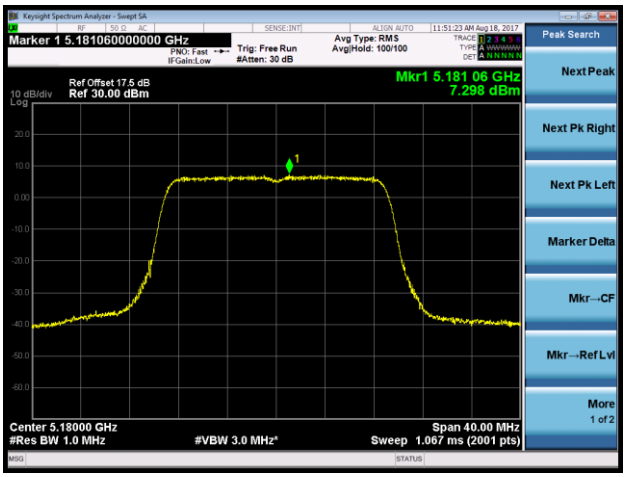
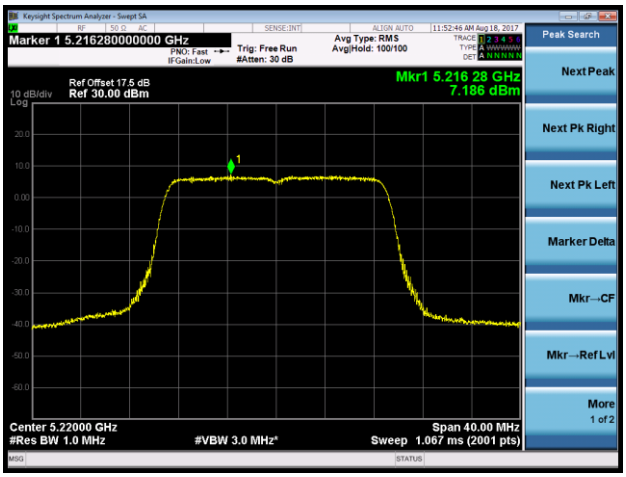
802.11ac-VHT20 Power Spectral Density - Ant 1 / Ant 1 + 2 (CDD Mode)

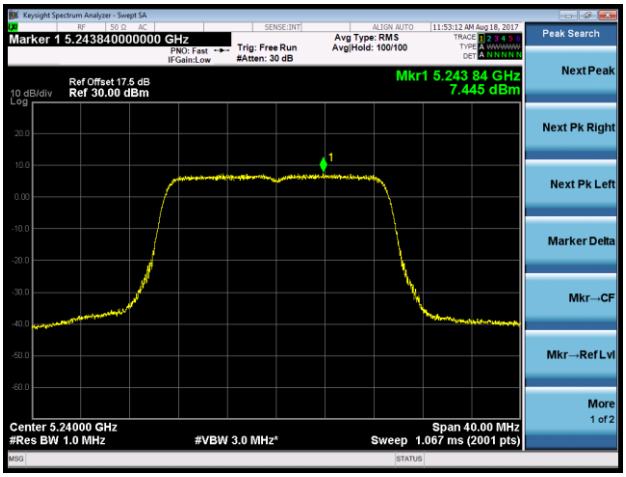
Channel 36 (5180MHz)



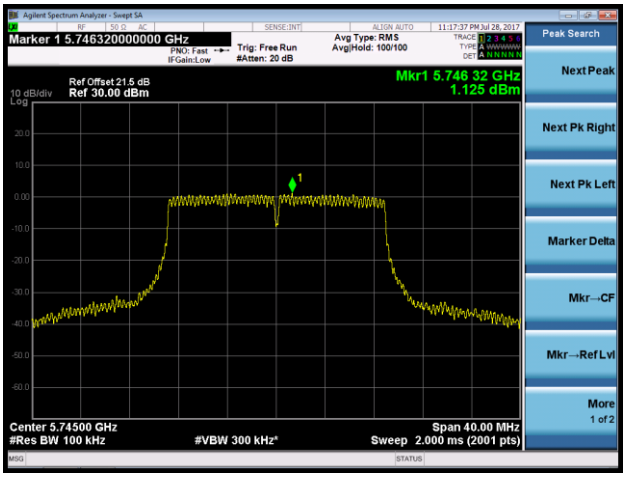
Channel 44 (5220MHz)



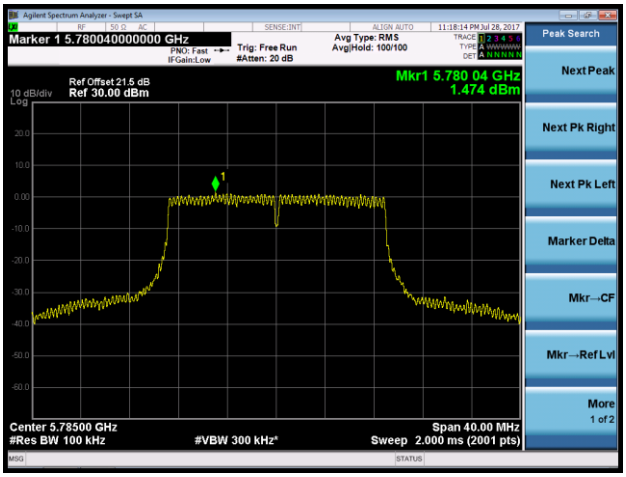
Channel 48 (5240MHz)



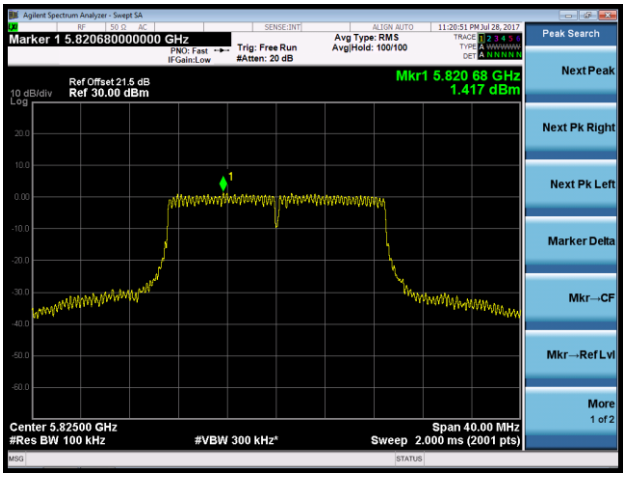
Channel 149 (5745MHz)

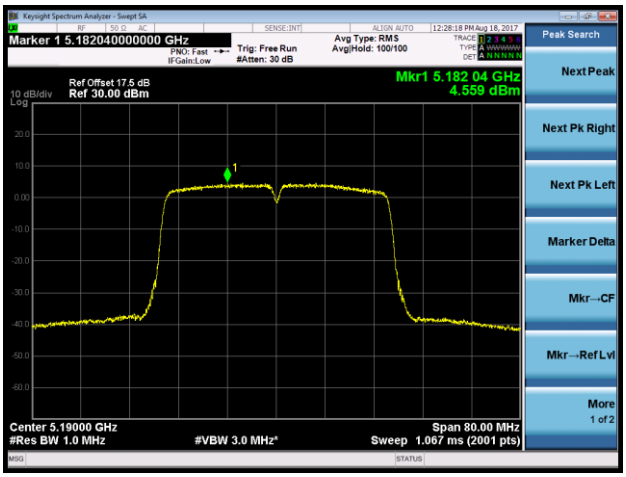
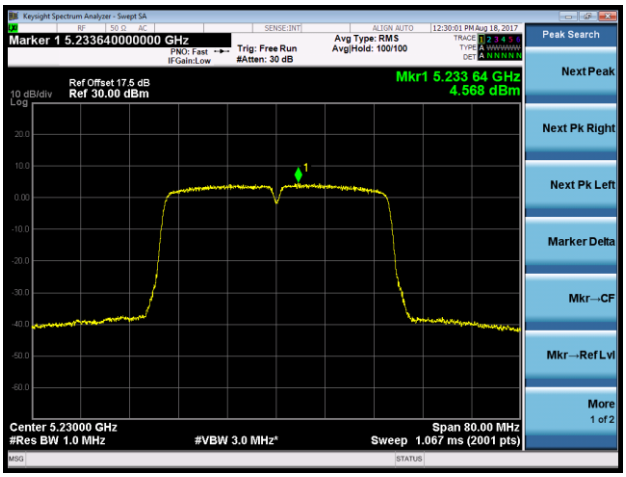
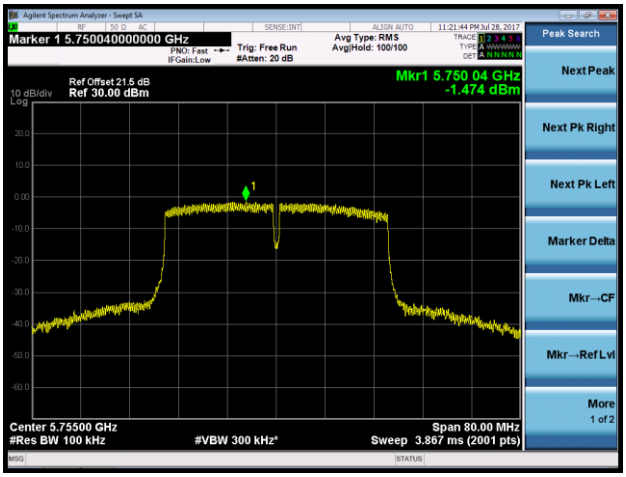
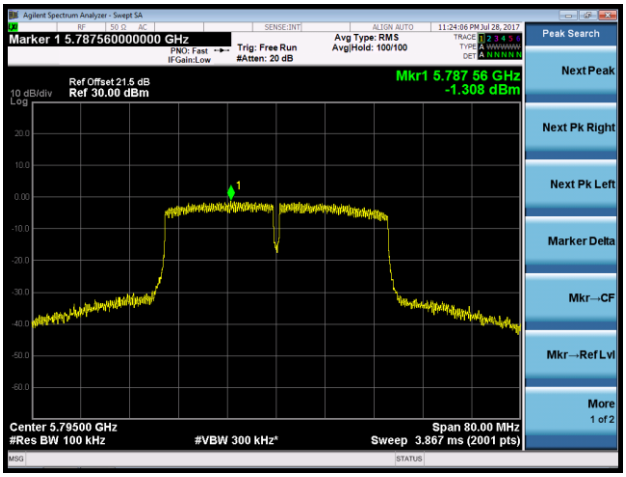
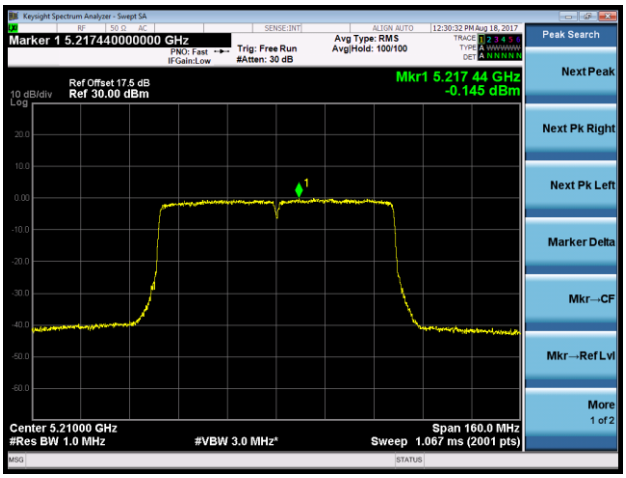
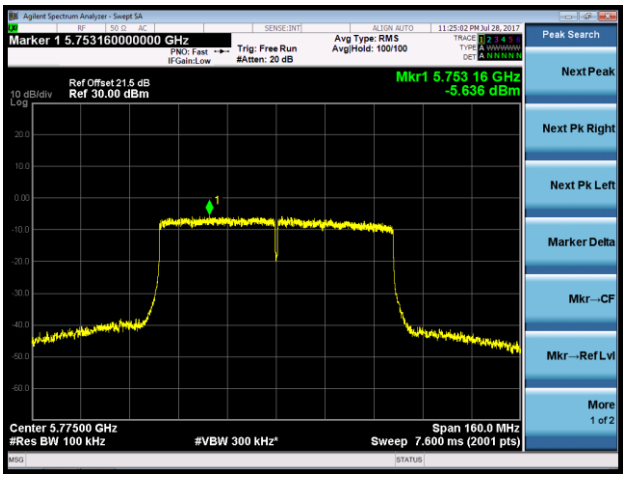


Channel 157 (5785MHz)



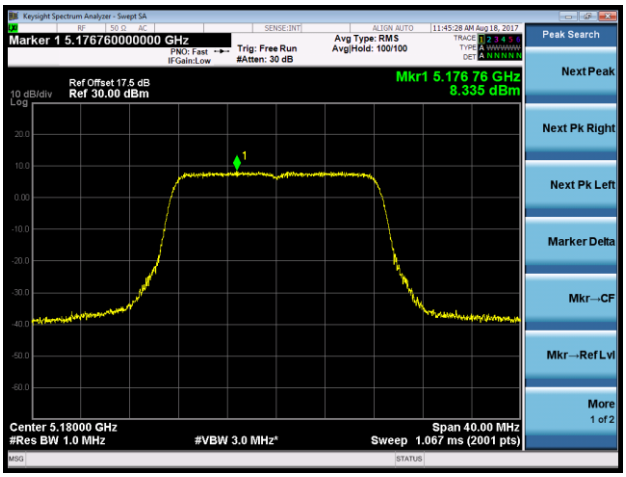
Channel 165 (5825MHz)



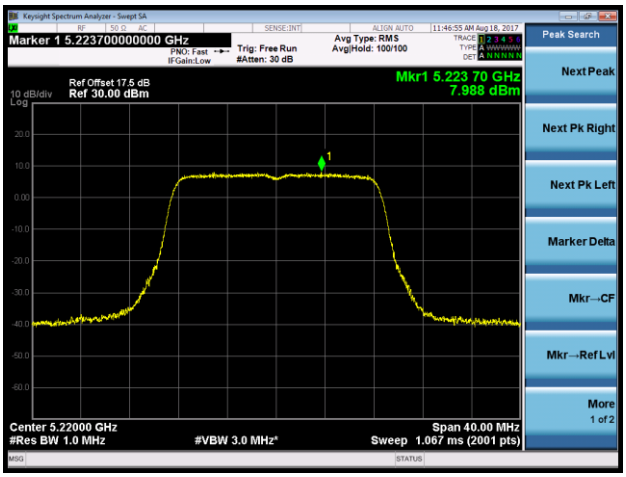
802.11ac-VHT40 Power Spectral Density - Ant 1 / Ant 1 + 2 (CDD Mode)	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
	
Channel 151 (5755MHz)	Channel 159 (5795MHz)
	
802.11ac-VHT80 Power Spectral Density- Ant 1 / Ant 1 + 2 (CDD Mode)	
Channel 42 (5210MHz)	Channel 155 (5775MHz)
	

802.11a Power Spectral Density - Ant 2 / Ant 1 + 2 (CDD Mode)

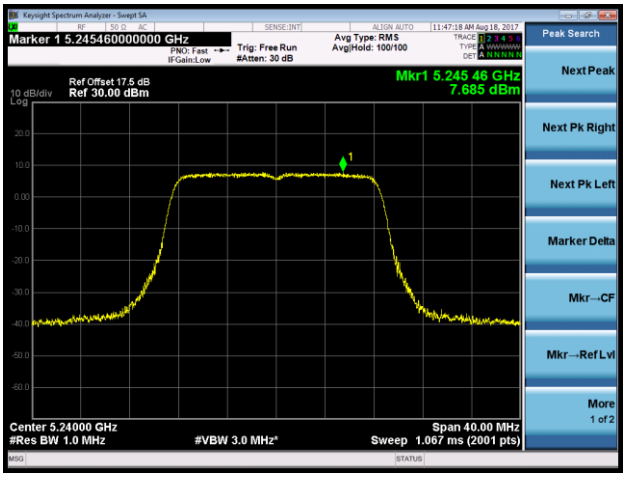
Channel 36 (5180MHz)



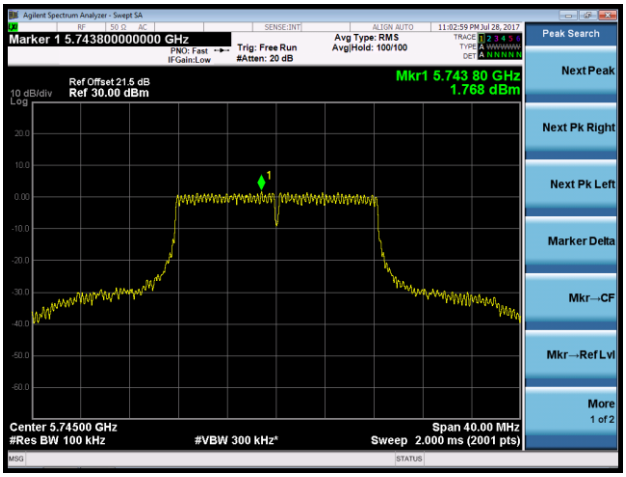
Channel 44 (5220MHz)



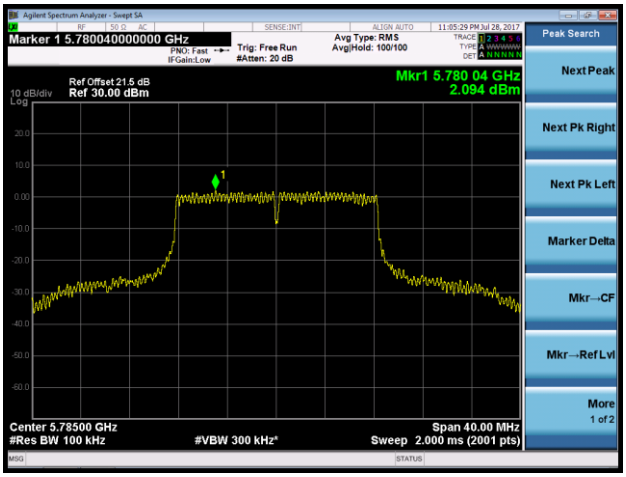
Channel 48 (5240MHz)



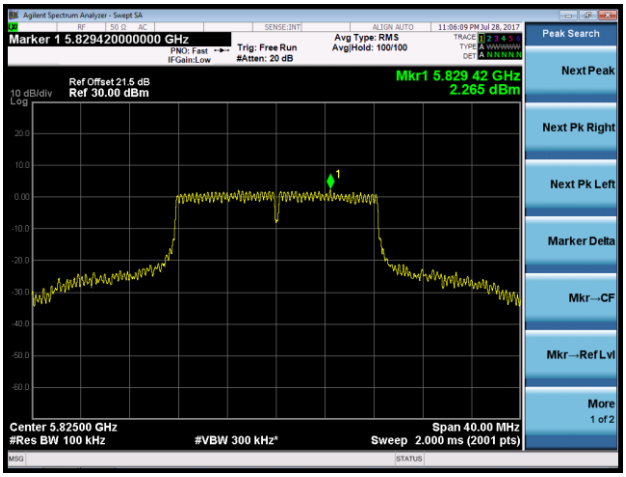
Channel 149 (5745MHz)



Channel 157 (5785MHz)

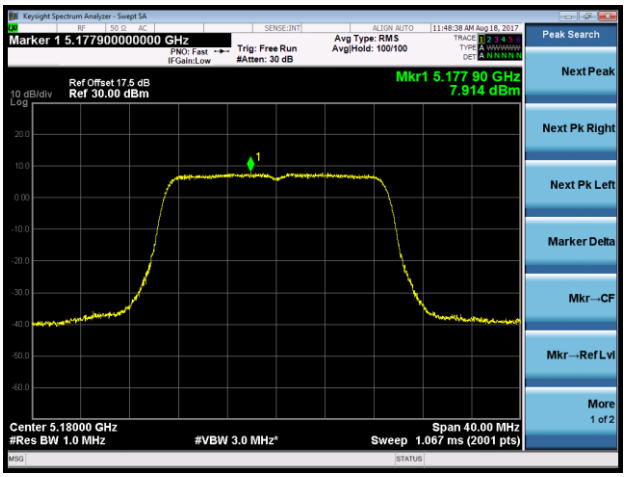


Channel 165 (5825MHz)

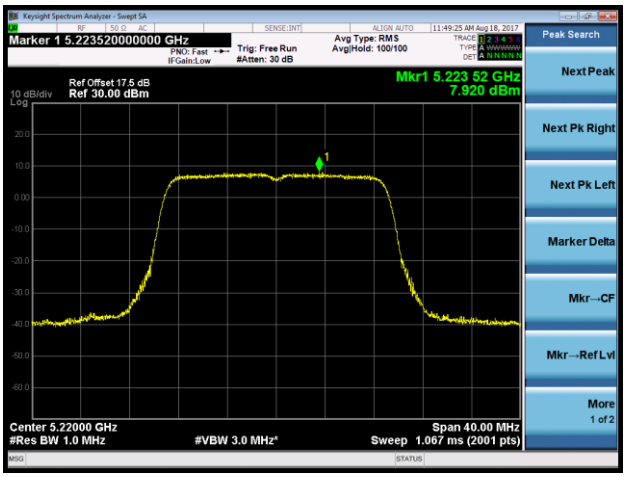


802.11n-HT20 Power Spectral Density- Ant 2 / Ant 1 + 2 (CDD Mode)

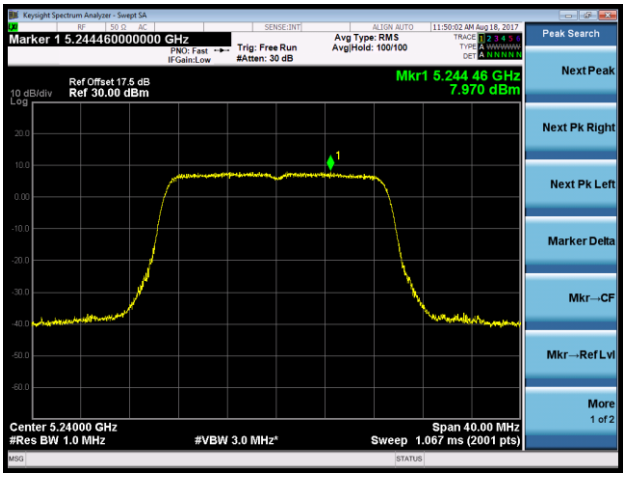
Channel 36 (5180MHz)



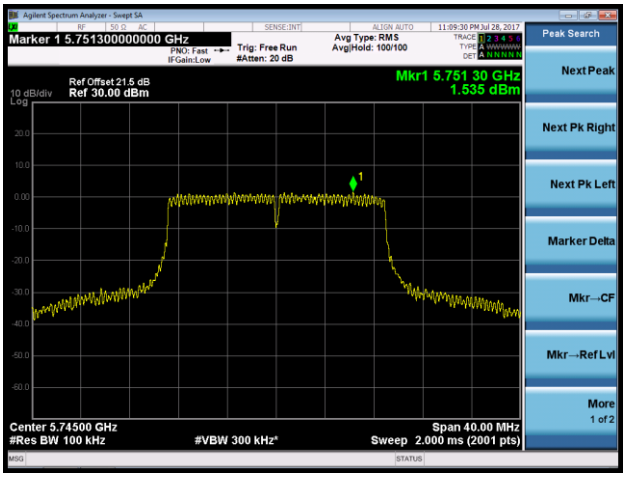
Channel 44 (5220MHz)



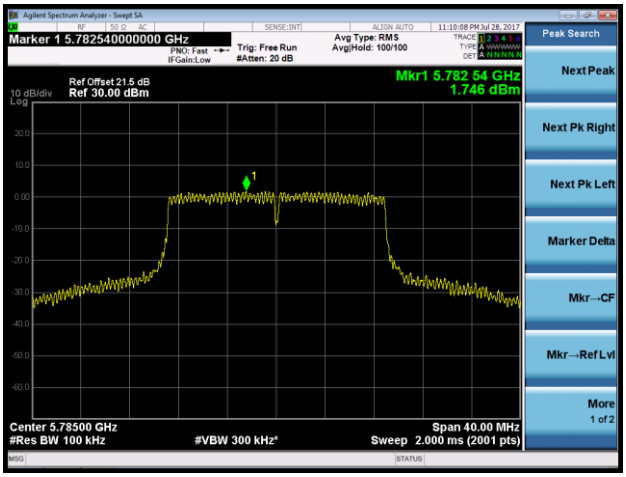
Channel 48 (5240MHz)



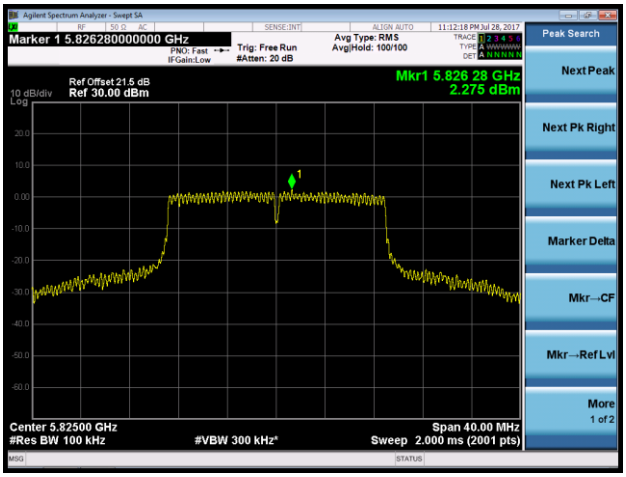
Channel 149 (5745MHz)

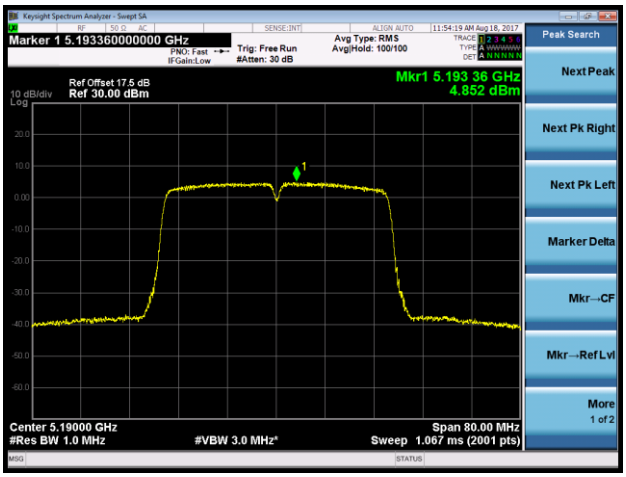
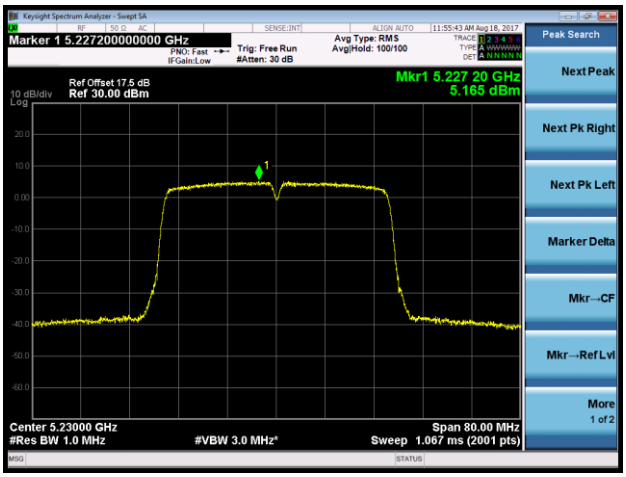
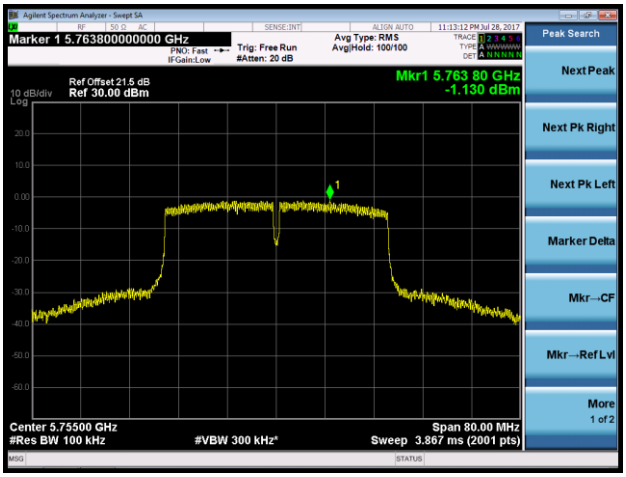
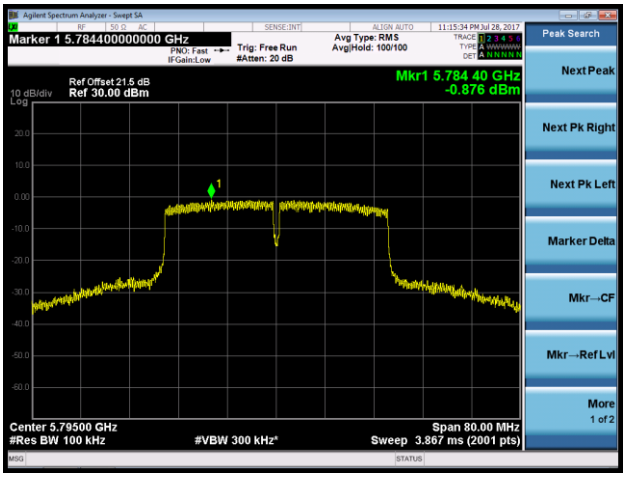


Channel 157 (5785MHz)



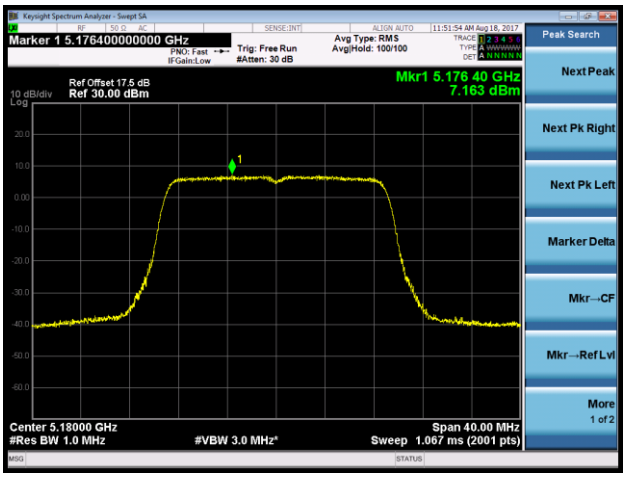
Channel 165 (5825MHz)



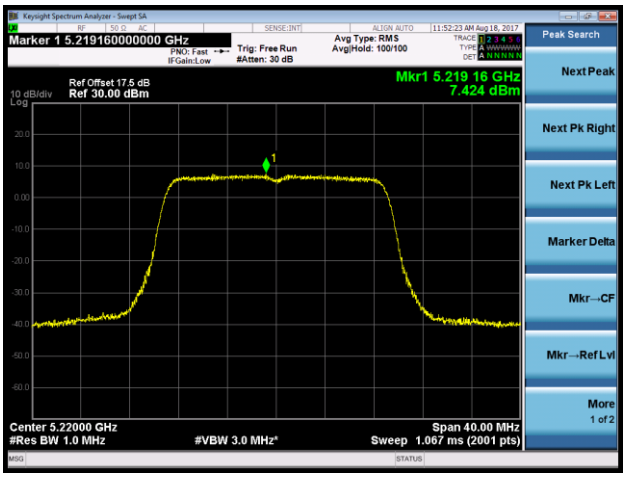
802.11n-HT40 Power Spectral Density- Ant 2 / Ant 1 + 2 (CDD Mode)	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
Channel 151 (5755MHz)	**Channel 159 (5795MHz)**
	

802.11ac-VHT20 Power Spectral Density- Ant 2 / Ant 1 + 2 (CDD Mode)

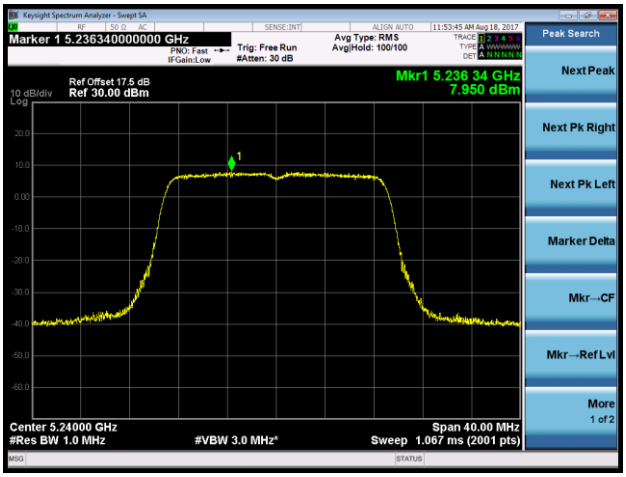
Channel 36 (5180MHz)



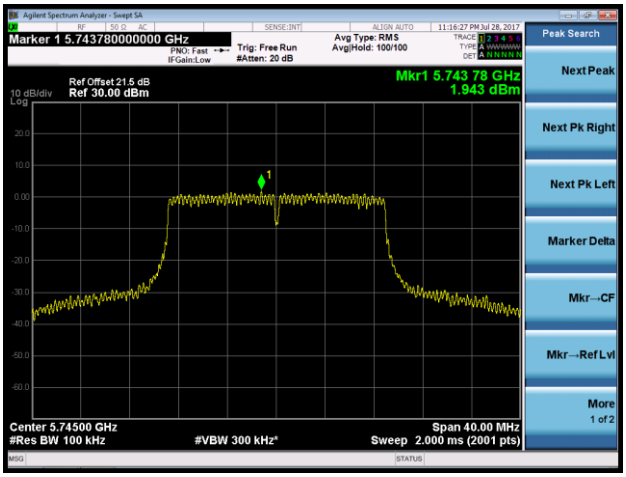
Channel 44 (5220MHz)



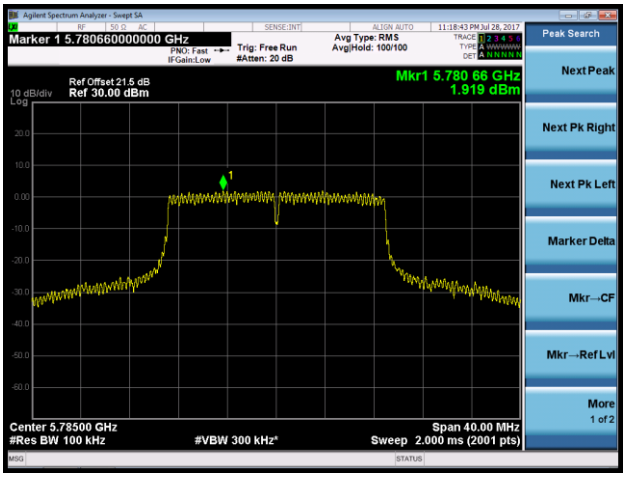
Channel 48 (5240MHz)



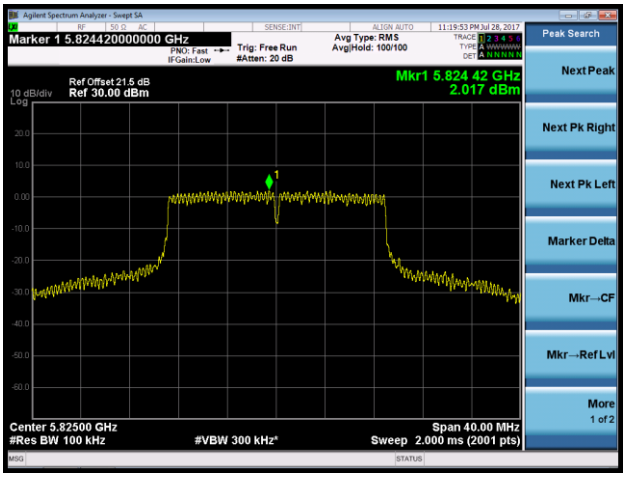
Channel 149 (5745MHz)

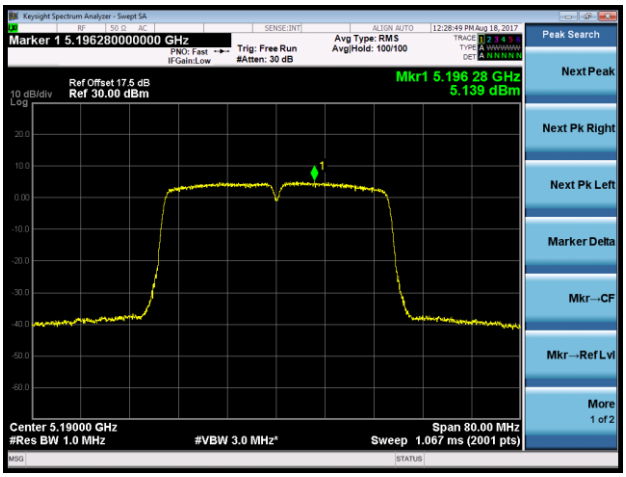
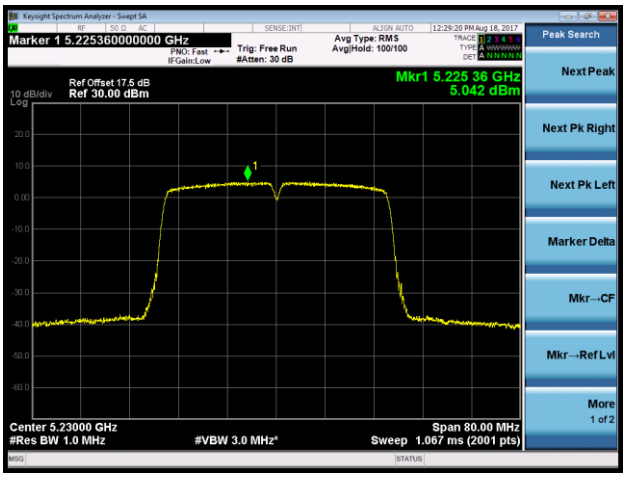
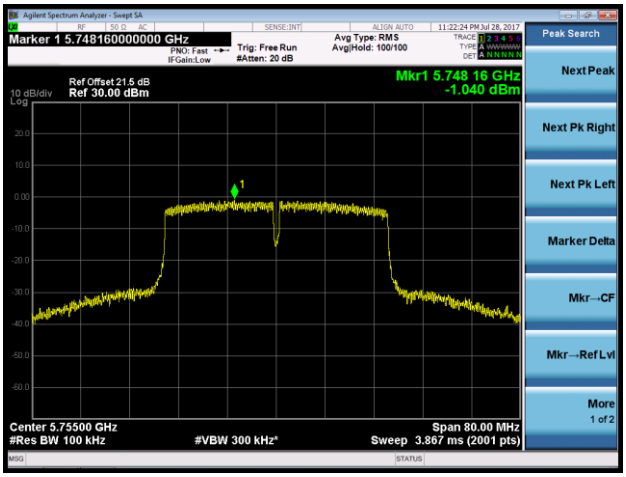
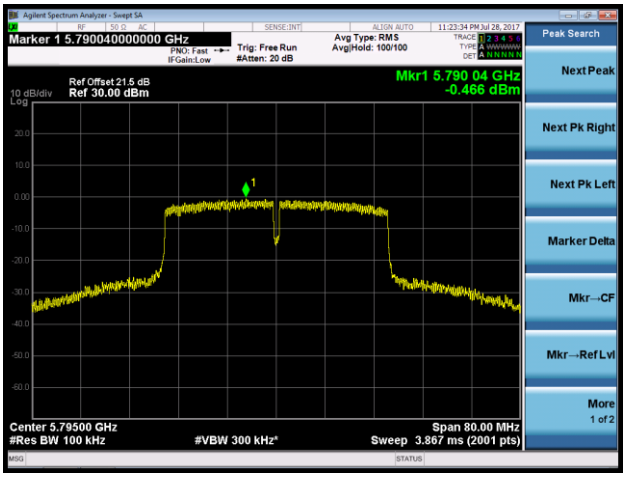
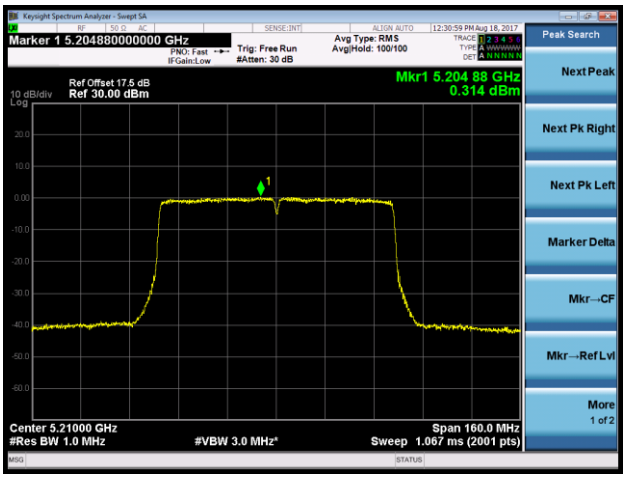
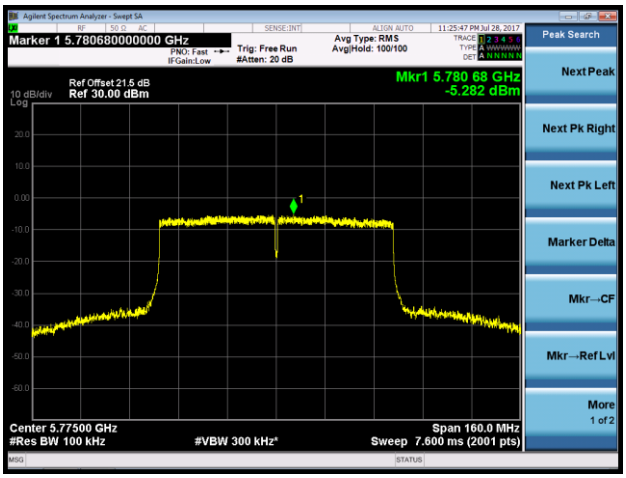


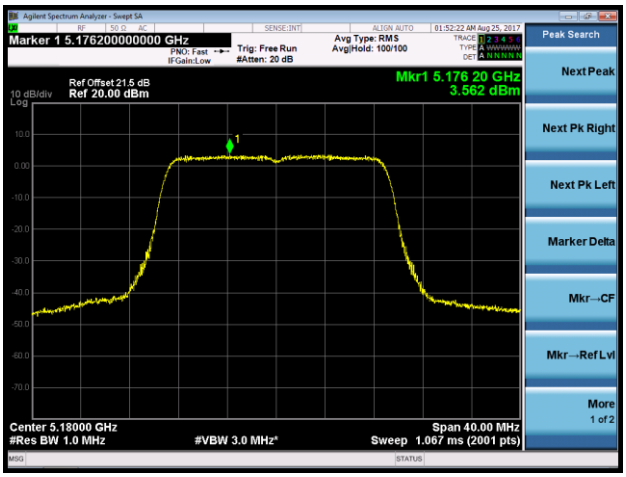
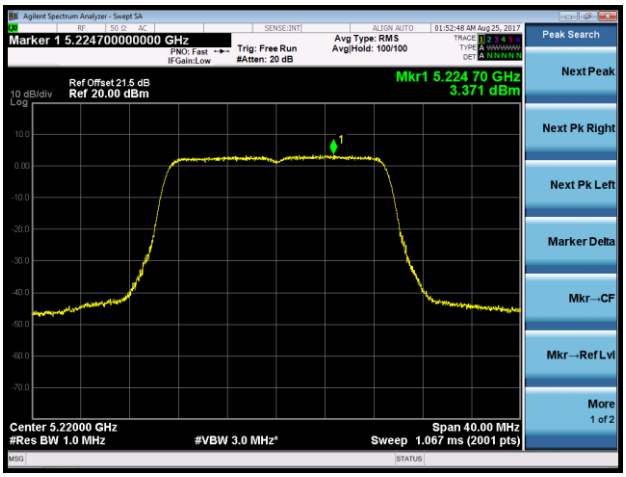
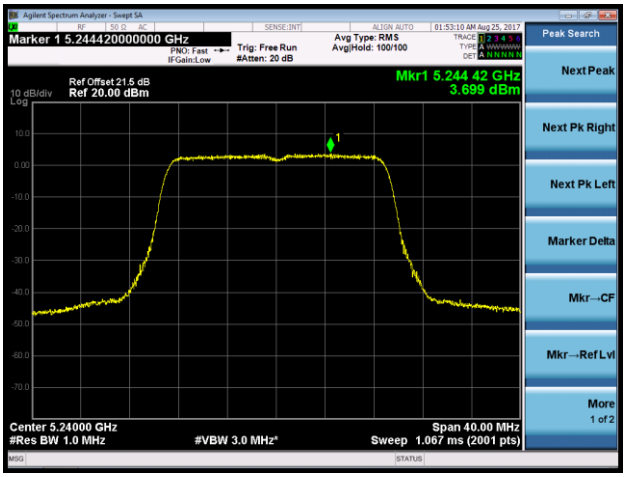
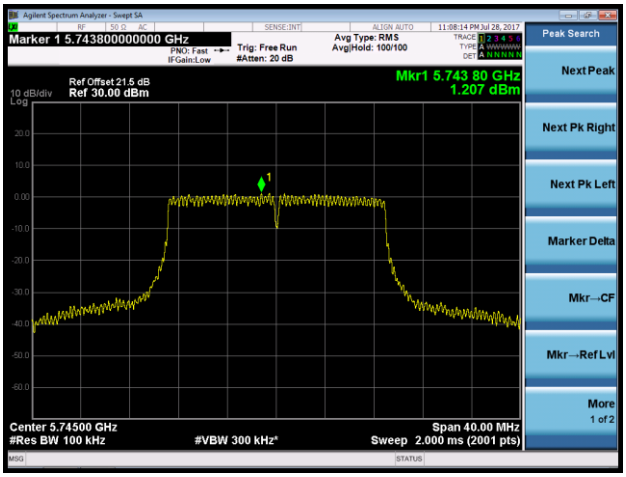
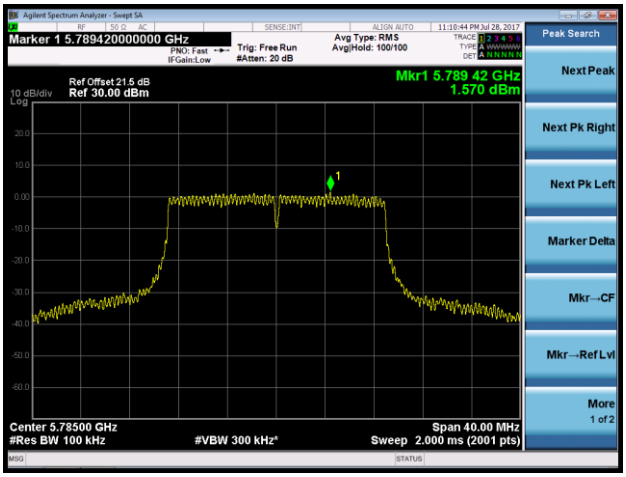
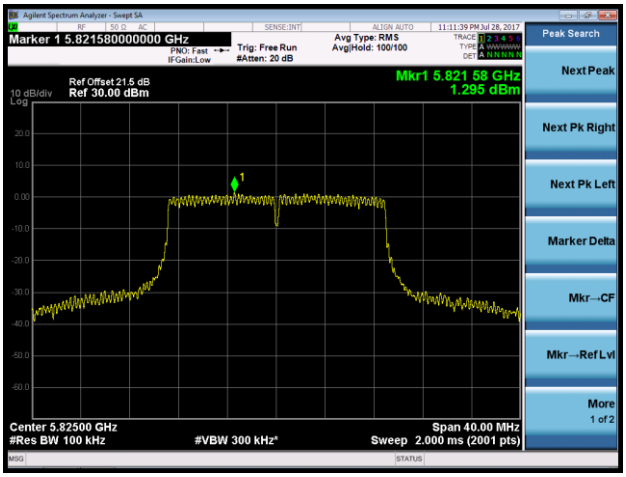
Channel 157 (5785MHz)

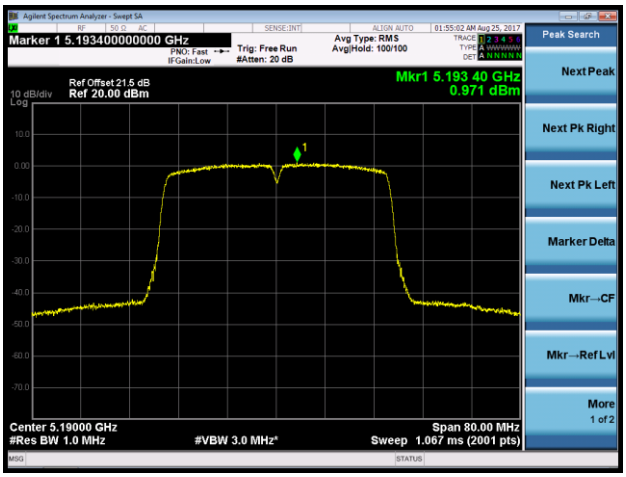
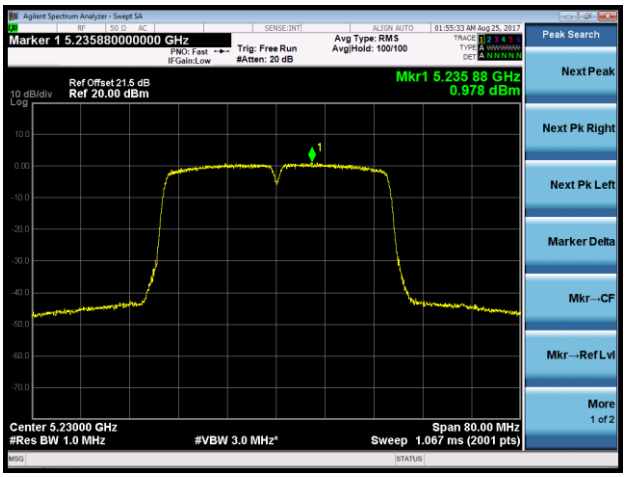
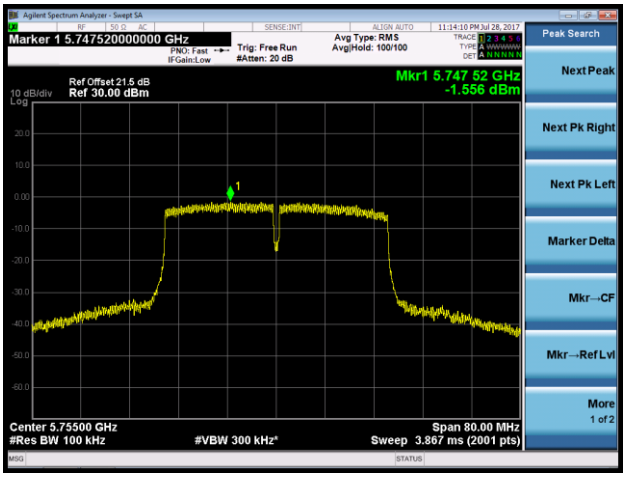
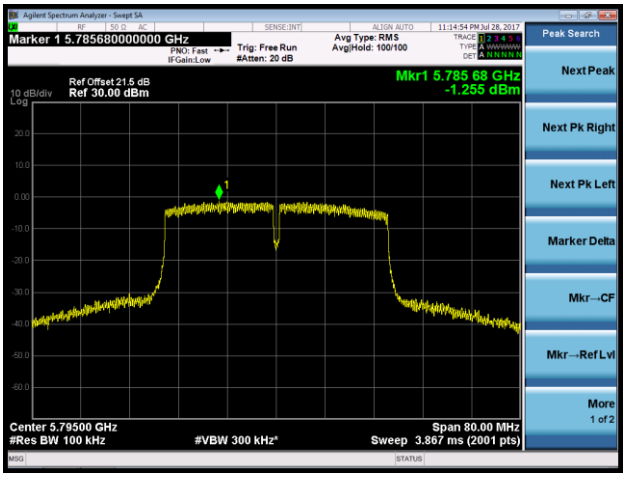


Channel 165 (5825MHz)



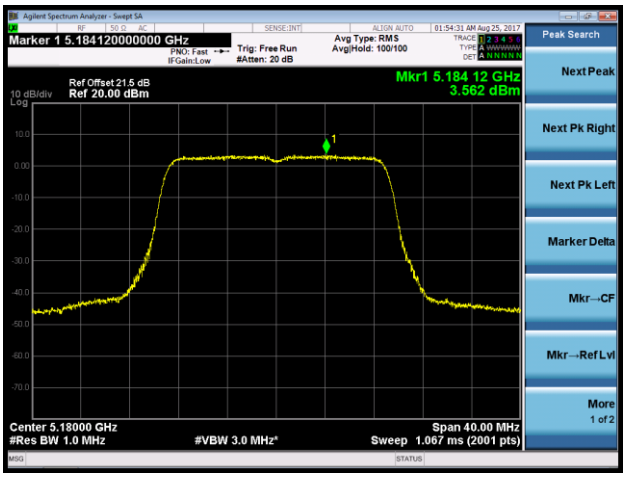
802.11ac-VHT40 Power Spectral Density - Ant 2 / Ant 1 + 2 (CDD Mode)	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
Channel 151 (5755MHz)	**Channel 159 (5795MHz)**
	
802.11ac-VHT80 Power Spectral Density - Ant 2 / Ant 1 + 2 (CDD Mode)	
Channel 42 (5210MHz)	**Channel 155 (5775MHz)**
	

802.11n-HT20 Power Spectral Density - Ant 1 / Ant 1 + 2 (Beam-Forming Mode)	
Channel 36 (5180MHz)	**Channel 44 (5220MHz)**
	
Channel 48 (5240MHz)	**Channel 149 (5745MHz)**
	
Channel 157 (5785MHz)	**Channel 165 (5825MHz)**
	

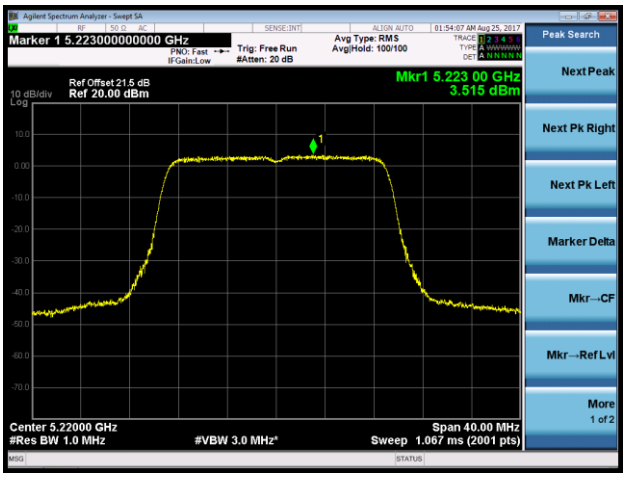
802.11n-HT40 Power Spectral Density - Ant 1 / Ant 1 + 2 (Beam-Forming Mode)	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
Channel 151 (5755MHz)	**Channel 159 (5795MHz)**
	

802.11ac-VHT20 Power Spectral Density- Ant 1 / Ant 1 + 2 (Beam-Forming Mode)

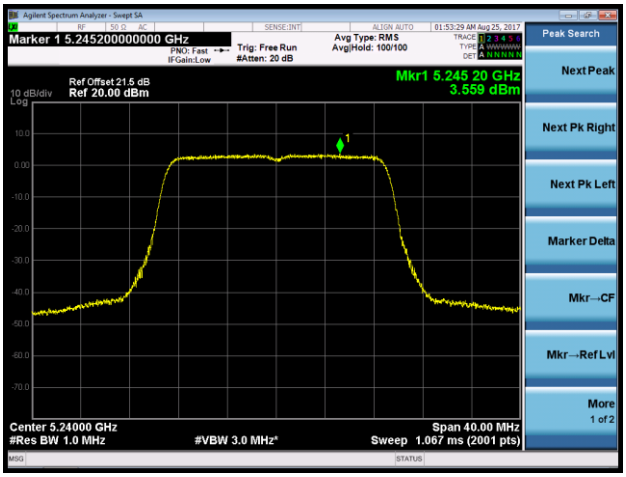
Channel 36 (5180MHz)



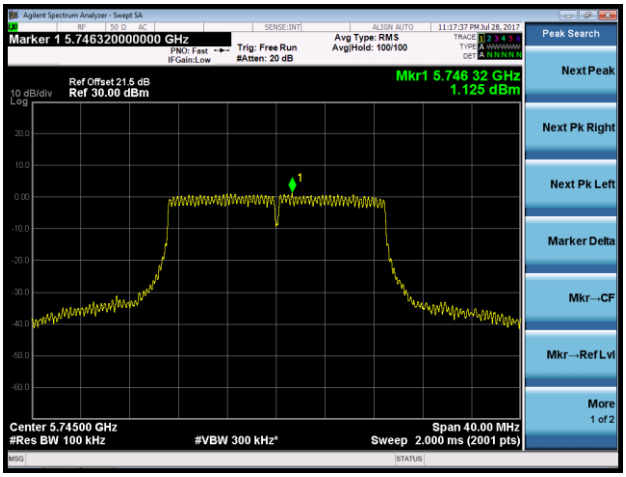
Channel 44 (5220MHz)



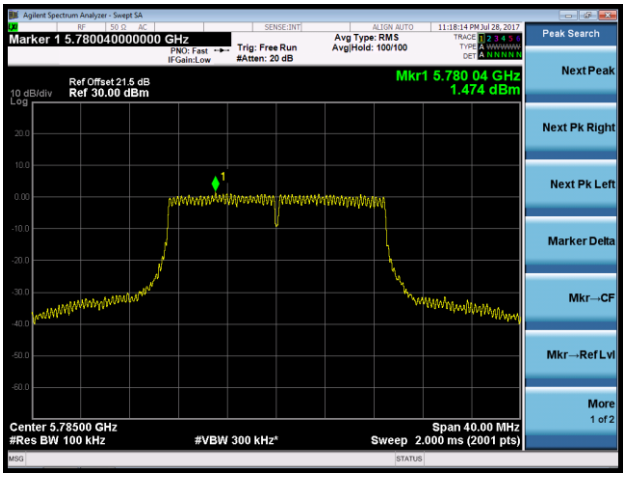
Channel 48 (5240MHz)



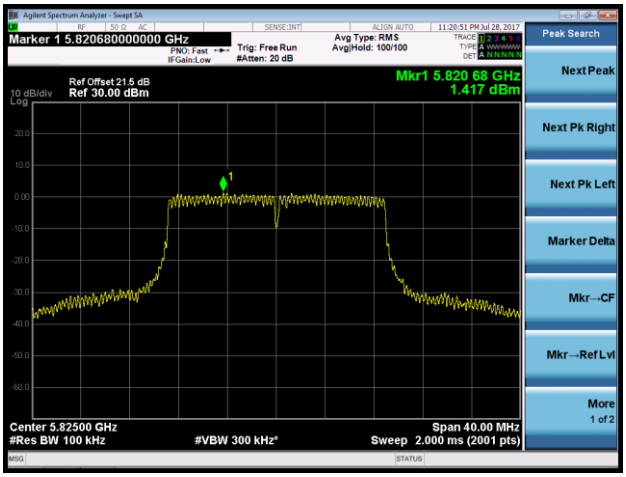
Channel 149 (5745MHz)

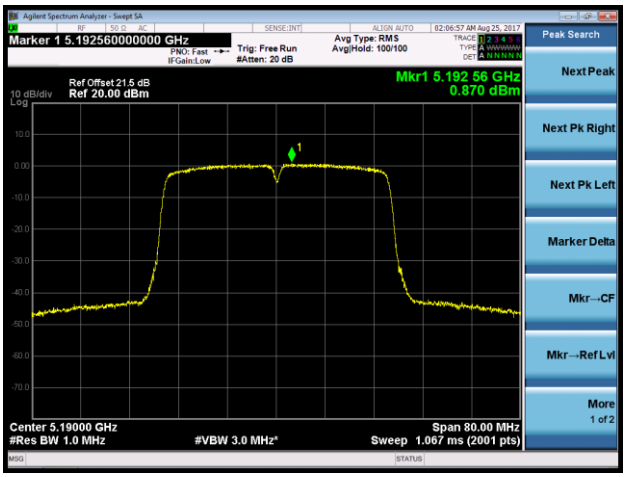
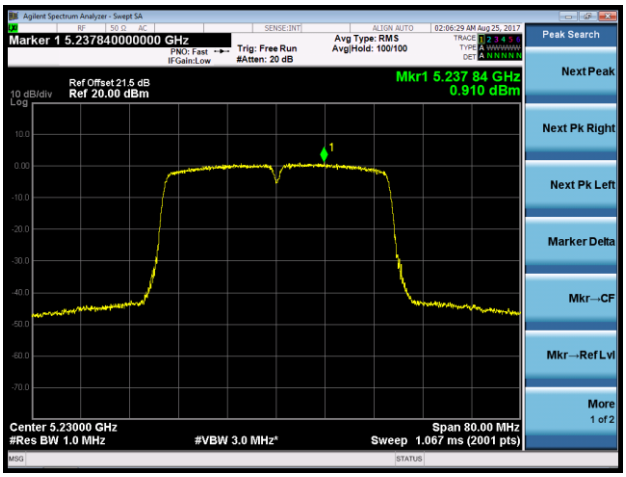
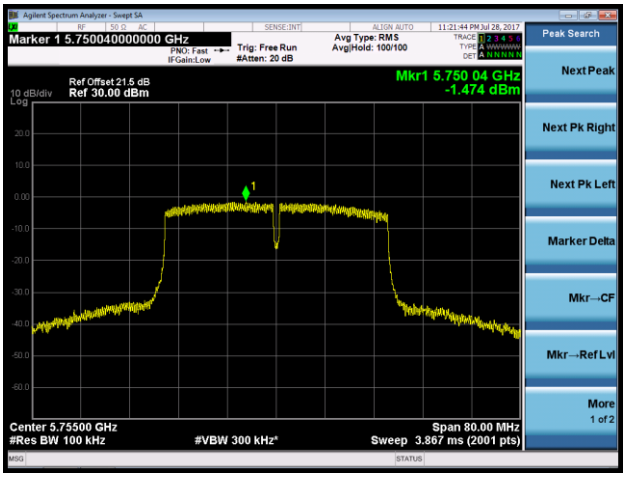
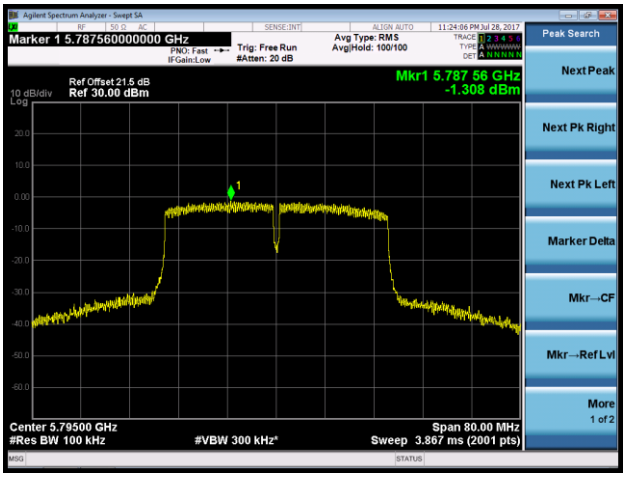
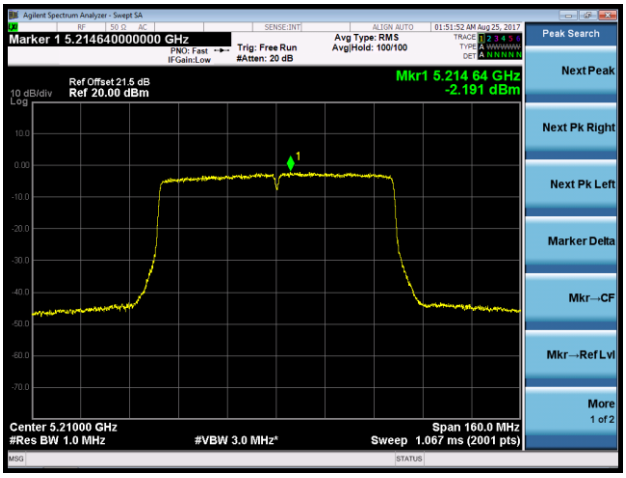
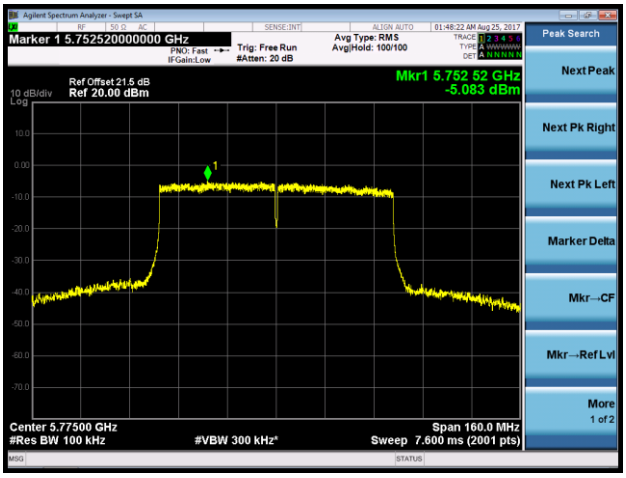


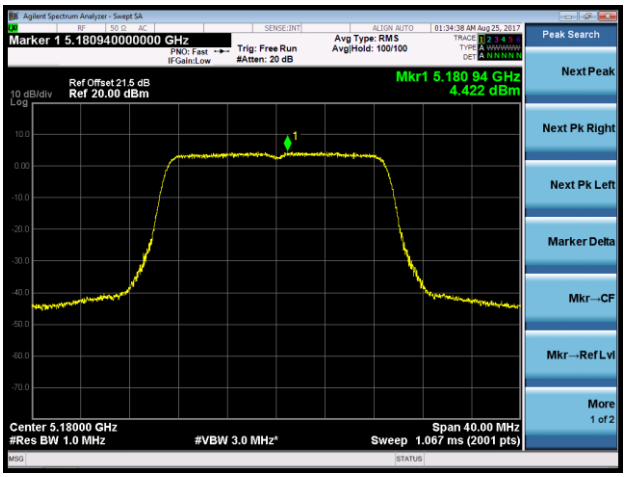
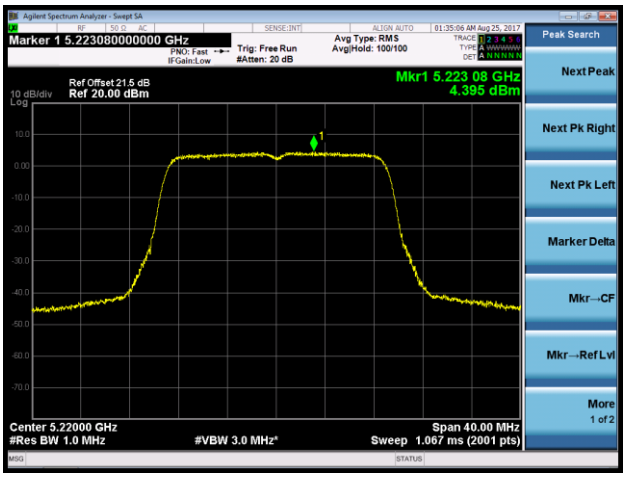
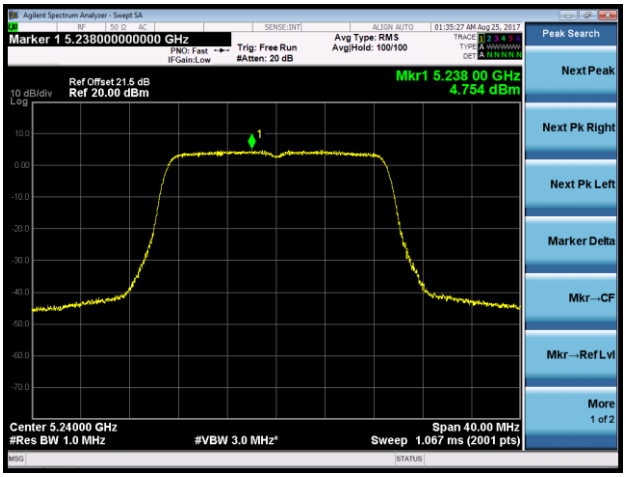
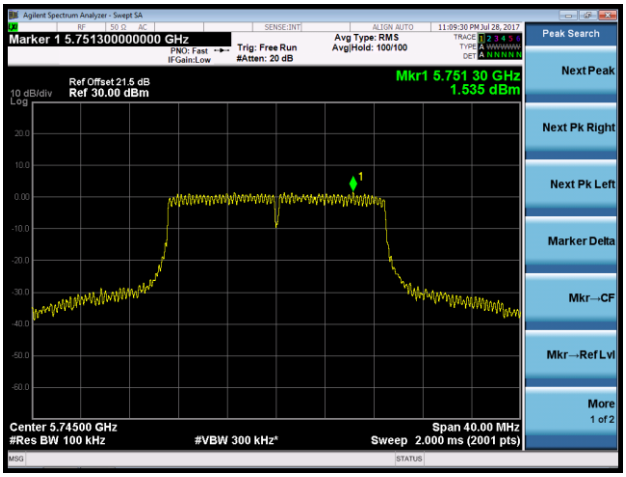
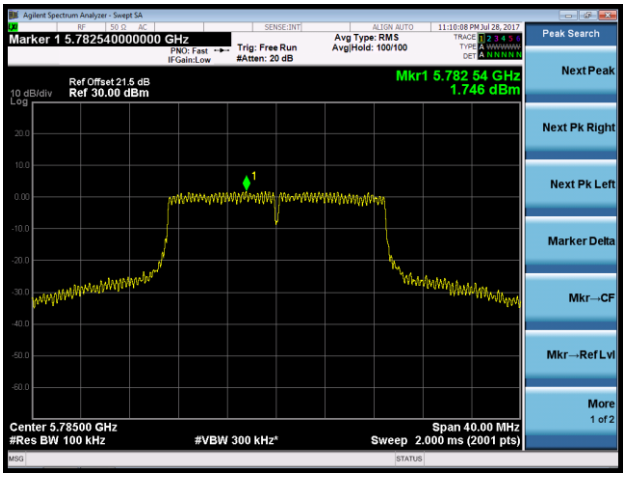
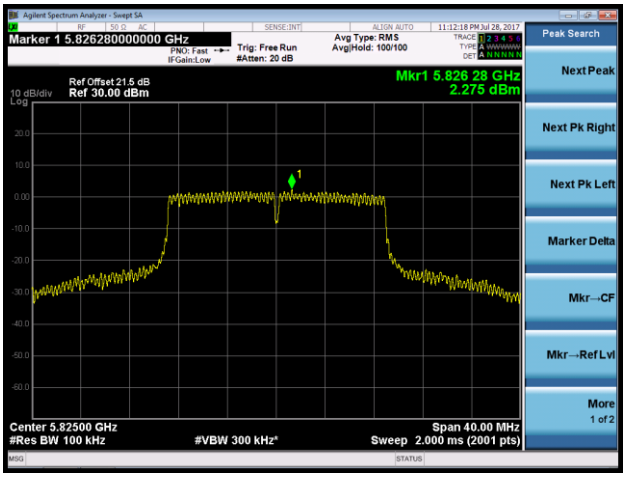
Channel 157 (5785MHz)

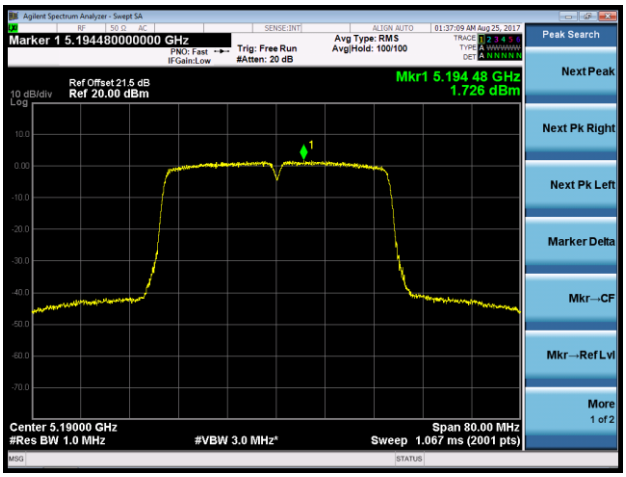
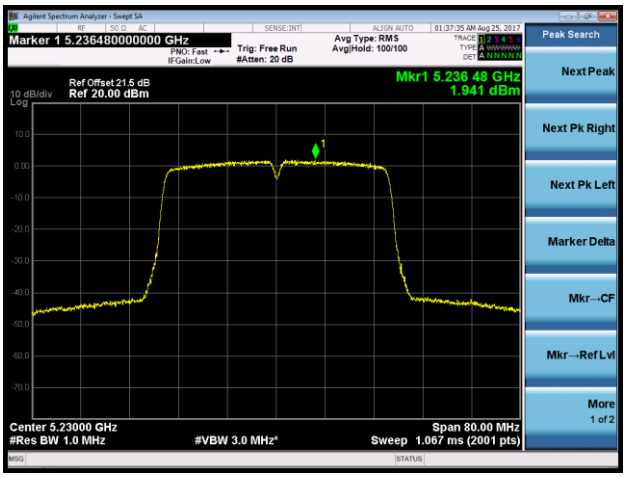
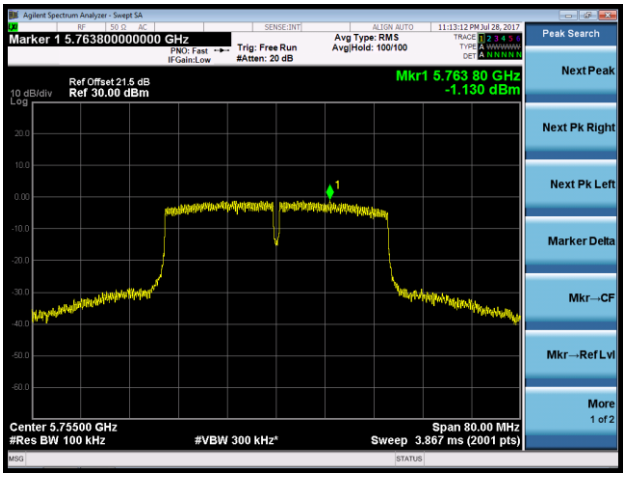
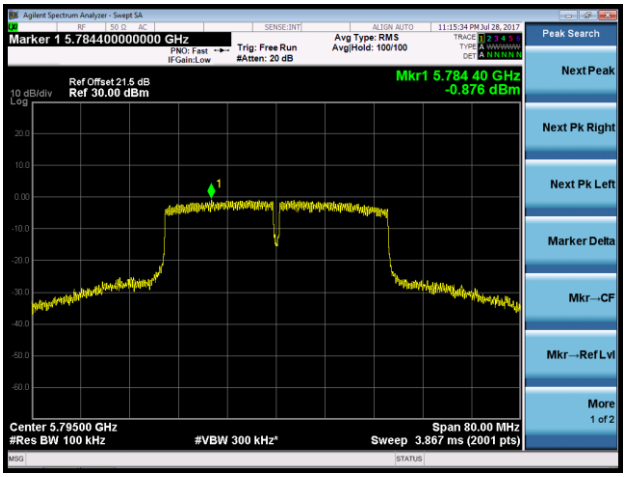


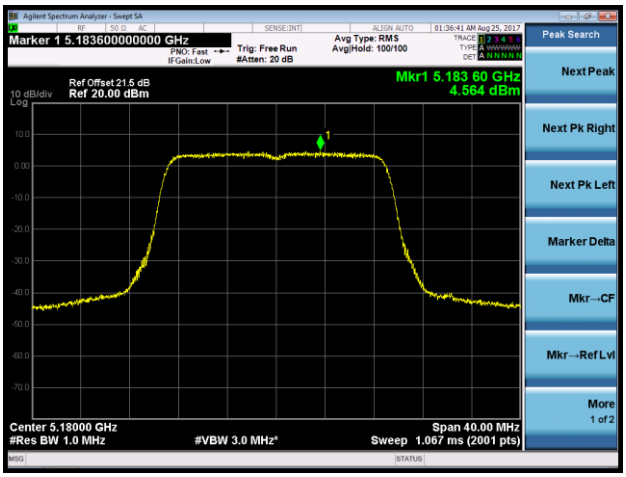
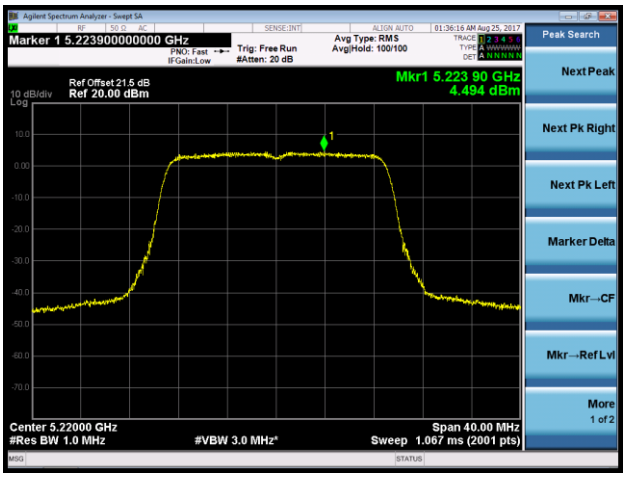
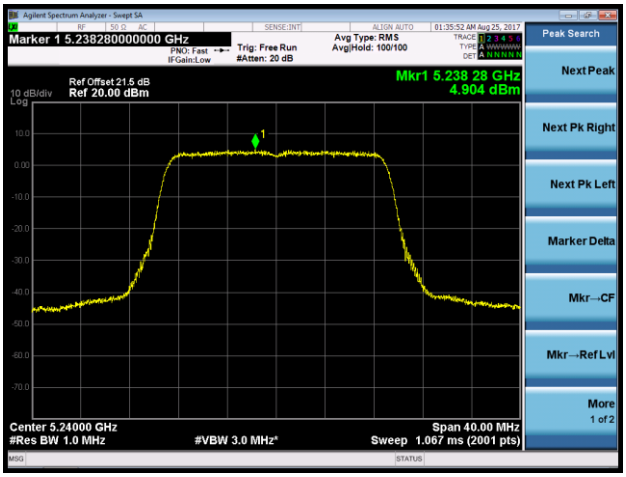
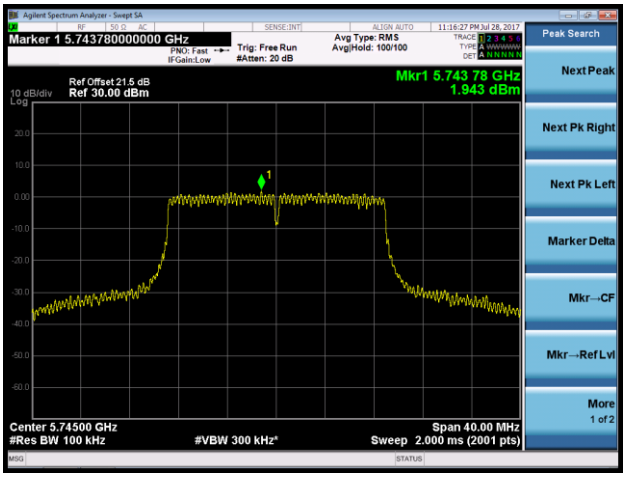
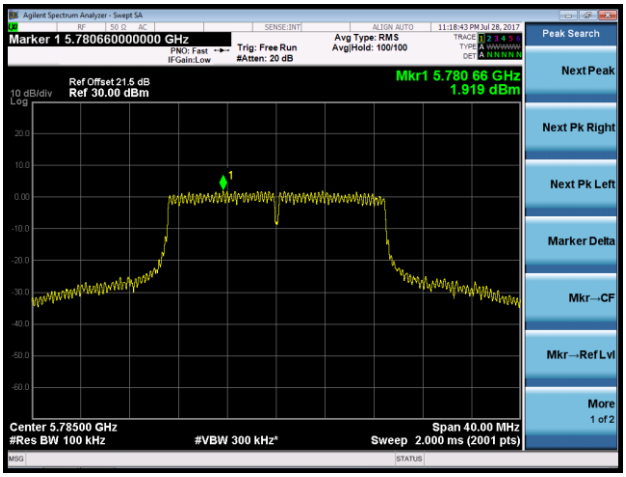
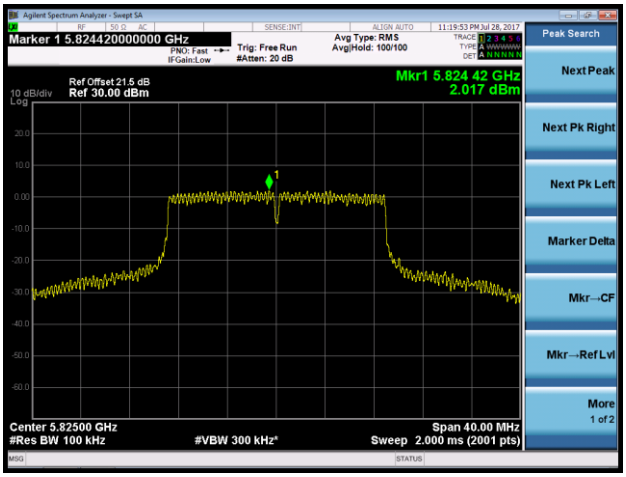
Channel 165 (5825MHz)

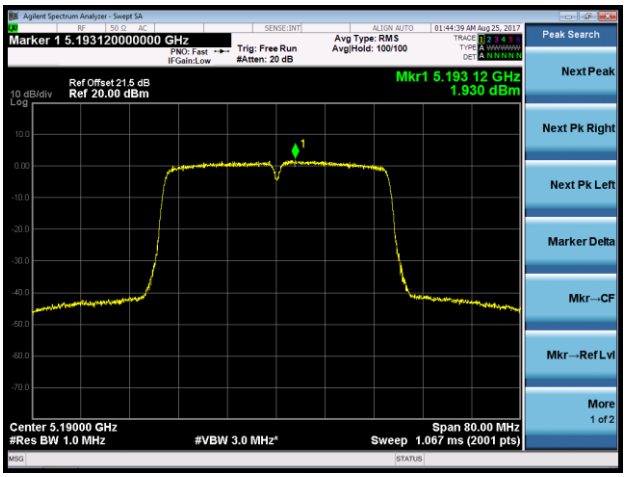
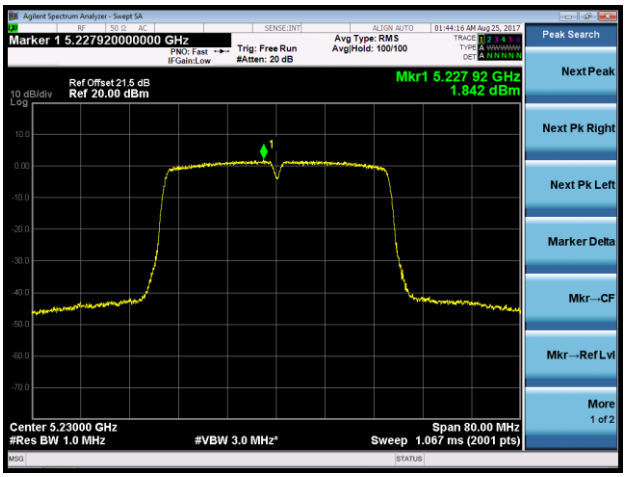
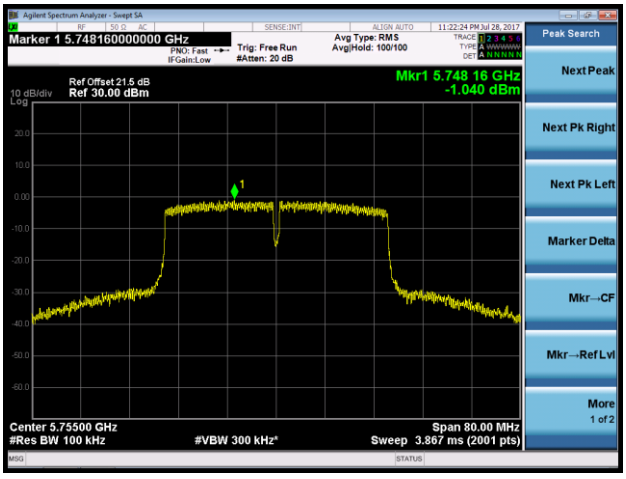
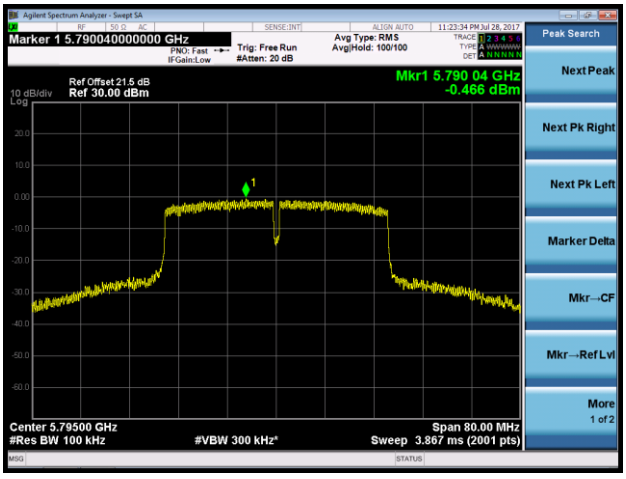
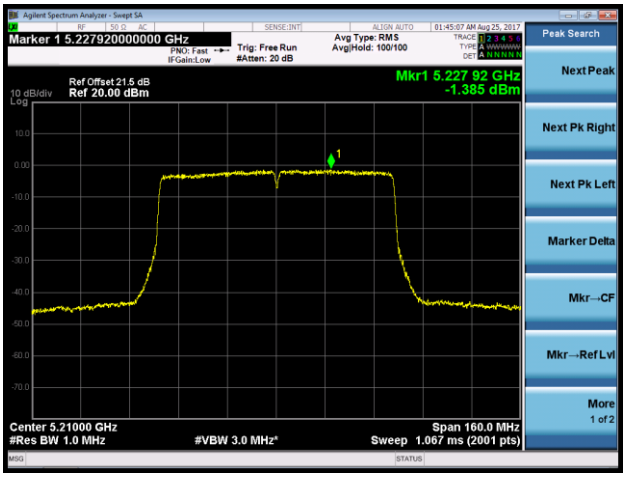
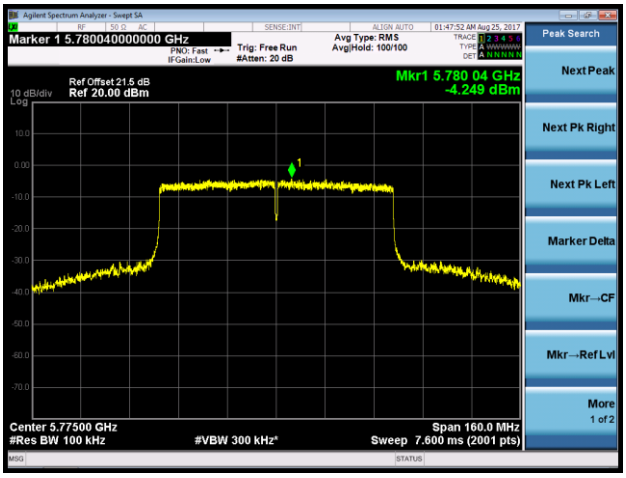


802.11ac-VHT40 Power Spectral Density - Ant 1 / Ant 1 + 2 (Beam-Forming Mode)	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
	
Channel 151 (5755MHz)	Channel 159 (5795MHz)
	
802.11ac-VHT80 Power Spectral Density - Ant 1 / Ant 1 + 2 (Beam-Forming Mode)	
Channel 42 (5210MHz)	Channel 155 (5775MHz)
	

802.11n-HT20 Power Spectral Density - Ant 2 / Ant 1 + 2 (Beam-Forming Mode)	
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 1 + 2 (Beam-Forming Mode)	
Channel 38 (5190MHz)	**Channel 46 (5230MHz)**
	
Channel 151 (5755MHz)	**Channel 159 (5795MHz)**
	

802.11ac-VHT20 Power Spectral Density - Ant 2 / Ant 1 + 2 (Beam-Forming Mode)	
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 1 + 2 (Beam-Forming Mode)	
Channel 38 (5190MHz)	Channel 46 (5230MHz)
	
Channel 151 (5755MHz)	Channel 159 (5795MHz)
	
802.11ac-VHT80 Power Spectral Density - Ant 2 / Ant 1 + 2 (Beam-Forming Mode)	
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.

The transmitter center frequency tolerance shall be ±20 ppm maximum for the 5GHz band (IEEE 802.11 specification).

7.7.2.Test Procedure Used

Frequency Stability Under Temperature Variations:

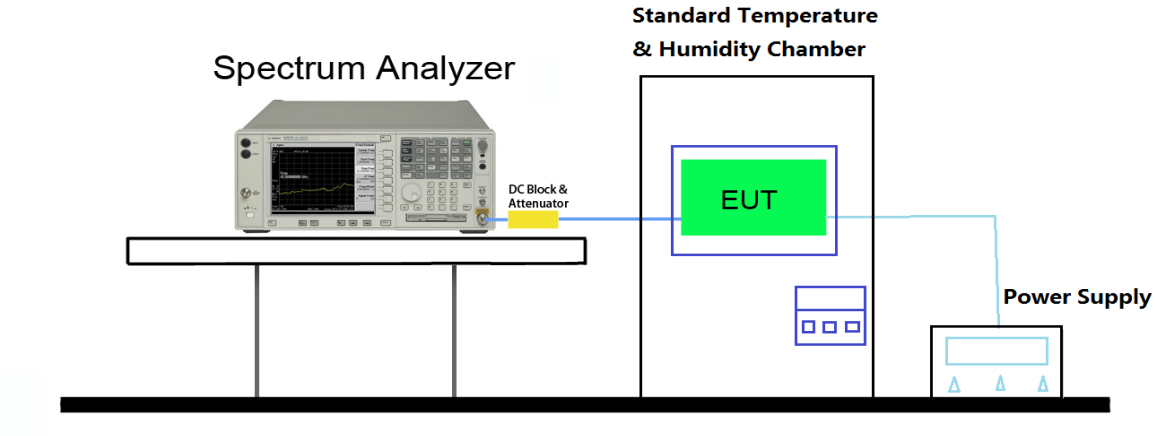
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain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

7.7.3.Test Setup



7.7.4.Test Result

Test Engineer	Johnson Liao	Temperature	-30 ~ 50°C
Test Time	2017/08/27	Relative Humidity	48 ~ 55%RH
Test Mode	5180MHz (Carrier Mode)	Test Site	SR2

Voltage (%)	Power (VAC)	Temp (°C)	Frequency Tolerance (ppm)			
			0 minutes	2 minutes	5 minutes	10 minutes
100%	120	- 30	-4.57	-5.24	-6.83	-7.88
		- 20	-5.76	-5.75	-6.95	-7.70
		- 10	-5.70	-7.01	-7.22	-7.87
		0	-6.83	-7.31	-8.76	-7.92
		+ 10	-7.31	-7.62	-9.15	-8.95
		+ 20 (Ref)	-7.63	-7.95	-9.26	-10.35
		+ 30	-8.36	-9.29	-9.90	-10.19
		+ 40	-8.53	-9.33	-10.28	-11.20
		+ 50	-8.82	-10.06	-10.22	-10.77
115%	138	+ 20	-8.44	-8.38	-10.75	-10.45
85%	102	+ 20	-6.73	-7.82	-9.38	-10.77

Note: Frequency Tolerance (ppm) = {[Measured Frequency (Hz) - Declared Frequency (Hz)] / Declared Frequency (Hz)} *10^6.

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 47CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/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 D02v01r04 – Section G

7.8.3.Test Setting

Quasi-Peak& Average Measurements below30MHz

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 = 200Hz for 9kHz to 150kHz frequency; RBW = 9kHz for 0.15MHz to 30MHz frequency
4. Detector = CISPR quasi-peak or power average (Average)
5. Sweep time = auto couple
6. 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

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

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 (Average)
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