

5.4.2. 11n-H40

Operation Mode	Antenna	Channel	Channel Frequency (MHz)	Attenuator + Cable offset (dB)	Peak Power Limit (dB m)	Peak Power Limit (dB m)
OFDM 802.11n_HT40	ANT0	Low	2 422	19.57	13.82	30
		Middle	2 437		14.09	
		High	2 452		14.31	
	ANT1	Low	2 422		12.90	
		Middle	2 437		13.33	
		High	2 452		13.12	
	ANT0+ANT1 (Calculated)	Low	2 422		16.39	
		Middle	2 437		16.74	
		High	2 452		16.77	
OFDM 802.11n_HT40	ANT0	Low	5 755	22.22	11.94	
		High	5 795		11.85	
	ANT1	Low	5 755		12.24	
		High	5 795		11.25	
	ANT0+ANT1 (Calculated)	Low	5 755		15.10	
		High	5 795		14.57	

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802.11a_HT40 26 dB Bandwidth and Peak Power

ANT0

26 dB Bandwidth

2 422 MHz



2 437 MHz

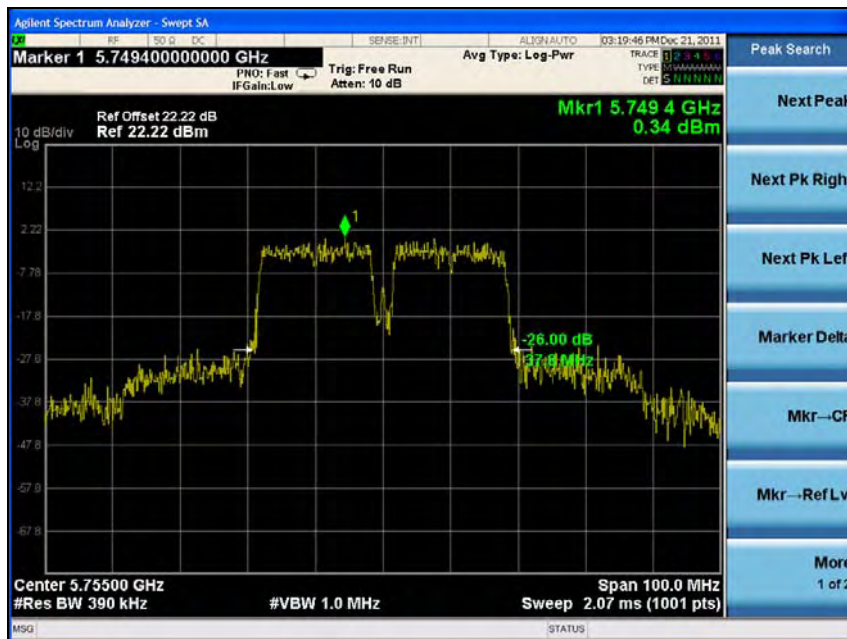


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2 452 MHz



5 755 MHz



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5 795 MHz



Peak Power

2 422 MHz



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2 437 MHz



2 452 MHz



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5 755 MHz



5 795 MHz



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ANT1

26 dB Bandwidth

2 422 MHz



2 437 MHz



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2 452 MHz



5 755 MHz



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5 795 MHz



Peak Power

2 422 MHz



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2 437 MHz



2 452 MHz



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5 755 MHz



5 795 MHz



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6. Power spectral density measurement

6.1. Test setup



6.2. Limit

According to §15.247(e), For digitally modulated system, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph(b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density

6.3. Test procedure

1. Place the EUT on the table and set it in transmitting mode
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3 kHz, VBW = 10 kHz, Span = 300 kHz, Sweep = 100 s
3. Record the max reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

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6.4. Test result

Ambient temperature : (24 ± 2) °C
 Relative humidity : 49 % R.H.

ANT0

Operation Mode	Frequency (MHz)	Final RF Power Level in 3 kHz BW (dB m)	Limit (dB m)
DSSS 802.11b	2 412	-8.44	8
	2 437	-9.33	
	2 462	-8.80	
OFDM 802.11g	2 412	-7.84	
	2 437	-9.87	
	2 462	-9.47	
OFDM 802.11a	5 745	-13.07	
	5 785	-12.97	
	5 825	-13.18	

Operation Mode	Frequency (MHz)	Final RF Power Level in 3 kHz BW (dB m)	Add 10log(2) at the Result (dB m)	Limit (dB m)
OFDM 802.11n_HT20	2 412	-1.70	1.31	8
	2 437	-2.25	0.76	
	2 462	-1.78	1.23	
OFDM 802.11n_HT40	2 422	-8.11	-5.10	
	2 437	-7.98	-4.97	
	2 452	-7.80	-4.79	
OFDM 802.11n_HT20	5 745	-14.32	-11.31	
	5 785	-14.34	-11.33	
	5 825	-14.58	-11.57	
OFDM 802.11n_HT40	5 755	-13.00	-9.99	
	5 795	-13.17	-10.16	

It has 2 outputs and 10log(2) is **10log(2) = 3.01 dB**

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ANT1

Operation Mode	Frequency (MHz)	Final RF Power Level in 3 kHz BW (dB m)	Limit (dB m)
DSSS 802.11b	2 412	-9.39	8
	2 437	-9.46	
	2 462	-9.21	
OFDM 802.11g	2 412	-11.48	
	2 437	-11.66	
	2 462	-11.86	
OFDM 802.11a	5 745	-12.65	
	5 785	-13.48	
	5 825	-13.86	

Operation Mode	Frequency (MHz)	Final RF Power Level in 3 kHz BW (dB m)	Add 10log(2) at the Result (dB m)	Limit (dB m)
OFDM 802.11n_HT20	2 412	-3.05	-0.04	8
	2 437	-3.03	-0.02	
	2 462	-2.67	0.34	
OFDM 802.11n_HT40	2 422	-9.07	-6.06	
	2 437	-9.21	-6.20	
	2 452	-9.30	-6.29	
OFDM 802.11n_HT20	5 745	-13.95	-10.94	
	5 785	-14.69	-11.68	
	5 825	-15.21	-13.20	
OFDM 802.11n_HT40	5 755	-14.37	-11.36	
	5 795	-13.49	-10.48	

It has 2 outputs and $10\log(2)$ is $10\log(2) = 3.01$ dB

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ANT0

2.4 GHz

802.11b

Low channel



Middle channel



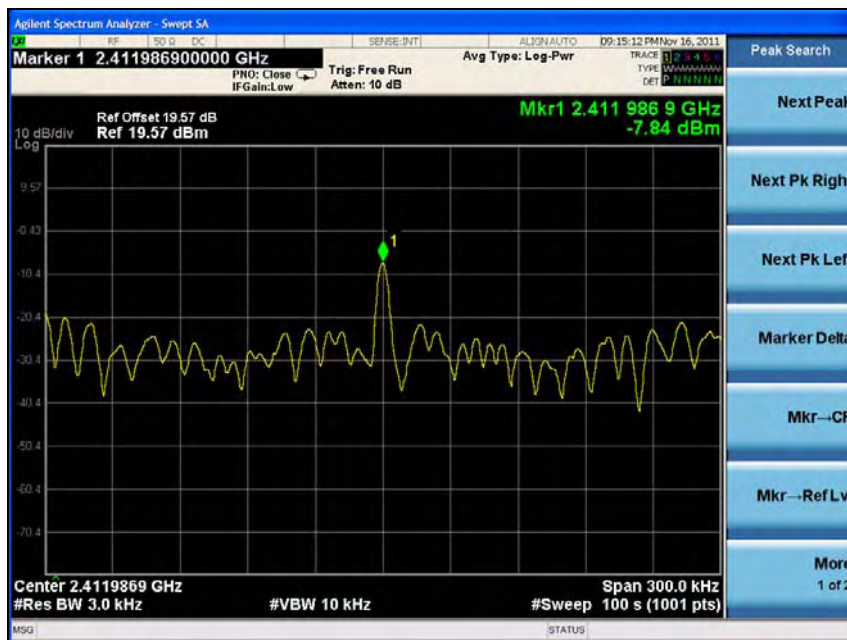
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High channel



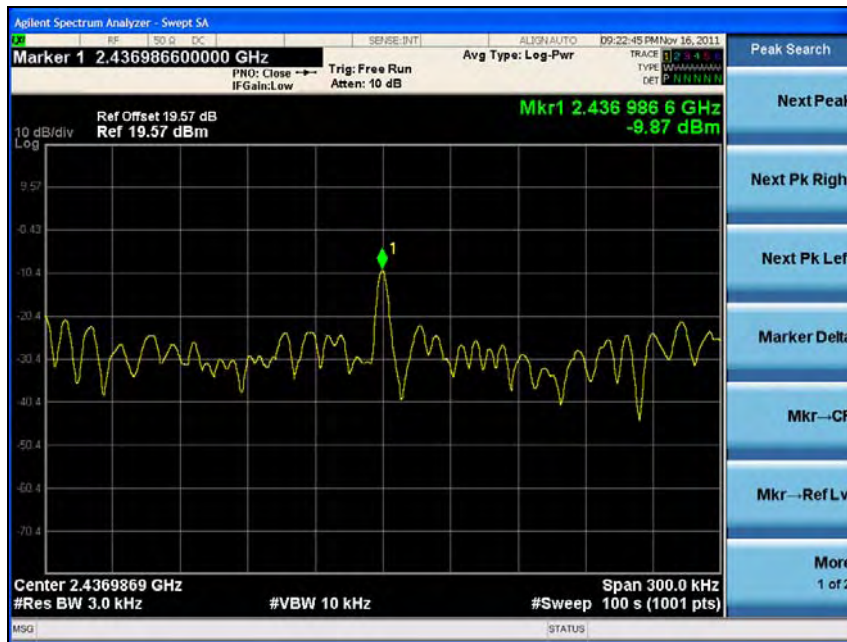
802.11g

Low channel

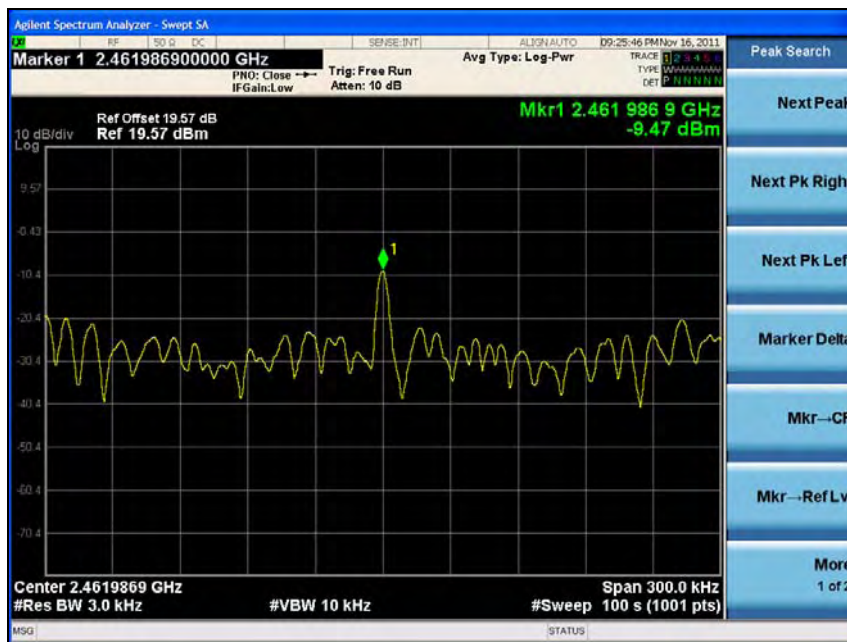


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Middle channel

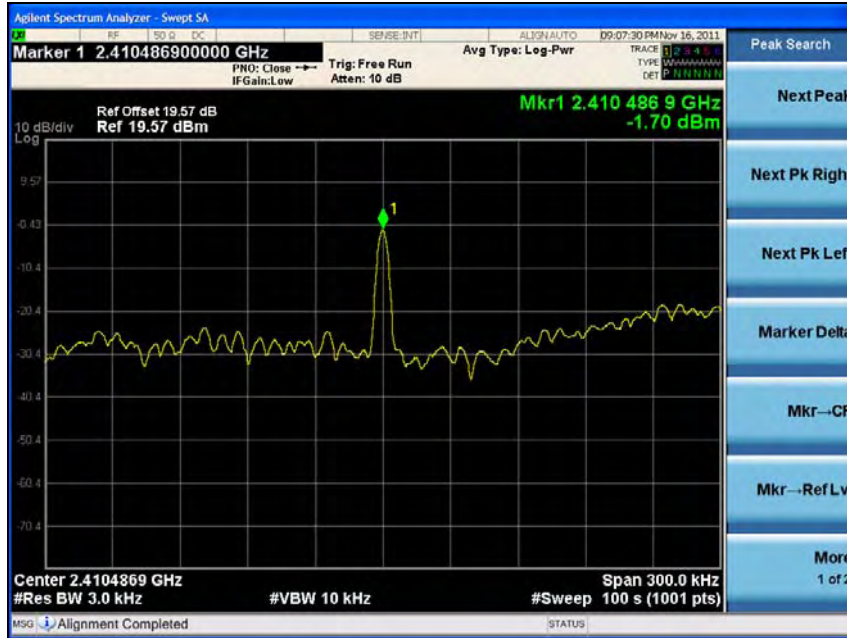


High channel



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802.11n_HT20
Low channel



Middle channel



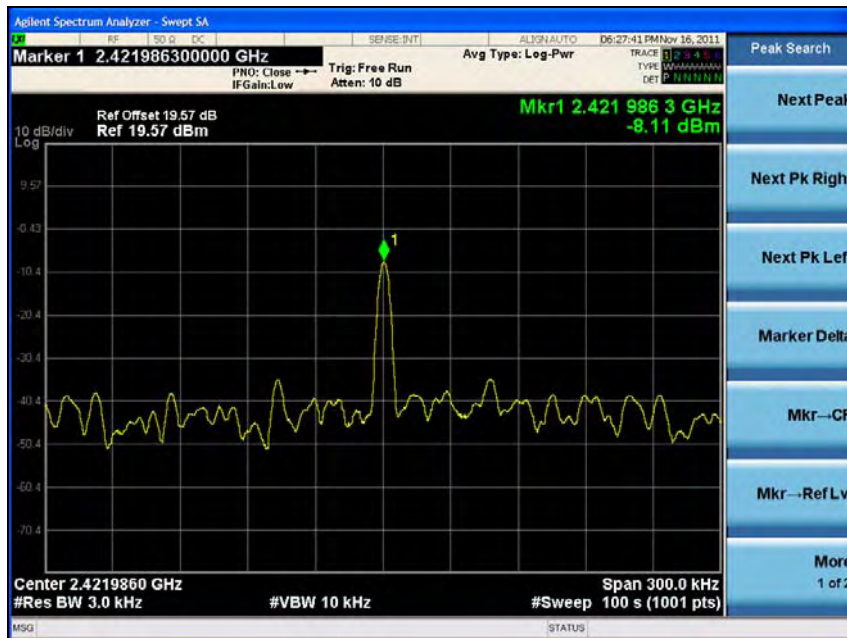
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High channel



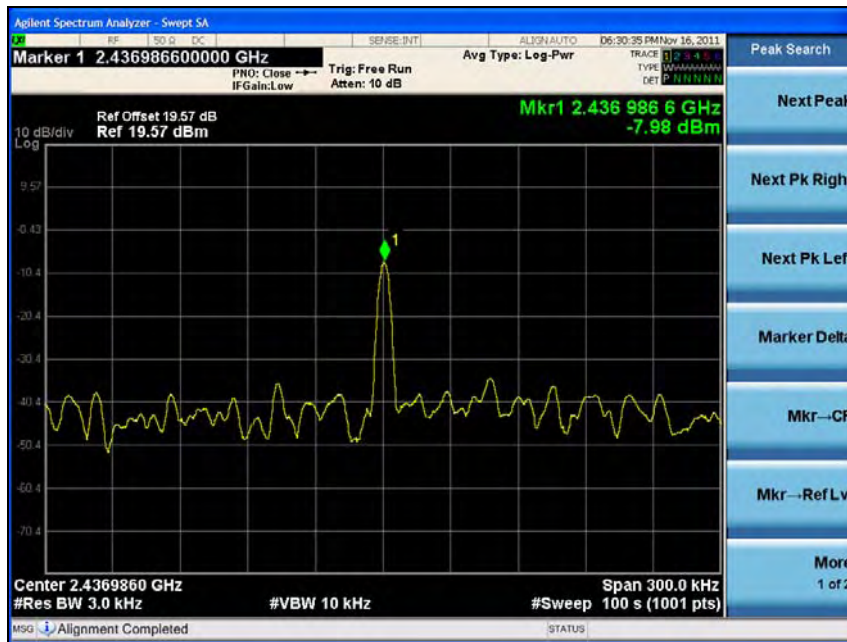
802.11n_HT40

Low channel

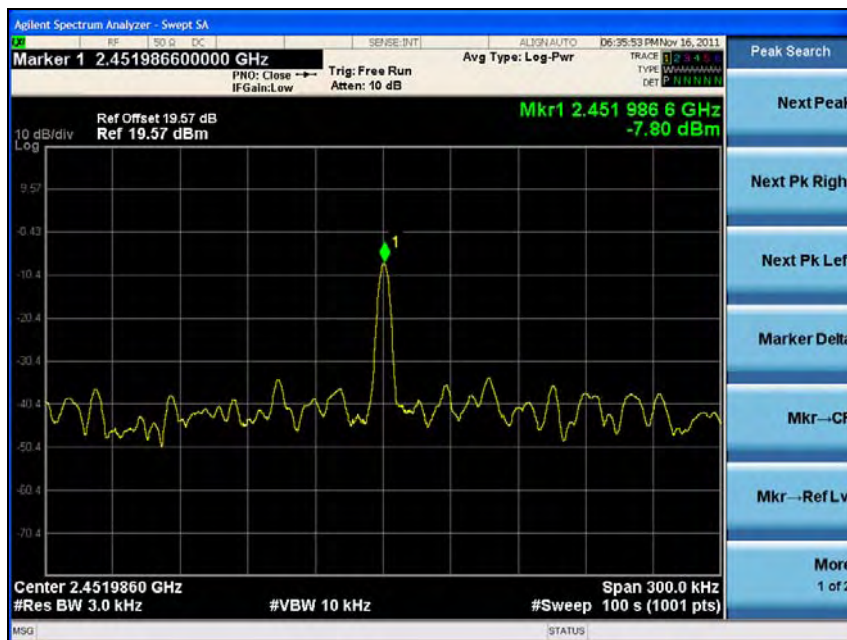


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Middle channel



High channel

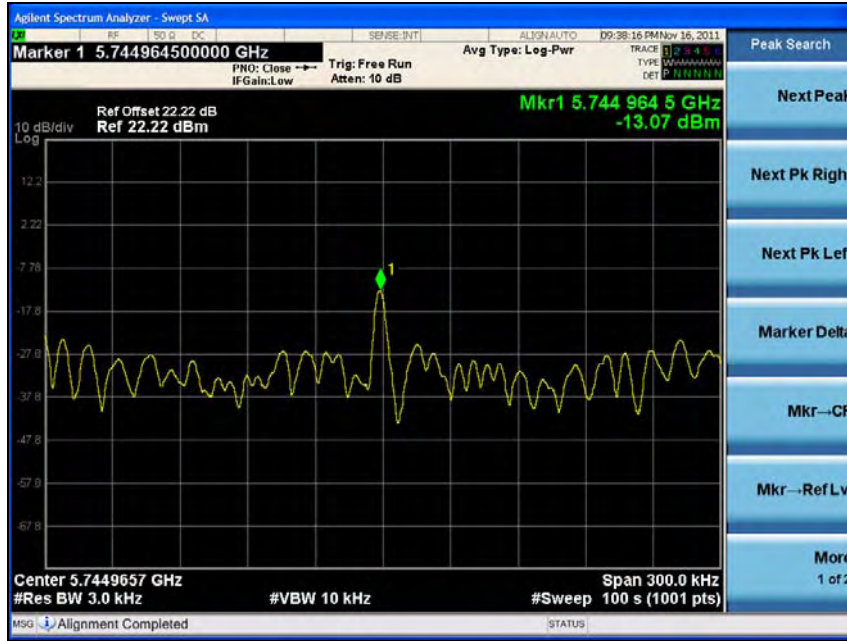


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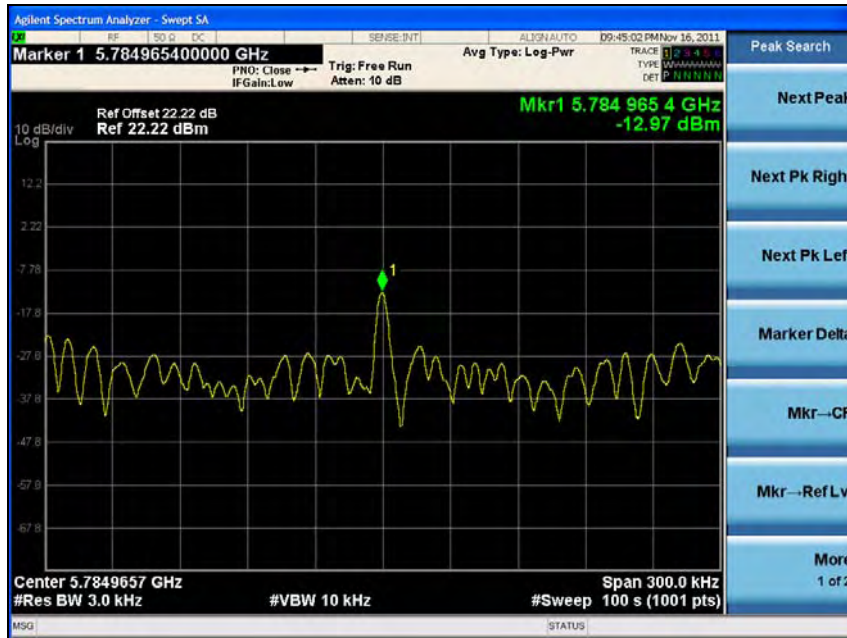
5.8GHz

802.11a

Low channel

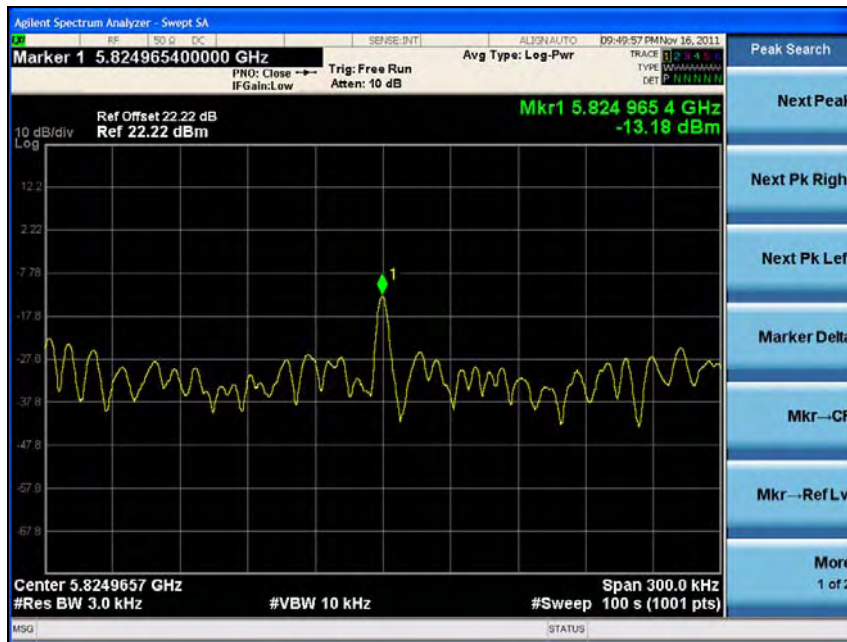


Middle channel



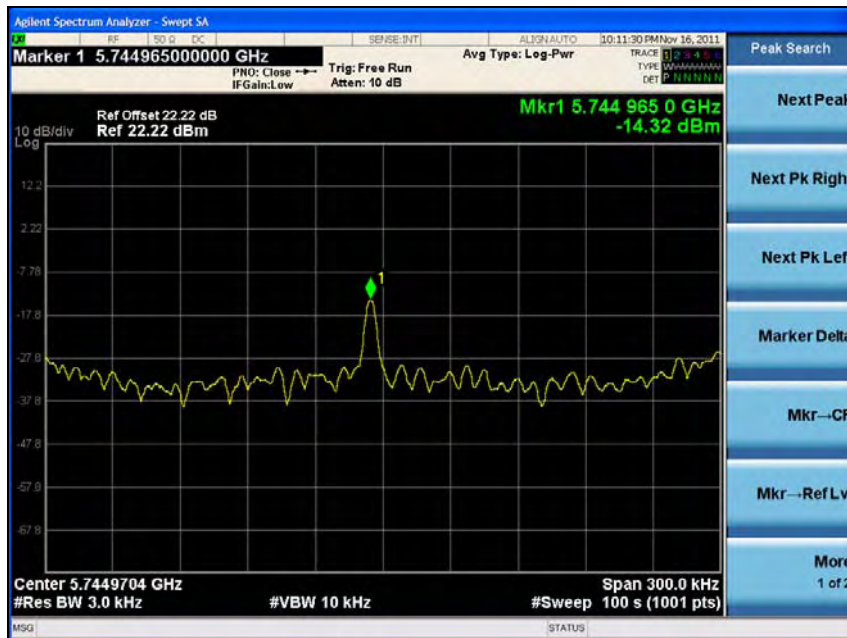
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High channel



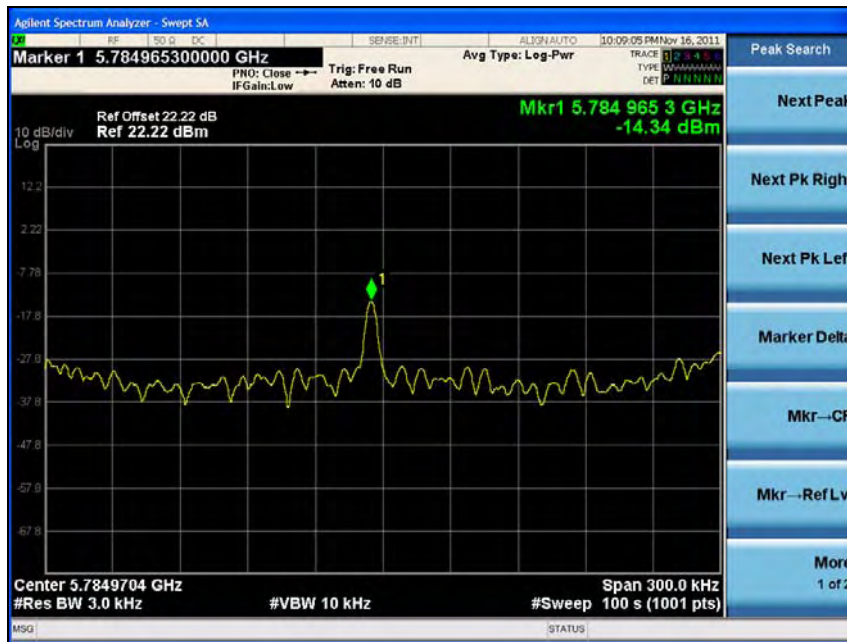
802.11n_HT20

Low channel

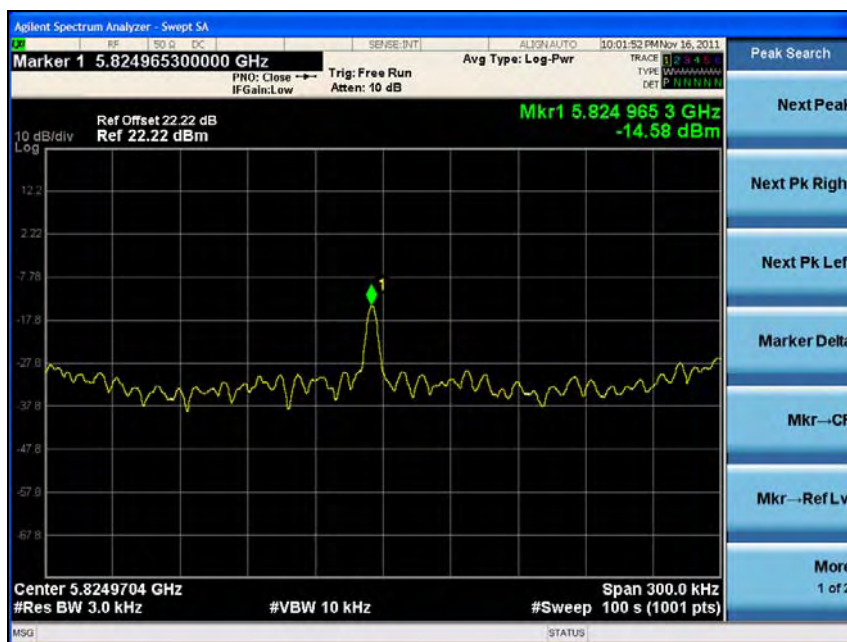


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Middle channel



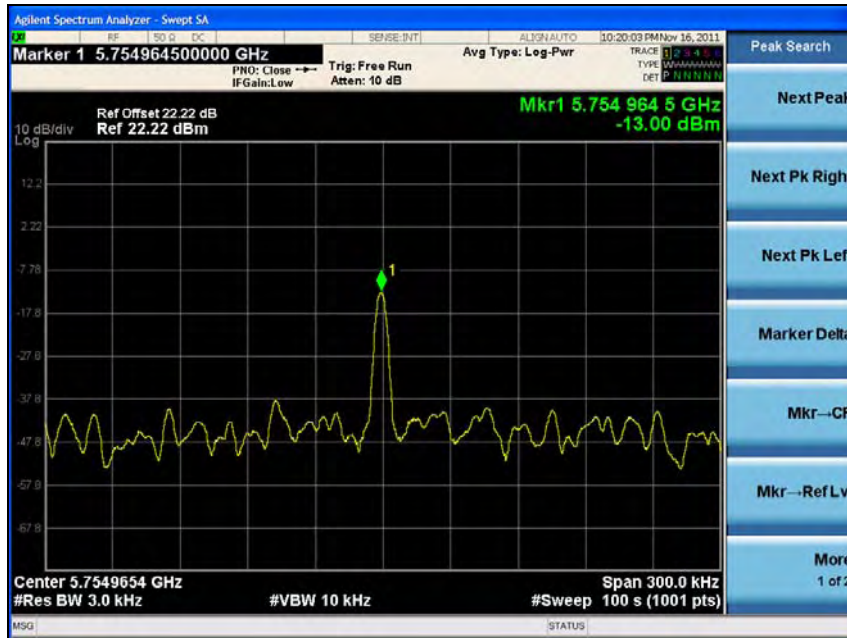
High channel



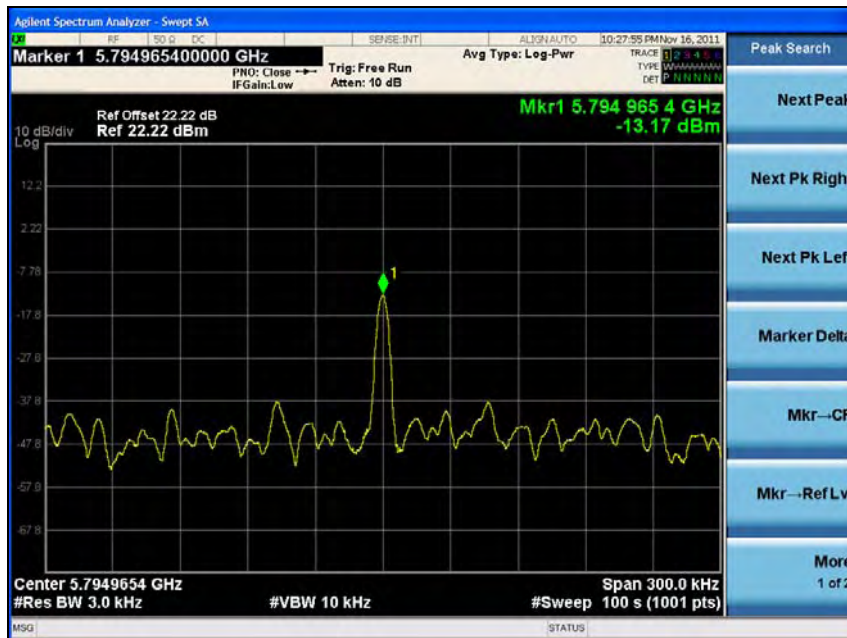
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802.11n_HT40

Low channel



High channel



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ANT1

2.4 GHz

802.11b

Low channel



Middle channel



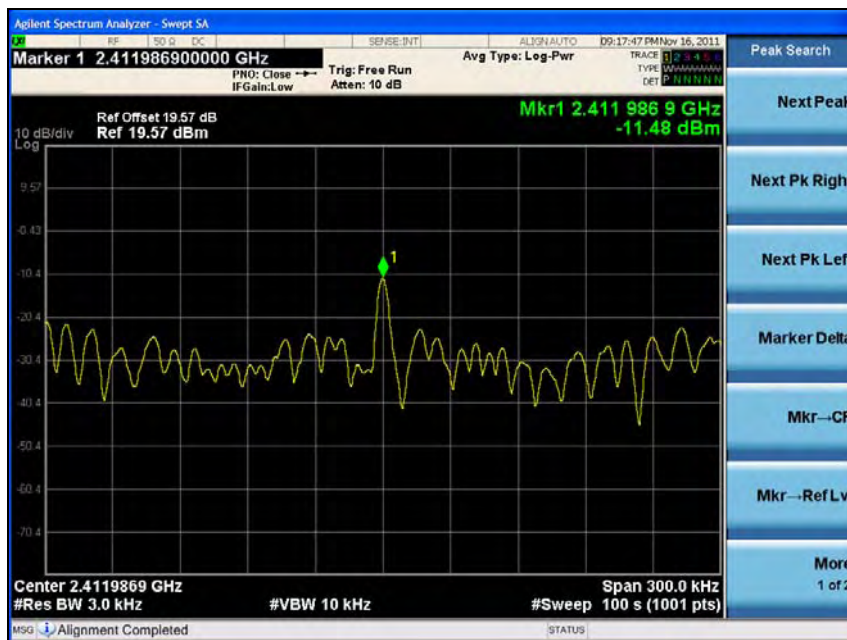
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High channel



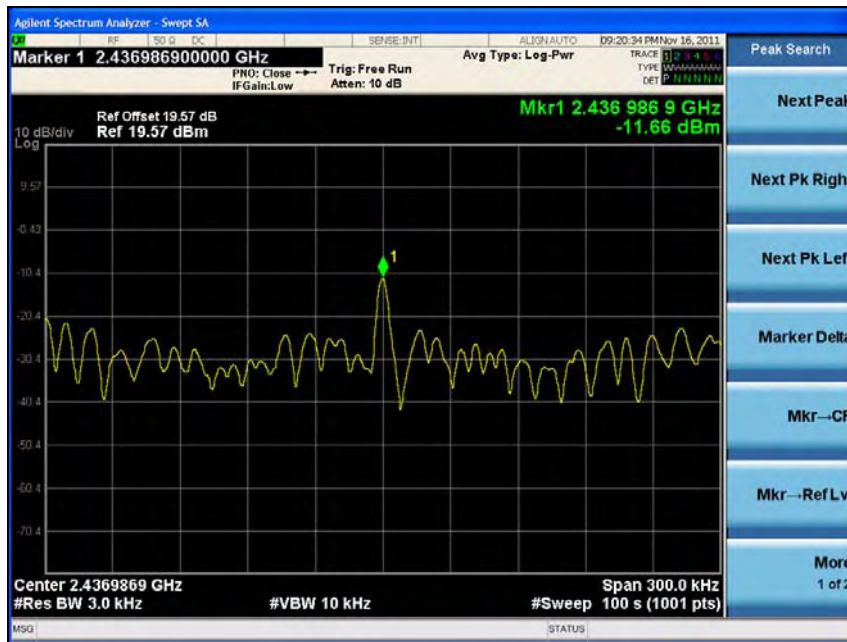
802.11g

Low channel

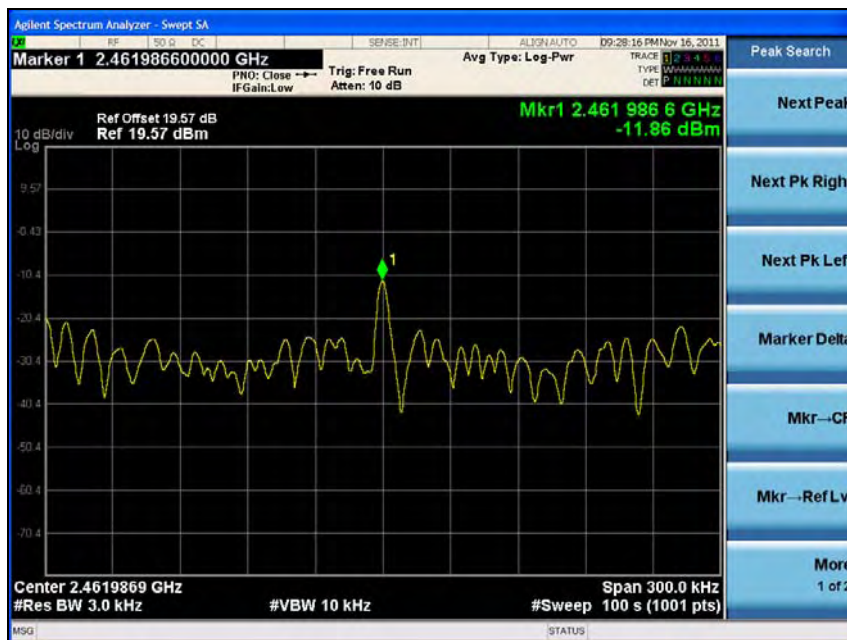


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Middle channel

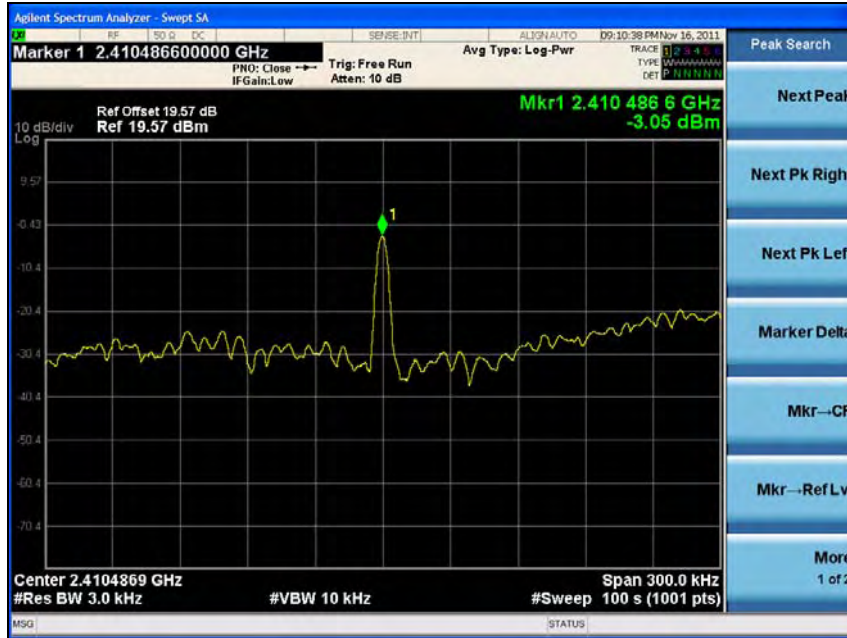


High channel



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802.11n_HT20
Low channel



Middle channel



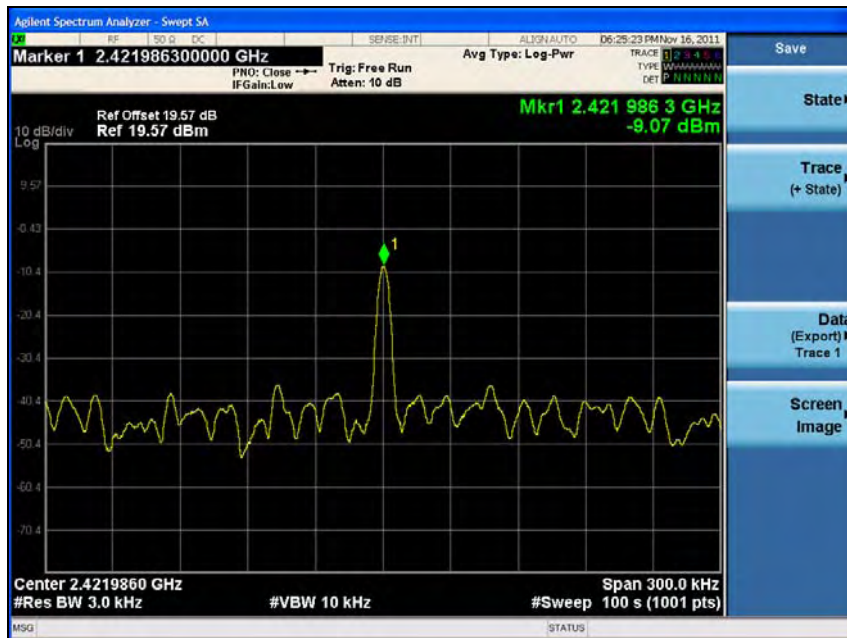
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High channel



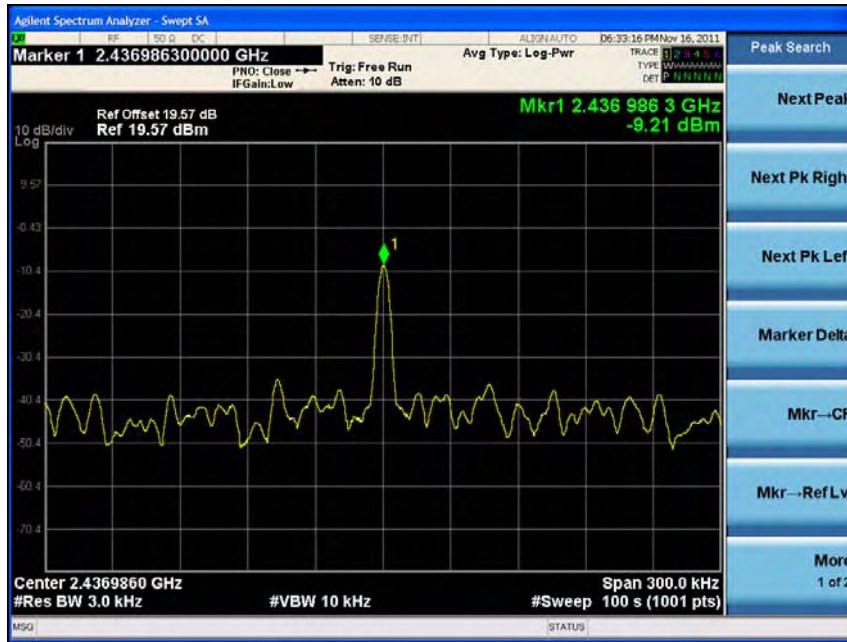
802.11n_HT40

Low channel

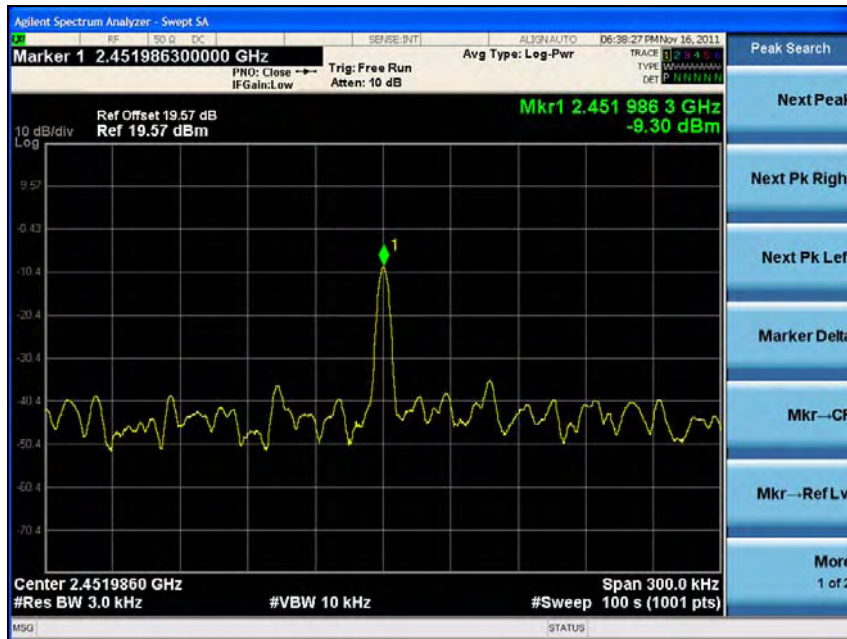


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Middle channel



High channel

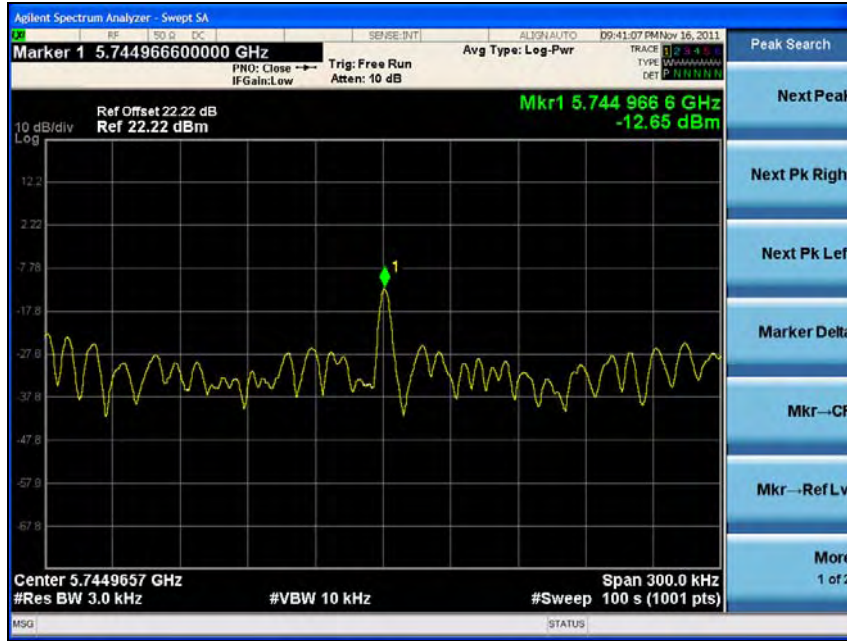


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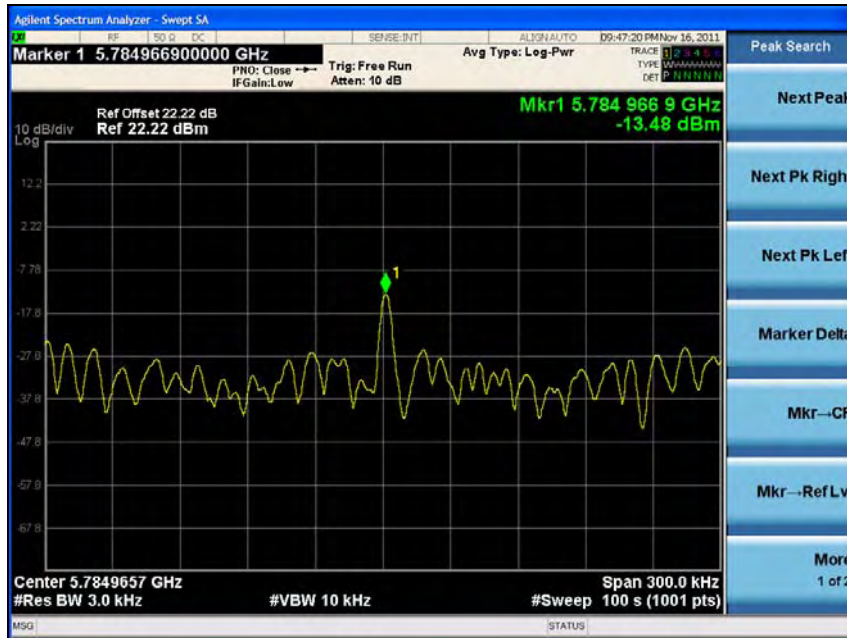
5.8GHz

802.11a

Low channel

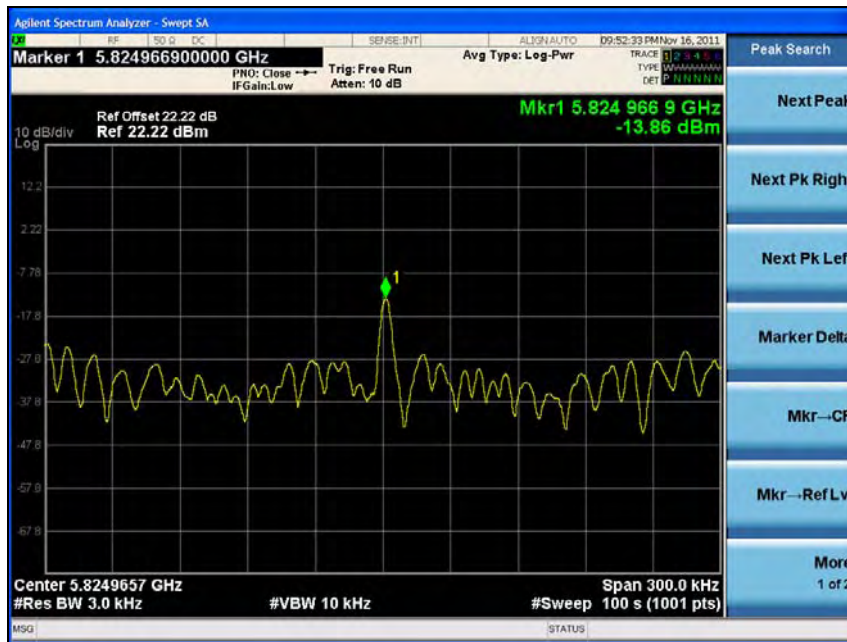


Middle channel



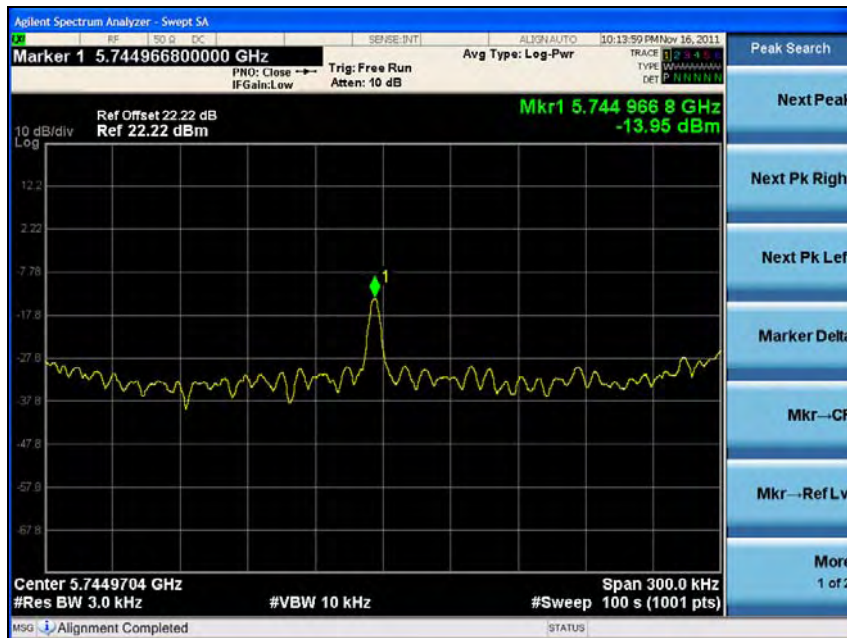
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High channel



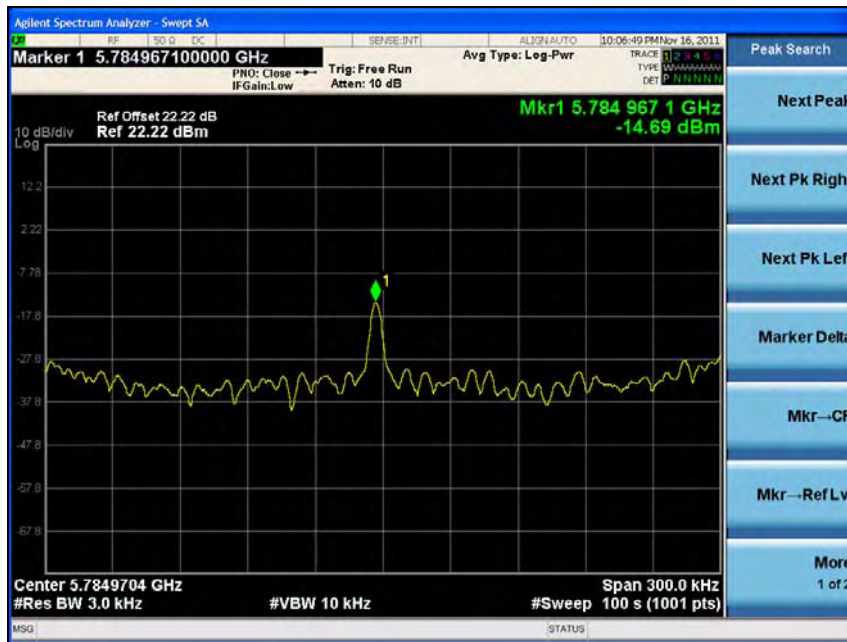
802.11n_HT20

Low channel

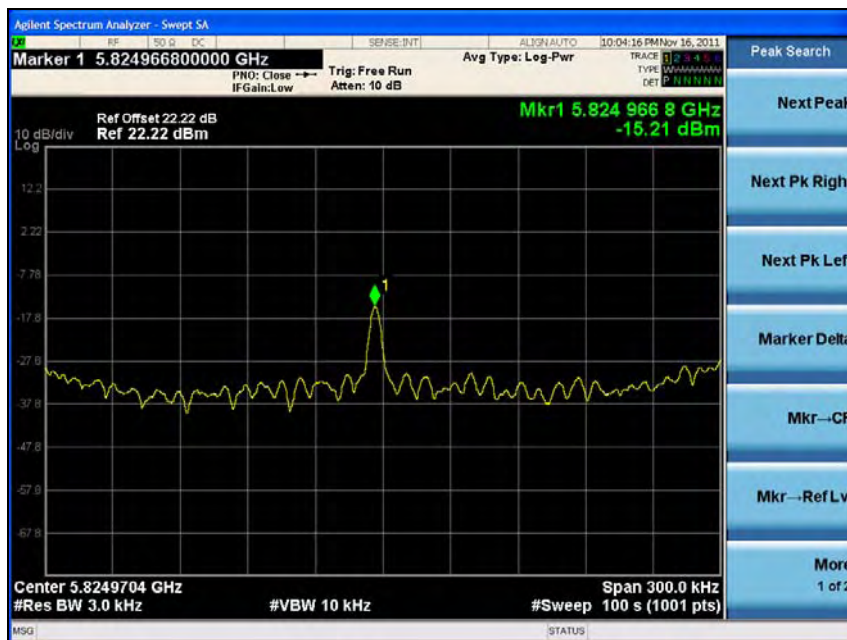


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Middle channel



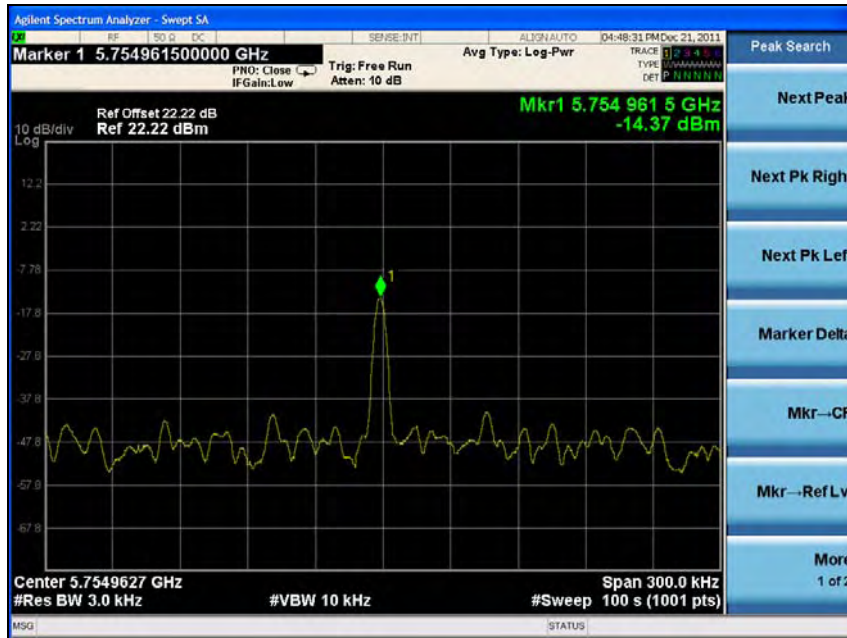
High channel



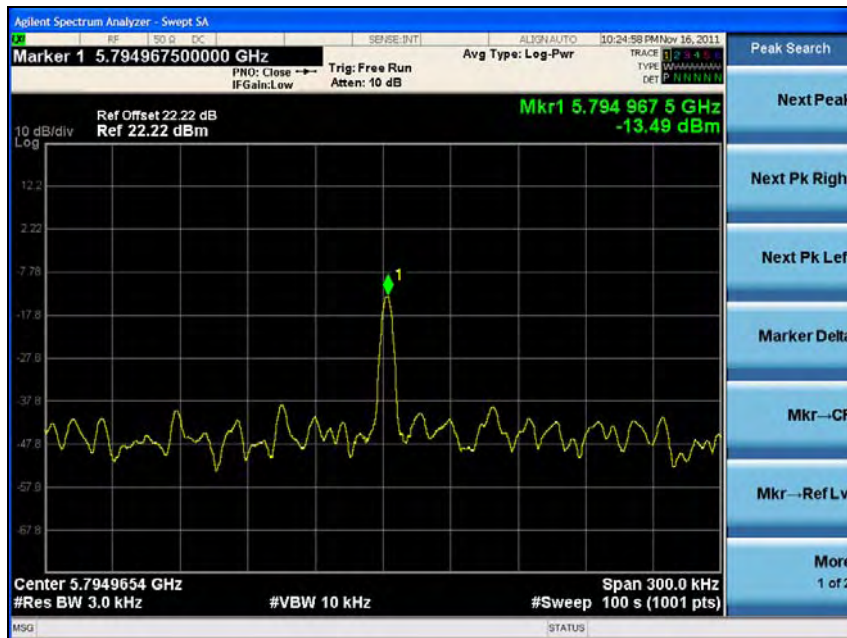
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802.11n_HT40

Low channel



High channel



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7. Antenna Requirement

7.1. 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. And according to FCC 47 CFR Section § 15.247 (b), if transmitting antennas of directional gain greater than 6 dB i are used, the power shall be reduced by the amount in dB that the gain of the antenna exceeds 6 dB i.

7.2. Antenna Connected Construction

The antenna used of this product is PIFA antenna.

The peak max gain of each antennas ANT0 & ANT1 and calculated antenna gain of ANT0+ANT1 are as below :

Antenna	11b/g/n	11a/n	11a/n – Non DFS	11a/n -DFS
ANT0	2.19 dB i	2.48 dB i	0.56 dB i	1.47 dB i
ANT1	2.92 dB i	1.21 dB i	2.13 dB i	2.37 dB i
ANT0+ANT1 (Calculated)	5.57 dB i	4.88 dB i	4.39 dB i	4.94 dB i

Formula

$$- \text{ANT0+ANT1 (Calculated)} = 10\log\left[\frac{10^{(\text{ANTB}/20)} + 10^{(\text{ANTC}/20)}}{2}\right]$$

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