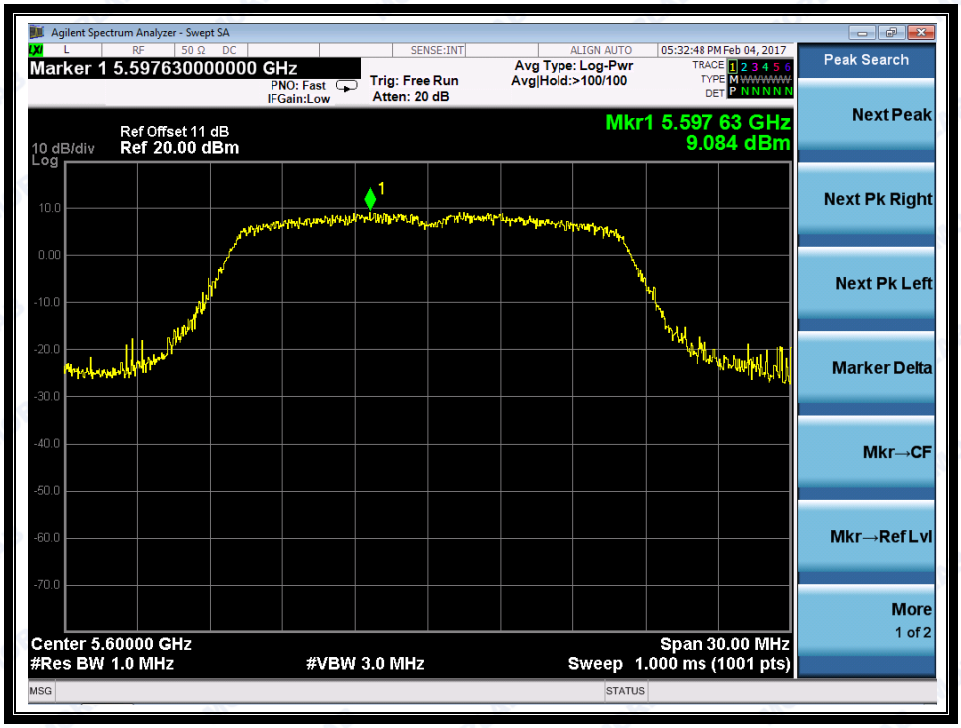
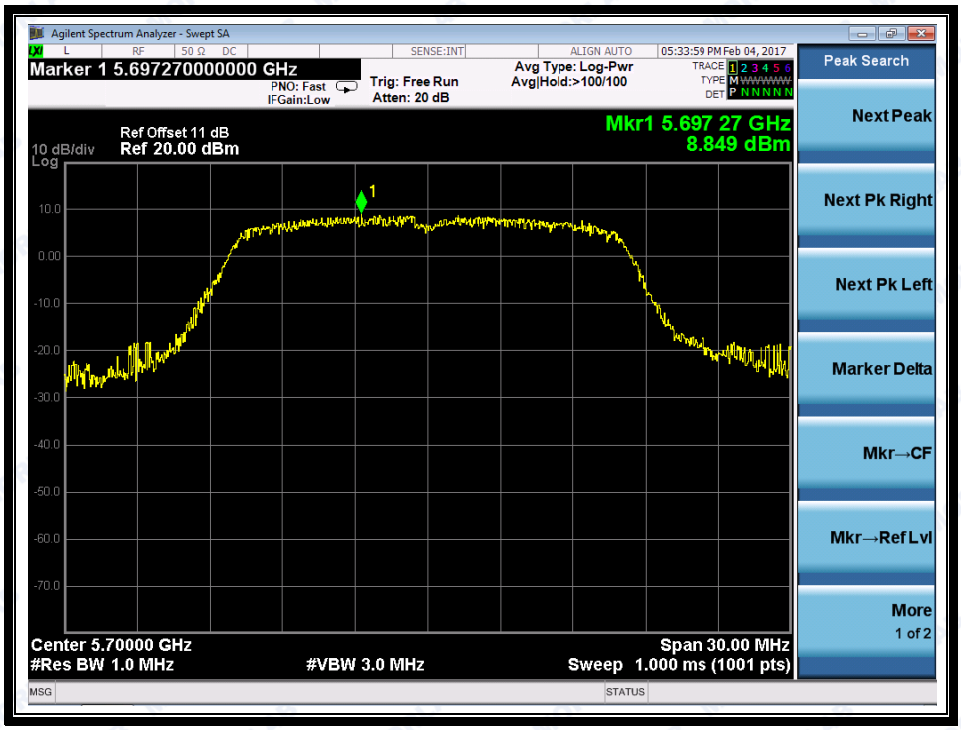
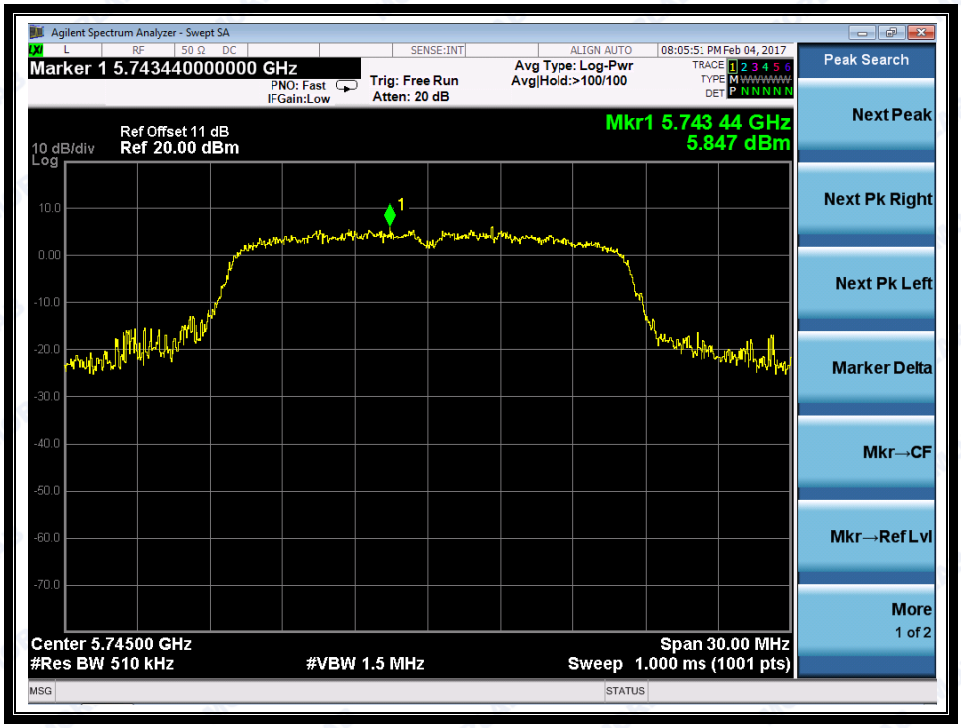


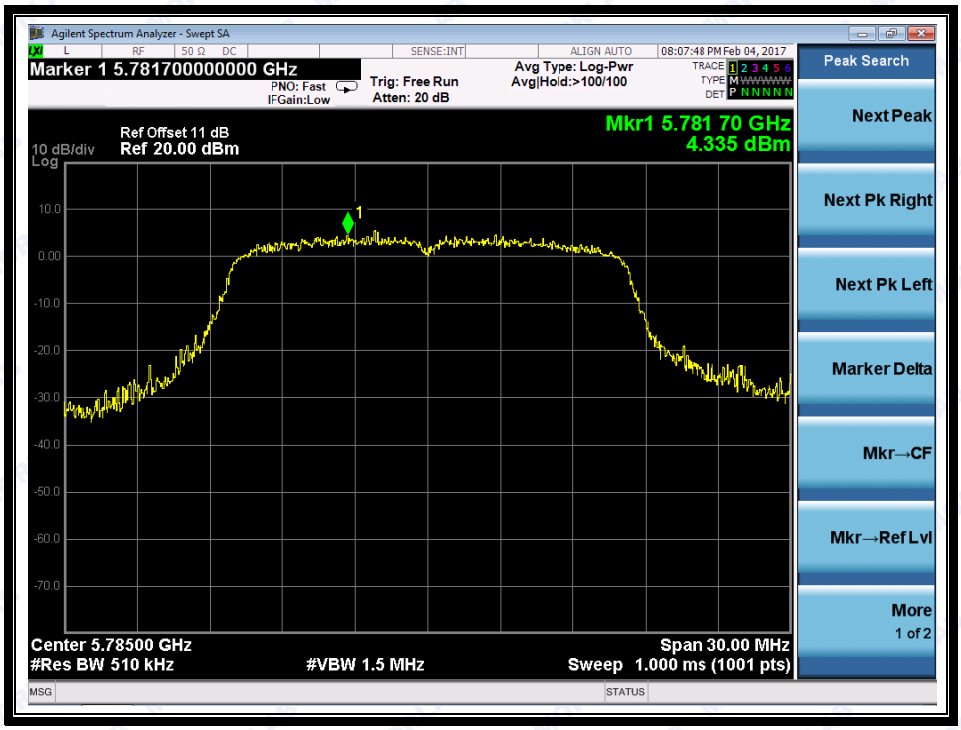
(Channel 120: 5600 MHz @ 802.11a)



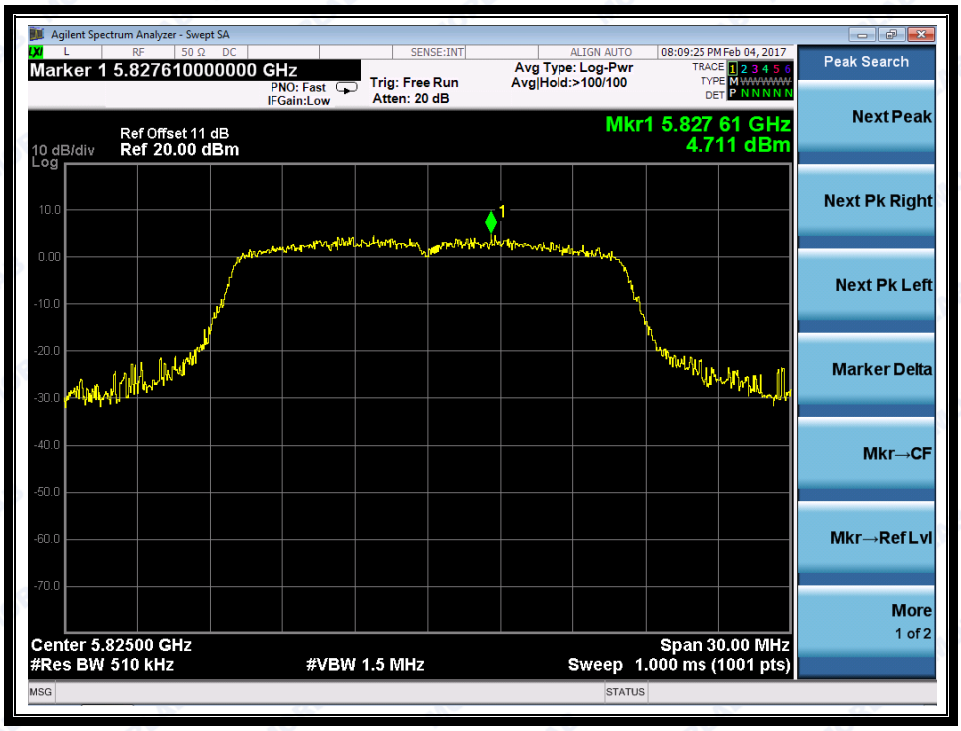
(Channel 140: 5700MHz @ 802.11a)



(Channel 149: 5745MHz @ 802.11a)



(Channel 157: 5785MHz @ 802.11a)



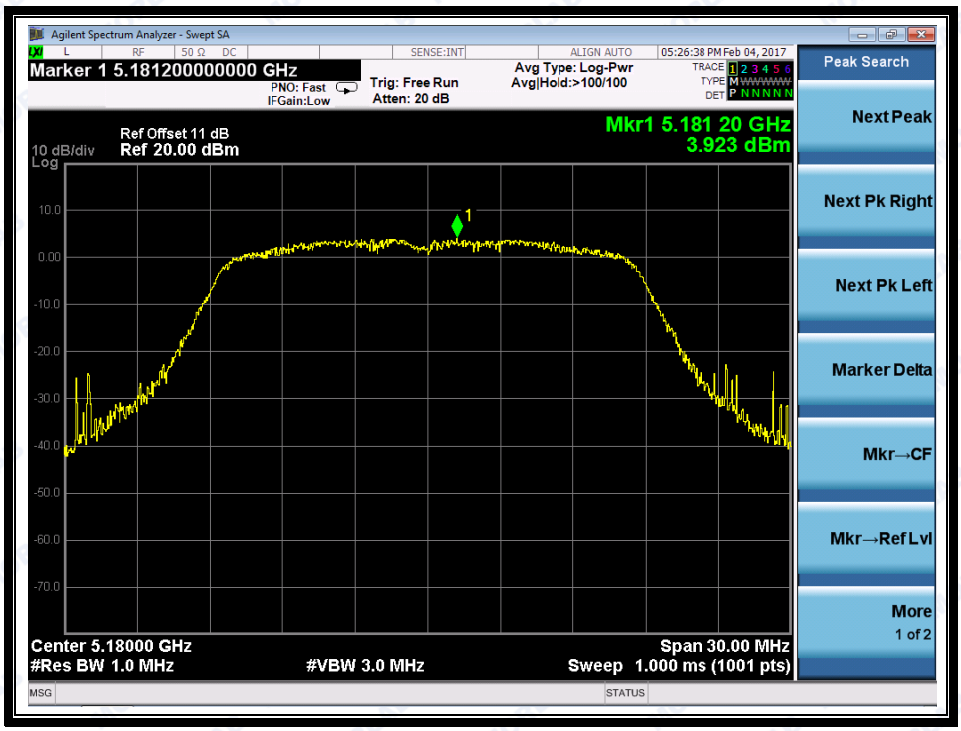
(Channel 165: 5825MHz @ 802.11a)

2.4.3.2 802.11ac-20MHz Test mode

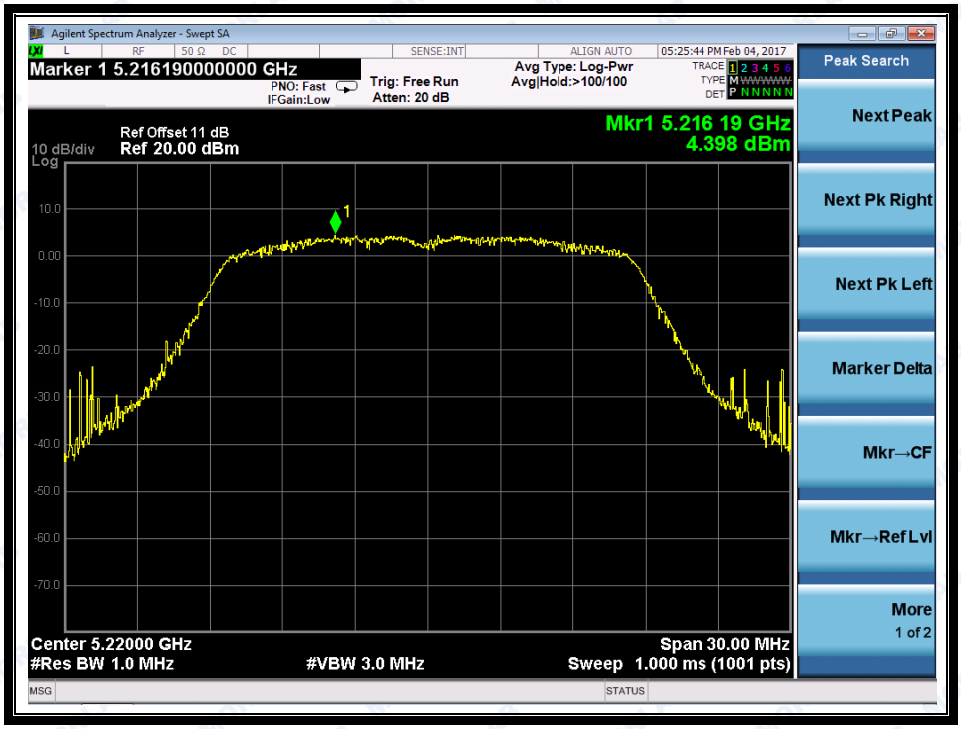
A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	3.92	11	PASS
44	5220	4.40		
48	5240	4.61		
52	5260	5.11		
60	5300	6.16		
64	5320	6.25		
100	5500	6.47		
120	5600	7.30		
140	5700	6.46		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	4.18	30	PASS
157	5785	4.34		
165	5825	1.69		

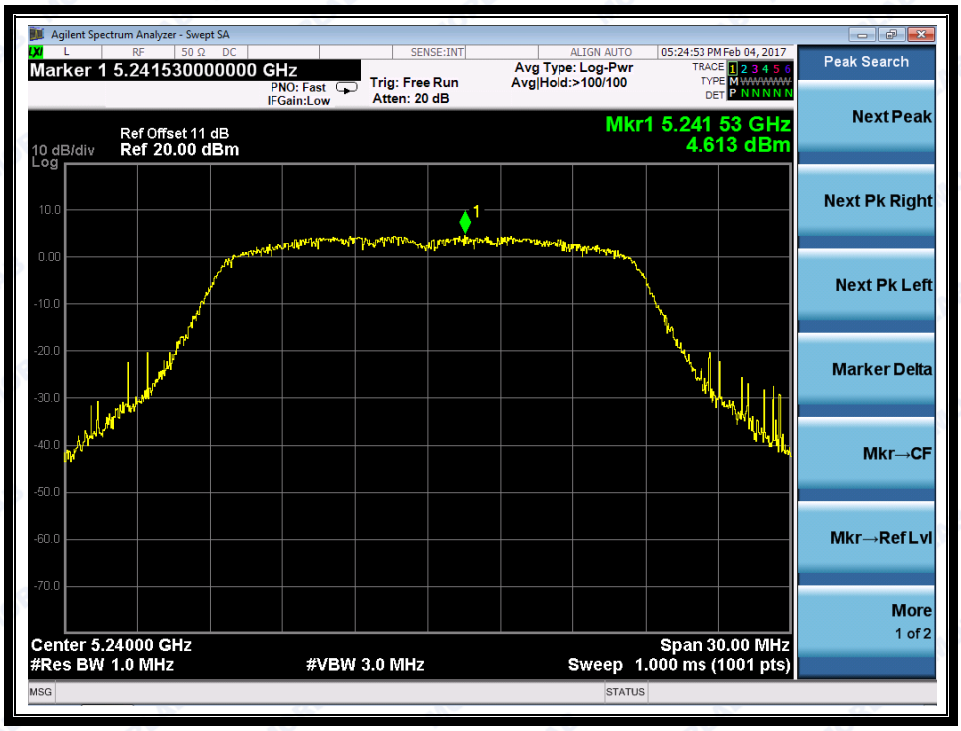
B. Test Plots



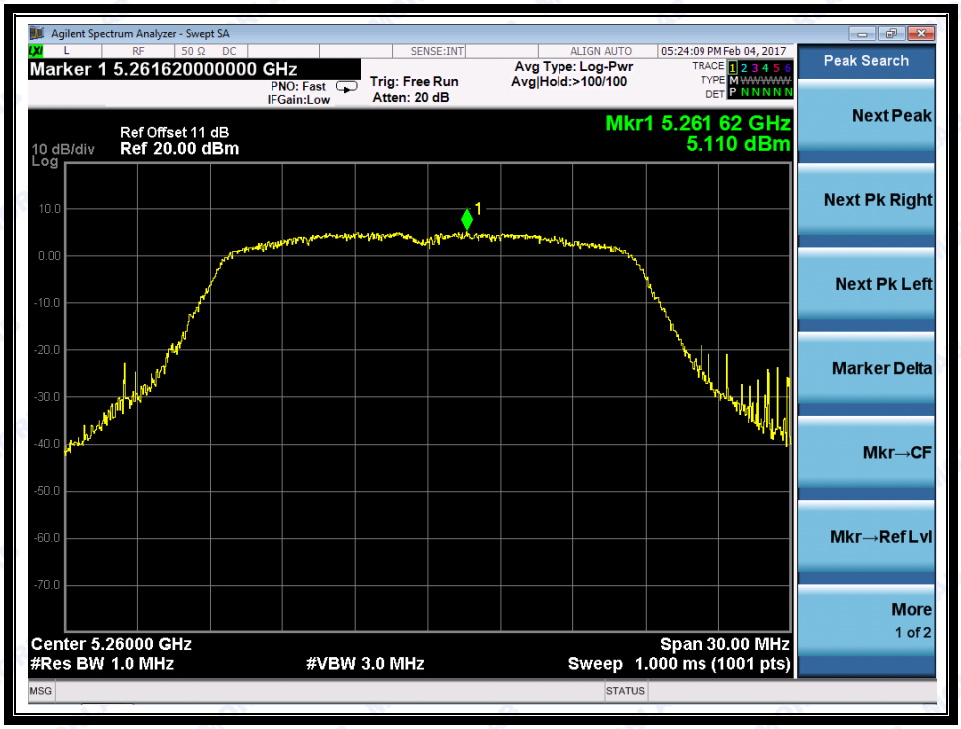
(Channel 36: 5180MHz @ 802.11ac)



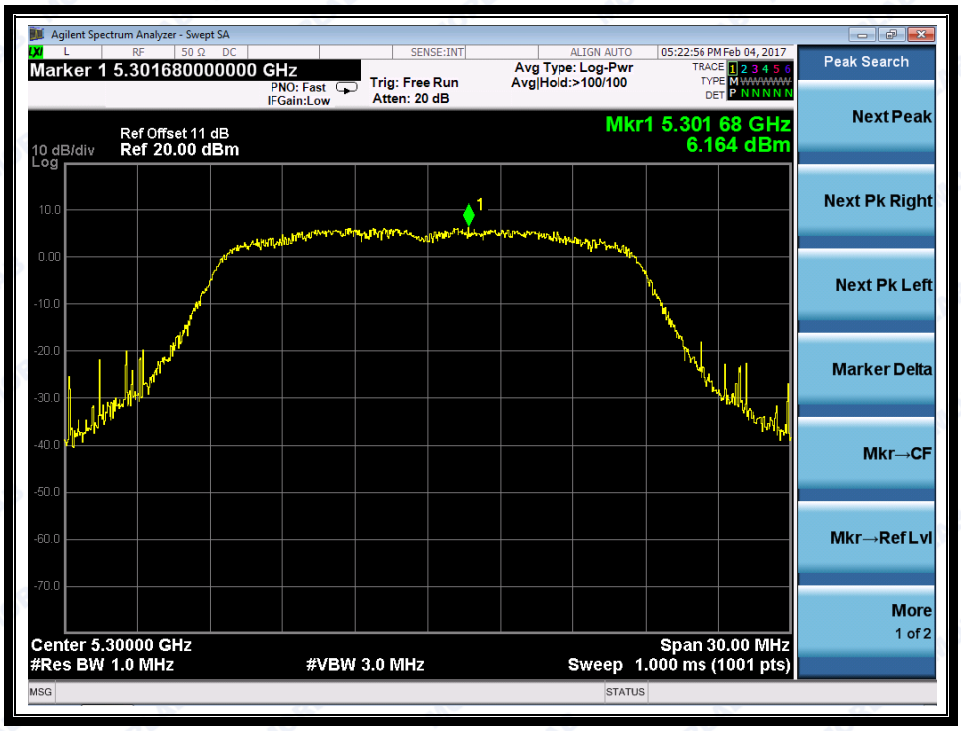
(Channel 44: 5220 MHz @ 802.11ac)



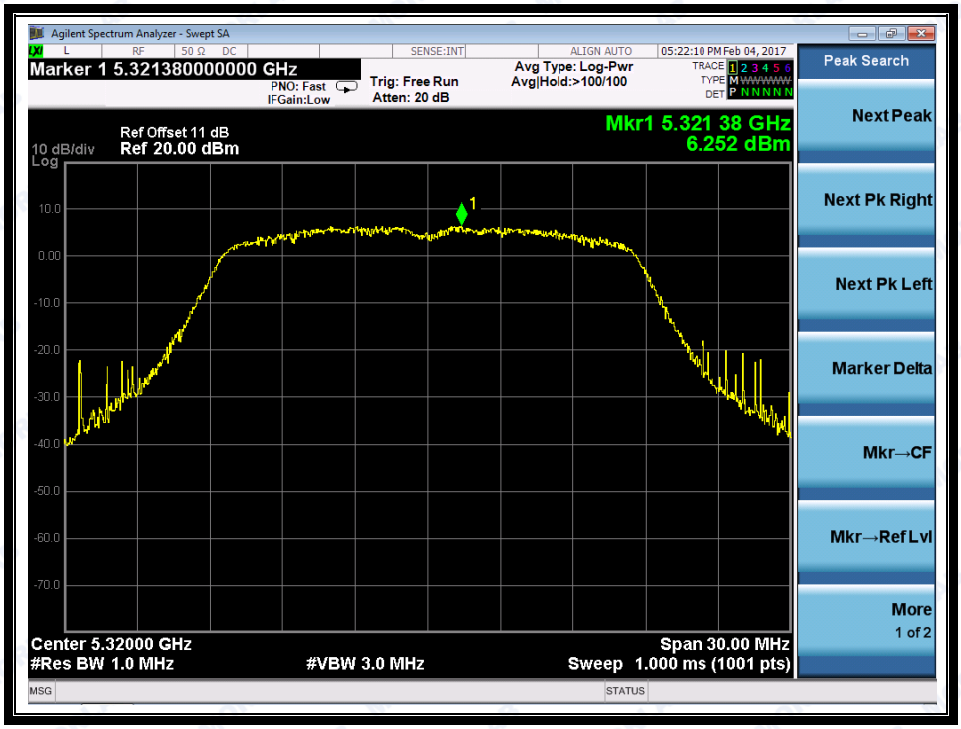
(Channel 48: 5240MHz @ 802.11ac)



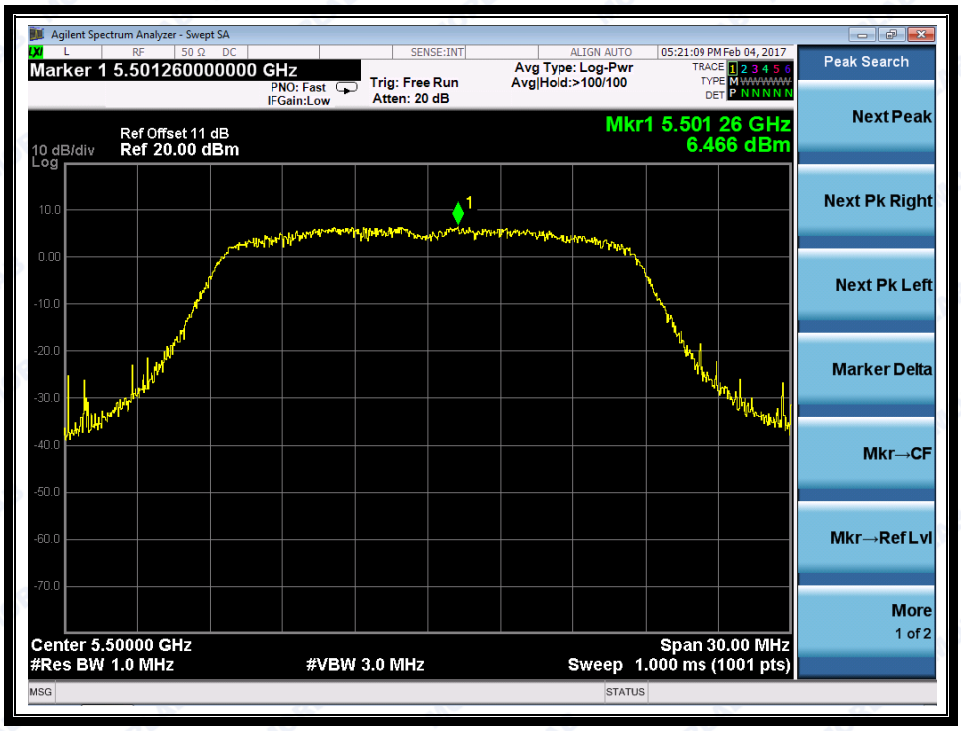
(Channel 52: 5260MHz @ 802.11ac)



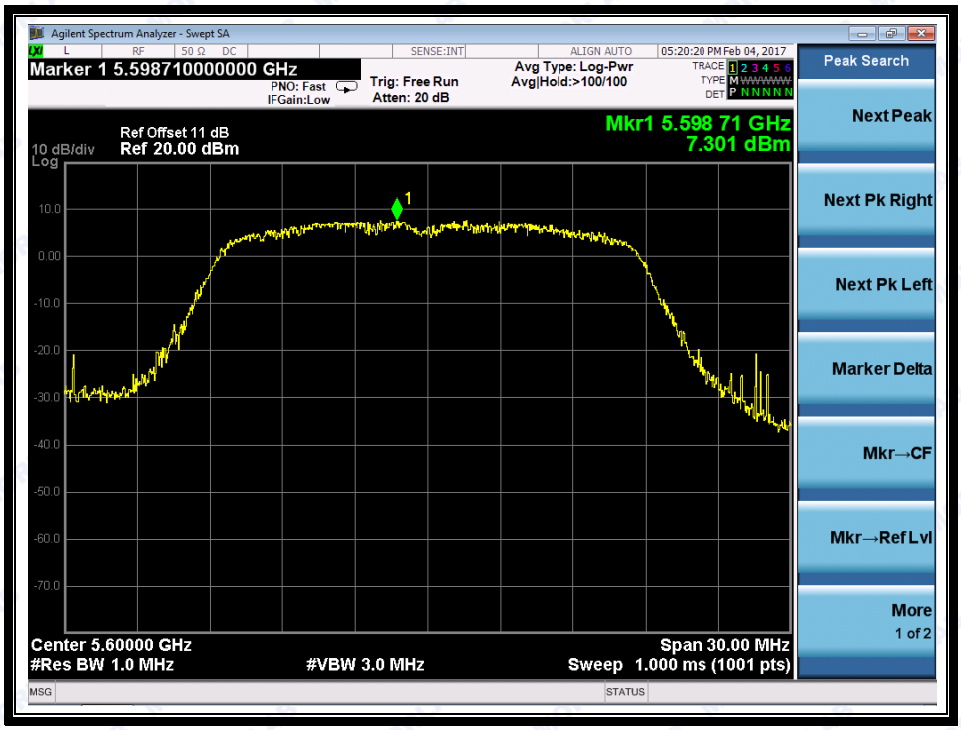
(Channel 60: 5300MHz @ 802.11ac)



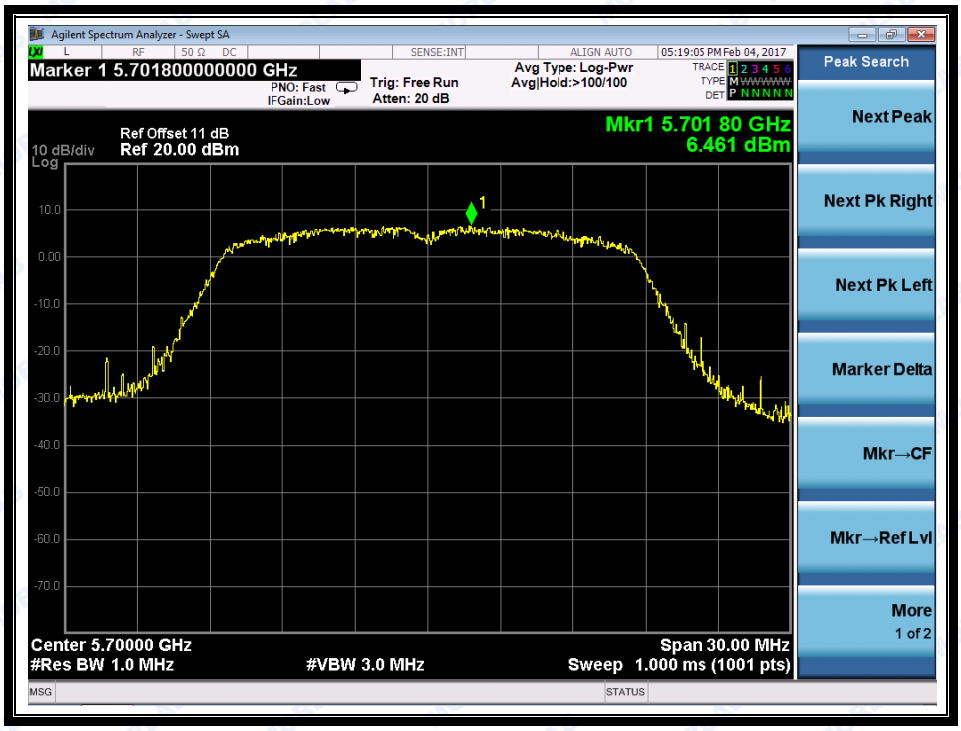
(Channel 64: 5320MHz @ 802.11ac



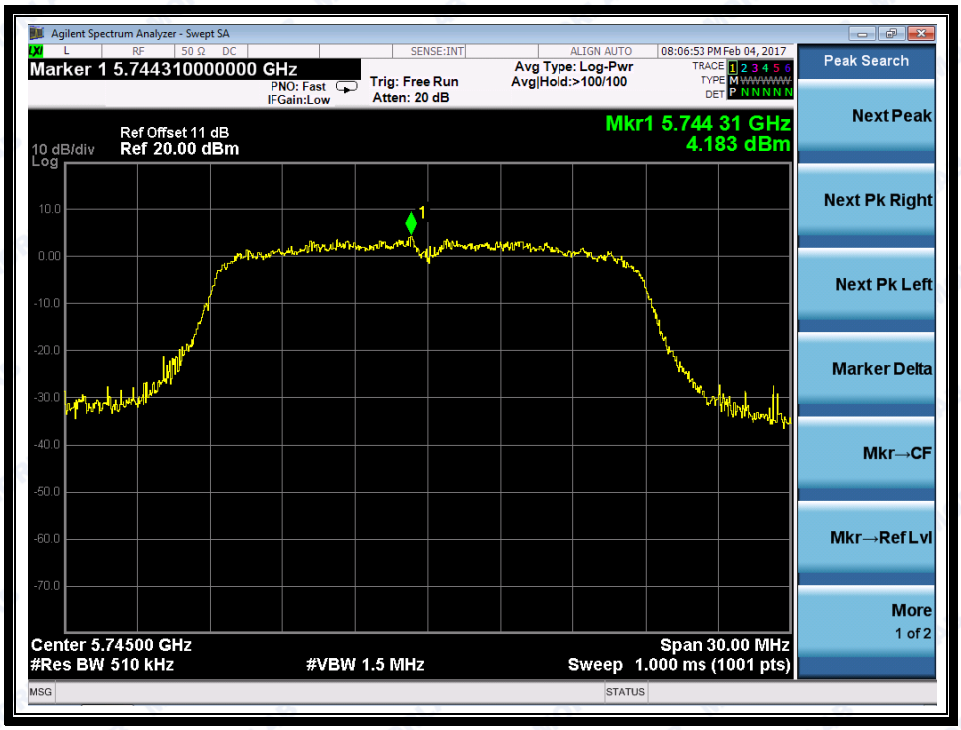
(Channel 100: 5500MHz @ 802.11ac)



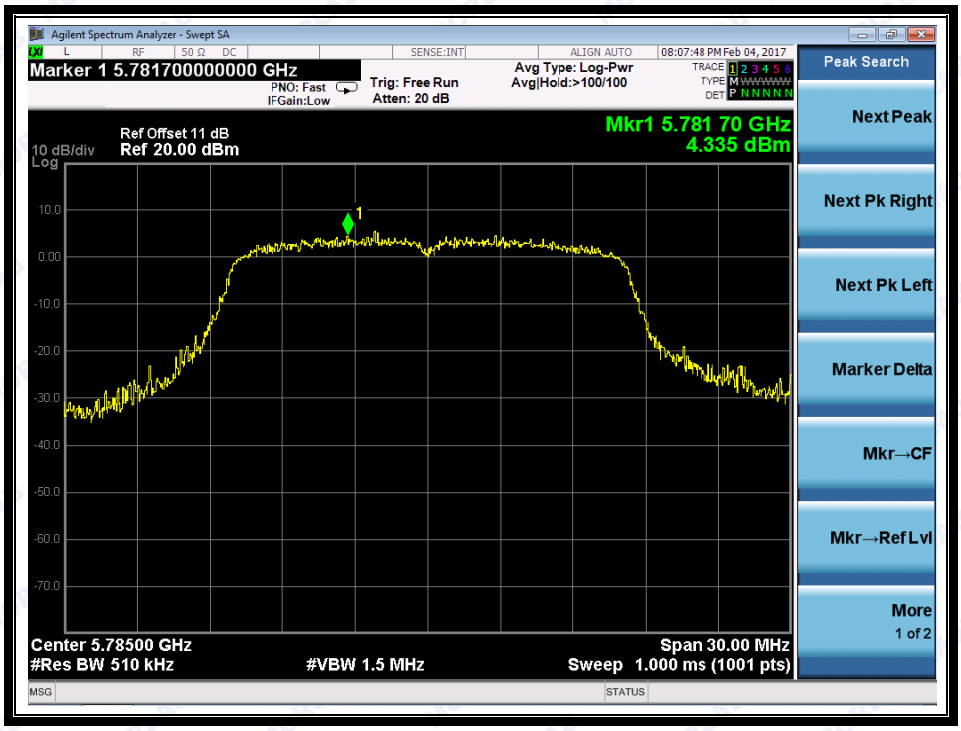
(Channel 120: 5600MHz @ 802.11ac)



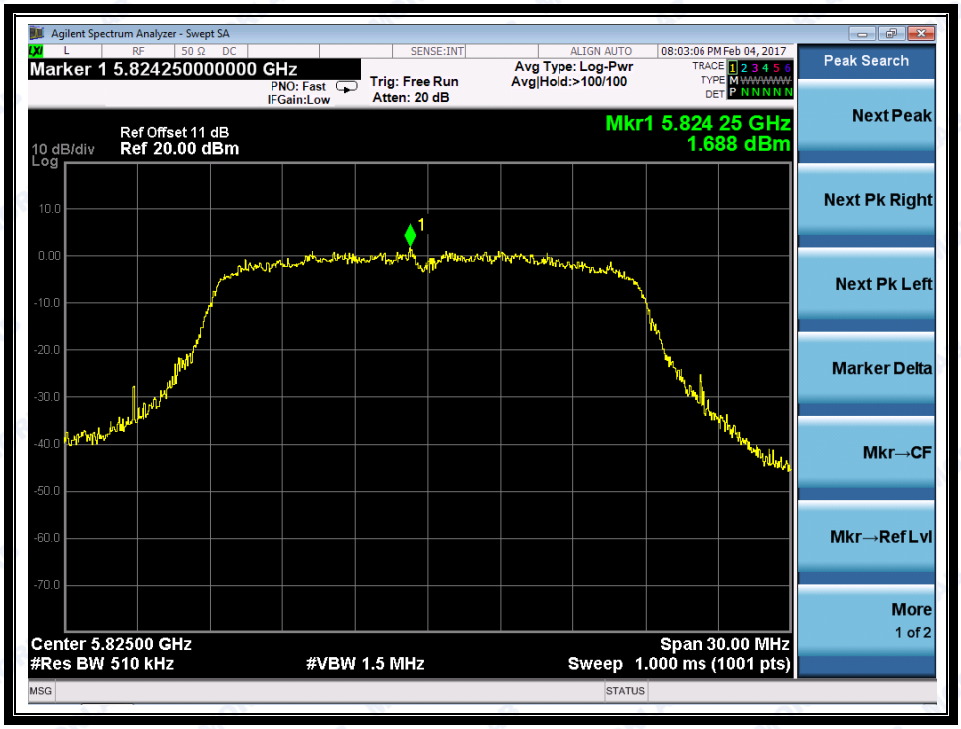
(Channel 140: 5700MHz @ 802.11ac)



(Channel 149: 5745MHz @ 802.11ac)



(Channel 157: 5785MHz @ 802.11ac)



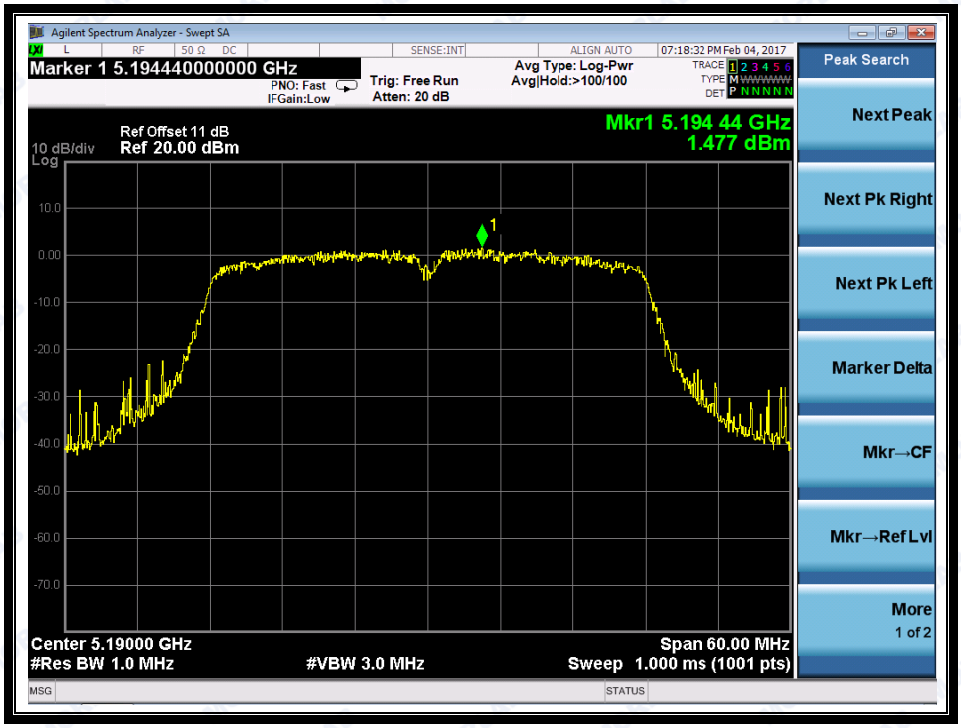
(Channel 165: 5825MHz @ 802.11ac)

2.4.3.3 802.11ac-40MHz Test mode

A. Test Verdict:

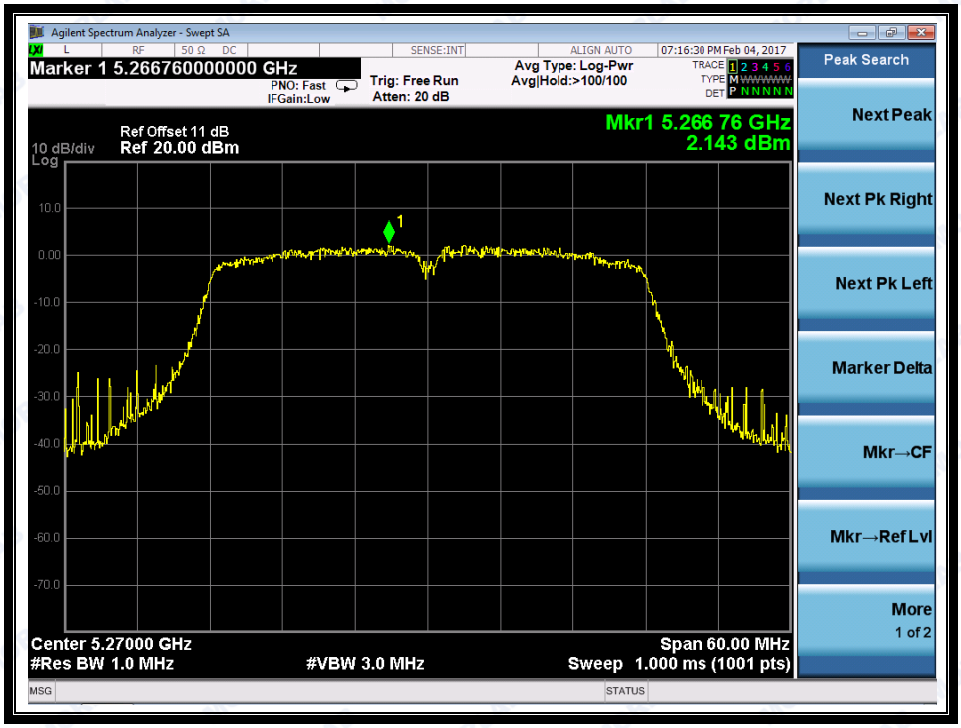
Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Limit (dBm/MHz))	Verdict
38	5190	1.48	11	PASS
46	5230	1.85		
54	5270	2.14		
62	5310	3.38		
102	5510	3.45		
126	5630	5.15		
142	5710	3.57	U-NII-2C:11dBm/MHz U-NII-3:30dBm/500KHz	
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
151	5755	0.21	30	PASS
159	5795	-0.78		

B. Test Plots

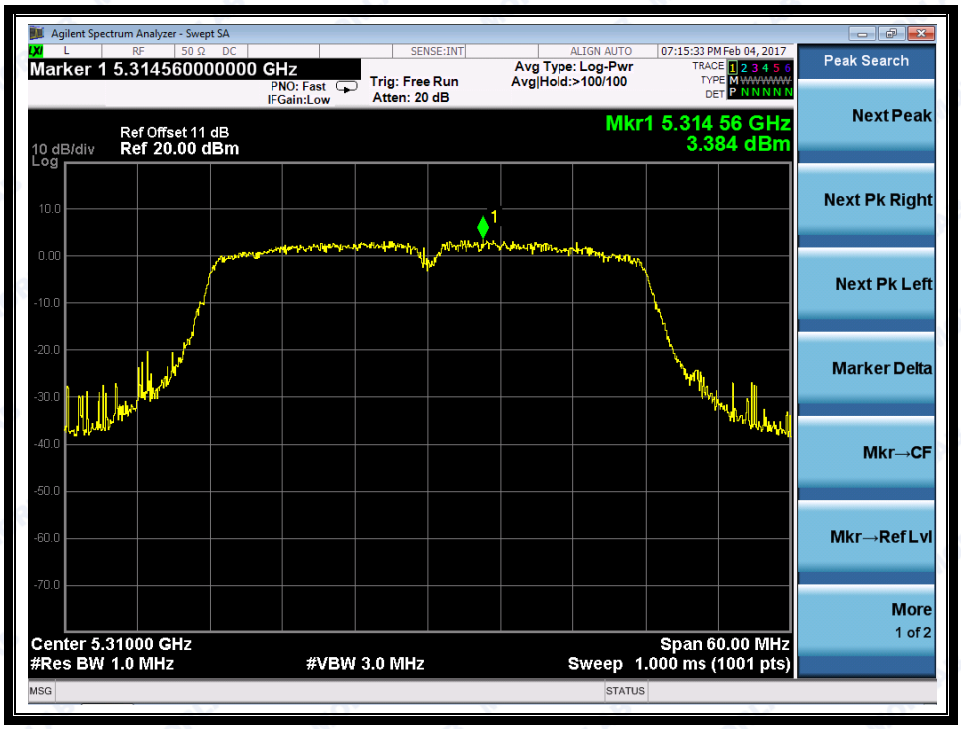


(Channel 38: 5190MHz @ 802.11ac)

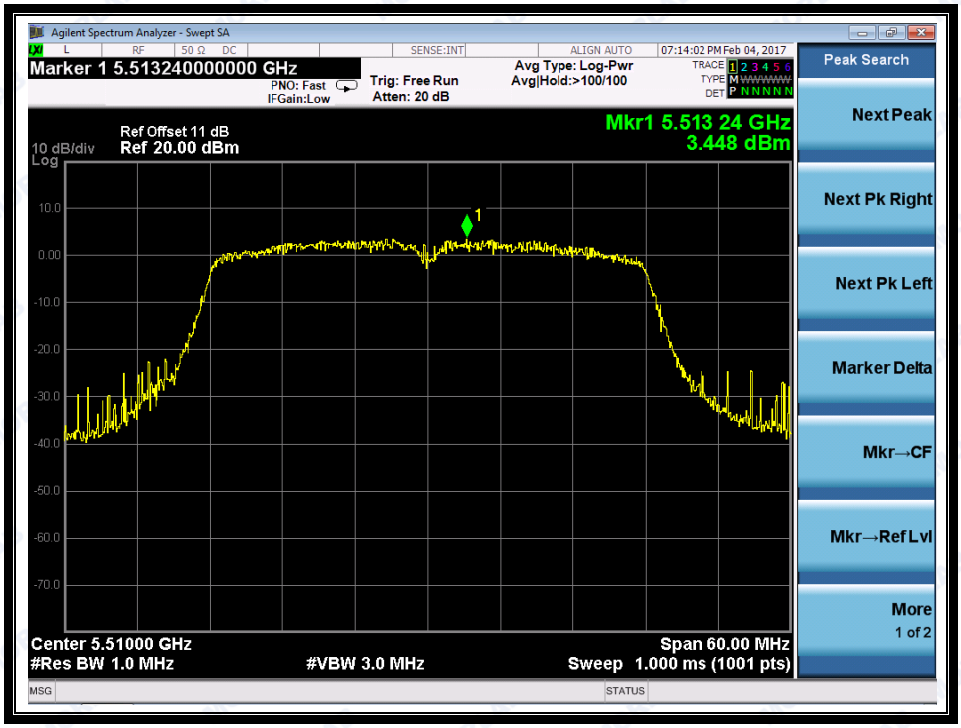
(Channel 46: 5230 MHz @ 802.11ac)



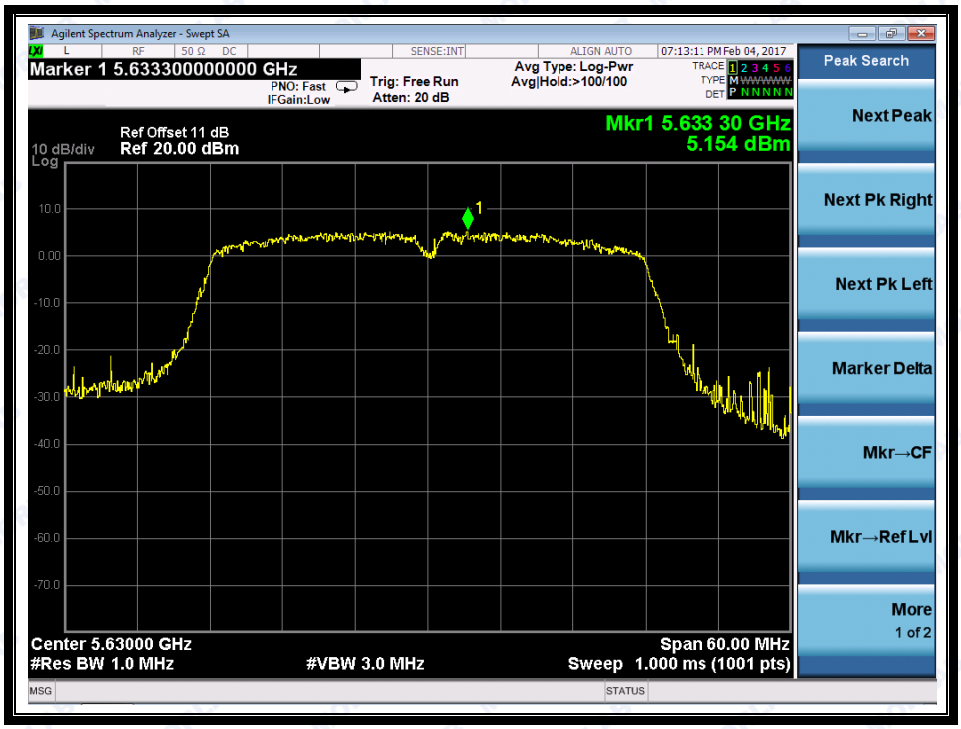
(Channel 54: 5270MHz @ 802.11ac)



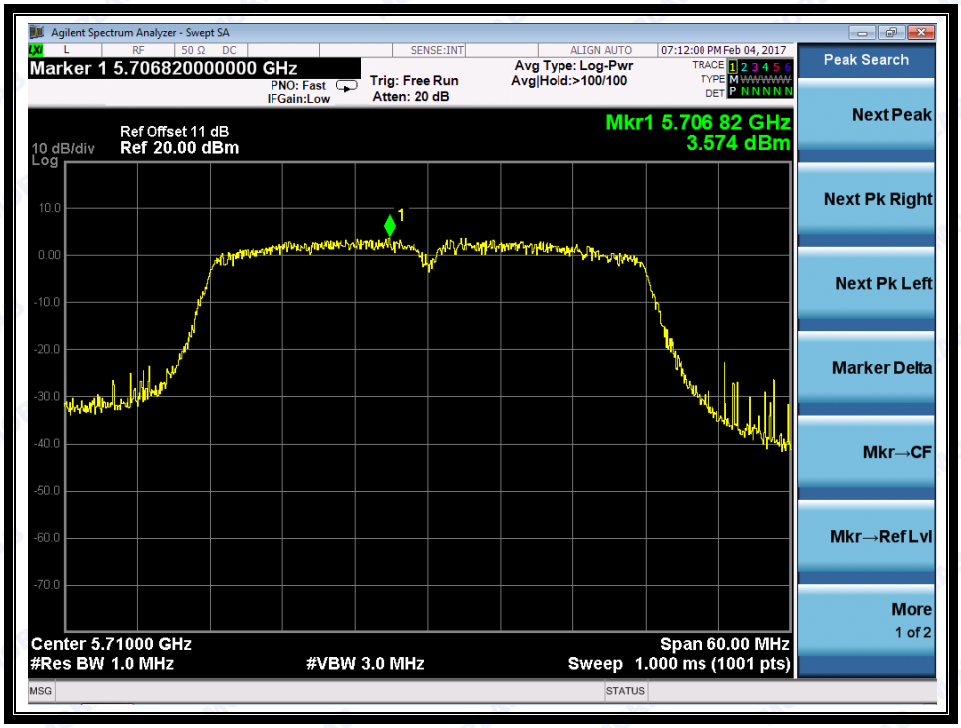
(Channel 62: 5310MHz @ 802.11ac)



(Channel 102: 5510MHz @ 802.11ac)

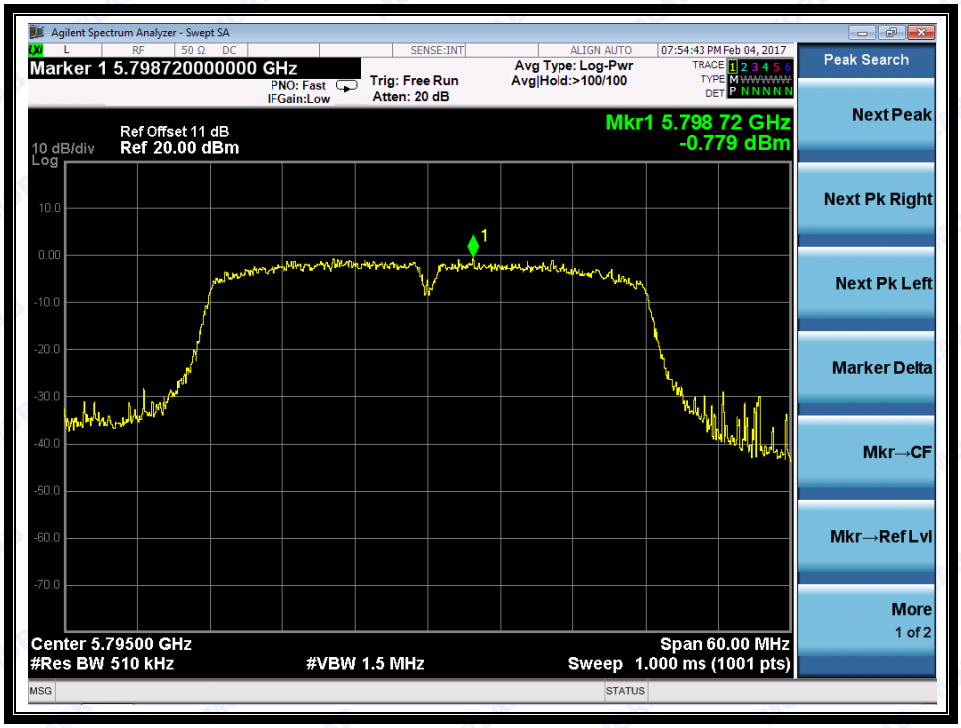


(Channel 126: 5630MHz @ 802.11ac)



(Channel 142: 5710MHz @ 802.11ac)

(Channel 151: 5755MHz @ 802.11ac)



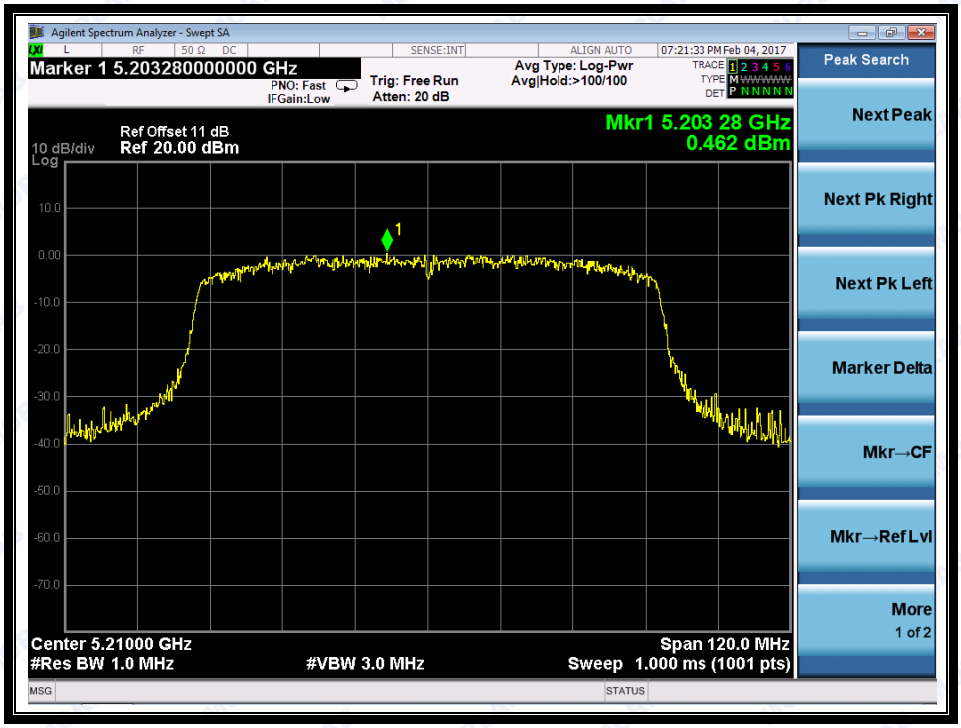
(Channel 159: 5795MHz @ 802.11ac)

2.4.3.4 802.11ac-80MHz Test mode

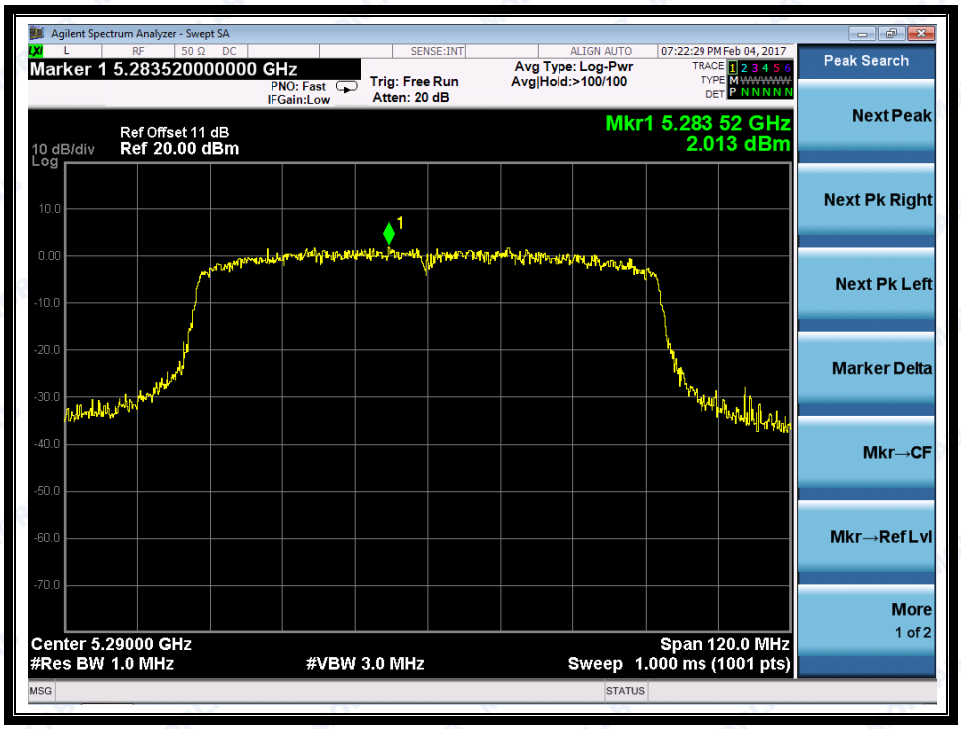
A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm)	Limit (dBm/MHz)	Verdict
42	5210	0.46	11	PASS
58	5290	2.01		
106	5530	3.72		
122	5610	4.18		
138	5690	2.71	U-NII-2C:11dBm/MHz U-NII-3:30dBm/500KHz	
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
155	5775	-0.97	30	PASS

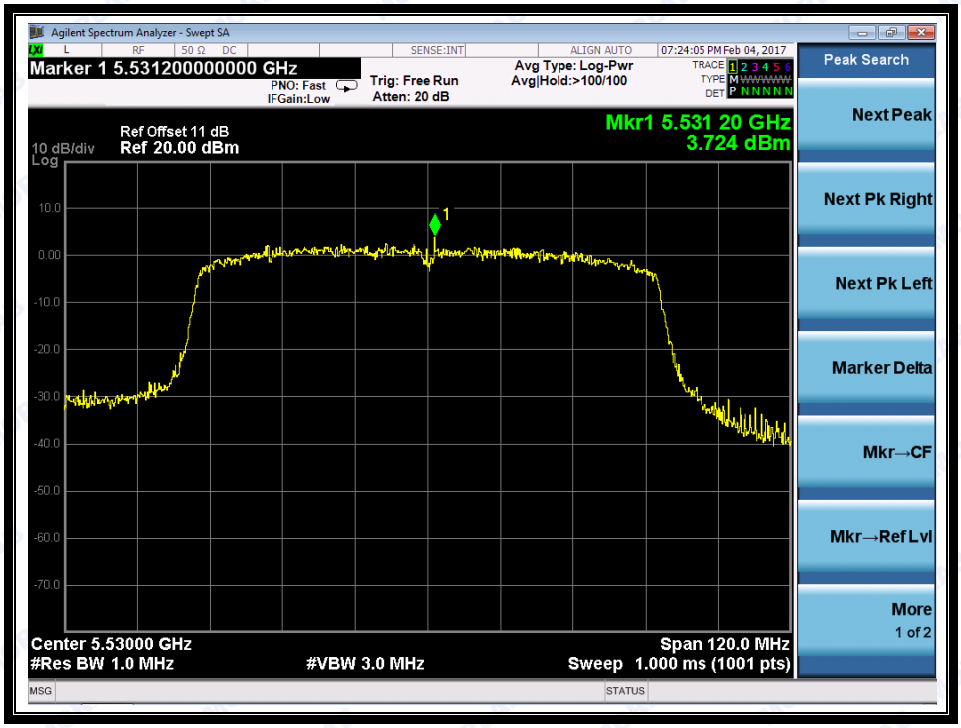
B. Test Plots



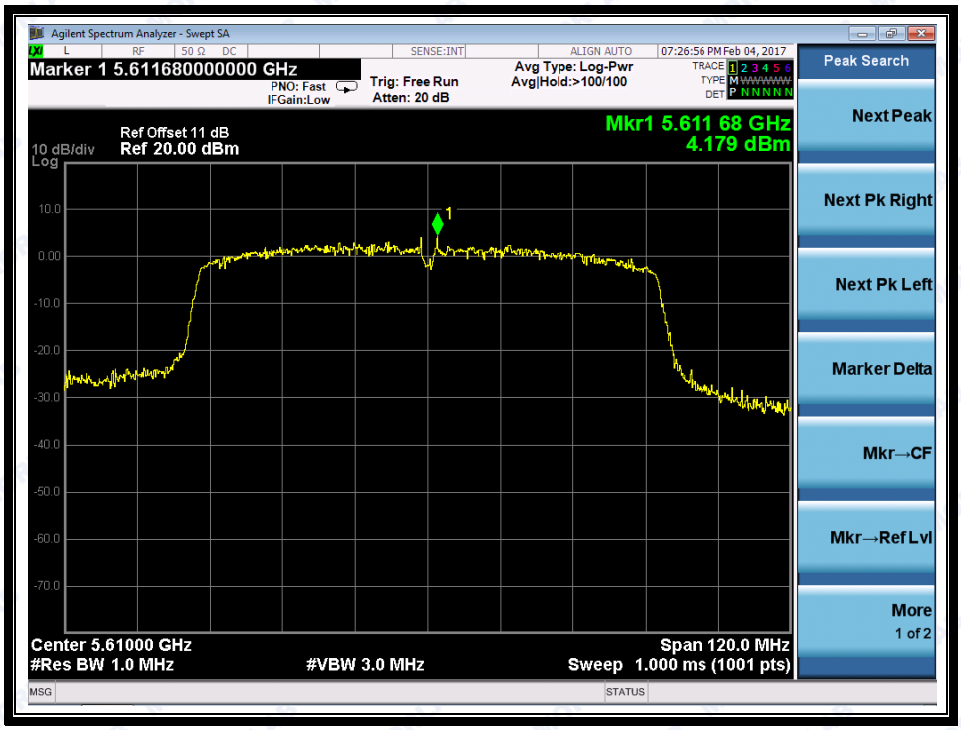
(Channel 42: 5210MHz @ 802.11ac)



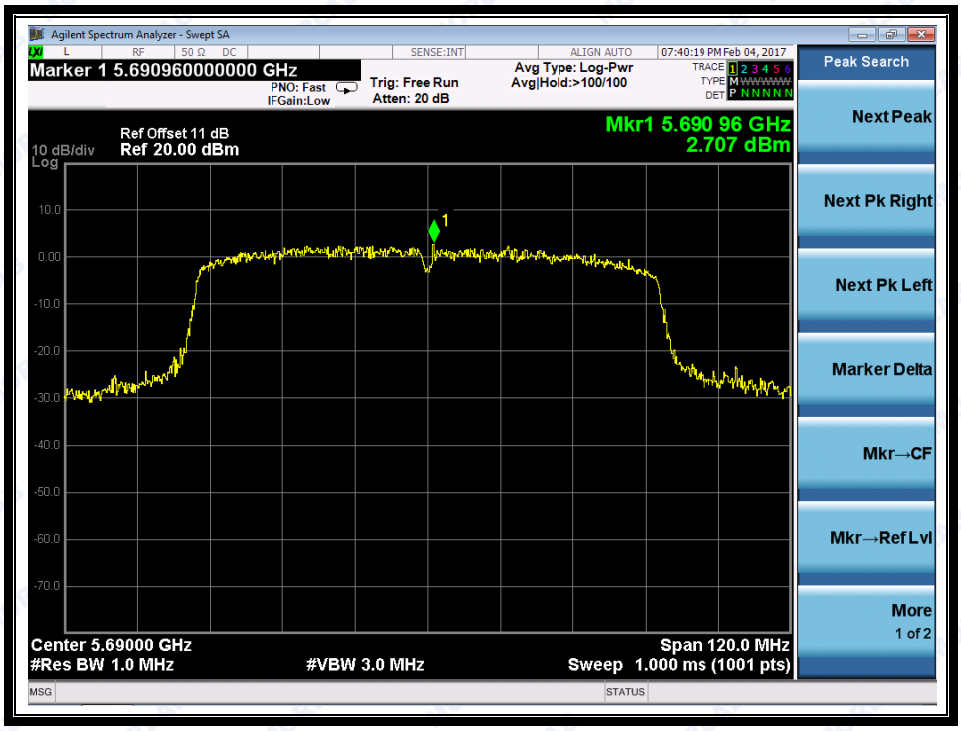
(Channel 58: 5290MHz @ 802.11ac)



(Channel 106: 5530MHz @ 802.11ac)



(Channel 122: 5610MHz @ 802.11ac)



(Channel 138: 5690MHz @ 802.11ac)

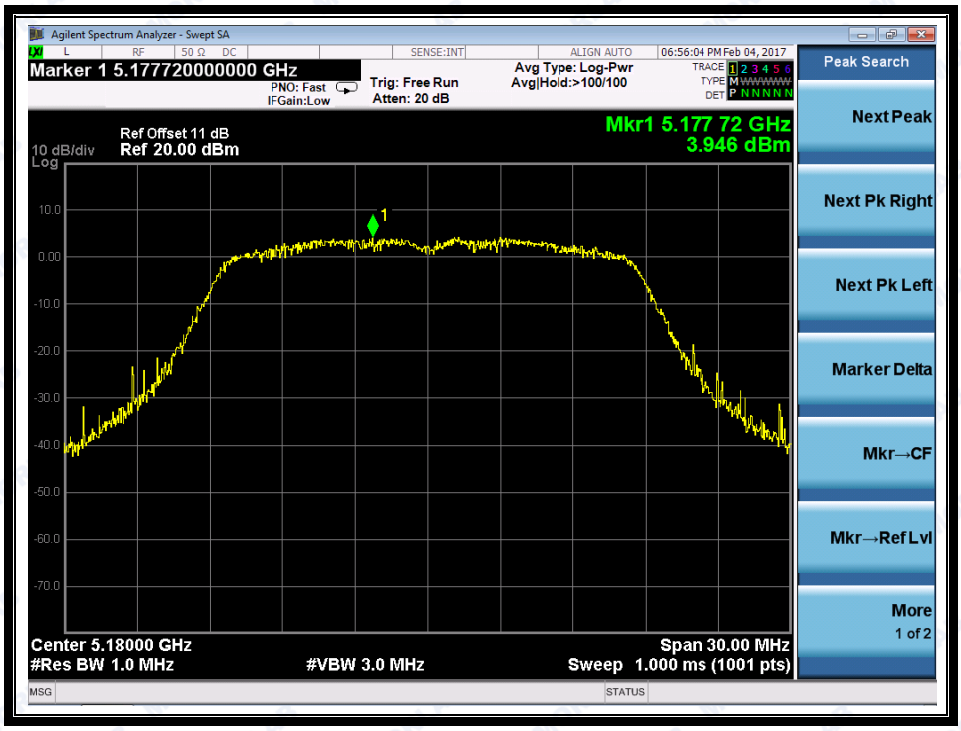
(Channel 155: 5775MHz @ 802.11ac)

2.4.3.5 802.11n-20MHz Test mode

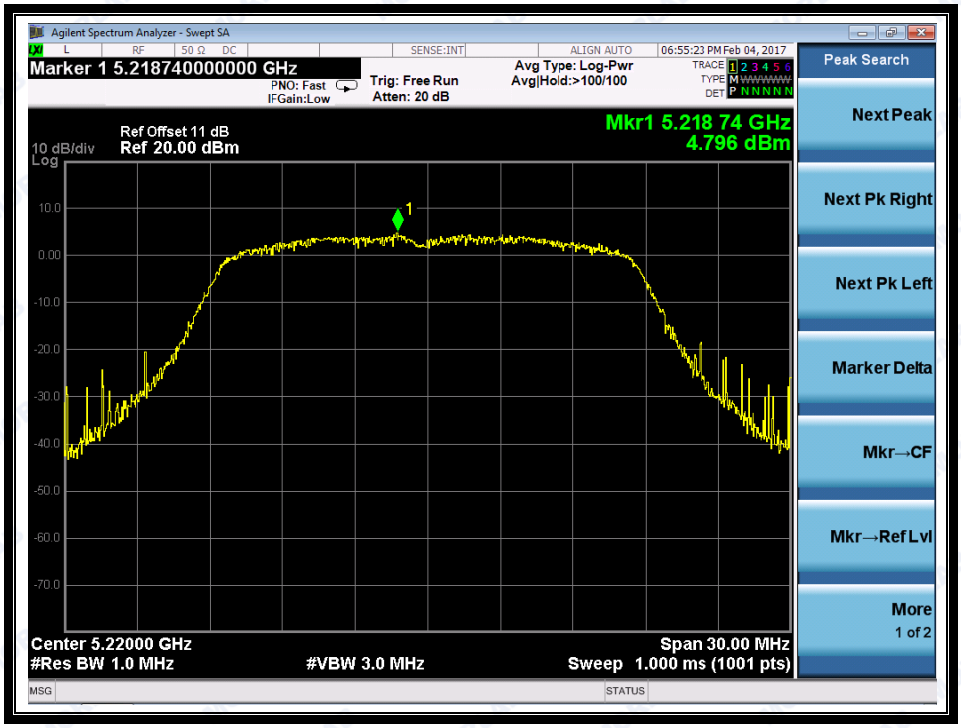
A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	3.95	11	PASS
44	5220	4.80		
48	5240	4.72		
52	5260	5.12		
60	5300	6.37		
64	5320	6.66		
100	5500	6.92		
120	5600	7.47		
140	5700	6.72		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	3.79	30	PASS
157	5785	2.57		
165	5825	1.93		

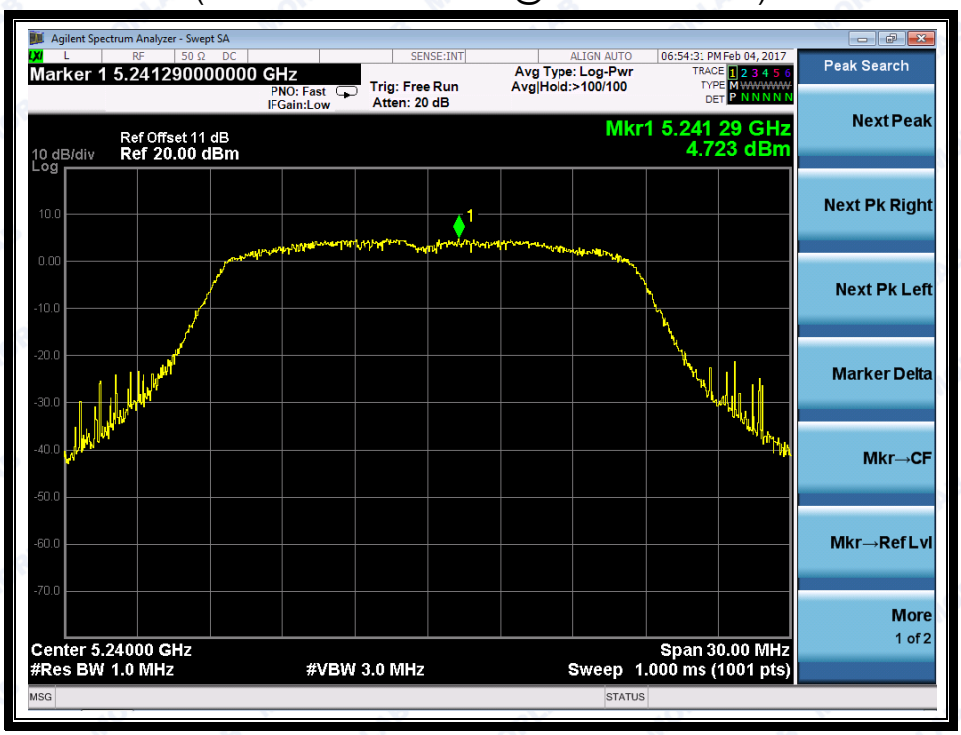
B. Test Plots



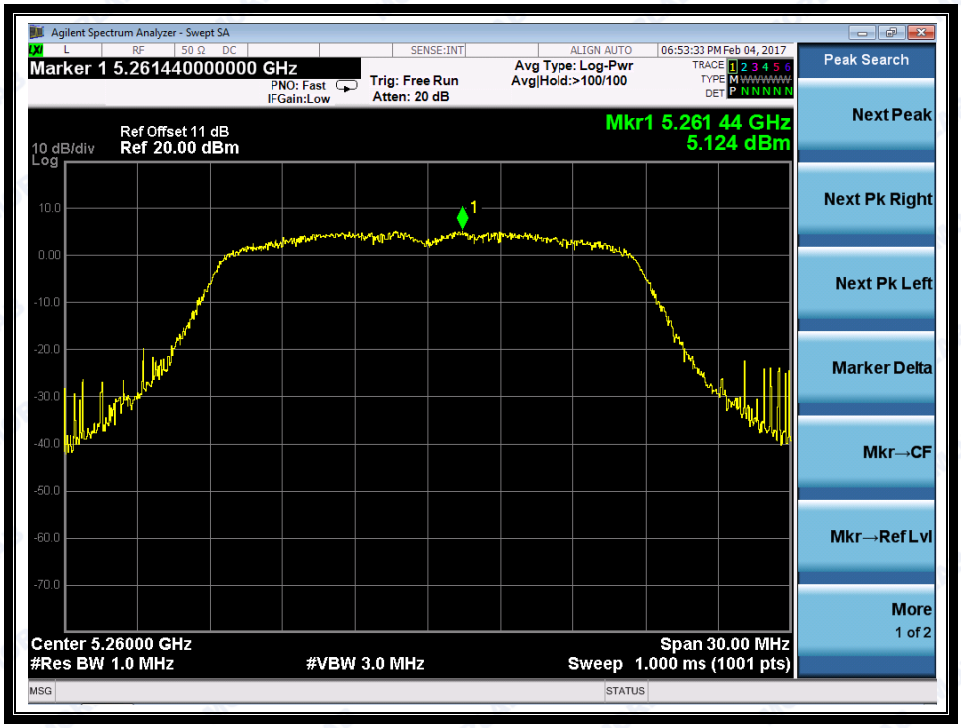
(Channel 36: 5180MHz @ 802.11n-20MHz)



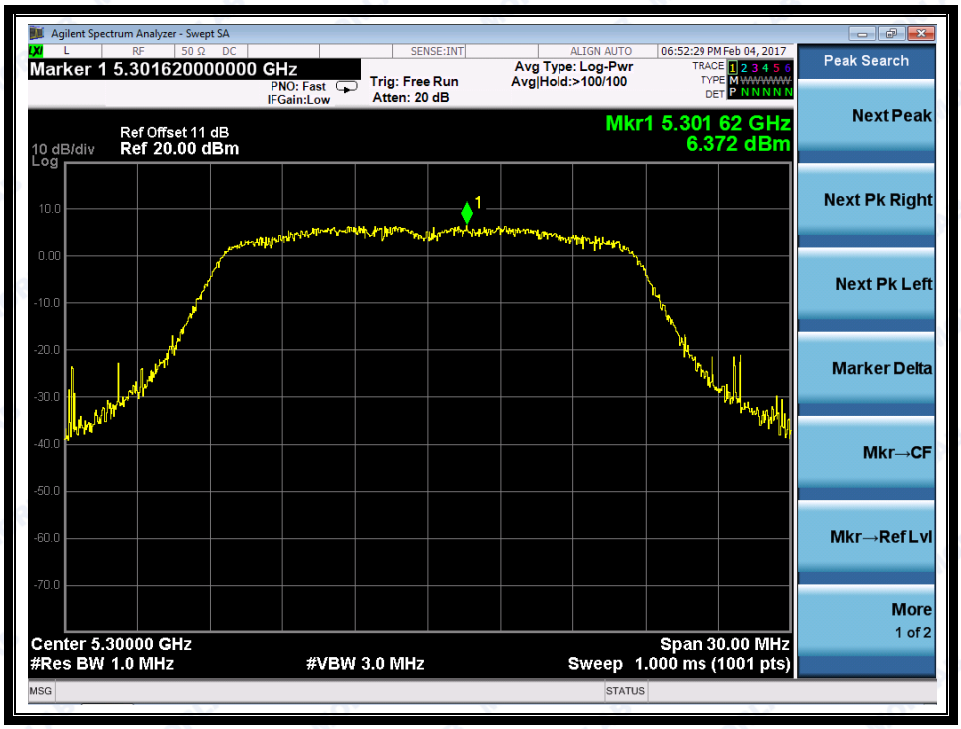
(Channel 44: 5220 MHz @ 802.11n-20MHz)



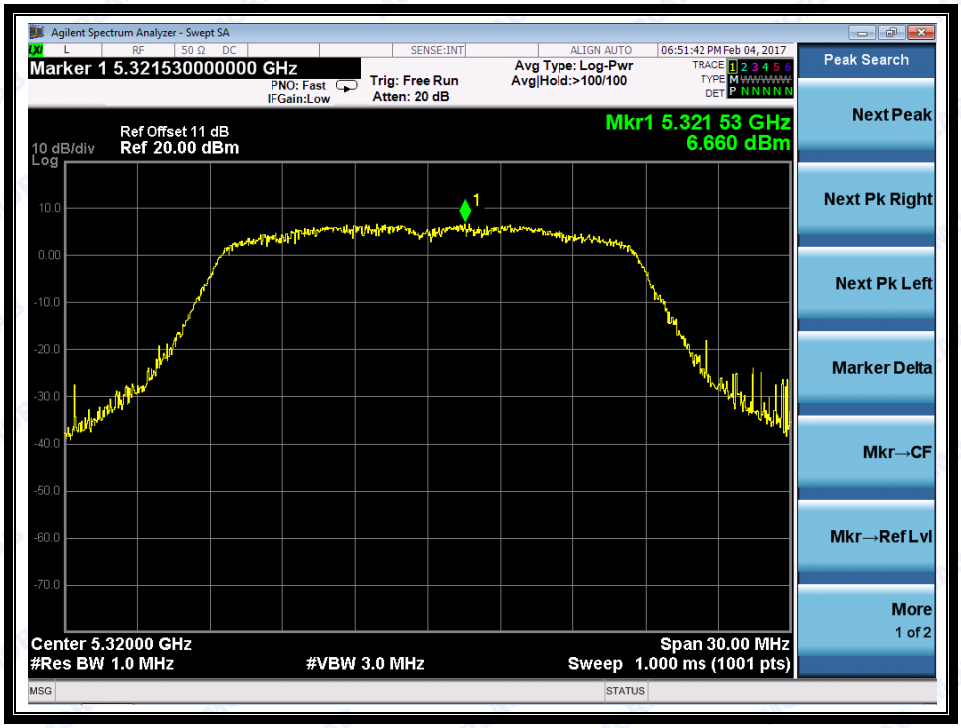
(Channel 48: 5240MHz @ 802.11n-20MHz)



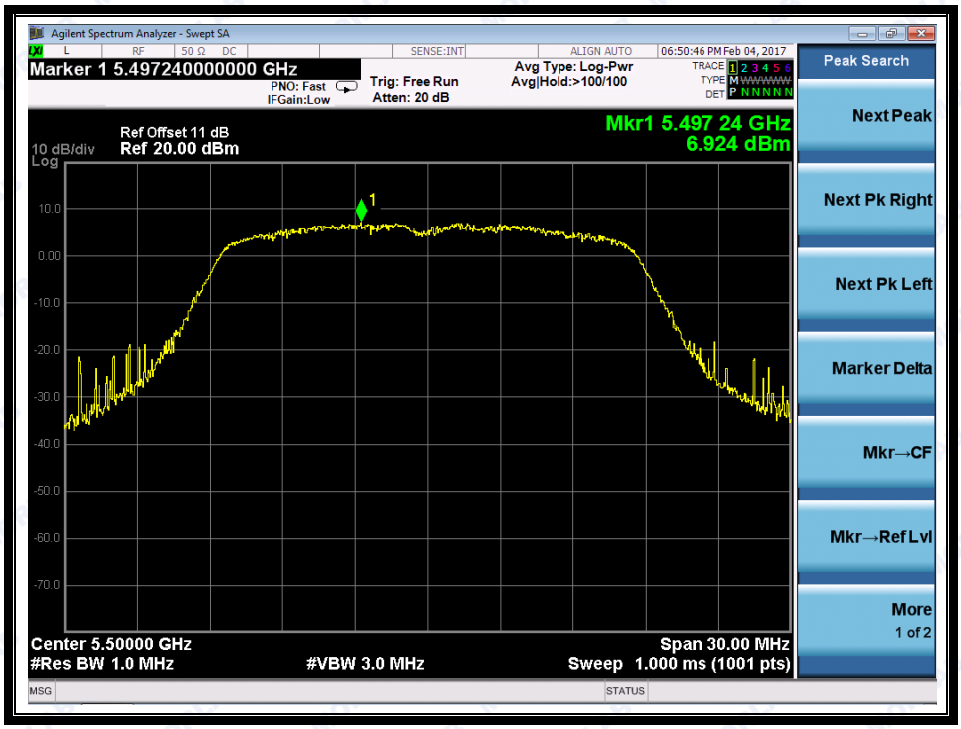
(Channel 52: 5260MHz @ 802.11n-20MHz)



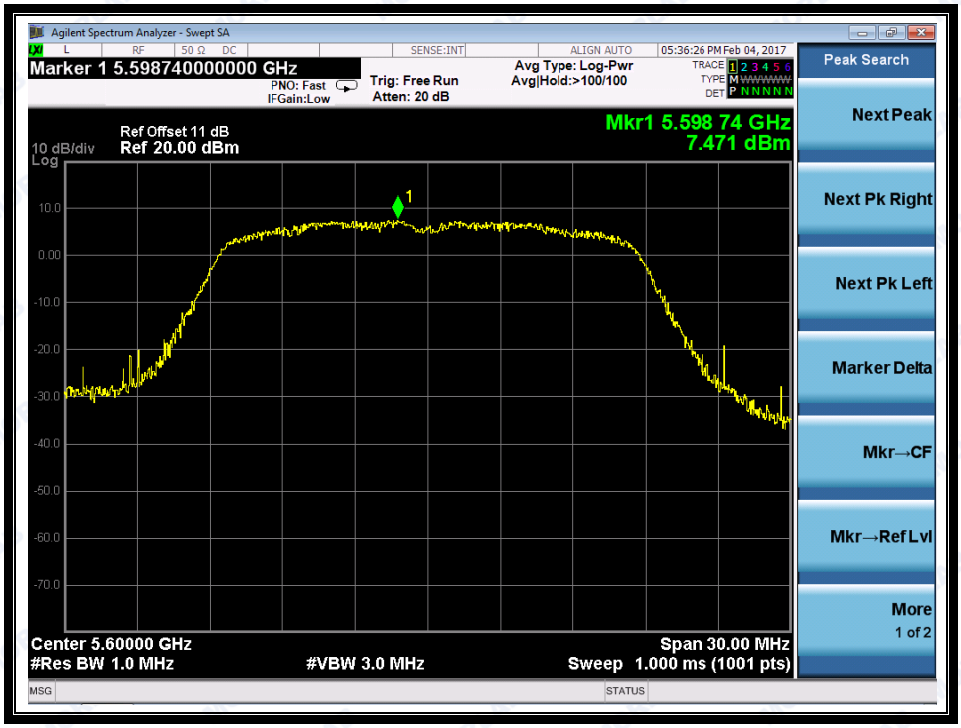
(Channel 60: 5300MHz @ 802.11n-20MHz)



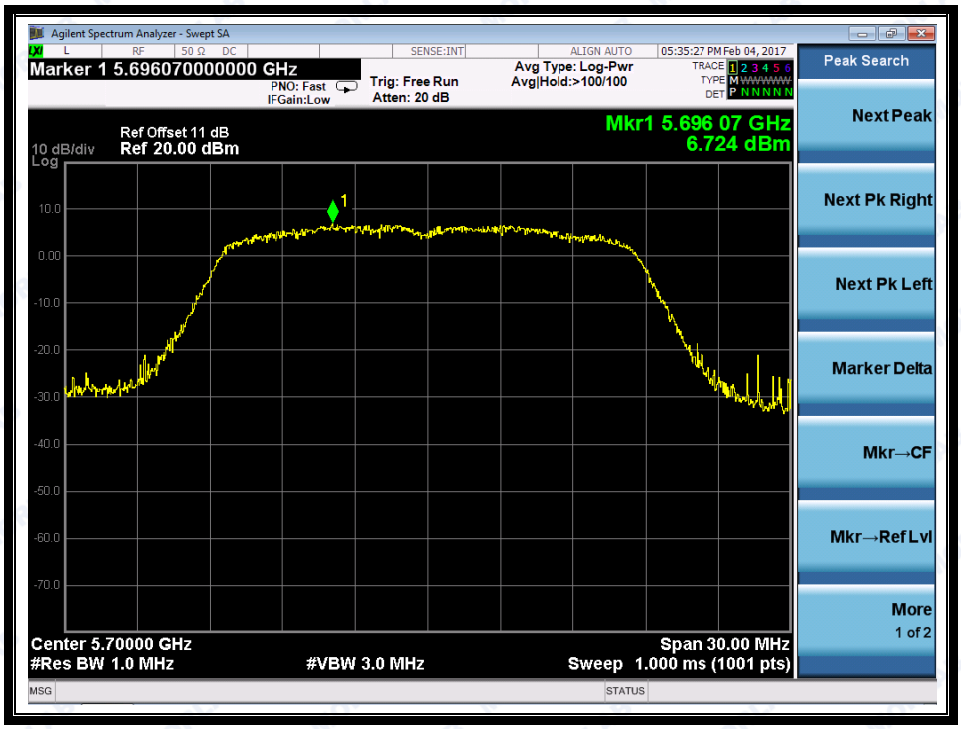
(Channel 64: 5320MHz @ 802.11n-20MHz)



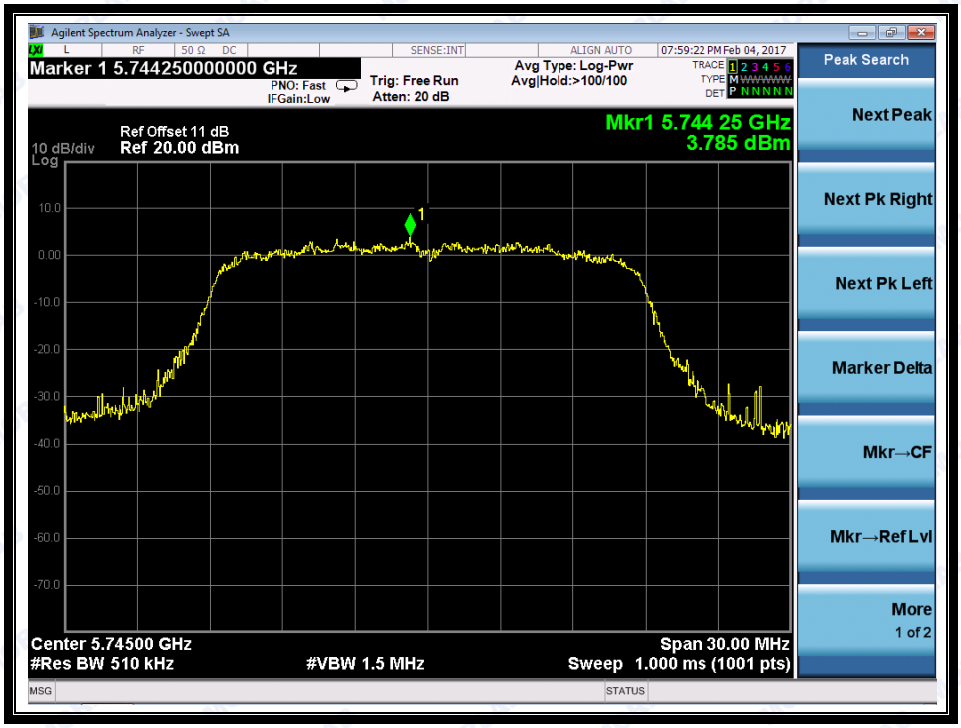
(Channel 100: 5500MHz @ 802.11n-20MHz)



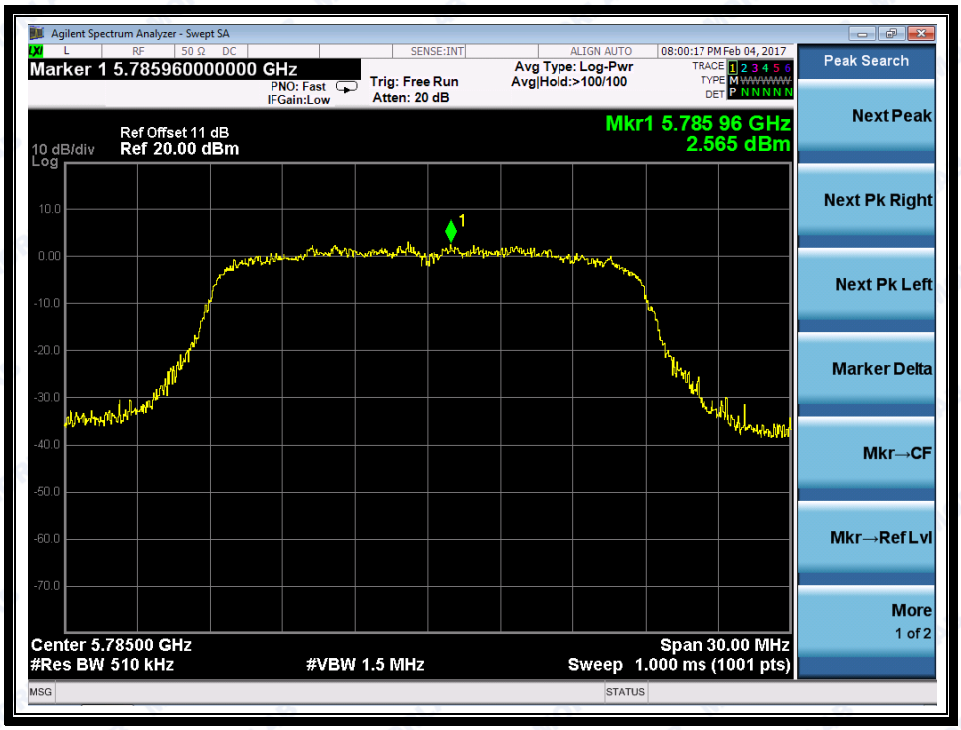
(Channel 120: 5600MHz @ 802.11n-20MHz)



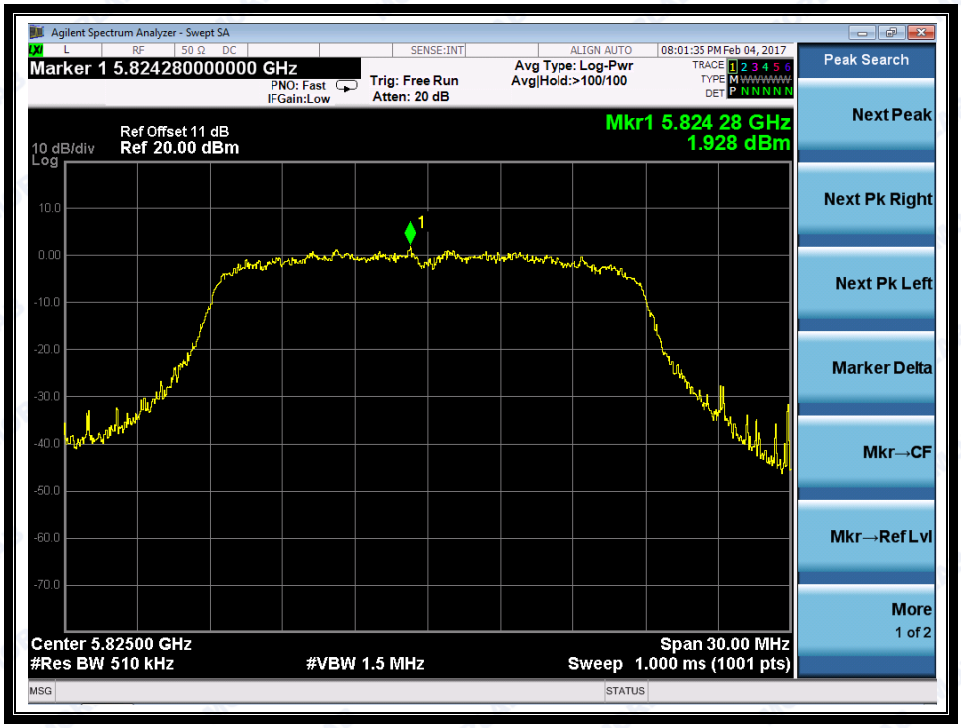
(Channel 140: 5700MHz @ 802.11n-20MHz)



(Channel 149: 5745MHz @ 802.11n-20MHz)



(Channel 157: 5785MHz @802.11n-20MHz)



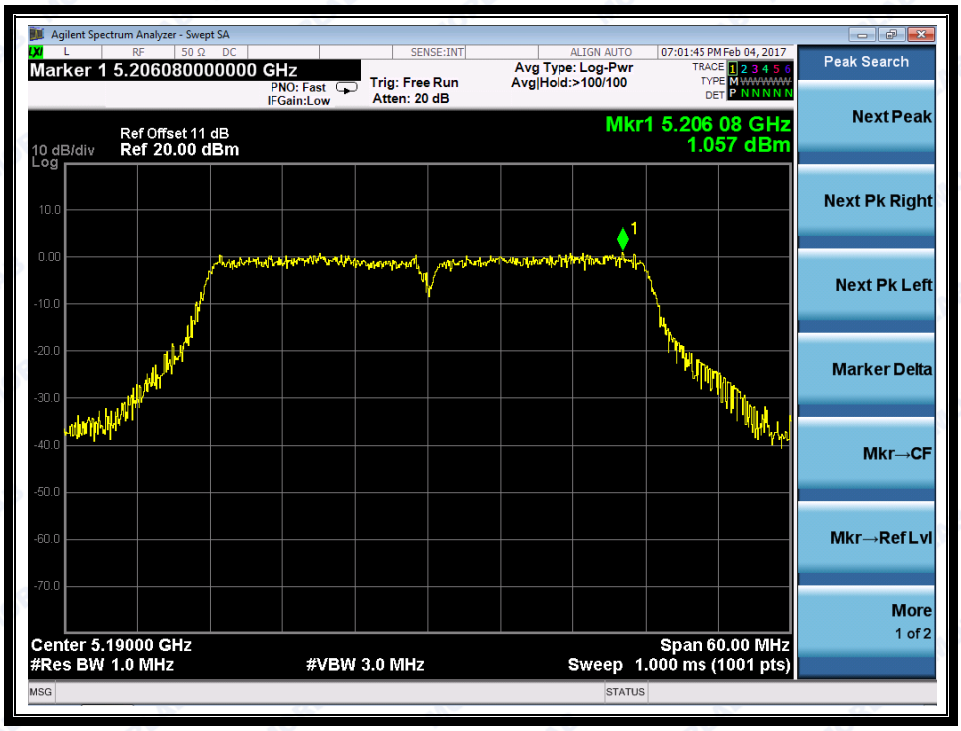
(Channel 165: 5825MHz @ 802.11n-20MHz)

2.4.3.6 802.11n-40MHz Test mode

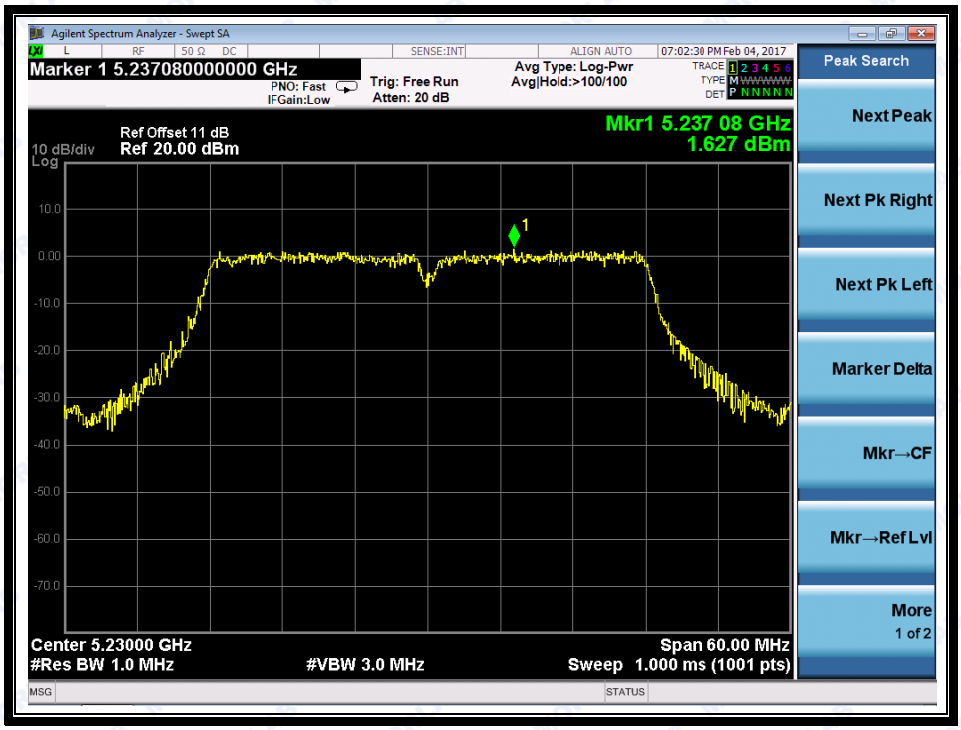
A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Limit (dBm/MHz))	Verdict
38	5190	1.06	11	PASS
46	5230	1.63		
54	5270	2.65		
62	5310	3.55		
102	5510	4.51		
126	5630	5.01		
142	5710	4.08	U-NII-2C:11dBm/MHz U-NII-3:30dBm/500KHz	
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
151	5755	3.07	30	PASS
159	5795	0.15		

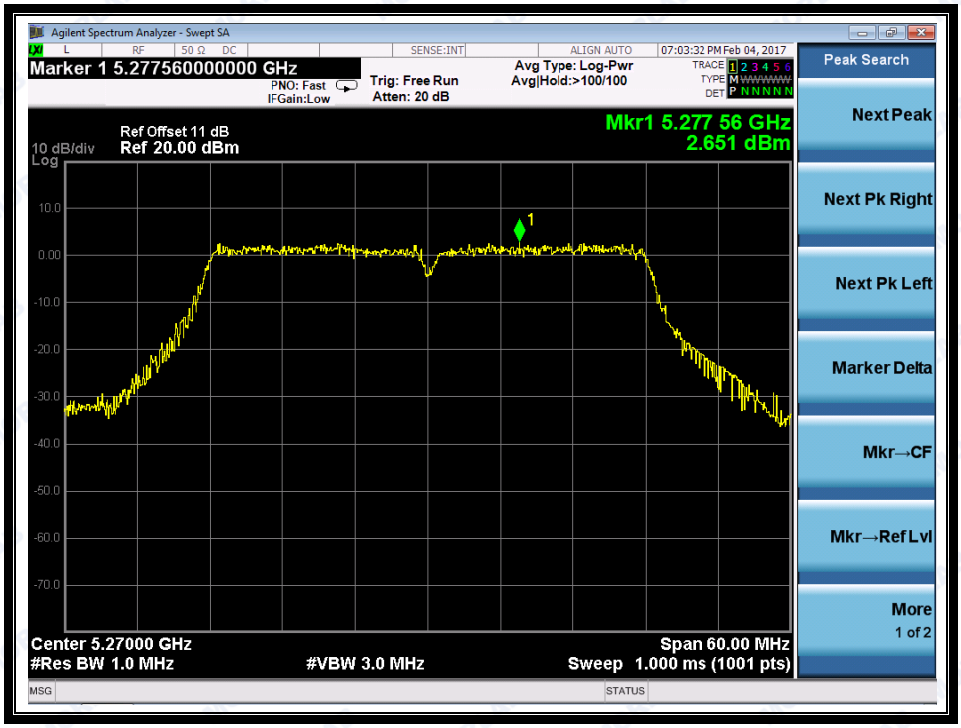
B. Test Plots



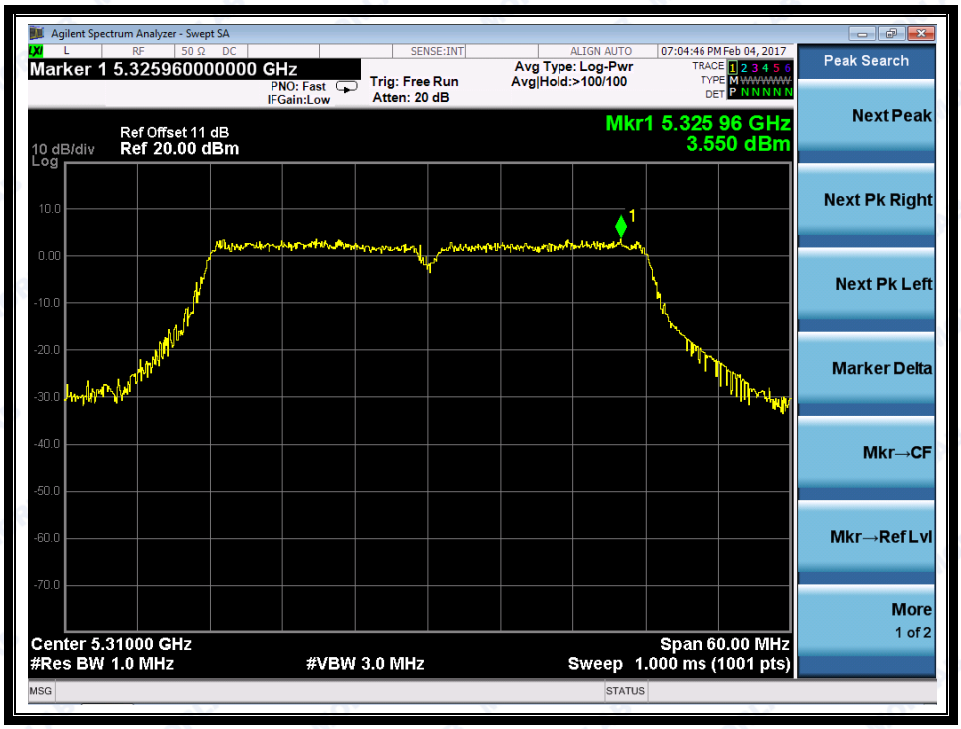
(Channel 38: 5190MHz @ 802.11n-40MHz)



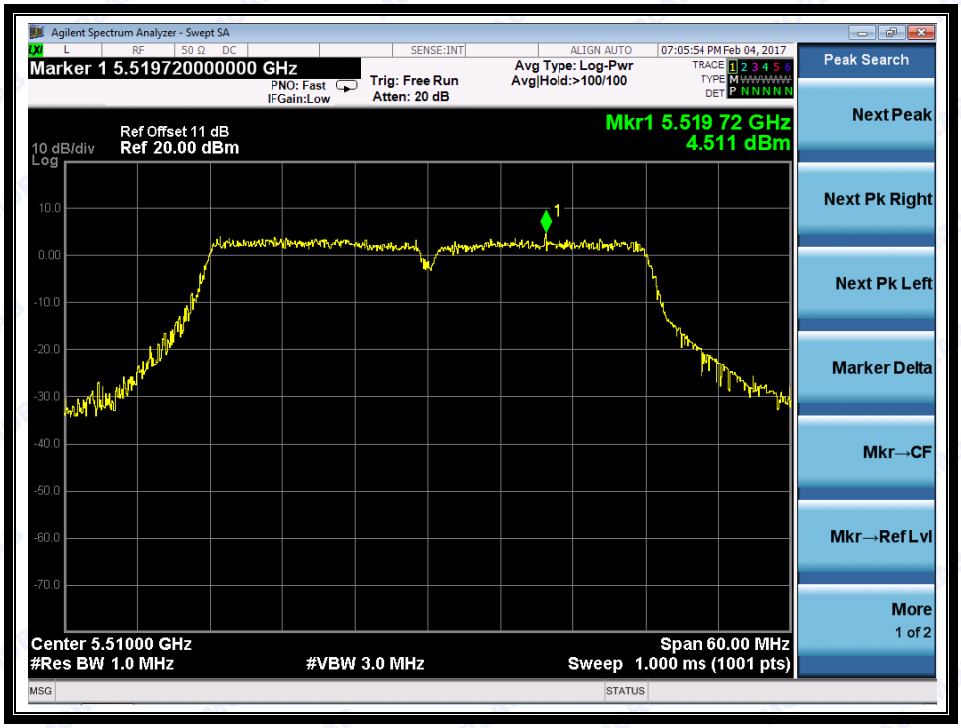
(Channel 46: 5230 MHz @ 802.11n-40MHz)



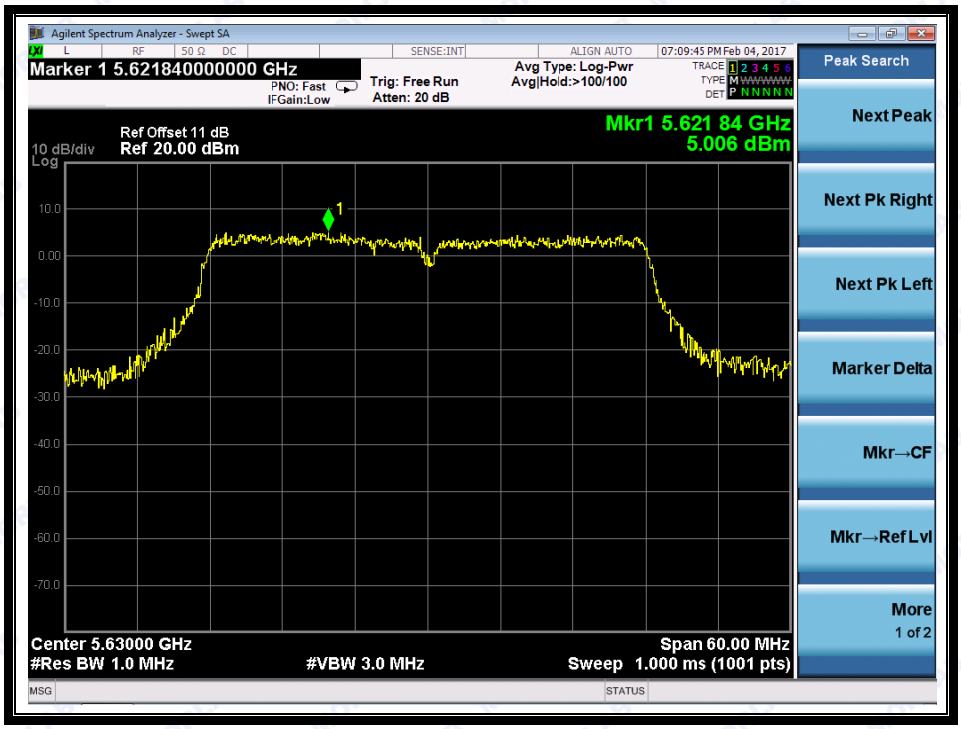
(Channel 54: 5270MHz @802.11n-40MHz)



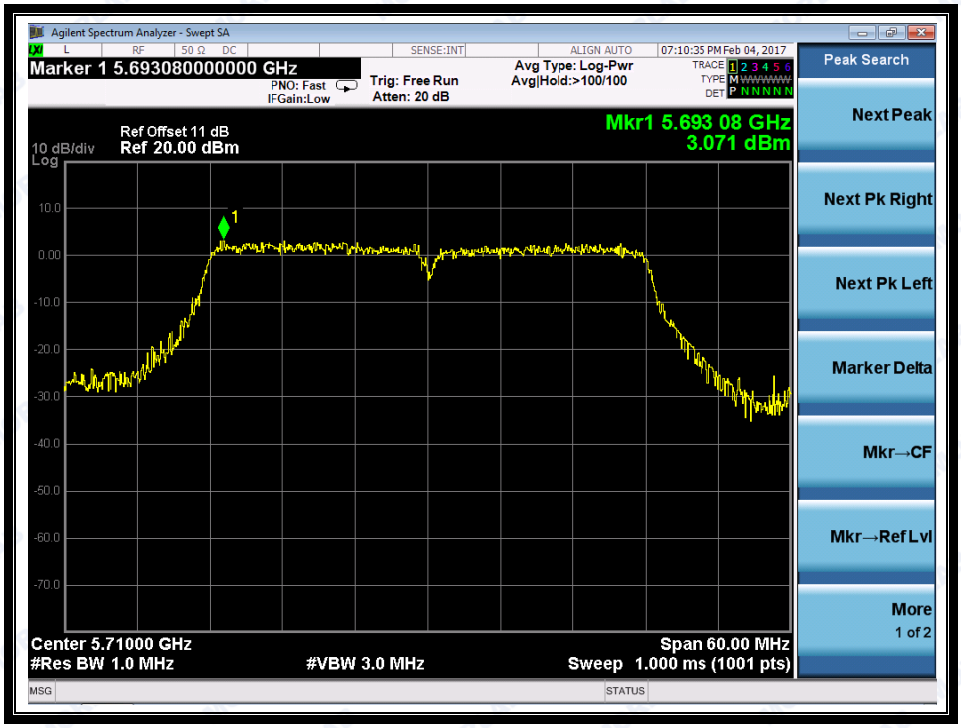
(Channel 62: 5310MHz @ 802.11n-40MHz)



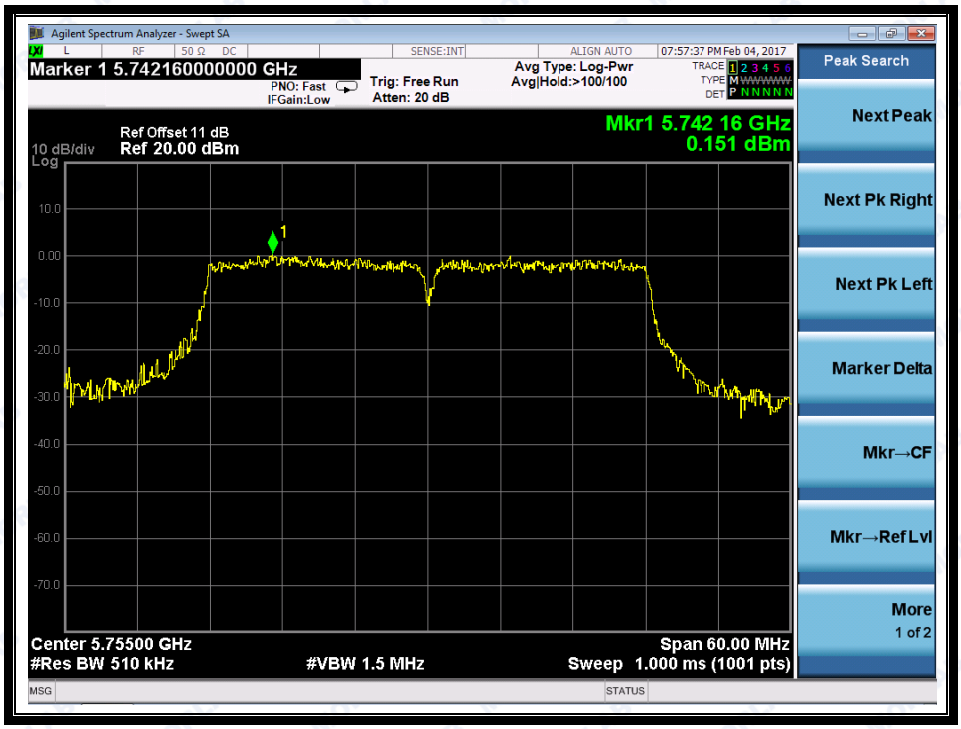
(Channel 102: 5510MHz @802.11n-40MHz)



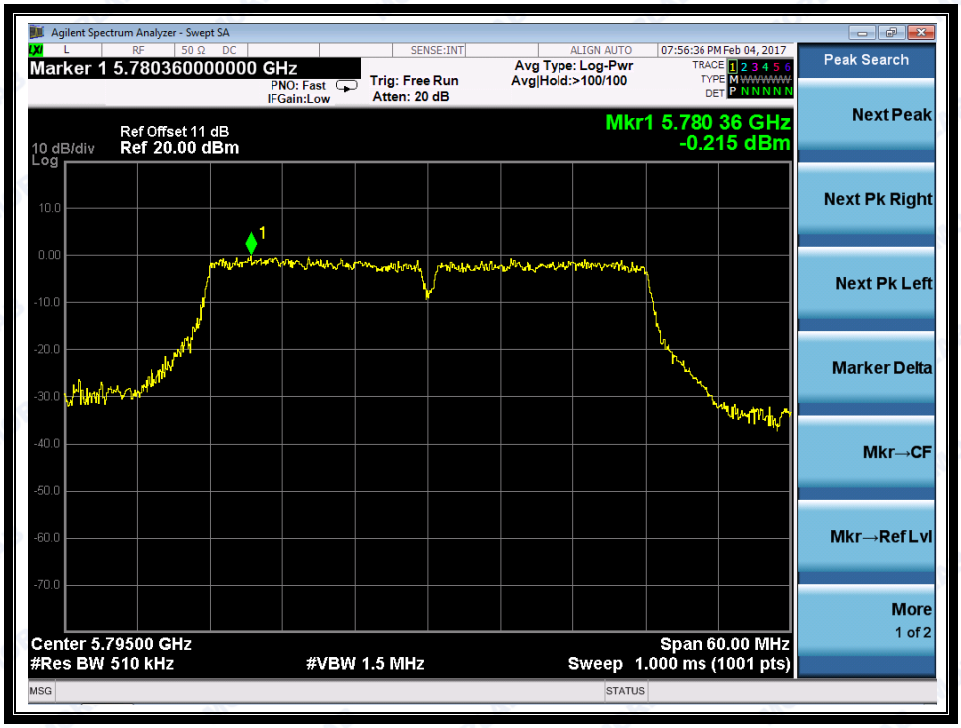
(Channel 126: 5630MHz @ 802.11n-40MHz)



(Channel 142: 5710MHz @ 802.11n-40MHz)



(Channel 151: 5755MHz @ 802.11n-40MHz)



(Channel 159: 5795MHz @802.11n-40MHz)

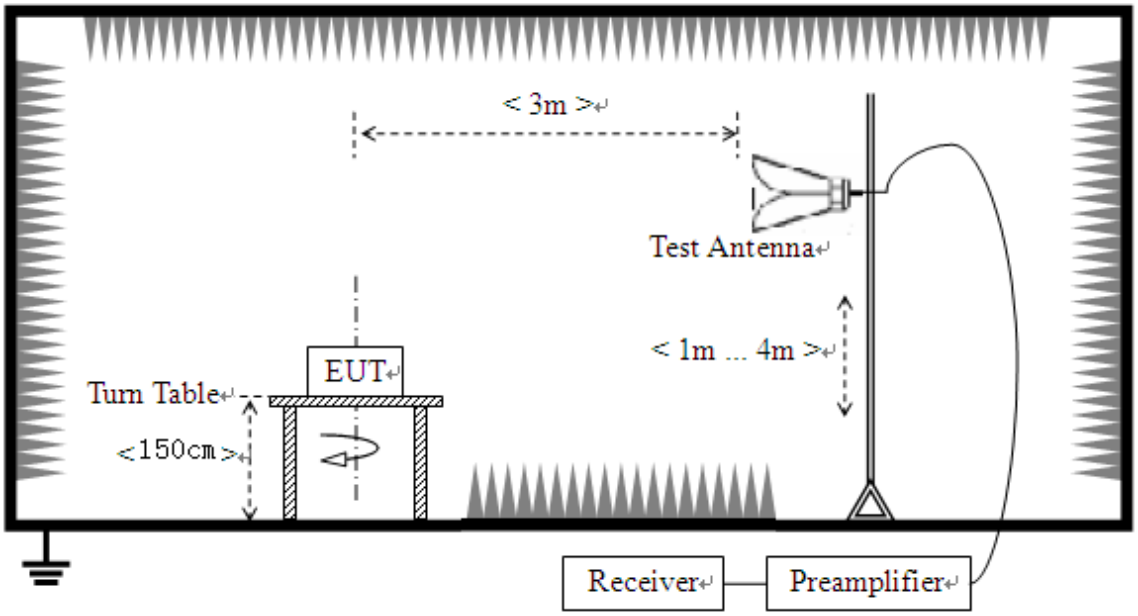
2.5 Restricted Frequency Bands

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 [dBμV/m] $=U_R + A_T + A_{Factor}$ [dB]; $A_T = L_{Cable\ loss}$ [dB]$-G_{preamp}$ [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.

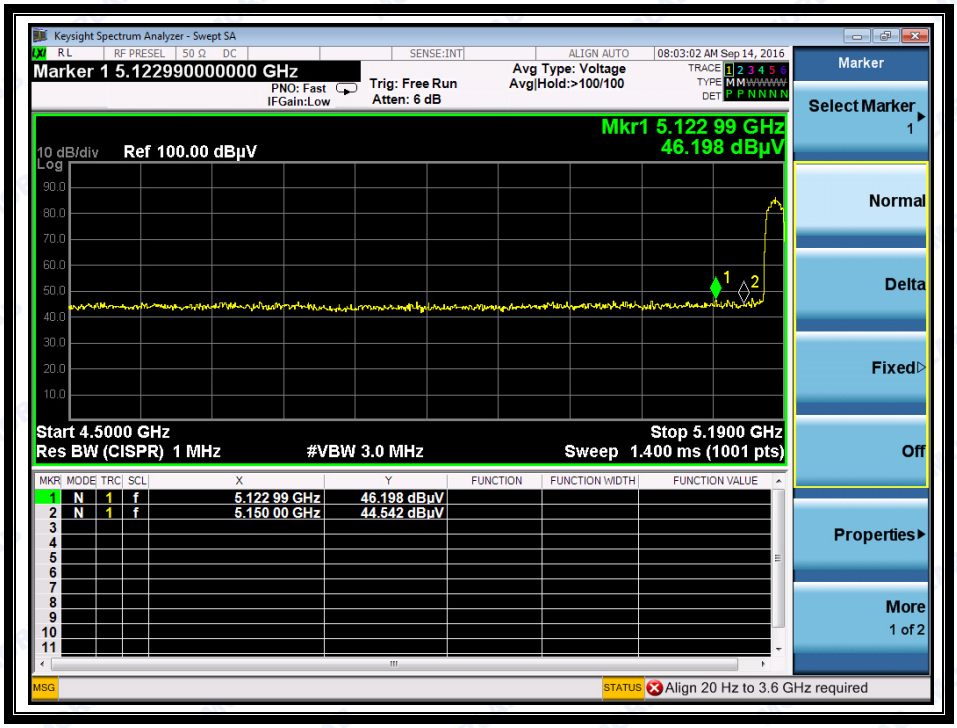
2.5.3.1 802.11a Test mode

The lowest and highest channels are tested to verify the band edge emissions.

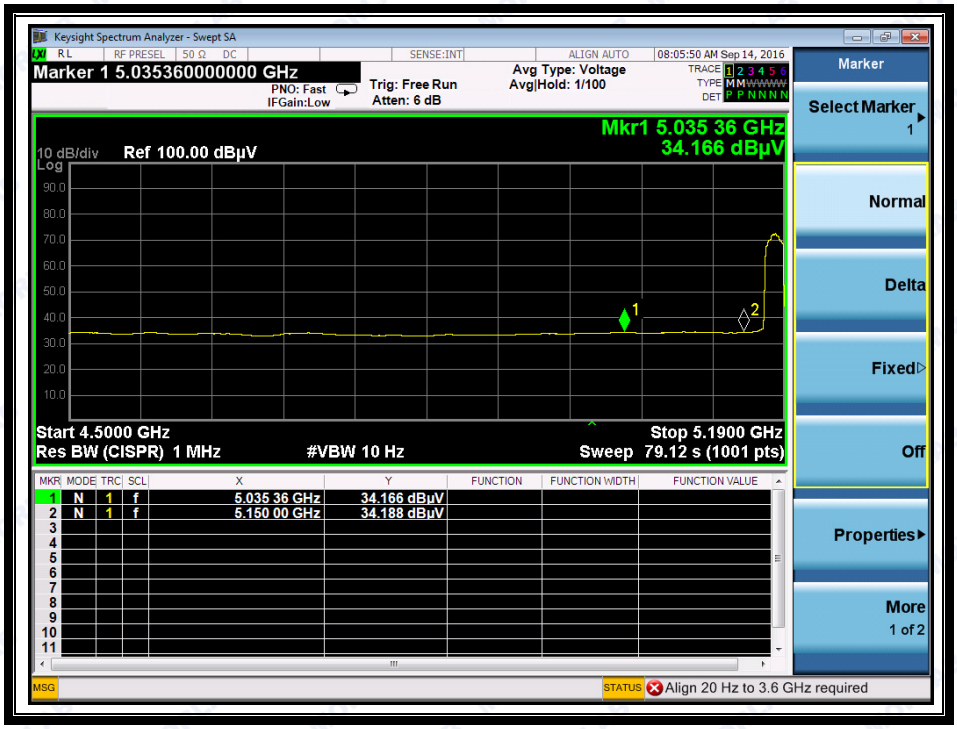
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
36	5122.99	PK	46.20	-50.65	32.11	27.66	74	Pass
36	5035.36	AV	34.17	-50.65	32.11	15.63	54	Pass
64	5393.08	PK	41.18	-50.65	32.11	22.64	74	Pass
64	5393.08	AV	32.72	-50.65	32.11	14.18	54	Pass
100	5461.50	PK	41.98	-50.65	32.11	23.44	74	Pass
100	5461.50	AV	32.83	-50.65	32.11	14.29	54	Pass
140	5770.90	PK	43.34	-50.65	32.11	24.8	74	Pass
140	5770.90	AV	34.10	-50.65	32.11	15.56	54	Pass

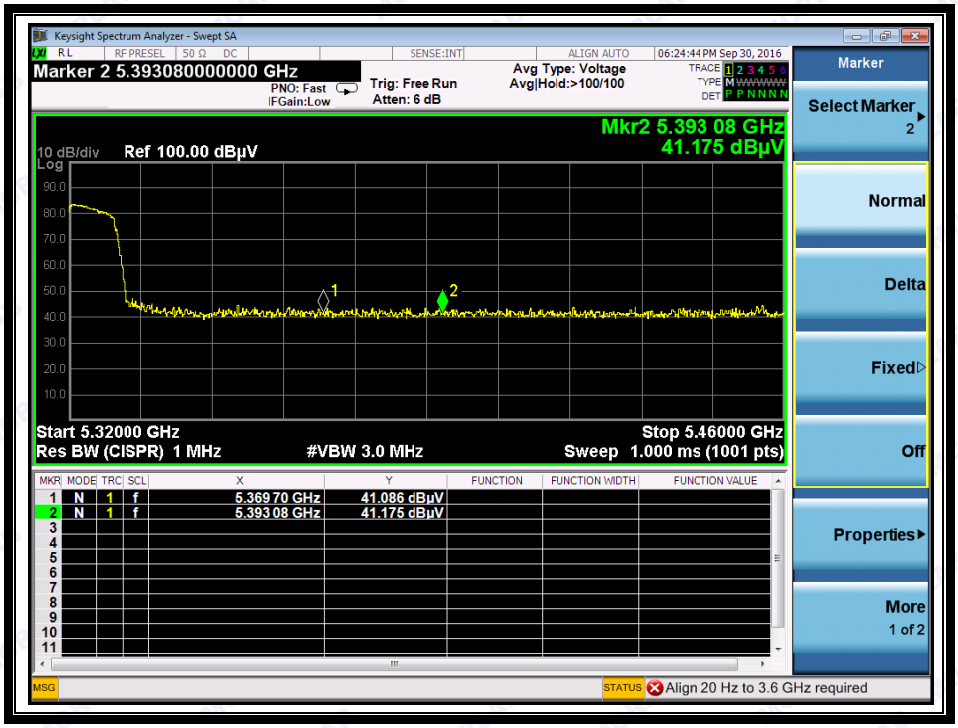
B. Test Plots:



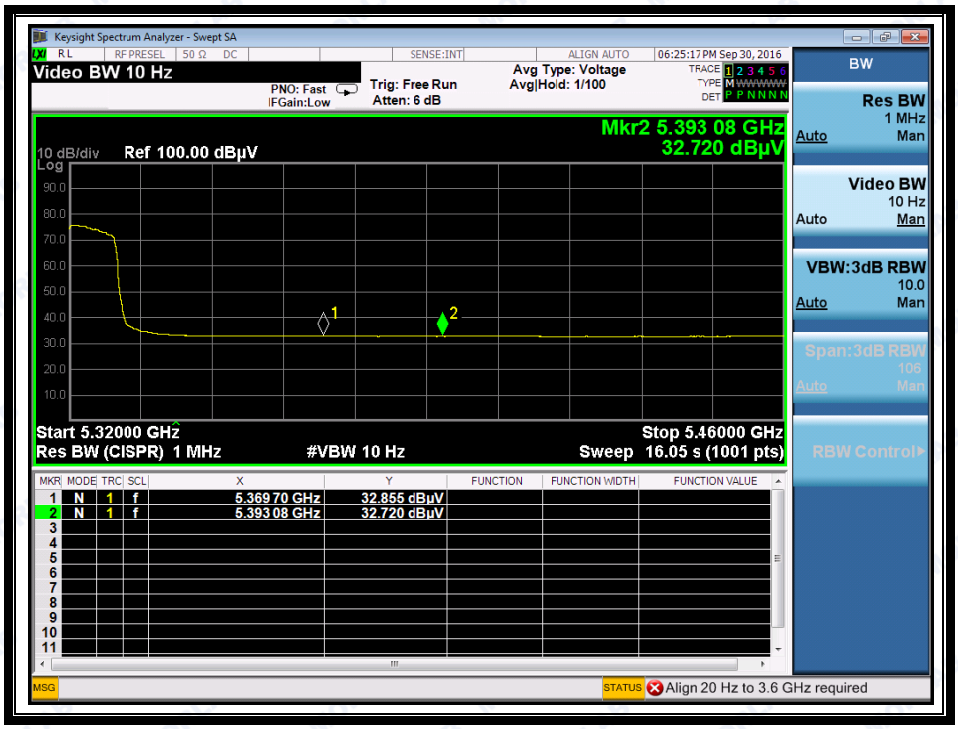
(Channel = 36 PEAK @ 802.11a)



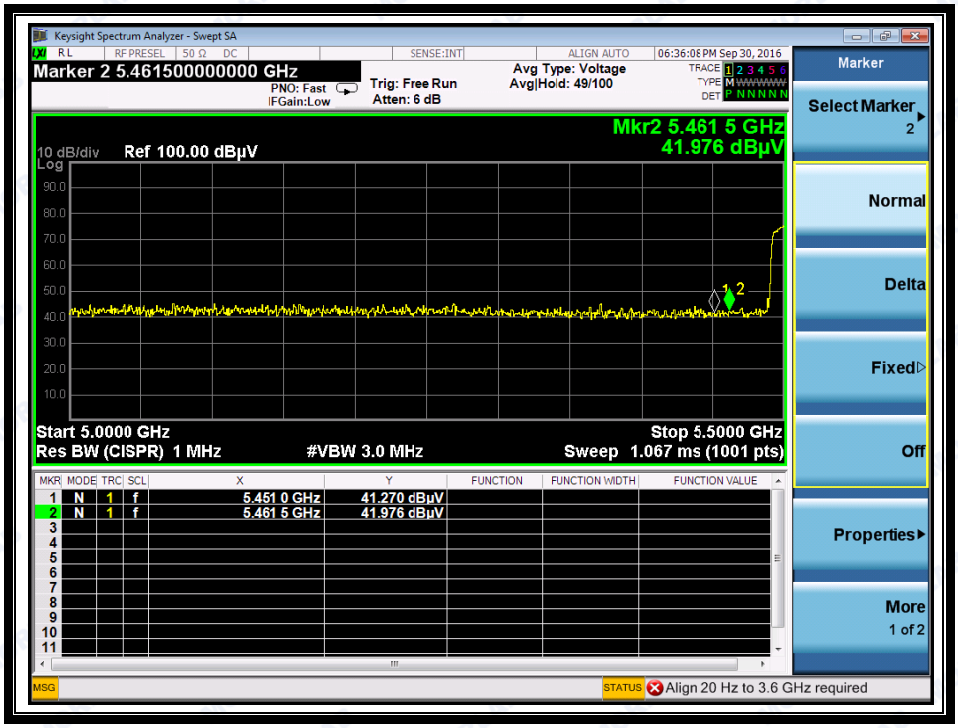
(Channel = 36 AVG @ 802.11a)



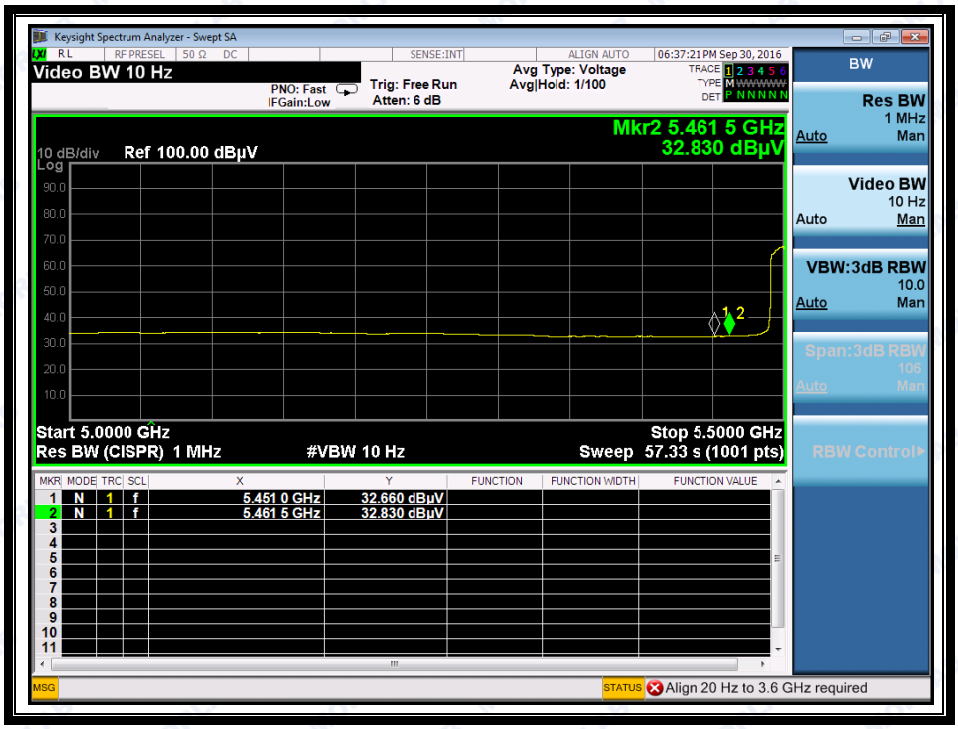
(Channel = 64 PEAK @ 802.11a)



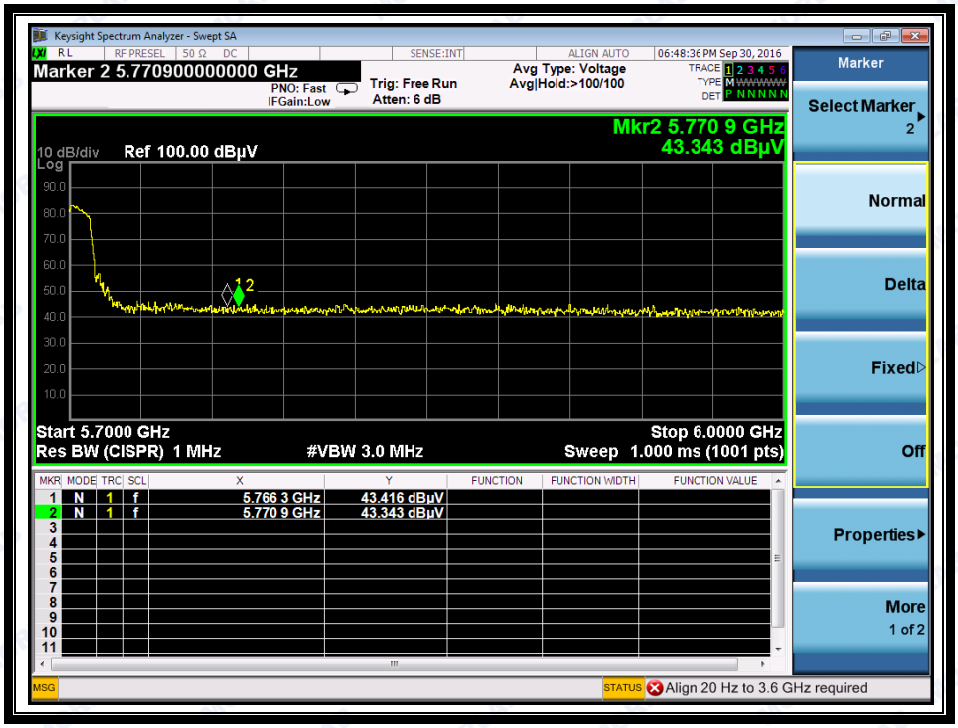
(Channel = 64 AVG @ 802.11a)



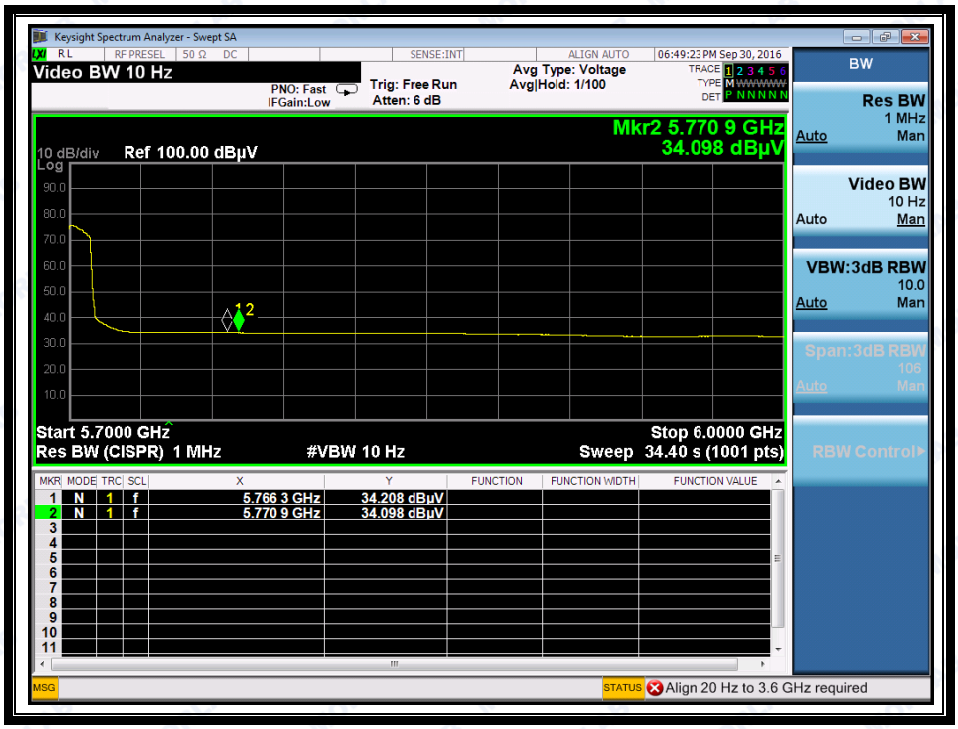
(Channel = 100 PEAK @ 802.11a)



(Channel =100 AVG @ 802.11a)



(Channel = 140 PEAK @ 802.11a)



(Channel = 140 AVG @ 802.11a)

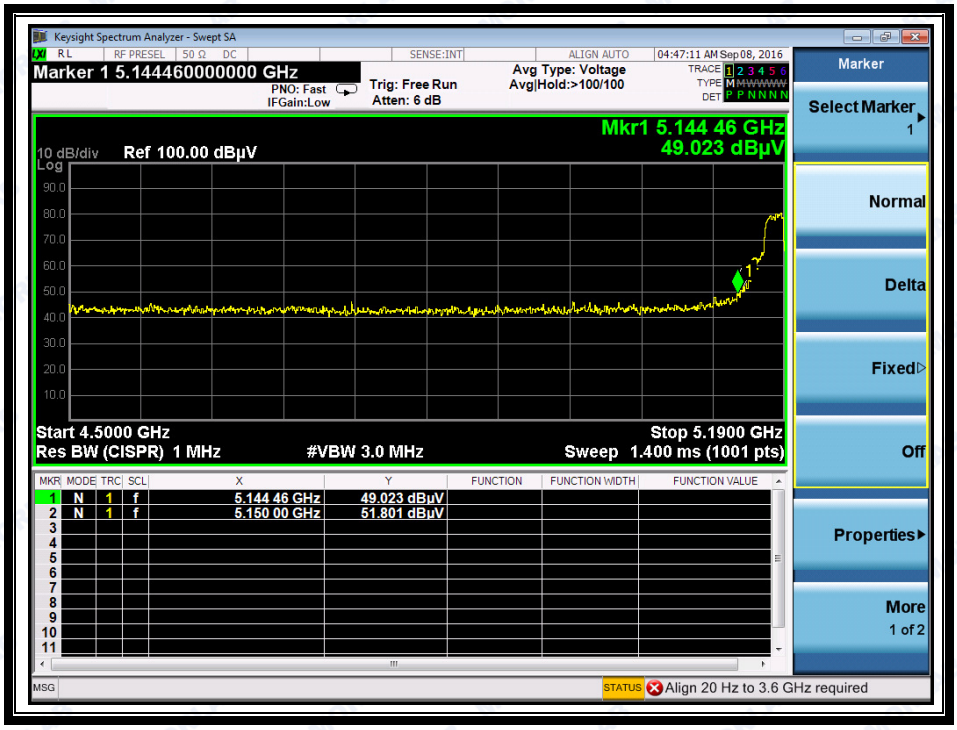
2.5.3.2 802.11ac-20MHz Test mode

The lowest and highest channels are tested to verify the band edge emissions.

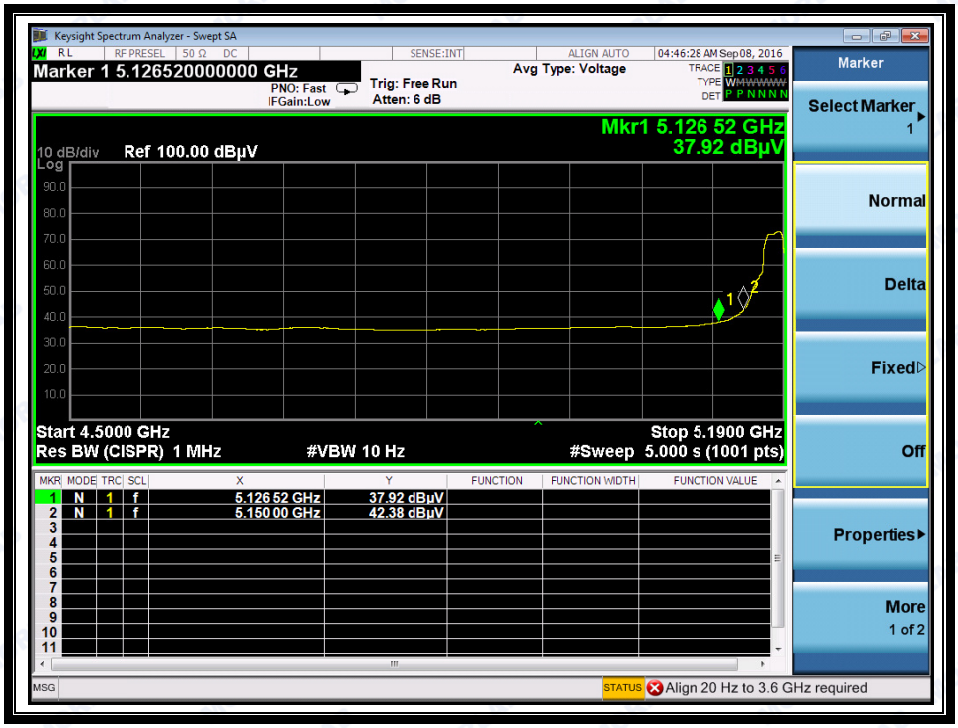
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
36	5144.46	PK	49.02	-50.65	32.11	30.48	74	Pass
36	5126.52	AV	37.92	-50.65	32.11	19.38	54	Pass
64	5392.80	PK	42.33	-50.65	32.11	23.79	74	Pass
64	5392.80	AV	32.75	-50.65	32.11	14.21	54	Pass
100	5470.00	PK	42.30	-50.65	32.11	23.76	74	Pass
100	5470.00	AV	32.96	-50.65	32.11	14.42	54	Pass
140	5775.70	PK	42.95	-50.65	32.11	24.41	74	Pass
140	5775.70	AV	34.04	-50.65	32.11	15.5	54	Pass

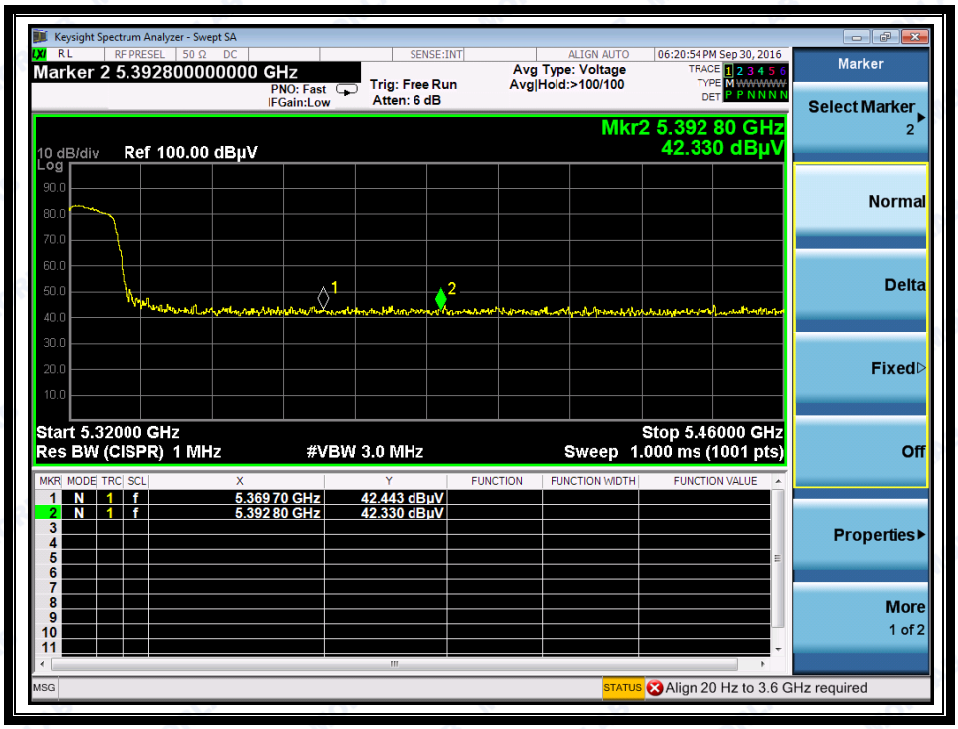
B. Test Plots:



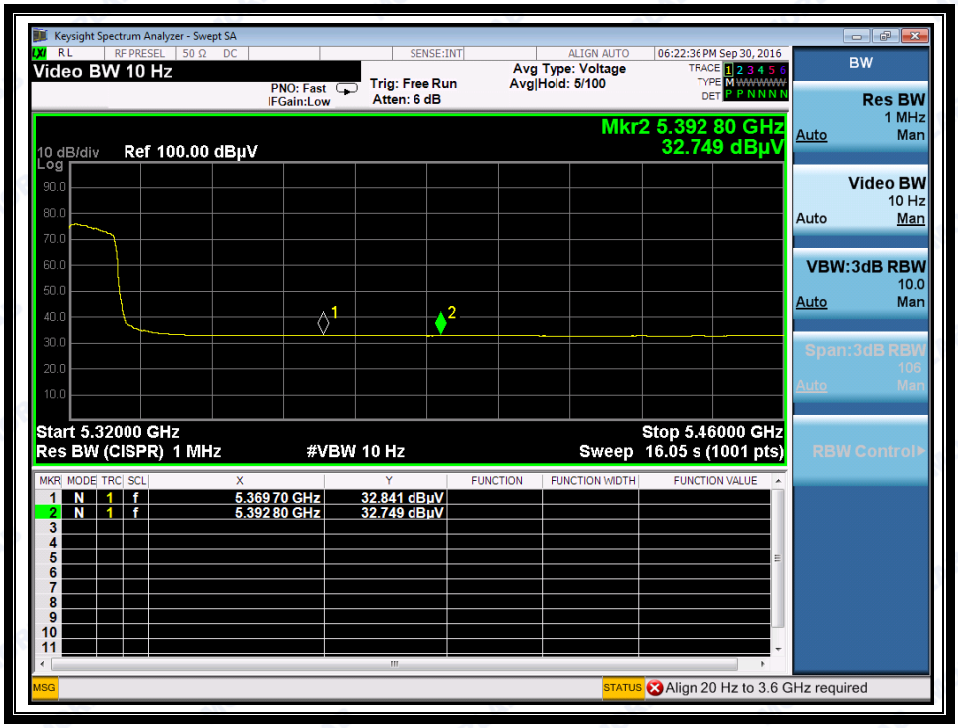
(Channel = 36 PEAK @ 802.11ac)



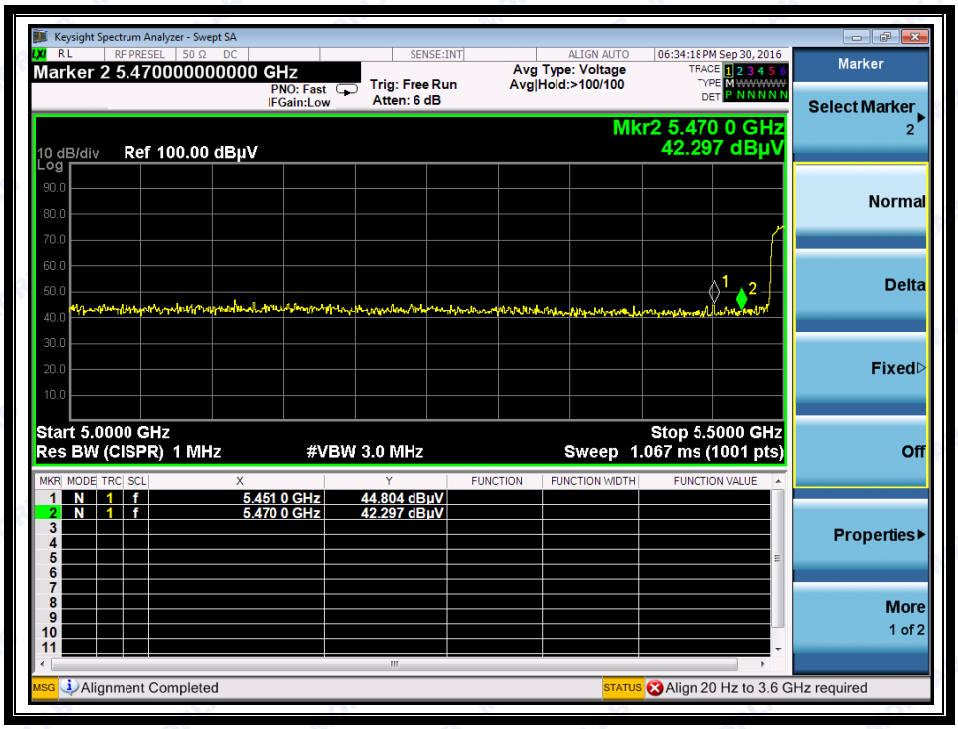
(Channel = 36 AVG @ 802.11ac)



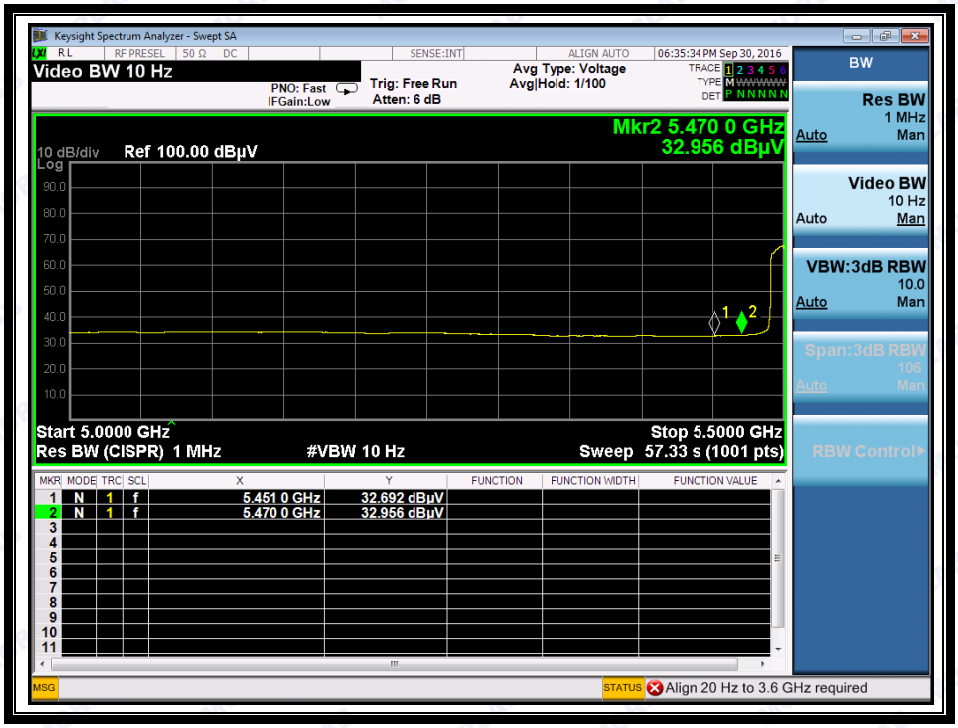
(Channel = 64 PEAK @ 802.11ac)



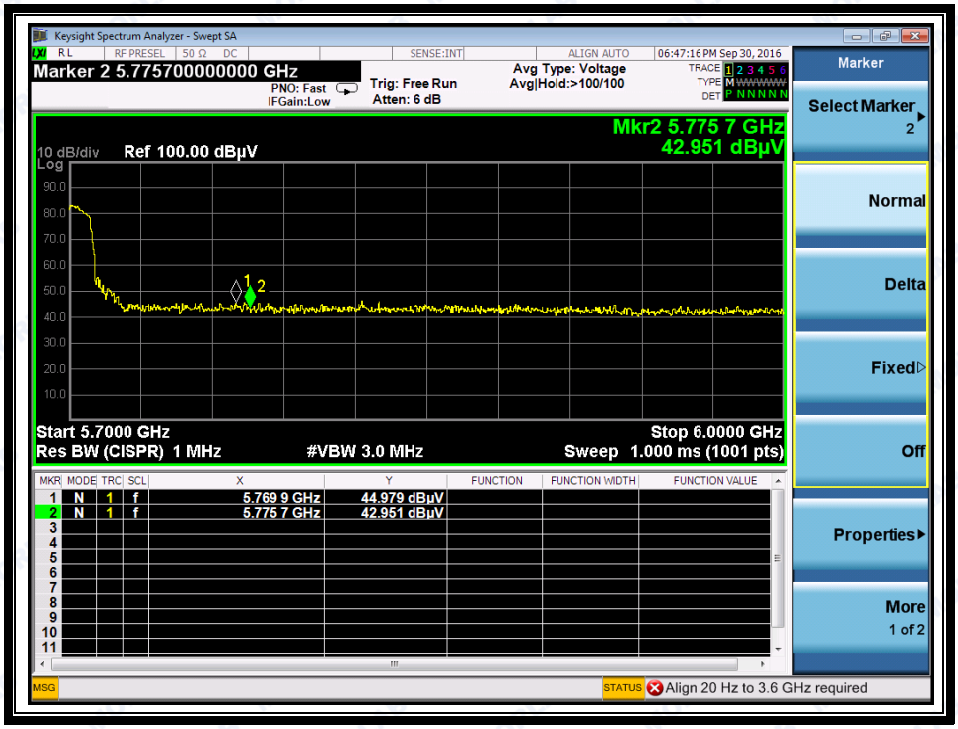
(Channel = 64 AVG @ 802.11ac)



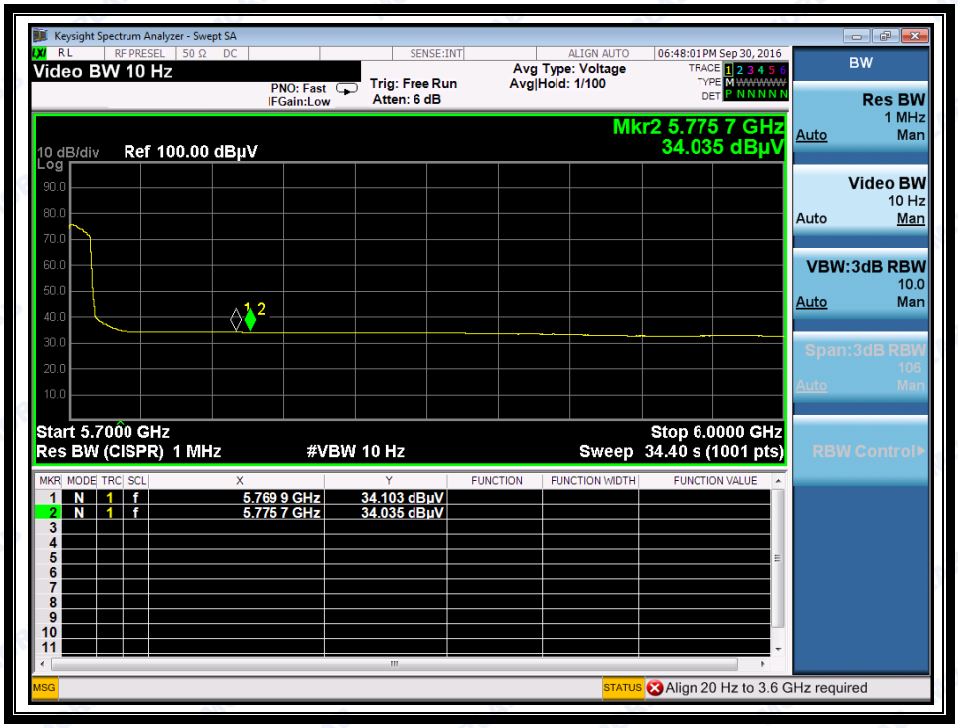
(Channel = 100 PEAK @ 802.11ac)



(Channel =100 AVG @ 802.11ac)



(Channel = 140 PEAK @ 802.11ac)



(Channel = 140 AVG @ 802.11ac)

2.5.3.3 802.11ac-40MHz Test mode

The lowest and highest channels are tested to verify the band edge emissions.

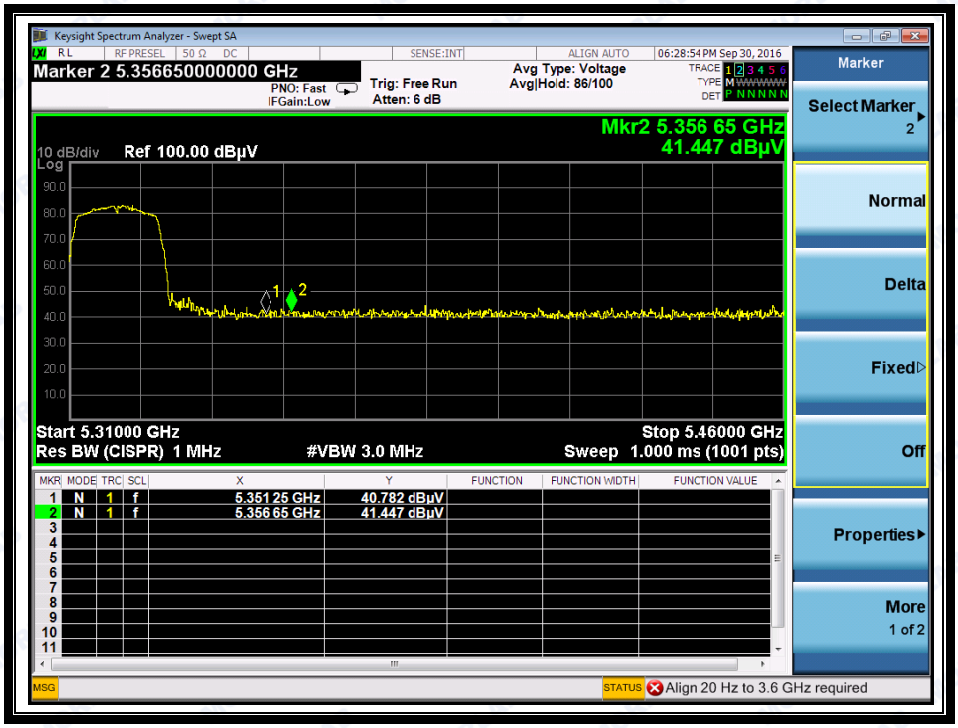
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBµV/m)	Limit (dBµV/m)	Verdict
38	5140.32	PK	51.61	-50.65	32.11	33.07	74	Pass
38	5118.93	AV	37.77	-50.65	32.11	19.23	54	Pass
62	5356.64	PK	41.45	-50.65	32.11	22.91	74	Pass
62	5356.65	AV	32.76	-50.65	32.11	14.22	54	Pass
102	5448.45	PK	39.99	-50.65	32.11	21.45	74	Pass
102	5448.45	AV	32.63	-50.65	32.11	14.09	54	Pass
142	5735.90	PK	45.64	-50.65	32.11	27.1	74	Pass
142	5735.90	AV	36.00	-50.65	32.11	17.46	54	Pass

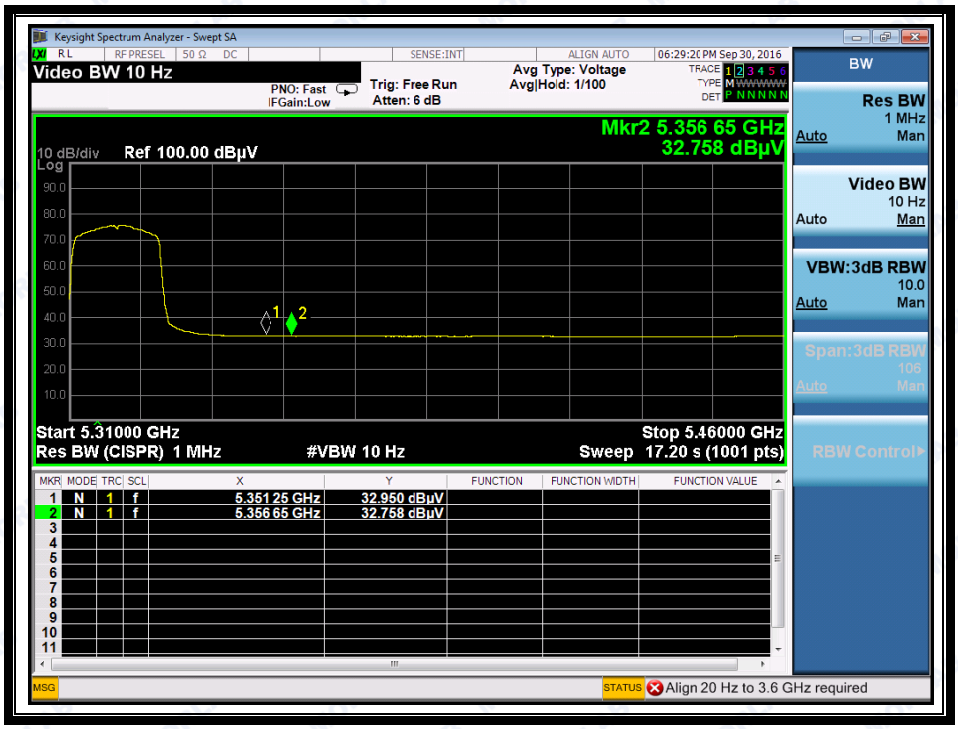
B. Test Plots:

(Channel = 38 PEAK @ 802.11ac)

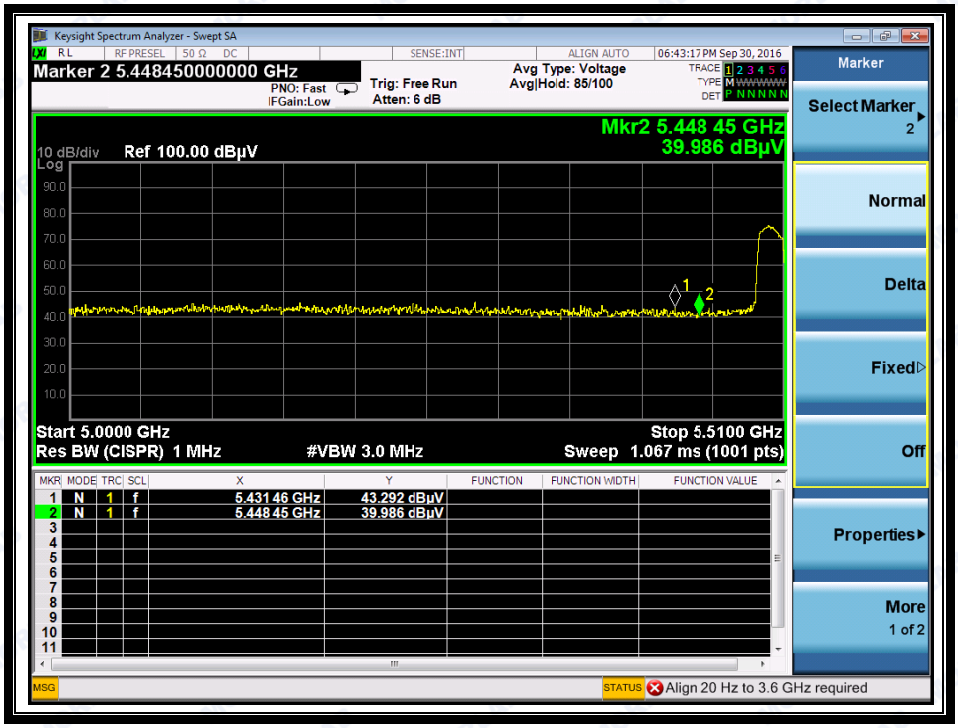
(Channel = 38 AVG @ 802.11ac)



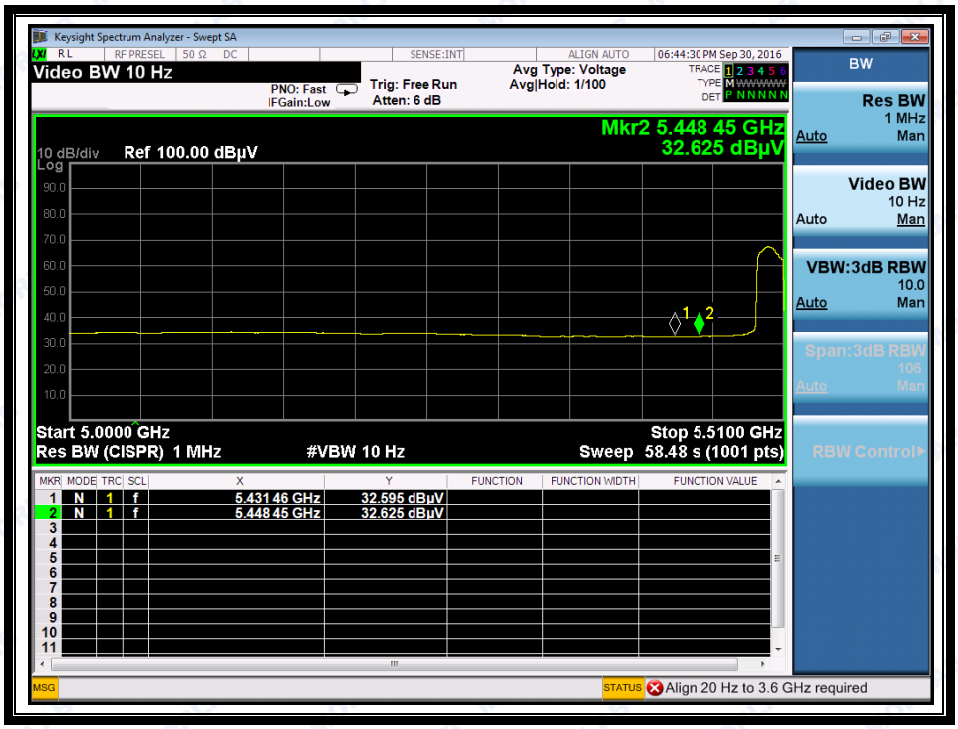
(Channel = 62 PEAK @ 802.11ac)



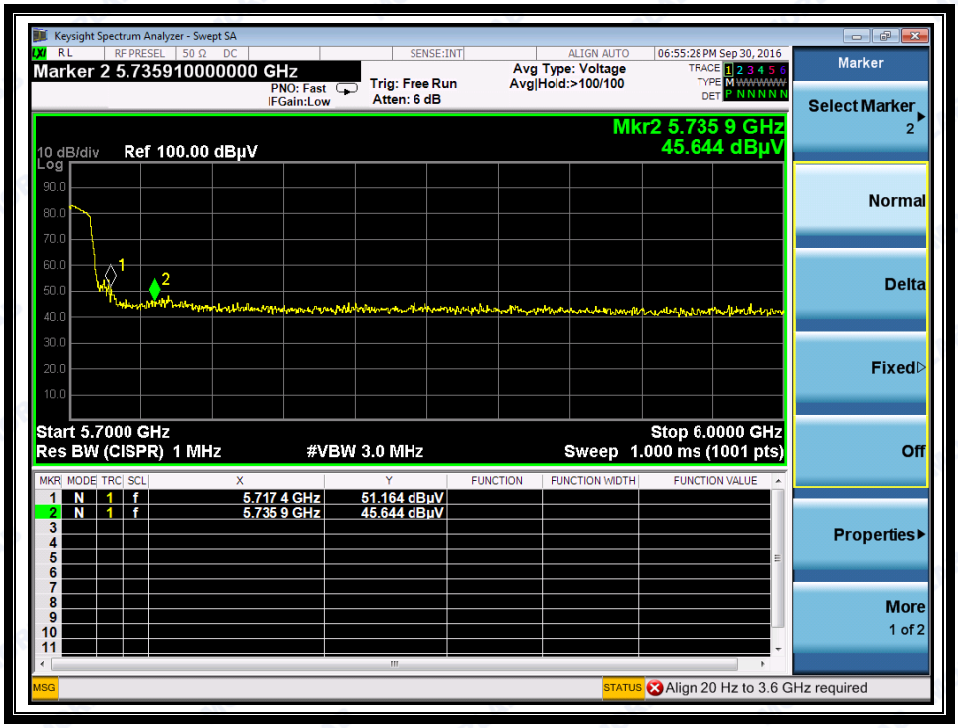
(Channel = 62 AVG @ 802.11ac)



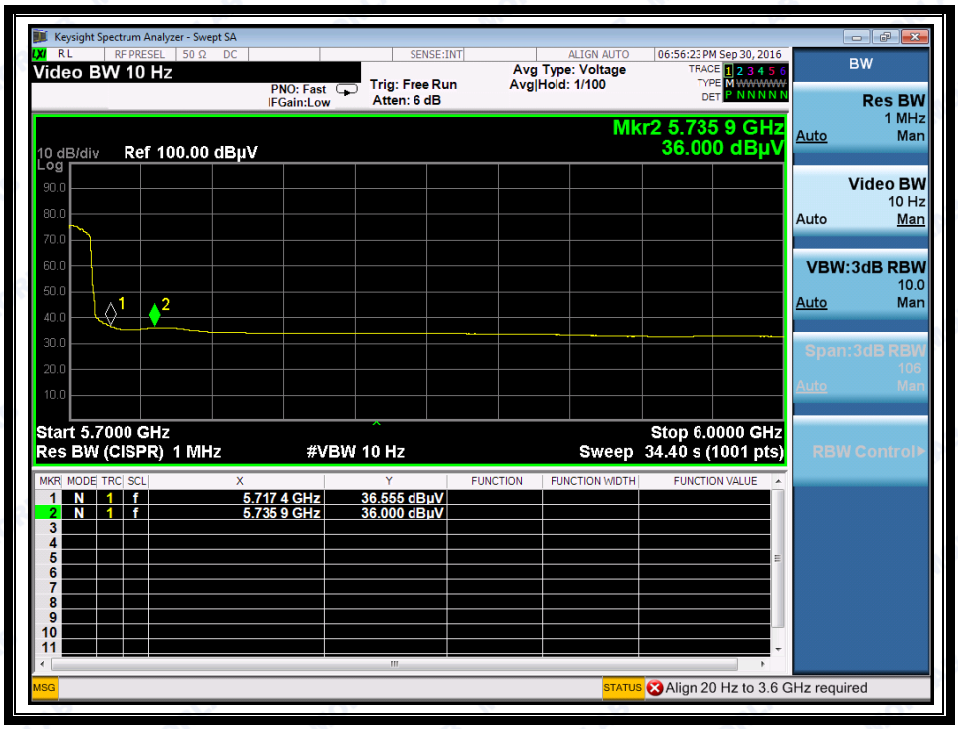
(Channel =102 PEAK @ 802.11ac)



(Channel = 102AVG @ 802.11ac)



(Channel = 142 PEAK @ 802.11ac)



(Channel = 142 AVG @ 802.11ac)

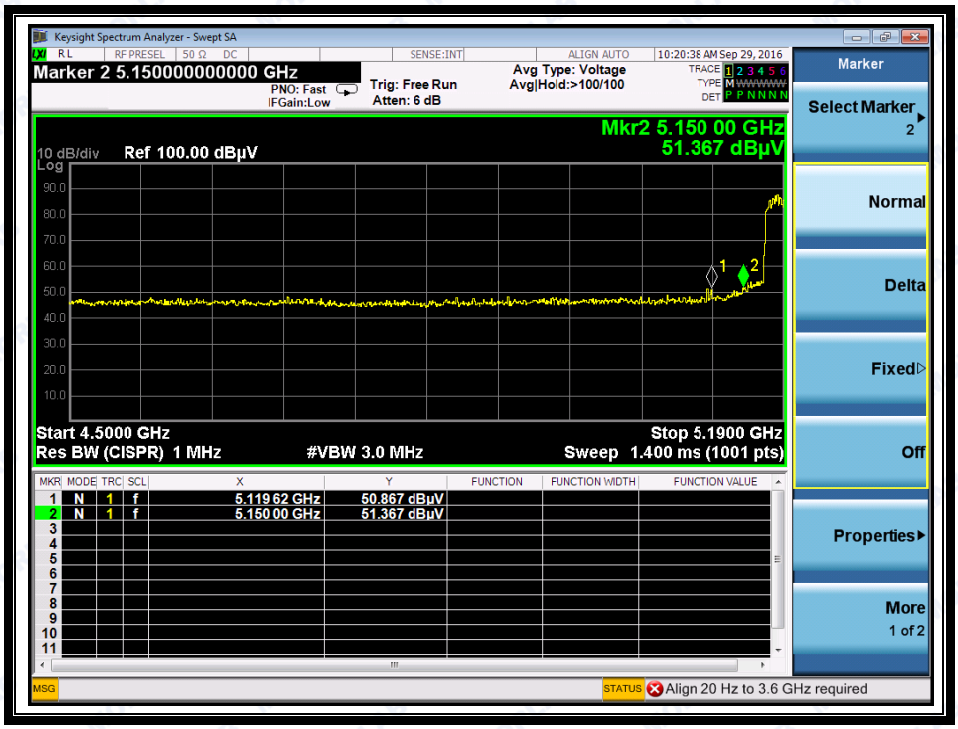
2.5.3.4 802.11ac-80MHz Test mode

The lowest and highest channels are tested to verify the band edge emissions.

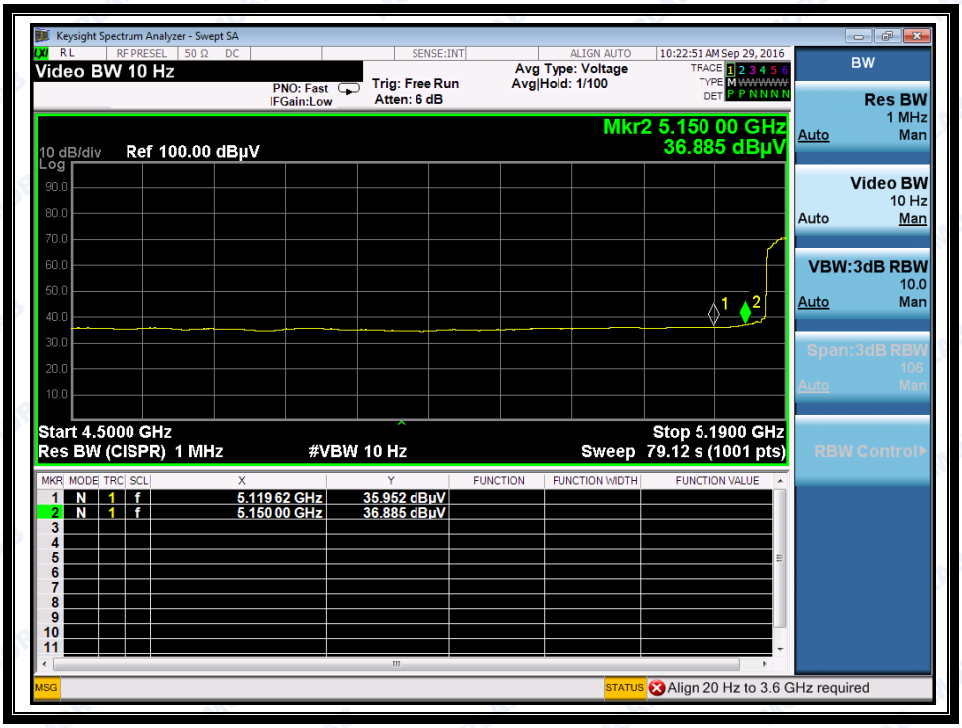
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
42	5150.00	PK	51.37	-50.65	32.11	32.83	74	Pass
42	5150.00	AV	36.89	-50.65	32.11	18.35	54	Pass
58	5367.70	PK	41.37	-50.65	32.11	22.83	74	Pass
58	5367.70	AV	33.03	-50.65	32.11	14.49	54	Pass
106	5441.15	PK	41.03	-50.65	32.11	22.49	74	Pass
106	5441.15	AV	32.81	-50.65	32.11	14.27	54	Pass
138	5734.59	PK	48.75	-50.65	32.11	30.21	74	Pass
138	5734.59	AV	37.94	-50.65	32.11	19.40	54	Pass

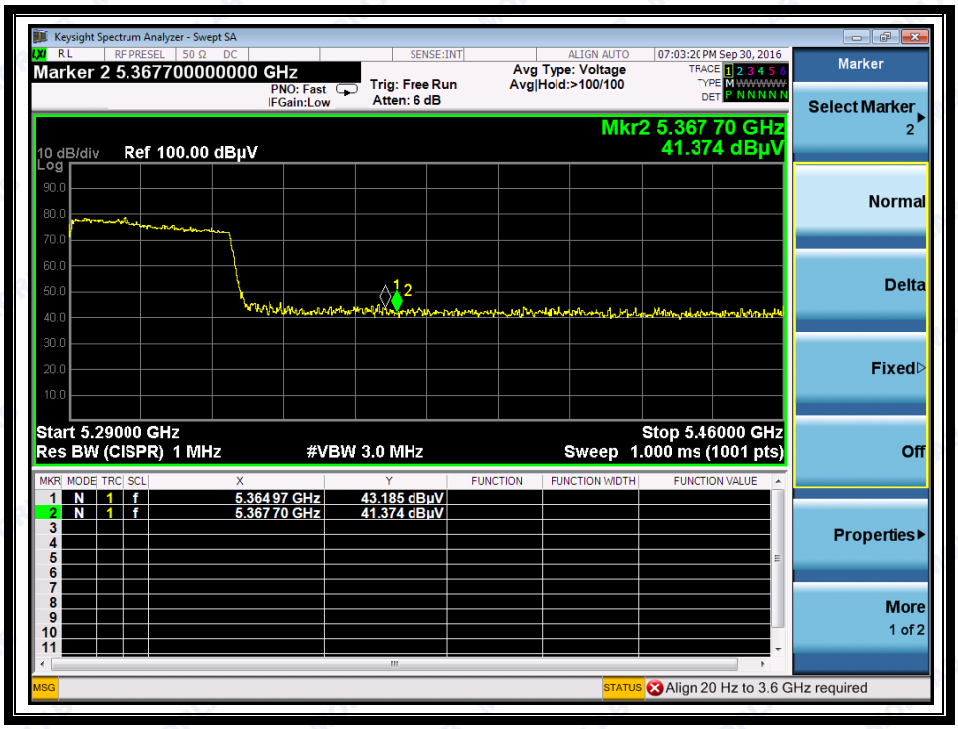
B. Test Plots:



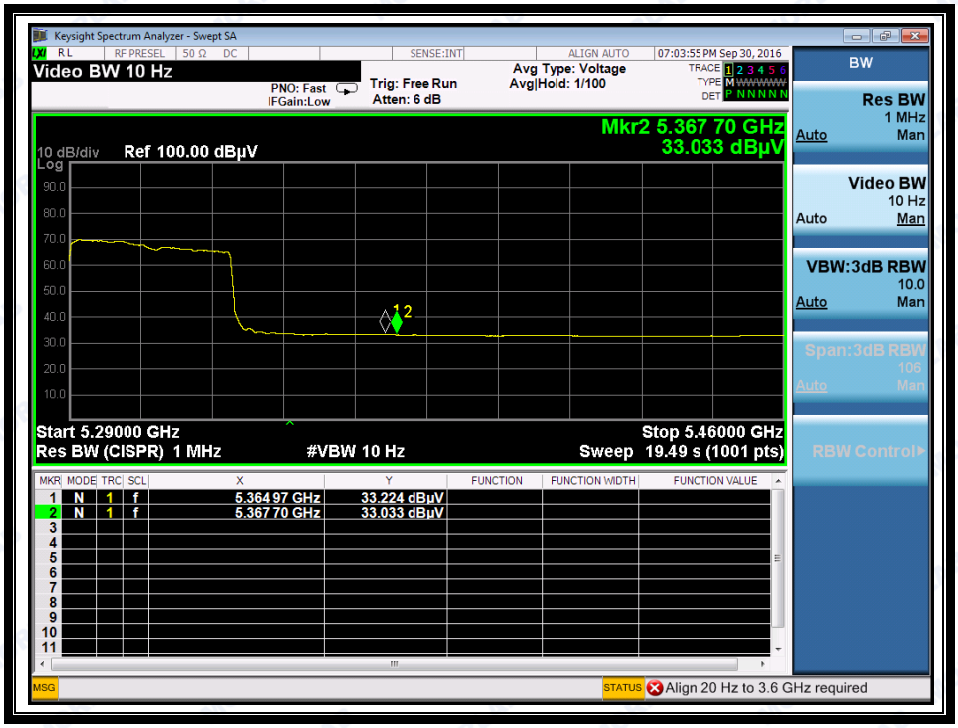
(Channel = 42 PEAK @ 802.11ac)



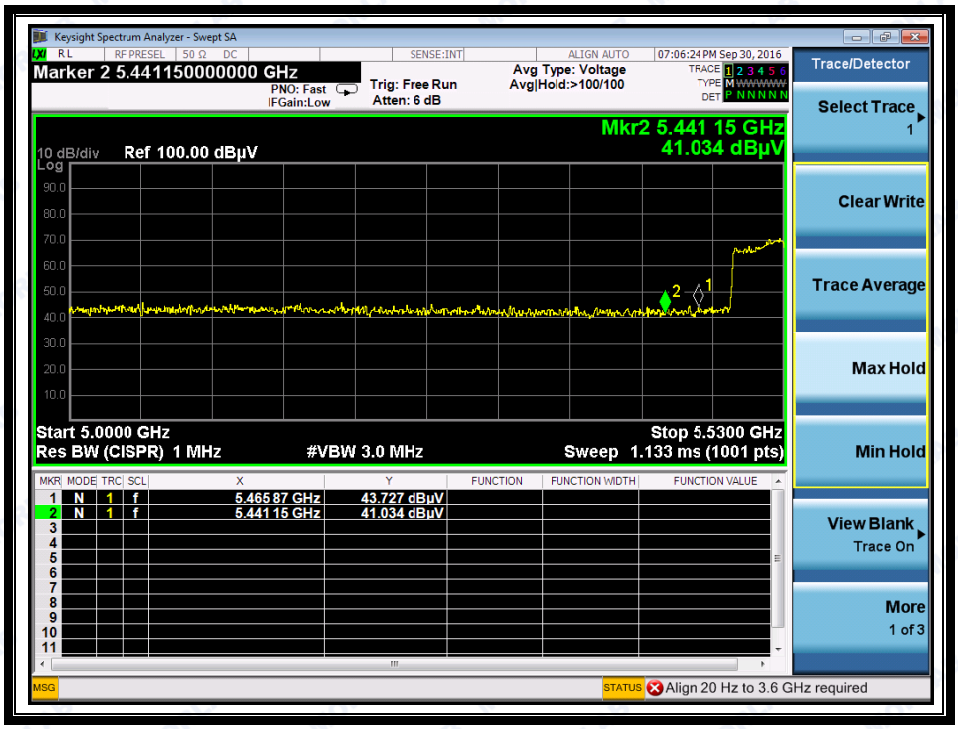
(Channel = 42 AVG @ 802.11ac)



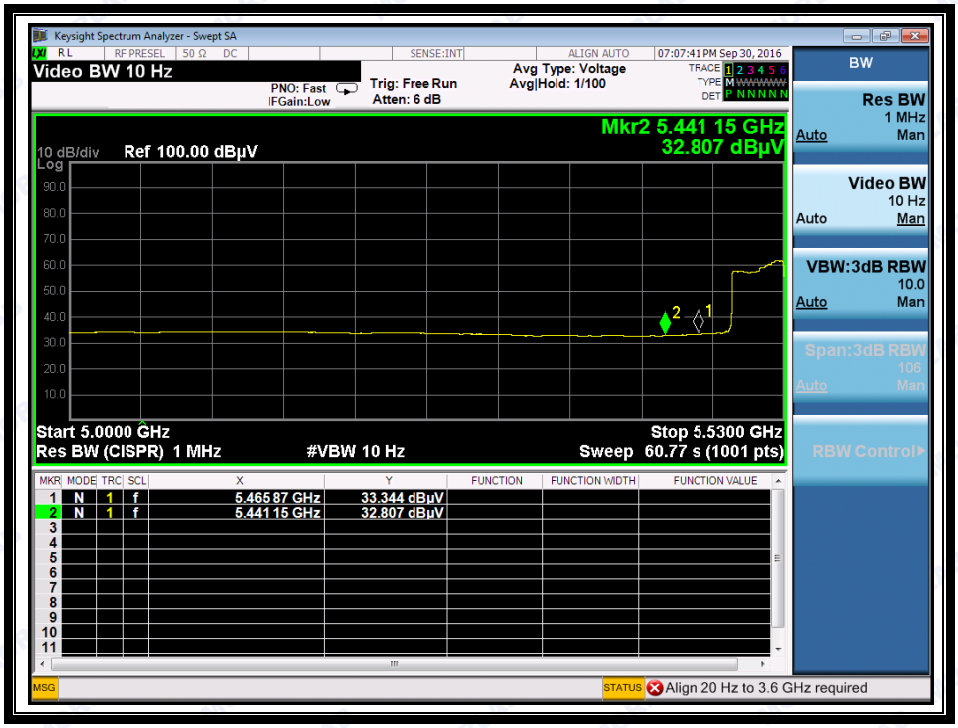
(Channel = 58 PEAK @ 802.11ac)



(Channel = 58 PEAK @ 802.11ac)



(Channel = 106 PEAK @ 802.11ac)



(Channel = 106 PEAK @ 802.11ac)

(Channel = 138 PEAK @ 802.11ac)

(Channel = 138 PEAK @ 802.11ac)

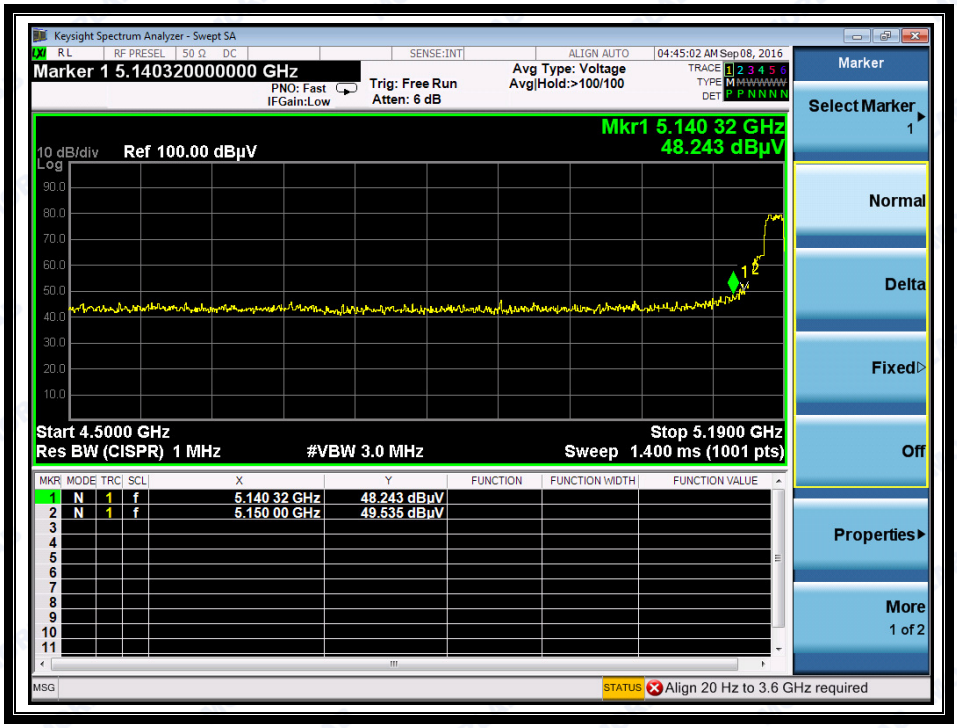
2.5.3.5 802.11n-20MHz Test mode

The lowest and highest channels are tested to verify the band edge emissions.

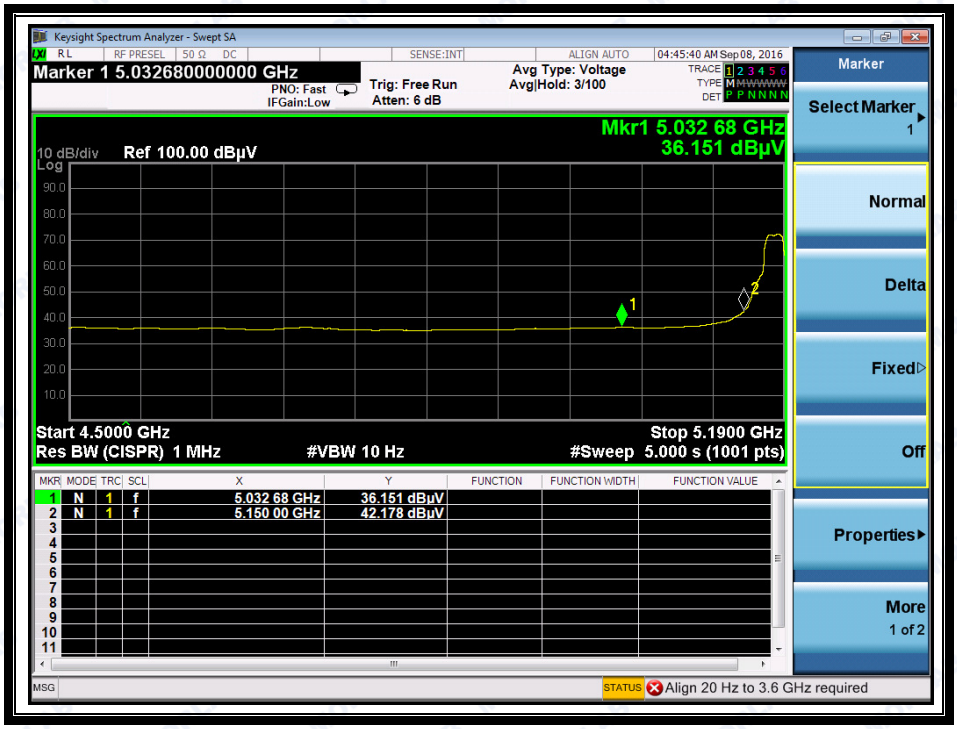
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBµV/m)	Limit (dBµV/m)	Verdict
36	5140.32	PK	48.24	-50.65	32.11	29.70	74	Pass
36	5032.68	AV	36.15	-50.65	32.11	17.61	54	Pass
64	5391.54	PK	40.88	-50.65	32.11	22.34	74	Pass
64	5391.54	AV	32.71	-50.65	32.11	14.17	54	Pass
100	5460.50	PK	41.36	-50.65	32.11	22.82	74	Pass
100	5468.50	AV	32.92	-50.65	32.11	14.38	54	Pass
140	5771.20	PK	44.11	-50.65	32.11	25.57	74	Pass
140	5771.20	AV	34.08	-50.65	32.11	15.54	54	Pass

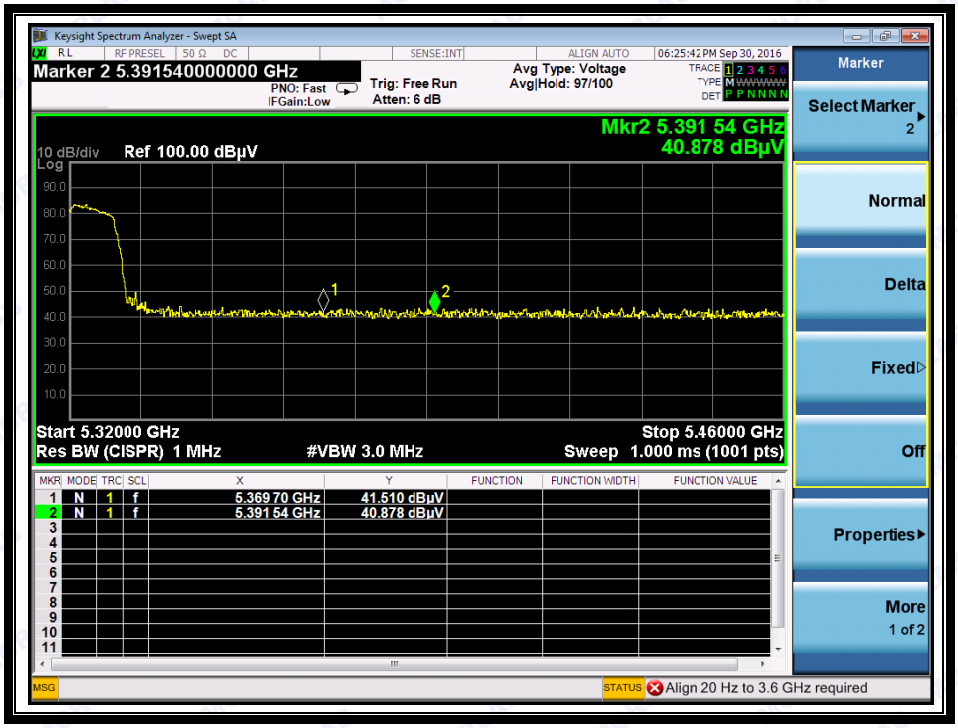
B. Test Plots:



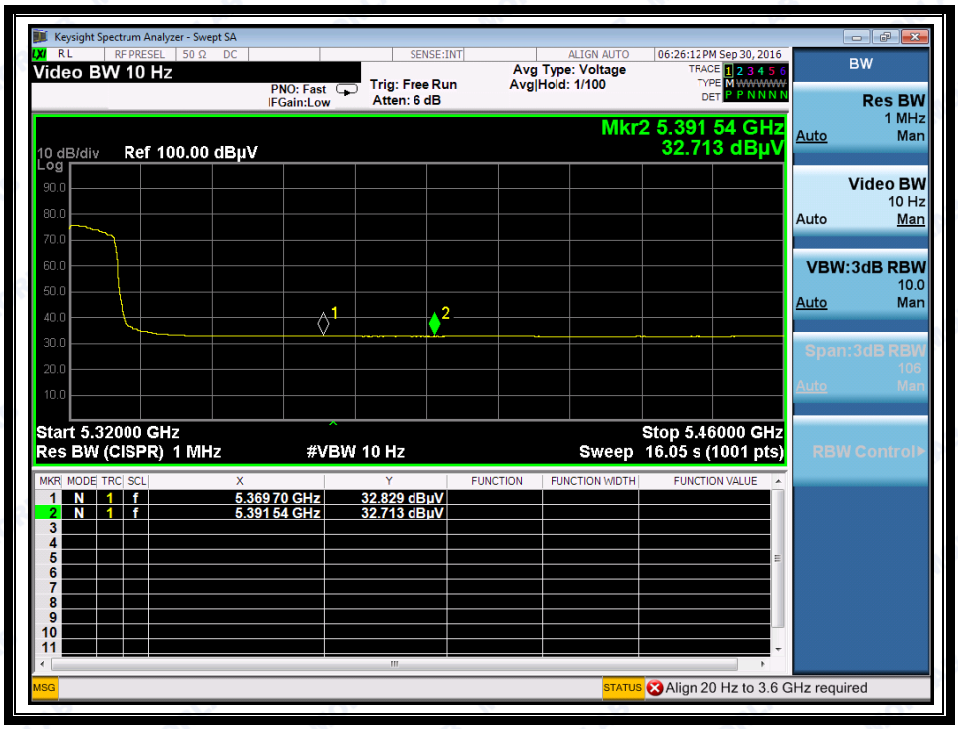
(Channel = 36 PEAK @ 802.11n 20MHz)



(Channel = 36 AVG @ 802.11n 20MHz)



(Channel = 64 PEAK @ 802.11n 20MHz)



(Channel = 64 AVG @ 802.11n 20MHz)