

8. OUTPUT POWER TEST

8.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	N9030A	MY51380221	Oct.29, 14	1Year
2.	Power meter	Anritsu	ML2487A	6K00002472	Apr. 28,14	1Year
3.	Power sensor	Anritsu	MA2491A	0033005	Apr. 28,14	1Year
4.	Attenuator (20dB)	Agilent	8491B	MY39262165	Apr. 28,14	1Year
5.	RF Cable	Hubersuhner	SUCOFLEX102	28610/2	Apr. 28,14	1Year

8.2. Limit (FCC Part 15C 15.247 b(3))

For systems using digital modulation in the 2400—2483.5MHz, The Peak out put Power shall not exceed 1W(30dBm)

8.3. Test Procedure

- 1, Connected the EUT's antenna port to measure device by 20dB attenuator.
- 2, For IEEE 802.11b/g and IEEE802.11n HT20 mode, use a PK power meter which's bandwidth is 20MHz and above 26dB bandwidth of signal to measure out each test modes' PK output power.
- 3, For IEEE802.11n HT40 mode, because the signal's bandwidth is about 40MHz and above 20MHz bandwidth of power sensor ML2491A. So used the test method per KDB558074.
 - 1) Set the RBW=1MHz and VBW =3MHz
 - 2) Set the span $\geq 1.5 \times$ DTS bandwidth
 - 3) Detector = peak
 - 4) Sweep time = auto couple
 - 5) Trace Mode = max hold
 - 6) allow trace to fully stabilize
 - 7) use the spectrum analyser's integrated band power measurement function with band limits set equal to the DTS bandwidth edges.

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

8.4. Test Results
5MHz

EUT:2.4GHz 300Mbps 12dBi Outdoor CPE					
M/N:CPE220					
Test date: 2015-01-21		Pressure: 101.9±1.0kpa		Humidity: 51.4±3.0%	
Tested by: Donjon_huang		Test site: RF site		Temperature:20.1±0.6 °C	
Test Mode	CH	Peak output Power (dBm)			Limit (dBm)
		ANT1	ANT2	Total	
11b	CH1	18.88	19.43	22.17	28
	CH6	18.95	19.41	22.20	28
	CH11	18.71	19.51	22.14	28
11g	CH1	20.21	20.88	23.57	28
	CH6	20.15	20.91	23.56	28
	CH11	20.28	20.86	23.59	28
11n HT20	CH1	20.65	21.41	24.06	28
	CH6	20.72	21.38	24.07	28
	CH11	20.85	21.37	24.13	28
Conclusion: PASS					

10MHz

EUT: 2.4GHz 300Mbps 12dBi Outdoor CPE					
M/N: CPE220					
Test date: 2015-01-21		Pressure: 101.9±1.0 kpa		Humidity: 51.4±3.0%	
Tested by: Donjon_huang		Test site: RF site		Temperature:20.1±0.6 °C	
Test Mode	CH	Peak output Power (dBm)			Limit (dBm)
		ANT1	ANT2	Total	
11b	CH1	21.38	21.87	24.64	28
	CH6	21.84	22.73	25.32	28
	CH11	21.09	22.08	24.62	28
11g	CH1	23.23	23.92	26.60	28
	CH6	23.88	24.73	27.34	28
	CH11	23.45	23.74	26.61	28
11n HT20	CH1	23.18	24.02	26.63	28
	CH6	23.65	24.54	27.13	28
	CH11	23.09	23.89	26.52	28
Conclusion: PASS					

20MHz

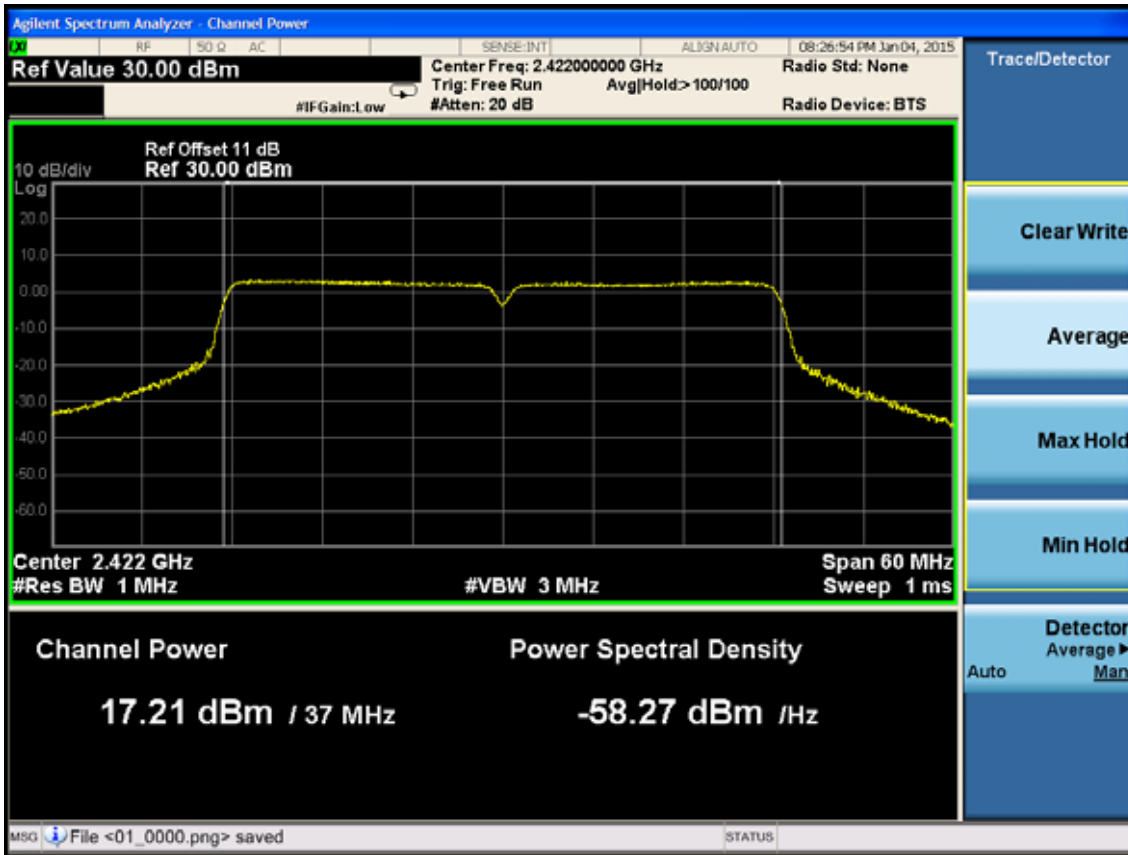
EUT: 2.4GHz 300Mbps 12dBi Outdoor CPE					
M/N: CPE220					
Test date: 2015-01-21		Pressure: 101.9±1.0 kpa		Humidity: 51.4±3.0%	
Tested by: Donjon_huang		Test site: RF site		Temperature:20.1±0.6 °C	
Test Mode	CH	Peak output Power (dBm)			Limit (dBm)
		ANT1	ANT2	Total	
11b	CH1	21.43	21.95	24.71	28
	CH6	21.87	22.59	25.26	28
	CH11	20.63	21.42	24.05	28
11g	CH1	23.25	23.86	26.58	28
	CH6	23.87	24.63	27.28	28
	CH11	23.38	23.78	26.59	28
11n HT20	CH1	23.42	23.84	26.65	28
	CH6	23.64	24.48	27.09	28
	CH11	23.18	23.69	26.45	28
11n HT40	CH3	17.21	17.75	20.50	28
	CH6	23.75	24.74	27.28	28
	CH9	18.16	18.89	21.55	28
Conclusion: PASS					

Note: This device use cross-polarized antenna and point to point operation.

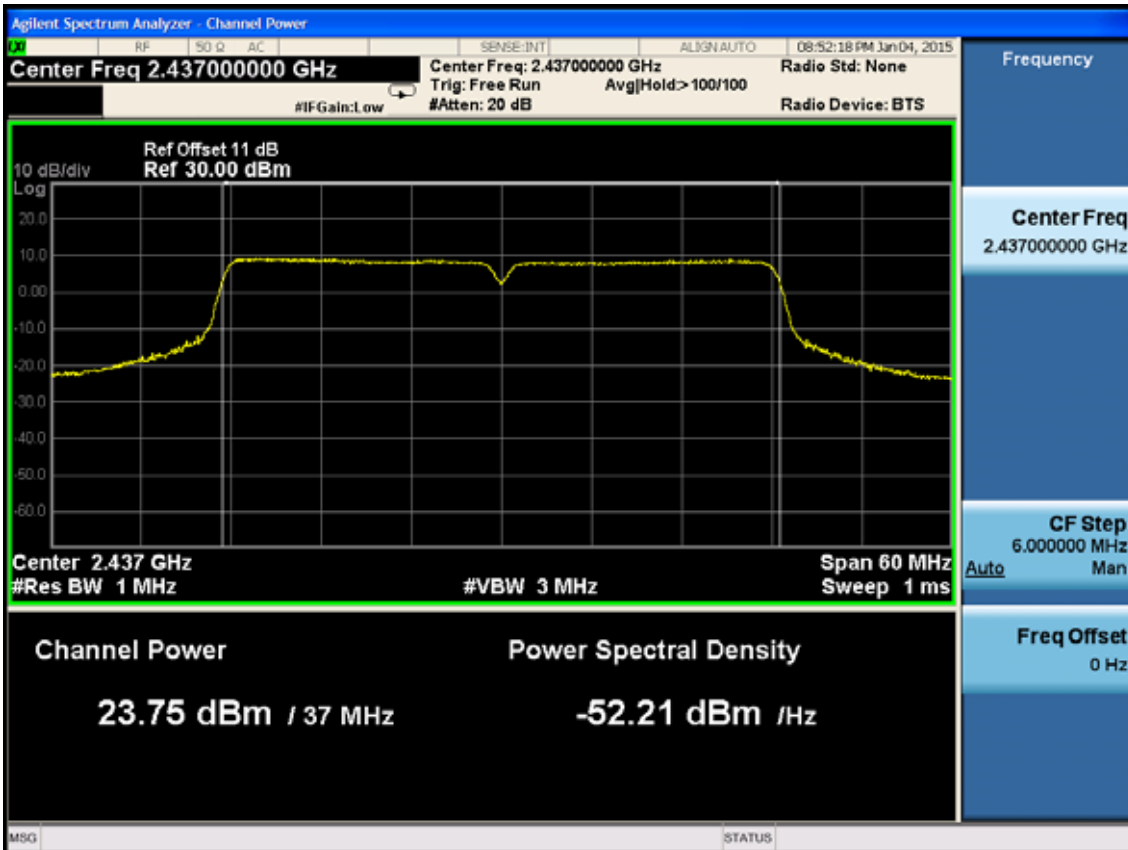
20MHz Antenna 1

Test Mode: IEEE 802.11n HT40

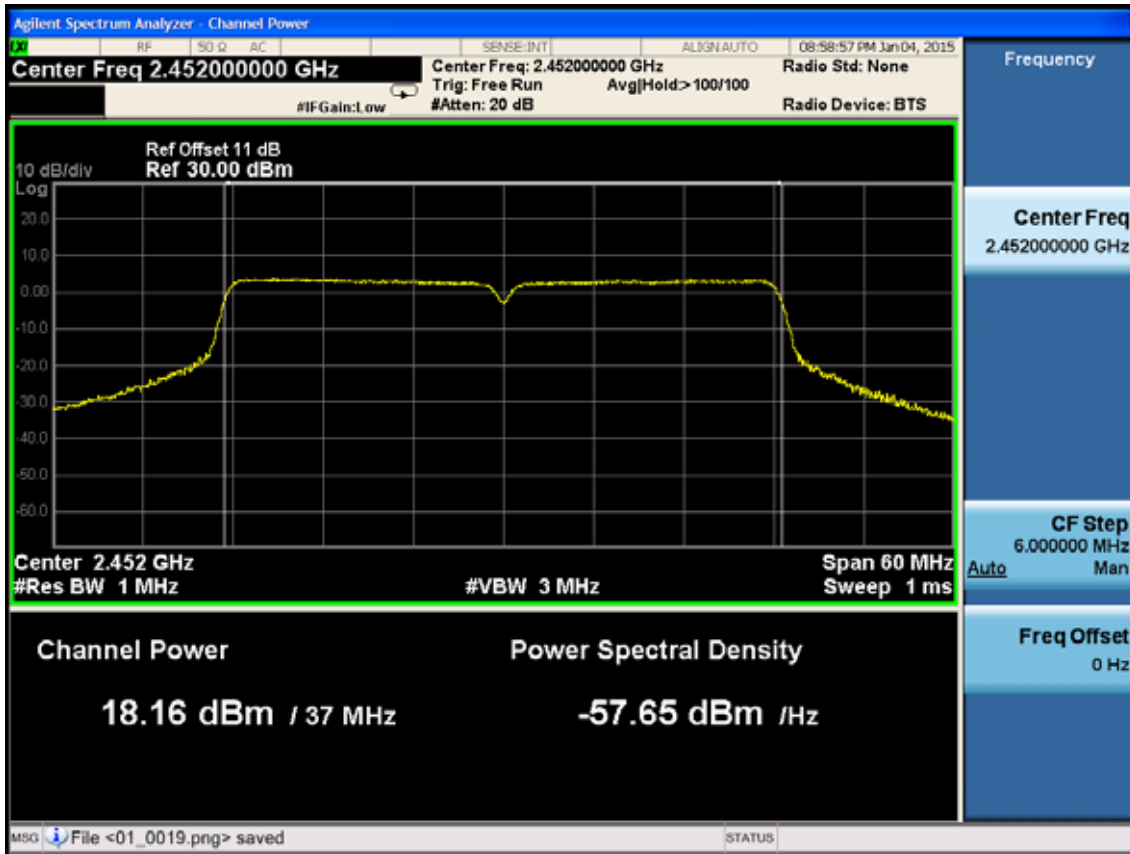
Test CH1: 2422MHz



Test CH4: 2437MHz



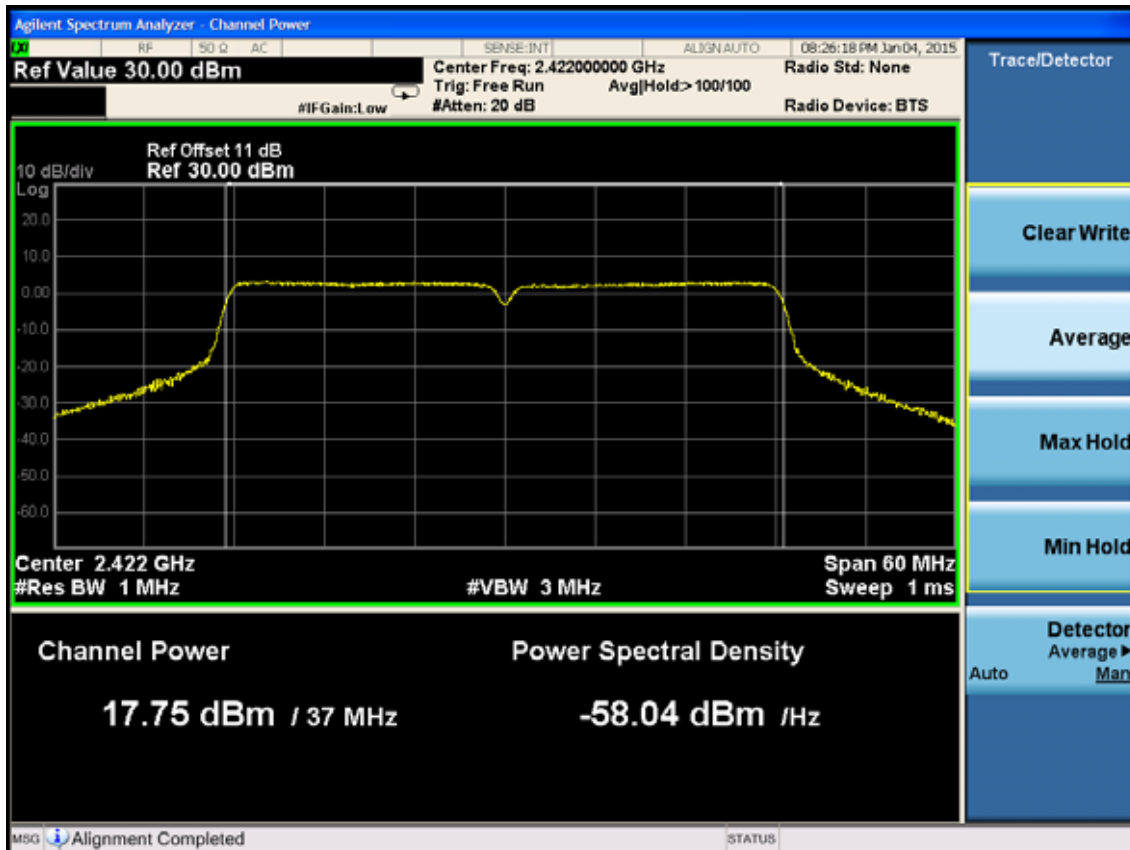
Test CH7: 2452MHz



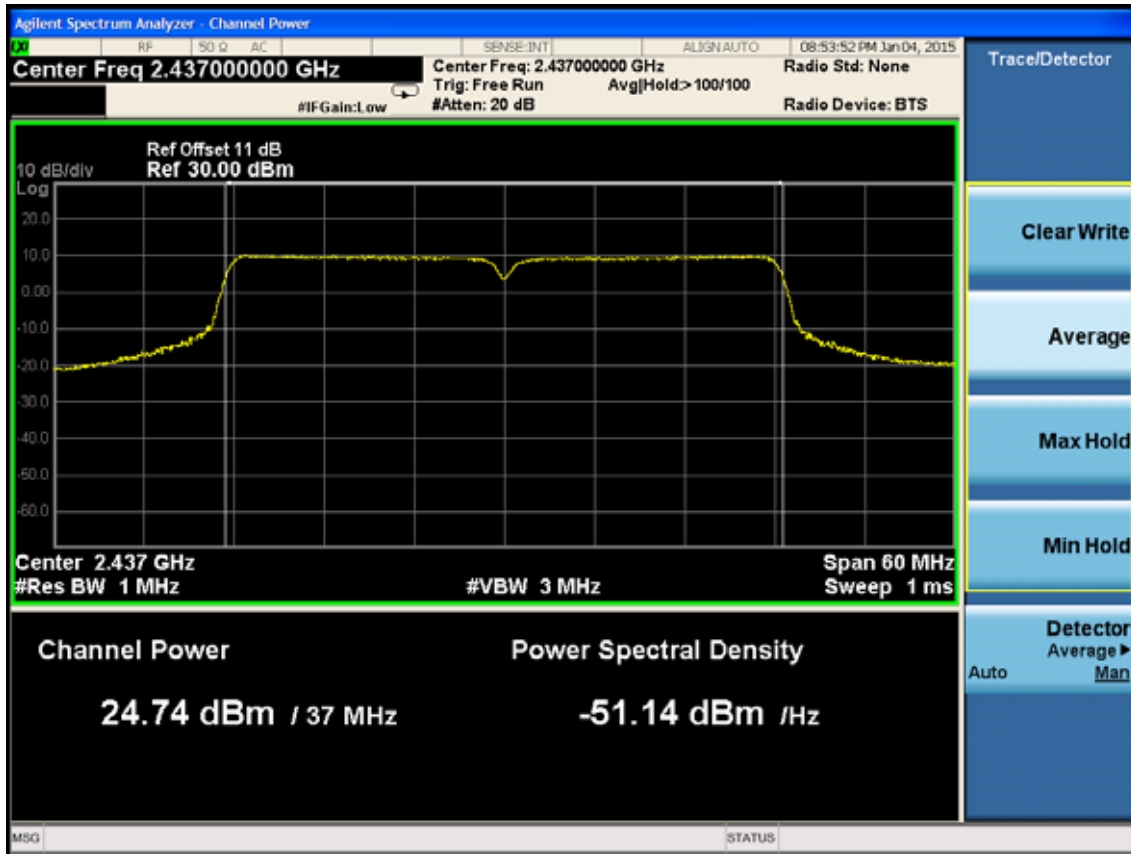
20MHz Antenna 2

Test Mode: IEEE 802.11n HT40

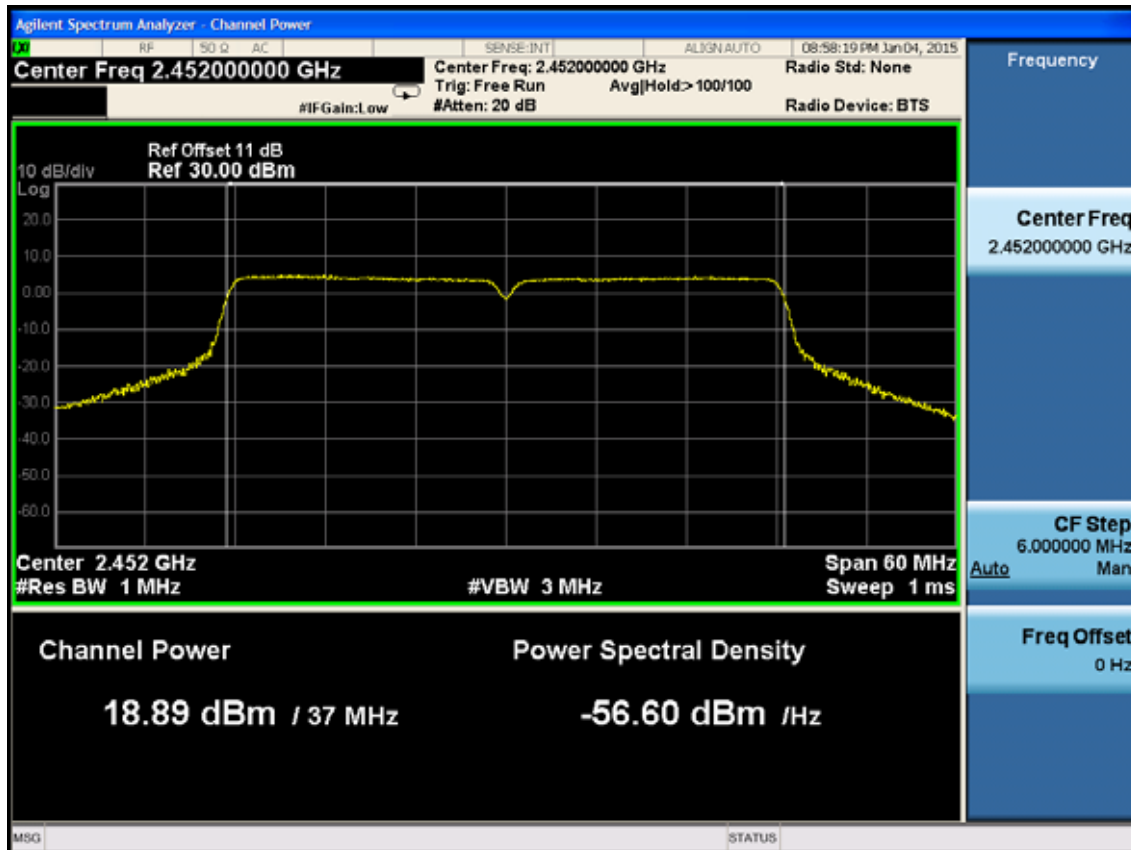
Test CH1: 2422MHz



Test CH4: 2437MHz



Test CH7: 2452MHz



9. POWER SPECTRAL DENSITY TEST

9.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	N9030A	MY51380221	Oct.29, 14	1 Year
2.	Attenuator (20dB)	Agilent	8491B	MY39262165	Apr. 28,14	1 Year
3	RF Cable	Hubersuhner	SUCOFLEX102	28610/2	Apr. 28,14	1 Year

9.2. 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.

9.3. Test Procedure

1. Connected the EUT's antenna port to spectrum analyzer device by 20dB attenuator.
2. Set the test frequency as center frequency, Set RBW=3KHz,VBW=10KHz,Span large enough capture the entire frequency, Read out maximum peak level frequency
3. Set the frequency read from produce 2 as center frequency, then set the span=300KHz, Sweep time=Span/RBW, Then Max hold, read out each mode and each chain's Power density.

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

9.4. Test Results

5MHz

EUT: 2.4GHz 300Mbps 12dBi Outdoor CPE		
M/N: CPE220		
Test date:2015-02-04	Pressure: 101.3±1.0kpa	Humidity: 51.6±3.0 %
Tested by:Donjon_Huang	Test site: RF site	Temperature: 21.3±0.6 °C

Test Mode	CH	Result			Limit (dBm/3KHz)
		Power density (dBm/3KHz)			
		ANT1	ANT2	Total	
11b	CH1	1.564	2.460	5.05	6
	CH6	1.496	2.620	5.10	6
	CH11	2.146	2.681	5.43	6
11g	CH1	1.157	2.127	4.68	6
	CH6	2.169	2.350	5.27	6
	CH11	2.018	2.211	5.13	6
11n HT20	CH1	1.427	2.255	4.87	6
	CH6	1.633	2.355	5.02	6
	CH11	1.907	2.038	4.98	6

Conclusion: PASS

10MHz

EUT: 2.4GHz 300Mbps 12dBi Outdoor CPE		
M/N: CPE220		
Test date:2015-01-23	Pressure: 101.3±1.0kpa	Humidity: 51.6±3.0 %
Tested by:Donjon_Huang	Test site: RF site	Temperature: 21.3±0.6 °C

Test Mode	CH	Result			Limit (dBm/3KHz)
		Power density (dBm/3KHz)			
		ANT1	ANT2	Total	
11b	CH1	2.144	1.772	4.97	6
	CH6	0.961	2.367	4.73	6
	CH11	1.494	1.106	4.31	6
11g	CH1	0.705	0.718	3.72	6
	CH6	-0.183	2.025	4.07	6
	CH11	-0.142	0.621	3.27	6
11n HT20	CH1	-1.612	-0.860	1.79	6
	CH6	-0.656	0.060	2.73	6
	CH11	-1.329	-0.526	2.10	6

Conclusion: PASS

20MHz

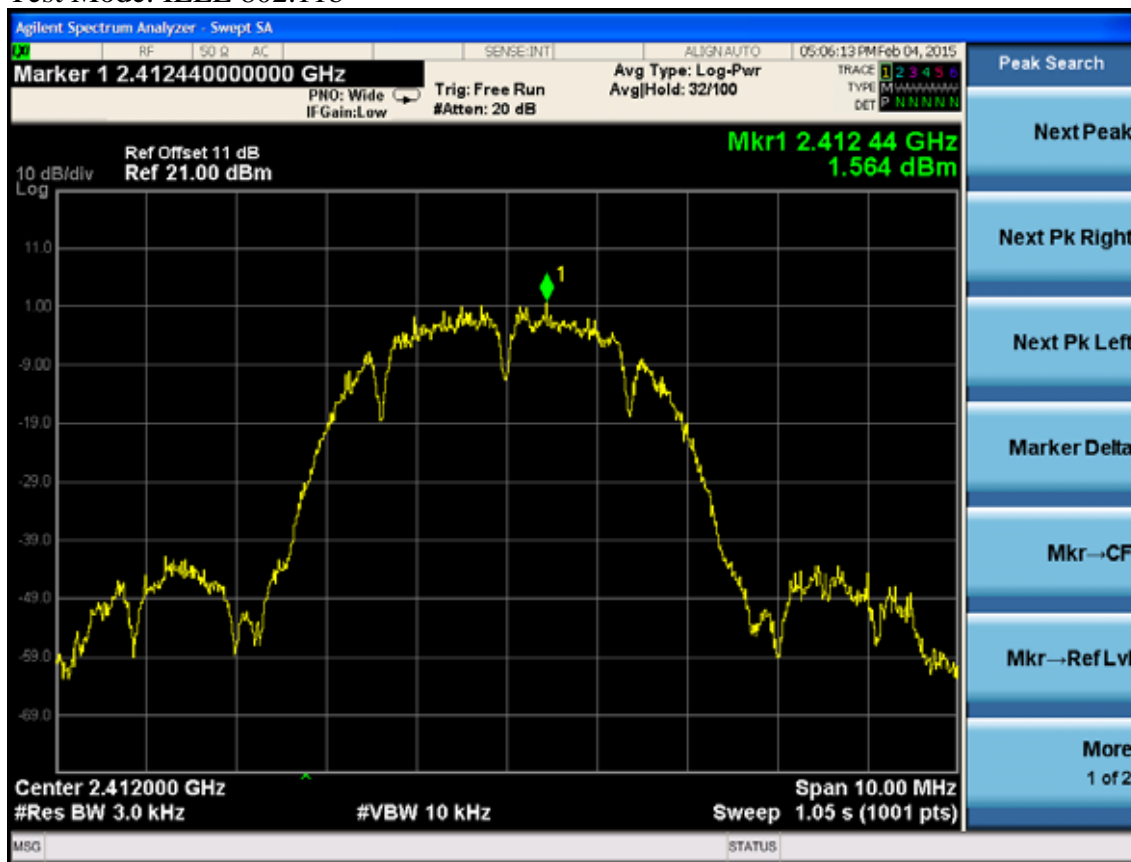
EUT: 2.4GHz 300Mbps 12dBi Outdoor CPE		
M/N: CPE220		
Test date:2015-01-05	Pressure: 102.3±1.0kpa	Humidity: 52.1±3.0 %
Tested by: Donjon_Huang	Test site: RF site	Temperature:22.4±0.6 °C

Test Mode	CH	Result			Limit (dBm/3KHz)
		Power density (dBm/3KHz)			
		ANT1	ANT2	Total	
11b	CH1	-1.084	-1.250	1.84	6
	CH6	-0.816	-0.415	2.40	6
	CH11	-1.828	-1.442	1.38	6
11g	CH1	-0.793	-0.681	2.27	6
	CH6	-1.661	-0.921	1.74	6
	CH11	-1.524	-1.238	1.63	6
11n HT20	CH1	-1.417	-0.359	2.15	6
	CH6	-0.635	-1.239	2.08	6
	CH11	-1.284	-1.232	1.75	6
11n HT40	CH3	-8.899	-9.625	-6.24	6
	CH6	-3.423	-3.232	-0.32	6
	CH9	-5.397	-3.543	-1.36	6

Conclusion: PASS

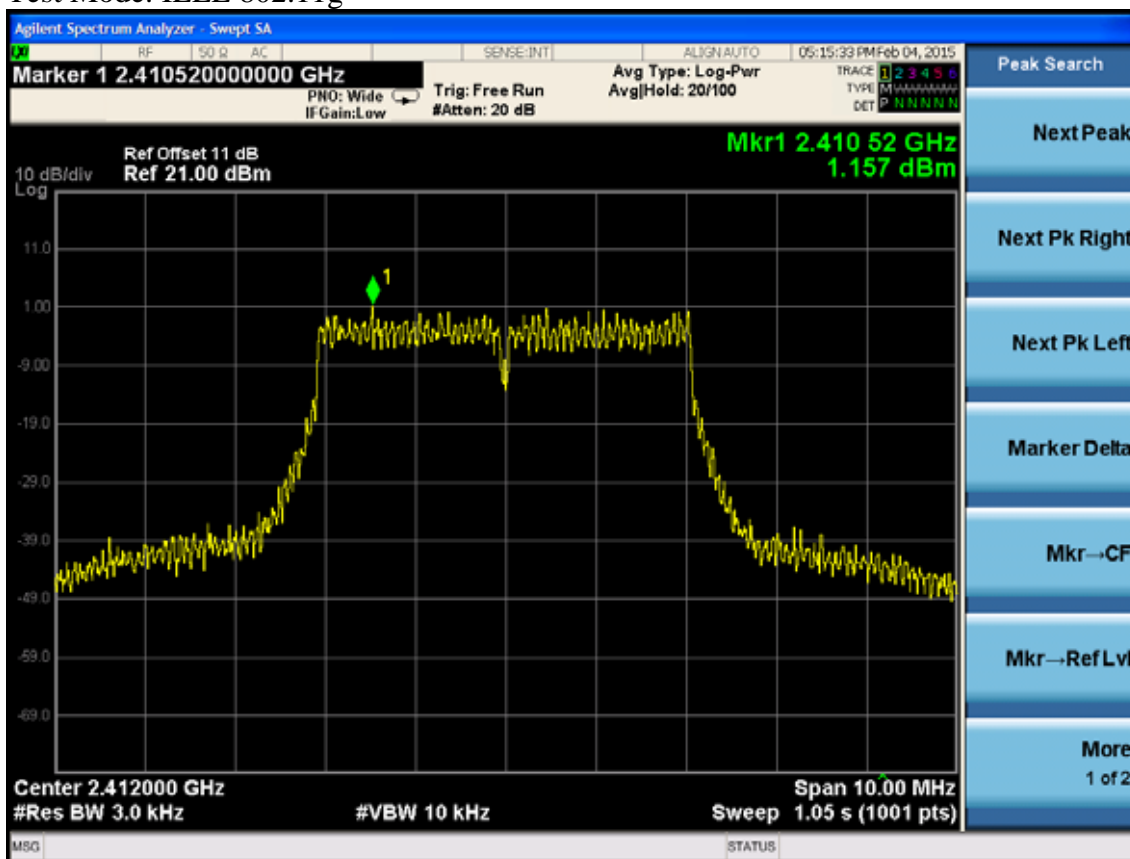
5MHz Antenna 1

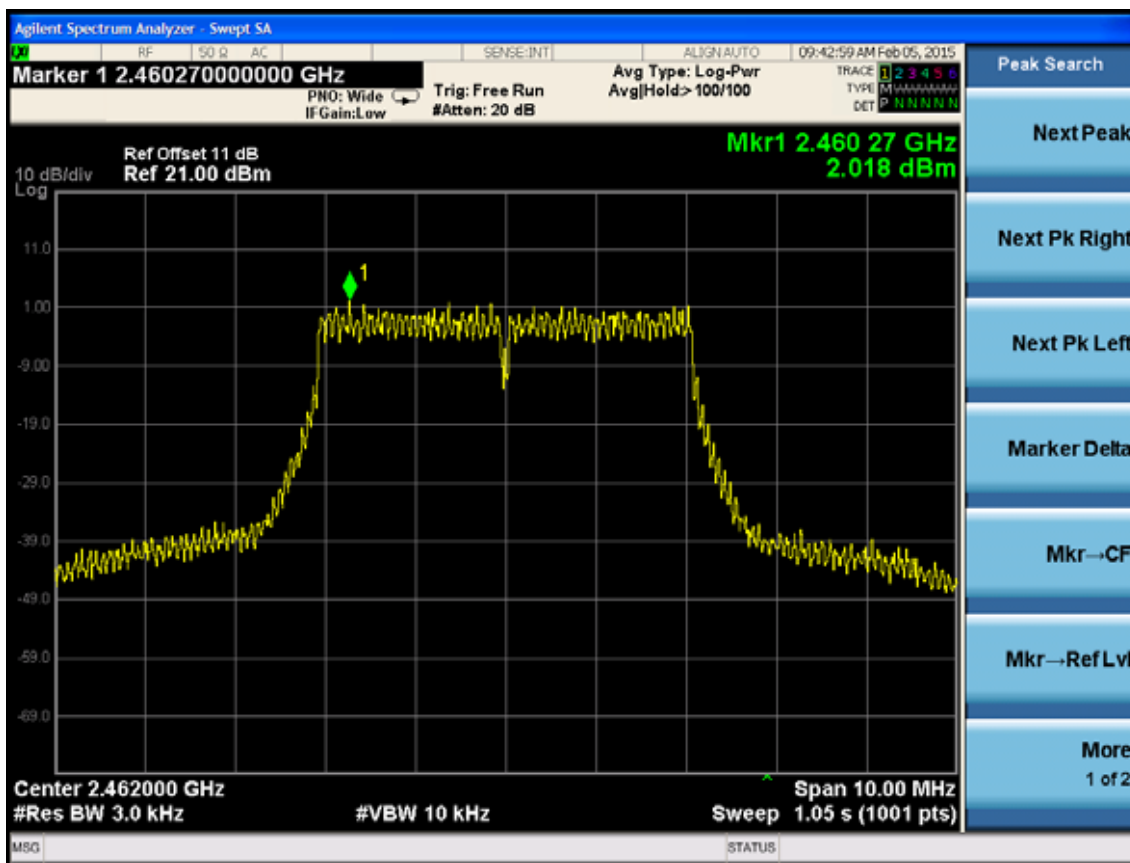
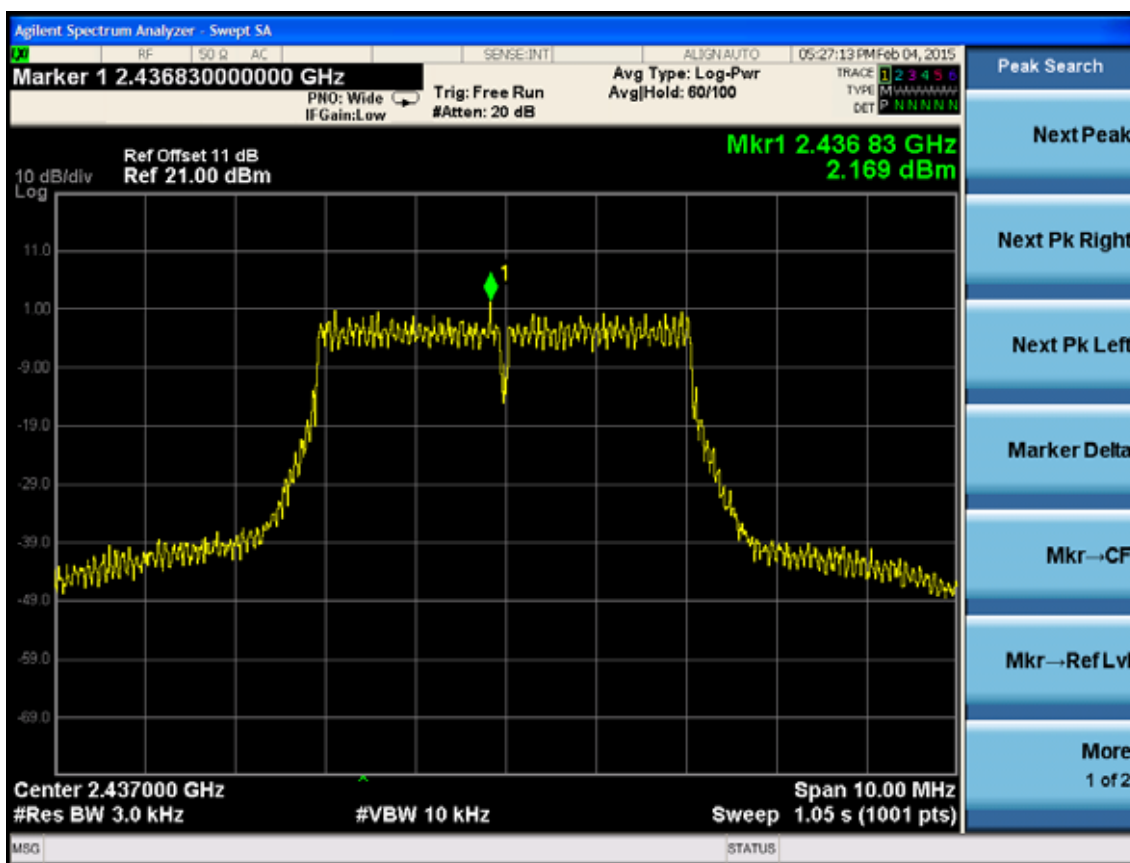
Test Mode: IEEE 802.11b



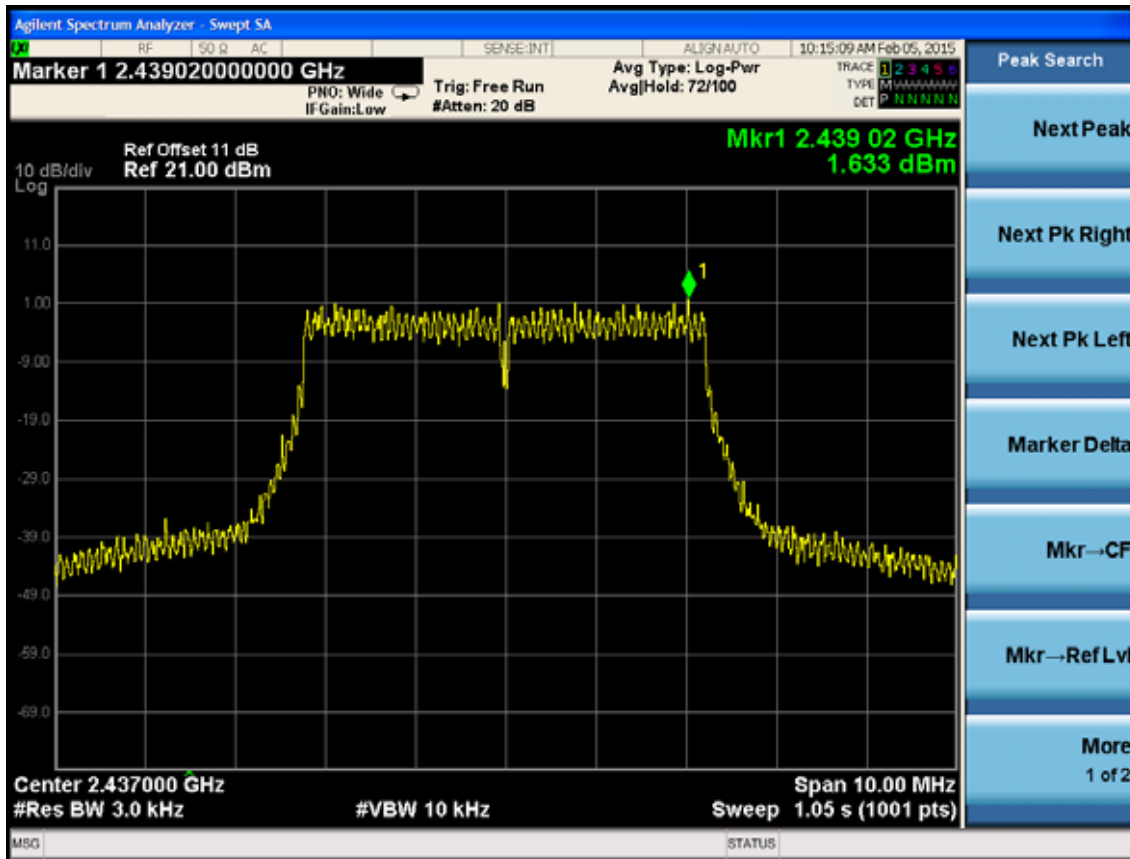
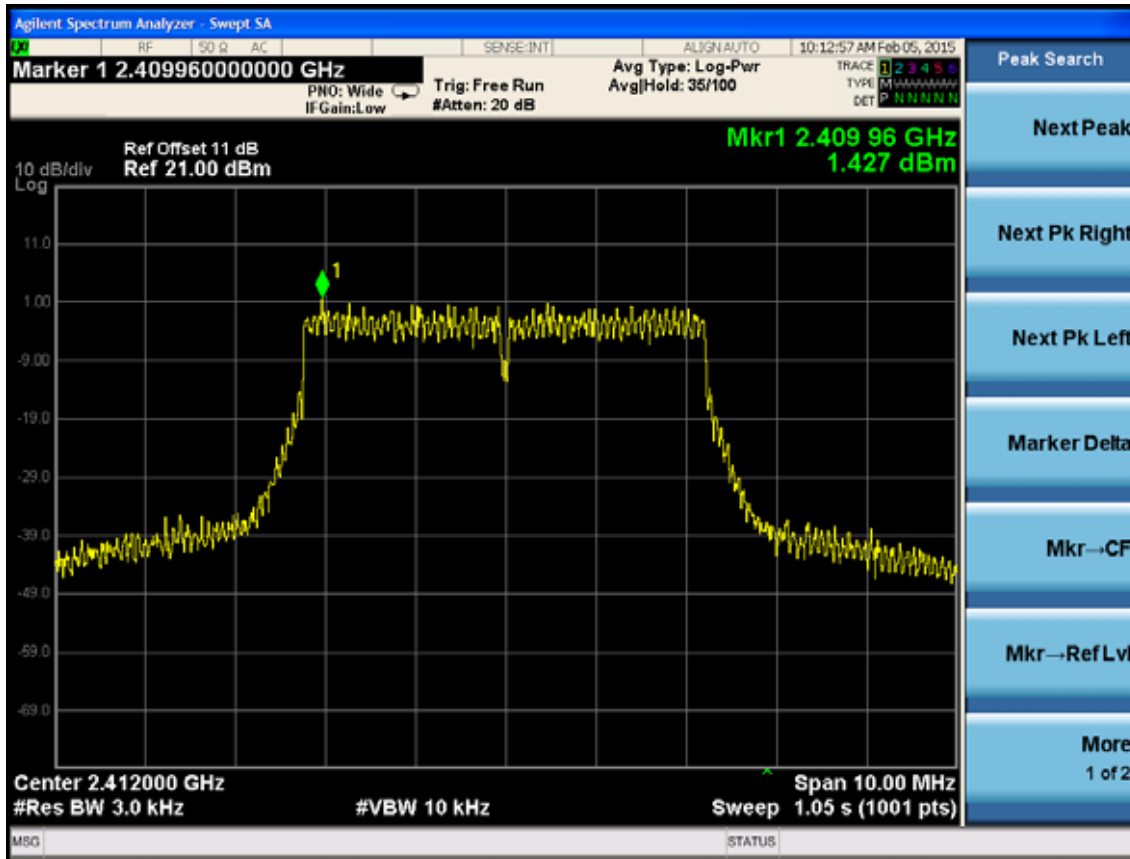


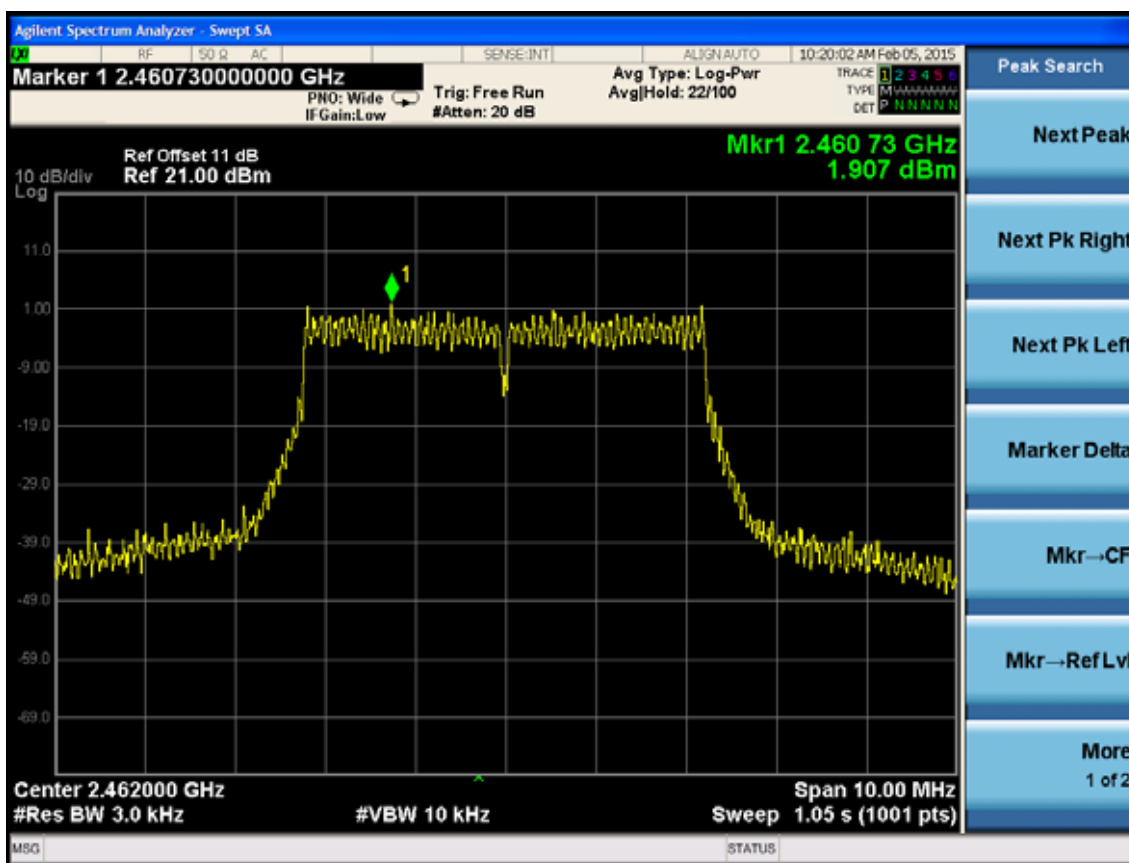
Test Mode: IEEE 802.11g





Test Mode: IEEE 11nHT20





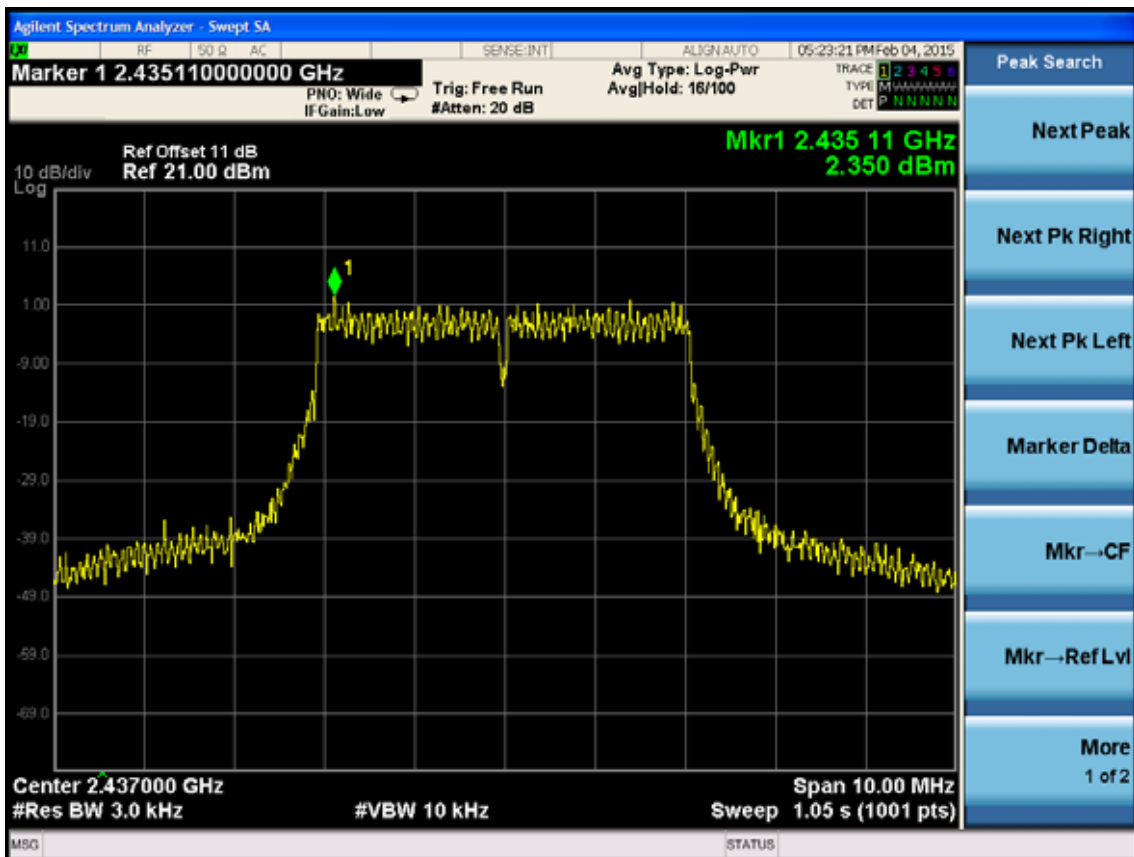
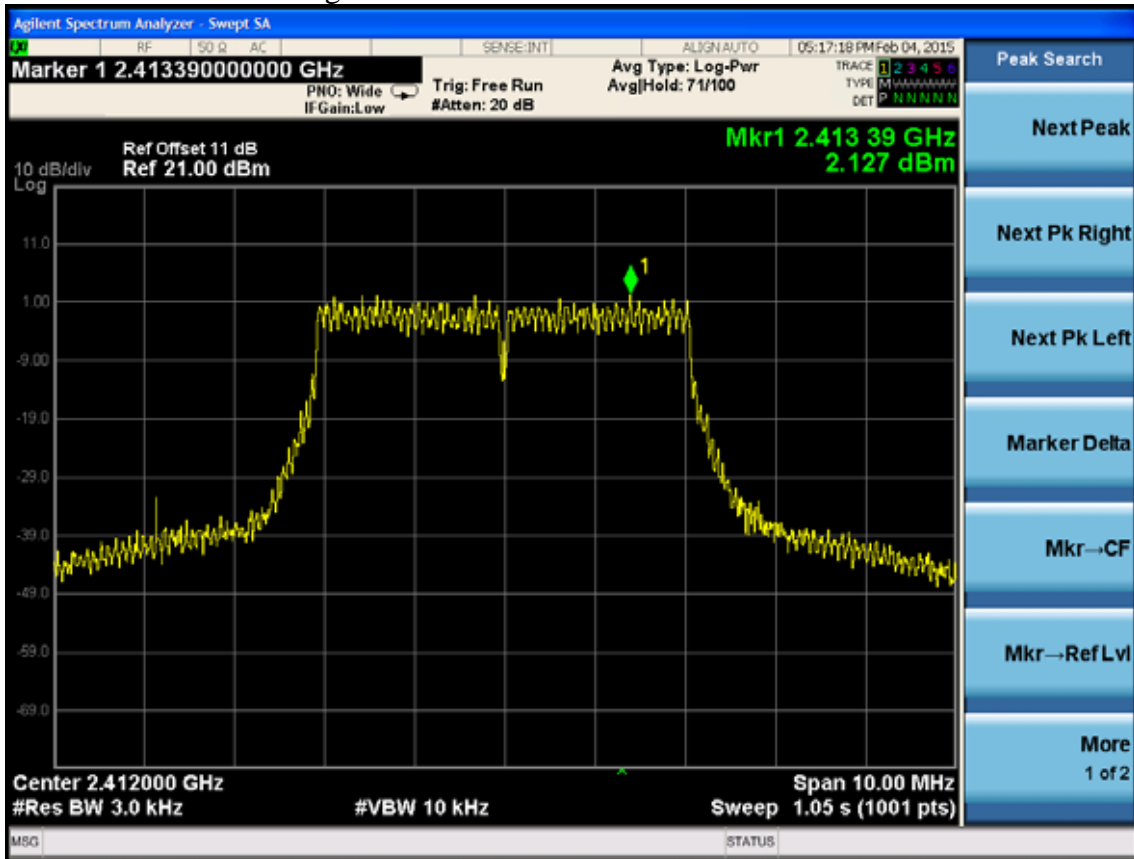
5MHz Antenna 2

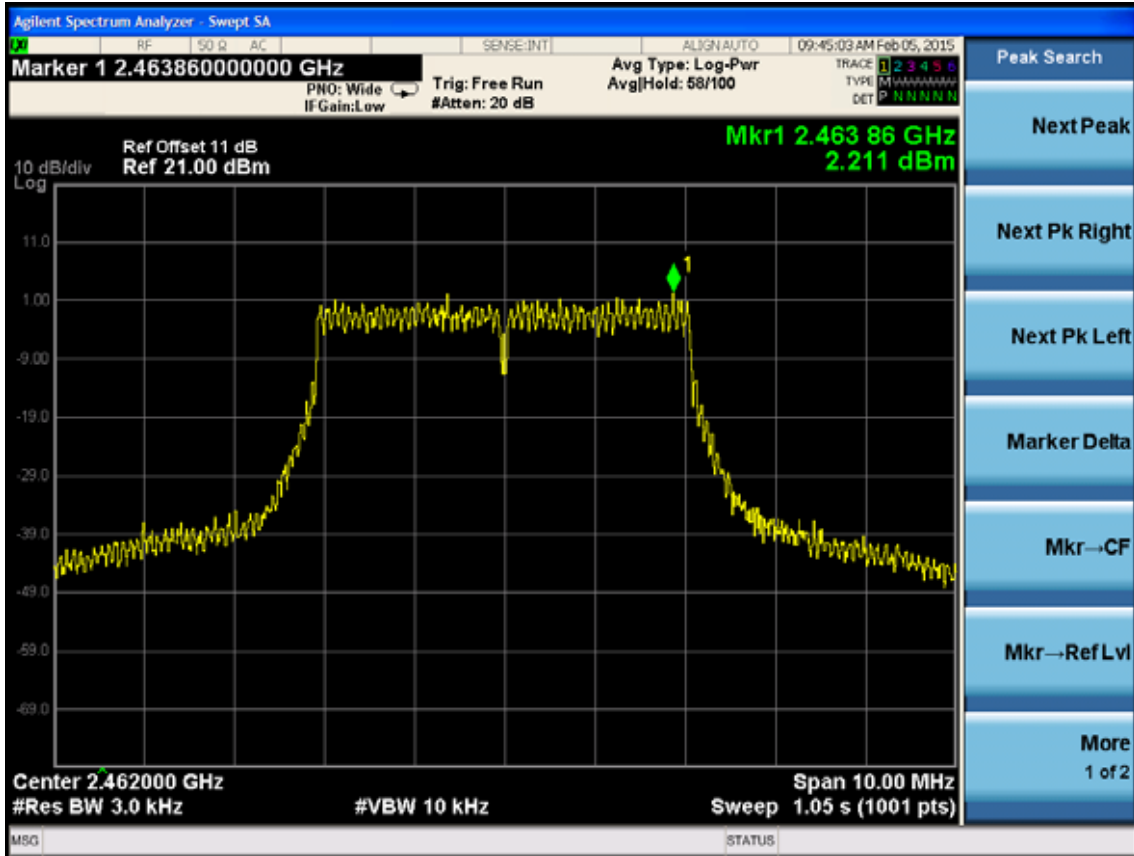
Test Mode: IEEE 802.11b



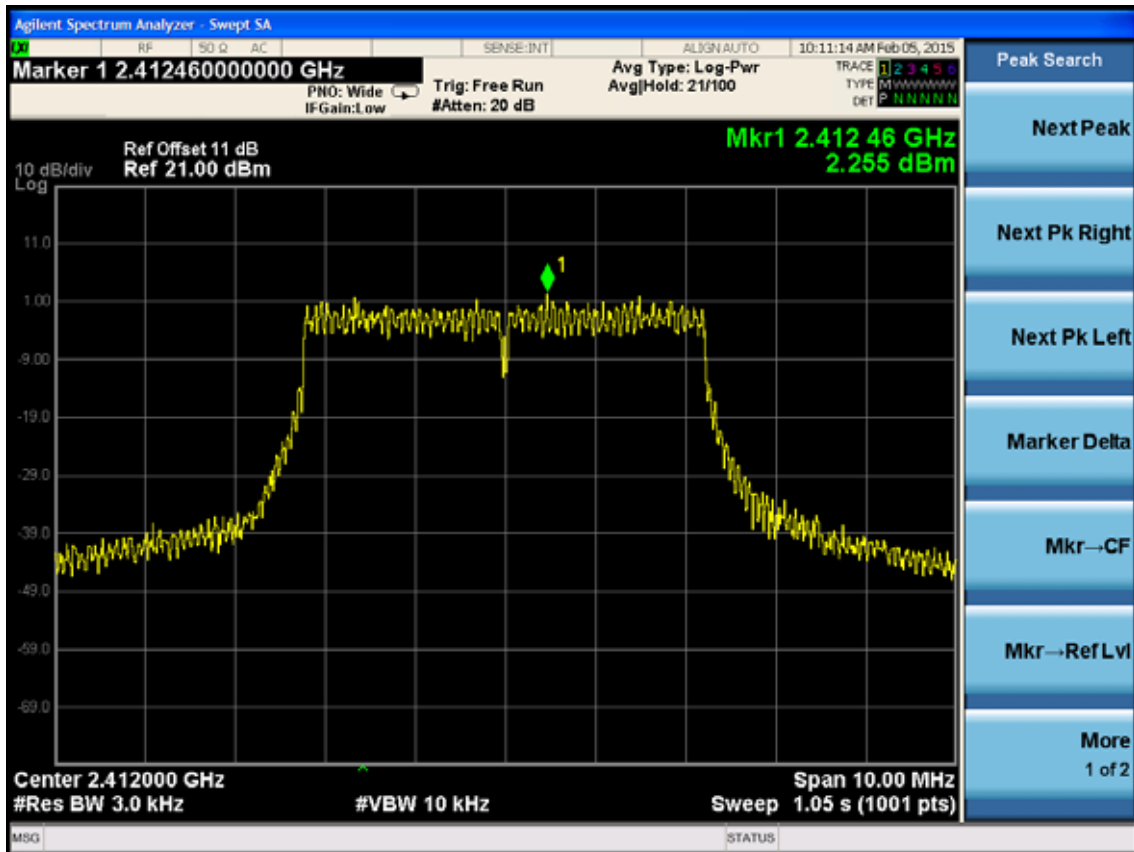


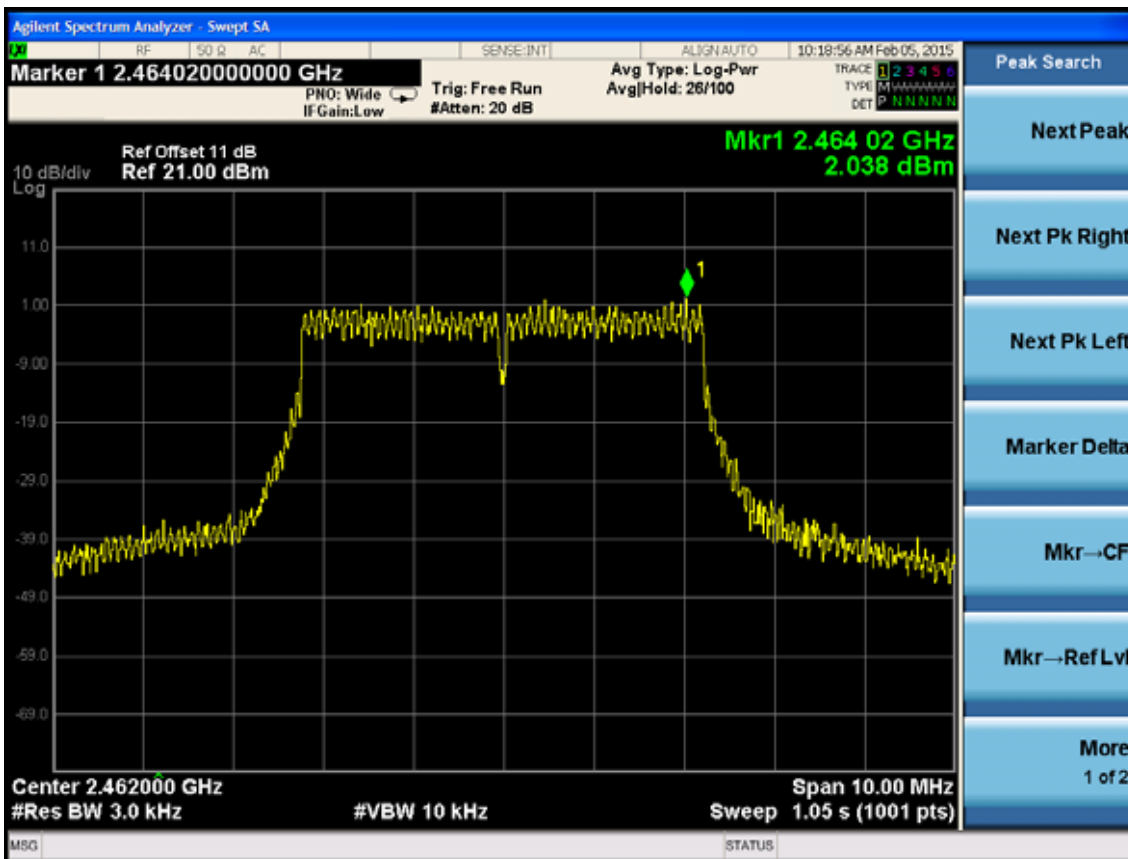
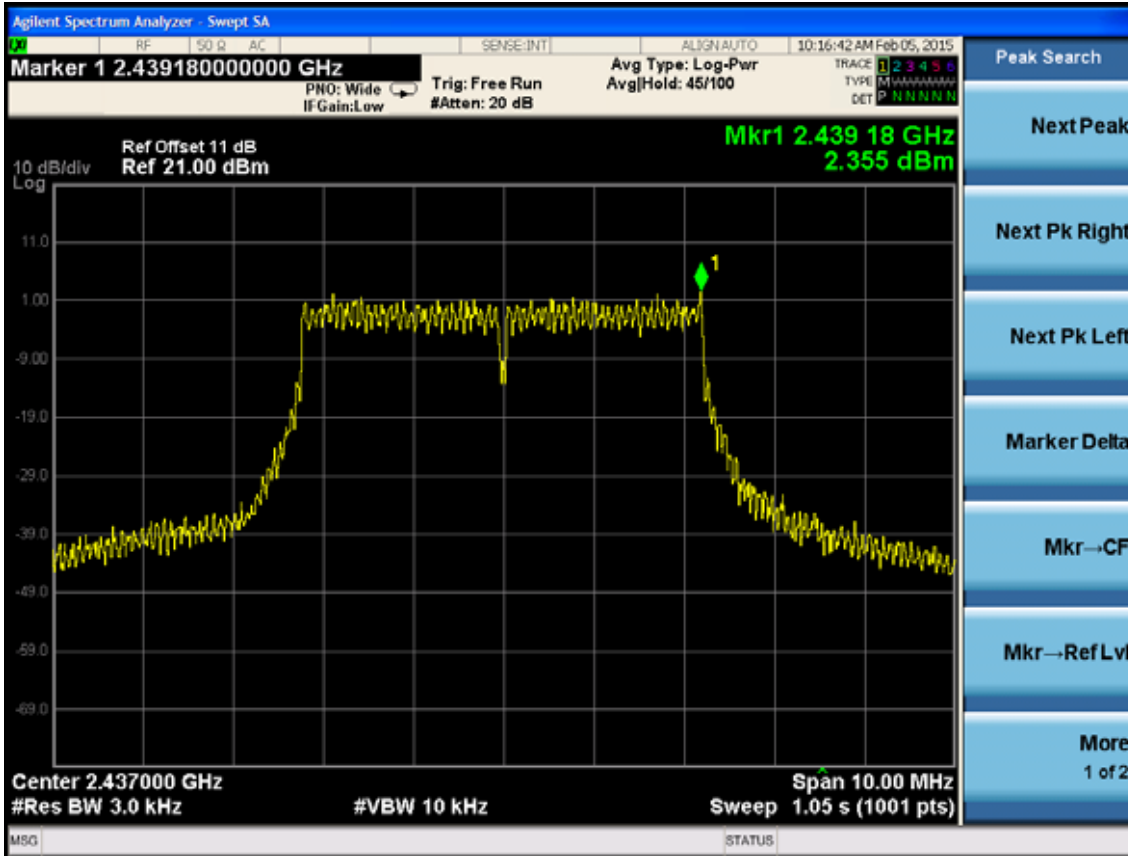
Test Mode: IEEE 802.11g





Test Mode: IEEE 11nHT20





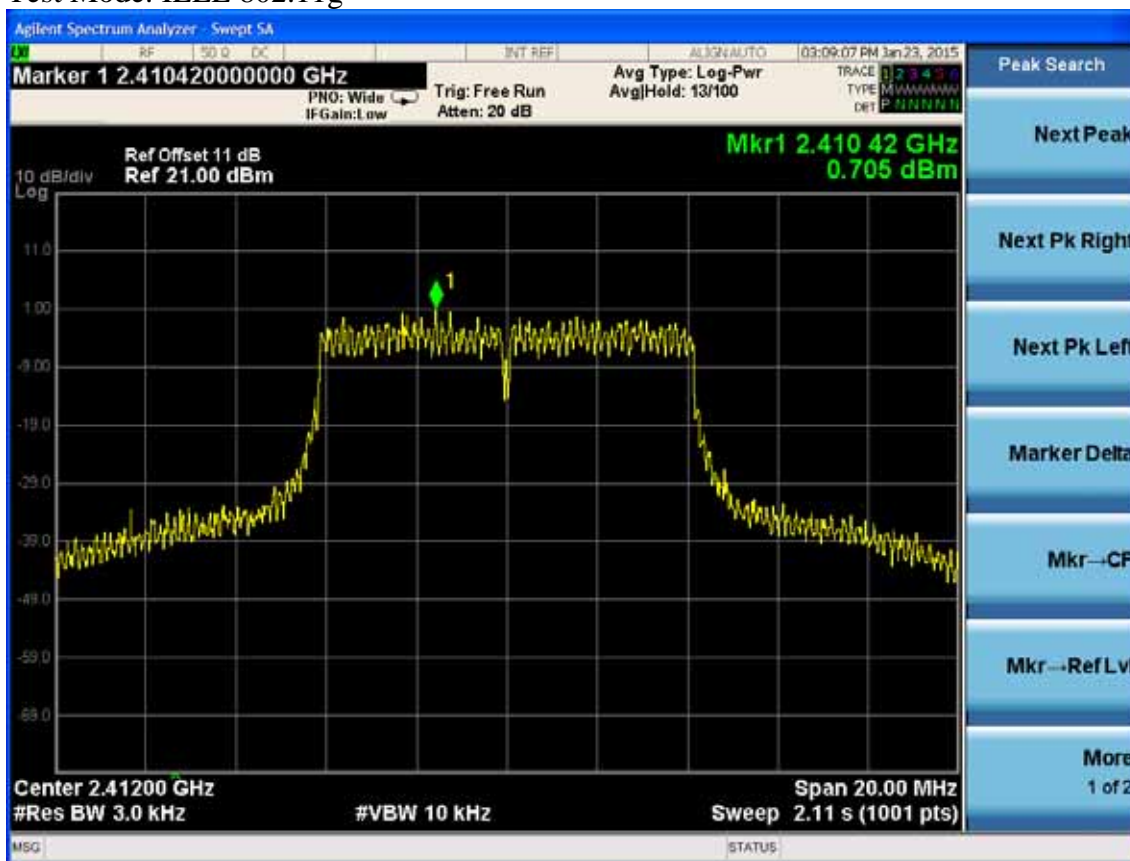
10MHz Antenna 1

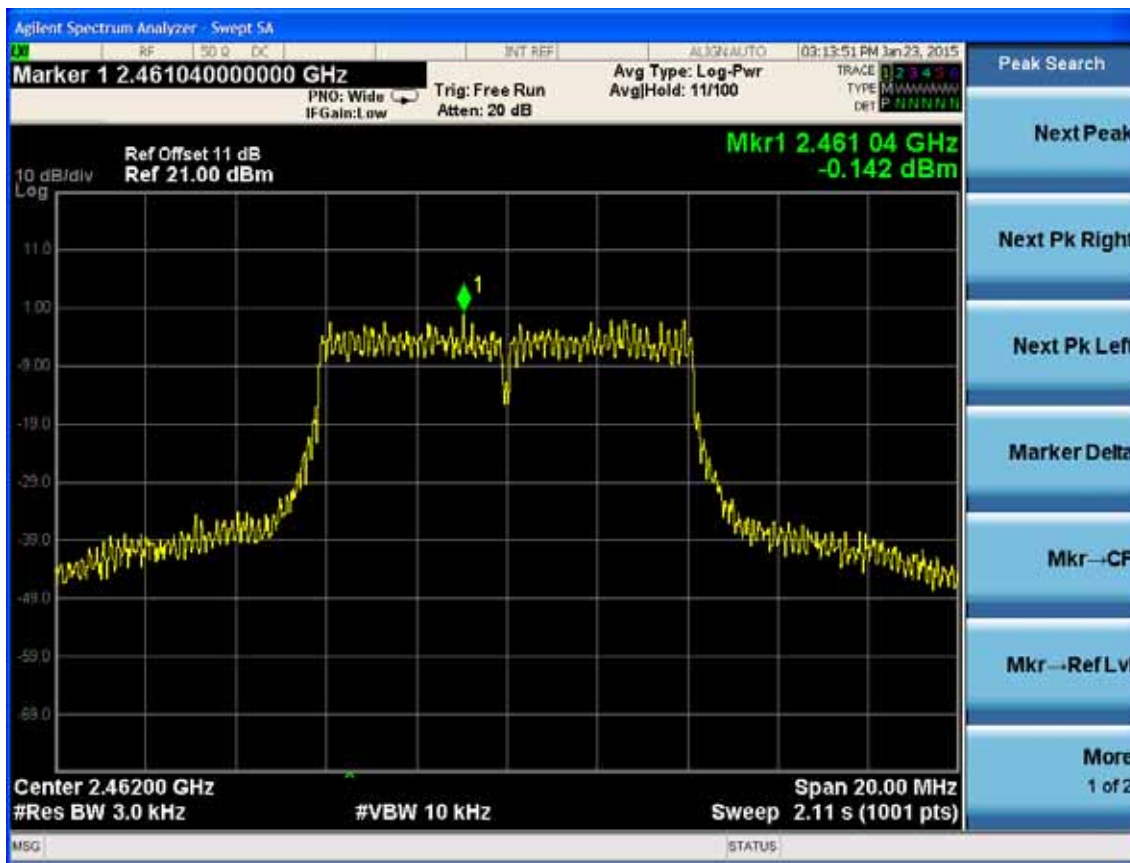
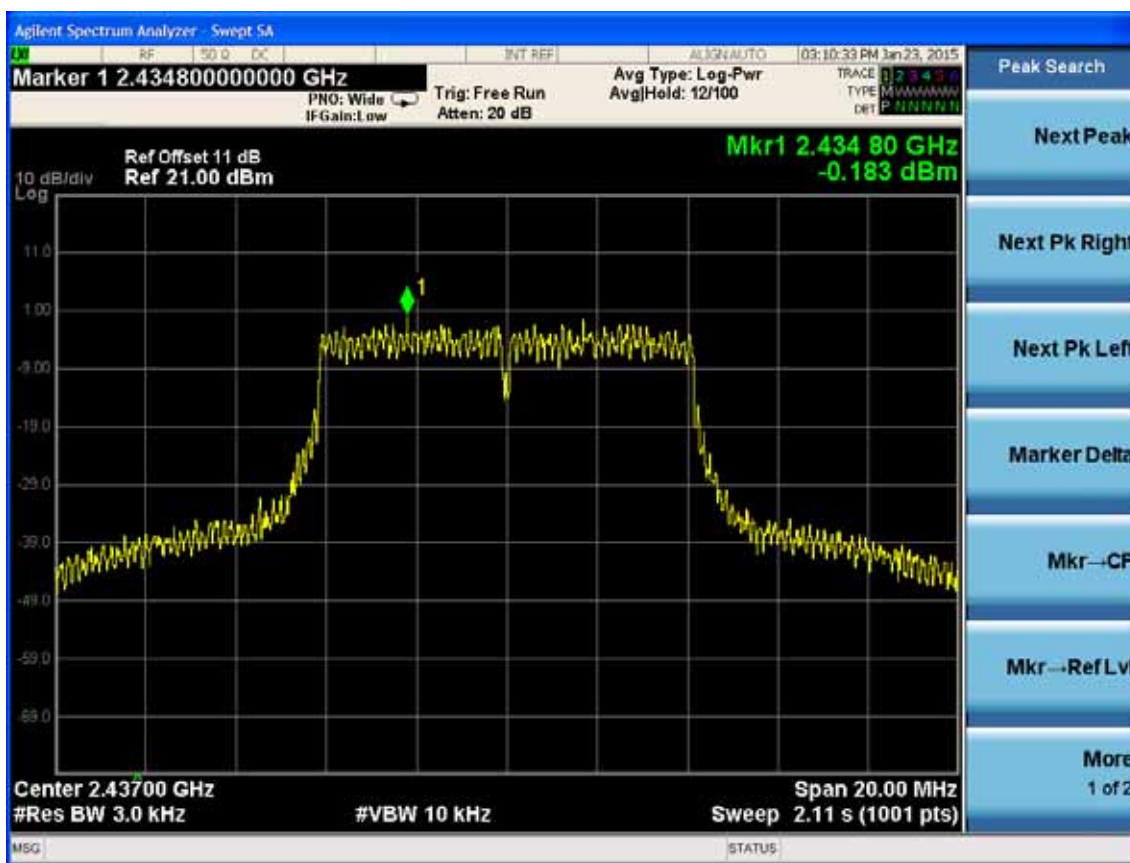
Test Mode: IEEE 802.11b



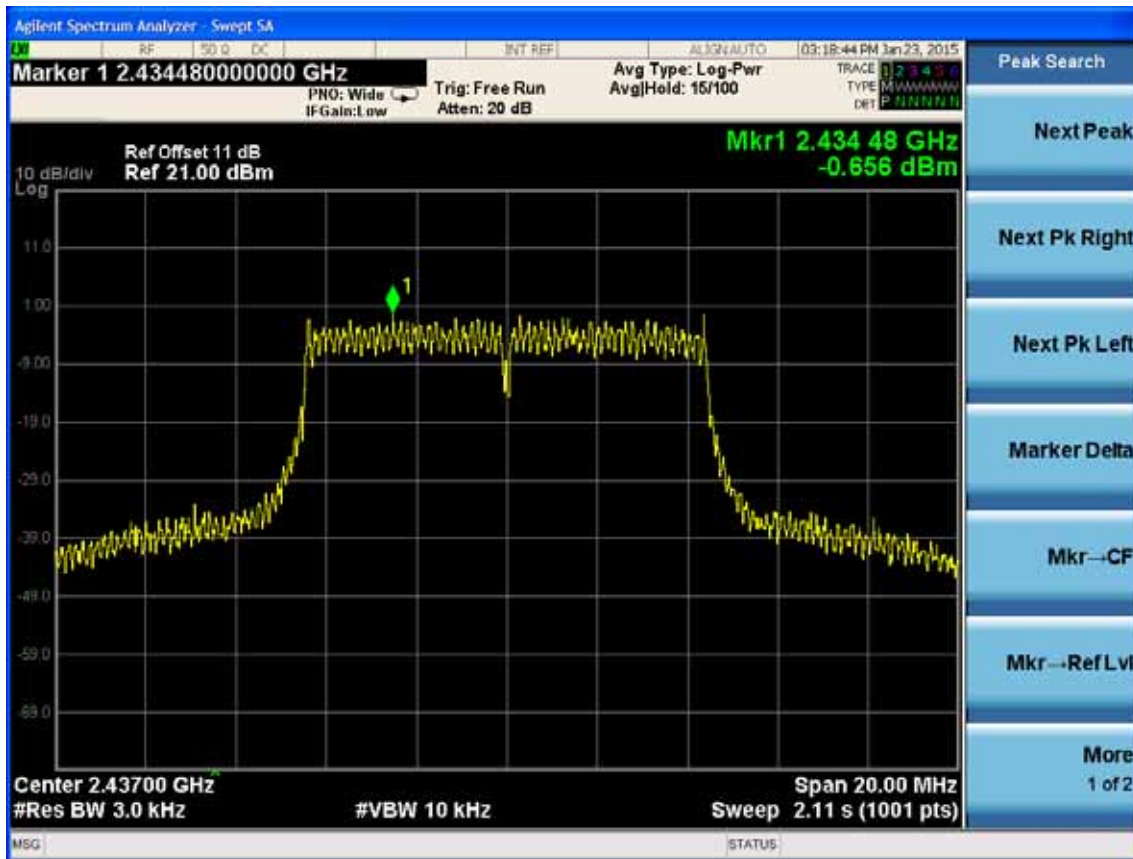
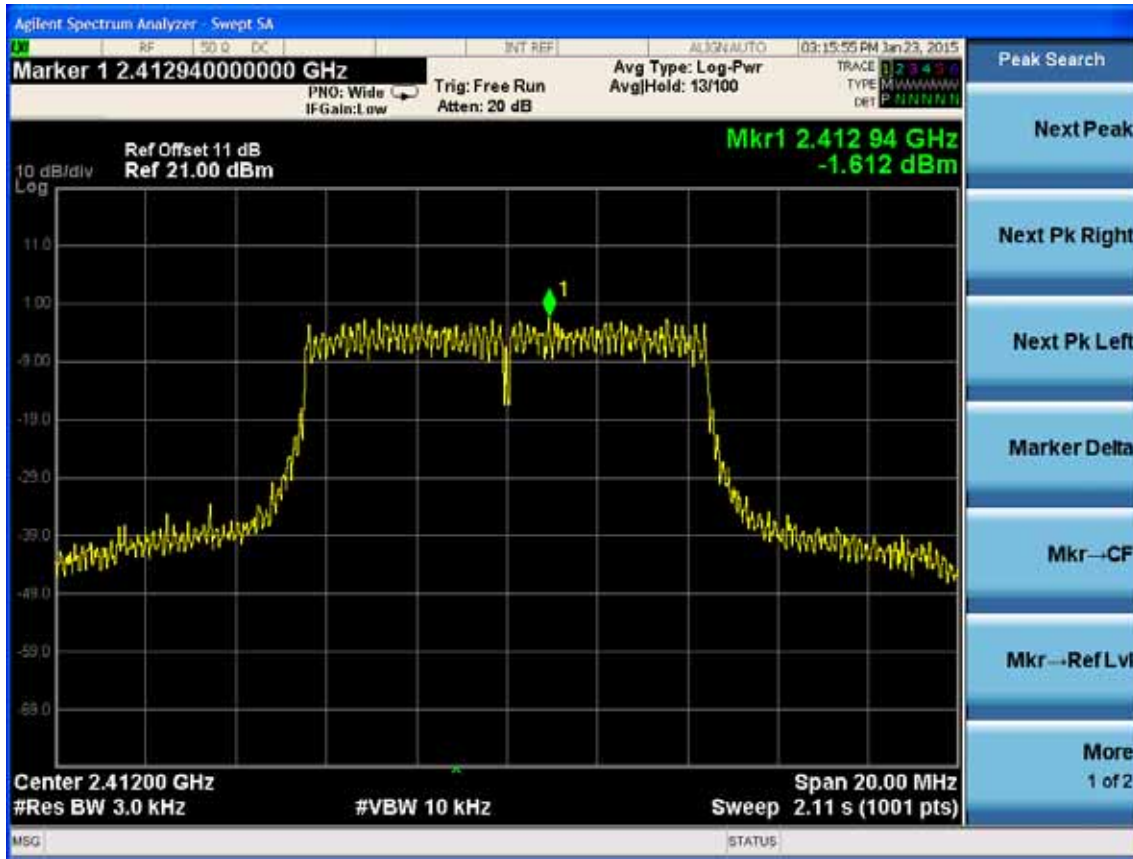


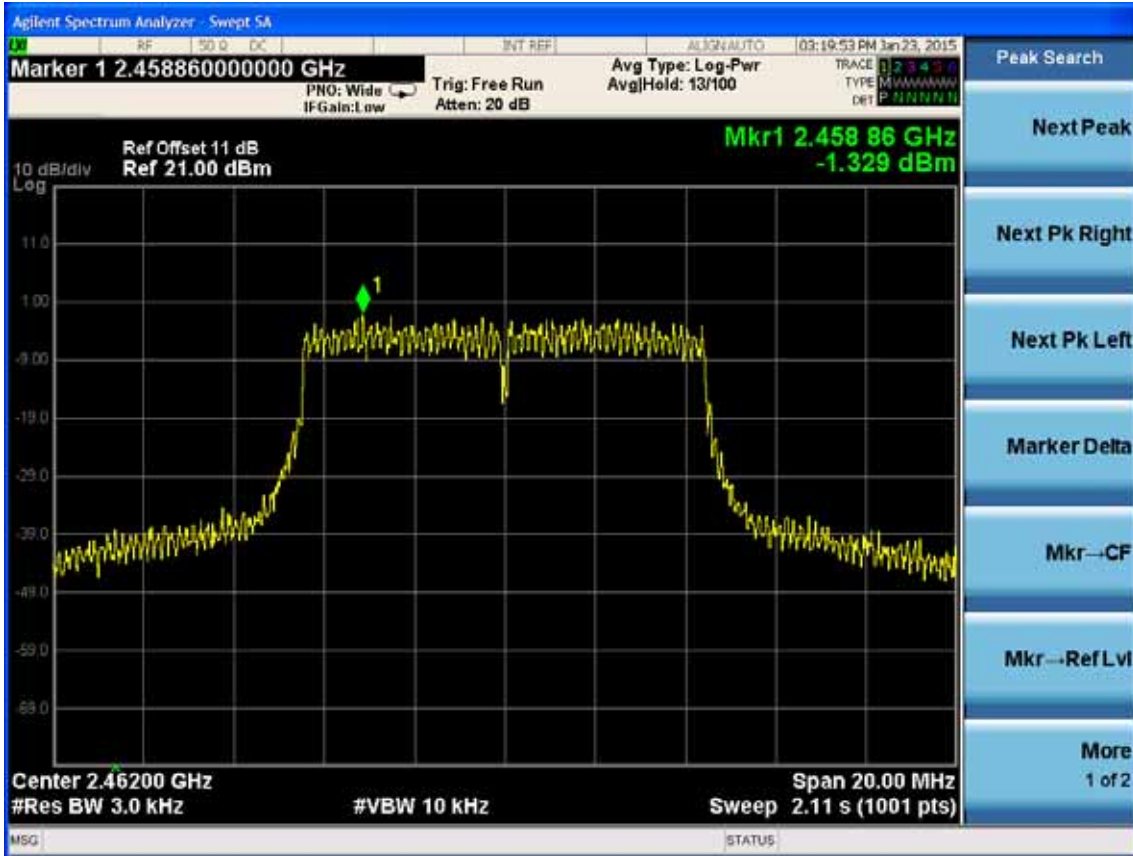
Test Mode: IEEE 802.11g





Test Mode: IEEE 11nHT20





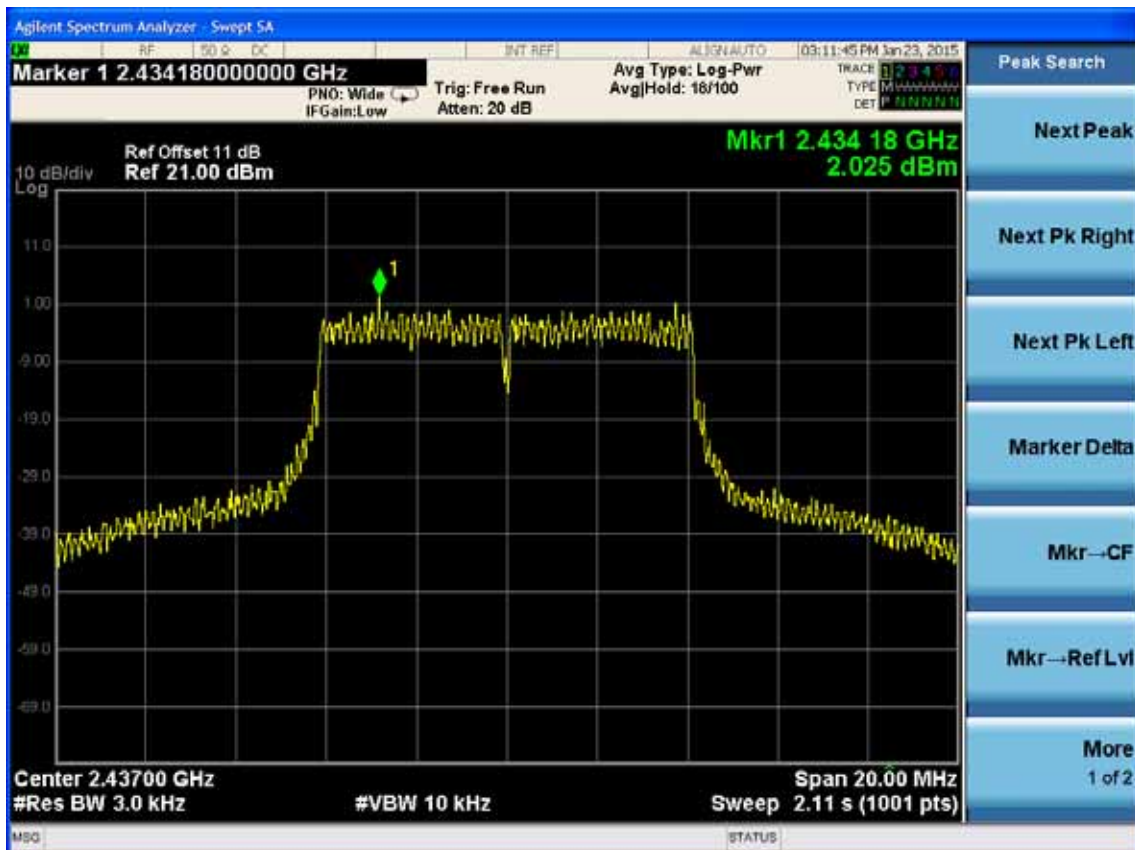
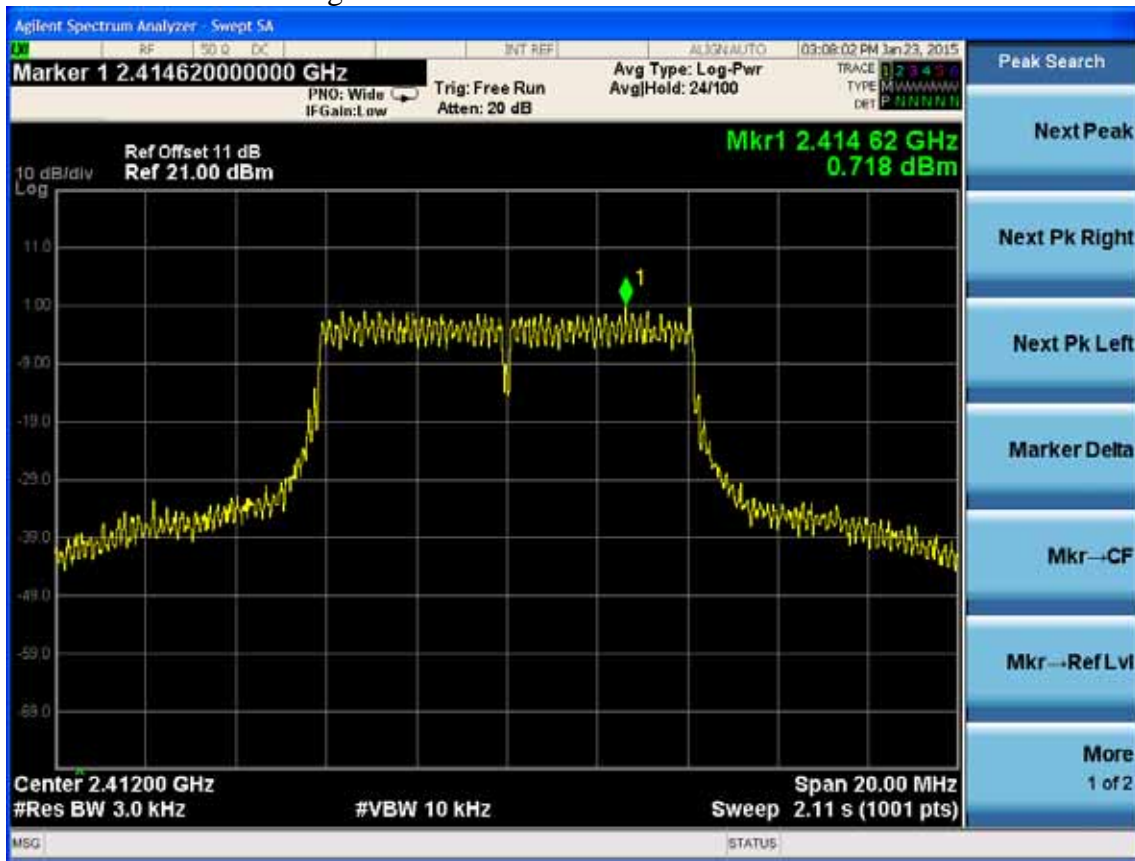
10MHz Antenna 2

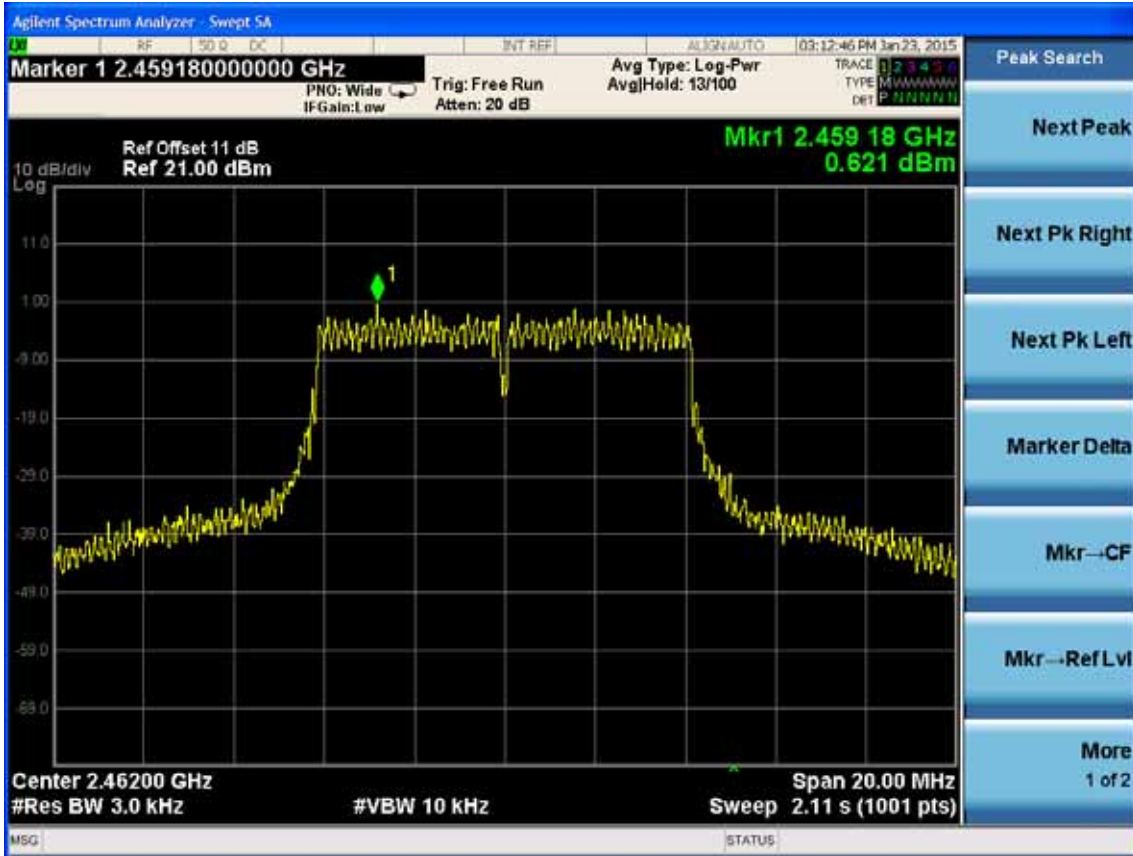
Test Mode: IEEE 802.11b



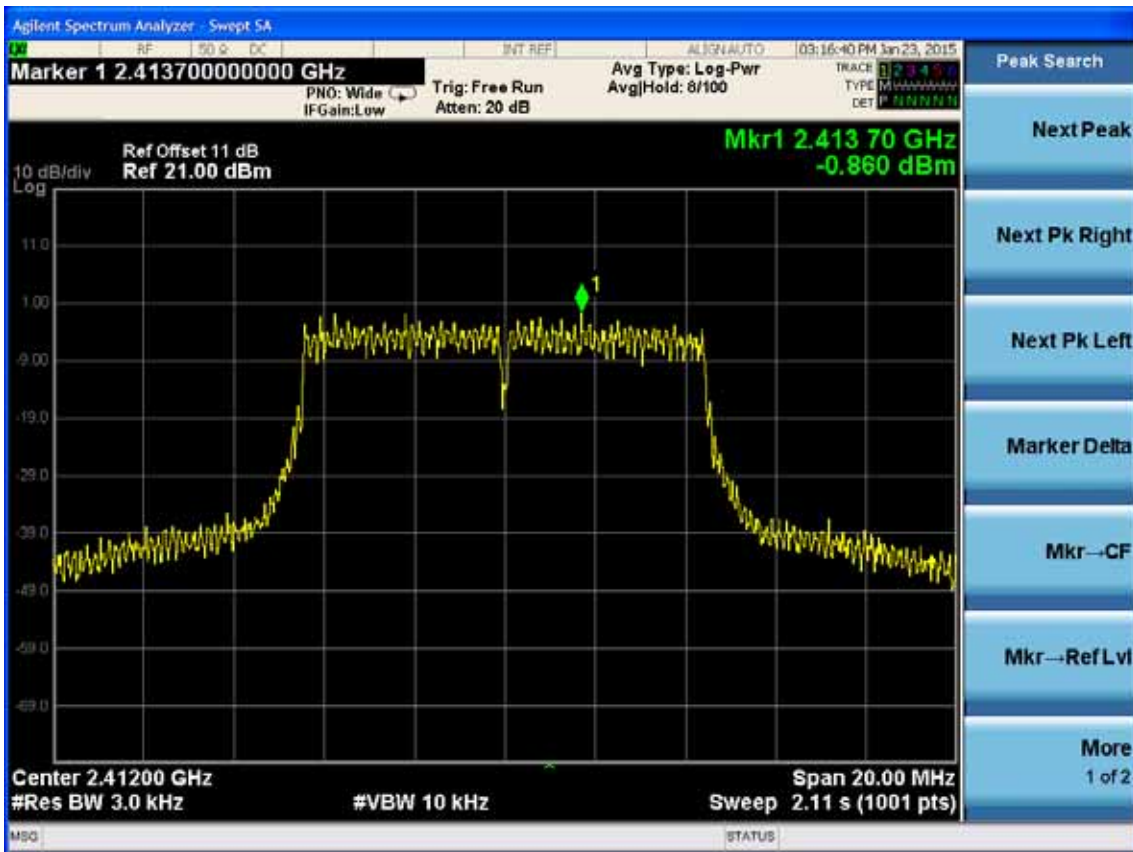


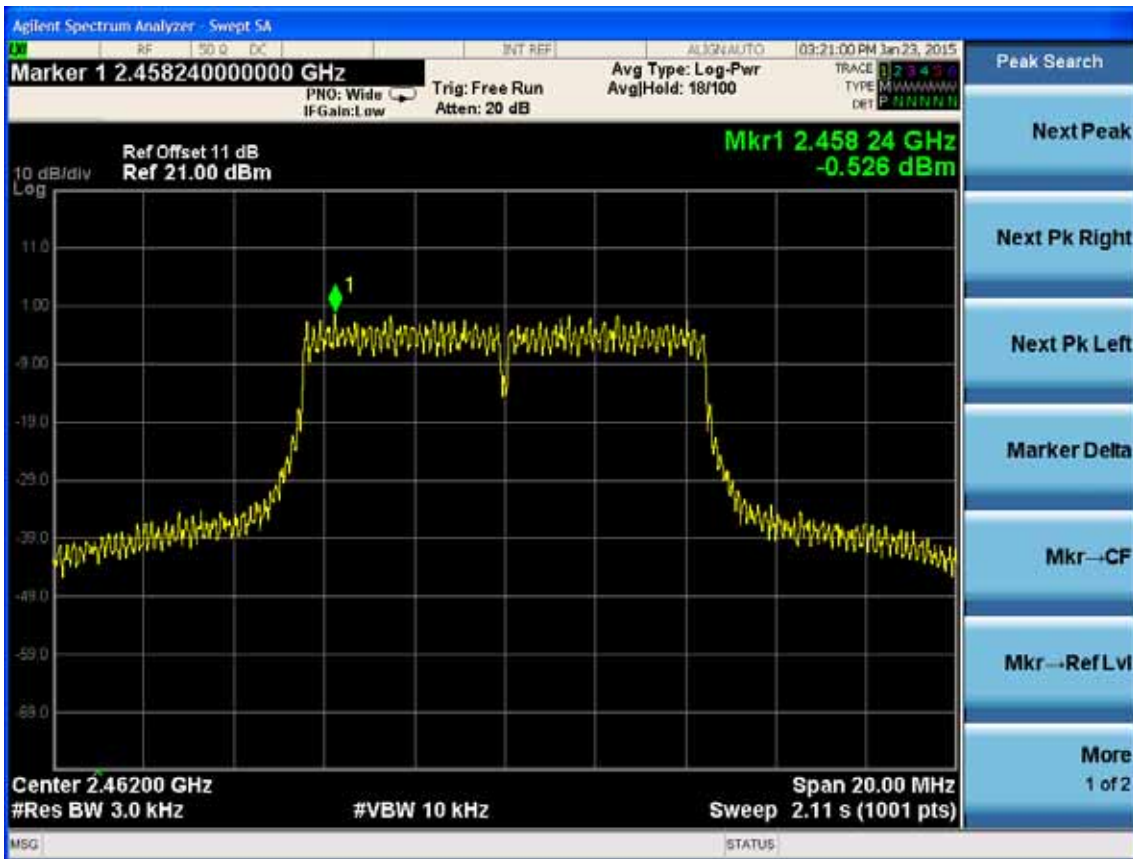
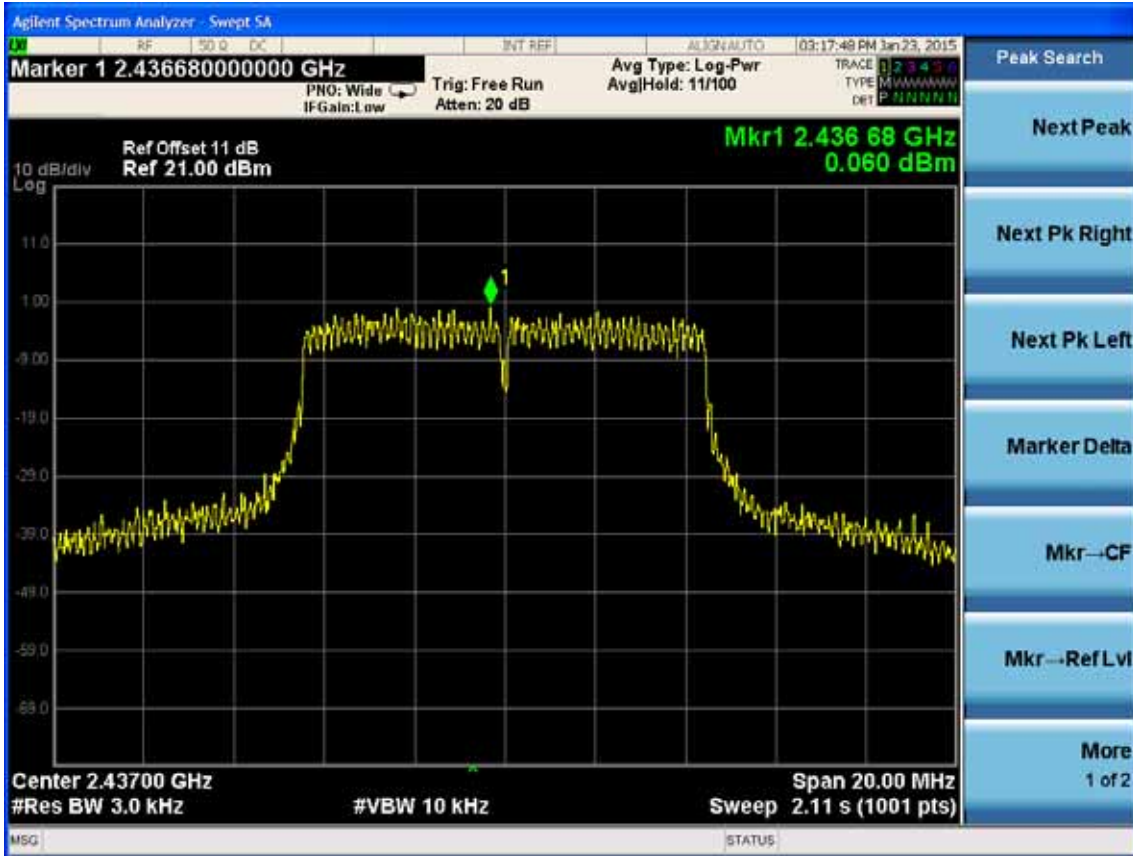
Test Mode: IEEE 802.11g





Test Mode: IEEE 11nHT20





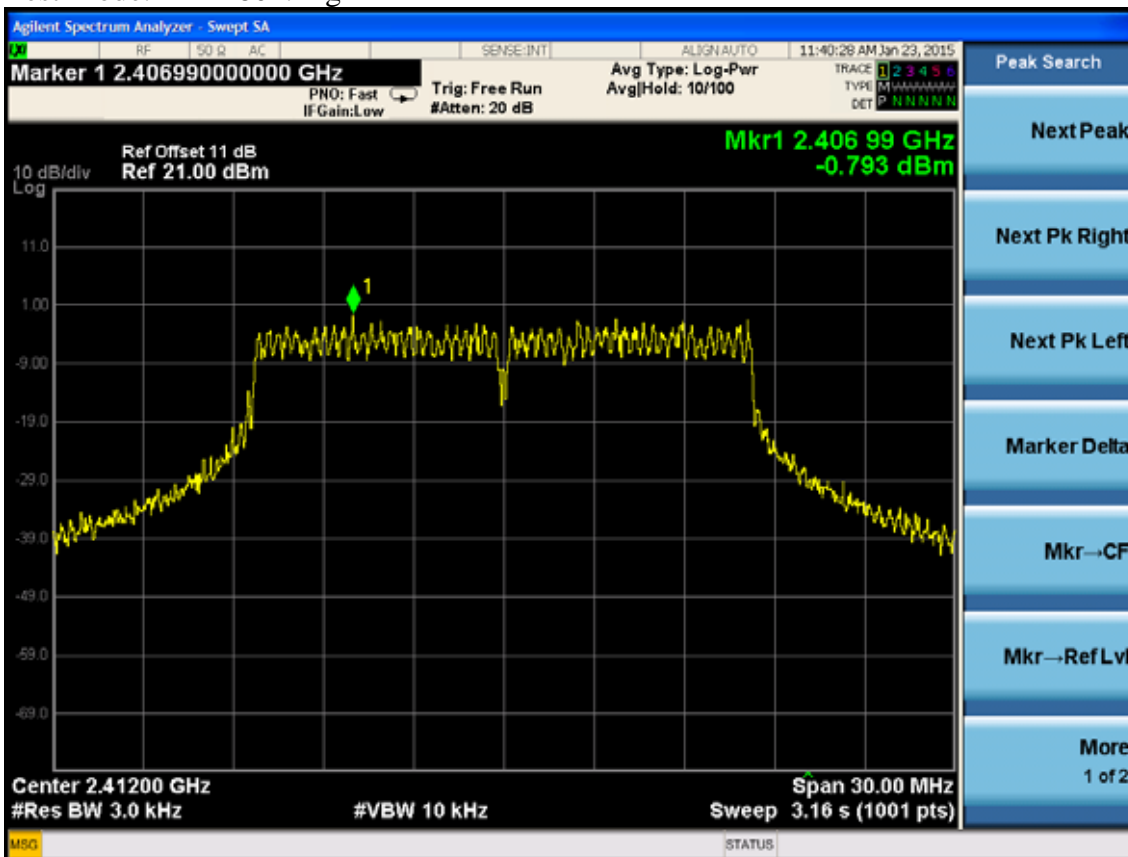
20MHz Antenna 1

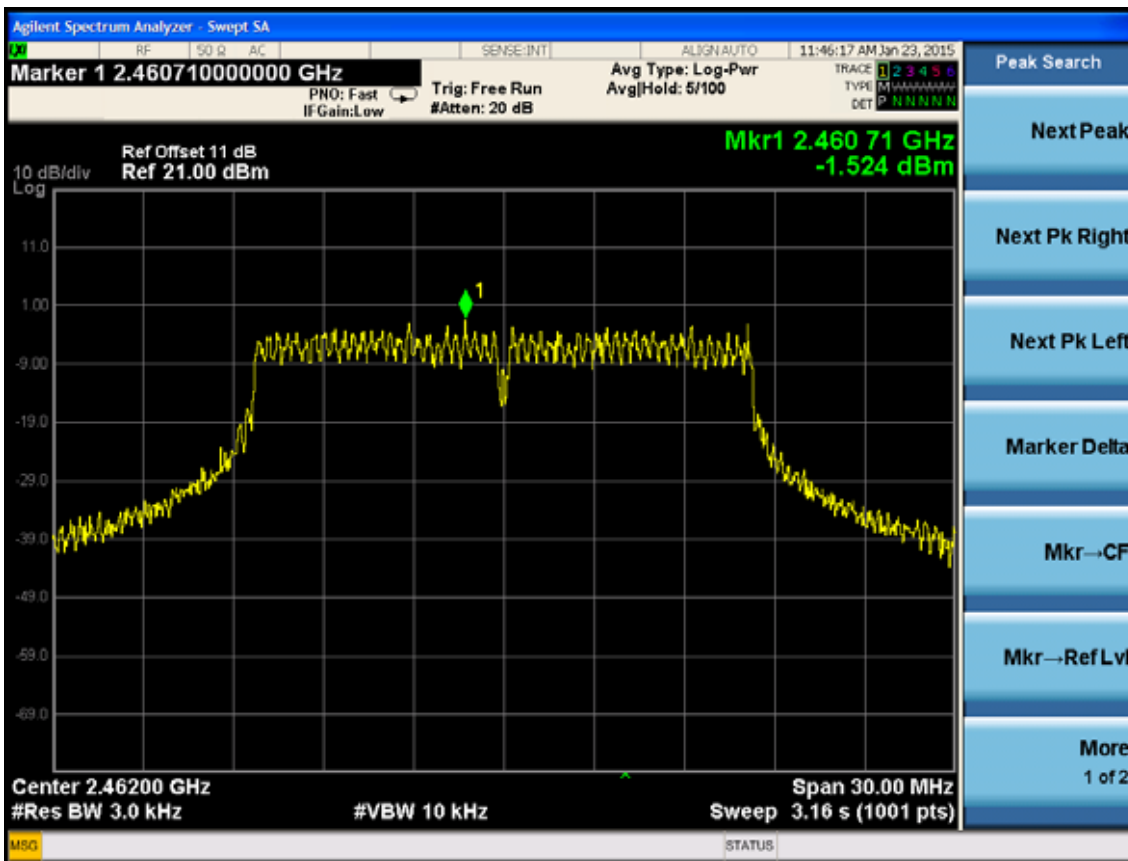
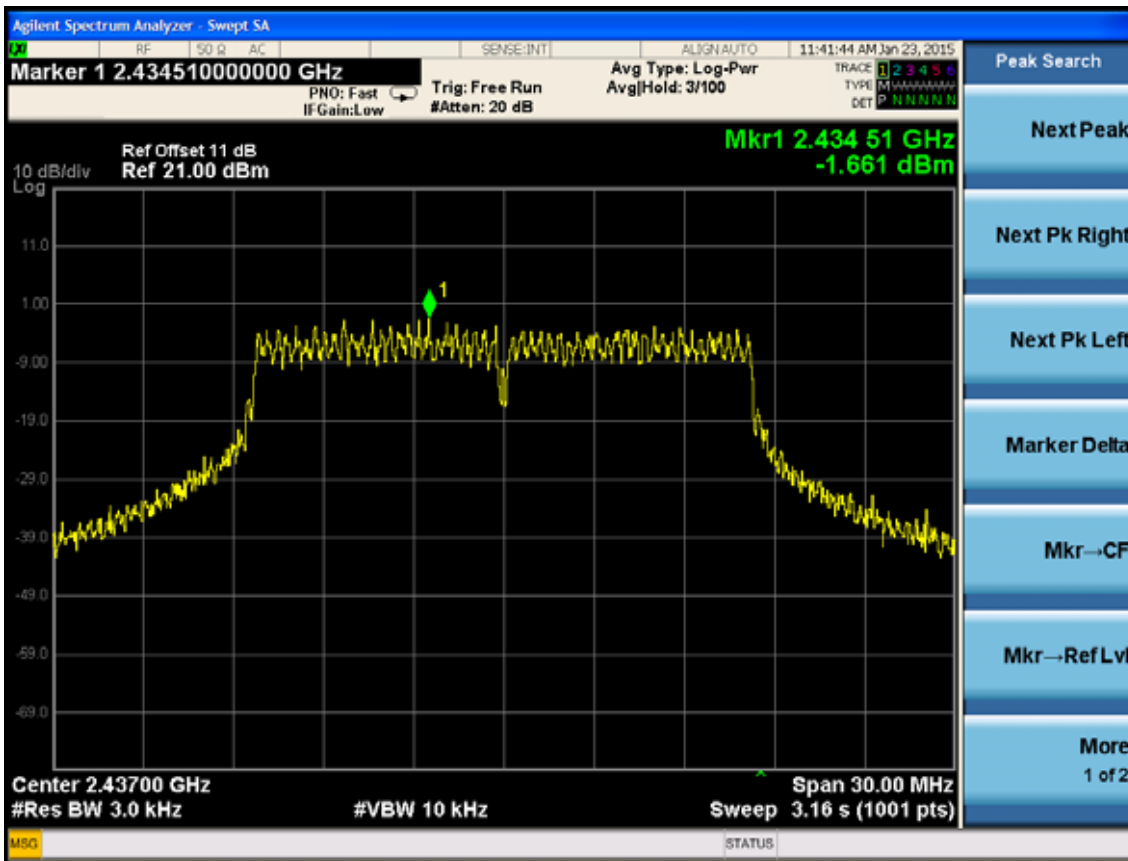
Test Mode: IEEE 802.11b



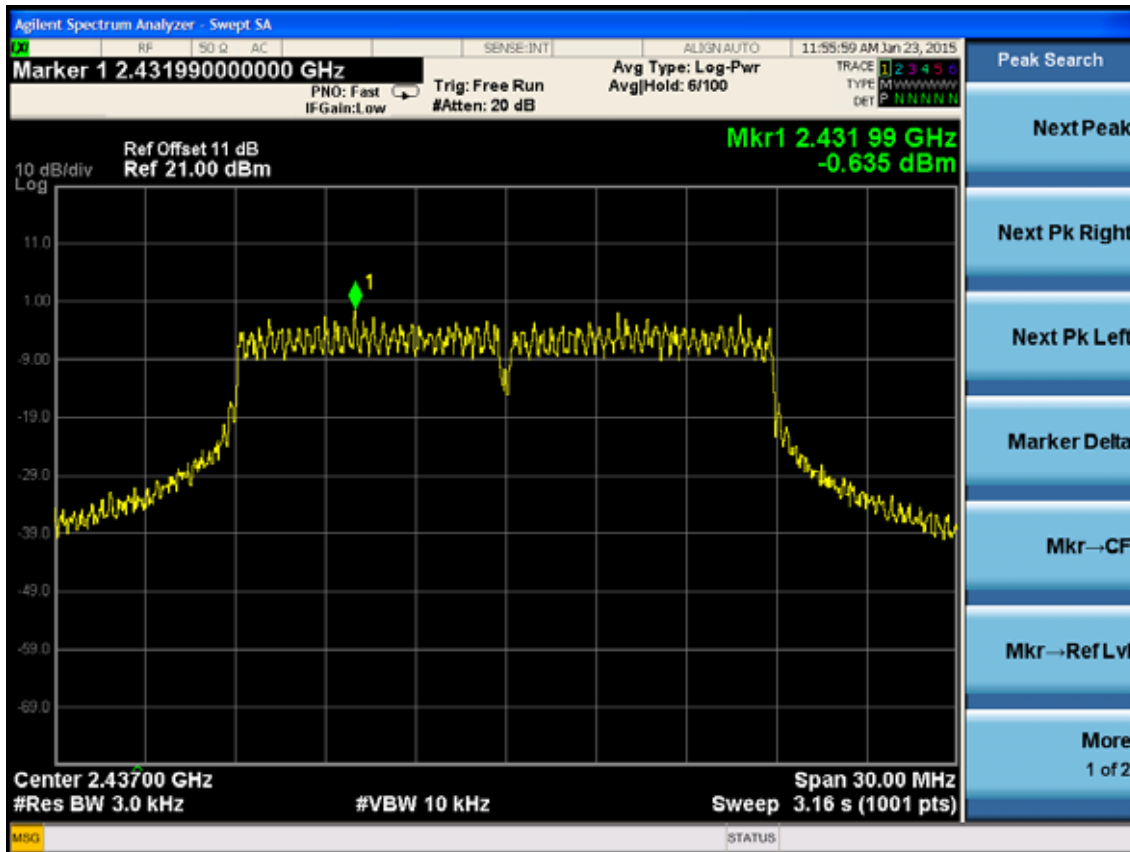
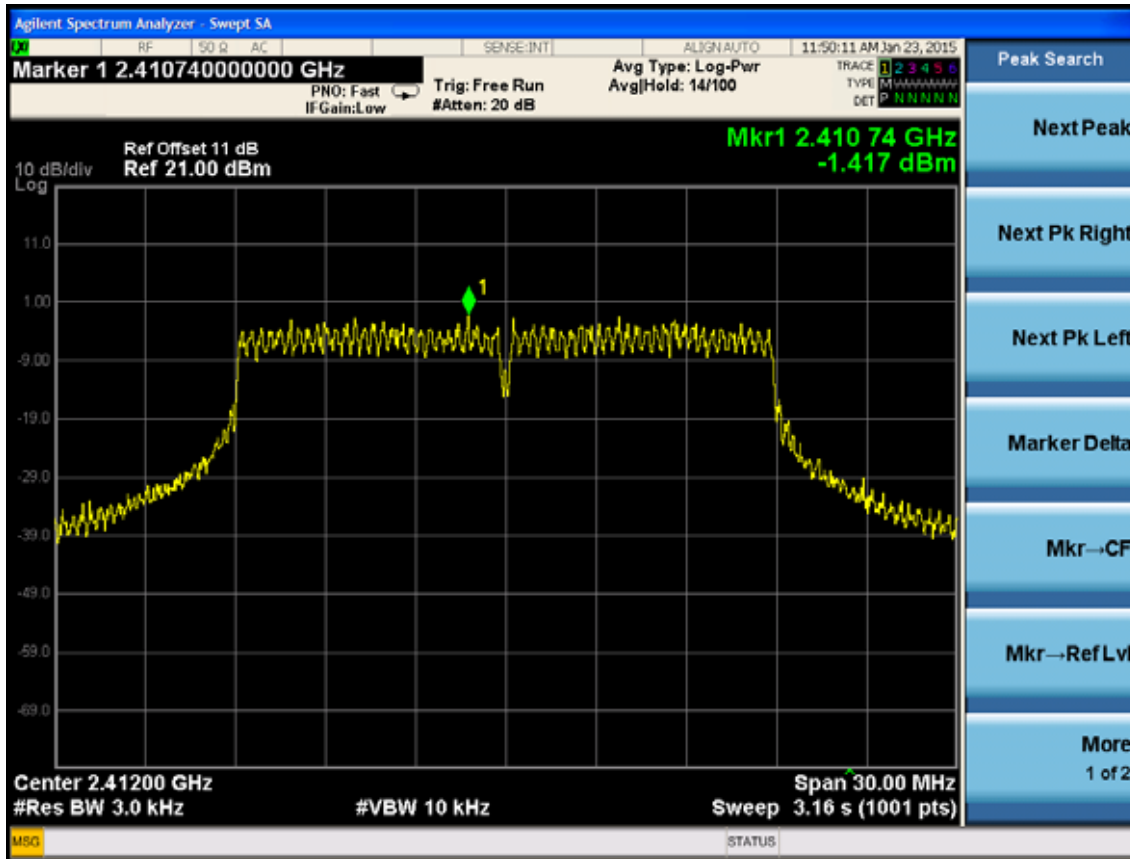


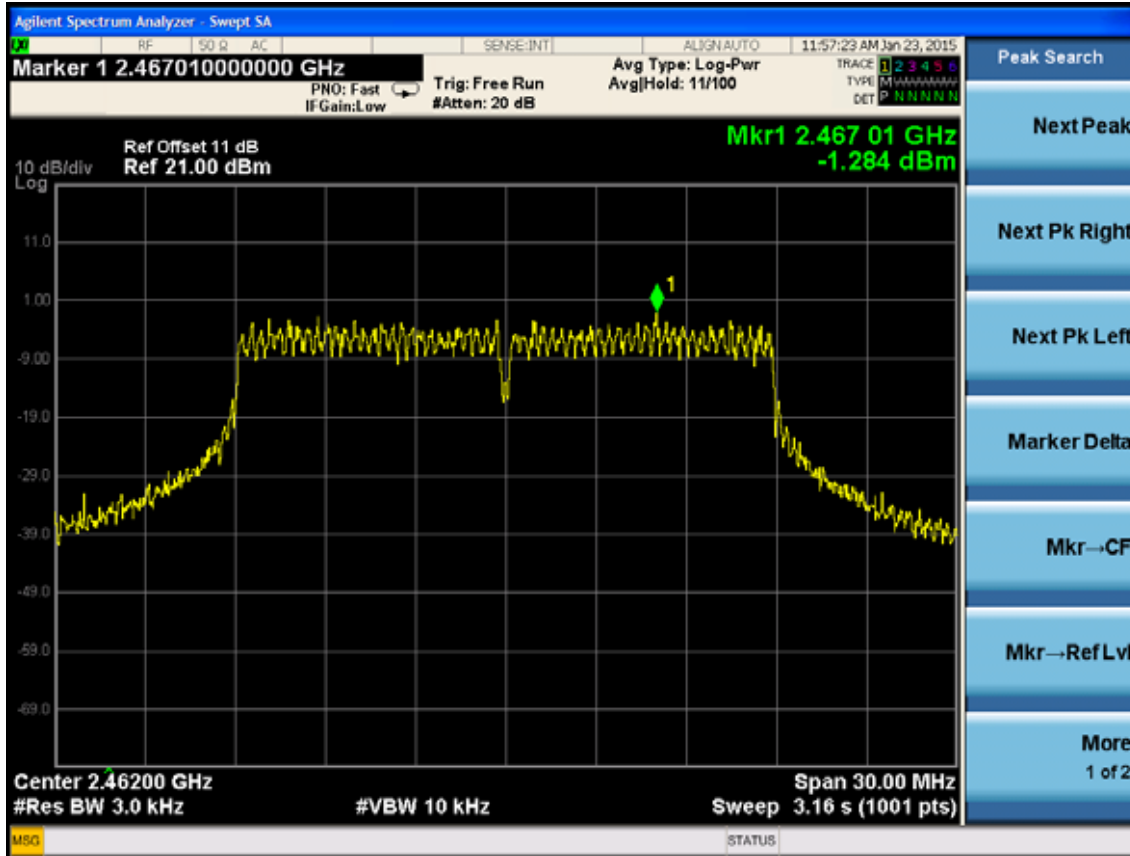
Test Mode: IEEE 802.11g



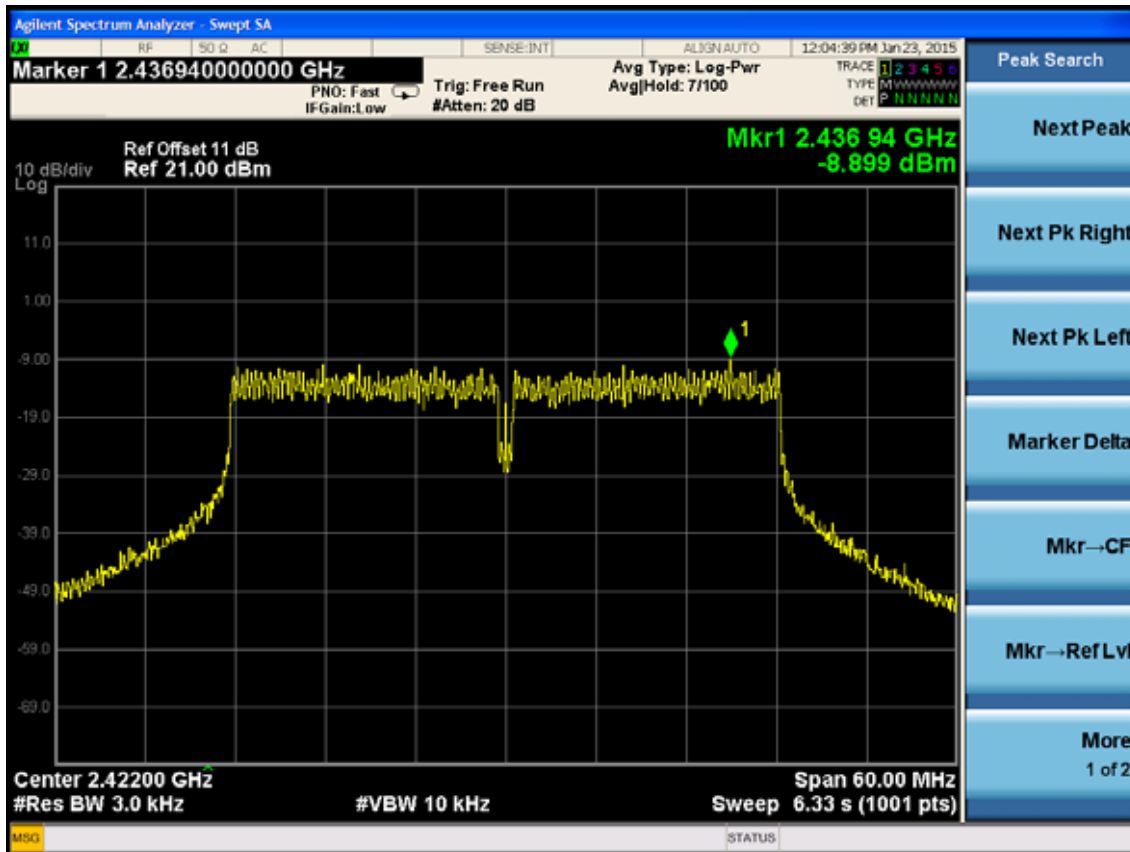


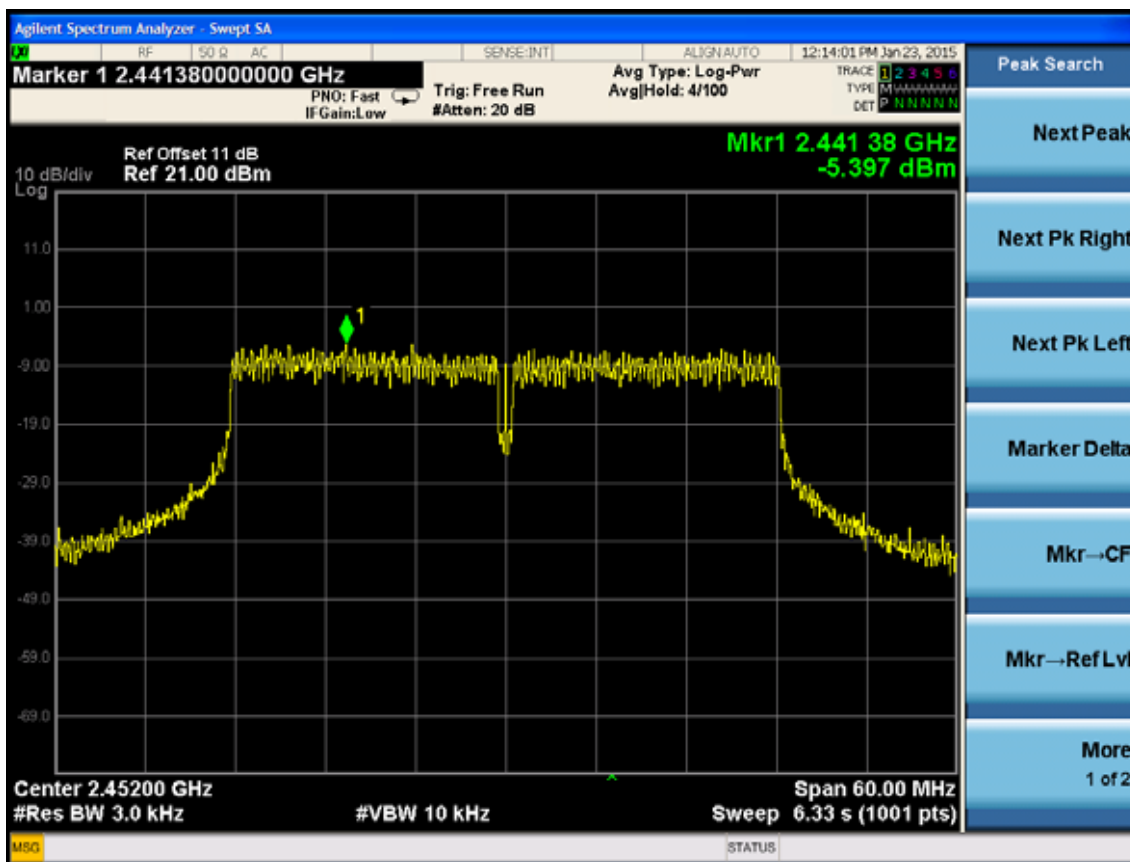
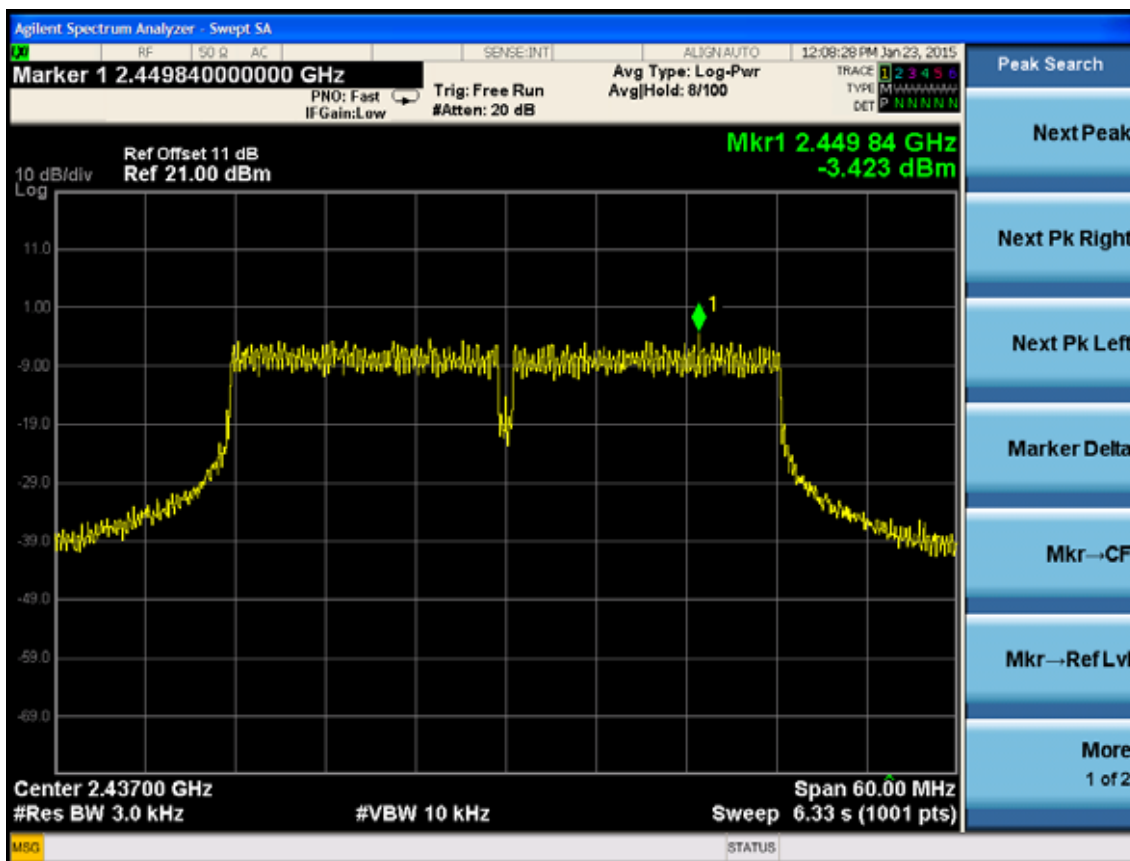
Test Mode: IEEE 11nHT20





Test Mode: IEEE 11nHT40

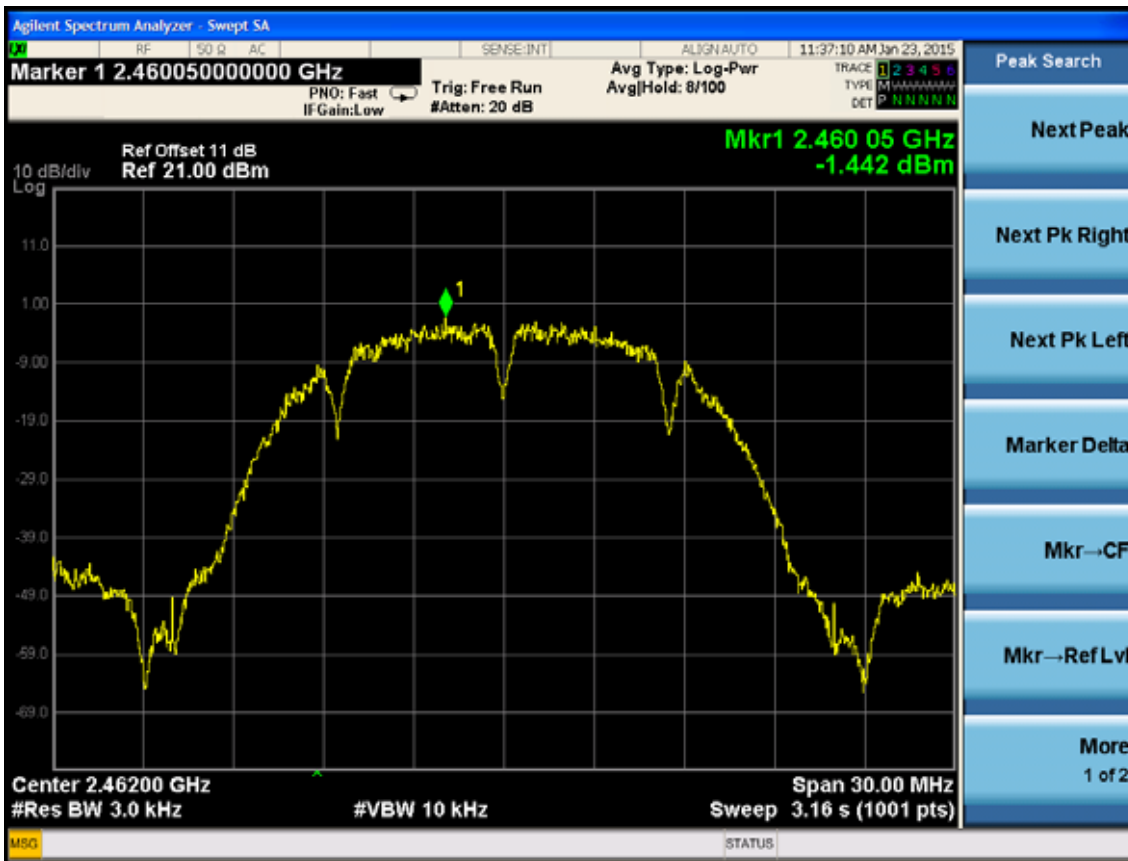




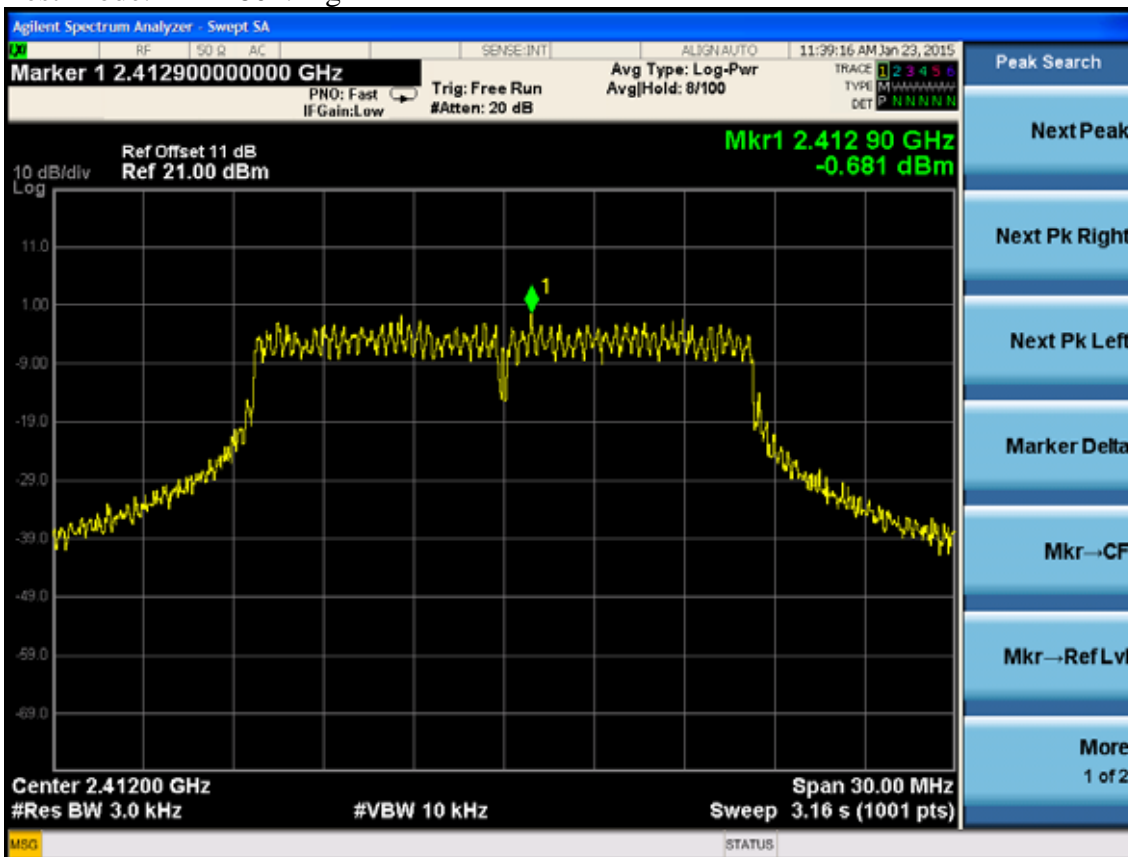
20MHz Antenna 2

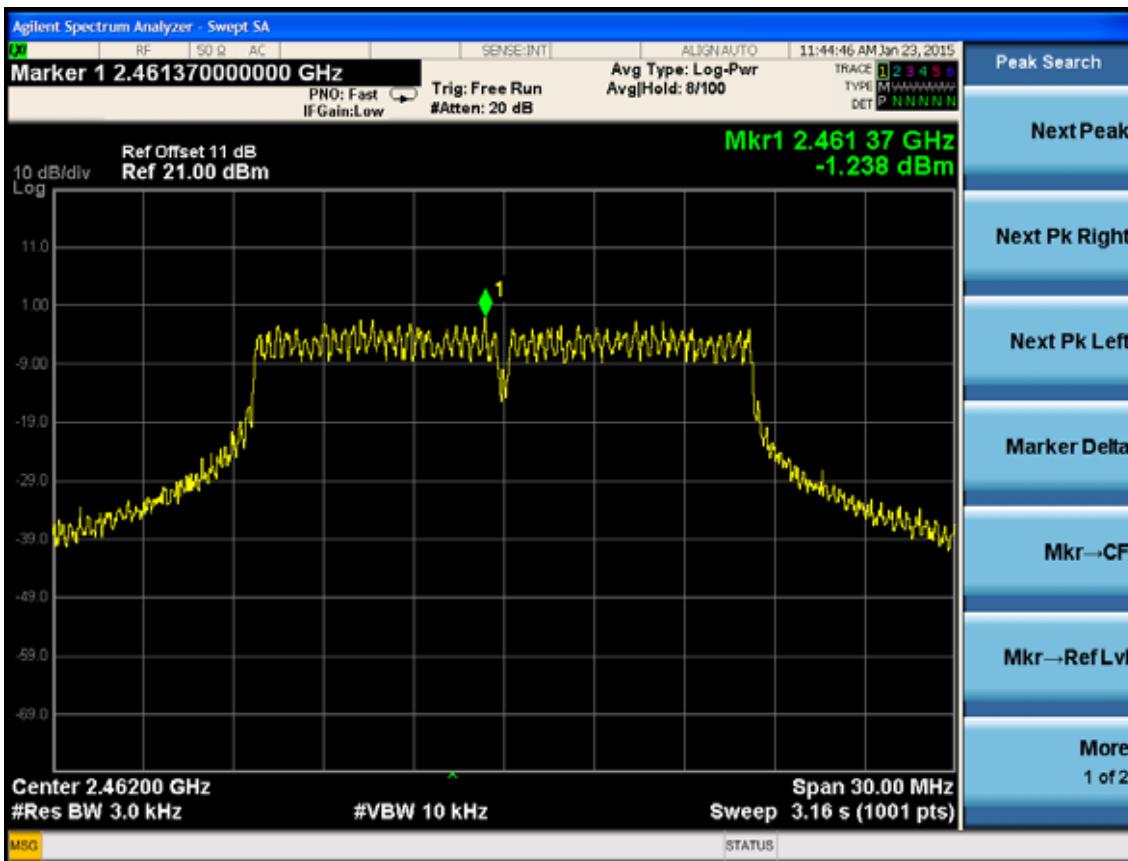
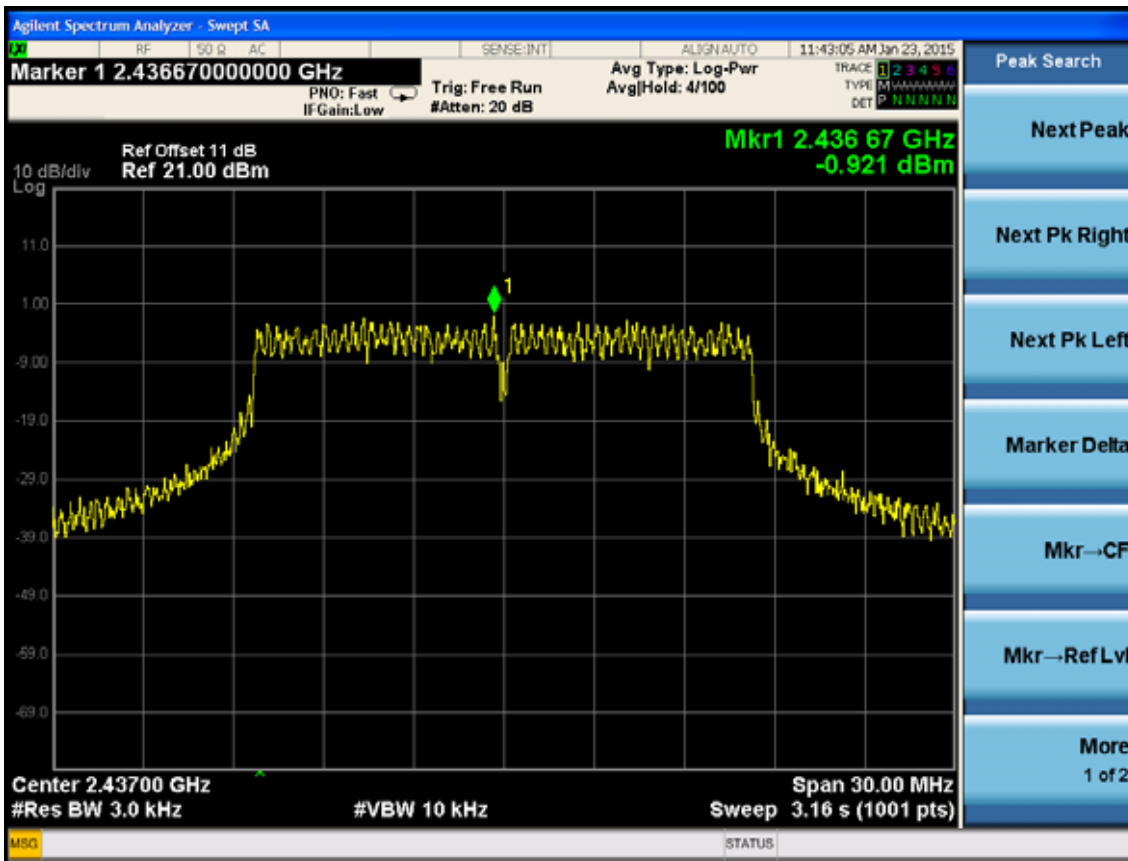
Test Mode: IEEE 802.11b



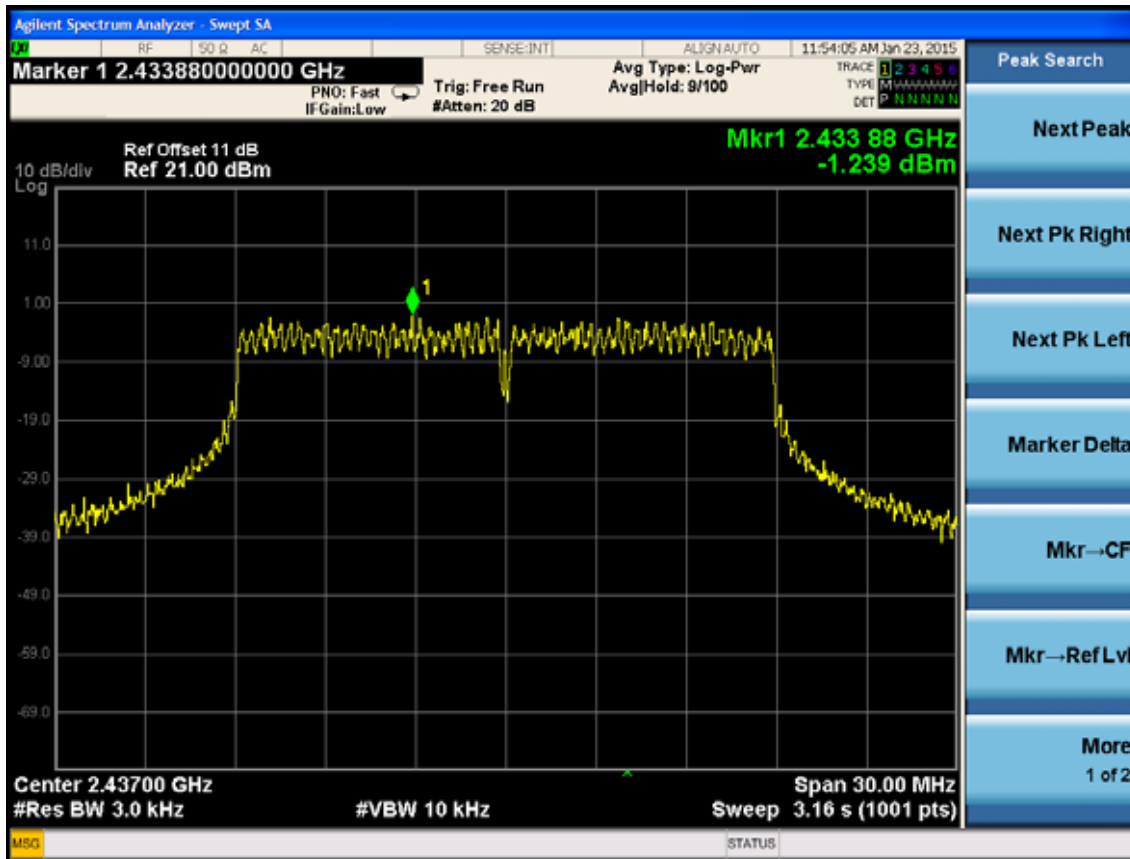
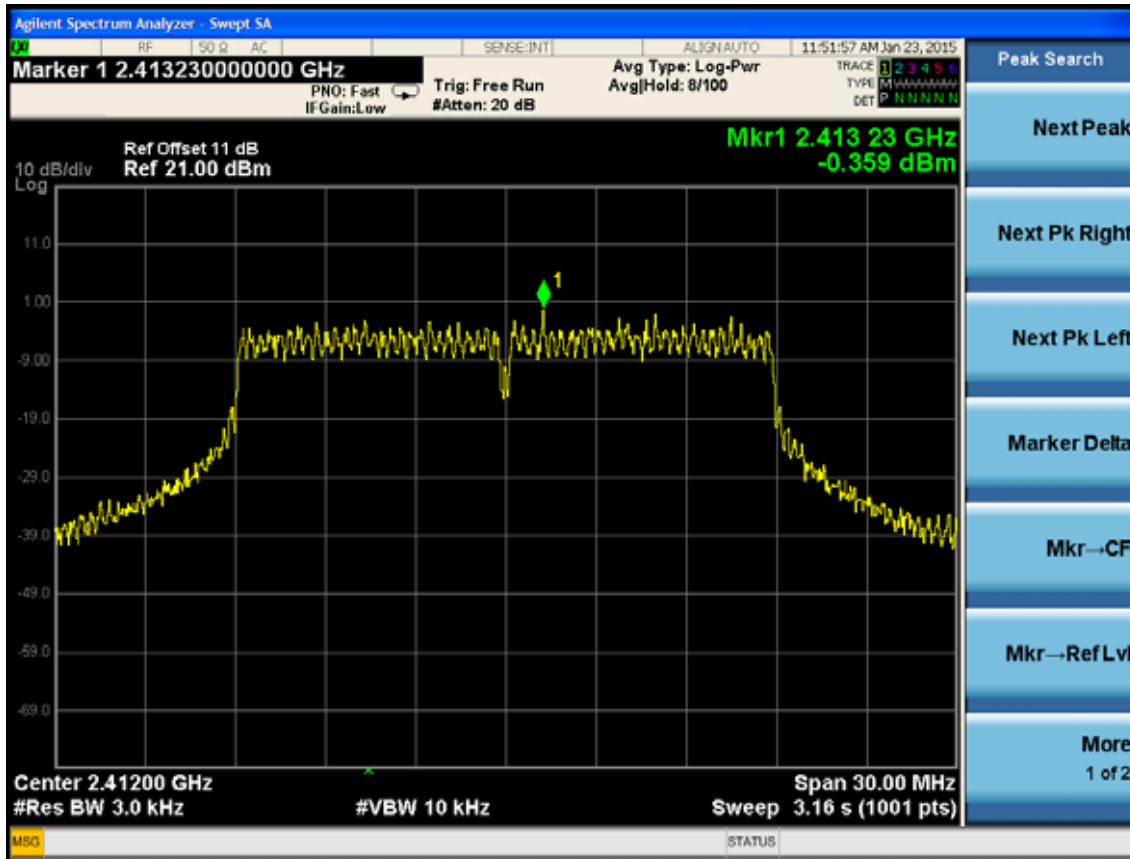


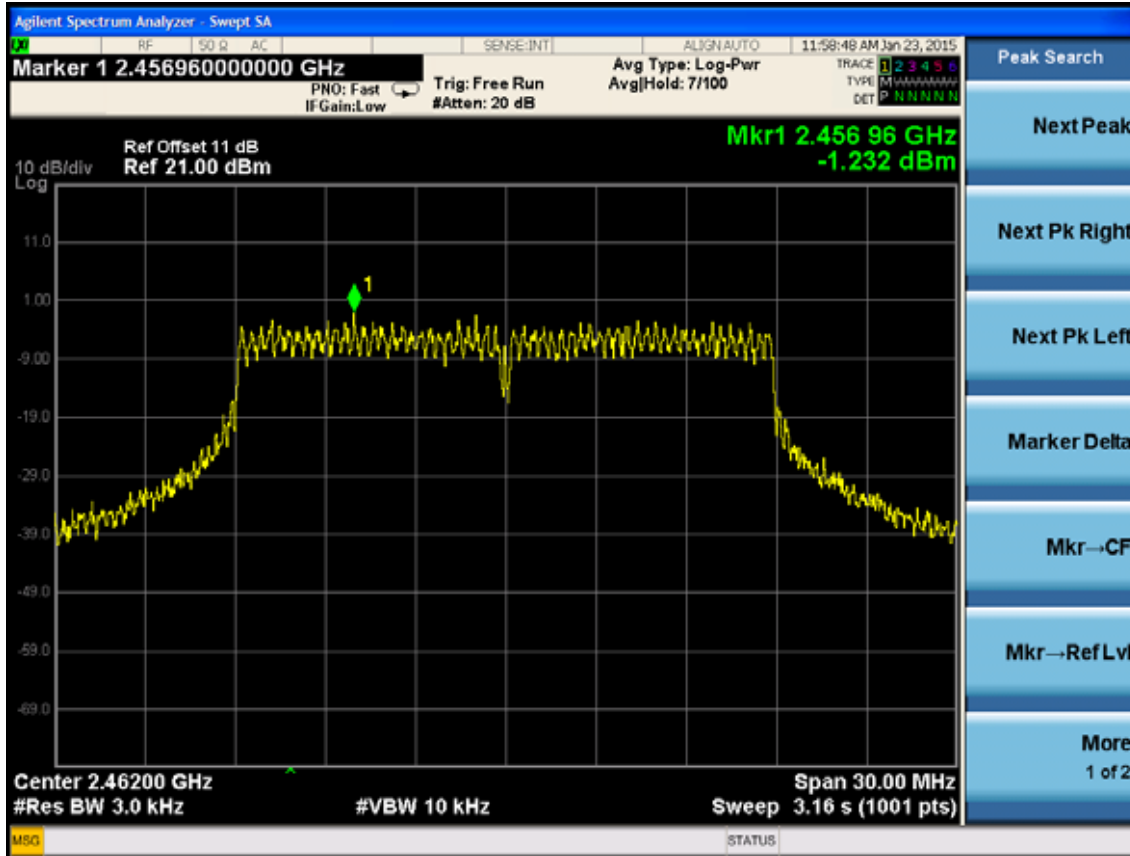
Test Mode: IEEE 802.11g





Test Mode: IEEE 11nHT20





Test Mode: IEEE 11nHT40

