

7 OUTPUT POWER MEASUREMENT

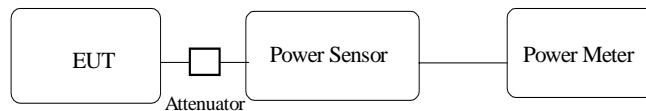
7.1 Standard Applicable

For direct sequence system, according to 15.247(b), the maximum peak output power of the transmitter shall not exceed 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 3. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range.
3. Measure the highest amplitude appearing on spectral display and record the level to calculate result data.
4. Repeat above procedures until all frequencies measured were complete.

Figure 3: Output Power Measurement Configuration



7.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Power Sensor	Boonton	56518	07/21/2005
Power Meter	Boonton	4532	06/13/2005

7.4 Measurement Data

7.4.1 IEEE 802.11b

Test Date: Sep. 01, 2004Temperature: 25Humidity: 63 %

Channel	Frequency (MHz)	Data Transfer Rate (Mbps)	Reading (dBm)	Attenuator & Cable Loss (dB)	Maximum Peak Output Power (dBm)	Maximum Peak Output Power (mW)	FCC Limit (mW)
1	2412	1	12.240	7.4	19.640	92.045	1000
		2	12.274	7.4	19.674	92.768	1000
		5.5	12.204	7.4	19.604	91.285	1000
		11	12.357	7.4	19.757	94.558	1000
6	2437	1	12.203	6.9	19.103	81.339	1000
		2	12.237	6.9	19.137	81.979	1000
		5.5	12.220	6.9	19.120	81.658	1000
		11	12.220	6.9	19.120	81.658	1000
11	2462	1	12.257	7.0	19.257	84.275	1000
		2	12.187	7.0	19.187	82.928	1000
		5.5	12.102	7.0	19.102	81.321	1000
		11	12.187	7.0	19.187	82.928	1000

*Note:**The estimated measurement uncertainty of the result measurement is $\pm 1.5\text{dB}$ (1GHz f 18GHz)*

7.4.2 IEEE 802.11g

Test Date: Sep. 01, 2004Temperature: 25Humidity: 63 %

Channel	Frequency (MHz)	Data Transfer Rate (Mbps)	Reading (dBm)	Attenuator & Cable Loss (dB)	Maximum Peak Output Power (dBm)	Maximum Peak Output Power (mW)	FCC Limit (mW)
1	2412	6	12.390	7.4	19.790	95.280	1000
		9	12.407	7.4	19.807	95.653	1000
		12	12.255	7.4	19.655	92.363	1000
		18	12.069	7.4	19.469	88.491	1000
		24	11.748	7.4	19.148	82.186	1000
		36	11.376	7.4	18.776	75.440	1000
		48	10.421	7.4	17.821	60.548	1000
		54	10.546	7.4	17.946	62.316	1000
6	2437	6	12.322	6.9	19.222	83.599	1000
		9	12.322	6.9	19.222	83.599	1000
		12	12.186	6.9	19.086	81.021	1000
		18	11.982	6.9	18.882	77.304	1000
		24	11.696	6.9	18.596	72.377	1000
		36	11.358	6.9	18.258	66.958	1000
		48	10.437	6.9	17.337	54.163	1000
		54	10.557	6.9	17.457	55.680	1000
11	2462	6	12.339	7.0	19.339	85.882	1000
		9	12.457	7.0	19.457	88.247	1000
		12	12.221	7.0	19.221	83.580	1000
		18	12.000	7.0	19.000	79.433	1000
		24	11.697	7.0	18.697	74.080	1000
		36	11.478	7.0	18.478	70.437	1000
		48	10.540	7.0	17.540	56.755	1000
		54	10.608	7.0	17.608	57.650	1000

*Note:**The estimated measurement uncertainty of the result measurement is $\pm 1.5\text{dB}$ (1GHz f 18GHz)*

8 POWER DENSITY MEASUREMENT

8.1 Standard Applicable

According to 15.247(d), for direct sequence systems, the transmitted power density averaged over any 1 second interval shall not be greater than 8 dBm in any 3 kHz bandwidth within these bands.

8.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 2. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set EUT to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of spectrum analyzer on highest level appearing on spectral display within a 300 kHz frequency span.
4. Set the spectrum analyzer on a 3 kHz resolution bandwidth and 10 kHz video bandwidth as well as max. hold function, then record the measurement result.
5. Repeat above procedures until all measured frequencies were complete.

8.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Hewlett-Packard	8564EC	09/16/2005

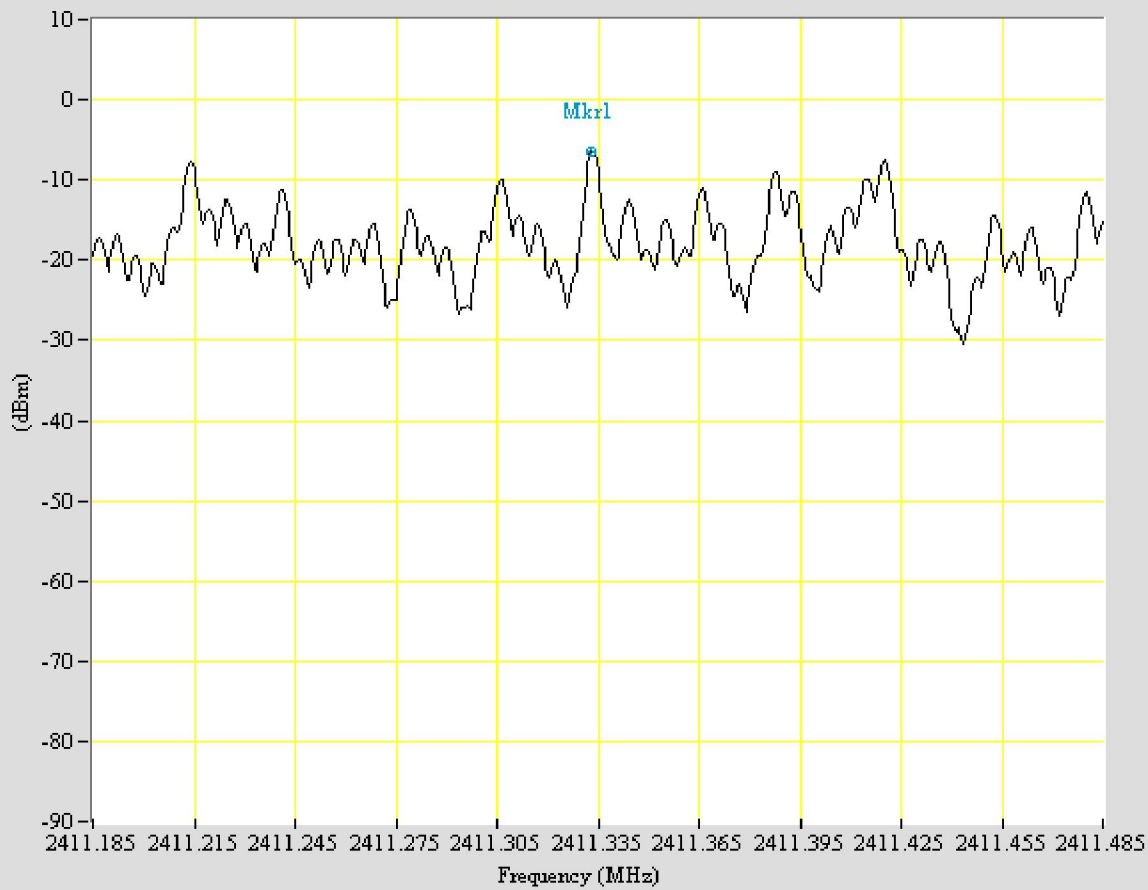
8.4 Measurement Data

8.4.1 802.11b

Test Date: Aug. 31, 2004Temperature: 25Humidity: 61 %

Channel	Frequency (MHz)	Data Transfer Rate (Mbps)	Reading (dBm)	Cable Loss (dB)	Peak Power Spectral Density (dBm)	FCC Limit (dBm)	Chart
1	2412	1	-13.00	1.5	-11.50	8	-
		2	-6.66	1.5	-5.16	8	-
		5.5	-12.16	1.5	-10.66	8	-
		11	-6.50	1.5	-5.00	8	Page 36
6	2437	1	-12.16	1.5	-10.66	8	-
		2	-6.16	1.5	-4.66	8	Page 37
		5.5	-6.83	1.5	-5.33	8	-
		11	-9.50	1.5	-8.00	8	-
11	2462	1	-12.50	1.6	-10.90	8	-
		2	-6.00	1.6	-4.40	8	Page 38
		5.5	-8.16	1.6	-6.56	8	-
		11	-9.50	1.6	-7.90	8	-

Note:**1. Please refer to page 36 to page 38 for chart****2. The estimated measurement uncertainty of the result measurement is $\pm 1.5\text{dB}$ (1GHz ~ 18GHz)**



*Center 2411.3350MHz

*SPAN 0.3000MHz

*RBW 3.00kHz

*VBW 10.00kHz

*SWP 100000.00msec

*ATTEN 20.00dB

*RL 10.00dBm

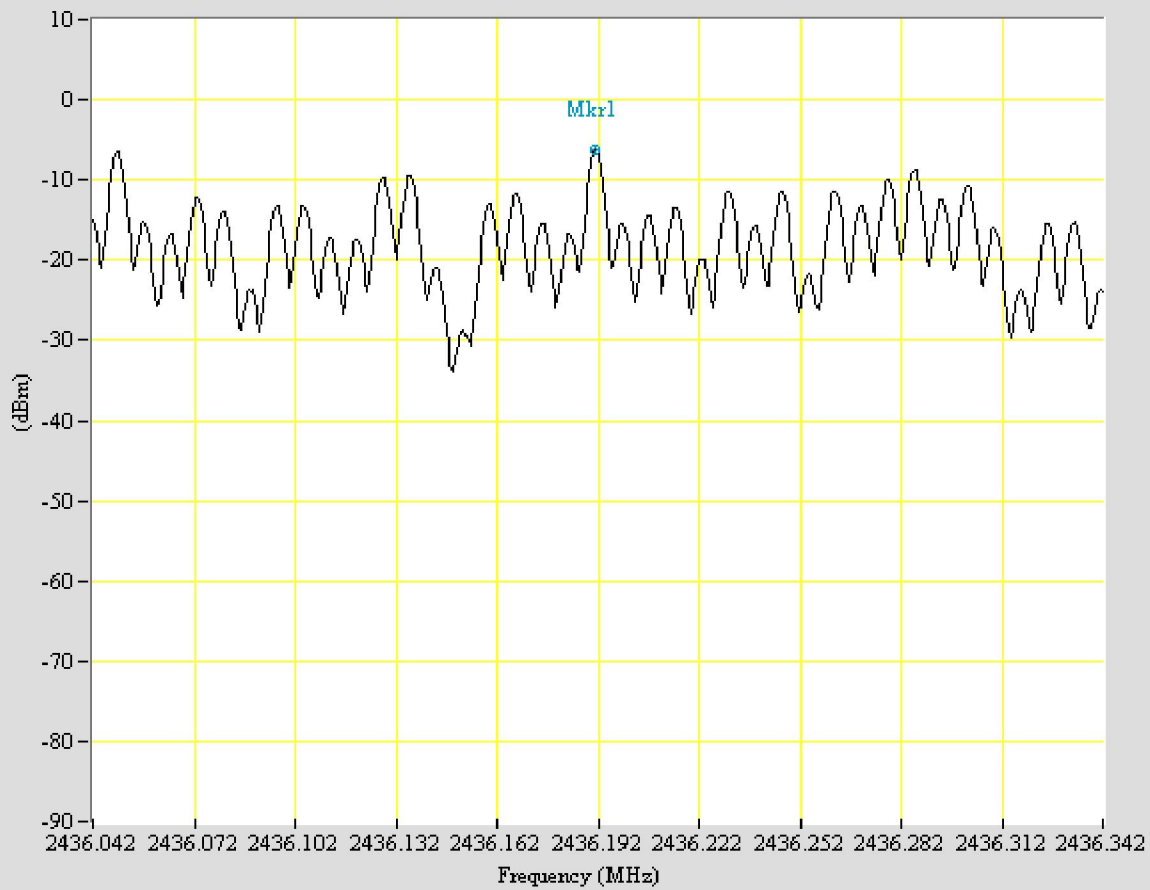
Marker 2411.333MHz -6.500dBm

EUT: DMA-10W

Purpose: PwrDensity

Condition: 802,11b_CH01_11Mbps

Note:



*Center 2436.1917MHz

*SPAN 0.3000MHz

*RBW 3.00kHz

*VBW 10.00kHz

*SWP 100000.00msec

*ATTEN 20.00dB

*RL 10.00dBm

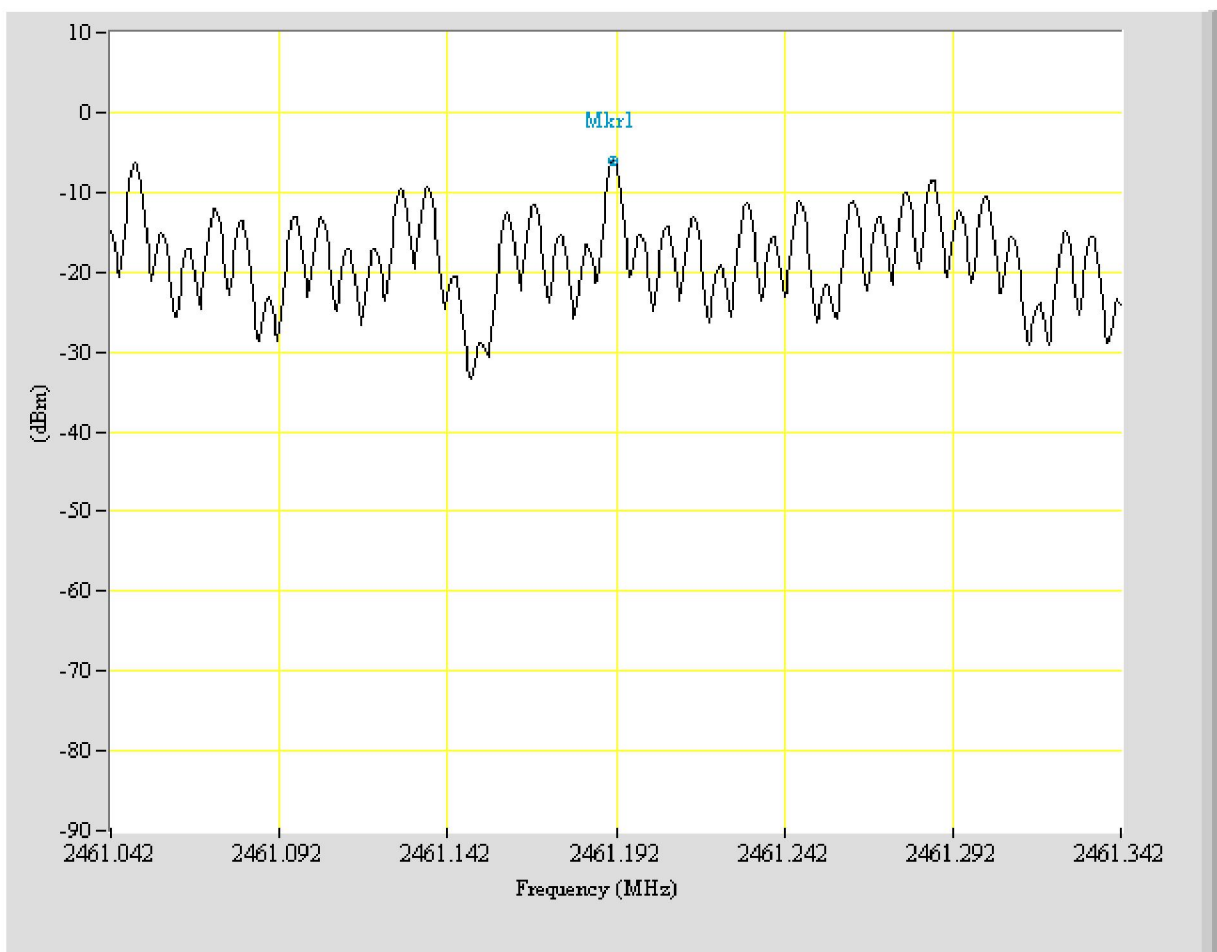
Marker 2436.191MHz -6.160dBm

EUT: DMA-10W

Purpose: PwrDensity

Condition: 802,11b_CH06_2Mbps

Note:



<pre>*Center 2461.1917MHz *SPAN 0.3000MHz *RBW 3.00kHz *VBW 10.00kHz *SWP 100000.00msec *ATTEN 20.00dB *RL 10.00dBm</pre>	<pre>Marker 2461.191MHz -6.000dBm</pre>
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EUT: DMA-10W
Purpose: PwrDensity
Condition: 802,11b_CH11_2Mbps
Note:

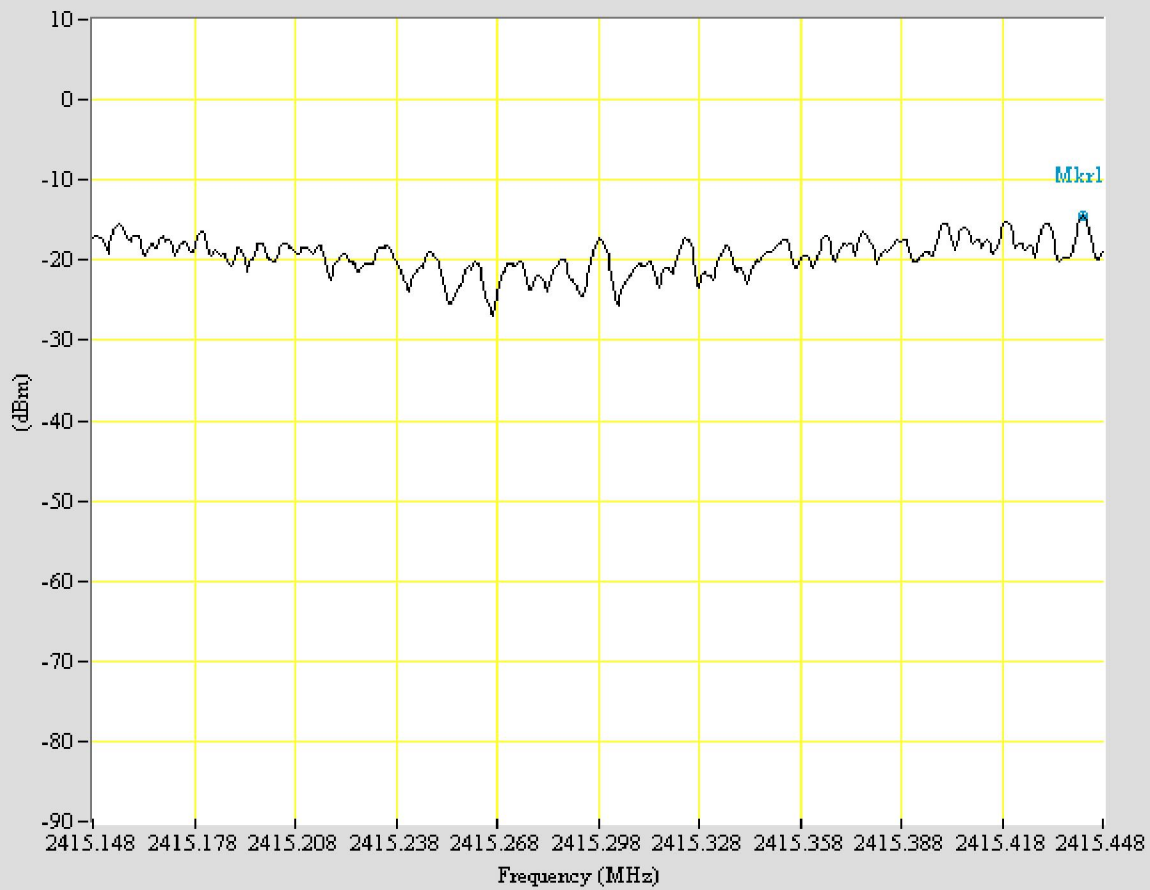
8.4.2 IEEE 802.11g

Test Date: Aug. 31, 2004Temperature: 25Humidity: 61 %

Channel	Frequency (MHz)	Data Transfer Rate (Mbps)	Reading (dBm)	Cable Loss (dB)	Peak Power Spectral Density (dBm)	FCC Limit (dBm)	Chart
1	2412	6	-14.50	1.5	-13.00	8	Page 40
		9	-14.66	1.5	-13.16	8	-
		12	-15.50	1.5	-14.00	8	-
		18	-15.30	1.5	-13.80	8	-
		24	-16.00	1.5	-14.50	8	-
		36	-16.00	1.5	-14.50	8	-
		48	-18.00	1.5	-16.50	8	-
		54	-18.16	1.5	-16.66	8	-
6	2437	6	-14.66	1.5	-13.16	8	-
		9	-14.33	1.5	-12.83	8	Page 41
		12	-15.33	1.5	-13.83	8	-
		18	-15.50	1.5	-14.00	8	-
		24	-15.66	1.5	-14.16	8	-
		36	-16.16	1.5	-14.66	8	-
		48	-18.66	1.5	-17.16	8	-
		54	-18.33	1.5	-16.83	8	-
11	2462	6	-14.66	1.6	-13.06	8	Page 42
		9	-14.83	1.6	-13.23	8	-
		12	-17.33	1.6	-15.73	8	-
		18	-15.66	1.6	-14.06	8	-
		24	-16.16	1.6	-14.56	8	-
		36	-16.33	1.6	-14.73	8	-
		48	-18.83	1.6	-17.23	8	-
		54	-18.33	1.6	-16.73	8	-

Note:

1. Please refer to page 40 to page 42 for chart
2. The estimated measurement uncertainty of the result measurement is $\pm 1.5\text{dB}$ (1GHz f 18GHz)



*Center 2415.2975MHz

*SPAN 0.3000MHz

*RBW 3.00kHz

*VBW 10.00kHz

*SWP 100000.00msec

*ATTEN 20.00dB

*RL 10.00dBm

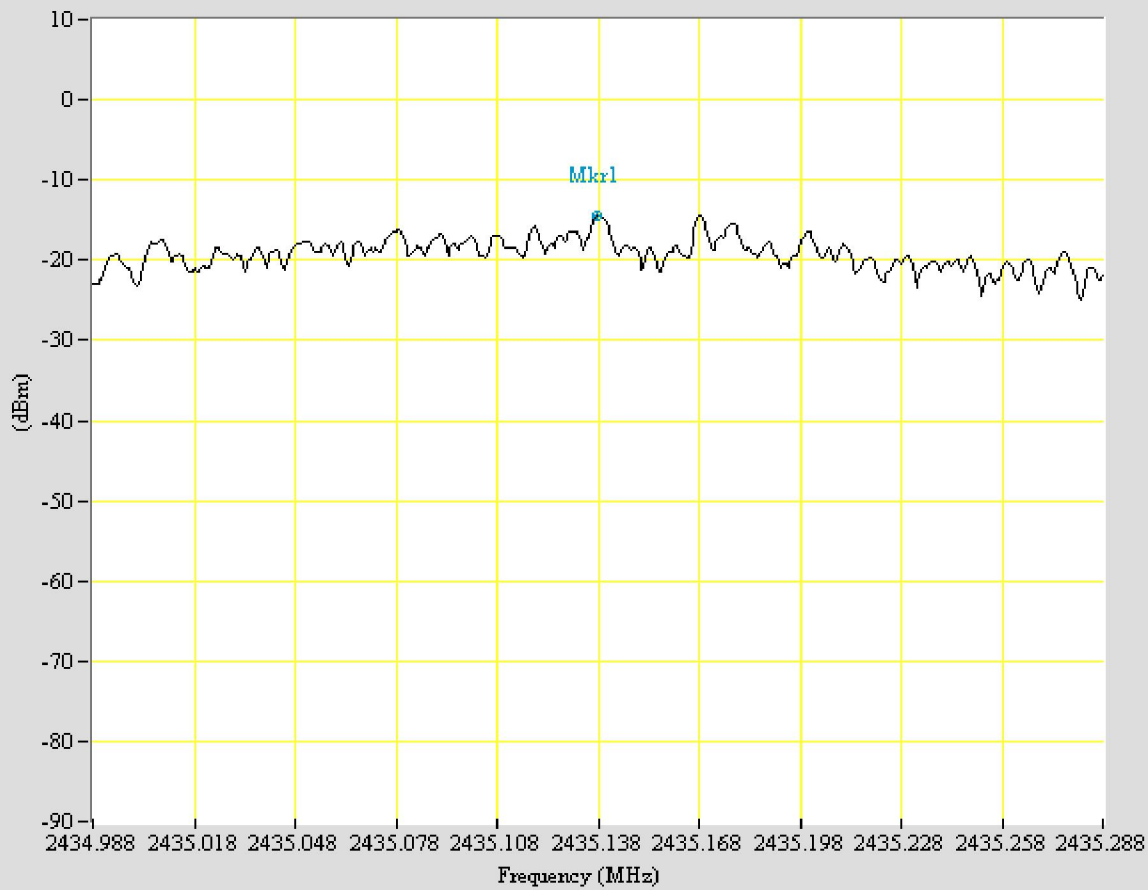
Marker 2415.442MHz -14.500dBm

EUT: DMA-10W

Purpose: PwrDensity

Condition: 802,11g_CH01_6Mbps

Note:



*Center 2435.1383MHz

*SPAN 0.3000MHz

*RBW 3.00kHz

*VBW 10.00kHz

*SWP 100000.00msec

*ATTEN 20.00dB

*RL 10.00dBm

Marker 2435.138MHz -14.330dBm

EUT: DMA-10W

Purpose: PwrDensity

Condition: 802,11g_CH06_9Mbps

Note:



*Center 2454.8167MHz

*SPAN 0.3000MHz

*RBW 3.00kHz

*VBW 10.00kHz

*SWP 100000.00msec

*ATTEN 20.00dB

*RL 10.00dBm

Marker 2454.817MHz -14.660dBm

EUT: DMA-10W

Purpose: PwrDensity

Condition: 802,11g_CH11_6Mbps

Note: