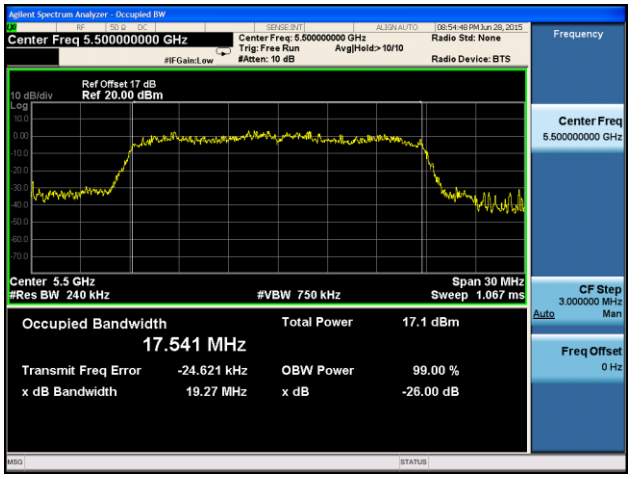
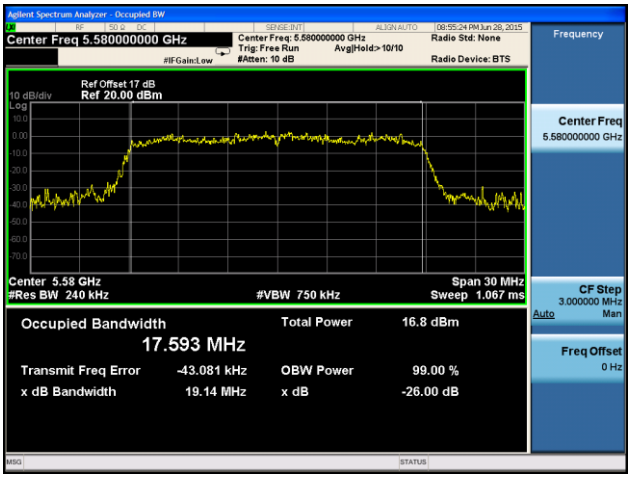
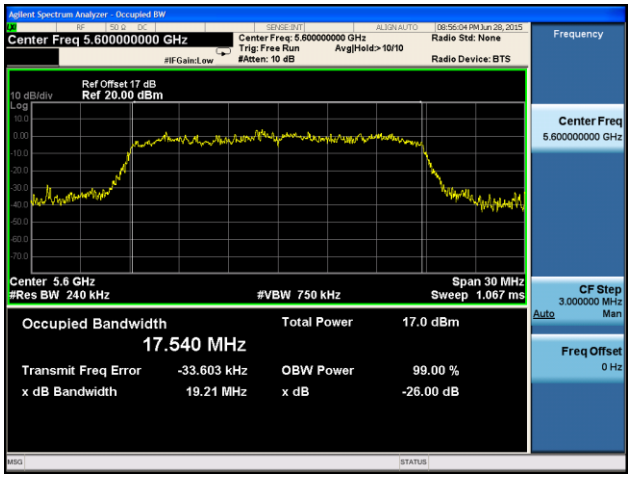
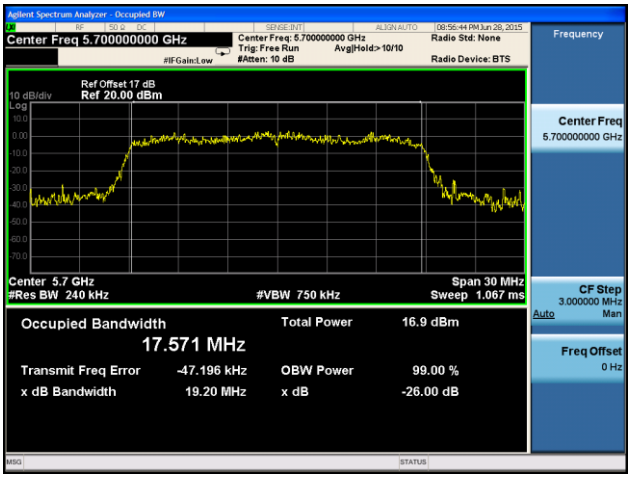
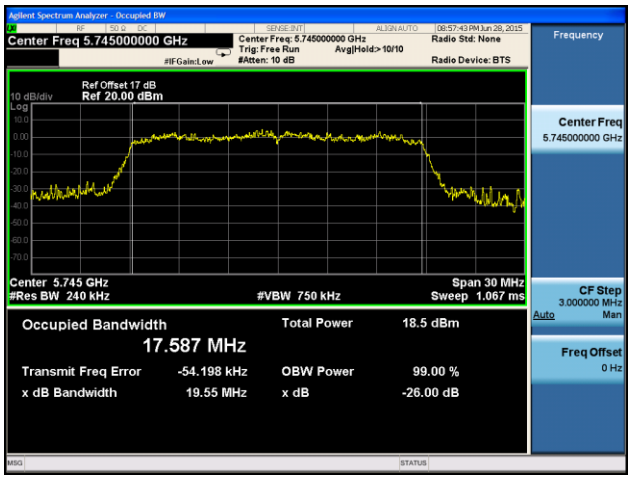
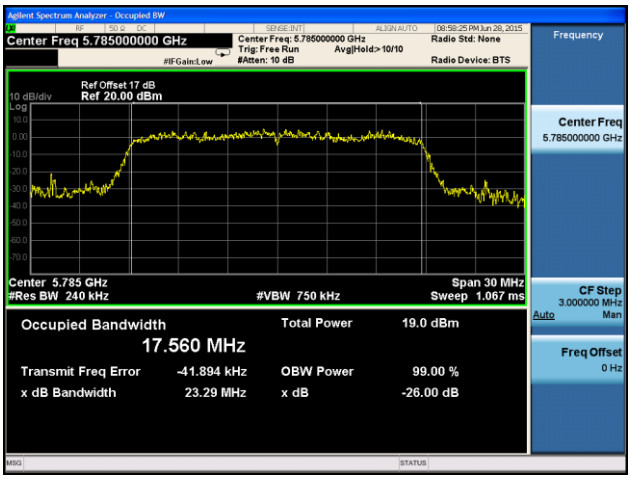
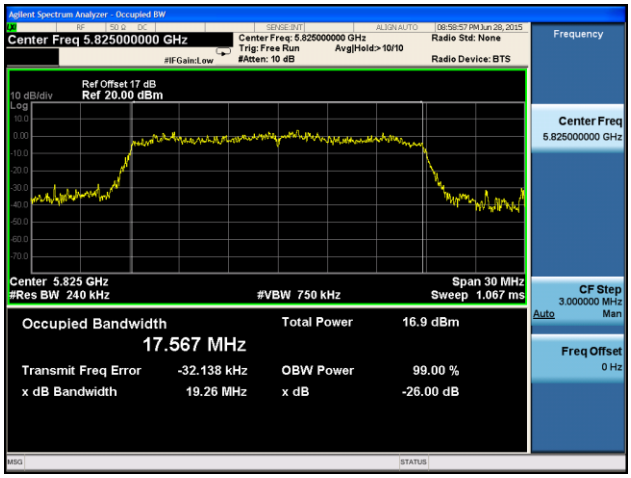
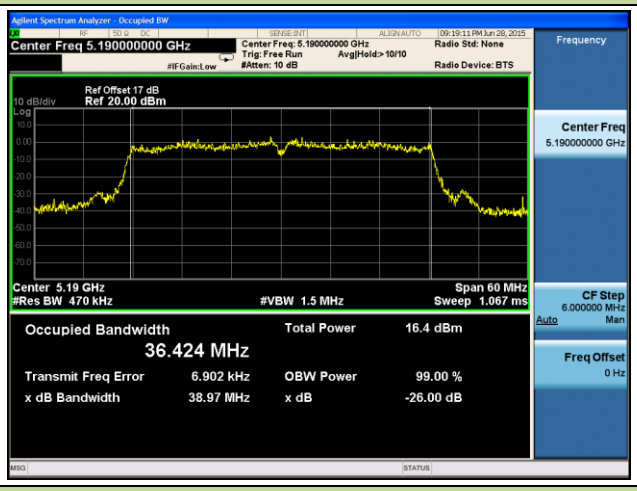
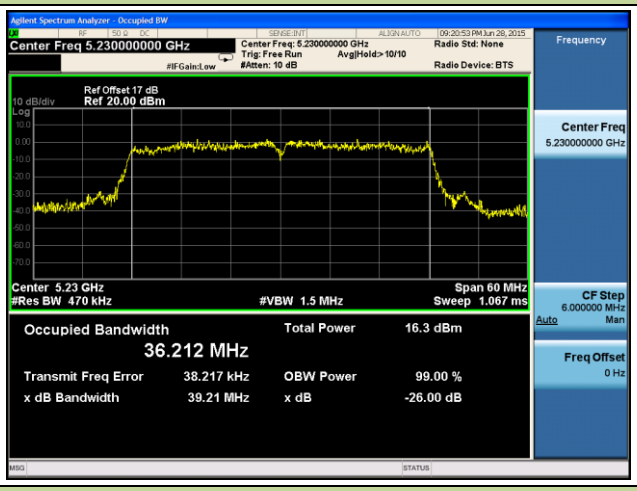
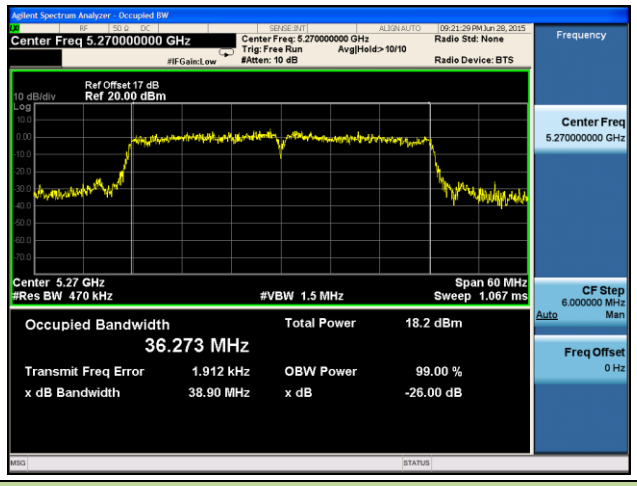
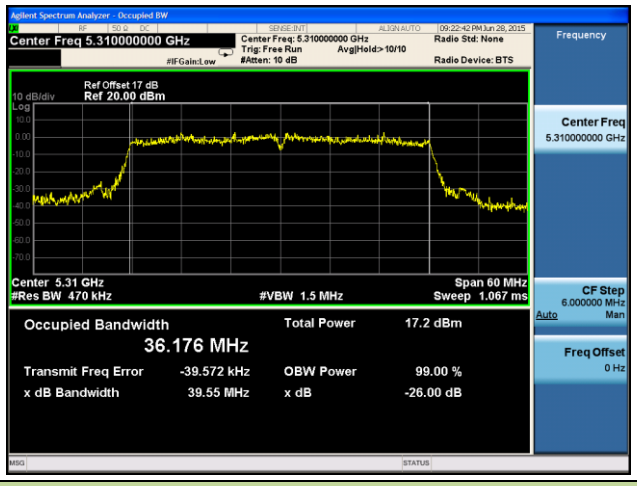
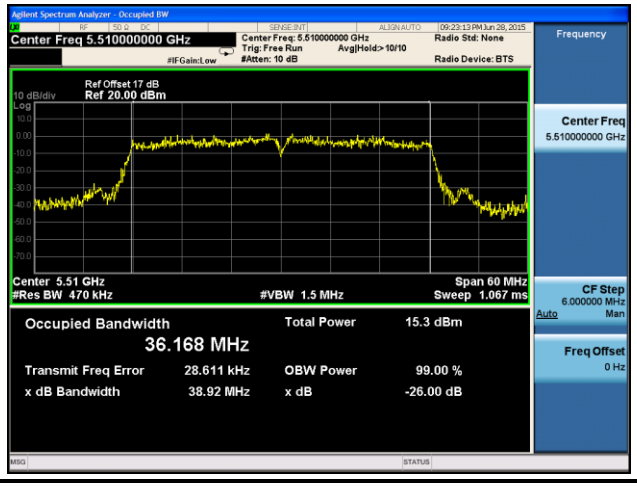
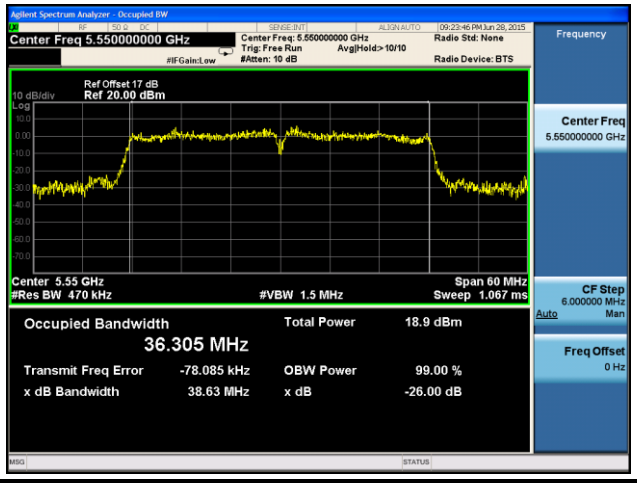
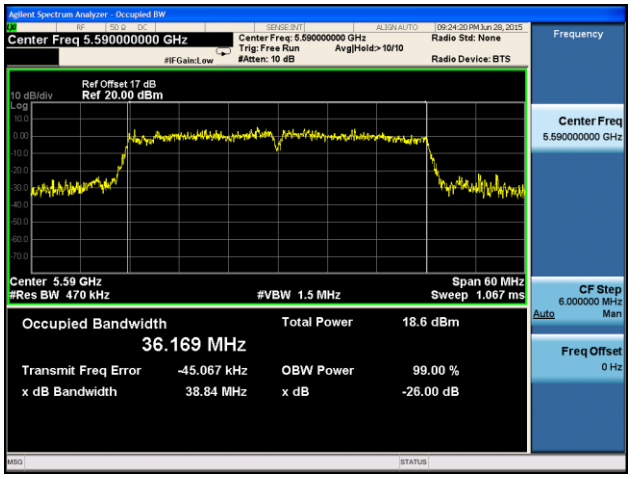
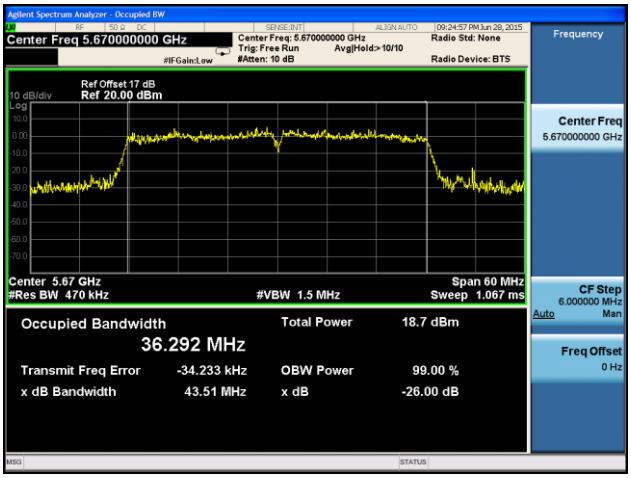
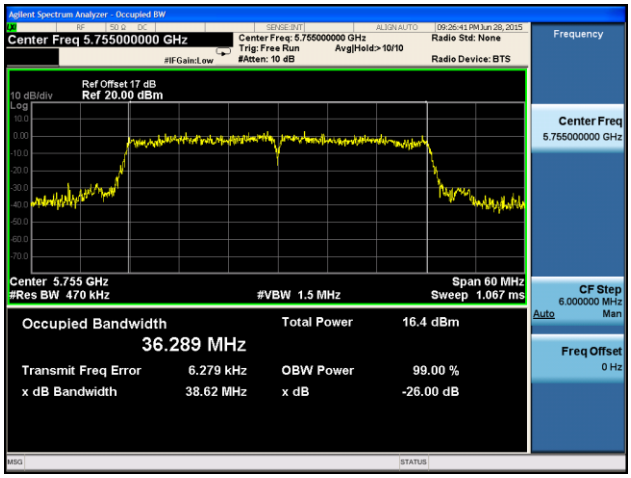
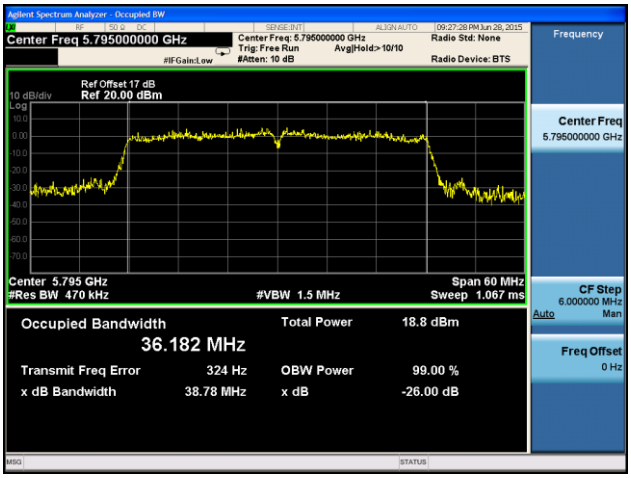
Channel 100 (5500MHz)	Channel 116 (5580MHz)
	
Channel 120 (5600MHz)	**Channel 140 (5700MHz)**
	
Channel 149 (5745MHz)	**Channel 157 (5785MHz)**
	

Channel 165 (5825MHz)	
	

802.11n-HT40 26dB Bandwidth & 99% Bandwidth - Ant 1 / Ant 0 + 1	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
Channel 54 (5270MHz)	**Channel 62 (5310MHz)**
	
Channel 102 (5510MHz)	**Channel 110 (5550MHz)**
	

Channel 118 (5590MHz)	Channel 134 (5670MHz)
	
Channel 151 (5755 MHz)	**Channel 159 (5795 MHz)**
	

7.3. 6dB Bandwidth Measurement

7.3.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

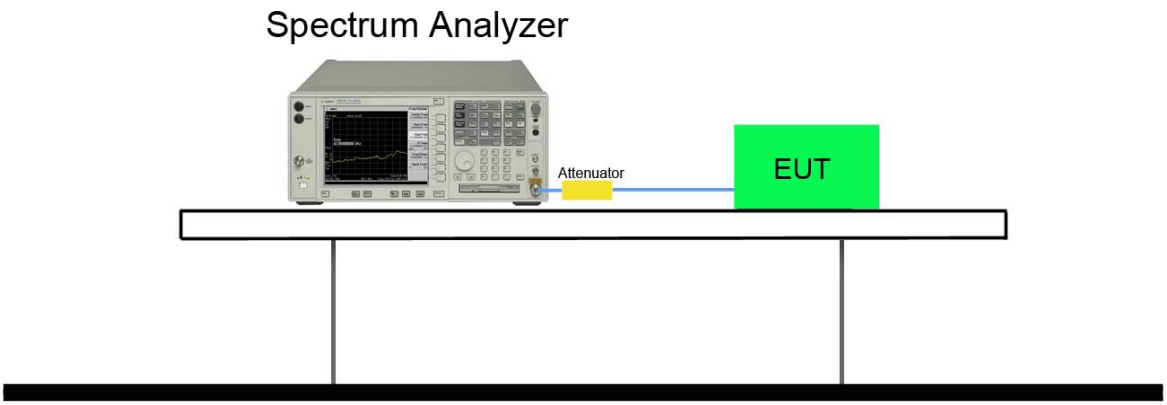
7.3.2. Test Procedure used

KDB 789033 D02v01 – Section C.2

7.3.3. Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 100 kHz.
3. VBW ≧ 3 × RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. 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.

7.3.4. Test Setup

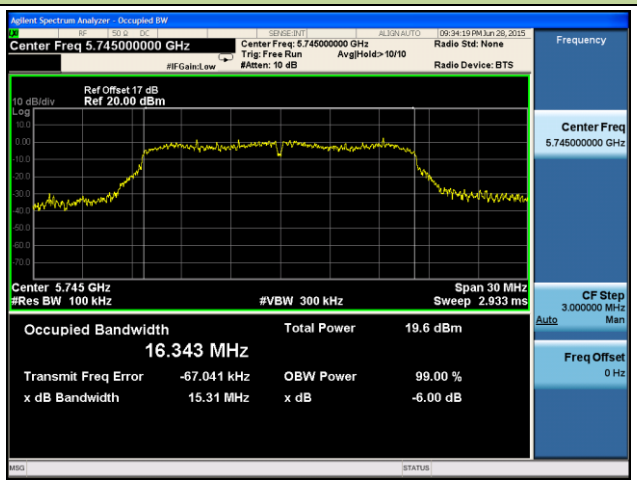


7.3.5. Test Result

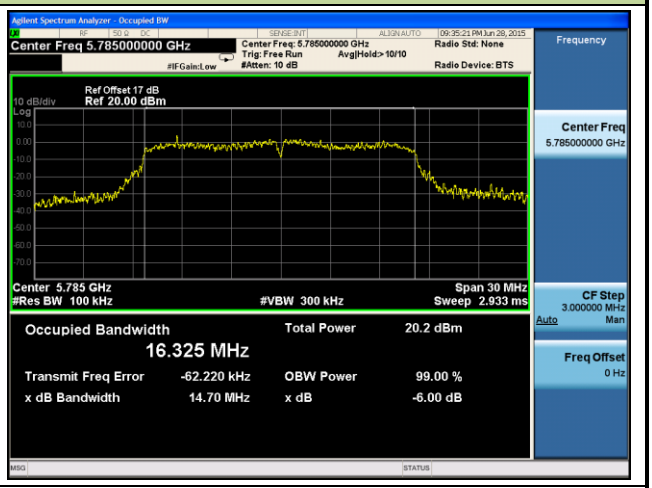
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant 0 / Ant 0 + 1						
802.11a	6	149	5745	15.31	≥ 0.5	Pass
802.11a	6	157	5785	14.70	≥ 0.5	Pass
802.11a	6	165	5825	16.08	≥ 0.5	Pass
802.11n-HT20	13	149	5745	15.02	≥ 0.5	Pass
802.11n-HT20	13	157	5785	16.94	≥ 0.5	Pass
802.11n-HT20	13	165	5825	16.69	≥ 0.5	Pass
802.11n-HT40	27	151	5755	35.71	≥ 0.5	Pass
802.11n-HT40	27	159	5795	35.71	≥ 0.5	Pass
Ant 1 / Ant 0 + 1						
802.11a	6	149	5745	15.86	≥ 0.5	Pass
802.11a	6	157	5785	15.67	≥ 0.5	Pass
802.11a	6	165	5825	16.35	≥ 0.5	Pass
802.11n-HT20	13	149	5745	16.04	≥ 0.5	Pass
802.11n-HT20	13	157	5785	17.57	≥ 0.5	Pass
802.11n-HT20	13	165	5825	15.10	≥ 0.5	Pass
802.11n-HT40	27	151	5755	36.37	≥ 0.5	Pass
802.11n-HT40	27	159	5795	36.28	≥ 0.5	Pass

802.11a 6dB Bandwidth - Ant 0 / Ant 0 + 1

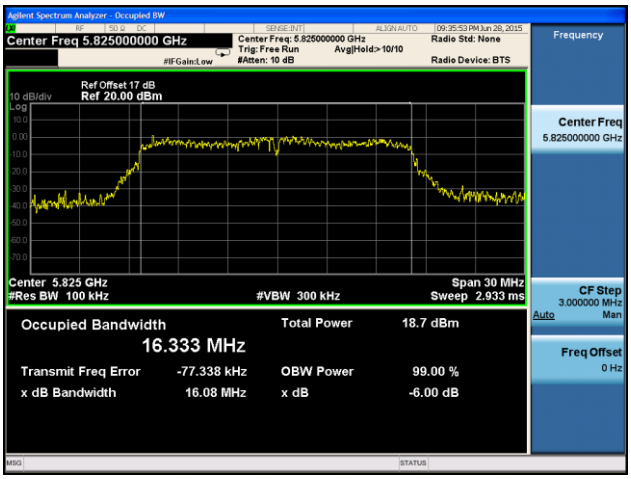
Channel 149 (5745MHz)



Channel 157 (5785MHz)

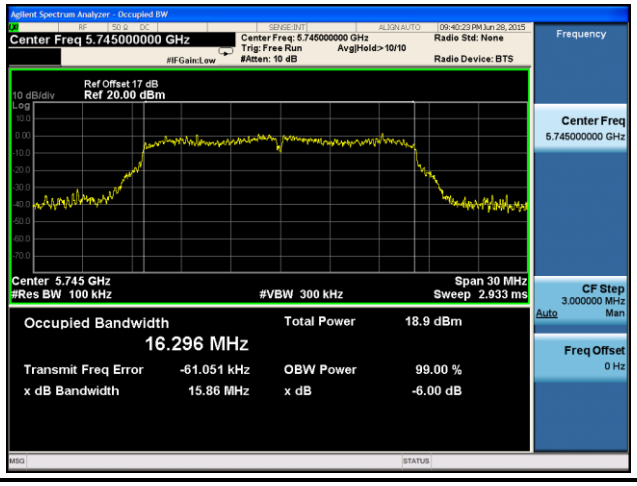


Channel 165 (5825MHz)

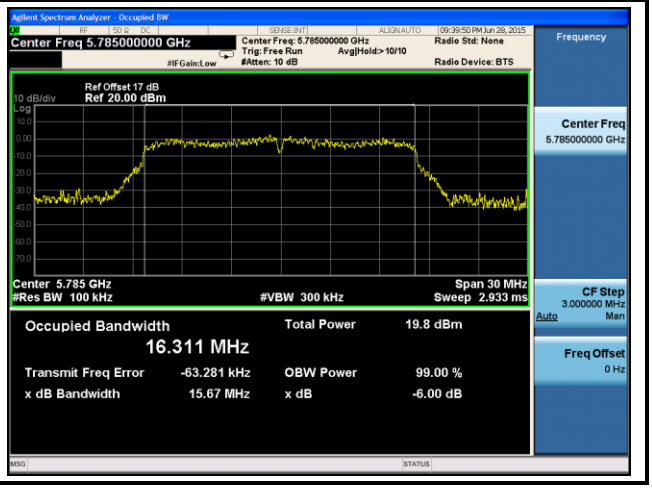


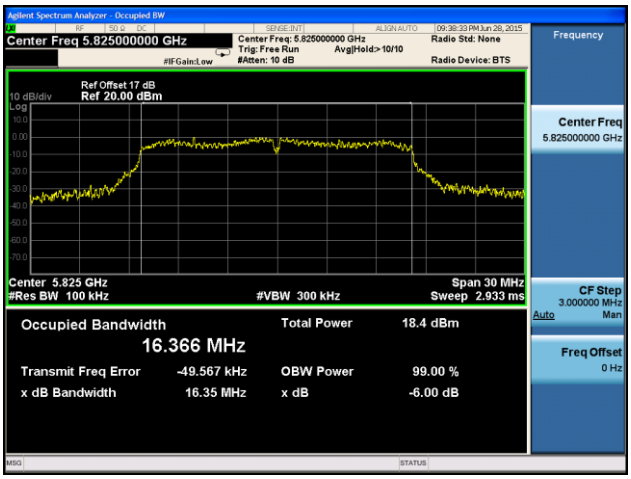
802.11a 6dB Bandwidth - Ant 1 / Ant 0 + 1

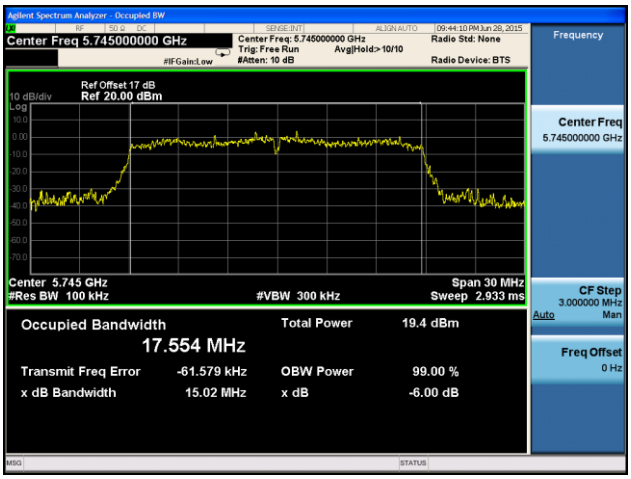
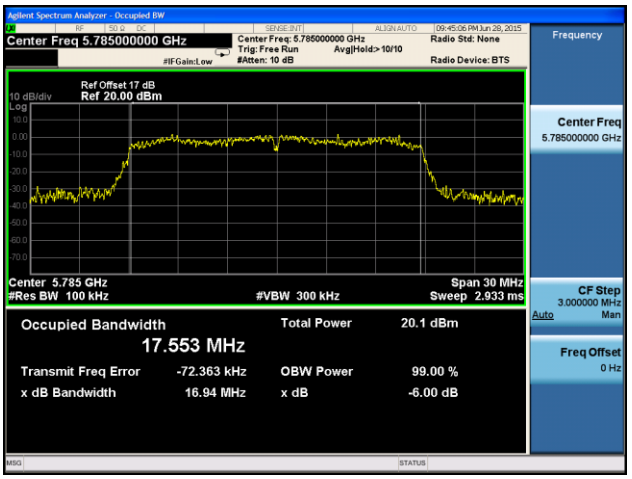
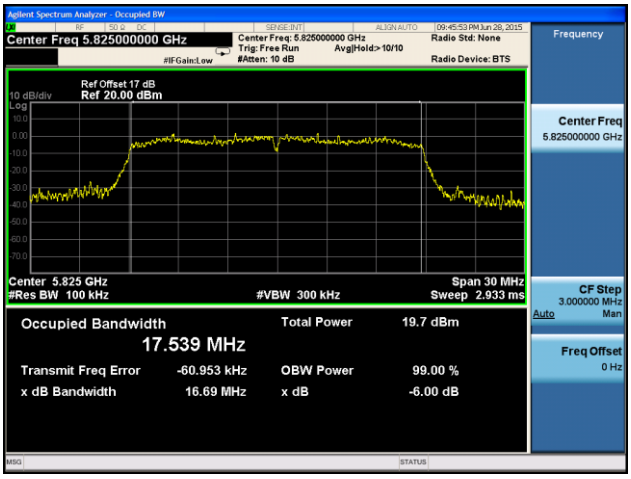
Channel 149 (5745MHz)



Channel 157 (5785MHz)

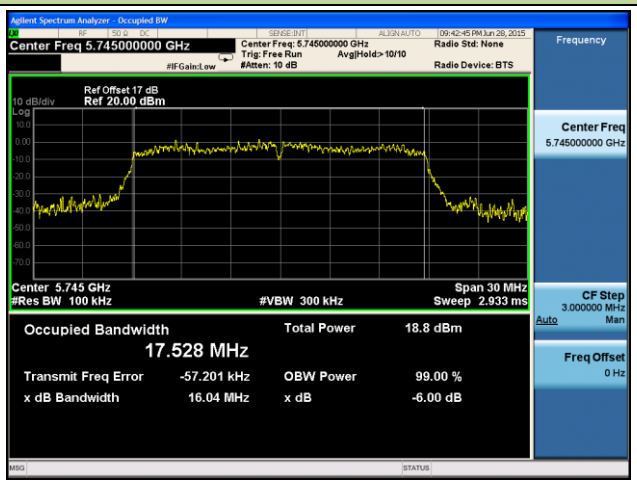


Channel 165 (5825MHz)	
	

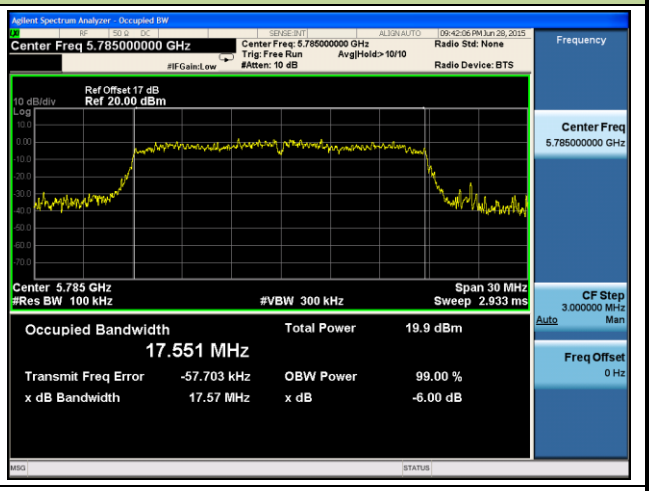
802.11n-HT20 6dB Bandwidth - Ant 0 / Ant 0 + 1	
Channel 149 (5745MHz)	**Channel 157 (5785MHz)**
	
Channel 165 (5825MHz)	
	

802.11n-HT20 6dB Bandwidth - Ant 1 / Ant 0 + 1

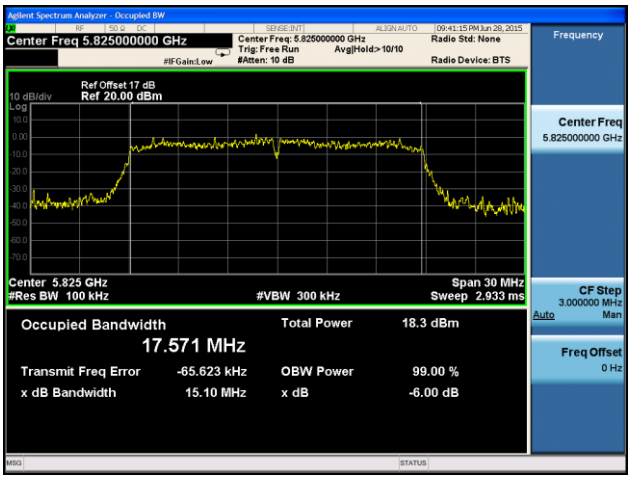
Channel 149 (5745MHz)



Channel 157 (5785MHz)

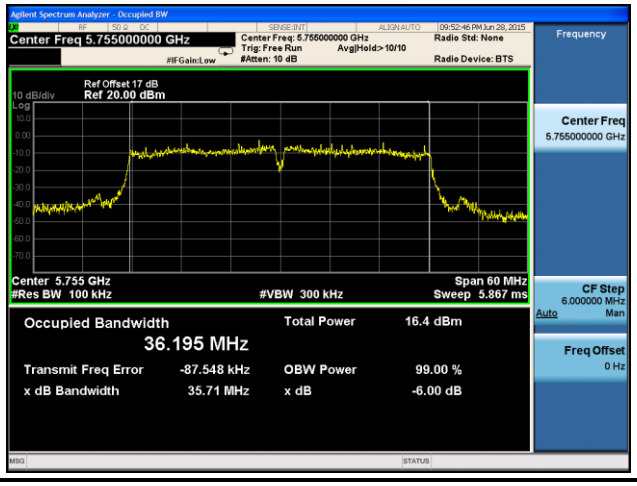


Channel 165 (5825MHz)

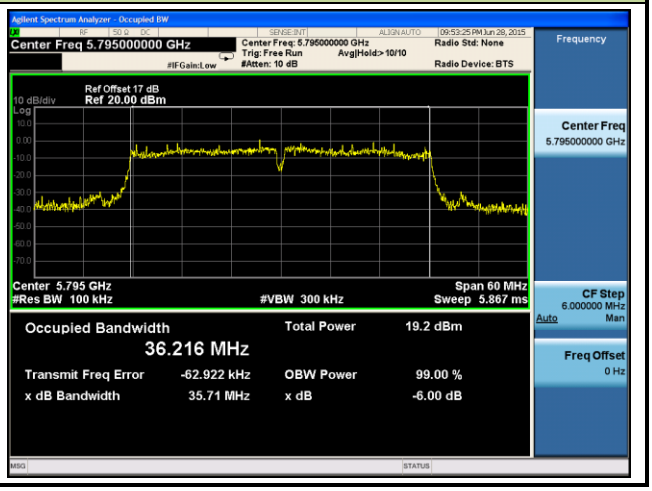


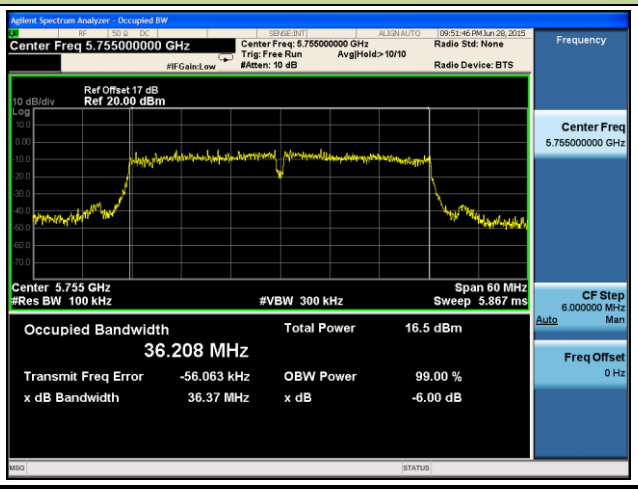
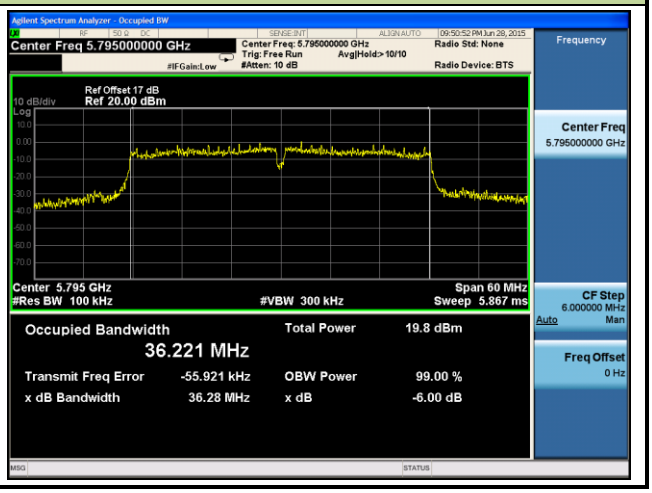
802.11n-HT40 6dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 151 (5755MHz)



Channel 159 (5795MHz)



802.11n-HT40 6dB Bandwidth - Ant 1 / Ant 0 + 1	
Channel 151 (5755MHz)	**Channel 159 (5795MHz)**
	

7.4. Output Power Measurement

7.4.1. Test Limit

For FCC

For mobile and portable client devices operating in the band 5.15-5.25 GHz, 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.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power shall not exceed 250 mW (23.98dBm) or 11 + 10 $\log_{10}$ B, dBm, whichever power is less. The maximum e.i.r.p. shall not exceed 1.0 W (30dBm) or 17 + 10 $\log_{10}$ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm).

For IC

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power shall not exceed 250 mW (23.98dBm) or 11 + 10 $\log_{10}$ B, dBm, whichever power is less. The maximum e.i.r.p. shall not exceed 1.0 W (30dBm) or 17 + 10 $\log_{10}$ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

For the 5.725-5.85 GHz band, the maximum conducted output power 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.

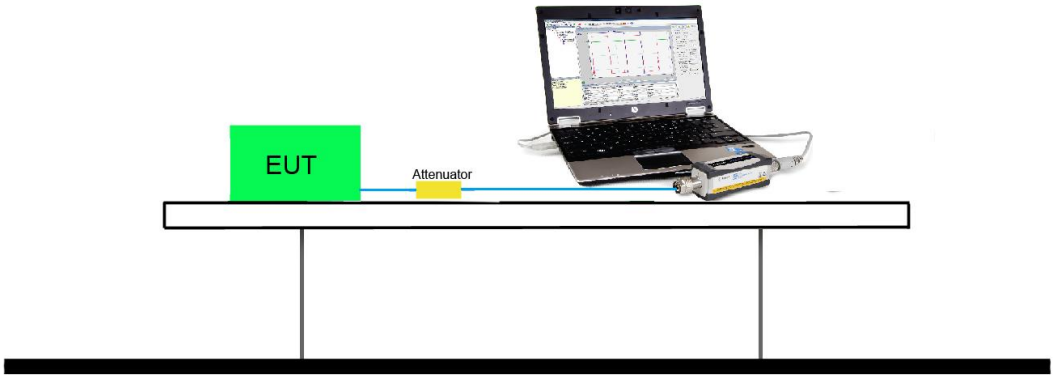
7.4.2. Test Procedure Used

KDB 789033 D02v01 - Section E) 3) b) Method PM-G

7.4.3. Test Setting

Average power measurements were perform only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

7.4.4. Test Setup



7.4.5. Test Result

Power output test was verified over all data rates of each mode shown as below, and then choose the maximum power output (yellow marker) for final test of each channel.

a	N_{Tx}	MCS Index for 802.11n	Data Rate (Mbps)			
			20MHz Bandwidth		40MHz Bandwidth	
			800ns GI	400ns GI	800ns GI	400ns GI
6	2	8	13.0	14.4	27.0	30.0
9	2	9	26.0	28.9	54.0	60.0
12	2	10	39.0	43.3	81.0	90.0
18	2	11	52.0	57.8	108.0	120.0
24	2	12	78.0	86.7	162.0	180.0
36	2	13	104.0	115.6	216.0	240.0
48	2	14	117.0	130.0	243.0	270.0
54	2	15	130.0	144.0	270.0	300.0

Output power at various data rates for Ant 0:

Test Mode	Bandwidth (MHz)	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)
802.11a	20	60	5300	6	11.88
				24	11.49
				54	11.08
802.11n	20	60	5300	13	14.27
				14.4	14.23
				78	14.20
				86.7	14.16
				130	14.13
				144	14.11
802.11n	40	62	5310	27	11.37
				30	11.25
				162	11.19
				180	11.03
				270	10.91
				300	10.75

Test Mode	N_{Tx}	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power (dBm)	Limit (dBm)	Max EIRP (dBm)	EIRP Limit (dBm)	Result
11a	2	6	36	5180	10.62	8.71	12.78	≤ 23.47	--	--	Pass
11a	2	6	44	5220	10.55	8.77	12.76	≤ 23.47	--	--	Pass
11a	2	6	48	5240	10.77	9.17	13.05	≤ 23.47	--	--	Pass
11a	2	6	52	5260	11.91	12.06	15.00	≤ 22.64	21.50	≤ 29.14	Pass
11a	2	6	60	5300	11.88	12.17	15.04	≤ 22.64	21.54	≤ 29.14	Pass
11a	2	6	64	5320	10.98	11.52	14.27	≤ 22.64	20.77	≤ 29.14	Pass
11a	2	6	100	5500	11.83	10.94	14.42	≤ 22.64	20.92	≤ 29.14	Pass
11a	2	6	116	5580	12.16	11.60	14.90	≤ 22.64	21.40	≤ 29.14	Pass
11a	2	6	120	5600	12.30	11.56	14.96	≤ 22.64	21.46	≤ 29.14	pass
11a	2	6	140	5700	11.33	11.21	14.28	≤ 22.64	20.78	≤ 29.14	Pass
11a	2	6	149	5745	12.13	12.01	15.08	≤ 29.5	--	--	Pass
11a	2	6	157	5785	13.10	12.97	16.05	≤ 29.5	--	--	Pass
11a	2	6	165	5825	12.29	11.76	15.04	≤ 29.5	--	--	Pass
11n-HT20	2	13	36	5180	9.58	10.21	12.92	≤ 23.47	--	--	Pass
11n-HT20	2	13	44	5220	9.65	10.23	12.96	≤ 23.47	--	--	Pass
11n-HT20	2	13	48	5240	9.64	10.33	13.01	≤ 23.47	--	--	Pass
11n-HT20	2	13	52	5260	14.19	14.38	17.30	≤ 22.93	20.83	≤ 29.43	Pass
11n-HT20	2	13	60	5300	14.27	14.70	17.50	≤ 22.93	21.06	≤ 29.43	Pass
11n-HT20	2	13	64	5320	13.29	13.41	16.36	≤ 22.93	19.89	≤ 29.43	Pass
11n-HT20	2	13	100	5500	12.97	12.20	15.61	≤ 22.93	19.04	≤ 29.43	Pass
11n-HT20	2	13	116	5580	13.06	12.37	15.74	≤ 22.93	19.17	≤ 29.43	Pass
11n-HT20	2	13	120	5600	13.00	12.39	15.72	≤ 22.93	19.16	≤ 29.43	pass
11n-HT20	2	13	140	5700	12.05	11.56	14.82	≤ 22.93	18.28	≤ 29.43	Pass
11n-HT20	2	13	149	5745	12.91	12.26	15.61	≤ 29.5	--	--	Pass
11n-HT20	2	13	157	5785	13.70	12.99	16.37	≤ 29.5	--	--	Pass
11n-HT20	2	13	165	5825	12.58	11.60	15.13	≤ 29.5	--	--	Pass
11n-HT40	2	27	38	5190	11.00	11.63	14.34	≤ 23.47	--	--	Pass
11n-HT40	2	27	46	5230	11.04	11.88	14.49	≤ 23.47	--	--	Pass
11n-HT40	2	27	54	5270	13.04	13.45	16.26	≤ 23.48	19.82	≤ 30	Pass
11n-HT40	2	27	62	5310	11.37	11.94	14.67	≤ 23.48	18.25	≤ 30	Pass
11n-HT40	2	27	102	5510	10.22	9.64	12.95	≤ 23.48	16.40	≤ 30	Pass
11n-HT40	2	27	110	5550	14.00	13.89	16.96	≤ 23.48	20.46	≤ 30	Pass
11n-HT40	2	27	118	5590	13.77	13.73	16.76	≤ 23.48	20.27	≤ 30	pass

11n-HT40	2	27	134	5670	12.64	12.47	15.57	≤ 23.48	19.06	≤ 30	Pass
11n-HT40	2	27	151	5755	9.71	10.01	12.87	≤ 29.5	--	--	Pass
11n-HT40	2	27	159	5795	12.60	11.99	15.32	≤ 29.5	--	--	Pass

Note 1: The Total Average Power (dBm) = $10*\log\{10^{(\text{Ant 0 Average Power }/10)}+10^{(\text{Ant 1 Average Power }/10)}\}$.

Max EIRP Power (dBm) = Total Average Power (dBm) + Antenna Gain.

Note 2: EIRP Limit Calculation as below:

For 5250-5350MHz, 5470-5725MHz

802.11a: 17 + 10 log10 (16.36MHz) = 29.14dBm < 30dBm;

802.11n-HT20: 17 + 10 log10 (17.51MHz) = 29.43dBm < 30dBm;

802.11n-HT40: 10 + 10 log10 B > 30dBm;

Note 3: Max Conducted Output Power Limit Calculation as below:

For 5250-5350MHz, 5470-5725MHz

802.11a: 11 + 10 $\log_{10}$ (16.36MHz) = 23.14dBm < 23.98dBm;

802.11n-HT20: 11 + 10 $\log_{10}$ (17.51MHz) = 23.43dBm < 23.98dBm;

802.11n-HT40: 11 + 10 log10 B > 23.98dBm;

7.5. Power Spectral Density Measurement

7.5.1. Test Limit

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

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

For the 5.725-5.85 GHz band, the power spectral density shall not exceed 30 dBm in any 500 kHz band.

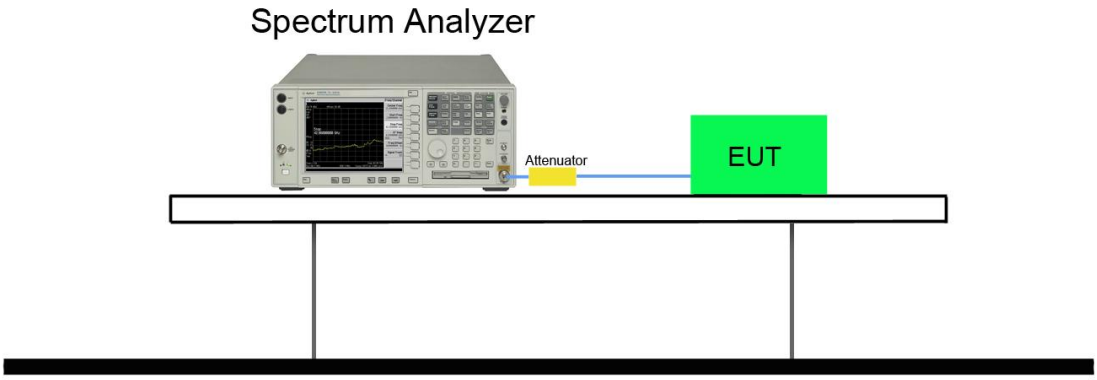
7.5.2. Test Procedure Used

KDB 789033 D02v01 - Section F

7.5.3. Test Setting

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz, if measurement bandwidth of Maximum PSD is specified in 500 kHz, RBW = 100 kHz
4. VBW = 3MHz
5. Number of sweep points ≥ 2 × (span / RBW)
6. Detector = power averaging (RMS)
7. Sweep time = auto
8. Trigger = free run
9. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
10. Add 10*log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add 10*log(1/0.25) = 6 dB if the duty cycle is 25 percent.
11. When the measurement bandwidth of Maximum PSD is specified in 500 kHz, add a constant factor 10*log(500kHz/100kHz) = 7 dB to the measured result

7.5.4. Test Setup



7.5.5. Test Result

Test Mode	N_{Tx}	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm /MHz)	Ant 1 PSD (dBm /MHz)	Duty Cycle (%)	Total PSD (dBm /MHz)	PSD Limit (dBm /MHz)	Result
11a	2	6	36	5180	-1.66	-1.00	87.3	2.28	≤ 10.5	Pass
11a	2	6	44	5220	1.88	2.21	87.3	5.65	≤ 10.5	Pass
11a	2	6	48	5240	2.04	2.37	87.3	5.81	≤ 10.5	Pass
11a	2	6	52	5260	1.82	3.61	87.3	6.41	≤ 10.5	Pass
11a	2	6	60	5300	3.81	3.86	87.3	7.44	≤ 10.5	Pass
11a	2	6	64	5320	2.54	2.82	87.3	6.28	≤ 10.5	Pass
11a	2	6	100	5500	2.78	2.11	87.3	6.06	≤ 10.5	Pass
11a	2	6	116	5580	3.17	2.65	87.3	6.52	≤ 10.5	Pass
11a	2	6	120	5600	2.74	2.92	87.3	6.43	≤ 10.5	Pass
11a	2	6	140	5700	2.42	2.35	87.3	5.99	≤ 10.5	Pass
11n-HT20	2	13	36	5180	-2.91	-1.80	76.5	1.85	≤ 10.5	Pass
11n-HT20	2	13	44	5220	-2.41	-1.61	76.5	2.18	≤ 10.5	Pass
11n-HT20	2	13	48	5240	-2.12	-1.72	76.5	2.26	≤ 10.5	Pass
11n-HT20	2	13	52	5260	1.92	1.86	76.5	6.06	≤ 10.5	Pass
11n-HT20	2	13	60	5300	2.63	2.90	76.5	6.94	≤ 10.5	Pass
11n-HT20	2	13	64	5320	1.77	1.90	76.5	6.01	≤ 10.5	Pass
11n-HT20	2	13	100	5500	2.27	1.30	76.5	5.99	≤ 10.5	Pass
11n-HT20	2	13	116	5580	2.54	1.61	76.5	6.27	≤ 10.5	Pass
11n-HT20	2	13	120	5600	2.57	1.83	76.5	6.39	≤ 10.5	pass
11n-HT20	2	13	140	5700	1.50	1.55	76.5	5.70	≤ 10.5	Pass
11n-HT40	2	27	38	5190	-4.83	-4.43	61.5	0.50	≤ 10.5	Pass
11n-HT40	2	27	46	5230	-5.02	-3.25	61.5	1.08	≤ 10.5	Pass
11n-HT40	2	27	54	5270	-1.78	-1.41	61.5	3.53	≤ 10.5	Pass
11n-HT40	2	27	62	5310	-3.73	-3.44	61.5	1.54	≤ 10.5	Pass
11n-HT40	2	27	102	5510	-5.01	-5.48	61.5	-0.12	≤ 10.5	Pass
11n-HT40	2	27	110	5550	-0.54	-0.45	61.5	4.63	≤ 10.5	Pass
11n-HT40	2	27	118	5590	-0.40	-0.83	61.5	4.51	≤ 10.5	pass
11n-HT40	2	27	134	5670	-1.68	-1.83	61.5	3.37	≤ 10.5	Pass

Note: When EUT duty cycle < 98%, the total PSD = $10*\log\{10^{(\text{Ant 0 PSD}/10)}+10^{(\text{Ant 1 PSD}/10)}\}$ + 10*log(1/duty cycle)

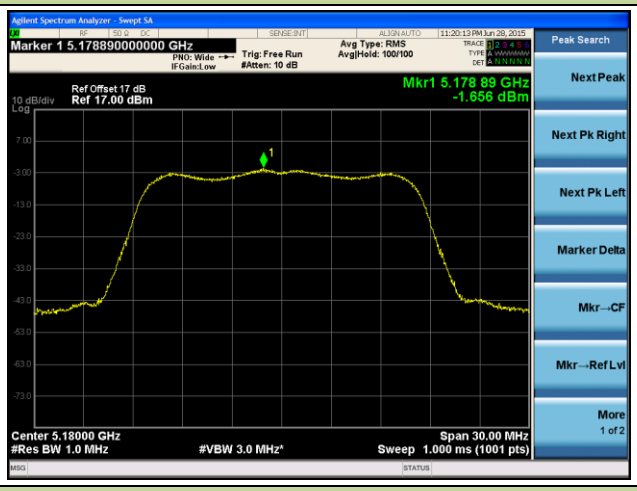
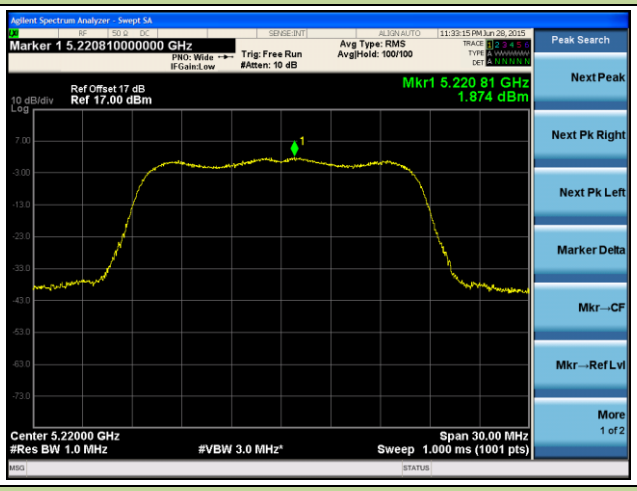
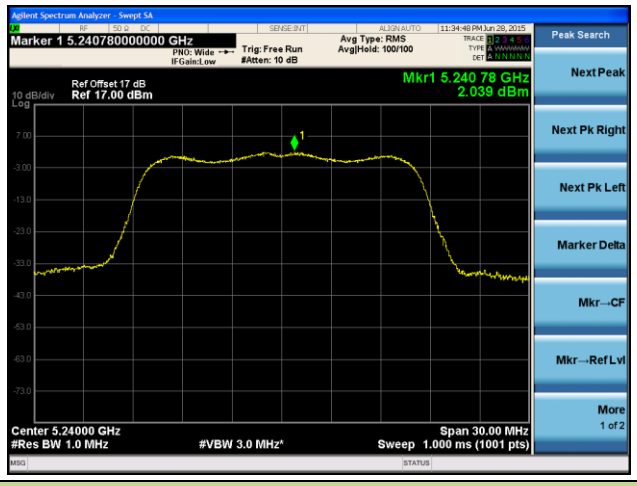
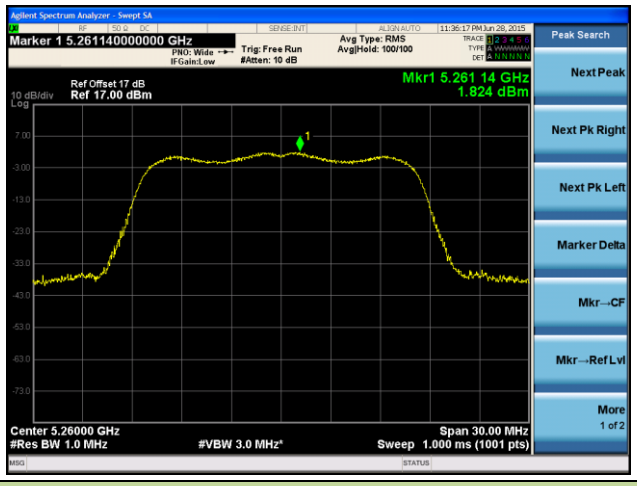
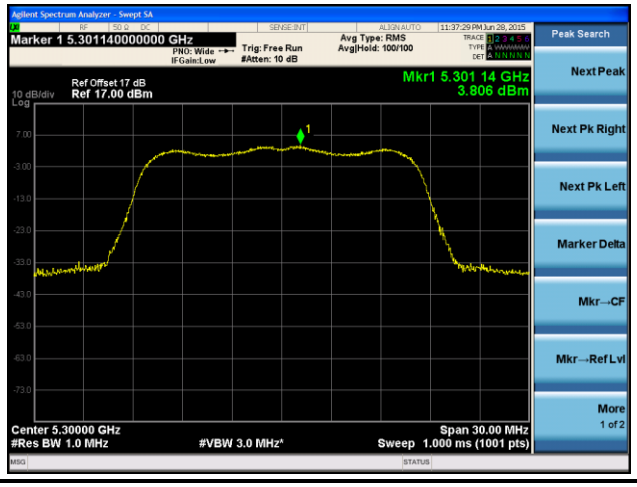
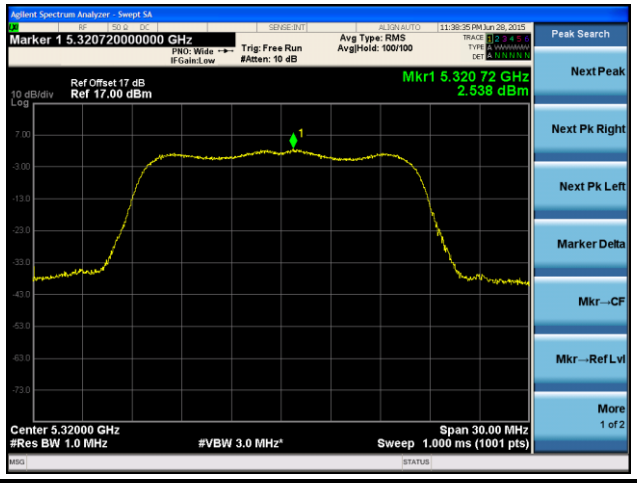
EIRP PSD Level (dBm/MHz) = Total PSD Level (dBm/MHz) + Antenna Gain.

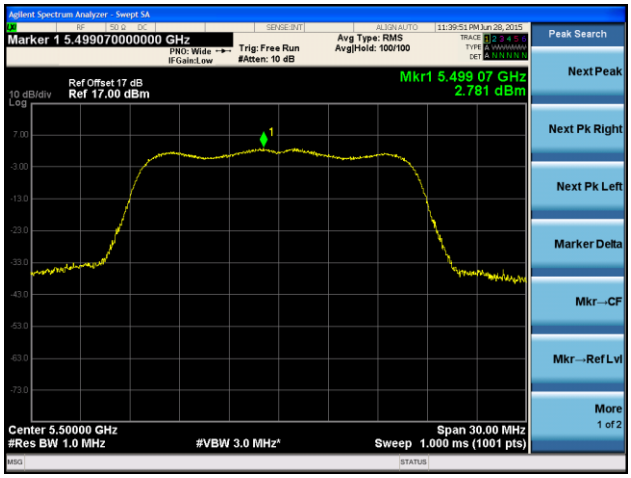
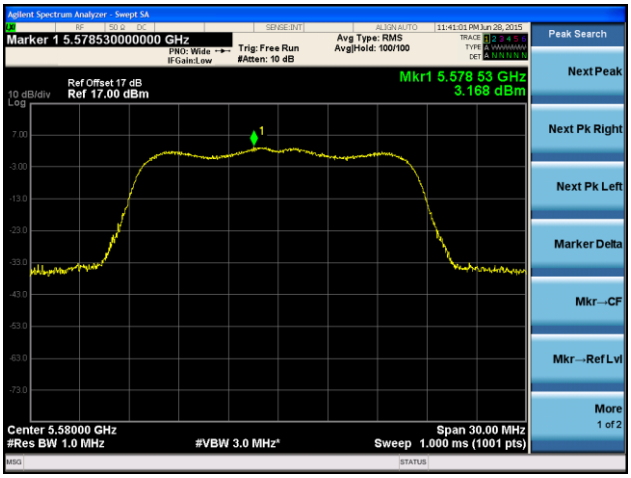
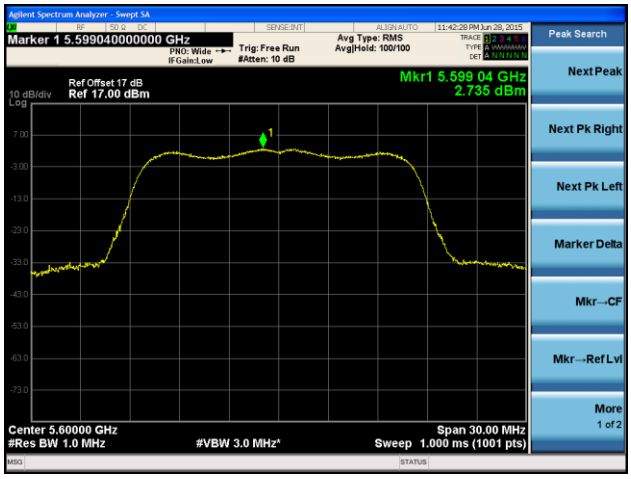
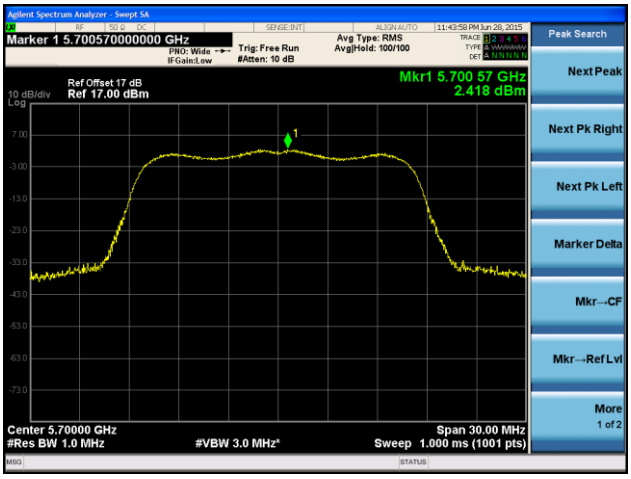
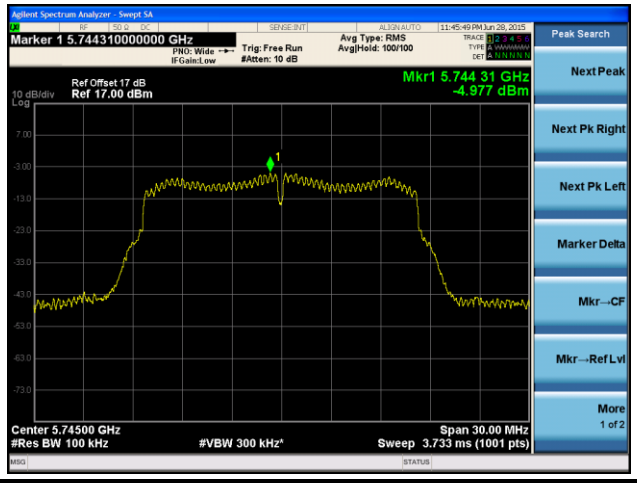
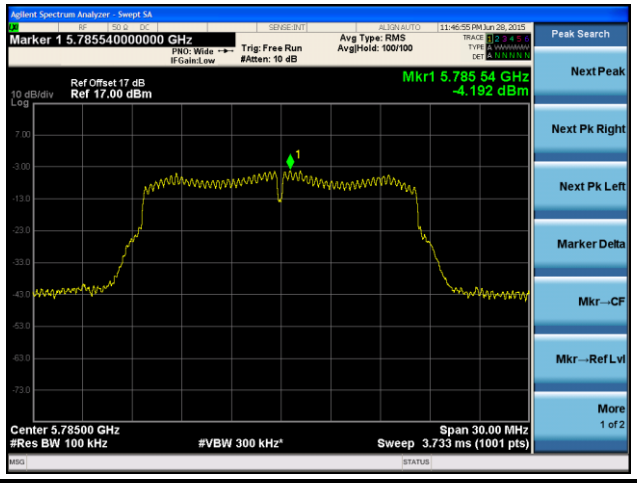
Test Mode	N_{Tx}	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ 100kHz)	Ant 1 PSD (dBm/ 100kHz)	Duty Cycle (%)	Constant Factor	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
11a	2	6	149	5745	-4.98	-5.55	87.3	7	5.34	≤ 30	Pass
11a	2	6	157	5785	-4.19	-4.58	87.3	7	6.22	≤ 30	Pass
11a	2	6	165	5825	-4.62	-6.07	87.3	7	5.32	≤ 30	Pass
11n-HT20	2	13	149	5745	-5.70	-6.79	76.5	7	4.96	≤ 30	Pass
11n-HT20	2	13	157	5785	-5.01	-5.50	76.5	7	5.93	≤ 30	Pass
11n-HT20	2	13	165	5825	-5.57	-7.11	76.5	7	4.90	≤ 30	Pass
11n-HT40	2	27	151	5755	-13.18	-13.15	61.5	7	-1.04	≤ 30	Pass
11n-HT40	2	27	159	5795	-10.48	-10.61	61.5	7	1.58	≤ 30	Pass

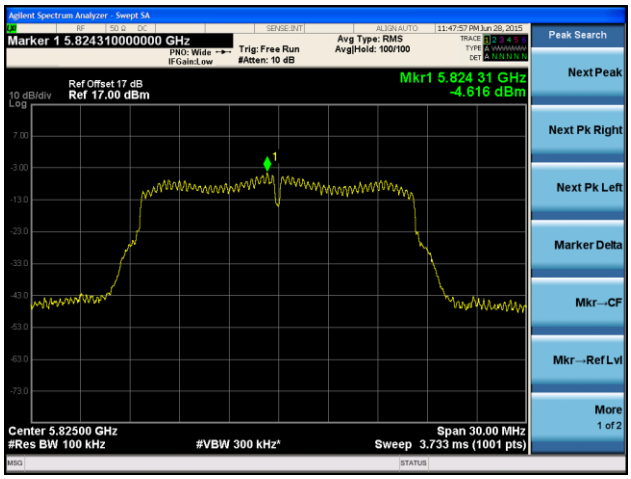
Note 1: When EUT duty cycle < 98%, the total PSD = $10*\log\{10^{(\text{Ant 0 PSD}/10)}+10^{(\text{Ant 1 PSD}/10)}\}$ + 10*log(1/duty cycle) + Constant Factor.

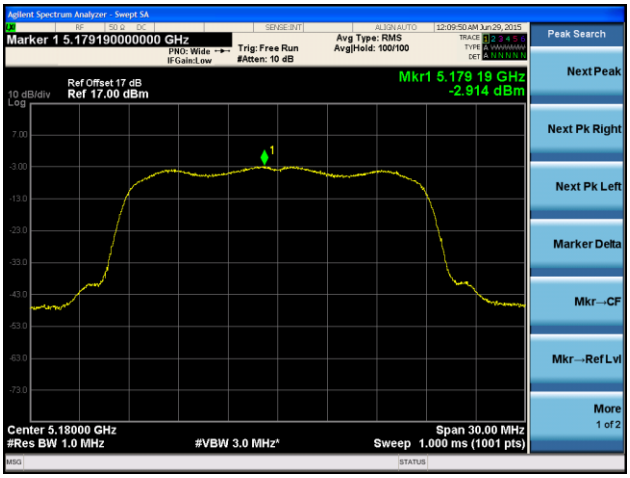
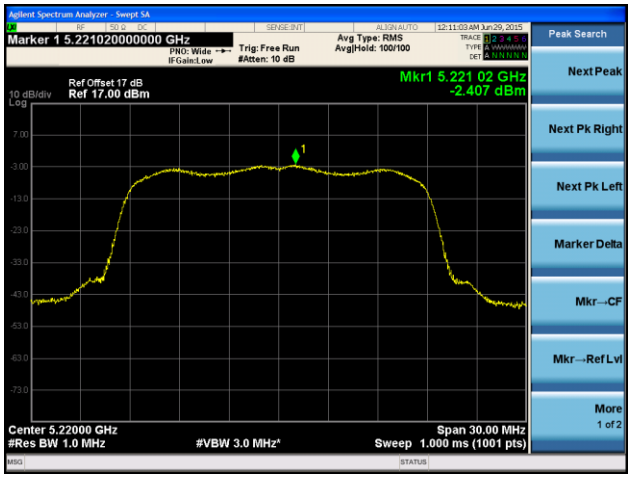
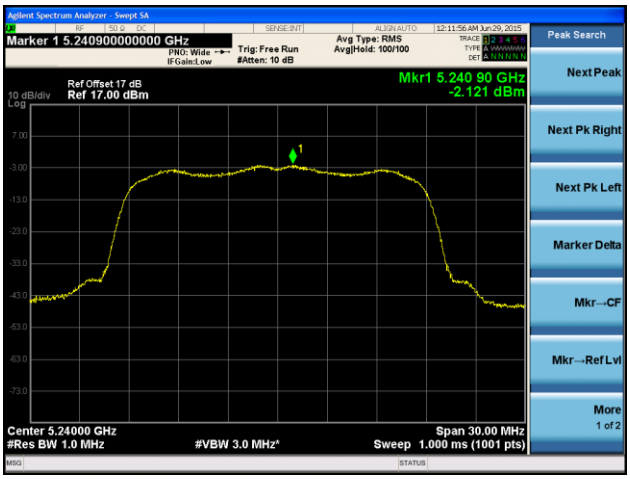
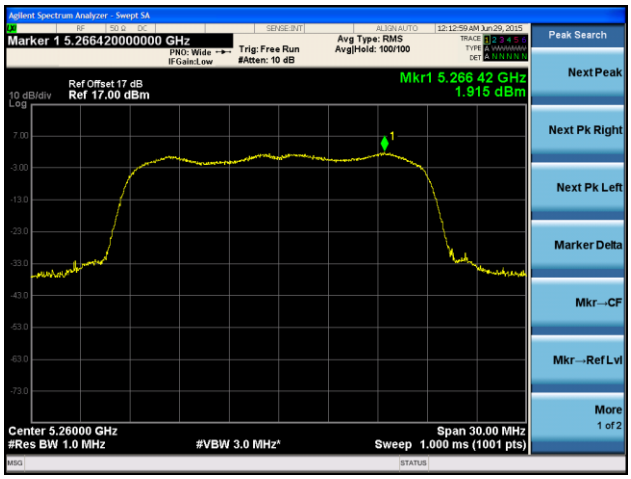
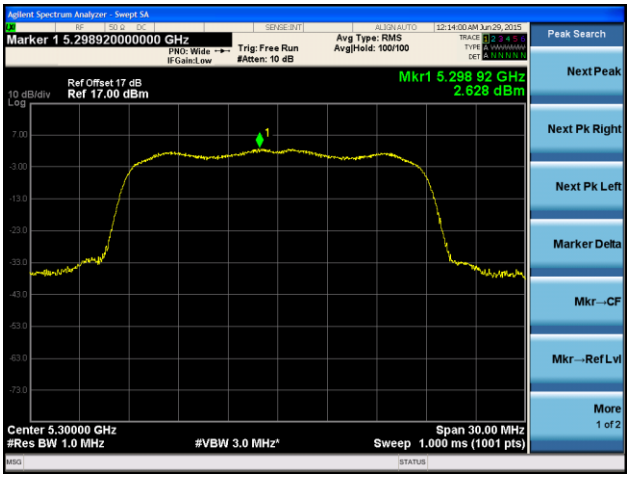
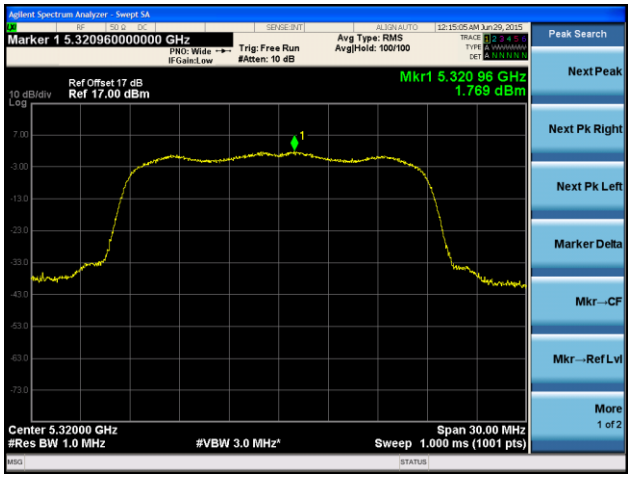
Note 2: For UNII-1 & UNII-2 bands, PSD Limit = 11dBm/MHz – (6.5dBi – 6dBi) = 10.5dBm/MHz.

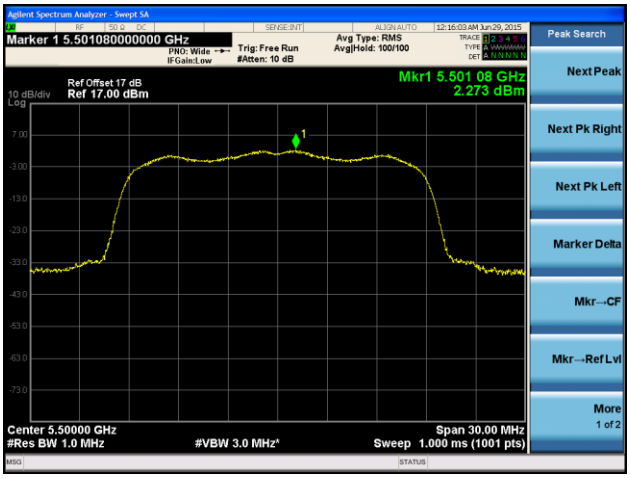
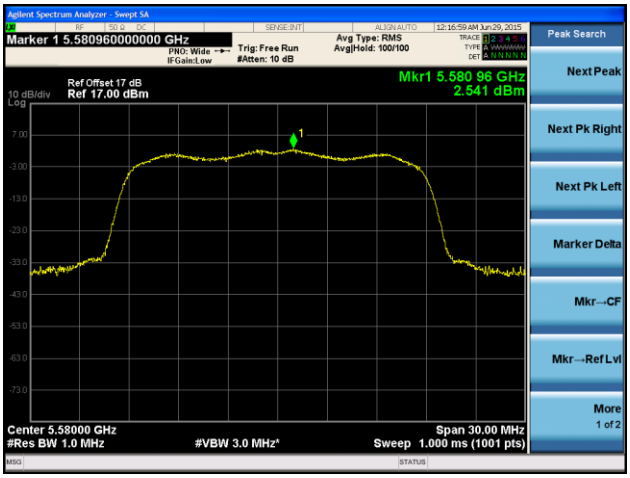
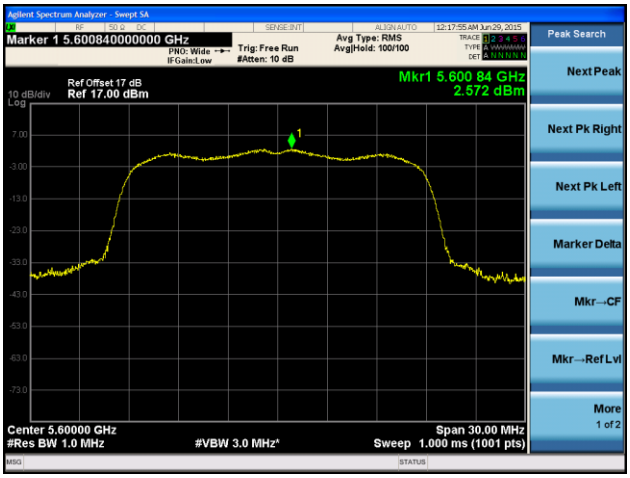
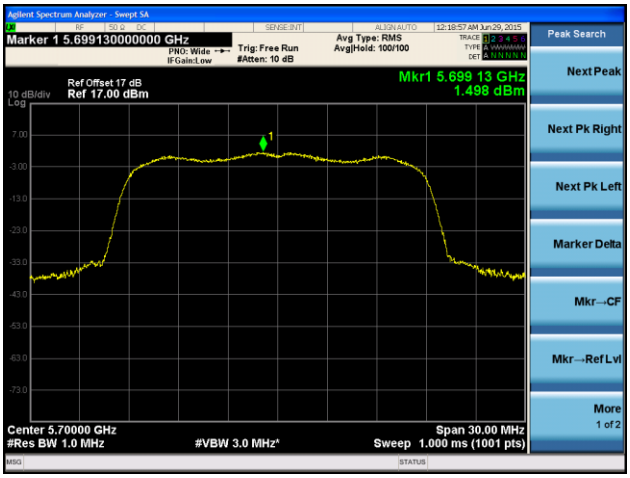
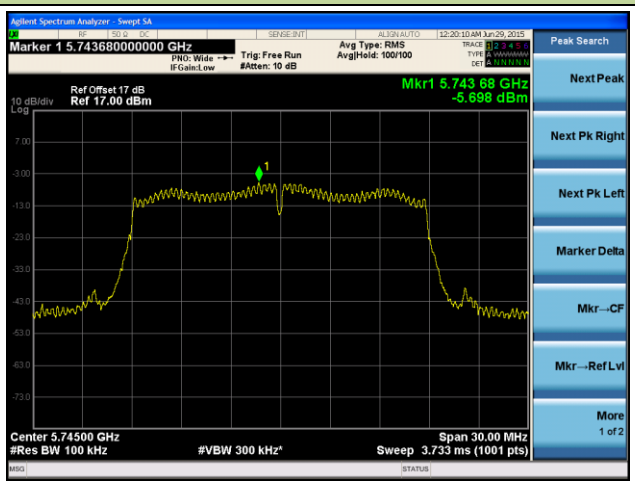
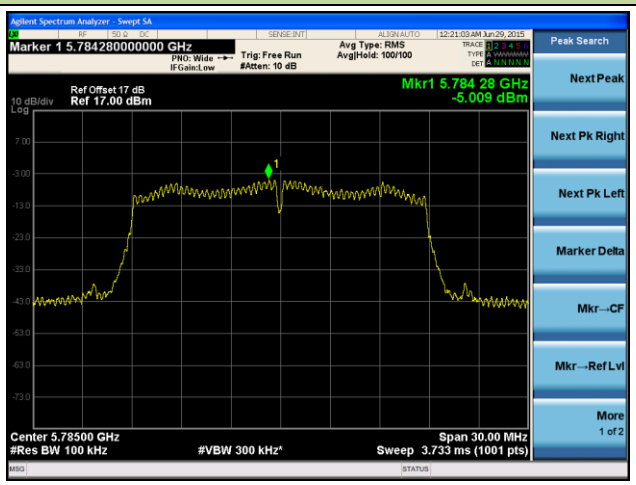
For UNII-3 band, PSD Limit = 30dBm/500kHz – (6.5dBi – 6dBi) = 29.5dBm/500kHz.

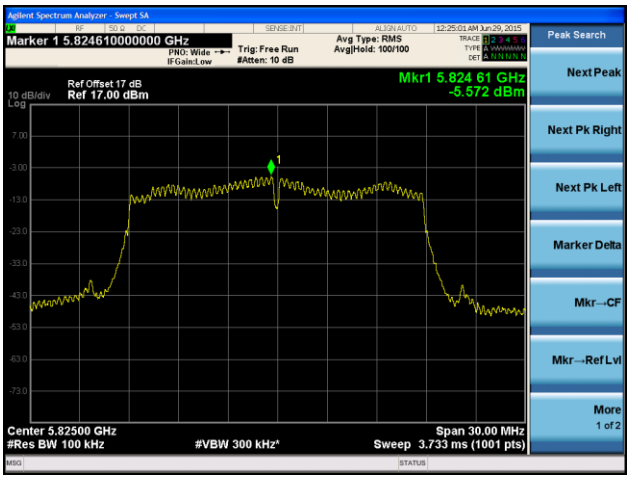
802.11a Power Spectral Density - Ant 0 / Ant 0 + 1	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	**Channel 52 (5260MHz)**
	
Channel 60 (5300MHz)	**Channel 64 (5320MHz)**
	

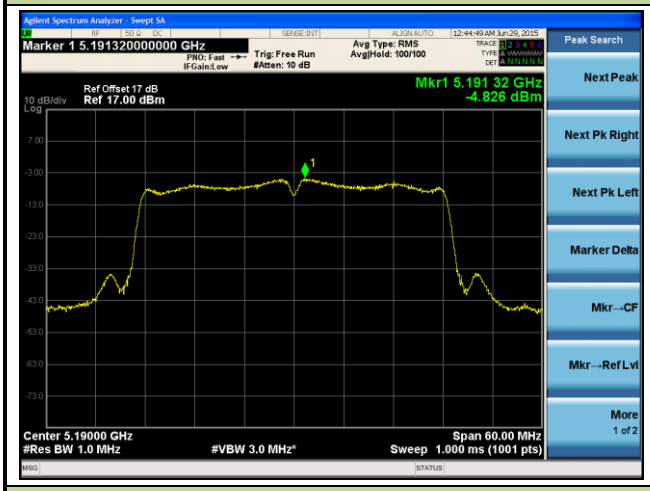
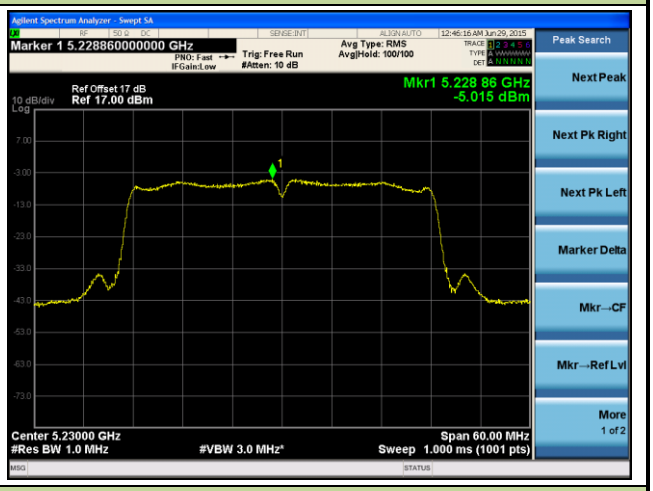
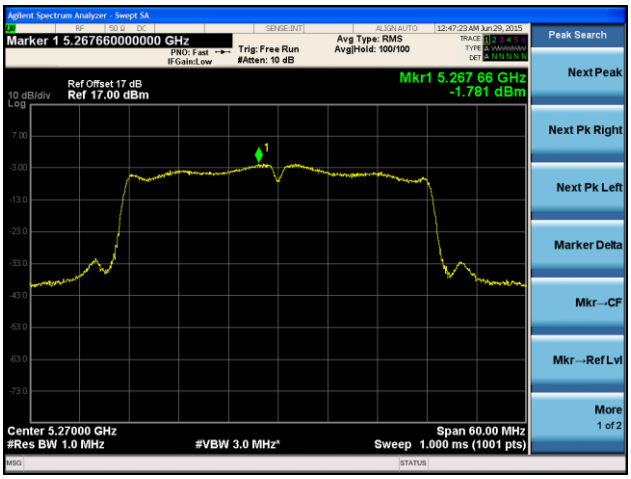
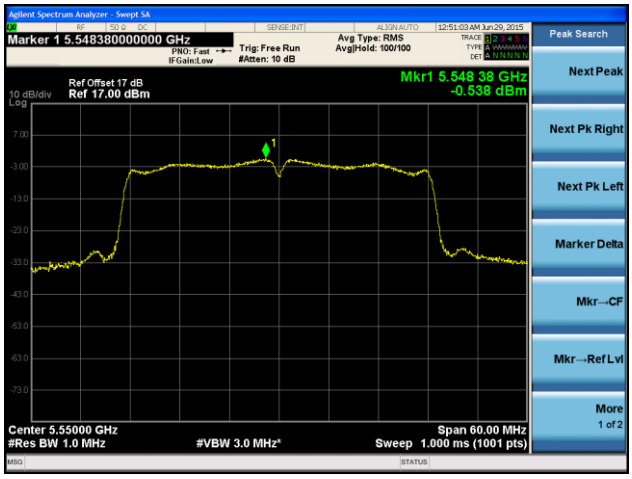
Channel 100 (5500MHz)	Channel 116 (5580MHz)
	
Channel 120 (5600MHz)	**Channel 140 (5700MHz)**
	
Channel 149 (5745MHz)	**Channel 157 (5785MHz)**
	

Channel 165 (5825MHz)	
	

802.11n-HT20 Power Spectral Density - Ant 0 / Ant 0 + 1	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	**Channel 52 (5260MHz)**
	
Channel 60 (5300MHz)	**Channel 64 (5320MHz)**
	

Channel 100 (5500MHz)	Channel 116 (5580MHz)
	
Channel 120 (5600MHz)	**Channel 140 (5700MHz)**
	
Channel 149 (5745MHz)	**Channel 157 (5785MHz)**
	

Channel 165 (5825MHz)	
	

802.11n-HT40 Power Spectral Density - Ant 0 / Ant 0 + 1	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
Channel 54 (5270MHz)	**Channel 62 (5310MHz)**
	
Channel 102 (5510MHz)	**Channel 110 (5550MHz)**