



# RF TEST REPORT

**Applicant** Huawei Device Co., Ltd.  
**FCC ID** 2ATEYWS7100  
**Product** 3000Mbps Wi-Fi 6 Router  
**Model** WS7100  
**Report No.** R2105A0471-R2  
**Issue Date** June 5, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2020)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Prepared by: Peng Tao

Approved by: Kai Xu

---

## TA Technology (Shanghai) Co., Ltd.

No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000



## TABLE OF CONTENT

1. Test Laboratory .....	4
1.1. Notes of the test report.....	4
1.2. Test facility .....	4
1.3. Testing Location .....	4
2. General Description of Equipment under Test.....	5
2.1. Applicant and Manufacturer Information.....	5
2.2. General information.....	5
3. Applied Standards .....	7
4. Test Configuration .....	8
5. Test Case Results .....	9
5.1. Maximum output power .....	9
5.2. 99% Bandwidth and 6dB Bandwidth .....	17
5.3. Band Edge .....	43
5.4. Power Spectral Density .....	55
5.5. Spurious RF Conducted Emissions.....	95
5.6. Unwanted Emission .....	109
5.7. Conducted Emission .....	239
6. Main Test Instruments.....	242



## Summary of measurement results

Number	Test Case	Clause in FCC rules	Verdict
1	Maximum output power	15.247(b)(3)	PASS
2	99% bandwidth and 6 dB bandwidth	15.247(a)(2)	PASS
3	Power spectral density	15.247(e)	PASS
4	Band Edge	15.247(d)	PASS
5	Spurious RF Conducted Emissions	15.247(d)	PASS
6	Unwanted Emissions	15.247(d),15.205,15.209	PASS
7	Conducted Emissions	15.207	PASS
Date of Testing: August 1, 2020~ August 26, 2020 and September 3, 2020 and June 1, 2021			
Note: 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.			

**WS7100 (Report No.: R2105A0471-R2) is a variant model of WS7100 (Report No.: R2007H0212-R2V1). This report only retests some power and added FCC ID. Other test values duplicated from Original for variant.**



## 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: No.145, Jintang Rd, Tangzhen Industry Park, Pudong  
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](mailto:xukai@ta-shanghai.com)

## 2. General Description of Equipment under Test

### 2.1. Applicant and Manufacturer Information

Applicant	Huawei Device Co., Ltd.
Applicant address	No.2 of Xincheng Road, Songshan Lake Zone, Dongguan, Guangdong 523808, People's Republic of China
Manufacturer	Huawei Device Co., Ltd.
Manufacturer address	No.2 of Xincheng Road, Songshan Lake Zone, Dongguan, Guangdong 523808, People's Republic of China

### 2.2. General information

EUT Description			
Model	WS7100		
SN	WS71003000000001		
Hardware Version	AM1WS7100M		
Software Version	10.0.5.19		
Power Supply	AC/ DC adapter		
Antenna Type	External Antenna		
Antenna Connector	Weld and IPEX studs (meet with the standard FCC Part 15.203 requirement)		
Antenna Gain	Antenna 1: 5dBi Antenna 2: 5dBi		
Directional Gain	Without Beamforming Mode for Power: 5.00 dBi Without Beamforming Mode for PSD: 8.01 dBi Beamforming Mode: 8.01 dBi		
Test Mode	802.11ax (HE20/HE40);		
Modulation Type	802.11ax (HE20/HE40):OFDMA, OFDM		
Max. Output Power	Wi-Fi 2.4G :23.45dBm		
Operating Frequency Range(s)	802.11ax (HE20): 2412 ~ 2462 MHz 802.11ax (HE40): 2422 ~ 2452 MHz		
EUT Accessory			
Accessory	Model	Manufacture	No.
Adapter	HW-120100E01	Dongguan Shilong Fuhua Electronic Co., Ltd	1
		Shenzhen Honor Electronic Co., Ltd	2
	HW-120100B01	Dongguan Shilong Fuhua Electronic Co., Ltd	3
		Shenzhen Honor Electronic Co., Ltd	4
	HW-120100U01	Dongguan Shilong Fuhua Electronic Co., Ltd	5



		Shenzhen Honor Electronic Co., Ltd	6
<p>Note:1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.</p> <p>2. There is more than one Adapter, each one should be applied throughout the compliance test respectively, and however, only the worst case (Adapter 1) will be recorded in this report.</p>			



### 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 15C (2020) Radio Frequency Devices**

**ANSI C63.10 (2013)**

**Reference standard:**

**KDB 558074 D01 15.247 Meas Guidance v05r02**

**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 lie-down position (X axis) and the loop antenna is vertical, the others are vertical and horizontal. 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.

Band	Data Rate	
	SISO Antenna	MIMO Antenna
802.11ax (HE20)	MCS0	MCS8
802.11ax (HE40)	MCS0	MCS8

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

Test Cases	SISO Antenna 1	SISO Antenna 2	MIMO
Maximum output power	802.11ax (HE20) 802.11ax (HE40)	802.11ax (HE20) 802.11ax (HE40)	802.11ax (HE20) 802.11ax (HE40)
99% bandwidth and 6 dB bandwidth	--	--	802.11ax (HE20) 802.11ax (HE40)
Band Edge	--	--	802.11ax (HE20) 802.11ax (HE40)
Power Spectral Density	802.11ax (HE20) 802.11ax (HE40)	802.11ax (HE20) 802.11ax (HE40)	802.11ax (HE20) 802.11ax (HE40)
Spurious RF Conducted Emissions	--	--	802.11ax (HE20) 802.11ax (HE40)
Unwanted Emissions	--	--	802.11ax (HE20) 802.11ax (HE40)
Conducted Emission	--	--	802.11ax (HE40)
Note: "O": test all bands			



## 5. Test Case Results

### 5.1. Maximum output power

#### Ambient condition

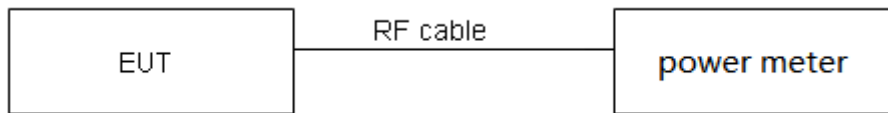
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### Methods of Measurement

During the process of the testing, The EUT was connected to Average Power meter with a known loss. The EUT is max power transmission with proper modulation. The signal transmission is continuous.

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

#### Test Setup



#### Limits

Rule Part 15.247 (b) (3) specifies that " For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz: 1 Watt."

Average Output Power	$\leq 1W$ (30dBm)
----------------------	-------------------

#### 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****TB Mode**

Band	T <sub>on</sub> (ms)	T <sub>(on+off)</sub> (ms)	Duty cycle	Duty cycle correction Factor(dB)
802.11ax (HE20) 26-Tones	2.05	2.15	0.95	0.21
802.11ax (HE20) 52-Tones	1.08	1.16	0.93	0.31
802.11ax (HE20) 106-Tones	0.54	0.64	0.84	0.74
802.11ax (HE40) 52-Tones	1.06	1.16	0.91	0.39
802.11ax (HE40) 106-Tones	0.55	0.65	0.85	0.73
802.11ax (HE40) 242-Tones	0.28	0.39	0.72	1.42
802.11ax (HE40) 484-Tones	0.18	0.27	0.66	1.83

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

**MIMO**

Network Standards	Carrier 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)			
802.11ax (HE20) 26-Tones	2412	10.73	10.94	10.11	10.32	13.65	30	PASS
	2417	11.89	12.10	11.40	11.61	14.87	30	PASS
	2422	13.02	13.23	12.88	13.09	16.17	30	PASS
	2427	16.77	16.98	15.82	16.03	19.54	30	PASS
	2437	16.48	16.69	15.76	15.97	19.35	30	PASS
	2452	15.46	15.67	15.44	15.65	18.67	30	PASS
	2457	14.06	14.27	13.92	14.13	17.21	30	PASS
	2462	13.09	13.30	12.56	12.77	16.05	30	PASS
802.11ax (HE20) 52-Tones	2412	11.73	12.04	11.25	11.56	14.82	30	PASS
	2417	14.07	14.38	13.50	13.81	17.11	30	PASS
	2422	14.72	15.03	14.38	14.69	17.87	30	PASS
	2427	18.57	18.88	17.01	17.32	21.18	30	PASS
	2437	18.18	18.49	16.97	17.28	20.94	30	PASS
	2452	17.51	17.82	16.95	17.26	20.56	30	PASS
	2457	15.75	16.06	15.43	15.74	18.91	30	PASS
	2462	14.97	15.28	14.36	14.67	18.00	30	PASS
802.11ax (HE20) 106-Tones	2412	13.04	13.78	11.62	12.36	16.14	30	PASS
	2417	13.48	14.22	12.86	13.60	16.93	30	PASS
	2422	14.62	15.36	14.02	14.76	18.08	30	PASS
	2427	18.80	19.54	17.95	18.69	22.14	30	PASS
	2437	18.69	19.43	17.94	18.68	22.08	30	PASS
	2452	17.84	18.58	17.81	18.55	21.57	30	PASS
	2457	16.35	17.09	16.09	16.83	19.97	30	PASS
	2462	15.20	15.94	14.74	15.48	18.72	30	PASS
802.11ax (HE40) 52-Tones	2422	10.48	10.87	9.52	9.91	13.43	30	PASS
	2427	11.70	12.09	10.29	10.68	14.45	30	PASS
	2432	12.73	13.12	11.32	11.71	15.48	30	PASS
	2437	13.68	14.07	12.92	13.31	16.72	30	PASS
	2447	13.50	13.89	12.70	13.09	16.52	30	PASS
	2452	15.35	15.74	14.54	14.93	18.37	30	PASS
802.11ax (HE40) 106-Tones	2422	11.55	12.28	10.91	11.64	14.98	30	PASS
	2427	12.37	13.10	11.75	12.48	15.81	30	PASS
	2432	13.11	13.84	12.35	13.08	16.48	30	PASS
	2437	14.69	15.42	13.73	14.46	17.97	30	PASS
	2447	14.34	15.07	13.63	14.36	17.74	30	PASS
	2452	16.02	16.75	15.86	16.59	19.68	30	PASS
802.11ax (HE40)	2422	12.83	14.25	12.71	14.13	17.20	30	PASS



242-Tones	2427	11.24	12.66	10.82	12.24	15.46	30	PASS
	2432	15.12	16.54	15.01	16.43	19.49	30	PASS
	2437	16.22	17.64	15.31	16.73	20.22	30	PASS
	2447	16.11	17.53	15.34	16.76	20.17	30	PASS
	2452	17.87	19.29	17.22	18.64	21.98	30	PASS
802.11ax (HE40) 484-Tones	2422	12.03	13.86	12.33	14.16	17.02	30	PASS
	2427	13.32	15.15	12.67	14.50	17.84	30	PASS
	2432	14.53	16.36	13.68	15.51	18.96	30	PASS
	2437	15.43	17.26	14.93	16.76	20.02	30	PASS
	2447	15.37	17.20	14.78	16.61	19.92	30	PASS
	2452	17.25	19.08	16.92	18.75	21.92	30	PASS

Note: 1. Average Power with duty factor = Average Power Measured + Duty cycle correction factor

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

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

3. The manufacturer declared the transmitter output signals is CDD mode. And  $N_{SS}=1$ . According to KDB 662911 D01 Multiple Transmitter Output v02r01 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  $\geq 40$  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 =  $G_{ANT} + \text{Array Gain} = 5 + 0 = 5 \text{ dBi} < 6 \text{ dBi}$ . So the power limit is 30dBm

**SU Mode**

Band	T <sub>on</sub> (ms)	T <sub>(on+off)</sub> (ms)	Duty cycle	Duty cycle correction Factor(dB)
802.11ax (HE20)	1.73	1.82	0.95	0.21
802.11ax (HE40)	0.90	0.99	0.90	0.44

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

**SISO Antenna 1**

Network Standards	Carrier frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11ax (HE20)	2412	17.11	17.32	30	PASS
	2417	18.21	18.42	30	PASS
	2422	19.71	19.92	30	PASS
	2427	22.01	22.22	30	PASS
	2437	22.03	22.24	30	PASS
	2452	21.68	21.89	30	PASS
	2457	21.75	21.96	30	PASS
	2462	20.16	20.37	30	PASS
802.11ax (HE40)	2422	16.22	16.66	30	PASS
	2427	18.03	18.47	30	PASS
	2432	18.11	18.55	30	PASS
	2437	20.32	20.76	30	PASS
	2442	19.96	20.40	30	PASS
	2447	19.99	20.43	30	PASS
	2452	20.99	21.43	30	PASS

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



## SISO Antenna 2

Network Standards	Carrier frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11ax (HE20)	2412	17.22	17.43	30	PASS
	2417	18.55	18.76	30	PASS
	2422	19.75	19.96	30	PASS
	2427	22.08	22.29	30	PASS
	2437	22.04	22.25	30	PASS
	2452	21.87	22.08	30	PASS
	2457	20.33	20.54	30	PASS
	2462	19.04	19.25	30	PASS
802.11ax (HE40)	2422	16.03	16.47	30	PASS
	2427	17.94	18.38	30	PASS
	2432	17.86	18.30	30	PASS
	2437	19.44	19.88	30	PASS
	2442	19.83	20.27	30	PASS
	2447	19.74	20.18	30	PASS
	2452	20.87	21.31	30	PASS

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

**MIMO****Without Beamforming**

Network Standards	Carrier 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)			
802.11ax (HE20)	2412	14.78	14.99	14.26	14.47	17.74	30	PASS
	2417	16.04	16.25	15.48	15.69	18.98	30	PASS
	2422	17.08	17.29	16.41	16.62	19.97	30	PASS
	2427	20.31	20.52	20.16	20.37	23.45	30	PASS
	2437	20.23	20.44	19.97	20.18	23.32	30	PASS
	2452	19.74	19.95	18.88	19.09	22.55	30	PASS
	2457	18.16	18.37	17.27	17.48	20.95	30	PASS
	2462	16.84	17.05	15.96	16.17	19.64	30	PASS
802.11ax (HE40)	2422	12.95	13.39	12.66	13.10	16.26	30	PASS
	2427	15.18	15.62	14.55	14.99	18.33	30	PASS
	2432	13.34	13.78	12.82	13.26	16.54	30	PASS
	2437	17.54	17.98	16.24	16.68	20.39	30	PASS
	2442	17.03	17.47	16.44	16.88	20.20	30	PASS
	2447	16.86	17.30	16.39	16.83	20.08	30	PASS
	2452	19.12	19.56	18.64	19.08	22.34	30	PASS

Note: 1. Average Power with duty factor = Average Power Measured + Duty cycle correction factor

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

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

3. The manufacturer declared the transmitter output signals is CDD mode. And  $N_{ss}=1$ . According to KDB 662911 D01 Multiple Transmitter Output v02r01 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  $\geq 40$  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 =  $G_{ANT} + \text{Array Gain} = 5 + 0 = 5 \text{ dBi} < 6 \text{ dBi}$ . So the power limit is 30dBm



## With Beamforming

Network Standards	Carrier 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)			
802.11ax (HE20)	2412	14.31	14.52	13.65	13.86	17.21	27.99	PASS
	2417	15.84	16.05	14.98	15.19	18.65	27.99	PASS
	2422	16.75	16.96	15.96	16.17	19.59	27.99	PASS
	2427	20.36	20.57	19.96	20.17	23.38	27.99	PASS
	2437	20.19	20.40	19.92	20.13	23.27	27.99	PASS
	2452	19.62	19.83	18.63	18.84	22.37	27.99	PASS
	2457	18.32	18.53	17.18	17.39	21.00	27.99	PASS
	2462	16.73	16.94	15.75	15.96	19.48	27.99	PASS
802.11ax (HE40)	2422	12.90	13.34	12.81	13.25	16.31	27.99	PASS
	2427	15.32	15.76	14.66	15.10	18.45	27.99	PASS
	2432	13.17	13.61	12.62	13.06	16.36	27.99	PASS
	2437	17.49	17.93	16.31	16.75	20.39	27.99	PASS
	2442	16.95	17.39	16.32	16.76	20.10	27.99	PASS
	2447	17.03	17.47	16.11	16.55	20.05	27.99	PASS
	2452	19.37	19.81	18.92	19.36	22.60	27.99	PASS

Note: 1. Average Power with duty factor = Average Power Measured + Duty cycle correction factor

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

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

3. The manufacturer declared the transmitter output signals is CDD mode And Nss=1. Direction gain calculation according to KDB662911 D01 Multiple Transmitter Output v02r01 F) 2) e) (i), If all antennas have the same gain, directional gain = GANT + 10 log(NANT/NSS) (ii) If antenna gains are not equal, directional gain = GANTMAX + 10 log(NANT/NSS). So the directional gain =  $5.0 + 10\log(2/Nss) = 8.01 > 6$ . So the power limit =  $30 - (8.01 - 6) = 27.99$ .



## 5.2. 99% Bandwidth and 6dB Bandwidth

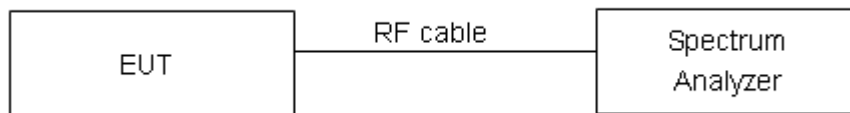
### Ambient condition

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. RBW is set to 100 kHz; VBW is set to 300 kHz on spectrum analyzer. Dector=Peak, Trace mode=max hold.

### Test Setup



### Limits

Rule Part 15.247 (a) (2) specifies that “Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.”

minimum 6 dB bandwidth	≥ 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:**  
**TB Mode**  
**MIMO Antenna**

Network Standards	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11ax (HE20) 26-Tones	2412	19.069	19.00	500	PASS
	2417	19.087	18.96	500	PASS
	2422	19.085	19.00	500	PASS
	2427	19.067	19.04	500	PASS
	2437	19.045	19.01	500	PASS
	2452	19.078	19.00	500	PASS
	2457	19.056	19.00	500	PASS
	2462	19.041	19.00	500	PASS
802.11ax (HE20) 52-Tones	2412	19.023	18.93	500	PASS
	2417	19.021	18.98	500	PASS
	2422	18.950	18.97	500	PASS
	2427	19.006	18.88	500	PASS
	2437	18.994	18.98	500	PASS
	2452	18.960	18.92	500	PASS
	2457	18.948	18.92	500	PASS
	2462	18.966	18.96	500	PASS
802.11ax (HE20) 106-Tones	2412	19.046	19.06	500	PASS
	2417	19.031	19.07	500	PASS
	2422	19.002	19.09	500	PASS
	2427	19.068	19.09	500	PASS
	2437	19.048	19.03	500	PASS
	2452	19.029	19.07	500	PASS
	2457	18.998	19.01	500	PASS
	2462	19.015	19.07	500	PASS
802.11ax (HE40)	2422	37.990	38.03	500	PASS



52-Tones	2427	37.967	38.04	500	PASS
	2432	37.972	37.98	500	PASS
	2437	37.968	38.01	500	PASS
	2447	37.999	38.03	500	PASS
	2452	38.043	38.02	500	PASS
802.11ax (HE40) 106-Tones	2422	37.832	38.01	500	PASS
	2427	37.786	38.00	500	PASS
	2432	37.826	38.06	500	PASS
	2437	37.835	38.04	500	PASS
	2447	37.846	38.06	500	PASS
	2452	37.793	38.04	500	PASS
802.11ax (HE40) 242-Tones	2422	37.788	38.02	500	PASS
	2427	37.844	38.02	500	PASS
	2432	37.818	37.87	500	PASS
	2437	37.810	37.96	500	PASS
	2447	37.830	38.02	500	PASS
	2452	37.821	38.04	500	PASS
802.11ax (HE40) 484-Tones	2422	37.776	38.11	500	PASS
	2427	37.807	37.95	500	PASS
	2432	37.817	37.81	500	PASS
	2437	37.832	38.01	500	PASS
	2447	37.801	38.03	500	PASS
	2452	37.795	37.93	500	PASS



## SU Mode

## MIMO Antenna

Network Standards	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11ax (HE20)	2412	19.085	19.00	500	PASS
	2417	19.043	19.01	500	PASS
	2422	19.043	18.98	500	PASS
	2427	19.125	19.03	500	PASS
	2437	19.134	19.07	500	PASS
	2452	19.104	18.94	500	PASS
	2457	19.062	19.02	500	PASS
	2462	19.051	18.96	500	PASS
802.11ax (HE40)	2422	37.826	37.82	500	PASS
	2427	37.862	38.01	500	PASS
	2432	37.903	38.05	500	PASS
	2437	37.847	38.13	500	PASS
	2442	37.829	38.10	500	PASS
	2447	37.852	38.11	500	PASS
	2452	37.821	38.04	500	PASS

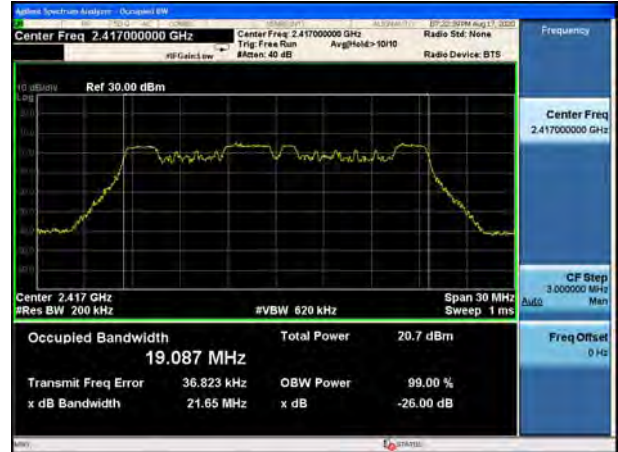


**TB Mode**  
**MIMO Antenna**  
**99%bandwidth**

802.11ax (HE20), Carrier frequency (MHz): 2412  
26-Tones



802.11ax (HE20), Carrier frequency (MHz): 2417  
26-Tones



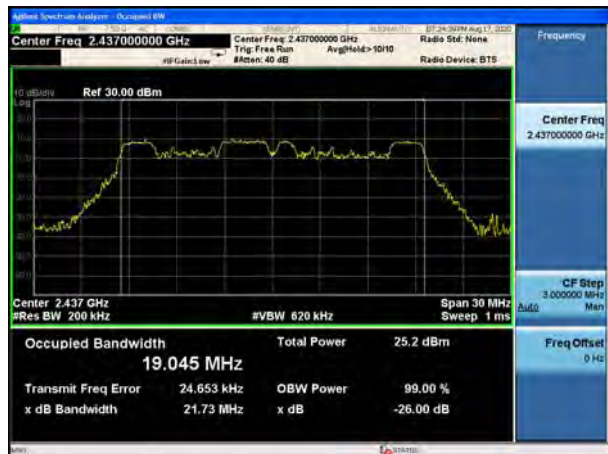
802.11ax (HE20)Carrier frequency (MHz): 2422  
26-Tones



802.11ax (HE20), Carrier frequency (MHz): 2427  
26-Tones



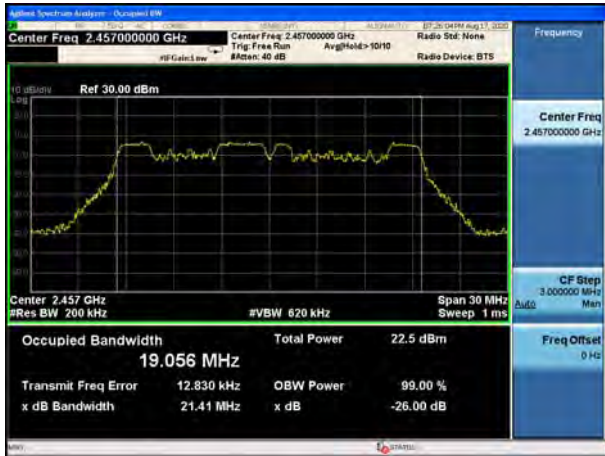
802.11ax (HE20), Carrier frequency (MHz):2437  
26-Tones



802.11ax (HE20) Carrier frequency (MHz):2452  
26-Tones



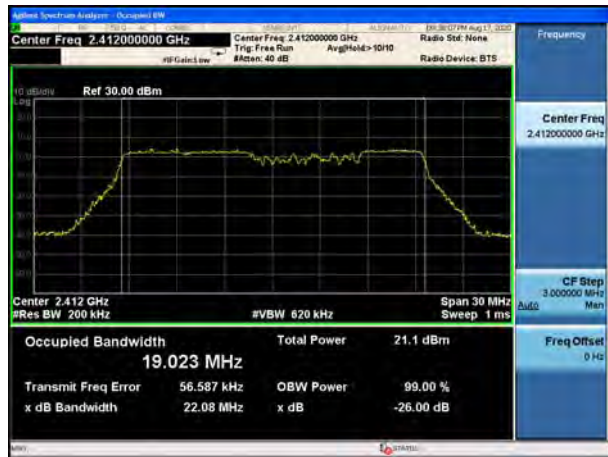
802.11ax (HE20), Carrier frequency (MHz):2457  
26-Tones



802.11ax (HE20) Carrier frequency (MHz):2462  
26-Tones



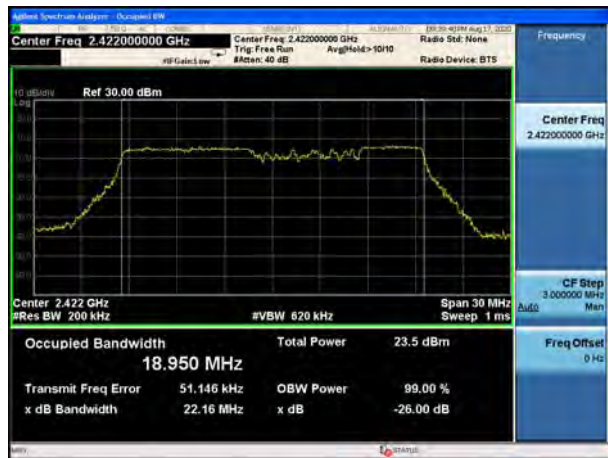
802.11ax (HE20), Carrier frequency (MHz): 2412  
52-Tones



802.11ax (HE20), Carrier frequency (MHz): 2417  
52-Tones



802.11ax (HE20)Carrier frequency (MHz): 2422  
52-Tones



802.11ax (HE20), Carrier frequency (MHz): 2427  
52-Tones



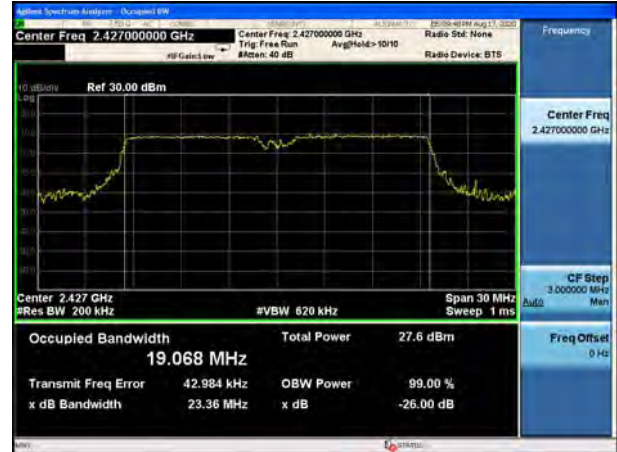




802.11ax (HE20)Carrier frequency (MHz): 2422  
106-Tones



802.11ax (HE20), Carrier frequency (MHz): 2427  
106-Tones



802.11ax (HE20), Carrier frequency (MHz):2437  
106-Tones



802.11ax (HE20) Carrier frequency (MHz):2452  
106-Tones



802.11ax (HE20), Carrier frequency (MHz):2457  
106-Tones



802.11ax (HE20) Carrier frequency (MHz):2462  
106-Tones







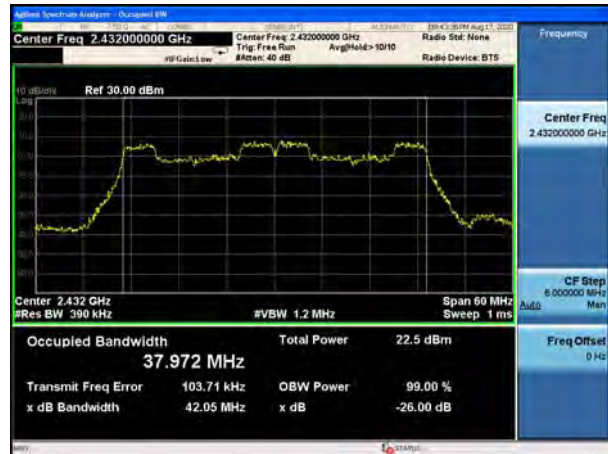
802.11ax (HE40), Carrier frequency (MHz): 2422  
52-Tones



802.11ax (HE40), Carrier frequency (MHz): 2427  
52-Tones



802.11ax (HE40)Carrier frequency (MHz): 2432  
52-Tones



802.11ax (HE40), Carrier frequency (MHz): 2437  
52-Tones



802.11ax (HE40), Carrier frequency (MHz):2447  
52-Tones



802.11ax (HE40) Carrier frequency (MHz):2452  
52-Tones





802.11ax (HE40), Carrier frequency (MHz): 2422  
106-Tones



802.11ax (HE40), Carrier frequency (MHz): 2427  
106-Tones



802.11ax (HE40)Carrier frequency (MHz): 2432  
106-Tones



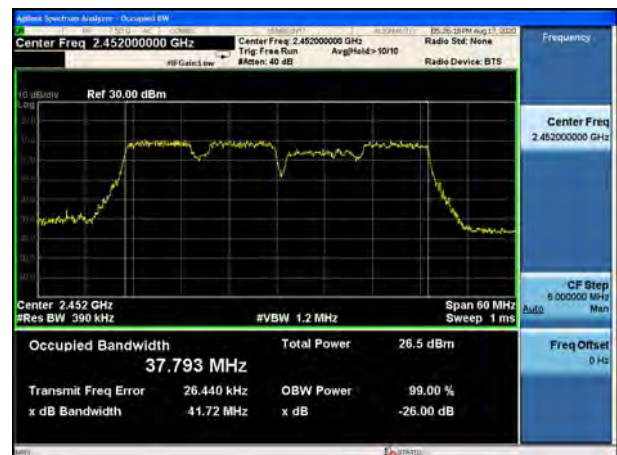
802.11ax (HE40), Carrier frequency (MHz): 2437  
106-Tones



802.11ax (HE40), Carrier frequency (MHz):2447  
106-Tones



802.11ax (HE40) Carrier frequency (MHz):2452  
106-Tones

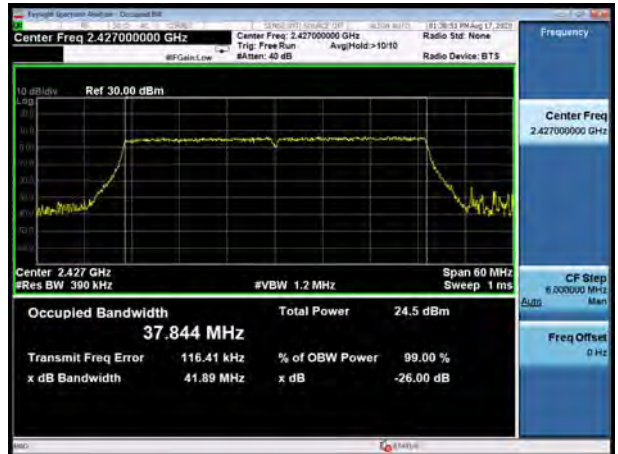




802.11ax (HE40), Carrier frequency (MHz): 2422  
242-Tones



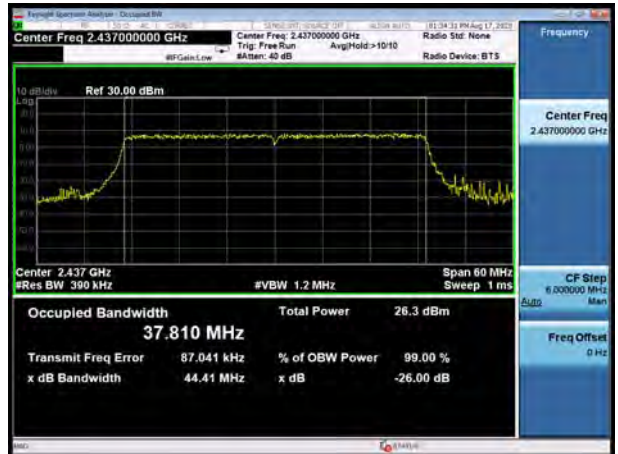
802.11ax (HE40), Carrier frequency (MHz): 2427  
242-Tones



802.11ax (HE40)Carrier frequency (MHz): 2432  
242-Tones



802.11ax (HE40), Carrier frequency (MHz): 2437  
242-Tones



802.11ax (HE40), Carrier frequency (MHz):2447  
242-Tones



802.11ax (HE40) Carrier frequency (MHz):2452  
242-Tones

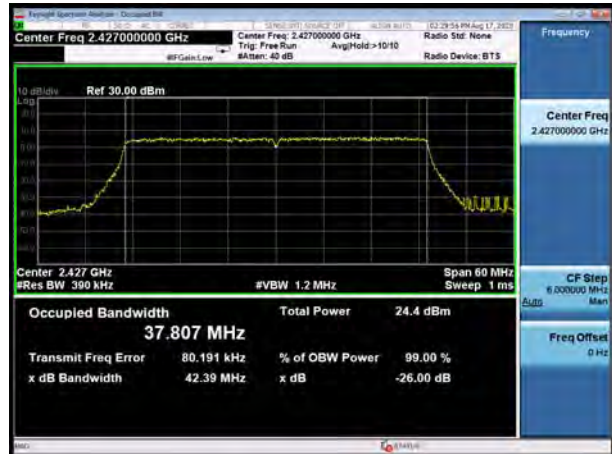




802.11ax (HE40), Carrier frequency (MHz): 2422  
484-Tones



802.11ax (HE40), Carrier frequency (MHz): 2427  
484-Tones



802.11ax (HE40) Carrier frequency (MHz): 2432  
484-Tones



802.11ax (HE40), Carrier frequency (MHz): 2437  
484-Tones



802.11ax (HE40), Carrier frequency (MHz): 2447  
484-Tones



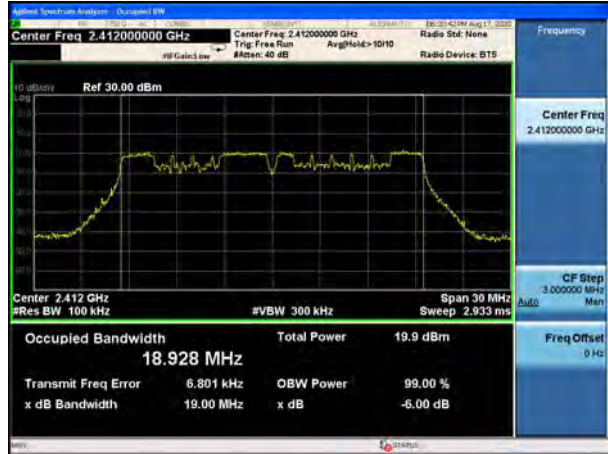
802.11ax (HE40) Carrier frequency (MHz): 2452  
484-Tones



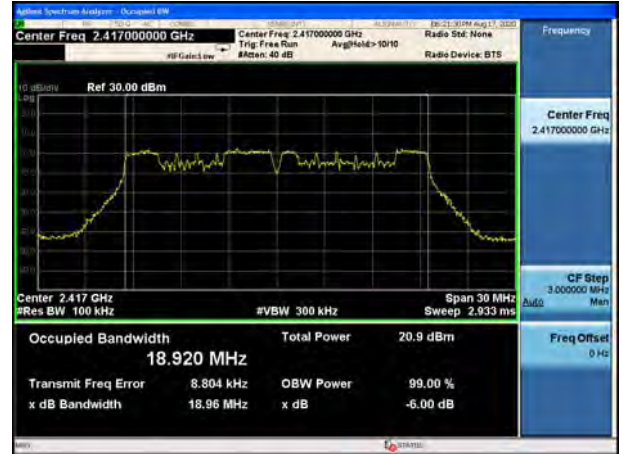


6 dB bandwidth

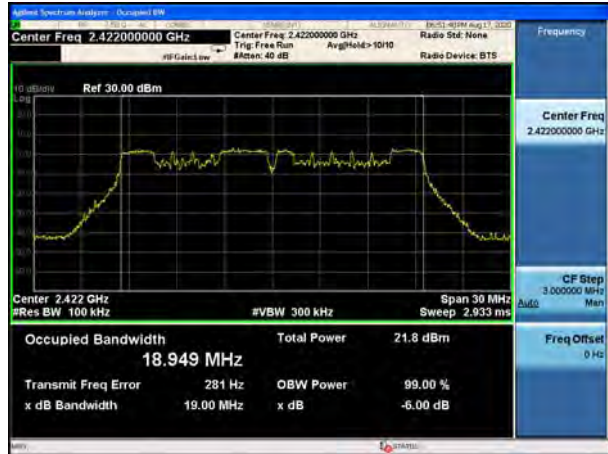
802.11ax (HE20), Carrier frequency (MHz): 2412  
26-Tones



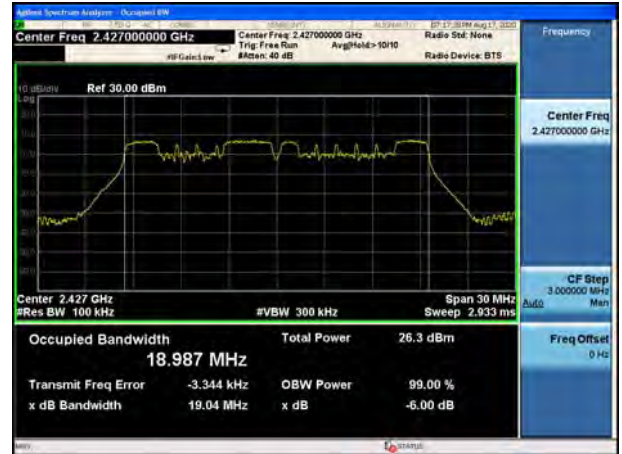
802.11ax (HE20), Carrier frequency (MHz): 2417  
26-Tones



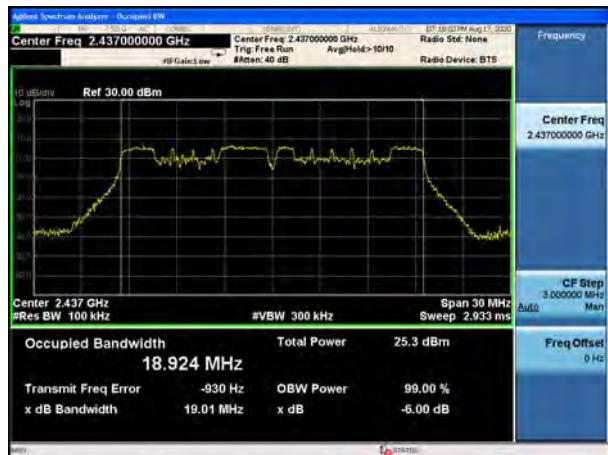
802.11ax (HE20)Carrier frequency (MHz): 2422  
26-Tones



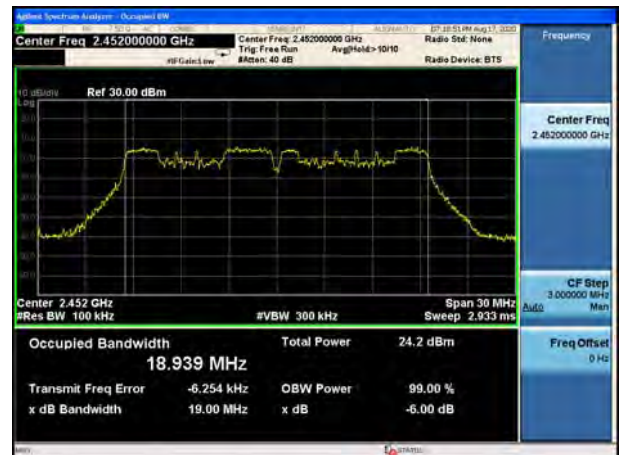
802.11ax (HE20), Carrier frequency (MHz): 2427  
26-Tones



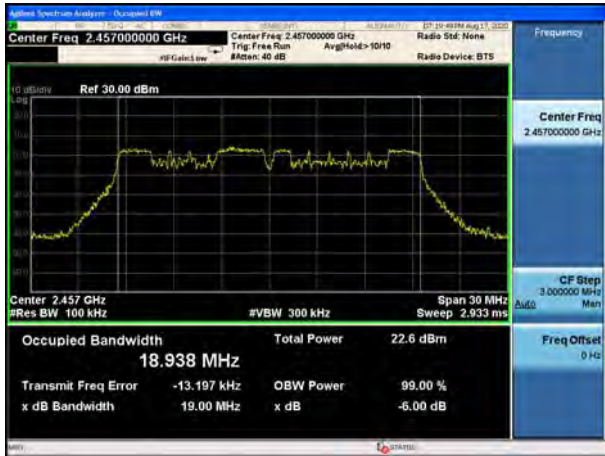
802.11ax (HE20), Carrier frequency (MHz):2437  
26-Tones



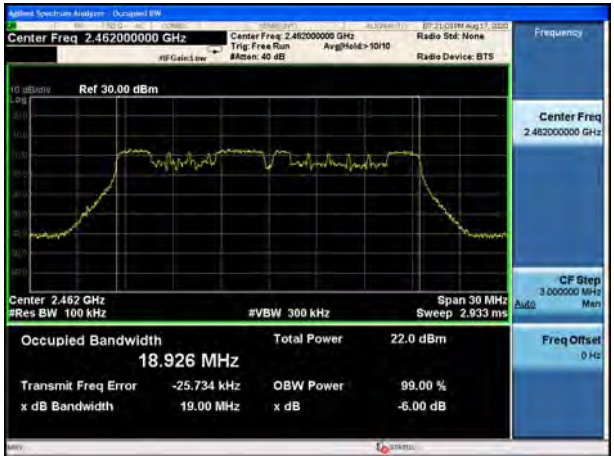
802.11ax (HE20) Carrier frequency (MHz):2452  
26-Tones



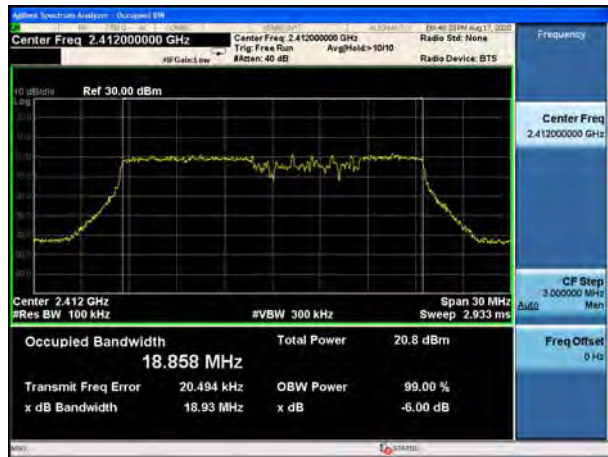
802.11ax (HE20), Carrier frequency (MHz):2457  
26-Tones



802.11ax (HE20) Carrier frequency (MHz):2462  
26-Tones



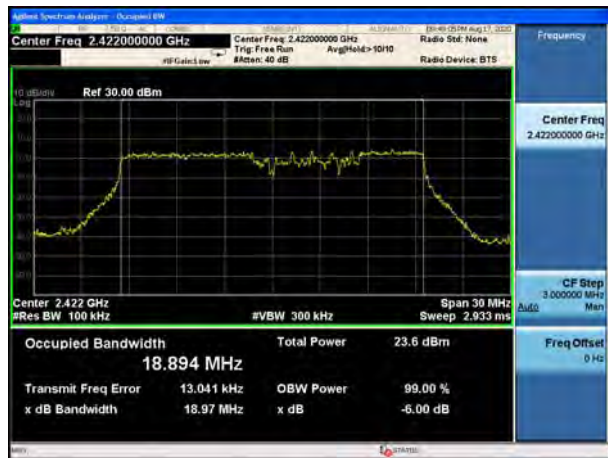
802.11ax (HE20), Carrier frequency (MHz): 2412  
52-Tones



802.11ax (HE20), Carrier frequency (MHz): 2417  
52-Tones



802.11ax (HE20)Carrier frequency (MHz): 2422  
52-Tones

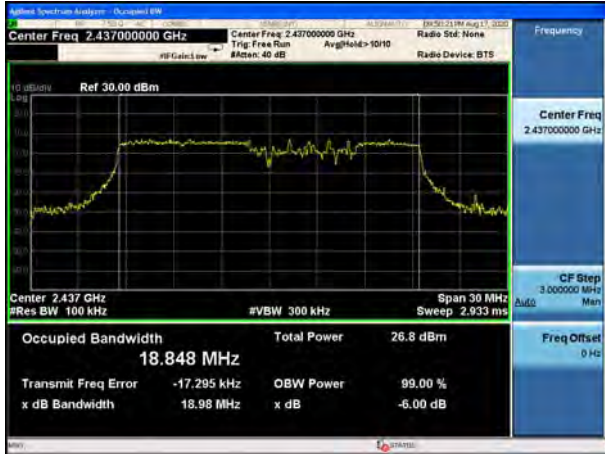


802.11ax (HE20), Carrier frequency (MHz): 2427  
52-Tones





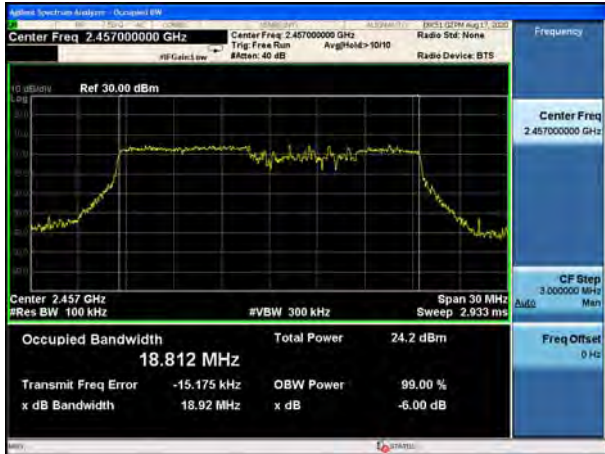
802.11ax (HE20), Carrier frequency (MHz):2437  
52-Tones



802.11ax (HE20) Carrier frequency (MHz):2452  
52-Tones



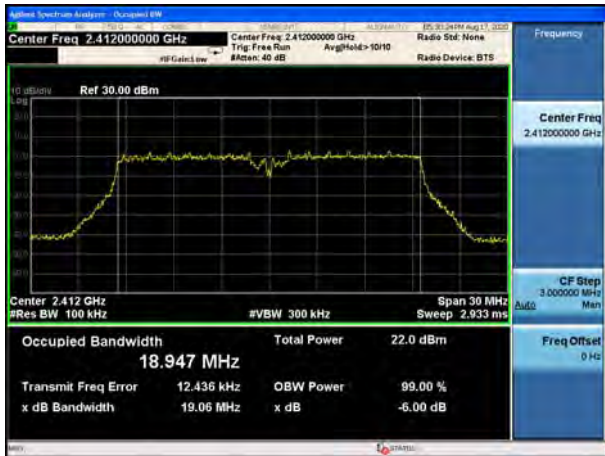
802.11ax (HE20), Carrier frequency (MHz):2457  
52-Tones



802.11ax (HE20) Carrier frequency (MHz):2462  
52-Tones



802.11ax (HE20), Carrier frequency (MHz): 2412  
106-Tones



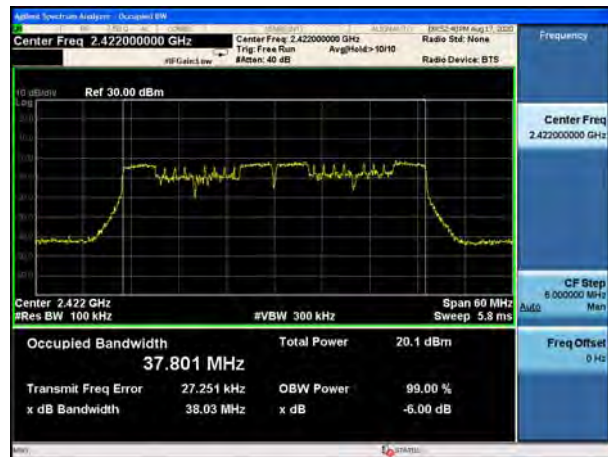
802.11ax (HE20), Carrier frequency (MHz): 2417  
106-Tones



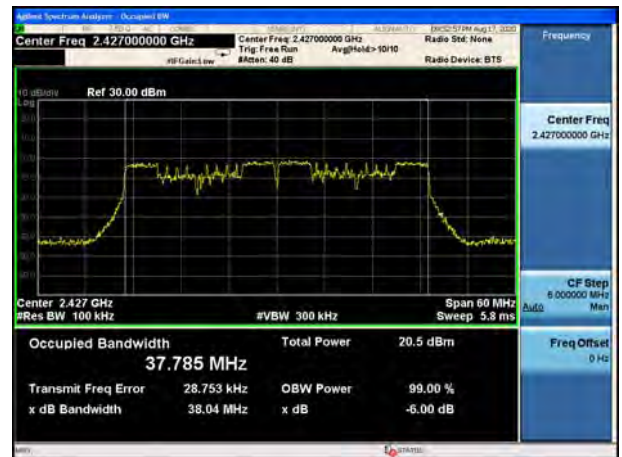




802.11ax (HE40), Carrier frequency (MHz): 2422  
52-Tones



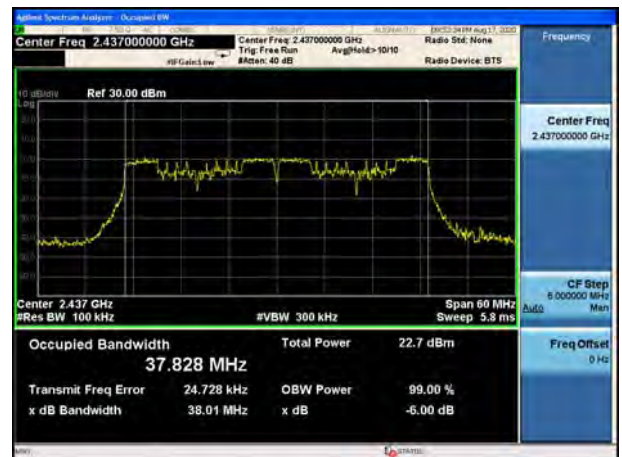
802.11ax (HE40), Carrier frequency (MHz): 2427  
52-Tones



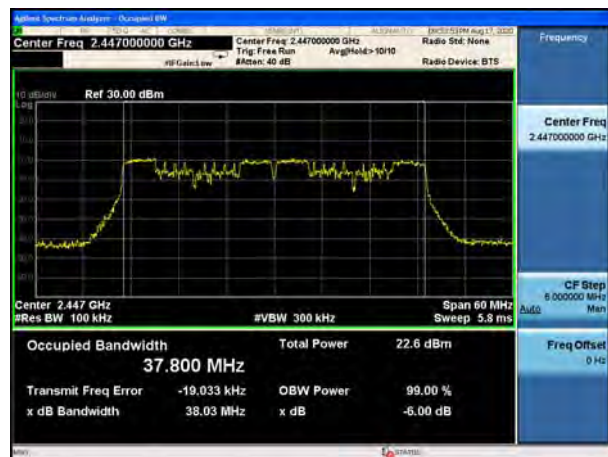
802.11ax (HE40)Carrier frequency (MHz): 2432  
52-Tones



802.11ax (HE40), Carrier frequency (MHz): 2437  
52-Tones



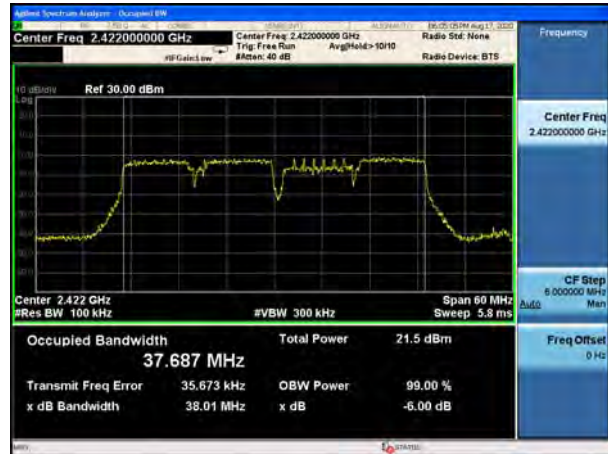
802.11ax (HE40), Carrier frequency (MHz):2447  
52-Tones



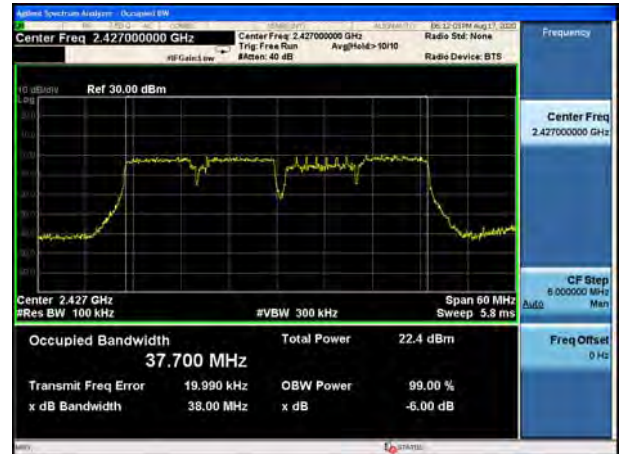
802.11ax (HE40) Carrier frequency (MHz):2452  
52-Tones



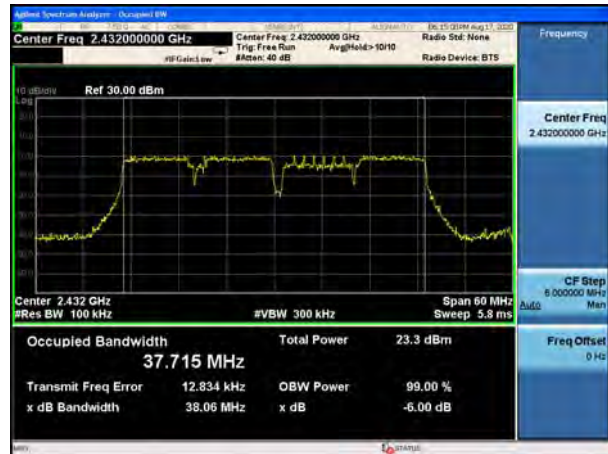
802.11ax (HE40), Carrier frequency (MHz): 2422  
106-Tones



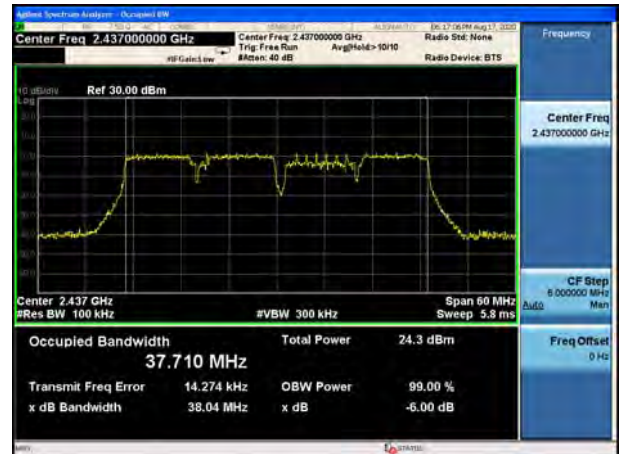
802.11ax (HE40), Carrier frequency (MHz): 2427  
106-Tones



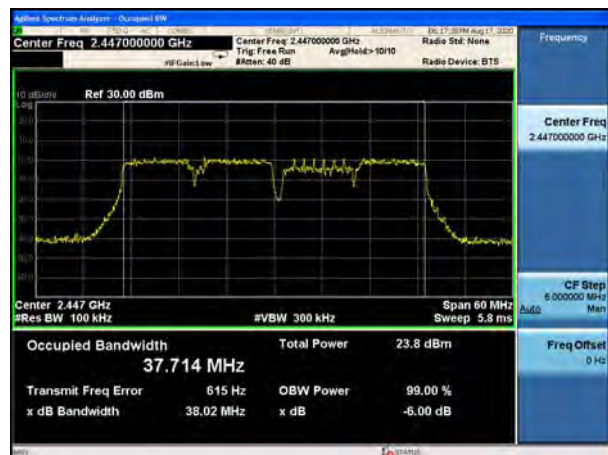
802.11ax (HE40)Carrier frequency (MHz): 2432  
106-Tones



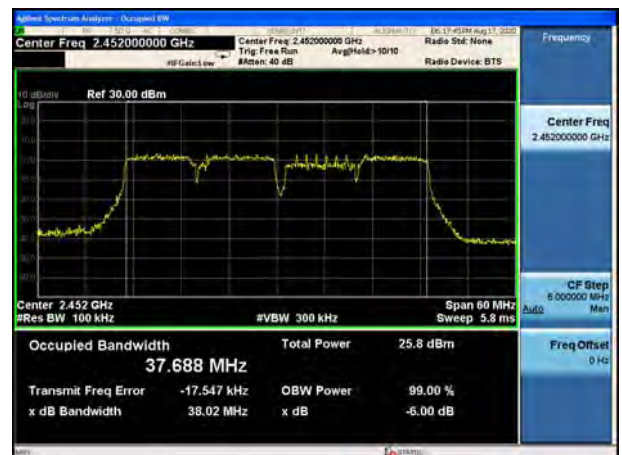
802.11ax (HE40), Carrier frequency (MHz): 2437  
106-Tones



802.11ax (HE40), Carrier frequency (MHz):2447  
106-Tones



802.11ax (HE40) Carrier frequency (MHz):2452  
106-Tones

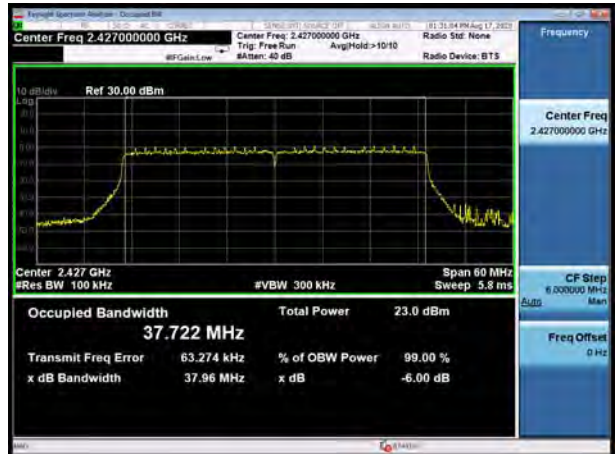




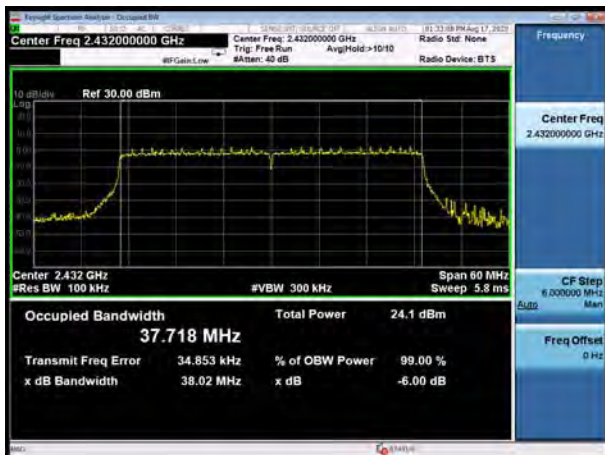
802.11ax (HE40), Carrier frequency (MHz): 2422  
242-Tones



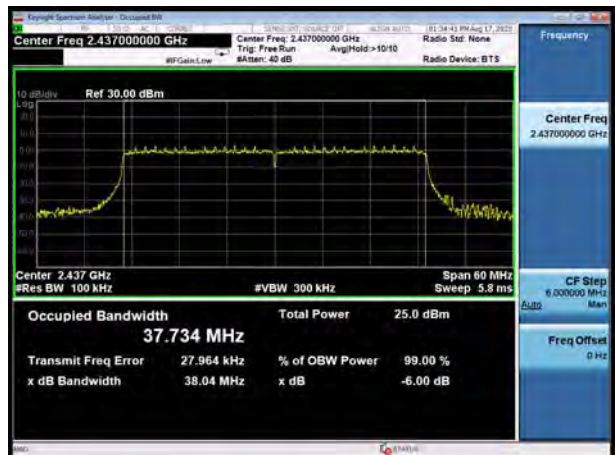
802.11ax (HE40), Carrier frequency (MHz): 2427  
242-Tones



802.11ax (HE40)Carrier frequency (MHz): 2432  
242-Tones



802.11ax (HE40), Carrier frequency (MHz): 2437  
242-Tones



802.11ax (HE40), Carrier frequency (MHz):2447  
242-Tones

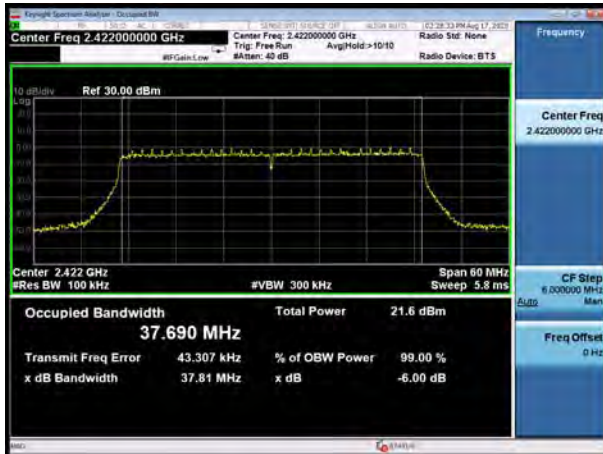


802.11ax (HE40) Carrier frequency (MHz):2452  
242-Tones

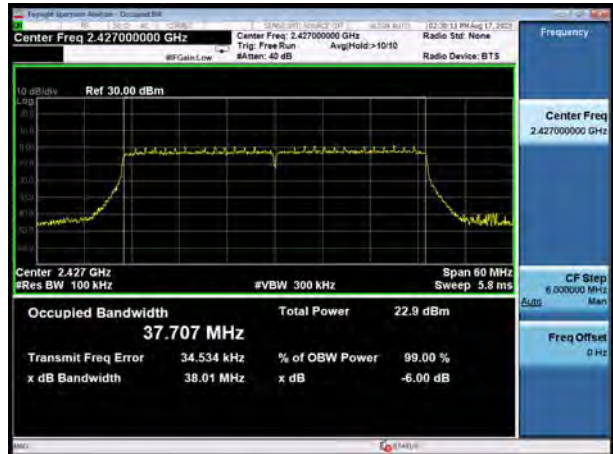




802.11ax (HE40), Carrier frequency (MHz): 2422  
484-Tones



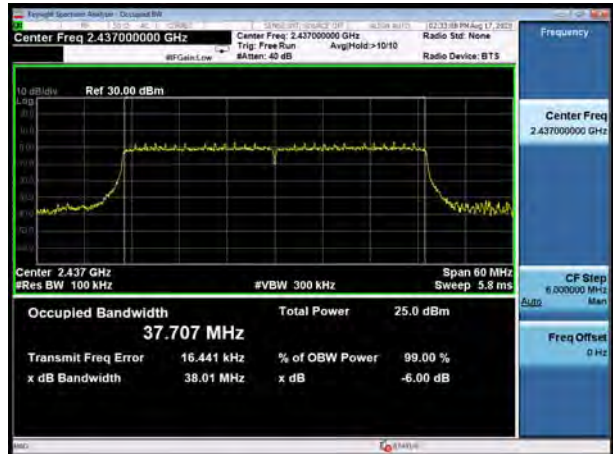
802.11ax (HE40), Carrier frequency (MHz): 2427  
484-Tones



802.11ax (HE40)Carrier frequency (MHz): 2432  
484-Tones



802.11ax (HE40), Carrier frequency (MHz): 2437  
484-Tones



802.11ax (HE40), Carrier frequency (MHz):2447  
484-Tones



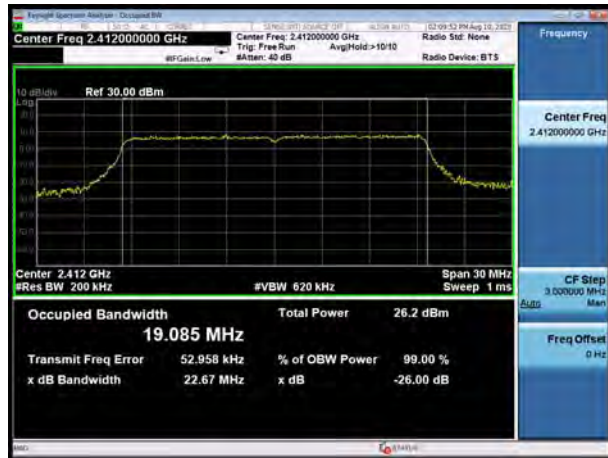
802.11ax (HE40) Carrier frequency (MHz):2452  
484-Tones



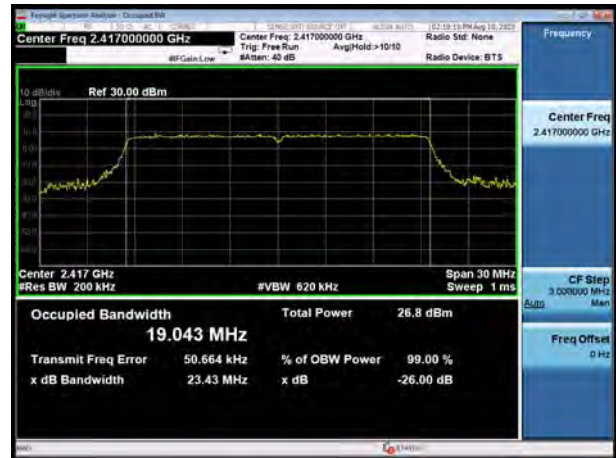


SU Mode  
MIMO Antenna  
99% bandwidth

802.11ax (HE20), Carrier frequency (MHz): 2412



802.11ax (HE20), Carrier frequency (MHz): 2417



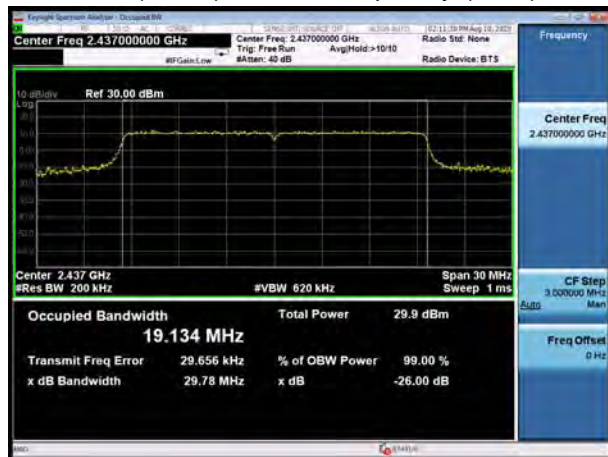
802.11ax (HE20)Carrier frequency (MHz): 2422



802.11ax (HE20)Carrier frequency (MHz): 2427



802.11ax (HE20), Carrier frequency (MHz):2437

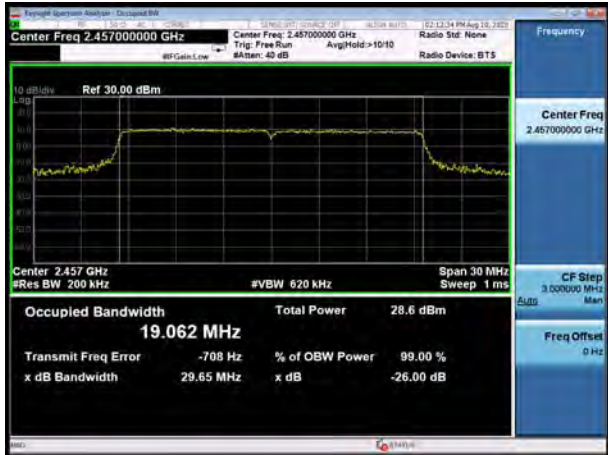


802.11ax (HE20), Carrier frequency (MHz):2452

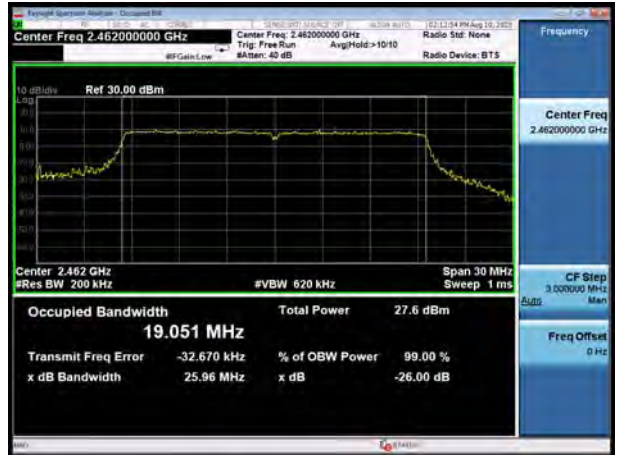




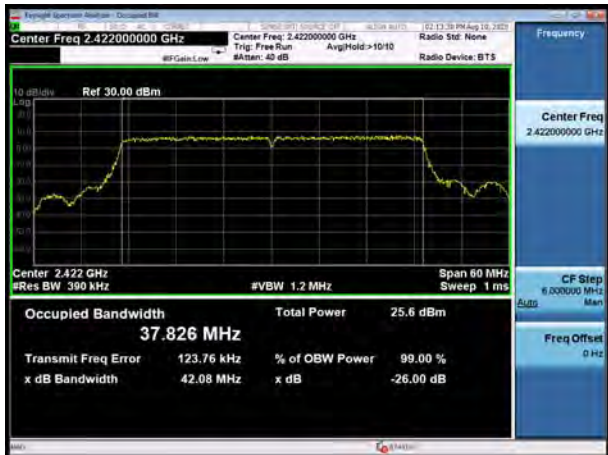
802.11ax (HE20), Carrier frequency (MHz):2457



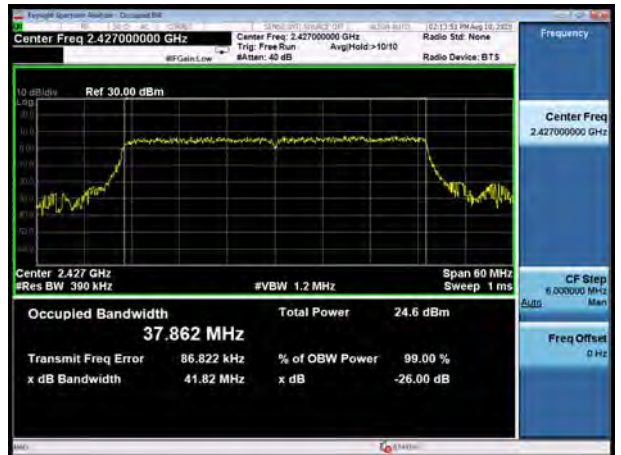
802.11ax (HE20), Carrier frequency (MHz):2462



802.11ax (HE40), Carrier frequency (MHz): 2422



802.11ax (HE40), Carrier frequency (MHz): 2427



802.11ax (HE40)Carrier frequency (MHz): 2432

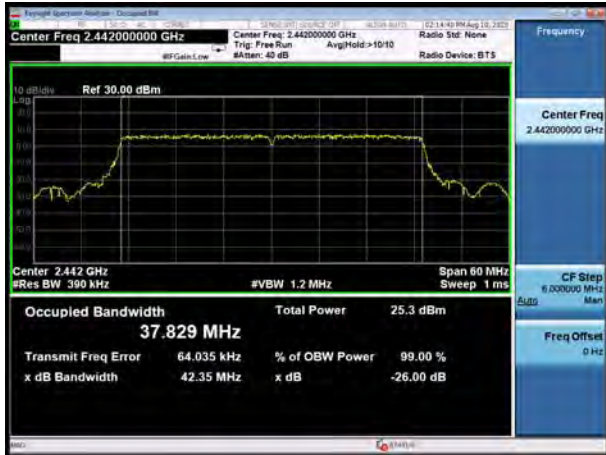


802.11ax (HE40)Carrier frequency (MHz): 2437

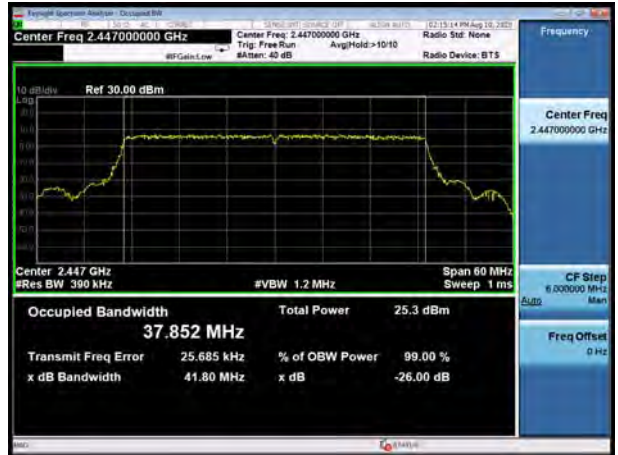




802.11ax (HE40), Carrier frequency (MHz):2442



802.11ax (HE40), Carrier frequency (MHz):2447



802.11ax (HE40), Carrier frequency (MHz):2452





6 dB bandwidth

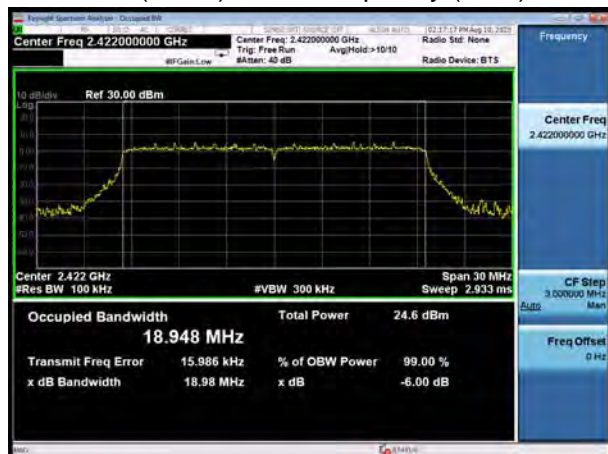
802.11ax (HE20), Carrier frequency (MHz): 2412



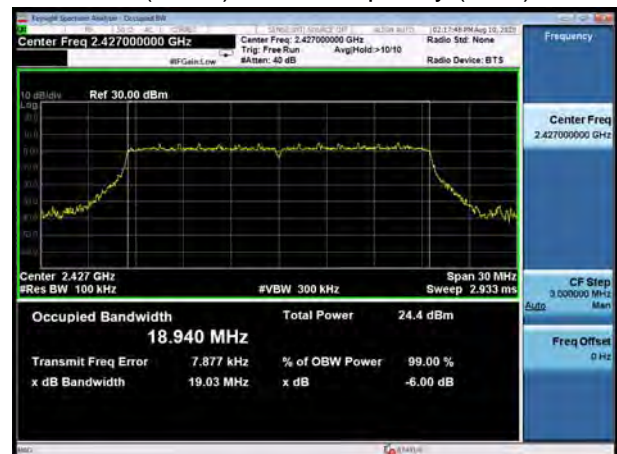
802.11ax (HE20), Carrier frequency (MHz): 2417



802.11ax (HE20)Carrier frequency (MHz): 2422



802.11ax (HE20)Carrier frequency (MHz): 2427



802.11ax (HE20), Carrier frequency (MHz):2437



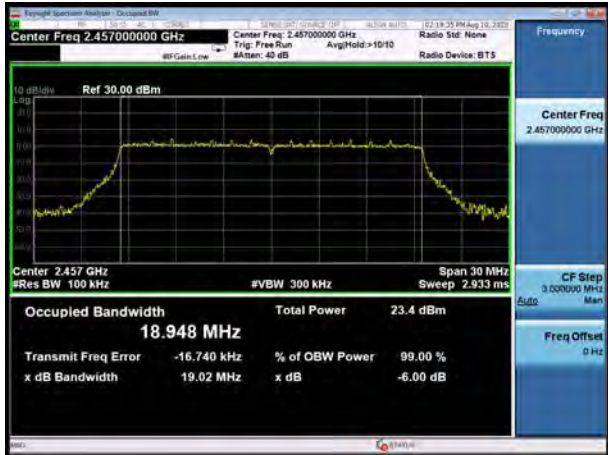
802.11ax (HE20), Carrier frequency (MHz):2452



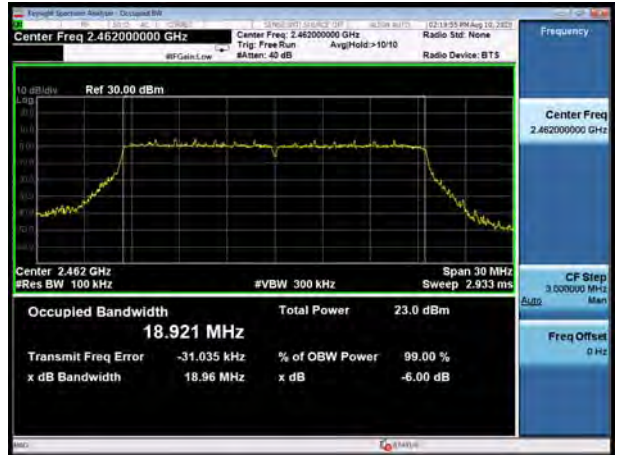




802.11ax (HE20), Carrier frequency (MHz):2457



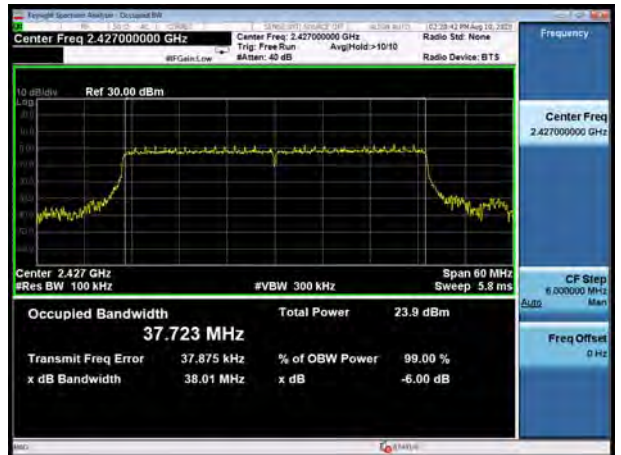
802.11ax (HE20), Carrier frequency (MHz):2462



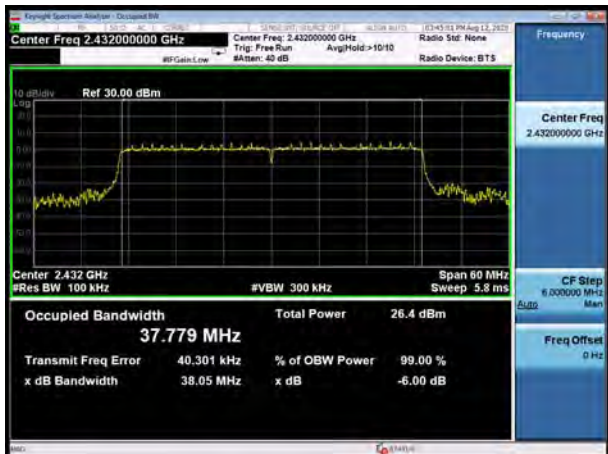
802.11ax (HE40), Carrier frequency (MHz): 2422



802.11ax (HE40), Carrier frequency (MHz): 2427



802.11ax (HE40)Carrier frequency (MHz): 2432

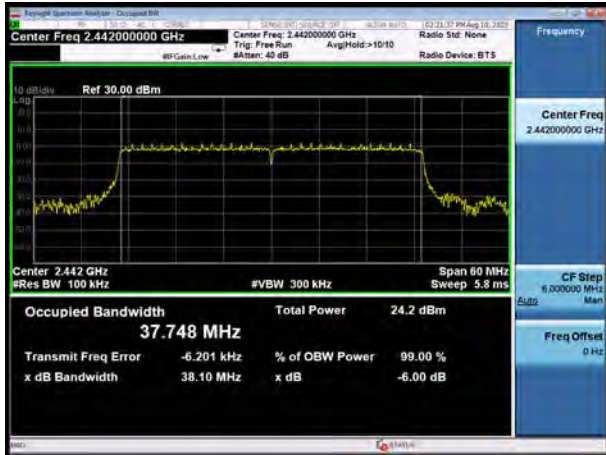


802.11ax (HE40)Carrier frequency (MHz): 2437

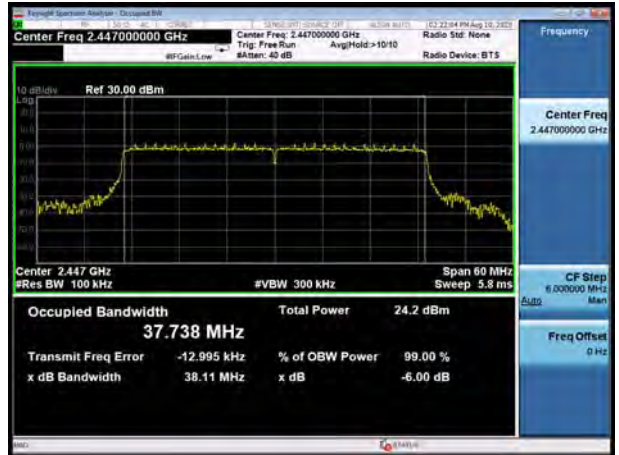




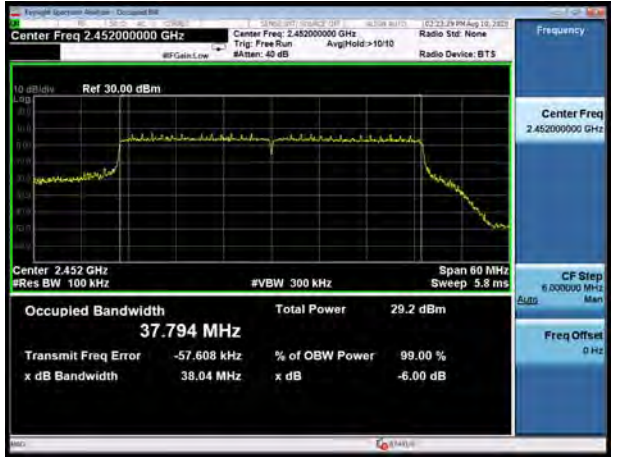
802.11ax (HE40), Carrier frequency (MHz):2442



802.11ax (HE40), Carrier frequency (MHz):2447



802.11ax (HE40), Carrier frequency (MHz):2452



### 5.3. Band Edge

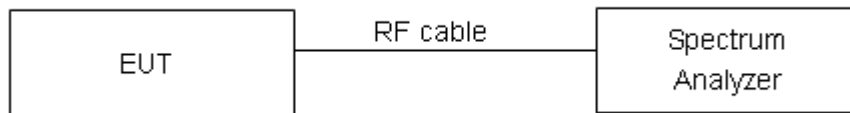
#### Ambient condition

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 the band edge of the lowest and highest channels were measured. The peak detector is used and RBW is set to 100 kHz and VBW is set to 300 kHz on spectrum analyzer. Spectrum analyzer plots are included on the following pages.

#### Test Setup



#### Limits

Rule Part 15.247(d) specifies that “In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak power limits.” If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.”

#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ .

Frequency	Uncertainty
2GHz-3GHz	1.407 dB

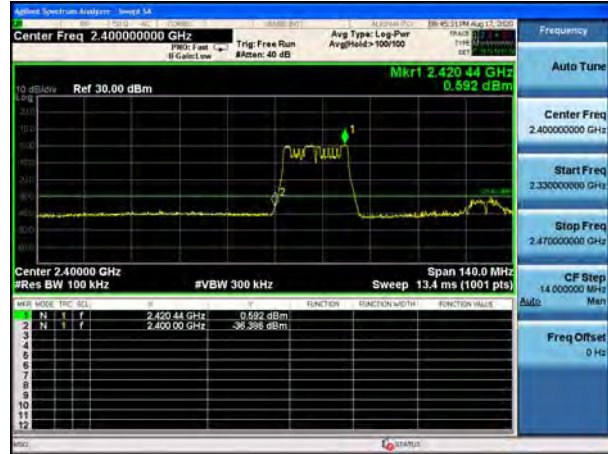


Test Results: PASS

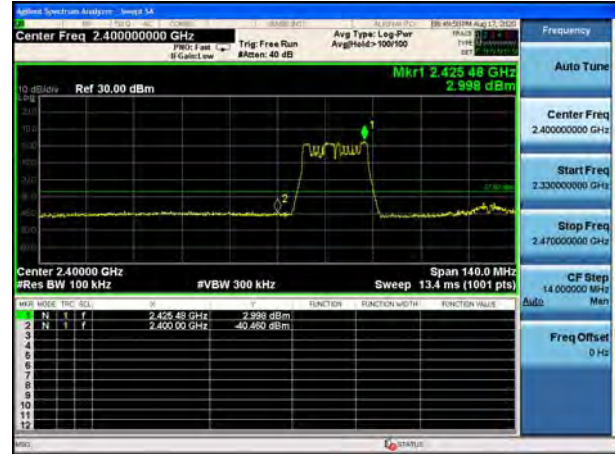
TB Mode

MIMO Antenna

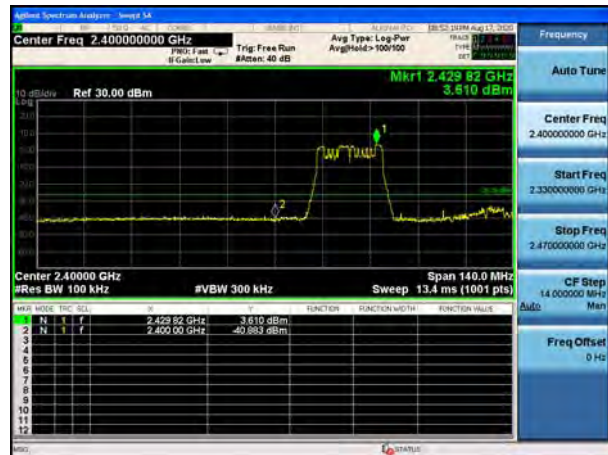
802.11ax (HE20), Channel No. 1  
26-Tones



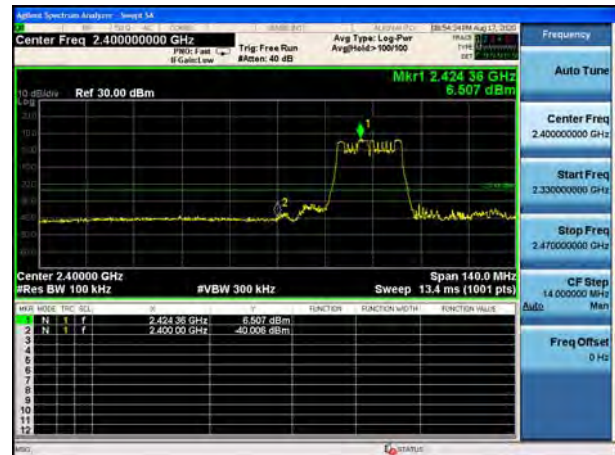
802.11ax (HE20), Channel No. 2  
26-Tones



802.11ax (HE20), Channel No. 3  
26-Tones



802.11ax (HE20), Channel No. 4  
26-Tones



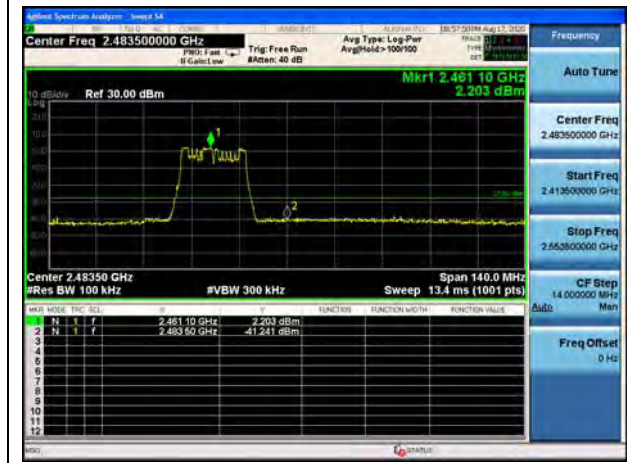
802.11ax (HE20), Channel No. 9  
26-Tones



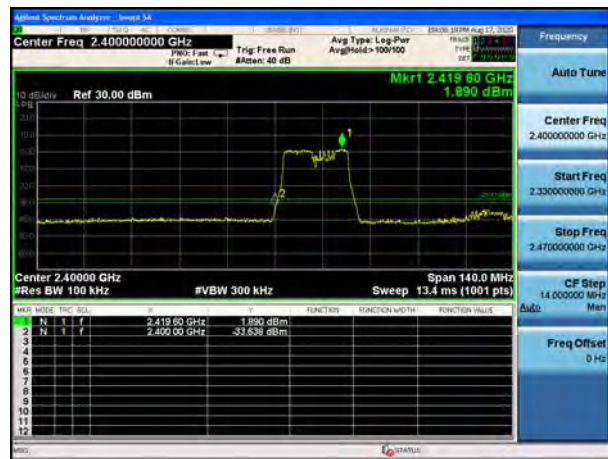
802.11ax (HE20), Channel No. 10  
26-Tones



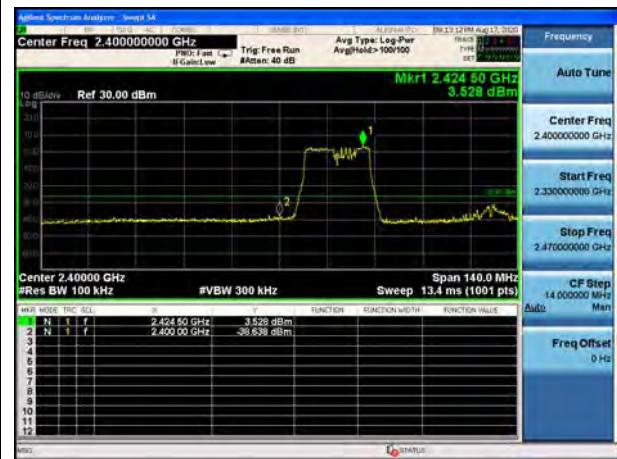
802.11ax (HE20), Channel No. 11  
26-Tones



802.11ax (HE20), Channel No. 1  
52-Tones



802.11ax (HE20), Channel No. 2  
52-Tones



802.11ax (HE20), Channel No. 3  
52-Tones



802.11ax (HE20), Channel No. 4  
52-Tones





802.11ax (HE20), Channel No. 9  
52-Tones



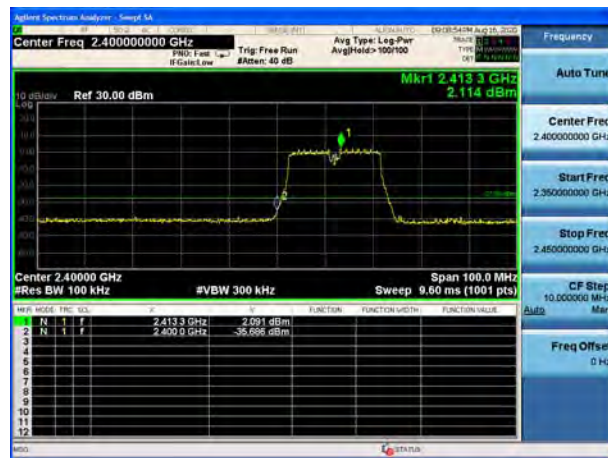
802.11ax (HE20), Channel No. 10  
52-Tones



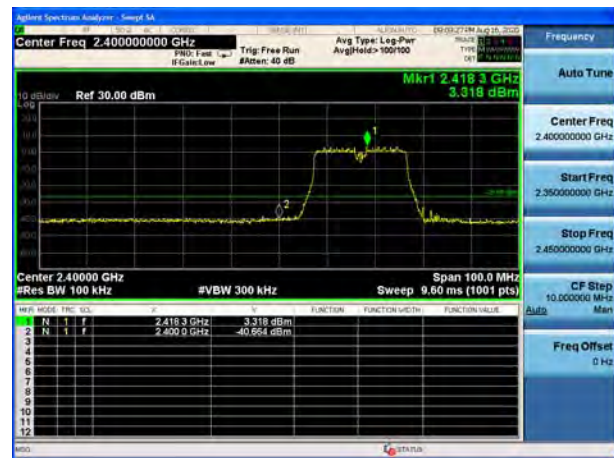
802.11ax (HE20), Channel No. 11  
52-Tones



802.11ax (HE20), Channel No. 1  
106-Tones

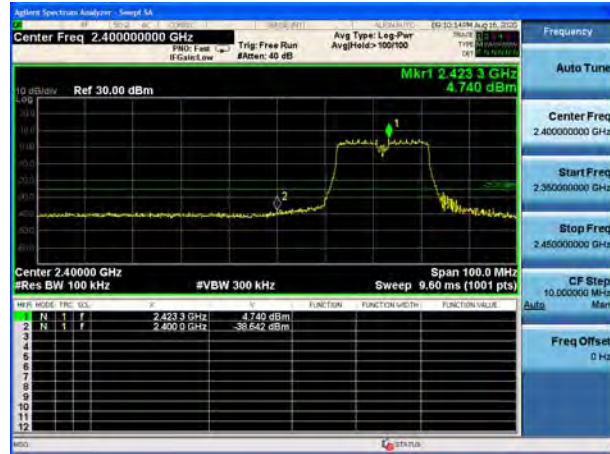


802.11ax (HE20), Channel No. 2  
106-Tones

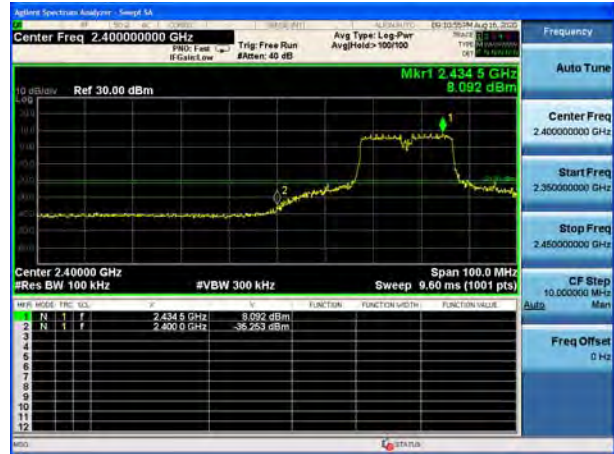




802.11ax (HE20), Channel No. 3  
106-Tones



802.11ax (HE20), Channel No. 4  
106-Tones



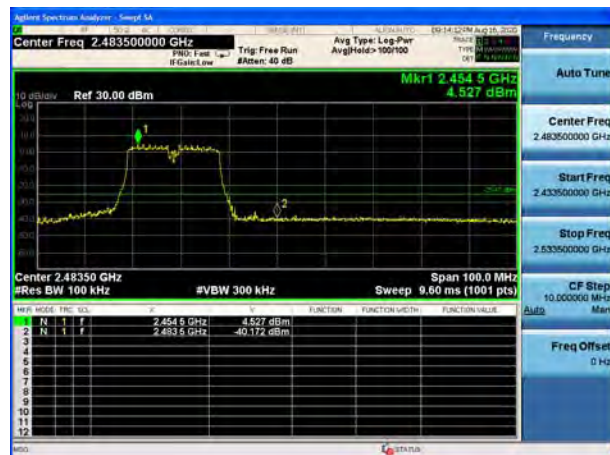
802.11ax (HE20), Channel No. 9  
106-Tones



802.11ax (HE20), Channel No. 10  
106-Tones

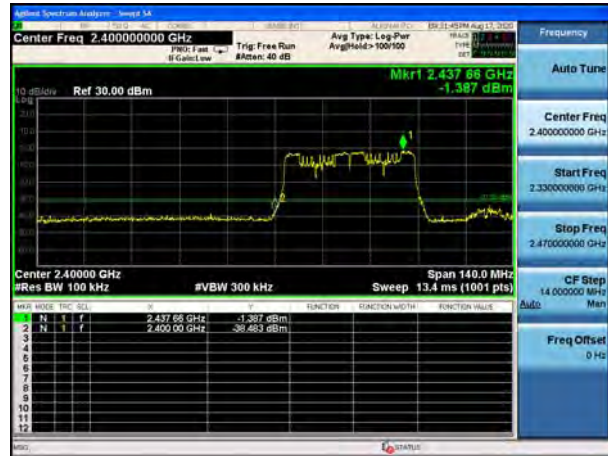


802.11ax (HE20), Channel No. 11  
106-Tones





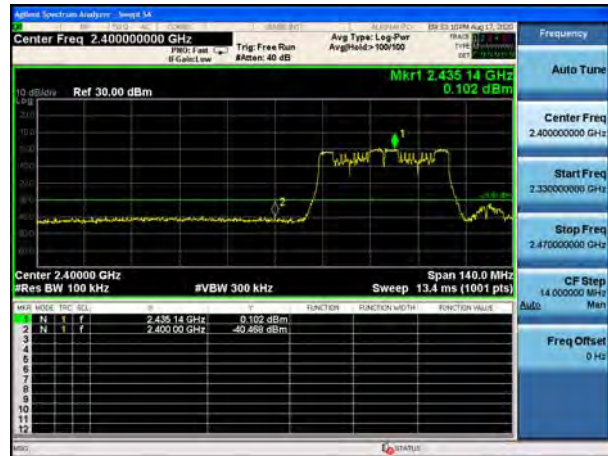
802.11ax (HE40), Channel No. 3  
52-Tones



802.11ax (HE40), Channel No. 4  
52-Tones



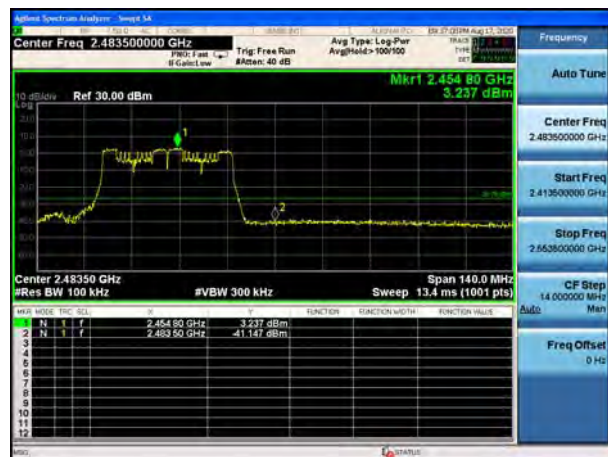
802.11ax (HE40), Channel No. 5  
52-Tones



802.11ax (HE40), Channel No. 8  
52-Tones



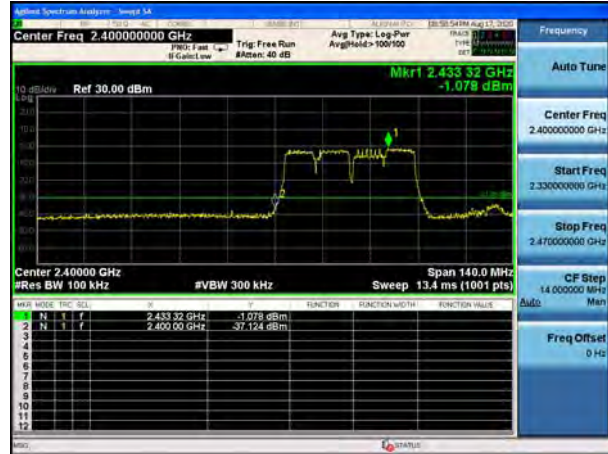
802.11ax (HE40), Channel No. 9  
52-Tones



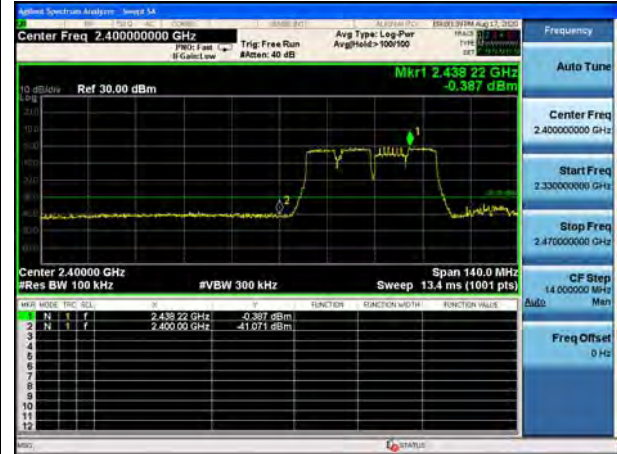




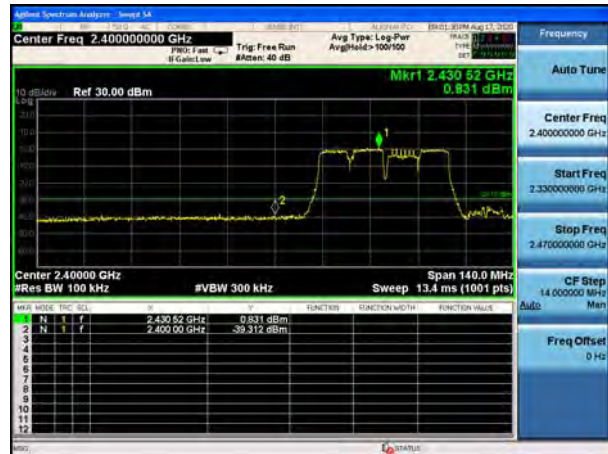
802.11ax (HE40), Channel No. 3  
106-Tones



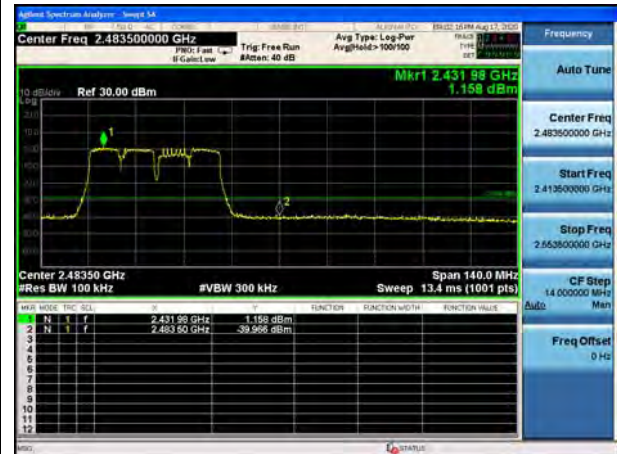
802.11ax (HE40), Channel No. 4  
106-Tones



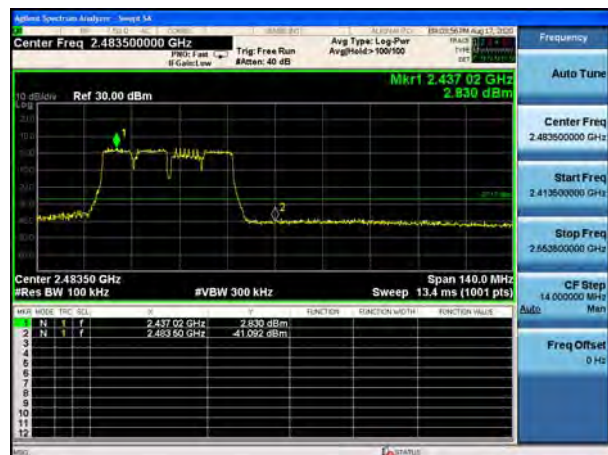
802.11ax (HE40), Channel No. 5  
106-Tones



802.11ax (HE40), Channel No. 8  
106-Tones

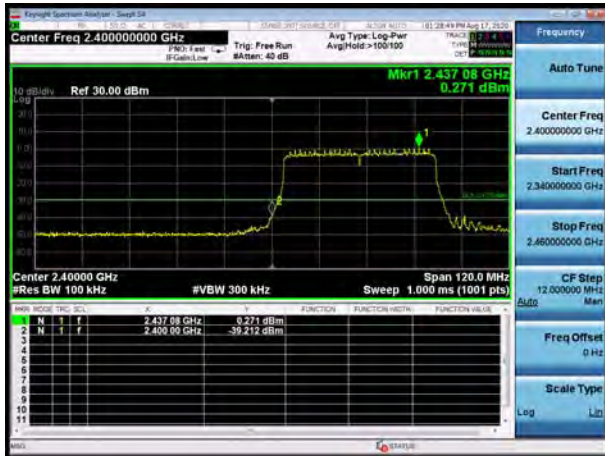


802.11ax (HE40), Channel No. 9  
106-Tones

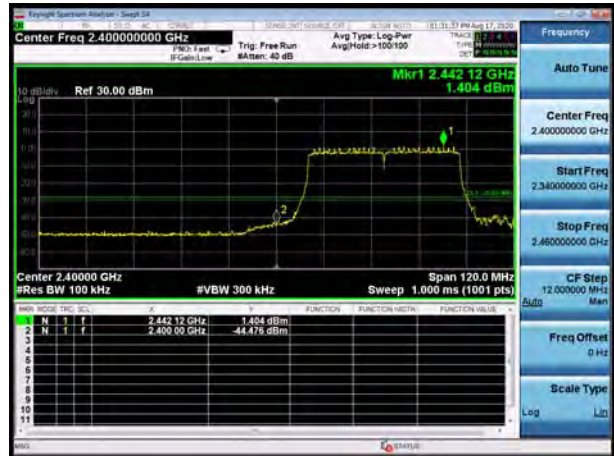




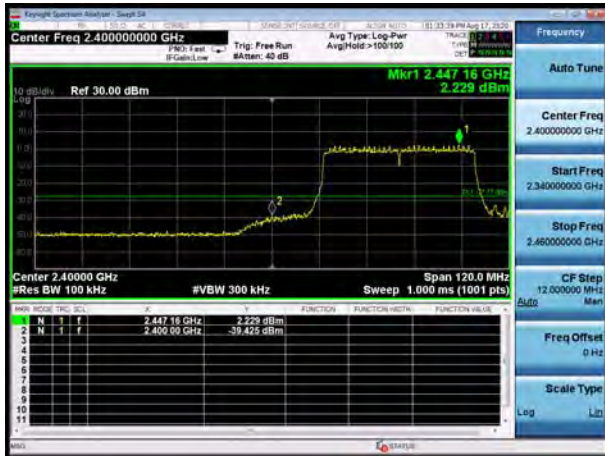
802.11ax (HE40), Channel No. 3  
242-Tones



802.11ax (HE40), Channel No. 4  
242-Tones



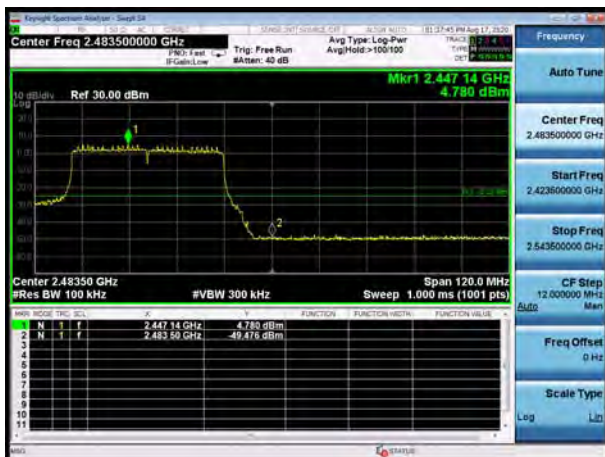
802.11ax (HE40), Channel No. 5  
242-Tones



802.11ax (HE40), Channel No. 8  
242-Tones

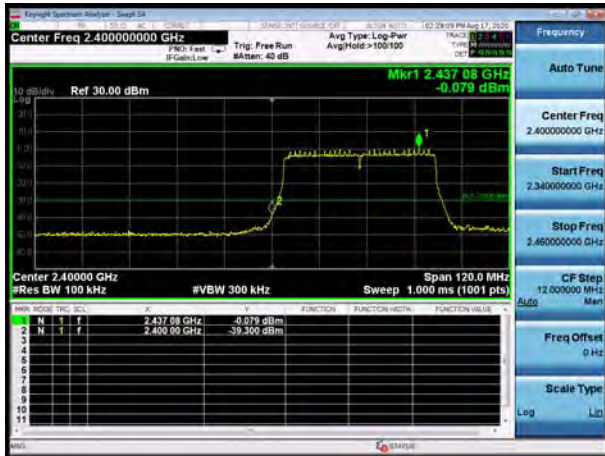


802.11ax (HE40), Channel No. 9  
242-Tones

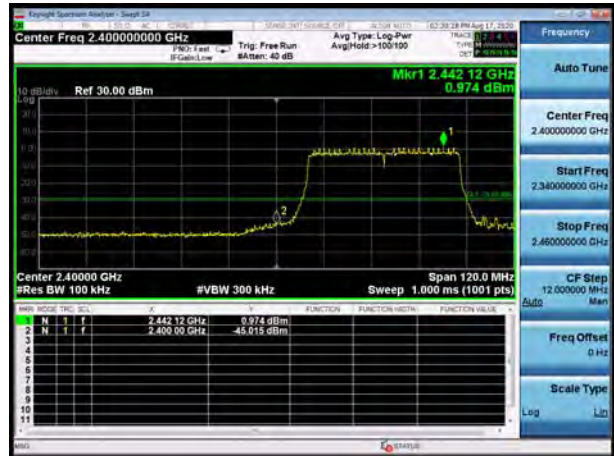




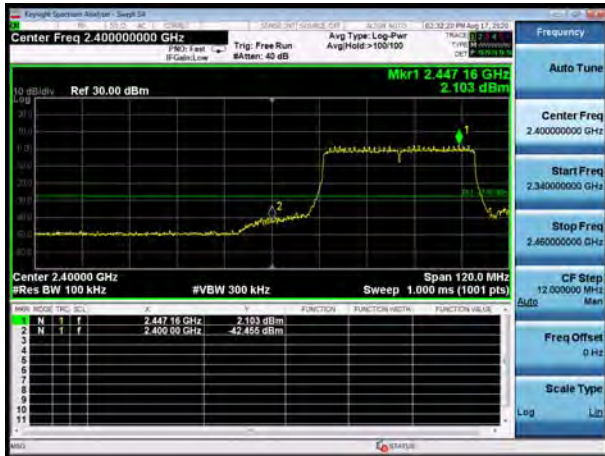
802.11ax (HE40), Channel No. 3  
484-Tones



802.11ax (HE40), Channel No. 4  
484-Tones



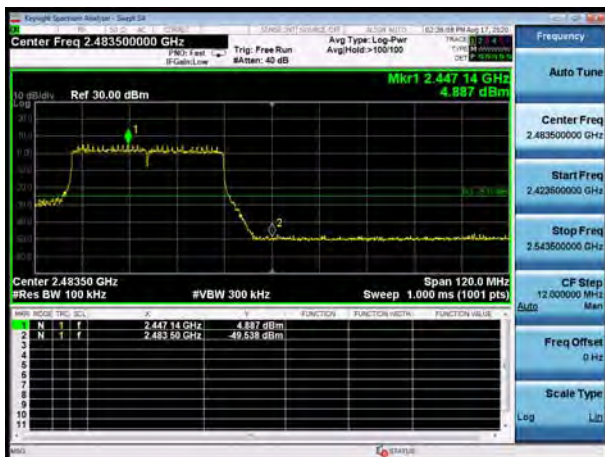
802.11ax (HE40), Channel No. 5  
484-Tones



802.11ax (HE40), Channel No. 8  
484-Tones



802.11ax (HE40), Channel No. 9  
484-Tones





SU Mode

MIMO Antenna

802.11ax (HE20), Channel No. 1



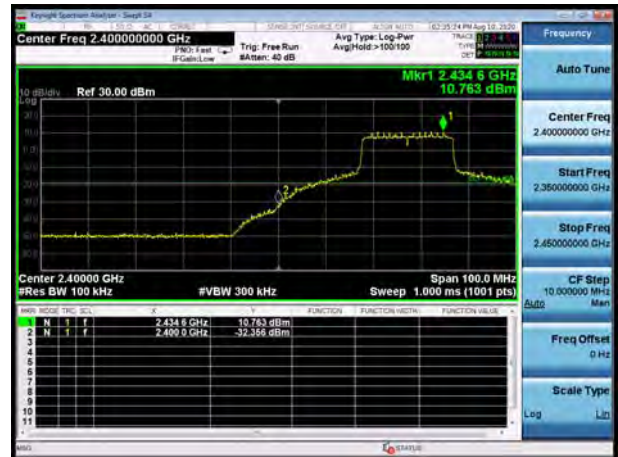
802.11ax (HE20), Channel No. 2



802.11ax (HE20), Channel No. 3



802.11ax (HE20), Channel No. 4

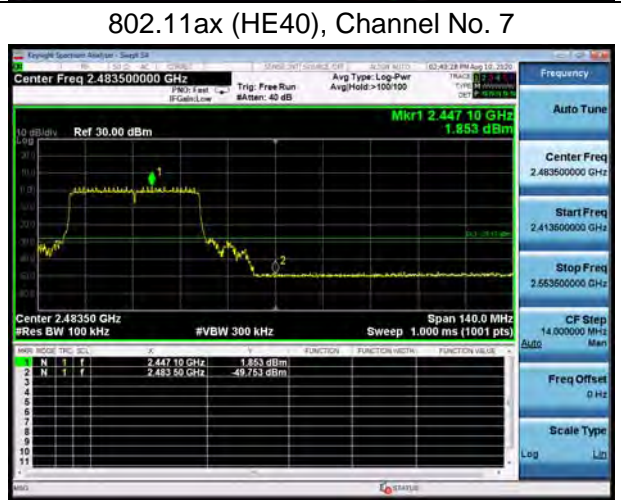
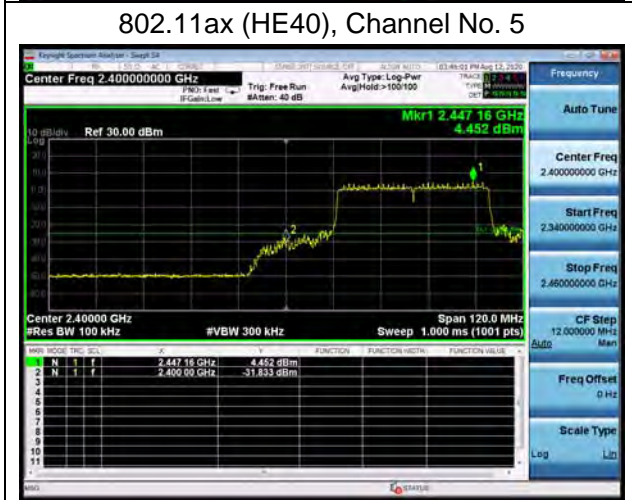
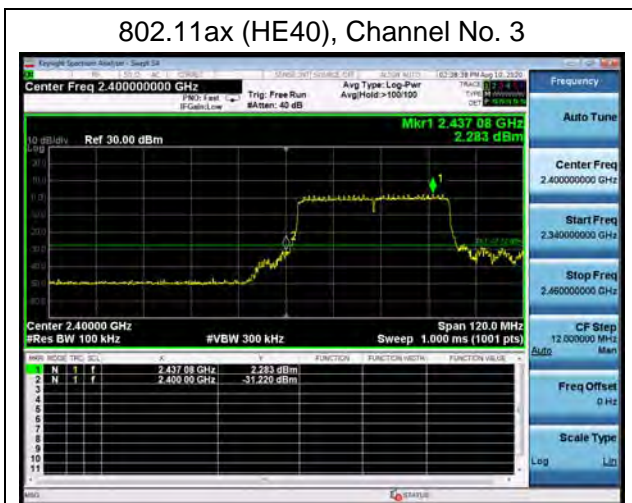
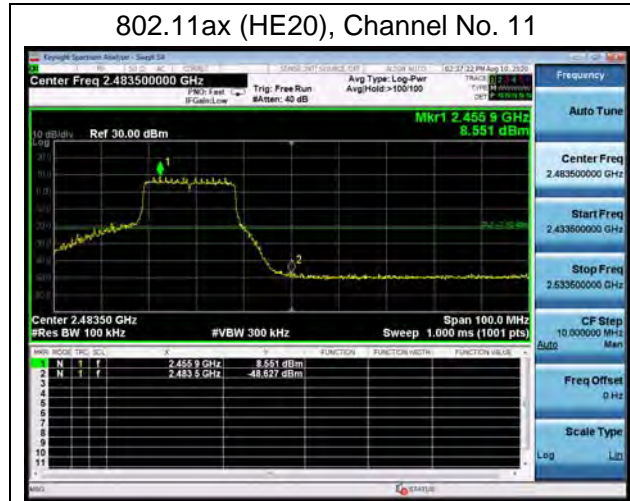


802.11ax (HE20), Channel No. 9



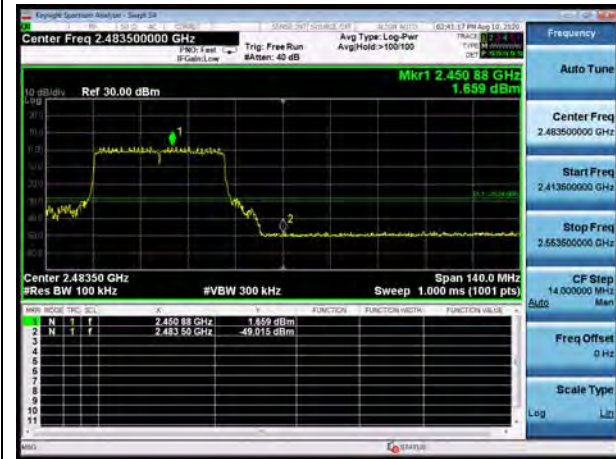
802.11ax (HE20), Channel No. 10



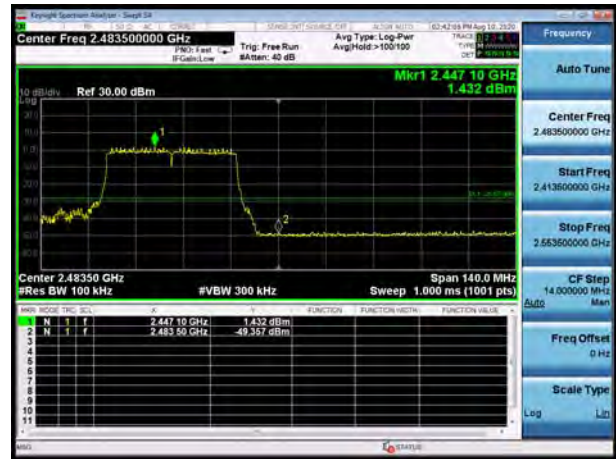




802.11ax (HE40), Channel No. 8



802.11ax (HE40), Channel No. 9



### 5.4. Power Spectral Density

#### Ambient condition

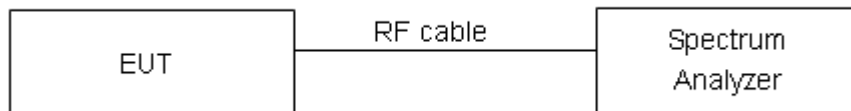
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### Method of Measurement

During the process of the testing, The EUT was connected to Spectrum Analyzer with a known loss. The EUT is max power transmission with proper modulation. Method AVGPS-2 in KDB558074 D01 was used for this test.

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

#### Test setup



#### Limits

Rule Part 15.247(e) specifies that” For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. “

Limits	≤ 8 dBm / 3kHz
--------	----------------

#### Measurement Uncertainty

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

**Test Results:****TB Mode****MIMO**

Network Standards	Channel Number	Power Spectral Density				Total PSD (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
		Antenna 1		Antenna 2				
		Read Value (dBm / 3kHz)	Power Spectral Density (dBm / 3kHz)	Read Value (dBm / 3kHz)	Power Spectral Density (dBm / 3kHz)			
802.11ax (HE20) 26-Tones	1	-22.00	-21.79	-22.72	-22.52	-19.13	5.99	PASS
	2	-20.53	-20.33	-21.10	-20.90	-17.59	5.99	PASS
	3	-19.42	-19.22	-20.35	-20.15	-16.65	5.99	PASS
	4	-16.07	-15.87	-17.07	-16.87	-13.33	5.99	PASS
	6	-16.39	-16.18	-17.07	-16.86	-13.50	5.99	PASS
	9	-17.37	-17.16	-17.15	-16.94	-14.04	5.99	PASS
	10	-18.70	-18.50	-18.71	-18.51	-15.49	5.99	PASS
	11	-19.30	-19.09	-20.24	-20.03	-16.53	5.99	PASS
802.11ax (HE20) 52-Tones	1	-21.50	-21.19	-22.15	-21.84	-18.49	5.99	PASS
	2	-19.84	-19.53	-20.83	-20.51	-16.99	5.99	PASS
	3	-18.83	-18.52	-19.74	-19.42	-15.94	5.99	PASS
	4	-15.53	-15.22	-16.67	-16.36	-12.75	5.99	PASS
	6	-15.60	-15.29	-16.28	-15.97	-12.60	5.99	PASS
	9	-16.53	-16.22	-17.00	-16.69	-13.44	5.99	PASS
	10	-17.52	-17.21	-18.45	-18.14	-14.64	5.99	PASS
	11	-18.76	-18.45	-19.55	-19.24	-15.82	5.99	PASS
802.11ax (HE20) 106-Tones	1	-20.91	-20.18	-22.04	-21.30	-17.69	5.99	PASS
	2	-20.31	-19.57	-21.34	-20.60	-17.04	5.99	PASS
	3	-19.57	-18.83	-19.37	-18.63	-15.72	5.99	PASS
	4	-15.28	-14.54	-15.87	-15.13	-11.82	5.99	PASS
	6	-15.34	-14.60	-15.66	-14.93	-11.75	5.99	PASS
	9	-16.61	-15.88	-16.08	-15.34	-12.59	5.99	PASS
	10	-18.32	-17.59	-18.39	-17.66	-14.61	5.99	PASS
	11	-19.39	-18.65	-19.52	-18.78	-15.70	5.99	PASS
802.11ax (HE40) 52-Tones	3	-24.96	-24.57	-26.85	-26.46	-22.40	5.99	PASS
	4	-24.19	-23.79	-25.52	-25.13	-21.40	5.99	PASS
	5	-22.98	-22.59	-24.58	-24.19	-20.31	5.99	PASS
	6	-22.64	-22.25	-23.42	-23.03	-19.61	5.99	PASS
	8	-22.54	-22.15	-23.48	-23.08	-19.58	5.99	PASS
	9	-20.48	-20.09	-21.24	-20.85	-17.44	5.99	PASS
802.11ax (HE40)	3	-25.16	-24.44	-26.01	-25.28	-21.83	5.99	PASS





106-Tones	4	-25.09	-24.36	-25.50	-24.77	-21.55	5.99	PASS
	5	-23.35	-22.62	-24.53	-23.81	-20.16	5.99	PASS
	6	-23.11	-22.38	-23.51	-22.78	-19.57	5.99	PASS
	8	-22.88	-22.15	-23.44	-22.72	-19.42	5.99	PASS
	9	-20.86	-20.14	-20.76	-20.03	-17.07	5.99	PASS
802.11ax (HE40) 242-Tones	3	-25.63	-24.21	-25.70	-24.28	-21.24	5.99	PASS
	4	-24.56	-23.14	-24.61	-23.20	-20.16	5.99	PASS
	5	-23.53	-22.12	-23.67	-22.25	-19.17	5.99	PASS
	6	-22.53	-21.11	-22.69	-21.27	-18.18	5.99	PASS
	8	-22.21	-20.80	-22.60	-21.19	-17.98	5.99	PASS
	9	-20.41	-18.99	-21.12	-19.71	-16.33	5.99	PASS
802.11ax (HE40) 484-Tones	3	-25.07	-23.24	-25.07	-23.24	-20.23	5.99	PASS
	4	-24.01	-22.18	-24.08	-22.25	-19.21	5.99	PASS
	5	-22.93	-21.10	-23.08	-21.26	-18.17	5.99	PASS
	6	-21.74	-19.91	-21.78	-19.96	-16.92	5.99	PASS
	8	-21.76	-19.93	-22.06	-20.23	-17.07	5.99	PASS
	9	-19.93	-18.10	-19.94	-18.12	-15.10	5.99	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 =  $10\log(10^{(\text{PSD antenna1 in dBm/10})} + 10^{(\text{PSD antenna2 in dBm/10})})$

3. The manufacturer declared the transmitter output signals is CDD mode. And  $N_{ss}=1$ . According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain =  $G_{ANT} + \text{Array Gain}$ , For PSD measurements on all devices, Array Gain =  $10\log(N_{ant}/N_{ss})\text{dB}$ , so directional gain =  $G_{ANT} + \text{Array Gain} = 5 + 10\log(2/1) = 8.01 > 6\text{dBi}$ . So the power limit is  $8 + 6 - \text{MAX}(6, \text{directional gain})\text{dBm} = 5.99\text{ dBm}$



## SU Mode

## SISO Antenna 1

Network Standards	Channel Number	Read Value (dBm / 3kHz)	Power Spectral Density (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
802.11ax (HE20)	1	-18.42	-18.21	8.00	PASS
	2	-16.11	-15.91	8.00	PASS
	3	-14.72	-14.52	8.00	PASS
	4	-13.12	-12.91	8.00	PASS
	6	-13.38	-13.17	8.00	PASS
	9	-14.47	-14.26	8.00	PASS
	10	-15.85	-15.64	8.00	PASS
	11	-15.01	-14.80	8.00	PASS
802.11ax (HE40)	3	-23.67	-23.22	8.00	PASS
	4	-23.41	-22.96	8.00	PASS
	5	-21.53	-21.09	8.00	PASS
	6	-19.26	-18.81	8.00	PASS
	7	-18.80	-18.36	8.00	PASS
	8	-19.01	-18.56	8.00	PASS
	9	-18.06	-17.61	8.00	PASS

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

## SISO Antenna 2

Network Standards	Channel Number	Read Value (dBm / 3kHz)	Power Spectral Density (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
802.11ax (HE20)	1	-17.91	-17.71	8.00	PASS
	2	-17.54	-17.34	8.00	PASS
	3	-15.50	-15.30	8.00	PASS
	4	-14.55	-14.34	8.00	PASS
	6	-14.44	-14.23	8.00	PASS
	9	-13.99	-13.79	8.00	PASS
	10	-15.30	-15.09	8.00	PASS
	11	-16.33	-16.12	8.00	PASS
802.11ax (HE40)	3	-23.11	-22.67	8.00	PASS
	4	-21.77	-21.32	8.00	PASS
	5	-21.58	-21.14	8.00	PASS
	6	-19.84	-19.39	8.00	PASS
	7	-19.89	-19.45	8.00	PASS
	8	-19.86	-19.42	8.00	PASS
	9	-17.94	-17.50	8.00	PASS

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

**MIMO**  
**Without Beamforming**

Network Standards	Channel Number	Power Spectral Density				Total PSD (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
		Antenna 1		Antenna 2				
		Read Value (dBm / 3kHz)	Power Spectral Density (dBm / 3kHz)	Read Value (dBm / 3kHz)	Power Spectral Density (dBm / 3kHz)			
802.11ax (HE20)	1	-21.14	-20.94	-21.37	-21.16	-18.04	5.99	PASS
	2	-19.44	-19.23	-20.09	-19.88	-16.53	5.99	PASS
	3	-18.31	-18.11	-18.97	-18.76	-15.41	5.99	PASS
	4	-14.98	-14.78	-15.52	-15.31	-12.03	5.99	PASS
	6	-15.35	-15.15	-15.72	-15.51	-12.32	5.99	PASS
	9	-16.41	-16.20	-16.96	-16.75	-13.46	5.99	PASS
	10	-17.70	-17.49	-18.90	-18.70	-15.04	5.99	PASS
	11	-19.08	-18.87	-19.99	-19.78	-16.29	5.99	PASS
802.11ax (HE40)	3	-26.05	-25.60	-26.07	-25.63	-22.60	5.99	PASS
	4	-23.08	-22.63	-23.24	-22.79	-19.70	5.99	PASS
	5	-26.17	-25.72	-26.18	-25.73	-22.72	5.99	PASS
	6	-23.00	-22.56	-22.90	-22.45	-19.50	5.99	PASS
	7	-22.98	-22.53	-22.88	-22.43	-19.47	5.99	PASS
	8	-22.99	-22.55	-22.85	-22.41	-19.47	5.99	PASS
	9	-20.49	-20.05	-20.98	-20.53	-17.27	5.99	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= $10\log(10^{(PSD\ antenna1\ in\ dBm/10)}+10^{(PSD\ antenna2\ in\ dBm/10)})$   
 3. The manufacturer declared the transmitter output signals is CDD mode. And  $N_{ss}=1$ . According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain =  $G_{ANT} + \text{Array Gain}$ , For PSD measurements on all devices, Array Gain= $10\log(N_{ant}/N_{ss})dB$ ,so directional gain= $G_{ANT}+\text{Array Gain}=5+10\log(2/1)=8.01 >6dB$ . So the power limit is  $8+6-\text{MAX}(6, \text{directional gain})dBm=5.99\ dBm$



## With Beamforming

Network Standards	Channel Number	Power Spectral Density				Total PSD (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
		Antenna 1		Antenna 2				
		Read Value (dBm / 3kHz)	Power Spectral Density (dBm / 3kHz)	Read Value (dBm / 3kHz)	Power Spectral Density (dBm / 3kHz)			
802.11ax (HE20)	1	-20.80	-20.60	-21.67	-21.47	-18.00	5.99	PASS
	2	-19.65	-19.44	-20.40	-20.19	-16.79	5.99	PASS
	3	-18.66	-18.46	-19.27	-19.06	-15.74	5.99	PASS
	4	-15.10	-14.89	-15.41	-15.20	-12.04	5.99	PASS
	6	-15.19	-14.99	-15.81	-15.60	-12.27	5.99	PASS
	9	-15.85	-15.65	-17.03	-16.82	-13.19	5.99	PASS
	10	-17.42	-17.22	-18.62	-18.41	-14.76	5.99	PASS
	11	-18.59	-18.39	-20.07	-19.86	-16.05	5.99	PASS
802.11ax (HE40)	3	-26.01	-25.57	-25.92	-25.47	-22.51	5.99	PASS
	4	-23.55	-23.11	-24.51	-24.06	-20.55	5.99	PASS
	5	-26.43	-25.99	-27.48	-27.04	-23.47	5.99	PASS
	6	-22.19	-21.75	-22.97	-22.53	-19.11	5.99	PASS
	7	-22.44	-22.00	-23.34	-22.89	-19.42	5.99	PASS
	8	-22.20	-21.76	-23.15	-22.70	-19.19	5.99	PASS
	9	-19.90	-19.46	-20.28	-19.83	-16.63	5.99	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 =  $10\log(10^{(\text{PSD antenna1 in dBm}/10)} + 10^{(\text{PSD antenna2 in dBm}/10)})$

3. The manufacturer declared the transmitter output signals is CDD mode. And  $N_{ss}=1$ . According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain =  $G_{ANT} + \text{Array Gain}$ , For PSD measurements on all devices, Array Gain =  $10\log(N_{ant}/N_{ss})\text{dB}$ , so directional gain =  $G_{ANT} + \text{Array Gain}$   
Gain =  $5 + 10\log(2/1) = 8.01 > 6\text{dBi}$ . So the power limit is  $8 + 6 - \text{MAX}(6, \text{directional gain})\text{dBm} = 5.99\text{ dBm}$



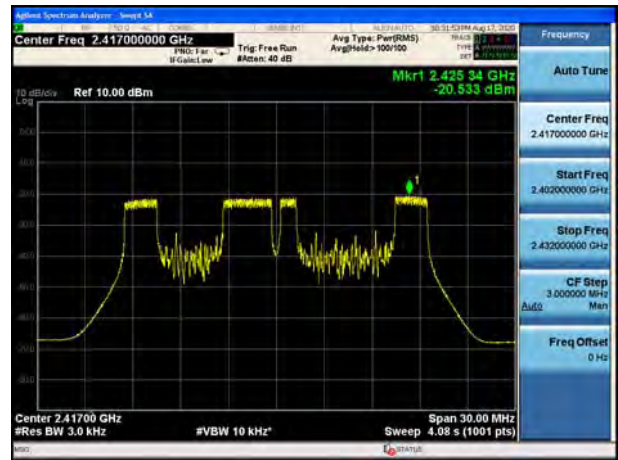
TB Mode

MIMO Antenna 1

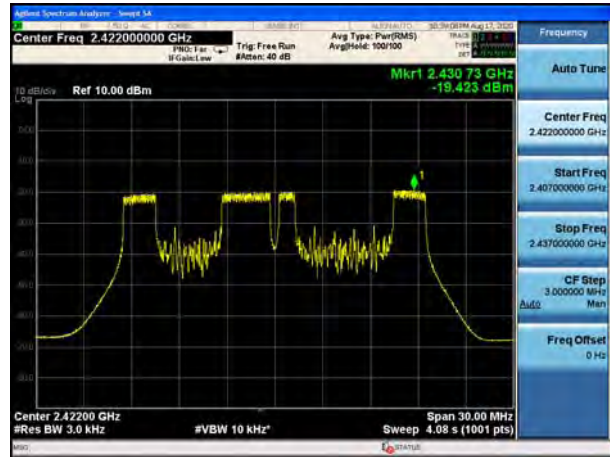
802.11ax (HE20), Channel No. 1  
26-Tones



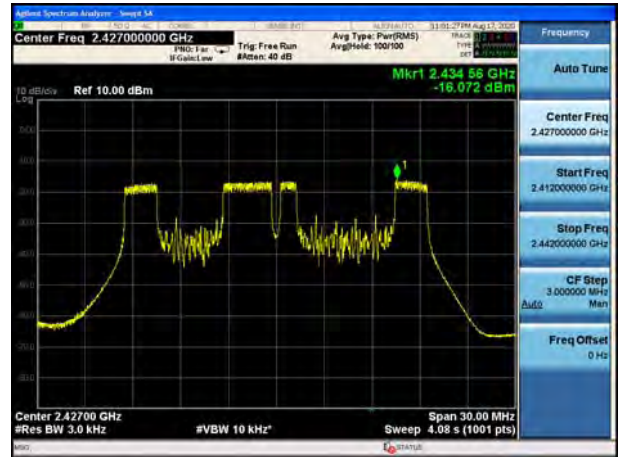
802.11ax (HE20), Channel No. 2  
26-Tones



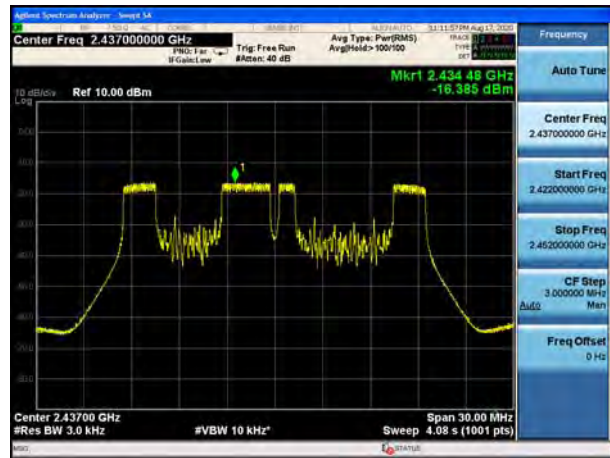
802.11ax (HE20), Channel No. 3  
26-Tones



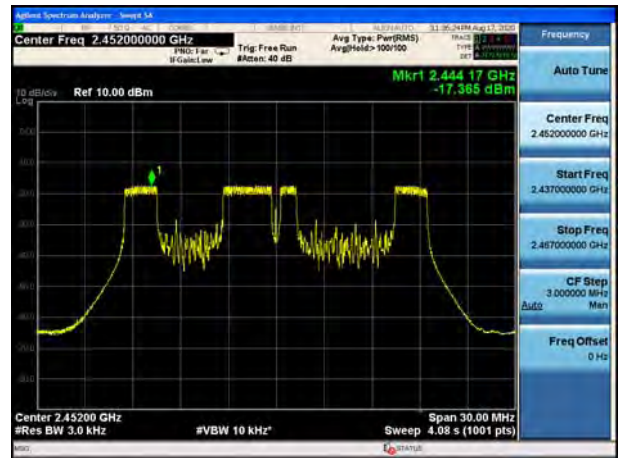
802.11ax (HE20), Channel No. 4  
26-Tones



802.11ax (HE20), Channel No. 6  
26-Tones

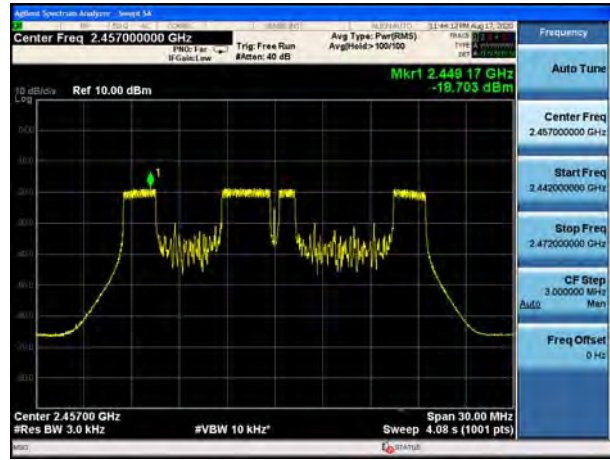


802.11ax (HE20), Channel No. 9  
26-Tones

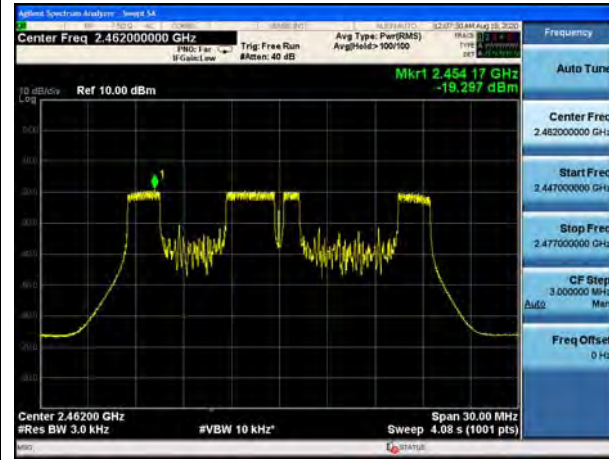




802.11ax (HE20), Channel No. 10  
26-Tones



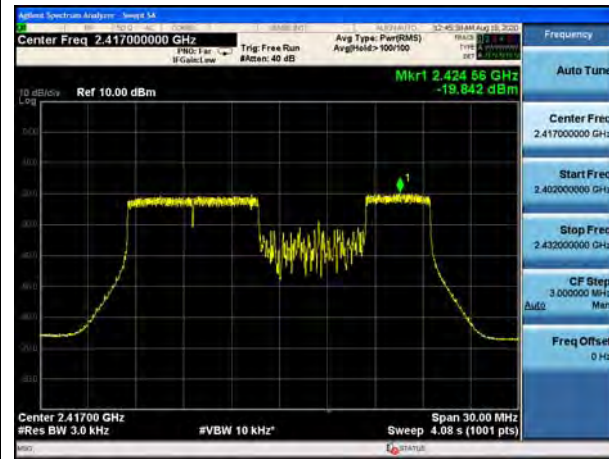
802.11ax (HE20), Channel No. 11  
26-Tones



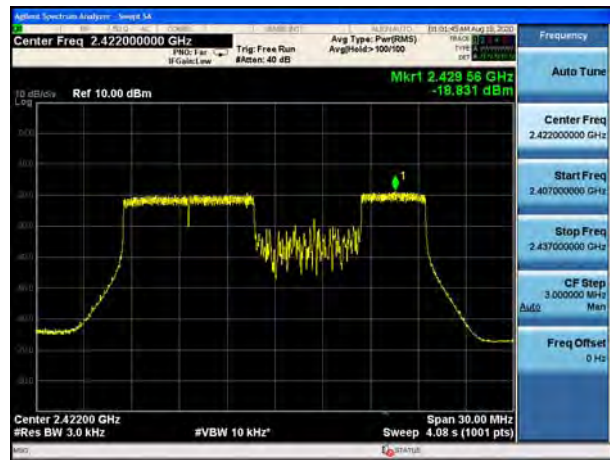
802.11ax (HE20), Channel No. 1  
52-Tones



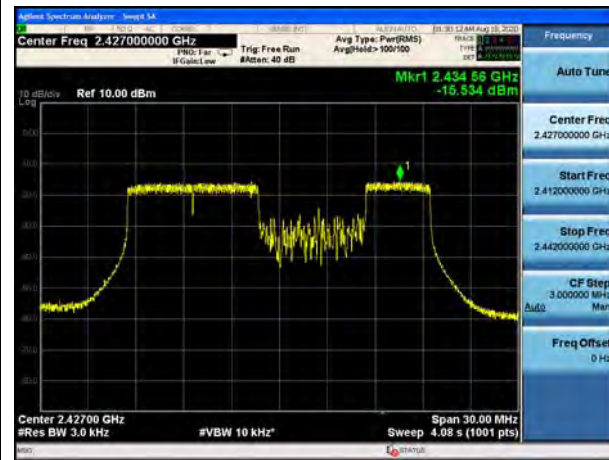
802.11ax (HE20), Channel No. 2  
52-Tones



802.11ax (HE20), Channel No. 3  
52-Tones

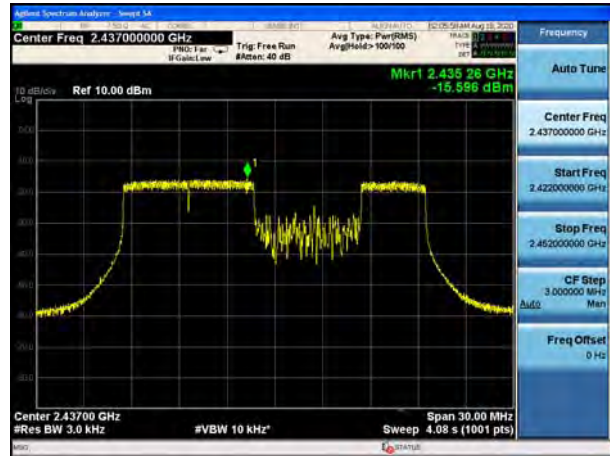


802.11ax (HE20), Channel No. 4  
52-Tones

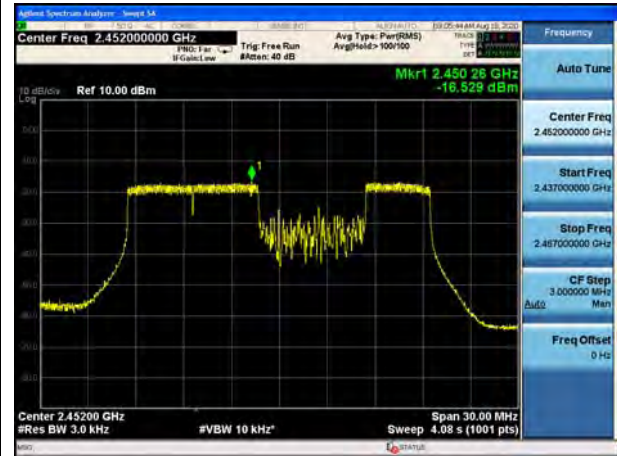




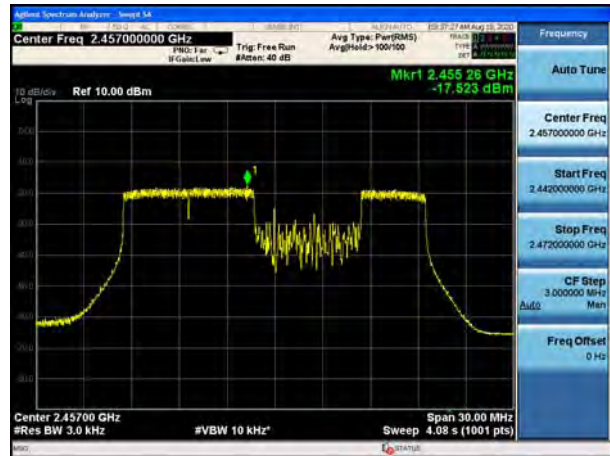
802.11ax (HE20), Channel No. 6  
52-Tones



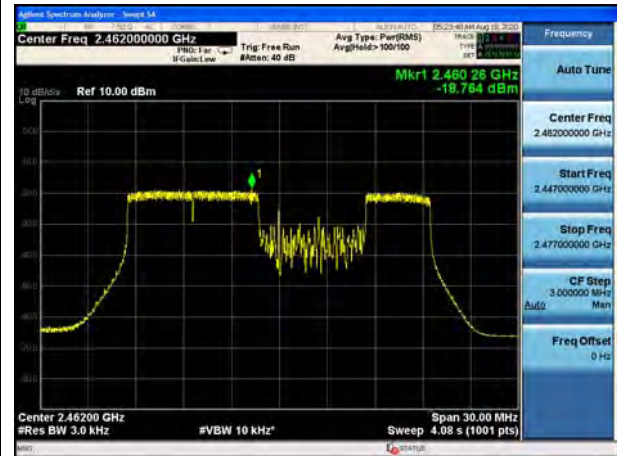
802.11ax (HE20), Channel No. 9  
52-Tones



802.11ax (HE20), Channel No. 10  
52-Tones



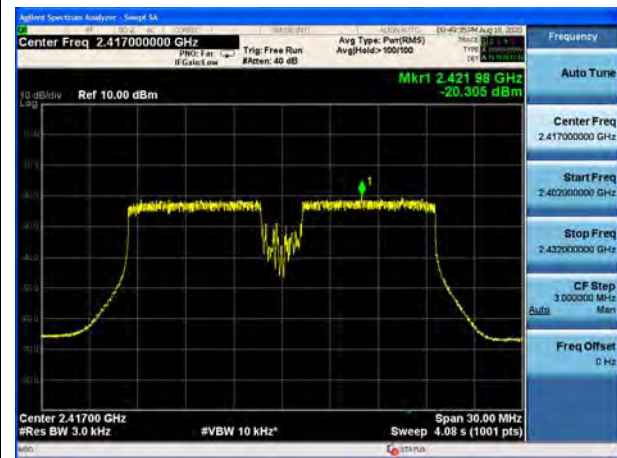
802.11ax (HE20), Channel No. 11  
52-Tones



802.11ax (HE20), Channel No. 1  
106-Tones

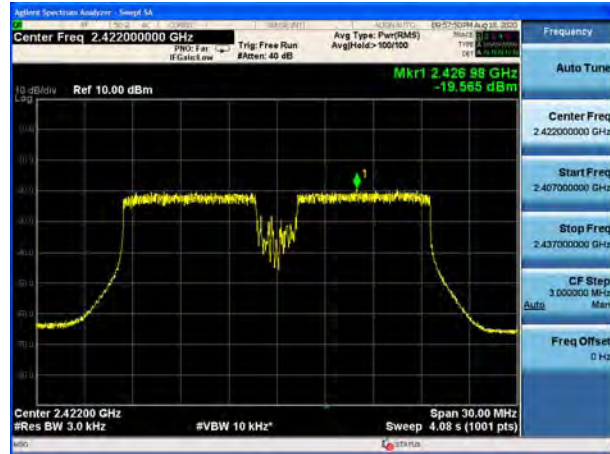


802.11ax (HE20), Channel No. 2  
106-Tones

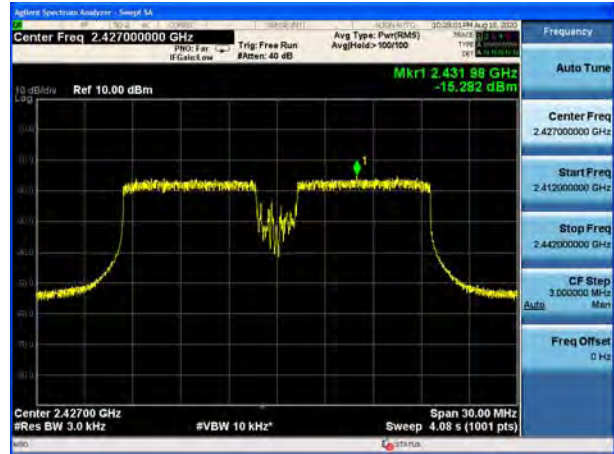




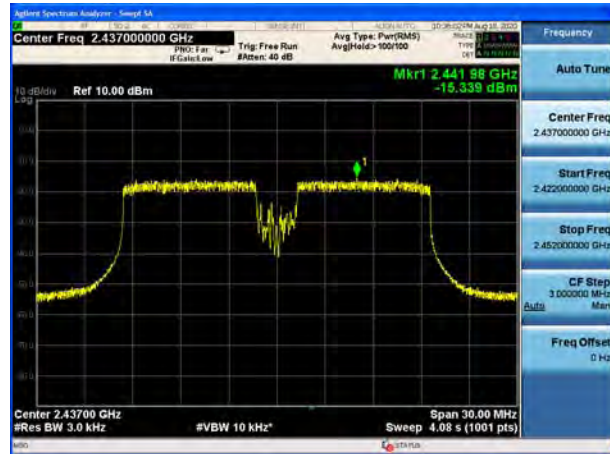
802.11ax (HE20), Channel No. 3  
106-Tones



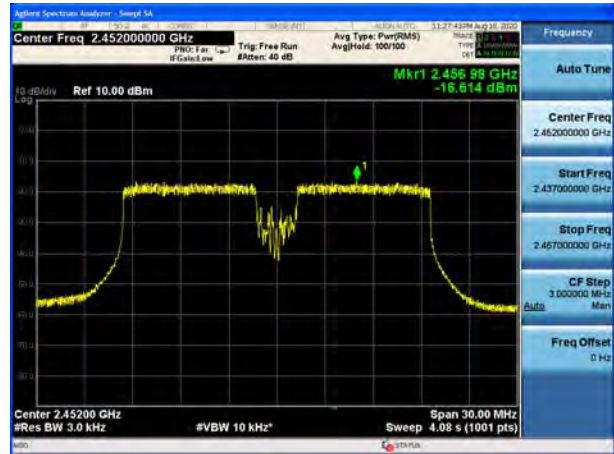
802.11ax (HE20), Channel No. 4  
106-Tones



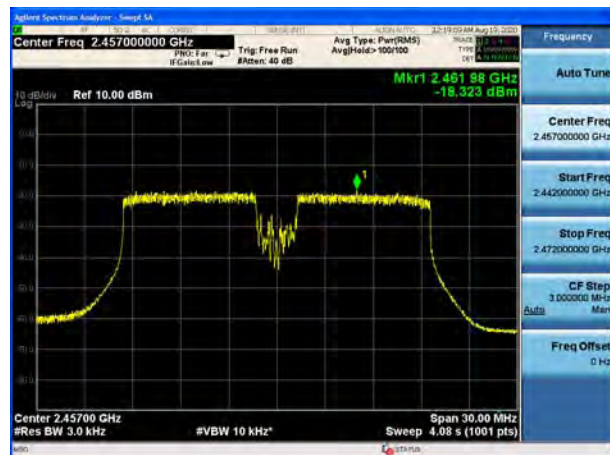
802.11ax (HE20), Channel No. 6  
106-Tones



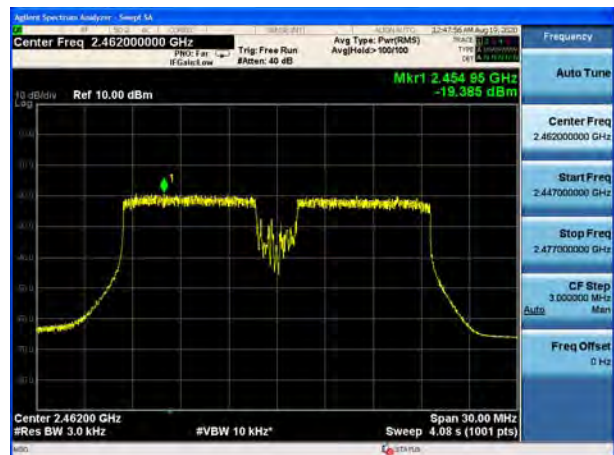
802.11ax (HE20), Channel No. 9  
106-Tones



802.11ax (HE20), Channel No. 10  
106-Tones



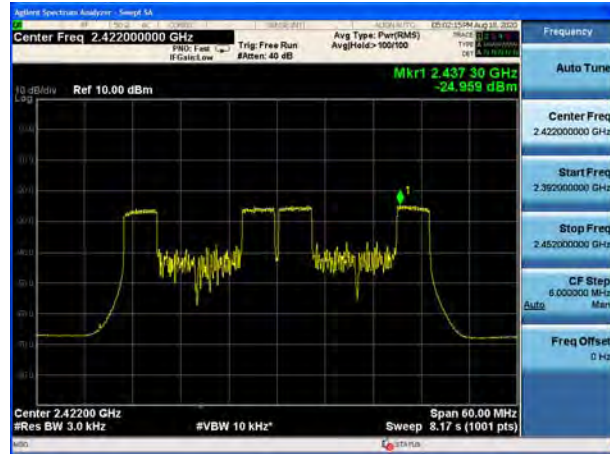
802.11ax (HE20), Channel No. 11  
106-Tones



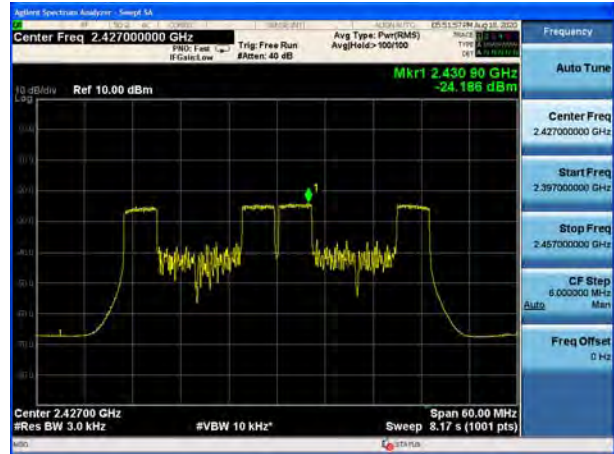




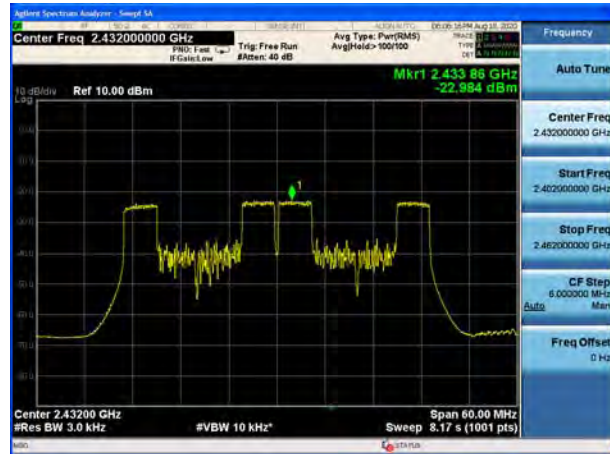
802.11ax (HE40), Channel No. 3  
52-Tones



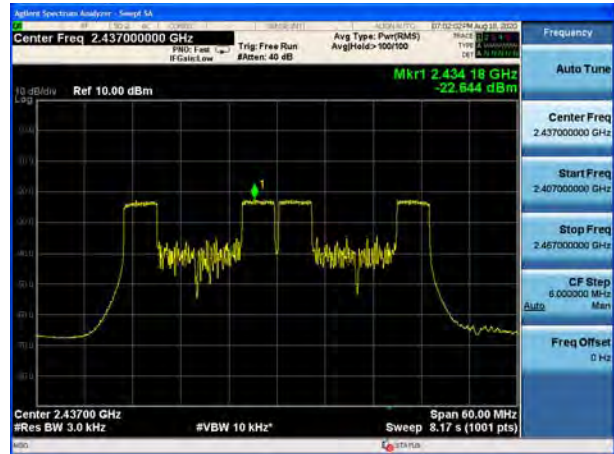
802.11ax (HE40), Channel No. 4  
52-Tones



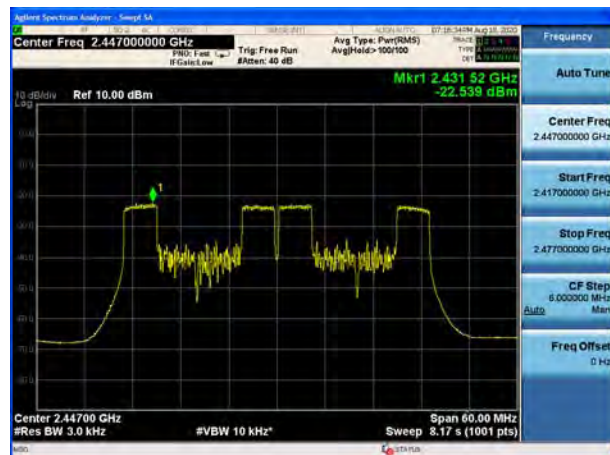
802.11ax (HE40), Channel No. 5  
52-Tones



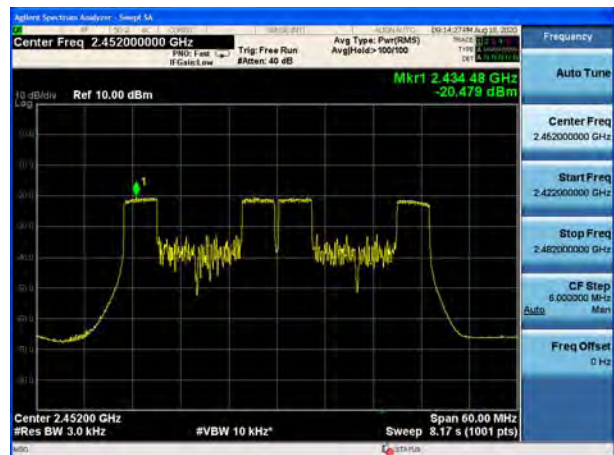
802.11ax (HE40), Channel No. 6  
52-Tones



802.11ax (HE40), Channel No. 8  
52-Tones

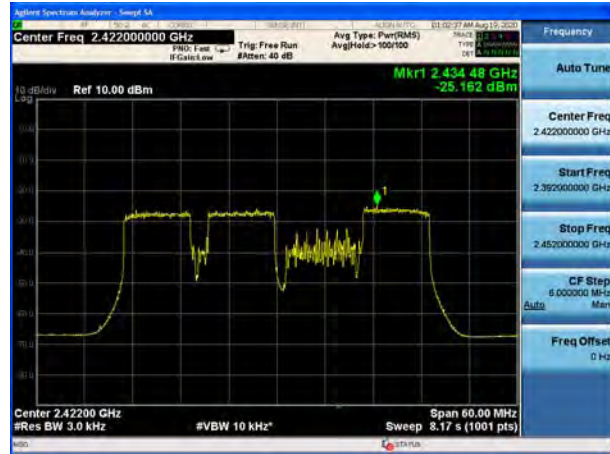


802.11ax (HE40), Channel No. 9  
52-Tones





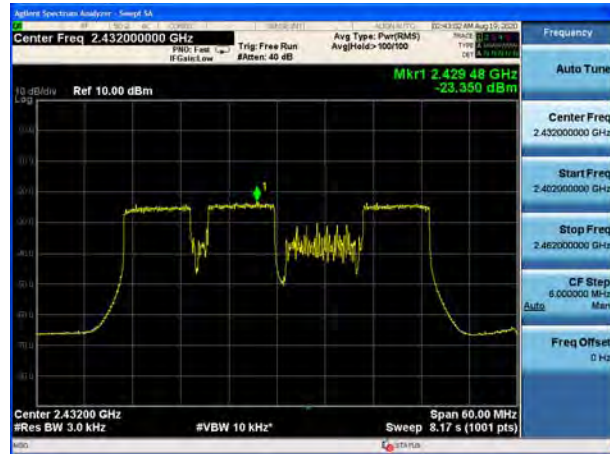
802.11ax (HE40), Channel No. 3  
106-Tones



802.11ax (HE40), Channel No. 4  
106-Tones



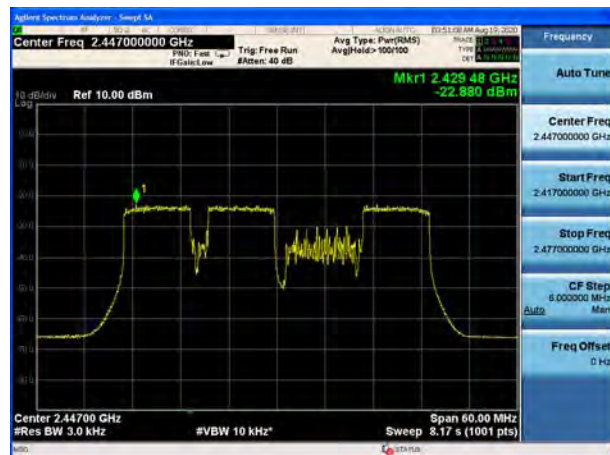
802.11ax (HE40), Channel No. 5  
106-Tones



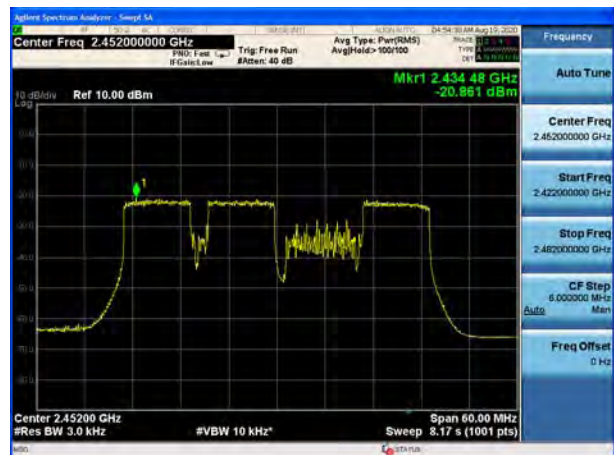
802.11ax (HE40), Channel No. 6  
106-Tones



802.11ax (HE40), Channel No. 8  
106-Tones



802.11ax (HE40), Channel No. 9  
106-Tones





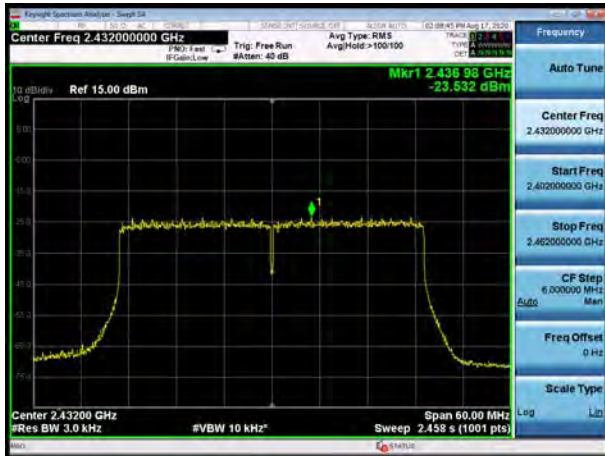
802.11ax (HE40), Channel No. 3  
242-Tones



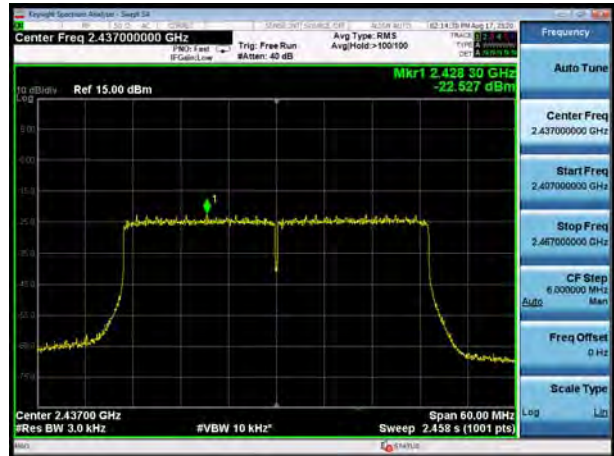
802.11ax (HE40), Channel No. 4  
242-Tones



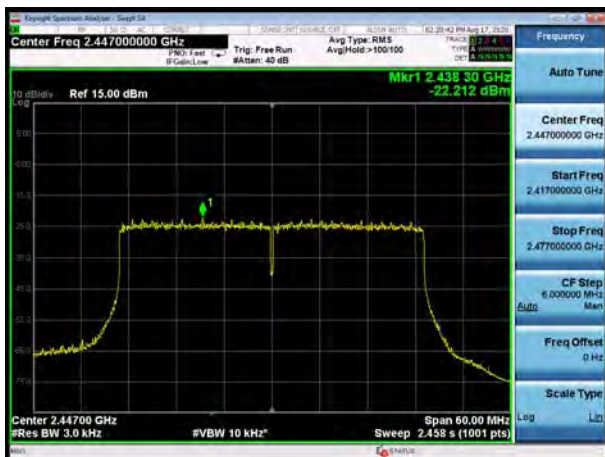
802.11ax (HE40), Channel No. 5  
242-Tones



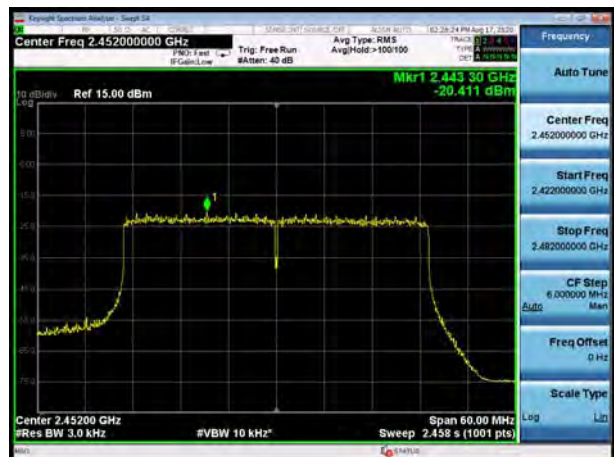
802.11ax (HE40), Channel No. 6  
242-Tones



802.11ax (HE40), Channel No. 8  
242-Tones

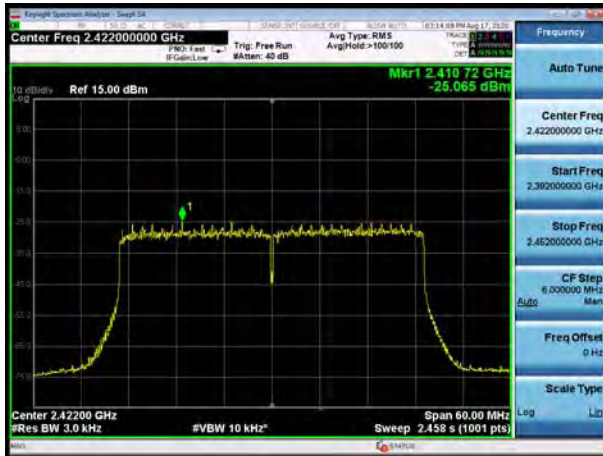


802.11ax (HE40), Channel No. 9  
242-Tones

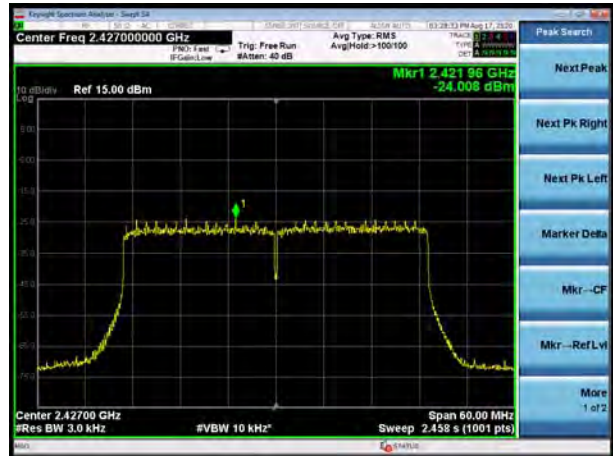




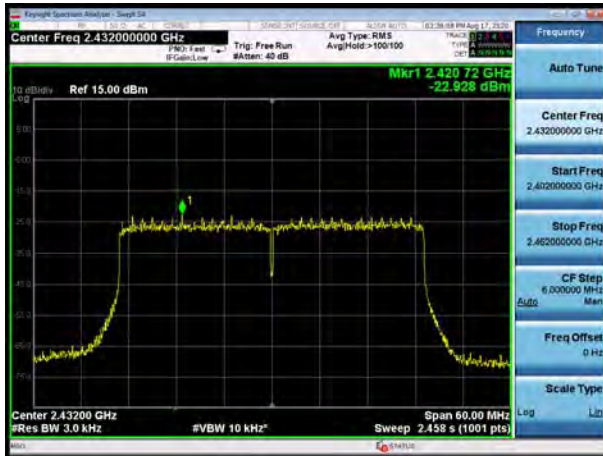
802.11ax (HE40), Channel No. 3  
484-Tones



802.11ax (HE40), Channel No. 4  
484-Tones



802.11ax (HE40), Channel No. 5  
484-Tones



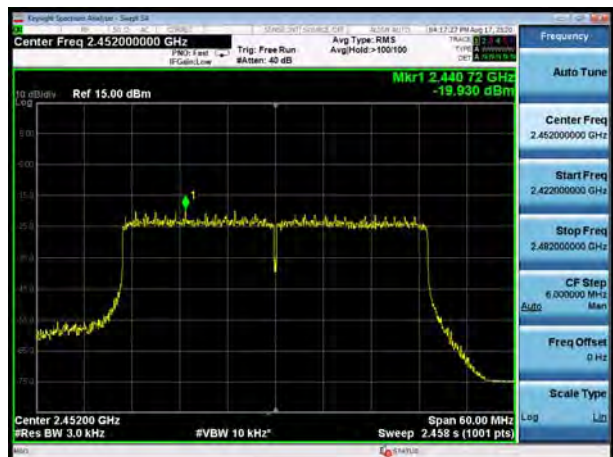
802.11ax (HE40), Channel No. 6  
484-Tones



802.11ax (HE40), Channel No. 8  
484-Tones



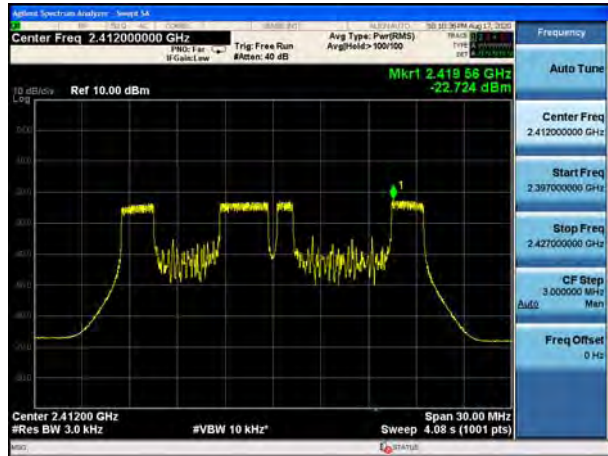
802.11ax (HE40), Channel No. 9  
484-Tones



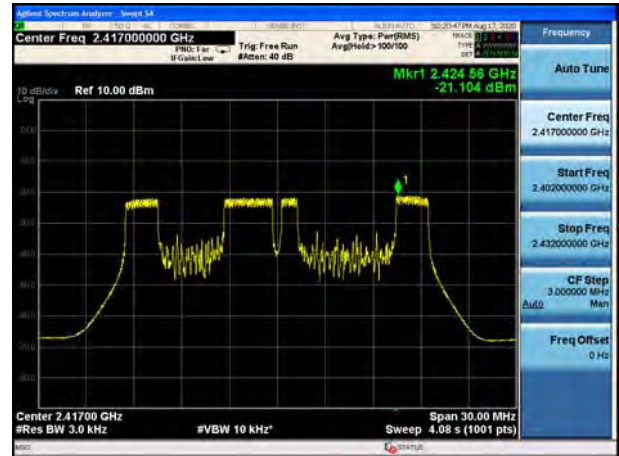


MIMO Antenna 2

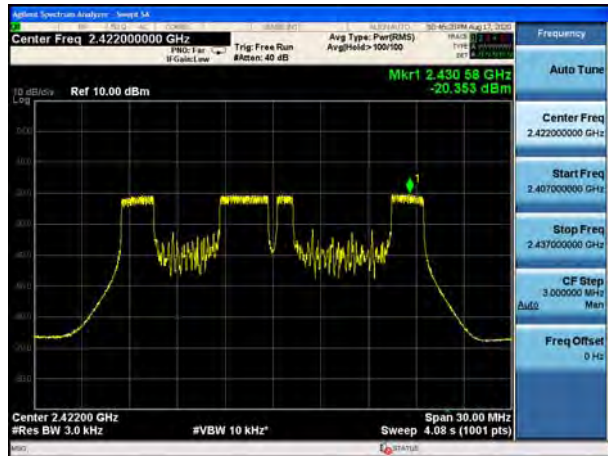
802.11ax (HE20), Channel No. 1  
26-Tones



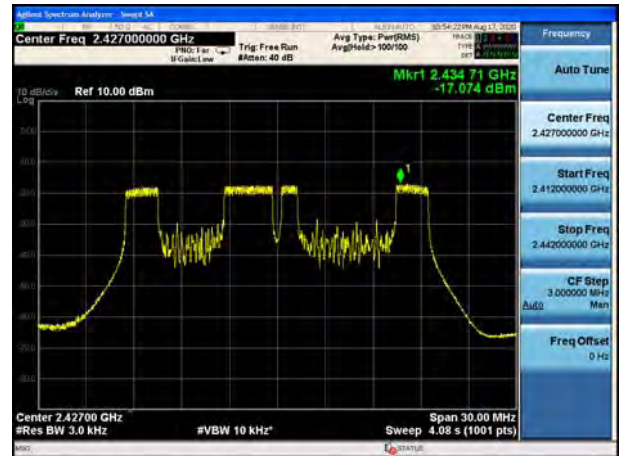
802.11ax (HE20), Channel No. 2  
26-Tones



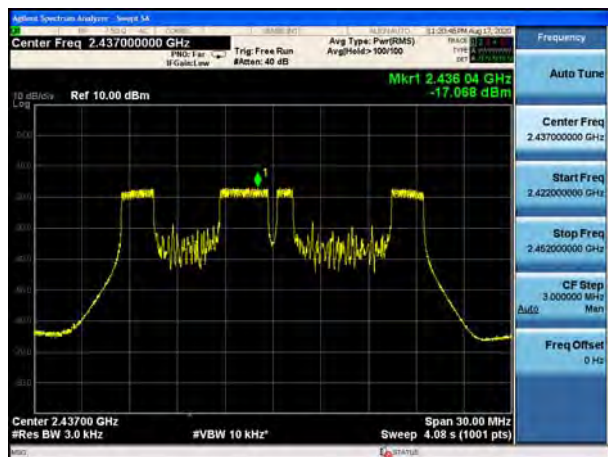
802.11ax (HE20), Channel No. 3  
26-Tones



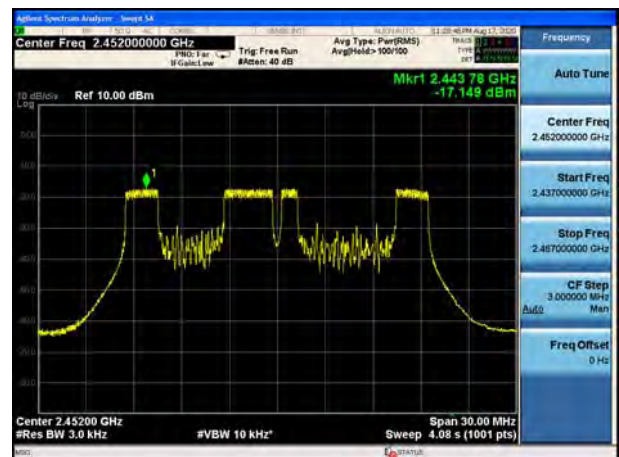
802.11ax (HE20), Channel No. 4  
26-Tones



802.11ax (HE20), Channel No. 6  
26-Tones

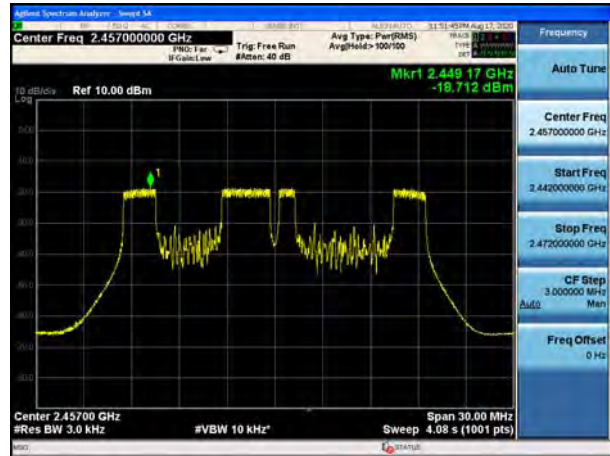


802.11ax (HE20), Channel No. 9  
26-Tones

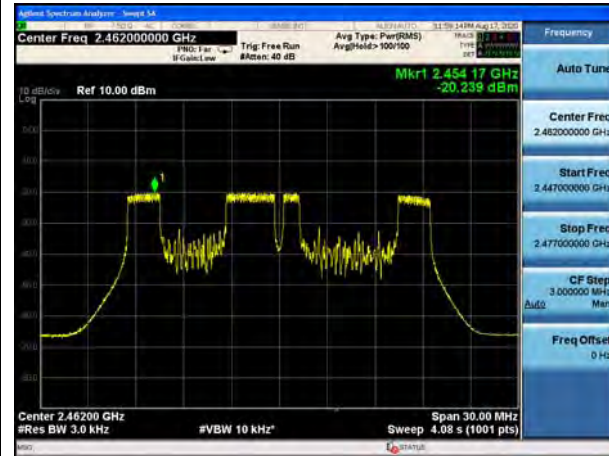




802.11ax (HE20), Channel No. 10  
26-Tones



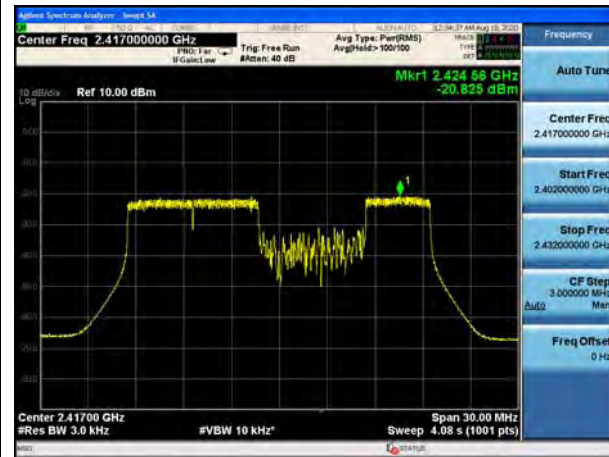
802.11ax (HE20), Channel No. 11  
26-Tones



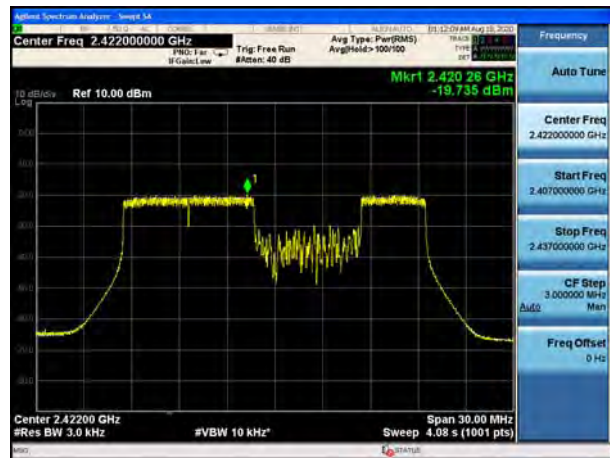
802.11ax (HE20), Channel No. 1  
52-Tones



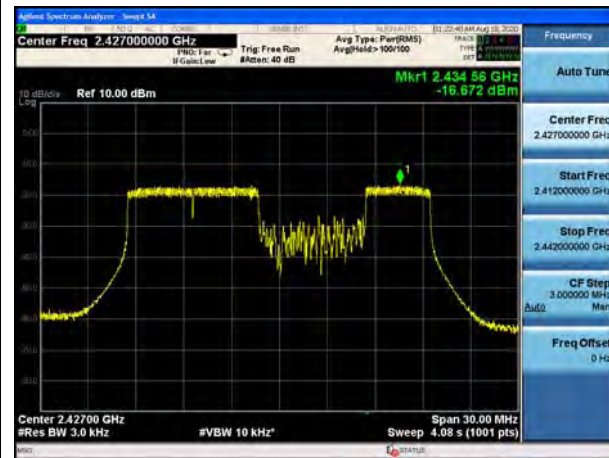
802.11ax (HE20), Channel No. 2  
52-Tones



802.11ax (HE20), Channel No. 3  
52-Tones

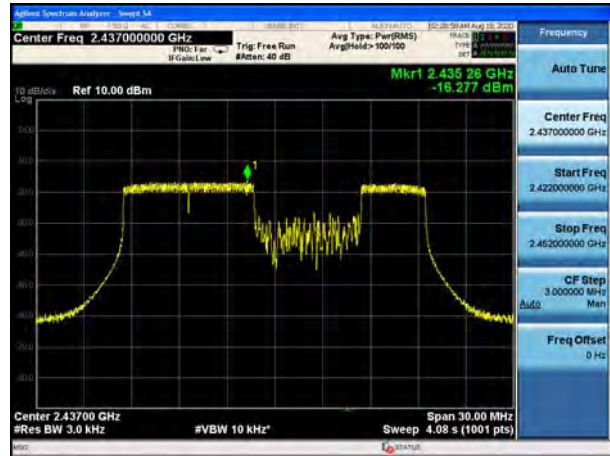


802.11ax (HE20), Channel No. 4  
52-Tones

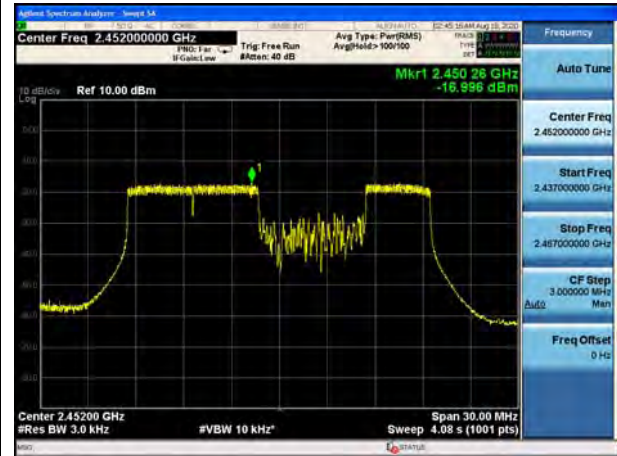




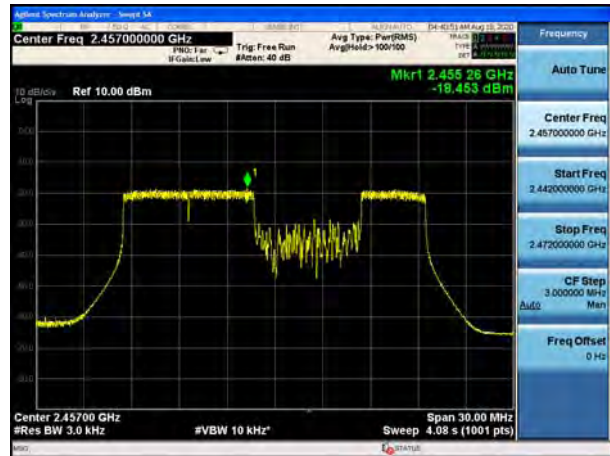
802.11ax (HE20), Channel No. 6  
52-Tones



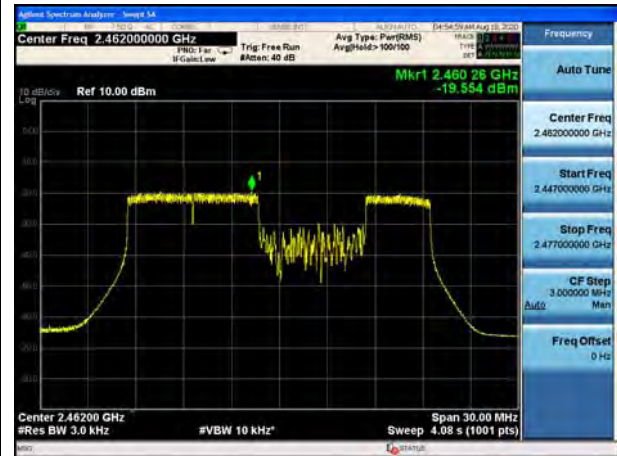
802.11ax (HE20), Channel No. 9  
52-Tones



802.11ax (HE20), Channel No. 10  
52-Tones



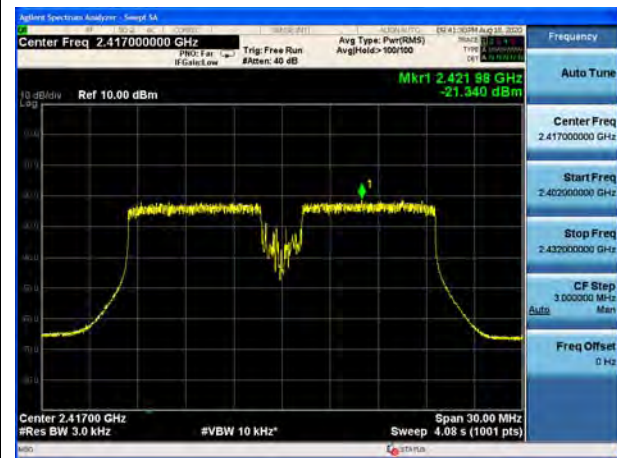
802.11ax (HE20), Channel No. 11  
52-Tones



802.11ax (HE20), Channel No. 1  
106-Tones

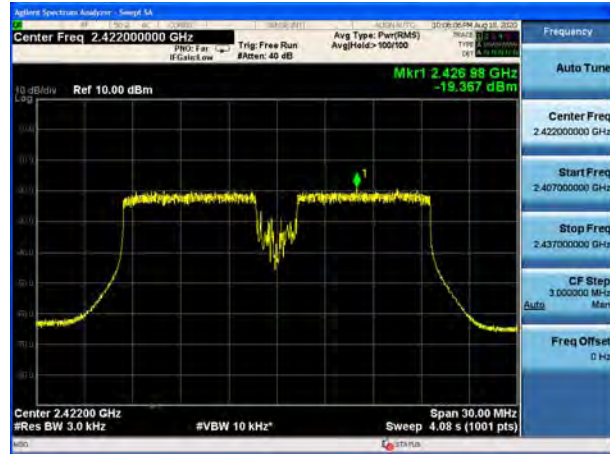


802.11ax (HE20), Channel No. 2  
106-Tones

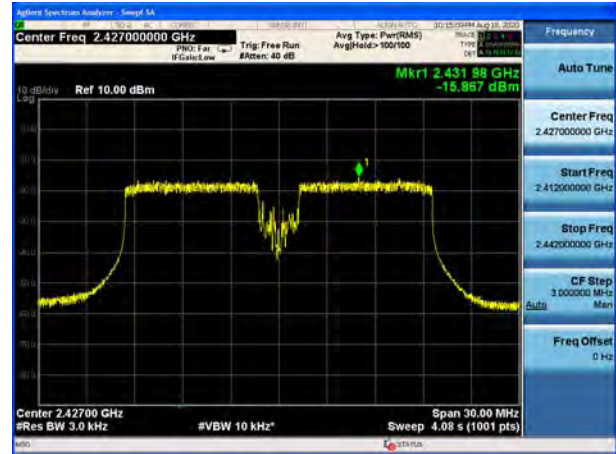




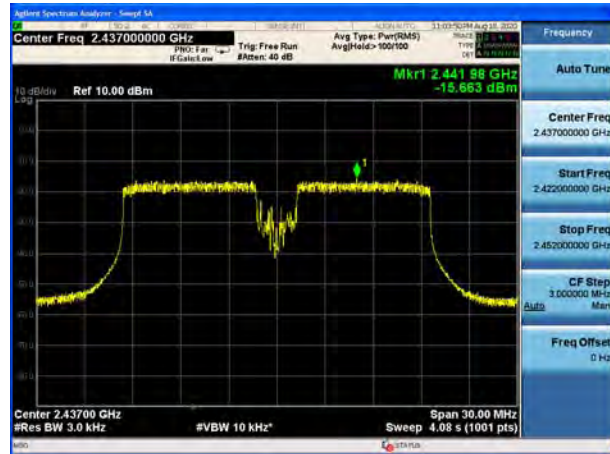
802.11ax (HE20), Channel No. 3  
106-Tones



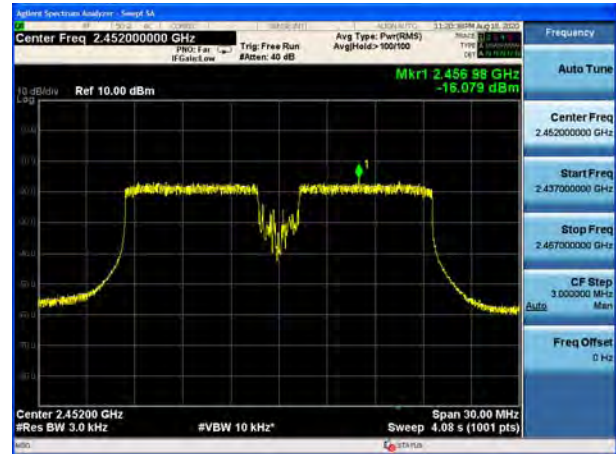
802.11ax (HE20), Channel No. 4  
106-Tones



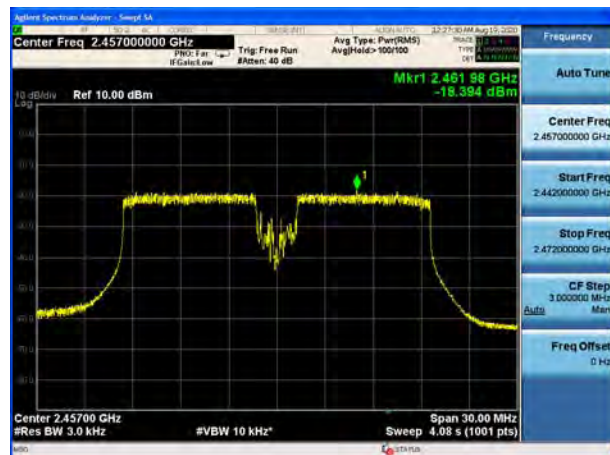
802.11ax (HE20), Channel No. 6  
106-Tones



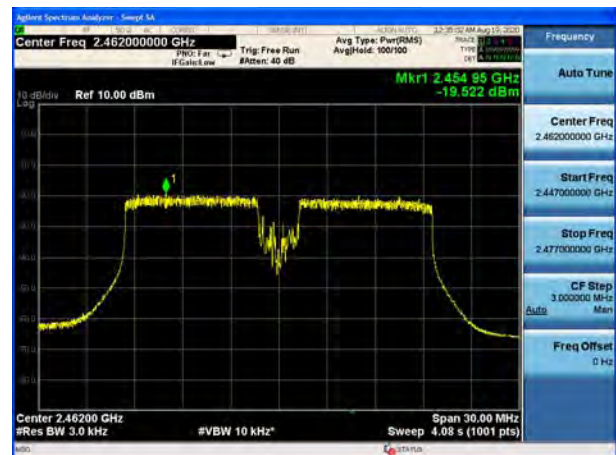
802.11ax (HE20), Channel No. 9  
106-Tones



802.11ax (HE20), Channel No. 10  
106-Tones



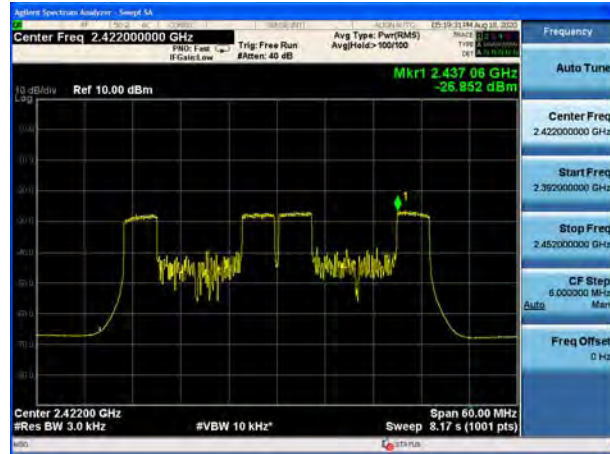
802.11ax (HE20), Channel No. 11  
106-Tones



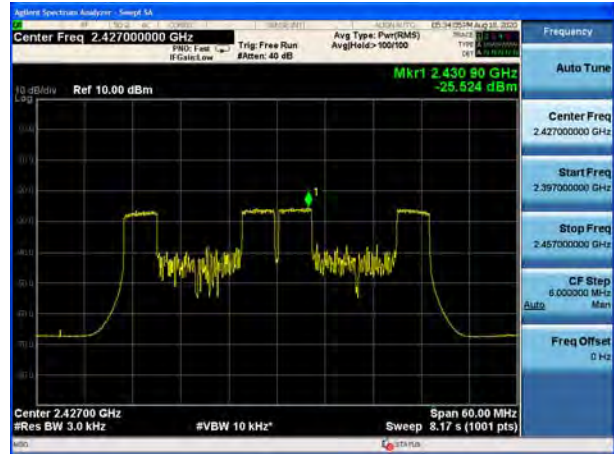




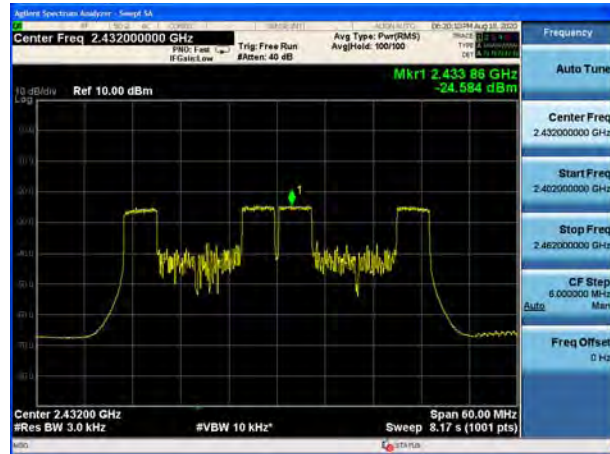
802.11ax (HE40), Channel No. 3  
52-Tones



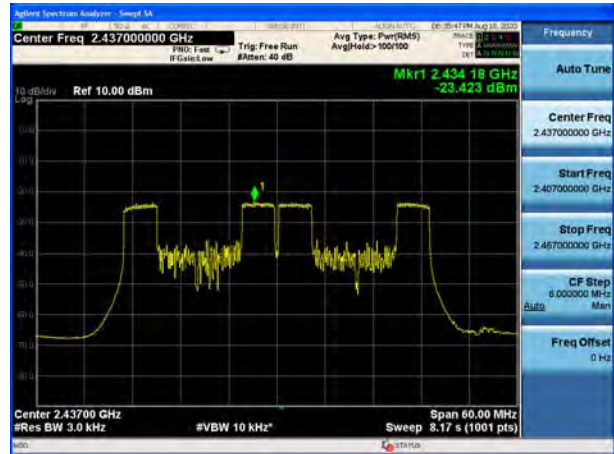
802.11ax (HE40), Channel No. 4  
52-Tones



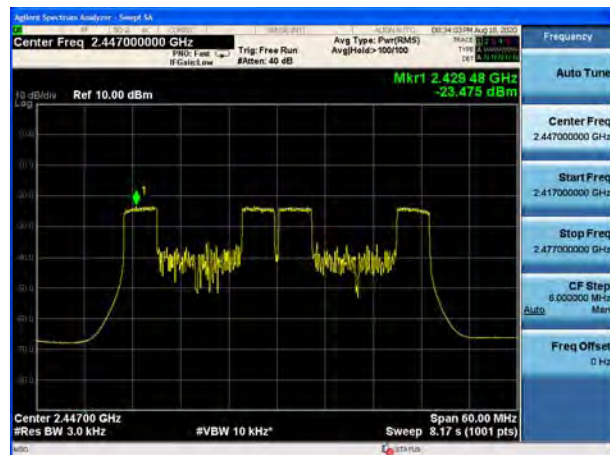
802.11ax (HE40), Channel No. 5  
52-Tones



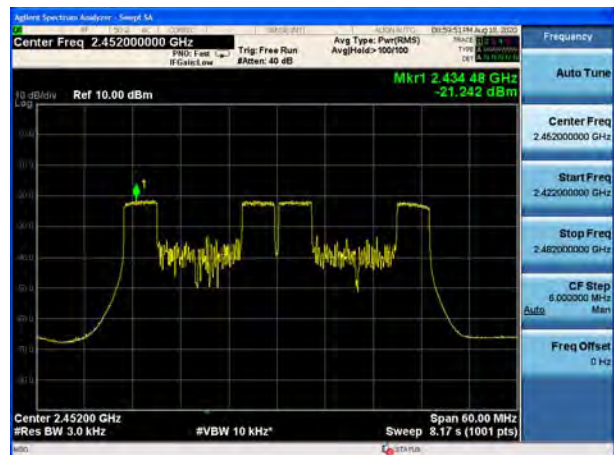
802.11ax (HE40), Channel No. 6  
52-Tones



802.11ax (HE40), Channel No. 8  
52-Tones

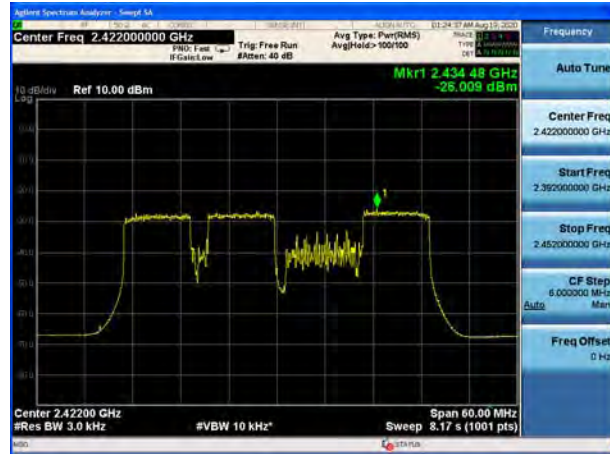


802.11ax (HE40), Channel No. 9  
52-Tones

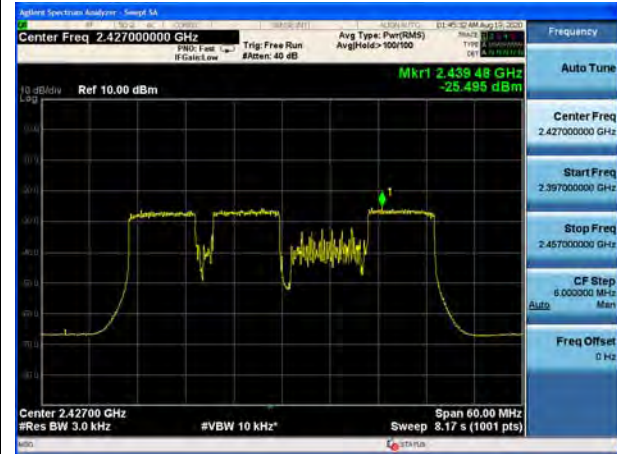




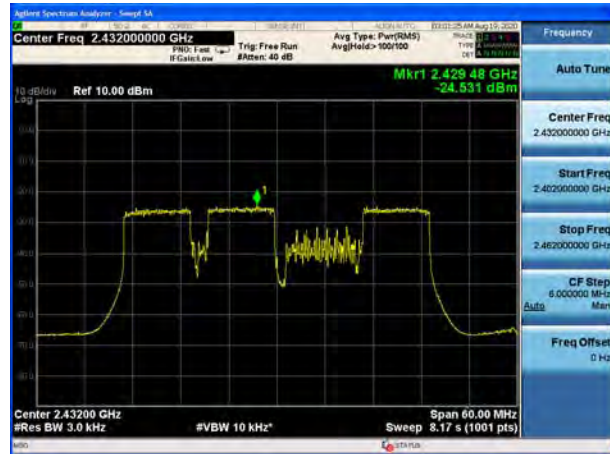
802.11ax (HE40), Channel No. 3  
106-Tones



802.11ax (HE40), Channel No. 4  
106-Tones



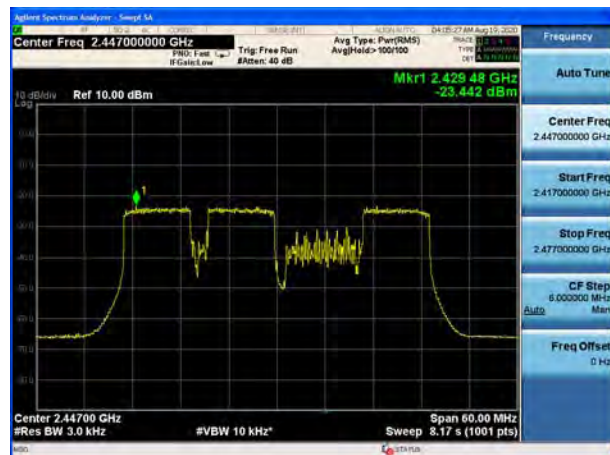
802.11ax (HE40), Channel No. 5  
106-Tones



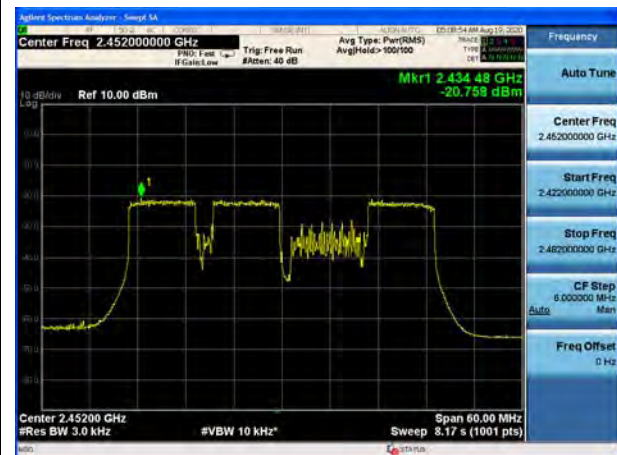
802.11ax (HE40), Channel No. 6  
106-Tones



802.11ax (HE40), Channel No. 8  
106-Tones



802.11ax (HE40), Channel No. 9  
106-Tones

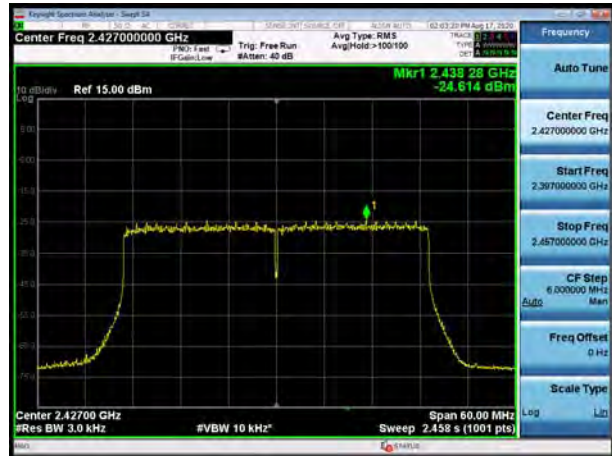




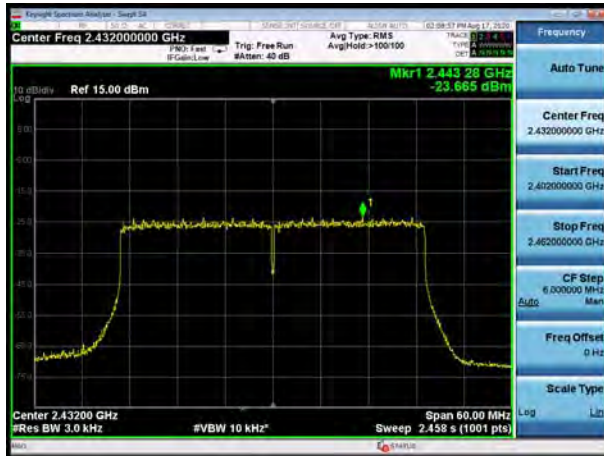
802.11ax (HE40), Channel No. 3  
242-Tones



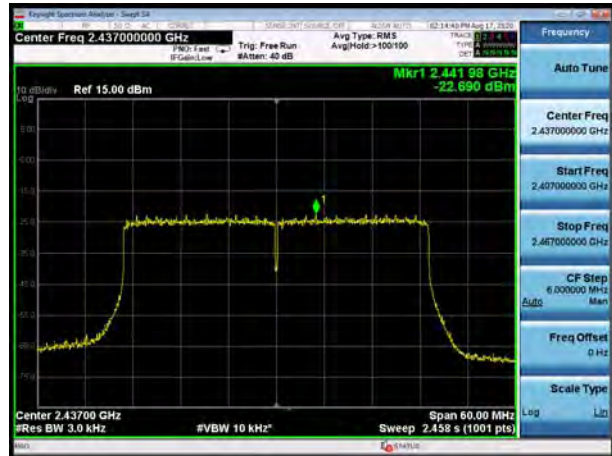
802.11ax (HE40), Channel No. 4  
242-Tones



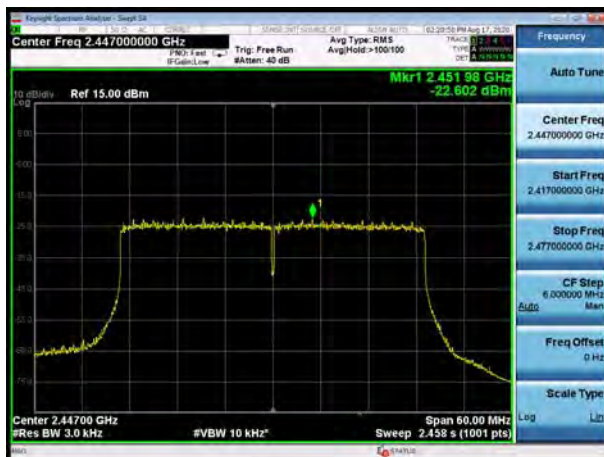
802.11ax (HE40), Channel No. 5  
242-Tones



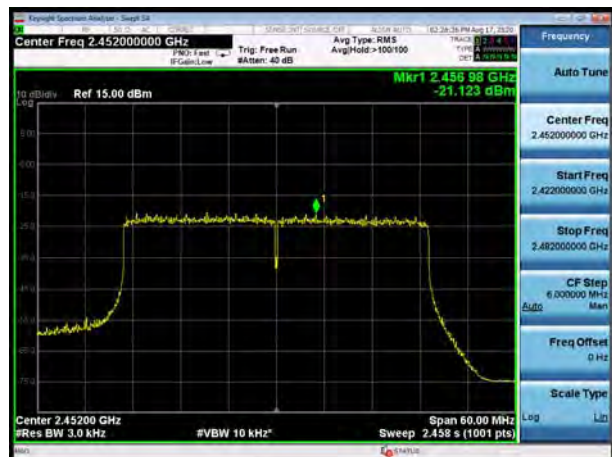
802.11ax (HE40), Channel No. 6  
242-Tones



802.11ax (HE40), Channel No. 8  
242-Tones

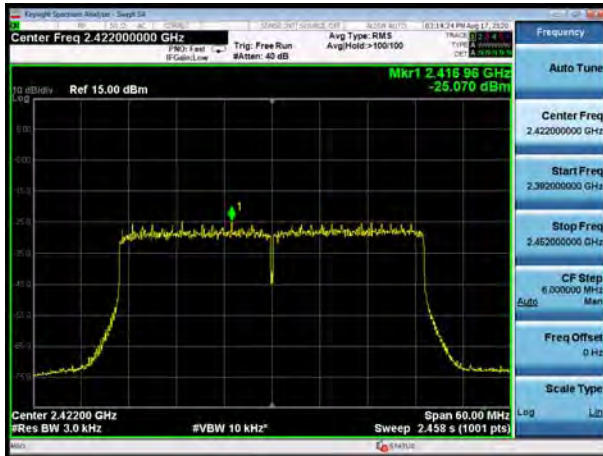


802.11ax (HE40), Channel No. 9  
242-Tones





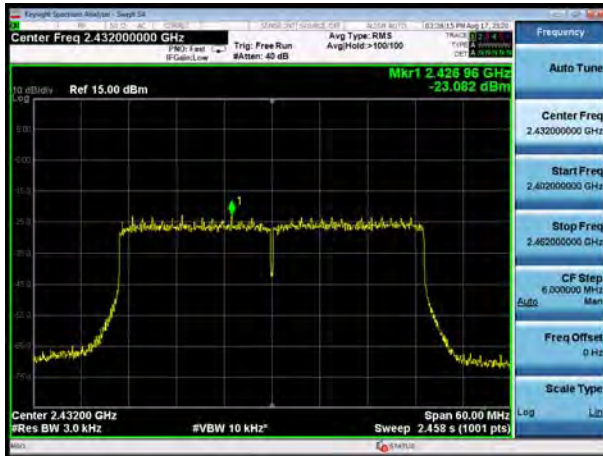
802.11ax (HE40), Channel No. 3  
484-Tones



802.11ax (HE40), Channel No. 4  
484-Tones



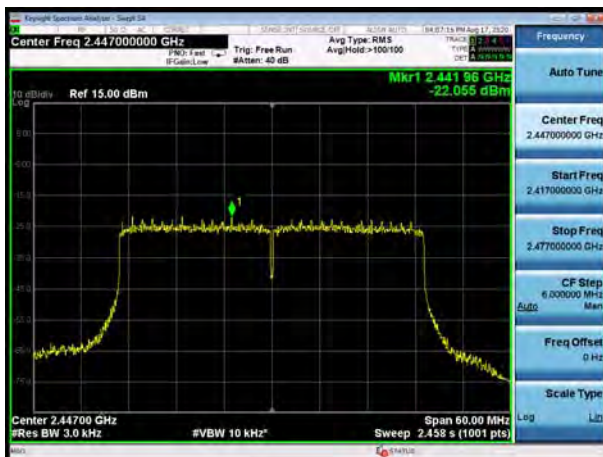
802.11ax (HE40), Channel No. 5  
484-Tones



802.11ax (HE40), Channel No. 6  
484-Tones



802.11ax (HE40), Channel No. 8  
484-Tones



802.11ax (HE40), Channel No. 9  
484-Tones

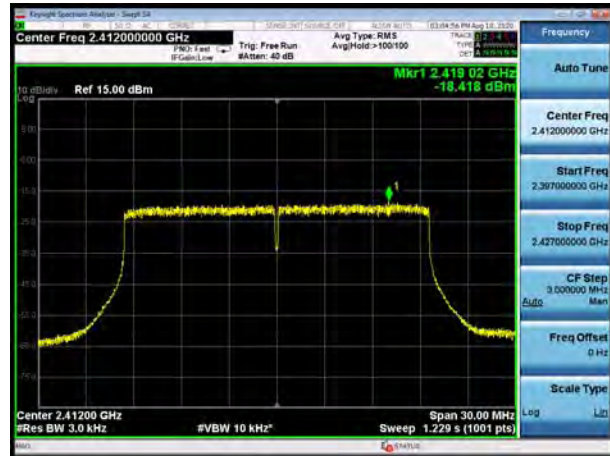




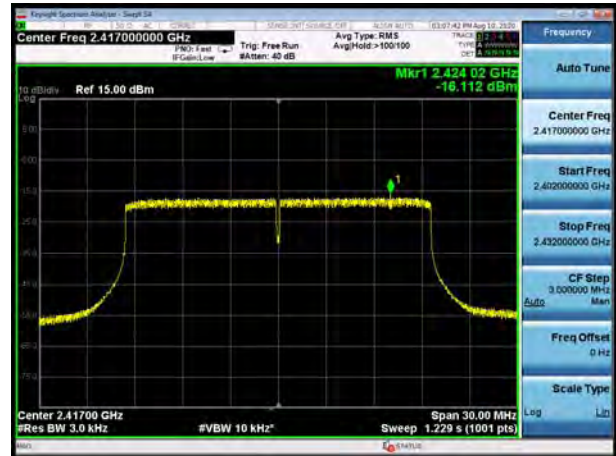
SU Mode

SISO Antenna 1

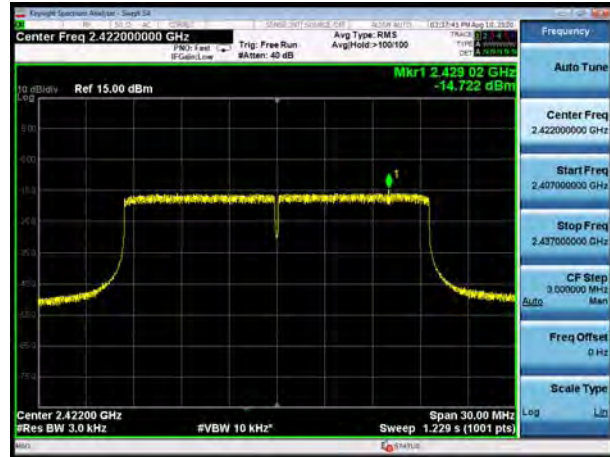
802.11ax (HE20), Channel No. 1



802.11ax (HE20), Channel No. 2



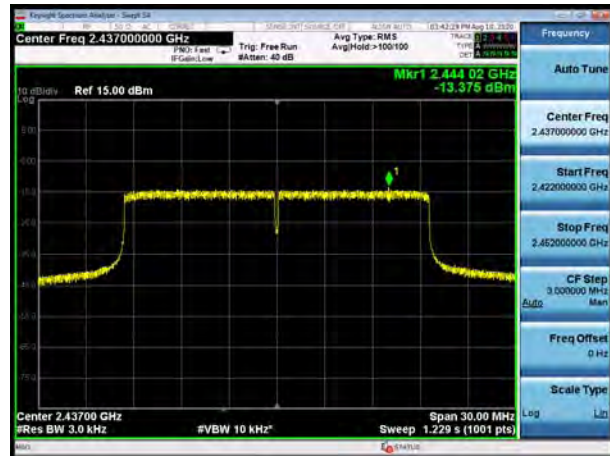
802.11ax (HE20), Channel No. 3



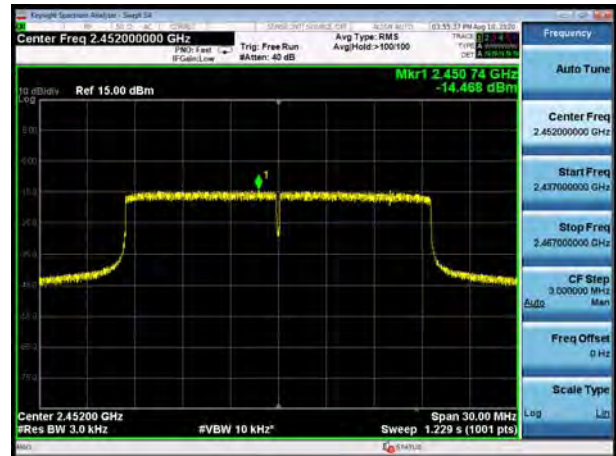
802.11ax (HE20), Channel No. 4



802.11ax (HE20), Channel No. 6

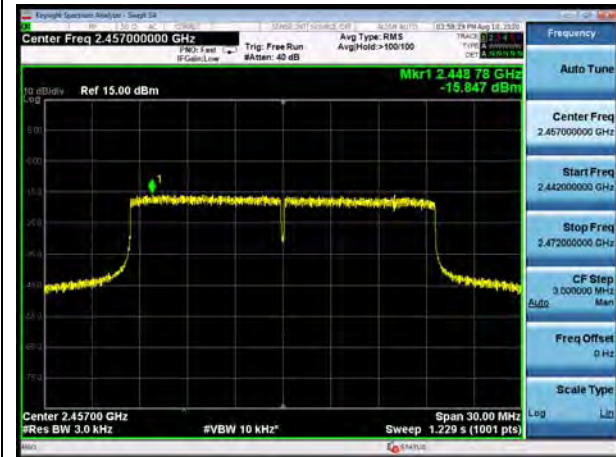


802.11ax (HE20), Channel No. 9





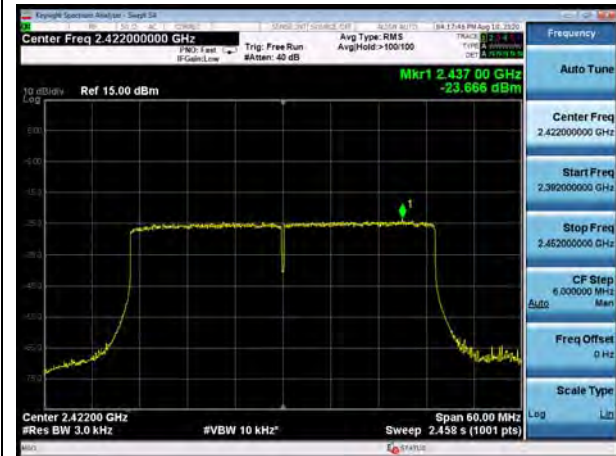
802.11ax (HE20), Channel No. 10



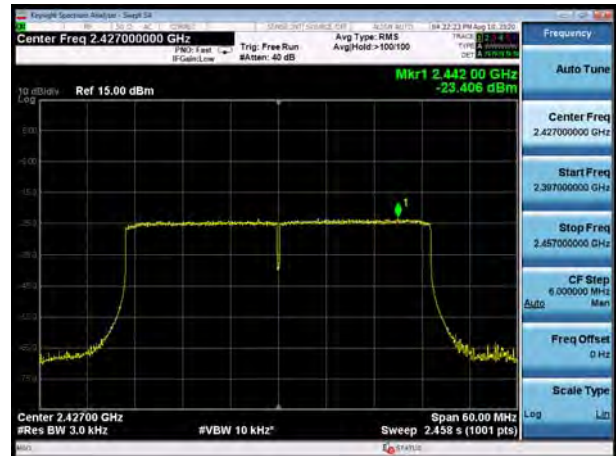
802.11ax (HE20), Channel No. 11



802.11ax (HE40), Channel No. 3



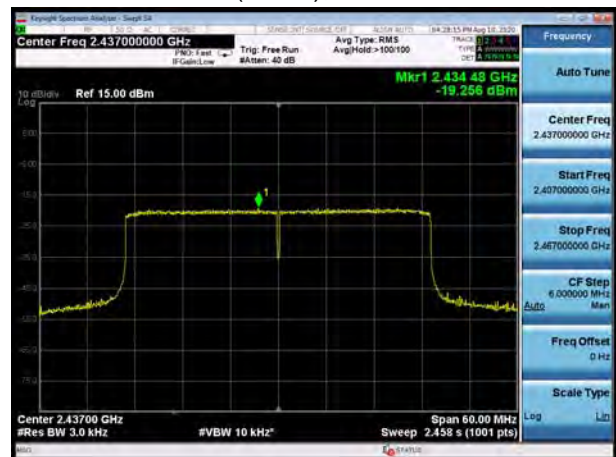
802.11ax (HE40), Channel No. 4



802.11ax (HE40), Channel No. 5

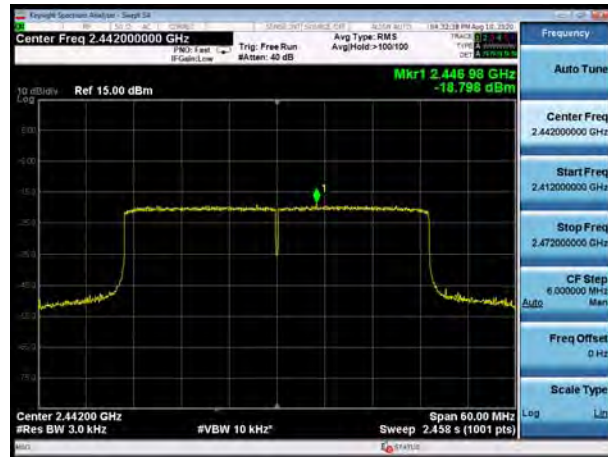


802.11ax (HE40), Channel No. 6





802.11ax (HE40), Channel No. 7



802.11ax (HE40), Channel No. 8



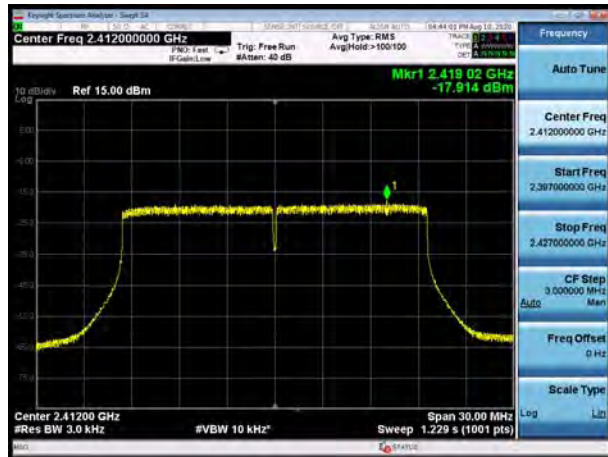
802.11ax (HE40), Channel No. 9



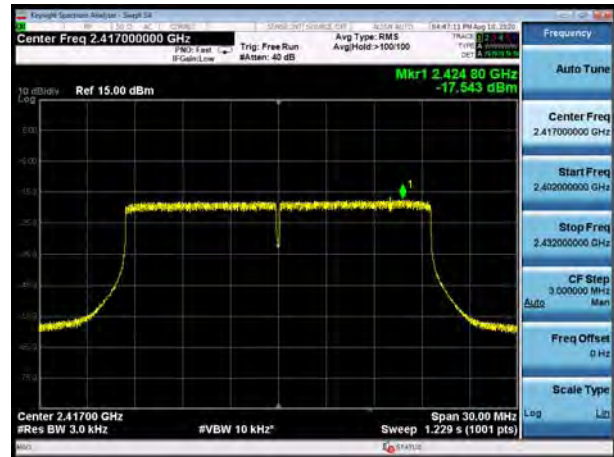


SISO Antenna 2

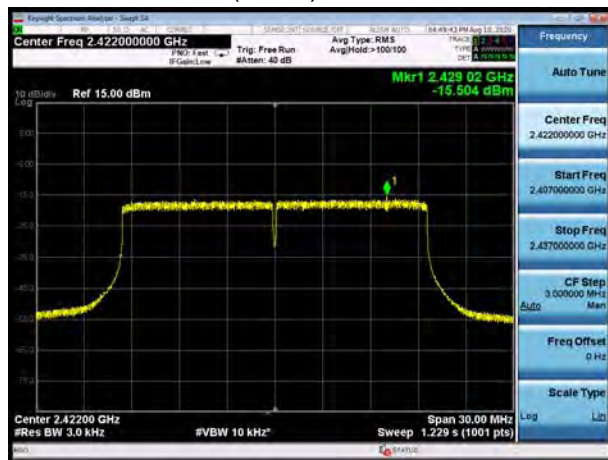
802.11ax (HE20), Channel No. 1



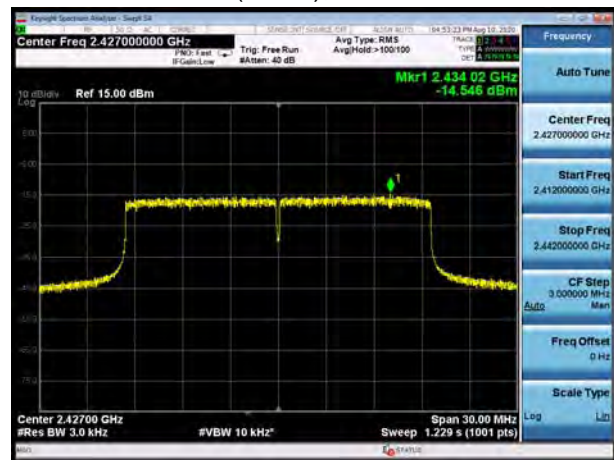
802.11ax (HE20), Channel No. 2



802.11ax (HE20), Channel No. 3



802.11ax (HE20), Channel No. 4



802.11ax (HE20), Channel No. 6



802.11ax (HE20), Channel No. 9

