Lab Code: 200167-0

FCC PART 15.247

EMI MEASUREMENT AND TEST REPORT

For

Always On Wireless, Inc.

3701 Kirby Dr. Suite 1090
Houston TX 77098

FCC ID: SINWDB30G
Model: WDB30G

This Report Concerns:	Product Type:
☒ Original Report	802.11b/g bridge with VOIP

Test Engineer:	James Ma
Report No.:	R0604265
Report Date:	2006-06-06
Reviewed By:	Daniel Deng
Prepared By:	Bay Area Compliance Laboratory Corporation (BACL) 1274 Anvilwood Ave. Sunnyvale, CA 94089 Tel: (408) 732-9162 Fax: (408) 732 9164

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Always On Wireless, Inc.'s.* product, *FCC ID: SINWDB30G*, or the "EUT" as referred to this report is a *802.11b/g Bridge with VOIP* which measures approximately *127 mmL x 89 mmW x 20.3 mmH.*

** The test data gathered are from production sample, MAC address: 0011E0026B88, provided by the manufacturer.*

EUT Photo

Additional photos in Exhibit C

Objective

This type approval report is prepared on behalf of *Always On Wireless, Inc.* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for Output Power, Antenna Requirements, 6 dB Bandwidth, and power spectral density, 100 kHz Bandwidth of Band Edges Measurement, Conducted and Radiated Spurious Emission.

Related Submittal(s)/Grant(s)

No Related Submittals.

Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at it's facility in Sunnyvale, California, USA.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and is listed under FCC registration number: 90464 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at
http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm

SYSTEM TEST CONFIGURATION

Justification

The host system was configured for testing according to ANSI C63.4-2003.

The EUT was tested in the normal (native) operating mode to represent *worst*-case results during the final qualification test.

EUT Exercise Software

Ubicom Software is using for testing, and the following power setting was used during the testing:

	2412 MHz	2437 MHz	2462 MHz	TX Power Setting
802.11b	17 dBm	17 dBm	17 dBm	17
802.11g	16 dBm	16 dBm	16 dBm	255

Special Accessories

N/A

Equipment Modifications

No modifications were made to the EUT.

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Compaq	Laptop	Preserio 2100	CNF43403FB

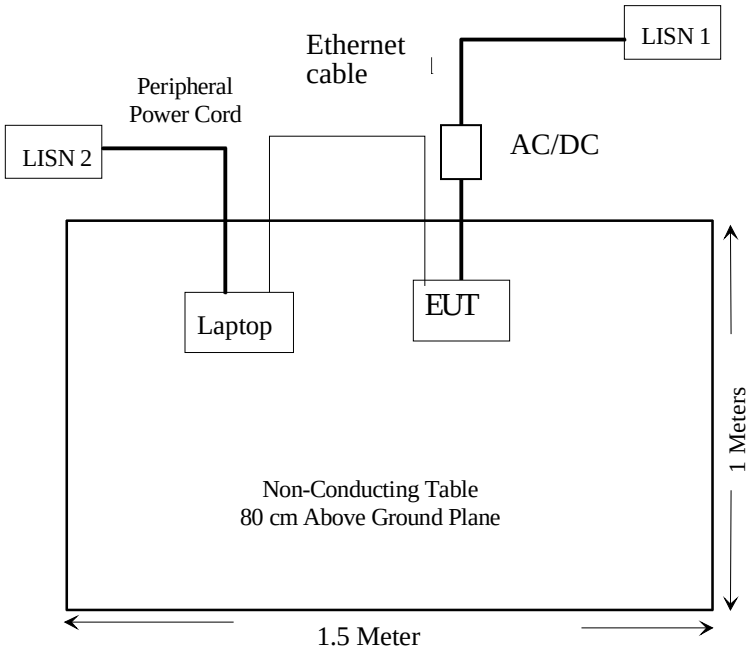
Power Supply Information

Manufacturer	Description	Model	Serial Number
WiFiyer	AC-DC adaptor	310-0618	507-0233020

Interface Ports and Cabling

Cable Description	Length (M)	From	To
Unshielded RJ 45 Cable	1.5	RJ 45 Ethernet Port/ EUT	RJ 45 Ethernet Port/ Laptops

Test Setup Block Diagram



SUMMARY OF TEST RESULTS

Results reported relate only to the product tested.

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.247(e)(i) §2.1091	RF Exposure	Complies
§15.203	Antenna Requirement	Complies
§ 15.207 (a)	Conducted Emissions	Complies
§2.1051 & §15.247(d)	Spurious Emission at Antenna Port	Complies
§15.205	Restricted Band	Complies
§15.209 (a) & §15.247(d)	Radiated Emission	Complies
§15.247 (a)(2)	6 dB Bandwidth	Complies
§15.247 (b)(3)	Maximum Peak Output Power	Complies
§ 15.247 (d)	100 kHz Bandwidth of Frequency Band Edge	Complies
§15.247 (e)	Peak Power Spectral Density	Complies

**The test data was within the measurement of uncertainty.*

§15.247(e)(i),§2.1091 - RF EXPOSURE

According to §15.247(e)(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

MPE Prediction

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S = PG/4\pi R^2$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal: 17.66 (dBm)
Maximum peak output power at antenna input terminal: 58.34 (mW)
Prediction distance: 20 (cm)
Prediction frequency: 2400 (MHz)
Antenna Gain (typical): 2.0 (dBi)
antenna gain: 1.58 (numeric)
Power density at prediction frequency at 20 cm: 0.018 (mW/cm^2)

MPE limit for uncontrolled exposure at prediction frequency: 1.0 (mW/cm^2)

Test Result

The EUT is a base device. The power density level at 20 cm is 0.018 mW/cm^2, which is below the uncontrolled exposure limit of 1.0mW/cm^2 at 2400 MHz.

§15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 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 § 15.247 (b) (4), 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.

The diversity antennas for this device are antennas with a gain of 2.0 dBi using “Reverse-Polarity” SMA connectors.

§15.207 (a) - CONDUCTED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are receiver, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at BACL is ±2.4 dB.

Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.4 – 2003 measurement procedure. The specification used was FCC Class B limits.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The EUT was connected with LISN-1.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal Date
Rohde & Schwarz	Receiver, EMI Test	ESCS30	100176	2006-03-13
Rohde & Schwarz	LISN, Artificial Mains	ESH2-Z5	871884/039	2005-11-14

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the power cord of the EUT was connected to the mains outlet of the LISN-1.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the peak detection mode, quasi-peak and average. Quasi-Peak readings are distinguished with a "QP". Average readings are distinguished with an "Ave".

Environmental Conditions

Temperature:	16° C
Relative Humidity:	55%
ATM Pressure:	1024 mbar

**The testing was performed by James Ma on 2006-05-25*

Summary of Test Results

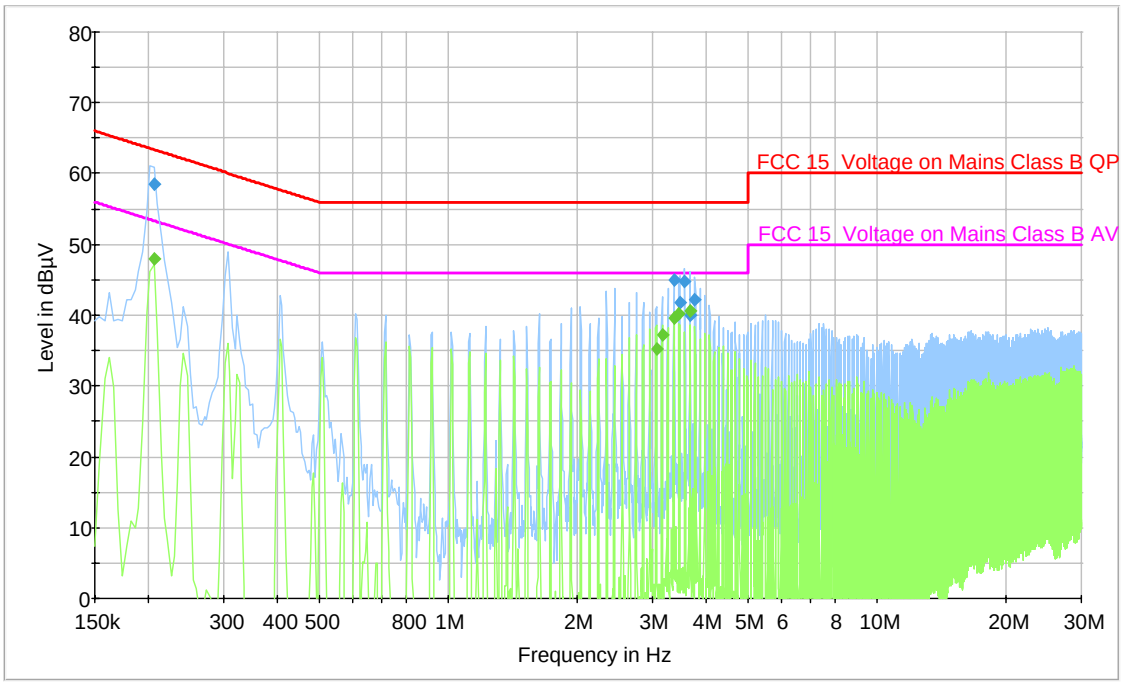
According to the recorded data in following table, the EUT complied with the FCC Conducted limit for a Class B device, with the *worst* margin reading of:

-0.8 dB at **3.358** MHz in the **Neutral** conductor mode

** The test data was within the measurement of uncertainty.*

Conducted Emissions Test plots and Data

120V 60HZ - Line



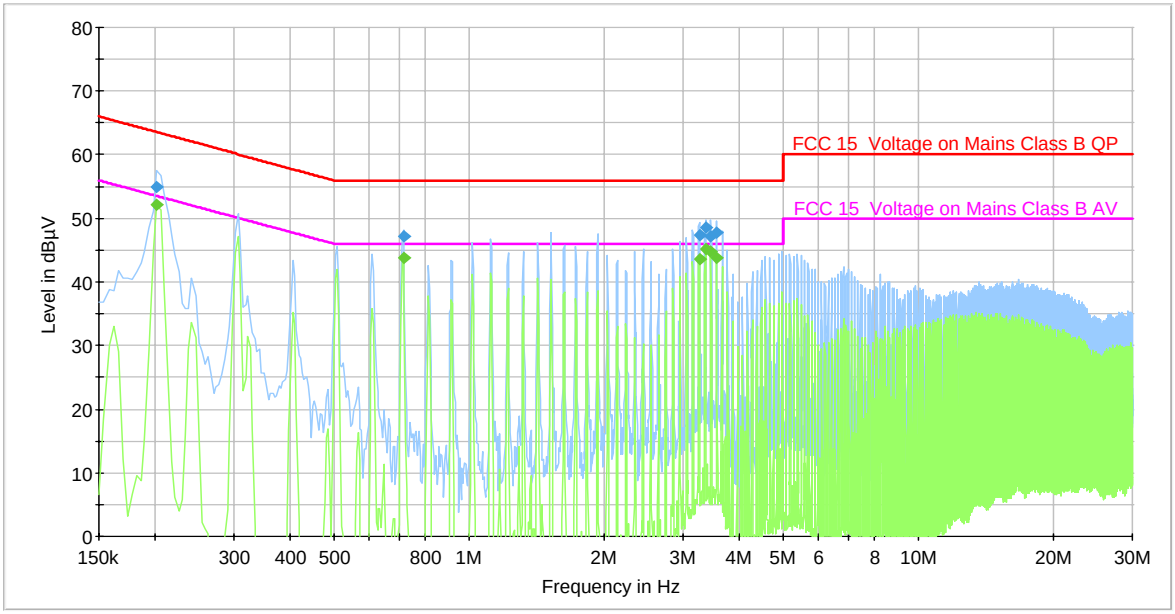
QP Measurements

Frequency (MHz)	QuasiPeak (dBµV)	Line	Corrected Reading (dB)	Limit (dBµV)	Margin (dB)
0.206000	58.6	L1	0.2	63.4	-4.8
3.362000	44.9	L1	0.3	56.0	-11.1
3.566000	44.7	L1	0.3	56.0	-11.3
3.770000	42.2	L1	0.3	56.0	-13.8
3.466000	41.7	L1	0.3	56.0	-14.3
3.670000	40.1	L1	0.3	56.0	-15.9

Average Measurements

Frequency (MHz)	Average (dBµV)	Line	Corrected Reading (dB)	Limit (dBµV)	Margin (dB)
3.666000	40.7	L1	0.3	46.0	-5.3
0.206000	48.0	L1	0.2	53.4	-5.4
3.462000	40.3	L1	0.3	46.0	-5.7
3.362000	39.7	L1	0.3	46.0	-6.3
3.158000	37.3	L1	0.3	46.0	-8.7
3.058000	35.2	L1	0.3	46.0	-10.8

120V 60HZ - Neutral



QP Measurements

Frequency (MHz)	QuasiPeak (dBµV)	Line	Corrected Reading (dB)	Limit (dBµV)	Margin (dB)
3.358000	48.6	N	0.3	56.0	-7.4
3.562000	47.8	N	0.3	56.0	-8.2
0.202000	55.0	N	0.2	63.5	-8.5
3.258000	47.4	N	0.3	56.0	-8.6
0.714000	47.2	N	0.3	56.0	-8.8
3.462000	47.1	N	0.3	56.0	-8.9

Average Measurements

Frequency (MHz)	Average (dBµV)	Line	Corrected Reading (dB)	Limit (dBµV)	Margin (dB)
3.358000	45.2	N	0.3	46.0	-0.8
3.458000	44.9	N	0.3	46.0	-1.2
0.202000	52.1	N	0.2	53.5	-1.4
0.714000	43.8	N	0.3	46.0	-2.2
3.562000	43.8	N	0.3	46.0	-2.2
3.258000	43.5	N	0.3	46.0	-2.5

** The test data was within the measurement of uncertainty.*

§2.1051 & §15.247(d) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Standard Applicable

Requirements: CFR 47, § 2.1051.

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1057.

Measurement Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10^{th} harmonic.

Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	16° C
Relative Humidity:	55%
ATM Pressure:	1024 mbar

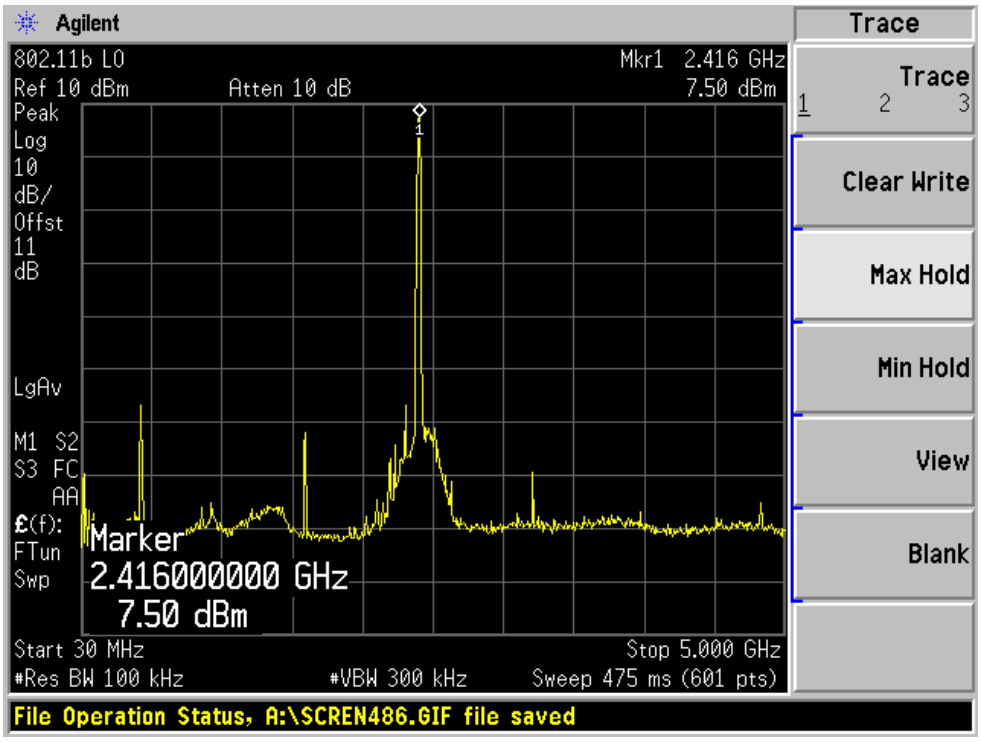
**The testing was performed by James Ma on 2006-05-24*

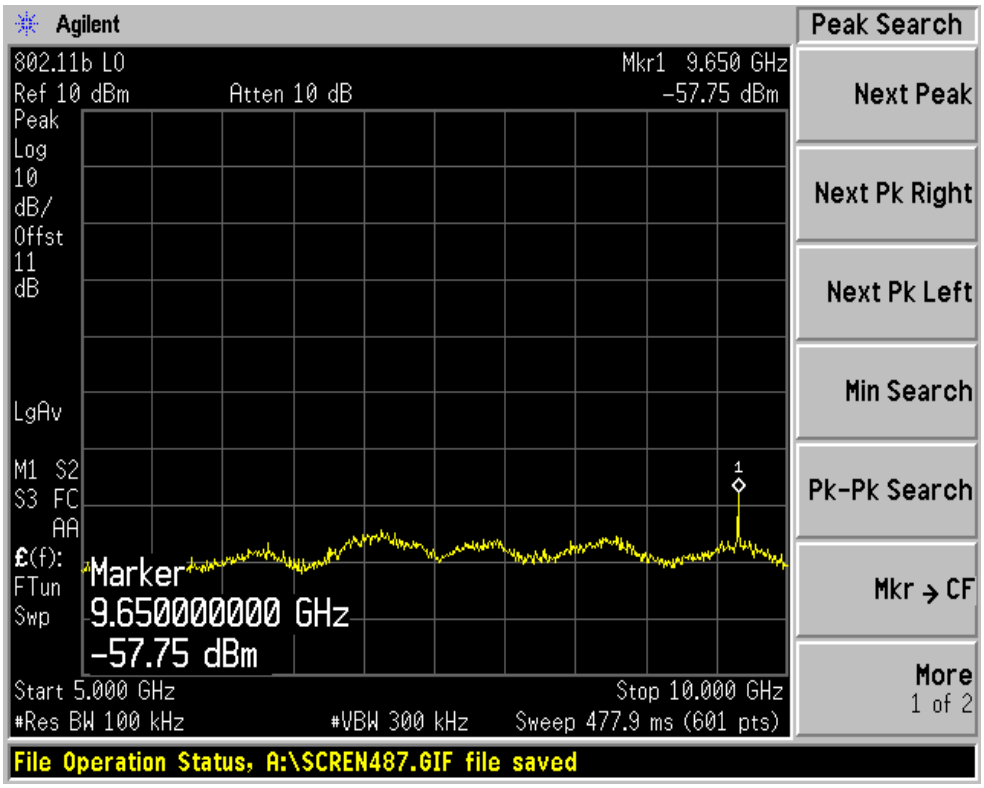
Measurement Result

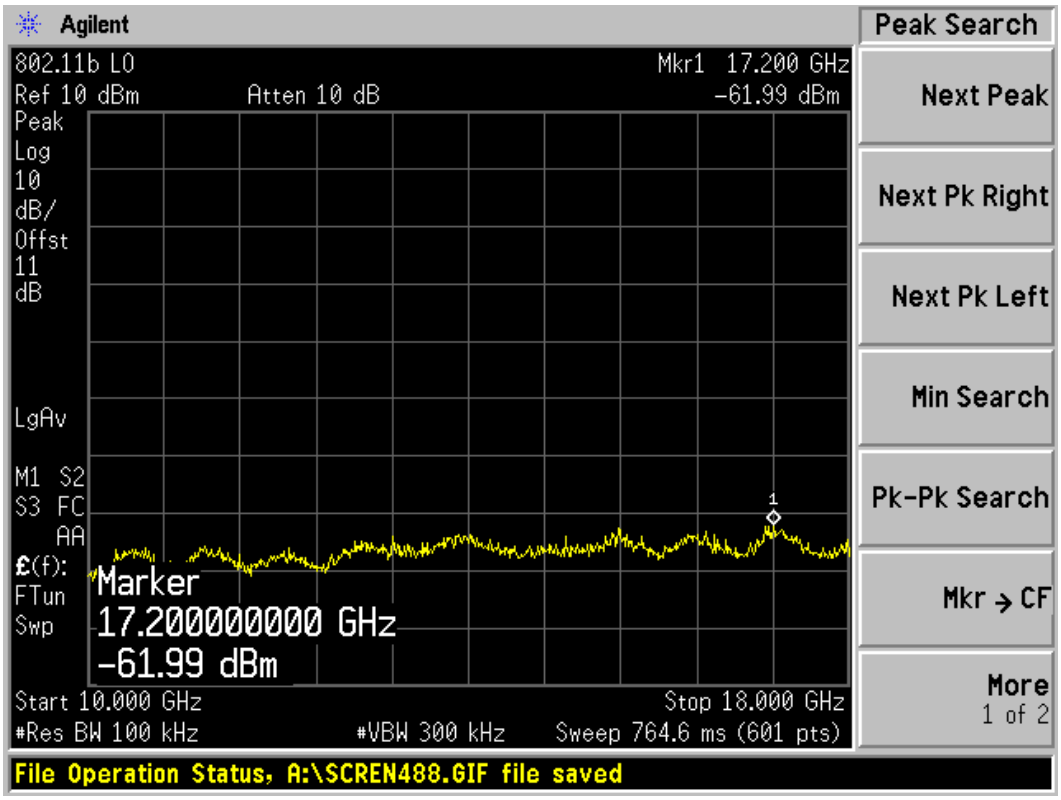
Please refer to following pages for plots of spurious emission.

802.11b:

Low Channel






Agilent
802.11b LO
Ref 10 dBm
Atten 10 dB
Mkr1 17.200 GHz
-61.99 dBm
Peak
Log
10
dB/
Offst
11
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
17.200000000 GHz
-61.99 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 764.6 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
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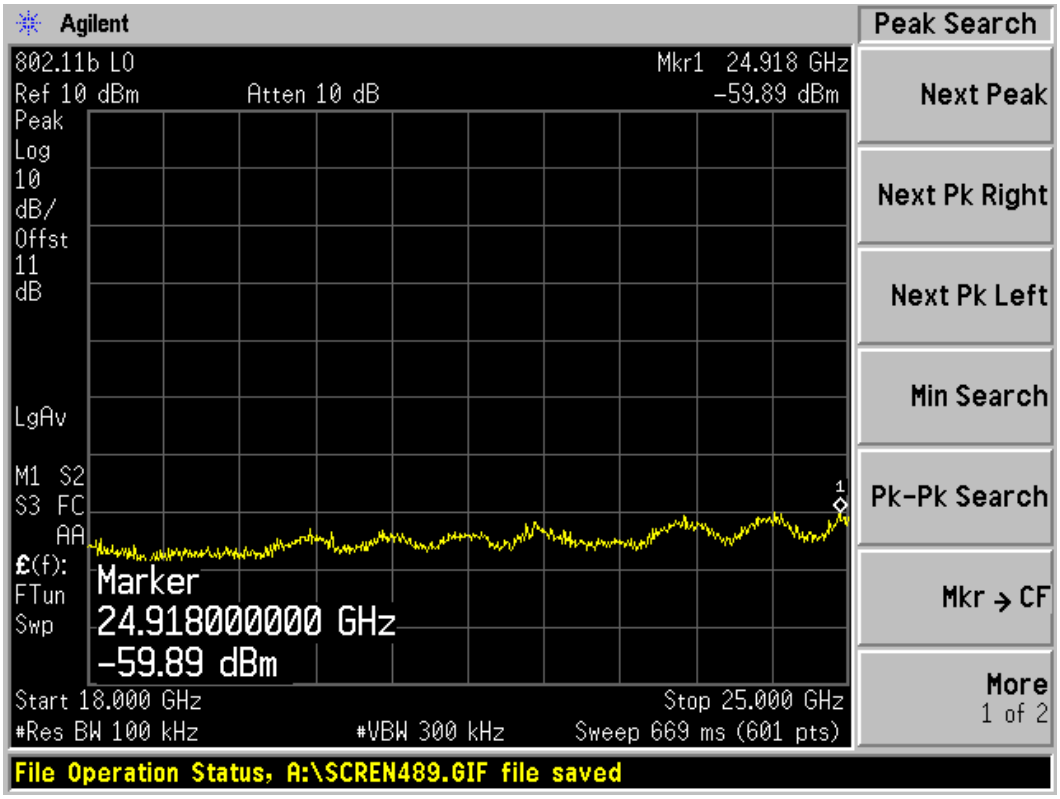
Agilent
802.11b LO
Ref 10 dBm
Atten 10 dB
Mkr1 24.918 GHz
-59.89 dBm
Peak
Log
10
dB/
Offst
11
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
24.918000000 GHz
-59.89 dBm
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
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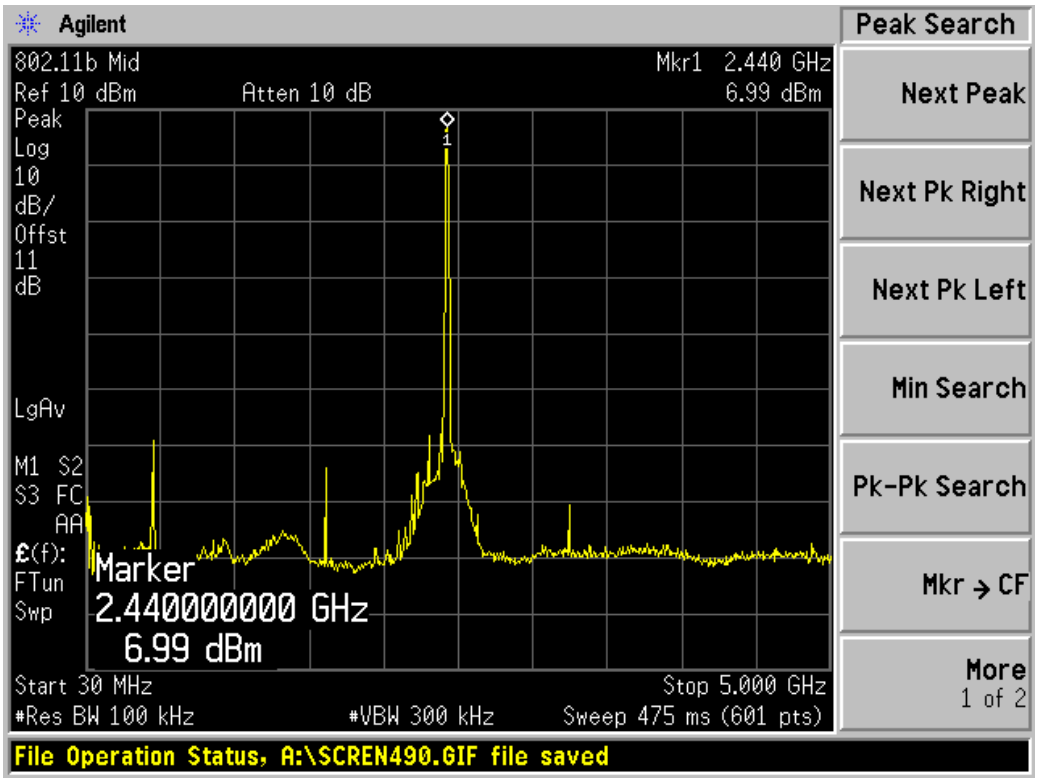
Mid Channel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802.11b Mid
Ref 10 dBm
Atten 10 dB
Mkr1 2.440 GHz
6.99 dBm
Peak
Log
10
dB/
Offst
11
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
2.440000000 GHz
6.99 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 5.000 GHz
Sweep 475 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
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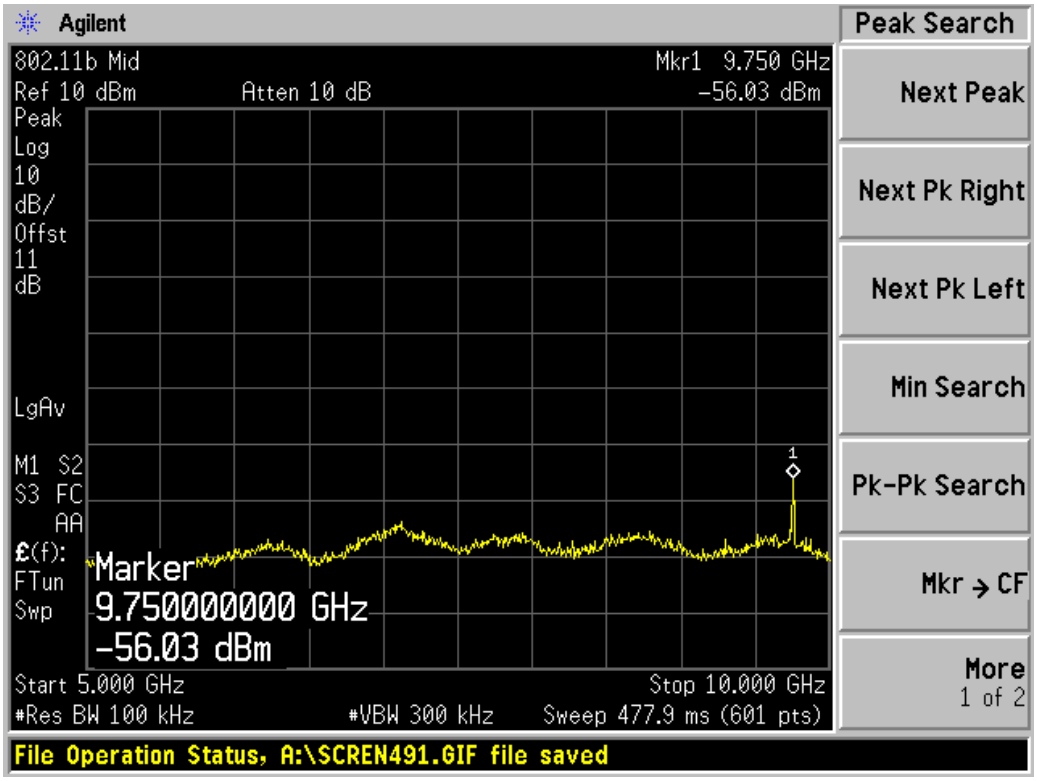
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802.11b Mid
Ref 10 dBm
Atten 10 dB
Mkr1 9.750 GHz
-56.03 dBm
Peak
Log
10
dB/
Offst
11
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
9.750000000 GHz
-56.03 dBm
Start 5.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 477.9 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
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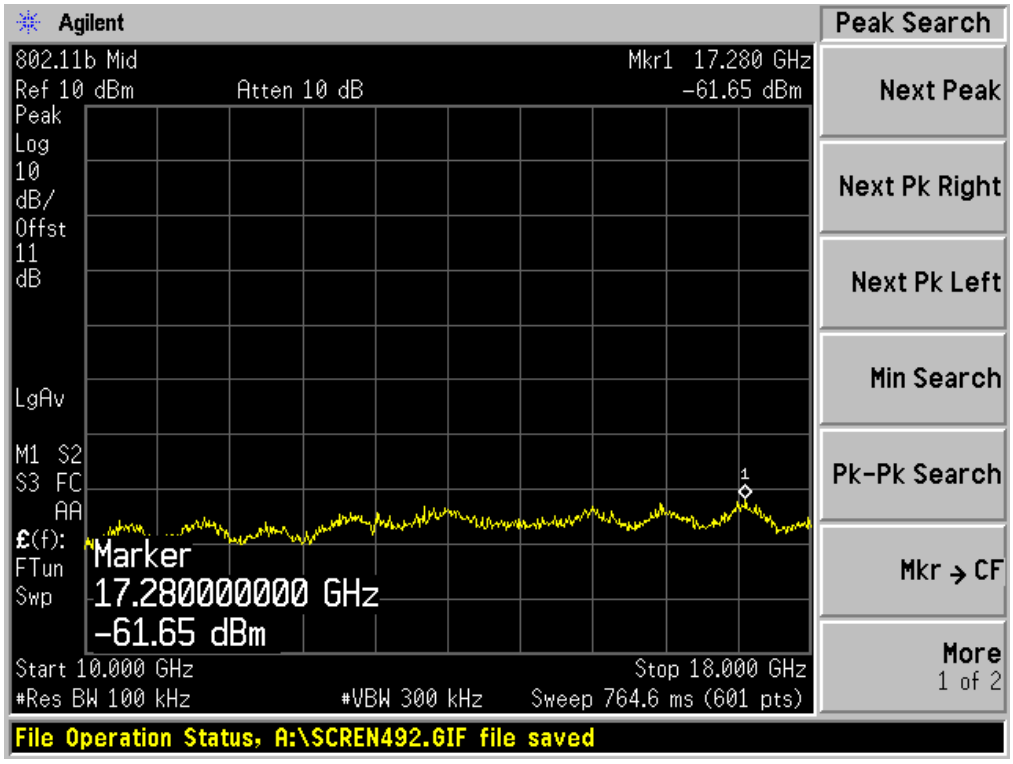
Agilent
802.11b Mid
Ref 10 dBm
Atten 10 dB
Mkr1 17.280 GHz
-61.65 dBm
Peak
Log
10
dB/
Offst
11
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
17.280000000 GHz
-61.65 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 764.6 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
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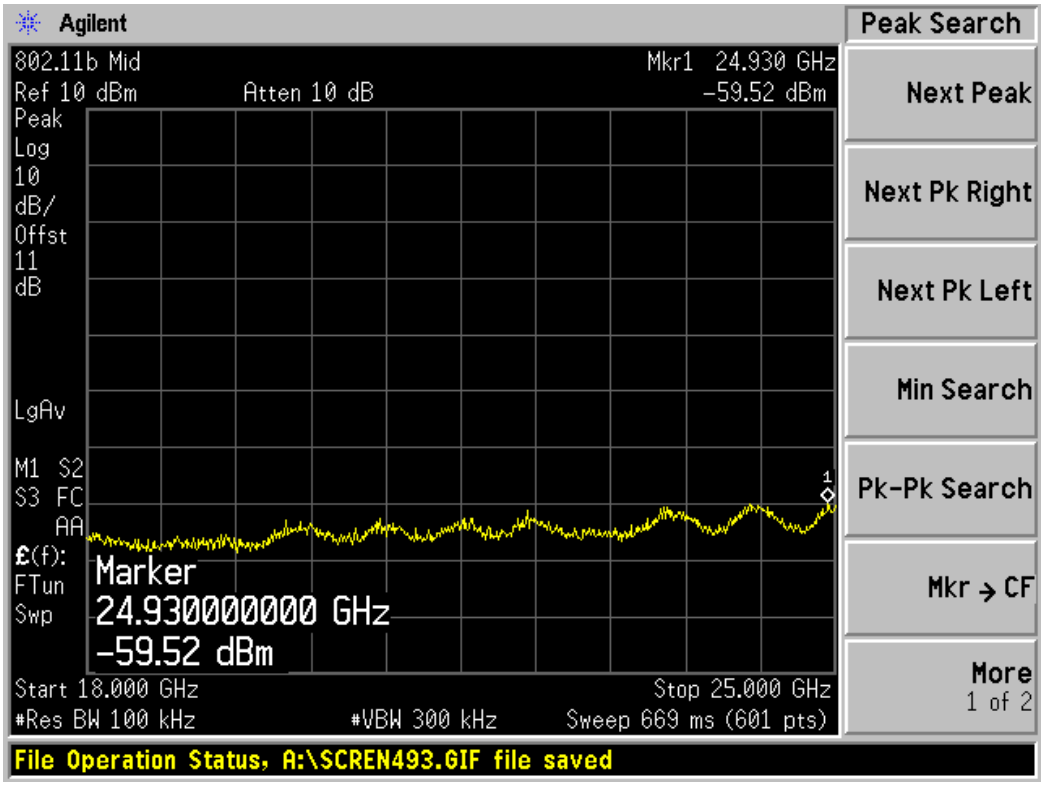
Agilent
802.11b Mid
Ref 10 dBm
Atten 10 dB
Mkr1 24.930 GHz
-59.52 dBm
Peak
Log
10
dB/
Offst
11
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
24.930000000 GHz
-59.52 dBm
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
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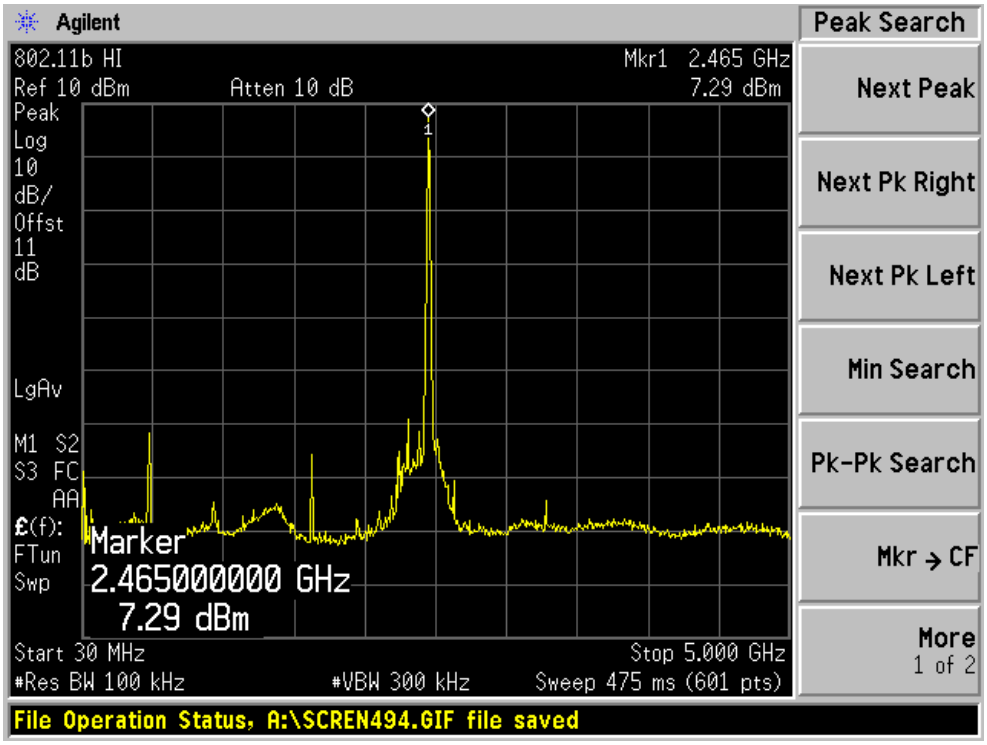
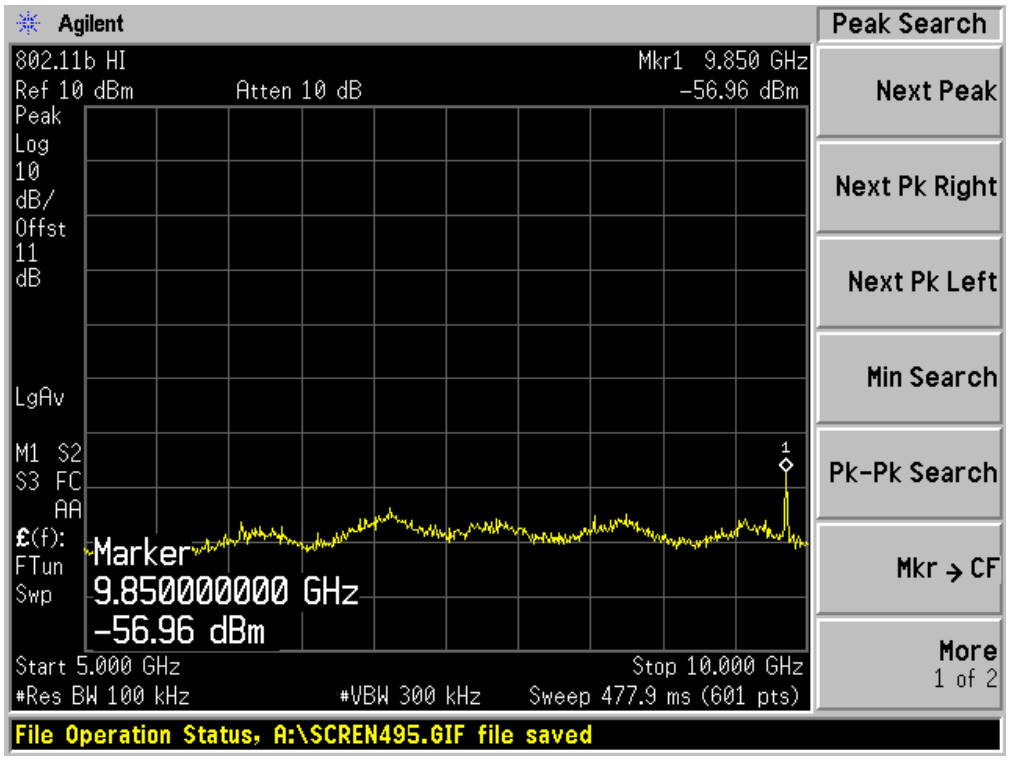
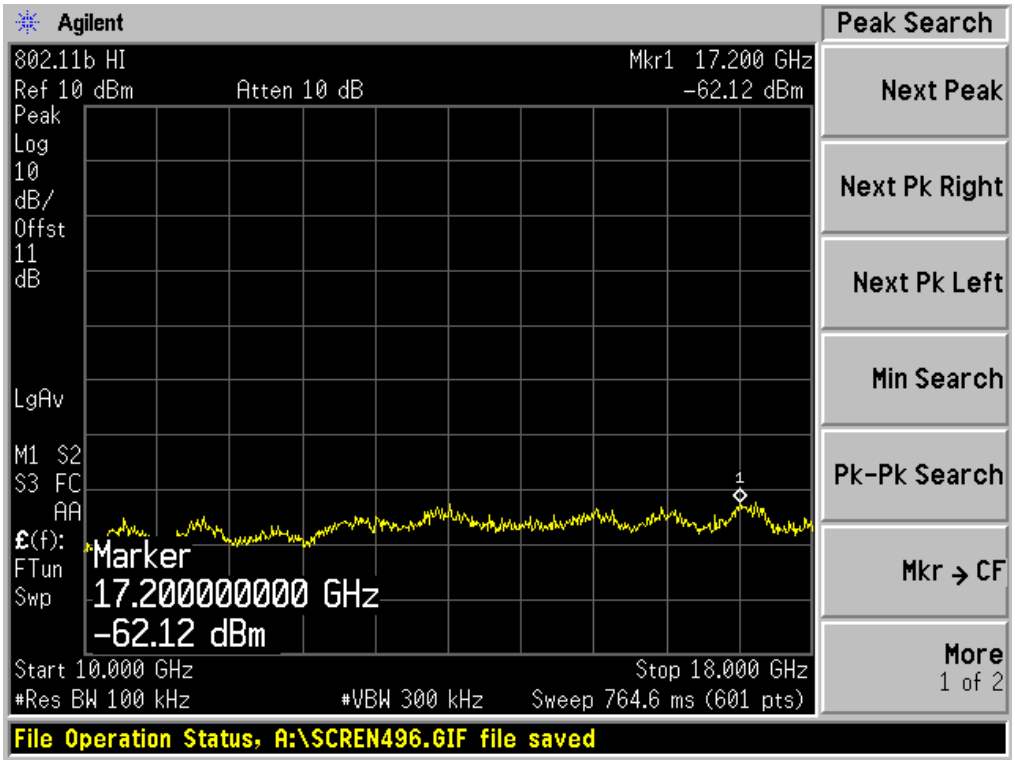
High Channel






Agilent
802.11b HI
Ref 10 dBm
Atten 10 dB
Mkr1 17.200 GHz
-62.12 dBm
Peak
Log
10
dB/
Offst
11
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
17.200000000 GHz
-62.12 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 764.6 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
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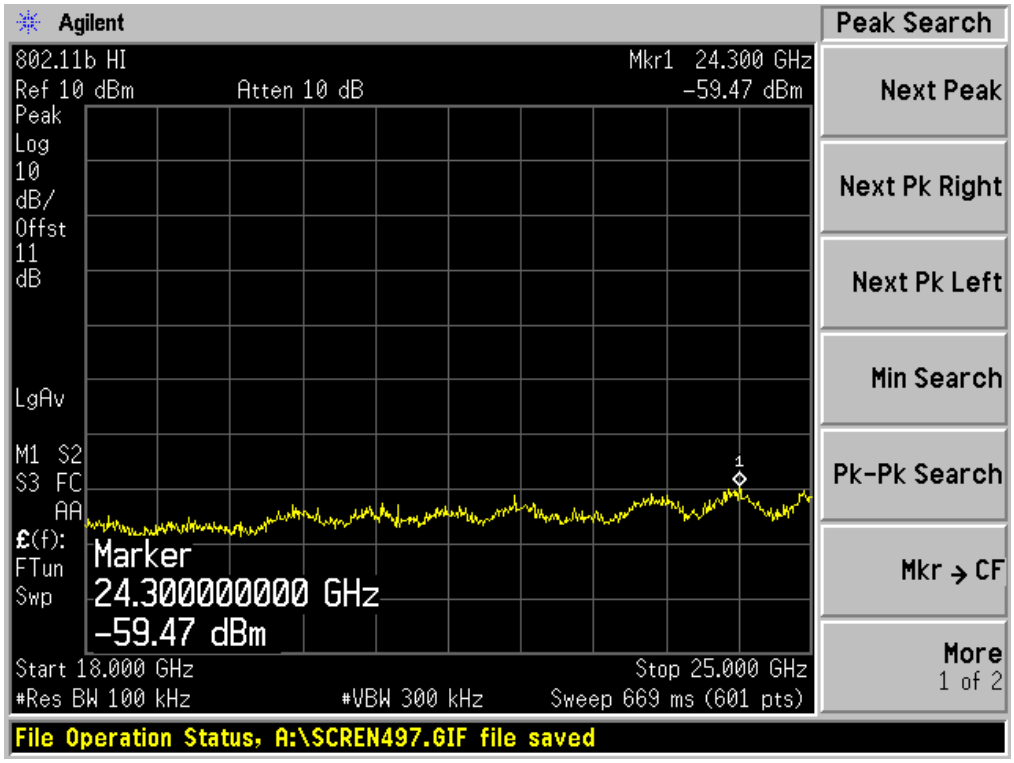
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802.11b HI
Ref 10 dBm
Atten 10 dB
Mkr1 24.300 GHz
-59.47 dBm
Peak
Log
10
dB/
Offst
11
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
24.300000000 GHz
-59.47 dBm
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
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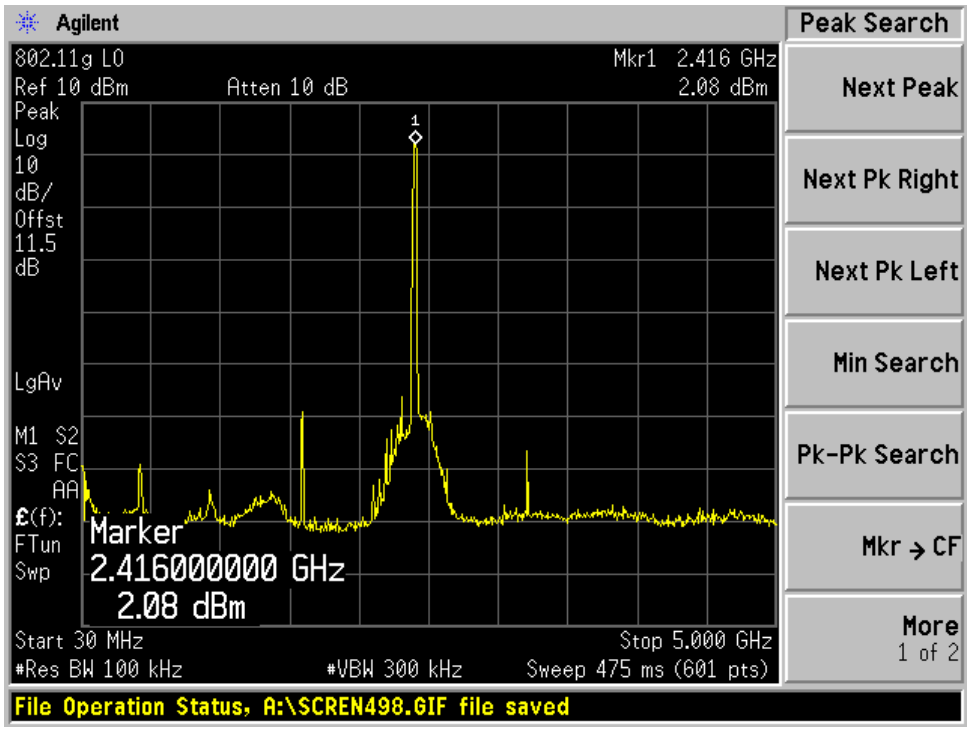
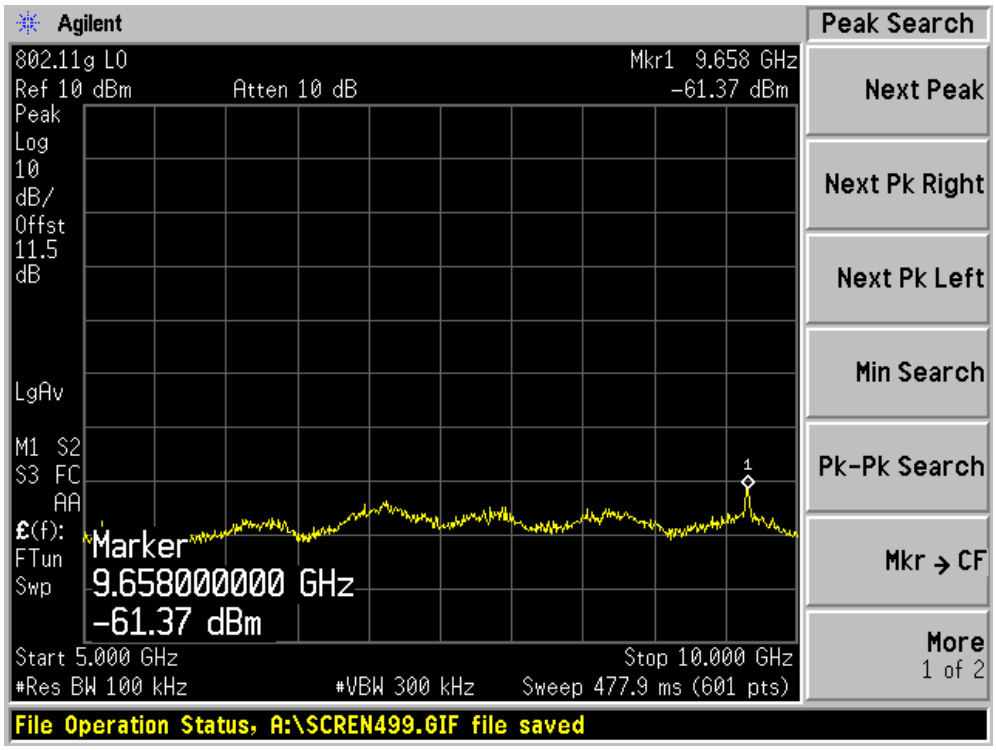
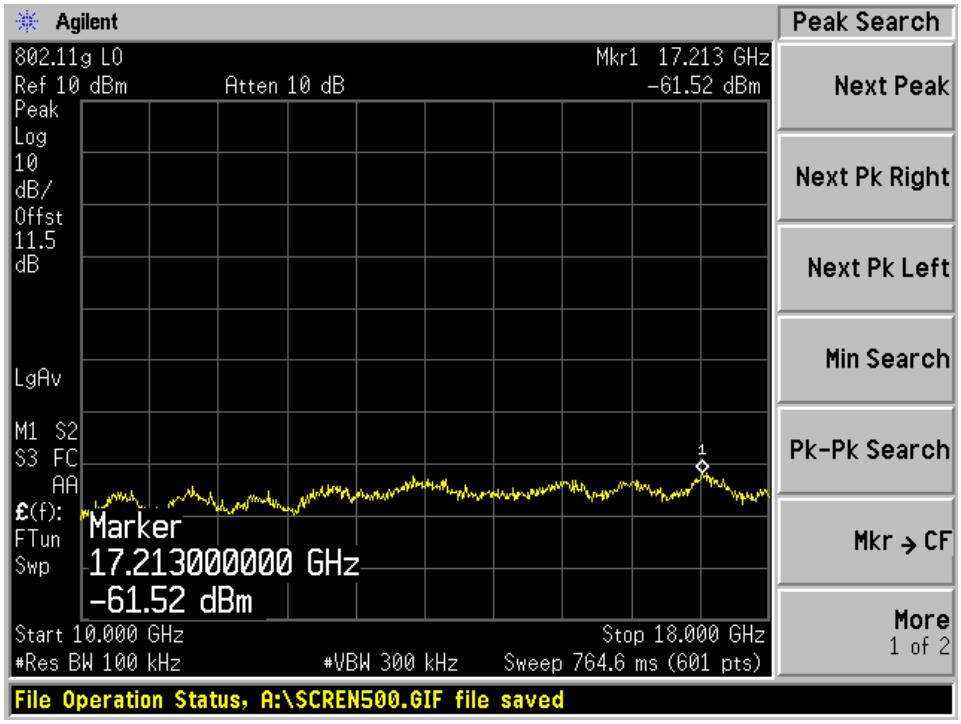
802.11g:

Low Channel



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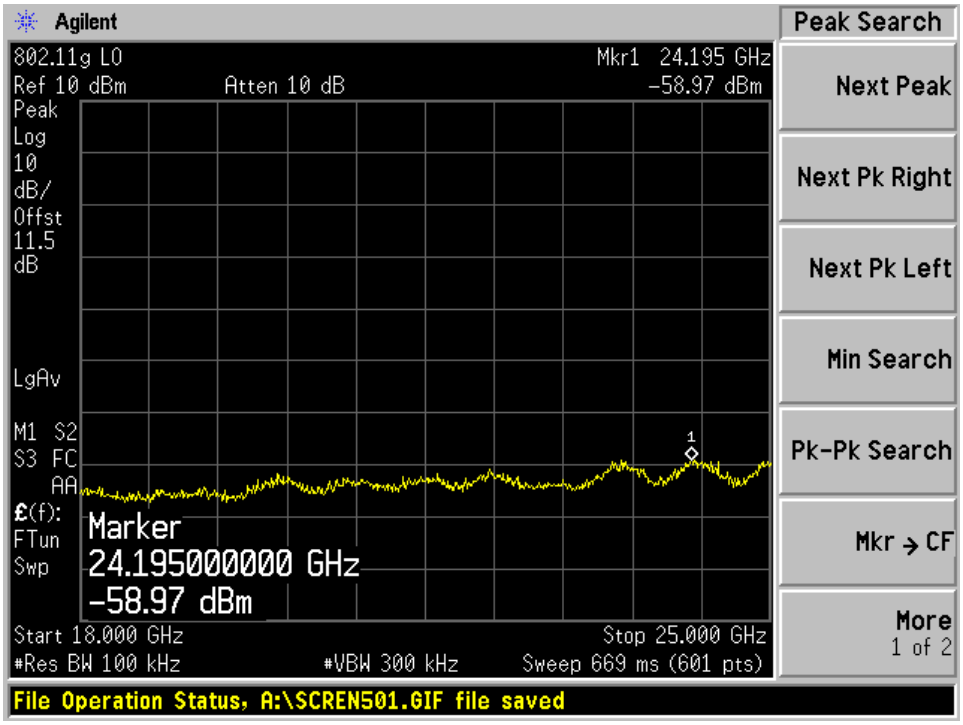
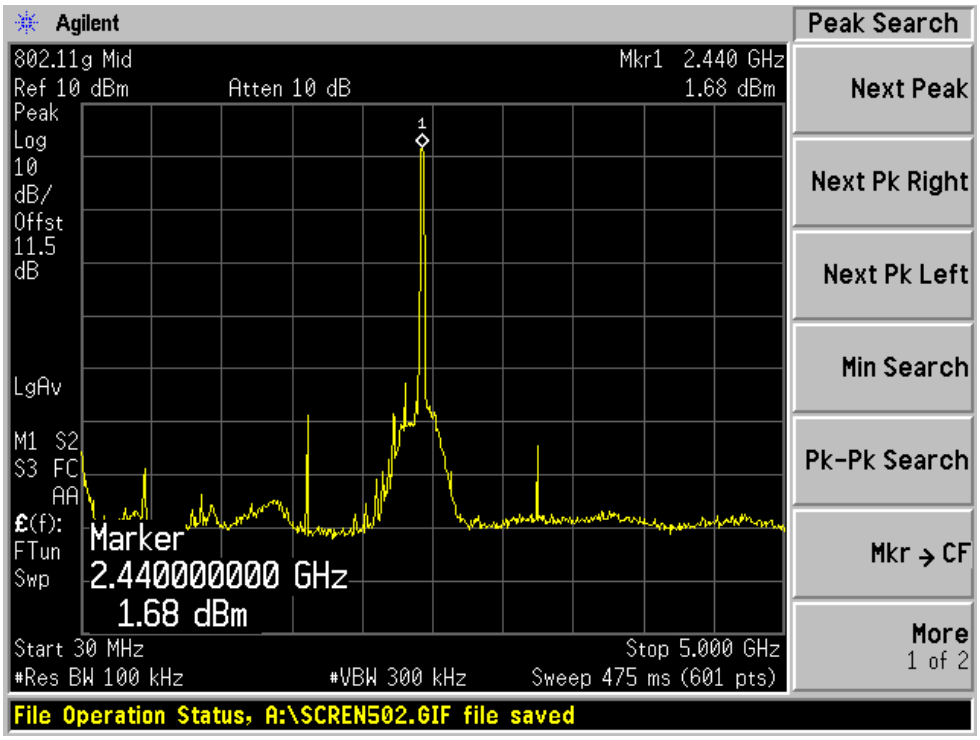
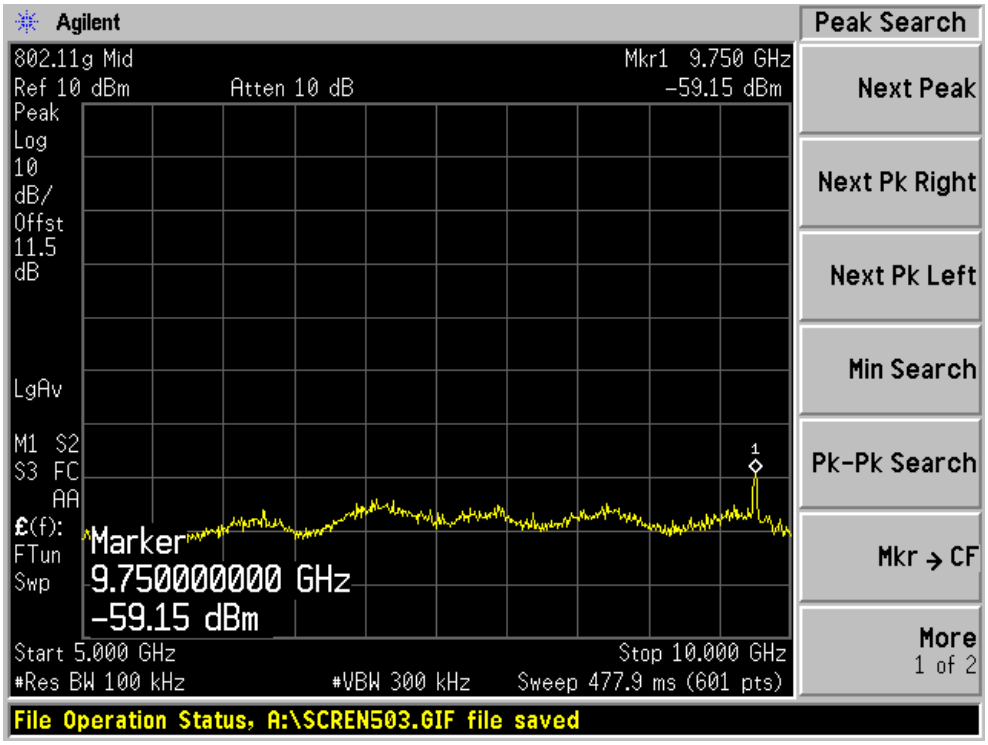
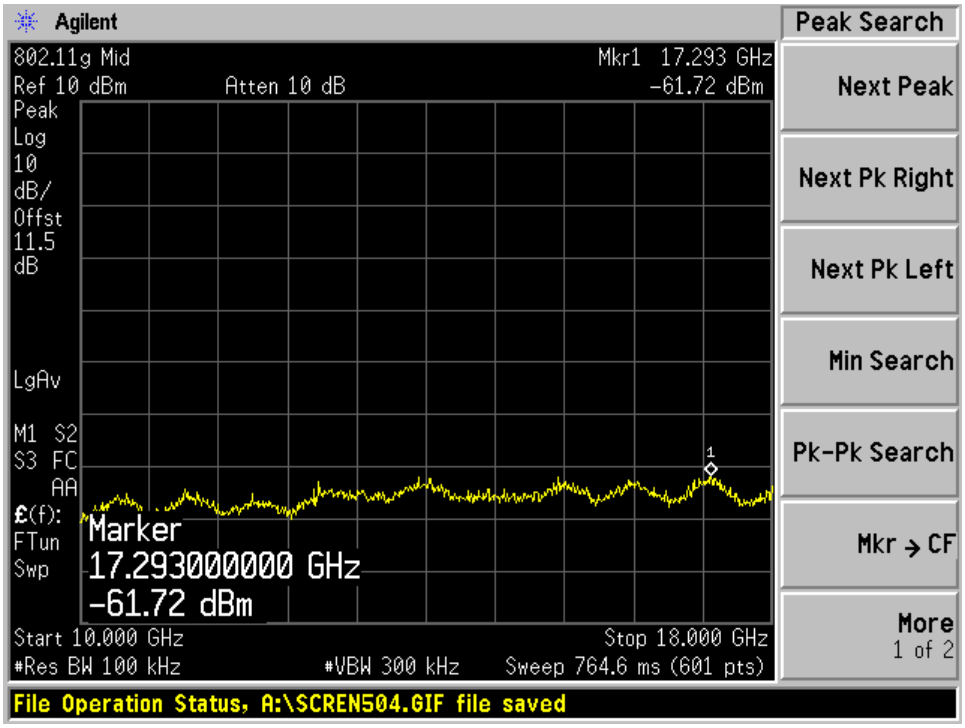
802.11g LO
Ref 10 dBm
Atten 10 dB
Mkr1 17.213 GHz
-61.52 dBm
Peak
Log
10
dB/
Offst
11.5
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
17.213000000 GHz
-61.52 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 764.6 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
File Operation Status, A:\SCREN500.GIF file saved

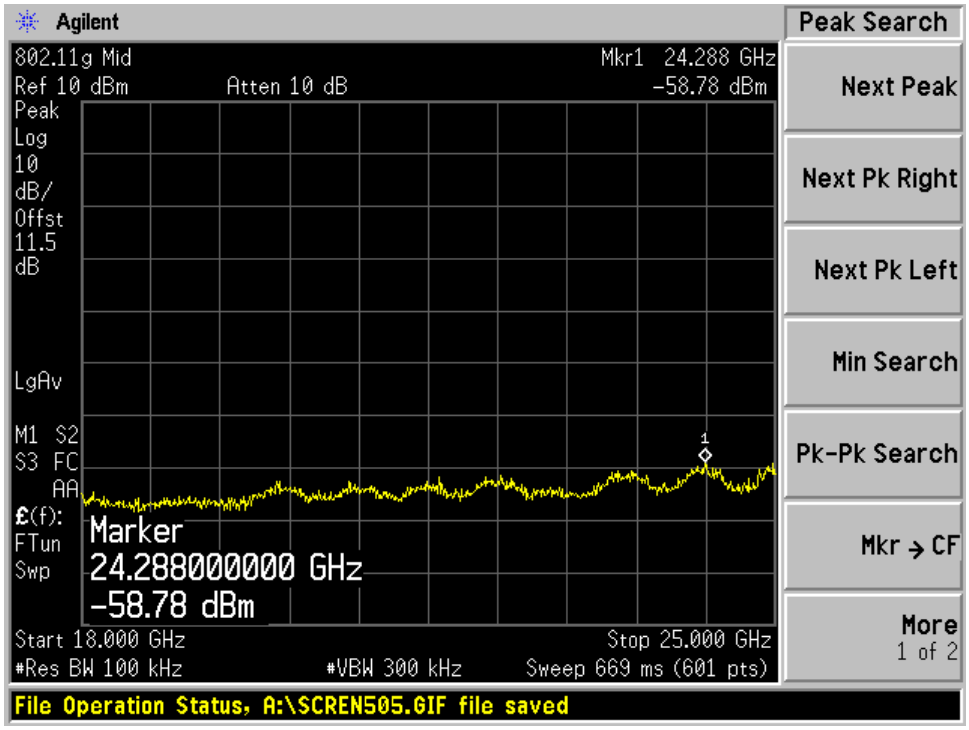

Agilent
802.11g LO
Ref 10 dBm
Atten 10 dB
Mkr1 24.195 GHz
-58.97 dBm
Peak
Log
10
dB/
Offst
11.5
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
24.195000000 GHz
-58.97 dBm
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
File Operation Status, A:\SCREN501.GIF file saved

Mid Channel

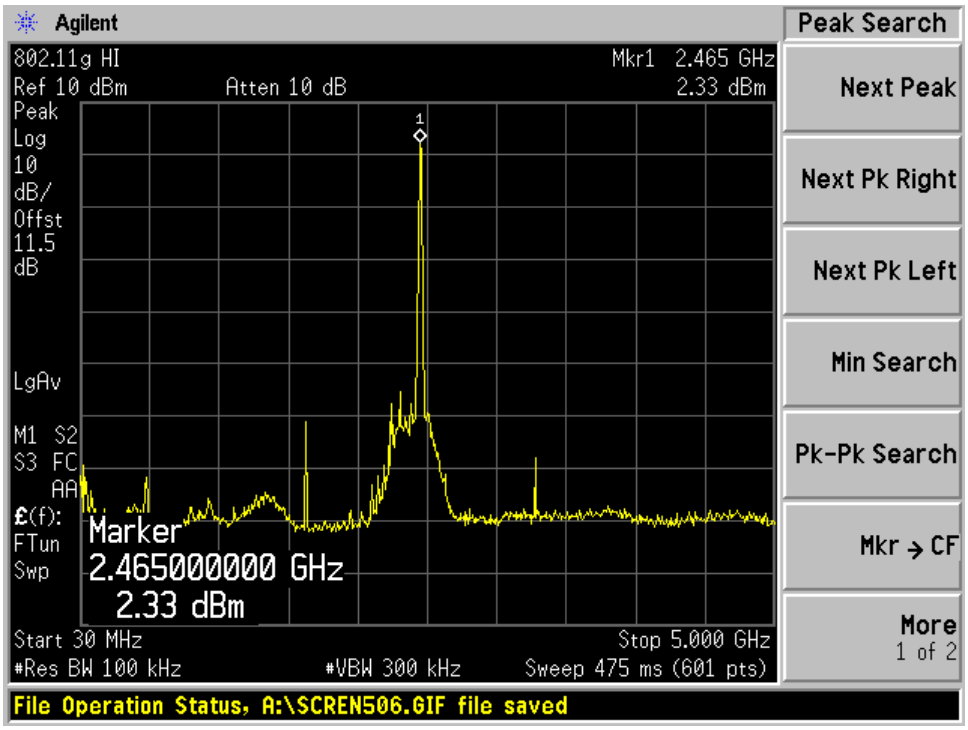

Agilent
Peak Search
802.11g Mid
Mkr1 2.440 GHz
Ref 10 dBm
Atten 10 dB
1.68 dBm
Peak
Log
10
dB/
Offst
11.5
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
2.440000000 GHz
1.68 dBm
Start 30 MHz
Stop 5.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 475 ms (601 pts)
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
File Operation Status, A:\SCREN502.GIF file saved

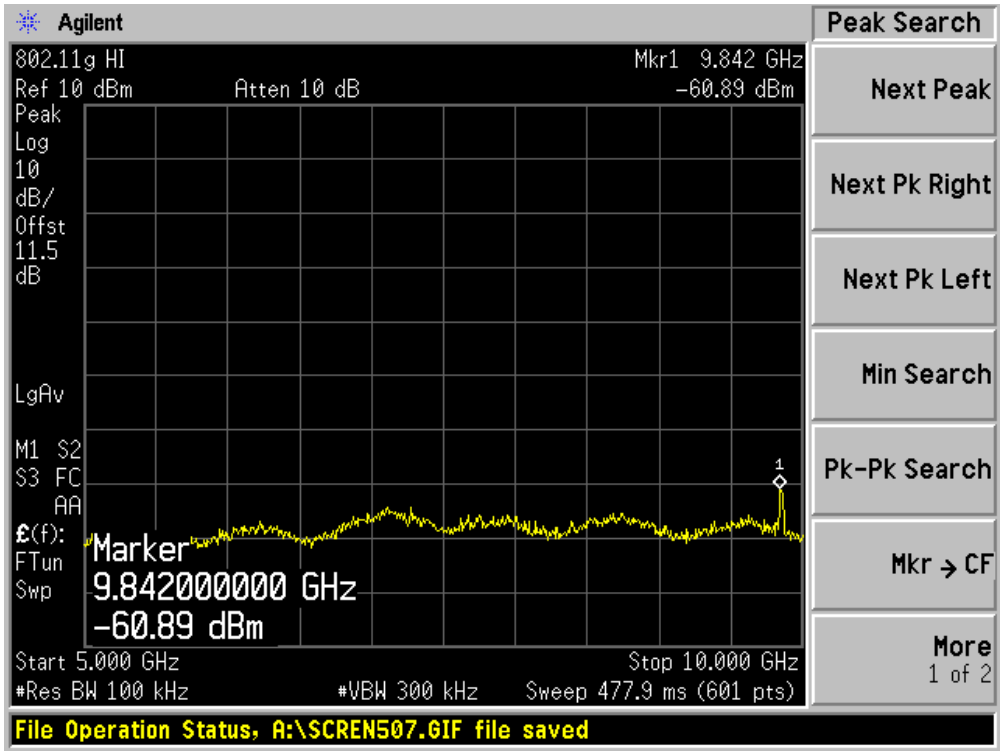

Agilent
Peak Search
802.11g Mid
Mkr1 9.750 GHz
Ref 10 dBm
Atten 10 dB
-59.15 dBm
Peak
Log
10
dB/
Offst
11.5
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
9.750000000 GHz
-59.15 dBm
Start 5.000 GHz
Stop 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 477.9 ms (601 pts)
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
File Operation Status, A:\SCREN503.GIF file saved

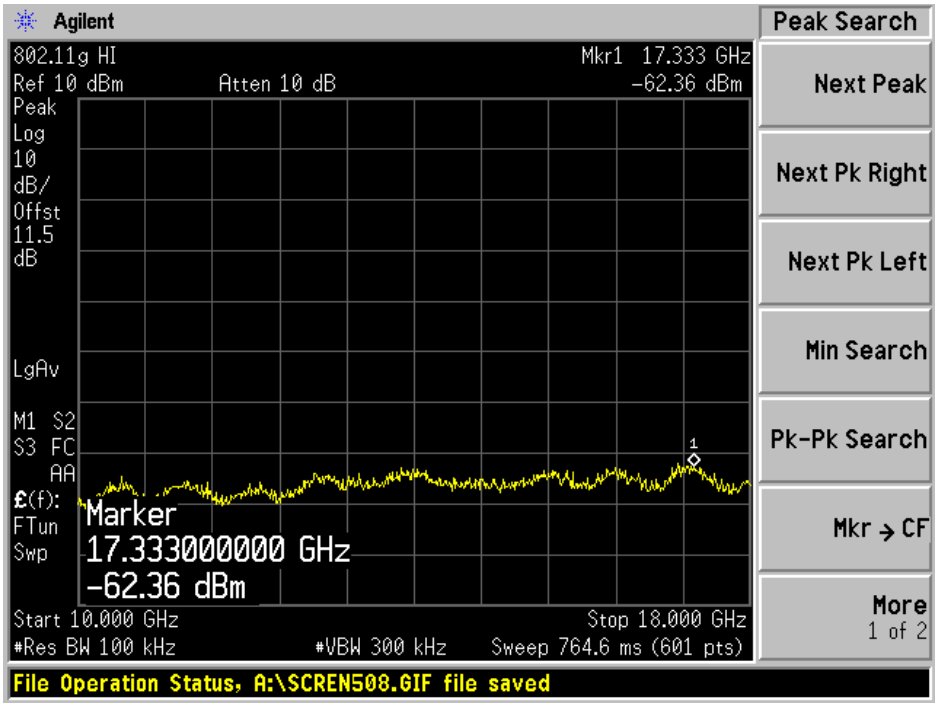

Agilent
802.11g Mid
Ref 10 dBm
Atten 10 dB
Mkr1 17.293 GHz
-61.72 dBm
Peak
Log
10
dB/
Offst
11.5
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
17.293000000 GHz
-61.72 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 764.6 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
File Operation Status, A:\SCREN504.GIF file saved

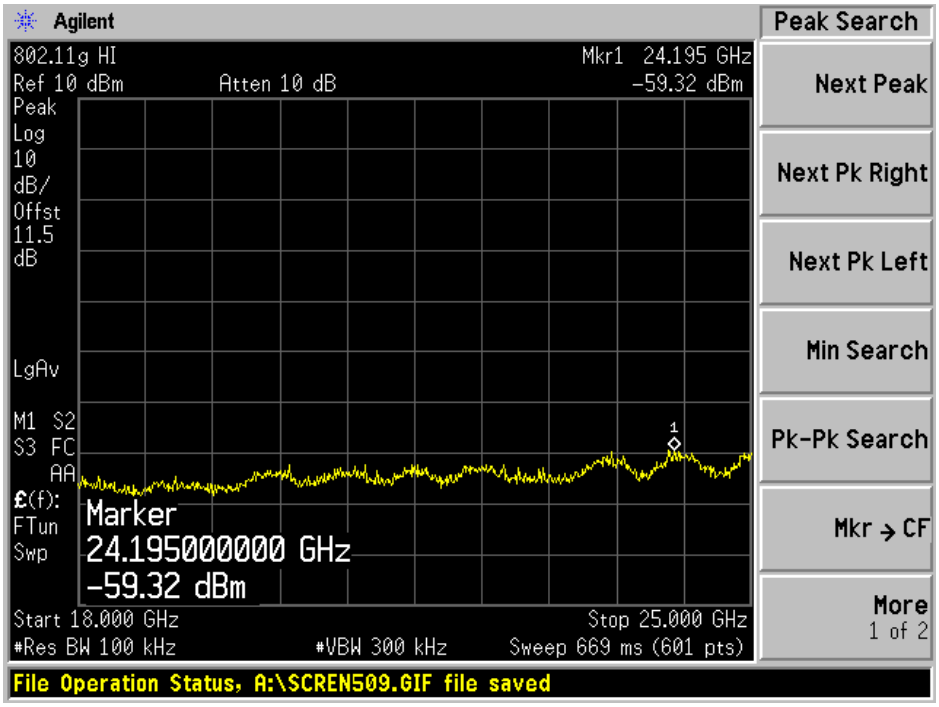

Agilent
802.11g Mid
Ref 10 dBm
Atten 10 dB
Mkr1 24.288 GHz
-58.78 dBm
Peak
Log
10
dB/
Offst
11.5
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
24.288000000 GHz
-58.78 dBm
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
File Operation Status, A:\SCREN505.GIF file saved

High Channel






Agilent
802.11g HI
Ref 10 dBm
Atten 10 dB
Mkr1 17.333 GHz
-62.36 dBm
Peak
Log
10
dB/
Offst
11.5
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
17.333000000 GHz
-62.36 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 764.6 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
File Operation Status, A:\SCREN508.GIF file saved


Agilent
802.11g HI
Ref 10 dBm
Atten 10 dB
Mkr1 24.195 GHz
-59.32 dBm
Peak
Log
10
dB/
Offst
11.5
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
24.195000000 GHz
-59.32 dBm
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
File Operation Status, A:\SCREN509.GIF file saved

§15.205 & §15.209 & §15.247(c) - SPURIOUS RADIATED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is ±4.0 dB.

According to §15.205, except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
[1]0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2655 – 2900	22.01 – 23.12
8.41425 – 8.41475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.57725	240 – 285	3345.8 – 3358	36.43 – 36.5
13.36 – 13.41	322 – 335.4	3600 – 4400	([2])

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510MHz
[2] Above 38.6

Except as provided in paragraph (d) and (e), the filed strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

According to §15.209, the device shall meet radiated emission general requirements.

Except for Class A device, the filed strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (Microvolts/meter)	Field Strength (dBμV/meter)
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

EUT Setup

The radiated emission tests were performed using the setup in accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

Test Equipment List and Details

Manufacturer	Description	Model	S/N	Cal Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06
HP	Pre, Amplifier (1 ~ 26.5 GHz)	8449B	3147A00400	2005-08-10
Sonoma Instrument	Amplifier Broadband (10 KHz - 2500 MHz)	317	260407	2006-03-20
Sunol Science	30MHz ~ 3 GHz Antenna	JB3	A020106-3/S006628	2006-02-14
A.R.A	Antenna, Horn, DRG	DRG-118/A	1132	2005-08-17

* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

For the radiated emissions test, the EUT, and all support equipment power cords was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all
installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission
was found to be marginal (within -4 dBμV of specification limits), and are distinguished with a "**QP**" in
the data table.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corrected Amplitude = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit.
The equation for margin calculation is as follows:

Margin = Corrected Amplitude - FCC 15.247 Limit

Environmental Conditions

Temperature:	16° C
Relative Humidity:	55%
ATM Pressure:	1024 mbar

**The testing was performed by James Ma on 2006-05-24*

Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247, and had the worst margin of:

802.11b:

-2.4 dB at **9648.00 MHz** in the **Vertical** polarization for Low Channel. *
-16.8 dB at **9748.00 MHz** in the **Vertical** polarization for Middle Channel.*
-16.1 dB at **9848.00 MHz** in the **Vertical** polarization for High Channel.*

802.11g:

-11.5 dB at **9648.00 MHz** in the **Vertical** polarization for Low Channel. *
-16.2 dB at **9748.00 MHz** in the **Vertical** polarization for Middle Channel.*
-16.9 dB at **9848.00 MHz** in the **Vertical** polarization for High Channel.*

** The test data was within the measurement of uncertainty.*

Radiated Emissions Test plot & data@ 3 Meters

802.11b mode

Primary scan 1GHz -25GHz, (Low channel 2412 MHz)

Frequency MHz	Reading dBuV/m	Azimuth Degrees	Height m	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments	Testing Condition Mode/ Distance
2412.00	113.1	330	1.4	V	28.7	1.5	35.8	97.5			Fund/Peak	CW / 3
2412.00	102.9	330	1.4	H	28.7	1.5	35.8	87.2			Fund/Peak	CW / 3
2412.00	108.8	330	1.4	V	28.7	1.5	35.8	93.1			Ave	CW / 3
2412.00	99.1	330	1.2	H	28.7	1.5	35.8	83.4			Ave	CW / 3
9648.00	44.0	180	2.0	V	38.1	3.7	34.2	51.6	54	-2.4	Ave	CW / 3
9648.00	43.6	90	2.0	H	38.1	3.7	34.2	51.2	54	-2.8	Ave	CW / 3
7236.00	42.6	180	2.0	V	36.7	4.2	34.7	48.8	54	-5.2	Ave	CW / 3
7236.00	42.3	90	2.0	H	36.7	4.2	34.7	48.5	54	-5.5	Ave	CW / 3
4824.00	44.9	270	2.4	V	32.5	1.9	34.8	44.5	54	-9.5	Ave	CW / 3
4824.00	44.8	180	2.3	H	32.5	1.9	34.8	44.4	54	-9.6	Ave	CW / 3
9648.00	54.6	90	2.0	V	38.1	3.7	34.2	62.2	74	-11.8	Peak	CW / 3
9648.00	54.1	180	2.0	H	38.1	3.7	34.2	61.7	74	-12.3	Peak	CW / 3
7236.00	53.3	90	2.0	V	36.7	4.2	34.7	59.5	74	-14.5	Peak	CW / 3
7236.00	52.8	180	2.0	H	36.7	4.2	34.7	59.0	74	-15.0	Peak	CW / 3
4824.00	55.3	200	1.7	V	32.5	1.9	34.8	54.9	74	-19.1	Peak	CW / 3
1192.35	46.7	180	2.0	V	23.3	1.1	36.8	34.3	54	-19.7	Ave	CW / 3
4824.00	53.6	180	2.3	H	32.5	1.9	34.8	53.2	74	-20.8	Peak	CW / 3
1192.35	45.4	90	2.0	H	23.3	1.1	36.8	33.0	54	-21.0	Ave	CW / 3
1192.35	63.8	90	2.0	V	23.3	1.1	36.8	51.4	74	-22.6	Peak	CW / 3
1192.35	58.2	180	2.0	H	23.3	1.1	36.8	45.8	74	-28.2	Peak	CW / 3

Primary scan 1GHz -25GHz, (Middle channel 2437MHz)

Frequency MHz	Reading dBuV/m	Azimuth Degrees	Height m	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments	Testing Condition Mode/ Distance
2437.00	111.2	180	1.3	V	28.7	1.5	35.8	95.5			Fund/Peak	CW / 3
2437.00	102.4	180	1.2	H	28.7	1.5	35.8	86.7			Fund/Peak	CW / 3
2437.00	106.8	180	1.3	V	28.7	1.5	35.8	91.1			Ave	CW / 3
2437.00	97.9	180	1.2	H	28.7	1.5	35.8	82.2			Ave	CW / 3
9748.00	29.6	180	2.0	V	38.1	3.7	34.2	37.2	54	-16.8	Ave	CW / 3
9748.00	29.1	90	2.0	H	38.1	3.7	34.2	36.7	54	-17.3	Ave	CW / 3
7311.00	27.9	270	2.4	V	36.7	4.2	34.7	34.1	54	-19.9	Ave	CW / 3
7311.00	27.4	180	2.1	H	36.7	4.2	34.7	33.6	54	-20.4	Ave	CW / 3
1196.40	61.8	90	2.0	V	23.3	1.1	36.8	49.4	74	-24.6	Peak	CW / 3
4874.00	29.2	270	2.4	V	32.5	1.9	34.8	28.8	54	-25.2	Ave	CW / 3
9748.00	41.2	90	2.0	V	38.1	3.7	34.2	48.8	74	-25.2	Peak	CW / 3
4874.00	29.1	180	2.2	H	32.5	1.9	34.8	28.7	54	-25.3	Ave	CW / 3
9748.00	40.6	180	2.0	H	38.1	3.7	34.2	48.2	74	-25.8	Peak	CW / 3
1196.40	37.5	180	2.0	V	23.3	1.1	36.8	25.1	54	-28.9	Ave	CW / 3
1196.40	57.2	180	2.0	H	23.3	1.1	36.8	44.8	74	-29.2	Peak	CW / 3
7311.00	38.5	270	2.4	V	36.7	4.2	34.7	44.7	74	-29.3	Peak	CW / 3
7311.00	38.0	180	2.3	H	36.7	4.2	34.7	44.2	74	-29.8	Peak	CW / 3
1196.40	35.6	90	2.0	H	23.3	1.1	36.8	23.2	54	-30.8	Ave	CW / 3
4874.00	40.2	270	2.4	V	32.5	1.9	34.8	39.8	74	-34.2	Peak	CW / 3
4874.00	40.0	180	2.2	H	32.5	1.9	34.8	39.6	74	-34.4	Peak	CW / 3

Primary scan 1GHz -25GHz, (High Channel 2462 MHz)

Frequency MHz	Reading dBuV/m	Azimuth Degrees	Height m	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments	Testing Condition Mode/Distance
2462.00	111.4	180	1.3	V	28.7	1.5	35.8	95.7			Fund/Peak	CW / 3
2462.00	104.6	180	1.2	H	28.7	1.5	35.8	88.9			Fund/Peak	CW / 3
2462.00	107.2	180	1.3	V	28.7	1.5	35.8	91.5			Ave	CW / 3
2462.00	101.2	180	1.2	H	28.7	1.5	35.8	85.5			Ave	CW / 3
9848.00	30.3	180	2.0	V	38.1	3.7	34.2	37.9	54	-16.1	Ave	CW / 3
9848.00	30.1	90	2.0	H	38.1	3.7	34.2	37.7	54	-16.3	Ave	CW / 3
7386.00	29.8	270	2.4	V	36.7	4.2	34.7	36.0	54	-18.0	Ave	CW / 3
7386.00	29.2	90	2.1	H	36.7	4.2	34.7	35.4	54	-18.6	Ave	CW / 3
4924.00	30.2	270	2.4	V	32.5	1.9	34.8	29.8	54	-24.2	Ave	CW / 3
4924.00	30.0	90	2.1	H	32.5	1.9	34.8	29.6	54	-24.4	Ave	CW / 3
1199.65	61.8	90	2.0	V	23.3	1.1	36.8	49.4	74	-24.6	Peak	CW / 3
1199.65	41.4	90	2.0	H	23.3	1.1	36.8	29.0	54	-25.0	Ave	CW / 3
9848.00	41.0	90	2.0	V	38.1	3.7	34.2	48.6	74	-25.4	Peak	CW / 3
9848.00	40.5	180	2.0	H	38.1	3.7	34.2	48.1	74	-25.9	Peak	CW / 3
7386.00	40.8	270	2.4	V	36.7	4.2	34.7	47.0	74	-27.0	Peak	CW / 3
7386.00	40.2	90	2.1	H	36.7	4.2	34.7	46.4	74	-27.6	Peak	CW / 3
1199.65	37.8	180	2.0	V	23.3	1.1	36.8	25.4	54	-28.6	Ave	CW / 3
1199.65	55.6	180	2.0	H	23.3	1.1	36.8	43.2	74	-30.8	Peak	CW / 3
4924.00	41.5	270	2.4	V	32.5	1.9	34.8	41.1	74	-32.9	Peak	CW / 3
4924.00	40.8	90	2.1	H	32.5	1.9	34.8	40.4	74	-33.6	Peak	CW / 3

802.11g mode

Primary scan 1GHz -25GHz, (Low channel 2412 MHz)

Frequency	Reading	Azimuth	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247	15.247		Testing Condition
MHz	dBuV/m	Degrees	m	H / V	dB	dB	dB	dBuV/m	Limit (dBuV/m)	Margin	Comments	Mode/Distance
2412.00	111.8	330	1.4	V	28.7	1.5	35.8	96.1			Fund/Peak	CW / 3
2412.00	101.6	330	1.4	H	28.7	1.5	35.8	85.9			Fund/Peak	CW / 3
2412.00	102.1	330	1.4	V	28.7	1.5	35.8	86.4			Ave	CW / 3
2412.00	91.5	330	1.2	H	28.7	1.5	35.8	75.8			Ave	CW / 3
9648.00	34.9	180	2.0	V	38.1	3.7	34.2	42.5	54	-11.5	Ave	CW / 3
9648.00	34.5	90	2.0	H	38.1	3.7	34.2	42.1	54	-11.9	Ave	CW / 3
7236.00	33.9	180	2.0	V	36.7	4.2	34.7	40.1	54	-13.9	Ave	CW / 3
7236.00	33.6	90	2.0	H	36.7	4.2	34.7	39.8	54	-14.2	Ave	CW / 3
4824.00	35.9	270	2.4	V	32.5	1.9	34.8	35.5	54	-18.5	Ave	CW / 3
9648.00	47.8	90	2.0	V	38.1	3.7	34.2	55.4	74	-18.6	Peak	CW / 3
4824.00	35.5	180	2.3	H	32.5	1.9	34.8	35.1	54	-18.9	Ave	CW / 3
9648.00	47.3	180	2.0	H	38.1	3.7	34.2	54.9	74	-19.1	Peak	CW / 3
7236.00	45.9	90	2.0	V	36.7	4.2	34.7	52.1	74	-21.9	Peak	CW / 3
7236.00	45.4	180	2.0	H	36.7	4.2	34.7	51.6	74	-22.4	Peak	CW / 3
1196.20	38.8	180	2.0	V	23.3	1.1	36.8	26.4	54	-27.6	Ave	CW / 3
4824.00	46.7	200	1.7	V	32.5	1.9	34.8	46.3	74	-27.7	Peak	CW / 3
4824.00	46.5	180	2.3	H	32.5	1.9	34.8	46.1	74	-27.9	Peak	CW / 3
1196.20	38.1	90	2.0	H	23.3	1.1	36.8	25.7	54	-28.3	Ave	CW / 3
1196.20	55.2	90	2.0	V	23.3	1.1	36.8	42.8	74	-31.2	Peak	CW / 3
1196.20	54.3	180	2.0	H	23.3	1.1	36.8	41.9	74	-32.1	Peak	CW / 3

Primary scan 1GHz -25GHz, (Middle channel 2437MHz)

Frequency MHz	Reading dBuV/m	Azimuth Degrees	Height m	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments	Testing Condition Mode/Distance
2437.00	112.8	180	1.3	V	28.7	1.5	35.8	97.1			Fund/Peak	CW / 3
2437.00	102.6	180	1.2	H	28.7	1.5	35.8	86.9			Fund/Peak	CW / 3
2437.00	102.2	180	1.3	V	28.7	1.5	35.8	86.5			Ave	CW / 3
2437.00	91.7	180	1.2	H	28.7	1.5	35.8	76.0			Ave	CW / 3
9748.00	30.2	180	2.0	V	38.1	3.7	34.2	37.8	54	-16.2	Ave	CW / 3
9748.00	29.4	90	2.0	H	38.1	3.7	34.2	37.0	54	-17.0	Ave	CW / 3
7311.00	28.2	270	2.4	V	36.7	4.2	34.7	34.4	54	-19.6	Ave	CW / 3
7311.00	27.8	180	2.1	H	36.7	4.2	34.7	34.0	54	-20.0	Ave	CW / 3
4874.00	29.2	270	2.4	V	32.5	1.9	34.8	28.8	54	-25.2	Ave	CW / 3
9748.00	41.2	90	2.0	V	38.1	3.7	34.2	48.8	74	-25.2	Peak	CW / 3
9748.00	40.8	180	2.0	H	38.1	3.7	34.2	48.4	74	-25.6	Peak	CW / 3
4874.00	28.5	180	2.2	H	32.5	1.9	34.8	28.1	54	-25.9	Ave	CW / 3
7311.00	40.6	270	2.4	V	36.7	4.2	34.7	46.8	74	-27.2	Peak	CW / 3
1201.40	58.6	180	2.0	H	23.3	1.4	36.8	46.4	74	-27.6	Peak	CW / 3
1201.40	58.3	90	2.0	V	23.3	1.4	36.8	46.1	74	-27.9	Peak	CW / 3
7311.00	39.3	180	2.3	H	36.7	4.2	34.7	45.5	74	-28.5	Peak	CW / 3
1201.40	37.7	180	2.0	V	23.3	1.4	36.8	25.5	54	-28.5	Ave	CW / 3
1201.40	37.0	90	2.0	H	23.3	1.4	36.8	24.8	54	-29.2	Ave	CW / 3
4874.00	41.6	270	2.4	V	32.5	1.9	34.8	41.2	74	-32.8	Peak	CW / 3
4874.00	41.2	180	2.2	H	32.5	1.9	34.8	40.8	74	-33.2	Peak	CW / 3

Primary scan 1GHz -25GHz, (High Channel 2462 MHz)

Frequency MHz	Reading dBuV/m	Azimuth Degree	Height m	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments	Testing Condition Mode/Distance
2462.00	111.9	180	1.3	V	28.7	1.5	35.8	96.2			Fund/Peak	CW / 3
2462.00	101.3	180	1.2	H	28.7	1.5	35.8	85.6			Fund/Peak	CW / 3
2462.00	100.9	180	1.3	V	28.7	1.5	35.8	85.2			Ave	CW / 3
2462.00	90.7	180	1.2	H	28.7	1.5	35.8	75.0			Ave	CW / 3
9848.00	29.5	180	2.0	V	38.1	3.7	34.2	37.1	54	-16.9	Ave	CW / 3
9848.00	29.3	90	2.0	H	38.1	3.7	34.2	36.9	54	-17.1	Ave	CW / 3
7386.00	29.8	270	2.4	V	36.7	4.2	34.7	36.0	54	-18.0	Ave	CW / 3
7386.00	28.5	90	2.1	H	36.7	4.2	34.7	34.7	54	-19.3	Ave	CW / 3
4924.00	30.5	270	2.4	V	32.5	1.9	34.8	30.1	54	-23.9	Ave	CW / 3
4924.00	30.0	90	2.1	H	32.5	1.9	34.8	29.6	54	-24.4	Ave	CW / 3
9848.00	41.2	90	2.0	V	38.1	3.7	34.2	48.8	74	-25.2	Peak	CW / 3
1201.40	60.8	90	2.0	V	23.3	1.4	36.8	48.6	74	-25.4	Peak	CW / 3
9848.00	40.5	180	2.0	H	38.1	3.7	34.2	48.1	74	-25.9	Peak	CW / 3
1201.40	37.1	180	2.0	V	23.3	1.4	36.8	24.9	54	-29.1	Ave	CW / 3
1201.40	36.8	90	2.0	H	23.3	1.4	36.8	24.6	54	-29.4	Ave	CW / 3
7386.00	37.8	270	2.4	V	36.7	4.2	34.7	44.0	74	-30.0	Peak	CW / 3
7386.00	37.4	90	2.1	H	36.7	4.2	34.7	43.6	74	-30.4	Peak	CW / 3
1201.40	54.4	180	2.0	H	23.3	1.4	36.8	42.2	74	-31.8	Peak	CW / 3
4924.00	42.2	270	2.4	V	32.5	1.9	34.8	41.8	74	-32.2	Peak	CW / 3
4924.00	41.6	90	2.1	H	32.5	1.9	34.8	41.2	74	-32.8	Peak	CW / 3

§15.247(a)(2) – 6 dB BANDWIDTH

Standard Applicable

According to §15.247(a)(2), for digital modulation techniques, the minimum 6dB bandwidth shall be at least 500 kHz.

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 without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth. (6 dB bandwidth for DTS)
4. Repeat above procedures until all frequencies measured were complete.

Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	16° C
Relative Humidity:	55%
ATM Pressure:	1024 mbar

**The testing was performed by James Ma on 2006-05-24*

Measurement Result

802.11b: Test Result

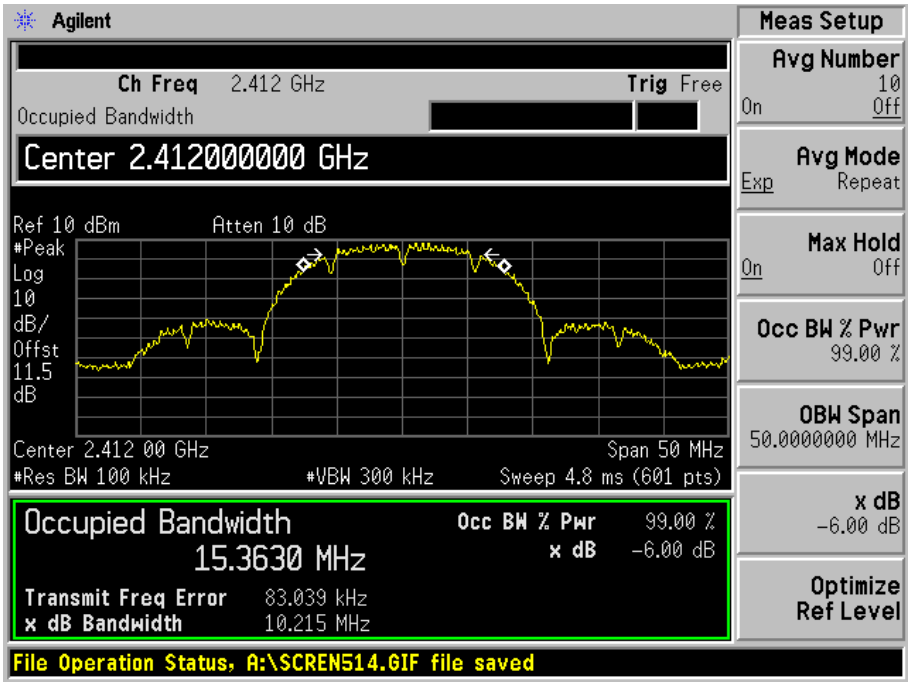
Channel	Frequency MHz	Channel Bandwidth (KHz)	Limit KHz
Low	2412	10215	>500
Mid	2437	12117	>500
High	2462	11183	>500

802.11g: Test Result

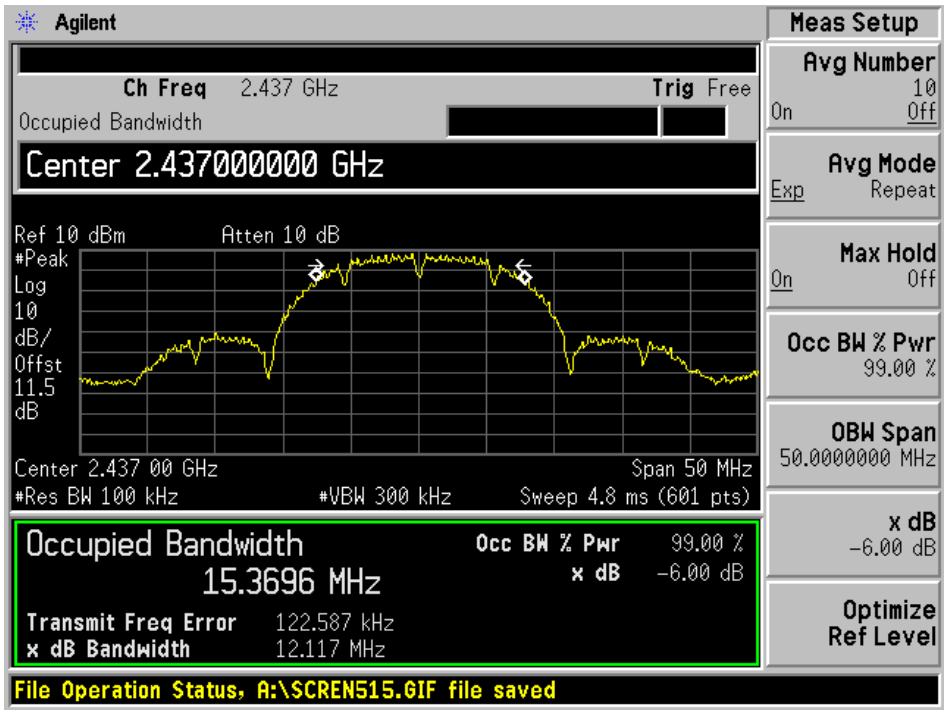
Channel	Frequency MHz	Channel Bandwidth (KHz)	Limit KHz
Low	2412	16452	>500
Mid	2437	16365	>500
High	2462	16563	>500

802.11b Plots:

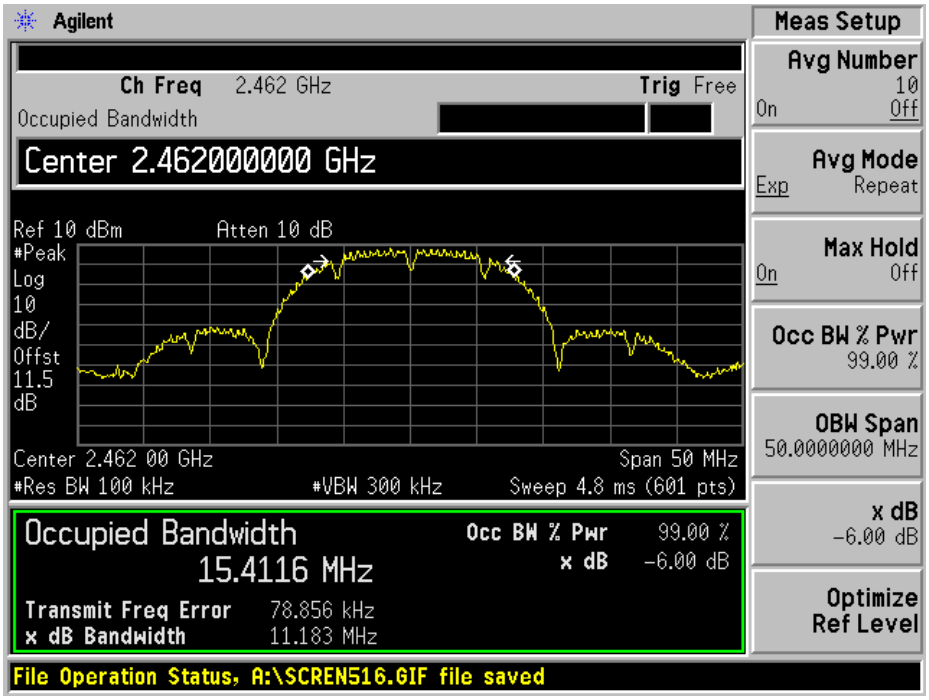
Low Channel



Middle Channel

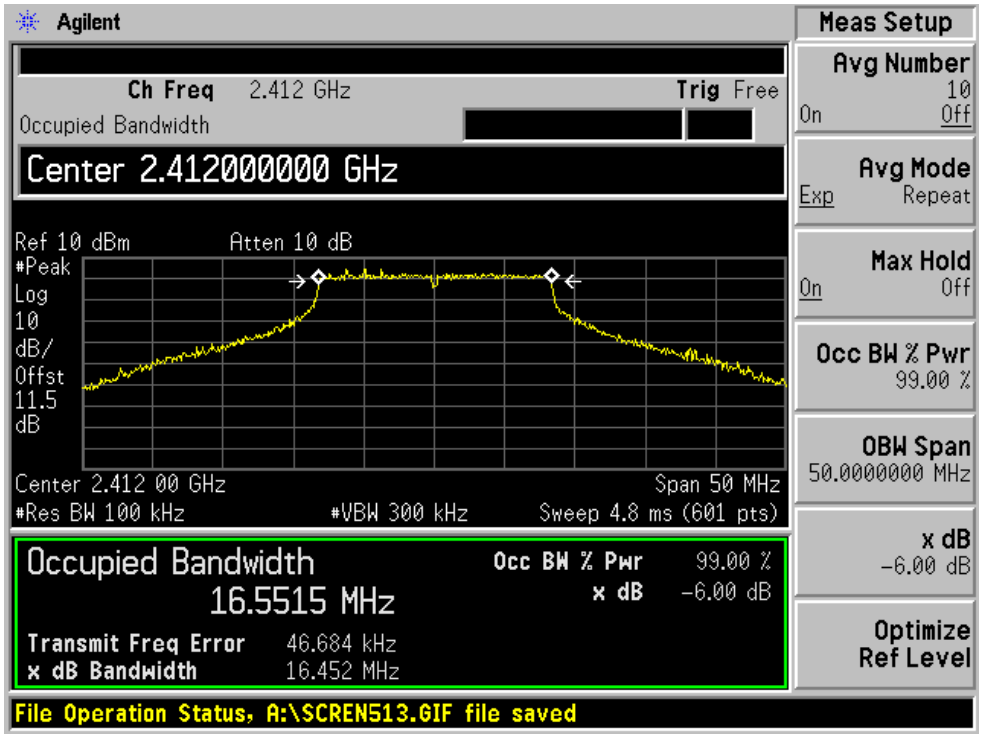


High Channel

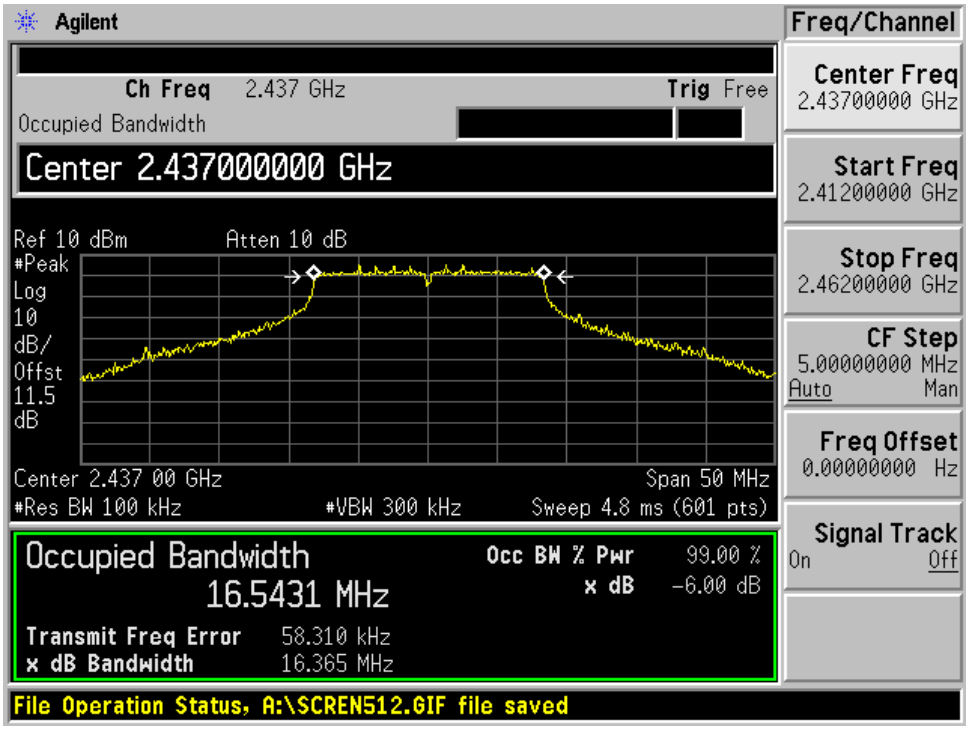


802.11g plots:

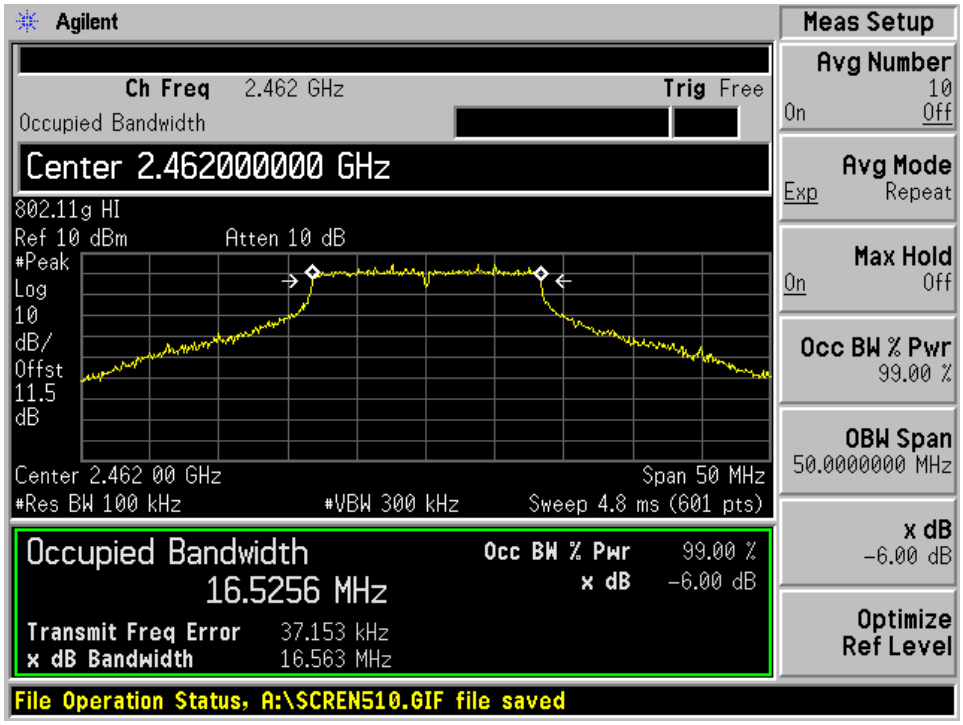
Low Channel



Mid. Channel



High Channel



§15.247(b)(3) - PEAK OUTPUT POWER MEASUREMENT

Standard Applicable

According to §15.247(b) (3), for systems using digital modulation in 2400-2483.5 MHz: 1 Watt

Measurement Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a spectrum analyzer.
3. Add a correction factor to the display.

Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	16° C
Relative Humidity:	55%
ATM Pressure:	1024 mbar

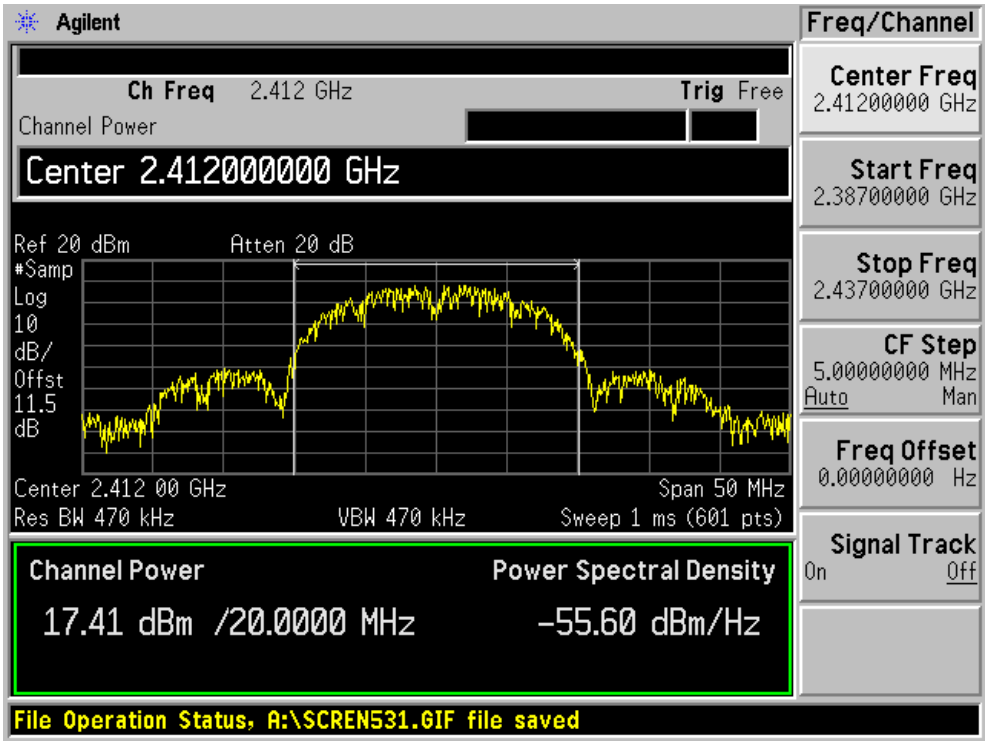
**The testing was performed by James Ma on 2006-05-24*

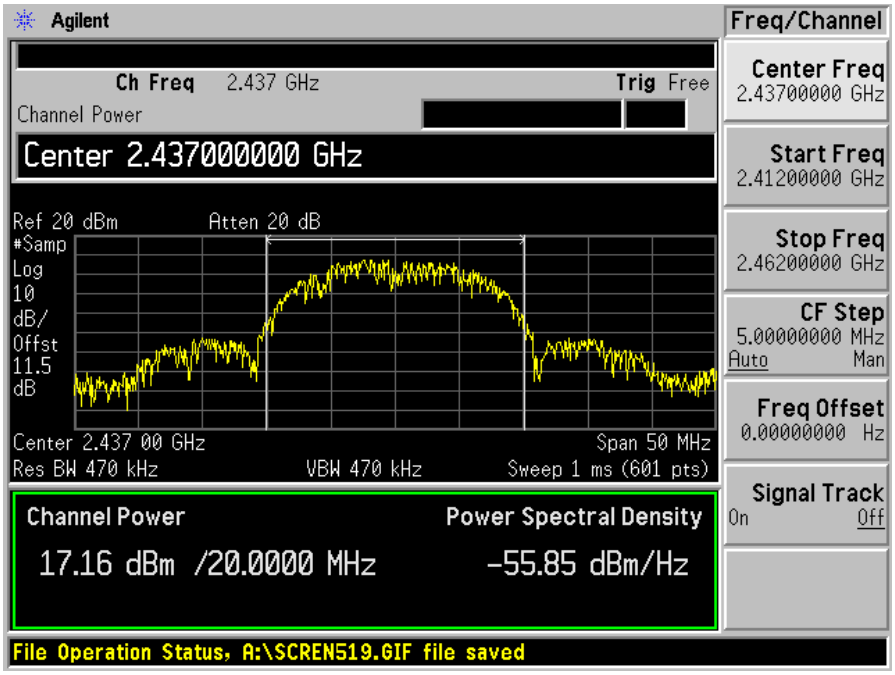
Measurement Result

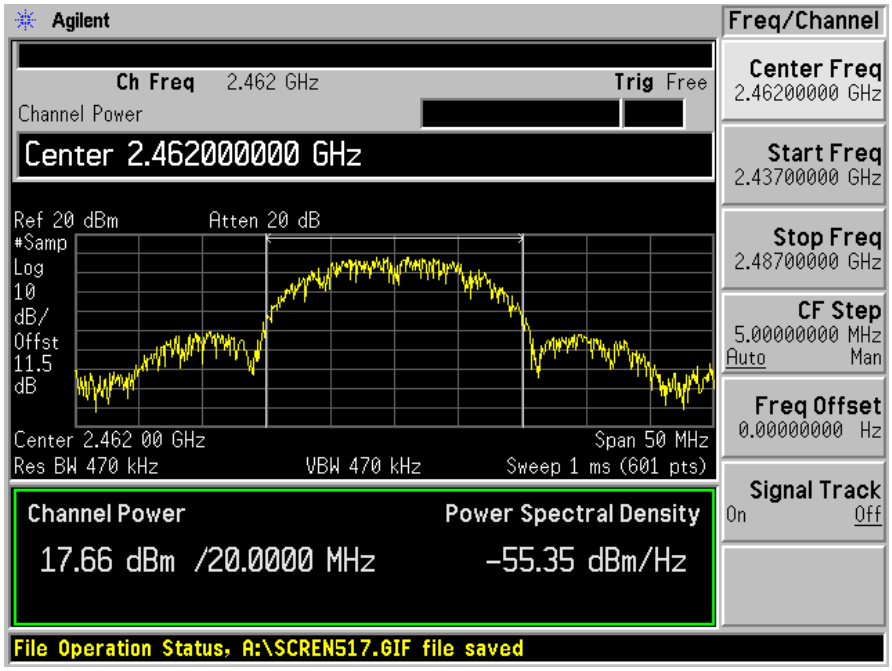
RF Output Power

802.11b mode:

Channel	Frequency MHz	Max Peak Output Power (dBm)	(m Watt)	Limit (m Watt)	Result
Low	2412	17.41	55.08	1000	Complies
Mid	2437	17.16	52.00	1000	Complies
High	2462	17.66	58.34	1000	Complies

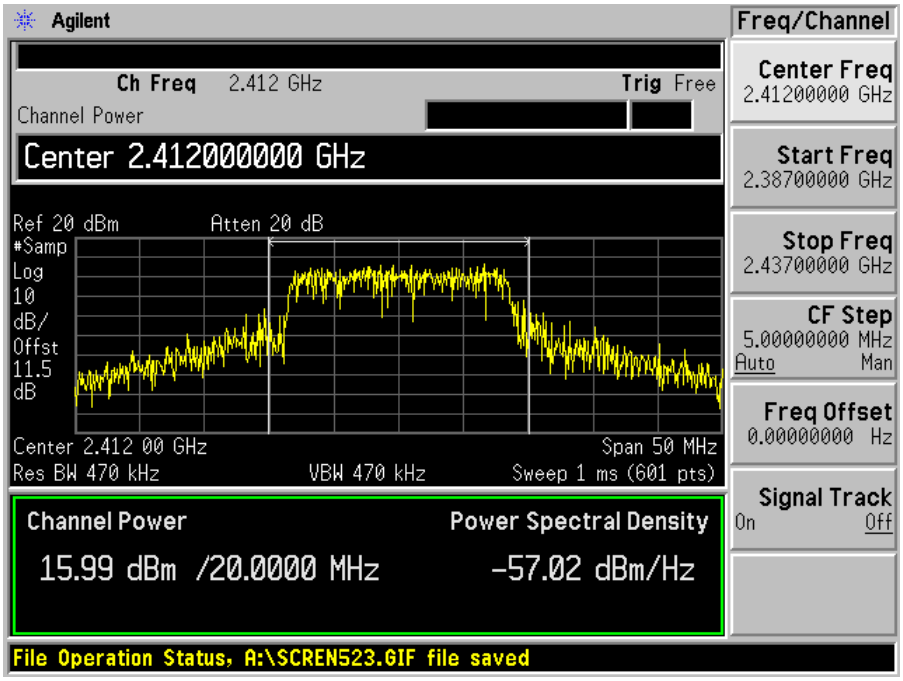


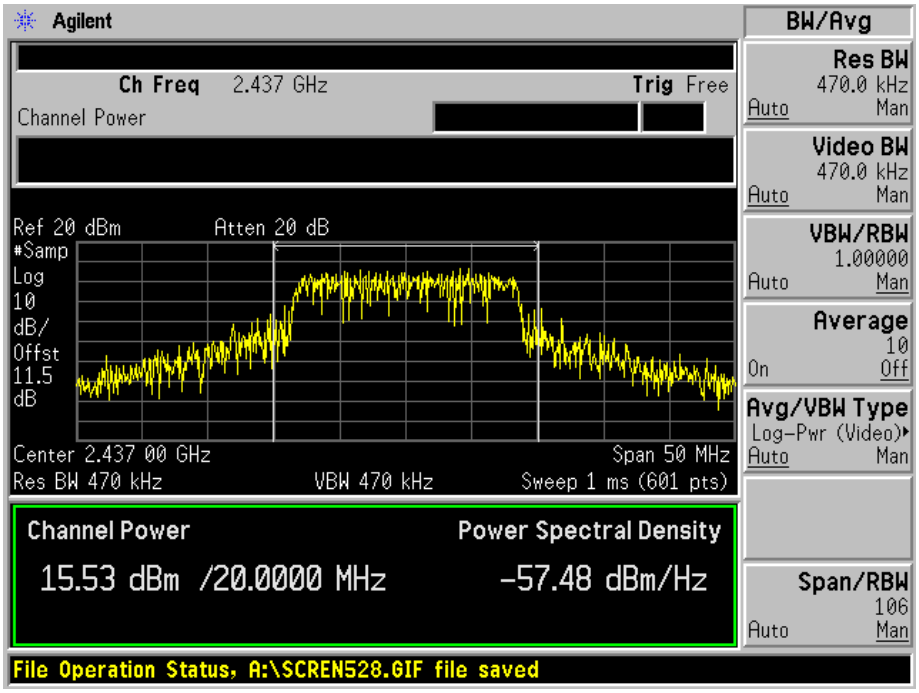

Agilent
Freq/Channel
Ch Freq 2.437 GHz
Trig Free
Channel Power
Center 2.437000000 GHz
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.5
dB
Center 2.437 00 GHz
Span 50 MHz
Res BW 470 kHz
VBW 470 kHz
Sweep 1 ms (601 pts)
Channel Power
17.16 dBm /20.0000 MHz
Power Spectral Density
-55.85 dBm/Hz
Center Freq
2.43700000 GHz
Start Freq
2.41200000 GHz
Stop Freq
2.46200000 GHz
CF Step
5.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, A:\SCREN519.GIF file saved

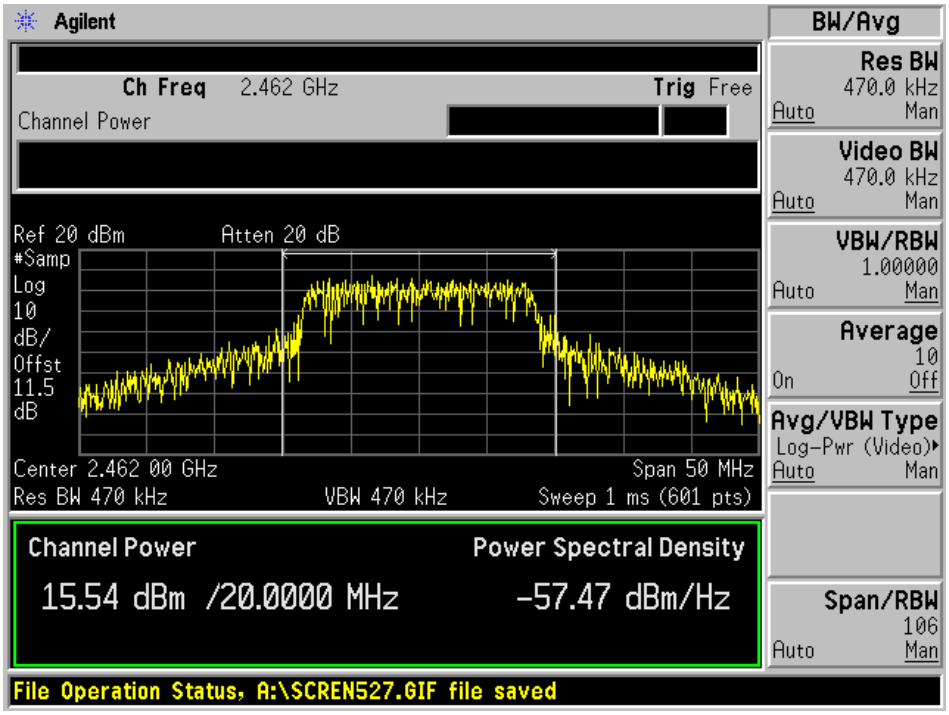

Agilent
Freq/Channel
Ch Freq 2.462 GHz
Trig Free
Channel Power
Center 2.462000000 GHz
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.5
dB
Center 2.462 00 GHz
Span 50 MHz
Res BW 470 kHz
VBW 470 kHz
Sweep 1 ms (601 pts)
Channel Power
17.66 dBm /20.0000 MHz
Power Spectral Density
-55.35 dBm/Hz
Center Freq
2.46200000 GHz
Start Freq
2.43700000 GHz
Stop Freq
2.48700000 GHz
CF Step
5.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, A:\SCREN517.GIF file saved

802.11g mode:

Channel	Frequency MHz	Max Peak Output Power (dBm)	(m Watt)	Limit (m Watt)	Result
Low	2412	15.99	39.72	1000	Complies
Mid	2437	15.53	35.73	1000	Complies
High	2462	15.54	35.81	1000	Complies




Agilent
BW/Avg
Ch Freq 2.437 GHz
Trig Free
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.5
dB
Center 2.437 00 GHz
Span 50 MHz
Res BW 470 kHz
VBW 470 kHz
Sweep 1 ms (601 pts)
Channel Power
15.53 dBm /20.0000 MHz
Power Spectral Density
-57.48 dBm/Hz
Res BW
470.0 kHz
Auto Man
Video BW
470.0 kHz
Auto Man
VBW/RBW
1.00000
Auto Man
Average
10
On Off
Avg/VBW Type
Log-Pwr (Video)
Auto Man
Span/RBW
106
Auto Man
File Operation Status, A:\SCREN528.GIF file saved


Agilent
BW/Avg
Ch Freq 2.462 GHz
Trig Free
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.5
dB
Center 2.462 00 GHz
Span 50 MHz
Res BW 470 kHz
VBW 470 kHz
Sweep 1 ms (601 pts)
Channel Power
15.54 dBm /20.0000 MHz
Power Spectral Density
-57.47 dBm/Hz
Res BW
470.0 kHz
Auto Man
Video BW
470.0 kHz
Auto Man
VBW/RBW
1.00000
Auto Man
Average
10
On Off
Avg/VBW Type
Log-Pwr (Video)
Auto Man
Span/RBW
106
Auto Man
File Operation Status, A:\SCREN527.GIF file saved

§15.247(c) - 100 KHZ BANDWIDTH OF BAND EDGES

Standard Applicable

According to §15.247(d), in *any* 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) see §15.205(c)).

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 without connection to measurement instrument. 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, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	16° C
Relative Humidity:	55%
ATM Pressure:	1024 mbar

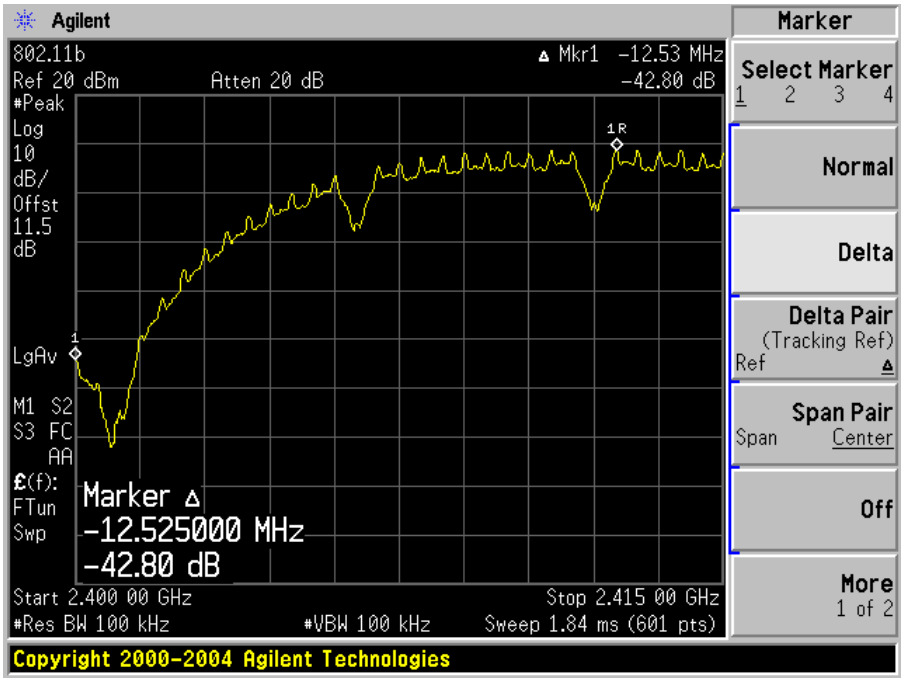
**The testing was performed by James Ma on 2006-05-24*

Measurement Result

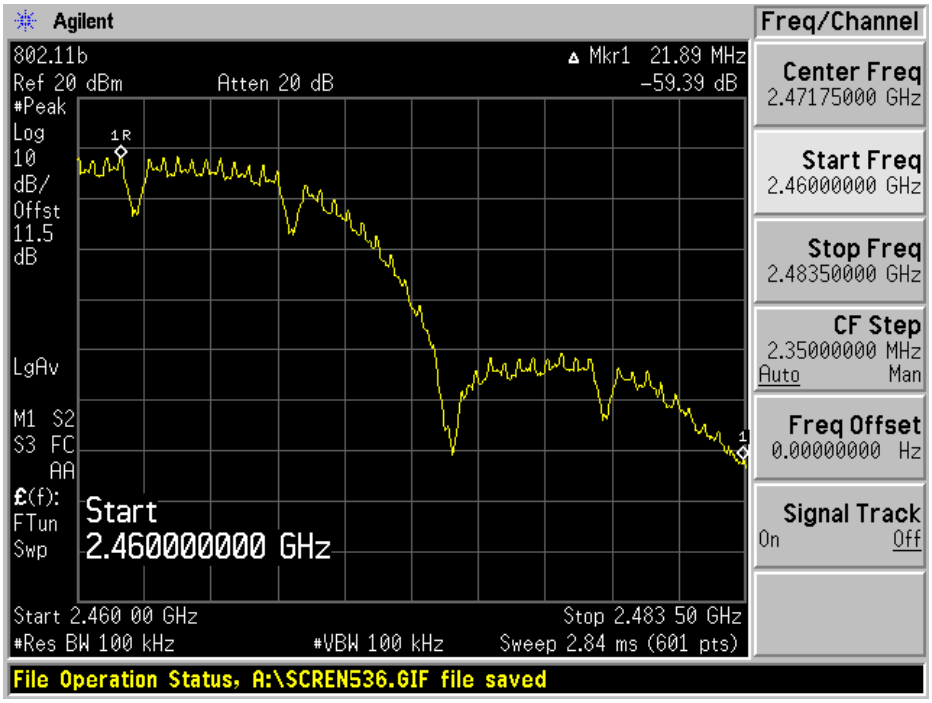
Please refer to following pages for plots of band edge.

802.11b mode:

Low Channel

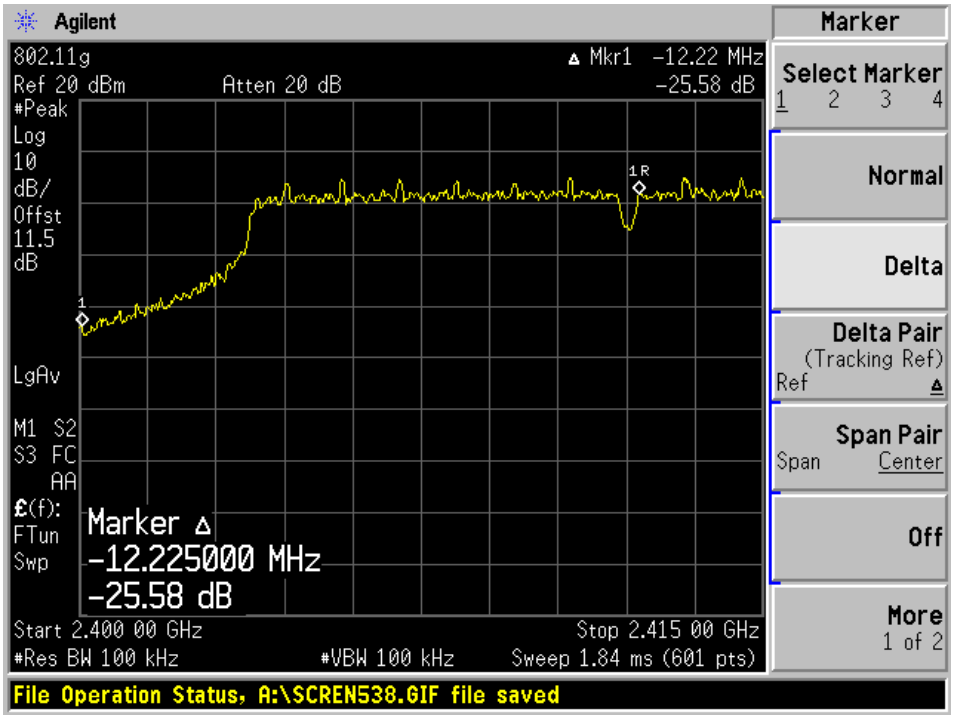


High Channel

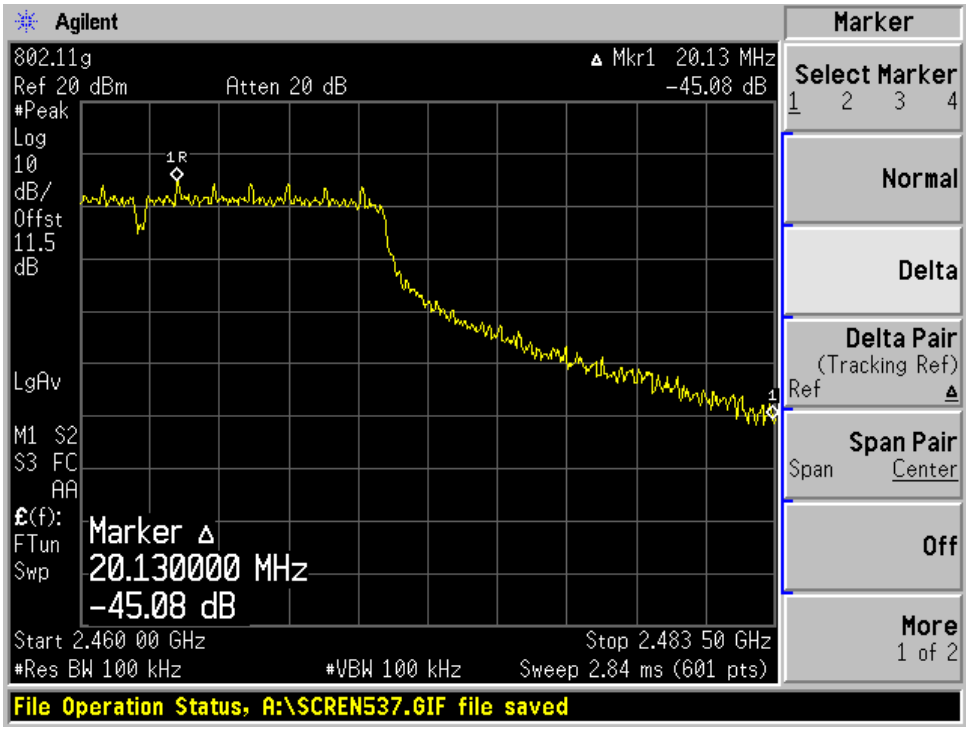


802.11g mode:

Low Channel



High Channel



§15.247(d) - POWER SPECTRAL DENSITY

Standard Applicable

According to §15.247 (d), for direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

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 was set without connection to measurement instrument. 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, and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to 1.5MHz span mode. And then, set RBW and VBW of spectrum analyzer to proper value. (DTS)
4. Repeat above procedures until all frequencies measured were complete.

Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	16° C
Relative Humidity:	55%
ATM Pressure:	1024 mbar

**The testing was performed by James Ma on 2006-05-24*

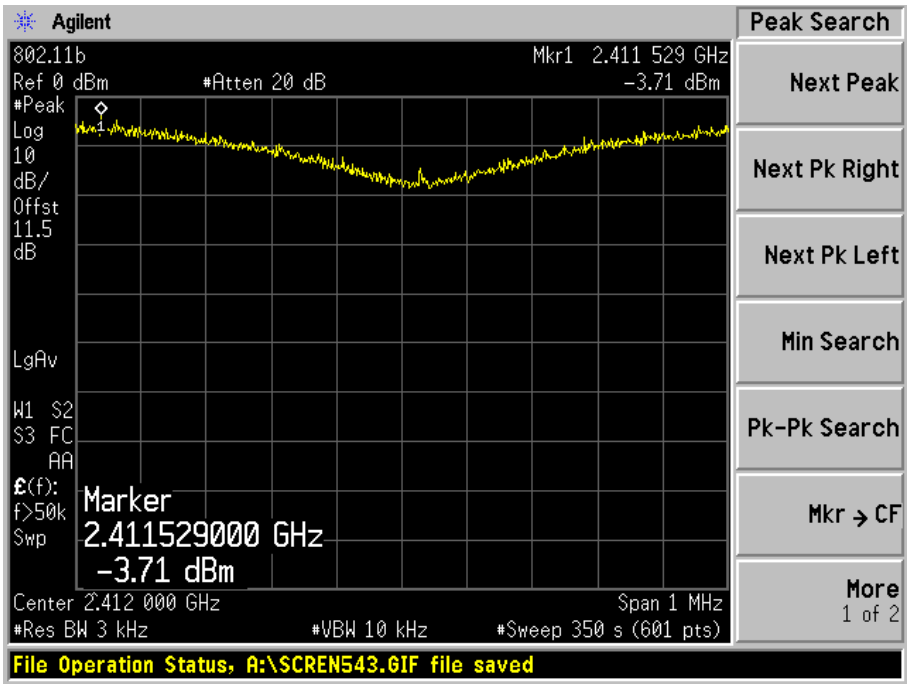
Measurement Result

Test Result

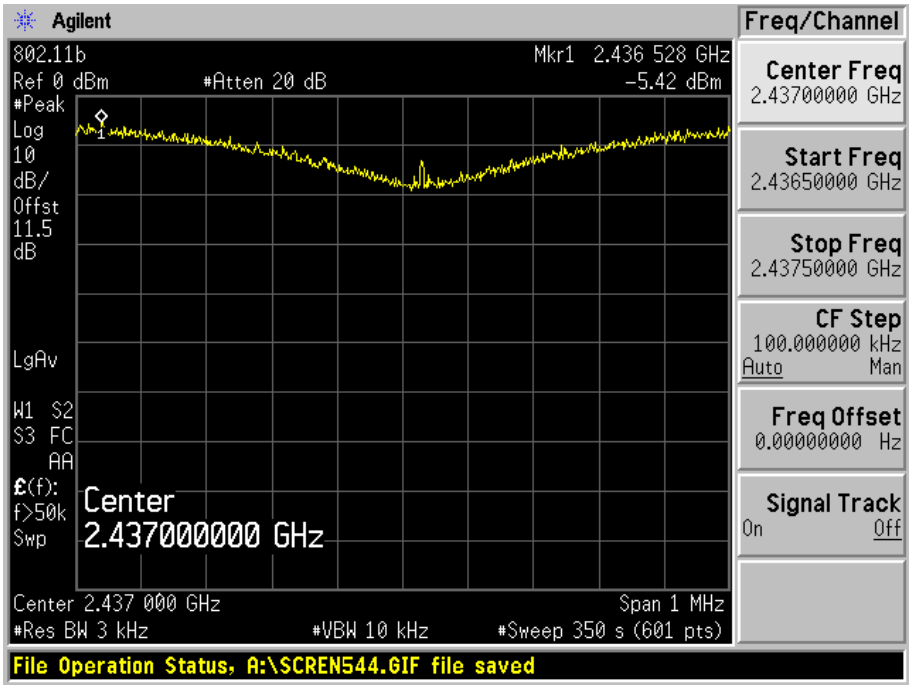
802.11b mode:

Channel	Frequency MHz	PSD dBm/3KHz	Limit dBm/3KHz
Low	2412	-3.71	8
Mid	2437	-5.42	8
High	2462	-4.45	8

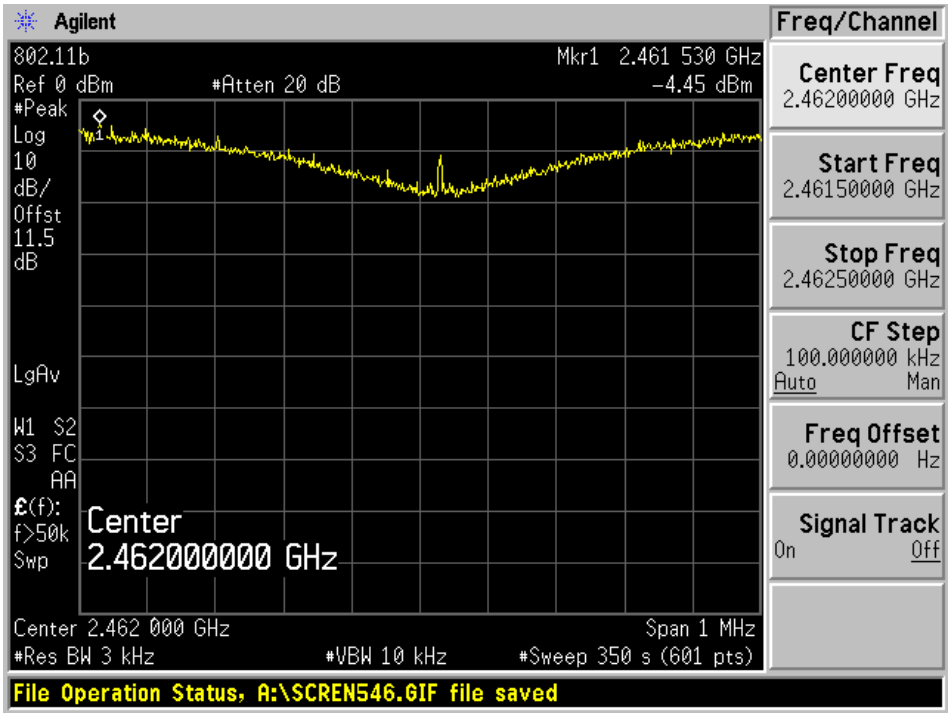
Low Channel



Mid. Channel



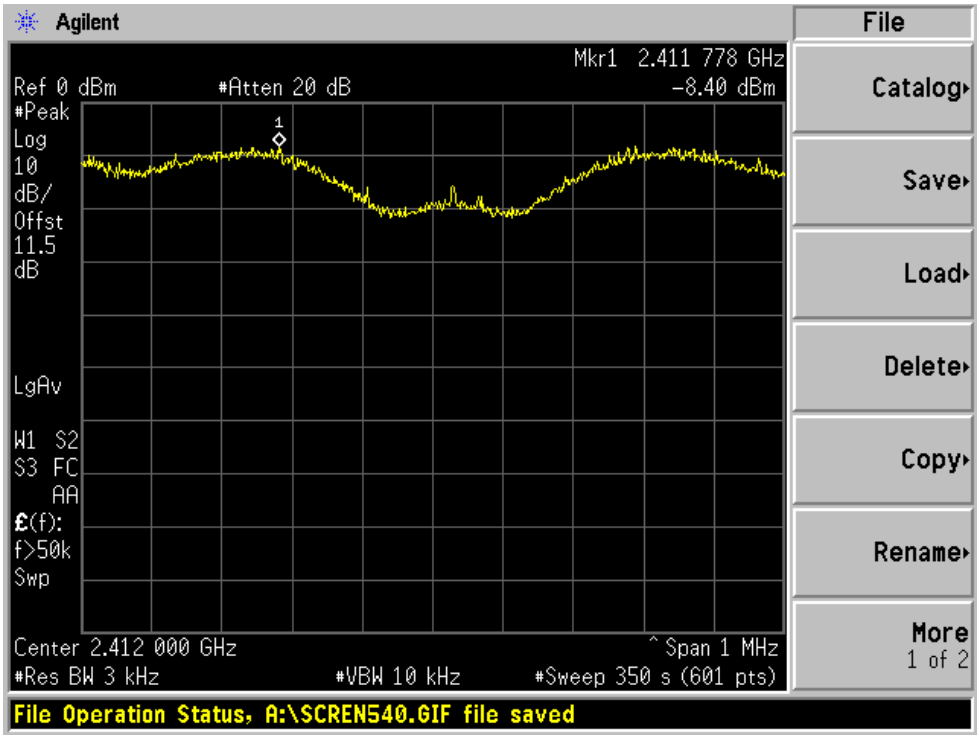
High Channel



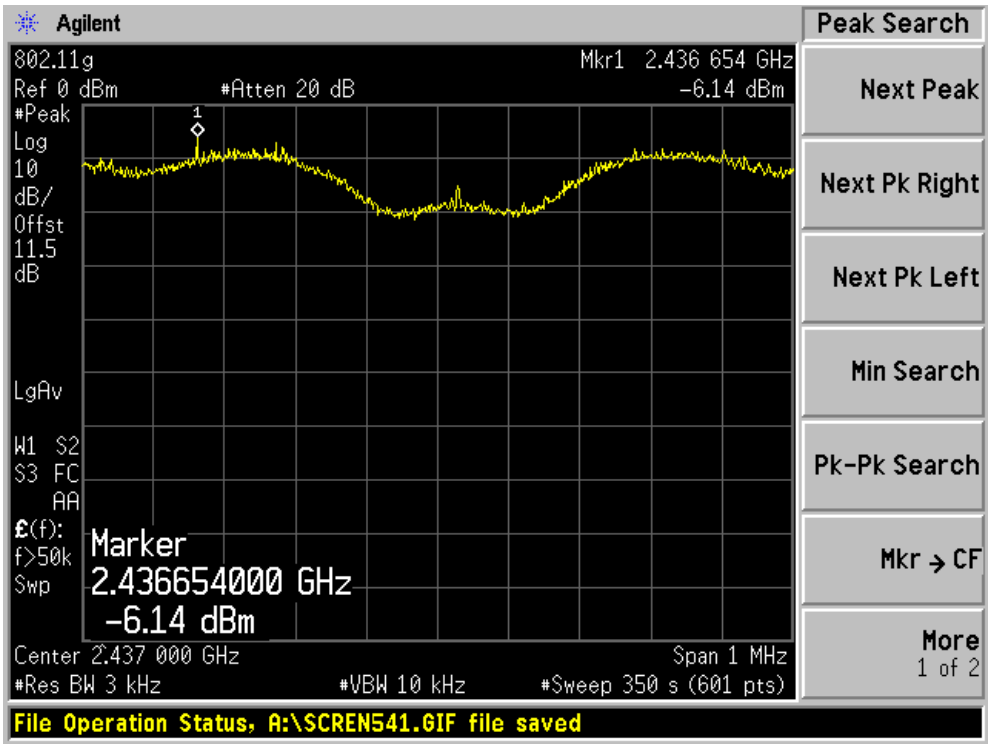
802.11g mode:

Channel	Frequency MHz	PSD dBm/3KHz	Limit dBm/3KHz
Low	2412	-8.40	8
Mid	2437	-6.14	8
High	2462	-7.93	8

Low Channel



Mid Channel



High Channel