Lab Code: 200167-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

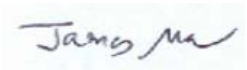
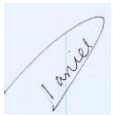
For

Aztech Systems Ltd.

31 Ubi Road 1, Aztech Building
Singapore, 408694

FCC ID: I38-DSL605EW
Model: DSL605EW

This Report Concerns:	Product Type:
☒ Original Report	4 Port Ethernet Router with WLAN

Test Engineer:	James Ma 
Report No.:	R0609082
Report Date:	2006-09-21
Reviewed By:	Daniel Deng 
Prepared By: (ct)	Bay Area Compliance Laboratory Corp. 1274 Anvilwood Ave. Sunnyvale, CA 94089, USA Tel: (408) 732-9162 Fax: (408) 732 9164

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Aztech Systems Ltd.* product, *FCC ID: I38-DSL605EW or* the "EUT" as referred to in this report is a ADSL2/2+ Wireless LAN 802.11g++ 4 Port Switch Combo Gateway using Texas Instruments' AR7 with 1350A for wireless combined Chipset solution that fully complies with ANSI T1.413 Issue 2, ITU-T G.992.1 (G.dmt) and G.992.2 (G.lite) ADSL standard. It also provides future proof functionality with higher data transmission rates with ADSL2, ADSL2+, and Extended Reach-ADSL support. This next generation ADSL will be providing up to 12Mbps speed and additional 600 feet reach for ADSL2 and 28Mbps speed for distances up to 5,000 feet for ADSL2+.

Targeted at the residential and SOHO users, it is the ideal solution to provide a **6 in 1 device** for both Wired and Wireless connectivity via a combined ADSL2/2+ Ready Modem support, Routing functionality for multi-user sharing, 4 port AutoMDI/MDIx 10/100 Switch, high speed 125Mbps IEEE802.11b/g/g++ Wireless LAN Access point and true firewall capability functionality.

Mechanical Description:

The *Aztech Systems Ltd.'s* product, model(s): *DSL605EW* or the "EUT" as referred to this report measures approximately *156mmL x 130mmW x 29mmH and weights 350g.*

** The test data gathered are from a typical production sample that is provided by the manufacturer with serial number: 002.*

EUT Photo

Additional photos in Exhibit C

Objective

This type approval report is prepared on behalf of *Aztech Systems Ltd.*in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C.

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, Spurious Emissions, Conducted and Spurious Radiated Emissions.

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.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. 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 values range from $\pm$2.0 for Conducted Emissions tests and $\pm$4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL.

Detailed instrumentation measurement uncertainties can be found in BACL report QAP-018.

Test Facility

The Test site used by BACL Corp. to collect 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, Industry Canada, and Voluntary Control Council for Interference have the reports on file and are listed under FCC file 31040/SIT 1300F2, IC registration number: 3062A, and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC, IC, 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

The EUT exercise program using for testing, and the following Channel setting was used during the testing:

802.11b	2412 MHZ	2437 MHz	2462 MHz
802.11g	2412 MHZ	2437 MHz	2462 MHz

Special Accessories

N/A

Equipment Modifications

No modifications were made to the EUT.

Interface Ports and Cabling

Cable Description	Length (M)	From	To
Power cable	1.0	Power supply	EUT
Ethernet RJ45 cable	1.5	Laptop	EUT

SUMMARY OF TEST RESULTS

Results reported relate only to the product tested.

FCC RULES	DESCRIPTION OF TEST	RESULT
§2.1091 §15.247 (e) (i)	RF Exposure	Compliant
§15.203	Antenna Requirements	Compliant
§ 15.207 (a)	AC Line Conducted Emissions	Compliant
§2.1051 & §15.247(d)	Spurious Emissions at Antenna Terminals	Compliant
§15.205, §15.209 (a) & §15.247(d)	Radiated Spurious Emissions	Compliant
§15.247 (a)(2)	6 dB Bandwidth	Compliant
§15.247 (b)(3)	Maximum Peak Output Power	Compliant
§ 15.247 (d)	100 kHz Bandwidth of Band Edge	Compliant
§15.247 (e)	Power Spectral Density	Compliant

§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 antenna for this device is an external but integral, non-disconnectable antenna with a gain of 3.0 dBi.

§15.207 (a) – AC LINE CONDUCTED EMISSIONS

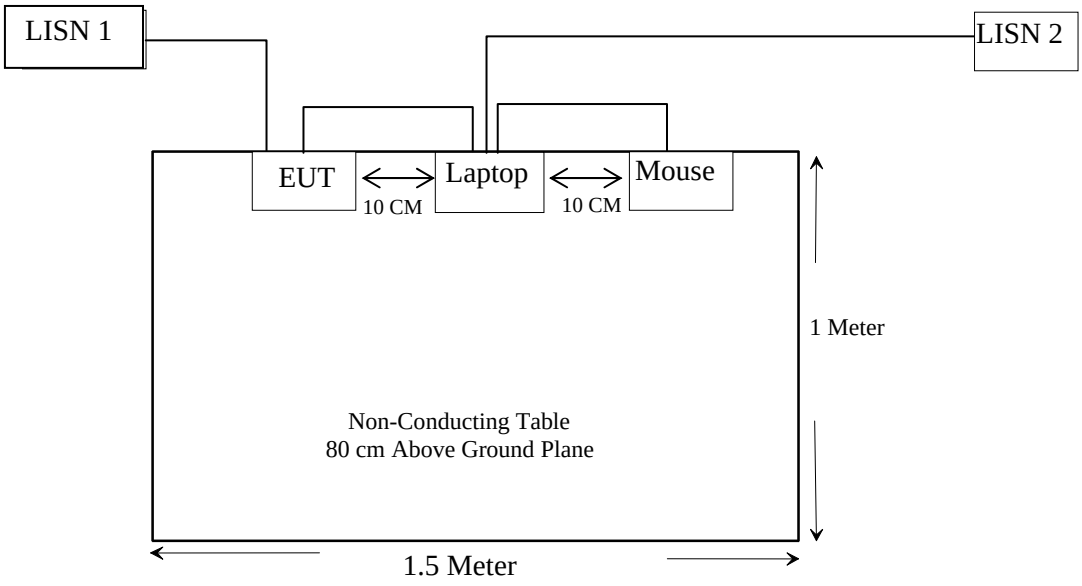
Test Setup

The measurement was performed at shield room, using the same 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 Setup Block Diagram



Test Procedure

During the conducted emissions 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 provided emissions of the EUT.

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

Environmental Conditions

Temperature:	27° C
Relative Humidity:	78%
ATM Pressure:	1024 mbar

**The testing was performed by James Ma on 2006-09-14.*

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
R&S	Receiver, EMI Test	ESCS30	100176	2006-03-16
R&S	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.

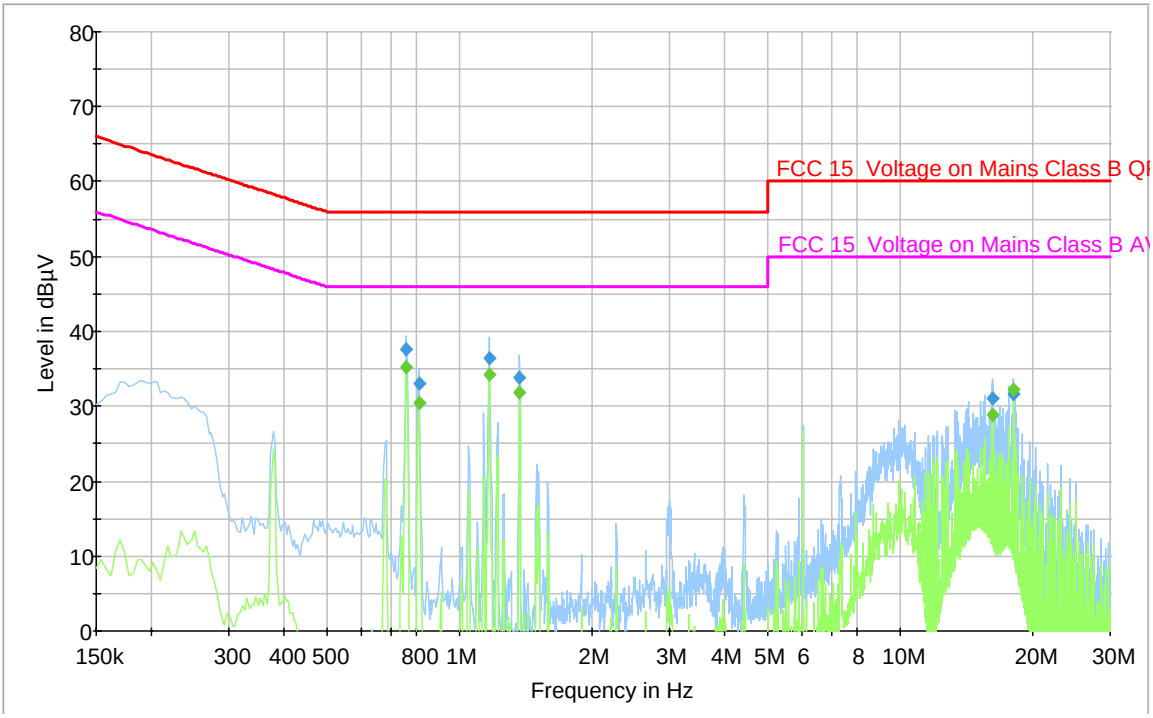
Summary of Test Results

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:

-10.9 dB at **0.758000 MHz** in the **Line** conductor

Conducted Emissions Test plots and Data:

Line:



QP Measurements

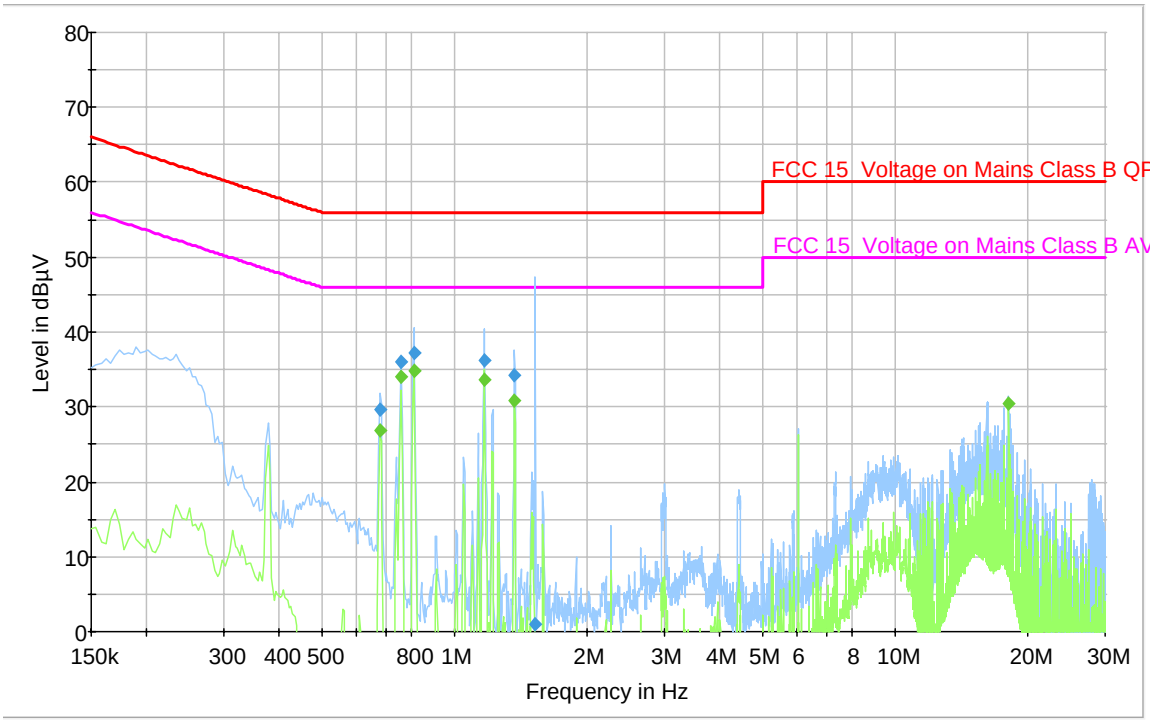
Frequency (MHz)	Quasi-Peak (dBµV)	Line	Corrected Reading (dB)	Limit (dBµV)	Margin (dB)
0.758000	37.6	L1	0.3	56.0	-18.5
1.170000	36.4	L1	0.3	56.0	-19.6
1.370000	33.8	L1	0.2	56.0	-22.2
0.810000	33.0	L1	0.3	56.0	-23.0
18.158000	31.7	L1	0.4	60.0	-28.3
16.230000	31.1	L1	0.3	60.0	-29.0

Average Measurements

Frequency (MHz)	Average (dBµV)	Line	Corrected Reading (dB)	Limit (dBµV)	Margin (dB)
0.758000	35.2	L1	0.3	46.0	-10.9
1.170000	34.1	L1	0.3	46.0	-11.9
1.370000	31.8	L1	0.2	46.0	-14.2
0.810000	30.4	L1	0.3	46.0	-15.7
18.162000	32.2	L1	0.4	50.0	-17.8
16.230000	28.9	L1	0.3	50.0	-21.1

Conducted Emissions Test plots and Data:

Neutral:



QP Measurements

Frequency (MHz)	Quasi-Peak (dBµV)	Line	Corrected Reading (dB)	Limit (dBµV)	Margin (dB)
0.809000	37.2	N	0.3	56.0	-18.8
1.169000	36.2	N	0.3	56.0	-19.8
0.757000	36.0	N	0.3	56.0	-20.0
1.369000	34.3	N	0.2	56.0	-21.7
0.681000	29.8	N	0.3	56.0	-26.3
1.529000	0.9	N	0.3	56.0	-55.1

Average Measurements

Frequency (MHz)	Average (dBµV)	Line	Corrected Reading (dB)	Limit (dBµV)	Margin (dB)
0.809000	34.9	N	0.3	46.0	-11.1
0.757000	34.1	N	0.3	46.0	-11.9
1.169000	33.7	N	0.3	46.0	-12.3
1.369000	30.9	N	0.2	46.0	-15.1
0.681000	27.0	N	0.3	46.0	-19.0
18.161000	30.4	N	0.4	50.0	-19.6

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

Applicable Standard

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 Lists

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:	22° C
Relative Humidity:	75%
ATM Pressure:	1021 mbar

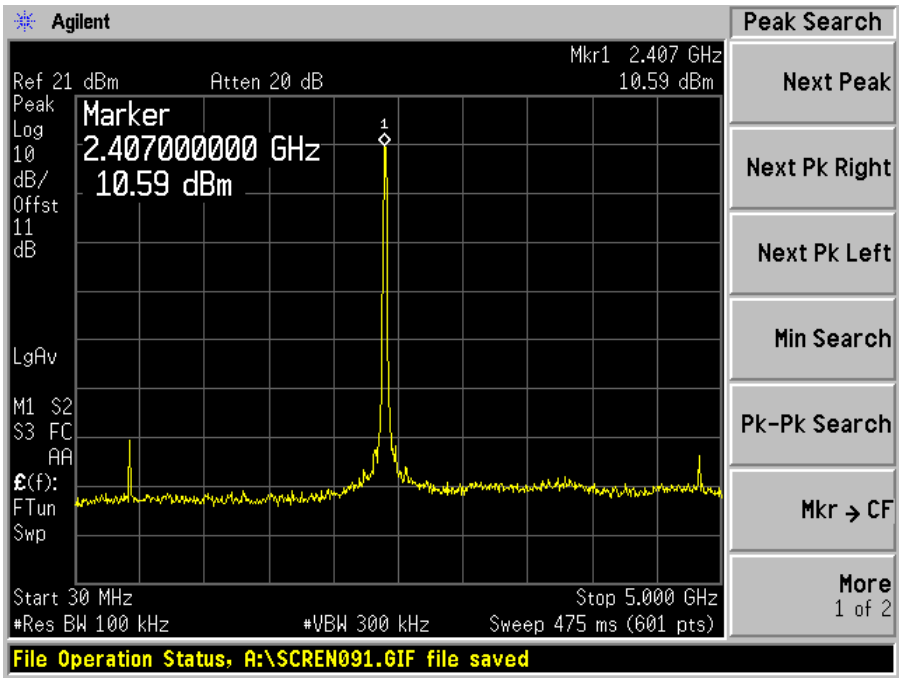
The testing was performed by James Ma on 2006-09-14.

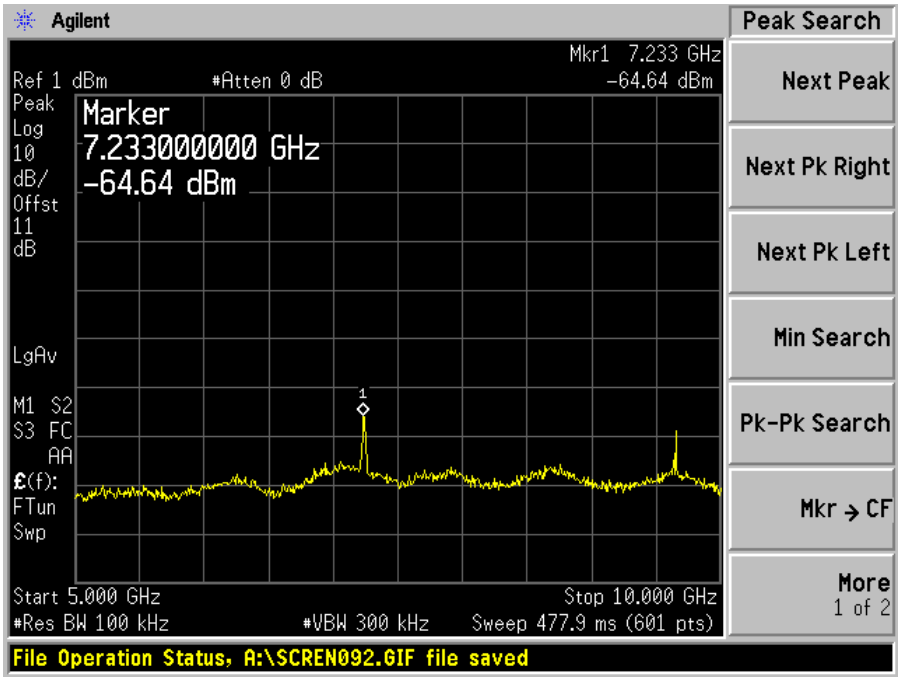
Measurement Result

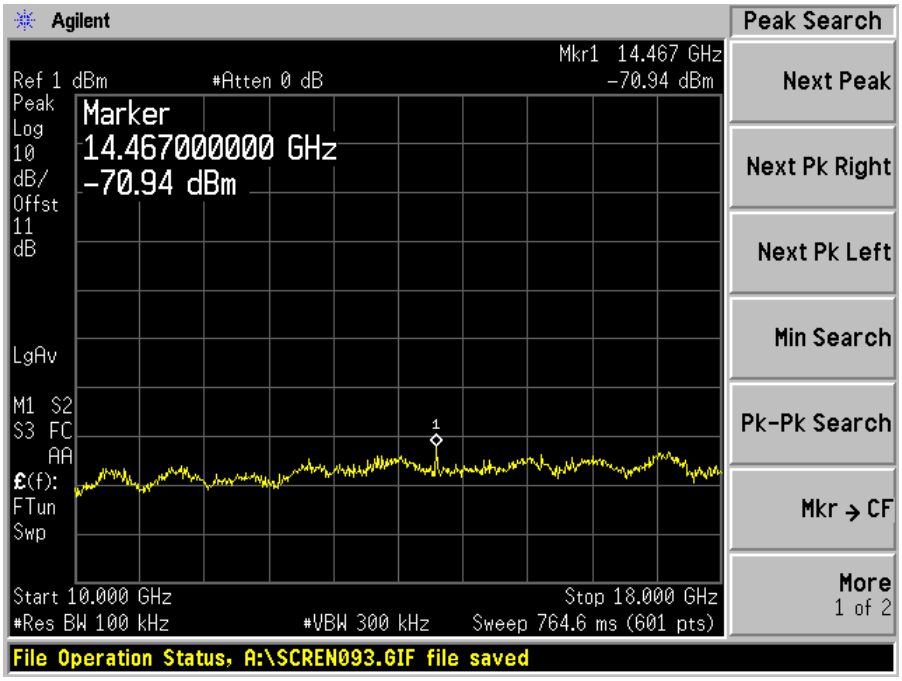
Please refer to following pages for plots of spurious emissions.

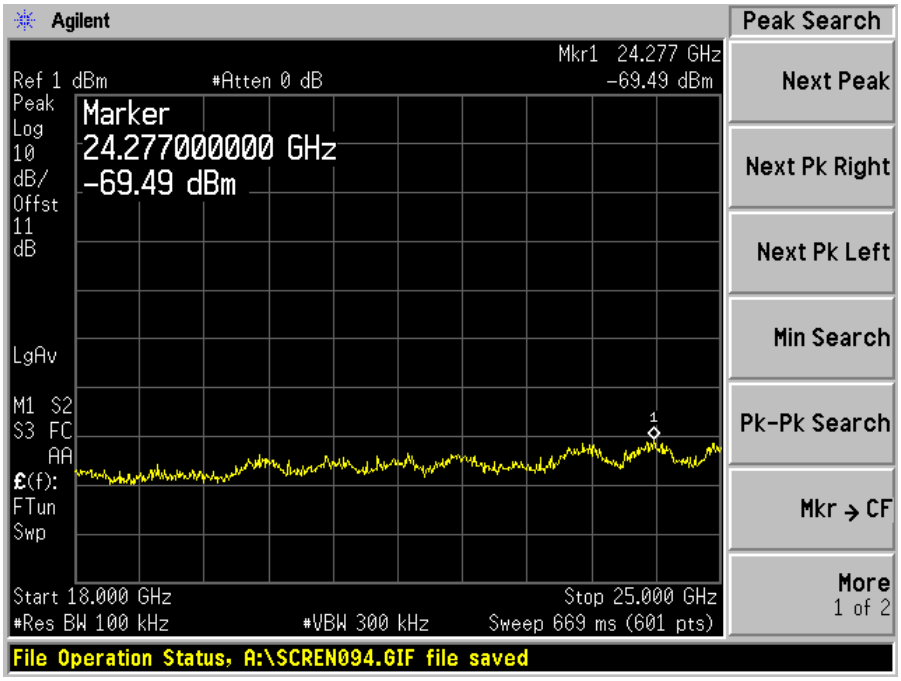
802.11b mode:

Low Channel

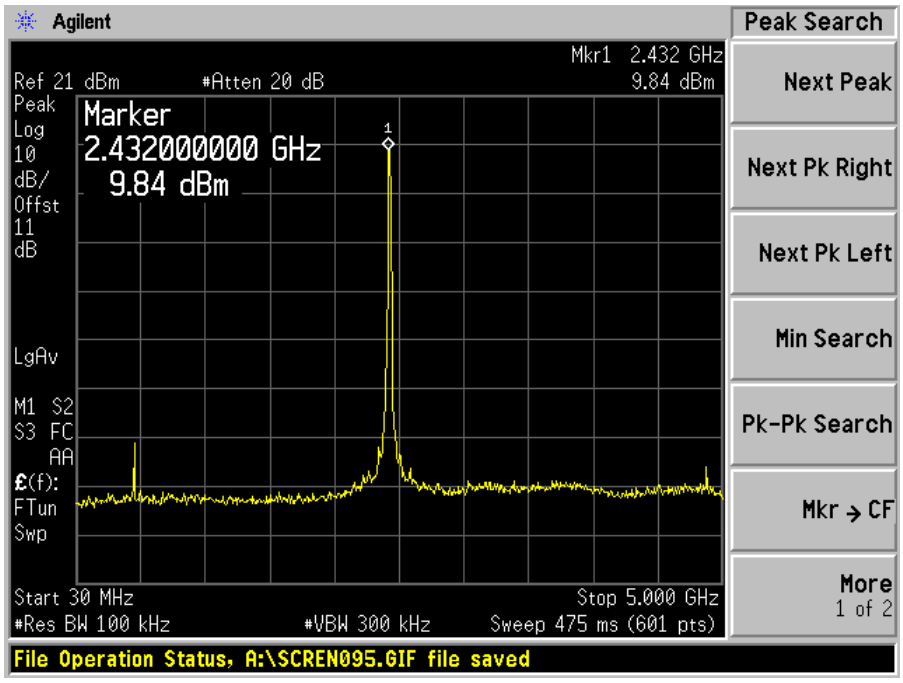


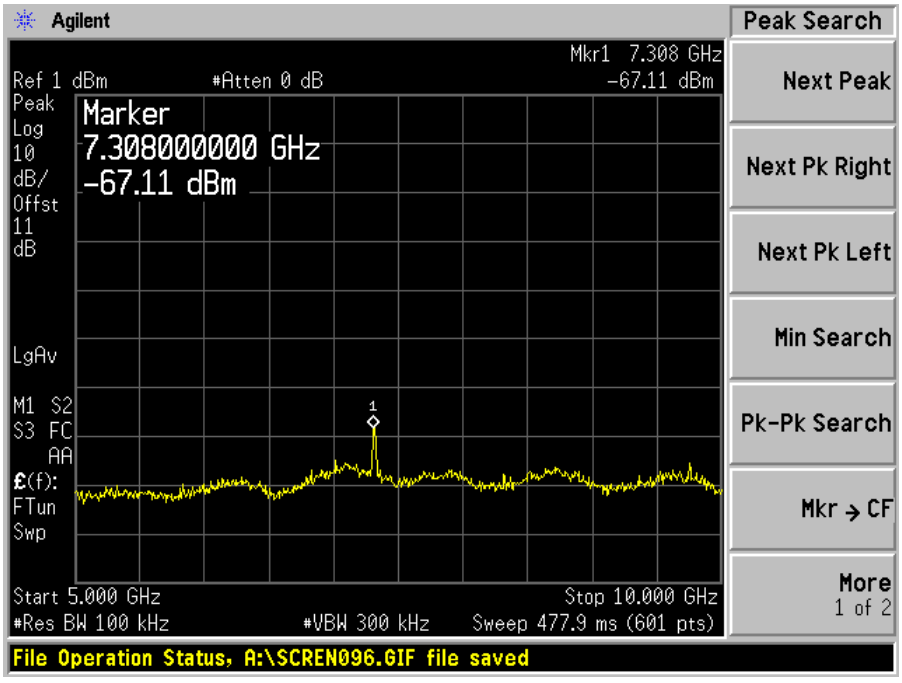


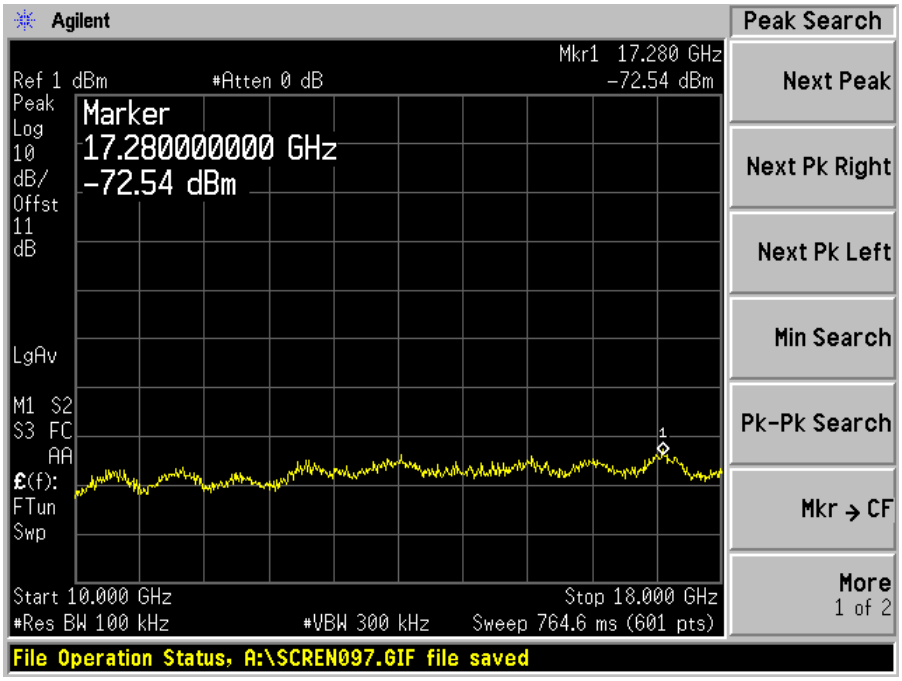

Agilent
Peak Search
Mkr1 14.467 GHz
Ref 1 dBm
#Atten 0 dB
-70.94 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
14.467000000 GHz
-70.94 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 10.000 GHz
Stop 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 764.6 ms (601 pts)
File Operation Status, A:\SCREN093.GIF file saved

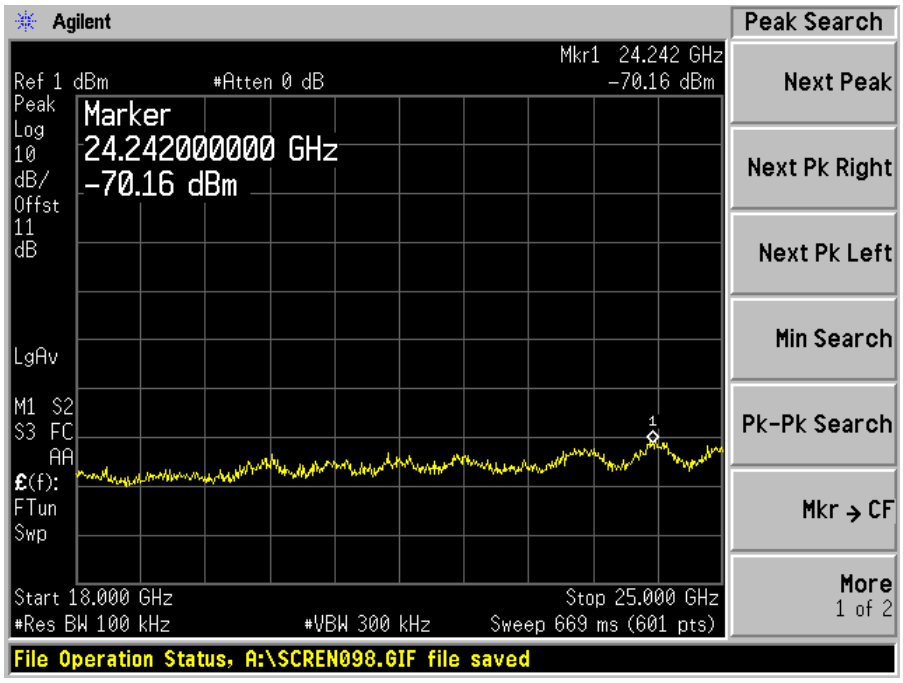

Agilent
Peak Search
Mkr1 24.277 GHz
Ref 1 dBm
#Atten 0 dB
-69.49 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
24.277000000 GHz
-69.49 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 18.000 GHz
Stop 25.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 669 ms (601 pts)
File Operation Status, A:\SCREN094.GIF file saved

Mid Channel

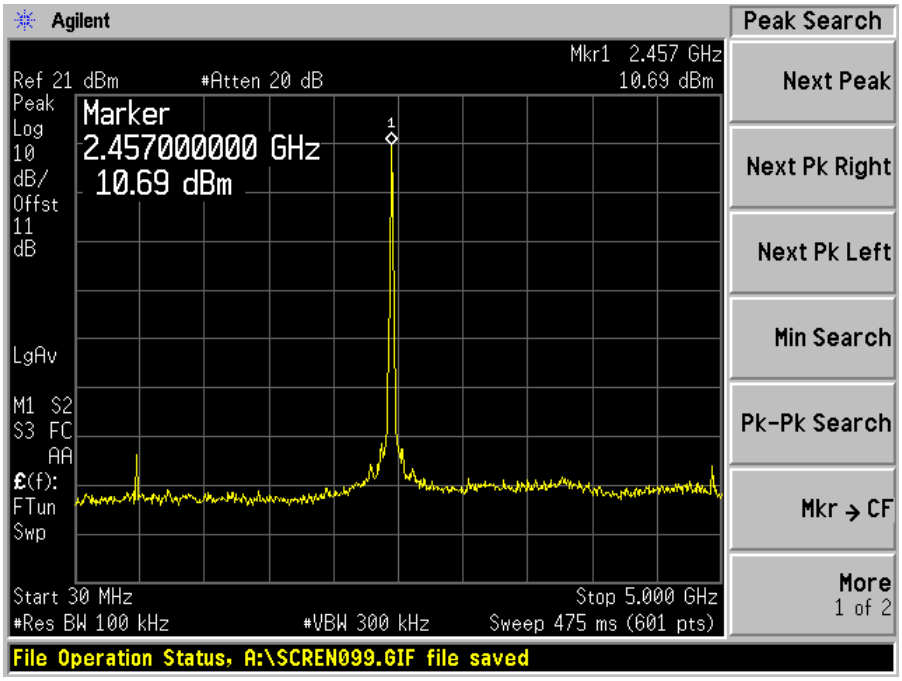

Agilent
Peak Search
Mkr1 2.432 GHz
Ref 21 dBm
#Atten 20 dB
9.84 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
2.432000000 GHz
9.84 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30 MHz
Stop 5.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 475 ms (601 pts)
File Operation Status, A:\SCREN095.GIF file saved

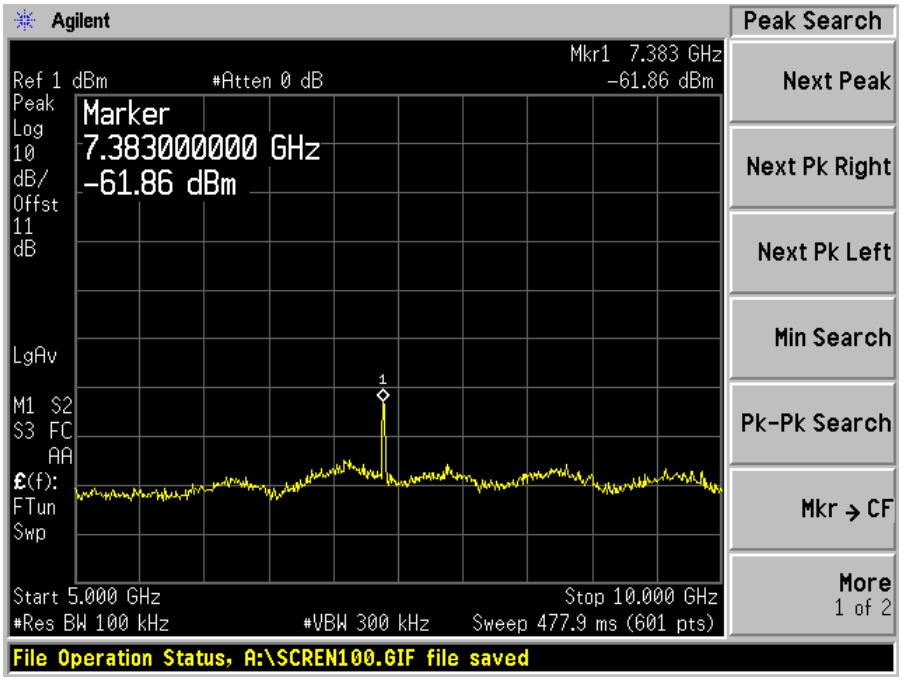

Agilent
Peak Search
Mkr1 7.308 GHz
Ref 1 dBm
#Atten 0 dB
-67.11 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
7.308000000 GHz
-67.11 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 5.000 GHz
Stop 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 477.9 ms (601 pts)
File Operation Status, A:\SCREN096.GIF file saved

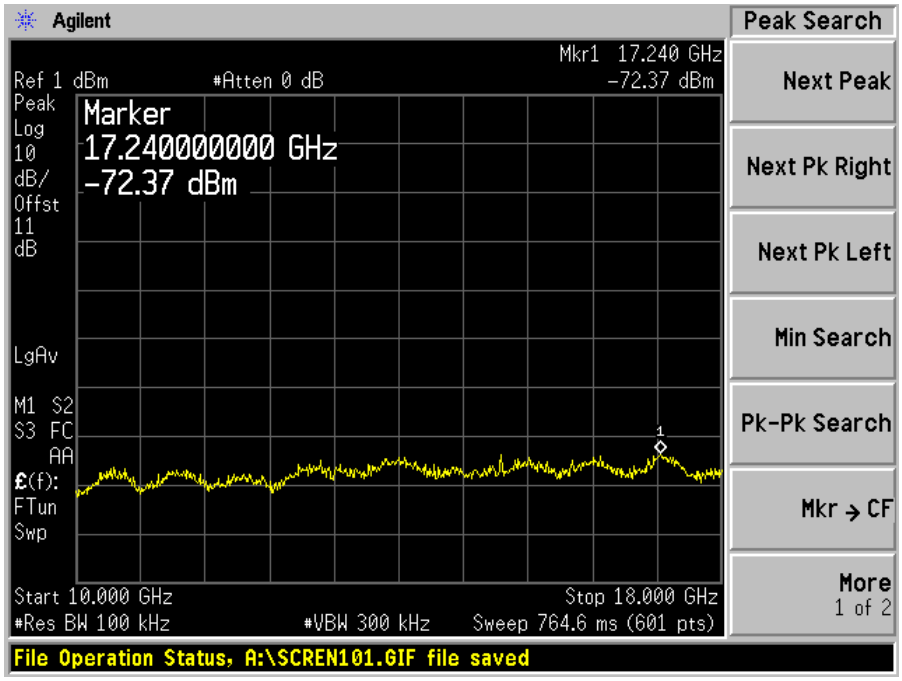

Agilent
Peak Search
Mkr1 17.280 GHz
Ref 1 dBm
#Atten 0 dB
-72.54 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
17.280000000 GHz
-72.54 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 10.000 GHz
Stop 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 764.6 ms (601 pts)
File Operation Status, A:\SCREN097.GIF file saved

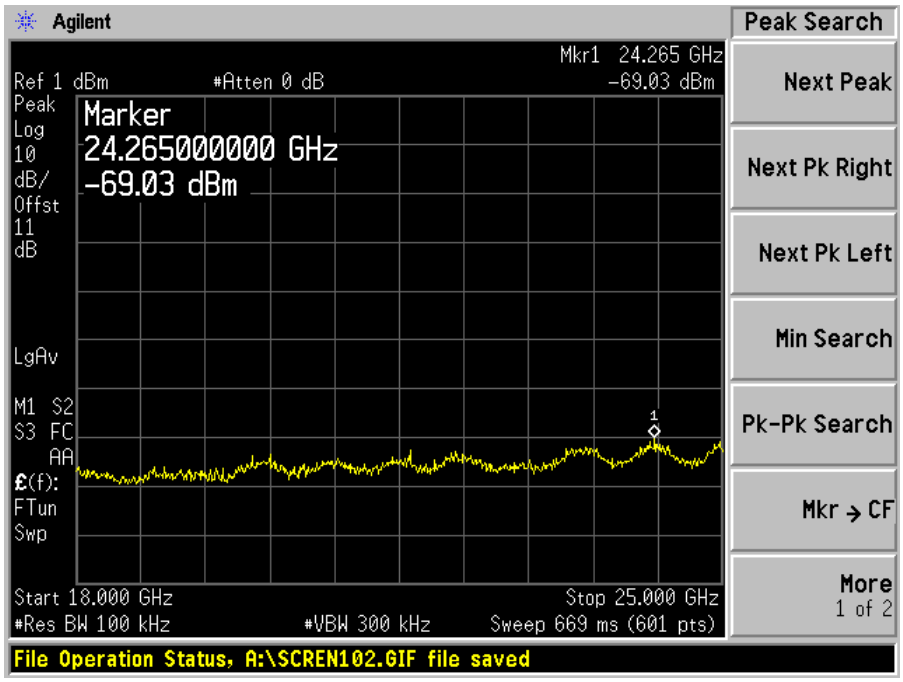

Agilent
Peak Search
Mkr1 24.242 GHz
Ref 1 dBm
#Atten 0 dB
-70.16 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
24.242000000 GHz
-70.16 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 18.000 GHz
Stop 25.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 669 ms (601 pts)
File Operation Status, A:\SCREN098.GIF file saved

High Channel






Agilent
Peak Search
Mkr1 17.240 GHz
Ref 1 dBm
#Atten 0 dB
-72.37 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
17.240000000 GHz
-72.37 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 10.000 GHz
Stop 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 764.6 ms (601 pts)
File Operation Status, A:\SCREN101.GIF file saved


Agilent
Peak Search
Mkr1 24.265 GHz
Ref 1 dBm
#Atten 0 dB
-69.03 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
24.265000000 GHz
-69.03 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 18.000 GHz
Stop 25.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 669 ms (601 pts)
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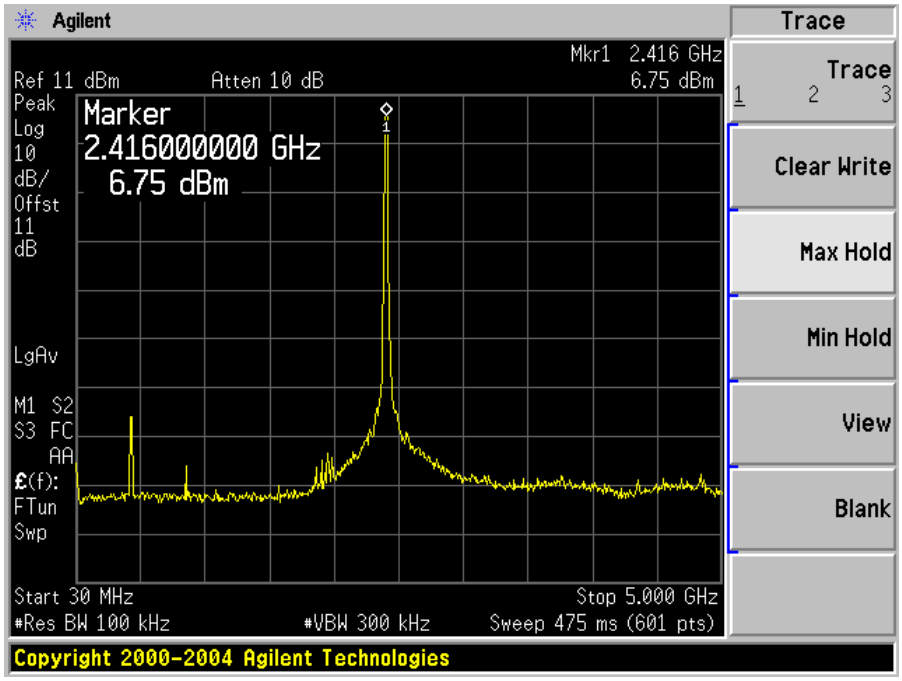
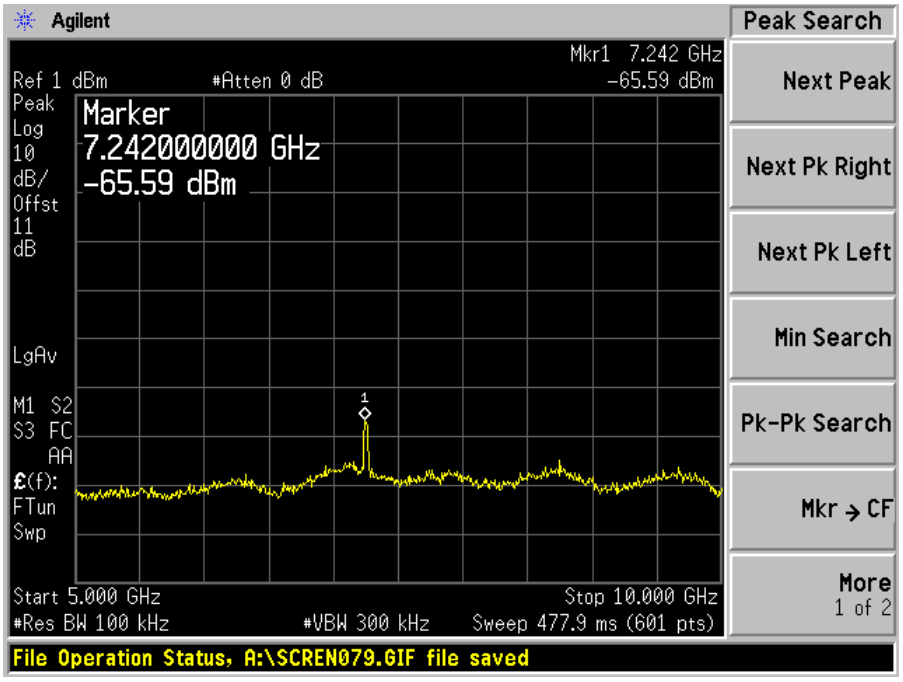
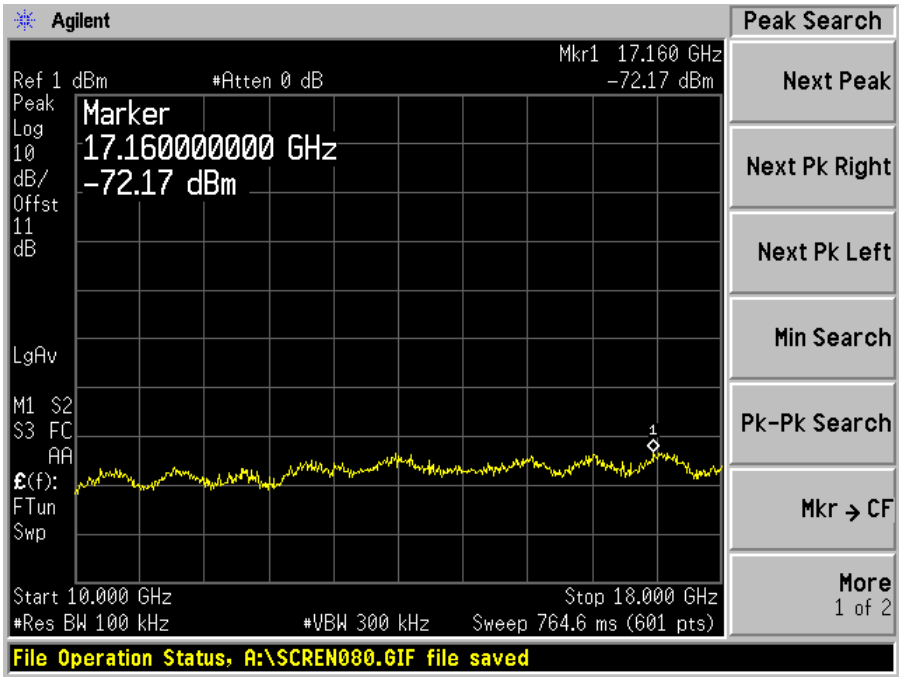
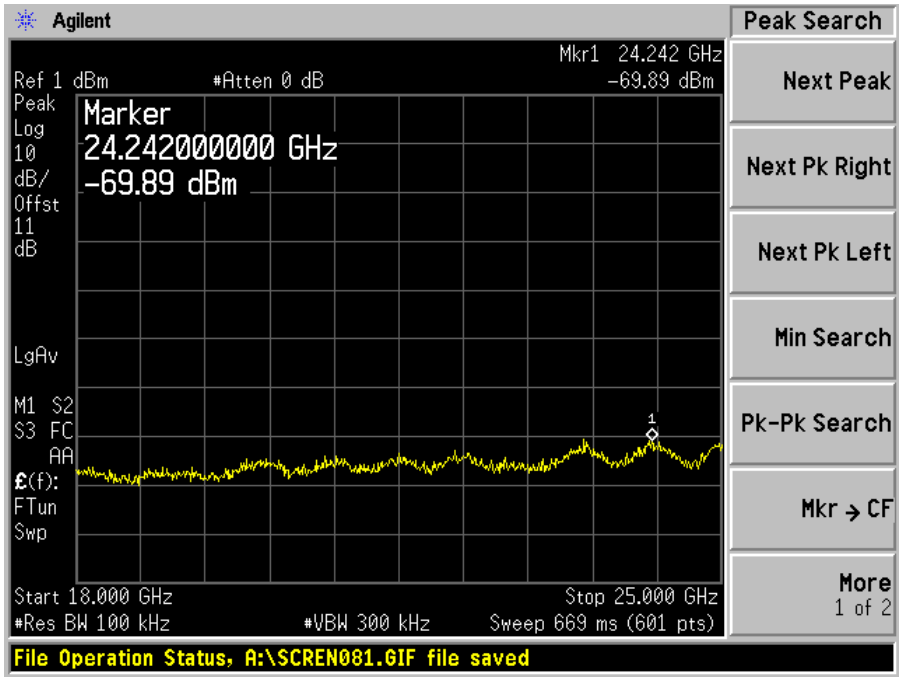
802.11g mode:

Low Channel

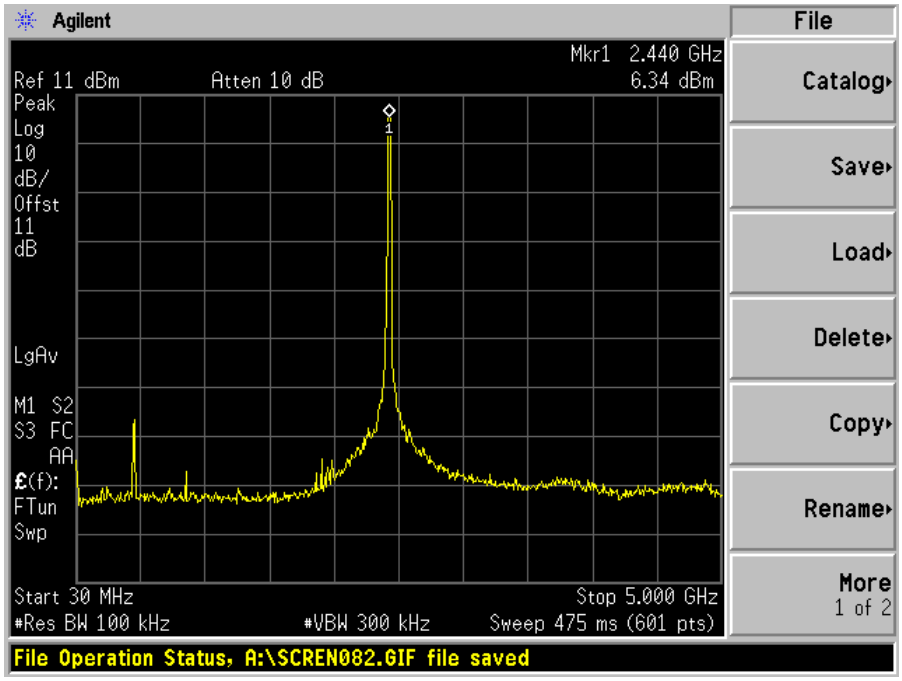


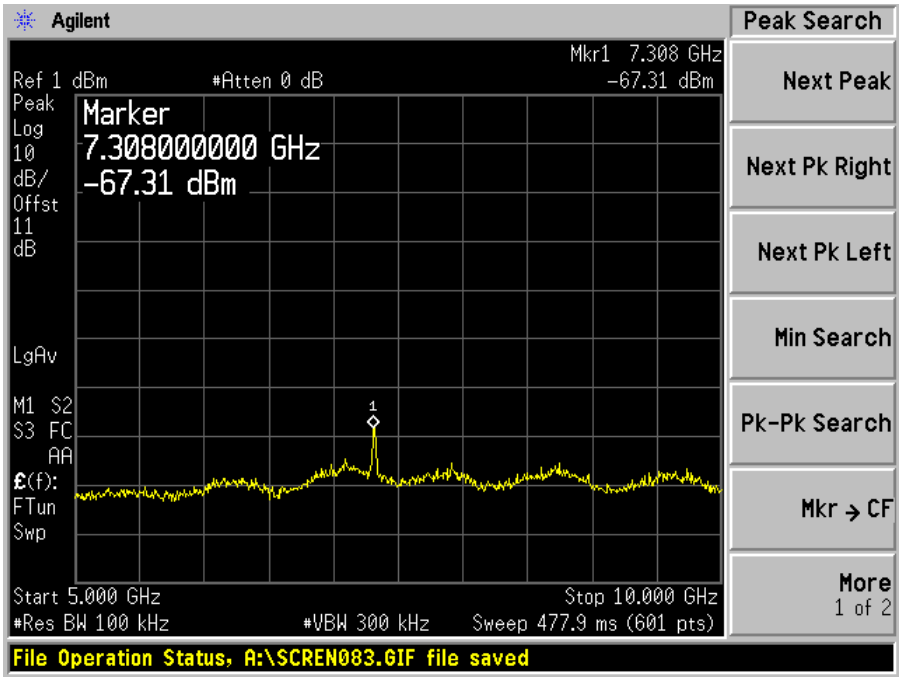


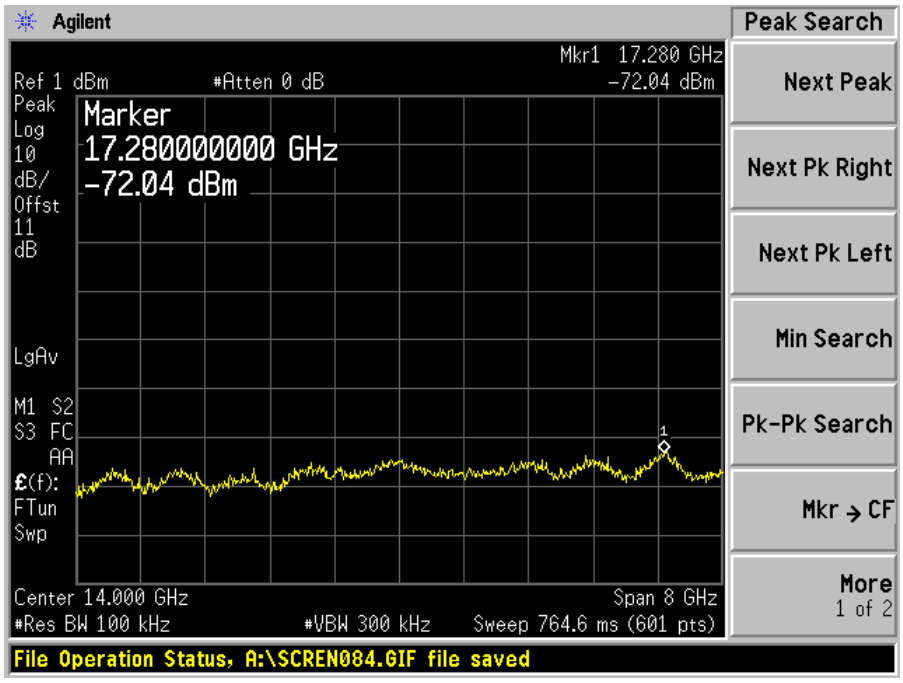

Agilent
Peak Search
Mkr1 17.160 GHz
Ref 1 dBm
#Atten 0 dB
-72.17 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
17.160000000 GHz
-72.17 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 10.000 GHz
Stop 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 764.6 ms (601 pts)
File Operation Status, A:\SCREN080.GIF file saved

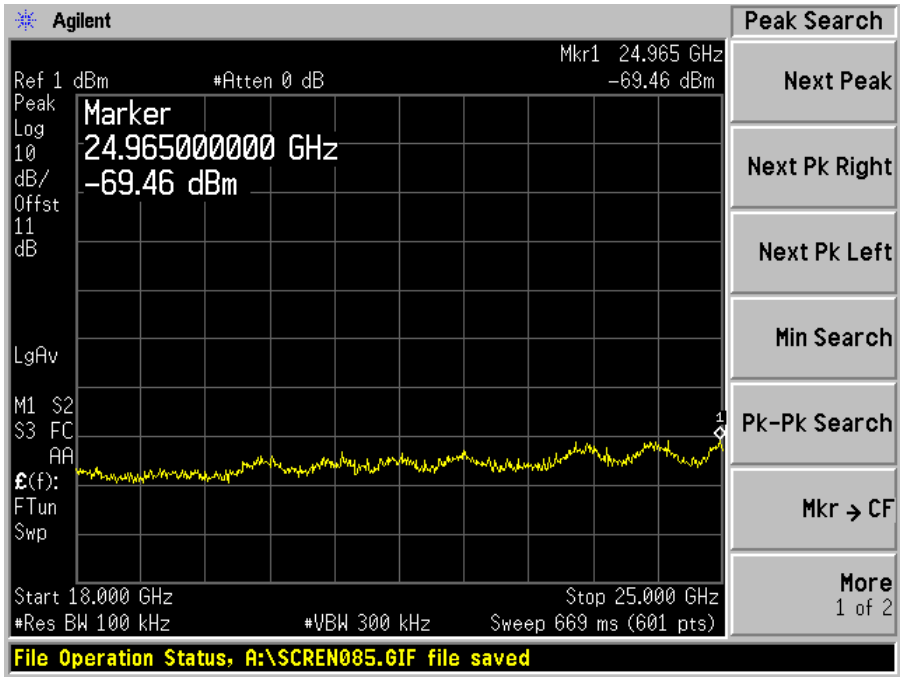

Agilent
Peak Search
Mkr1 24.242 GHz
Ref 1 dBm
#Atten 0 dB
-69.89 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
24.242000000 GHz
-69.89 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 18.000 GHz
Stop 25.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 669 ms (601 pts)
File Operation Status, A:\SCREN081.GIF file saved

Mid Channel

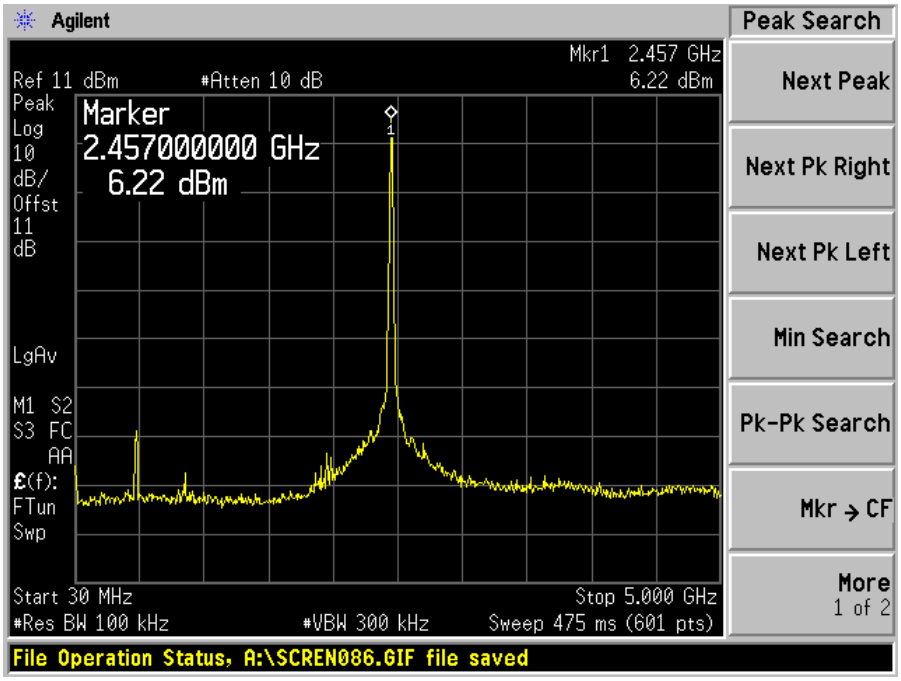

Agilent
File
Mkr1 2.440 GHz
Ref 11 dBm
Atten 10 dB
6.34 dBm
Peak
Log
10
dB/
Offst
11
dB
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Start 30 MHz
Stop 5.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 475 ms (601 pts)
Catalog
Save
Load
Delete
Copy
Rename
More
1 of 2
File Operation Status, A:\SCREN082.GIF file saved

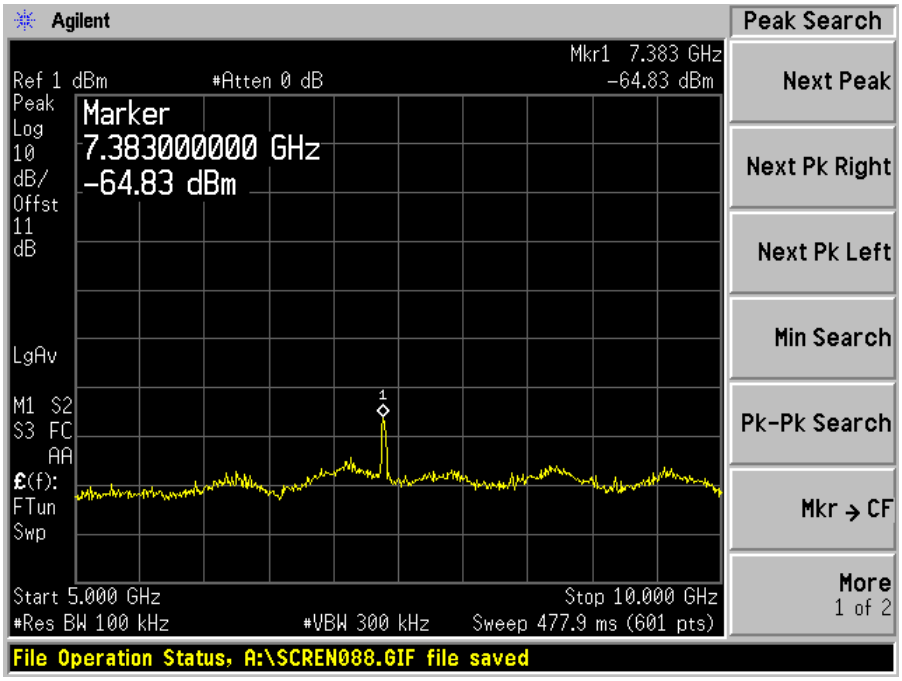

Agilent
Peak Search
Mkr1 7.308 GHz
Ref 1 dBm
#Atten 0 dB
-67.31 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
7.308000000 GHz
-67.31 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Start 5.000 GHz
Stop 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 477.9 ms (601 pts)
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
File Operation Status, A:\SCREN083.GIF file saved

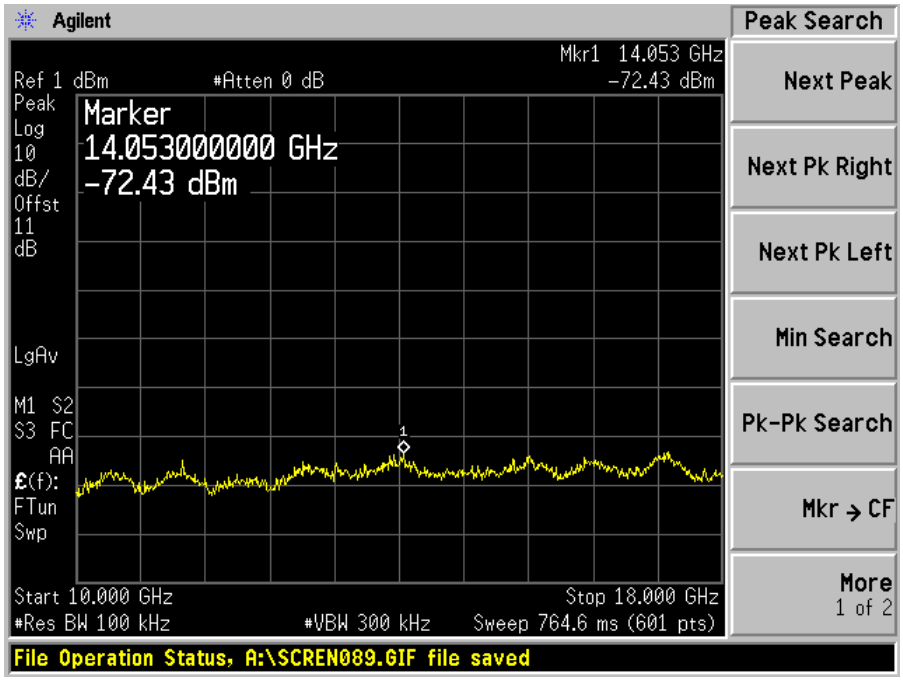

Agilent
Peak Search
Mkr1 17.280 GHz
Ref 1 dBm
#Atten 0 dB
-72.04 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
17.280000000 GHz
-72.04 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 14.000 GHz
Span 8 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 764.6 ms (601 pts)
File Operation Status, A:\SCREN084.GIF file saved

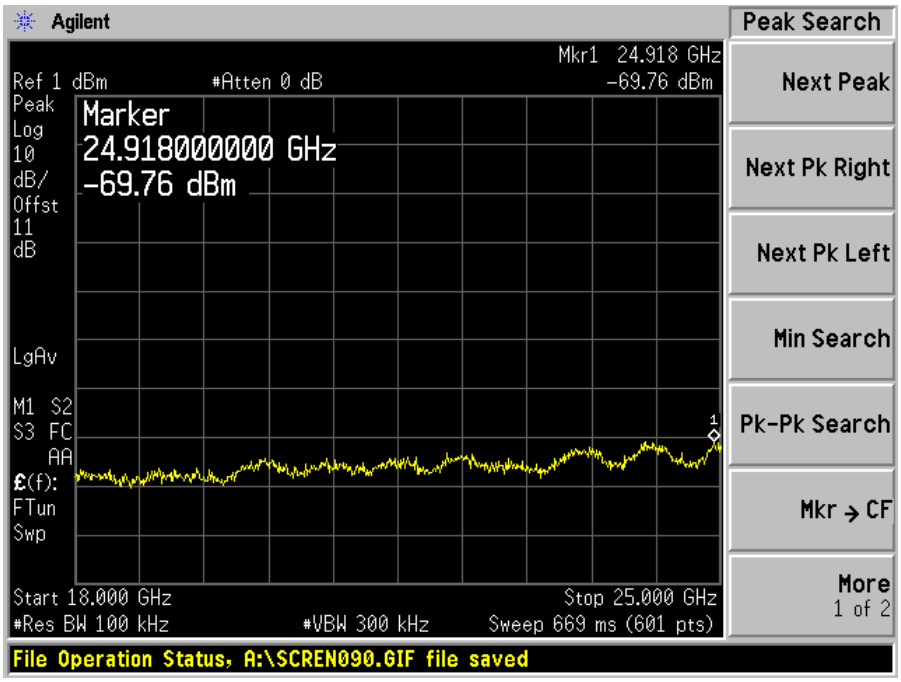

Agilent
Peak Search
Mkr1 24.965 GHz
Ref 1 dBm
#Atten 0 dB
-69.46 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
24.965000000 GHz
-69.46 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 18.000 GHz
Stop 25.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 669 ms (601 pts)
File Operation Status, A:\SCREN085.GIF file saved

High Channel






Agilent
Peak Search
Mkr1 14.053 GHz
Ref 1 dBm
#Atten 0 dB
-72.43 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
14.053000000 GHz
-72.43 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Start 10.000 GHz
Stop 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 764.6 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:\SCREN089.GIF file saved

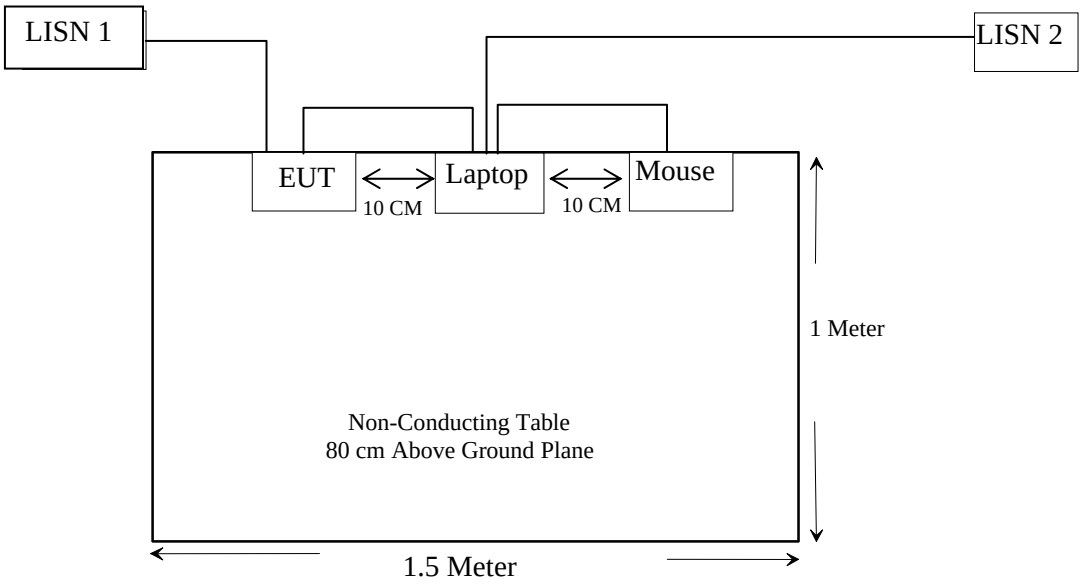

Agilent
Peak Search
Mkr1 24.918 GHz
Ref 1 dBm
#Atten 0 dB
-69.76 dBm
Peak
Log
10
dB/
Offst
11
dB
Marker
24.918000000 GHz
-69.76 dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Start 18.000 GHz
Stop 25.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 669 ms (601 pts)
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
File Operation Status, A:\SCREN090.GIF file saved

§15.205, §15.209 (a) & §15.247(d) – RADIATED SPURIOUS EMISSIONS

Test Setup

The radiated emissions tests were performed in the 3-meter open area test site, using the setup in accordance with ANSI C63.4-2003. The specification used was the FCC 15 Subpart C limits.

Test Setup Block Diagram



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Sonoma	Amplifier, Pre	317	260408	2006-02-03
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06
HP	Pre, Amplifier (1 ~ 26.5 GHz)	8449B	3147A00400	2006-08-10
Sunol Sciences	Antenna	JB3	A020106-3/S006628	2006-03-14
A. R.A	Horn Antenna	DRG-118/A	1132	2005-10-17

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

Environmental Conditions

Temperature:	22° C
Relative Humidity:	75%
ATM Pressure:	1021 mbar

The testing was performed by James Ma on 2006-09-14.

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations.

All data were recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB 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 emissions is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Corrected Amplitude – Part15.247 Limit

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:

-16.4 dB at **9648 MHz** in the **Vertical** polarization, 802.11b Low Channel, 3 meters

-16.9dB at **9748 MHz** in the **Vertical** polarization, 802.11b Middle Channel, 3 meters

-16.2 dB at **9848 MHz** in the **Vertical** polarization, 802.11b High Channel, 3 meters

-17.1 dB at **9648 MHz** in the **Vertical** polarization, 802.11g Low Channel, 3 meters

-16.6dB at **7311 MHz** in the **Vertical** polarization, 802.11g Middle Channel, 3 meters

-17.1 dB at **9848 MHz** in the **Vertical** polarization, 802.11g High Channel, 3 meters

Run#1 Radiated Harmonics and Spur Emissions

802.11b Low Channel:

Frequency MHz	Reading dBuV	Azimuth Degrees	Height m	Polar H / V	Antenna Factor dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments
9648.00	30.0	180	2.0	v	38.1	3.7	34.2	37.6	54	-16.4	Ave
7236.00	31.1	180	2.0	v	36.7	4.2	34.7	37.3	54	-16.7	Ave
9648.00	29.3	90	2.0	h	38.1	3.7	34.2	36.9	54	-17.1	Ave
7236.00	30.2	90	2.0	h	36.7	4.2	34.7	36.4	54	-17.6	Ave
4824.00	30.0	270	2.4	v	32.5	1.9	34.8	29.6	54	-24.4	Ave
4824.00	29.4	180	2.3	h	32.5	1.9	34.8	29.0	54	-25.0	Ave
9648.00	39.4	90	2.0	v	38.1	3.7	34.2	47.0	74	-27.0	Peak
9648.00	39.0	180	2.0	h	38.1	3.7	34.2	46.6	74	-27.4	Peak
7236.00	40.2	90	2.0	v	36.7	4.2	34.7	46.4	74	-27.6	Peak
7236.00	40.0	180	2.0	h	36.7	4.2	34.7	46.2	74	-27.8	Peak
4824.00	41.8	270	2.4	v	32.5	1.9	34.8	41.4	74	-32.6	Peak
4824.00	40.3	180	2.3	h	32.5	1.9	34.8	39.9	74	-34.1	Peak

802.11b Middle Channel:

Frequency MHz	Reading dBuV	Azimuth Degrees	Height m	Polar H / V	Antenna Factor dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments
9748.00	29.5	180	2.0	v	38.1	3.7	34.2	37.1	54	-16.9	Ave
9748.00	29.2	90	2.0	h	38.1	3.7	34.2	36.8	54	-17.2	Ave
7311.00	29.6	270	2.4	v	36.7	4.2	34.7	35.8	54	-18.2	Ave
7311.00	29.2	180	2.1	h	36.7	4.2	34.7	35.4	54	-18.6	Ave
4874.00	30.0	270	2.4	v	32.5	1.9	34.8	29.6	54	-24.4	Ave
4874.00	29.5	180	2.2	h	32.5	1.9	34.8	29.1	54	-24.9	Ave
9748.00	39.1	90	2.0	v	38.1	3.7	34.2	46.7	74	-27.3	Peak
9748.00	38.7	180	2.0	h	38.1	3.7	34.2	46.3	74	-27.7	Peak
7311.00	39.4	270	2.4	v	36.7	4.2	34.7	45.6	74	-28.4	Peak
7311.00	39.1	180	2.3	h	36.7	4.2	34.7	45.3	74	-28.7	Peak
4874.00	40.0	270	2.4	v	32.5	1.9	34.8	39.6	74	-34.4	Peak
4874.00	39.4	180	2.2	h	32.5	1.9	34.8	39.0	74	-35.0	Peak

802.11b High Channel:

Frequency MHz	Reading dBuV	Azimuth Degrees	Height m	Polar H / V	Antenna Factor dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments
9848.00	30.2	180	2.0	v	38.1	3.7	34.2	37.8	54	-16.2	Ave
9848.00	29.3	90	2.0	h	38.1	3.7	34.2	36.9	54	-17.1	Ave
7386.00	29.3	270	2.4	v	36.7	4.2	34.7	35.5	54	-18.5	Ave
7386.00	29.0	90	2.1	h	36.7	4.2	34.7	35.2	54	-18.8	Ave
4924.00	30.0	270	2.4	v	32.5	1.9	34.8	29.6	54	-24.4	Ave
4924.00	29.4	90	2.1	h	32.5	1.9	34.8	29.0	54	-25.0	Ave
9848.00	40.0	90	2.0	v	38.1	3.7	34.2	47.6	74	-26.4	Peak
9848.00	38.9	180	2.0	h	38.1	3.7	34.2	46.5	74	-27.5	Peak
7386.00	39.5	270	2.4	v	36.7	4.2	34.7	45.7	74	-28.3	Peak
7386.00	39.3	90	2.1	h	36.7	4.2	34.7	45.5	74	-28.5	Peak
4924.00	40.0	270	2.4	v	32.5	1.9	34.8	39.6	74	-34.4	Peak
4924.00	39.3	90	2.1	h	32.5	1.9	34.8	38.9	74	-35.1	Peak

802.11g Low Channel:

Frequency MHz	Reading dBuV	Azimuth Degrees	Height m	Polar H / V	Antenna Factor dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments
9648.00	29.3	180	2.0	v	38.1	3.7	34.2	36.9	54	-17.1	Ave
7236.00	30.2	180	2.0	v	36.7	4.2	34.7	36.4	54	-17.6	Ave
9648.00	28.1	90	2.0	h	38.1	3.7	34.2	35.7	54	-18.3	Ave
7236.00	28.4	90	2.0	h	36.7	4.2	34.7	34.6	54	-19.4	Ave
4824.00	29.8	270	2.4	v	32.5	1.9	34.8	29.4	54	-24.6	Ave
4824.00	28.2	180	2.3	h	32.5	1.9	34.8	27.8	54	-26.2	Ave
9648.00	39.8	90	2.0	v	38.1	3.7	34.2	47.4	74	-26.6	Peak
7236.00	40.0	90	2.0	v	36.7	4.2	34.7	46.2	74	-27.8	Peak
9648.00	37.6	180	2.0	h	38.1	3.7	34.2	45.2	74	-28.8	Peak
7236.00	37.1	180	2.0	h	36.7	4.2	34.7	43.3	74	-30.7	Peak
4824.00	40.2	270	2.4	v	32.5	1.9	34.8	39.8	74	-34.2	Peak
4824.00	37.5	180	2.3	h	32.5	1.9	34.8	37.1	74	-36.9	Peak

802.11g Middle Channel:

Frequency MHz	Reading dBuV	Azimuth Degrees	Height m	Polar H / V	Antenna Factor dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments
7311.00	31.2	270	2.4	v	36.7	4.2	34.7	37.4	54	-16.6	Ave
9748.00	29.8	180	2.0	v	38.1	3.7	34.2	37.4	54	-16.6	Ave
9748.00	29.6	90	2.0	h	38.1	3.7	34.2	37.2	54	-16.8	Ave
7311.00	30.0	180	2.1	h	36.7	4.2	34.7	36.2	54	-17.8	Ave
4874.00	29.3	270	2.4	v	32.5	1.9	34.8	28.9	54	-25.1	Ave
4874.00	29.1	180	2.2	h	32.5	1.9	34.8	28.7	54	-25.3	Ave
9748.00	40.2	90	2.0	v	38.1	3.7	34.2	47.8	74	-26.2	Peak
9748.00	39.6	180	2.0	h	38.1	3.7	34.2	47.2	74	-26.8	Peak
7311.00	40.1	270	2.4	v	36.7	4.2	34.7	46.3	74	-27.7	Peak
7311.00	40.0	180	2.3	h	36.7	4.2	34.7	46.2	74	-27.8	Peak
4874.00	39.7	270	2.4	v	32.5	1.9	34.8	39.3	74	-34.7	Peak
4874.00	39.4	180	2.2	h	32.5	1.9	34.8	39.0	74	-35.0	Peak

802.11g High Channel:

Frequency MHz	Reading dBuV	Azimuth Degrees	Height m	Polar H / V	Antenna Factor dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments
9848.00	29.3	180	2.0	v	38.1	3.7	34.2	36.9	54	-17.1	Ave
9848.00	29.0	90	2.0	h	38.1	3.7	34.2	36.6	54	-17.4	Ave
7386.00	29.2	270	2.4	v	36.7	4.2	34.7	35.4	54	-18.6	Ave
7386.00	29.0	90	2.1	h	36.7	4.2	34.7	35.2	54	-18.8	Ave
4924.00	28.7	270	2.4	v	32.5	1.9	34.8	28.3	54	-25.7	Ave
4924.00	28.5	90	2.1	h	32.5	1.9	34.8	28.1	54	-25.9	Ave
9848.00	38.7	90	2.0	v	38.1	3.7	34.2	46.3	74	-27.7	Peak
9848.00	38.5	180	2.0	h	38.1	3.7	34.2	46.1	74	-27.9	Peak
7386.00	39.5	270	2.4	v	36.7	4.2	34.7	45.7	74	-28.3	Peak
7386.00	39.3	90	2.1	h	36.7	4.2	34.7	45.5	74	-28.5	Peak
4924.00	40.1	270	2.4	v	32.5	1.9	34.8	39.7	74	-34.3	Peak
4924.00	39.8	90	2.1	h	32.5	1.9	34.8	39.4	74	-34.6	Peak

§15.247(a) (2) – 6 dB BANDWIDTH

Applicable Standard

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 emissions bandwidth. (6 dB bandwidth for DTS)
4. Repeat above procedures until all frequencies measured were complete.

Equipment Lists

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:	22° C
Relative Humidity:	75%
ATM Pressure:	1021 mbar

The testing was performed by James Ma on 2006-09-14.

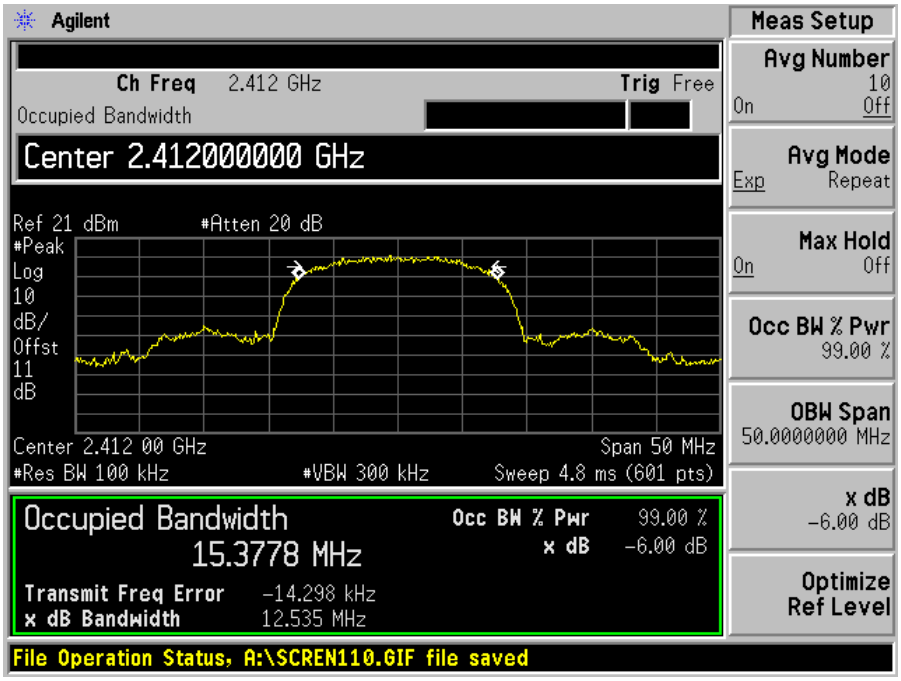
Measurement Result

Channel 802.11b	Frequency MHz	Channel Bandwidth (KHz)	Limit KHz
Low	2412	12535	>500
Mid	2437	12496	>500
High	2462	13147	>500

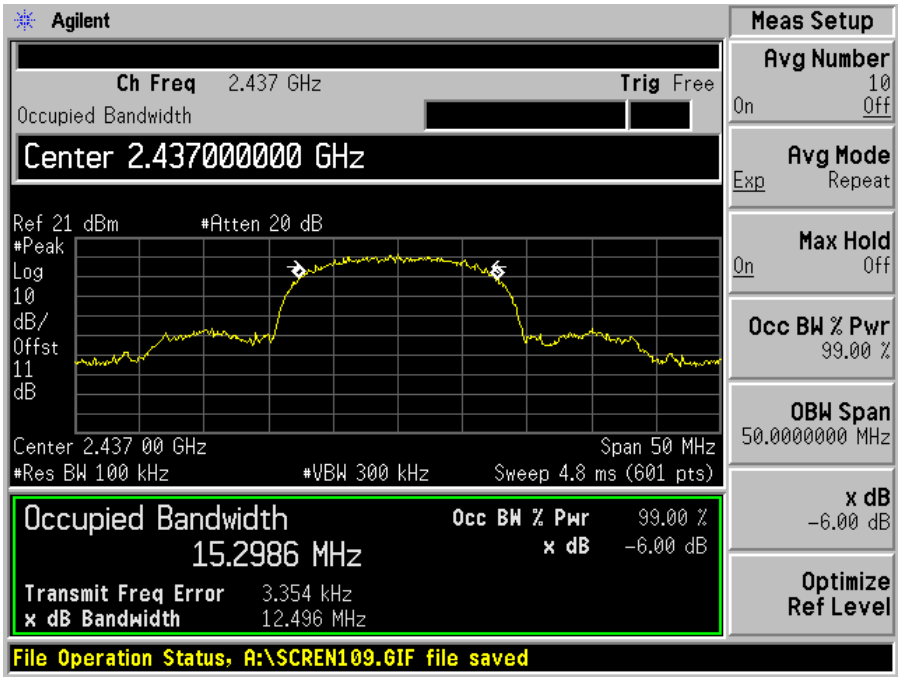
Channel 802.11g	Frequency MHz	Channel Bandwidth (KHz)	Limit KHz
Low	2412	16600	>500
Mid	2437	16611	>500
High	2462	16600	>500

802.11b mode:

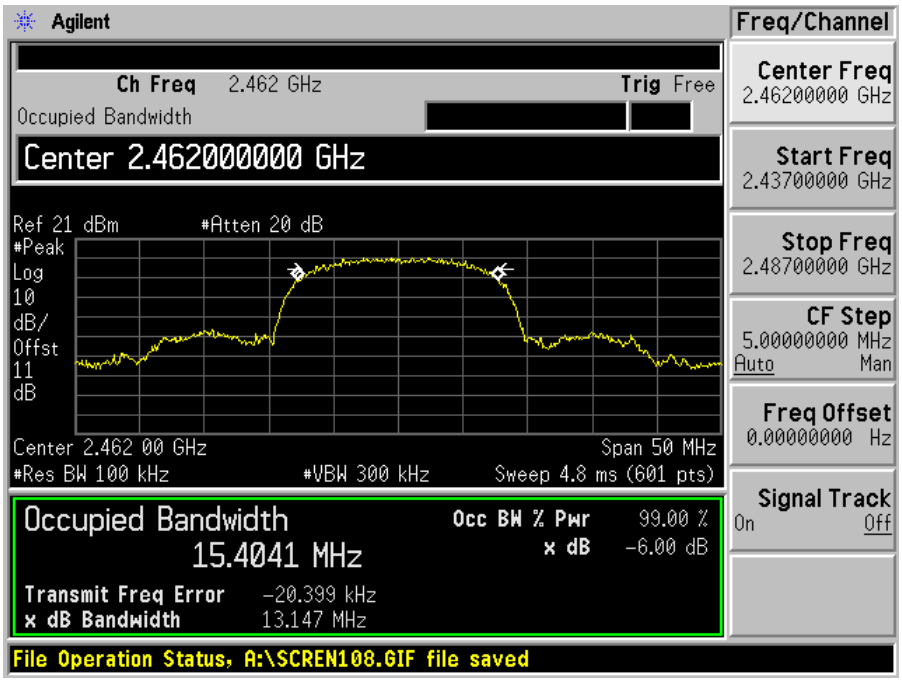
Low Channel



Middle Channel

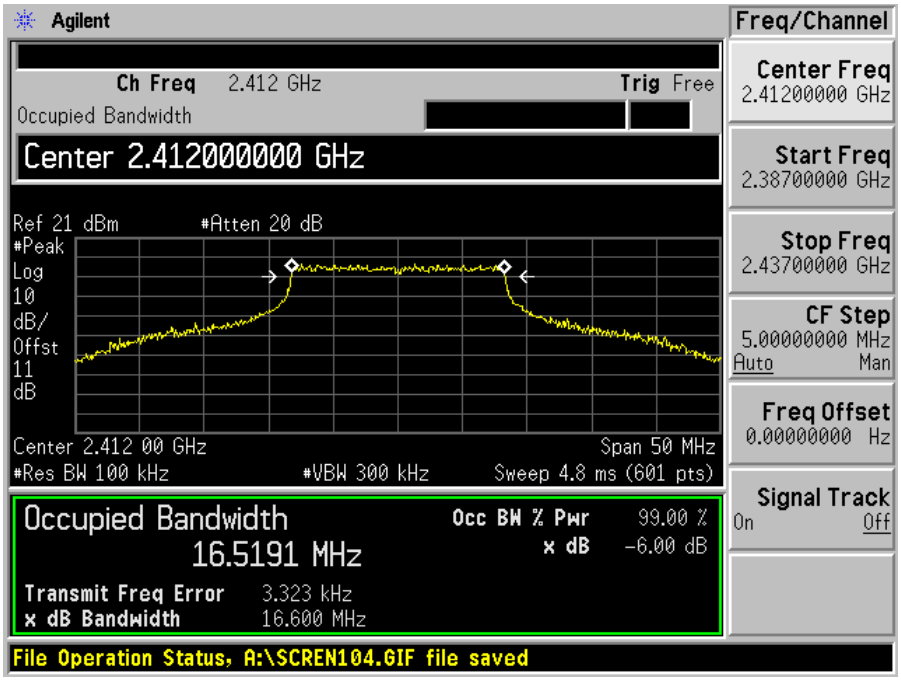


High Channel

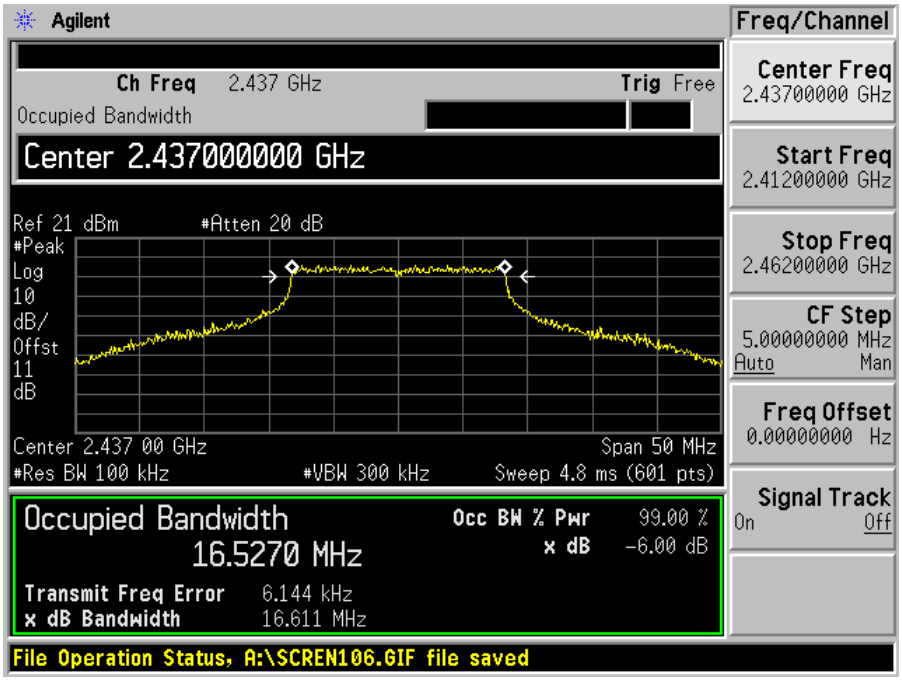


802.11g mode:

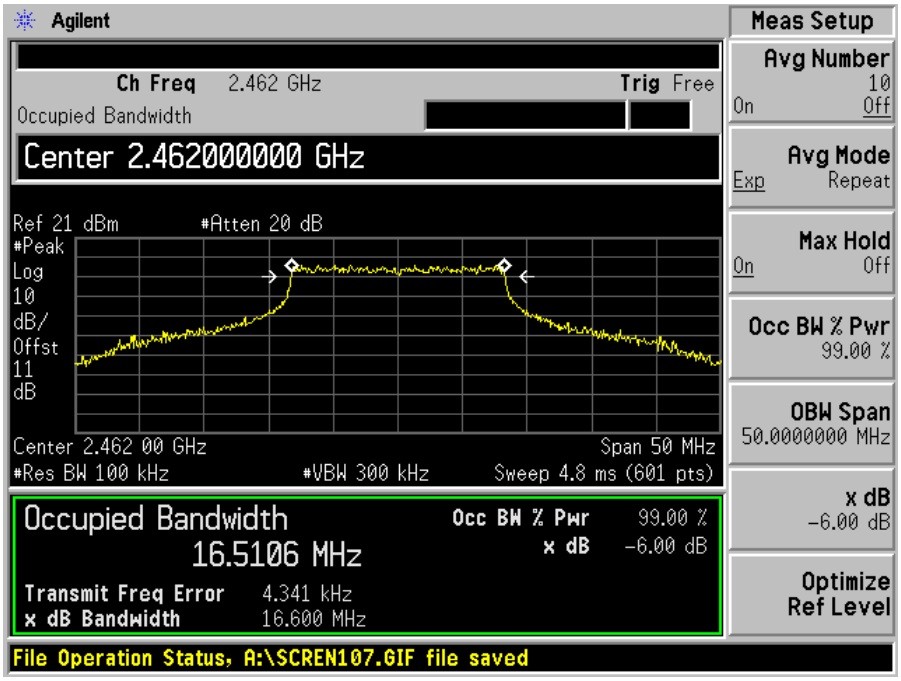
Low Channel



Mid. Channel



High Channel



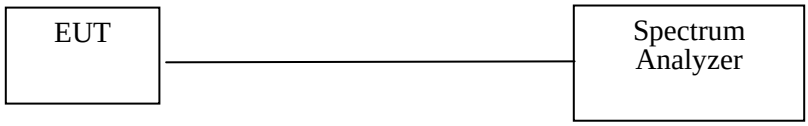
§15.247(b) (3) – MAXIMUM PEAK OUTPUT POWER

Applicable Standard

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 Lists

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:	22° C
Relative Humidity:	75%
ATM Pressure:	1021 mbar

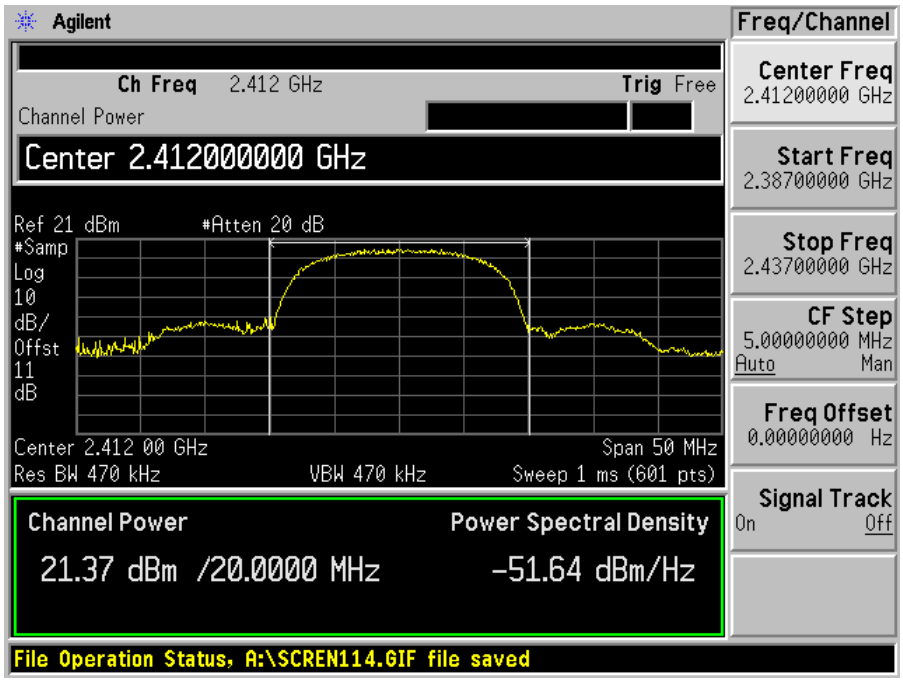
The testing was performed by James Ma on 2006-09-14.

Measurement Result

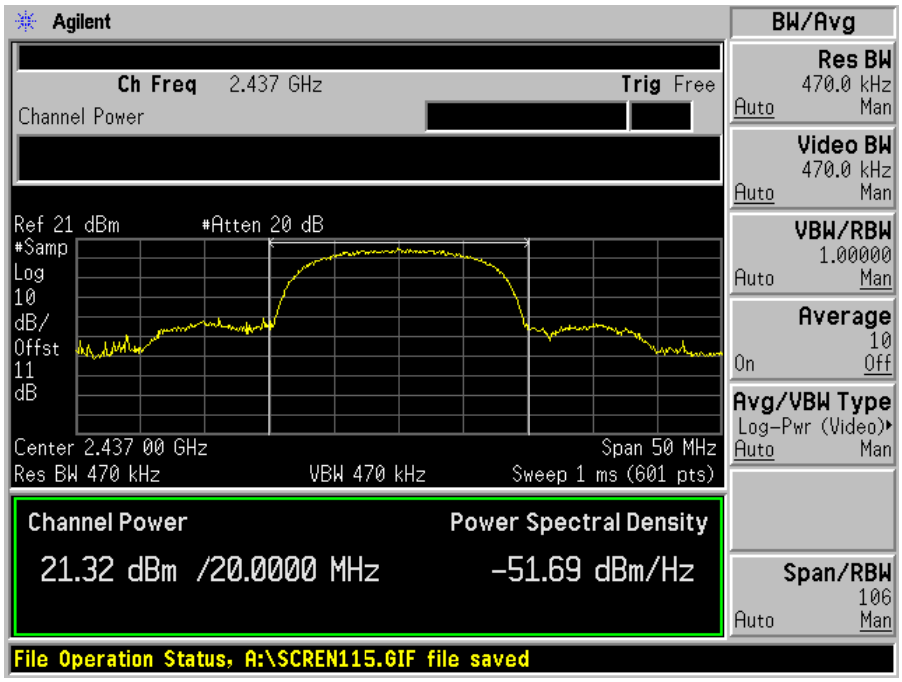
Frequency (MHz)	RF Power (dBm)		Limit (dBm)
	802.11b	802.11g	
2412	21.37	18.23	30
2437	21.32	18.24	30
2462	21.25	18.39	30

802.11b mode:

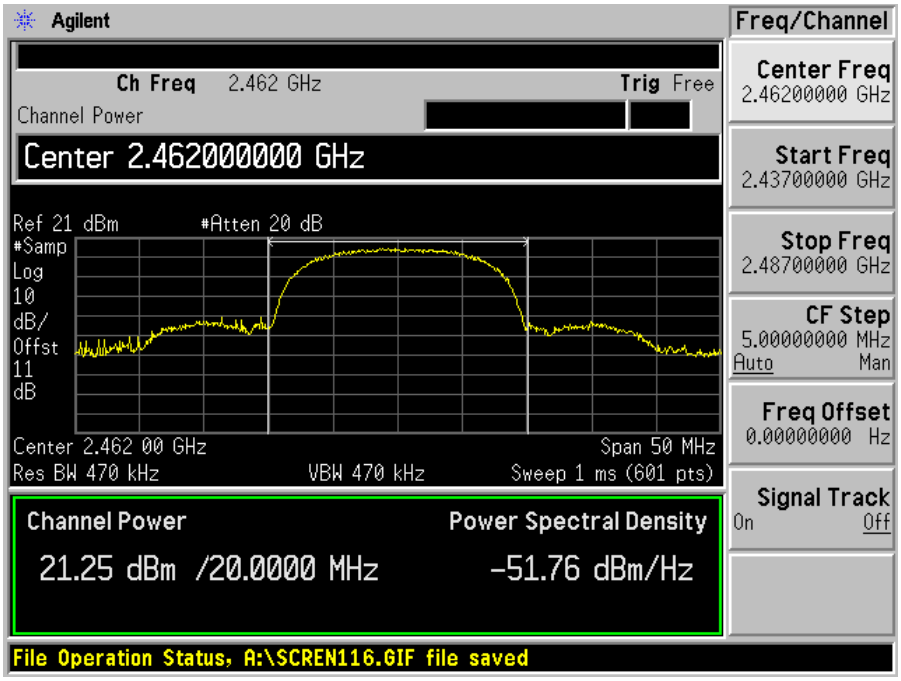
Low Channel



Middle Channel

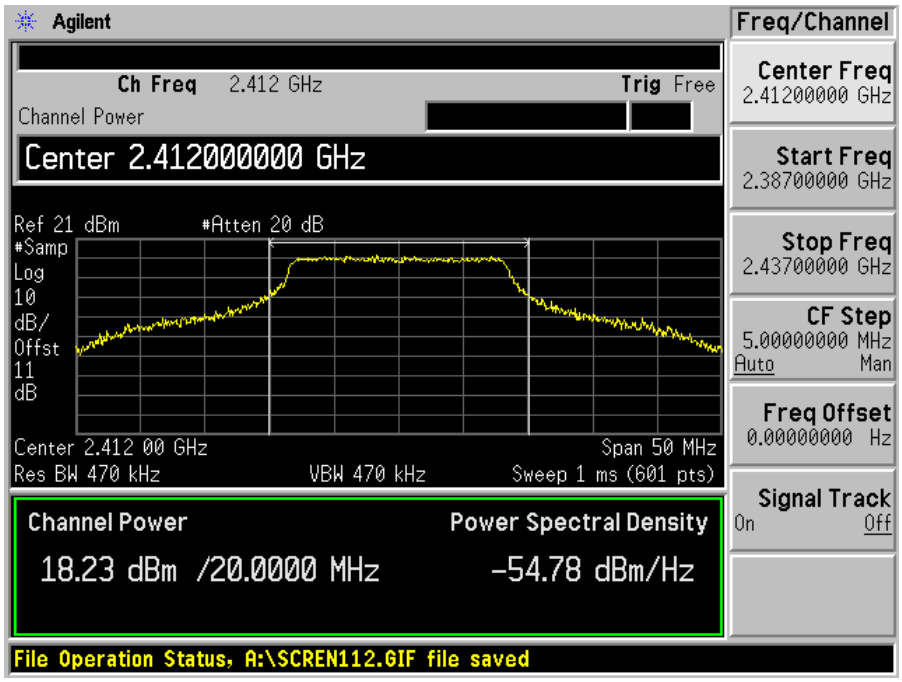


High Channel

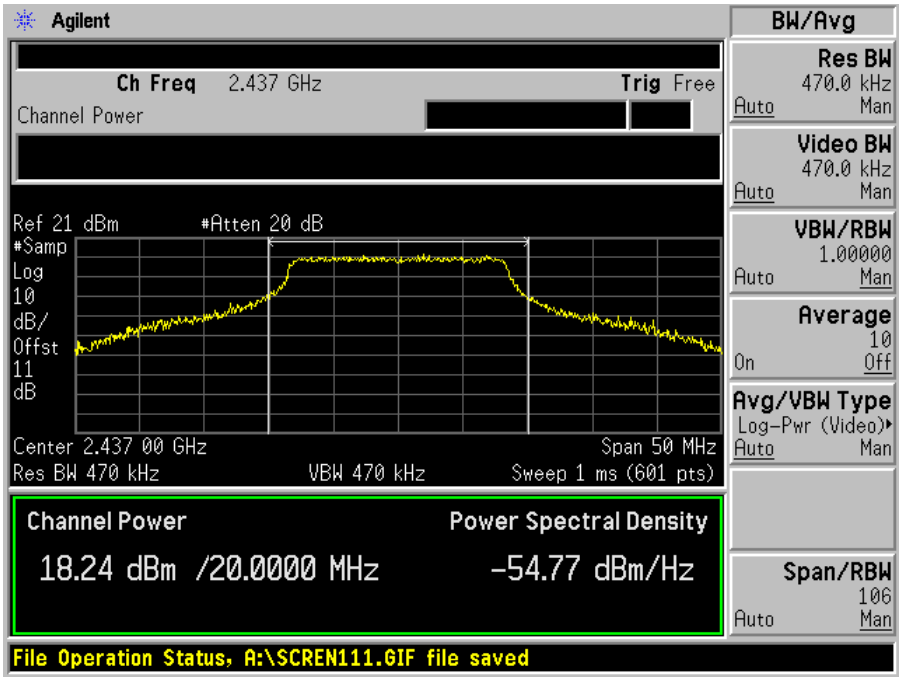


802.11g mode:

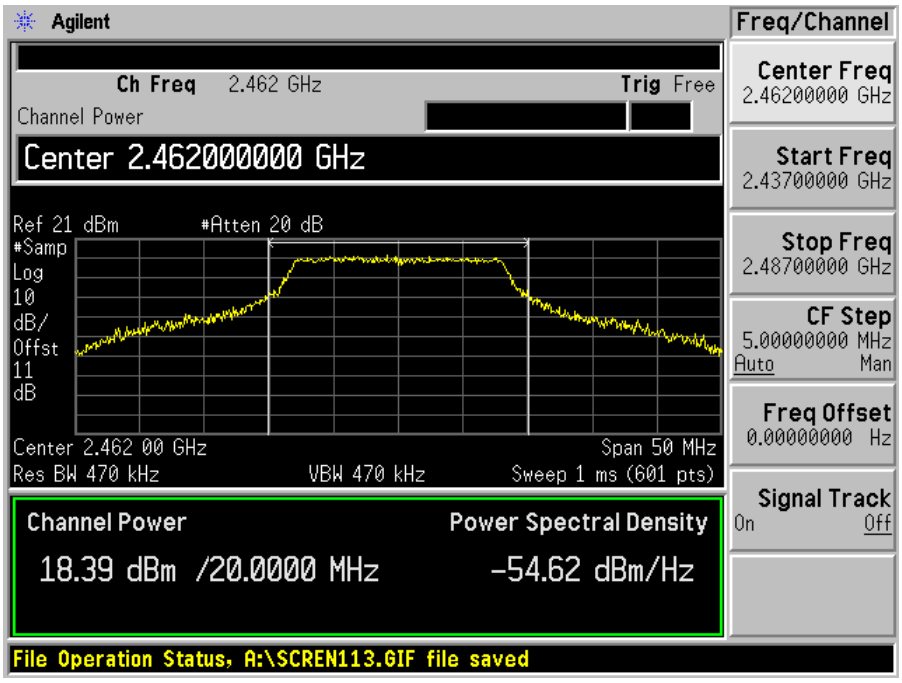
Low Channel



Middle Channel



High Channel



§15.247(d) - 100 KHZ BANDWIDTH FROM BAND EDGES

Applicable Standard

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 emissions 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 Lists

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:	22° C
Relative Humidity:	75%
ATM Pressure:	1021 mbar

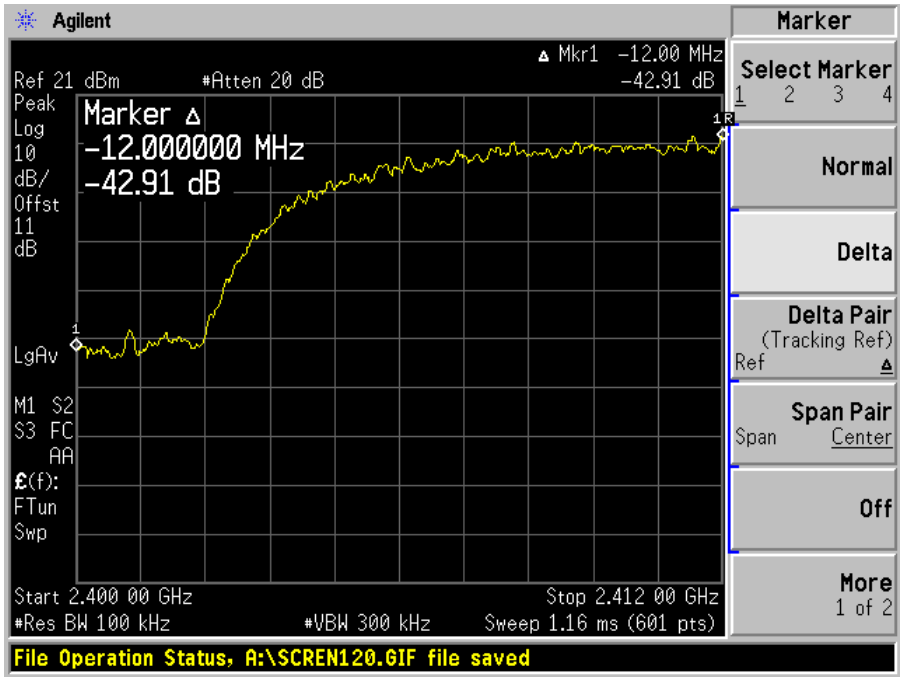
The testing was performed by James Ma on 2006-09-14.

Measurement Result

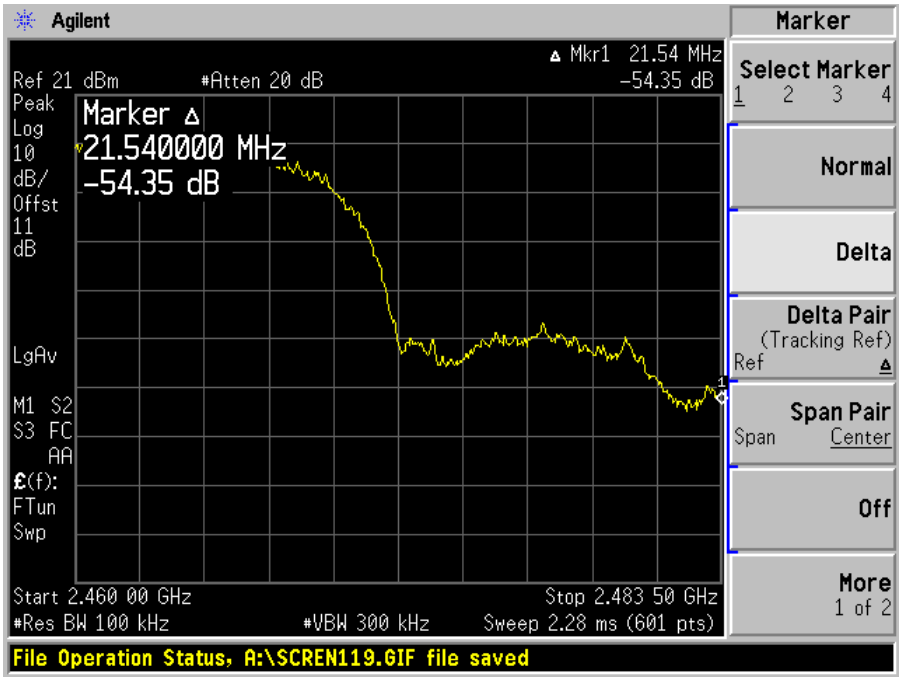
Please refer to following pages for plots of band edge.

802.11b mode:

Lowest Channel

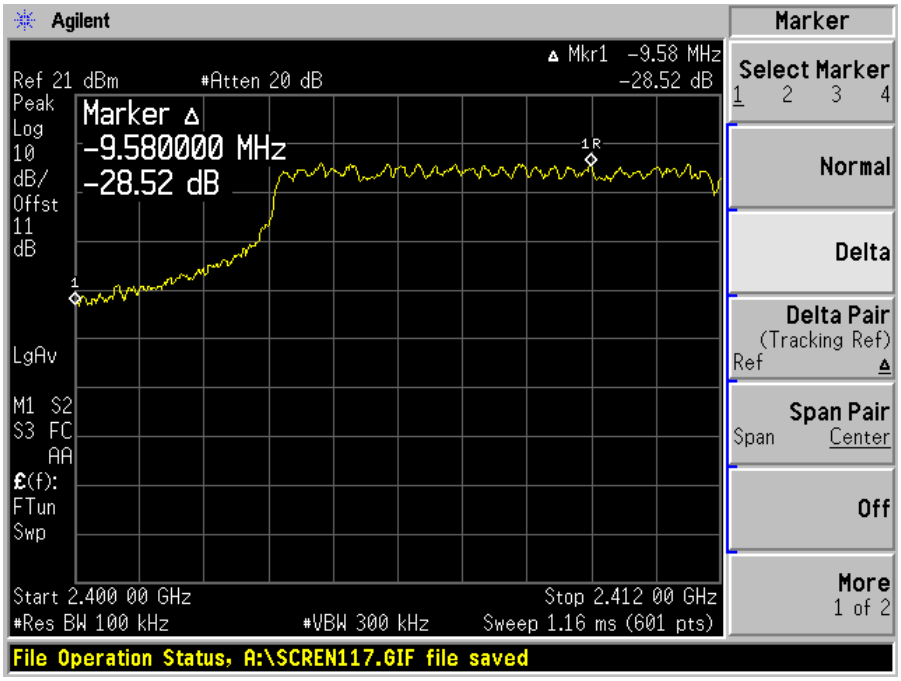


Highest Channel

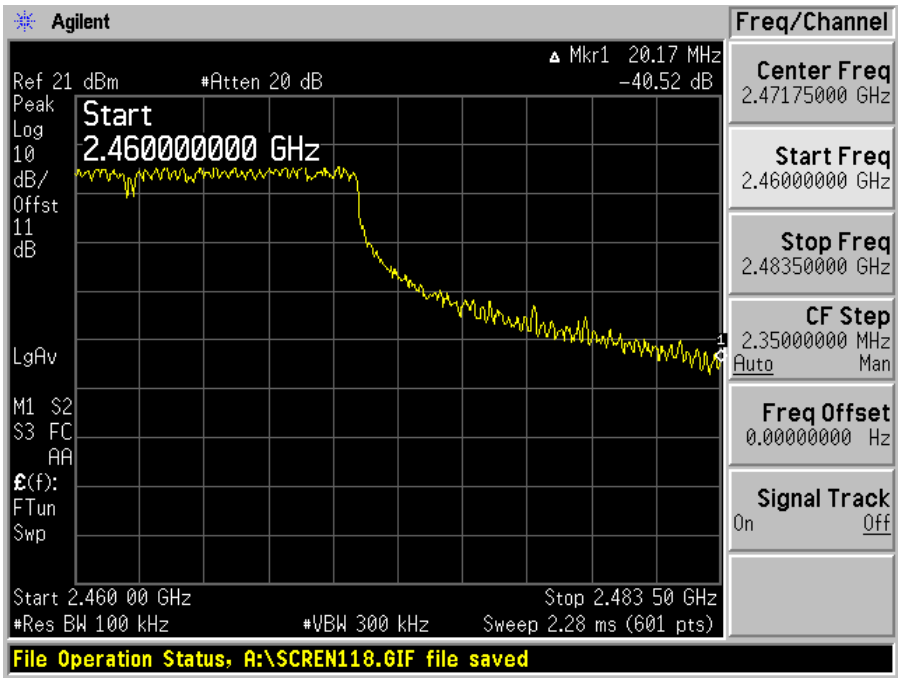


802.11g mode:

Lowest Channel



Highest Channel



§15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

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 Lists

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:	22° C
Relative Humidity:	75%
ATM Pressure:	1021 mbar

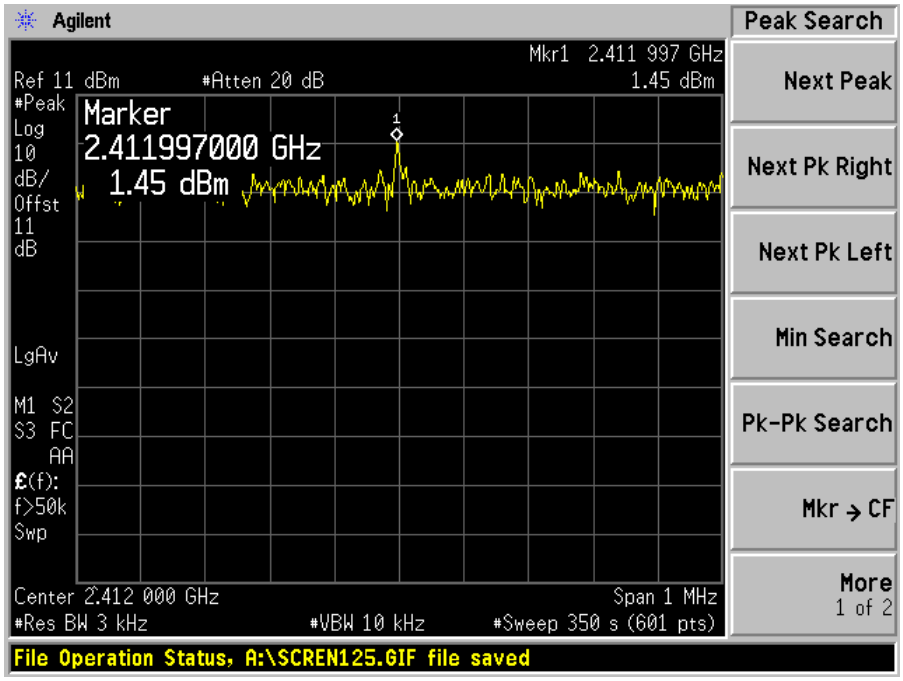
The testing was performed by James Ma on 2006-09-14.

Measurement Result

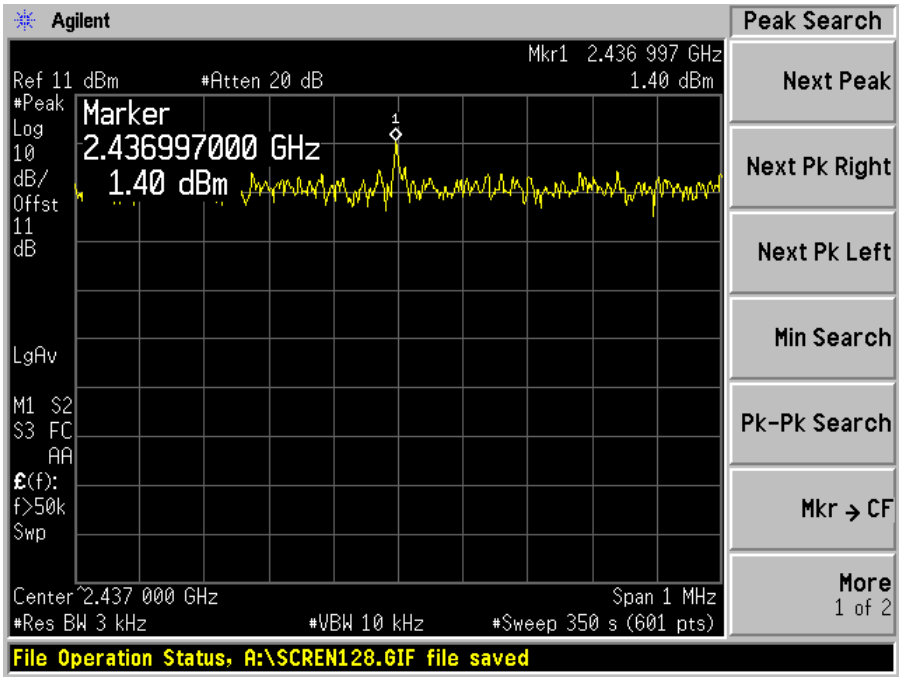
Channel	Power Spectral Density (dBm/3KHz)		Limit (dBm/3KHz)
	802.11b	802.11g	
Low	1.45	0.69	8
Mid	1.40	0.01	8
High	0.76	0.19	8

802.11b mode:

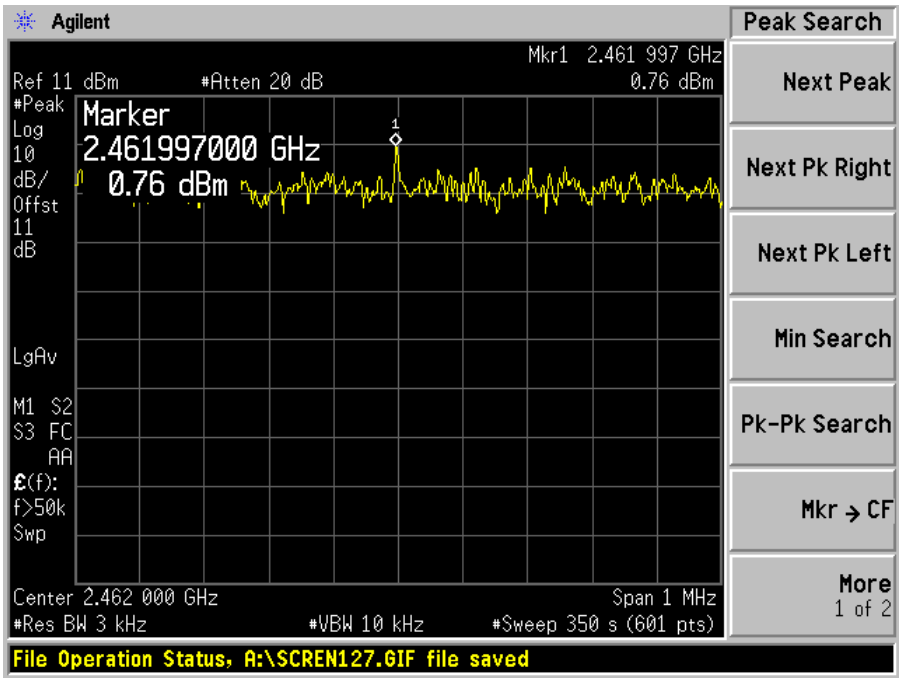
Low Channel



Mid. Channel

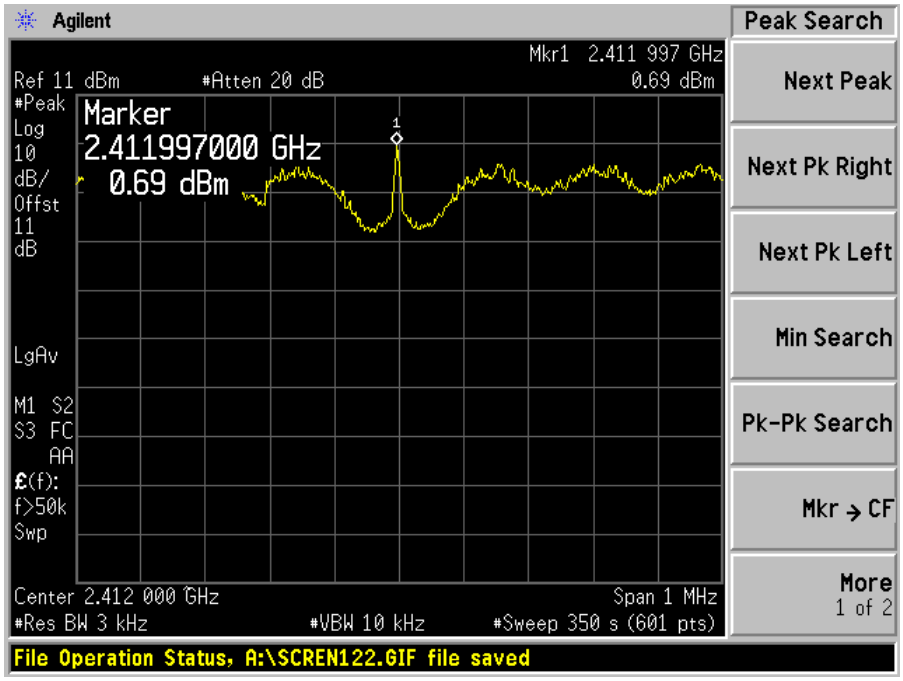


High Channel

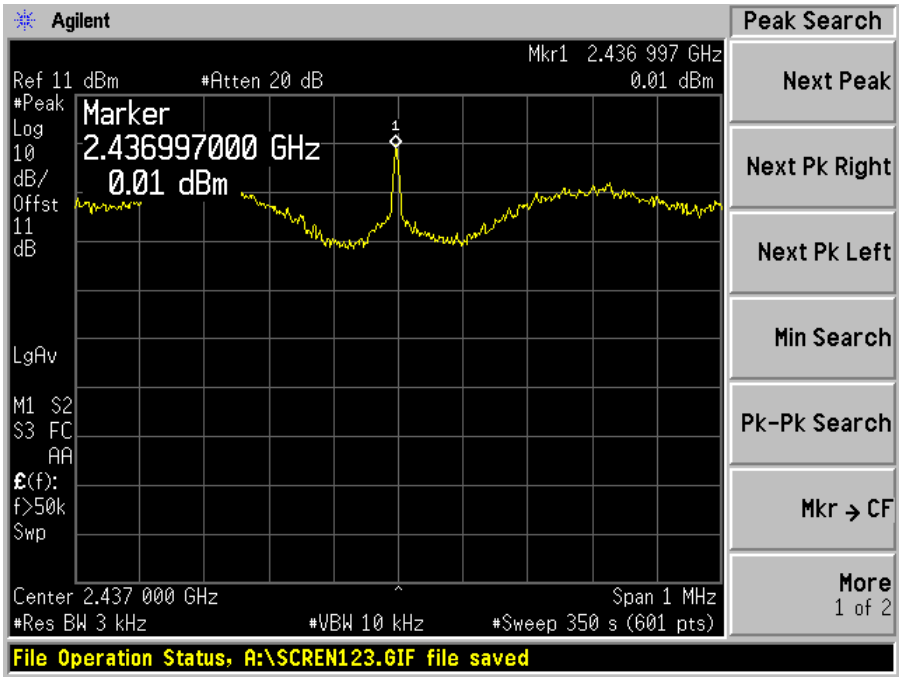


802.11g mode:

Low Channel



Mid Channel



High Channel