Engineering and Testing for EMC and Safety Compliance

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

Test Lab:	Applicant:
Rhein Tech Laboratories, Inc. Phone: 703-689-0368 360 Herndon Parkway Fax: 703-689-2056 Suite 1400 Web: www.rheintech.com Herndon, VA 20170 E-Mail: ATCBINFO@rheintech.com	Psion Teklogix Inc. Phone: 905-812-6200 x3358 2100 Meadowvale Blvd. Fax: 434-978-2888 Mississauga, Ontario L5N 7J9 Contact: Sada Dharwarkar Canada Email: sada.dharwarkar@psionteklogix.com

FCC ID / IC ID:	GM39160RA2060 / 2739D-91602060	**Test Report Date:**	September 22, 2005
Platform:	802.11 Application Platform	**RTL Work Order Number:**	2005076
Model No:	9160-RA2060	**RTL Quote Number:**	QRTL05-022E

American National Standard Institute:	ANSI C63.4: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
FCC Classification:	DTS – Part 15 Digital Transmission System
FCC Rule Part(s):	FCC Rules Part 15.247: Operation within the bands 920-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz Direct Sequence System 97-114: Amendment of Parts 2 and 15 of the Commission's Rules Regarding Spread Spectrum Transmitters, ET Docket No. 96-8
Industry Canada:	RSS-210: Low Power License-Exempt Communications Devices
Digital Interface Information	Digital Interface was found to be compliant

Frequency Range (MHz)	Output Power (W)	Frequency Tolerance	Emission Designator
2412-2462	0.100	N/A	N/A

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 of FCC Part 2, FCC Part 15, FCC 97-114, ANSI C63.4, and Industry Canada RSS-210.

Signature: _____ Date: September 22, 2005

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

This report may not be reproduced, except in full, without the written approval of Rhein Tech Laboratories, Inc.
The test results relate only to the item(s) tested.

Table of Contents

1 GENERAL INFORMATION 7
1.1 Scope 7
1.2 Description of EUT 7
1.3 Test Facility 7
1.4 Related Submittal(s)/Grant(s) 7
1.5 Modifications 7
2 TEST INFORMATION 8
2.1 Description of Test Modes 8
2.2 Exercising the EUT 8
2.3 Test Result Summary 8
2.4 Test System Details 9
2.5 Configuration of Tested System 10
3 TEST RESULTS FOR 802.11b AND 802.11g 11
3.1 Peak Output Power - §15.247(b)(1); RSS-210 §6.6.2(o) 11
3.1.1 Power Output Test Procedure 11
3.1.2 Power Output Test Data 11
3.2 Compliance With the Band Edge – FCC §15.247(c); RSS-210 §6.6.2(o) 12
3.2.1 Band Edge Test Procedure 12
3.2.2 Restricted Band Edge Test Results 13
3.3 Antenna Conducted Spurious Emissions - §15.247(c); RSS-210 §6.6.2(o) 25
3.3.1 Antenna Conducted Spurious Emissions Test Procedures 25
3.3.2 Antenna Conducted Spurious Emissions Test Results 26
3.4 6 dB Bandwidth - §15.247(a)(2); RSS-210 §6.6.2(o) 32
3.4.1 6 db Bandwidth Test Procedure – Minimum 6 db Bandwidth 32
3.4.2 6 db Bandwidth Test Results 32
3.5 Power Spectral Density - §15.247(d); RSS-210 §6.6.2(o) 40
3.5.1 Power Spectral Density Test Procedure 40
3.5.2 Power Spectral Density Test Data 40
3.5.3 Power Spectral Density Plots - 802.11b 41
3.5.4 Power Spectral Density Plots - 802.11g 44
3.6 Conducted Emissions Measurement Limits – FCC §15.207; RSS-210 §9 48
3.6.1 Limits of Conducted Emissions Measurement 48
3.6.2 Conducted Emissions Measurement Test Procedure 48
3.6.3 Conducted Emissions Test Data 49
3.7 Radiated Emissions - §15.209; RSS-210 §6.2.1 52
3.7.1 Limits of Radiated Emissions Measurement 52
3.7.2 Radiated Emissions Measurement Test Procedure 52
3.7.3 Radiated Emissions Test Results 54
4 CONCLUSION 74

Figure Index

Figure 2-1: Configuration Of System Under Test 10

Table Index

Table 2-1: Channels Tested for 802.11b – 1 Mbps 8
Table 2-2: Channels Tested for 802.11g – 6 Mbps 8
Table 2-3: Test Result Summary For FCC Rules and Regulations – FCC Part 15, Subpart C (Section 15.247)..8
Table 2-4: Equipment Under Test (EUT)....9
Table 2-5: Support Equipment 9
Table 3-1: Power Output Test Equipment....11
Table 3-2: Power Output Test Data – 802.11b....11
Table 3-3: Power Output Test Data - 802.11g 11
Table 3-4: Band Edge Test Equipment 12
Table 3-5: Antenna Conducted Spurious Test Equipment 25
Table 3-6: Antenna Conducted Spurious Emissions - Channel 1 - 2412 MHz 802.11b 26
Table 3-7: Antenna Conducted Spurious Emissions - Channel 6 - 2437 MHz 802.11b 27
Table 3-8: Antenna Conducted Spurious Emissions - Channel 11 - 2462 MHz 802.11b 28
Table 3-9: Antenna Conducted Spurious Emissions - Channel 1 - 2412 MHz 802.11g 29
Table 3-10: Antenna Conducted Spurious Emissions - Channel 6 - 2437 MHz 802.11g 30
Table 3-11: Antenna Conducted Spurious Emissions - Channel 11 - 2462 MHz 802.11g 31
Table 3-12: 6 dB Bandwidth Test Equipment....32
Table 3-13: 6 db Bandwidth Test Data - 802.11b....32
Table 3-14: 6 db Bandwidth Test Data - 802.11g....32
Table 3-15: Power Spectral Density Test Equipment....40
Table 3-16: Power Spectral Density Test Data - 802.11b 40
Table 3-17: Power Spectral Density Test Data - 802.11g 40
Table 3-18: Conducted Emissions Test Equipment 48
Table 3-19: Conducted Emissions Test Data; TX Mid Ch. 802.11b; Neutral Side (Line 1) 49
Table 3-20: Conducted Emissions Test Data; TX Mid Ch. 802.11b; Hot Side (Line 2) 49
Table 3-21: Conducted Emissions Test Data; TX Mid Ch. 802.11g; Neutral Side (Line 1) 49
Table 3-22: Conducted Emissions Test Data; TX Mid Ch. 802.11g; Hot Side (Line 2) 50
Table 3-23: Conducted Emissions Test Data; VAC; Neutral Side (Line 1)....50
Table 3-24: Conducted Emissions Test Data; VAC; Hot Side (Line 2)....50
Table 3-25: Conducted Emissions Test Data; Power over Ethernet Injector, Neutral Side (Line 1)....51
Table 3-26: Conducted Emissions Test Data; Mode TX, Channel 1, Hot Side (Line 2) 51
Table 3-27: Radiated Emissions Test Equipment 53
Table 3-28: Radiated Emissions Test Results – Below 1000 MHz Using Power Over Ethernet Injector 54
Table 3-29: Radiated Emissions Test Results – Below 1000 MHz Using AC Power 55
Table 3-30: Radiated Emissions Harmonics/Spurious Channel 1 (TX Frequency: 2412 MHz 1 Mbps) 8.5 dBi Patch Antenna 802.11b 56
Table 3-31: Radiated Emissions Harmonics/Spurious Channel 6 (TX Frequency: 2437 MHz 1 Mbps) 8.5 dBi Patch Antenna 802.11b 57
Table 3-32: Radiated Emissions Harmonics/Spurious Channel 11 (TX Frequency: 2462 MHz 1 Mbps) 8.5 dBi Patch Antenna 802.11b 58
Table 3-33: Radiated Emissions Harmonics/Spurious Channel 1 (TX Frequency: 2412 MHz 6 Mbps) 8.5 dBi Patch Antenna 802.11g 59
Table 3-34: Radiated Emissions Harmonics/Spurious Channel 6 (TX Frequency: 2437 MHz 6 Mbps) 8.5 dBi Patch Antenna 802.11g 60
Table 3-35: Radiated Emissions Harmonics/Spurious Channel 11 (TX Frequency: 2462 MHz 6 Mbps) 8.5 dBi Patch Antenna 802.11g 61

Table 3-36: Radiated Emissions Harmonics/Spurious Channel 1 (TX Frequency: 2412 MHz 1 Mbps) 12 dBi Collinear Omni Antenna 802.11b 62
Table 3-37: Radiated Emissions Harmonics/Spurious Channel 6 (TX Frequency: 2437 MHz 1 Mbps) 12 dBi Collinear Omni Antenna 802.11b 63
Table 3-38: Radiated Emissions Harmonics/Spurious Channel 11 (TX Frequency: 2462 MHz 1 Mbps) 12 dBi Collinear Omni Antenna 802.11b 64
Table 3-39: Radiated Emissions Harmonics/Spurious Channel 1 (TX Frequency: 2412 MHz 6 Mbps) 12 dBi Collinear Omni Antenna 802.11g 65
Table 3-40: Radiated Emissions Harmonics/Spurious Channel 6 (TX Frequency: 2437 MHz 6 Mbps) 12 dBi Collinear Omni Antenna 802.11g 66
Table 3-41: Radiated Emissions Harmonics/Spurious Channel 11 (TX Frequency: 2462 MHz 6 Mbps) 12 dBi Collinear Omni Antenna 802.11g 67
Table 3-42: Radiated Emissions Harmonics/Spurious Channel 1 (TX Frequency: 2412 MHz 1 Mbps) 14 dBi YAGI Antenna 802.11b 68
Table 3-43: Radiated Emissions Harmonics/Spurious Channel 6 (TX Frequency: 2437 MHz 1 Mbps) 14 dBi YAGI Antenna 802.11b 69
Table 3-44: Radiated Emissions Harmonics/Spurious Channel 11 (TX Frequency: 2462 MHz 1 Mbps) 14 dBi YAGI Antenna 802.11b 70
Table 3-45: Radiated Emissions Harmonics/Spurious Channel 1 (TX Frequency: 2412 MHz 6 Mbps) 14 dBi YAGI Antenna 802.11g 71
Table 3-46: Radiated Emissions Harmonics/Spurious Channel 6 (TX Frequency: 2437 MHz 6 Mbps) 14 dBi YAGI Antenna 802.11g 72
Table 3-47: Radiated Emissions Harmonics/Spurious Channel 11 (TX Frequency: 2462 MHz 6 Mbps) 14 dBi YAGI Antenna 802.11g 73

Plot Index

Plot 3-1: Lower Band Edge: Average Measurement Channel 1 (TX Frequency: 2412 MHz – 1 Mbps) Omni Antenna 13
Plot 3-2: Upper Band Edge: Average Measurement Channel 11 (TX Frequency: 2462 MHz – 1 Mbps) Omni Antenna 14
Plot 3-3: Lower Band Edge: Average Measurement Channel 1 (TX Frequency: 2412 MHz – 1 Mbps) Patch Antenna 15
Plot 3-4: Upper Band Edge: Average Measurement Channel 11 (TX Frequency: 2462 MHz – 1 Mbps) Patch Antenna 16
Plot 3-5: Lower Band Edge: Average Measurement Channel 1 (TX Frequency: 2412 MHz – 1 Mbps) YAGI Antenna 17
Plot 3-6: Upper Band Edge: Average Measurement Channel 11 (TX Frequency: 2462 MHz – 1 Mbps) YAGI Antenna 18
Plot 3-7: Lower Band Edge: Average Measurement Channel 1 (TX Frequency: 2412 MHz – 6 Mbps) Omni Antenna 19
Plot 3-8: Upper Band Edge: Average Measurement Channel 11 (TX Frequency: 2462 MHz – 6 Mbps) Omni Antenna 20
Plot 3-9: Lower Band Edge: Average Measurement Channel 1 (TX Frequency: 2412 MHz – 6 Mbps) Patch Antenna 21
Plot 3-10: Upper Band Edge: Average Measurement Channel 11 (TX Frequency: 2462 MHz – 6 Mbps) Patch Antenna 22
Plot 3-11: Lower Band Edge: Average Measurement Channel 1 (TX Frequency: 2412 MHz – 6 Mbps) YAGI Antenna 23
Plot 3-12: Upper Band Edge: Average Measurement Channel 11 (TX Frequency: 2462 MHz – 6 Mbps) YAGI Antenna 24
Plot 3-13: 6 dB Bandwidth Channel 1 (TX Frequency: 2412 MHz – 1 Mbps) 802.11b 33
Plot 3-14: 6 dB Bandwidth Channel 6; (TX Frequency: 2437 MHz – 1 Mbps) 802.11b 34
Plot 3-15: 6 dB Bandwidth Channel 11 (TX Frequency: 2462 MHz – 1 Mbps) 802.11b 35
Plot 3-16: 6 dB Bandwidth Channel 1 (TX Frequency: 2412 MHz – 6 Mbps) 802.11g 36
Plot 3-17: 6 dB Bandwidth Channel 6 (TX Frequency: 2437 MHz – 6 Mbps) 802.11g 37
Plot 3-18: 6 dB Bandwidth Channel 11 (TX Frequency: 2462 MHz - 6 Mbps) 802.11g 38
Plot 3-19: 6 dB Bandwidth Channel 6 (TX Frequency: 2437 MHz – Turbo 12 Mbps) 802.11g 39
Plot 3-20: Power Spectral Density: Channel 1 (2412 MHz – 1 Mbps) 41
Plot 3-21: Power Spectral Density: Channel 6 (2437 MHz – 1 Mbps) 42
Plot 3-22: Power Spectral Density: Channel 11 (2462 MHz – 1 Mbps) 43
Plot 3-23: Power Spectral Density: Channel 1 (2412 MHz – 6 Mbps) 44
Plot 3-24: Power Spectral Density: Channel 6 (2437 MHz – 6 Mbps) 45
Plot 3-25: Power Spectral Density: Channel 6 Turbo (2437 MHz – 12 Mbps) 46
Plot 3-26: Power Spectral Density: Channel 11 (2462 MHz – 6 Mbps) 47

Appendix Index

Appendix A: RF Exposure Compliance....75
Appendix B: Antenna Specifications Per FCC §15.204(c)....76
Appendix C: Agency Authorization Letter....77
Appendix D: Confidentiality Request Letter....78
Appendix E: Power Attestation Letter....79
Appendix F: Professional Installation Attestation....80
Appendix G: Label and Label Location....81
Appendix H: Technical Operational Description....82
Appendix I: Schematics....83
Appendix J: Block Diagram....84
Appendix K: Manual....85
Appendix L: Test Photographs....86
Appendix M: External Photographs....97
Appendix N: Internal Photographs....103

Photograph Index

Photograph 1: Radiated Testing – 8.5 dBi Patch Front View....86
Photograph 2: Radiated Testing – 8.5 dBi Patch Rear View....87
Photograph 3: Radiated Testing – 12 dBi Collinear Omni Front View....88
Photograph 4: Radiated Testing – 12 dBi Collinear Omni Rear View....89
Photograph 5: Radiated Testing – 14 dBi YAGI Front View....90
Photograph 6: Radiated Testing – 14 dBi YAGI Rear View....91
Photograph 7: Conducted Line Emissions Testing; AC Powered - Front View....92
Photograph 8: Conducted Line Emissions Testing; AC Powered - Rear View....93
Photograph 9: Conducted Line Emissions Testing; Powered Over Ethernet - Front View....94
Photograph 10: Conducted Line Emissions Testing; Powered Over Ethernet - Rear View....95
Photograph 11: Conducted Antenna Port Testing....96
Photograph 12: EUT Front View....97
Photograph 13: EUT Rear View....98
Photograph 14: EUT Top View....99
Photograph 15: EUT Left Side View....100
Photograph 16: EUT Right Side View....101
Photograph 17: EUT Bottom View....102
Photograph 18: Inside Bottom View with PCB's....103
Photograph 19: Inside Bottom View PCB's Removed....104
Photograph 20: Main PCB; Top View – with Radio Card....105
Photograph 21: Main PCB; Top View – Radio Removed....106
Photograph 22: Main PCB Bottom View....107
Photograph 23: Top of Power Supply PCB....108
Photograph 24: Bottom of Power Supply PCB....109

1 General Information

1.1 Scope

Applicable Standards:

- 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.
- Industry Canada RSS-210: Low Power License-Exempt Communications Devices

1.2 Description of EUT

Equipment Under Test	802.11 Application Platform
Model	9160-RA2060
Modulation Type	DBPSK, DQPSK, CCK, OFDM
Modulation Technology	DSSS, CCK
Transfer Rate	54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, and 1 Mbps
Frequency Range	802.11b & g: 2412 – 2462 MHz
Output Power	20 dBm typical
Power Supply	110-230 VAC
Antenna Connector Type	Dual U.FL connected to reverse thread SMA
Antenna Types	Mobile Mark OD12-2400 Collinear Omni 12 dBi Centurion CAF94180 Patch 8.5 dBi Maxrad MYP24014 Yagi 14 dBi

1.3 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).

1.4 Related Submittal(s)/Grant(s)

This is an original application for certification for Psion Teklogix Inc. Model 9160-RA2060, 802.11 Application Platform, FCC ID: GM39160RA2060.

1.5 Modifications

No physical modifications were made to the EUT, but power level settings had to be specifically adjusted for band edge compliance for each of the antennas. The manufacturer understands that this product must be configured as tested when the product is sold in the marketplace. A separate attestation letter has been provided.

2 Test Information

2.1 Description of Test Modes

In accordance with FCC 15.31(m), and because the EUT utilizes an operating band greater than 10 MHz, the following frequencies were tested for 802.11b and 802.11g:

Table 2-1: Channels Tested for 802.11b – 1 Mbps

Channel	Frequency
1	2412
6	2437
11	2462

Table 2-2: Channels Tested for 802.11g – 6 Mbps

Channel	Frequency
1	2412
6	2437
11	2462

2.2 Exercising the EUT

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

2.3 Test Result Summary

Table 2-3: Test Result Summary For FCC Rules and Regulations – FCC Part 15, Subpart C (Section 15.247)

Standard	Test	Pass/Fail or N/A
FCC 15.207	AC Power Conducted Emissions	Pass
FCC 15.247(a)(2)	Spectrum Bandwidth of DSSS System – Limit: 500 kHz minimum	Pass
FCC 15.247(b)	Maximum Peak Power Output - Limit: 30 dBm max.	Pass
FCC 15.247(c)	Antenna Conducted Spurious Emissions – Limit: 15.209	Pass
FCC 15.247(d)	Power Spectral Density – Limit: 8 dBm max.	Pass
FCC 15.247(c)	Band Edge Measurement – Limit: 20 dB less than peak level of fundamental	Pass

2.4 Test System Details

The test sample was received on April 11, 2005. The FCC identifiers for all applicable equipment, plus descriptions of all cables used in the tested system, are identified in the following tables.

Table 2-4: Equipment Under Test (EUT)

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Bar Code
Wireless Access Point	Psion Teklogix Inc.	9160-RA2060	ES0-0006	GM39160RA2060	1.7m shielded power; 1m unshielded serial; 1m unshielded Ethernet; 36" shielded RT SMA m-N m RG223/U antenna cable	16720
Power Over LAN Hub	ADI Engineering	Powerdsine 6001	104436040 020080B03	N/A	1 m unshielded Ethernet	16646
Collinear Omni Antenna	Mobile Mark	OD12-2400	N/A	N/A	N/A	16731
YAGI Antenna	MaxRad	MYP24014PT NR	N/A	N/A	34” Shielded	16663
Patch Antenna	Centurion	CAF94180	NA	N/A	10.5” Shielded	16732

Table 2-5: Support Equipment

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Bar Code
Laptop	Toshiba	Satellite 1905-S301	92043315C	N/A	3m unshielded power	16621
USB Mobile Port Replicator	Targus	PA070	430-0019-001B	N/A	0.9m unshielded I/O	16622
19V 4.74A AC Adaptor	EDA Power Elec.	EA1060B	N/A	N/A	1.9m unshielded AC power, 1.2m unshielded DC power	16672

2.5 Configuration of Tested System

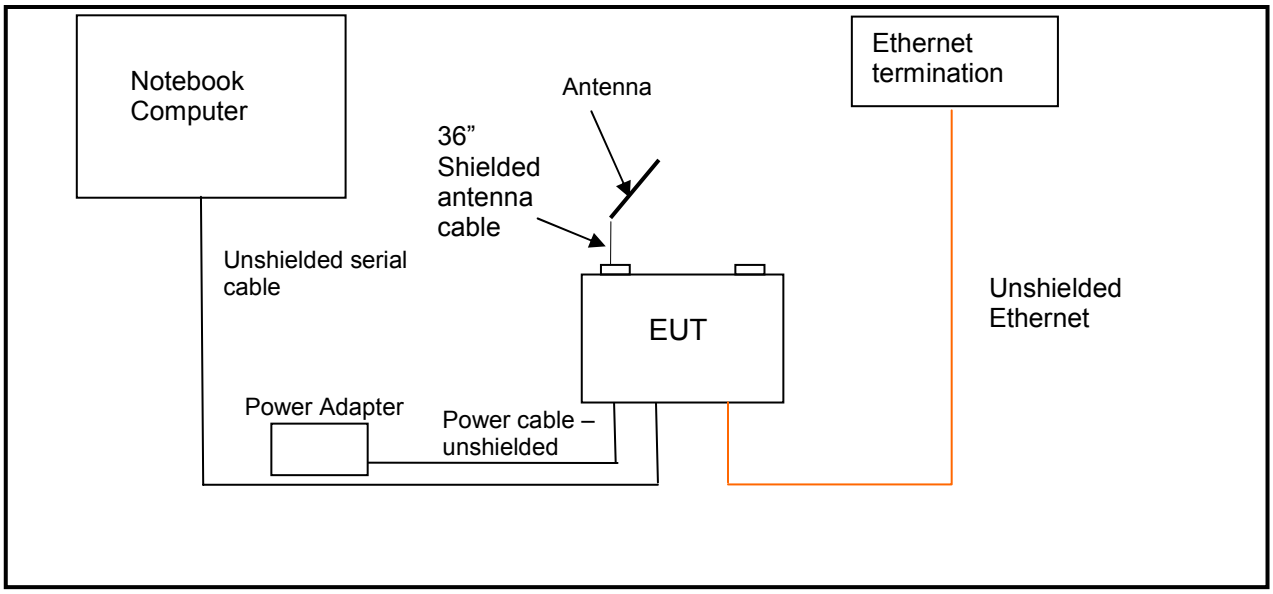


Figure 2-1: Configuration Of System Under Test

3 Test Results for 802.11b and 802.11g

3.1 Peak Output Power - §15.247(b)(1); RSS-210 §6.6.2(o)

3.1.1 Power Output Test Procedure

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

Power level settings had to be specifically adjusted for band edge compliance for each of the antennas. The manufacturer understands that this product must be configured as tested when the product is sold in the marketplace. A separate attestation letter has been provided.

Table 3-1: Power Output Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901184	Agilent Technologies	E4416A	EPM-P Power Meter, single channel	GB41050573	9/10/06
901356	Agilent Technologies	E9323A	Power Sensor	31764-264	9/10/06

3.1.2 Power Output Test Data

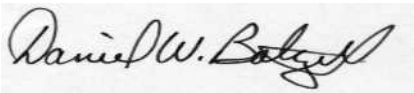
Table 3-2: Power Output Test Data – 802.11b

Channel	Frequency (MHz)	Peak Power Conducted Output (dBm)		
		8.5 dBi Patch	12 dBi Collinear Omni	14 dBi Yagi
1	2412	17.6	17.6	12.5
6	2437	19.7	19.7	19.7
11	2462	17.3	17.3	8.8

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

Channel	Frequency (MHz)	Peak Power Conducted Output (dBm)		
		8.5 dBi Patch	12 dBi Collinear Omni	14 dBi Yagi
1	2412	16.4	19.9	15.8
6	2437	19.4	19.4	19.4
11	2462	15.0	20.0	12.6

Test Personnel:



Daniel W. Baltzell		September 13, 2005
EMC Test Engineer	Signature	Date Of Test

3.2 Compliance With the Band Edge – FCC §15.247(c); RSS-210 §6.6.2(o)

3.2.1 Band Edge Test Procedure

The transmitter output was connected to its appropriate antenna. Peak (1 MHz RBW/VBW) and average (1 MHz RBW/10 Hz VBW) radiated measurements were taken with a suitable span to encompass the peak of the fundamental. A delta measurement was performed from the highest peak in the restricted band to the peak of the fundamental, and subtracted from the field strength; the result was compared to the limit in the restricted band (54 dBuV/m).

Table 3-4: Band Edge Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901020	Hewlett Packard	8564E	Portable Spectrum Analyzer (9 kHz - 40 GHz)	3943A01719	9/14/06
900878	Rhein Tech Labs	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901231	IW Microwave Products	KPS-1503-2400-KPS	High frequency RF cables	240"	9/1/06
901232	IW Microwave Products	KPS-1503-2400-KPS	High frequency RF cables	240"	9/1/06
901235	IW Microwave Products	KPS-1503-360-KPS	High frequency RF cables	36"	9/1/06
901242	Rhein Tech Labs	WRT-000-0003	Wood rotating table	N/A	Not Required
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	5/20/07

3.2.2 Restricted Band Edge Test Results

3.2.2.1 802.11b Test Results

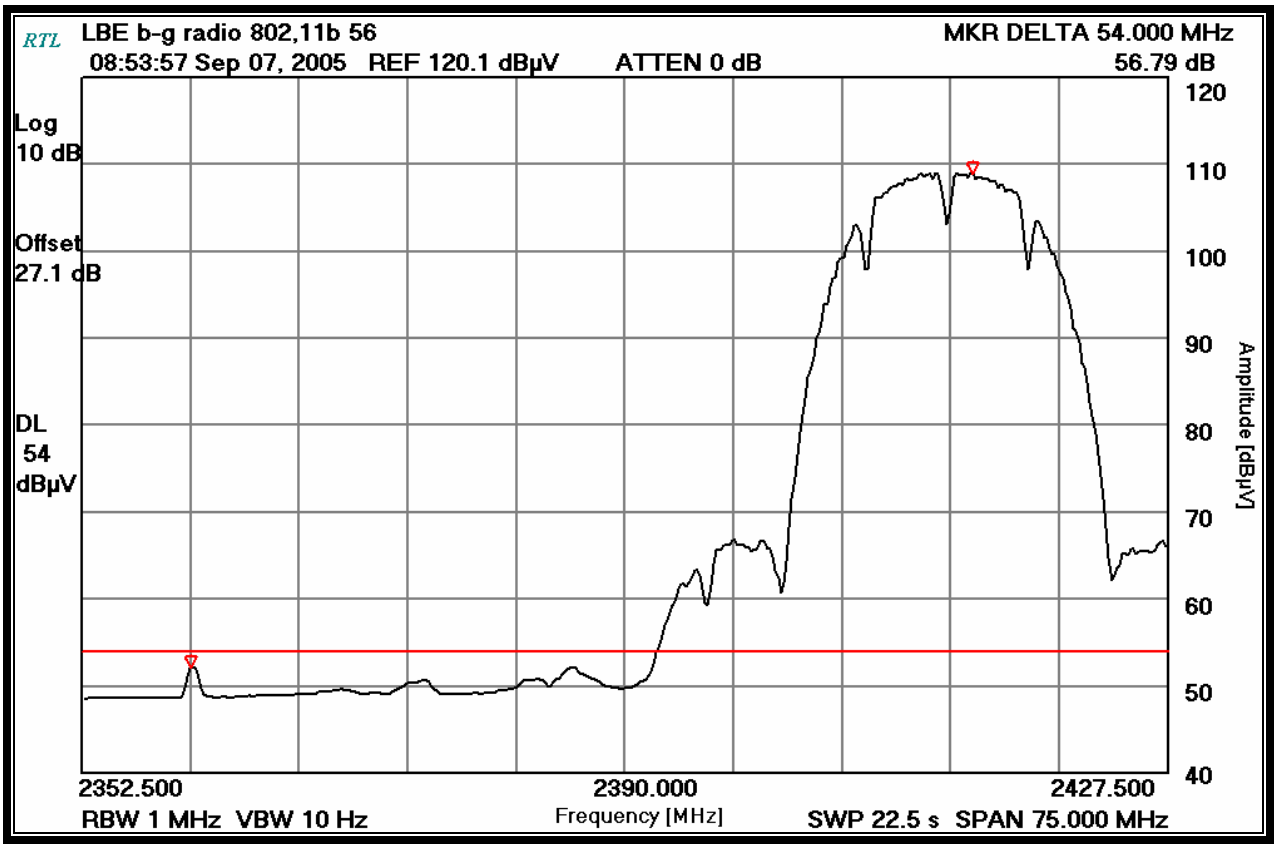
3.2.2.1.1 Calculation of Lower Band Edge - Mobile Mark Collinear Omni 12 dBi Antenna

109.0 dBuV/m is the field strength measurement, from which the delta measurement of 56.8 dB is subtracted (reference plots), resulting in a level of 52.2 dB. This level has a margin of 1.8 dB below the limit of 54 dBuV/m.

Calculation: 109.0 dBuV/m – 56.8 dB – 54 dBuV/m = -1.8 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 113.2 dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 109.0 dBuV/m
Delta measurement = 56.8 dB

Plot 3-1: Lower Band Edge: Average Measurement Channel 1 (TX Frequency: 2412 MHz – 1 Mbps) Omni Antenna



3.2.2.1.2 Calculation of Upper Band Edge - Mobile Mark Collinear Omni 12 dBi Antenna

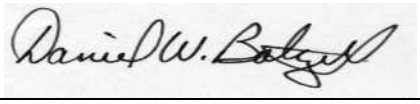
109.0 dBuV/m is the field strength measurement, from which the delta measurement of 57.2 dB is subtracted (reference plots), resulting in a level of 51.8 dB. This level has a margin of 7.3 dB below the limit of 54 dBuV/m.

Calculation: 109.0 dBuV/m – 57.2 dB – 54 dBuV/m = -2.2 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 112.6 dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 109.0 dBuV/m
Delta measurement = 57.2 dB

Plot 3-2: Upper Band Edge: Average Measurement Channel 11 (TX Frequency: 2462 MHz – 1 Mbps) Omni Antenna

Test Personnel:

Daniel W. Baltzell		September 6 & 7, 2005
Test Engineer	Signature	Dates Of Test

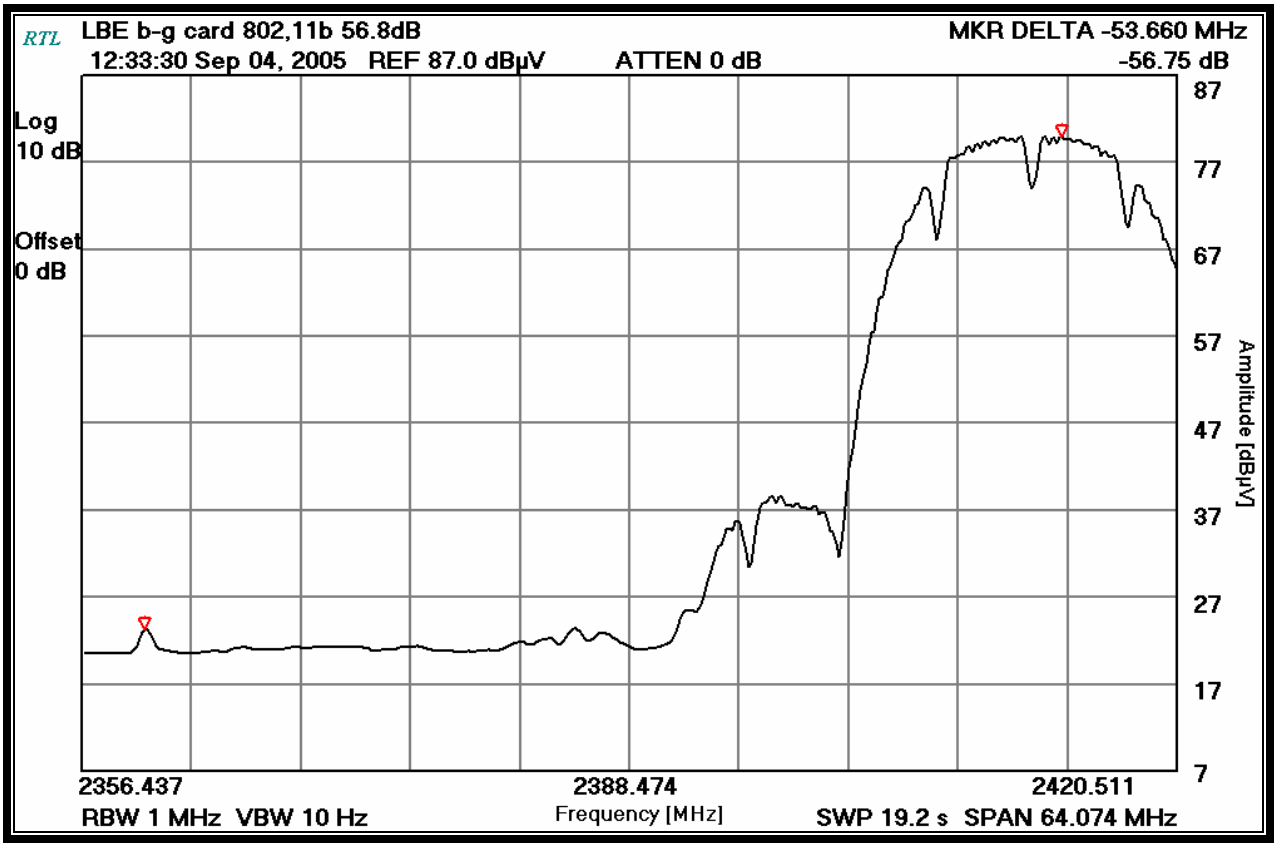
3.2.2.1.3 Calculation of Lower Band Edge Centurion Patch 8.5 dBi Antenna

107.1 dBuV/m is the field strength measurement, from which the delta measurement of 56.8 dB is subtracted (reference plots), resulting in a level of 50.3 dB. This level has a margin of 3.7 dB below the limit of 54 dBuV/m.

Calculation: 107.1 dBuV/m – 56.8 dB – 54 dBuV/m = -3.7 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 111.7 dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 107.1 dBuV/m
Delta measurement = 56.8 dB

Plot 3-3: Lower Band Edge: Average Measurement Channel 1 (TX Frequency: 2412 MHz – 1 Mbps) Patch Antenna



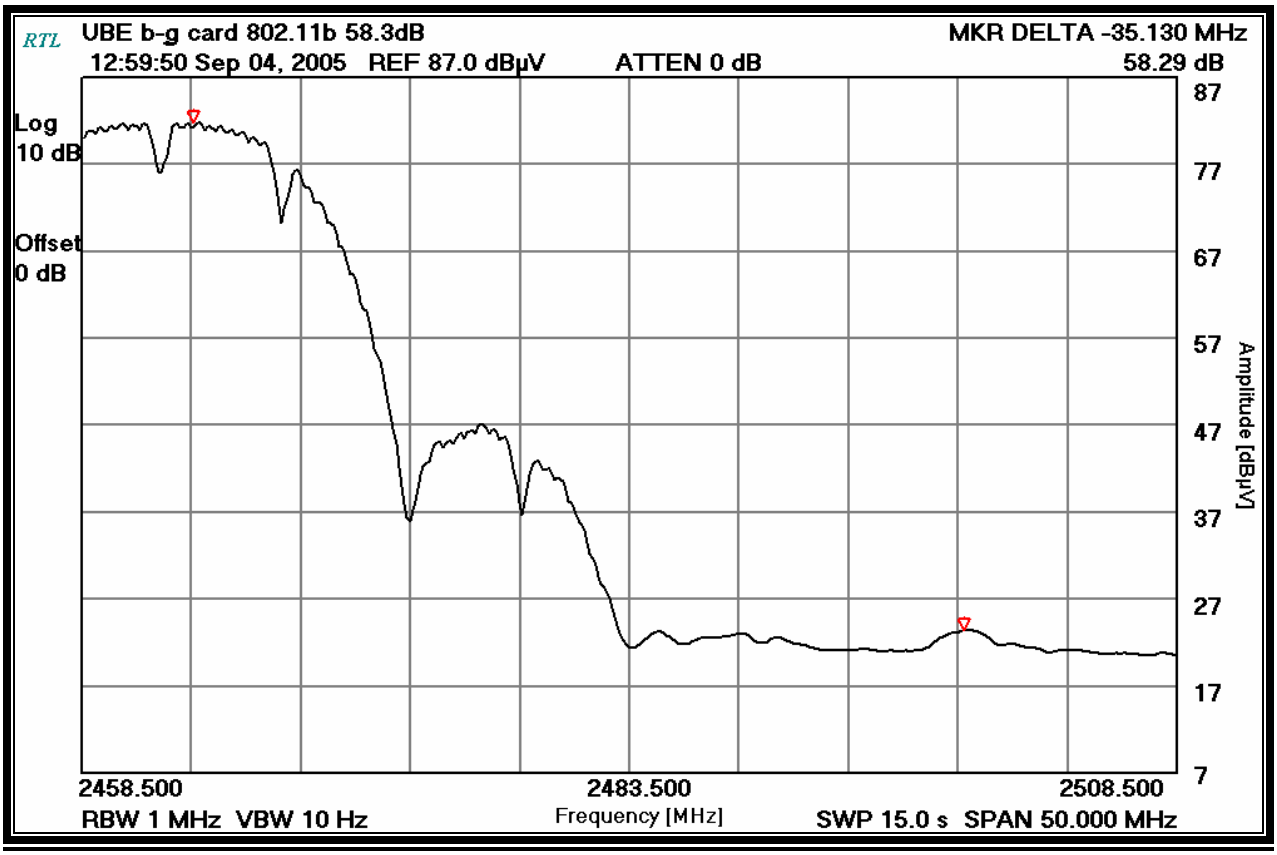
3.2.2.1.4 Calculation of Upper Band Edge Centurion Patch 8.5 dBi Antenna

109.0 dBuV/m is the field strength measurement, from which the delta measurement of 58.3 dB is subtracted (reference plots), resulting in a level of 50.7 dB. This level has a margin of 3.3 dB below the limit of 54 dBuV/m.

Calculation: 109.0 dBuV/m – 58.3 dB – 54 dBuV/m = -3.3 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 113.2 dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 109.0 dBuV/m
Delta measurement = 58.3 dB

Plot 3-4: Upper Band Edge: Average Measurement Channel 11 (TX Frequency: 2462 MHz – 1 Mbps) Patch Antenna



Test Personnel:

Daniel W. Baltzell		September 4, 2005
Test Engineer	Signature	Dates Of Test

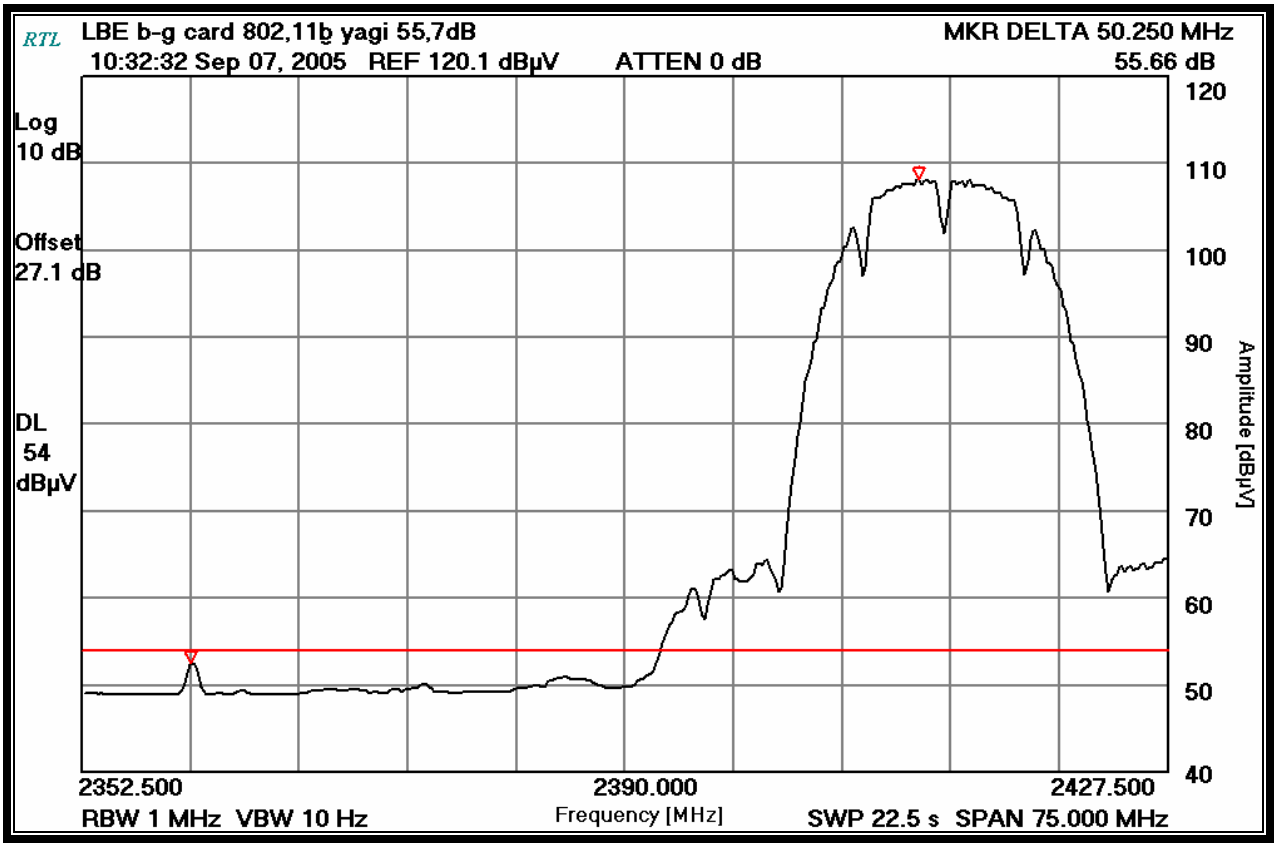
3.2.2.1.5 Calculation of Lower Band Edge - MaxRad YAGI 14 dBi Antenna

108.2 dBuV/m is the field strength measurement, from which the delta measurement of 55.7 dB is subtracted (reference plots), resulting in a level of 52.5 dB. This level has a margin of 1.5 dB below the limit of 54 dBuV/m.

Calculation: 108.2 dBuV/m – 55.7 dB – 54 dBuV/m = -1.5 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 111.9 dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 108.2 dBuV/m
Delta measurement = 55.7 dB

Plot 3-5: Lower Band Edge: Average Measurement Channel 1 (TX Frequency: 2412 MHz – 1 Mbps) YAGI Antenna



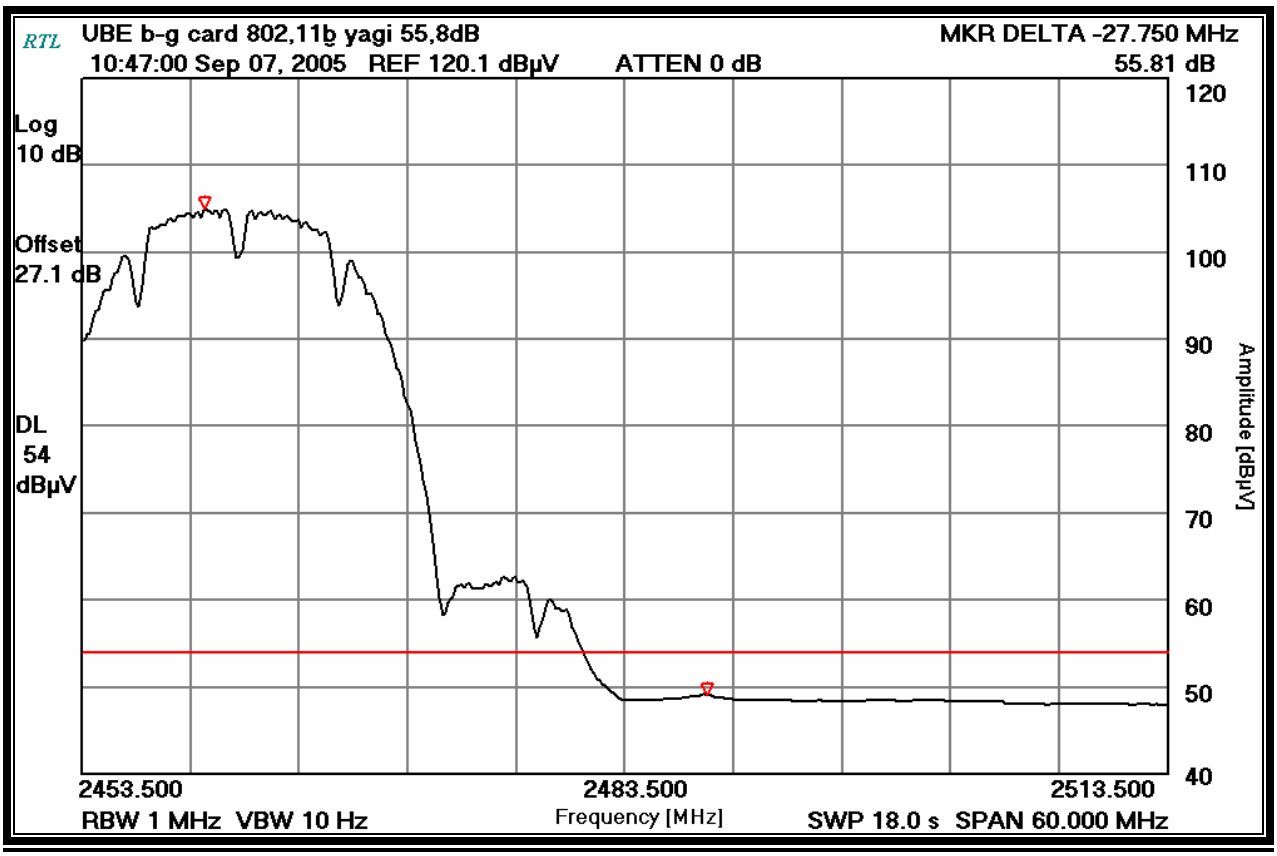
3.2.2.1.6 Calculation of Upper Band Edge - MaxRad YAGI 14 dBi Antenna

104.9dBuV/m is the field strength measurement, from which the delta measurement of 55.8 dB is subtracted (reference plots), resulting in a level of 49.1 dB. This level has a margin of 4.9 dB below the limit of 54 dBuV/m.

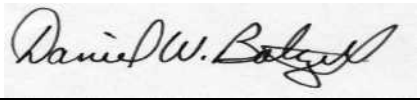
Calculation: 104.9 dBuV/m – 55.8 dB – 54 dBuV/m = -4.9 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 108.6 dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 104.9 dBuV/m
Delta measurement = 55.8 dB

Plot 3-6: Upper Band Edge: Average Measurement Channel 11 (TX Frequency: 2462 MHz – 1 Mbps) YAGI Antenna



Test Personnel:

Daniel W. Baltzell		September 7, 2005
Test Engineer	Signature	Dates Of Test

3.2.2.2 802.11g Test Results

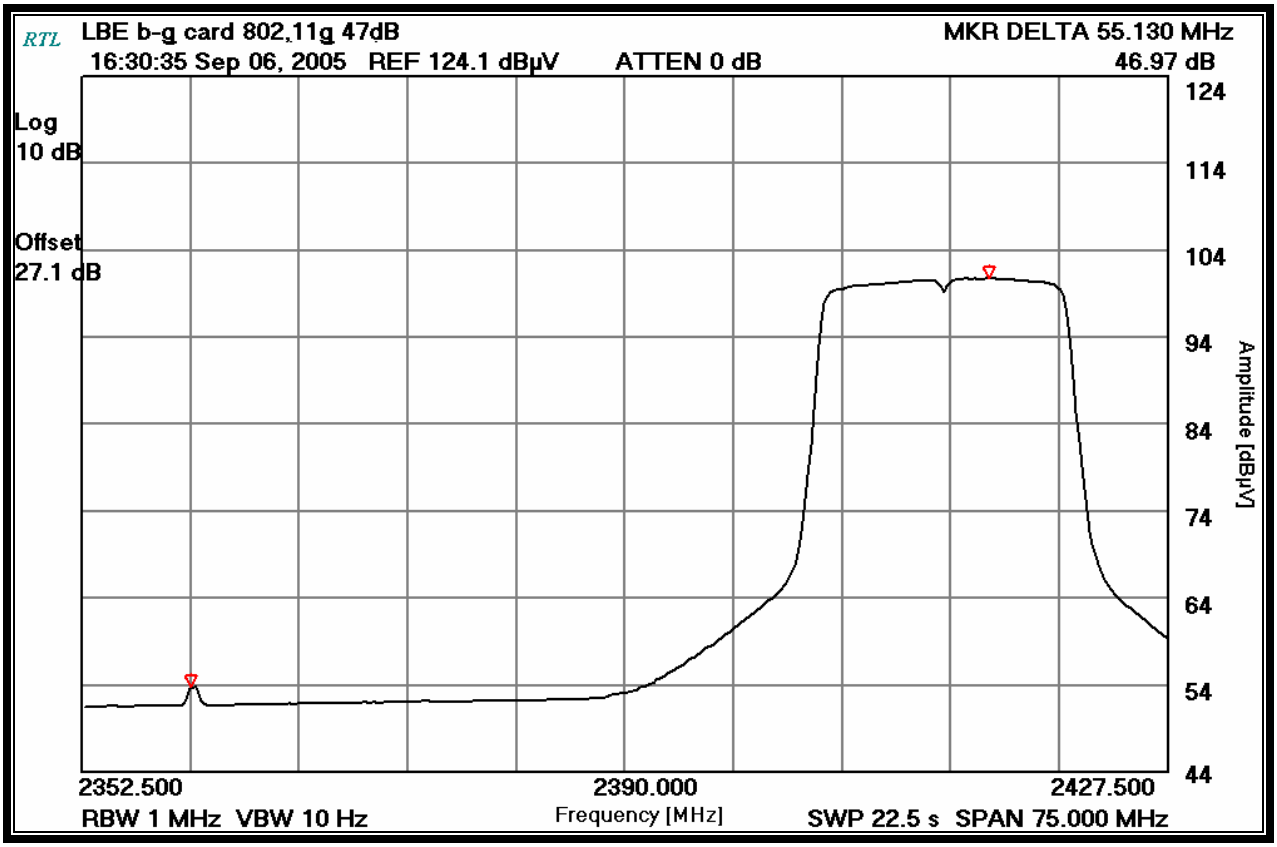
3.2.2.2.1 Calculation of Lower Band Edge - Mobile Mark Collinear Omni 12 dBi Antenna

100.8 dBuV/m is the field strength measurement, from which the delta measurement of 47.0 dB is subtracted (reference plots), resulting in a level of 53.8 dB. This level has a margin of 0.2 dB below the limit of 54 dBuV/m.

Calculation: 100.8 dBuV/m – 47.0 dB – 54 dBuV/m = -0.2 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 112.0. dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 100.8 dBuV/m
Delta measurement = 47.0 dB

Plot 3-7: Lower Band Edge: Average Measurement Channel 1 (TX Frequency: 2412 MHz – 6 Mbps) Omni Antenna



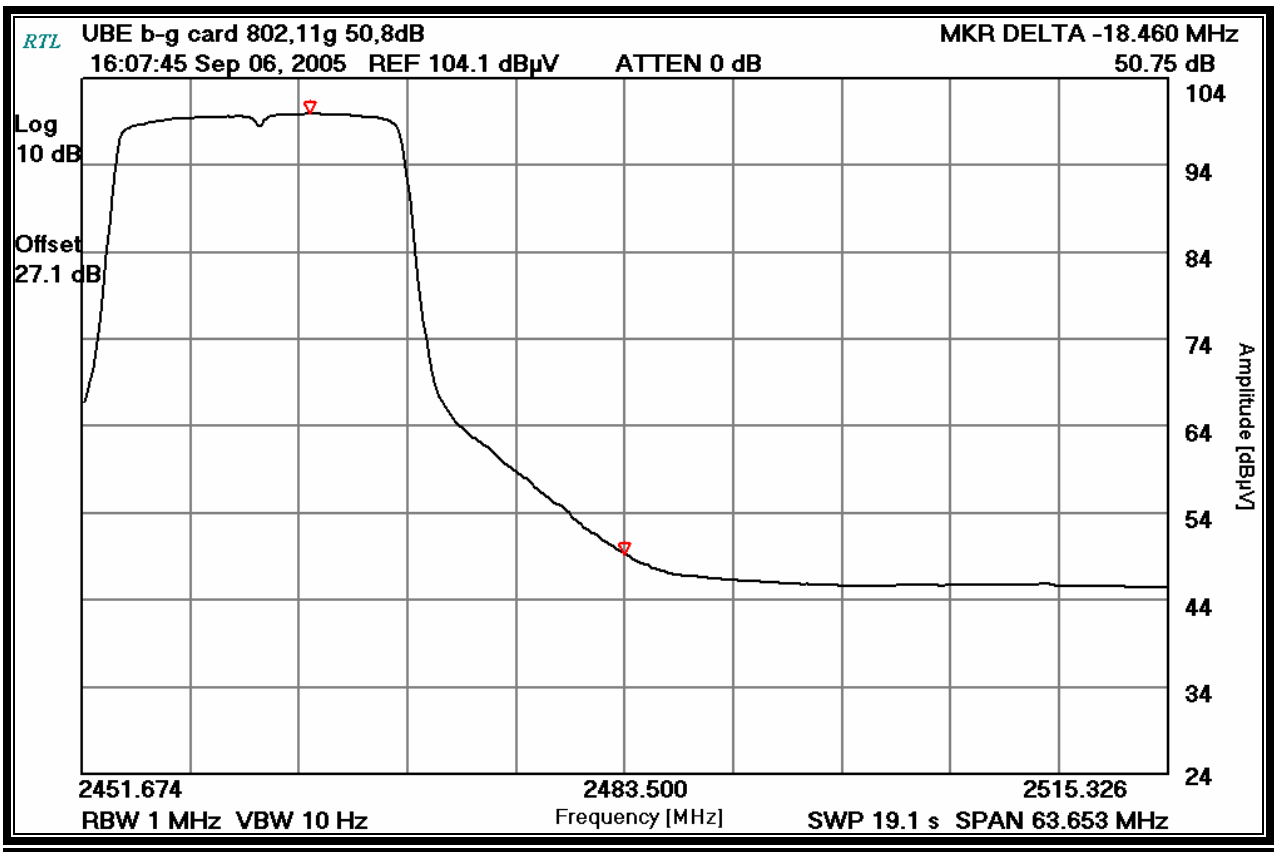
3.2.2.2.2 Calculation of Upper Band Edge - Mobile Mark Collinear Omni 12 dBi Antenna

102.9 dBuV/m is the field strength measurement, from which the delta measurement of 50.8 dB is subtracted (reference plots), resulting in a level of 52.1 dB. This level has a margin of 1.9 dB below the limit of 54 dBuV/m.

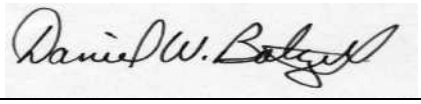
Calculation: 102.9 dBuV/m – 50.8 dB – 54 dBuV/m = -1.9 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 114.2 dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 102.9 dBuV/m
Delta measurement = 50.8 dB

Plot 3-8: Upper Band Edge: Average Measurement Channel 11 (TX Frequency: 2462 MHz – 6 Mbps) Omni Antenna



Test Personnel:

Daniel W. Baltzell		September 6, 2005
Test Engineer	Signature	Dates Of Test

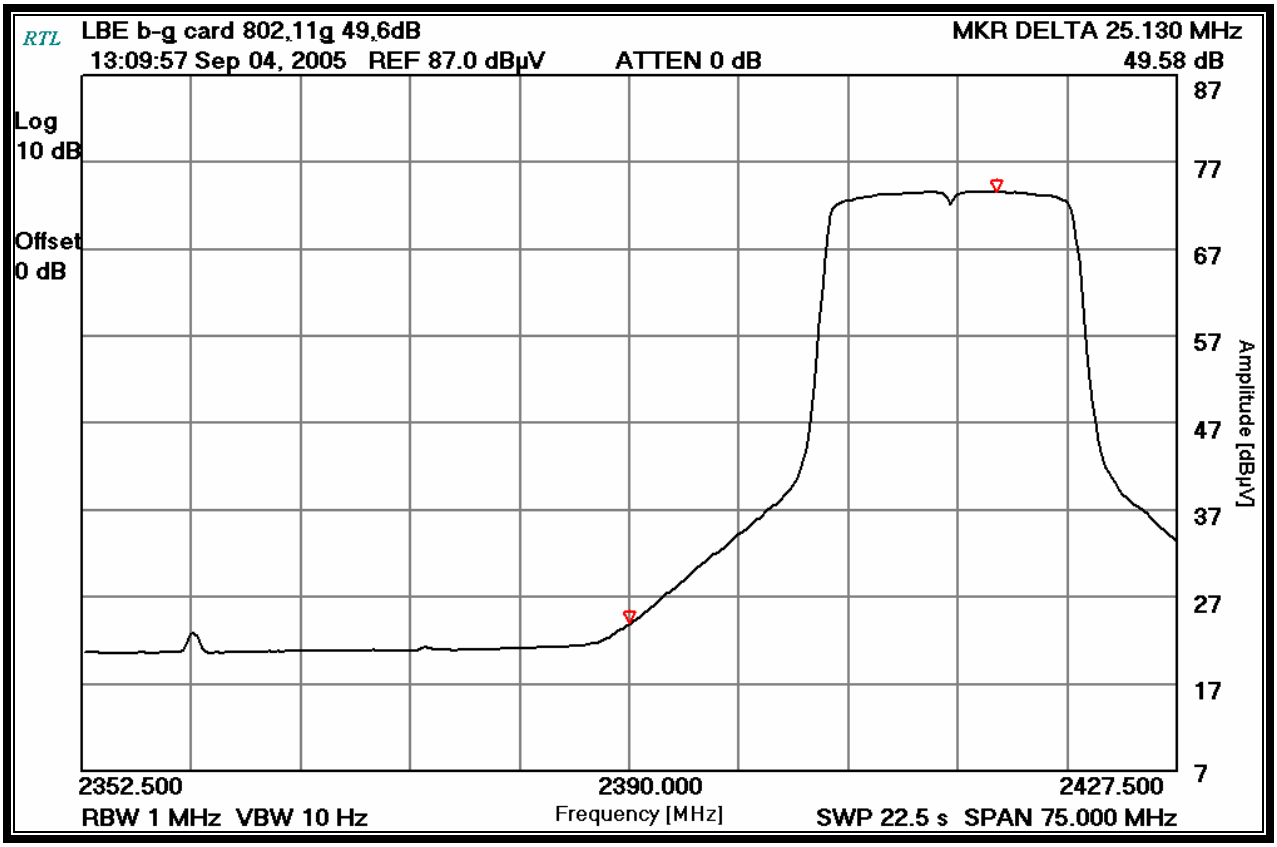
3.2.2.2.3 Calculation of Lower Band Edge - Centurion Patch 8.5 dBi Antenna

101.4 dBuV/m is the field strength measurement, from which the delta measurement of 49.6 dB is subtracted (reference plots), resulting in a level of 51.8 dB. This level has a margin of 2.2 dB below the limit of 54 dBuV/m.

Calculation: 101.4 dBuV/m – 49.6 dB – 54 dBuV/m = -2.2 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 113.4 dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 101.4 dBuV/m
Delta measurement = 49.6 dB

Plot 3-9: Lower Band Edge: Average Measurement Channel 1 (TX Frequency: 2412 MHz – 6 Mbps) Patch Antenna



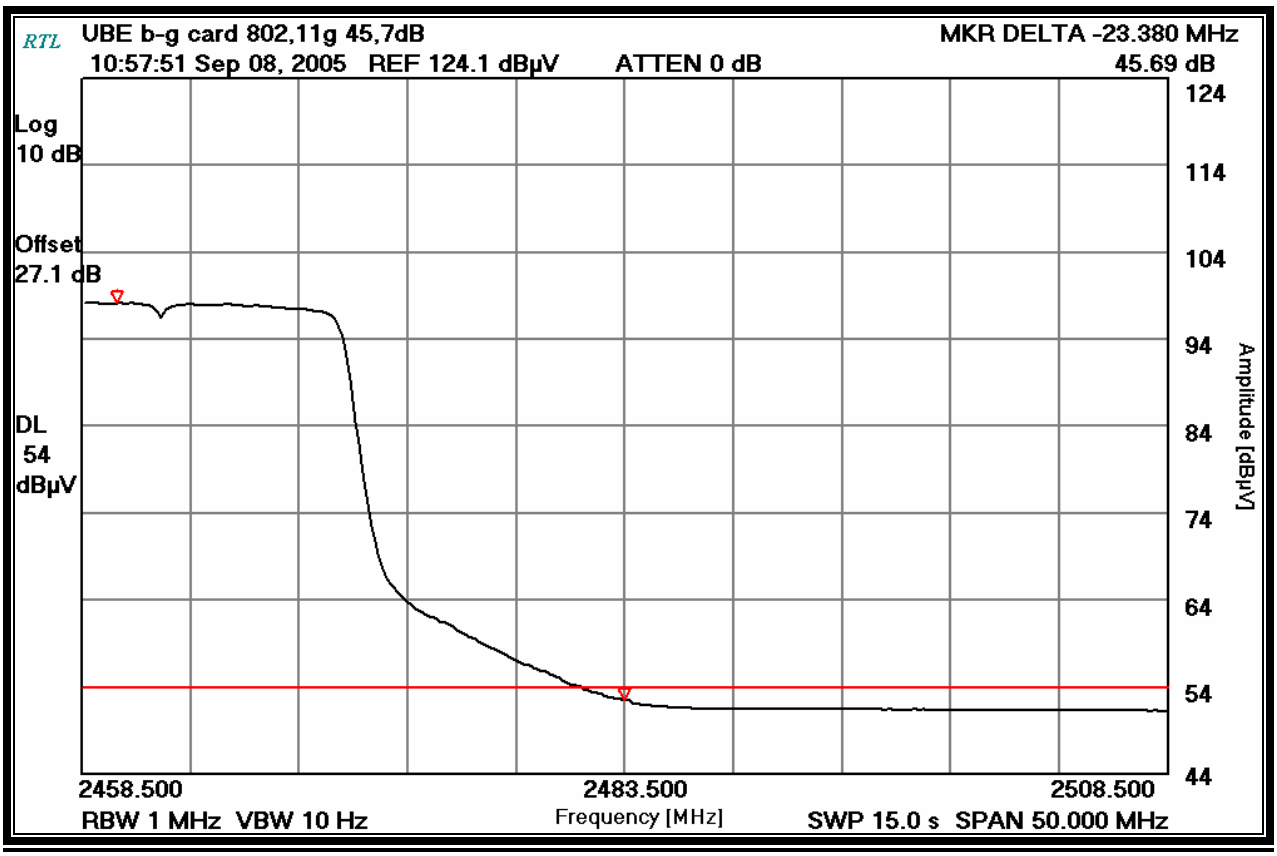
3.2.2.2.4 Calculation of Upper Band Edge - Centurion Patch 8.5 dBi Antenna

98.5 dBuV/m is the field strength measurement, from which the delta measurement of 45.7 dB is subtracted (reference plots), resulting in a level of 52.8 dB. This level has a margin of 1.2 dB below the limit of 54 dBuV/m.

Calculation: 98.5 dBuV/m – 45.7 dB – 54 dBuV/m = -1.2 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 109.4 dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 98.5 dBuV/m
Delta measurement = 45.7 dB

Plot 3-10: Upper Band Edge: Average Measurement Channel 11 (TX Frequency: 2462 MHz – 6 Mbps) Patch Antenna



Test Personnel:

Daniel W. Baltzell		September 4 & 8, 2005
Test Engineer	Signature	Dates Of Test

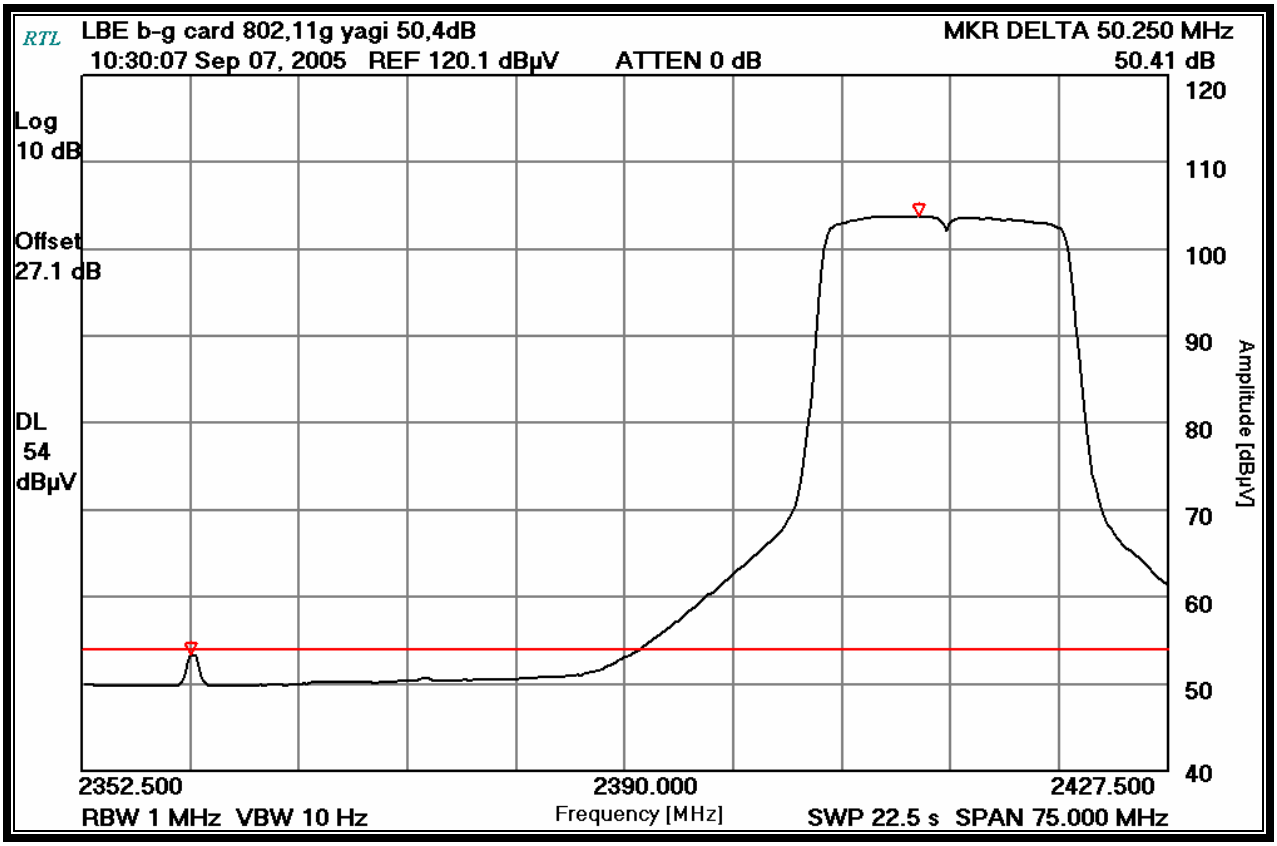
3.2.2.2.5 Calculation of Lower Band Edge - MaxRad YAGI 14 dBi Antenna

103.9 dBuV/m is the field strength measurement, from which the delta measurement of 50.4 dB is subtracted (reference plots), resulting in a level of 53.5 dB. This level has a margin of 0.5 dB below the limit of 54 dBuV/m.

Calculation: 103.9 dBuV/m – 50.4 dB – 54 dBuV/m = -0.5 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 114.9 dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 103.9 dBuV/m
Delta measurement = 50.4 dB

Plot 3-11: Lower Band Edge: Average Measurement Channel 1 (TX Frequency: 2412 MHz – 6 Mbps) YAGI Antenna



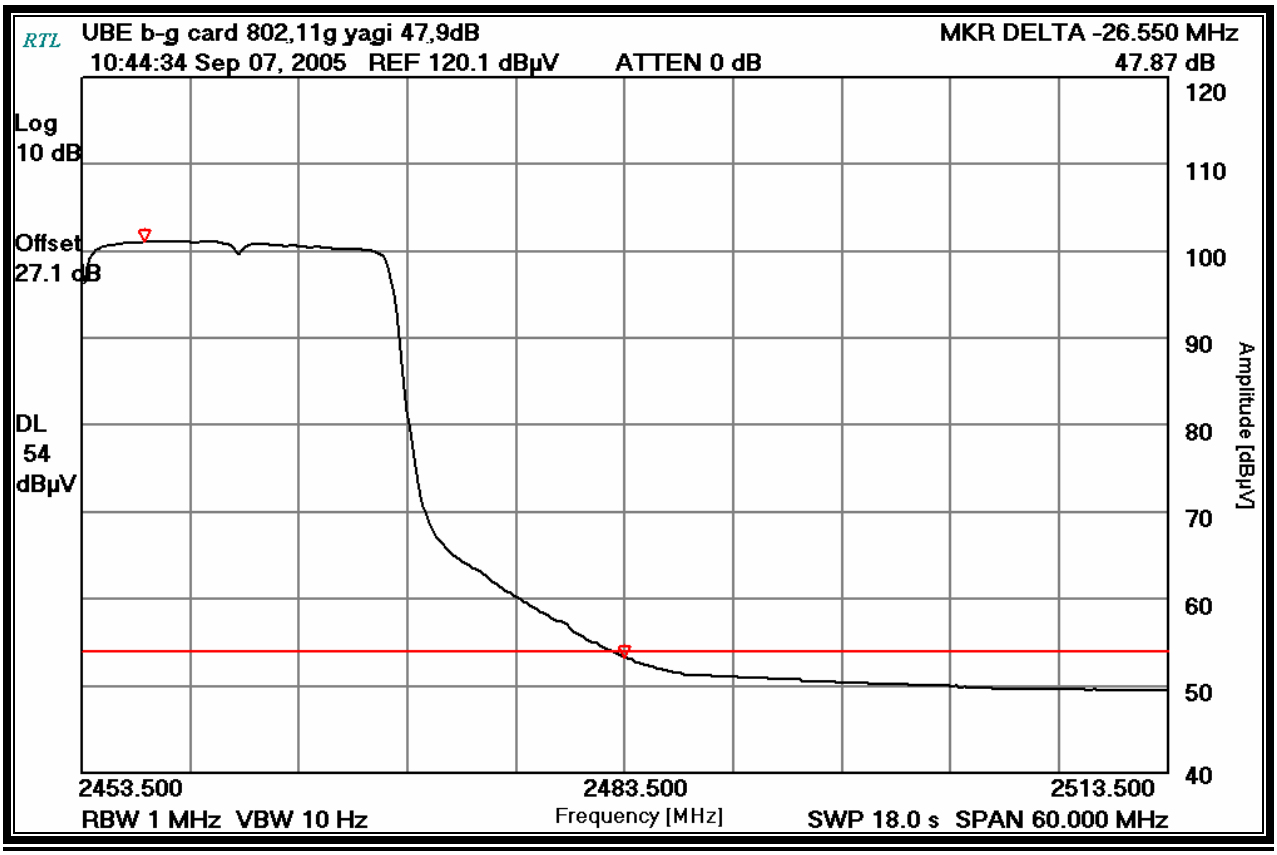
3.2.2.2.6 Calculation of Upper Band Edge - MaxRad YAGI 14 dBi Antenna

101.2 dBuV/m is the field strength measurement, from which the delta measurement of 47.9 dB is subtracted (reference plots), resulting in a level of 53.3 dB. This level has a margin of 0.7 dB below the limit of 54 dBuV/m.

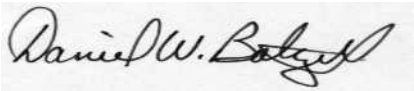
Calculation: 101.2 dBuV/m – 47.9 dB – 54 dBuV/m = -0.7 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 111.0 dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 101.2 dBuV/m
Delta measurement = 47.9 dB

Plot 3-12: Upper Band Edge: Average Measurement Channel 11 (TX Frequency: 2462 MHz – 6 Mbps) YAGI Antenna



Test Personnel:

Daniel W. Baltzell		September 7, 2005
Test Engineer	Signature	Dates Of Test

3.3 Antenna Conducted Spurious Emissions - §15.247(c); RSS-210 §6.6.2(o)

3.3.1 Antenna Conducted Spurious Emissions Test Procedures

Antenna spurious emissions per FCC 15.247(c) was 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 100 kHz. The modulated carrier was identified at the following frequencies: 2412 MHz, 2437 MHz and 2462 MHz. No other harmonics or spurs were found within 20 dB of the carrier level from 2.5 GHz to 24 GHz. See the Antenna Conducted Spurious Noise Table below. The low, middle, and high frequencies were investigated and tested.

Table 3-5: Antenna Conducted Spurious Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	8/03/06

3.3.2 Antenna Conducted Spurious Emissions Test Results

3.3.2.1 802.11b Test Results

Table 3-6: Antenna Conducted Spurious Emissions - Channel 1 - 2412 MHz 802.11b

Frequency (MHz)	Amplitude (dBm)	Amplitude (dBc)	Limit (dBc)	Margin (dB)
601.268	-54.3	59.2	20.0	-39.2
1607.988	-70.8	75.7	20.0	-55.7
2210.634	-59.0	63.9	20.0	-43.9
2239.983	-57.3	62.2	20.0	-42.2
2279.966	-53.4	58.3	20.0	-38.3
2359.974	-50.3	55.2	20.0	-35.2
2396.959	-33.4	38.3	20.0	-18.3
2412.000	4.9	Fundamental		
2426.969	-32.6	37.5	20.0	-17.5
2439.990	-49.9	54.8	20.0	-34.8
2479.976	-54.6	59.5	20.0	-39.5
3040.000	-79.7	84.6	20.0	-64.6
3216.000	-67.0	71.9	20.0	-51.9
4813.000	-77.4	82.3	20.0	-62.3
4816.000	-78.4	83.3	20.0	-63.3
4824.000	-64.6	69.5	20.0	-49.5
4832.050	-78.1	83.0	20.0	-63.0
4835.050	-76.5	81.4	20.0	-61.4
7236.000	-83.2	88.1	20.0	-68.1
9647.890	-75.1	80.0	20.0	-60.0
12059.890	-83.2	88.1	20.0	-68.1
14471.890	-78.8	83.7	20.0	-63.7
16883.890	-80.7	85.6	20.0	-65.6
19295.890	-75.0	79.9	20.0	-59.9
21707.890	-75.0	79.9	20.0	-59.9
24119.890	-71.1	76.0	20.0	-56.0

Table 3-7: Antenna Conducted Spurious Emissions - Channel 6 - 2437 MHz 802.11b

Frequency (MHz)	Amplitude (dBm)	Amplitude (dBc)	Limit (dBc)	Margin (dB)
65.971	-77.7	84.1	20.0	-64.1
88.006	-75.8	82.2	20.0	-62.2
810.100	-72.3	78.7	20.0	-58.7
1624.641	-69.6	76.0	20.0	-56.0
2233.500	-58.1	64.5	20.0	-44.5
2240.000	-58.5	64.9	20.0	-44.9
2280.000	-53.3	59.7	20.0	-39.7
2359.974	-49.4	55.8	20.0	-35.8
2422.200	-32.6	39.0	20.0	-19.0
2437.000	6.4	Fundamental		
2449.600	-35.6	42.0	20.0	-22.0
2462.460	-49.4	55.8	20.0	-35.8
2473.540	-50.8	57.2	20.0	-37.2
3039.000	-78.8	85.2	20.0	-65.2
3249.000	-65.9	72.3	20.0	-52.3
4862.900	-72.3	78.7	20.0	-58.7
4866.000	-74.1	80.5	20.0	-60.5
4873.950	-63.4	69.8	20.0	-49.8
4882.050	-72.5	78.9	20.0	-58.9
4885.000	-71.9	78.3	20.0	-58.3
7311.000	-73.0	79.4	20.0	-59.4
9736.900	-66.9	73.3	20.0	-53.3
9739.900	-66.0	72.4	20.0	-52.4
9748.000	-58.6	65.0	20.0	-45.0
9756.000	-66.1	72.5	20.0	-52.5
9758.950	-66.9	73.3	20.0	-53.3
12185.000	-71.0	77.4	20.0	-57.4
14621.800	-66.1	72.5	20.0	-52.5
17058.800	-80.2	86.6	20.0	-66.6
19495.800	-72.9	79.3	20.0	-59.3
21932.800	-74.1	80.5	20.0	-60.5
24369.800	-74.5	80.9	20.0	-60.9

Table 3-8: Antenna Conducted Spurious Emissions - Channel 11 - 2462 MHz 802.11b

Frequency (MHz)	Amplitude (dBm)	Amplitude (dBc)	Limit (dBc)	Margin (dB)
65.980	-76.9	82.4	20.0	-62.4
88.030	-76	81.5	20.0	-61.5
822.700	-71.5	77.0	20.0	-57.0
938.800	-66.3	71.8	20.0	-51.8
1641.314	-69.7	75.2	20.0	-55.2
2239.900	-56.7	62.2	20.0	-42.2
2256.050	-56.5	62.0	20.0	-42.0
2257.000	-56.2	61.7	20.0	-41.7
2279.500	-55.4	60.9	20.0	-40.9
2360.000	-52.0	57.5	20.0	-37.5
2462.000	5.5	Fundamental		
2559.000	-59.4	64.9	20.0	-44.9
2815.000	-71.3	76.8	20.0	-56.8
2990.000	-70.9	76.4	20.0	-56.4
3039.900	-79.4	84.9	20.0	-64.9
3282.630	-61.8	67.3	20.0	-47.3
4912.950	-78.8	84.3	20.0	-64.3
4915.950	-79.9	85.4	20.0	-65.4
4924.000	-69.0	74.5	20.0	-54.5
4932.100	-80.3	85.8	20.0	-65.8
4935.100	-78.9	84.4	20.0	-64.4
7311.000	-80.5	86.0	20.0	-66.0
9836.850	-77.4	82.9	20.0	-62.9
9839.850	-77.2	82.7	20.0	-62.7
9847.900	-71.8	77.3	20.0	-57.3
9855.900	-78.2	83.7	20.0	-63.7
9858.900	-79.7	85.2	20.0	-65.2
12310.000	-83.7	89.2	20.0	-69.2
14772.000	-76.5	82.0	20.0	-62.0
17234.000	-77.8	83.3	20.0	-63.3
19696.000	-74.9	80.4	20.0	-60.4
22158.000	-74.4	79.9	20.0	-59.9
24620.000	-73.9	79.4	20.0	-59.4

3.3.2.2 802.11g Test Results

Table 3-9: Antenna Conducted Spurious Emissions - Channel 1 - 2412 MHz 802.11g

Frequency (MHz)	Amplitude (dBm)	Amplitude (dBc)	Limit (dBc)	Margin (dB)
213.330	-70.9	71.1	20.0	-51.1
1607.988	-68.9	69.1	20.0	-49.1
2210.634	-60.4	60.6	20.0	-40.6
2239.983	-59.8	60.0	20.0	-40.0
2279.966	-55.8	56.0	20.0	-36.0
2359.974	-52.1	52.3	20.0	-32.3
2401.096	-24.3	24.5	20.0	-4.5
2412.000	0.2	Fundamental		
2423.200	-24.8	25.0	20.0	-5.0
2439.870	-48.9	49.1	20.0	-29.1
2479.976	-54.2	54.4	20.0	-34.4
3040.000	-79.3	79.5	20.0	-59.5
3216.000	-65.0	65.2	20.0	-45.2
4825.860	-74.0	74.2	20.0	-54.2
7237.860	-80.3	80.5	20.0	-60.5
9647.890	-74.3	74.5	20.0	-54.5
12059.890	-81.0	81.2	20.0	-61.2
14471.890	-76.2	76.4	20.0	-56.4
16883.890	-76.1	76.3	20.0	-56.3
19295.890	-71.9	72.1	20.0	-52.1
21707.890	-71.2	71.4	20.0	-51.4
24119.890	-71.0	71.2	20.0	-51.2

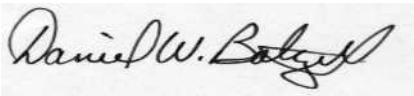
Table 3-10: Antenna Conducted Spurious Emissions - Channel 6 - 2437 MHz 802.11g

Frequency (MHz)	Amplitude (dBm)	Amplitude (dBc)	Limit (dBc)	Margin (dB)
43.930	-78.4	81.1	20.0	-61.1
88.100	-76.1	78.8	20.0	-58.8
816.400	-68.3	71.0	20.0	-51.0
1624.638	-65.7	68.4	20.0	-48.4
2233.400	-56.1	58.8	20.0	-38.8
2280.100	-53.1	55.8	20.0	-35.8
2288.400	-54.0	56.7	20.0	-36.7
2320.300	-52.4	55.1	20.0	-35.1
2360.100	-49.4	52.1	20.0	-32.1
2425.362	-20.6	23.3	20.0	-3.3
2437.000	2.7	Fundamental		
2450.040	-21.9	24.6	20.0	-4.6
3039.000	-80.4	83.1	20.0	-63.1
3249.000	-66.7	69.4	20.0	-49.4
4871.700	-68.8	71.5	20.0	-51.5
7306.500	-69.4	72.1	20.0	-52.1
9750.700	-59.2	61.9	20.0	-41.9
12192.600	-68.1	70.8	20.0	-50.8
14621.800	-66.4	69.1	20.0	-49.1
17058.800	-78.7	81.4	20.0	-61.4
19495.800	-73.1	75.8	20.0	-55.8
21932.800	-75.1	77.8	20.0	-57.8
24369.800	-73.5	76.2	20.0	-56.2

Table 3-11: Antenna Conducted Spurious Emissions - Channel 11 - 2462 MHz 802.11g

Frequency (MHz)	Amplitude (dBm)	Amplitude (dBc)	Limit (dBc)	Margin (dB)
88.170	-73.3	78.6	20.0	-58.6
828.100	-66.5	71.8	20.0	-51.8
1641.000	-67.1	72.4	20.0	-52.4
2160.000	-68.3	73.6	20.0	-53.6
2240.000	-63.7	69.0	20.0	-49.0
2257.500	-59.7	65.0	20.0	-45.0
2280.500	-58.4	63.7	20.0	-43.7
2360.000	-49.4	54.7	20.0	-34.7
2462.000	5.3	Fundamental		
2501.000	-42.4	47.7	20.0	-27.7
2759.500	-75.4	80.7	20.0	-60.7
2815.500	-74.3	79.6	20.0	-59.6
2839.500	-75.0	80.3	20.0	-60.3
2919.500	-76.3	81.6	20.0	-61.6
2960.000	-75.4	80.7	20.0	-60.7
2992.000	-73.2	78.5	20.0	-58.5
3040.000	-79.0	84.3	20.0	-64.3
3282.620	-65.5	70.8	20.0	-50.8
4921.900	-62.2	67.5	20.0	-47.5
7386.550	-75.9	81.2	20.0	-61.2
9845.400	-54.6	59.9	20.0	-39.9
12307.400	-63.0	68.3	20.0	-48.3
14770.000	-59.6	64.9	20.0	-44.9
17234.000	-79.1	84.4	20.0	-64.4
19696.000	-73.5	78.8	20.0	-58.8
22158.000	-73.8	79.1	20.0	-59.1
24620.000	-73.7	79.0	20.0	-59.0

Test Personnel:

Daniel W. Baltzell		September 13, 2005
EMC Test Engineer	Signature	Date Of Test

3.4 6 dB Bandwidth - §15.247(a)(2); RSS-210 §6.6.2(o)

3.4.1 6 db Bandwidth Test Procedure – Minimum 6 db Bandwidth

The minimum 6 dB bandwidths per FCC 15.247(a)(2) were measured using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 100 kHz. The device was modulated using the maximum 1 Mbps data rate for 802.11b and 6 Mbps for 802.11g. The minimum 6 dB bandwidths are presented below.

Table 3-12: 6 dB Bandwidth Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901215	Hewlett Packard	8596EM	Spectrum Analyzer (9 kHz – 12.8 GHz)	3826A00142	9/8/05

3.4.2 6 db Bandwidth Test Results

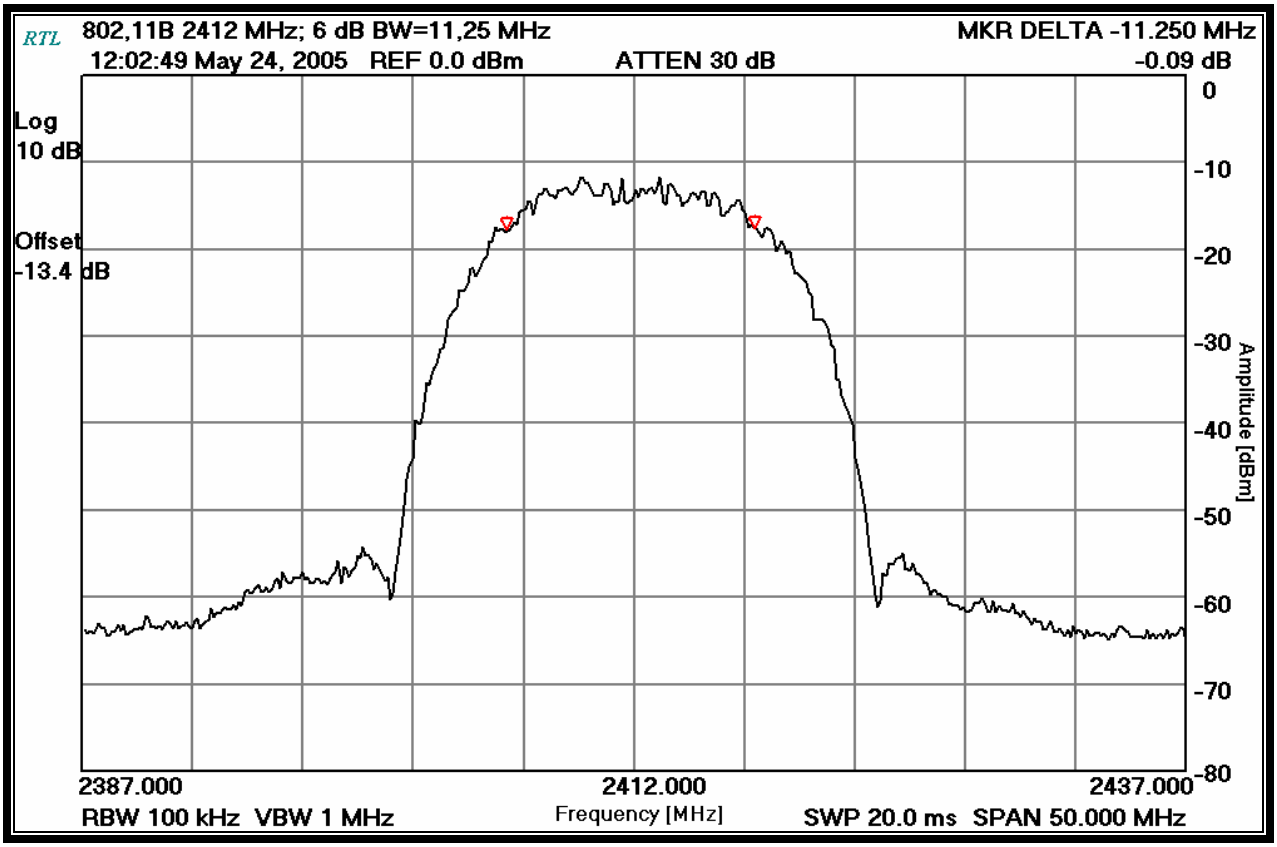
Table 3-13: 6 db Bandwidth Test Data - 802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/Fail
1	2412	11.25	0.5	Pass
6	2437	11.25	0.5	Pass
11	2462	11.75	0.5	Pass

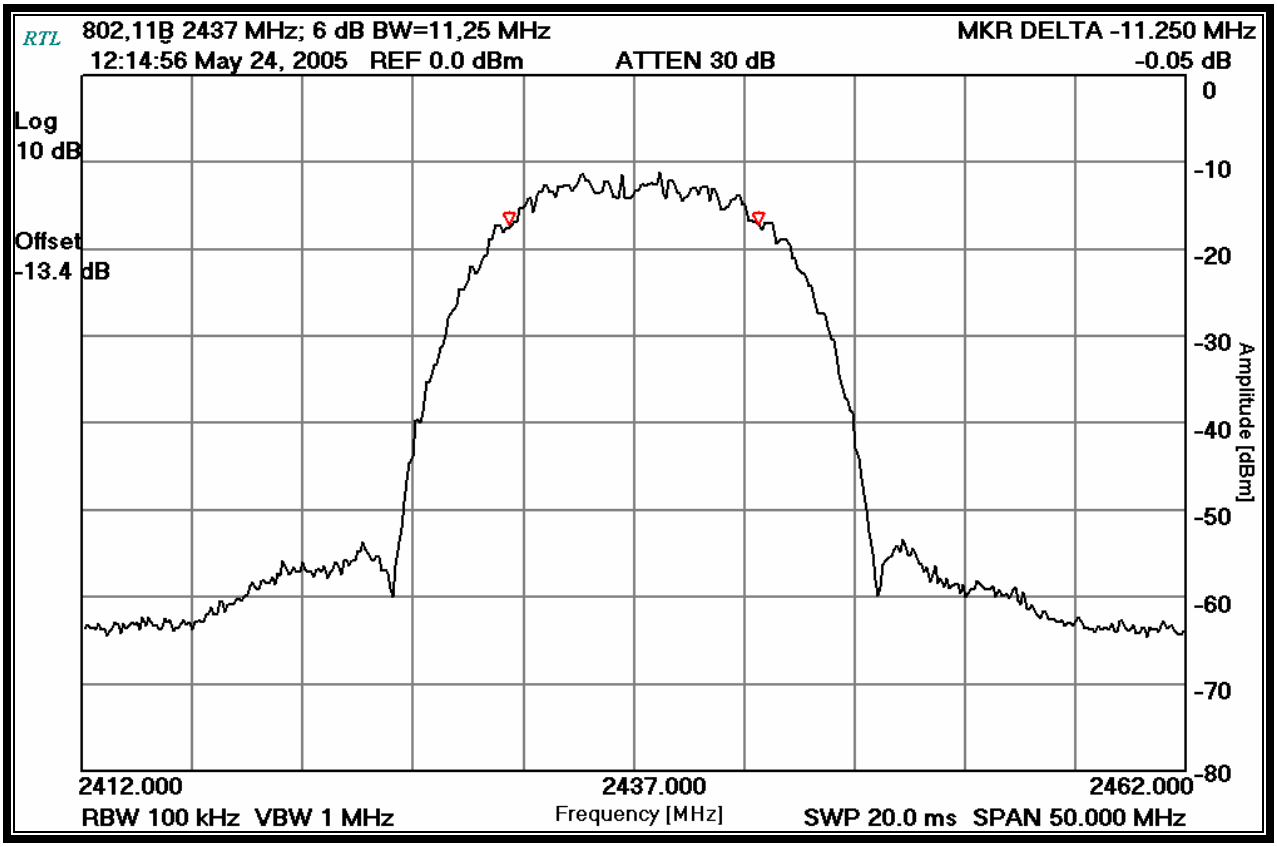
Table 3-14: 6 db Bandwidth Test Data - 802.11g

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/Fail
1	2412	16.75	0.5	Pass
6	2437	16.75	0.5	Pass
11	2462	16.75	0.5	Pass

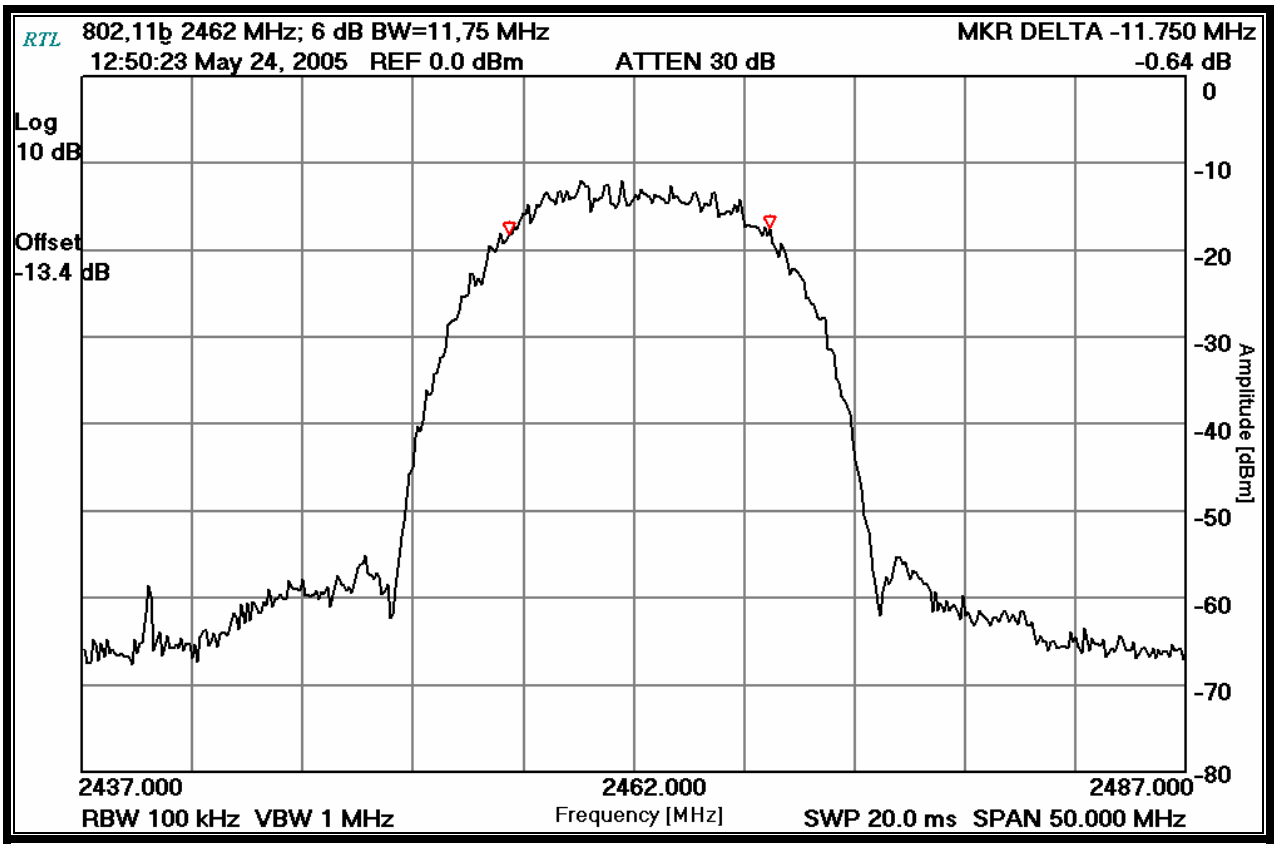
Plot 3-13: 6 dB Bandwidth Channel 1 (TX Frequency: 2412 MHz – 1 Mbps) 802.11b



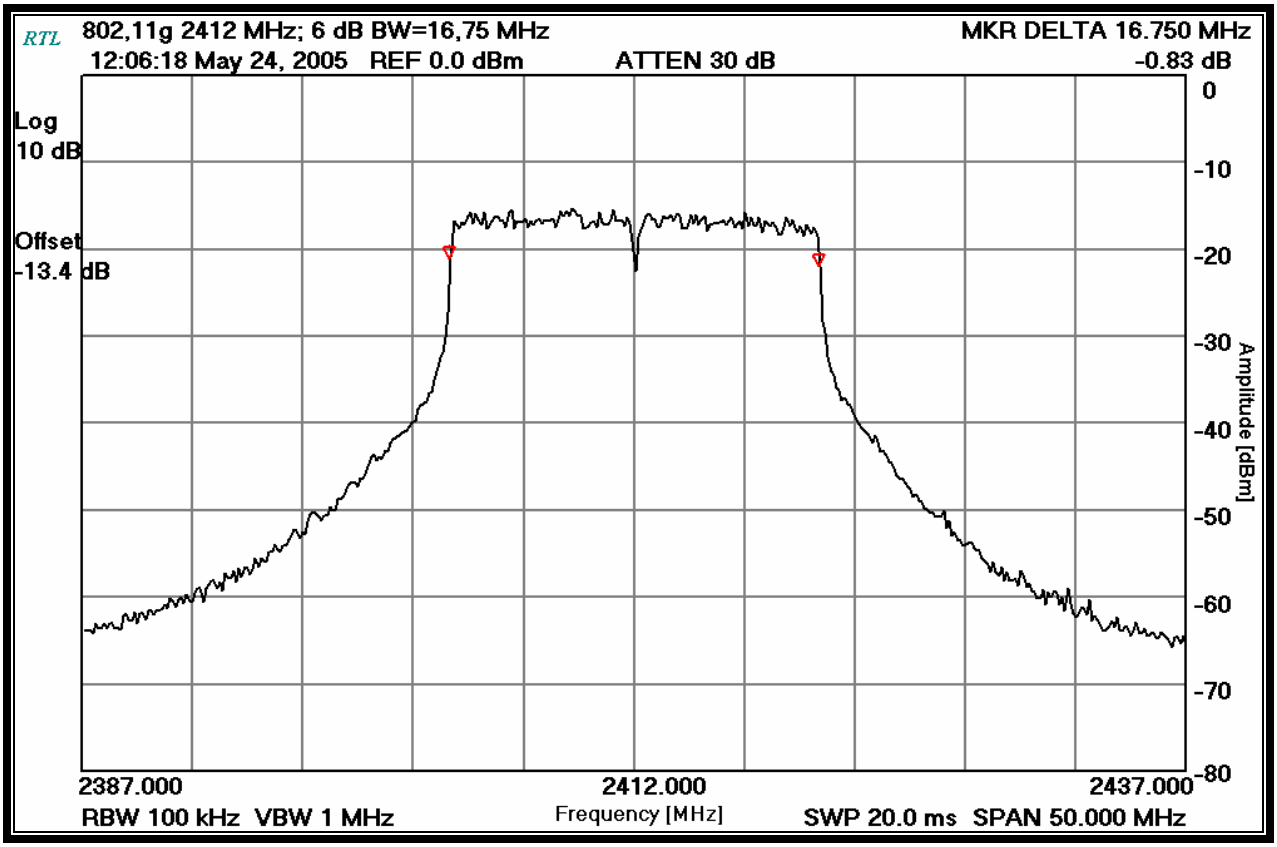
Plot 3-14: 6 dB Bandwidth Channel 6; (TX Frequency: 2437 MHz – 1 Mbps) 802.11b



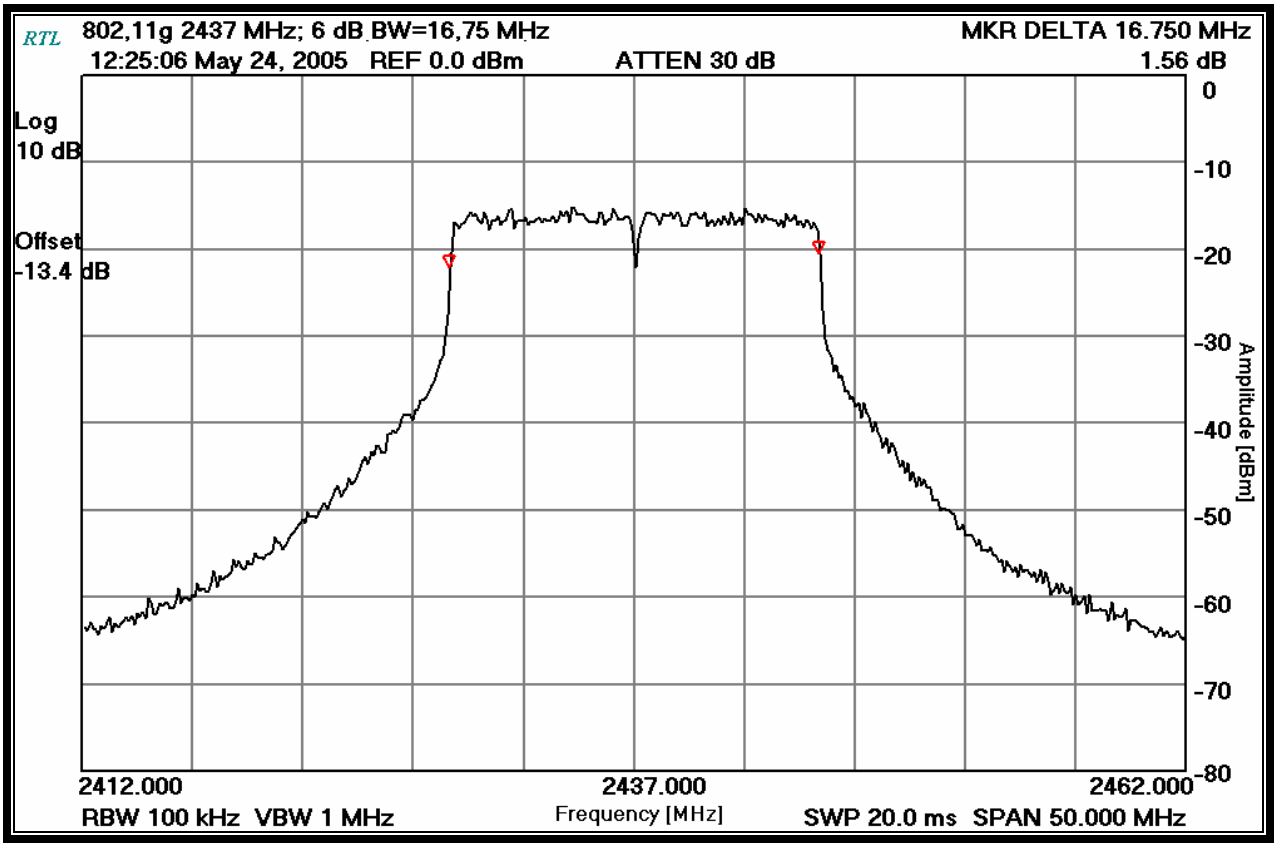
Plot 3-15: 6 dB Bandwidth Channel 11 (TX Frequency: 2462 MHz – 1 Mbps) 802.11b



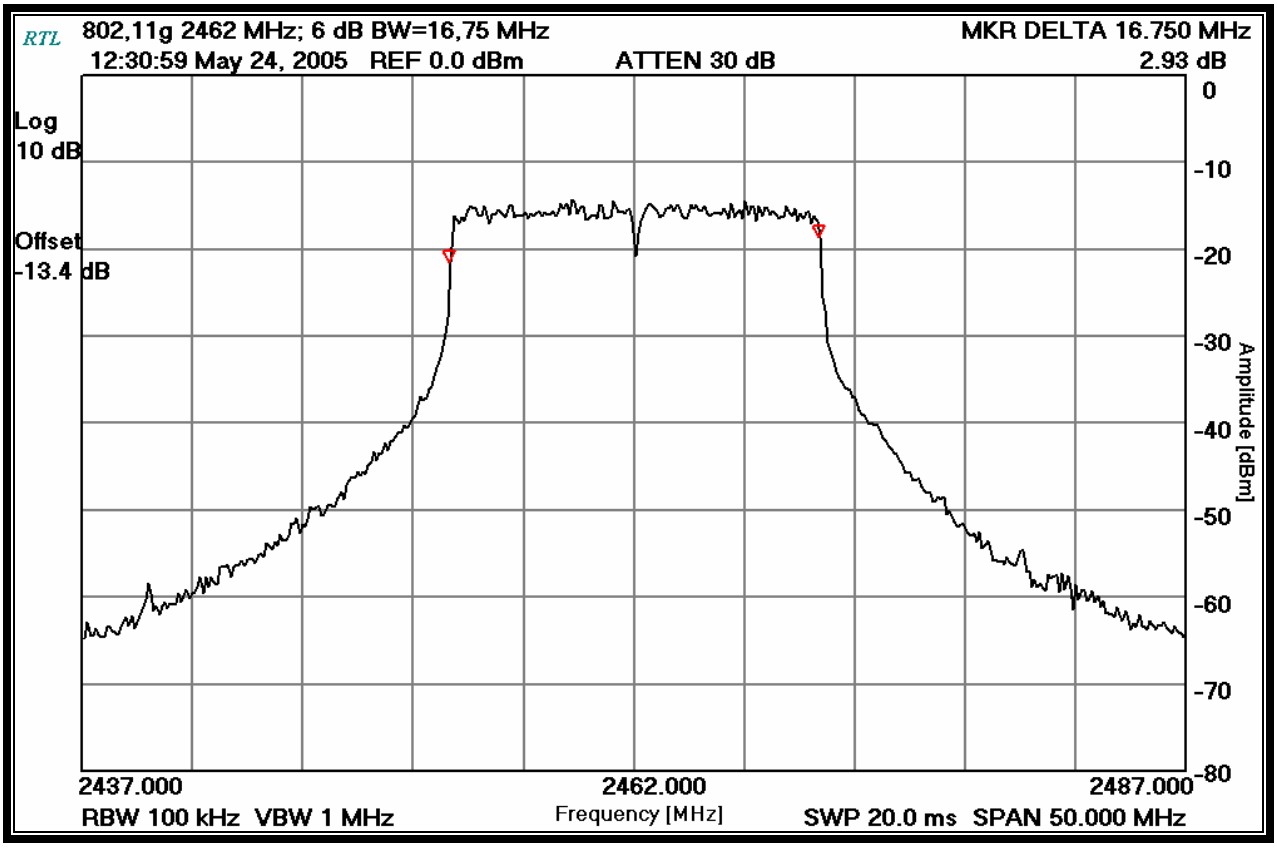
Plot 3-16: 6 dB Bandwidth Channel 1 (TX Frequency: 2412 MHz – 6 Mbps) 802.11g



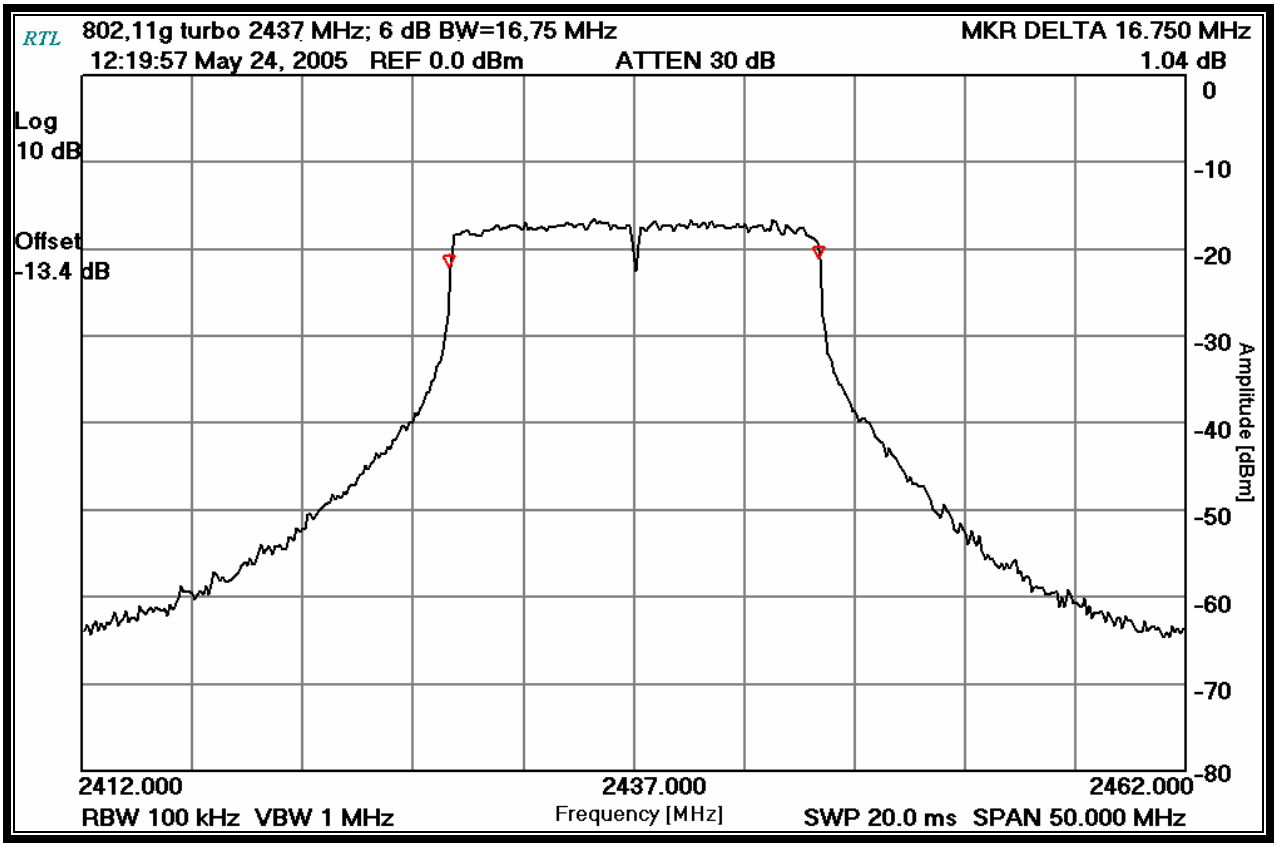
Plot 3-17: 6 dB Bandwidth Channel 6 (TX Frequency: 2437 MHz – 6 Mbps) 802.11g



Plot 3-18: 6 dB Bandwidth Channel 11 (TX Frequency: 2462 MHz - 6 Mbps) 802.11g



Plot 3-19: 6 dB Bandwidth Channel 6 (TX Frequency: 2437 MHz – Turbo 12 Mbps) 802.11g



Test Personnel:

Daniel W. Baltzell		May 24, 2005
EMC Test Engineer	Signature	Date Of Test

3.5 Power Spectral Density - §15.247(d); RSS-210 §6.6.2(o)

3.5.1 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 spectral lines were resolved for the modulated carriers at 2.412 GHz, 2.437 GHz, and 2.462 GHz respectively. These levels are below the +8 dBm limit. See the power spectral density table and plots.

Table 3-15: Power Spectral Density Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	8/3/06

3.5.2 Power Spectral Density Test Data

Table 3-16: Power Spectral Density Test Data - 802.11b

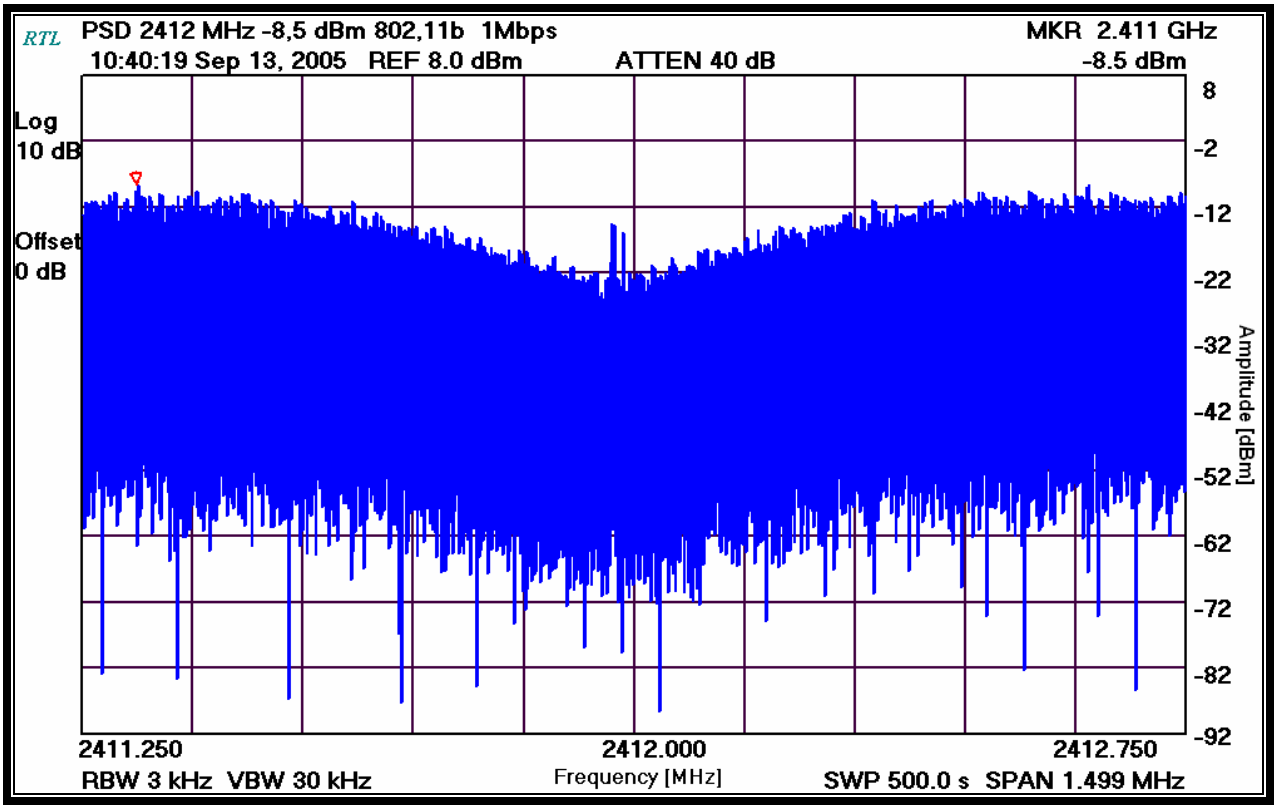
Channel	Frequency (MHz)	RF Power Level (dBm)	Maximum Limit +8dBm	Pass/Fail
1	2412	-8.5	8	Pass
6	2437	-8.1	8	Pass
11	2462	-8.1	8	Pass

Table 3-17: Power Spectral Density Test Data - 802.11g

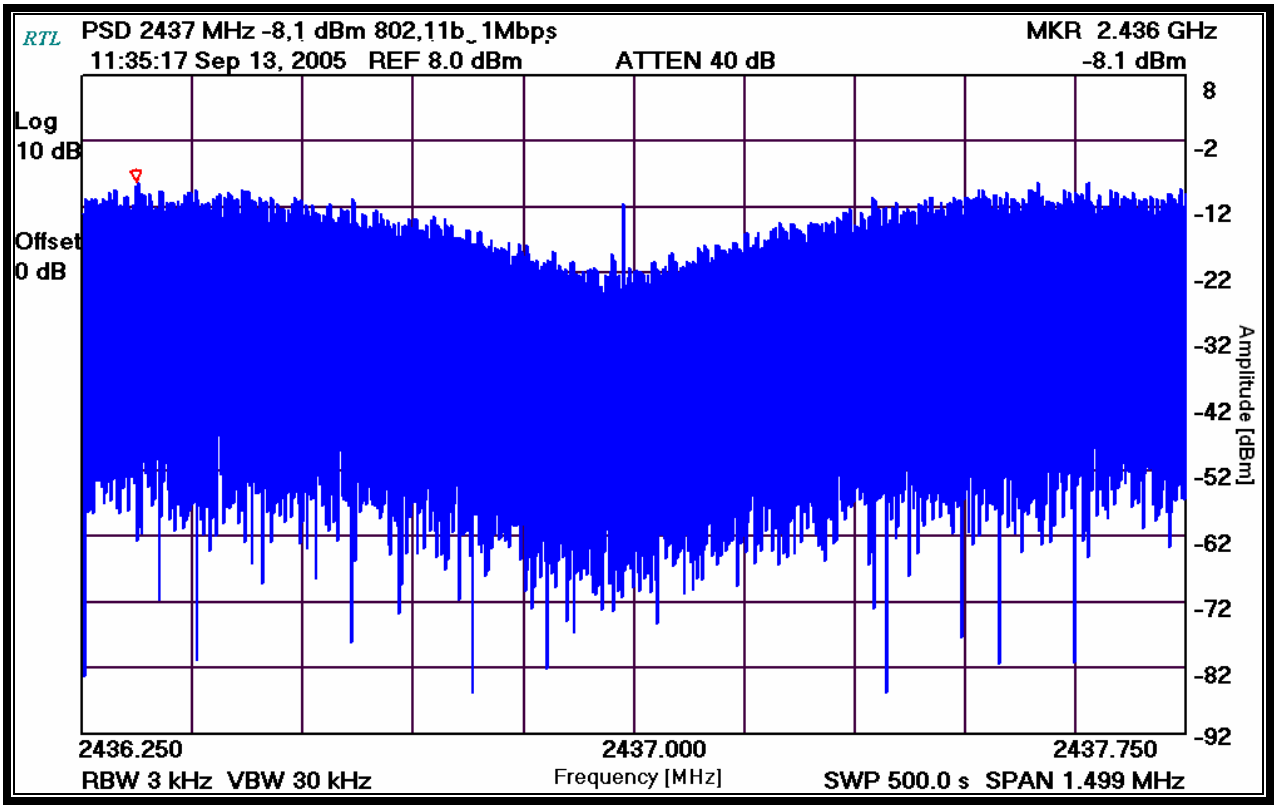
Channel	Frequency (MHz)	RF Power Level (dBm)	Maximum Limit +8dBm	Pass/Fail
1	2412	-15.3	8	Pass
6	2437	-10.9	8	Pass
11	2462	-9.8	8	Pass

3.5.3 Power Spectral Density Plots - 802.11b

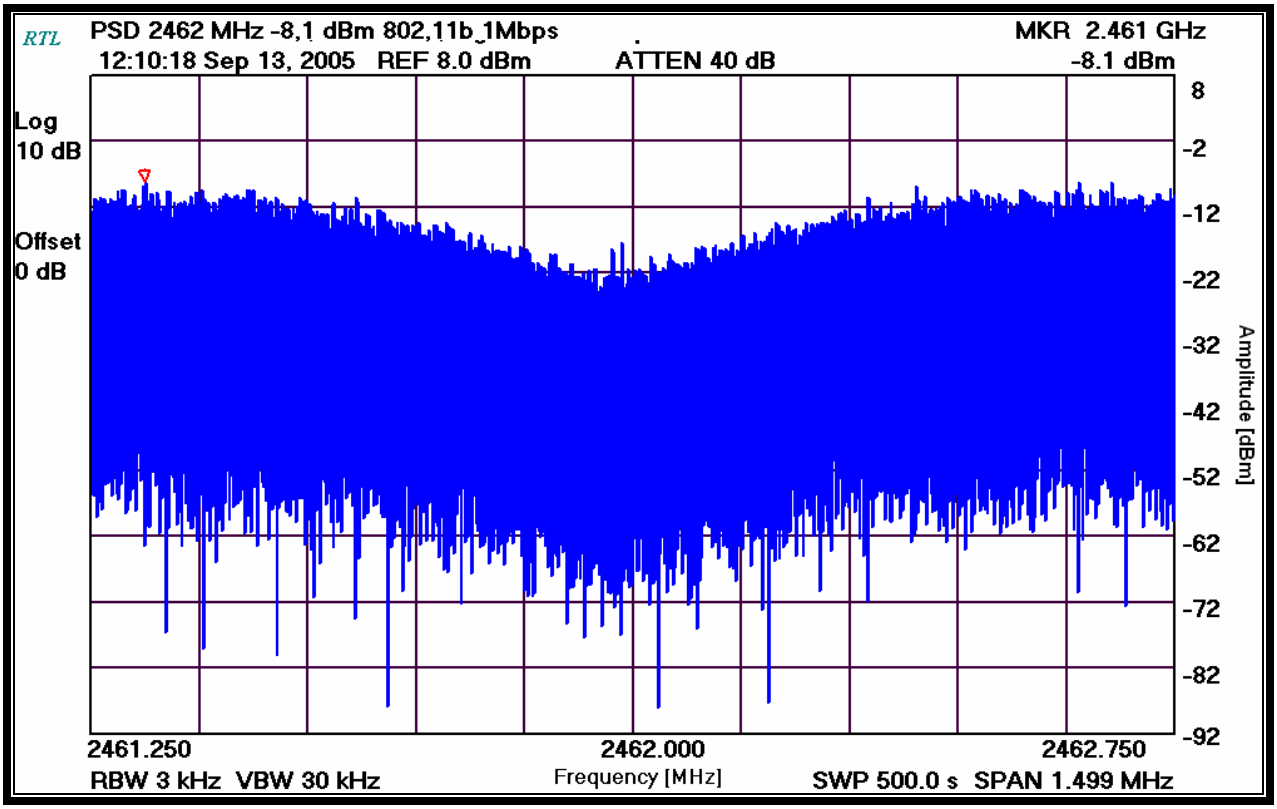
Plot 3-20: Power Spectral Density: Channel 1 (2412 MHz – 1 Mbps)



Plot 3-21: Power Spectral Density: Channel 6 (2437 MHz – 1 Mbps)

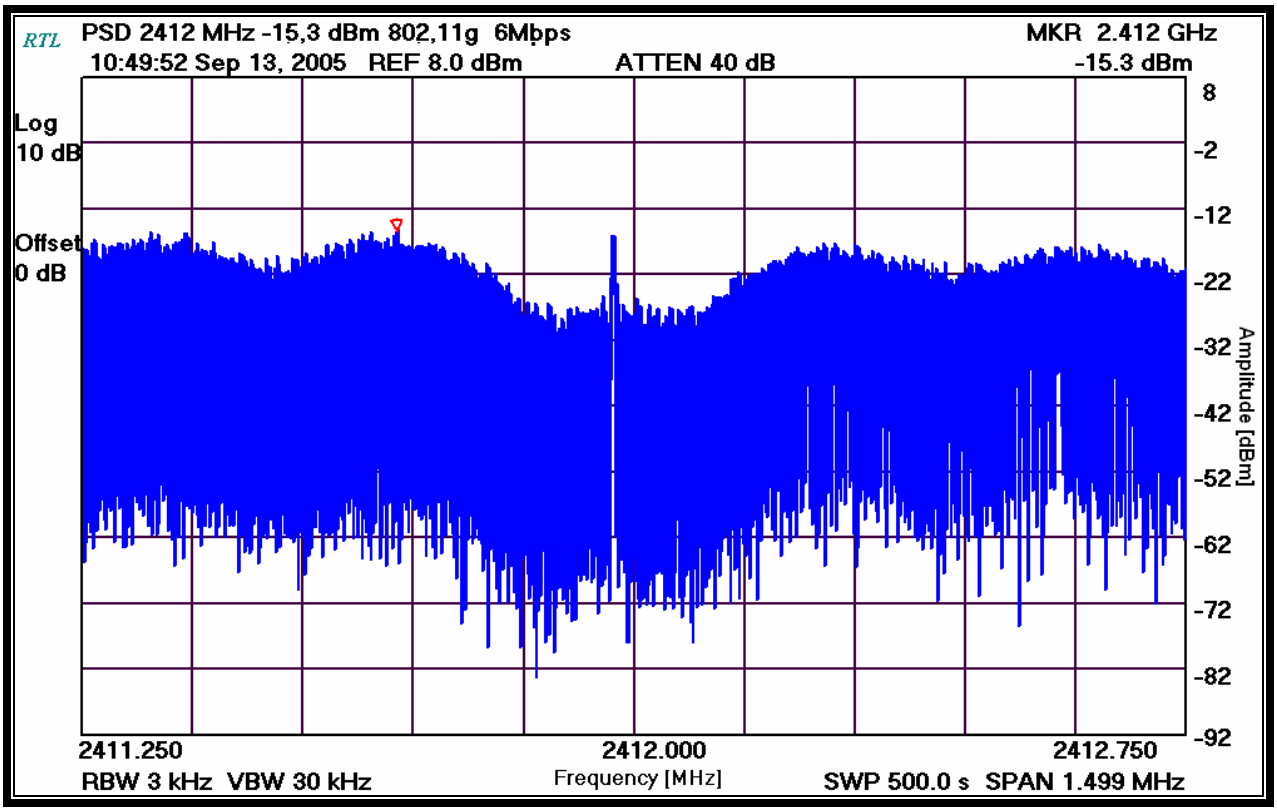


Plot 3-22: Power Spectral Density: Channel 11 (2462 MHz – 1 Mbps)

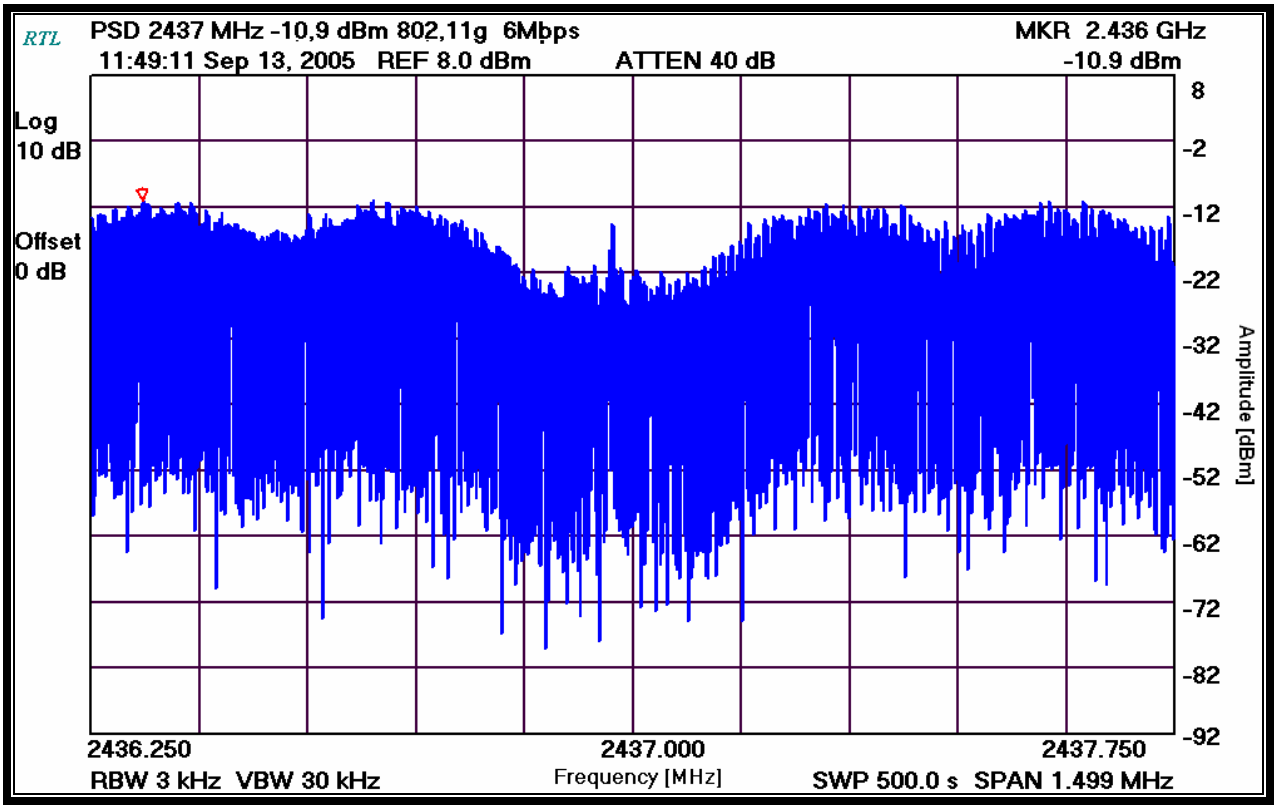


3.5.4 Power Spectral Density Plots - 802.11g

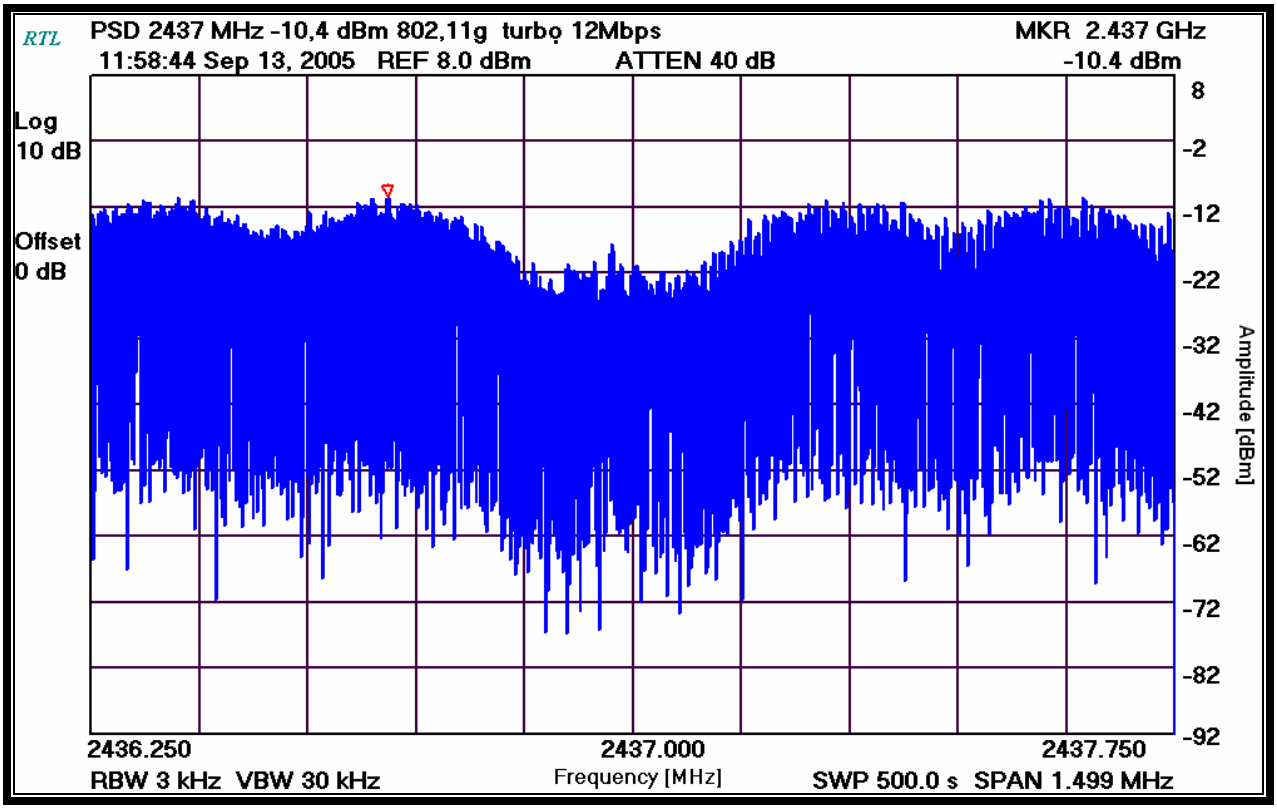
Plot 3-23: Power Spectral Density: Channel 1 (2412 MHz – 6 Mbps)



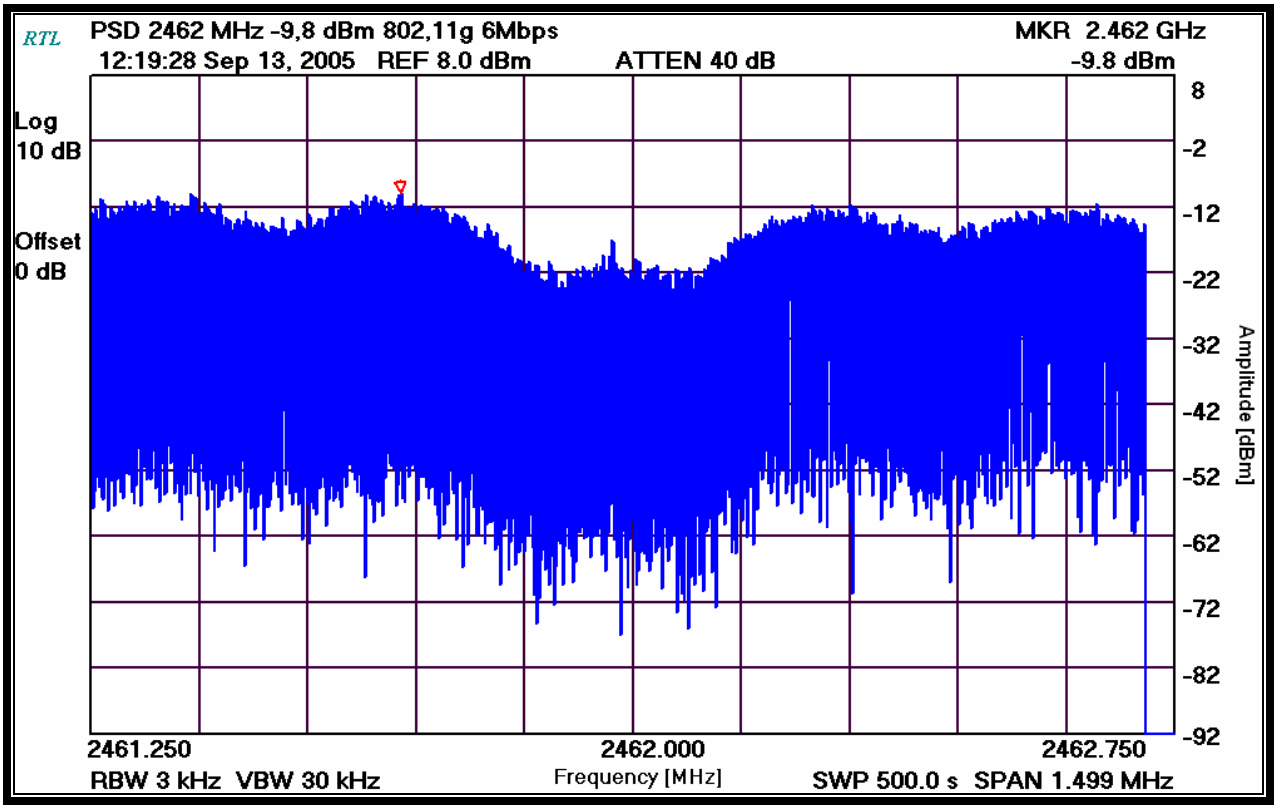
Plot 3-24: Power Spectral Density: Channel 6 (2437 MHz – 6 Mbps)



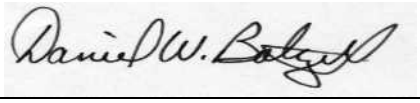
Plot 3-25: Power Spectral Density: Channel 6 Turbo (2437 MHz – 12 Mbps)



Plot 3-26: Power Spectral Density: Channel 11 (2462 MHz – 6 Mbps)



Test Personnel:

Daniel W. Baltzell		September 13, 2005
EMC Test Engineer	Signature	Date Of Test

3.6 Conducted Emissions Measurement Limits – FCC §15.207; RSS-210 §9

3.6.1 Limits of Conducted Emissions Measurement

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

3.6.2 Conducted Emissions Measurement Test Procedure

The EUT was placed 0.4 meters from the conducting bulkhead of the shielded room. The EUT was connected to mains through a line impedance stabilization network (LISN). The LISN provides 50 ohm/50 uH coupling impedance to the measuring receiver.

The test frequency range was from 150 kHz to 30 MHz.

Table 3-18: Conducted Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	8/3/06
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	8/3/06
900728	Solar	8130	Filter	947305	N/A
901084	AFJ International	LS16	16A LISN	16010020082	12/24/05
900889	Hewlett Packard	85685A	RF Preselector (20 Hz - 2 GHz)	3146A01309	4/5/06

3.6.3 Conducted Emissions Test Data

Table 3-19: Conducted Emissions Test Data; TX Mid Ch. 802.11b; Neutral Side (Line 1)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)	Pass/ Fail
0.152	Pk	44.4	0.2	44.6	65.9	-21.3	55.9	-11.3	Pass
0.197	Pk	46.2	0.2	46.4	63.7	-17.3	53.7	-7.3	Pass
0.269	Pk	44.6	0.2	44.8	61.1	-16.3	51.1	-6.3	Pass
0.333	Pk	38.6	0.2	38.8	59.4	-20.6	49.4	-10.6	Pass
0.399	Pk	36.1	0.3	36.4	57.9	-21.5	47.9	-11.5	Pass
5.070	Pk	37.7	1.2	38.9	60.0	-21.1	50.0	-11.1	Pass

Table 3-20: Conducted Emissions Test Data; TX Mid Ch. 802.11b; Hot Side (Line 2)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)	Pass/ Fail
0.153	Pk	43.5	0.2	43.7	65.8	-22.1	55.8	-12.1	Pass
0.199	Pk	46.2	0.2	46.4	63.7	-17.3	53.7	-7.3	Pass
0.266	Pk	43.0	0.2	43.2	61.2	-18.0	51.2	-8.0	Pass
0.399	Pk	31.0	0.3	31.3	57.9	-26.6	47.9	-16.6	Pass
0.465	Pk	33.3	0.2	33.5	56.6	-23.1	46.6	-13.1	Pass
4.840	Pk	34.9	1.2	36.1	56.0	-19.9	46.0	-9.9	Pass

Table 3-21: Conducted Emissions Test Data; TX Mid Ch. 802.11g; Neutral Side (Line 1)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)	Pass/ Fail
0.150	Pk	41.7	0.2	41.9	66.0	-24.1	56.0	-14.1	Pass
0.201	Pk	48.6	0.2	48.8	63.6	-14.8	53.6	-4.8	Pass
0.268	Pk	44.4	0.2	44.6	61.2	-16.6	51.2	-6.6	Pass
0.330	Pk	37.5	0.2	37.7	59.5	-21.8	49.5	-11.8	Pass
0.400	Pk	35.6	0.3	35.9	57.9	-22.0	47.9	-12.0	Pass
5.040	Pk	37.7	1.2	38.9	60.0	-21.1	50.0	-11.1	Pass

Table 3-22: Conducted Emissions Test Data; TX Mid Ch. 802.11g; Hot Side (Line 2)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)	Pass/ Fail
0.160	Pk	43.4	0.2	43.6	65.5	-21.9	55.5	-11.9	Pass
0.200	Pk	45.9	0.2	46.1	63.6	-17.5	53.6	-7.5	Pass
0.268	Pk	43.2	0.2	43.4	61.2	-17.8	51.2	-7.8	Pass
0.398	Pk	31.9	0.3	32.2	57.9	-25.7	47.9	-15.7	Pass
0.465	Pk	34.1	0.2	34.3	56.6	-22.3	46.6	-12.3	Pass
5.040	Pk	36.2	1.2	37.4	60.0	-22.6	50.0	-12.6	Pass

Table 3-23: Conducted Emissions Test Data; VAC; Neutral Side (Line 1)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)	Pass/ Fail
0.198	Pk	48.7	0.2	48.9	63.7	-14.8	53.7	-4.8	Pass
0.266	Pk	45.8	0.2	46.0	61.2	-15.2	51.2	-5.2	Pass
0.332	Pk	38.2	0.2	38.4	59.4	-21.0	49.4	-11.0	Pass
0.398	Pk	37.7	0.3	38.0	57.9	-19.9	47.9	-9.9	Pass
0.466	Pk	33.8	0.2	34.0	56.6	-22.6	46.6	-12.6	Pass
5.040	Pk	34.7	1.2	35.9	60.0	-24.1	50.0	-14.1	Pass

Table 3-24: Conducted Emissions Test Data; VAC; Hot Side (Line 2)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)	Pass/ Fail
0.153	Pk	43.7	0.2	43.9	65.8	-21.9	55.8	-11.9	Pass
0.201	Pk	46.1	0.2	46.3	63.6	-17.3	53.6	-7.3	Pass
0.266	Pk	43.2	0.2	43.4	61.2	-17.8	51.2	-7.8	Pass
0.332	Pk	35.6	0.2	35.8	59.4	-23.6	49.4	-13.6	Pass
0.464	Pk	31.8	0.2	32.0	56.6	-24.6	46.6	-14.6	Pass
27.910	Pk	39.4	2.3	41.7	60.0	-18.3	50.0	-8.3	Pass

Table 3-25: Conducted Emissions Test Data; Power over Ethernet Injector, Neutral Side (Line 1)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)	Pass/ Fail
0.223	Pk	44.2	0.2	44.4	62.7	-18.3	52.7	-8.3	Pass
0.395	Pk	39.2	0.3	39.5	58.0	-18.5	48.0	-8.5	Pass
2.180	Pk	41.2	0.8	42.0	56.0	-14.0	46.0	-4.0	Pass
8.230	Pk	38.9	1.5	40.4	60.0	-19.6	50.0	-9.6	Pass
16.840	Pk	37.8	2.2	40.0	60.0	-20.0	50.0	-10.0	Pass
24.990	Pk	37.2	2.6	39.8	60.0	-20.2	50.0	-10.2	Pass

Table 3-26: Conducted Emissions Test Data; Mode TX, Channel 1, Hot Side (Line 2)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)	Pass/ Fail
0.221	Pk	45.1	0.2	45.3	62.8	-17.5	52.8	-7.5	Pass
0.390	Pk	42.2	0.3	42.5	58.1	-15.6	48.1	-5.6	Pass
2.150	Pk	39.8	0.8	40.6	56.0	-15.4	46.0	-5.4	Pass
8.230	Pk	37.7	1.5	39.2	60.0	-20.8	50.0	-10.8	Pass
16.900	Pk	38.1	2.2	40.3	60.0	-19.7	50.0	-9.7	Pass
24.840	Pk	36.4	2.6	39.0	60.0	-21.0	50.0	-11.0	Pass

3.7 Radiated Emissions - §15.209; RSS-210 §6.2.1

3.7.1 Limits of Radiated Emissions Measurement

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	2400/F (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

As shown in 15.35(b), for frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any circumstances of modulation.

3.7.2 Radiated Emissions Measurement Test Procedure

Before final measurements of radiated emissions were made on the open-field three/ten meter range, the EUT was scanned indoors at one and three meter distances. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to ensure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three/ten-meter, open-field test site. The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The spectrum was examined from 9 kHz to the 10th harmonic of the highest fundamental transmitter frequency (24.62 GHz).

At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations. For frequencies between 30 and 1000 MHz, the spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode. For emissions above 1000 MHz, emissions are measured using the average detector function with a minimum resolution bandwidth of 1 MHz. No video filter less than 10 times the resolution bandwidth was used. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

Table 3-27: Radiated Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901053	Schaffner-Chase	CBL6112	Antenna (25 MHz – 2 GHz)	2648	9/20/05
900151	Rohde and Schwarz	HFH2-Z2	Antenna (Loop antenna, (9 kHz - 30 MHz)	827525/019	8/25/06
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
900811	Rhein Tech Labs	PR-1040	Amplifier	1003	3/8/06
900878	Rhein Tech Labs	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901231	IW Microwave Products	KPS-1503-2400-KPS	High frequency RF cables	240"	9/1/06
901232	IW Microwave Products	KPS-1503-2400-KPS	High frequency RF cables	240"	9/1/06
901235	IW Microwave Products	KPS-1503-360-KPS	High frequency RF cables	36"	9/1/06
901242	Rhein Tech Labs	WRT-000-0003	Wood rotating table	N/A	Not Required
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	5/20/07
900321	EMCO	3161-03	Horn Antennas (4 - 8,2GHz)	9508-1020	5/20/07
900323	EMCO	3160-7	Horn Antennas (8,2 - 12,4 GHz)	9605-1054	5/20/07
900356	EMCO	3160-08	Horn Antenna (12.4 - 18 GHz)	9607-1044	5/20/07
900325	EMCO	3160-9	Horn Antennas (18 - 26.5 GHz)	9605-1051	5/20/07
901218	EMCO	3301B	Horn Antenna (18 - 26.5 GHz)	960281-003	5/20/07
900392	Hewlett Packard	1197OK	Harmonic Mixer (18 – 26.5 GH)z	3525A00159	11/27/07
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	8/3/06
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	8/3/06
900889	Hewlett Packard	85685A	RF Preselector (20 Hz - 2 GHz)	3146A01309	4/5/06

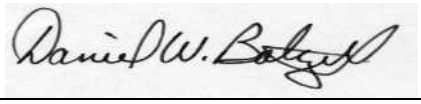
3.7.3 Radiated Emissions Test Results

3.7.3.1 Frequency Range – Below 1000 MHz

Table 3-28: Radiated Emissions Test Results – Below 1000 MHz Using Power Over Ethernet Injector

Temperature: 76°F Humidity: 65%										
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)**	**Pass/ Fail**
30.616	Qp	H	170	2.0	43.3	-13.2	30.1	40.0	-9.9	Pass
53.936	Qp	V	230	1.0	63.8	-26.1	37.7	40.0	-2.3	Pass
55.872	Qp	V	270	1.4	62.1	-26.1	36.0	40.0	-4.0	Pass
56.636	Qp	H	190	2.5	59.4	-25.1	34.3	40.0	-5.7	Pass
60.232	Qp	H	180	3.0	62.1	-25.6	36.5	40.0	-3.5	Pass
69.015	Qp	H	230	1.2	53.8	-25.5	28.3	40.0	-11.7	Pass
108.799	Qp	V	35	1.0	59.9	-18.5	41.4	43.5	-2.1	Pass
145.208	Qp	H	225	1.8	46.9	-19.5	27.4	43.5	-16.1	Pass
154.210	Qp	H	0	1.5	55.5	-20.0	35.5	43.5	-8.0	Pass
156.398	Qp	H	0	1.5	43.8	-20.2	23.6	43.5	-19.9	Pass
263.757	Qp	H	120	1.5	46.7	-15.7	31.0	46.0	-15.0	Pass
264.250	Qp	V	185	1.0	41.2	-16.8	24.4	46.0	-21.6	Pass
269.080	Qp	V	220	1.0	37.4	-16.8	20.6	46.0	-25.4	Pass
329.707	Qp	H	100	1.4	44.7	-14.6	30.1	46.0	-15.9	Pass
333.530	Qp	H	220	1.3	44.3	-14.4	29.9	46.0	-16.1	Pass
400.225	Qp	H	28	1.0	49.8	-12.2	37.6	46.0	-8.4	Pass
433.601	Qp	H	270	1.0	38.9	-11.0	27.9	46.0	-18.1	Pass
494.510	Qp	H	350	1.0	43.3	-9.7	33.6	46.0	-12.4	Pass

Test Personnel:

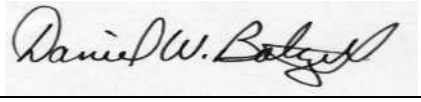


Daniel W. Baltzell		June 5, 2005
EMC Test Engineer	Signature	Date Of Test

Table 3-29: Radiated Emissions Test Results – Below 1000 MHz Using AC Power

Temperature: 84°F Humidity: 69%										
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)**	**Pass/ Fail**
266.903	Qp	V	180	1.0	60.3	-24.0	36.3	46.0	-9.7	Pass
300.228	Qp	V	90	1.0	53.0	-24.1	28.9	46.0	-17.1	Pass
333.623	Qp	V	180	1.0	57.5	-23.0	34.5	46.0	-11.5	Pass
366.978	Qp	H	225	1.5	53.0	-22.2	30.8	46.0	-15.2	Pass
400.338	Qp	H	180	1.5	48.1	-21.4	26.7	46.0	-19.3	Pass
433.718	Qp	V	180	1.0	51.0	-20.1	30.9	46.0	-15.1	Pass
500.448	Qp	V	121	1.0	54.1	-19.2	34.9	46.0	-11.1	Pass
533.813	Qp	H	121	1.5	48.6	-19.3	29.3	46.0	-16.7	Pass

Test Personnel:



Daniel W. Baltzell		August 17, 2005
EMC Test Engineer	Signature	Date Of Test

3.7.3.2 Frequency Range – 1000 MHz – 25000 MHz

Table 3-30: Radiated Emissions Harmonics/Spurious Channel 1 (TX Frequency: 2412 MHz 1 Mbps) 8.5 dBi Patch Antenna 802.11b

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1473.130	61.9	Pk	-11.1	50.8	74.0	-23.2
1473.130	48.0	Av	-11.1	36.9	54.0	-17.1
1552.210	64.9	Pk	-10.5	54.4	74.0	-19.6
1552.210	50.2	Av	-10.5	39.7	54.0	-14.3
2280.000	45.3	Pk	10.2	55.5	74.0	-18.5
2280.000	33.0	Av	10.2	43.2	54.0	-10.8
2320.000	48.0	Pk	10.9	58.9	74.0	-15.1
2320.000	36.0	Av	10.9	46.9	54.0	-7.1
2360.000	47.7	Pk	10.7	58.4	74.0	-15.6
2360.000	36.8	Av	10.7	47.5	54.0	-6.5
2376.000	46.3	Pk	10.6	56.9	74.0	-17.1
2376.000	33.8	Av	10.6	44.4	54.0	-9.6
4824.000	40.7	Pk	14.2	54.9	74.0	-19.1
4824.000	27.3	Av	14.2	41.5	54.0	-12.5
7236.000	39.6	Pk	13.1	52.7	107.1	-54.4
7236.000	27.1	Av	13.1	40.2	87.1	-46.9
9648.000	41.1	Pk	18.6	59.7	107.1	-47.4
9648.000	28.4	Av	18.6	47.0	87.1	-40.1
12060.000	40.6	Pk	19.9	60.5	74.0	-13.5
12060.000	28.3	Av	19.9	48.2	54.0	-5.8

Table 3-31: Radiated Emissions Harmonics/Spurious Channel 6 (TX Frequency: 2437 MHz 1 Mbps) 8.5 dBi Patch Antenna 802.11b

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1498.500	61.3	Pk	-10.6	50.7	74.0	-23.3
1498.500	48.5	Av	-10.6	37.9	54.0	-16.1
1581.150	63.8	Pk	-10.6	53.2	74.0	-20.8
1581.150	49.4	Av	-10.6	38.8	54.0	-15.2
2280.000	47.4	Pk	10.2	57.6	74.0	-16.4
2280.000	35.7	Av	10.2	45.9	54.0	-8.1
2320.000	48.4	Pk	10.9	59.3	74.0	-14.7
2320.000	35.7	Av	10.9	46.6	54.0	-7.4
2360.000	47.1	Pk	10.7	57.8	74.0	-16.2
2360.000	36.3	Av	10.7	47.0	54.0	-7.0
4874.000	40.9	Pk	14.4	55.3	74.0	-18.7
4874.000	27.9	Av	14.4	42.3	54.0	-11.7
7311.000	40.3	Pk	13.1	53.4	74.0	-20.6
7311.000	27.4	Av	13.1	40.5	54.0	-13.5
9748.000	42.1	Pk	18.1	60.2	103.9	-43.7
9748.000	28.3	Av	18.1	46.4	83.9	-37.5
12185.000	39.9	Pk	18.5	58.4	74.0	-15.6
12185.000	27.5	Av	18.5	46.0	54.0	-8.0

Table 3-32: Radiated Emissions Harmonics/Spurious Channel 11 (TX Frequency: 2462 MHz 1 Mbps) 8.5 dBi Patch Antenna 802.11b

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1523.700	61.4	Pk	-10.7	50.7	74.0	-23.3
1523.700	49.0	Av	-10.7	38.3	54.0	-15.7
1601.630	62.1	Pk	-9.3	52.8	74.0	-21.2
1601.630	47.9	Av	-9.3	38.6	54.0	-15.4
2280.000	45.5	Pk	10.2	55.7	74.0	-18.3
2280.000	33.0	Av	10.2	43.2	54.0	-10.8
2320.000	47.6	Pk	10.9	58.5	74.0	-15.5
2320.000	35.3	Av	10.9	46.2	54.0	-7.8
2360.000	48.1	Pk	10.7	58.8	74.0	-15.2
2360.000	37.2	Av	10.7	47.9	54.0	-6.1
4924.000	41.1	Pk	14.7	55.8	74.0	-18.2
4924.000	28.2	Av	14.7	42.9	54.0	-11.1
7386.000	40.4	Pk	13.3	53.7	74.0	-20.3
7386.000	27.3	Av	13.3	40.6	54.0	-13.4
9848.000	42.0	Pk	18.1	60.1	109.0	-48.9
9848.000	28.8	Av	18.1	46.9	89.0	-42.1
12310.000	40.0	Pk	18.7	58.7	74.0	-15.3
12310.000	27.1	Av	18.7	45.8	54.0	-8.2

Table 3-33: Radiated Emissions Harmonics/Spurious Channel 1 (TX Frequency: 2412 MHz 6 Mbps) 8.5 dBi Patch Antenna 802.11g

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1657.000	60.8	Pk	-9.8	51.0	101.4	-50.4
1657.000	47.6	Av	-9.8	37.8	81.4	-43.6
1476.000	60.1	Pk	-11.1	49.0	74.0	-25.0
1476.000	47.0	Av	-11.1	35.9	54.0	-18.1
1552.210	66.5	Pk	-10.5	56.0	74.0	-18.0
1552.210	54.6	Av	-10.5	44.1	54.0	-9.9
2280.000	46.2	Pk	10.2	56.4	74.0	-17.6
2280.000	33.5	Av	10.2	43.7	54.0	-10.3
2320.000	48.2	Pk	10.9	59.1	74.0	-14.9
2320.000	36.4	Av	10.9	47.3	54.0	-6.7
2360.000	48.5	Pk	10.7	59.2	74.0	-14.8
2360.000	38.0	Av	10.7	48.7	54.0	-5.3
2376.000	47.2	Pk	10.6	57.8	74.0	-16.2
2376.000	34.5	Av	10.6	45.1	54.0	-8.9
4824.000	40.4	Pk	14.2	54.6	74.0	-19.4
4824.000	27.5	Av	14.2	41.7	54.0	-12.3
7236.000	38.4	Pk	13.1	51.5	101.4	-49.9
7236.000	27.6	Av	13.1	40.7	81.4	-40.7
9648.000	41.2	Pk	18.6	59.8	101.4	-41.6
9648.000	29.3	Av	18.6	47.9	81.4	-33.5
12060.000	41.0	Pk	19.9	60.9	74.0	-13.1
12060.000	28.1	Av	19.9	48.0	54.0	-6.0

Table 3-34: Radiated Emissions Harmonics/Spurious Channel 6 (TX Frequency: 2437 MHz 6 Mbps) 8.5 dBi Patch Antenna 802.11g

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1500.050	64.2	Pk	-10.5	53.7	74.0	-20.3
1500.050	50.5	Av	-10.5	40.0	54.0	-14.0
1579.150	65.2	Pk	-10.5	54.7	74.0	-19.3
1579.150	50.2	Av	-10.5	39.7	54.0	-14.3
2280.000	46.3	Pk	10.2	56.5	74.0	-17.5
2280.000	33.3	Av	10.2	43.5	54.0	-10.5
2320.000	48.4	Pk	10.9	59.3	74.0	-14.7
2320.000	36.5	Av	10.9	47.4	54.0	-6.6
2360.000	48.5	Pk	10.7	59.2	74.0	-14.8
2360.000	37.7	Av	10.7	48.4	54.0	-5.6
4874.000	40.8	Pk	14.4	55.2	74.0	-18.8
4874.000	27.8	Av	14.4	42.2	54.0	-11.8
7311.000	40.1	Pk	13.1	53.2	74.0	-20.8
7311.000	27.4	Av	13.1	40.5	54.0	-13.5
9748.000	42.0	Pk	18.1	60.1	100.2	-40.1
9748.000	28.4	Av	18.1	46.5	80.2	-33.7
12185.000	40.5	Pk	18.5	59.0	74.0	-15.0
12185.000	27.7	Av	18.5	46.2	54.0	-7.8

Table 3-35: Radiated Emissions Harmonics/Spurious Channel 11 (TX Frequency: 2462 MHz 6 Mbps) 8.5 dBi Patch Antenna 802.11g

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1524.350	62.2	Pk	-10.7	51.5	74.0	-22.5
1524.350	47.4	Av	-10.7	36.7	54.0	-17.3
1601.250	60.6	Pk	-10.2	50.4	74.0	-23.6
1601.250	46.8	Av	-10.2	36.6	54.0	-17.4
2280.000	47.1	Pk	10.2	57.3	74.0	-16.7
2280.000	33.6	Av	10.2	43.8	54.0	-10.2
2320.000	48.4	Pk	10.9	59.3	74.0	-14.7
2320.000	36.2	Av	10.9	47.1	54.0	-6.9
2360.000	48.5	Pk	10.7	59.2	74.0	-14.8
2360.000	37.6	Av	10.7	48.3	54.0	-5.7
4924.000	41.4	Pk	14.7	56.1	74.0	-17.9
4924.000	28.3	Av	14.7	43.0	54.0	-11.0
7386.000	40.4	Pk	13.3	53.7	74.0	-20.3
7386.000	27.5	Av	13.3	40.8	54.0	-13.2
9848.000	41.9	Pk	18.1	60.0	98.5	-38.5
9848.000	28.1	Av	18.1	46.2	78.5	-32.3
12310.000	40.2	Pk	18.7	58.9	74.0	-15.1
12310.000	27.2	Av	18.7	45.9	54.0	-8.1

Test Personnel:

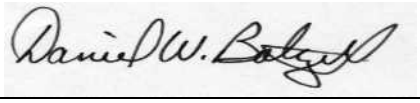
Daniel W. Baltzell		September 7, 2005
EMC Test Engineer	Signature	Date Of Test

Table 3-36: Radiated Emissions Harmonics/Spurious Channel 1 (TX Frequency: 2412 MHz 1 Mbps) 12 dBi Collinear Omni Antenna 802.11b

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1470.0	59.0	Pk	-11.1	47.9	74.0	-26.1
1470.0	47.1	Av	-11.1	36.0	54.0	-18.0
1552.2	64.2	Pk	-10.5	53.7	74.0	-20.3
1552.2	48.8	Av	-10.5	38.3	54.0	-15.7
1656.9	60.4	Pk	-9.8	50.6	109.0	-58.4
1656.9	48.2	Av	-9.8	38.4	89.0	-50.6
2280.0	43.9	Pk	10.2	54.1	74.0	-19.9
2280.0	33.7	Av	10.2	43.9	54.0	-10.1
2320.0	49.5	Pk	10.9	60.4	74.0	-13.6
2320.0	37.6	Av	10.9	48.5	54.0	-5.5
2360.0	40.0	Pk	10.7	50.7	74.0	-23.3
2360.0	39.4	Av	10.7	50.1	54.0	-3.9
2376.0	46.9	Pk	10.6	57.5	74.0	-16.5
2376.0	36.7	Av	10.6	47.3	54.0	-6.7
2520.0	41.2	Pk	11.2	52.4	109.0	-56.6
2520.0	31.3	Av	11.2	42.5	89.0	-46.5
4824.0	40.9	Pk	14.2	55.1	74.0	-18.9
4824.0	27.6	Av	14.2	41.8	54.0	-12.2
7236.0	41.6	Pk	13.1	54.7	109.0	-54.3
7236.0	27.2	Av	13.1	40.3	89.0	-48.7
9648.0	41.0	Pk	18.6	59.6	109.0	-49.4
9648.0	27.7	Av	18.6	46.3	89.0	-42.7
12060.0	41.4	Pk	19.9	61.3	74.0	-12.7
12060.0	28.2	Av	19.9	48.1	54.0	-5.9

Table 3-37: Radiated Emissions Harmonics/Spurious Channel 6 (TX Frequency: 2437 MHz 1 Mbps) 12 dBi Collinear Omni Antenna 802.11b

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1497.8	60.1	Pk	-10.6	49.5	74.0	-24.5
1497.8	47.4	Av	-10.6	36.8	54.0	-17.2
1581.2	62.9	Pk	-10.6	52.3	74.0	-21.7
1581.2	48.8	Av	-10.6	38.2	54.0	-15.8
1733.6	61.4	Pk	-9.8	51.6	109.7	-58.1
1733.6	46.9	Av	-9.8	37.1	89.7	-52.6
2280.0	46.0	Pk	10.2	56.2	74.0	-17.8
2280.0	34.8	Av	10.2	45.0	54.0	-9.0
2320.0	47.8	Pk	10.9	58.7	74.0	-15.3
2320.0	36.9	Av	10.9	47.8	54.0	-6.2
2360.0	48.7	Pk	10.7	59.4	74.0	-14.6
2360.0	38.4	Av	10.7	49.1	54.0	-4.9
4874.0	38.4	Pk	14.4	52.8	74.0	-21.2
4874.0	27.3	Av	14.4	41.7	54.0	-12.3
7311.0	40.5	Pk	13.1	53.6	74.0	-20.4
7311.0	27.2	Av	13.1	40.3	54.0	-13.7
9748.0	41.8	Pk	18.1	59.9	109.7	-49.8
9748.0	28.1	Av	18.1	46.2	89.7	-43.5
12185.0	40.2	Pk	18.5	58.7	74.0	-15.3
12185.0	27.4	Av	18.5	45.9	54.0	-8.1

Table 3-38: Radiated Emissions Harmonics/Spurious Channel 11 (TX Frequency: 2462 MHz 1 Mbps) 12 dBi Collinear Omni Antenna 802.11b

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1523.5	63.5	Pk	-10.7	52.8	74.0	-21.2
1523.5	52.4	Av	-10.7	41.7	54.0	-12.3
1603.1	68.1	Pk	-9.3	58.8	74.0	-15.2
1603.1	53.9	Av	-9.3	44.6	54.0	-9.4
1753.8	60.5	Pk	-9.2	51.3	109.0	-57.7
1753.8	47.3	Av	-9.2	38.1	89.0	-50.9
2280.0	41.9	Pk	10.2	52.1	74.0	-21.9
2280.0	30.8	Av	10.2	41.0	54.0	-13.0
2320.0	43.5	Pk	10.9	54.4	74.0	-19.6
2320.0	31.5	Av	10.9	42.4	54.0	-11.6
2360.0	44.2	Pk	10.7	54.9	74.0	-19.1
2360.0	35.5	Av	10.7	46.2	54.0	-7.8
4924.0	41.4	Pk	14.7	56.1	74.0	-17.9
4924.0	27.9	Av	14.7	42.6	54.0	-11.4
7386.0	40.3	Pk	13.3	53.6	74.0	-20.4
7386.0	27.1	Av	13.3	40.4	54.0	-13.6
9848.0	41.1	Pk	18.1	59.2	109.0	-49.8
9848.0	28.6	Av	18.1	46.7	89.0	-42.3
12310.0	40.2	Pk	18.7	58.9	74.0	-15.1
12310.0	26.8	Av	18.7	45.5	54.0	-8.5

Table 3-39: Radiated Emissions Harmonics/Spurious Channel 1 (TX Frequency: 2412 MHz 6 Mbps) 12 dBi Collinear Omni Antenna 802.11g

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1478.750	61.3	Pk	-11.1	50.2	74.0	-23.8
1478.750	48.6	Av	-11.1	37.5	54.0	-16.5
1552.210	66.8	Pk	-10.5	56.3	74.0	-17.7
1552.210	51.2	Av	-10.5	40.7	54.0	-13.3
1656.630	66.4	Pk	-9.8	56.6	100.8	-44.2
1656.630	49.6	Av	-9.8	39.8	80.8	-41.0
2280.000	46.9	Pk	10.2	57.1	74.0	-16.9
2280.000	35.9	Av	10.2	46.1	54.0	-7.9
2320.000	50.3	Pk	10.9	61.2	74.0	-12.8
2320.000	37.1	Av	10.9	48.0	54.0	-6.0
2360.000	49.5	Pk	10.7	60.2	74.0	-13.8
2360.000	39.2	Av	10.7	49.9	54.0	-4.1
2376.000	37.0	Pk	10.6	47.6	74.0	-26.4
2376.000	34.5	Av	10.6	45.1	54.0	-8.9
2520.000	31.5	Pk	11.2	42.7	100.8	-58.1
2520.000	23.1	Av	11.2	34.3	80.8	-46.5
4824.000	40.2	Pk	14.2	54.4	74.0	-19.6
4824.000	27.6	Av	14.2	41.8	54.0	-12.2
7236.000	40.4	Pk	13.1	53.5	100.8	-47.3
7236.000	28.0	Av	13.1	41.1	80.8	-39.7
9648.000	41.1	Pk	18.6	59.7	100.8	-41.1
9648.000	28.0	Av	18.6	46.6	80.8	-34.2
12060.000	40.9	Pk	19.9	60.8	74.0	-13.2
12060.000	28.2	Av	19.9	48.1	54.0	-5.9

Table 3-40: Radiated Emissions Harmonics/Spurious Channel 6 (TX Frequency: 2437 MHz 6 Mbps) 12 dBi Collinear Omni Antenna 802.11g

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1500.050	62.1	Pk	-10.5	51.6	74.0	-22.4
1500.050	48.7	Av	-10.5	38.2	54.0	-15.8
1579.150	67.3	Pk	-10.5	56.8	74.0	-17.2
1579.150	51.4	Av	-10.5	40.9	54.0	-13.1
1731.255	63.0	Pk	-9.7	53.3	105.9	-52.6
1731.255	48.6	Av	-9.7	38.9	85.9	-47.0
2280.000	45.4	Pk	10.2	55.6	74.0	-18.4
2280.000	33.3	Av	10.2	43.5	54.0	-10.5
2320.000	48.5	Pk	10.9	59.4	74.0	-14.6
2320.000	36.6	Av	10.9	47.5	54.0	-6.5
2360.000	50.2	Pk	10.7	60.9	74.0	-13.1
2360.000	39.2	Av	10.7	49.9	54.0	-4.1
4874.000	40.6	Pk	14.4	55.0	74.0	-19.0
4874.000	27.9	Av	14.4	42.3	54.0	-11.7
7311.000	40.4	Pk	13.1	53.5	74.0	-20.5
7311.000	27.9	Av	13.1	41.0	54.0	-13.0
9748.000	41.2	Pk	18.1	59.3	105.9	-46.6
9748.000	27.5	Av	18.1	45.6	85.9	-40.3
12185.000	40.5	Pk	18.5	59.0	74.0	-15.0
12185.000	27.5	Av	18.5	46.0	54.0	-8.0

Table 3-41: Radiated Emissions Harmonics/Spurious Channel 11 (TX Frequency: 2462 MHz 6 Mbps) 12 dBi Collinear Omni Antenna 802.11g

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1528.850	65.3	Pk	-10.7	54.6	74.0	-19.4
1528.850	51.7	Av	-10.7	41.0	54.0	-13.0
1603.210	72.5	Pk	-10.2	62.3	74.0	-11.7
1603.210	55.0	Av	-10.2	44.8	54.0	-9.2
1755.530	61.6	Pk	-9.1	52.5	102.9	-50.4
1755.530	47.6	Av	-9.1	38.5	82.9	-44.4
2280.000	46.3	Pk	10.2	56.5	74.0	-17.5
2280.000	33.9	Av	10.2	44.1	54.0	-9.9
2320.000	46.9	Pk	10.9	57.8	74.0	-16.2
2320.000	35.0	Av	10.9	45.9	54.0	-8.1
2360.000	48.0	Pk	10.7	58.7	74.0	-15.3
2360.000	37.4	Av	10.7	48.1	54.0	-5.9
4924.000	41.5	Pk	14.7	56.2	74.0	-17.8
4924.000	28.3	Av	14.7	43.0	54.0	-11.0
7386.000	40.7	Pk	13.3	54.0	74.0	-20.0
7386.000	27.3	Av	13.3	40.6	54.0	-13.4
9848.000	41.7	Pk	18.1	59.8	102.9	-43.1
9848.000	28.8	Av	18.1	46.9	82.9	-36.0
12310.000	39.8	Pk	18.7	58.5	74.0	-15.5
12310.000	27.1	Av	18.7	45.8	54.0	-8.2

Test Personnel:

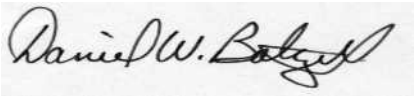
Daniel W. Baltzell		September 7, 2005
EMC Test Engineer	Signature	Date Of Test

Table 3-42: Radiated Emissions Harmonics/Spurious Channel 1 (TX Frequency: 2412 MHz 1 Mbps) 14 dBi YAGI Antenna 802.11b

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1473.130	59.0	Pk	-10.0	49.0	74.0	-25.0
1473.130	47.3	Av	-10.0	37.3	54.0	-16.7
1552.500	56.6	Pk	-9.4	47.2	74.0	-26.8
1552.500	45.0	Av	-9.4	35.6	54.0	-18.4
2210.650	46.4	Pk	10.4	56.8	74.0	-17.2
2210.650	35.7	Av	10.4	46.1	54.0	-7.9
2240.000	46.1	Pk	10.5	56.6	74.0	-17.4
2240.000	37.2	Av	10.5	47.7	54.0	-6.3
2280.000	48.2	Pk	10.2	58.4	74.0	-15.6
2280.000	38.4	Av	10.2	48.6	54.0	-5.4
2288.000	50.0	Pk	10.3	60.3	74.0	-13.7
2288.000	40.6	Av	10.3	50.9	54.0	-3.1
2320.000	50.7	Pk	10.9	61.6	74.0	-12.4
2320.000	41.6	Av	10.9	52.5	54.0	-1.5
2360.000	50.3	Pk	10.7	61.0	74.0	-13.0
2360.000	42.0	Av	10.7	52.7	54.0	-1.3
2376.000	49.4	Pk	10.6	60.0	74.0	-14.0
2376.000	38.8	Av	10.6	49.4	54.0	-4.6
4824.000	40.1	Pk	14.2	54.3	74.0	-19.7
4824.000	27.4	Av	14.2	41.6	54.0	-12.4
7236.000	39.8	Pk	13.1	52.9	107.1	-54.2
7236.000	27.9	Av	13.1	41.0	87.1	-46.1
9648.000	40.9	Pk	18.6	59.5	107.1	-47.6
9648.000	29.1	Av	18.6	47.7	87.1	-39.4
12060.000	40.3	Pk	19.9	60.2	74.0	-13.8
12060.000	27.7	Av	19.9	47.6	54.0	-6.4

Table 3-43: Radiated Emissions Harmonics/Spurious Channel 6 (TX Frequency: 2437 MHz 1 Mbps) 14 dBi YAGI Antenna 802.11b

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1505.500	59.4	Pk	-9.2	50.2	74.0	-23.8
1505.500	47.8	Av	-9.2	38.6	54.0	-15.4
1575.500	56.8	Pk	-9.3	47.5	74.0	-26.5
1575.500	44.8	Av	-9.3	35.5	54.0	-18.5
2280.000	48.2	Pk	10.2	58.4	74.0	-15.6
2280.000	36.2	Av	10.2	46.4	54.0	-7.6
2288.000	48.2	Pk	10.3	58.5	74.0	-15.5
2288.000	37.5	Av	10.3	47.8	54.0	-6.2
2320.000	49.9	Pk	10.9	60.8	74.0	-13.2
2320.000	38.2	Av	10.9	49.1	54.0	-4.9
2360.000	50	Pk	10.7	60.7	74.0	-13.3
2360.000	42.6	Av	10.7	53.3	54.0	-0.7
4874.000	41.5	Pk	14.4	55.9	74.0	-18.1
4874.000	28.2	Av	14.4	42.6	54.0	-11.4
7311.000	40.8	Pk	13.1	53.9	74.0	-20.1
7311.000	27.7	Av	13.1	40.8	54.0	-13.2
9748.000	41.3	Pk	18.1	59.4	103.9	-44.5
9748.000	28.1	Av	18.1	46.2	83.9	-37.7
12185.000	40.1	Pk	18.5	58.6	74.0	-15.4
12185.000	27.4	Av	18.5	45.9	54.0	-8.1

Table 3-44: Radiated Emissions Harmonics/Spurious Channel 11 (TX Frequency: 2462 MHz 1 Mbps) 14 dBi YAGI Antenna 802.11b

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1528.300	58.0	Pk	-9.3	48.7	74.0	-25.3
1528.300	45.6	Av	-9.3	36.3	54.0	-17.7
1730.000	51.0	Pk	-8.3	42.7	109.0	-66.3
1730.000	44.5	Av	-8.3	36.2	89.0	-52.8
2280.000	46.7	Pk	10.2	56.9	74.0	-17.1
2280.000	35.3	Av	10.2	45.5	54.0	-8.5
2288.000	47.6	Pk	10.3	57.9	74.0	-16.1
2288.000	36.5	Av	10.3	46.8	54.0	-7.2
2320.000	46.6	Pk	10.9	57.5	74.0	-16.5
2320.000	36.6	Av	10.9	47.5	54.0	-6.5
2360.000	49.5	Pk	10.7	60.2	74.0	-13.8
2360.000	40.3	Av	10.7	51.0	54.0	-3.0
4924.000	41.6	Pk	14.7	56.3	74.0	-17.7
4924.000	28.2	Av	14.7	42.9	54.0	-11.1
7386.000	40.4	Pk	13.3	53.7	74.0	-20.3
7386.000	27.3	Av	13.3	40.6	54.0	-13.4
9848.000	41.8	Pk	18.1	59.9	109.0	-49.1
9848.000	28.8	Av	18.1	46.9	89.0	-42.1
12310.000	39.6	Pk	18.7	58.3	74.0	-15.7
12310.000	26.5	Av	18.7	45.2	54.0	-8.8

Table 3-45: Radiated Emissions Harmonics/Spurious Channel 1 (TX Frequency: 2412 MHz 6 Mbps) 14 dBi YAGI Antenna 802.11g

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1476.000	60.1	Pk	-10.0	50.1	74.0	-23.9
1476.000	47.0	Av	-10.0	37.0	54.0	-17.0
1552.880	58.9	Pk	-9.4	49.5	74.0	-24.5
1552.880	44.7	Av	-9.4	35.3	54.0	-18.7
2210.650	45.1	Pk	10.4	55.5	74.0	-18.5
2210.650	34.5	Av	10.4	44.9	54.0	-9.1
2240.000	46.0	Pk	10.5	56.5	74.0	-17.5
2240.000	35.6	Av	10.5	46.1	54.0	-7.9
2280.000	46.2	Pk	10.2	56.4	74.0	-17.6
2280.000	37.3	Av	10.2	47.5	54.0	-6.5
2288.150	48.7	Pk	10.3	59.0	74.0	-15.0
2288.150	37.9	Av	10.3	48.2	54.0	-5.8
2320.000	50.0	Pk	10.9	60.9	74.0	-13.1
2320.000	39.3	Av	10.9	50.2	54.0	-3.8
2360.000	51.4	Pk	10.7	62.1	74.0	-11.9
2360.000	42.7	Av	10.7	53.4	54.0	-0.6
4824.000	39.9	Pk	14.2	54.1	74.0	-19.9
4824.000	27.5	Av	14.2	41.7	54.0	-12.3
7236.000	39.4	Pk	13.1	52.5	101.4	-48.9
7236.000	27.0	Av	13.1	40.1	81.4	-41.3
9648.000	40.7	Pk	18.6	59.3	101.4	-42.1
9648.000	27.7	Av	18.6	46.3	81.4	-35.1
12060.000	40.5	Pk	19.9	60.4	74.0	-13.6
12060.000	27.9	Av	19.9	47.8	54.0	-6.2

Table 3-46: Radiated Emissions Harmonics/Spurious Channel 6 (TX Frequency: 2437 MHz 6 Mbps) 14 dBi YAGI Antenna 802.11g

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1694.380	56.9	Pk	-8.3	48.6	74.0	-25.4
1694.380	45.2	Av	-8.3	36.9	54.0	-17.1
2280.000	48.9	Pk	10.2	59.1	74.0	-14.9
2280.000	37.3	Av	10.2	47.5	54.0	-6.5
2288.000	49.2	Pk	10.3	59.5	74.0	-14.5
2288.000	38.3	Av	10.3	48.6	54.0	-5.4
2320.000	50.9	Pk	10.9	61.8	74.0	-12.2
2320.000	39.3	Av	10.9	50.2	54.0	-3.8
2360.000	52.9	Pk	10.7	63.6	74.0	-10.4
2360.000	43.2	Av	10.7	53.9	54.0	-0.1
4874.000	40.5	Pk	14.4	54.9	74.0	-19.1
4874.000	28.2	Av	14.4	42.6	54.0	-11.4
7311.000	39.7	Pk	13.1	52.8	74.0	-21.2
7311.000	27.8	Av	13.1	40.9	54.0	-13.1
9748.000	41.1	Pk	18.1	59.2	100.2	-41.0
9748.000	28.5	Av	18.1	46.6	80.2	-33.6
12185.000	40.6	Pk	18.5	59.1	74.0	-14.9
12185.000	27.1	Av	18.5	45.6	54.0	-8.4

Table 3-47: Radiated Emissions Harmonics/Spurious Channel 11 (TX Frequency: 2462 MHz 6 Mbps) 14 dBi YAGI Antenna 802.11g

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Detector Pk=1 MHz RBW/VBW; Av=1 MHz RBW/10 Hz VBW	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1520.800	58.5	Pk	-9.3	49.2	74.0	-24.8
1520.800	45.7	Av	-9.3	36.4	54.0	-17.6
1729.900	59.9	Pk	-8.3	51.6	98.5	-46.9
1729.900	46.3	Av	-8.3	38.0	78.5	-40.5
2280.000	46.1	Pk	10.2	56.3	74.0	-17.7
2280.000	37.2	Av	10.2	47.4	54.0	-6.6
2288.000	48.9	Pk	10.3	59.2	74.0	-14.8
2288.000	37.9	Av	10.3	48.2	54.0	-5.8
2320.000	50.2	Pk	10.9	61.1	74.0	-12.9
2320.000	38.6	Av	10.9	49.5	54.0	-4.5
2360.000	52.5	Pk	10.7	63.2	74.0	-10.8
2360.000	43.1	Av	10.7	53.8	54.0	-0.2
4924.000	41.4	Pk	14.7	56.1	74.0	-17.9
4924.000	28.2	Av	14.7	42.9	54.0	-11.1
7386.000	40.2	Pk	13.3	53.5	74.0	-20.5
7386.000	27.4	Av	13.3	40.7	54.0	-13.3
9848.000	41.7	Pk	18.1	59.8	98.5	-38.7
9848.000	28.7	Av	18.1	46.8	78.5	-31.7
12310.000	39.1	Pk	18.7	57.8	74.0	-16.2
12310.000	26.8	Av	18.7	45.5	54.0	-8.5

Test Personnel:

Daniel W. Baltzell		September 7, 2005
EMC Test Engineer	Signature	Date Of Test

4 Conclusion

The data in this measurement report shows that the EUT as tested, Psion Teklogix Inc. Model: 9160-RA2060, FCC ID: GM39160RA2060, complies with all the applicable requirements of Parts 2 and 15 of the FCC Rules and Regulations, and Industry Canada RSS-210.