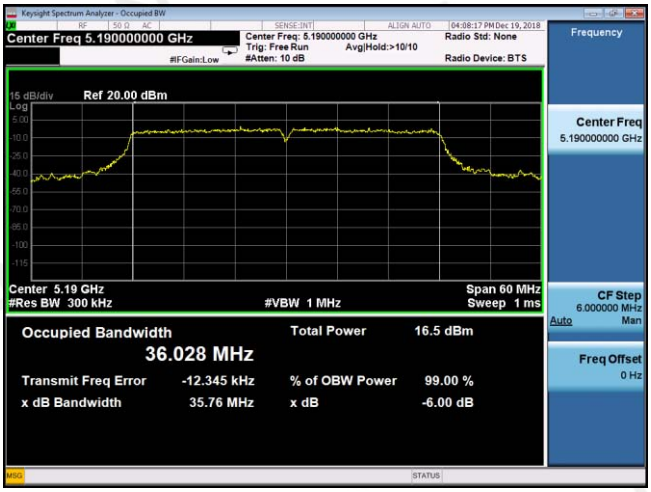
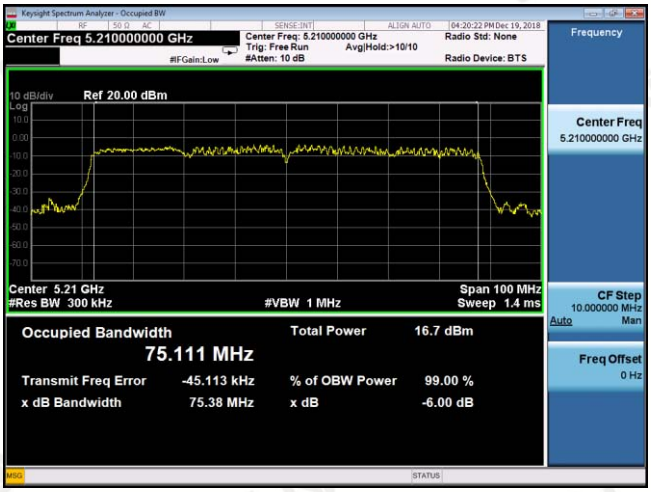
ANT D 802.11ac (40M)	ANT D 802.11ac (80M)
	
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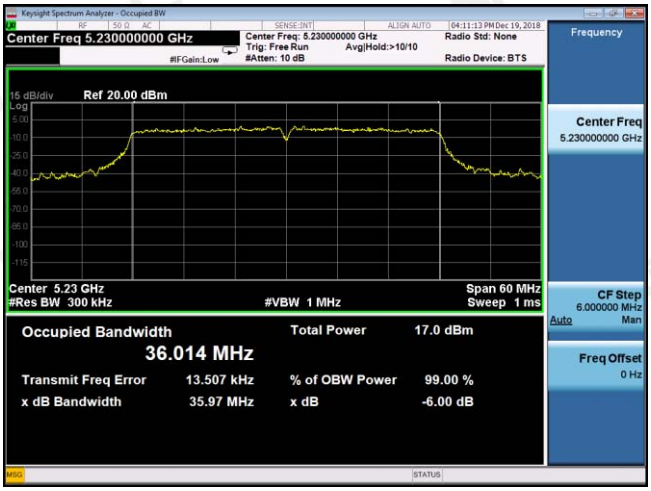	
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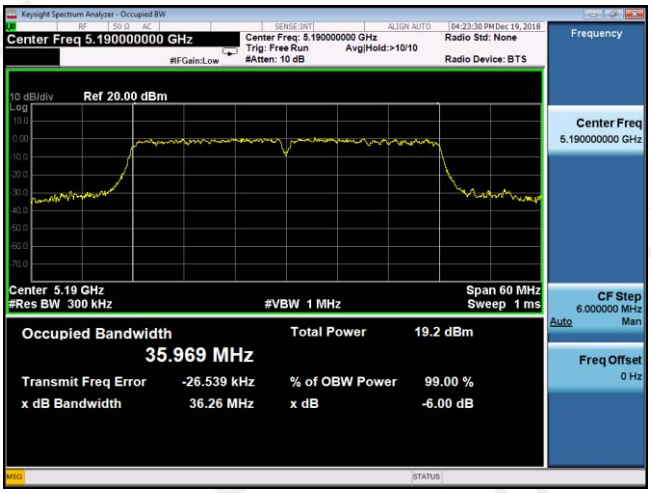
ANT D 802.11n (40M)	
	
5190	5230

7. POWER SPECTRAL DENSITY TEST

7.1 Test Limit

In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.
In addition, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band.

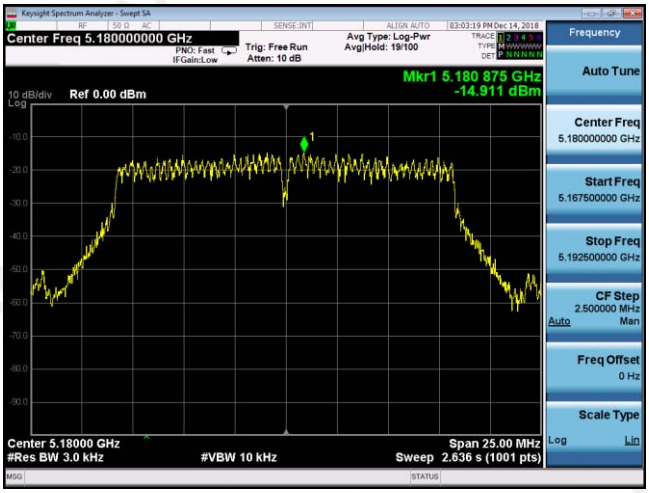
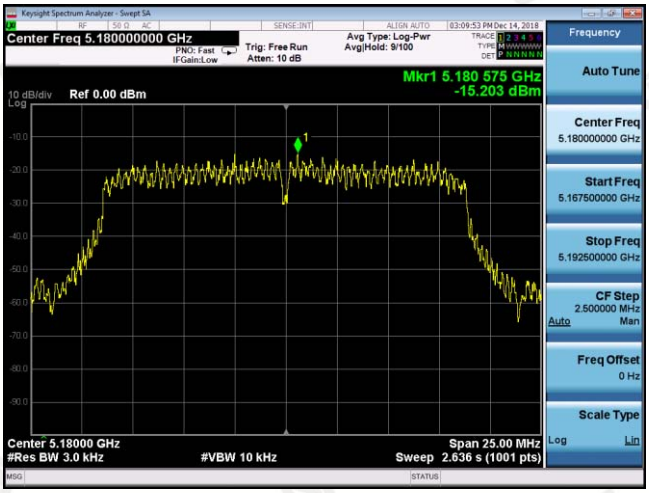
7.2 Test Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
4. For U-NII1, U-NII-2A, U-NII-2C Band:
Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
For U-NII-3 Band:
Set RBW=510 kHz, VBW=3*RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
5. User the cursor on spectrum to peak search the highest level of trace
6. Record the max. reading and add 10 log(1/duty cycle).
we test all antennas, the antenna 1 was worst mode and the data recording in the report.

7.3 Test Result

PASS

	Frequency (MHz)	Reading Level (dBm)				PSD (dBm)				FCC Limit (dBm)	Result
		ANT A	ANT B	ANT C	ANT D	ANT A	ANT B	ANT C	ANT D		
802.11a	5180	-14.91	-15.90	-12.49	-13.06	-14.91	-15.90	-12.49	-13.06	11.00	Pass
	5220	-14.14	-15.68	-14.03	-13.80	-14.14	-15.68	-14.03	-13.80	11.00	Pass
	5240	-13.54	-14.83	-12.99	-14.87	-13.54	-14.83	-12.99	-14.87	11.00	Pass
802.11ac (20M)	5180	-15.20	-14.17	-13.91	-14.33	-8.36				5.98	Pass
	5220	-15.75	-15.37	-13.34	-12.37	-7.96				5.98	Pass
	5240	-14.72	-16.68	-15.50	-14.55	-9.26				5.98	Pass
802.11ac (40M)	5190	-16.88	-18.81	-15.44	-15.95	-10.57				5.98	Pass
	5230	-16.79	-15.03	-15.62	-16.11	-9.82				5.98	Pass
802.11ac (80M)	5210	-14.34	-11.14	-13.59	-12.00	-6.56				5.98	Pass
802.11n (40MHz)	5190	-17.10	-16.54	-15.40	-14.28	-9.67				5.98	Pass
	5230	-15.95	-15.11	-15.13	-15.89	-9.48				5.98	Pass

ANT A 802.11a	ANT A 802.11ac (20M)
	
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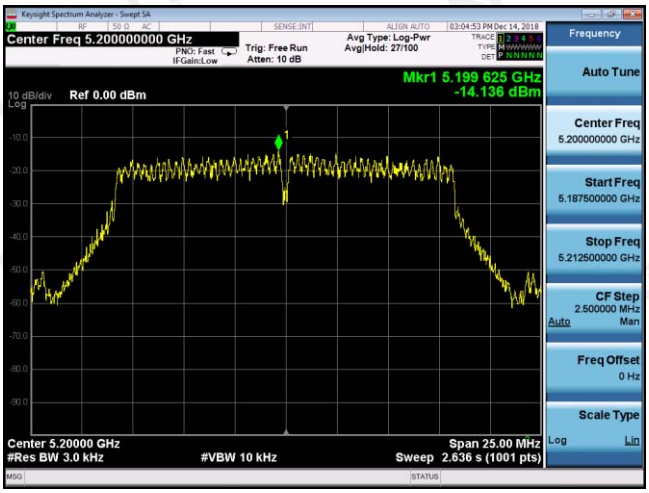	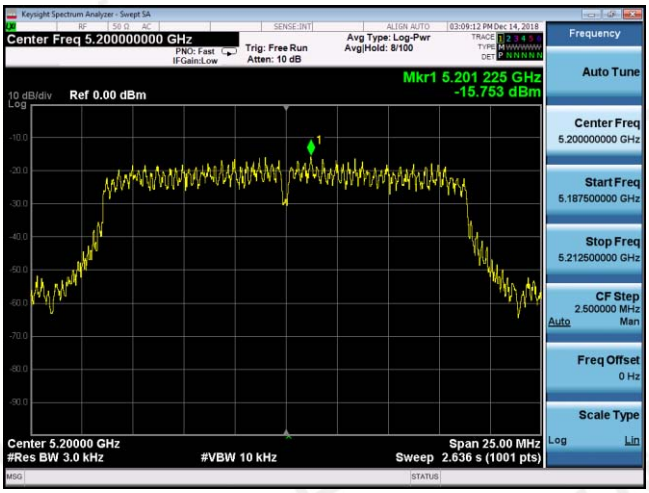
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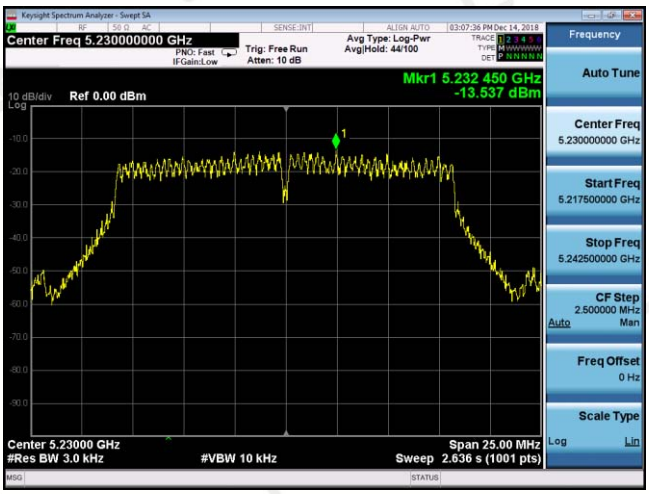
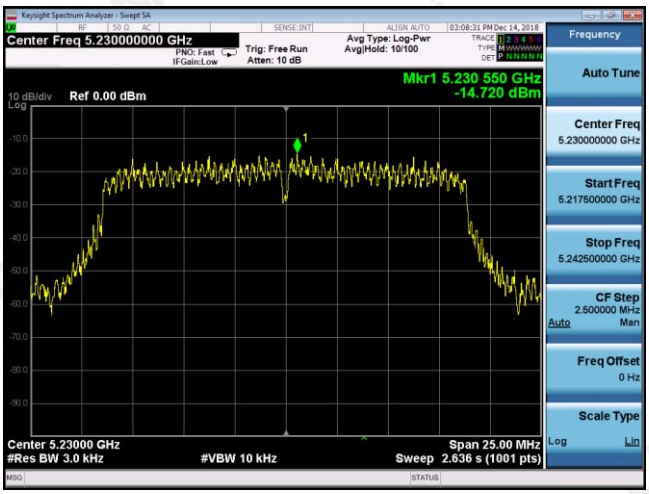
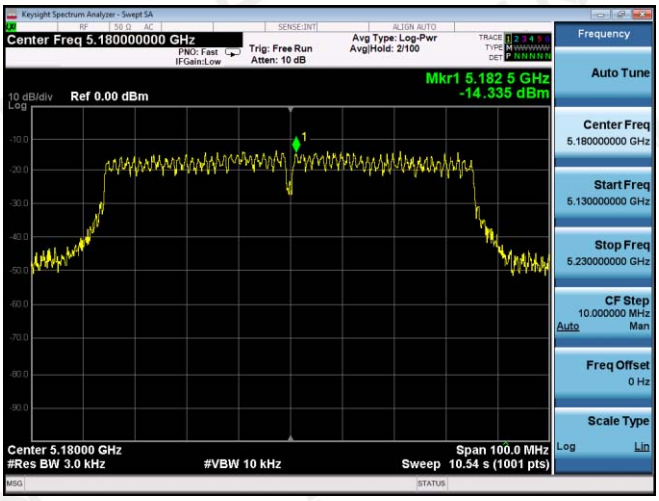
	
5240	5240

ANT A 802.11ac (40M)	ANT A 802.11ac (80M)
	
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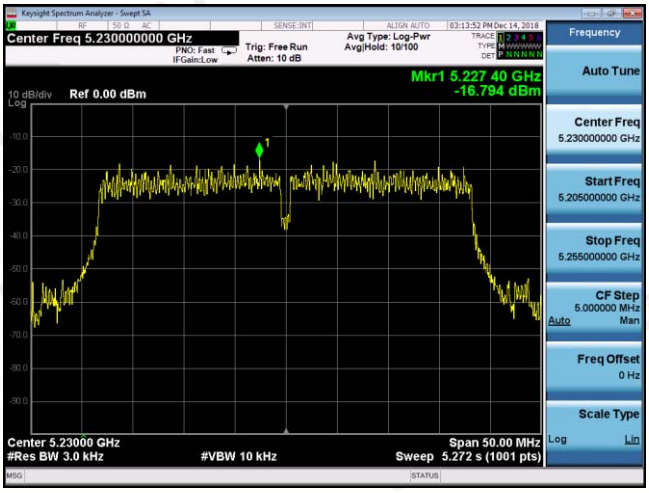	
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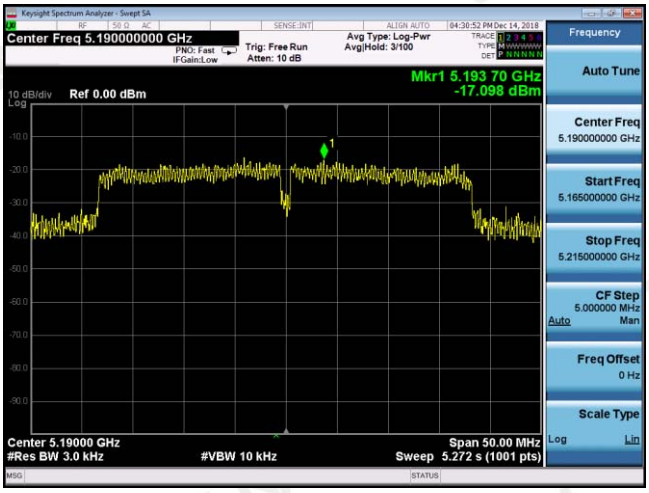
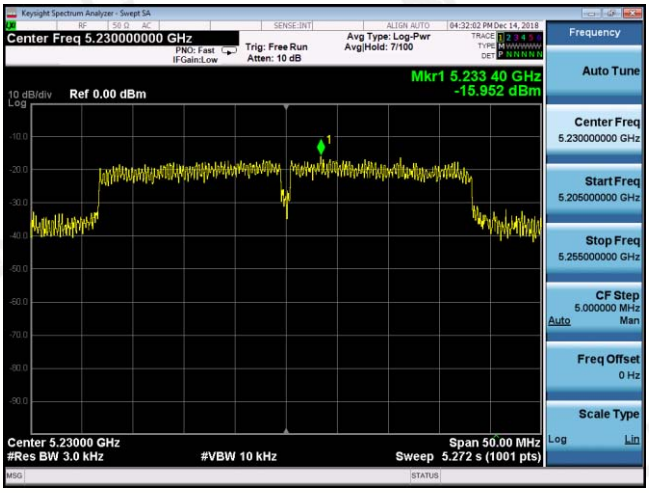
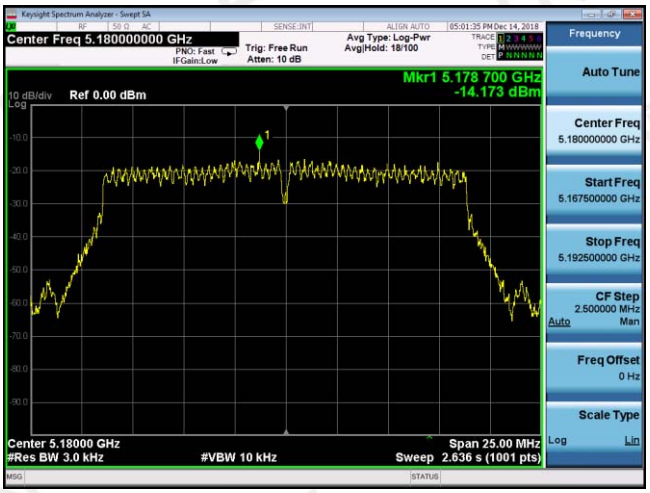
	
5190	5230

ANT B 802.11a	ANT B 802.11ac (20M)
	
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	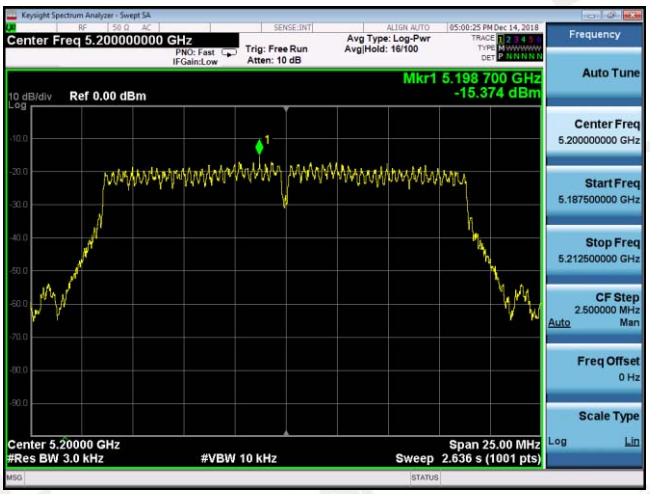
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5240	5240

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	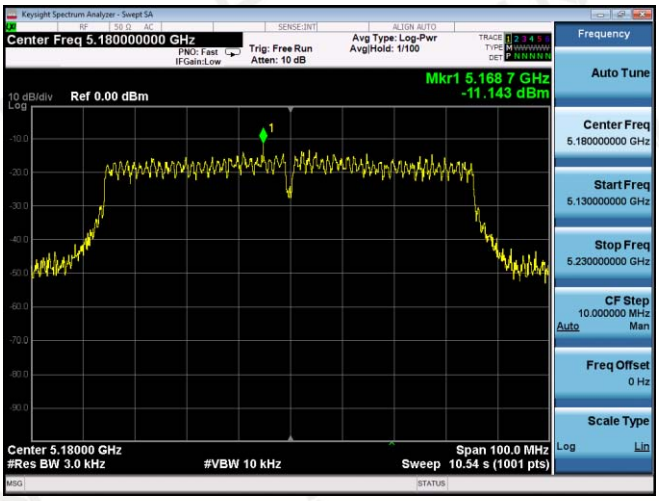
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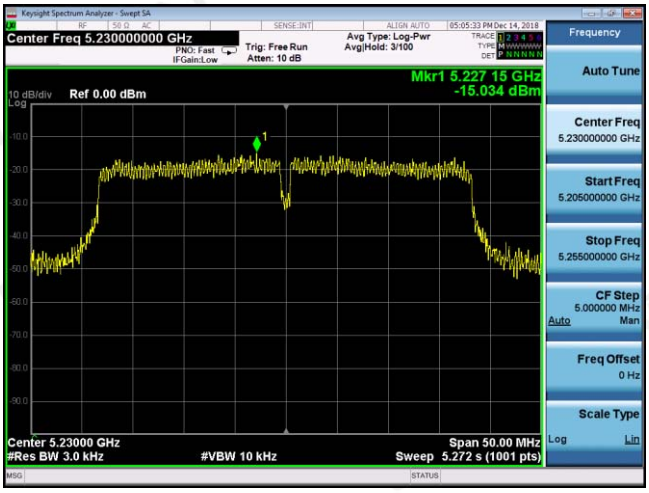	
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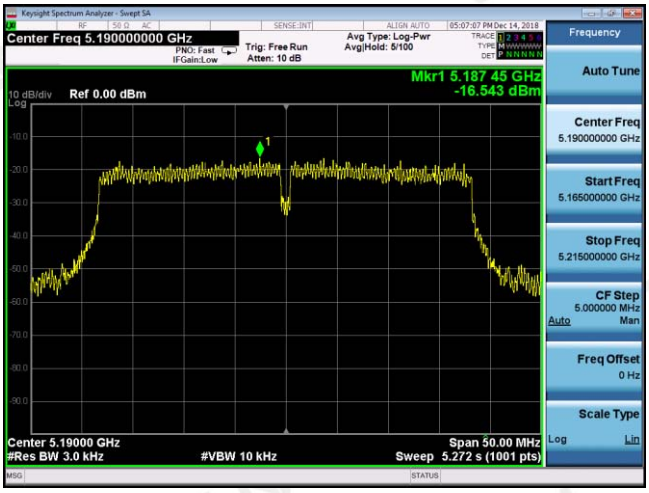
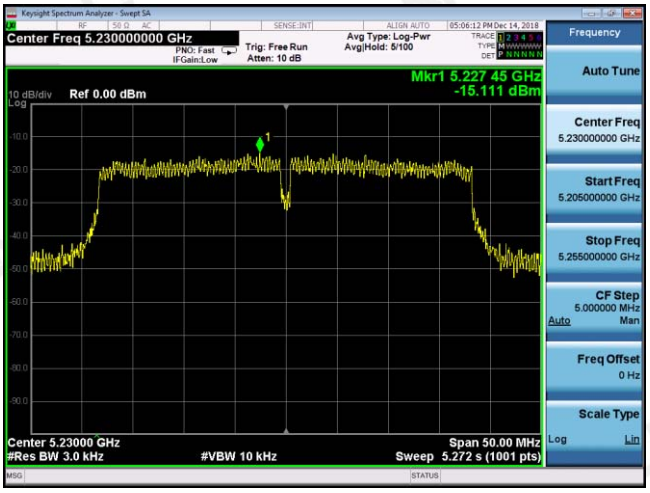
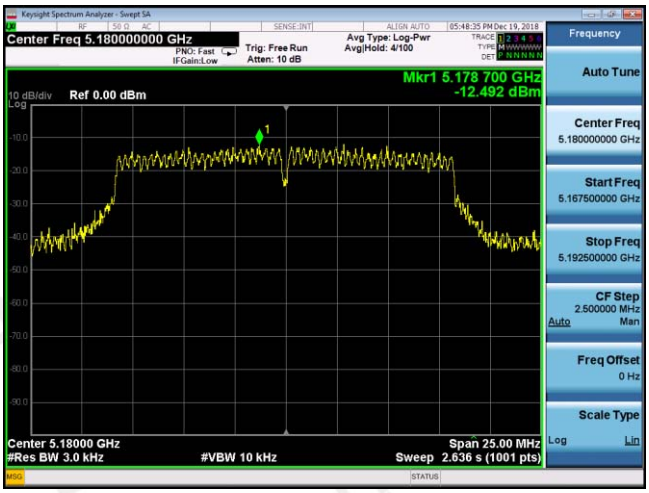
	
5190	5230

ANT C 802.11a	ANT C 802.11ac (20M)
	
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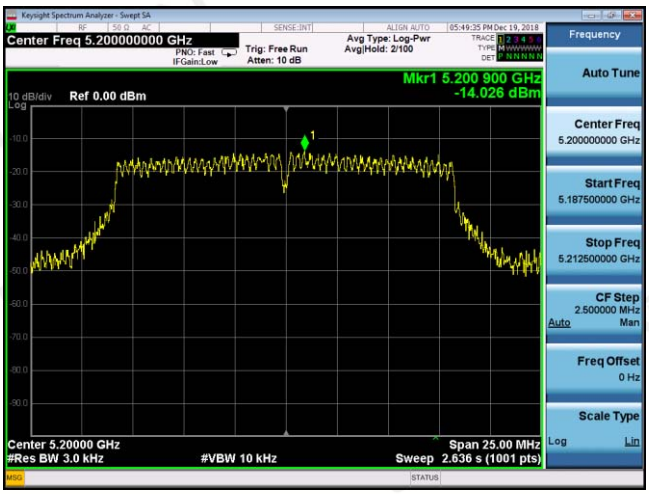	
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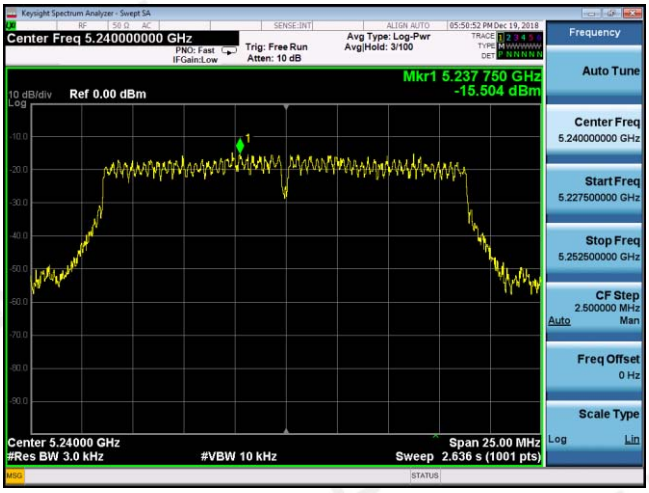
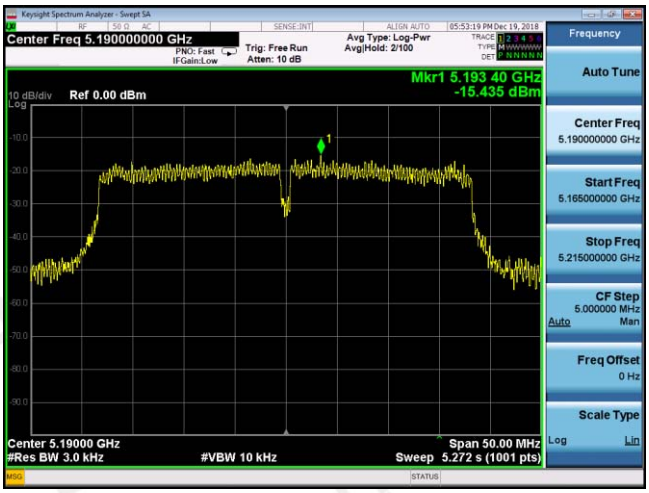
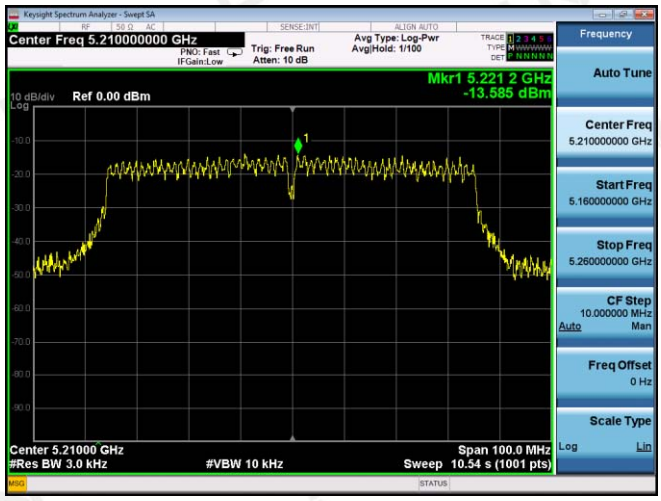
	
5240	5240

ANT C 802.11ac (40M)	ANT C 802.11ac (80M)
	
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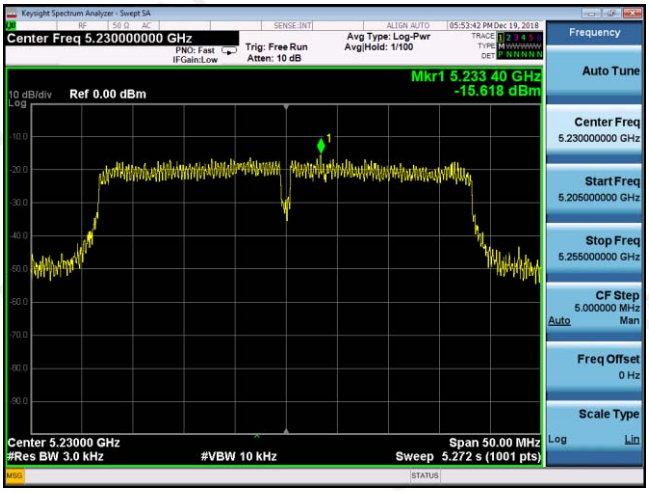	
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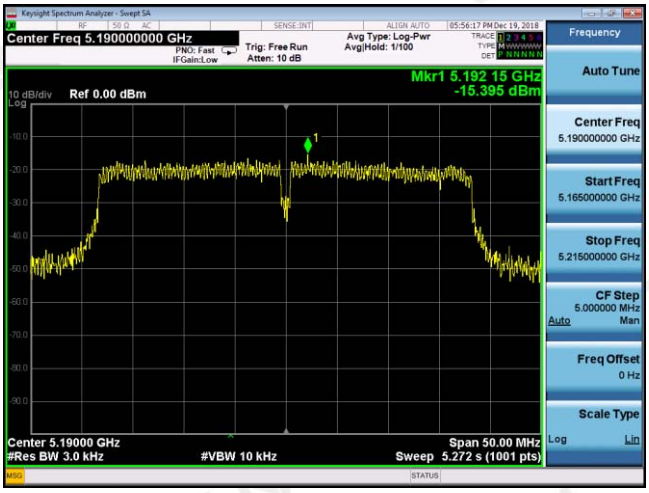
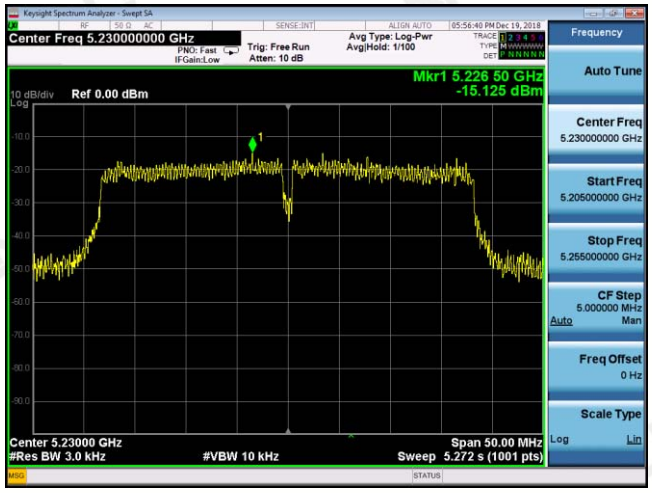
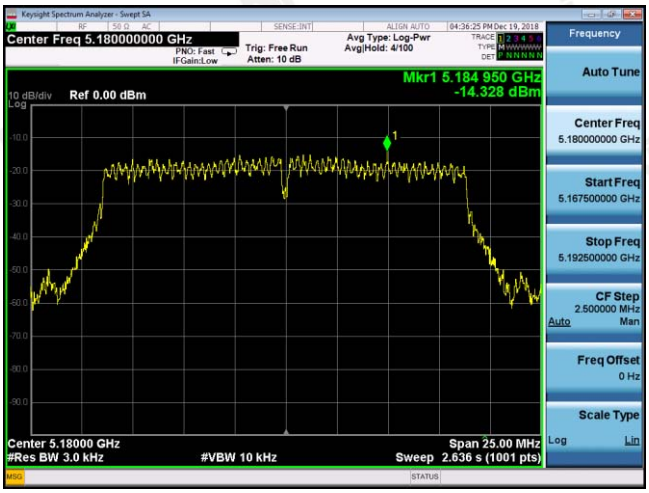
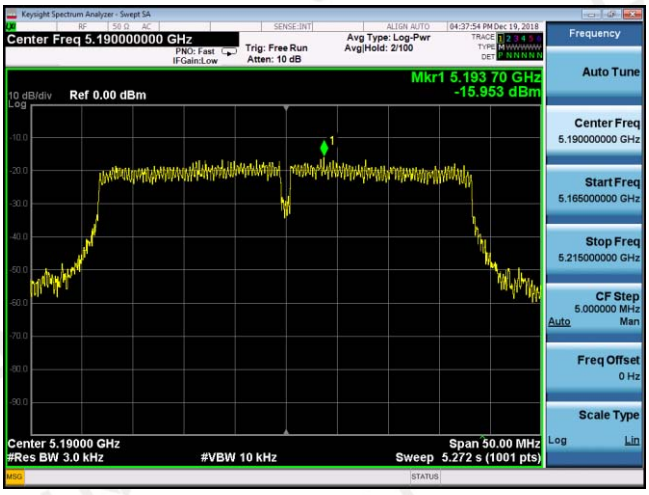
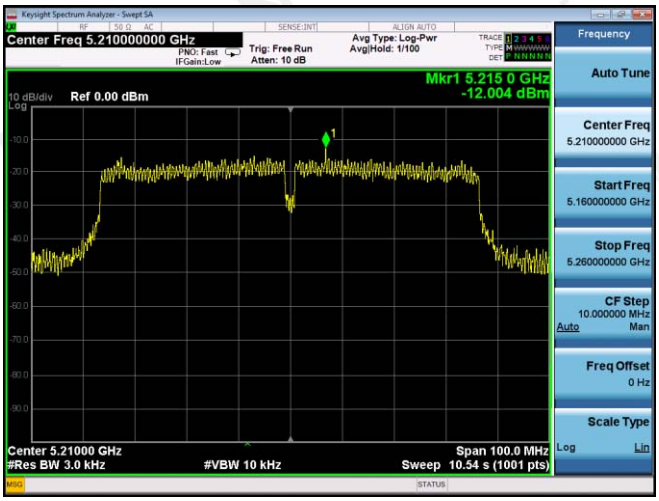
	
5190	5230

ANT D 802.11a	ANT D 802.11ac (20M)
	
5180	5180
	
5200	5200
	
5240	5240

ANT D 802.11ac (40M)	ANT D 802.11ac (80M)
	
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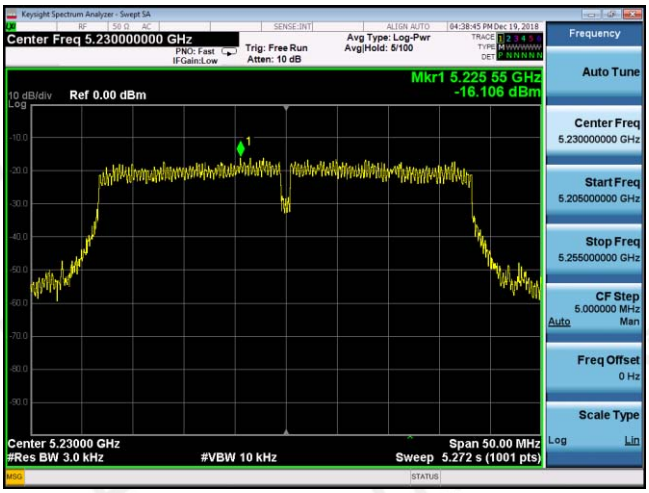	
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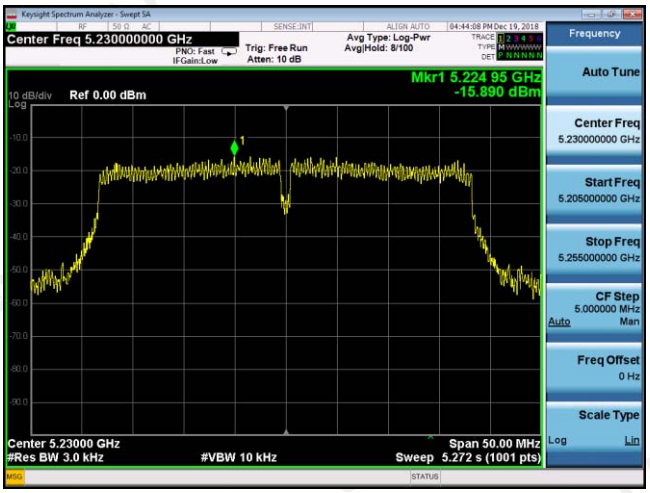
ANT D 802.11n (40M)	
	
5190	5230

Note:

1). Measured peak power spectrum density at difference data rate for each mode and recorded worst case for each mode.
2). Test results including cable loss;
3). 802.11b ,802.11g mode the ANT A, ANT B, ANT C, ANT D, can not TX and RX at the same time;
4). 802.11n(20)/ 802.11n(40) mode the ANT A, ANT B, ANT C, ANT D, can TX and RX at the same time;
5). Directional gain=GANT +10log(N)dbi =5.0+10log(4)=11.02dbi;
6). For MIMO with CCD technology device, The Directional Gain= Gain of individual transmit antennas (dBi) + Array gain; Array gain = 10 log (Nant), where Nant is the number of transmit antennas.

8. MAXIMUM CONDUCTED OUTPUT POWER TEST

8.1 Test Limit

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

8.2 Test Procedure

The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

a. The Transmitter output (antenna port) was connected to the power meter.
b. Turn on the EUT and power meter and then record the power value.
c. Repeat above procedures on all channels needed to be tested.

8.4 Test Result

PASS

All the test modes completed for test.

	Frequency (MHz)	Average Output Power(dBm)				Total Output Power(dBm)				FCC Limit (dBm)	Result
		ANT A	ANT B	ANT C	ANT D	ANT A	ANT B	ANT C	ANT D		
802.11a	5180	13.32	13.25	13.45	13.15	13.32	13.25	13.45	13.15	30	Pass
	5200	13.28	13.27	13.48	13.63	13.28	13.27	13.48	13.63	30	Pass
	5240	13.25	14.97	13.02	13.78	13.25	13.34	13.02	13.78	30	Pass
802.11ac (20M)	5180	12.22	12.17	12.11	12.63	18.31				24.98	Pass
	5220	12.23	13.19	12.45	12.87	18.72				24.98	Pass
	5240	12.29	12.20	12.16	13.26	18.51				24.98	Pass
802.11ac (40M)	5190	12.24	12.22	13.22	12.06	18.48				24.98	Pass
	5230	12.25	12.19	12.44	12.78	18.44				24.98	Pass
802.11ac (80M)	5210	12.29	12.33	12.36	13.53	18.59				24.98	Pass
802.11n (40M)Hz)	5190	12.26	12.06	12.42	12.53	18.37				24.98	Pass
	5230	12.71	12.13	13.63	12.49	18.70				24.98	Pass

Note:
1) Measured output power at difference data rate for each mode and recorded worst case for each mode.
2). Test results including cable loss;
3). 802.11b ,802.11g mode the ANT A, ANT B, ANT C, ANT D can not TX and RX at the same time;
4). 802.11n(20)/ 802.11n(40) mode the ANT A, ANT B, ANT C, ANT D can TX and RX at the same time;
5). Directional gain=GANT +10log(N)dbi =5.0+10log(4)=11.02dbi;
6). For power test the duty cycle is 100% in continous transmitting mode.
7).TX means Transmitter; RX means Receive.

9. DUTY CYCLE TEST SIGNAL

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

Formula:
Duty Cycle = Ton / (Ton+Toff)

9.2 Test Procedure

1. Set span = Zero
2. RBW = 8MHz
3. VBW = 50MHz,
4. Detector = Peak

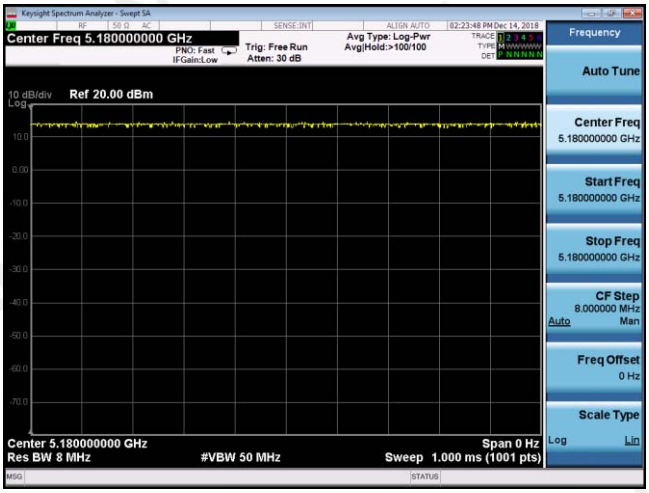
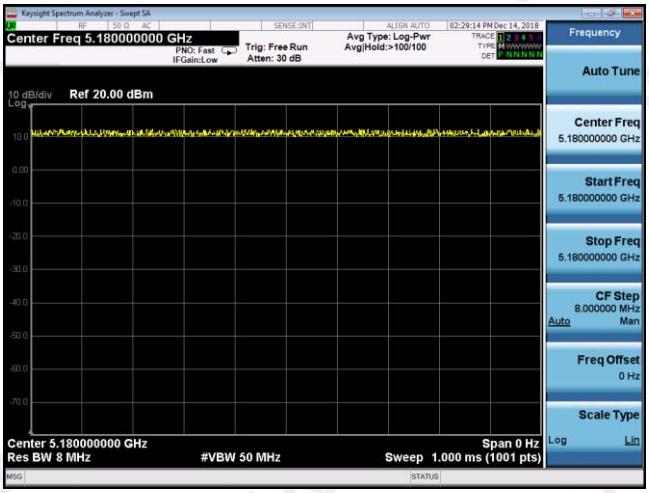
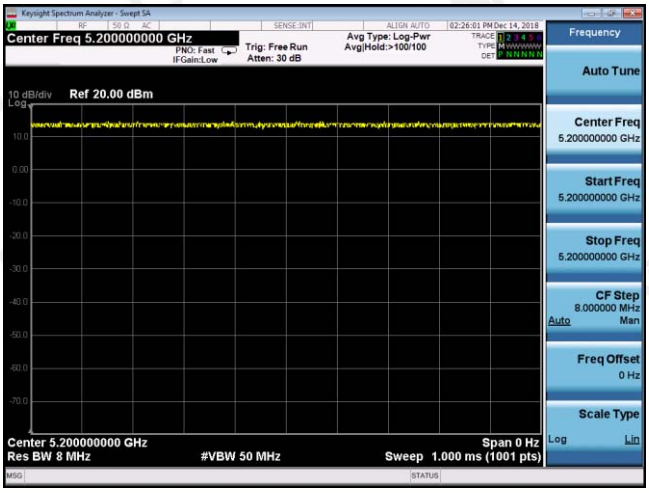
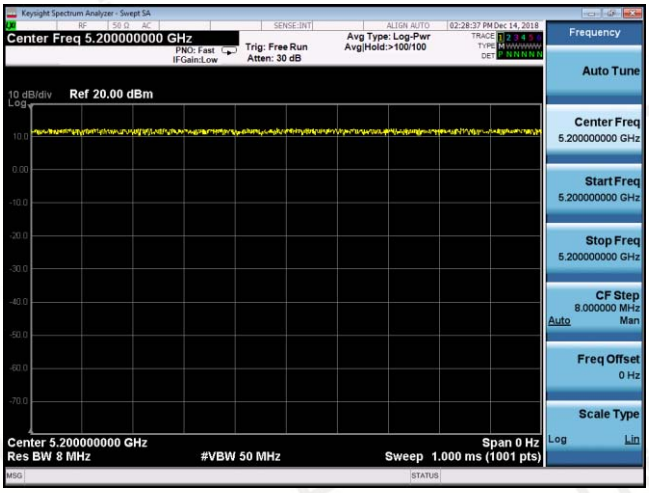
9.3 Test Setup

9.4 Test Result

PASS

Duty Cycle:

Operation Mode	Duty Cycle	Duty Fator (dB) 10 * log (1/ Duty cycle)
802.11a	100%	0
802.11ac(20M)	100%	0
802.11ac(40M)	100%	0
802.11ac(80M)	100%	0
802.11n(40M)	100%	0

ANT A 802.11a	ANT A 802.11ac (20M)
	
5180	5180
	
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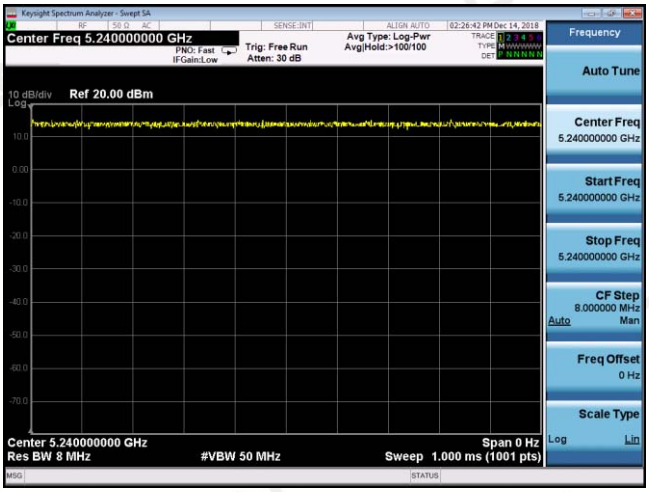
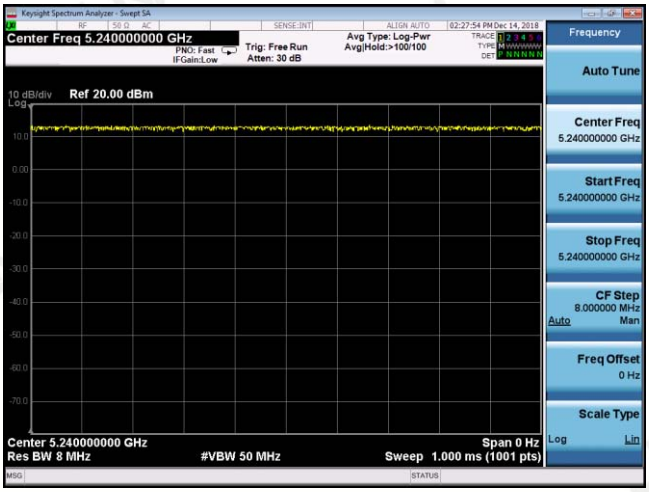
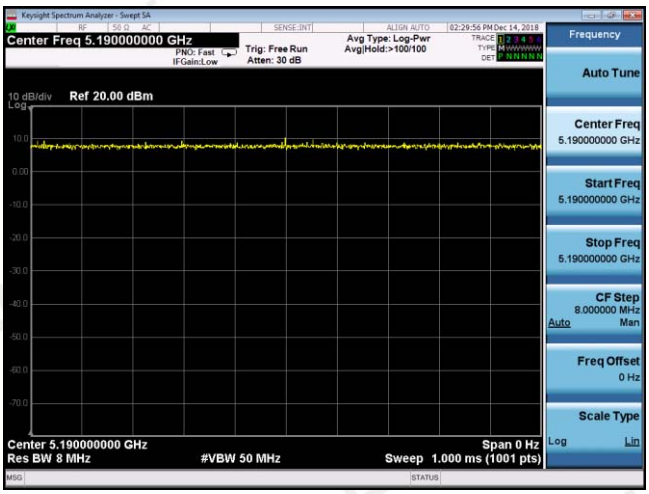
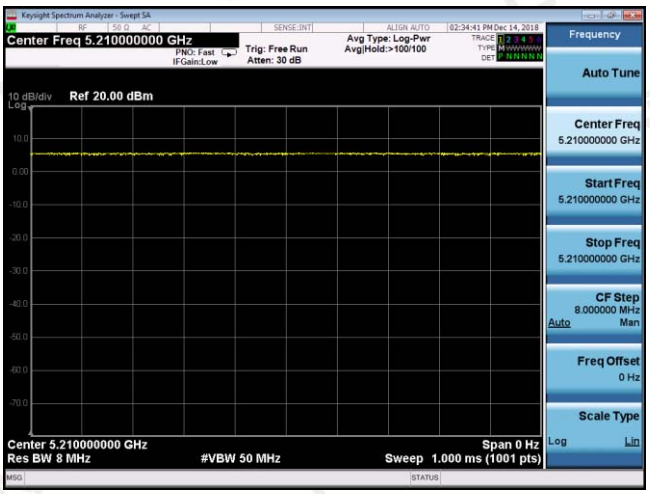
	
5240	5240

ANT A 802.11ac (40M)	ANT A 802.11ac (80M)
	
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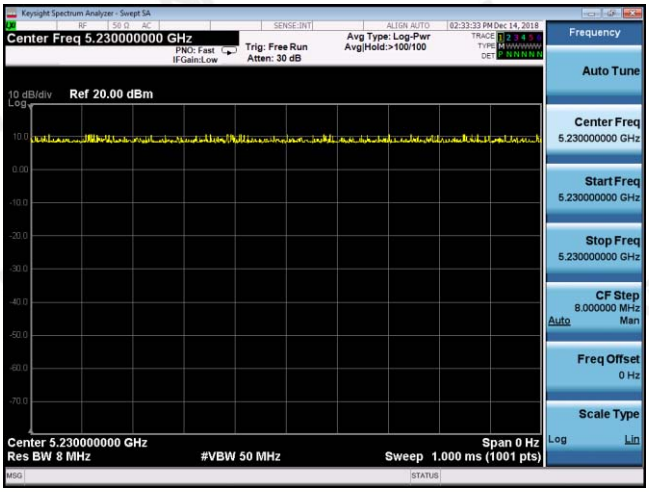	
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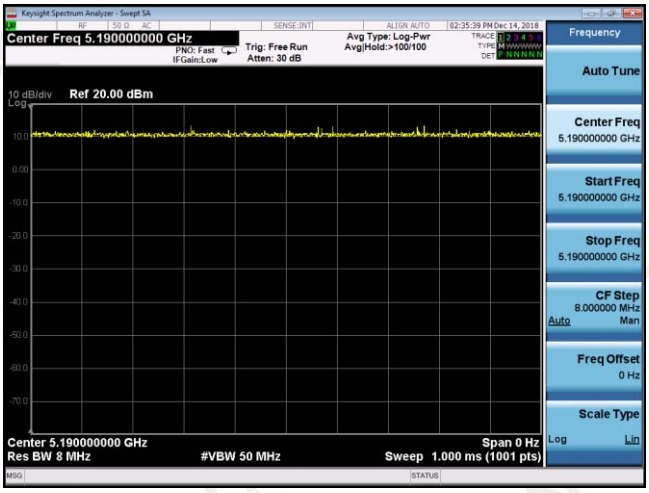	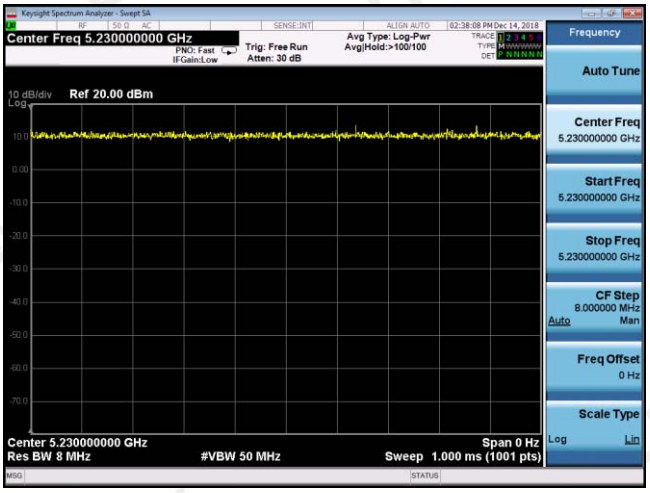
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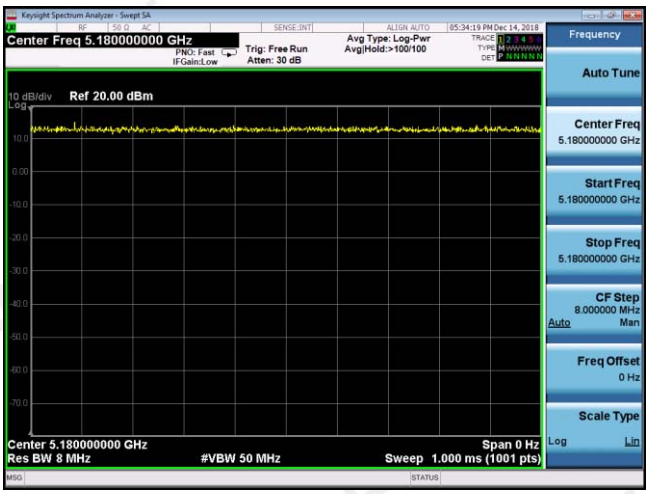	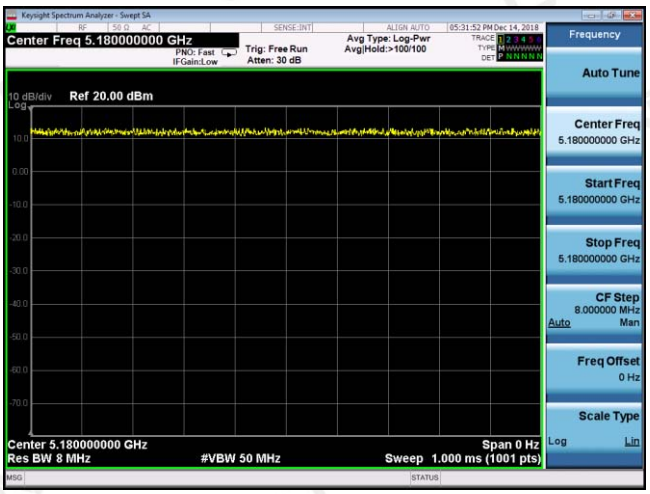
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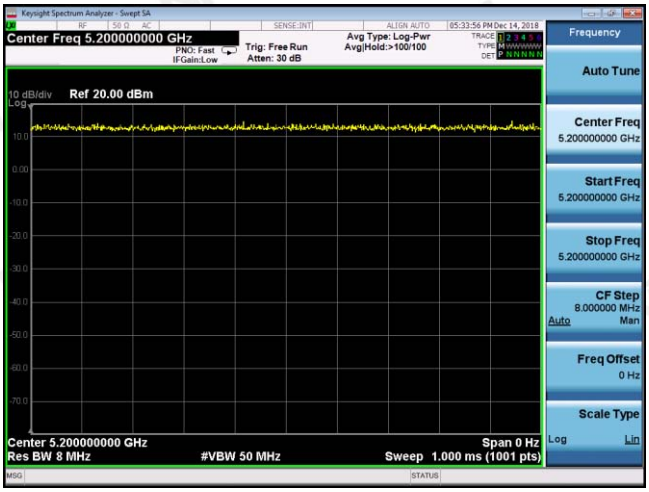	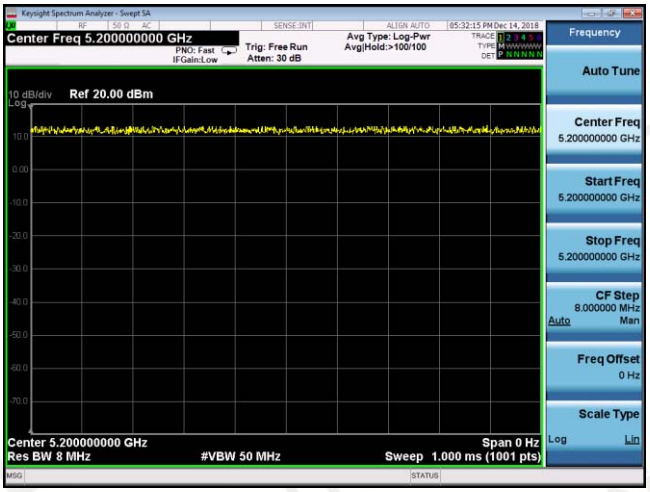
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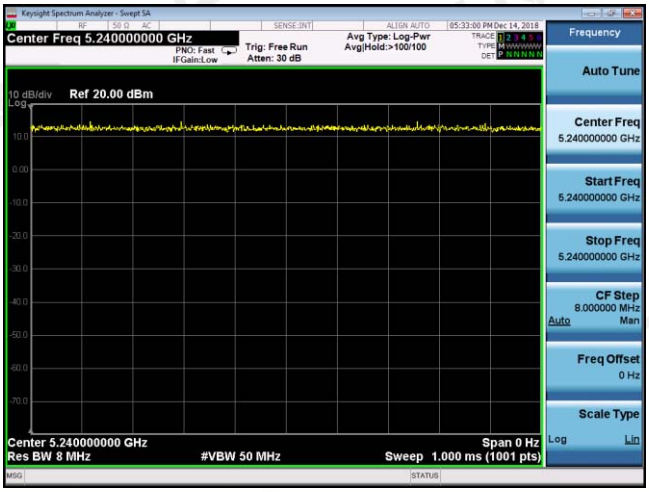	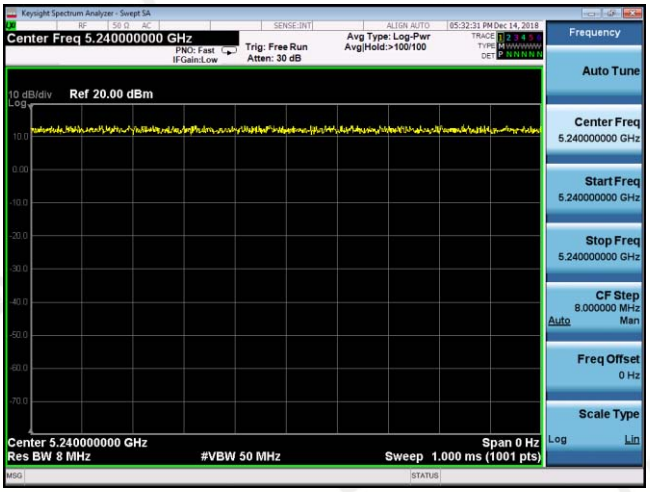
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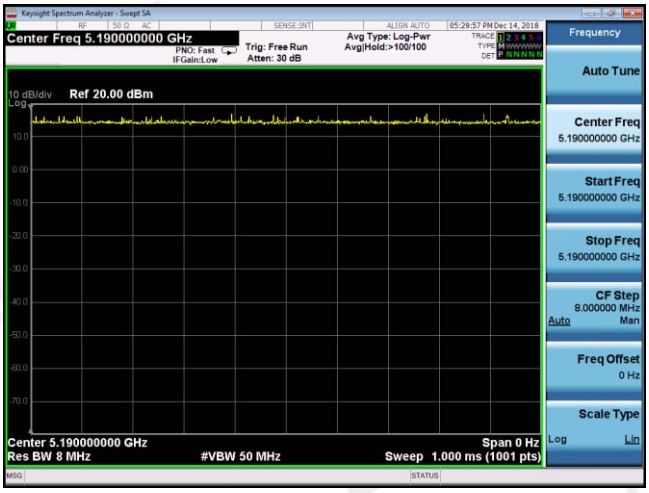	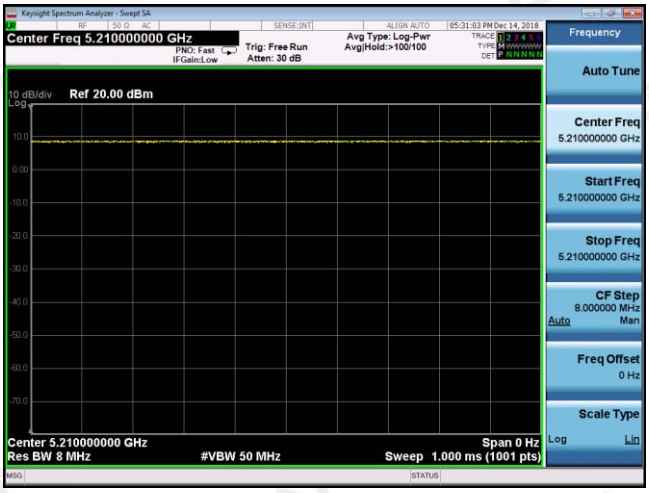
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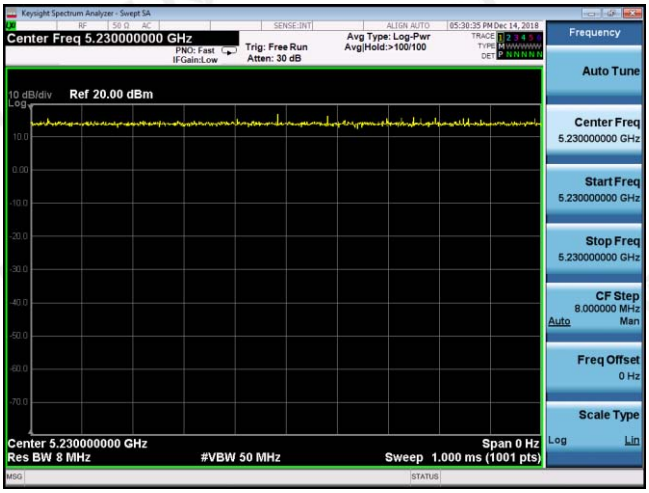	
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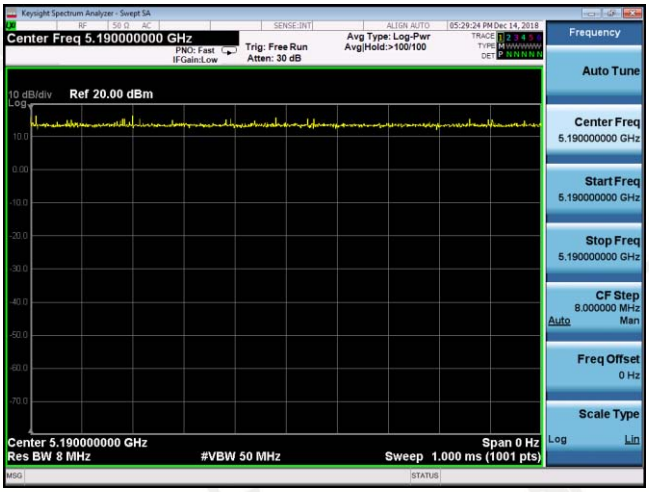	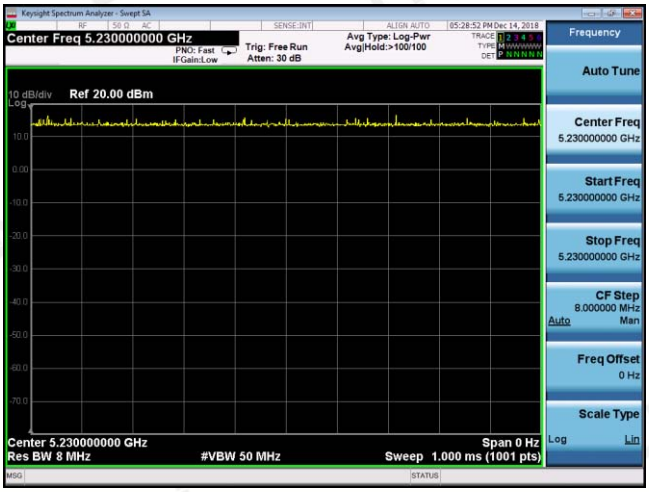
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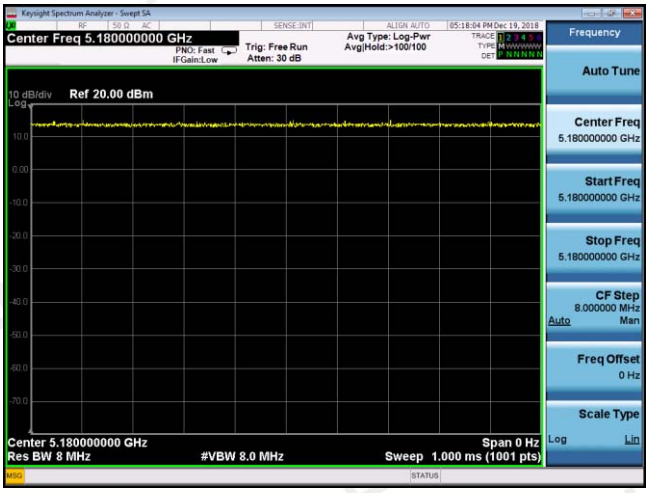
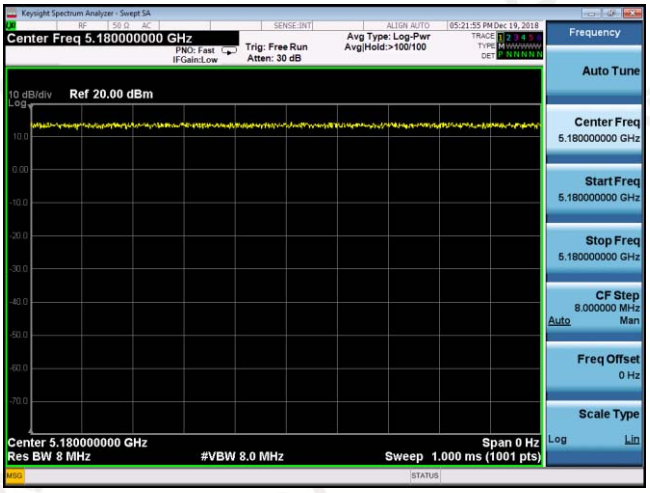
ANT C 802.11a	ANT C 802.11ac (20M)
	
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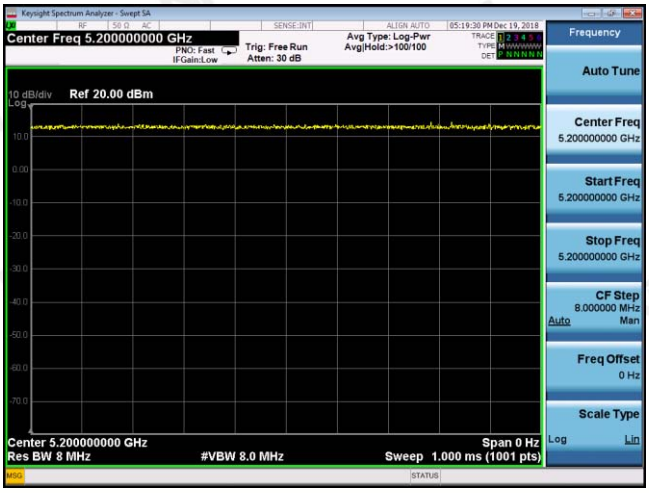	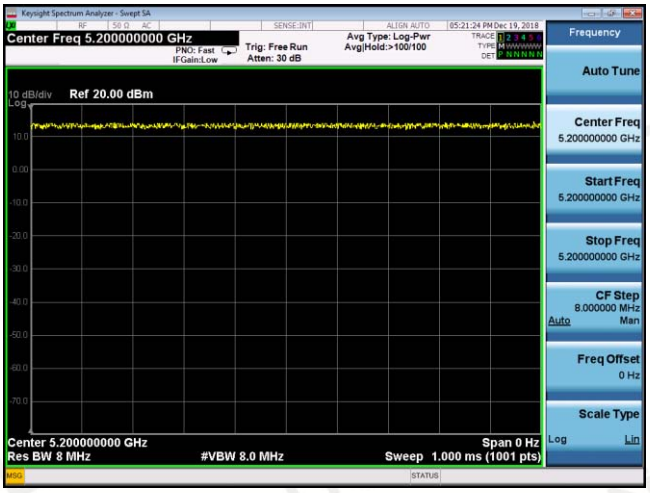
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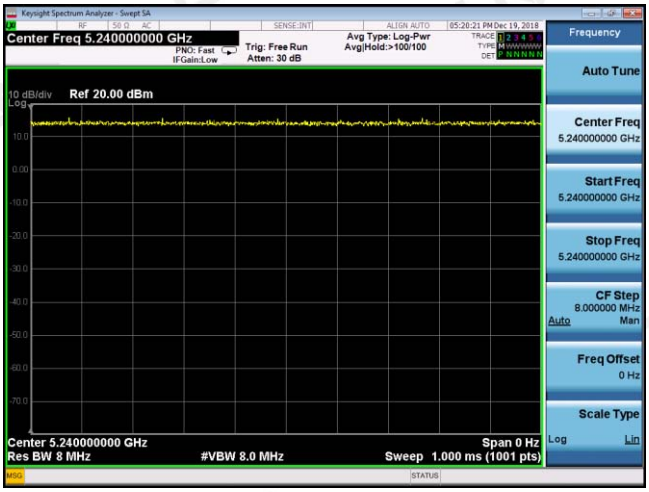	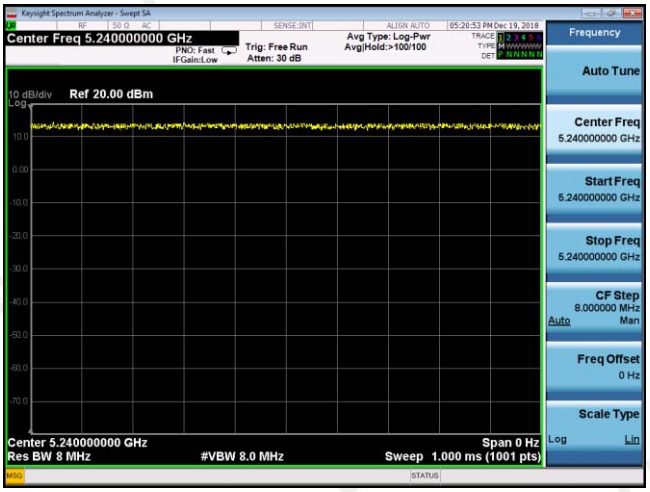
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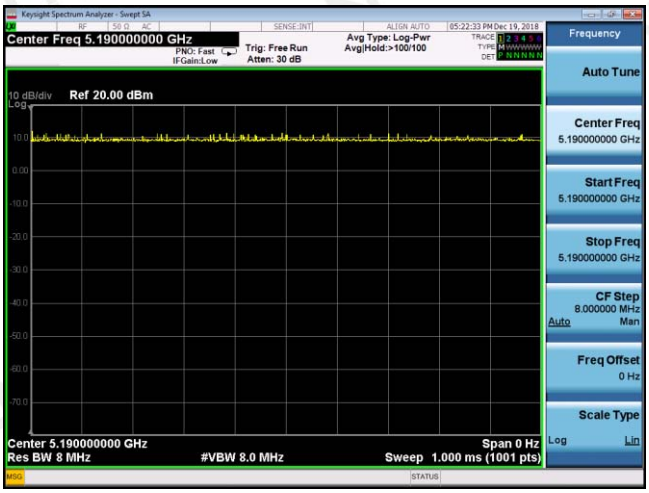
ANT C 802.11ac (40M)	ANT C 802.11ac (80M)



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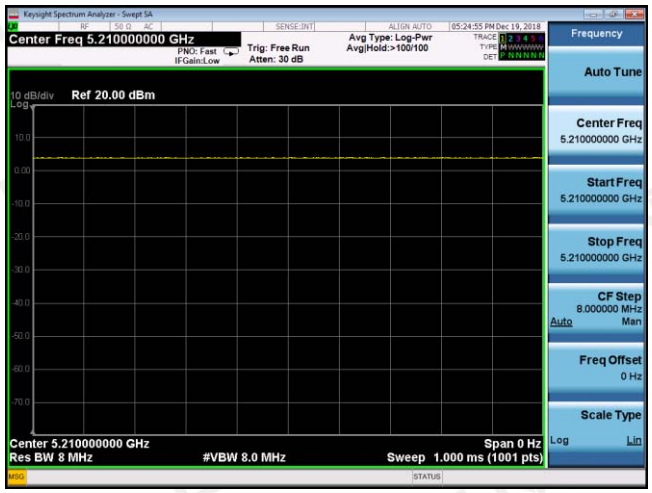

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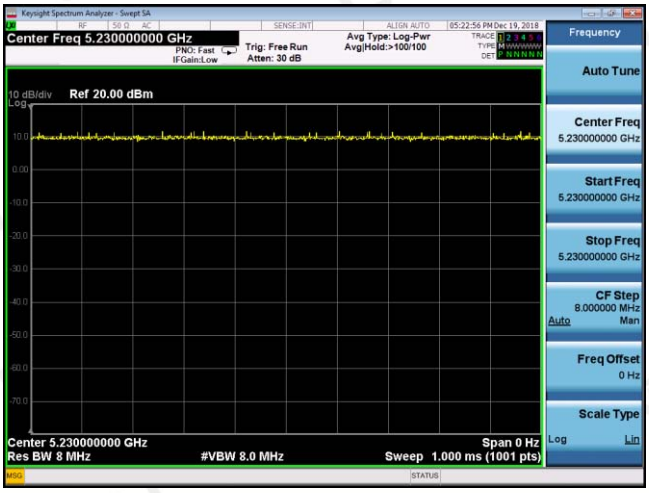

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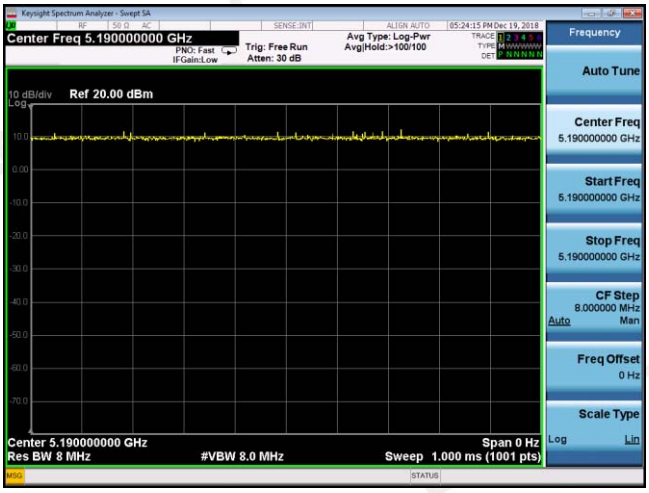
ANT C 802.11n (40M)



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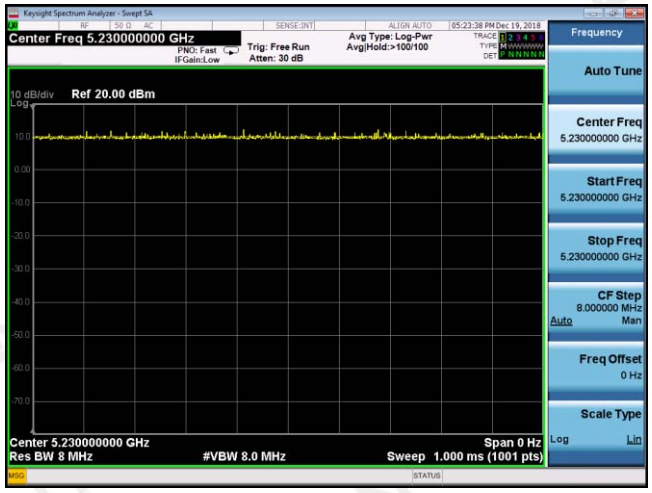

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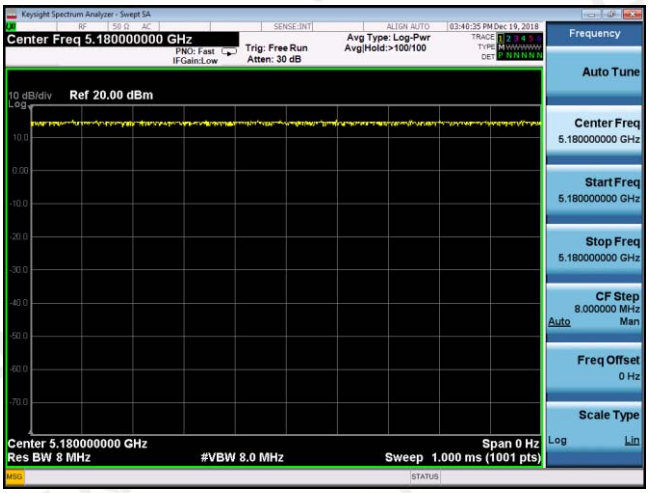
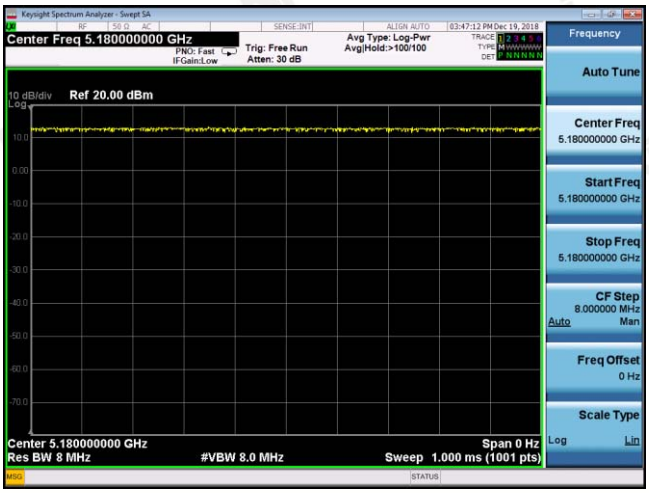
ANT D 802.11a	ANT D 802.11ac (20M)
	
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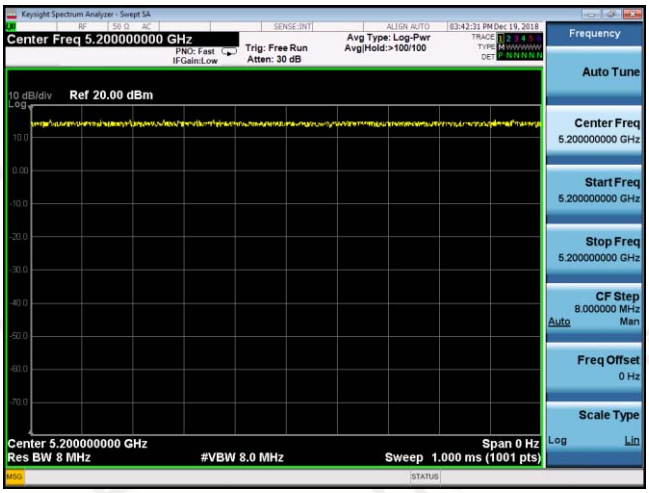	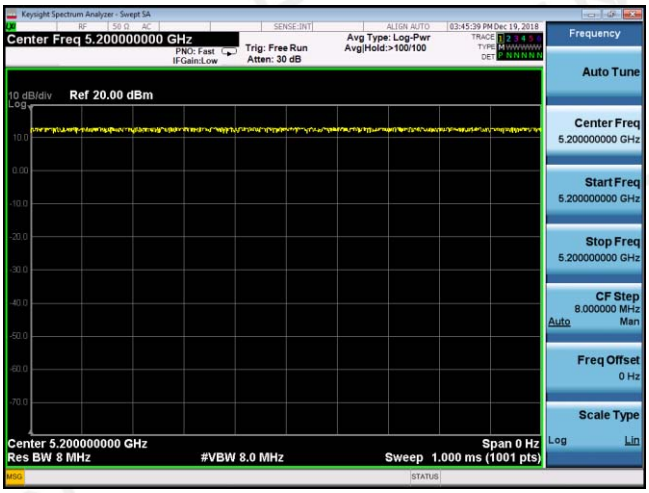
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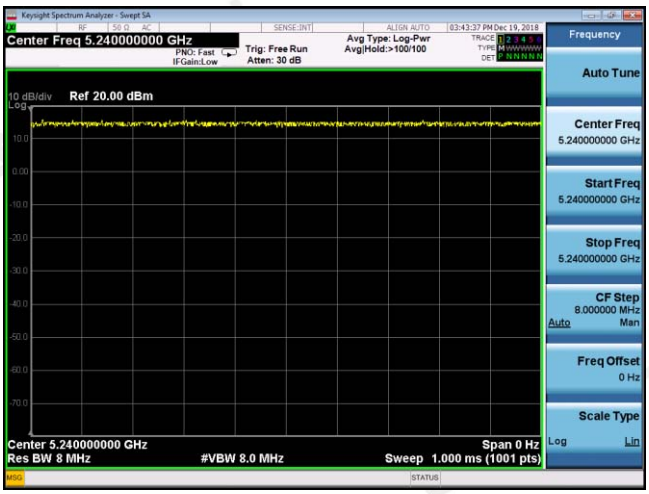	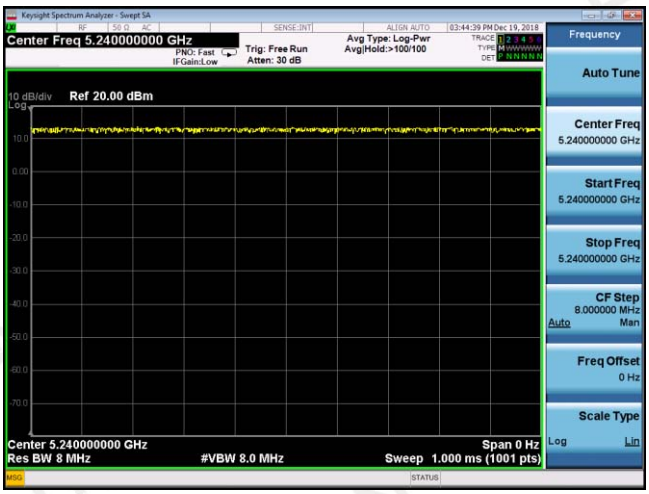
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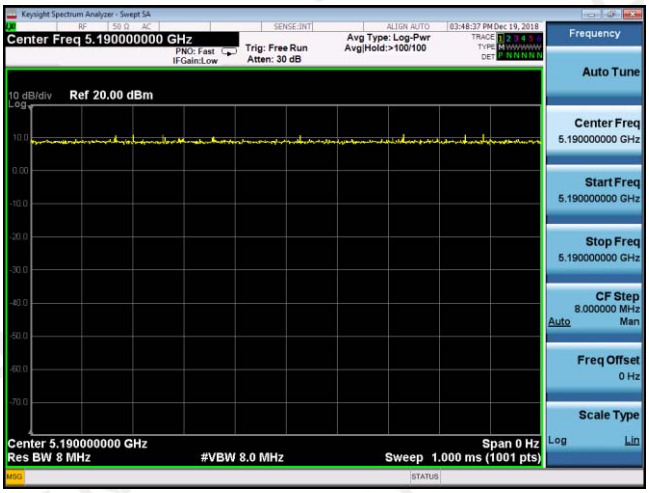
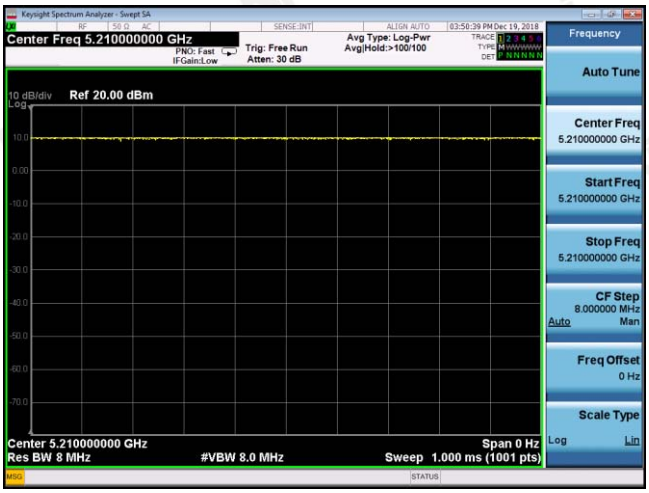
ANT D 802.11ac (40M)	ANT D 802.11ac (80M)
	
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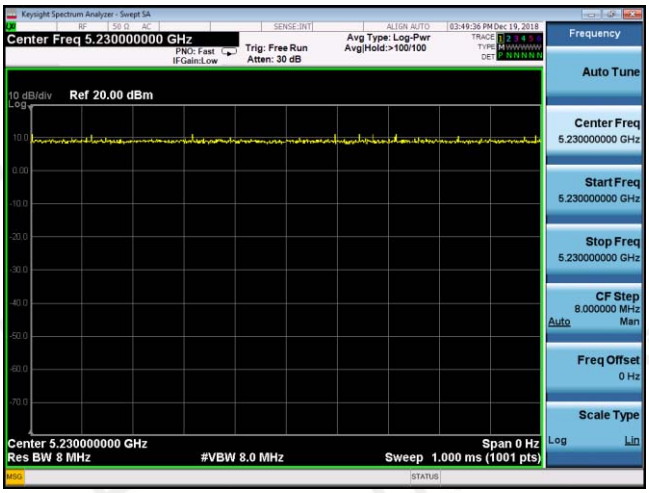	
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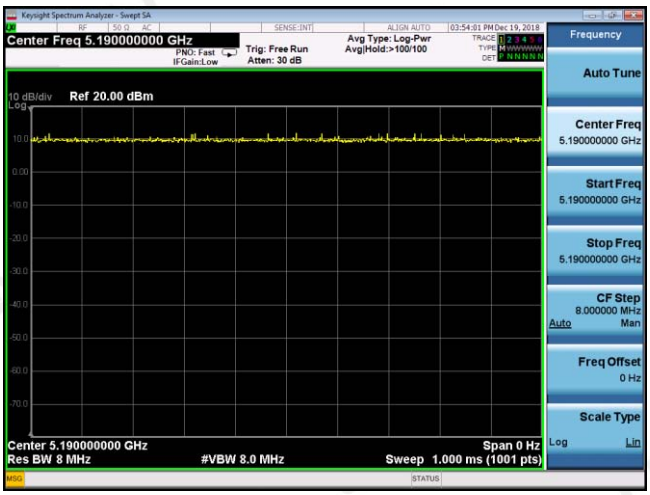
	
5190	5230

10. FREQUENCY STABILITY

10.1 Test 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 user's manual.

10.2 Test Procedure

1. The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.
2. Set EUT as normal operation.
3. Turn the EUT on and couple its output to spectrum.
4. Turn the EUT off and set the chamber to the highest temperature specified.
5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT and measure the operating frequency.
6. Repeat step with the temperature chamber set to the lowest temperature.

10.3 Test Result

PASS

11. ANTENNA REQUIREMENT

Standard Applicable:
For intentional device, according to FCC 47 CFR Section 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.

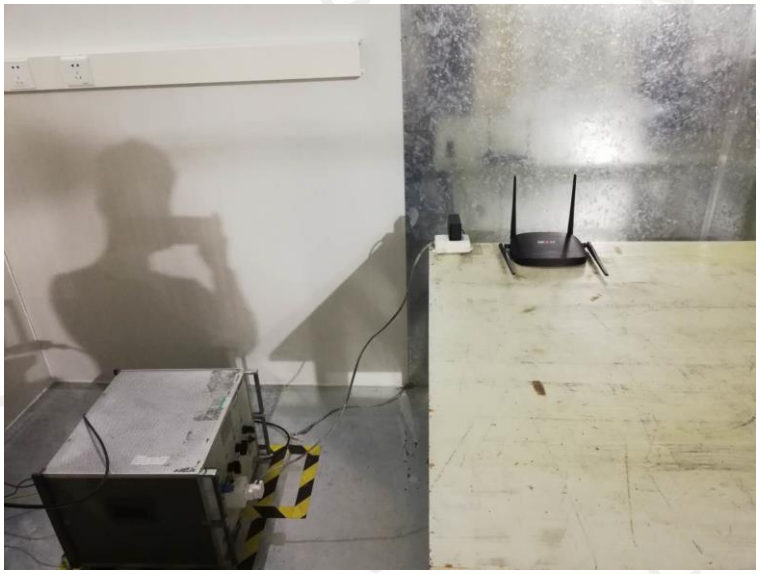
Antenna Connected Construction
The antenna used in this product is an External Antenna, The directional gains of antenna used for transmitting is 5dBi.

12. PHOTOGRAPH OF TEST

Radiated Emission
(Below 1G)

Radiated Emission
(Above 1G)

Conducted Emission



End of Report