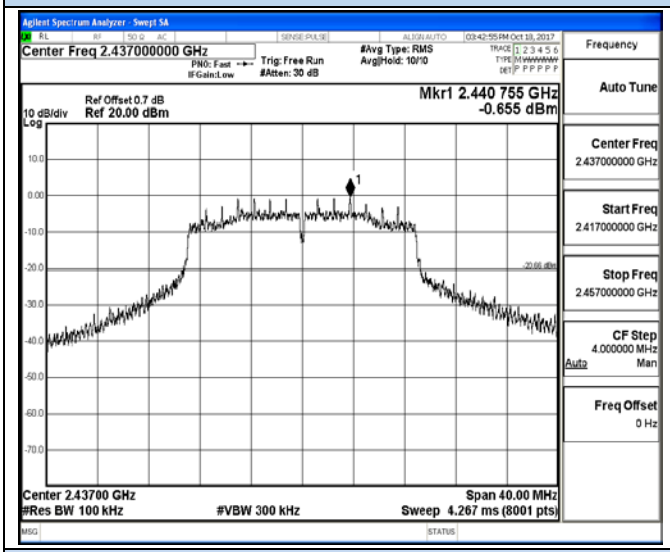
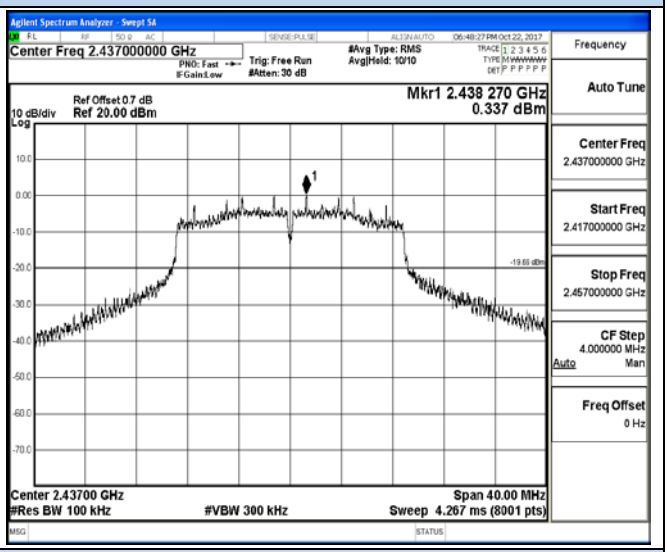
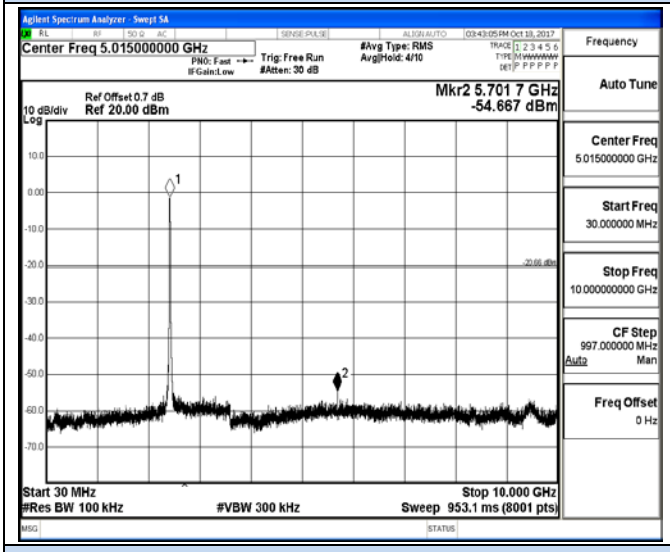
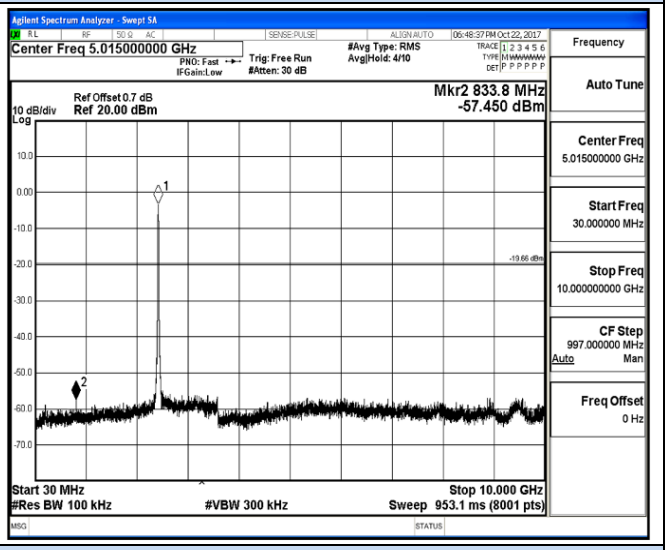
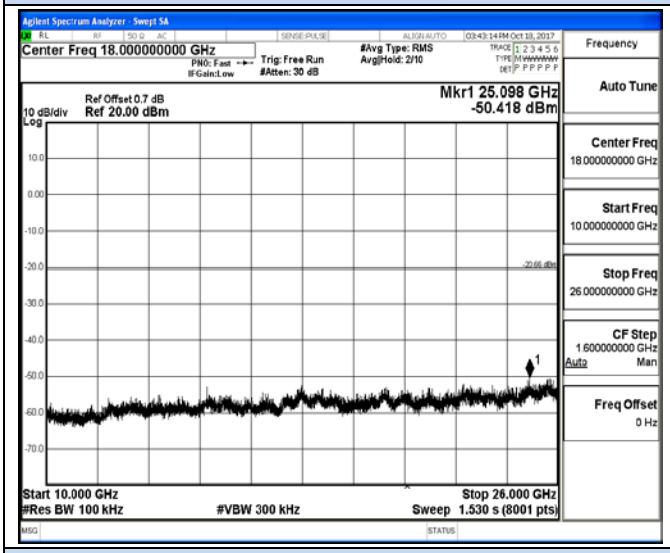
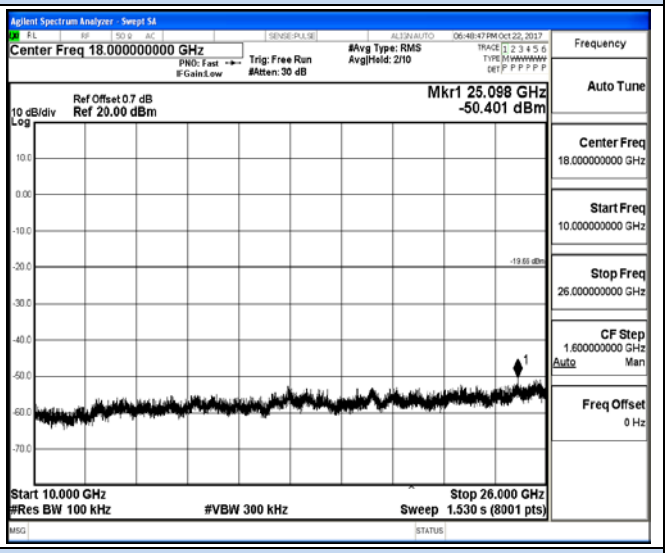
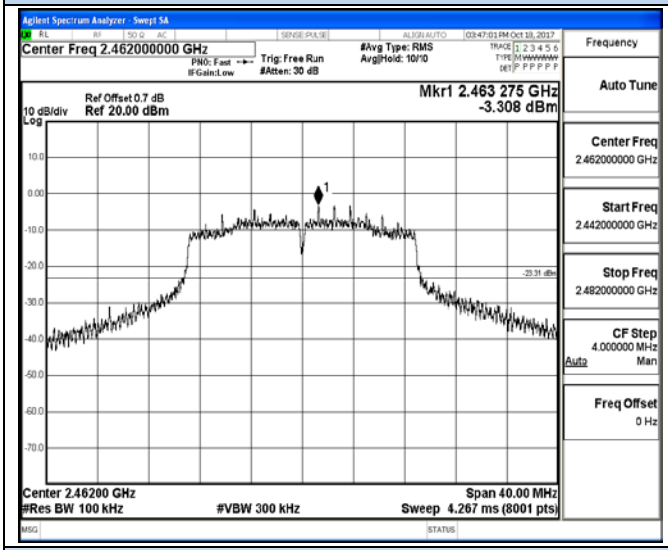
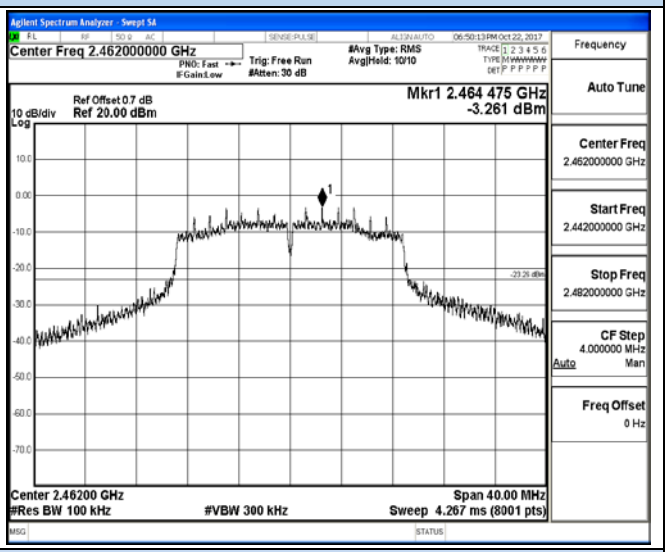
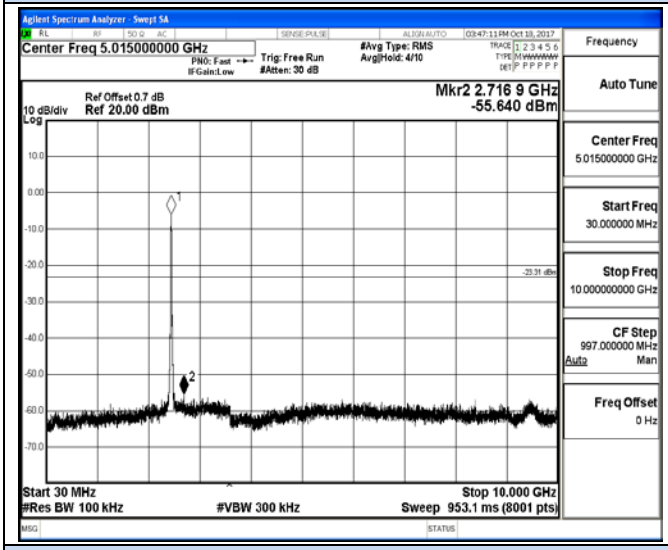
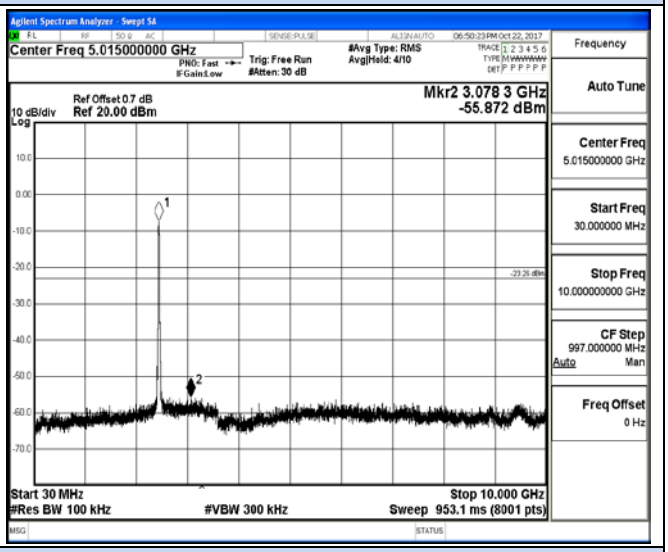
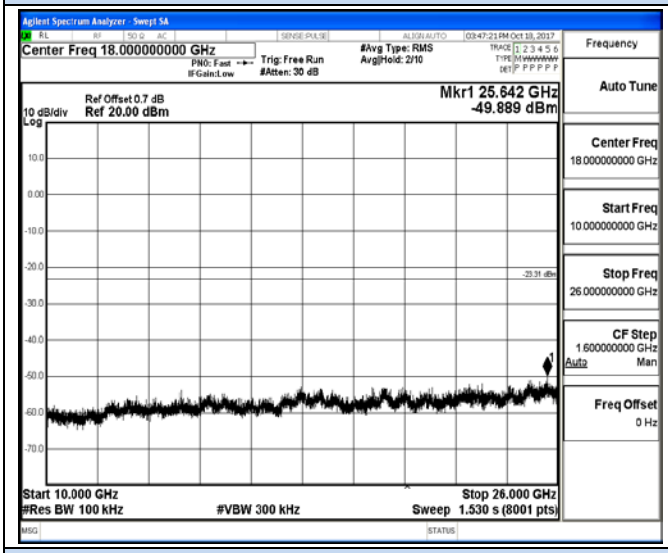
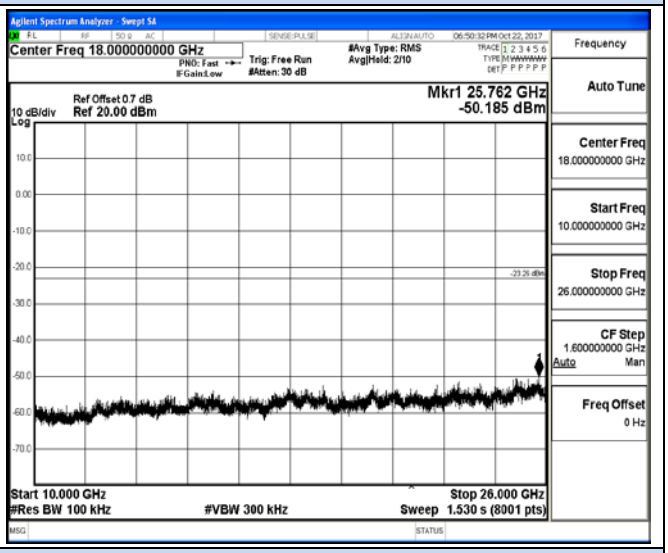
RF Conducted Spurious Emission

IEEE 802.11n HT20

Antenna 0	Antenna 1
Channel 6 / 2437 MHz	Channel 6 / 2437 MHz
	
2417 MHz – 2457 MHz	2417 MHz – 2457 MHz
	
30 MHz – 10 GHz	30 MHz – 10 GHz
	
10 GHz – 26 GHz	10 GHz – 26 GHz

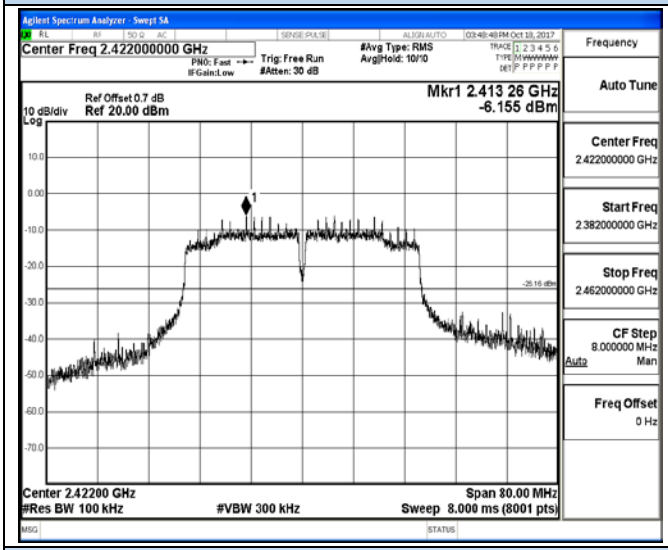
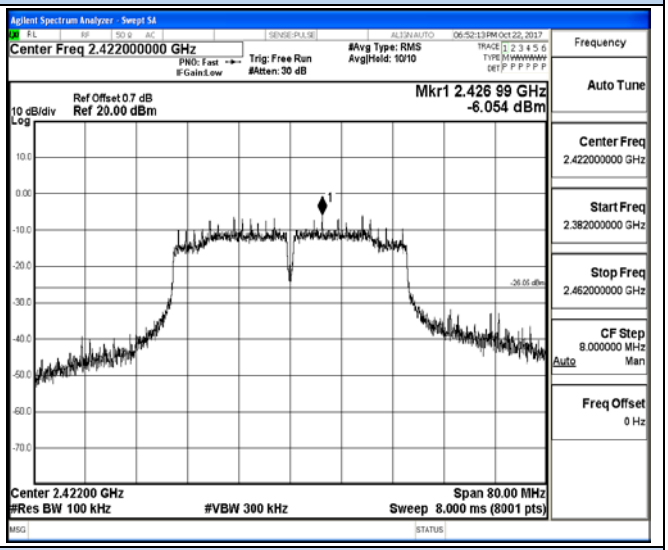
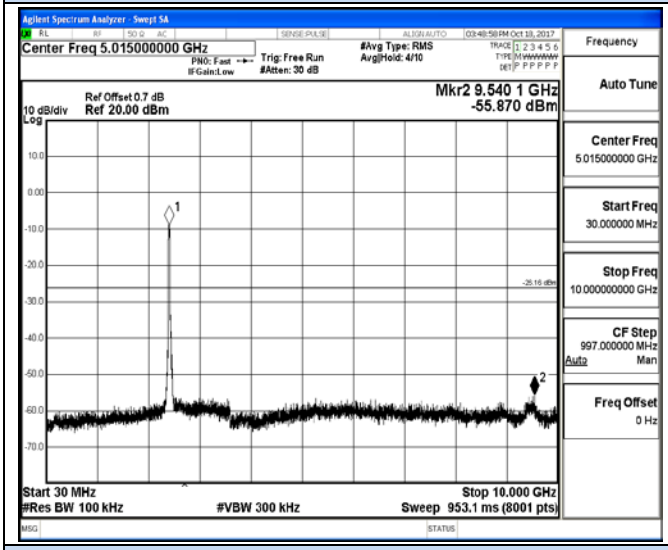
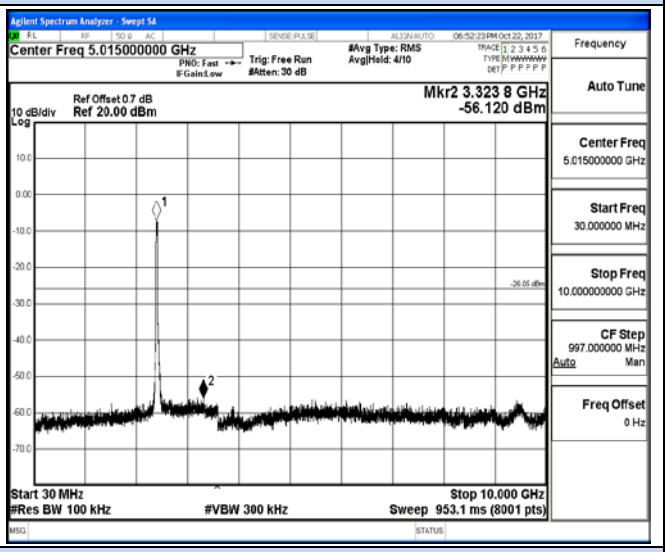
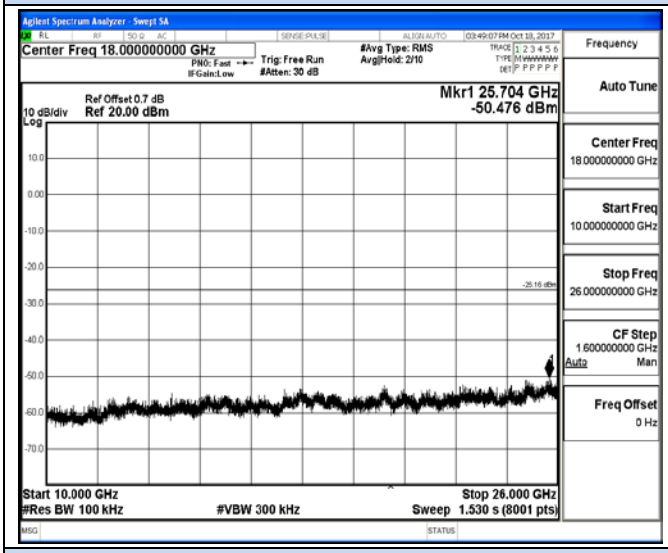
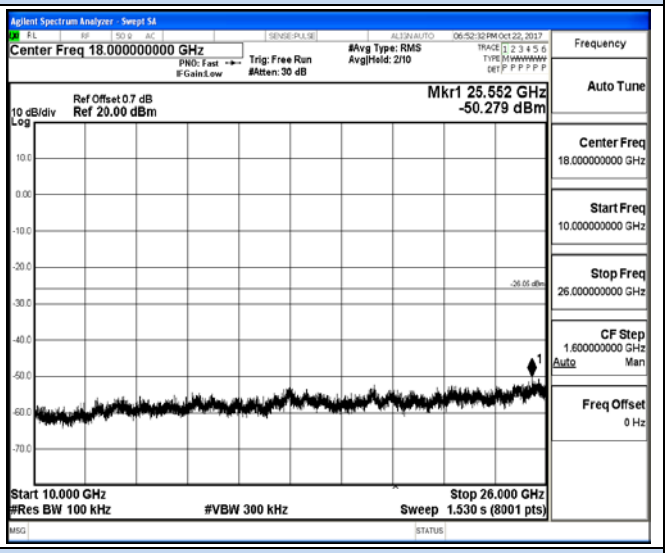
RF Conducted Spurious Emission

IEEE 802.11n HT20

Antenna 0	Antenna 1
Channel 11 / 2462 MHz	Channel 11 / 2462 MHz
	
2442 MHz – 2482 MHz	2417 MHz – 2457 MHz
	
30 MHz – 10 GHz	30 MHz – 10 GHz
	
10 GHz – 26 GHz	10 GHz – 26 GHz

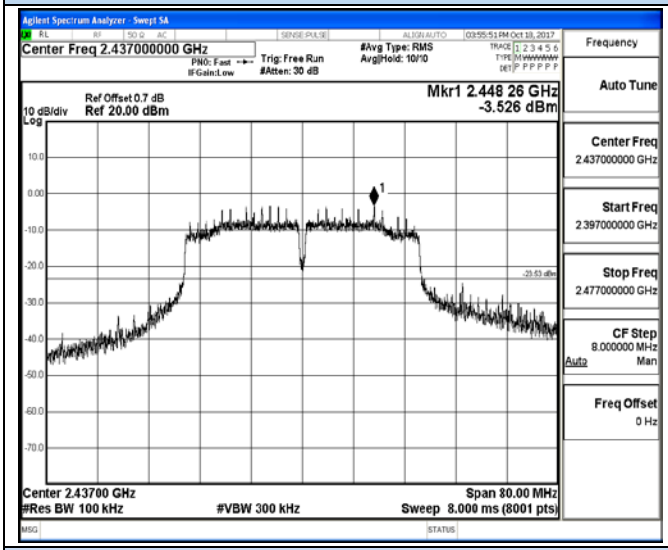
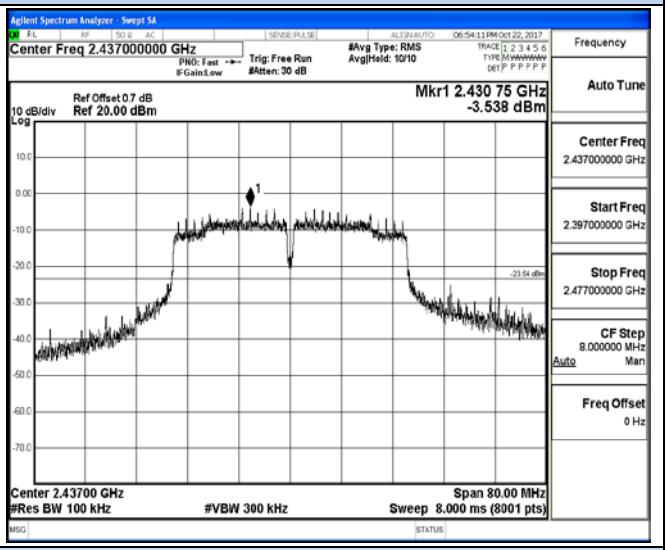
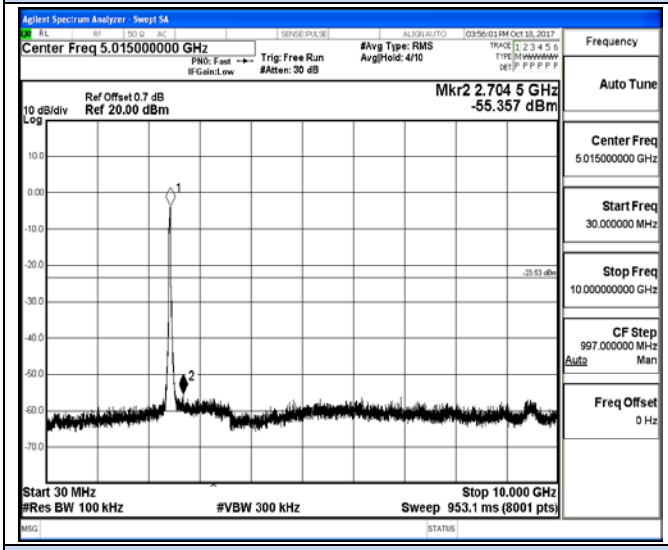
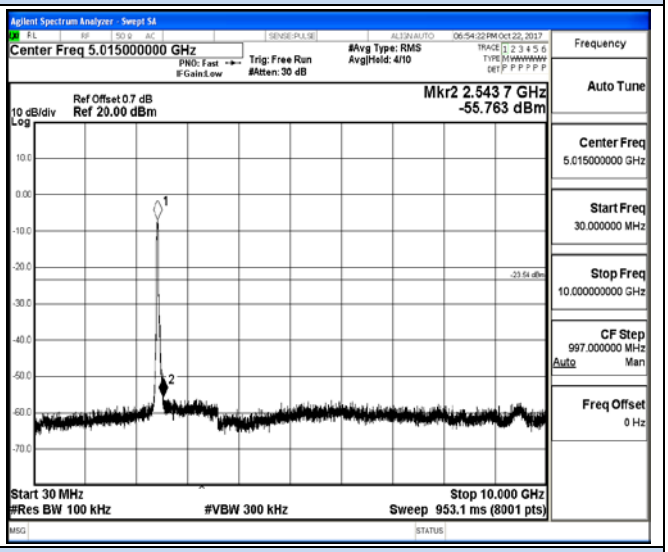
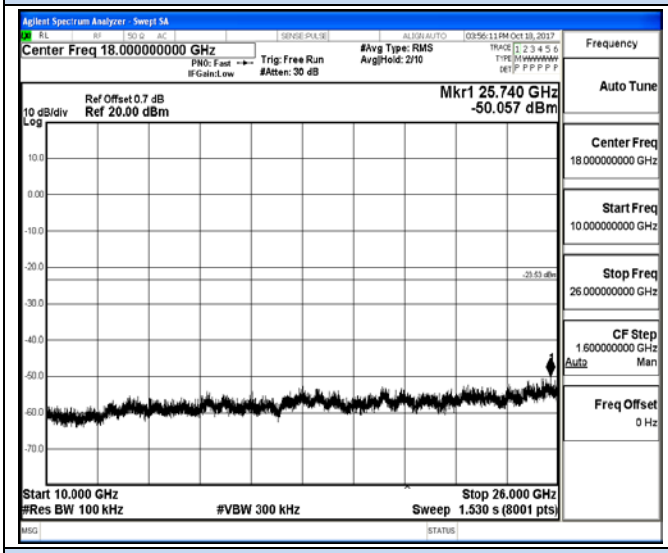
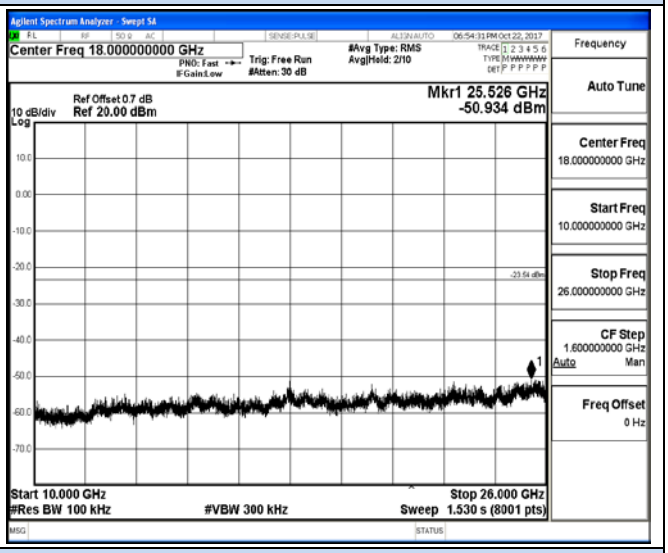
RF Conducted Spurious Emission

IEEE 802.11n HT40

Antenna 0	Antenna 1
Channel 3 / 2422 MHz	Channel 3 / 2422 MHz
	
2382 MHz – 2462 MHz	2382 MHz – 2462 MHz
	
30 MHz – 10 GHz	30 MHz – 10 GHz
	
10 GHz – 26 GHz	10 GHz – 26 GHz

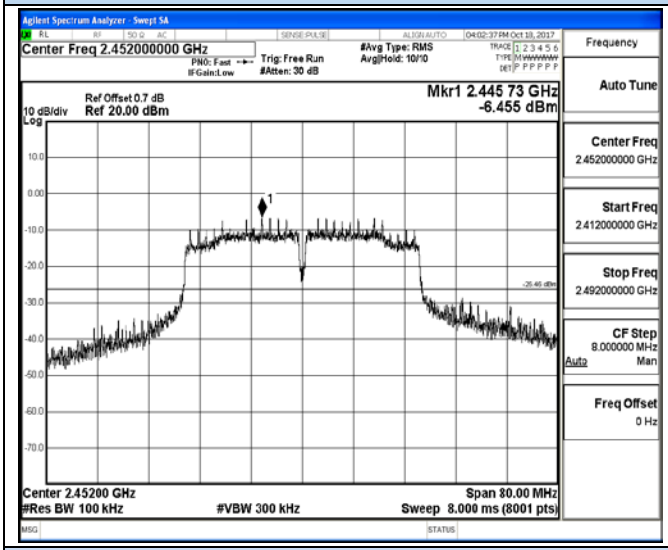
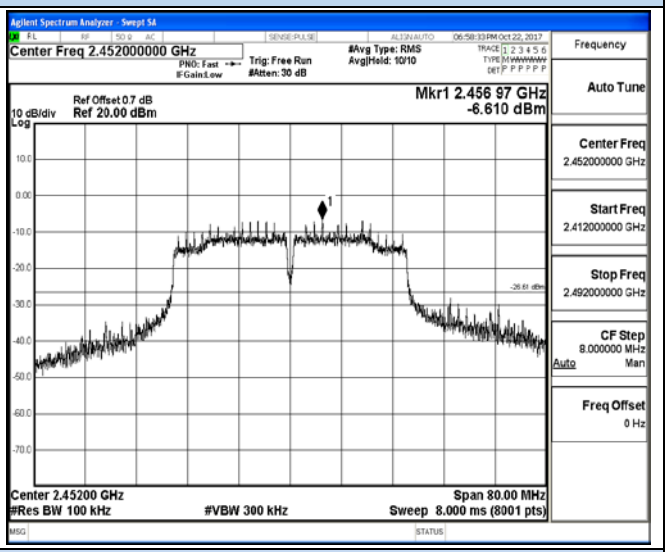
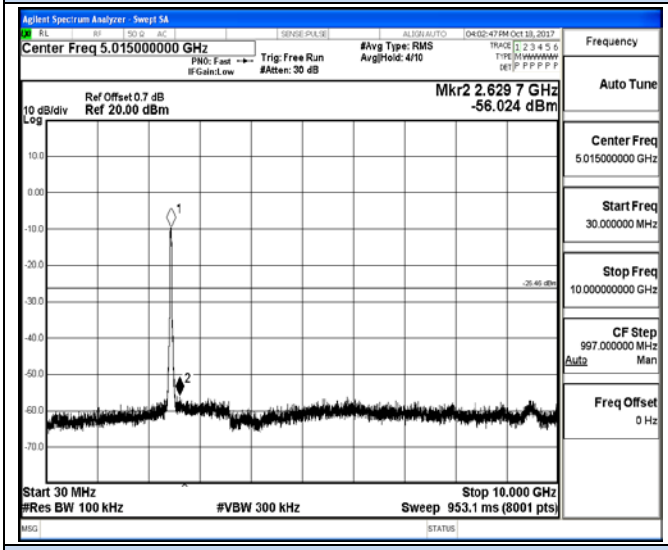
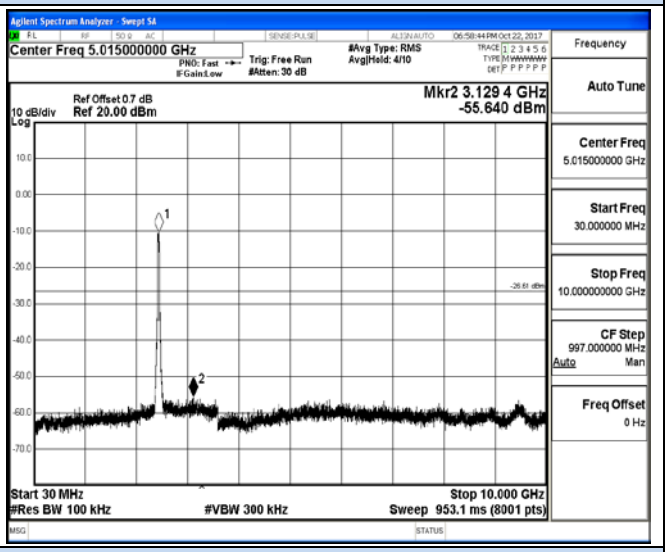
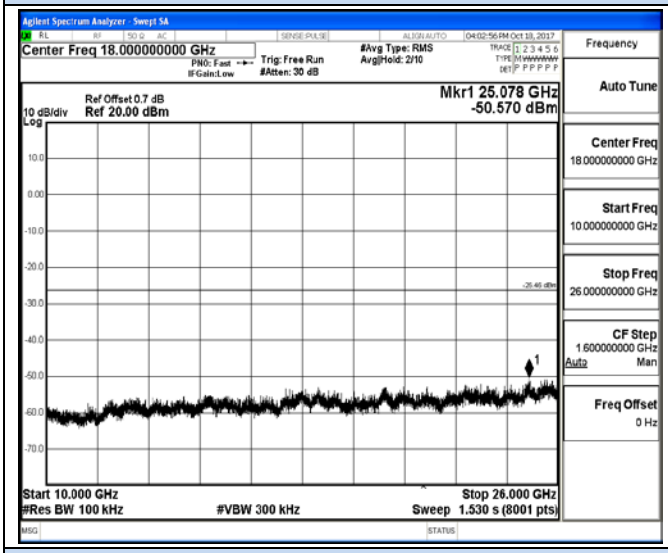
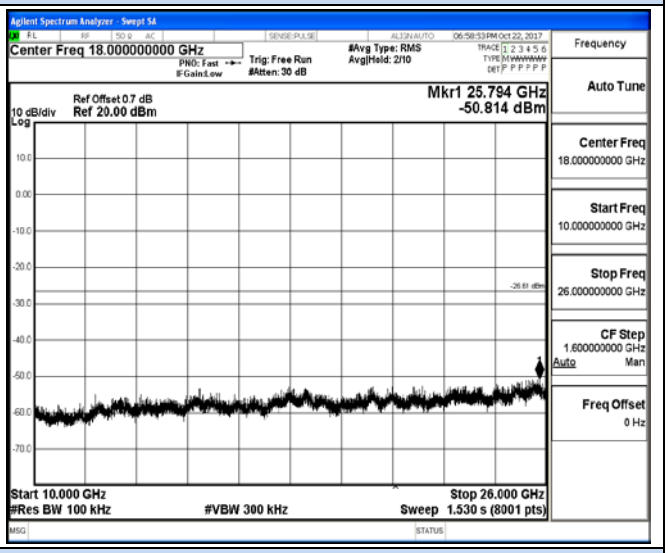
RF Conducted Spurious Emission

IEEE 802.11n HT40

Antenna 0	Antenna 1
Channel 6 / 2437 MHz	Channel 6 / 2437 MHz
	
2397 MHz – 2477 MHz	2397 MHz – 2477 MHz
	
30 MHz – 10 GHz	30 MHz – 10 GHz
	
10 GHz – 26 GHz	10 GHz – 26 GHz

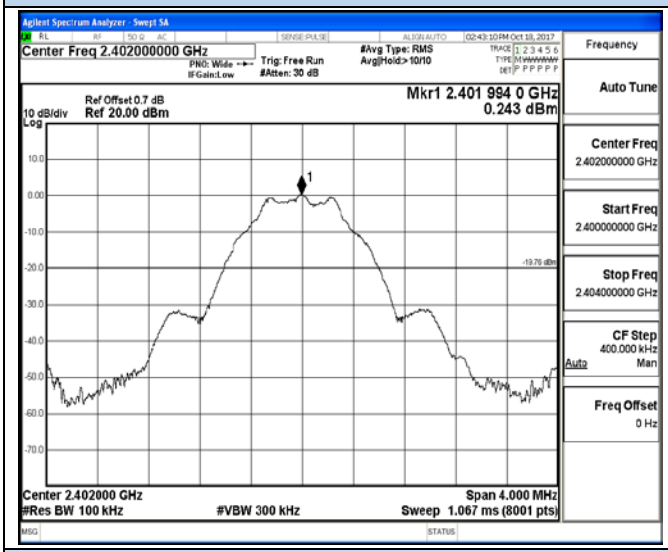
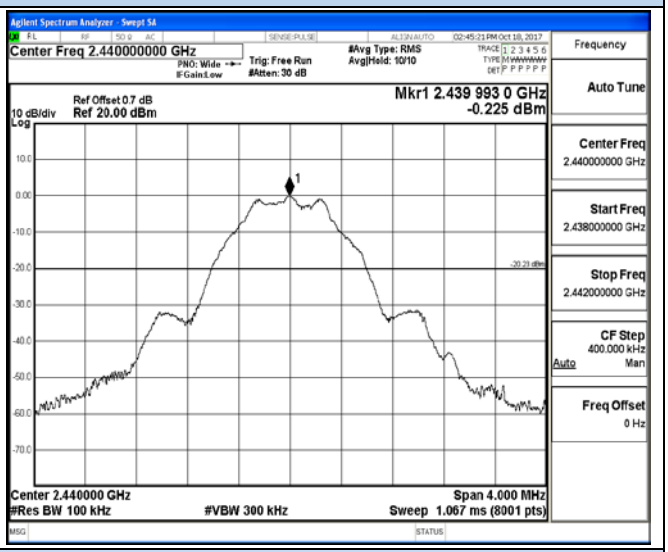
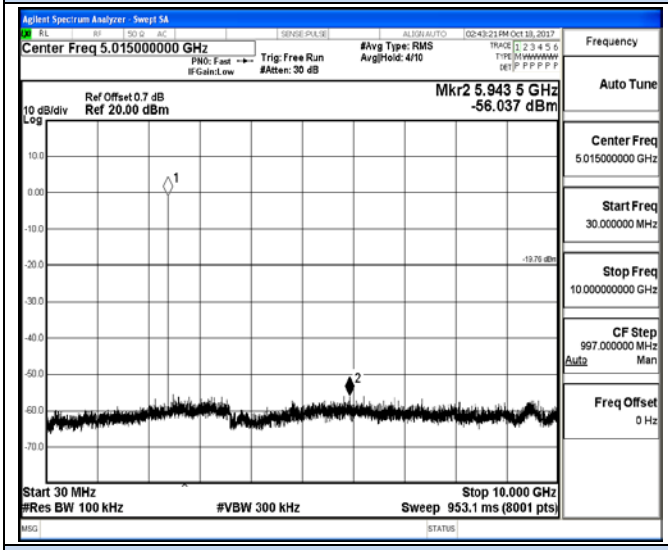
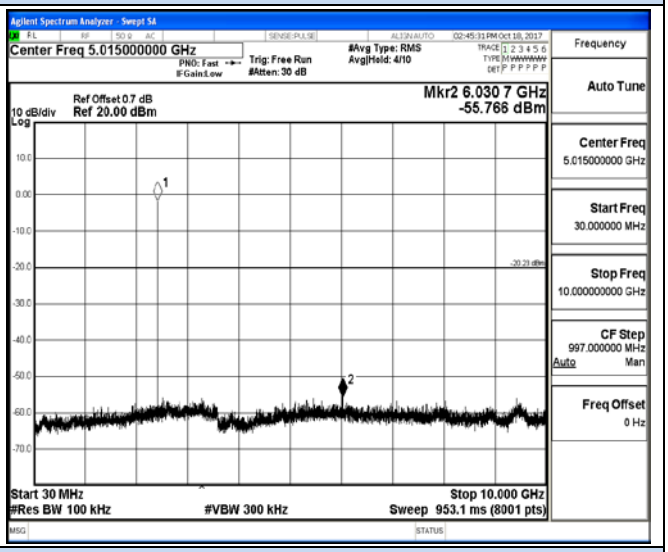
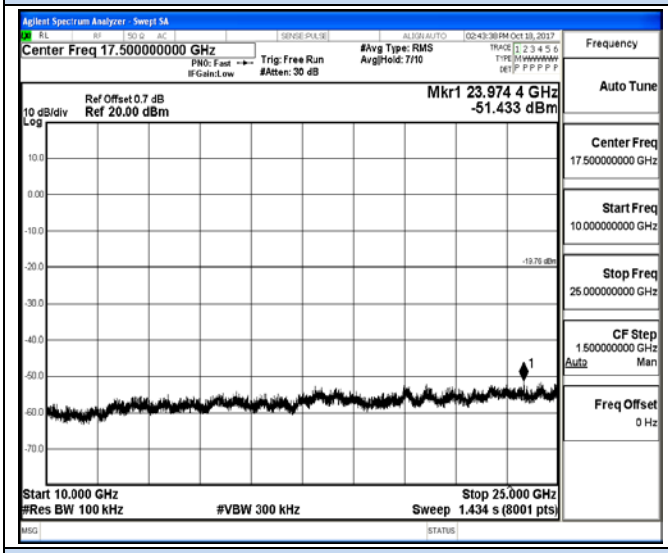
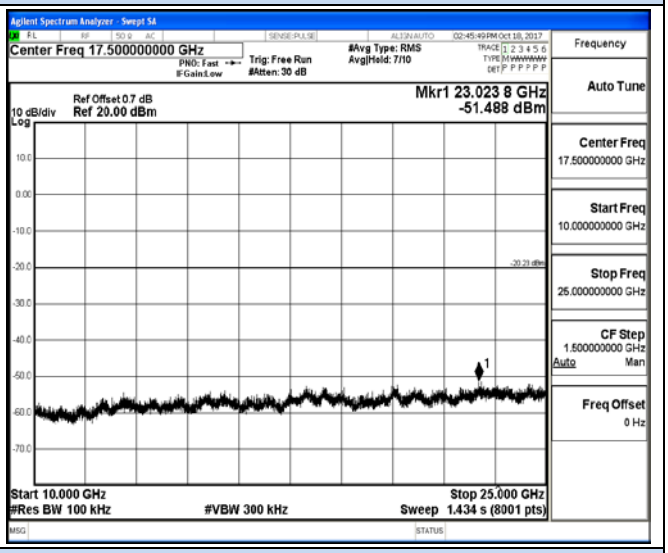
RF Conducted Spurious Emission

IEEE 802.11n HT40

Antenna 0	Antenna 1
Channel 9 / 2452 MHz	Channel 9 / 2452 MHz
	
2412 MHz – 2492 MHz	2412 MHz – 2492 MHz
	
30 MHz – 10 GHz	30 MHz – 10 GHz
	
10 GHz – 26 GHz	10 GHz – 26 GHz

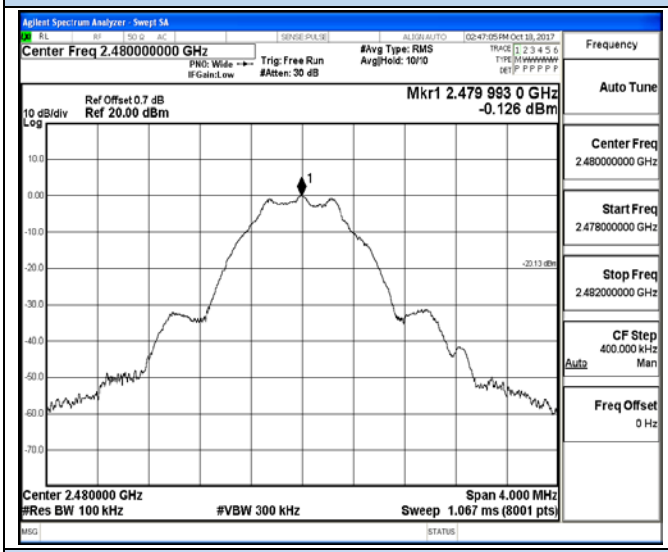
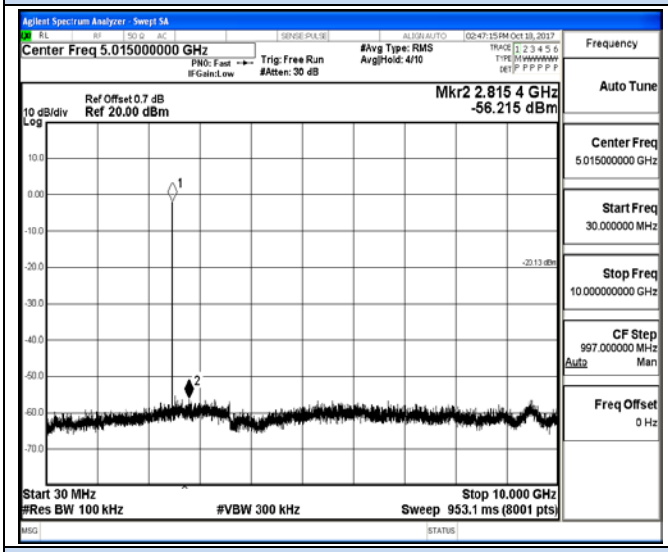
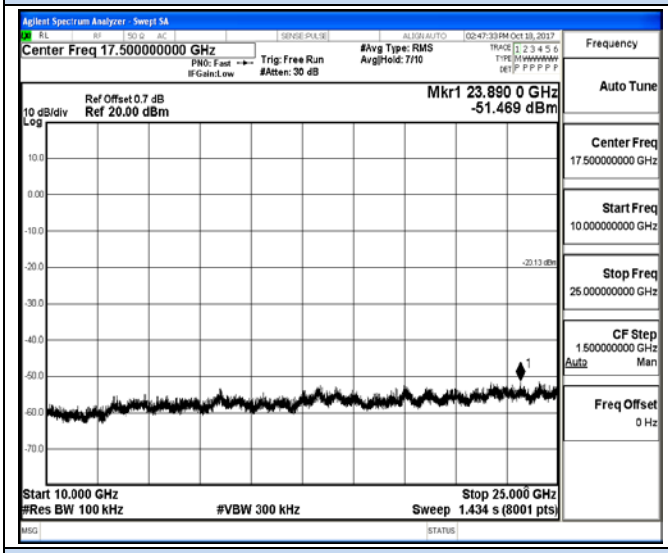
RF Conducted Spurious Emission

BT LE

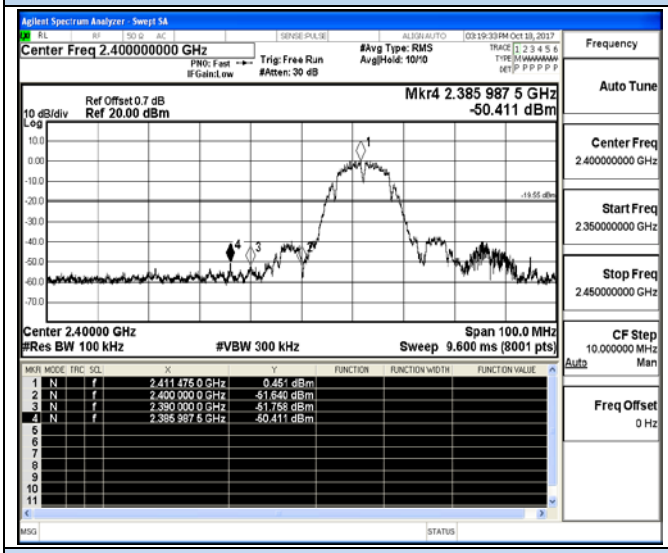
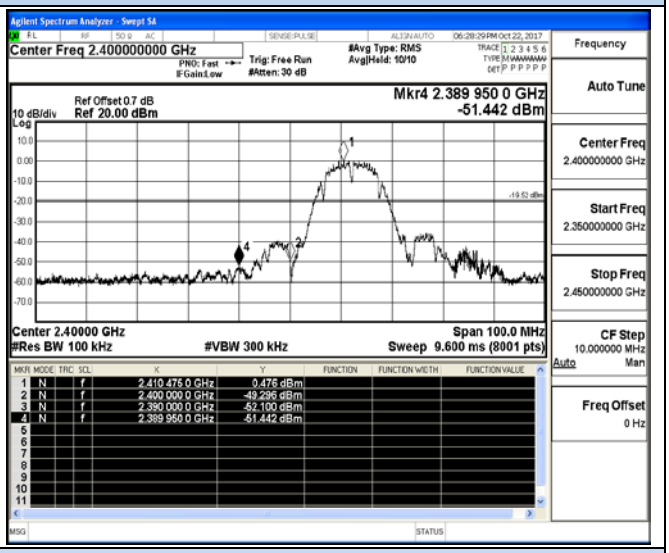
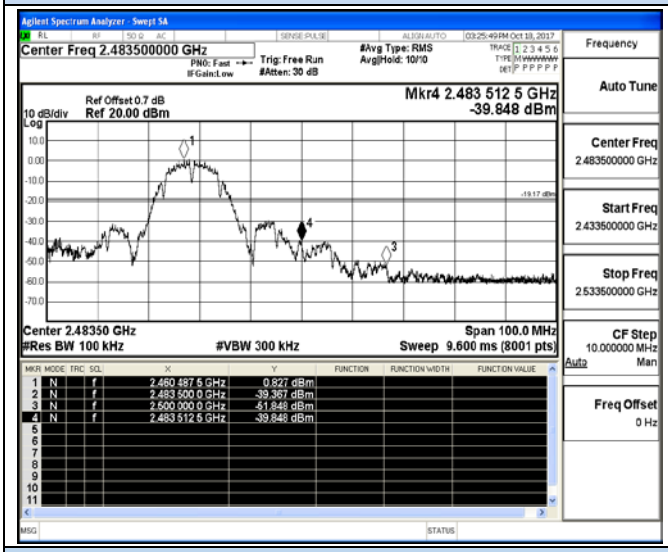
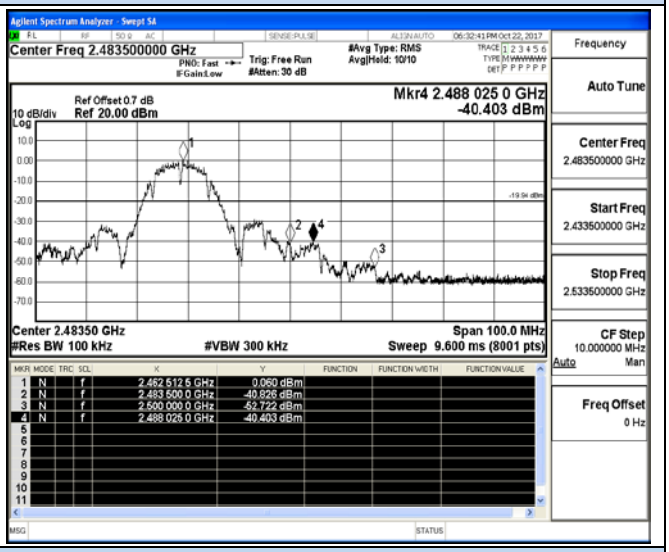
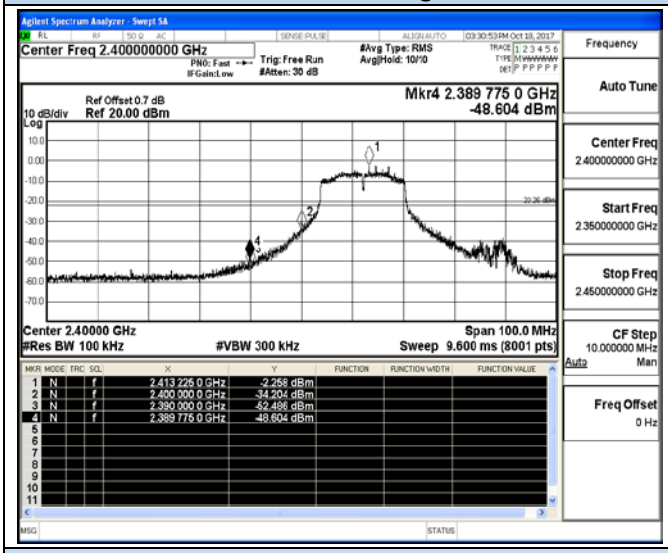
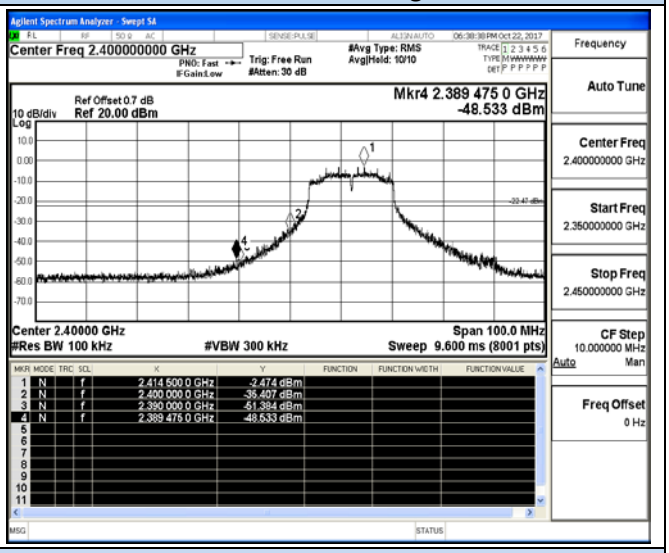
Antenna 0	Antenna 0
Channel 0 / 2402 MHz	Channel 19 / 2440 MHz
	
2400 MHz – 2404 MHz	2438 MHz – 2442 MHz
	
30 MHz – 10 GHz	30 MHz – 10 GHz
	
10 GHz – 26 GHz	10 GHz – 26 GHz

RF Conducted Spurious Emission

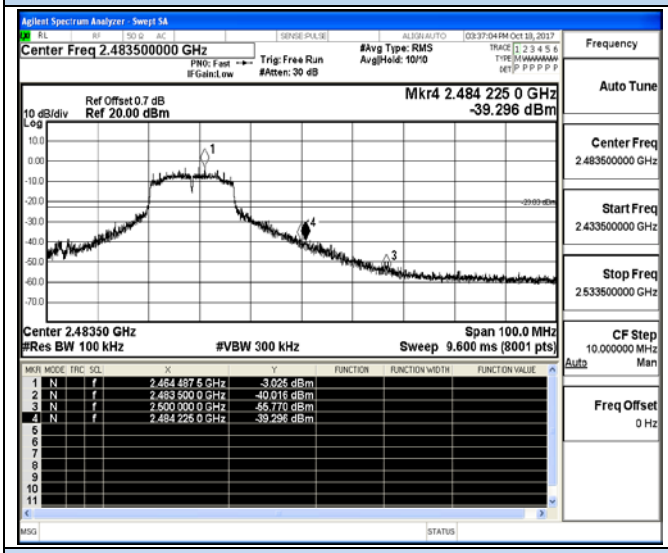
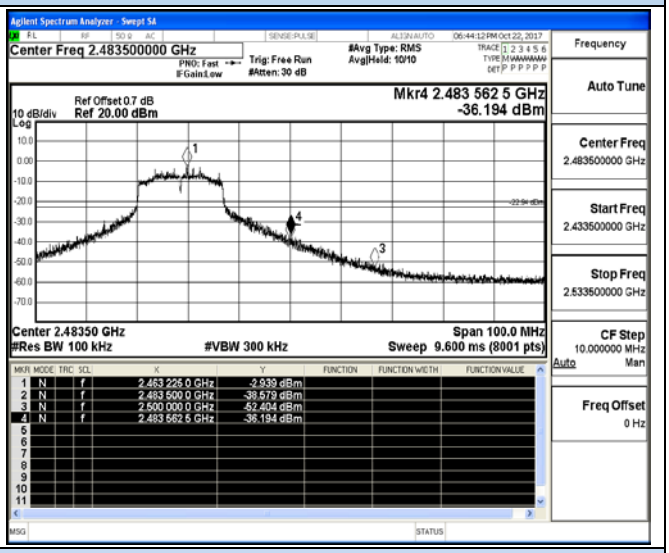
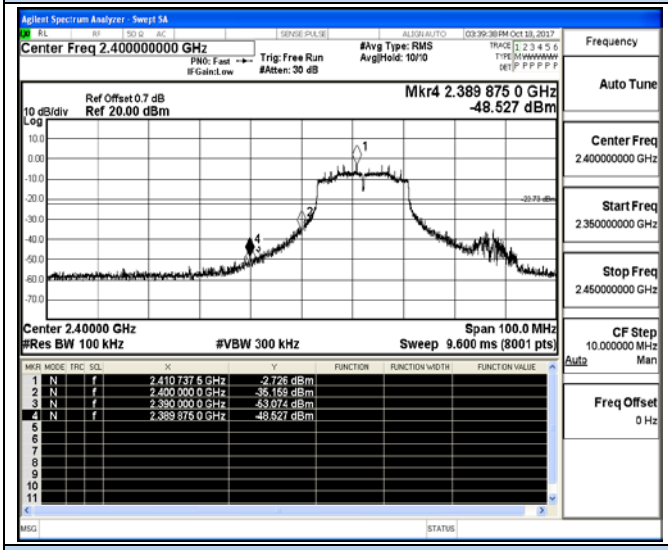
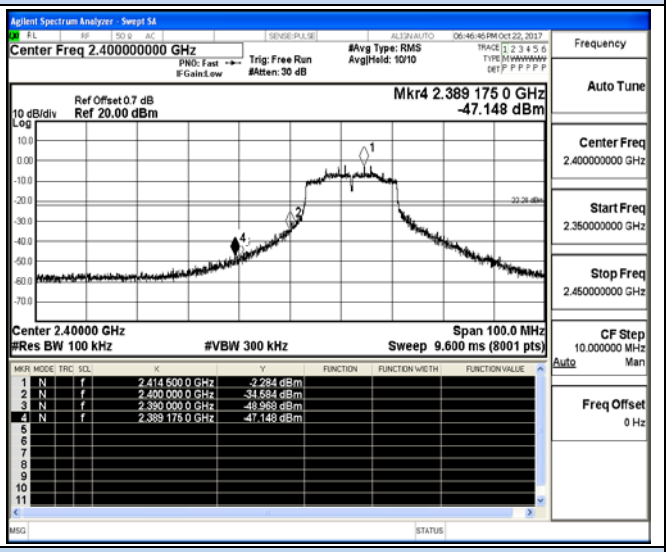
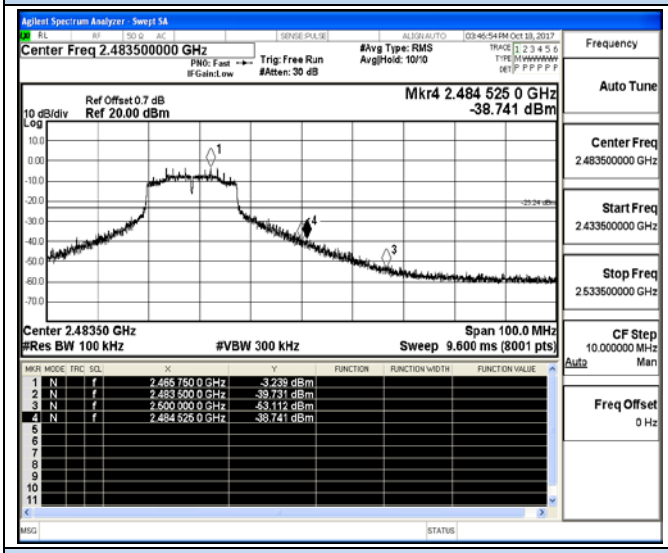
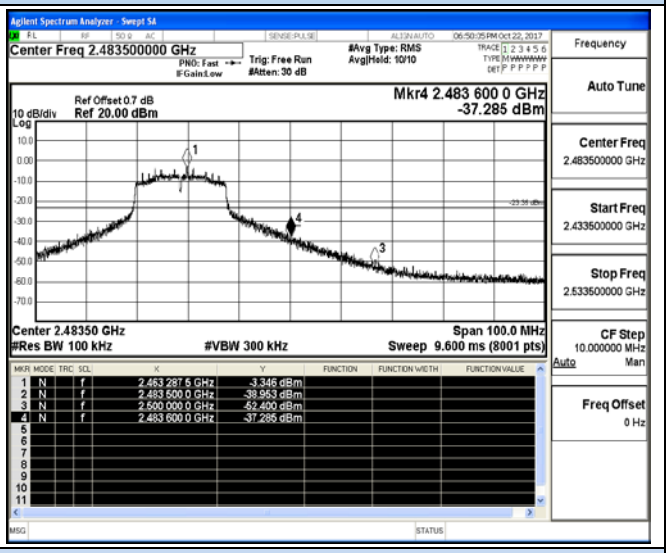
BT LE

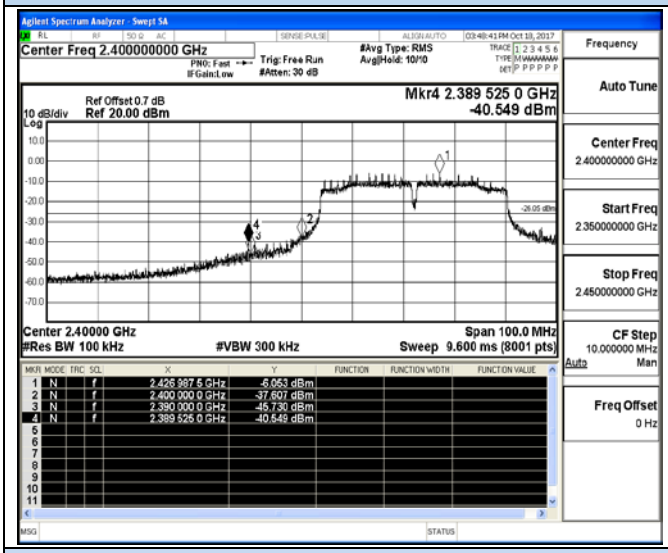
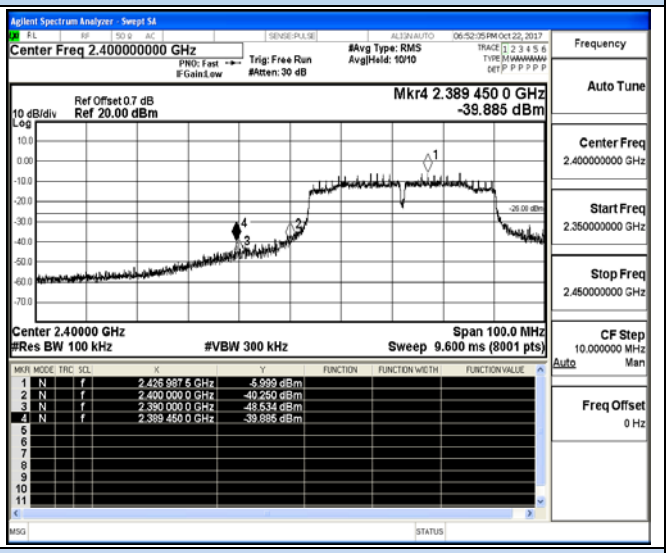
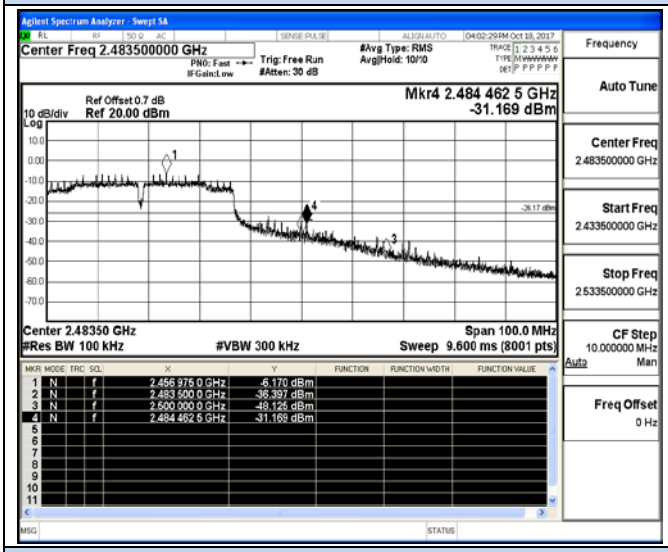
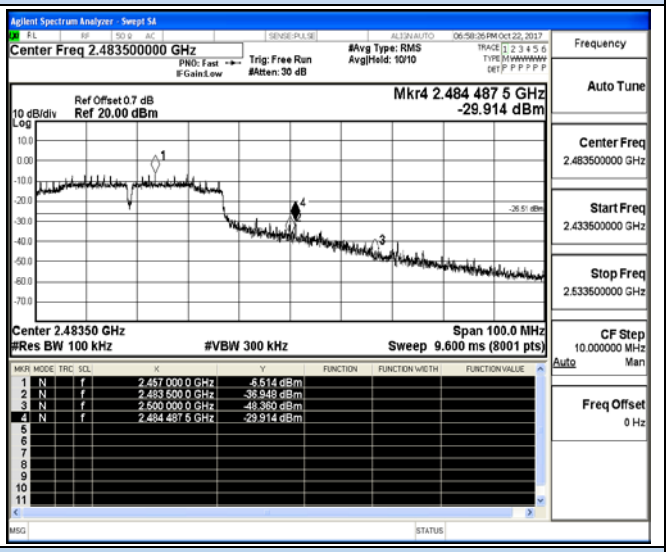
Antenna 0	
Channel 39 / 2480 MHz	
	
2478 MHz – 2482 MHz	
	
30 MHz – 10 GHz	30 MHz – 10 GHz
	
10 GHz – 26 GHz	10 GHz – 26 GHz

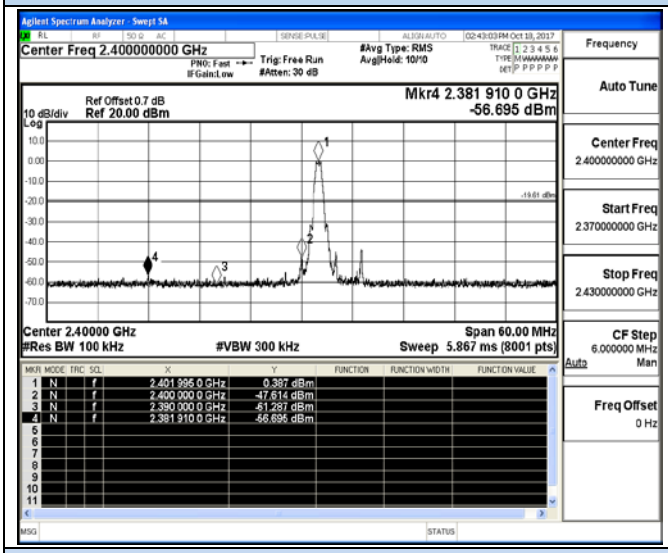
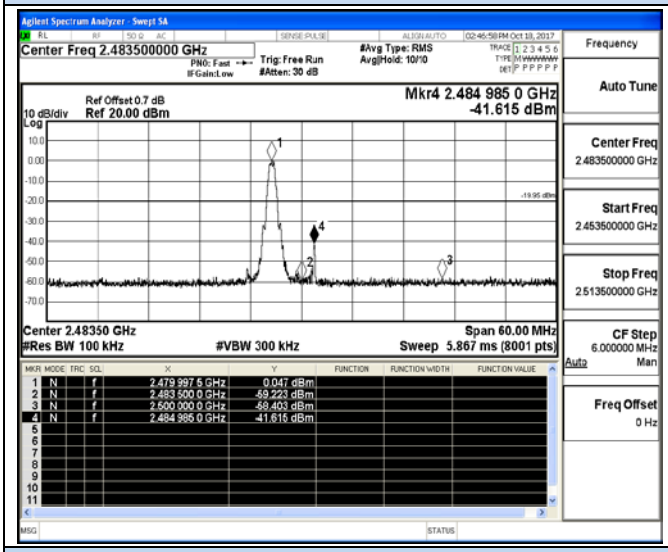
Band-edge measurements for conducted emissions

IEEE 802.11b	IEEE 802.11b
Antenna 0	Antenna 1
	
Channel 1 / 2412 MHz	Channel 1 / 2412 MHz
	
Channel 11 / 2462 MHz	Channel 11 / 2462 MHz
IEEE 802.11g	IEEE 802.11g
	
Channel 1 / 2412 MHz	Channel 1 / 2412 MHz

Band-edge measurements for conducted emissions

IEEE 802.11g	IEEE 802.11g
Antenna 0	Antenna 1
	
Channel 11 / 2462 MHz	Channel 11 / 2462 MHz
IEEE 802.11n HT20	IEEE 802.11n HT20
	
Channel 1 / 2412 MHz	Channel 11 / 2462 MHz
	
Channel 1 / 2412 MHz	Channel 11 / 2462 MHz

Band-edge measurements for conducted emissions	
IEEE 802.11n HT40	IEEE 802.11n HT40
Antenna 0	Antenna 1
	
Channel 3 / 2422 MHz	Channel 3 / 2422 MHz
	
Channel 9 / 2452 MHz	Channel 9 / 2452 MHz

Band-edge measurements for conducted emissions	
BT – LE	
Antenna 0	
	
Channel 0 / 2402 MHz	
	
Channel 39 / 2480 MHz	Channel 39 / 2480 MHz

5.7. Power line conducted emissions

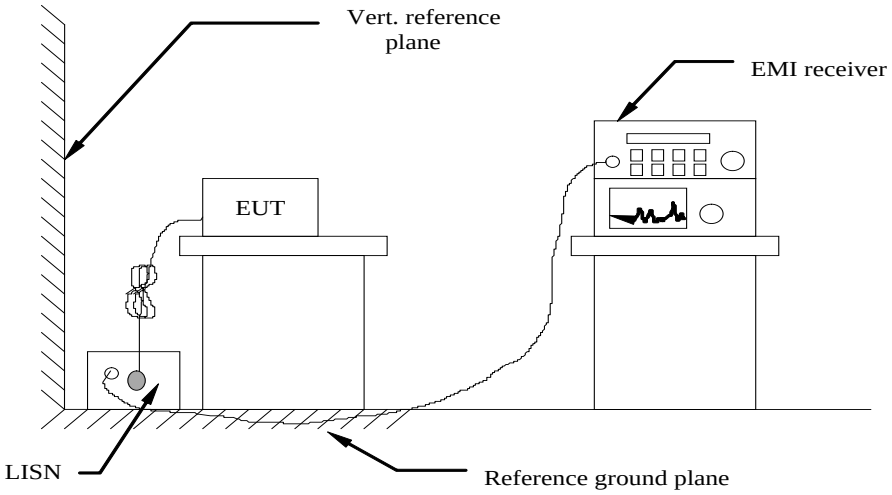
5.7.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

* Decreasing linearly with the logarithm of the frequency

5.7.2 Block Diagram of Test Setup



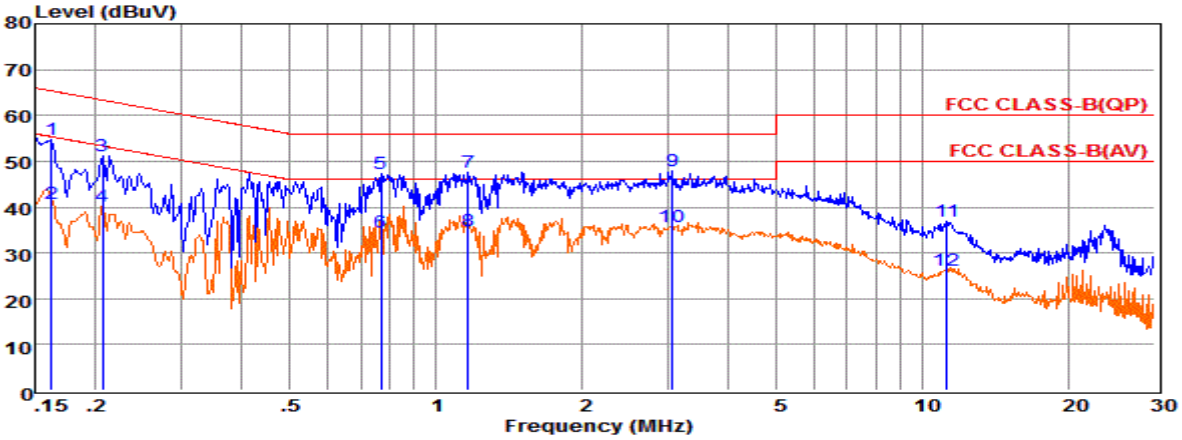
5.7.3 Test Results

PASS.

The test data please refer to following page.

AC Conducted Emission of power adapter @ AC 240V/50Hz @ IEEE 802.11b (worst case)

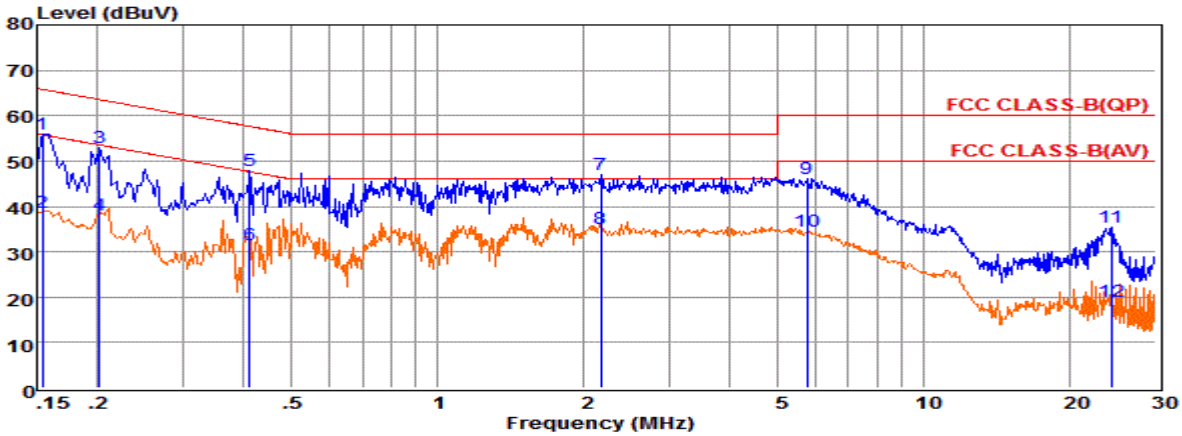
Line



	Freq MHz	Reading dBuV	LISNFac dB	CabLos dB	Aux2Fac dB	Measured dB	Limit dBuV	Over dBuV	Remark dB
1	0.16	35.18	9.59	0.02	10.00	54.79	65.34	-10.55	QP
2	0.16	21.10	9.59	0.02	10.00	40.71	55.33	-14.62	Average
3	0.21	31.58	9.63	0.03	10.00	51.24	63.36	-12.12	QP
4	0.21	20.36	9.63	0.03	10.00	40.02	53.36	-13.34	Average
5	0.77	27.66	9.64	0.04	10.00	47.34	56.00	-8.66	QP
6	0.77	14.71	9.64	0.04	10.00	34.39	46.00	-11.61	Average
7	1.17	27.98	9.63	0.05	10.00	47.66	56.00	-8.34	QP
8	1.17	15.25	9.63	0.05	10.00	34.93	46.00	-11.07	Average
9	3.06	28.19	9.64	0.06	10.00	47.89	56.00	-8.11	QP
10	3.06	15.97	9.64	0.06	10.00	35.67	46.00	-10.33	Average
11	11.20	17.07	9.70	0.09	10.00	36.86	60.00	-23.14	QP
12	11.20	6.52	9.70	0.09	10.00	26.31	50.00	-23.69	Average

Remarks: 1. Measured = Reading + LISNFac + Cable Loss + Aux2 Fac.
2. The emission levels that are 20dB below the official limit are not reported.

Neutral



	Freq MHz	Reading dBuV	LISNFac dB	CabLos dB	Aux2Fac dB	Measured dB	Limit dBuV	Over dBuV	Remark dB
1	0.15	36.33	9.69	0.02	10.00	56.04	65.78	-9.74	QP
2	0.15	19.04	9.69	0.02	10.00	38.75	55.77	-17.02	Average
3	0.20	33.42	9.59	0.02	10.00	53.03	63.54	-10.51	QP
4	0.20	18.57	9.59	0.02	10.00	38.18	53.53	-15.35	Average
5	0.41	28.34	9.61	0.04	10.00	47.99	57.64	-9.65	QP
6	0.41	11.75	9.61	0.04	10.00	31.40	47.64	-16.24	Average
7	2.17	27.30	9.63	0.05	10.00	46.98	56.00	-9.02	QP
8	2.17	15.50	9.63	0.05	10.00	35.18	46.00	-10.82	Average
9	5.74	26.48	9.67	0.06	10.00	46.21	60.00	-13.79	QP
10	5.74	14.63	9.67	0.06	10.00	34.36	50.00	-15.64	Average
11	24.27	15.34	9.83	0.13	10.00	35.30	60.00	-24.70	QP
12	24.27	-0.98	9.83	0.13	10.00	18.98	50.00	-31.02	Average

Remarks: 1. Measured = Reading + LISNFac + Cable Loss + Aux2 Fac.
2. The emission levels that are 20dB below the official limit are not reported.

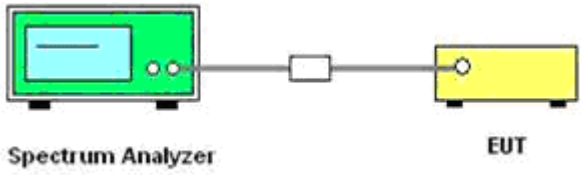
****Note: Pre-scan all modes and recorded the worst case results in this report (IEEE 802.11b)*

5.8. Restrict-band band-edge measurements for radiated emissions

5.8.1 Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

5.8.2. Test Setup Layout



5.8.3. Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of Spectrum Analyzer.

5.8.4. Test Procedures

According to KDB 558074 D01 for Antenna-port conducted measurement. Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious emissions is required.

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to an EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz for peak detector and RBW=1MHz, VBW=1/B for AV detector.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.
6. Measure the conducted output power (in dBm) using the detector specified by the appropriate regulatory agency (see 12.2.2, 12.2.3, and 12.2.4 for guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).
7. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)
8. Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
9. For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).
10. Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

$$E = EIRP - 20\log D + 104.77 = EIRP + 95.23$$

Where:
E = electric field strength in dBμV/m,
EIRP = equivalent isotropic radiated power in dBm
D = specified measurement distance in meters.

11. Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.
12. Per KDB662911 D01 section b) In cases where a combination of conducted measurements and cabinet radiated measurements are permitted to demonstrate compliance with absolute radiated out-of-band and spurious limits (e.g., KDB Publications 558074 for DTS and 789033 for U-NII), the conducted measurements must be combined with directional gain to compute the radiated levels of the out-of-band and spurious emissions as described in this section.
13. Compare the resultant electric field strength level to the applicable regulatory limit.
14. Perform radiated spurious emission test duress until all measured frequencies were complete.

5.8.5 Test Results

IEEE 802.11b												
Frequency (MHz)	Conducted Power (dBm)			Antenna Gain (dBi)		Directional Gain (dBi)	Ground Reflection Factor (dB)	Covert Radiated E Level At 3m (dBuV/m)			Limit (dBuV/m)	Verdict
	Antenna 1	Antenna 2	Sum	Antenna 1	Antenna 2			Antenna 1	Antenna 2	Sum		
2310.000	-49.951	-51.160	-/-	-1.00	-1.00	-/-	0.00	47.249	46.040	-/-	74.00	PASS
2310.000	-61.201	-61.132	-/-	-1.00	-1.00	-/-	0.00	35.999	36.068	-/-	54.00	PASS
2390.000	-49.229	-48.538	-/-	-1.00	-1.00	-/-	0.00	47.971	48.662	-/-	74.00	PASS
2390.000	-59.394	-59.340	-/-	-1.00	-1.00	-/-	0.00	37.806	37.860	-/-	54.00	PASS
2483.500	-49.226	-49.657	-/-	-1.00	-1.00	-/-	0.00	47.974	47.543	-/-	74.00	PASS
2483.500	-60.289	-59.409	-/-	-1.00	-1.00	-/-	0.00	36.911	37.791	-/-	54.00	PASS
2500.000	-50.201	-50.047	-/-	-1.00	-1.00	-/-	0.00	46.999	47.153	-/-	74.00	PASS
2500.000	-60.466	-59.985	-/-	-1.00	-1.00	-/-	0.00	36.734	37.215	-/-	54.00	PASS

IEEE 802.11g												
Frequency (MHz)	Conducted Power (dBm)			Antenna Gain (dBi)		Directional Gain (dBi)	Ground Reflection Factor (dB)	Covert Radiated E Level At 3m (dBuV/m)			Limit (dBuV/m)	Verdict
	Antenna 1	Antenna 2	Sum	Antenna 1	Antenna 2			Antenna 1	Antenna 2	Sum		
2310.000	-50.478	-51.043	-/-	-1.00	-1.00	-/-	0.00	46.722	46.157	-/-	74.00	PASS
2310.000	-61.088	-61.047	-/-	-1.00	-1.00	-/-	0.00	36.112	36.153	-/-	54.00	PASS
2390.000	-46.639	-44.131	-/-	-1.00	-1.00	-/-	0.00	50.561	53.069	-/-	74.00	PASS
2390.000	-57.794	-56.353	-/-	-1.00	-1.00	-/-	0.00	39.406	40.847	-/-	54.00	PASS
2483.500	-46.838	-45.818	-/-	-1.00	-1.00	-/-	0.00	50.362	51.382	-/-	74.00	PASS
2483.500	-57.985	-56.951	-/-	-1.00	-1.00	-/-	0.00	39.215	40.249	-/-	54.00	PASS
2500.000	-48.281	-46.976	-/-	-1.00	-1.00	-/-	0.00	48.919	50.224	-/-	74.00	PASS
2500.000	-59.142	-58.734	-/-	-1.00	-1.00	-/-	0.00	38.058	38.466	-/-	54.00	PASS

IEEE 802.11n HT20												
Frequency (MHz)	Conducted Power (dBm)			Antenna Gain (dBi)		Directional Gain (dBi)	Ground Reflection Factor (dB)	Covert Radiated E Level At 3m (dBuV/m)			Limit (dBuV/m)	Verdict
	Antenna 1	Antenna 2	Sum	Antenna 1	Antenna 2			Antenna 1	Antenna 2	Sum		
2310.000	-50.713	-49.638	-47.132	-1.00	-1.00	2.01	0.00	46.487	47.562	50.078	74.00	PASS
2310.000	-61.102	-61.036	-58.059	-1.00	-1.00	2.01	0.00	36.098	36.164	39.151	54.00	PASS
2390.000	-46.757	-42.884	-41.392	-1.00	-1.00	2.01	0.00	50.443	54.316	55.818	74.00	PASS
2390.000	-57.509	-56.743	-54.099	-1.00	-1.00	2.01	0.00	39.691	40.457	43.111	54.00	PASS
2483.500	-46.600	-43.013	-41.436	-1.00	-1.00	2.01	0.00	50.600	54.187	55.774	74.00	PASS
2483.500	-57.675	-57.390	-54.520	-1.00	-1.00	2.01	0.00	39.525	39.810	42.690	54.00	PASS
2500.000	-48.062	-47.342	-44.677	-1.00	-1.00	2.01	0.00	49.138	49.858	52.533	74.00	PASS
2500.000	-59.051	-58.774	-55.900	-1.00	-1.00	2.01	0.00	38.149	38.426	41.310	54.00	PASS

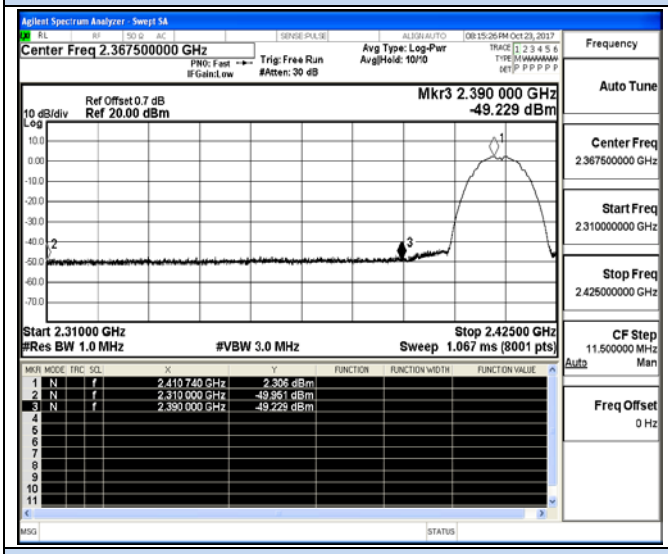
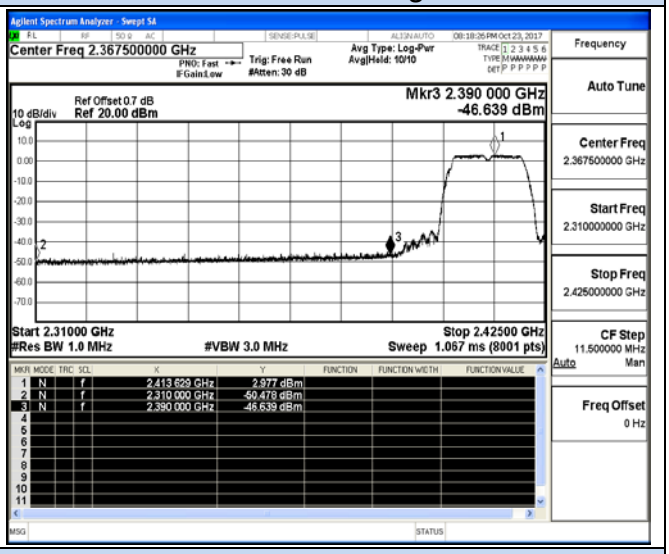
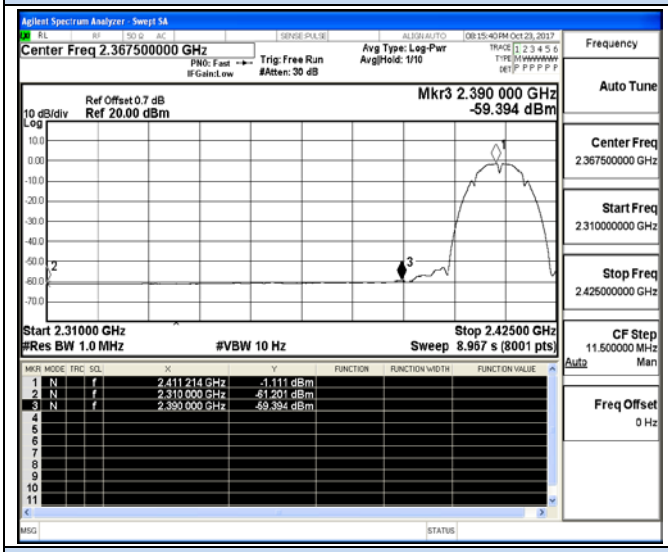
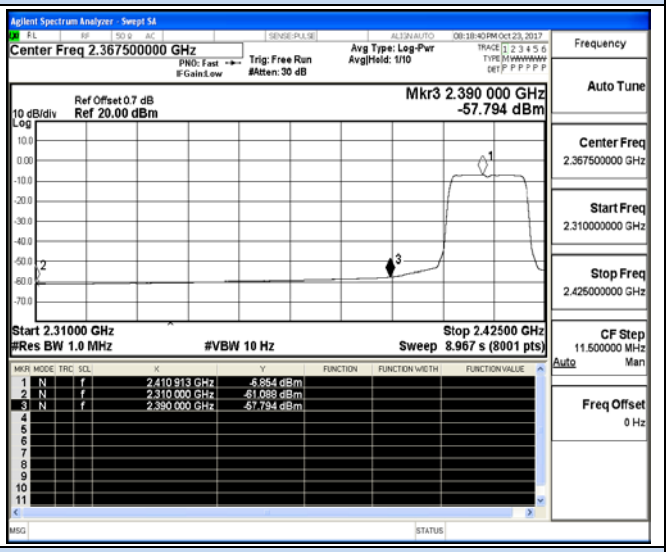
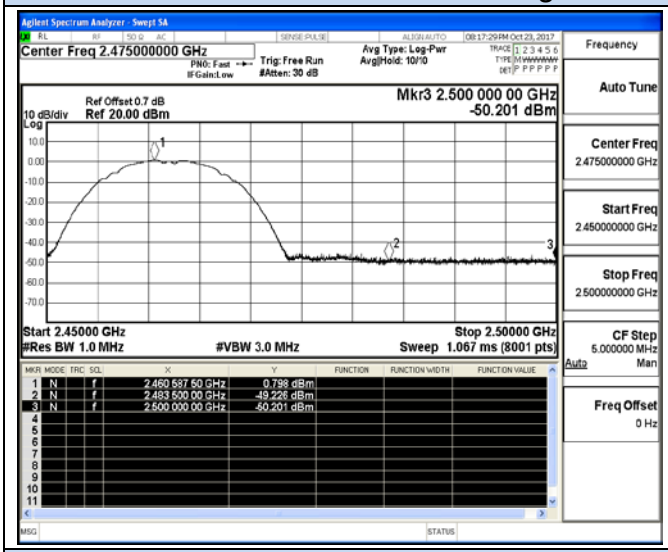
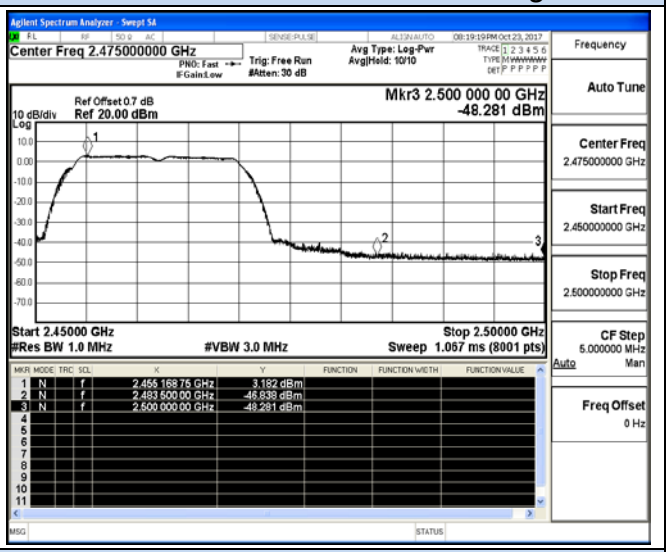
IEEE 802.11n HT40												
Frequency (MHz)	Conducted Power (dBm)			Antenna Gain (dBi)		Directional Gain (dBi)	Ground Reflection Factor (dB)	Covert Radiated E Level At 3m (dBuV/m)			Limit (dBuV/m)	Verdict
	Antenna 1	Antenna 2	Sum	Antenna 1	Antenna 2			Antenna 1	Antenna 2	Sum		
2310.000	-49.681	-51.429	-47.457	-1.00	-1.00	2.01	0.00	47.519	45.771	49.753	74.00	PASS
2310.000	-61.160	-61.110	-58.125	-1.00	-1.00	2.01	0.00	36.040	36.090	39.085	54.00	PASS
2390.000	-45.758	-36.878	-36.349	-1.00	-1.00	2.01	0.00	51.442	60.322	60.861	74.00	PASS
2390.000	-57.030	-48.911	-48.288	-1.00	-1.00	2.01	0.00	40.170	48.289	48.922	54.00	PASS
2483.500	-47.230	-37.417	-36.986	-1.00	-1.00	2.01	0.00	49.970	59.783	60.224	74.00	PASS
2483.500	-58.121	-50.110	-49.473	-1.00	-1.00	2.01	0.00	39.079	47.090	47.737	54.00	PASS
2500.000	-47.461	-45.996	-43.657	-1.00	-1.00	2.01	0.00	49.739	51.204	53.553	74.00	PASS
2500.000	-59.261	-56.648	-54.751	-1.00	-1.00	2.01	0.00	37.939	40.552	42.459	54.00	PASS

BT – LE							
Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Ground Reflection Factor (dB)	Covert Radiated E Level At 3m (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
2310.000	-51.098	-1.000	0.000	46.102	Peak	74.00	PASS
2390.000	-51.709	-1.000	0.000	45.491	Peak	74.00	PASS
2483.500	-48.088	-1.000	0.000	49.112	Peak	74.00	PASS
2500.000	-51.373	-1.000	0.000	45.827	Peak	74.00	PASS

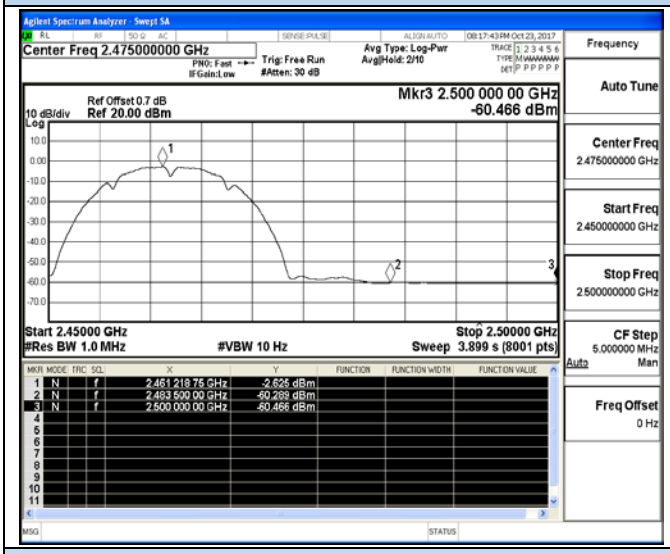
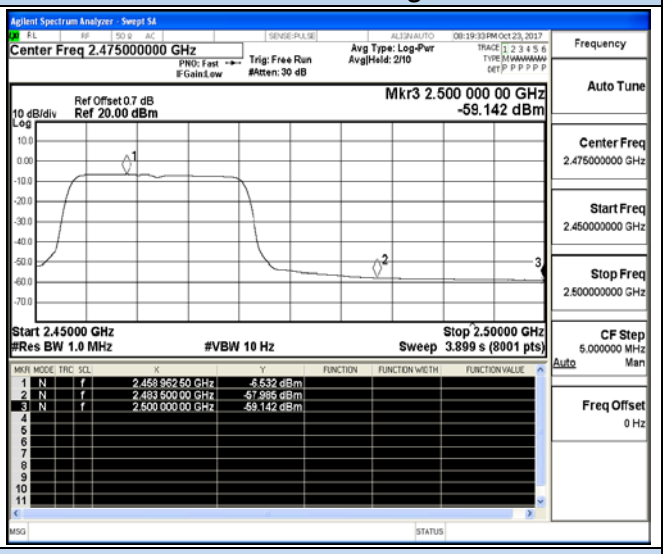
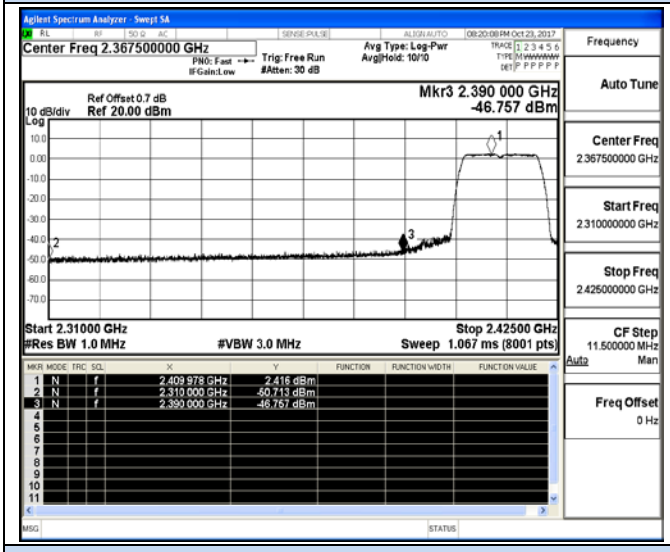
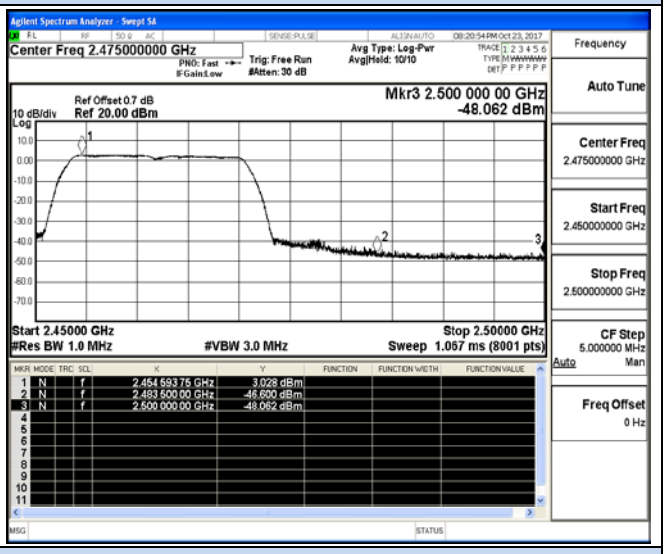
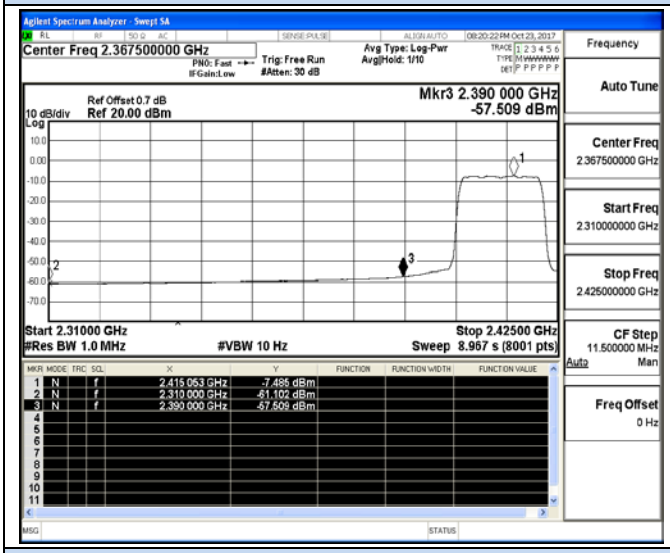
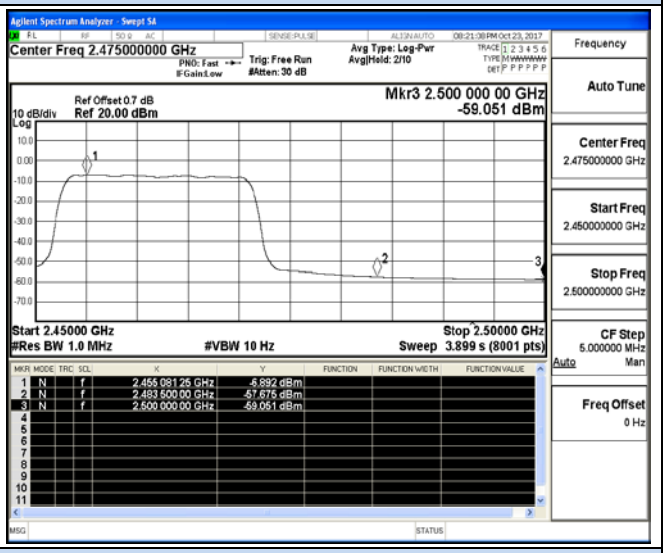
Remark:

1. *Measured Band-edge measurement for radiated at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20; 13.5Mbps at IEEE 802.11n HT40;*
4. *"---"means that the fundamental frequency not for 15.209 limits requirement.*
5. *No need measure Average values if Peak values meets Average limits;*
6. *Please refer to following plots;*

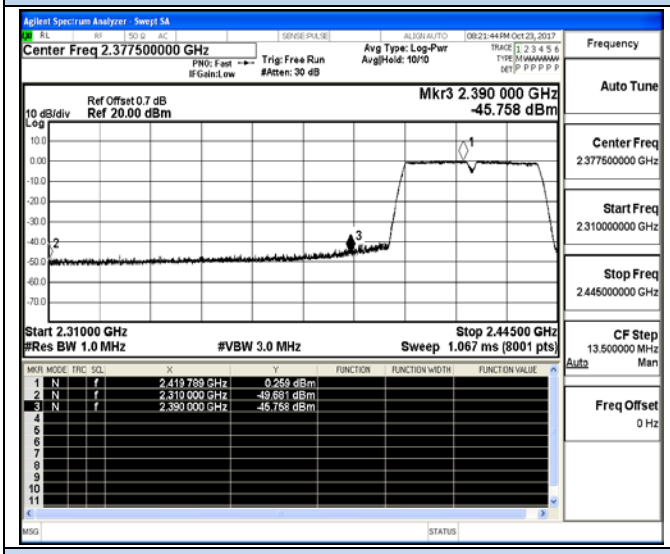
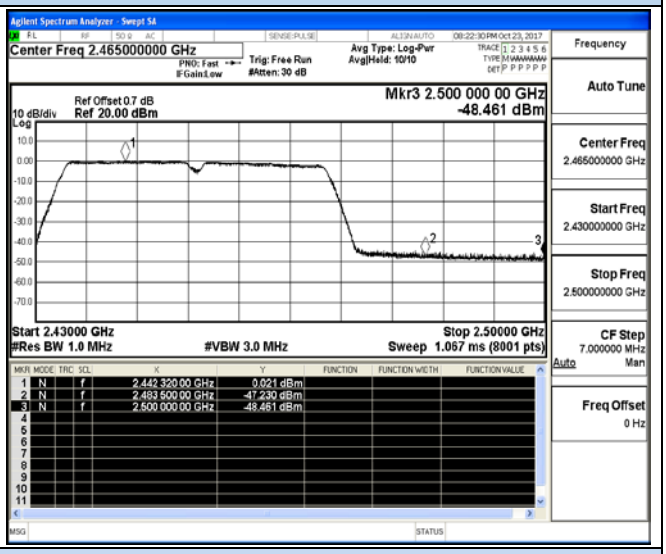
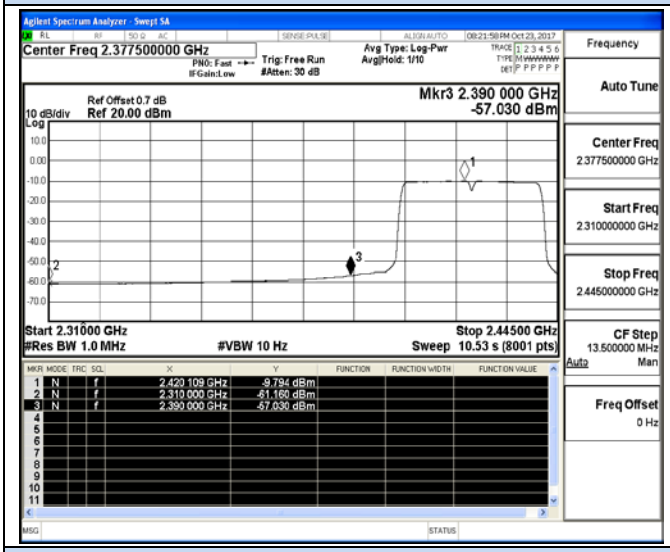
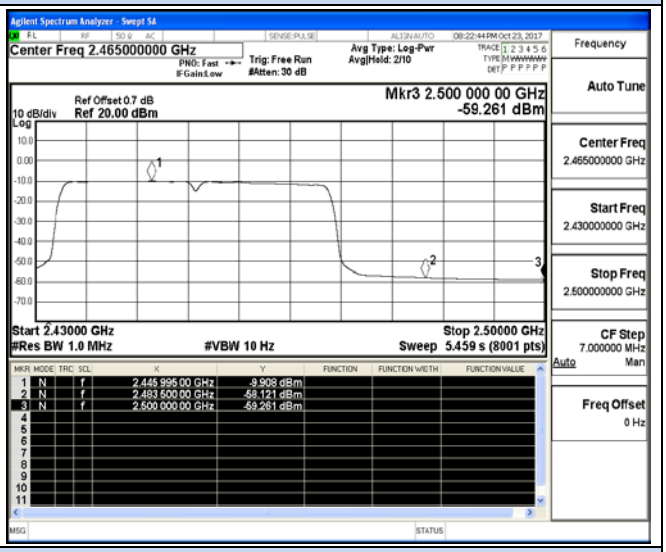
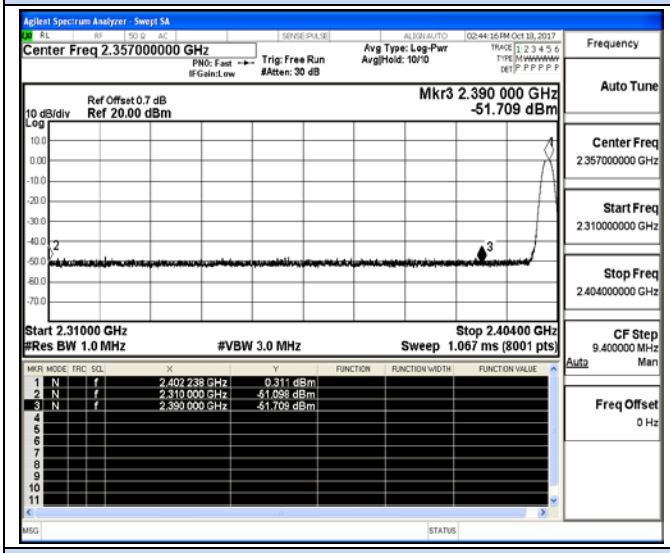
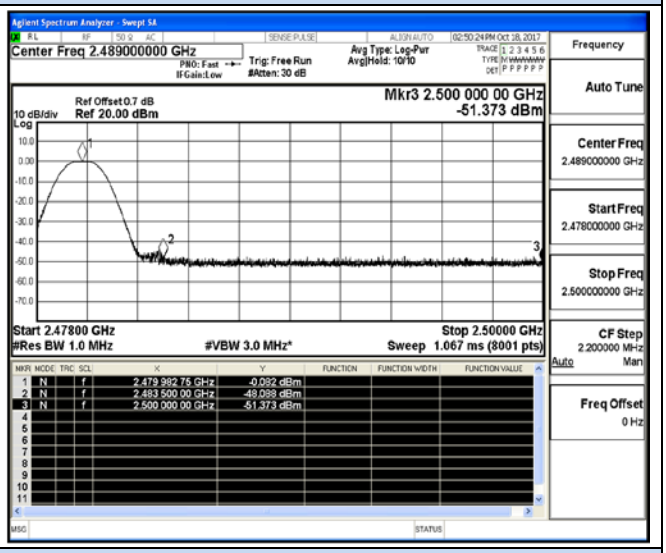
Restrict-band band-edge measurements for conducted emissions

Antenna 0	Antenna 0
IEEE 802.11b	IEEE 802.11g
	
Channel 1 / 2412 MHz – Peak	Channel 1 / 2412 MHz – Peak
	
Channel 1 / 2412 MHz – Average	Channel 1 / 2412 MHz – Average
	
Channel 11 / 2462 MHz – Peak	Channel 11 / 2412 MHz – Peak

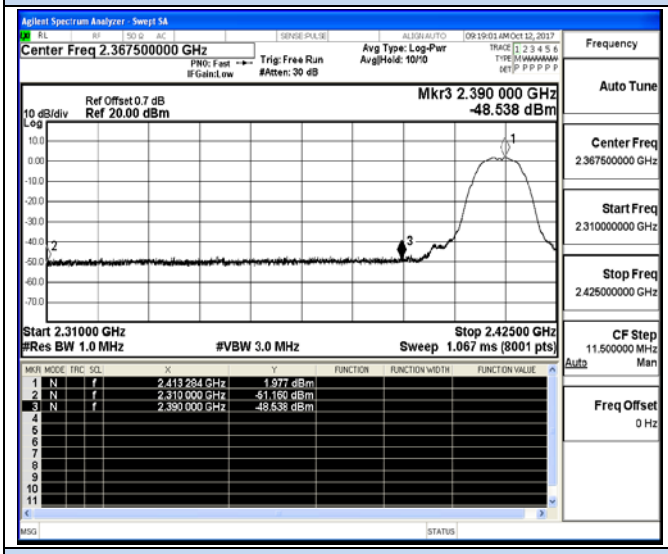
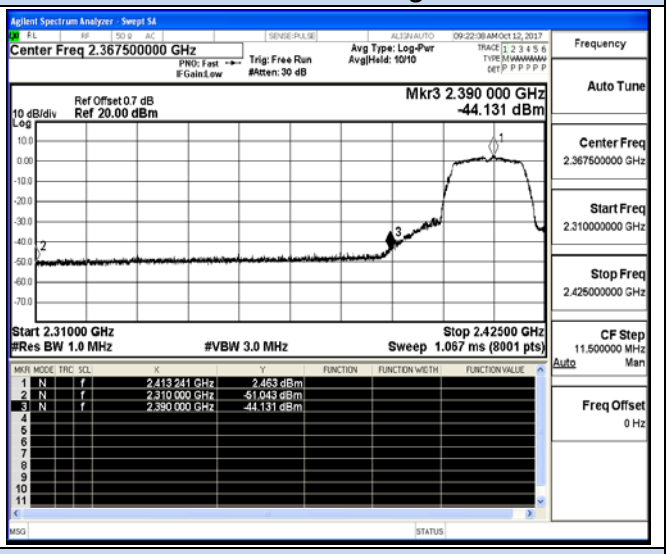
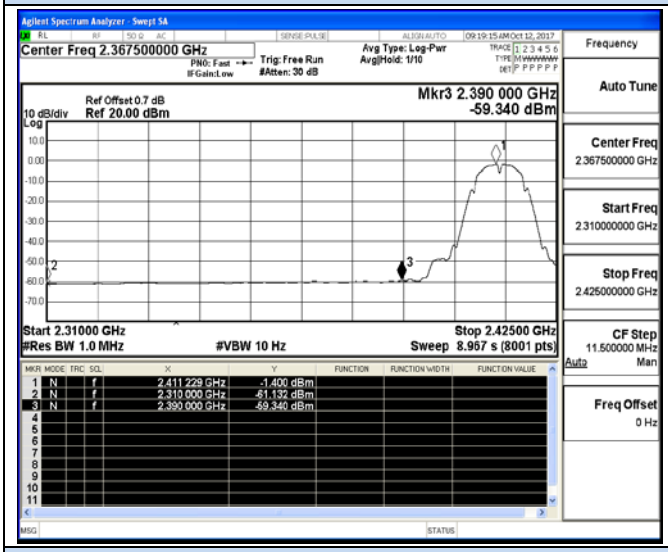
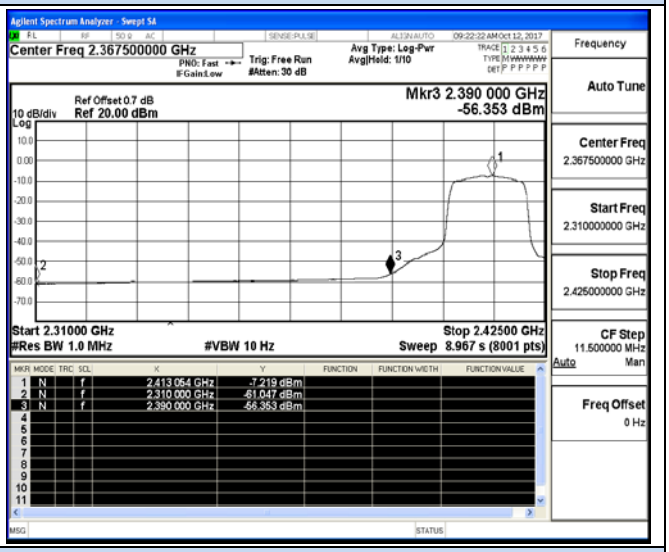
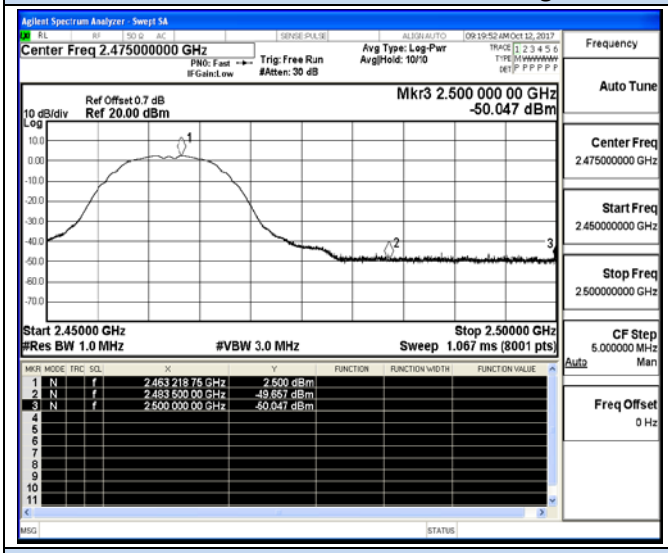
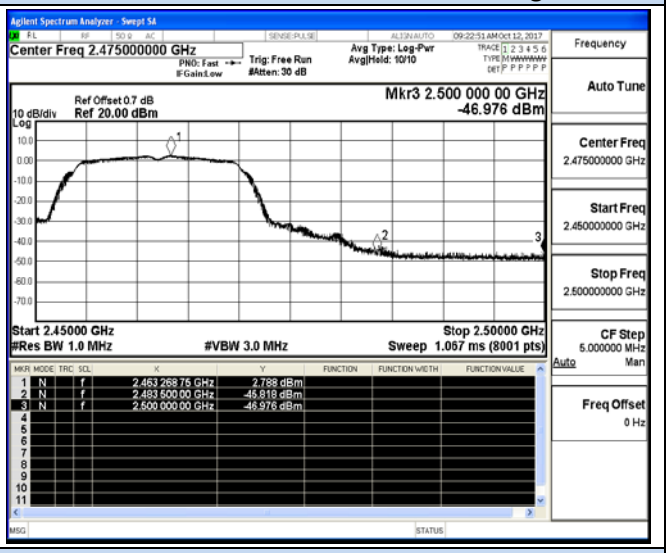
Restrict-band band-edge measurements for conducted emissions

Antenna 0	Antenna 0
IEEE 802.11b	IEEE 802.11g
	
Channel 11 / 2462 MHz – Average	Channel 11 / 2412 MHz – Average
IEEE 802.11n HT20	IEEE 802.11n HT20
	
Channel 1 / 2412 MHz – Peak	Channel 11 / 2462 MHz – Peak
	
Channel 1 / 2412 MHz – Average	Channel 11 / 2462 MHz – Average

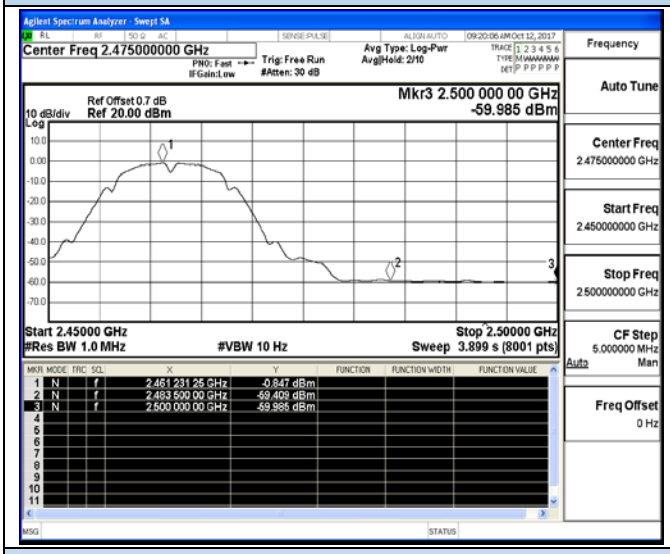
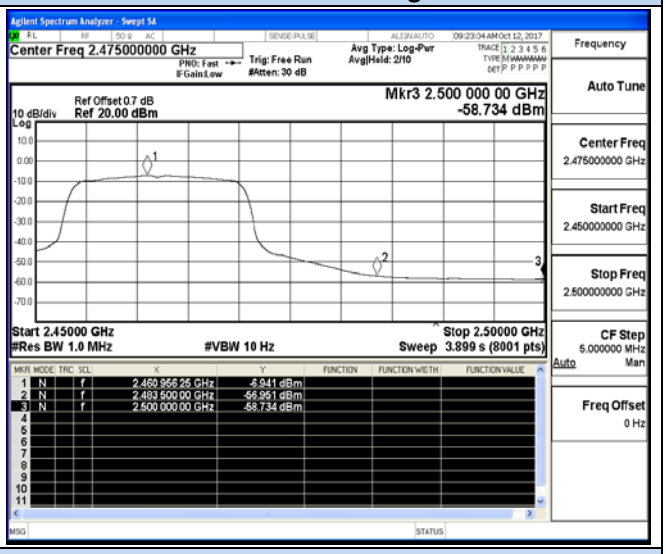
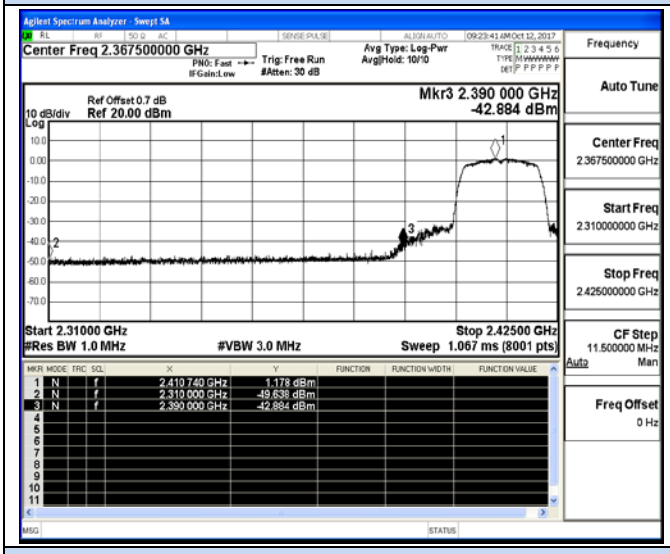
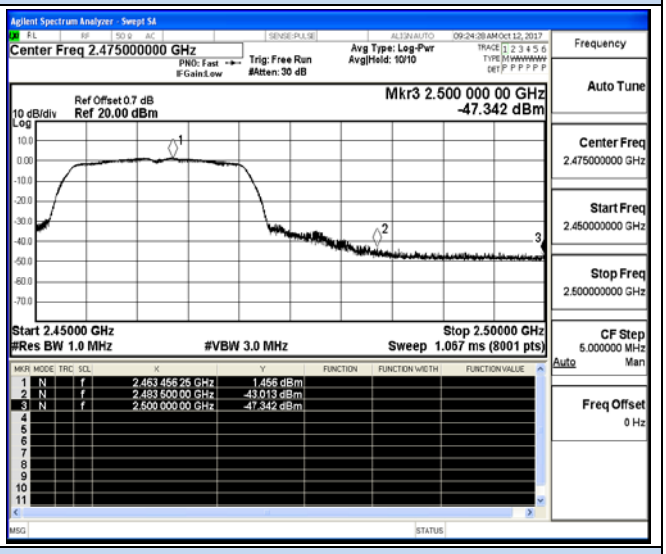
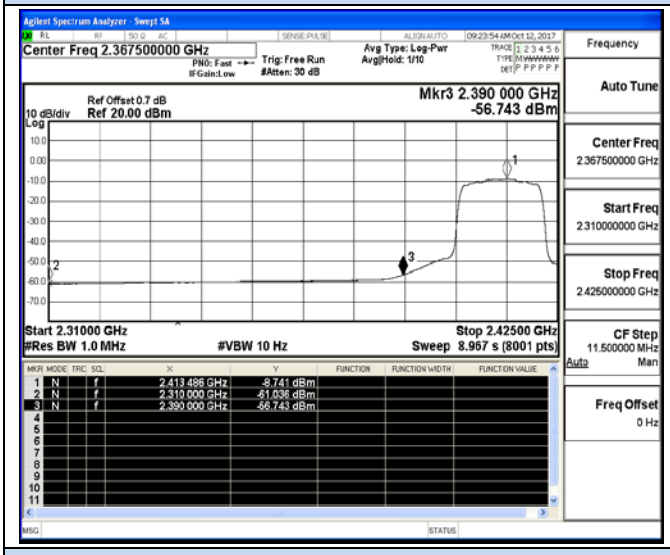
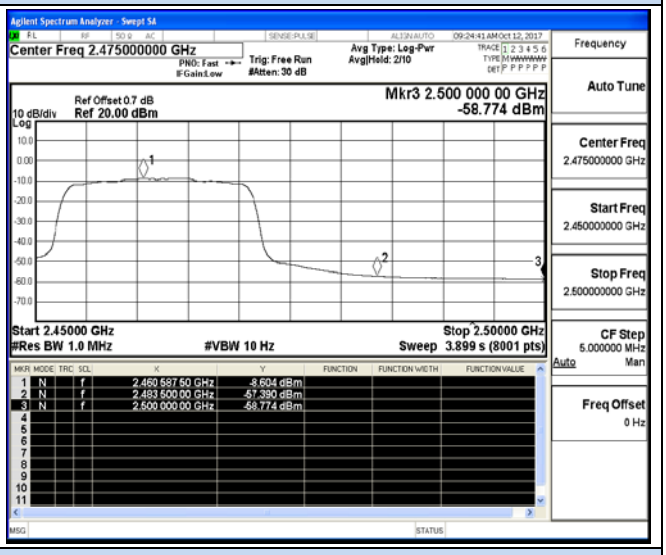
Restrict-band band-edge measurements for conducted emissions

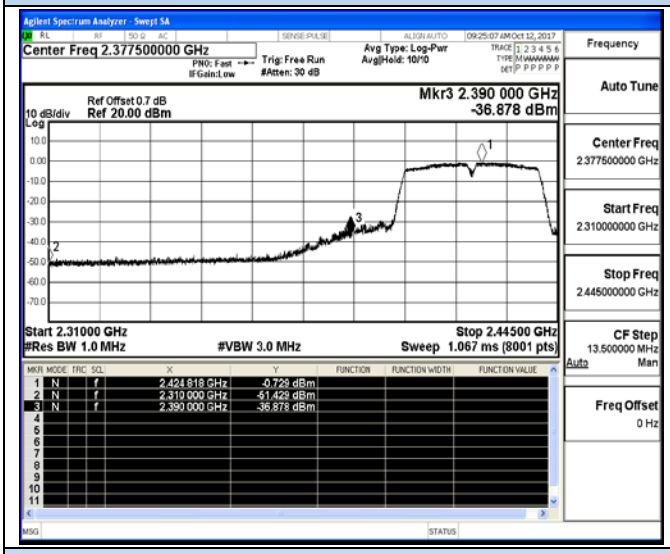
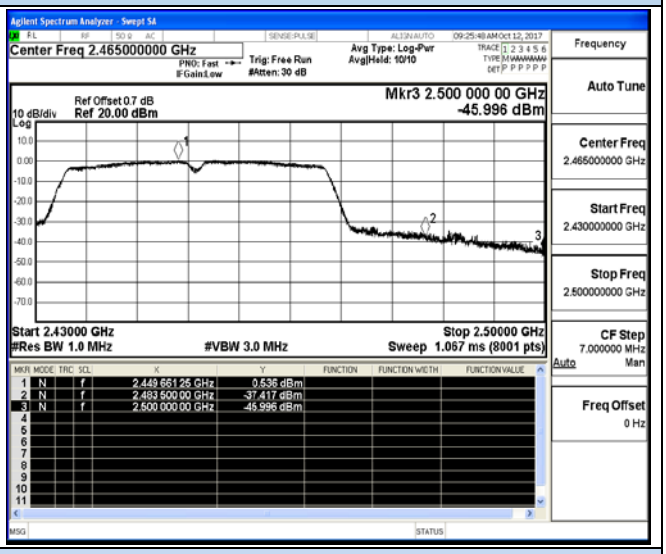
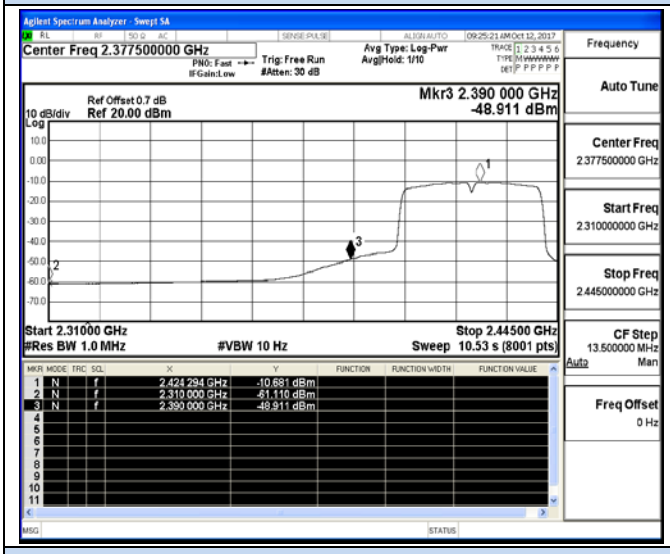
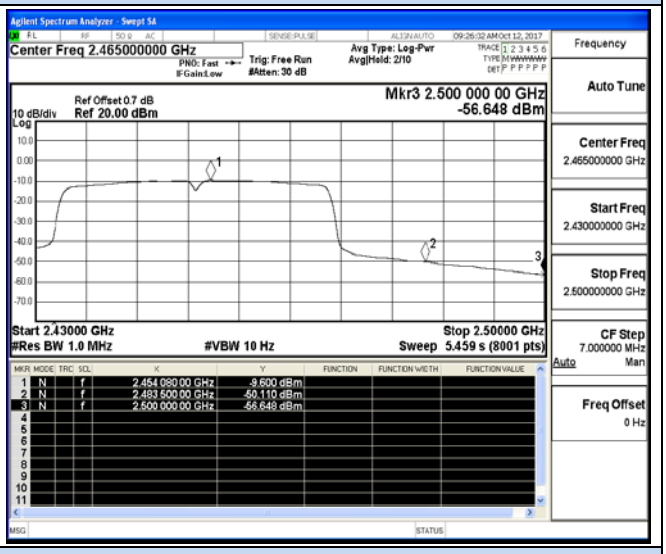
Antenna 0	Antenna 0
IEEE 802.11n HT40	IEEE 802.11n HT40
	
Channel 3 / 2422 MHz – Peak	Channel 9 / 2452 MHz – Peak
	
Channel 3 / 2422 MHz – Average	Channel 9 / 2452 MHz – Average
BT – LE	BT – LE
	
Channel 0 / 2402 MHz – Peak	Channel 39 / 2480 MHz – Peak

Restrict-band band-edge measurements for conducted emissions

Antenna 1	Antenna 1
IEEE 802.11b	IEEE 802.11g
	
Channel 1 / 2412 MHz – Peak	Channel 1 / 2412 MHz – Peak
	
Channel 1 / 2412 MHz – Average	Channel 1 / 2412 MHz – Average
	
Channel 11 / 2462 MHz – Peak	Channel 11 / 2412 MHz – Peak

Restrict-band band-edge measurements for conducted emissions

Antenna 1	Antenna 1
IEEE 802.11b	IEEE 802.11g
	
Channel 11 / 2462 MHz – Average	Channel 11 / 2412 MHz – Average
IEEE 802.11n HT20	IEEE 802.11n HT20
	
Channel 1 / 2412 MHz – Peak	Channel 11 / 2462 MHz – Peak
	
Channel 1 / 2412 MHz – Average	Channel 11 / 2462 MHz – Average

Restrict-band band-edge measurements for conducted emissions	
Antenna 1	Antenna 1
IEEE 802.11n HT40	IEEE 802.11n HT40
	
Channel 3 / 2422 MHz – Peak	Channel 9 / 2452 MHz – Peak
	
Channel 3 / 2422 MHz – Average	Channel 9 / 2452 MHz – Average

5.9. Antenna Requirements

5.9.1 Standard Applicable

According to antenna requirement of §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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

And according to §15.247(4) (1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

5.9.2 Antenna Connected Construction

5.9.2.1. Standard Applicable

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.

5.9.2.2. Antenna Connector Construction

The directional gains of antenna used for transmitting is -1.0dBi, and the antennas are two PIFA antennas connect to PCB board and no consideration of replacement. Please see EUT photo for details.
The sample support 2 antennas, antenna 0 can transmit both WLAN and Bluetooth while antenna 1 can only transmit WLAN.

5.9.2.3. Results: Compliance.

Measurement

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.
Conducted power refers ANSI C63.10:2013 Output power test procedure for DTS devices.
Radiated power refers to ANSI C63.10:2013 Radiated emissions tests.

Measurement parameters

Measurement parameter	
Detector:	Peak
Sweep Time:	Auto
Resolution bandwidth:	1MHz
Video bandwidth:	3MHz
Trace-Mode:	Max hold

Limits

FCC	ISED
Antenna Gain	
6 dBi	

Note: The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For normal WLAN devices, the IEEE 802.11b mode is used.

Antenna 0

T_{nom}	V_{nom}	Lowest Channel 2412 MHz	Middle Channel 2437 MHz	Highest Channel 2462 MHz
Conducted power [dBm] Measured with DSSS modulation		2.309	1.858	1.027
Radiated power [dBm] Measured with DSSS modulation		1.665	1.687	0.535
Gain [dBi] Calculated		-0.644	-0.171	-0.492
Measurement uncertainty			± 1.6 dB (cond.) / ± 3.8 dB (rad.)	

T_{nom}	V_{nom}	Lowest Channel 2402 MHz	Middle Channel 2440 MHz	Highest Channel 2480 MHz
Conducted power [dBm] Measured with GFSK modulation		0.316	0.584	-0.012
Radiated power [dBm] Measured with GFSK modulation		-0.567	0.451	-0.837
Gain [dBi] Calculated		-0.883	-0.133	-0.825
Measurement uncertainty			± 1.6 dB (cond.) / ± 3.8 dB (rad.)	

Antenna 1

T_{nom}	V_{nom}	Lowest Channel 2412 MHz	Middle Channel 2437 MHz	Highest Channel 2462 MHz
Conducted power [dBm] Measured with DSSS modulation		2.014	2.056	2.550
Radiated power [dBm] Measured with DSSS modulation		1.417	1.912	1.989
Gain [dBi] Calculated		-0.597	-0.144	-0.561
Measurement uncertainty			± 1.6 dB (cond.) / ± 3.8 dB (rad.)	

6. LIST OF MEASURING EQUIPMENTS

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	Power Meter	R&S	NRVS	100444	2017-06-17	2018-06-16
2	Power Sensor	R&S	NRV-Z81	100458	2017-06-17	2018-06-16
3	Power Sensor	R&S	NRV-Z32	10057	2017-06-17	2018-06-16
4	EPM Series Power Meter	Agilent	E4419B	MY45104493	2017-06-17	2018-06-16
5	E-SERIES AVG POWER SENSOR	Agilent	E9301H	MY41495234	2017-06-17	2018-06-16
6	ESA-E SERIES SPECTRUM ANALYZER	Agilent	E4407B	MY41440754	2016-11-18	2017-11-17
7	MXA Signal Analyzer	Agilent	N9020A	MY49100040	2017-06-17	2018-06-16
8	SPECTRUM ANALYZER	R&S	FSP	100503	2017-06-17	2018-06-16
9	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2017-06-17	2018-06-16
10	Positioning Controller	MF	MF-7082	/	2017-06-17	2018-06-16
11	EMI Test Software	AUDIX	E3	N/A	2017-06-17	2018-06-16
12	EMI Test Receiver	R&S	ESR 7	101181	2017-06-17	2018-06-16
13	AMPLIFIER	QuieTek	QTK-A2525G	CHM10809065	2016-11-18	2017-11-17
14	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2017-06-23	2018-06-22
15	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2017-05-02	2018-05-01
16	Horn Antenna	EMCO	3115	6741	2017-06-23	2018-06-22
17	RF Cable-R03m	Jye Bao	RG142	CB021	2017-06-17	2018-06-16
18	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2017-06-17	2018-06-16
19	TEST RECEIVER	R&S	ESCI	101142	2017-06-17	2018-06-16
20	RF Cable-CON	UTIFLEX	3102-26886-4	CB049	2017-06-17	2018-06-16
21	10dB Attenuator	SCHWARZBECK	MTS-IMP136	261115-001-0032	2017-06-17	2018-06-16
22	Artificial Mains	R&S	ENV216	101288	2017-06-17	2018-06-16
23	X-series USB Peak and Average Power Sensor Aglient	Agilent	U2021XA	MY54080022	2016-10-27	2017-10-26
24	4 CH. Simultaneous Sampling 14 Bits 2MS/s	Agilent	U2531A	MY54080016	2016-10-27	2017-10-26
25	Test Software	Ascentest	AT890-SW	20160630	N/A	N/A
26	RF Control Unit	Ascentest	AT890-RFB	N/A	2017-06-17	2018-06-16
27	Universal Radio Communication Tester	R&S	CMU 200	105788	2017-06-17	2018-06-16
28	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2017-06-17	2018-06-16
29	RF Control Unit	Tonscend	JS0806-1	N/A	2017-06-17	2018-06-16
30	DC Power Supply	Agilent	E3642A	N/A	2016-11-18	2017-11-17
31	LTE Test Software	Tonscend	JS1120-1	N/A	N/A	N/A

7. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separate file for test setup photographs.

8. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separate file for exterior photographs of EUT.

9. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separate file for interior photographs of EUT.

----------THE END OF REPORT----------