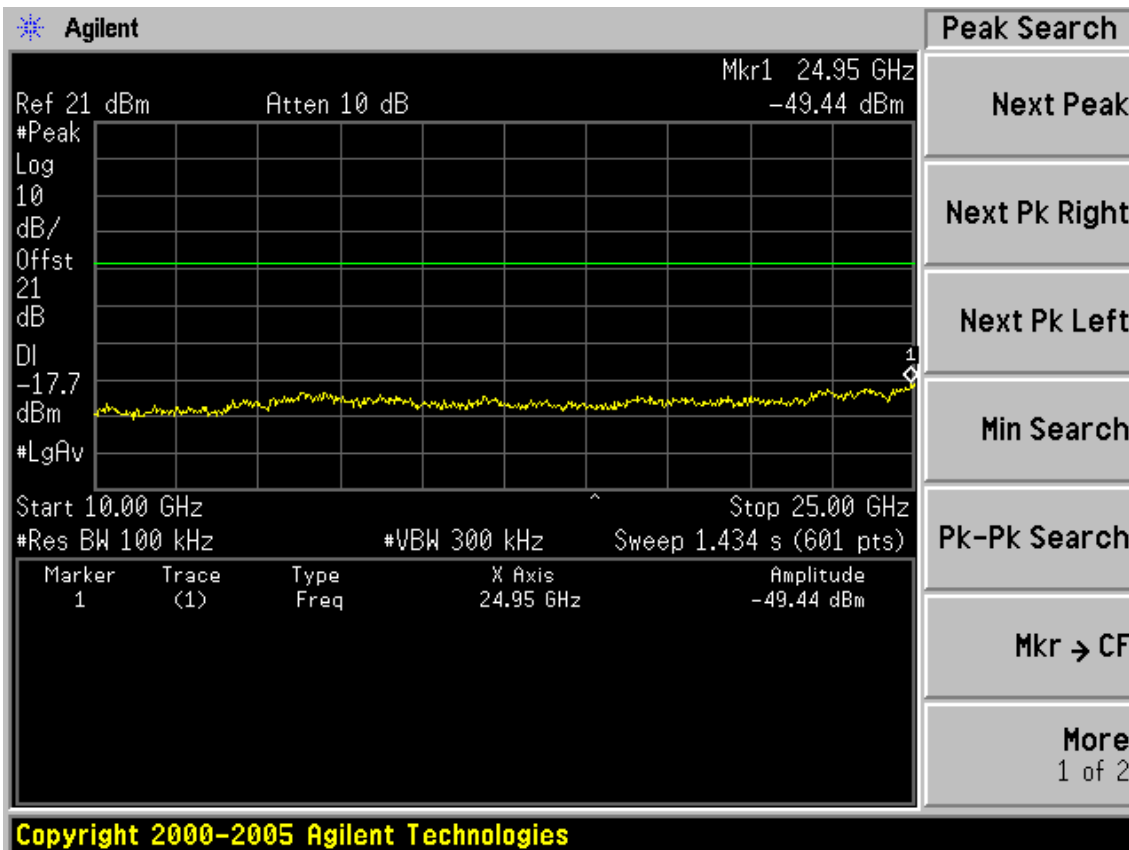
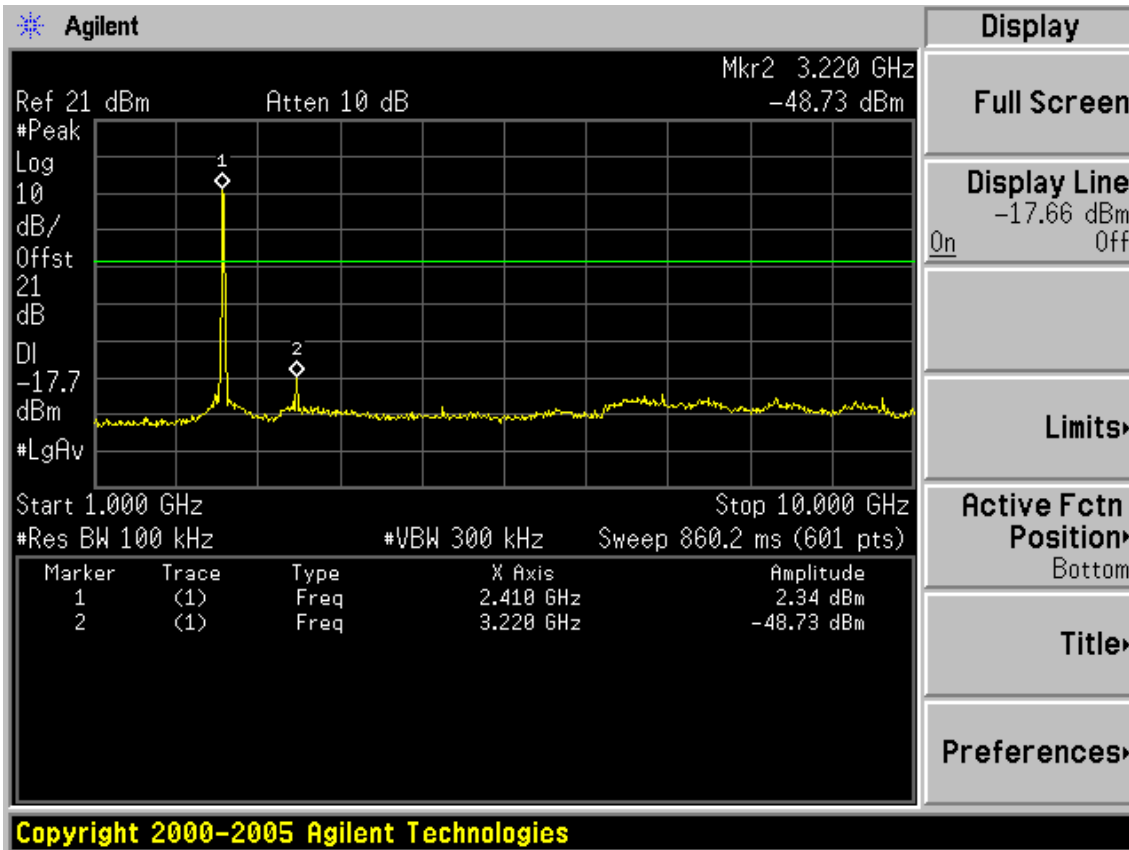
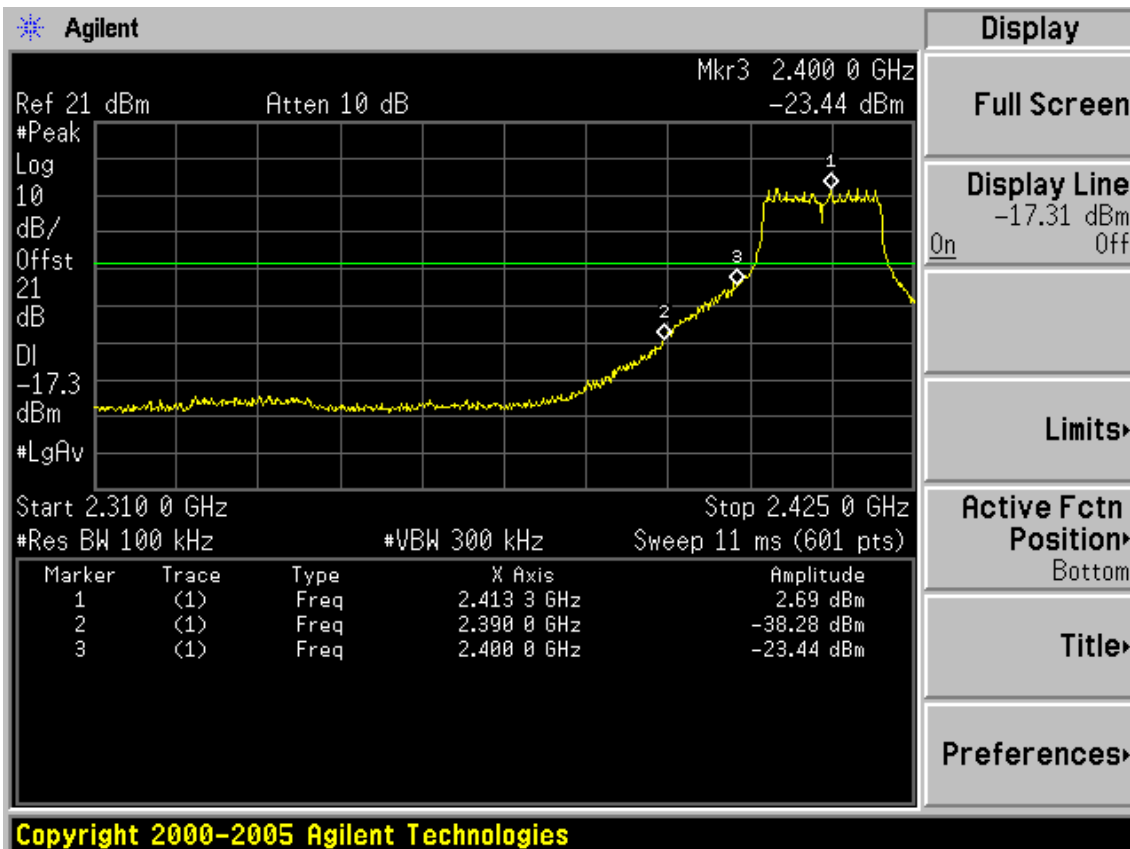
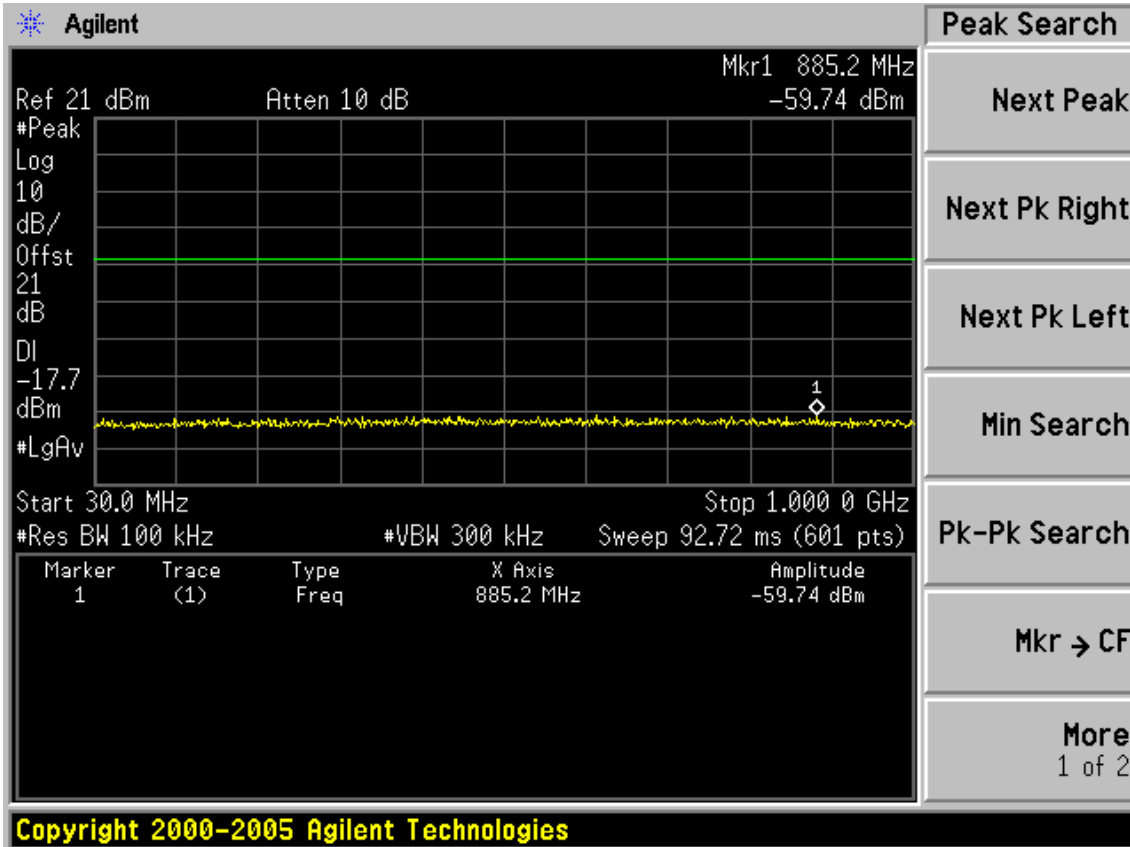
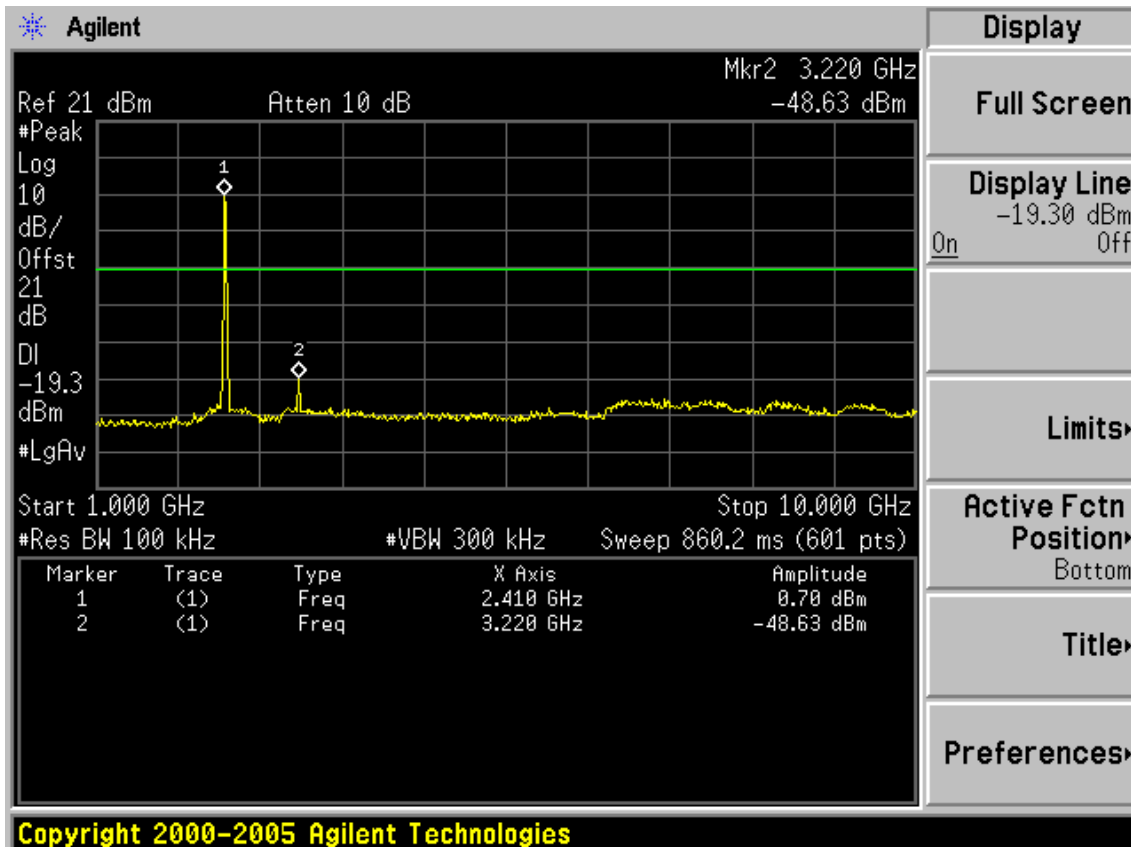
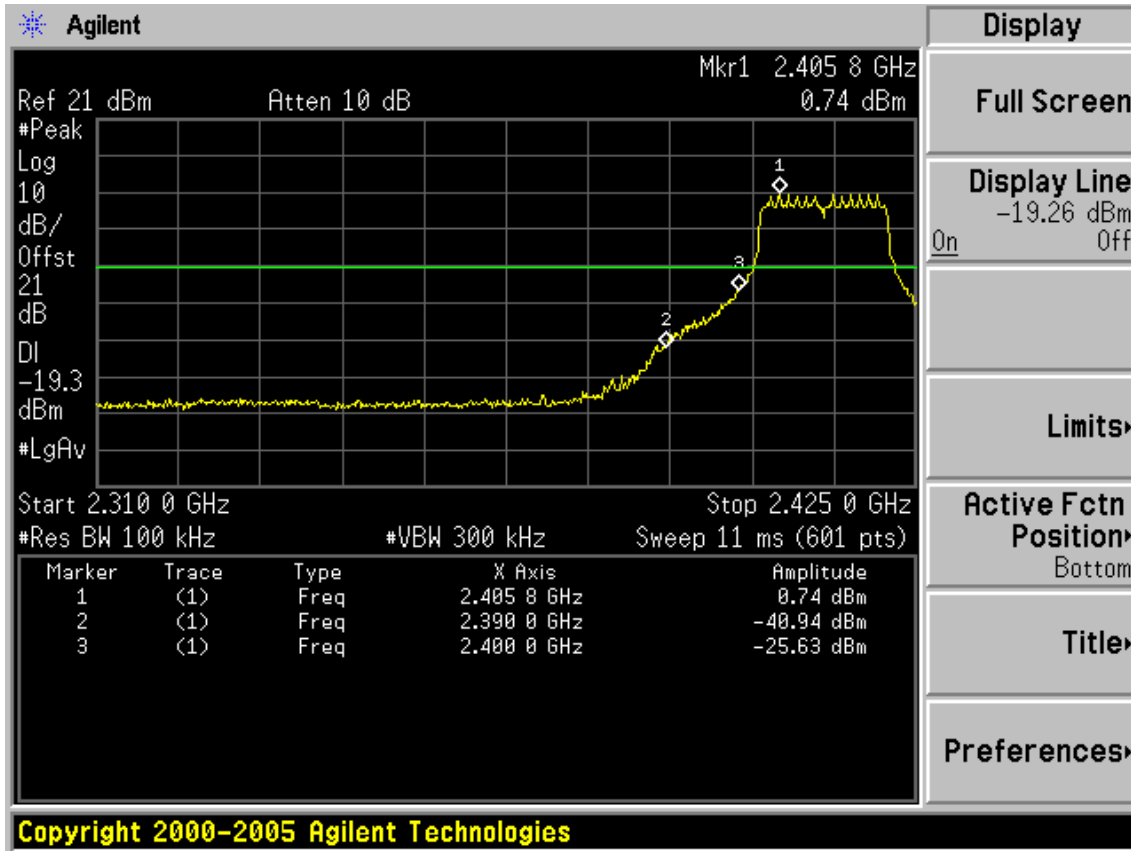


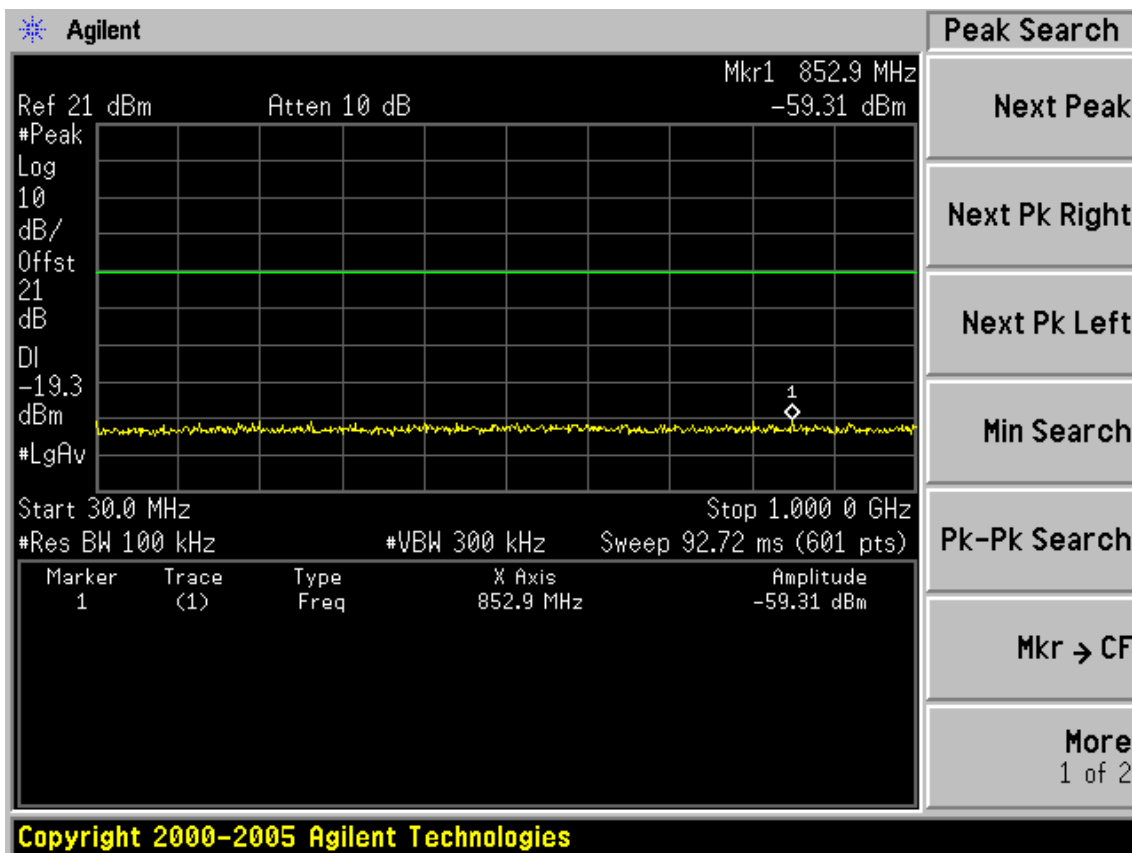
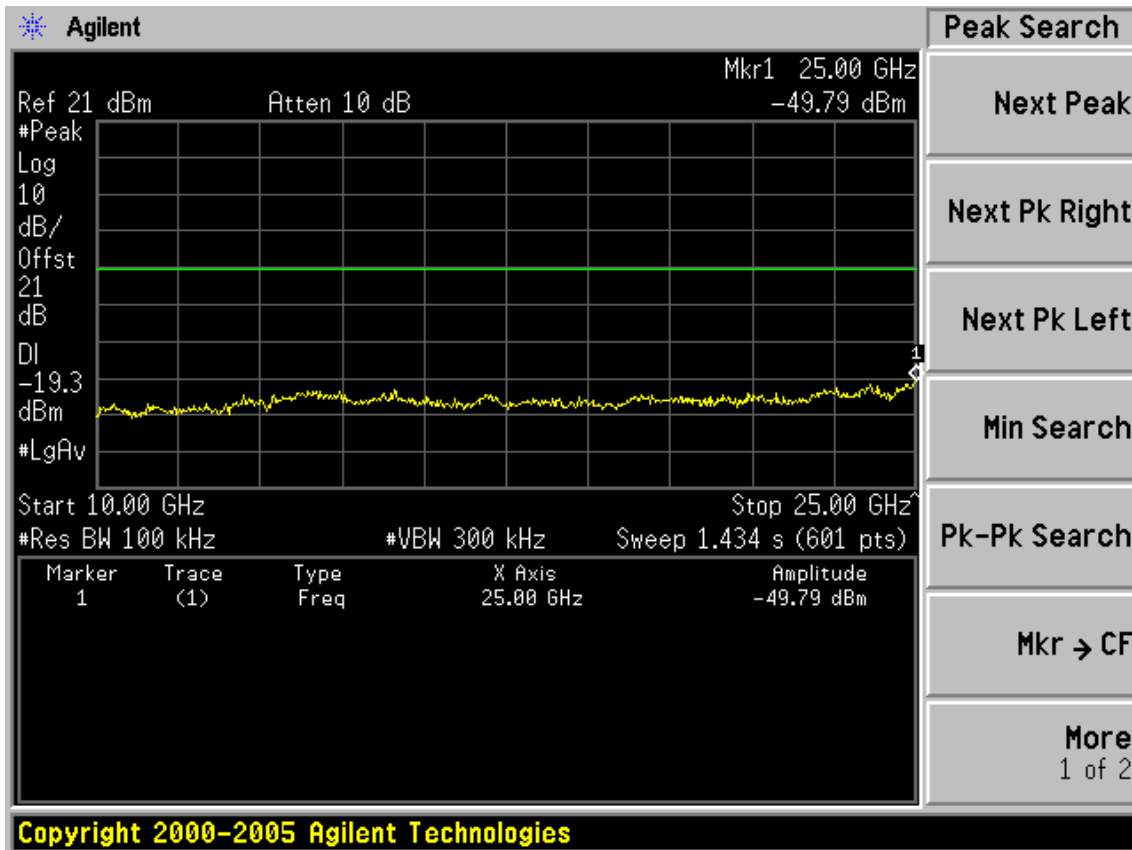
Test CH11: 2462MHz



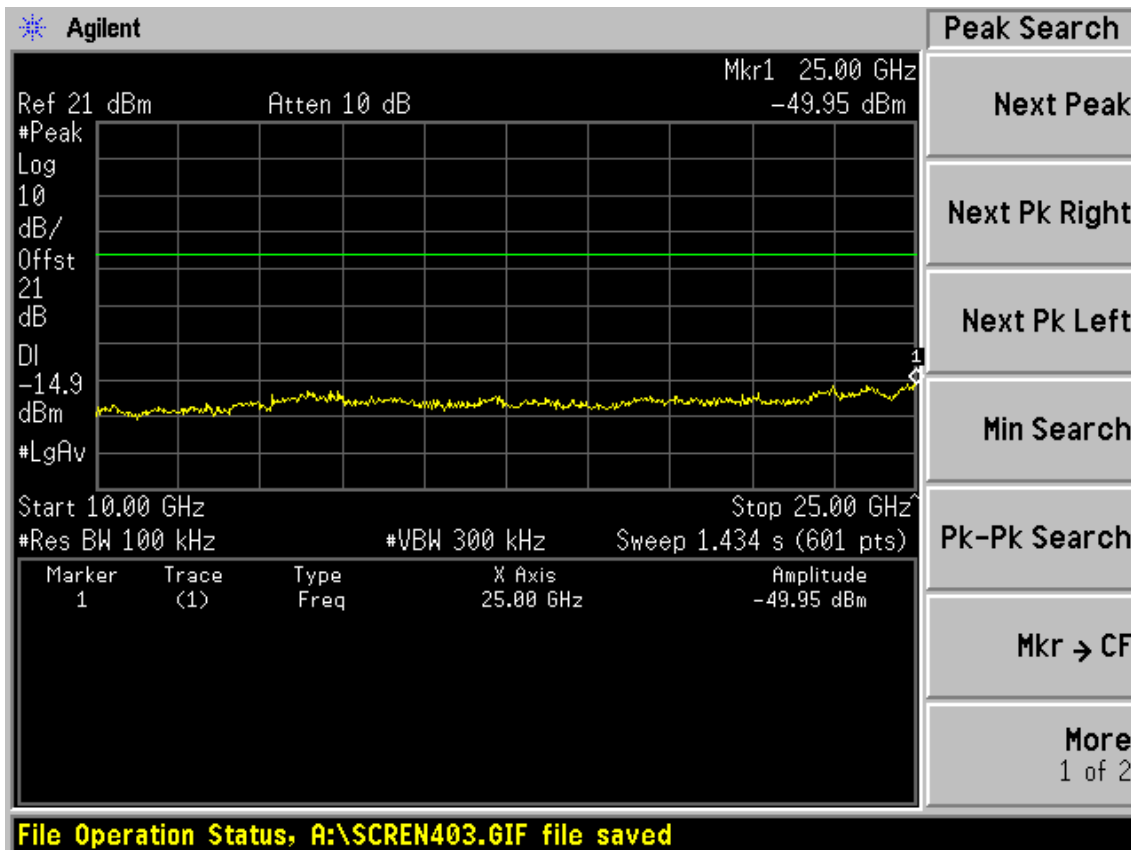
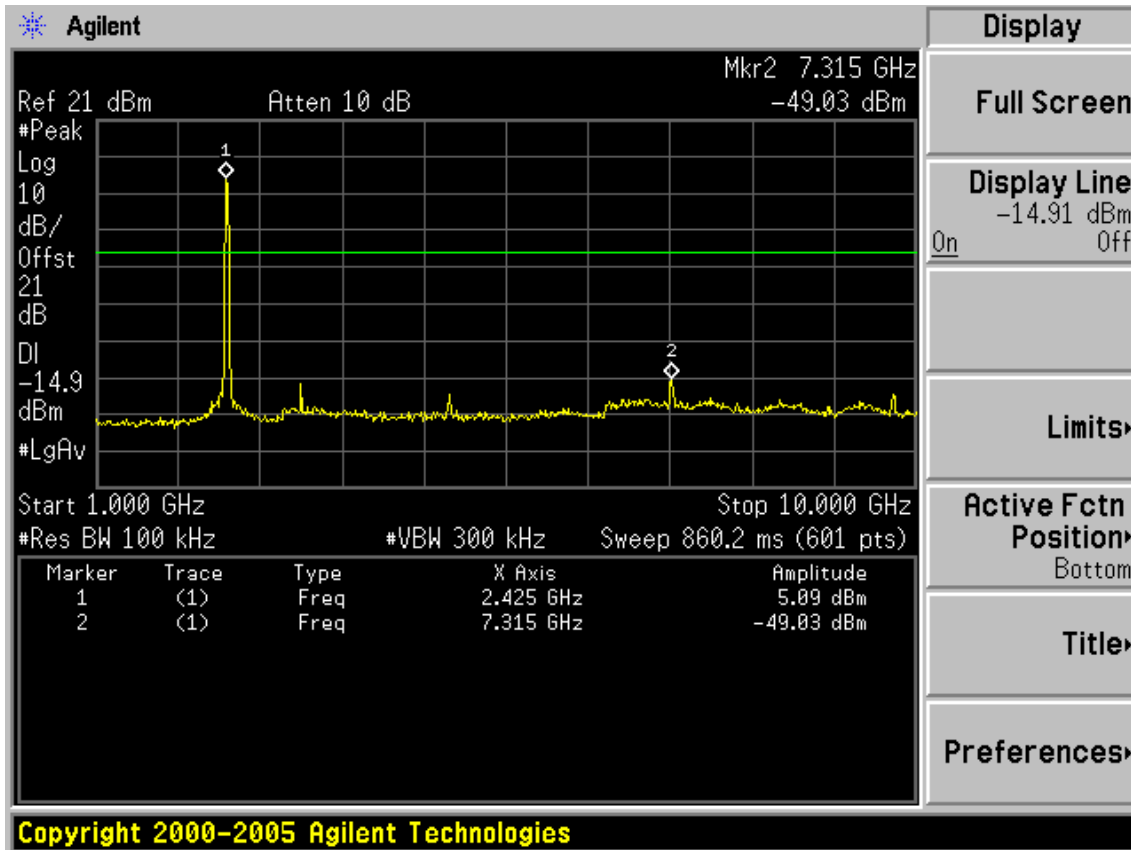


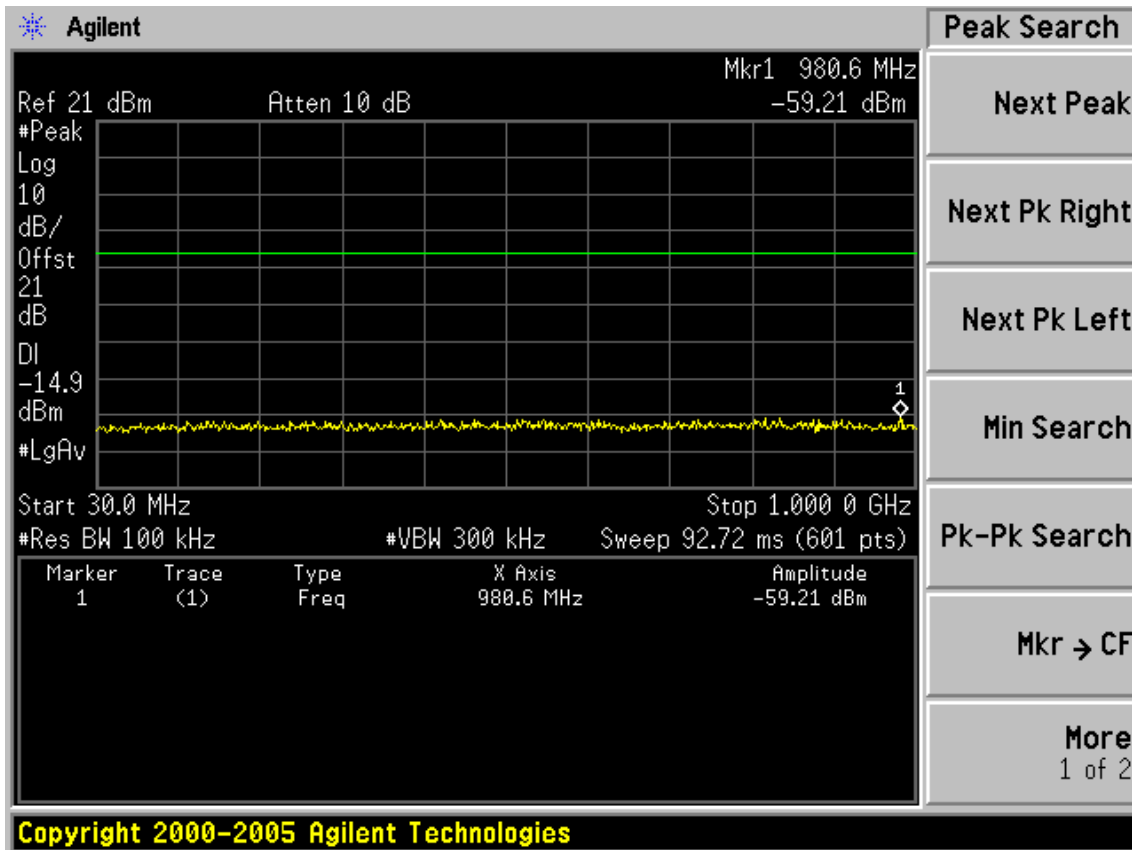
Test Mode: IEEE 802.11n HT20 TX  
 Test CH1: 2412MHz



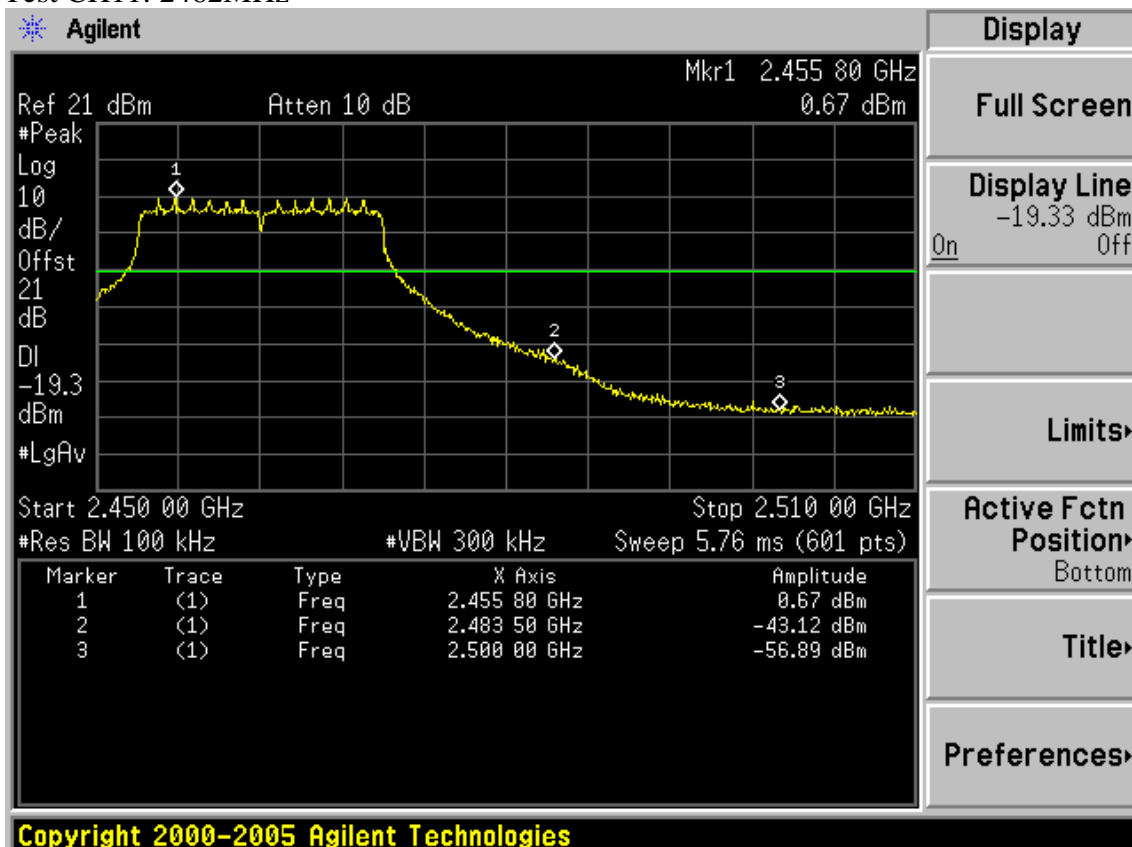


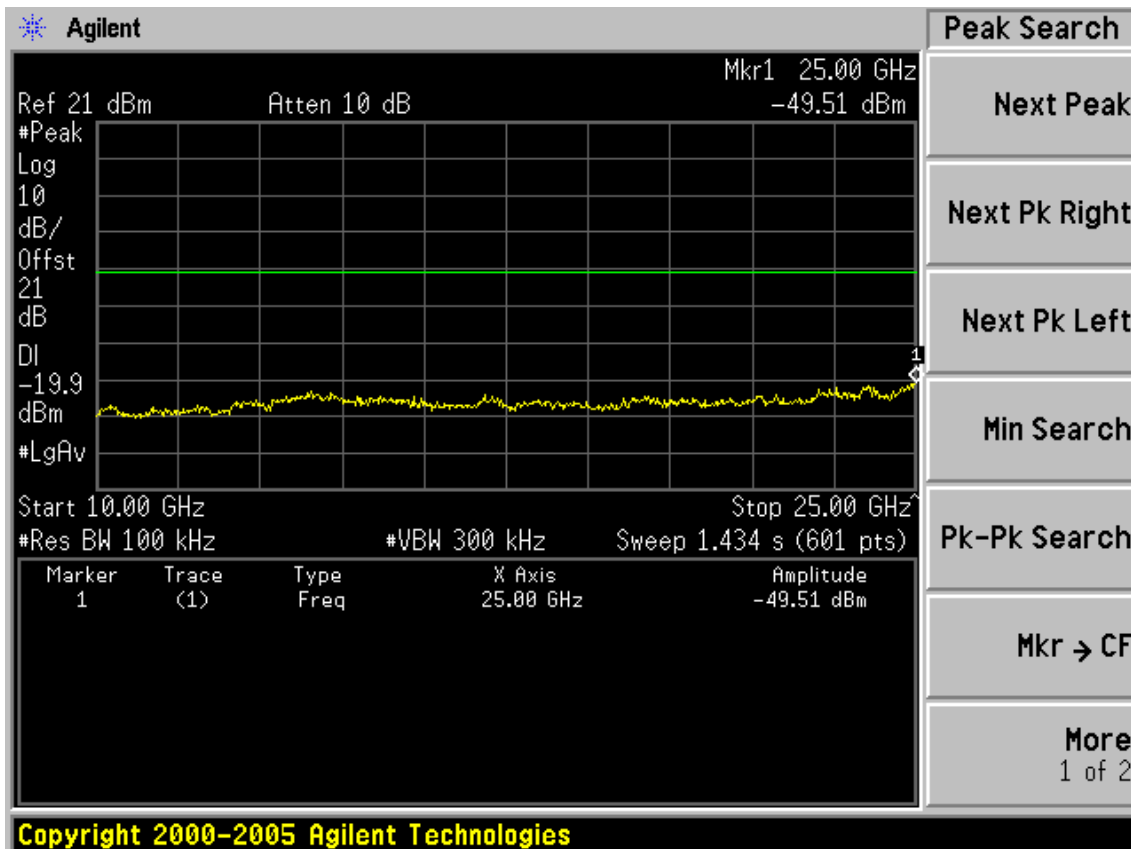
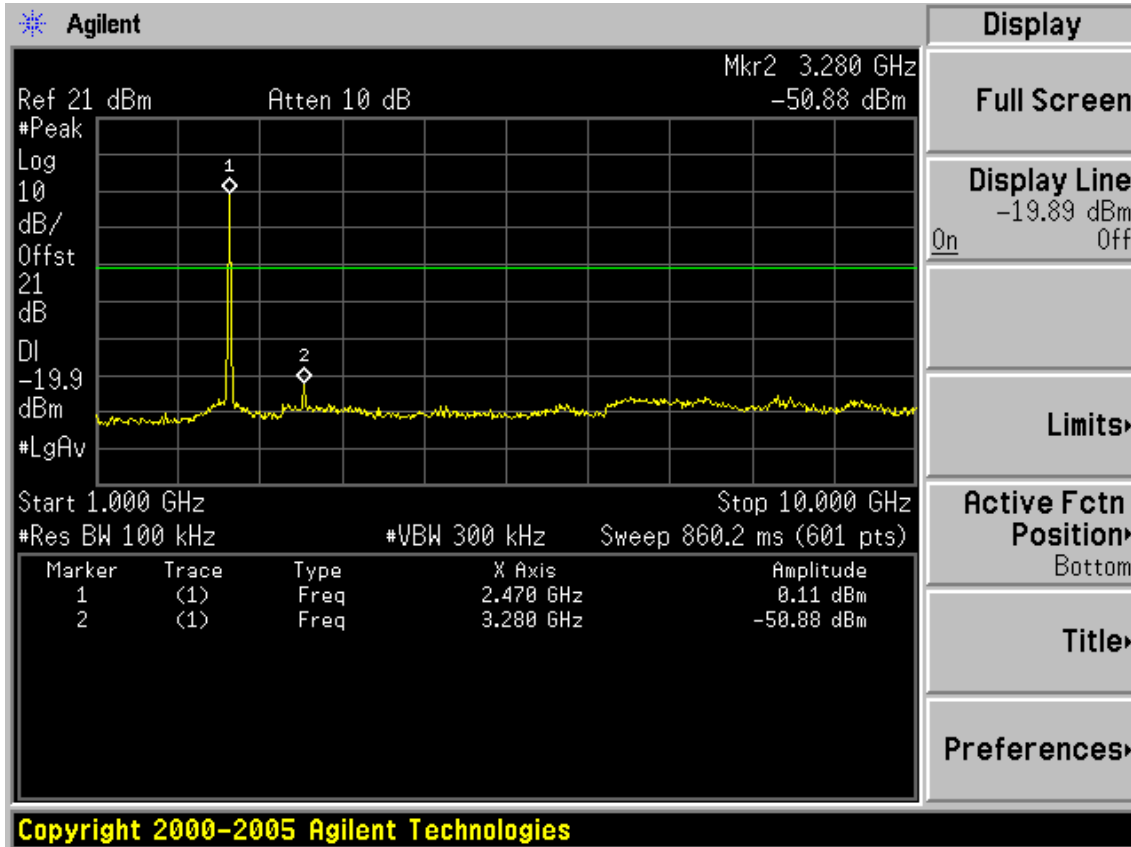
Test CH6: 2437MHz



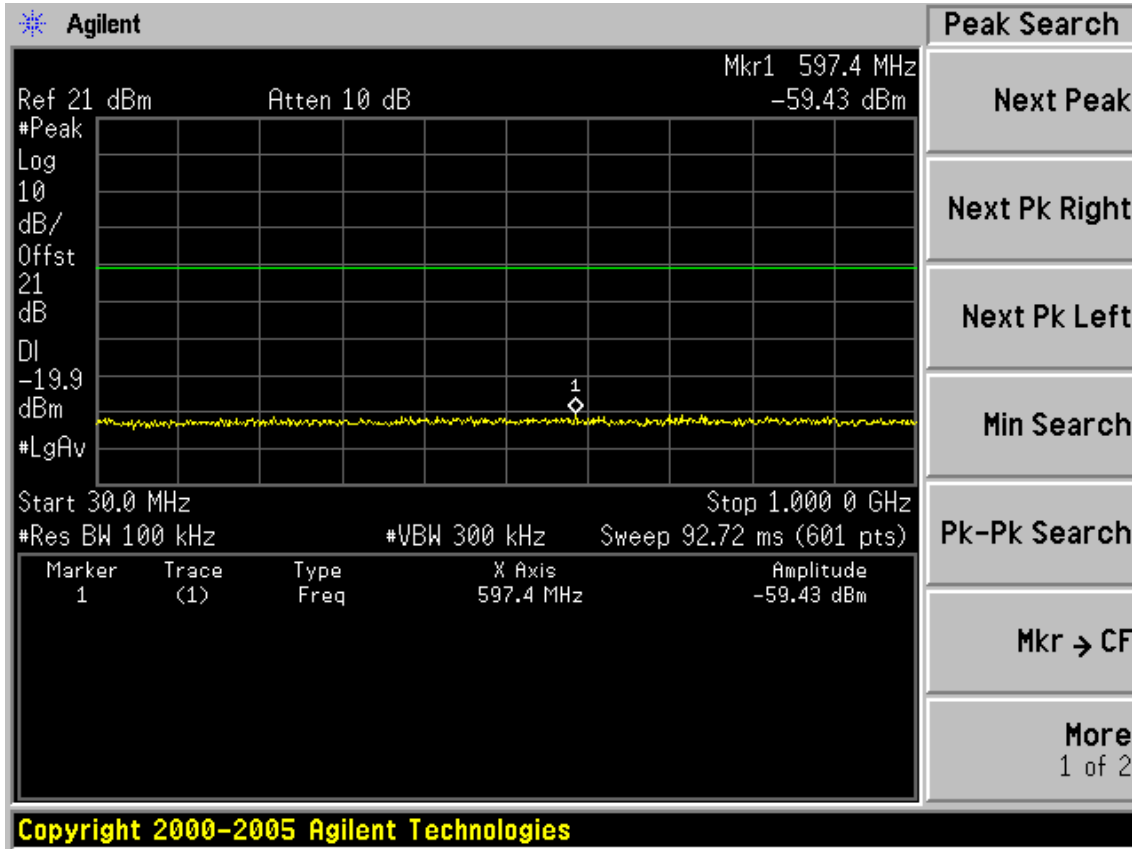


Test CH11: 2462MHz

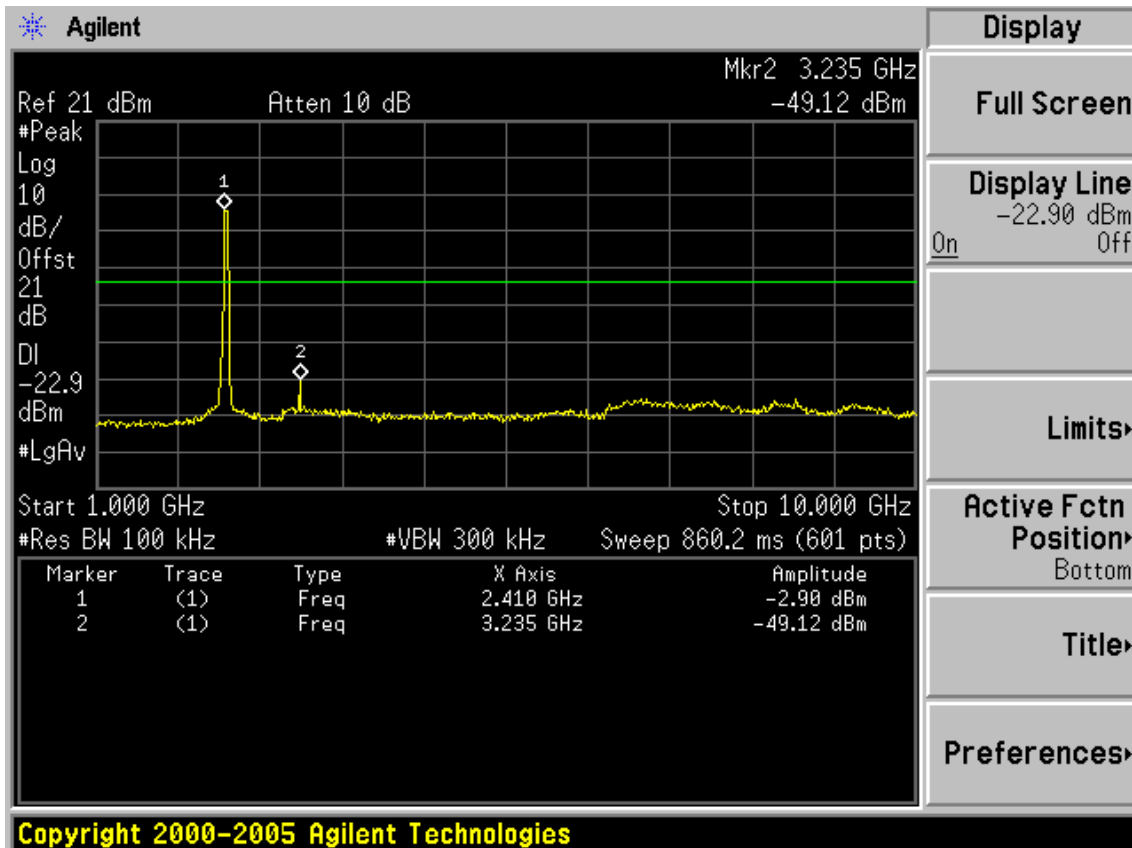


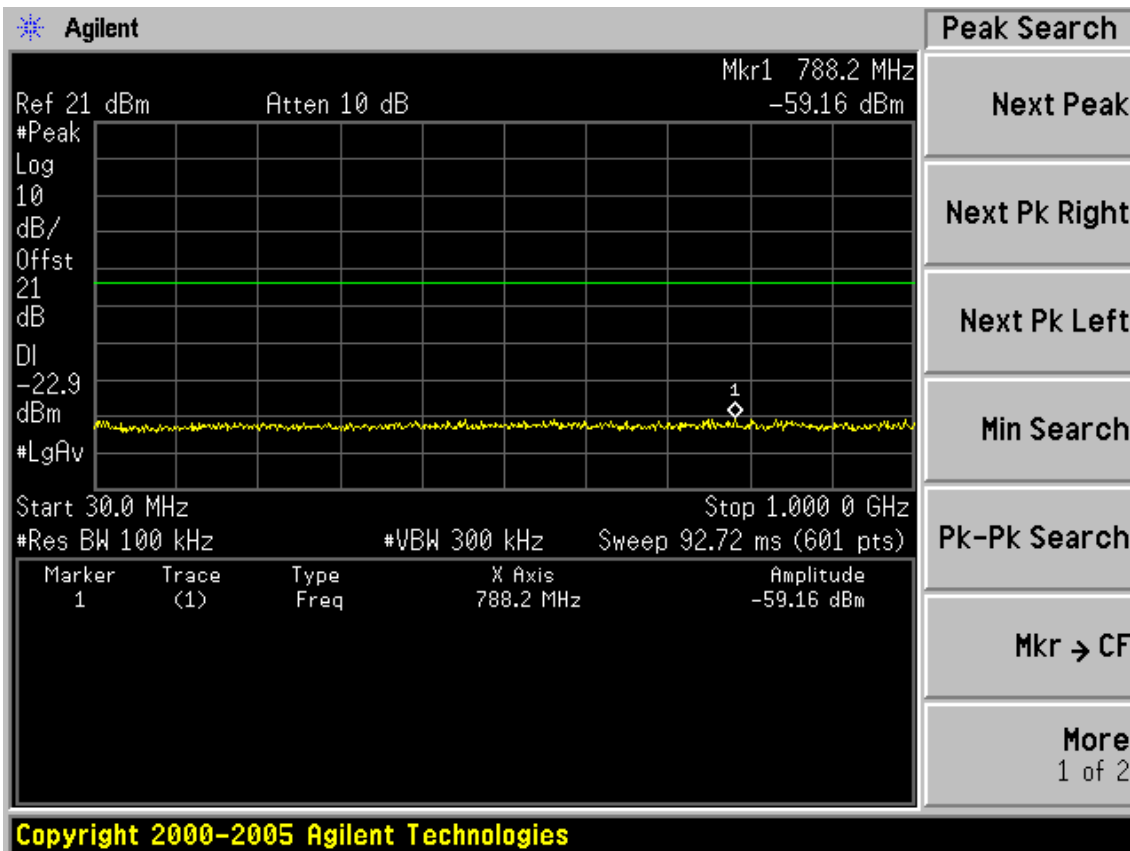
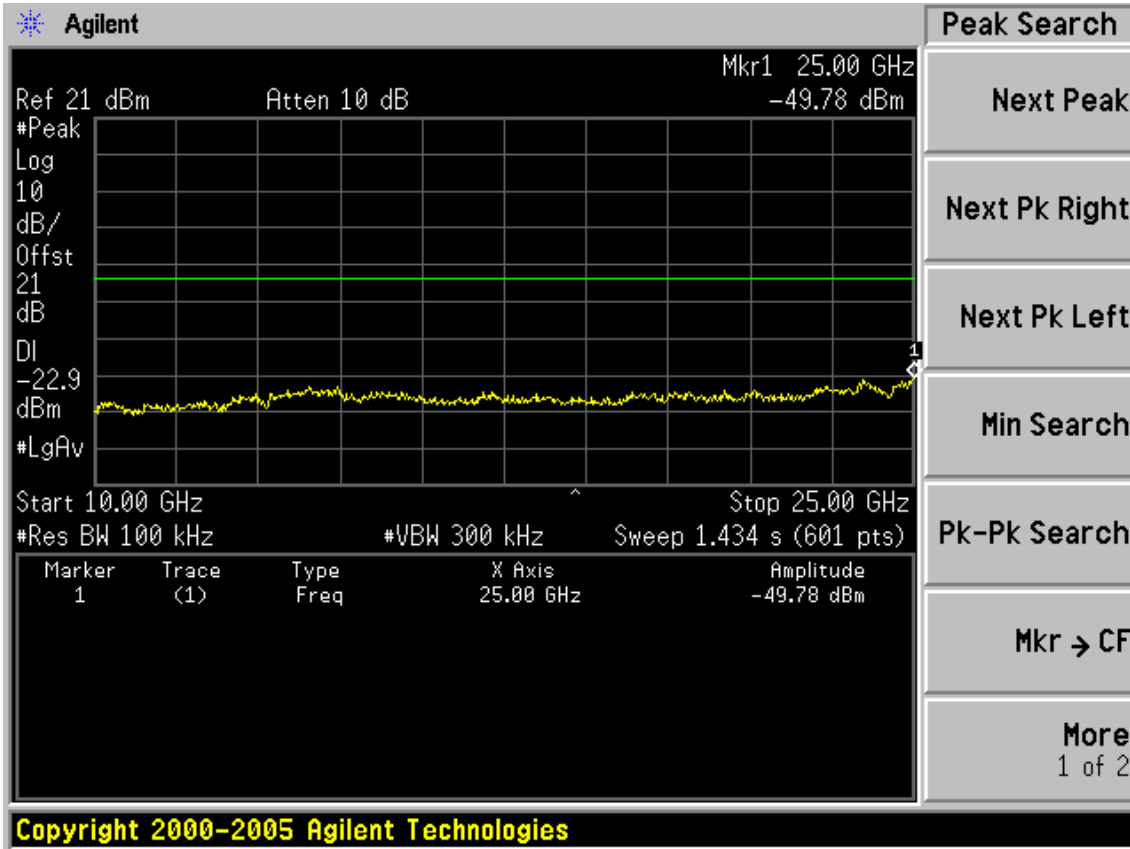


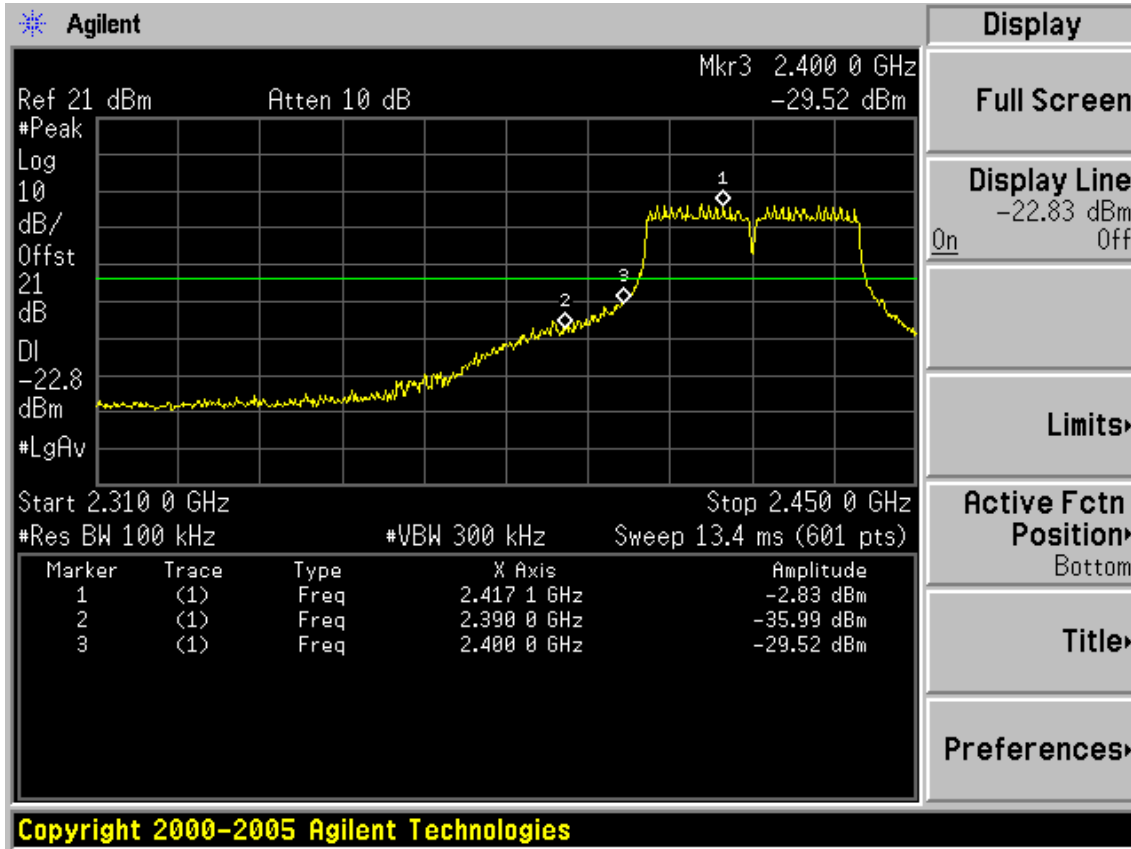




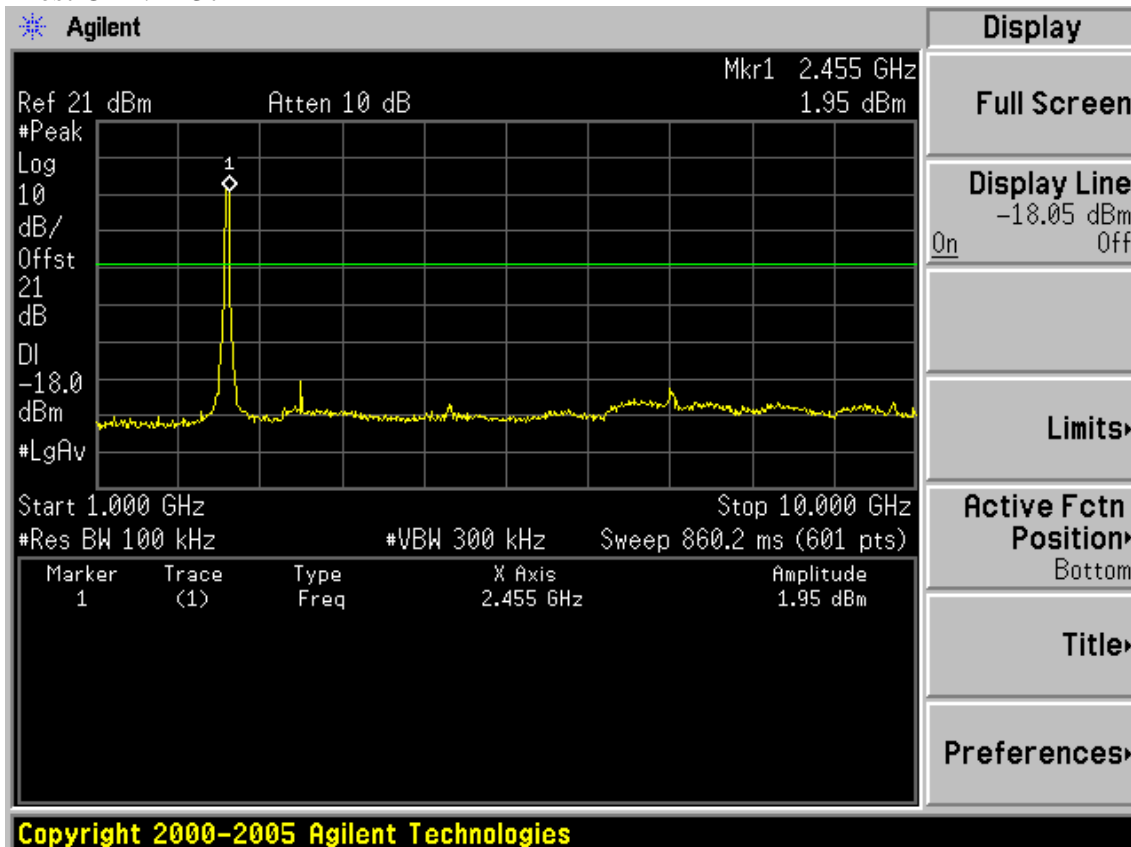
Test Mode: IEEE 802.11n HT40 TX  
Test CH1: 2422MHz

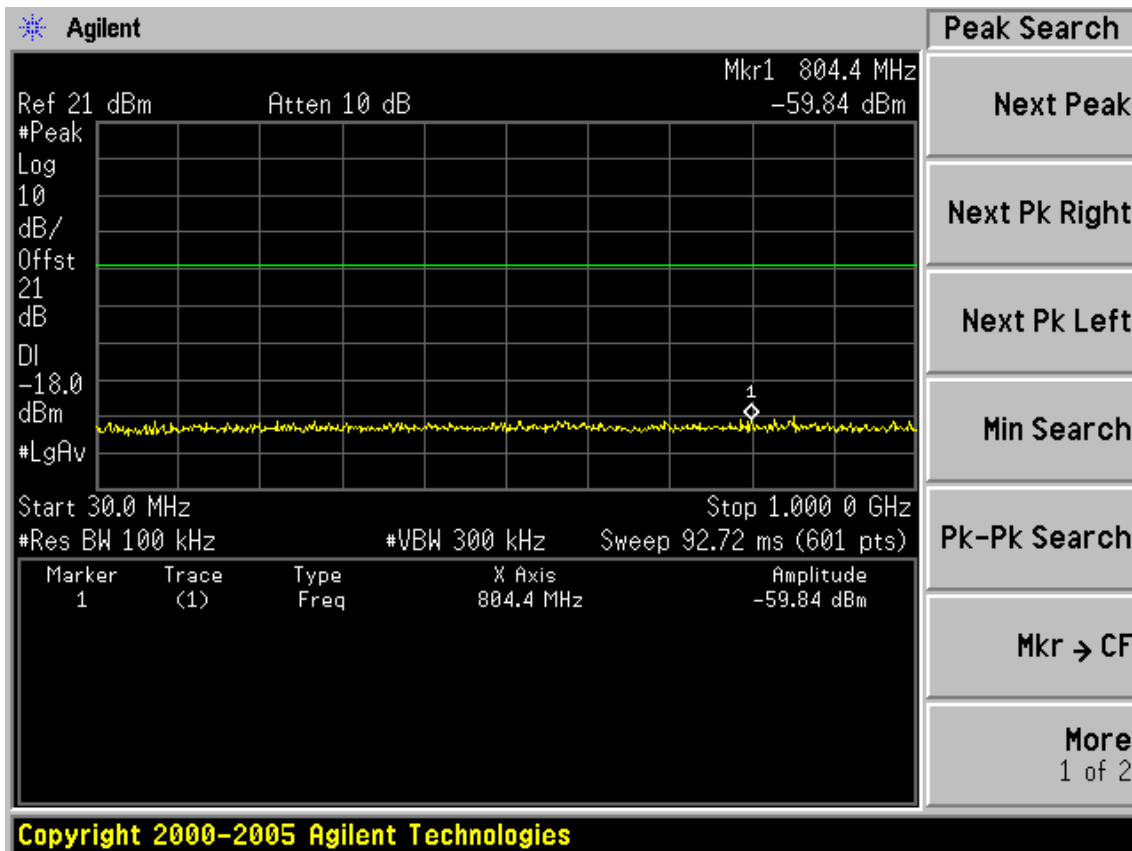
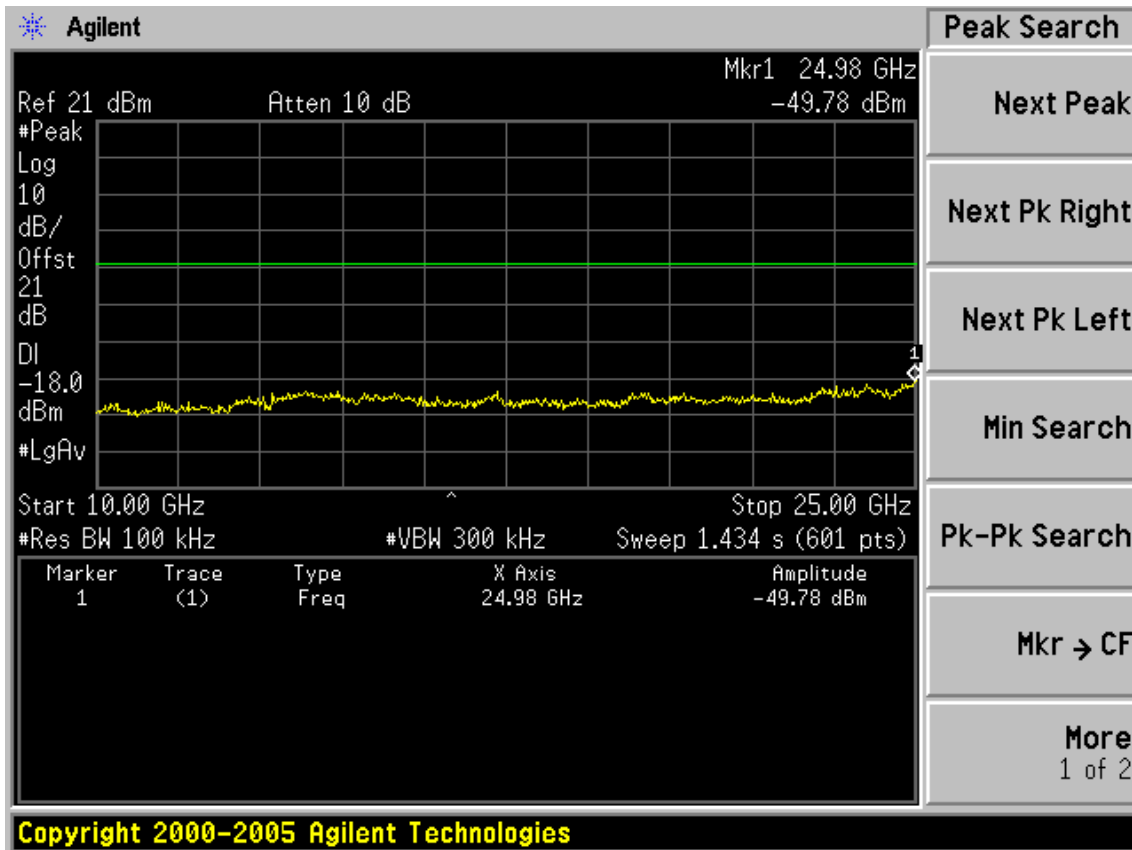




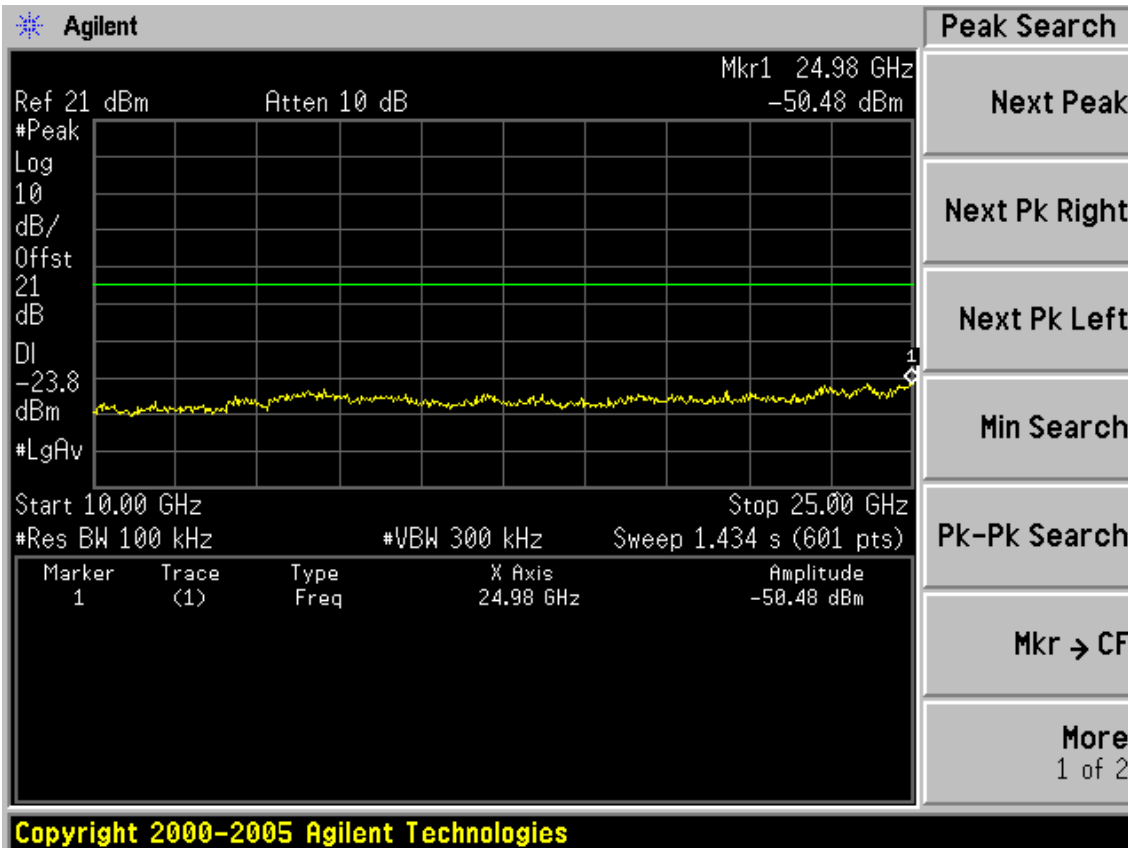
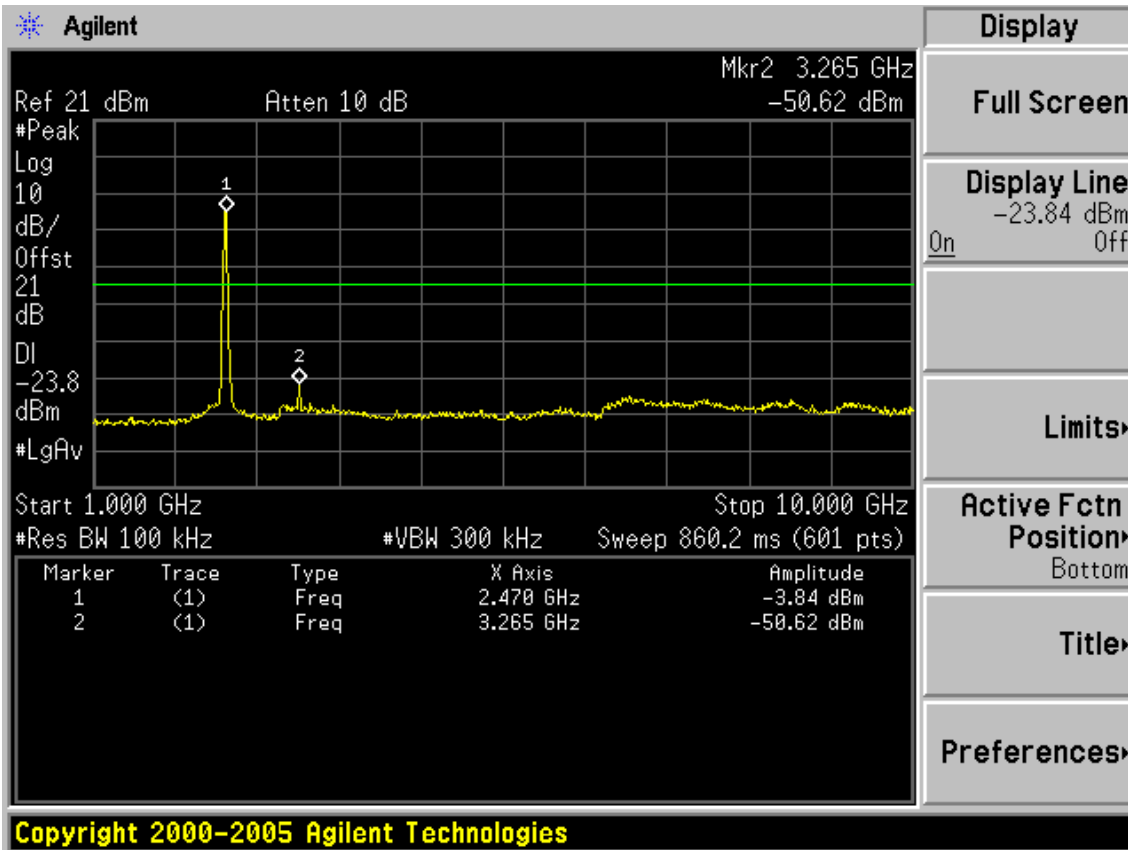


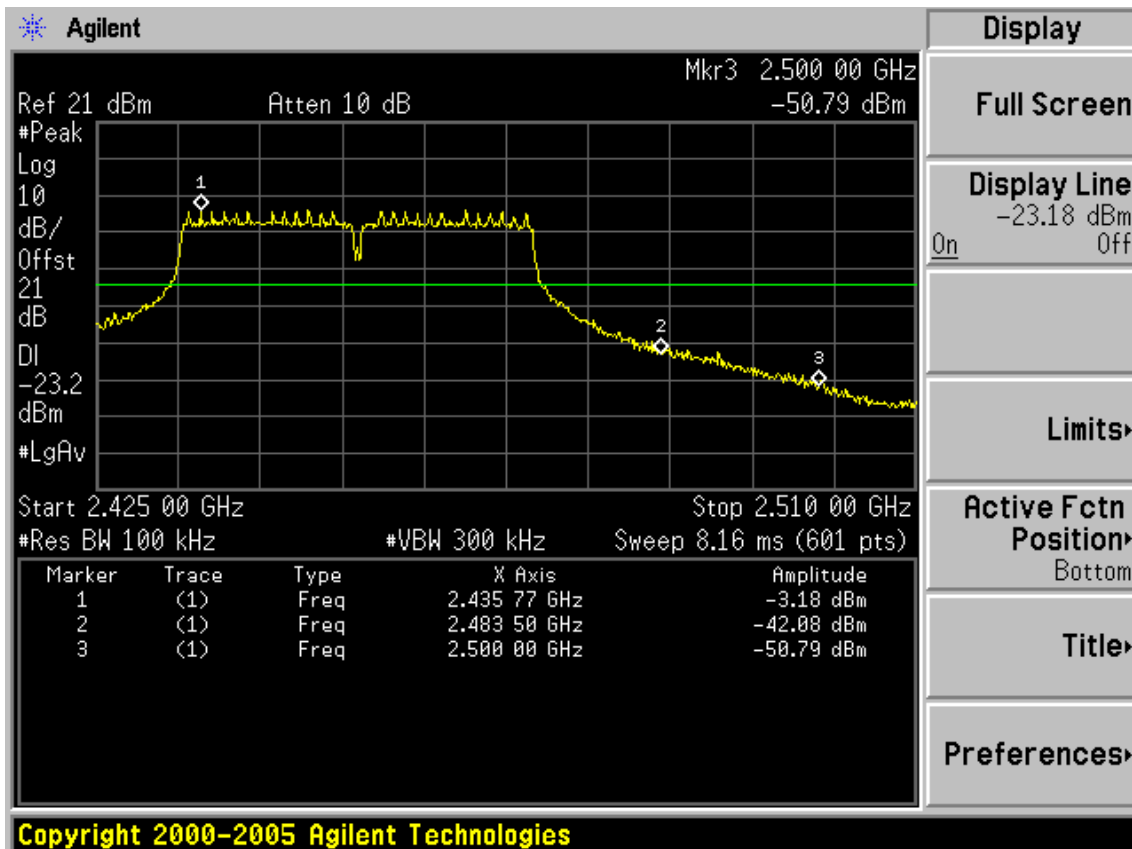
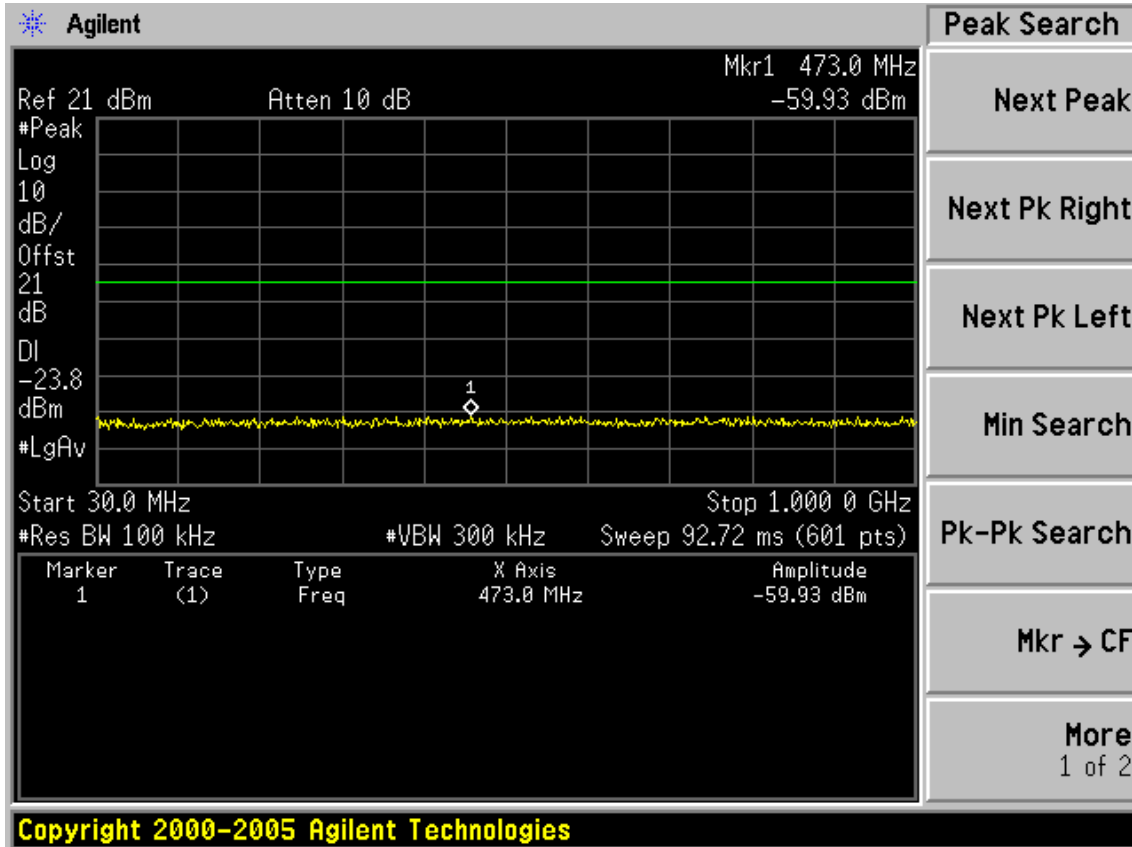
Test CH4: 2437MHz





Test CH7: 2452MHz

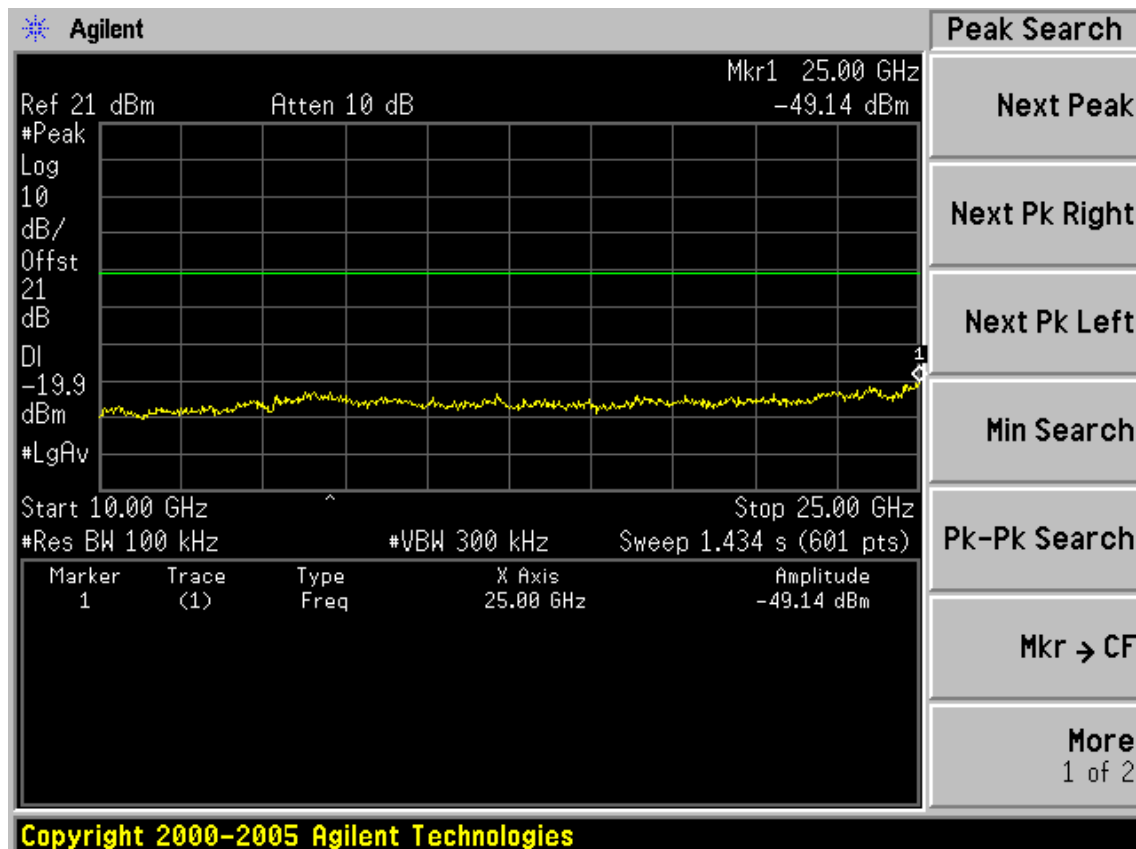
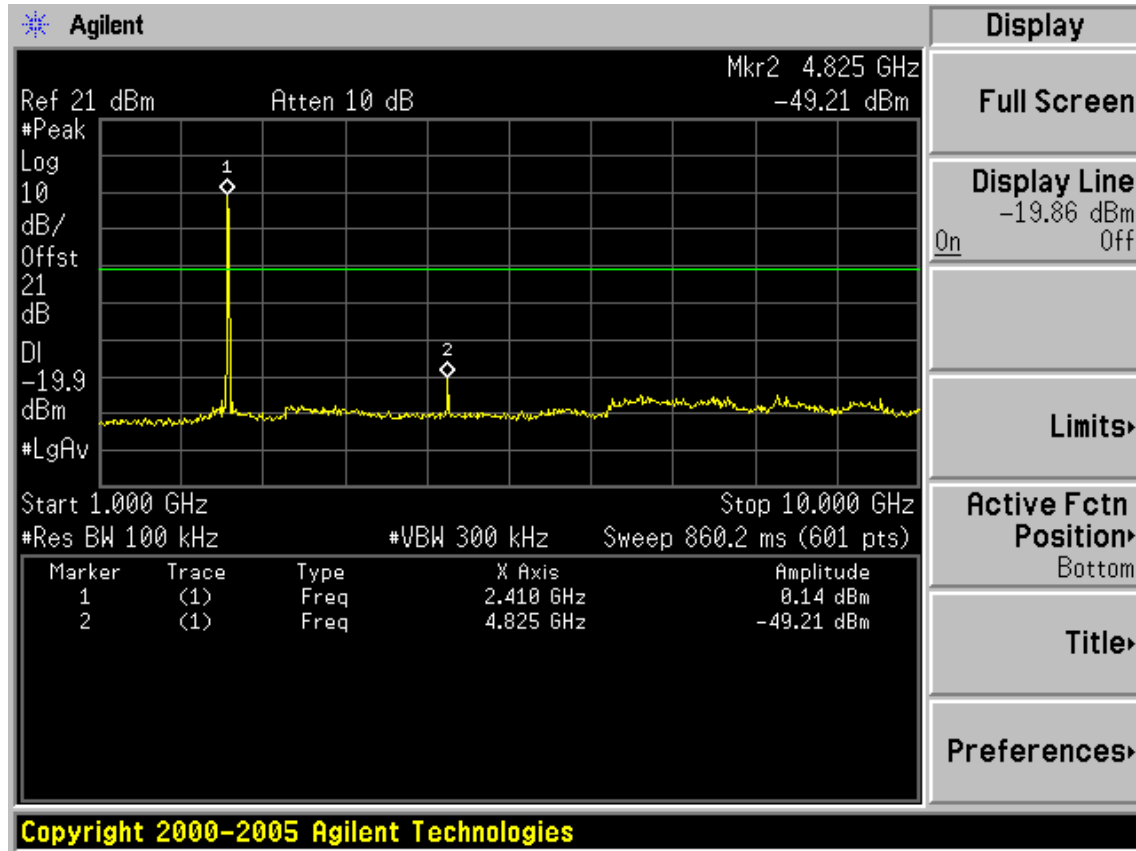


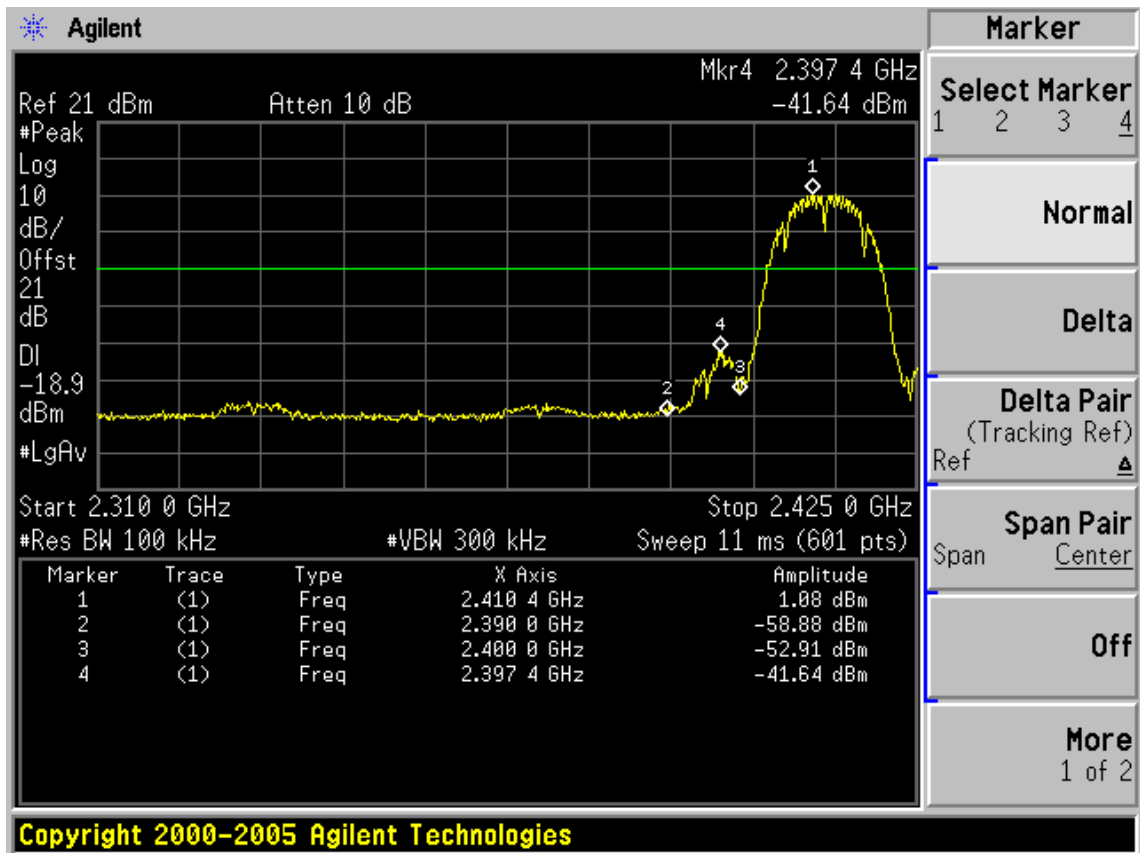
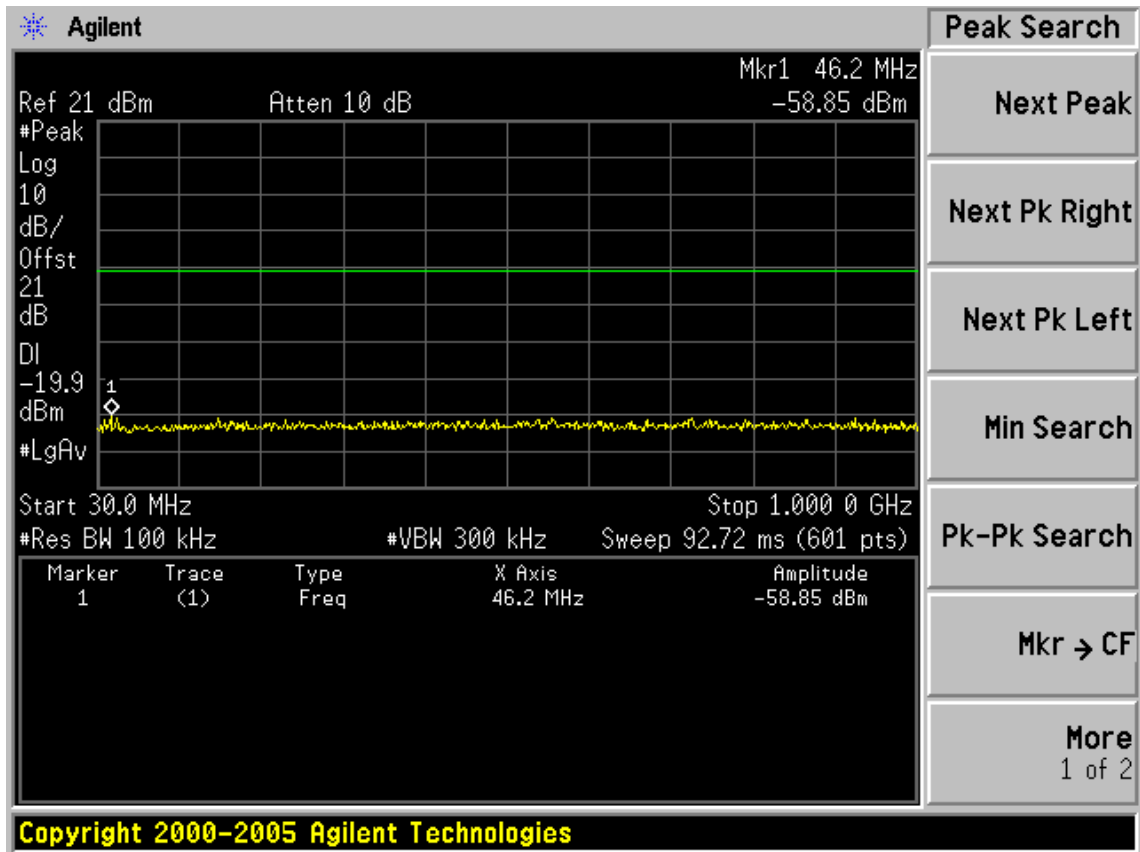


**ANT1**

Test Mode: IEEE 802.11b TX

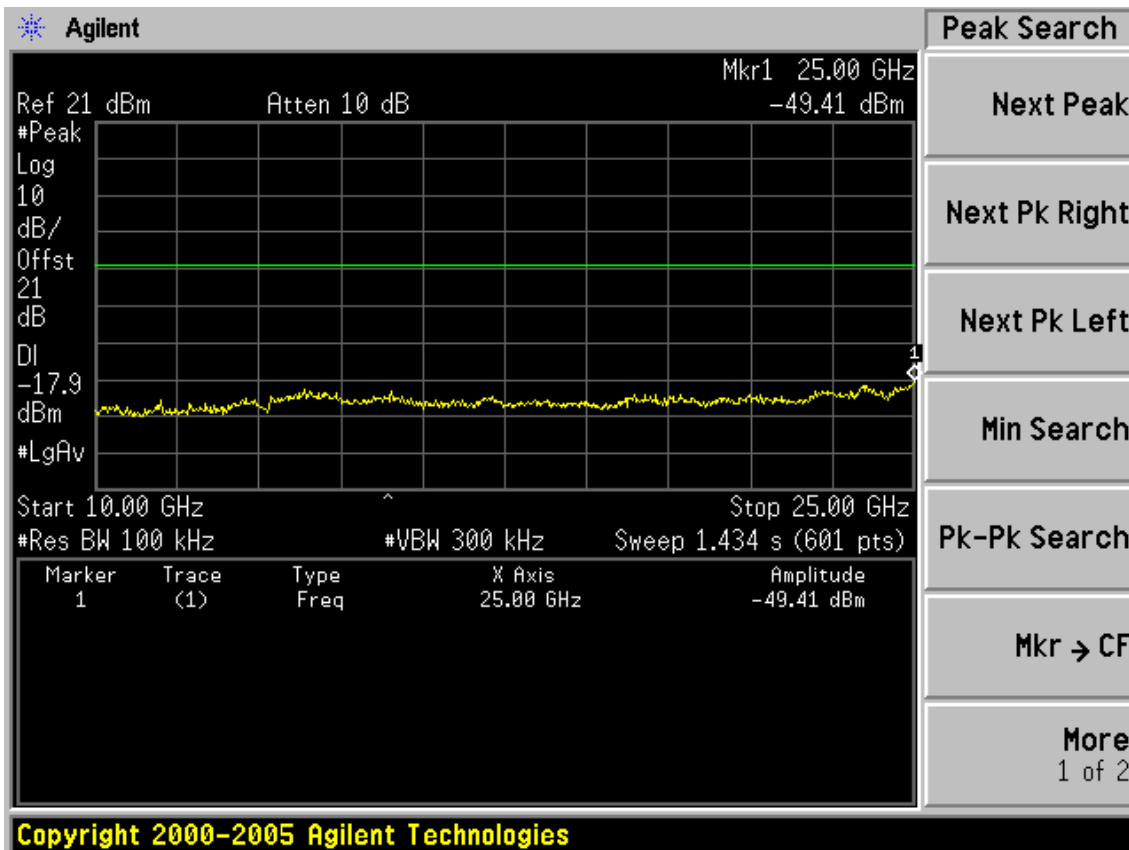
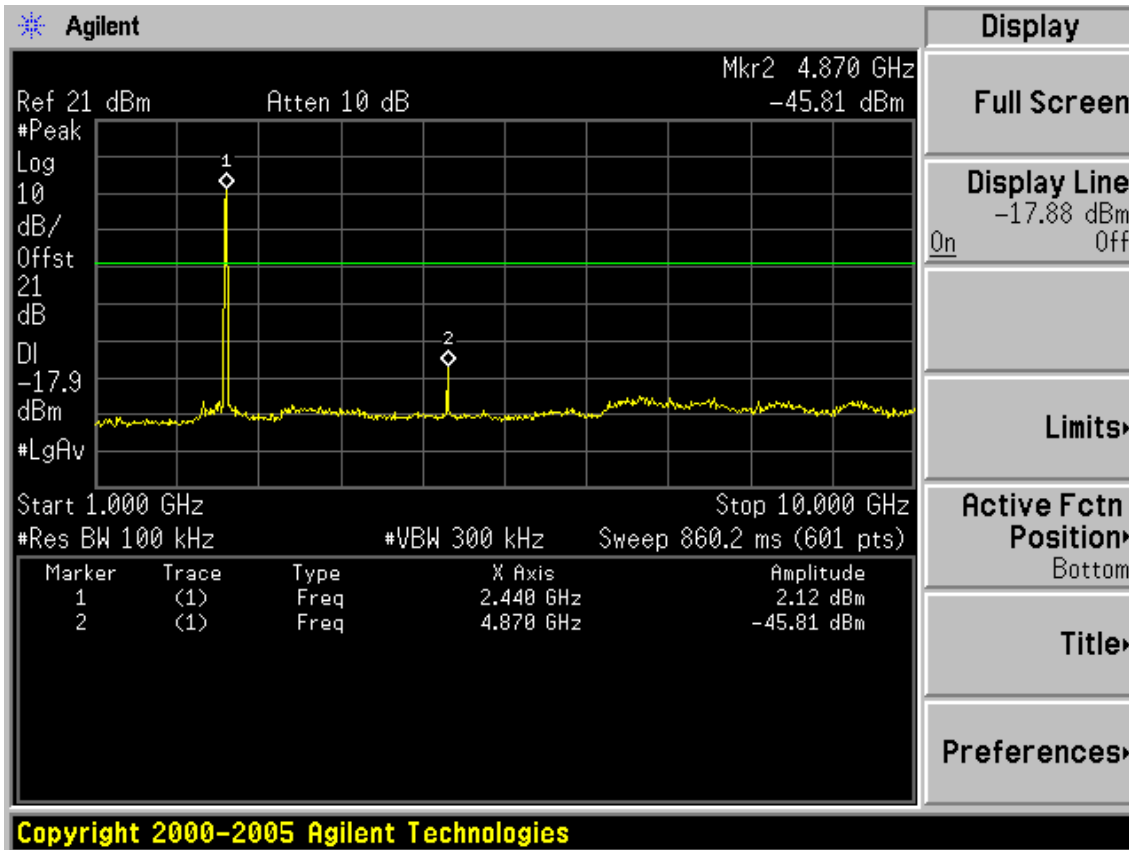
Test CH1: 2412MHz

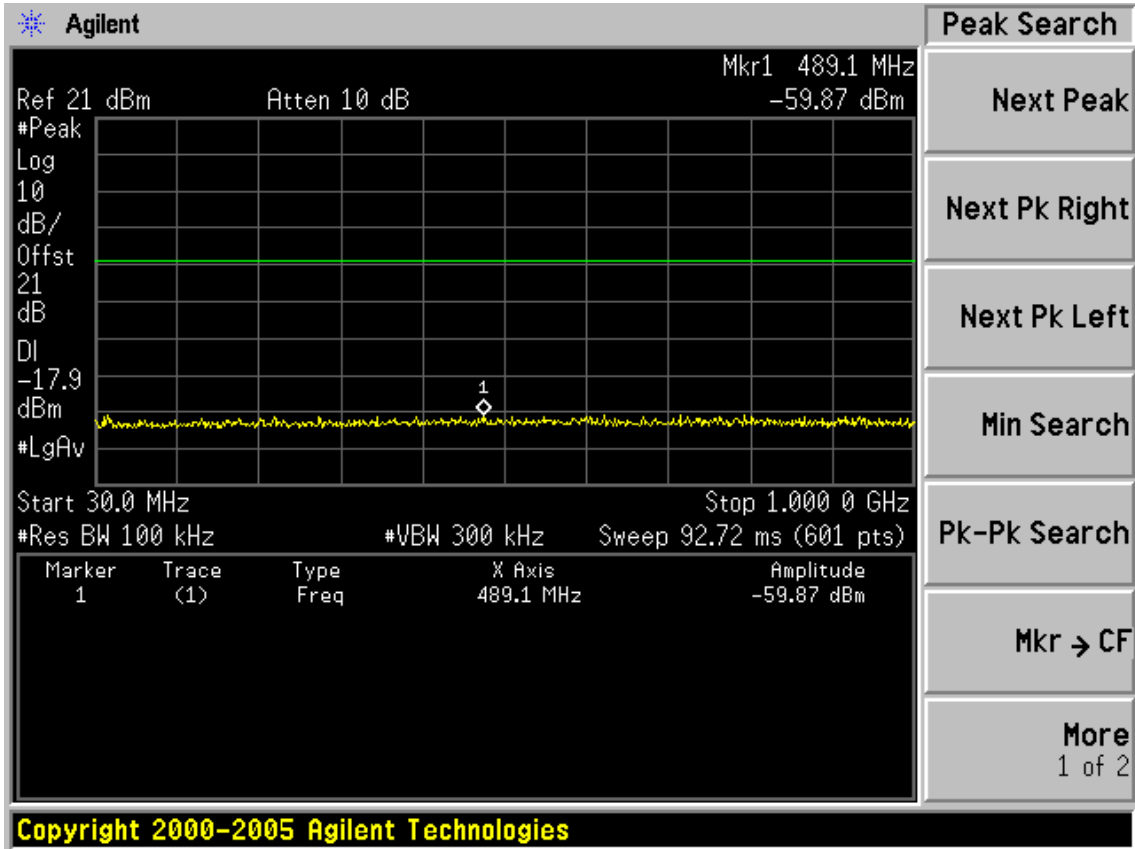




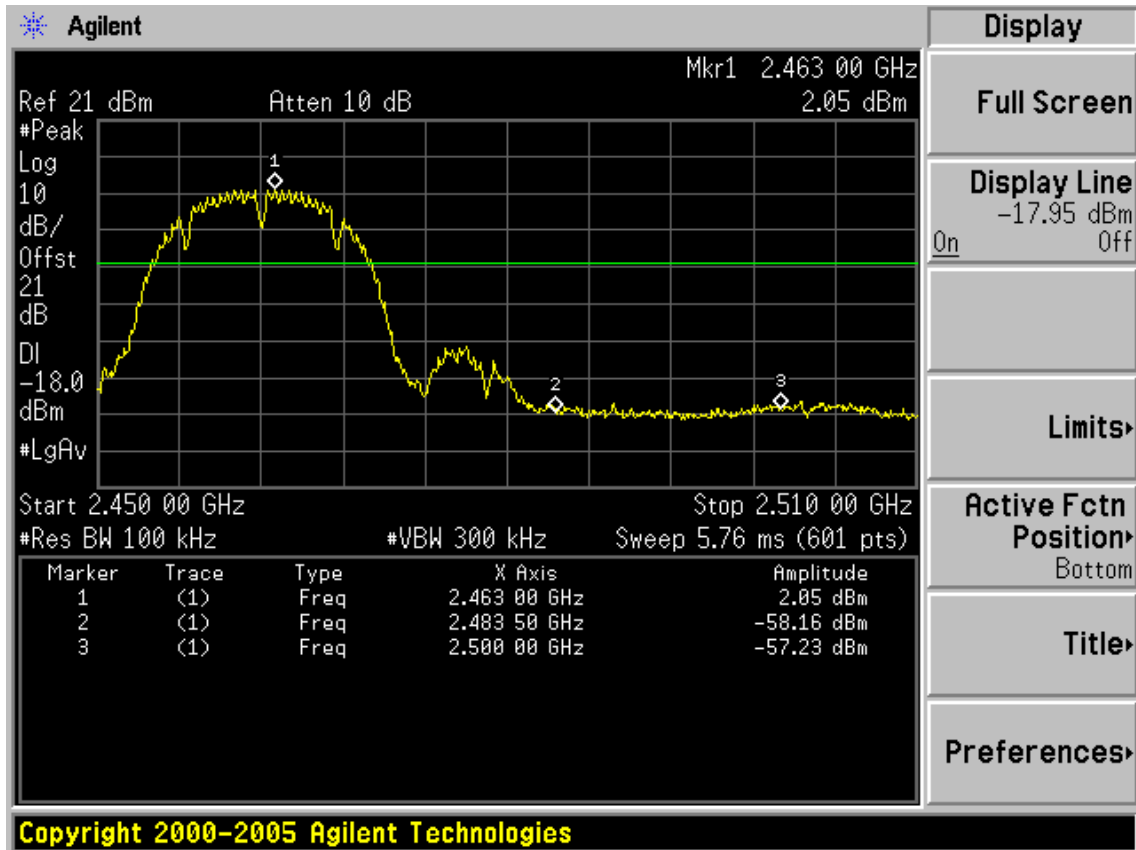


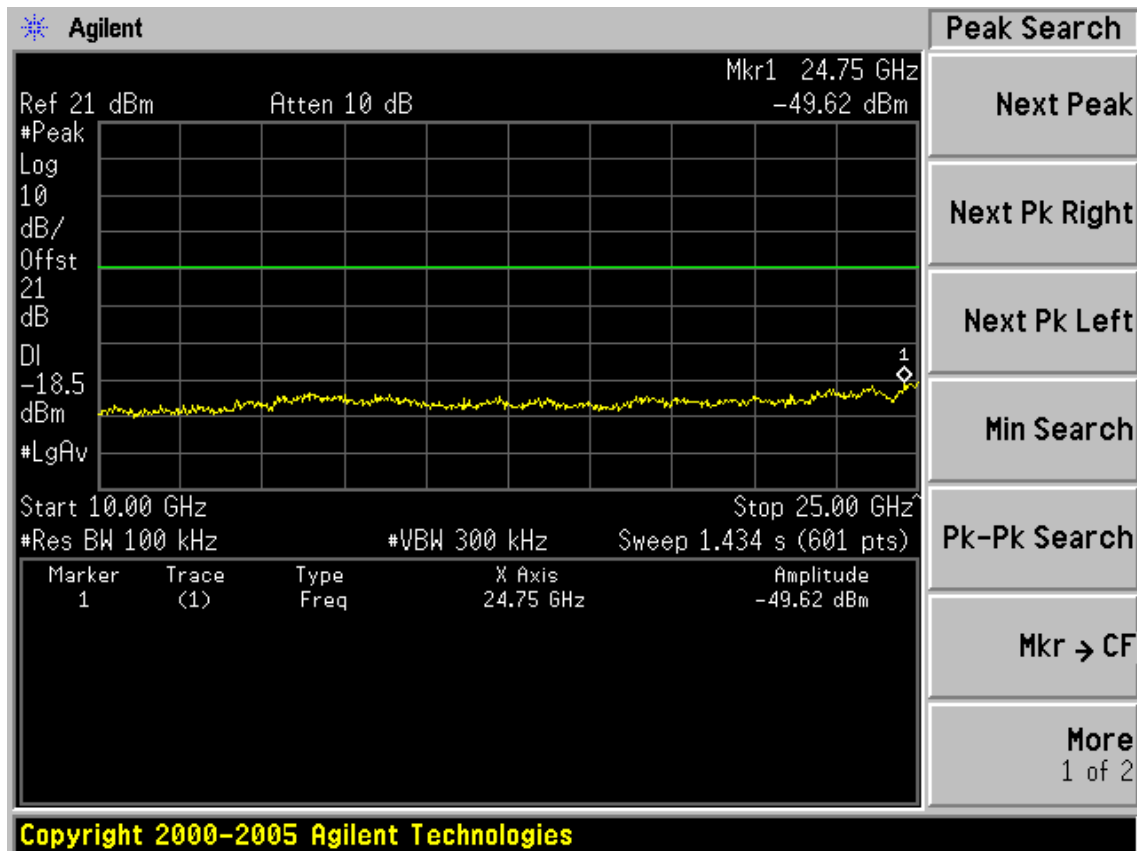
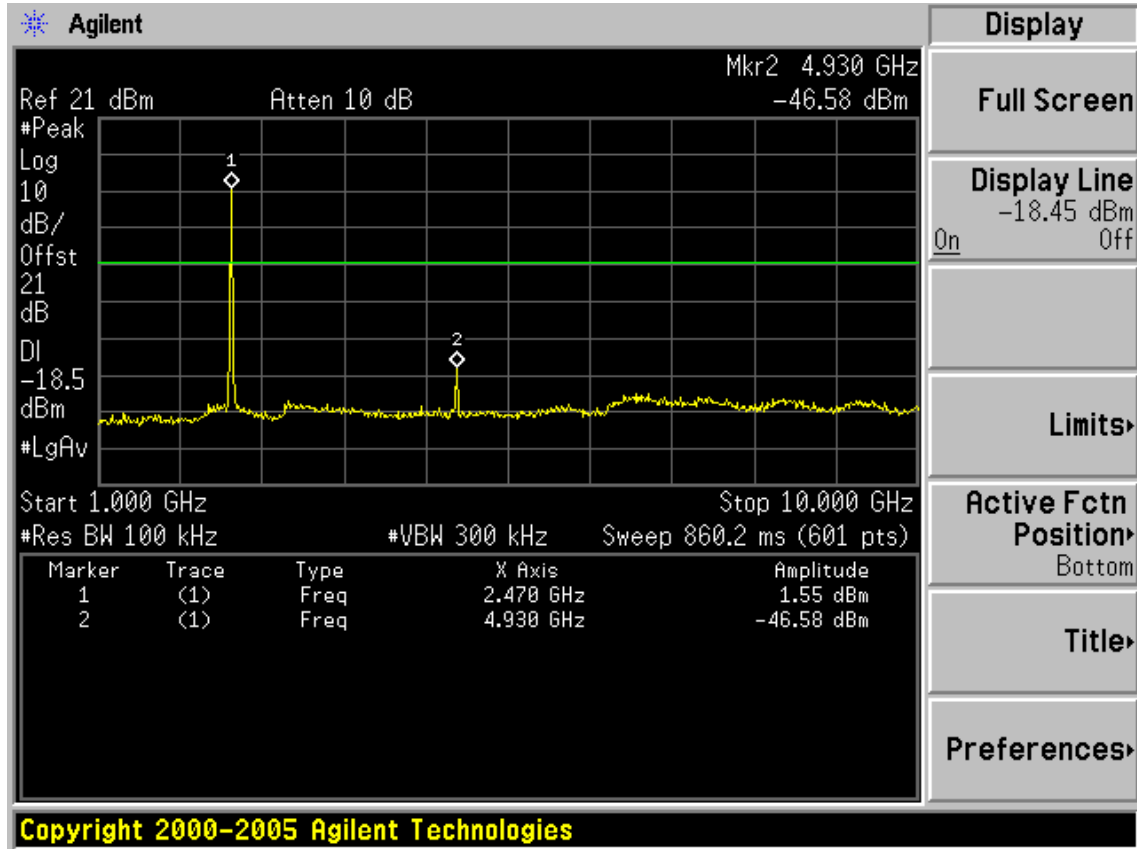
Test CH6: 2437MHz

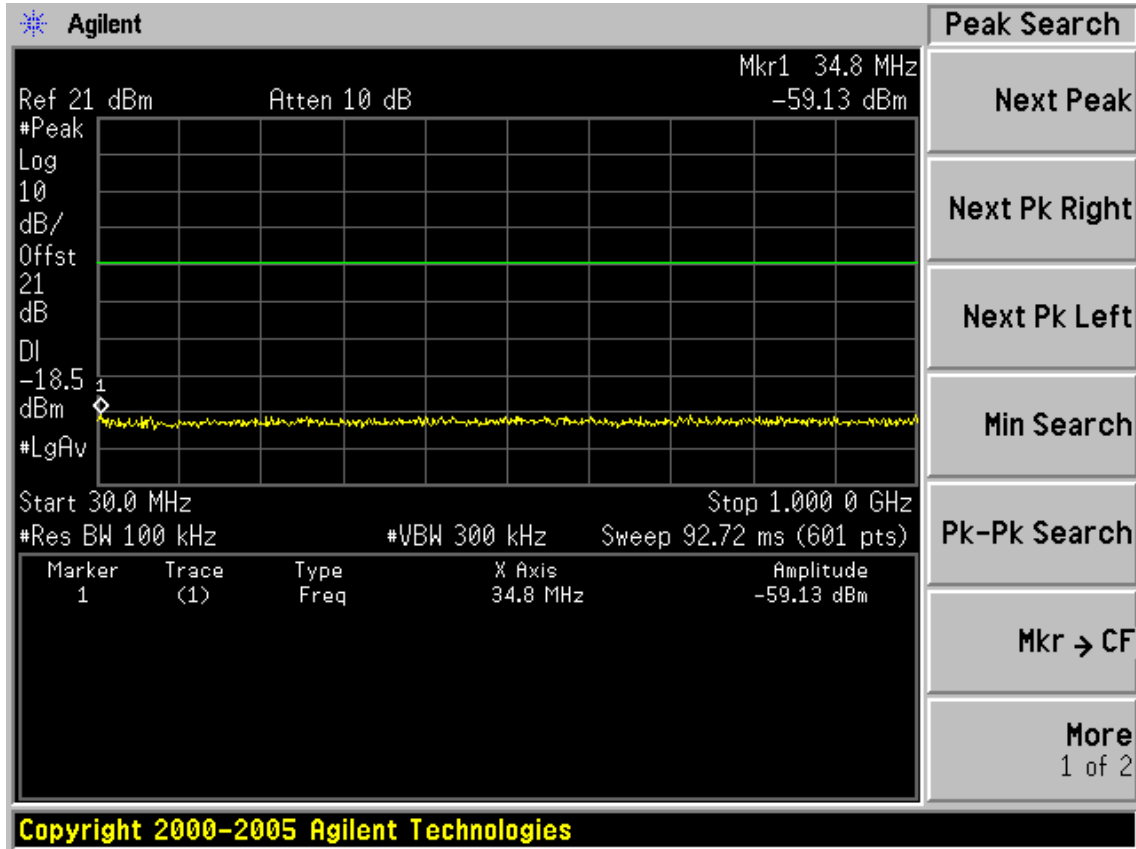




Test CH11: 2462MHz

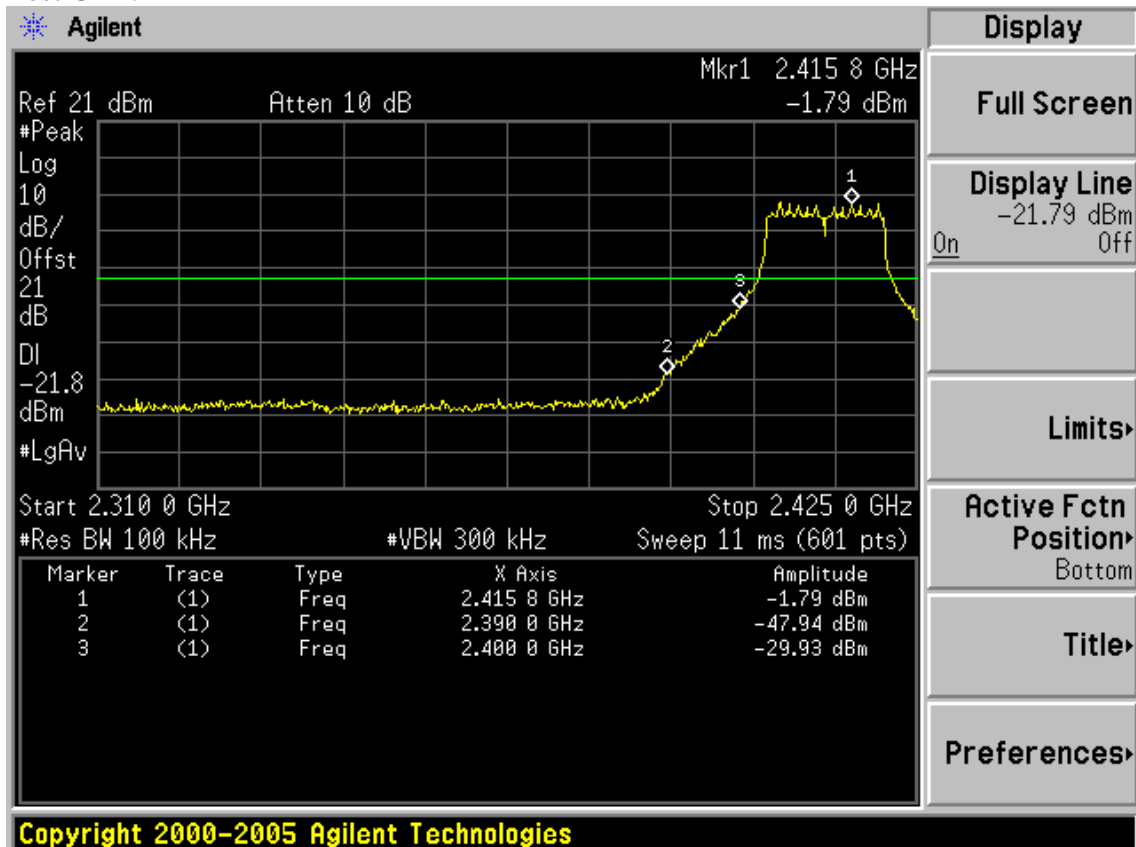


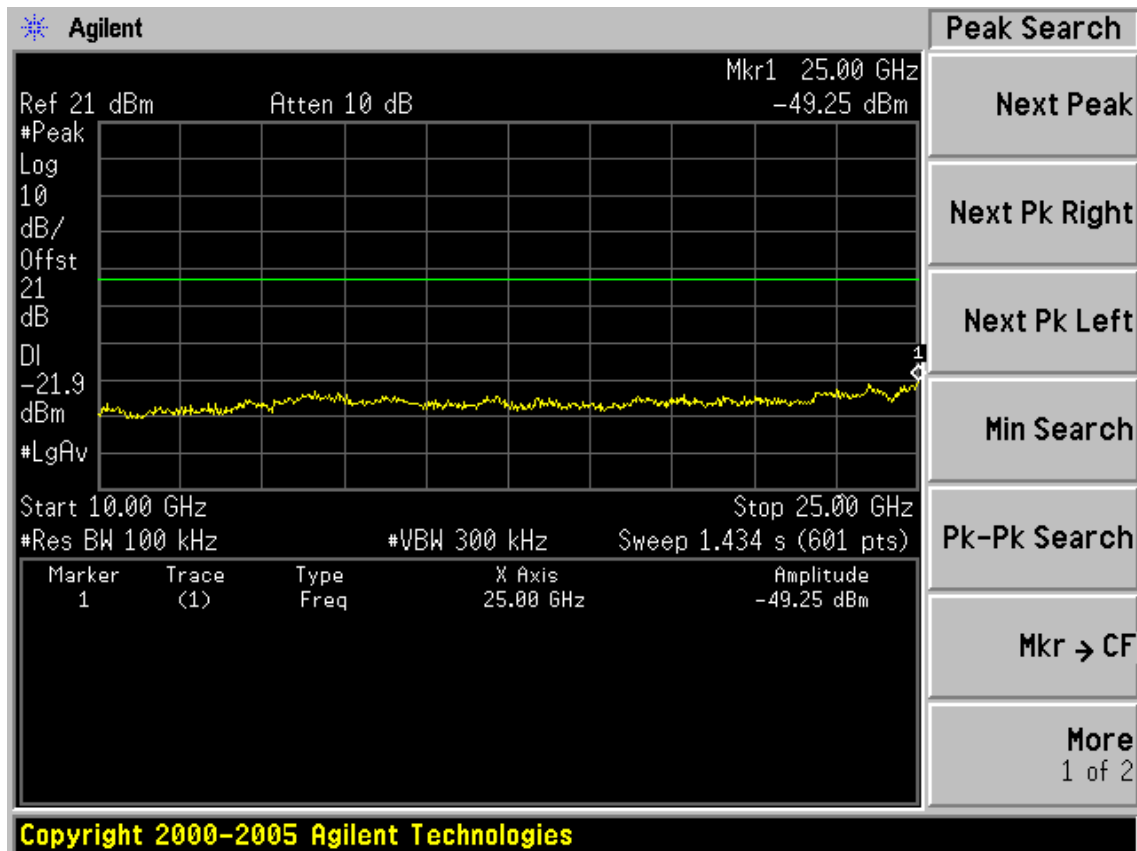
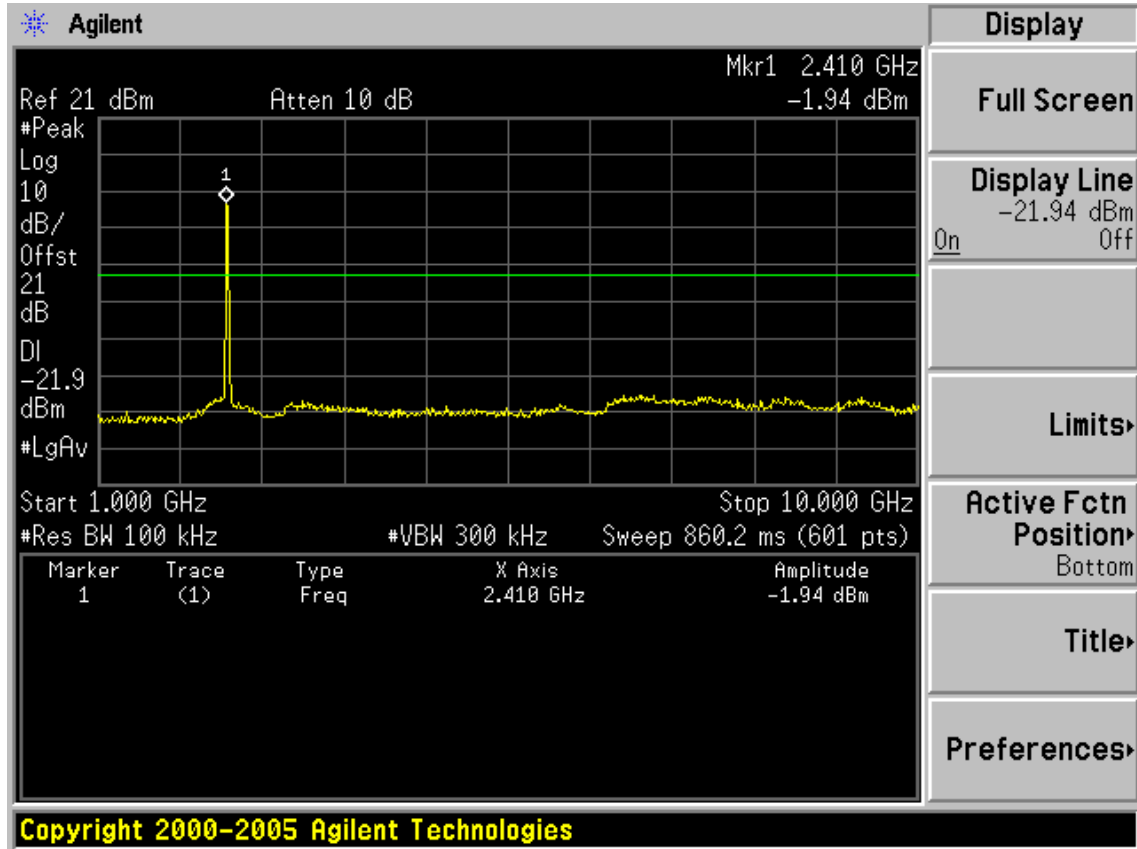


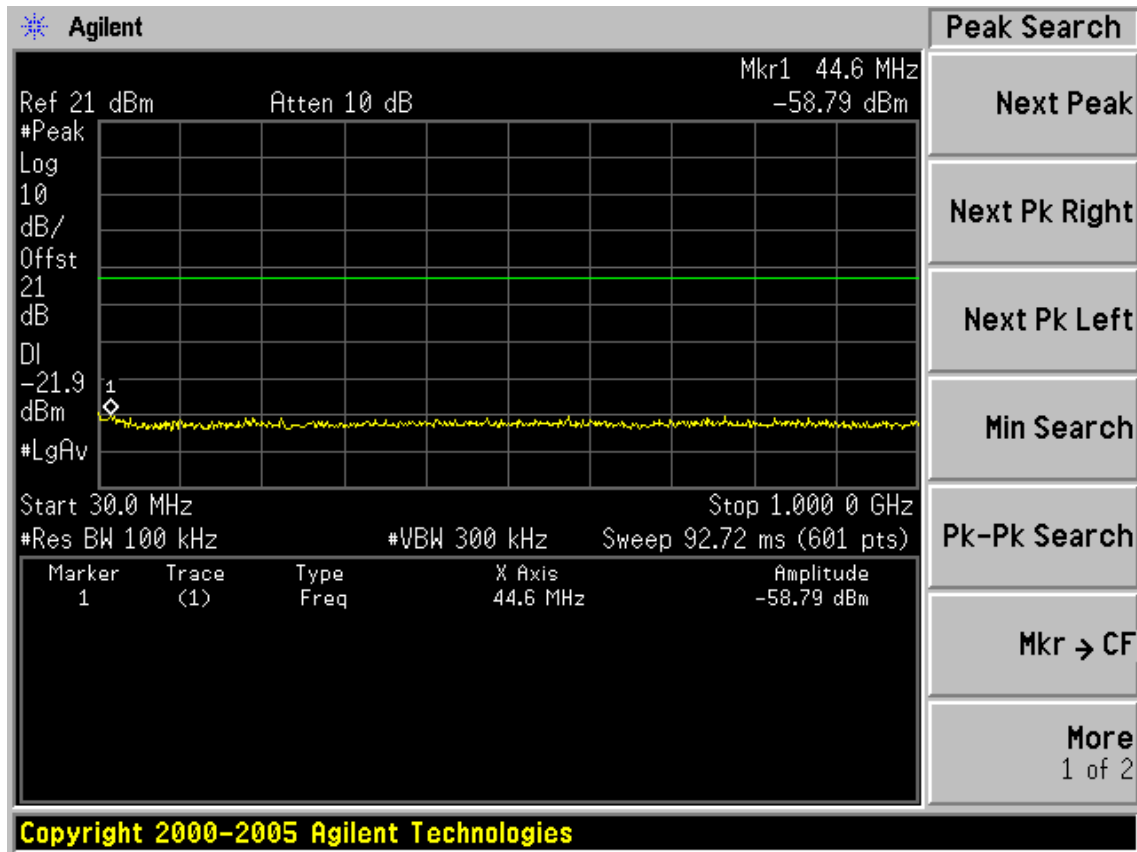


Test Mode: IEEE 802.11g TX

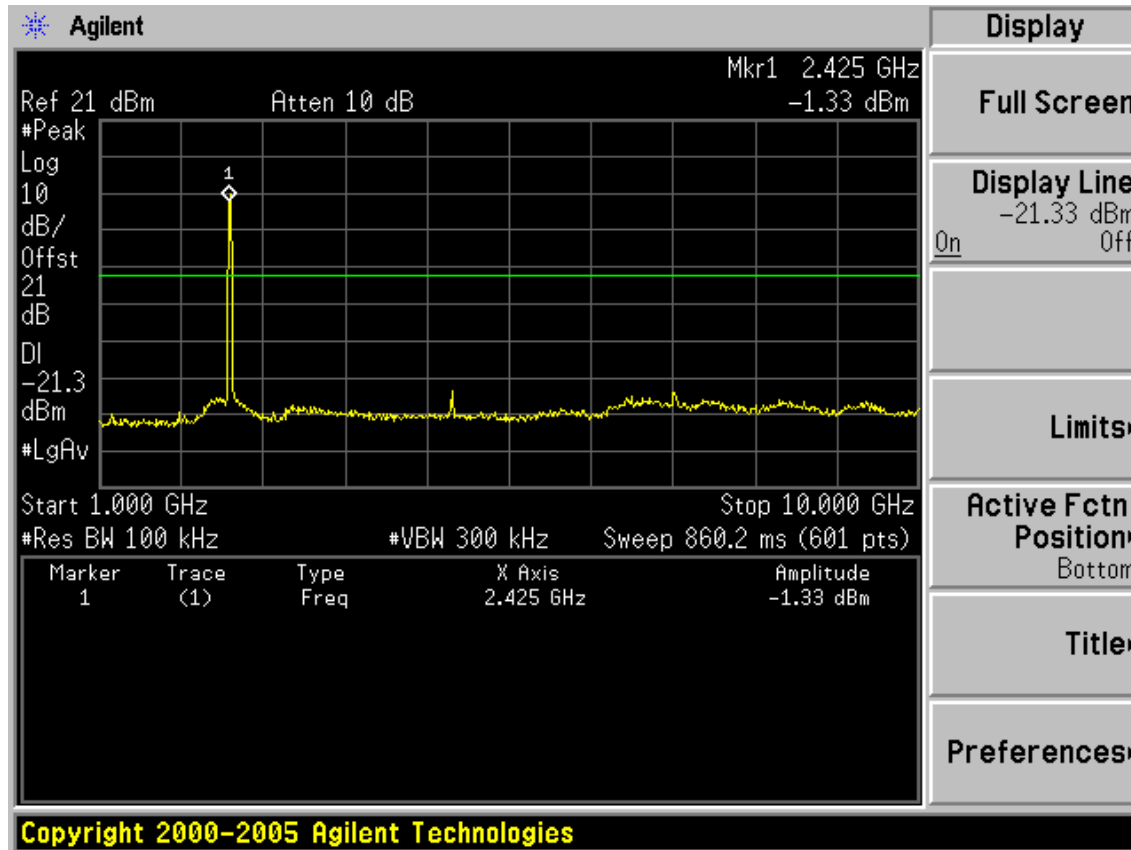
Test CH1: 2412MHz

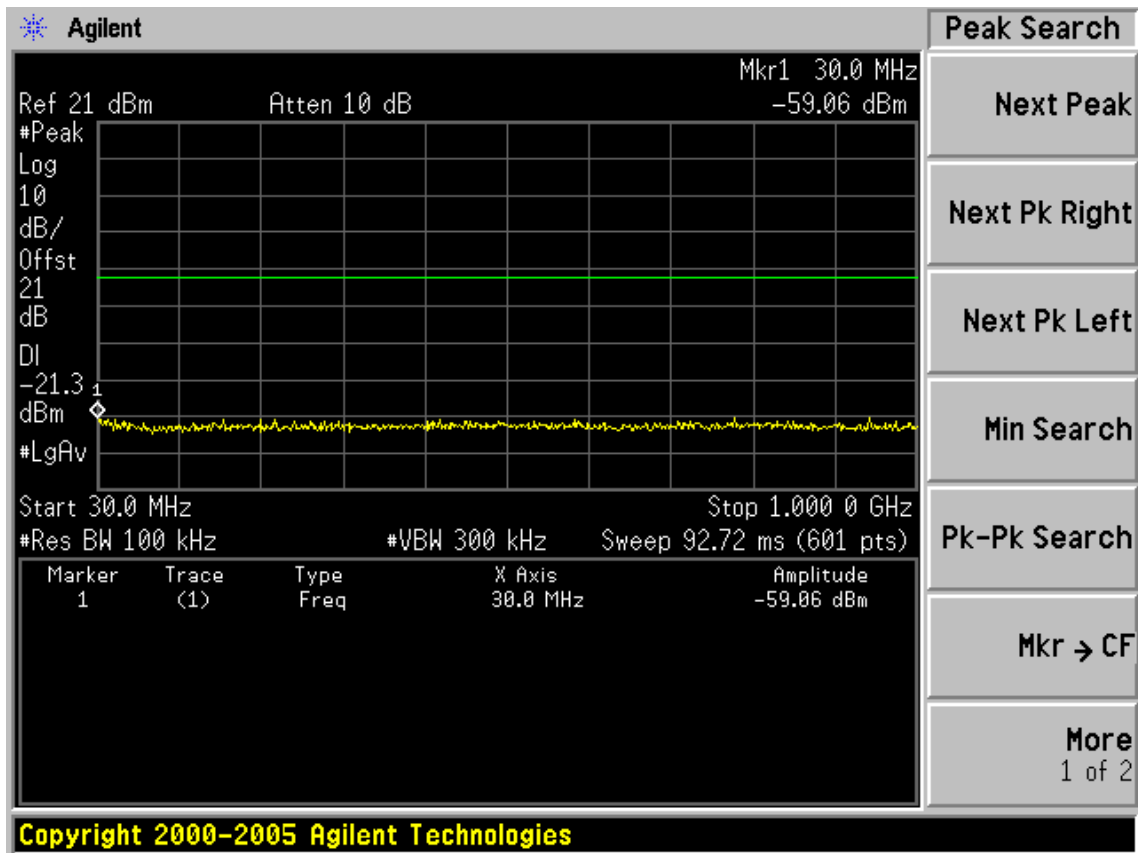
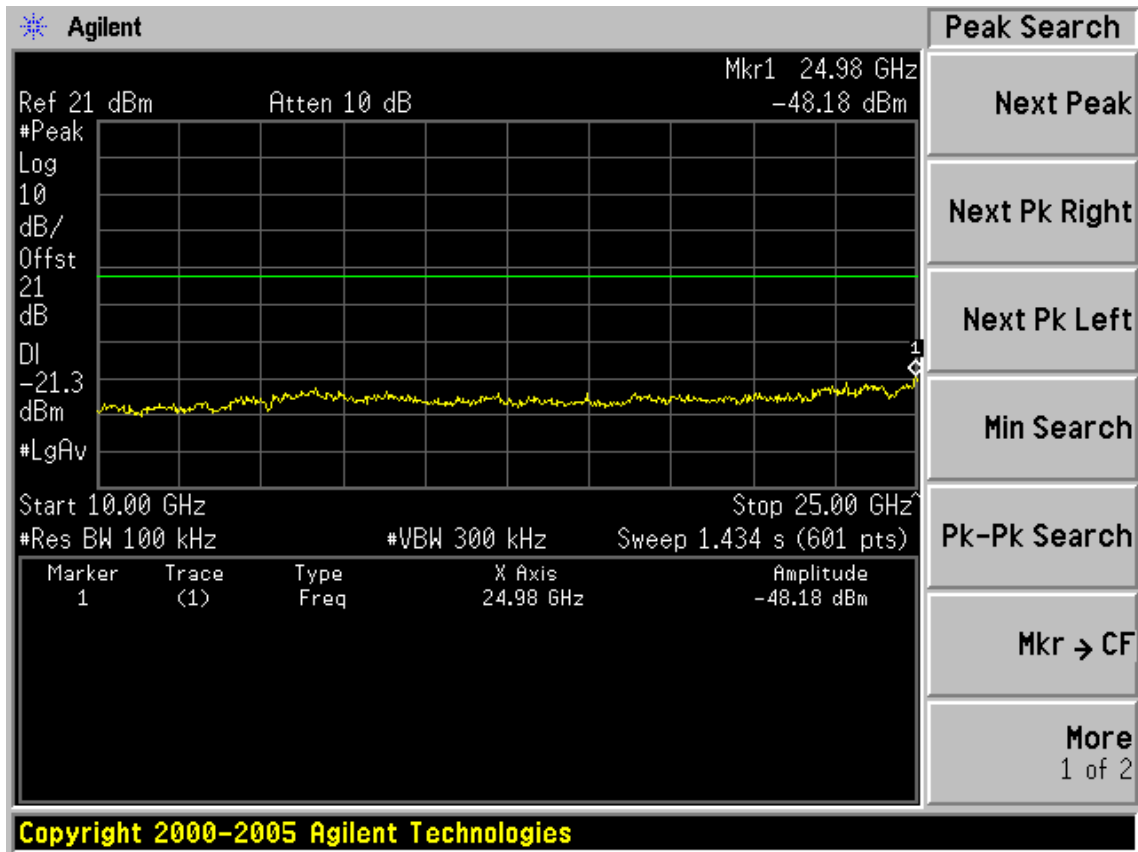




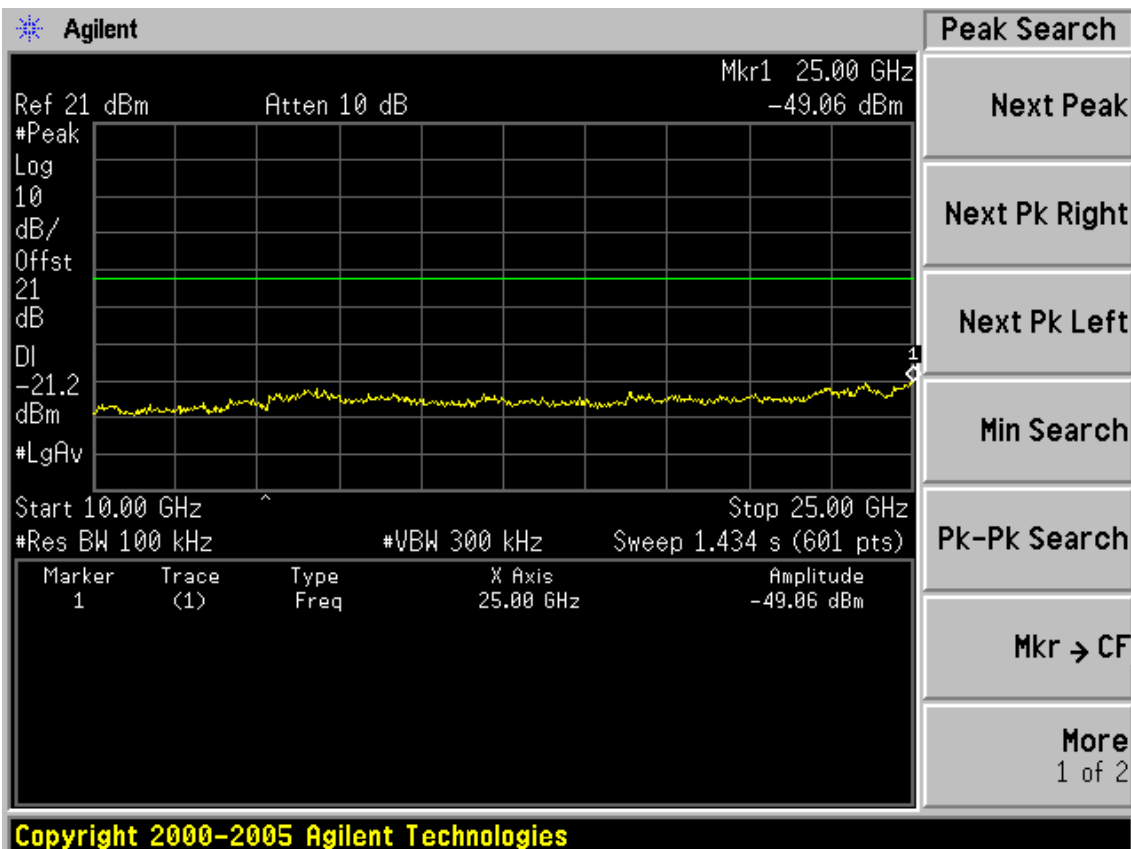
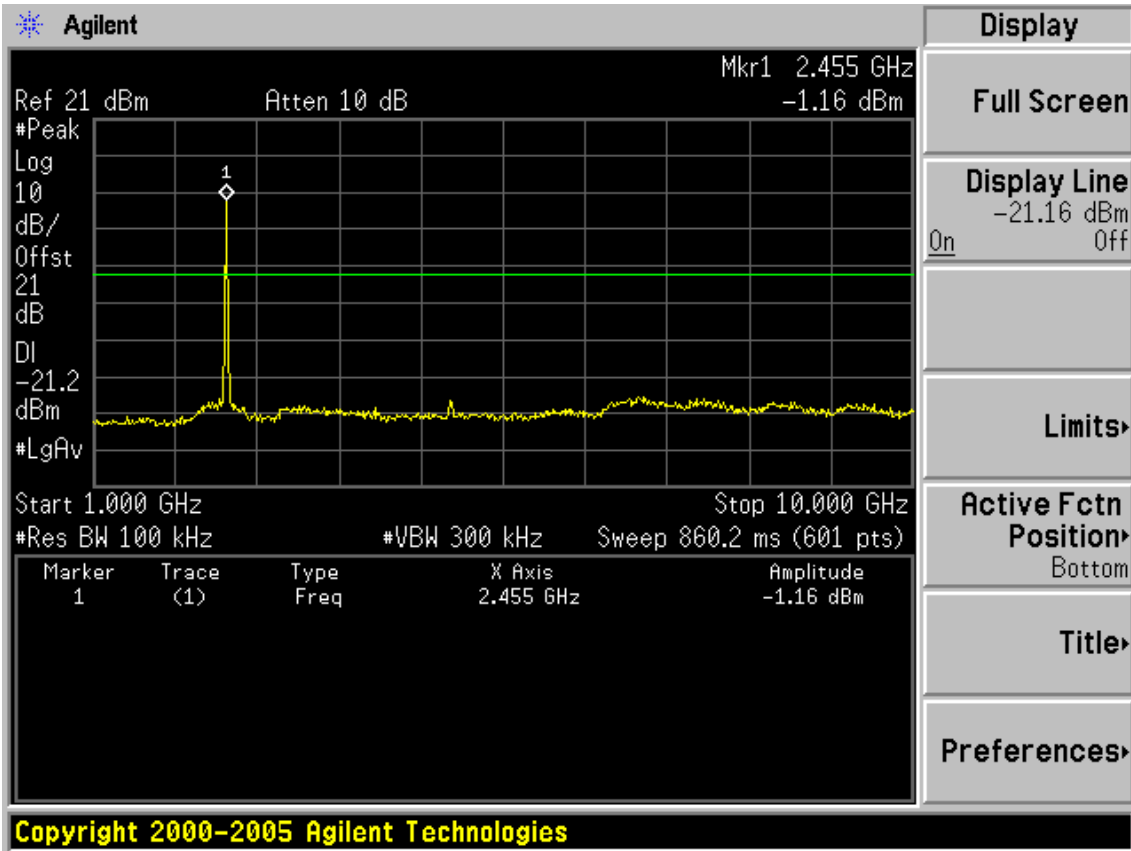


Test CH6: 2437MHz

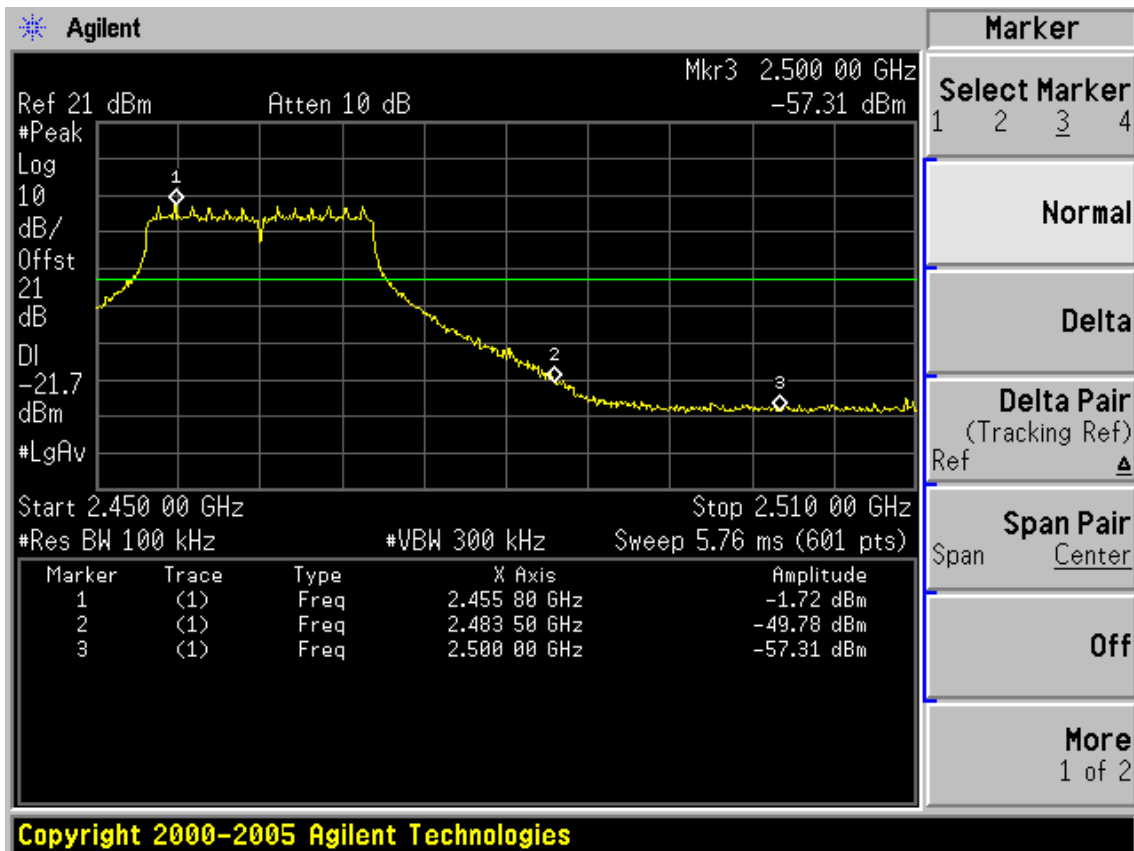
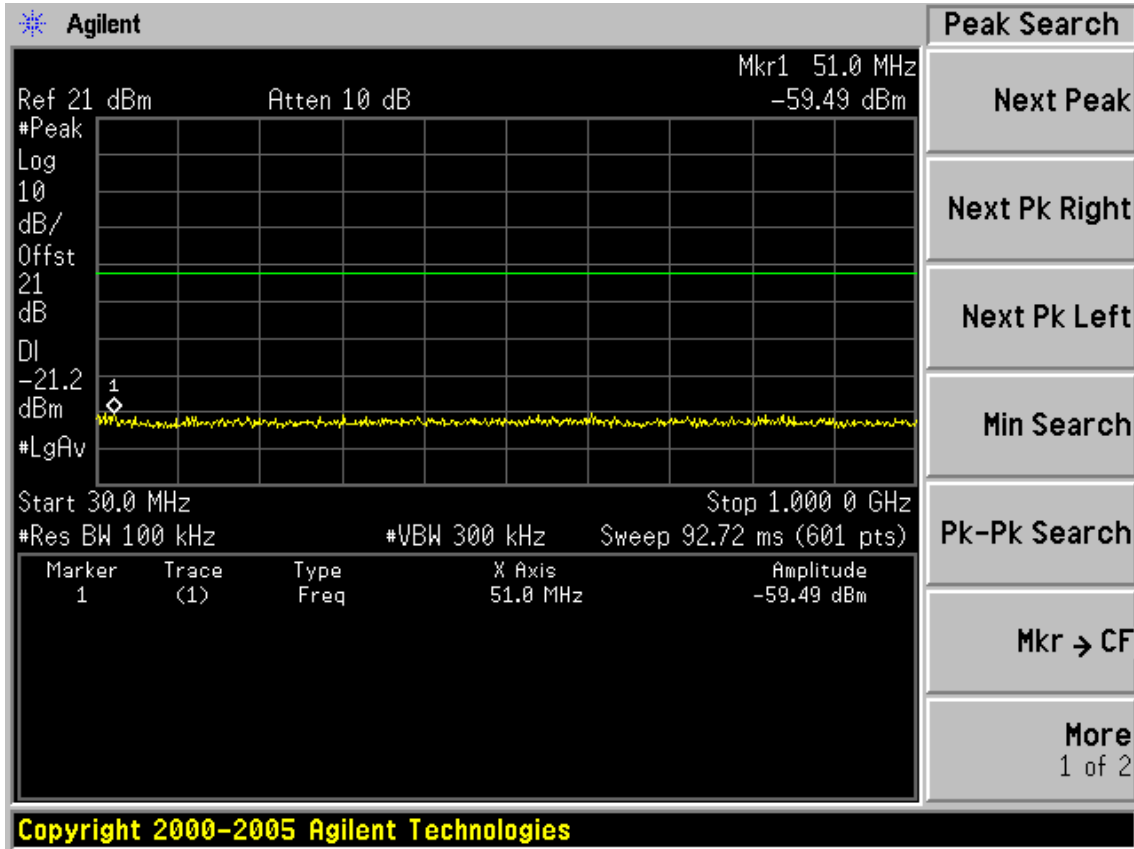




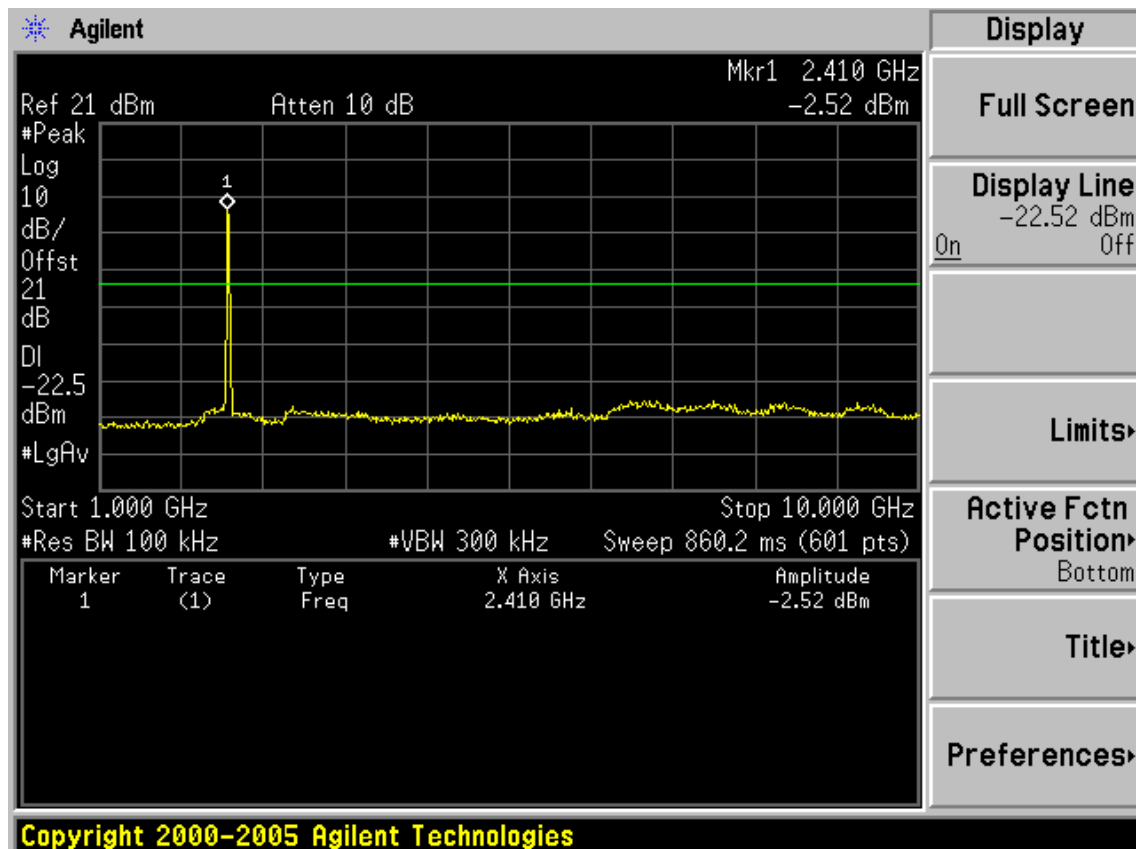
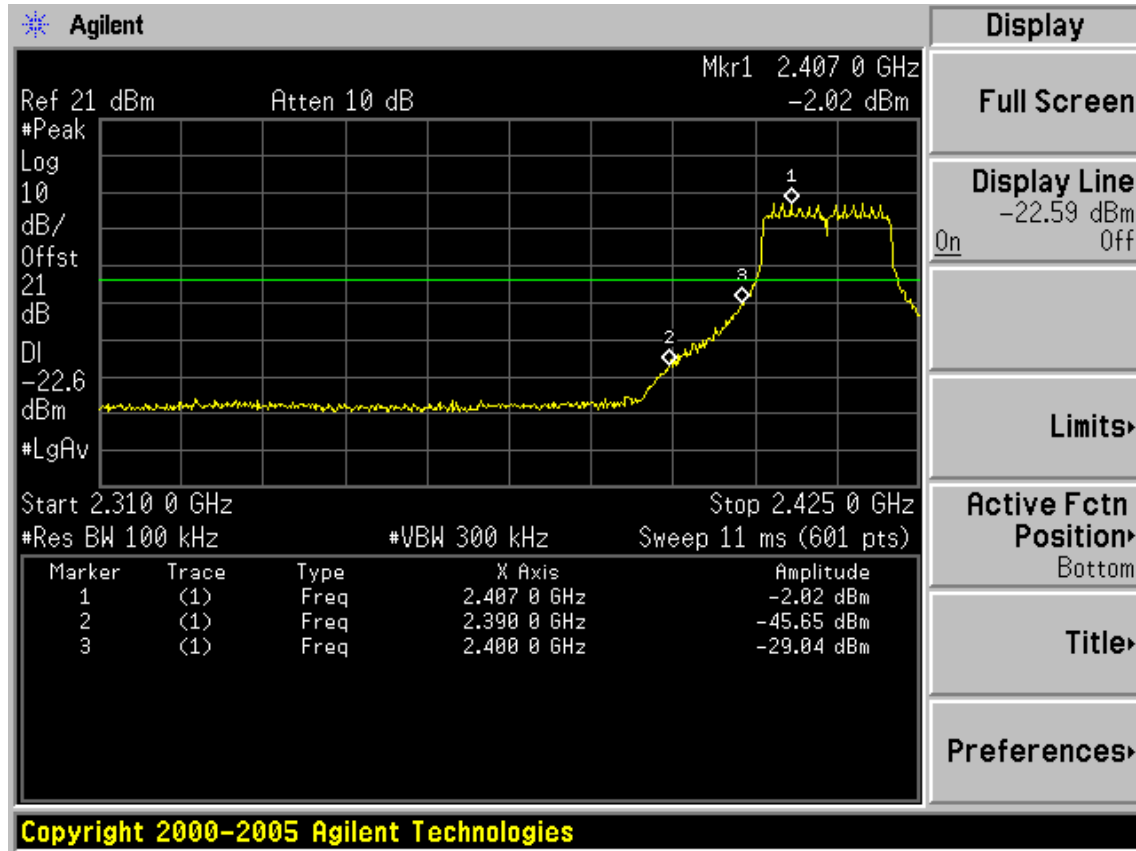
Test CH11: 2462MHz

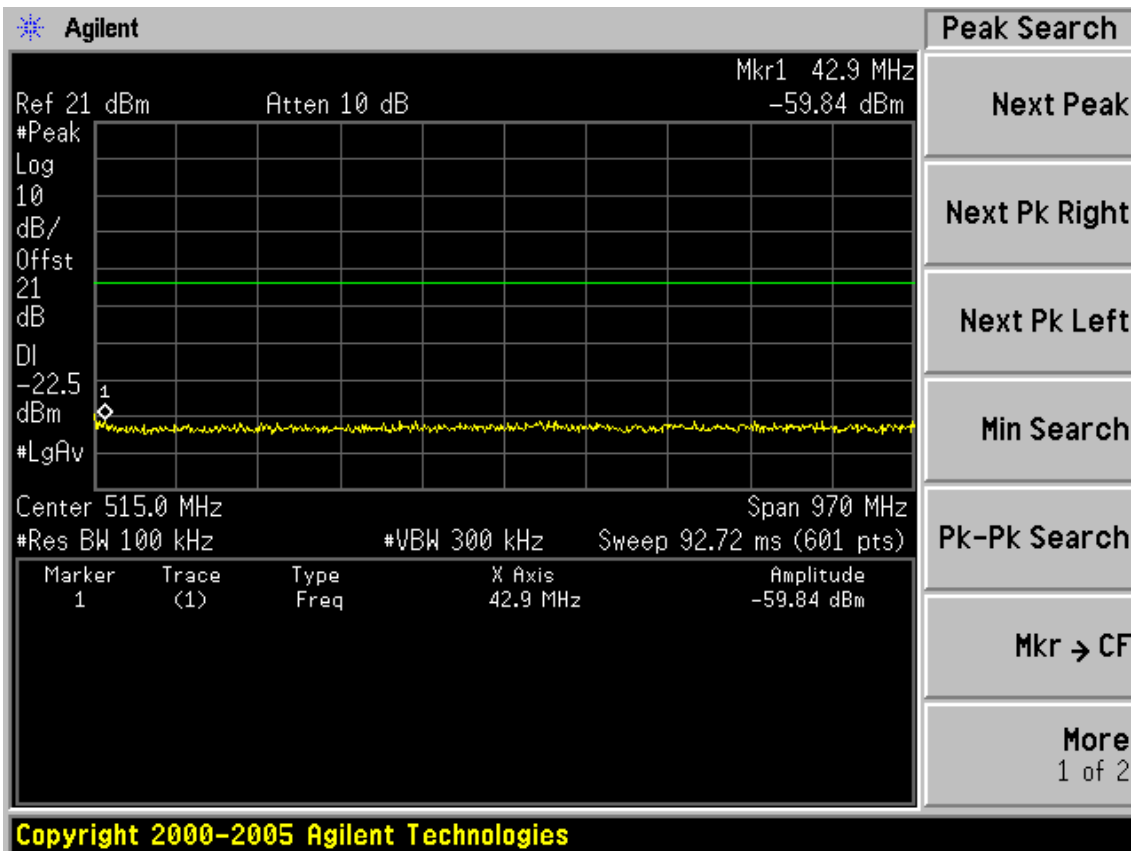
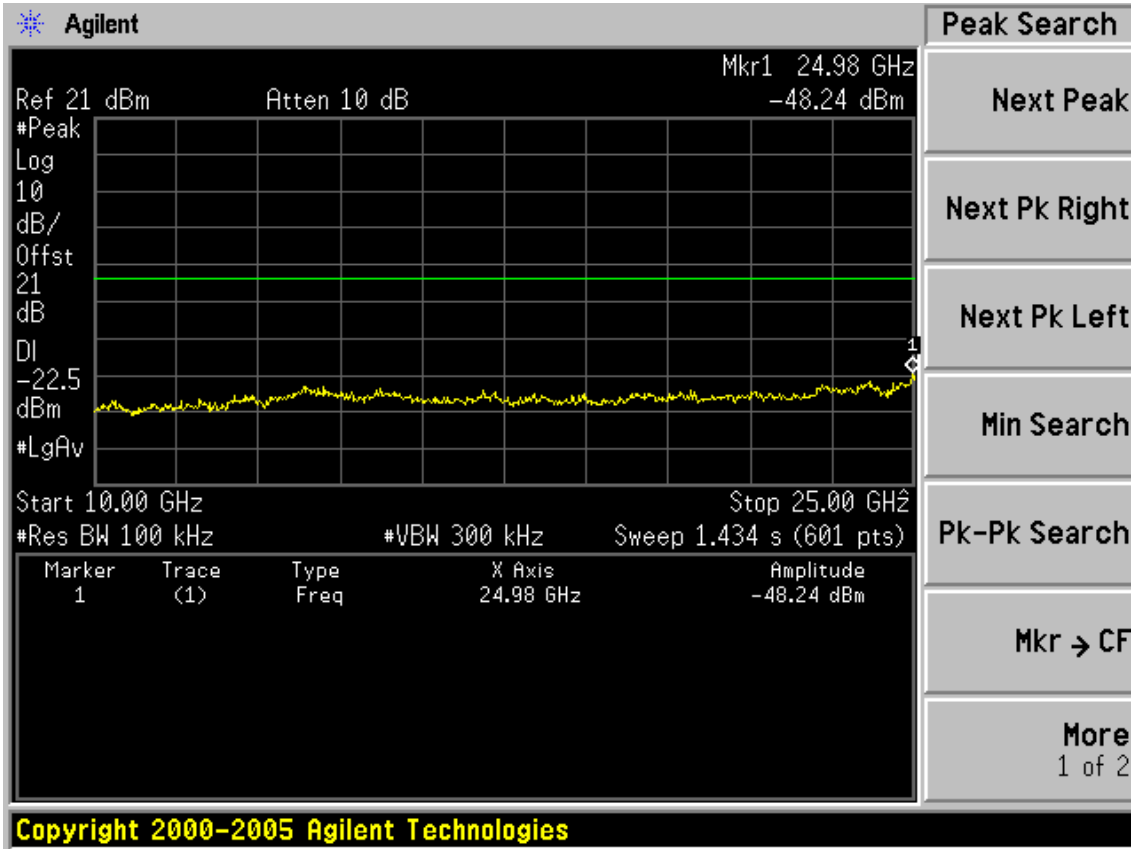




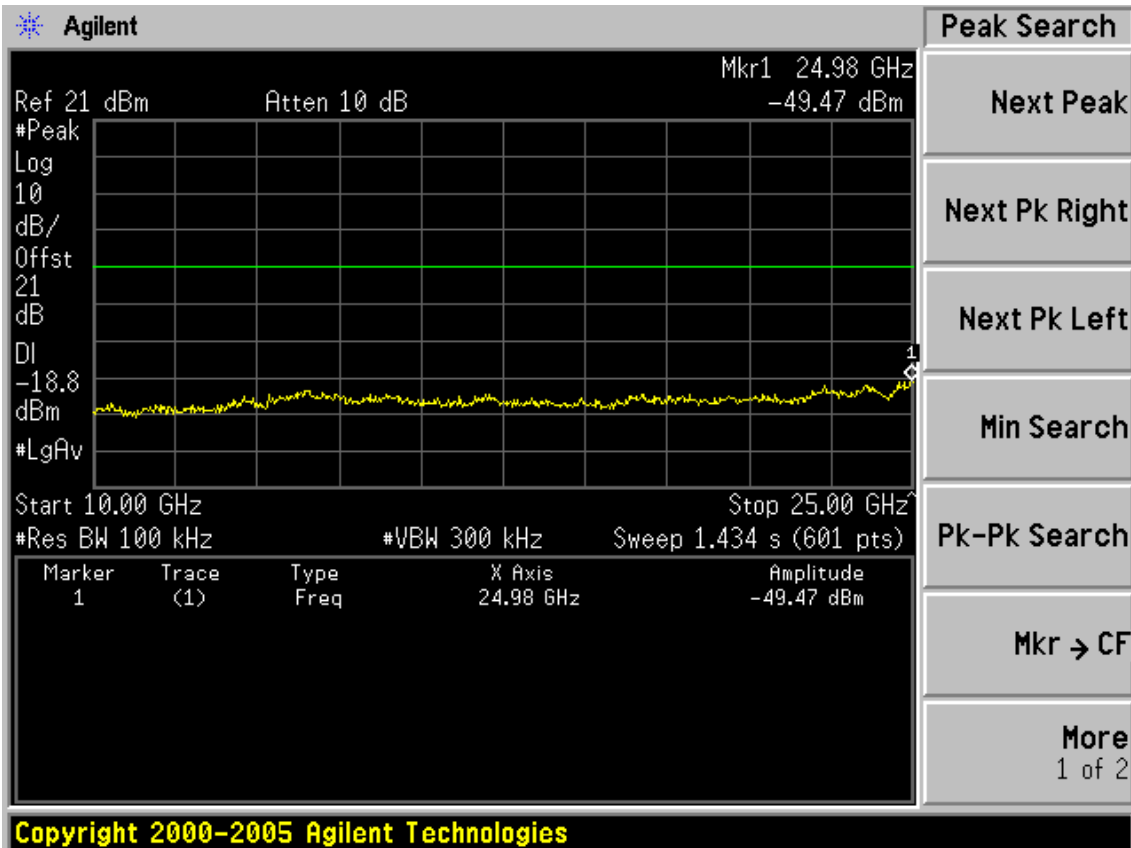
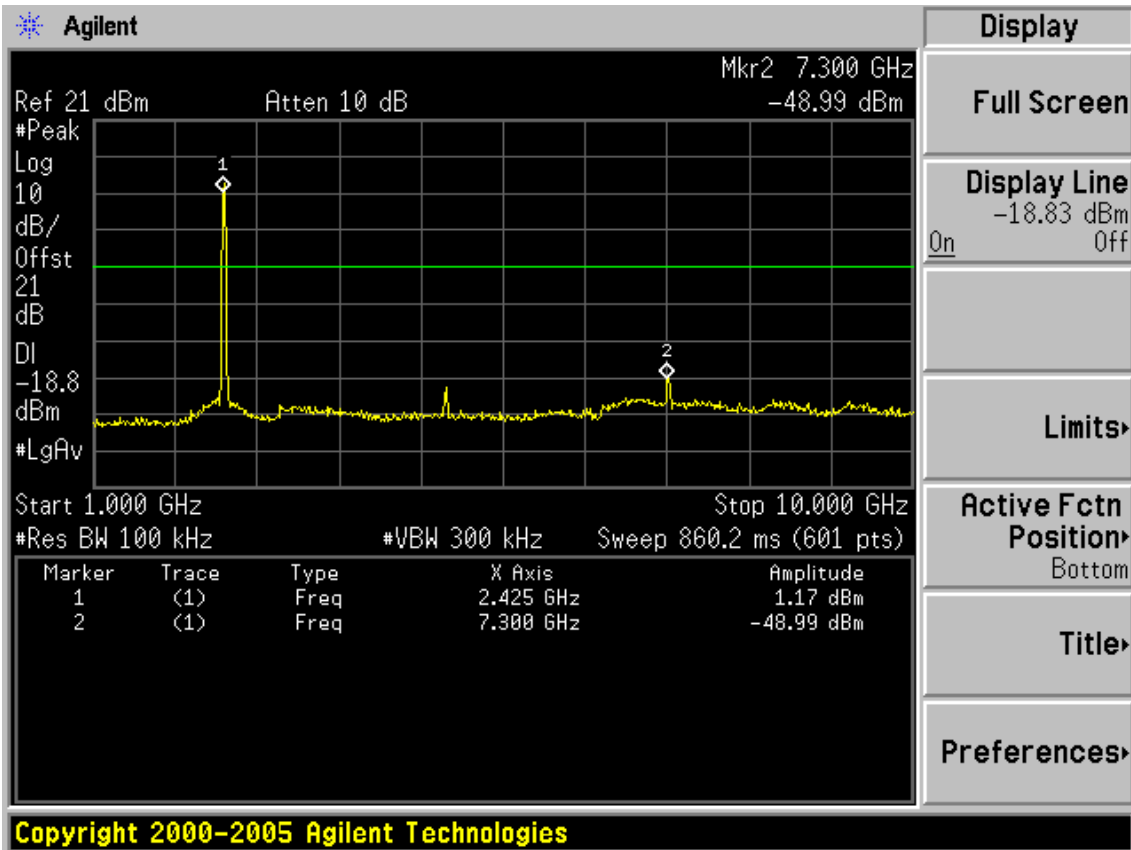


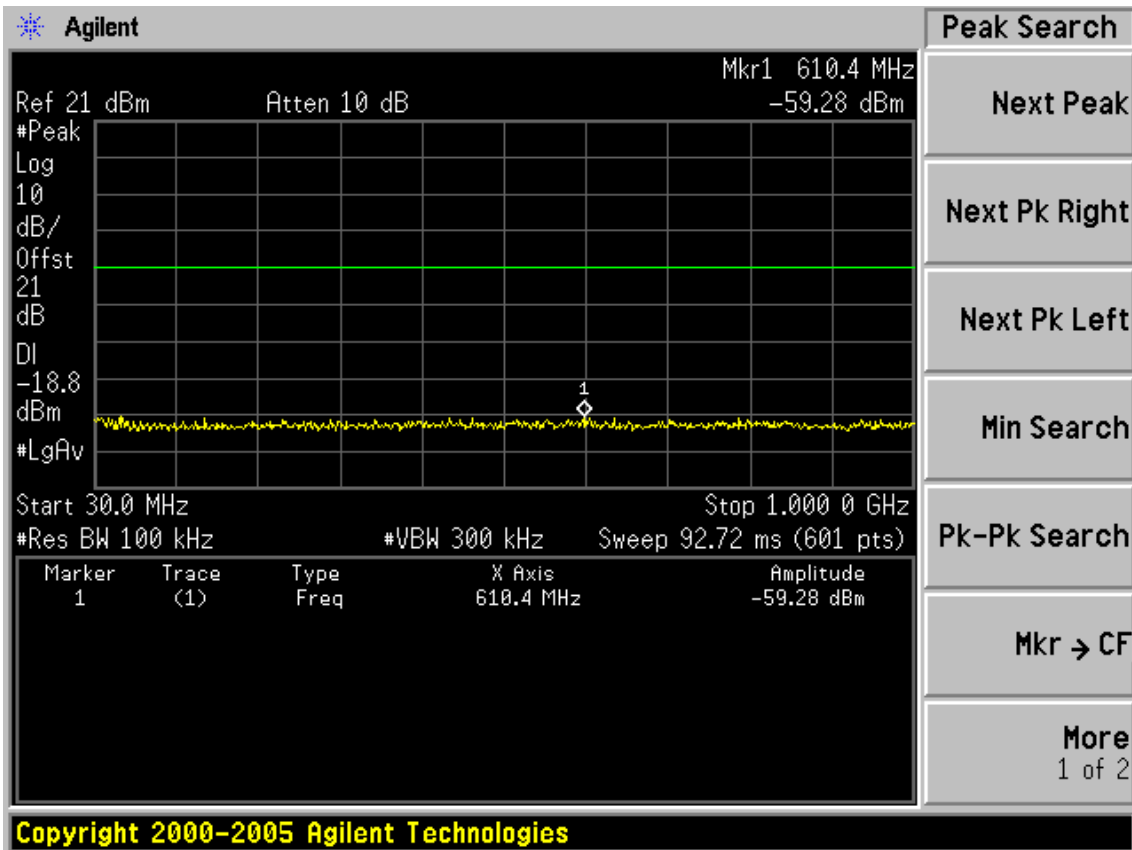
Test Mode: IEEE 802.11n HT20 TX  
 Test CH1: 2412MHz



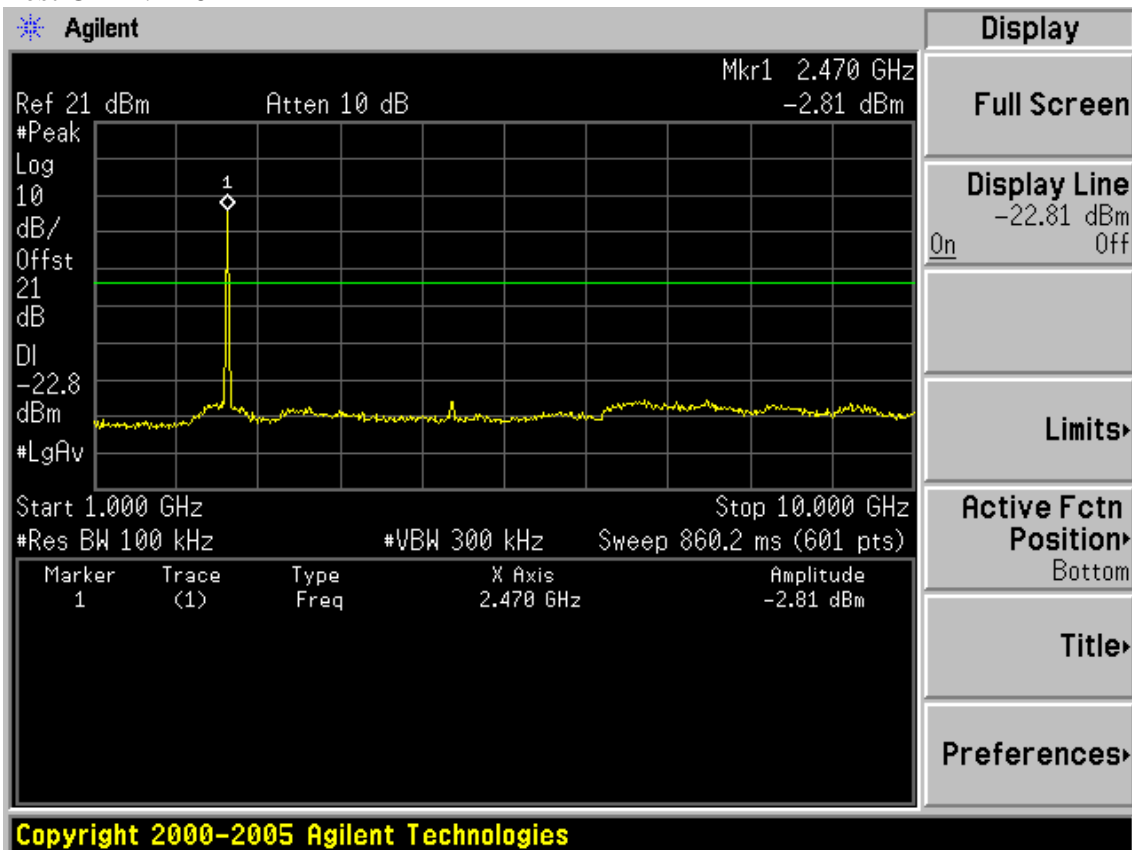


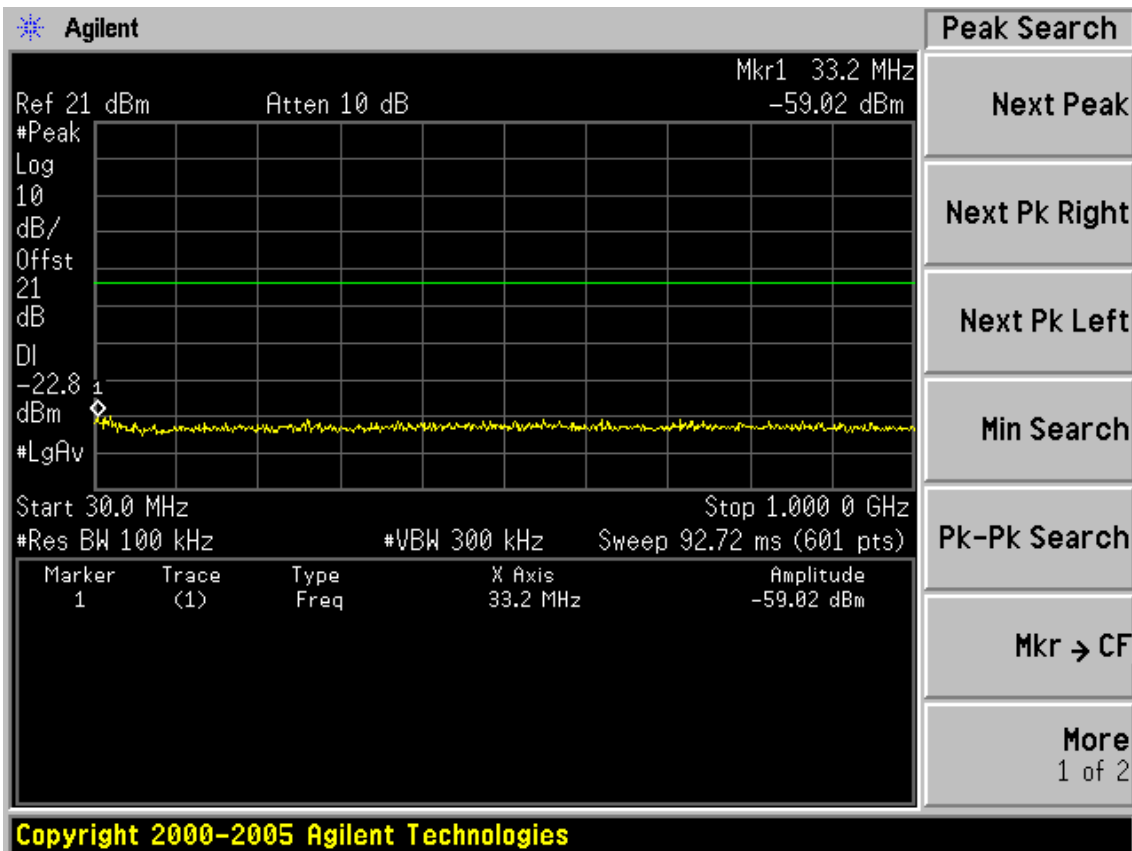
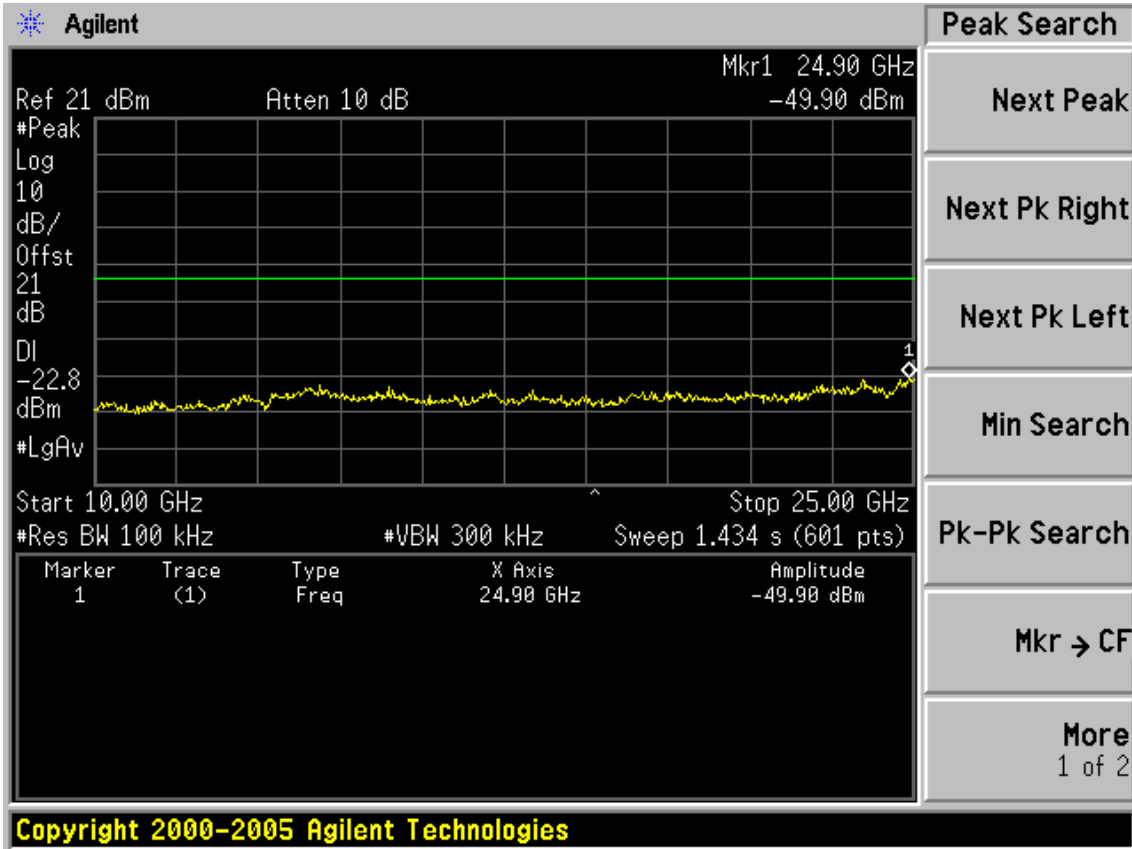
Test CH6: 2437MHz

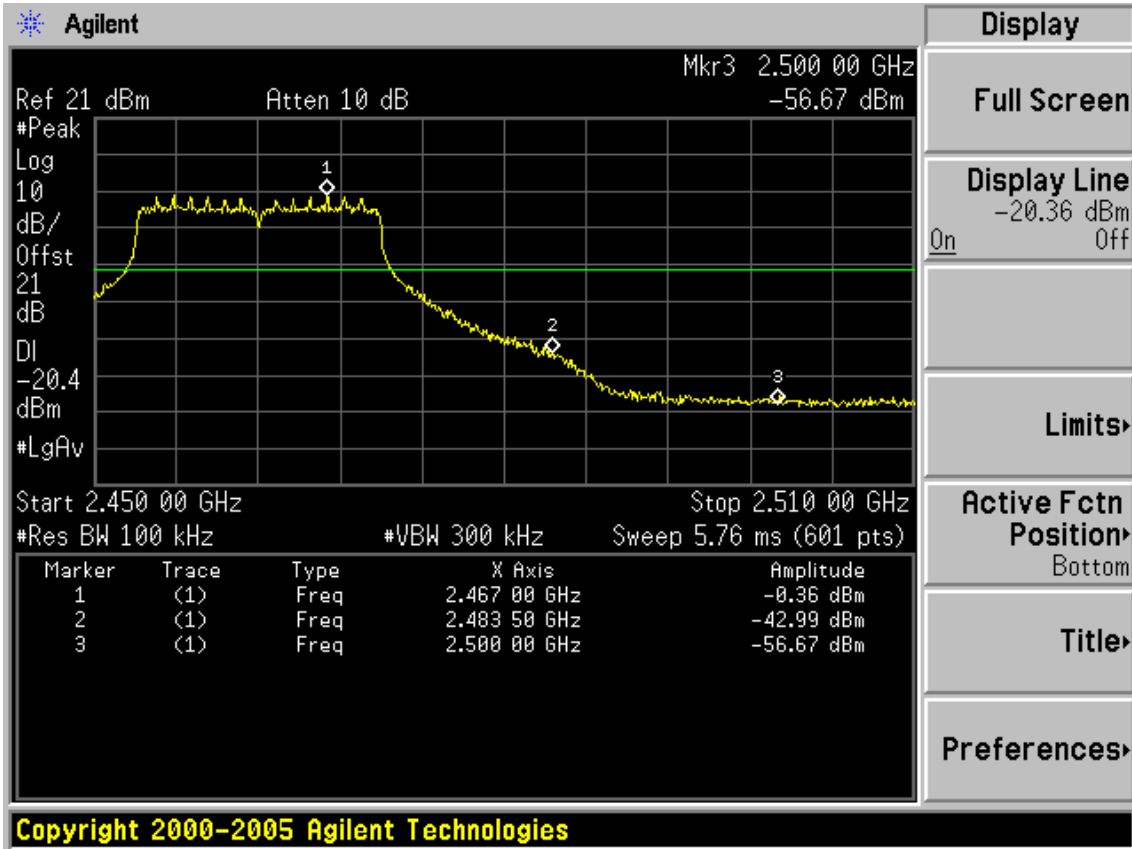




Test CH11: 2462MHz

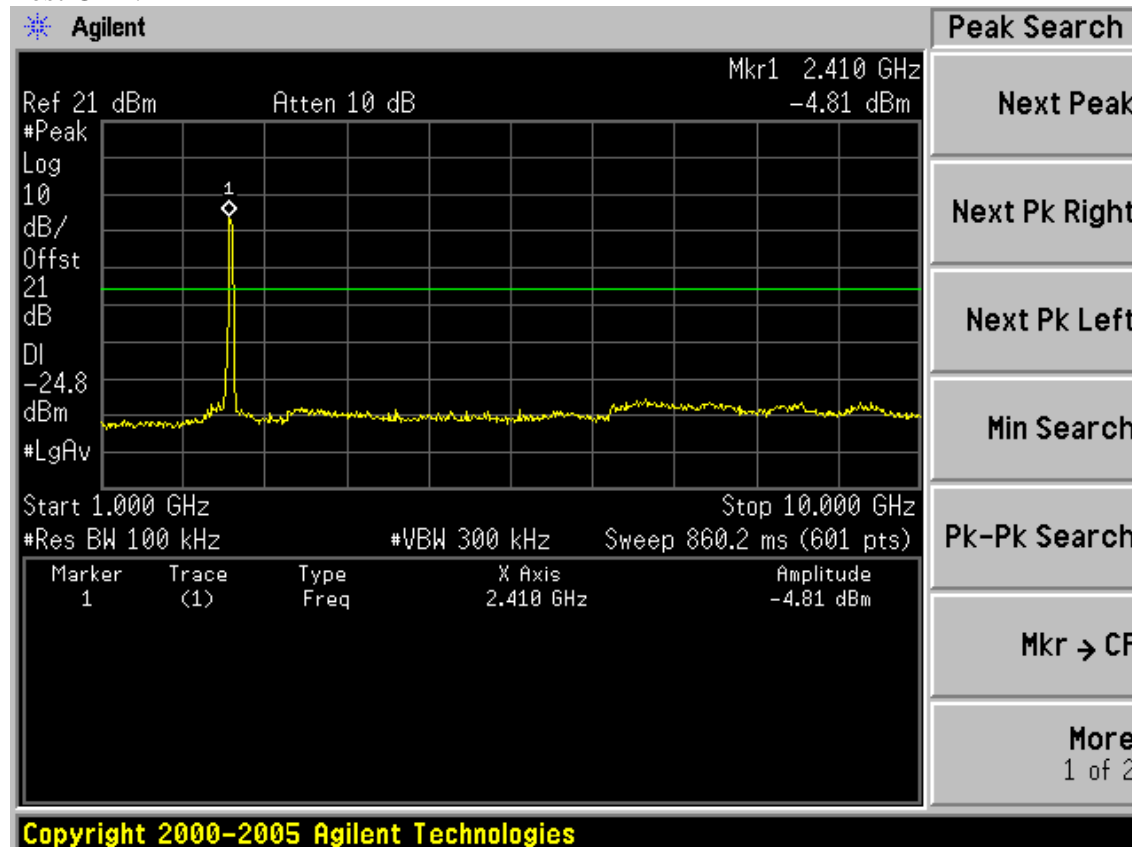


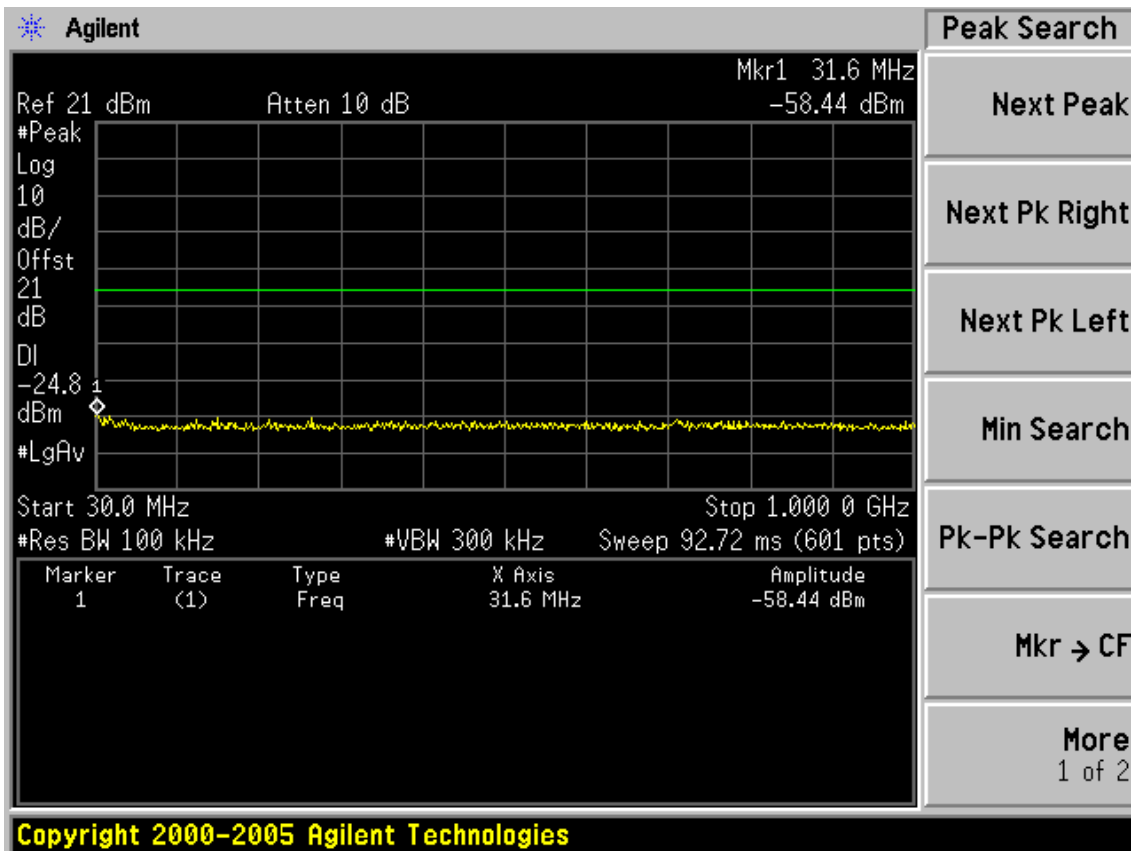
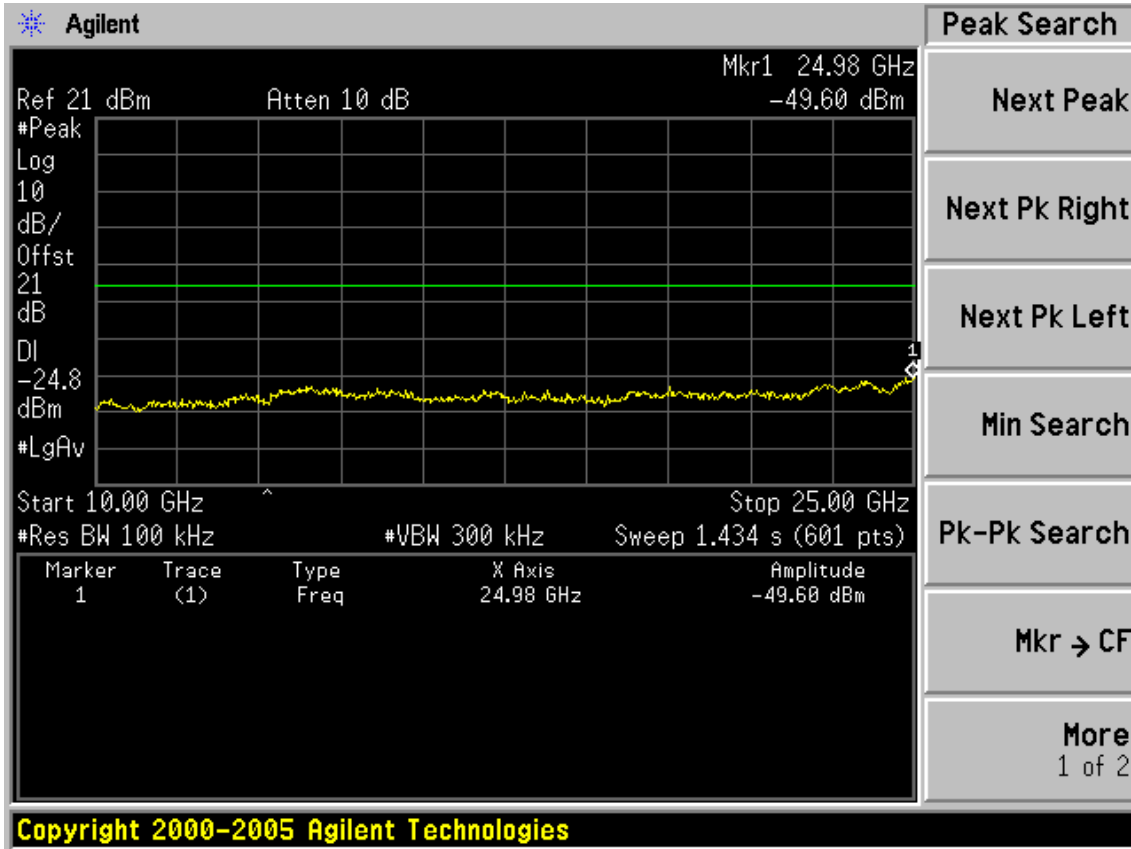




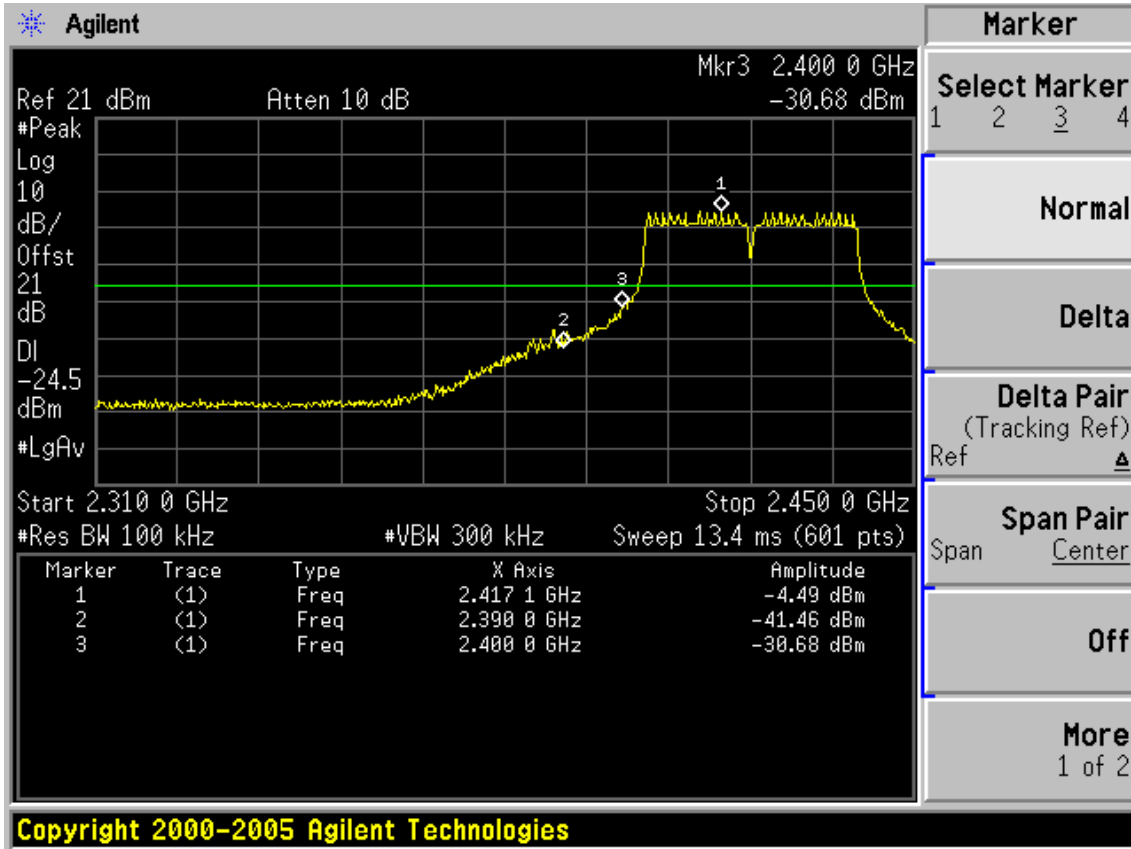
Test Mode: IEEE 802.11n HT40 TX

Test CH1: 2422MHz

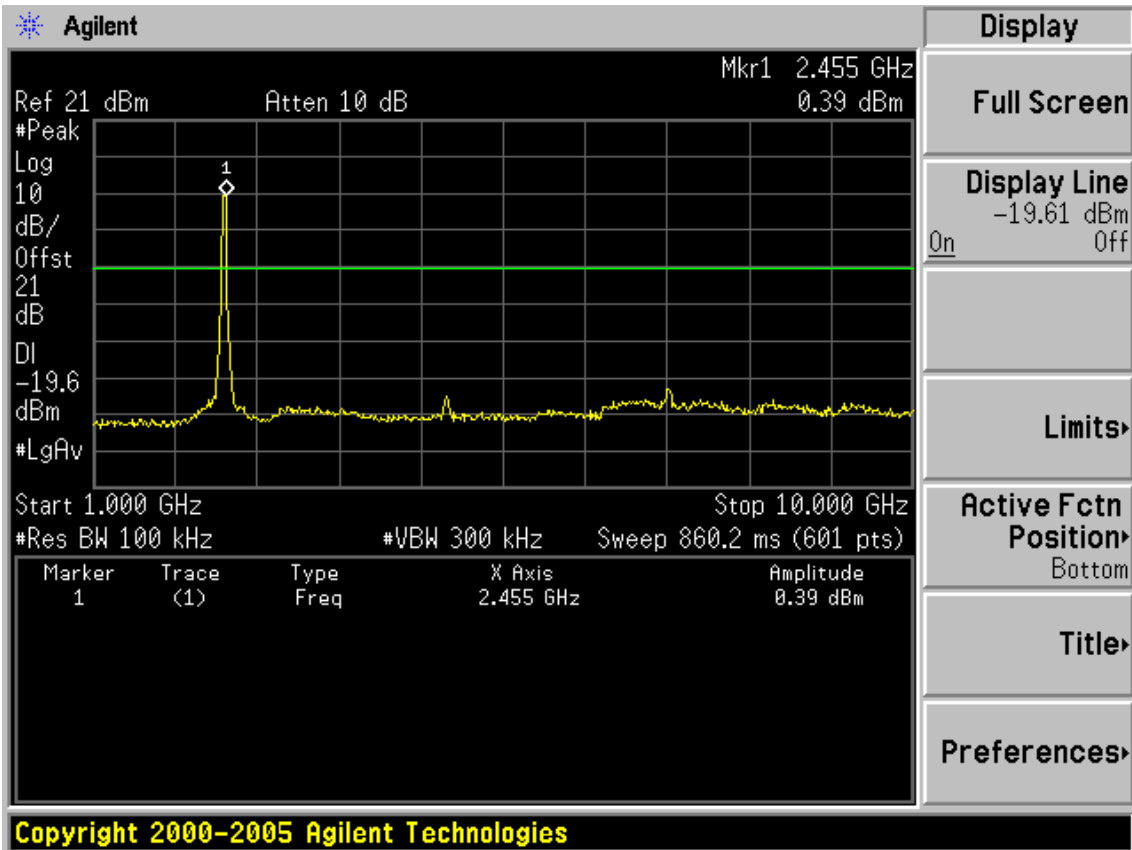


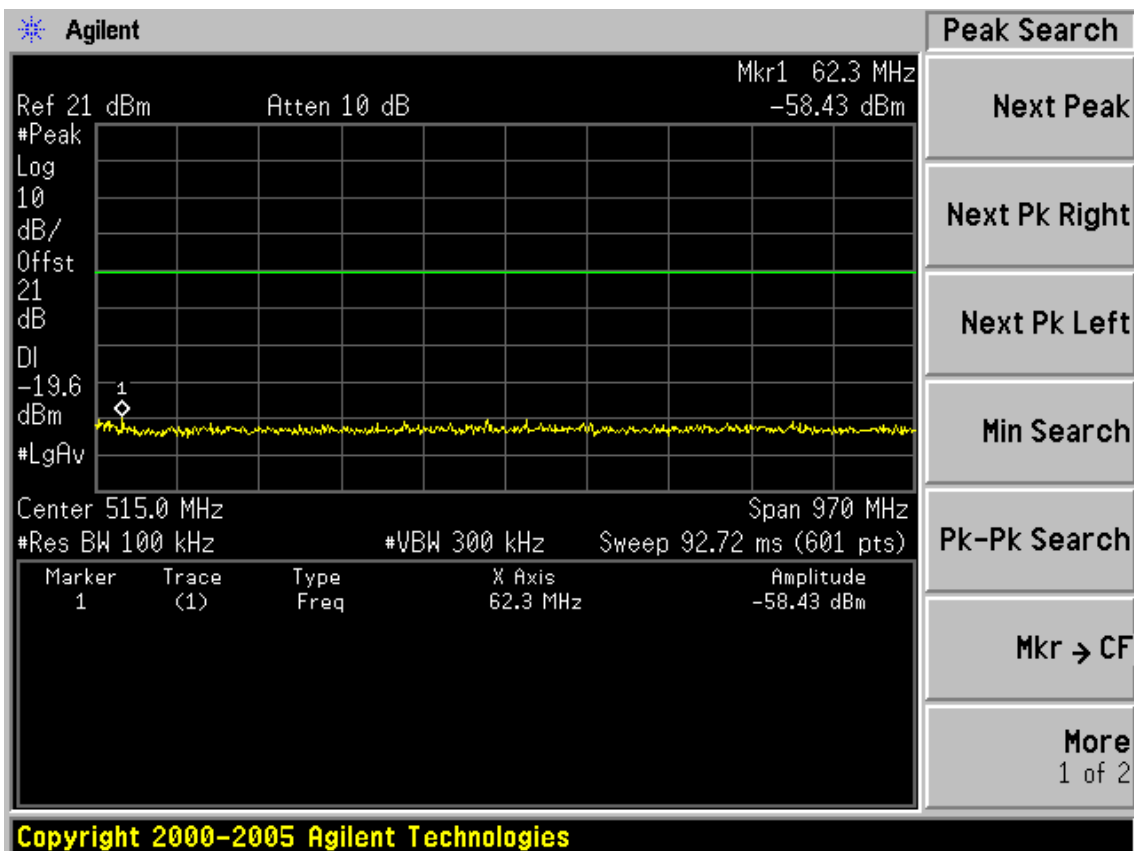
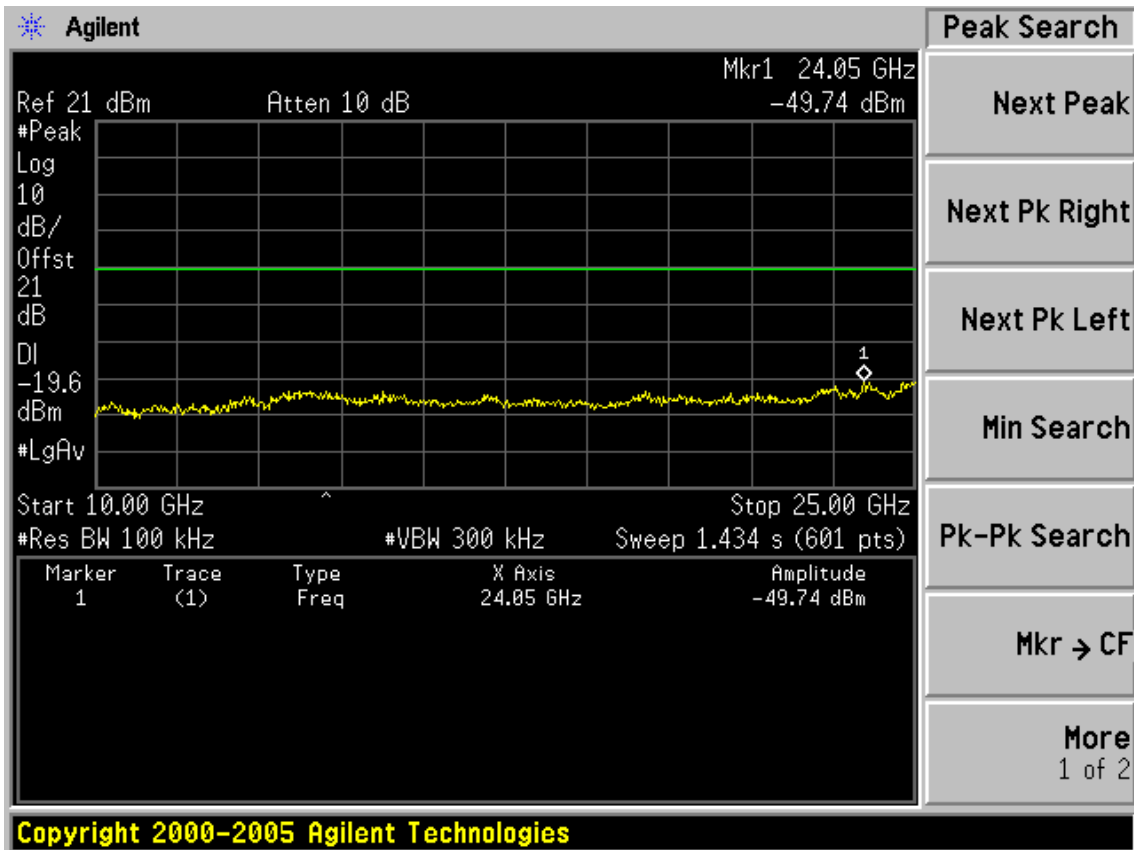




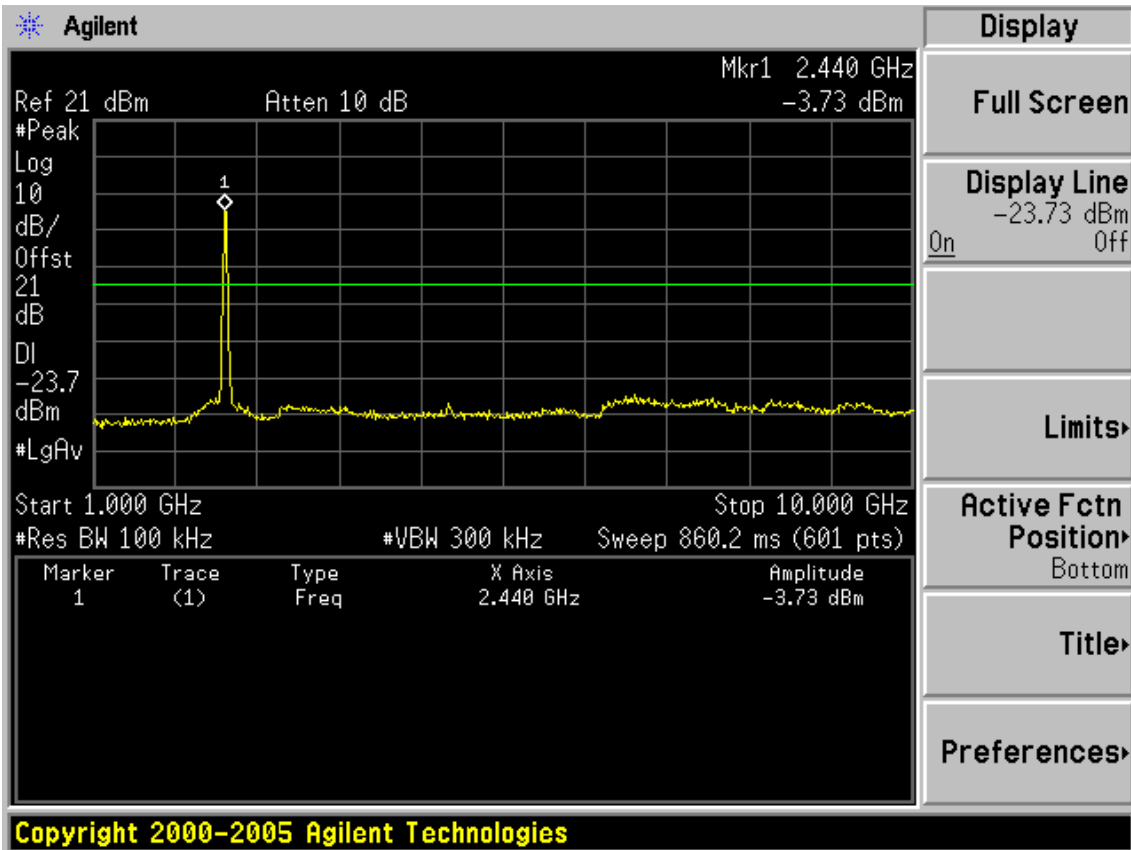
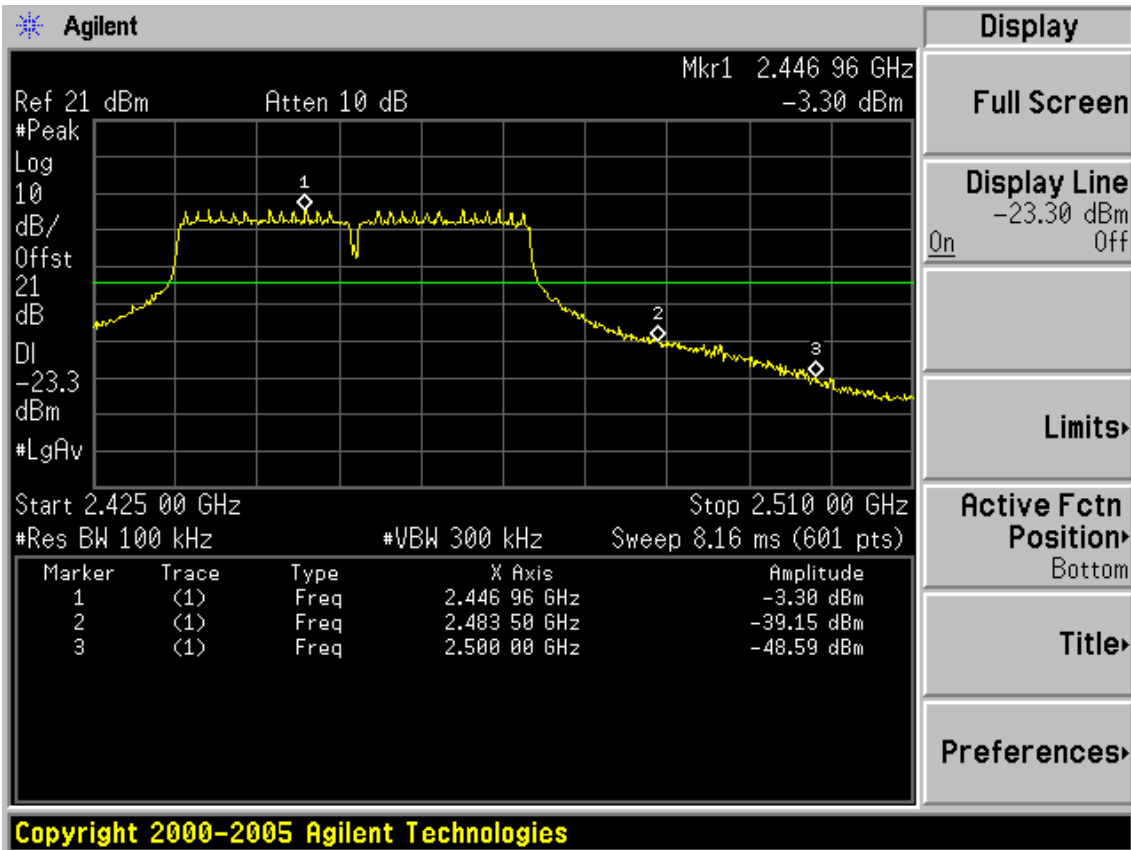


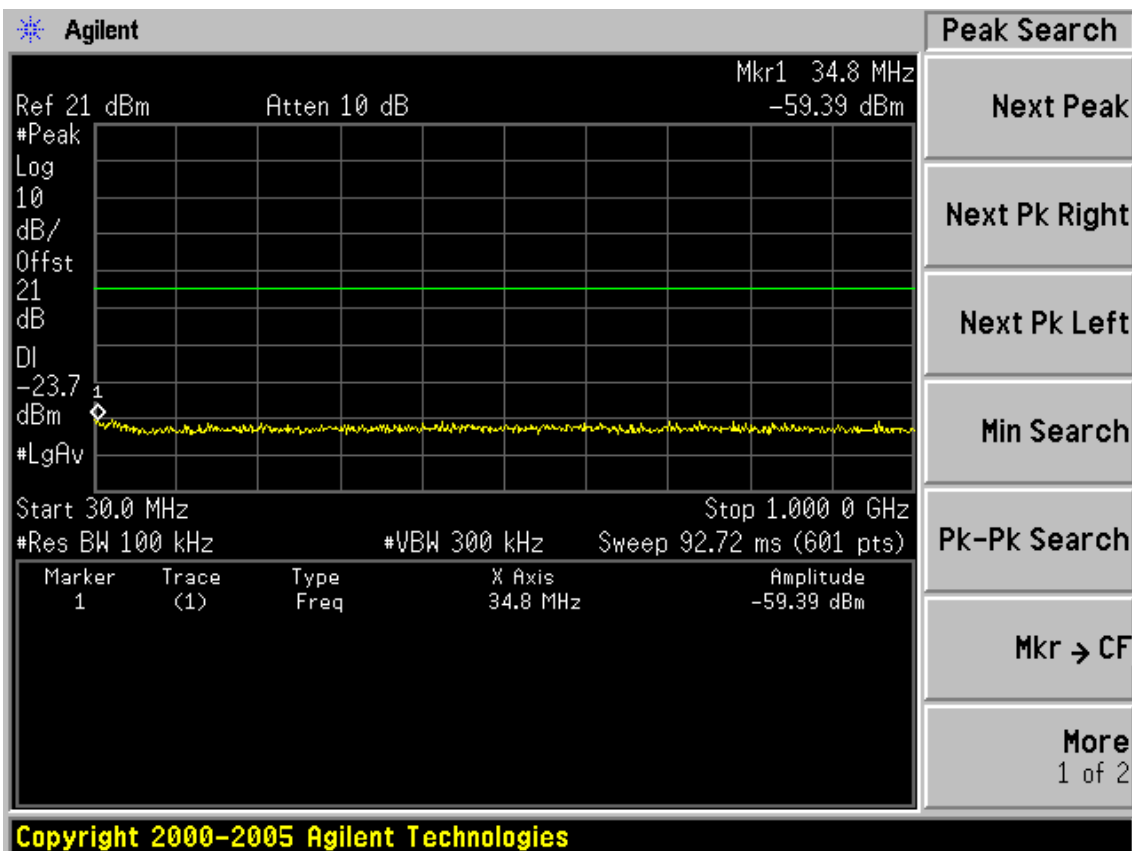
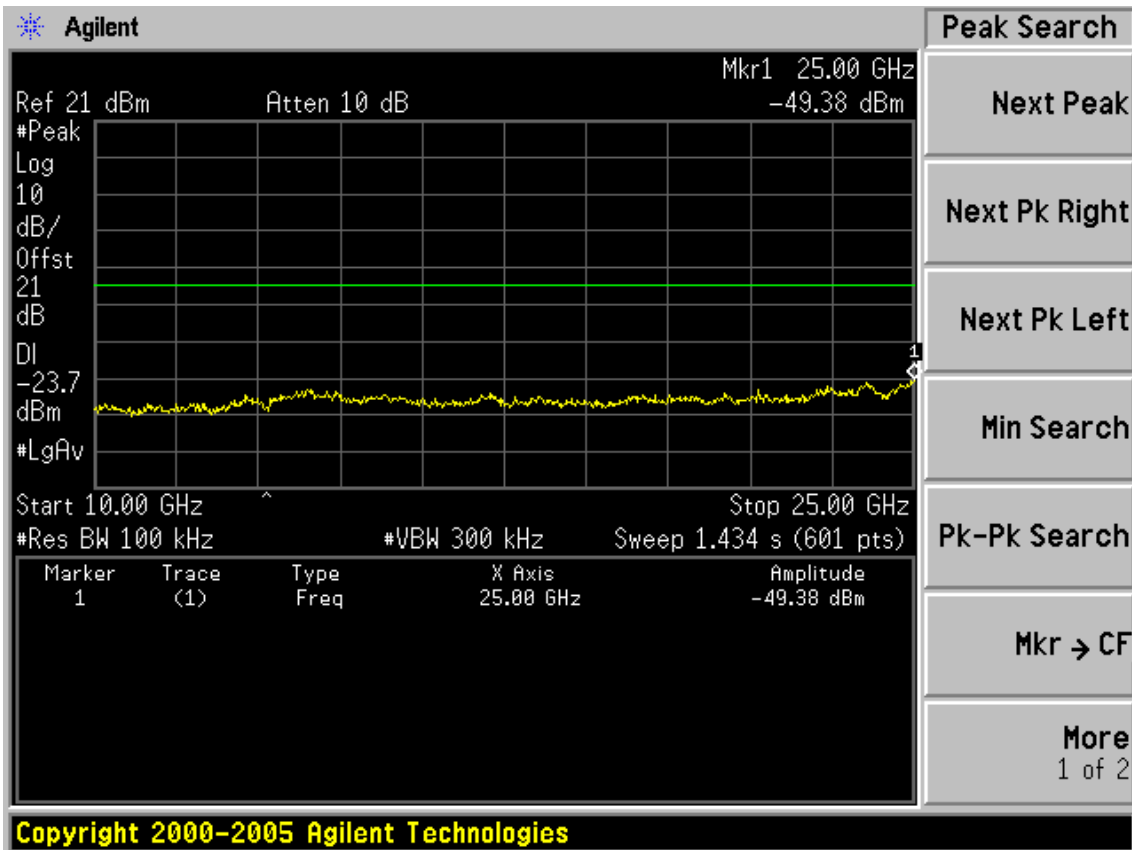
Test CH4: 2437MH





Test CH7: 2452MHz





## 6. BAND EDGE COMPLIANCE TEST

### 6.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	May.08, 12	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 12	1 Year
3.	Antenna	EMCO	3115	9510-4580	May.08, 12	1Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 12	1 Year

### 6.2. Limit

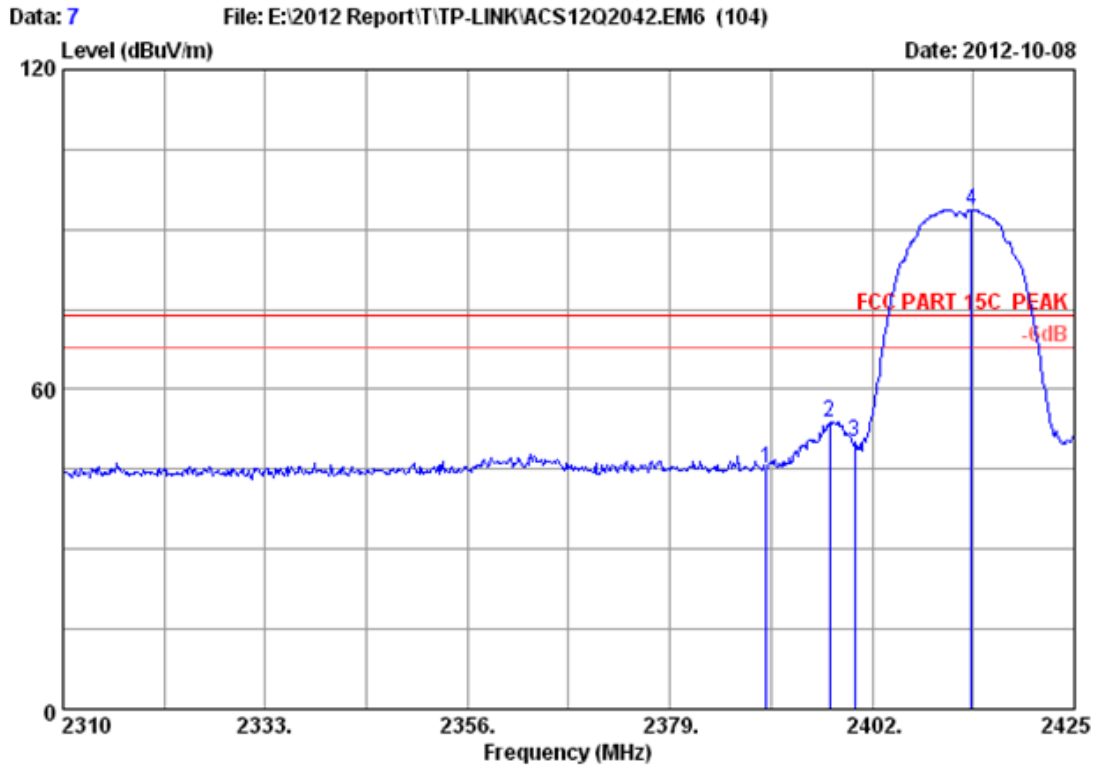
All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

### 6.3. Test Produce

1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
  - (a) PEAK: RBW=1MHz; VBW=3MHz; Sweep=AUTO
  - (b) AVERAGE: RBW=1MHz; VBW=10Hz; Sweep=AUTO

### 6.4. Test Results

Pass (The testing data was attached in the next pages.)

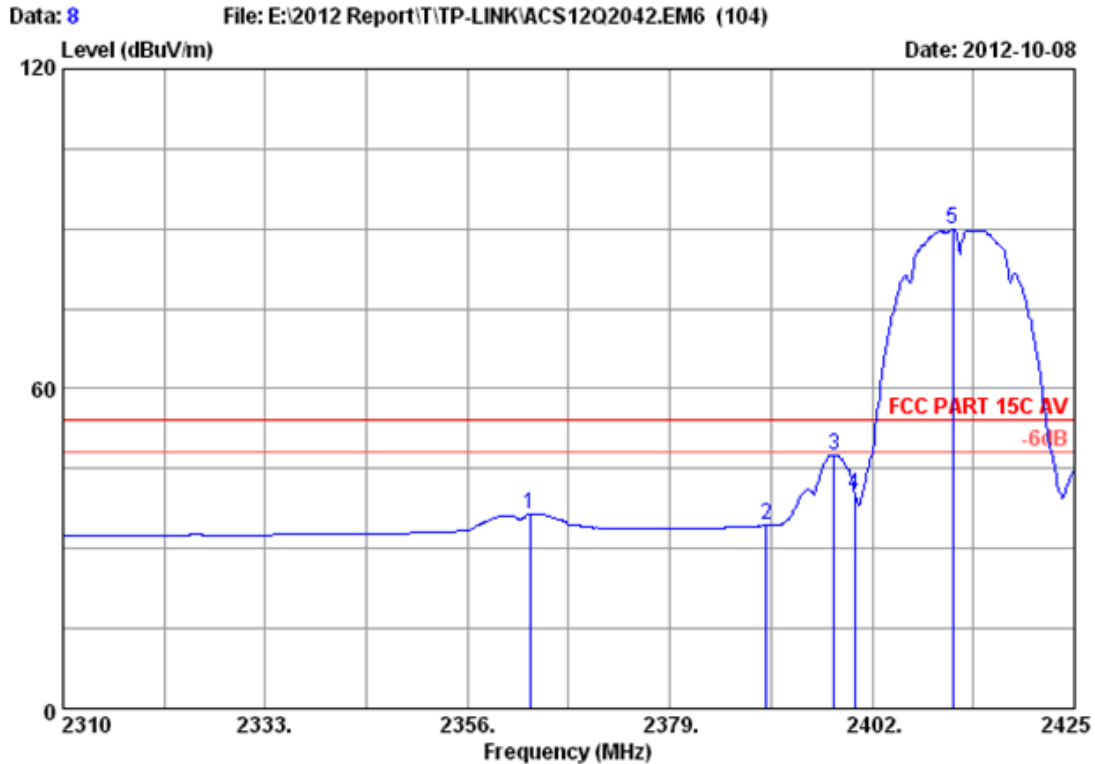


Site no. : 3m Chamber Data no. : 7  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11b CH 1 2412MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	26.70	6.00	35.92	48.35	45.13	74.00	28.87	Peak
2	2397.170	26.74	6.01	35.92	57.04	53.87	74.00	20.13	Peak
3	2400.000	26.76	6.02	35.92	53.32	50.18	74.00	23.82	Peak
4	2413.270	26.84	6.04	35.92	96.76	93.72	74.00	-19.72	Peak

Remarks:

- Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
- The emission levels that are 20dB below the official limit are not reported.

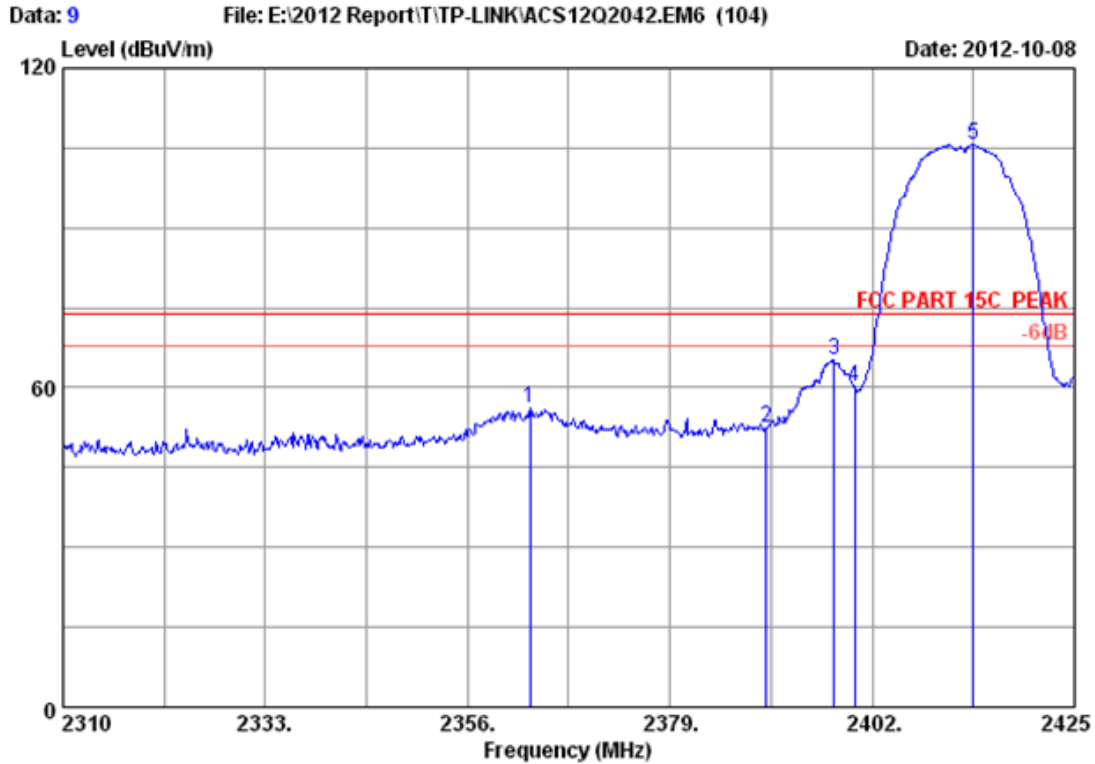


Site no. : 3m Chamber Data no. : 8  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11b CH 1 2412MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2363.130	26.52	5.95	35.92	39.88	36.43	54.00	17.57	Average
2	2390.000	26.70	6.00	35.92	37.58	34.36	54.00	19.64	Average
3	2397.630	26.74	6.01	35.92	50.77	47.60	54.00	6.40	Average
4	2400.000	26.76	6.02	35.92	43.20	40.06	54.00	13.94	Average
5	2411.200	26.83	6.04	35.92	92.92	89.87	54.00	-35.87	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



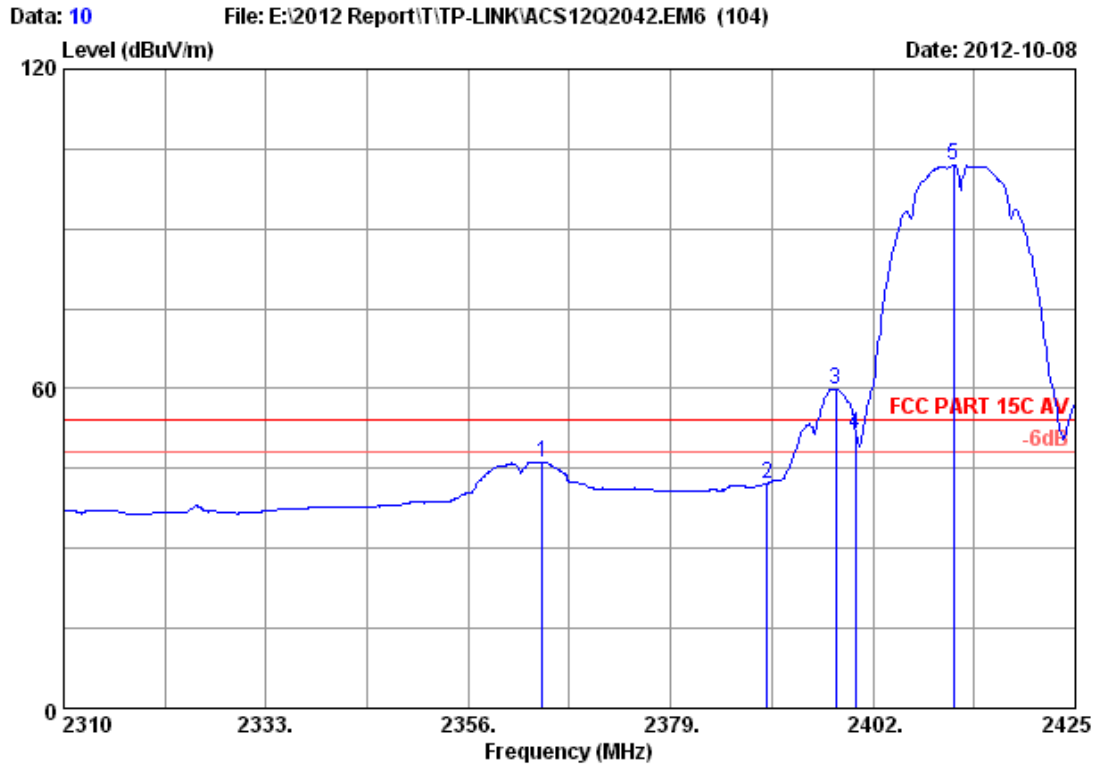
Site no. : 3m Chamber Data no. : 9  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11b CH 1 2412MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2363.130	26.52	5.95	35.92	59.47	56.02	74.00	17.98	Peak
2	2390.000	26.70	6.00	35.92	55.70	52.48	74.00	21.52	Peak
3	2397.630	26.74	6.01	35.92	68.39	65.22	74.00	8.78	Peak
4	2400.000	26.76	6.02	35.92	63.30	60.16	74.00	13.84	Peak
5	2413.500	26.85	6.04	35.92	108.58	105.55	74.00	-31.55	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



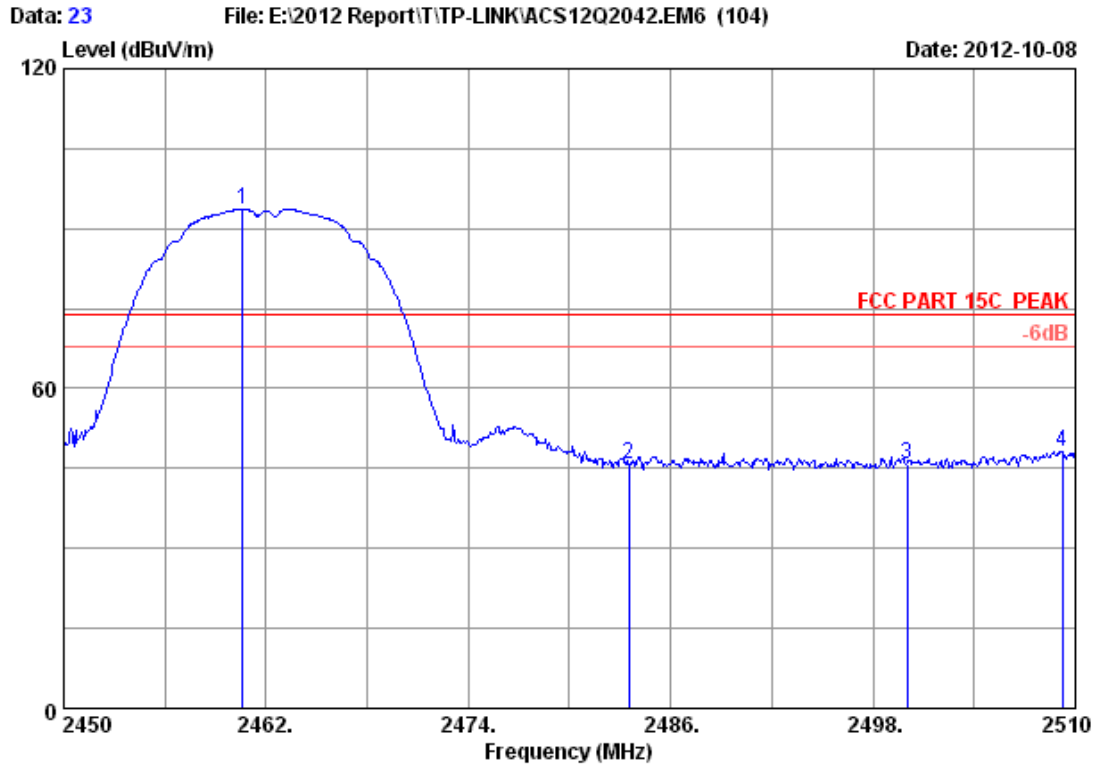


Site no. : 3m Chamber Data no. : 10  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23\*C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11b CH 1 2412MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2364.395	26.53	5.96	35.92	49.67	46.24	54.00	7.76	Average
2	2390.000	26.70	6.00	35.92	45.45	42.23	54.00	11.77	Average
3	2397.745	26.75	6.01	35.92	63.12	59.96	54.00	-5.96	Average
4	2400.000	26.76	6.02	35.92	54.65	51.51	54.00	2.49	Average
5	2411.200	26.83	6.04	35.92	105.01	101.96	54.00	-47.96	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

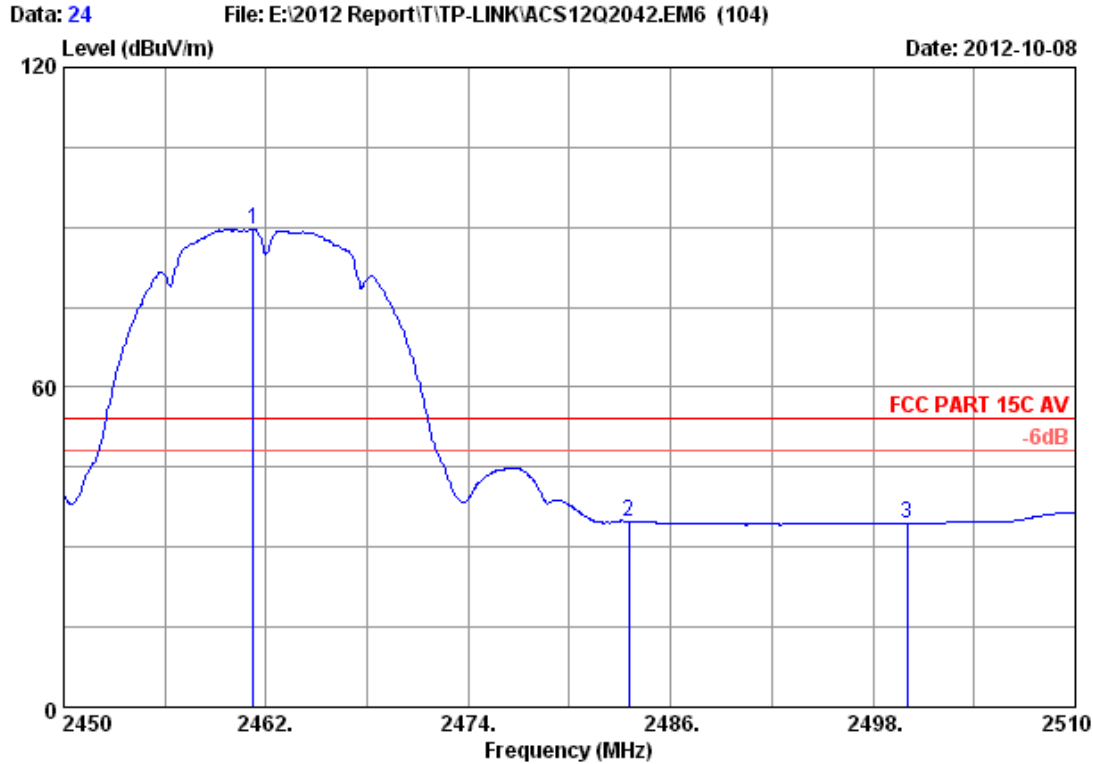


Site no. : 3m Chamber Data no. : 23  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11b CH 11 2462MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2460.620	27.15	6.12	35.92	96.28	93.63	74.00	-19.63	Peak
2	2483.500	27.29	6.16	35.92	48.36	45.89	74.00	28.11	Peak
3	2500.000	27.40	6.19	35.93	48.27	45.93	74.00	28.07	Peak
4	2509.220	27.43	6.20	35.93	50.54	48.24	74.00	25.76	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

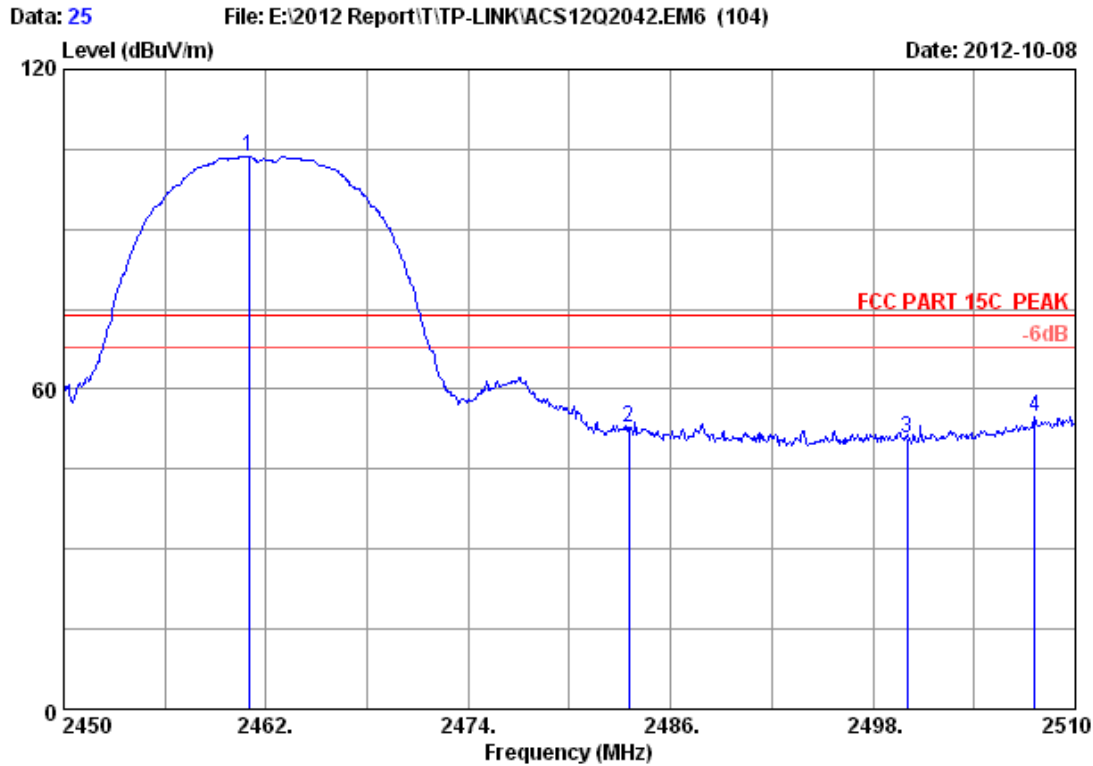


Site no. : 3m Chamber Data no. : 24  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11b CH 11 2462MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2461.220	27.15	6.12	35.92	92.40	89.75	54.00	-35.75	Average
2	2483.500	27.29	6.16	35.92	37.35	34.88	54.00	19.12	Average
3	2500.000	27.40	6.19	35.93	36.84	34.50	54.00	19.50	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

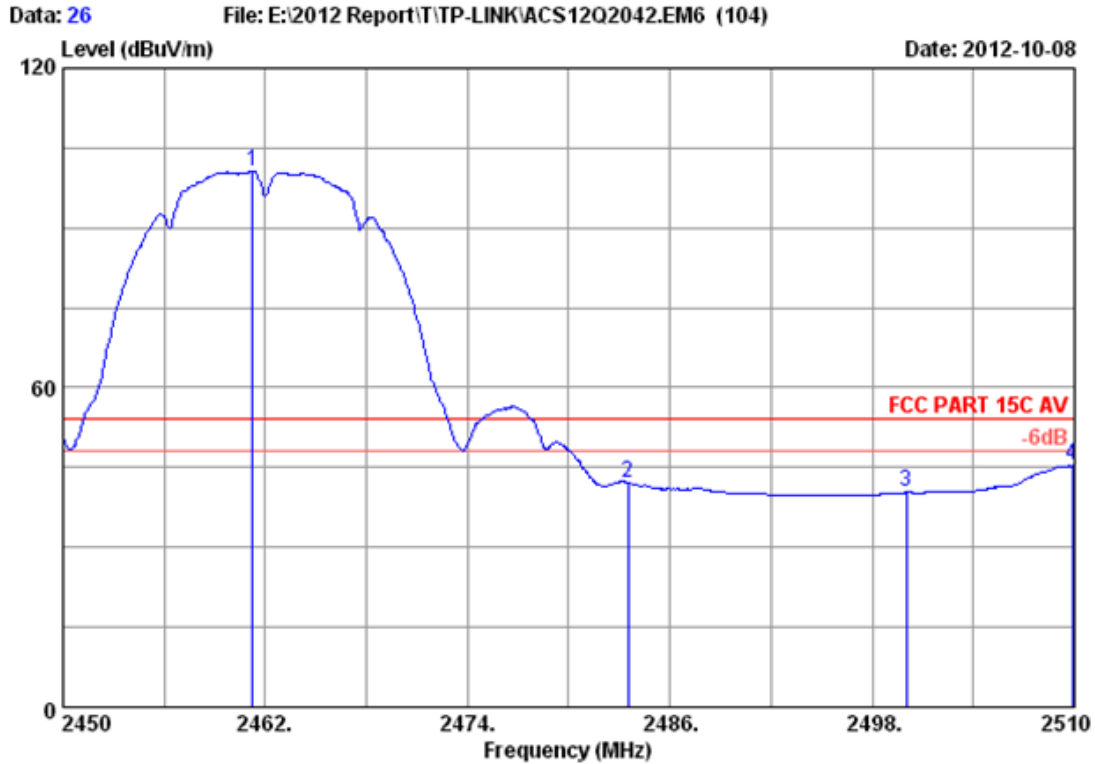


Site no. : 3m Chamber Data no. : 25  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11b CH 11 2462MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2460.980	27.15	6.12	35.92	106.28	103.63	74.00	-29.63	Peak
2	2483.500	27.29	6.16	35.92	55.27	52.80	74.00	21.20	Peak
3	2500.000	27.40	6.19	35.93	53.20	50.86	74.00	23.14	Peak
4	2507.600	27.43	6.20	35.93	56.97	54.67	74.00	19.33	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

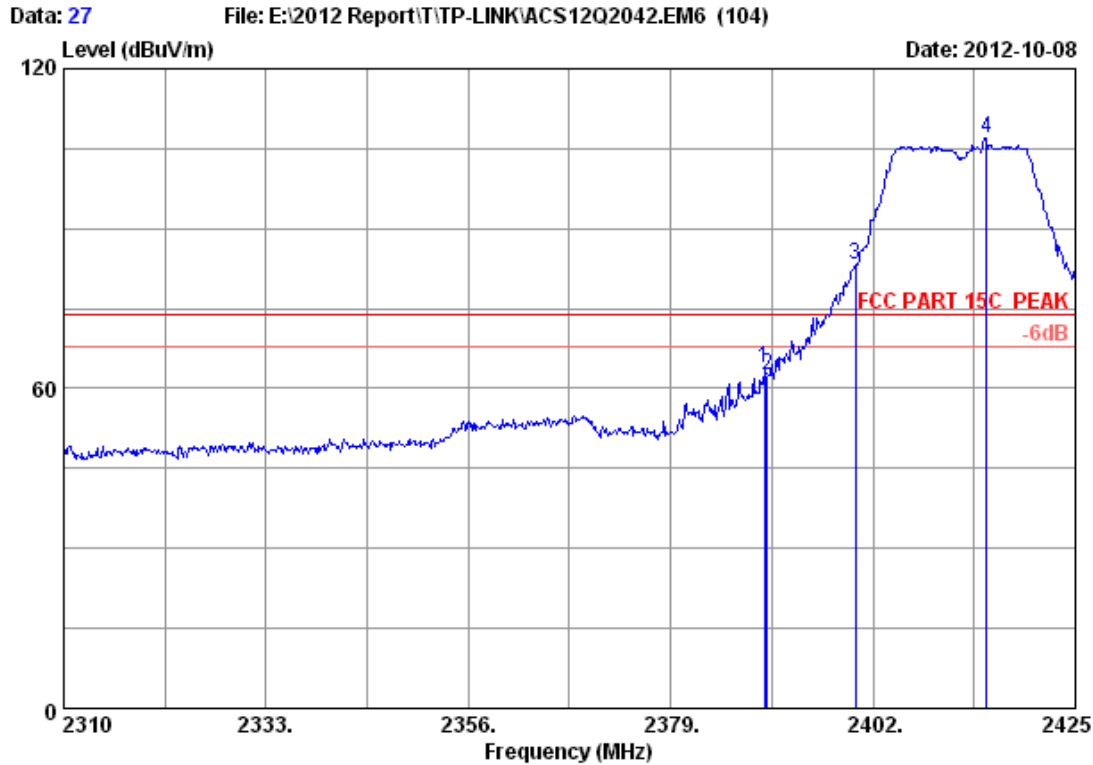


Site no. : 3m Chamber Data no. : 26  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11b CH 11 2462MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2461.220	27.15	6.12	35.92	103.28	100.63	54.00	-46.63	Average
2	2483.500	27.29	6.16	35.92	44.65	42.18	54.00	11.82	Average
3	2500.000	27.40	6.19	35.93	42.69	40.35	54.00	13.65	Average
4	2509.880	27.44	6.20	35.93	47.65	45.36	54.00	8.64	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

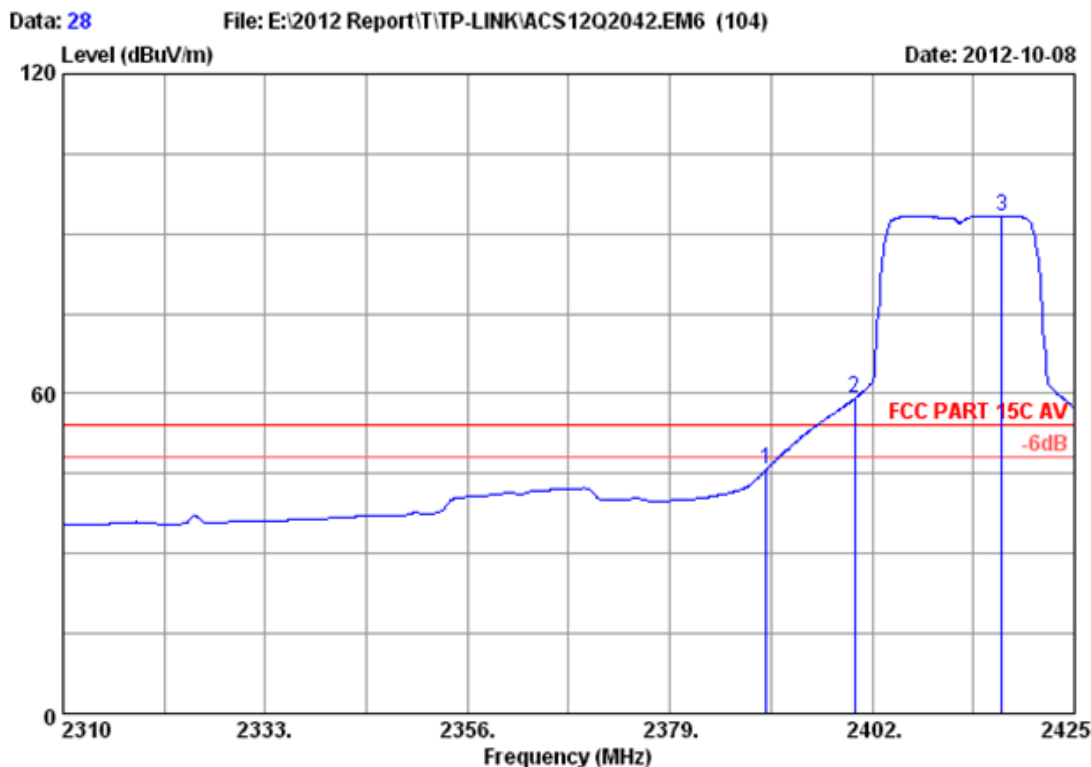


Site no. : 3m Chamber Data no. : 27  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11g CH 1 2412MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2389.695	26.69	6.00	35.92	67.15	63.92	74.00	10.08	Peak
2	2390.000	26.70	6.00	35.92	65.87	62.65	74.00	11.35	Peak
3	2400.000	26.76	6.02	35.92	86.52	83.38	74.00	-9.38	Peak
4	2414.880	26.86	6.04	35.92	110.11	107.09	74.00	-33.09	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

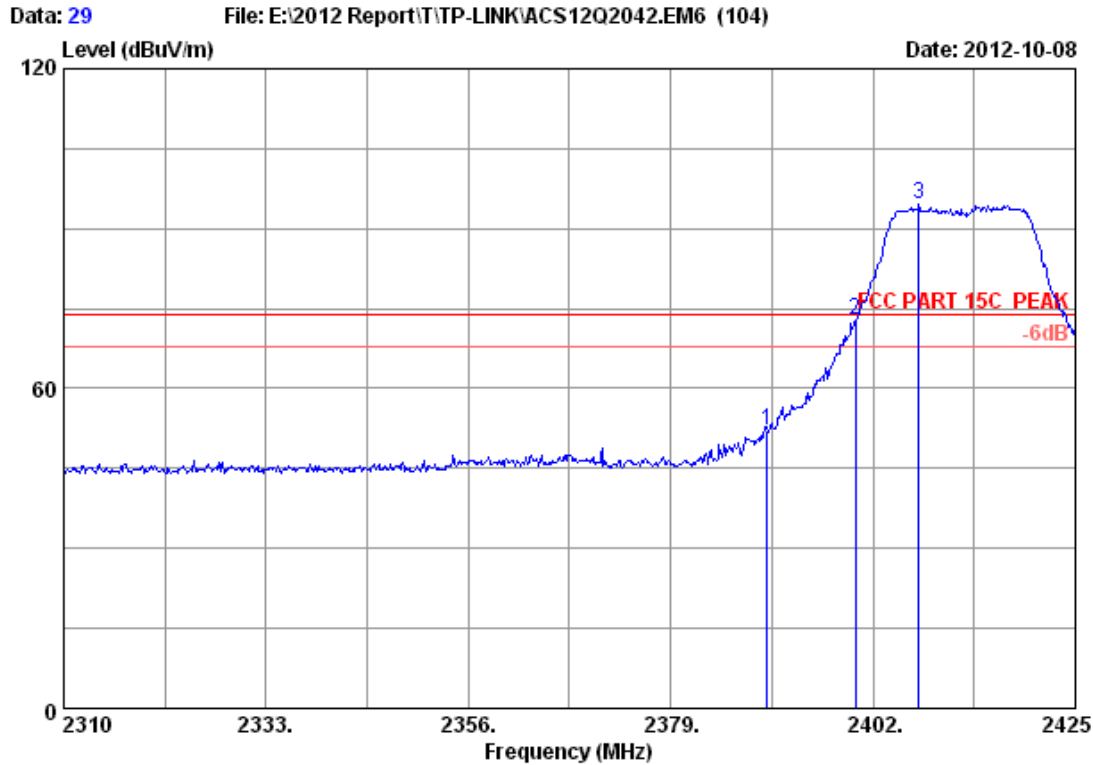


Site no. : 3m Chamber Data no. : 28  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11g CH 1 2412MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	26.70	6.00	35.92	49.08	45.86	54.00	8.14	Average
2	2400.000	26.76	6.02	35.92	62.38	59.24	54.00	-5.24	Average
3	2416.720	26.87	6.05	35.92	96.35	93.35	54.00	-39.35	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



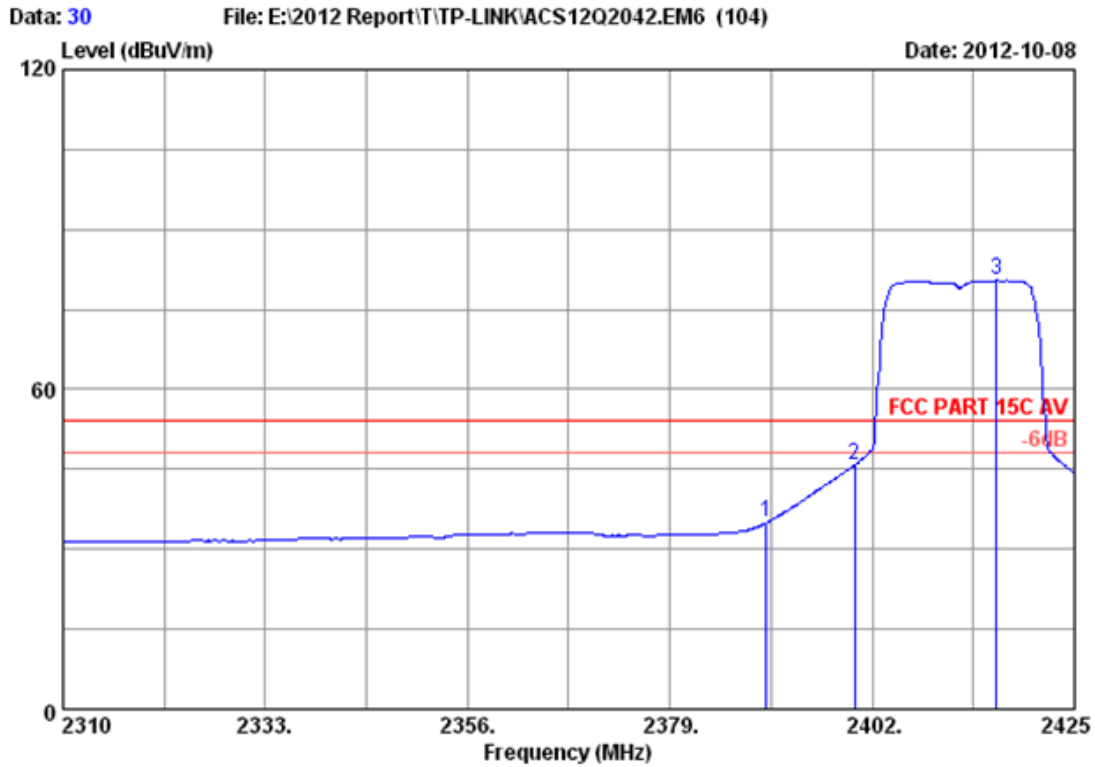
Site no. : 3m Chamber Data no. : 29  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11g CH 1 2412MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	26.70	6.00	35.92	55.52	52.30	74.00	21.70	Peak
2	2400.000	26.76	6.02	35.92	76.11	72.97	74.00	1.03	Peak
3	2407.175	26.81	6.03	35.92	97.60	94.52	74.00	-20.52	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



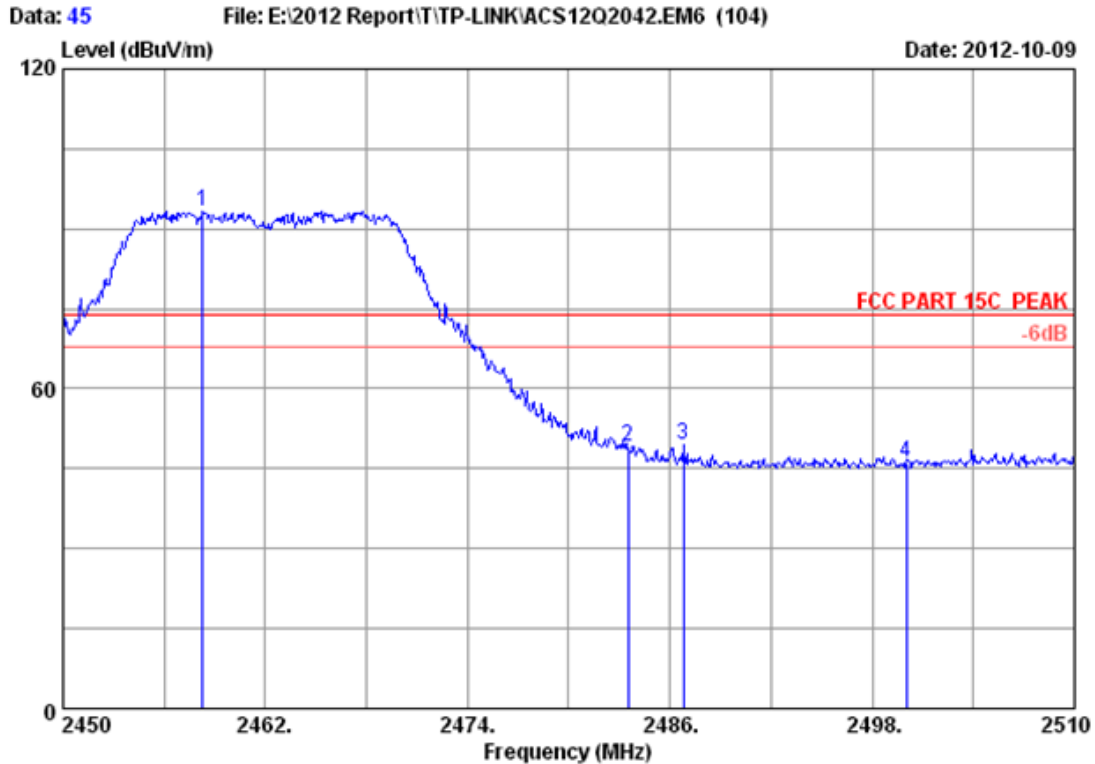


Site no. : 3m Chamber Data no. : 30  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11g CH 1 2412MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	26.70	6.00	35.92	38.22	35.00	54.00	19.00	Average
2	2400.000	26.76	6.02	35.92	49.08	45.94	54.00	8.06	Average
3	2416.145	26.86	6.04	35.92	83.42	80.40	54.00	-26.40	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

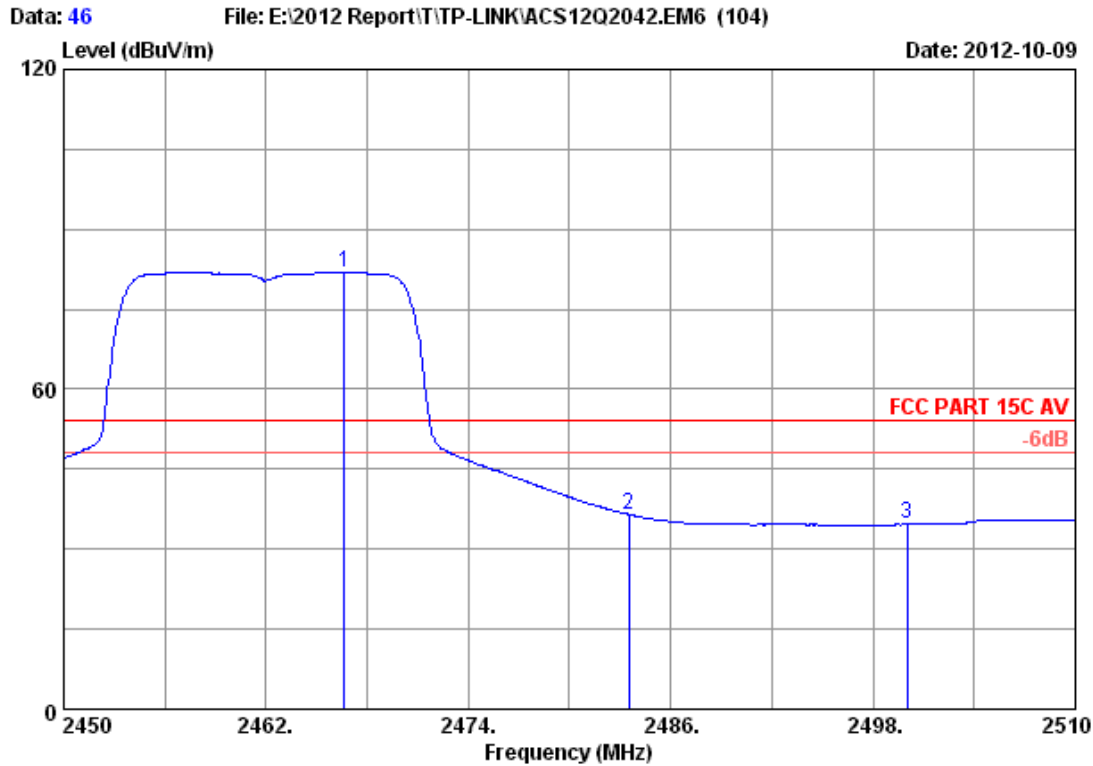


Site no. : 3m Chamber Data no. : 45  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11g CH 11 2462MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2458.280	27.13	6.12	35.92	95.85	93.18	74.00	-19.18	Peak
2	2483.500	27.29	6.16	35.92	51.48	49.01	74.00	24.99	Peak
3	2486.780	27.32	6.16	35.92	51.84	49.40	74.00	24.60	Peak
4	2500.000	27.40	6.19	35.93	48.39	46.05	74.00	27.95	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

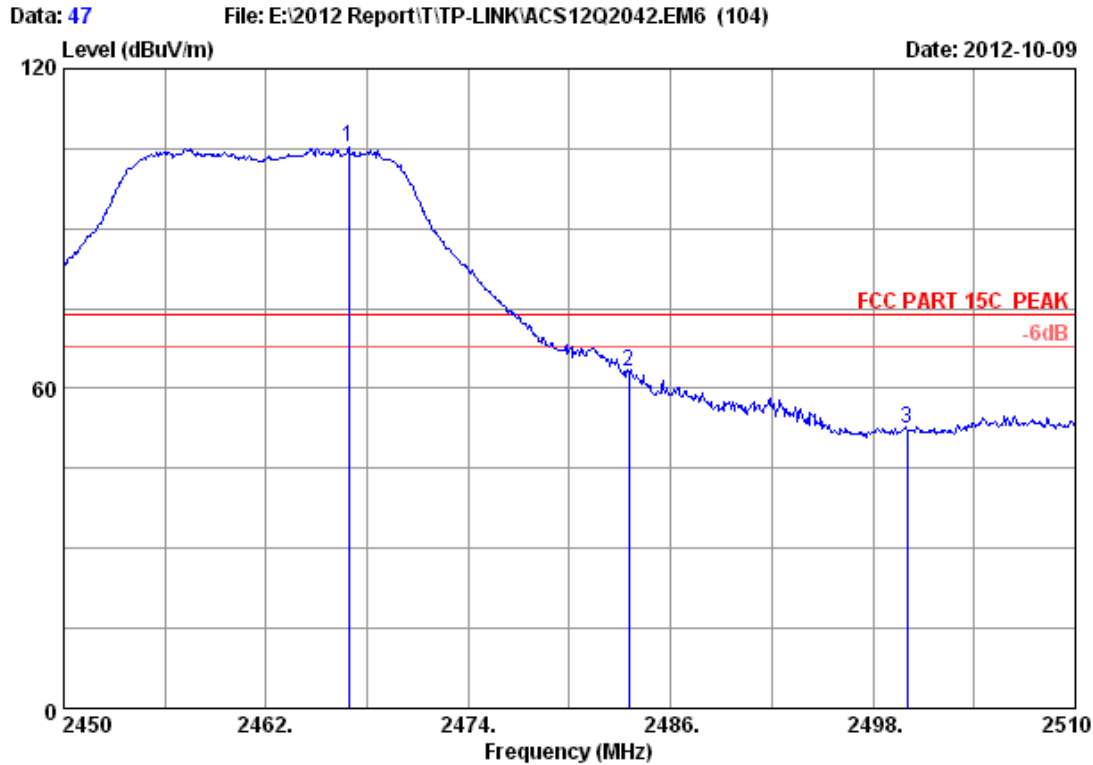


Site no. : 3m Chamber Data no. : 46  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11g CH 11 2462MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2466.620	27.19	6.13	35.92	84.46	81.86	54.00	-27.86	Average
2	2483.500	27.29	6.16	35.92	39.02	36.55	54.00	17.45	Average
3	2500.000	27.40	6.19	35.93	36.96	34.62	54.00	19.38	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

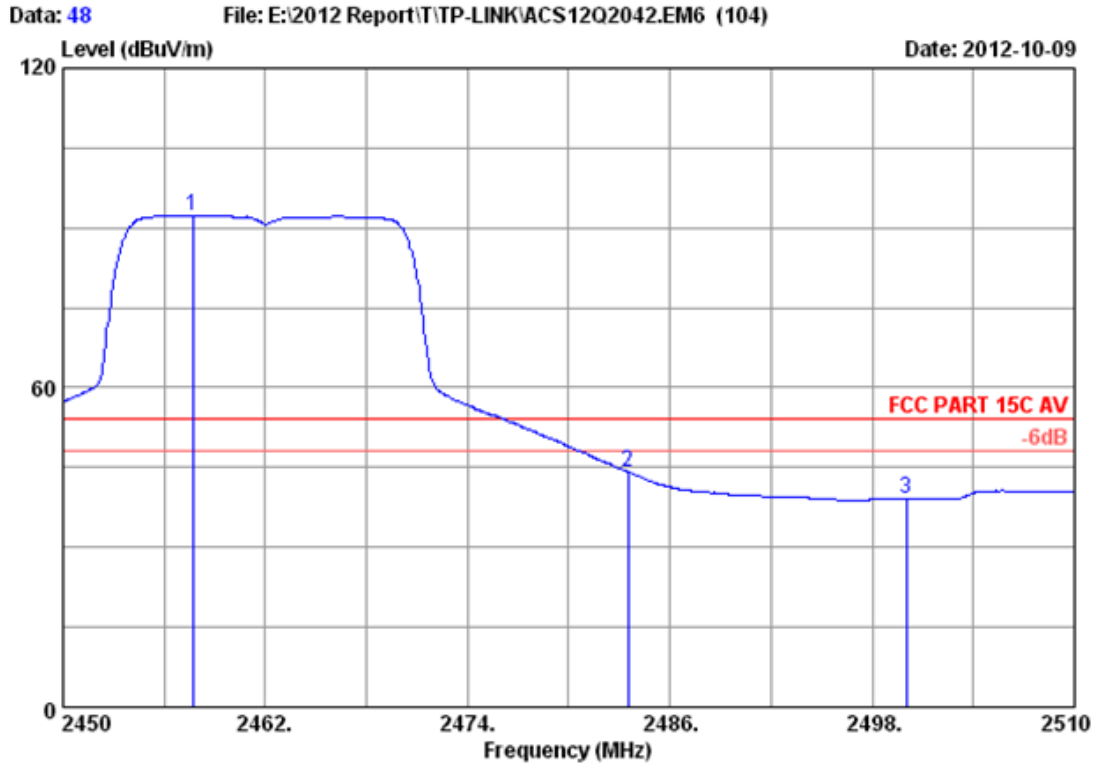


Site no. : 3m Chamber Data no. : 47  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11g CH 11 2462MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2466.920	27.19	6.13	35.92	107.74	105.14	74.00	-31.14	Peak
2	2483.500	27.29	6.16	35.92	65.68	63.21	74.00	10.79	Peak
3	2500.000	27.40	6.19	35.93	54.96	52.62	74.00	21.38	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

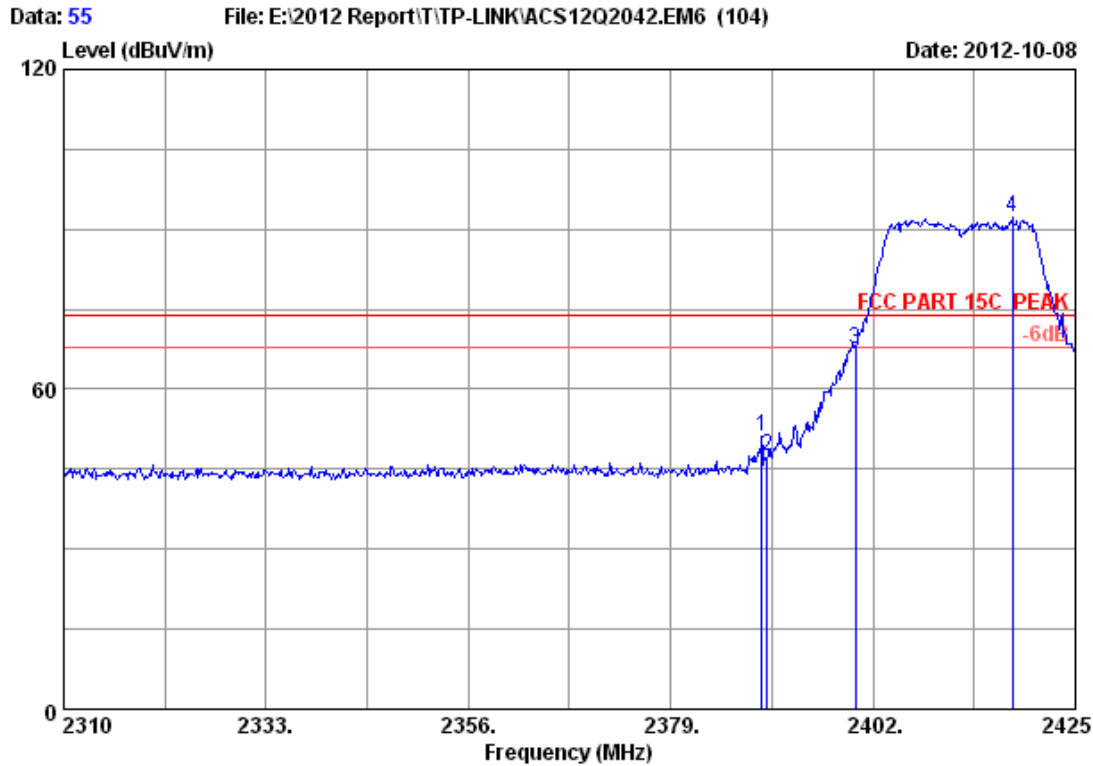


Site no. : 3m Chamber Data no. : 48  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11g CH 11 2462MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2457.680	27.13	6.12	35.92	95.07	92.40	54.00	-38.40	Average
2	2483.500	27.29	6.16	35.92	46.70	44.23	54.00	9.77	Average
3	2500.000	27.40	6.19	35.93	41.55	39.21	54.00	14.79	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

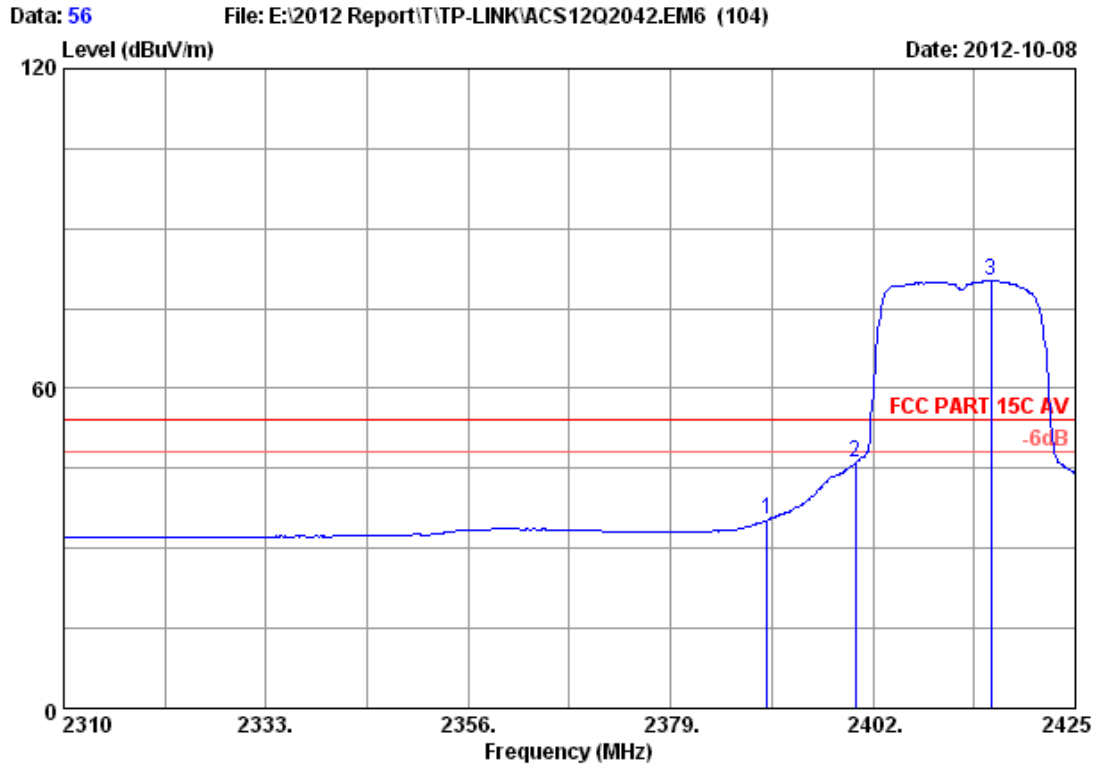


Site no. : 3m Chamber Data no. : 55  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT20 CH 1 2412MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2389.350	26.69	6.00	35.92	54.34	51.11	74.00	22.89	Peak
2	2390.000	26.70	6.00	35.92	50.80	47.58	74.00	26.42	Peak
3	2400.000	26.76	6.02	35.92	70.72	67.58	74.00	6.42	Peak
4	2417.870	26.87	6.05	35.92	95.12	92.12	74.00	-18.12	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

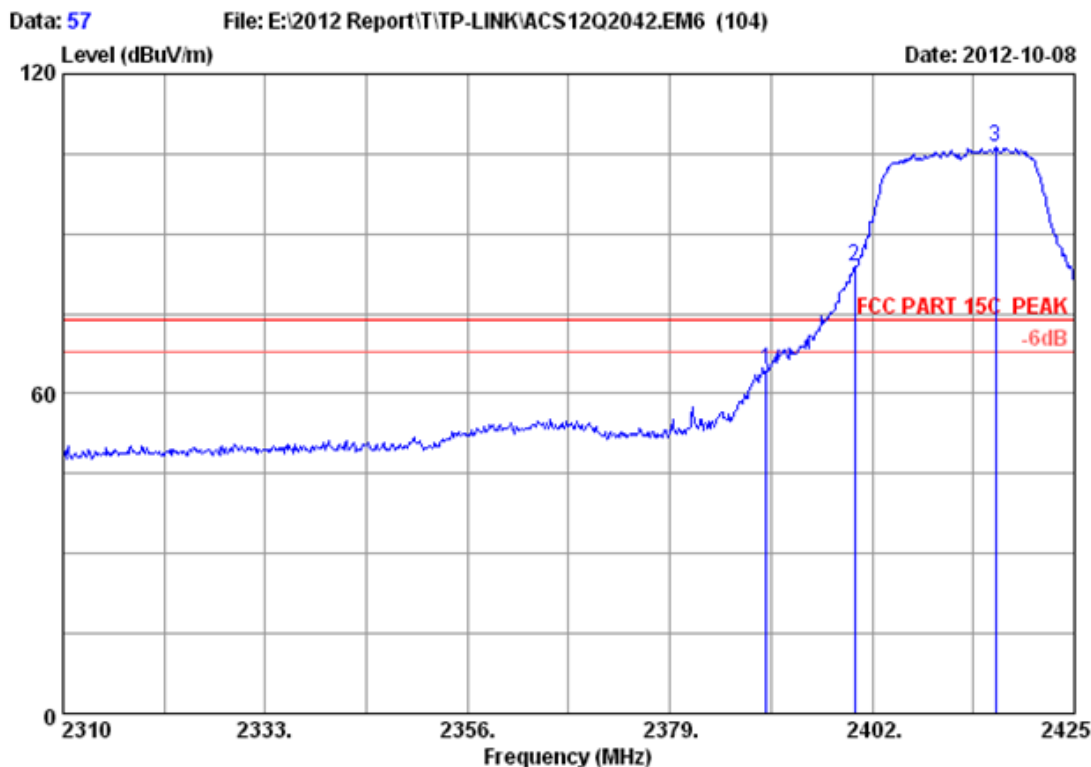


Site no. : 3m Chamber Data no. : 56  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT20 CH 1 2412MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	26.70	6.00	35.92	38.55	35.33	54.00	18.67	Average
2	2400.000	26.76	6.02	35.92	49.38	46.24	54.00	7.76	Average
3	2415.455	26.86	6.04	35.92	83.23	80.21	54.00	-26.21	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



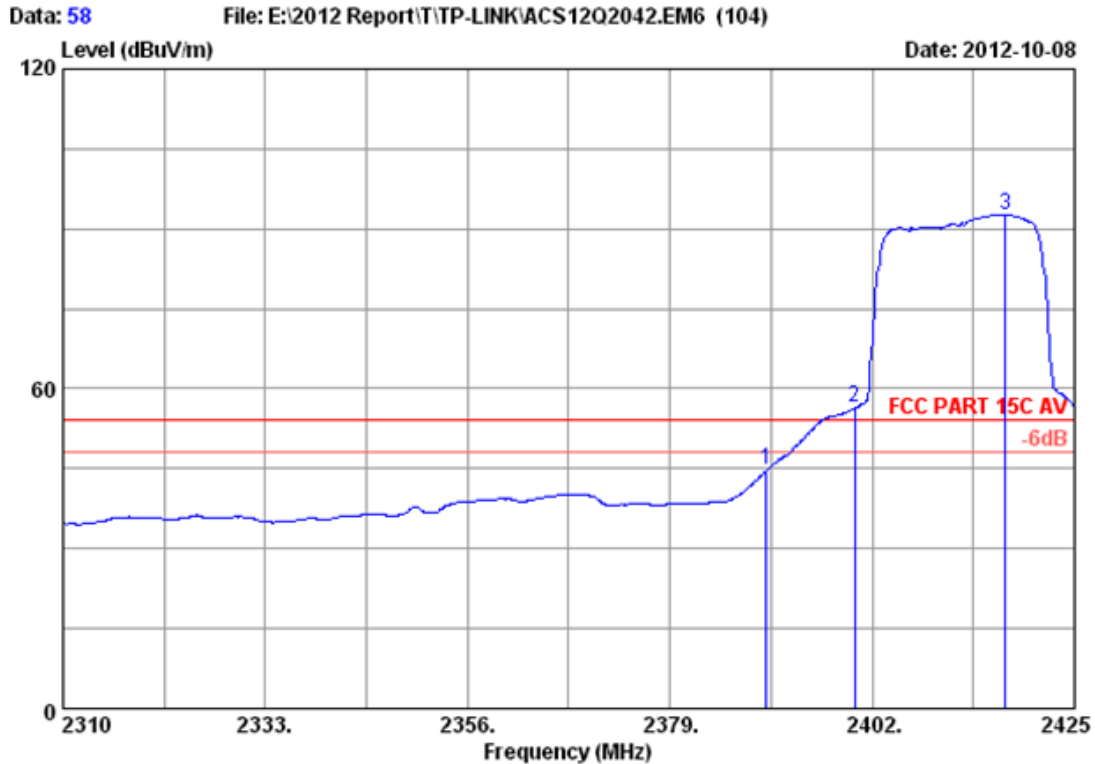
Site no. : 3m Chamber Data no. : 57  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT20 CH 1 2412MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	26.70	6.00	35.92	67.70	64.48	74.00	9.52	Peak
2	2400.000	26.76	6.02	35.92	86.96	83.82	74.00	-9.82	Peak
3	2416.030	26.86	6.04	35.92	109.20	106.18	74.00	-32.18	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



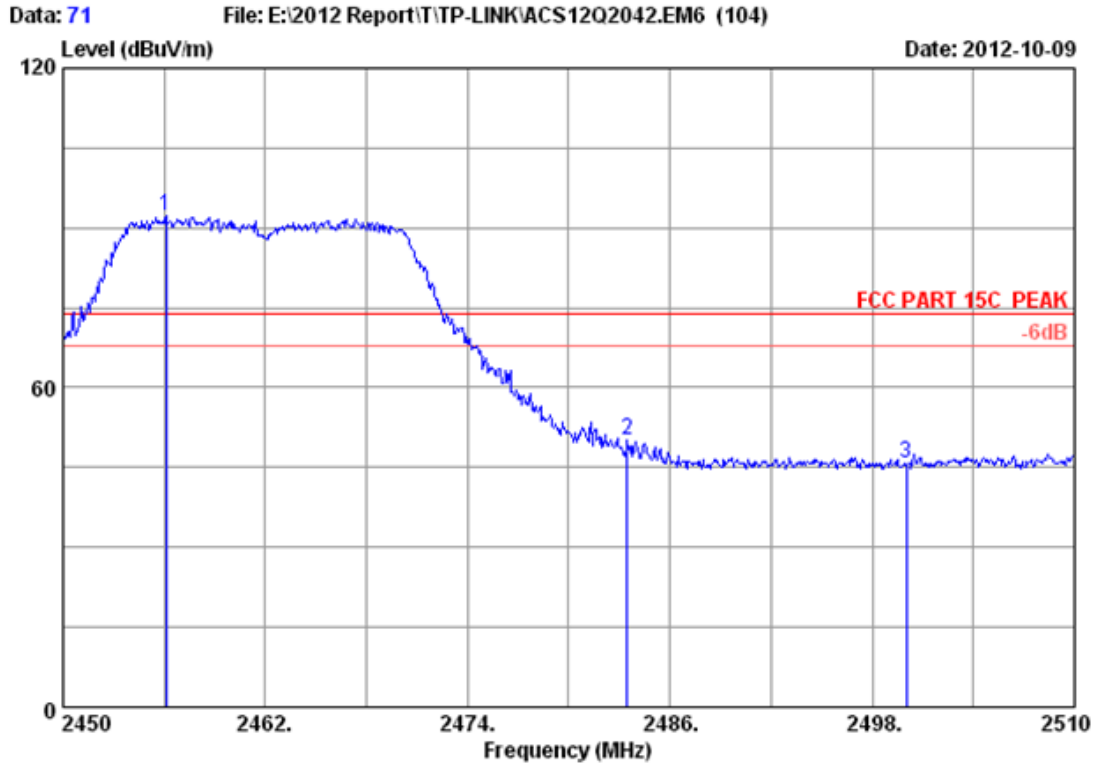


Site no. : 3m Chamber Data no. : 58  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT20 CH 1 2412MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	26.70	6.00	35.92	47.92	44.70	54.00	9.30	Average
2	2400.000	26.76	6.02	35.92	59.53	56.39	54.00	-2.39	Average
3	2417.180	26.87	6.05	35.92	95.62	92.62	54.00	-38.62	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

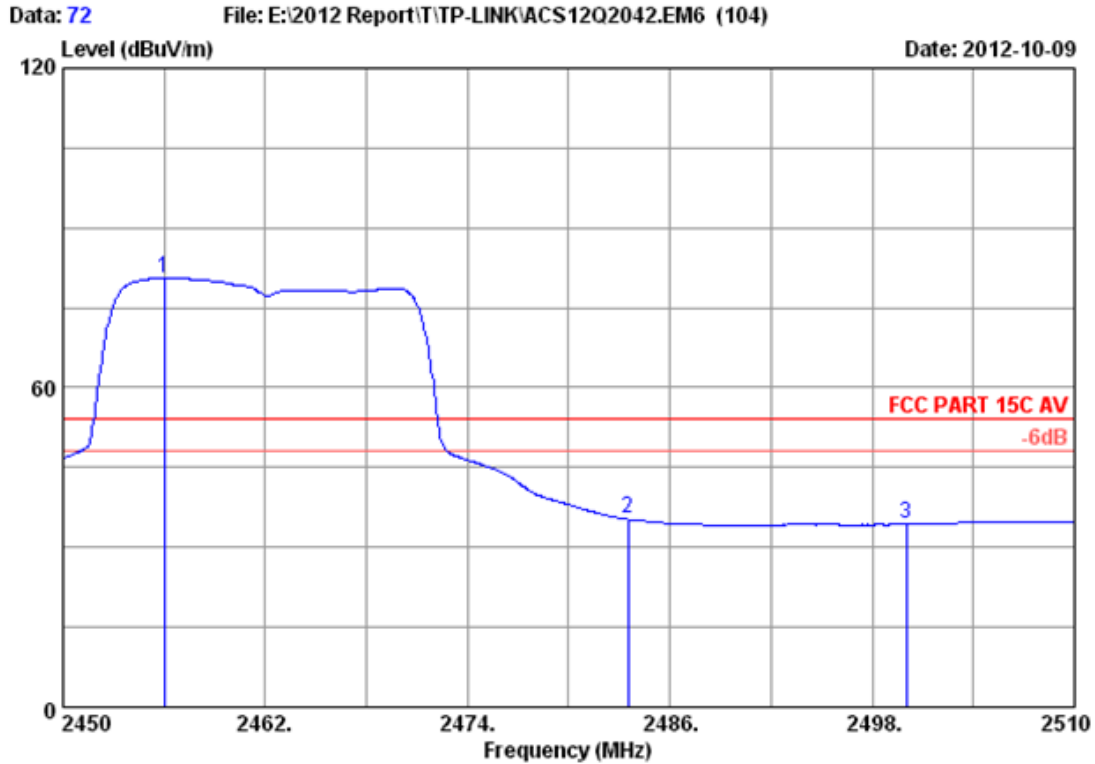


Site no. : 3m Chamber Data no. : 71  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT20 CH 11 2462MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2456.120	27.12	6.11	35.92	94.79	92.10	74.00	-18.10	Peak
2	2483.480	27.29	6.16	35.92	52.53	50.06	74.00	23.94	Peak
3	2500.000	27.40	6.19	35.93	48.06	45.72	74.00	28.28	Peak

Remarks:

- Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
- The emission levels that are 20dB below the official limit are not reported.

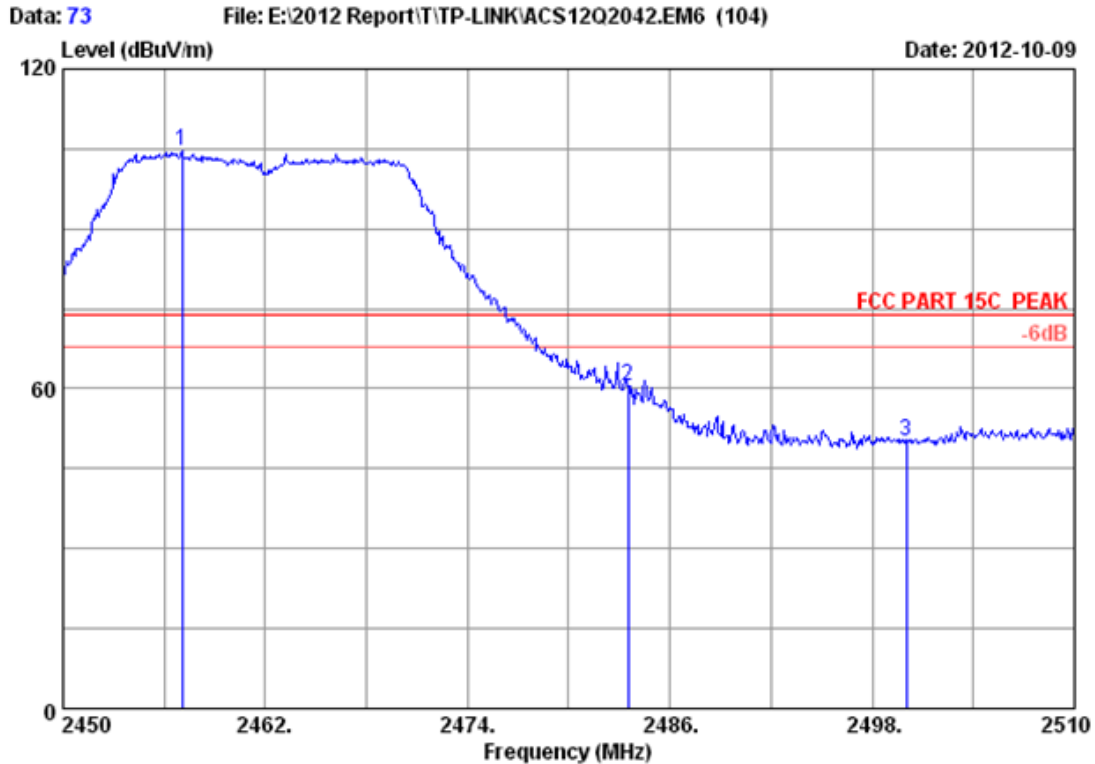


Site no. : 3m Chamber Data no. : 72  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT20 CH 11 2462MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2456.000	27.12	6.11	35.92	83.34	80.65	54.00	-26.65	Average
2	2483.500	27.29	6.16	35.92	37.75	35.28	54.00	18.72	Average
3	2500.000	27.40	6.19	35.93	36.67	34.33	54.00	19.67	Average

Remarks:

- Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
- The emission levels that are 20dB below the official limit are not reported.

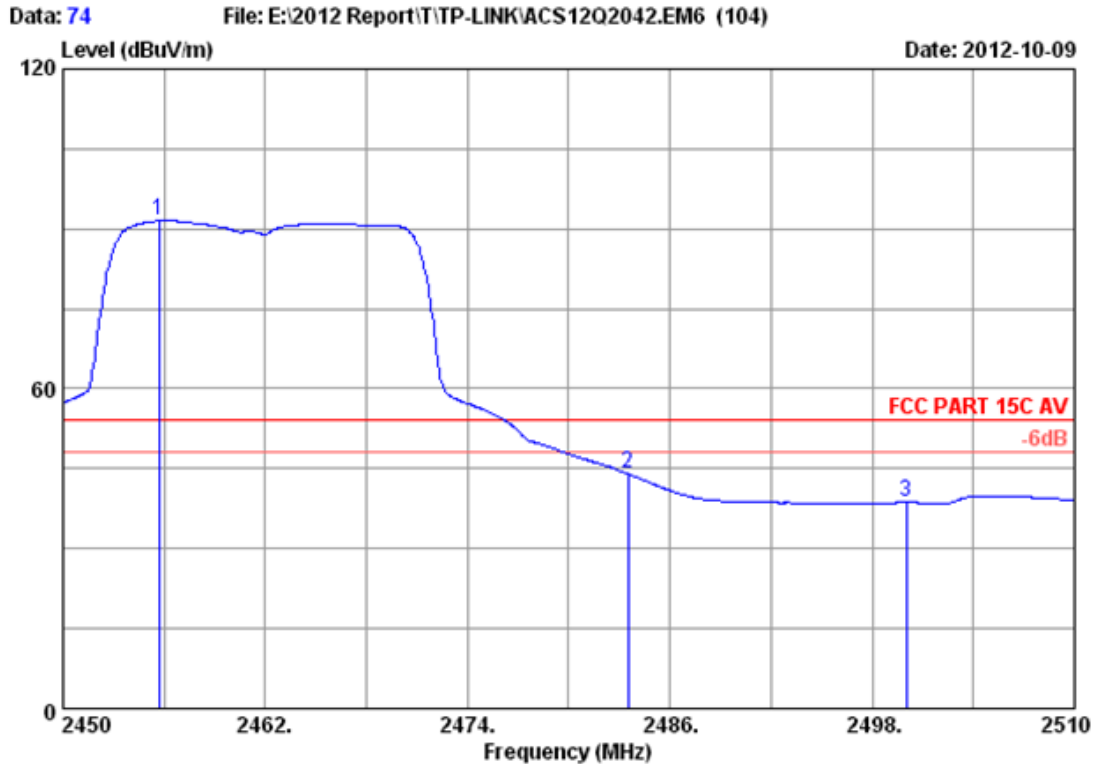


Site no. : 3m Chamber Data no. : 73  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT20 CH 11 2462MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2457.080	27.13	6.11	35.92	107.36	104.68	74.00	-30.68	Peak
2	2483.500	27.29	6.16	35.92	63.12	60.65	74.00	13.35	Peak
3	2500.000	27.40	6.19	35.93	52.48	50.14	74.00	23.86	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

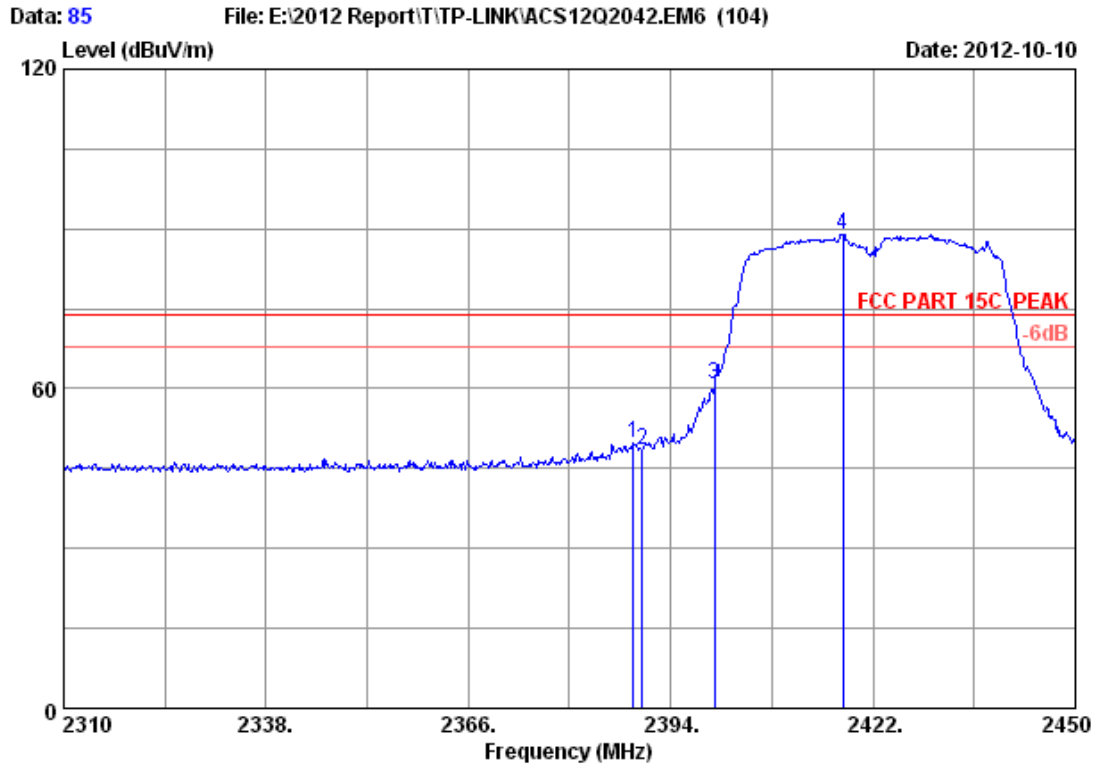


Site no. : 3m Chamber Data no. : 74  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT20 CH 11 2462MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2455.700	27.12	6.11	35.92	94.18	91.49	54.00	-37.49	Average
2	2483.500	27.29	6.16	35.92	46.53	44.06	54.00	9.94	Average
3	2500.000	27.40	6.19	35.93	41.08	38.74	54.00	15.26	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

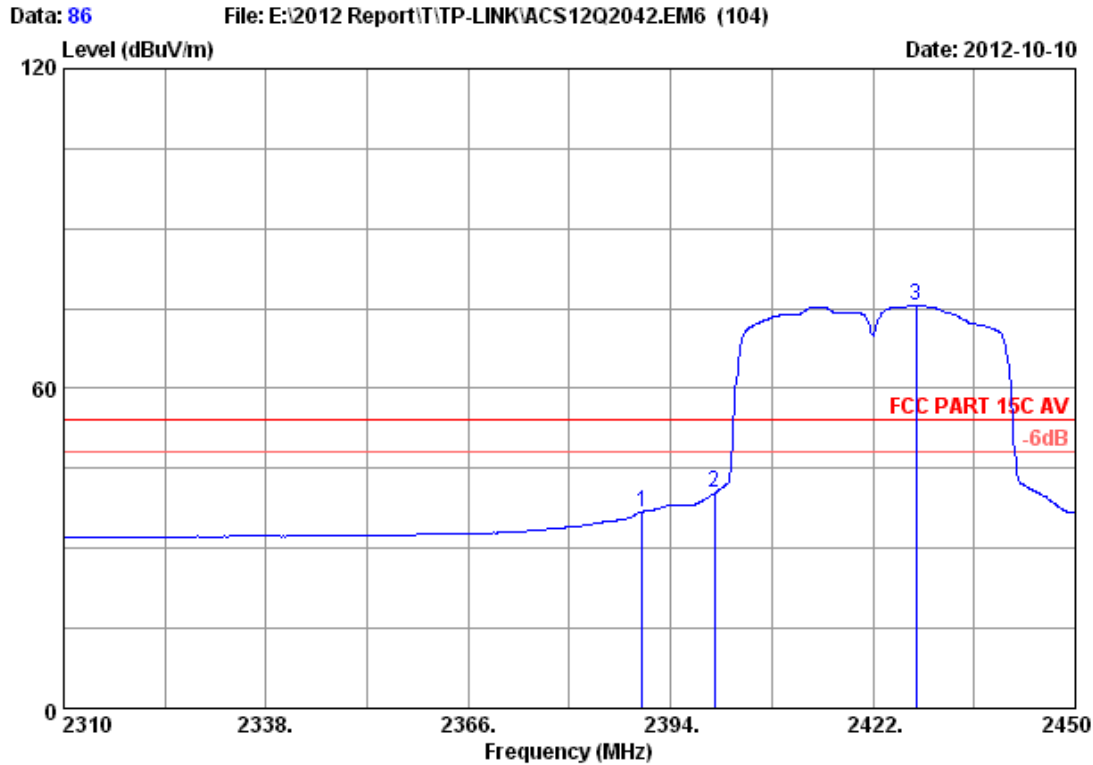


Site no. : 3m Chamber Data no. : 85  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT40 CH 1 2422MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2388.820	26.69	6.00	35.92	52.93	49.70	74.00	24.30	Peak
2	2390.000	26.70	6.00	35.92	51.73	48.51	74.00	25.49	Peak
3	2400.000	26.76	6.02	35.92	63.86	60.72	74.00	13.28	Peak
4	2417.800	26.87	6.05	35.92	92.07	89.07	74.00	-15.07	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

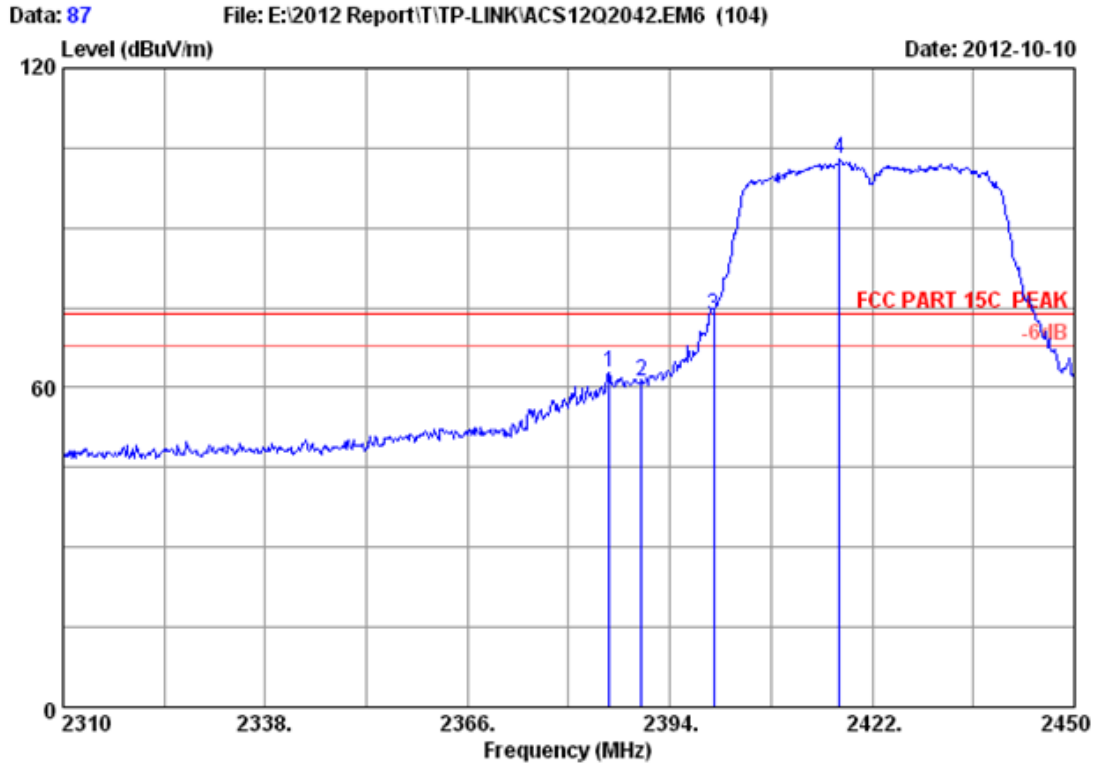


Site no. : 3m Chamber Data no. : 86  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT40 CH 1 2422MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	26.70	6.00	35.92	40.00	36.78	54.00	17.22	Average
2	2400.000	26.76	6.02	35.92	43.50	40.36	54.00	13.64	Average
3	2428.020	26.94	6.06	35.92	78.44	75.52	54.00	-21.52	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



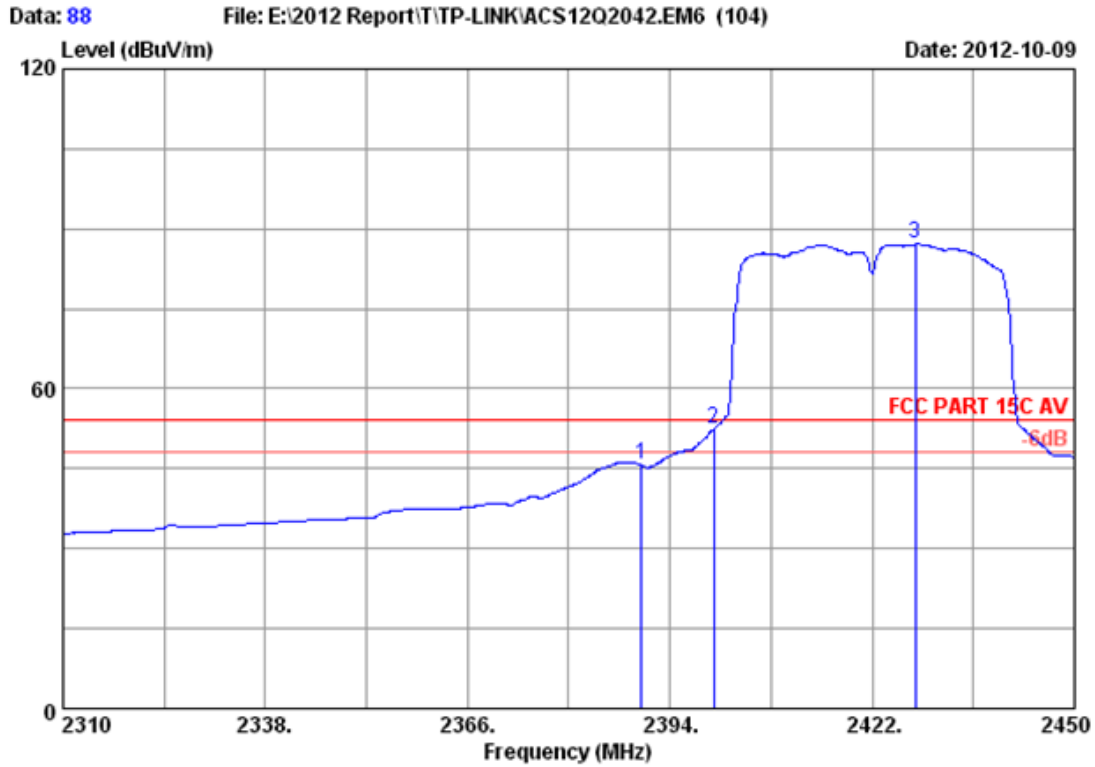
Site no. : 3m Chamber Data no. : 87  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT40 CH 1 2422MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBUV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Remark
1	2385.600	26.67	5.99	35.92	66.18	62.92	74.00	11.08	Peak
2	2390.000	26.70	6.00	35.92	64.26	61.04	74.00	12.96	Peak
3	2400.000	26.76	6.02	35.92	76.74	73.60	74.00	0.40	Peak
4	2417.520	26.87	6.05	35.92	105.93	102.93	74.00	-28.93	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



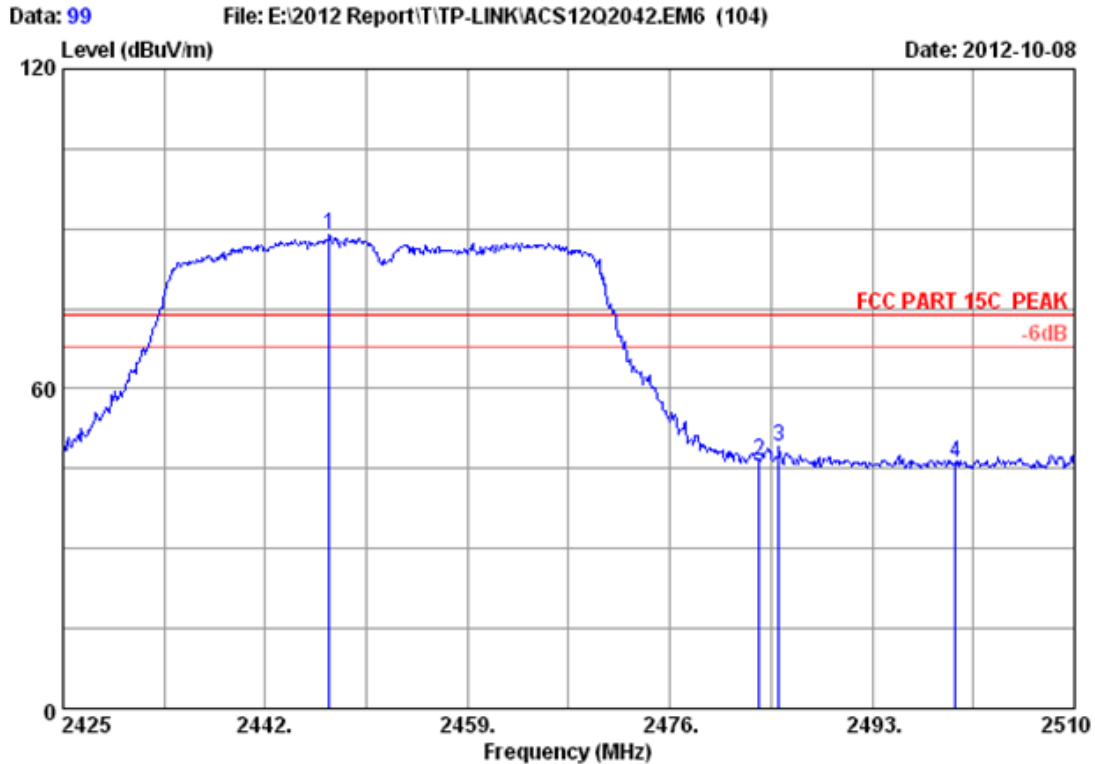


Site no. : 3m Chamber Data no. : 88  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23\*C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT40 CH 1 2422MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	26.70	6.00	35.92	48.93	45.71	54.00	8.29	Average
2	2400.000	26.76	6.02	35.92	55.57	52.43	54.00	1.57	Average
3	2428.020	26.94	6.06	35.92	90.03	87.11	54.00	-33.11	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

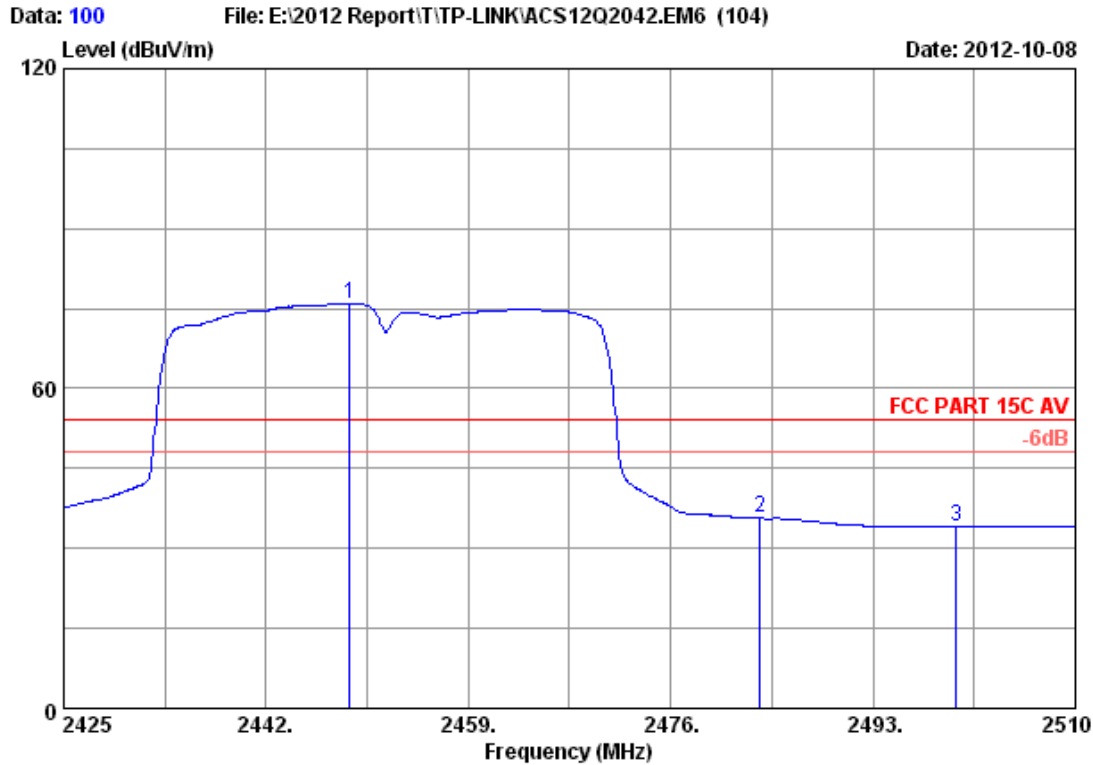


Site no. : 3m Chamber Data no. : 99  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT40 CH 7 2452MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2447.355	27.06	6.10	35.92	91.54	88.78	74.00	-14.78	Peak
2	2483.500	27.29	6.16	35.92	48.92	46.45	74.00	27.55	Peak
3	2485.180	27.31	6.16	35.92	51.71	49.26	74.00	24.74	Peak
4	2500.000	27.40	6.19	35.93	48.56	46.22	74.00	27.78	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

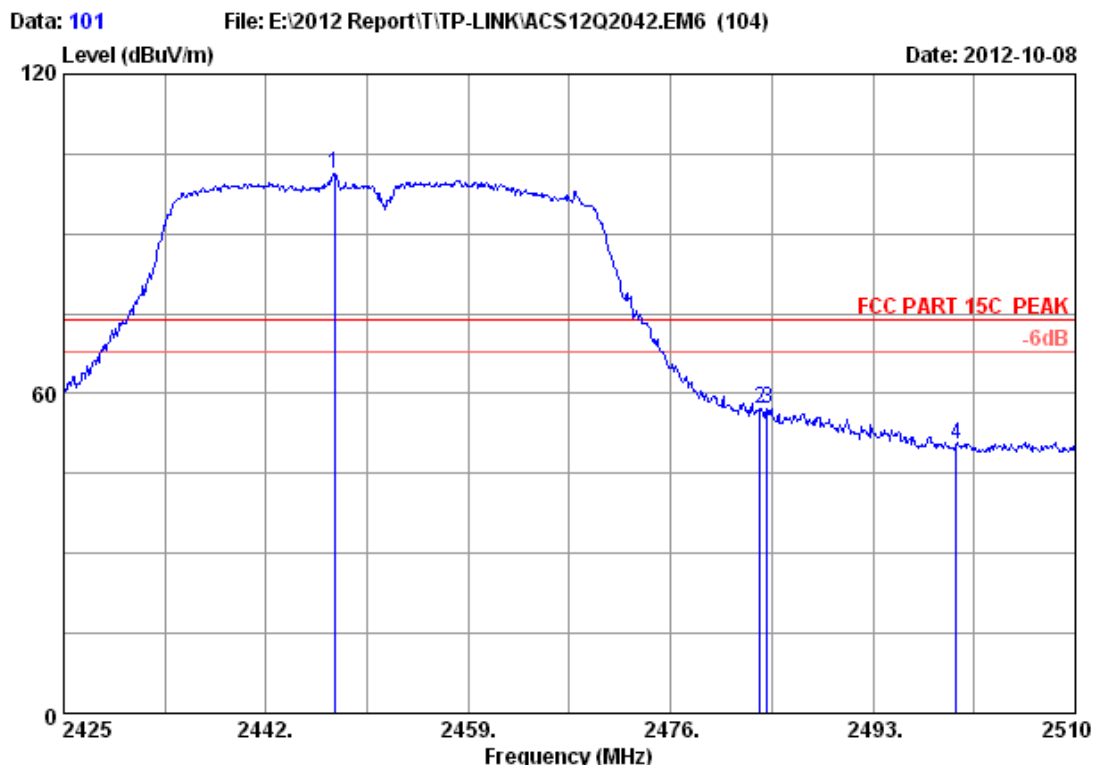


Site no. : 3m Chamber Data no. : 100  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT40 CH 7 2452MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2449.055	27.07	6.10	35.92	78.72	75.97	54.00	-21.97	Average
2	2483.500	27.29	6.16	35.92	38.11	35.64	54.00	18.36	Average
3	2500.000	27.40	6.19	35.93	36.49	34.15	54.00	19.85	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

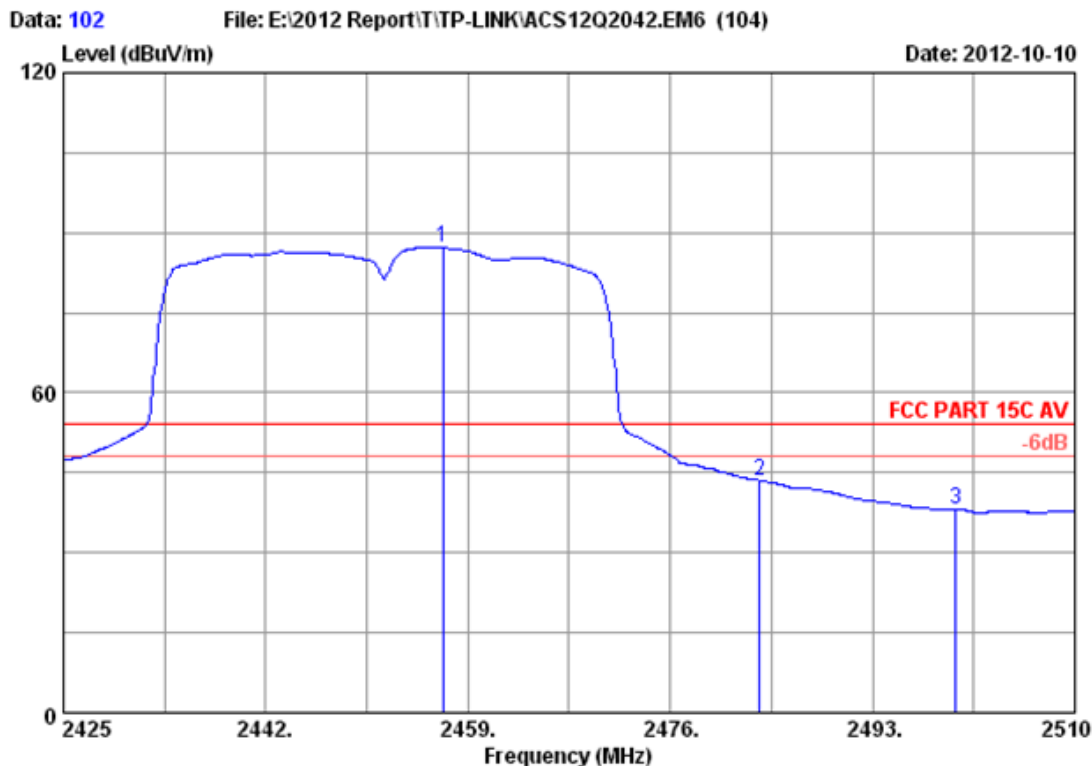


Site no. : 3m Chamber Data no. : 101  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT40 CH 7 2452MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2447.780	27.07	6.10	35.92	104.01	101.26	74.00	-27.26	Peak
2	2483.500	27.29	6.16	35.92	59.51	57.04	74.00	16.96	Peak
3	2484.075	27.30	6.16	35.92	59.65	57.19	74.00	16.81	Peak
4	2500.000	27.40	6.19	35.93	52.78	50.44	74.00	23.56	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 102  
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 3G/4G Wireless N Router  
 Power supply : DC 12V From Adapter Input AC 120V/60Hz  
 Test mode : IEEE802.11nHT40 CH 7 2452MHz Tx  
 M/N : TL-MR3420

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2456.875	27.12	6.11	35.92	89.89	87.20	54.00	-33.20	Average
2	2483.500	27.29	6.16	35.92	46.00	43.53	54.00	10.47	Average
3	2500.000	27.40	6.19	35.93	40.45	38.11	54.00	15.89	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

## 7. 6dB Bandwidth Test

### 7.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	May.08, 12	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 12	1 Year
3.	Antenna	EMCO	3115	9510-4580	May.08, 12	1Year
4.	HF Cable	Hubersuhner	Sucoflex104	-	May.08, 12	1 Year

### 7.2. Limit

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

### 7.3. Test Procedure

The transmitter output was connected to a spectrum analyzer, The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300 kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

### 7.4. Test Results

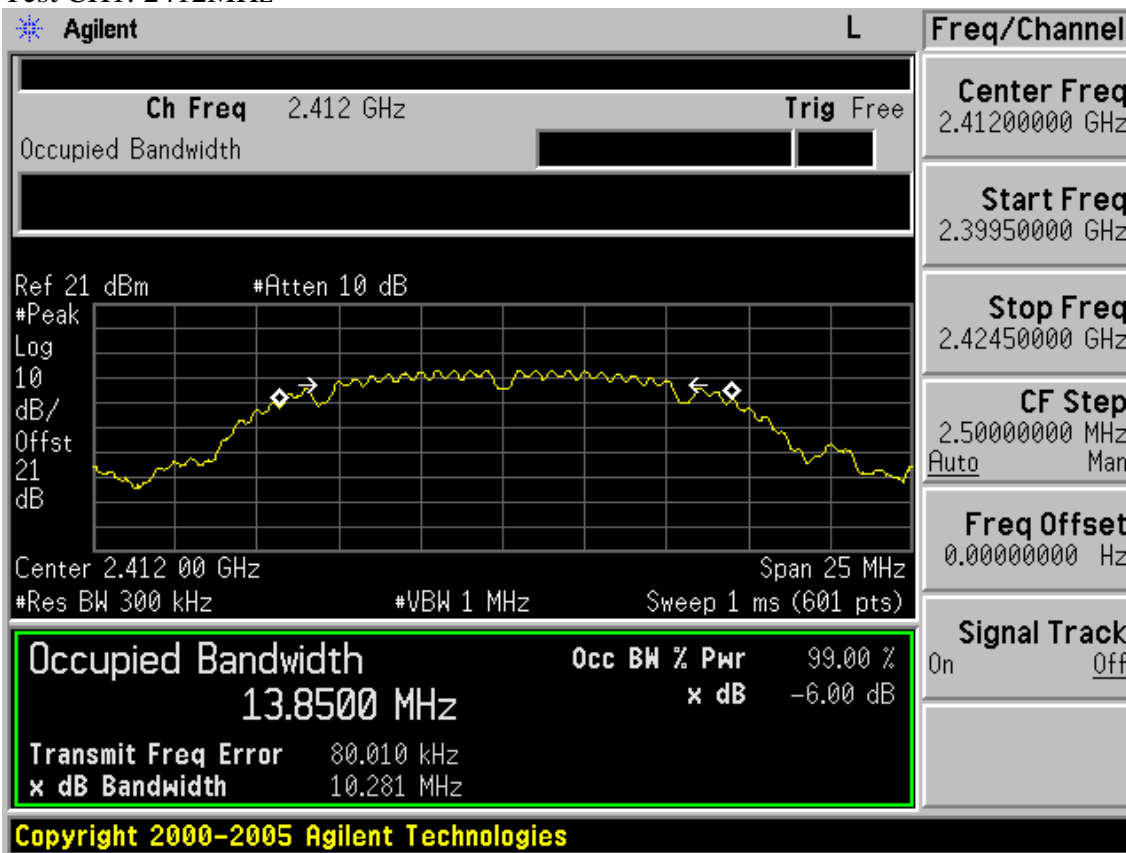
EUT: 3G/4G Wireless N Router		
M/N: TL-MR3420		
Test date:2012-10-14	Pressure: 101.3 kpa	Humidity: 52.3%
Tested by: Leo-Li	Test site: RF Site	Temperature : 24.2°C

Cable loss: 1 dB		Attenuator loss: 20 dB		
Test Mode	CH	6dB bandwidth (MHz)		Limit (KHz)
		Chain0	Chain1	
11b	CH1	10.281	10.273	>500
	CH6	10.281	10.273	>500
	CH11	10.286	10.267	>500
11g	CH1	16.453	16.431	>500
	CH6	16.378	16.434	>500
	CH11	16.491	16.454	>500
11n HT20	CH1	17.695	17.678	>500
	CH6	17.816	17.642	>500
	CH11	17.668	17.643	>500
11n HT40	CH1	35.543	35.672	>500
	CH4	35.945	35.428	>500
	CH7	36.095	35.808	>500
Conclusion : PASS				

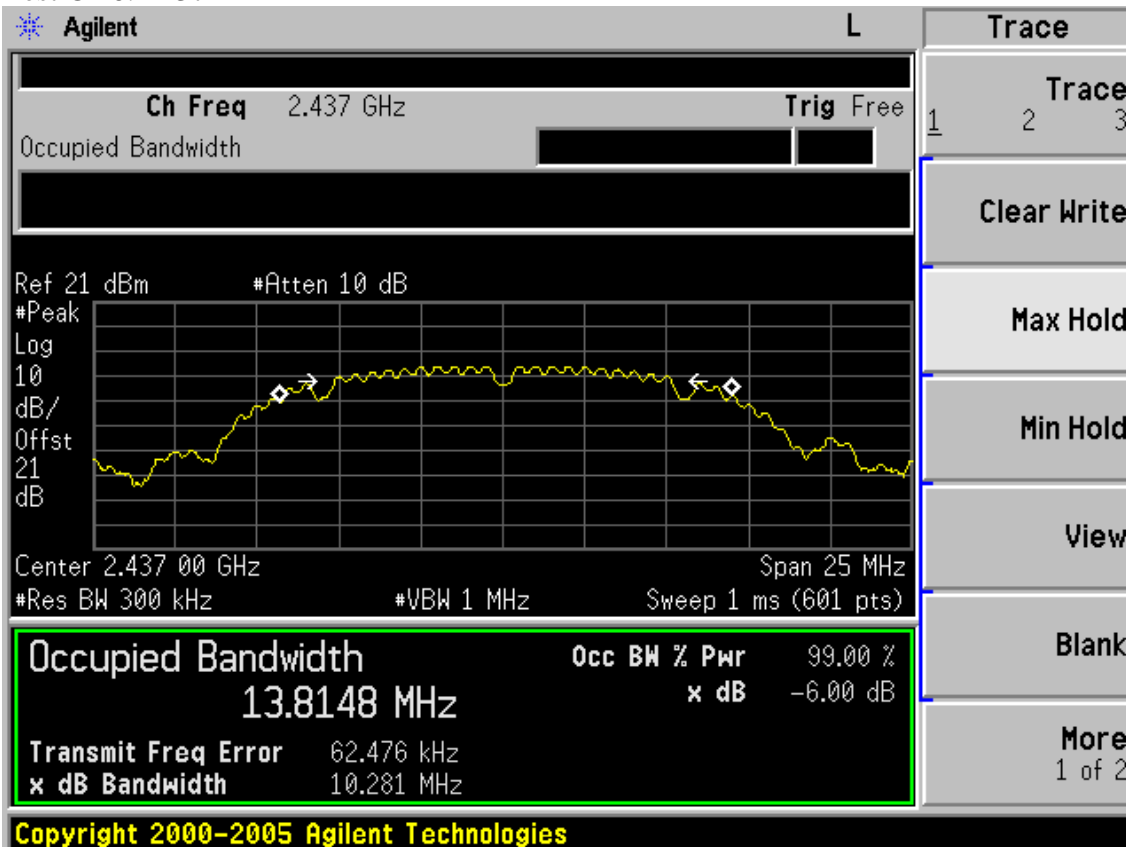
**ANT0**

Test Mode: IEEE 802.11b TX

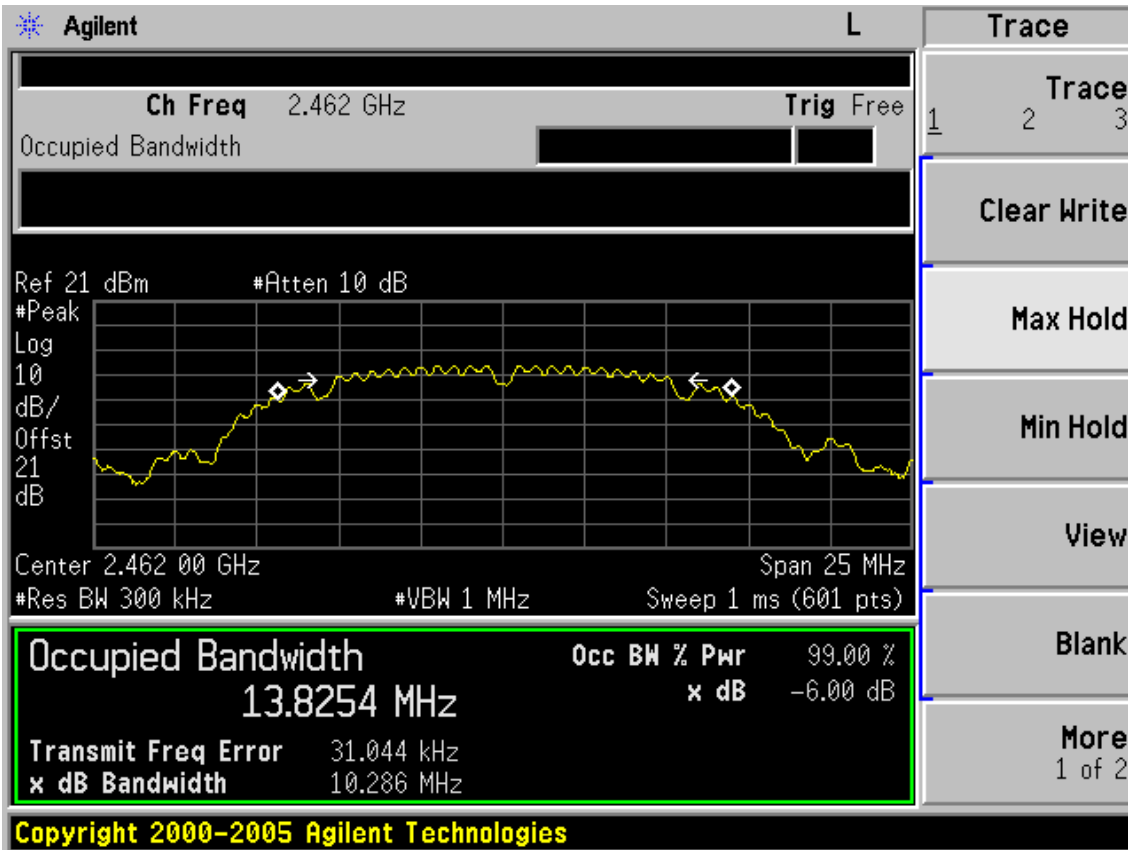
Test CH1: 2412MHz



Test CH6: 2437MHz

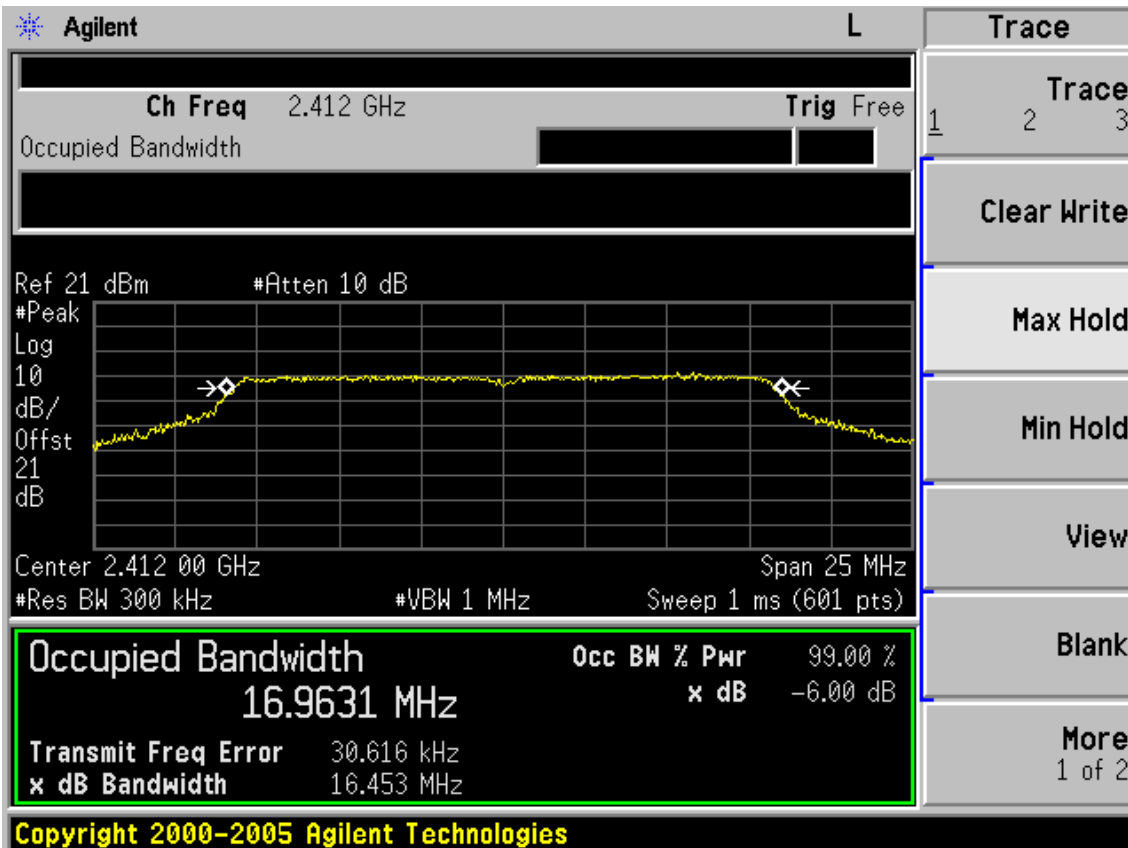


Test CH11: 2462MHz



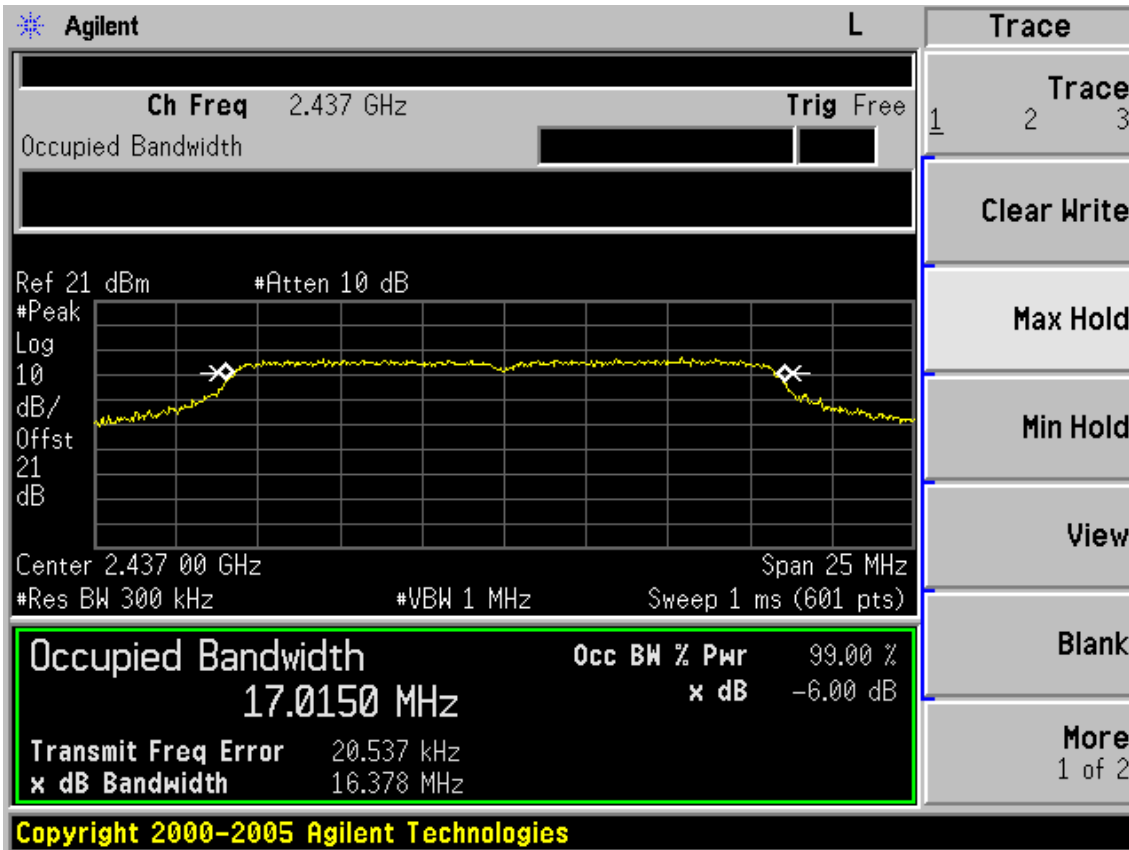
Test Mode: IEEE 802.11g TX

Test CH1: 2412MHz

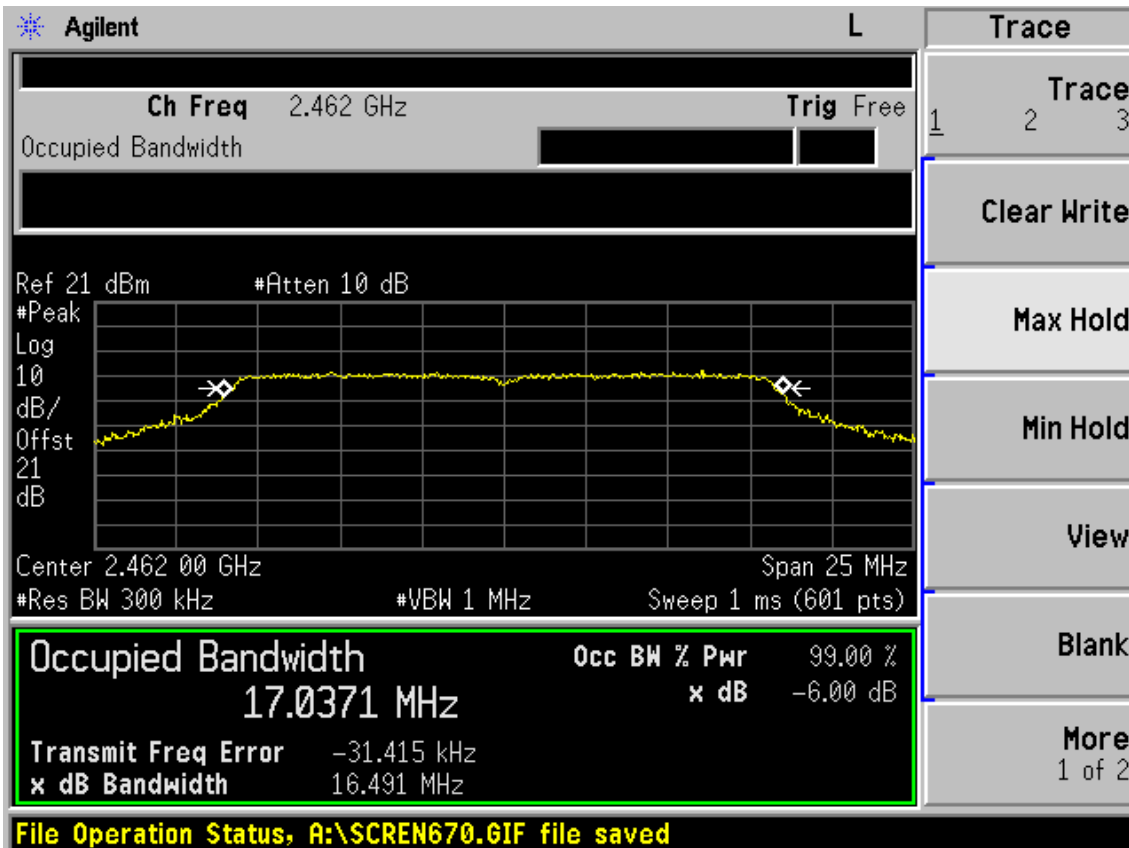




Test CH6: 2437MHz



Test CH11: 2462MHz



Test Mode: IEEE 802.11n HT20 TX  
 Test CH1: 2412MHz

Agilent
L

Ch Freq 2.412 GHz
Trig Free

Occupied Bandwidth

Ref 21 dBm #Atten 10 dB

Center 2.412 00 GHz Span 25 MHz  
 #Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)

Trace

1 2 3

Trace

Clear Write

Max Hold

Min Hold

View

Blank

More  
1 of 2

**Occupied Bandwidth**

**17.9398 MHz**

Occ BW % Pwr 99.00 %

x dB -6.00 dB

Transmit Freq Error 35.982 kHz

x dB Bandwidth 17.695 MHz

File Operation Status, A:\SCREN673.GIF file saved

Test CH6: 2437MHz

Agilent
L

Ch Freq 2.437 GHz
Trig Free

Occupied Bandwidth

**Center 2.437000000 GHz**

Ref 21 dBm #Atten 10 dB

Center 2.437 00 GHz Span 25 MHz  
 #Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)

Trace

1 2 3

Trace

Clear Write

Max Hold

Min Hold

View

Blank

More  
1 of 2

**Occupied Bandwidth**

**18.0623 MHz**

Occ BW % Pwr 99.00 %

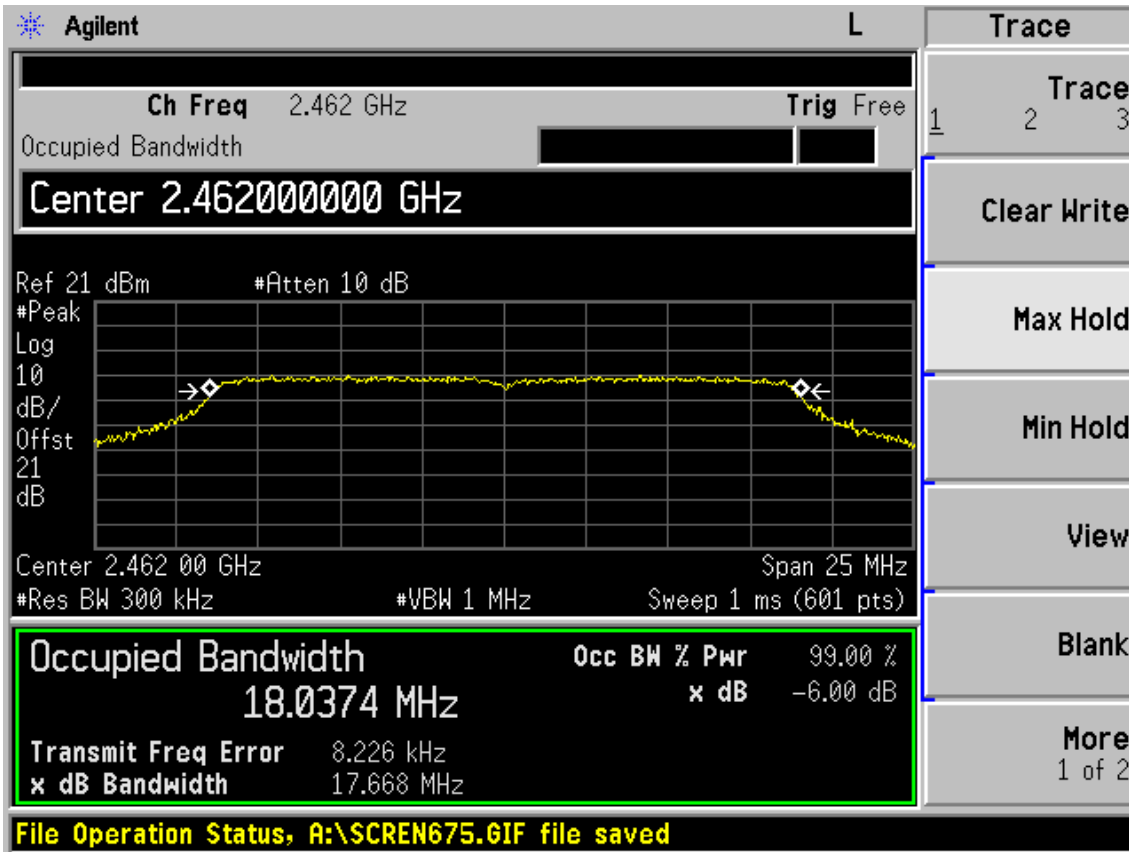
x dB -6.00 dB

Transmit Freq Error 25.748 kHz

x dB Bandwidth 17.816 MHz

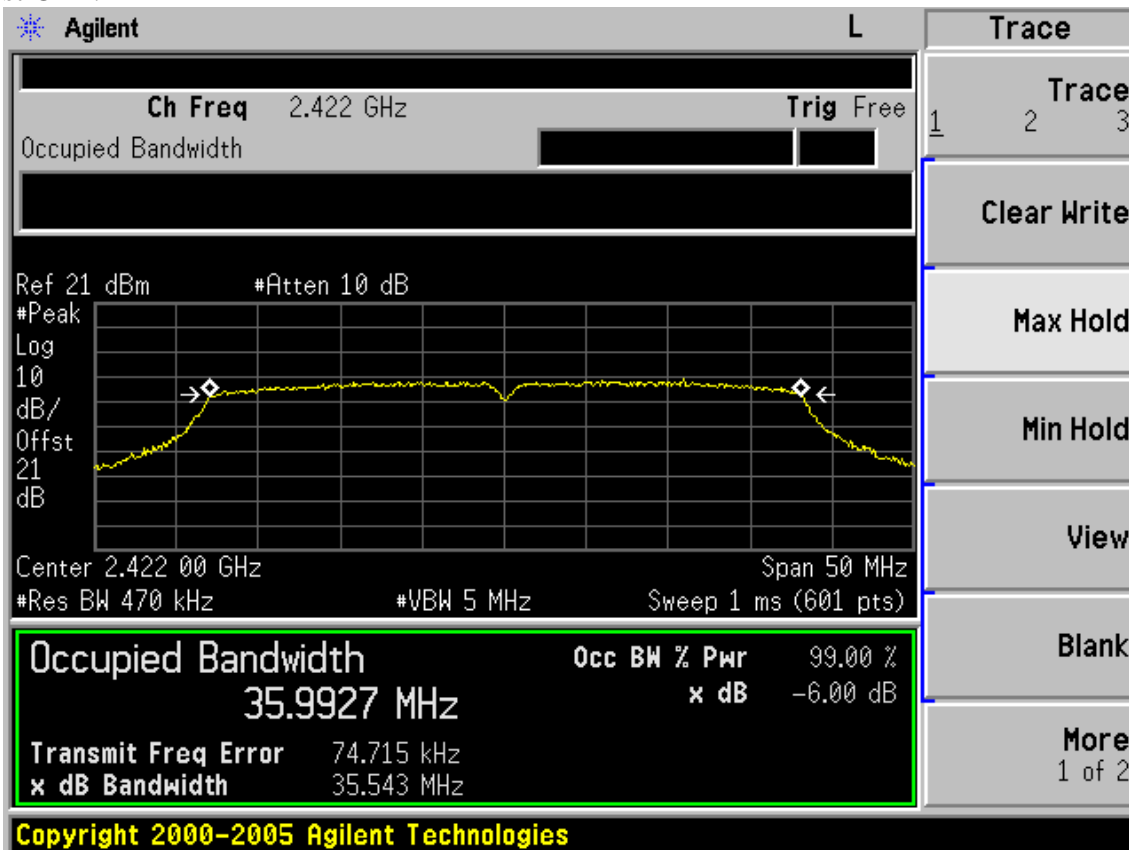
File Operation Status, A:\SCREN674.GIF file saved

Test CH11: 2462MHz

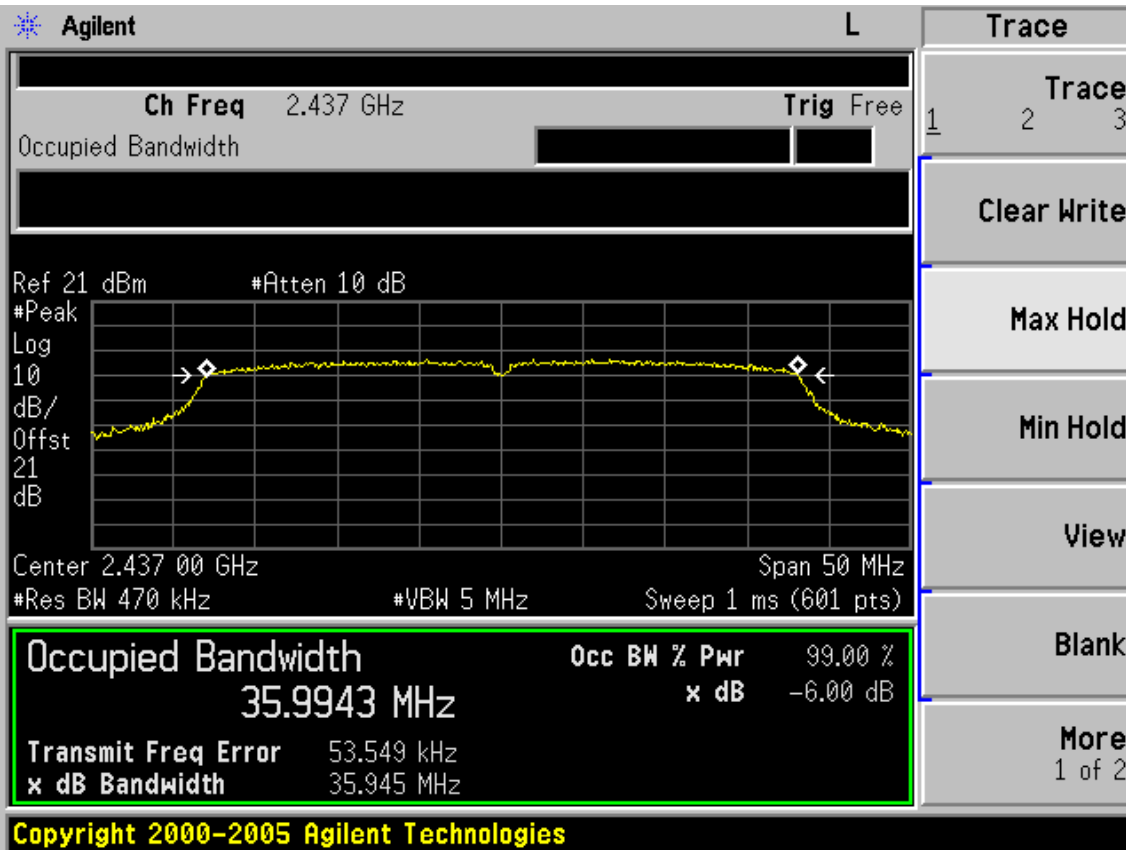


Test Mode: IEEE 802.11n HT40 TX

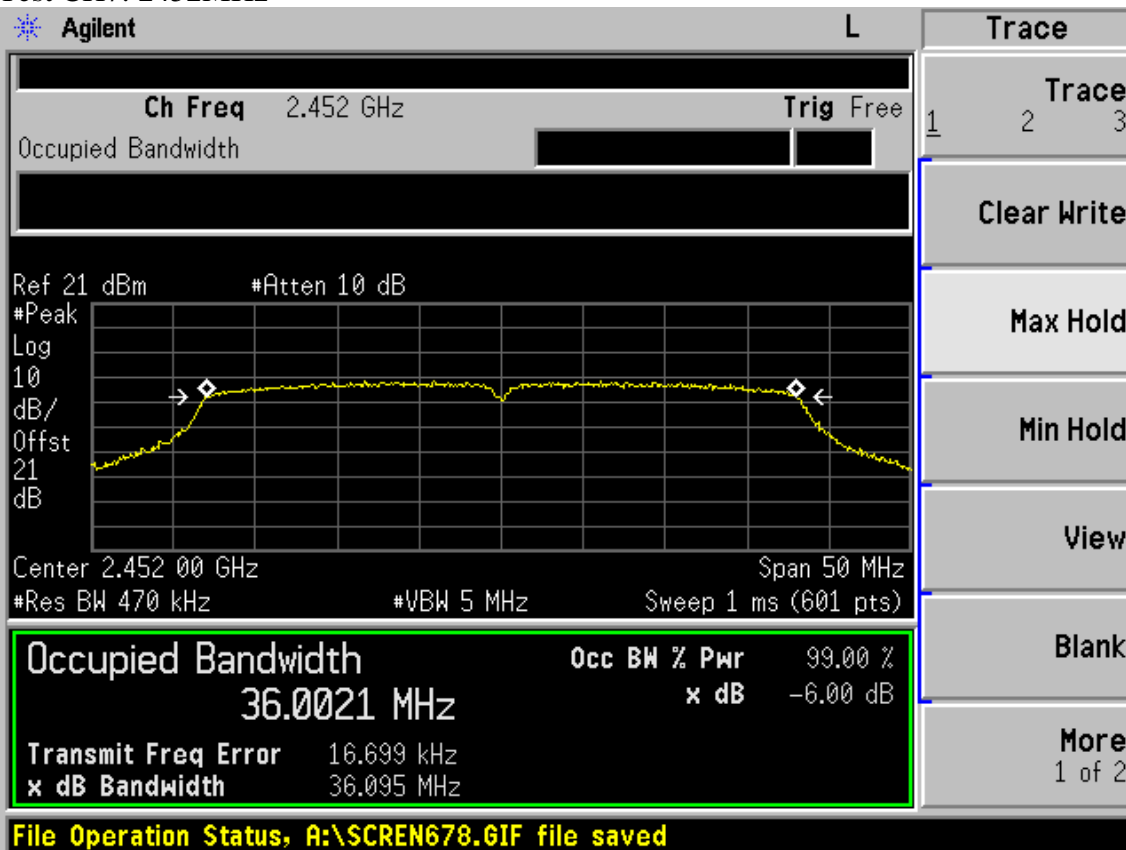
Test CH1: 2422MHz



Test CH4: 2437MHz



Test CH7: 2452MHz



**ANT1**

Test Mode: IEEE 802.11b TX

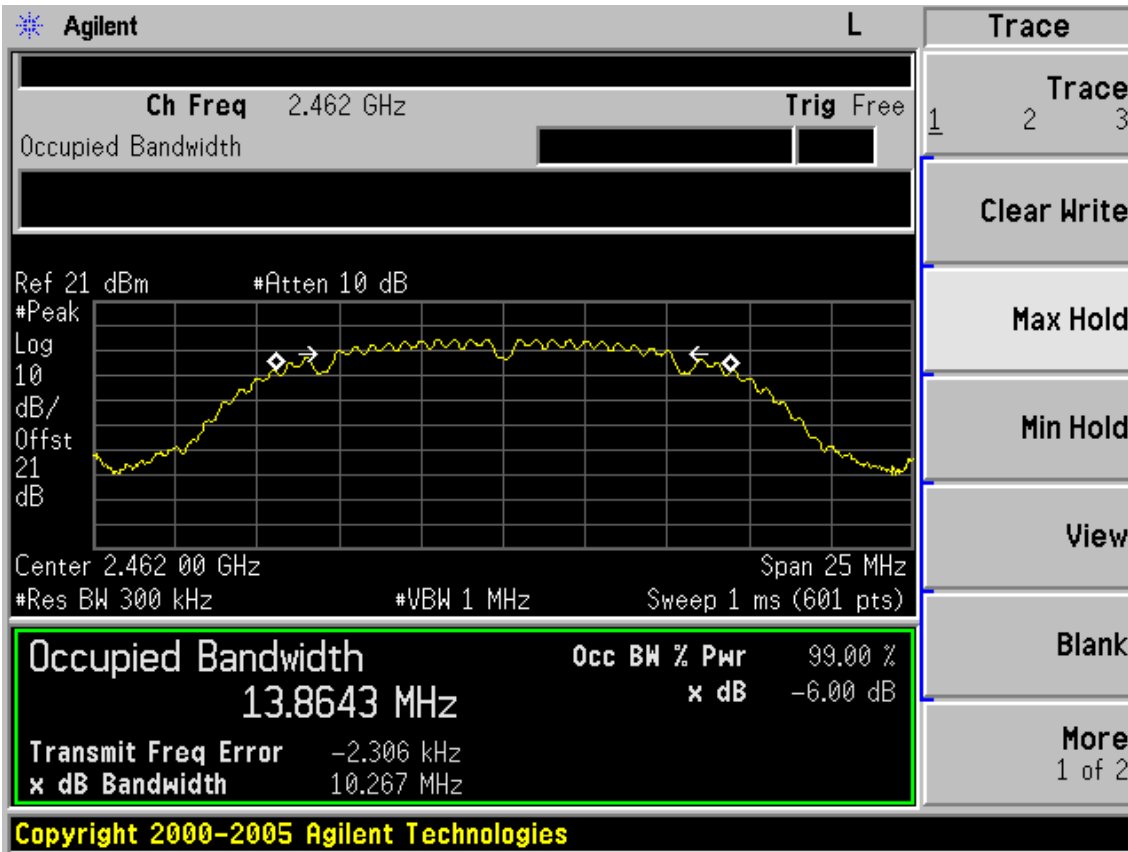
Test CH1: 2412MHz

<p>Agilent L</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Occupied Bandwidth</p>		Trace
<p>Ref 21 dBm #Atten 10 dB</p> <p>#Peak Log 10 dB/ Offst 21 dB</p> <p>Center 2.412 00 GHz Span 25 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)</p>		<p>Trace 1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p>
<p><b>Occupied Bandwidth</b> Occ BW % Pwr 99.00 %</p> <p><b>13.8688 MHz</b> x dB -6.00 dB</p> <p>Transmit Freq Error 33.455 kHz</p> <p>x dB Bandwidth 10.273 MHz</p>		
<p>File Operation Status, A:\SCREN688.GIF file saved</p>		

Test CH6: 2437MHz

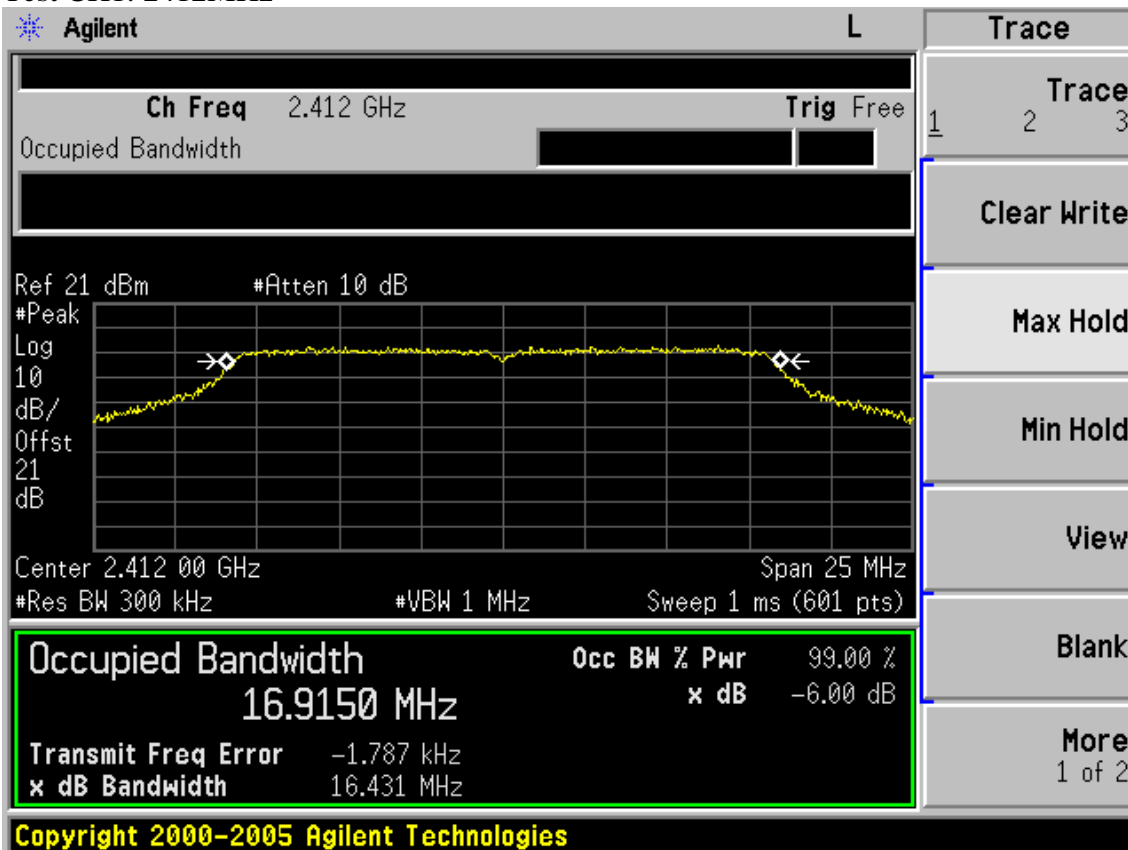
<p>Agilent L</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Occupied Bandwidth</p>		Trace
<p>Ref 21 dBm #Atten 10 dB</p> <p>#Peak Log 10 dB/ Offst 21 dB</p> <p>Start 2.424 50 GHz Stop 2.449 50 GHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)</p>		<p>Trace 1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p>
<p><b>Occupied Bandwidth</b> Occ BW % Pwr 99.00 %</p> <p><b>13.8705 MHz</b> x dB -6.00 dB</p> <p>Transmit Freq Error 17.046 kHz</p> <p>x dB Bandwidth 10.273 MHz</p>		
<p>Copyright 2000-2005 Agilent Technologies</p>		

Test CH11: 2462MHz



Test Mode: IEEE 802.11g TX

Test CH1: 2412MHz



Test CH6: 2437MHz

Agilent
L

Ch Freq 2.437 GHz
Trig Free

Ref 21 dBm #Atten 10 dB

#Peak

Log

10

dB/

Offst

21

dB

Center 2.437 00 GHz Span 25 MHz

#Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)

**Occupied Bandwidth** Occ BW % Pwr 99.00 %

17.0495 MHz

x dB -6.00 dB

Transmit Freq Error -4.769 kHz

x dB Bandwidth 16.434 MHz

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Trace

Trace 1 2 3

Clear Write

Max Hold

Min Hold

View

Blank

More 1 of 2

Test CH11: 2462MHz

Agilent
L

Ch Freq 2.462 GHz
Trig Free

Ref 21 dBm #Atten 10 dB

#Peak

Log

10

dB/

Offst

21

dB

Center 2.462 00 GHz Span 25 MHz

#Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)

**Occupied Bandwidth** Occ BW % Pwr 99.00 %

16.9522 MHz

x dB -6.00 dB

Transmit Freq Error -33.641 kHz

x dB Bandwidth 16.454 MHz

File Operation Status, A:\SCREN685.GIF file saved

Trace

Trace 1 2 3

Clear Write

Max Hold

Min Hold

View

Blank

More 1 of 2

Test Mode: IEEE 802.11n HT20 TX

Test CH1: 2412MHz

Agilent
L

Ch Freq 2.412 GHz
Trig Free

Ref 21 dBm #Atten 10 dB

Center 2.412 00 GHz Span 25 MHz  
#Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)

<b>Occupied Bandwidth</b>	<b>Occ BW % Pwr</b> 99.00 %
18.0113 MHz	x dB -6.00 dB
Transmit Freq Error 18.683 kHz	
x dB Bandwidth 17.678 MHz	

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Trace

Trace 1 2 3

Clear Write

Max Hold

Min Hold

View

Blank

More 1 of 2

Test CH6: 2437MHz

Agilent
L

Ch Freq 2.437 GHz
Trig Free

Ref 21 dBm #Atten 10 dB

Center 2.437 00 GHz Span 25 MHz  
#Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)

<b>Occupied Bandwidth</b>	<b>Occ BW % Pwr</b> 99.00 %
18.0426 MHz	x dB -6.00 dB
Transmit Freq Error 18.852 kHz	
x dB Bandwidth 17.642 MHz	

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Freq/Channel

Center Freq 2.43700000 GHz

Start Freq 2.42450000 GHz

Stop Freq 2.44950000 GHz

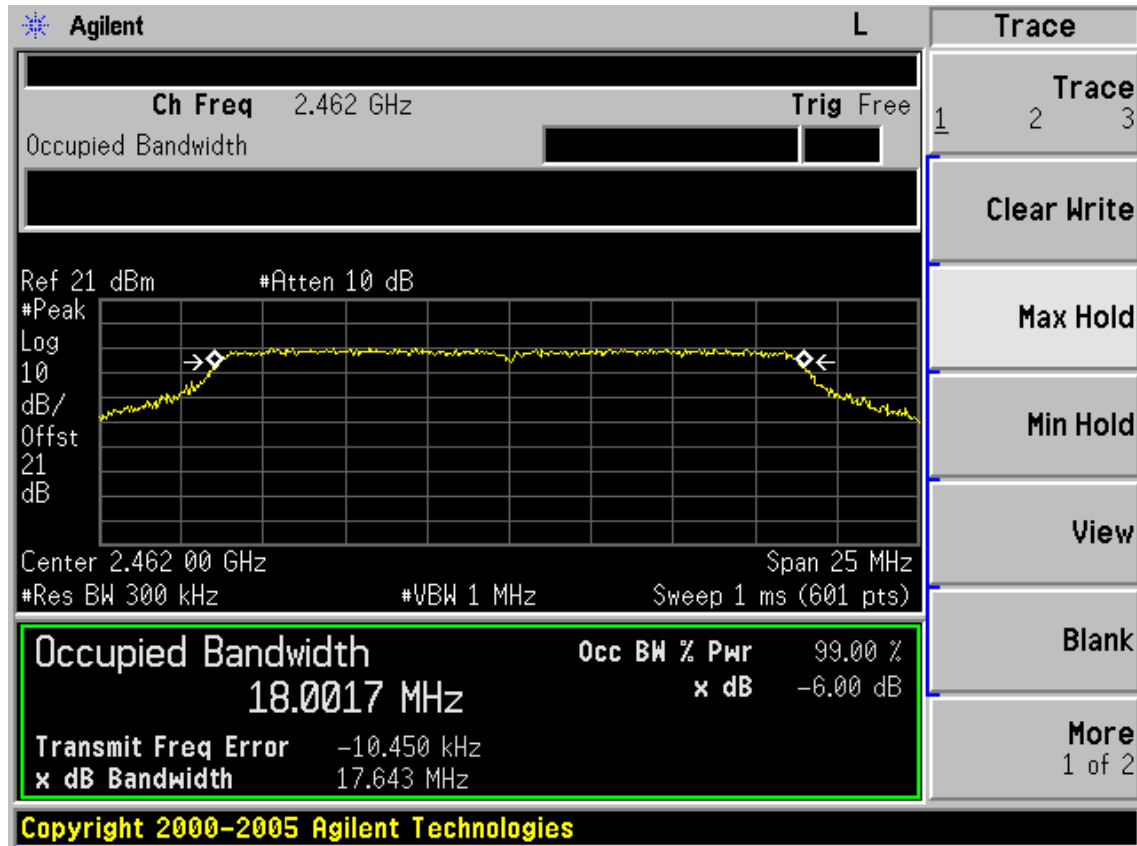
CF Step 2.50000000 MHz  
Auto Man

Freq Offset 0.00000000 Hz

Signal Track On Off

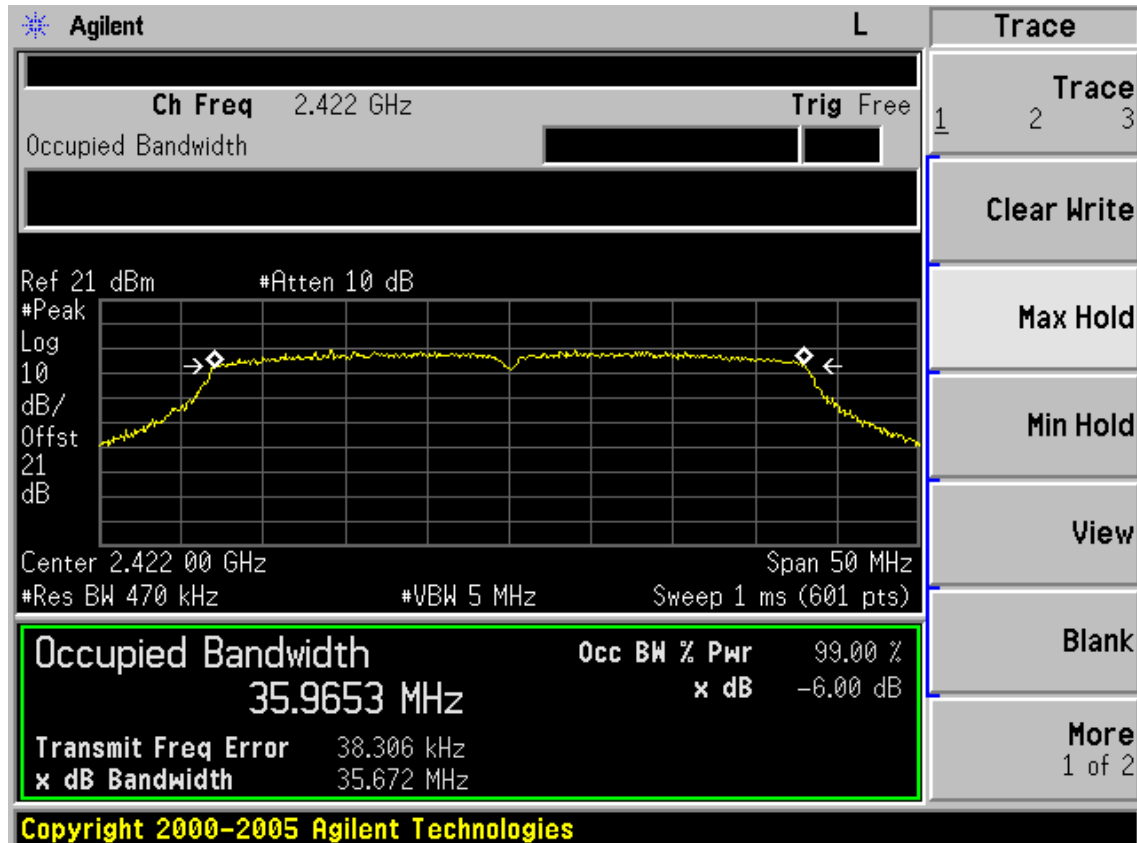


Test CH11: 2462MHz

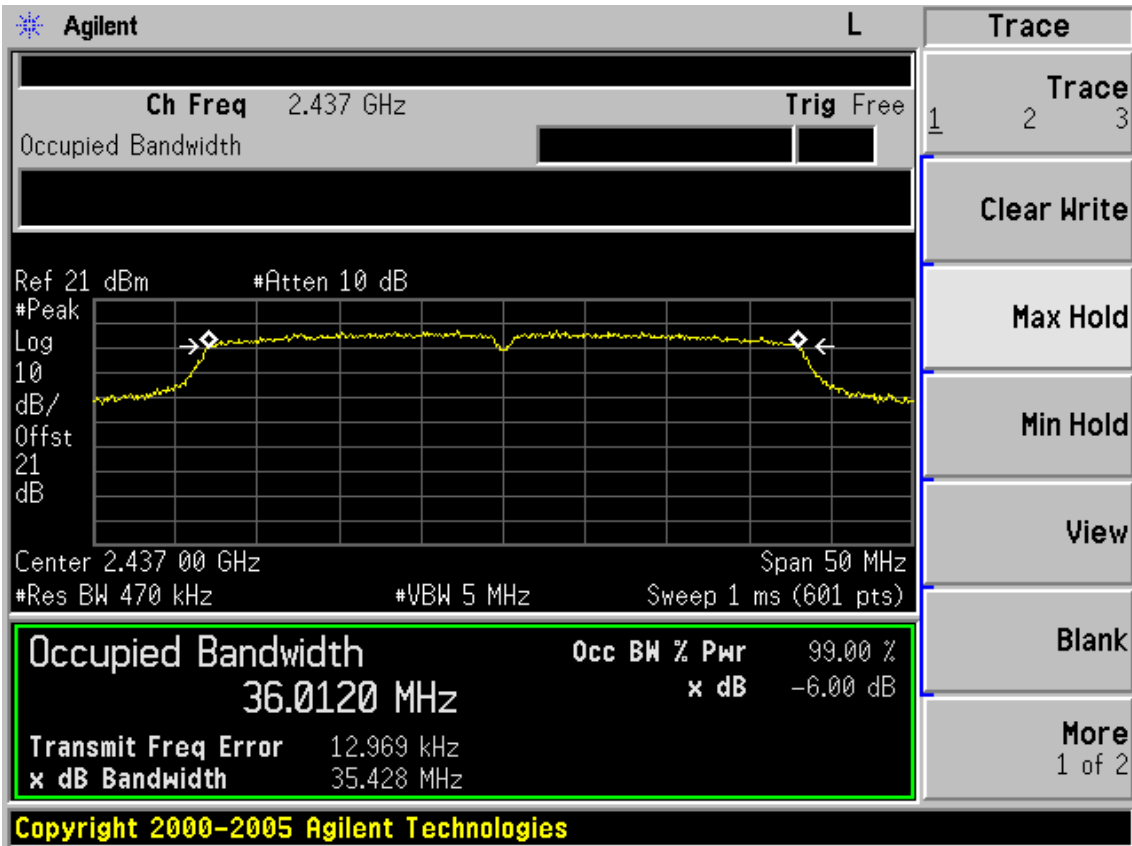


Test Mode: IEEE 802.11n HT40 TX

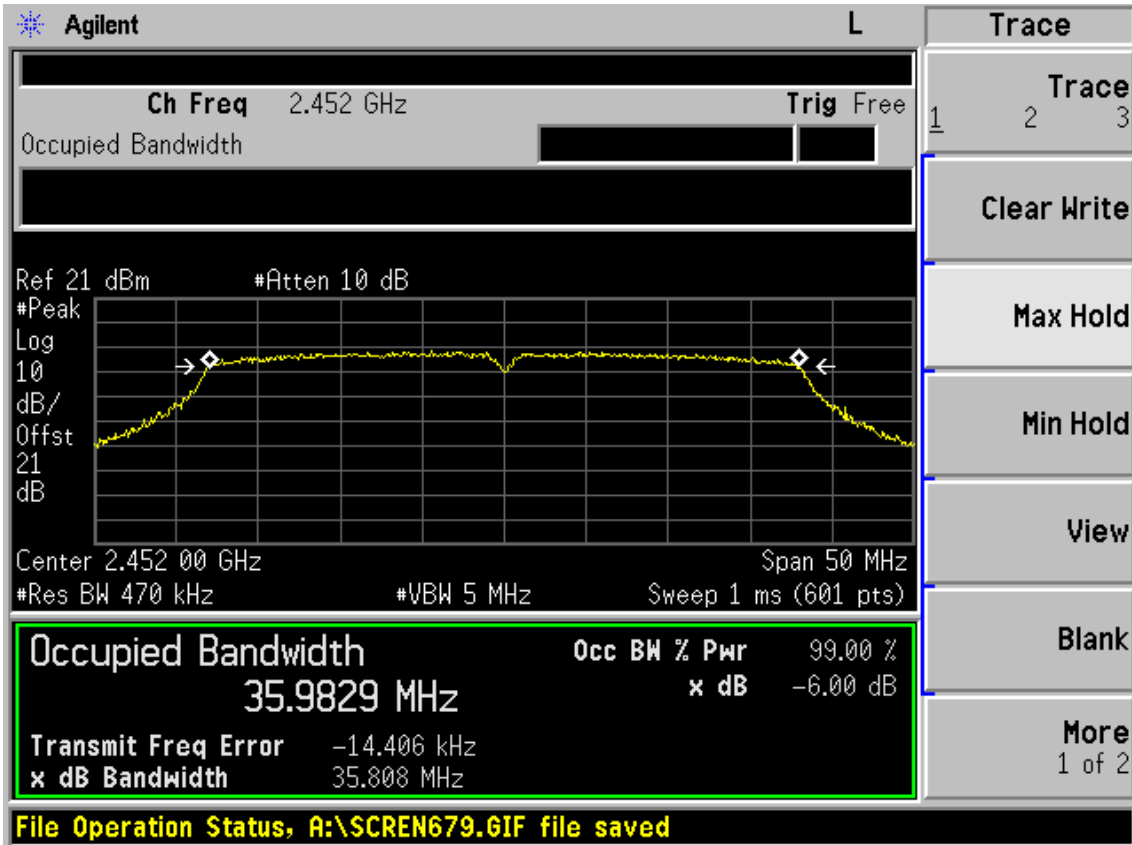
Test CH1: 2422MHz



Test CH4: 2437MHz



Test CH7: 2452MHz



## 8. OUTPUT POWER TEST

### 8.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	May.08, 12	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 12	1 Year
3.	Antenna	EMCO	3115	9510-4580	May.08, 12	1Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 12	1 Year
5.	Power Meter	Anritsu	ML2487A	6K00002472	May.08, 12	1Year
6.	Power Sensor	Anritsu	MA2491A	033005	May.08, 12	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 26dB 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 Bandwidth correction method according to ANSI C63.10 clause 6.10.2.1 part (c) was used:
  - 1) Set the RBW=3MHz and VBW =8MHz
  - 2) Turn averaging off
  - 3) Set sweep to automatic
  - 4) Set the span just large enough to capture the emission
  - 5) Use a peak detector on max hold
  - 6) Record the measured power
  - 7) Calculate Output power of EUT use the formula:

Peak output power =measured power+ 10log[(26dB bandwidth of emission)/(analyzer RBW)]

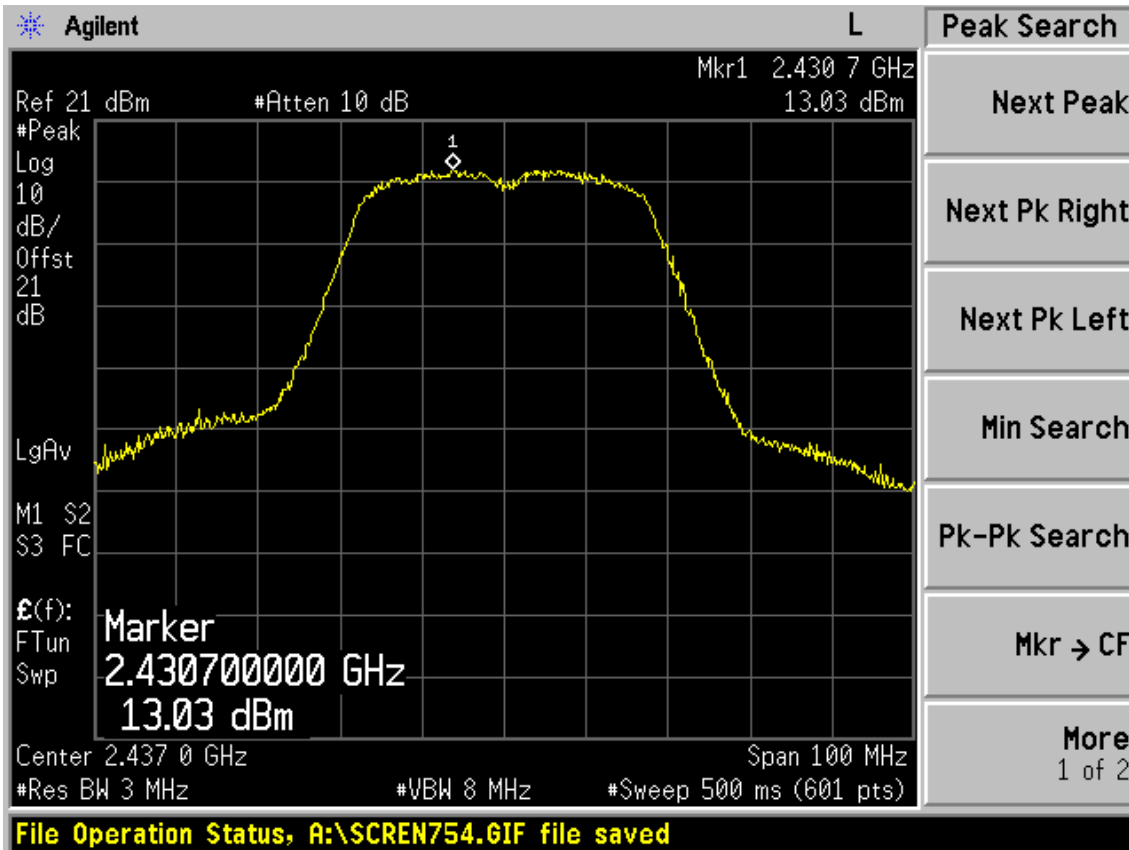
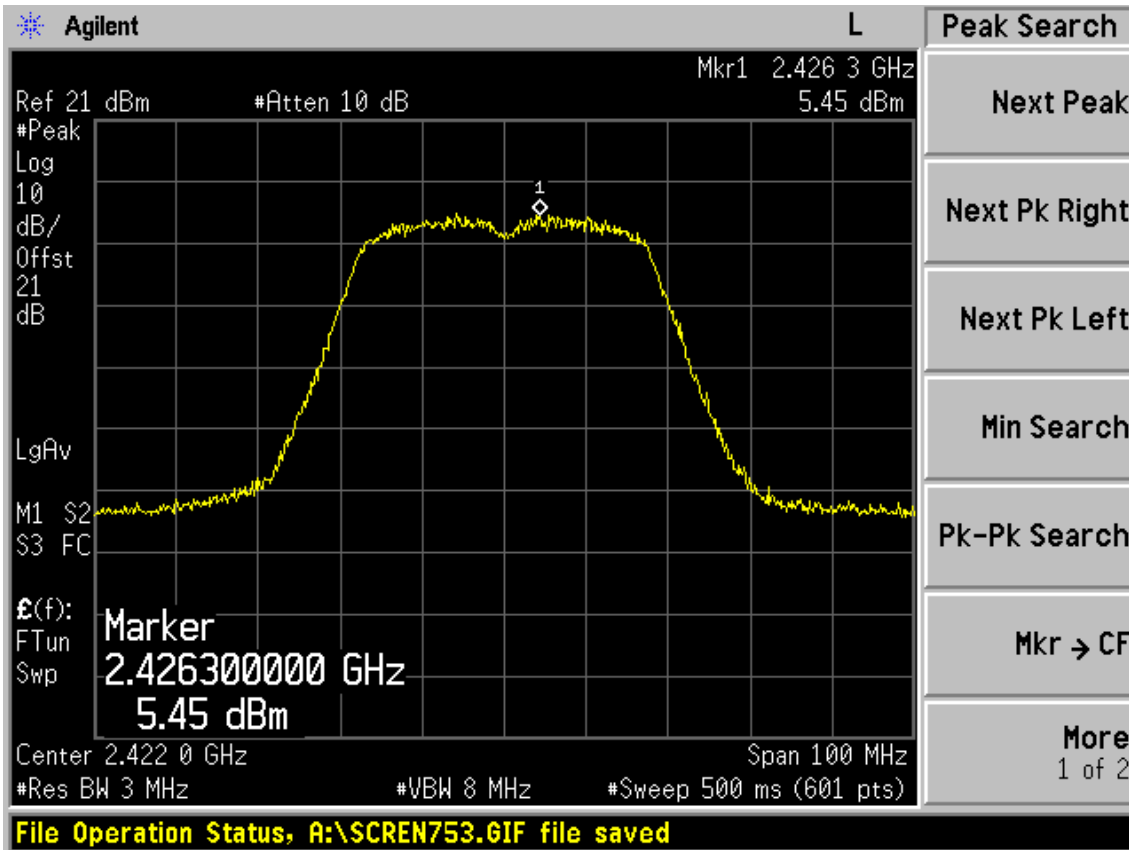
Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

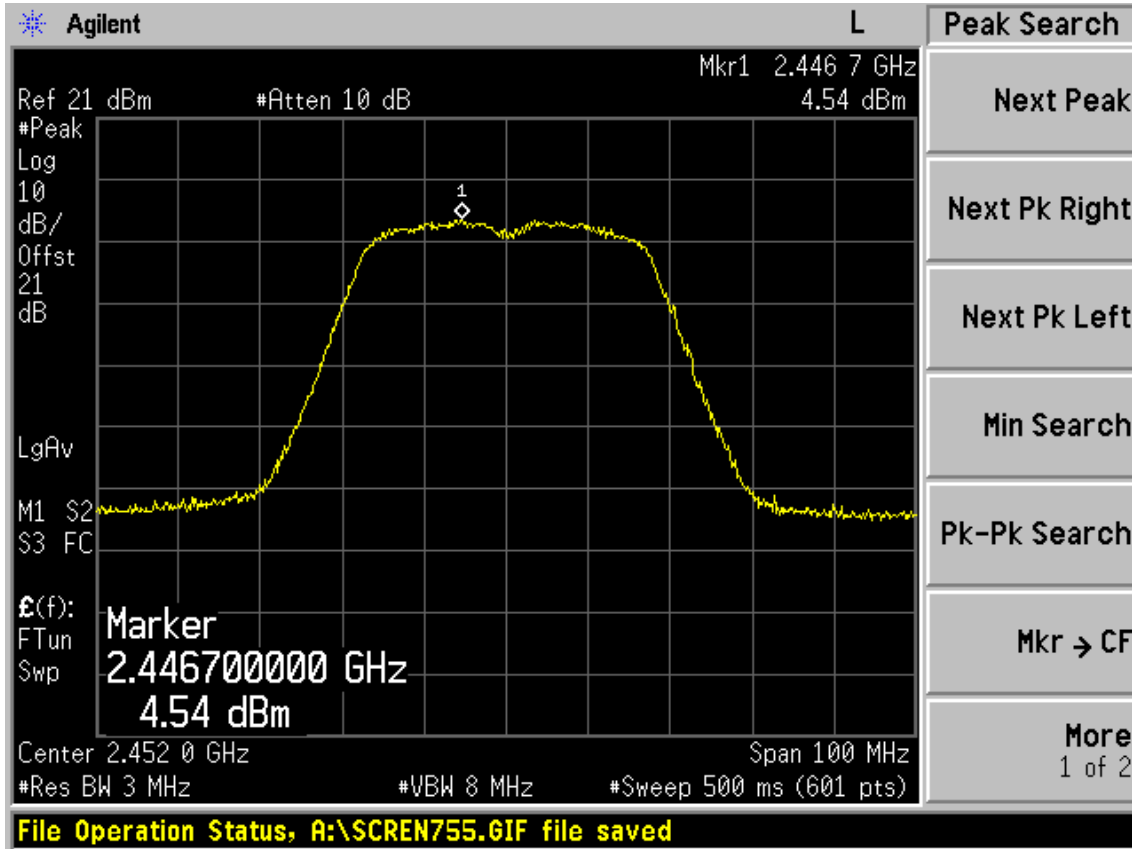
8.4. Test Results

EUT: 3G/4G Wireless N Router							
M/N: TL-MR3420							
Test date: 2012-10-14		Pressure: 101.1 kpa		Humidity: 52.2 %			
Tested by: Leo-Li		Test site: RF site		Temperature: 25.3 °C			
Cable loss: 1 dB			Attenuator loss: 20 dB				
Test Mode	CH (MHz)	Peak output Power (dBm)			Limit (dBm)		
		Chain0	Chain1	Total			
11b	CH1	17.09	16.35	N/A	30		
	CH6	17.78	16.80	N/A	30		
	CH11	16.68	15.77	N/A	30		
11g	CH1	19.37	18.75	N/A	30		
	CH6	24.16	23.94	N/A	30		
	CH11	19.02	18.41	N/A	30		
11n HT20	CH1	17.25	17.18	20.23	30		
	CH6	24.27	23.72	27.01	30		
	CH11	17.98	16.97	20.51	30		
Test Mode	CH	Result					Limit (dBm)
		Measured power(dBm)/3MHz		PK Output power (dBm)			
		Chain0	Chain1	Chain0	Chain1	Total	
11n HT40	CH1	5.45	4.76	17.01	16.34	19.70	30
	CH4	13.03	12.51	24.59	24.09	27.36	30
	CH7	4.54	4.03	16.10	15.61	18.87	30
Chain 0		26dB Bandwidth for 11n HT40: 43.017MHz					
Chain 1		26dB Bandwidth for 11n HT40: 43.130MHz					
Chain 0		BW correction factor = $10\log[(43.017\text{MHz})/(3\text{MHz})] = 11.56\text{B}$					
Chain 1		BW correction factor = $10\log[(43.130\text{MHz})/(3\text{MHz})] = 11.58\text{dB}$					
Conclusion: PASS							

**ANT0**

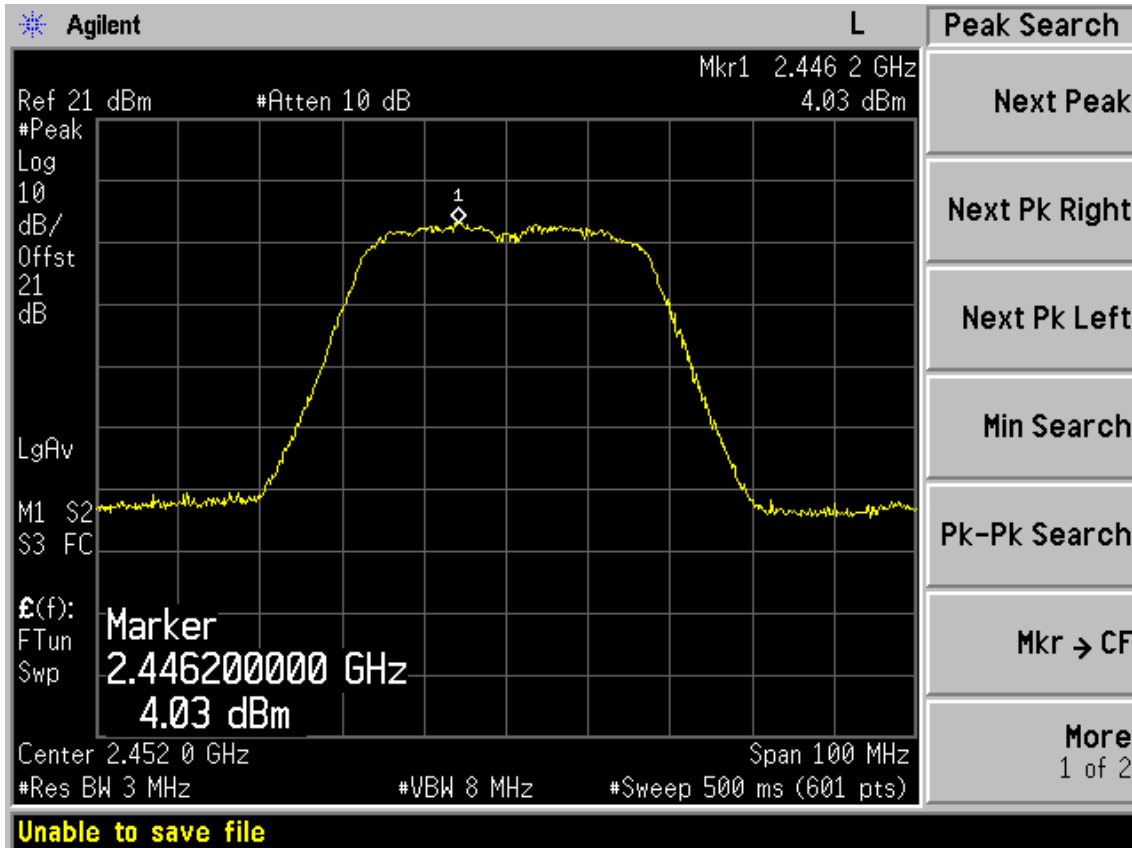
Test Mode: IEEE 802.11n HT40

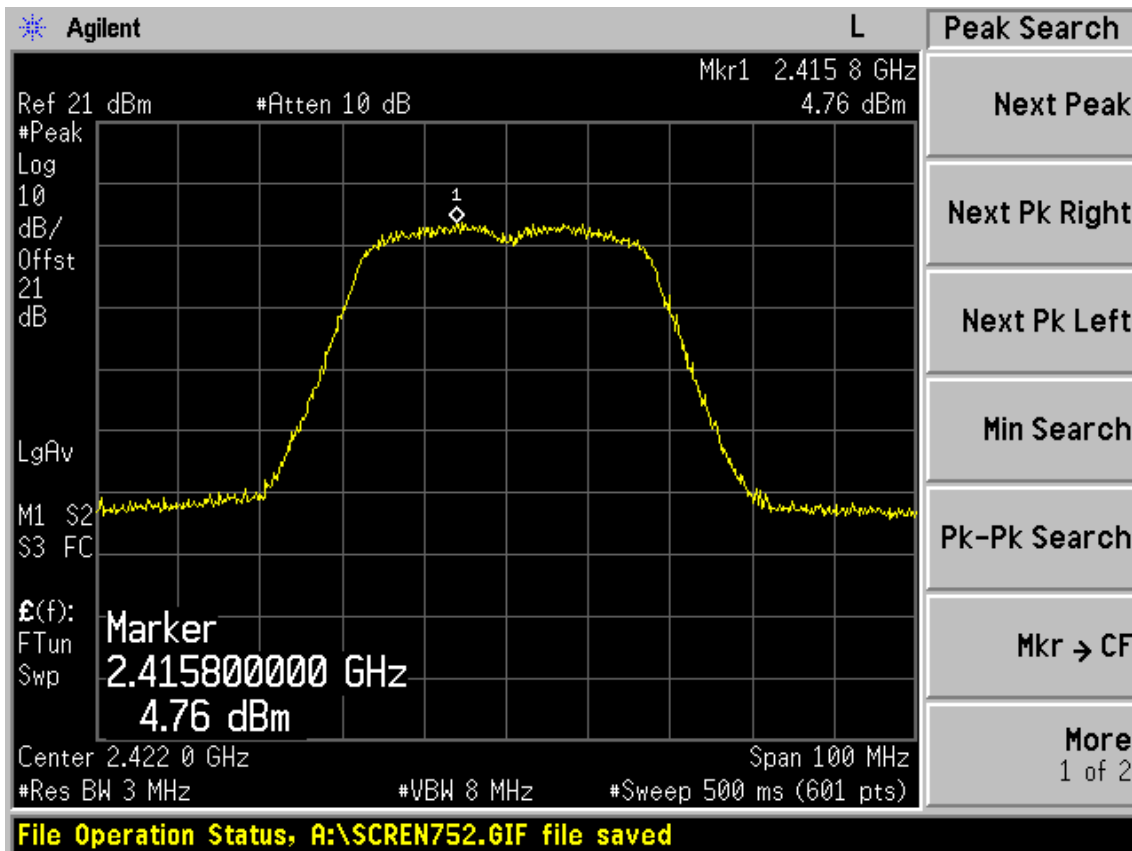
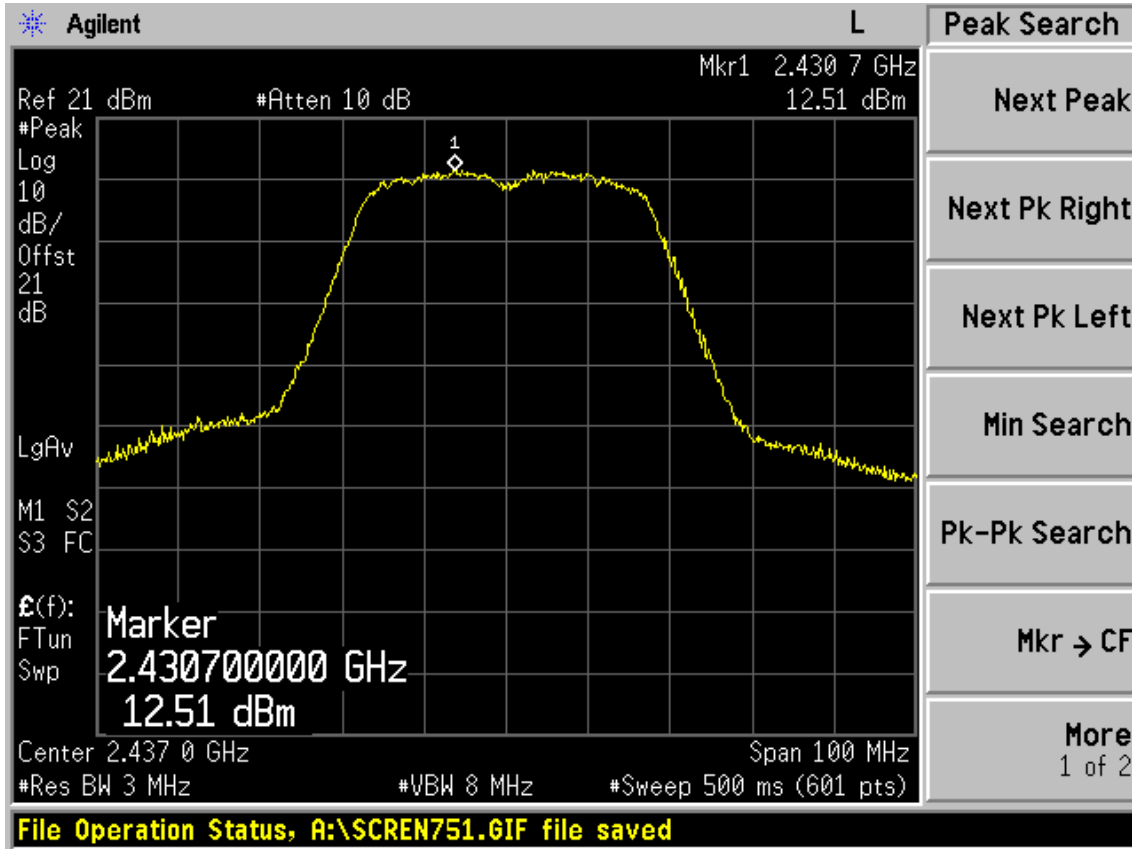




**ANT1**

Test Mode: IEEE 802.11n HT40





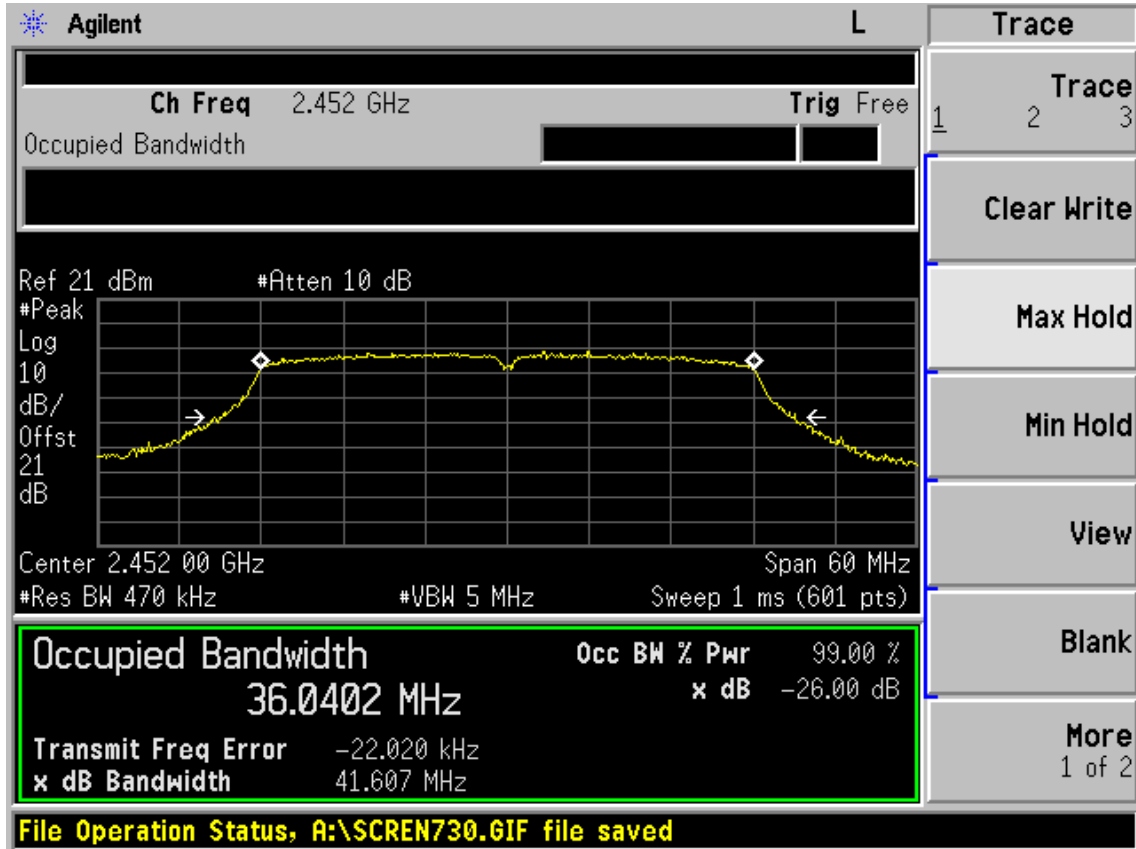
ANT 0

26dB Bandwidth

<p>Agilent L</p> <p>Ch Freq 2.422 GHz Trig Free</p> <p>Occupied Bandwidth</p>		<p><b>Meas Setup</b></p> <p>Avg Number 10 On Off</p> <p>Avg Mode Repeat Exp</p> <p>Max Hold Off On</p> <p>Occ BW % Pwr 99.00 %</p> <p>OBW Span 60.0000000 MHz</p> <p>x dB -26.00 dB</p> <p>Optimize Ref Level</p>
<p>Ref 21 dBm #Atten 10 dB</p> <p>#Peak</p> <p>Log 10 dB/Offst 21 dB</p> <p>Center 2.422 00 GHz Span 60 MHz #Res BW 470 kHz #VBW 5 MHz Sweep 1 ms (601 pts)</p>		
<p><b>Occupied Bandwidth</b> 35.9955 MHz</p> <p>Transmit Freq Error 22.648 kHz</p> <p>x dB Bandwidth 42.160 MHz</p>		<p>Occ BW % Pwr 99.00 %</p> <p>x dB -26.00 dB</p>
<p>Copyright 2000-2005 Agilent Technologies</p>		

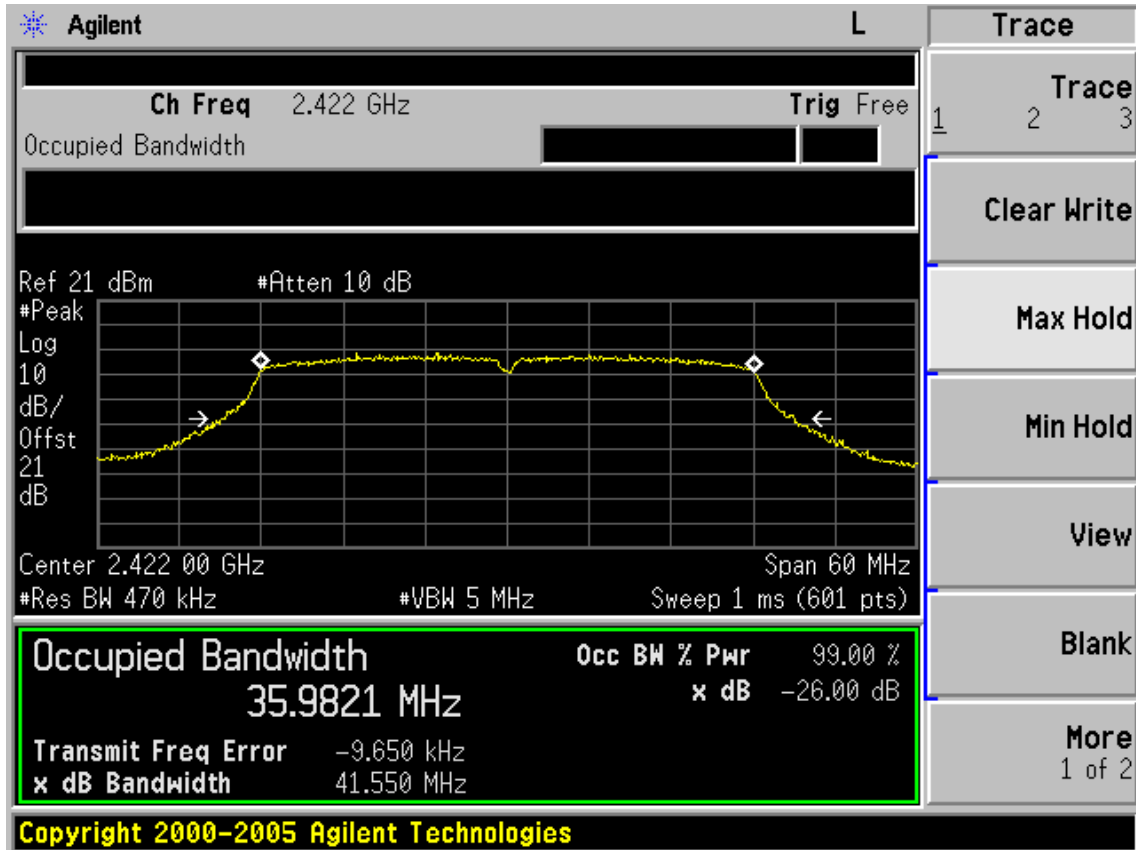
<p>Agilent L</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Occupied Bandwidth</p>		<p><b>Trace</b></p> <p>Trace 1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p>
<p>Ref 21 dBm #Atten 10 dB</p> <p>#Peak</p> <p>Log 10 dB/Offst 21 dB</p> <p>Center 2.437 00 GHz Span 60 MHz #Res BW 470 kHz #VBW 5 MHz Sweep 1 ms (601 pts)</p>		
<p><b>Occupied Bandwidth</b> 36.0850 MHz</p> <p>Transmit Freq Error -26.404 kHz</p> <p>x dB Bandwidth 43.017 MHz</p>		<p>Occ BW % Pwr 99.00 %</p> <p>x dB -26.00 dB</p>
<p>Copyright 2000-2005 Agilent Technologies</p>		

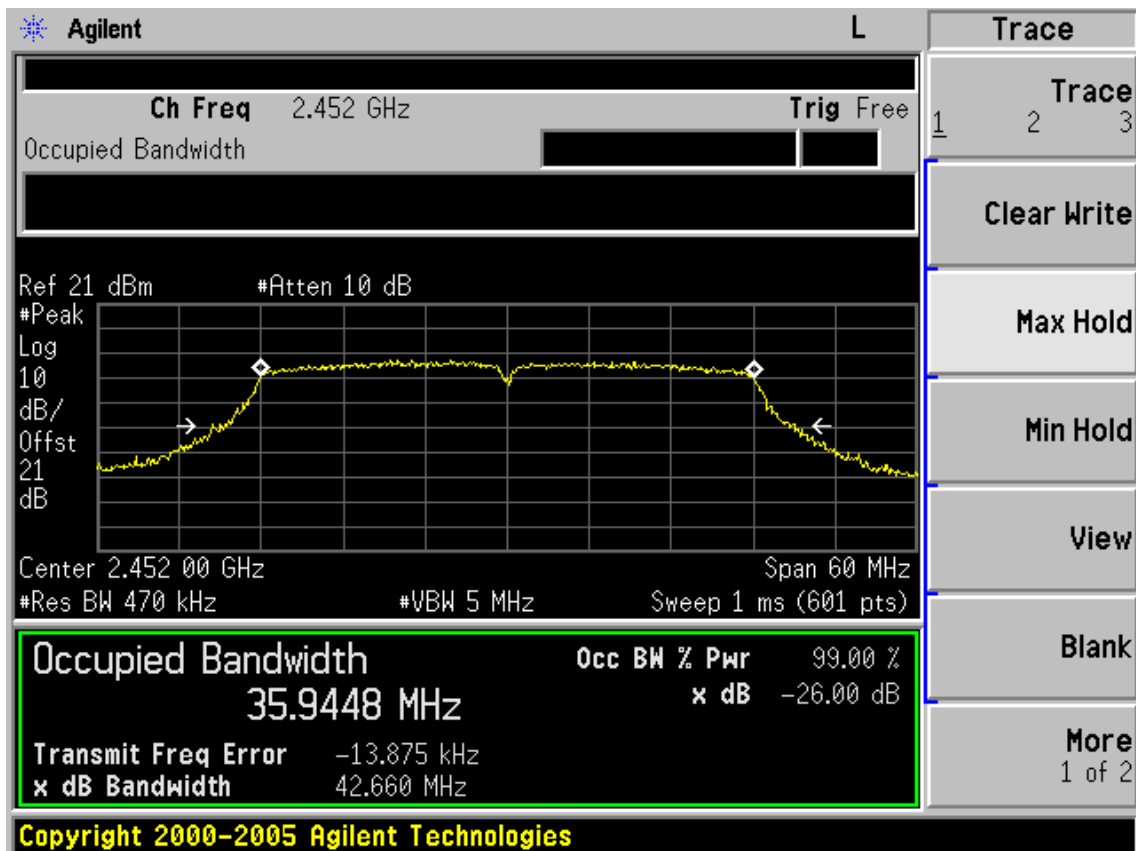
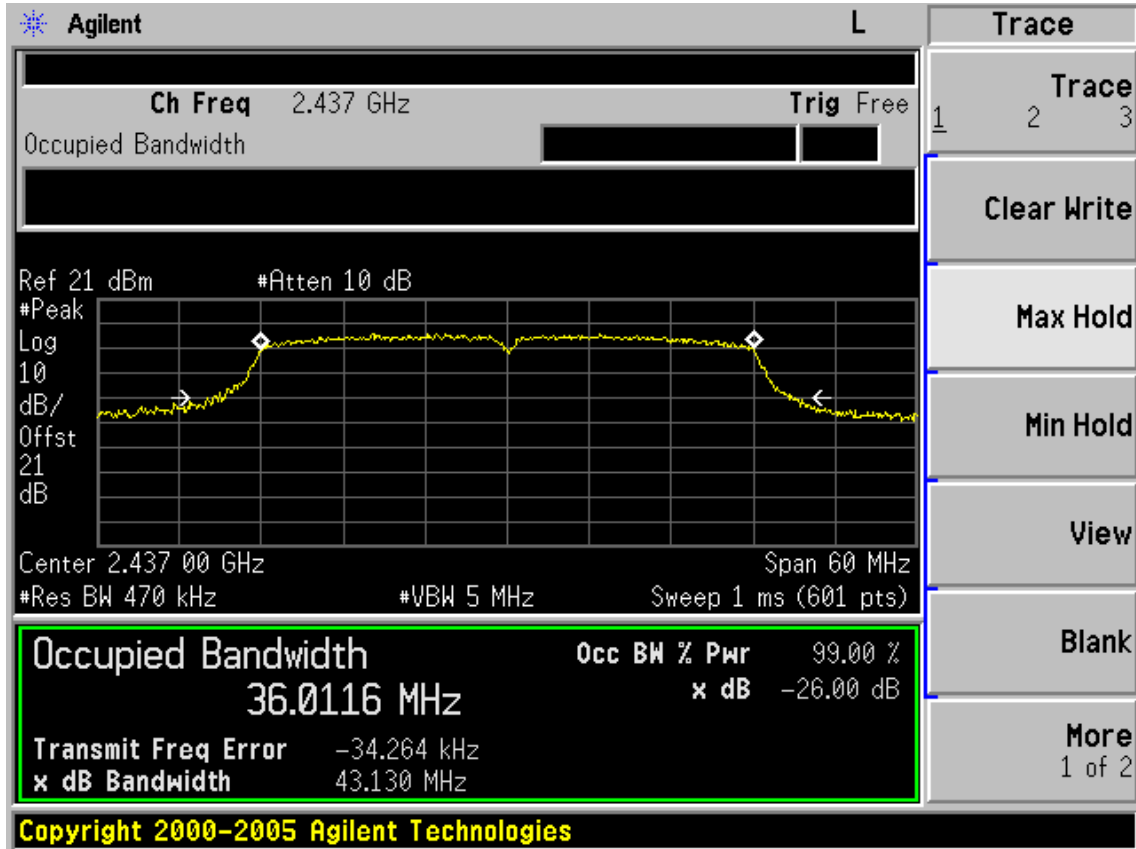




ANT 1

26dB Bandwidth





## 9. POWER SPECTRAL DENSITY TEST

### 9.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	May.08, 12	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 12	1 Year
3.	Antenna	EMCO	3115	9510-4580	May.08, 12	1Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 12	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=100KHz, VBW=300KHz, Span to 5-30 % greater than the EBW, Read out maximum peak level of the test frequency.
- 3, adjusting (reducing) the measured power in step 2 by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3 \text{ kHz}/100 \text{ kHz} = -15.2 \text{ dB})$

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

**9.4. Test Results**

EUT: 3G/4G Wireless N Router		
M/N: TL-MR3420		
Test date: 2012-10-14	Pressure: 101.2kpa	Humidity: 53.3 %
Tested by: Leo-Li	Test site: RF Site	Temperature : 24.7°C

Cable loss: 1 dB		Attenuator loss: 20 dB				Limit (dBm/3KHz)
Test Mode	CH	Power density ( dBm/100KHz )		Power density ( dBm/3KHz )		
		ANT0	ANT1	ANT0	ANT1	
11b	CH1	-6.28	4.96	-21.48	-10.24	8
	CH6	-5.47	5.10	-20.67	-10.10	8
	CH11	-5.83	5.15	-21.03	-10.05	8
11g	CH1	-10.67	1.08	-25.87	-14.12	8
	CH6	-5.24	5.95	-20.44	-9.25	8
	CH11	-10.20	0.82	-25.40	-14.38	8

**11n Mode**

Test Mode	CH	Power density ( dBm/100KHz )		Power density ( dBm/3KHz )	Limit (dBm/3KHz)
		ANT0	ANT1	Total	
11n HT20	CH1	-12.05	-0.71	-15.6	8
	CH6	-5.22	5.29	-9.54	8
	CH11	-11.64	-1.08	-15.93	8
11n HT40	CH1	-14.82	-4.23	-19.04	8
	CH4	-6.80	3.72	-11.13	8
	CH7	-14.91	-4.72	-19.50	8

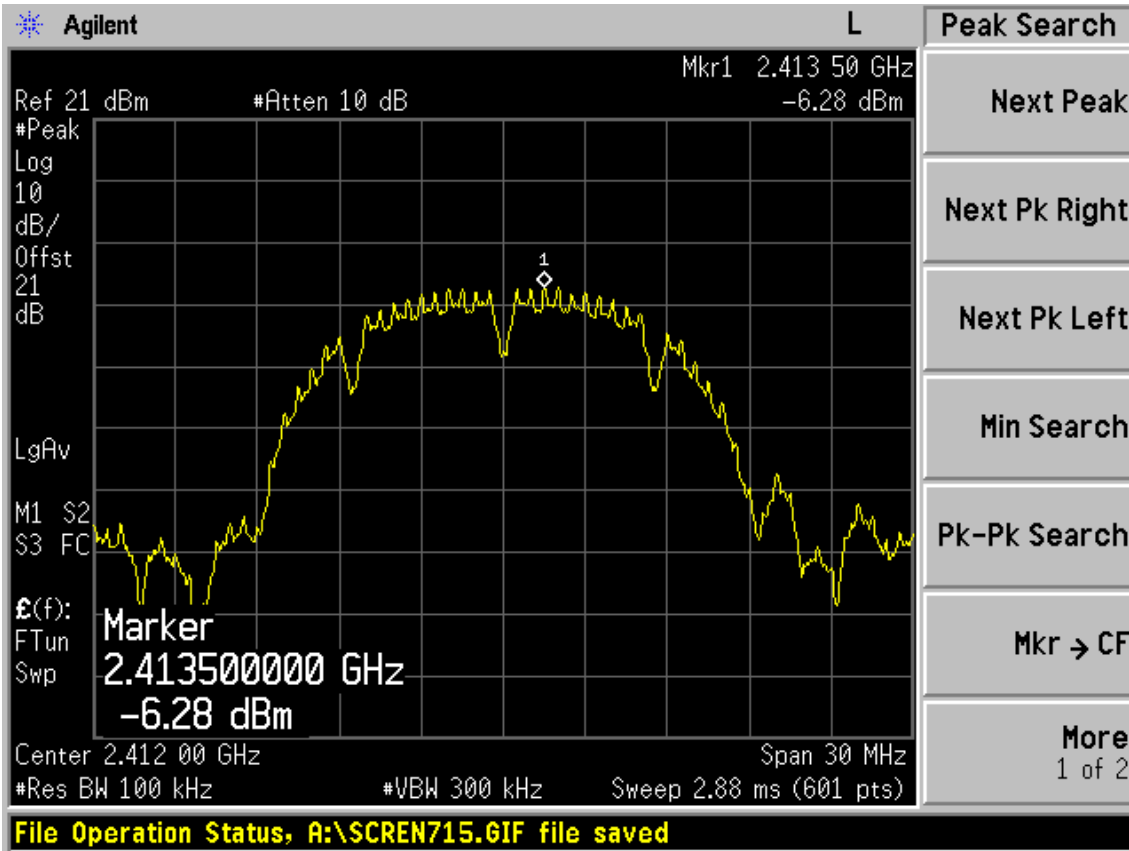
 BW correction factor =  $10\log[(3/100\text{KHz})] = -15.2$ 

Conclusion : PASS

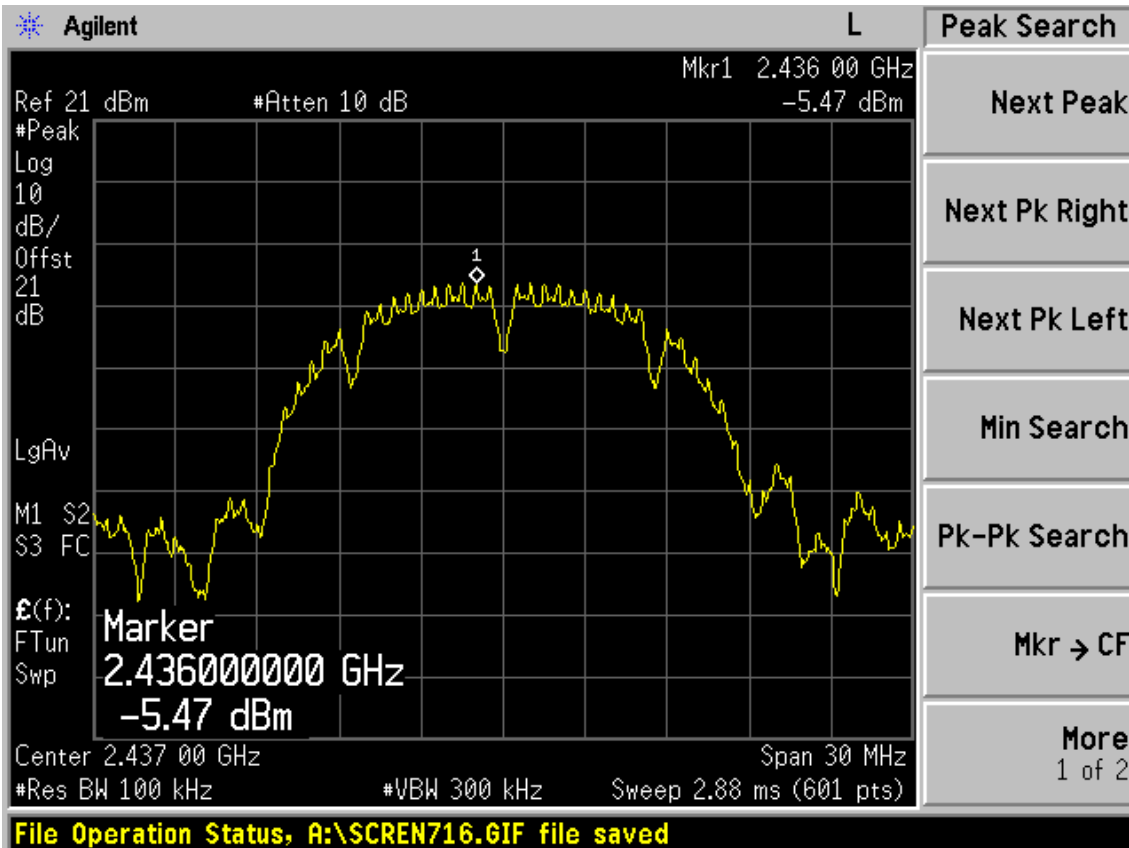
**ANT0**

Test Mode: IEEE 802.11b TX

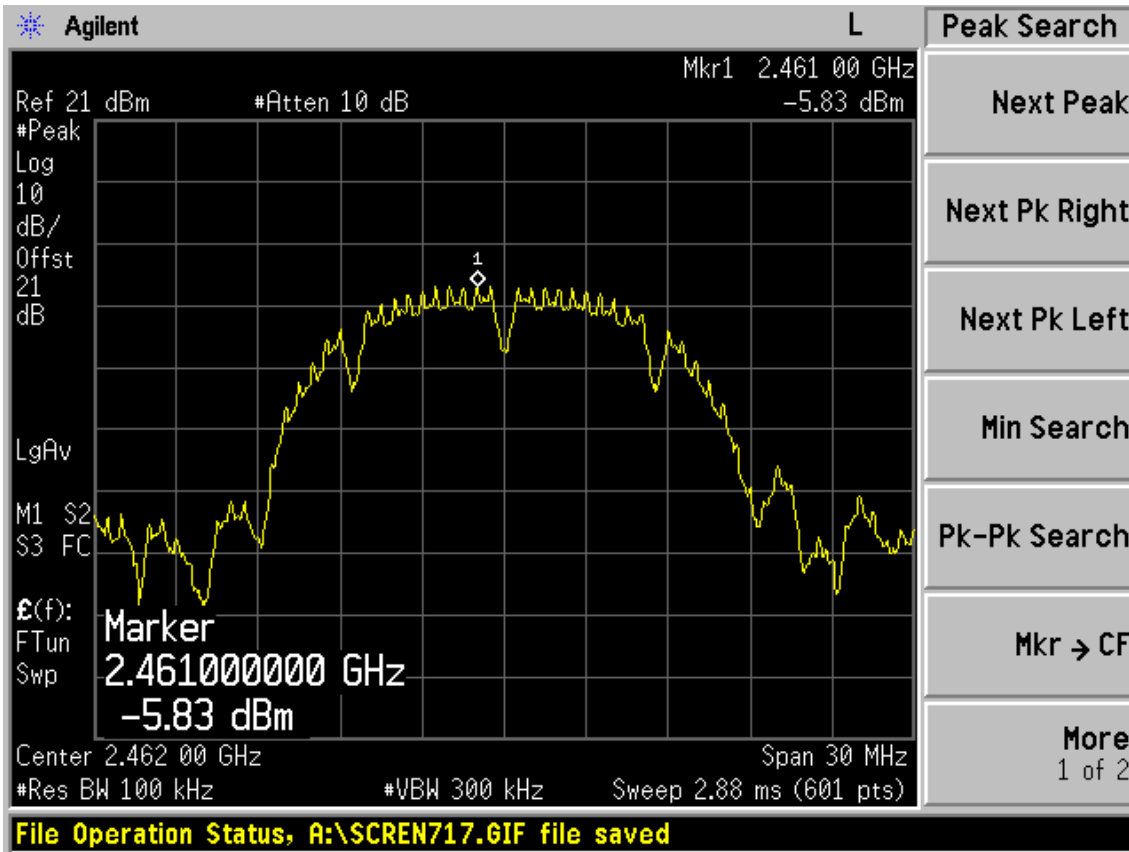
Test CH1: 2412MHz



Test CH6: 2437MHz

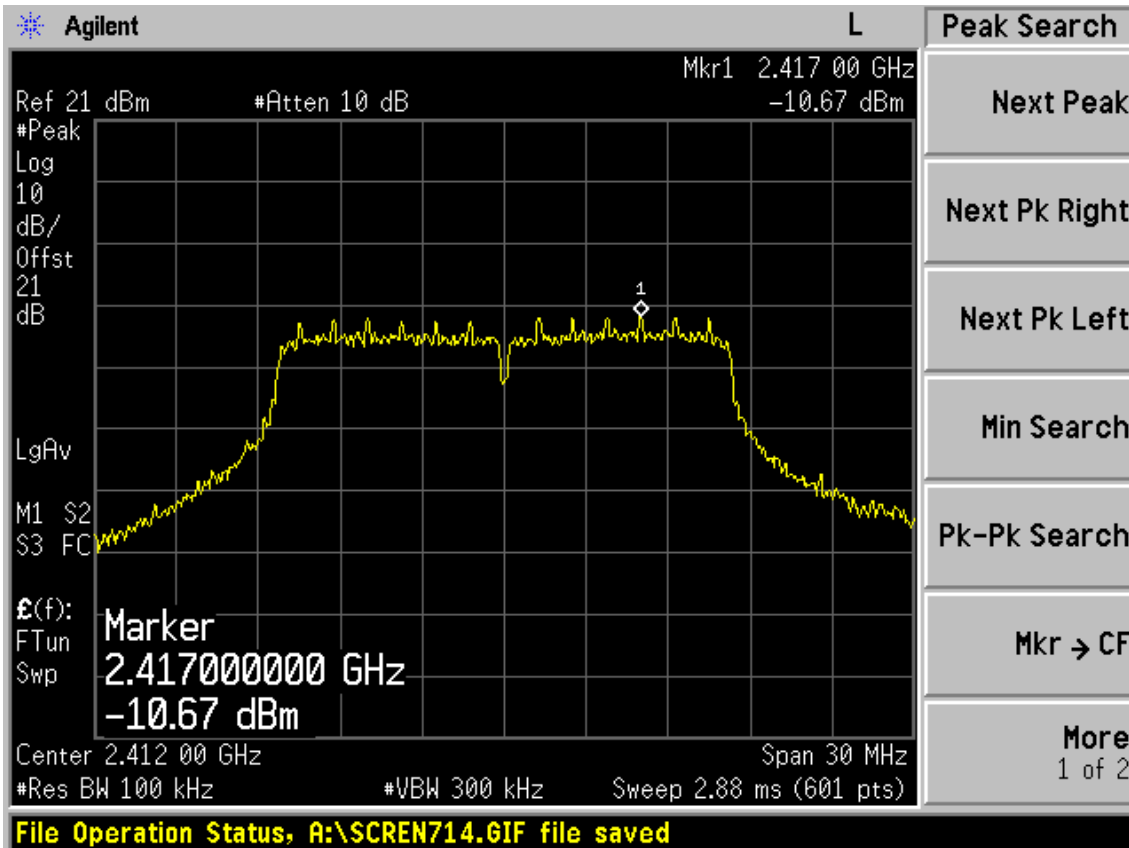


Test CH11: 2462MHz

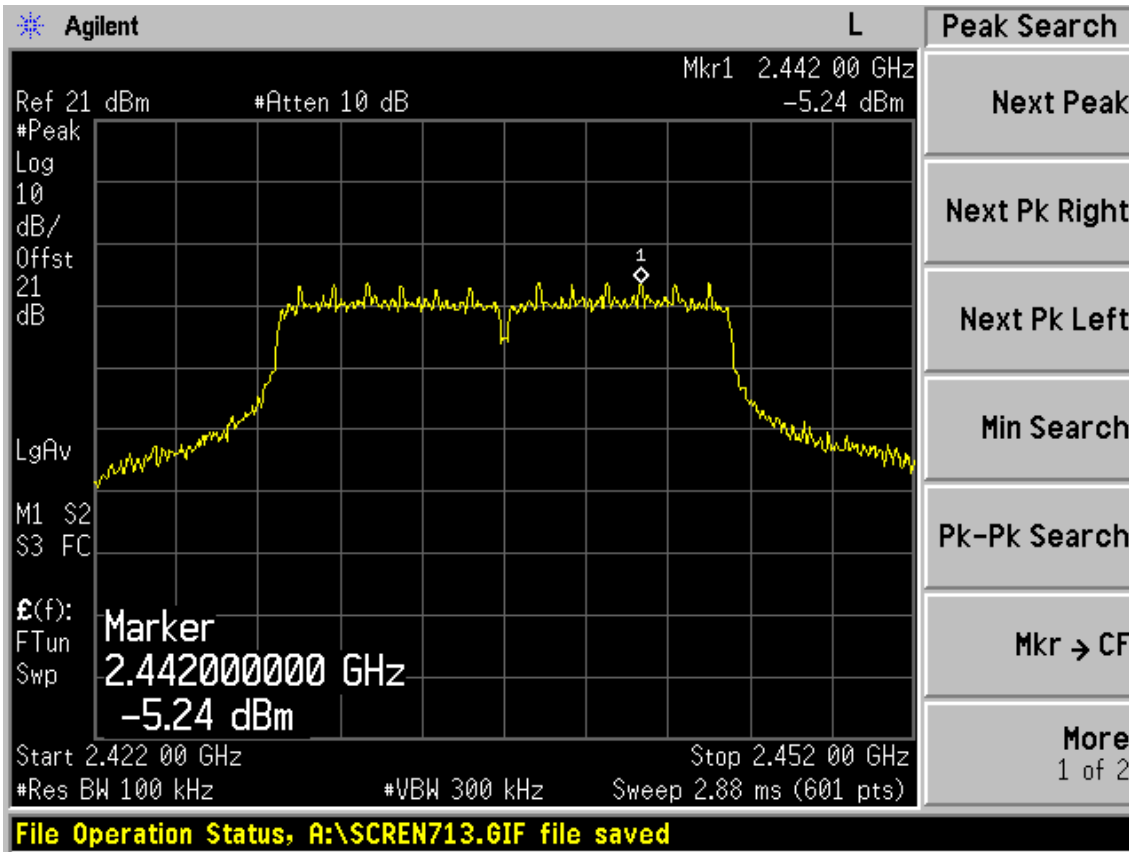


Test Mode: IEEE 802.11g TX

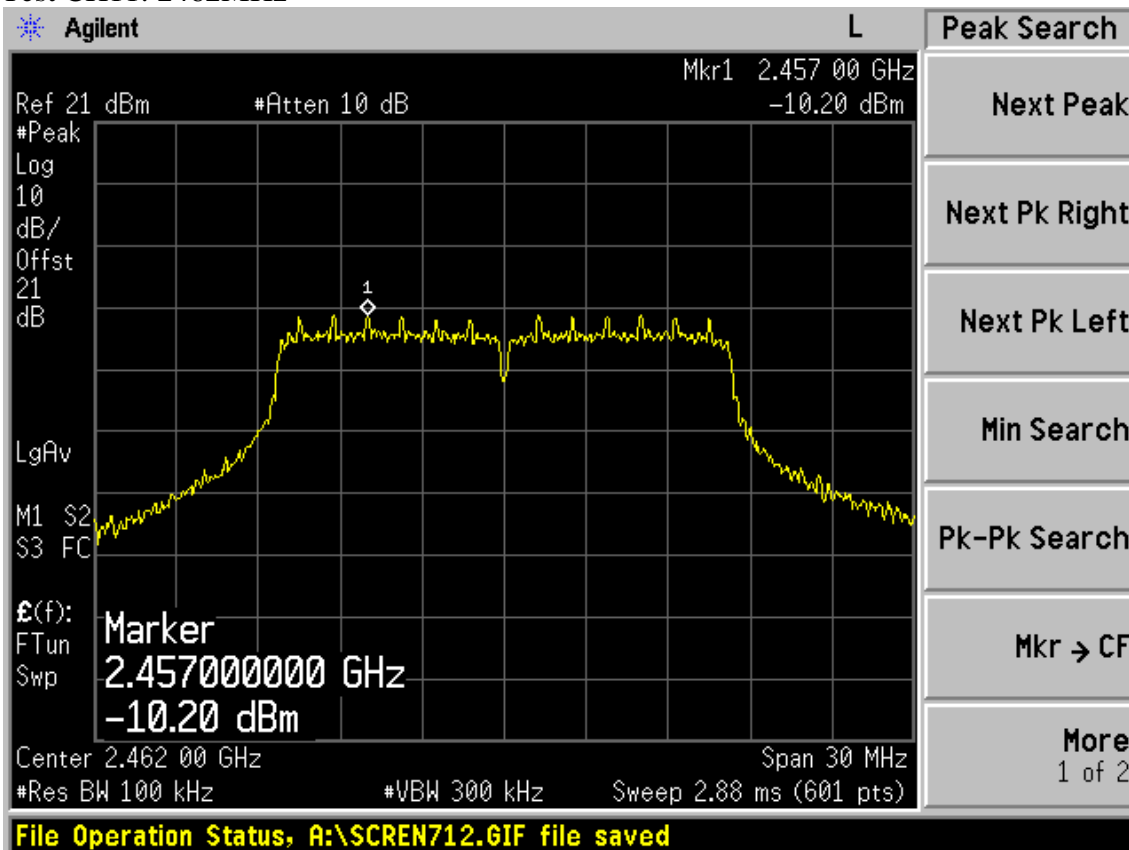
Test CH1: 2412MHz



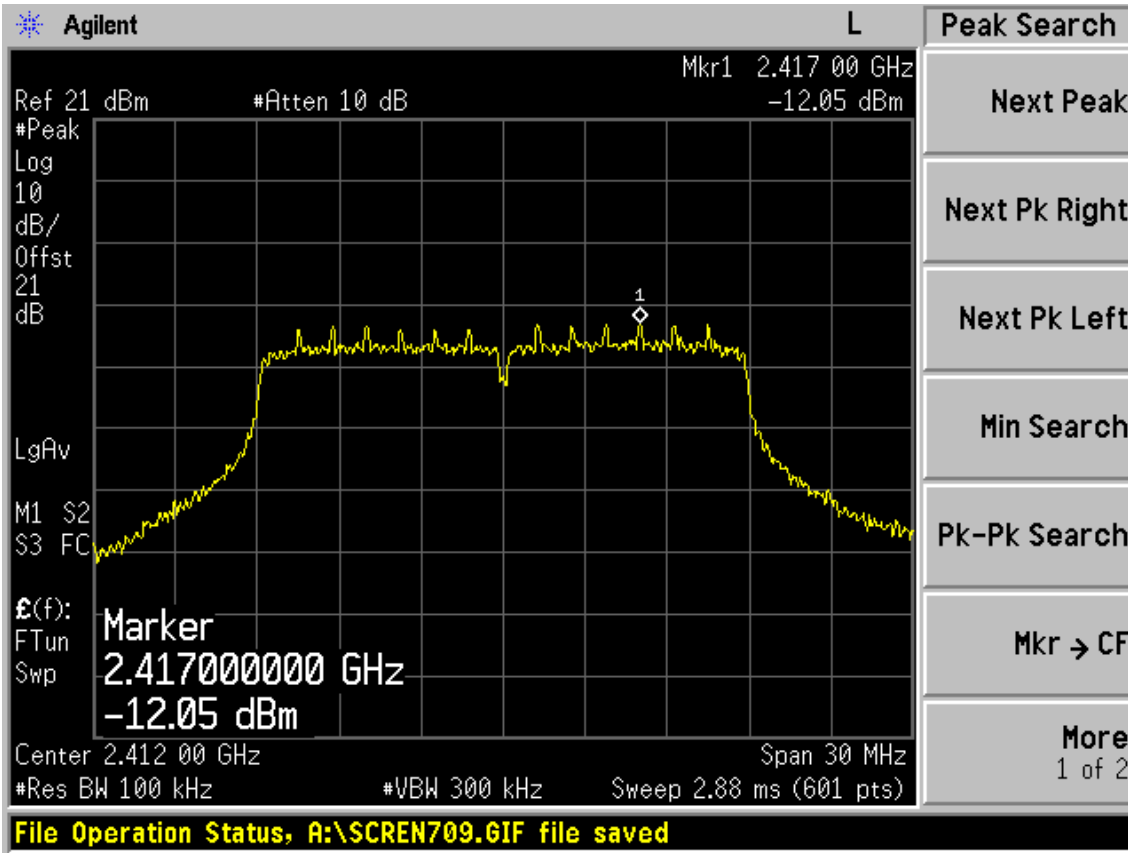
Test CH6: 2437MHz



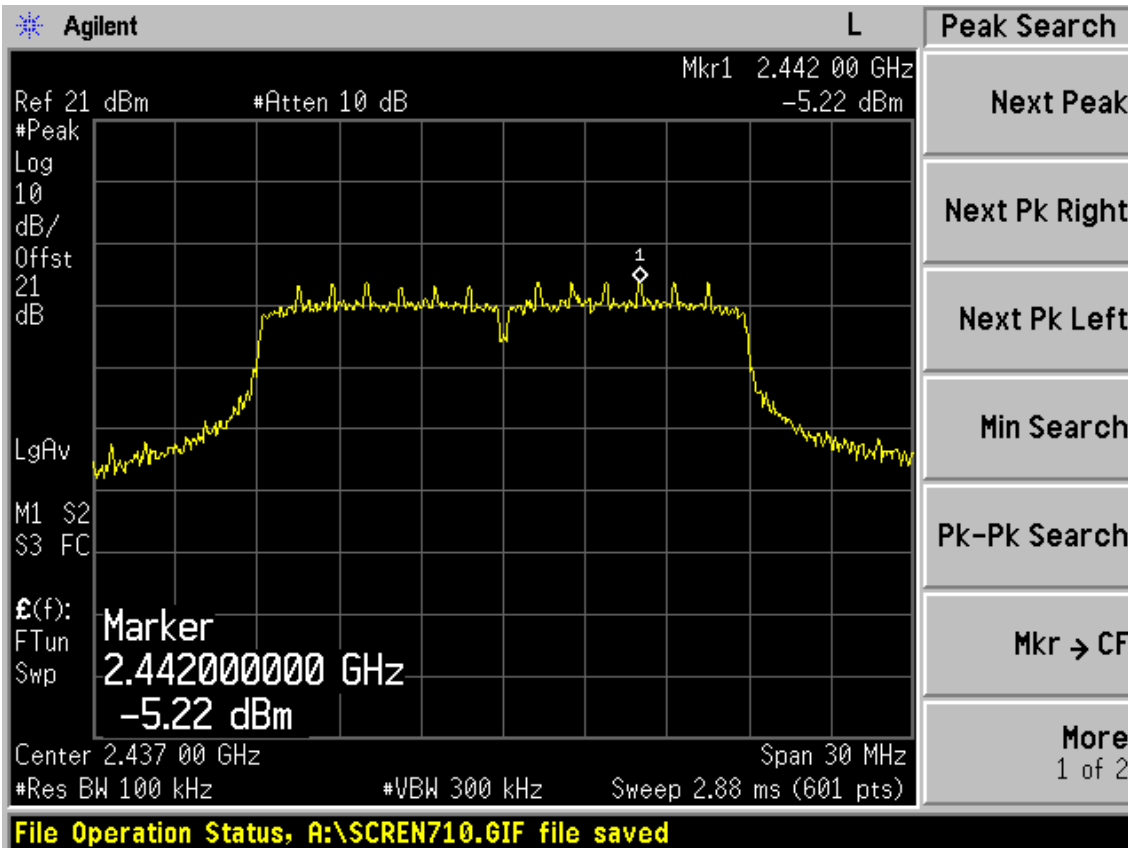
Test CH11: 2462MHz



Test Mode: IEEE 802.11n HT20 TX  
 Test CH1: 2412MHz

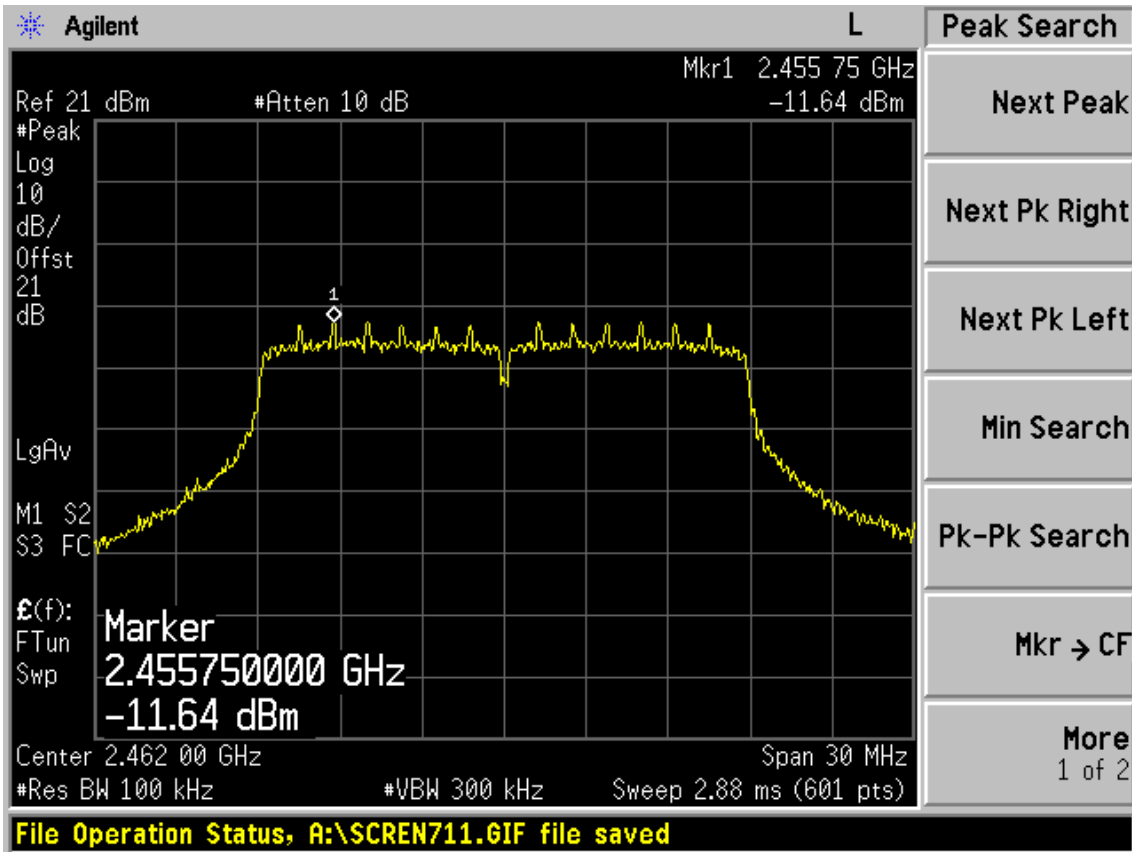


Test CH6: 2437MHz



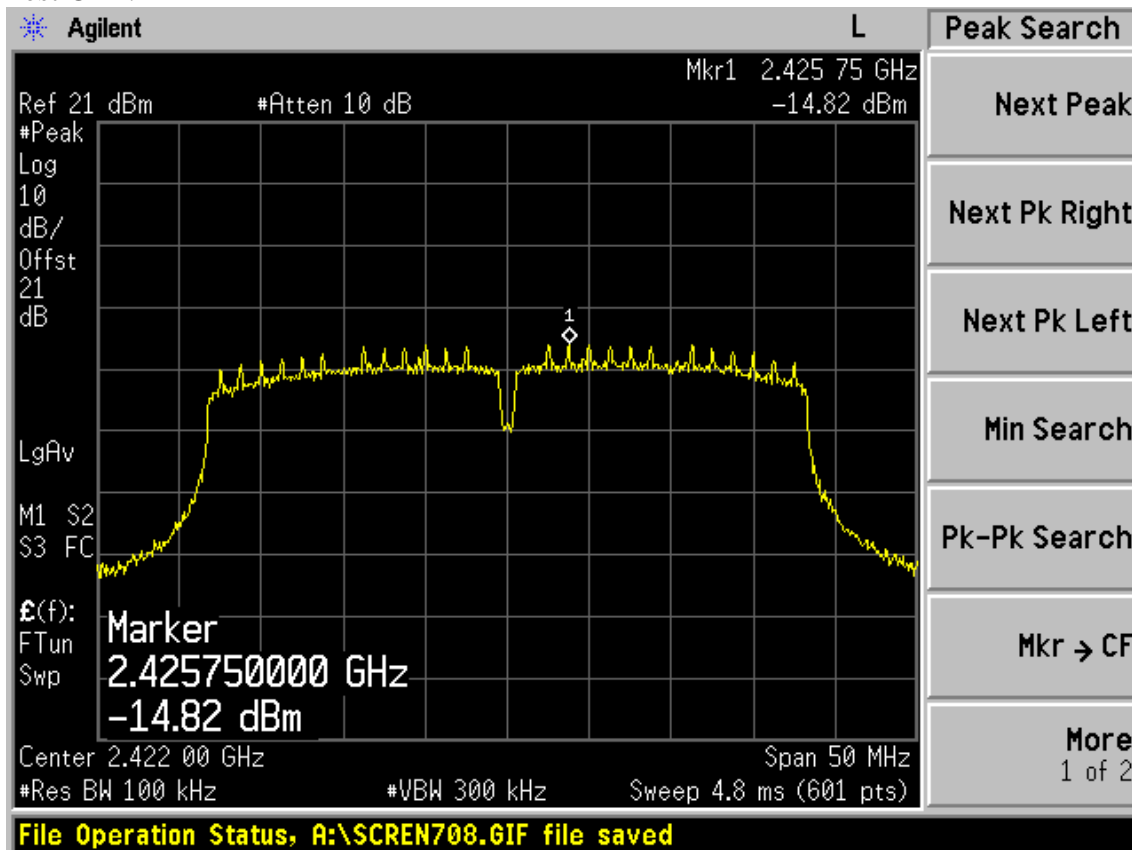


Test CH11: 2462MHz

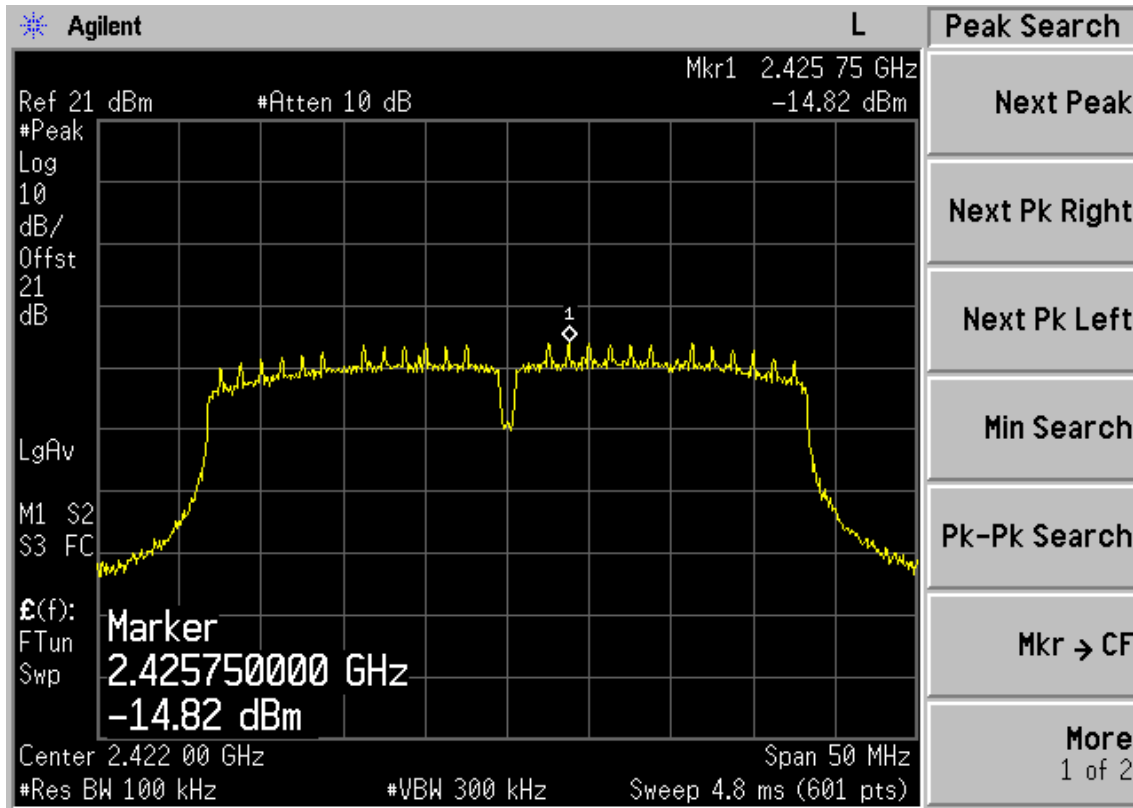


Test Mode: IEEE 802.11n HT40 TX

Test CH1: 2422MHz

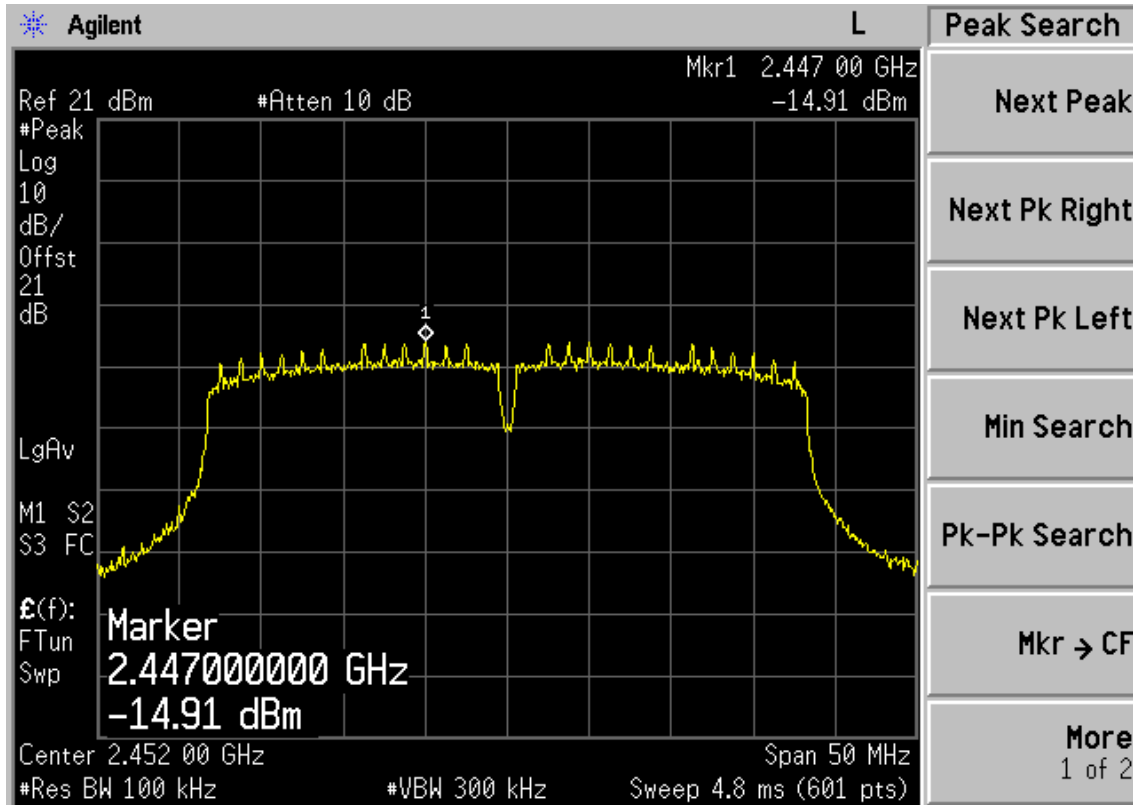


Test CH4: 2437MHz



File Operation Status, A:\SCREN708.GIF file saved

Test CH7: 2452MHz

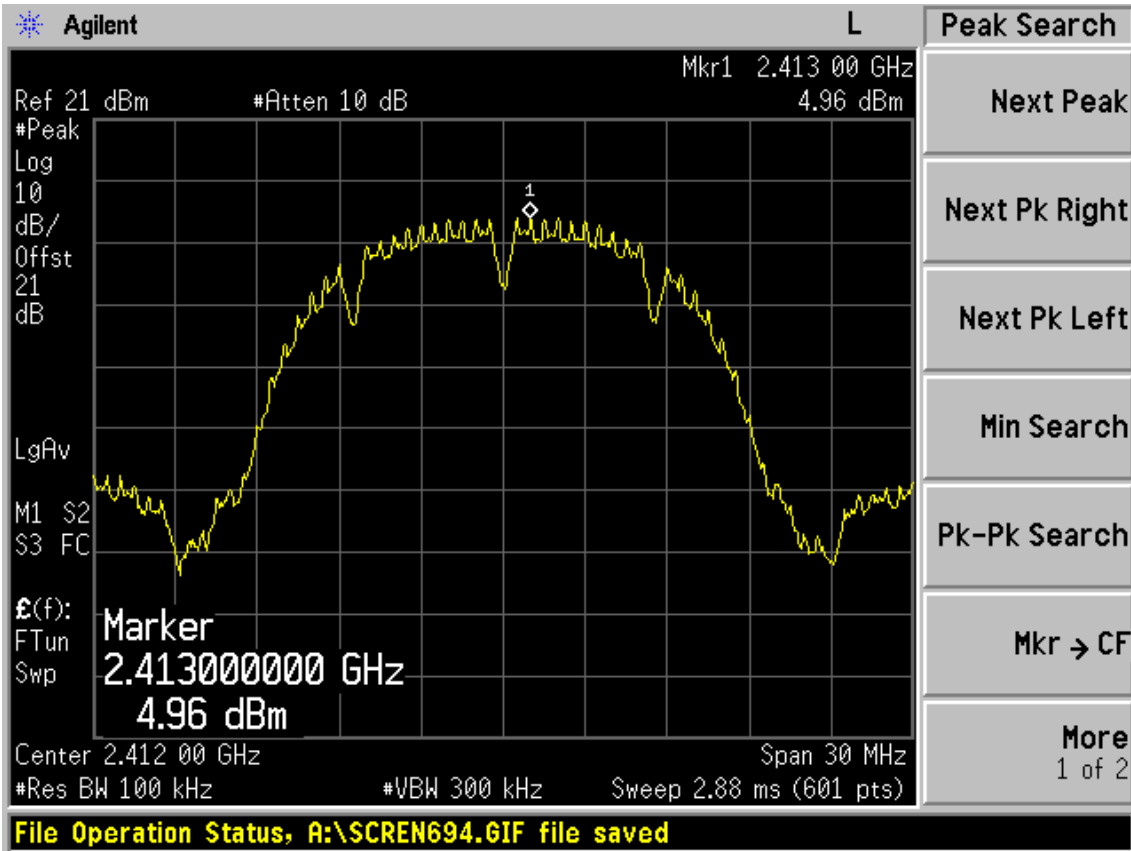


File Operation Status, A:\SCREN706.GIF file saved

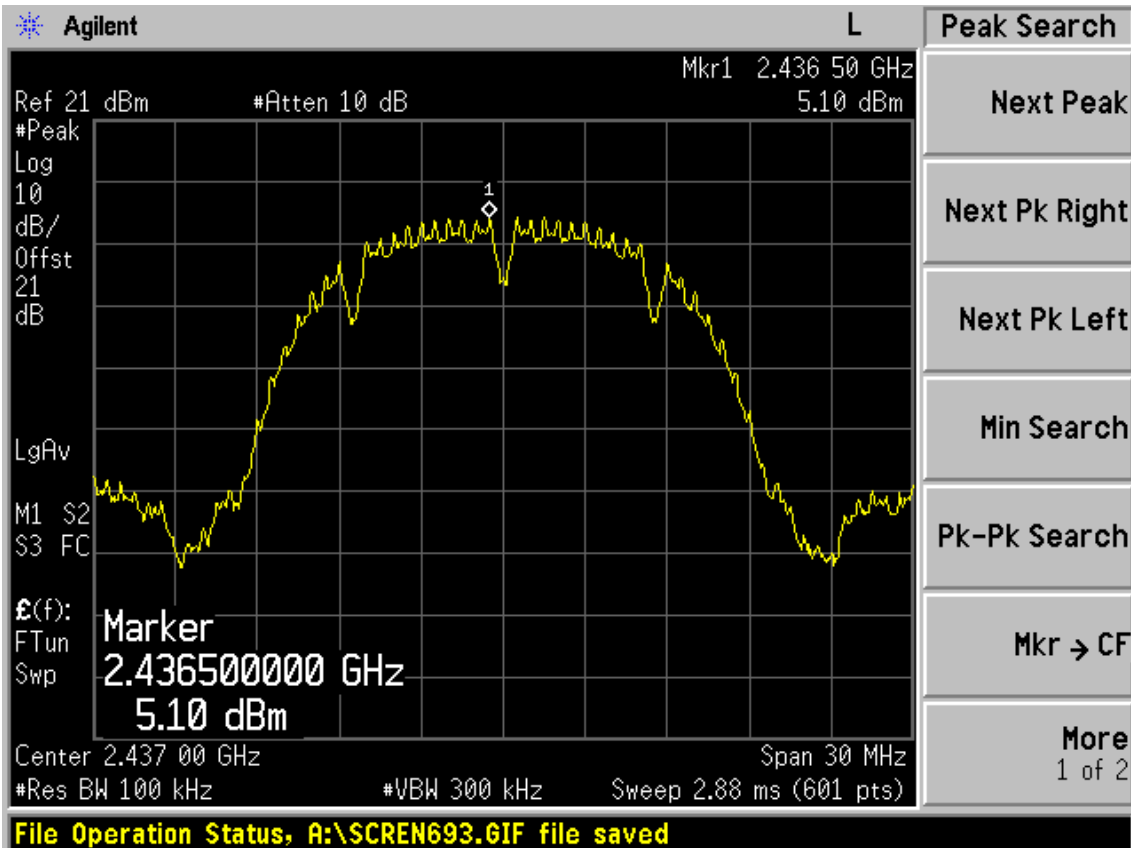
**ANT1**

Test Mode: IEEE 802.11b TX

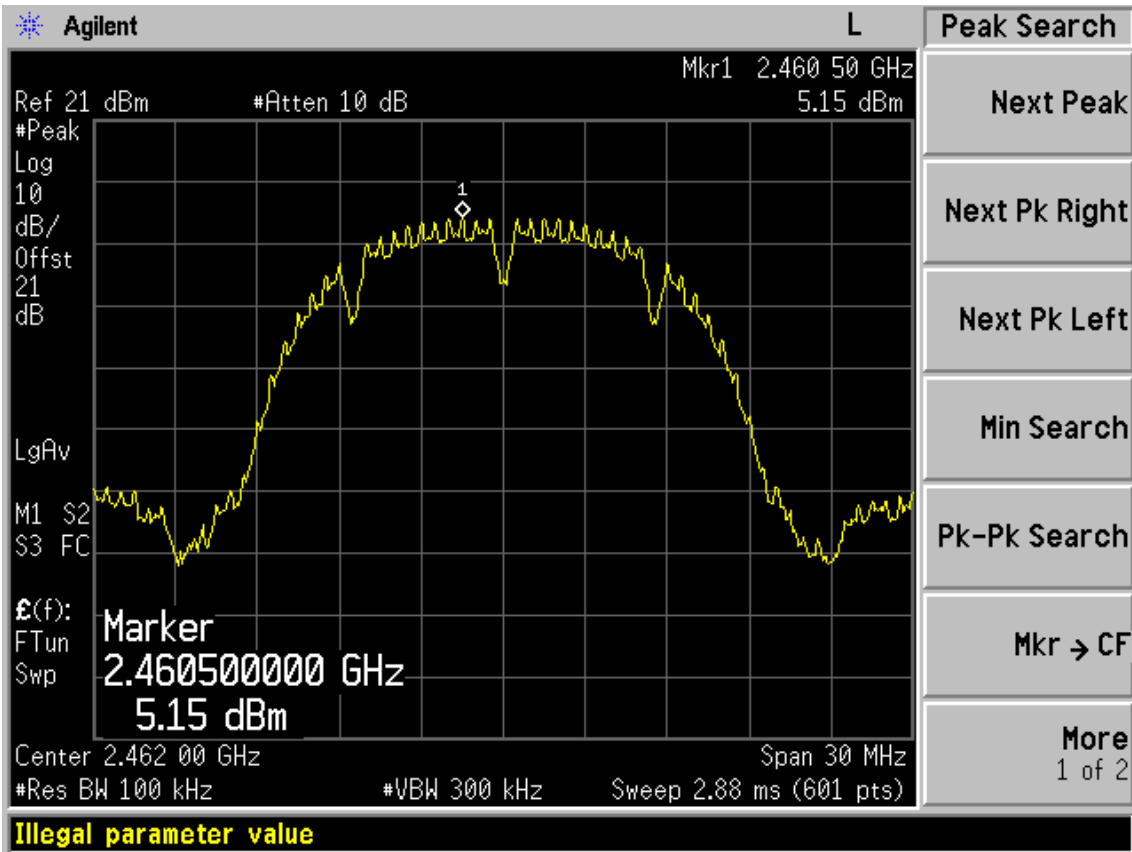
Test CH1: 2412MHz



Test CH6: 2437MHz

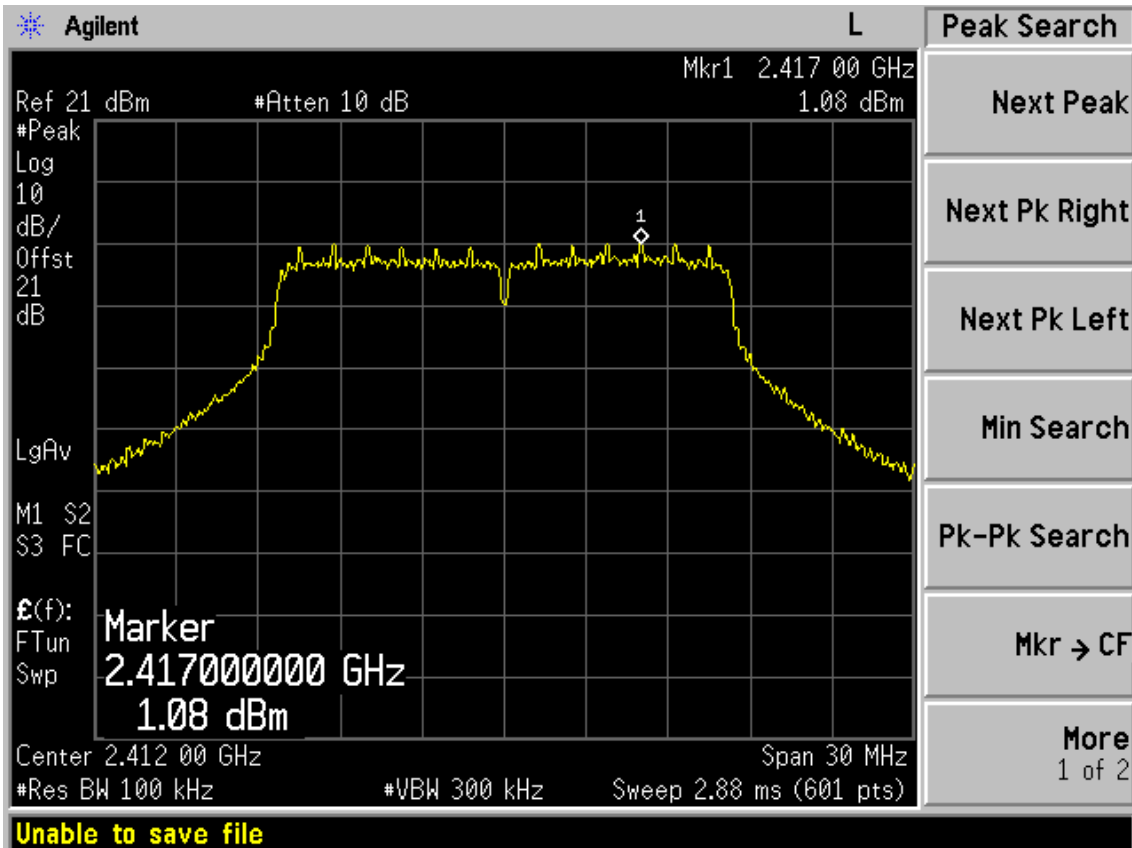


Test CH11: 2462MHz

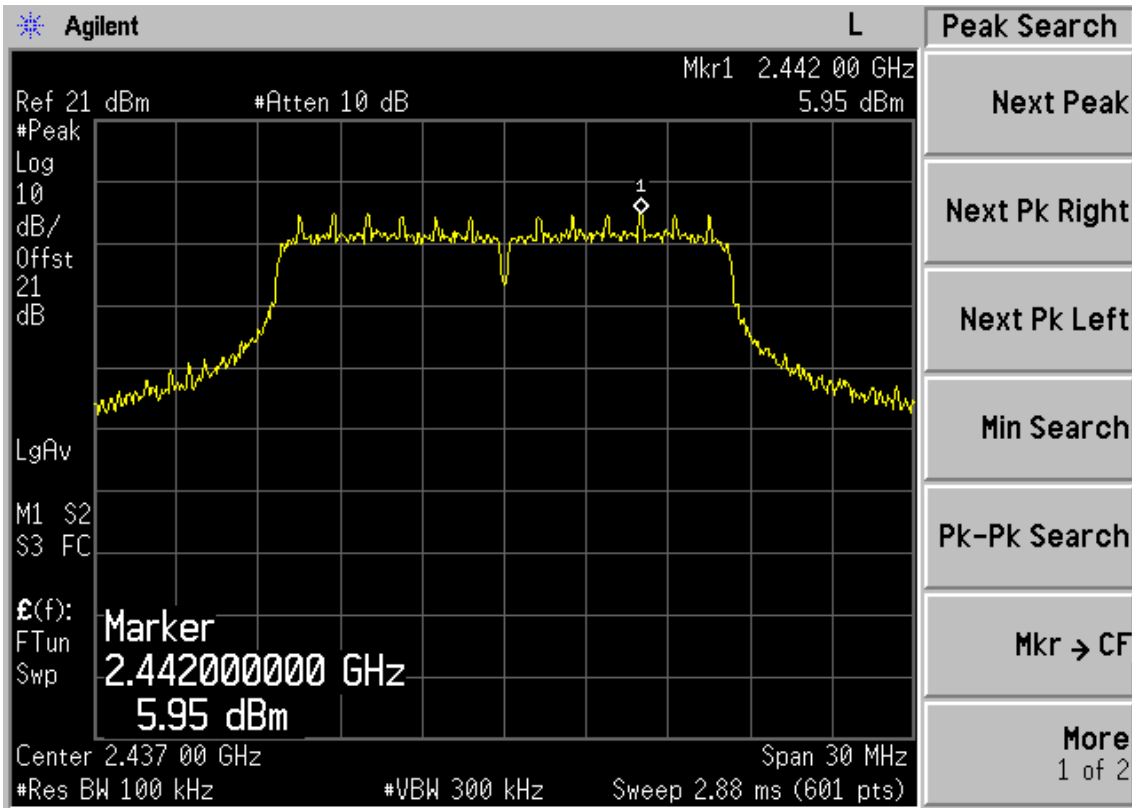


Test Mode: IEEE 802.11g TX

Test CH1: 2412MHz

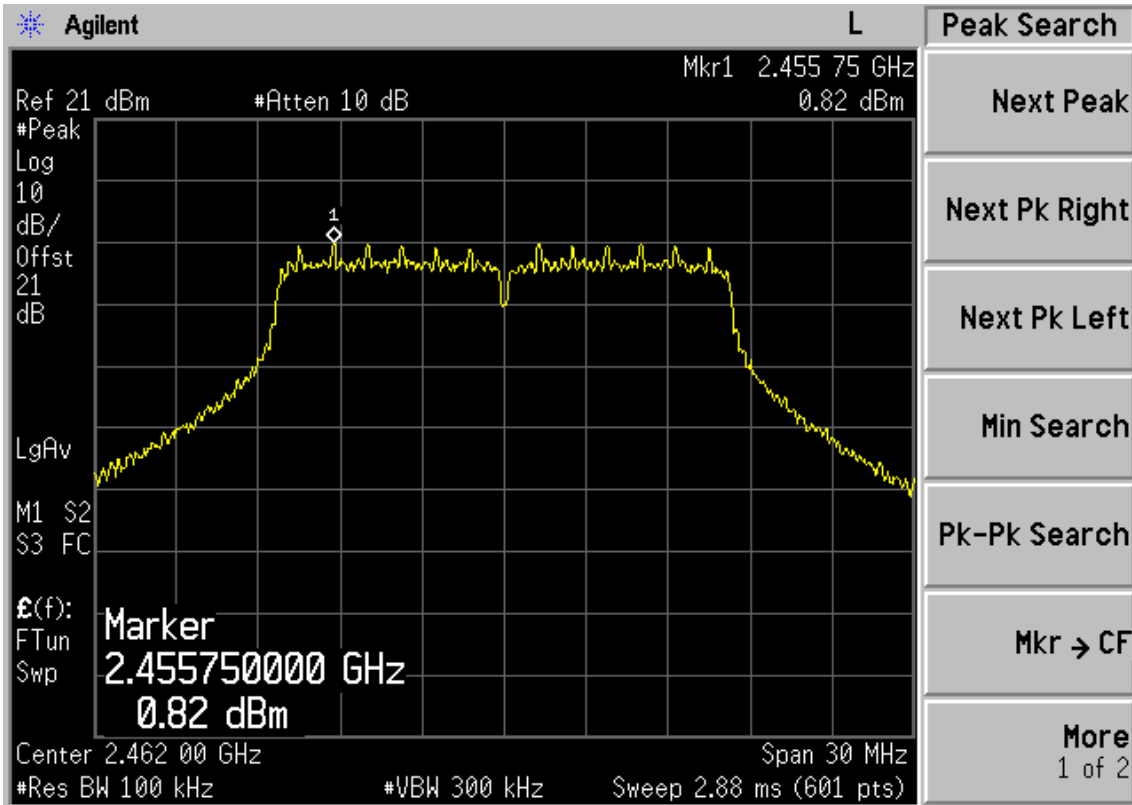


Test CH6: 2437MHz



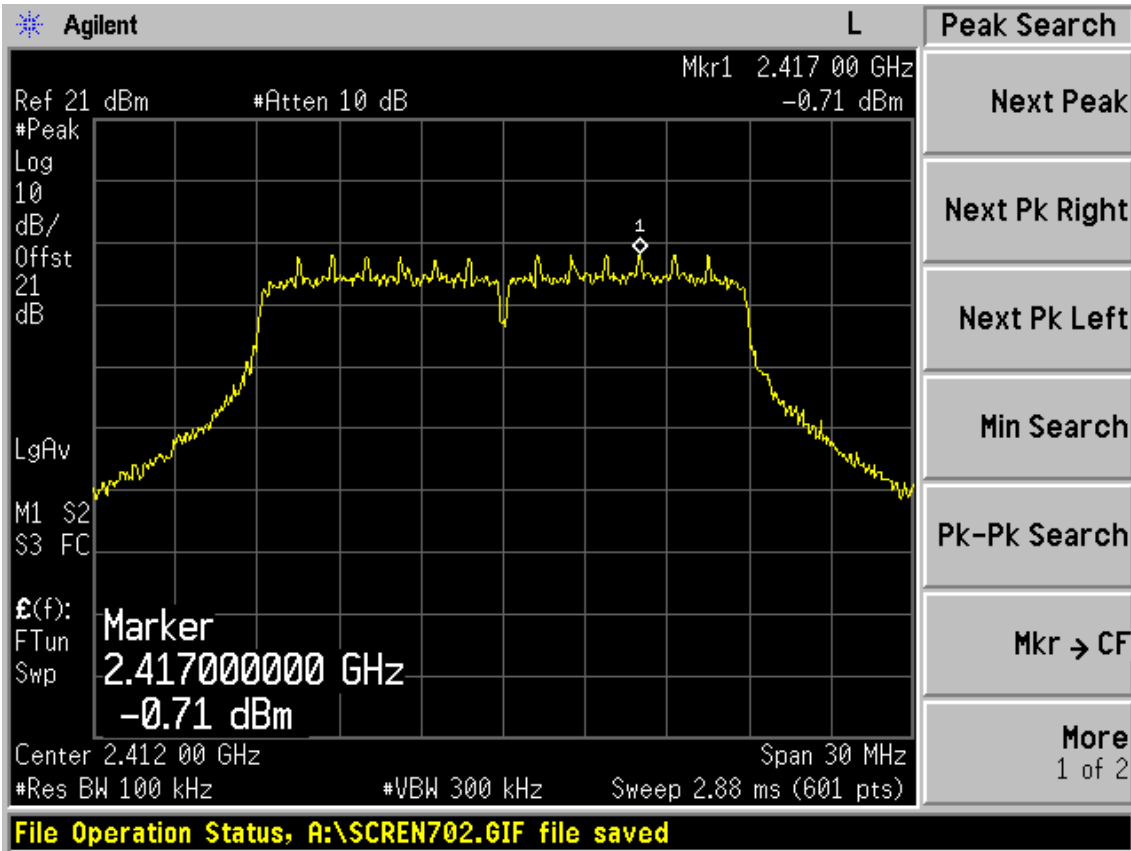
File Operation Status, A:\SCREN698.GIF file saved

Test CH11: 2462MHz

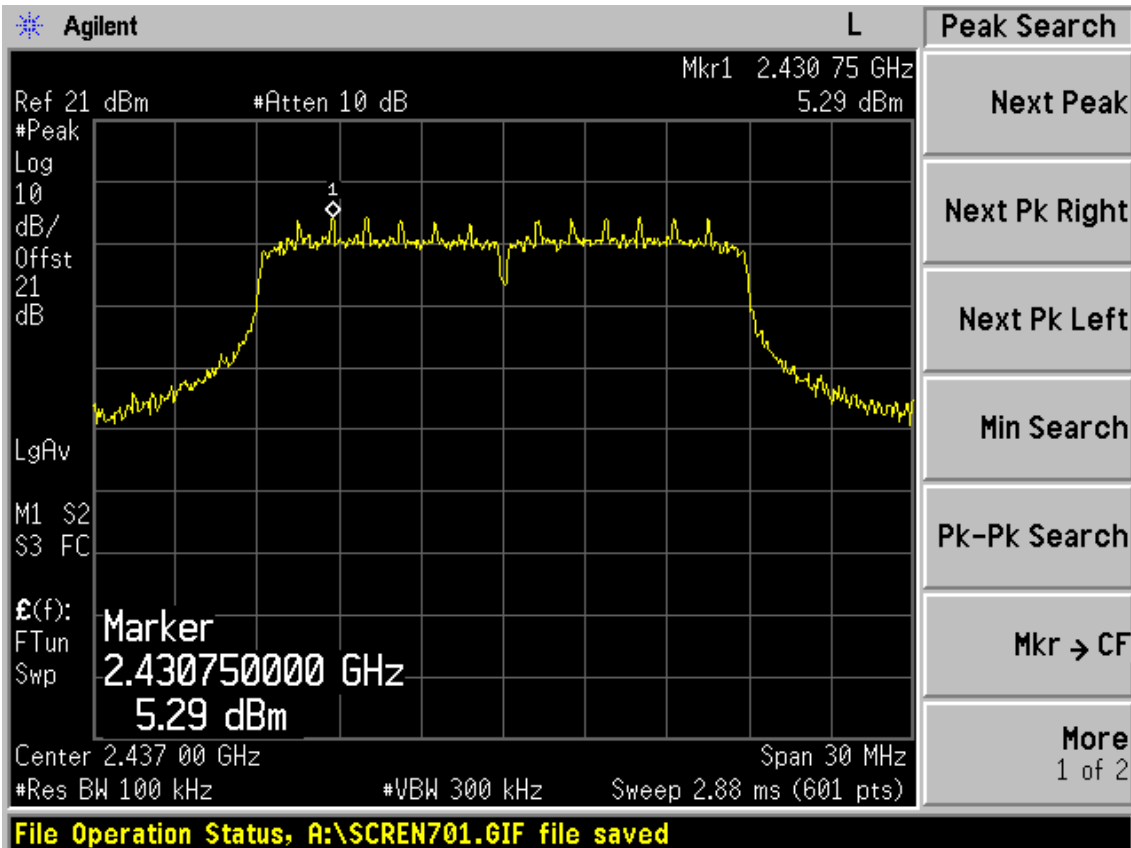


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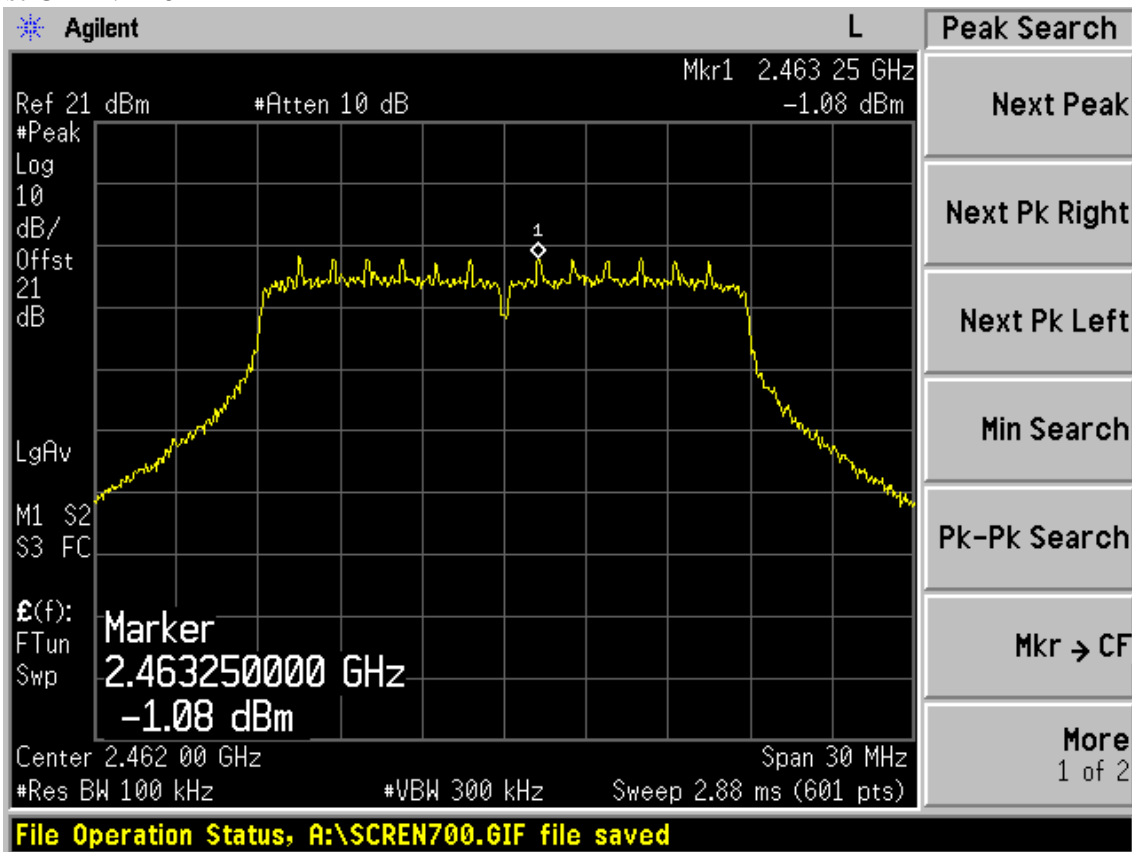
Test Mode: IEEE 802.11n HT20 TX  
 Test CH1: 2412MHz



Test CH6: 2437MHz

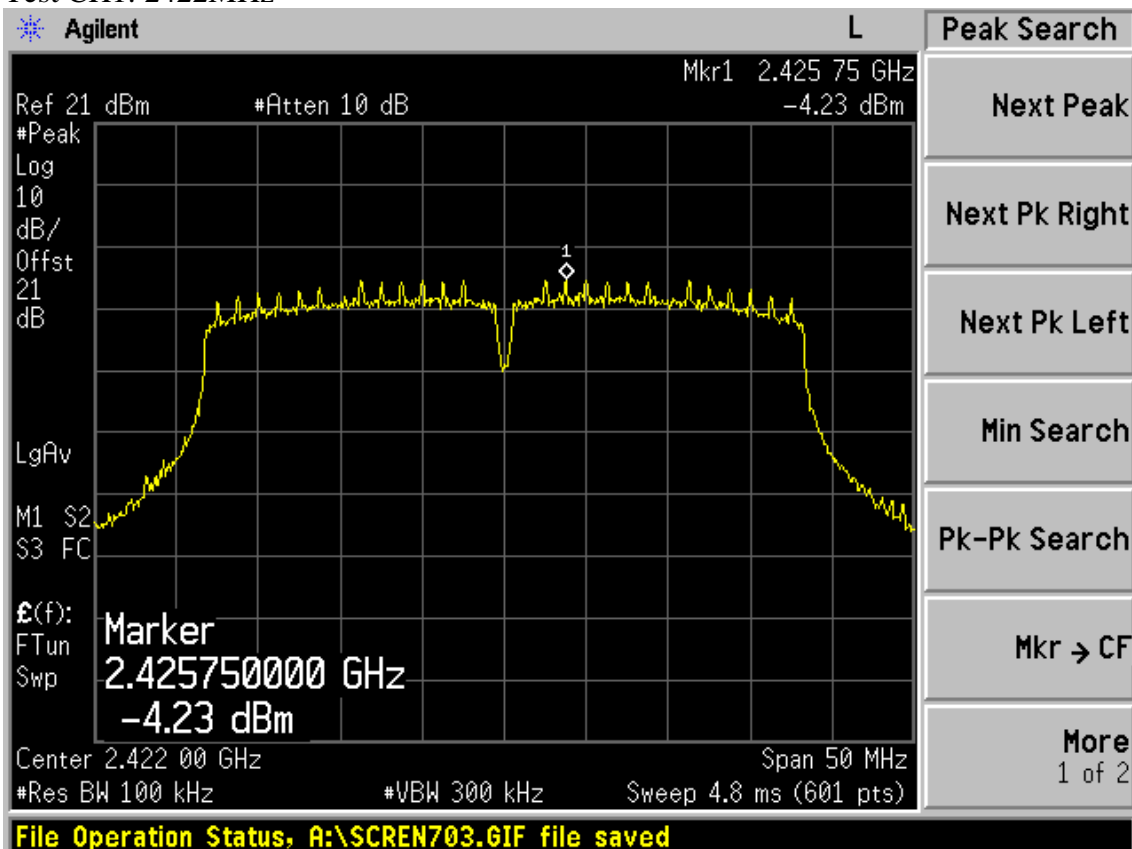


Test CH11: 2462MH

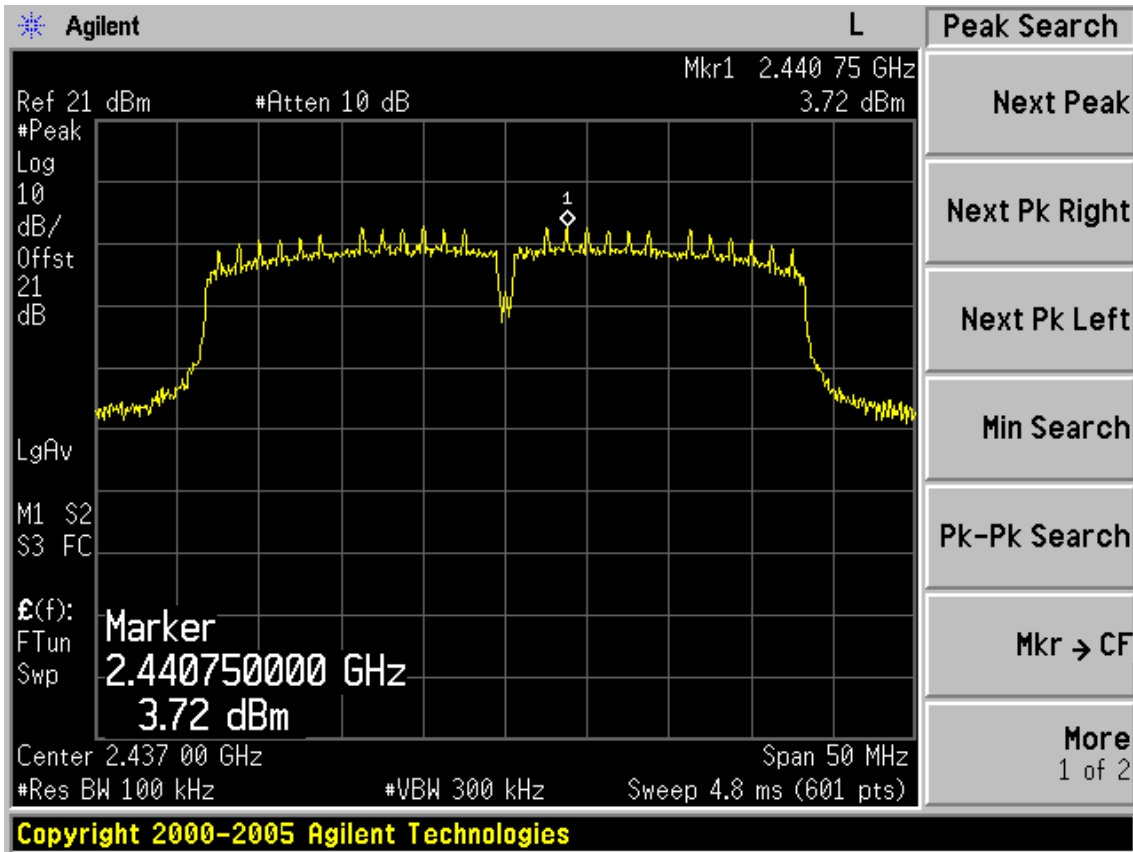


Test Mode: IEEE 802.11n HT40 TX

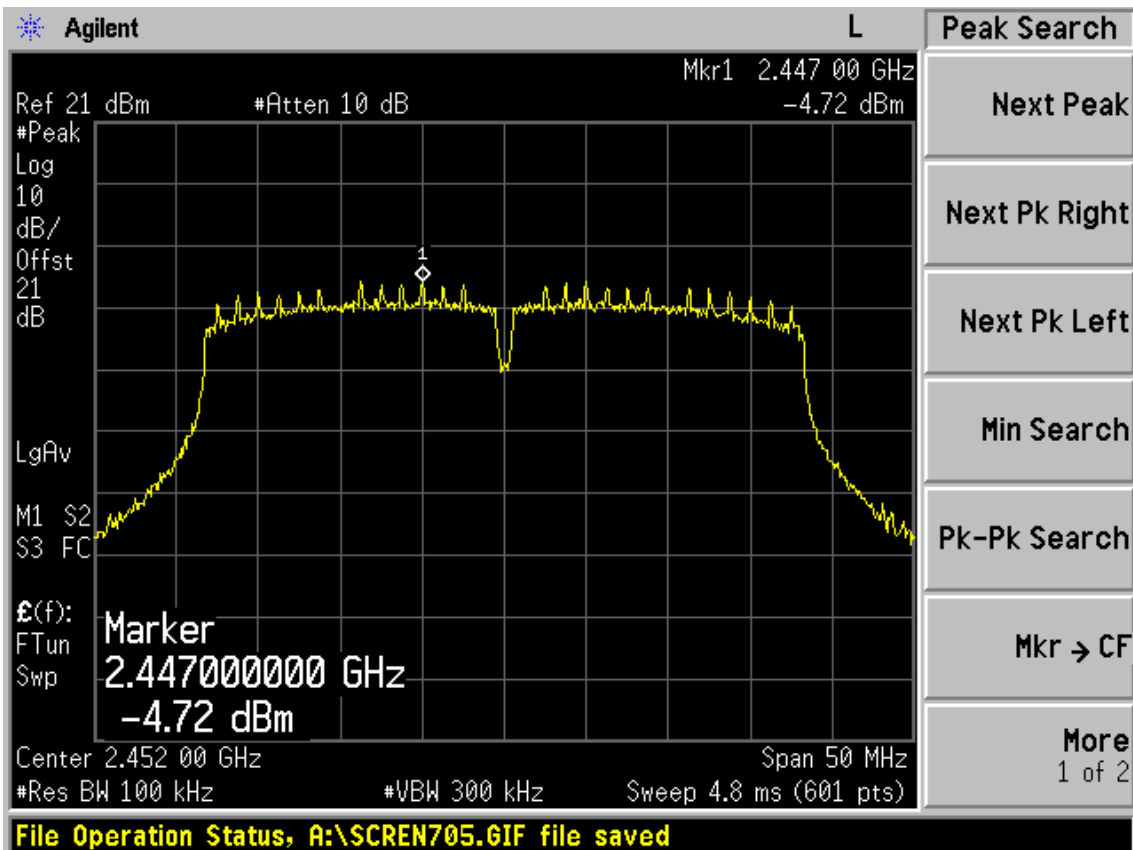
Test CH1: 2422MHz



Test CH4: 2437MHz



Test CH7: 2452MHz





## **10. ANTENNA REQUIREMENT**

### **10.1. 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 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### **10.2. ANTENNA CONNECTED CONSTRUCTION**

The antennas used for this product are Dipole antenna that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 5.3dBi.

## 11.MPE ESTIMATION

### 11.1.Limit for General Population/ Uncontrolled Exposures

Frequency	Power density (mW/ cm <sup>2</sup> )	Averaging time(minutes)
300MHz----1.5GHz	F/1500	30
1.5GHz---100GHz	1.0	30

Frequency(MHz)	Power density (mW/ cm <sup>2</sup> )	Averaging time(minutes)
2412	1	30
2437	1	30
2462	1	30

Note: F= Frequency in MHz

### 11.2. Estimation Result

EUT: 3G/4G Wireless N Router		
M/N: TL-MR3420		
Test date:2012-10-14	Pressure: 101.2 kpa	Humidity: 53.8%
Tested by: Leo-Li	Test site: RF Site	Temperature : 23.1℃

Cable loss: 1 dB		Attenuator loss: 20 dB				Antenna Gain: 5.3dBi	
Test Mode	CH	Frequency (MHz)	Peak Output Power (dBm)	Output Power (mW)	Antenna Gain (dBi)	Antenna Gain (Linear)	MPE
11b	CH1	2412	17.09	51.17	5.3	3.39	0.0322
	CH6	2437	17.78	59.98	5.3	3.39	0.0378
	CH11	2462	16.68	46.56	5.3	3.39	0.0293
11g	CH1	2412	19.37	86.50	5.3	3.39	0.0544
	CH6	2437	24.16	260.62	5.3	3.39	0.1640
	CH11	2462	19.02	79.80	5.3	3.39	0.0502
11n HT20	CH1	2412	20.23	105.44	5.3	3.39	0.0711
	CH6	2437	27.01	502.34	5.3	3.39	0.3388
	CH11	2462	20.51	112.46	5.3	3.39	0.0758
11n HT40	CH1	2422	19.70	93.33	5.3	3.39	0.0629
	CH4	2437	27.36	544.50	5.3	3.39	0.3672
	CH7	2452	18.87	77.09	5.3	3.39	0.0520

## 12.DEVIATION TO TEST SPECIFICATIONS

[ NONE ]