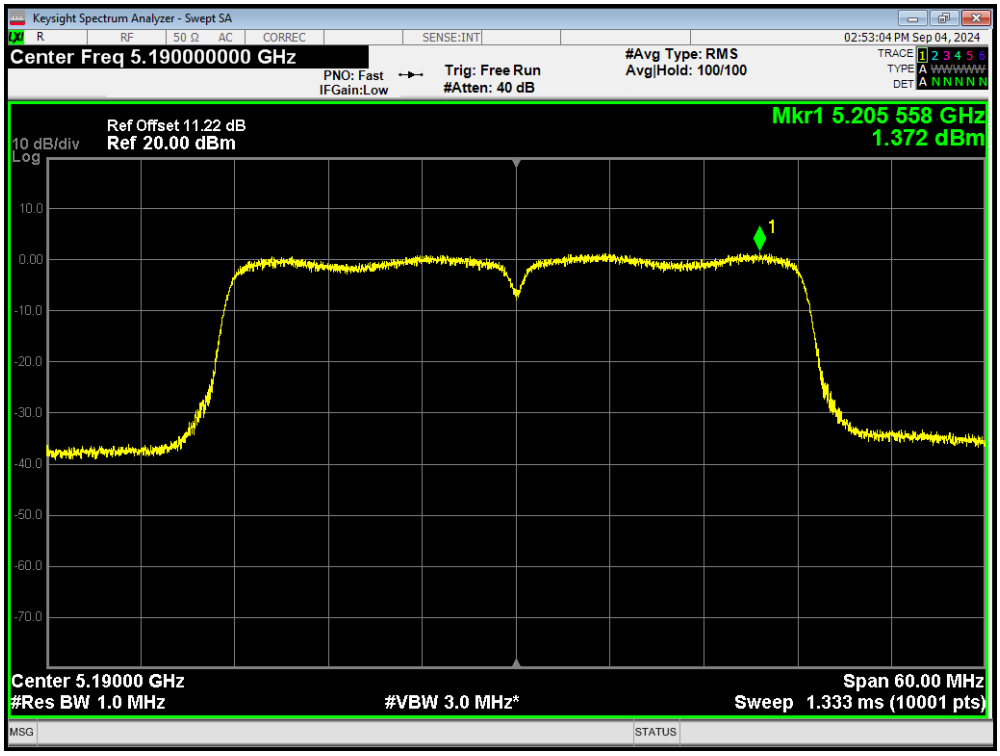


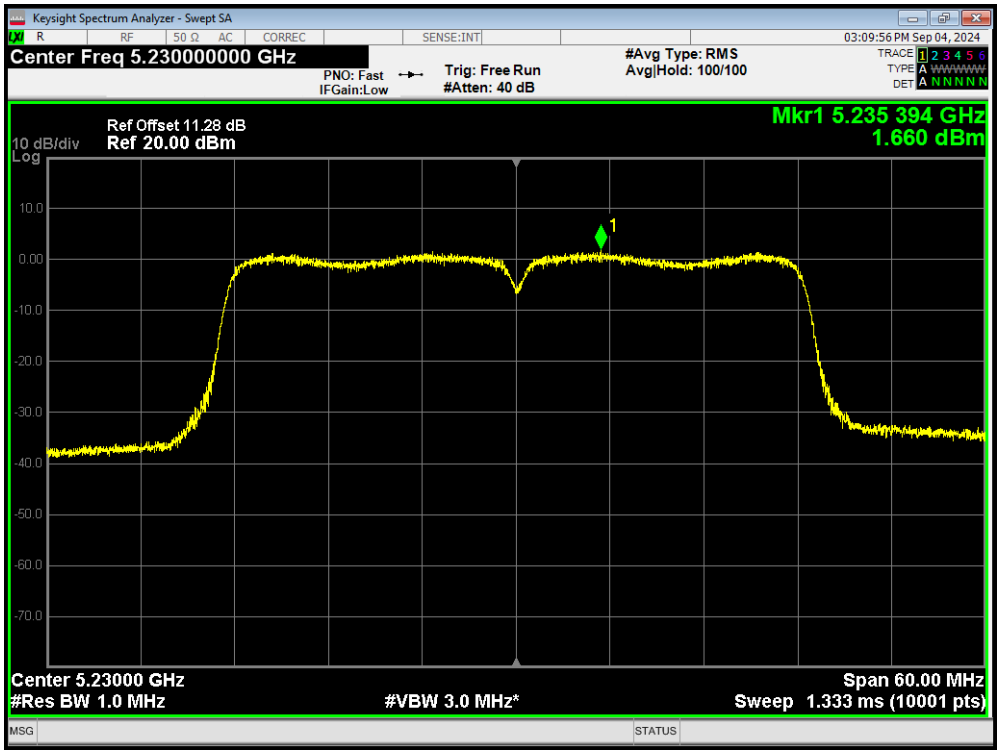
PSD 802.11n(HT20) 5240MHz



PSD 802.11n(HT40) 5190MHz

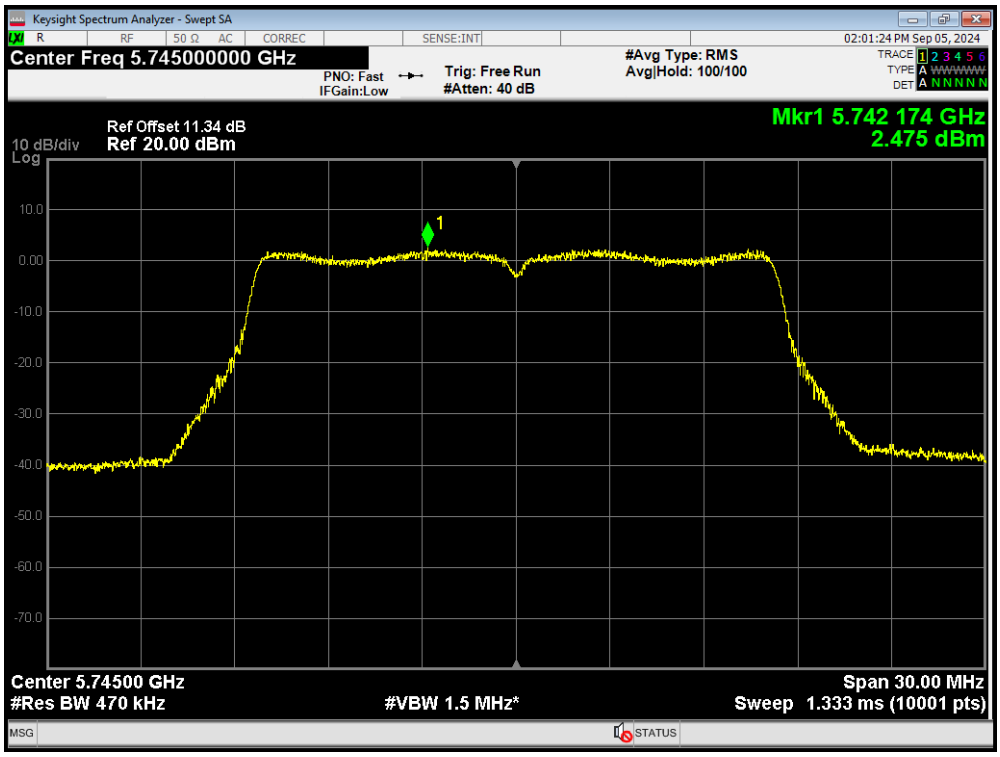


PSD 802.11n(HT40) 5230MHz

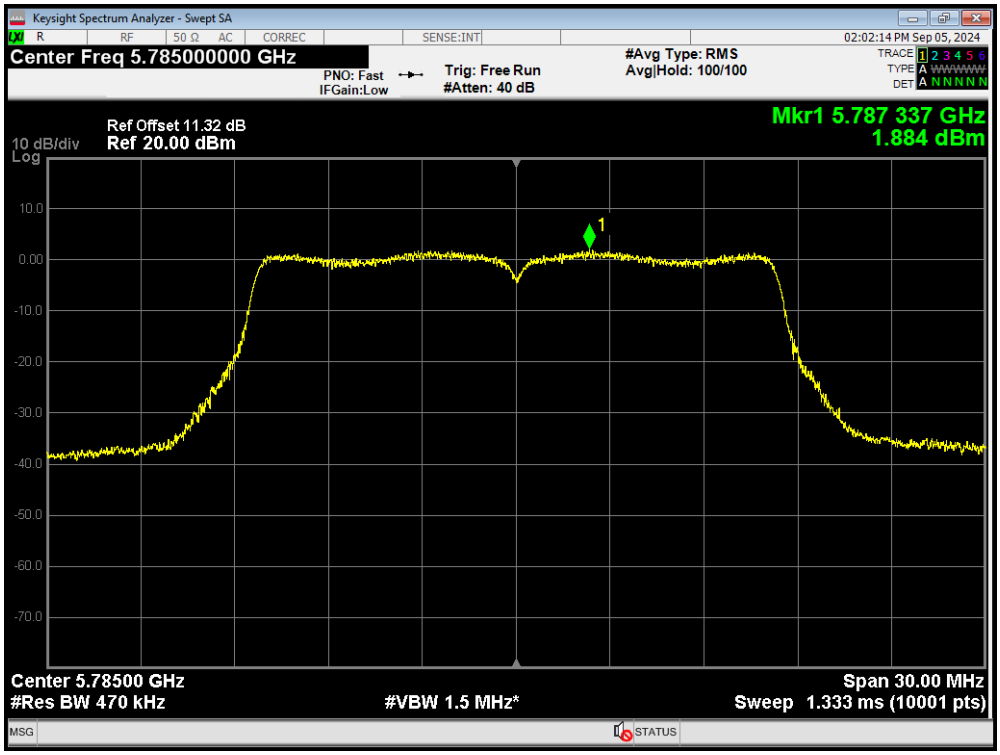


U-NII-3

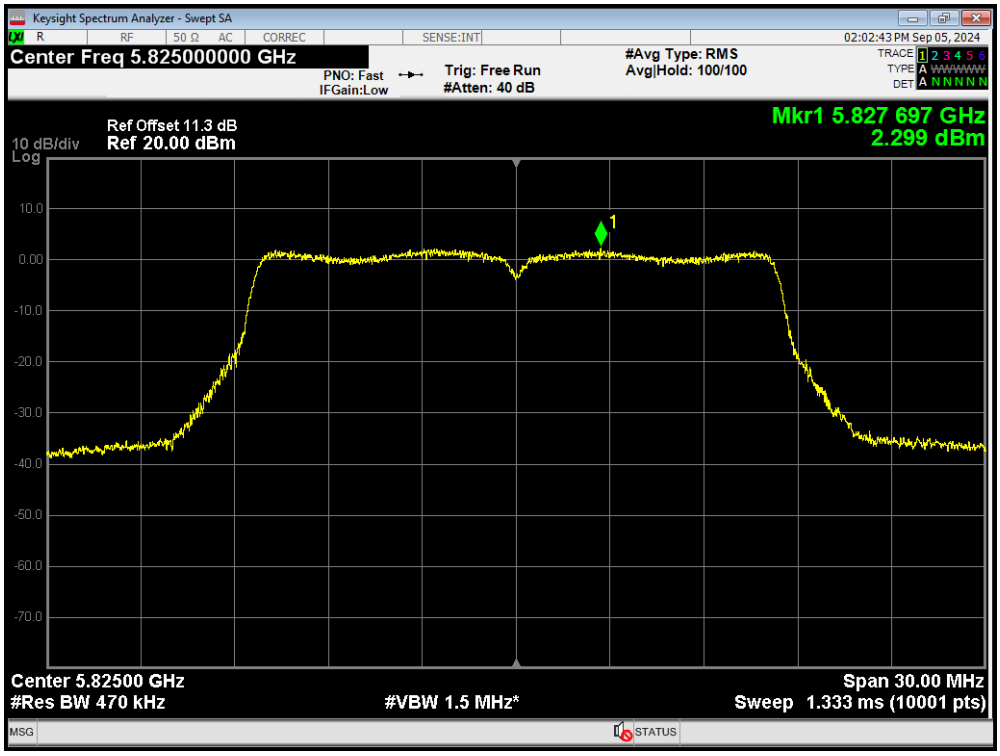
PSD 802.11a 5745MHz



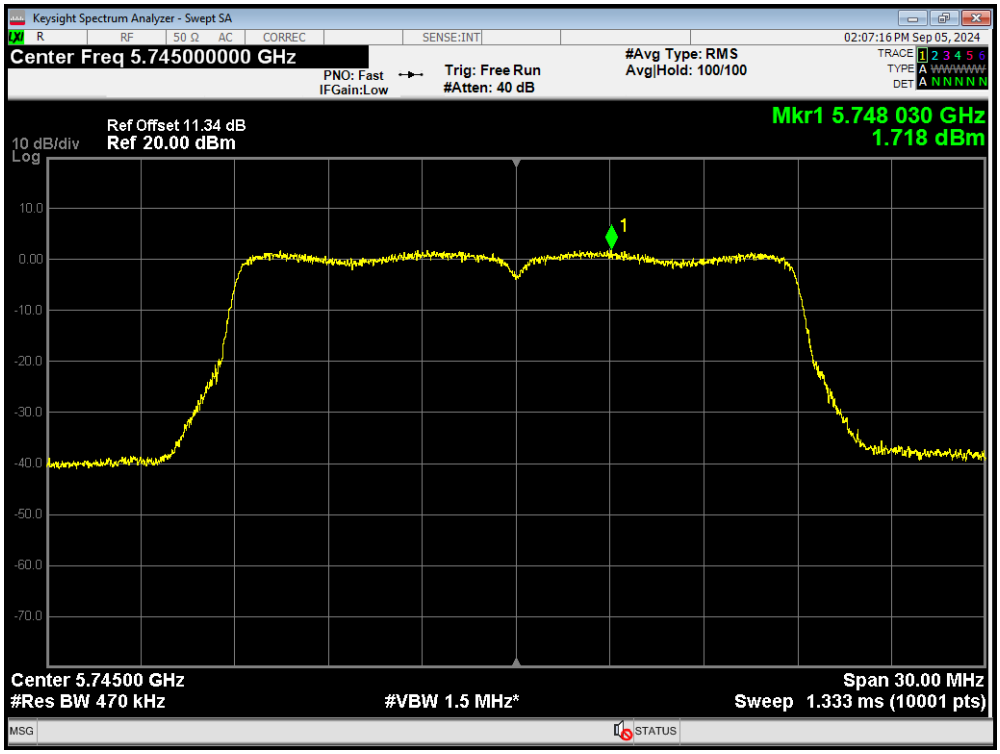
PSD 802.11a 5785MHz



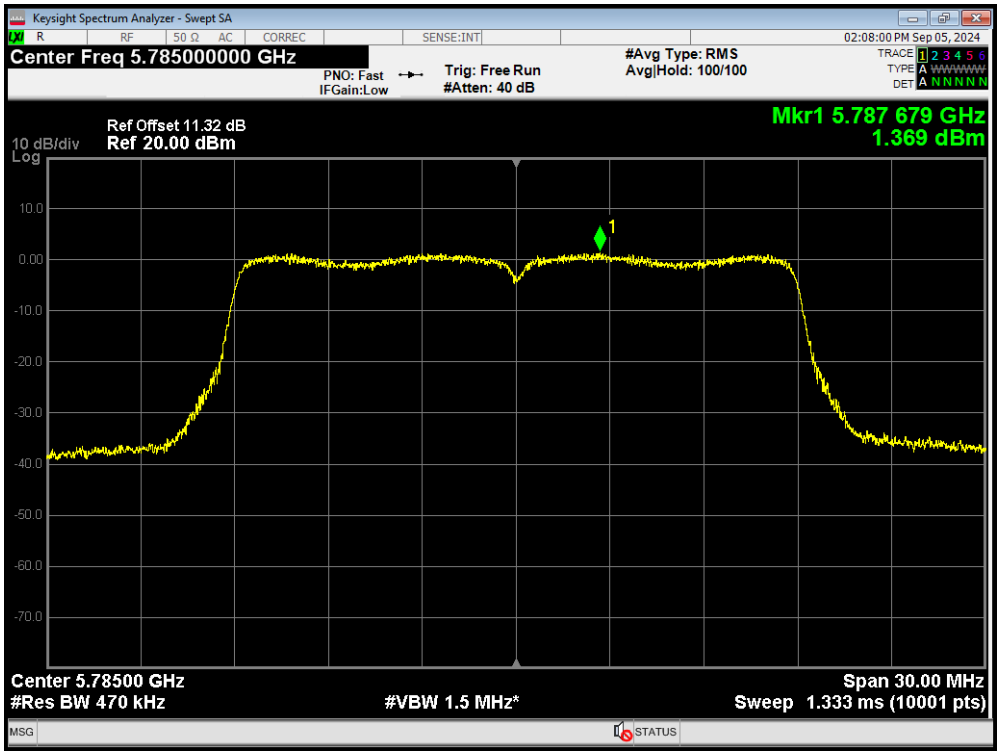
PSD 802.11a 5825MHz



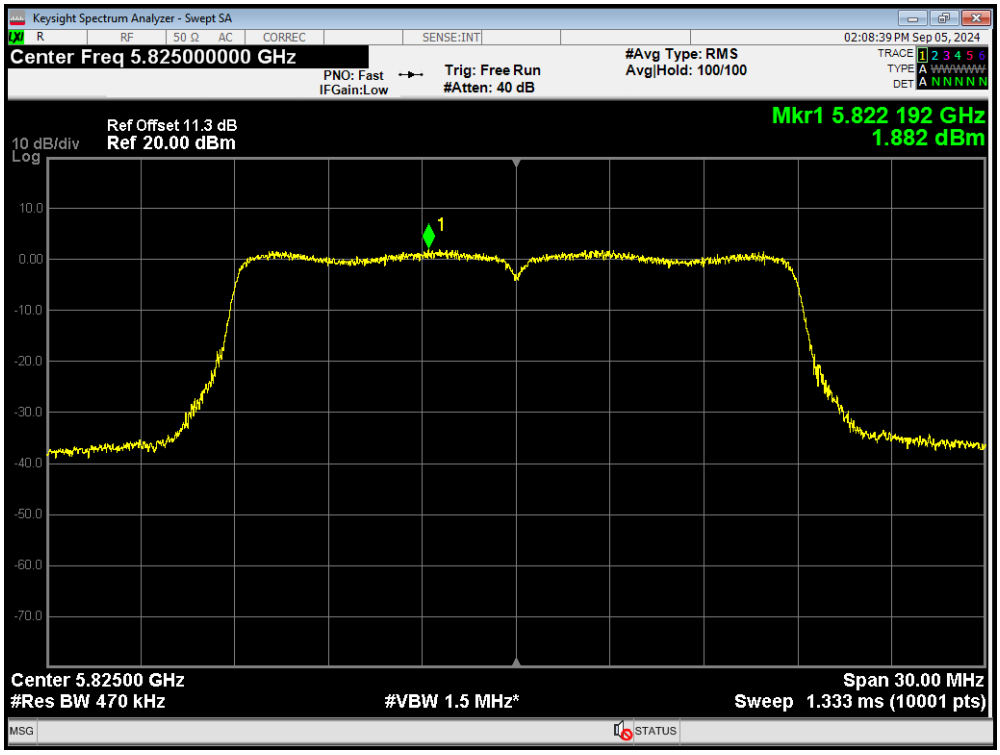
PSD 802.11ac(VHT20) 5745MHz



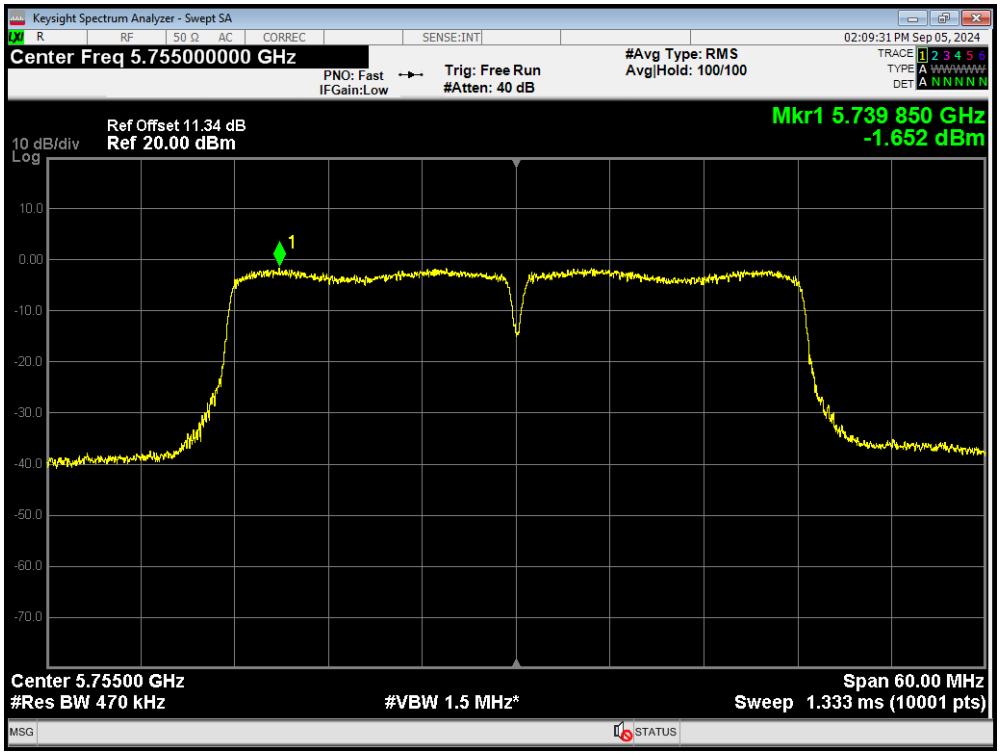
PSD 802.11ac(VHT20) 5785MHz



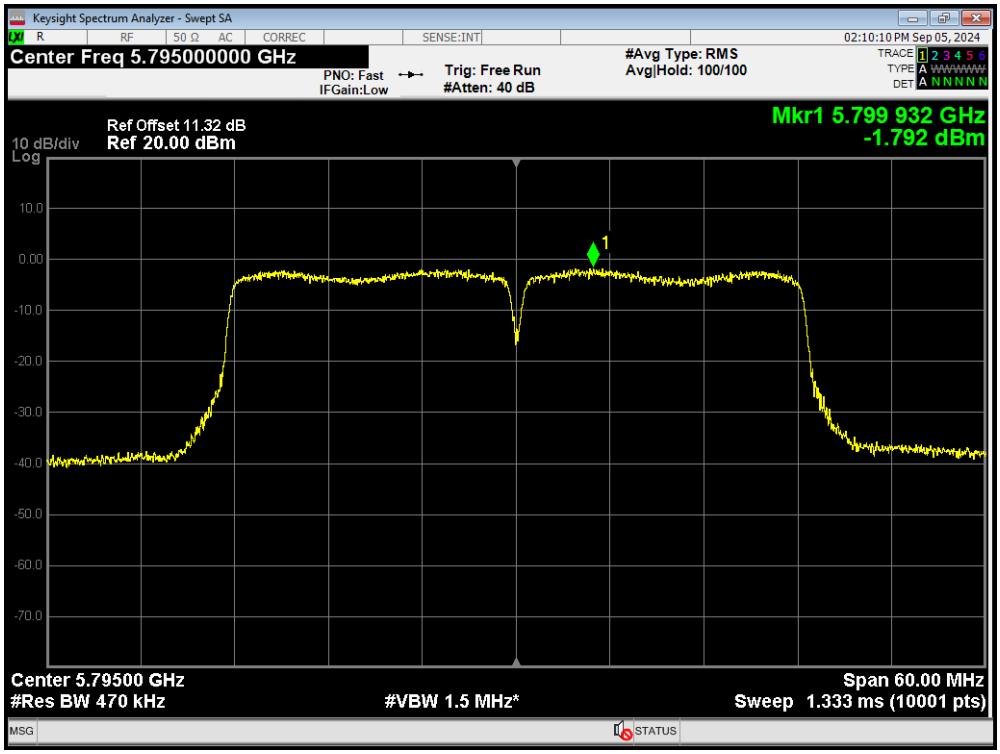
PSD 802.11ac(VHT20) 5825MHz



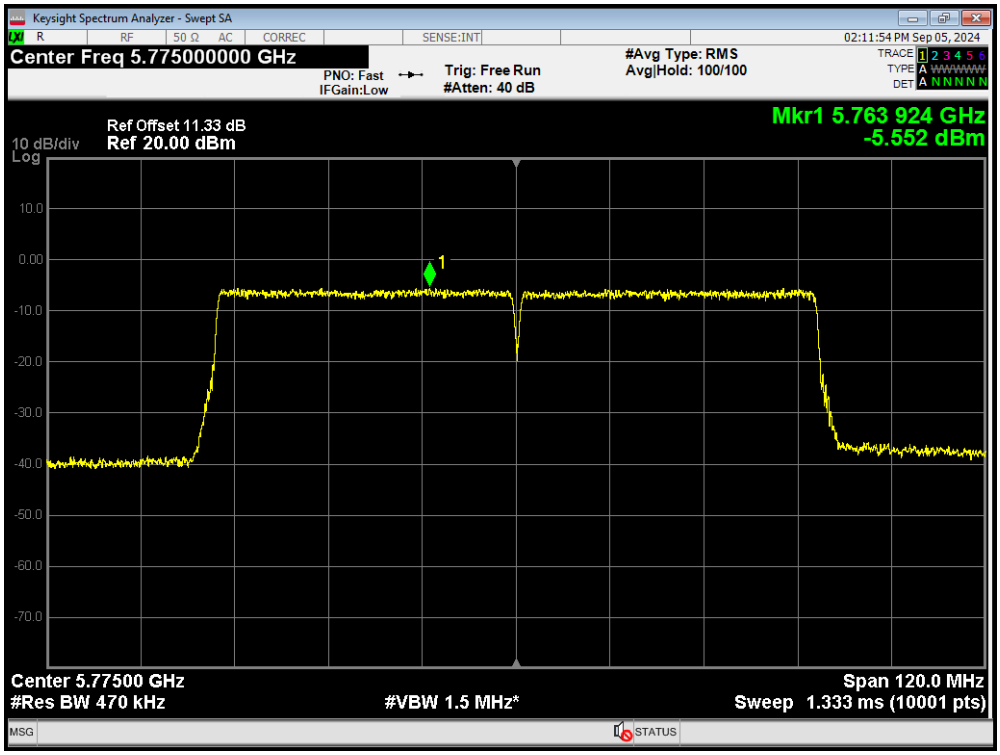
PSD 802.11ac(VHT40) 5755MHz



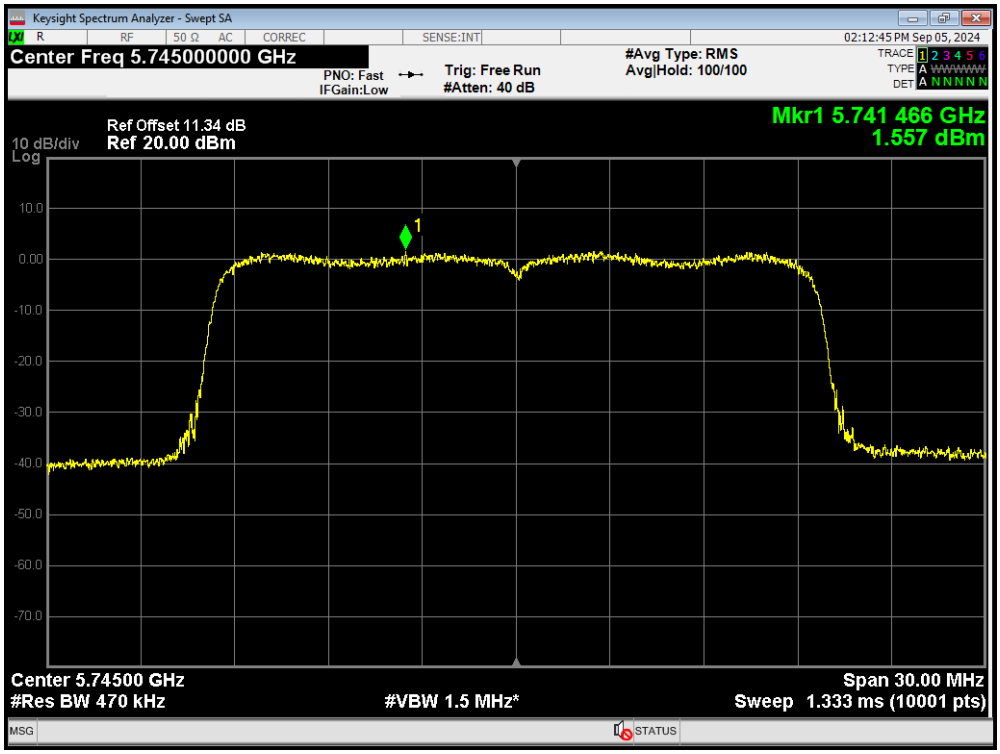
PSD 802.11ac(VHT40) 5795MHz



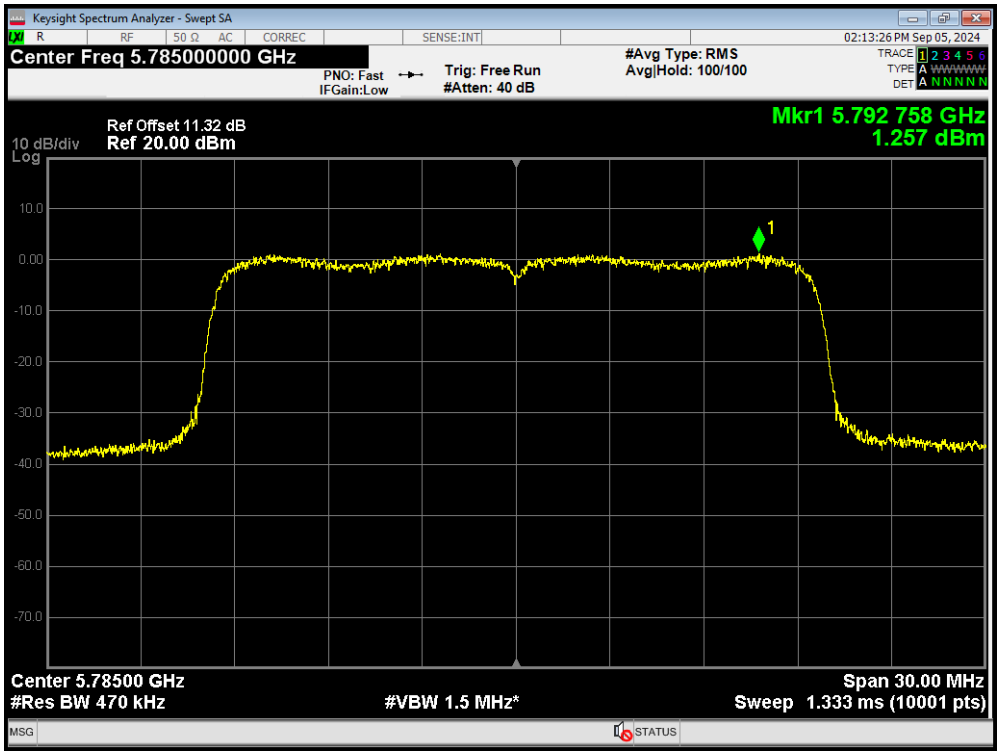
PSD 802.11ac(VHT80) 5775MHz



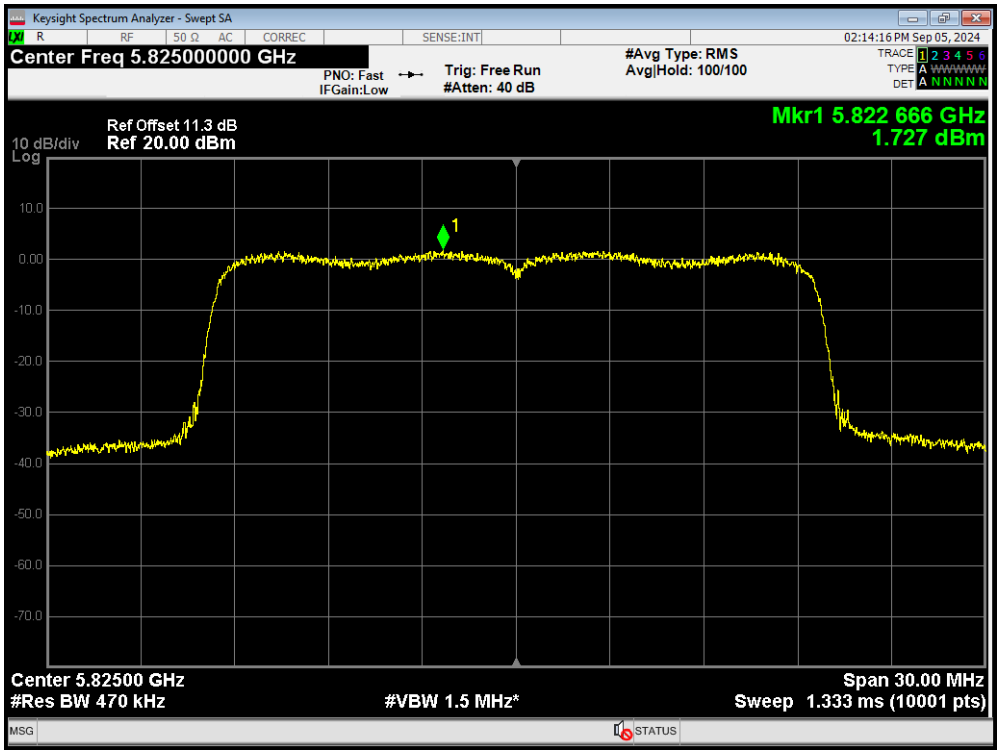
PSD 802.11ax(HE20) 5745MHz



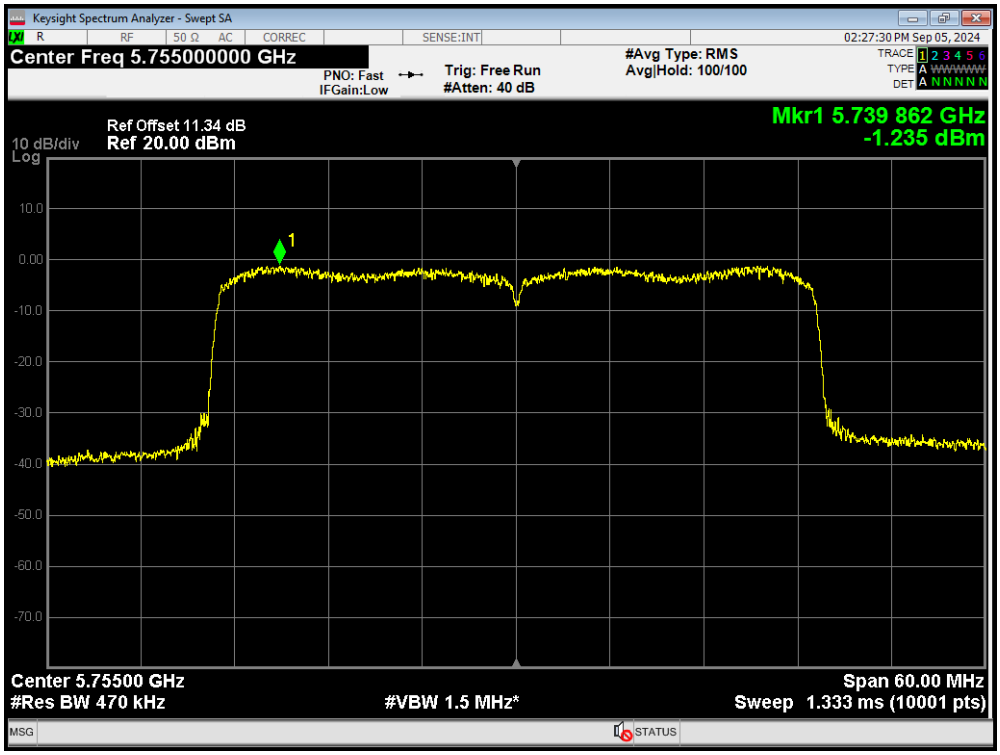
PSD 802.11ax(HE20) 5785MHz



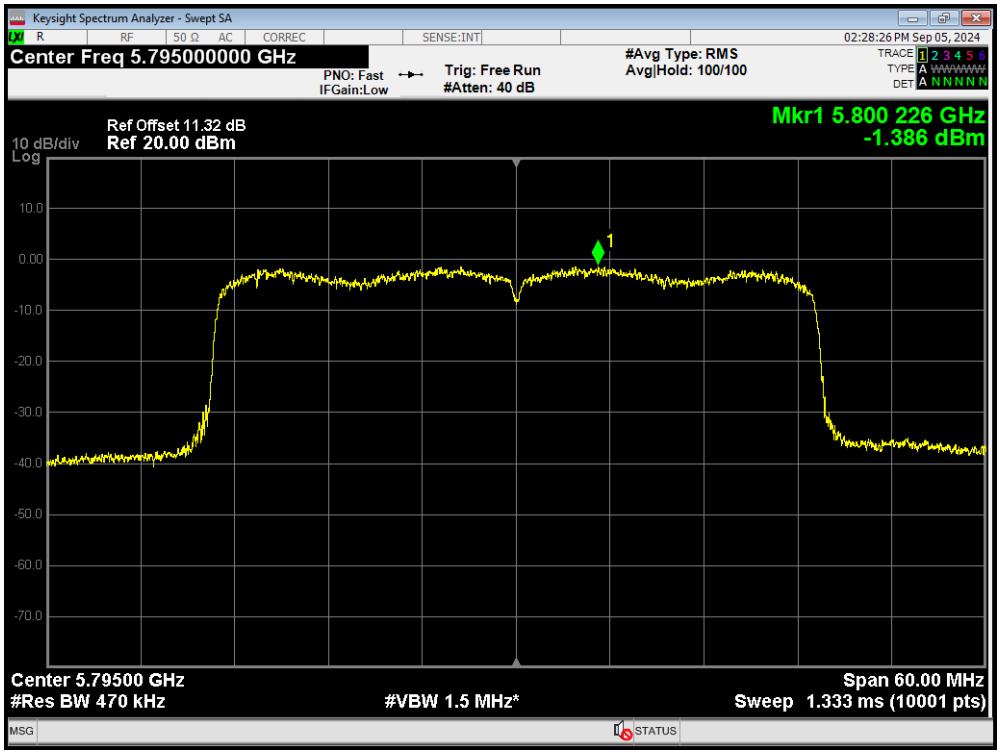
PSD 802.11ax(HE20) 5825MHz



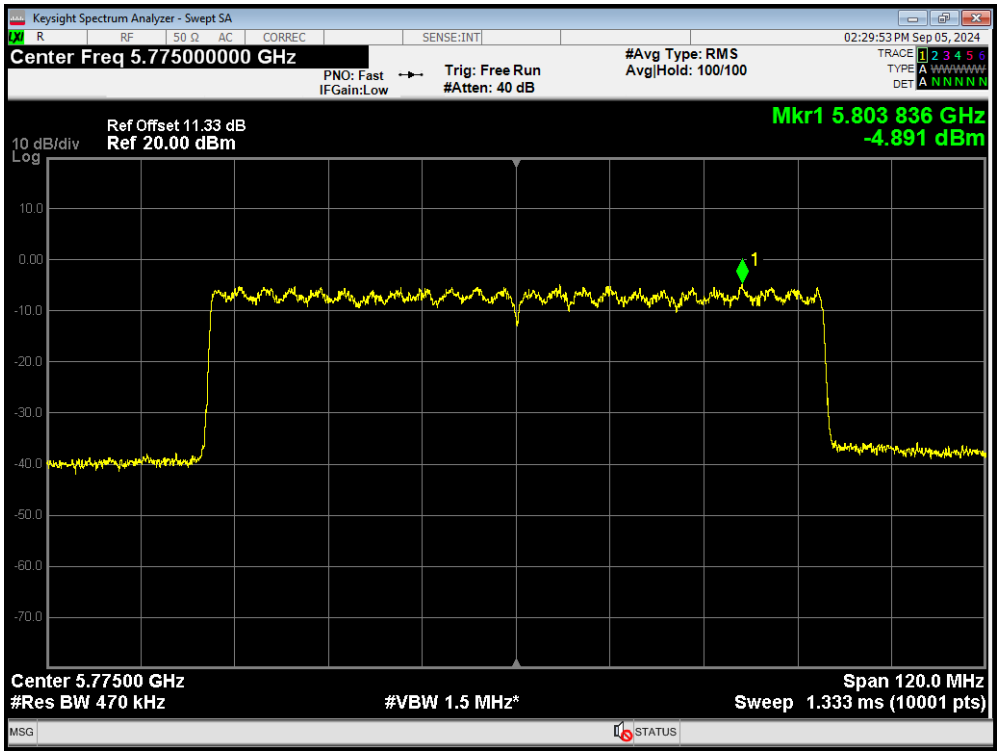
PSD 802.11ax(HE40) 5755MHz



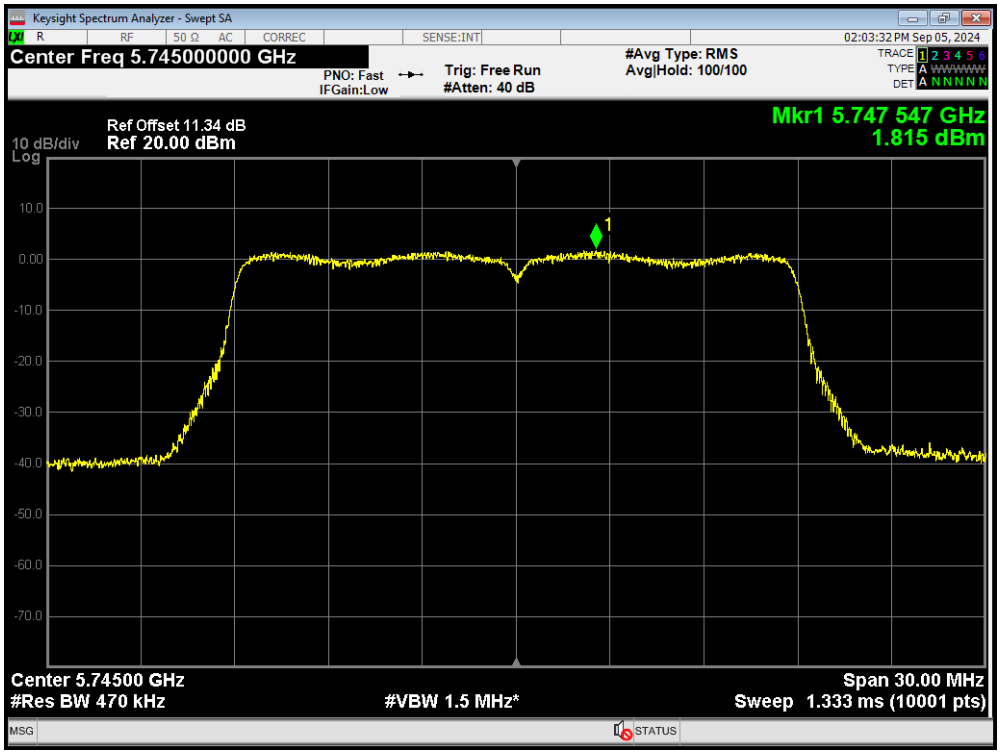
PSD 802.11ax(HE40) 5795MHz



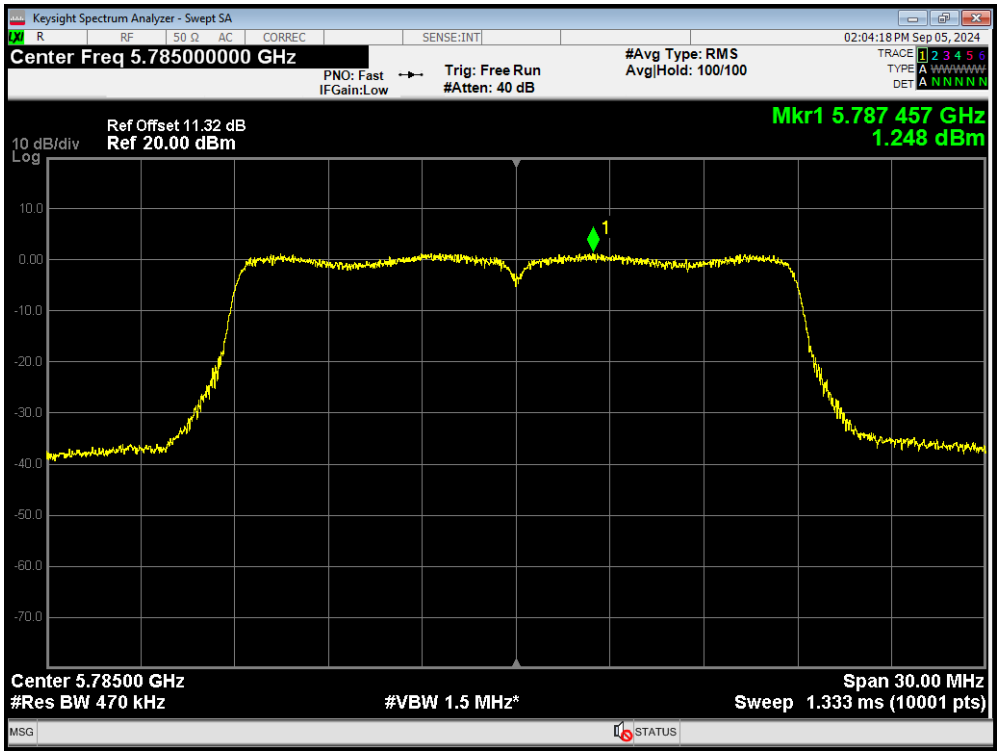
PSD 802.11ax(HE80) 5775MHz



PSD 802.11n(HT20) 5745MHz



PSD 802.11n(HT20) 5785MHz



PSD 802.11n(HT20) 5825MHz