



REPORT No.: SZ18050094W04

TEST REPORT

APPLICANT : Thundercomm Technology Co., Ltd

PRODUCT NAME : Thundersoft TurboX S626 SOM

MODEL NAME : TurboX S626

BRAND NAME : TurboX

FCC ID : 2AOHHTURBOXSOMS626

STANDARD(S) : 47 CFR Part 15 Subpart E

TEST DATE : 2018-05-24 to 2018-05-31

ISSUE DATE : 2018-06-12

Tested by:

Su Hang

Su Hang (Test Engineer)

Approved by:

Andy Yeh

Andy Yeh (Technical Director)

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MORLAB

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Change History		
Issue	Date	Reason for change
1.0	2018-06-12	First edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Thundercomm Technology Co., Ltd
Applicant Address:	4 floor, Taixiang Building 1A# Longxiang Road Haidian District Beijing, China,100191
Manufacturer:	Thundercomm Technology Co., Ltd
Manufacturer Address:	4 floor, Taixiang Building 1A# Longxiang Road Haidian District Beijing, China,100191

1.2. Equipment Under Test (EUT) Description

Product Name:	Thundersoft TurboX S626 SOM	
Serial No:	(N/A, marked #1 by test site)	
Hardware Version:	S625_SOM_V03	
Software Version:	N/A	
Modulation Type:	OFDM	
Modulation Mode:	802.11a, 802.11n(HT20), 802.11n(HT40)	
Operating Frequency Range:	5.180 GHz- 5.240 GHz; 5.745GHz- 5.825GHz	
Channel Number:	Refer to 1.3	
Antenna Type:	PCB Antenna Note1	
Antenna Gain:	4 dBi Note1	
Operating voltage:	Normal(NV):	3.8V
	Lowest(LV):	3.5V
	Highest(HV):	4.4V

Note 1: The product will not sell with antenna. The antennas we use for all radiated test were just for test, the antenna type is PCB antenna and the antenna gain is 4 dBi. For more detailed, please refer to the internal photos.

Note 2: WIFI hotspot does not support U-NII band.

Note 3: During test, the duty cycle of the EUT was setting to 100%.

Note 4: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



1.3. The channel number and frequency of EUT

Frequency Range: 5180-5240MHz				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	36	5180	40	5200
	44	5220	48	5240
40MHz	38	5190	46	5230
Frequency Range: 5745-5805MHz				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	149	5745	153	5765
	157	5785	161	5805
	165	5825		
40MHz	151	5775	159	5795

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



1.4. 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
1	15.203	Antenna Requirement	N/A	N/A	PASS
2	15.407(a) (e)	Emission Bandwidth	May 25, 2018	Su Hang	PASS
3	15.407(a)	Maximum conducted output Power	May 25, 2018	Su Hang	PASS
4	15.407(a)	Peak Power spectral density	May 25, 2018	Su Hang	PASS
5	15.407(b)	Restricted Frequency Bands	May 25, 2018	Peng Xuwei	PASS
6	15.207	Conducted Emission	May 24, 2018	Peng Xuwei	PASS
7	15.407(b)	Radiated Emission	May 30, 2018	Peng Xuwei	PASS
8	15.407(c)	Automatically discontinue transmission requirement	N/A	N/A	PASS
Note2: The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.10 2013.					
Note3: These RF tests were performed according to the method of measurements prescribed in KDB789033 D02 General UNII Test Procedures New Rules v01r03					

1.5. 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 15C 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. 2.1.2 Result: Compliant

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

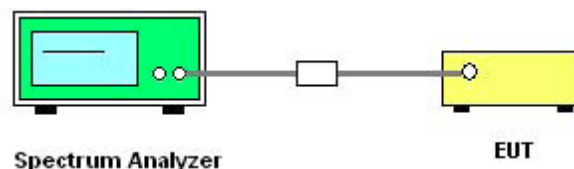
2.2. Emission Bandwidth

2.2.1. 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.

2.2.2. Test Description

A. Test Set:



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.

B. 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 the 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 the 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.

2.2.3. Test Result

802.11a Test mode

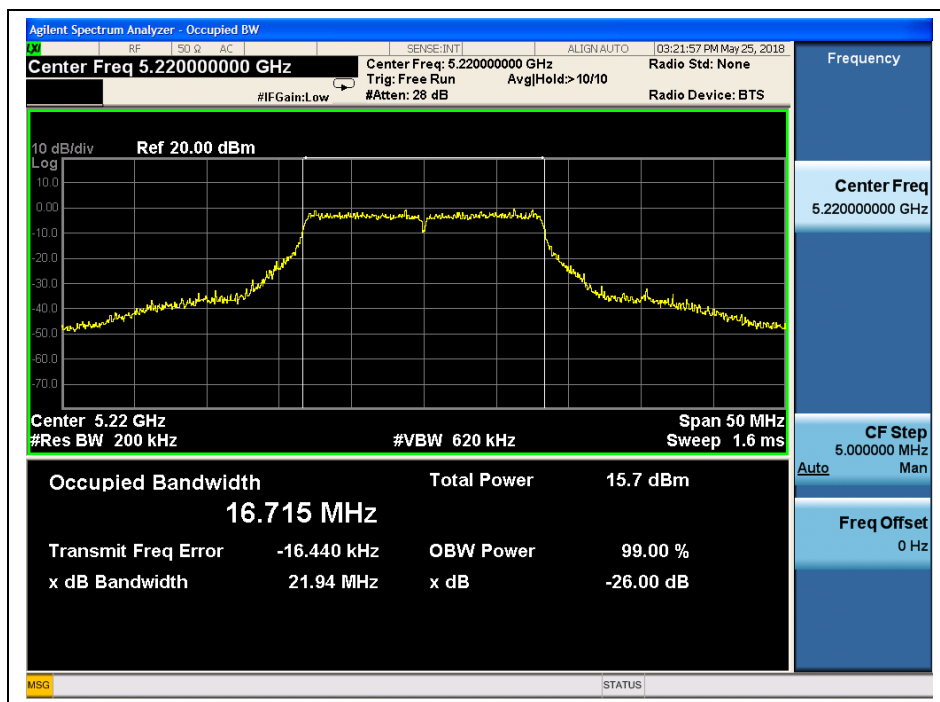
A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	21.56
44	5220	21.94
48	5240	21.85
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
149	5745	16.46
157	5785	16.45
165	5825	16.45

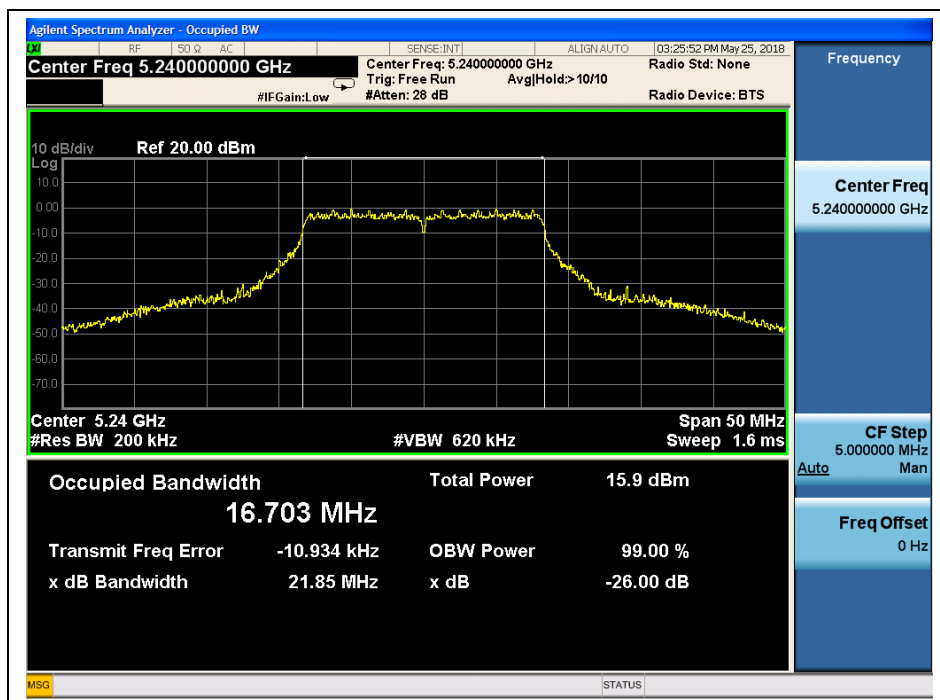
B. Test Plots



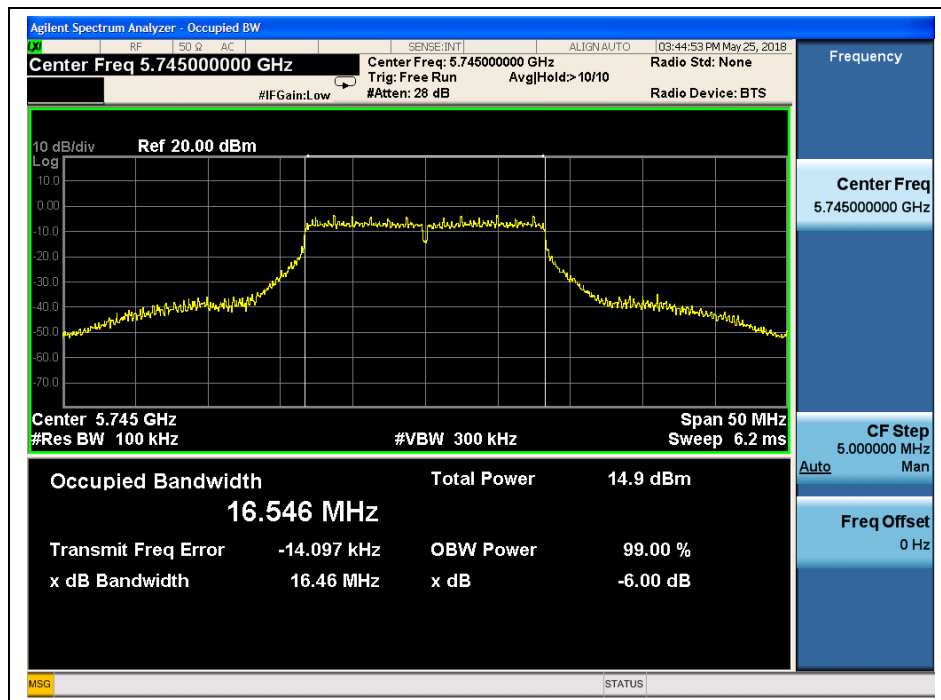
(Channel 36, 5180MHz, 802.11a,)



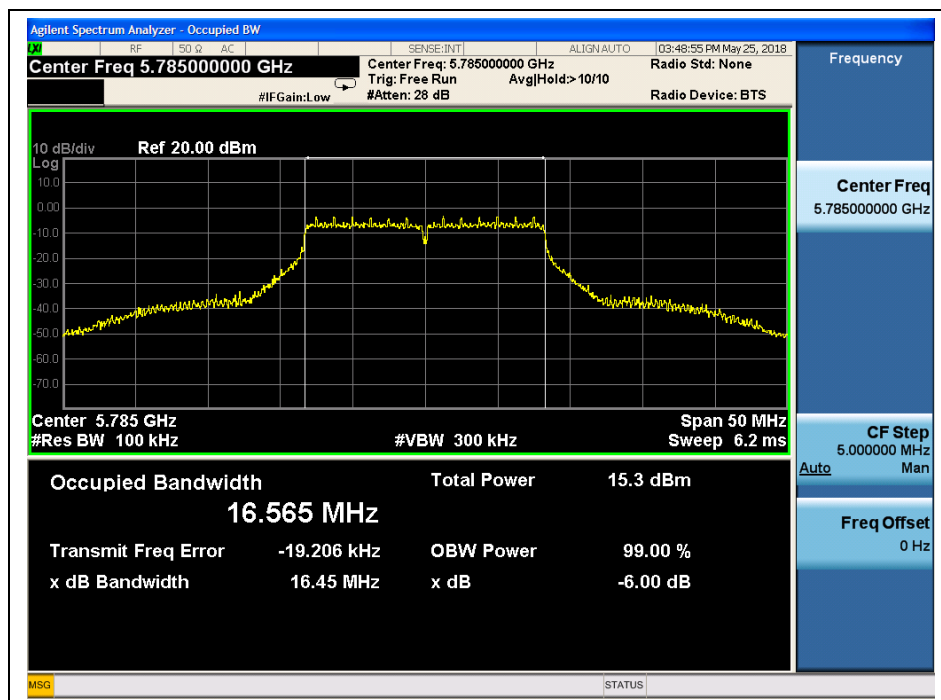
(Channel 44, 5220 MHz, 802.11a,)



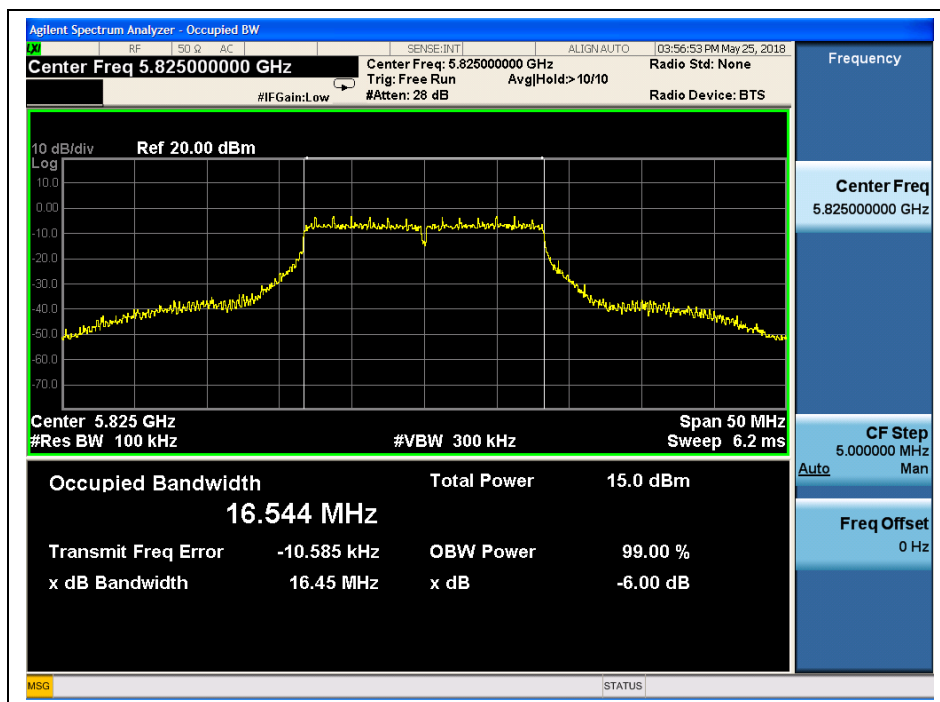
(Channel 48, 5240MHz, 802.11a,)



(Channel 149, 5745MHz, 802.11a)



(Channel 157, 5785MHz, 802.11a)



(Channel 165, 5825MHz, 802.11a)

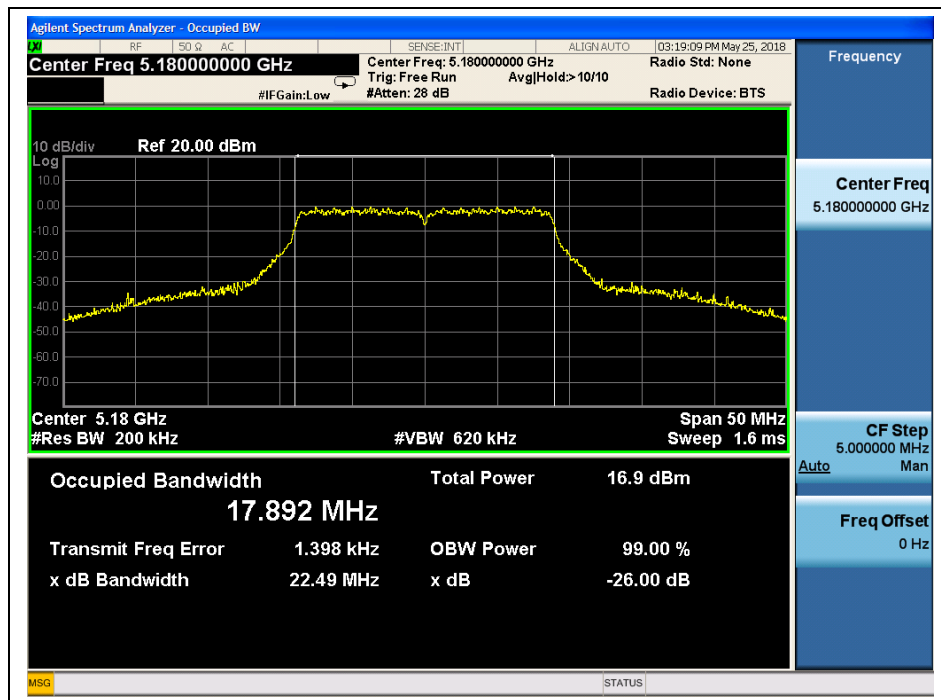


802.11n (HT20) Test mode

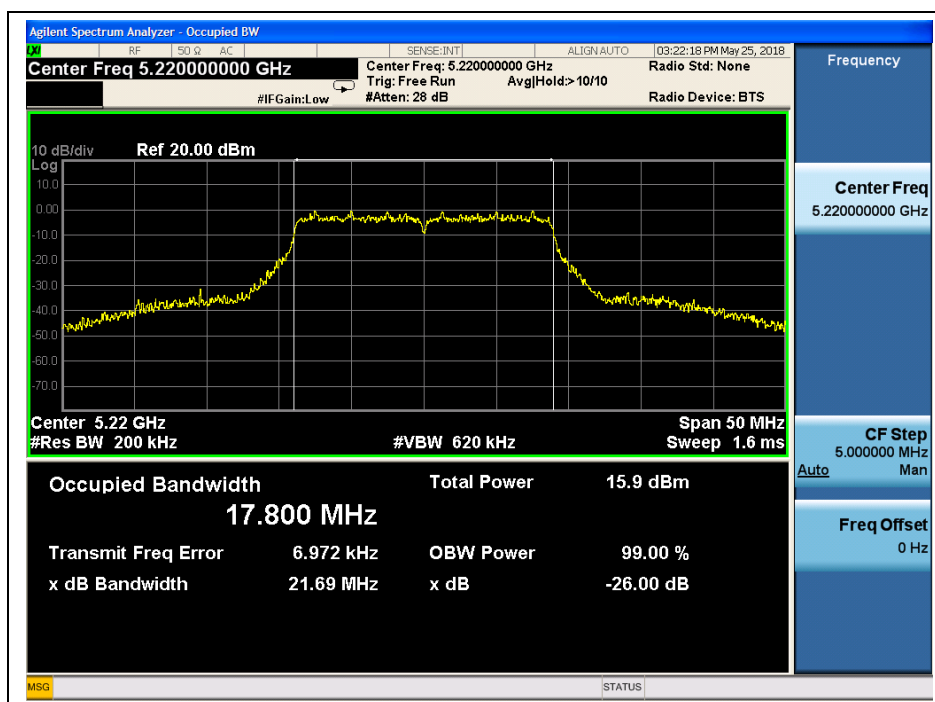
A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	22.49
44	5220	21.69
48	5240	21.82
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
149	5745	17.67
157	5785	17.69
165	5825	17.67

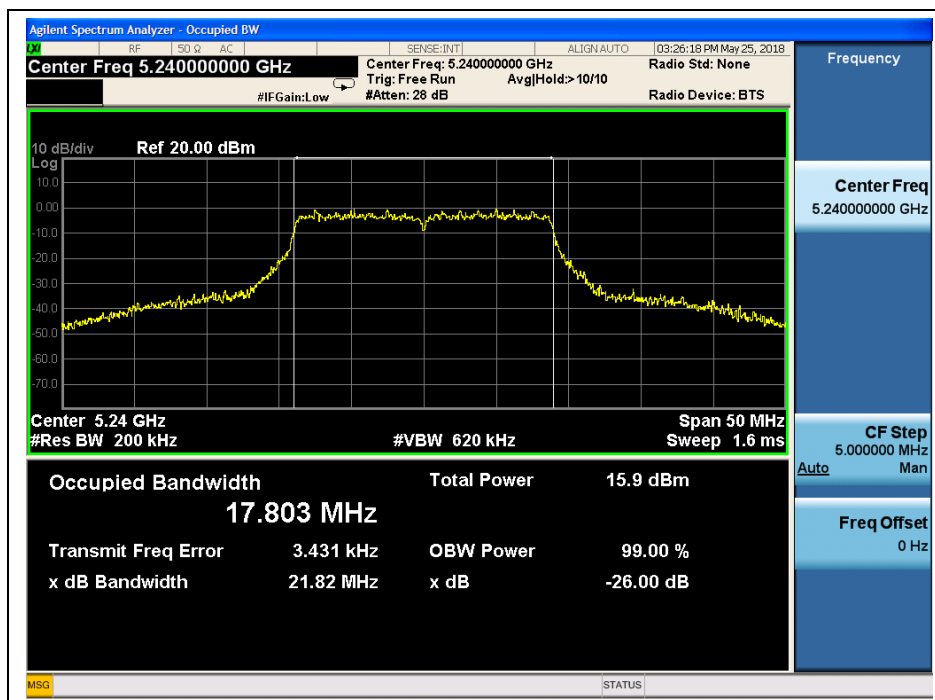
B. Test Plots



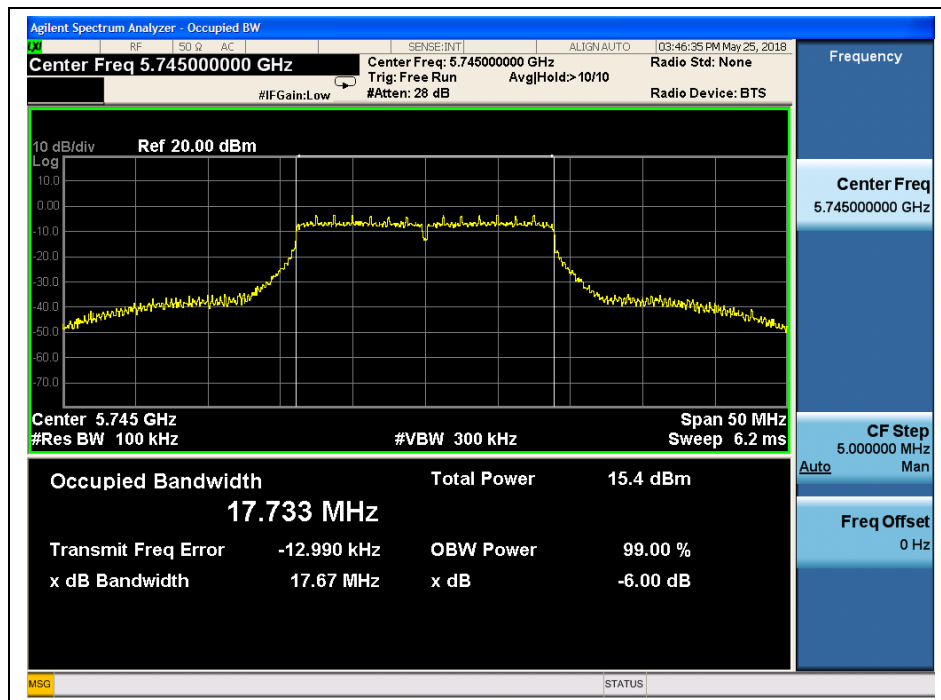
(Channel 36, 5180MHz, 802.11 n (HT20))



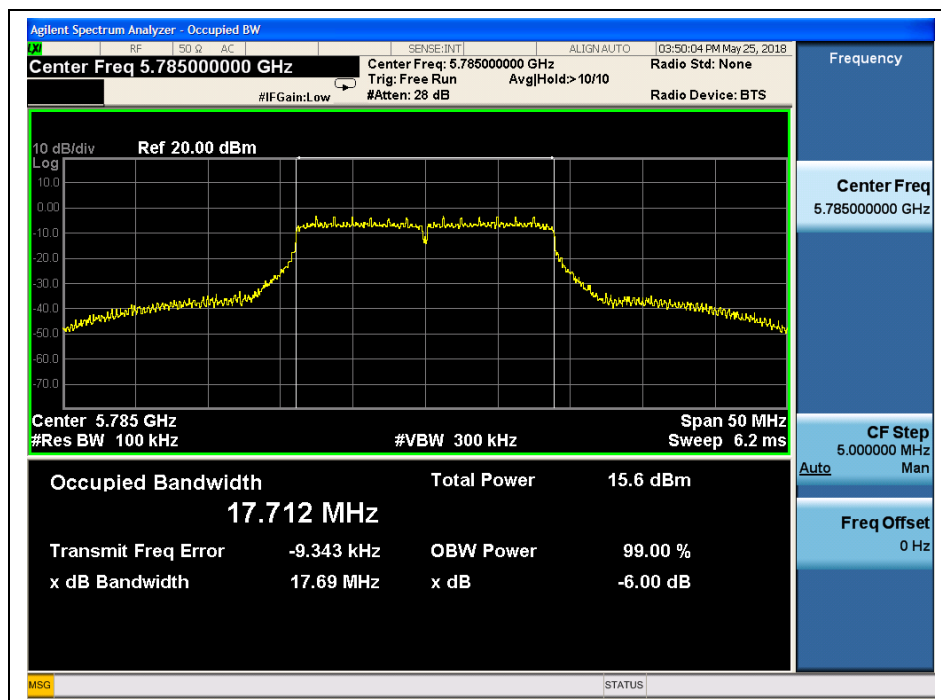
(Channel 44, 5220 MHz, 802.11 n (HT20))



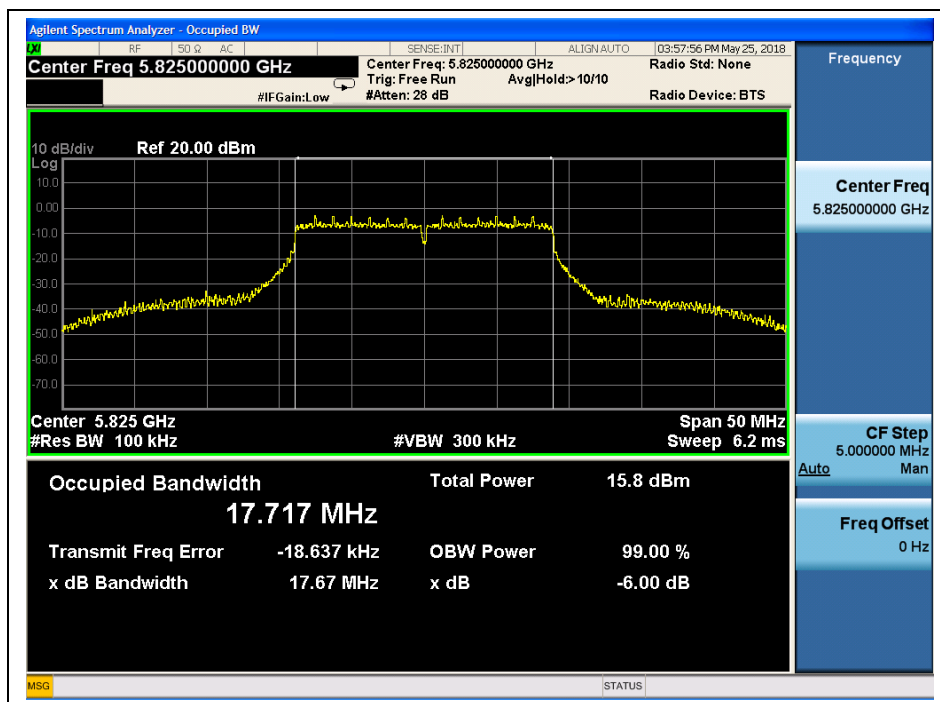
(Channel 48, 5240MHz, 802.11 n (HT20))



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



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



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

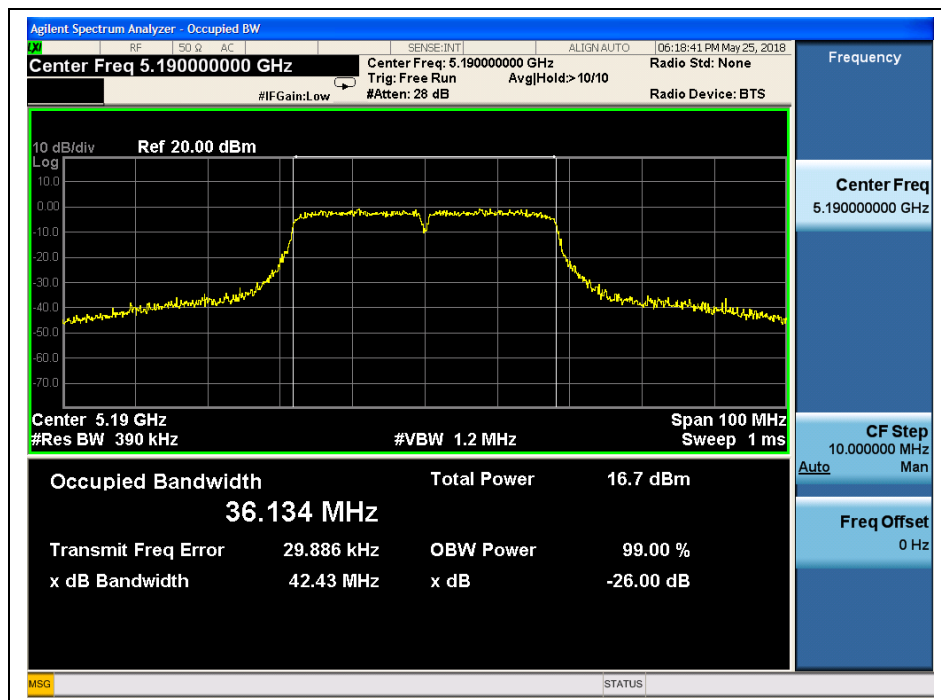


802.11n (HT40) Test mode

A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
38	5190	42.43
46	5230	43.02
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
151	5755	36.03
159	5795	35.50

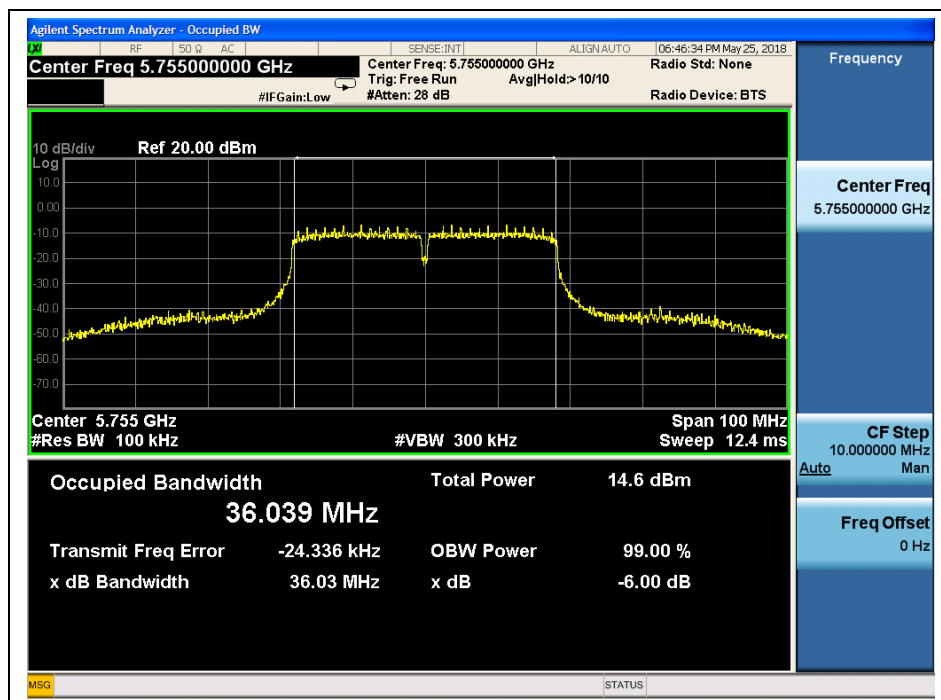
B. Test Plots



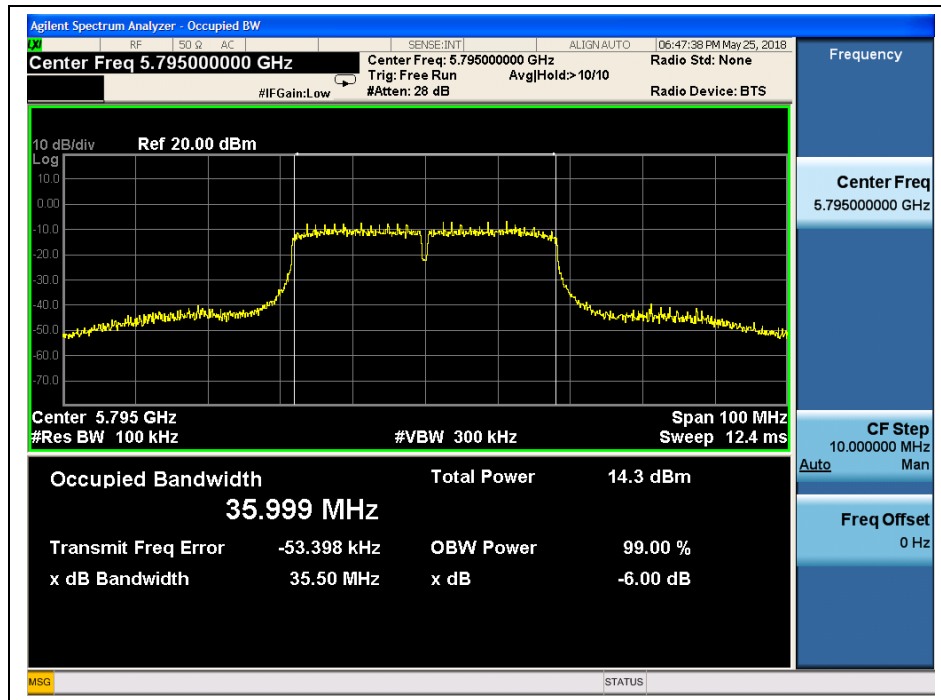
(Channel 38, 5190MHz, 802.11n (HT40))



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



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



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

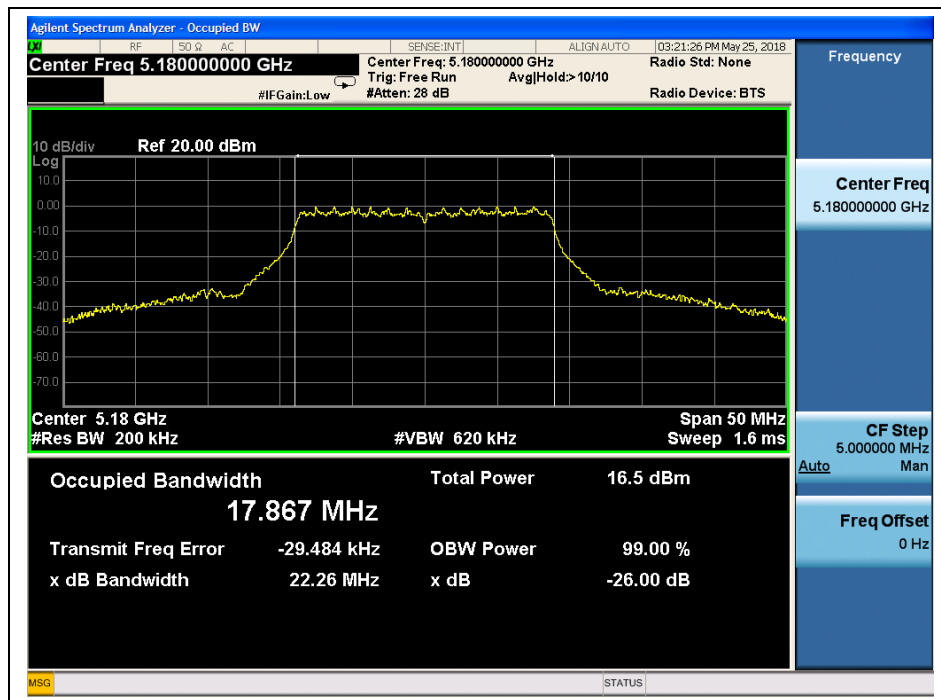


802.11ac (VHT20) Test mode

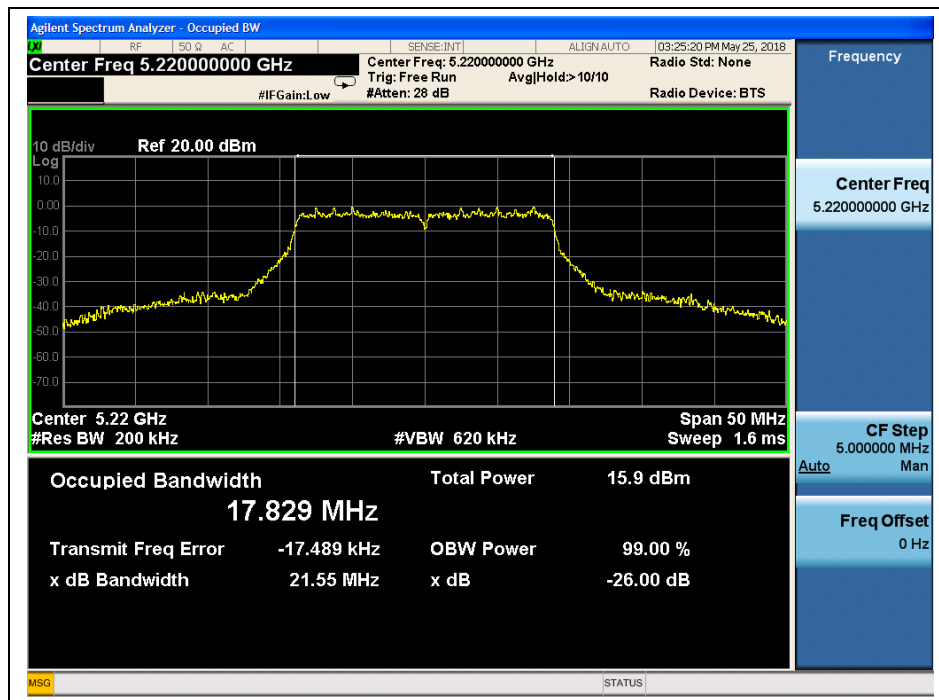
A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	22.26
44	5220	21.55
48	5240	21.83
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
149	5745	17.63
157	5785	17.65
165	5825	17.62

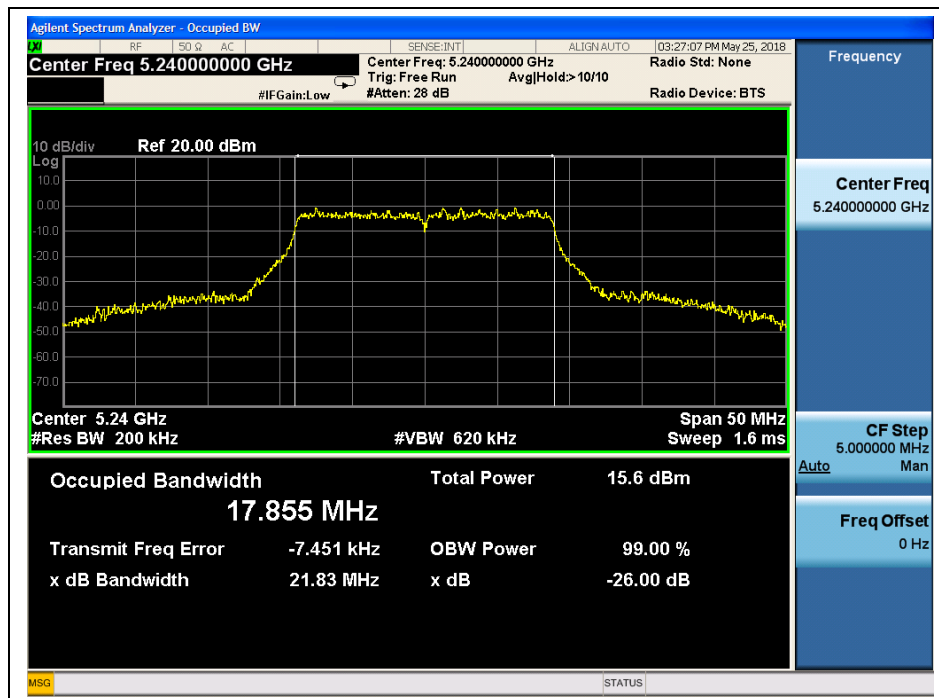
B. Test Plots



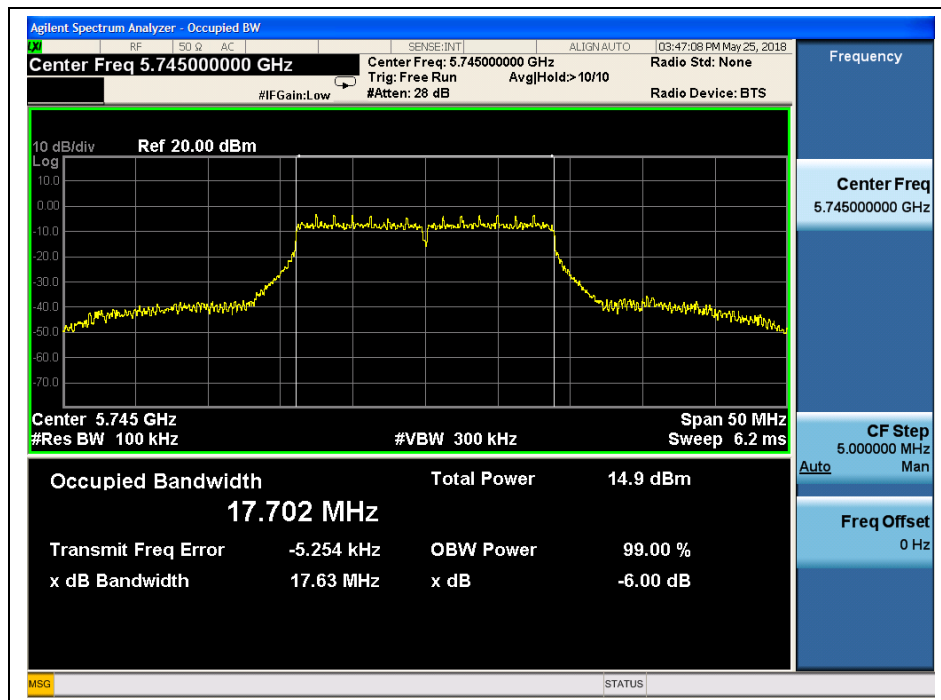
(Channel 36, 5180MHz, 802.11 ac (VHT20))



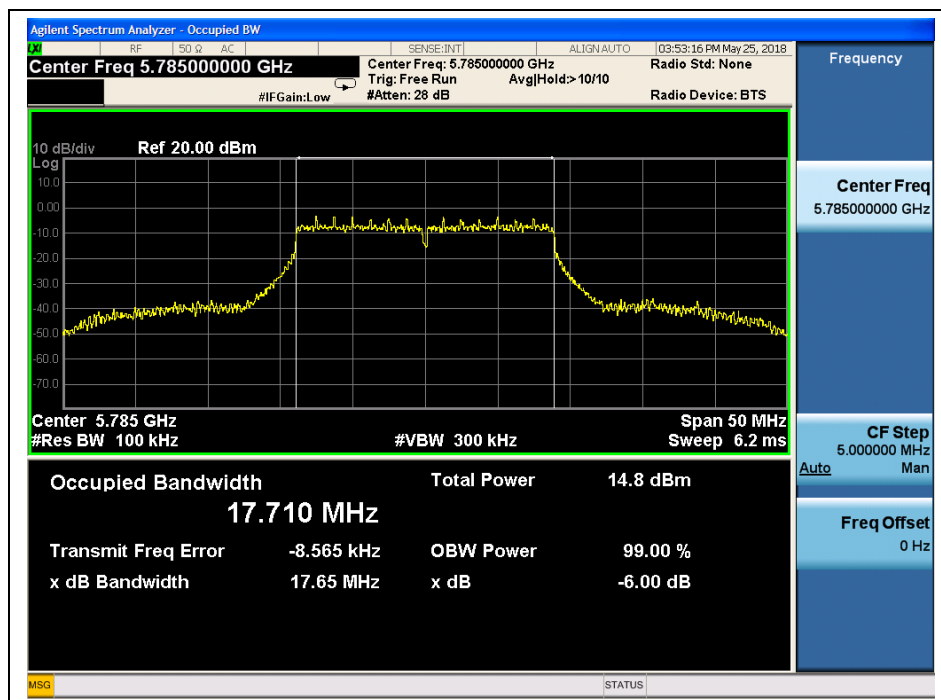
(Channel 44, 5220 MHz, 802.11 ac (VHT20))



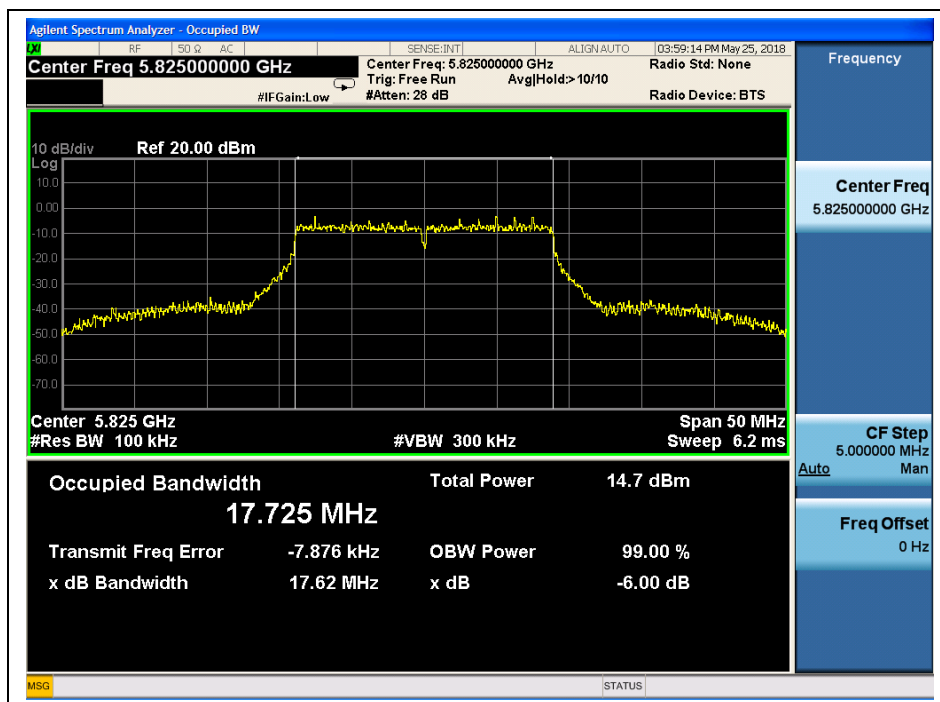
(Channel 48, 5240MHz, 802.11 ac (VHT20))



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



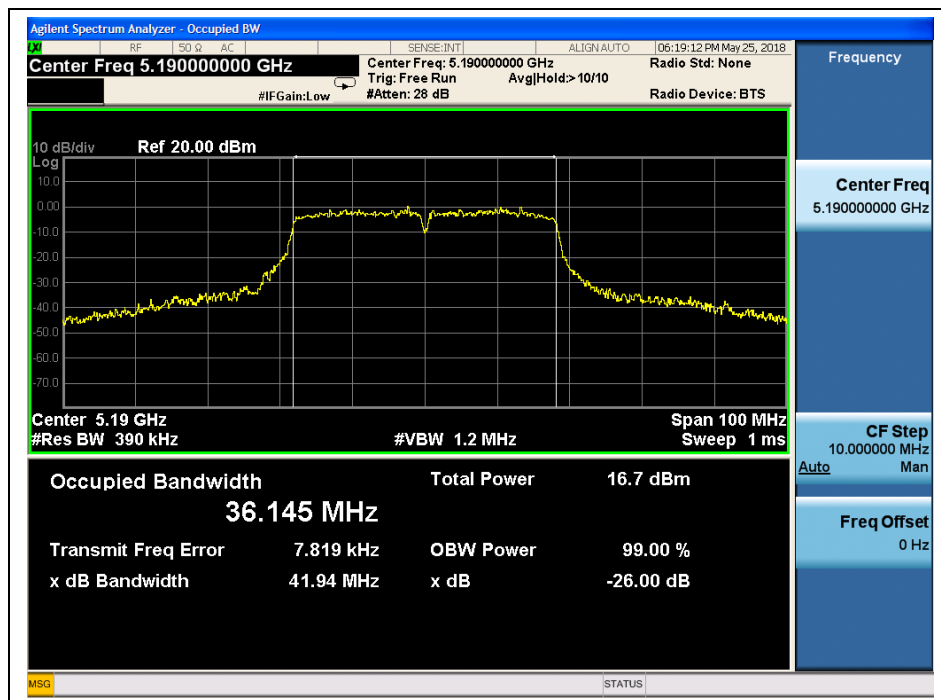
(Channel 157, 5785MHz, 802.11 ac (VHT20))



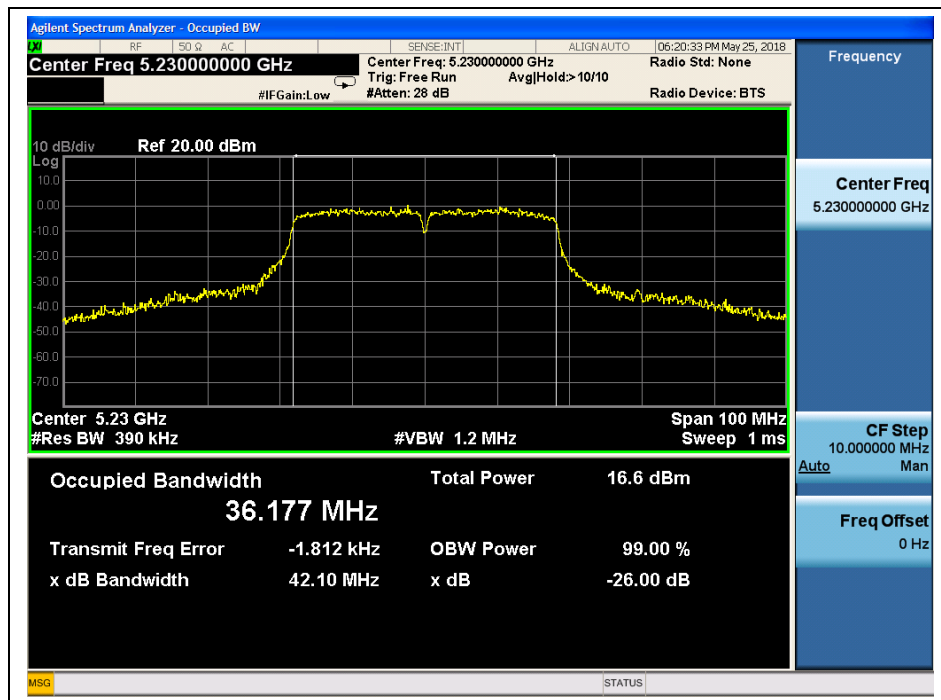
(Channel 165, 5825MHz, 802.11 ac (VHT20))

**802.11ac (VHT40) Test mode****A. Test Verdict:**

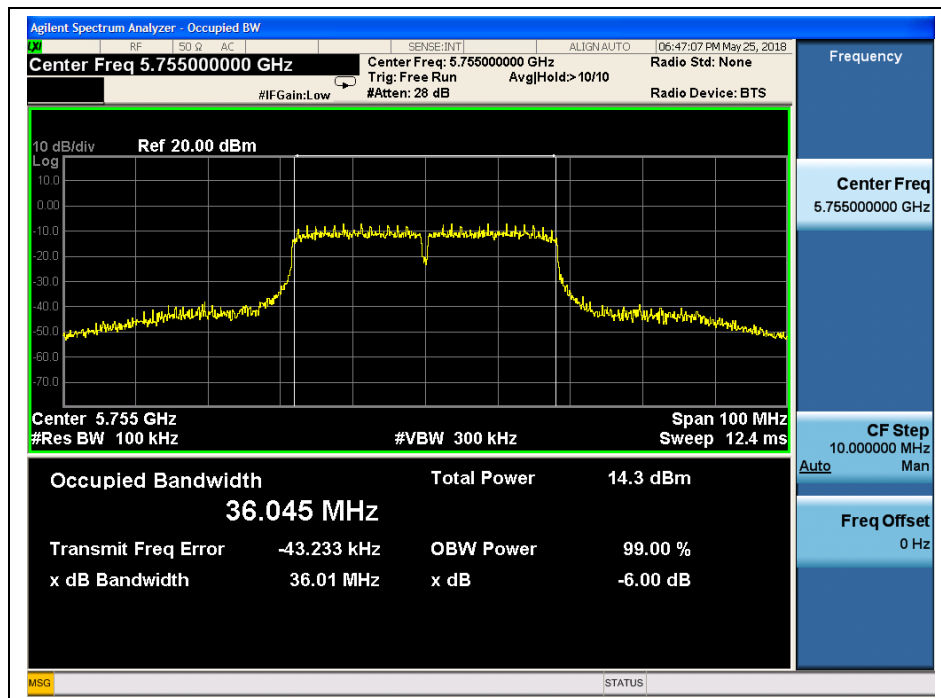
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
38	5190	41.94
46	5230	42.10
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
151	5755	36.01
159	5795	35.42

B. Test Plots

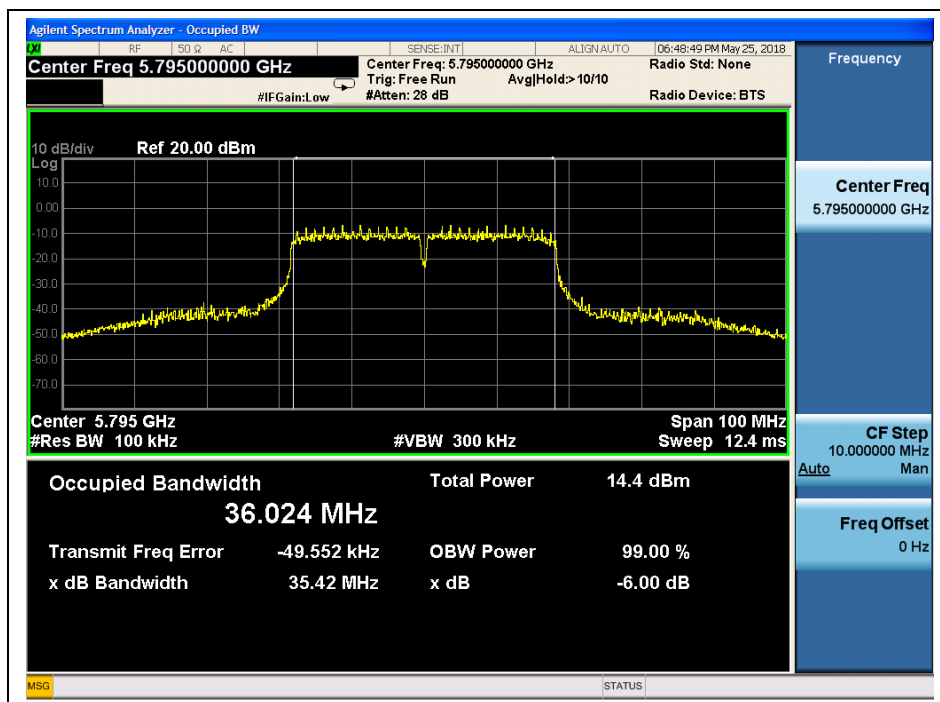
(Channel 38, 5190MHz, 802.11ac (VHT40))



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



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



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

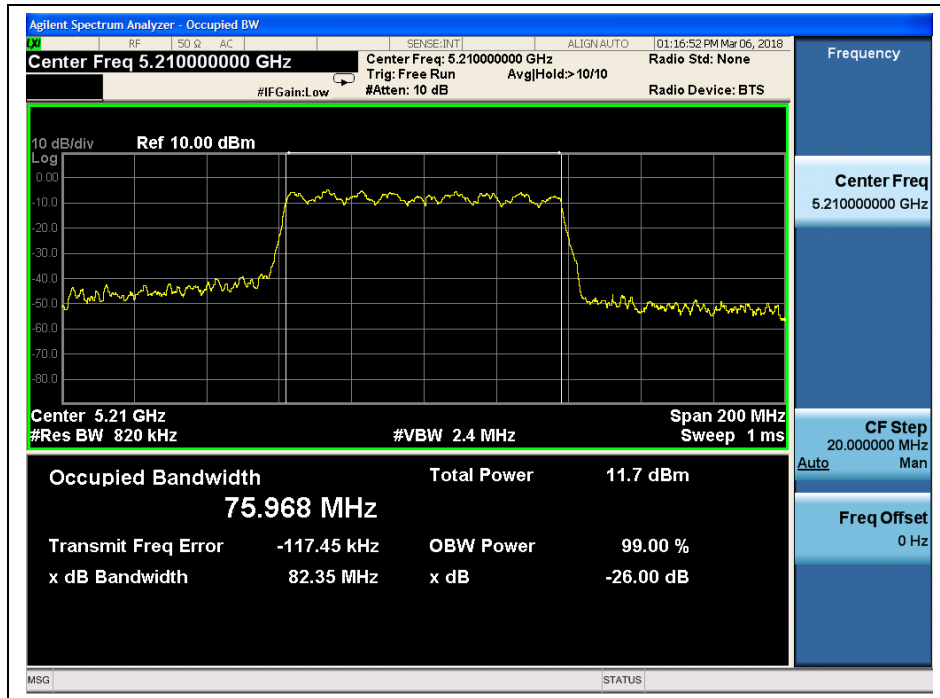
802.11ac (VHT80) Test mode

A. Test Verdict:

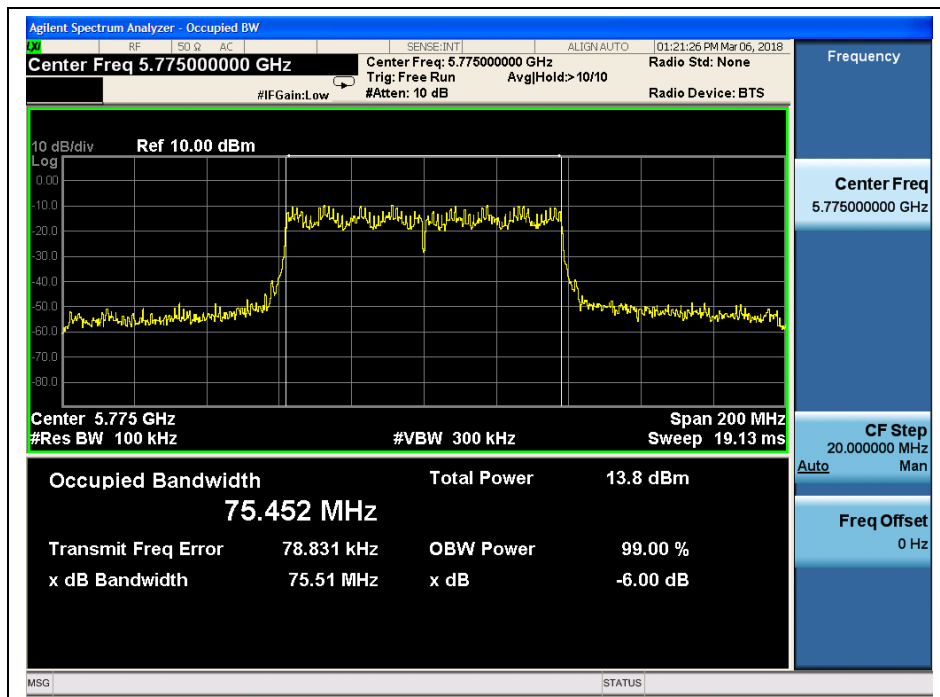
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
42	5210	82.35
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
155	5775	75.51



B. Test Plots



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



(Channel 155, 5775 MHz, 802.11 ac (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.

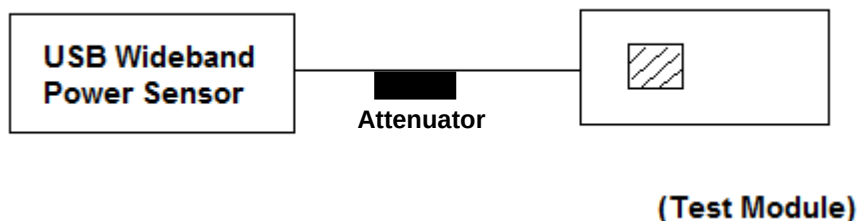
(4) According to KDB662911D01 Measure-and-sum technique, the conducted emission level (e.g., transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the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

A. 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.

**2.3.3. Test Result****802.11a Test mode**

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit (dBm)	Verdict
36	5180	20.41	24	PASS
44	5220	20.33		
48	5240	20.35		
149	5745	17.52	30	
157	5785	17.48		
165	5825	18.11		

Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit (dBm)	Verdict
36	5180	10.19	24	PASS
44	5220	10.22		
48	5240	10.28		
149	5745	9.04	30	
157	5785	8.65		
165	5825	8.78		

**802.11n (HT20) Test mode**

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit (dBm)	Verdict
36	5180	20.35	24	PASS
44	5220	20.29		
48	5240	20.41		
149	5745	17.55	30	
157	5785	17.48		
165	5825	18.00		

Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit (dBm)	Verdict
36	5180	10.15	24	PASS
44	5220	10.27		
48	5240	10.25		
149	5745	9.12	30	
157	5785	8.62		
165	5825	8.79		

802.11n (HT40) Test mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit (dBm)	Verdict
38	5190	19.69	24	PASS
46	5230	19.22		
151	5755	17.14	30	
159	5795	16.48		

Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit (dBm)	Verdict
38	5190	9.56	24	PASS
46	5230	9.59		
151	5755	8.38	30	
159	5795	7.87		

**802.11ac (VHT20) Test mode**

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit (dBm)	Verdict
36	5180	20.25	24	PASS
44	5220	20.18		
48	5240	20.20		
149	5745	17.44	30	
157	5785	17.20		
165	5825	17.84		

Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit (dBm)	Verdict
36	5180	10.04	24	PASS
44	5220	10.03		
48	5240	10.11		
149	5745	8.91	30	
157	5785	8.48		
165	5825	8.61		

802.11ac (VHT40) Test mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit (dBm)	Verdict
38	5190	18.75	24	PASS
46	5230	18.69		
151	5755	16.33	30	
159	5795	16.09		

Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit (dBm)	Verdict
38	5190	9.21	24	PASS
46	5230	9.26		
151	5755	9.55	30	
159	5795	9.21		

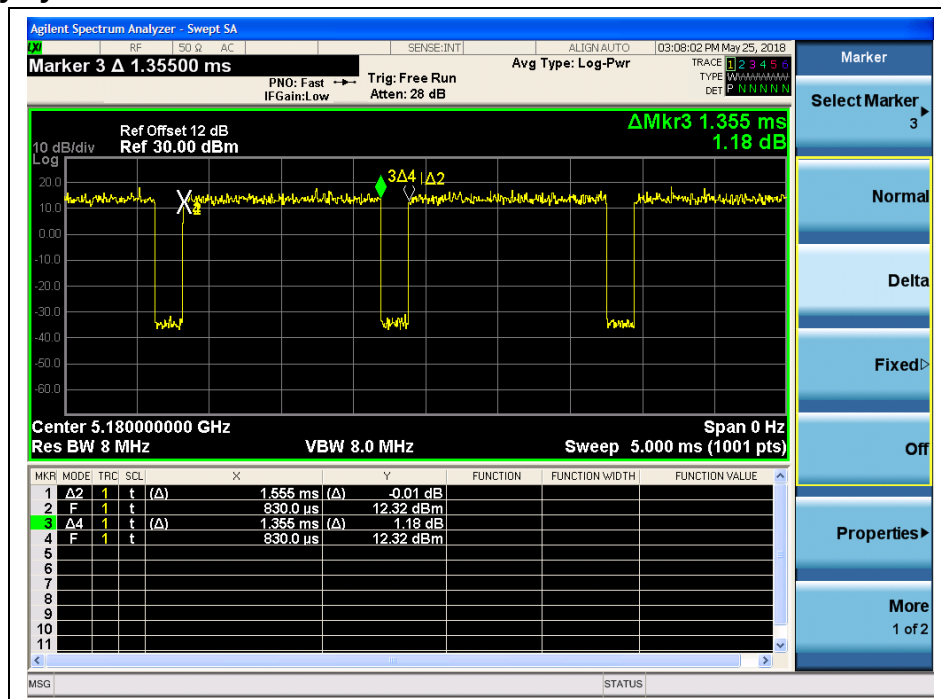


802.11ac (VHT80) Test mode

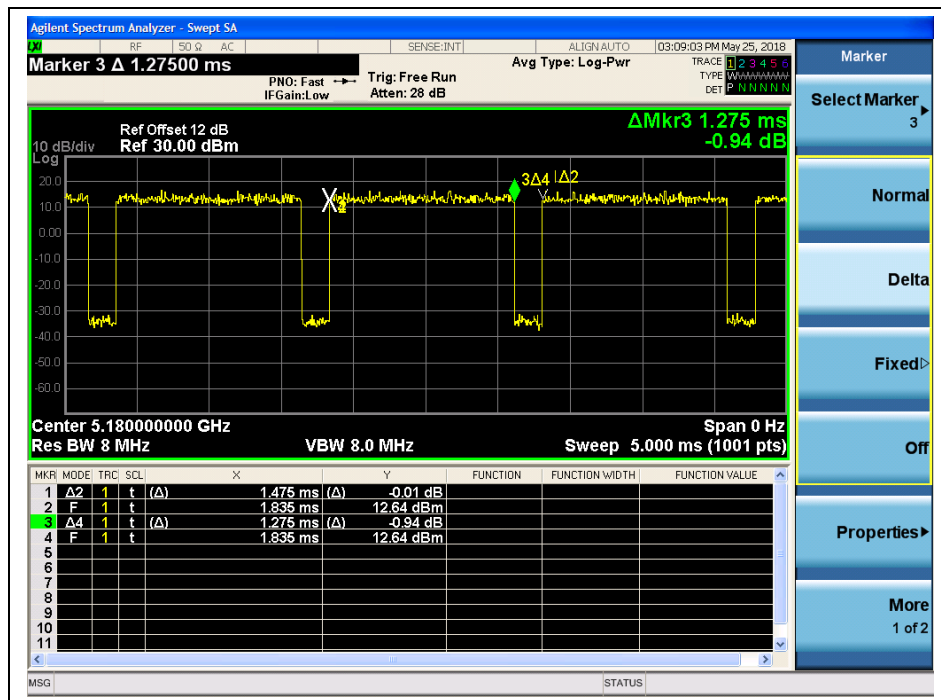
Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit (dBm)	Verdict
42	5210	18.98	24	PASS
155	5775	16.37	30	

Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit (dBm)	Verdict
42	5210	7.90	24	PASS
155	5775	6.61	30	

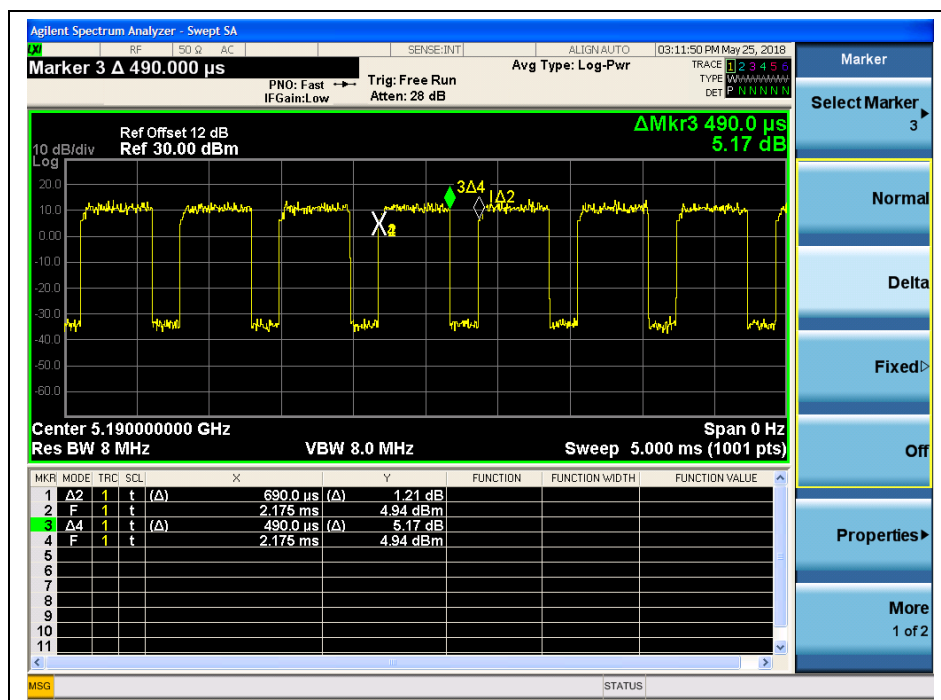
Plot for duty cycle



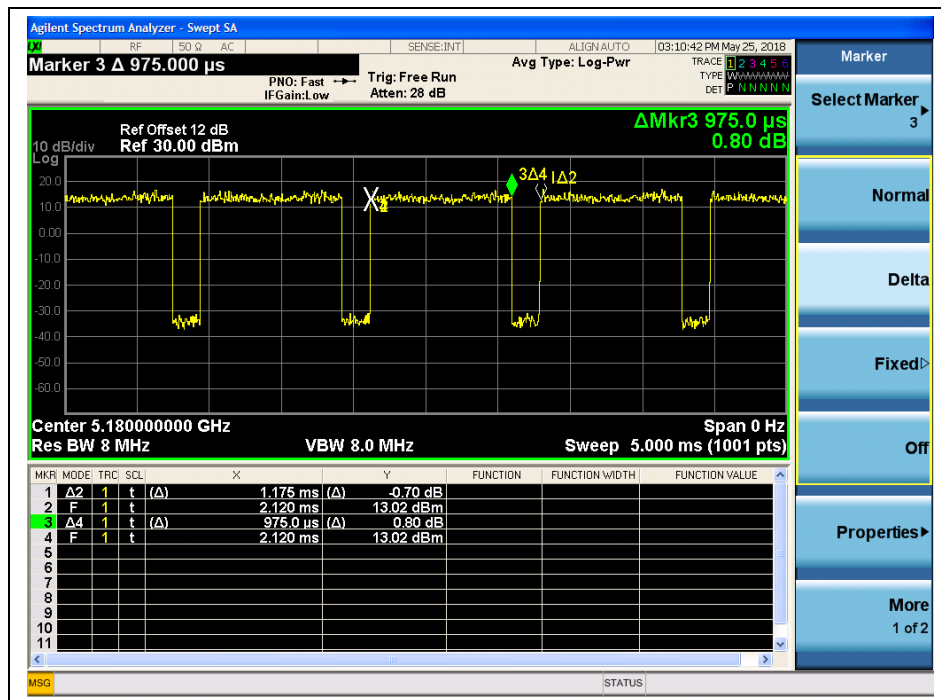
(Duty cycle for 802.11 a)



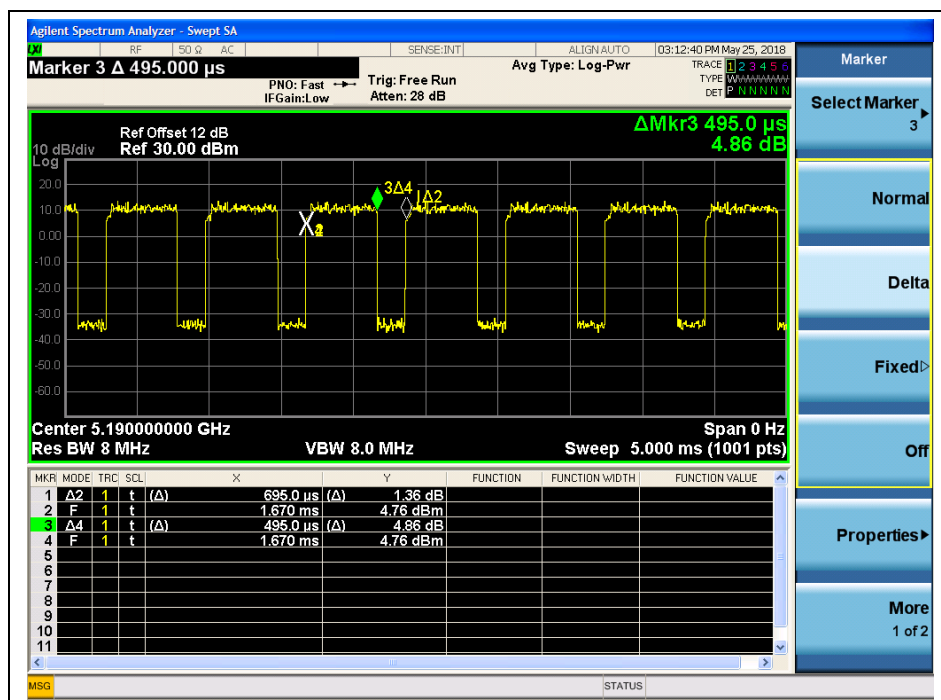
(Duty cycle for 802.11 n (HT20))



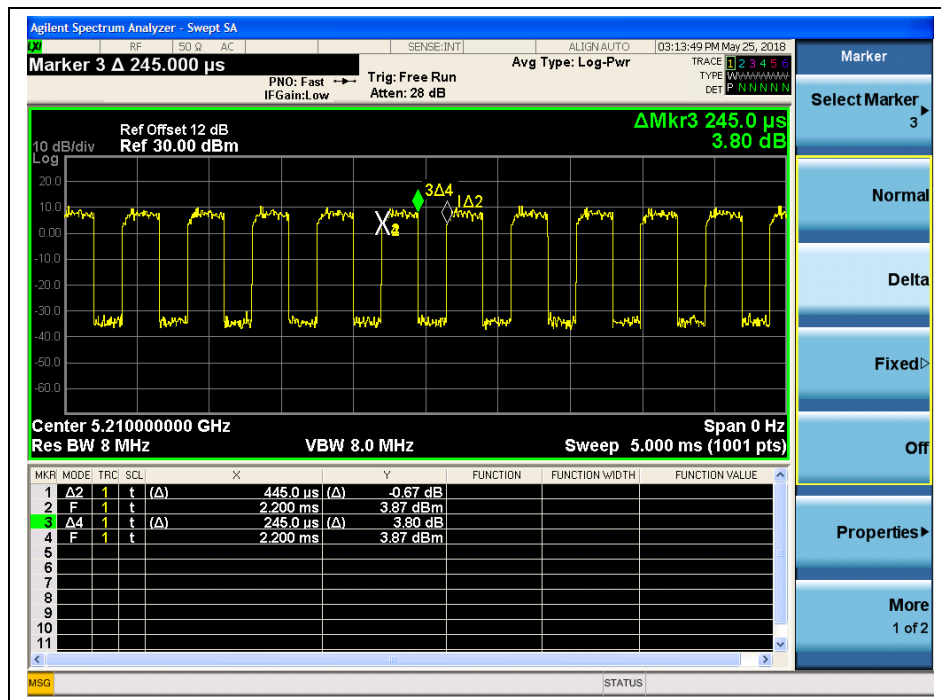
(Duty cycle for 802.11 n(HT40))



(Duty cycle for 802.11 ac (VHT20))



(Duty cycle for 802.11 ac (VHT40))



(Duty cycle for 802.11 ac (VHT80))

2.4. Peak Power spectral density

2.4.1. 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.

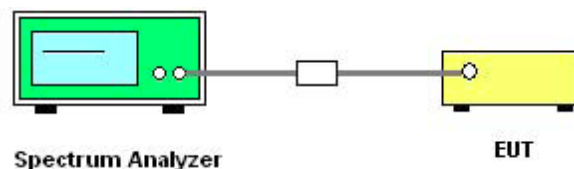
If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(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.

2.4.2. Test Description

A. Test Set:



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.

B. 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 $\geq$ 2 Span / RBW. Sweep time = auto.
- 4) Detector = RMS (i.e., power averaging)
- 5) Trace average at least 100 traces in power averaging (i.e., RMS) mode
- 6) Record the max value



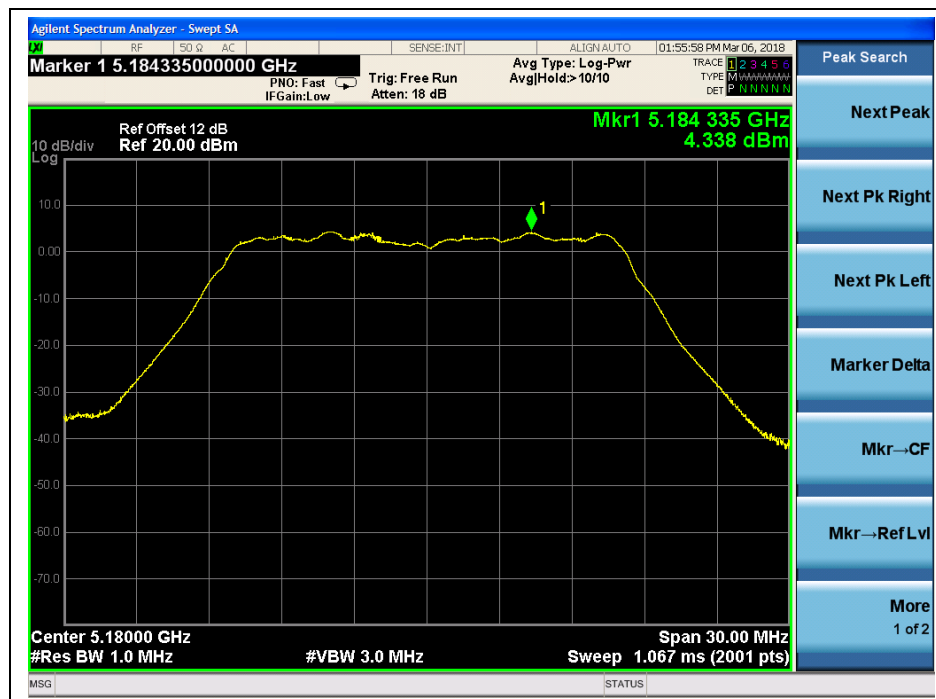
2.4.3. Test Result

802.11a Test mode

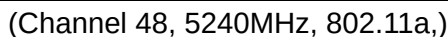
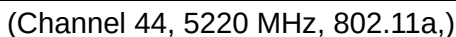
A. Test Verdict:

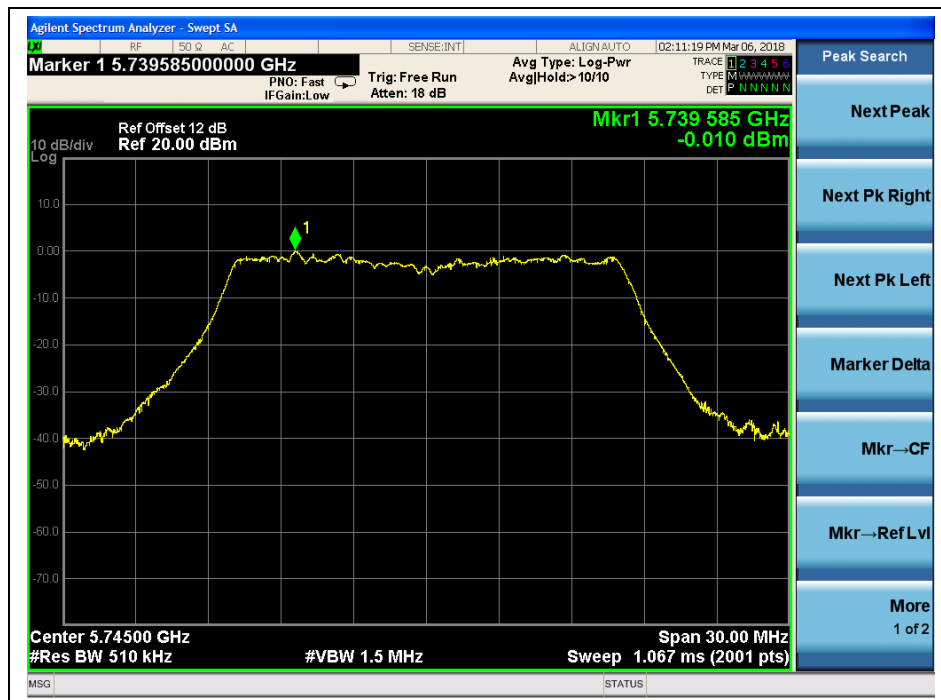
Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	4.34	11	PASS
44	5220	4.67		
48	5240	3.16		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	-0.01	30	PASS
157	5785	1.16		
165	5825	1.04		

B. Test Plots

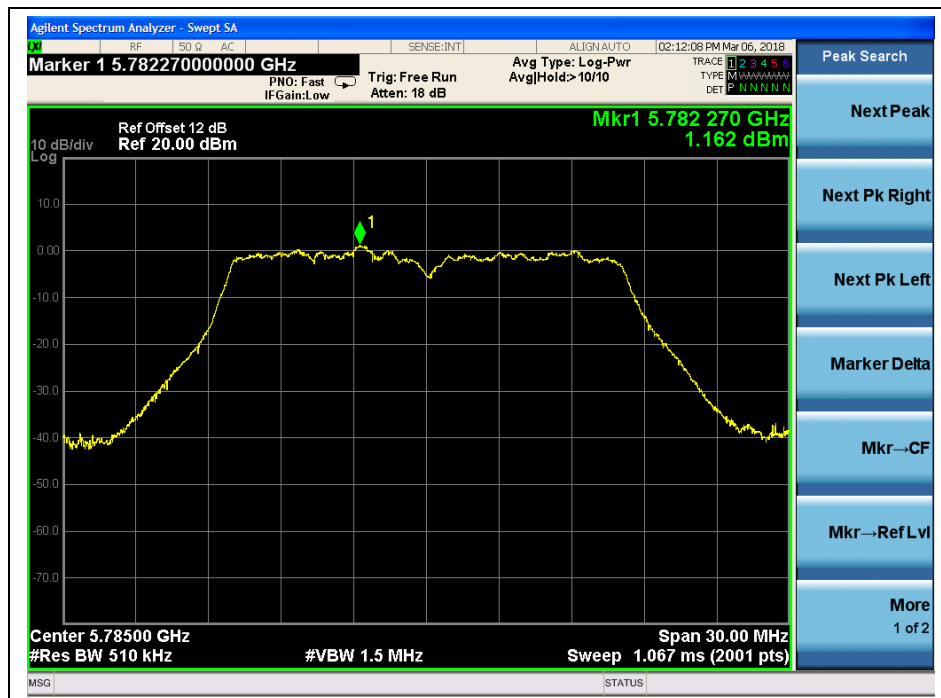


(Channel 36, 5180MHz, 802.11a,)

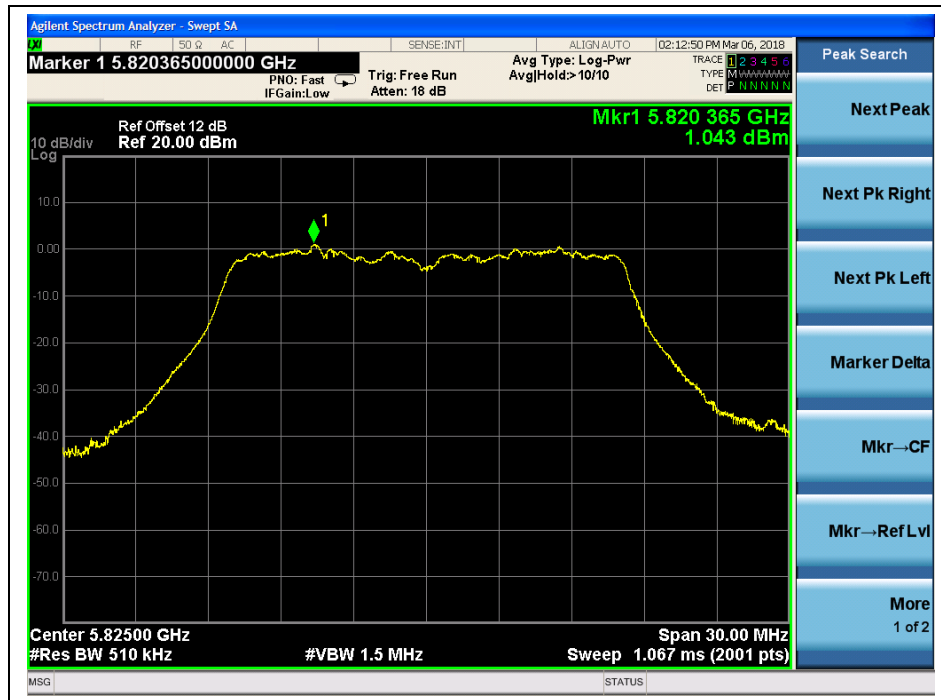




(Channel 149, 5745MHz, 802.11a)



(Channel 157, 5785MHz, 802.11a)



(Channel 165, 5825MHz, 802.11a)

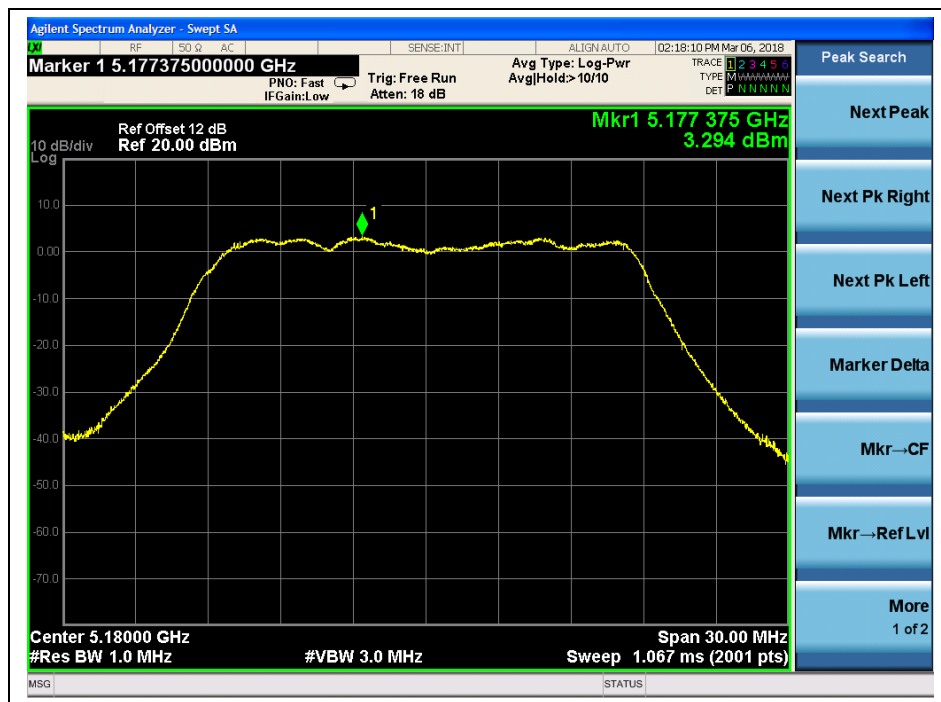


802.11n (HT20) Test mode

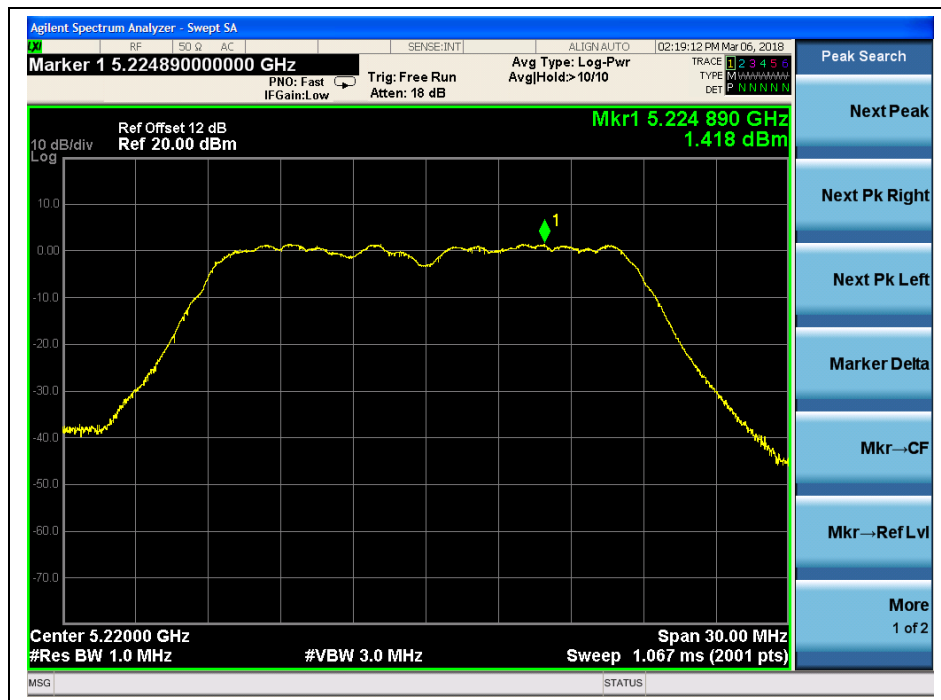
A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	3.29	11	PASS
44	5220	1.42		
48	5240	1.06		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	-1.69	30	PASS
157	5785	-0.82		
165	5825	-0.12		

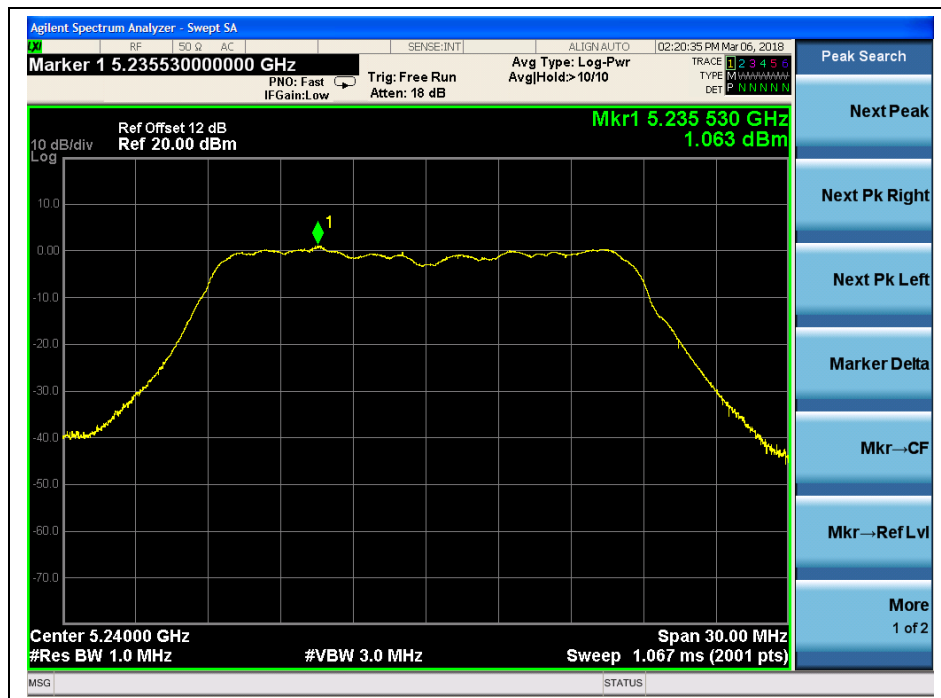
B. Test Plots



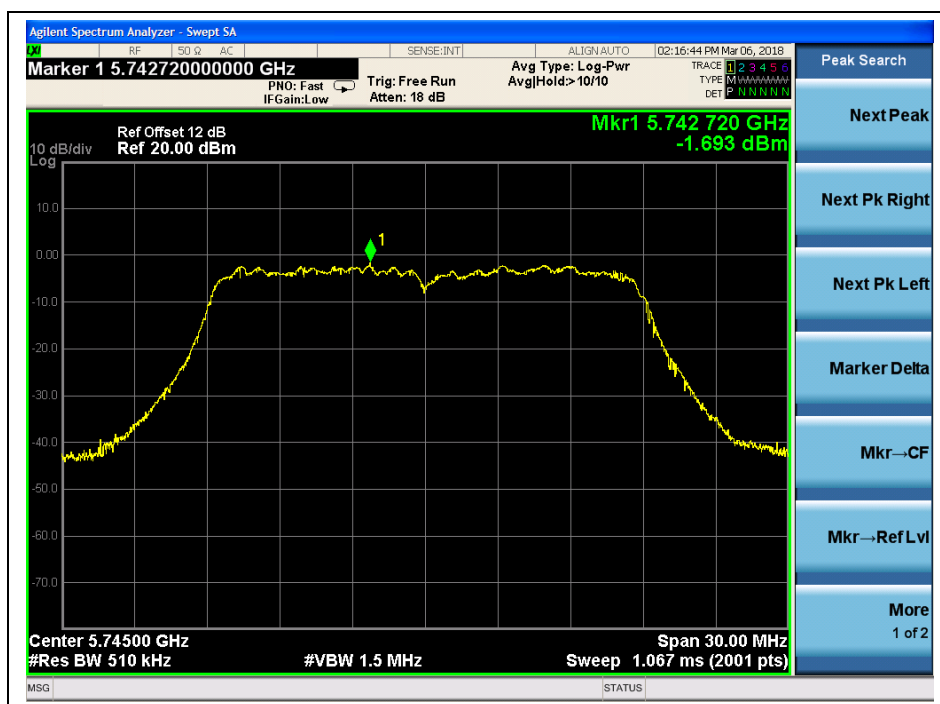
(Channel 36, 5180MHz, 802.11 n (HT20))



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



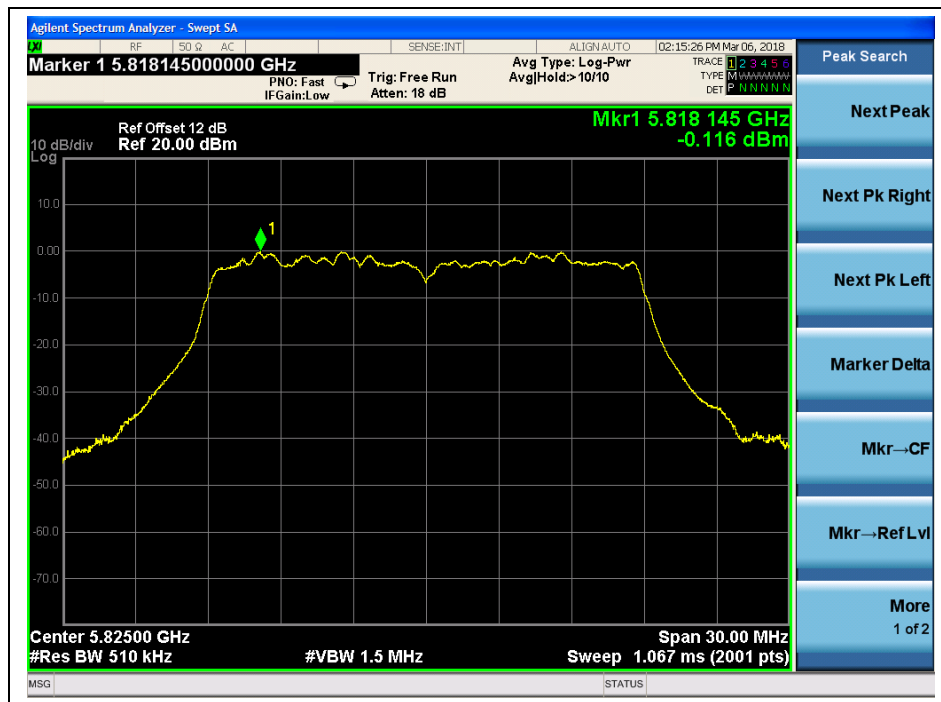
(Channel 48, 5240MHz, 802.11 n (HT20))



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



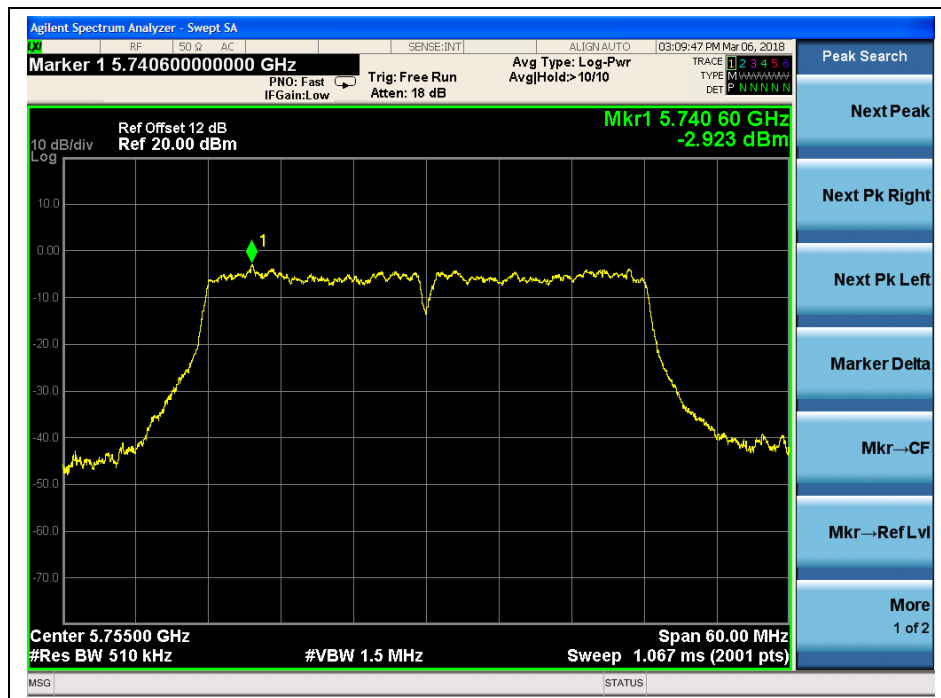
(Channel 157, 5785MHz, 802.11 n (HT20))



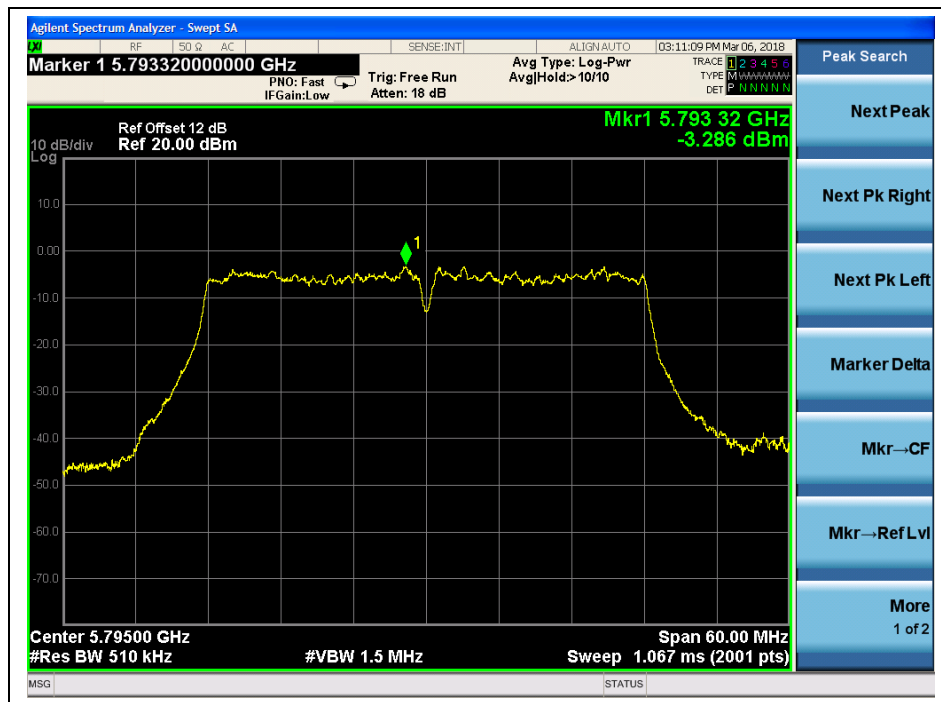
(Channel 165, 5825MHz, 802.11 n (HT20))



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



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



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

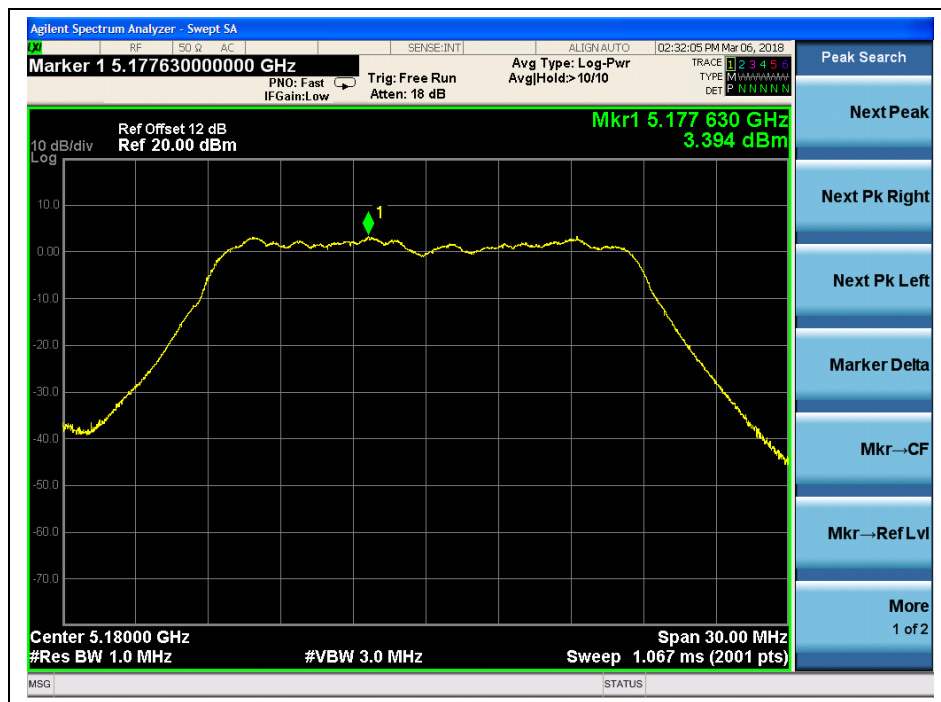


802.11ac (VHT20) Test mode

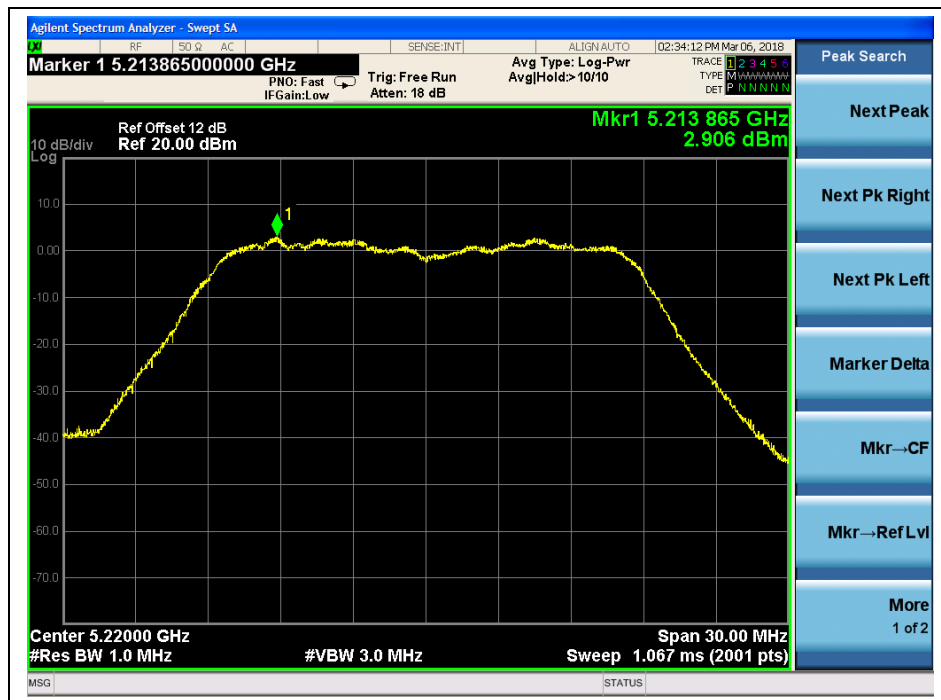
A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	3.39	11	PASS
44	5220	2.91		
48	5240	1.24		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	-1.17	30	PASS
157	5785	-1.52		
165	5825	-0.51		

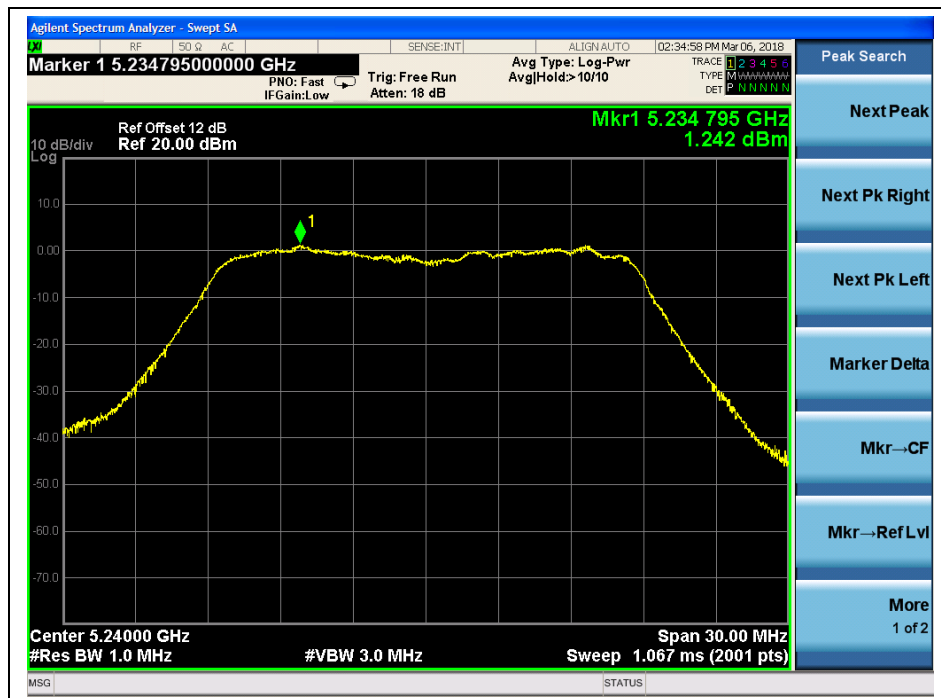
B. Test Plots



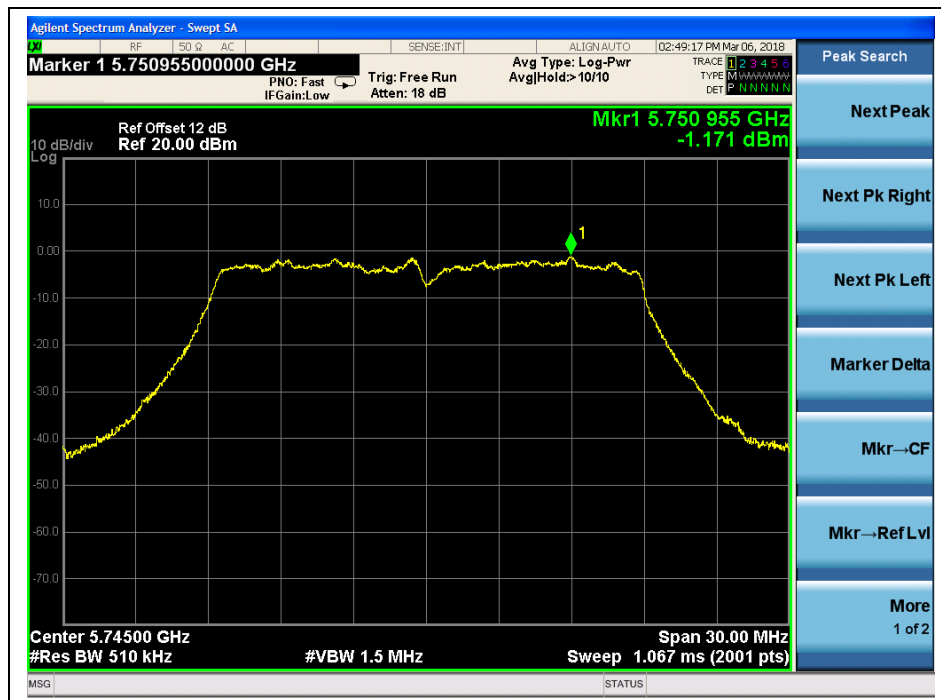
(Channel 36, 5180MHz, 802.11 ac (VHT20))



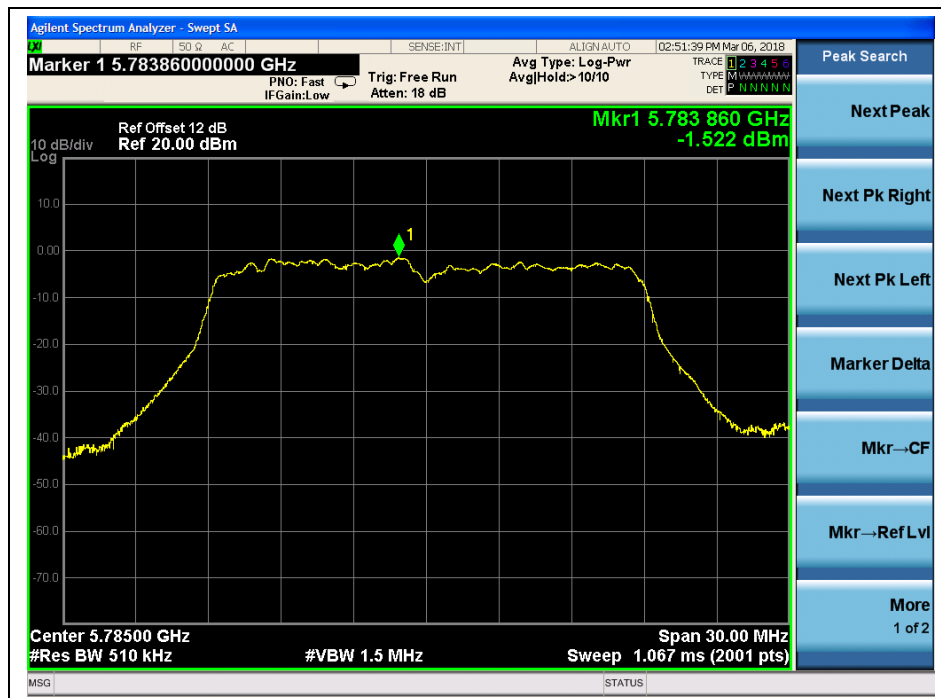
(Channel 44, 5220 MHz, 802.11 ac (VHT20))



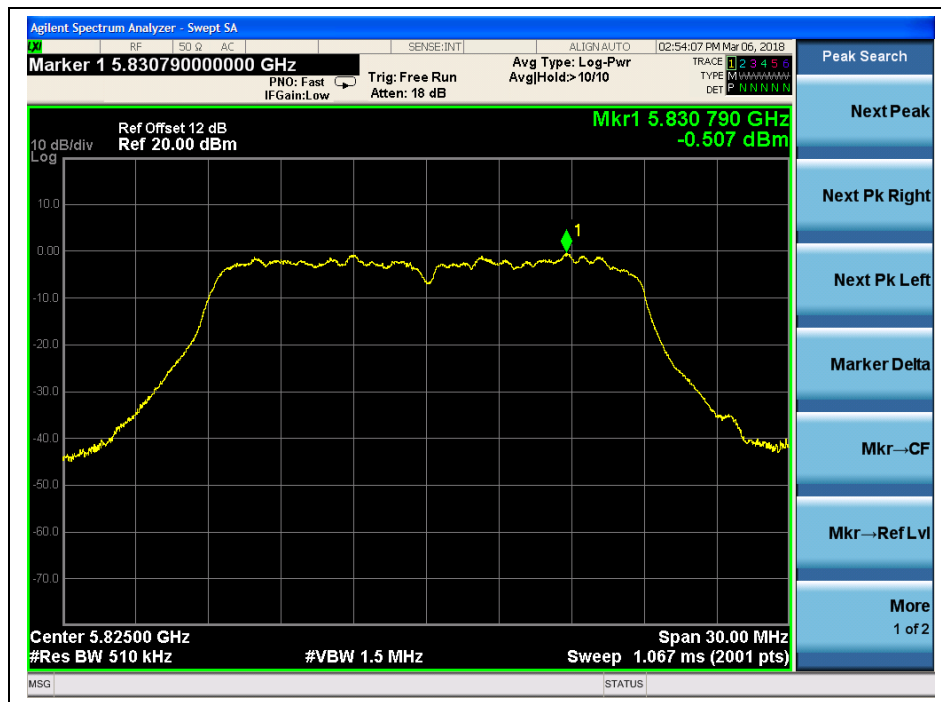
(Channel 48, 5240MHz, 802.11 ac (VHT20))



(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

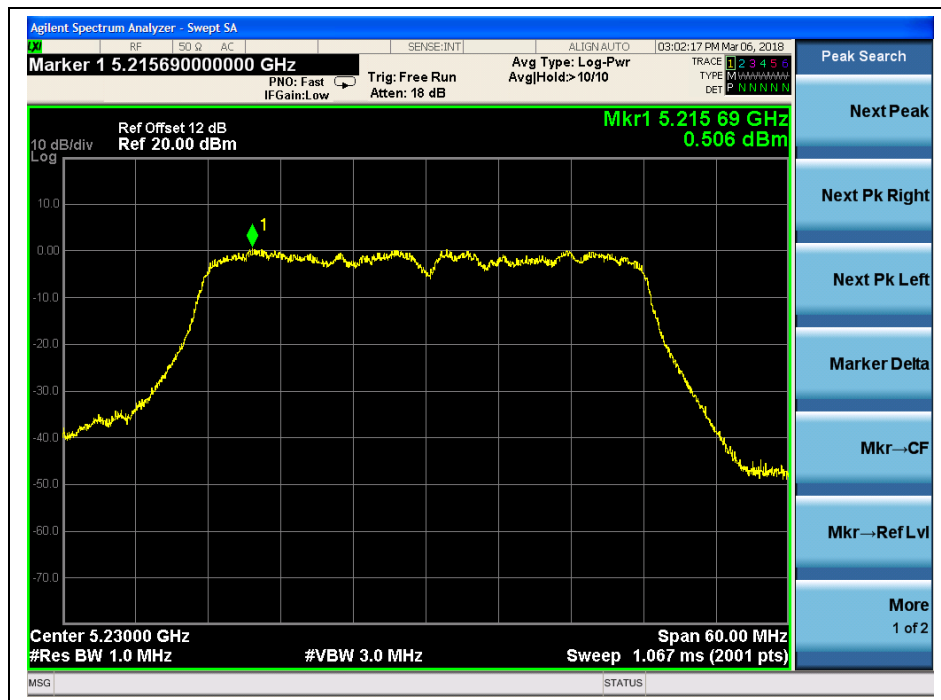
A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
38	5190	-0.56	11	PASS
46	5230	0.51		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
151	5755	-2.75	30	PASS
159	5795	-2.66		

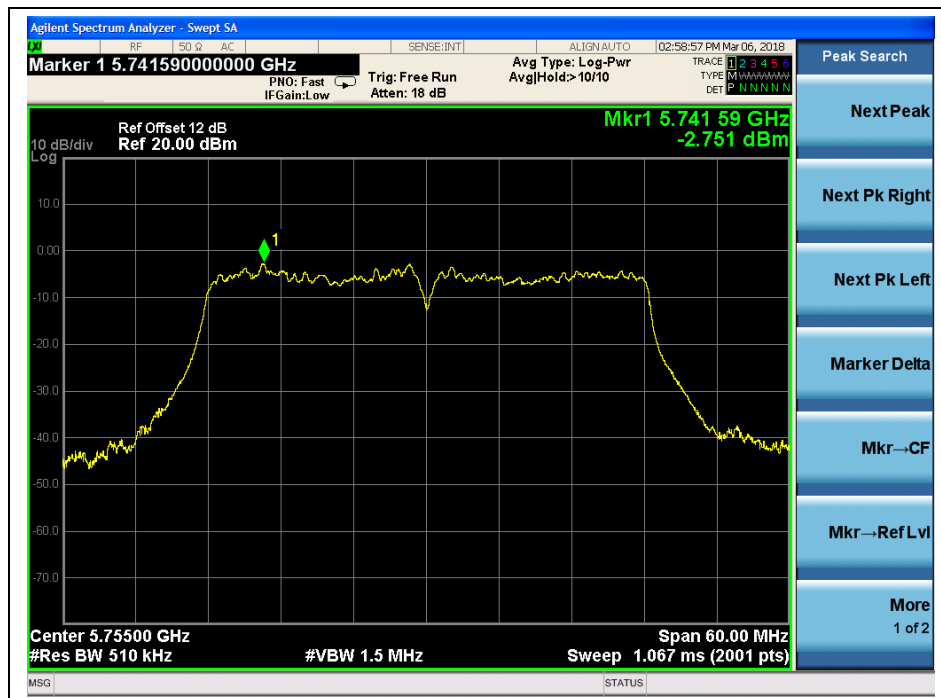
B. Test Plots



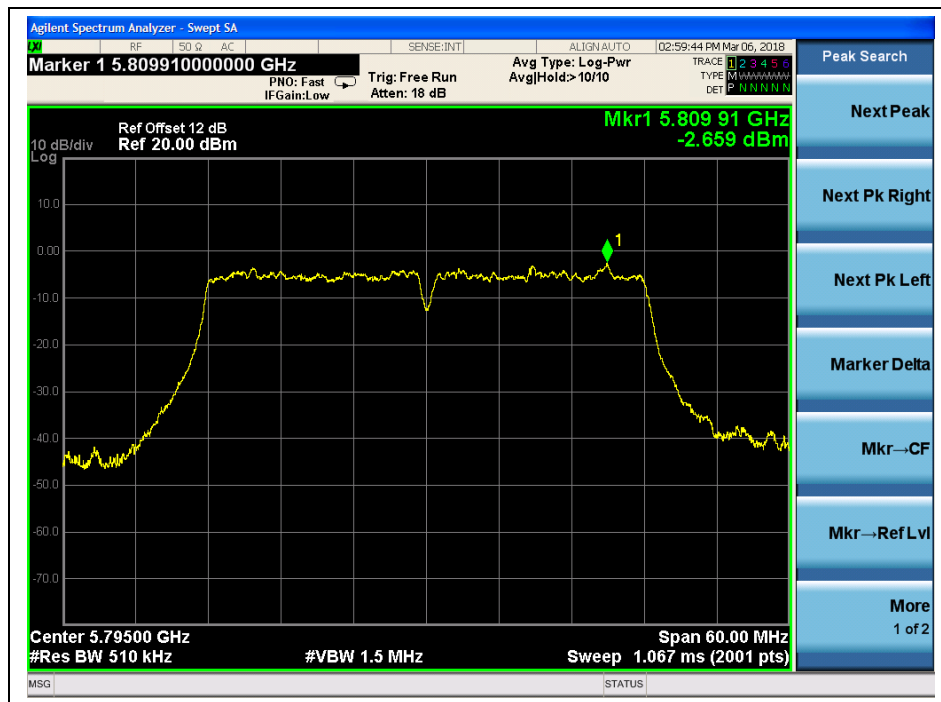
(Channel 38, 5190MHz, 802.11ac (VHT40))



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



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



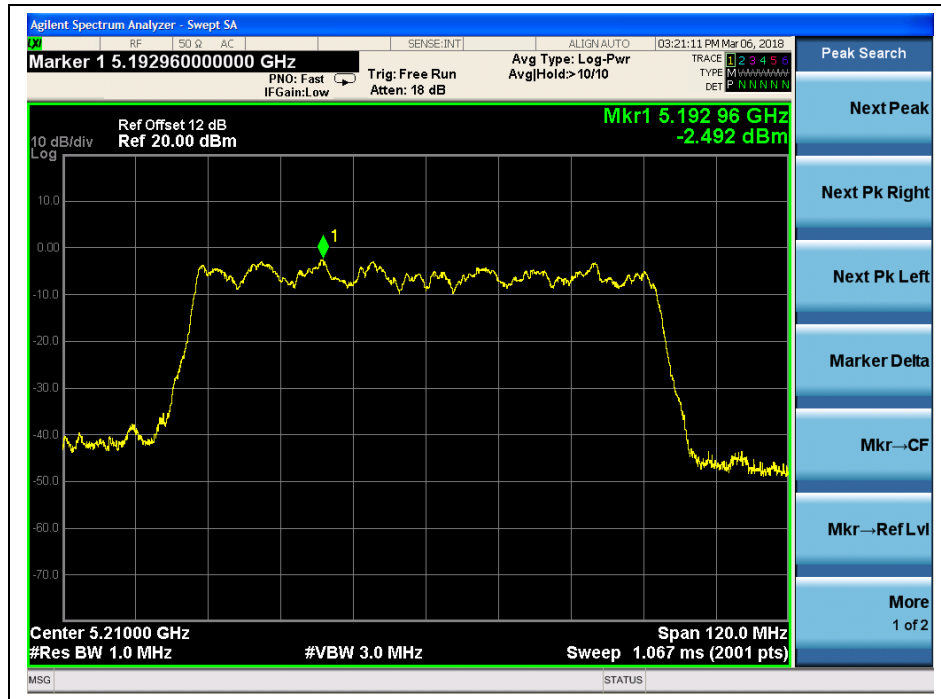
(Channel 159, 5795MHz, 802.11ac (VHT40))

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

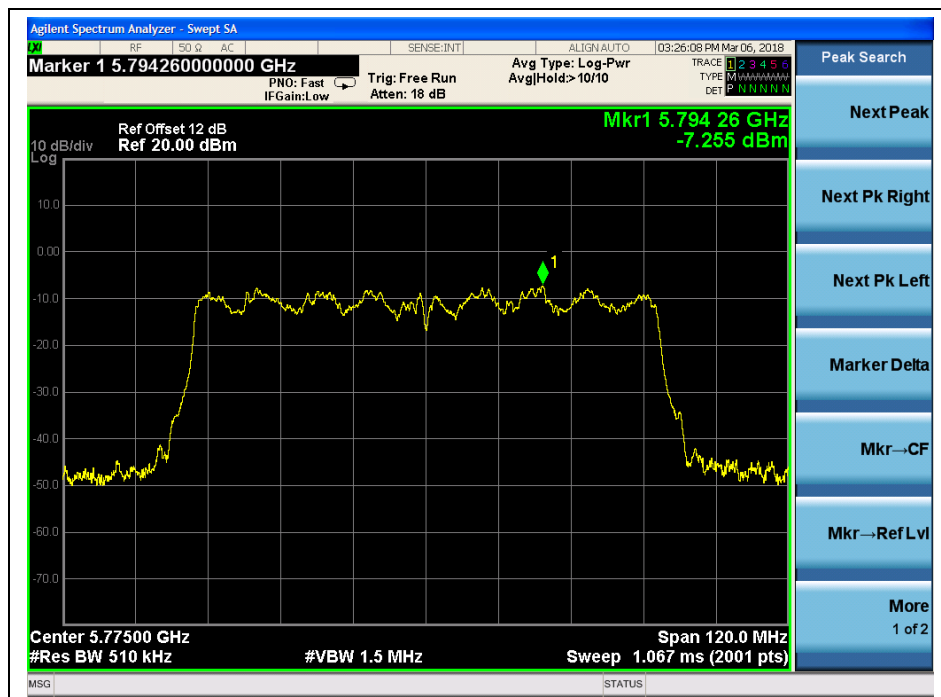
Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
42	5210	-2.49	11	PASS
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
155	5775	-7.26	30	PASS



B. Test Plots



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



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

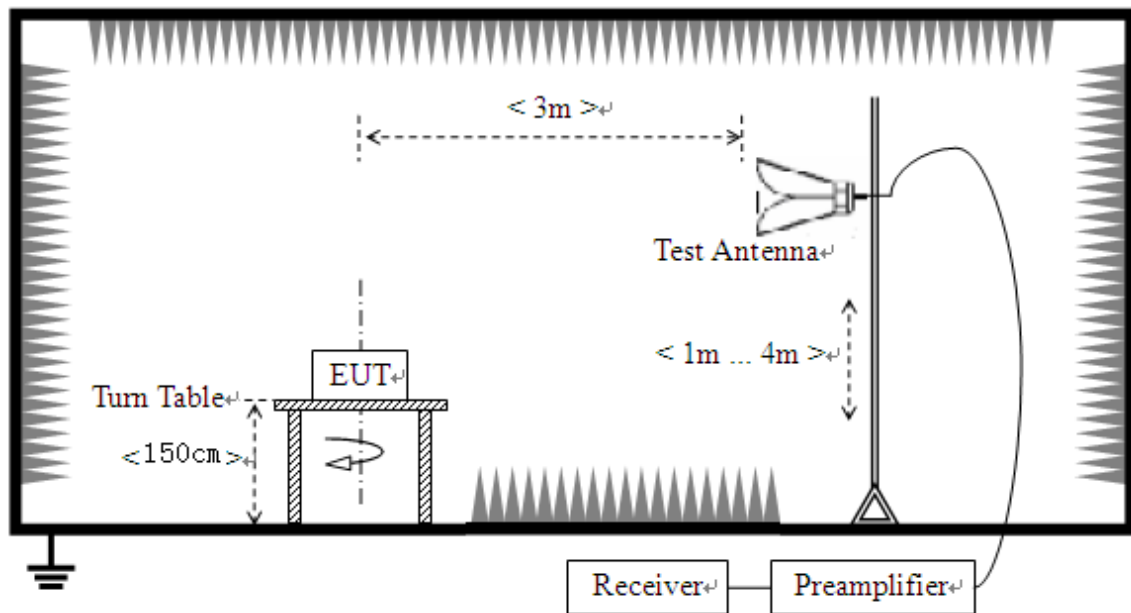
2.5. Restricted Frequency Bands

2.5.1. 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).

2.5.2. Test Description

A. 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.



2.5.3. 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	5111.86	PK	72.98	-50.65	32.11	54.44	74	PASS
36	5148.59	AV	57.99	-50.65	32.11	39.45	54	PASS
48	5370.82	PK	58.75	-50.65	32.11	40.21	74	PASS
48	5354.98	AV	51.54	-50.65	32.11	33.00	54	PASS
149	5722.92	PK	83.81	-50.65	32.11	65.27	117.49	PASS
149	5723.08	AV	67.45	-50.65	32.11	48.91	54	PASS
165	5850.73	PK	74.06	-50.65	32.11	55.52	120.84	PASS
165	5850.61	AV	59.03	-50.65	32.11	40.49	54	PASS



Spectrum Analyzer - Swept SA

RL RF 50 Ω DC SENSE:INT ALIGN OFF 05:02:20 AM May 30, 2018

Marker 1 5.111863975268 GHz Avg Type: Voltage AvgHold:>100/100
PNO: Fast IFGain:Low Trig: Free Run #Atten: 14 dB TRACE 1 2 3 4 5 6 TYPE M N H V W X Y Z DET P N N N N

10 dB/div Ref 110.00 dBμV

Mkr1 5.111 86 GHz
72.975 dBμV

Start 4.5000 GHz Stop 5.1800 GHz
#Res BW (CISPR) 1 MHz #VBW 3.0 MHz Sweep 1.466 ms (5500 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	5.111 86 GHz	72.975 dBμV			
2	N	1	f	5.150 00 GHz	68.612 dBμV			
3								
4								
5								
6								
7								
8								
9								
10								
11								

Trace/Detector
Select Trace 2
Clear Write
Trace Average
Max Hold
Min Hold
View Blank Blank
More 1 of 3

Keysight Spectrum Analyzer - Swept SA

RL RF 50 Ω DC SENSE:INT ALIGN OFF 05:03:44 AM May 30, 2018

Marker 1 5.148590652846 GHz Avg Type: Voltage Avg Hold: 100/100

PNO: Fast Trig: Free Run IF Gain: Low #Atten: 14 dB

TRACE 1 2 3 4 5 6 TYPE M P N N N N DET P P N N N N

10 dB/div Ref 110.00 dBμV

Log

Mkr1 5.148 59 GHz 57.986 dBμV

Start 4.5000 GHz Stop 5.1800 GHz

#Res BW (CISPR) 1 MHz #VBW 10 Hz #Sweep 10.00 s (5500 pts)

Mkr	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	5.148 59 GHz	57.986 dBμV			
2	N	1	f	5.150 00 GHz	58.862 dBμV			
3								
4								
5								
6								
7								
8								
9								
10								
11								

Select Marker 1

Normal

Delta

Fixed

Off

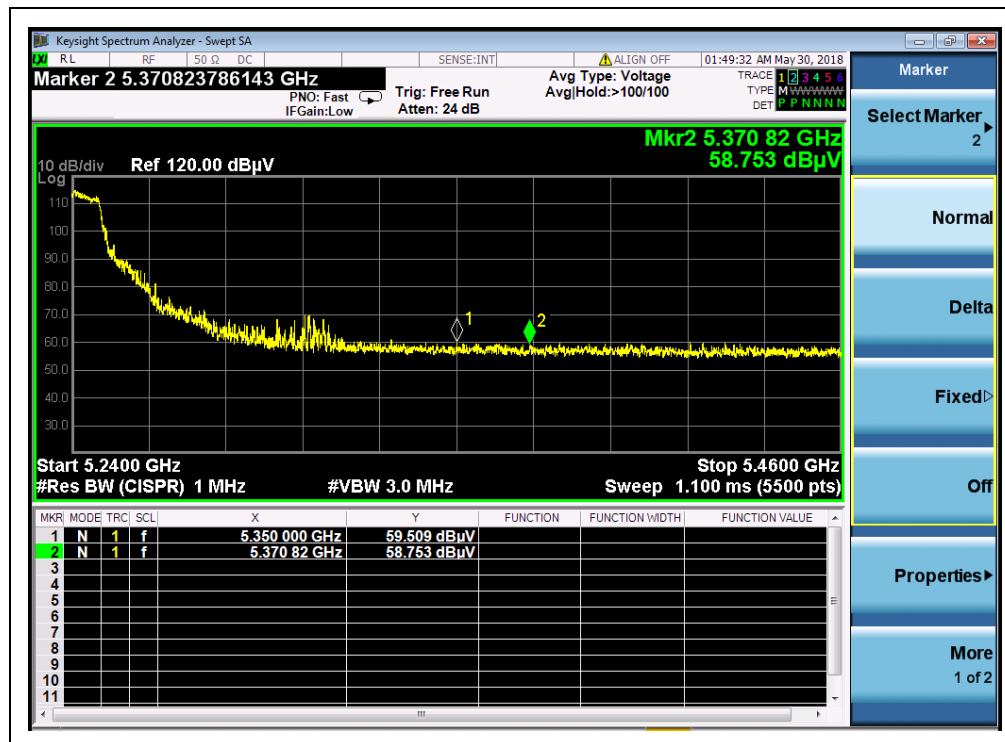
Properties

More 1 of 2

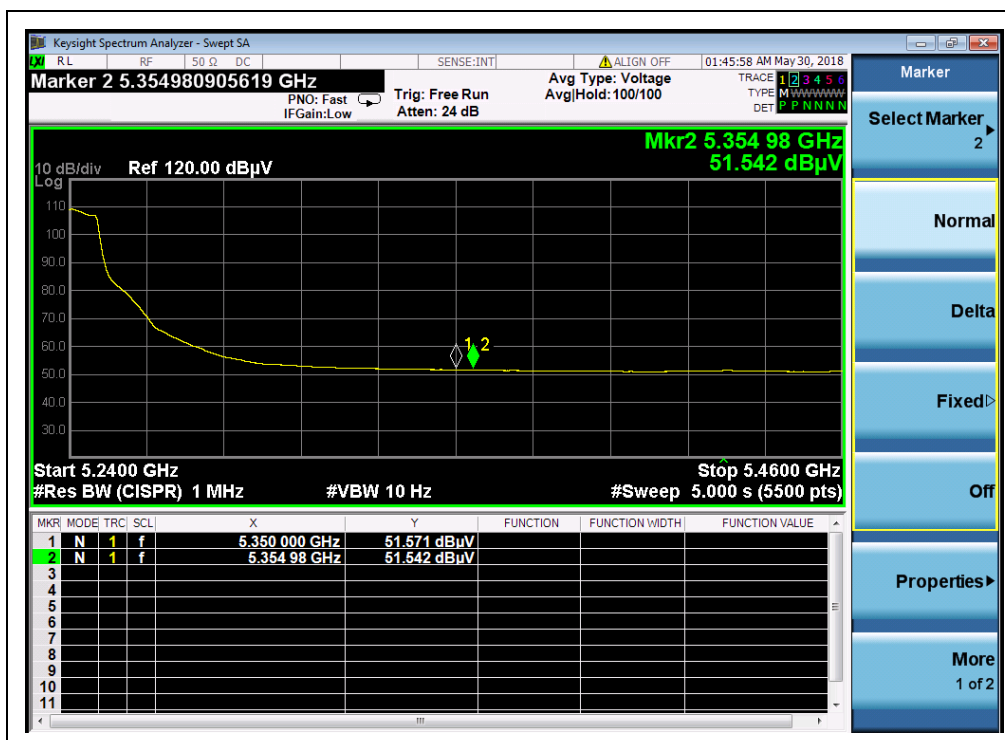
MORLAB

Fax: 86-755-36698525

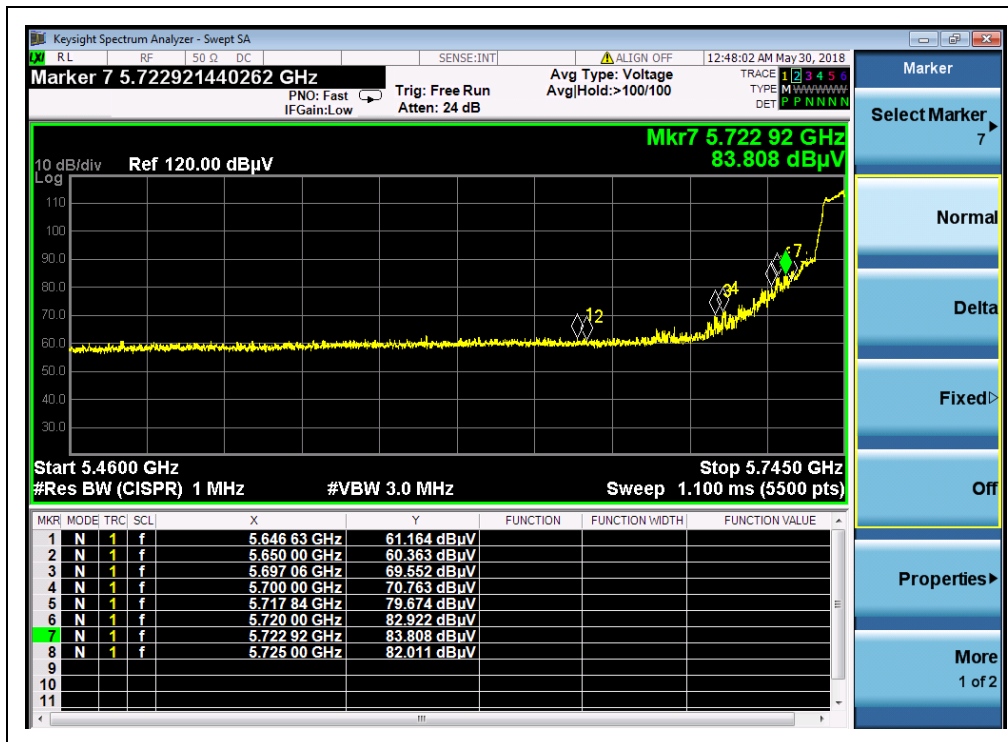
E-mail: service@morlab.cn



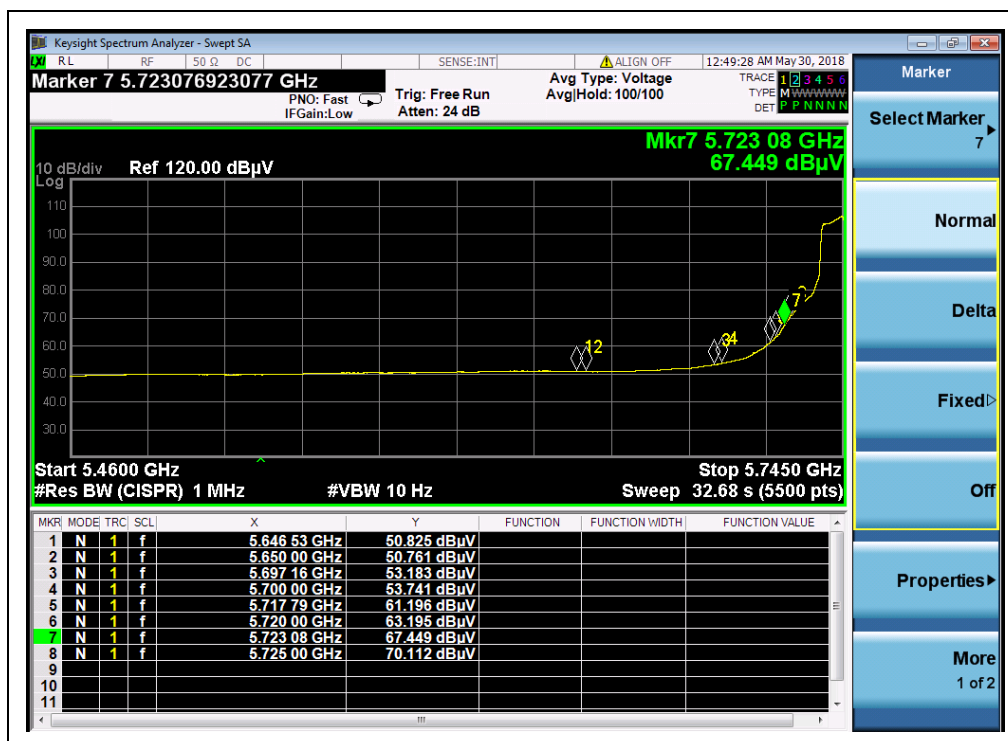
(Channel 48, PEAK, 802.11a)



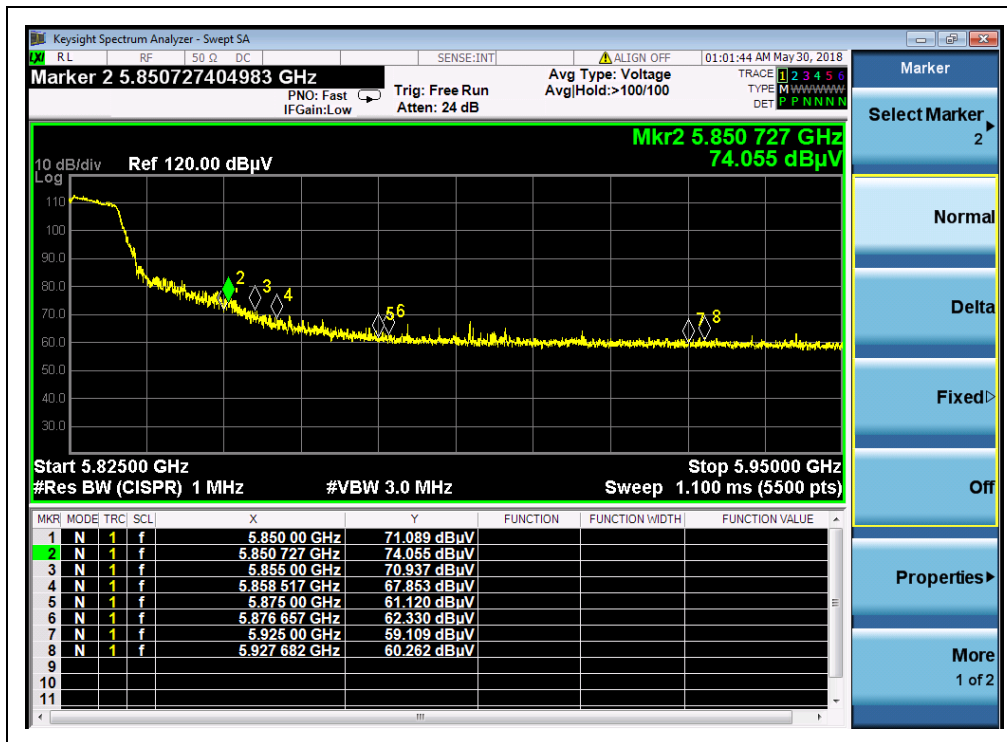
(Channel 48, AVG, 802.11a)



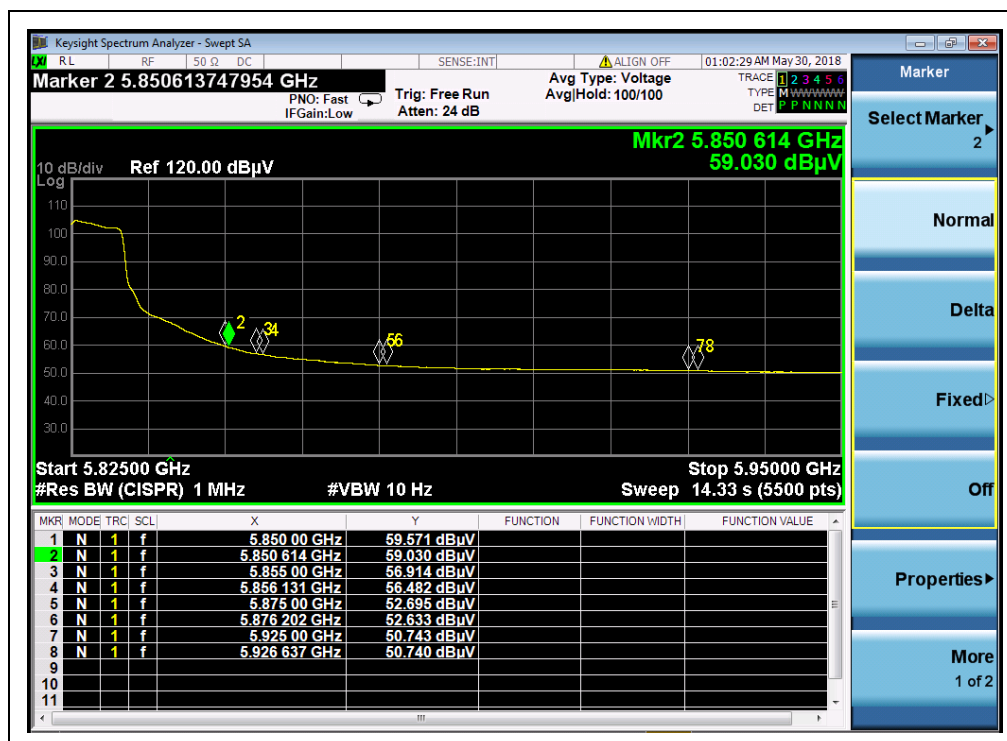
(Channel 149, PEAK, 802.11a)



(Channel 149, AVG, 802.11a)



(Channel 165, PEAK, 802.11a)



(Channel 165, AVG, 802.11a)

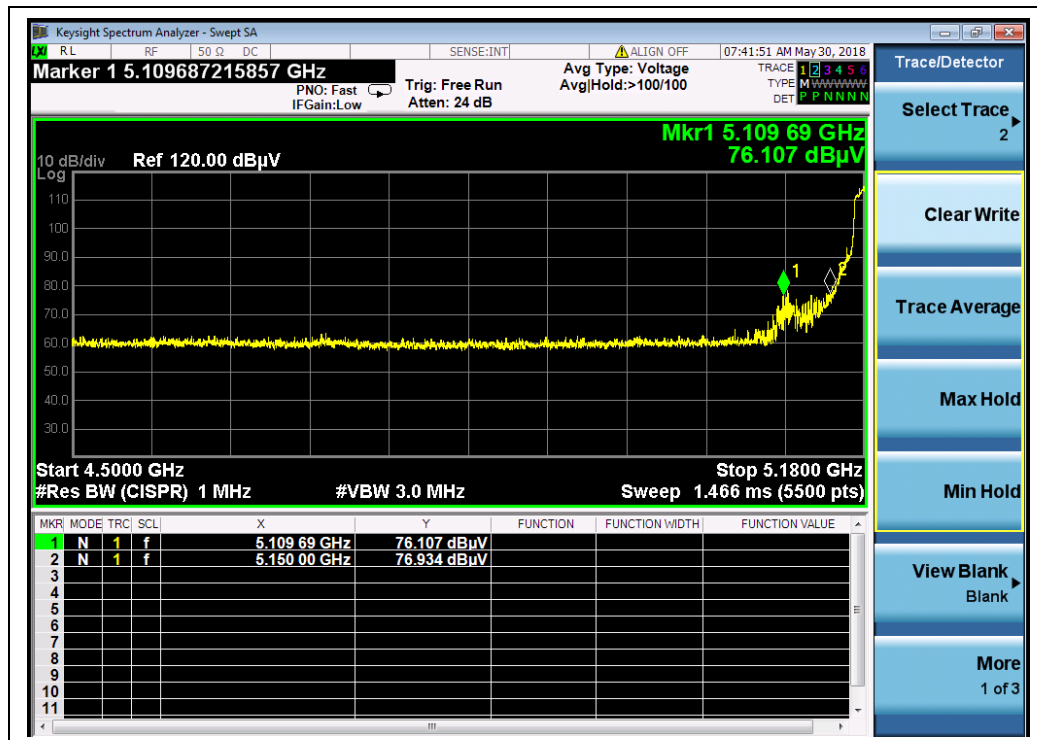


802.11n (HT20) Test mode

A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
36	5109.69	PK	76.11	-50.65	32.11	57.57	74	PASS
36	5148.52	AV	65.37	-50.65	32.11	46.83	54	PASS
48	5357.86	PK	59.49	-50.65	32.11	40.95	74	PASS
48	5353.06	AV	51.48	-50.65	32.11	32.94	54	PASS
149	5724.06	PK	81.06	-50.65	32.11	62.52	120.09	PASS
149	5723.18	AV	68.88	-50.65	32.11	50.34	54	PASS
165	5850.39	PK	72.67	-50.65	32.11	54.13	121.34	PASS
165	5850.69	AV	57.53	-50.65	32.11	38.99	54	PASS

B. Test Plots:



(Channel 36, PEAK, 802.11n (HT20))