7.5. Power Spectral Density Measurement

7.5.1. Test Limit

For fixed point-to-point access points operating in the band 5.15-5.25 GHz, fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.

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 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.

5.15-5.25 GHz: Limit (dBm/MHz) = 17dBm/MHz.

5.725-5.85 GHz Limit (dBm/500kHz) = 30dBm/500kHz.

7.5.2. Test Procedure Used

KDB 789033 D02v01 - Section F

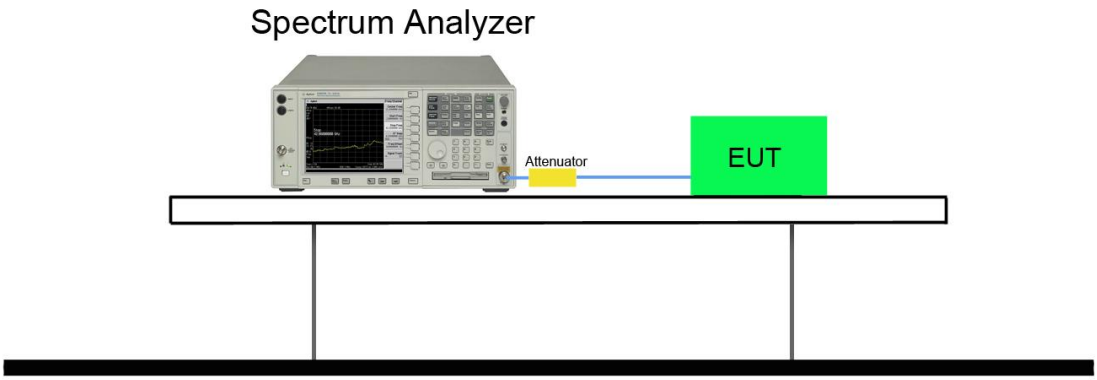
7.5.3. Test Setting

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) = 6.99 dB to the measured result

7.5.4. Test Setup



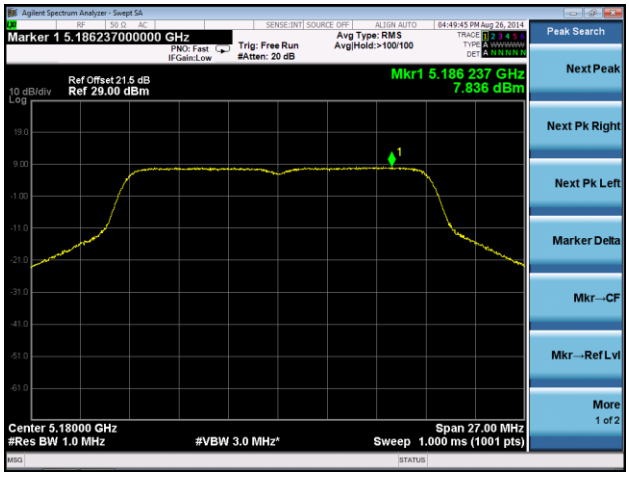
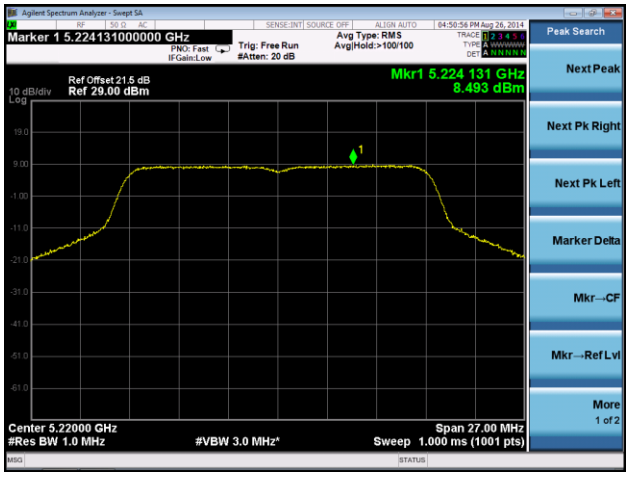
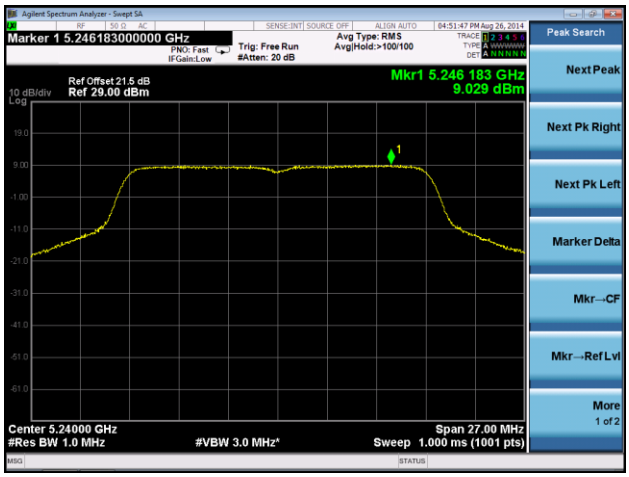
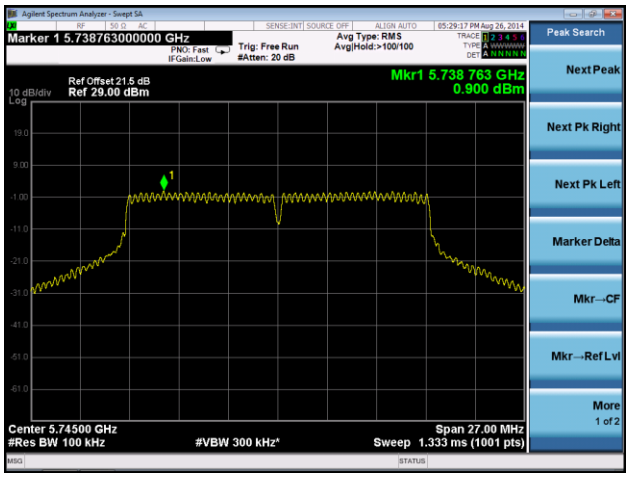
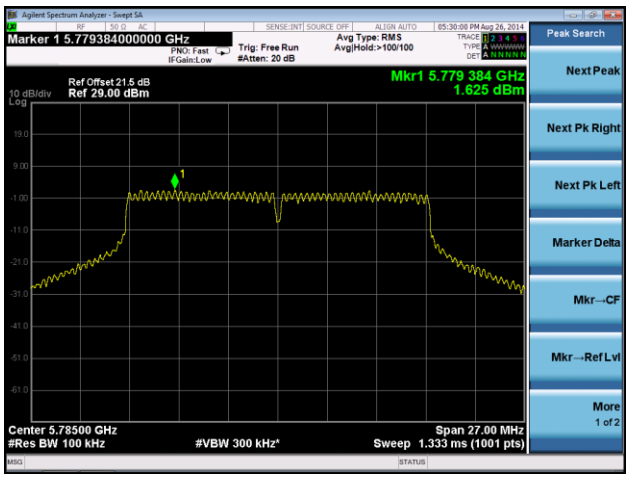
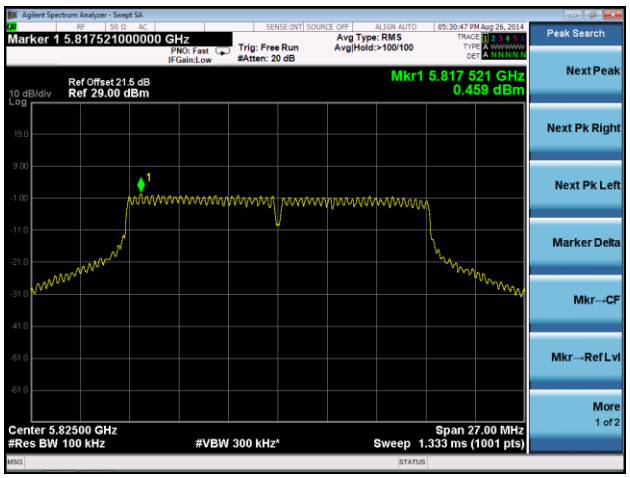
7.5.5. Test Result

Test Mode	N_{Tx}	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm)	Ant 1 PSD (dBm)	Total PSD (dBm)	Limit (dBm /MHz)	Result
11a	1	6	36	5180	7.836	8.575	--	17	Pass
11a	1	6	44	5220	8.493	8.808	--	17	Pass
11a	1	6	48	5240	9.029	8.976	--	17	Pass
11n-HT20	1	6.5	36	5180	7.575	7.887	--	17	Pass
11n-HT20	1	6.5	44	5220	8.117	7.860	--	17	Pass
11n-HT20	1	6.5	48	5240	8.692	8.550	--	17	Pass
11n-HT20	2	13	36	5180	5.062	5.630	8.366	17	Pass
11n-HT20	2	13	44	5220	10.479	11.013	13.765	17	Pass
11n-HT20	2	13	48	5240	9.878	10.975	13.471	17	Pass
11n-HT40	1	13.5	38	5190	4.064	4.427	--	17	Pass
11n-HT40	1	13.5	46	5230	4.516	4.078	--	17	Pass
11n-HT40	2	27	38	5190	1.090	1.680	4.405	17	Pass
11n-HT40	2	27	46	5230	6.550	6.854	9.715	17	Pass

Test Mode	N_{Tx}	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Constant Factor	Ant 0 PSD (dBm)	Ant 1 PSD (dBm)	Total PSD (dBm)	Limit (dBm/ 500kHz)	Result
11a	1	6	149	5745	6.99	7.890	8.128	--	30	Pass
11a	1	6	157	5785	6.99	8.615	8.650	--	30	Pass
11a	1	6	165	5825	6.99	7.449	6.756	--	30	Pass
11n-HT20	1	6.5	149	5745	6.99	7.086	8.648	--	30	Pass
11n-HT20	1	6.5	157	5785	6.99	7.922	8.131	--	30	Pass
11n-HT20	1	6.5	165	5825	6.99	6.720	6.919	--	30	Pass
11n-HT20	2	13	149	5745	6.99	4.408	5.347	7.913	30	Pass
11n-HT20	2	13	157	5785	6.99	8.686	9.343	12.037	30	Pass
11n-HT20	2	13	165	5825	6.99	4.267	4.864	7.586	30	Pass
11n-HT40	1	13.5	151	5755	6.99	4.736	4.503	--	30	Pass
11n-HT40	1	13.5	159	5795	6.99	5.019	4.373	--	30	Pass
11n-HT40	2	27	151	5755	6.99	2.320	2.517	5.430	30	Pass
11n-HT40	2	27	159	5795	6.99	2.622	2.338	5.492	30	Pass

Note: The PSD Level = The Reading level + Constant Factor.

The Total PSD Level = $10*\log\{10^{(\text{Ant 0 PSD}/10)}+10^{(\text{Ant 1 PSD}/10)}\}$ + Constant Factor.

802.11a Power Spectral Density - Ant 0	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

802.11a Power Spectral Density - Ant 1	
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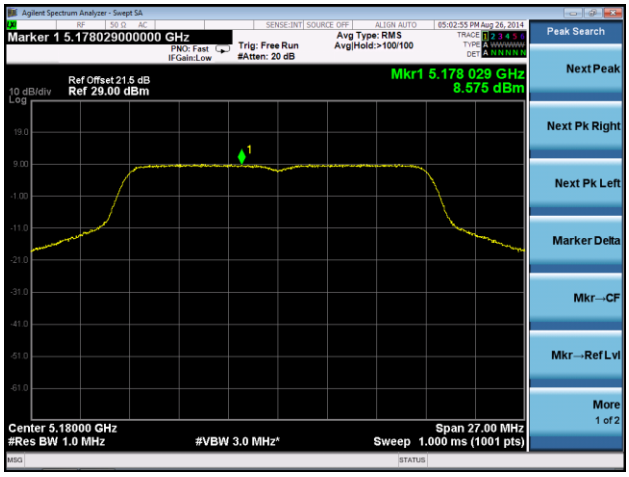
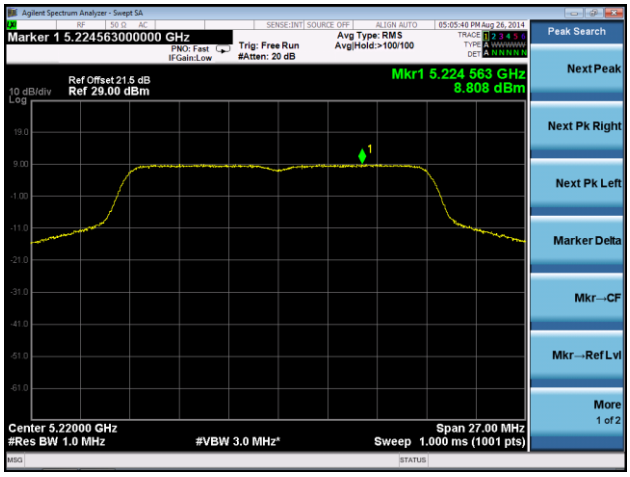
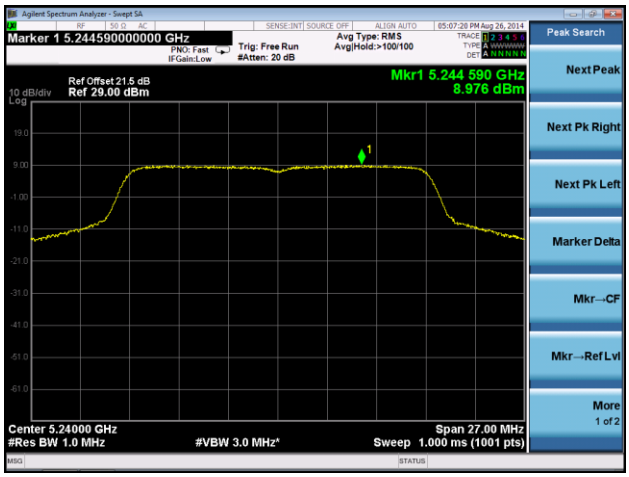
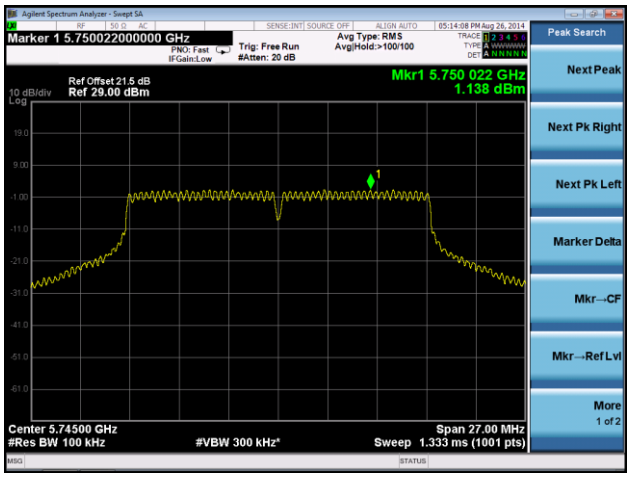
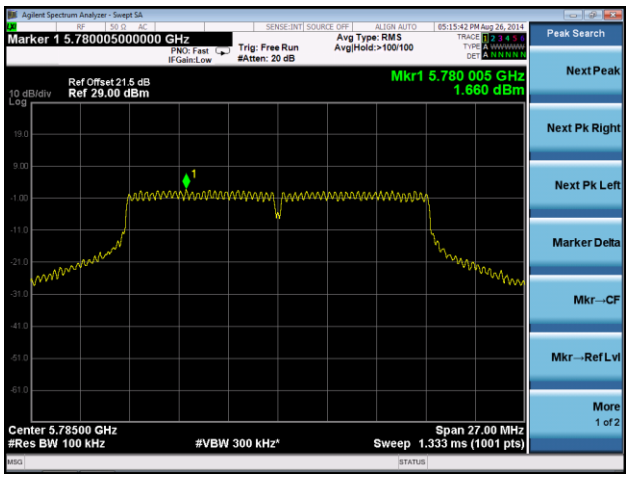
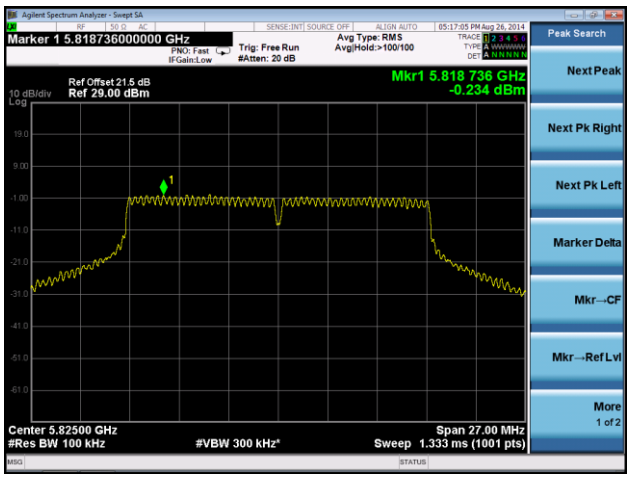
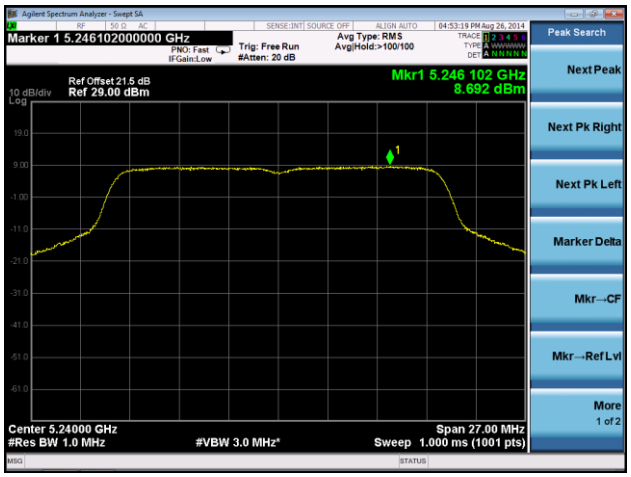
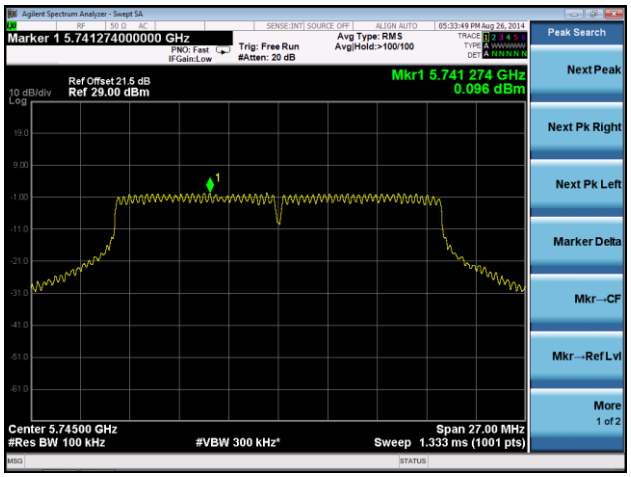
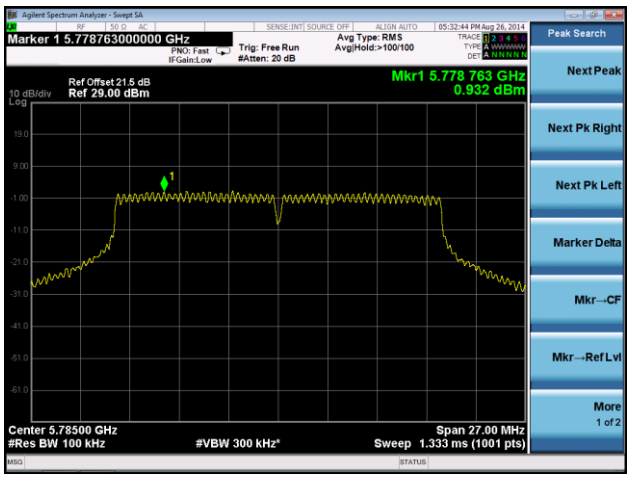
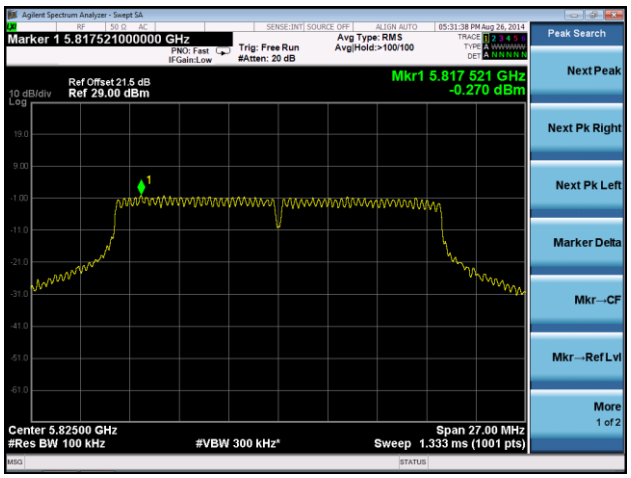
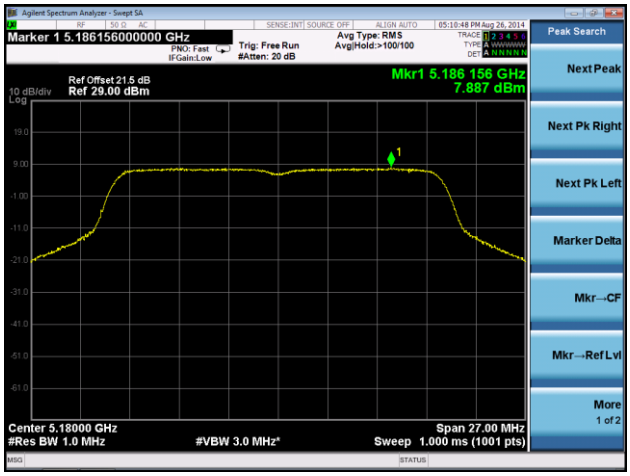
	
Channel 48 (5240MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

802.11n-HT20 Power Spectral Density - Ant 0	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

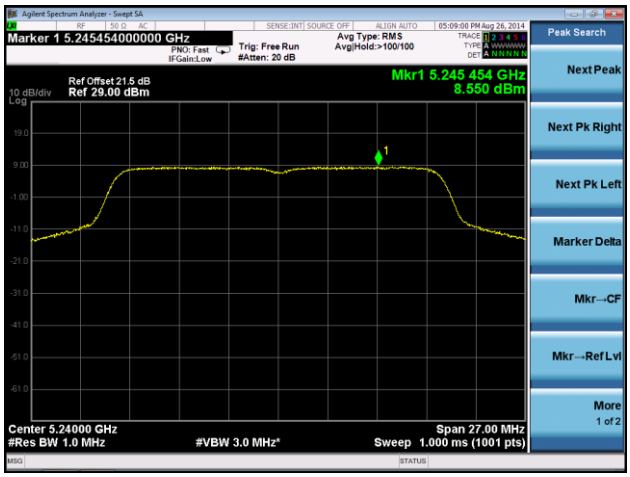
802.11n-HT20 Power Spectral Density - Ant 1

Channel 36 (5180MHz)

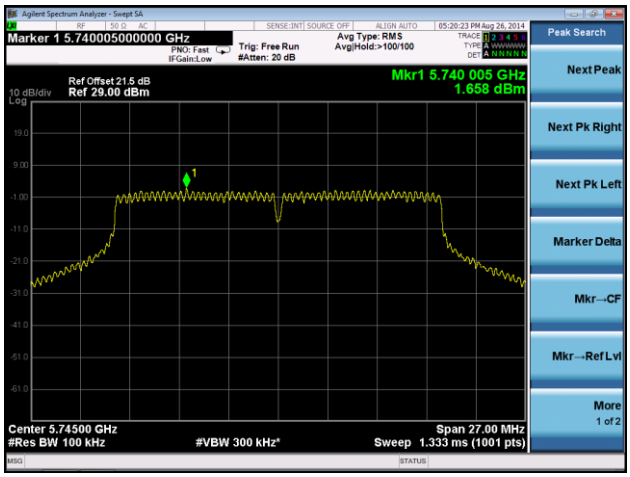


Channel 44 (5220MHz)

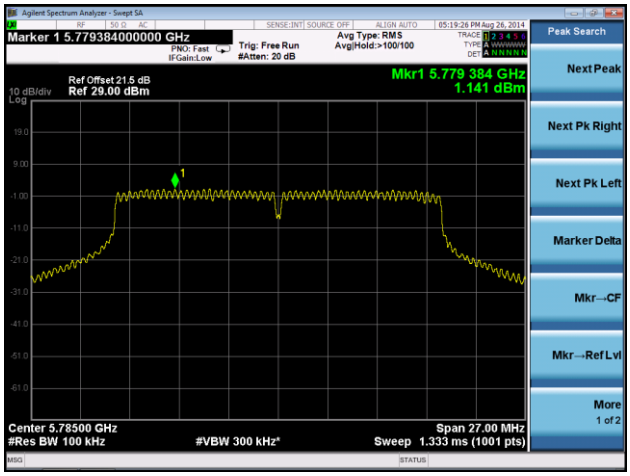
Channel 48 (5240MHz)



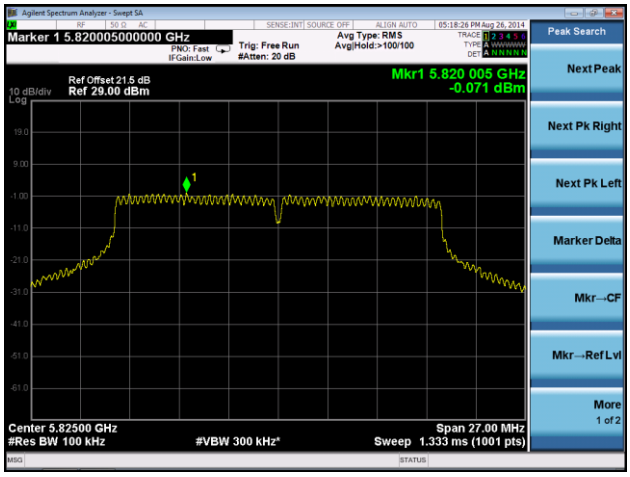
Channel 149 (5745MHz)

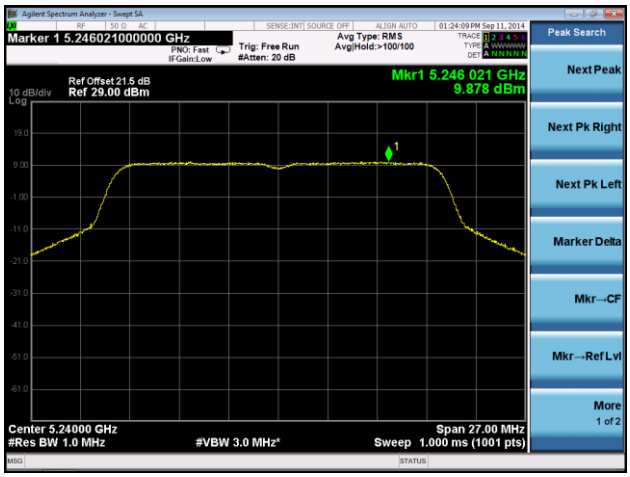
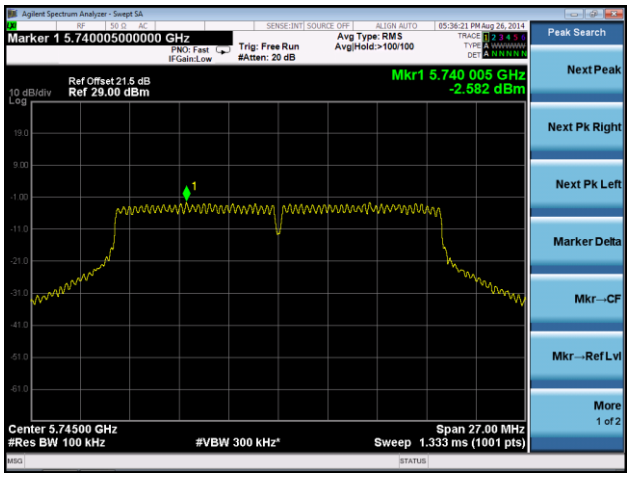
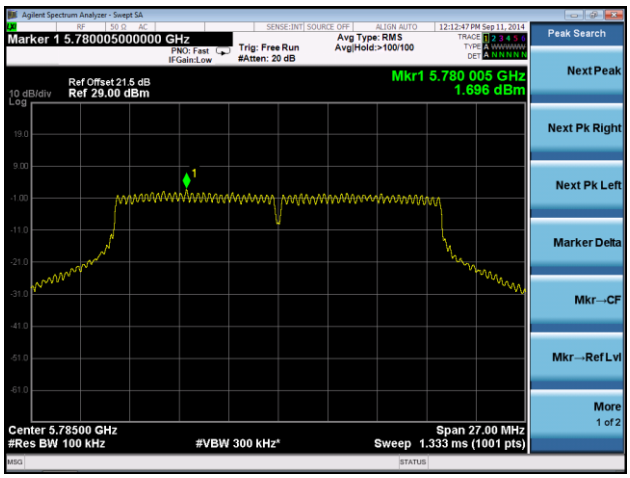
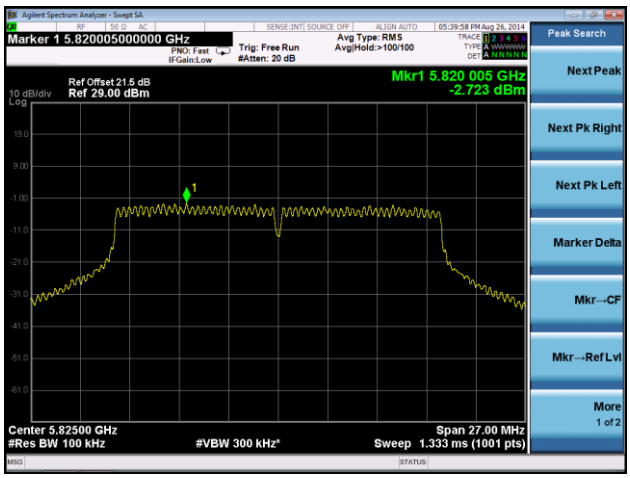


Channel 157 (5785MHz)



Channel 165 (5825MHz)



802.11n-HT20 Power Spectral Density - Ant 0 / Ant 0 + 1	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

802.11n-HT20 Power Spectral Density - Ant 1 / Ant 0 + 1	
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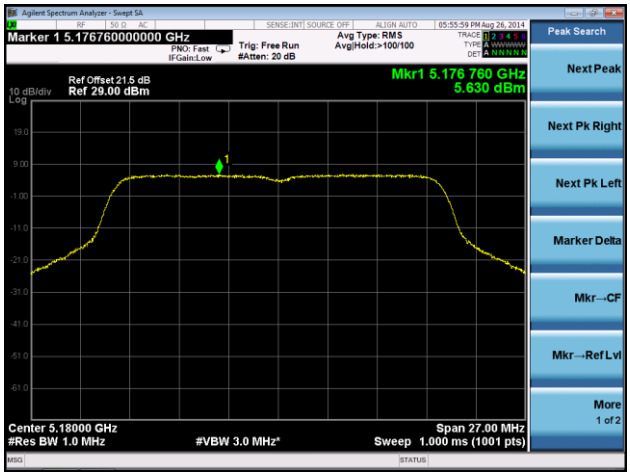
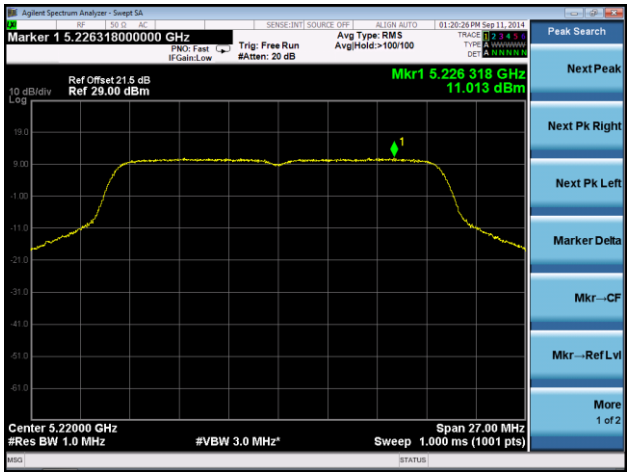
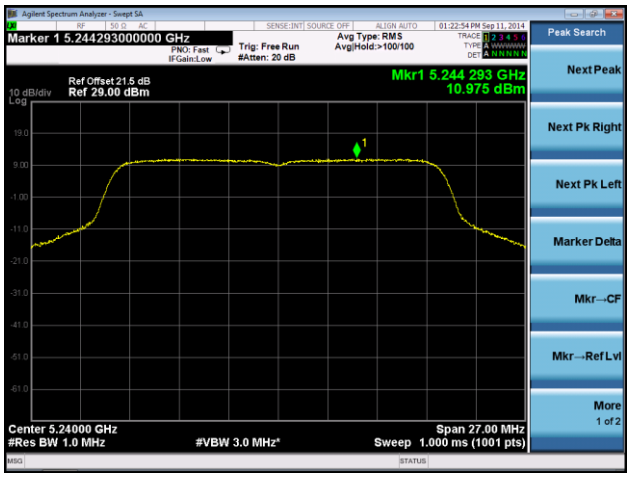
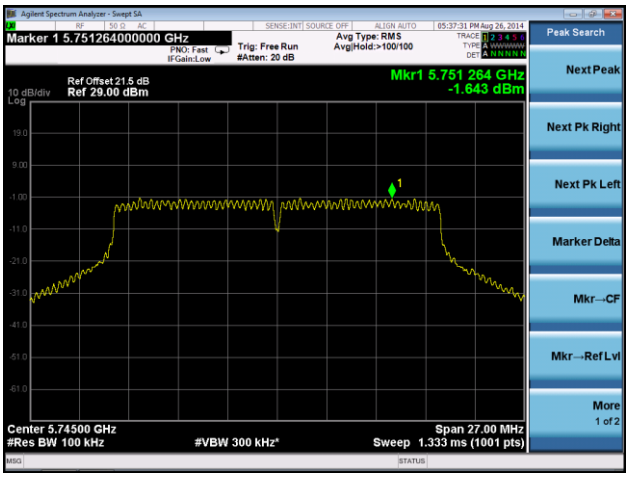
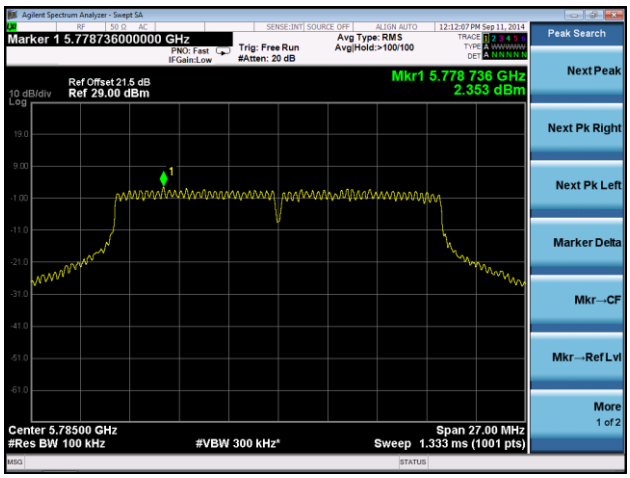
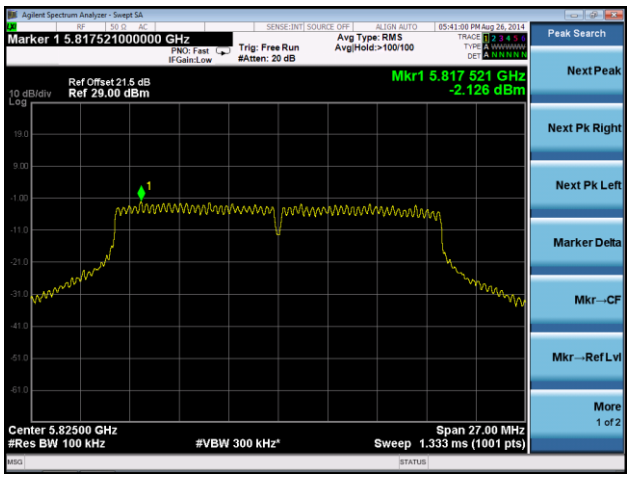
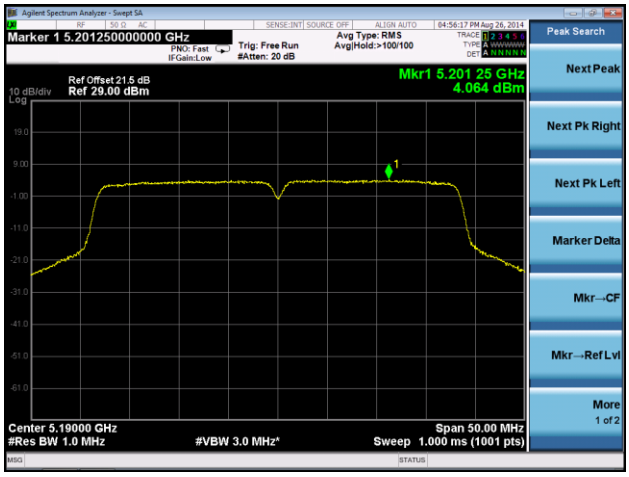
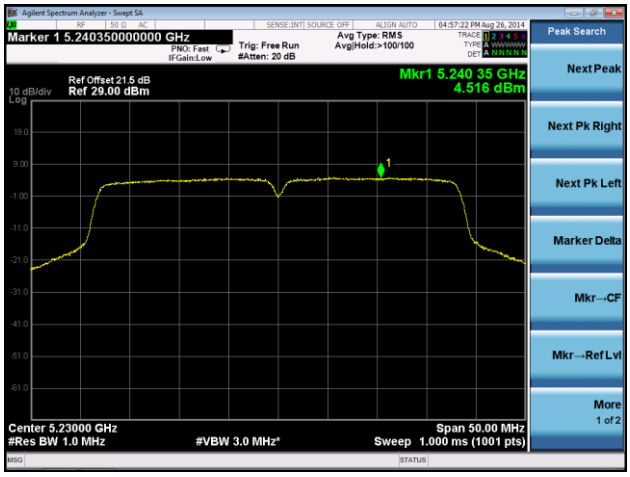
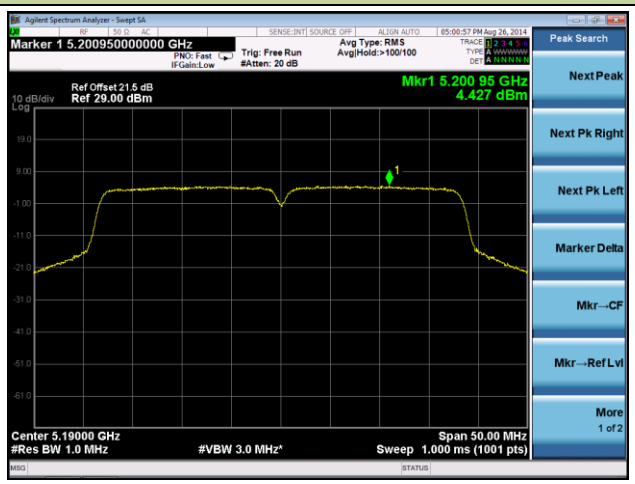
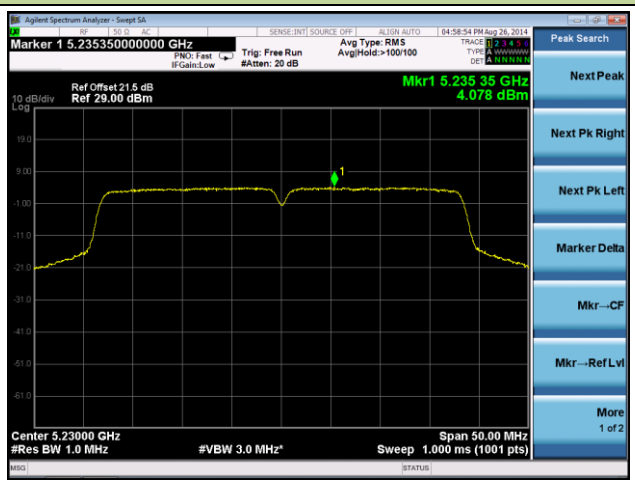
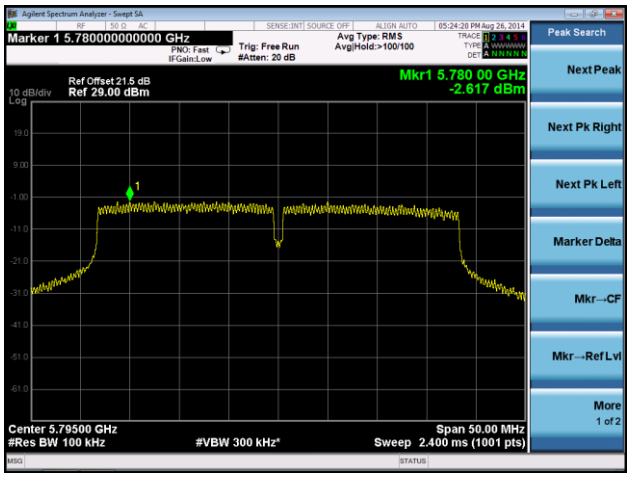
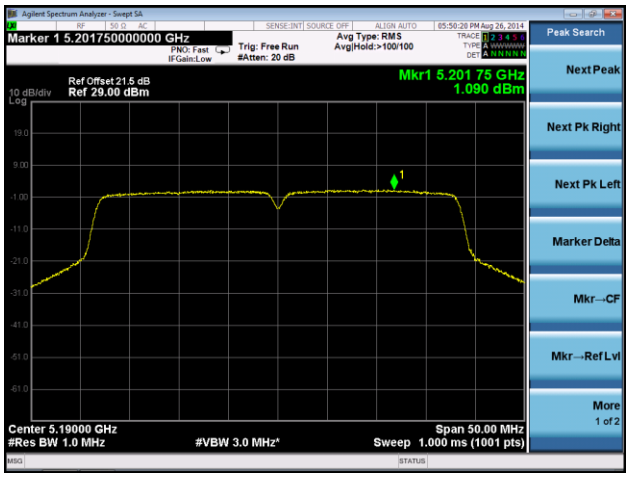
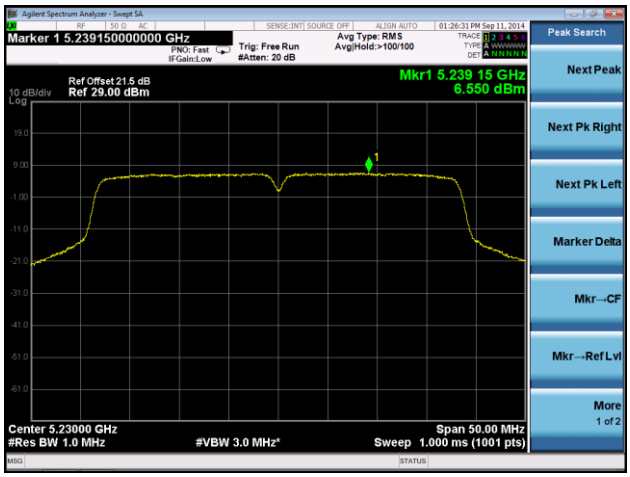
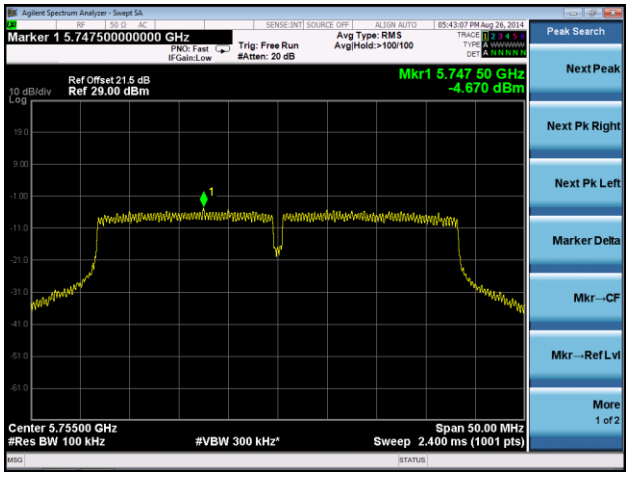
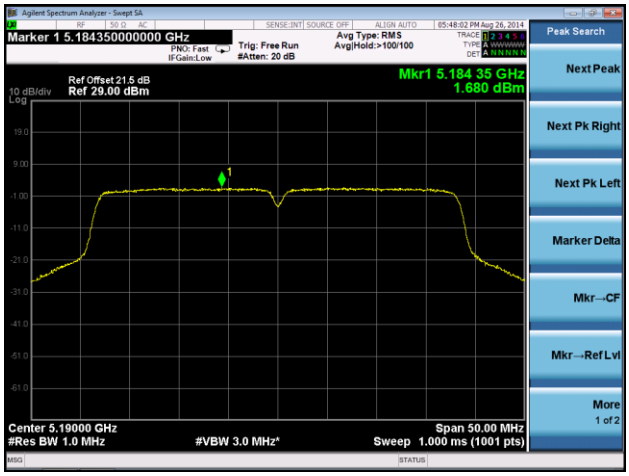
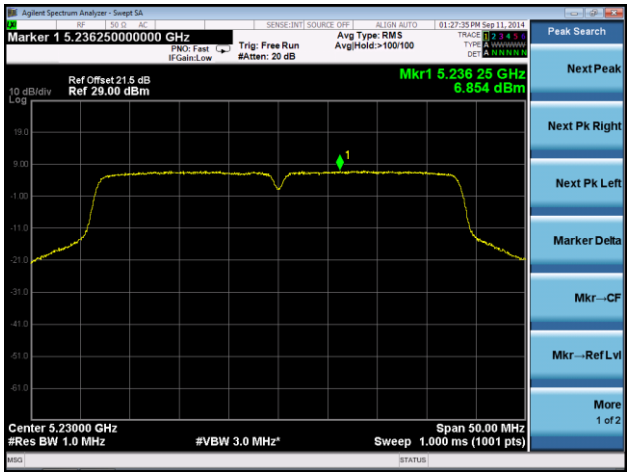
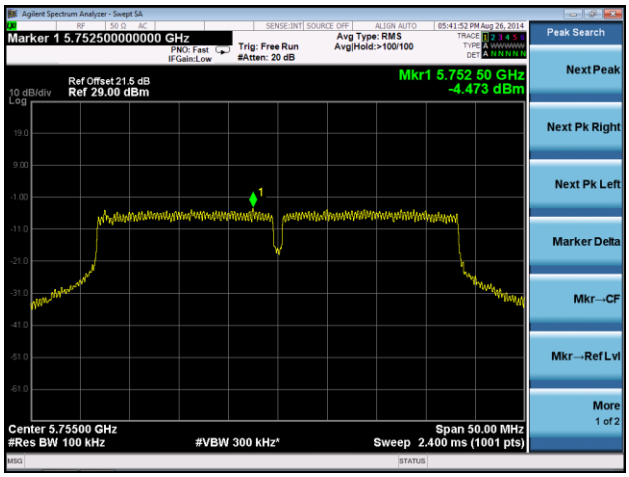
	
Channel 48 (5240MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

802.11n-HT40 Power Spectral Density - Ant 0	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
Channel 151 (5755MHz)	**Channel 159 (5795MHz)**
	
802.11n-HT40 Power Spectral Density - Ant 1	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	

Channel 151 (5755 MHz)	Channel 159 (5795 MHz)
	

802.11n-HT40 Power Spectral Density - Ant 0 / Ant 0+1	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
Channel 151 (5755MHz)	**Channel 159 (5795MHz)**
	

802.11n-HT40 Power Spectral Density - Ant 1 / Ant 0+1	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
Channel 151 (5755 MHz)	**Channel 159 (5795 MHz)**
	

7.6. Frequency Stability Measurement

7.6.1. Test Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

7.6.2. Test Procedure Used

Frequency Stability Under Temperature Variations:

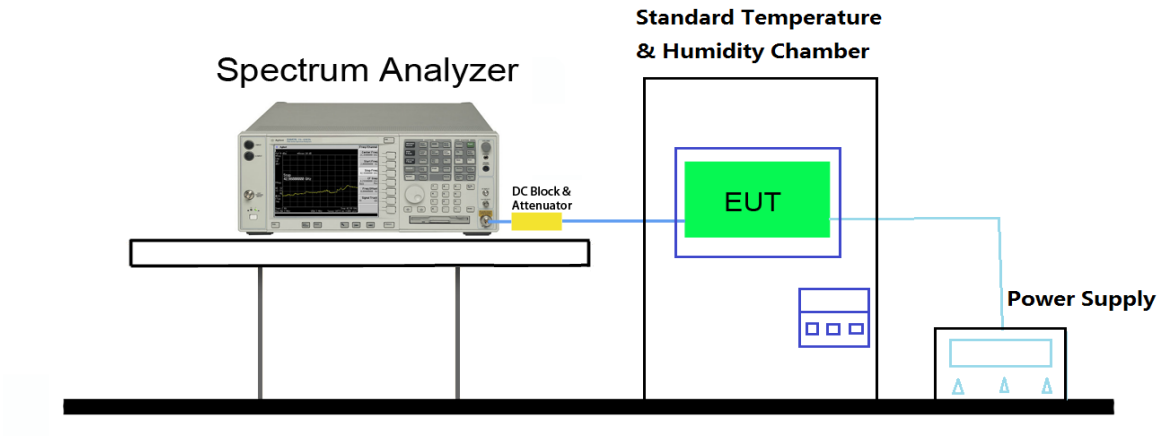
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the lowest temperature reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change.

7.6.3. Test Setup



7.6.4. Test Result

Voltage (%)	Power (VAC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	120	+ 20 (Ref)	5220018651.694	18651.694	0.000357
			5784998125.684	-1874.316	-0.000032
		- 30	5220031581.522	31581.522	0.000605
			5785029633.344	29633.344	0.000512
		- 20	5220028764.749	28764.749	0.000551
			5785014243.547	14243.547	0.000246
		- 10	5220036157.243	36157.243	0.000693
			5785031634.751	31634.751	0.000547
		0	5220010357.212	10357.212	0.000198
			5785041821.370	41821.370	0.000723
		+ 10	5220015658.651	15658.651	0.000300
			5784995187.658	-4812.342	-0.000083
		+ 20	5220025680.830	25680.830	0.000492
			5784996714.185	-3285.815	-0.000057
		+ 30	5219989752.347	-10247.653	-0.000196
			5785015204.625	15204.625	0.000263
		+ 40	5220001738.711	1738.711	0.000033
			5784990164.571	-9835.429	-0.000170
		+ 50	5219996525.712	-3474.288	-0.000067
			5784989303.618	-10696.382	-0.000185
115%	138	+ 20	5220002774.668	2774.668	0.000053
			5784988601.402	-11398.598	-0.000197
85%	102	+ 20	5219998124.121	-1875.879	-0.000036
			5784988413.321	-11586.679	-0.000200

7.7. Radiated Spurious Emission Measurement

7.7.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [V/m]	Measured Distance [Meters]
0.009 – 0.490	2400/F (kHz)	300
0.490 – 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.7.2. Test Procedure Used

KDB 789033 D02v01 – Section G

7.7.3. Test Setting

Peak Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Quasi-Peak Measurements below 1GHz

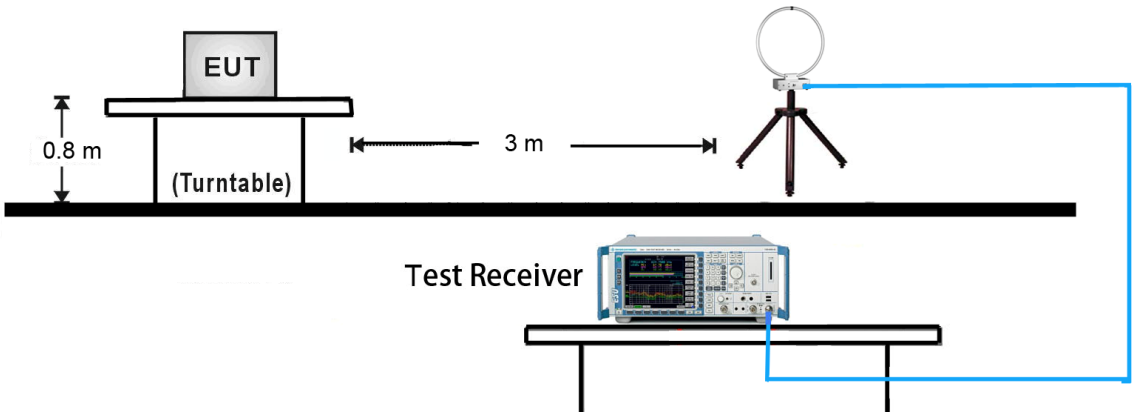
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 120 kHz
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Average Measurements above 1GHz (Method AD)

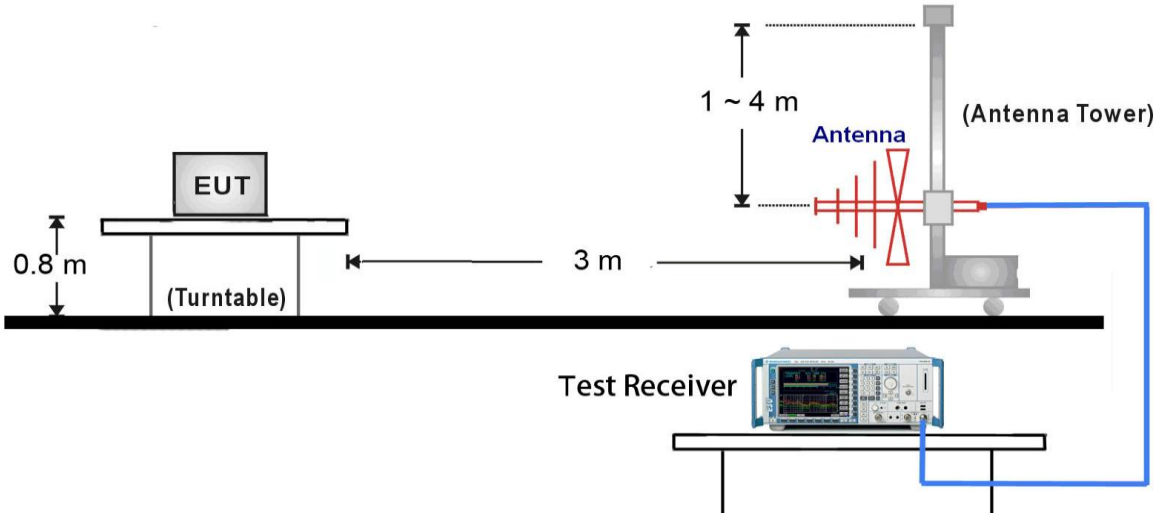
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be > 2 x span/RBW)
6. Sweep time = auto
7. Trace was averaged over at 100 sweeps

7.7.4. Test Setup

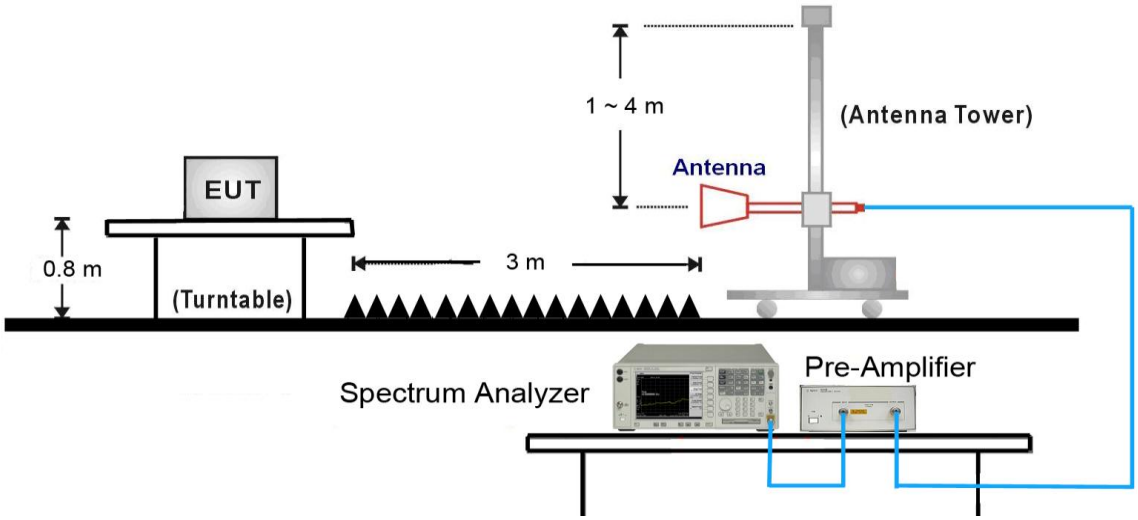
9kHz ~ 30MHz Test Setup:



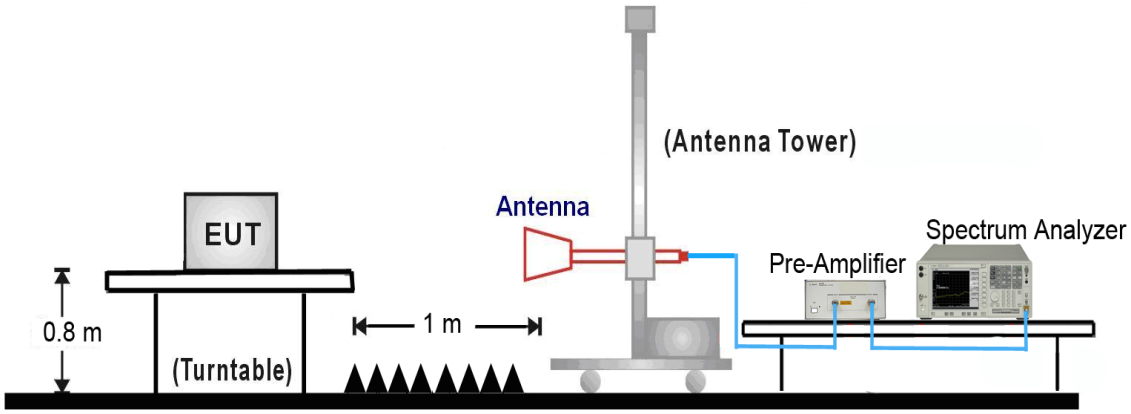
30MHz ~ 1GHz Test Setup:



1GHz ~18GHz Test Setup:



18GHz ~40GHz Test Setup:



7.7.5. Test Result

Test by Panel Antenna – 15dBi for 5150-5250MHz Band;

Test by Panel Antenna – 25dBi for 5725-5850MHz Band;

Test Mode:	802.11a – Ant 0	Test Site:	AC1
Test Channel:	36	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7043.5	35.3	13.1	48.4	88.2	-39.8	Peak	Horizontal
*	7111.5	34.0	13.4	47.4	88.2	-40.8	Peak	Horizontal
	9035.0	34.2	14.5	48.7	74.0	-25.3	Peak	Horizontal
	9100.5	35.6	14.6	50.2	74.0	-23.8	Peak	Horizontal
*	7044.0	34.7	13.1	47.8	88.2	-40.4	Peak	Vertical
*	7134.0	34.6	13.5	48.1	88.2	-40.1	Peak	Vertical
	9114.7	34.6	14.8	49.4	74.0	-24.6	Peak	Vertical
	9185.6	35.3	15.3	50.6	74.0	-23.4	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11a – Ant 0	Test Site:	AC1
Test Channel:	44	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7213.5	35.7	13.7	49.4	88.2	-38.8	Peak	Horizontal
*	7817.0	34.0	15.0	49.0	88.2	-39.2	Peak	Horizontal
	9142.0	35.3	15.2	50.5	74.0	-23.5	Peak	Horizontal
	9321.5	34.8	15.4	50.2	74.0	-23.8	Peak	Horizontal
*	7168.4	34.3	13.6	47.9	88.2	-40.3	Peak	Vertical
*	7806.9	33.4	15.0	48.4	88.2	-39.8	Peak	Vertical
	9336.4	34.8	15.4	50.2	74.0	-23.8	Peak	Vertical
	9364.9	33.8	15.3	49.1	74.0	-24.9	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11a – Ant 0	Test Site:	AC1
Test Channel:	48	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7842.5	33.4	15.1	48.5	88.2	-39.7	Peak	Horizontal
*	7953.0	33.5	15.1	48.6	88.2	-39.6	Peak	Horizontal
	9463.0	35.0	15.4	50.4	74.0	-23.6	Peak	Horizontal
	9466.0	35.4	15.4	50.8	74.0	-23.2	Peak	Horizontal
*	8006.0	34.1	15.1	49.2	88.2	-39.0	Peak	Vertical
*	8694.3	34.6	14.8	49.4	88.2	-38.8	Peak	Vertical
	9412.6	33.8	15.5	49.3	74.0	-24.7	Peak	Vertical
	9484.6	35.2	15.4	50.6	74.0	-23.4	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11a – Ant 0	Test Site:	AC1
Test Channel:	149	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7014.5	35.4	12.8	48.2	88.2	-40.0	Peak	Horizontal
*	7115.0	34.4	13.4	47.8	88.2	-40.4	Peak	Horizontal
	9047.4	34.0	14.5	48.5	74.0	-25.5	Peak	Horizontal
	9089.9	34.4	14.6	49.0	74.0	-25.0	Peak	Horizontal
*	7045.4	35.0	13.1	48.1	88.2	-40.1	Peak	Vertical
*	7164.4	34.6	13.6	48.2	88.2	-40.0	Peak	Vertical
	8156.5	33.5	14.9	48.4	74.0	-25.6	Peak	Vertical
	8169.7	34.4	14.8	49.2	74.0	-24.8	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz or -17dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11a – Ant 0	Test Site:	AC1
Test Channel:	157	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7804.6	33.5	15.0	48.5	88.2	-39.7	Peak	Horizontal
*	8003.4	34.2	15.1	49.3	88.2	-38.9	Peak	Horizontal
	9114.9	34.5	14.8	49.3	74.0	-24.7	Peak	Horizontal
	9168.4	34.8	15.3	50.1	74.0	-23.9	Peak	Horizontal
*	7208.9	35.0	13.7	48.7	88.2	-39.5	Peak	Vertical
*	7806.2	33.5	15.0	48.5	88.2	-39.7	Peak	Vertical
	8234.0	33.0	14.5	47.5	74.0	-26.5	Peak	Vertical
	8304.7	34.2	14.3	48.5	74.0	-25.5	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz or -17dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11a – Ant 0	Test Site:	AC1
Test Channel:	165	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	8597.4	33.5	14.8	48.3	88.2	-39.9	Peak	Horizontal
*	8912.7	35.0	14.3	49.3	88.2	-38.9	Peak	Horizontal
	9190.0	35.1	15.3	50.4	74.0	-23.6	Peak	Horizontal
	9324.4	34.9	15.4	50.3	74.0	-23.7	Peak	Horizontal
*	7889.2	33.9	15.0	48.9	88.2	-39.3	Peak	Vertical
*	8001.6	34.5	15.1	49.6	88.2	-38.6	Peak	Vertical
	8495.5	34.3	14.7	49.0	74.0	-25.0	Peak	Vertical
	9110.1	34.0	14.7	48.7	74.0	-25.3	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz or -17dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11a – Ant 1	Test Site:	AC1
Test Channel:	36	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7106.8	34.5	13.4	47.9	88.2	-40.3	Peak	Horizontal
*	7112.5	34.0	13.4	47.4	88.2	-40.8	Peak	Horizontal
	8115.5	34.5	15.1	49.6	74.0	-24.4	Peak	Horizontal
	8201.9	33.4	14.6	48.0	74.0	-26.0	Peak	Horizontal
*	7097.0	34.1	13.3	47.4	88.2	-40.8	Peak	Vertical
*	7113.0	34.6	13.4	48.0	88.2	-40.2	Peak	Vertical
	8046.5	34.3	15.2	49.5	74.0	-24.5	Peak	Vertical
	8110.6	33.7	15.1	48.8	74.0	-25.2	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11a – Ant 1	Test Site:	AC1
Test Channel:	44	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7207.5	34.9	13.6	48.5	88.2	-39.7	Peak	Horizontal
*	7811.5	33.8	15.0	48.8	88.2	-39.4	Peak	Horizontal
	8256.4	34.8	14.4	49.2	74.0	-24.8	Peak	Horizontal
	8397.0	35.2	14.4	49.6	74.0	-24.4	Peak	Horizontal
*	7156.0	34.8	13.6	48.4	88.2	-39.8	Peak	Vertical
*	7205.0	34.3	13.6	47.9	88.2	-40.3	Peak	Vertical
	8204.5	34.3	14.6	48.9	74.0	-25.1	Peak	Vertical
	8221.6	34.3	14.5	48.8	74.0	-25.2	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11a – Ant 1	Test Site:	AC1
Test Channel:	48	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7816.1	33.8	15.0	48.8	88.2	-39.4	Peak	Horizontal
*	7908.0	33.7	15.0	48.7	88.2	-39.5	Peak	Horizontal
	8451.6	34.6	14.5	49.1	74.0	-24.9	Peak	Horizontal
	8775.1	34.8	14.5	49.3	74.0	-24.7	Peak	Horizontal
*	7805.0	33.3	15.0	48.3	88.2	-39.9	Peak	Vertical
*	7866.9	34.1	15.0	49.1	88.2	-39.1	Peak	Vertical
	8354.0	35.2	14.4	49.6	74.0	-24.4	Peak	Vertical
	8461.1	34.3	14.5	48.8	74.0	-25.2	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11a – Ant 1	Test Site:	AC1
Test Channel:	149	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7110.6	35.5	13.4	48.9	88.2	-39.3	Peak	Horizontal
*	7162.9	34.3	13.6	47.9	88.2	-40.3	Peak	Horizontal
	8110.4	34.2	15.1	49.3	74.0	-24.7	Peak	Horizontal
	8181.4	34.0	14.7	48.7	74.0	-25.3	Peak	Horizontal
*	7064.0	35.0	13.2	48.2	88.2	-40.0	Peak	Vertical
*	7118.9	35.2	13.4	48.6	88.2	-39.6	Peak	Vertical
	8056.4	34.1	15.2	49.3	74.0	-24.7	Peak	Vertical
	8172.0	33.9	14.8	48.7	74.0	-25.3	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz or -17dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11a – Ant 1	Test Site:	AC1
Test Channel:	157	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7206.1	34.6	13.6	48.2	88.2	-40.0	Peak	Horizontal
*	7224.6	35.2	13.7	48.9	88.2	-39.3	Peak	Horizontal
	8201.6	34.5	14.6	49.1	74.0	-24.9	Peak	Horizontal
	8336.1	34.1	14.5	48.6	74.0	-25.4	Peak	Horizontal
*	7204.0	34.5	13.6	48.1	88.2	-40.1	Peak	Vertical
*	7244.0	34.9	13.8	48.7	88.2	-39.5	Peak	Vertical
	8264.5	34.1	14.4	48.5	74.0	-25.5	Peak	Vertical
	8354.9	34.5	14.4	48.9	74.0	-25.1	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz or -17dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11a – Ant 1	Test Site:	AC1
Test Channel:	165	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7804.2	33.3	15.0	48.3	88.2	-39.9	Peak	Horizontal
*	7811.5	33.4	15.0	48.4	88.2	-39.8	Peak	Horizontal
	8401.2	34.7	14.5	49.2	74.0	-24.8	Peak	Horizontal
	8499.6	34.3	14.7	49.0	74.0	-25.0	Peak	Horizontal
*	7804.6	33.6	15.0	48.6	88.2	-39.6	Peak	Vertical
*	7846.0	34.0	15.1	49.1	88.2	-39.1	Peak	Vertical
	8394.1	35.5	14.4	49.9	74.0	-24.1	Peak	Vertical
	8495.4	33.5	14.7	48.2	74.0	-25.8	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz or -17dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11n-HT20 – Ant 0	Test Site:	AC1
Test Channel:	36	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7104.0	34.5	13.4	47.9	88.2	-40.3	Peak	Horizontal
*	7183.2	35.2	13.6	48.8	88.2	-39.4	Peak	Horizontal
	8114.2	34.3	15.1	49.4	74.0	-24.6	Peak	Horizontal
	8214.7	34.3	14.6	48.9	74.0	-25.1	Peak	Horizontal
*	7084.1	34.7	13.3	48.0	88.2	-40.2	Peak	Vertical
*	7111.5	34.7	13.4	48.1	88.2	-40.1	Peak	Vertical
	8094.0	34.0	15.1	49.1	74.0	-24.9	Peak	Vertical
	8110.7	33.8	15.1	48.9	74.0	-25.1	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11n-HT20 – Ant 0	Test Site:	AC1
Test Channel:	44	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7198.4	34.7	13.6	48.3	88.2	-39.9	Peak	Horizontal
*	7201.6	34.6	13.6	48.2	88.2	-40.0	Peak	Horizontal
	8264.3	33.7	14.4	48.1	74.0	-25.9	Peak	Horizontal
	8344.4	34.6	14.4	49.0	74.0	-25.0	Peak	Horizontal
*	7199.4	34.7	13.6	48.3	88.2	-39.9	Peak	Vertical
*	7241.5	34.4	13.8	48.2	88.2	-40.0	Peak	Vertical
	8201.5	33.6	14.6	48.2	74.0	-25.8	Peak	Vertical
	8354.2	34.4	14.4	48.8	74.0	-25.2	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11n-HT20 – Ant 0	Test Site:	AC1
Test Channel:	48	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7807.1	33.3	15.0	48.3	88.2	-39.9	Peak	Horizontal
*	7893.2	34.1	15.0	49.1	88.2	-39.1	Peak	Horizontal
	8451.2	35.0	14.5	49.5	74.0	-24.5	Peak	Horizontal
	8487.2	34.1	14.7	48.8	74.0	-25.2	Peak	Horizontal
*	7811.9	33.6	15.0	48.6	88.2	-39.6	Peak	Vertical
*	7924.1	34.8	15.1	49.9	88.2	-38.3	Peak	Vertical
	8369.9	35.0	14.4	49.4	74.0	-24.6	Peak	Vertical
	8432.2	34.1	14.6	48.7	74.0	-25.3	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11n-HT20 – Ant 0	Test Site:	AC1
Test Channel:	149	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7097.0	34.5	13.3	47.8	88.2	-40.4	Peak	Horizontal
*	7114.0	34.9	13.4	48.3	88.2	-39.9	Peak	Horizontal
	8094.5	34.0	15.1	49.1	74.0	-24.9	Peak	Horizontal
	8193.7	34.2	14.7	48.9	74.0	-25.1	Peak	Horizontal
*	7046.9	35.1	13.1	48.2	88.2	-40.0	Peak	Vertical
*	7114.9	34.6	13.4	48.0	88.2	-40.2	Peak	Vertical
	8177.4	34.1	14.8	48.9	74.0	-25.1	Peak	Vertical
	8258.2	33.9	14.4	48.3	74.0	-25.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz or -17dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.
Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11n-HT20 – Ant 0	Test Site:	AC1
Test Channel:	157	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7204.0	35.1	13.6	48.7	88.2	-39.5	Peak	Horizontal
*	7214.1	34.6	13.7	48.3	88.2	-39.9	Peak	Horizontal
	8194.7	34.1	14.7	48.8	74.0	-25.2	Peak	Horizontal
	8267.9	33.5	14.4	47.9	74.0	-26.1	Peak	Horizontal
*	7198.4	34.9	13.6	48.5	88.2	-39.7	Peak	Vertical
*	7206.9	34.8	13.6	48.4	88.2	-39.8	Peak	Vertical
	8284.1	34.8	14.3	49.1	74.0	-24.9	Peak	Vertical
	8344.9	35.6	14.4	50.0	74.0	-24.0	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz or -17dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	802.11n-HT20 – Ant 0	Test Site:	AC1
Test Channel:	165	Test Engineer:	Roy Cheng
Test Date	08-25-2014	Relative Humidity	58%
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7241.6	34.5	13.8	48.3	88.2	-39.9	Peak	Horizontal
*	7804.0	34.2	15.0	49.2	88.2	-39.0	Peak	Horizontal
	8331.4	34.6	14.5	49.1	74.0	-24.9	Peak	Horizontal
	8424.9	34.5	14.6	49.1	74.0	-24.9	Peak	Horizontal
*	7814.9	33.9	15.0	48.9	88.2	-39.3	Peak	Vertical
*	7824.2	33.1	15.1	48.2	88.2	-40.0	Peak	Vertical
	8354.7	35.4	14.4	49.8	74.0	-24.2	Peak	Vertical
	8494.7	33.7	14.7	48.4	74.0	-25.6	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz or -17dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)