



REPORT No.: SZ19120121W06

TEST REPORT

APPLICANT : HAJEN Co., Ltd

PRODUCT NAME : HAJEN_SPRINT AI Speaker

MODEL NAME : FIXTA

BRAND NAME : HAJEN CO

FCC ID : 2ACFTRT1505NN

STANDARD(S) : 47 CFR Part 15 Subpart E

RECEIPT DATE : 2019-12-13

TEST DATE : 2020-01-08 to 2020-01-14

ISSUE DATE : 2020-07-22

Edited by:

Peng Mi (Rapporteur)

Approved by:

Peng Huarui(Supervisor)

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Change History		
Version	Date	Reason for change
1.0	2020-07-22	First edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	HAJEN Co., Ltd
Applicant Address:	D-304 Digital Empire Bldg., 16, Deogyong-daero 1556beon-gil, Yeongtonggu, Suwon-si, South Korea
Manufacturer:	HAJEN Co., Ltd
Manufacturer Address:	D-304 Digital Empire Bldg., 16, Deogyong-daero 1556beon-gil, Yeongtonggu, Suwon-si, South Korea

1.2. Equipment Under Test (EUT) Description

Product Name:	HAJEN_SPRINT AI Speaker	
Serial No.:	(N/A, marked #1 by test site)	
Hardware Version:	V03	
Software Version:	3.6.138365.0	
Modulation Type:	OFDM	
Modulation Mode:	802.11a, 802.11n(HT20), 802.11n(HT40) 802.11ac(VHT20), 802.11ac(VHT40), 802.11ac(VHT80),	
Operating Frequency Range:	5.150 GHz- 5.250 GHz; 5.250 GHz -5.350 GHz ; 5.470 GHz -5.725 GHz ; 5.745GHz- 5.825GHz	
Channel Number:	Refer to 1.3	
Antenna Type:	Internal FPC Antenna	
Antenna Gain:	4.21dBi	
Accessory Information:	Battery	
	Brand Name:	A&S Power Technology Co., Ltd.
	Model No.:	P/N: AS-853450-1500-122
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	3000mAh
	Rated Voltage:	3.70V
	Charge Limit:	4.20V

Note1: WIFI hotspot does not support U-NII band.

Note2: 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

Modulation technology	Modulation Type	Data Rate (Mbps) ^{Note1}
OFDM (802.11a)	BPSK	6/9
	QPSK	12/18
	16QAM	24/36
	64QAM	48/54
OFDM (802.11n)	BPSK	6.5
	QPSK	13/19.5
	16QAM	26/39
	64QAM	52/58.5/65
OFDM (802.11ac)	BPSK	6.5
	QPSK	13/19.5
	16QAM	26/39
	64QAM	52/58.5/65
	256QAM	78

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

Frequency Range: 5150MHz-5250MHz				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	36	5180	40	5200
	44	5220	48	5240
40MHz	38	5190	46	5230
80MHz	42	5210		
Frequency Range: 5250MHz-5350MHz				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	52	5260	56	5280
	60	5300	64	5320
40MHz	54	5270	62	5310
80MHz	58	5290		
Frequency Range: 5470MHz-5725MHz				
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		
Frequency Range: 5725MHz-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	Jan 08, 2020	Zhou Chuang	PASS	No deviation
3	15.407(a)	Maximum Conducted Output Power	Jan 08, 2020	Zhou Chuang	PASS	No deviation
4	15.407(a) (e)	Emission Bandwidth	Jan 08, 2020	Zhou Chuang	PASS	No deviation
5	15.407(a)	Peak Power Spectral Density	Jan 08, 2020	Zhou Chuang	PASS	No deviation
6	15.407(g)	Frequency Stability	Jan 08, 2020	Zhou Chuang	PASS	No deviation
7	15.207	Conducted Emission	Jan 09, 2020	Lin Jiayong	PASS	No deviation
8	15.407(b)	Restricted Frequency Bands	Jan 08, 2020	Peng Xuwei	PASS	No deviation
9	15.407(b)	Radiated Emission	Jan 13&14, 2020	Peng Xuwei	PASS	No deviation

Note 1: The DFS test report was documented in a separate report (Report No.: SZ19120121W06).

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 v01r03.

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 12.5dB contains two parts that cable loss 2.0dB 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.

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. Result: Compliant

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

2.2. Duty Cycle of the Test Signal

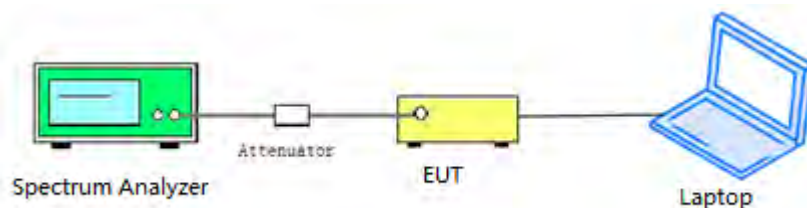
2.2.1. Requirement

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 50 Ohm; 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.

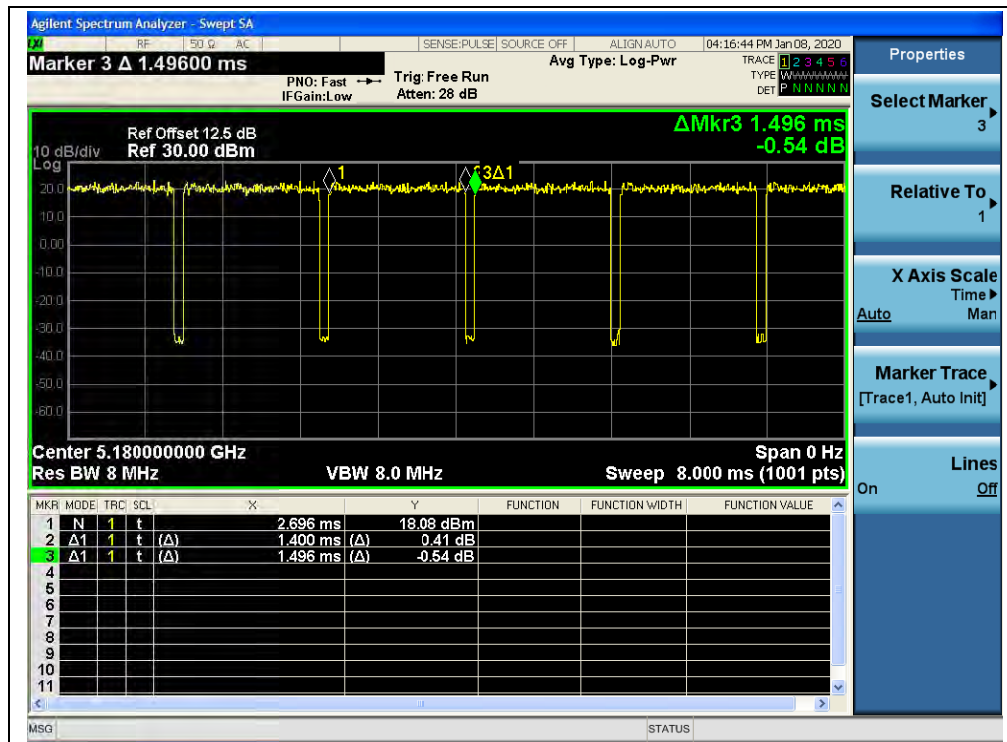


2.2.4. Test Result

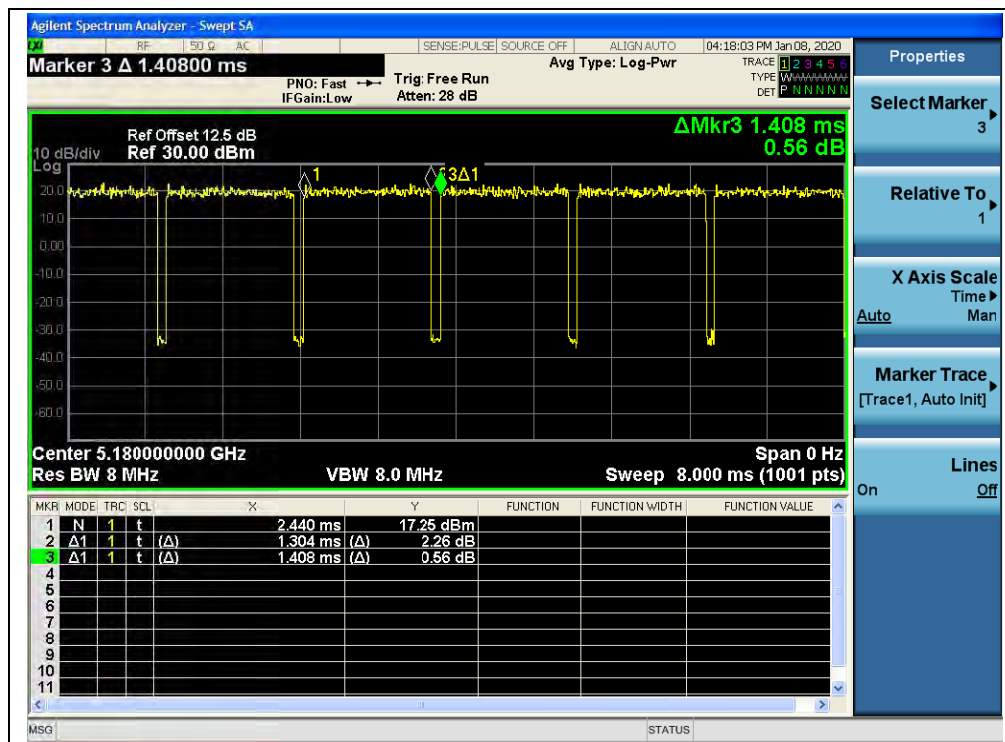
A. Test Verdict:

Test Mode	Duty Cycle (%) (D)	Duty Factor (10*log[1/D])
802.11a	93.58	0.29
802.11n(HT20)	92.61	0.33
802.11n(HT40)	86.00	0.66
802.11ac(VHT20)	92.66	0.33
802.11ac(VHT40)	86.18	0.65
802.11ac(VHT80)	76.06	1.19

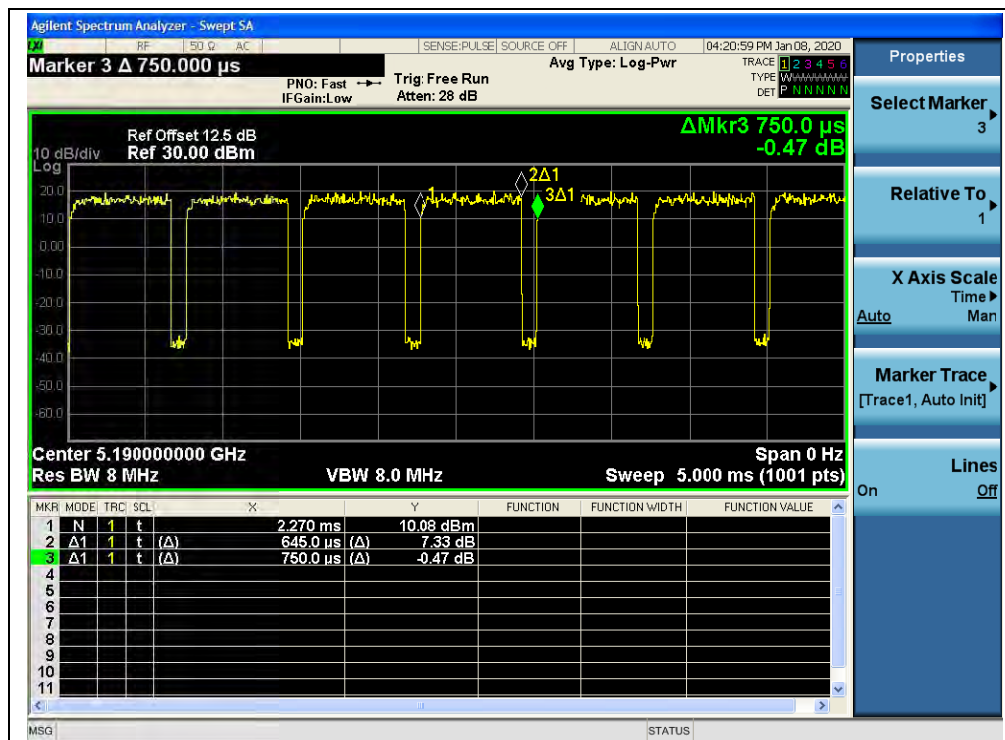
B. Test Plots



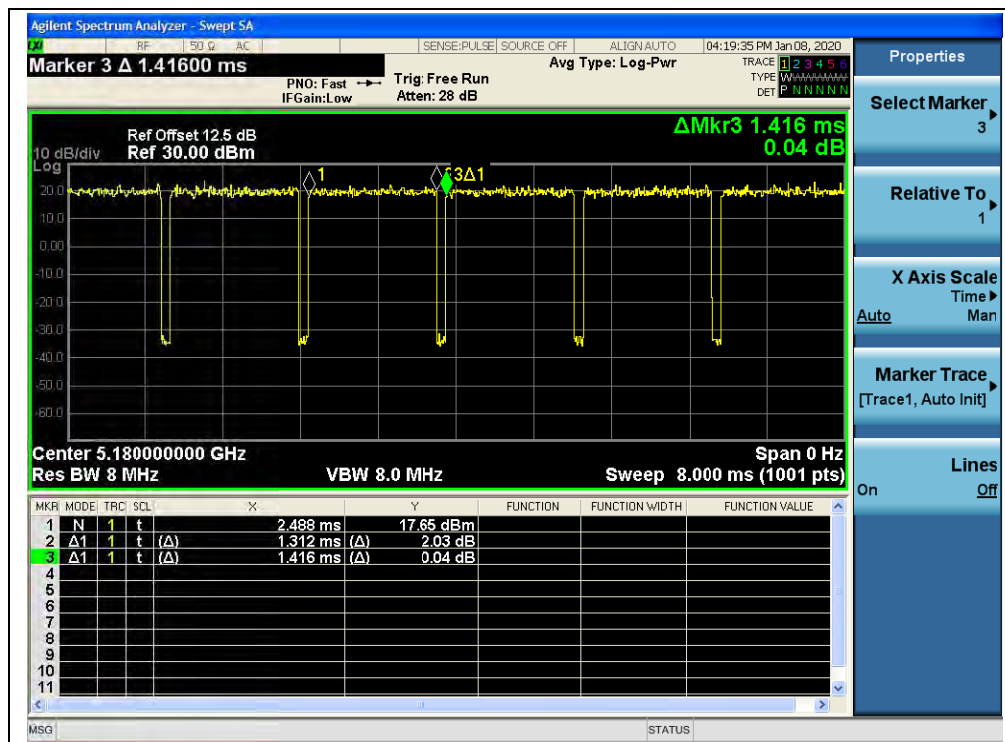
(CH36_5180MHz_802.11a)



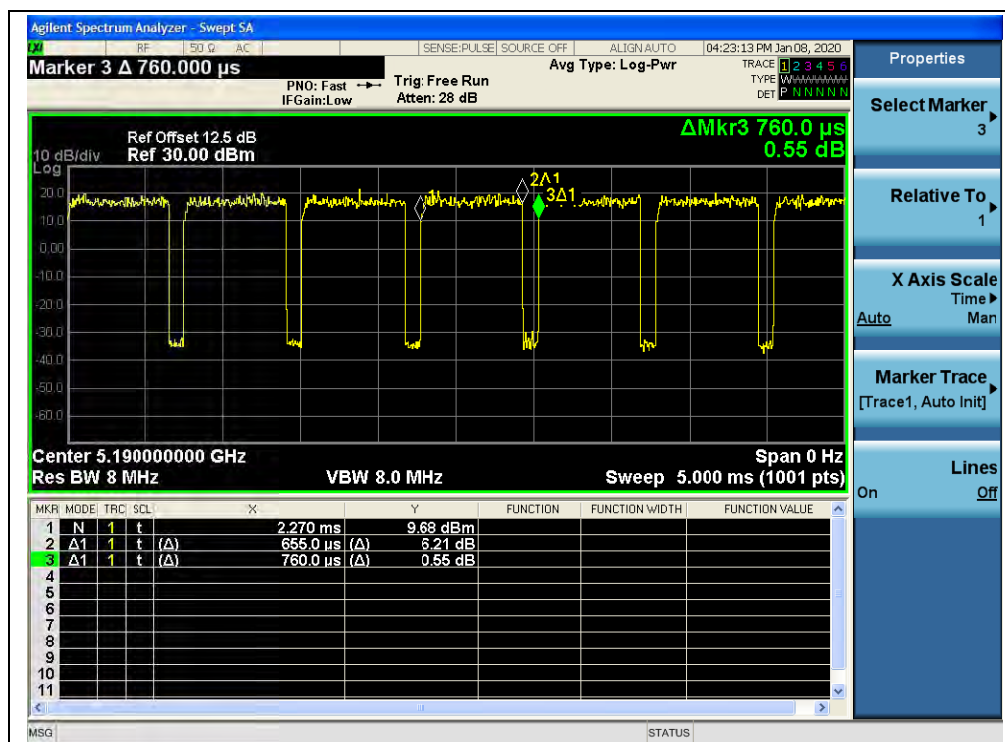
(CH36_5180MHz_802.11n(HT20))



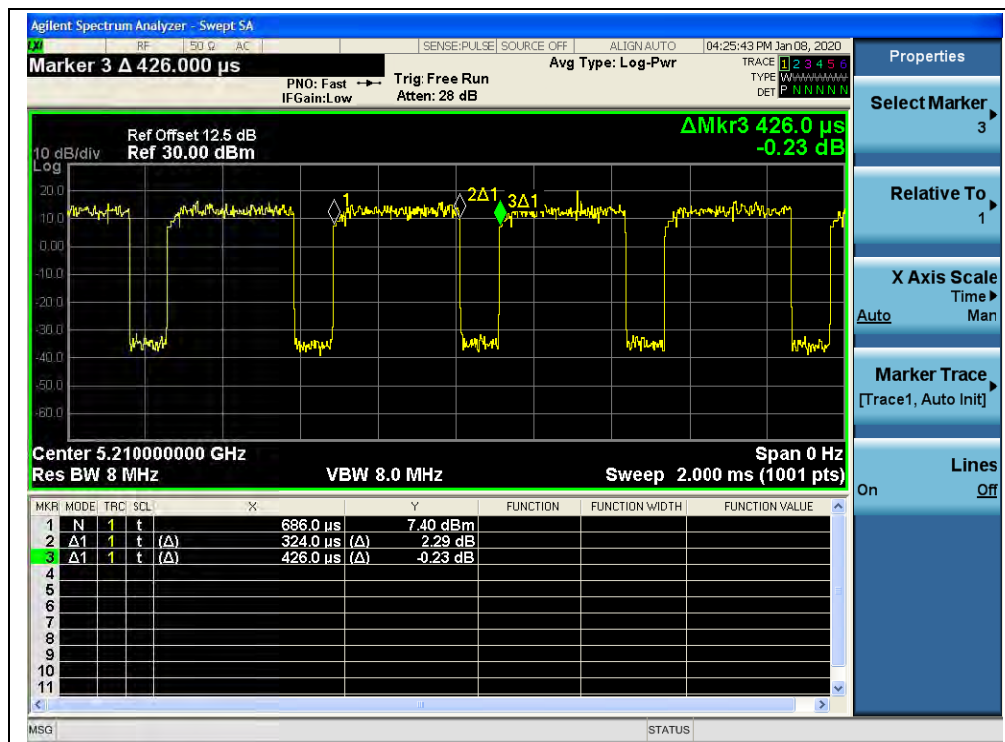
(CH38_5190MHz_802.11n(HT40))



(CH36_5180MHz_802.11ac(VHT20))



(CH38_5190MHz_802.11ac(VHT40))



(CH42_5210MHz_802.11ac(VHT80))

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 250 mW provided the maximum antenna gain does not exceed 6 dBi.

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

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

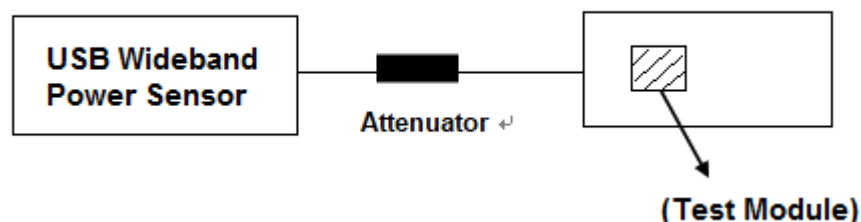
(4) According to KDB662911D01 Measure-and-sum technique, the conducted emission level (e.g., transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the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

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

2.3.2. Test Description

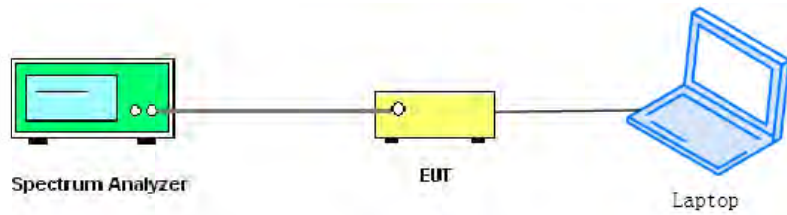
Section E) 3) of KDB 789033 defines a methodology using a USB Wideband Power Sensor.

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 50 Ohm; 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	21.07	24.24	24.00
		5300	21.14	24.25	24.00
		5320	21.41	24.31	24.00
	UNII-2c	5500	21.25	24.27	24.00
		5600	21.31	24.29	24.00
		5720	21.35	24.29	24.00
n20	UNII-2a	5260	21.18	24.26	24.00
		5300	21.47	24.32	24.00
		5320	21.25	24.27	24.00
	UNII-2c	5500	21.5	24.32	24.00
		5600	21.48	24.32	24.00
		5720	23.11	24.64	24.00
ac20	UNII-2a	5260	21.35	24.29	24.00
		5300	22.71	24.56	24.00
		5320	23.66	24.74	24.00
	UNII-2c	5500	21.42	24.31	24.00
		5600	21.66	24.36	24.00
		5720	21.59	24.45	24.00



2.3.4. Test Result

Maximum Average Conducted Output Power

802.11a Test mode

Frequency (MHz)	Average Power (dBm)				Limit (dBm)		Verdict
	Measured	Duty Factor	Duty factor Calculated		dBm		
	dBm		dBm	W	dBm	W	
5180	15.47	0.29	15.76	0.038	24	0.25	PASS
5220	15.19		15.48	0.035			
5240	15.08		15.37	0.034			
5260	15.22		15.51	0.036			
5300	14.98		15.27	0.034			
5320	14.67		14.96	0.031			
5500	13.63		13.92	0.025			
5600	13.74		14.03	0.025			
5720	13.79		14.08	0.026			
5745	14.47		14.76	0.030	30	1	
5785	14.22		14.51	0.028			
5825	13.56		13.85	0.024			

802.11n (HT20) Test mode

Frequency (MHz)	Average Power (dBm)				Limit (dBm)		Verdict
	Measured	Duty Factor	Duty factor Calculated		dBm W		
	dBm		dBm	W			
5180	15.09	0.33	15.42	0.035	24	0.25	PASS
5220	14.89		15.22	0.033			
5240	14.72		15.05	0.032			
5260	14.82		15.15	0.033			
5300	14.65		14.98	0.032			
5320	14.41		14.74	0.030			
5500	13.20		13.53	0.023			
5600	13.34		13.67	0.023			
5720	13.47		13.80	0.024			
5745	14.03		14.36	0.027	30	1	
5785	13.82		14.15	0.026			
5825	13.21		13.54	0.023			

**802.11n (HT40) Test mode**

Frequency (MHz)	Average Power (dBm)				Limit (dBm)		Verdict
	Measured	Duty Factor	Duty factor Calculated		dBm	W	
	dBm		dBm	W			
5190	14.72	0.66	15.38	0.034	24	0.25	PASS
5230	14.74		15.40	0.035			
5270	14.47		15.13	0.033			
5310	14.18		14.84	0.030			
5510	13.08		13.74	0.024			
5630	13.27		13.93	0.025			
5710	13.21		13.87	0.024			
5755	13.37		14.03	0.025	30	1	
5795	13.11		13.77	0.024			

802.11ac (VHT20) Test mode

Frequency (MHz)	Average Power (dBm)				Limit (dBm)		Verdict
	Measured	Duty Factor	Duty factor Calculated		dBm	W	
	dBm		dBm	W			
5180	14.99	0.33	15.32	0.034	24	0.25	PASS
5220	14.68		15.01	0.032			
5240	14.39		14.72	0.030			
5260	14.87		15.20	0.033			
5300	14.65		14.98	0.031			
5320	14.41		14.74	0.030			
5500	13.16		13.49	0.022			
5600	12.99		13.32	0.021			
5720	12.85		13.18	0.021			
5745	13.86		14.19	0.026	30	1	
5785	13.51		13.84	0.024			
5825	13.13		13.46	0.022			

**802.11ac (VHT40) Test mode**

Frequency (MHz)	Average Power (dBm)				Limit (dBm)		Verdict
	Measured	Duty Factor	Duty factor Calculated		dBm	W	
	dBm		dBm	W			
5190	14.69	0.65	15.34	0.034	24	0.25	PASS
5230	14.64		15.29	0.034			
5270	14.57		15.22	0.033			
5310	14.45		15.10	0.032			
5510	13.06		13.71	0.023			
5630	13.01		13.66	0.023			
5710	12.98		13.63	0.023			
5755	13.62		14.27	0.027	30	1	
5795	13.16		13.81	0.024			

802.11ac (VHT80) Test mode

Frequency (MHz)	Average Power (dBm)				Limit (dBm)		Verdict
	Measured	Duty Factor	Duty factor Calculated		dBm	W	
	dBm		dBm	W			
5210	13.68	1.19	14.87	0.031	24	0.25	PASS
5290	13.37		14.56	0.029			
5530	12.09		13.28	0.021			
5610	12.00		13.19	0.021			
5690	11.87		13.06	0.020			
5775	12.25		13.44	0.022	30	1	

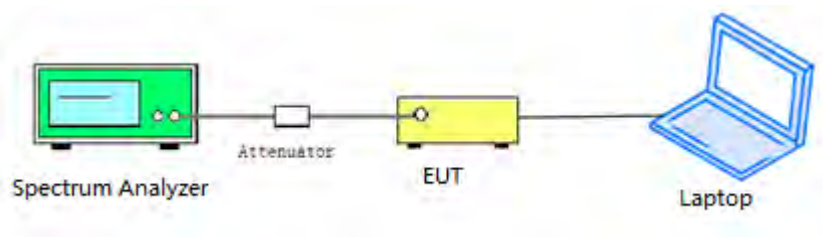
2.4. Emission Bandwidth

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 5.725-5.85 GHz was used in order to prove compliance.
- Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for



theband5.715-5.85 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

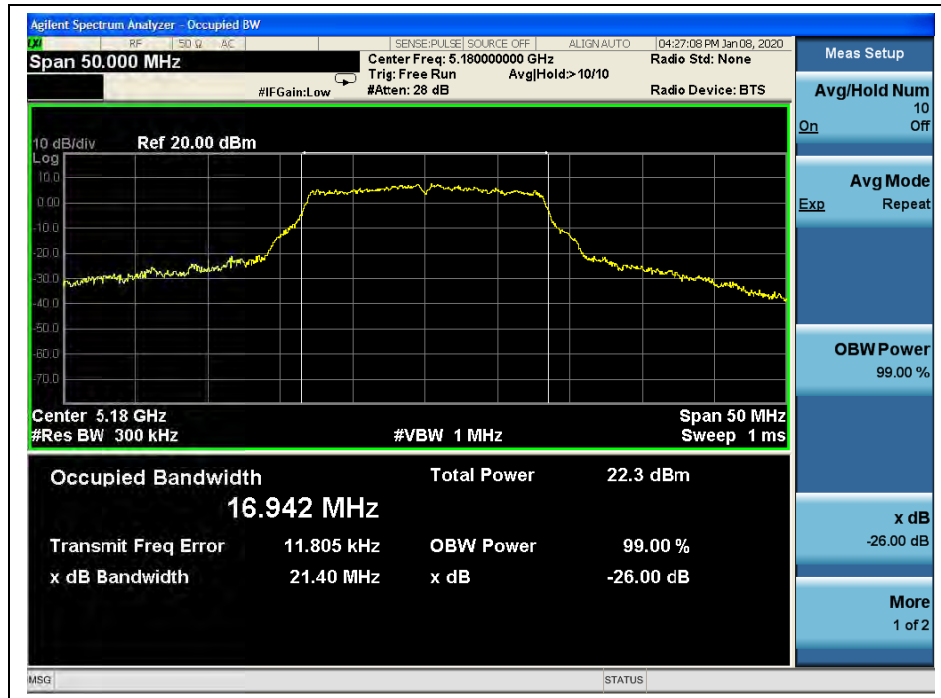
802.11a Test mode

A. Test Verdict:

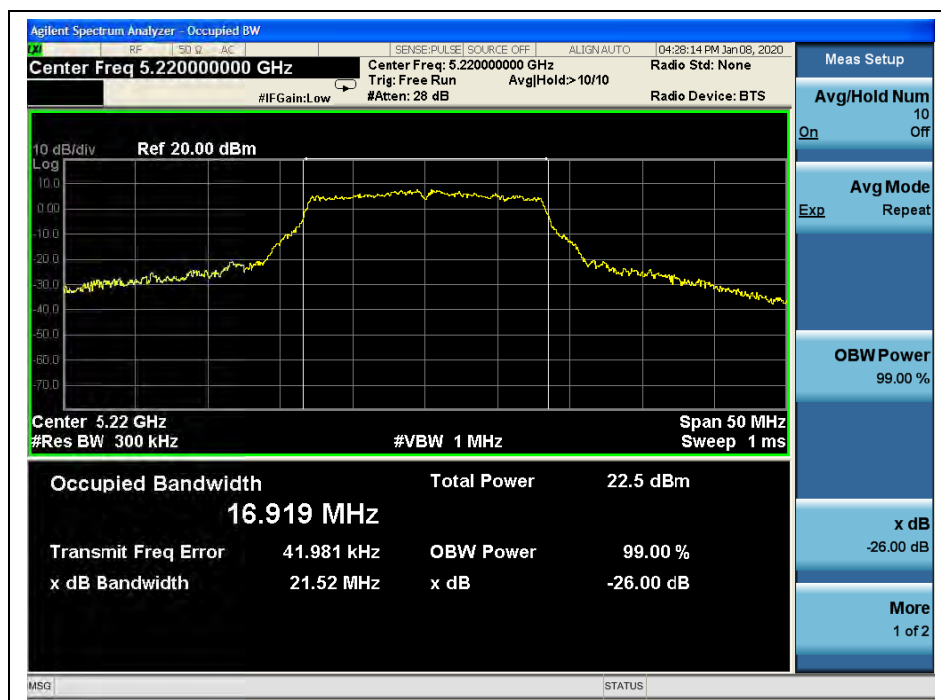
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	21.40
44	5220	21.52
48	5240	21.54
52	5260	21.07
60	5300	21.14
64	5320	21.41
100	5500	21.25
120	5600	21.31
144	5720	21.35
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
144	5720	16.35
149	5745	16.38
157	5785	16.37
165	5825	16.34



B. Test Plots



(Channel 36, 5180 MHz, 802.11a,)



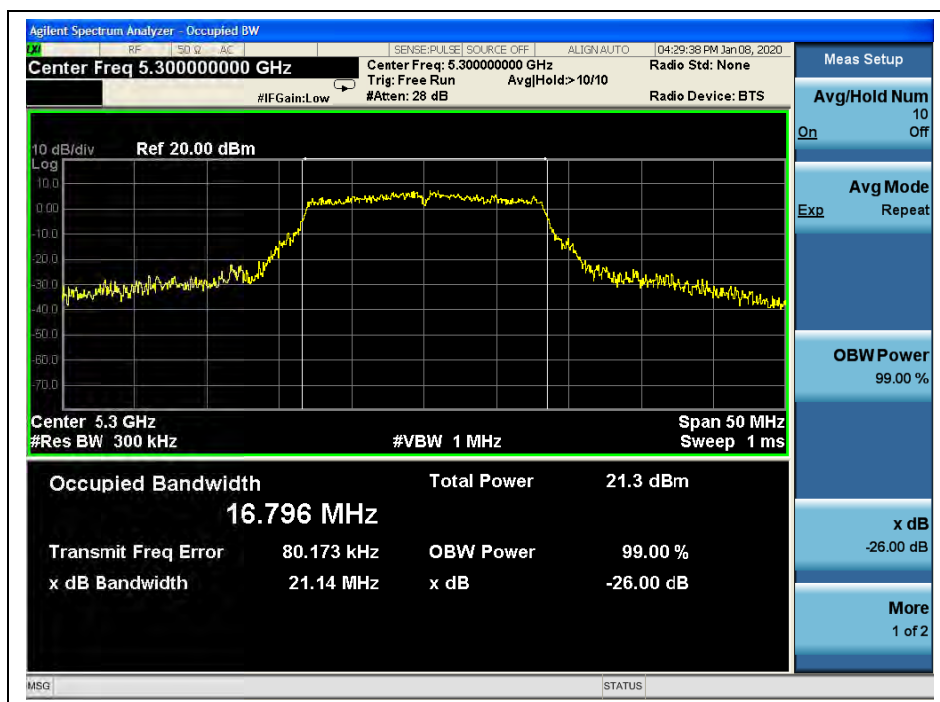
(Channel 44, 5220 MHz, 802.11a,)



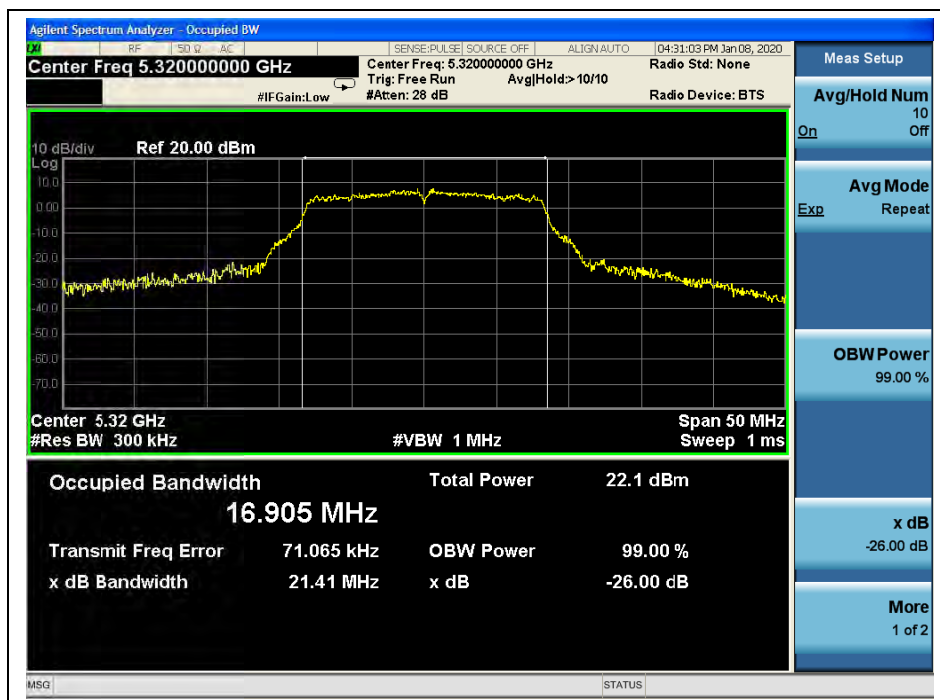
(Channel 48, 5240MHz, 802.11a,)



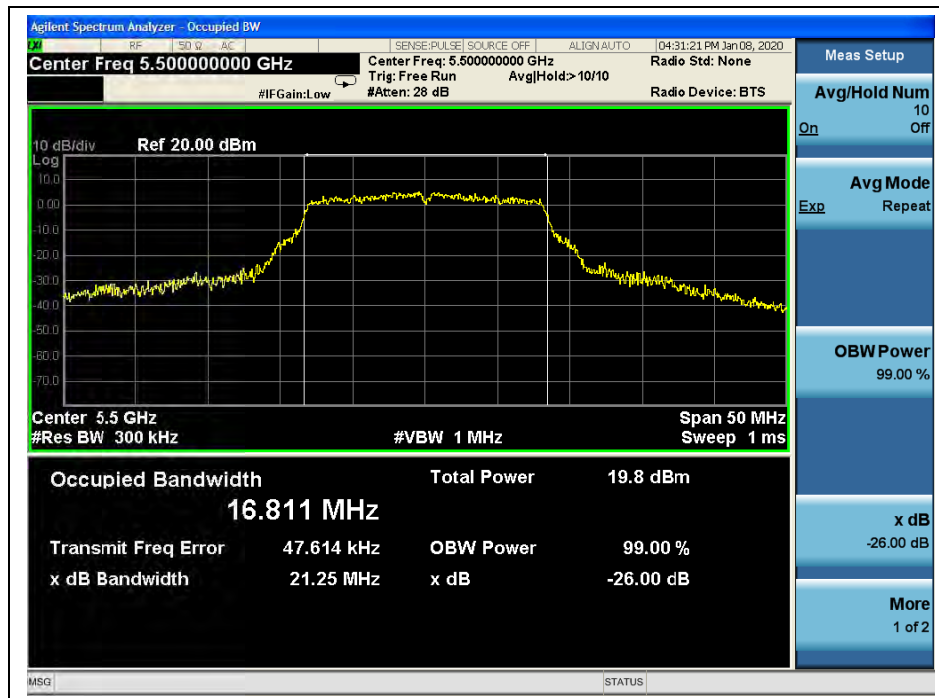
(Channel 52, 5260MHz, 802.11a,)



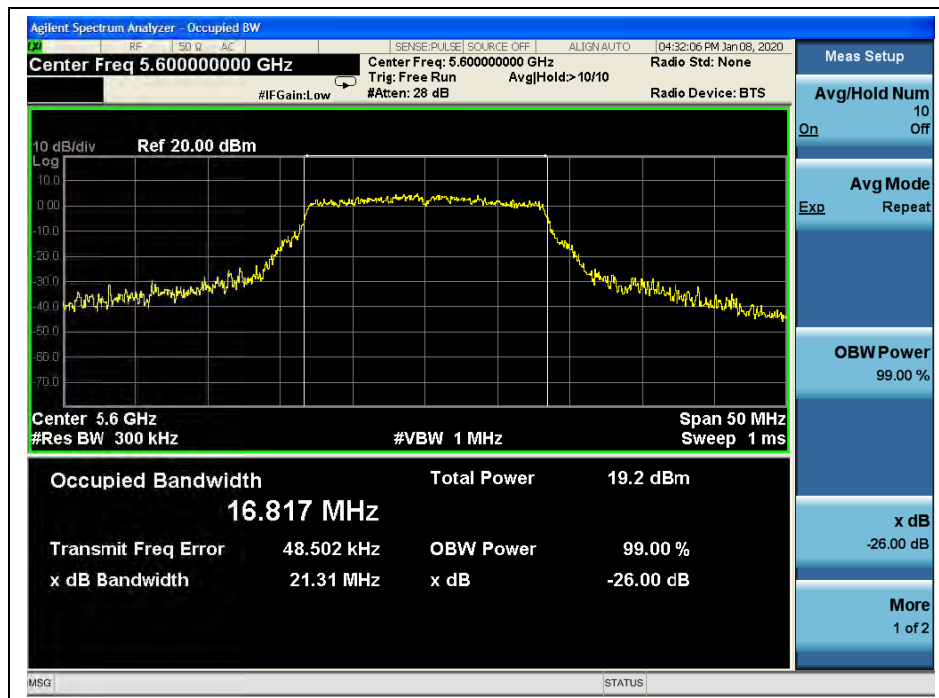
(Channel 60, 5300 MHz, 802.11a,)



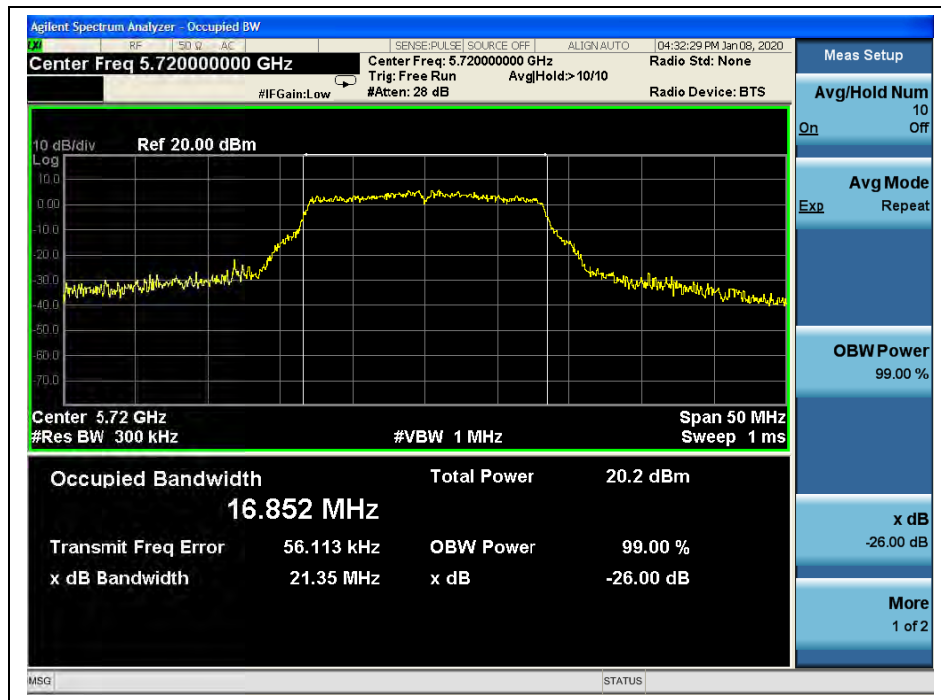
(Channel 64, 5320MHz, 802.11a,)



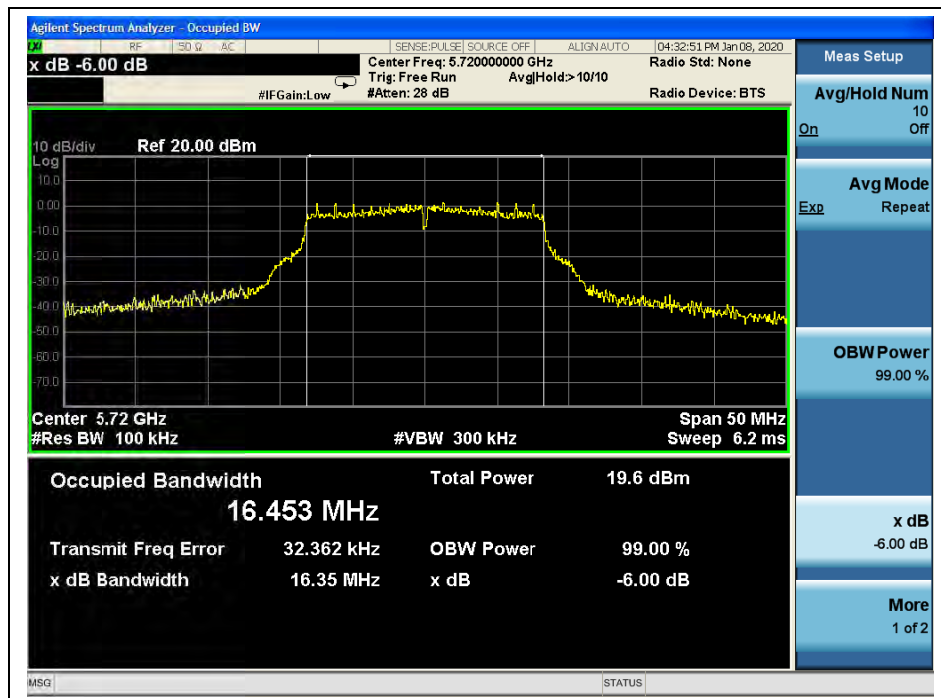
(Channel 100, 5500 MHz, 802.11a,)



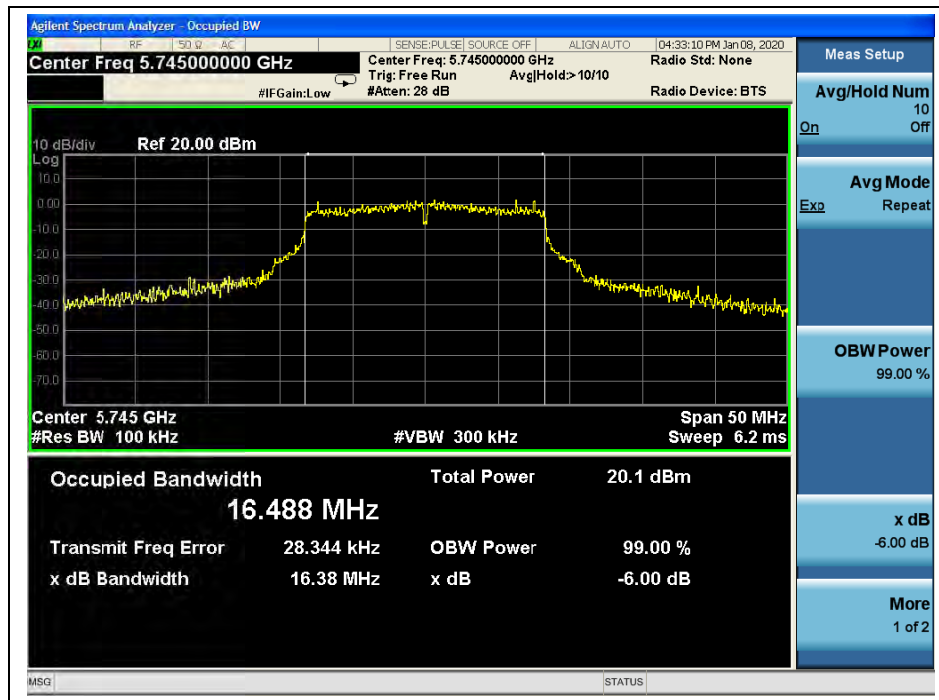
(Channel 120, 5600 MHz, 802.11a,)



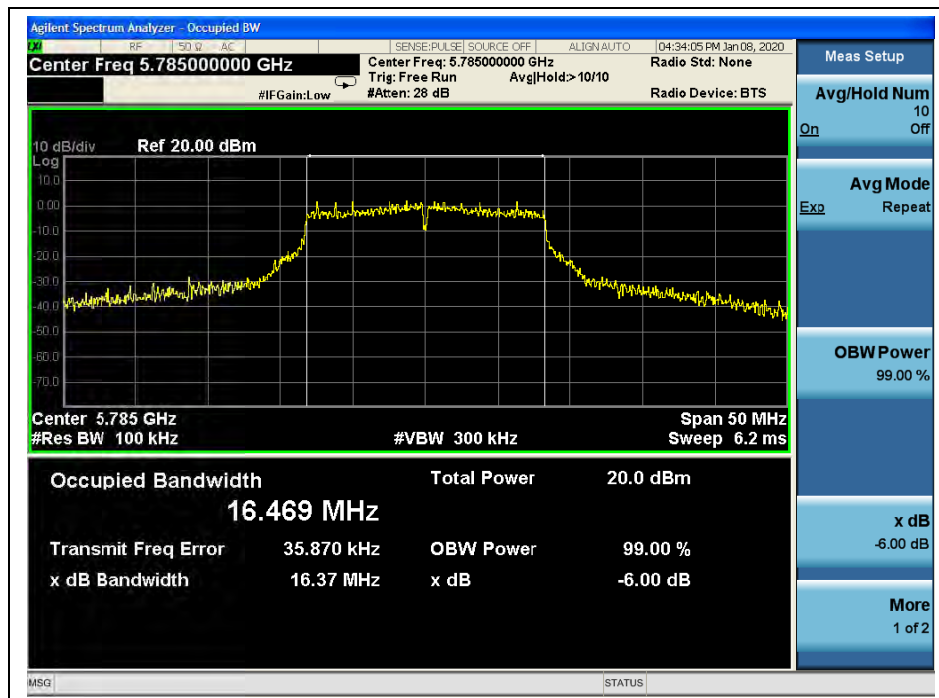
(Channel 144, 5720MHz, 802.11a,)



(Channel 144, 5720MHz, 802.11a,)



(Channel 149,5745MHz, 802.11a)



(Channel 157,5785MHz, 802.11a)



(Channel 165,5825MHz, 802.11a)

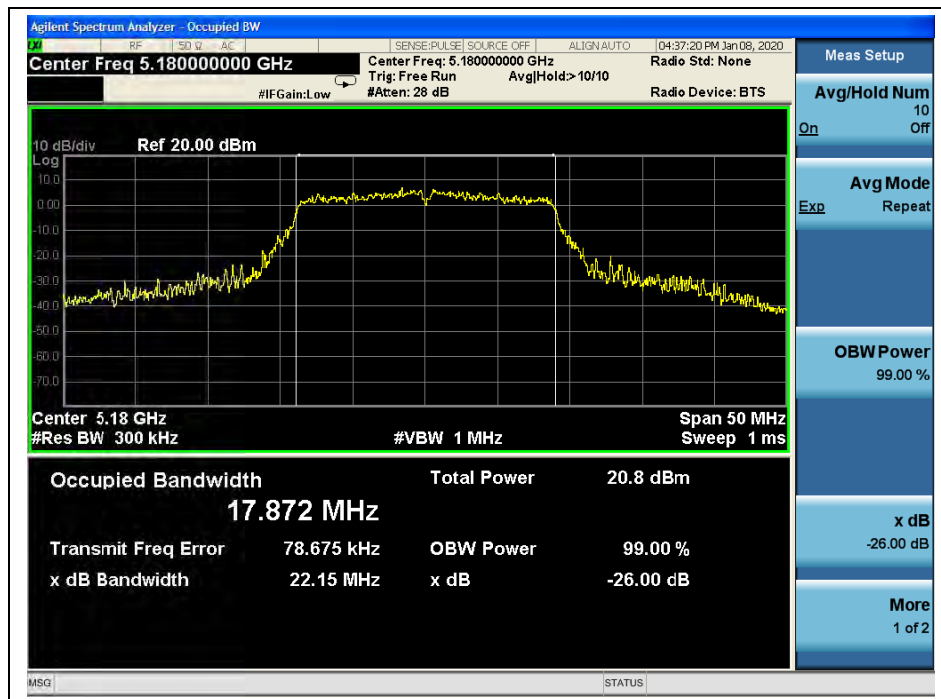


802.11n (HT20) Test mode

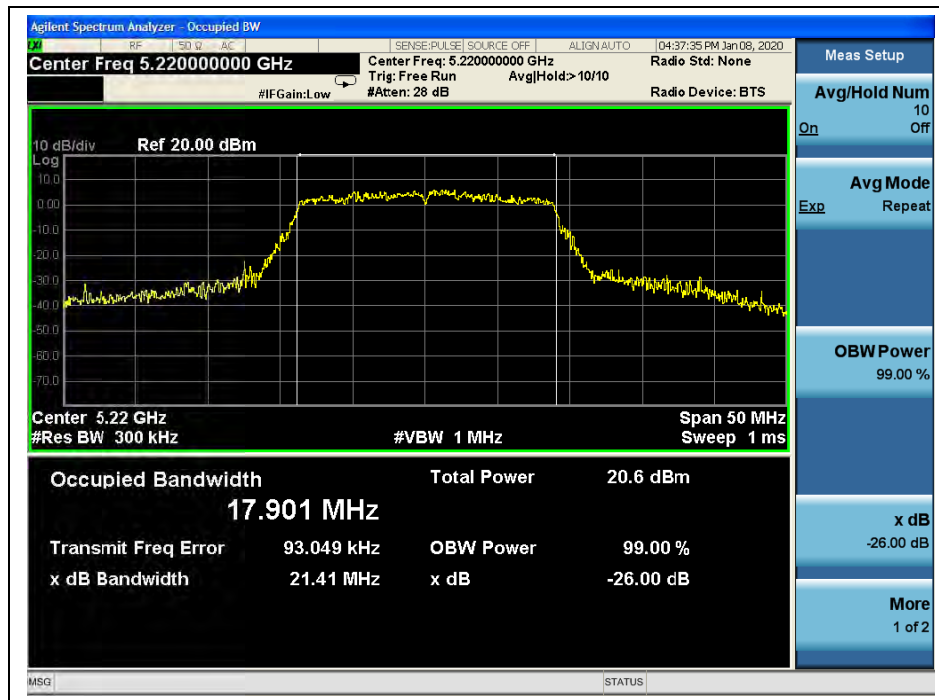
A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	22.15
44	5220	21.41
48	5240	21.70
52	5260	21.18
60	5300	21.47
64	5320	21.25
100	5500	21.50
120	5600	21.48
144	5720	23.11
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
144	5720	17.58
149	5745	17.53
157	5785	17.57
165	5825	16.13

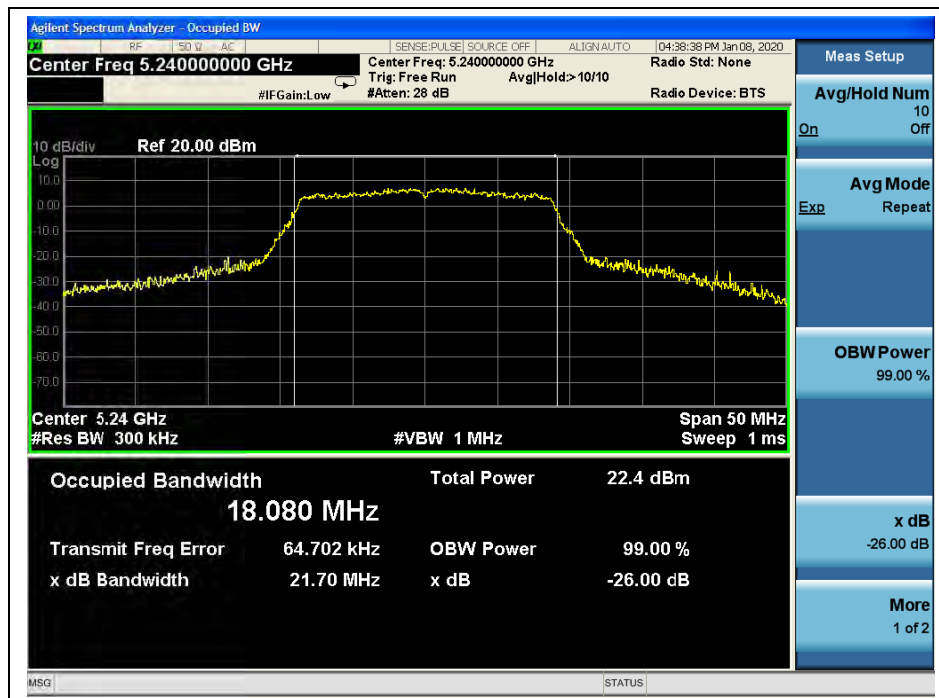
B. Test Plots



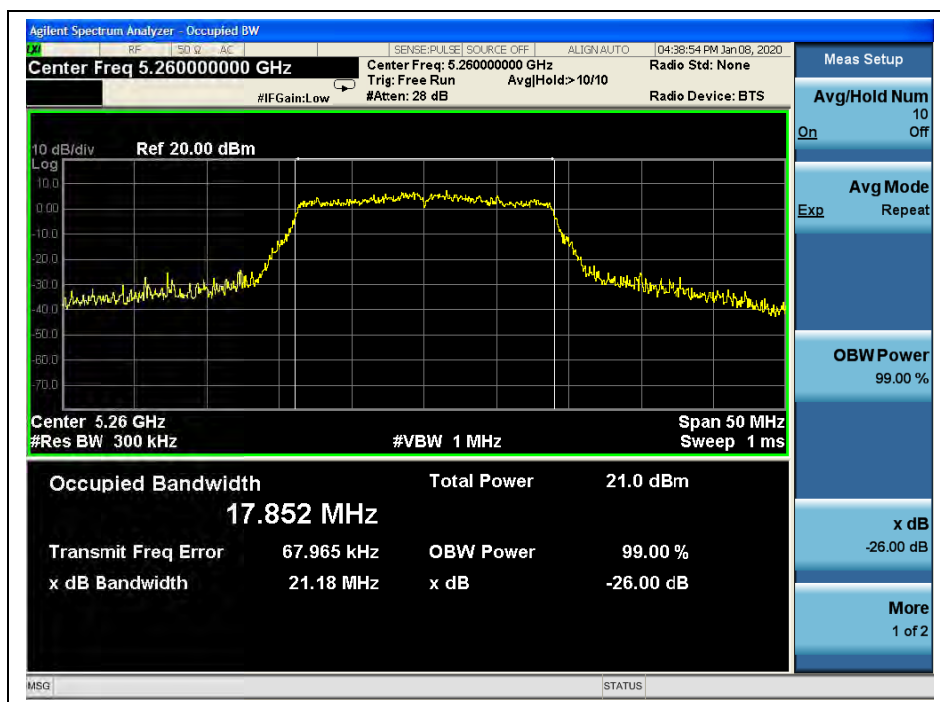
(Channel 36, 5180 MHz, 802.11n (HT20))



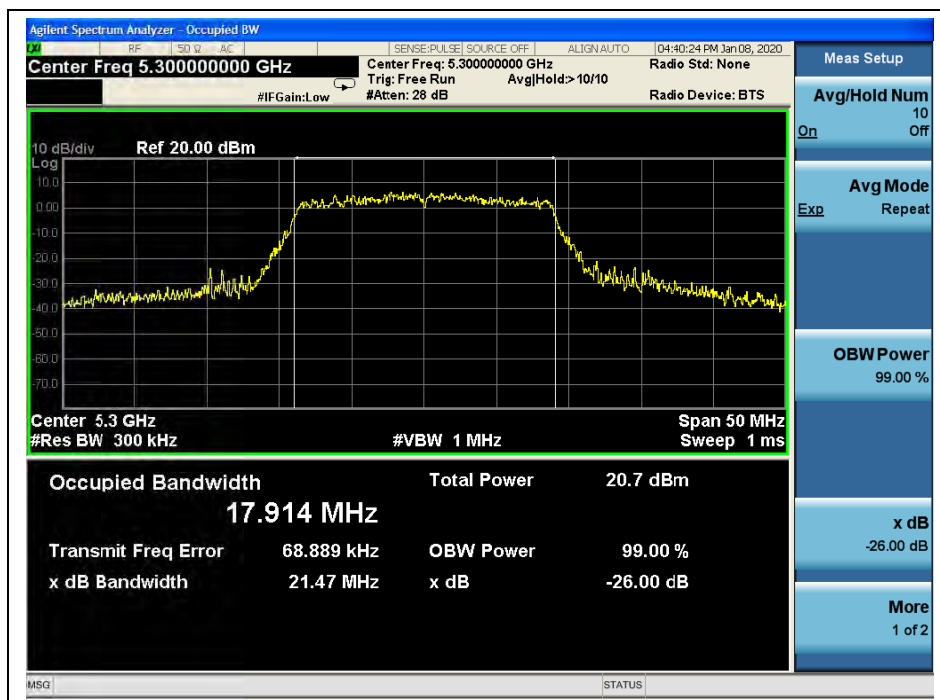
(Channel 44, 5220 MHz, 802.11n (HT20))



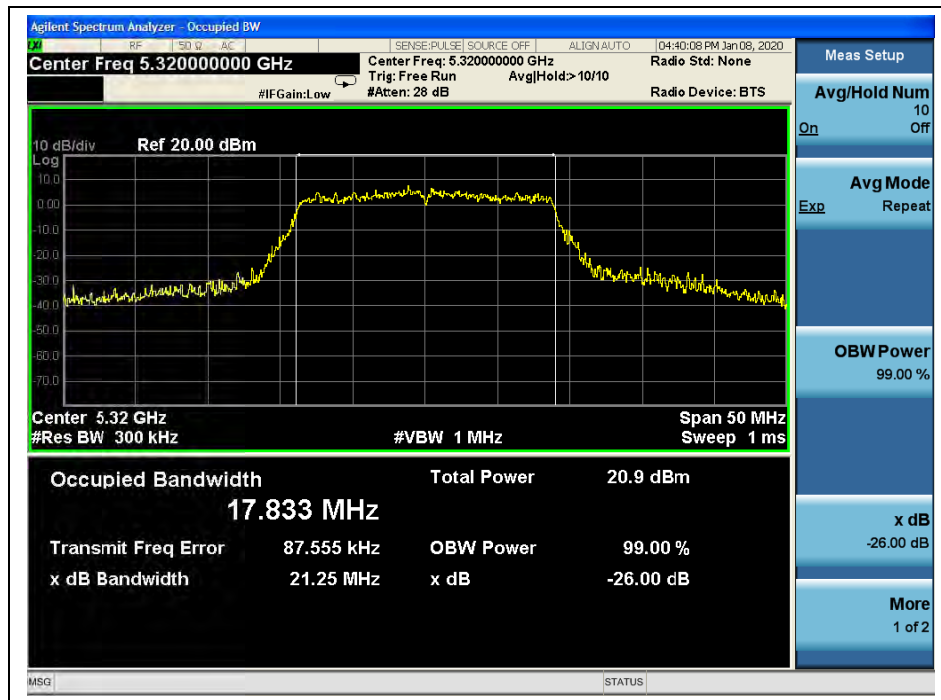
(Channel 48, 5240MHz, 802.11n (HT20))



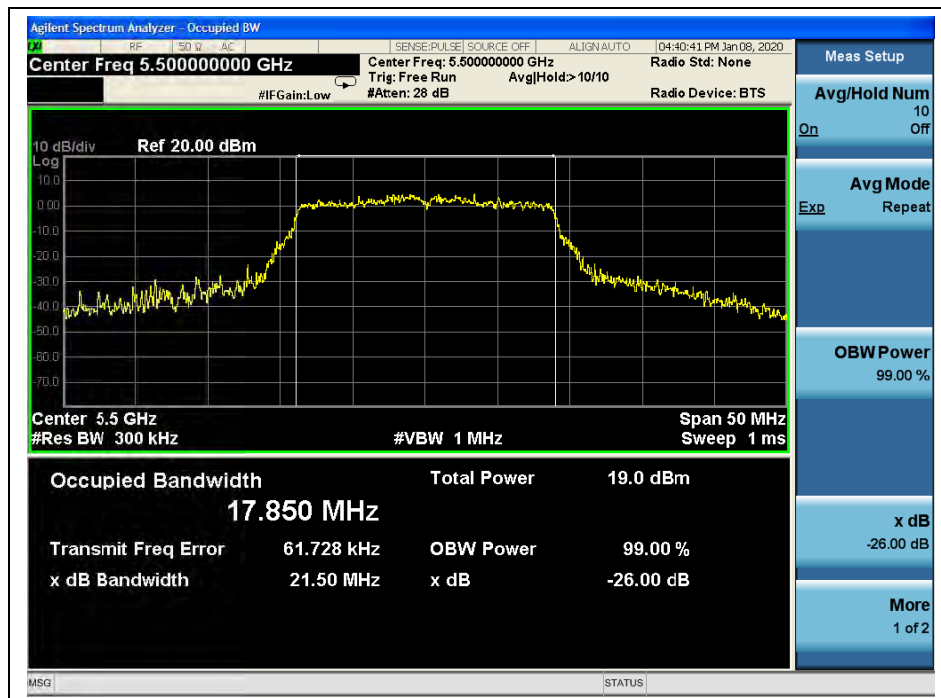
(Channel 52, 5260 MHz, 802.11n (HT20))



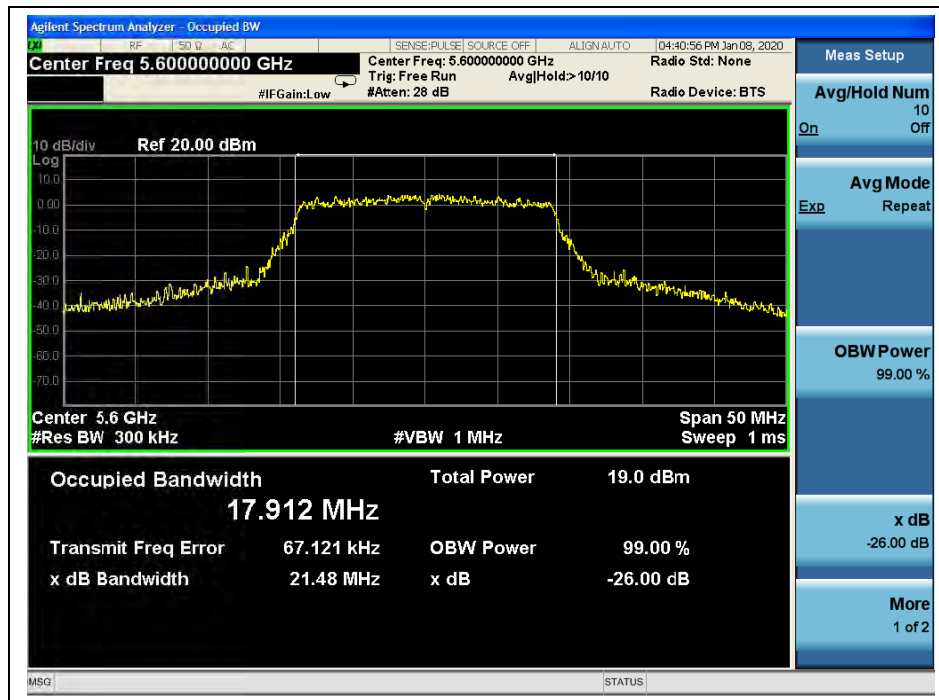
(Channel 60, 5300 MHz, 802.11n (HT20))



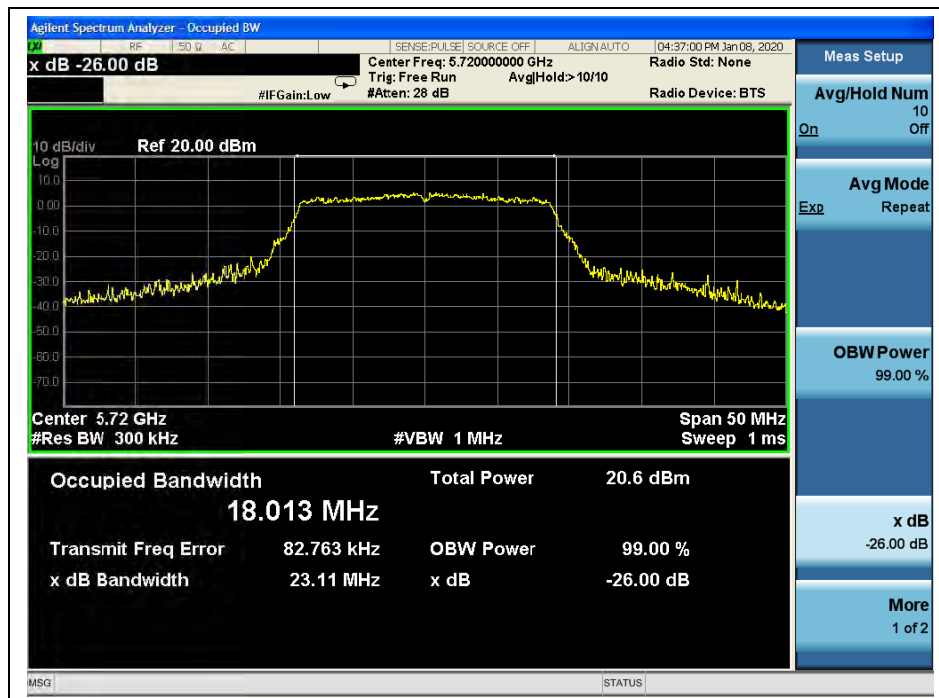
(Channel 64, 5320MHz, 802.11n (HT20))



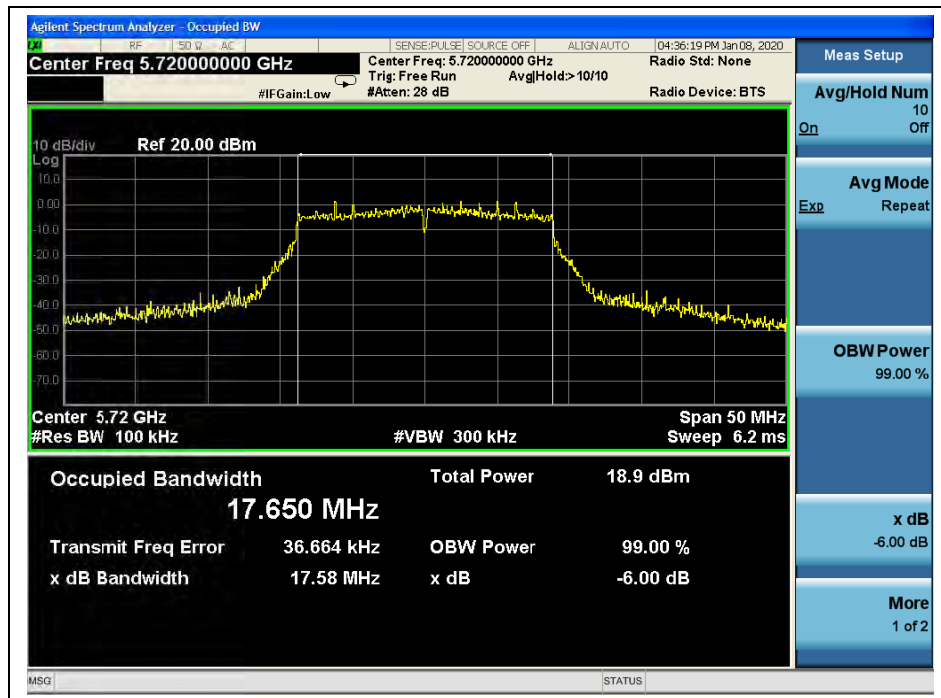
(Channel 100, 5500MHz, 802.11n (HT20))



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



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



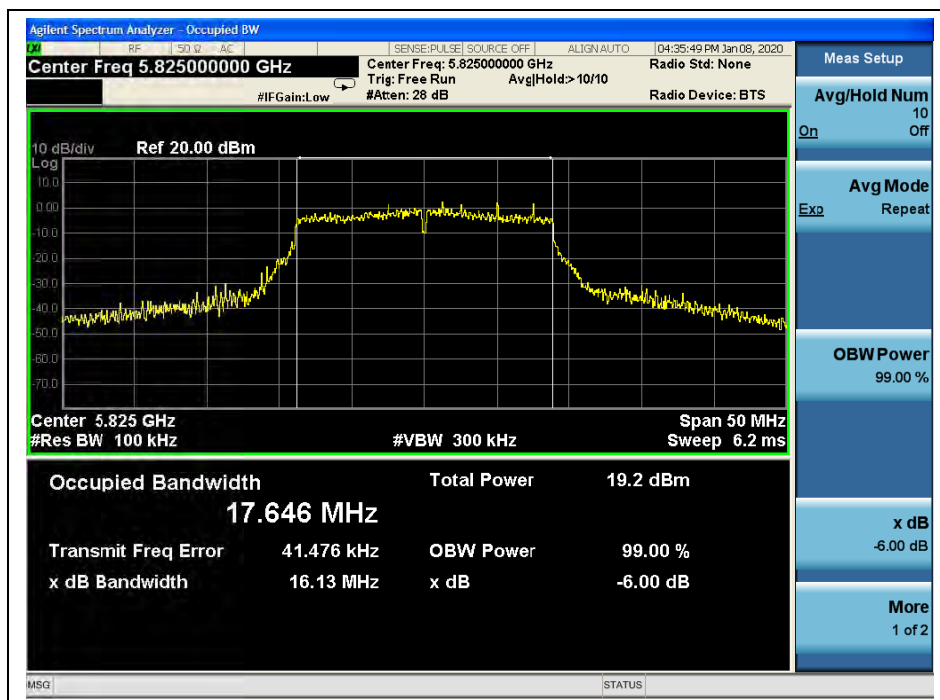
(Channel 144, 5720MHz, 802.11 n (HT20))



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



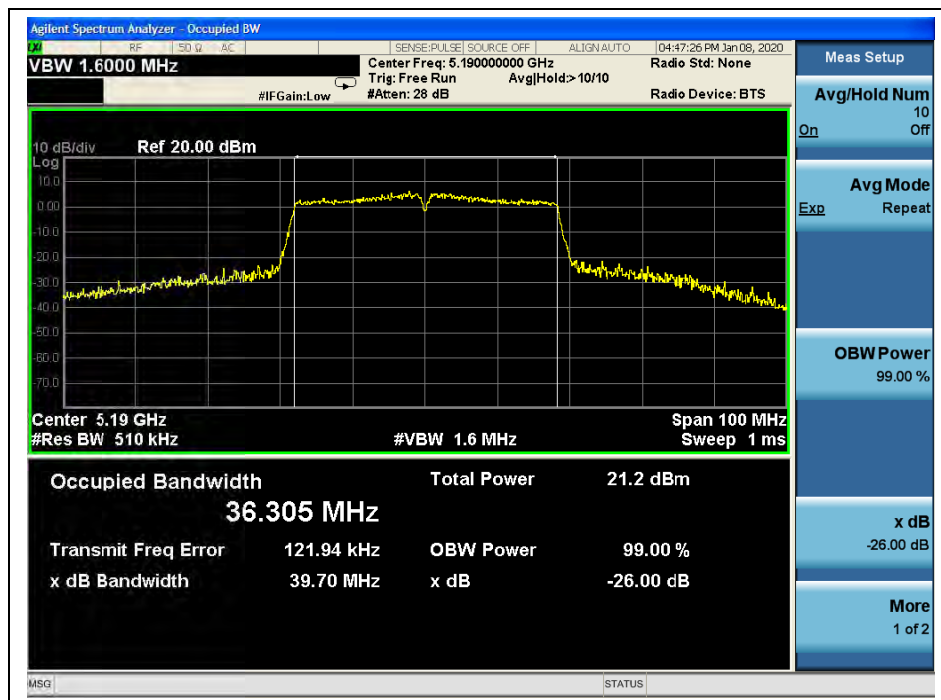
(Channel 157,5785MHz, 802.11 n (HT20))



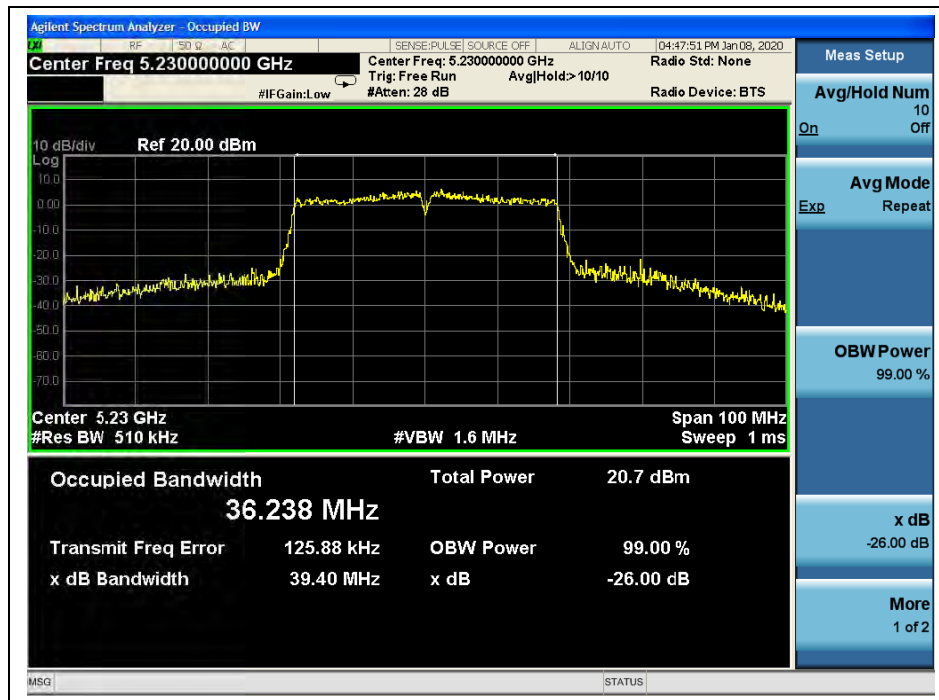
(Channel 165,5825MHz, 802.11 n (HT20))

**802.11n (HT40) Test mode****A. Test Verdict:**

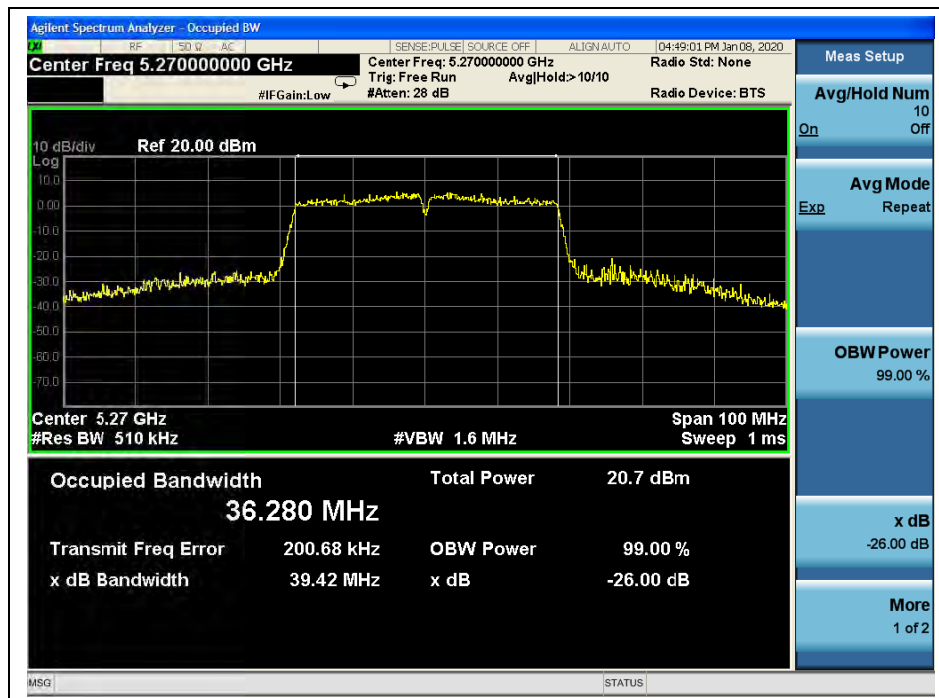
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
38	5190	39.70
46	5230	39.40
54	5270	39.42
62	5310	39.89
102	5510	39.54
126	5630	39.58
142	5710	40.17
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
142	5710	36.32
151	5755	36.32
159	5795	36.23

B. Test Plots

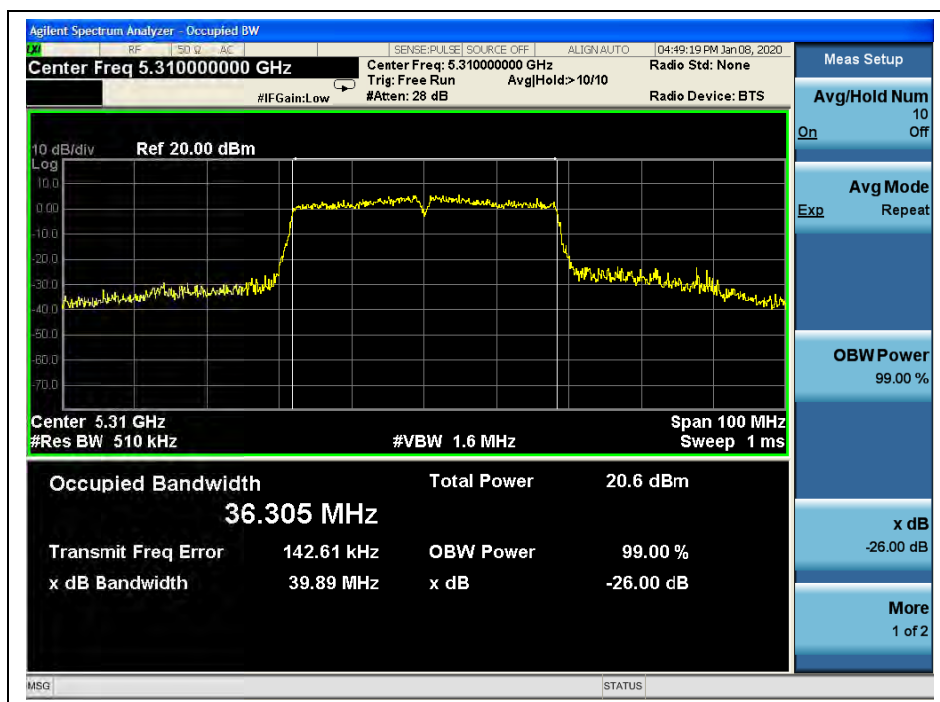
(Channel 38,5190MHz, 802.11n(HT40))



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



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



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



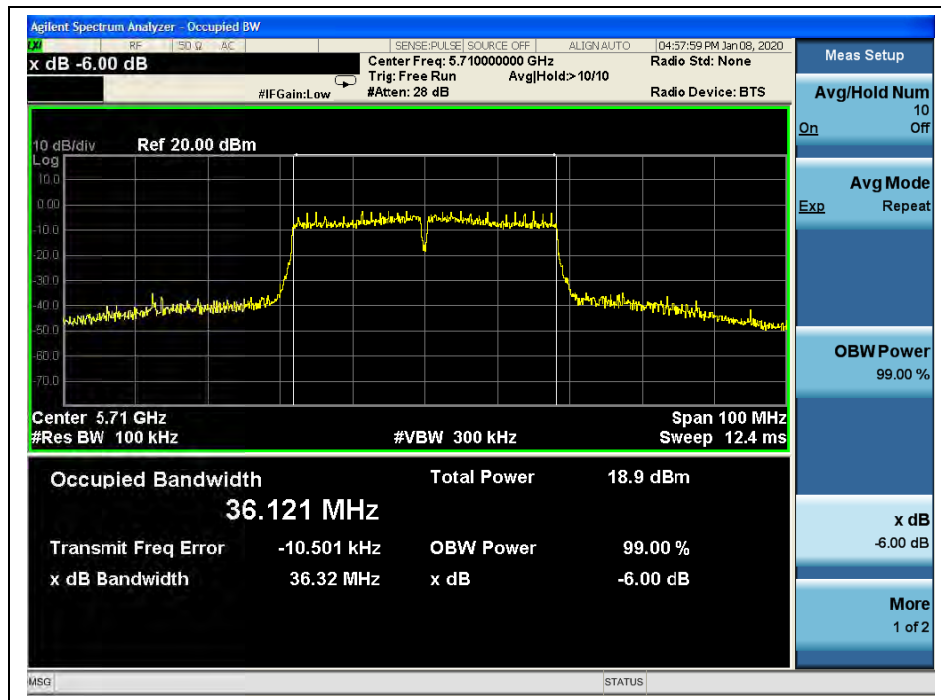
(Channel 102, 5510 MHz, 802.11n(HT40))



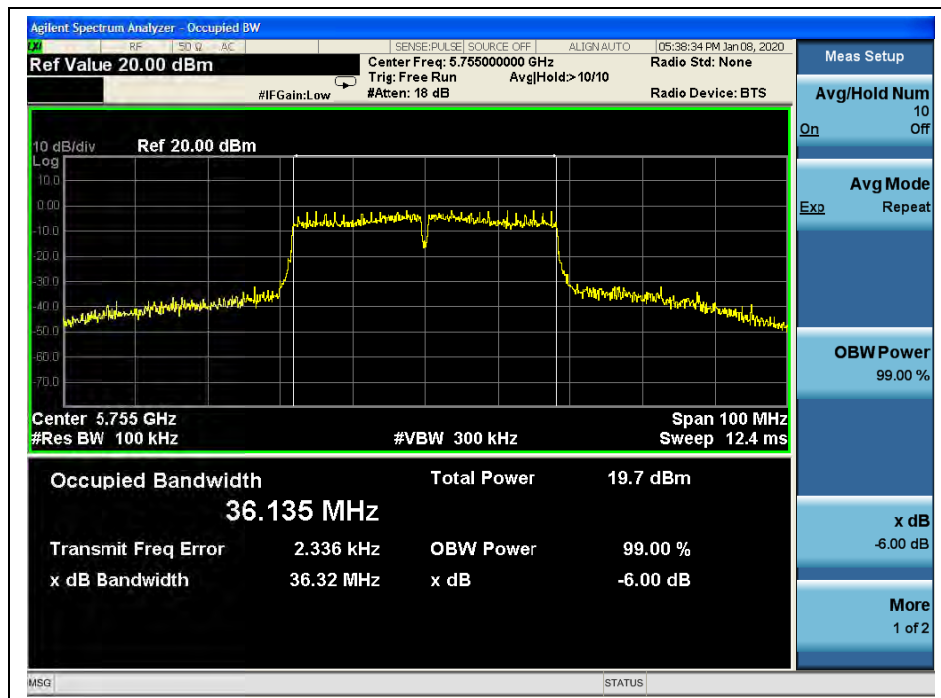
(Channel 126, 5630 MHz, 802.11n(HT40))



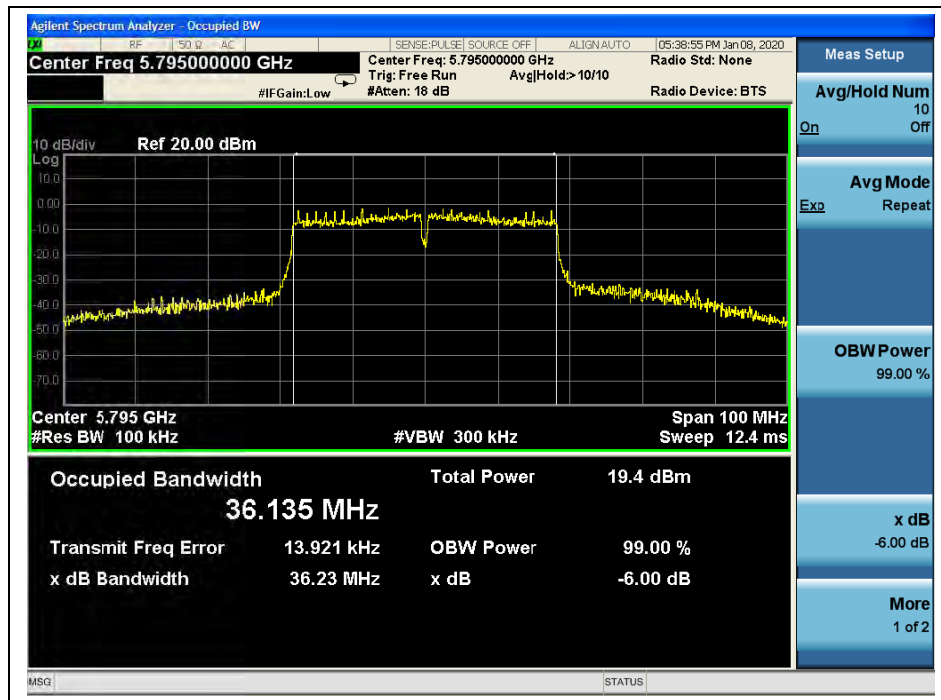
(Channel 142, 5710 MHz, 802.11n(HT40))



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



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



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

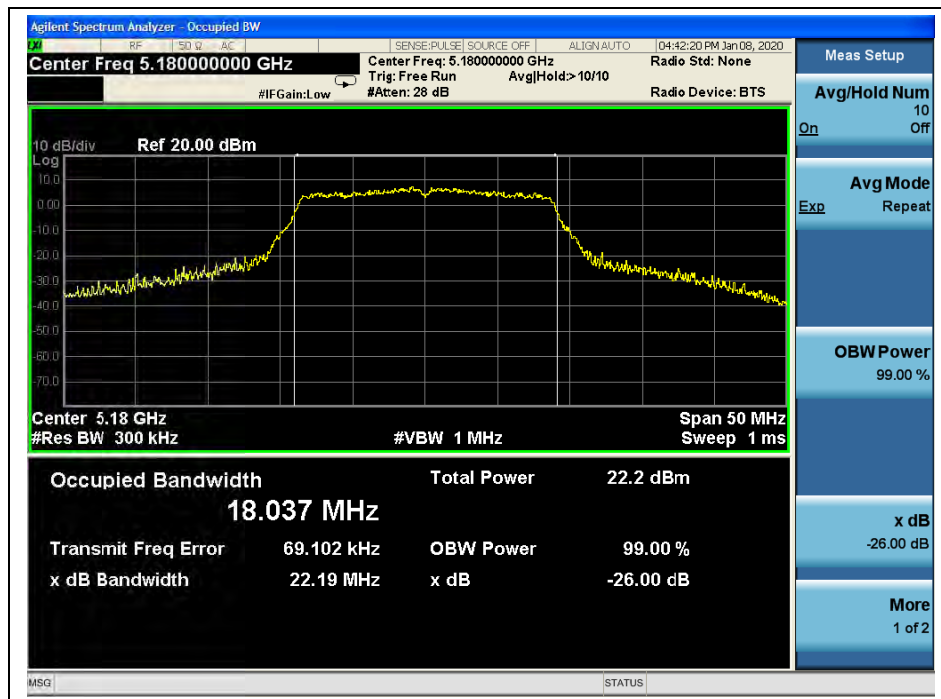


802.11ac (VHT20) Test mode

A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	22.19
44	5220	21.30
48	5240	21.47
52	5260	21.35
60	5300	22.71
64	5320	23.66
100	5500	21.42
120	5600	21.66
144	5720	21.59
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
144	5720	16.93
149	5745	17.27
157	5785	17.31
165	5825	17.60

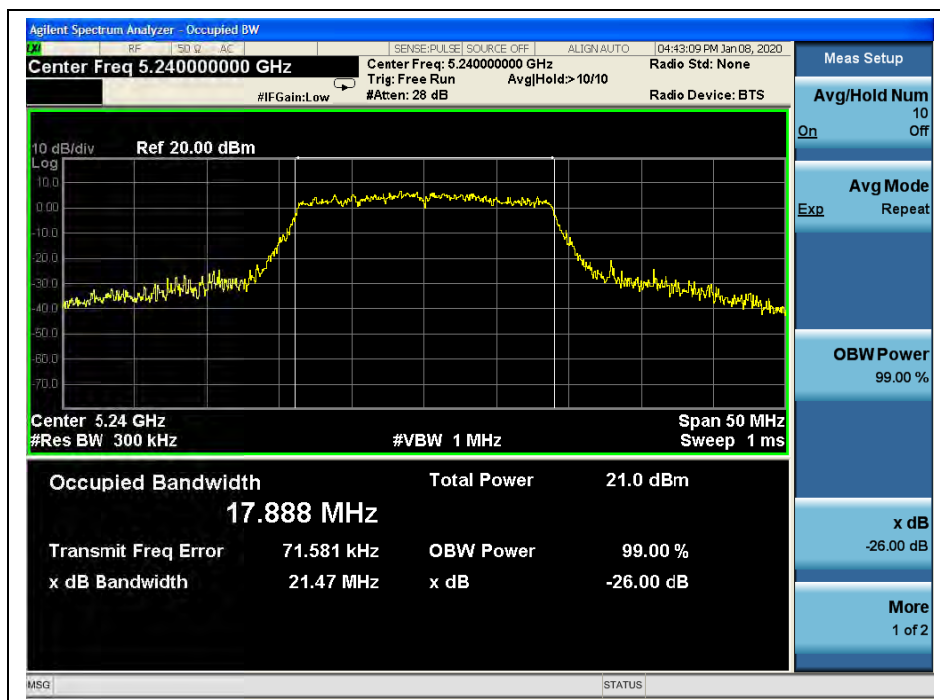
B. Test Plots



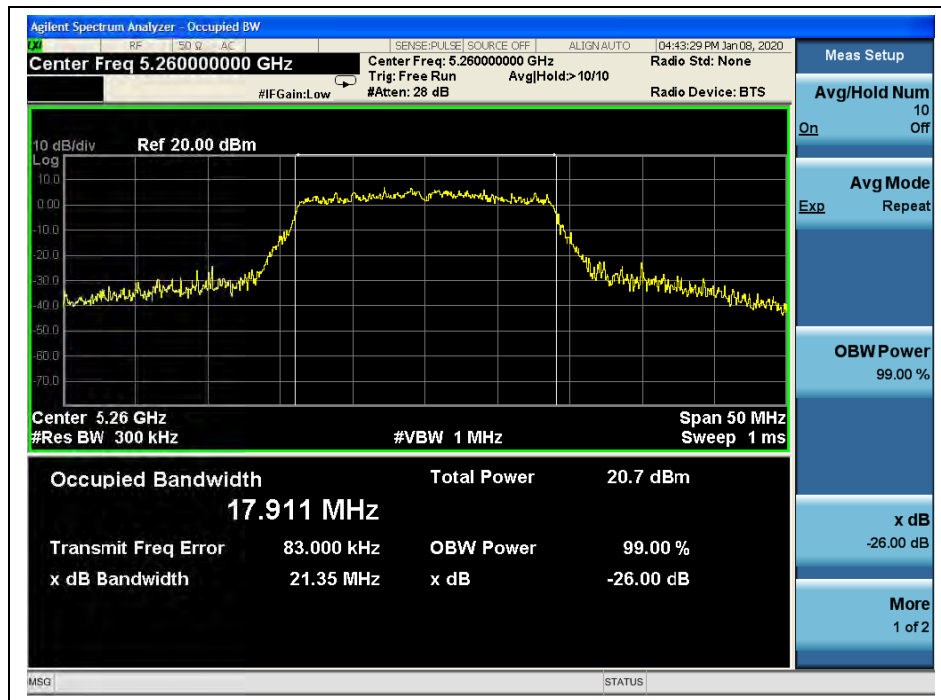
(Channel 36, 5180 MHz, 802.11ac (VHT20))



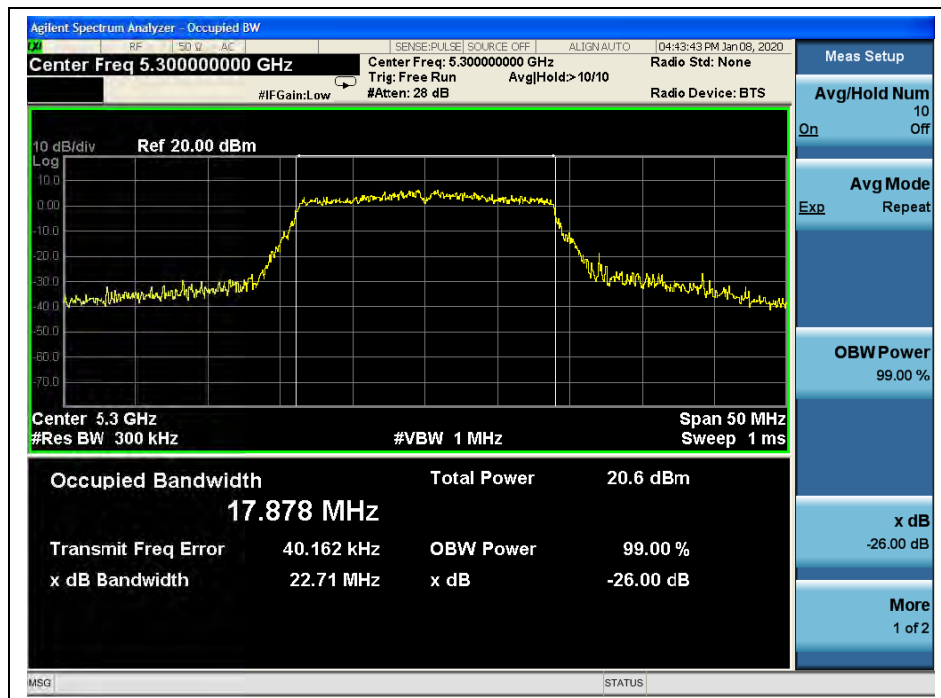
(Channel 44, 5220 MHz, 802.11ac (VHT20))



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



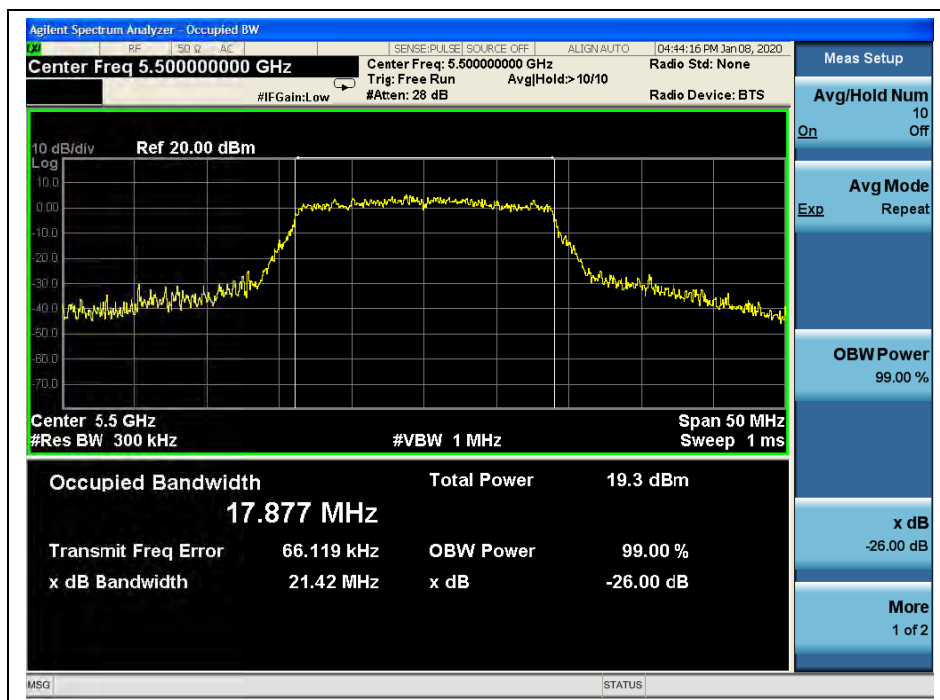
(Channel 52, 5260 MHz, 802.11ac (VHT20))



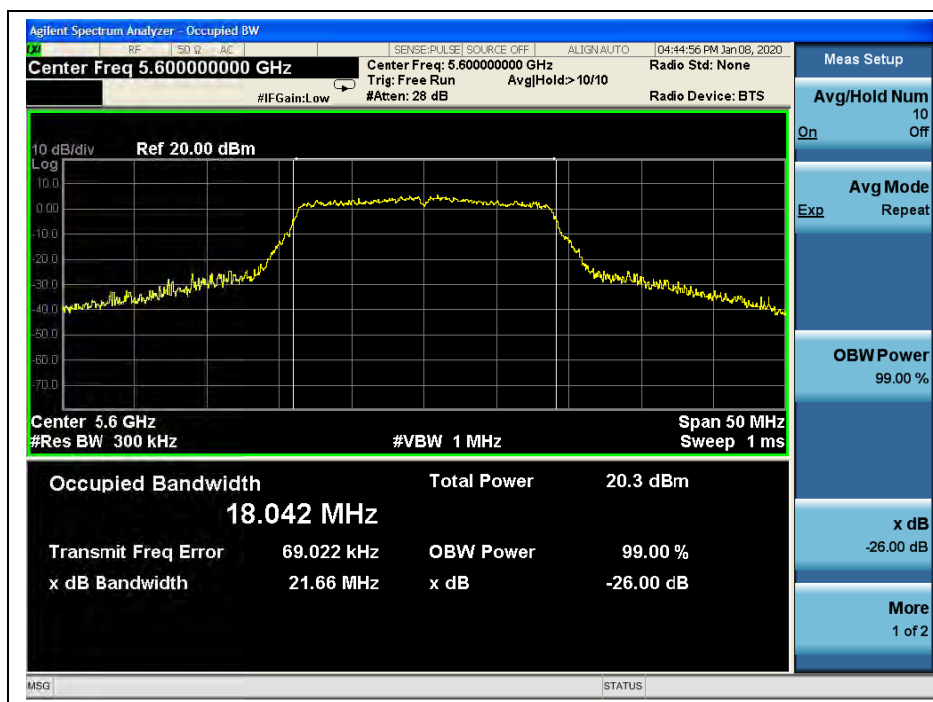
(Channel 60, 5300 MHz, 802.11ac (VHT20))



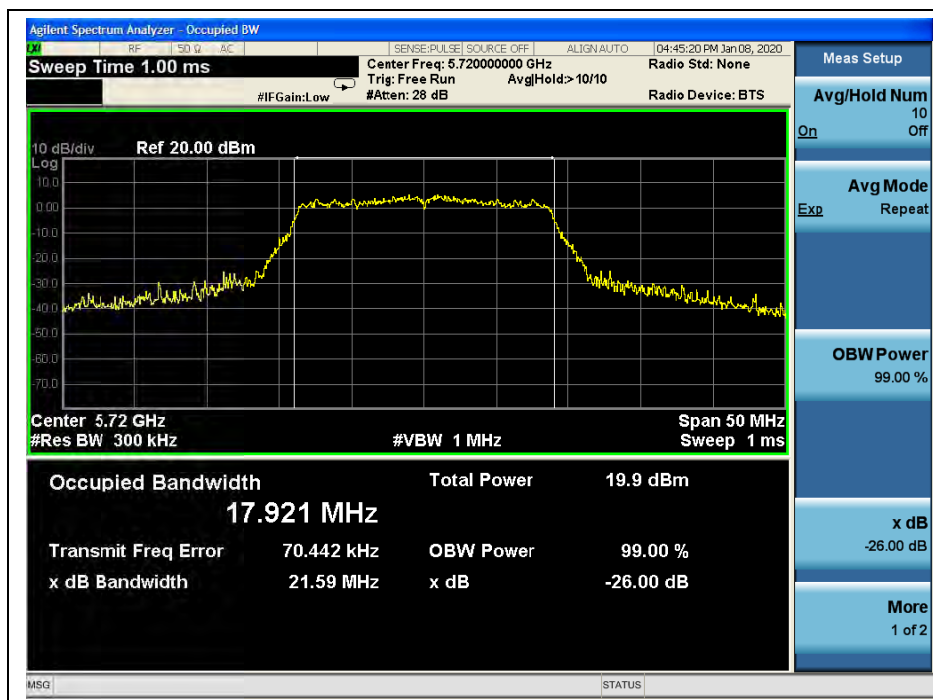
(Channel 64, 5320MHz, 802.11ac (VHT20))



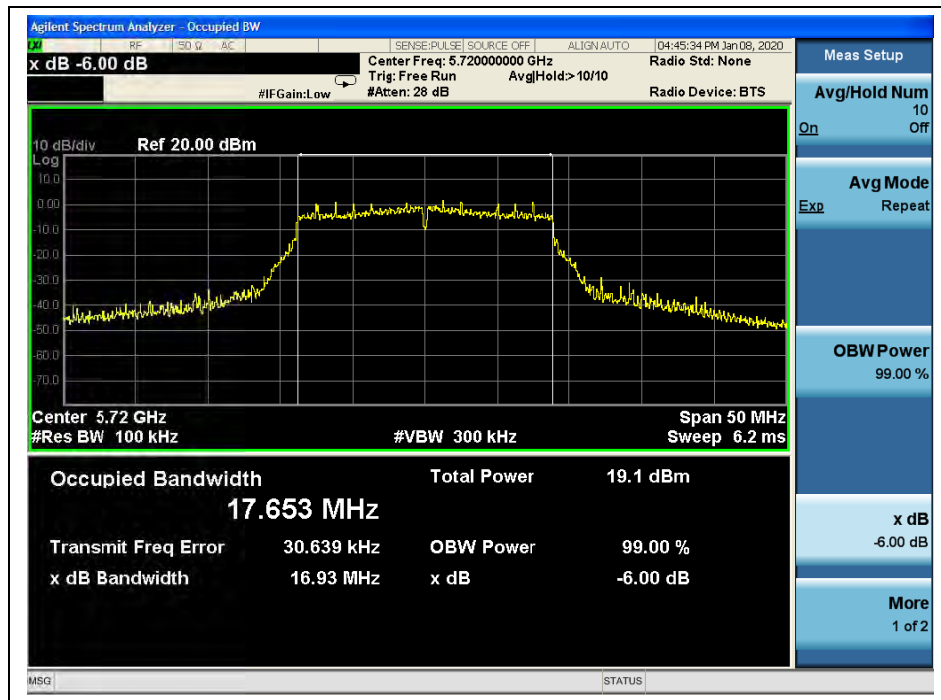
(Channel 100, 5500MHz, 802.11ac (VHT20))



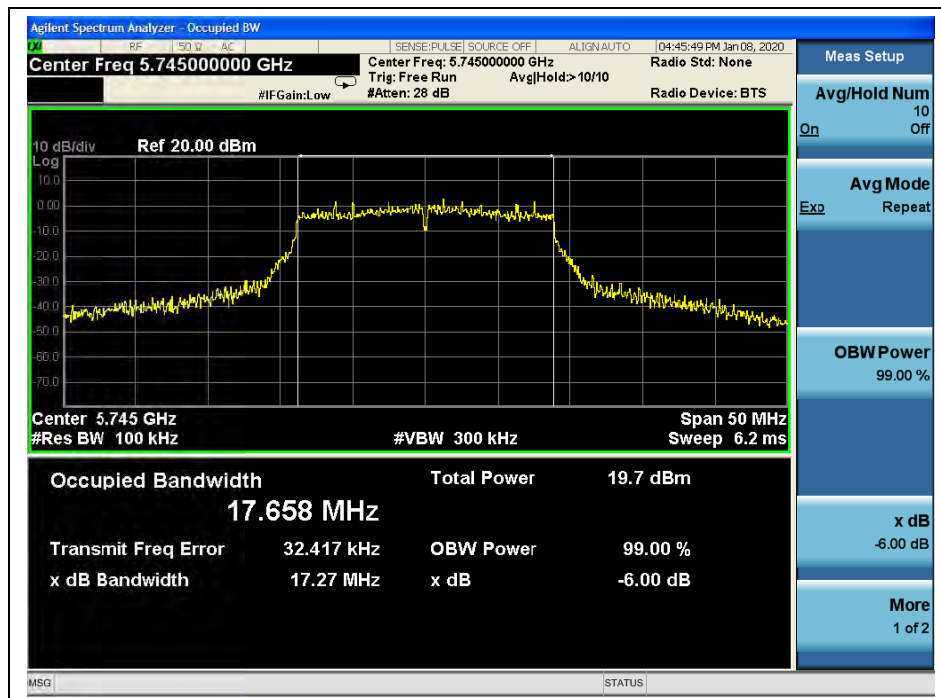
(Channel 120, 5600 MHz, 802.11ac (VHT20))



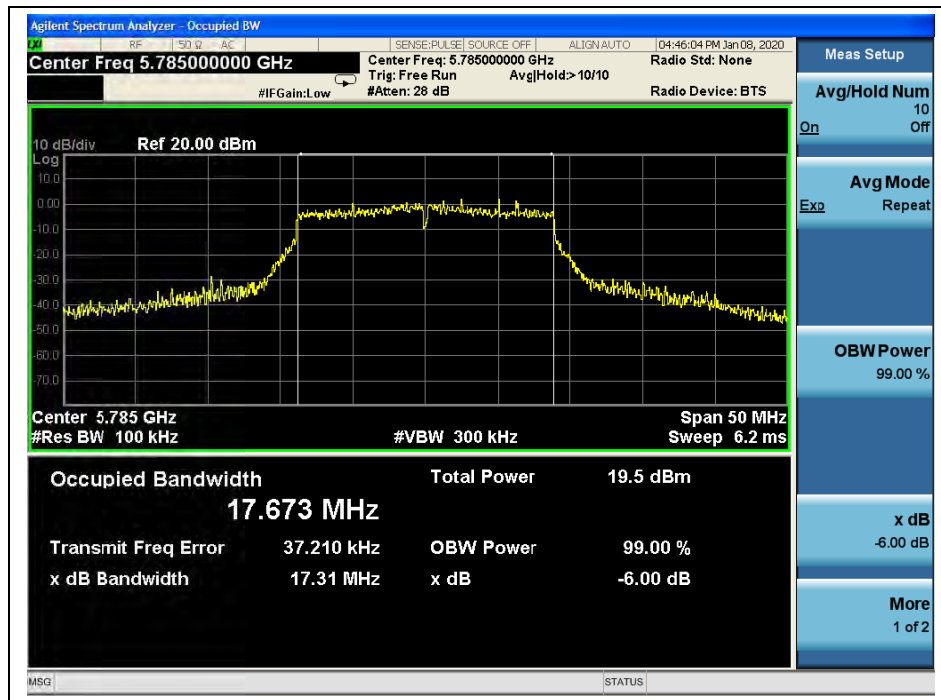
(Channel 144, 5720MHz, 802.11ac (VHT20))



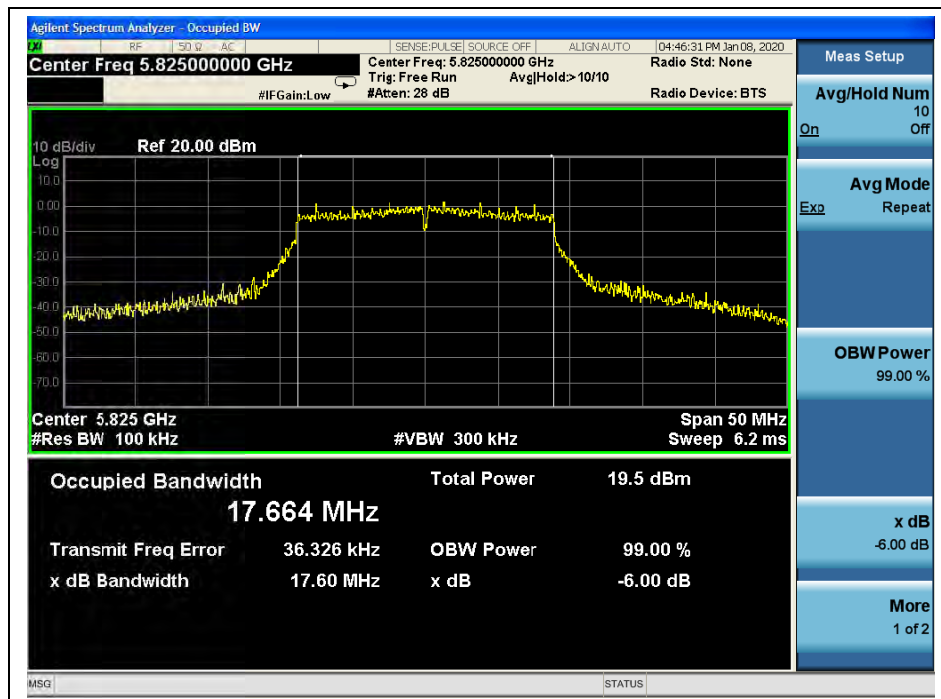
(Channel 144, 5720MHz, 802.11ac (VHT20))



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



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



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



802.11ac (VHT40) Test mode

A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
38	5190	39.69
46	5230	39.68
354	5270	39.95
62	5310	40.42
102	5510	42.31
126	5630	40.35
142	5710	39.55
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
142	5710	36.27
151	5755	36.34
159	5795	36.05

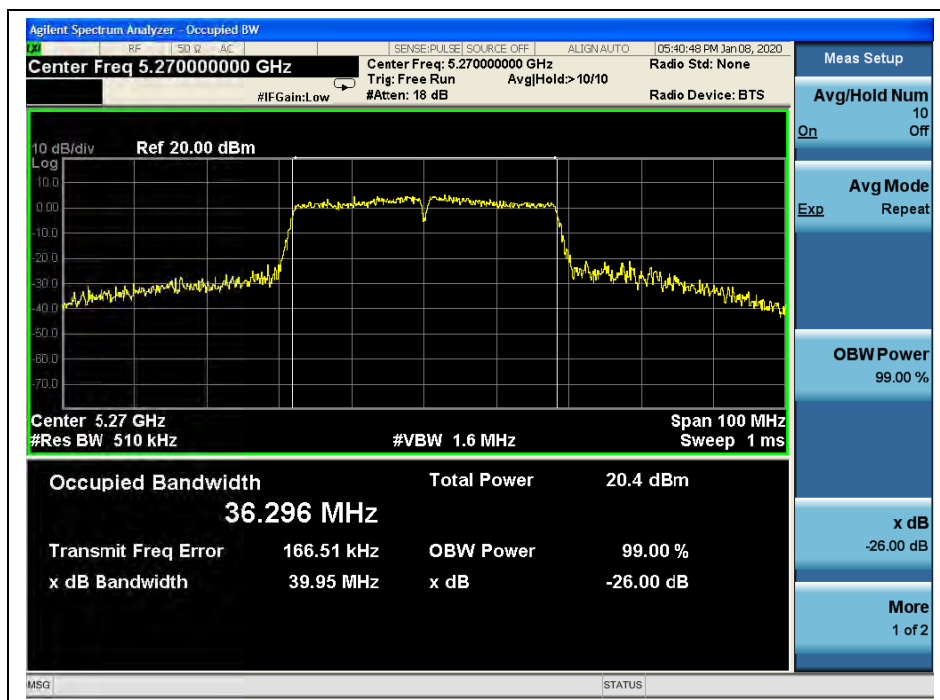
B. Test Plots



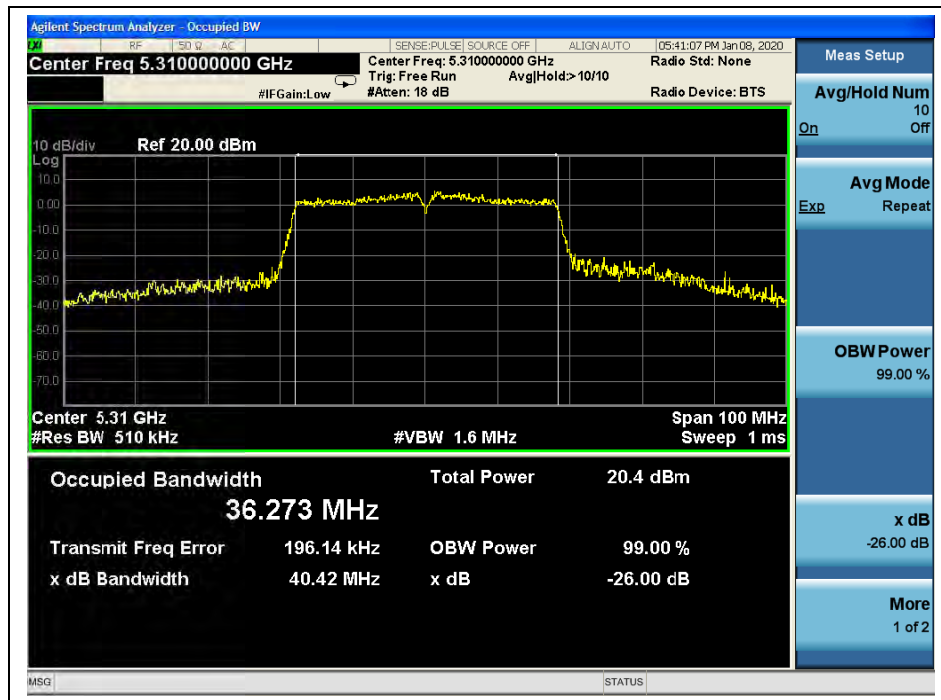
(Channel 38, 5190 MHz, 802.11ac (VHT40))



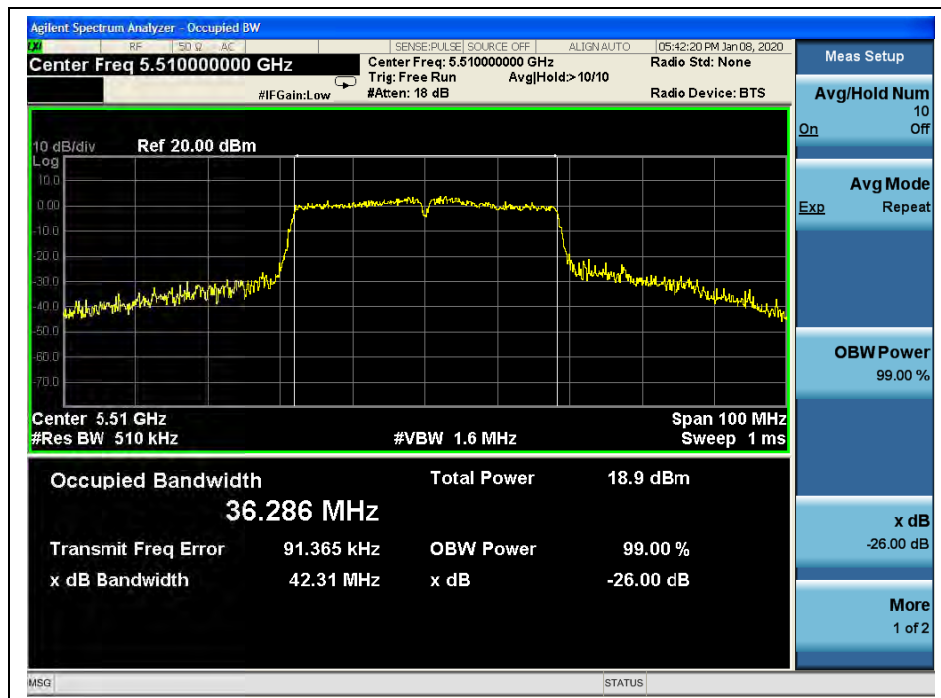
(Channel 46, 5230 MHz, 802.11ac(VHT40))



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



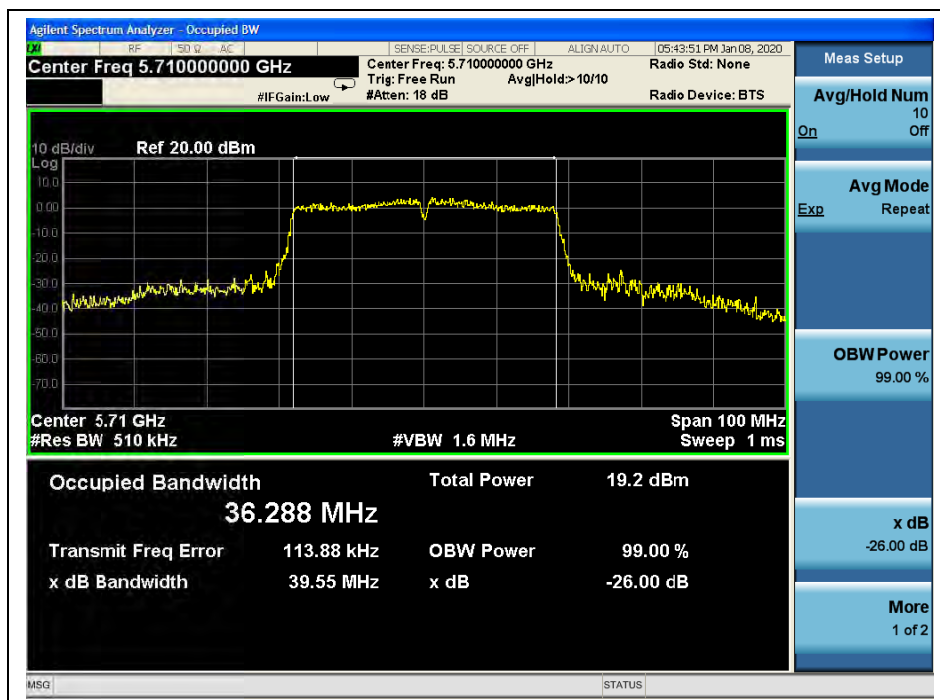
(Channel 62, 5310 MHz, 802.11ac(VHT40))



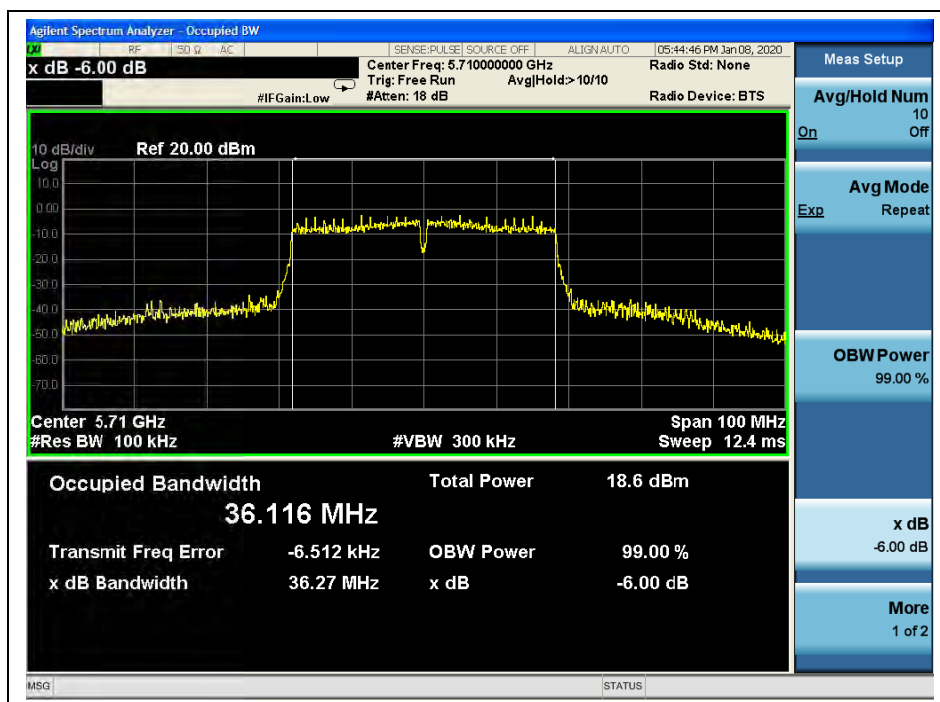
(Channel 102, 5510 MHz, 802.11ac(VHT40))



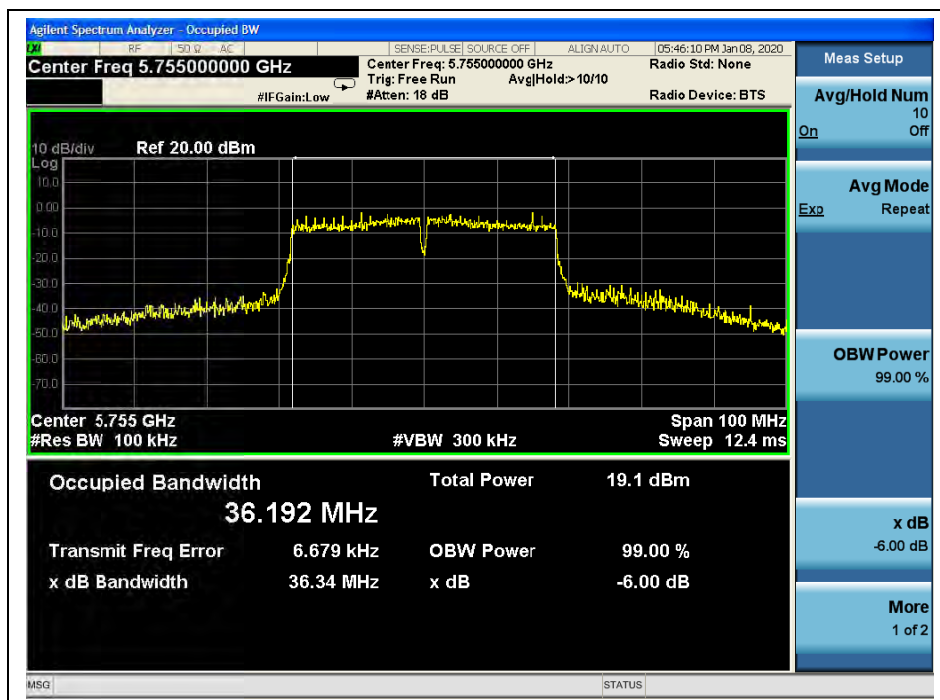
(Channel 126, 5630 MHz, 802.11ac(VHT40))



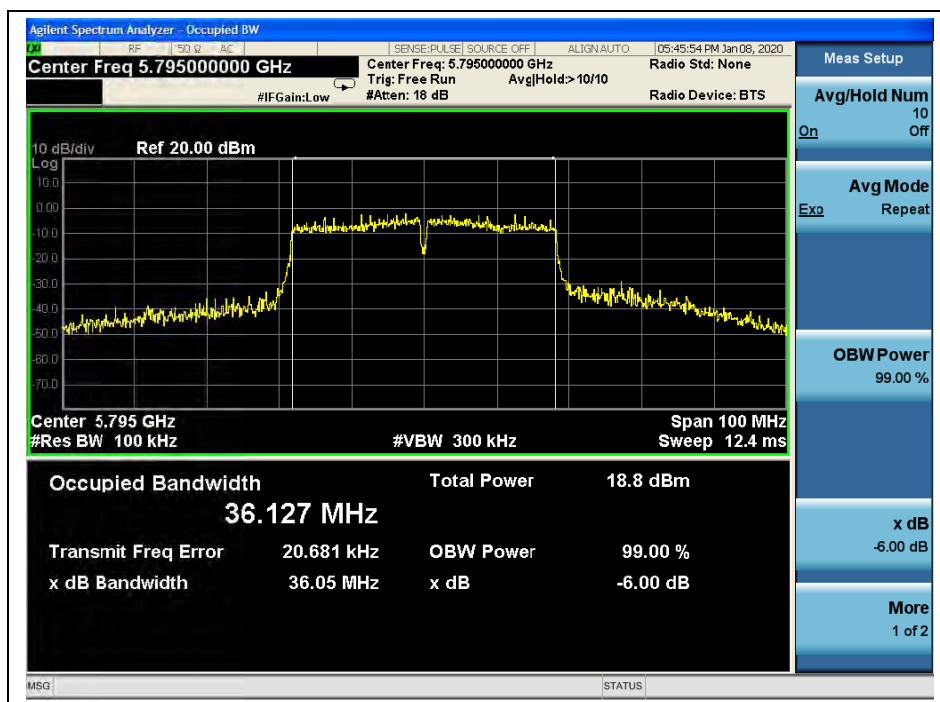
(Channel 142, 5710 MHz, 802.11ac(VHT40))



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



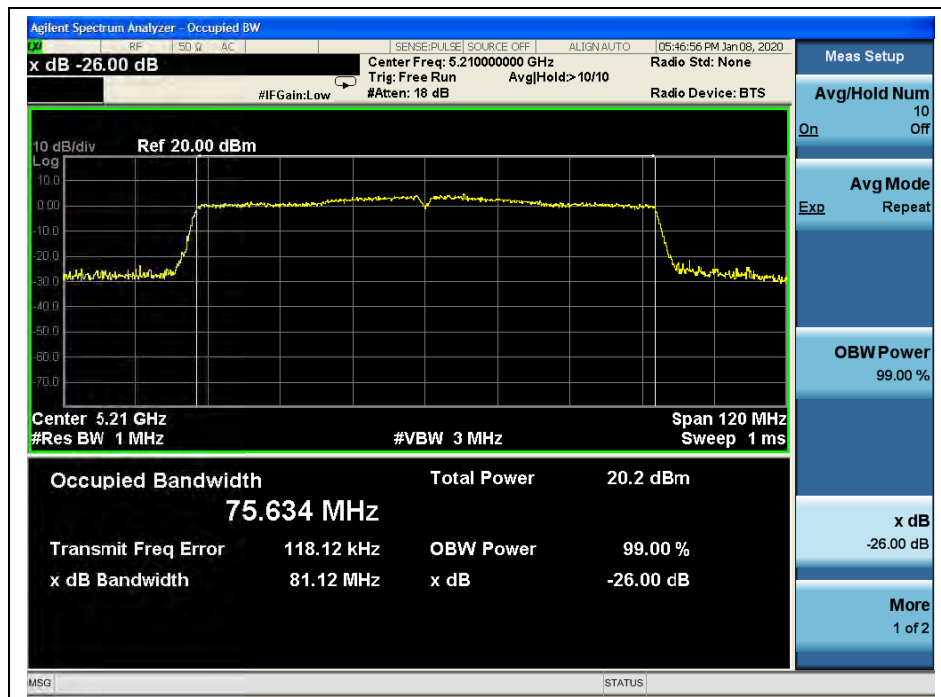
(Channel 151, 5755 MHz, 802.11ac(VHT40))



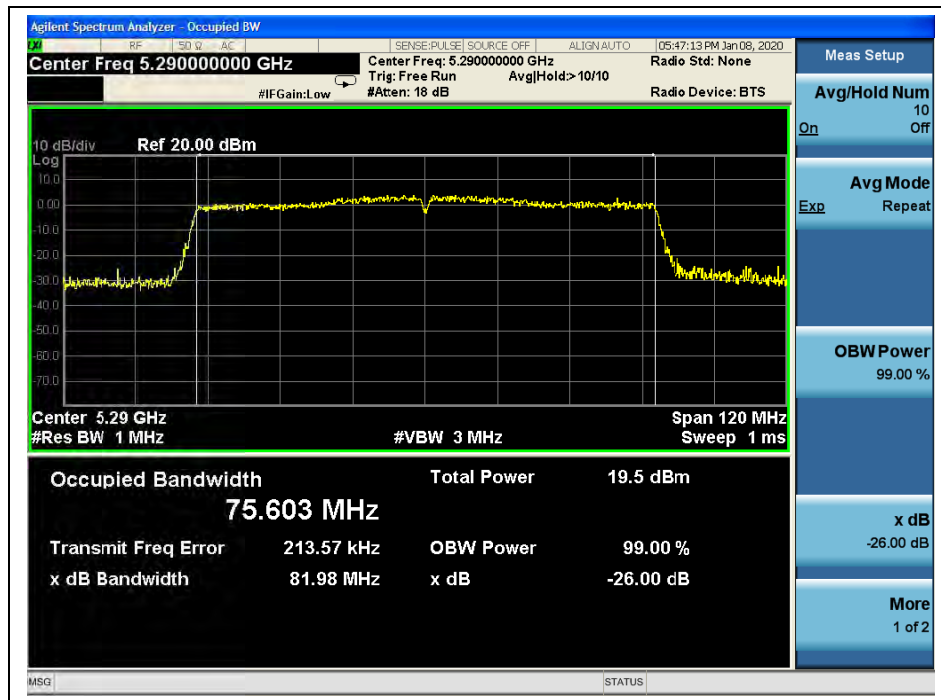
(Channel 159,5795MHz,802.11ac(VHT40))

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

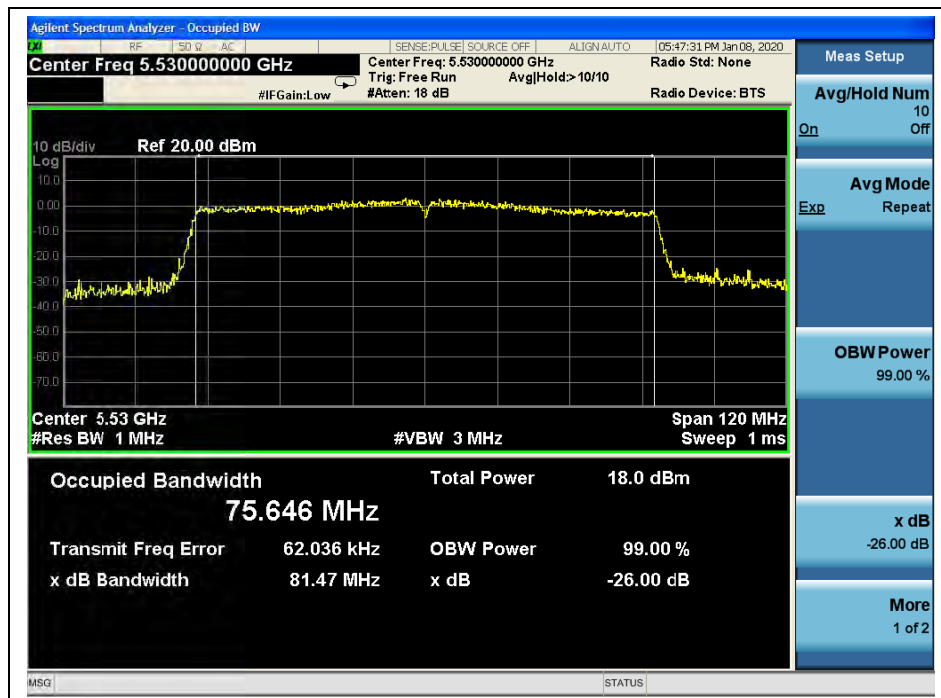
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
42	5210	81.12
58	5290	81.98
106	5530	81.47
122	5610	81.11
138	5690	81.37
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
138	5690	75.83
155	5775	75.43

B. Test Plots

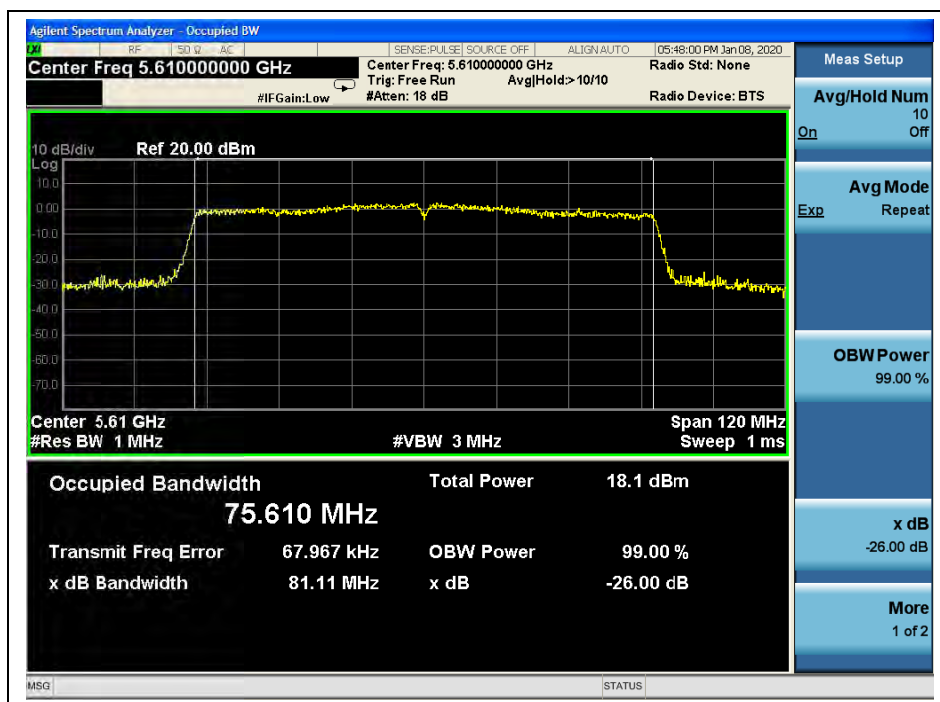
(Channel 42,5210MHz, 802.11ac(VHT80))



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



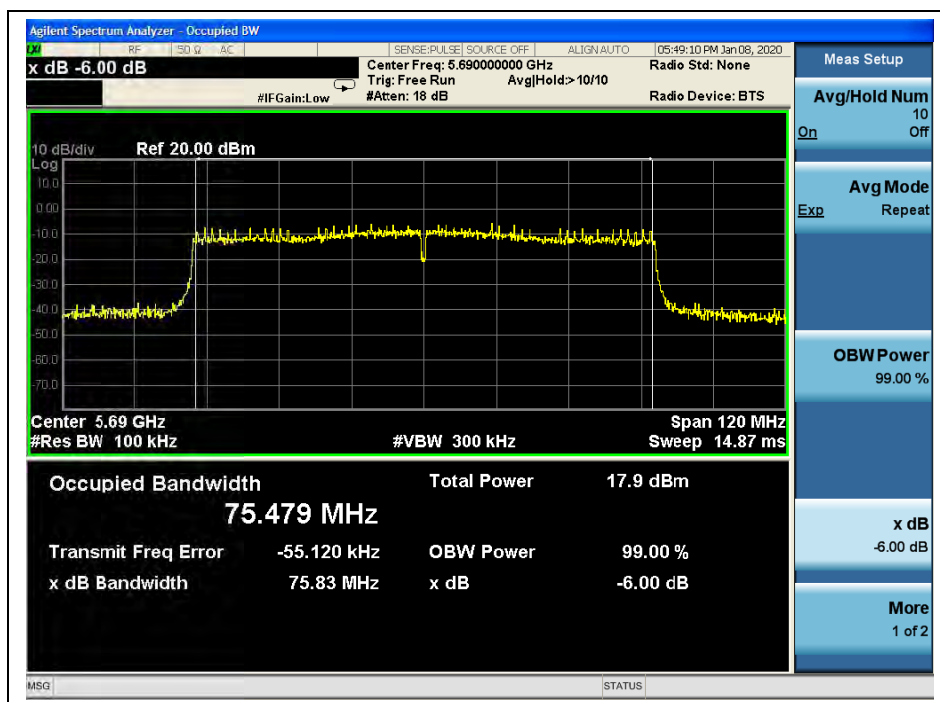
(Channel 106, 5530 MHz, 802.11ac(VHT80))



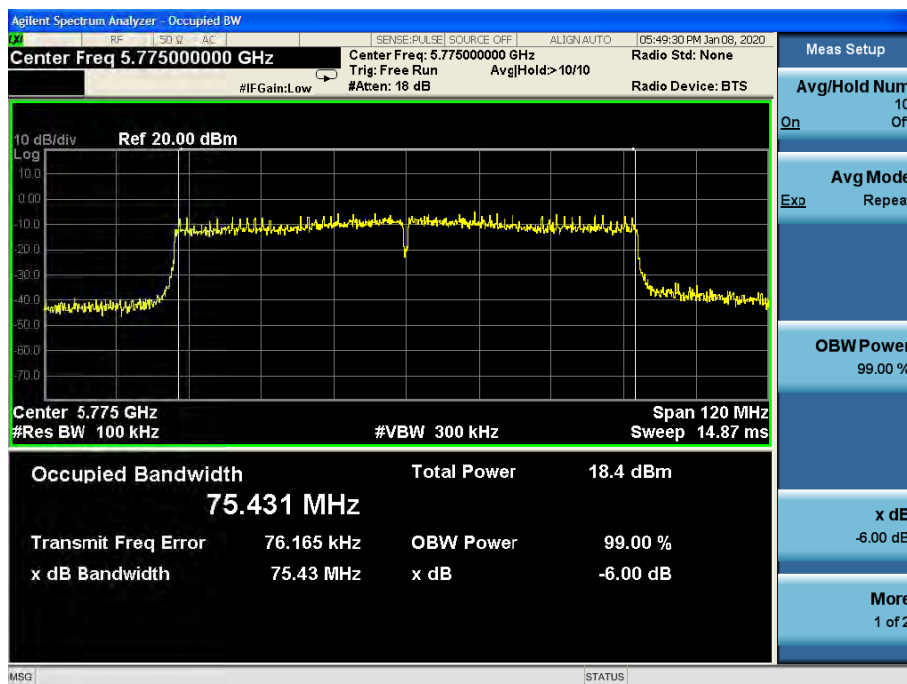
(Channel 122, 5610 MHz, 802.11ac(VHT80))



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



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



2.5. Peak Power Spectral Density

2.5.1. Requirement

(1) For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

(3) For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500KHz band.

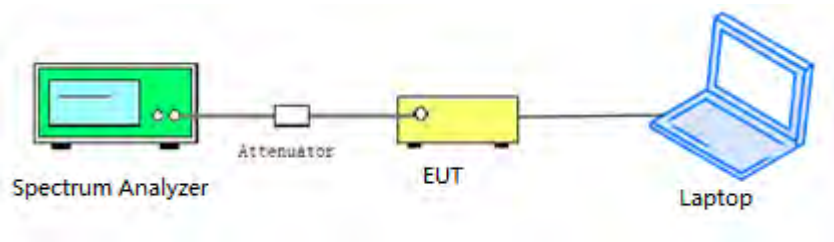
If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(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 = $G_{ANT} + 10\log(N_{ANT})$ dBi, where G_{ANT} is the antenna gain in dBi, N_{ANT} is the number of outputs.

2.5.2. 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.

2.5.3. Test Procedure

KDB 789033 Section F) Maximum Power Spectral Density (PSD) Method SA-1 was used in order to prove compliance

- 1) Set span to encompass the entire 26-dB emission bandwidth
- 2) Set RBW = 1 MHz. Set VBW $\geq$ 3 MHz



- 3) Number of points in sweep ≥ 2 Span / RBW. Sweep time = auto
- 4) Detector = Peak
- 5) Trace mode=Max hold
- 6) Record the max value

2.5.4. Test Result

802.11a Test mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Duty Factor	Corrected PPSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	5.64	0.29	5.93	11	PASS
44	5220	5.87		6.16		
48	5240	6.00		6.29		
52	5260	5.99		6.28		
60	5300	5.93		6.22		
64	5320	5.72		6.01		
100	5500	4.31		4.60		
120	5600	4.19		4.48		
144	5720	4.39		4.68		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Duty Factor	Total PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
144	5720	1.75	0.29	2.04	30	PASS
149	5745	2.95		3.24		
157	5785	2.56		2.85		
165	5825	2.08		2.37		



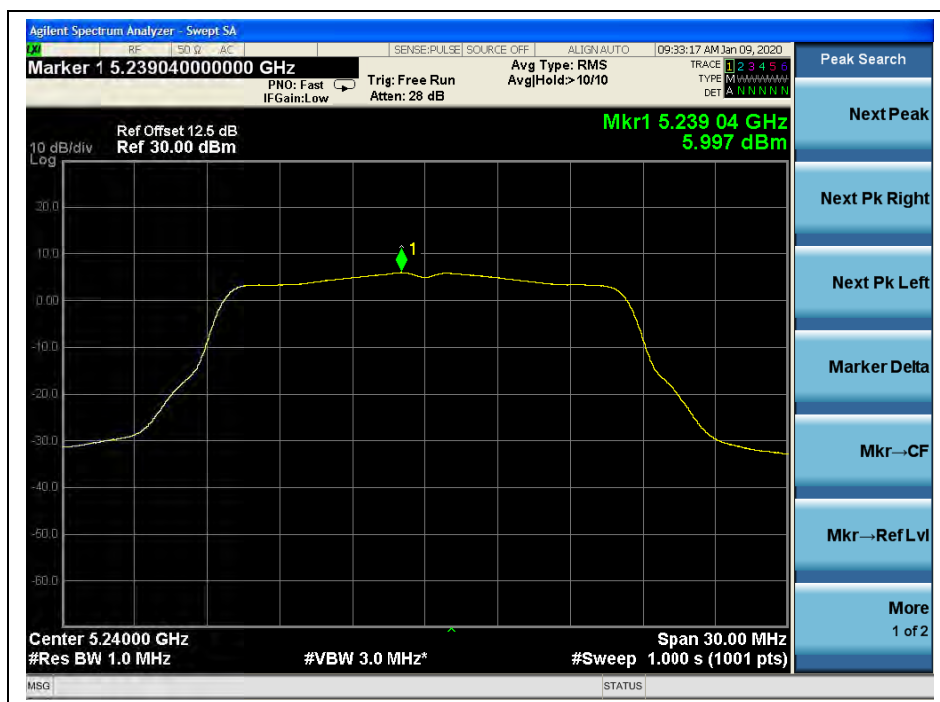
B. Test Plots



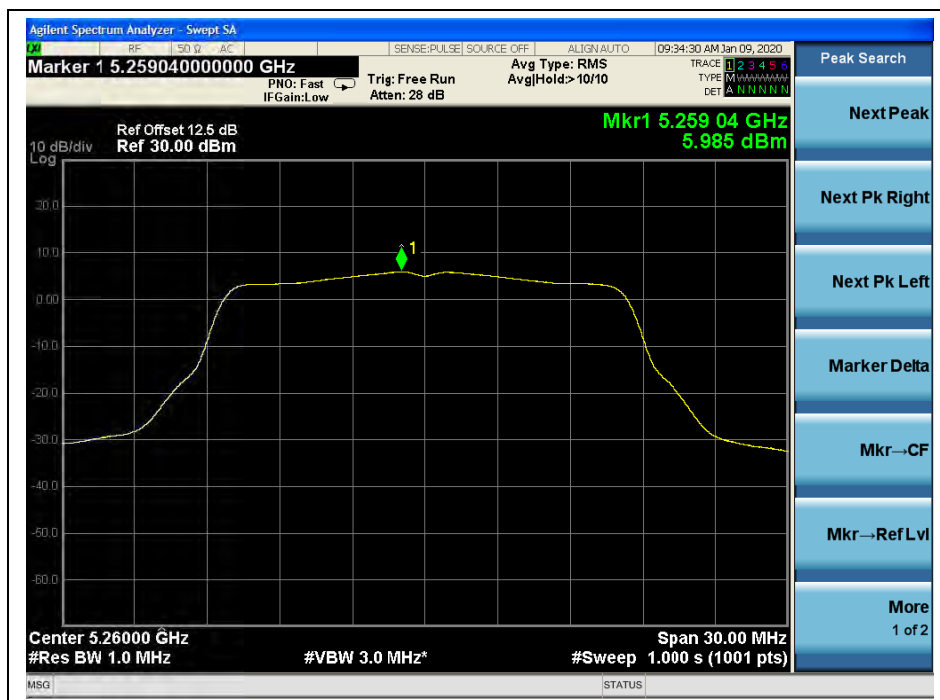
(Channel 36, 5180 MHz, 802.11a)



(Channel 44, 5220 MHz, 802.11a)



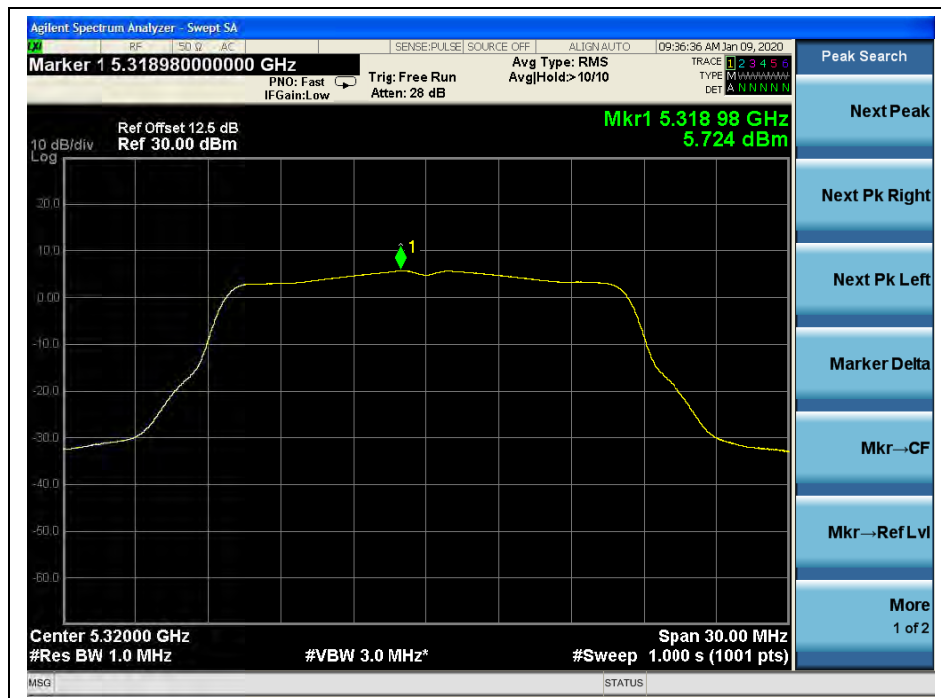
(Channel 48, 5240MHz, 802.11a)



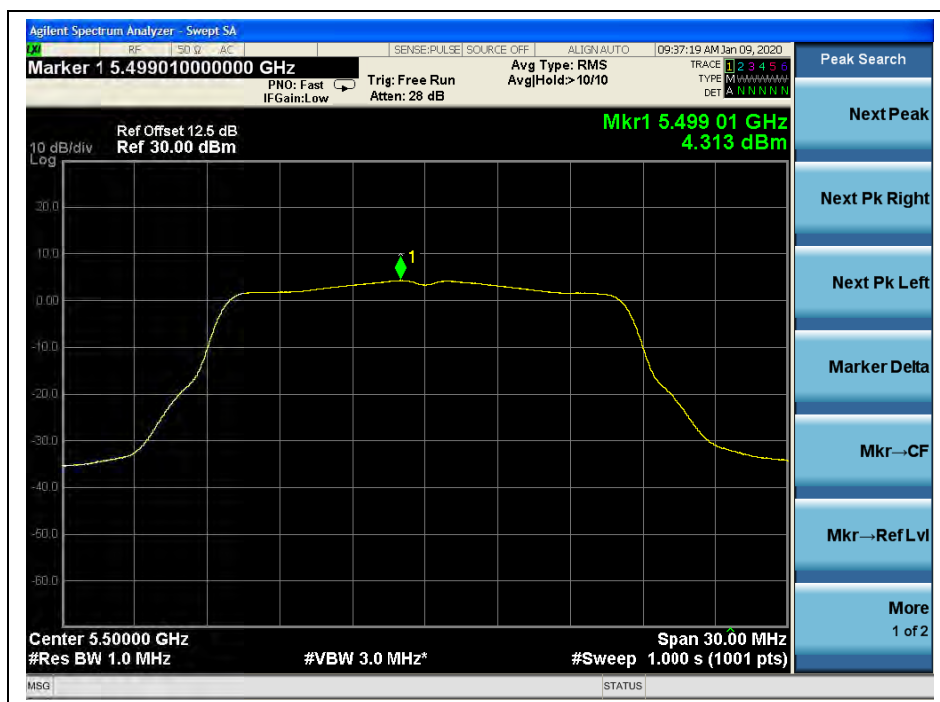
(Channel 52, 5260MHz, 802.11a)



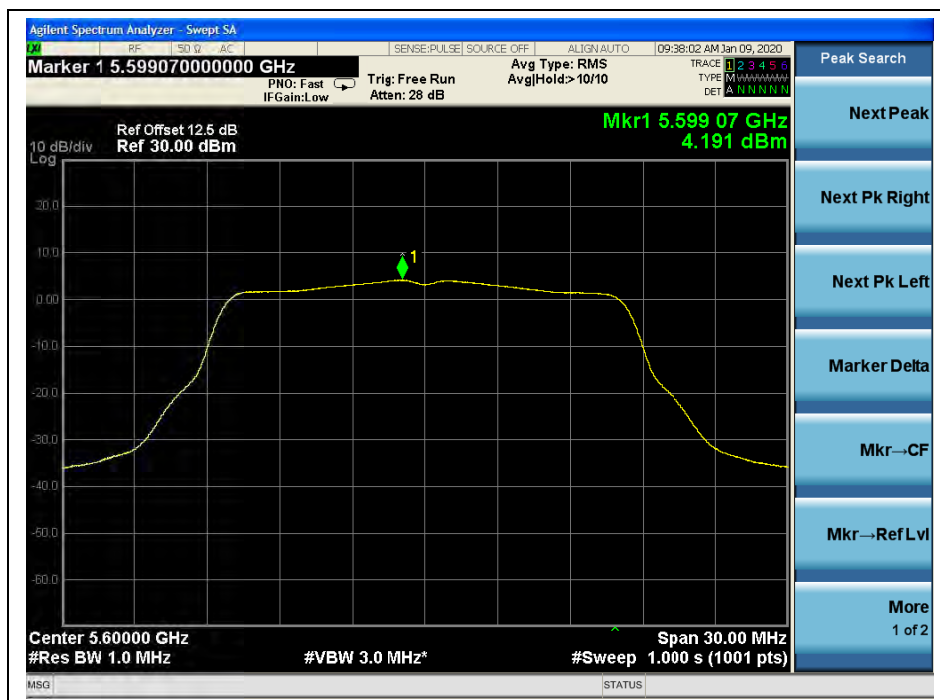
(Channel 60, 5300 MHz, 802.11a)



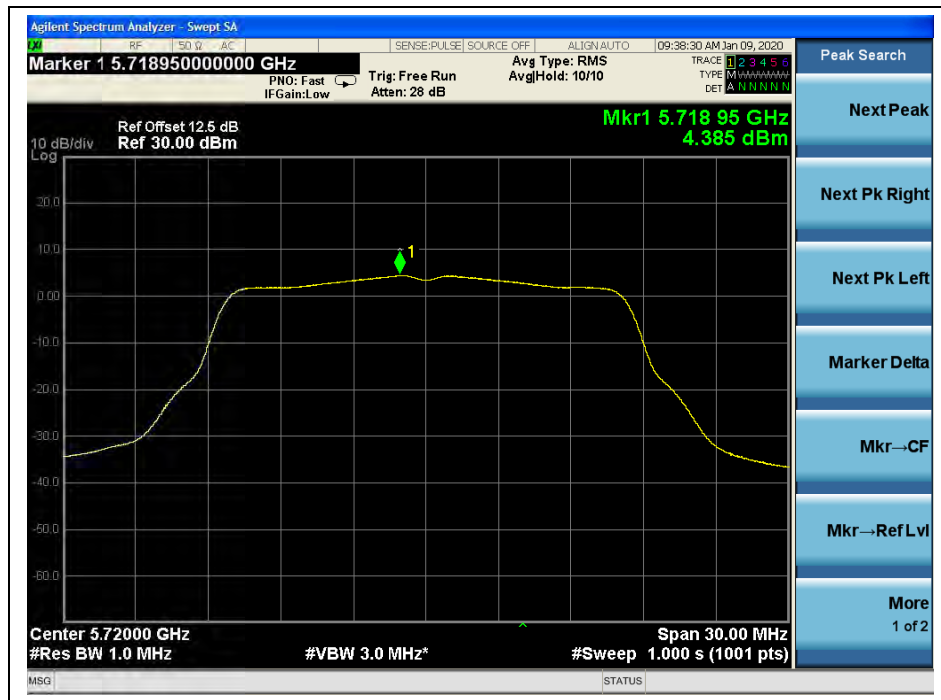
(Channel 64, 5320MHz, 802.11a)



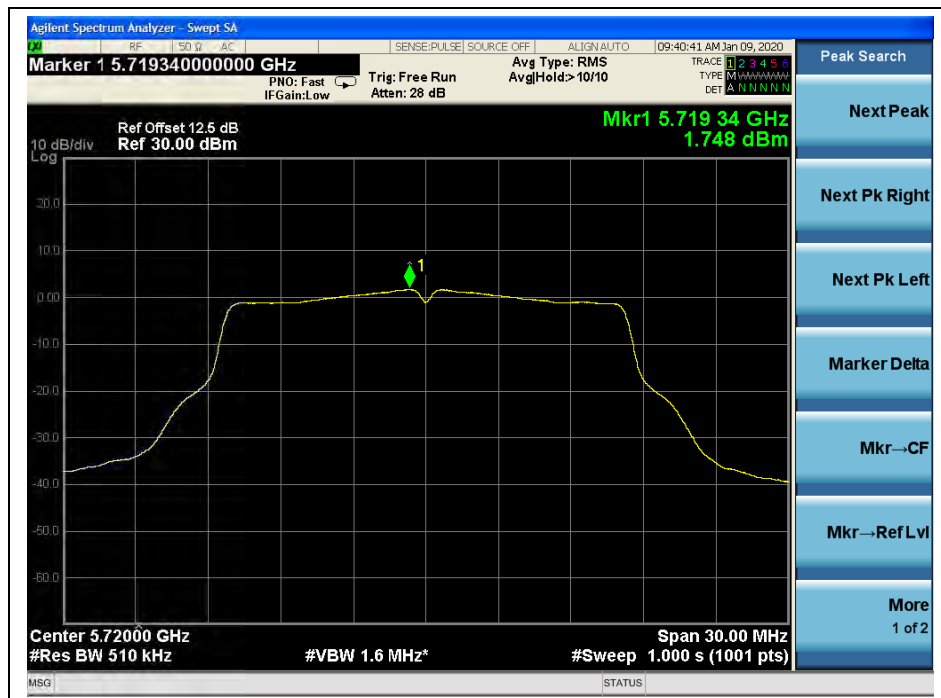
(Channel 100,5500MHz, 802.11a)



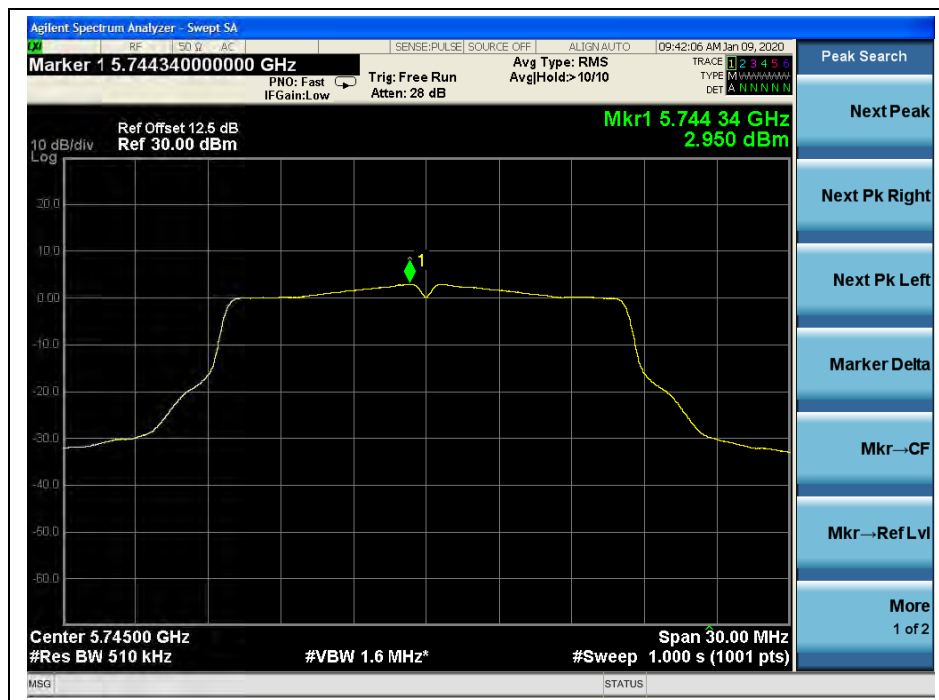
(Channel 120, 5600 MHz, 802.11a)



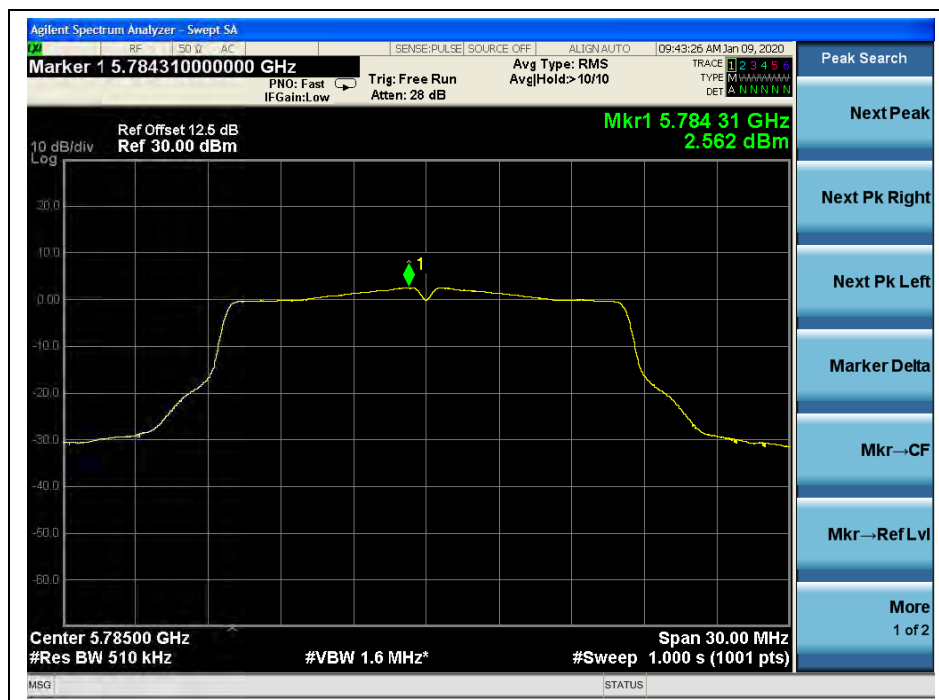
(Channel 144, 5720MHz, 802.11a)



(Channel 144, 5720MHz, 802.11a)



(Channel 149,5745MHz, 802.11a)



(Channel 157,5785MHz, 802.11a)



(Channel 165,5825MHz, 802.11a)

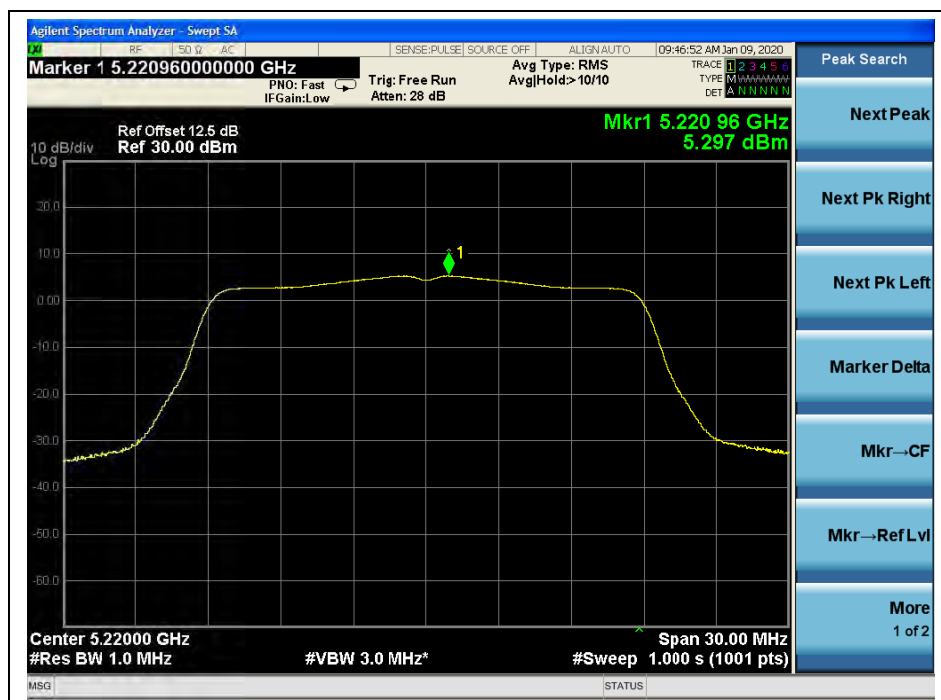
**802.11n (HT20) Test mode****A. Test Verdict:**

Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Duty Factor	Corrected PPSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	5.02	0.33	5.35	11	PASS
44	5220	5.30		5.63		
48	5240	5.34		5.67		
52	5260	5.28		5.61		
60	5300	5.42		5.75		
64	5320	5.41		5.74		
100	5500	3.86		4.19		
120	5600	3.56		3.89		
144	5720	3.90		4.23		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Duty Factor	Total PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
144	5720	1.34	0.33	1.67	30	PASS
149	5745	2.32		2.65		
157	5785	2.04		2.37		
165	5825	1.60		1.93		

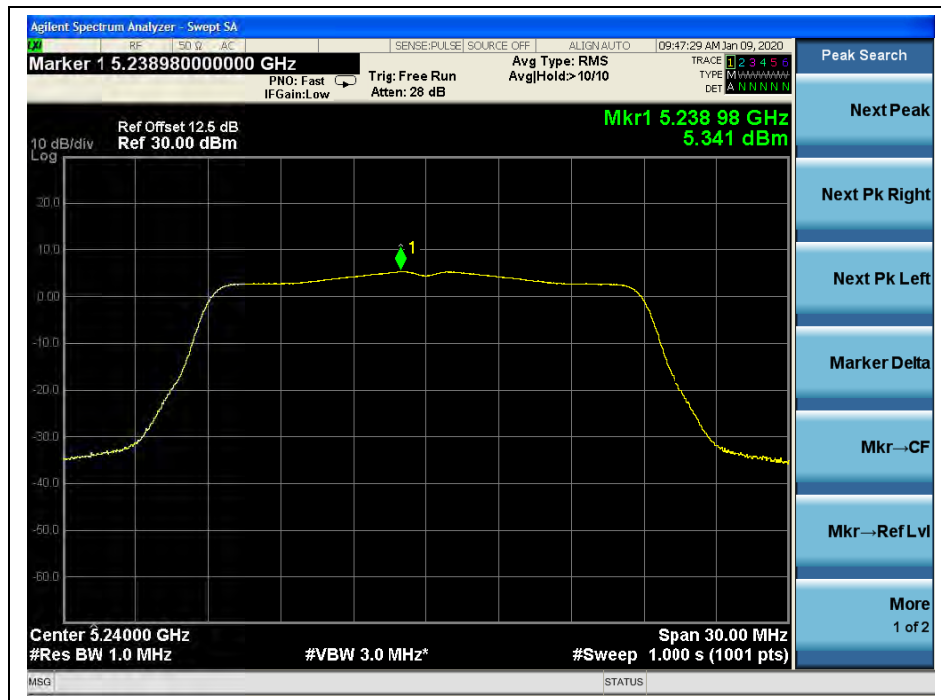
B. Test Plots



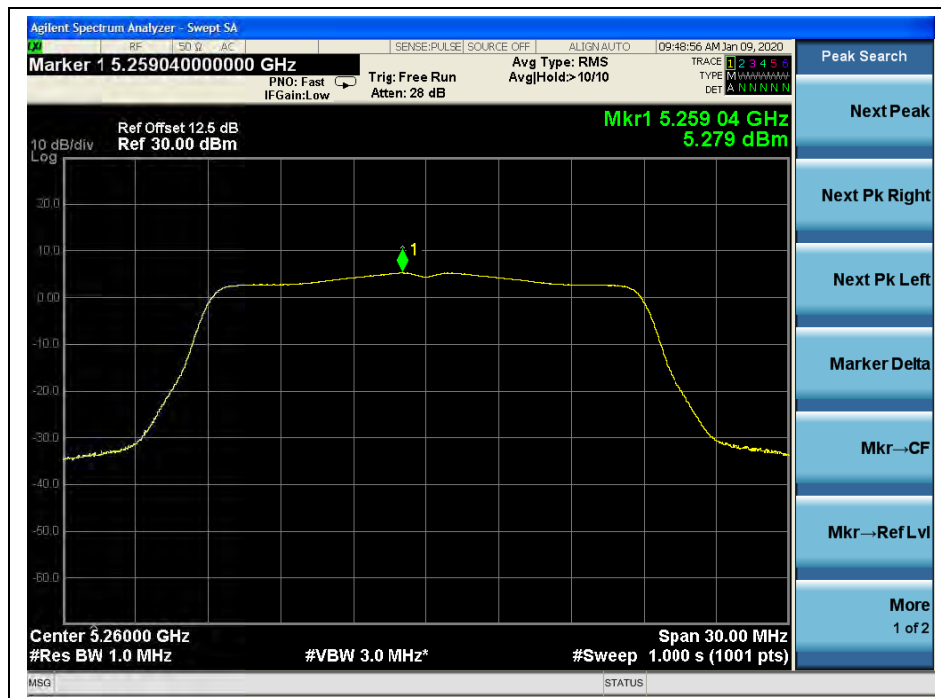
(Channel 36,5180MHz, 802.11n (HT20))



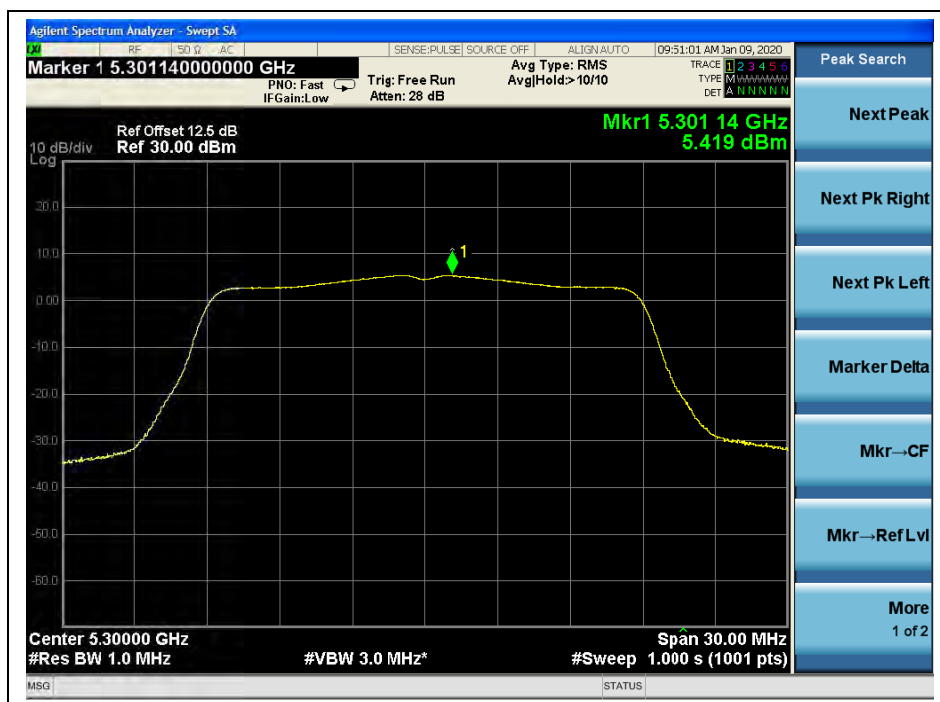
(Channel 44, 5220 MHz, 802.11n (HT20))



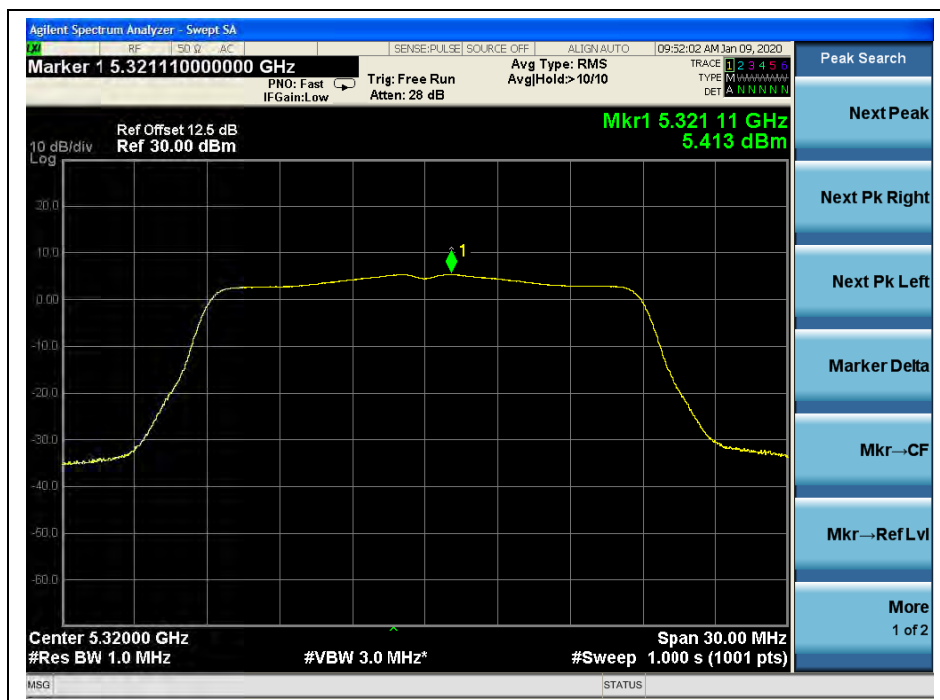
(Channel 48, 5240MHz, 802.11n (HT20))



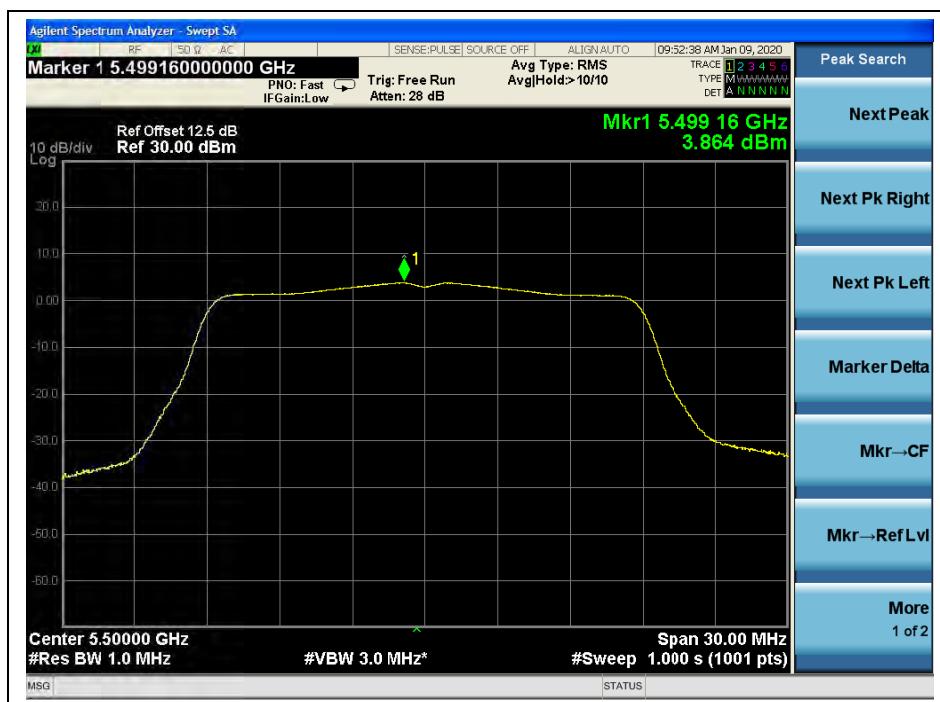
(Channel 52, 5260MHz, 802.11n (HT20))



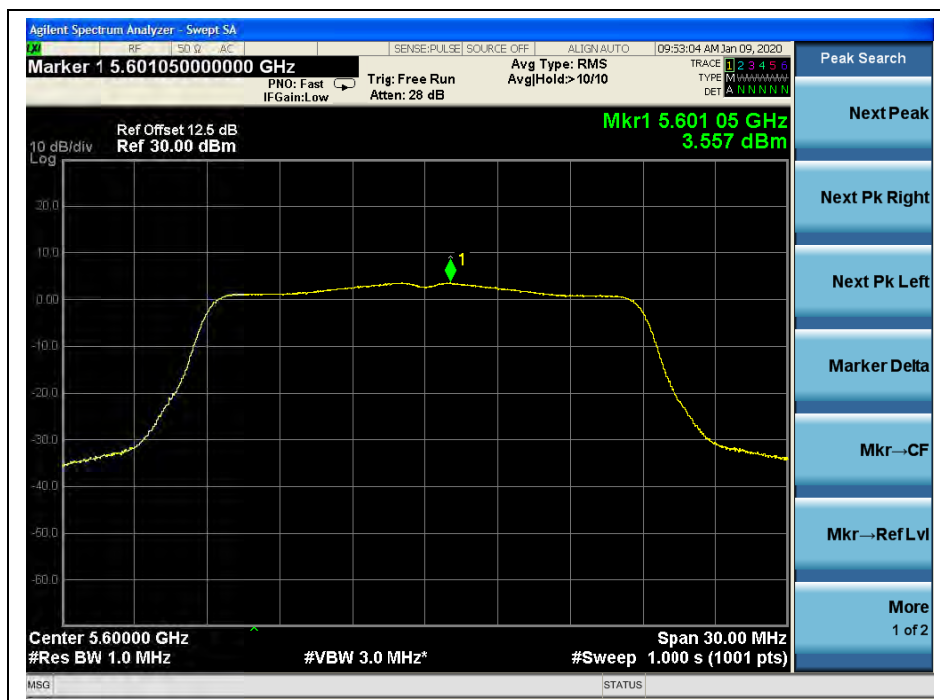
(Channel 60, 5300 MHz, 802.11n (HT20))



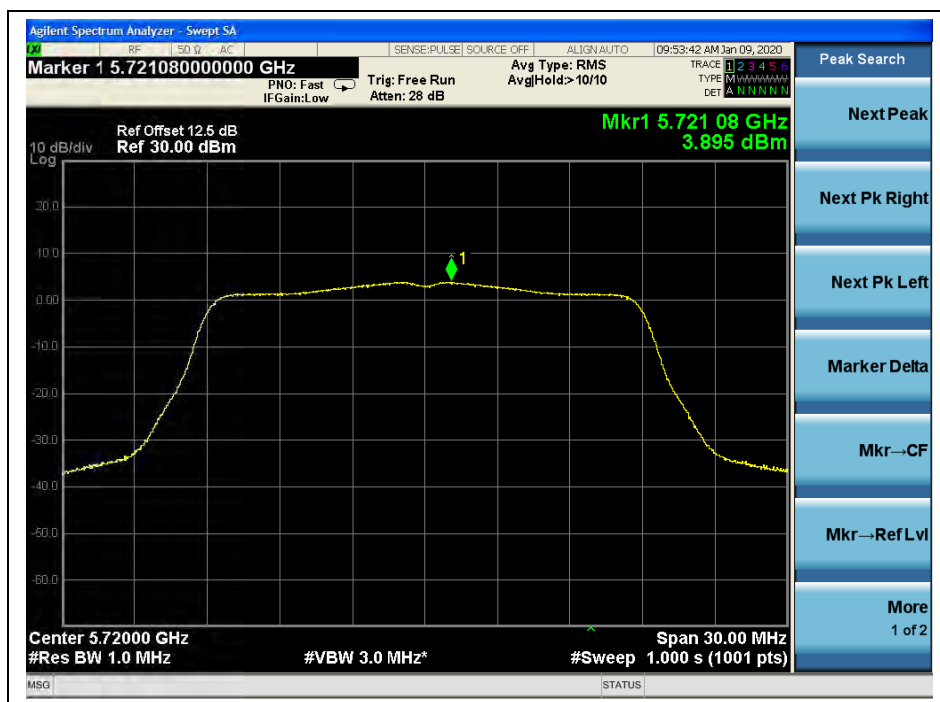
(Channel 64, 5320MHz, 802.11n (HT20))



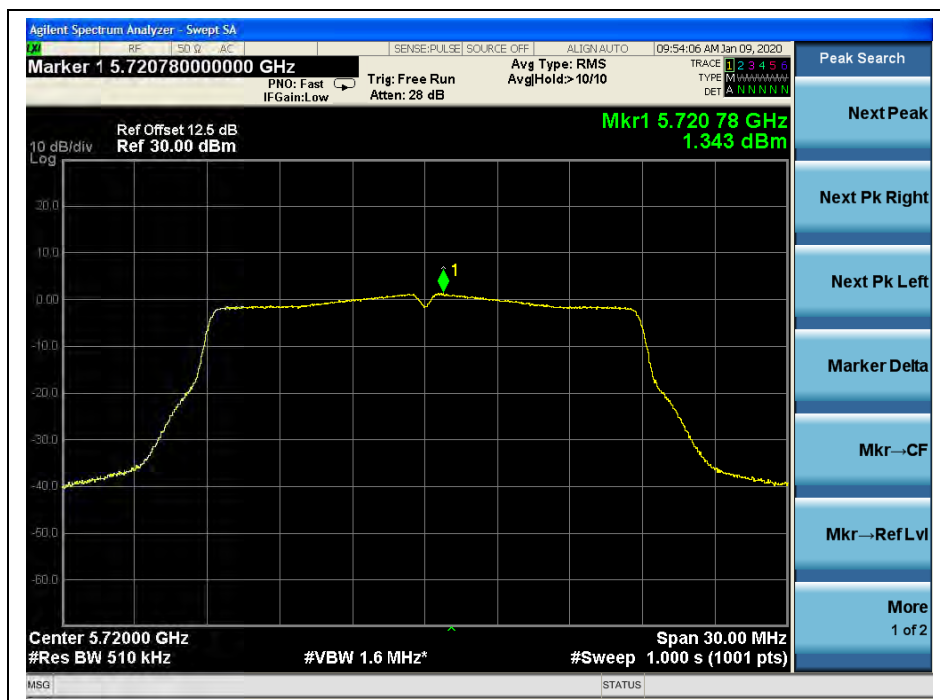
(Channel 100, 5500MHz, 802.11n (HT20))



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



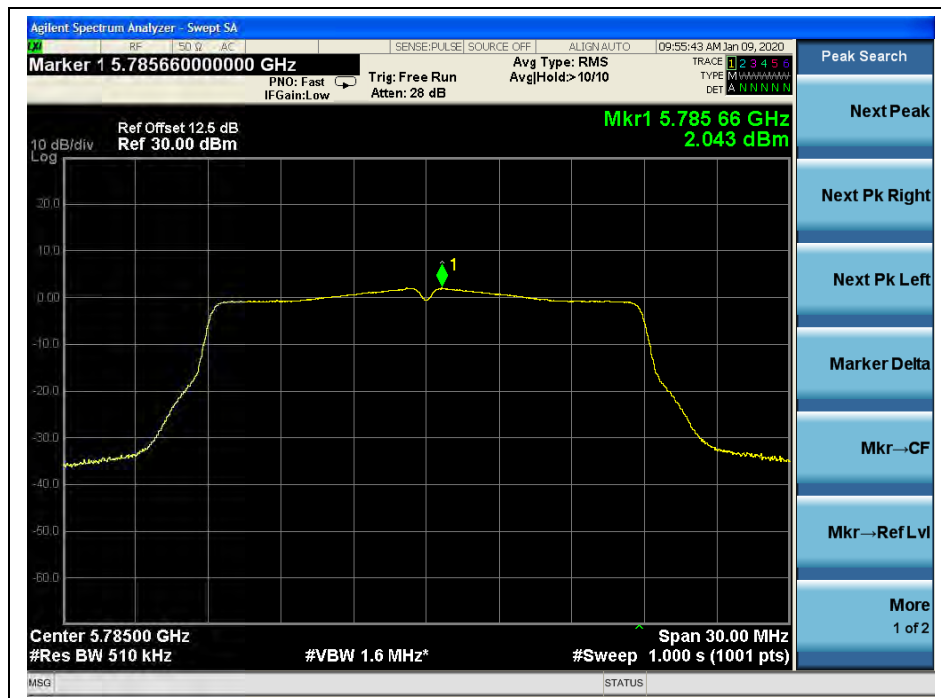
(Channel 144, 5720MHz, 802.11n (HT20))



(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))

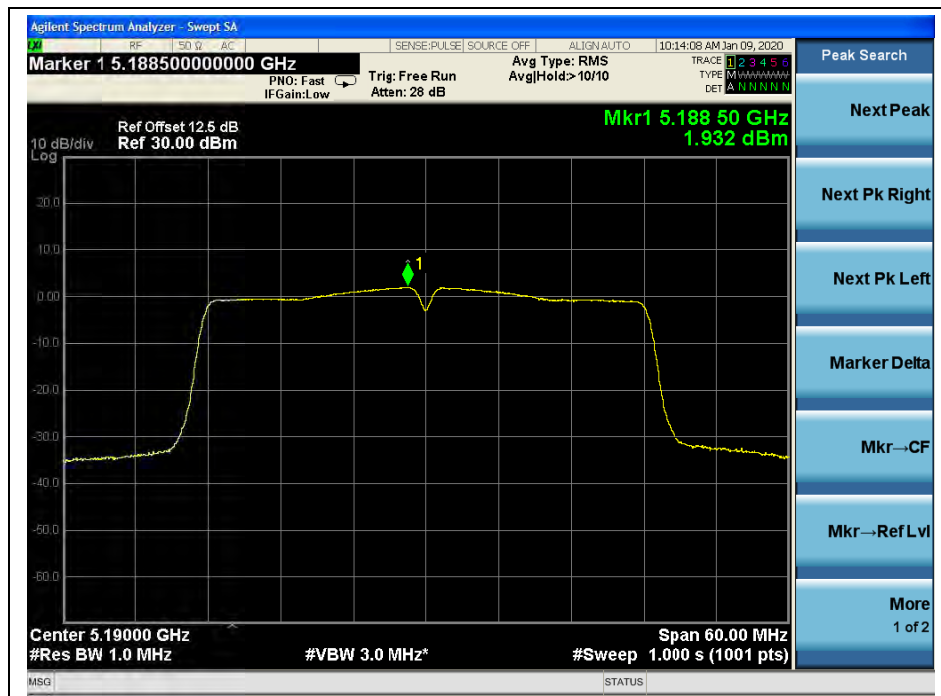


802.11n (HT40) Test mode

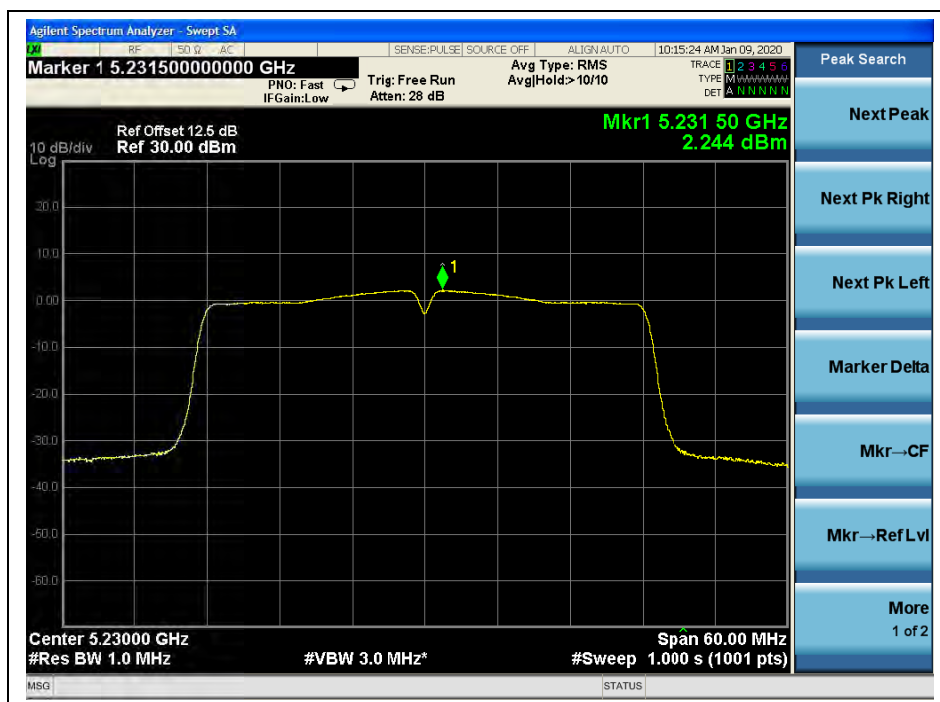
A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSP (dBm/MHz)	Duty Factor	Corrected PPSP (dBm/MHz)	Limit (dBm/MHz)	Verdict
38	5190	1.93	0.66	2.59	11	PASS
46	5230	2.24		2.90		
54	5270	2.18		2.84		
62	5310	2.09		2.75		
102	5510	0.76		1.42		
126	5630	0.79		1.45		
142	5710	0.91		1.57		
Channel	Frequency (MHz)	Measured PPSP (dBm/500KHz)	Duty Factor	Total PPSP (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
142	5710	-1.90	0.66	-1.24	30	PASS
151	5755	-1.06		-0.40		
159	5795	-1.45		-0.79		

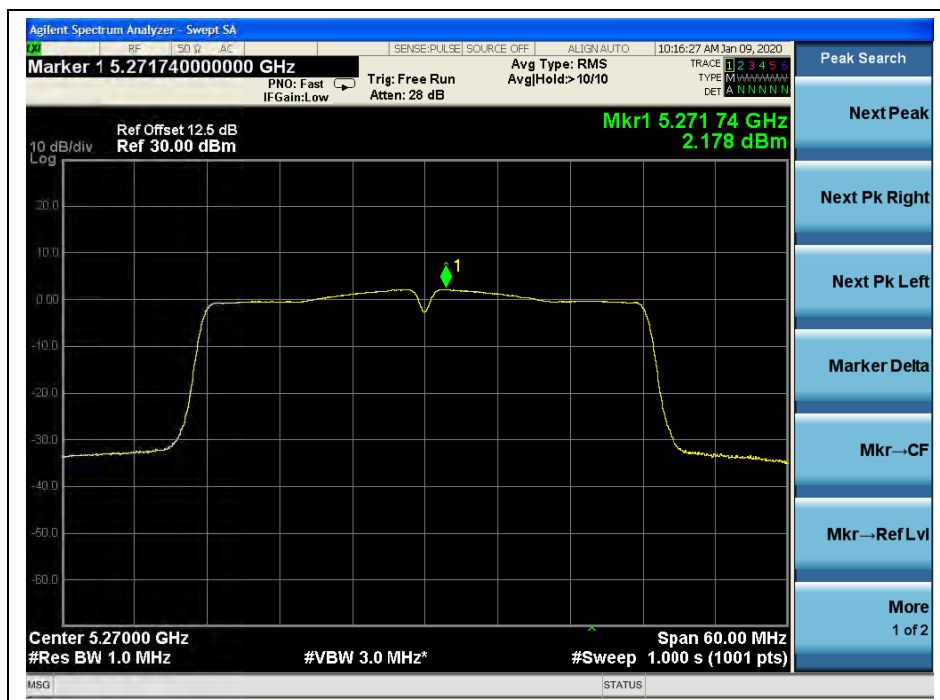
B. Test Plots



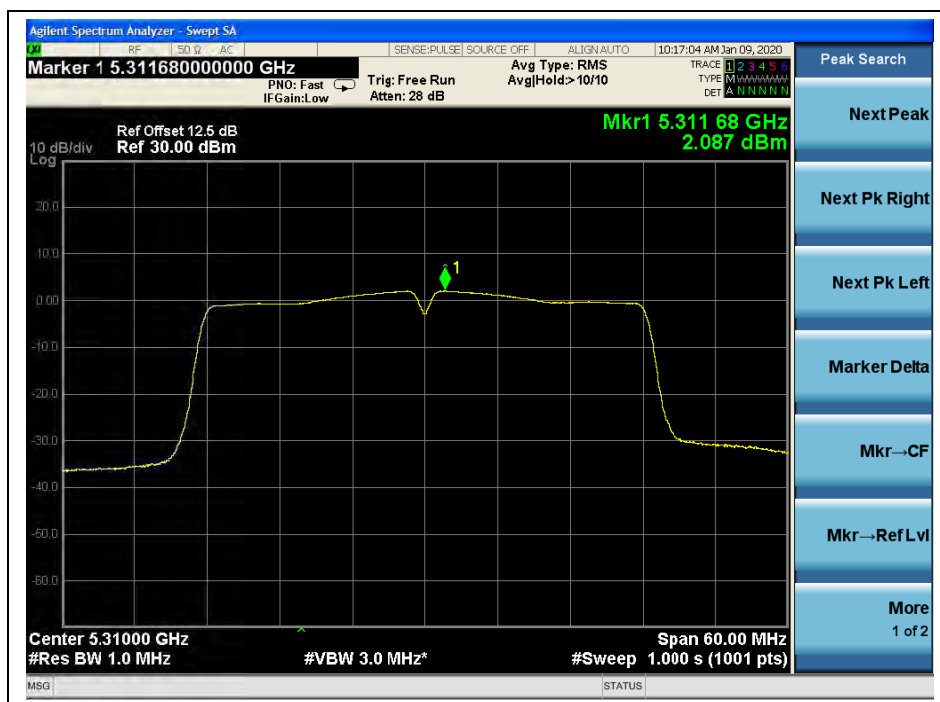
(Channel 38,5190MHz, 802.11n(HT40))



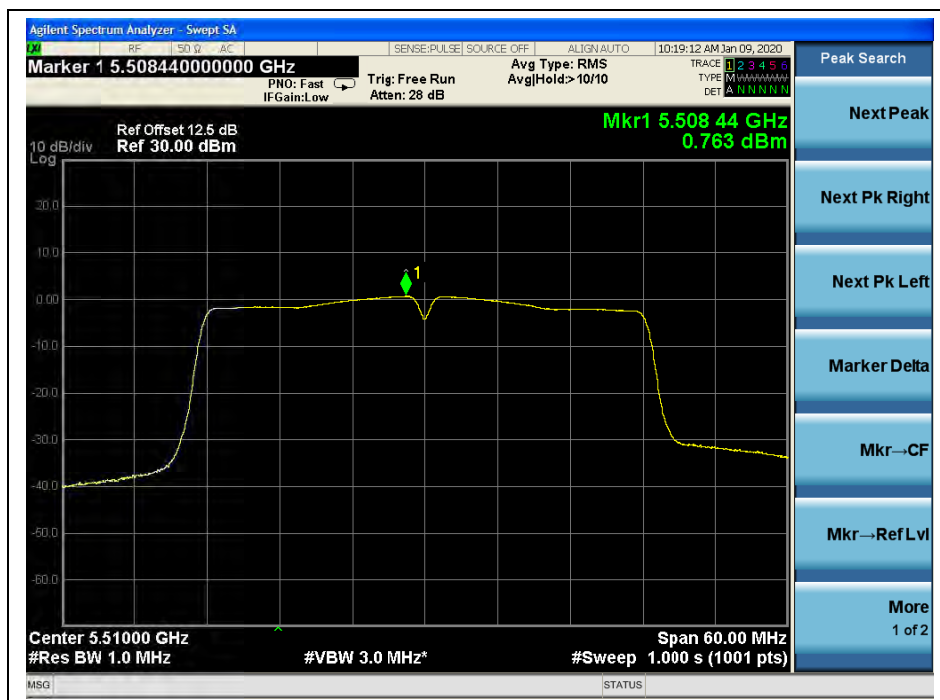
(Channel 46, 5230 MHz, 802.11n(HT40))



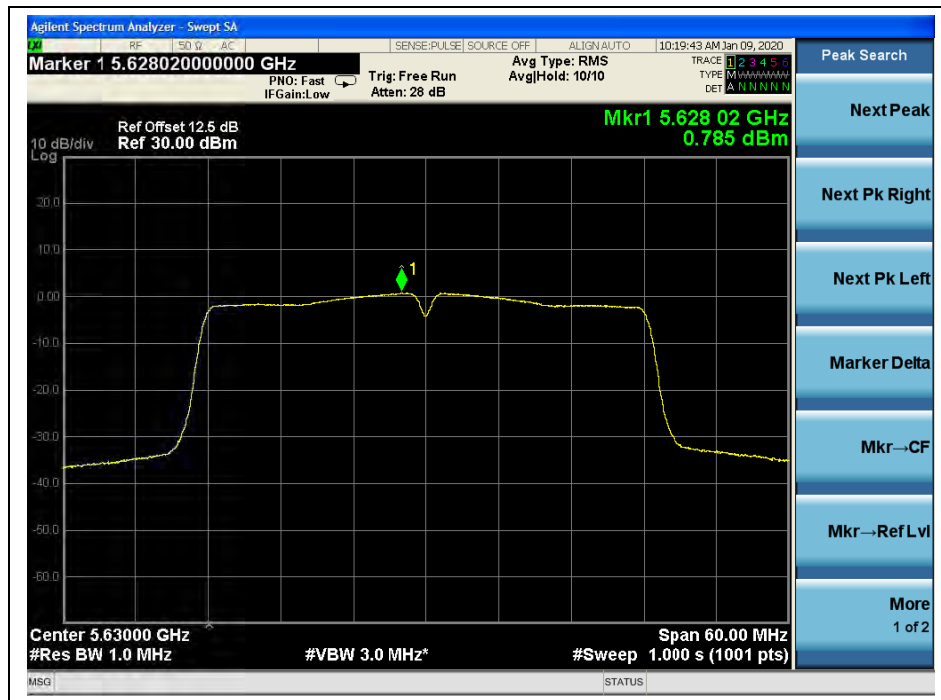
(Channel 54, 5270 MHz, 802.11n(HT40))



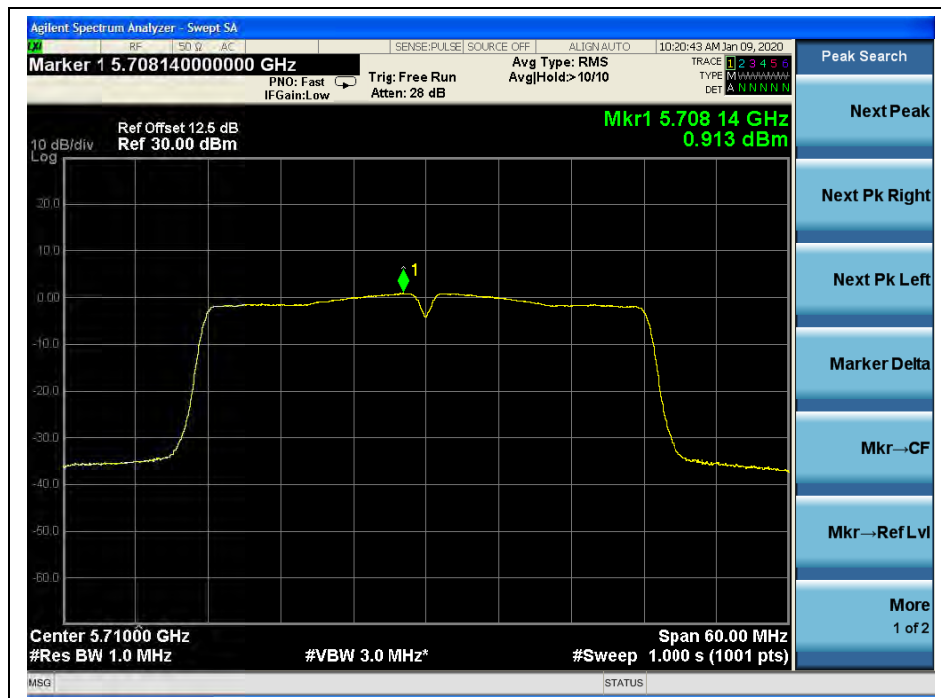
(Channel 62, 5310 MHz, 802.11n(HT40))



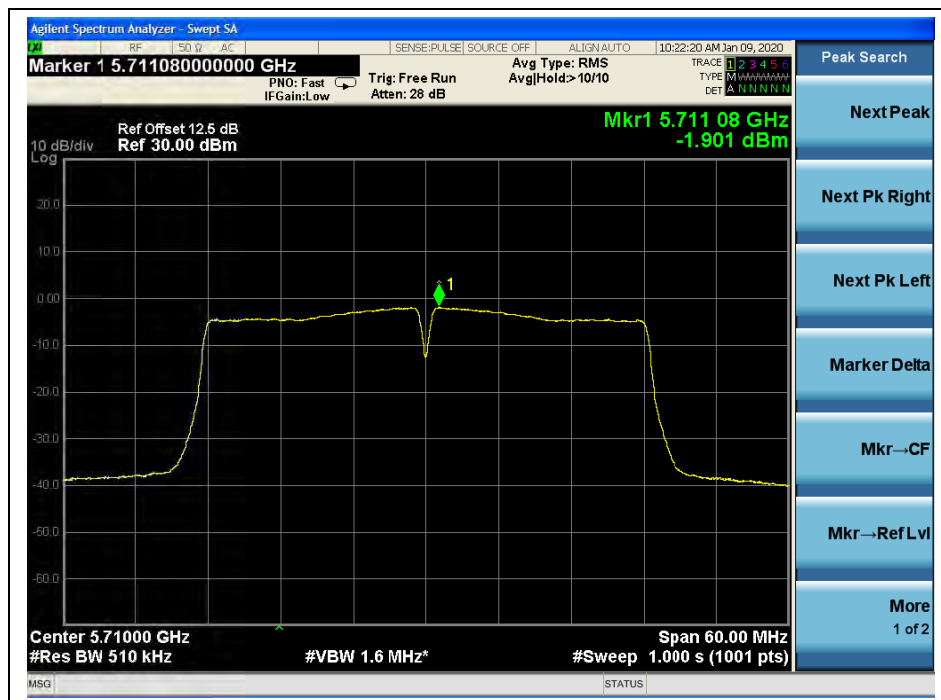
(Channel 102, 5510 MHz, 802.11n(HT40))



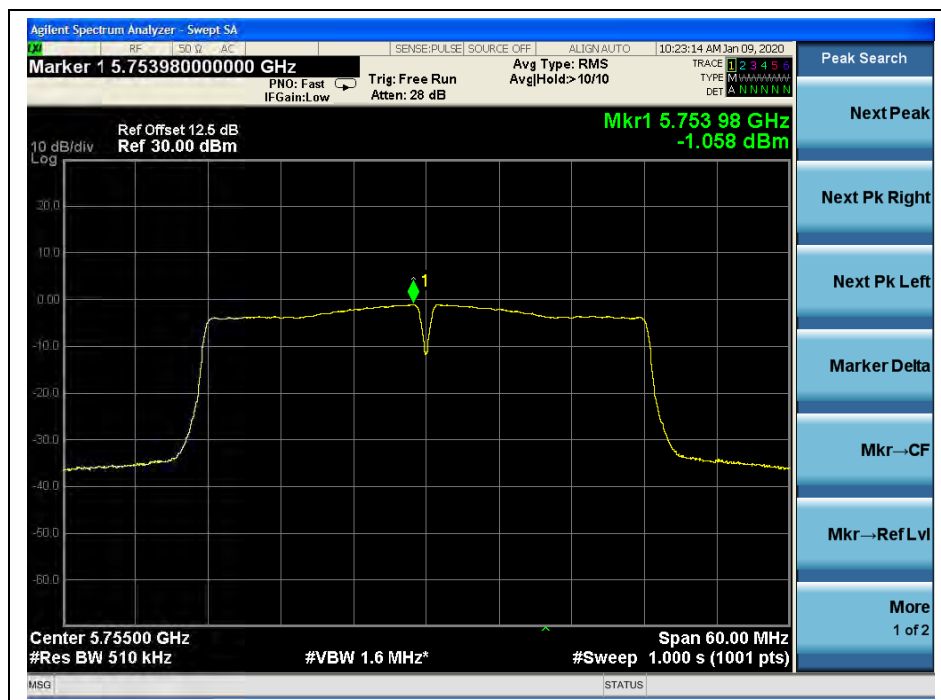
(Channel 126, 5630 MHz, 802.11n(HT40))



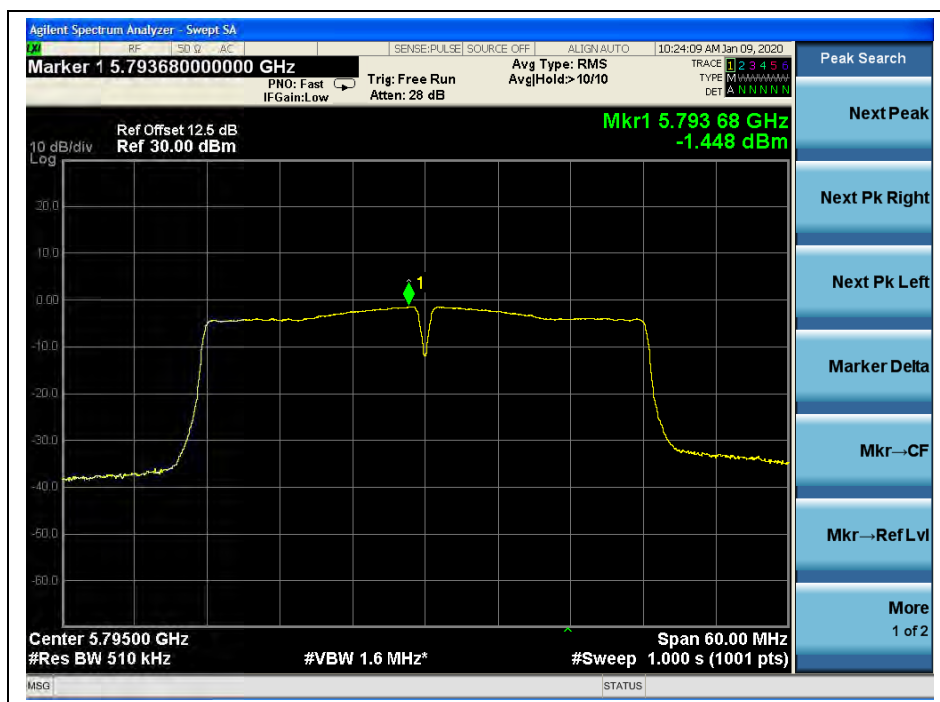
(Channel 142, 5710 MHz, 802.11n(HT40))



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



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



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



802.11ac(VHT20) Test mode

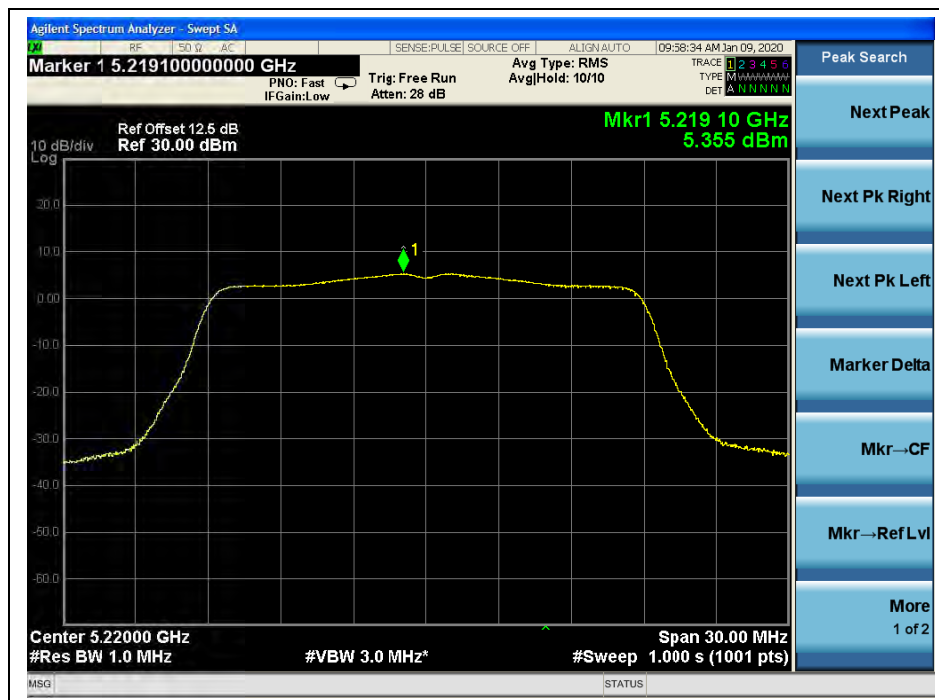
A. Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Corrected PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	5.15	0.33	5.48	11	PASS
44	5220	5.36		5.69		
48	5240	5.38		5.71		
52	5260	5.32		5.65		
60	5300	5.40		5.73		
64	5320	5.31		5.64		
100	5500	3.76		4.09		
120	5600	3.70		4.03		
144	5720	3.95		4.28		
Channel	Frequency (MHz)	Measured PSD (dBm/500KHz)	Duty Factor	Total PSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
144	5720	1.41	0.33	1.74	30	PASS
149	5745	2.41		2.74		
157	5785	1.99		2.32		
165	5825	1.73		2.06		

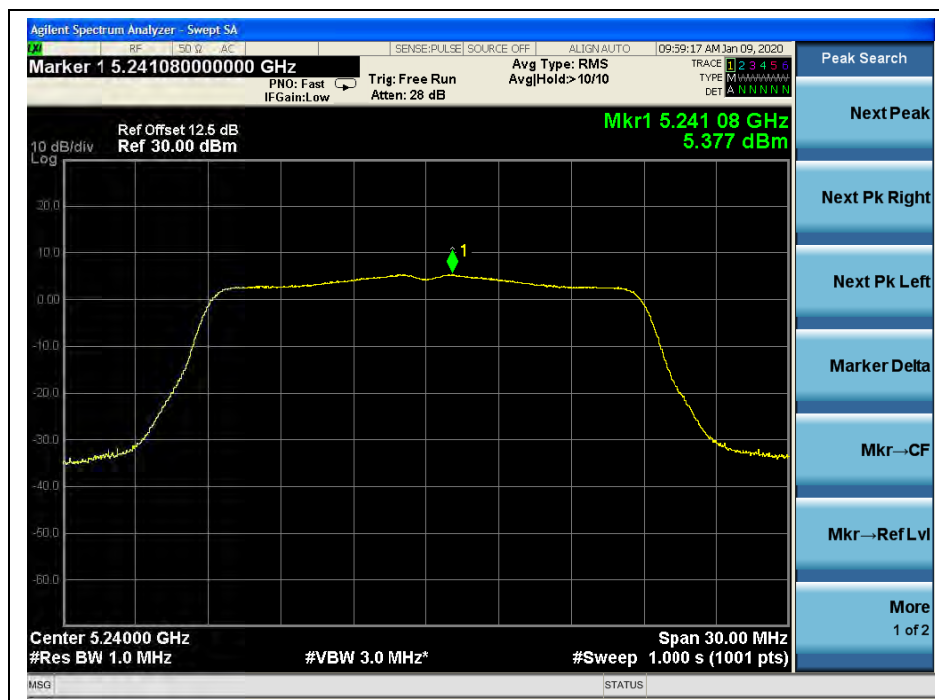
B. Test Plots



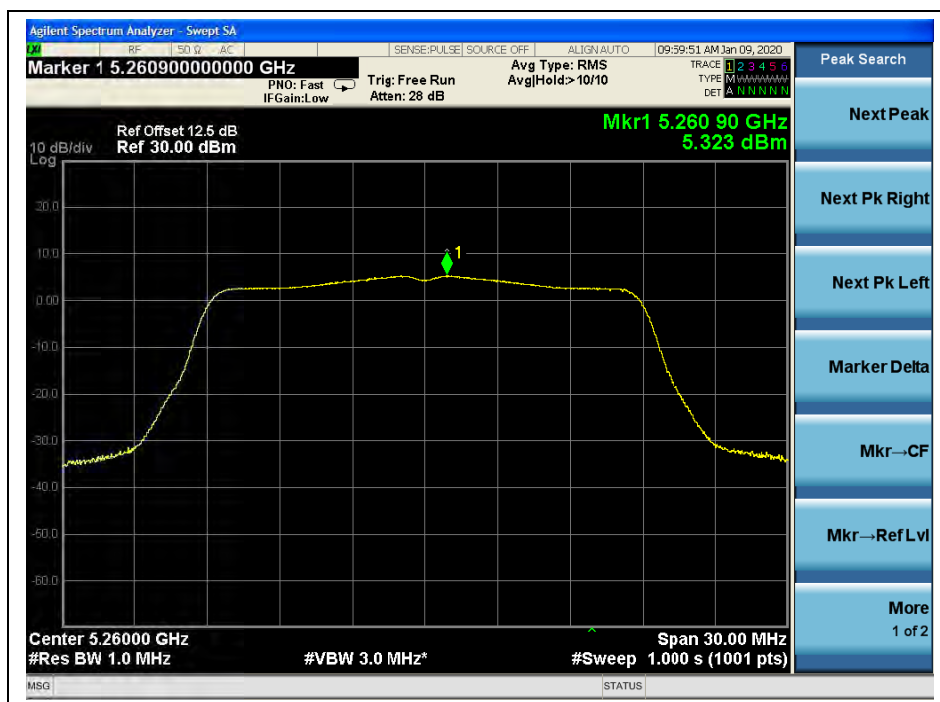
(Channel 36, 5180 MHz, 802.11ac (VHT20))



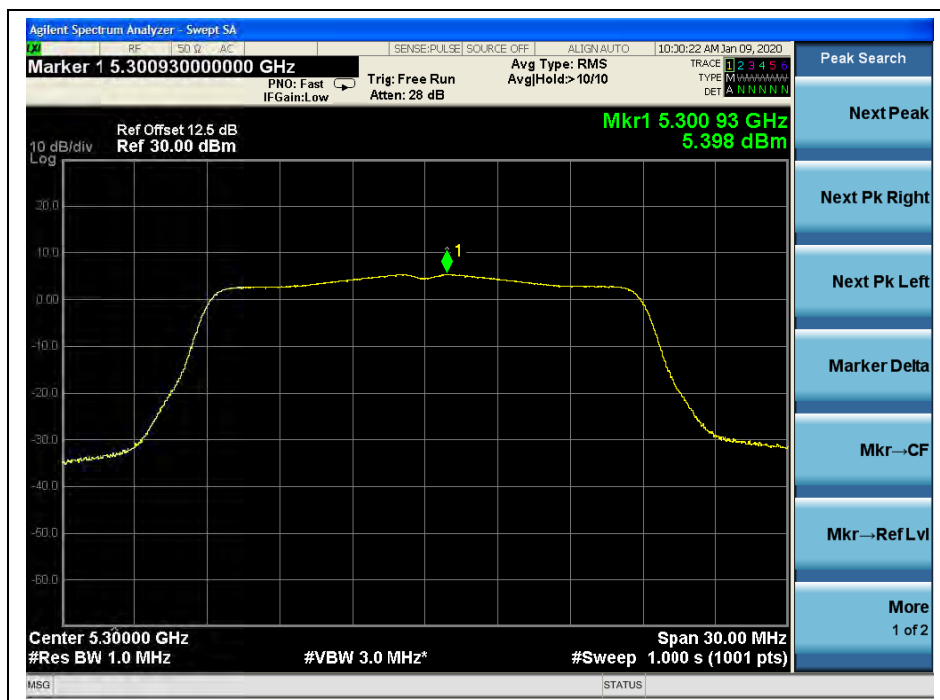
(Channel 44, 5220 MHz, 802.11ac (VHT20))



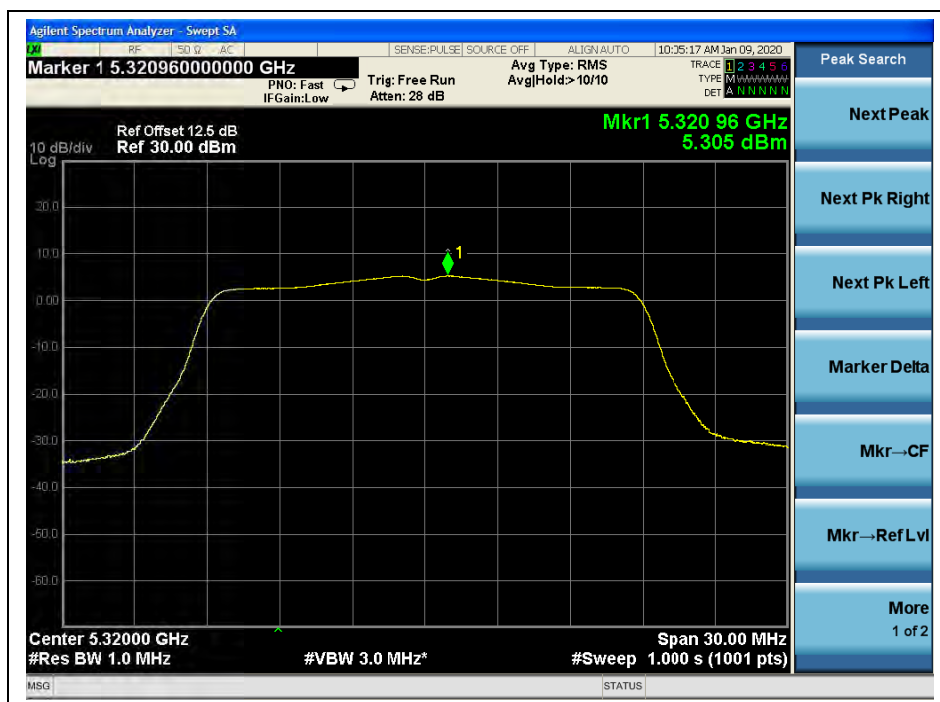
(Channel 48, 5240MHz, 802.11ac(VHT20))



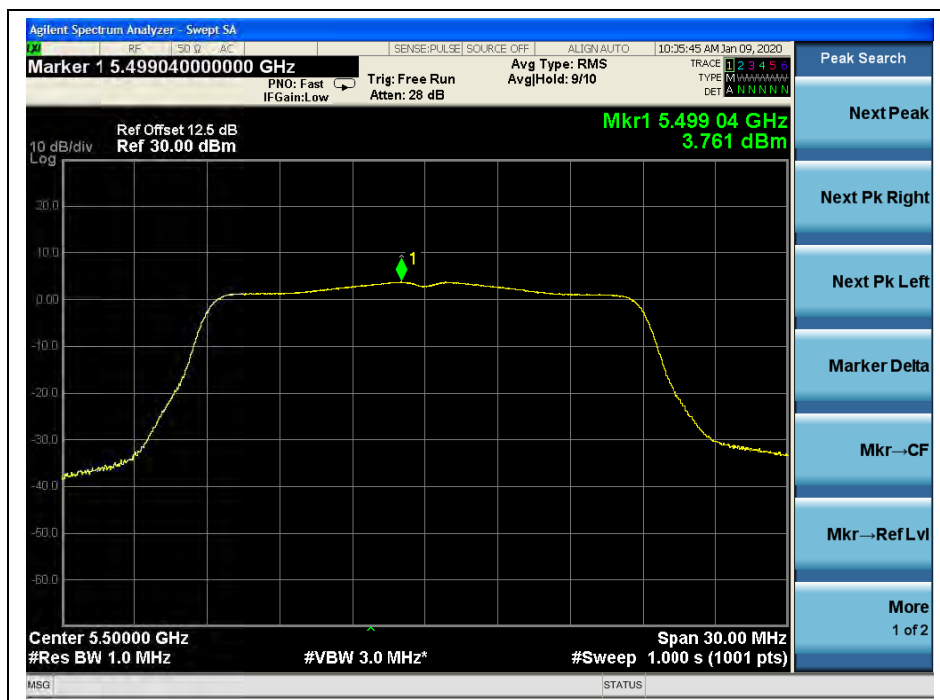
(Channel 52, 5260 MHz, 802.11ac(VHT20))



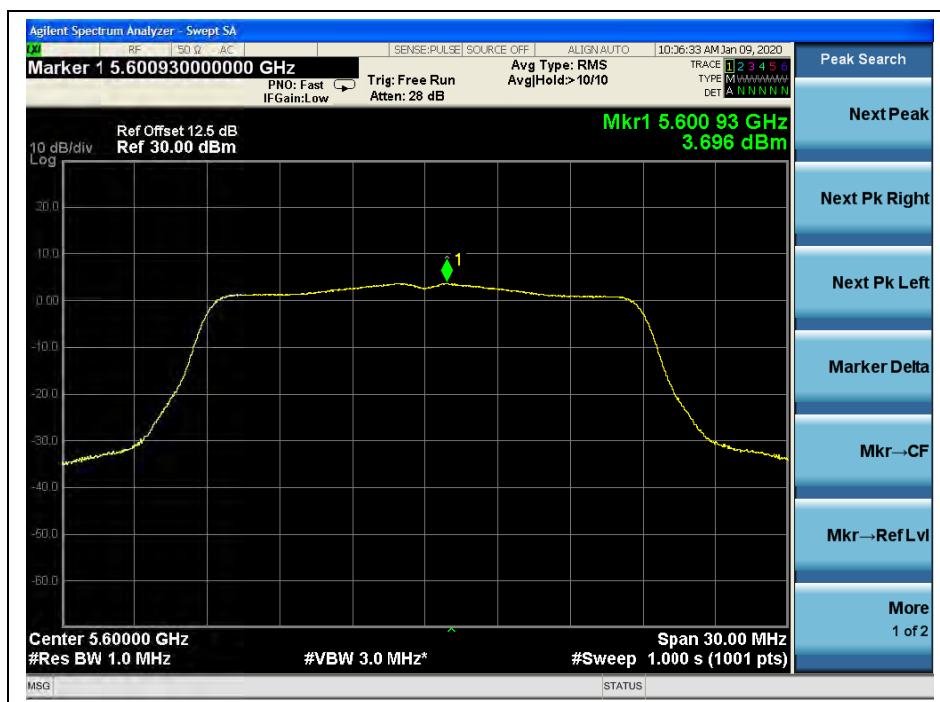
(Channel 60, 5300 MHz, 802.11ac(VHT20))



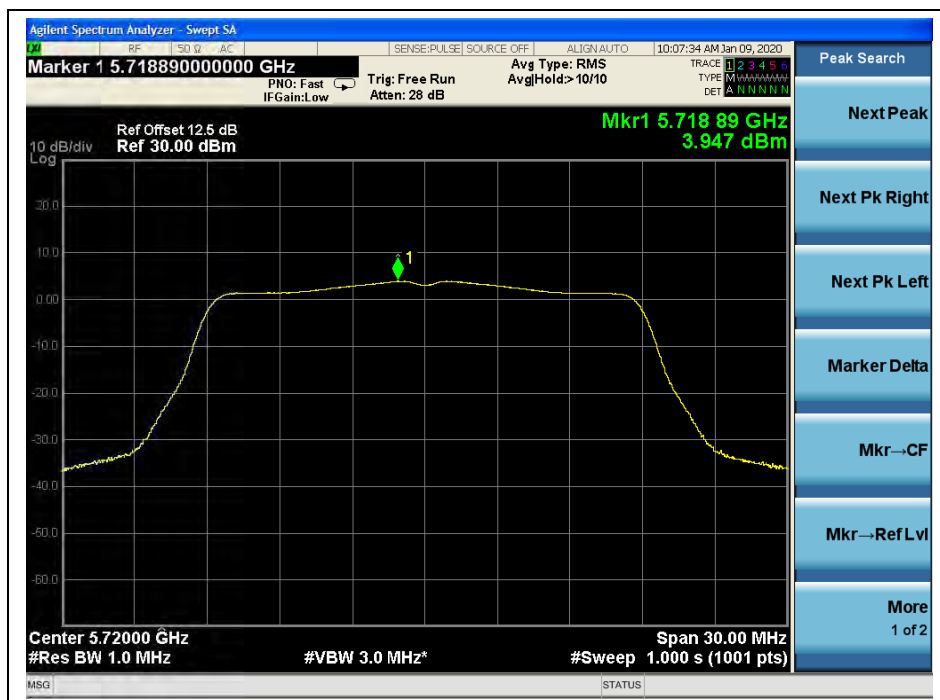
(Channel 64, 5320MHz, 802.11ac (VHT20))



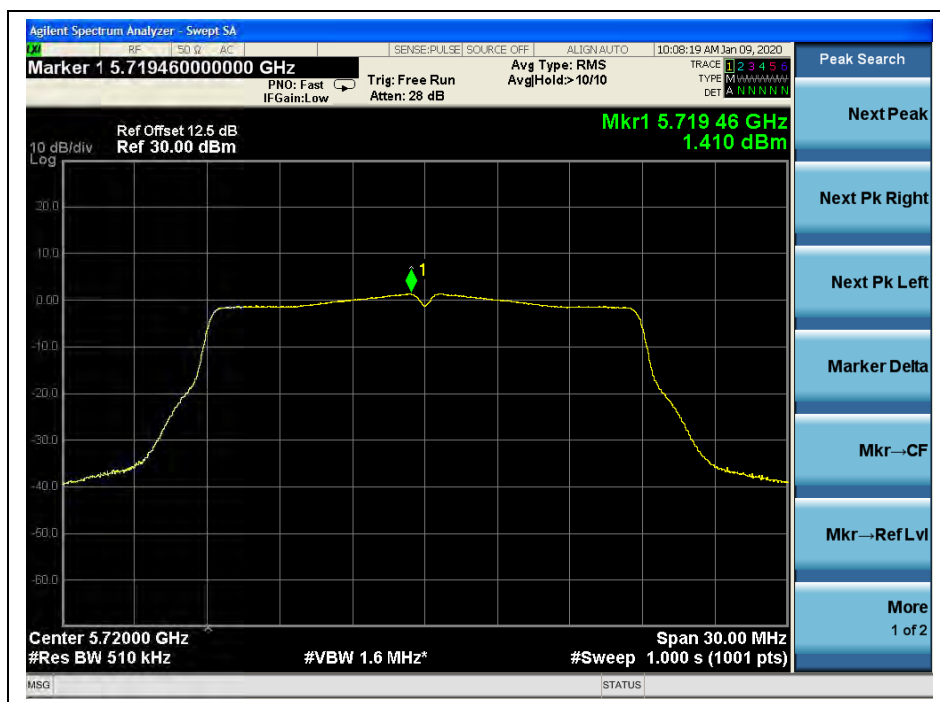
(Channel 100, 5500MHz, 802.11ac (VHT20))



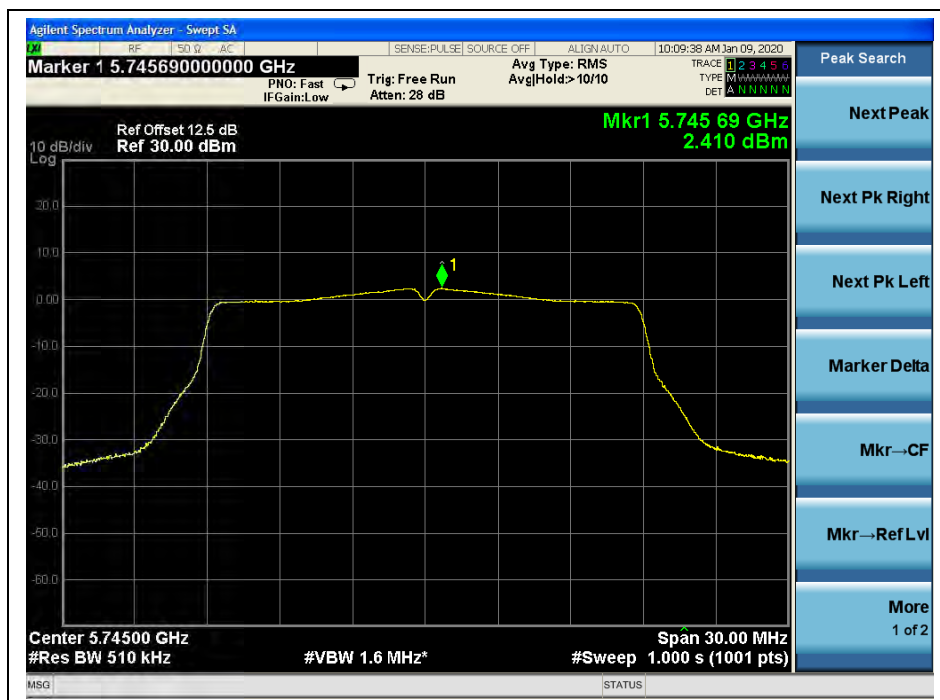
(Channel 120, 5600 MHz, 802.11ac (VHT20))



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



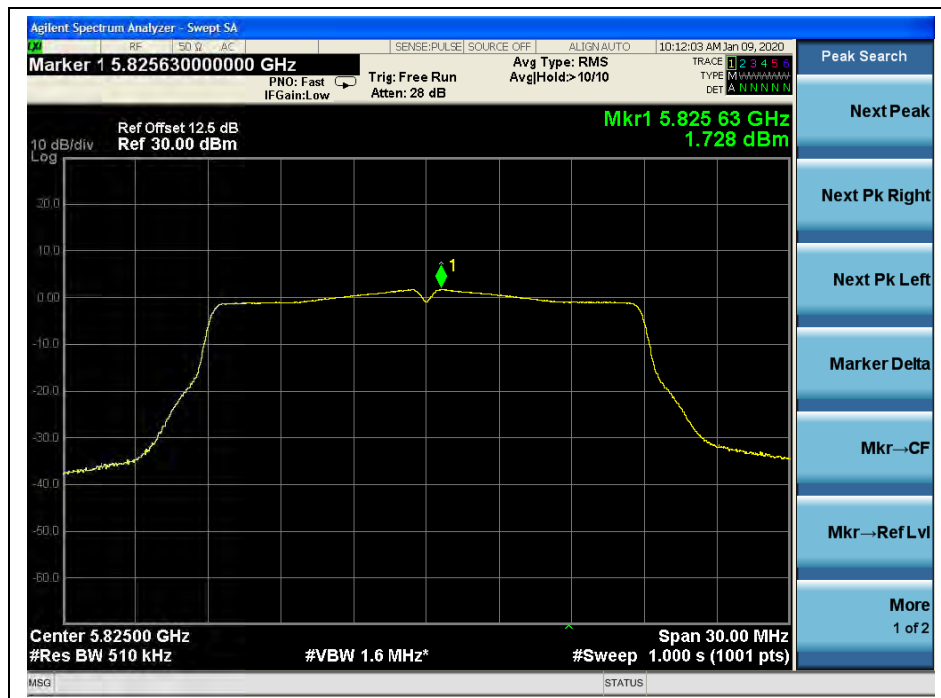
(Channel 144, 5720MHz, 802.11ac(VHT20))



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



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



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

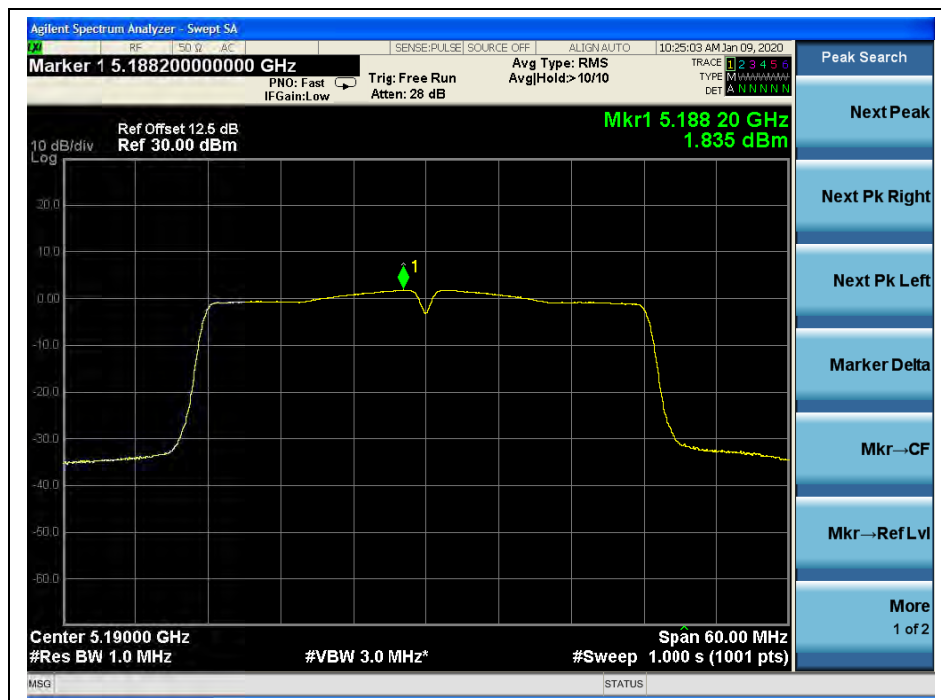


802.11ac (VHT40) Test mode

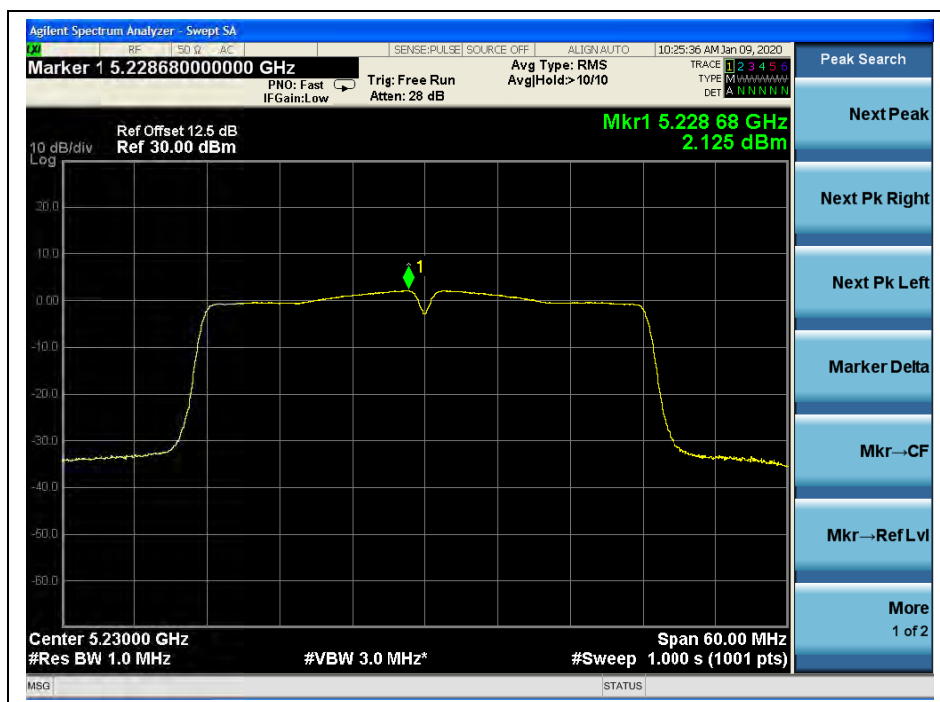
A. Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Corrected PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
38	5190	1.84	0.65	2.49	11	PASS
46	5230	2.13		2.78		
54	5270	2.11		2.76		
62	5310	2.12		2.77		
102	5510	0.80		1.45		
126	5630	0.83		1.48		
142	5710	0.84		1.49		
Channel	Frequency (MHz)	Measured PSD (dBm/500KHz)	Duty Factor	Total PSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
142	5710	-1.85	0.65	-1.20	30	PASS
151	5755	-0.85		-0.20		
155	5795	-1.35		-0.70		

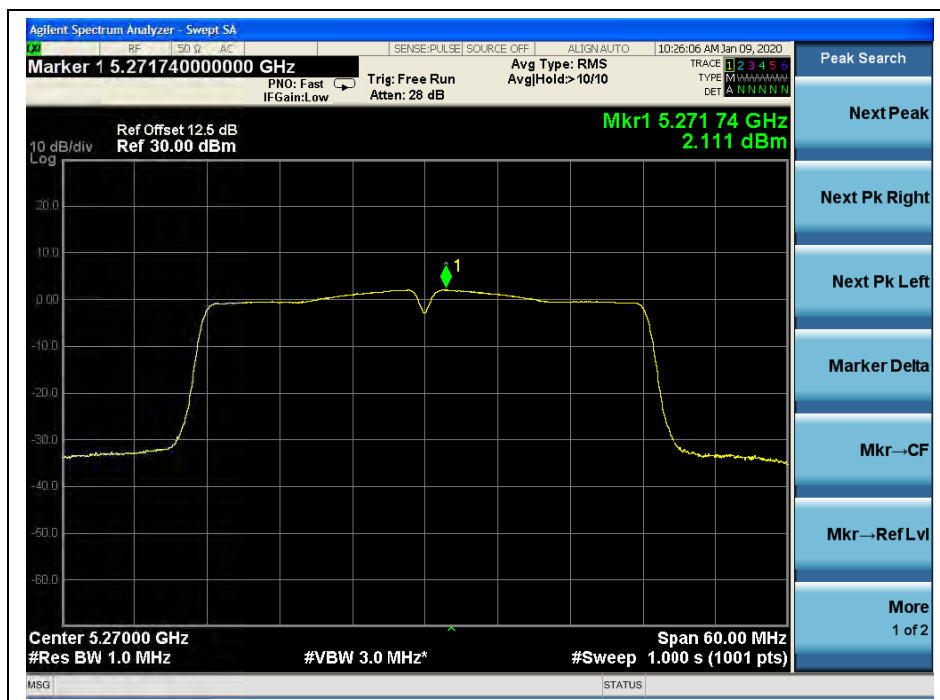
B. Test Plots



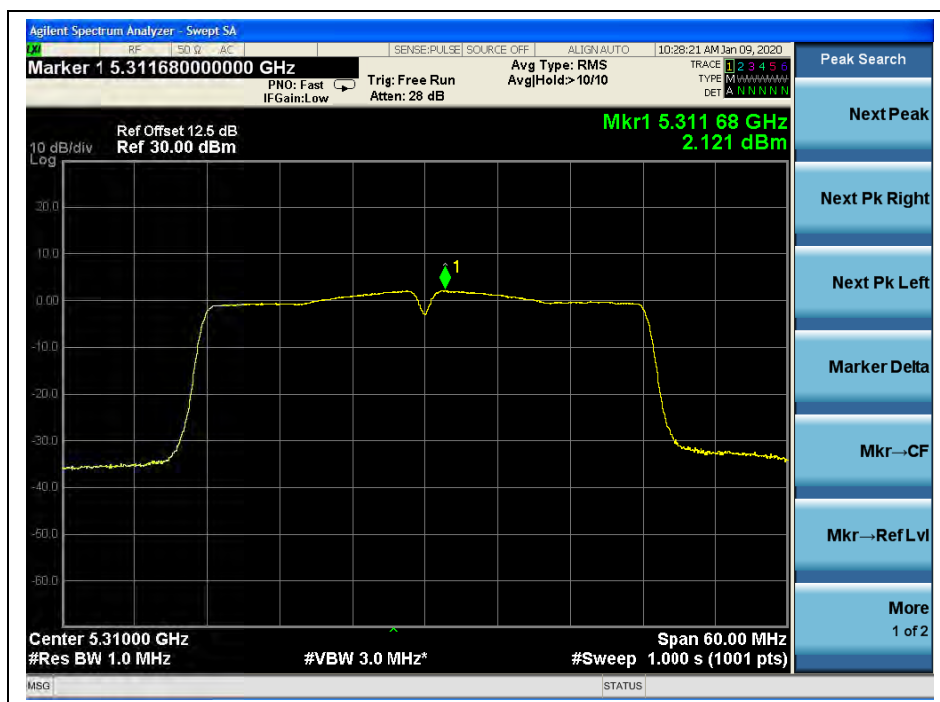
(Channel 38,5190MHz, 802.11ac (VHT40))



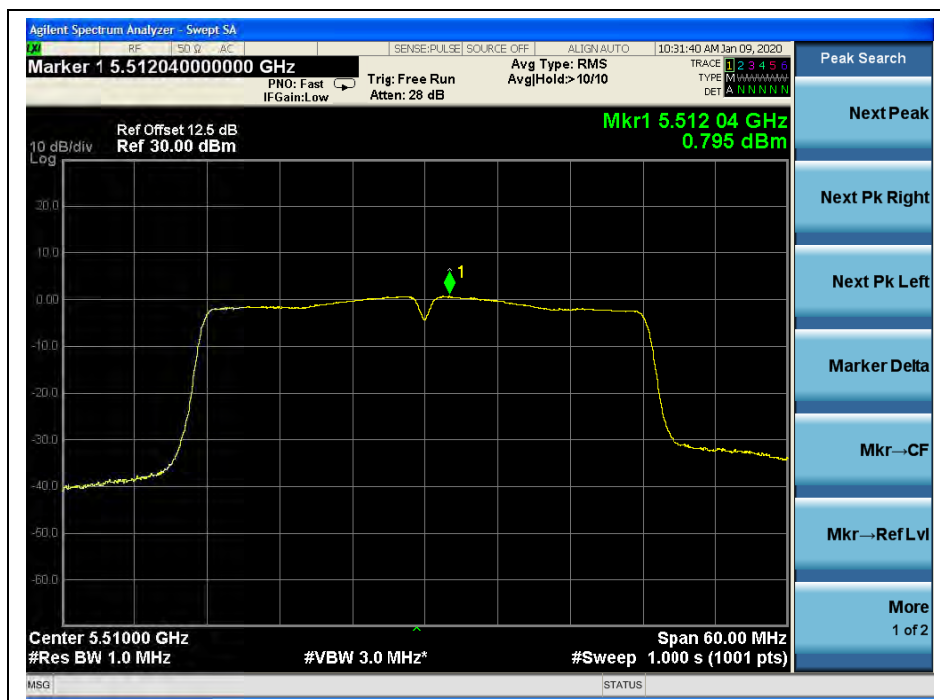
(Channel 46, 5230 MHz, 802.11ac (VHT40))



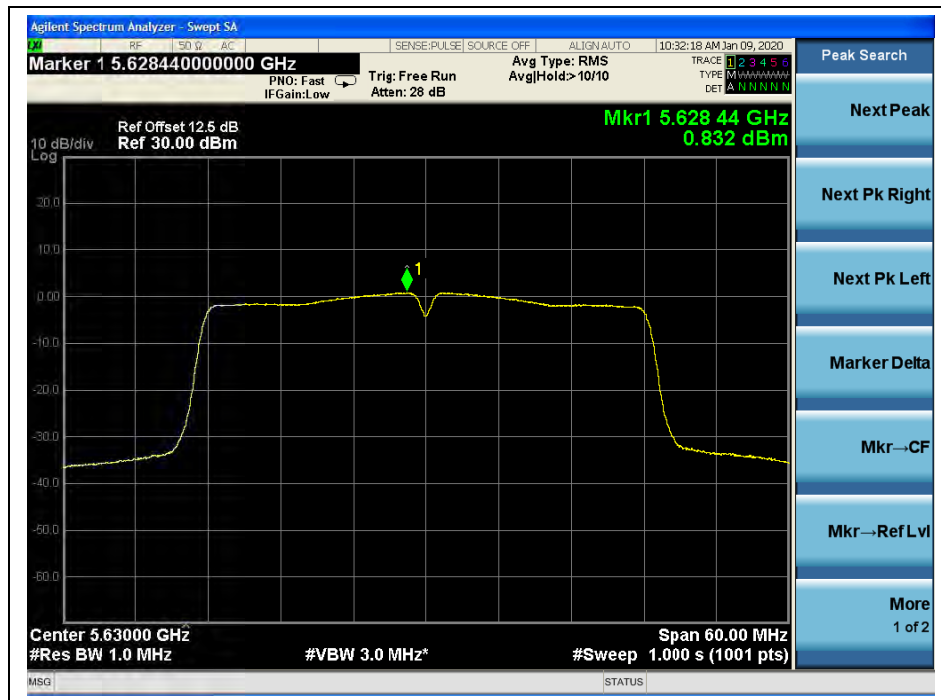
(Channel 54, 5270MHz, 802.11ac (VHT40))



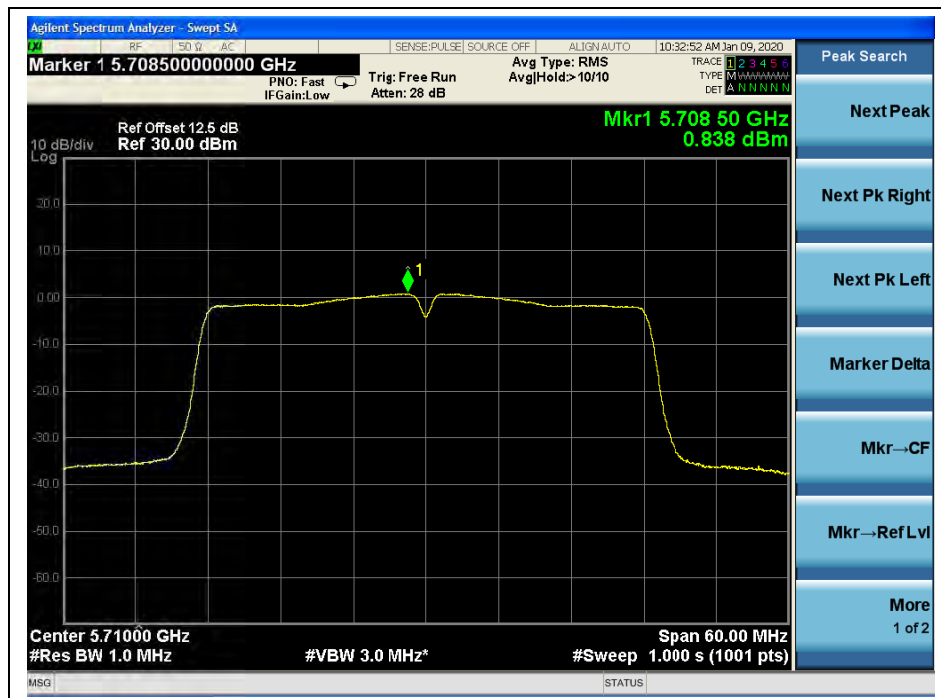
(Channel 62, 5310 MHz, 802.11ac (VHT40))



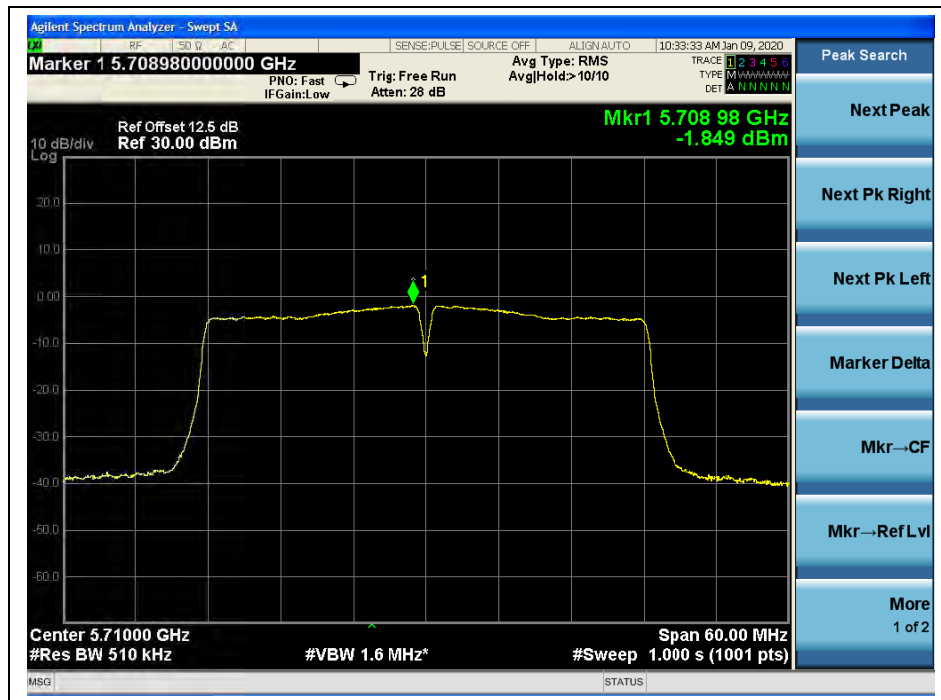
(Channel 102, 5510 MHz, 802.11ac (VHT40))



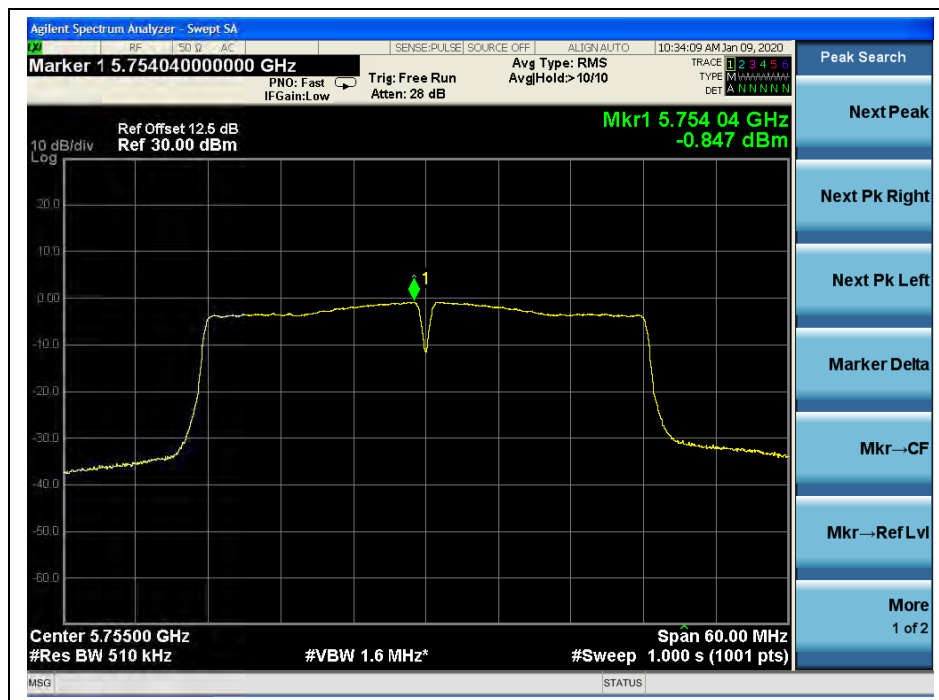
(Channel 126, 5630MHz, 802.11ac (VHT40))



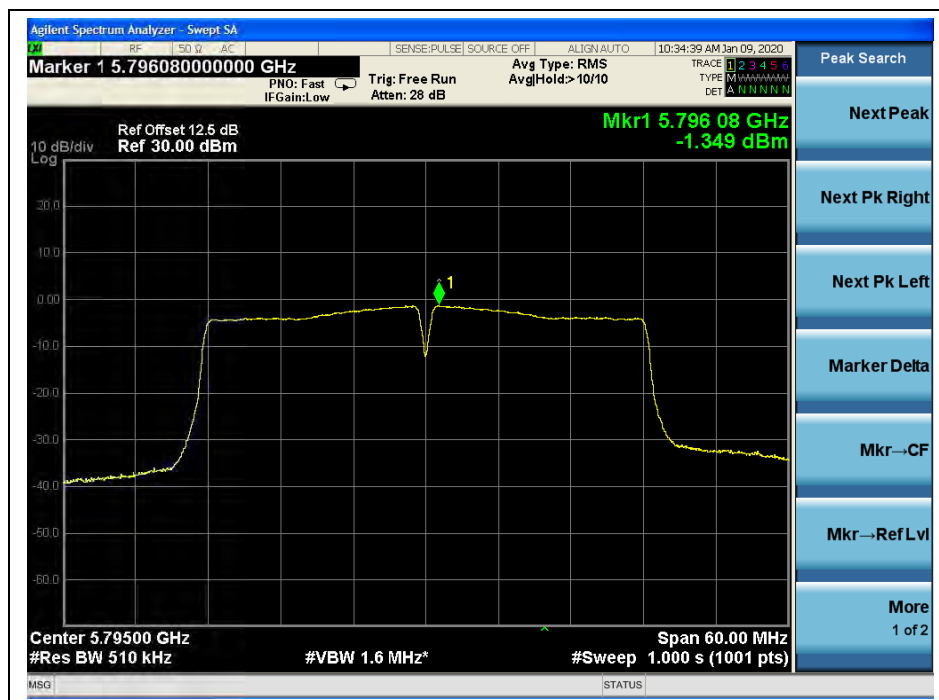
(Channel 142, 5710MHz, 802.11ac (VHT40))



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



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



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

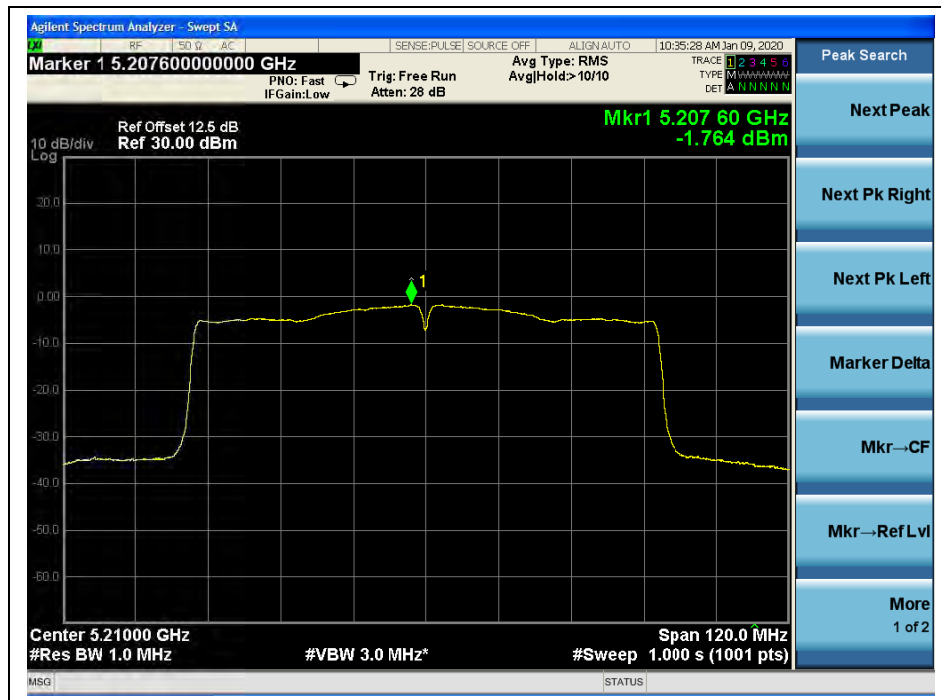


802.11ac (VHT80) Test mode

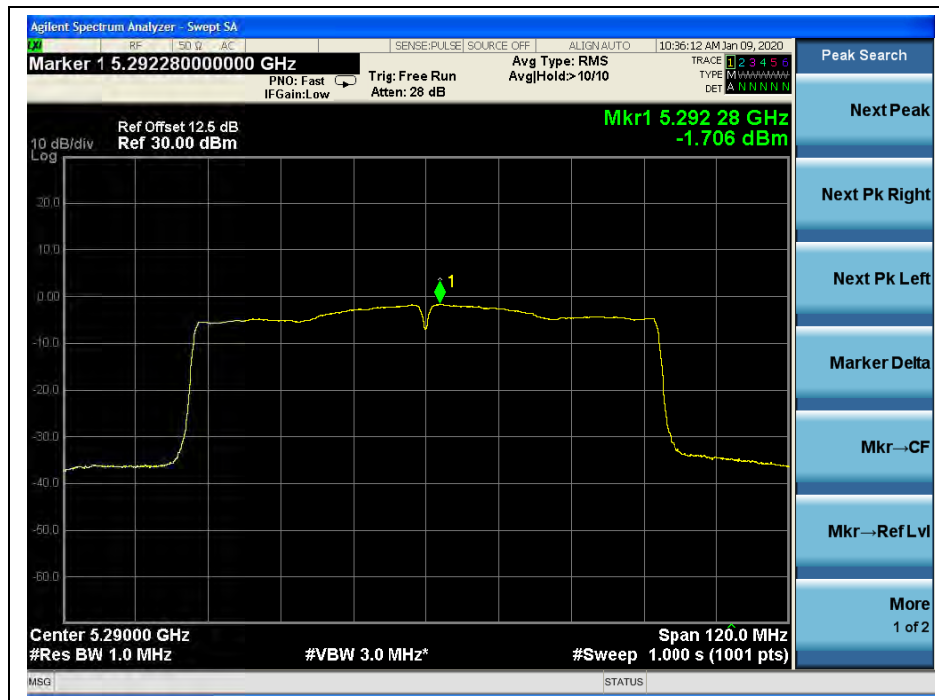
A. Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Corrected PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
42	5210	-1.76	1.19	-0.57	11	PASS
58	5290	-1.71		-0.52		
106	5530	-3.16		-1.97		
122	5610	-3.19		-2.00		
138	5690	-2.86		-1.67		
Channel	Frequency (MHz)	Measured PSD (dBm/500KHz)	Duty Factor	Total PSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
138	5690	-5.61	1.19	-4.42	30	PASS
155	5775	-5.16		-3.97		

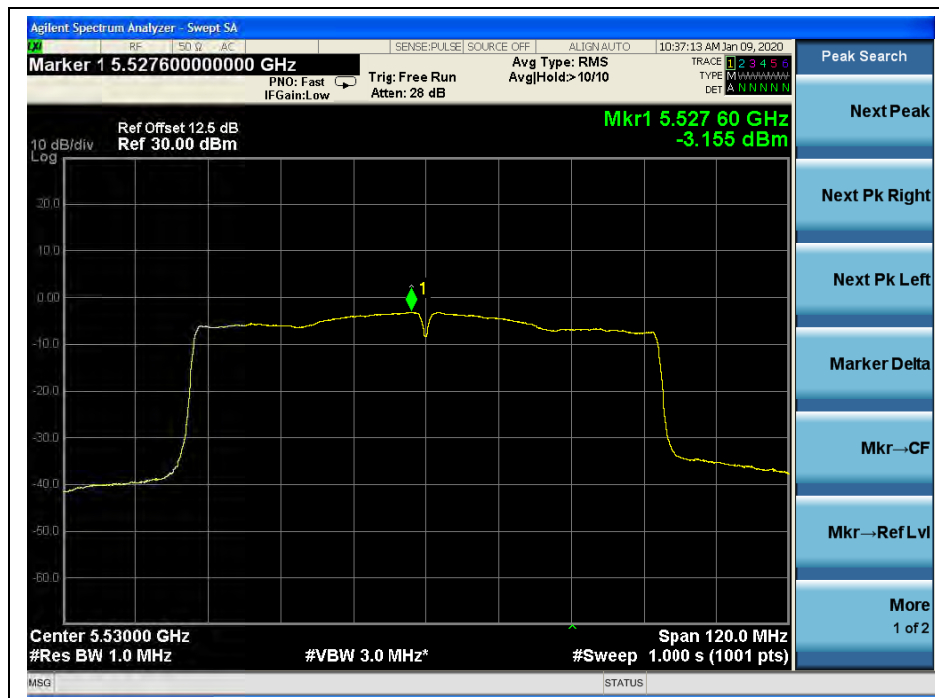
B. Test Plots



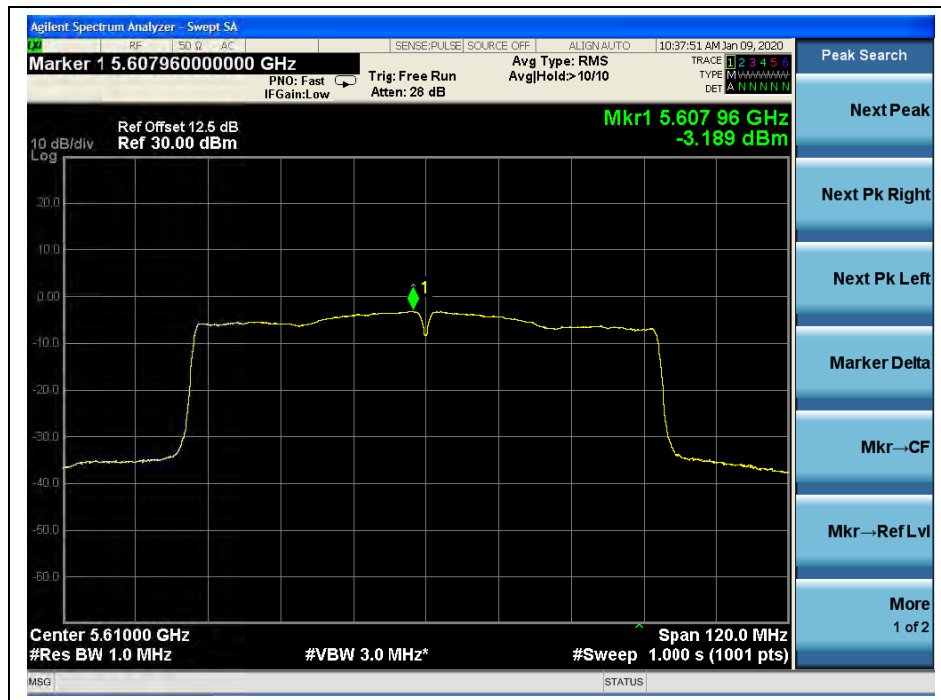
(Channel 42, 5210 MHz, 802.11ac (VHT80))



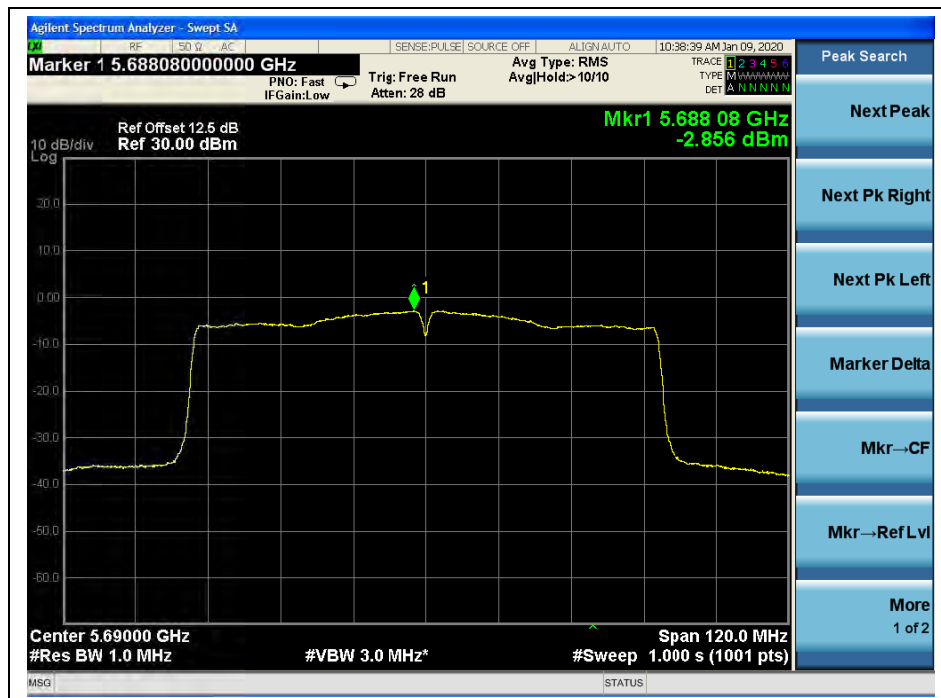
(Channel 58, 5290 MHz, 802.11ac(VHT80))



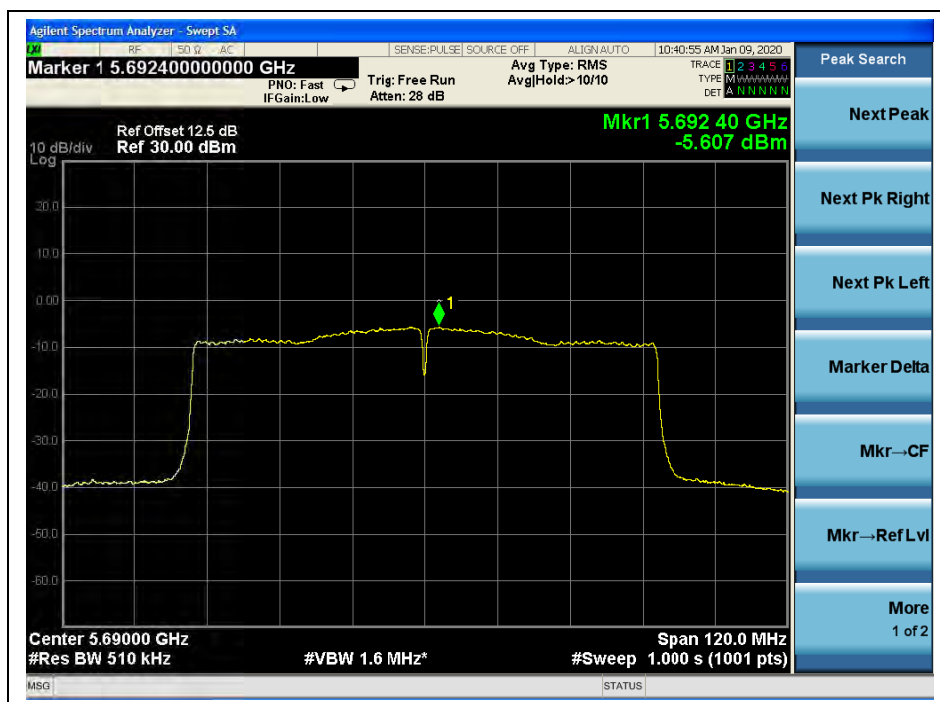
(Channel 106, 5530 MHz, 802.11ac(VHT80))



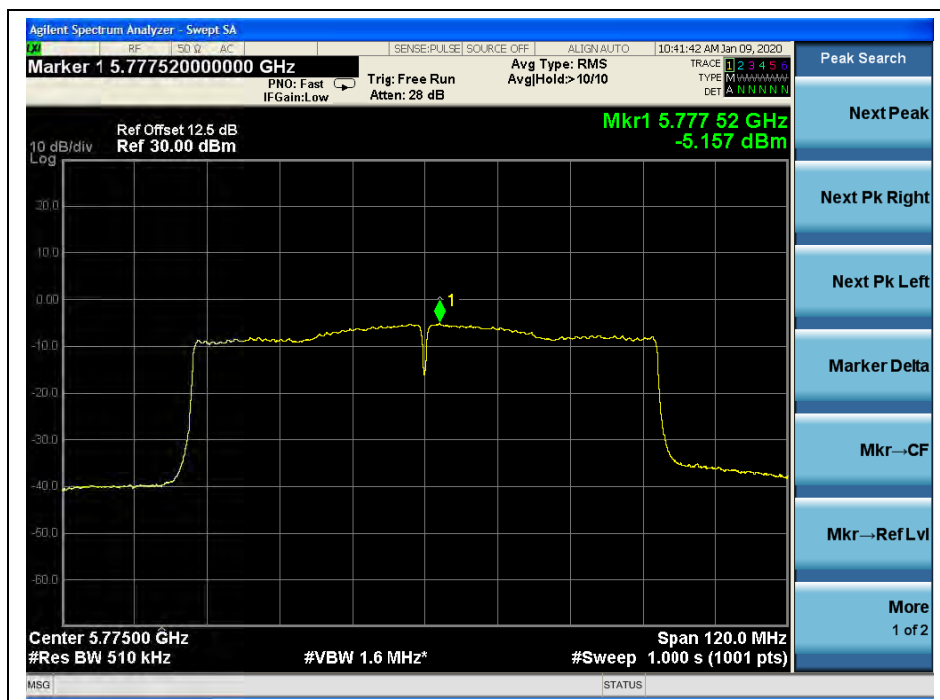
(Channel 122, 5610 MHz, 802.11ac(VHT80))



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



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



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



2.6. Frequency Stability

2.6.1. Requirement

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

2.6.2. Test Procedure

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between 5°C to 40°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

2.6.3. Test Result

U-NII-1 (Ch. 36) 5180MHz				
VOLTAGE (%)	POWER (VDC)	TEMP (°C)	Freq Dev. (Hz)	Deviation (ppm)
100%	3.70	+20(Ref)	22	0.004
100%		-30	50	0.010
100%		-20	47	0.009
100%		-10	36	0.007
100%		0	32	0.006
100%		+10	25	0.005
100%		+20	27	0.005
100%		+30	35	0.007
100%		+40	42	0.008
100%		+50	49	0.009
85%	3.15	+20	51	0.010
115%	4.26	+20	41	0.008



U-NII-2A (Ch. 52)				
5260MHz				
VOLTAGE (%)	POWER (VDC)	TEMP (°C)	Freq Dev. (Hz)	Deviation (ppm)
100%	3.70	+20(Ref)	32	0.006
100%		-30	50	0.010
100%		-20	46	0.009
100%		-10	39	0.007
100%		0	33	0.006
100%		+10	33	0.006
100%		+20	37	0.007
100%		+30	41	0.008
100%		+40	46	0.009
100%		+50	57	0.011
85%	3.15	+20	30	0.006
115%	4.26	+20	32	0.006

U-NII-2C (Ch. 100)				
5500MHz				
VOLTAGE (%)	POWER (VDC)	TEMP (°C)	Freq Dev. (Hz)	Deviation (ppm)
100%	3.70	+20(Ref)	20	0.004
100%		-30	48	0.009
100%		-20	39	0.007
100%		-10	25	0.005
100%		0	21	0.004
100%		+10	18	0.003
100%		+20	21	0.004
100%		+30	28	0.005
100%		+40	35	0.006
100%		+50	47	0.009
85%	3.15	+20	27	0.005
115%	4.26	+20	32	0.006



U-NII-3 (Ch. 149) 5745MHz				
VOLTAGE (%)	POWER (VDC)	TEMP (°C)	Freq Dev. (Hz)	Deviation (ppm)
100%	3.70	+20(Ref)	22	0.004
100%		-30	50	0.009
100%		-20	45	0.008
100%		-10	38	0.007
100%		0	35	0.006
100%		+10	24	0.004
100%		+20	30	0.005
100%		+30	25	0.004
100%		+40	31	0.005
100%		+50	41	0.007
85%	3.15	+20	21	0.004
115%	4.26	+20	36	0.006

2.7. Conducted Emission

2.7.1. Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

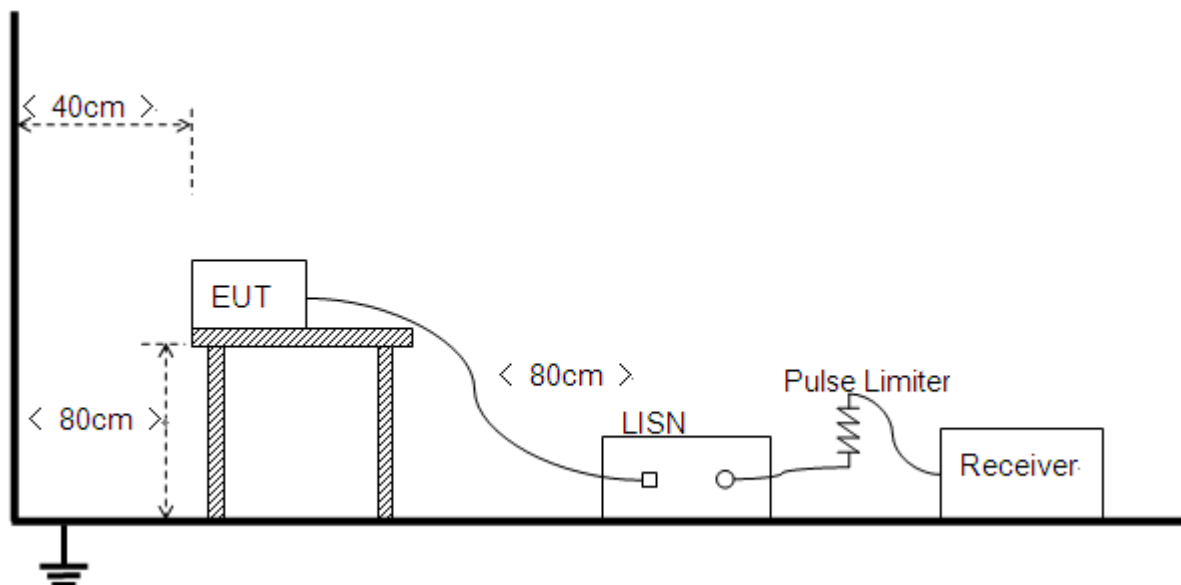
Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

- The lower limit shall apply at the band edges.
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

2.7.2. Test Description

TestSetup:



The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10: 2013.



2.7.3. Test Result

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

Note: Both of the test voltage AC 120V/60Hz and AC 230V/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

A. Test Setup:

Test Mode: EUT+ADAPTER+WIFI TX

Test Voltage: AC 120V/60Hz

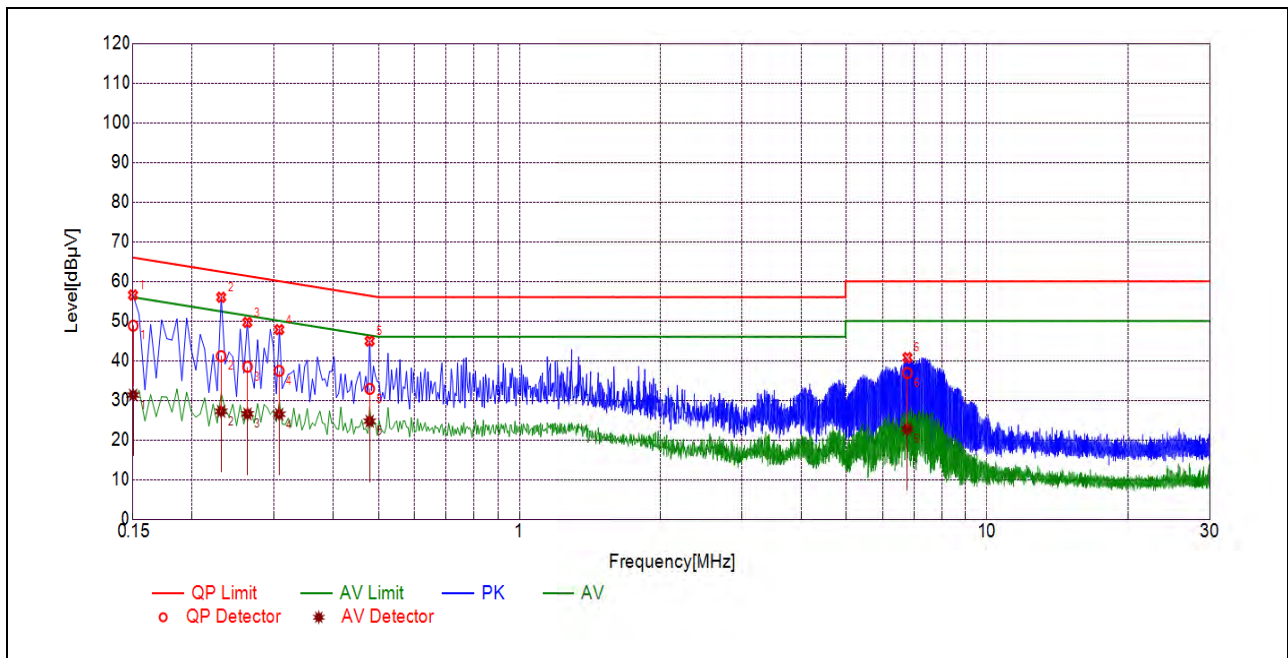
The measurement results are obtained as below:

$$E \text{ [dB}\mu\text{V]} = U_R + L_{\text{Cable loss [dB]} + A_{\text{Factor}}$$

U_R : Receiver Reading

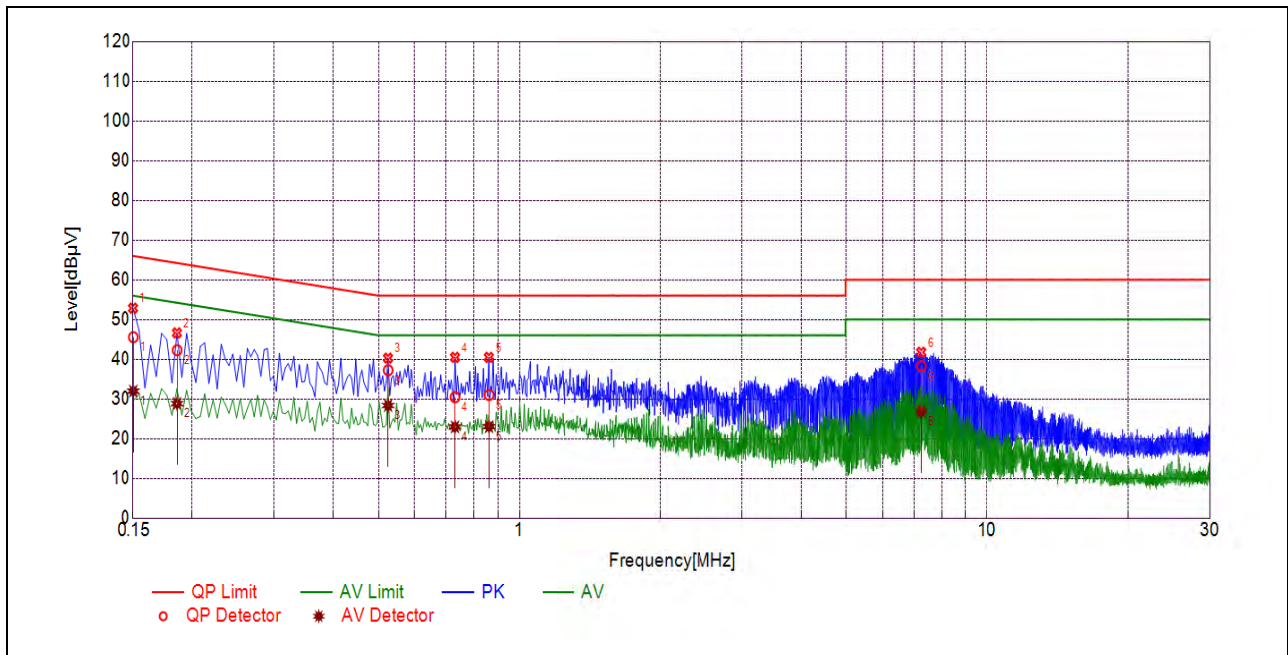
A_{Factor} : Voltage division factor of LISN

B. Test Plots:



(L Phase)

NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1501	48.83	31.33	66.00	56.00	Line	PASS
2	0.2309	41.14	27.21	62.42	52.42		PASS
3	0.2627	38.47	26.57	61.34	51.34		PASS
4	0.3073	37.42	26.49	60.04	50.04		PASS
5	0.4786	32.89	24.73	56.36	46.36		PASS
6	6.7638	36.87	22.74	60.00	50.00		PASS



(N Phase)

NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1502	45.54	31.96	65.99	55.99	Neutral	PASS
2	0.1861	42.28	28.83	64.21	54.21		PASS
3	0.5237	37.22	28.35	56.00	46.00		PASS
4	0.7303	30.43	22.95	56.00	46.00		PASS
5	0.8619	31.00	23.01	56.00	46.00		PASS
6	7.2405	38.27	26.89	60.00	50.00		PASS

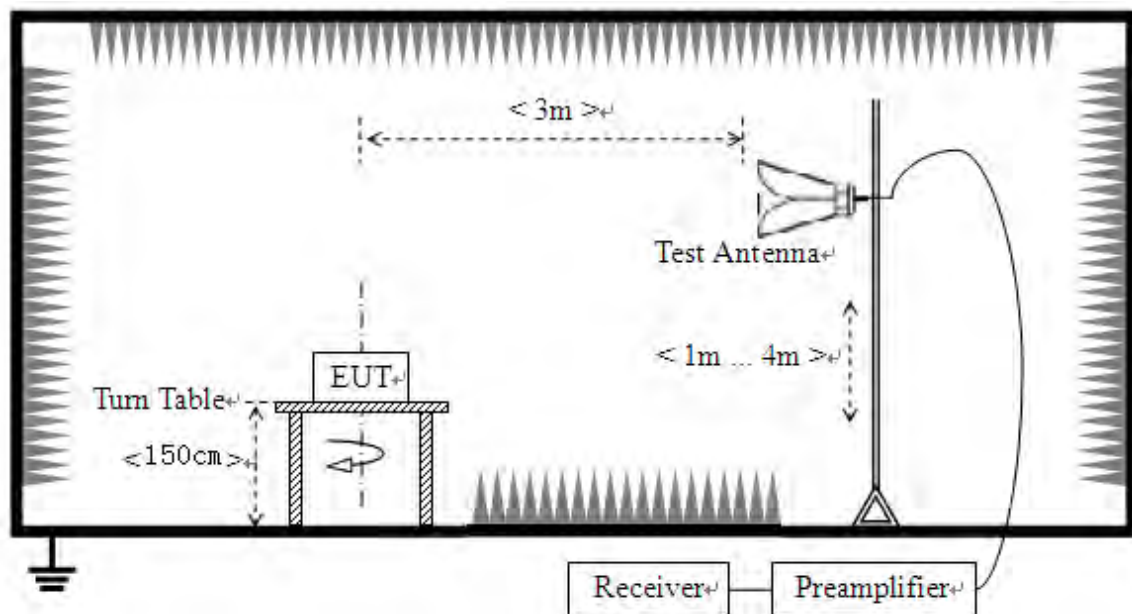
2.8. Restricted Frequency Bands

2.8.1. Requirement

According to FCC section 15.407(b)(7), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

2.8.2. Test Description

Test Setup



The Module is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

KDB 789033 Section H) 3)5)6(d)) was used in order to prove compliance

For the Test Antenna:

Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.



2.8.3. Test Result

The lowest and highest channels are tested to verify Restricted Frequency Bands.

The measurement results are obtained as below:

$$E \text{ [dB}\mu\text{V/m]} = U_R + A_T + A_{\text{Factor}} \text{ [dB]}; A_T = L_{\text{Cable loss}} \text{ [dB]} - G_{\text{preamp}} \text{ [dB]}$$

A_T : Total correction Factor except Antenna; U_R : Receiver Reading

G_{preamp} : Preamplifier Gain; A_{Factor} : Antenna Factor at 3m

Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

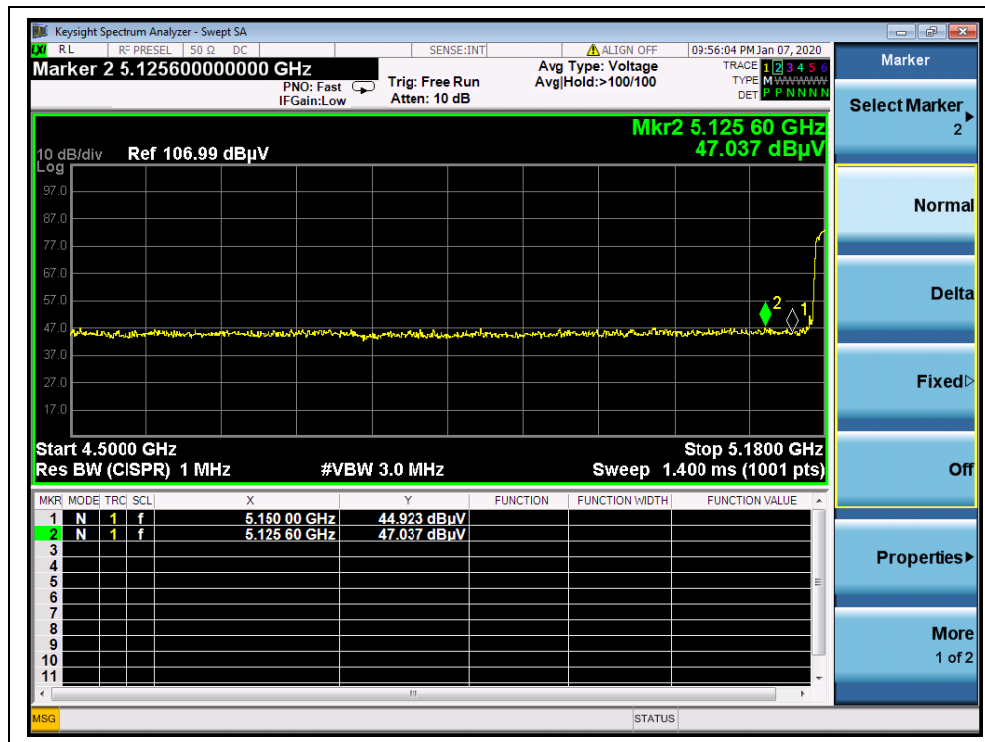
802.11a Test mode

A. Test Verdict:

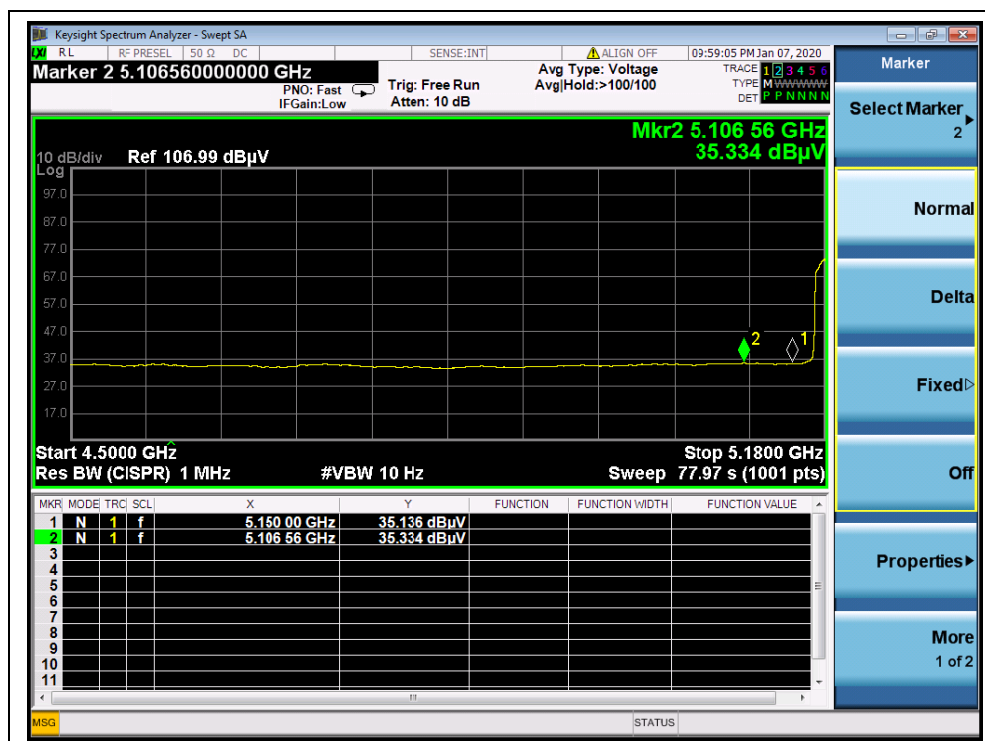
Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dB μ V/m)	Limit (dB μ V/m)	Verdict
		PK/ AV						
36	5125.60	PK	47.04	-26.92	32.20	52.32	74	PASS
36	5106.56	AV	35.33	-26.92	32.20	40.61	54	PASS
64	5382.72	PK	44.49	-26.80	32.20	49.89	74	PASS
64	5350.00	AV	33.51	-26.80	32.20	38.91	54	PASS
100	5283.05	PK	46.94	-26.64	32.20	52.50	68.26	PASS
100	5470.00	AV	33.70	-26.64	32.20	39.26	54	PASS
144	5735.00	PK	45.51	-26.64	32.20	51.07	68.23	PASS
144	5746.40	AV	35.44	-26.64	32.20	41.00	54	PASS
149	5650.00	PK	44.51	-26.23	32.20	50.48	68.23	PASS
149	5725.00	AV	35.78	-26.23	32.20	41.75	54	PASS
165	5855.00	PK	44.84	-26.23	32.20	50.81	110.83	PASS
165	5850.00	AV	35.07	-26.23	32.20	41.04	54	PASS



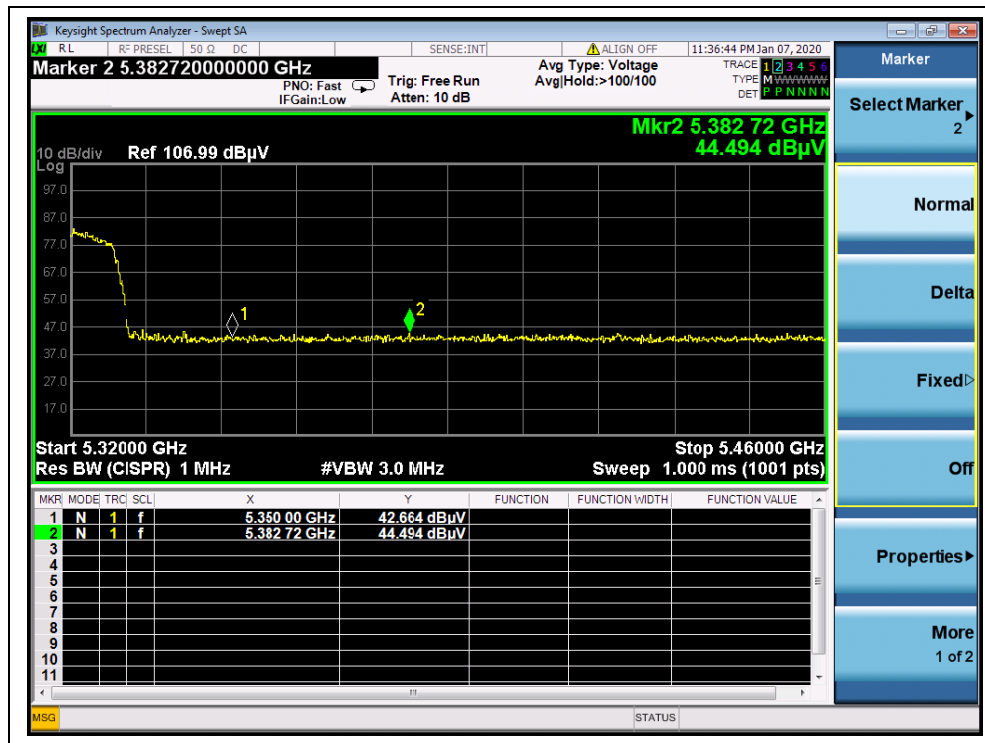
B. Test Plots:



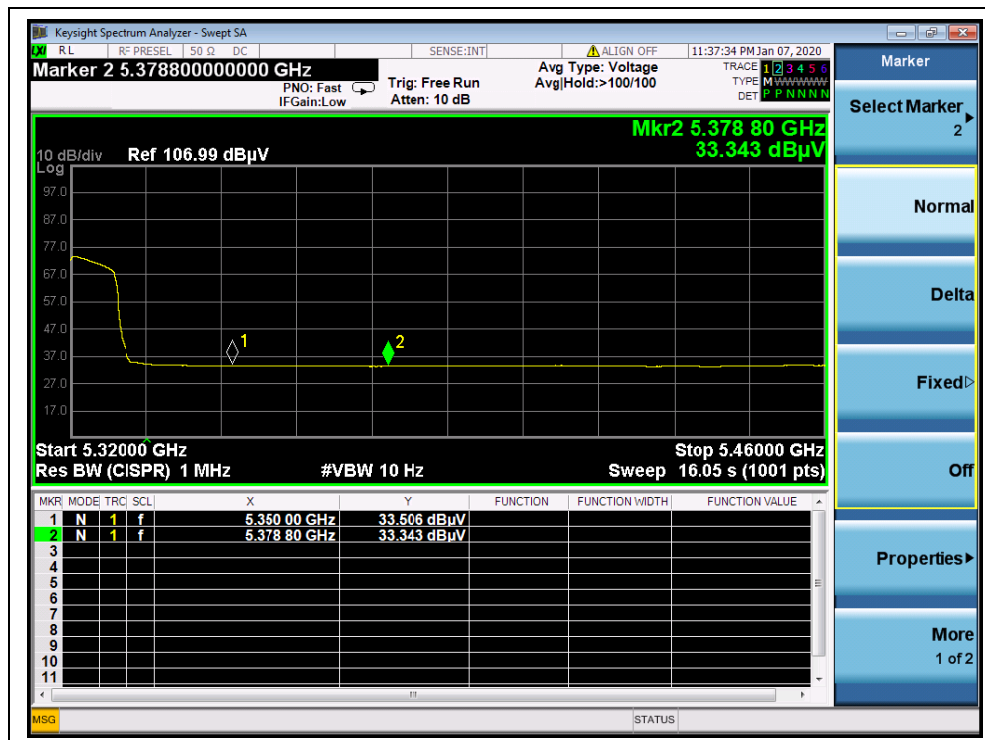
(PEAK,Channel 36, 802.11a)



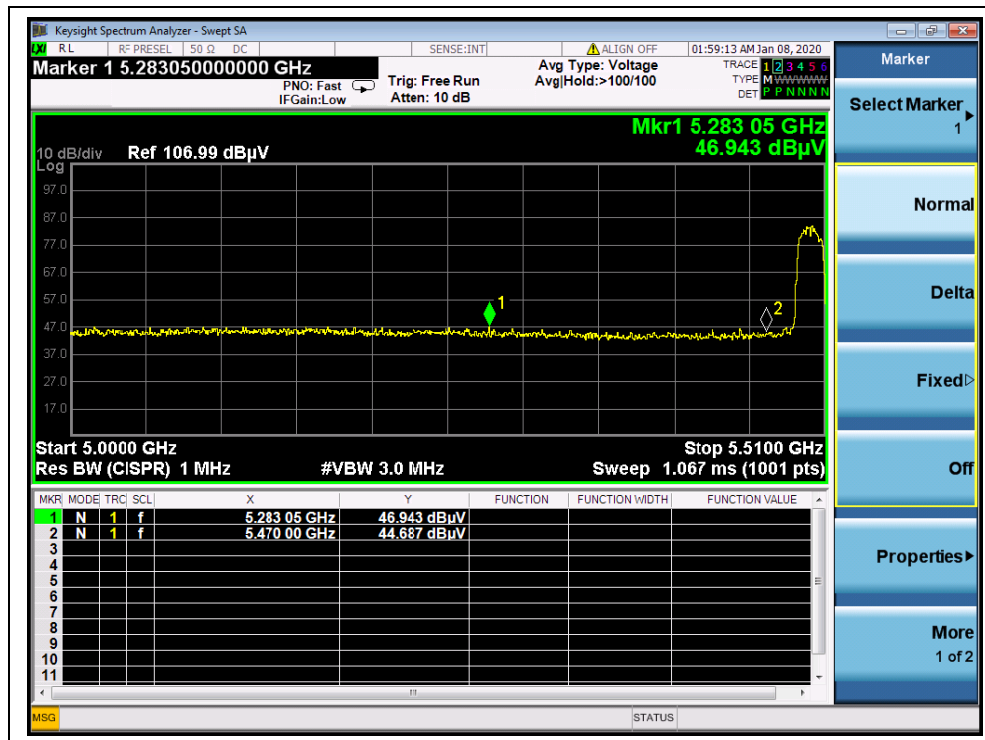
(AVG,Channel 36,802.11a)



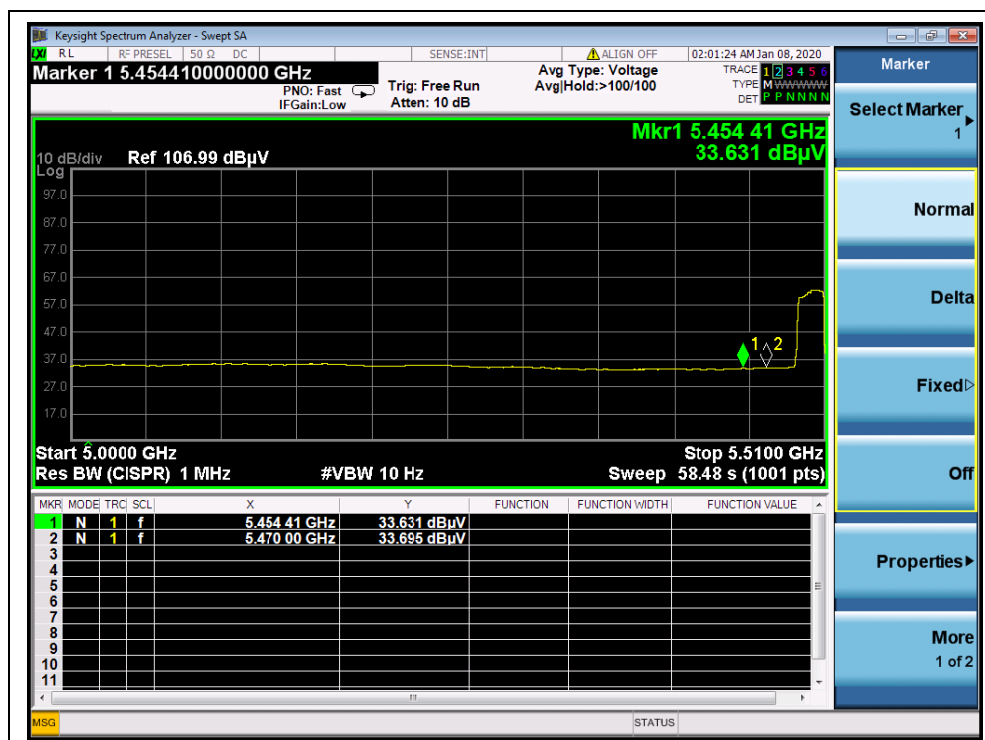
(PEAK,Channel64, 802.11a)



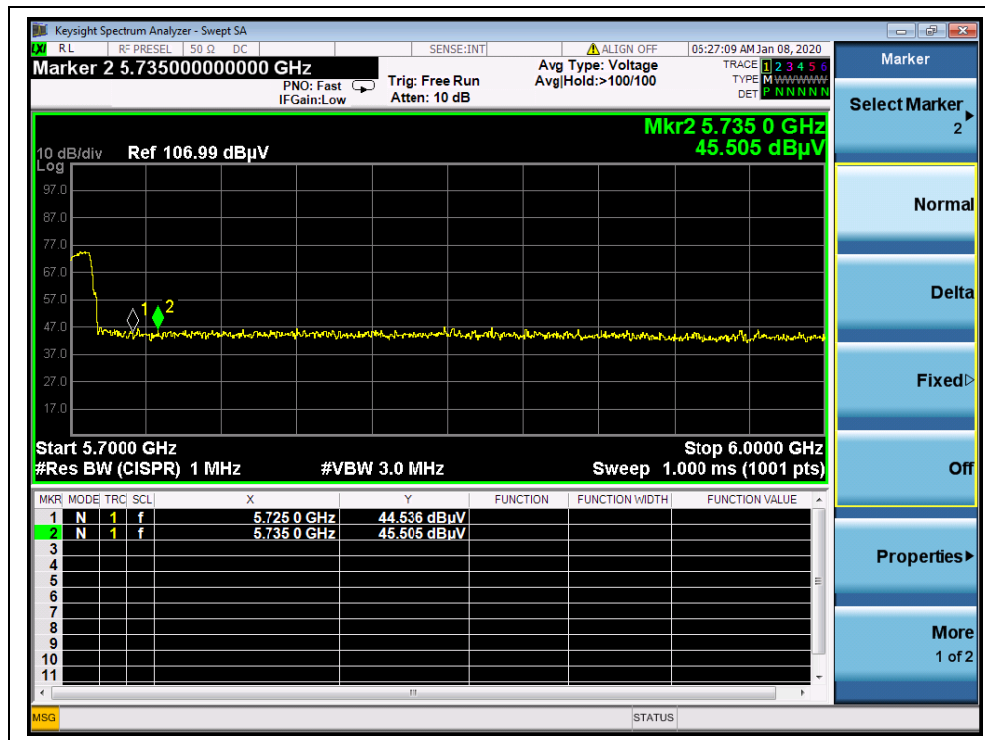
(AVG,Channel 64, 802.11a)



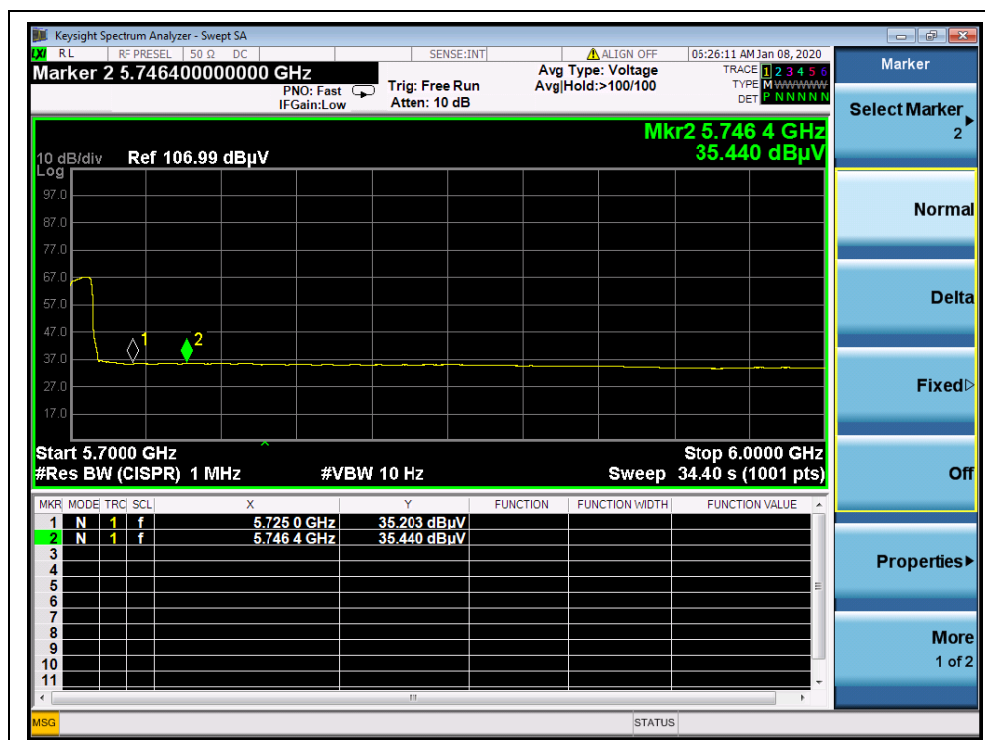
(PEAK,Channel100, 802.11a)



(AVG,Channel 100, 802.11a)



(PEAK,Channel144, 802.11a)



(AVG,Channel 144, 802.11a)