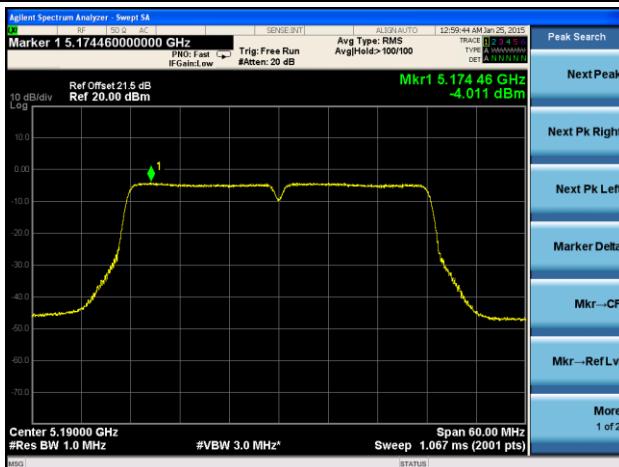


802.11n-HT40 Power Spectral Density - Ant 1 / Ant 0 + 1 + 2 + 3

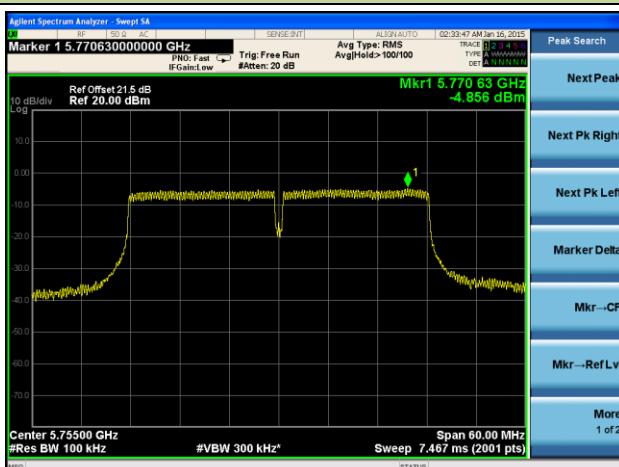
Channel 38 (5190MHz)



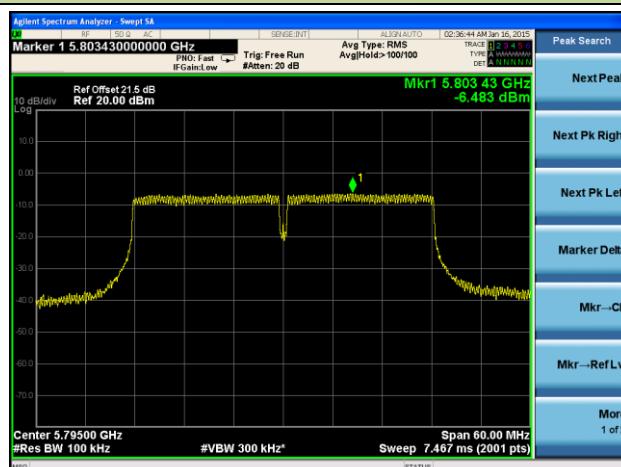
Channel 46 (5230MHz)



Channel 151 (5755MHz)



Channel 159 (5795MHz)



802.11ac-VHT20 Power Spectral Density - Ant 1 / Ant 0 + 1 + 2 + 3

Channel 36 (5180MHz)



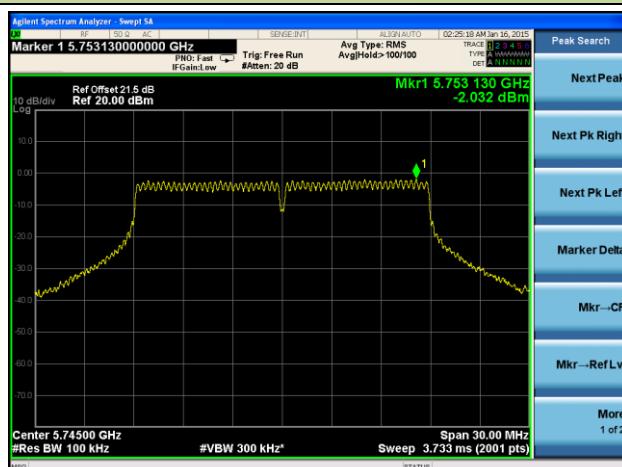
Channel 44 (5220MHz)



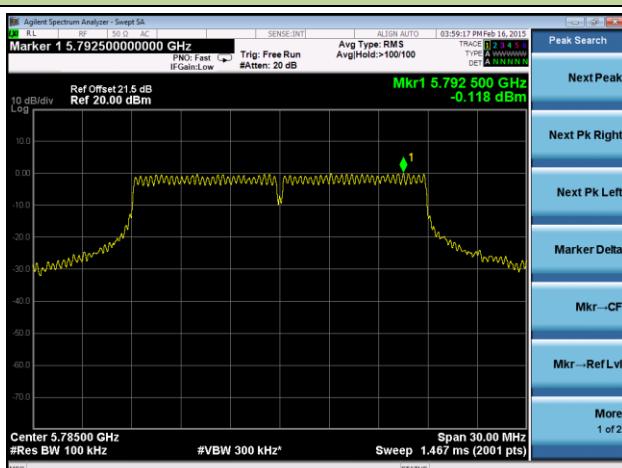
Channel 48 (5240MHz)



Channel 149 (5745MHz)



Channel 157 (5785MHz)

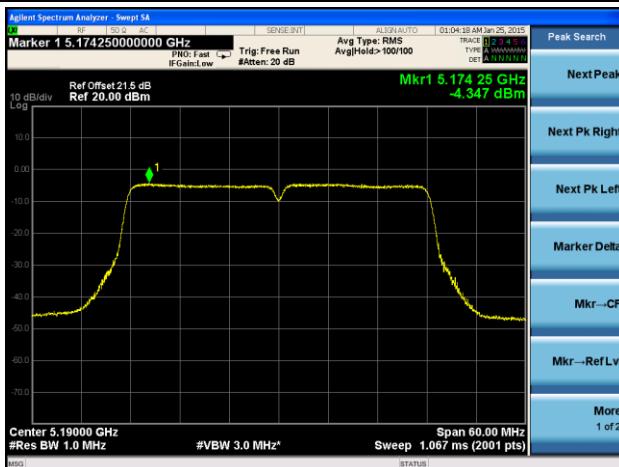


Channel 165 (5825MHz)



802.11ac-VHT40 Power Spectral Density - Ant 1 / Ant 0 + 1 + 2 + 3

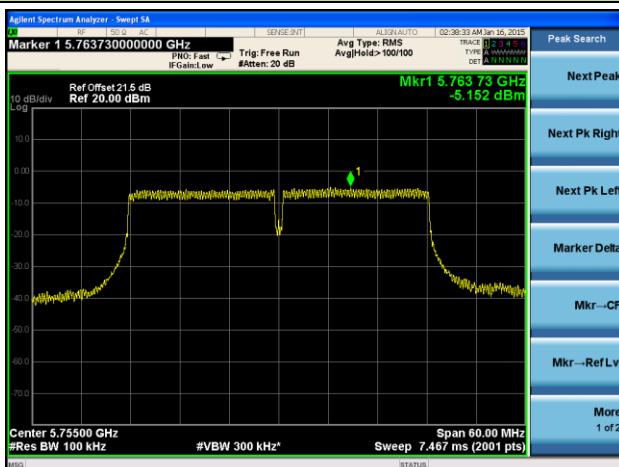
Channel 38 (5190MHz)



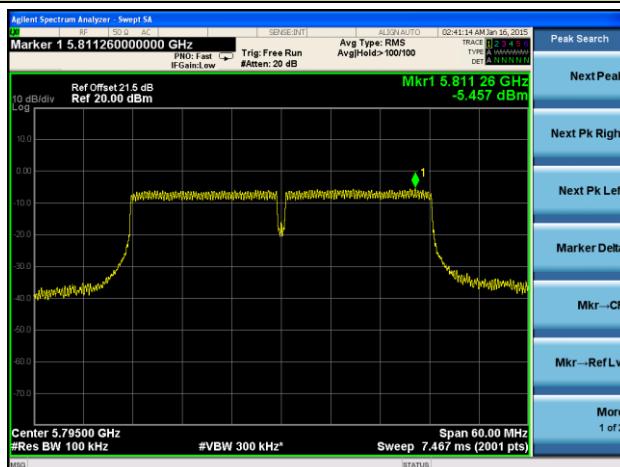
Channel 46 (5230MHz)



Channel 151 (5755MHz)



Channel 159 (5795MHz)



802.11ac-VHT80 Power Spectral Density - Ant 1 / Ant 0 + 1 + 2 + 3

Channel 42 (5210MHz)

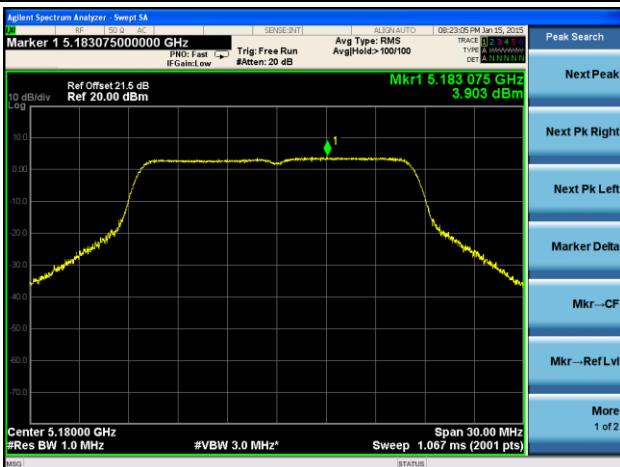


Channel 155 (5775MHz)



802.11a Power Spectral Density - Ant 2 / Ant 0 + 1 + 2 + 3

Channel 36 (5180MHz)



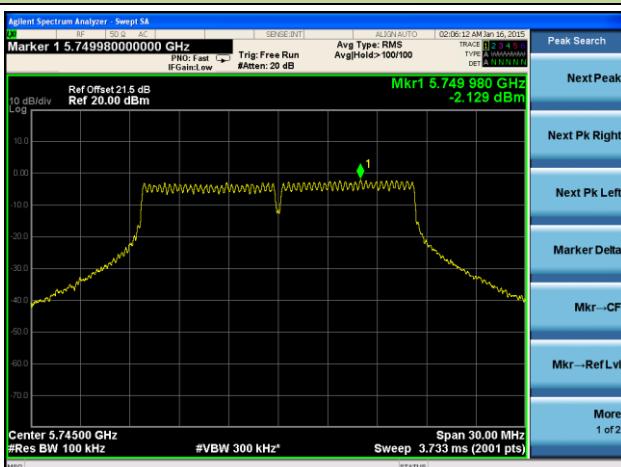
Channel 44 (5220MHz)



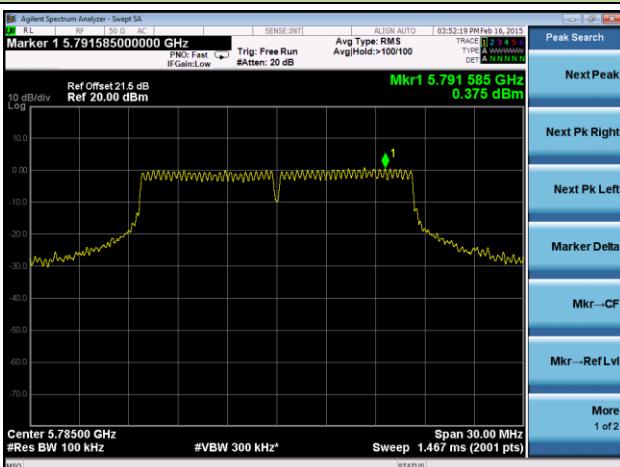
Channel 48 (5240MHz)



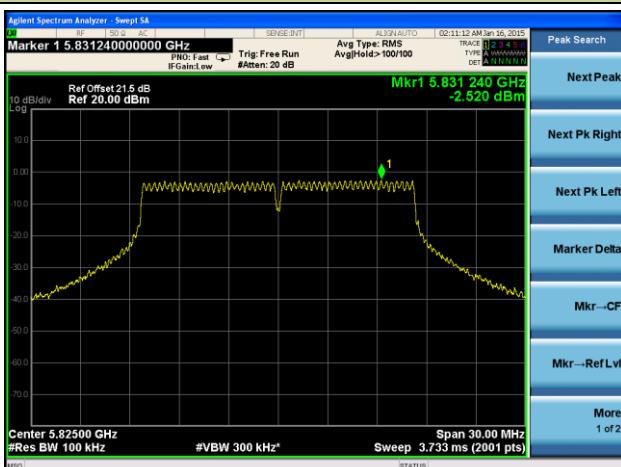
Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)



802.11n-HT20 Power Spectral Density - Ant 2 / Ant 0 + 1 + 2 + 3

Channel 36 (5180MHz)



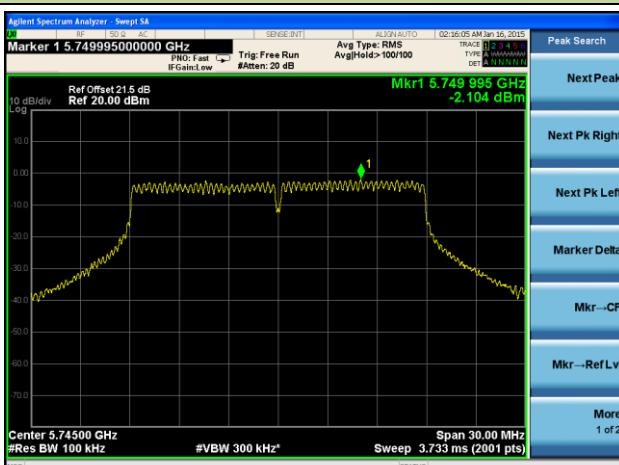
Channel 44 (5220MHz)



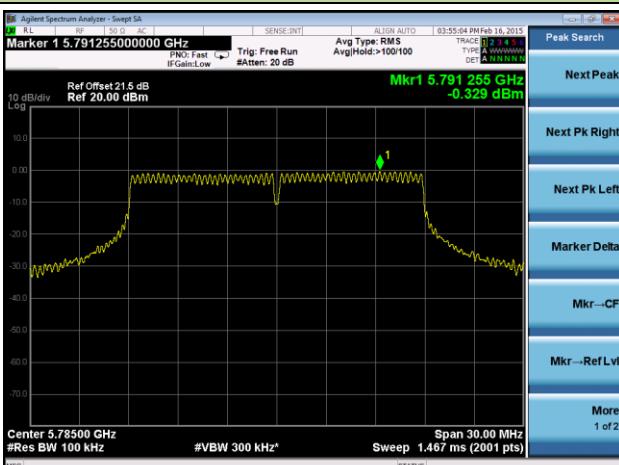
Channel 48 (5240MHz)



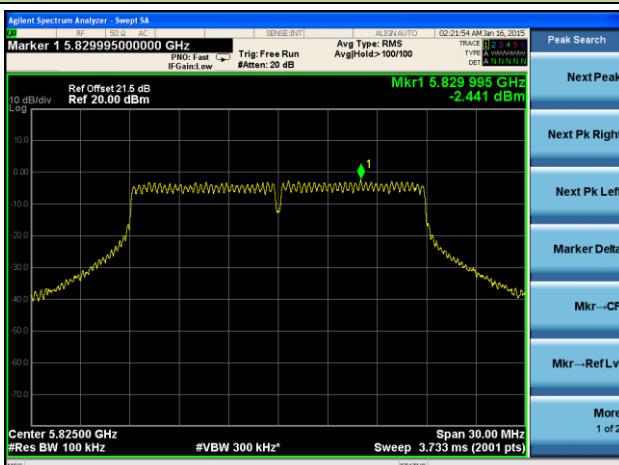
Channel 149 (5745MHz)



Channel 157 (5785MHz)

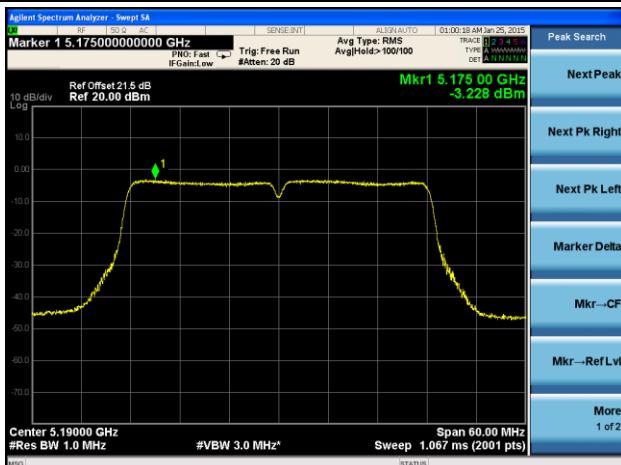


Channel 165 (5825MHz)



802.11n-HT40 Power Spectral Density - Ant 2 / Ant 0 + 1 + 2 + 3

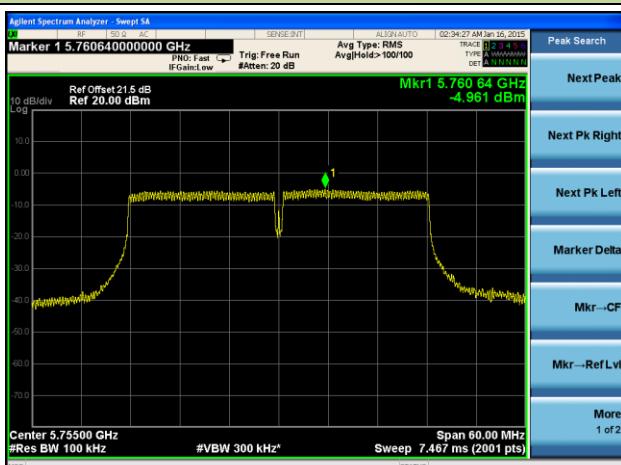
Channel 38 (5190MHz)



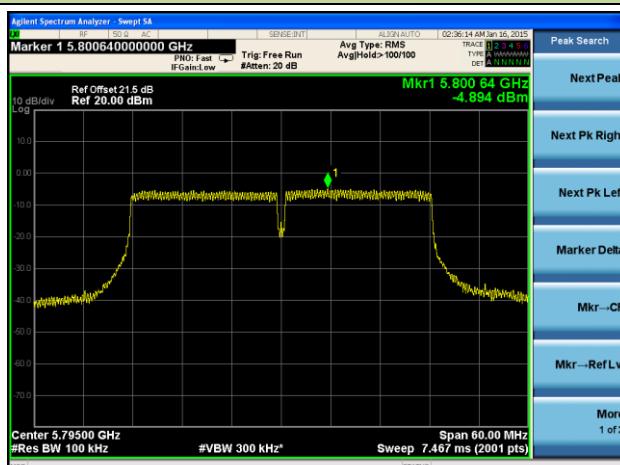
Channel 46 (5230MHz)



Channel 151 (5755MHz)



Channel 159 (5795MHz)



802.11ac-VHT20 Power Spectral Density - Ant 2 / Ant 0 + 1 + 2 + 3

Channel 36 (5180MHz)



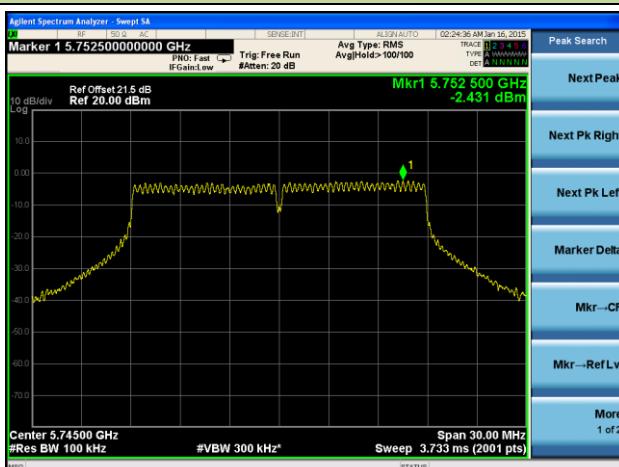
Channel 44 (5220MHz)



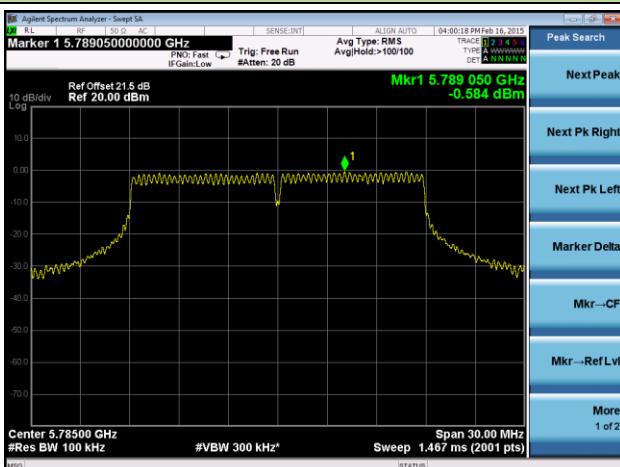
Channel 48 (5240MHz)



Channel 149 (5745MHz)



Channel 157 (5785MHz)

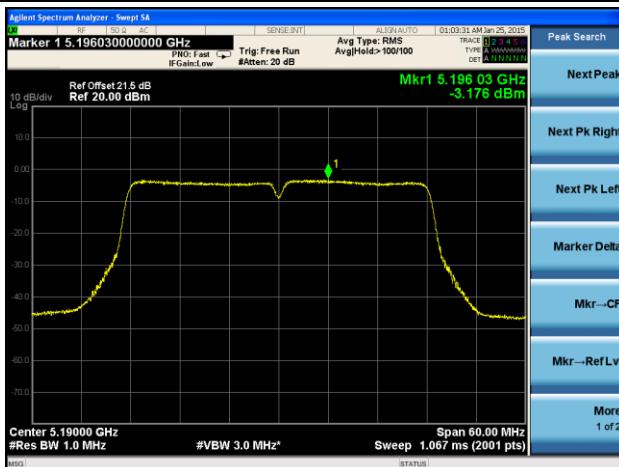


Channel 165 (5825MHz)



802.11ac-VHT40 Power Spectral Density - Ant 2 / Ant 0 + 1 + 2 + 3

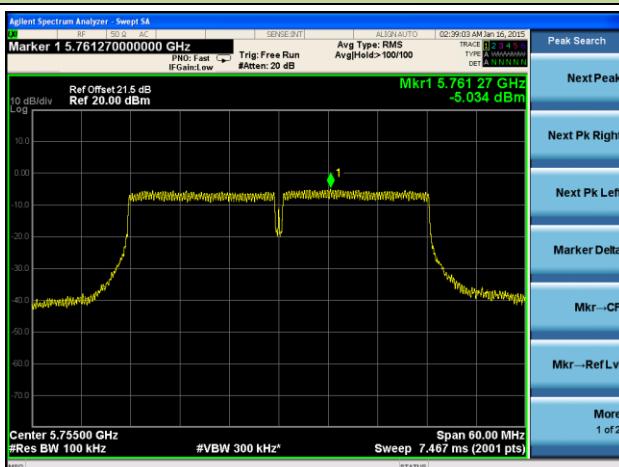
Channel 38 (5190MHz)



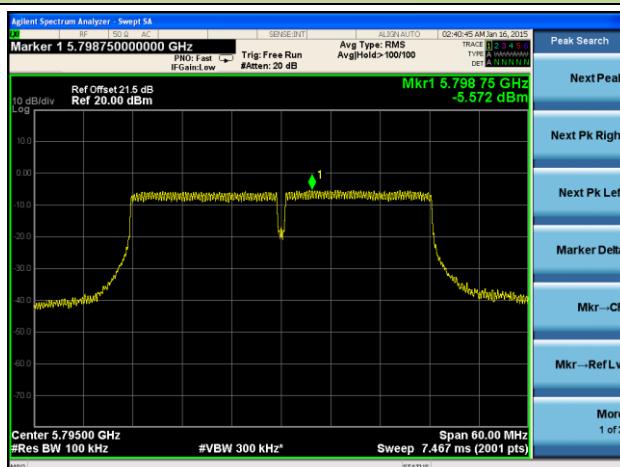
Channel 46 (5230MHz)



Channel 151 (5755MHz)



Channel 159 (5795MHz)



802.11ac-VHT80 Power Spectral Density - Ant 2 / Ant 0 + 1 + 2 + 3

Channel 42 (5210MHz)



Channel 155 (5775MHz)



802.11a Power Spectral Density - Ant 3 / Ant 0 + 1 + 2 + 3

Channel 36 (5180MHz)



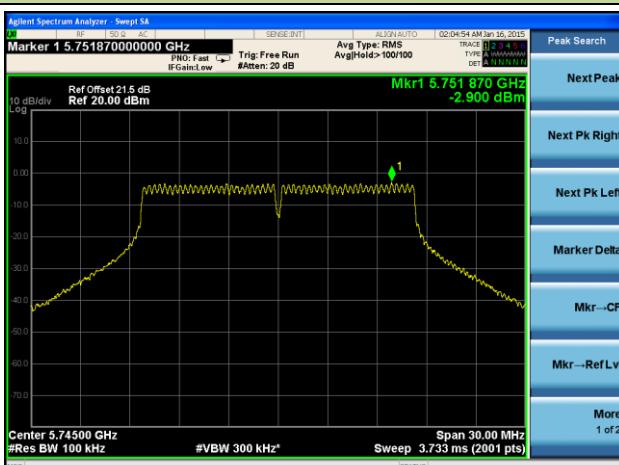
Channel 44 (5220MHz)



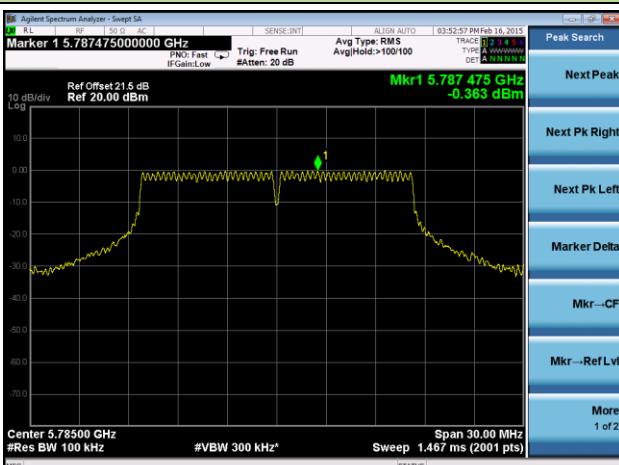
Channel 48 (5240MHz)



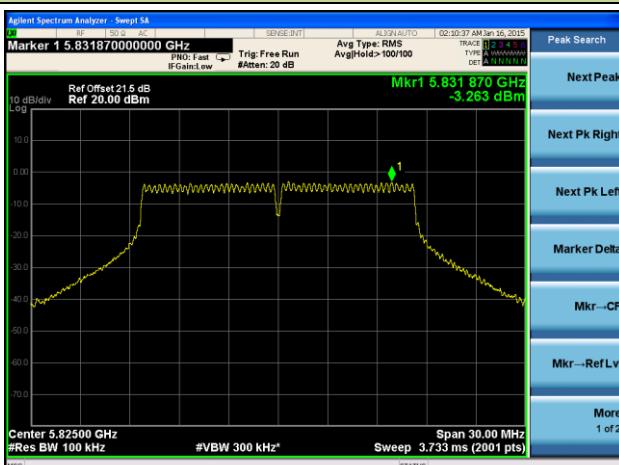
Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)



802.11n-HT20 Power Spectral Density - Ant 3 / Ant 0 + 1 + 2 + 3

Channel 36 (5180MHz)



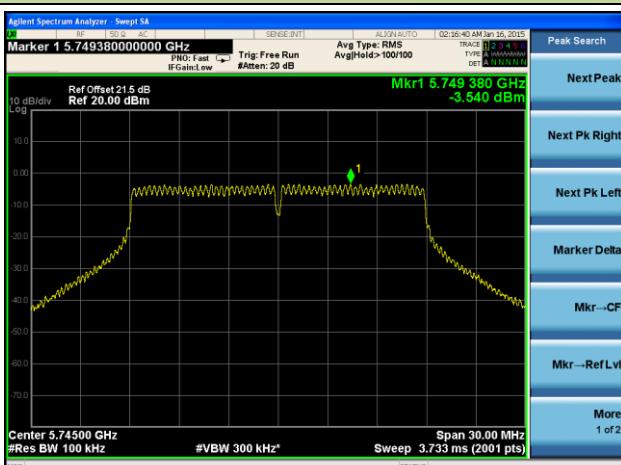
Channel 44 (5220MHz)



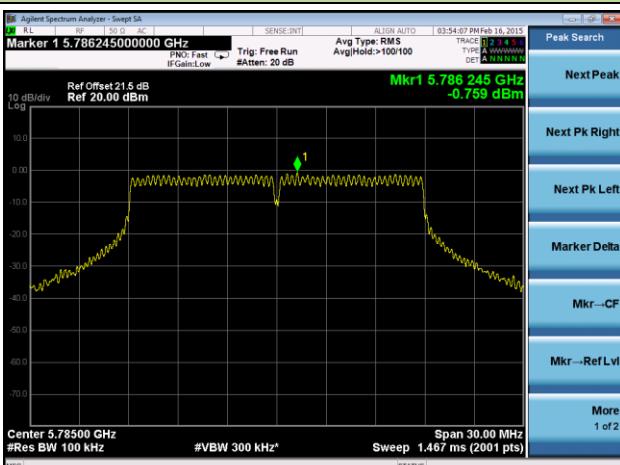
Channel 48 (5240MHz)



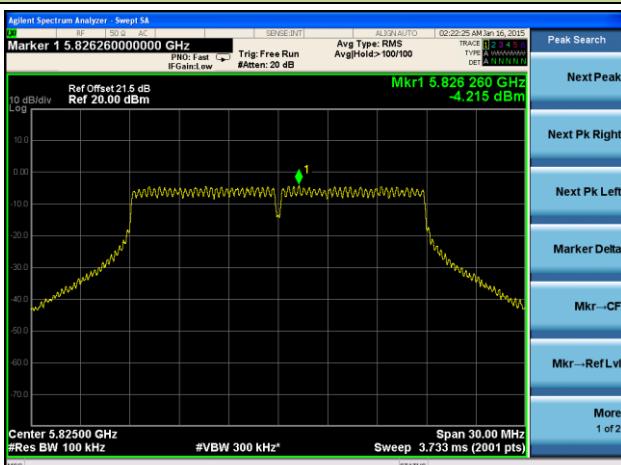
Channel 149 (5745MHz)



Channel 157 (5785MHz)

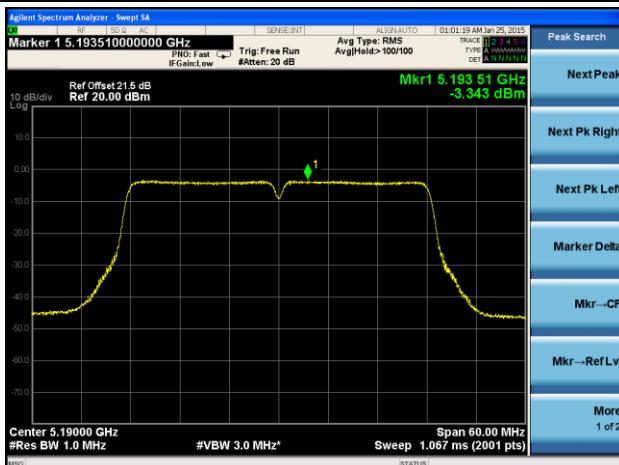


Channel 165 (5825MHz)

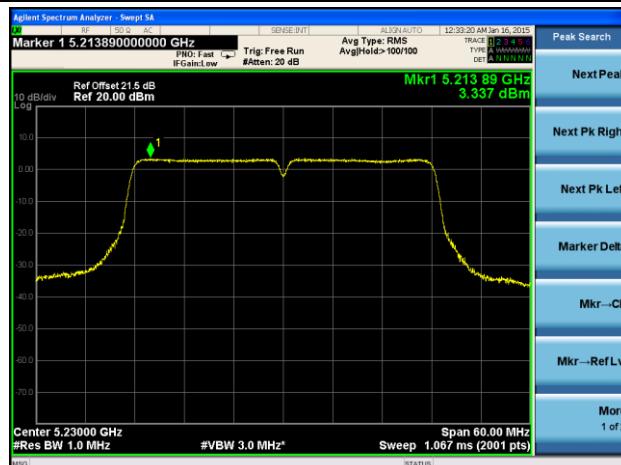


802.11n-HT40 Power Spectral Density - Ant 3 / Ant 0 + 1 + 2 + 3

Channel 38 (5190MHz)



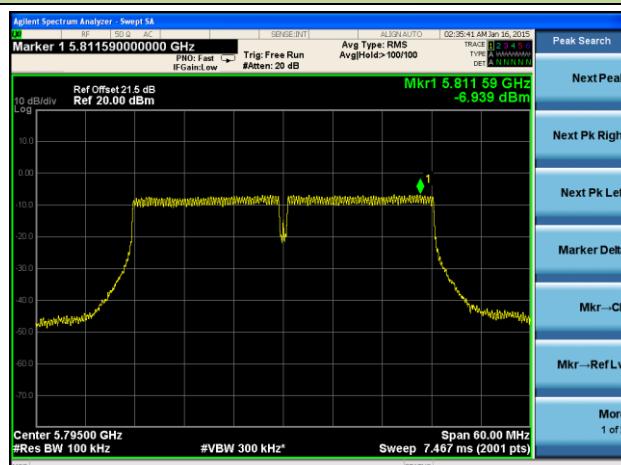
Channel 46 (5230MHz)



Channel 151 (5755MHz)



Channel 159 (5795MHz)



802.11ac-VHT20 Power Spectral Density - Ant 3 / Ant 0 + 1 + 2 + 3

Channel 36 (5180MHz)



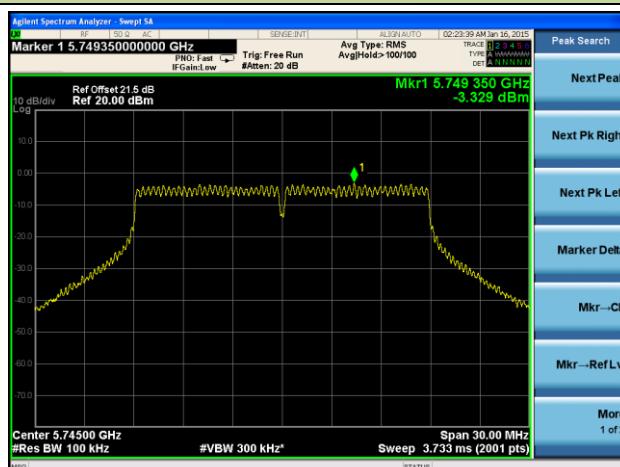
Channel 44 (5220MHz)



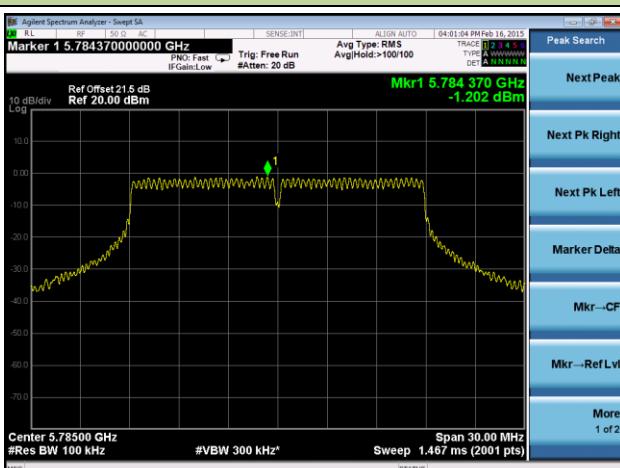
Channel 48 (5240MHz)



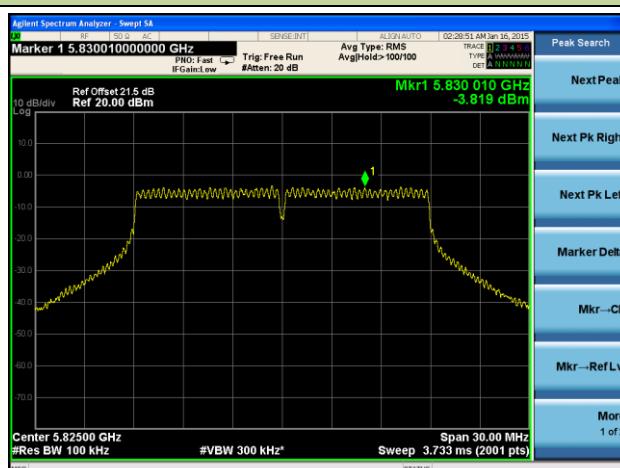
Channel 149 (5745MHz)



Channel 157 (5785MHz)

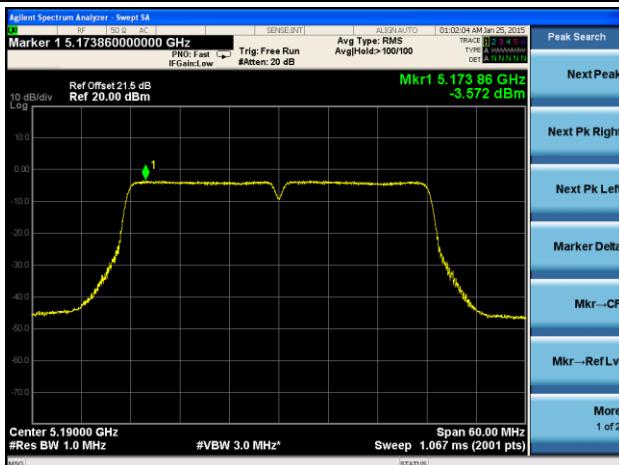


Channel 165 (5825MHz)

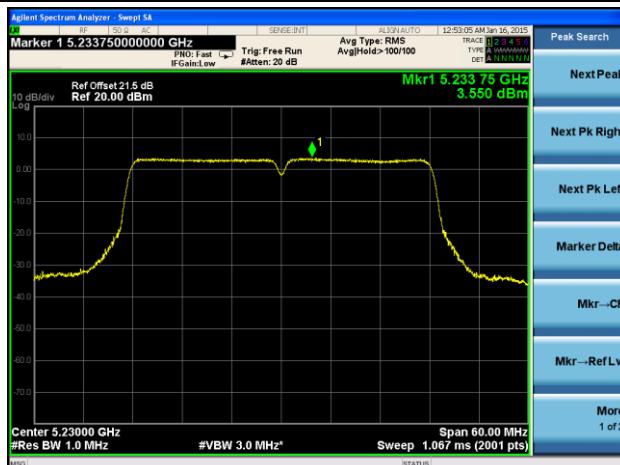


802.11ac-VHT40 Power Spectral Density - Ant 3 / Ant 0 + 1 + 2 + 3

Channel 38 (5190MHz)



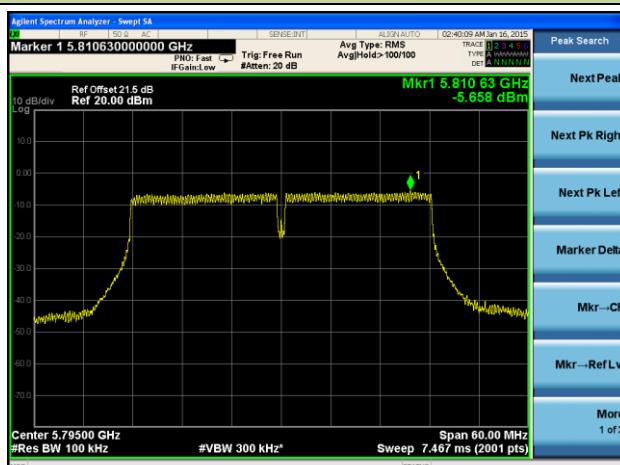
Channel 46 (5230MHz)



Channel 151 (5755MHz)



Channel 159 (5795MHz)



802.11ac-VHT80 Power Spectral Density - Ant 3 / Ant 0 + 1 + 2 + 3

Channel 42 (5210MHz)



Channel 155 (5775MHz)



7.7. Frequency Stability Measurement

7.7.1. 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.

7.7.2. Test Procedure Used

Frequency Stability Under Temperature Variations:

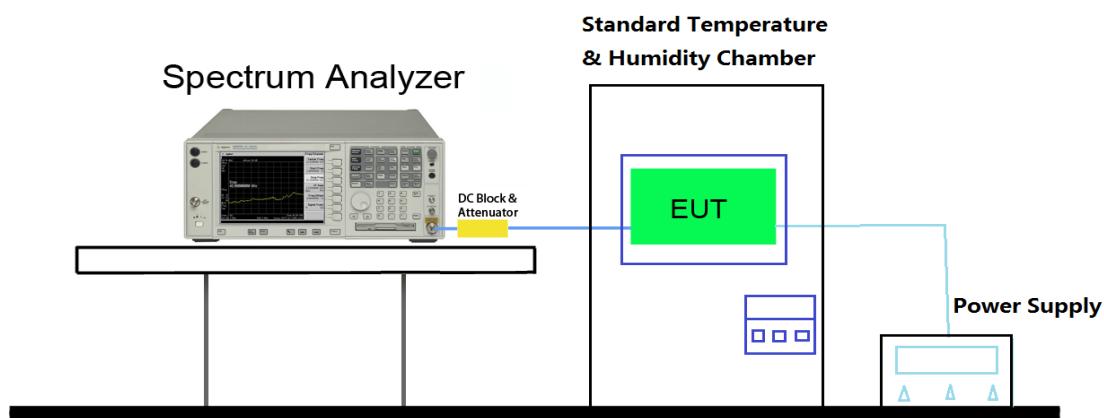
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain 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 ($\pm 15\%$) and endpoint, record the maximum frequency change.

7.7.3. Test Setup



7.7.4. Test Result

Voltage (%)	Power (VAC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	120	+ 20 (Ref)	5219994355	-5645.29	-0.000108
			5784991343	-8657.29	-0.000150
		- 30	5220019665	19665.45	0.000377
			5785030096	30096.41	0.000520
		- 20	5220016259	16259.40	0.000311
			5784998354	-1645.81	-0.000028
		- 10	5219996733	-3267.19	-0.000063
			5785003459	3459.18	0.000060
		0	5220002148	2148.02	0.000041
			5785001559	1559.11	0.000027
		+ 10	5219993271	-6728.56	-0.000129
			5784991871	-8129.20	-0.000141
		+ 20	5219993355	-6645.29	-0.000127
			5784991343	-8657.29	-0.000150
		+ 30	5219994801	-5199.46	-0.000100
			5784991342	-8657.69	-0.000150
		+ 40	5219993386	-6613.68	-0.000127
			5784991768	-8231.80	-0.000142
		+ 50	5219993081	-6918.74	-0.000133
			5784997630	-2369.79	-0.000041
115%	138	+ 20	5219994290	-5709.65	-0.000109
			5784992080	-7920.07	-0.000137
85%	102	+ 20	5219996385	-3615.29	-0.000069
			5784992665	-7334.87	-0.000127

7.8. Radiated Spurious Emission Measurement

7.8.1. 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

7.8.2. Test Procedure Used

KDB 789033 D02v01 - Section G

7.8.3. 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

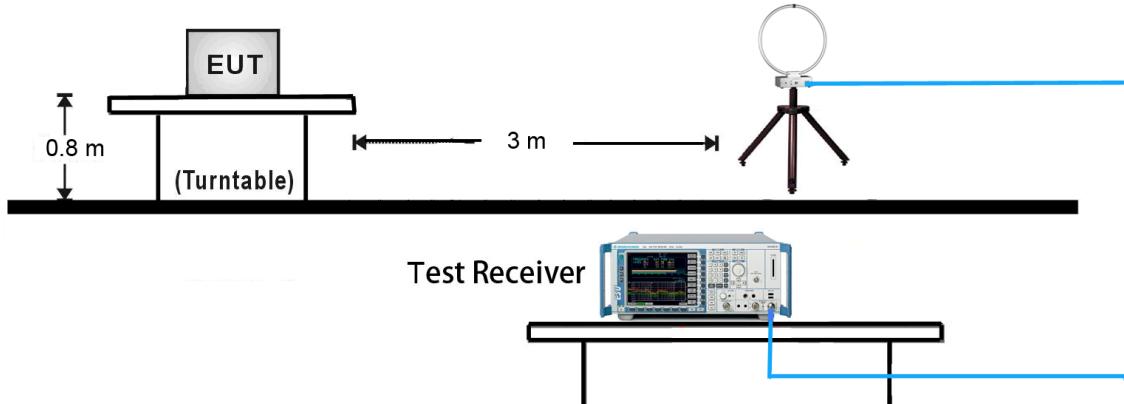
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 120 kHz
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

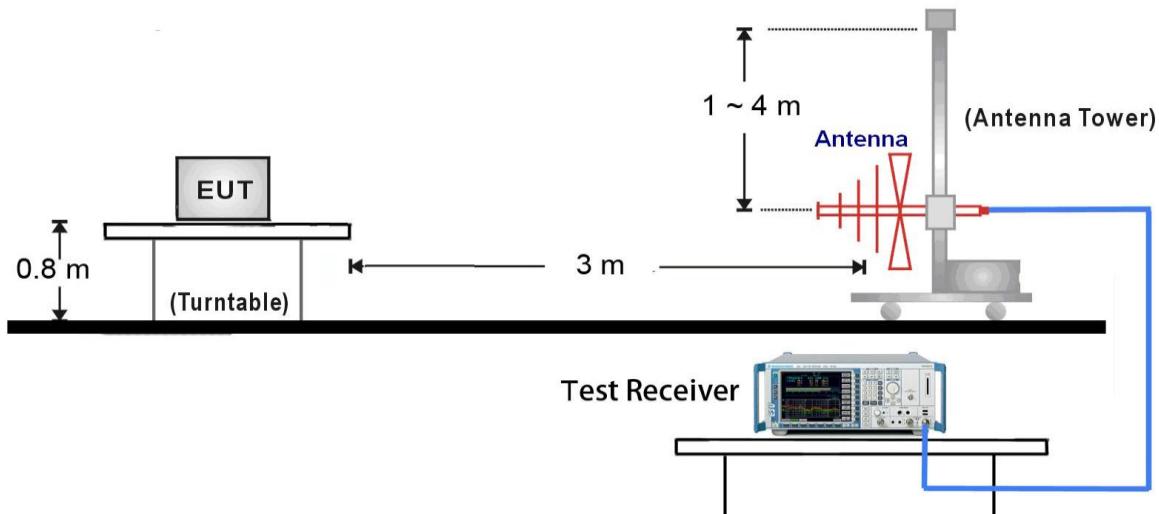
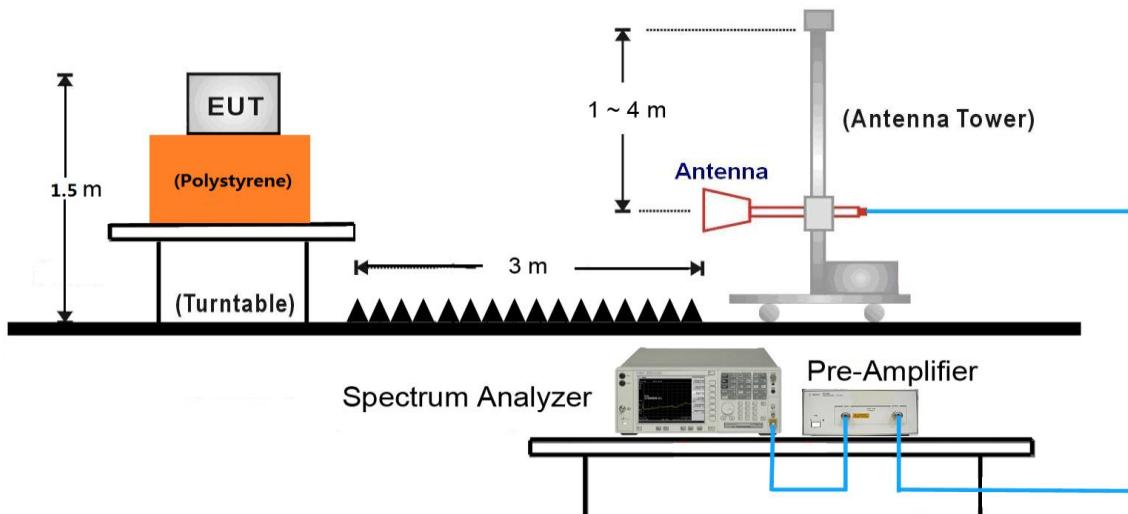
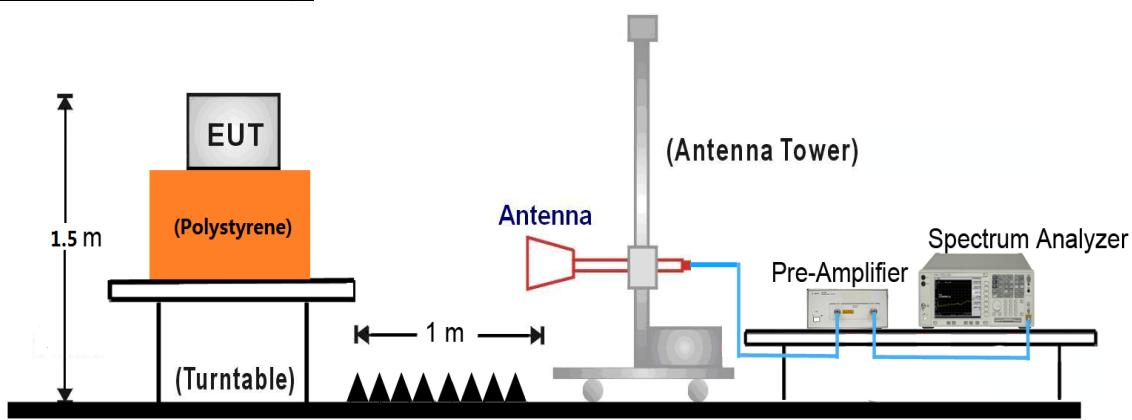
Average Measurements above 1GHz (Method AD)

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

7.8.4. Test Setup

9kHz ~ 30MHz Test Setup:



30MHz ~ 1GHz Test Setup:

1GHz ~18GHz Test Setup:

18GHz ~40GHz Test Setup:


7.8.5. Test Result

Test Mode:	802.11a	Test Site:	AC1
Test Channel:	36	Test Engineer:	Roy Cheng
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 (dB μ V)	Factor (dB)	Measure Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector	Polarization
	7409.0	38.3	8.0	46.3	74.0	-27.7	Peak	Horizontal
*	10358.5	39.0	12.2	51.2	88.2	-37.0	Peak	Horizontal
	15543.5	40.8	12.2	53.0	74.0	-21.0	Peak	Horizontal
*	16674.0	36.1	14.4	50.5	88.2	-37.7	Peak	Horizontal
	7383.5	37.8	7.9	45.7	74.0	-28.3	Peak	Vertical
*	10367.0	43.7	12.2	55.9	88.2	-32.3	Peak	Vertical
	11506.0	37.4	12.8	50.2	74.0	-23.8	Peak	Vertical
*	13546.0	36.0	13.9	49.9	88.2	-38.3	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 dB μ V/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 68.2dB μ V/m.

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

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

Test Mode:	802.11a	Test Site:	AC1
Test Channel:	44	Test Engineer:	Roy Cheng
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 (dB μ V)	Factor (dB)	Measure Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector	Polarization
	8097.5	38.0	8.6	46.6	74.0	-27.4	Peak	Horizontal
*	10443.5	41.2	12.0	53.2	88.2	-35.0	Peak	Horizontal
	15660.3	30.4	12.0	42.4	54.0	-11.6	Average	Horizontal
	15662.5	46.2	12.0	58.2	74.0	-15.8	Peak	Horizontal
*	16648.5	35.6	14.1	49.7	88.2	-38.5	Peak	Horizontal
	7494.0	37.9	8.2	46.1	74.0	-27.9	Peak	Vertical
*	10443.5	46.8	12.0	58.8	88.2	-29.4	Peak	Vertical
	15662.5	40.7	12.0	52.7	74.0	-21.3	Peak	Vertical
*	16733.5	35.5	14.6	50.1	88.2	-38.1	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 dB μ V/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 68.2dB μ V/m.

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

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

Test Mode:	802.11a	Test Site:	AC1
Test Channel:	48	Test Engineer:	Roy Cheng
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 (dB μ V)	Factor (dB)	Measure Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector	Polarization
	9100.5	37.0	9.3	46.3	74.0	-27.7	Peak	Horizontal
*	10477.5	42.8	12.2	55.0	88.2	-33.2	Peak	Horizontal
	15720.4	28.9	11.8	40.7	54.0	-13.3	Average	Horizontal
	15722.0	45.6	11.8	57.4	74.0	-16.6	Peak	Horizontal
*	16580.5	34.8	13.7	48.5	88.2	-39.7	Peak	Horizontal
	8216.5	37.6	8.2	45.8	74.0	-28.2	Peak	Vertical
*	10477.5	46.7	12.2	58.9	88.2	-29.3	Peak	Vertical
	15722.0	41.2	11.8	53.0	74.0	-21.0	Peak	Vertical
*	16512.5	35.2	13.5	48.7	88.2	-39.5	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 dB μ V/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 68.2dB μ V/m.

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

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

Test Mode:	802.11a	Test Site:	AC1
Test Channel:	149	Test Engineer:	Roy Cheng
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 (dB μ V)	Factor (dB)	Measure Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector	Polarization
	8318.3	38.0	8.0	46.0	74.0	-28.0	Peak	Horizontal
*	11500.5	41.0	12.8	53.8	88.2	-34.4	Peak	Horizontal
	13389.4	35.7	13.7	49.4	74.0	-24.6	Peak	Horizontal
*	17252.2	42.4	15.9	58.3	88.2	-29.9	Peak	Horizontal
	7663.2	37.6	8.0	45.6	74.0	-28.4	Peak	Vertical
*	9662.7	36.0	11.0	47.0	88.2	-41.2	Peak	Vertical
	11492.0	38.4	12.7	51.1	74.0	-22.9	Peak	Vertical
*	17252.2	39.6	15.9	55.5	88.2	-32.7	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 dB μ V/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 68.2dB μ V/m.

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

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