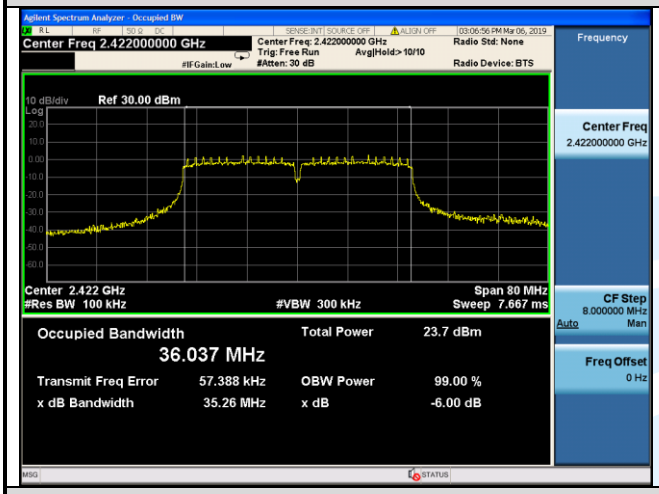
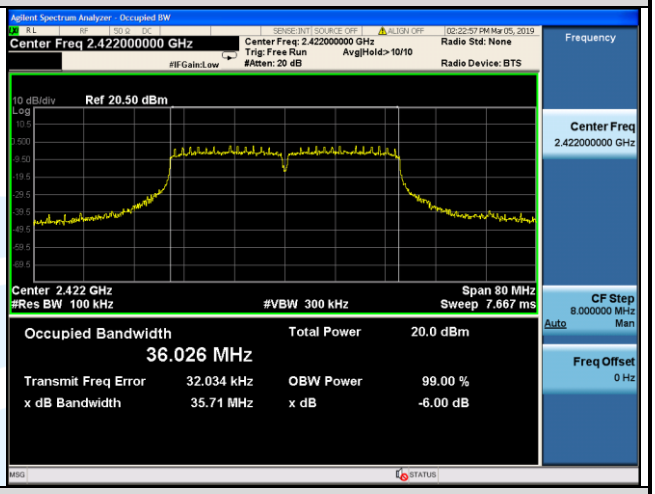
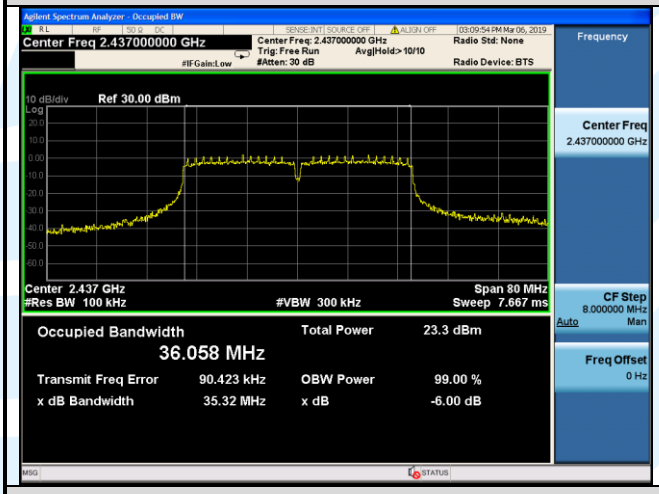
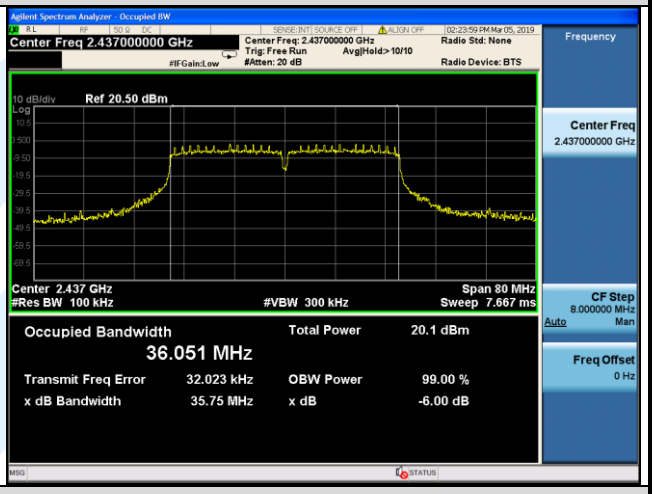
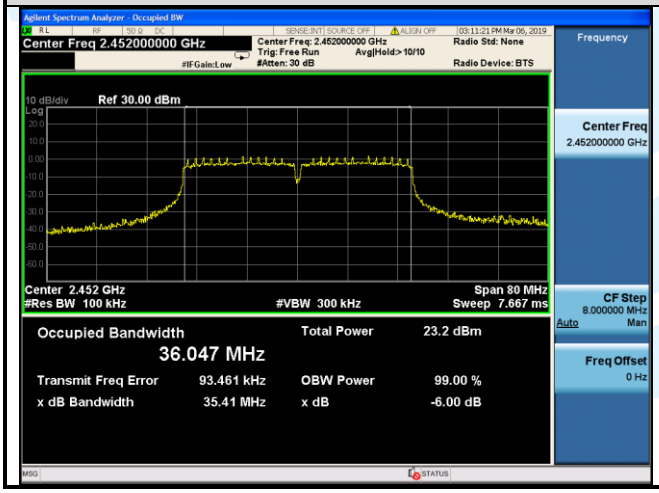
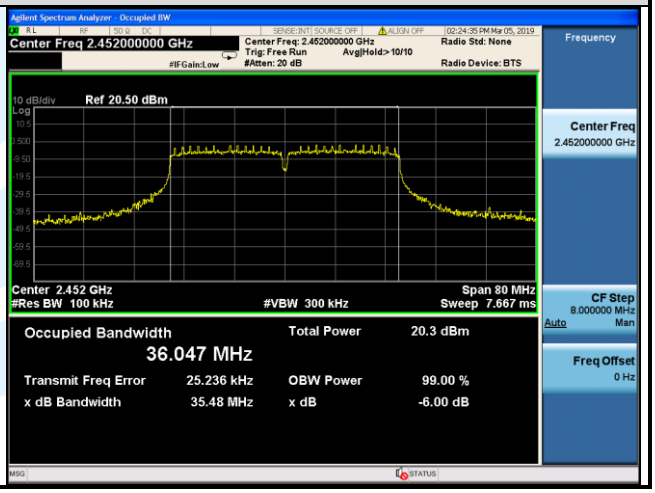
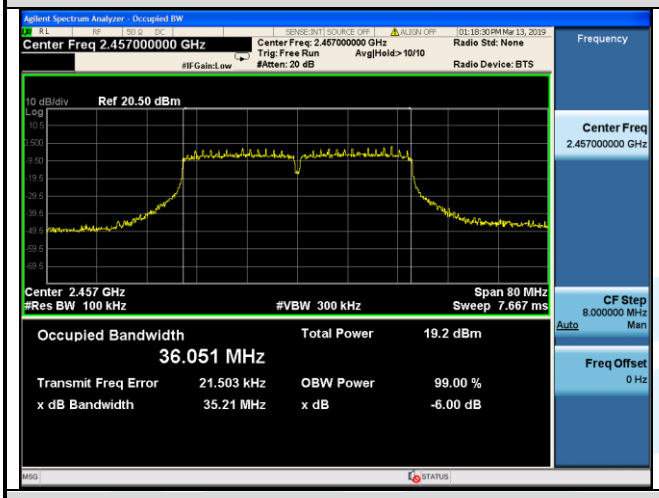
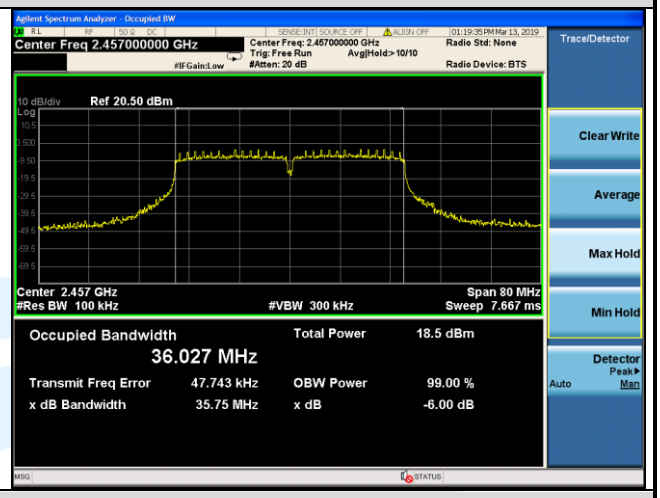
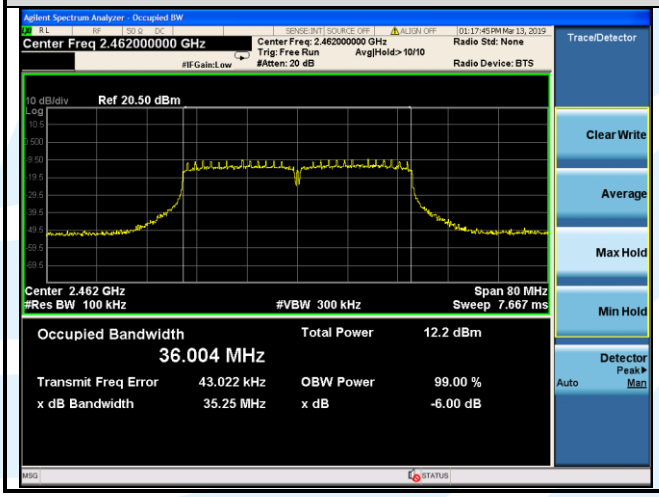
IEEE 802.11n-HT40	
MIMO_ Chain 0	MIMO_ Chain 1
Channel 3	
	
Channel 6	
	
Channel 9	
	

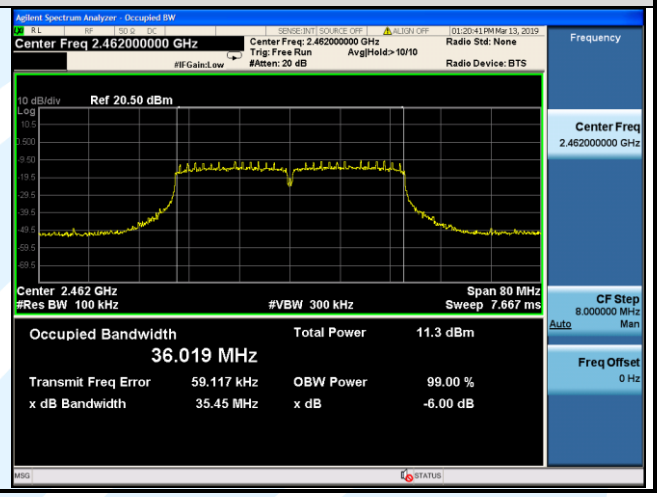
Channel 10





Channel 11





5.5 POWER SPECTRAL DENSITY

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.247 (e)
RSS-247 Issue 2, Section 5.2(b)

Test Method: ANSI C63.10-2013 Clause 11.10.2

Limit: For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

Test Procedure: Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
Use the following spectrum analyzer settings:

a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d) Set the VBW ≥ 3 x RBW.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Results:

Mode	Channel/ Frequency (MHz)	Power spectral density (dBm/3kHz)				
		SISO_ Chain 0	SISO_ Chain 1	Total PSD MIMO_ Chain 0+1	Limit @3kHz (dBm)	Pass / Fail
IEEE 802.11b	1(2412)	**-6.819**	-7.600	---	8	Pass
	6(2437)	-8.106	-8.863	---	8	Pass
	11(2462)	-7.809	-7.115	---	8	Pass
	12(2467)	-6.256	-8.447	---	8	Pass
	13(2472)	-10.350	-7.994	---	8	Pass
IEEE 802.11g	1(2412)	-10.968	-13.269	---	8	Pass
	6(2437)	**-9.568**	-13.130	---	8	Pass
	11(2462)	-11.130	-13.411	---	8	Pass
	12(2467)	-13.577	-11.407	---	8	Pass
	13(2472)	-16.022	-12.072	---	8	Pass
IEEE 802.11n-HT20	1(2412)	-10.521	-14.268	-8.99	8	Pass
	6(2437)	-11.825	-14.354	-9.90	8	Pass
	11(2462)	-10.987	-12.745	**-8.77**	8	Pass
	12(2467)	-12.027	-23.048	-11.70	8	Pass
	13(2472)	-16.836	-18.853	-14.72	8	Pass
IEEE 802.11n-HT40	3(2422)	-12.666	-16.310	-11.11	8	Pass
	6(2437)	-12.932	-16.465	-11.34	8	Pass
	9(2452)	-12.839	-15.563	**-10.98**	8	Pass
	10(2457)	-15.451	-17.707	-13.42	8	Pass
	11(2462)	-18.404	-24.659	-17.48	8	Pass

Remark:
1. Power with Duty Factor = Measured Power + Duty Cycle Factor

2. Total (Chain 0+1) = 10*log[(10$^{Chain\ 0/10}$)+(10$^{Chain\ 1/10}$)]
3. Directional gain and the maximum conducted power spectral density limit see table below:

Frequency Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated chains directional gain (dBi)	Peak Power Limit (dBm)
2400 MHz to 2483.5 MHz	2.02	2.29	5.17	8.00
Unequal antenna gains, with equal transmit powers. Directional gain is to be computed as follows:				
If transmit signals are correlated, then				
Directional gain = 10 log[(10^G1 /20 + 10^G2 /20 + … + 10^GN /20)^2 /NANT] dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]				

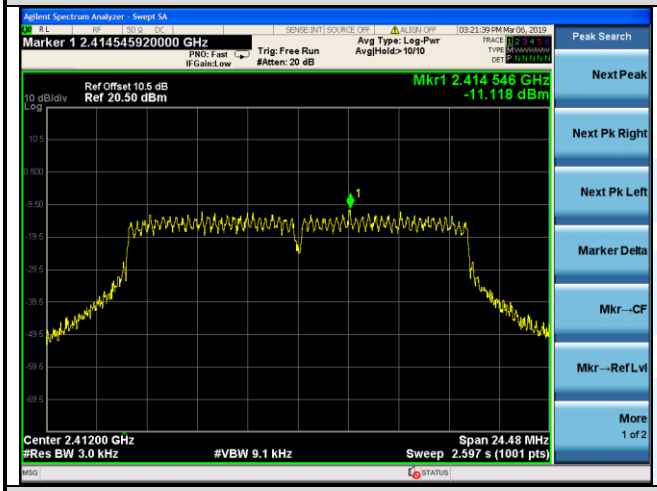
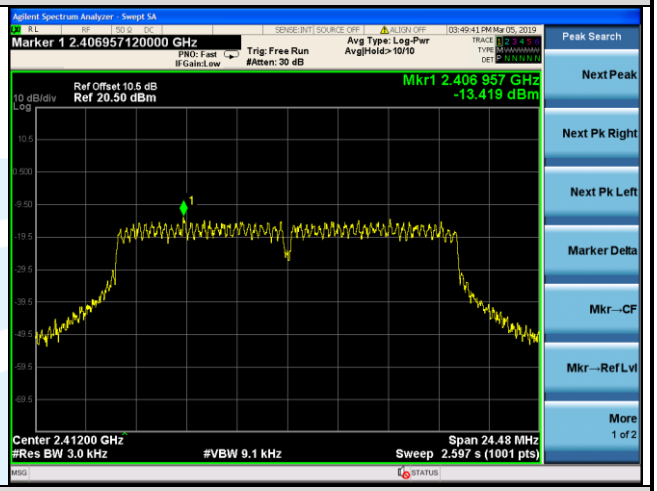
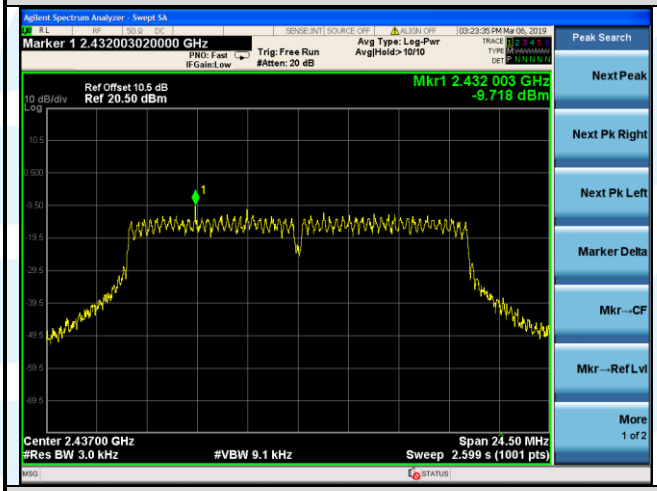
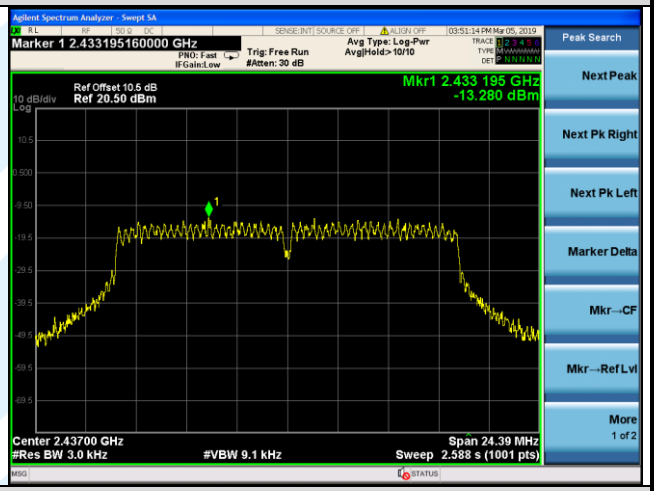
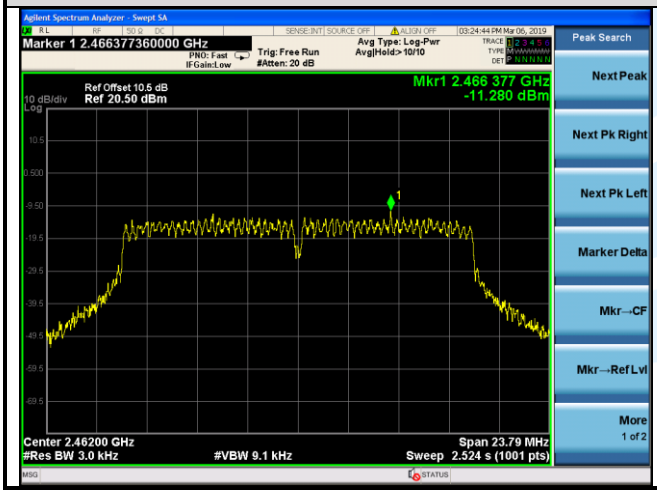
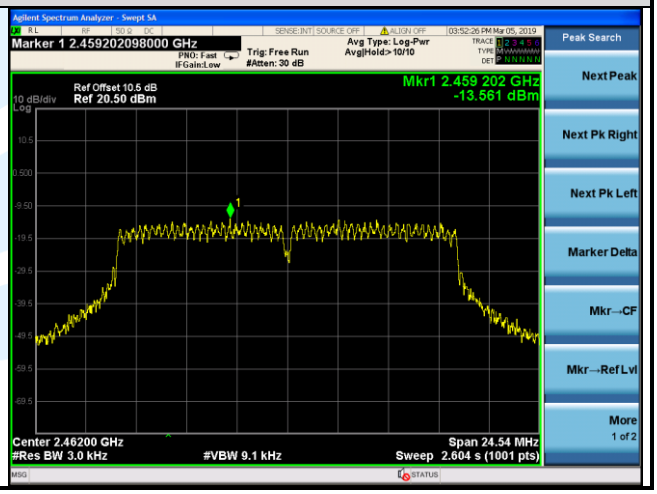
The test plots as follows:

IEEE 802.11b	
SISO_ Chain 0	SISO_ Chain 1
Channel 1	
	
Channel 6	
	

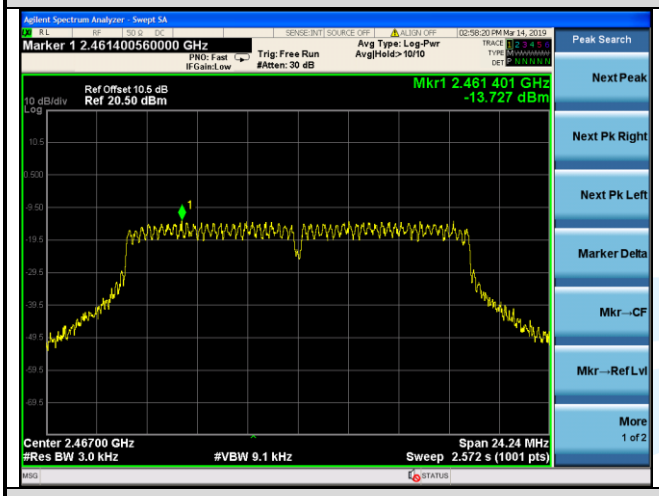
Channel 11

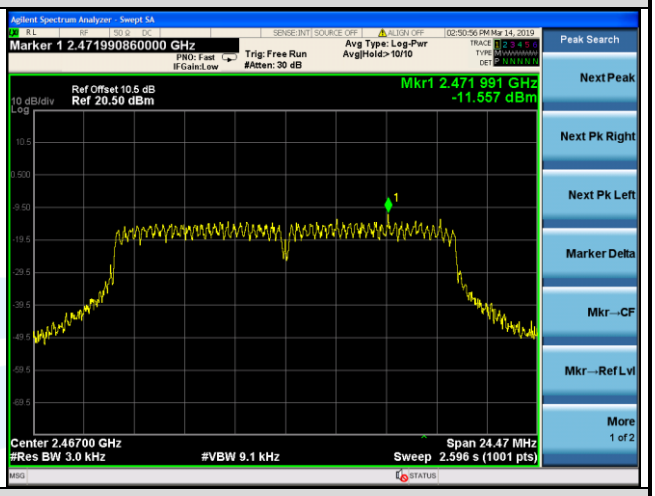
Channel 12

Channel 13

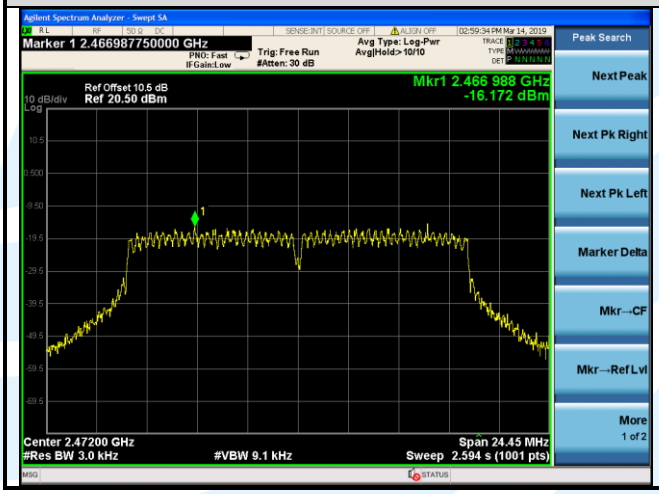
IEEE 802.11g	
SISO_ Chain 0	SISO_ Chain 1
Channel 1	
	
Channel 6	
	
Channel 11	
	

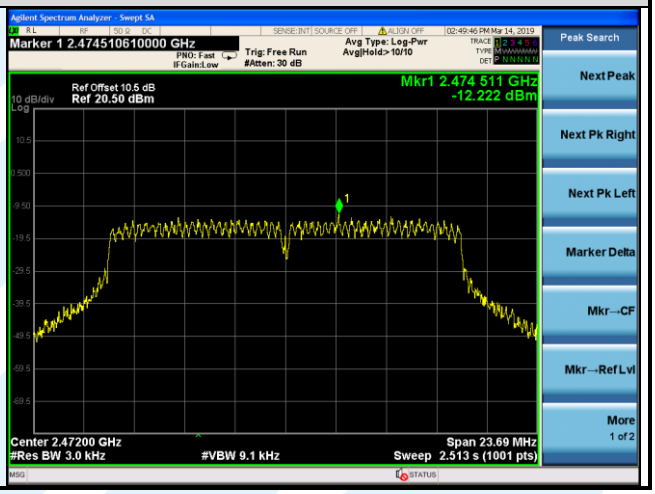
Channel 12

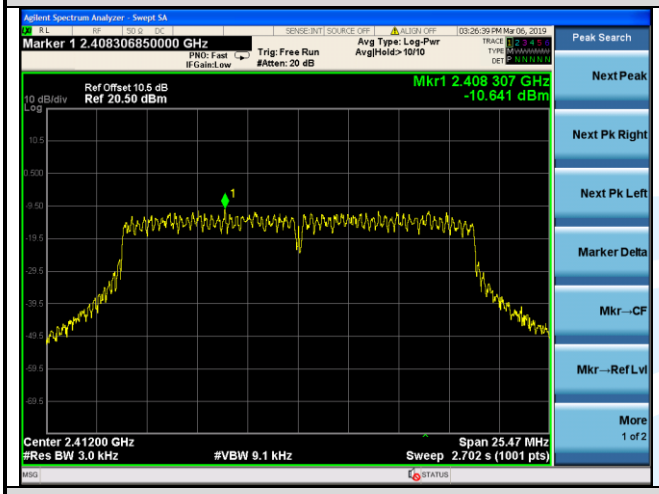
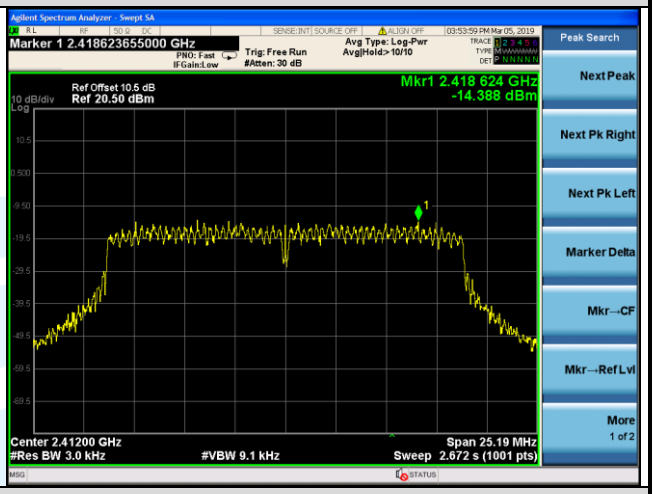
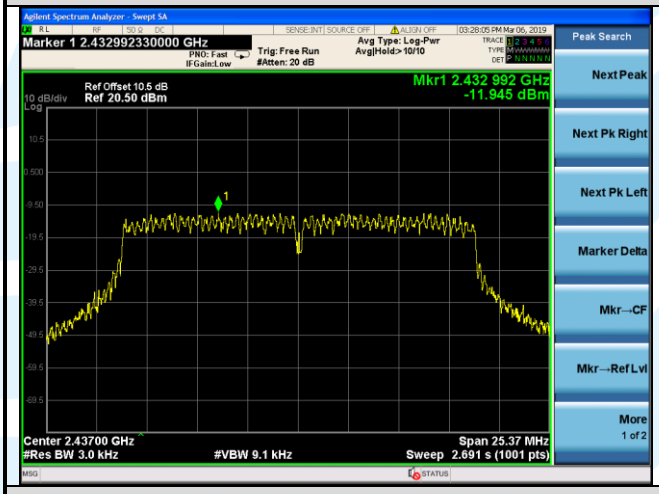
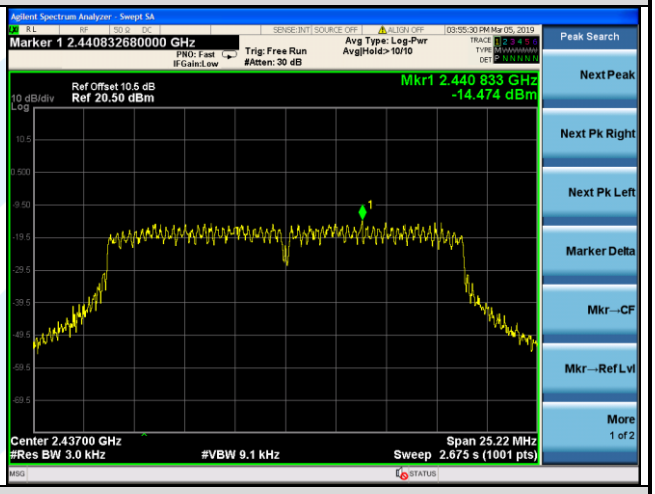
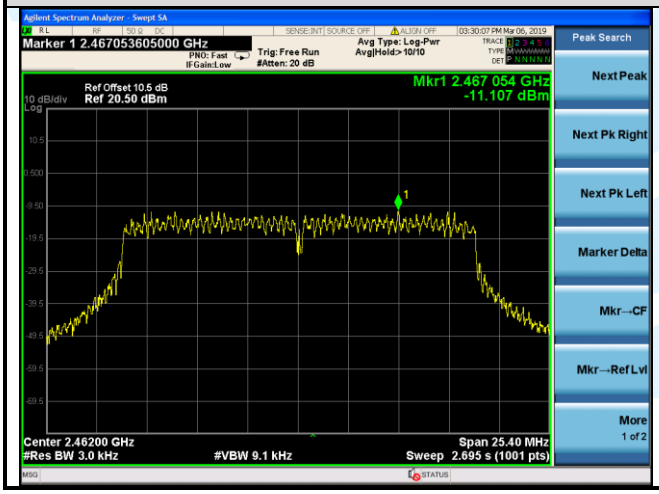
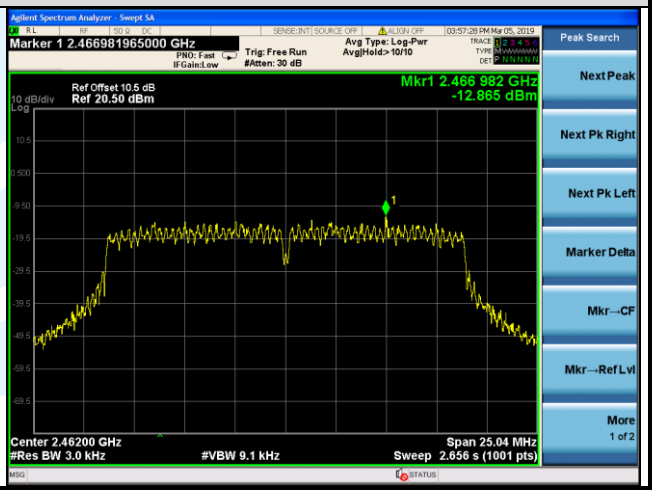




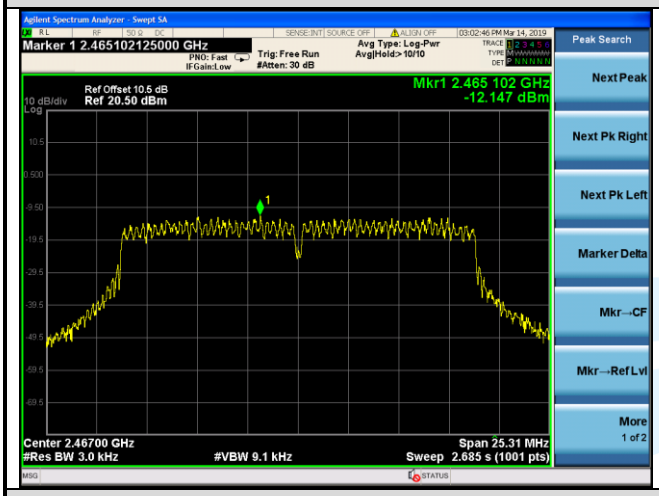
Channel 13

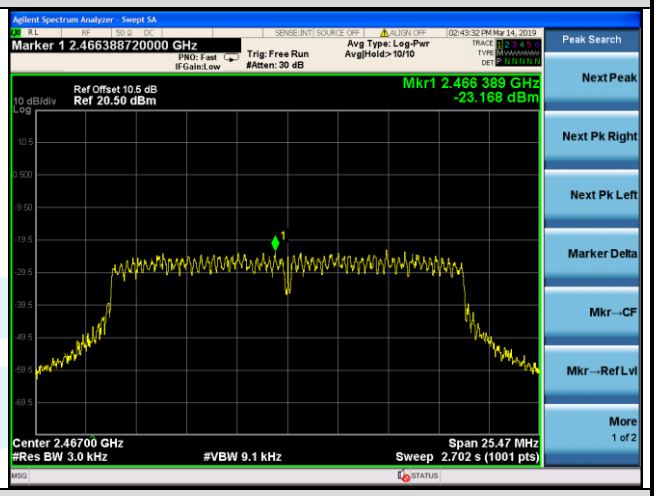




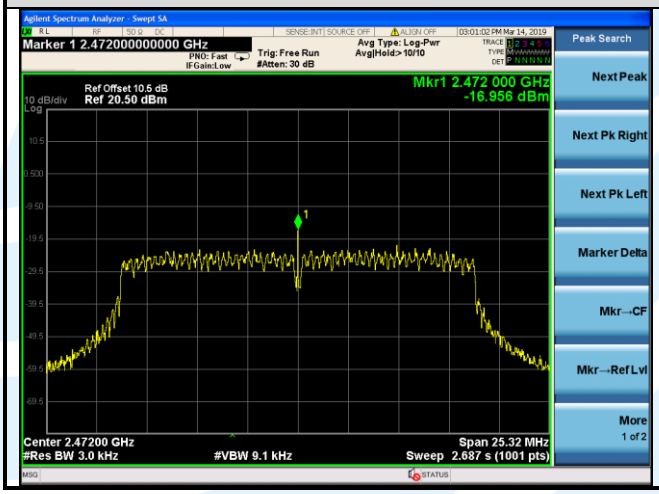
IEEE 802.11n-HT20	
MIMO_ Chain 0	MIMO_ Chain 1
Channel 1	
	
Channel 6	
	
Channel 11	
	

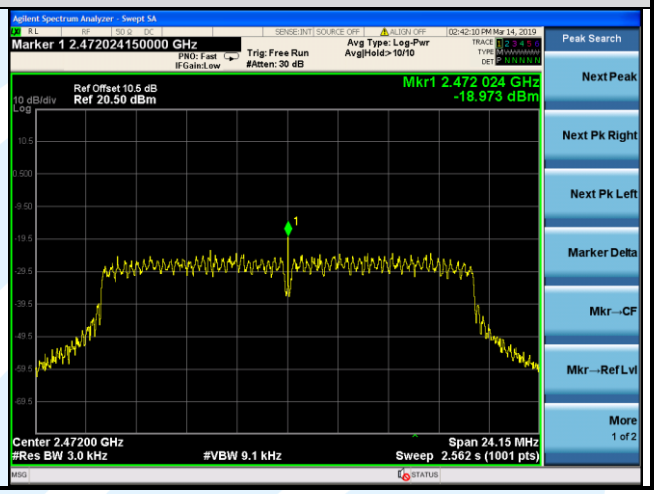
Channel 12

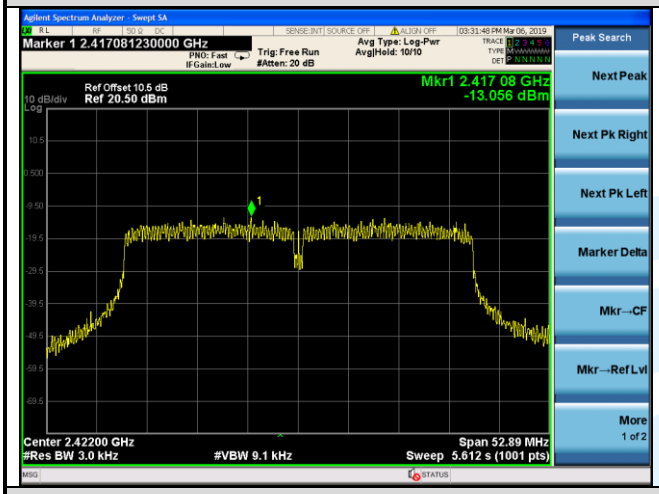
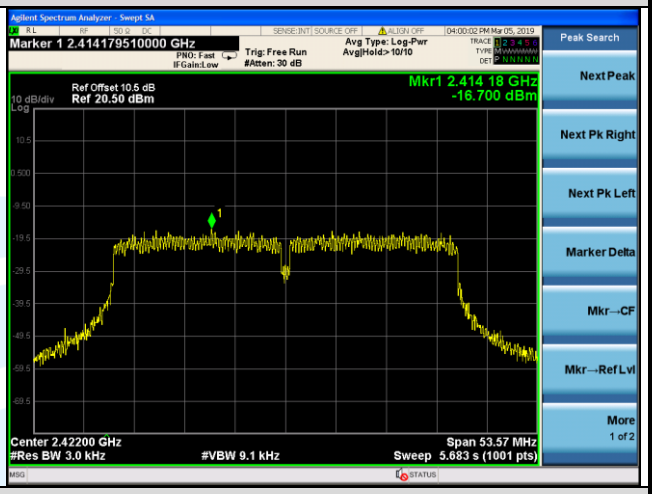
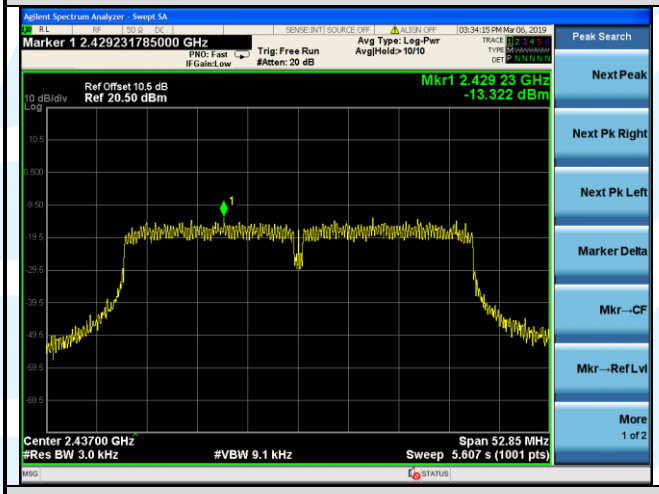
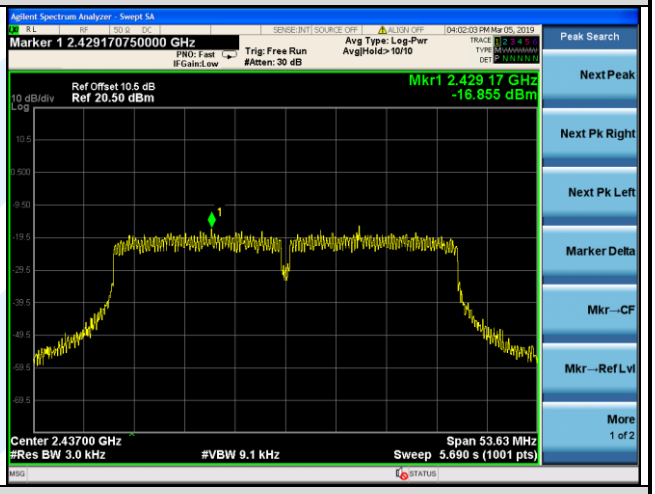
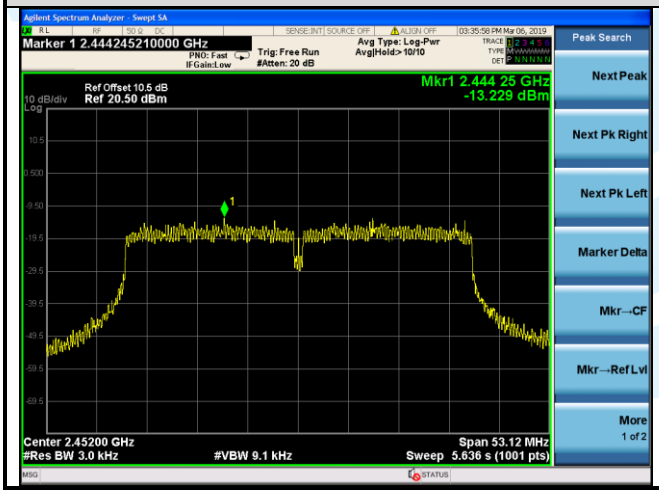
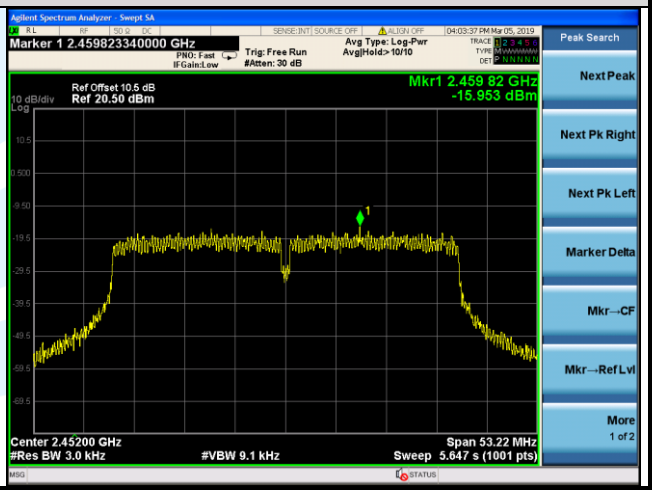




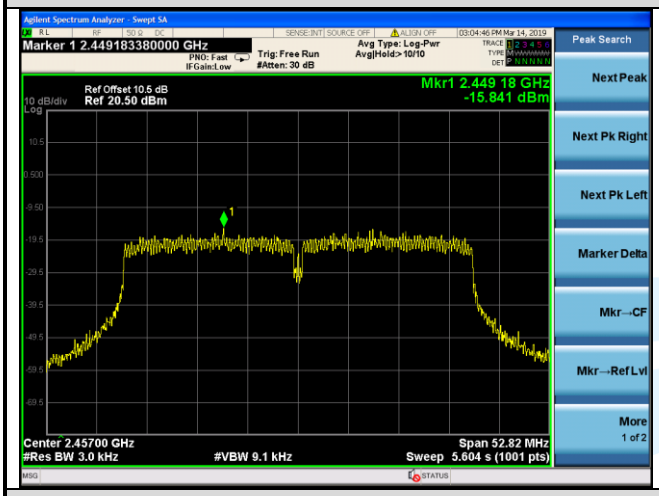
Channel 13

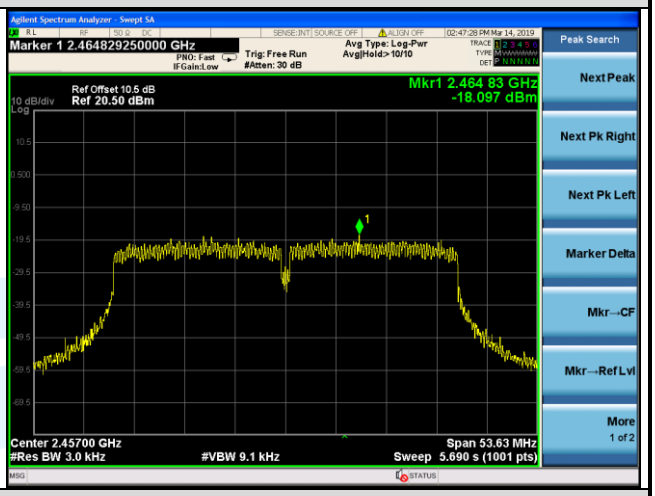




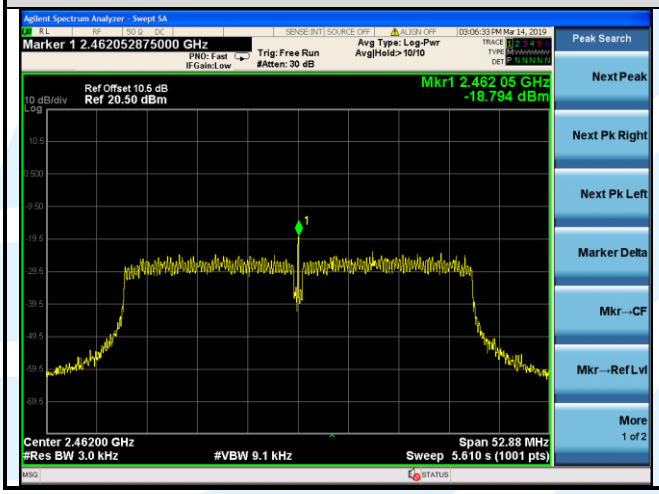
IEEE 802.11n-HT40	
MIMO_ Chain 0	MIMO_ Chain 1
Channel 3	
	
Channel 6	
	
Channel 9	
	

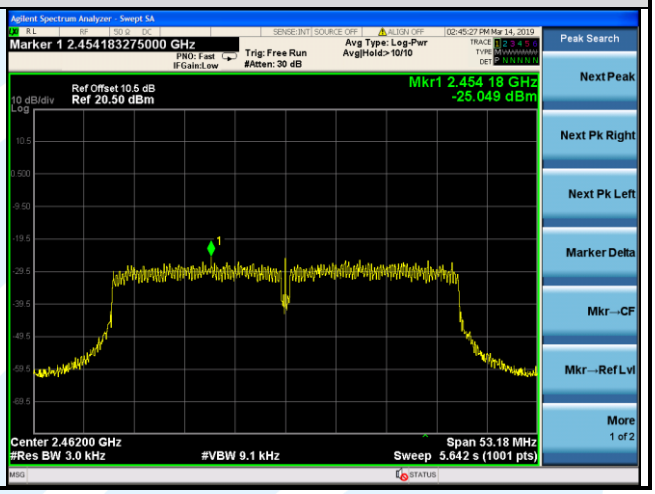
Channel 10





Channel 11





5.6 CONDUCTED OUT OF BAND EMISSION

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.247(d)
RSS-247 Issue 2, Section 5.5

Test Method: ANSI C63.10-2013 Clause 11.11

Limit: In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

Test Procedure: Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
Use the following spectrum analyzer settings:

Step 1:Measurement Procedure REF

a) Set instrument center frequency to DTS channel center frequency.
b) Set the span to ≥ 1.5 times the DTS bandwidth.
c) Set the RBW = 100 kHz.
d) Set the VBW ≥ 3 x RBW.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum PSD level.
j) Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Step 2:Measurement Procedure OOBE

a) Set RBW = 100 kHz.
b) Set VBW ≥ 300 kHz.
c) Detector = peak.
d) Sweep = auto couple.
e) Trace Mode = max hold.
f) Allow trace to fully stabilize.
g) Use the peak marker function to determine the maximum amplitude level.

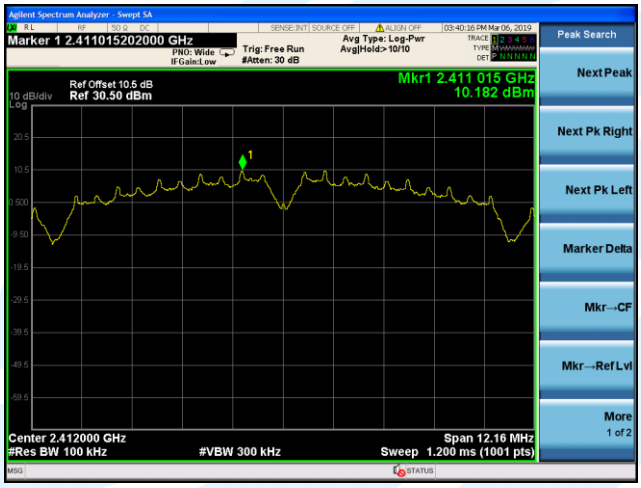
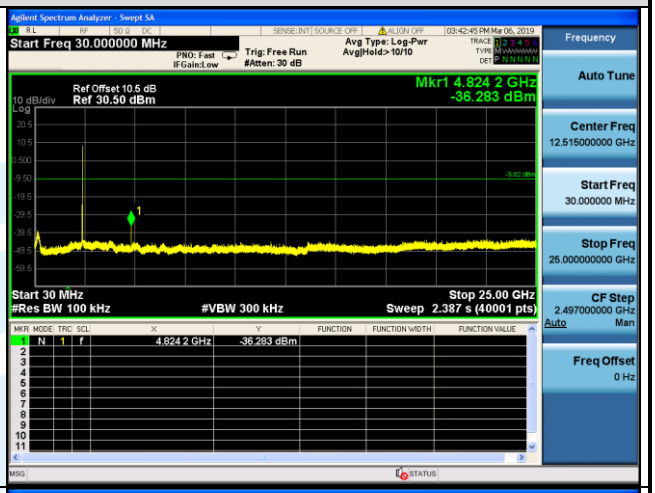
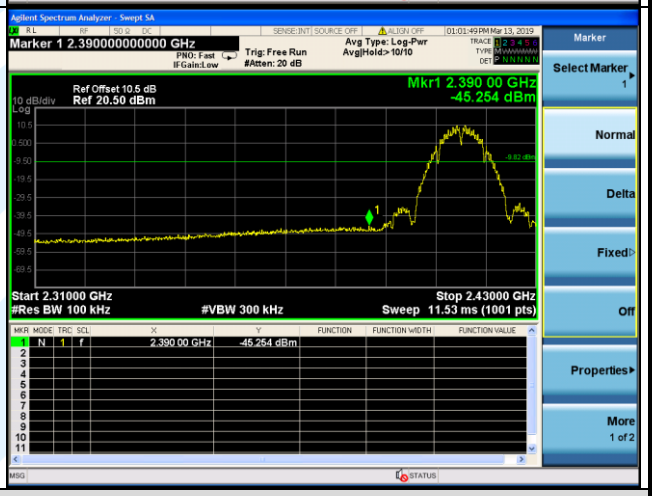
Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Results: Pass

The test plots as follows:

SISO_ Chain 0_ IEEE 802.11b	
In-Band Reference Level	**Out of Band Emission**
Channel 1	
	
	
Channel 6