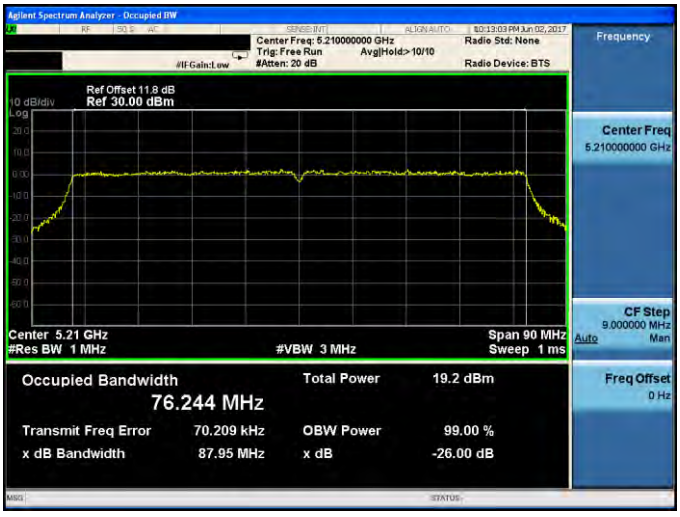
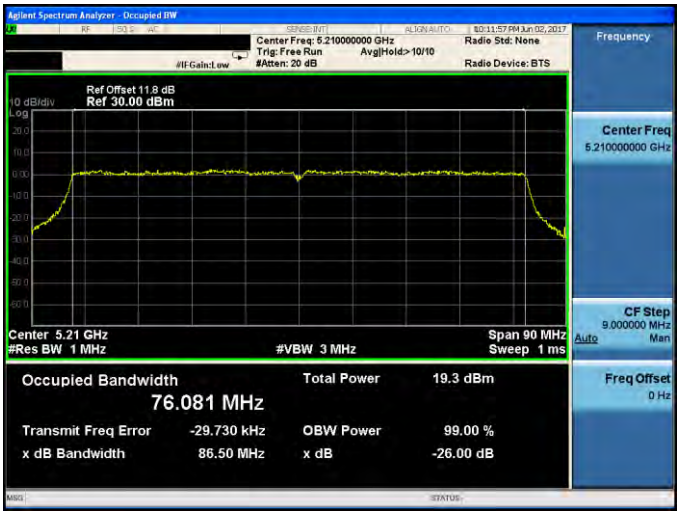
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-0	
5190 MHz	
5230 MHz	

Mode 5: IEEE 802.11ac 80MHz Continuous TX mode_ ANT-0	
5210 MHz	

Mode 2: IEEE 802.11a Continuous TX mode_ ANT-1	
5180 MHz	
5200 MHz	
5240 MHz	

Mode 3: IEEE 802.11ac 20MHz Continuous TX mode_ ANT-1	
5180 MHz	
5200 MHz	
5240 MHz	

Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-1	
5190 MHz	
5230 MHz	

Mode 5: IEEE 802.11ac 80MHz Continuous TX mode_ ANT-1	
5210 MHz	

Beamforming on	
Mode 2: IEEE 802.11a Continuous TX mode_ ANT-0	
5180 MHz	
5200 MHz	
5240 MHz	

Mode 3: IEEE 802.11ac 20MHz Continuous TX mode_ ANT-0	
5180 MHz	
5200 MHz	
5240 MHz	

Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-0	
5190 MHz	
5230 MHz	

Mode 5: IEEE 802.11ac 80MHz Continuous TX mode_ ANT-0	
5210 MHz	

Mode 2: IEEE 802.11a Continuous TX mode_ ANT-1	
5180 MHz	
5200 MHz	
5240 MHz	

Mode 3: IEEE 802.11ac 20MHz Continuous TX mode_ ANT-1	
5180 MHz	
5200 MHz	
5240 MHz	

Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-1	
5190 MHz	
5230 MHz	

Mode 5: IEEE 802.11ac 80MHz Continuous TX mode_ ANT-1	
5210 MHz	

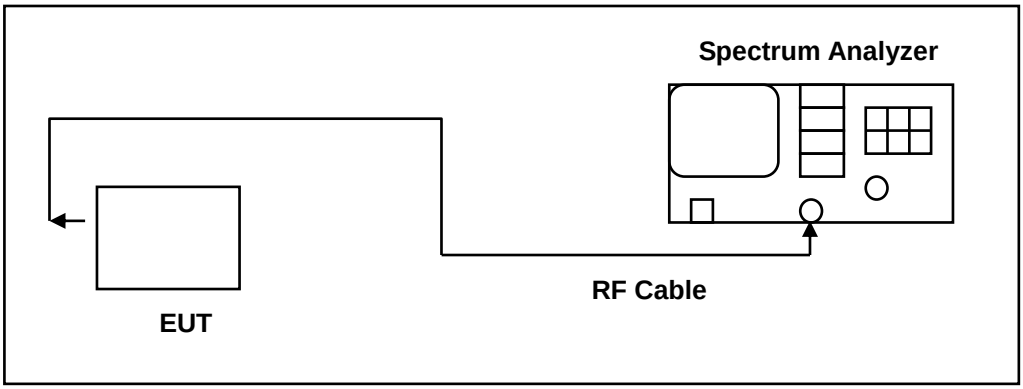
4.6. 6dB RF Bandwidth Measurement

■ **Limit**

6dB RF Bandwidth

Systems using digital modulation techniques may operate in the 5725~5850MHz bands. The minimum 6 dB band-width shall be at least 500 kHz.

■ **Test Setup**



■ **Test Instruments**

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ **Test Procedure**

6dB RF Bandwidth

The EUT tested to UNII test procedure of KDB789033 D02 for compliance to FCC 47CFR 15.407 requirements. The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A peak output reading was taken, a DISPLAY line was drawn 6 dB lower than peak level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

The test was performed at 3 channels.

■ **Test Result**

Test Item	6dB RF Bandwidth		
Test Mode	Mode 2: IEEE 802.11a Continuous TX mode		
Frequency (MHz)	6dB Bandwidth (kHz)		Limit (kHz)
	ANT-0	ANT-1	
5745	16340	16290	> 500
5785	16350	16300	> 500
5825	16330	15710	> 500

Test Item	6dB RF Bandwidth		
Test Mode	Mode 3: IEEE 802.11ac 20MHz Continuous TX mode		
Frequency (MHz)	6dB Bandwidth (kHz)		Limit (kHz)
	ANT-0	ANT-1	
5745	17600	16640	> 500
5785	17580	17530	> 500
5825	17560	17150	> 500

Test Item	6dB RF Bandwidth		
Test Mode	Mode 4: IEEE 802.11ac 40MHz Continuous TX mode		
Frequency (MHz)	6dB Bandwidth (kHz)		Limit (kHz)
	ANT-0	ANT-1	
5755	35300	35690	> 500
5795	35090	35030	> 500

Test Item	6dB RF Bandwidth		
Test Mode	Mode 5: IEEE 802.11ac 80MHz Continuous TX mode		
Frequency (MHz)	6dB Bandwidth (kHz)		Limit (kHz)
	ANT-0	ANT-1	
5775	76400	76380	> 500

Beamforming on

Test Item	6dB RF Bandwidth		
Test Mode	Mode 2: IEEE 802.11a Continuous TX mode		
Frequency (MHz)	6dB Bandwidth (kHz)		Limit (kHz)
	ANT-0	ANT-1	
5745	16360	16360	> 500
5785	16360	16070	> 500
5825	16390	15740	> 500

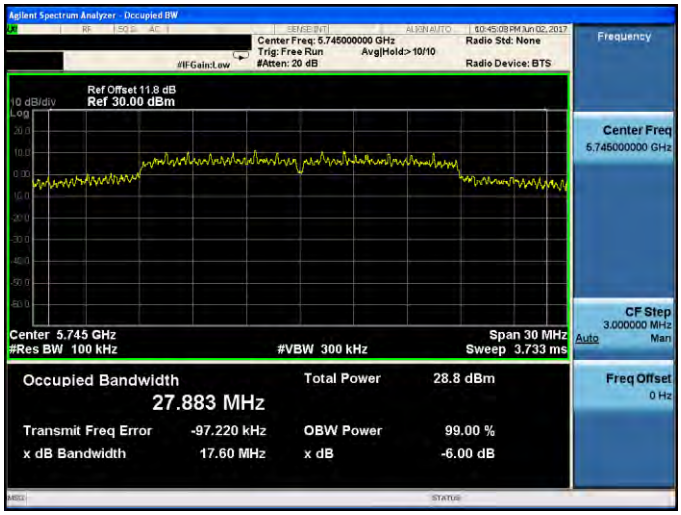
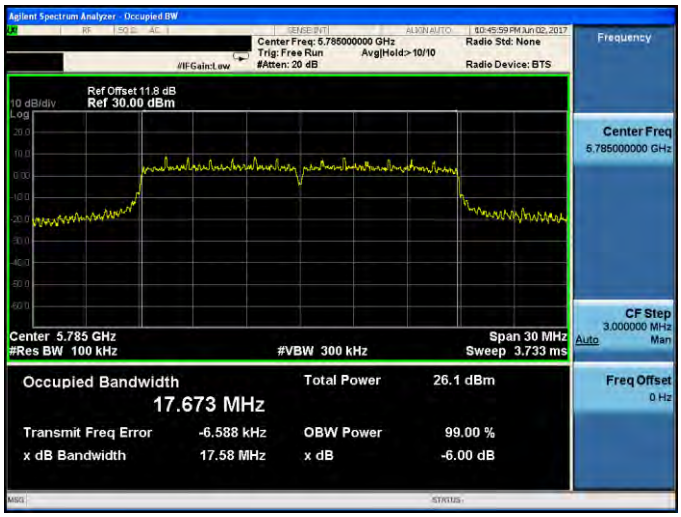
Test Item	6dB RF Bandwidth		
Test Mode	Mode 3: IEEE 802.11ac 20MHz Continuous TX mode		
Frequency (MHz)	6dB Bandwidth (kHz)		Limit (kHz)
	ANT-0	ANT-1	
5745	17580	17570	> 500
5785	17590	17560	> 500
5825	17590	17560	> 500

Test Item	6dB RF Bandwidth		
Test Mode	Mode 4: IEEE 802.11ac 40MHz Continuous TX mode		
Frequency (MHz)	6dB Bandwidth (kHz)		Limit (kHz)
	ANT-0	ANT-1	
5755	35140	35110	> 500
5795	35140	35420	> 500

Test Item	6dB RF Bandwidth		
Test Mode	Mode 5: IEEE 802.11ac 80MHz Continuous TX mode		
Frequency (MHz)	6dB Bandwidth (kHz)		Limit (kHz)
	ANT-0	ANT-1	
5775	76410	76440	> 500

■ **Test Graphs**

Mode 2: IEEE 802.11a Continuous TX mode_ANT-0	
5745 MHz	
5785 MHz	
5825 MHz	

Mode 3: IEEE 802.11ac 20MHz Continuous TX mode_ANT-0	
5745 MHz	
5785 MHz	
5825 MHz	

Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ANT-0	
5755 MHz	
5795 MHz	

Mode 5: IEEE 802.11ac 80MHz Continuous TX mode_ANT-0	
5775 MHz	

Mode 2: IEEE 802.11a Continuous TX mode_ANT-1	
5745 MHz	
5785 MHz	
5825 MHz	

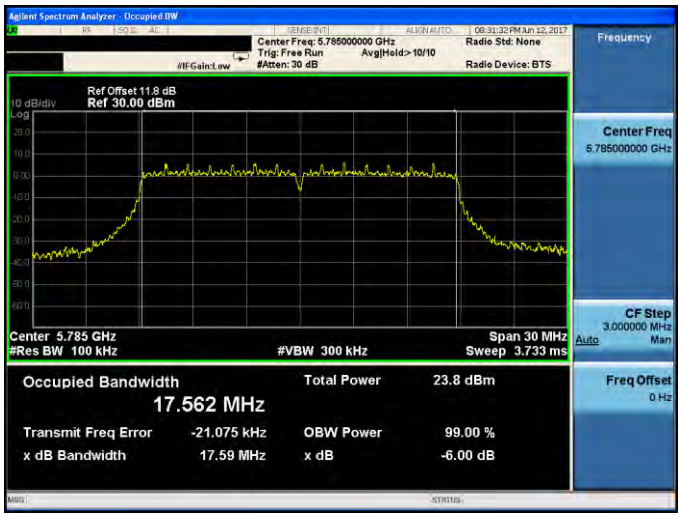
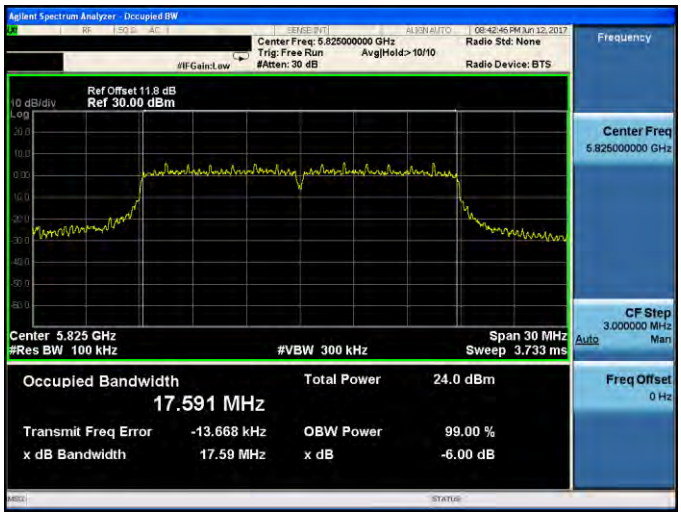
Mode 3: IEEE 802.11ac 20MHz Continuous TX mode_ANT-1	
5745 MHz	
5785 MHz	
5825 MHz	

Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ANT-1	
5755 MHz	
5795 MHz	

Mode 5: IEEE 802.11ac 80MHz Continuous TX mode_ANT-1	
5775 MHz	

Beamforming on

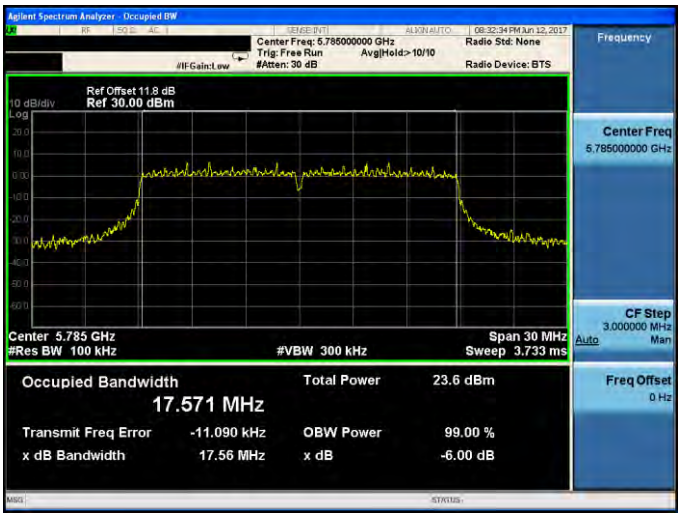
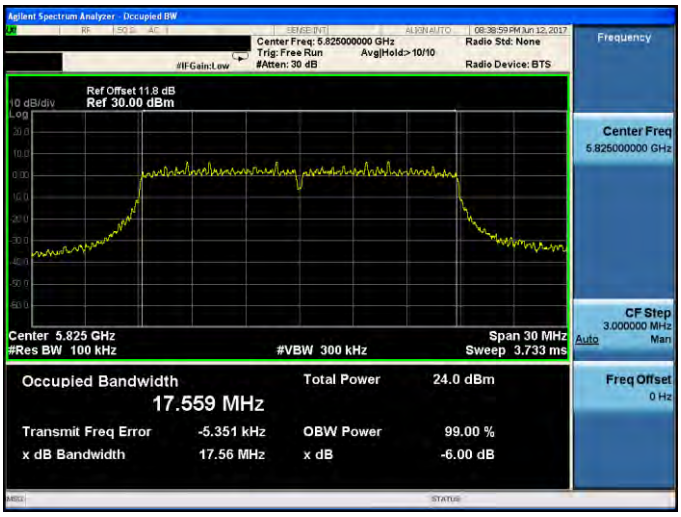
Mode 2: IEEE 802.11a Continuous TX mode_ANT-0	
5745 MHz	
5785 MHz	
5825 MHz	

Mode 3: IEEE 802.11ac 20MHz Continuous TX mode_ANT-0	
5745 MHz	
5785 MHz	
5825 MHz	

Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ANT-0	
5755 MHz	
5795 MHz	

Mode 5: IEEE 802.11ac 80MHz Continuous TX mode_ANT-0	
5775 MHz	

Mode 2: IEEE 802.11a Continuous TX mode_ANT-1	
5745 MHz	
5785 MHz	
5825 MHz	

Mode 3: IEEE 802.11ac 20MHz Continuous TX mode_ANT-1	
5745 MHz	
5785 MHz	
5825 MHz	

Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ANT-1	
5755 MHz	
5795 MHz	

Mode 5: IEEE 802.11ac 80MHz Continuous TX mode_ANT-1	
5775 MHz	

4.7. Peak Power Spectral Density Measurement

■ **Limit**

Conducted power spectral density

Frequency Range (MHz)	FCC Limit
	Master
5.150 ~ 5.250 GHz	17 dBm/MHz
5.725 ~ 5.850 GHz	30 dBm/500KHz

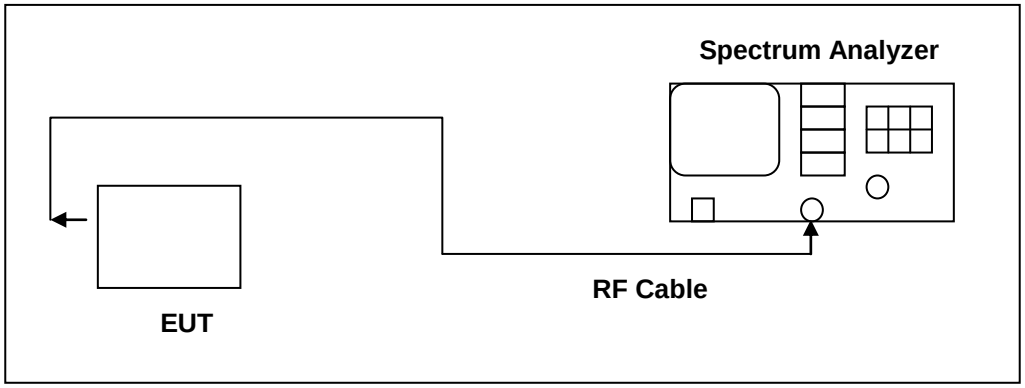
According FCC KDB 662911 D01 v02r01 – for power spectral density measurements on IEEE802.11 devices,

∗ CDD/BF mode：Directional Gain =10*log{[10^(G1/20)+10^(G2/20)+…+10^(Gn/20)]^2/NANT} = 7.36 dBi > 6dBi

∗ CDD/BF mode power limit shall be reduced = 17 – 1.36 = 15.64 dBm/MHz (5.150 ~ 5.250 GHz)

∗ CDD/BF mode power limit shall be reduced = 30 – 1.36 = 28.64 dBm/500KHz (5.725 ~ 5.850 GHz)

■ **Test Setup**



■ **Test Instruments**

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ **Test Procedure**

The test is performed in accordance with KDB789033: D02 General UNII Test Procedures New Rules v01r04, Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	1 MHz (5725 ~ 5850MHz use 100 kHz)
VBW	3 MHz (5725 ~ 5850MHz use 300 kHz)
Detector	RMS
Trace	AVERAGE
Sweep Time	Auto
Trace Average	100 times
Note: If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/100kHz) to the measured result.	

■ **Test Result**

Test Item	Conducted power spectral density			
Test Mode	Mode 2: IEEE 802.11a link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5180	6.940	0.123	7.063	< 15.64
5200	10.222	0.123	10.345	
5240	10.198	0.123	10.321	
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5180	7.547	0.123	7.670	< 15.64
5200	10.009	0.123	10.132	
5240	10.510	0.123	10.633	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5180	10.387			< 15.64
5200	13.250			
5240	13.490			

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Test Item	Conducted power spectral density			
Test Mode	Mode 2: IEEE 802.11a link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5745	1.05	0.123	8.16	< 28.64
5785	1.55	0.123	8.67	
5825	2.17	0.123	9.28	
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5745	3.00	0.123	10.11	< 28.64
5785	2.32	0.123	9.44	
5825	2.22	0.123	9.33	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/500KHz)
5745	12.25			< 28.64
5785	12.08			
5825	12.32			

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Conversion ratio = 10*Log(500k/100k)

Test Item	Conducted power spectral density			
Test Mode	Mode 3: IEEE 802.11ac 20MHz link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5180	6.820	0.101	6.921	< 15.64
5200	10.357	0.101	10.458	
5240	10.960	0.101	11.061	
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5180	7.316	0.101	7.417	< 15.64
5200	10.455	0.101	10.556	
5240	9.889	0.101	9.990	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5180	10.186			< 15.64
5200	13.517			
5240	13.568			

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Test Item	Conducted power spectral density			
Test Mode	Mode 3: IEEE 802.11ac 20MHz link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5745	0.85	0.101	7.94	< 28.64
5785	-0.22	0.101	6.87	
5825	1.48	0.101	8.57	
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5745	1.90	0.101	8.99	< 28.64
5785	1.35	0.101	8.44	
5825	1.81	0.101	8.90	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/500KHz)
5745	11.51			< 28.64
5785	10.74			
5825	11.75			

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Conversion ratio = 10*Log(500k/100k)

Test Item	Conducted power spectral density			
Test Mode	Mode 4: IEEE 802.11ac 40MHz link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5190	3.379	0.238	3.617	< 15.64
5230	7.473	0.238	7.711	
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5190	3.947	0.238	4.185	< 15.64
5230	6.534	0.238	6.772	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5190	6.920			< 15.64
5230	10.277			

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Test Item	Conducted power spectral density			
Test Mode	Mode 4: IEEE 802.11ac 40MHz link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5755	-2.98	0.238	4.24	< 28.64
5795	-0.26	0.238	6.97	
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5755	-0.22	0.238	7.01	< 28.64
5795	-1.16	0.238	6.07	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/500KHz)
5755	8.85			< 28.64
5795	9.55			

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Conversion ratio = 10*Log(500k/100k)

Test Item	Conducted power spectral density			
Test Mode	Mode 5: IEEE 802.11ac 80MHz link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5210	-5.273	0.625	-4.648	< 15.64
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5210	-4.758	0.625	-4.133	< 15.64
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5210	-1.373			< 15.64

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Test Item	Conducted power spectral density			
Test Mode	Mode 5: IEEE 802.11ac 80MHz link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/MHz)
5775	-5.35	0.625	2.26	< 28.64
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/MHz)
5775	-3.23	0.625	4.38	< 28.64
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/MHz)
5775	6.46			< 28.64

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Conversion ratio = 10*Log(500k/100k)

Beamforming on

Test Item	Conducted power spectral density			
Test Mode	Mode 2: IEEE 802.11a link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5180	4.159	0.123	4.283	< 15.64
5200	6.943	0.123	7.067	
5240	6.611	0.123	6.735	
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5180	4.185	0.123	4.309	< 15.64
5200	6.952	0.123	7.076	
5240	7.082	0.123	7.206	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5180	7.306			< 15.64
5200	10.082			
5240	9.987			

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Test Item	Conducted power spectral density			
Test Mode	Mode 2: IEEE 802.11a link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5745	-1.02	0.123	6.09	< 28.64
5785	-1.76	0.123	5.35	
5825	-0.10	0.123	7.01	
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5745	0.50	0.123	7.61	< 28.64
5785	-0.39	0.123	6.72	
5825	-0.18	0.123	6.93	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/500KHz)
5745	9.93			< 28.64
5785	9.10			
5825	9.98			

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Conversion ratio = 10*Log(500k/100k)

Test Item	Conducted power spectral density			
Test Mode	Mode 3: IEEE 802.11ac 20MHz link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5180	3.440	0.101	3.879	< 15.64
5200	8.068	0.101	8.507	
5240	7.479	0.101	7.918	
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5180	3.806	0.101	4.245	< 15.64
5200	7.295	0.101	7.734	
5240	7.542	0.101	7.981	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5180	7.076			< 15.64
5200	11.148			
5240	10.960			

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Test Item	Conducted power spectral density			
Test Mode	Mode 3: IEEE 802.11ac 20MHz link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5745	-1.56	0.101	5.87	< 28.64
5785	-2.46	0.101	4.97	
5825	-0.41	0.101	7.02	
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5745	-0.66	0.101	6.76	< 28.64
5785	-1.05	0.101	6.38	
5825	-0.64	0.101	6.79	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/500KHz)
5745	9.35			< 28.64
5785	8.74			
5825	9.91			

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Conversion ratio = 10*Log(500k/100k)

Test Item	Conducted power spectral density			
Test Mode	Mode 4: IEEE 802.11ac 40MHz link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5190	1.206	0.238	1.827	< 15.64
5230	5.024	0.238	5.645	
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5190	1.035	0.238	1.656	< 15.64
5230	4.246	0.238	4.867	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5190	4.753			< 15.64
5230	8.284			

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Test Item	Conducted power spectral density			
Test Mode	Mode 4: IEEE 802.11ac 40MHz link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5755	-4.83	0.238	2.78	< 28.64
5795	-2.22	0.238	5.39	
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5755	-2.63	0.238	4.98	< 28.64
5795	-3.20	0.238	4.41	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/500KHz)
5755	7.03			< 28.64
5795	7.94			

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Conversion ratio = 10*Log(500k/100k)

Test Item	Conducted power spectral density			
Test Mode	Mode 5: IEEE 802.11ac 80MHz link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5210	-7.939	0.625	-6.758	< 15.64
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5210	-7.422	0.625	-6.241	< 15.64
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5210	-3.482			< 15.64

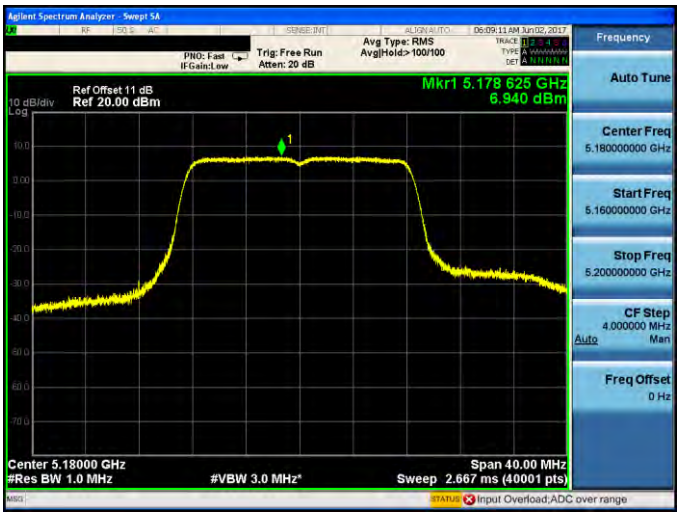
Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

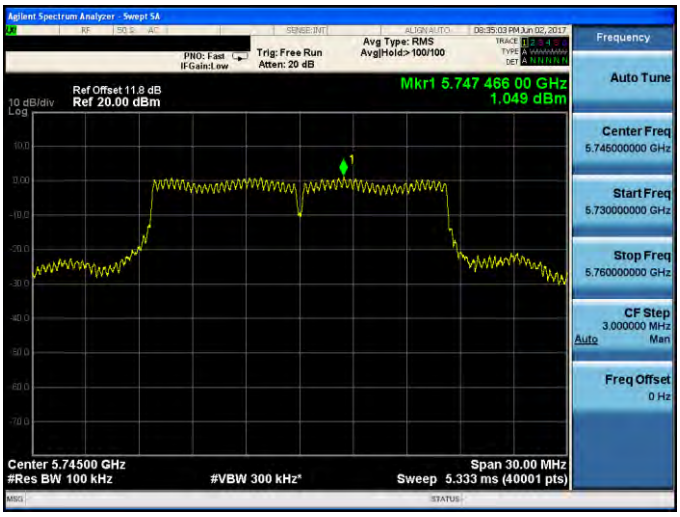
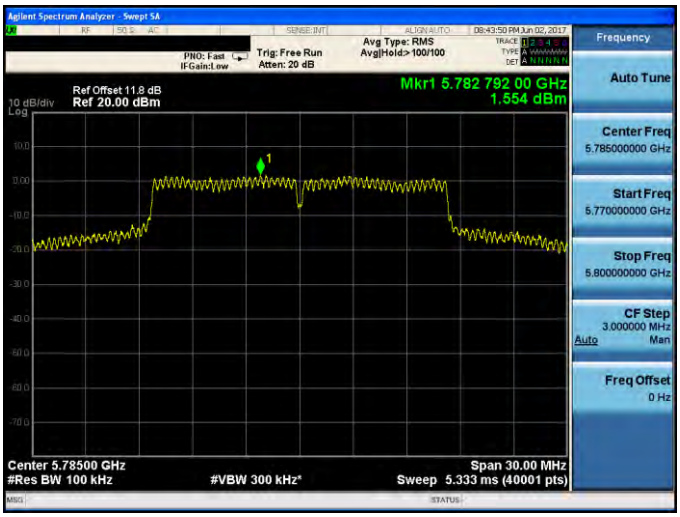
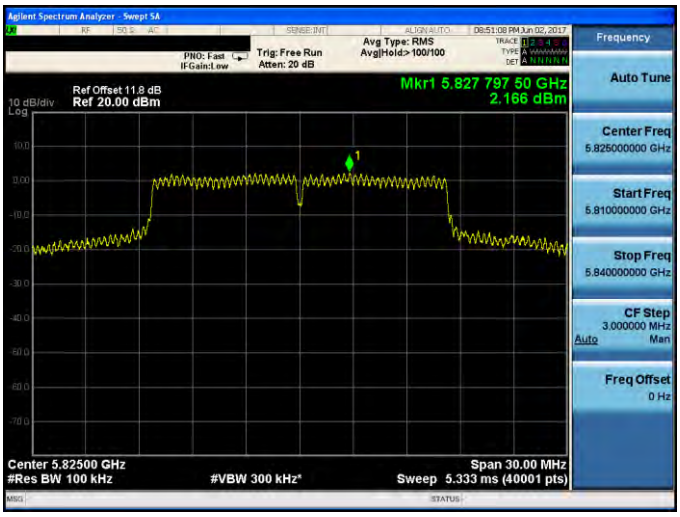
Test Item	Conducted power spectral density			
Test Mode	Mode 5: IEEE 802.11ac 80MHz link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/MHz)
5775	-7.17	0.625	1.01	< 28.64
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/MHz)
5775	-5.39	0.625	2.78	< 28.64
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/MHz)
5775	4.99			< 28.64

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

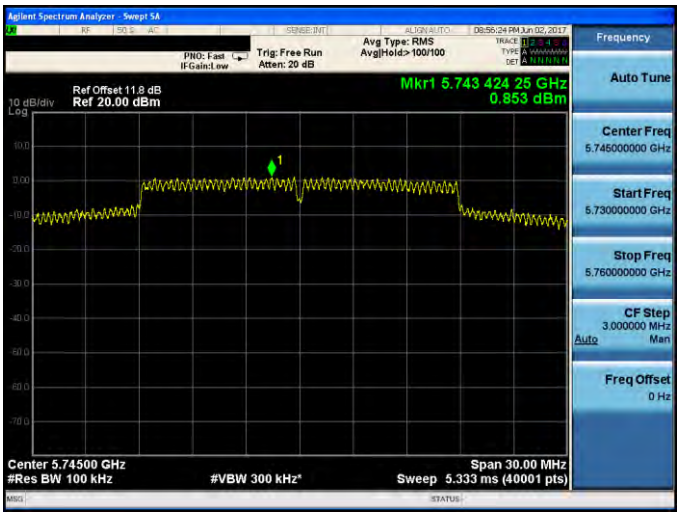
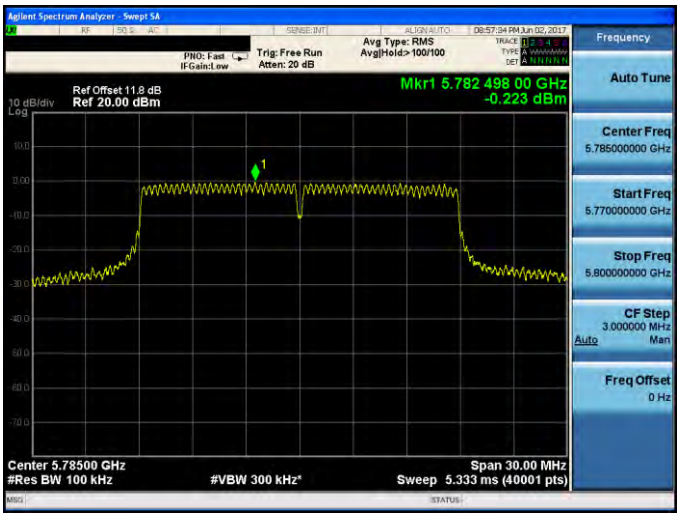
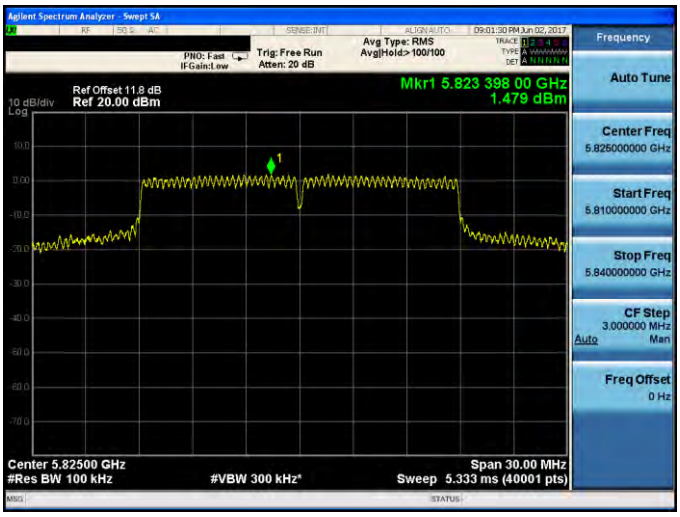
Conversion ratio = 10*Log(500k/100k)

■ **Test Graphs**

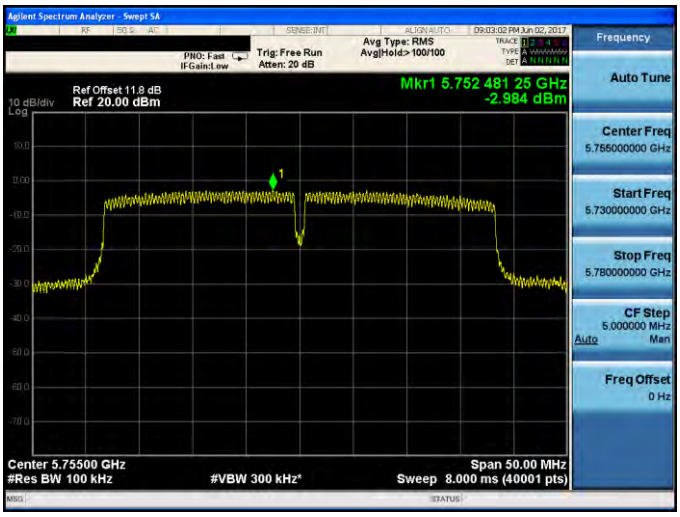
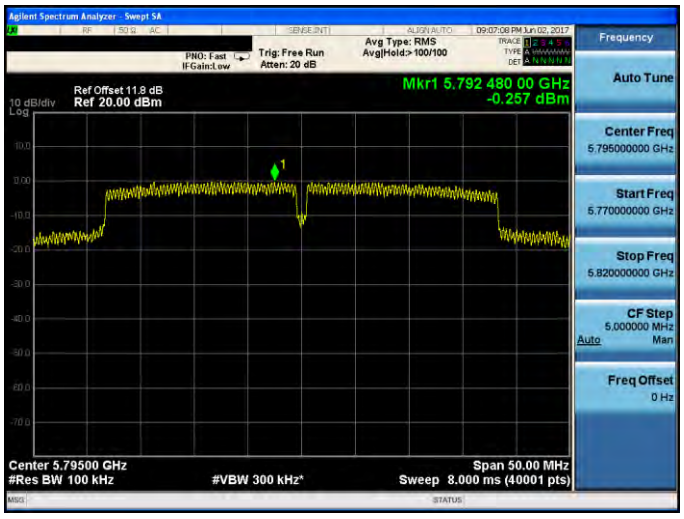
Mode 2: IEEE 802.11a Continuous TX mode_ ANT-0	
5180 MHz	
5200 MHz	
5240 MHz	

Mode 2: IEEE 802.11a Continuous TX mode_ ANT-0	
5745 MHz	
5785 MHz	
5825 MHz	

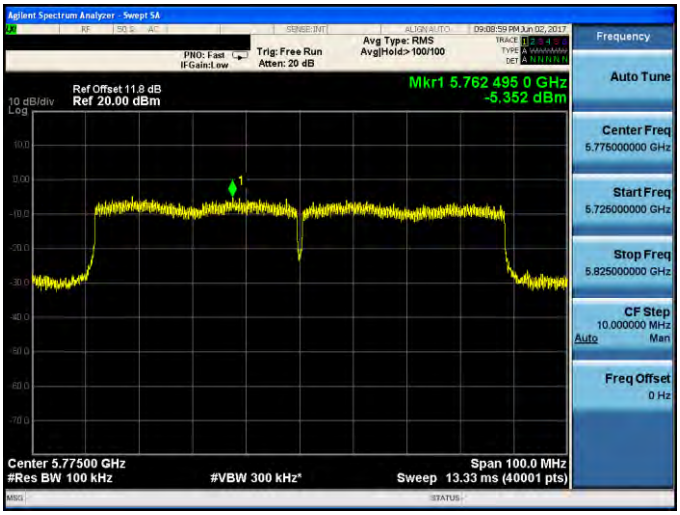
Mode 3: IEEE 802.11ac 20MHz Continuous TX mode _ ANT-0	
5180 MHz	
5200 MHz	
5240 MHz	

Mode 3: IEEE 802.11ac 20MHz Continuous TX mode _ ANT-0	
5745 MHz	
5785 MHz	
5825 MHz	

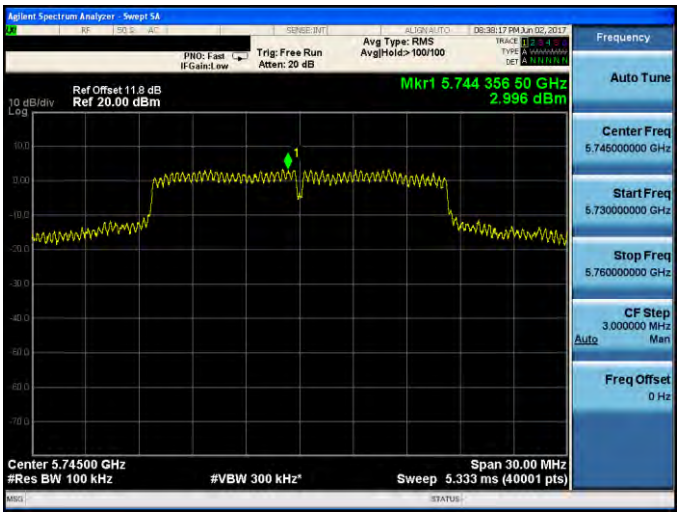
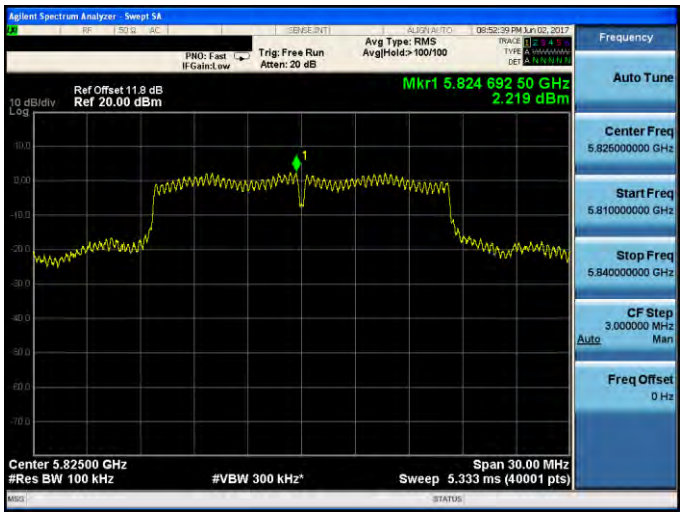
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-0	
5190 MHz	
5230 MHz	

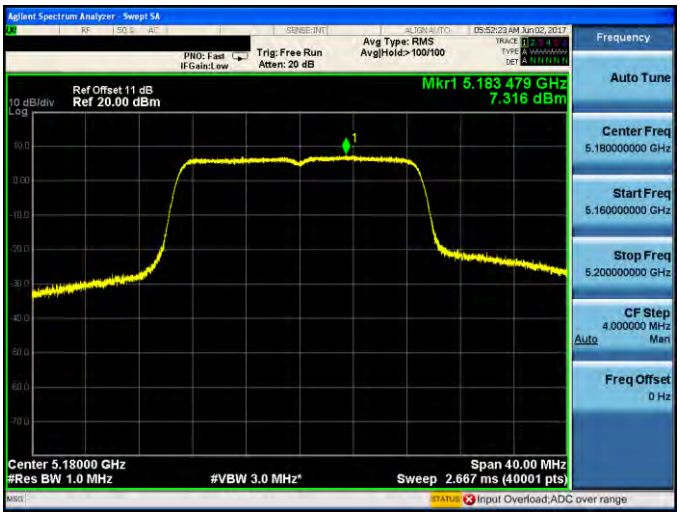
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-0	
5755 MHz	
5795 MHz	

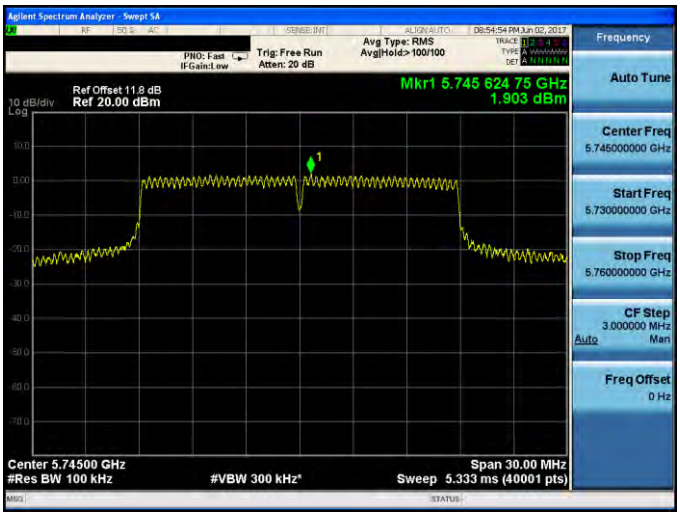
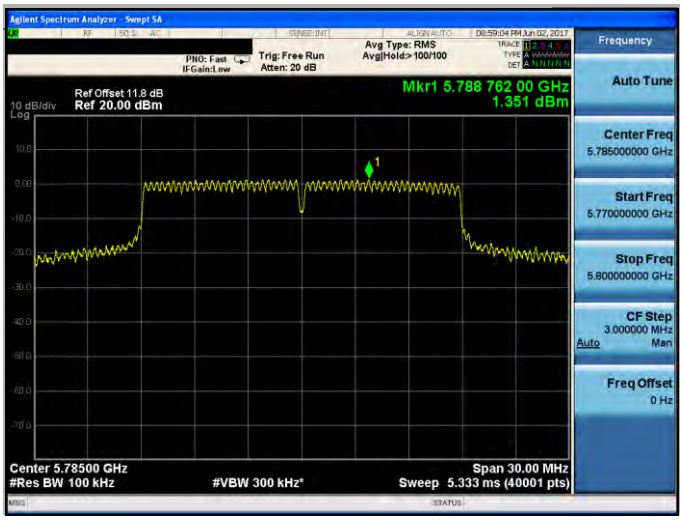
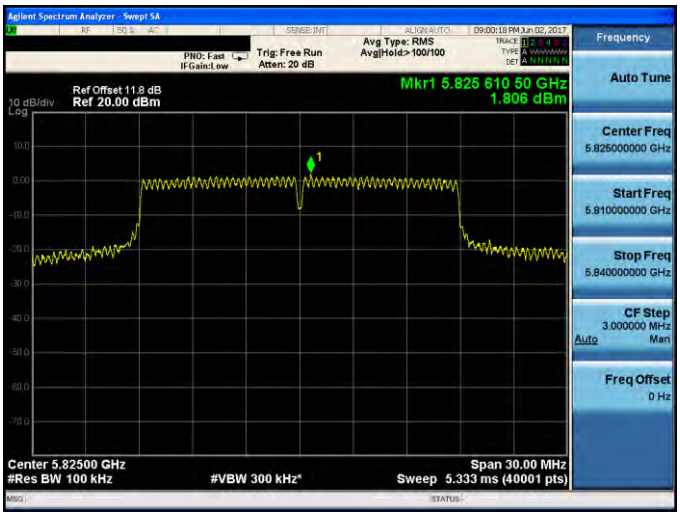
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-0	
5210 MHz	

Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-0	
5775 MHz	

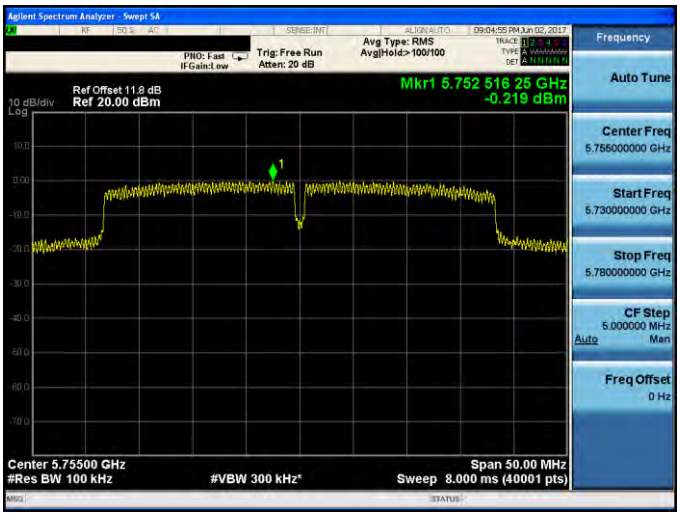
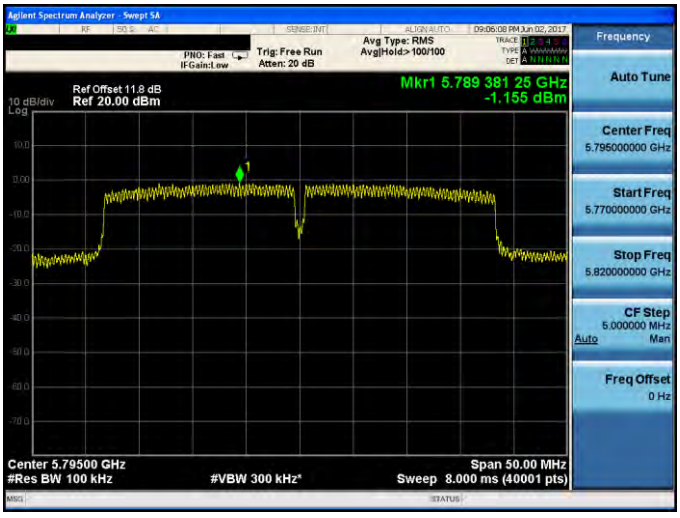
Mode 2: IEEE 802.11a Continuous TX mode_ ANT-1	
5180 MHz	
5200 MHz	
5240 MHz	

Mode 2: IEEE 802.11a Continuous TX mode_ ANT-1	
5745 MHz	
5785 MHz	
5825 MHz	

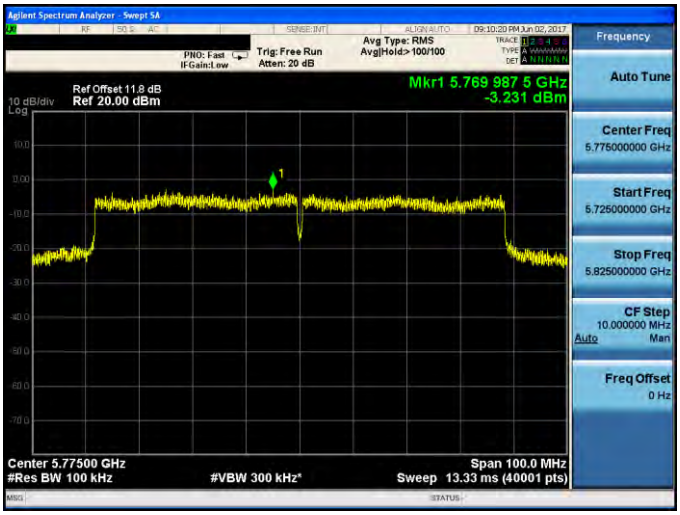
Mode 3: IEEE 802.11ac 20MHz Continuous TX mode _ ANT-1	
5180 MHz	
5200 MHz	
5240 MHz	

Mode 3: IEEE 802.11ac 20MHz Continuous TX mode _ ANT-1	
5745 MHz	
5785 MHz	
5825 MHz	

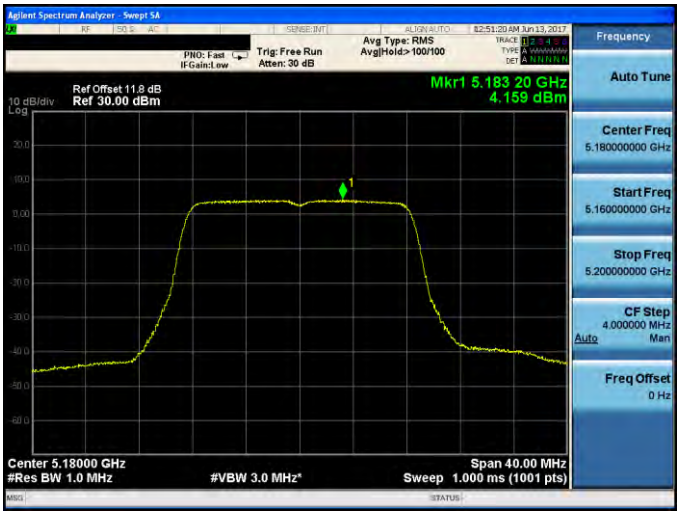
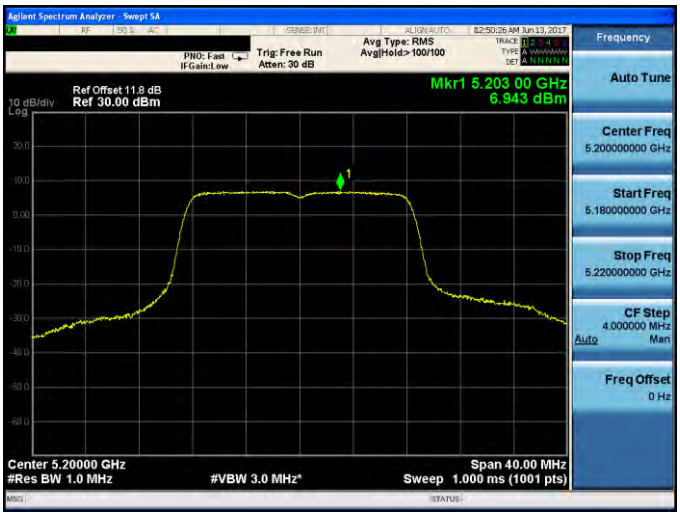
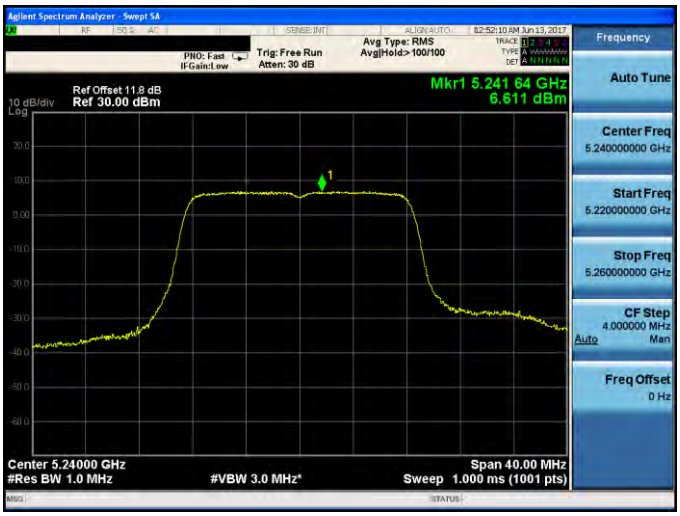
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-1	
5190 MHz	
5230 MHz	

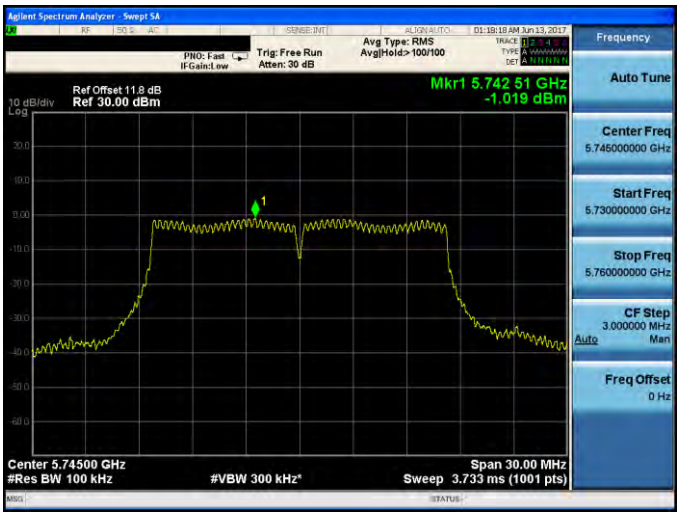
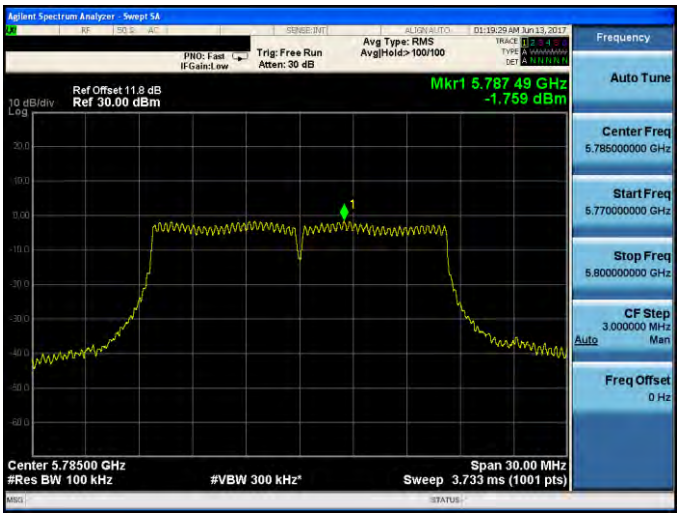
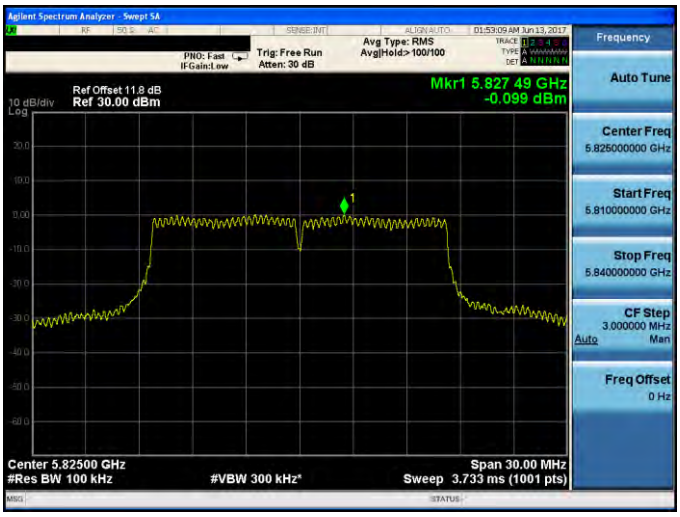
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-1	
5755 MHz	
5795 MHz	

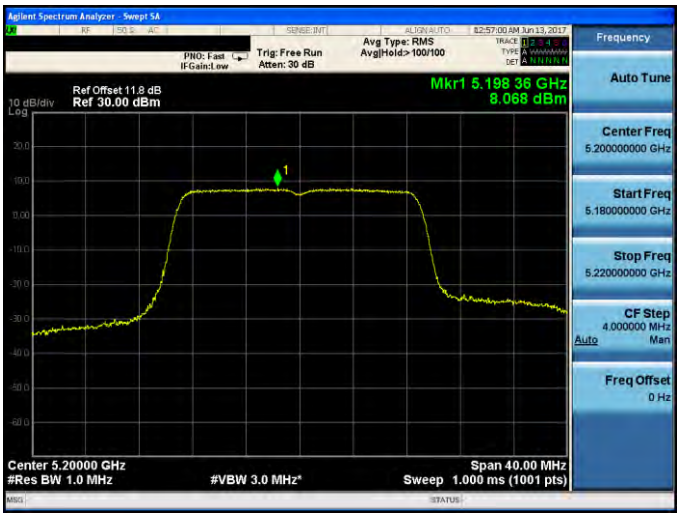
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-1	
5210 MHz	

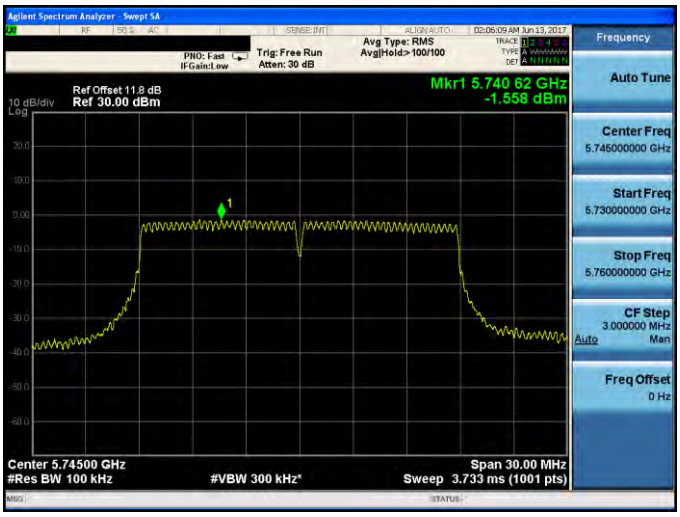
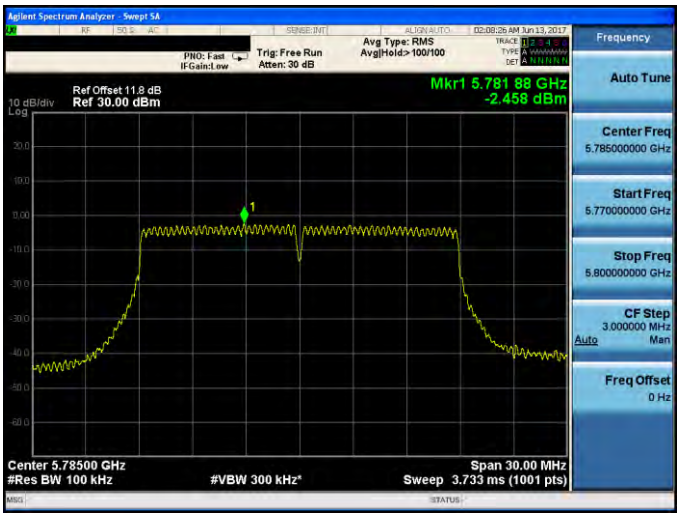
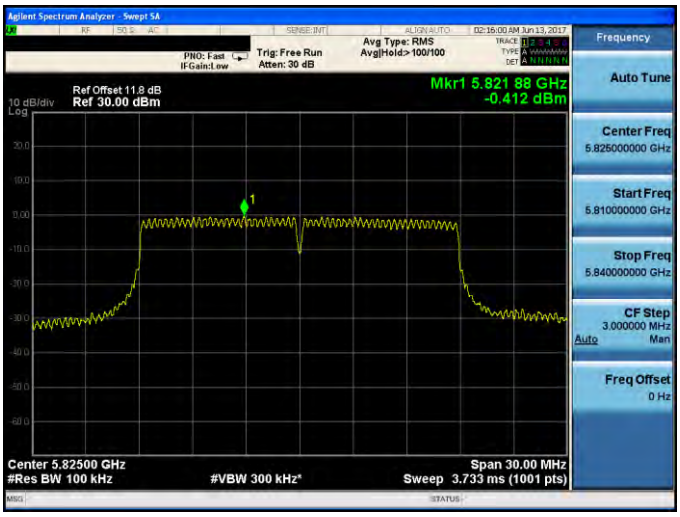
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-1	
5775 MHz	

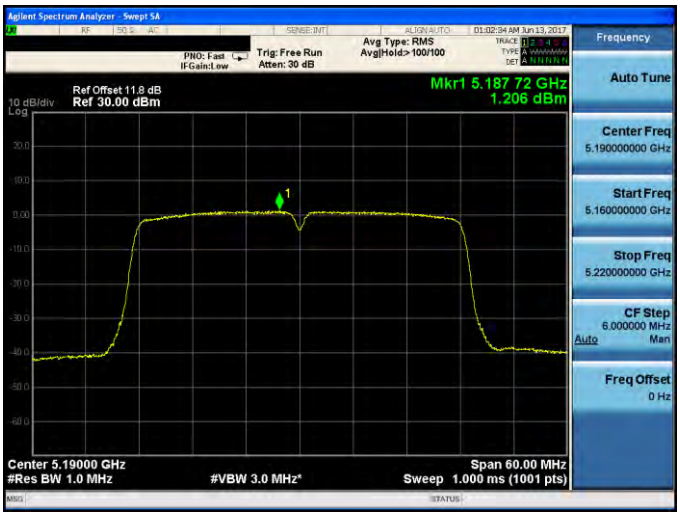
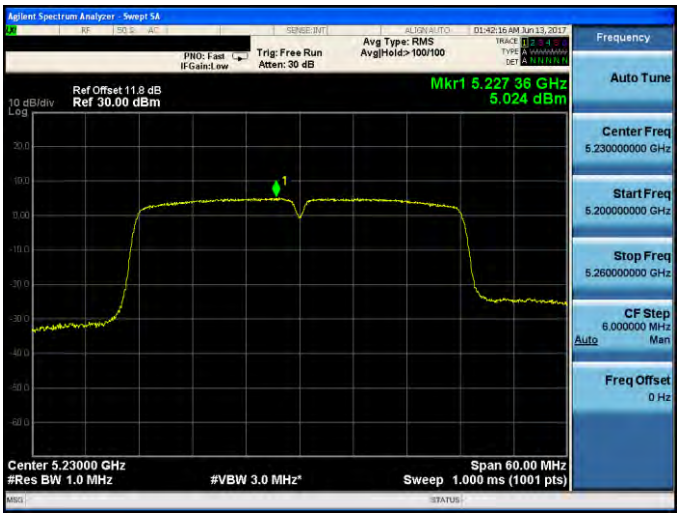
Beamforming on

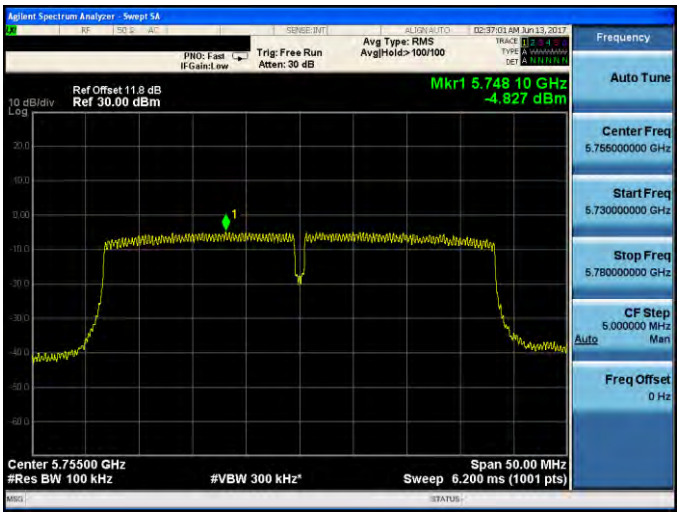
Mode 2: IEEE 802.11a Continuous TX mode_ ANT-0	
5180 MHz	
5200 MHz	
5240 MHz	

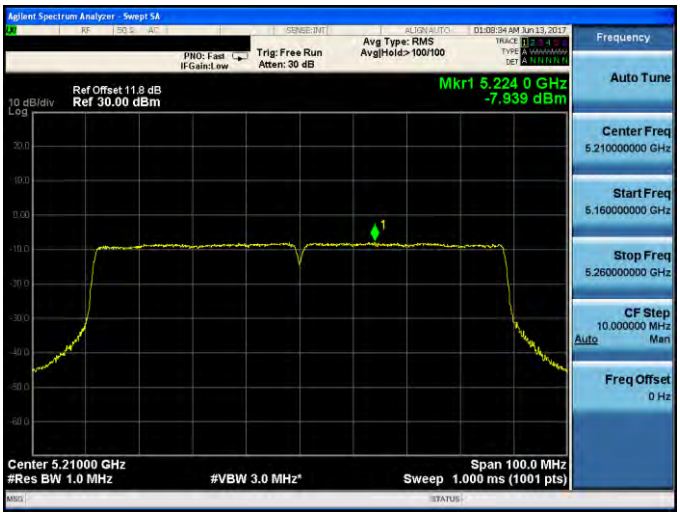
Mode 2: IEEE 802.11a Continuous TX mode_ ANT-0	
5745 MHz	
5785 MHz	
5825 MHz	

Mode 3: IEEE 802.11ac 20MHz Continuous TX mode _ ANT-0	
5180 MHz	
5200 MHz	
5240 MHz	

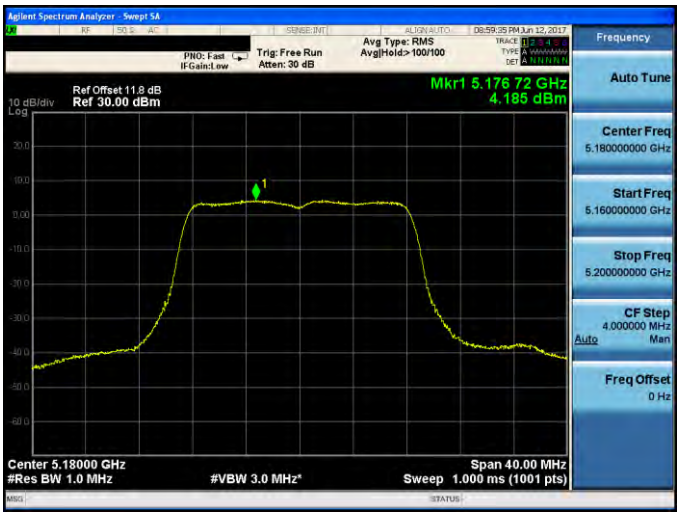
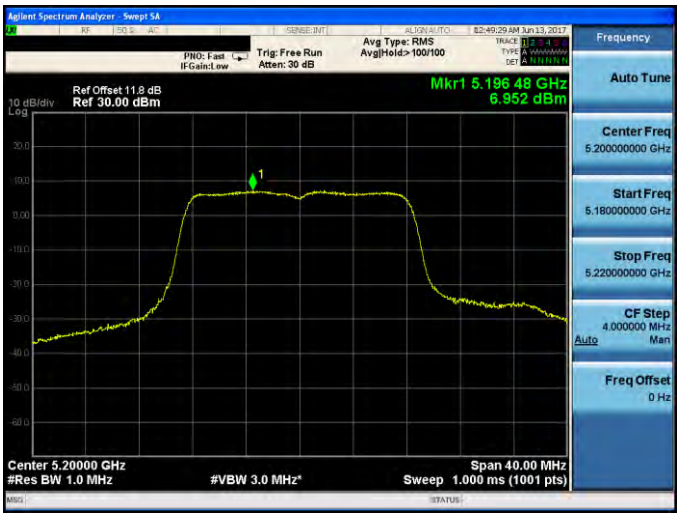
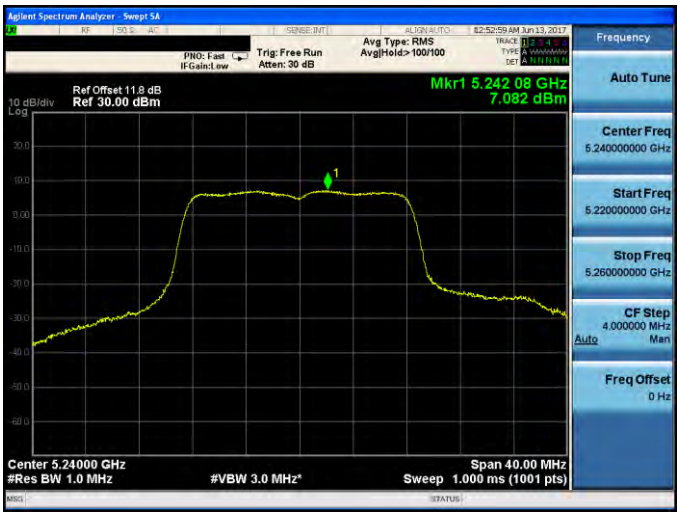
Mode 3: IEEE 802.11ac 20MHz Continuous TX mode _ ANT-0	
5745 MHz	
5785 MHz	
5825 MHz	

Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-0	
5190 MHz	
5230 MHz	

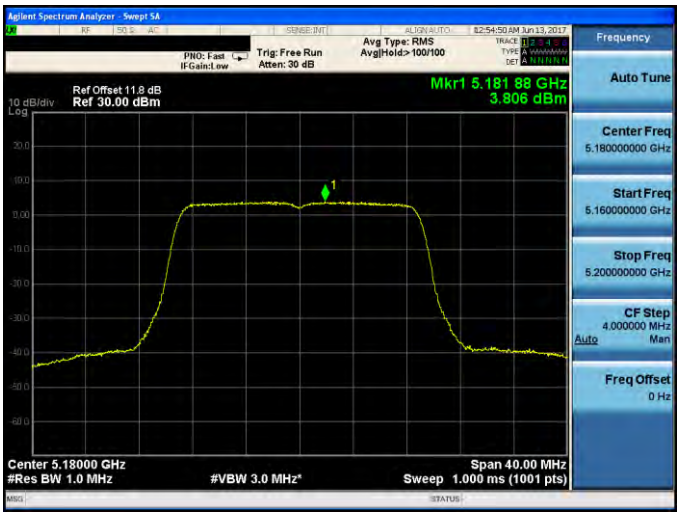
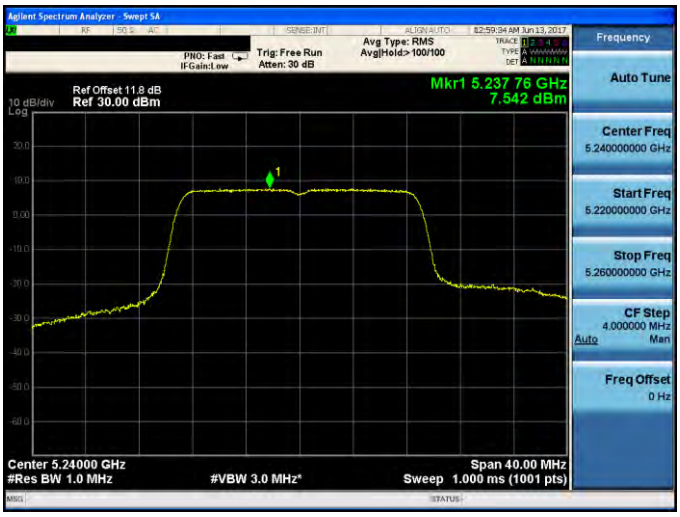
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-0	
5755 MHz	
5795 MHz	

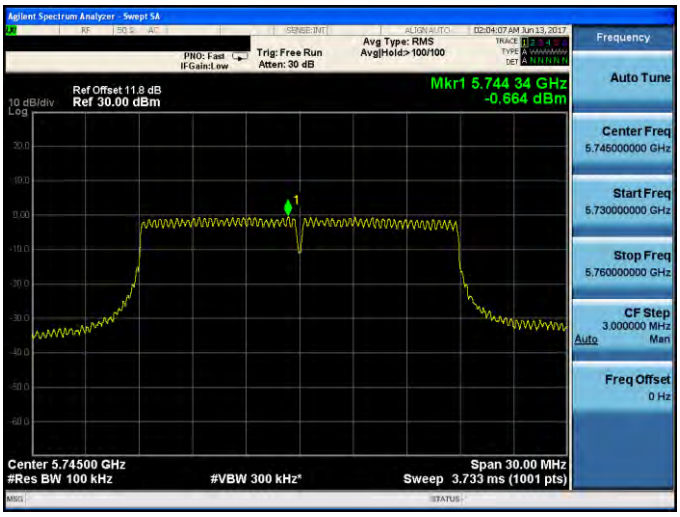
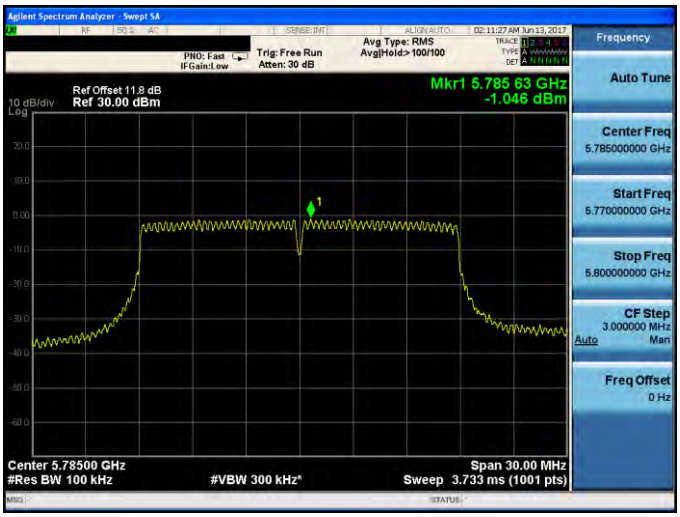
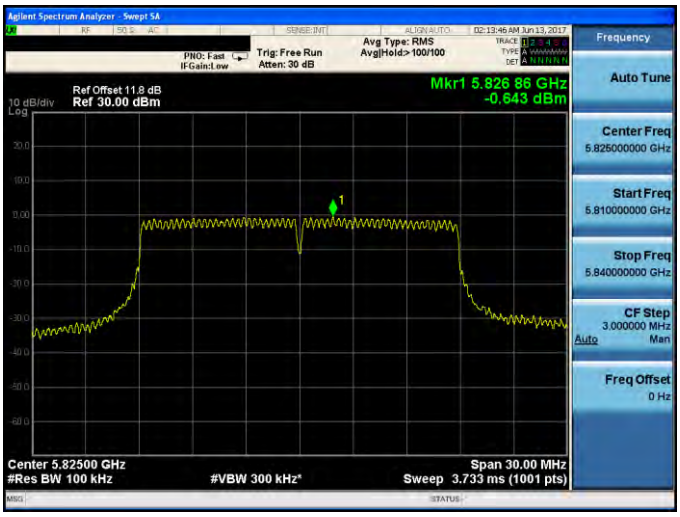
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-0	
5210 MHz	

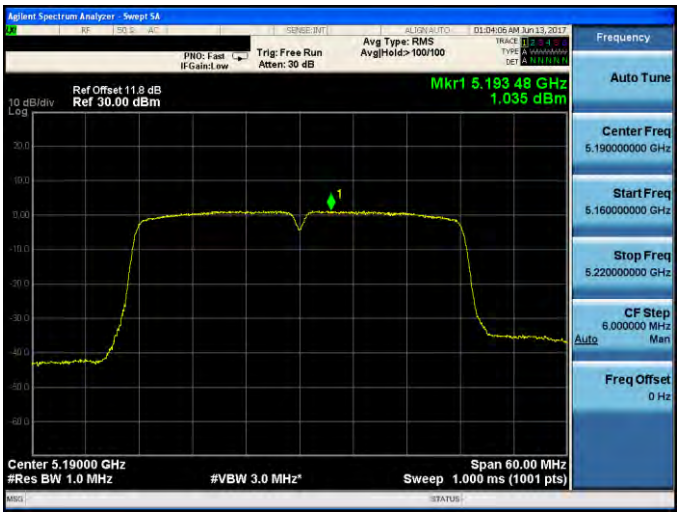
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-0	
5775 MHz	

Mode 2: IEEE 802.11a Continuous TX mode_ ANT-1	
5180 MHz	
5200 MHz	
5240 MHz	

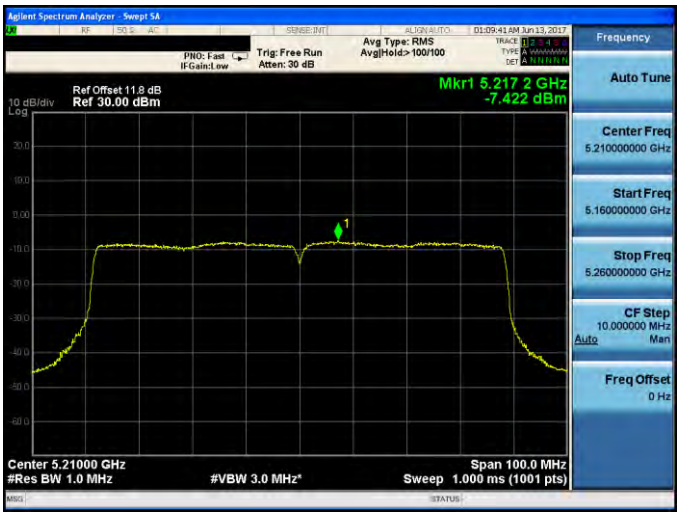
Mode 2: IEEE 802.11a Continuous TX mode_ ANT-1	
5745 MHz	
5785 MHz	
5825 MHz	

Mode 3: IEEE 802.11ac 20MHz Continuous TX mode _ ANT-1	
5180 MHz	
5200 MHz	
5240 MHz	

Mode 3: IEEE 802.11ac 20MHz Continuous TX mode _ ANT-1	
5745 MHz	
5785 MHz	
5825 MHz	

Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-1	
5190 MHz	
5230 MHz	

Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-1	
5755 MHz	
5795 MHz	

Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-1	
5210 MHz	

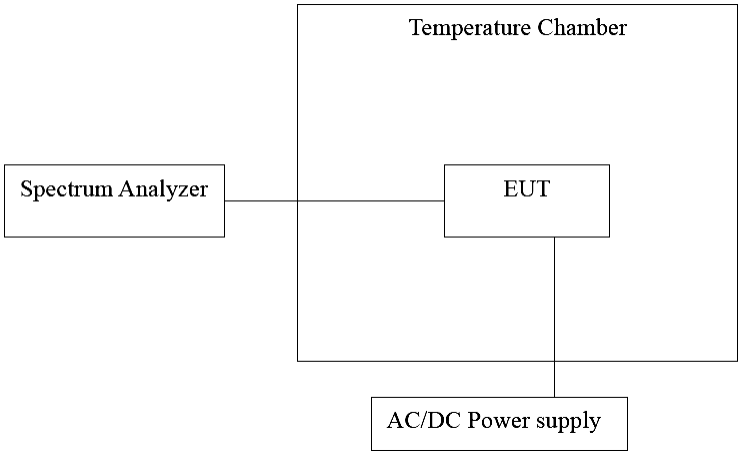
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-1	
5775 MHz	

4.8. Frequency Stability Measurement

■ **Limit**

Manufacturers 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 users manual.

■ **Test Setup**



■ **Test Instruments**

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4408B	MY45107753	08/08/2016	1 year
Temperature & Humidity Chamber	TAICHY	MHU-225LA	980729	04/17/2017	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ **Test Procedure**

1. The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

■ **Test Result**

Temperature Variations

Test Item	Frequency Stability					
Frequency	Temp. (°C)	Voltage (Vac)	Measured Freq. (MHz)	Delta Freq. (Hz)	Tolerance (ppm)	Result (Pass/Fail)
5200 MHz	0	120	5199.992	-8000	-1.538	Pass
	10		5199.9835	-16500	-3.173	Pass
	20		5199.9792	-20800	-4.000	Pass
	30		5199.9601	-39900	-7.673	Pass
	40		5199.9675	-32500	-6.250	Pass
5785 MHz	0	120	5784.9953	-4700	-0.812	Pass
	10		5784.9938	-6200	-1.072	Pass
	20		5784.9814	-18600	-3.215	Pass
	30		5784.9699	-30100	-5.203	Pass
	40		5784.9668	-33200	-5.739	Pass

Voltage Variations

Test Item	Frequency Stability					
Frequency	Temp. (°C)	Voltage (Vac)	Measured Freq. (MHz)	Delta Freq. (Hz)	Tolerance (ppm)	Result (Pass/Fail)
5200 MHz	20	138.00	5199.9812	-18800	-3.615	Pass
		120.00	5199.9792	-20800	-4.000	Pass
		102.00	5199.9725	-27500	-5.288	Pass
5785 MHz	20	138.00	5784.9889	-11100	-1.919	Pass
		120.00	5784.9814	-18600	-3.215	Pass
		102.00	5784.97	-30000	-5.186	Pass

Note: The manufacturer's frequency stability specification is better then 20ppm.

Beamforming on

Temperature Variations

Test Item	Frequency Stability					
Frequency	Temp. (°C)	Voltage (Vac)	Measured Freq. (MHz)	Delta Freq. (Hz)	Tolerance (ppm)	Result (Pass/Fail)
5200 MHz	0	120	5199.992	-8000	-1.538	Pass
	10		5199.9835	-16500	-3.173	Pass
	20		5199.9792	-20800	-4.000	Pass
	30		5199.9601	-39900	-7.673	Pass
	40		5199.9675	-32500	-6.250	Pass
5785 MHz	0	120	5784.9953	-4700	-0.812	Pass
	10		5784.9938	-6200	-1.072	Pass
	20		5784.9814	-18600	-3.215	Pass
	30		5784.9699	-30100	-5.203	Pass
	40		5784.9668	-33200	-5.739	Pass

Voltage Variations

Test Item	Frequency Stability					
Frequency	Temp. (°C)	Voltage (Vac)	Measured Freq. (MHz)	Delta Freq. (Hz)	Tolerance (ppm)	Result (Pass/Fail)
5200 MHz	20	138.00	5199.9812	-18800	-3.615	Pass
		120.00	5199.9792	-20800	-4.000	Pass
		102.00	5199.9725	-27500	-5.288	Pass
5785 MHz	20	138.00	5784.9889	-11100	-1.919	Pass
		120.00	5784.9814	-18600	-3.215	Pass
		102.00	5784.97	-30000	-5.186	Pass

Note: The manufacturer's frequency stability specification is better then 20ppm.

4.9. Antenna Requirement

■ **Limit**

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And According to 15.407 (a), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

■ **Antenna Connector Construction**

See section 2 – antenna information.

■ **Directional Gain Calculated**

Directional Gain = 10*log{[10^(G1/20)+10^(G2/20)+…+10^(Gn/20)]^2/NANT} = 7.36 dBi > 6dBi

Operate Freq. Band		Directional Gain (dBi)
IEEE 802.11a	U-NII Band I	7.36
	U-NII Band III	7.36
IEEE 802.11ac 20MHz	U-NII Band I	7.36
	U-NII Band III	7.36
IEEE 802.11ac 40MHz	U-NII Band I	7.36
	U-NII Band III	7.36
IEEE 802.11ac 80MHz	U-NII Band I	7.36
	U-NII Band III	7.36