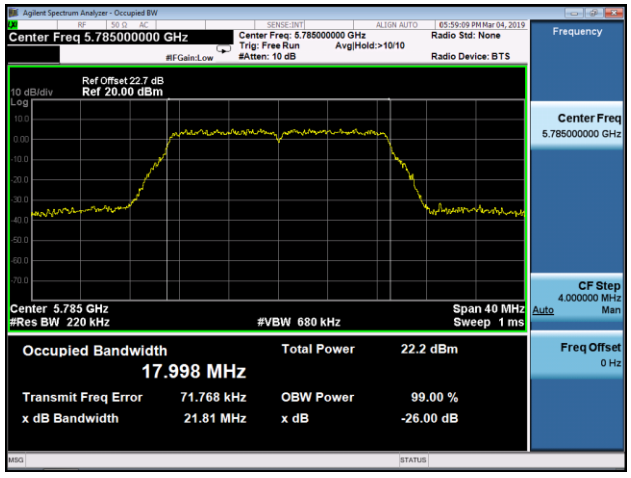
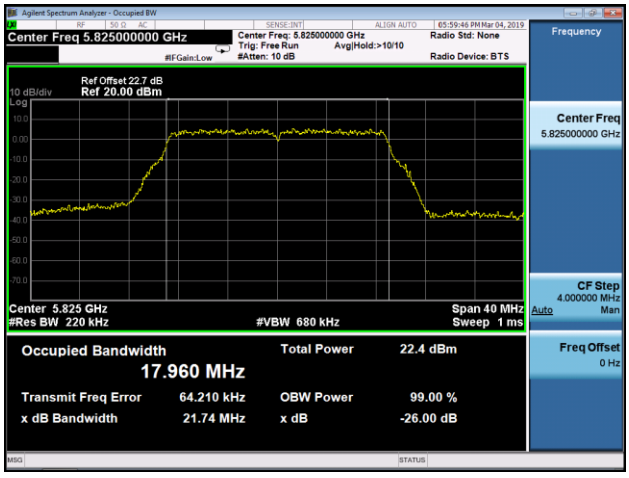
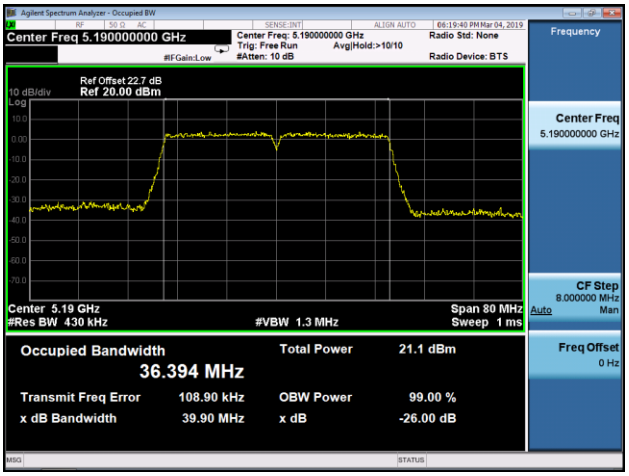
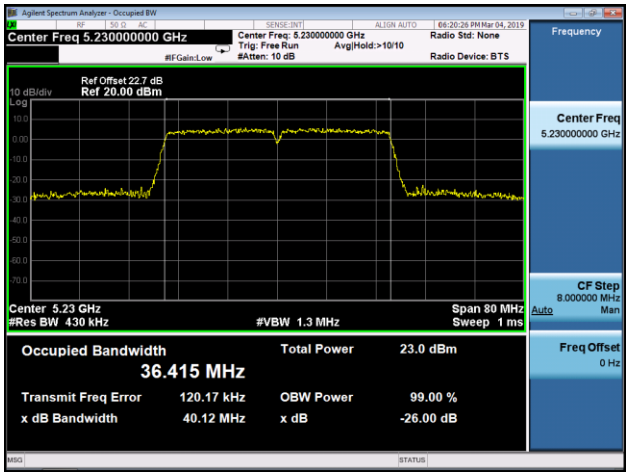
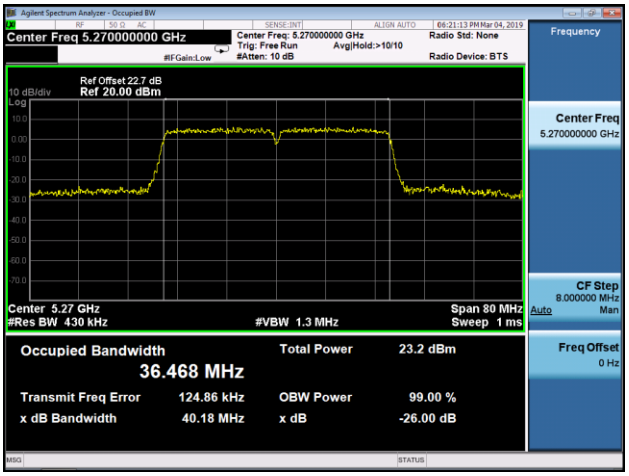
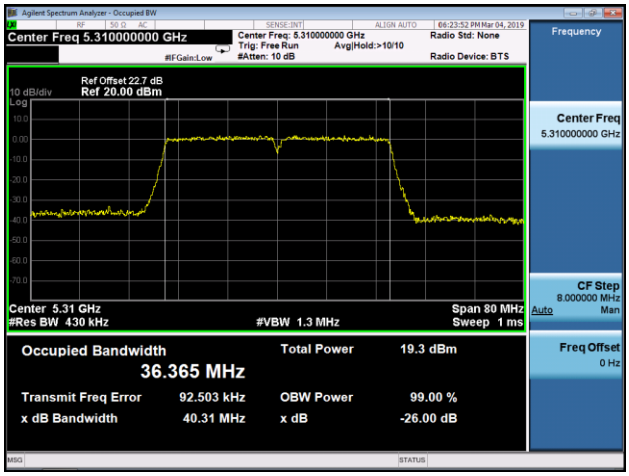
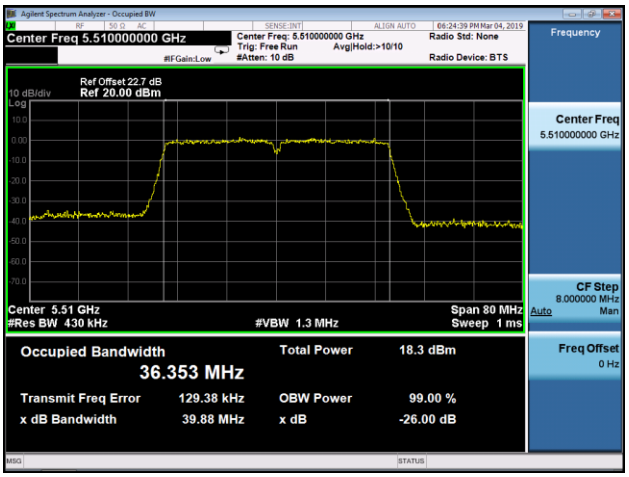
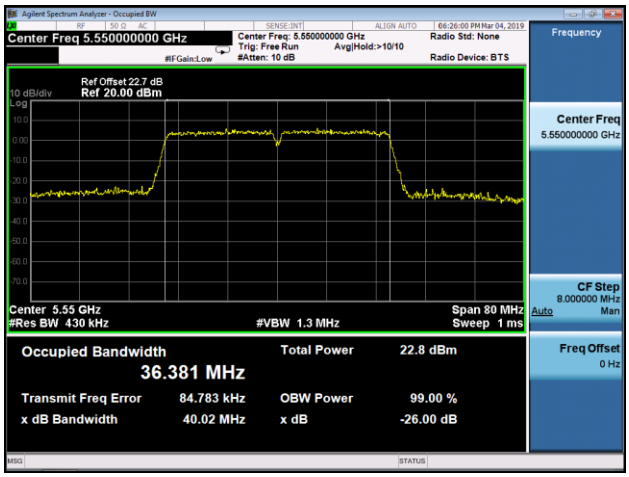
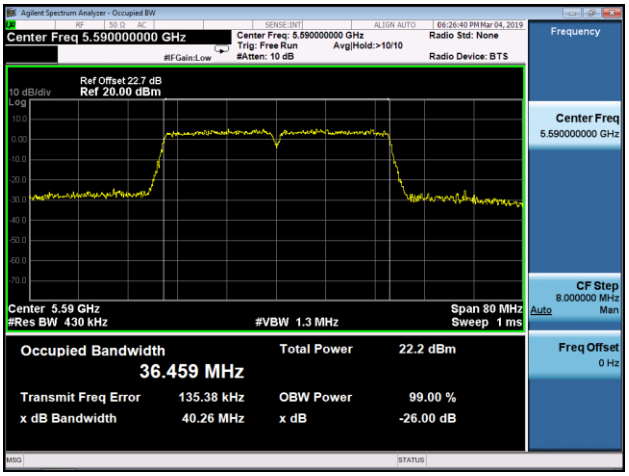
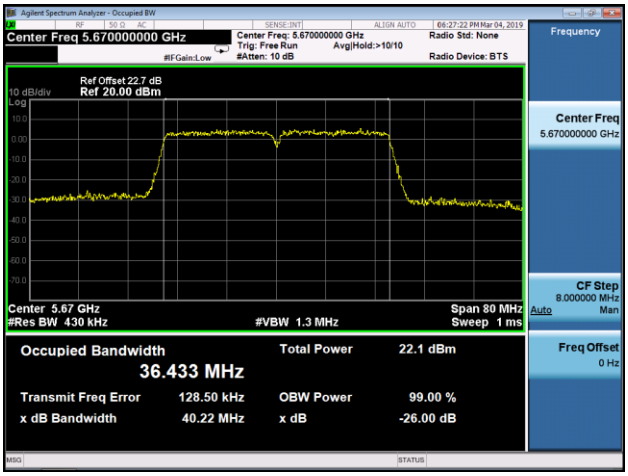
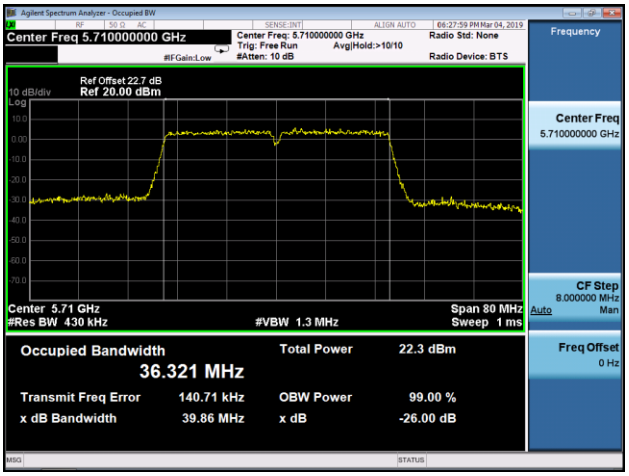
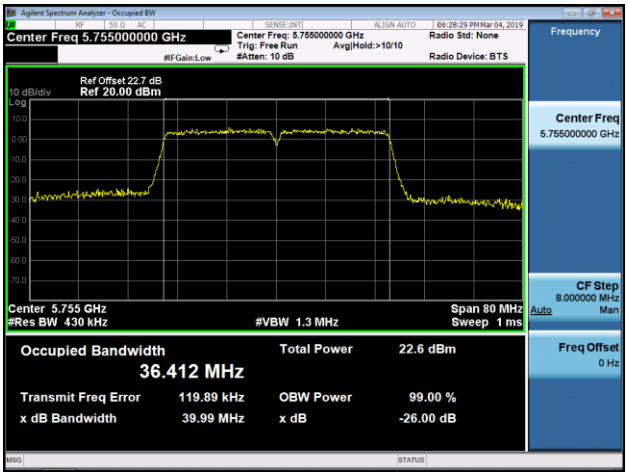
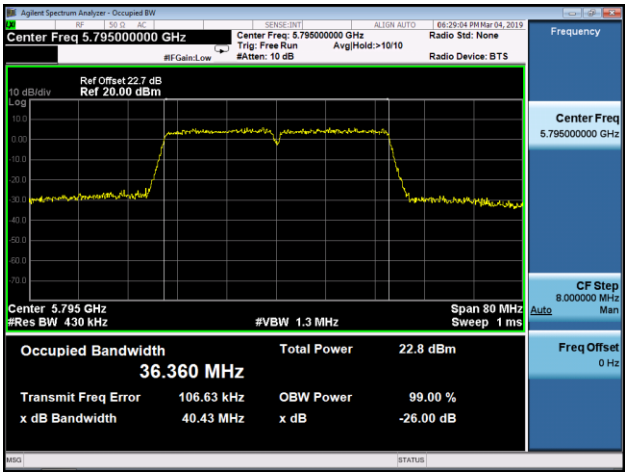
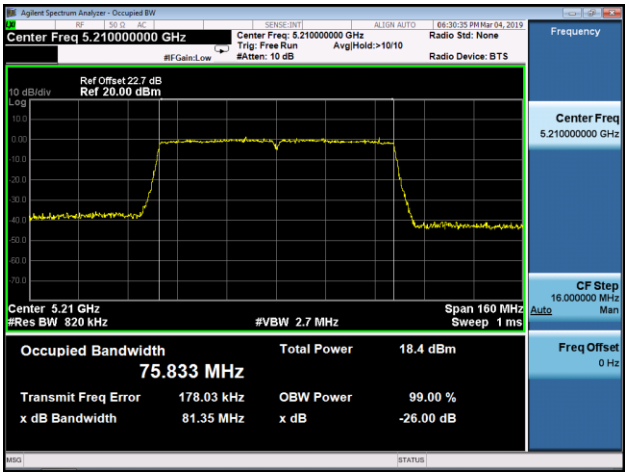
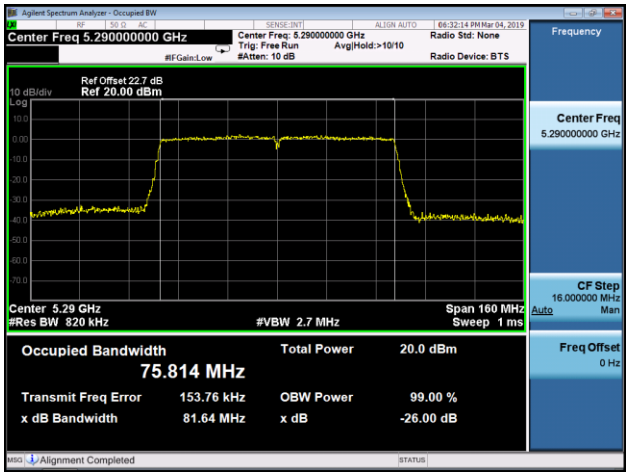
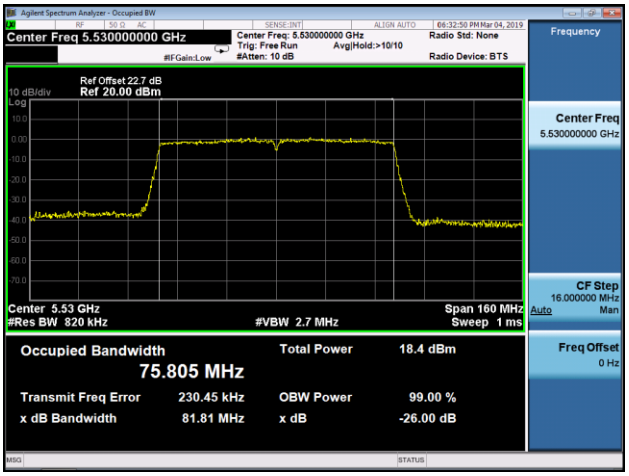
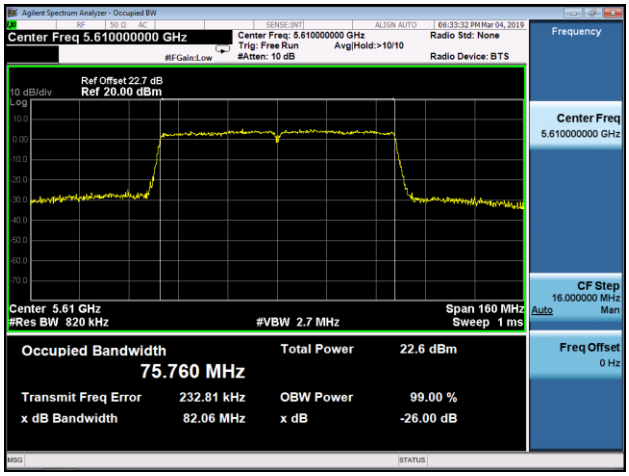
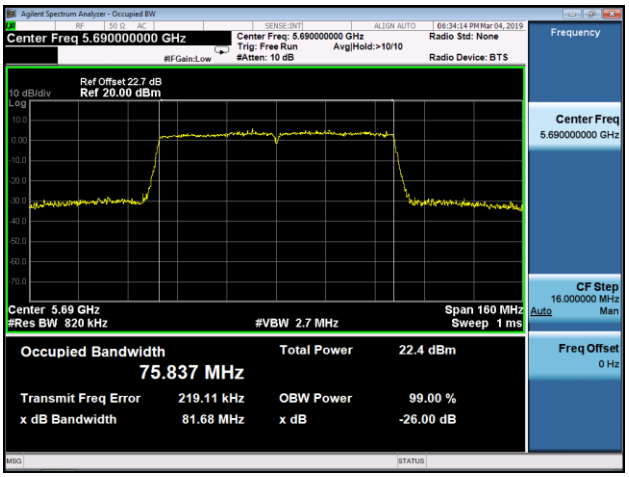
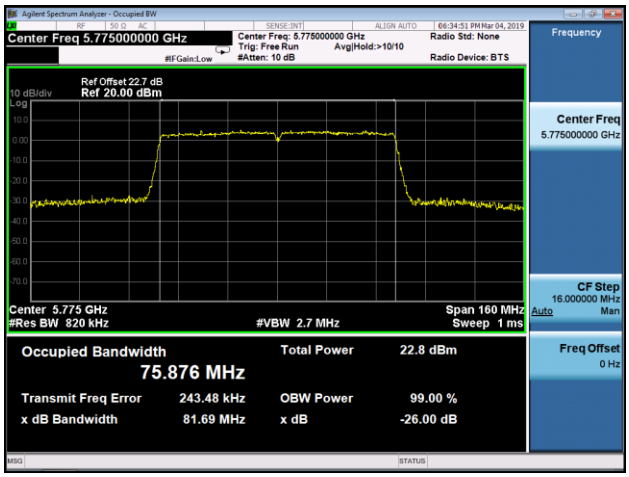
802.11 ac-VHT20 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1	
Channel 157 (5785MHz)	Channel 165 (5825MHz)
	

802.11ac-VHT40 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
	
Channel 54 (5270MHz)	Channel 62 (5310MHz)
	
Channel 102 (5510MHz)	Channel 110 (5550MHz)
	

802.11 ac-VHT40 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1	
Channel 118 (5590MHz)	Channel 134 (5670MHz)
	
Channel 142 (5710MHz)	Channel 151 (5755MHz)
	
Channel 159 (5795MHz)	
	

802.11ac-VHT80 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1	
Channel 42 (5210MHz)	Channel 58 (5290MHz)
	
Channel 106 (5530MHz)	Channel 122 (5610MHz)
	
Channel 138 (5690MHz)	Channel 155 (5775MHz)
	

7.3. 6dB Bandwidth Measurement

7.3.1.Test Limit

The minimum 6dBbandwidth shall be at least 500 kHz.

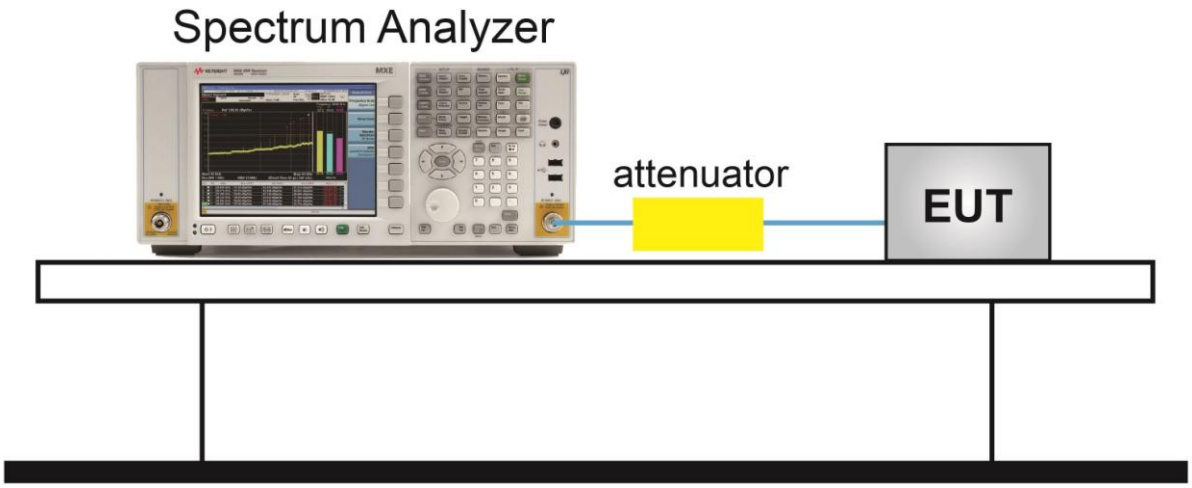
7.3.2.Test Procedure used

KDB 789033 D02v02r01 - 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.

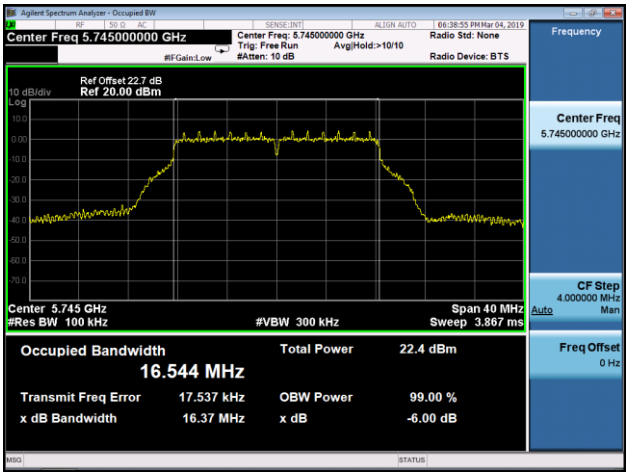
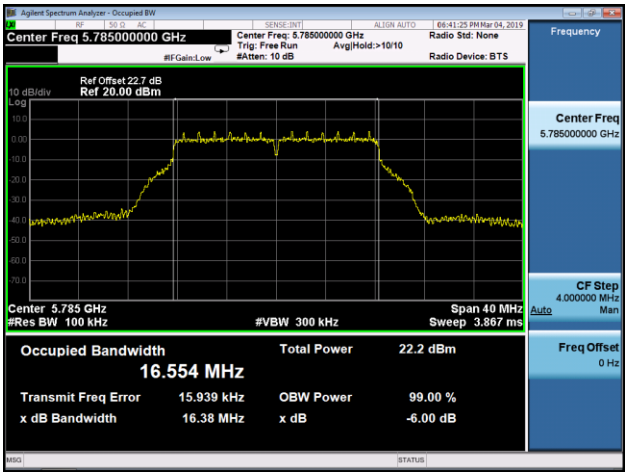
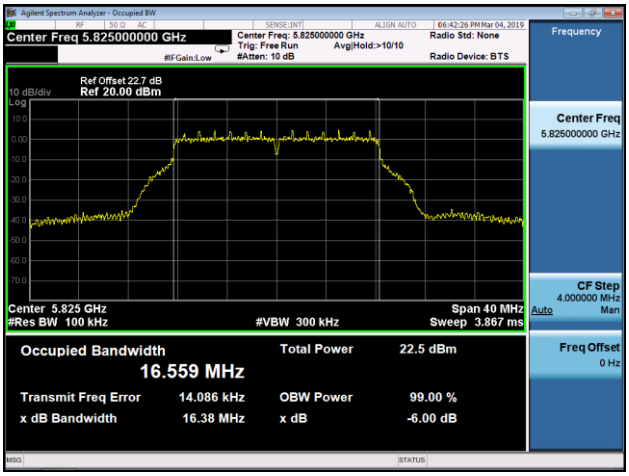
7.3.4.Test Setup

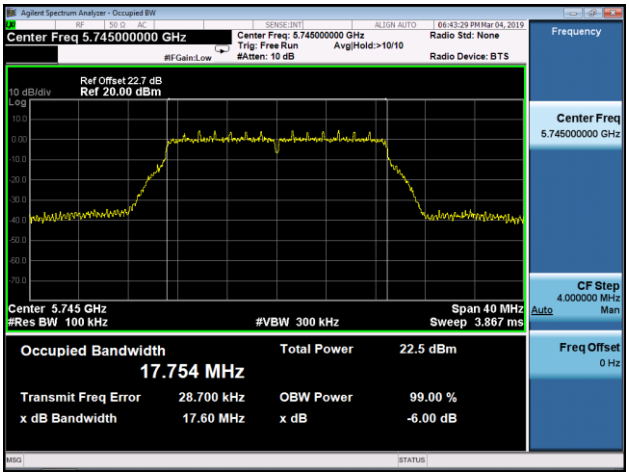
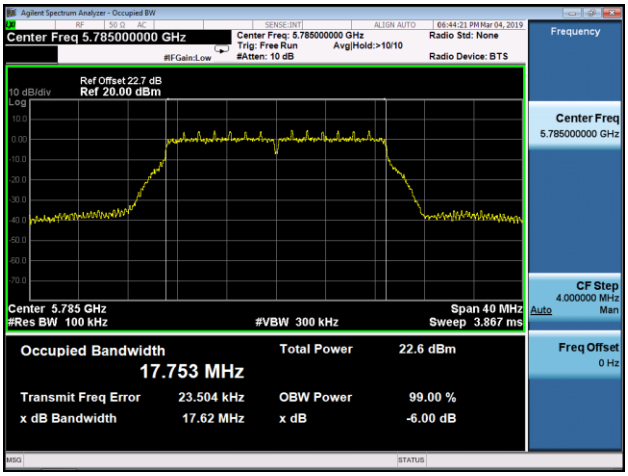
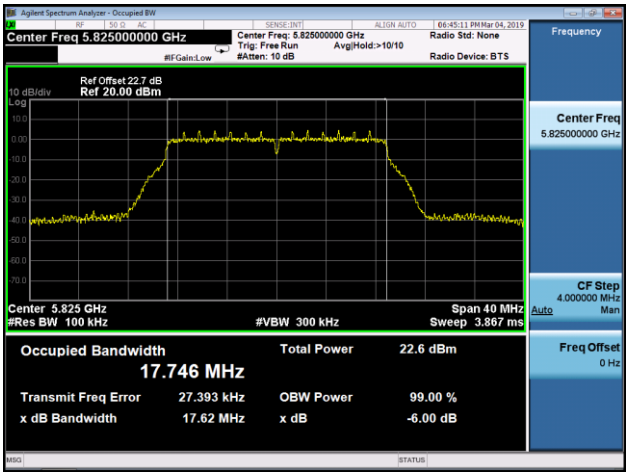


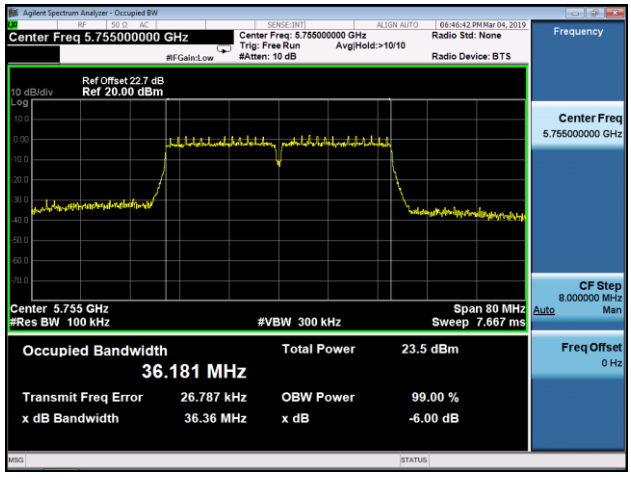
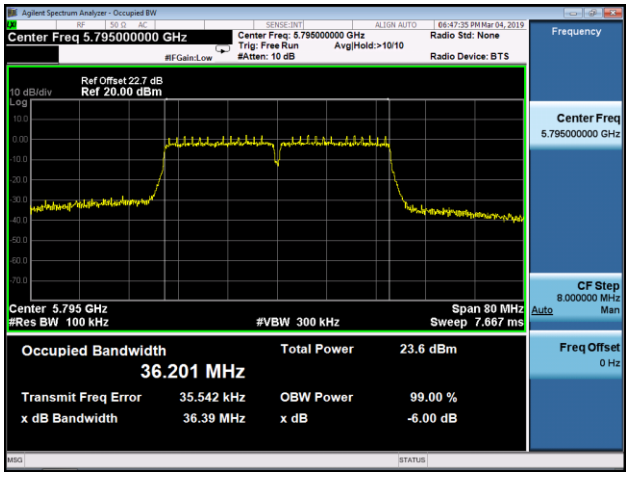
7.3.5.Test Result

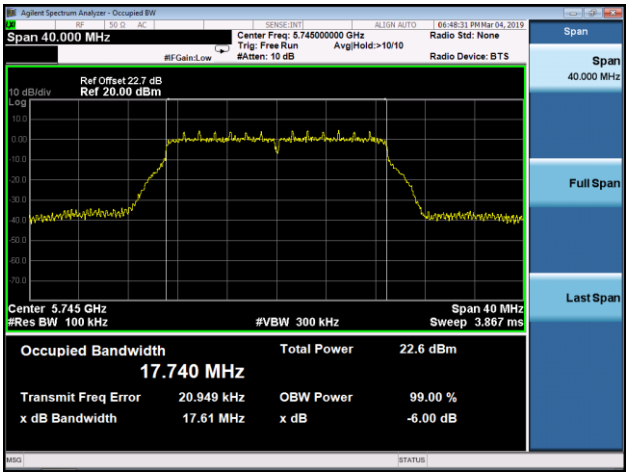
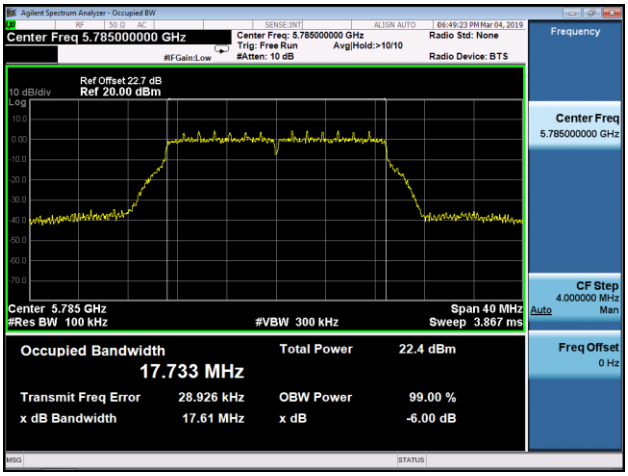
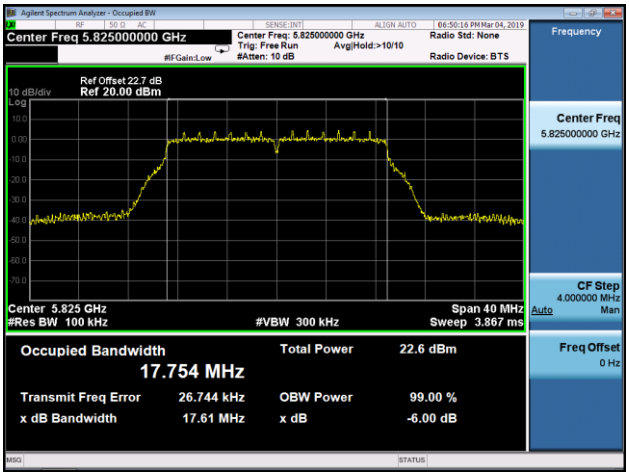
Product	WIFI+BT Combo Module	Temperature	23°C
Test Engineer	Will Yan	Relative Humidity	54%
Test Site	TR3	Test Date	2019/03/04

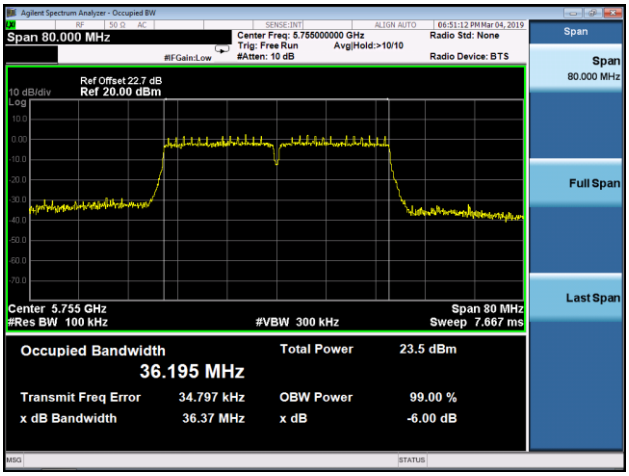
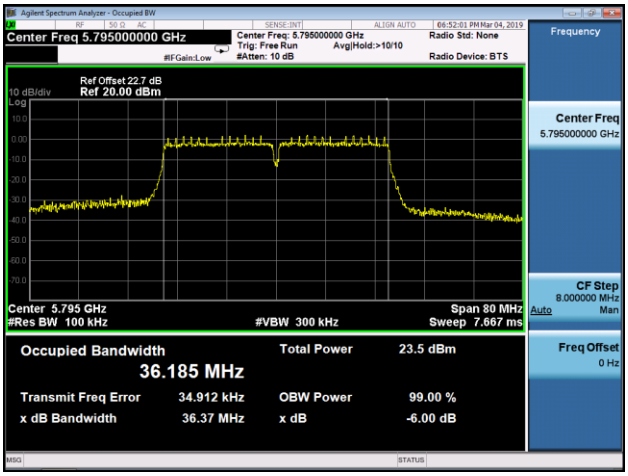
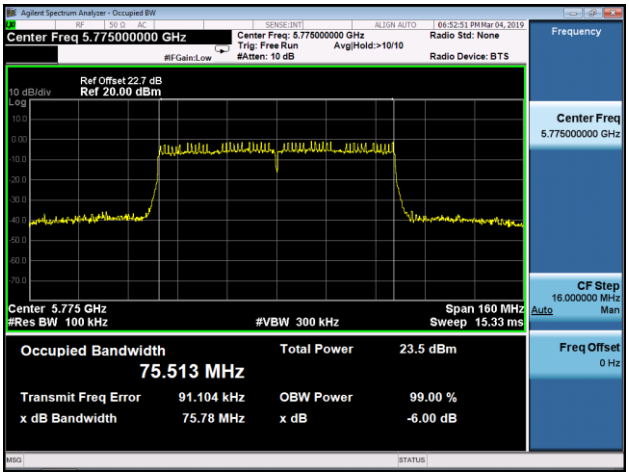
Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant 0 / Ant 0 + 1						
802.11a	6Mbps	149	5745	16.37	≥0.5	Pass
802.11a	6Mbps	157	5785	16.38	≥0.5	Pass
802.11a	6Mbps	165	5825	16.38	≥0.5	Pass
802.11n-HT20	MCS0	149	5745	17.60	≥0.5	Pass
802.11n-HT20	MCS0	157	5785	17.62	≥0.5	Pass
802.11n-HT20	MCS0	165	5825	17.62	≥0.5	Pass
802.11n-HT40	MCS0	151	5755	36.36	≥0.5	Pass
802.11n-HT40	MCS0	159	5795	36.39	≥0.5	Pass
802.11ac-VHT20	MCS0	149	5745	17.61	≥0.5	Pass
802.11ac-VHT20	MCS0	157	5785	17.61	≥0.5	Pass
802.11ac-VHT20	MCS0	165	5825	17.61	≥0.5	Pass
802.11ac-VHT40	MCS0	151	5755	36.37	≥0.5	Pass
802.11ac-VHT40	MCS0	159	5795	36.37	≥0.5	Pass
802.11ac-VHT80	MCS0	155	5775	75.78	≥0.5	Pass

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

802.11ac-VHT20 6dB Bandwidth - Ant 0 / Ant 0 + 1	
Channel 149 (5745MHz)	Channel 157 (5785MHz)
	
Channel 165 (5825MHz)	
	

802.11ac-VHT40 6dB Bandwidth - Ant 0 / Ant 0 + 1	
Channel 151 (5755MHz)	Channel 159 (5795MHz)
	
802.11ac-VHT80 6dB Bandwidth - Ant 0 / Ant 0 + 1	
Channel 155 (5775MHz)	
	

7.4. Output Power Measurement

7.4.1.Test Limit

FCC Limit

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.

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 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.

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).

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

IC Limit

For the band 5.15-5.25 GHz, the maximum e.i.r.p. shall not exceed 200 mW (23.01dBm) or 10 + 10 $\log_{10}$ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

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.

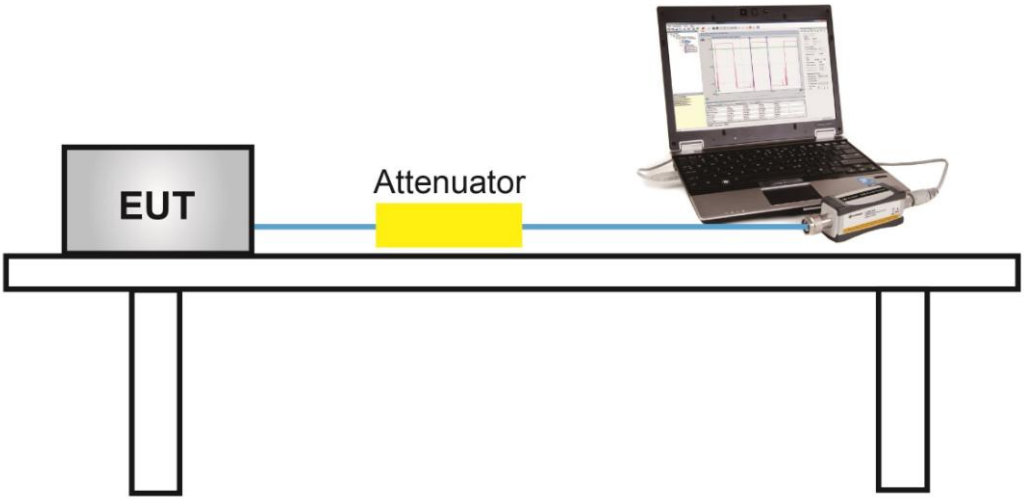
7.4.2.Test Procedure Used

KDB 789033D02v01r04- 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 table, and then choose the maximum power output (gray marker) for final test of each channel.

Output power at various data rates for Ant 0 / Ant 0 + 1 port:

Test Mode	Bandwidth	Channel	Frequency (MHz)	Data Rate/ MCS	Average Power (dBm)
802.11a	20	36	5180	6Mbps	10.80
				24Mbps	10.68
				54Mbps	10.45
802.11n	20	36	5180	MCS0	10.64
				MCS4	10.42
				MCS8	10.28
802.11n	40	38	5190	MCS0	13.90
				MCS4	13.73
				MCS9	13.59
802.11ac	20	36	5180	MCS0	10.65
				MCS4	10.40
				MCS8	10.17
802.11ac	40	38	5190	MCS0	13.75
				MCS4	13.52
				MCS9	13.39
802.11ac	80	42	5210	MCS0	8.97
				MCS4	8.73
				MCS9	8.52

Product	WIFI+BT Combo Module	Temperature	24°C
Test Engineer	Messiah Li	Relative Humidity	59%
Test Site	TR3	Test Date	2019/03/01

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power(dBm)	Average Power Limit(dBm)	Max E.I.R.P (dBm)	E.I.R.P Limit (dBm)	Result
For IC U-NII 1										
11a	6Mbps	36	5180	10.80	7.97	12.62	--	17.74	≤ 22.26	Pass
11a	6Mbps	44	5220	10.81	8.04	12.65	--	17.77	≤ 22.26	Pass
11a	6Mbps	48	5240	10.75	8.13	12.64	--	17.76	≤ 22.26	Pass
11n-HT20	MCS0	36	5180	10.64	7.61	12.39	--	17.51	≤ 22.55	Pass
11n-HT20	MCS0	44	5220	10.71	8.21	12.65	--	17.77	≤ 22.55	Pass
11n-HT20	MCS0	48	5240	10.70	8.29	12.67	--	17.79	≤ 22.55	Pass
11n-HT40	MCS0	38	5190	12.88	10.59	14.89	--	20.01	≤ 23.01	Pass
11n-HT40	MCS0	46	5230	13.82	11.10	15.68	--	20.80	≤ 23.01	Pass
11ac-VHT20	MCS0	36	5180	10.65	7.86	12.49	--	17.61	≤ 22.54	Pass
11ac-VHT20	MCS0	44	5220	10.93	8.34	12.84	--	17.96	≤ 22.54	Pass
11ac-VHT20	MCS0	48	5240	10.90	8.35	12.82	--	17.94	≤ 22.54	Pass
11ac-VHT40	MCS0	38	5190	13.71	11.00	15.57	--	20.69	≤ 23.01	Pass
11ac-VHT40	MCS0	46	5230	13.80	11.10	15.67	--	20.79	≤ 23.01	Pass
11ac-VHT80	MCS0	42	5210	8.97	6.21	10.82	--	15.94	≤ 23.01	Pass

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

Note 1: Max E.I.R.P (dBm) = Total Average Power (dBm) + Antenna Gain (dBi), Antenna Gain = 5.12dBi.

Note 2: EIRP Limit Calculation as below:

For 5150-5250MHz

802.11a: 10 + 10 log10 (16.83MHz) = 22.26dBm < 23dBm;

802.11n-HT20: 10 + 10 log10 (17.99MHz) = 22.55dBm < 23dBm;

802.11ac-VHT20: 10 + 10 log10 (17.96MHz) = 22.54dBm < 23dBm;

802.11n-HT40/ac-VHT40/ac-VHT80: 10 + 10 log10 B > 23.01dBm.

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power(dBm)	Average Power Limit(dBm)	Result
For FCC U-NII 1								
11a	6Mbps	36	5180	15.37	12.44	17.16	≤ 23.98	Pass
11a	6Mbps	44	5220	15.52	12.65	17.33	≤ 23.98	Pass
11a	6Mbps	48	5240	15.47	12.78	17.34	≤ 23.98	Pass
11n-HT20	MCS0	36	5180	14.47	12.02	16.43	≤ 23.98	Pass
11n-HT20	MCS0	44	5220	14.67	12.08	16.58	≤ 23.98	Pass
11n-HT20	MCS0	48	5240	14.86	12.49	16.85	≤ 23.98	Pass
11n-HT40	MCS0	38	5190	12.88	10.59	14.89	≤ 23.98	Pass
11n-HT40	MCS0	46	5230	15.14	13.38	17.36	≤ 23.98	Pass
11ac-VHT20	MCS0	36	5180	15.58	12.22	17.23	≤ 23.98	Pass
11ac-VHT20	MCS0	44	5220	15.55	12.68	17.36	≤ 23.98	Pass
11ac-VHT20	MCS0	48	5240	15.64	12.99	17.52	≤ 23.98	Pass
11ac-VHT40	MCS0	38	5190	13.71	11.00	15.57	≤ 23.98	Pass
11ac-VHT40	MCS0	46	5230	14.83	11.96	16.64	≤ 23.98	Pass
11ac-VHT80	MCS0	42	5210	8.97	6.21	10.82	≤ 23.98	Pass

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

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power(dBm)	Average Power Limit(dBm)	Max E.I.R.P (dBm)	E.I.R.P Limit (dBm)	Result
For FCC & IC U-NII2a & U-NII 2c & U-NII 3										
11a	6Mbps	52	5260	14.58	11.99	16.49	≤ 23.26	21.61	≤ 29.26	Pass
11a	6Mbps	60	5300	14.96	12.63	16.96	≤ 23.26	22.08	≤ 29.26	Pass
11a	6Mbps	64	5320	14.70	12.56	16.77	≤ 23.26	21.89	≤ 29.26	Pass
11a	6Mbps	100	5500	14.56	13.22	16.95	≤ 23.26	22.07	≤ 29.26	Pass
11a	6Mbps	116	5580	14.34	13.12	16.78	≤ 23.26	21.90	≤ 29.26	Pass
11a	6Mbps	120	5600	13.88	12.86	16.41	≤ 23.26	21.53	≤ 29.26	Pass
11a	6Mbps	140	5700	13.58	12.77	16.20	≤ 23.26	21.32	≤ 29.26	Pass
11a	6Mbps	144	5720	13.58	12.89	16.26	≤ 23.26	21.38	≤ 29.26	Pass
11a	6Mbps	149	5745	14.15	13.05	16.65	≤ 30.00	--	--	Pass
11a	6Mbps	157	5785	14.11	12.91	16.56	≤ 30.00	--	--	Pass
11a	6Mbps	165	5825	13.92	12.58	16.31	≤ 30.00	--	--	Pass
11n-HT20	MCS0	52	5260	15.12	12.52	17.02	≤ 23.54	22.14	≤ 29.54	Pass
11n-HT20	MCS0	60	5300	15.20	12.90	17.21	≤ 23.54	22.33	≤ 29.54	Pass
11n-HT20	MCS0	64	5320	15.13	12.74	17.11	≤ 23.54	22.23	≤ 29.54	Pass
11n-HT20	MCS0	100	5500	15.03	13.58	17.38	≤ 23.54	22.50	≤ 29.54	Pass
11n-HT20	MCS0	116	5580	14.24	13.18	16.75	≤ 23.54	21.87	≤ 29.54	Pass
11n-HT20	MCS0	120	5600	14.63	13.60	17.16	≤ 23.54	22.28	≤ 29.54	Pass
11n-HT20	MCS0	140	5700	14.28	12.86	16.64	≤ 23.54	21.76	≤ 29.54	Pass
11n-HT20	MCS0	144	5720	14.28	13.01	16.70	≤ 23.54	21.82	≤ 29.54	Pass
11n-HT20	MCS0	149	5745	14.12	13.01	16.61	≤ 30.00	--	--	Pass
11n-HT20	MCS0	157	5785	14.55	12.82	16.78	≤ 30.00	--	--	Pass
11n-HT20	MCS0	165	5825	14.21	13.10	16.70	≤ 30.00	--	--	Pass
11n-HT40	MCS0	54	5270	15.28	12.23	17.03	≤ 23.98	22.15	≤ 30.00	Pass
11n-HT40	MCS0	62	5310	15.39	12.47	17.18	≤ 23.98	22.30	≤ 30.00	Pass
11n-HT40	MCS0	102	5510	13.70	12.04	15.96	≤ 23.98	21.08	≤ 30.00	Pass
11n-HT40	MCS0	110	5550	15.09	13.29	17.29	≤ 23.98	22.41	≤ 30.00	Pass
11n-HT40	MCS0	118	5590	14.72	13.16	17.02	≤ 23.98	22.14	≤ 30.00	Pass
11n-HT40	MCS0	134	5670	14.53	12.92	16.81	≤ 23.98	21.93	≤ 30.00	Pass
11n-HT40	MCS0	142	5710	14.13	12.91	16.57	≤ 23.98	21.69	≤ 30.00	Pass
11n-HT40	MCS0	151	5755	15.03	13.43	17.31	≤ 30.00	--	--	Pass
11n-HT40	MCS0	159	5795	14.64	13.36	17.06	≤ 30.00	--	--	Pass

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power(dBm)	Average Power Limit(dBm)	Max E.I.R.P (dBm)	E.I.R.P Limit (dBm)	Result
11ac-VHT20	MCS0	52	5260	14.71	12.05	16.59	≤ 23.54	21.71	≤ 29.54	Pass
11ac-VHT20	MCS0	60	5300	14.86	12.47	16.84	≤ 23.54	21.96	≤ 29.54	Pass
11ac-VHT20	MCS0	64	5320	14.82	12.68	16.89	≤ 23.54	22.01	≤ 29.54	Pass
11ac-VHT20	MCS0	100	5500	14.78	13.02	17.00	≤ 23.54	22.12	≤ 29.54	Pass
11ac-VHT20	MCS0	116	5580	14.57	13.04	16.88	≤ 23.54	22.00	≤ 29.54	Pass
11ac-VHT20	MCS0	120	5600	14.36	12.77	16.65	≤ 23.54	21.77	≤ 29.54	Pass
11ac-VHT20	MCS0	140	5700	13.82	12.74	16.32	≤ 23.54	21.44	≤ 29.54	Pass
11ac-VHT20	MCS0	144	5720	13.81	12.82	16.35	≤ 23.54	21.47	≤ 29.54	Pass
11ac-VHT20	MCS0	149	5745	14.49	12.96	16.80	≤ 30.00	--	--	Pass
11ac-VHT20	MCS0	157	5785	14.40	12.74	16.66	≤ 30.00	--	--	Pass
11ac-VHT20	MCS0	165	5825	14.29	12.80	16.62	≤ 30.00	--	--	Pass
11ac-VHT40	MCS0	54	5270	15.22	12.59	17.11	≤ 23.98	22.23	≤ 30.00	Pass
11ac-VHT40	MCS0	62	5310	11.30	9.78	13.62	≤ 23.98	18.74	≤ 30.00	Pass
11ac-VHT40	MCS0	102	5510	10.99	9.76	13.43	≤ 23.98	18.55	≤ 30.00	Pass
11ac-VHT40	MCS0	110	5550	15.43	13.47	17.57	≤ 23.98	22.69	≤ 30.00	Pass
11ac-VHT40	MCS0	118	5590	14.85	13.41	17.20	≤ 23.98	22.32	≤ 30.00	Pass
11ac-VHT40	MCS0	134	5670	14.01	13.42	16.74	≤ 23.98	21.86	≤ 30.00	Pass
11ac-VHT40	MCS0	142	5710	13.75	13.03	16.42	≤ 23.98	21.54	≤ 30.00	Pass
11ac-VHT40	MCS0	151	5755	14.67	12.97	16.91	≤ 30.00	--	--	Pass
11ac-VHT40	MCS0	159	5795	14.47	12.84	16.74	≤ 30.00	--	--	Pass
11ac-VHT80	MCS0	58	5290	10.39	8.70	12.64	≤ 23.98	17.76	≤ 30.00	Pass
11ac-VHT80	MCS0	106	5530	9.28	8.55	11.94	≤ 23.98	17.06	≤ 30.00	Pass
11ac-VHT80	MCS0	122	5610	13.36	11.86	15.68	≤ 23.98	20.80	≤ 30.00	Pass
11ac-VHT80	MCS0	138	5690	12.98	11.75	15.42	≤ 23.98	20.54	≤ 30.00	Pass
11ac-VHT80	MCS0	155	5775	13.25	11.86	15.62	≤ 30.00	--	--	Pass

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

Note 1: Max E.I.R.P (dBm) = Total Average Power (dBm) + Antenna Gain (dBi), Antenna Gain = 5.12dBi.

Note 2: EIRP Limit Calculation as below:

For 5150-5250MHz

802.11a: 10 + 10 log10 (16.83MHz) = 22.26dBm < 23dBm;

802.11n-HT20: 10 + 10 log10 (17.99MHz) = 22.55dBm < 23dBm;

802.11ac-VHT20: 10 + 10 log10 (17.96MHz) = 22.54dBm < 23dBm;

802.11n-HT40/ac-VHT40/ac-VHT80: 10 + 10 log10 B > 23.01dBm;

For 5250-5350MHz, 5470-5725MHz

802.11a: 17 + 10 log10 (16.82MHz) = 29.26dBm < 30dBm;

802.11n-HT20: 17 + 10 log10 (17.93MHz) = 29.54dBm < 30dBm;

802.11ac-VHT20: 17 + 10 log10 (17.94MHz) = 29.54dBm < 30dBm;

802.11n-HT40/ac-VHT40/ac-VHT80: 17 + 10 log10 B > 30dBm;

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

For 5250-5350MHz, 5470-5725MHz

802.11a: 11 + 10 log10 (16.82MHz) = 23.26dBm < 30dBm;

802.11n-HT20: 11 + 10 log10 (17.93MHz) = 23.54dBm < 30dBm;

802.11ac-VHT20: 11 + 10 log10 (17.94MHz) = 23.54dBm < 30dBm;

802.11n-HT40/ac-VHT40/ac-VHT80: 11 + 10 log10 B > 23.98dBm;

7.5. Transmit Power Control

7.5.1.Test Limit

The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30dBm.

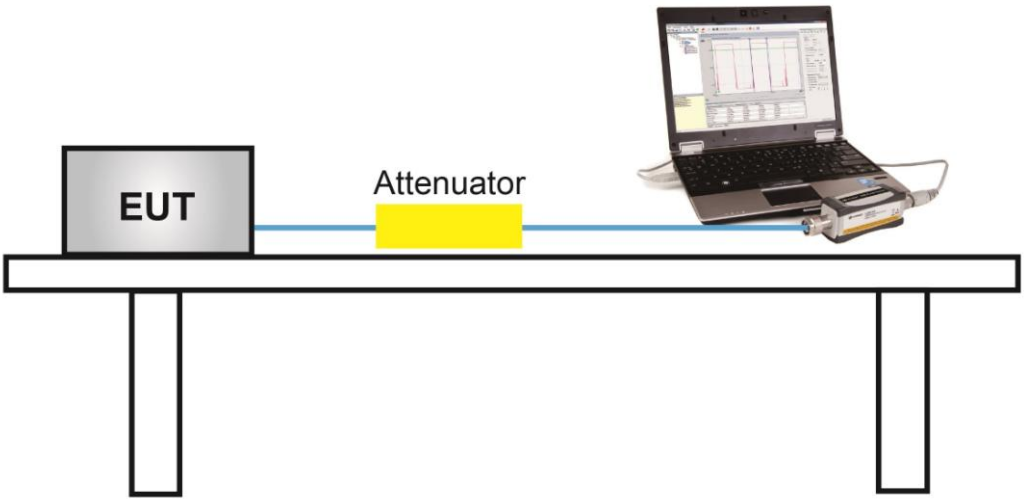
7.5.2.Test Procedure Used

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

7.5.3.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.

7.5.4.Test Setup



7.5.5.Test Result

A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

7.6. Power Spectral Density Measurement

7.6.1.Test Limit

FCC Limit

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.

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.

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

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

IC Limit

For the band 5.15-5.25 GHz, the e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

7.6.2.Test Procedure Used

KDB 789033 D02v02r01 - Section F

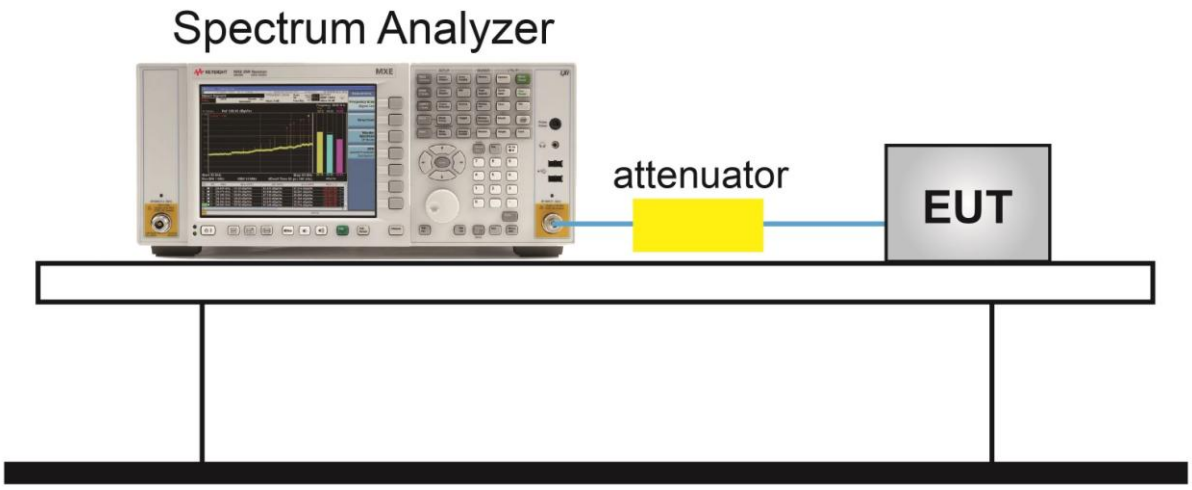
7.6.3.Test Setting

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 (Average)
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) = 6.99 dB to the measured result.

7.6.4.Test Setup



7.6.5.Test Result

Product	WIFI+BT Combo Module	Temperature	23°C
Test Engineer	Snake Ni	Relative Humidity	54%
Test Site	TR3	Test Date	2019/03/04

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ MHz)	Ant 1 PSD (dBm/ MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/ MHz)	E.I.R.P PSD (dBm /MHz)	E.I.R.P PSD Limit (dBm /MHz)	Result
For IC U-NII 1											
11a	6Mbps	36	5180	-0.49	-3.22	93.17	1.67	--	9.80	≤ 10.00	Pass
11a	6Mbps	44	5220	-0.56	-3.29	93.17	1.60	--	9.73	≤ 10.00	Pass
11a	6Mbps	48	5240	-0.56	-3.32	93.17	1.59	--	9.72	≤ 10.00	Pass
11n-HT20	MCS0	36	5180	-0.62	-3.42	92.46	1.55	--	9.68	≤ 10.00	Pass
11n-HT20	MCS0	44	5220	-0.69	-3.24	92.46	1.57	--	9.70	≤ 10.00	Pass
11n-HT20	MCS0	48	5240	-0.74	-3.21	92.46	1.55	--	9.68	≤ 10.00	Pass
11n-HT40	MCS0	38	5190	-0.9	-3.63	86.45	1.59	--	9.72	≤ 10.00	Pass
11n-HT40	MCS0	46	5230	-0.83	-3.75	86.45	1.59	--	9.72	≤ 10.00	Pass
11ac-VHT20	MCS0	36	5180	-0.62	-3.43	92.66	1.54	--	9.67	≤ 10.00	Pass
11ac-VHT20	MCS0	44	5220	-0.65	-3.25	92.66	1.58	--	9.71	≤ 10.00	Pass
11ac-VHT20	MCS0	48	5240	-0.63	-3.22	92.66	1.61	--	9.74	≤ 10.00	Pass
11ac-VHT40	MCS0	38	5190	-0.88	-3.68	86.61	1.58	--	9.71	≤ 10.00	Pass
11ac-VHT40	MCS0	46	5230	-0.92	-3.59	86.61	1.58	--	9.71	≤ 10.00	Pass
11ac-VHT80	MCS0	42	5210	-7.07	-10.02	76.23	-4.11	--	4.02	≤ 10.00	Pass

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

Note 2: When EUT duty cycle < 98%, the total PSD (dBm/MHz)= $10*\log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\}$ + 10*log(1/duty cycle)

Note 3: E.I.R.P PSD (dBm /MHz) = Total PSD (dBm/ MHz) + Antenna Gain (dBi), Antenna Gain = 8.13dBi.

Test Mode	Data Rate/ MCS	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
For FCC U-NII 1									
11a	6Mbps	36	5180	5.11	2.00	93.17	7.15	≤ 8.87	Pass
11a	6Mbps	44	5220	4.70	2.16	93.17	6.93	≤ 8.87	Pass
11a	6Mbps	48	5240	5.12	2.23	93.17	7.23	≤ 8.87	Pass
11n-HT20	MCS0	36	5180	4.79	1.50	92.46	6.80	≤ 8.87	Pass
11n-HT20	MCS0	44	5220	4.50	1.73	92.46	6.68	≤ 8.87	Pass
11n-HT20	MCS0	48	5240	4.64	1.49	92.46	6.70	≤ 8.87	Pass
11n-HT40	MCS0	38	5190	-0.9	-3.63	86.45	1.59	≤ 8.87	Pass
11n-HT40	MCS0	46	5230	1.45	-1.64	86.45	3.82	≤ 8.87	Pass
11ac-VHT20	MCS0	36	5180	4.62	1.80	92.66	6.78	≤ 8.87	Pass
11ac-VHT20	MCS0	44	5220	4.59	1.69	92.66	6.72	≤ 8.87	Pass
11ac-VHT20	MCS0	48	5240	4.74	2.02	92.66	6.93	≤ 8.87	Pass
11ac-VHT40	MCS0	38	5190	-0.88	-3.68	86.61	1.58	≤ 8.87	Pass
11ac-VHT40	MCS0	46	5230	0.99	-1.61	86.61	3.52	≤ 8.87	Pass
11ac-VHT80	MCS0	42	5210	-7.07	-10.02	76.23	-4.11	≤ 8.87	Pass

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

Note 2: When EUT duty cycle < 98%, the total PSD (dBm/MHz)= $10*\log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\}$ + 10*log(1/duty cycle)

Note 3: E.I.R.P PSD (dBm /MHz) = Total PSD (dBm/ MHz) + Antenna Gain (dBi), Antenna Gain = 8.13dBi.

Note 4: PSD Limit (dBm/MHz) = 11dBm/MHz - (8.13dBi - 6dBi) = 8.87dBm/MHz.

Test Mode	Data Rate/ MCS	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
For FCC & IC U-NII 2c & U-NII 2c									
11a	6Mbps	52	5260	4.27	1.47	93.17	6.41	≤ 8.87	Pass
11a	6Mbps	60	5300	4.22	1.79	93.17	6.49	≤ 8.87	Pass
11a	6Mbps	64	5320	4.66	1.81	93.17	6.78	≤ 8.87	Pass
11a	6Mbps	100	5500	3.99	2.30	93.17	6.54	≤ 8.87	Pass
11a	6Mbps	116	5580	3.62	2.74	93.17	6.52	≤ 8.87	Pass
11a	6Mbps	120	5600	3.76	2.67	93.17	6.57	≤ 8.87	Pass
11a	6Mbps	140	5700	3.72	2.51	93.17	6.47	≤ 8.87	Pass
11a	6Mbps	144	5720	3.80	2.04	93.17	6.33	≤ 8.87	Pass
11n-HT20	MCS0	52	5260	4.09	0.89	92.46	6.13	≤ 8.87	Pass
11n-HT20	MCS0	60	5300	4.04	1.42	92.46	6.28	≤ 8.87	Pass
11n-HT20	MCS0	64	5320	4.19	1.35	92.46	6.35	≤ 8.87	Pass
11n-HT20	MCS0	100	5500	3.44	2.13	92.46	6.18	≤ 8.87	Pass
11n-HT20	MCS0	116	5580	3.59	2.14	92.46	6.28	≤ 8.87	Pass
11n-HT20	MCS0	120	5600	3.45	2.08	92.46	6.17	≤ 8.87	Pass
11n-HT20	MCS0	140	5700	3.40	2.38	92.46	6.27	≤ 8.87	Pass
11n-HT20	MCS0	144	5720	3.39	2.46	92.46	6.30	≤ 8.87	Pass
11n-HT40	MCS0	54	5270	2.22	-1.06	86.45	4.53	≤ 8.87	Pass
11n-HT40	MCS0	62	5310	1.81	-1.05	86.45	4.25	≤ 8.87	Pass
11n-HT40	MCS0	102	5510	-0.57	-1.60	86.45	2.59	≤ 8.87	Pass
11n-HT40	MCS0	110	5550	0.93	-0.62	86.45	3.87	≤ 8.87	Pass
11n-HT40	MCS0	118	5590	0.82	-0.53	86.45	3.84	≤ 8.87	Pass
11n-HT40	MCS0	134	5670	0.59	-0.53	86.45	3.71	≤ 8.87	Pass
11n-HT40	MCS0	142	5710	0.99	-0.58	86.45	3.92	≤ 8.87	Pass
11ac-VHT20	MCS0	52	5260	3.92	0.94	92.66	6.02	≤ 8.87	Pass
11ac-VHT20	MCS0	60	5300	4.37	1.37	92.66	6.47	≤ 8.87	Pass
11ac-VHT20	MCS0	64	5320	4.44	1.43	92.66	6.53	≤ 8.87	Pass
11ac-VHT20	MCS0	100	5500	3.75	2.37	92.66	6.46	≤ 8.87	Pass
11ac-VHT20	MCS0	116	5580	3.38	2.32	92.66	6.22	≤ 8.87	Pass
11ac-VHT20	MCS0	120	5600	3.32	2.47	92.66	6.26	≤ 8.87	Pass
11ac-VHT20	MCS0	140	5700	3.06	1.94	92.66	5.88	≤ 8.87	Pass
11ac-VHT20	MCS0	144	5720	3.01	1.78	92.66	5.78	≤ 8.87	Pass

Test Mode	Data Rate/ MCS	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
For FCC & IC U-NII 2A & U-NII 2C									
11ac-VHT40	MCS0	54	5270	1.86	-1.37	86.61	4.17	≤ 8.87	Pass
11ac-VHT40	MCS0	62	5310	-2.00	-3.96	86.61	0.76	≤ 8.87	Pass
11ac-VHT40	MCS0	102	5510	-3.39	-3.97	86.61	-0.04	≤ 8.87	Pass
11ac-VHT40	MCS0	110	5550	1.13	-0.46	86.61	4.04	≤ 8.87	Pass
11ac-VHT40	MCS0	118	5590	1.00	-0.56	86.61	3.92	≤ 8.87	Pass
11ac-VHT40	MCS0	134	5670	0.81	-0.43	86.61	3.87	≤ 8.87	Pass
11ac-VHT40	MCS0	142	5710	0.54	-0.51	86.61	3.68	≤ 8.87	Pass
11ac-VHT80	MCS0	58	5290	-5.76	-7.57	76.23	-2.38	≤ 8.87	Pass
11ac-VHT80	MCS0	106	5530	-7.20	-7.78	76.23	-3.29	≤ 8.87	Pass
11ac-VHT80	MCS0	122	5610	-2.88	-4.55	76.23	0.55	≤ 8.87	Pass
11ac-VHT80	MCS0	138	5690	-2.90	-4.70	76.23	0.48	≤ 8.87	Pass

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

Note 2: When EUT duty cycle < 98%, the total PSD (dBm/MHz)= $10*\log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\}$ + 10*log(1/duty cycle)

Note 3: PSD Limit (dBm/MHz) = 11dBm/MHz - (8.13dBi - 6dBi) = 8.87dBm/MHz.

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ 100kHz)	Ant 1 PSD (dBm/ 100kHz)	Duty Cycle (%)	Constant Factor (dB)	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
For FCC & IC U-NII 3										
11a	6Mbps	149	5745	-4.81	-6.06	93.17	6.99	4.92	≤ 27.87	Pass
11a	6Mbps	157	5785	-4.53	-6.39	93.17	6.99	4.95	≤ 27.87	Pass
11a	6Mbps	165	5825	-4.54	-6.71	93.17	6.99	4.82	≤ 27.87	Pass
11n-HT20	MCS0	149	5745	-5.11	-6.73	92.46	6.99	4.50	≤ 27.87	Pass
11n-HT20	MCS0	157	5785	-4.79	-6.71	92.46	6.99	4.70	≤ 27.87	Pass
11n-HT20	MCS0	165	5825	-4.72	-6.48	92.46	6.99	4.83	≤ 27.87	Pass
11n-HT40	MCS0	151	5755	-7.60	-8.70	86.45	6.99	2.52	≤ 27.87	Pass
11n-HT40	MCS0	159	5795	-7.48	-9.25	86.45	6.99	2.36	≤ 27.87	Pass
11ac-VHT20	MCS0	149	5745	-4.74	-6.59	92.66	6.99	4.76	≤ 27.87	Pass
11ac-VHT20	MCS0	157	5785	-5.30	-6.95	92.66	6.99	4.28	≤ 27.87	Pass
11ac-VHT20	MCS0	165	5825	-4.75	-6.91	92.66	6.99	4.63	≤ 27.87	Pass
11ac-VHT40	MCS0	151	5755	-7.18	-8.94	86.61	6.99	2.65	≤ 27.87	Pass
11ac-VHT40	MCS0	159	5795	-7.81	-8.16	86.61	6.99	2.64	≤ 27.87	Pass
11ac-VHT80	MCS0	155	5775	-11.02	-12.51	76.23	6.99	-0.52	≤ 27.87	Pass

Note 1: When EUT duty cycle ≥ 98%, Final PSD (dBm/ 500kHz) = PSD (dBm/ 100kHz) + Constant Factor (dB).

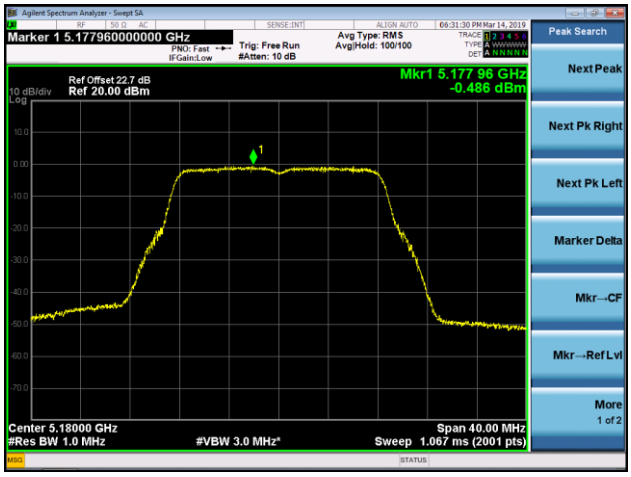
Note 2: When EUT duty cycle < 98%, Final PSD (dBm/ 500kHz) = PSD (dBm/ 100kHz) + Constant Factor (dB) + 10*log (1/Duty Cycle).

Note 3: PSD Limit (dBm/MHz) = 30dBm/MHz - (8.13dBi - 6dBi) = 27.87dBm/MHz.

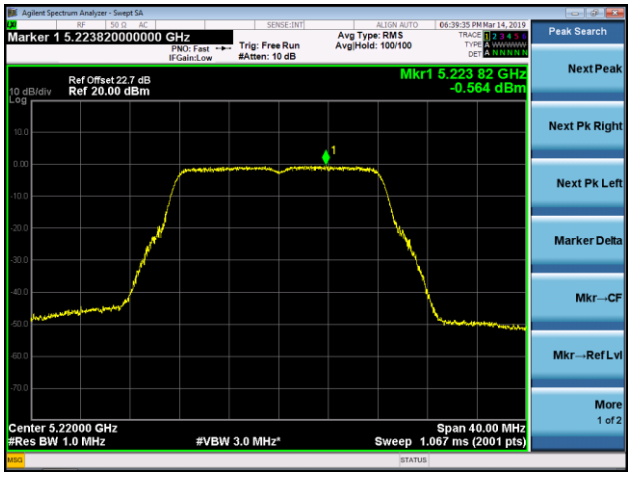
Product	WIFI+BT Combo Module	Temperature	23°C
Test Engineer	Snake Ni	Relative Humidity	54%
Test Site	TR3	Test Date	2019/03/04
Note	For IC U-NII 1		

802.11a Power Spectral Density - Ant 0 / Ant 0 + 1

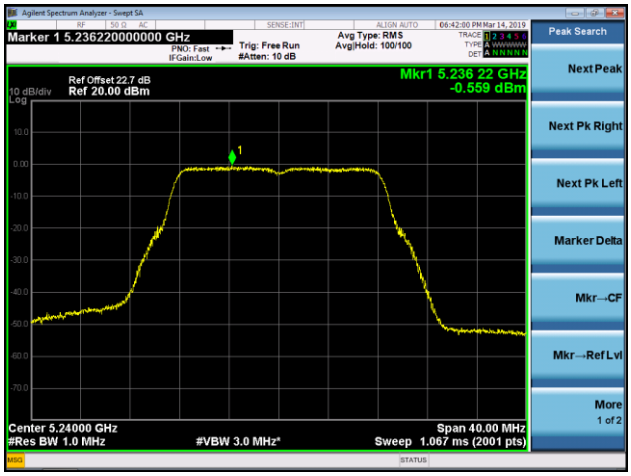
Channel 36 (5180MHz)

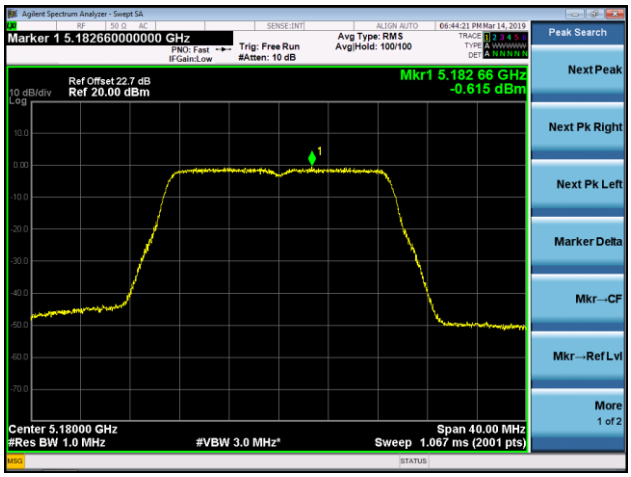
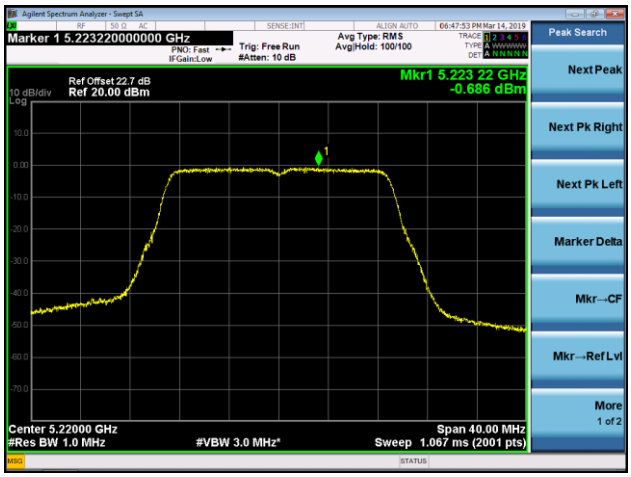


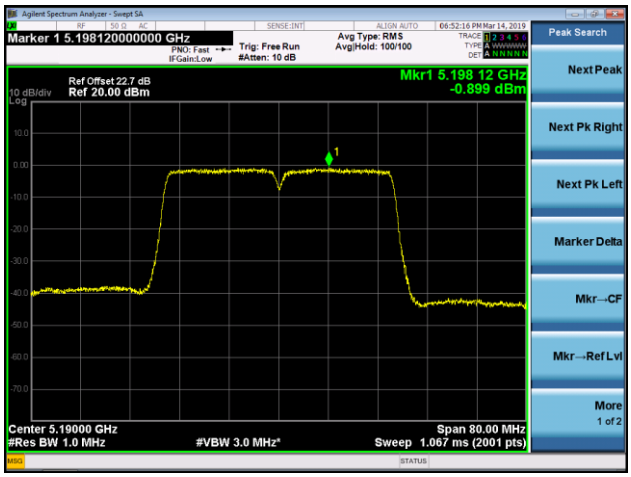
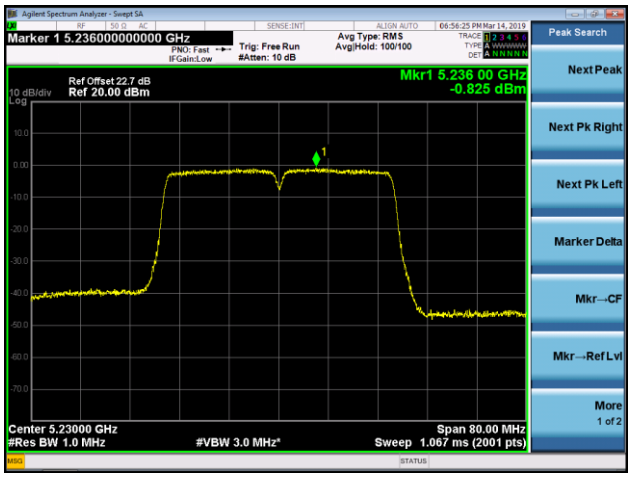
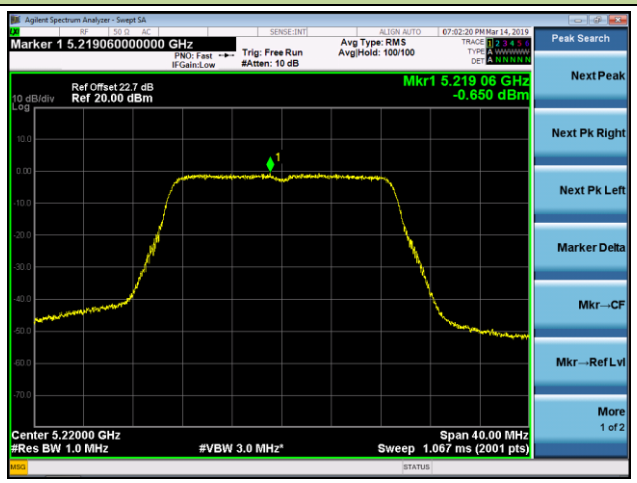
Channel 44 (5220MHz)

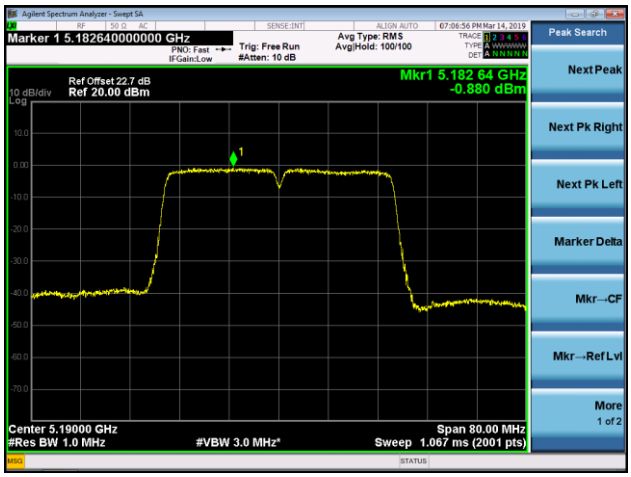
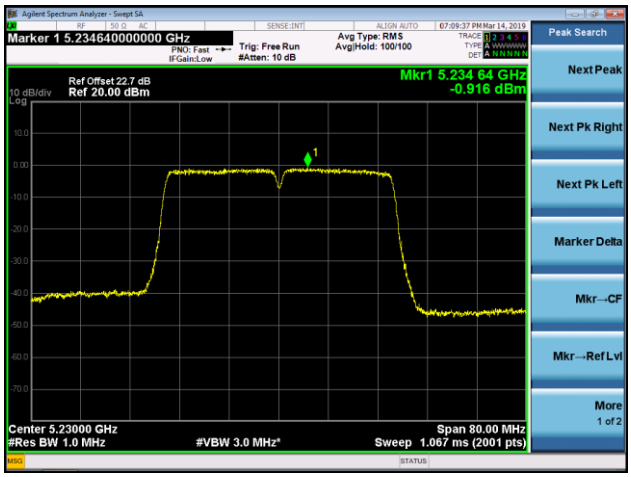
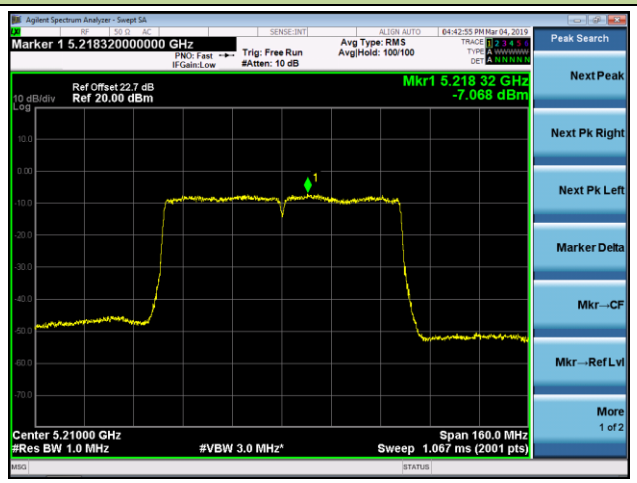


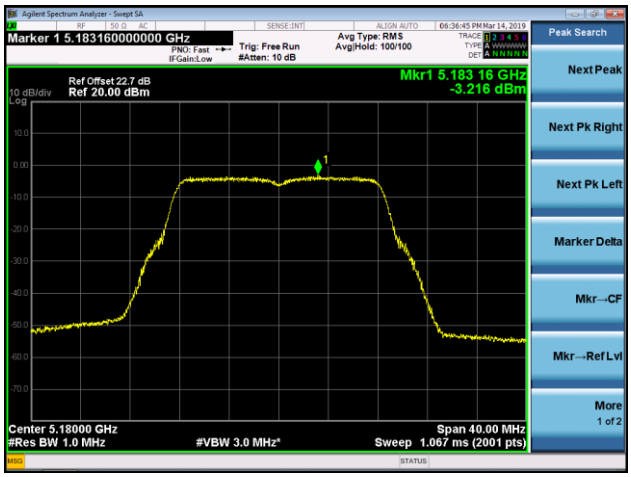
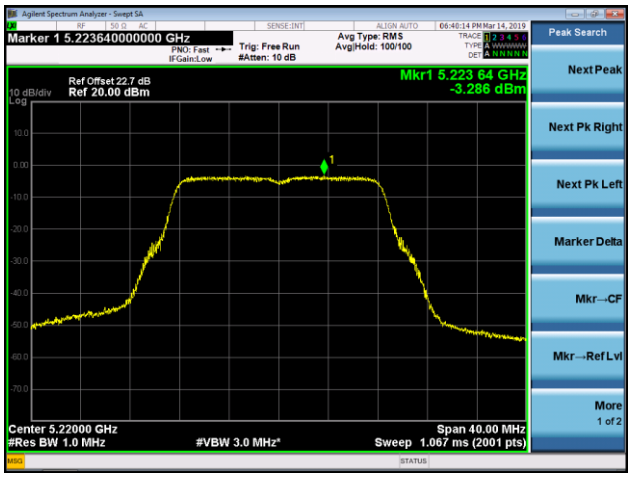
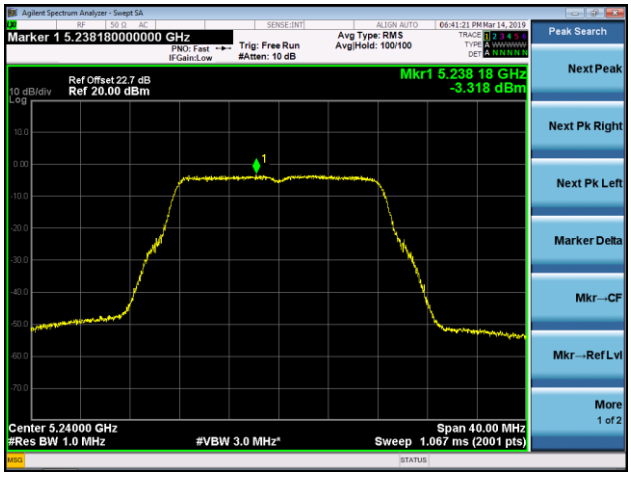
Channel 48 (5240MHz)

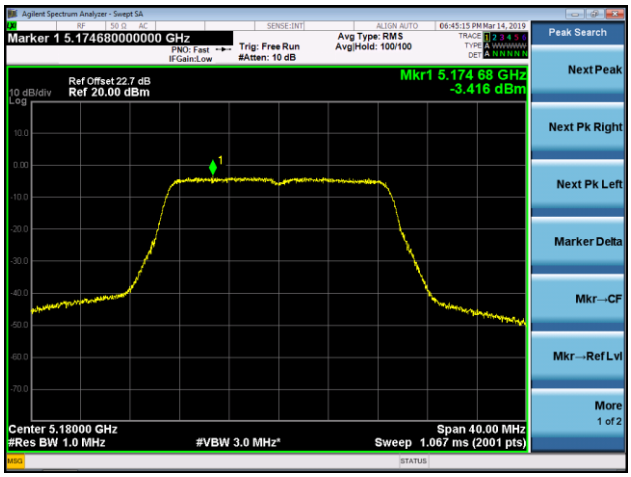
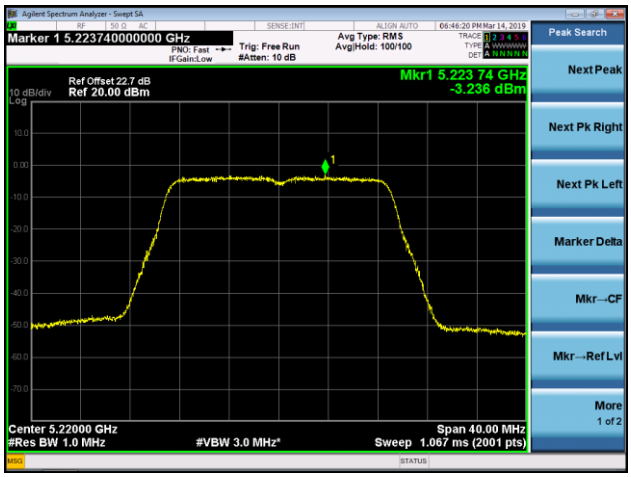
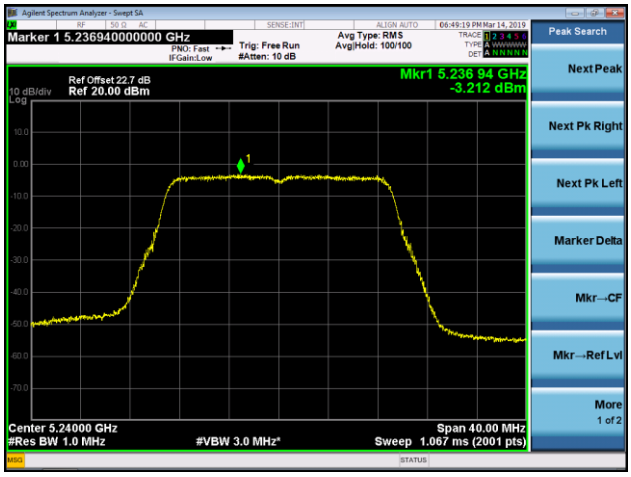


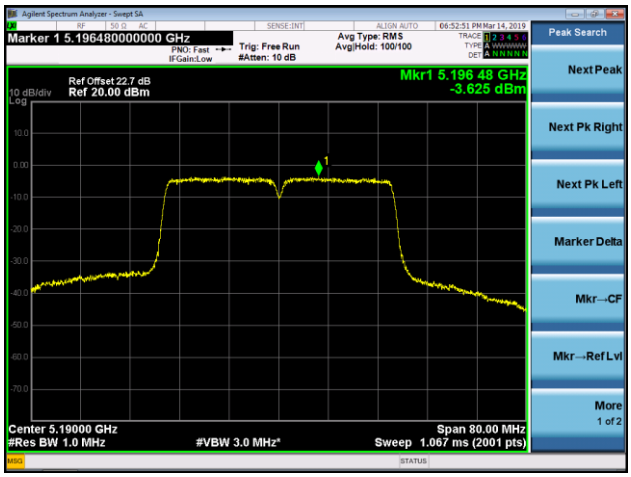
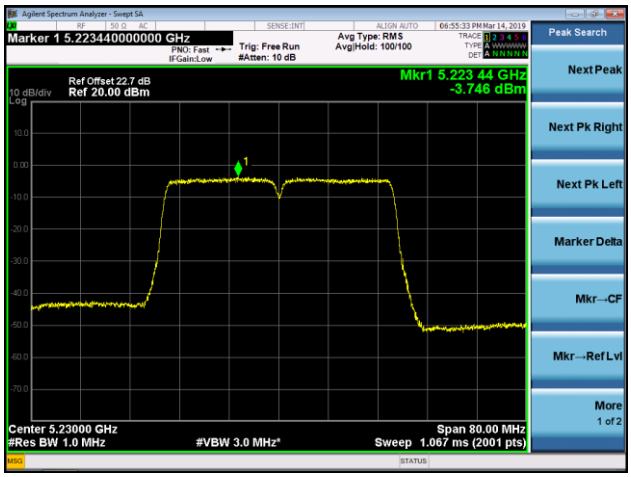
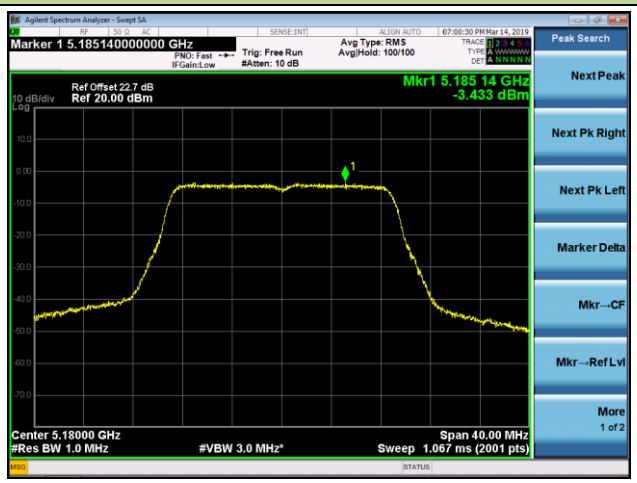
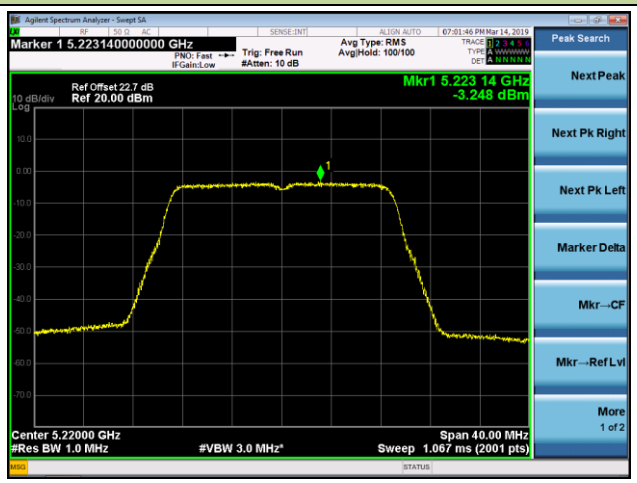
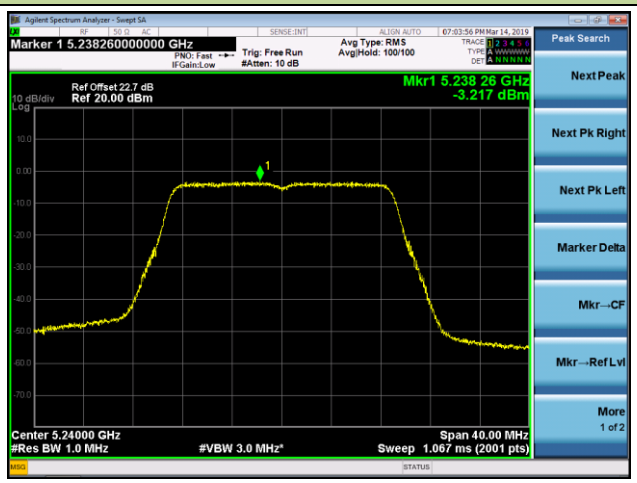
802.11n-HT20 Power Spectral Density - Ant 0 / Ant 0 + 1	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
	
Channel 48 (5240MHz)	
	

802.11n-HT40 Power Spectral Density - Ant 0 / Ant 0 + 1	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
	
802.11ac-VHT20 Power Spectral Density - Ant 0 / Ant 0 + 1	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
	
Channel 48 (5240MHz)	
	

802.11ac-VHT40 Power Spectral Density - Ant 0 / Ant 0 + 1	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
	
802.11ac-VHT80 Power Spectral Density - Ant 0 / Ant 0 + 1	
Channel 42 (5210MHz)	
	

802.11a Power Spectral Density - Ant 1 / Ant 0 + 1	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
	
Channel 48 (5240MHz)	
	

802.11n-HT20 Power Spectral Density - Ant 1 / Ant 0 + 1	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
	
Channel 48 (5240MHz)	
	

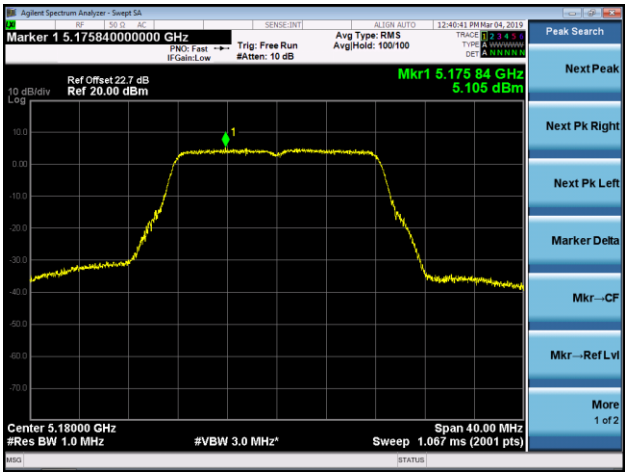
802.11n-HT40 Power Spectral Density - Ant 1 / Ant 0 + 1	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
	
802.11ac-VHT20 Power Spectral Density - Ant 1 / Ant 0 + 1	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
	
Channel 48 (5240MHz)	
	

802.11ac-VHT40 Power Spectral Density - Ant 1 / Ant 0 + 1	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
	
802.11ac-VHT80 Power Spectral Density - Ant 1 / Ant 0 + 1	
Channel 42 (5210MHz)	
	

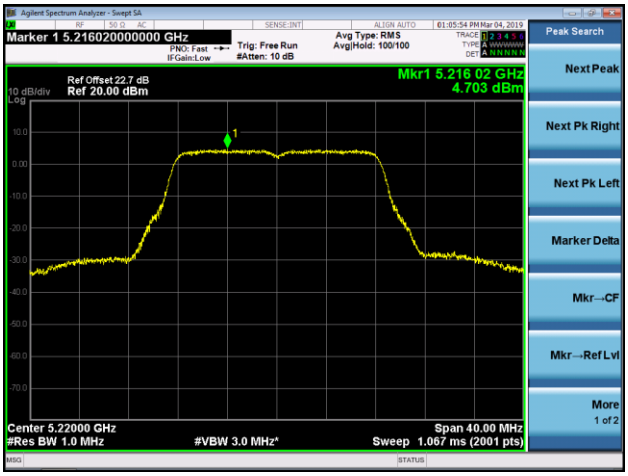
Product	WIFI+BT Combo Module	Temperature	23°C
Test Engineer	Snake Ni	Relative Humidity	54%
Test Site	TR3	Test Date	2019/03/04
Note	For FCC U-NII 1		

802.11a Power Spectral Density - Ant 0 / Ant 0 + 1

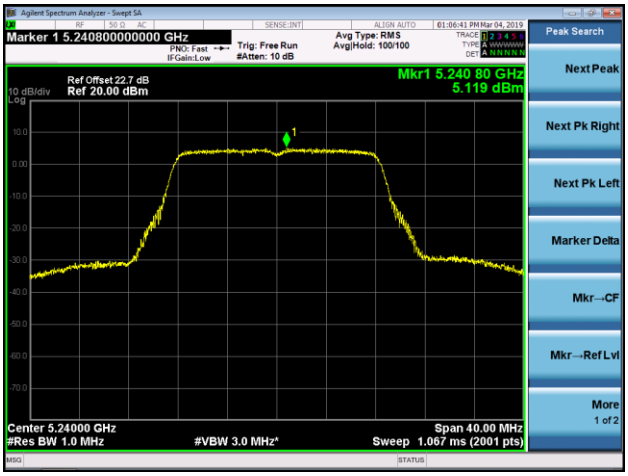
Channel 36 (5180MHz)

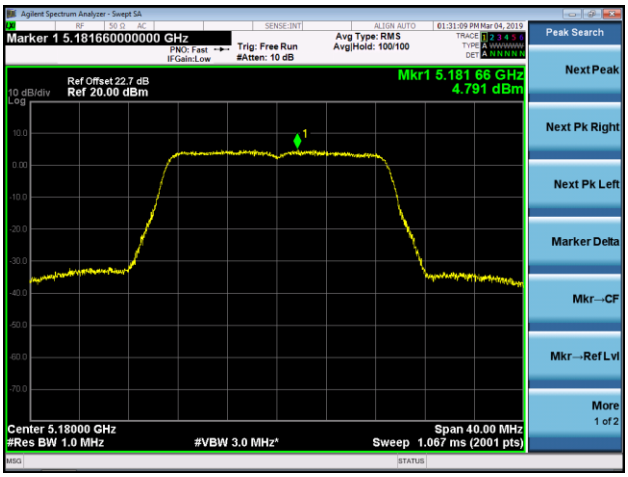
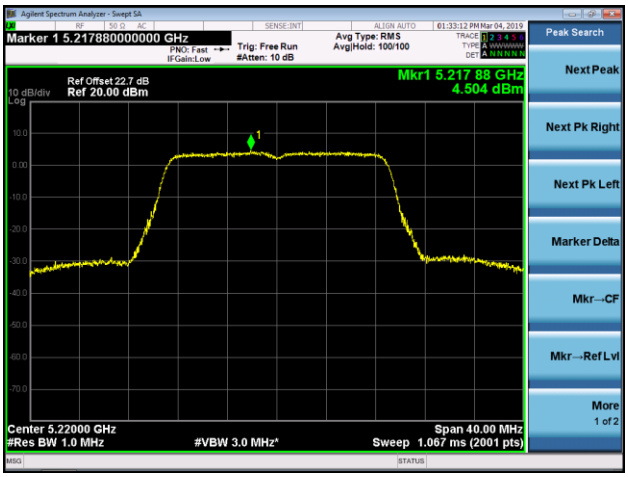


Channel 44 (5220MHz)



Channel 48 (5240MHz)



802.11n-HT20 Power Spectral Density - Ant 0 / Ant 0 + 1	
Channel 36 (5180MHz)	Channel 44 (5220MHz)
	
Channel 48 (5240MHz)