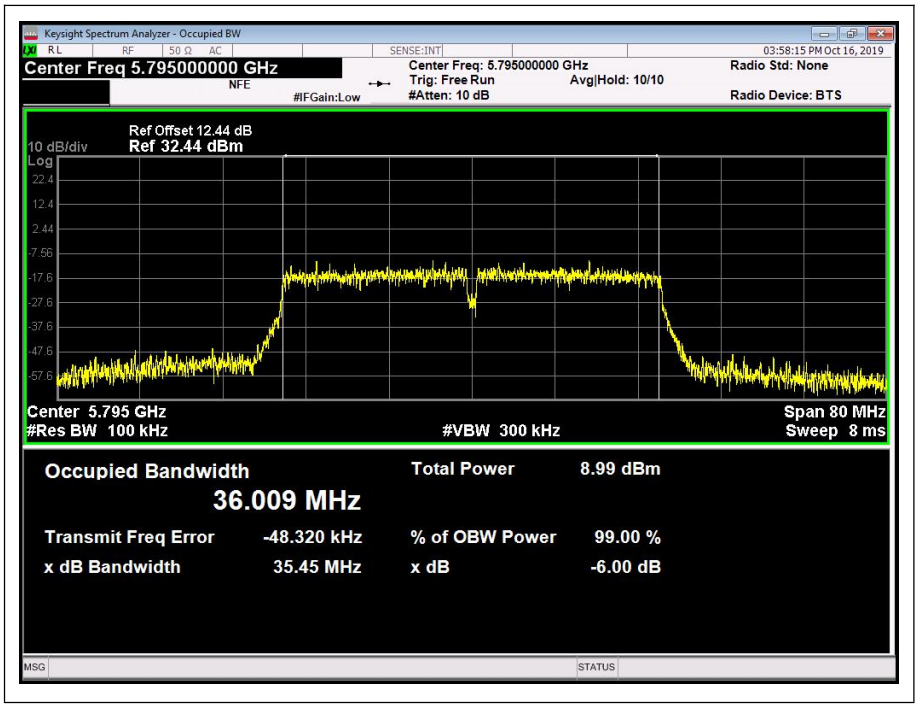


(Channel 159, 5795 MHz, 802.11ac (HT40))

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 bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 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 KDB662911D01Measure-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.

2.3.2. Test Description

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

A. Test Set:

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

Duty Cycle Factor

Mode	Channel	Frequency (MHz)	T_{on} (ms)	$T_{(on+off)}$ (ms)	Duty Cycle (%)	Duty Cycle Factor
802.11 HT20	36	5180	100	100	100	0
802.11 HT40	38	5190	100	100	100	0
802.11 ac20	42	5180	100	100	100	0
802.11 ac40	38	5190	100	100	100	0

802.11a Test mode

Channel	Frequency (MHz)	Average Output Power (dBm)	Limit		Verdict
			(dBm)	11+10*log(EBW) (dBm)	
36	5180	11.69	24	\	PASS
44	5220	11.66		\	
48	5240	11.78		\	
52	5260	10.42		23.91	
60	5300	10.41		23.88	
64	5320	10.09		23.87	
149	5745	9.89	30		
157	5785	9.99			
165	5825	9.63			
Note: Power limit is 24dBm or 11+10*log(EBW)					

802.11n (HT20) Test mode

Channel	Frequency (MHz)	Average Output Power (dBm)	Limit		Verdict
			(dBm)	11+10*log(EBW) (dBm)	
36	5180	8.42	24	\	PASS
44	5220	8.78		\	
48	5240	10.41		\	
52	5260	9.76		23.95	
60	5300	9.58		24.00	
64	5320	10.02		23.95	
149	5745	8.27	30		
157	5785	9.20			
165	5825	7.99			
Note: Power limit is 24dBm or 11+10*log(EBW)					

802.11n (HT40) Test mode

Channel	Frequency (MHz)	Average Output Power (dBm)	Limit		Verdict
			(dBm)	11+10*log(EBW) (dBm)	
38	5190	9.05	24	\	PASS
46	5230	10.62		\	PASS
54	5270	10.07		26.87	PASS
62	5310	9.35		26.97	PASS
151	5755	9.03	30		PASS
159	5795	9.64			PASS
Note: Power limit is 24dBm or 11+10*log(EBW)					

Note: The duty cycle factor has been compensated into the test result

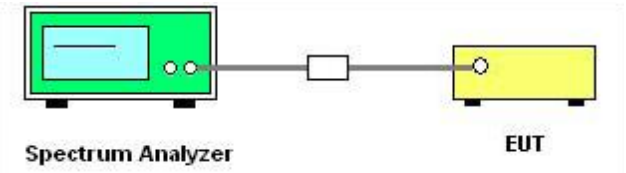
2.4. Peak Power spectral density

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 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 KDB662911D01Measure-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} +10log(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.test procedure for Band 1 and Band 2A:

1) Set span to encompass the entire 26-dB emission bandwidth
2) Set RBW = 1 MHz. Set VBW ≥ 3 MHz.
3) Number of points in sweep ≥ 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

Band 4 test procedure:
For devices operating in the band 5.725−5.85 GHz, the rules specify a measurement bandwidth of 500 kHz

2.4.3. Test Result

802.11a Test mode

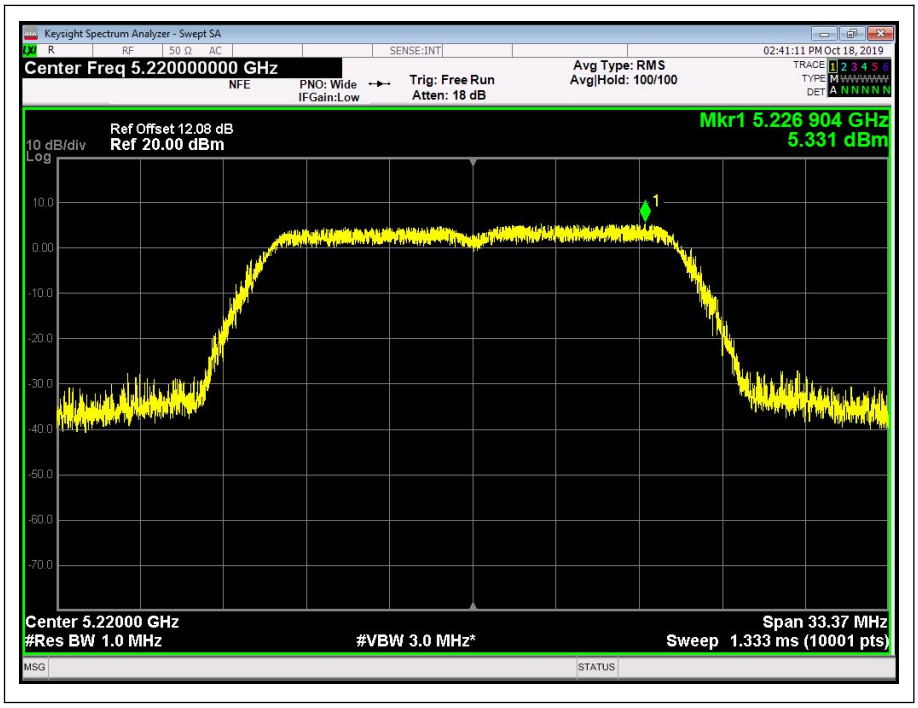
A. Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	5.568	11	PASS
40	5200	4.698		
44	5220	5.331		
48	5240	5.633		
52	5260	2.142		
56	5280	2.453		
60	5300	2.999		
64	5320	2.579		
Channel	Frequency (MHz)	Measured PSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	-0.087	30	PASS
157	5785	-0.675		
165	5825	-0.765		

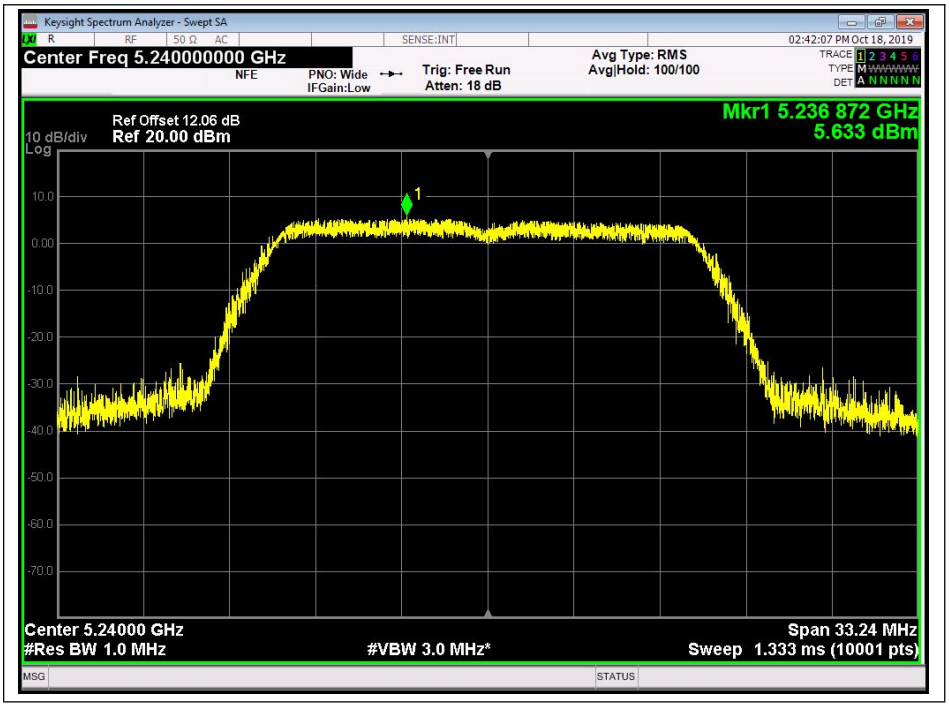
B. Test Plots

(Channel 36, 5180MHz, 802.11a,)

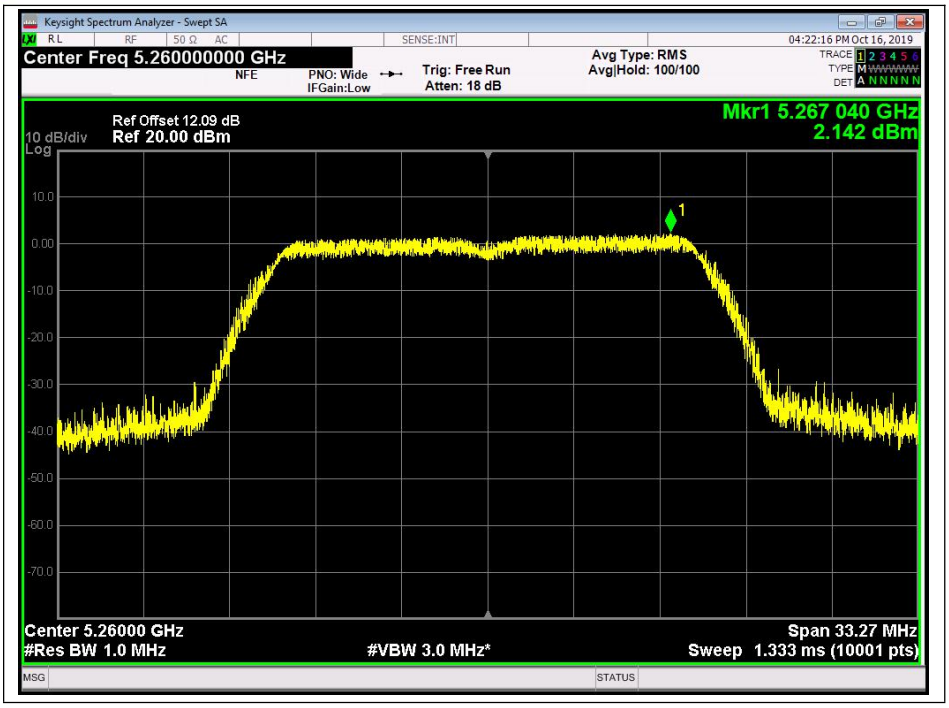
(Channel 40, 5200 MHz, 802.11a,)



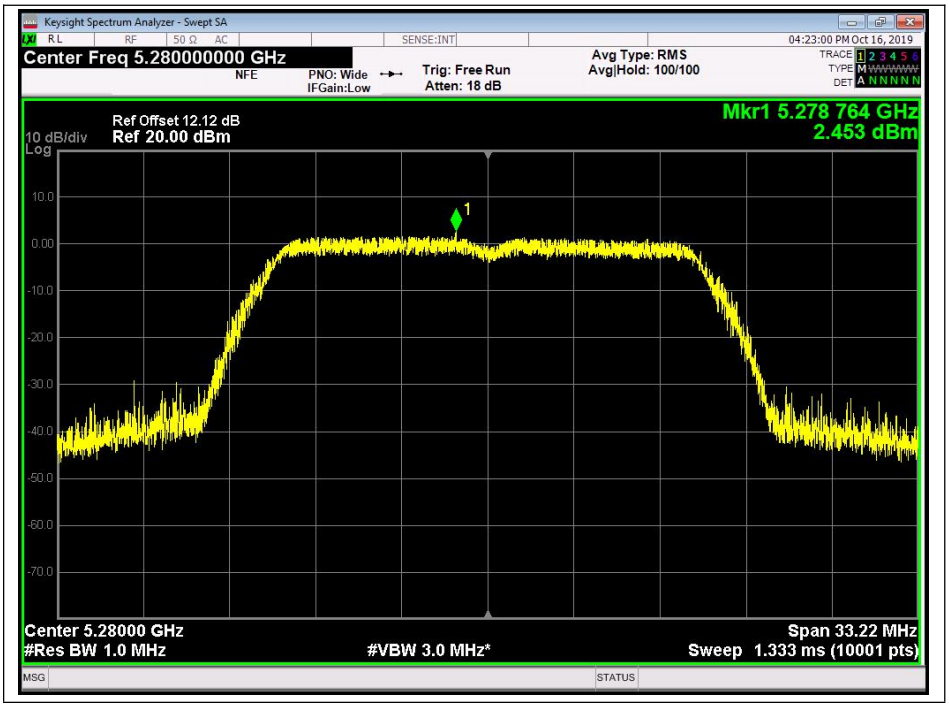
(Channel 44, 5220 MHz, 802.11a,)



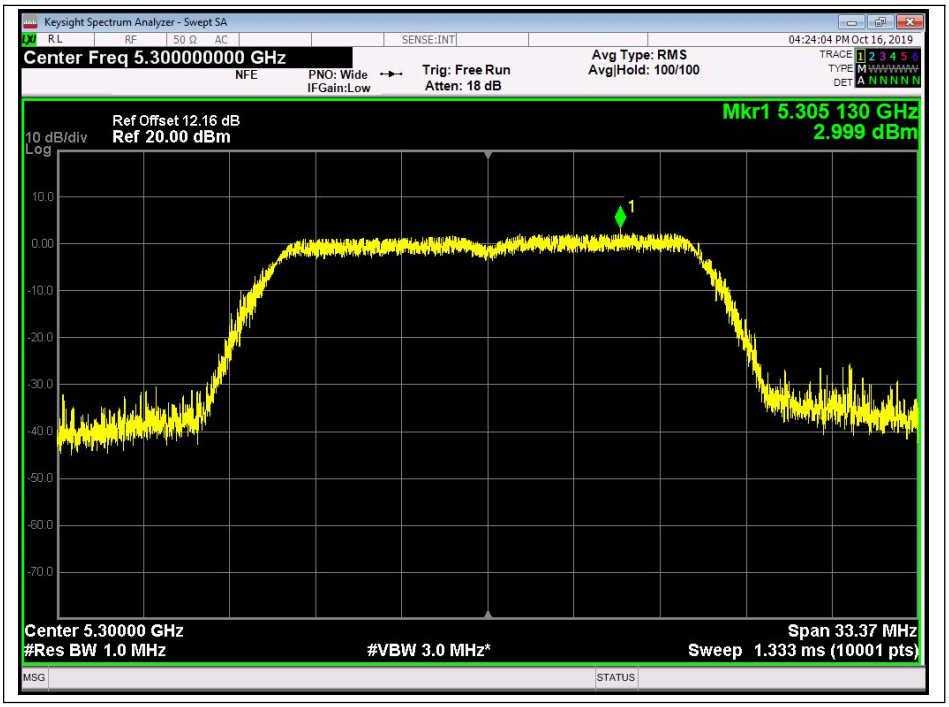
(Channel 48, 5240MHz, 802.11a,)



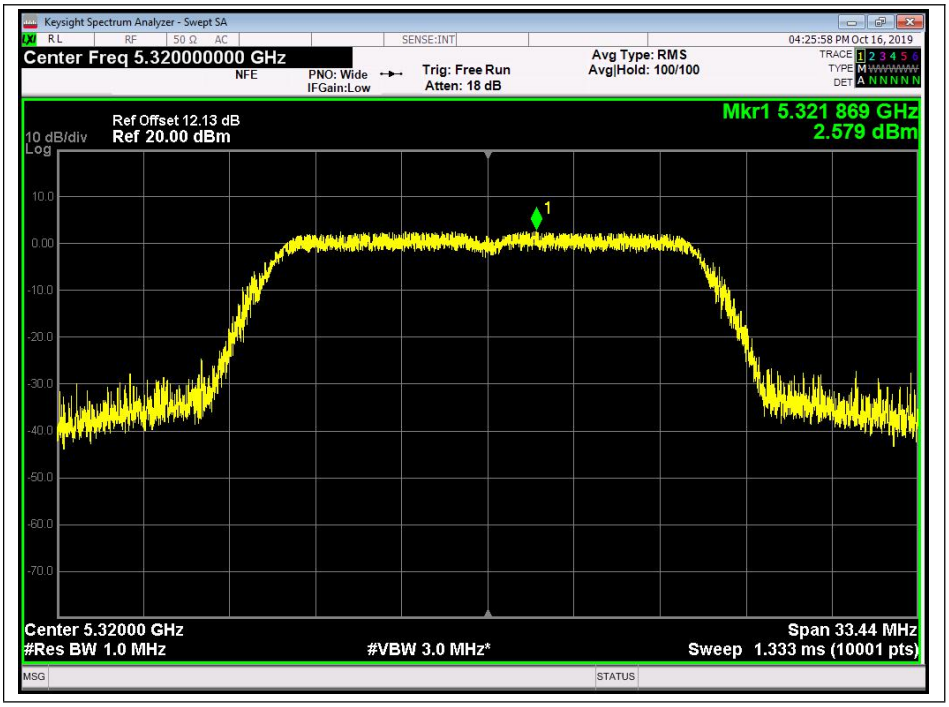
(Channel 52, 5260MHz, 802.11a)



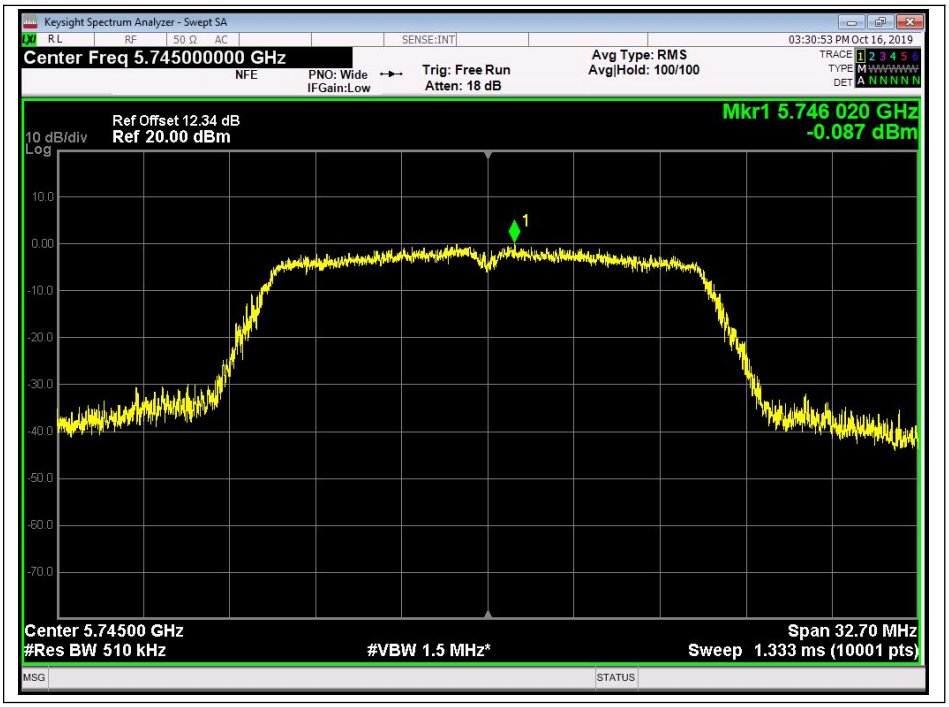
(Channel 56, 5280 MHz, 802.11a,)



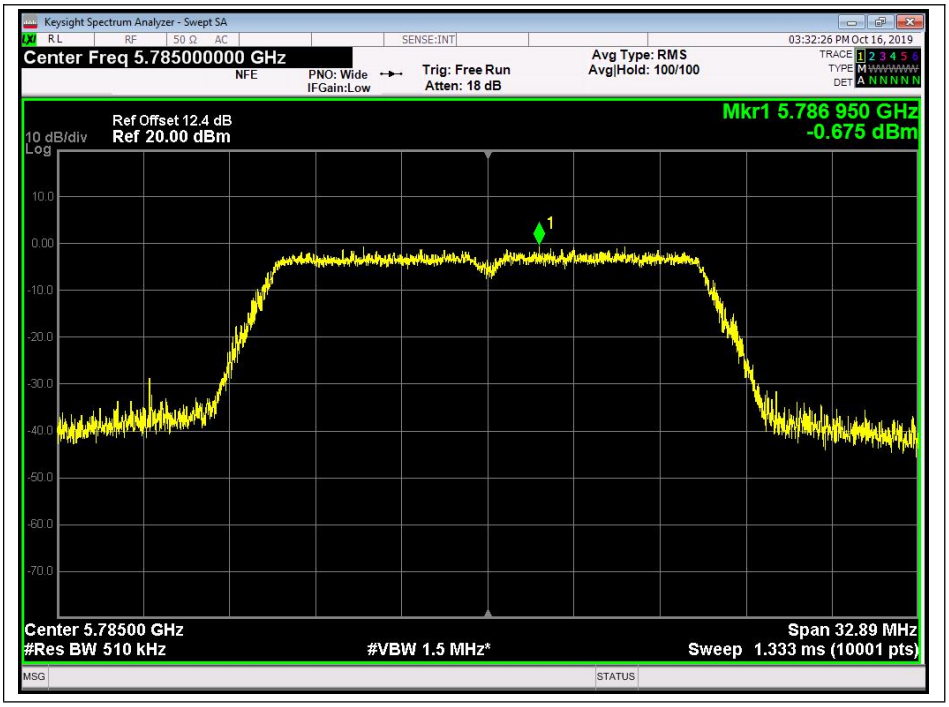
(Channel 60, 5300 MHz, 802.11a,)



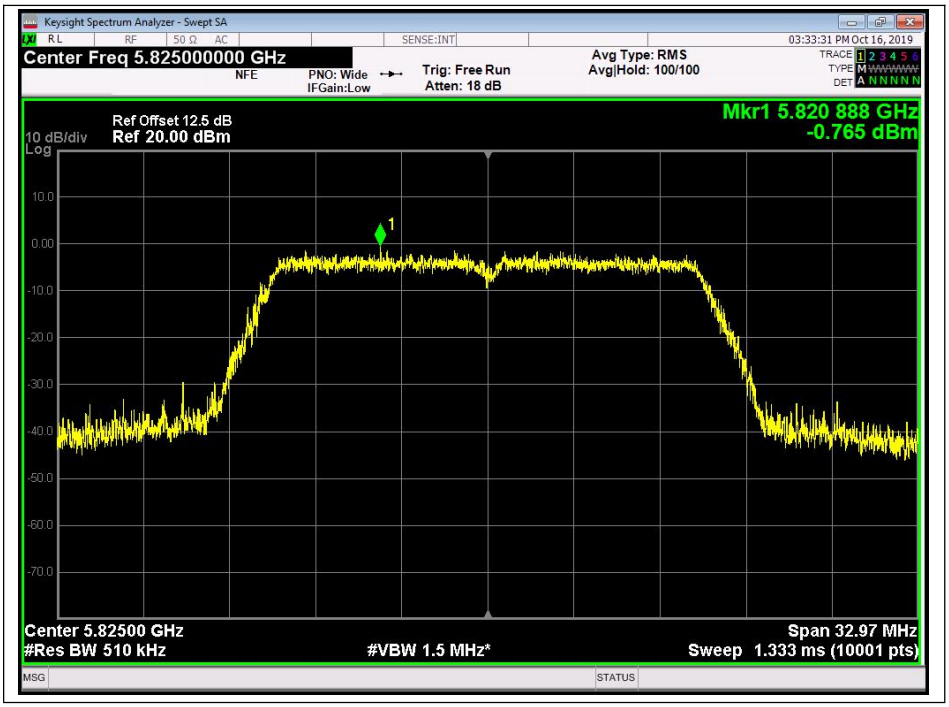
(Channel 64, 5320MHz, 802.11a,)



(Channel 149, 5745MHz, 802.11a)



(Channel 157, 5785MHz, 802.11a)



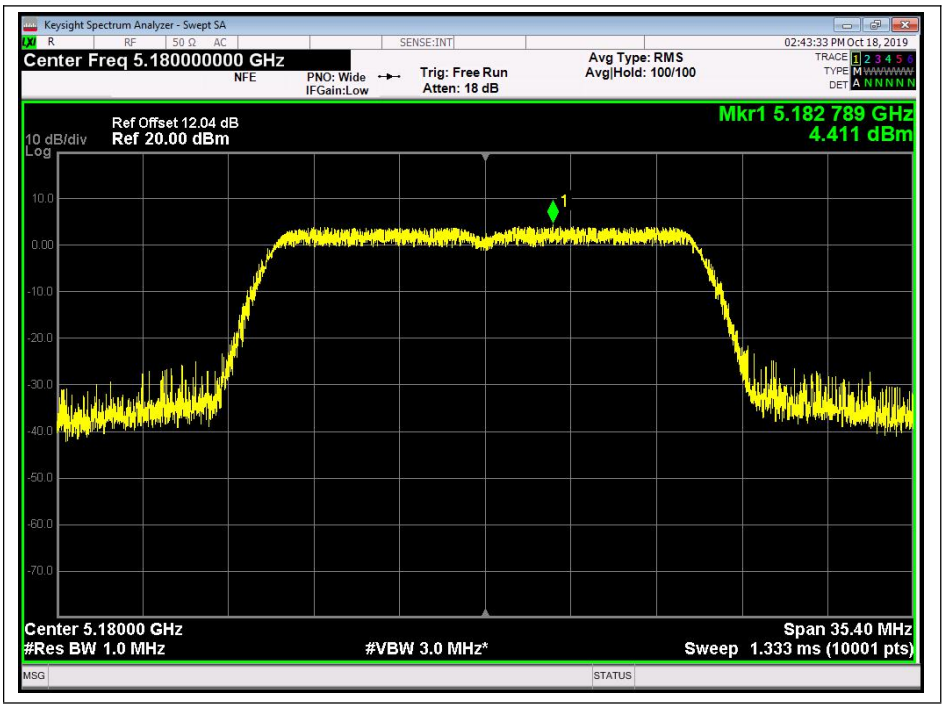
(Channel 165, 5825MHz, 802.11a)

802.11n (HT20) Test mode

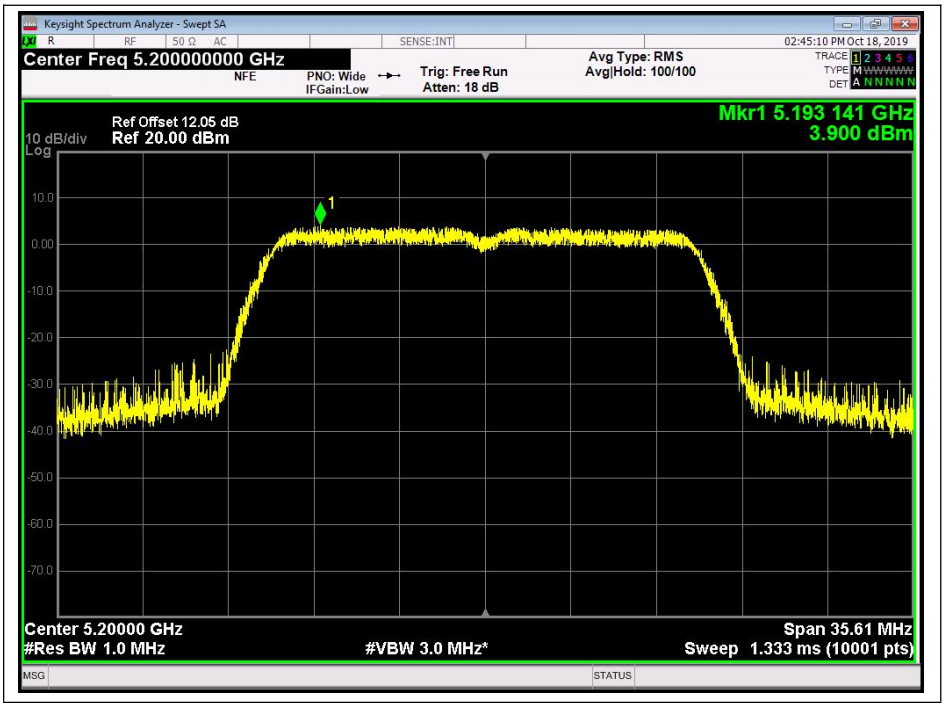
A. Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	4.411	11	PASS
44	5220	3.900		
48	5240	5.077		
52	5260	5.219		
60	5300	2.265		
64	5320	1.808		
Channel	Frequency (MHz)	Measured PSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	-3.074	30	PASS
157	5785	-3.146		
165	5825	-2.689		

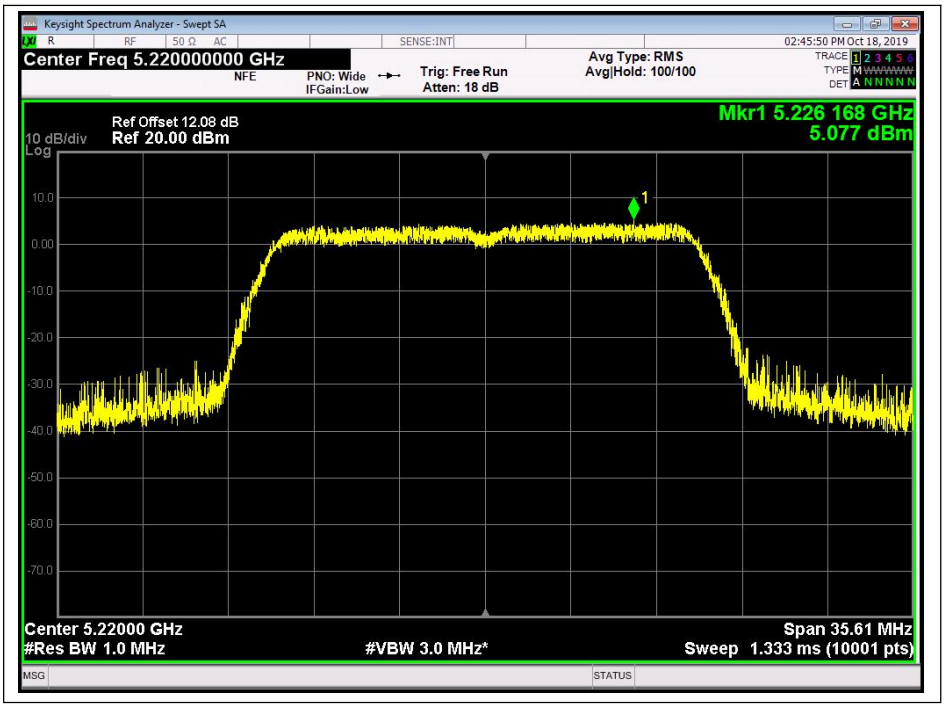
B. Test Plots



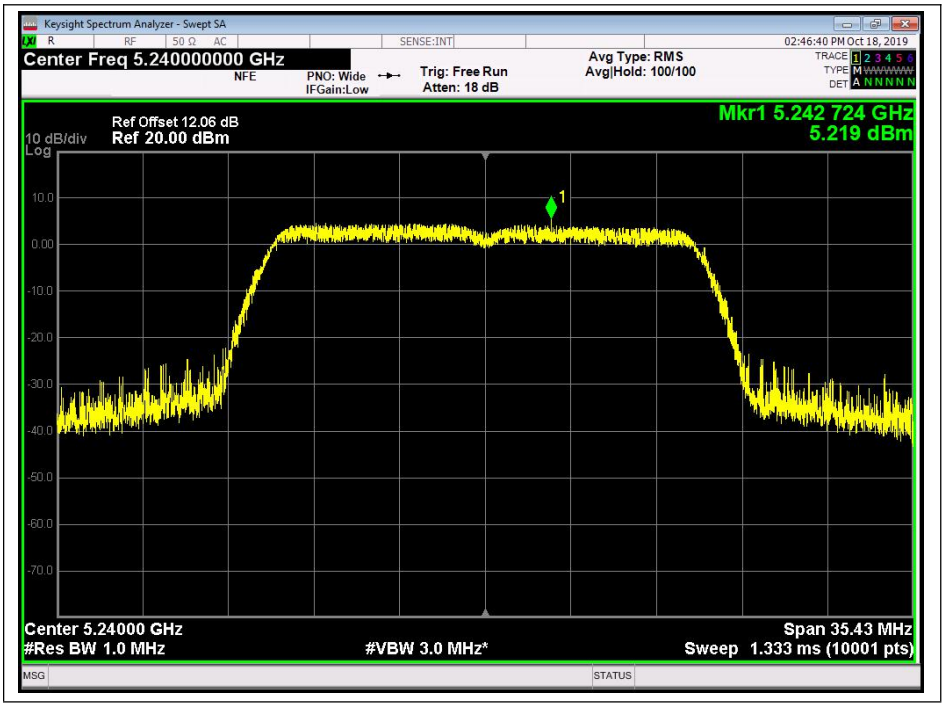
(Channel 36, 5180MHz, 802.11 n (HT20))



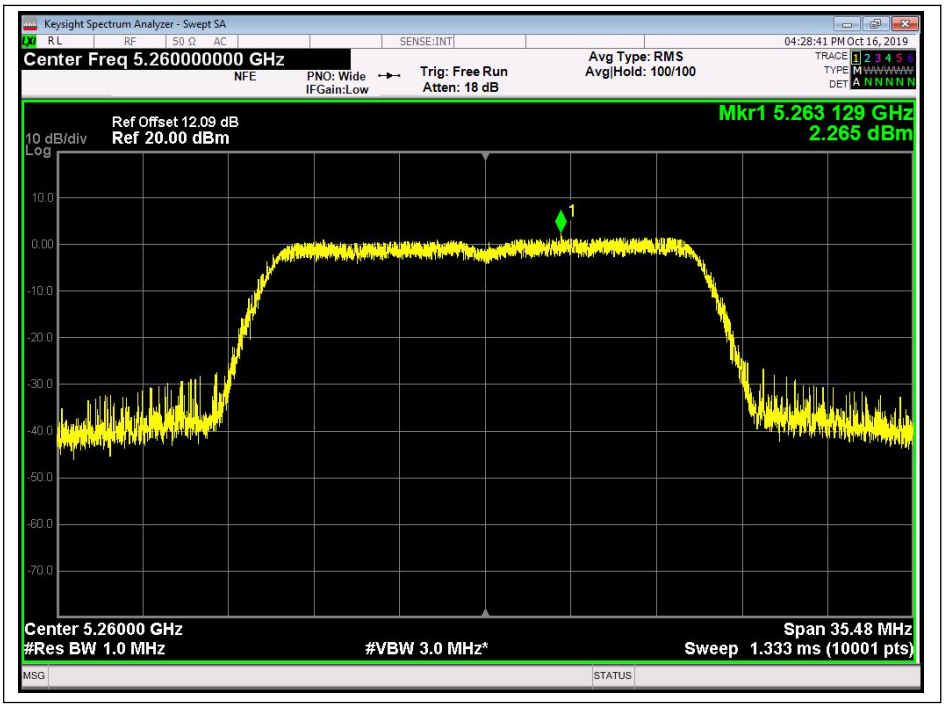
(Channel 44, 5200 MHz, 802.11 n (HT20))



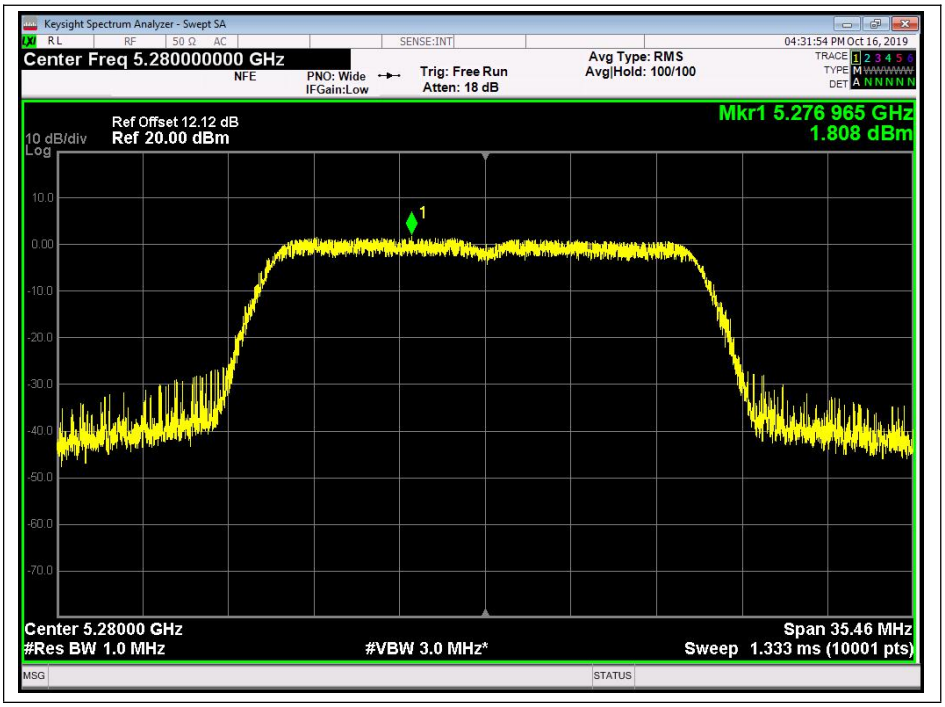
(Channel 44, 5220 MHz, 802.11 n (HT20))



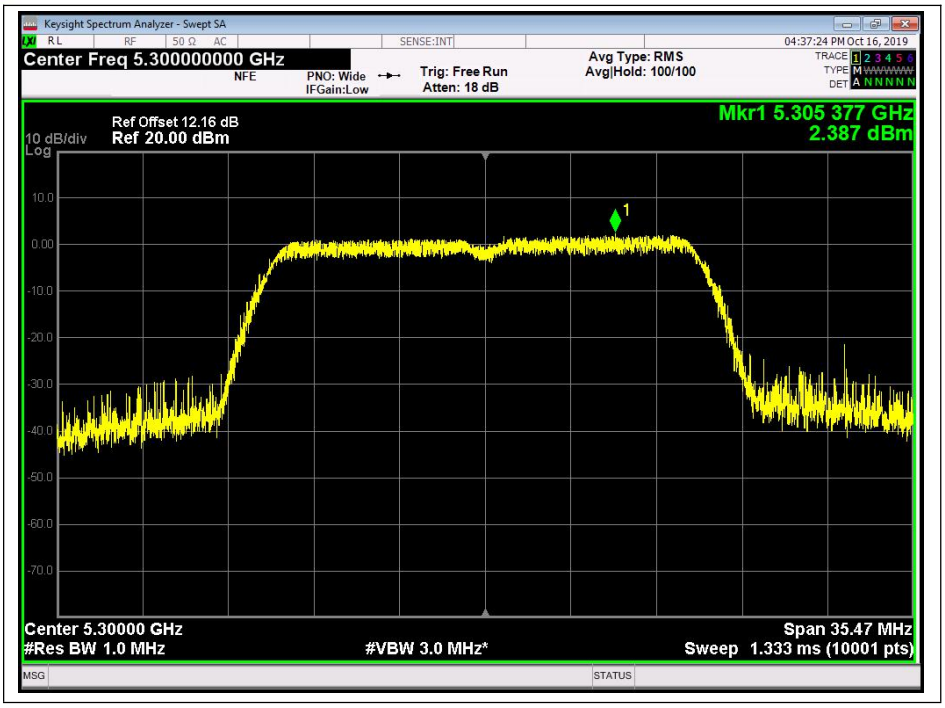
(Channel 48, 5240MHz, 802.11 n (HT20))



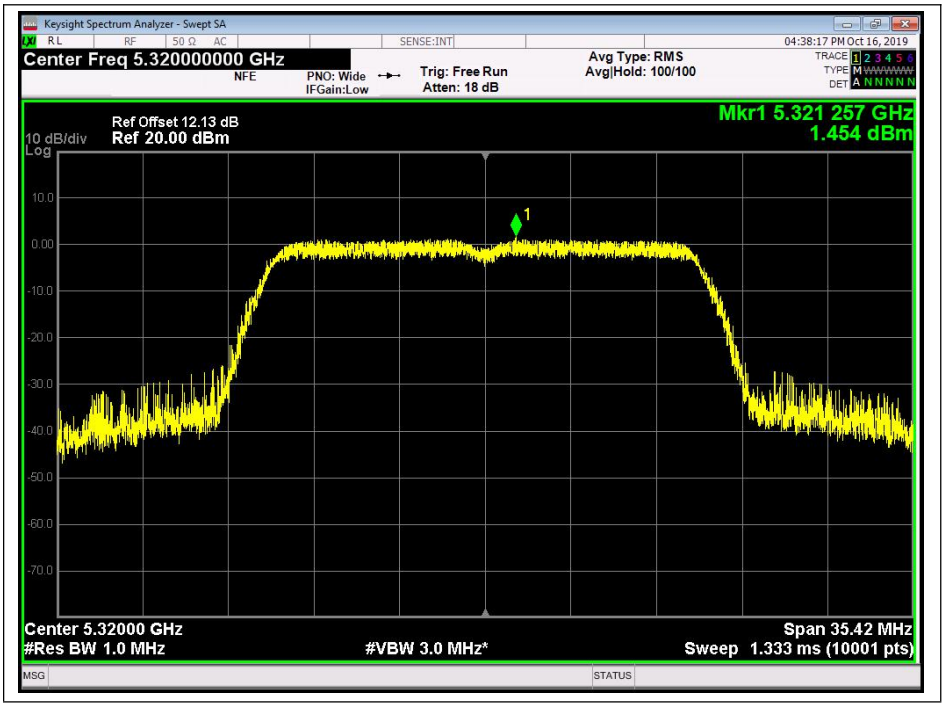
(Channel 52, 5260MHz, 802.11 n (HT20))



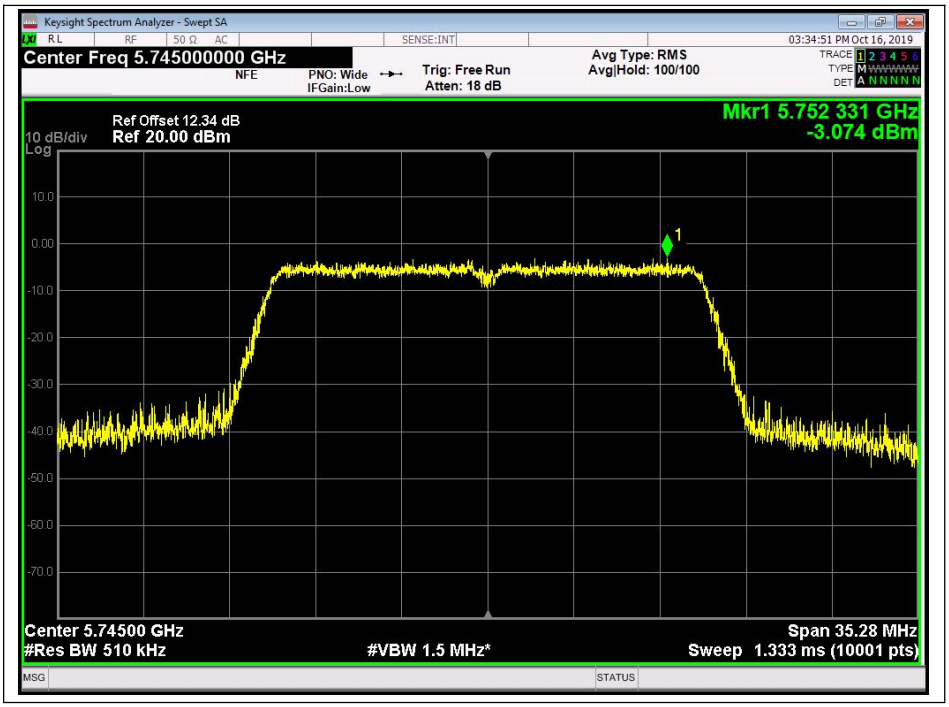
(Channel 56, 5280MHz, 802.11 n (HT20))



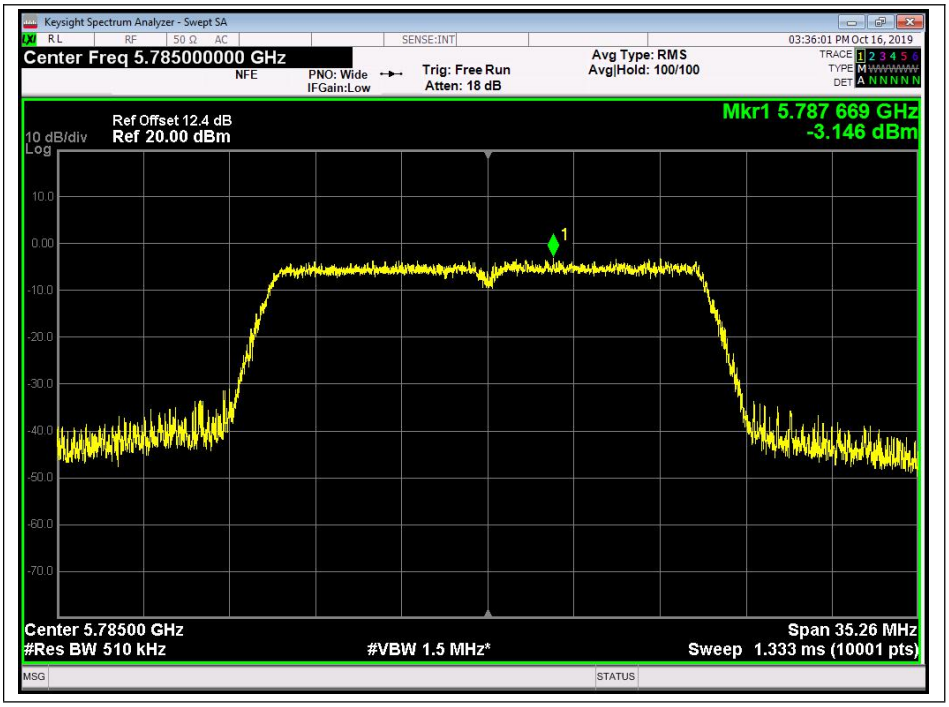
(Channel 60, 5300 MHz, 802.11 n (HT20))



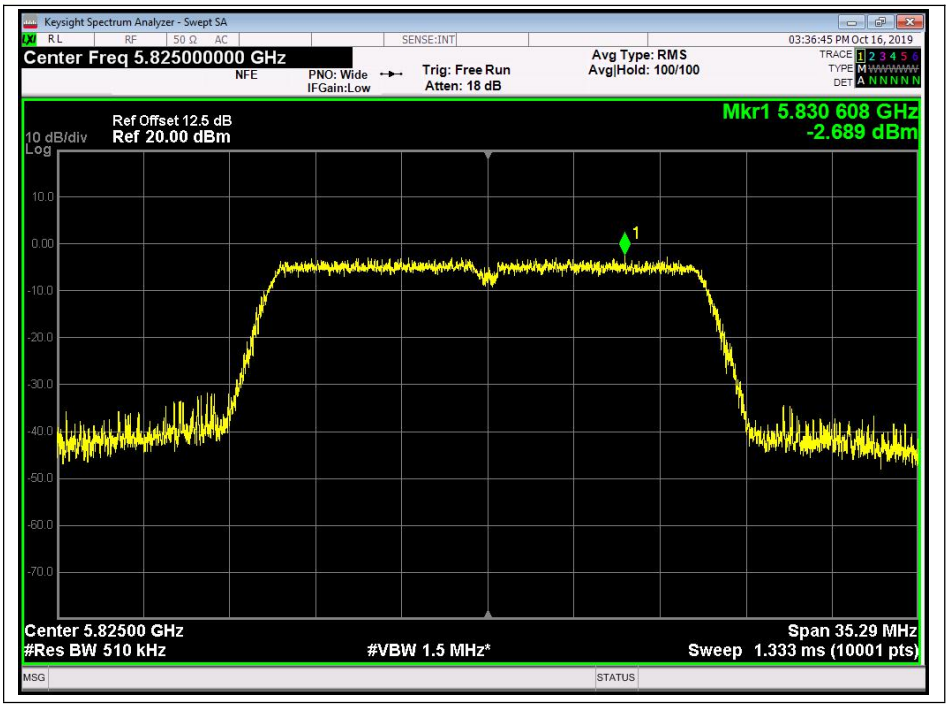
(Channel 64, 5320MHz, 802.11 n (HT20))



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



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



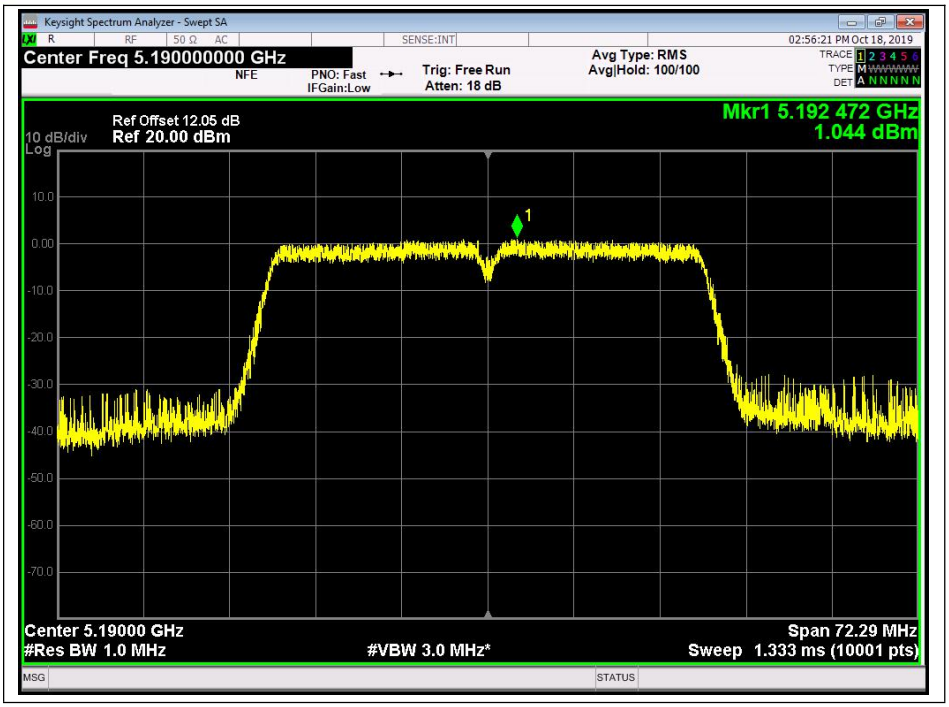
(Channel 165, 5825MHz, 802.11 n (HT20))

802.11n (HT40) Test mode

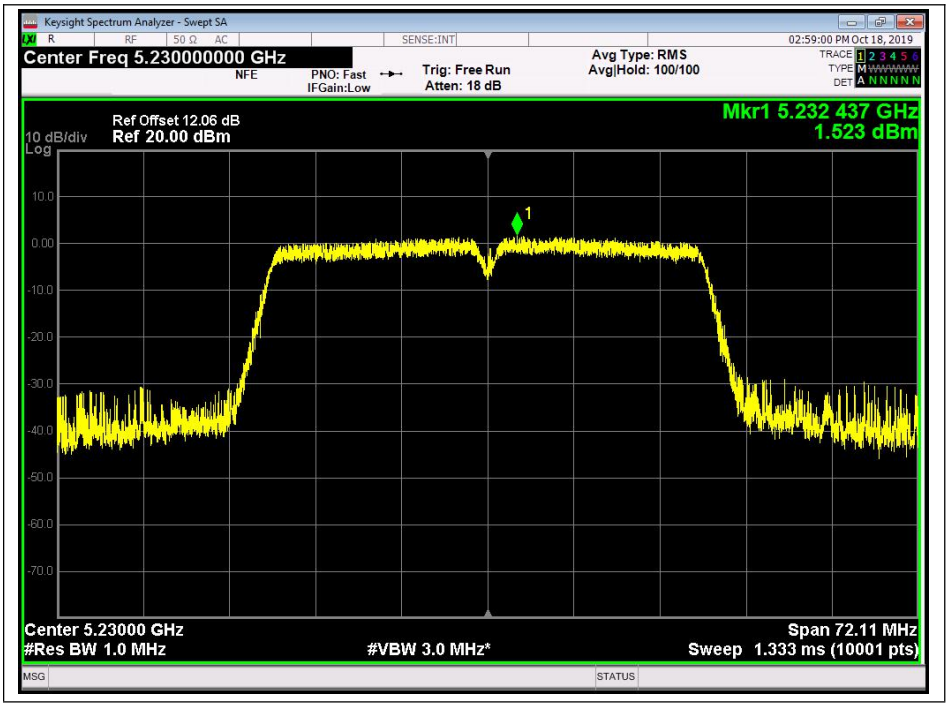
A. Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
38	5190	1.044	11	PASS
46	5230	1.523		
54	5270	0.453		
62	5310	-0.460		
Channel	Frequency (MHz)	Measured PSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
151	5755	-5.163	30	PASS
159	5795	-4.201		

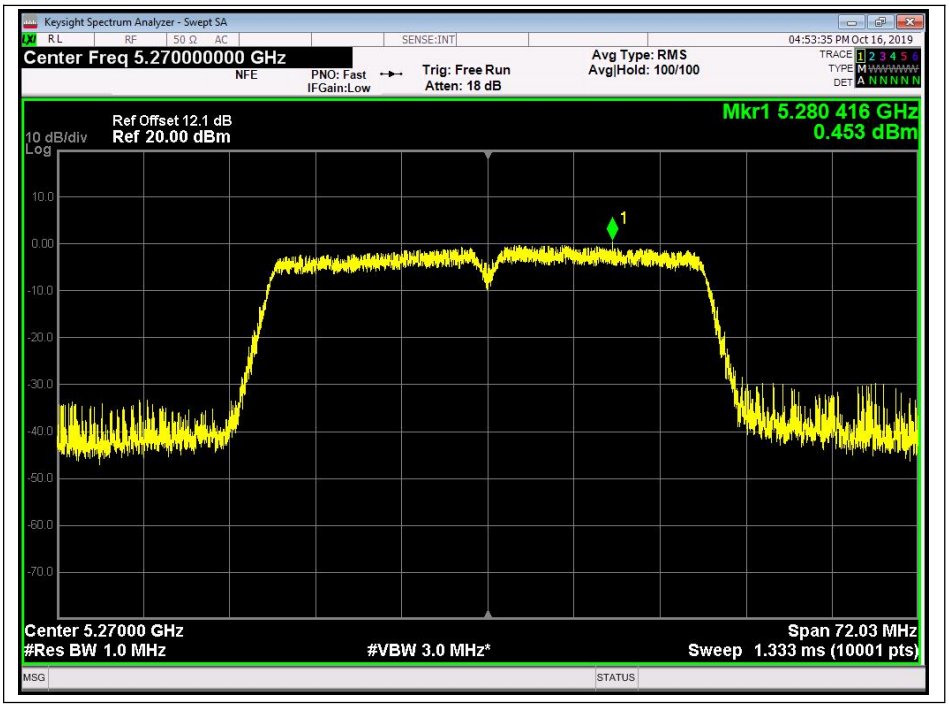
B. Test Plots



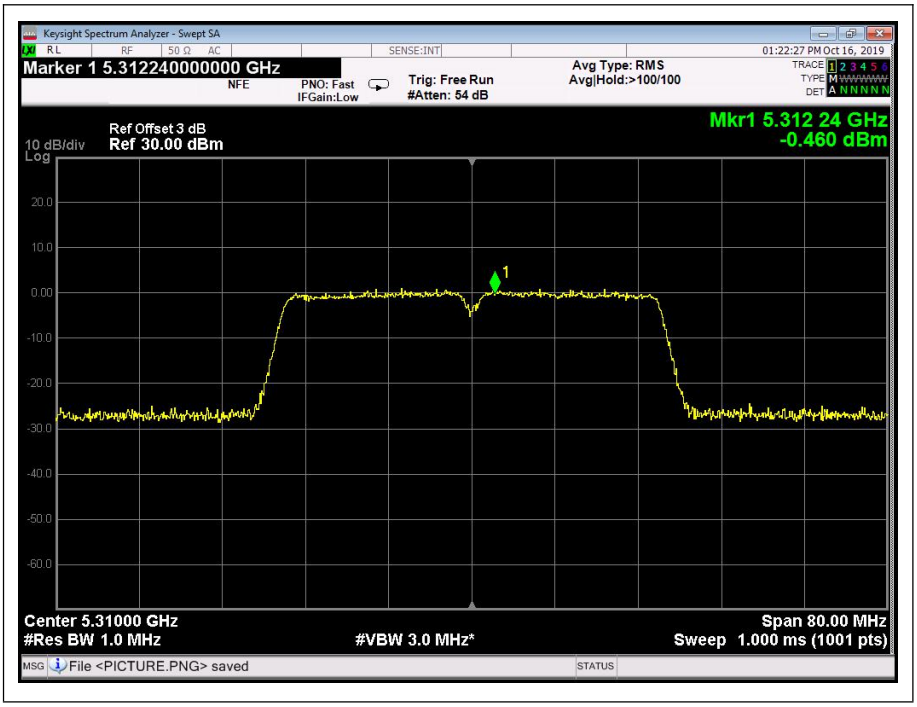
(Channel 38, 5190MHz, 802.11n (HT40))



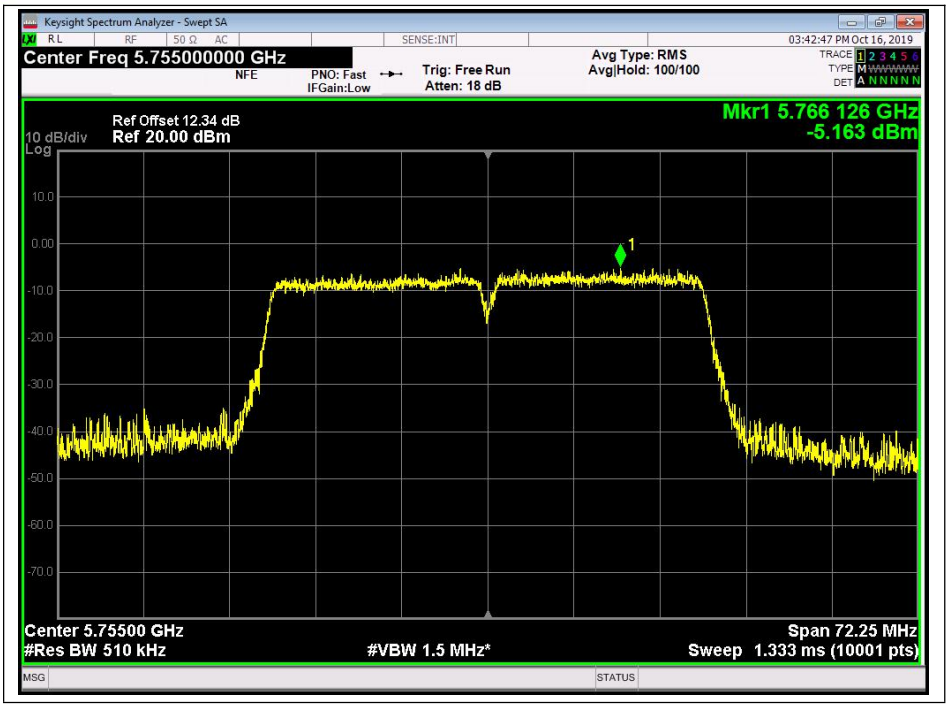
(Channel 46, 5230 MHz, 802.11n (HT40))



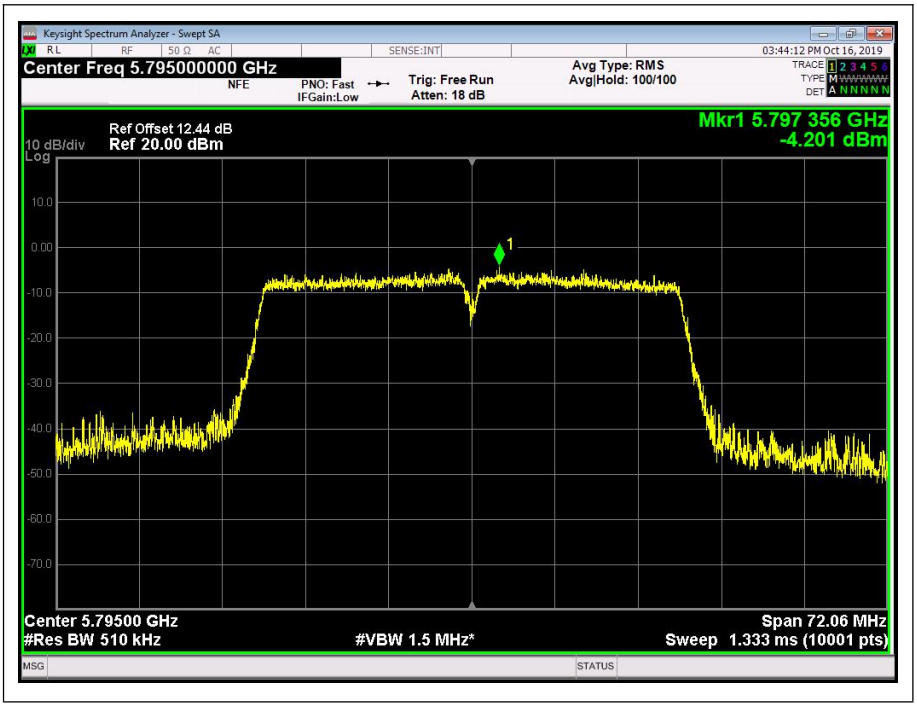
(Channel 54, 5270MHz, 802.11n (HT40))



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



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



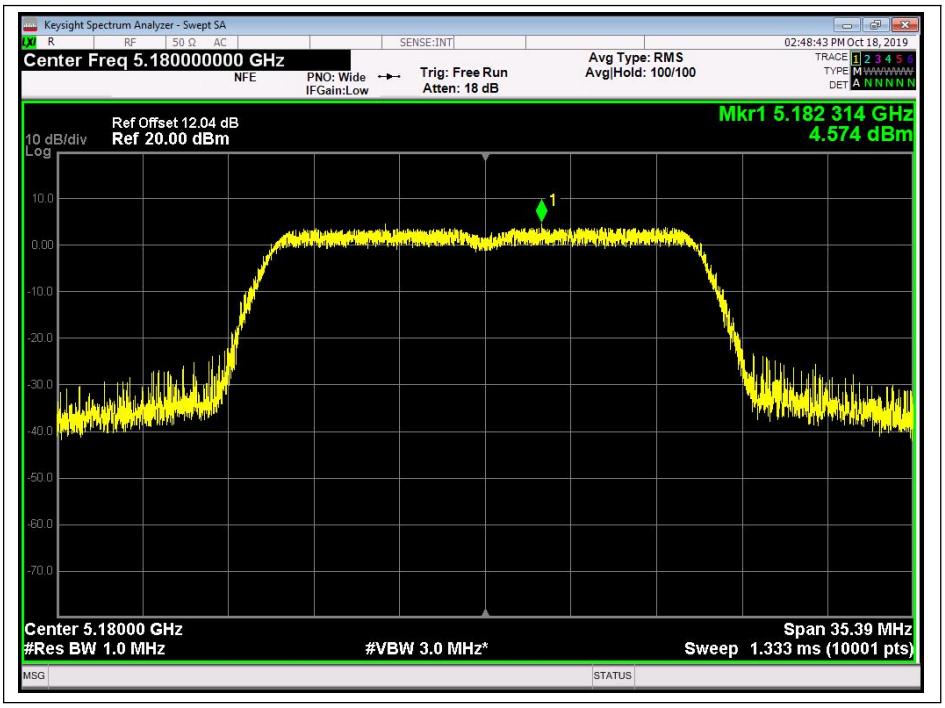
(Channel 159, 5795MHz, 802.11n (HT40))

802.11ac (HT20) Test mode

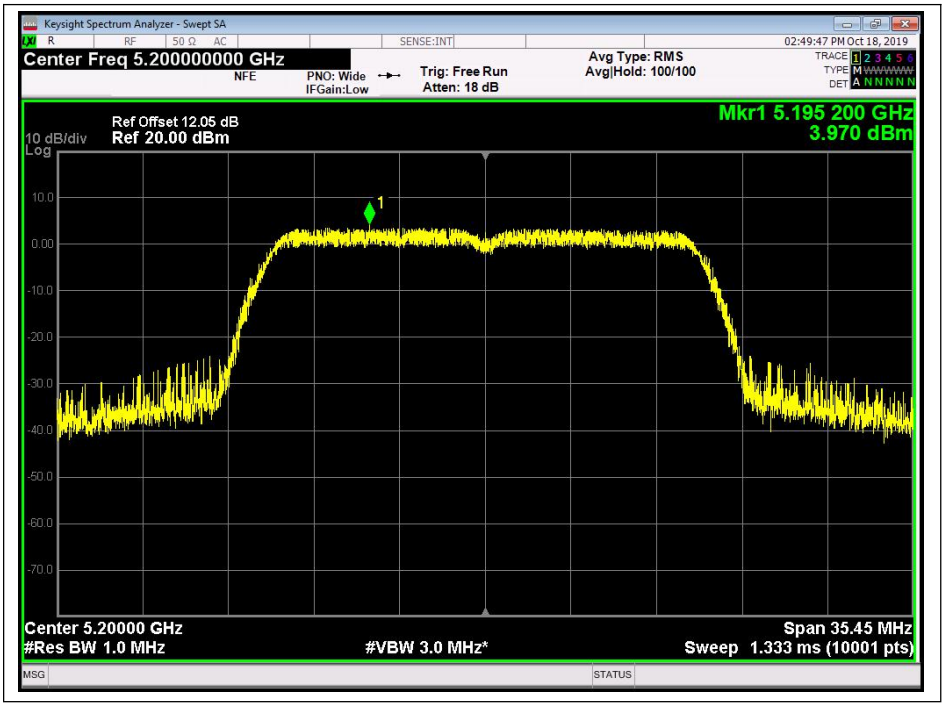
C. Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	4.574	11	PASS
40	5200	3.970		
44	5220	4.499		
48	5240	4.350		
52	5260	2.019		
56	5280	1.987		
60	5300	1.041		
64	5320	2.552		
Channel	Frequency (MHz)	Measured PSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	-2.982	30	PASS
157	5785	-0.983		
165	5825	-2.159		

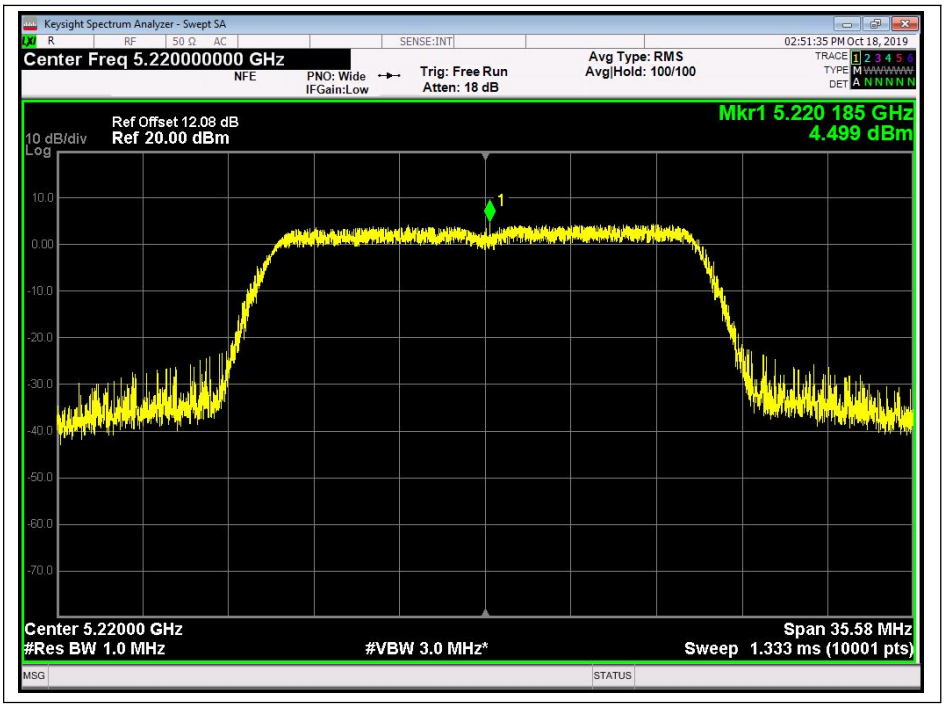
D. Test Plots



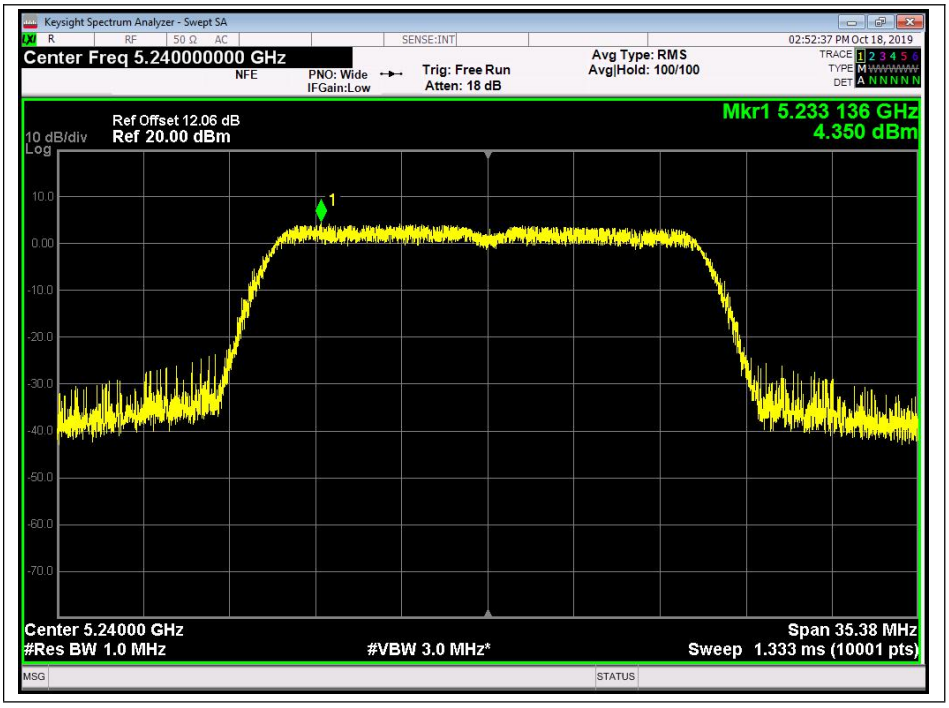
(Channel 36, 5180MHz, 802.11ac)



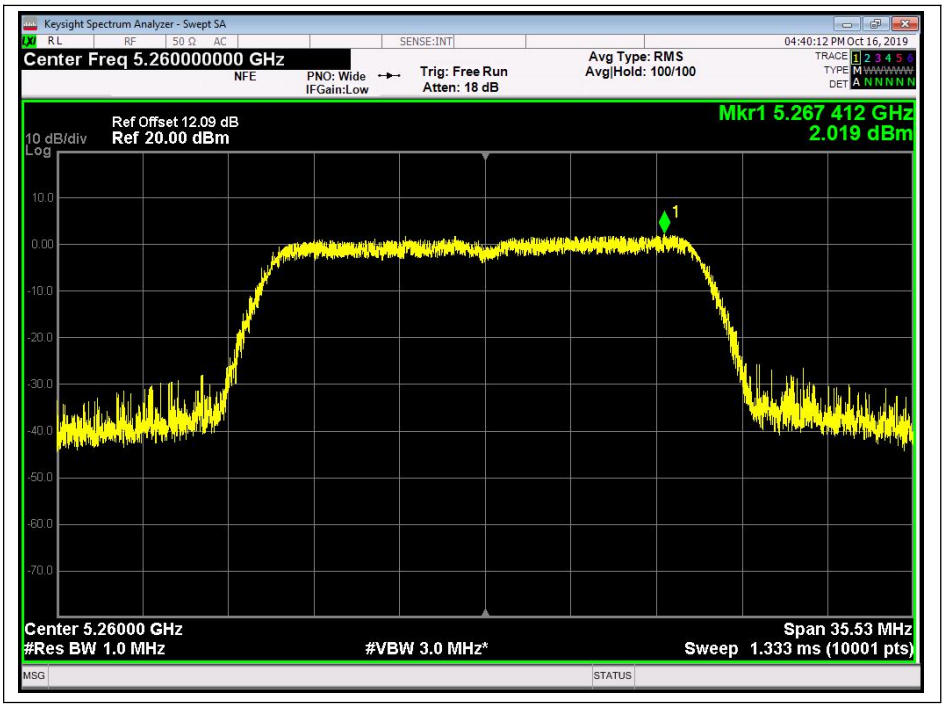
(Channel 40, 5200 MHz, 802.11ac)



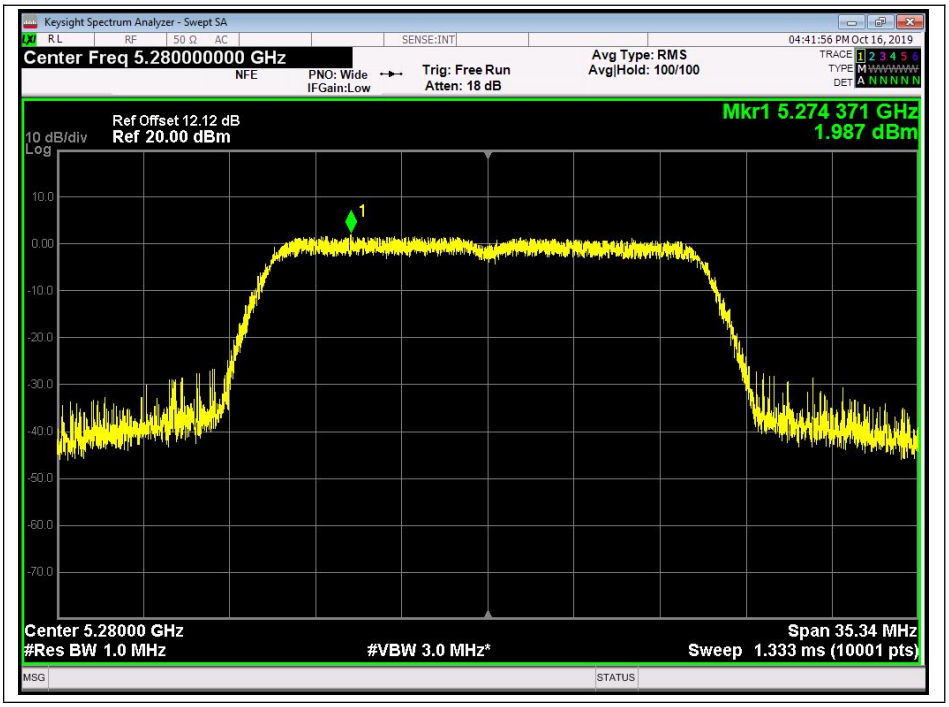
(Channel 44, 5220 MHz, 802.11ac)



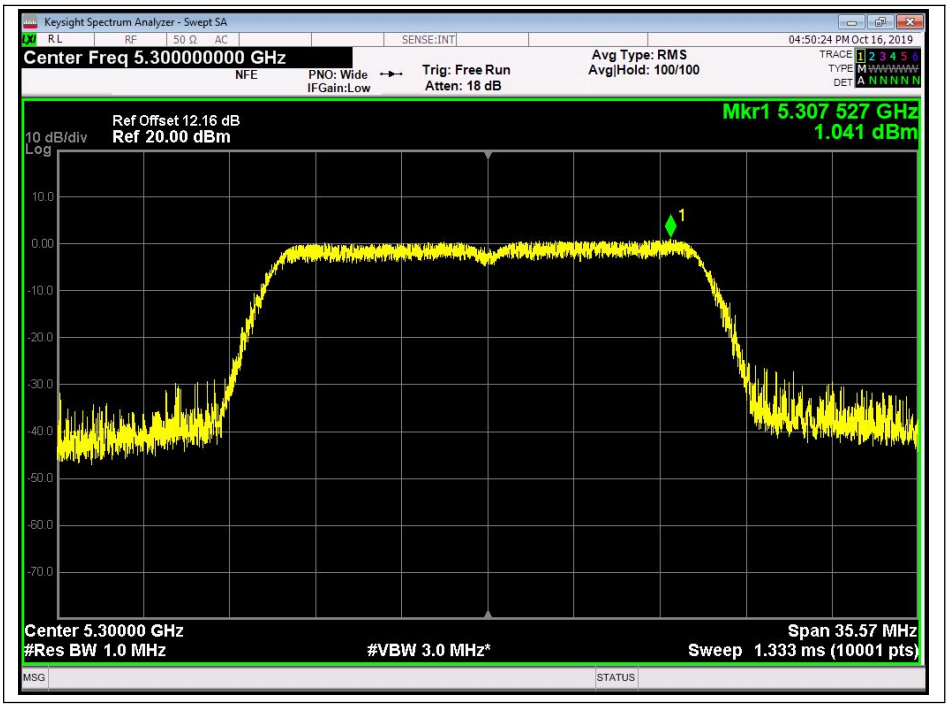
(Channel 48, 5240MHz, 802.11ac)



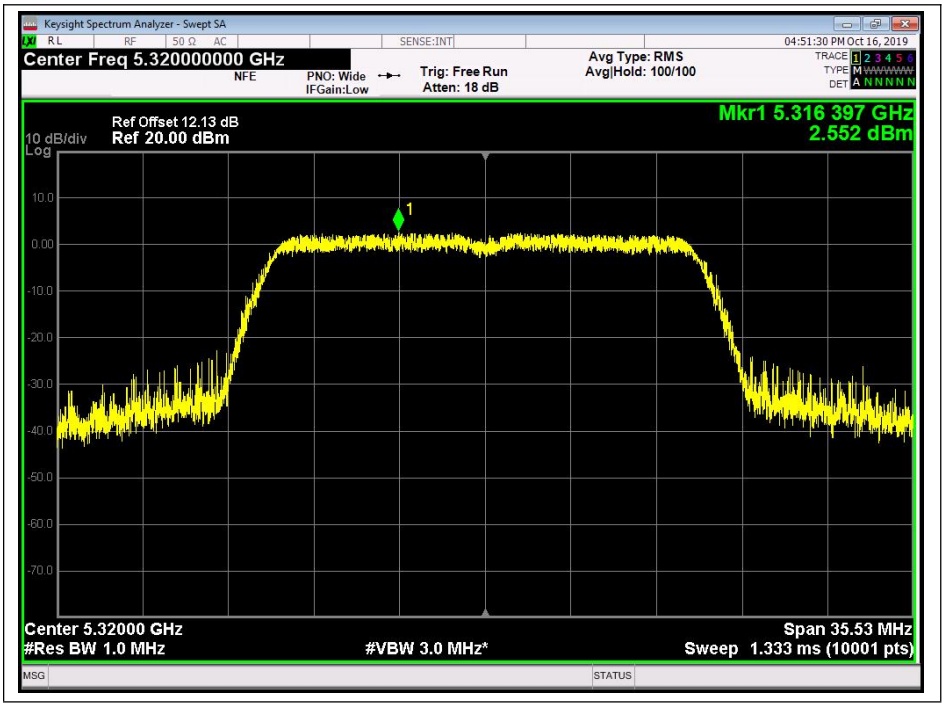
(Channel 52, 5260MHz, 802.11ac)



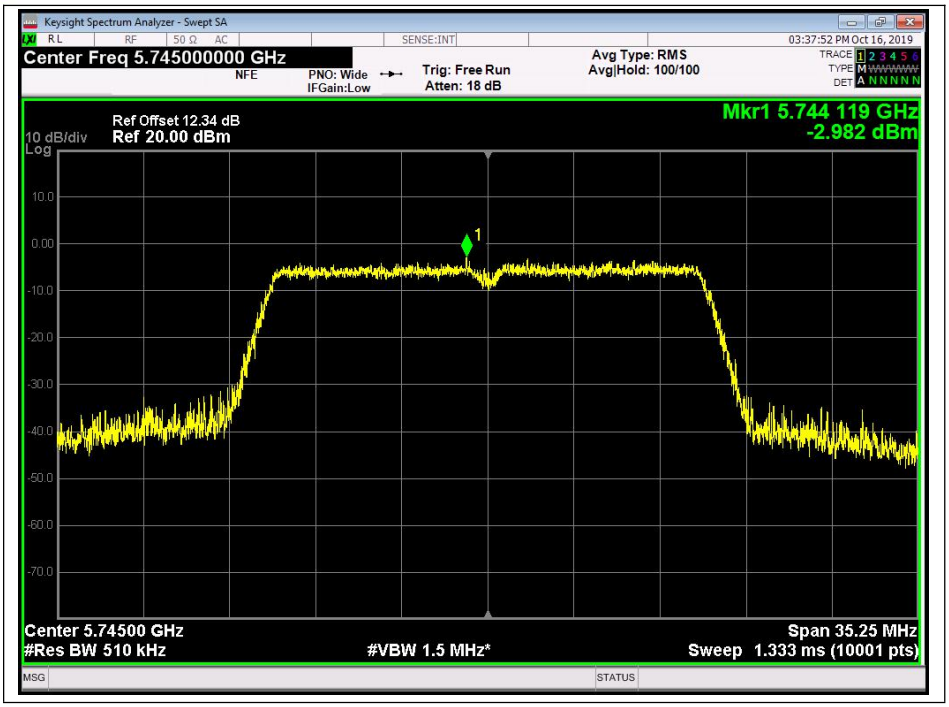
(Channel 56, 5280 MHz, 802.11ac)



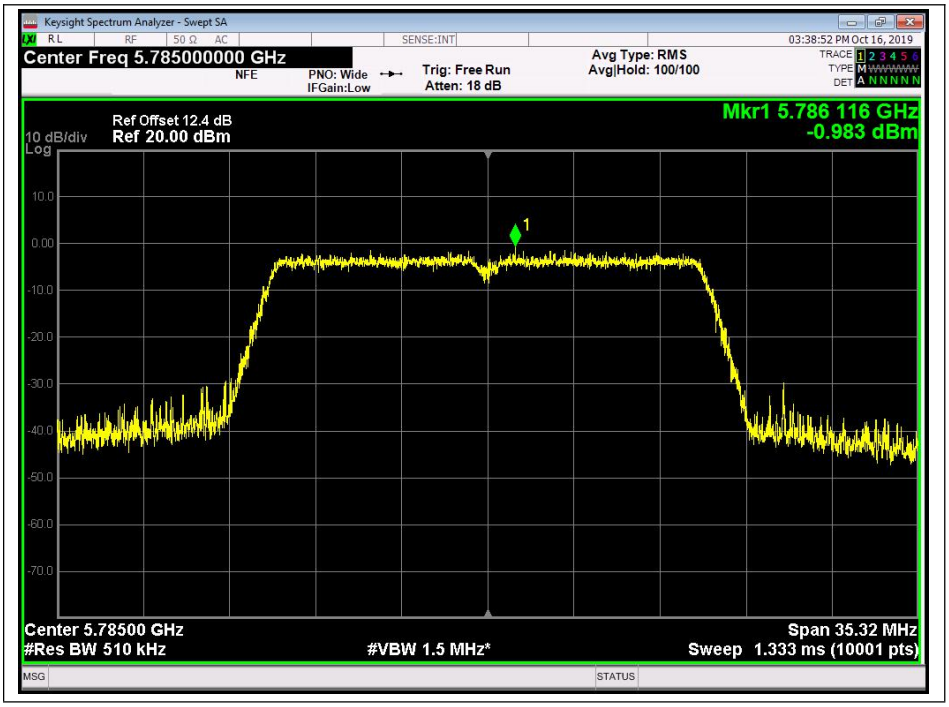
(Channel 60, 5300 MHz, 802.11ac)



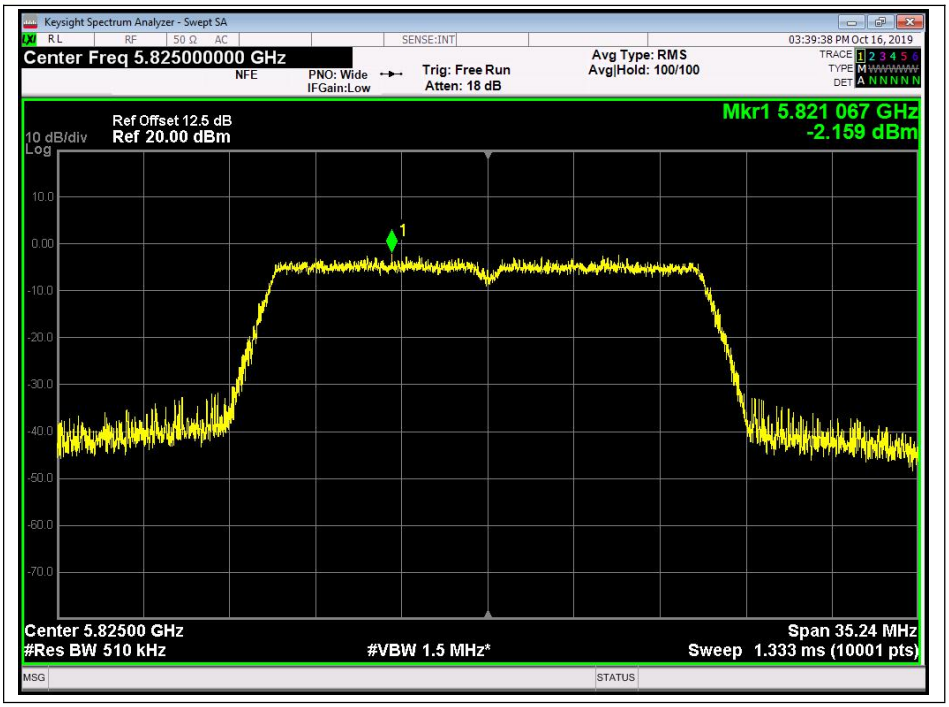
(Channel 64, 5320MHz, 802.11ac)



(Channel 149, 5745MHz, 802.11ac)



(Channel 157, 5785MHz, 802.11ac)



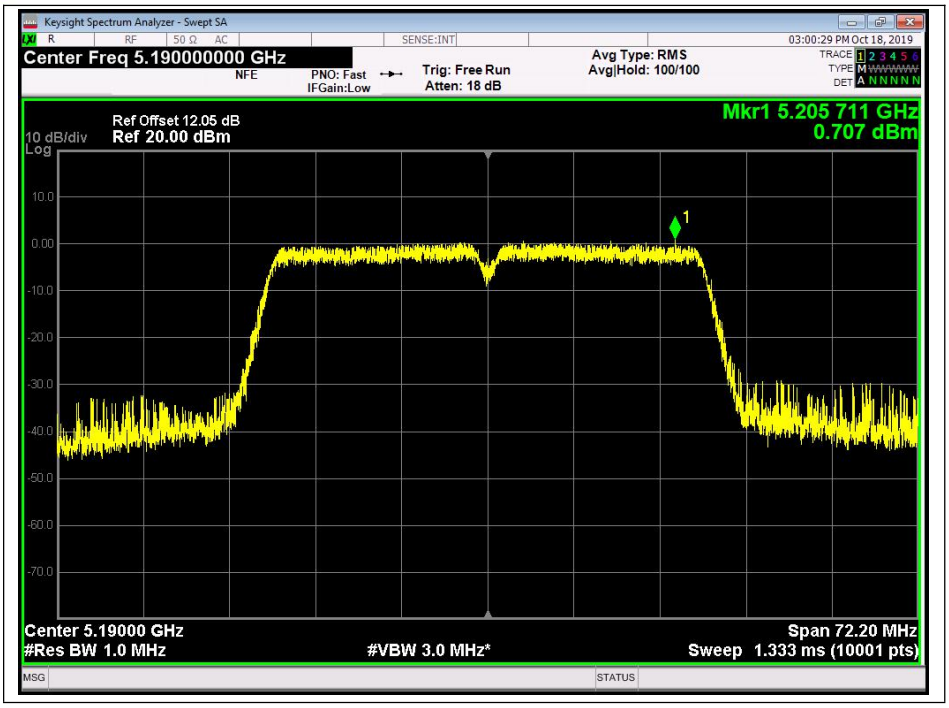
(Channel 165, 5825MHz, 802.11ac)

802.11ac (HT40) Test mode

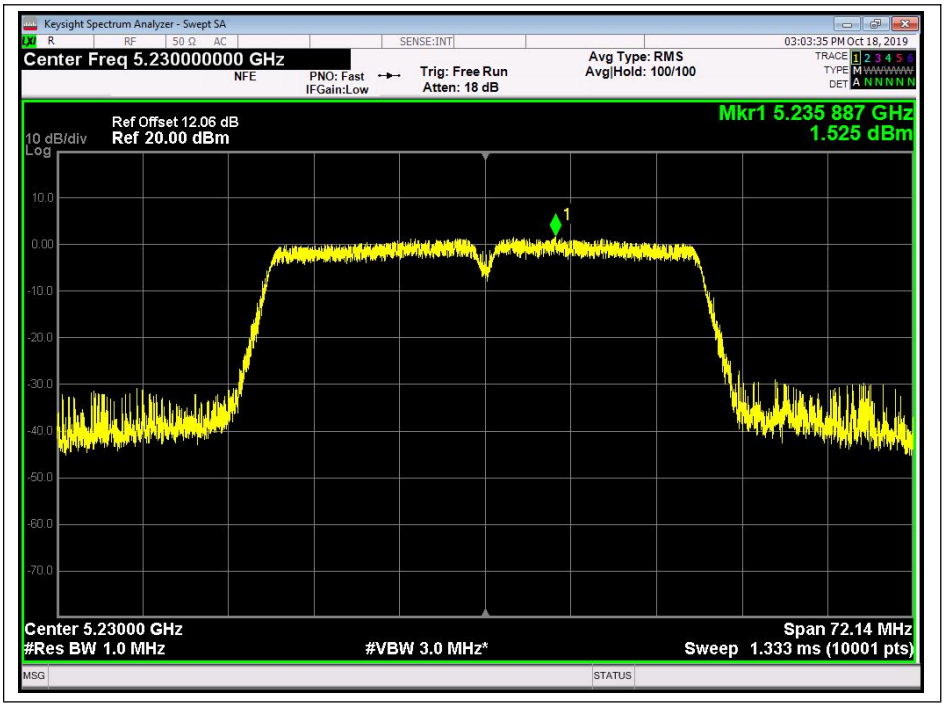
C. Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
38	5190	0.707	11	PASS
46	5230	1.525		
54	5270	2.409		
62	5310	2.394		
Channel	Frequency (MHz)	Measured PSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
151	5755	-4.898	30	PASS
159	5795	-4.647		

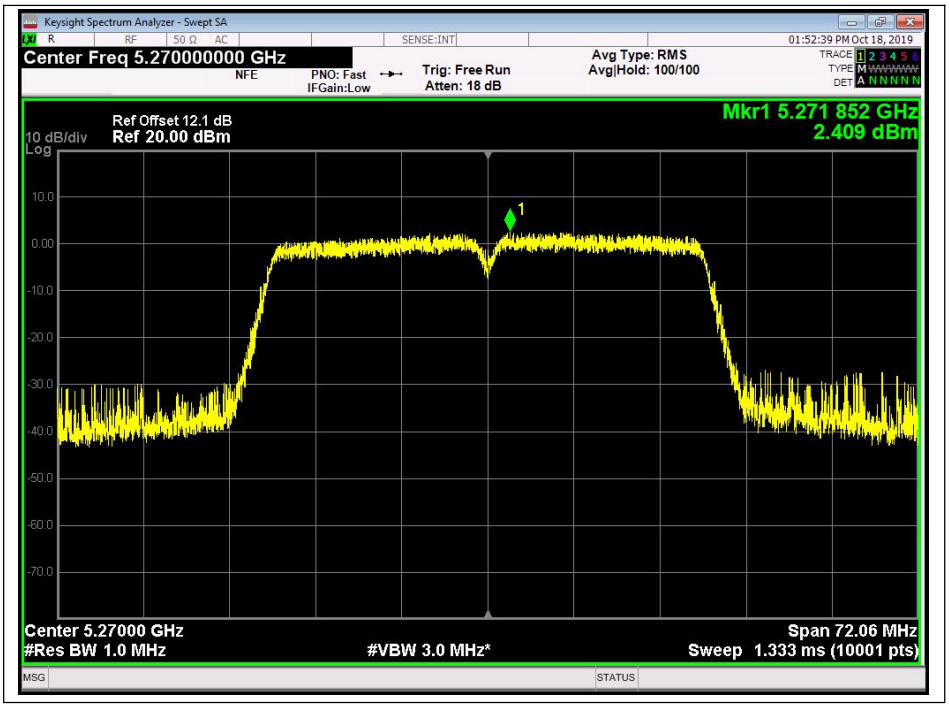
D. Test Plots



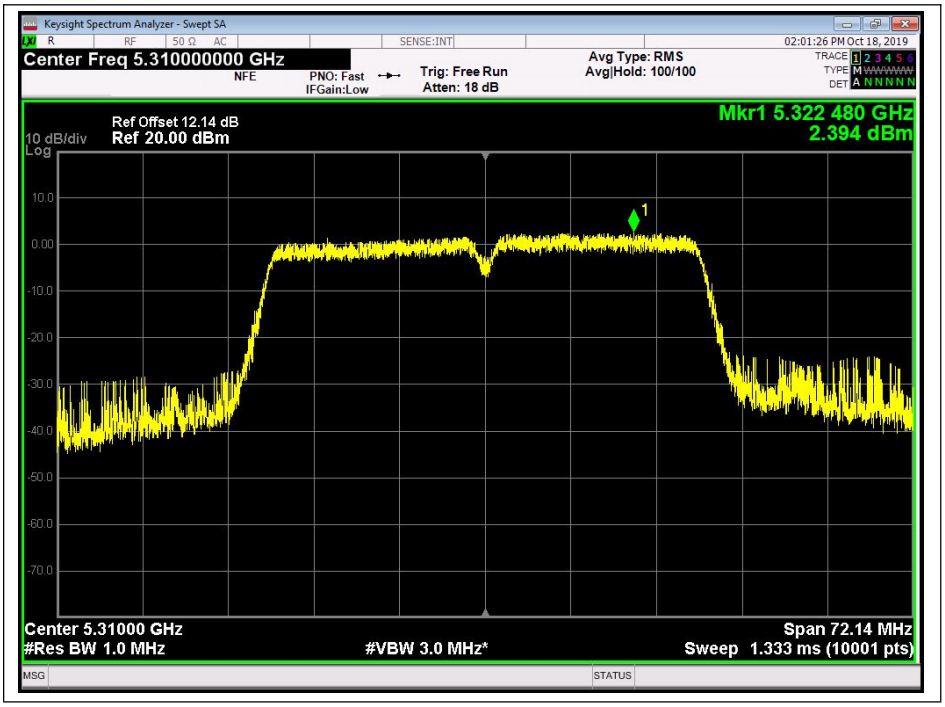
(Channel 38, 5190MHz, 802.11ac (HT40))



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



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



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