



REPORT No.: SZ22100161W15

TEST REPORT

APPLICANT : Shenzhen Tengfei
Technology Management Ltd.

PRODUCT NAME : 5G Mobile Phone

MODEL NAME : NX729J

BRAND NAME : REDMAGIC

FCC ID : 2A9QD-NX729J

STANDARD(S) : 47 CFR Part 15 Subpart E

RECEIPT DATE : 2022-11-01

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DIRECTORY

1. Technical Information	3
1.1. Applicant and Manufacturer Information	3
1.2. Equipment Under Test (EUT) Description	3
1.3. Modulation Type and Data Rate of EUT	5
1.4. The Channel Number and Frequency	6
1.5. Test Standards and Results	7
1.6. Environmental Conditions	8
2. 47 CFR Part 15E Requirements	9
2.1. Antenna Requirement	9
2.2. Duty Cycle of the Test Signal	10
2.3. Maximum Conducted Output Power	17
2.4. Emission Bandwidth	30
2.5. Peak Power Spectral Density	93
2.6. Frequency Stability	160
2.7. Conducted Emission	163
2.8. Restricted Frequency Bands	167
2.9. Radiated Emission	195
Annex A Test Uncertainty	250
Annex B Testing Laboratory Information	251

Change History		
Version	Date	Reason for change
1.0	2022-12-16	First edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Shenzhen Tengfei Technology Management Ltd.
Applicant Address:	Room 3101, Building D1, Chuangzhi Yuncheng, Liuxian Avenue, Xili Street, Nanshan, Shenzhen, China
Manufacturer:	Shenzhen Tengfei Technology Management Ltd.
Manufacturer Address:	Room 3101, Building D1, Chuangzhi Yuncheng, Liuxian Avenue, Xili Street, Nanshan, Shenzhen, China

1.2. Equipment Under Test (EUT) Description

Product Name:	5G Mobile Phone	
Sample No.:	1#	
Hardware Version:	NX729J_V1AMB	
Software Version:	NX729J_UNCommon_V3.03	
Modulation Technology:	OFDM	
Modulation Mode:	802.11a, 802.11n (HT20), 802.11n (HT40) 802.11ac (VHT20), 802.11ac (VHT40), 802.11ac (VHT80) 802.11ax (HEW20), 802.11ax (HEW40), 802.11ax (HEW80)	
Operating Frequency Range:	5180MHz-5240MHz; 5260MHz-5320MHz; 5500MHz-5720MHz; 5745MHz-5825MHz	
Channel Number:	Refer to 1.3	
Antenna Type:	PIFA Antenna	
Antenna Gain:	ANT 0: -0.2dBi; ANT 1: -0.8dBi	
Directional Gain:	2.51dBi _{Note 2}	
Accessory Information:	Battery	
	Brand Name:	ATL
	Model No.:	Li3928T89P8h603285
	Serial No.:	N/A
	Capacity:	2860mAh
	Rated Voltage:	7.78V
	Charge Limit:	8.9V
	Manufacturer:	Dongguan Amperex Technology Limited



Accessory Information:	AC Adapter	
	Brand Name:	N/A
	Model No.:	STC-A59152050AC-Z
	Serial No.:	N/A
	Rated Output:	5V=3A, 9V=3A, 15V=3A, 20V=3.25A, PPS: 5.0V-11.0V=5.0A, 5.0V-20.0V=3.25A
	Rated Input:	100-240V~50/60Hz, 1.5A
	Manufacturer:	ShenZhen KunXing Technology Co.,Ltd.
	USB Cable	
	Model No.:	N52111200016D

Note 1: The EUT supports a MIMO function. Physically, the EUT provides two completed transmitters and two receivers for 802.11n, 802.11ac and 802.11ax modulation mode.

Modulation Mode:	TX Function
802.11n	2TX
802.11ac	2TX
802.11ax	2TX

Note 2: According to KDB 662911 D01, the directional gain = $G_{ANT} + 10\log(N_{ANT})$ dBi, where G_{ANT} is the maximum antenna gain in dBi, N_{ANT} is the number of outputs.

Note 3: For conducted test item Conducted Output Power and Peak Power Spectral Density of each modulation mode, we recorded the test result of two antennas separately, for other conducted test items both of the two antennas were tested separately, we only recorded the worst test result (ANT0) in this report.

Note 4: All radiation test items for 802.11n, 802.11ac and 802.11ax modulation mode operate at MIMO mode during the test. Other modulation mode operate at SISO mode, both of the two antennas were tested separately, we only recorded the worst test result(ANT0) in this report.

Note 5: WiFi hotspot only support U-NII-1 and U-NII-3 band.

Note 6: We use the dedicated software to control the EUT continuous transmission.

Note 7: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.3. Modulation Type and Data Rate of EUT

Mode	Bandwidth (MHz)	Modulation Technology	Modulation Type	Data Rate	RU Size
802.11a	20	OFDM	DBPSK	1/2/5.5/11Mbps	N/A
			DQPSK		
			CCK		
802.11n	20/40 (HT20/40)	OFDM	BPSK	MCS0~MCS7	N/A
			QPSK		
			16QAM		
			64QAM		
802.11ac	20/40/80 (VHT20/40/80)	OFDM	BPSK	MCS0~MCS9	N/A
			QPSK		
			16QAM		
			64QAM		
			256QAM		
802.11ax	20/40/80 (HEW20/40/80)	OFDMA	BPSK	MCS0~MCS11	26/52/106/242/484/996
			QPSK		
			16QAM		
			64QAM		
			256QAM		
			1024QAM		

Note1: The worst-case mode(black bold) in all data rates has been determined during the pre-scan, only the test data of the worst-case were recorded in this report.

1.4. The Channel Number and Frequency

(U-NII-1) 5180MHz-5240MHz				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	36	5180	40	5200
	44	5220	48	5240
40MHz	38	5190	46	5230
80MHz	42	5210		
(U-NII-2A) 5260MHz-5320MHz				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	52	5260	56	5280
	60	5300	64	5320
40MHz	54	5270	62	5310
80MHz	58	5290		
(U-NII-2C) 5500MHz-5720MHz				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	100	5500	105	5520
	108	5540	112	5560
	116	5580	120	5600
	124	5620	128	5640
	132	5660	136	5680
	140	5700	144	5720
40MHz	102	5510	110	5550
	118	5590	126	5630
	134	5670	142	5710
80MHz	106	5530	122	5610
	138	5690		
(U-NII-3) 5745MHz-5825MHz				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	149	5745	153	5765
	157	5785	161	5805
	165	5825		
40MHz	151	5775	159	5795
80MHz	155	5775		

Note 1: The black bold channels were selected for test.



1.5. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart E (U-NII band) for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15(5-1-14 Edition)	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result	Method determination /Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	No deviation
2	ANSI C63.10	Duty Cycle of the Test Signal	Nov. 10, 2022	Zhong Yanshan	PASS	No deviation
3	15.407(a)	Maximum Conducted Output Power	Nov. 10, 2022	Zhong Yanshan	PASS	No deviation
4	15.407(a) (e)	Emission Bandwidth	Nov. 26, 2022	Zhong Yanshan	PASS	No deviation
5	15.407(a)	Peak Power Spectral Density	Nov. 26, 2022	Zhong Yanshan	PASS	No deviation
6	15.407(g)	Frequency Stability	Nov. 29, 2022	Zhong Yanshan	PASS	No deviation
7	15.207	Conducted Emission	Nov. 22, 2022	Fan Zehang	PASS	No deviation
8	15.407(b)	Restricted Frequency Bands	Nov. 29&30, 2022	Su Zhan	PASS	No deviation
9	15.407(b)	Radiated Emission	Nov. 28, 2022	Su Zhan	PASS	No deviation

Note 1: The DFS test report was documented in a separate report (Report No.: SZ22100161W05).

Note 2: The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.102013.

Note 3: These RF tests were performed according to the method of measurements prescribed in KDB789033 D02 v02r01 and KDB662911 D01 v02r01.

Note 4: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The ref offset 11.5dB contains two parts that cable loss 1.5dB and Attenuator 10dB.

Note 5: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 6: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

1.6. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15-35
Relative Humidity (%):	30-60
Atmospheric Pressure (kPa):	86-106



2. 47 CFR Part 15E Requirements

2.1. Antenna Requirement

2.1.1. Applicable Standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

2.1.2. Test Result: Compliant

Inside of the EUT has a PIFA antenna coupled with the I-PEX connector. Please refer to the EUT photos.

2.2. Duty Cycle of the Test Signal

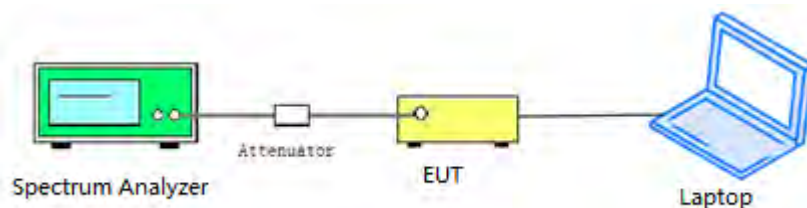
2.2.1. Requirement

Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%). When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be used to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration (T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data are being acquired (i.e., no transmitter OFF-time is to be considered).

When continuous transmission cannot be achieved and sweep triggering/signal gating cannot be implemented, alternative procedures are provided that can be used to measure the average power; however, they will require an additional measurement of the transmitter duty cycle (D). Within this sub clause, the duty cycle refers to the fraction of time over which the transmitter is ON and is transmitting at its maximum power control level. The duty cycle is considered to be constant if variations are less than $\pm 2\%$; otherwise, the duty cycle is considered to be nonconstant.

2.2.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2.2.3. Test Procedure

KDB 789033 Section B was used in order to prove compliance.

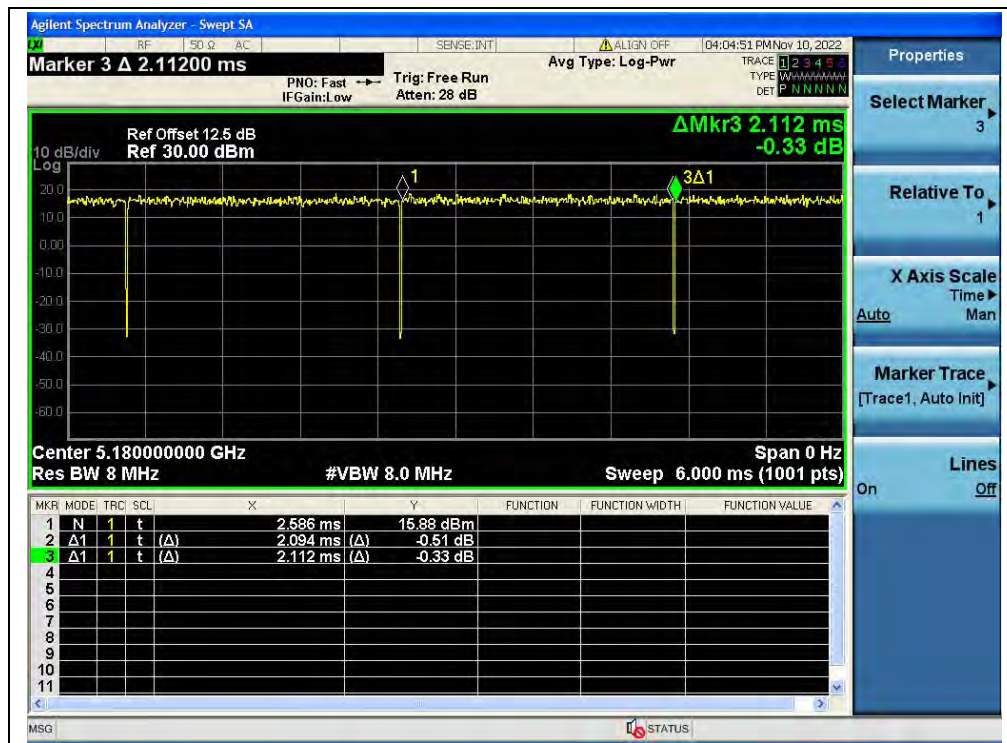


2.2.4. Test Result

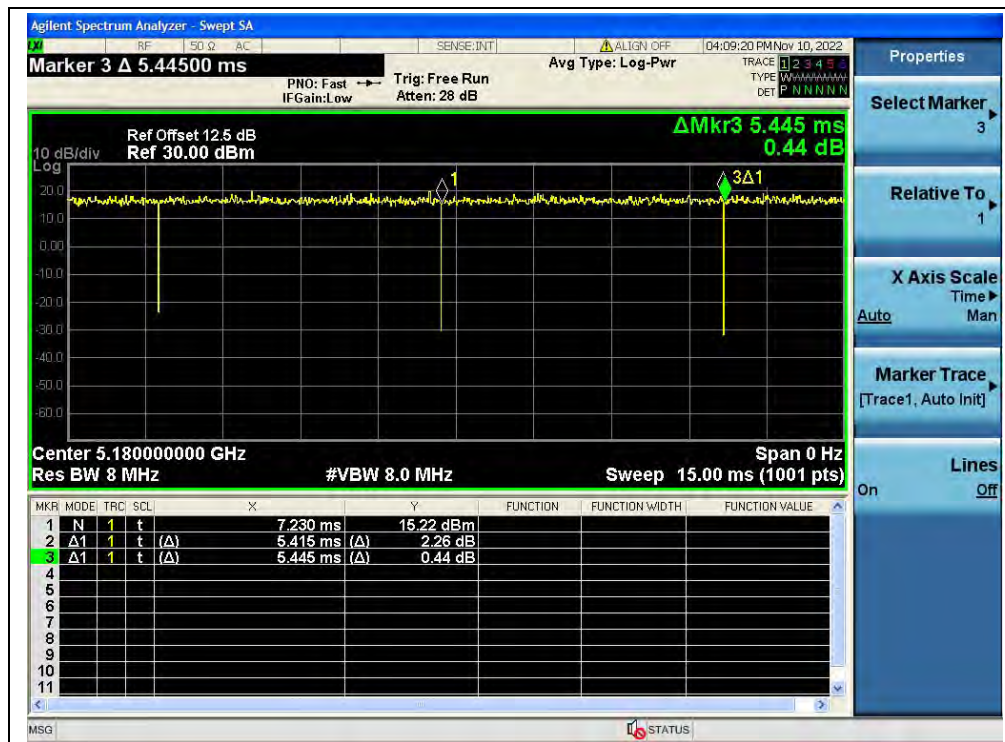
A. Test Verdict:

Test Mode	Duty Cycle (%) (D)	Duty Factor (10*log[1/D])
802.11a	99.15	0.04
802.11n(HT20)	99.45	0.02
802.11n(HT40)	99.63	0.02
802.11ac(VHT20)	99.45	0.02
802.11ac(VHT40)	99.71	0.01
802.11ac(VHT80)	99.71	0.01
802.11ax(HEW20)	99.63	0.02
802.11ax(HEW20) RU26	96.07	0.17
802.11ax(HEW40)	99.71	0.01
802.11ax(HEW80)	99.71	0.01

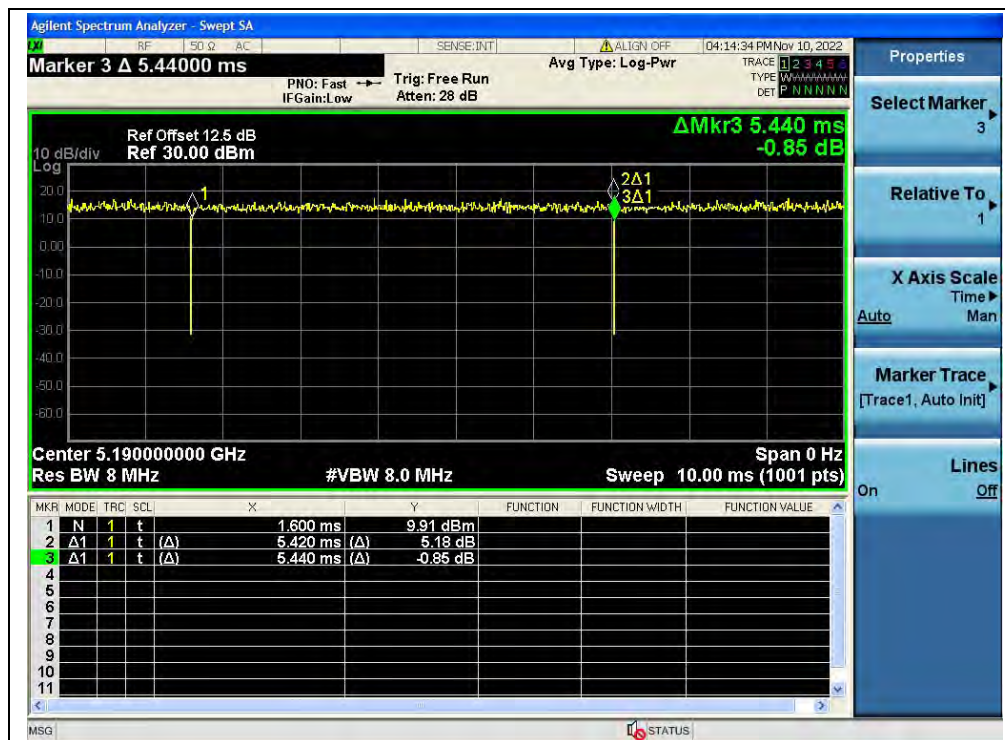
B. Test Plot:



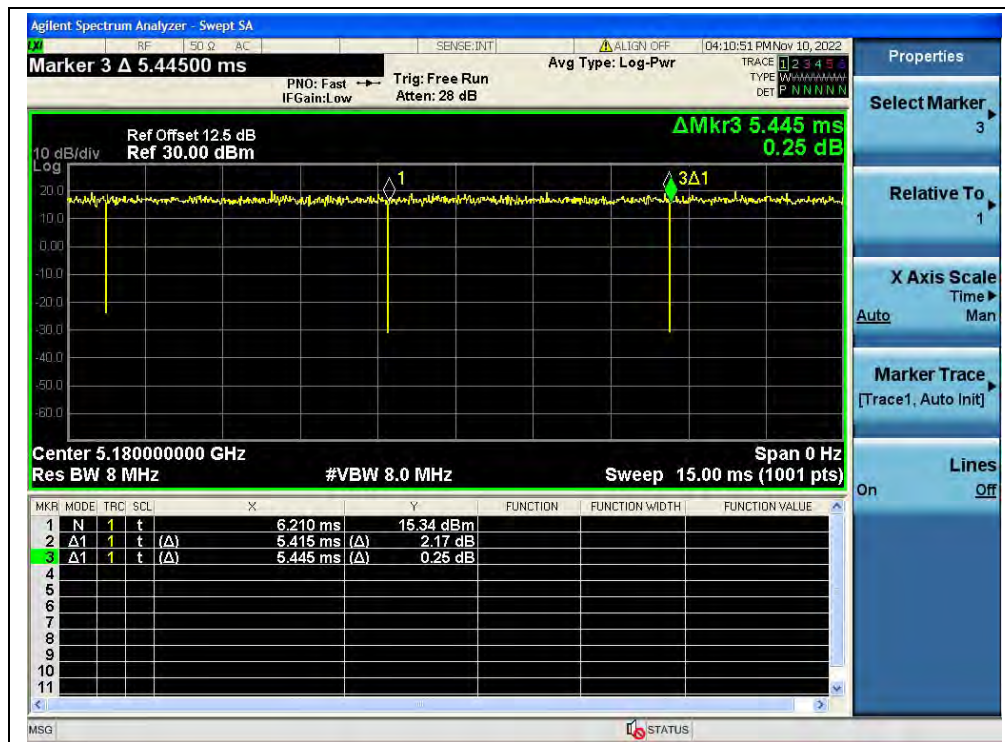
(Channel 36, 5180MHz, 802.11a)



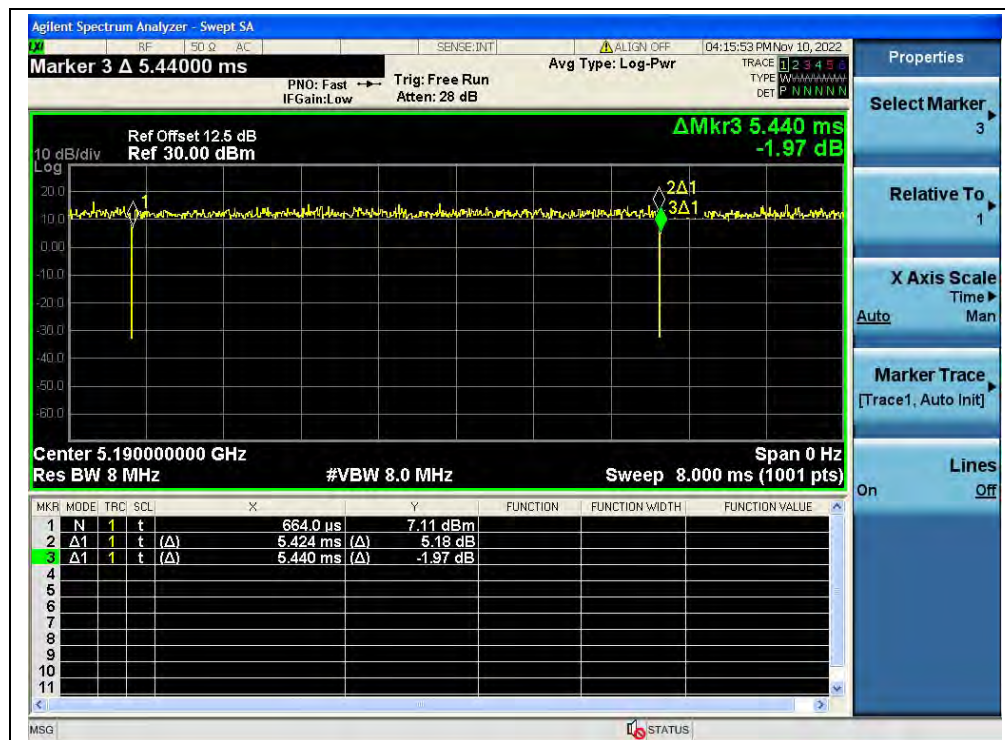
(Channel 36, 5180MHz, 802.11n (HT20))



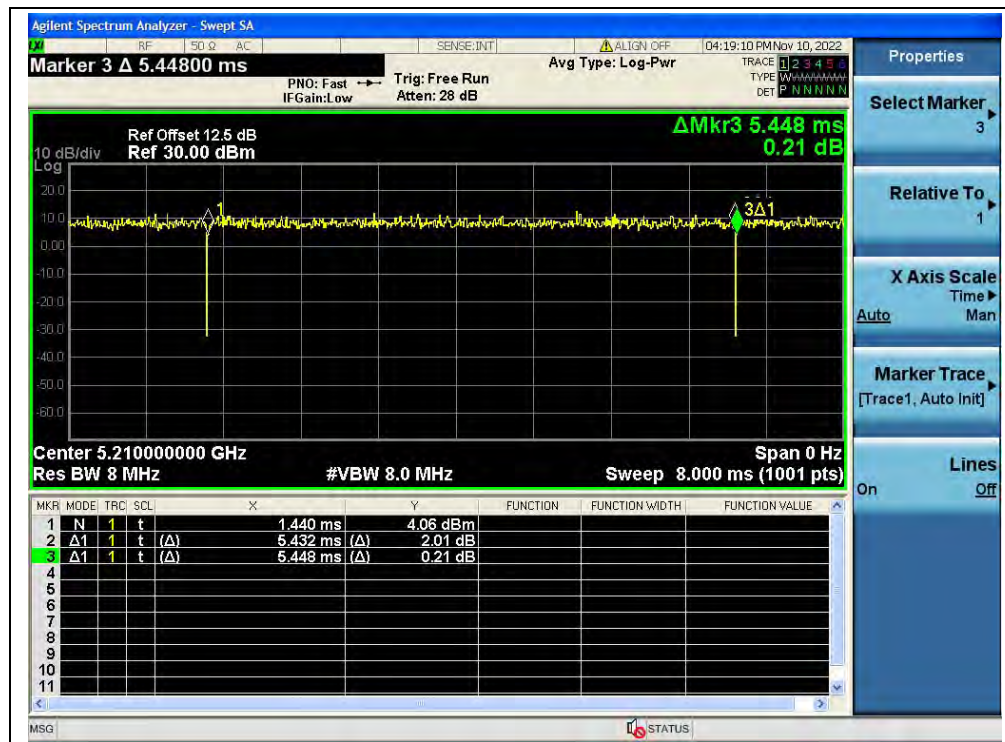
(Channel 38, 5190MHz, 802.11n (HT40))



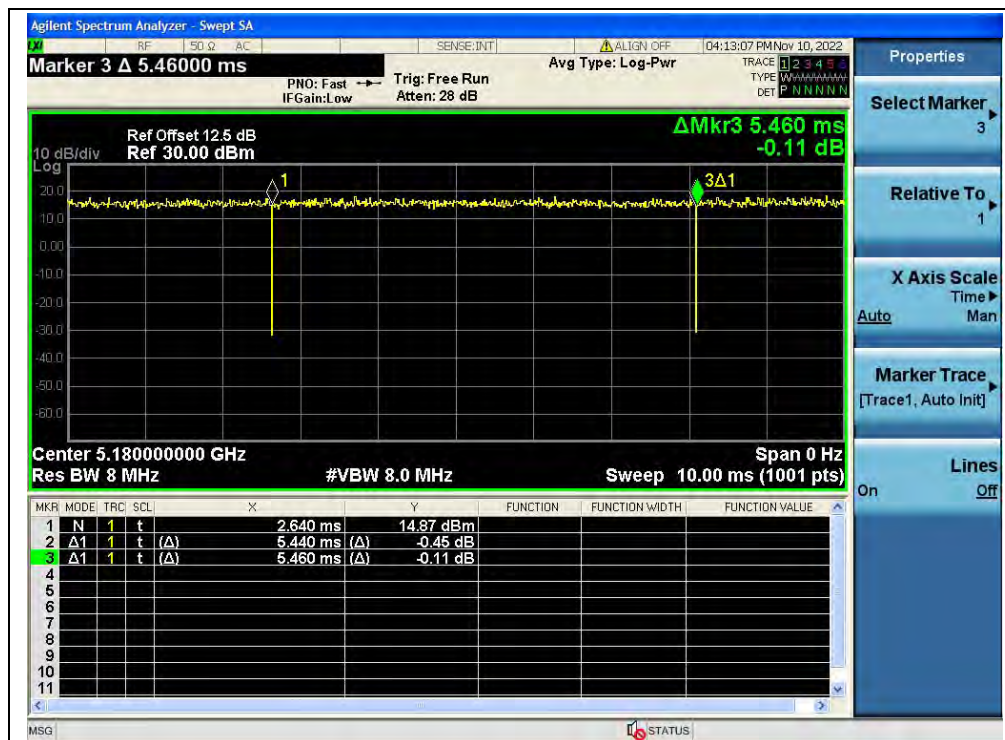
(Channel 36, 5180MHz, 802.11ac (VHT20))



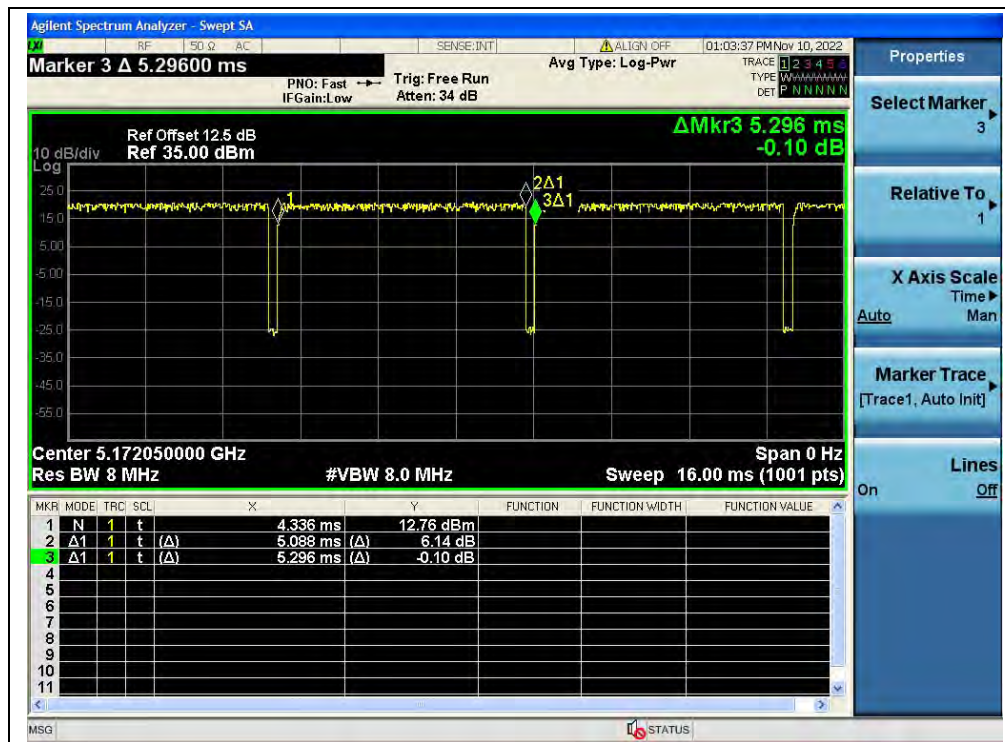
(Channel 38, 5190MHz, 802.11ac (VHT40))



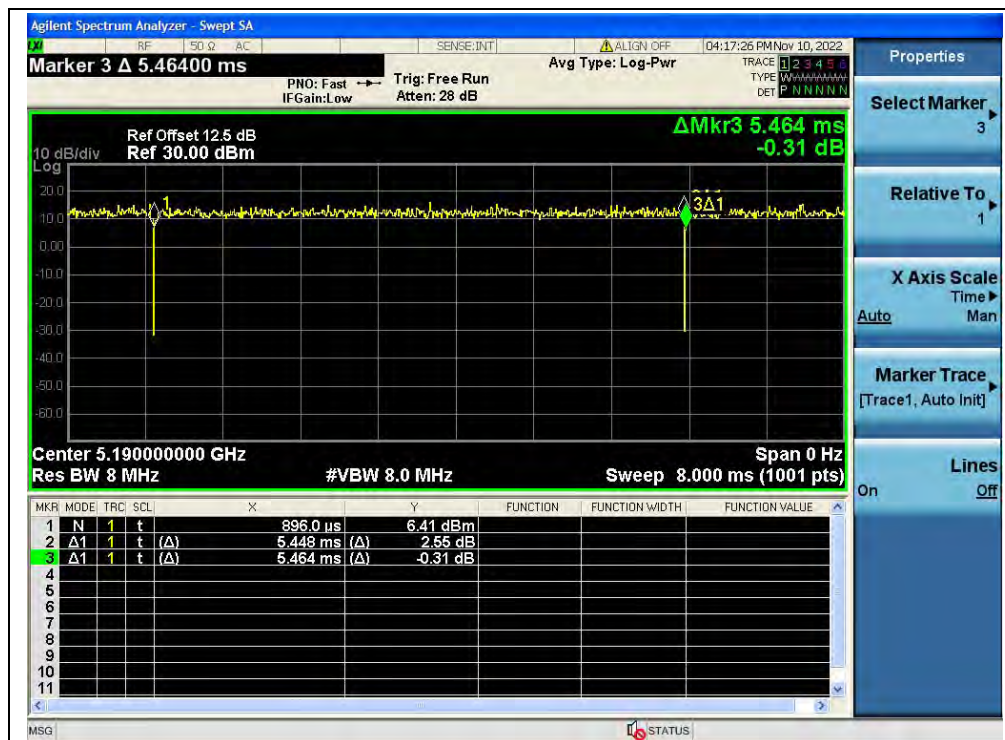
(Channel 42, 5210MHz, 802.11ac (VHT80))



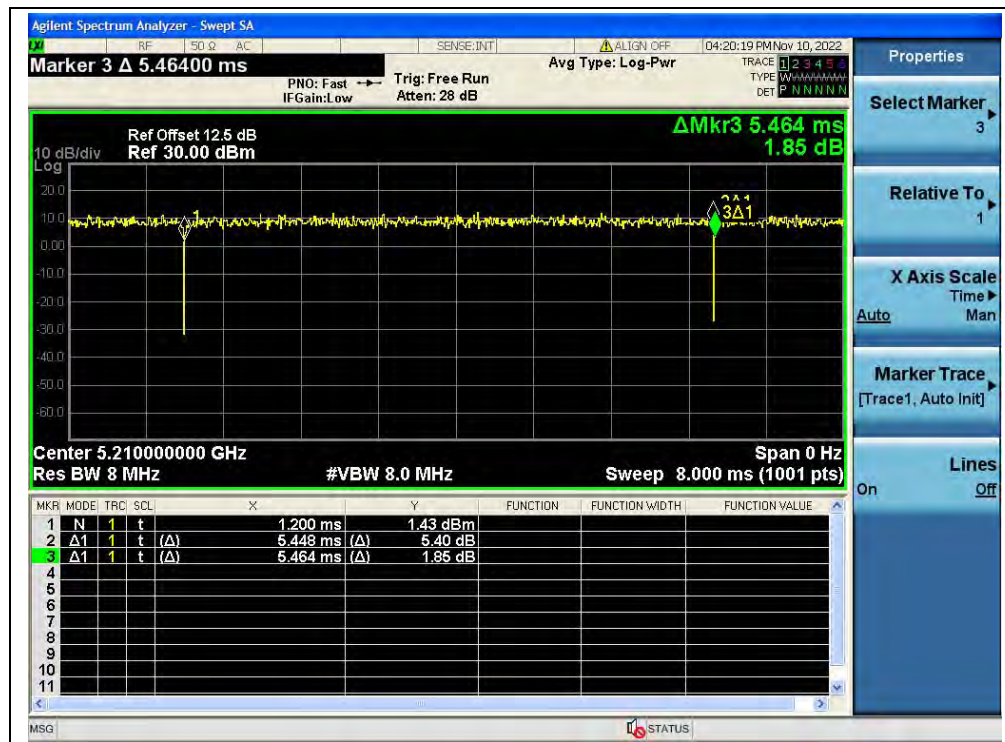
(CH36, 5180MHz, 802.11ax (HEW20))



(CH36, 5180MHz, 802.11ax (HEW20) RU26)



(CH38, 5190MHz, 802.11ax (HEW40))



(CH42, 5210MHz, 802.11ax (HEW80))

2.3. Maximum Conducted Output Power

2.3.1. Requirement

(1) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or $11\text{dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

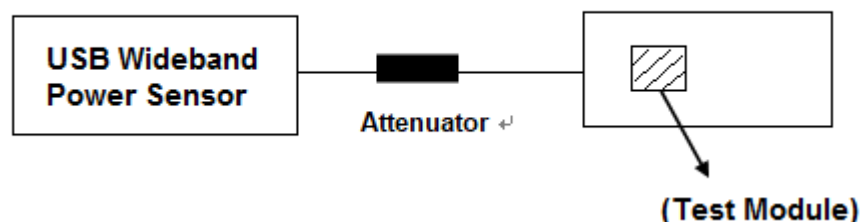
(4) According to KDB662911D01 Measure-and-sum technique, the conducted emission level (e.g., transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in units that are directly proportional to power.

(5) According to KDB 662911 D01, the directional gain = $G_{\text{ANT}} + 10\log(N_{\text{ANT}})\text{dBi}$, where G_{ANT} is the antenna gain in dBi, N_{ANT} is the number of outputs.

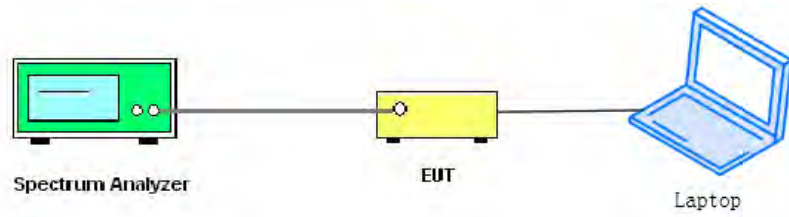
2.3.2. Test Description

Section E) 3) of KDB 789033 defines a methodology using a USB Wideband Power Sensor.

Test Setup:



The EUT (Equipment under the test) which is coupled to the USB Wideband Power Sensor; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in USB Wideband Power Sensor.

For ac (VHT80) mode power

The EUT (Equipment under the test) is coupled to the Spectrum analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in Spectrum analyzer.



2.3.3. Limits

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

Mode	Band	Channel (MHz)	26dB BW (MHz)	$11+10\log(26\text{dB BW})$	Limits (dBm)
a	UNII-2a	5260	23.27	24.67	24.00
		5300	23.28	24.67	24.00
		5320	23.15	24.65	24.00
	UNII-2c	5500	22.75	24.57	24.00
		5600	23.29	24.67	24.00
		5720	23.15	24.65	24.00
n20	UNII-2a	5260	23.67	24.74	24.00
		5300	23.68	24.74	24.00
		5320	23.52	24.71	24.00
	UNII-2c	5500	23.69	24.75	24.00
		5600	23.76	24.76	24.00
		5720	23.40	24.69	24.00
ac20	UNII-2a	5260	23.43	24.70	24.00
		5300	23.57	24.72	24.00
		5320	23.62	24.73	23.90
	UNII-2c	5500	23.66	24.74	24.00
		5600	23.98	24.80	24.00
		5720	24.16	24.83	24.00
ax20	UNII-2a	5260	23.72	24.75	24.00
		5300	23.12	24.64	24.00
		5320	23.72	24.75	24.00
	UNII-2c	5500	23.33	24.68	24.00
		5600	23.60	24.73	24.00
		5720	23.57	24.72	24.00
ax_RU26	UNII-2a	5260	20.55	24.13	24.00
		5300	20.37	24.09	24.00
		5320	20.43	24.10	24.00
	UNII-2c	5500	20.64	24.15	24.00
		5600	20.49	24.12	24.00
		5720	20.66	24.15	24.00



2.3.4. Test Result

Maximum Average Conducted Output Power

802.11a Mode

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty Factor Calculated						
	ANT0	ANT1		ANT0		ANT1				
	dBm	dBm		dBm	W	dBm	W			
5180	8.92	11.81	0.04	8.96	0.008	11.85	0.015	24	0.25	PASS
5220	8.44	11.78		8.48	0.007	11.82	0.015			
5240	8.45	11.71		8.49	0.007	11.75	0.015			
5260	9.63	11.69		9.67	0.009	11.73	0.015			
5300	9.90	11.36		9.94	0.010	11.40	0.014			
5320	9.92	11.65		9.96	0.010	11.69	0.015			
5500	6.37	11.40		6.41	0.004	11.44	0.014			
5600	6.97	11.83		7.01	0.005	11.87	0.015			
5720	6.91	11.53		6.95	0.005	11.57	0.014			
5745	6.63	11.16		6.67	0.005	11.20	0.013	30	1	
5785	6.60	11.14		6.64	0.005	11.18	0.013			
5825	6.76	11.52		6.80	0.005	11.56	0.014			

802.11n (HT20) SISO Mode

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty Factor Calculated						
	ANT0	ANT1		ANT0		ANT1				
	dBm	dBm		dBm	W	dBm	W			
5180	9.24	11.98	0.02	9.26	0.008	12.00	0.016	24	0.25	PASS
5220	8.80	11.96		8.82	0.008	11.98	0.016			
5240	8.62	11.83		8.64	0.007	11.85	0.015			
5260	9.75	11.81		9.77	0.009	11.83	0.015			
5300	10.08	11.44		10.10	0.010	11.46	0.014			
5320	10.03	11.69		10.05	0.010	11.71	0.015			
5500	6.41	11.48		6.43	0.004	11.50	0.014			
5600	6.93	11.91		6.95	0.005	11.93	0.016			
5720	7.12	11.64		7.14	0.005	11.66	0.015			
5745	6.70	11.28		6.72	0.005	11.30	0.013	30	1	
5785	6.71	11.16		6.73	0.005	11.18	0.013			
5825	6.79	11.55		6.81	0.005	11.57	0.014			



802.11n (HT20) MIMO Mode

Frequency (MHz)	Average Power				Limit		Verdict	
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT0	ANT1			dBm	W		dBm
5180	8.95	11.88	0.02	13.62	0.023	24	0.25	PASS
5220	8.15	11.16		13.01	0.020			
5240	8.02	10.99		12.79	0.019			
5260	8.98	10.89		13.01	0.020			
5300	9.23	11.04		13.22	0.021			
5320	9.03	10.95		13.22	0.021			
5500	6.04	11.89		13.01	0.020			
5600	6.15	11.06		12.30	0.017			
5720	6.42	11.64		12.79	0.019			
5745	6.32	11.28		12.55	0.018	30	1	
5785	6.25	11.16		12.30	0.017			
5825	6.28	11.55		12.79	0.019			
Note: Directional gain = -0.50dBi +10log(2) = 2.51dBi<6dBi, so the power limit shall be 24dBm for 5.18-5.24GHz, 5.260-5.320GHz, 5.500-5.720GHz band and 30dBm for 5.745-5.825GHz band.								

802.11n (HT40) SISO Mode

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty Factor Calculated						
	ANT0	ANT1		ANT0		ANT1				
	dBm	dBm		dBm	W	dBm	W			
5190	9.99	12.73	0.02	10.01	0.010	12.75	0.019	24	0.25	PASS
5230	9.49	12.48		9.51	0.009	12.50	0.018			
5270	7.69	12.36		7.71	0.006	12.38	0.017			
5310	10.85	12.24		10.87	0.012	12.26	0.017			
5510	7.41	12.26		7.43	0.006	12.28	0.017			
5630	8.36	12.84		8.38	0.007	12.86	0.019			
5710	8.08	12.45		8.10	0.006	12.47	0.018			
5755	7.47	11.85		7.49	0.006	11.87	0.015	30	1	
5795	7.54	11.79		7.56	0.006	11.81	0.015			

**802.11n (HT40) MIMO Mode**

Frequency (MHz)	Average Power				Limit		Verdict	
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT0	ANT1		dBm	W	dBm		W
5190	8.89	11.75	0.02	13.62	0.023	24	0.25	PASS
5230	8.49	11.38		13.22	0.021			
5270	9.69	11.24		13.62	0.023			
5310	9.86	11.20		13.62	0.023			
5510	6.43	11.28		12.55	0.018			
5630	7.02	12.05		13.22	0.021			
5710	7.10	12.02		13.22	0.021			
5755	6.29	11.25		12.55	0.018	30	1	
5795	6.33	11.39		12.55	0.018			
Note: Directional gain = -0.50dBi +10log(2) = 2.51dBi<6dBi, so the power limit shall be 24dBm for 5.18-5.24GHz, 5.260-5.320GHz, 5.500-5.720GHz band and 30dBm for 5.745-5.825GHz band.								



802.11ac (VHT20) SISO Mode

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty Factor Calculated						
	ANT0	ANT1		ANT0		ANT1				
	dBm	dBm		dBm	W	dBm	W			
5180	9.29	11.92	0.02	9.31	0.009	11.94	0.016	24	0.25	PASS
5220	8.84	11.86		8.86	0.008	11.88	0.015			
5240	8.77	11.56		8.79	0.008	11.58	0.014			
5260	9.93	11.52		9.95	0.010	11.54	0.014			
5300	10.18	11.20		10.20	0.010	11.22	0.013			
5320	10.16	11.47		10.18	0.010	11.49	0.014			
5500	6.58	11.39		6.60	0.005	11.41	0.014			
5600	7.11	11.82		7.13	0.005	11.84	0.015			
5720	7.06	11.58		7.08	0.005	11.60	0.014			
5745	6.80	11.30		6.82	0.005	11.32	0.014	30	1	
5785	6.78	11.14		6.80	0.005	11.16	0.013			
5825	6.95	11.49		6.97	0.005	11.51	0.014			

802.11ac (VHT20) MIMO Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT0	ANT1						
	dBm	dBm		dBm	W	dBm	W	
5180	8.07	11.17	0.02	13.01	0.020	24	0.25	PASS
5220	7.55	10.58		12.30	0.017			
5240	7.39	10.20		12.04	0.016			
5260	8.86	10.54		12.79	0.019			
5300	8.70	10.25		12.55	0.018			
5320	8.78	10.48		12.79	0.019			
5500	5.02	10.10		11.14	0.013			
5600	5.53	10.42		11.76	0.015			
5720	5.60	10.25		11.46	0.014			
5745	5.37	10.36		11.46	0.014			
5785	5.29	10.42		11.46	0.014	30	1	
5825	5.27	10.19		11.46	0.014			

Note: Directional gain = $-0.50\text{dBi} + 10\log(2) = 2.51\text{dBi} < 6\text{dBi}$, so the power limit shall be 24dBm for 5.18-5.24GHz, 5.260-5.320GHz, 5.500-5.720GHz band and 30dBm for 5.745-5.825GHz band.

**802.11ac (VHT40) SISO Mode**

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty Factor Calculated						
	ANT0	ANT1		ANT0		ANT1				
	dBm	dBm		dBm	W	dBm	W	dBm	W	
5190	7.96	10.68	0.01	7.97	0.006	10.69	0.012	24	0.25	PASS
5230	7.40	10.31		7.41	0.006	10.32	0.011			
5270	8.67	10.36		8.68	0.007	10.37	0.011			
5310	8.72	10.14		8.73	0.007	10.15	0.010			
5510	5.24	10.19		5.25	0.003	10.20	0.010			
5630	6.25	10.82		6.26	0.004	10.83	0.012			
5710	5.87	10.44		5.88	0.004	10.45	0.011			
5755	5.24	9.90		5.25	0.003	9.91	0.010	30	1	
5795	5.39	9.97	5.40	0.003	9.98	0.010				

802.11ac (VHT40) MIMO Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT0	ANT1						
	dBm	dBm		dBm	W	dBm	W	
5190	7.25	10.18	0.01	12.04	0.016	24	0.25	PASS
5230	6.22	9.20		11.14	0.013			
5270	7.40	9.36		11.46	0.014			
5310	7.47	9.15		11.46	0.014			
5510	4.24	9.35		10.41	0.011			
5630	4.65	9.28		10.41	0.011			
5710	4.78	9.65		10.79	0.012			
5755	4.25	9.18		10.41	0.011	30	1	
5795	4.32	9.37		10.41	0.011			

Note: Directional gain = $-0.50\text{dBi} + 10\log(2) = 2.51\text{dBi} < 6\text{dBi}$, so the power limit shall be 24dBm for 5.18-5.24GHz, 5.260-5.320GHz, 5.500-5.720GHz band and 30dBm for 5.745-5.825GHz band.

**802.11ac (VHT80) SISO Mode**

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty Factor Calculated						
	ANT0	ANT1		ANT0		ANT1				
	dBm	dBm		dBm	W	dBm	W	dBm	W	
5210	7.24	10.50	0.01	7.25	0.005	10.51	0.011	24	0.25	PASS
5290	10.30	9.98		10.31	0.011	9.99	0.010			
5530	5.01	9.63		5.02	0.003	9.64	0.009			
5610	5.59	10.30		5.60	0.004	10.31	0.011			
5690	5.62	10.26		5.63	0.004	10.27	0.011			
5775	4.93	9.61		4.94	0.003	9.62	0.009	30	1	

802.11ac (VHT80) MIMO Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT0	ANT1						
	dBm	dBm		W	dBm	dBm	W	
5210	9.30	10.35	0.01	12.79	0.019	24	0.25	PASS
5290	7.28	9.48		11.46	0.014			
5530	4.85	9.83		11.14	0.013			
5610	4.60	9.15		10.41	0.011			
5690	4.42	9.26		10.41	0.011			
5775	4.93	9.61		10.79	0.012	30	1	

Note: Directional gain = $-0.50\text{dBi} + 10\log(2) = 2.51\text{dBi} < 6\text{dBi}$, so the power limit shall be 24dBm for 5.18-5.24GHz, 5.260-5.320GHz, 5.500-5.720GHz band and 30dBm for 5.745-5.825GHz band.

**802.11ax (HEW20) SISO Mode**

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty Factor Calculated						
	ANT0	ANT1		ANT0		ANT1				
	dBm	dBm		dBm	W	dBm	W	dBm	W	
5180	8.24	11.06	0.02	8.26	0.007	11.08	0.013	24	0.25	PASS
5220	7.78	10.92		7.80	0.006	10.94	0.012			
5240	7.69	10.79		7.71	0.006	10.81	0.012			
5260	8.90	10.86		8.92	0.008	10.88	0.012			
5300	9.06	10.45		9.08	0.008	10.47	0.011			
5320	9.13	10.73		9.15	0.008	10.75	0.012			
5500	5.53	10.54		5.55	0.004	10.56	0.011			
5600	6.17	11.00		6.19	0.004	11.02	0.013			
5720	5.86	10.72		5.88	0.004	10.74	0.012			
5745	5.60	10.37		5.62	0.004	10.39	0.011			
5785	5.51	10.27		5.53	0.004	10.29	0.011	30	1	
5825	5.80	10.62		5.82	0.004	10.64	0.012			

802.11ax (HEW20) MIMO Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT0	ANT1						
	dBm	dBm		dBm	W	dBm	W	
5180	8.24	11.06	0.02	13.01	0.020	24	0.25	PASS
5220	7.78	10.29		12.30	0.017			
5240	7.69	10.39		12.30	0.017			
5260	8.90	10.46		12.79	0.019			
5300	9.06	10.42		12.79	0.019			
5320	9.13	10.73		13.01	0.020			
5500	5.53	10.54		11.76	0.015			
5600	5.68	10.20		11.46	0.014			
5720	5.06	10.34		11.46	0.014			
5745	5.41	10.27		11.46	0.014			
5785	5.31	10.18		11.46	0.014	30	1	
5825	5.21	10.26		11.46	0.014			

Note: Directional gain = $-0.50\text{dBi} + 10\log(2) = 2.51\text{dBi} < 6\text{dBi}$, so the power limit shall be 24dBm for 5.18-5.24GHz, 5.260-5.320GHz, 5.500-5.720GHz band and 30dBm for 5.745-5.825GHz band.

**802.11ax (HEW20) RU26 SISO Mode**

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty Factor Calculated						
	ANT0	ANT1		ANT0		ANT1				
	dBm	dBm		dBm	W	dBm	W			
5180	6.11	8.90	0.17	6.28	0.004	9.07	0.008	24	0.25	PASS
5220	5.56	9.41		5.73	0.004	9.58	0.009			
5240	6.05	8.88		6.22	0.004	9.05	0.008			
5260	6.97	8.78		7.14	0.005	8.95	0.008			
5300	6.72	9.18		6.89	0.005	9.35	0.009			
5320	7.55	8.81		7.72	0.006	8.98	0.008			
5500	2.53	8.60		2.70	0.002	8.77	0.008			
5600	4.15	9.25		4.32	0.003	9.42	0.009			
5720	4.32	8.98		4.49	0.003	9.15	0.008			
5745	3.95	8.77		4.12	0.003	8.94	0.008	30	1	
5785	3.30	8.55		3.47	0.002	8.72	0.007			
5825	3.38	8.88		3.55	0.002	9.05	0.008			

802.11ax (HEW20) RU26 MIMO Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT0	ANT1						
	dBm	dBm		dBm	W			
5180	4.95	7.91	0.17	10.00	0.010	24	0.25	PASS
5220	4.56	7.41		9.54	0.009			
5240	4.61	7.77		9.54	0.009			
5260	5.82	7.58		10.00	0.010			
5300	5.18	7.20		9.54	0.009			
5320	5.89	7.49		10.00	0.010			
5500	1.53	7.60		8.45	0.007			
5600	2.05	7.25		8.45	0.007			
5720	2.50	7.32		8.45	0.007			
5745	2.53	7.72		9.03	0.008	30	1	
5785	2.29	7.15		8.45	0.007			
5825	2.28	7.34		8.45	0.007			

Note: Directional gain = $-0.50\text{dBi} + 10\log(2) = 2.51\text{dBi} < 6\text{dBi}$, so the power limit shall be 24dBm for 5.18-5.24GHz, 5.260-5.320GHz, 5.500-5.720GHz band and 30dBm for 5.745-5.825GHz band.

**802.11ax (HEW40) SISO Mode**

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty Factor Calculated						
	ANT0	ANT1		ANT0		ANT1				
	dBm	dBm		dBm	W	dBm	W			
5190	7.78	10.69	0.01	7.79	0.006	10.70	0.012	24	0.25	PASS
5230	7.24	10.41		7.25	0.005	10.42	0.011			
5270	8.40	10.34		8.41	0.007	10.35	0.011			
5310	8.55	10.15		8.56	0.007	10.16	0.010			
5510	5.08	10.17		5.09	0.003	10.18	0.010			
5630	6.22	10.79		6.23	0.004	10.80	0.012			
5710	5.78	10.37		5.79	0.004	10.38	0.011			
5755	5.03	9.80		5.04	0.003	9.81	0.010	30	1	
5795	5.14	9.86	5.15	0.003	9.87	0.010				

802.11ax (HEW40) MIMO Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT0	ANT1						
	dBm	dBm		dBm	W	dBm	W	
5190	6.75	9.74	0.01	11.46	0.014	24	0.25	PASS
5230	6.31	9.41		11.14	0.013			
5270	7.47	9.34		11.46	0.014			
5310	7.50	9.55		11.76	0.015			
5510	4.55	9.45		10.79	0.012			
5630	5.08	10.09		11.14	0.013			
5710	4.68	9.43		10.79	0.012			
5755	4.16	9.20		10.41	0.011	30	1	
5795	4.24	9.42		10.41	0.011			

Note: Directional gain = $-0.50\text{dBi} + 10\log(2) = 2.51\text{dBi} < 6\text{dBi}$, so the power limit shall be 24dBm for 5.18-5.24GHz, 5.260-5.320GHz, 5.500-5.720GHz band and 30dBm for 5.745-5.825GHz band.

**802.11ax (HEW80) SISO Mode**

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty Factor Calculated						
	ANT0	ANT1		ANT0		ANT1				
	dBm	dBm		dBm	W	dBm	W	dBm	W	
5210	7.41	10.29	0.01	7.42	0.006	10.30	0.011	24	0.25	PASS
5290	8.42	10.08		8.43	0.007	10.09	0.010			
5530	5.07	9.83		5.08	0.003	9.84	0.010			
5610	5.77	10.30		5.78	0.004	10.31	0.011			
5690	5.83	10.39		5.84	0.004	10.40	0.011			
5775	5.07	9.76		5.08	0.003	9.77	0.009	30	1	

802.11ax (HEW80) MIMO Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT0	ANT1						
	dBm	dBm		dBm	W	dBm	W	
5210	6.46	9.49	0.01	11.14	0.013	24	0.25	PASS
5290	7.50	9.80		11.76	0.015			
5530	4.45	9.38		10.41	0.011			
5610	4.48	9.34		10.41	0.011			
5690	4.68	9.39		10.79	0.012			
5775	4.15	9.16		10.41	0.011	30	1	

Note: Directional gain = $-0.50\text{dBi} + 10\log(2) = 2.51\text{dBi} < 6\text{dBi}$, so the power limit shall be 24dBm for 5.18-5.24GHz, 5.260-5.320GHz, 5.500-5.720GHz band and 30dBm for 5.745-5.825GHz band.

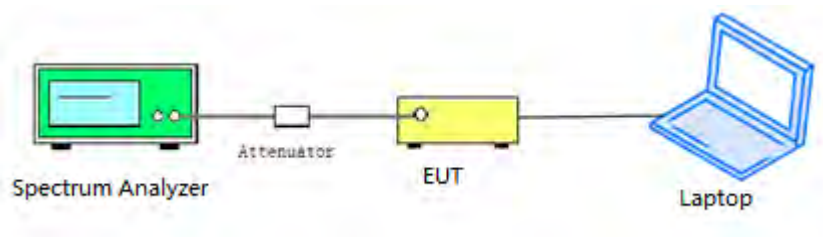
2.4. Emission Bandwidth

2.4.1. Requirement

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement. Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

2.4.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50 Ohm; the path loss as the factor is calibrated to correct the reading.

2.4.3. Test Procedure

1. KDB 789033 Section C) 1) Emission Bandwidth was used in order to prove compliance
 - a) Set RBW = approximately 1% of the emission bandwidth.
 - b) Set VBW > RBW.
 - c) Detector = Peak.
 - d) Trace mode = max hold.
 - e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
 2. KDB 789033 Section C) 2) minimum emission bandwidth for the band 5.725-5.85GHz was used in order to prove compliance.
- Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:



- a) Set RBW = 100 kHz.
- b) Set video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

2.4.4. Test Result

802.11a Mode

A.Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	23.46
44	5220	23.54
48	5240	23.45
52	5260	23.27
60	5300	23.28
64	5320	23.15
100	5500	22.75
120	5600	23.29
144	5720	23.15
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)
144	5720	16.35
149	5745	16.38
157	5785	16.38
165	5825	16.37



B.Test Plot:



(Channel 36, 5180MHz, 802.11a)



(Channel 44, 5220 MHz, 802.11a)



(Channel 48, 5240MHz, 802.11a)



(Channel 52, 5260MHz, 802.11a)



(Channel 60, 5300 MHz, 802.11a)



(Channel 64, 5320MHz, 802.11a)



(Channel 100, 5500 MHz, 802.11a)



(Channel 120, 5600 MHz, 802.11a)



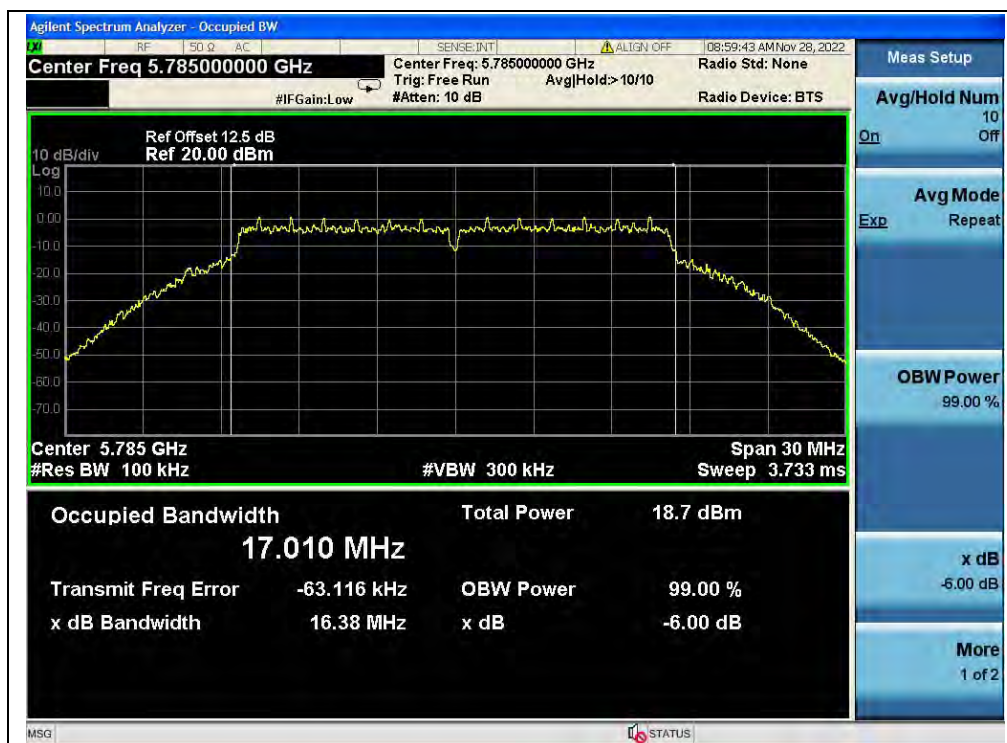
(Channel 144, 5720MHz, 802.11a)



(Channel 144, 5720MHz, 802.11a)



(Channel 149,5745MHz, 802.11a)



(Channel 157,5785MHz, 802.11a)



(Channel 165, 5825MHz, 802.11a)



802.11n (HT20) Mode

A.Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	23.44
44	5220	23.46
48	5240	23.80
52	5260	23.67
60	5300	23.68
64	5320	23.52
100	5500	23.69
120	5600	23.76
144	5720	23.40
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)
144	5720	17.62
149	5745	17.64
157	5785	17.64
165	5825	17.62

B.Test Plot:



(Channel 36, 5180MHz, 802.11n (HT20))



(Channel 44, 5220MHz, 802.11n (HT20))



(Channel 48, 5240MHz, 802.11n (HT20))



(Channel 52, 5260MHz, 802.11n (HT20))



(Channel 60, 5300MHz, 802.11n (HT20))



(Channel 64, 5320MHz, 802.11n (HT20))



(Channel 100, 5500MHz, 802.11n (HT20))



(Channel 120, 5600MHz, 802.11n (HT20))



(Channel 144, 5720MHz, 802.11n (HT20))



(Channel 144, 5720MHz, 802.11 n (HT20))



(Channel 149, 5745MHz, 802.11 n (HT20))



(Channel 157, 5785MHz, 802.11 n (HT20))



(Channel 165, 5825MHz, 802.11 n (HT20))



802.11n (HT40) Test mode

A.Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
38	5190	45.42
46	5230	45.12
54	5270	45.25
62	5310	44.53
102	5510	44.82
126	5630	44.95
142	5710	44.68
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)
142	5710	36.43
151	5755	36.43
159	5795	36.39

B.Test Plot:



(Channel 38, 5190MHz, 802.11n (HT40))



(Channel 46, 5230MHz, 802.11n (HT40))



(Channel 54, 5270MHz, 802.11n (HT40))



(Channel 62, 5310MHz, 802.11n (HT40))



(Channel 102, 5510MHz, 802.11n (HT40))



(Channel 126, 5630MHz, 802.11n (HT40))



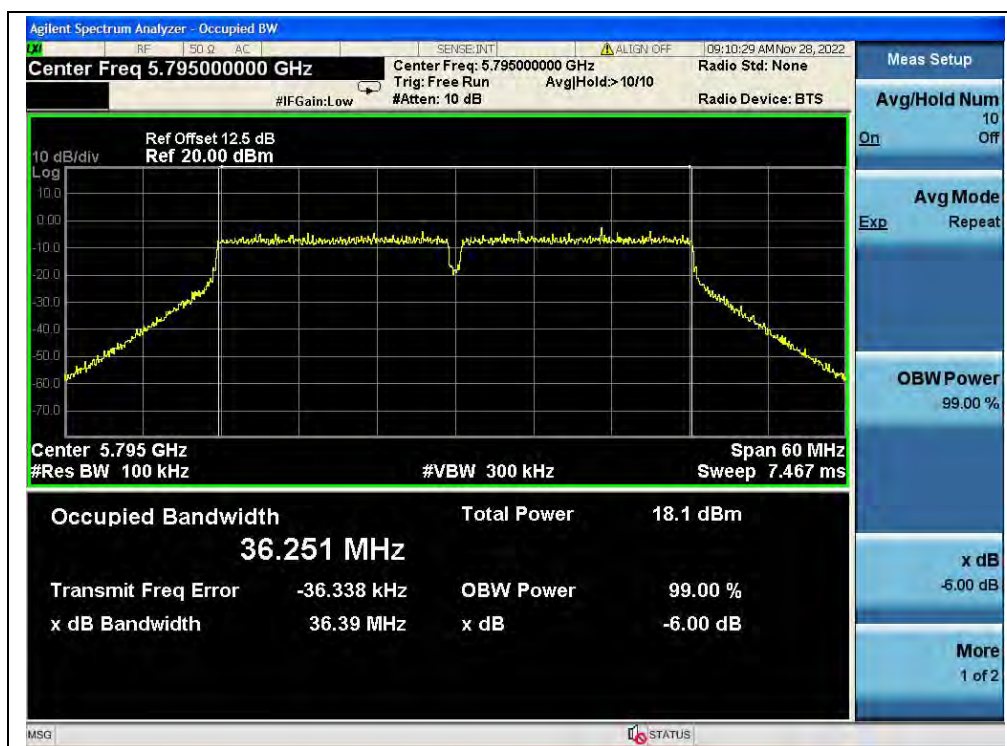
(Channel 142, 5710MHz, 802.11n (HT40))



(Channel 142, 5710MHz, 802.11n (HT40))



(Channel 151, 5755MHz, 802.11n (HT40))



(Channel 159, 5795MHz, 802.11n (HT40))

**802.11ac (VHT20) Mode****A.Test Verdict:**

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	23.44
44	5220	23.59
48	5240	23.40
52	5260	23.43
60	5300	23.57
64	5320	23.62
100	5500	23.66
120	5600	23.98
144	5720	24.16
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)
144	5720	17.68
149	5745	17.63
157	5785	17.66
165	5825	17.65

B.Test Plot:

(Channel 36, 5180MHz, 802.11ac (VHT20))



(Channel 44, 5220MHz, 802.11ac (VHT20))



(Channel 48, 5240MHz, 802.11ac (VHT20))



(Channel 52, 5260MHz, 802.11ac (VHT20))



(Channel 60, 5300MHz, 802.11ac (VHT20))



(Channel 64, 5320MHz, 802.11ac (VHT20))



(Channel 100, 5500MHz, 802.11ac (VHT20))



(Channel 120, 5600MHz, 802.11ac (VHT20))



(Channel 144, 5720MHz, 802.11ac (VHT20))



(Channel 144, 5720MHz, 802.11ac (VHT20))



(Channel 149, 5745MHz, 802.11 ac (VHT20))



(Channel 157, 5785MHz, 802.11 ac (VHT20))



(Channel 165, 5825MHz, 802.11 ac (VHT20))



802.11ac (VHT40) Mode

A.Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
38	5190	44.86
46	5230	45.14
54	5270	46.27
62	5310	45.41
102	5510	45.16
126	5630	45.81
142	5710	45.39
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)
142	5710	36.41
151	5755	36.42
159	5795	36.41

B.Test Plot:



(Channel 38, 5190MHz, 802.11ac (VHT40))



(Channel 46, 5230MHz, 802.11ac (VHT40))



(Channel 54, 5270MHz, 802.11ac (VHT40))



(Channel 62, 5310MHz, 802.11ac (VHT40))



(Channel 102, 5510MHz, 802.11ac (VHT40))



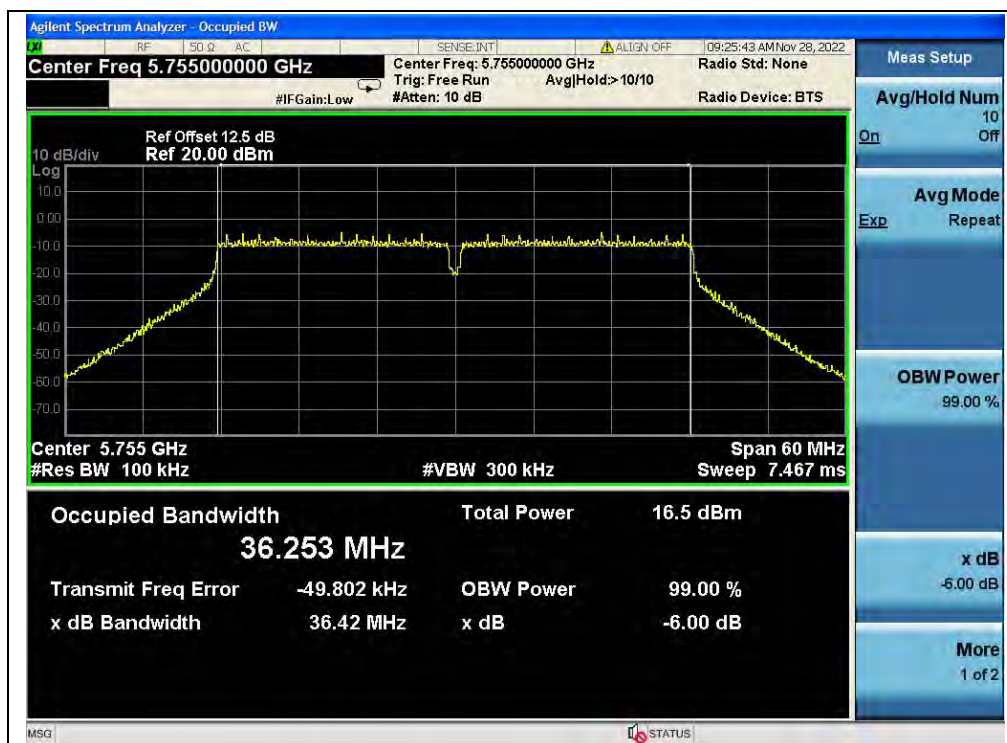
(Channel 126, 5630MHz, 802.11ac (VHT40))



(Channel 142, 5710MHz, 802.11ac (VHT40))



(Channel 142, 5710MHz, 802.11ac (VHT40))



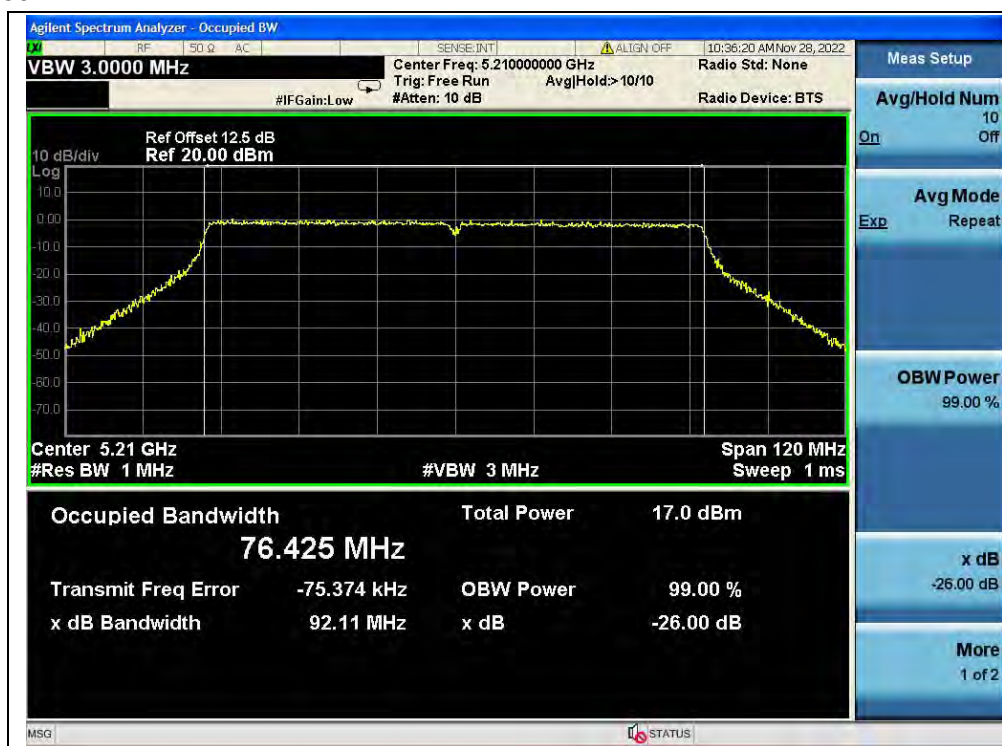
(Channel 151, 5755MHz, 802.11ac (VHT40))



(Channel 159, 5795MHz, 802.11ac (VHT40))

**802.11ac (VHT80) Mode****A.Test Verdict:**

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
42	5210	92.11
58	5290	89.94
106	5530	91.94
122	5610	90.65
138	5690	92.00
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)
138	5690	76.48
155	5775	76.47

B.Test Plot:

(Channel 42, 5210MHz, 802.11ac (VHT80))



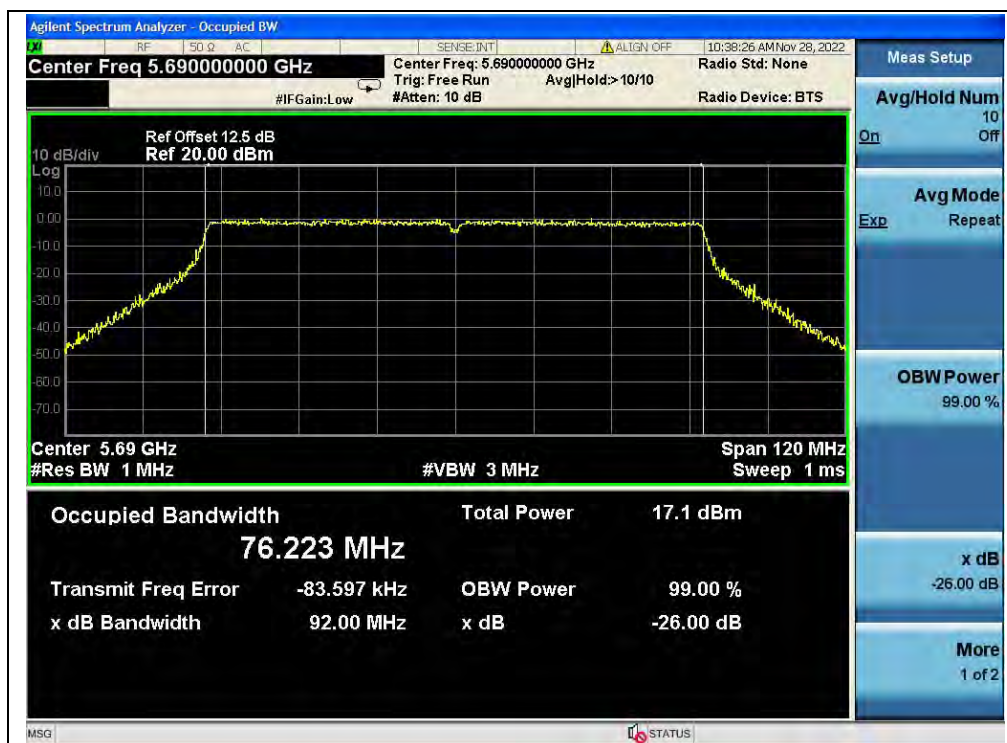
(Channel 58, 5290MHz, 802.11ac (VHT80))



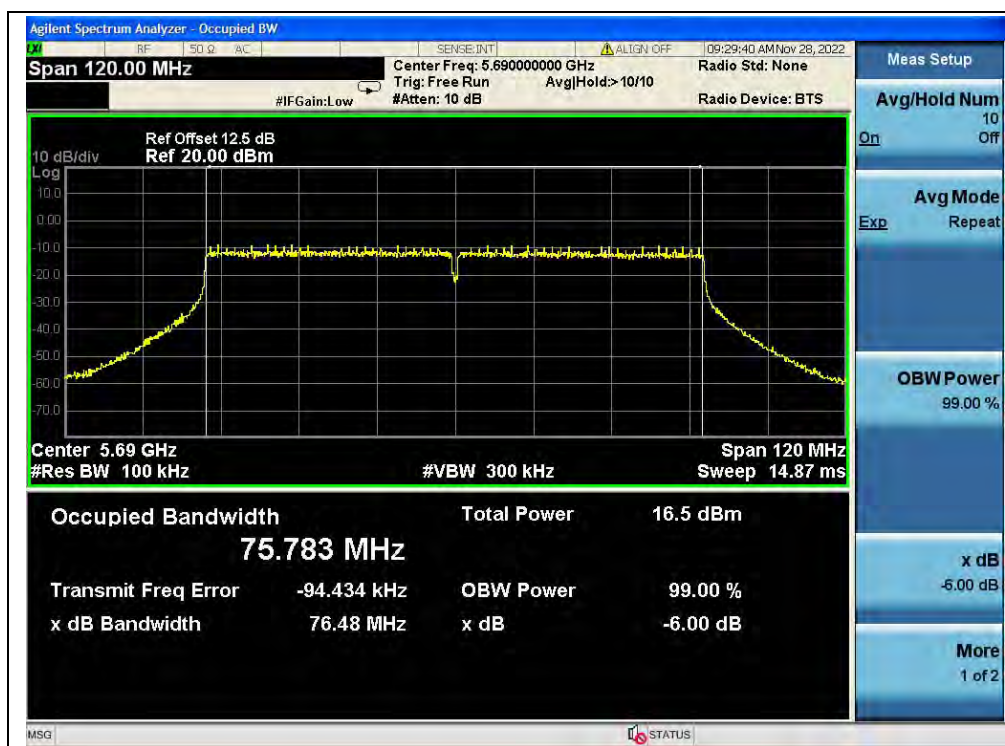
(Channel 106, 5530MHz, 802.11ac (VHT80))



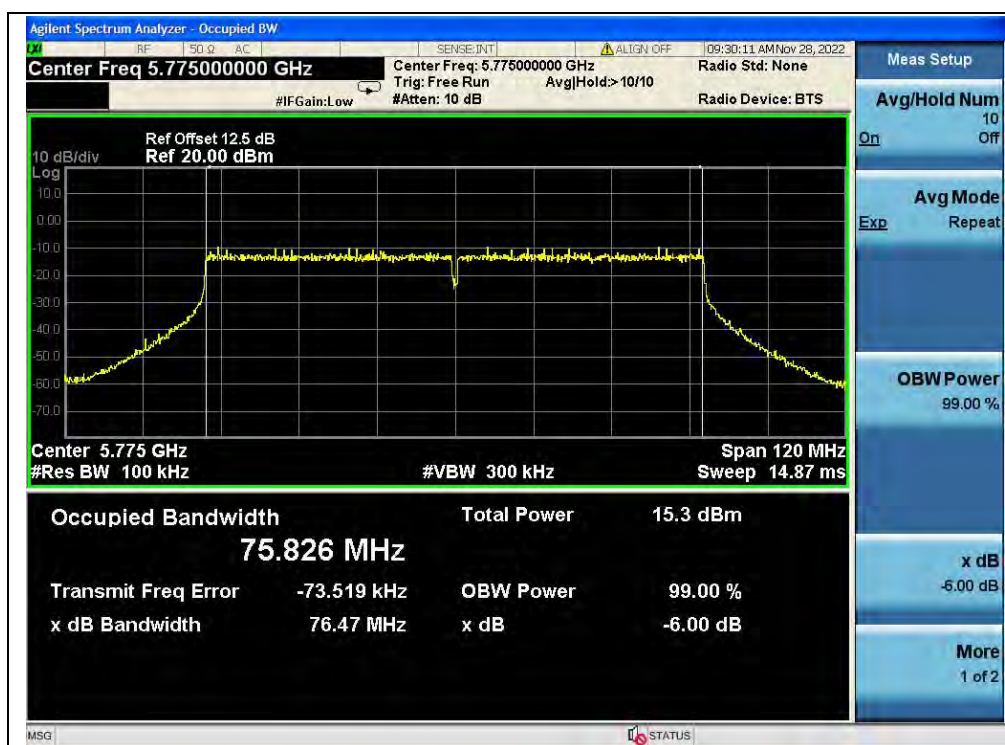
(Channel 122, 5610MHz, 802.11ac (VHT80))



(Channel 138, 5690MHz, 802.11ac (VHT80))



(Channel 138, 5690MHz, 802.11ac (VHT80))



(Channel 155, 5775MHz, 802.11ac (VHT80))



802.11ax (HEW20) Mode

A.Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	23.43
44	5220	23.57
48	5240	23.23
52	5260	23.72
60	5300	23.12
64	5320	23.72
100	5500	23.33
120	5600	23.60
144	5720	23.57
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)
144	5720	19.02
149	5745	19.02
157	5785	19.04
165	5825	19.03

B.Test Plot:



(Channel 36, 5180MHz, 802.11ax (HEW20))



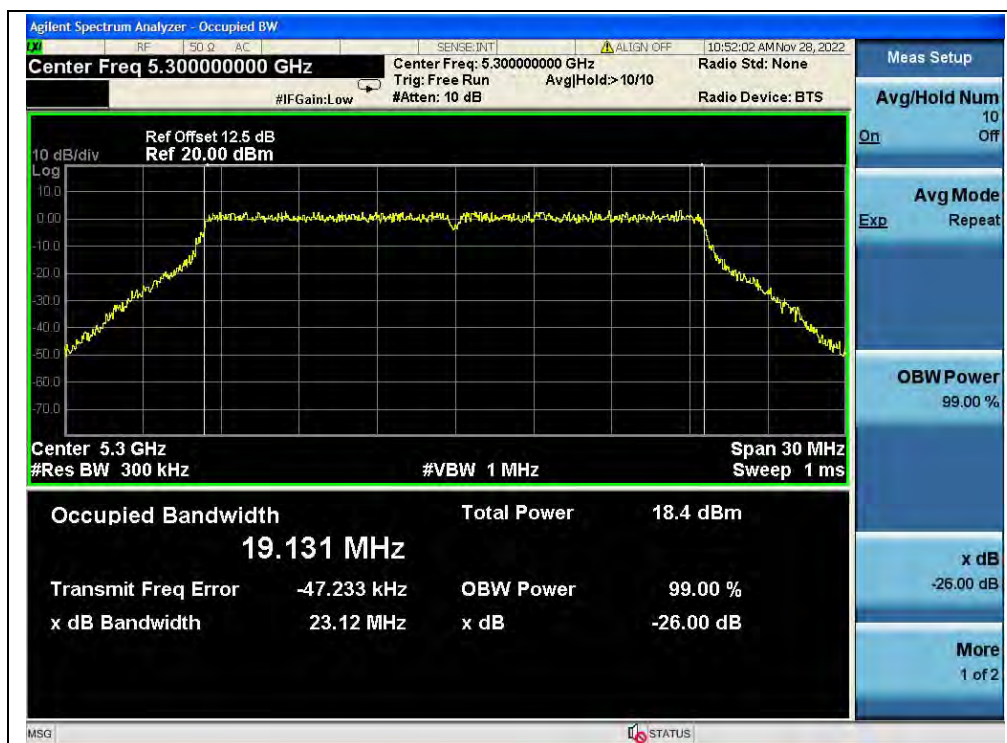
(Channel 44, 5220MHz, 802.11ax (HEW20))



(Channel 48, 5240MHz, 802.11ax (HEW20))



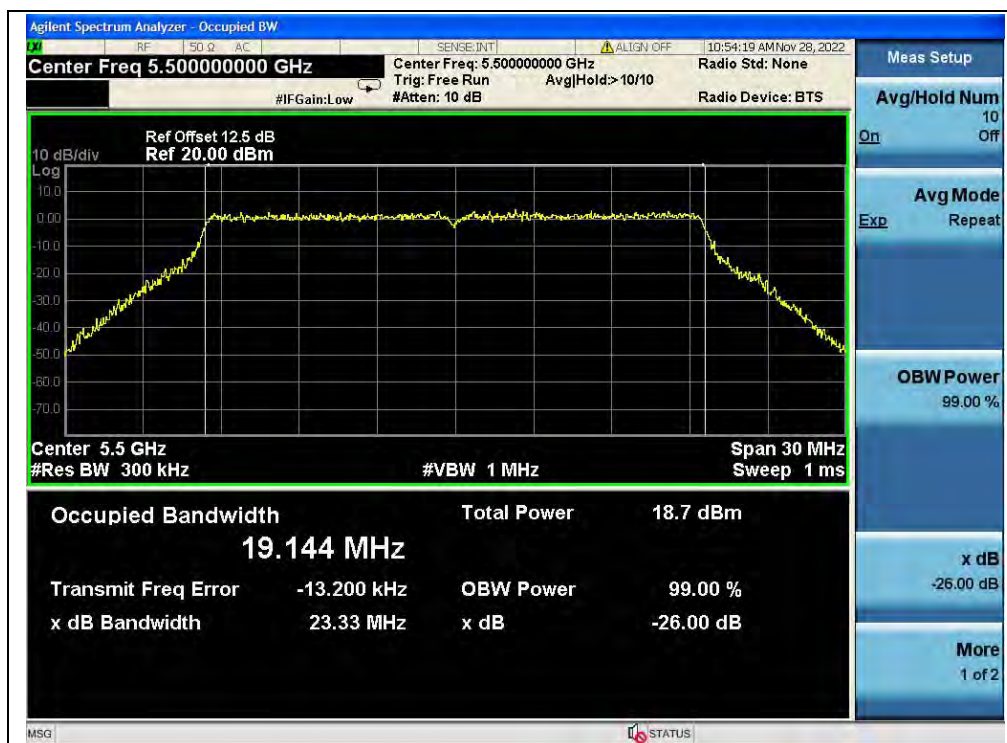
(Channel 52, 5260MHz, 802.11ax (HEW20))



(Channel 60, 5300MHz, 802.11ax (HEW20))



(Channel 64, 5320MHz, 802.11ax (HEW20))



(Channel 100, 5500MHz, 802.11ax (HEW20))



(Channel 120, 5600MHz, 802.11ax (HEW20))



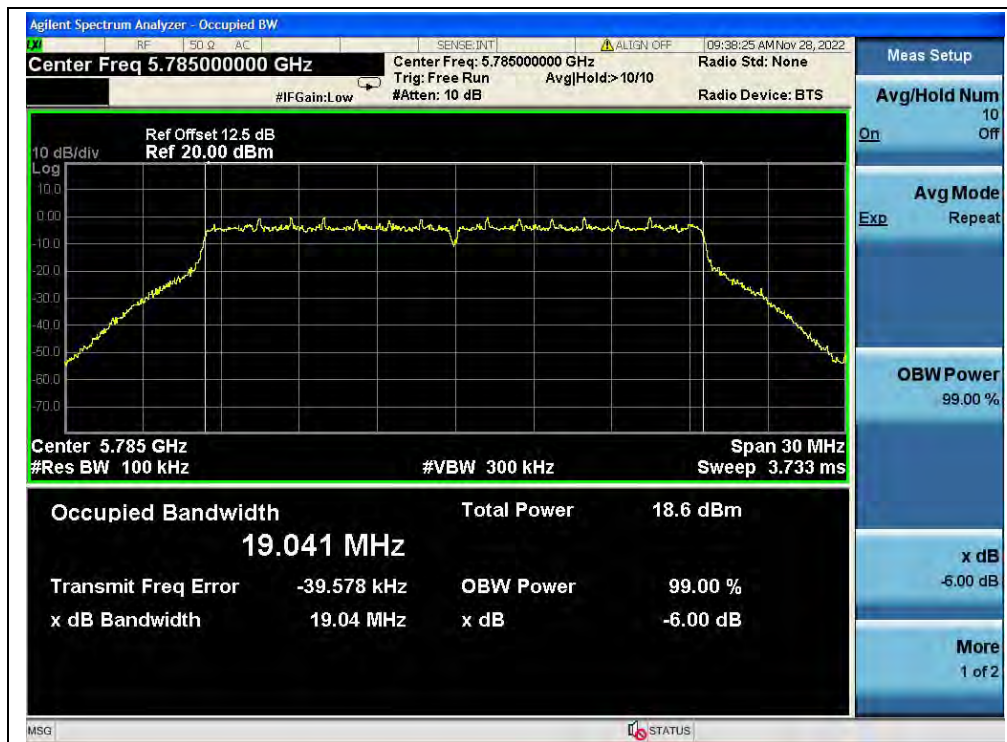
(Channel 144, 5720MHz, 802.11ax (HEW20))



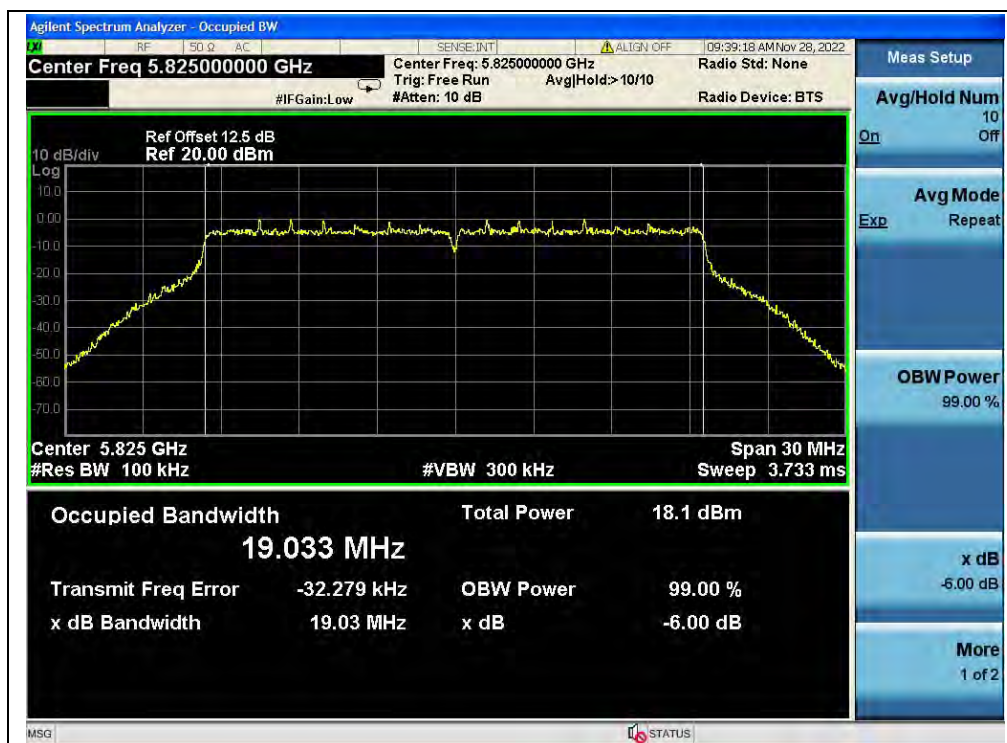
(Channel 144, 5720MHz, 802.11ax (HEW20))



(Channel 149, 5745MHz, 802.11ax (HEW20))



(Channel 157, 5785MHz, 802.11ax (HEW20))



(Channel 165, 5825MHz, 802.11ax (HEW20))



802.11ax (HEW20) RU26 Mode

A.Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	20.47
44	5220	20.69
48	5240	20.55
52	5260	20.55
60	5300	20.37
64	5320	20.43
100	5500	20.64
120	5600	20.49
144	5720	20.66
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)
144	5720	2.11
149	5745	2.08
157	5785	2.09
165	5825	2.09

B.Test Plot:



(Channel 36, 5180MHz, 802.11ax (HEW20) RU26)



(Channel 44, 5220MHz, 802.11ax (HEW20) RU26)



(Channel 48, 5240MHz, 802.11ax (HEW20) RU26)



(Channel 52, 5260MHz, 802.11ax (HEW20) RU26)



(Channel 60, 5300MHz, 802.11ax (HEW20) RU26)



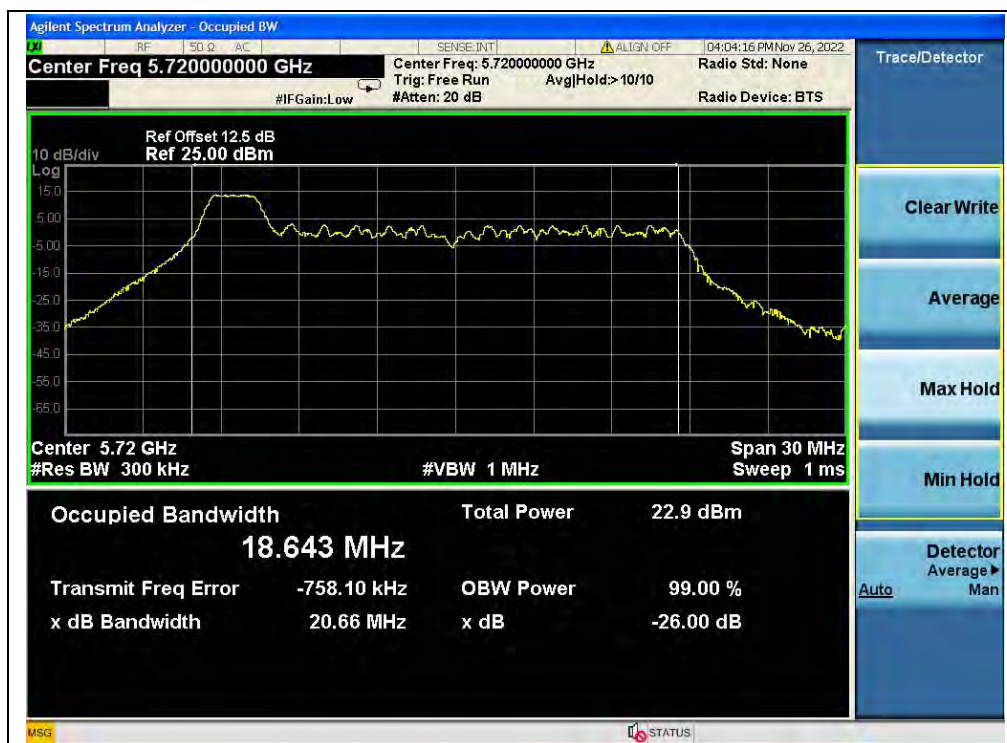
(Channel 64, 5320MHz, 802.11ax (HEW20) RU26)



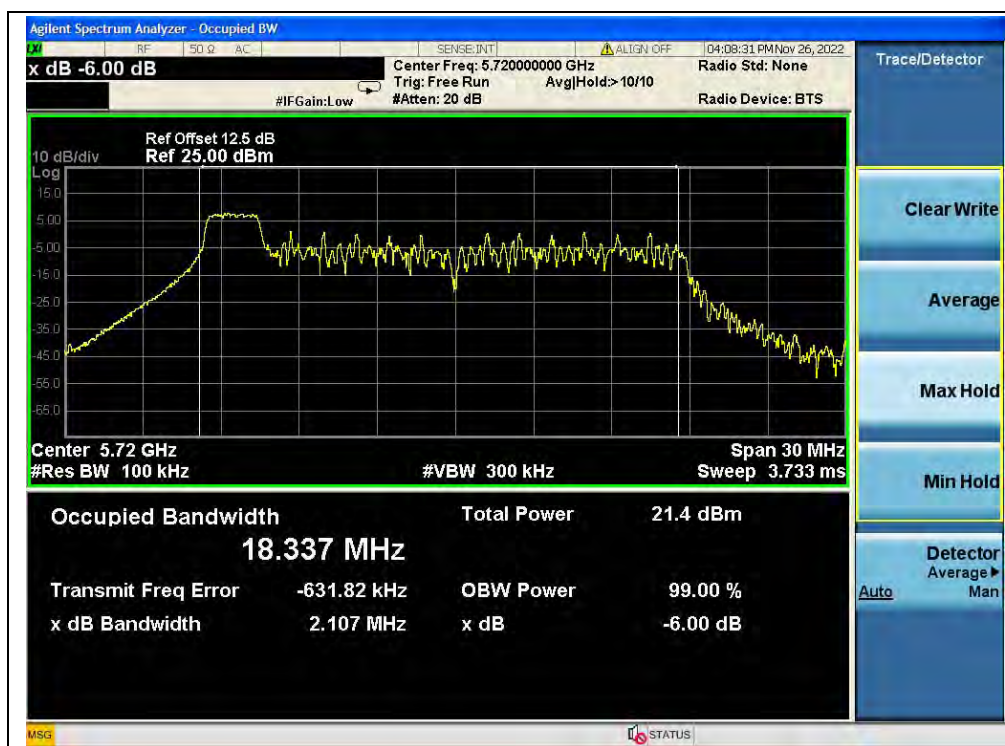
(Channel 100, 5500MHz, 802.11ax (HEW20) RU26)



(Channel 120, 5600MHz, 802.11ax (HEW20) RU26)



(Channel 144, 5720MHz, 802.11ax (HEW20) RU26)



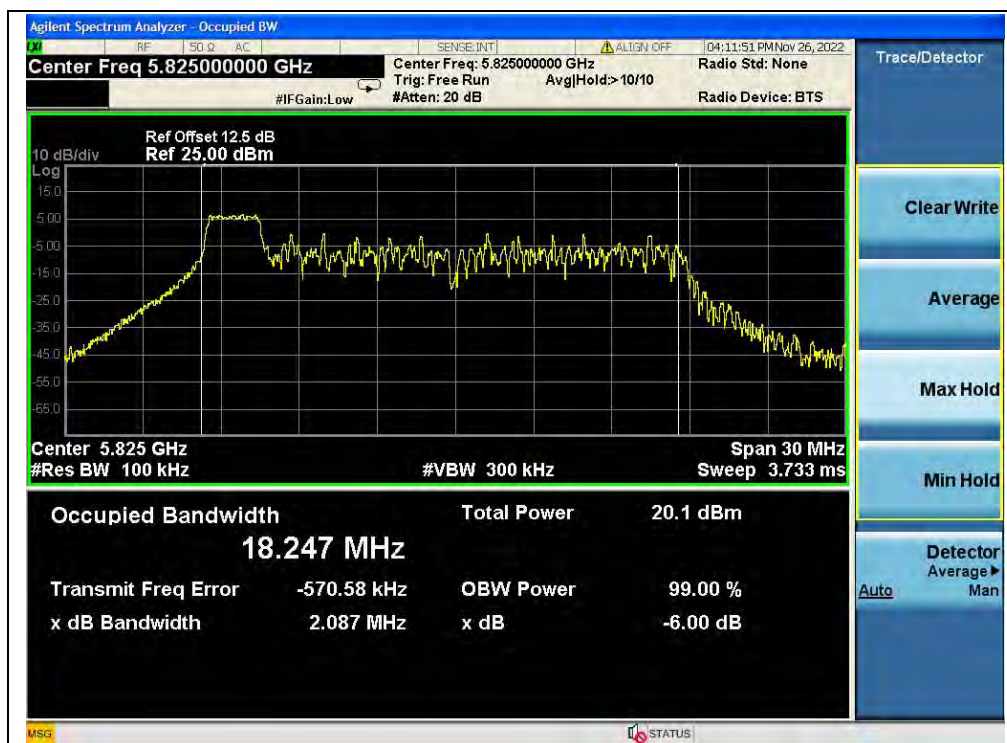
(Channel 144, 5720MHz, 802.11ax (HEW20) RU26)



(Channel 149, 5745MHz, 802.11ax (HEW20) RU26)



(Channel 157, 5785MHz, 802.11ax (HEW20) RU26)



(Channel 165, 5825MHz, 802.11ax (HEW20) RU26)