■ **Test Result**

Test Item	26dB RF Bandwidth & 99 % Occupied Bandwidth Measurement			
Test Mode	Mode 2: IEEE 802.11a Continuous TX mode			
Frequency (MHz)	ANT-0		ANT-1	
	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5180	19.270	16.458	18.840	16.389
5200	19.120	16.465	18.750	16.401
5240	19.210	16.470	18.880	16.389

Test Item	26dB RF Bandwidth & 99 % Occupied Bandwidth Measurement			
Test Mode	Mode 3: IEEE 802.11ac 20MHz Continuous TX mode			
Frequency (MHz)	ANT-0		ANT-1	
	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5180	20.050	17.616	19.810	17.544
5200	20.080	17.611	19.930	17.542
5240	20.180	17.613	19.990	17.524

Test Item	26dB RF Bandwidth & 99 % Occupied Bandwidth Measurement			
Test Mode	Mode 4: IEEE 802.11ac 40MHz Continuous TX mode			
Frequency (MHz)	ANT-0		ANT-1	
	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5190	40.260	36.008	40.440	36.144
5230	40.300	36.018	40.480	36.151

Test Item	26dB RF Bandwidth & 99 % Occupied Bandwidth Measurement			
Test Mode	Mode 5: IEEE 802.11ac 80MHz Continuous TX mode			
Frequency (MHz)	ANT-0		ANT-1	
	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5210	82.600	75.537	82.210	75.655

Note: The 99% occupied bandwidth not crossed 5250MHz.

Beamforming on

Test Item	26dB RF Bandwidth & 99 % Occupied Bandwidth Measurement			
Test Mode	Mode 3: IEEE 802.11ac 20MHz Continuous TX mode			
Frequency (MHz)	ANT-0		ANT-1	
	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5180	20.100	17.621	19.960	17.560
5200	20.120	17.615	19.930	17.552
5240	20.140	17.614	19.820	17.537

Test Item	26dB RF Bandwidth & 99 % Occupied Bandwidth Measurement			
Test Mode	Mode 4: IEEE 802.11ac 40MHz Continuous TX mode			
Frequency (MHz)	ANT-0		ANT-1	
	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5190	40.240	35.986	40.110	36.169
5230	40.330	36.026	40.540	36.152

Test Item	26dB RF Bandwidth & 99 % Occupied Bandwidth Measurement			
Test Mode	Mode 5: IEEE 802.11ac 80MHz Continuous TX mode			
Frequency (MHz)	ANT-0		ANT-1	
	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5210	82.960	75.542	82.700	75.680

Note: The 99% occupied bandwidth not crossed 5250MHz.

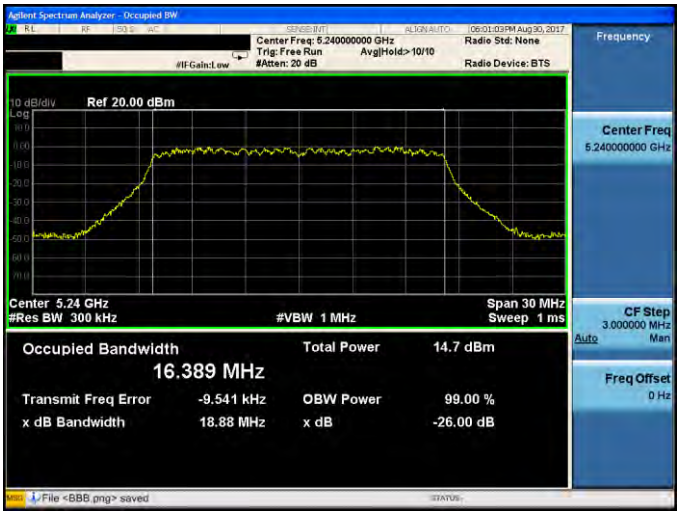
■ **Test Graphs**

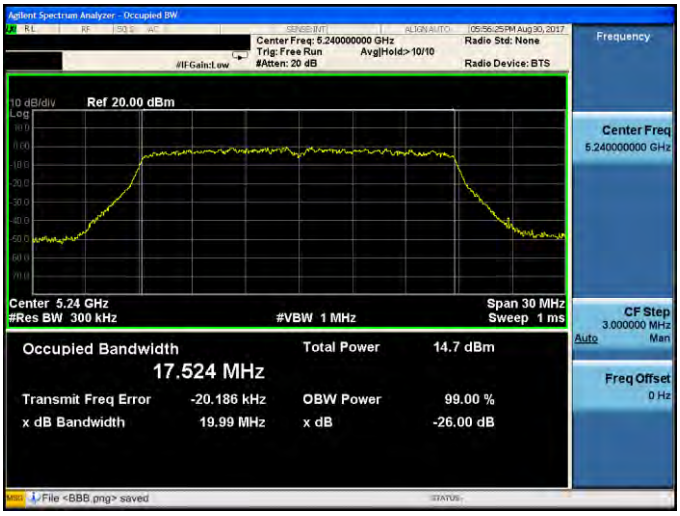
Mode 2: IEEE 802.11a Continuous TX mode_ ANT-0	
5180 MHz	
5200 MHz	
5240 MHz	

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	

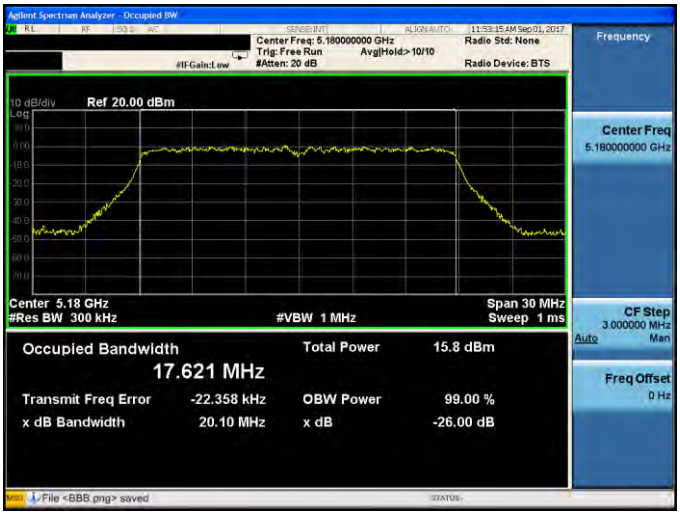
Mode 2: IEEE 802.11a Continuous TX mode_ ANT-1	
5180 MHz	
5200 MHz	
5240 MHz	

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	

Beamforming on

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 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	

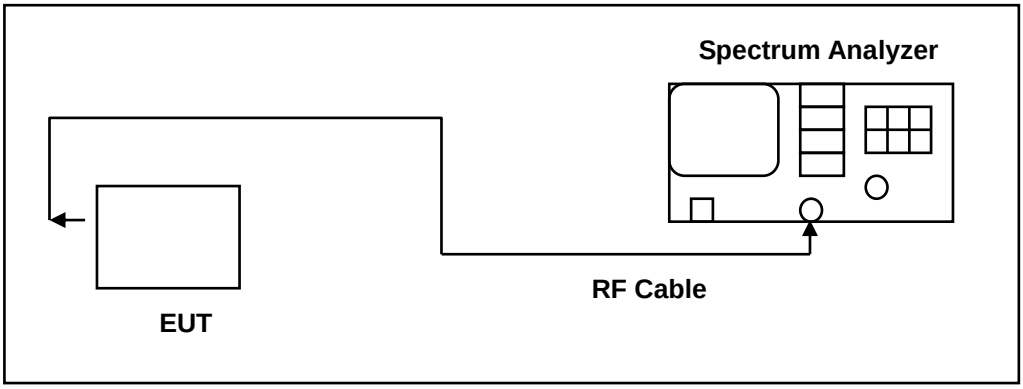
4.6. 6dB RF Bandwidth Measurement

■ **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	16350	> 500
5785	16370	16370	> 500
5825	16320	16390	> 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	17560	17630	> 500
5785	17590	17590	> 500
5825	17580	17610	> 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	35130	35110	> 500
5795	35030	35090	> 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	75410	75250	> 500

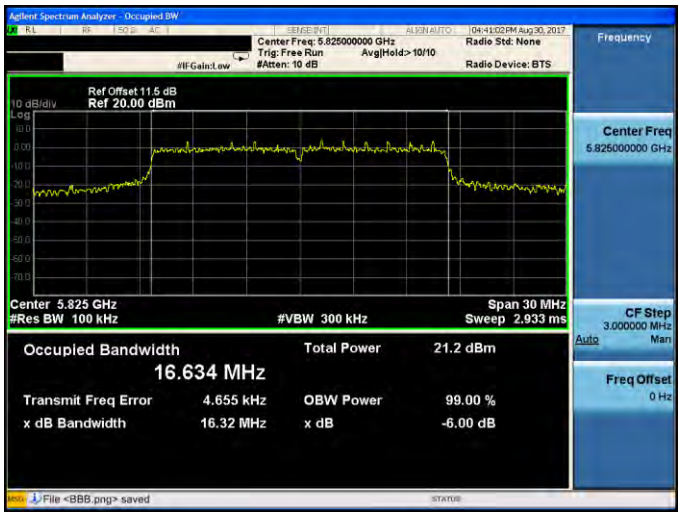
Beamforming on

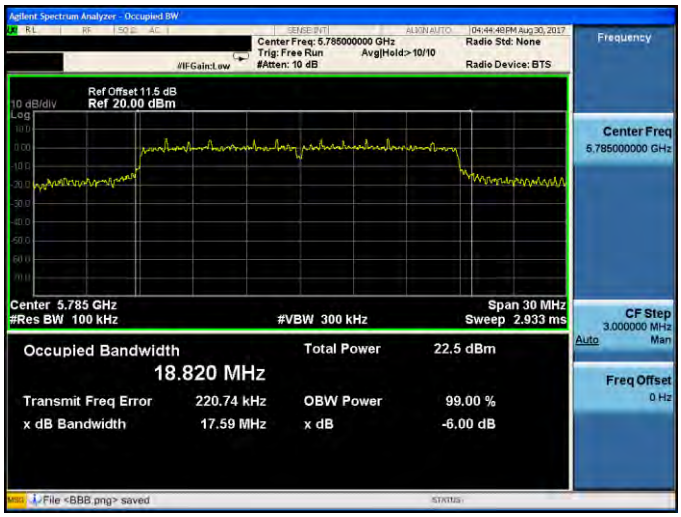
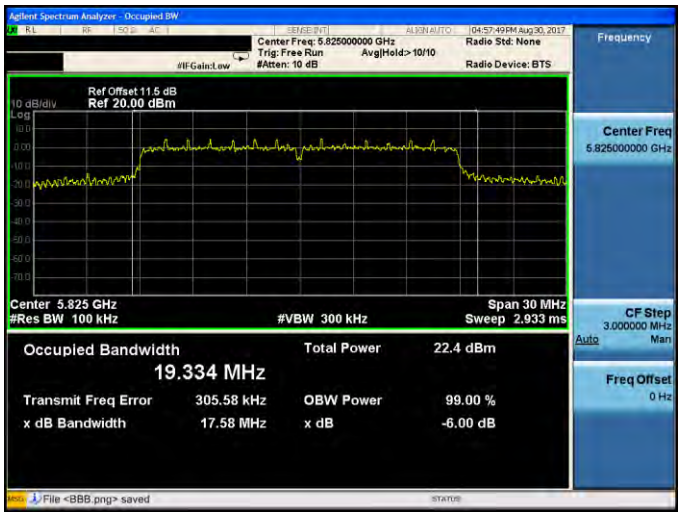
Test Item	6dB RF Bandwidth		
Test Mode	Mode 3: IEEE 802.11ac 20MHz Continuous TX mode		
Frequency (MHz)	6dB Bandwidth (kHz)		Limit (kHz)
	ANT-0	ANT-1	
5745	17600	17640	> 500
5785	17620	17650	> 500
5825	17600	17610	> 500

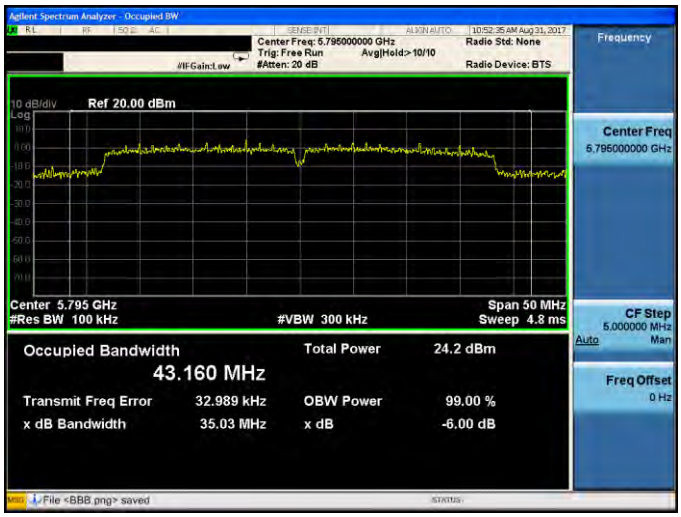
Test Item	6dB RF Bandwidth		
Test Mode	Mode 4: IEEE 802.11ac 40MHz Continuous TX mode		
Frequency (MHz)	6dB Bandwidth (kHz)		Limit (kHz)
	ANT-0	ANT-1	
5755	35100	34960	> 500
5795	35100	34460	> 500

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	75410	75260	> 500

■ **Test Graphs**

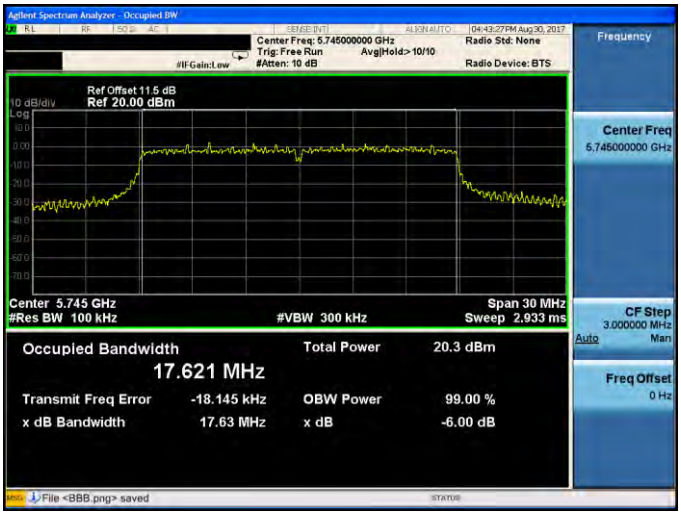
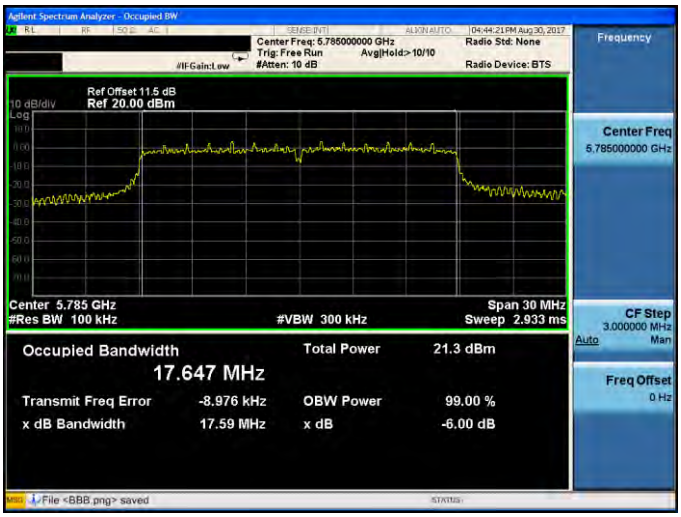
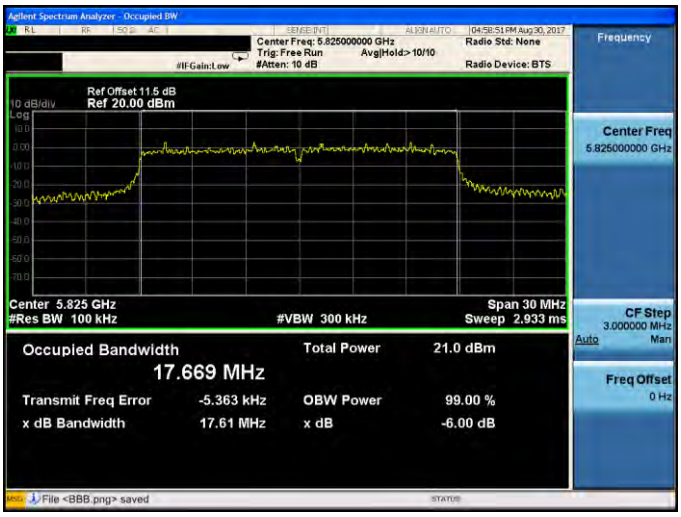
Mode 2: IEEE 802.11a Continuous TX mode_ANT-0	
5745 MHz	
5785 MHz	
5825 MHz	

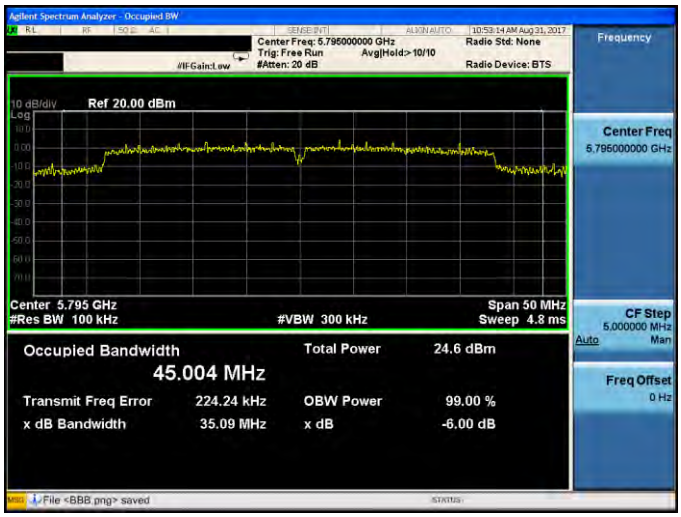
Mode 3: IEEE 802.11ac 20MHz Continuous TX mode_ANT-0	
5745 MHz	
5785 MHz	
5825 MHz	

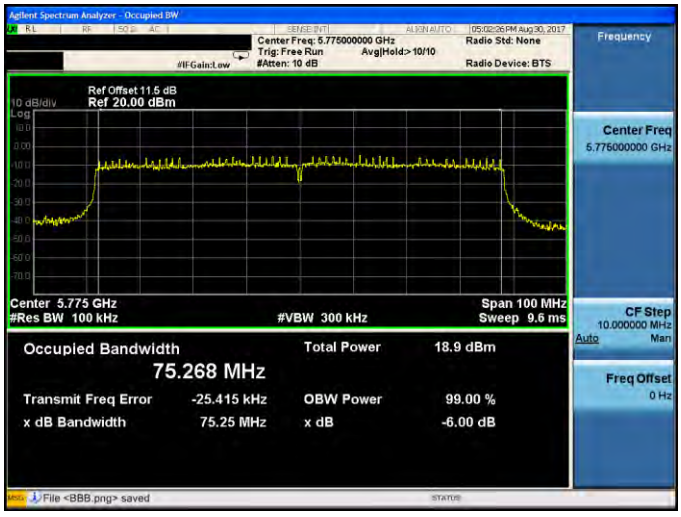
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ANT-0	
5755 MHz	
5795 MHz	

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

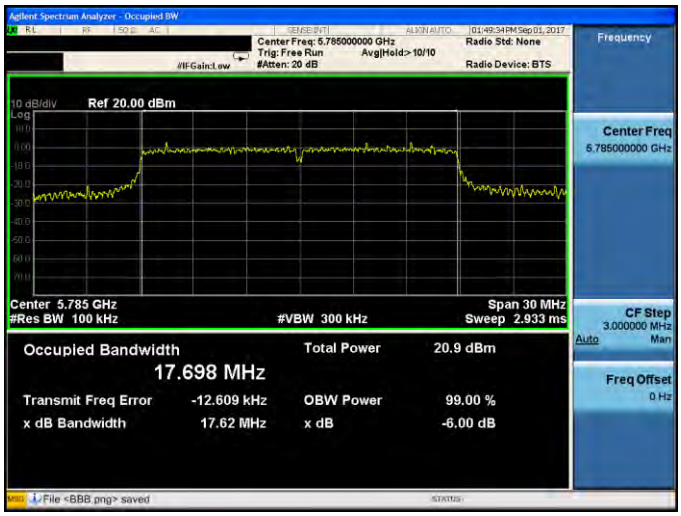
Mode 2: IEEE 802.11a Continuous TX mode_ANT-1	
5745 MHz	
5785 MHz	
5825 MHz	

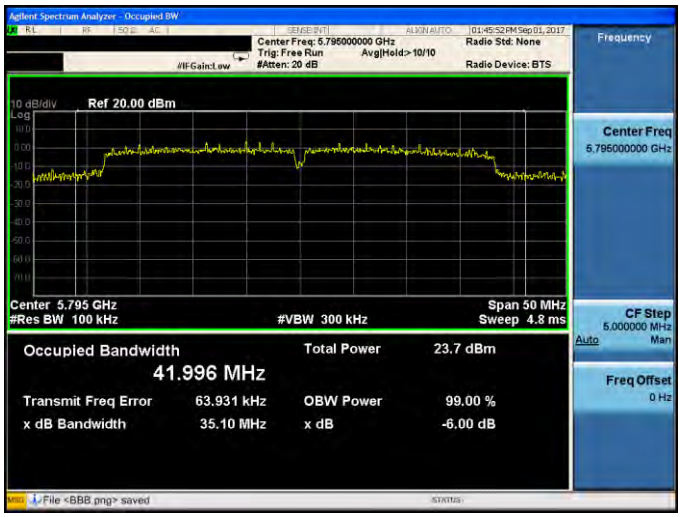
Mode 3: IEEE 802.11ac 20MHz Continuous TX mode_ANT-1	
5745 MHz	
5785 MHz	
5825 MHz	

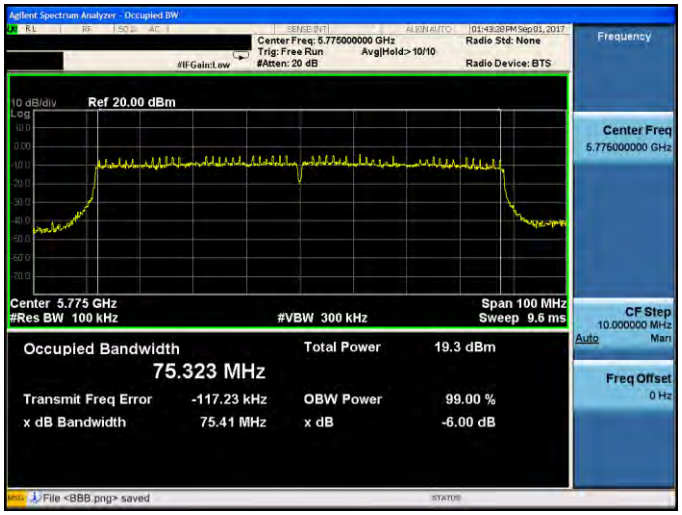
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ANT-1	
5755 MHz	
5795 MHz	

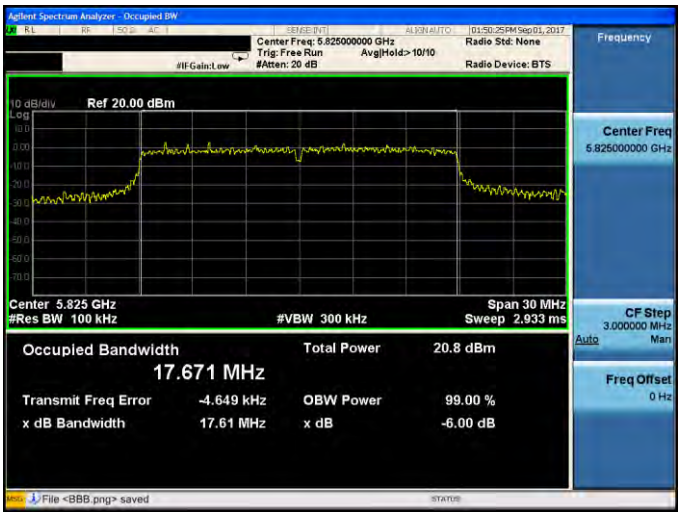
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode_ANT-1	
5775 MHz	

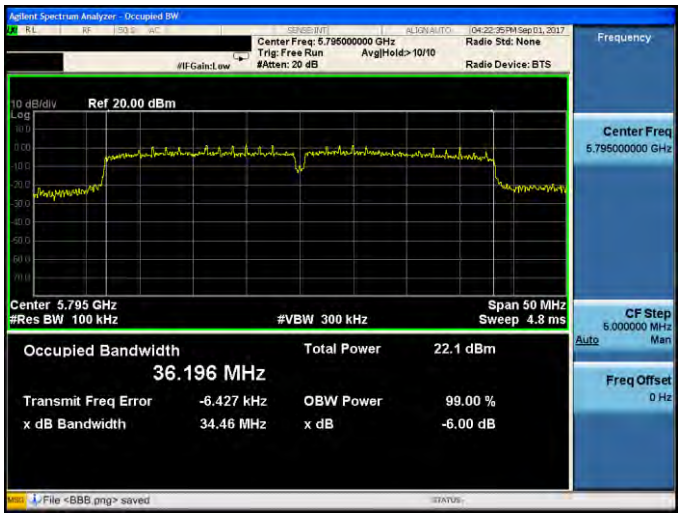
Beamforming on

Mode 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 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,

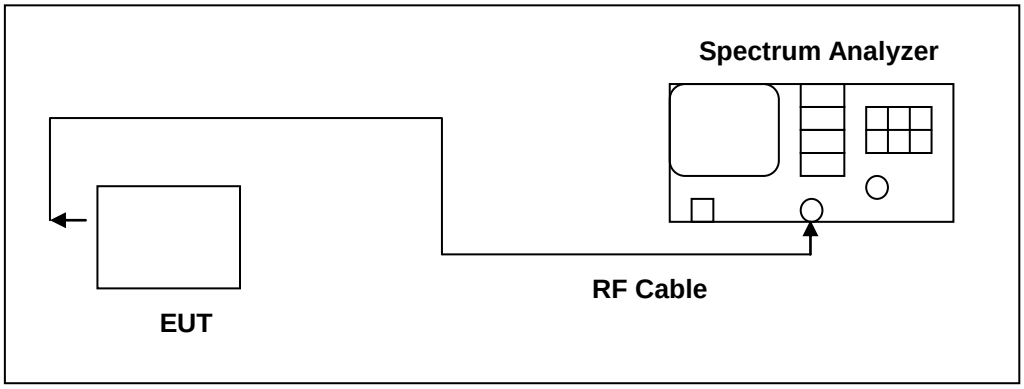
∗ CDD/BF mode：Directional Gain = 10*log{[10^(G1/20)+10^(G2/20)+…+10^(Gn/20)]^2/NANT}
= 9.19 dBi > 6dBi (5.150 ~ 5.250 GHz)

∗ CDD/BF mode：Directional Gain = 10*log{[10^(G1/20)+10^(G2/20)+…+10^(Gn/20)]^2/NANT}
= 9.06 dBi > 6dBi (5.725 ~ 5.850 GHz)

∗ CDD/BF mode power limit shall be reduced = 17 – 3.19 = 13.81 dBm/MHz (5.150 ~ 5.250 GHz)

∗ CDD/BF mode power limit shall be reduced = 30 – 3.06 = 26.94 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	0.377	0.124	0.501	< 13.81
5200	0.536	0.124	0.660	
5240	0.800	0.124	0.924	
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5180	-2.431	0.124	-2.307	< 13.81
5200	-2.474	0.124	-2.350	
5240	-2.340	0.124	-2.216	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5180	2.330			< 13.81
5200	2.421			
5240	2.642			

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	-4.97	0.124	2.14	< 26.94
5785	-5.59	0.124	1.52	
5825	-5.33	0.124	1.79	
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5745	-6.71	0.124	0.40	< 26.94
5785	-7.28	0.124	-0.17	
5825	-6.59	0.124	0.53	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/500KHz)
5745	4.37			< 26.94
5785	3.77			
5825	4.21			

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	0.277	0.060	0.337	< 13.81
5200	0.026	0.060	0.086	
5240	0.079	0.060	0.139	
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5180	-2.405	0.060	-2.345	< 13.81
5200	-2.498	0.060	-2.438	
5240	-2.773	0.060	-2.713	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5180	2.210			< 13.81
5200	2.015			
5240	1.953			

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	-4.90	0.060	2.15	< 26.94
5785	-4.22	0.060	2.83	
5825	-4.93	0.060	2.12	
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5745	-6.31	0.060	0.74	< 26.94
5785	-5.88	0.060	1.17	
5825	-5.69	0.060	1.36	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/500KHz)
5745	4.51			< 26.94
5785	5.09			
5825	4.77			

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	-3.123	0.105	-3.018	< 13.81
5230	-2.518	0.105	-2.413	
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5190	-5.831	0.105	-5.726	< 13.81
5230	-5.200	0.105	-5.095	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5190	-1.154			< 13.81
5230	-0.540			

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	-5.80	0.105	1.29	< 26.94
5795	-6.30	0.105	0.79	
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5755	-8.11	0.105	-1.02	< 26.94
5795	-5.45	0.105	1.65	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/500KHz)
5755	3.30			< 26.94
5795	4.25			

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	-9.340	0.272	-9.068	< 13.81
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5210	-11.834	0.272	-11.562	< 13.81
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5210	-7.128			< 13.81

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	-12.33	0.272	-5.07	< 26.94
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/MHz)
5775	-14.34	0.272	-7.08	< 26.94
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/MHz)
5775	-2.95			< 26.94

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

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

Beamforming on

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	-1.182	0.051	-1.131	< 13.81
5200	-1.459	0.051	-1.408	
5240	-1.051	0.051	-1.000	
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5180	-4.047	0.051	-3.996	< 13.81
5200	-4.223	0.051	-4.172	
5240	-3.628	0.051	-3.577	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5180	0.679			< 13.81
5200	0.437			
5240	0.911			

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	-5.56	0.051	1.48	< 26.94
5785	-5.28	0.051	1.76	
5825	-6.11	0.051	0.93	
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5745	-7.80	0.051	-0.76	< 26.94
5785	-6.91	0.051	0.13	
5825	-7.24	0.051	-0.20	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/500KHz)
5745	3.52			< 26.94
5785	4.03			
5825	3.41			

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	-4.901	0.105	-4.796	< 13.81
5230	-4.207	0.105	-4.102	
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5190	-7.563	0.105	-7.458	< 13.81
5230	-7.141	0.105	-7.036	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5190	-2.916			< 13.81
5230	-2.316			

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	-7.27	0.105	-0.18	< 26.94
5795	-6.20	0.105	0.90	
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/500KHz)
5755	-9.79	0.105	-2.69	< 26.94
5795	-7.43	0.105	-0.34	
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/500KHz)
5755	1.76			< 26.94
5795	3.33			

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	-11.305	0.252	-11.053	< 13.81
Frequency (MHz)	ANT-1			
	Measurement (dBm/MHz)	Duty Factor (dB)	Calculated (dBm/MHz)	Limit (dBm/MHz)
5210	-13.715	0.252	-13.463	< 13.81
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/MHz)			Limit (dBm/MHz)
5210	-9.082			< 13.81

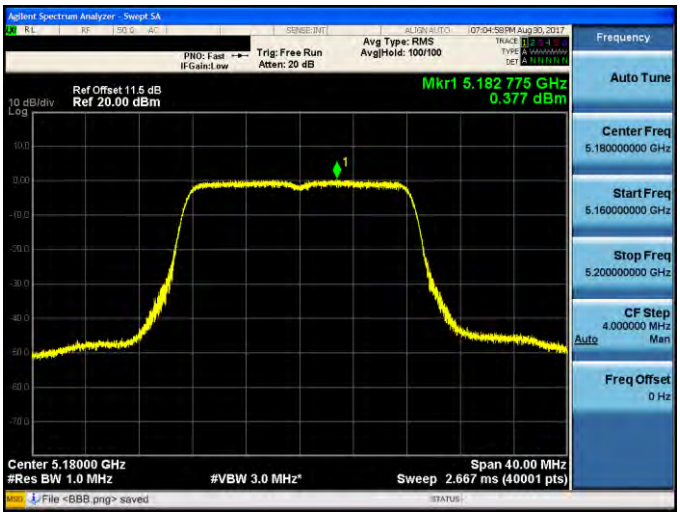
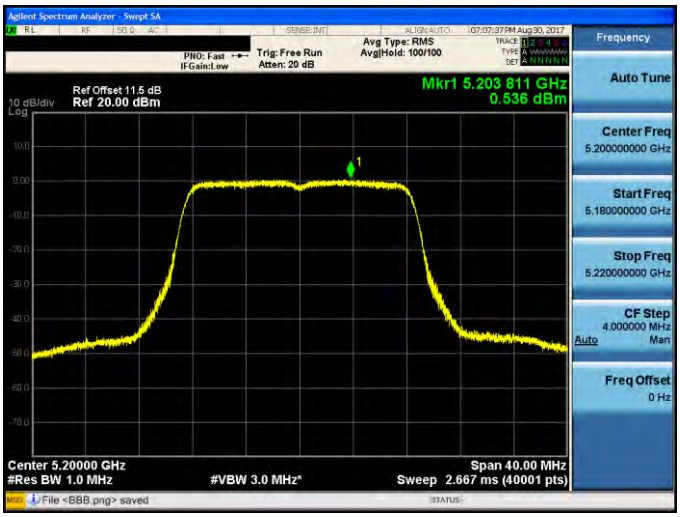
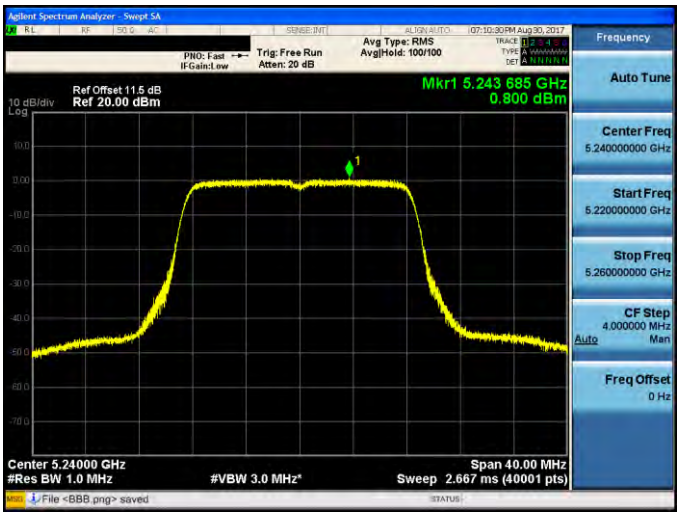
Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

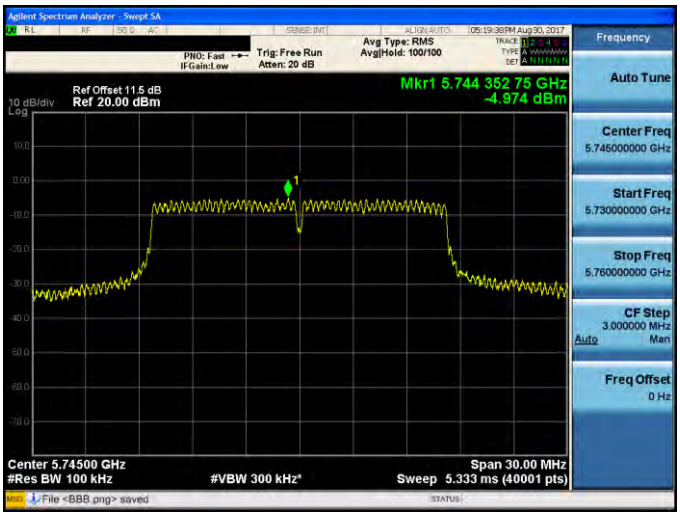
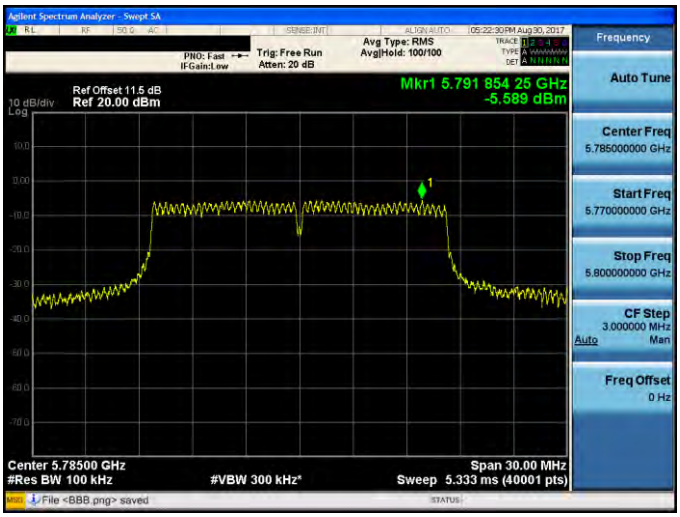
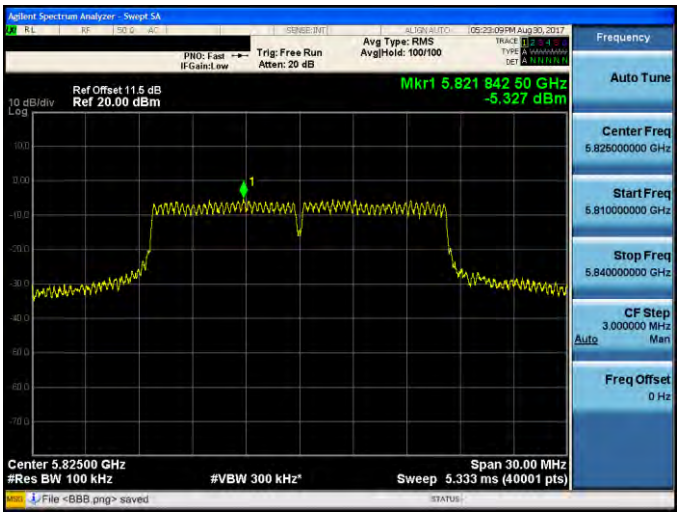
Test Item	Conducted power spectral density			
Test Mode	Mode 5: IEEE 802.11ac 80MHz link mode			
Frequency (MHz)	ANT-0			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/MHz)
5775	-13.68	0.252	-6.44	< 26.94
Frequency (MHz)	ANT-1			
	Measurement (dBm/100KHz)	Duty Factor (dB)	Calculated (dBm/500KHz)	Limit (dBm/MHz)
5775	-15.70	0.252	-8.46	< 26.94
Frequency (MHz)	ANT-0+1			
	Calculated (dBm/500KHz)			Limit (dBm/MHz)
5775	-4.32			< 26.94

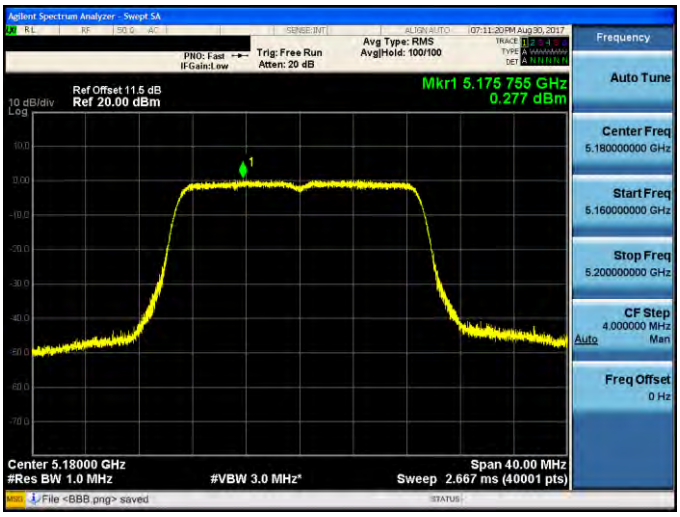
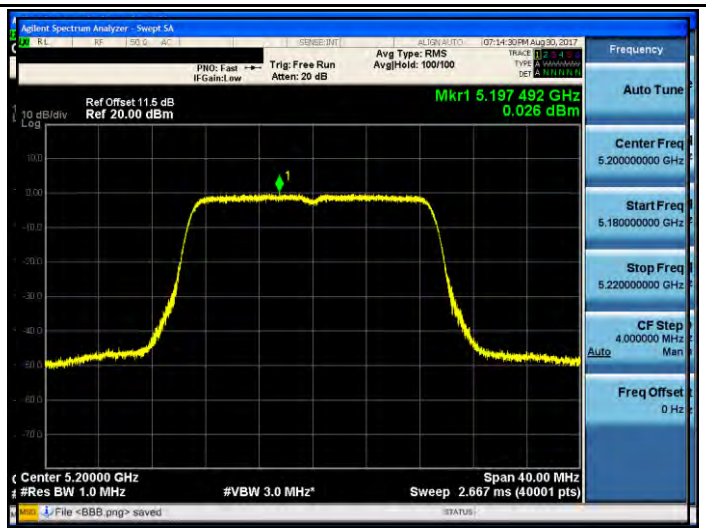
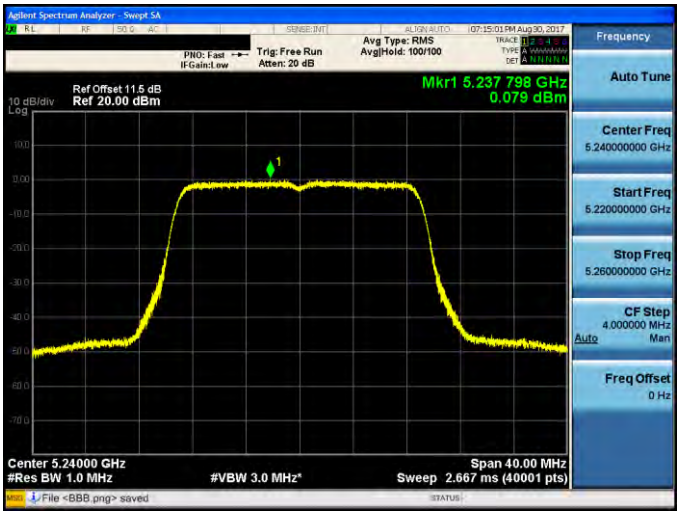
Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

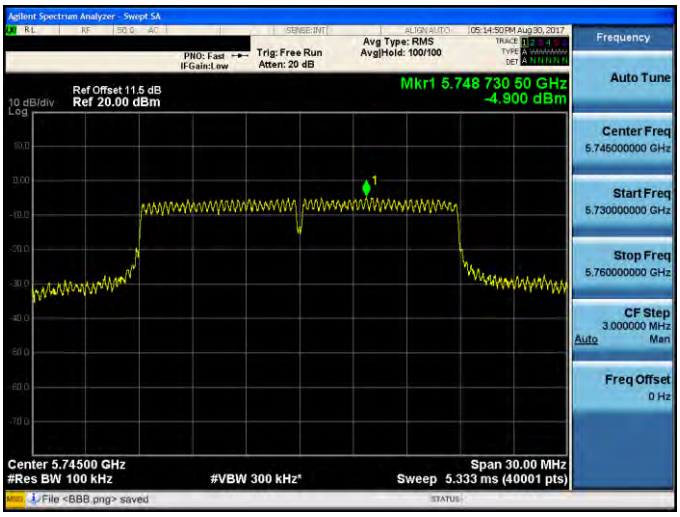
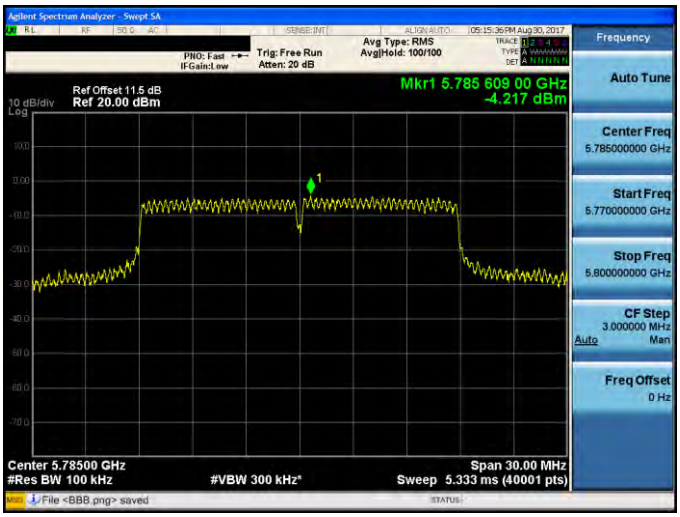
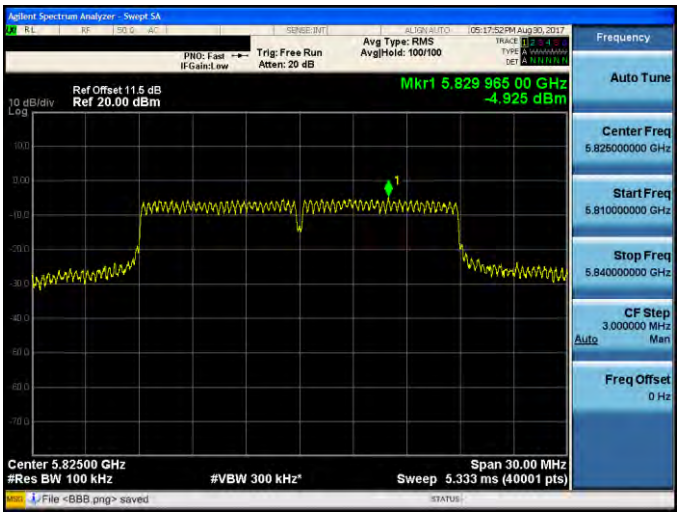
Conversion ratio = 10*Log(500k/100k)

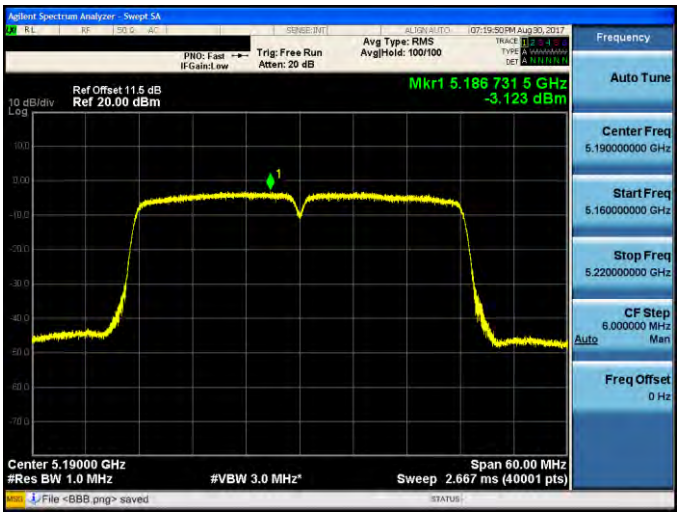
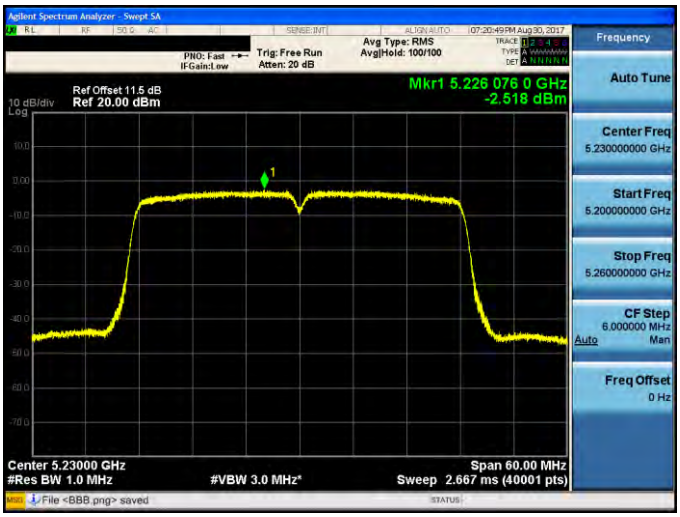
■ **Test Graphs**

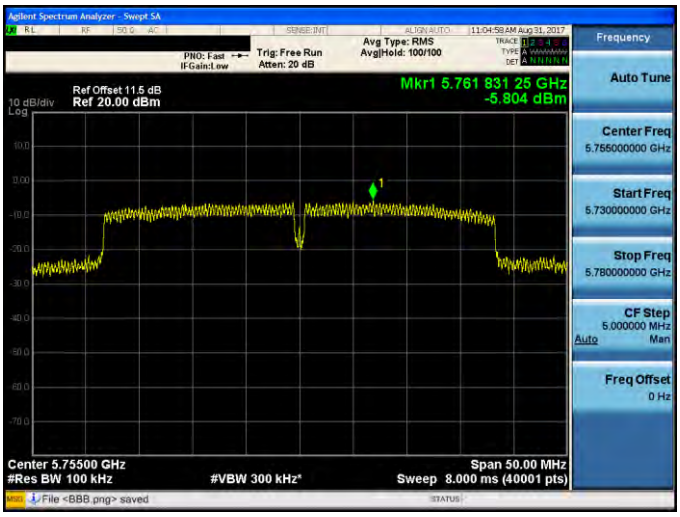
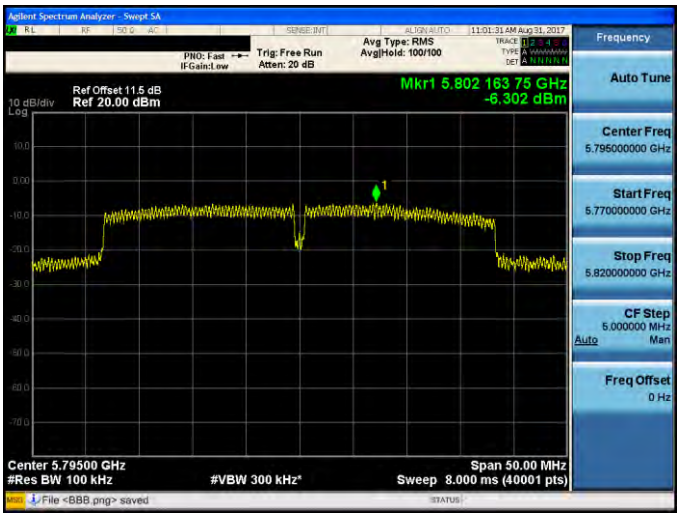
Mode 2: IEEE 802.11a Continuous TX mode_ ANT-0	
5180 MHz	
5200 MHz	
5240 MHz	

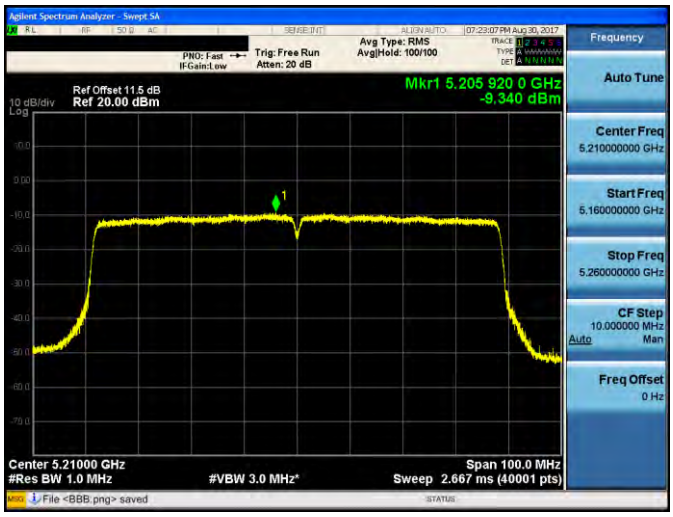
Mode 2: IEEE 802.11a Continuous TX mode_ ANT-0	
5745 MHz	
5785 MHz	
5825 MHz	

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

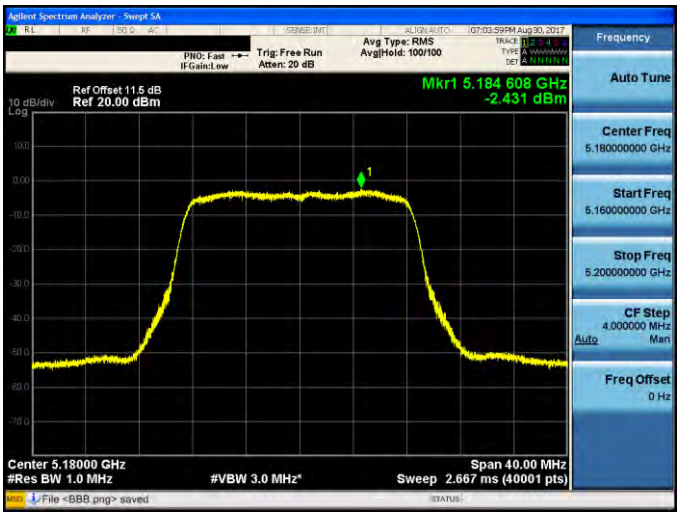
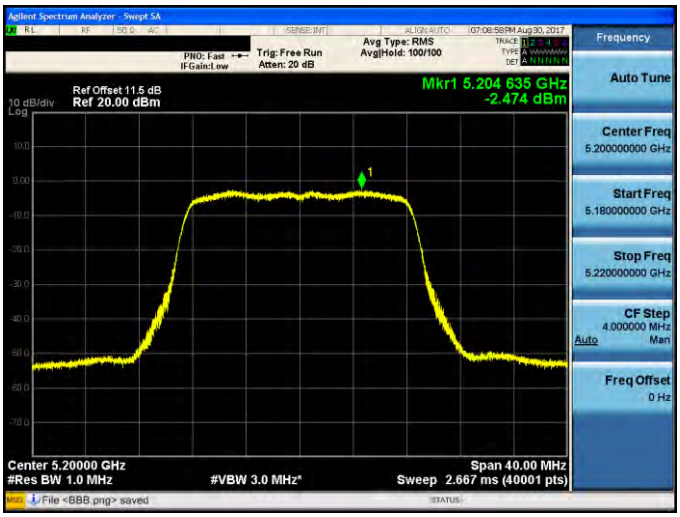
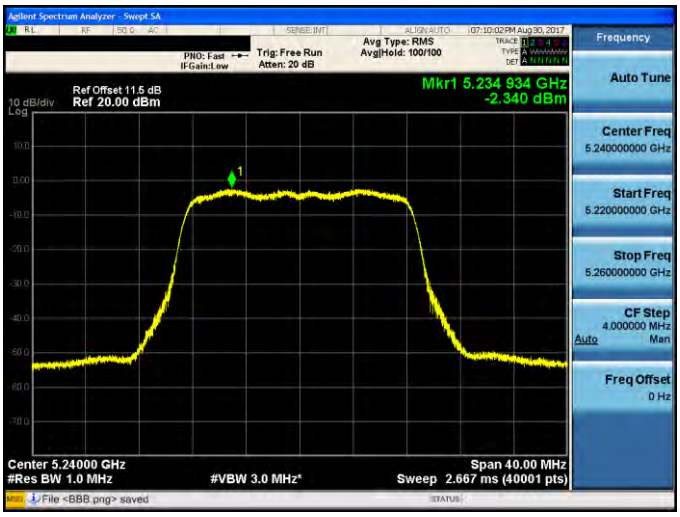
Mode 3: IEEE 802.11ac 20MHz Continuous TX mode _ ANT-0	
5745 MHz	
5785 MHz	
5825 MHz	

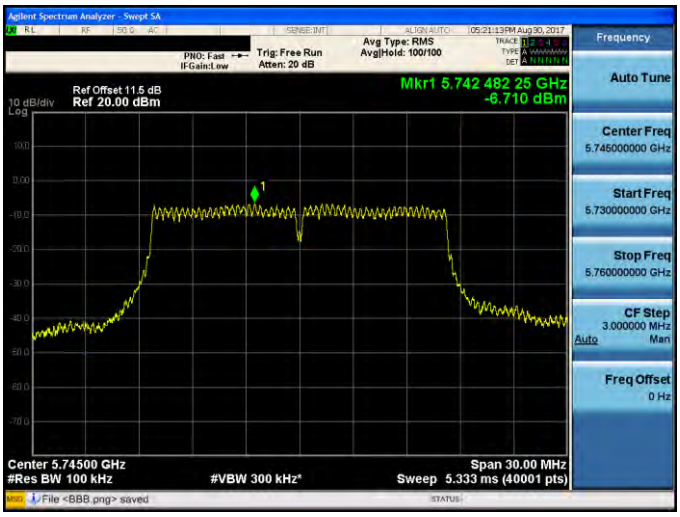
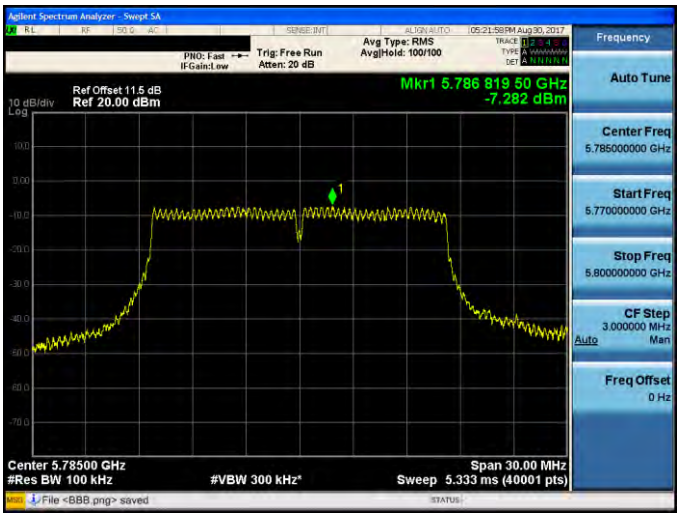
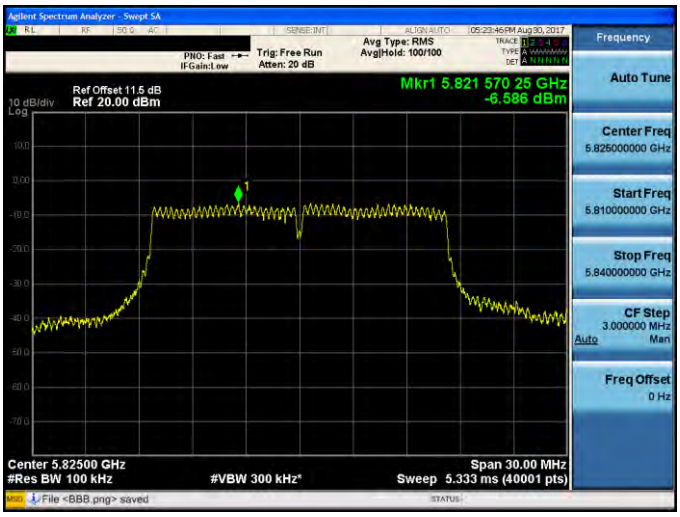
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-0	
5190 MHz	
5230 MHz	

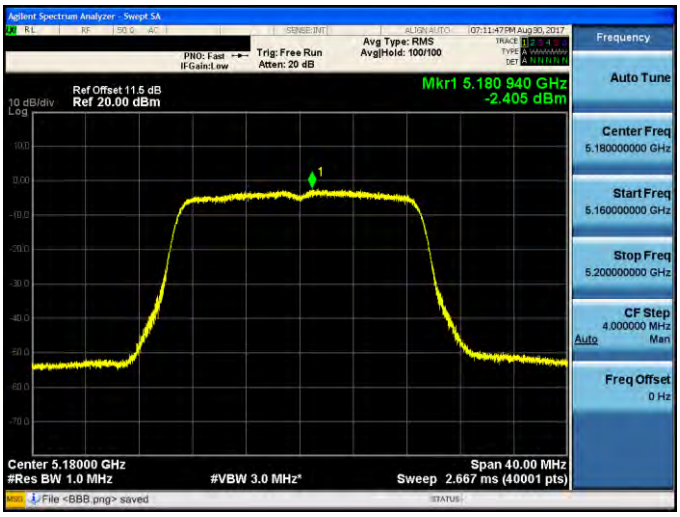
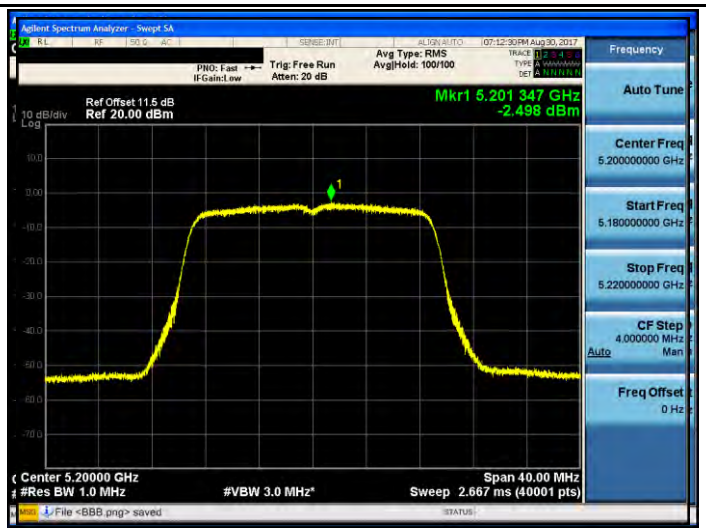
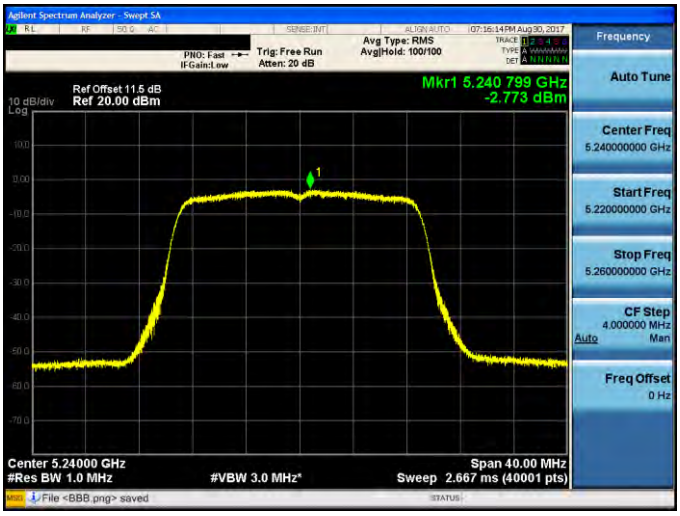
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-0	
5755 MHz	
5795 MHz	

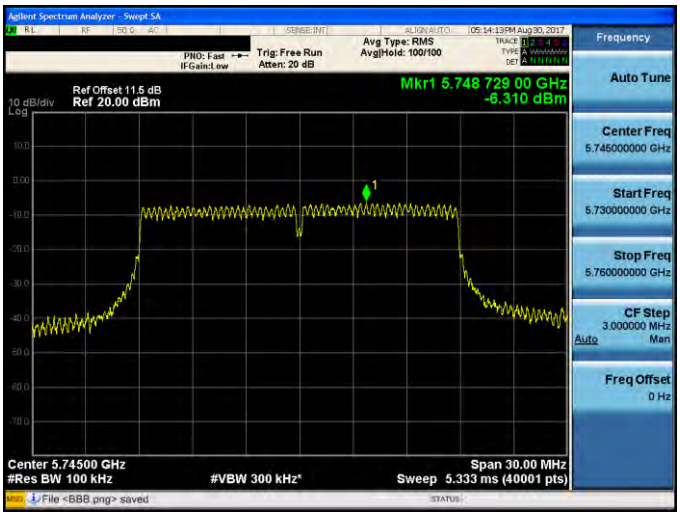
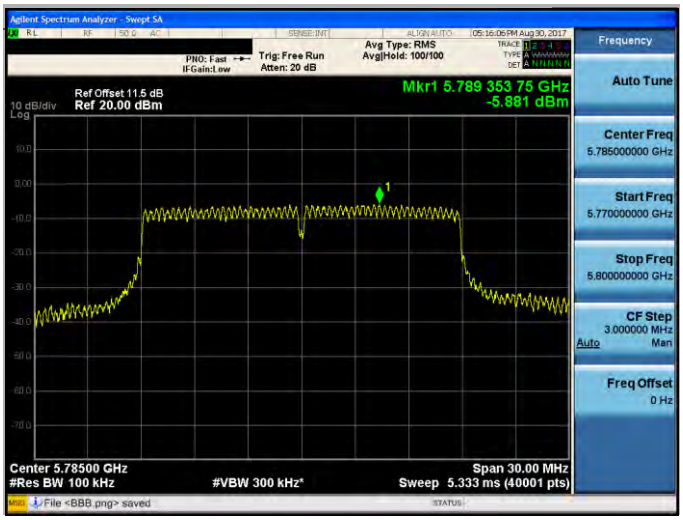
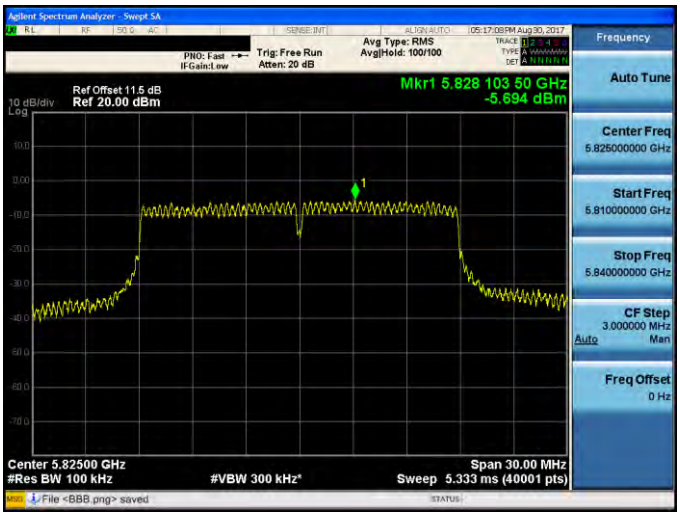
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-0	
5210 MHz	

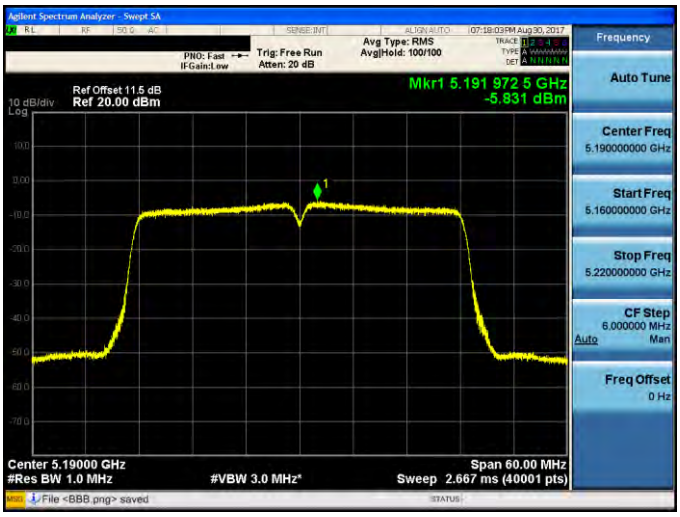
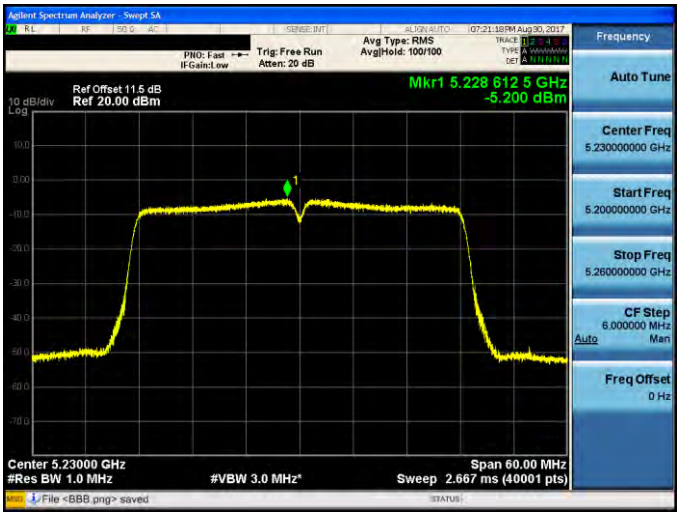
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-0	
5775 MHz	

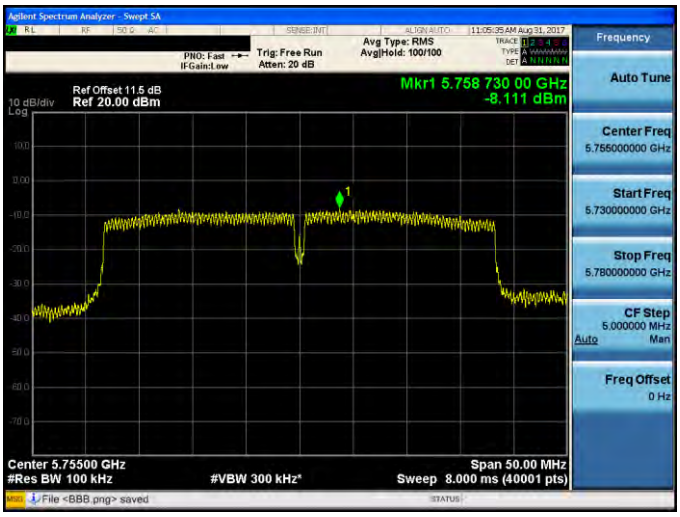
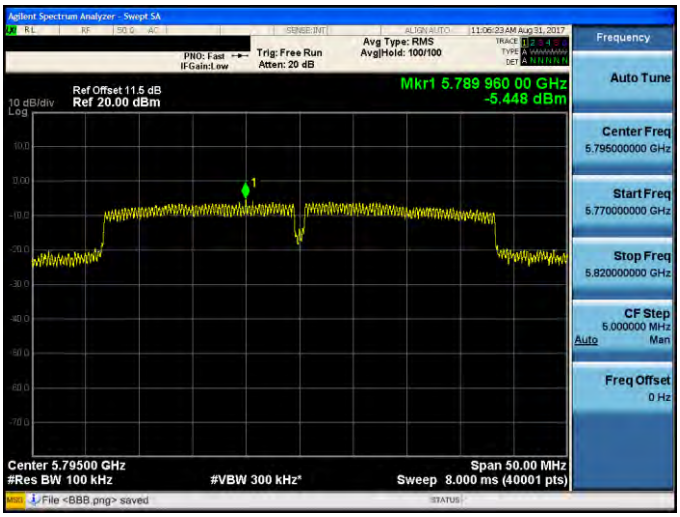
Mode 2: IEEE 802.11a Continuous TX mode_ ANT-1	
5180 MHz	
5200 MHz	
5240 MHz	

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

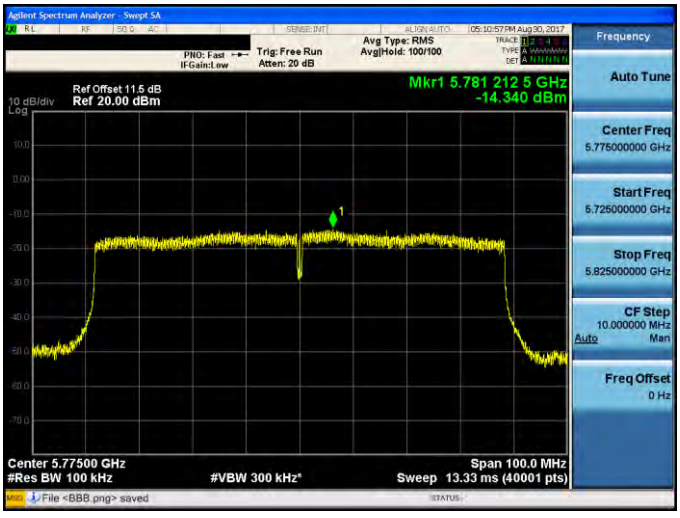
Mode 3: IEEE 802.11ac 20MHz Continuous TX mode _ ANT-1	
5180 MHz	
5200 MHz	
5240 MHz	

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

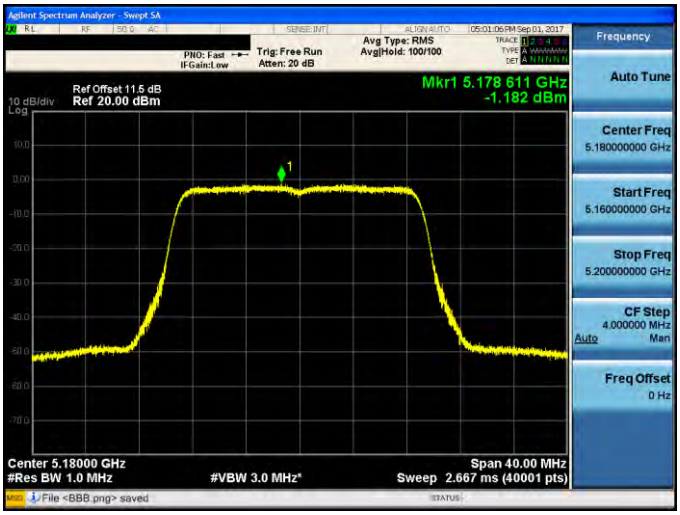
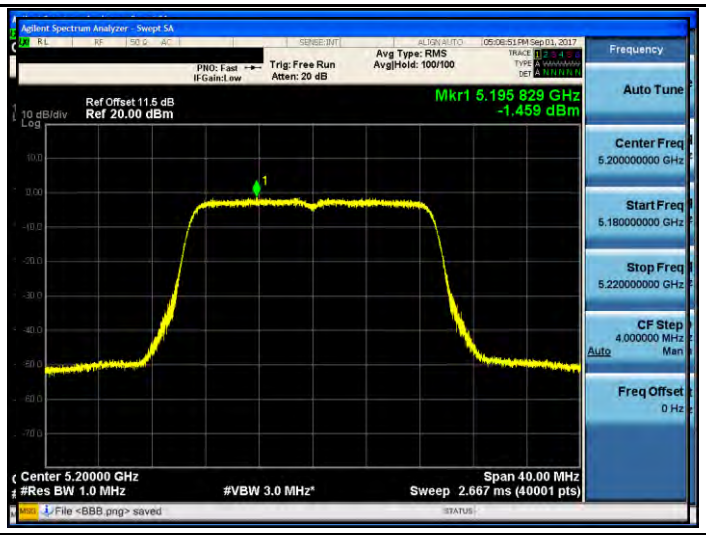
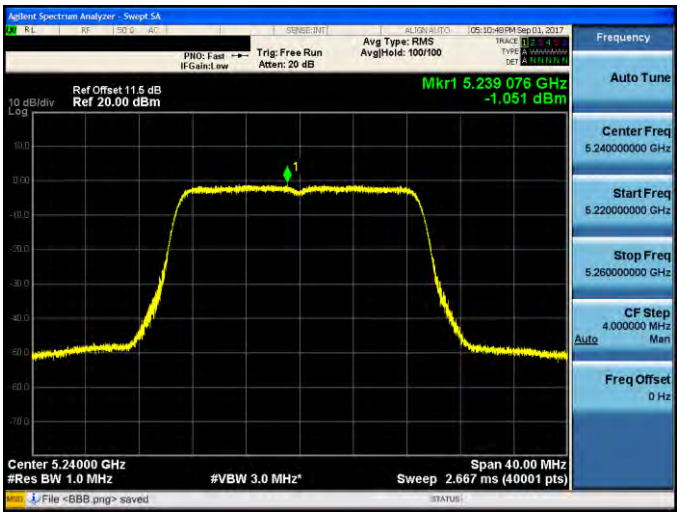
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-1	
5190 MHz	
5230 MHz	

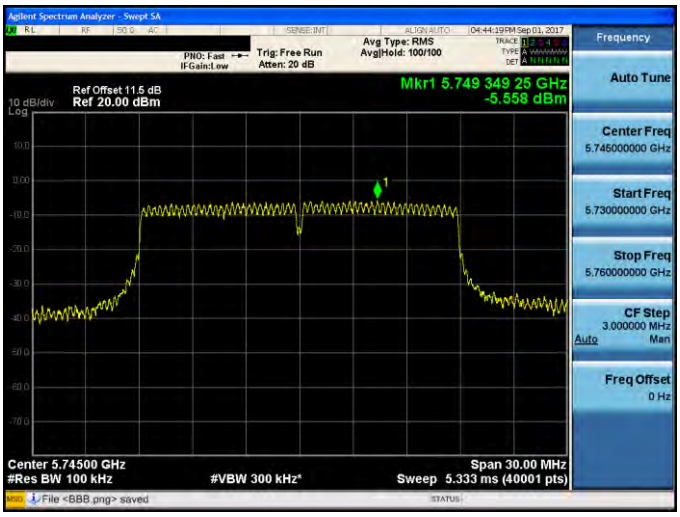
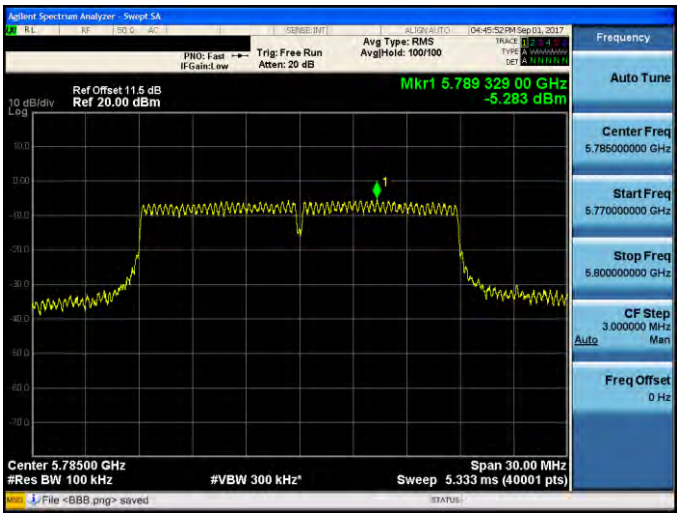
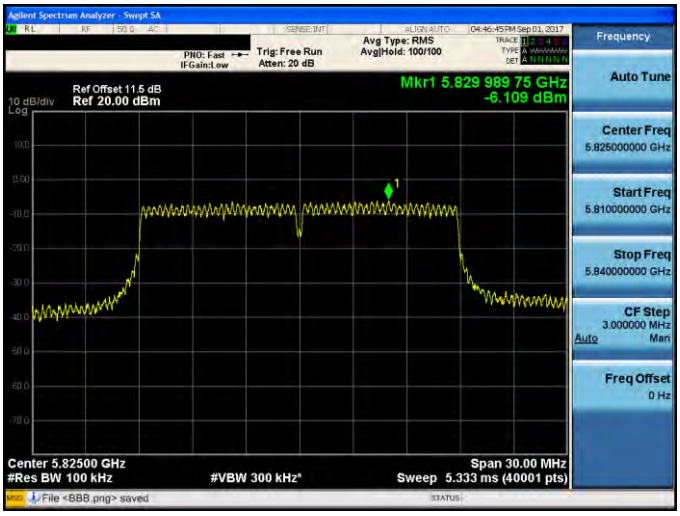
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-1	
5755 MHz	
5795 MHz	

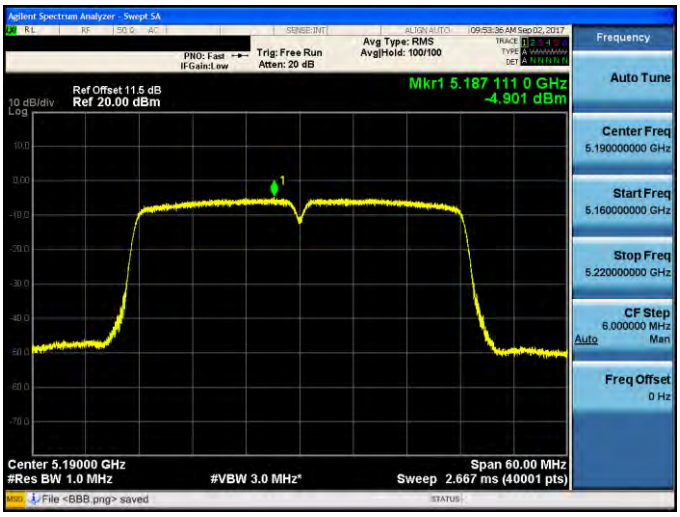
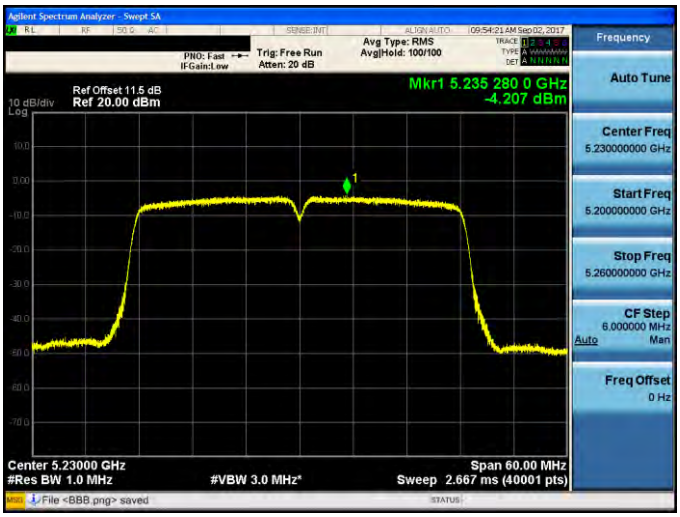
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-1	
5210 MHz	

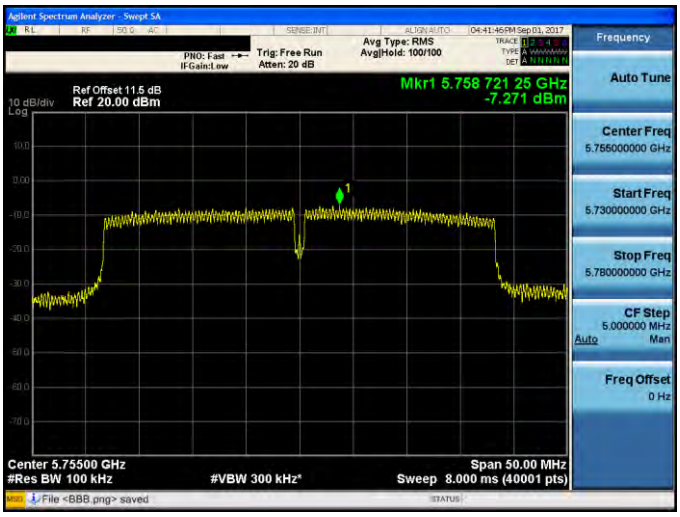
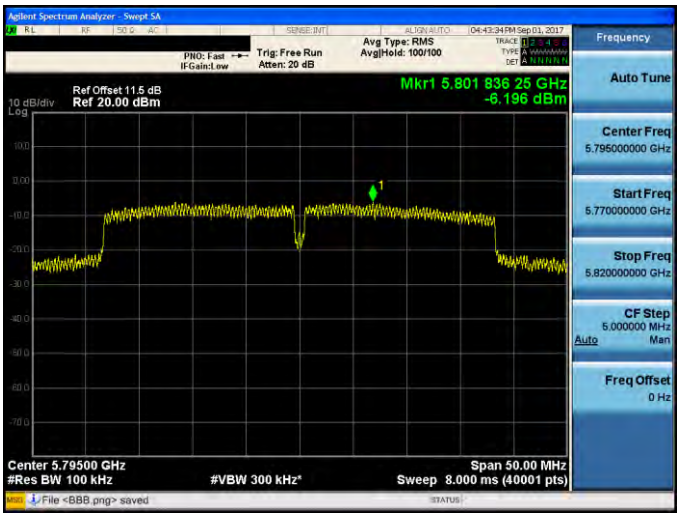
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-1	
5775 MHz	

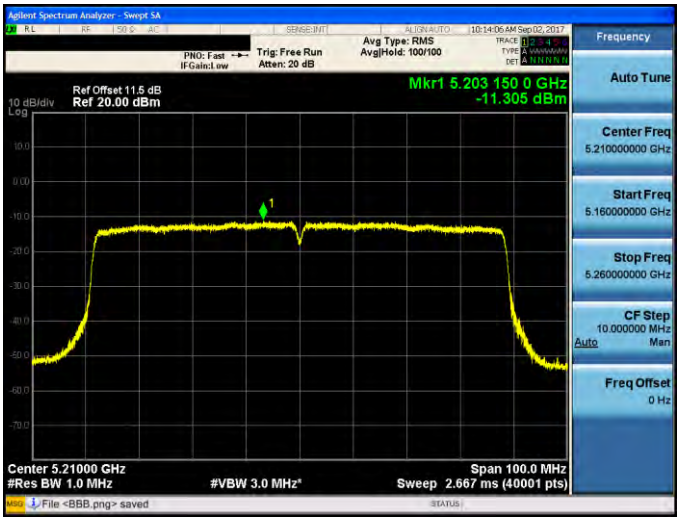
Beamforming on

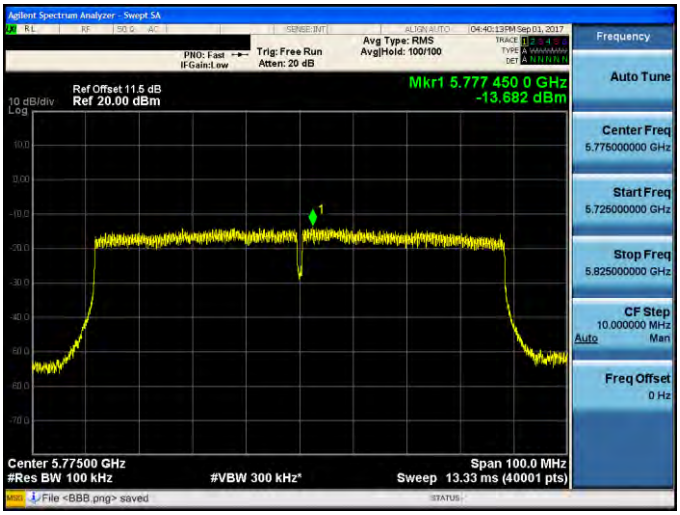
Mode 3: IEEE 802.11ac 20MHz Continuous TX mode _ ANT-0	
5180 MHz	
5200 MHz	
5240 MHz	

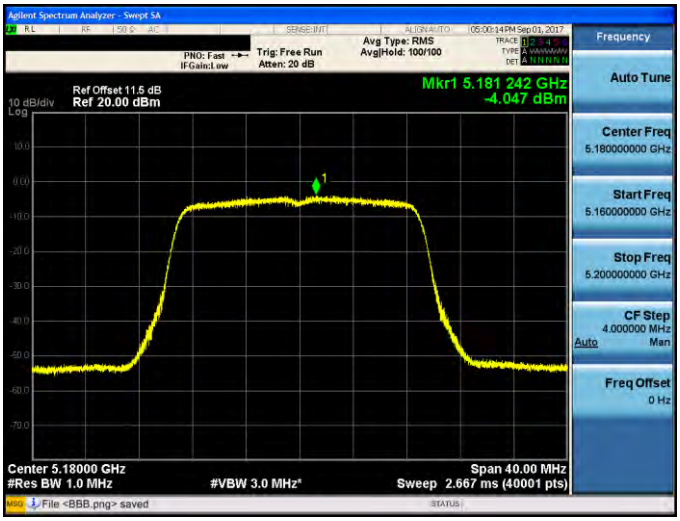
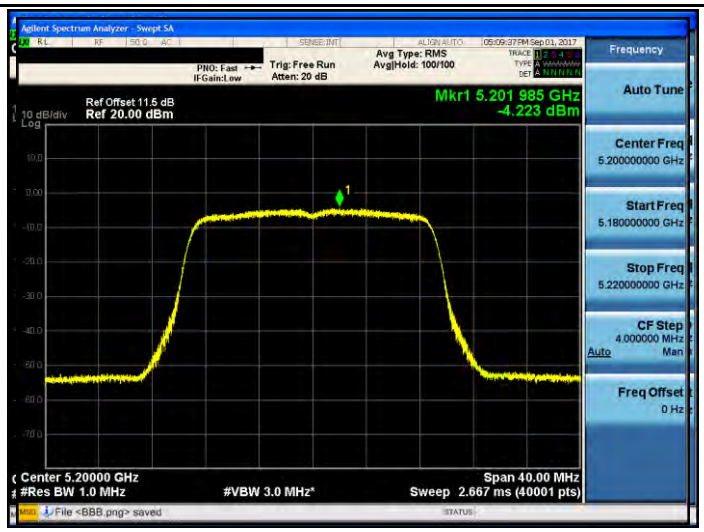
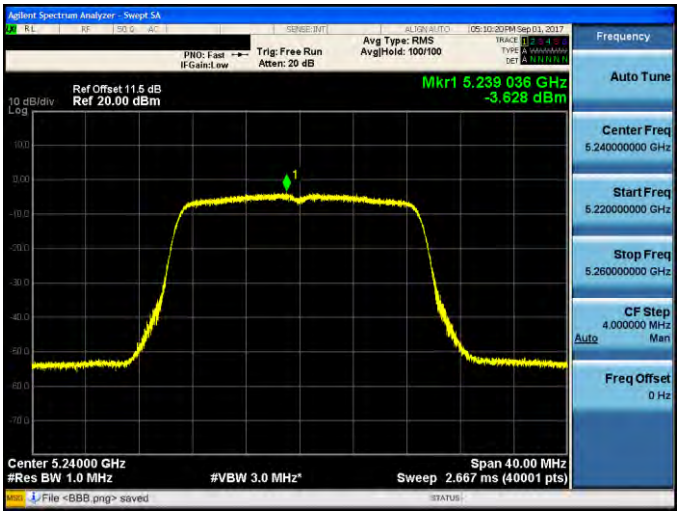
Mode 3: IEEE 802.11ac 20MHz Continuous TX mode _ ANT-0	
5745 MHz	
5785 MHz	
5825 MHz	

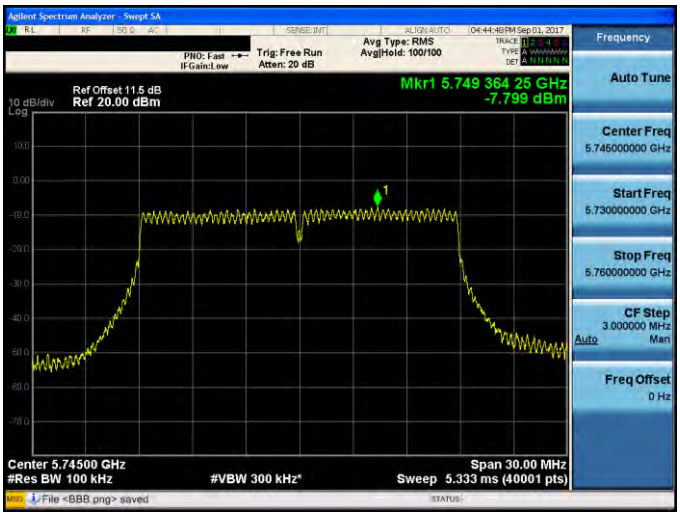
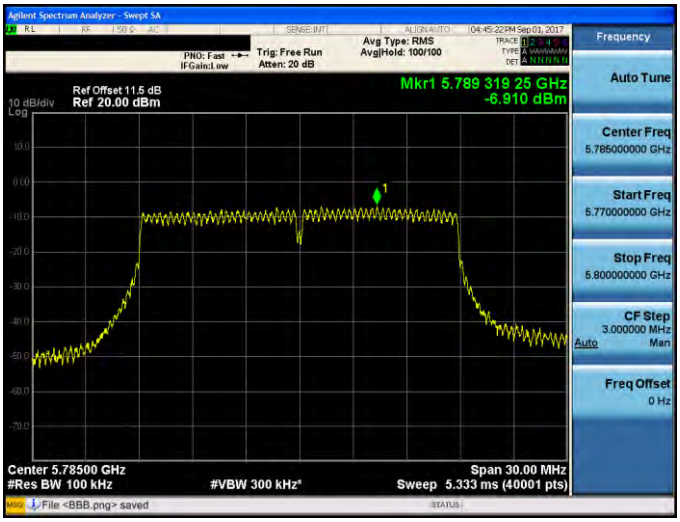
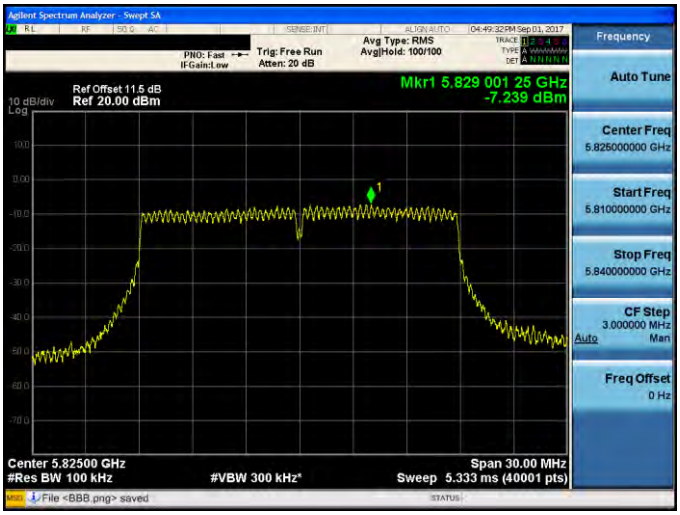
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-0	
5190 MHz	
5230 MHz	

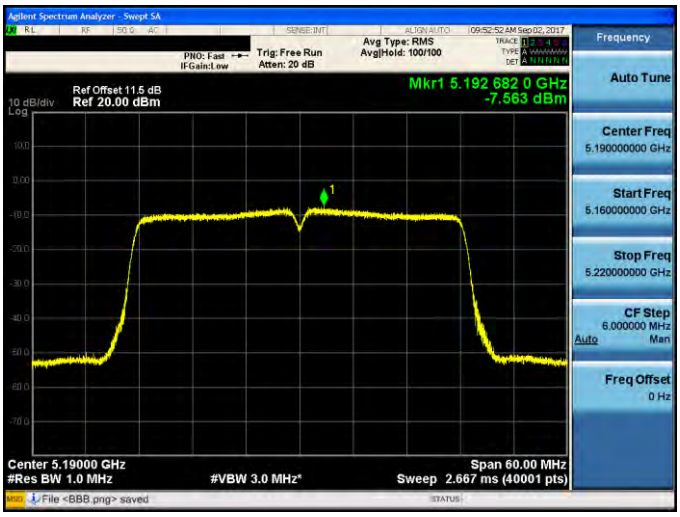
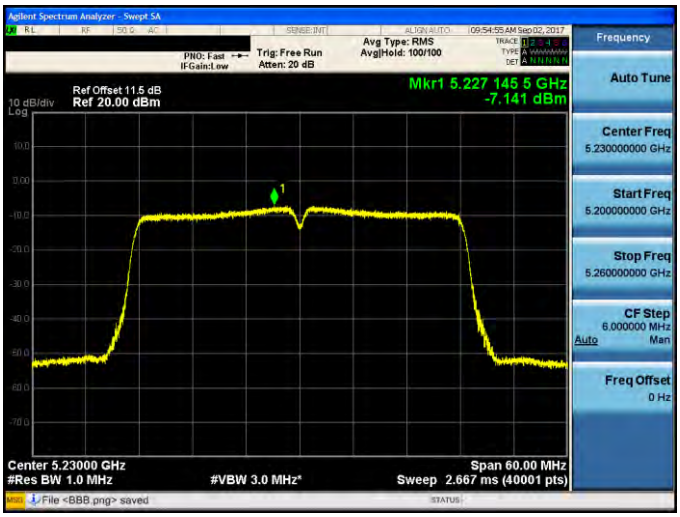
Mode 4: IEEE 802.11ac 40MHz Continuous TX mode_ ANT-0	
5755 MHz	
5795 MHz	

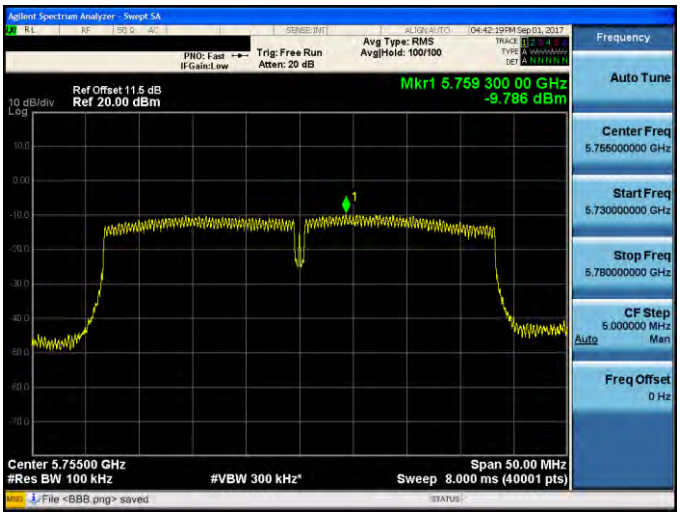
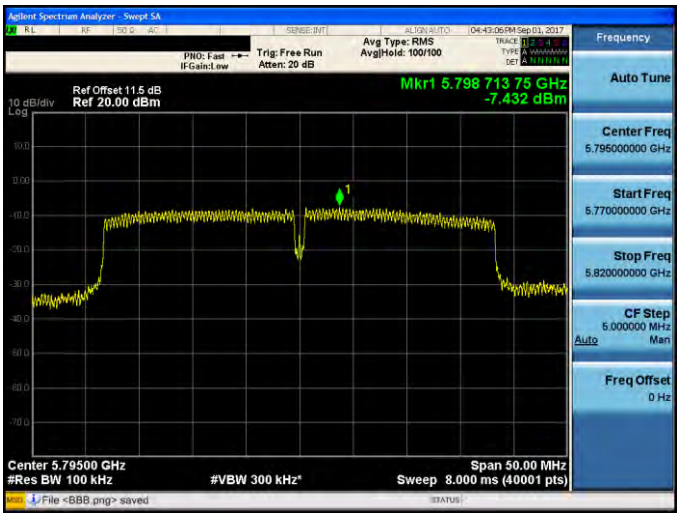
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-0	
5210 MHz	

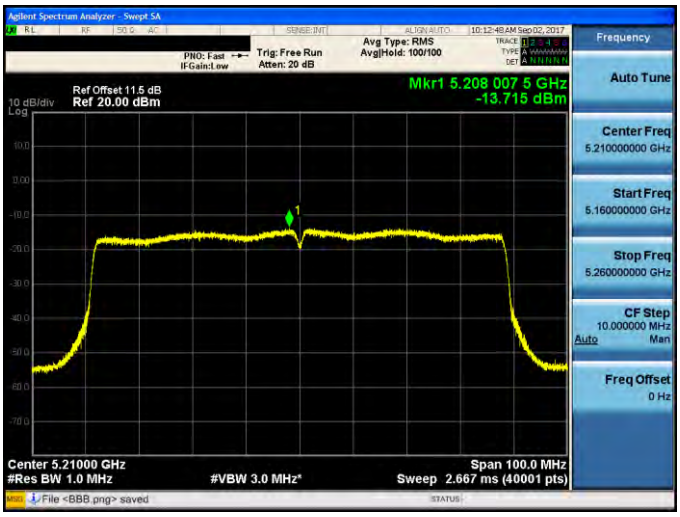
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-0	
5775 MHz	

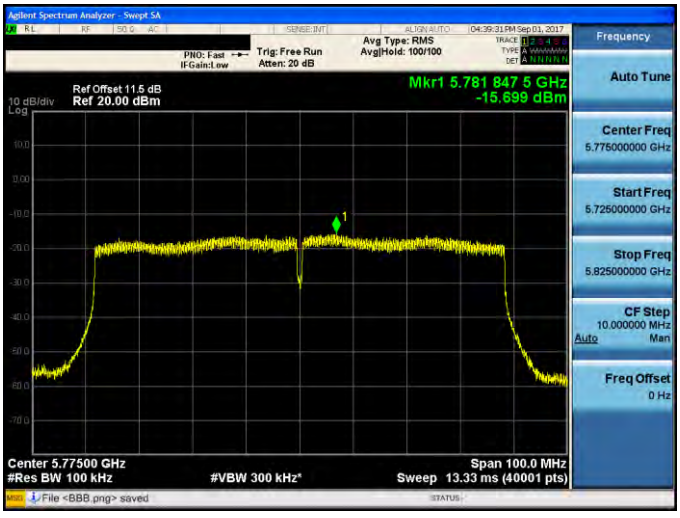
Mode 3: IEEE 802.11ac 20MHz Continuous TX mode _ ANT-1	
5180 MHz	
5200 MHz	
5240 MHz	

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	

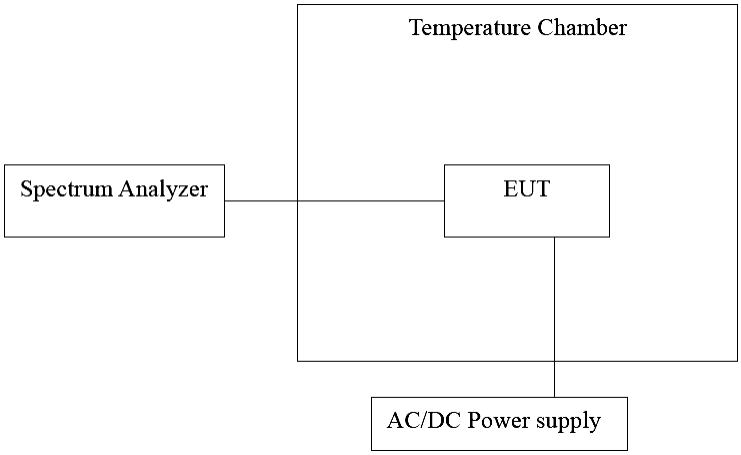
Mode 5: IEEE 802.11ac 80MHz Continuous TX mode _ ANT-1	
5775 MHz	

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	08/14/2017	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	-40	120	5199.944	-56000	-10.769	Pass
	-30		5199.9496	-50400	-9.692	Pass
	-20		5199.9508	-49200	-9.462	Pass
	-10		5199.956	-44000	-8.462	Pass
	0		5199.9566	-43400	-8.346	Pass
	10		5199.9622	-37800	-7.269	Pass
	20		5199.9694	-30600	-5.885	Pass
	30		5199.9713	-28700	-5.519	Pass
	40		5199.9885	-11500	-2.212	Pass
	50		5200.0002	200	0.038	Pass
	60		5200.0084	8400	1.615	Pass
5785 MHz	-40	120	5784.9387	-61300	-10.596	Pass
	-30		5784.9428	-57200	-9.888	Pass
	-20		5784.9495	-50500	-8.729	Pass
	-10		5784.9565	-43500	-7.519	Pass
	0		5784.9598	-40200	-6.949	Pass
	10		5784.9627	-37300	-6.448	Pass
	20		5784.9655	-34500	-5.964	Pass
	30		5784.9725	-27500	-4.754	Pass
	40		5784.9824	-17600	-3.042	Pass
	50		5784.9964	-3600	-0.622	Pass
	60		5785.0031	3100	0.536	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	5199.9449	-55100	-10.596	Pass
		120.00	5199.9694	-30600	-5.885	Pass
		102.00	5199.9853	-14700	-2.827	Pass
5785 MHz	20	138.00	5784.9372	-62800	-10.856	Pass
		120.00	5784.9655	-34500	-5.964	Pass
		102.00	5785.0037	3700	0.640	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	-40	120	5199.944	-56000	-10.769	Pass
	-30		5199.9496	-50400	-9.692	Pass
	-20		5199.9508	-49200	-9.462	Pass
	-10		5199.956	-44000	-8.462	Pass
	0		5199.9566	-43400	-8.346	Pass
	10		5199.9622	-37800	-7.269	Pass
	20		5199.9694	-30600	-5.885	Pass
	30		5199.9713	-28700	-5.519	Pass
	40		5199.9885	-11500	-2.212	Pass
	50		5200.0002	200	0.038	Pass
	60		5200.0084	8400	1.615	Pass
5785 MHz	-40	120	5784.9387	-61300	-10.596	Pass
	-30		5784.9428	-57200	-9.888	Pass
	-20		5784.9495	-50500	-8.729	Pass
	-10		5784.9565	-43500	-7.519	Pass
	0		5784.9598	-40200	-6.949	Pass
	10		5784.9627	-37300	-6.448	Pass
	20		5784.9655	-34500	-5.964	Pass
	30		5784.9725	-27500	-4.754	Pass
	40		5784.9824	-17600	-3.042	Pass
	50		5784.9964	-3600	-0.622	Pass
	60		5785.0031	3100	0.536	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	5199.9449	-55100	-10.596	Pass
		120.00	5199.9694	-30600	-5.885	Pass
		102.00	5199.9853	-14700	-2.827	Pass
5785 MHz	20	138.00	5784.9372	-62800	-10.856	Pass
		120.00	5784.9655	-34500	-5.964	Pass
		102.00	5785.0037	3700	0.640	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}

= 9.19 dBi > 6dBi (5.150 ~ 5.250 GHz)

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

= 9.06 dBi > 6dBi (5.725 ~ 5.850 GHz)

Operate Freq. Band		Directional Gain (dBi)
IEEE 802.11a	U-NII Band I	9.19
	U-NII Band III	9.06
IEEE 802.11ac 20MHz	U-NII Band I	9.19
	U-NII Band III	9.06
IEEE 802.11ac 40MHz	U-NII Band I	9.19
	U-NII Band III	9.06
IEEE 802.11ac 80MHz	U-NII Band I	9.19
	U-NII Band III	9.06