Engineering and Testing for EMC and Safety Compliance

CERTIFICATION APPLICATION REPORT
FCC PART 15.247 & INDUSTRY CANADA RSS-210

Test Lab:	Applicant:
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FCC ID / IC ID	I28MD-ZLAN11G	**TEST REPORT DATE**	May 3, 2006
PLATFORM	Modular	**RTL WORK ORDER #**	2006029
MODEL	ZLAN11G Radio Module	**RTL QUOTE #**	QRTL06-172

Standards and Procedures	ANSI 63.4 and FCC 97-114 (DSSS)
FCC Classification	DTS
FCC Rule Part	Part 15.247: Operation within the bands 920-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz Direct Sequence System
Industry Canada Standard	RSS-210: Low Power License-Exempt Radio Communication Devices (All Frequency Bands)
Digital Interface Information	Digital Interface was found to be compliant

Frequency Range (MHz)	Output Power*(W)	Frequency Tolerance	Emission Designator
2412-2462	0.076	N/A	16M4G7D

* output power is maximum peak conducted

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards.

Furthermore, there was no deviation from, additions to, or exclusions from the applicable parts or FCC Part 2, FCC Part 15, Industry Canada RSS-210, ANSI 63.4, and FCC 97-114 (DSSS).

Signature:  Date: May 4, 2006

Typed/Printed Name: Desmond A. Fraser Position: President

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1 General Information

1.1 Scope

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

IC RSS-210 Section 6.2.2(o): Frequency Hopping, Direct Spread Spectrum, and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

1.2 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 2003).

1.3 Related Submittals(s)/Grant(s)

This is an original FCC certification application for limited modular approval per DA 00-1407 for Zebra Technologies Corp., Model Name: ZLAN11G, FCC ID: I28MD-ZLAN11G.

The applicant requests LIMITED MODULAR APPROVAL to allow the use of this radio in Zebra printers and other Zebra products similar in style to those presented in this report, including housing type and materials, and not limited to the printers in this report. Appendix E of this report includes a letter from the applicant justifying the LIMITED MODULAR APPROVAL request. With respect to Industry Canada, IC: 3798A-ZLAN11G the applicant requests LIMITED MODULAR APPROVAL, based on RSS-GEN. Appendix F of this report includes a letter from the applicant justifying LIMITED MODULAR APPROVAL under the conditions set forth in RSS-GEN.

1.4 Modifications

No modifications were implemented to meet testing criteria.

2 Test Information

2.1 Test Justification

The EUT was tested in all three orthogonal planes in order to determine worst-case emissions. Channel 1 at 2412 MHz, Channel 6 at 2437 MHz, and Channel 11 at 2462 MHz were tested and investigated from 9 kHz to 24 GHz. Data for all three channels are presented in this report.

The EUT is connected to an external dipole antenna mounted in representative printers in which it will be used. This antenna transmits, receives, and is connected to the antenna port.

The worst case data taken in this report represents the highest data rates at 11 Mbps for 802.11b and 6 Mbps for 802.11g. Data rates of 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps were investigated and found to be in compliance. The change in envelope did not cause the EUT to be non-compliant in any of the aforementioned modes.

2.2 Exercising the EUT

The EUT was provided with the software to continuously transmit during testing. The carrier was also checked to verify that the information was being transmitted. There were no deviations from the test standard(s) and/or methods.

2.3 Test Result Summary

Table 2-1: Test Result Summary for FCC Rules and Regulations

STANDARD	TEST	PASS/FAIL OR N/A
FCC 15.205	Compliance with the Restricted Band Edge	Pass
FCC 15.207	Conducted Emissions	Pass
FCC 15.209	Radiated Emissions	Pass
FCC 15.247(a)(2)	Modulated Bandwidth	Pass
FCC 15.247(b)	Power Output	Pass
FCC 15.247(c)	Antenna Conducted Spurious Emissions	Pass
FCC 15.247(d)	Power Spectral Density	Pass

2.4 Test System Details

The test sample was received on March 31, 2006. The FCC Identifiers for all equipment, and descriptions of all cables used in the tested system, are shown in the following table.

Table 2-2: Equipment under Test (EUT)

Part	Manufacturer	Model #	Serial Number	FCC ID	Cable Description	RTL Bar Code
ZLAN11G Zebra Embedded 802.11b/g Radio (EUT)	Samsung Electro-Mechanics	SWL-2460	V05091539697	I28MD-ZLAN11G	N/A	17171
ZLAN11G Zebra Embedded 802.11b/g Radio (EUT)	Samsung Electro-Mechanics	SWL-2460	V05091539710	I28MD-ZLAN11G	N/A	17177
ZLAN11G Zebra Embedded 802.11b/g Radio (EUT)	Samsung Electro-Mechanics	SWL-2460	V05091539665	I28MD-ZLAN11G	N/A	17192
Wireless Printer	Zebra Technologies	QL420	XXVT06-05-5044	N/A	N/A	17180
Wireless Printer	Zebra Technologies	QL420	XXVT06-44-5163	N/A	N/A	17129
Ribbon Cable Extension	Zebra Technologies	N/A	N/A	N/A	16mm unshielded ribbon cable	17176
Patch Antenna	Zebra Technologies	CQ17922-G1	N/A	N/A	9mm shielded U.FL connectors with ferrite beads at radio end	17132
Antenna	Zebra Technologies	CQ17810-G1M	N/A	N/A	9mm shielded U.FL connectors with ferrite beads at radio end	17134
Antenna	Zebra Technologies	CQ17810-G2M Rev D	N/A	N/A	9mm shielded U.FL connectors with ferrite beads at radio end	17133
Antenna	Zebra Technologies	CQ17810-G3M Rev D	N/A	N/A	9mm shielded U.FL connectors with ferrite beads at radio end	17135
7.4 VDC Li-Ion Battery	Zebra Technologies	AT16293-1	14005GCG	N/A	N/A	17136
Battery Charger	Zebra Technologies	L172	N/A	N/A	2m shielded	16162

2.5 Configuration of Tested System

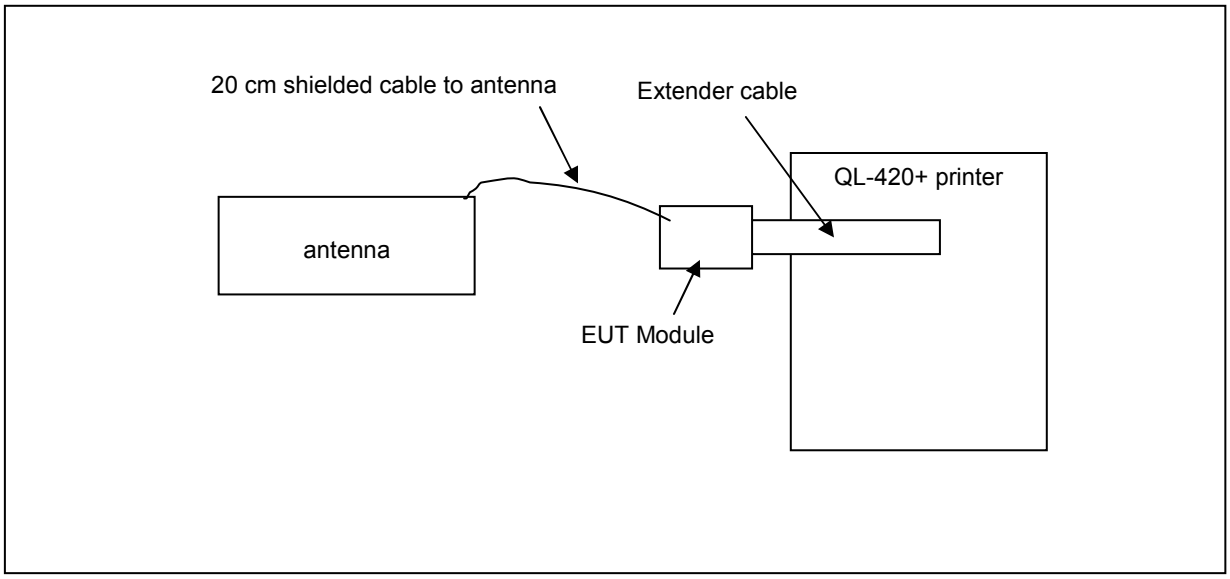


Figure 2-1: Worst Case Configuration of System under Test

3 Peak Output Power - FCC §15.247(b)(1); IC RSS-210 §6.2.2(o)(b)

3.1 Power Output Test Procedure

The conducted output power of the EUT was measured using an Agilent 4416A EPM-P Series Power Meter with an E9323A Peak and Average Power Sensor.

3.2 Power Output Test Data

Table 3-1: Power Output Test Data; 802.11b

CHANNEL	PEAK POWER CONDUCTED OUTPUT (dBm)
1	18.8
6	18.4
11	18.6

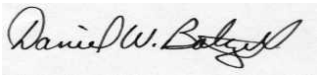
*Measurement accuracy is +/- 1.5 dB

Table 3-2: Power Output Test Data; 802.11g

CHANNEL	PEAK POWER CONDUCTED OUTPUT (dBm)
1	15.0
6	15.0
11	14.9

*Measurement accuracy is +/- 1.5 dB

TEST PERSONNEL:

Daniel W. Baltzell		May 3, 2006
Test Engineer	Signature	Date Of Test

3.3 Power Output Test Equipment

Table 3-3: Power Output Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901356	Agilent Technologies	E9323A	Power Sensor	31764-264	9/21/06
901184	Agilent Technologies	E4416A	EPM-P Power Meter, single channel	GB41050573	9/21/06

4 Compliance with the Restricted Band Edge - FCC §15.247(c), §15.205; IC RSS-210 §6.3

4.1 Band Edge Test Procedure

Compliance with the band edges was performed using the FCC's "Radiated Measurement at a Band Edge" guidance document. The final data derived below were from radiated measurements only. The data shown in this report represents the worst case at 11 Mbps for 802.11b and 54 Mbps for 802.11g modes. Data rates of 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps were investigated and found to be in compliance.

4.2 Restricted Band Edge Plots

Calculation of Lower Band Edge; 802.11b for Patch Antenna

The level 102.8 dBμV/m is the worst case average field strength measurement, from which the delta measurement of 51.2 dB is subtracted (reference plots), which is equivalent to a level of 51.6 dB. This level has a margin of 2.4 dB under the limit 54 dBμV/m.

Calculation: 102.8 dBμV/m – 51.2 dB – 54 dBμV/m = -2.4 dB

Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 111.1 dBμV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 102.8 dBμV/m
Delta measurement: 51.2 dB

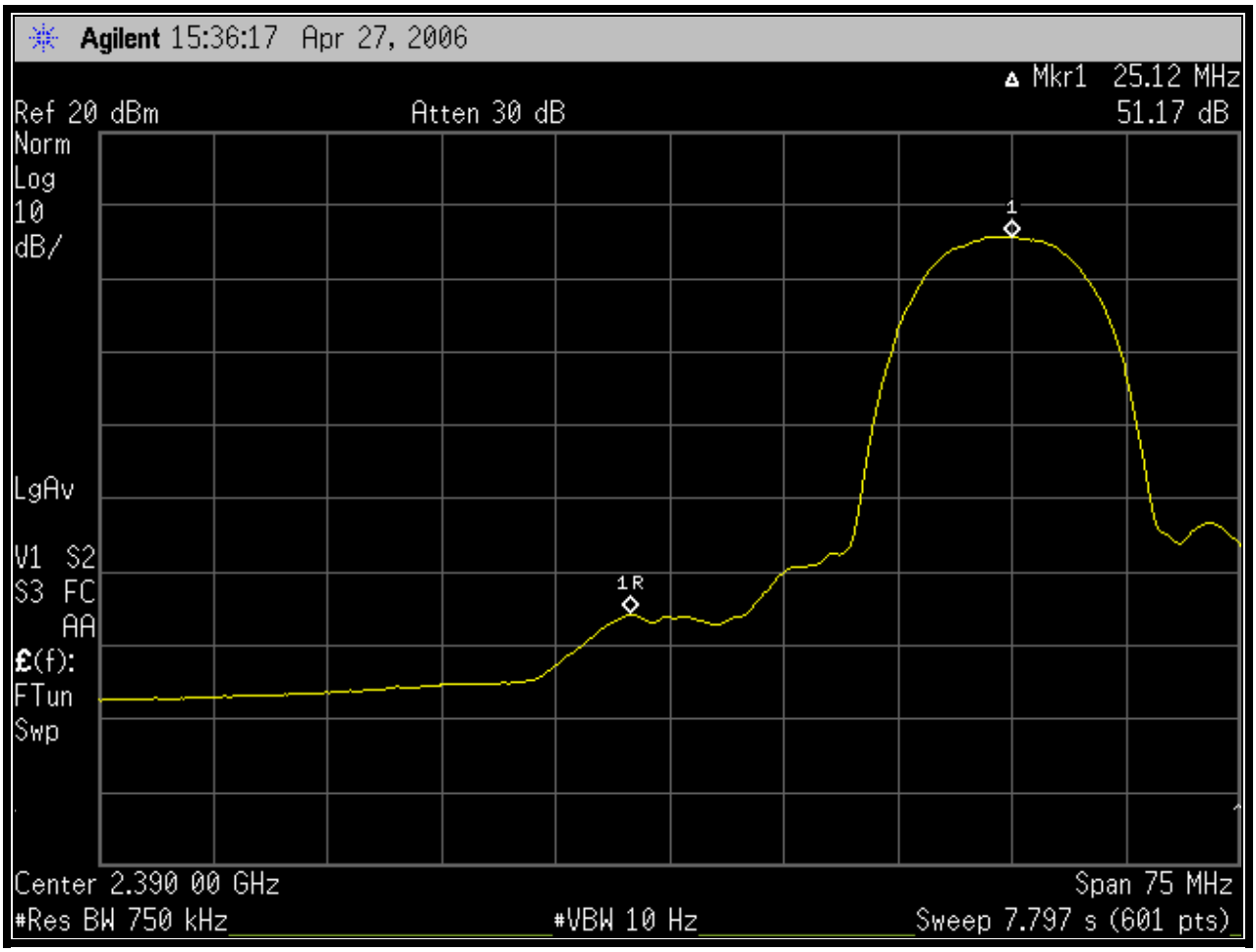
Calculation of Lower Band Edge; 802.11b for G2M Antenna

The level 95.7 dBμV/m is the worst case average field strength measurement, from which the delta measurement of 51.2 dB is subtracted (reference plots), which is equivalent to a level of 44.5 dB. This level has a margin of 9.5 dB under the limit of 54 dBμV/m.

Calculation: 95.7dBuV/m – 51.2 dB – 54 dBμV/m = -9.5 dB

Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 104.9 dBμV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 95.7 dBμV/m
Delta measurement: 51.2 dB

Plot 4-1: Lower Band Edge: Delta Measurement 802.11b



Calculation of Upper Band Edge; 802.11b for Patch Antenna

The level 101.9 dBµV/m is the worst case average field strength measurement, from which the delta measurement of 51.2 dB is subtracted (reference plots), which is equivalent to a level of 50.7 dB. This level has a margin of 3.3 dB under the limit 54 dBµV/m.

Calculation: 101.9 dBµV/m – 51.2 dB – 54 dBµV/m = -3.3 dB

Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 107.4 dBµV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 101.9 dBµV/m
Delta measurement: 51.2 dB

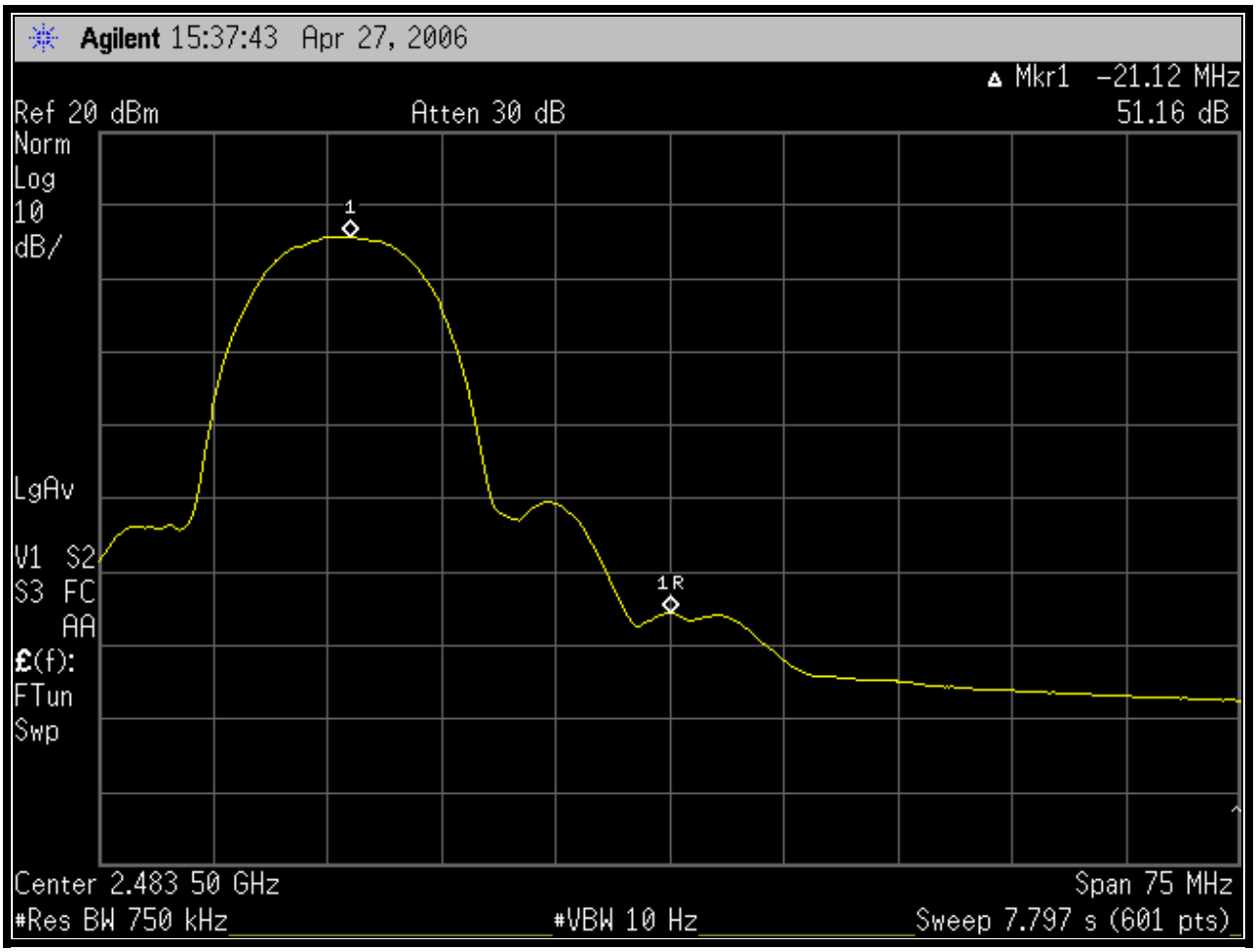
Calculation of Upper Band Edge; 802.11b for G2M Antenna

The level 98.6 dBµV/m is the worst case average field strength measurement, from which the delta measurement of 51.2 dB is subtracted (reference plots), which is equivalent to a level of 47.4 dB. This level has a margin of 6.6 dB under the limit of 54 dBµV/m.

Calculation: 98.6 dBµV/m – 51.2 dB – 54 dBµV/m = -6.6 dB

Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 105.1 dBµV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 98.6 dBµV/m
Delta measurement: 51.2 dB

Plot 4-2: Upper Band Edge: Delta Measurement 802.11b



Calculation of Lower Band Edge; 802.11g for Patch Antenna

The level 95.9 dBμV/m is the worst case average field strength measurement, from which the delta measurement of 52.9 dB is subtracted (reference plots), which is equivalent to a level of 43.0 dB. This level has a margin of 11.0 dB under the limit 54 dBμV/m.

Calculation: 95.9 dBμV/m – 52.9 dB – 54 dBμV/m = -11.0 dB

Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 107.1 dBμV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 95.9 dBμV/m
Delta measurement: 52.9 dB

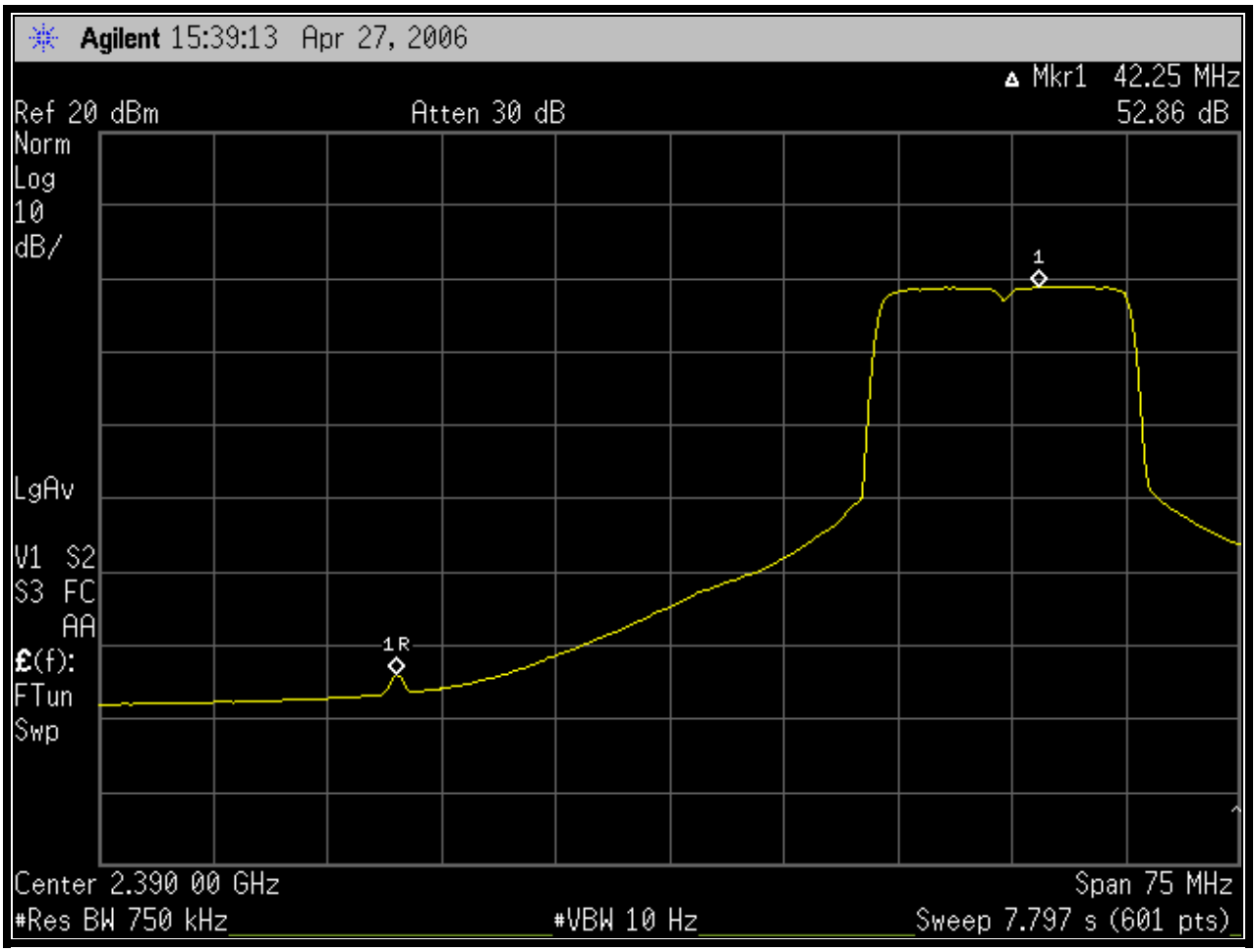
Calculation of Lower Band Edge; 802.11g for G2M Antenna

The level 91.0 dBμV/m is the worst case average field strength measurement, from which the delta measurement of 52.9 dB is subtracted (reference plots), which is equivalent to a level of 38.1 dB. This level has a margin of 15.9 dB under the limit 54 dBμV/m.

Calculation: 91.0 dBμV/m – 52.9 dB – 54 dBμV/m = -15.9 dB

Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 102.5 dBμV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 91.0 dBμV/m
Delta measurement: 52.9 dB

Plot 4-3: Lower Band Edge: Delta Measurement 802.11g



Calculation of Upper Band Edge; 802.11g for Patch Antenna

The level 96.3 dBμV/m is the worst case average field strength measurement, from which the delta measurement of 43.5 dB is subtracted (reference plots), which is equivalent to a level of 52.8 dB. This level has a margin of 1.2 dB under the limit of 54 dBμV/m.

Calculation: 96.3 dBμV/m – 43.5 dB – 54 dBμV/m = -1.2 dB

Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 107.1 dBμV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 96.3 dBμV/m
Delta measurement: 43.5 dB

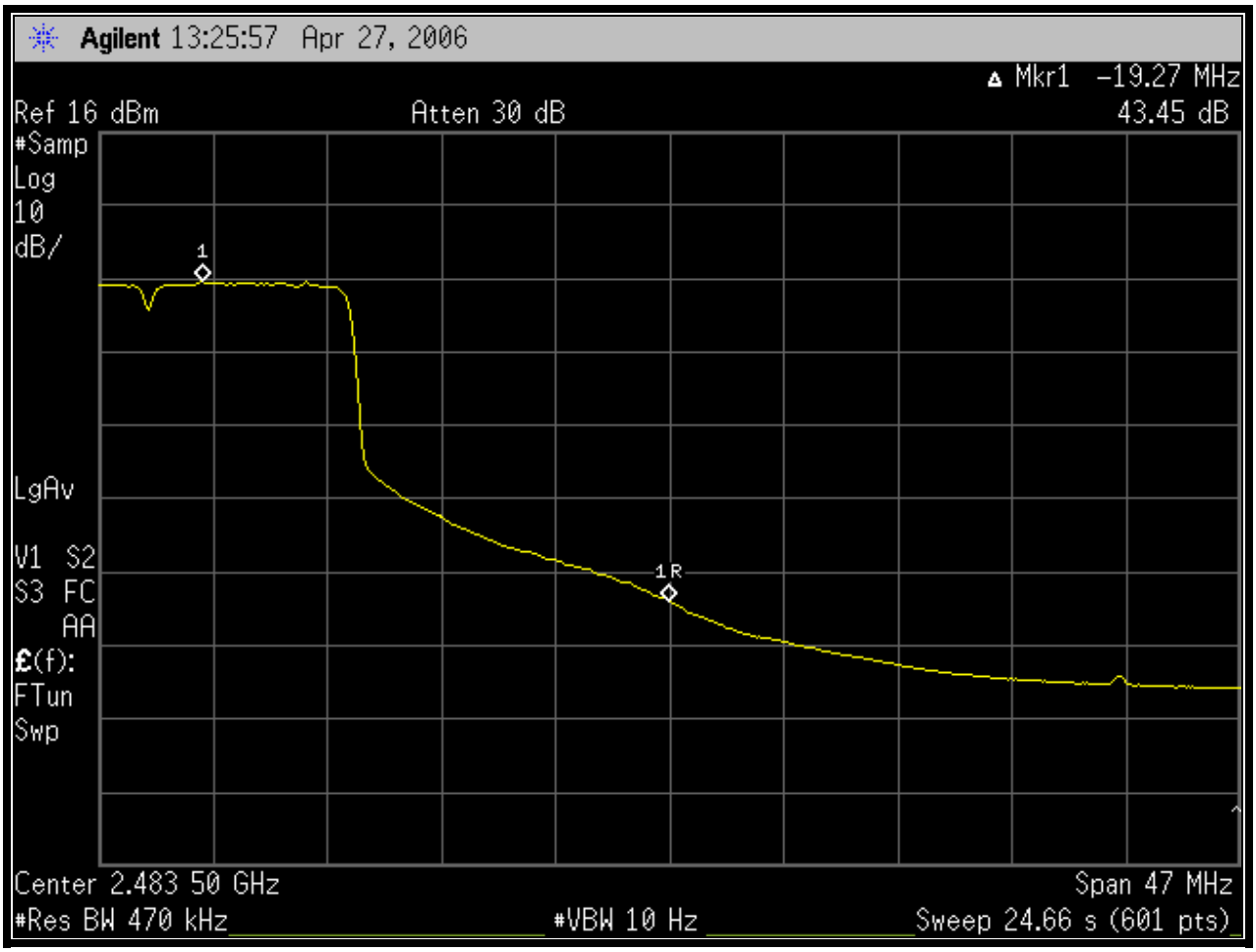
Calculation of Upper Band Edge; 802.11g for G2M Antenna

The level 91.9 dBμV/m is the worst case average field strength measurement, from which the delta measurement of 43.5 dB is subtracted (reference plots), which is equivalent to a level of 48.4 dB. This level has a margin of 5.6 dB under the limit of 54 dBμV/m.

Calculation: 91.9 dBμV/m – 43.5 dB – 54 dBμV/m = -5.6 dB

Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 103.0 dBμV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 91.9 dBμV/m
Delta measurement: 43.5 dB

Plot 4-4: Upper Band Edge: Delta Measurement 802.11g



TEST PERSONNEL:

Daniel W. Baltzell	Daniel W. Baltzell	April 27, 2006
Test Engineer	Signature	Date Of Test

4.3 Band Edge Test Equipment

Table 4-1: Band Edge Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900878	Rhein Tech Labs	AM3-1197-0005	3 meter Antenna Mast, Polarizing	Outdoor Range 1	Not Required
901242	Rhein Tech Labs	WRT-000-0003	Wood Rotating Table	N/A	Not Required
901424	IW Microwave Products	KPS-1503-2400-KPS	High Frequency RF Cables	240"	12/11/06
901425	IW Microwave Products	KPS-1503-360-KPS	High Frequency RF Cables	36"	12/11/06
900772	EMCO	3161-02	Horn Antenna	9804-1044	5/20/07
901020	Hewlett Packard	8564E	Spectrum Analyzer (30 Hz-40 GHz)	3943A01719	9/14/06
901413	Hewlett Packard	E4448A	Spectrum Analyzer	US44020346	11/2/06

5 Conducted Emissions – FCC §15.207; IC RSS-GEN

5.1 Test Methodology for Conducted Emissions Measurements

The power line conducted emission measurements were performed in a Series 81 type shielded enclosure manufactured by Rayproof. The EUT was assembled on a wooden table 80 centimeters high. Power was fed to the EUT through a 50 ohm / 50 microhenry Line Impedance Stabilization Network (EUT LISN). The EUT LISN was fed power through an A.C. filter box on the outside of the shielded enclosure. The filter box and EUT LISN housing are bonded to the ground plane of the shielded enclosure. A second LISN, the peripheral LISN, provides isolation for the EUT test peripherals. This peripheral LISN was also fed A.C. power. A metal power outlet box, which is bonded to the ground plane and electrically connected to the peripheral LISN, powers the EUT host peripherals.

The spectrum analyzer was connected to the A.C. line through an isolation transformer. The 50 ohm output of the EUT LISN was connected to the spectrum analyzer input through a Solar high-pass filter. The filter is used to prevent overload of the spectrum analyzer from noise below 150 kHz. Conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable). The analyzer's 6 dB bandwidth was set to 9 kHz. No video filter less than 10 times the resolution bandwidth was used. Average measurements are performed in linear mode using a 10 kHz resolution bandwidth, a 1 Hz video bandwidth, and by increasing the sweep time in order to obtain a calibrated measurement. The emission spectrum was scanned from 150 kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in this report.

Note: Rhein Tech Laboratories, Inc. has implemented procedures to minimize errors that occur from test instruments, calibration, procedures, and test setups. Test instrument and calibration errors are documented by the manufacturer or calibration lab. Other errors have been defined and calculated within the Rhein Tech Quality Manual, Section 6.1. Rhein Tech implements the following procedures to minimize errors that may occur: yearly as well as daily calibration methods, technician training, and emphasis to employees on avoiding errors.

5.2 Conducted Emissions Test

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. If the conducted emissions exceed the limit, then the instrument is set to the quasi-peak mode and compared to the quasi-peak limit, then measurements are made in the average mode and compared to the average limit. The conducted test was performed with the EUT exercise program loaded, and the emissions were scanned between 150 kHz to 30 MHz on the NEUTRAL SIDE and PHASE SIDE.

5.3 Conducted Emissions Test Data

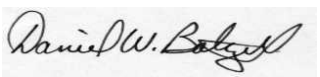
Table 5-1: Conducted Emissions (Neutral Side)

Temperature: 25.6°F Humidity: 31%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.152	Qp	44.5	0.2	44.7	65.5	-20.8		
0.152	Av	21.7	0.2	21.9			55.9	-34.0
0.176	Qp	45.2	0.2	45.4	64.7	-19.3		
0.176	Av	28.7	0.2	28.9			54.4	-25.5
0.272	Qp	42.9	0.2	43.1	63.0	-19.9		
0.272	Av	19.2	0.2	19.4			51.1	-31.7
0.421	Qp	41.6	0.3	41.9	57.4	-15.5		
0.423	Av	25.0	0.3	25.3			47.4	-22.1
0.530	Pk	40.5	0.2	40.7			46.0	-5.3
20.800	Pk	27.2	2.4	29.6			50.0	-20.4
27.080	Pk	28.4	2.4	30.8			50.0	-19.2

Table 5-2: Conducted Emissions (Phase Side)

Temperature: 25.6°F Humidity: 31%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.154	Qp	50.7	0.2	50.9	65.8	-14.9		
0.154	Av	37.9	0.2	38.1			55.8	-17.7
0.309	Qp	54.8	0.3	55.1	60.0	-4.9		
0.309	Av	41.7	0.3	42.0			50.0	-8.0
0.370	Qp	55.4	0.2	55.6	58.5	-2.9		
0.370	Av	41.9	0.2	42.1			48.5	-6.4
0.431	Qp	52.9	0.2	53.1	57.2	-4.1		
0.431	Av	39.4	0.2	39.6			47.2	-7.6
0.803	Qp	48.8	0.3	49.1	56.0	-6.9		
0.803	Av	44.0	0.3	44.3			46.0	-1.7
2.441	Av	39.3	0.8	40.1			46.0	-5.9
26.058	Av	25.8	2.5	28.3			50.0	-21.7

TEST PERSONNEL:



Daniel W. Baltzell		April 10, 2006
Test Engineer	Signature	Date Of Test

5.4 Conducted Emissions Test Equipment

Table 5-3: Conducted Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900969	Hewlett Packard	85650A	Quasi-Peak Adapter	2412A00414	8/3/06
901083	AFJ International	LS16	16A LISN (110 V)	16010020080	3/28/08
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz-22 GHz)	3138A07771	4/5/07
900889	Hewlett Packard	85685A	RF Preselector (20 Hz-2 GHz)	3146A01309	4/12/07

6 Radiated Emissions for Receiver/Digital Interface – FCC §15.209; IC RSS-GEN

6.1 Radiated Emissions Test Procedure for Receiver/Digital Interface

Radiated spurious emissions for digital interface fall between 30 MHz and up to the 2nd LO when the EUT is in the receiver/digital interface mode. The highest levels measured are presented. The maximum permitted average field strength is listed in Part 15.209. The data in this report represents the worst case modes.

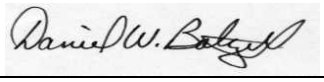
6.2 Radiated Emission Test Data Receiver/Digital Interface

Table 6-1: Digital Radiated Emissions Test Data

Temperature: 74°F Humidity: 31%									
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
111.550	Pk	V	0	1	55.5	-26.7	28.8	43.5	-14.7
133.869	Pk	V	0	1	49.2	-26.5	22.7	43.5	-20.8
183.869	Pk	V	0	1	45.5	-29.0	16.5	43.5	-27.0
206.160	Pk	V	0	1	55.4	-29.0	26.4	43.5	-17.1
221.180	Pk	V	0	1	62.8	-28.8	34.0	46.0	-12.0
243.503	Pk	V	0	1	59.9	-27.2	32.7	46.0	-13.3
251.789	Pk	V	0	1	58.0	-26.6	31.4	46.0	-14.6
361.300	Pk	V	0	1	48.8	-24.2	24.6	46.0	-21.4

QP: RES. = 100 KHZ, VID = 100 KHZ

TEST PERSONNEL:

Daniel W. Baltzell		April 10, 2006
Test Engineer	Signature	Date Of Test

6.3 Radiated Digital Emissions Test Equipment

Table 6-2: Radiated Digital Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900878	Rhein Tech Labs	AM3-1197-0005	3 meter antenna mast	Outdoor Range 1	Not Required
900969	Hewlett Packard	85650A	Quasi-Peak Adapter	2412A00414	8/3/06
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz-22 GHz)	3138A07771	4/5/07
900889	Hewlett Packard	85685A	RF Preselector (20 Hz-2 GHz)	3146A01309	4/12/07
901242	Rhein Tech Labs	WRT-000-0003	Wood rotating table	N/A	Not Required
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz-2 GHz)	2648	11/1/06
900905	Rhein Tech Labs	PR-1040	OATS 1 Preamplifier 40dB (30 MHz–2 GHz)	1006	3/15/07
900889	Hewlett Packard	85685A	RF Preselector (20 Hz-2 GHz)	3146A01309	4/12/07

7 Radiated Emissions Radiated Harmonics/Spurious Noise – FCC §15.247; IC RSS-210 §6.2.2(o)(e1); §6.3

7.1 Radiated Emissions Test Procedure for Harmonics/Spurious Noise

Radiated Spurious Emissions applies to harmonics and spurious emissions that fall in the restricted bands when the EUT is configured in the transmit mode. The restricted bands are listed in Part 15.205. The maximum permitted average field strength for the restricted band is listed in Part 15.209. The EUT was tested in three orthogonal planes from 10 kHz to the 10th harmonic of the fundamental. The data in this report represents the worst case modes.

7.2 Radiated Emissions Harmonics/Spurious Test Data (Stand Alone)

Table 7-1: Radiated Emissions Harmonics/Spurious (2412 MHz) CQ-17922-G1 Antenna 802.11b

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4824.0	51.8	40.0	10.3	50.3	54.0	-3.7
7236.0	41.7	28.3	10.2	38.5	82.8	-44.3
9648.0	40.8	29.0	12.6	41.6	82.8	-41.2
12060.0	40.5	26.7	15.9	42.6	54.0	-11.4
14472.0	40.3	28.0	19.2	47.2	54.0	-6.8
16884.0	41.0	28.2	19.9	48.1	82.8	-34.7

Fundamental Field Strength (100 kHz / dBuV/m): 102.1

Table 7-2: Radiated Emissions Harmonics/Spurious (2437 MHz) CQ-17922-G1 Antenna 802.11b

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.0	51.0	38.7	9.8	48.5	54.0	-5.5
7311.0	40.8	29.8	9.7	39.5	54.0	-14.5
9748.0	39.8	27.2	12.6	39.8	81.0	-41.2
12185.0	41.3	27.8	14.6	42.4	54.0	-11.6
14622.0	38.7	28.3	19.3	47.6	81.0	-33.4
17059.0	40.5	28.4	19.8	48.2	81.0	-32.8

Fundamental Field Strength (100 kHz / dBuV/m): 101.0

Table 7-3: Radiated Emissions Harmonics/Spurious (2462 MHz) CQ-17922-G1 Antenna 802.11b

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4924.0	49.7	38.7	10.1	48.8	54.0	-5.2
7386.0	39.0	28.3	11.3	39.6	84.3	-44.7
9848.0	42.3	33.2	13.4	46.6	84.3	-37.7
12310.0	39.8	27.5	13.9	41.4	54.0	-12.6
14772.0	40.0	27.7	19.7	47.4	84.3	-36.9
17234.0	41.0	28.7	18.7	47.4	84.3	-36.9

Fundamental Field Strength (100 kHz / dBuV/m): 104.3

Table 7-4: Radiated Emissions Harmonics/Spurious (2412 MHz) CQ-17922-G1 Antenna 802.11g

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4824.0	48.8	35.8	10.3	46.1	54.0	-7.9
7236.0	40.0	28.5	10.2	38.7	75.9	-37.2
9648.0	39.3	27.2	12.6	39.8	75.9	-36.1
12060.0	39.3	26.7	15.9	42.6	54.0	-11.4
14472.0	40.7	27.8	19.2	47.0	54.0	-7.0
16884.0	41.3	28.0	19.9	47.9	75.9	-28.0

Fundamental Field Strength (100 kHz / dBuV/m): 95.9

Table 7-5: Radiated Emissions Harmonics/Spurious (2437 MHz) CQ-17922-G1 Antenna 802.11g

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.0	47.2	34.8	9.8	44.6	54.0	-9.4
7311.0	40.5	28.2	9.7	37.9	54.0	-16.1
9748.0	39.0	26.5	12.6	39.1	76.6	-37.5
12185.0	39.5	27.2	14.6	41.8	54.0	-12.2
14622.0	40.2	27.8	19.3	47.1	76.6	-29.5
17059.0	40.7	28.3	19.8	48.1	76.6	-28.5

Fundamental Field Strength (100 kHz / dBuV/m): 96.6

Table 7-6: Radiated Emissions Harmonics/Spurious (2462 MHz) CQ-17922-G1 Antenna 802.11g

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4924.0	47.2	34.3	10.1	44.4	54.0	-9.6
7386.0	40.2	27.2	11.3	38.5	76.3	-37.8
9848.0	39.2	27.0	13.4	40.4	76.3	-35.9
12310.0	40.2	27.5	13.9	41.4	54.0	-12.6
14772.0	40.0	27.5	19.7	47.2	76.3	-29.1
17234.0	41.5	28.8	18.7	47.5	76.3	-28.8

Fundamental Field Strength (100 kHz / dBuV/m): 96.3

Table 7-7: Radiated Emissions Harmonics/Spurious (2412 MHz) CQ17810-G2M Antenna 802.11b

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4824.0	53.8	40.9	10.3	51.2	54.0	-2.8
7236.0	38.8	27.4	10.2	37.6	75.7	-38.1
9648.0	42.8	33.5	12.6	46.1	75.7	-29.6
12060.0	39.7	26.8	15.9	42.7	54.0	-11.3
14472.0	40.3	26.8	19.2	46.0	54.0	-8.0
16884.0	40.2	28.1	19.9	48.0	75.7	-27.7

Fundamental Field Strength (100 kHz / dBuV/m): 95.7

Table 7-8: Radiated Emissions Harmonics/Spurious (2437 MHz) CQ17810-G2M Antenna 802.11b

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.0	53.6	40.4	9.8	50.2	54.0	-3.8
7311.0	39.9	26.6	9.7	36.3	54.0	-17.7
9748.0	39.8	28.8	12.6	41.4	77.4	-36.0
12185.0	41.3	28.7	14.6	43.3	54.0	-10.7
14622.0	41.5	27.7	19.3	47.0	77.4	-30.4
17059.0	38.9	28.3	19.8	48.1	77.4	-29.3

Fundamental Field Strength (100 kHz / dBuV/m): 97.4

Table 7-9: Radiated Emissions Harmonics/Spurious (2462 MHz) CQ17810-G2M Antenna 802.11b

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4924.0	52.4	38.9	10.1	49.0	54.0	-5.0
7386.0	39.1	26.7	11.3	38.0	78.6	-40.6
9848.0	41.3	30.5	13.4	43.9	78.6	-34.7
12310.0	39.5	22.5	13.9	36.4	54.0	-17.6
14772.0	39.7	27.6	19.7	47.3	78.6	-31.3
17234.0	39.8	27.6	18.7	46.3	78.6	-32.3

Fundamental Field Strength (100 kHz / dBuV/m): 98.6

Table 7-10: Radiated Emissions Harmonics/Spurious (2412 MHz) CQ17810-G2M Antenna 802.11g

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4824.0	50.7	38.3	10.3	48.6	54.0	-5.4
7236.0	43.2	31.3	10.2	41.5	71.0	-29.5
9648.0	39.3	27.7	12.6	40.3	71.0	-30.7
12060.0	38.8	26.5	15.9	42.4	54.0	-11.6
14472.0	40.2	27.8	19.2	47.0	54.0	-7.0
16884.0	40.8	28.0	19.9	47.9	71.0	-23.1

Fundamental Field Strength (100 kHz / dBuV/m): 91.0

Table 7-11: Radiated Emissions Harmonics/spurious (2437 MHz) CQ17810-G2M Antenna 802.11g

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.0	48.3	35.7	9.8	45.5	54.0	-8.5
7311.0	39.0	27.5	9.7	37.2	54.0	-16.8
9748.0	39.2	26.7	12.6	39.3	71.0	-31.7
12185.0	39.3	27.0	14.6	41.6	54.0	-12.4
14622.0	40.8	27.8	19.3	47.1	71.0	-23.9
17059.0	40.8	28.2	19.8	48.0	71.0	-23.0

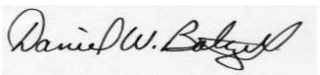
Fundamental Field Strength (100 kHz / dBuV/m): 91.0

Table 7-12: Radiated Emissions Harmonics/Spurious (2462 MHz) CQ17810-G2M Antenna 802.11g

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4924.0	46.3	34.3	10.1	44.4	54.0	-9.6
7386.0	38.0	27.2	11.3	38.5	71.9	-33.4
9848.0	40.2	27.2	13.4	40.6	71.9	-31.3
12310.0	39.7	27.5	13.9	41.4	54.0	-12.6
14772.0	40.2	27.7	19.7	47.4	71.9	-24.5
17234.0	41.2	28.7	18.7	47.4	71.9	-24.5

Fundamental Field Strength (100 kHz / dBuV/m): 91.9

TEST PERSONNEL:



Daniel W. Baltzell		April 26, 2006
Test Engineer	Signature	Date Of Test

7.3 Radiated Emissions Harmonics/Spurious Test Data (in Host QL-420 Plus Printer)

Table 7-13: Radiated Emissions Harmonics/Spurious (2412 MHz) CQ17810-G2M Antenna 802.11b

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4824.0	54.2	40.8	10.3	51.1	54.0	-2.9
7236.0	39.0	26.0	10.2	36.2	75.7	-39.5
9648.0	38.2	28.5	12.6	41.1	75.7	-34.6
12060.0	38.4	25.9	15.9	41.8	54.0	-12.2
14472.0	43.4	30.2	19.2	49.4	54.0	-4.6
16884.0	42.4	30.8	19.9	50.7	75.7	-25.0

Fundamental Field Strength (100 kHz / dBuV/m): 95.7

Table 7-14: Radiated Emissions Harmonics/Spurious (2437 MHz) CQ17810-G2M Antenna 802.11b

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.0	53.2	39.9	9.8	49.7	54.0	-4.3
7311.0	39.3	25.8	9.7	35.5	54.0	-18.5
9748.0	38.9	25.7	12.6	38.3	77.4	-39.1
12185.0	39.4	25.8	14.6	40.4	54.0	-13.6
14622.0	41.6	29.2	19.3	48.5	77.4	-28.9
17059.0	43.3	30.8	19.8	50.6	77.4	-26.8

Fundamental Field Strength (100 kHz / dBuV/m): 97.4

Table 7-15: Radiated Emissions Harmonics/Spurious (2462 MHz) CQ17810-G2M Antenna 802.11b

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4924.0	51.3	38.4	10.1	48.5	54.0	-5.5
7386.0	38.7	25.8	11.3	37.1	78.6	-41.5
9848.0	38.9	25.3	25.4	50.7	78.6	-27.9
12310.0	38.5	25.4	13.9	39.3	54.0	-14.7
14772.0	42.4	30.0	19.7	49.7	78.6	-28.9
17234.0	43.9	30.9	18.7	49.6	78.6	-29.0

Fundamental Field Strength (100 kHz / dBuV/m): 98.6

Table 7-16: Radiated Emissions Harmonics/Spurious (2412 MHz) CQ17810-G2M Antenna 802.11g

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4824.0	47.3	35.2	10.3	45.5	54.0	-8.5
7236.0	38.3	26.2	10.2	36.4	71.0	-34.6
9648.0	38.3	25.7	12.6	38.3	71.0	-32.7
12060.0	39.2	26.0	15.9	41.9	54.0	-12.1
14472.0	41.7	30.2	19.2	49.4	54.0	-4.6
16884.0	42.7	29.9	19.9	49.8	71.0	-21.2

Fundamental Field Strength (100 kHz / dBuV/m): 91.0

Table 7-17: Radiated Emissions Harmonics/Spurious (2437 MHz) CQ17810-G2M Antenna 802.11g

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.0	47.1	36.4	9.8	46.2	54.0	-7.8
7311.0	38.8	25.9	9.7	35.6	54.0	-18.4
9748.0	38.7	25.8	12.6	38.4	71.0	-32.6
12185.0	38.7	25.8	14.6	40.4	54.0	-13.6
14622.0	41.3	29.2	19.3	48.5	71.0	-22.5
17059.0	44.2	30.8	19.8	50.6	71.0	-20.4

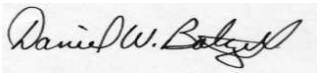
Fundamental Field Strength (100 kHz / dBuV/m): 91.0

Table 7-18: Radiated Emissions Harmonics/Spurious (2462 MHz) CQ17810-G2M Antenna 802.11g

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4924.0	44.1	33.4	10.1	43.5	54.0	-10.5
7386.0	38.6	25.9	11.3	37.2	71.9	-34.7
9848.0	37.9	25.4	13.4	38.8	71.9	-33.1
12310.0	38.5	25.4	13.9	39.3	54.0	-14.7
14772.0	42.4	30.0	19.7	49.7	71.9	-22.2
17234.0	43.9	30.9	18.7	49.6	71.9	-22.3

Fundamental Field Strength (100 kHz / dBuV/m): 91.9

TEST PERSONNEL:

Daniel W. Baltzell		May 4, 2006
Test Engineer	Signature	Date Of Test

7.4 Radiated Spurious Emissions Test Equipment

Table 7-19: Radiated Spurious Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900878	Rhein Tech Labs	AM3-1197-0005	3 Meter Antenna Mast	Outdoor Range 1	Not Required
901242	Rhein Tech Labs	WRT-000-0003	Wood Rotating Table	N/A	Not Required
901424	IW Microwave Products	KPS-1503-2400-KPS	High Frequency RF Cables	240"	12/11/06
901425	IW Microwave Products	KPS-1503-360-KPS	High Frequency RF Cables	36"	12/11/06
900772	EMCO	3161-02	Horn Antenna (2–4 GHz)	9804-1044	5/20/07
900321	EMCO	3161-03	Horn Antennas (4-8,2 GHz)	9508-1020	5/20/07
900323	EMCO	3160-7	Horn Antennas (8,2-12,4 GHz)	9605-1054	5/20/07
900325	EMCO	3160-9	Horn Antennas (18-26.5 GHz)	9605-1051	5/20/07
900932	Hewlett Packard	8449B OPT H02	Preamplifier (1-26.5 GHz)	3008A00505	5/20/06
901020	Hewlett Packard	8564E	Portable Spectrum Analyzer (9 kHz-40 GHz)	3943A01719	9/14/06

8 Modulated Bandwidth – FCC §15.247(a)(2)

8.1 Modulated Bandwidth Test Procedure

The minimum 6 dB bandwidth per FCC 15.247(a)(2) was measured using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 1 MHz. The minimum 6 dB modulated bandwidths are the following:

8.2 Modulated Bandwidth Test Data

Table 8-1: Minimum 6 dB Modulated Bandwidths 802.11b

CHANNEL	6 dB BANDWIDTH (MHz)
1	13.8
6	13.4
11	13.6

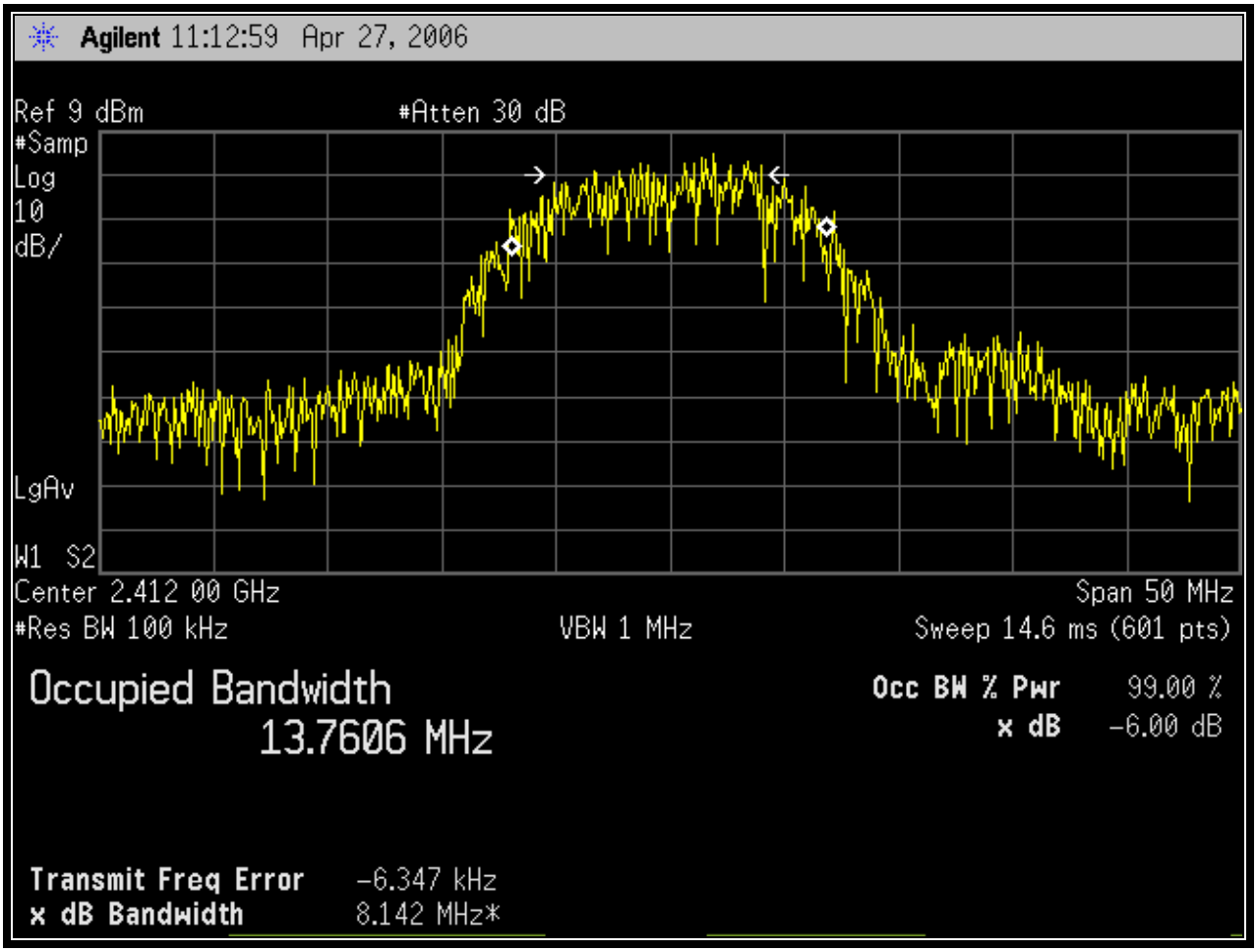
Table 8-2: Minimum 6 dB Modulated Bandwidths 802.11g

CHANNEL	6 dB BANDWIDTH (MHz)
1	16.4
6	16.2
11	16.4

8.3 Modulated Bandwidth Plots 802.11b

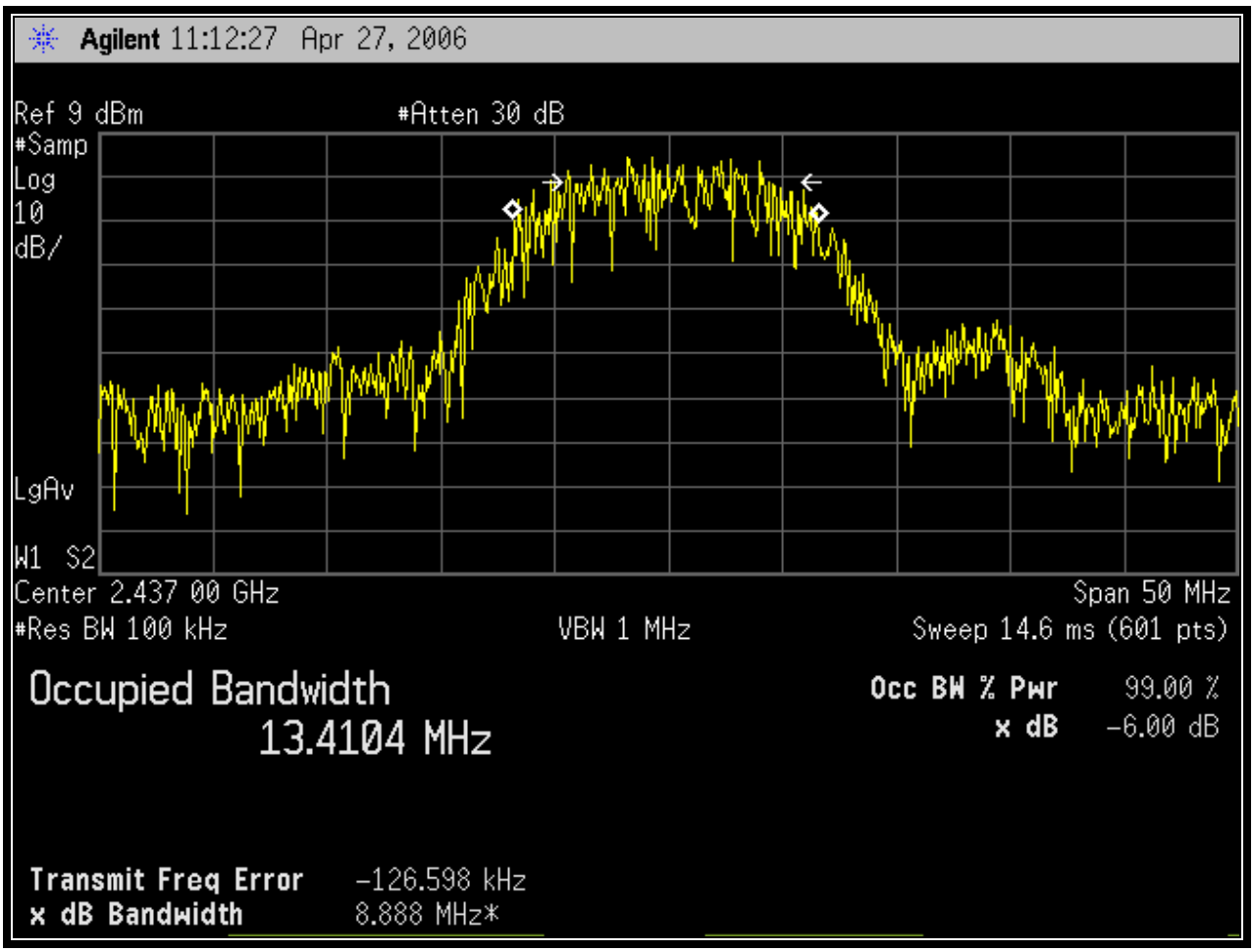
Channel Number:	1
Frequency (MHz):	2412
Resolution Bandwidth (kHz):	100
Video Bandwidth (MHz):	1
Sweep Time (ms):	20.0

Plot 8-1: Modulated Bandwidth Channel 1; 802.11b



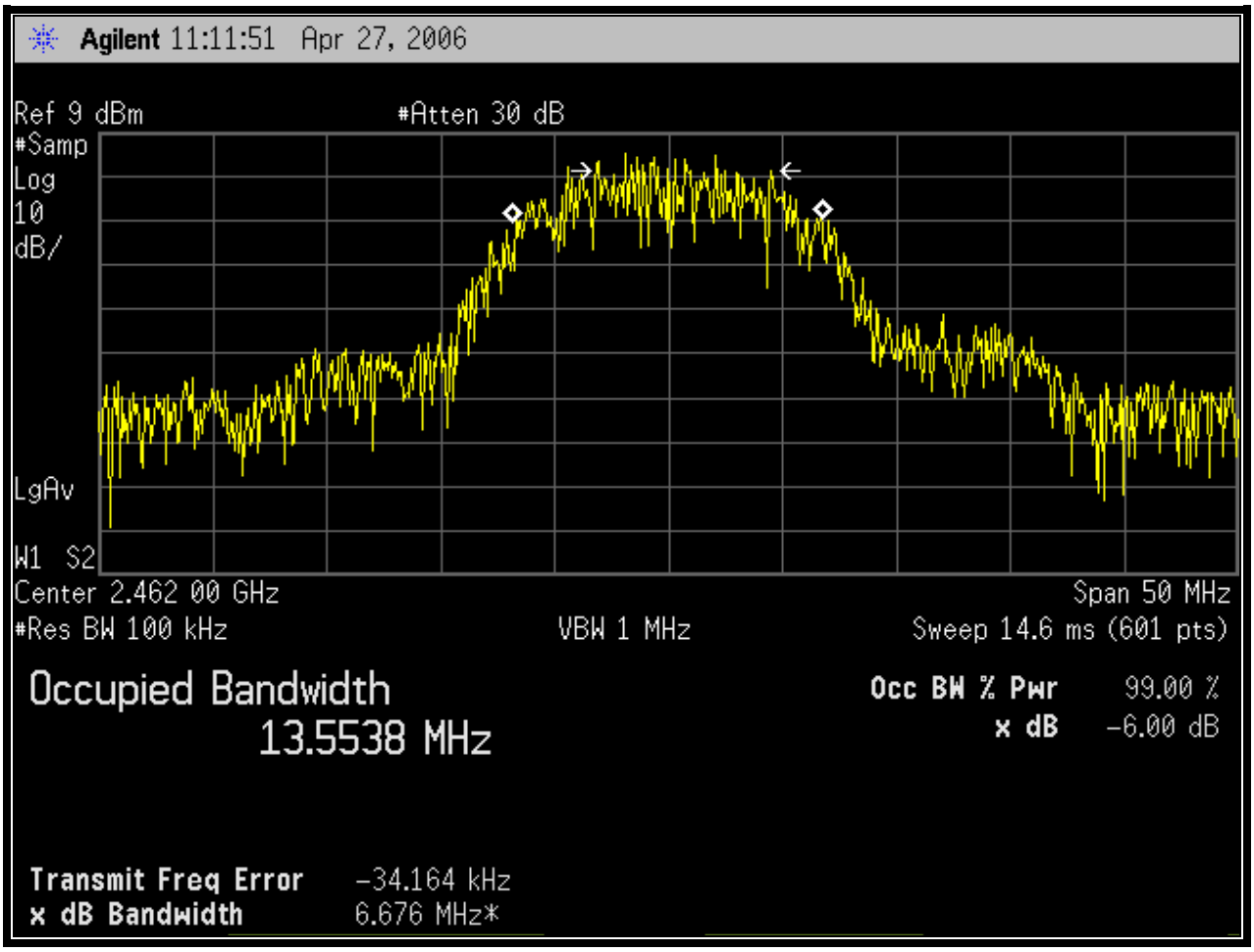
Channel Number:	6
Frequency (MHz):	2437
Resolution Bandwidth (kHz):	100
Video Bandwidth (MHz):	1
Sweep Time (ms):	20.0

Plot 8-2: Modulated Bandwidth Channel 6; 802.11b



Channel Number:	11
Frequency (MHz):	2462
Resolution Bandwidth (kHz):	100
Video Bandwidth (MHz):	1
Sweep Time (ms):	20.0

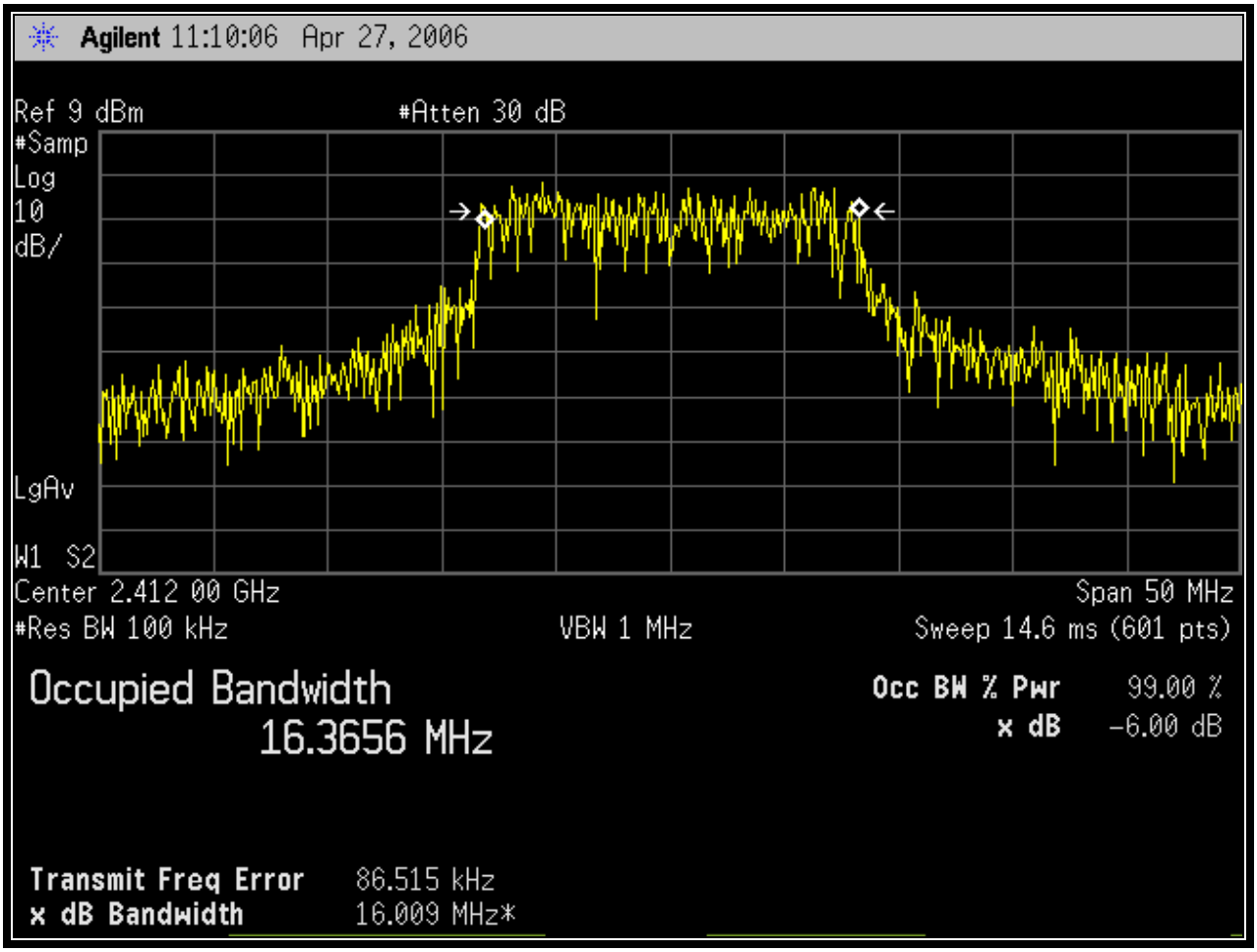
Plot 8-3: Modulated Bandwidth Channel 11; 802.11b



8.4 Modulated Bandwidth Plots 802.11g

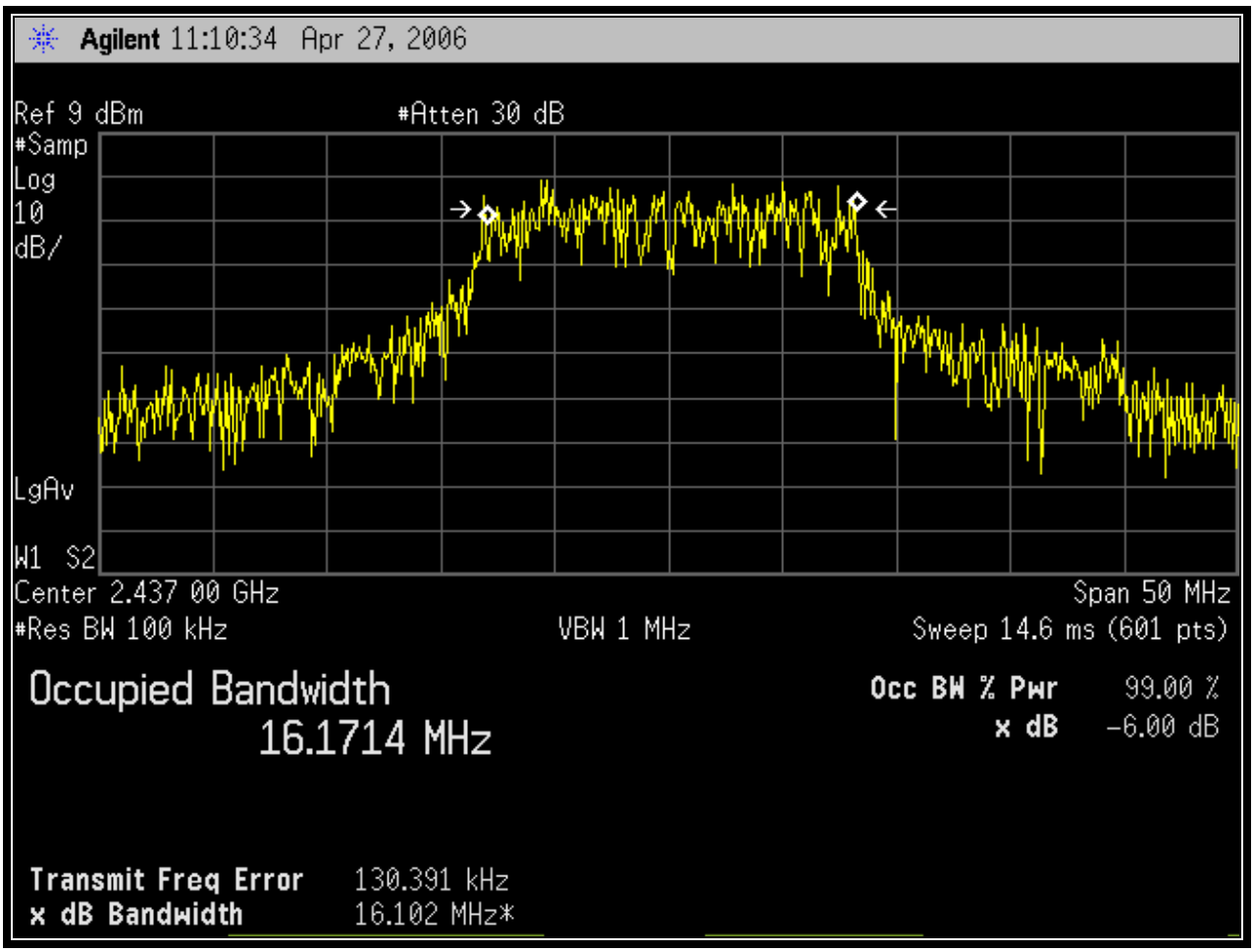
Channel Number:	1
Frequency (MHz):	2412
Resolution Bandwidth (kHz):	100
Video Bandwidth (MHz):	1
Sweep Time (ms):	20.0

Plot 8-4: Modulated Bandwidth Channel 1; 802.11g



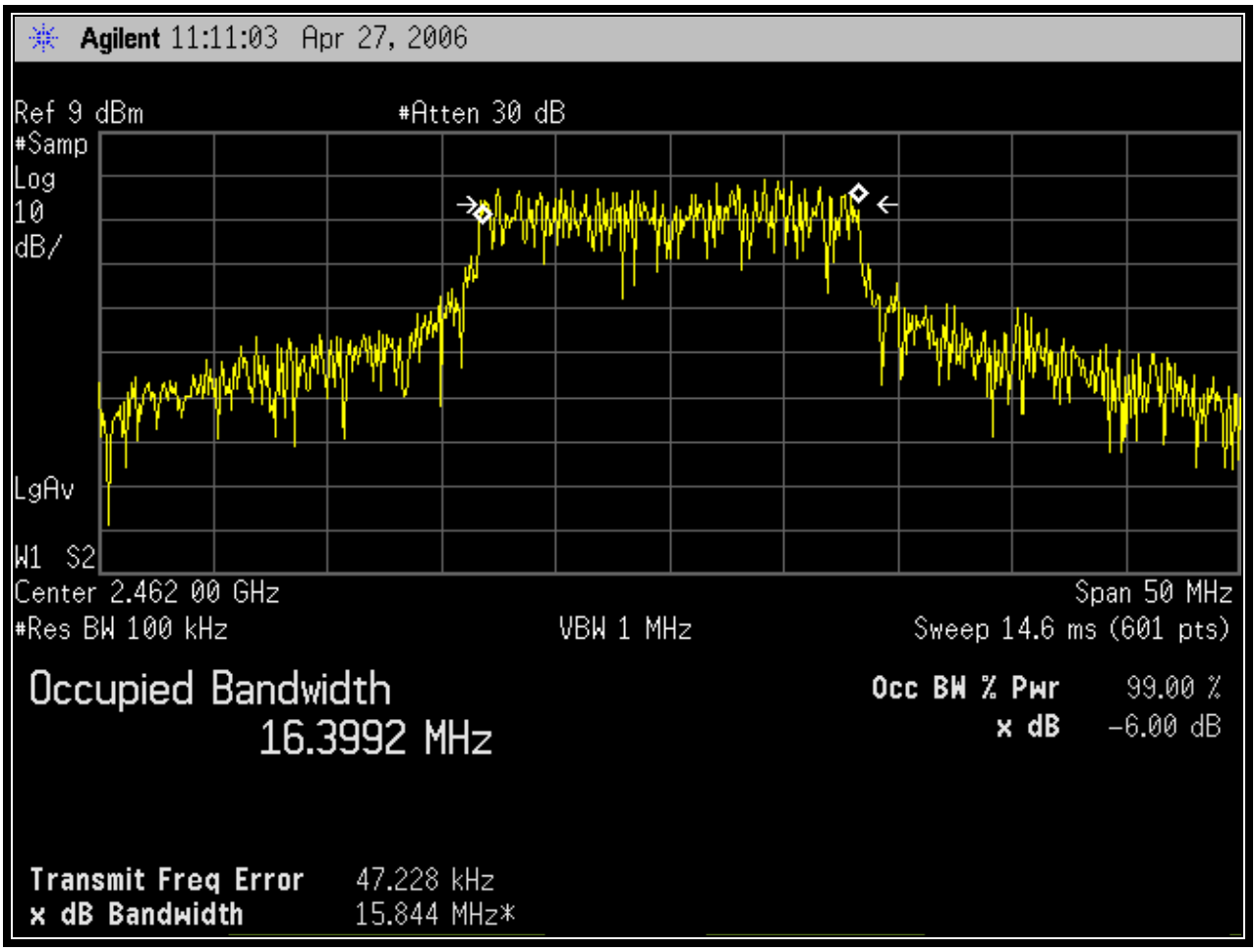
Channel Number:	6
Frequency (MHz):	2437
Resolution Bandwidth (kHz):	100
Video Bandwidth (MHz):	1
Sweep Time (ms):	20.0

Plot 8-5: Modulated Bandwidth Channel 6; 802.11g



Channel Number:	11
Frequency (MHz):	2462
Resolution Bandwidth (kHz):	100
Video Bandwidth (MHz):	1
Sweep Time (ms):	20.0

Plot 8-6: Modulated Bandwidth Channel 11; 802.11g



TEST PERSONNEL:

Daniel Baltzell	Daniel W. Baltzell	April 27, 2006
Test Engineer	Signature	Date Of Test

8.5 Modulated Bandwidth Test Equipment

Table 8-3: Modulated Bandwidth Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901413	Hewlett Packard	E4448A	US44020346	US44020346	11/2/06

9 Antenna Conducted Spurious Emissions – FCC §15.247(c); IC RSS-210 §6.2.2(o)(e1)

9.1 Antenna Conducted Spurious Emissions Test Procedures

Antenna spurious emissions per FCC 15.247(c) were measured from the EUT antenna port using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 1 MHz. The modulated carrier was identified at 2.412 GHz for Channel 1, 2.437 GHz for Channel 6, and 2.462 GHz for Channel 11. No other harmonics or spurs were found within 20 dB of the carrier level, and from 9 kHz to the carrier's 10^{th} harmonic. A notch filter was not used; it was found to have no effect on the levels.

Channels 1, 6, and 11 were investigated and tested.

9.2 Antenna Conducted Spurious Emissions Channel 1; 802.11b

Operating Frequency (MHz): 2412
Channel: 1
Measured Peak Conducted Power (dBm): 7.8
Conducted Spurious Limit (dBm): -12.2

Table 9-1: Antenna Conducted Spurious Emissions Channel 1; 802.11b

Frequency (MHz)	Measured Level (dBm)	Measured Level (dBc)	Limits (dBc)	Margin (dB)
4824.0	-59.1	66.9	20.0	-46.9
7236.0	-82.9	90.7	20.0	-70.7
9648.0	-78.2	86.0	20.0	-66.0
12060.0	-82.6	90.4	20.0	-70.4
14472.0	-82.0	89.8	20.0	-69.8
16884.0	-82.7	90.5	20.0	-70.5
19296.0	-83.2	91.0	20.0	-71.0
21708.0	-81.7	89.5	20.0	-69.5
24120.0	-78.2	86.0	20.0	-66.0

9.3 Antenna Conducted Spurious Emissions Channel 6; 802.11b

Operating Frequency (MHz): 2437
Channel: 6
Measured Peak Conducted Power (dBm): 7.9
Conducted Spurious Limit (dBm): -12.1

Table 9-2: Antenna Conducted Spurious Emissions Channel 6; 802.11b

Frequency (MHz)	Measured Level (dBm)	Measured Level (dBc)	Limits (dBc)	Margin (dB)
4874.0	-72.7	80.6	20.0	-60.6
7311.0	-94.4	102.3	20.0	-82.3
9748.0	-72.5	80.4	20.0	-60.4
12185.0	-93.5	101.4	20.0	-81.4
14622.0	-92.1	100.0	20.0	-80.0
17059.0	-91.4	99.3	20.0	-79.3
19496.0	-92.5	100.4	20.0	-80.4
21933.0	-91.4	99.3	20.0	-79.3
24370.0	-90.2	98.1	20.0	-78.1

9.4 Antenna Conducted Spurious Emissions Channel 11; 802.11b

Operating Frequency (MHz): 2462
Channel: 11
Measured Peak Conducted Power (dBm): 7.7
Conducted Spurious Limit (dBm): -12.3

Table 9-3: Antenna conducted spurious emissions Channel 11; 802.11b

Frequency (MHz)	Measured Level (dBm)	Measured Level (dBc)	Limits (dBc)	Margin (dB)
4924.0	-75.8	83.5	20.0	-63.5
7386.0	-94.2	101.9	20.0	-81.9
9848.0	-68.1	75.8	20.0	-55.8
12310.0	-93.9	101.6	20.0	-81.6
14772.0	-92.5	100.2	20.0	-80.2
17234.0	-90.4	98.1	20.0	-78.1
19696.0	-91.1	98.8	20.0	-78.8
22158.0	-90.6	98.3	20.0	-78.3
24620.0	-89.4	97.1	20.0	-77.1

9.5 Antenna Conducted Spurious Emissions Channel 1; 802.11g

Operating Frequency (MHz): 2412
Channel: 1
Measured Peak Conducted Power (dBm): 0.5
Conducted Spurious Limit (dBm): -19.5

Table 9-4: Antenna Conducted Spurious Emissions Channel 1; 802.11g

Frequency (MHz)	Measured Level (dBm)	Measured Level (dBc)	Limits (dBc)	Margin (dB)
4824.0	-69.8	70.3	20.0	-50.3
7236.0	-83.9	84.4	20.0	-64.4
9648.0	-83.6	84.1	20.0	-64.1
12060.0	-83.8	84.3	20.0	-64.3
14472.0	-82.4	82.9	20.0	-62.9
16884.0	-83.2	83.7	20.0	-63.7
19296.0	-83.6	84.1	20.0	-64.1
21708.0	-82.2	82.7	20.0	-62.7
24120.0	-78.7	79.2	20.0	-59.2

9.6 Antenna Conducted Spurious Emissions Channel 6; 802.11g

Operating Frequency (MHz): 2437
Channel: 6
Measured Peak Conducted Power (dBm): 0.2
Conducted Spurious Limit (dBm): -19.8

Table 9-5: Antenna Conducted Spurious Emissions Channel 6; 802.11g

Frequency (MHz)	Measured Level (dBm)	Measured Level (dBc)	Limits (dBc)	Margin (dB)
4874.0	-78.2	78.4	20.0	-58.4
7311.0	-94.9	95.1	20.0	-75.1
9748.0	-86.8	87.0	20.0	-67.0
12185.0	-94.6	94.8	20.0	-74.8
14622.0	-92.7	92.9	20.0	-72.9
17059.0	-92.2	92.4	20.0	-72.4
19496.0	-93.2	93.4	20.0	-73.4
21933.0	-92.0	92.2	20.0	-72.2
24370.0	-90.8	91.0	20.0	-71.0

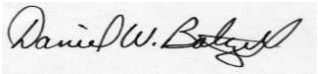
9.7 Antenna Conducted Spurious Emissions Channel 11; 802.11g

Operating Frequency (MHz): 2462
Channel: 11
Measured Peak Conducted Power (dBm): 0.8
Conducted Spurious Limit (dBm): -19.2

Table 9-6: Antenna Conducted Spurious Emissions Channel 11; 802.11g

Frequency (MHz)	Measured Level (dBm)	Measured Level (dBc)	Limits (dBc)	Margin (dB)
4924.0	-83.0	83.8	20.0	-63.8
7386.0	-94.8	95.6	20.0	-75.6
9848.0	-85.0	85.8	20.0	-65.8
12310.0	-95.2	96.0	20.0	-76.0
14772.0	-93.1	93.9	20.0	-73.9
17234.0	-91.1	91.9	20.0	-71.9
19696.0	-91.7	92.5	20.0	-72.5
22158.0	-91.1	91.9	20.0	-71.9
24620.0	-90.1	90.9	20.0	-70.9

TEST PERSONNEL:



Daniel W. Baltzell		April 7, 2006
Test Engineer	Signature	Date Of Test

9.8 Antenna Conducted Spurious Test Equipment

Table 9-7: Antenna Conducted Spurious Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901413	Hewlett Packard	E4448A	Spectrum Analyzer	US44020346	11/2/06

10 Power Spectral Density – FCC §15.247(d); IC RSS-210 §6.2.2(o)(b)

10.1 Power Spectral Density Test Procedure

The power spectral density per FCC 15.247(d) was measured using a 50 ohm spectrum analyzer with the resolution bandwidth set at 3 kHz, the video bandwidth set at 30 kHz, and the sweep time set at 500 seconds. The test was performed as a conducted test. The spectral lines were resolved for the modulated carriers at 2.412 GHz, 2.437 GHz, and 2.462 GHz respectively. These levels are well below the +8 dBm limit. See the power spectral density table and plots that follow.

10.2 Power Spectral Density Test Data

Table 10-1: Power Spectral Density – 802.11b

CHANNEL	POWER SPECTRAL DENSITY (dBm) (LIMIT = +8dBm)
1	-12.4
6	-11.9
11	-12.5

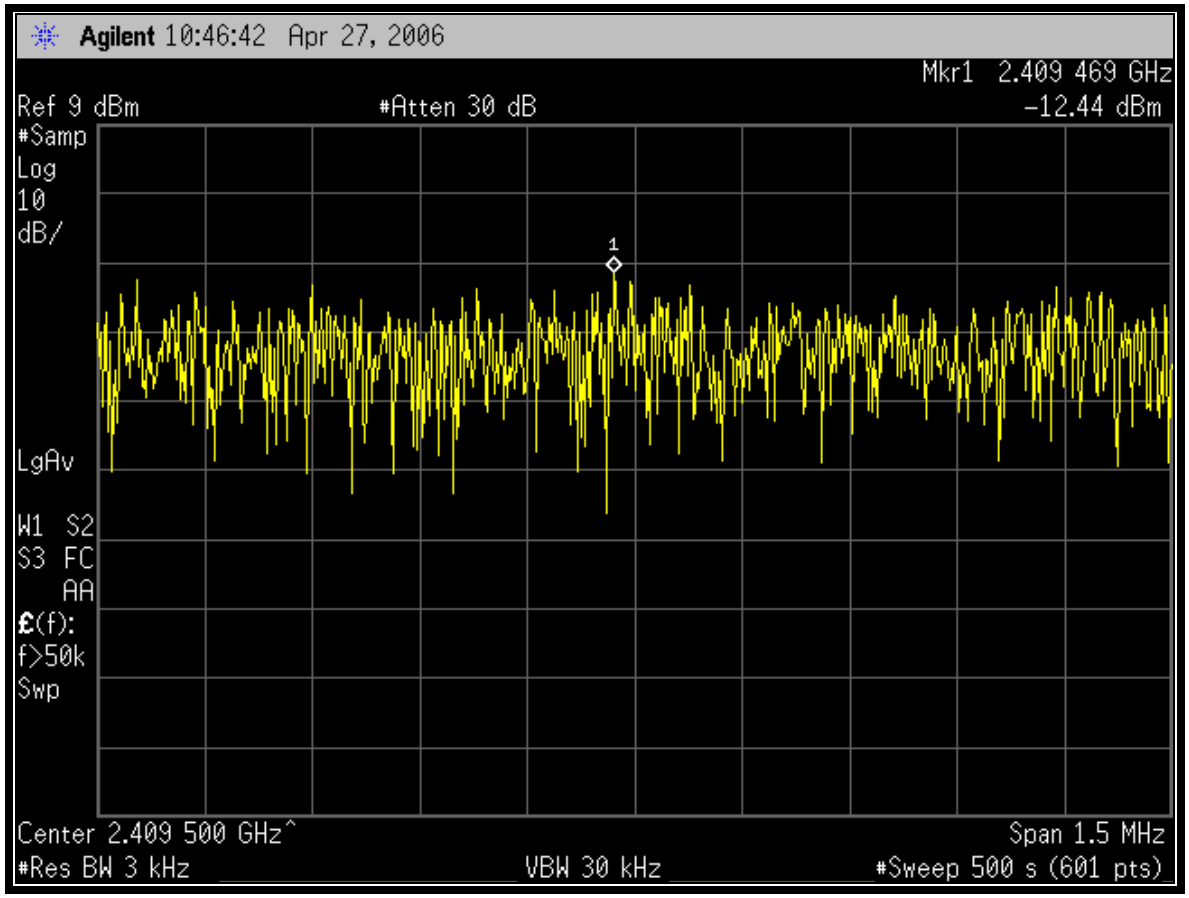
Table 10-2: Power Spectral Density - 802.11g

CHANNEL	POWER SPECTRAL DENSITY (dBm) (LIMIT = +8dBm)
1	-16.2
6	-15.1
11	-16.0

10.3 Power Spectral Density Plots; 802.11b

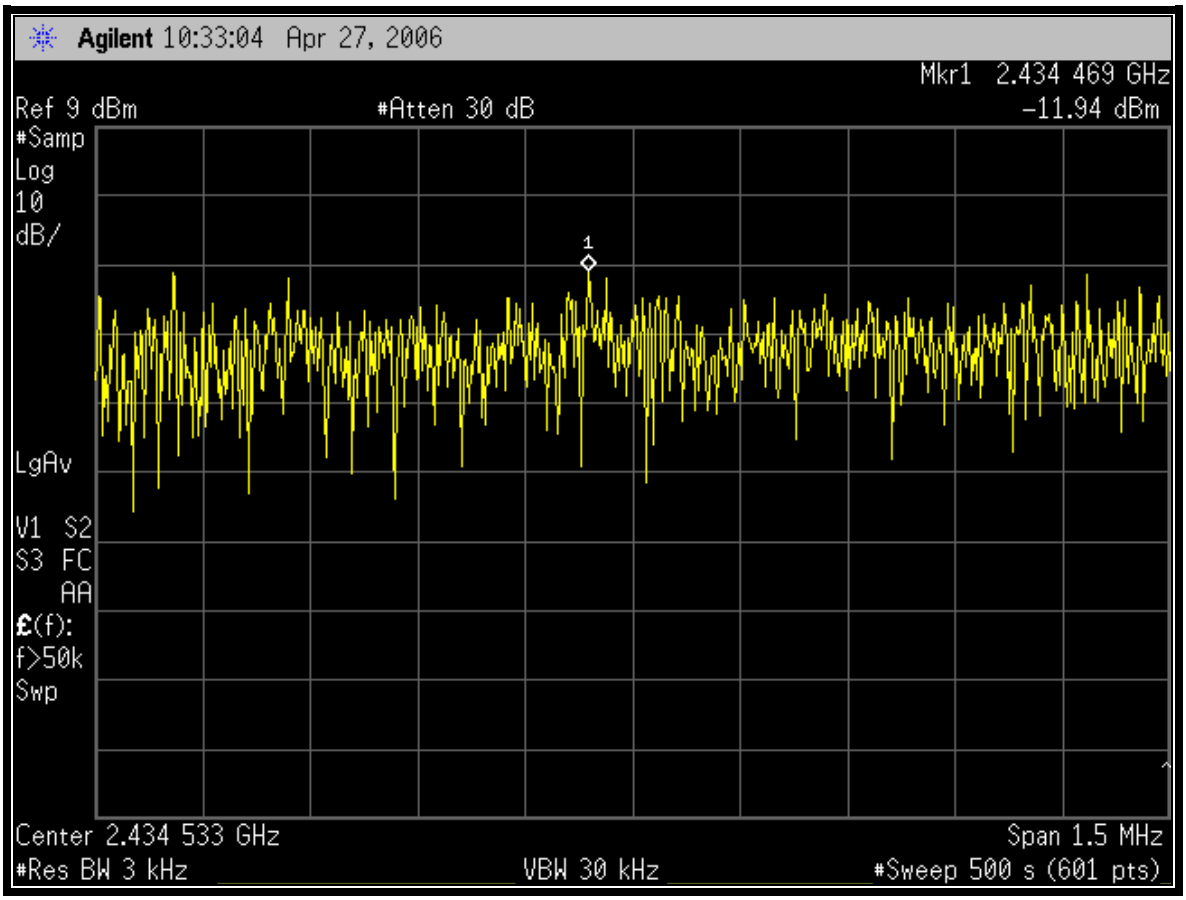
Operating Frequency (MHz):	2412
Channel:	1
Bandwidth Resolution (kHz):	3
Bandwidth Video (kHz):	30
Sweep Time (s):	500

Plot 10-1: Power Spectral Density: Channel 1; 802.11b



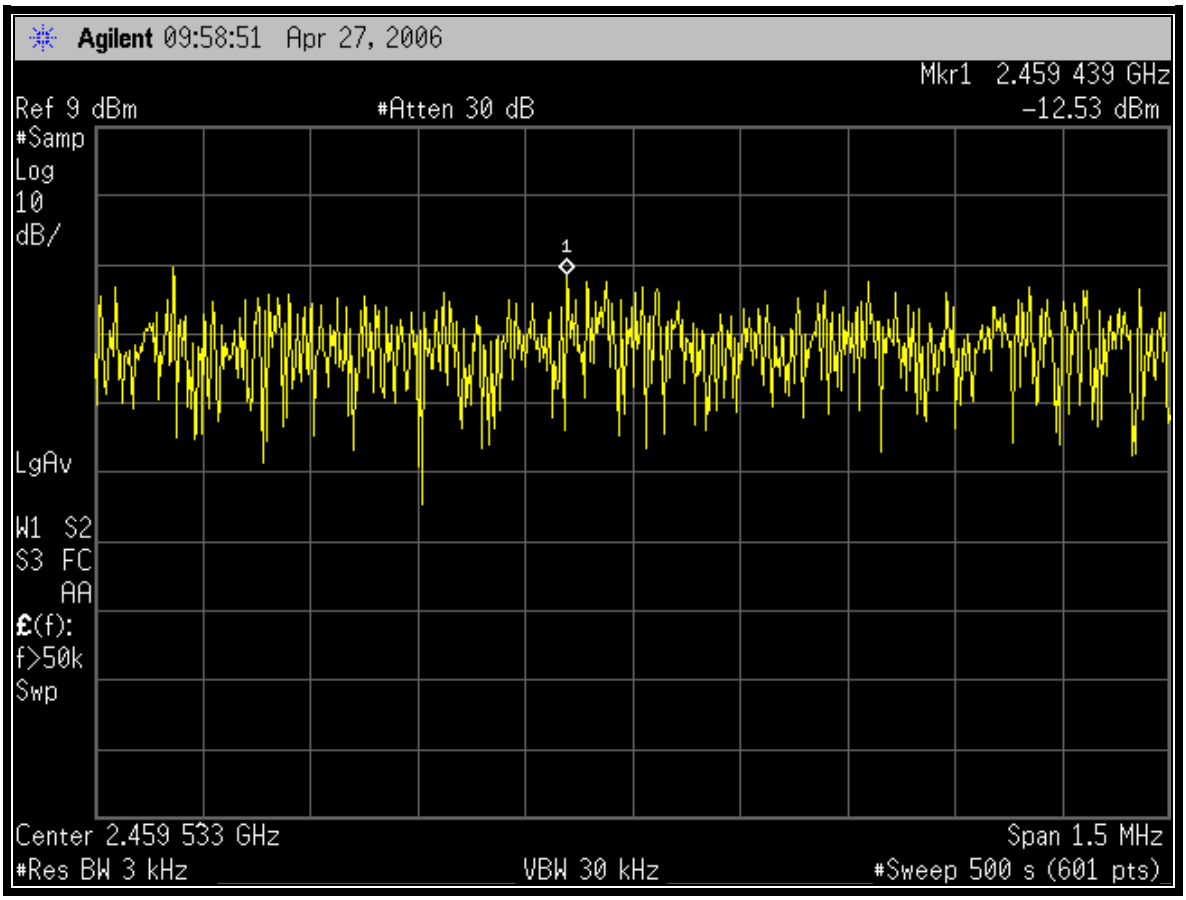
Operating Frequency (MHz):	2437
Channel:	6
Bandwidth Resolution (kHz):	3
Bandwidth Video (kHz):	30
Sweep Time (s):	500

Plot 10-2: Power Spectral Density: Channel 6; 802.11b



Operating Frequency (MHz):	2462
Channel:	11
Bandwidth Resolution (kHz):	3
Bandwidth Video (kHz):	30
Sweep Time (s):	500

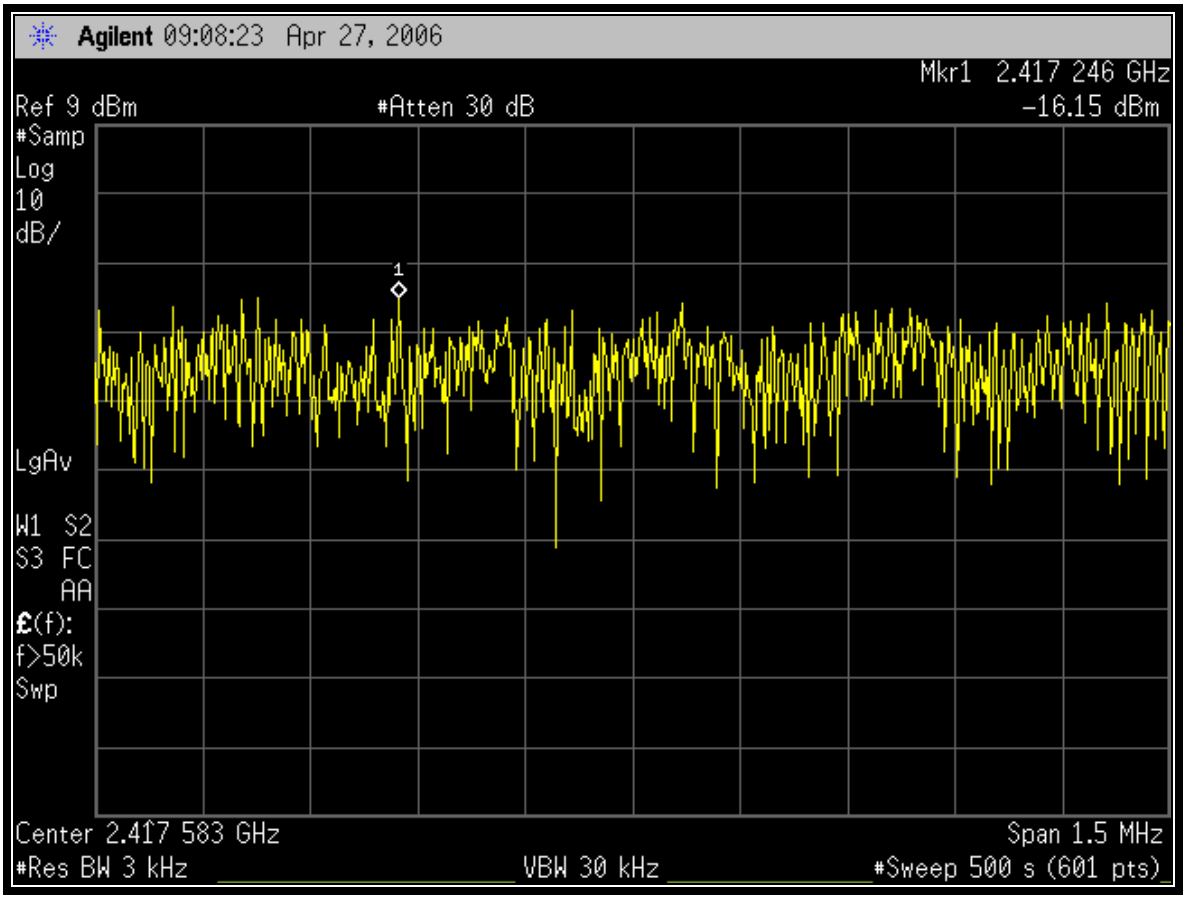
Plot 10-3: Power Spectral Density: Channel 11; 802.11b



10.4 Power Spectral Density Plots; 802.11g

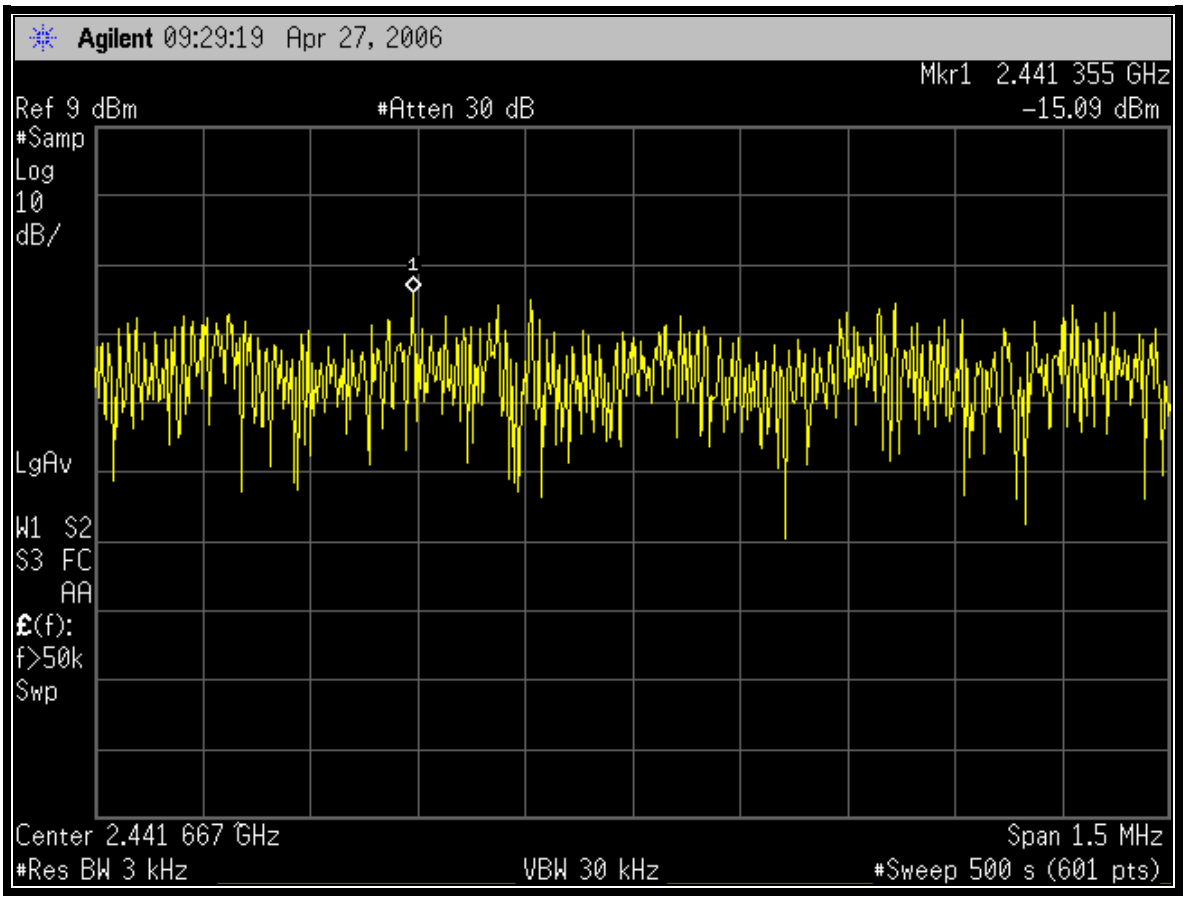
Operating Frequency (MHz):	2412
Channel:	1
Bandwidth Resolution (kHz):	3
Bandwidth Video (kHz):	30
Sweep Time (s):	500

Plot 10-4: Power Spectral Density: Channel 1; 802.11g



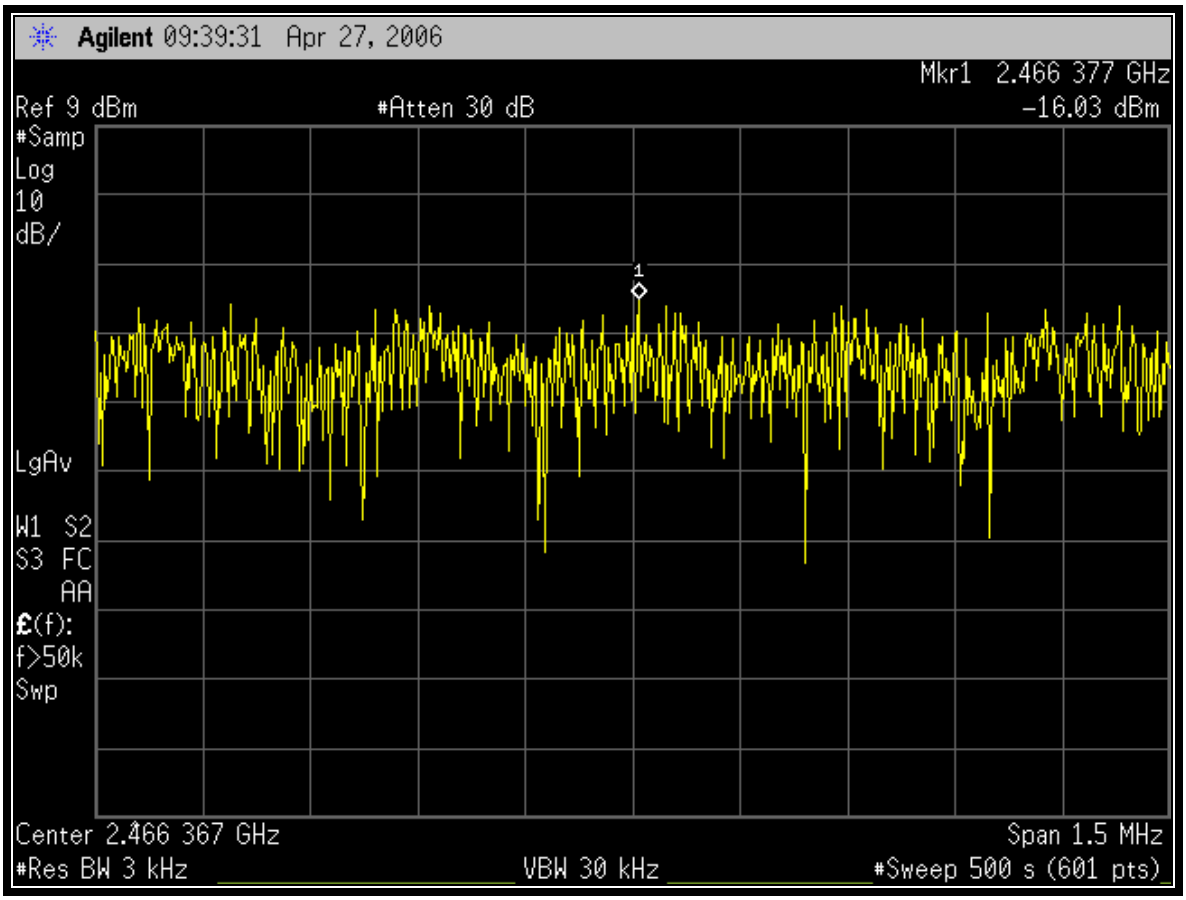
Operating Frequency (MHz):	2437
Channel:	6
Bandwidth Resolution (kHz):	3
Bandwidth Video (kHz):	30
Sweep Time (s):	500

Plot 10-5: Power Spectral Density: Channel 6; 802.11g



Operating Frequency (MHz):	2462
Channel:	11
Bandwidth Resolution (kHz):	3
Bandwidth Video (kHz):	30
Sweep Time (s):	500

Plot 10-6: Power Spectral Density: Channel 11; 802.11g



TEST PERSONNEL:

Daniel Baltzell		April 27, 2006
Test Engineer	Signature	Date Of Test

10.5 Power Spectral Density Test Equipment

Table 10-3: Power Spectral Density Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901413	Hewlett Packard	E4448A	Spectrum Analyzer	US44020346	11/2/06

11 Conclusion

The data in this measurement report shows that the Zebra Technologies Model ZLAN11G, FCC ID: I28MD-ZLAN11G, complies with all the applicable requirements of Parts 2 and 15 of the FCC Rules, Industry Canada RSS-210, ANSI 63.4 and FCC 97-114 (DSSS).