



Radio Intentional EMC Test Report: EDCS -775583

For

CP-9971-C-K9, CP-9971-CL-K9, CP-9971-W-K9 & CP-9971-WL-K9

2.4GHz Radio

Against the following Specifications :

47 CFR 15.247

RSS-210

RSS-102

Cisco Systems

EMC Laboratory

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San Jose, CA 95134

Author: Dean Yarza

Approved By: Craig Mullis

Title: Regulatory Compliance Manager

This report replaces any previously entered test report under EDCS -775583



This test report has been electronically authorized and archived using the CISCO Engineering Document Control system.

SECTION 1: OVERVIEW	3
TEST SUMMARY.....	3
2.3 REPORT ISSUE DATE	5
2.4 TESTING FACILITIES	5
2.6 EUT DESCRIPTION.....	6
2.7 SCOPE OF ASSESSMENT.....	6
2.8 UNITS OF MEASUREMENT	6
2.9 REPORT TEMPLATE CONTROL NO.....	7
EDCS#: 703456	7
SECTION 3: RESULT SUMMARY.....	8
3.1 RESULTS SUMMARY TABLE	8
SECTION 4: SAMPLE DETAILS.....	9
4.1 SAMPLE DETAILS	9
4.2 SYSTEM DETAILS	9
4.3 MODE OF OPERATION DETAILS	9
SECTION 5: MODIFICATIONS	9
5.1 SAMPLE MODIFICATIONS PERFORMED DURING ASSESSMENT	9
APPENDIX A: FORMAL TEST RESULTS.....	10
6 DB BANDWIDTH.....	10
PEAK OUTPUT POWER	17
POWER SPECTRAL DENSITY	24
CONDUCTED SPURIOUS EMISSIONS	31
RADIATED SPURIOUS AND HARMONICS EMISSIONS	36
RADIATED BAND EDGE MEASUREMENTS	66
CO-LOCATOR RADIATED SPURIOUS EMISSIONS	77
APPENDIX B: ABBREVIATION KEY AND DEFINITIONS.....	90
APPENDIX C: TEST EQUIPMENT USED TO PERFORM THE TEST	91
APPENDIX D: TEST PROCEDURES	93
APPENDIX D: TEST PROCEDURES	93



Section 1: Overview

Test Summary

The samples were assessed against the tests detailed in section 3 under the requirements of the following standards:

Emissions:

CFR47 Part 15.247

RSS-210

RSS102

Notes:

- 1) Measurements were made in accordance with FCC docket #:DA 02-2138, ET docket 96-8, KDB Publication No. 558074& measurement method of spurious emission tolerance to the International Telecommunication Union (ITU) Recommendation SM329.



Section 2: Assessment Information

2.1 General

This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the federal Government.

With regard to this assessment, the following points should be noted:

- a) The results contained in this report relate only to the items tested and were obtained in the period between the date of the initial assessment and the date of issue of the report. Manufactured products will not necessarily give identical results, due to production tolerances and measurement uncertainties.
- b) The apparatus was set up and exercised using the configuration and modes of operation defined in this report only.
- c) Where relevant, the apparatus was only assessed using the susceptibility criteria defined in this report and the Test Assessment Plan (TAP).
- d) All testing was performed under the following environmental conditions:
 - Temperature 15°C to 35°C (54°F to 95°F)
 - Atmospheric Pressure 860mbar to 1060mbar (25.4" to 31.3")
 - Humidity 10% to 75*%
- e) All AC testing was performed at one or more of the following supply voltages:
 - 110V (+/-10%) 60Hz
 - 220V (+/-10%) 50 or 60Hz
- f) Cisco Systems, Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). The scope of accreditation, certificate number 1178-01 is referenced in appendix C, along with further details.

This report must not be reproduced except in full, without written approval of Cisco Systems, Inc.



2.2 Start Date of Testing

28-April-2009

2.3 Report Issue Date

Cisco Systems, Inc. uses an electronic system to issue, store and control the revision of test reports. This system is called the Engineering Document Control System (EDCS). The actual report issue date is embedded into the original file on EDCS. Any copies of this report, either electronic or paper, that are not on EDCS must be considered uncontrolled

2.4 Testing facilities

This assessment was performed by:

Testing Laboratory

Cisco Systems, Inc.,
170 West Tasman Drive
San Jose, CA 95134,
USA

Registration Numbers for Industry Canada

Cisco System Site	Site Identifier
Building P, 10m Chamber	Company #: 4624-2
Building P, 5m Chamber	Company #: 4624-1
Building N, 5m Chamber	Company #: 6111
Building I, 5m Chamber	Company #: 6112

Test Engineers

Dean Yarza

2.5 Equipment Assessed (EUT)

CP-9971-W-K9

2.6 EUT Description

Roundtable is the next generation of desktop phones. It will support the use of 802.11a/b/g in addition to Ethernet as network interface. This SFS defines the requirements for 802.11a/b/g support.

The WLAN subsystem of Roundtable phones will comprise of the MuRata LBEH1WULQC module with support for TNET1253 for WLAN and BRF6350 for Bluetooth support.

Report will be used to cover the following Models:

CP-9971-C-K9: Charcoal with Thick Handset

CP-9971-CL-K9: Charcoal with Thin Handset

CP-9971-W-K9: Charcoal with Thick Handset

CP-9971-WL-K9: Charcoal with Thin Handset

2.7 Scope of Assessment

Tests have been performed in accordance with the relevant Test and Assessment Plan (TAP), a copy of which is contained in Appendix F of this report, and the relevant Cisco Systems, Inc. radio test procedures (EDCS-420238). This test report may not cover all of the tests highlighted in the test plan.

2.8 Units of Measurement

The units of measurements defined in the appendices are reported in specific terms, which are test dependent. Where radiated measurements are concerned these are defined at a particular distance. Basic voltage measurements are defined in units of [dBuV]

As an example, the basic calculation for all measurements is as follows:

$$\text{Emission level [dBuV]} = \text{Indicated voltage level [dBuV]} + \text{Cable Loss [dB]} + \text{Other correction factors [dB]}$$

The combinations of correction factors are dependent upon the exact test configurations [see test equipment lists for further details] and may include:-

Antenna Factors, Pre Amplifier Gain, LISN Loss, Pulse Limiter Loss and Filter Insertion Loss..

Note: to convert the results from dBuV/m to uV/m use the following formula:-

$$\text{Level in uV/m} = \text{Common Antilogarithm} [(X \text{ dBuV/m})/20] = Y \text{ uV/m}$$



2.9 Report Template Control No.

EDCS#: 703456



Section 3: Result Summary

3.1 Results Summary Table

Conducted emissions

Basic Standard	Test Details / Comments	Result
Power Spectral Density	15.247: For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. (RSS-210 A8.2)	Pass
Peak Output Power	15.247: The maximum conducted output power of the intentional radiator for systems using digital modulation in the 2400-2483.5MHz band shall not exceed 1 Watt (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. (RSS-210 A8.4)	Pass
6dB Bandwidth	15.247: Systems using digital modulation techniques may operate in the 5725-5850MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz. (RSS-210 A8.2)	Pass
Conducted Spurious Emissions	15.247: In any 100 kHz bandwidth outside the frequency band in which the digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. (RSS-210 A8.5)	Pass

Radiated emissions

Basic Standard	Test Details / Comments	Result
Radiated Spurious and Harmonic Emissions	Radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a). (RSS-210 Sec2.7)	Pass
Restricted Bandedge Measurements	Radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a). (RSS-210 Sec2.7)	Pass



Section 4: Sample Details

Note: Each sample was evaluated to ensure that its condition was suitable to be used as a test sample prior to the commencement of testing. During preliminary testing all three planes (X,Y & Z) were evaluated to determine "Worst Case". The data collected determine that the orientation used for this report was demined "Worst Case".

4.1 Sample Details

Sample Number	Equipment Details	Serial Number	Part Number
S01	CP-9971G	IAC1232A00M	74-5464-01

The following antennas were evaluated as part of this testing process. The antennas listed reflect the maximum gain allowed for each family type of antenna:

Fixed internal Antenna, Gain = 0.44dBi (no external antenna can be used.)

4.2 System Details

System #	Description	Samples
1	Radio Test Sample	S01

4.3 Mode of Operation Details

Mode#	Description	Comments
1	802.11B/G Test Mode	System is placed in a continuous Tx State at a Low, Middle, High Channel per Test Requirements. 802.11B running at 11Mbps, where 802.11G is running at 6Mbps.
2	Co-locator Test Mode	System is connected to the MT8852B Bluetooth Tester and placed in a continuous Tx Mode with Hopping Turned ON or OFF per test requirement while Wi-fi is also placed in a continuous Tx state.

Section 5: Modifications

5.1 Sample Modifications Performed During Assessment

No modifications were performed during assessment.

Appendix A: Formal Test Results

6 dB Bandwidth

15.247 & RSS-210 A8.2:

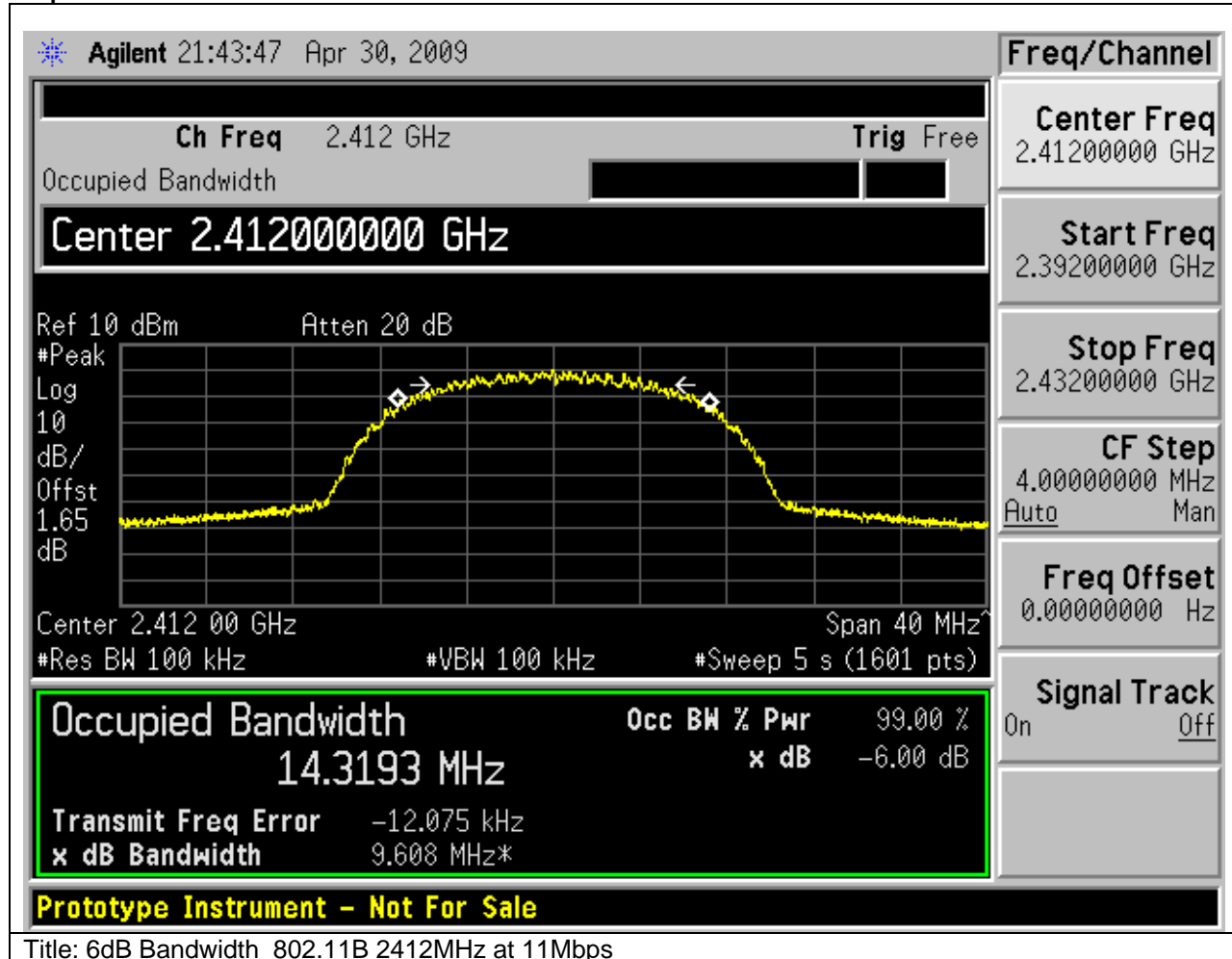
Systems using digital modulation techniques may operate in the 2400-2483.5MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz

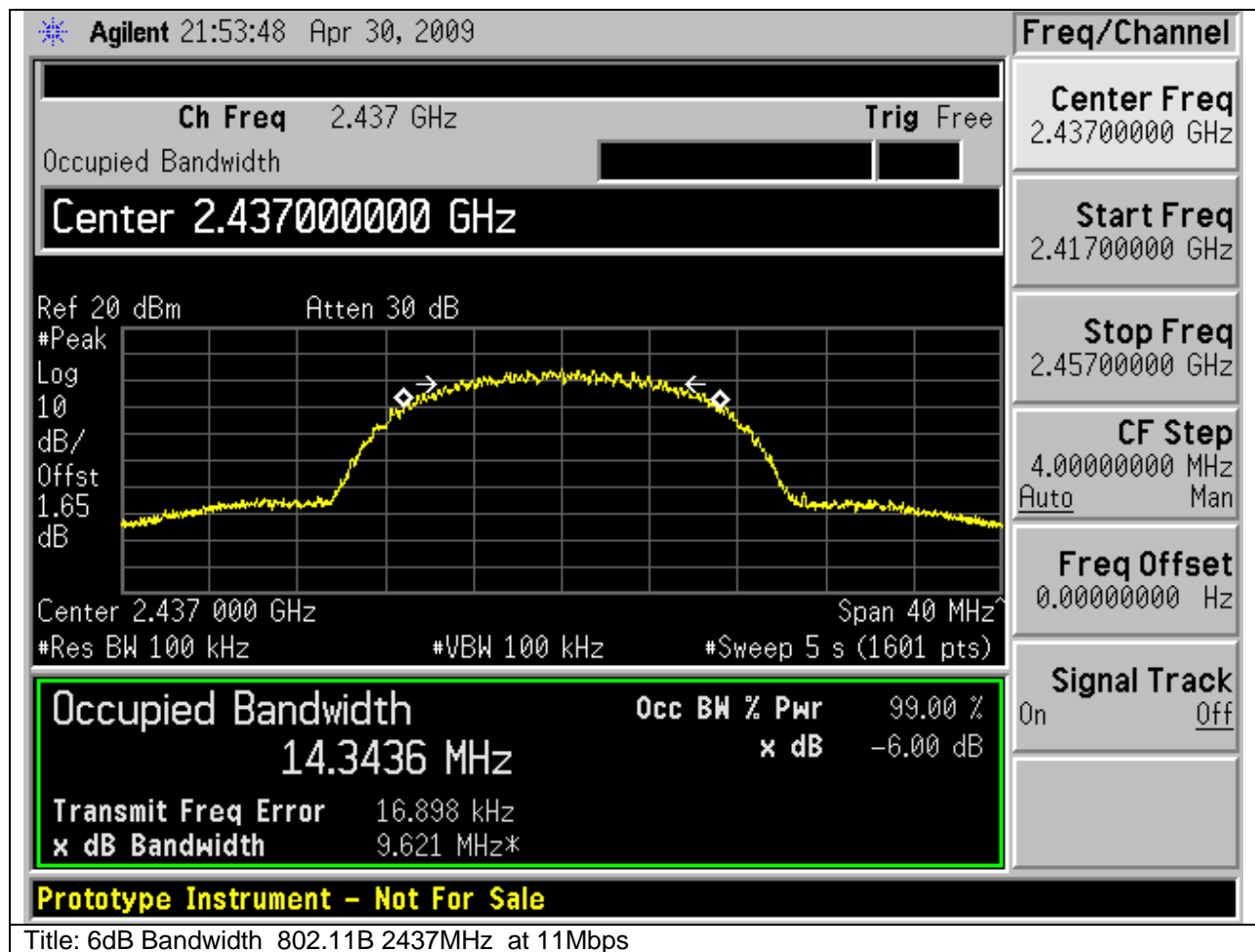
Frequency (MHz)	Data Rate (Mbps)	6dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
2412	11	9608	500	-9108
2437	11	9631	500	-9131
2462	11	9636	500	-9136
2412	6	1633.4	500	-1133.4
2437	6	1634.2	500	-1134.2
2462	6	1634.4	500	-1134.4

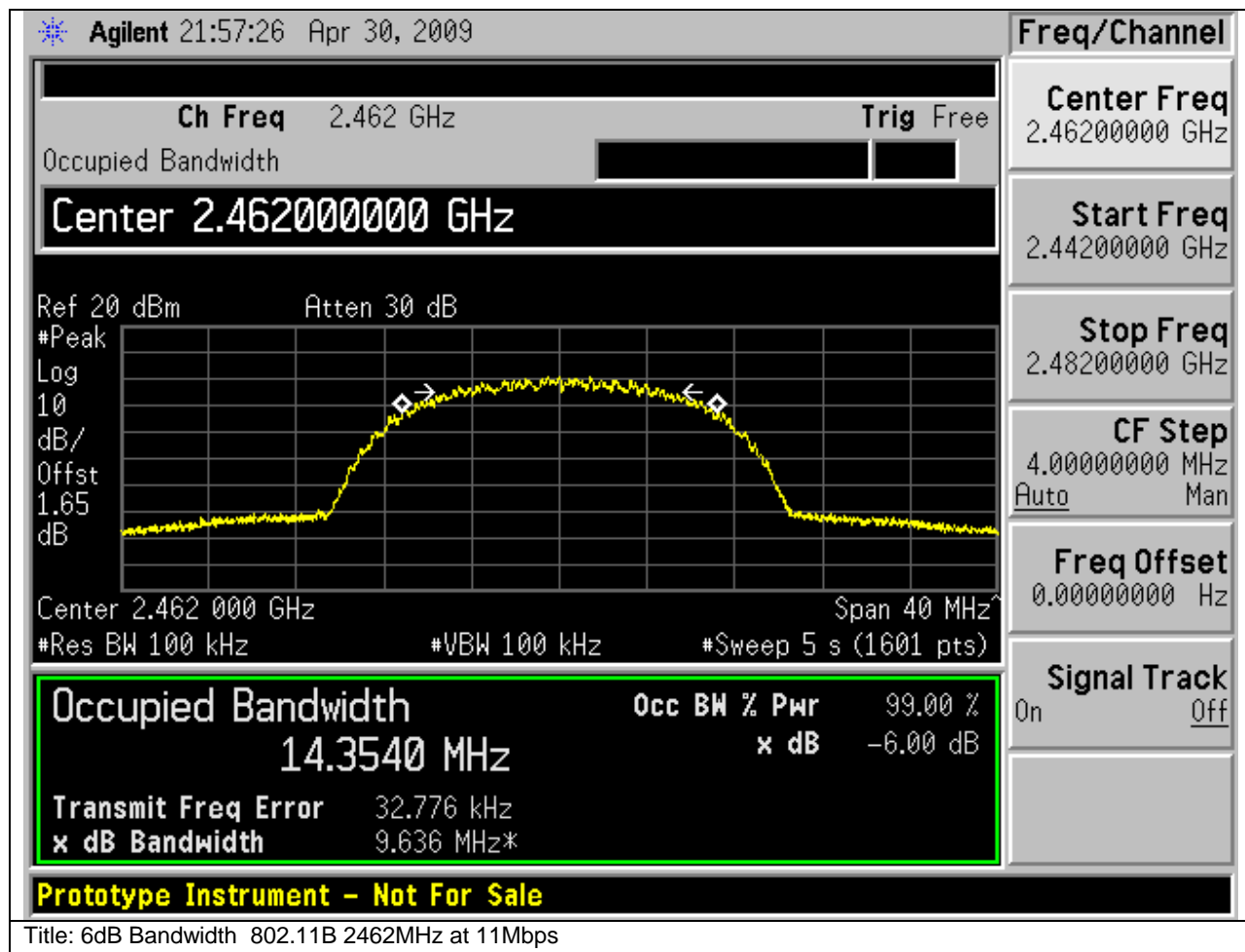
Frequency (MHz)	Data Rate (Mbps)	99% Bandwidth (kHz)
2412	11	14319.3
2437	11	14343.6
2462	11	14354
2412	6	16405.6
2437	6	16467
2462	6	16406

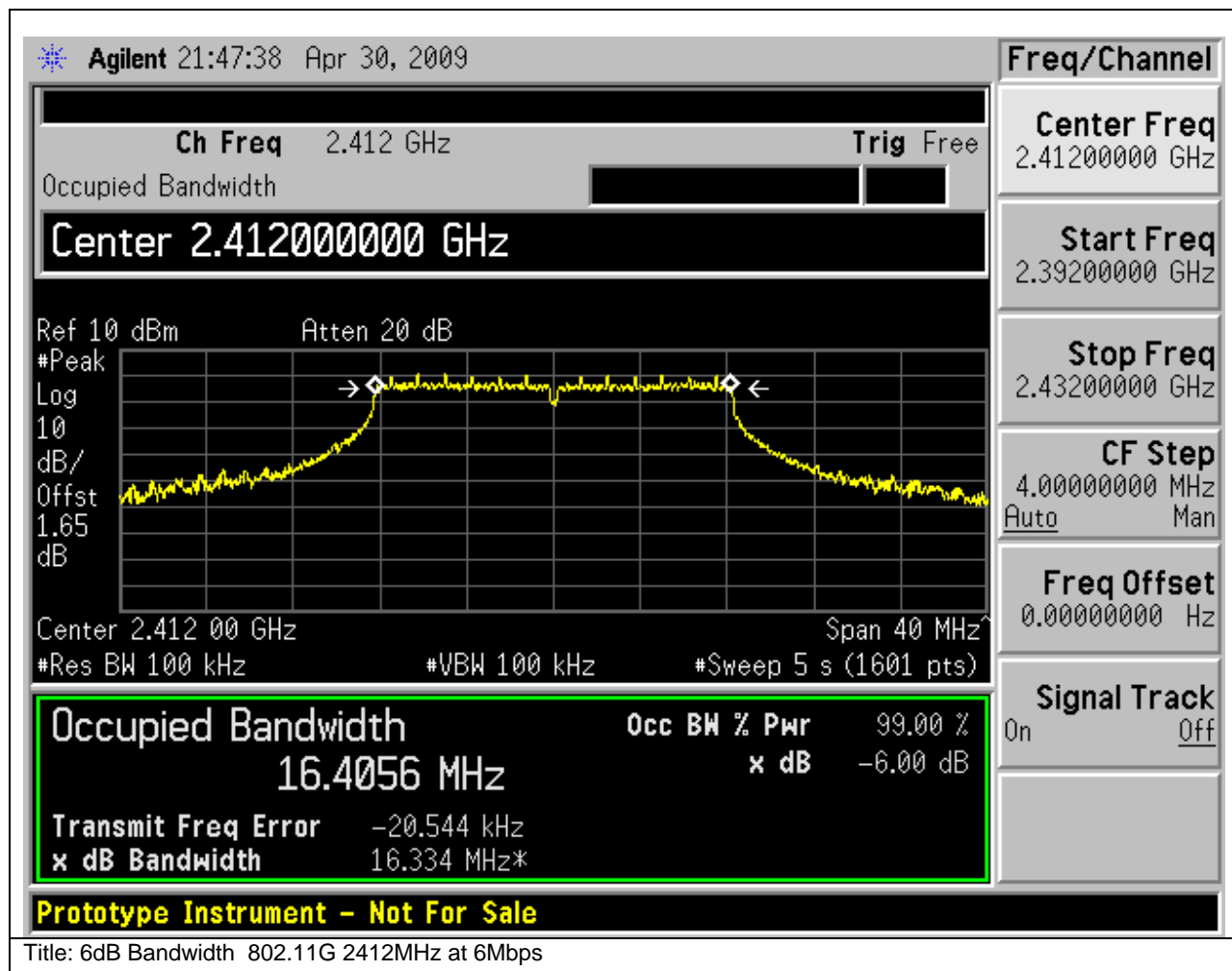


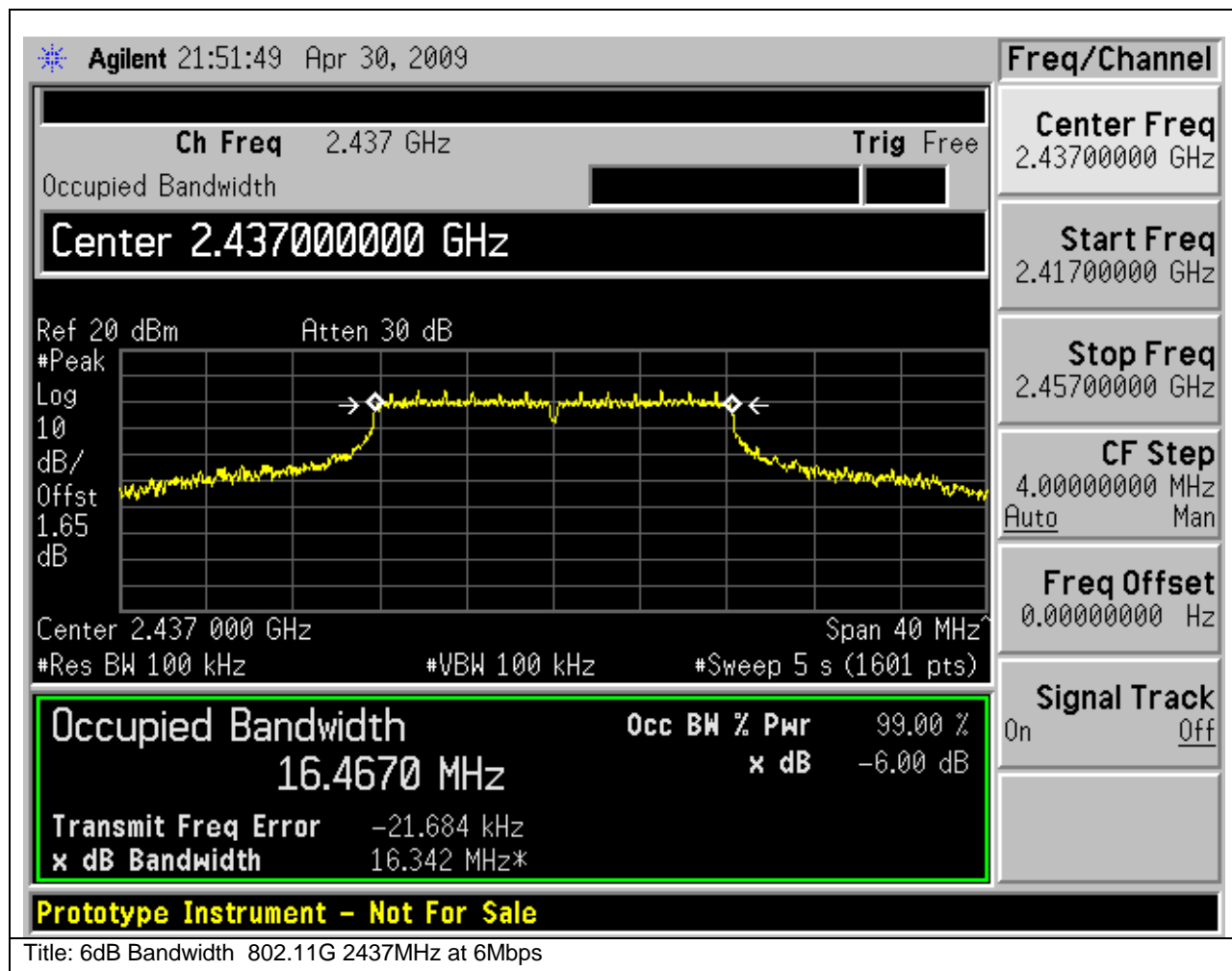
Graphical Test Results

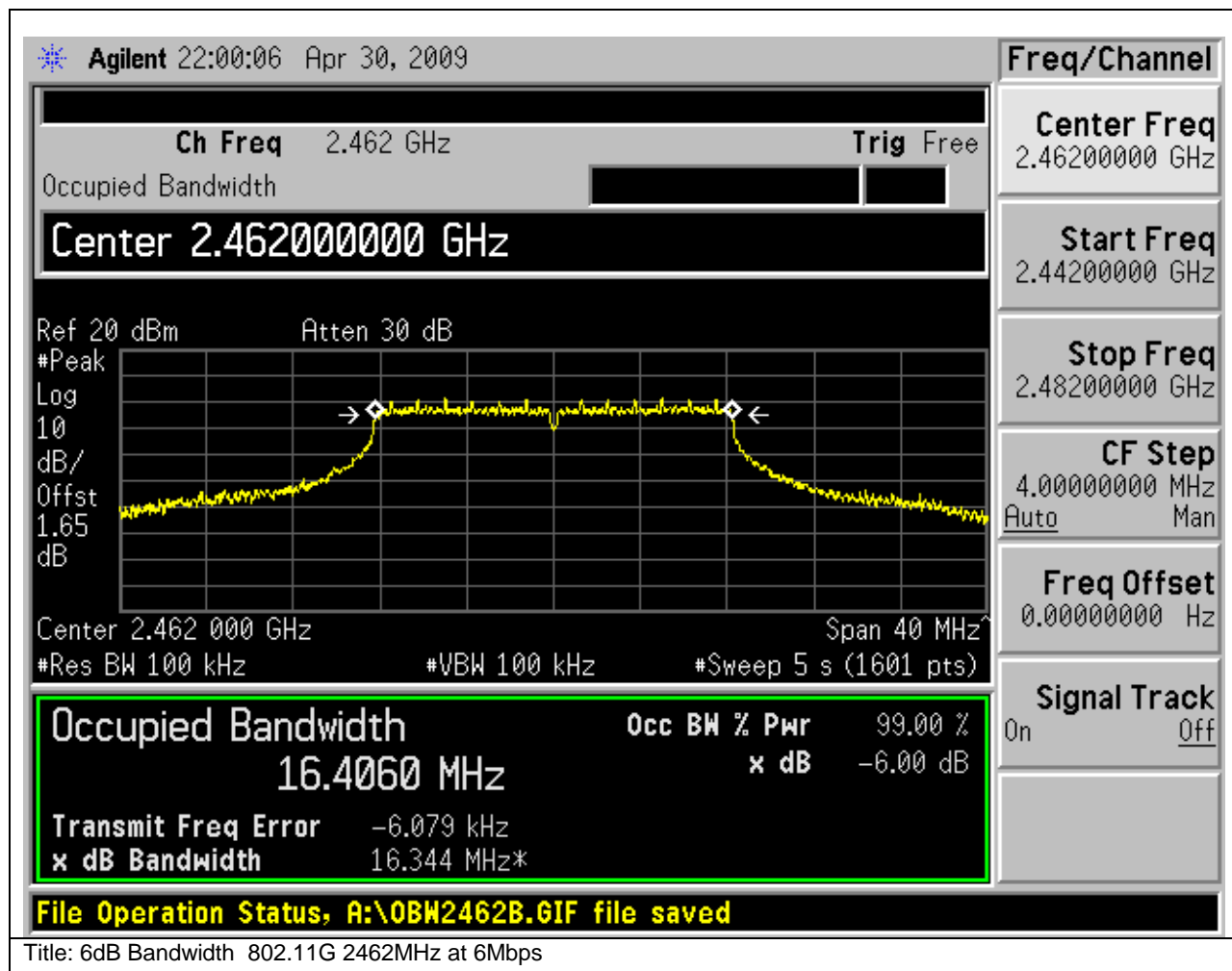












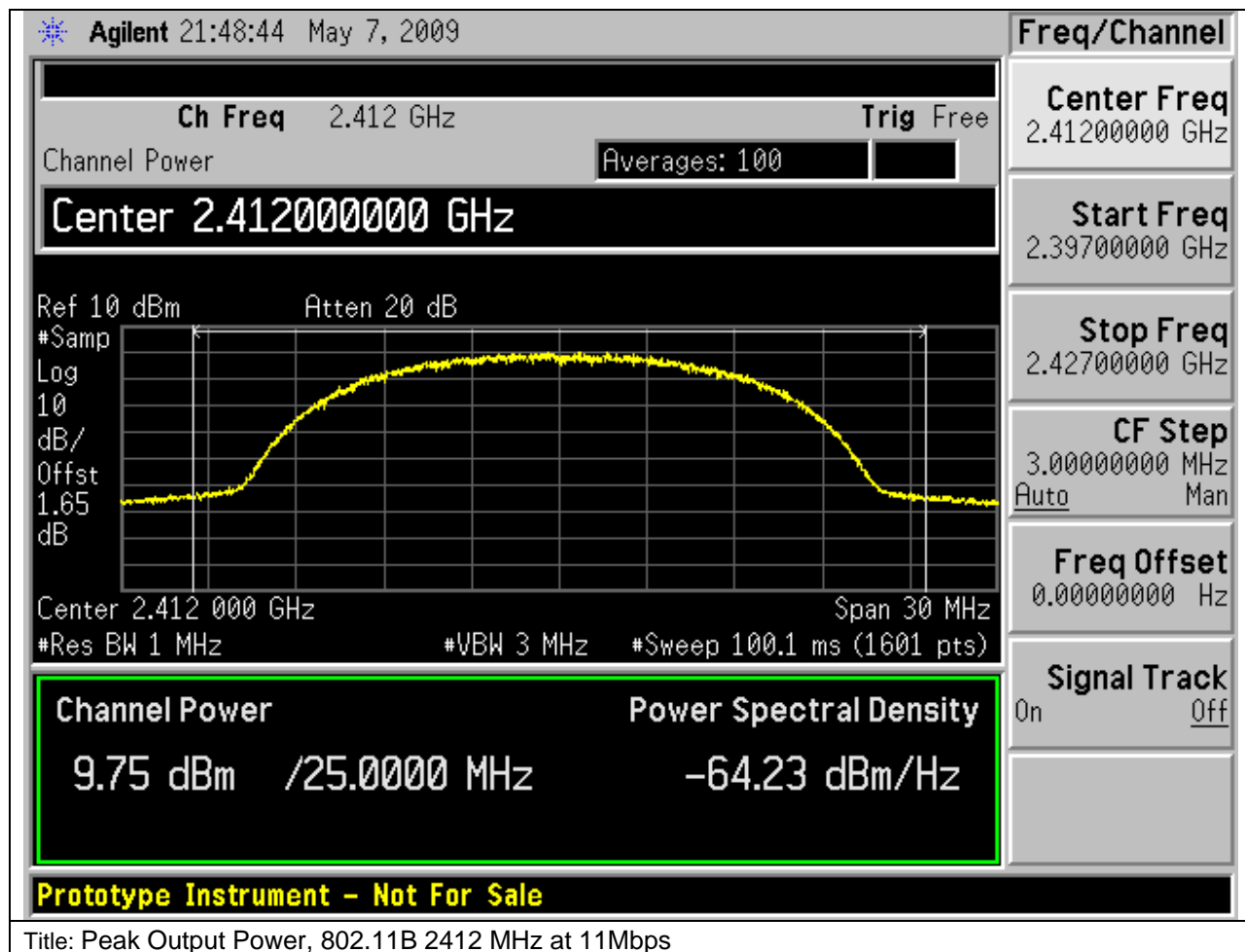
Peak Output Power

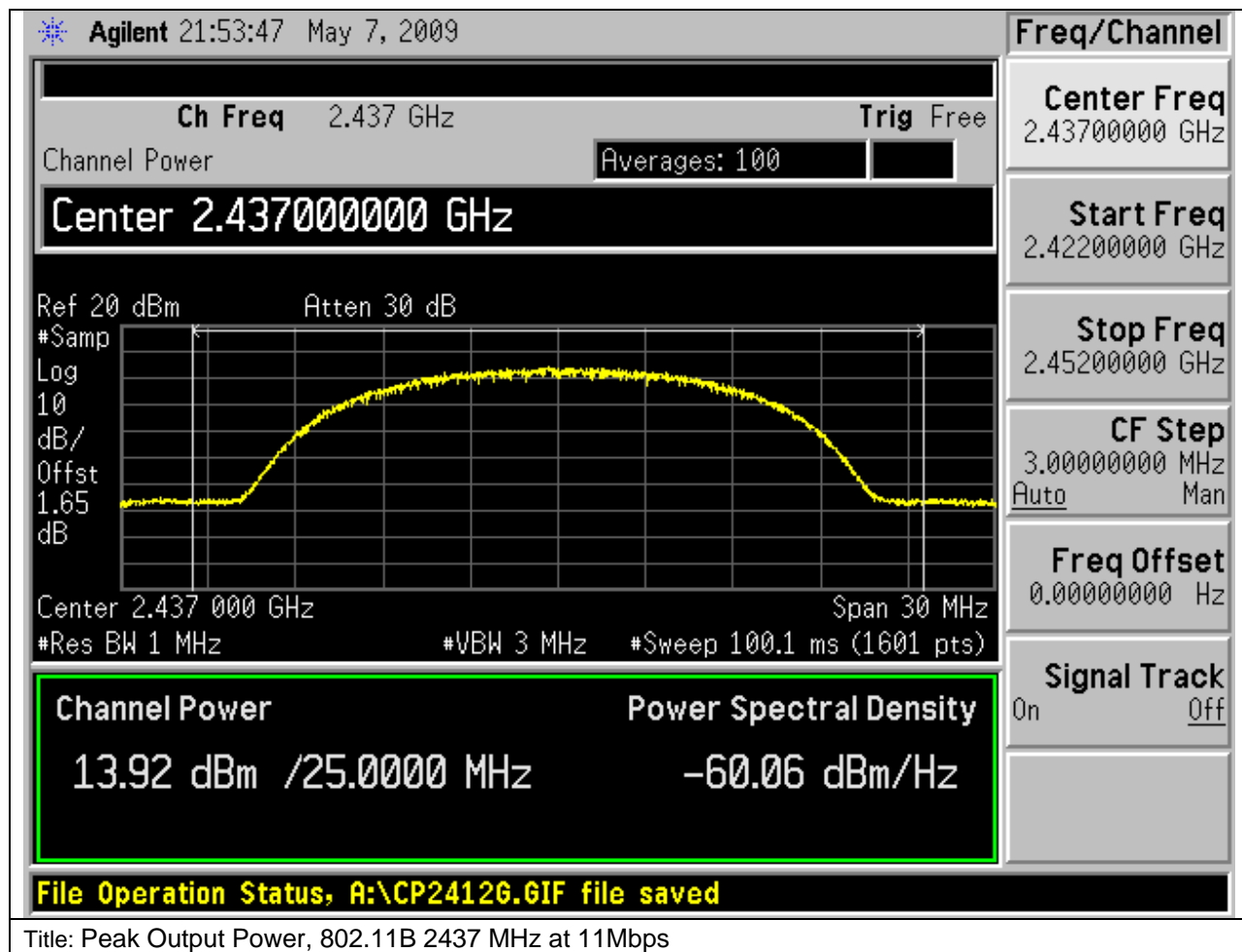
15.247 & RSS-210 A8.4:

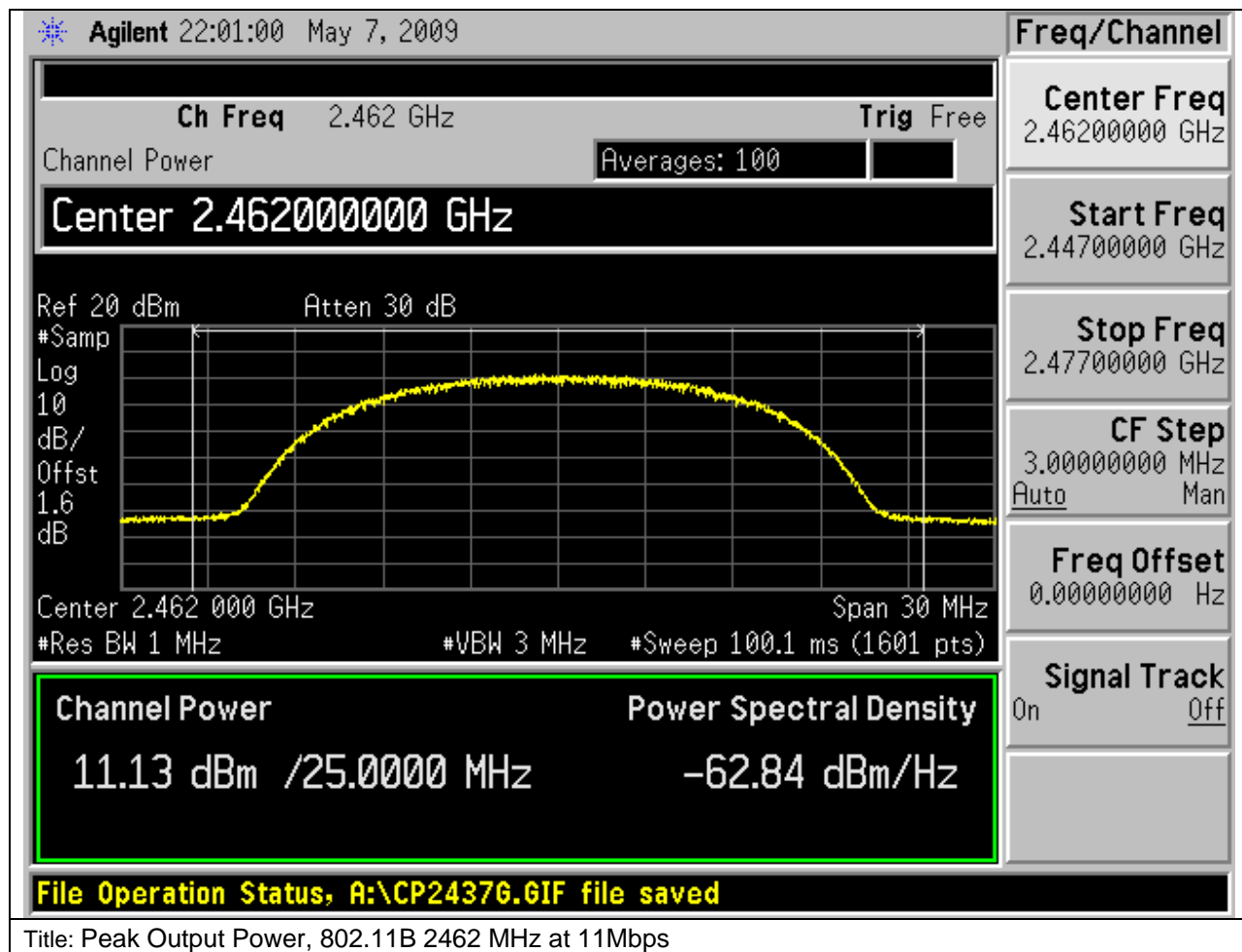
The maximum conducted output power of the intentional radiator for systems using digital modulation in the 2400-2483.5MHz band shall not exceed 1 Watt (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

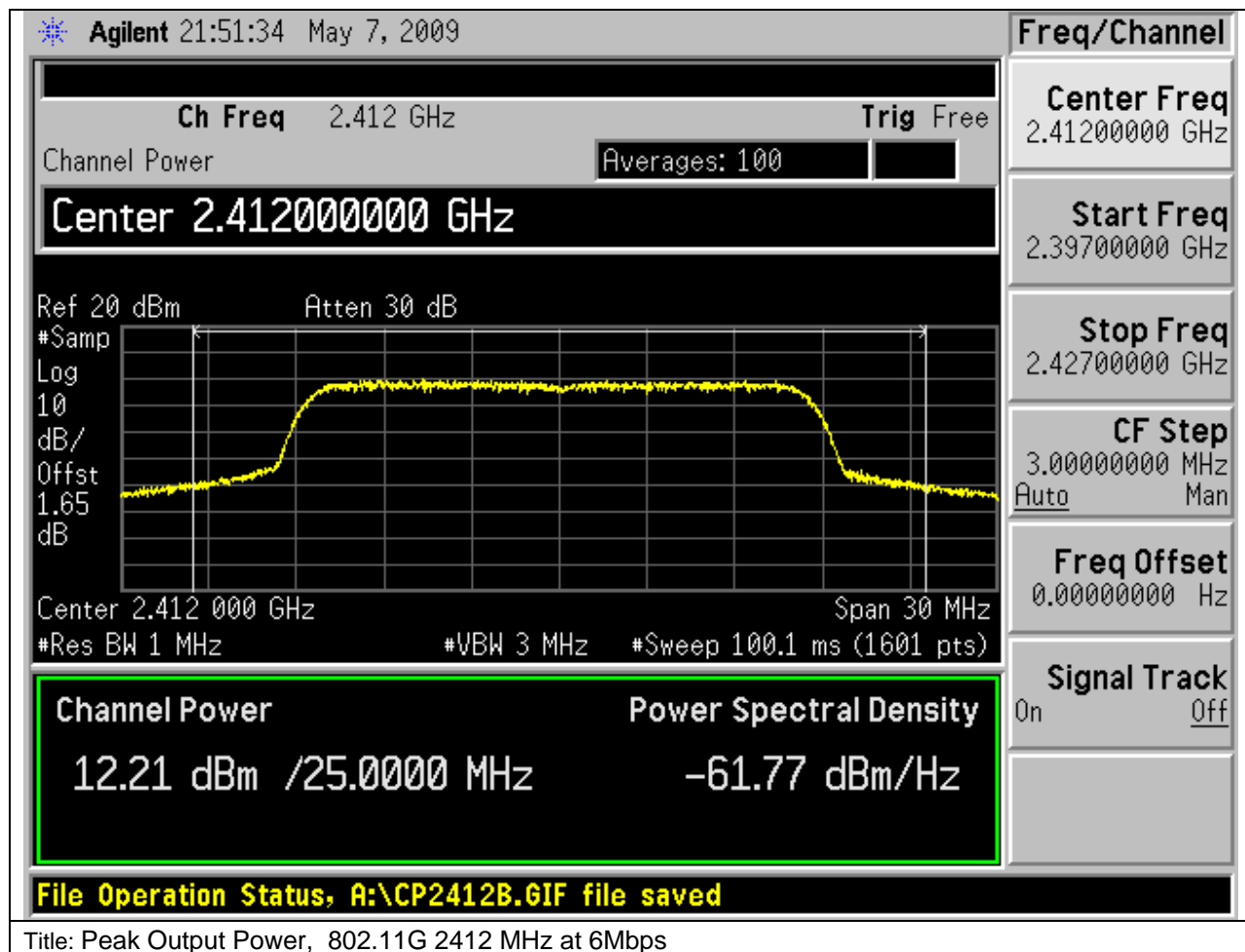
Frequency (MHz)	Data Rate (Mbps)	Peak Output Power (dBm)	Limit (dBm)	Margin (dB)
2412	11	9.75	30	-20.25
2437	11	13.92	30	-16.08
2462	11	11.13	30	-18.87
2412	6	12.21	30	-17.79
2437	6	16.24	30	-13.76
2462	6	13.52	30	-16.48

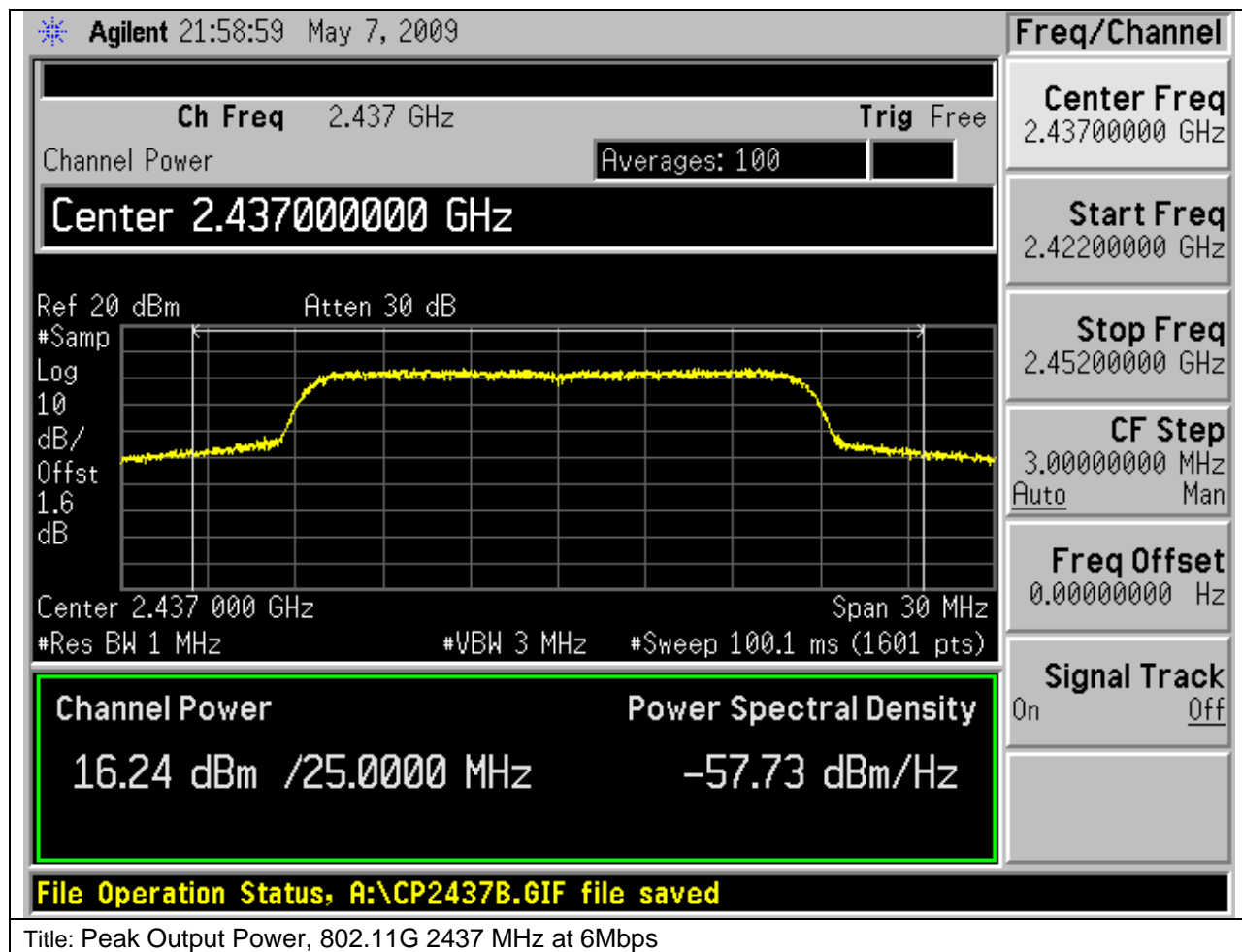
Measurement procedure as per KDB Publication No. 558074 power output option 1, peak power meter.

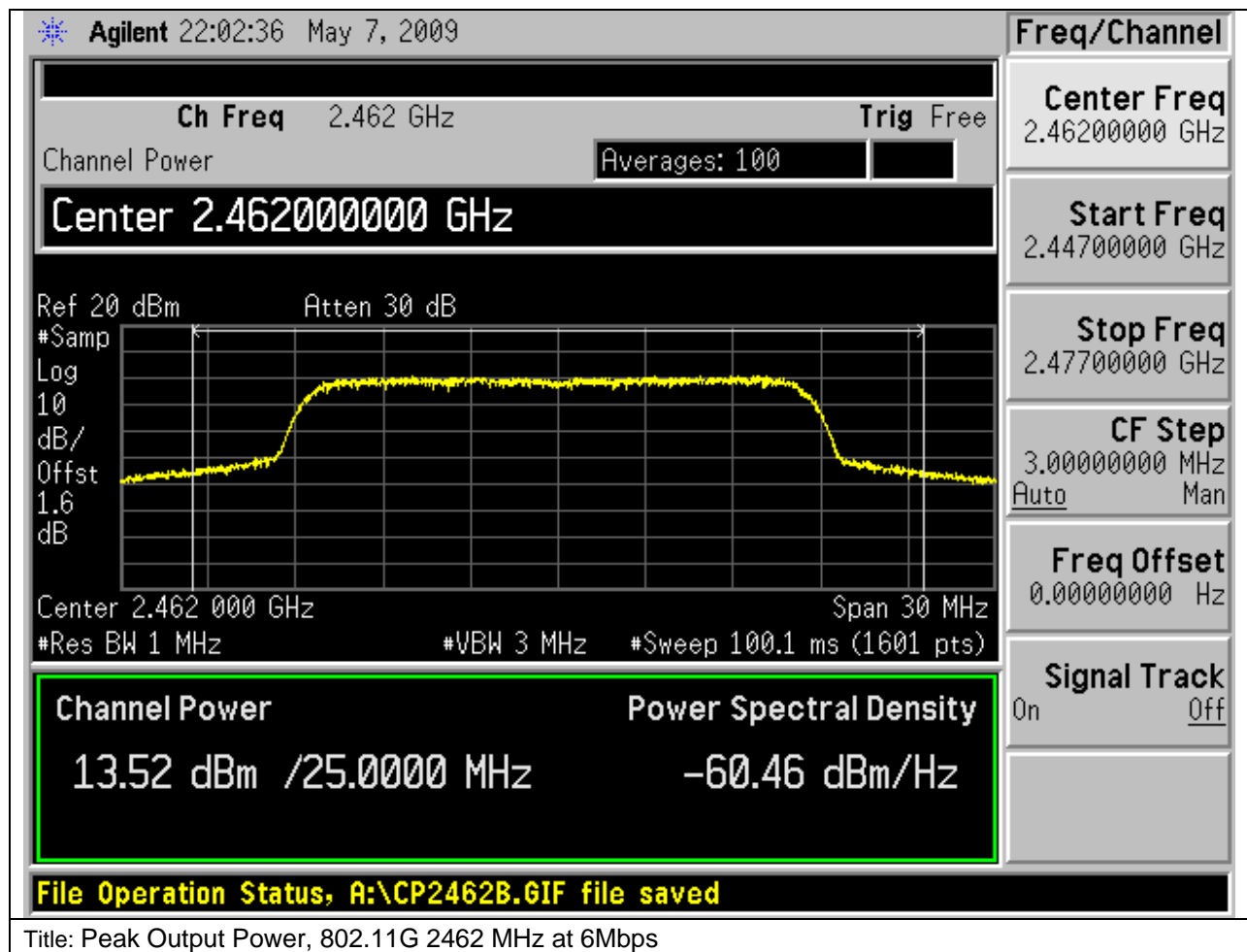














Power Spectral Density

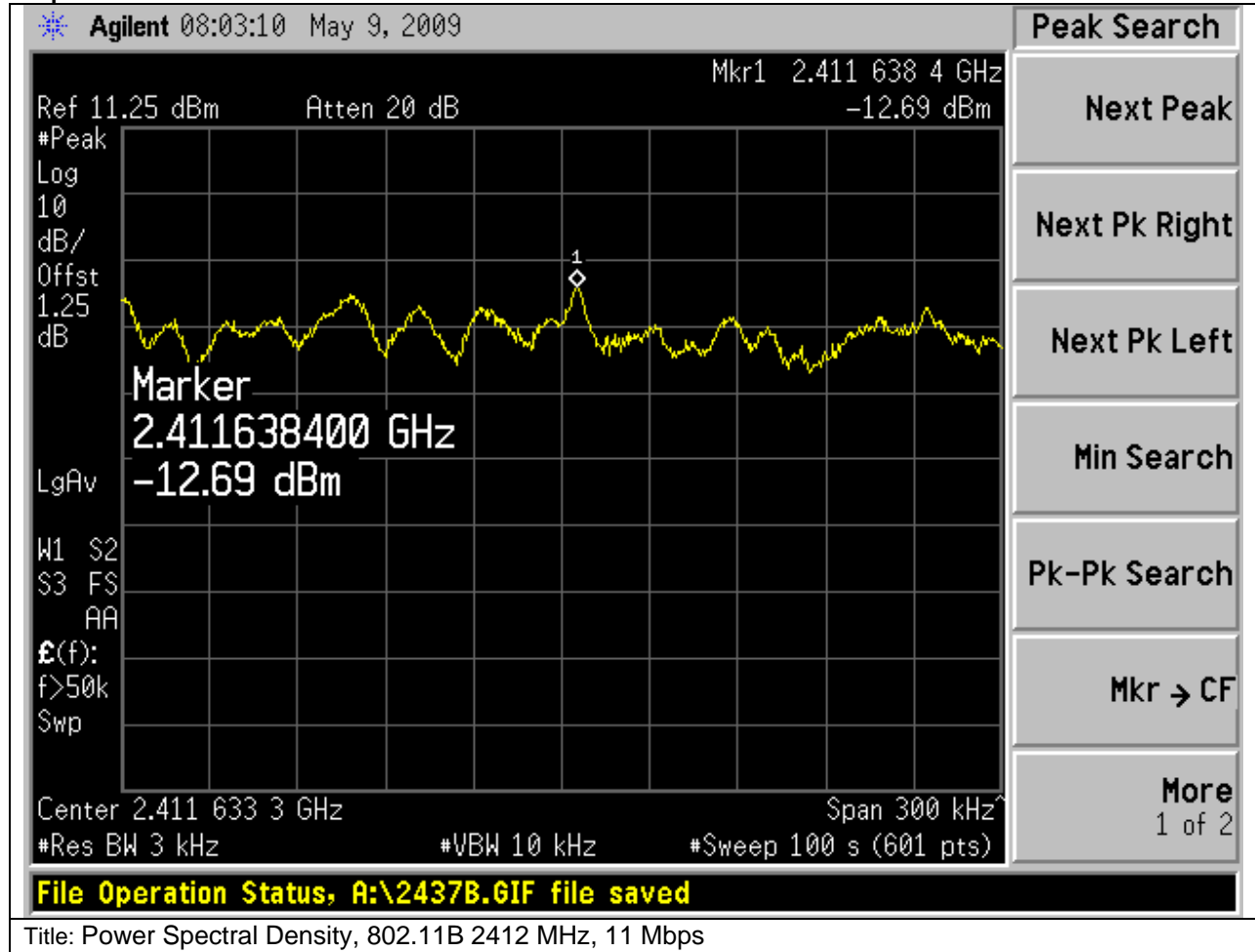
15.247 & RSS-210 A8.2:

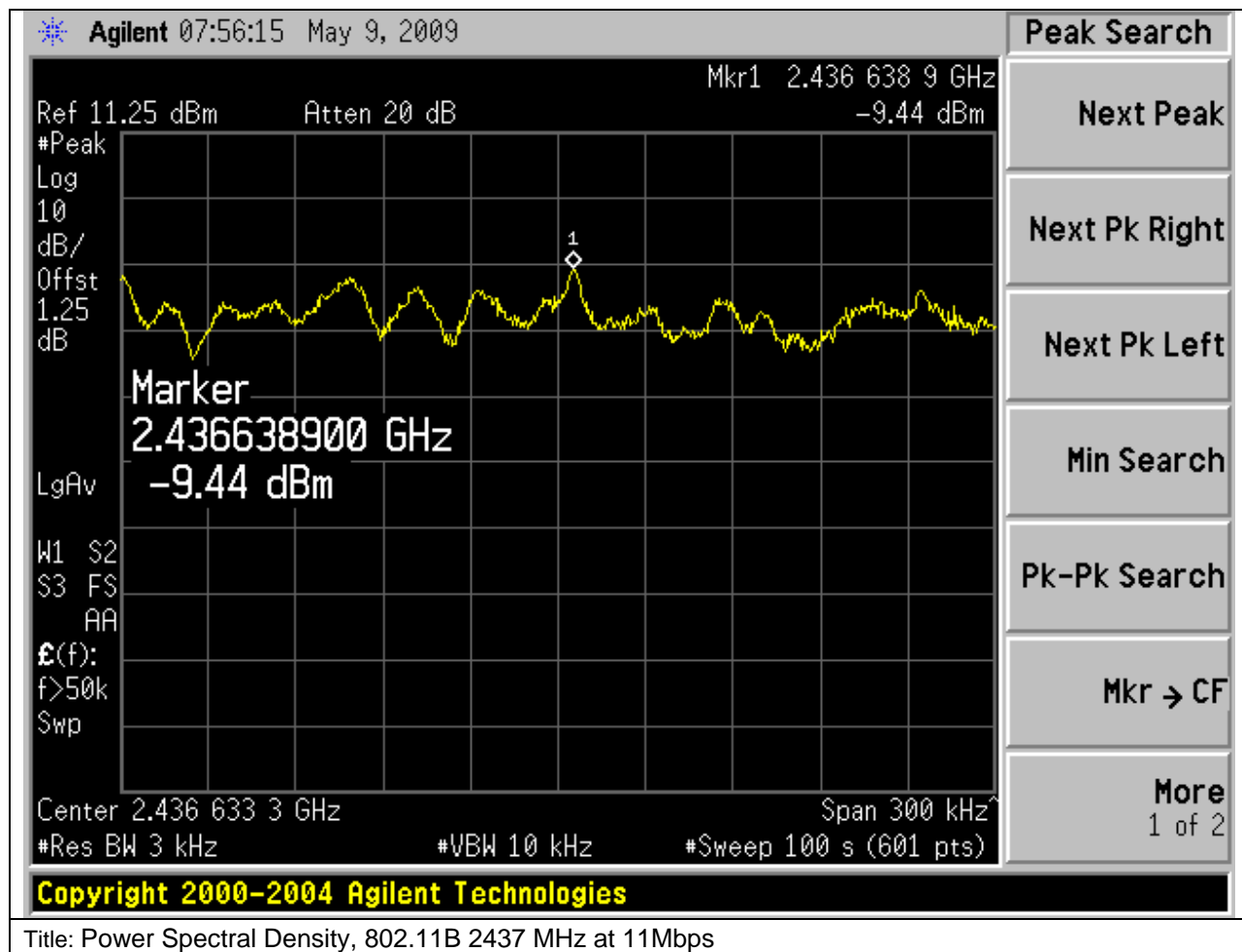
For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission

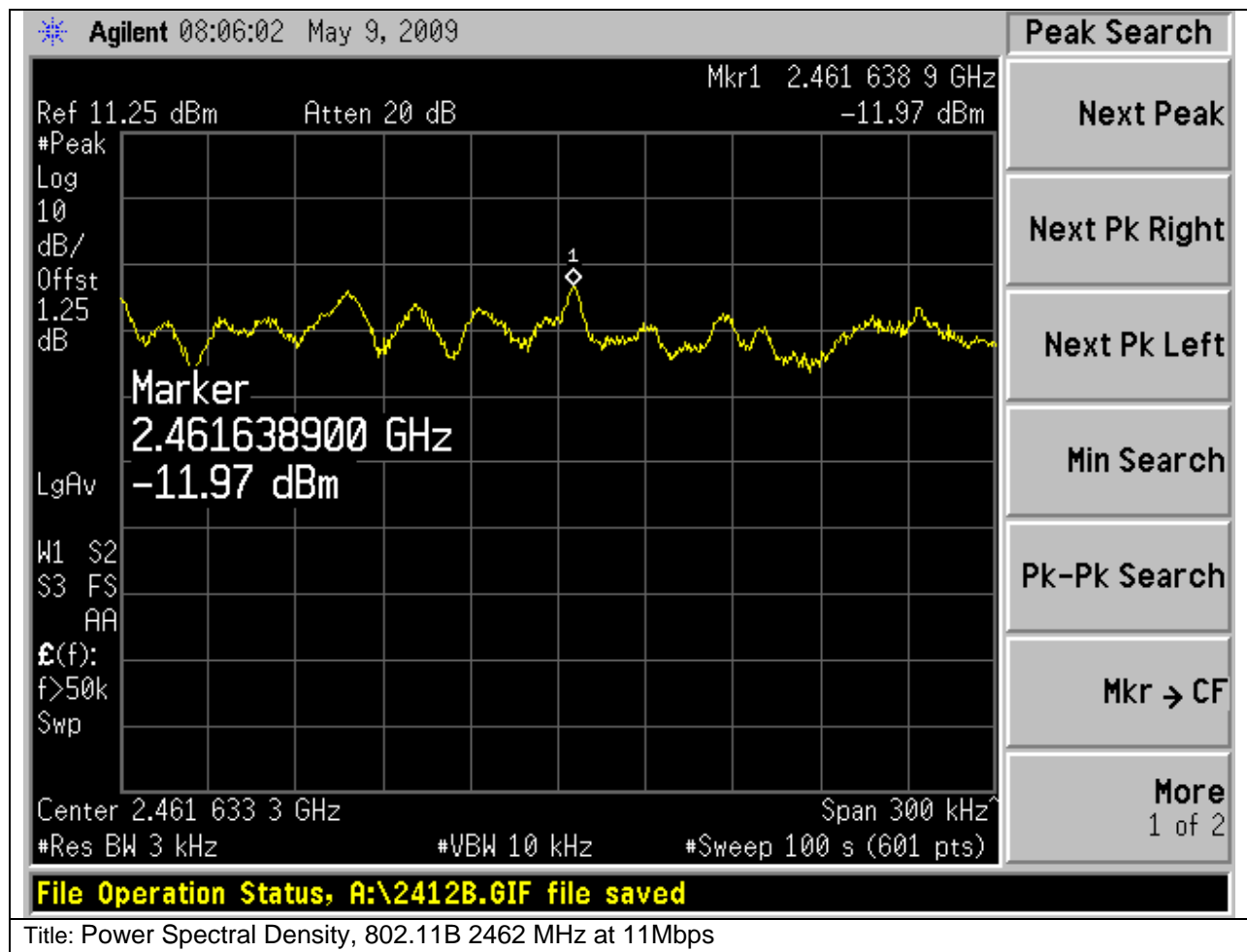
Frequency (MHz)	Data Rate (Mbps)	Peak Power Spectral Density (dBm/3kHz)	Limit (dBm)	Margin (dB)
2412	1	-12.69	8	-20.69
2437	1	-9.44	8	-17.44
2462	1	-11.97	8	-19.97
2412	6	-13.57	8	-21.57
2437	6	-10.63	8	-18.63
2462	6	-14.14	8	-22.14

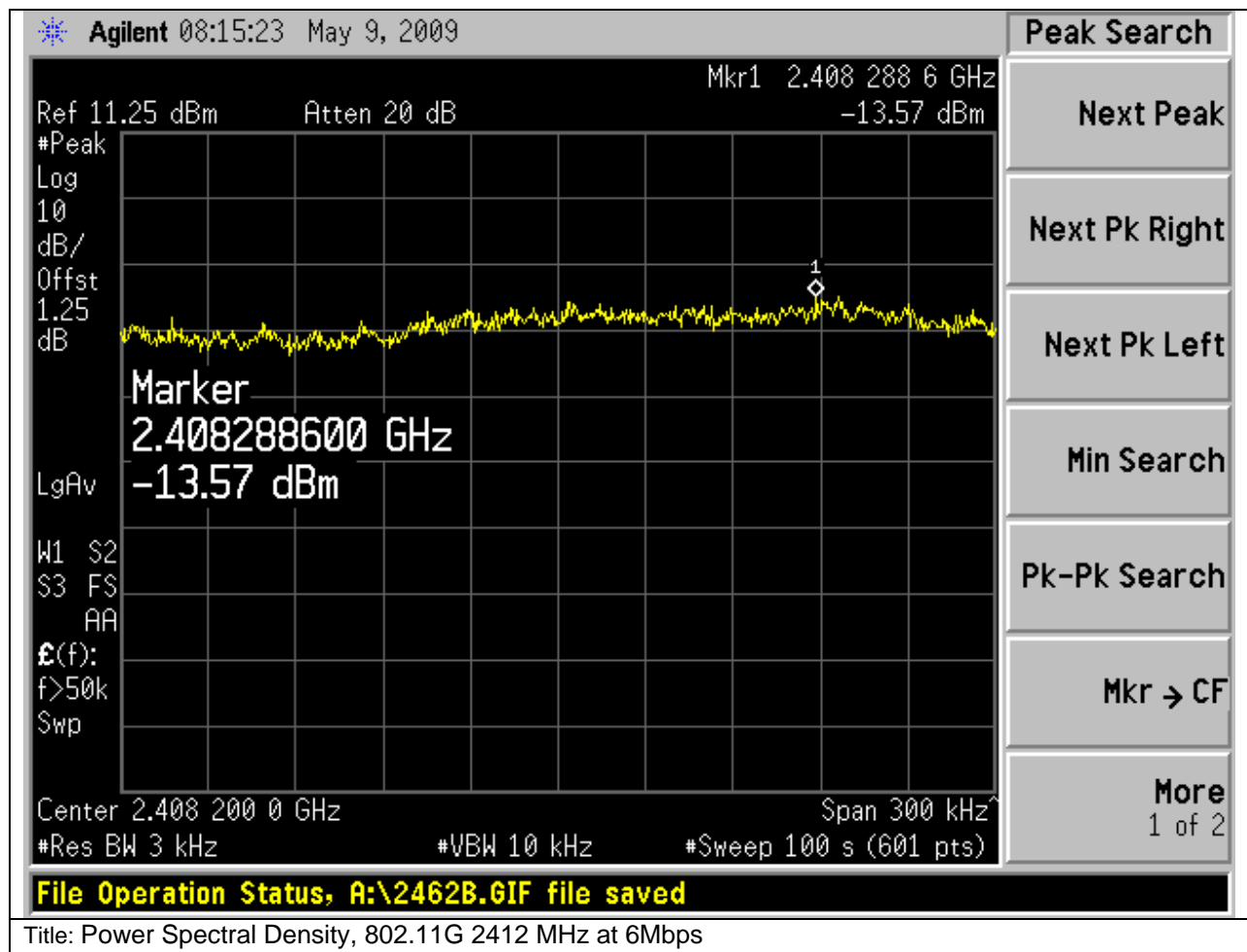


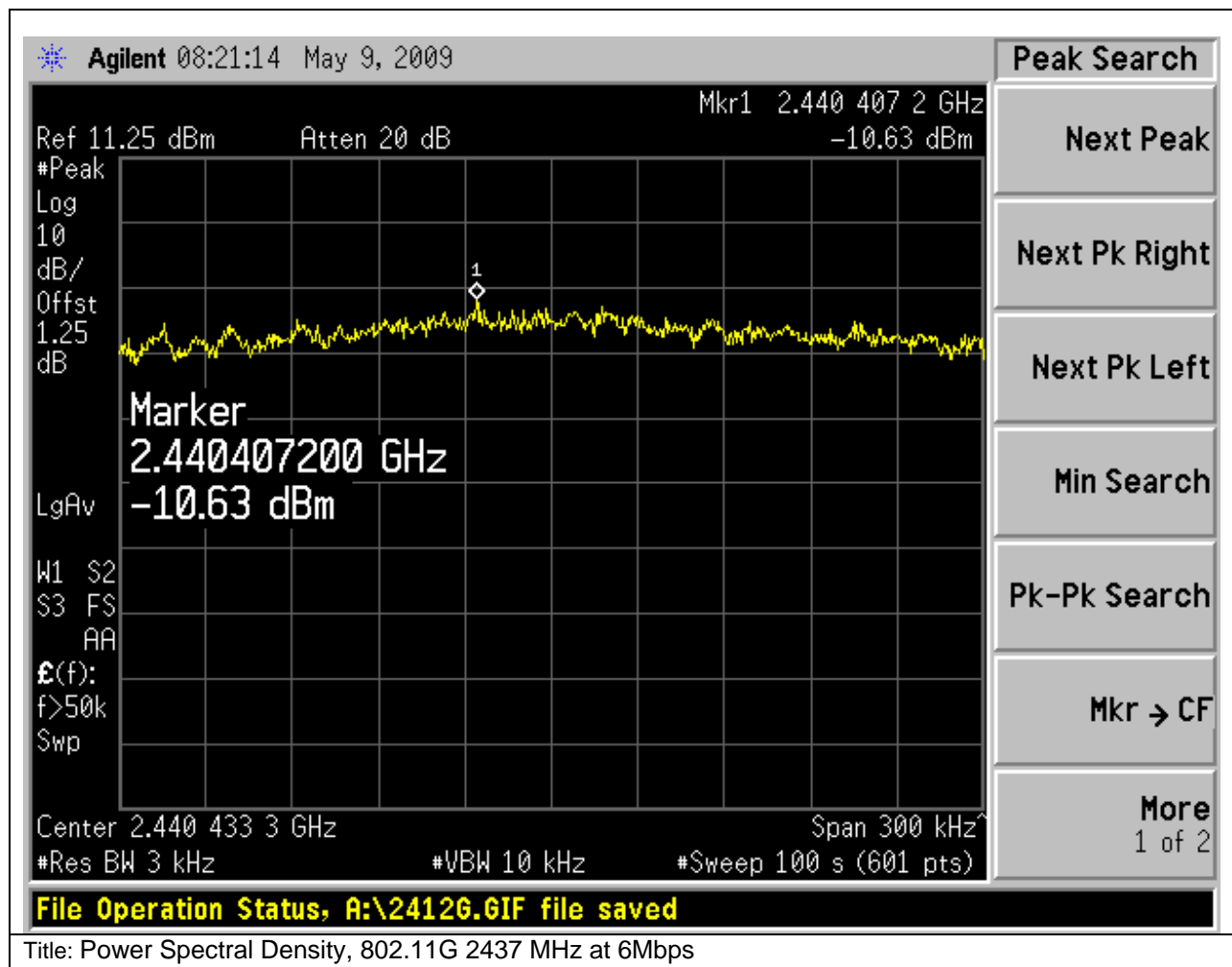
Graphical Test Results

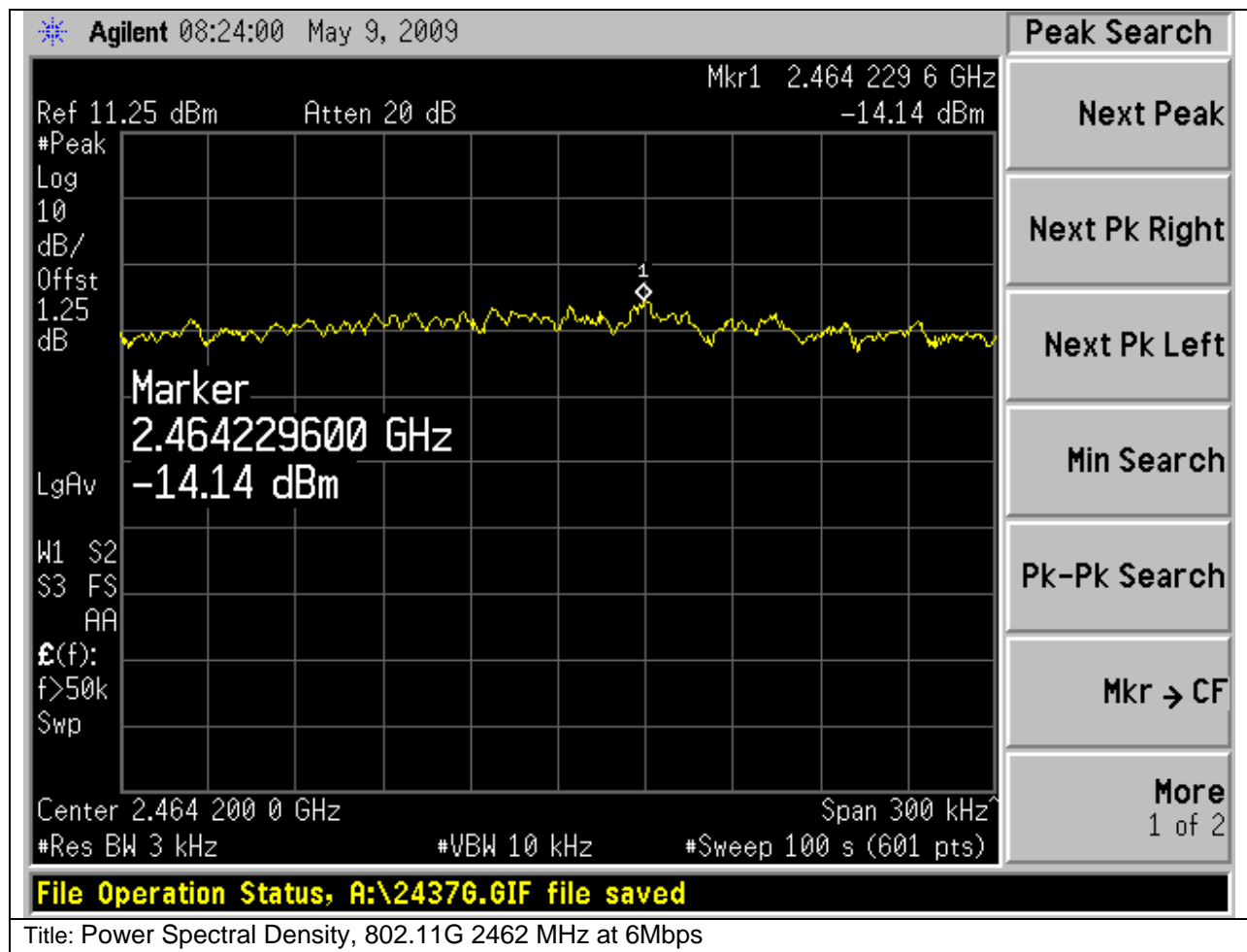










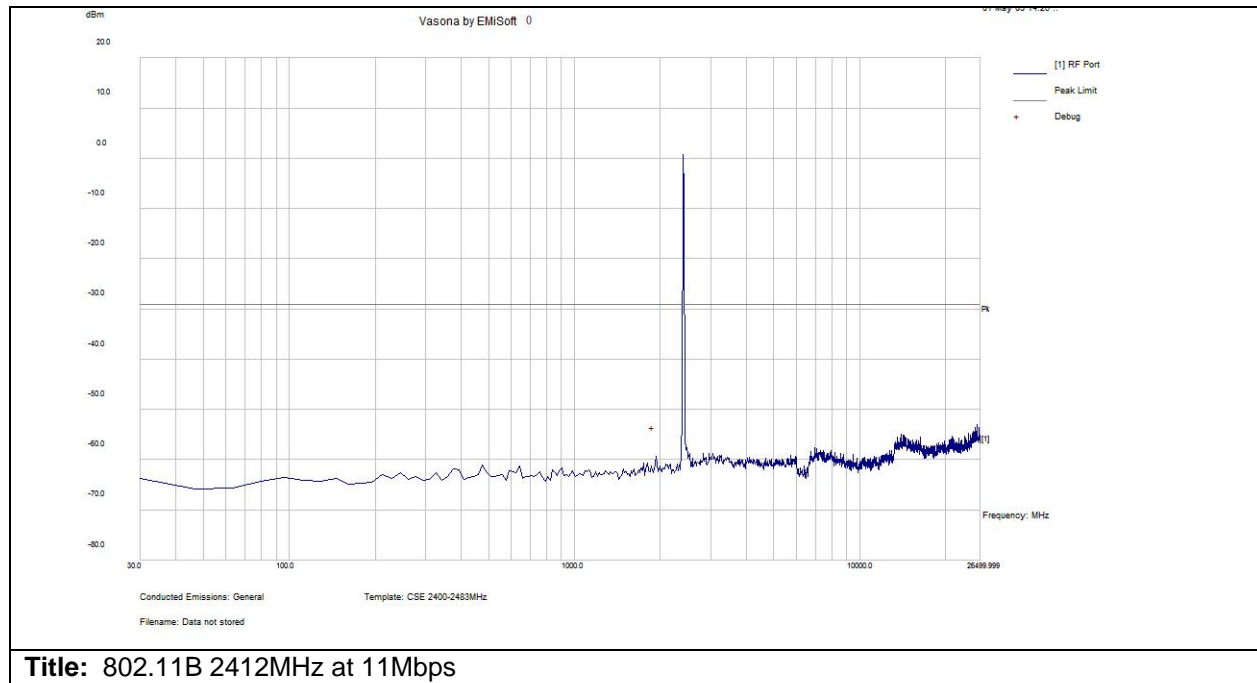


Conducted Spurious emissions

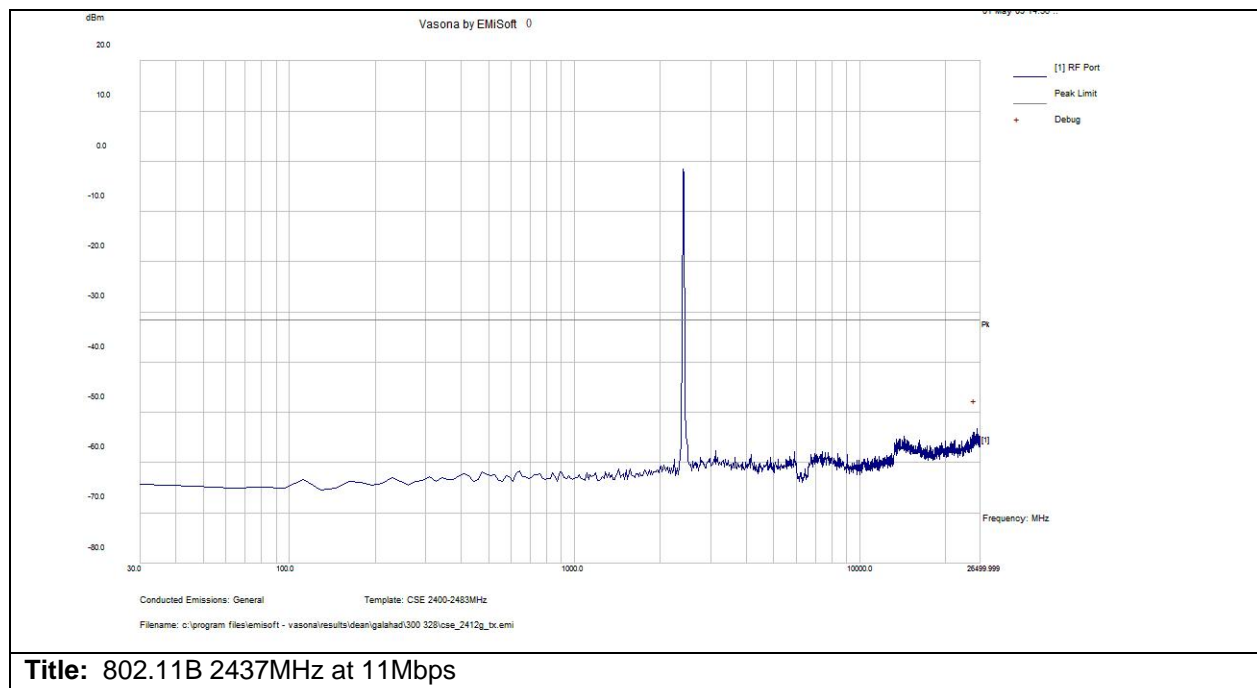
15.247 & RSS-210 A8.5:

In any 100 kHz bandwidth outside the frequency band in which the digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

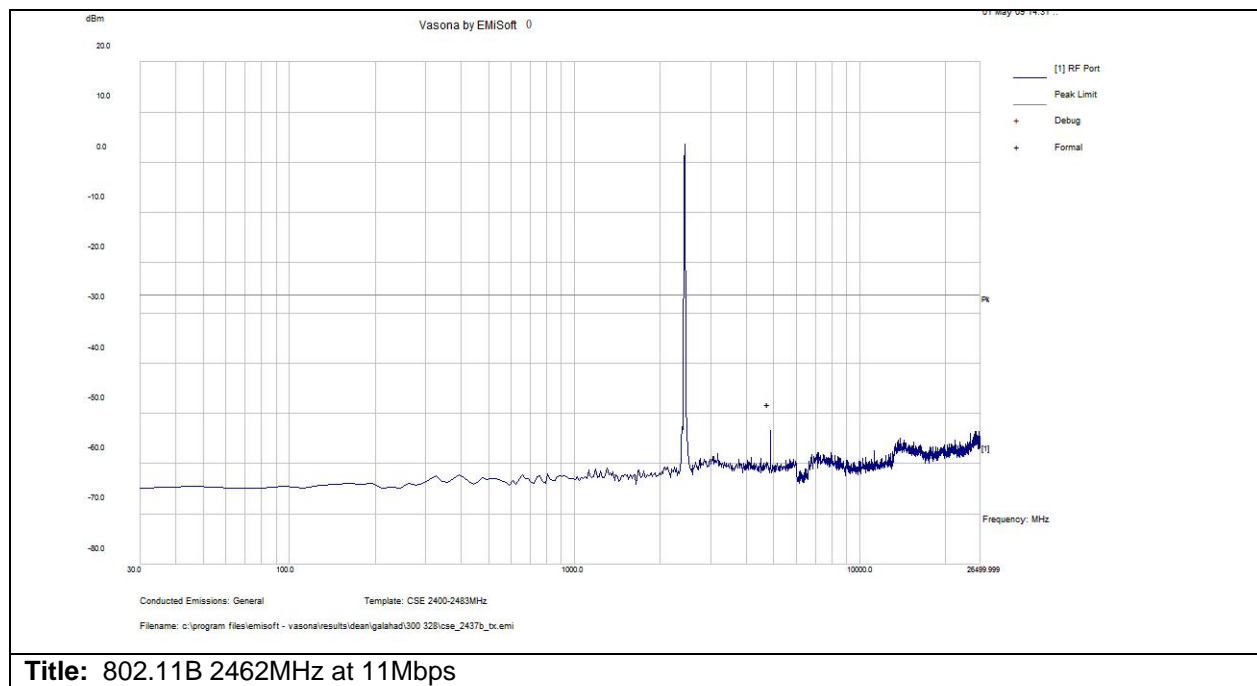
Test Results



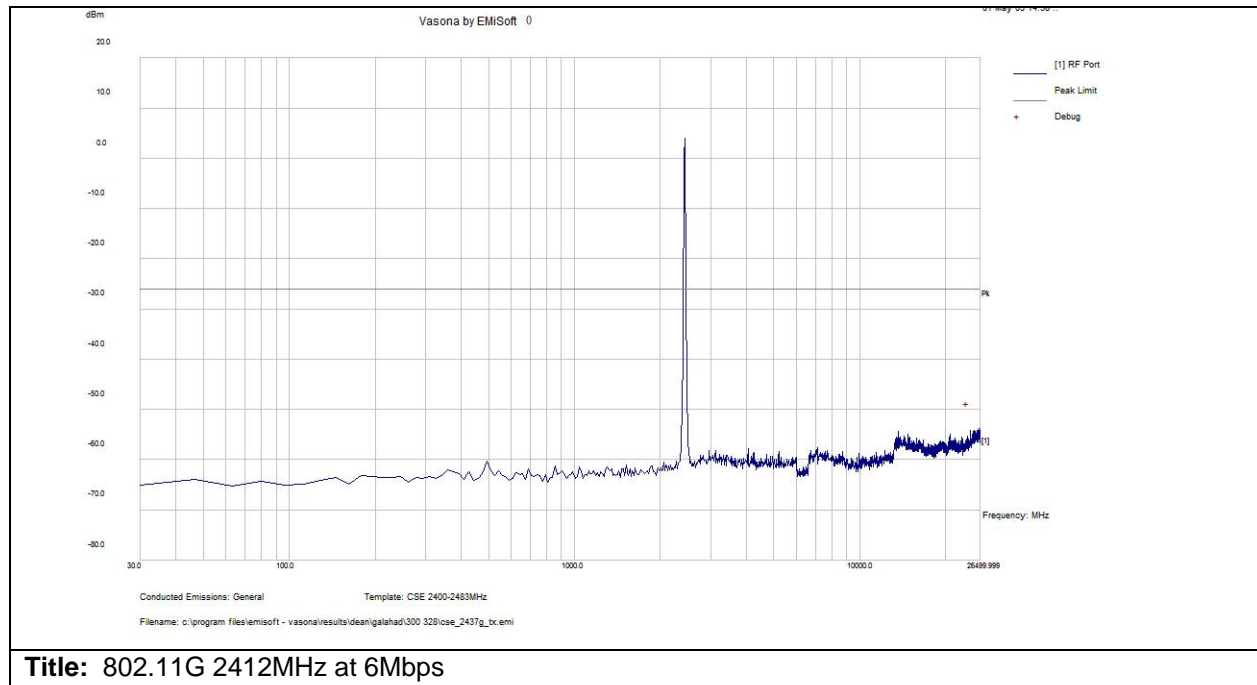
Comments: No Signals seen within 6dB of the Limit.



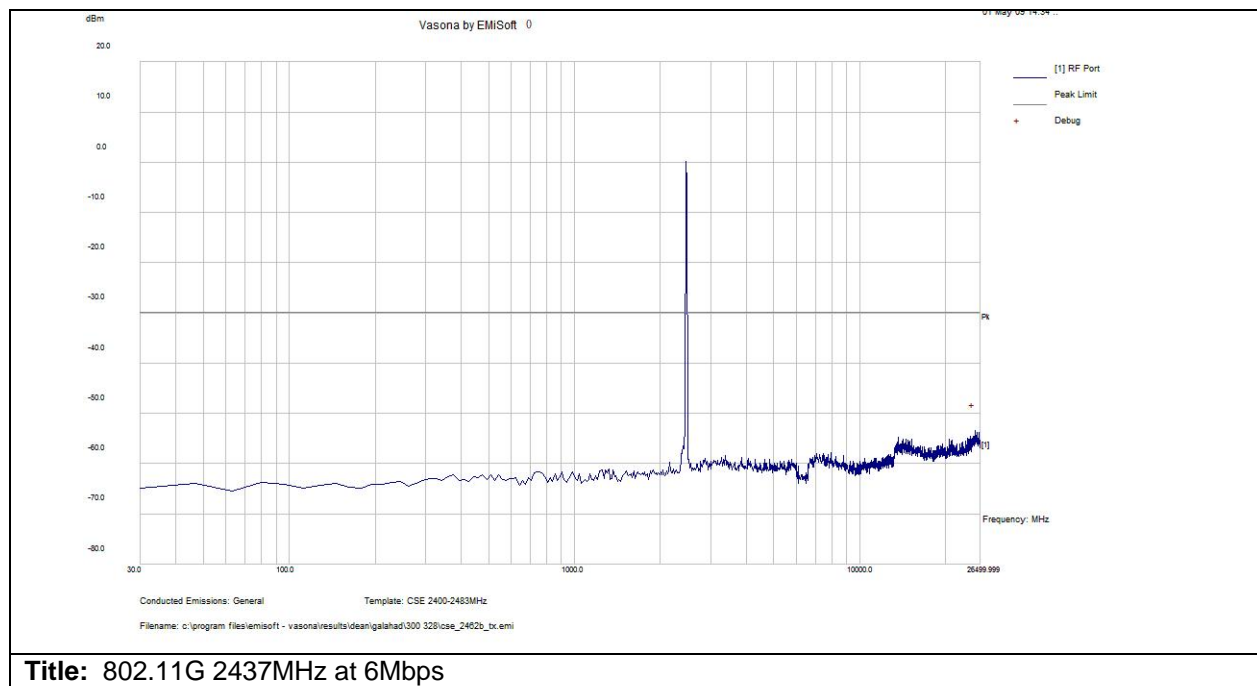
Comments: No Signals seen within 6dB of the Limit.



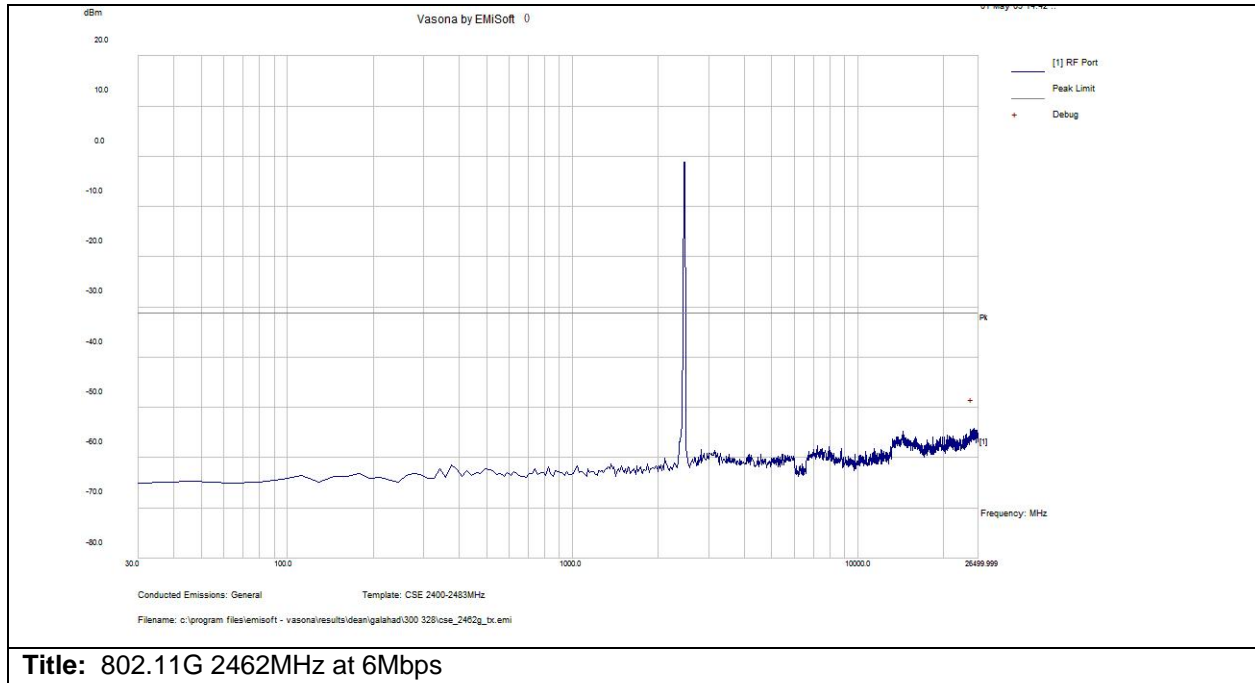
Comments: No Signals seen within 6dB of the Limit.



Comments: No Signals seen within 6dB of the Limit.

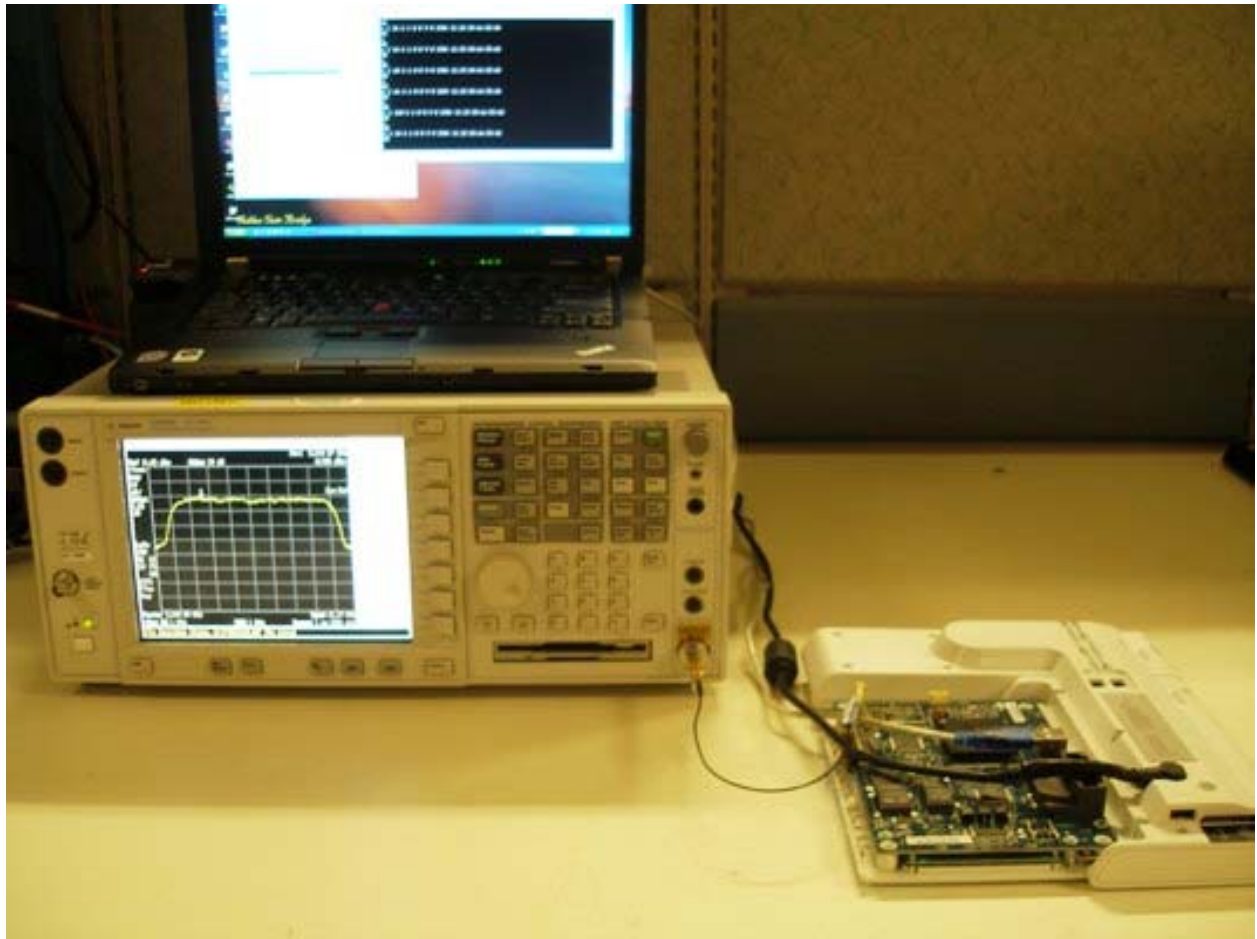


Comments: No Signals seen within 6dB of the Limit.



Comments: No Signals seen within 6dB of the Limit.

Physical Test arrangement Photograph:



Title: setup test Bench

Comments on the above Photograph:

No further comments



Radiated Spurious and Harmonics Emissions

15.205 & RSS-210 sec2.7:

Radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a).

Test Number: 35896 Spec ID: 647				
Basic Standard	Applied to	Class	Freq Range	Test Details / Comments
Radiated Spurious Emissions	Enclosure	B	30MHz - 26.5GHz	CFR47 Part 15.109CFR47 Part 15.247, RSS-210, LP0002 HKTA1039
Operating Mode	Mode : 1, 802.11B/G Test Mode			
Power Input	48, DC (+/-20%)			
Overall Result	Pass			
Comments	No further comments			
Deviation	There were no deviations from the specification			

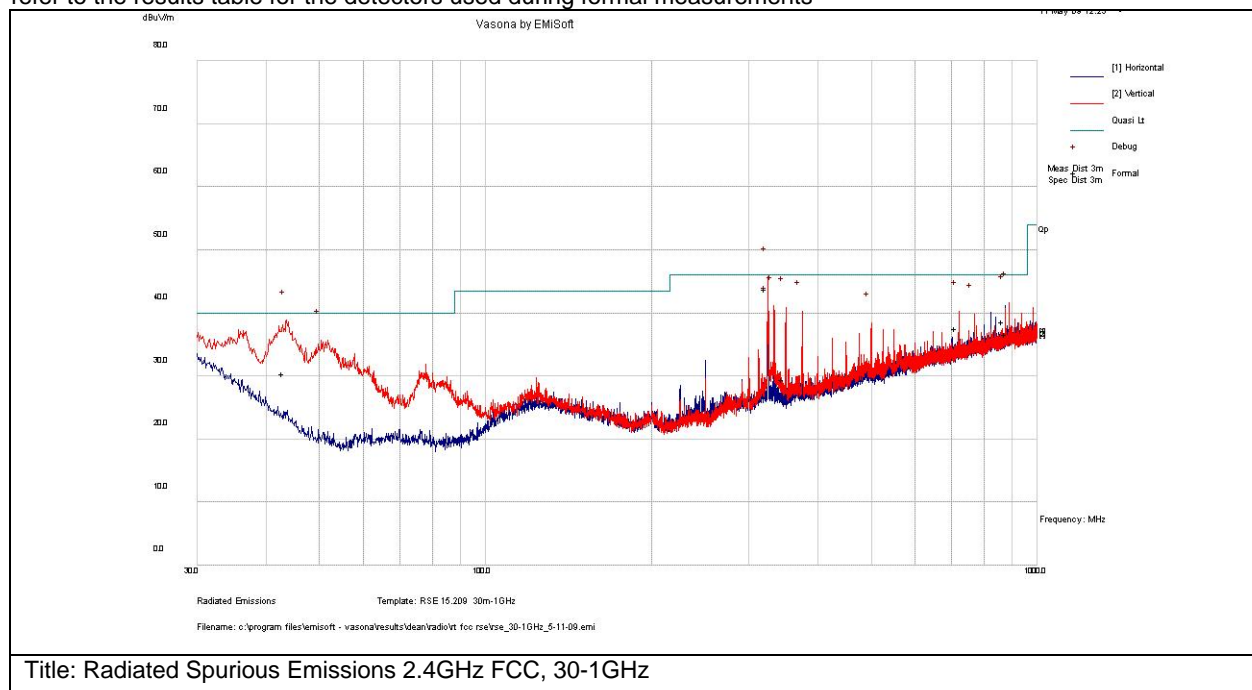
System Number	Description	Samples	System under test	Support equipment
1	WiFi Radio test sample	S01	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Subtest Number: 35896 - 1		Subtest Date: 13-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions		
Subtest Result	Pass		
Highest Frequency	1000.0		
Lowest Frequency	30.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	



Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

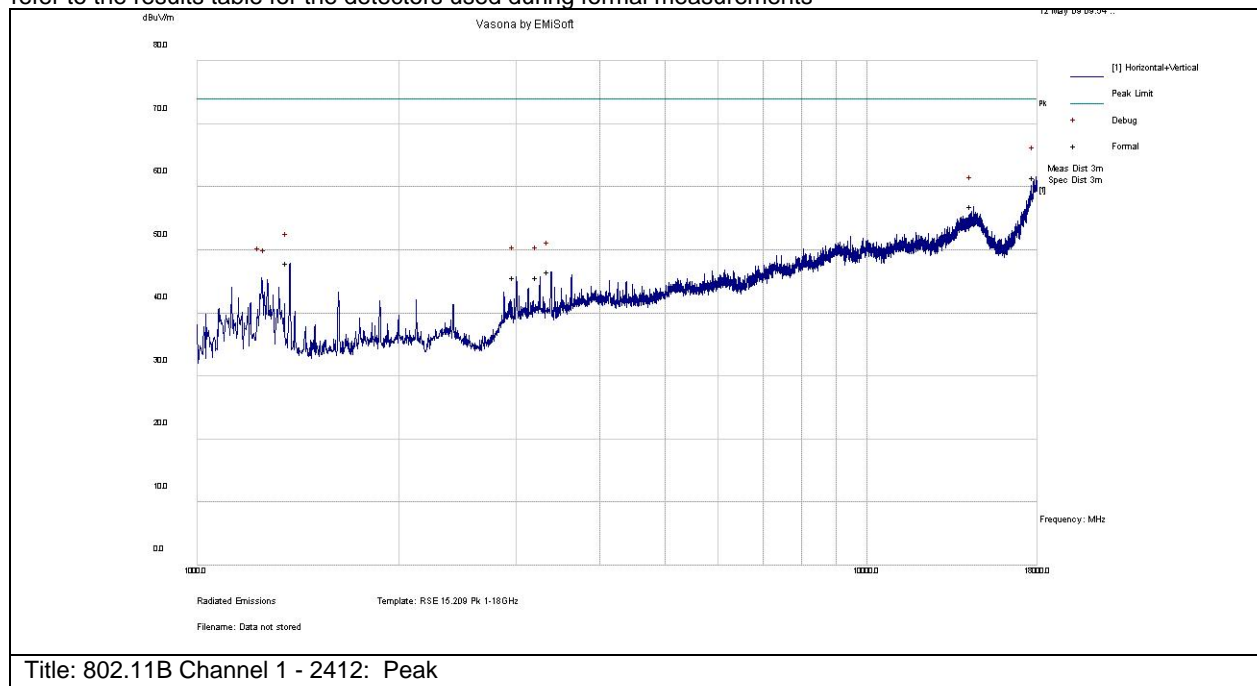
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
324.987	28.3	1.5	14	43.8	Qp	V	157	291	46	-2.2	Pass	
874.997	14.1	2.5	22	38.6	Qp	H	145	163	46	-7.4	Pass	
719.992	14.7	2.3	20.5	37.5	Qp	V	139	33	46	-8.5	Pass	
888.009	12	2.5	22.1	36.6	Qp	V	100	113	46	-9.4	Pass	
43.524	18.9	0.5	11	30.4	Qp	V	194	220	40	-9.6	Pass	
350.067	13.5	1.6	14.3	29.4	Qp	H	99	214	46	-16.6	Pass	



Subtest Number: 35896 - 2		Subtest Date: 26-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	802.11B Radiated Spurious Emissions		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
17939.021	37.4	12.4	11.8	61.6	NA	V	100	0	74	-12.4	Pass	
14473.799	39.4	11.2	6.3	56.9	NA	H	125	0	74	-17.1	Pass	
1376.482	52.6	3.2	-7.8	47.9	NA	V	100	0	74	-26.1	Pass	



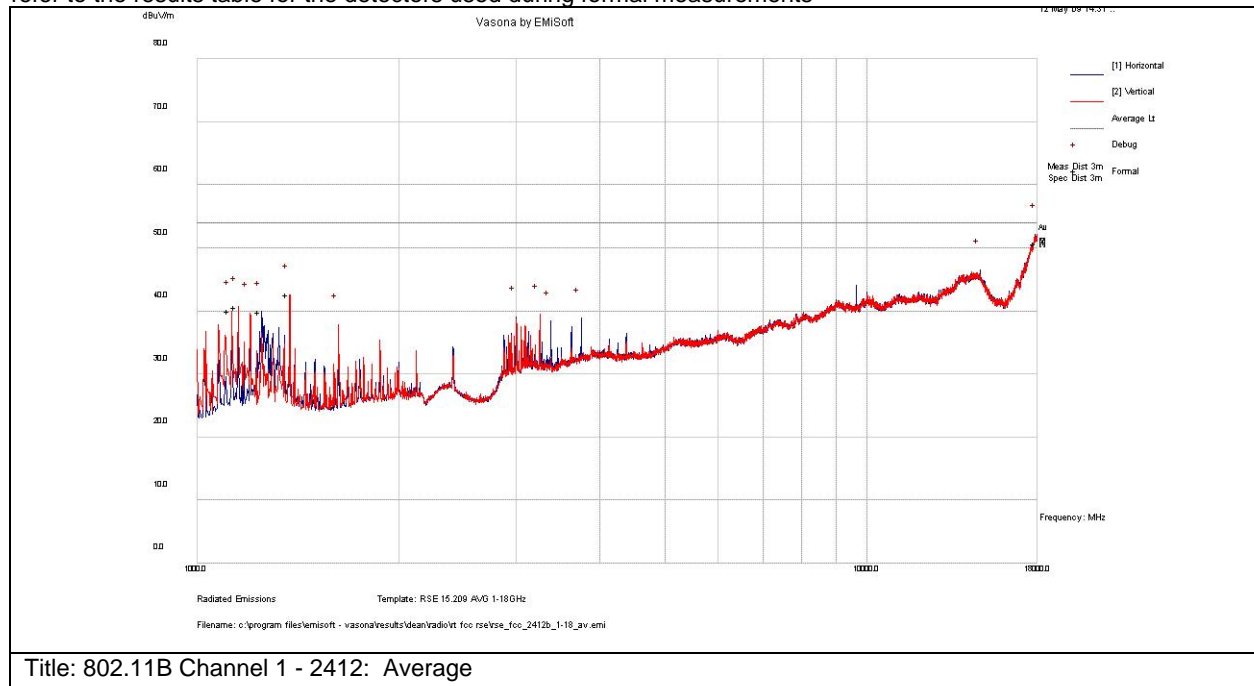
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
3380.848	45.9	5.1	-4.5	46.5	NA	H	100	0	74	-27.5	Pass	
3250.936	44.9	5	-4.2	45.7	NA	V	100	0	74	-28.3	Pass	
2999.064	45.5	4.8	-4.7	45.7	NA	H	100	0	74	-28.3	Pass	



Subtest Number: 35896 - 3		Subtest Date: 26-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions: 802.11B		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
17989.41	26.4	12.4	11.9	50.7	Av	H	99	0	54	-3.3	Pass	Noise Floor
1375.129	44.2	3.2	-7.8	39.5	Av	V	135	150	54	-14.5	Pass	
1124.783	40.6	2.9	-8.4	35	Av	V	137	186	54	-19	Pass	



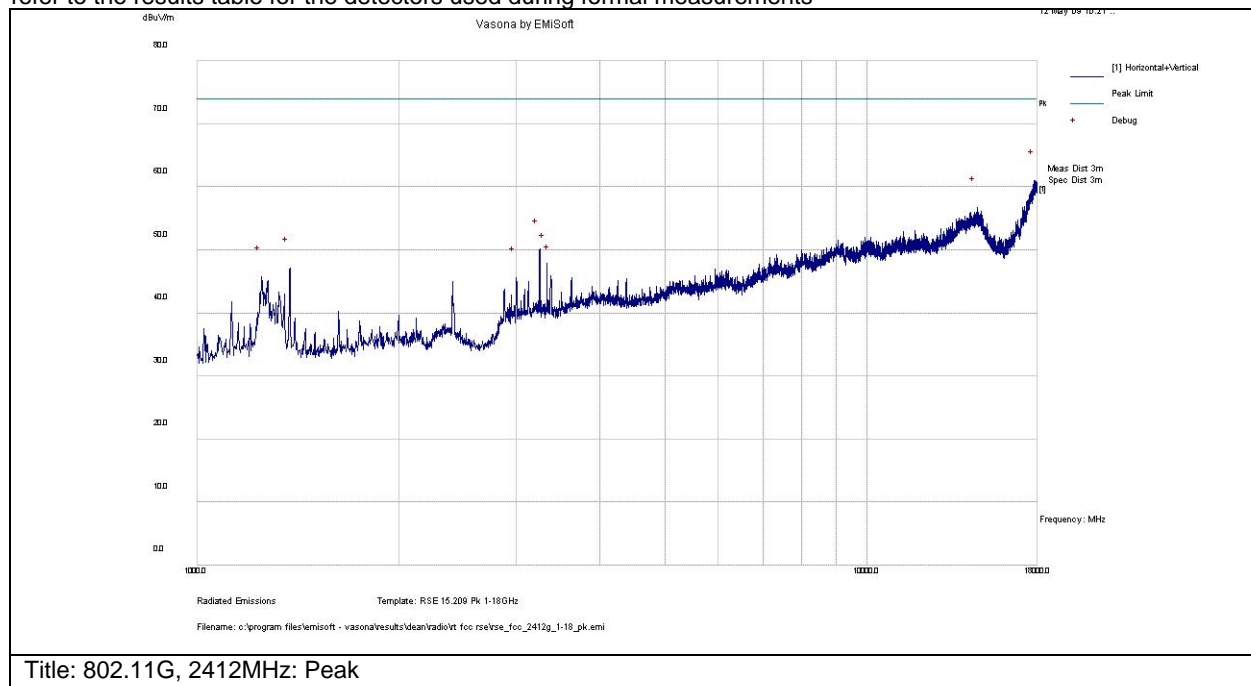
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1249.93	39.2	3	-8	34.3	Av	V	127	170	54	-19.7	Pass	
1152.104	39.6	2.9	-8.3	34.2	Av	V	137	134	54	-19.8	Pass	
1199.964	35.8	3	-8.2	30.6	Av	V	128	133	54	-23.4	Pass	



Subtest Number: 35896 - 4		Subtest Date: 26-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions: 802.11G		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Test Results Table

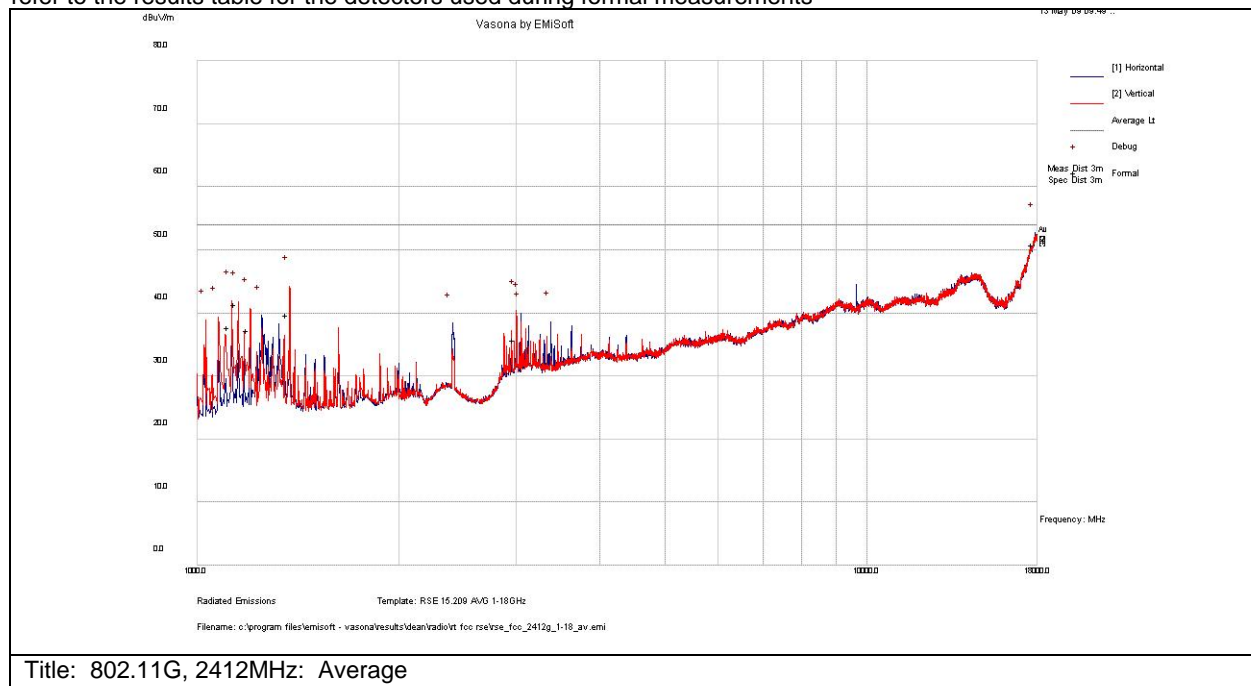
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
17867.436	37.2	12.3	11.6	61	NA	H	125	0	74	-13	Pass	
14638.178	39.7	11.2	5.8	56.7	NA	V	100	0	74	-17.3	Pass	
3250.936	49.3	5	-4.2	50.1	NA	V	125	0	74	-23.9	Pass	
3327.823	47	5.1	-4.4	47.8	NA	V	125	0	74	-26.2	Pass	
1376.482	51.8	3.2	-7.8	47.2	NA	V	100	0	74	-26.8	Pass	
3378.197	45.3	5.1	-4.5	45.9	NA	V	100	0	74	-28.1	Pass	



Subtest Number: 35896 - 5		Subtest Date: 26-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions: 802.11G		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Test Results Table

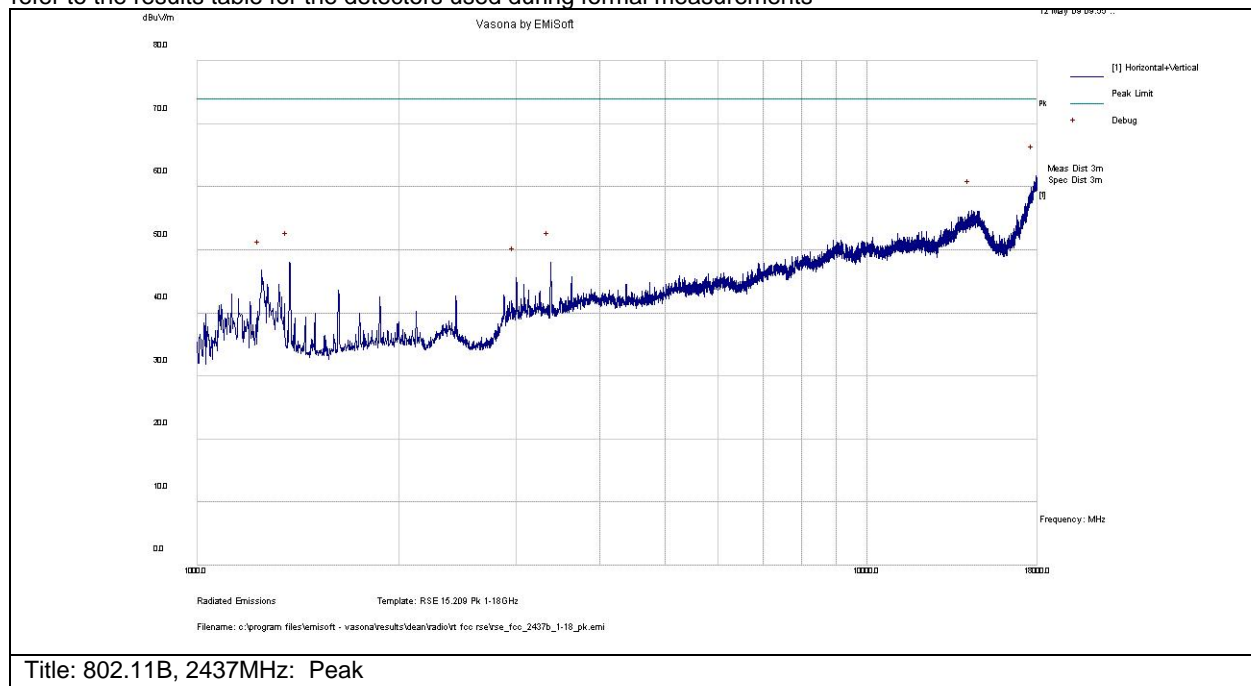
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
17874.611	26.9	12.3	11.6	50.8	Av	H	194	203	54	-3.2	Pass	Noise Floor
1151.974	46.8	2.9	-8.3	41.4	Av	V	107	11	54	-12.6	Pass	
1374.81	44.4	3.2	-7.8	39.7	Av	V	109	153	54	-14.3	Pass	
1125.055	43.2	2.9	-8.4	37.7	Av	V	134	161	54	-16.3	Pass	
1199.985	42.5	3	-8.2	37.3	Av	V	109	-1	54	-16.7	Pass	
2999.672	35.5	4.8	-4.7	35.7	Av	V	152	170	54	-18.3	Pass	



Subtest Number: 35896 - 6		Subtest Date: 26-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions: 802.11B		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Test Results Table

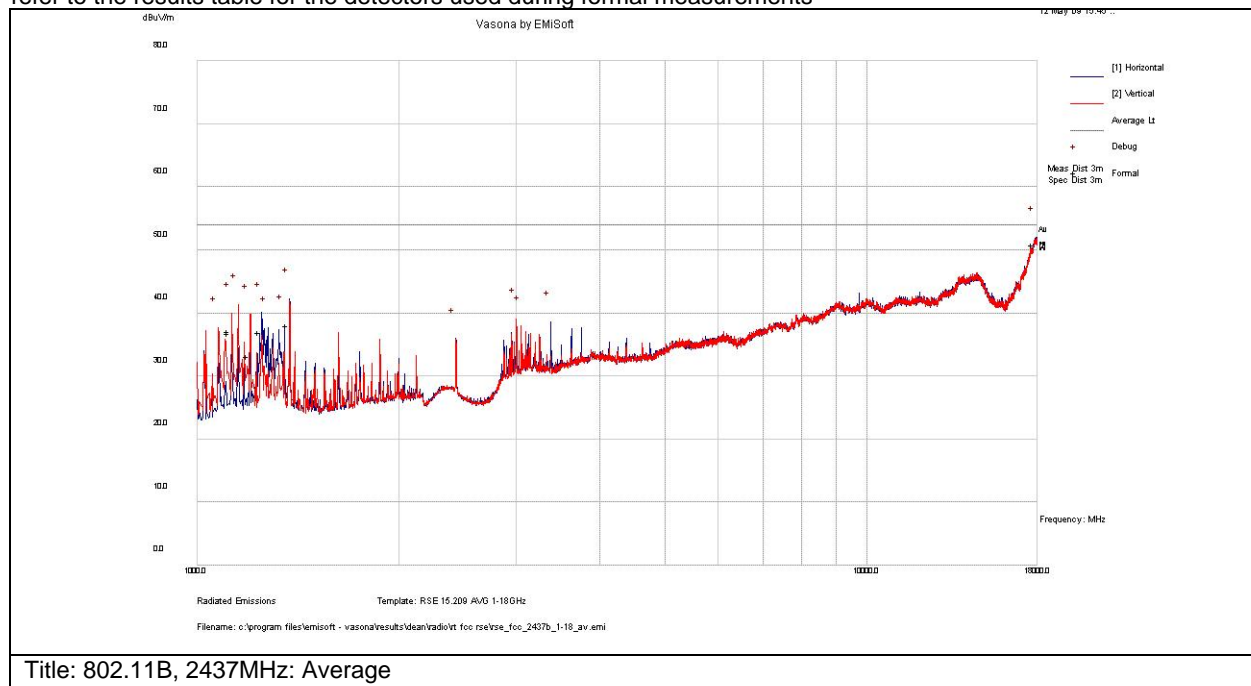
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
17907.205	37.7	12.4	11.7	61.8	NA	H	100	0	74	-12.2	Pass	
14357.143	38.7	11	6.5	56.2	NA	H	100	0	74	-17.8	Pass	
3378.197	47.4	5.1	-4.5	48	NA	H	100	0	74	-26	Pass	
1373.83	52.7	3.2	-7.8	48	NA	H	100	0	74	-26	Pass	
1249.22	51.7	3	-8	46.8	NA	H	100	0	74	-27.2	Pass	
2999.064	45.4	4.8	-4.7	45.6	NA	H	100	0	74	-28.4	Pass	



Subtest Number: 35896 - 7		Subtest Date: 26-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions: 802.11B		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Test Results Table

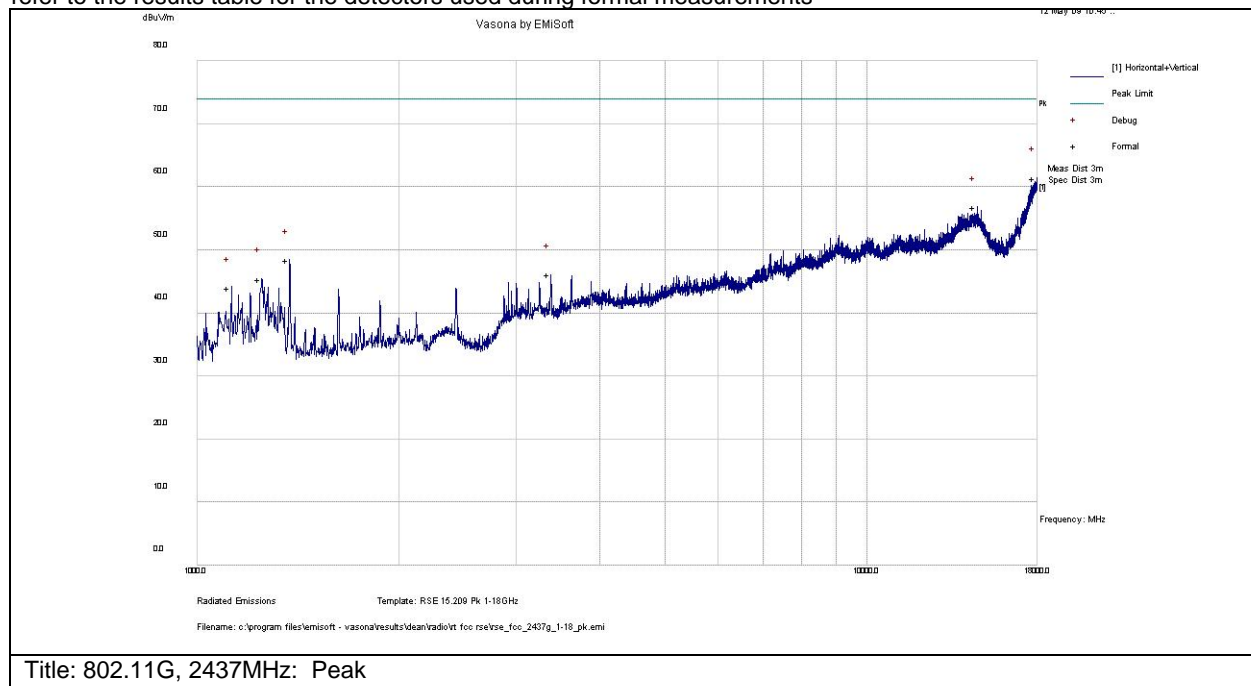
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
17908.327	26.8	12.4	11.7	50.8	Av	H	122	339	54	-3.2	Pass	Noise Floor
1375.258	42.6	3.2	-7.8	38	Av	H	133	234	54	-16	Pass	
1124.921	42.6	2.9	-8.4	37.1	Av	V	146	194	54	-16.9	Pass	
1249.905	41.8	3	-8	36.9	Av	H	148	231	54	-17.1	Pass	
1124.97	42.4	2.9	-8.4	36.8	Av	V	133	209	54	-17.2	Pass	
1200.022	38.3	3	-8.2	33.1	Av	V	125	361	54	-20.9	Pass	



Subtest Number: 35896 - 8		Subtest Date: 26-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions: 802.11G		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Test Results Table

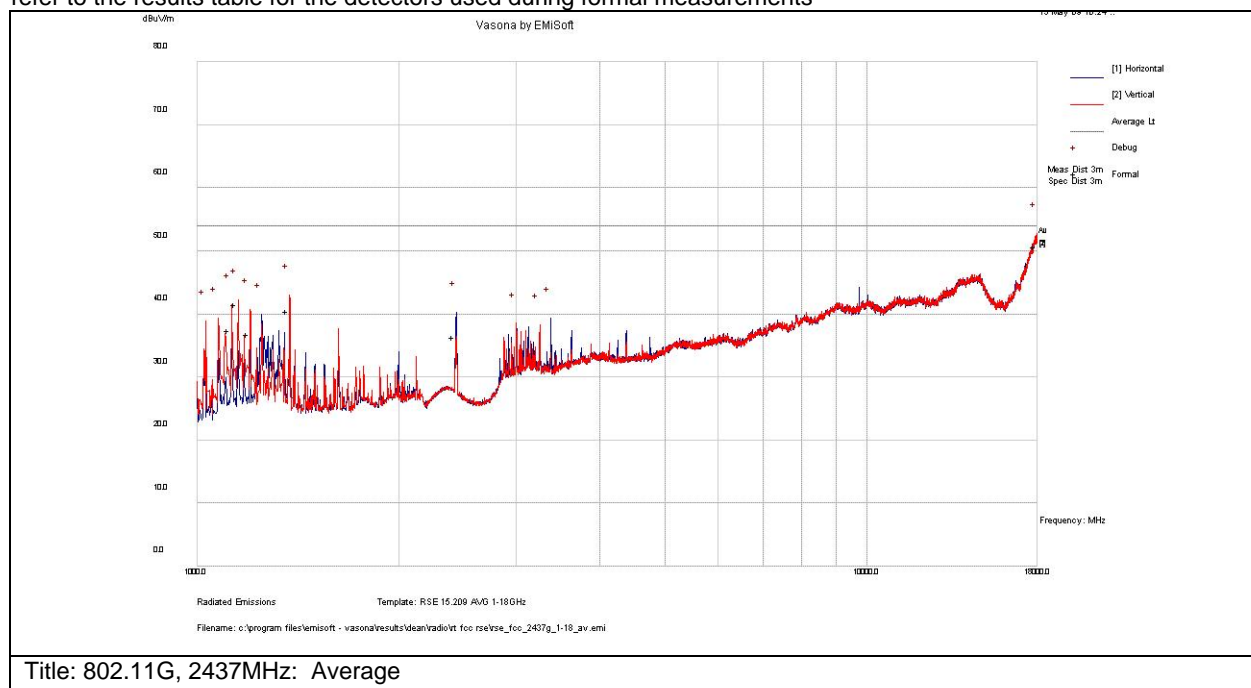
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
17952.277	37.3	12.4	11.8	61.4	NA	V	125	0	74	-12.6	Pass	
14622.271	39.8	11.2	5.9	56.8	NA	H	100	0	74	-17.2	Pass	
1373.83	53	3.2	-7.8	48.4	NA	H	100	0	74	-25.6	Pass	
3375.546	45.4	5.1	-4.5	46	NA	H	100	0	74	-28	Pass	
1249.22	50.3	3	-8	45.4	NA	H	100	0	74	-28.6	Pass	
1124.806	49.4	2.9	-8.4	43.9	Peak(Scan)	H	99	-1	74	-30.1	Pass	



Subtest Number: 35896 - 13		Subtest Date: 27-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions: 802.11G		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Test Results Table

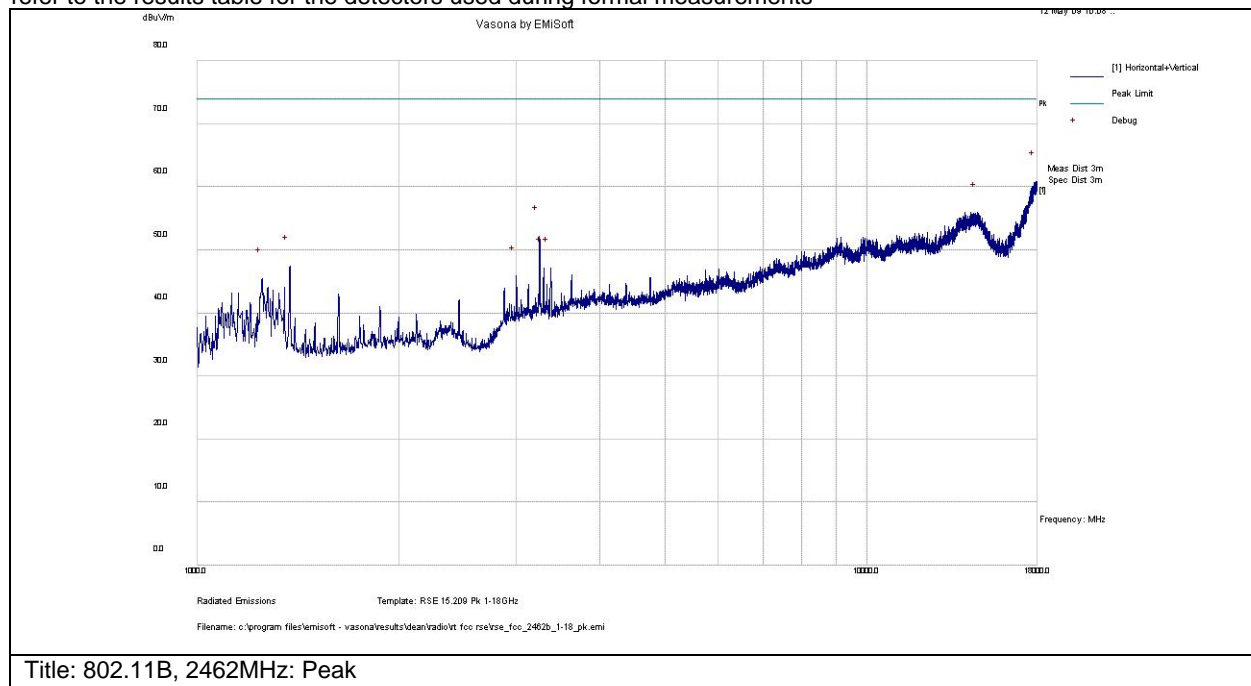
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
17991.165	26.4	12.4	11.9	50.7	Av	V	180	48	54	-3.3	Pass	Noise Floor
1152.038	46.9	2.9	-8.3	41.5	Av	V	102	9	54	-12.5	Pass	
1374.822	45.1	3.2	-7.8	40.4	Av	V	158	159	54	-13.6	Pass	
1124.96	42.9	2.9	-8.4	37.4	Av	V	187	149	54	-16.6	Pass	
1199.957	41.9	3	-8.2	36.7	Av	V	115	341	54	-17.3	Pass	
2437	37.6	4.3	-5.5	36.4	Av	H	100	125	54	-17.6	Pass	Fundamental



Subtest Number: 35896 - 9		Subtest Date: 26-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions: 802.11B		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Test Results Table

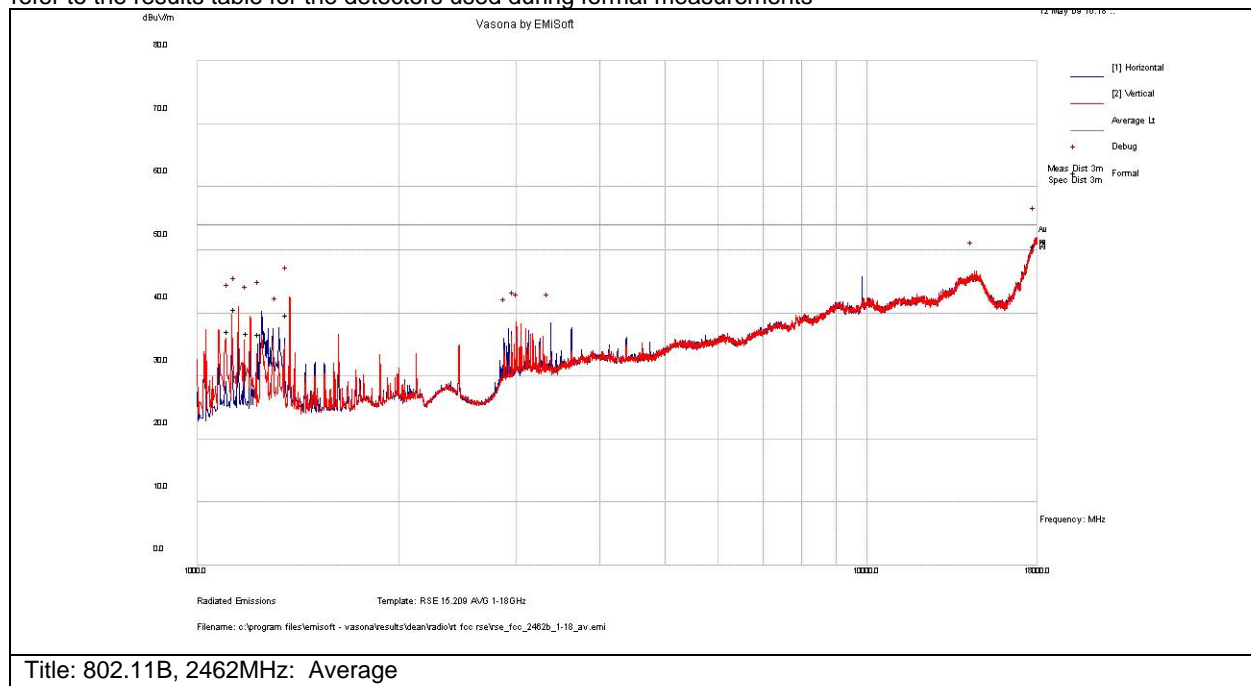
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
17925.764	36.7	12.4	11.8	60.9	NA	V	125	0	74	-13.1	Pass	
14667.342	39	11.2	5.7	55.9	NA	V	100	0	74	-18.1	Pass	
3248.284	51.3	5	-4.2	52.1	NA	H	125	0	74	-21.9	Pass	
1376.482	52.1	3.2	-7.8	47.4	NA	V	100	0	74	-26.6	Pass	
3370.243	46.5	5.1	-4.5	47.2	NA	H	100	0	74	-26.8	Pass	
3293.356	46.3	5.1	-4.3	47.1	NA	V	100	0	74	-26.9	Pass	



Subtest Number: 35896 - 10		Subtest Date: 26-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions: 802.11B		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Test Results Table

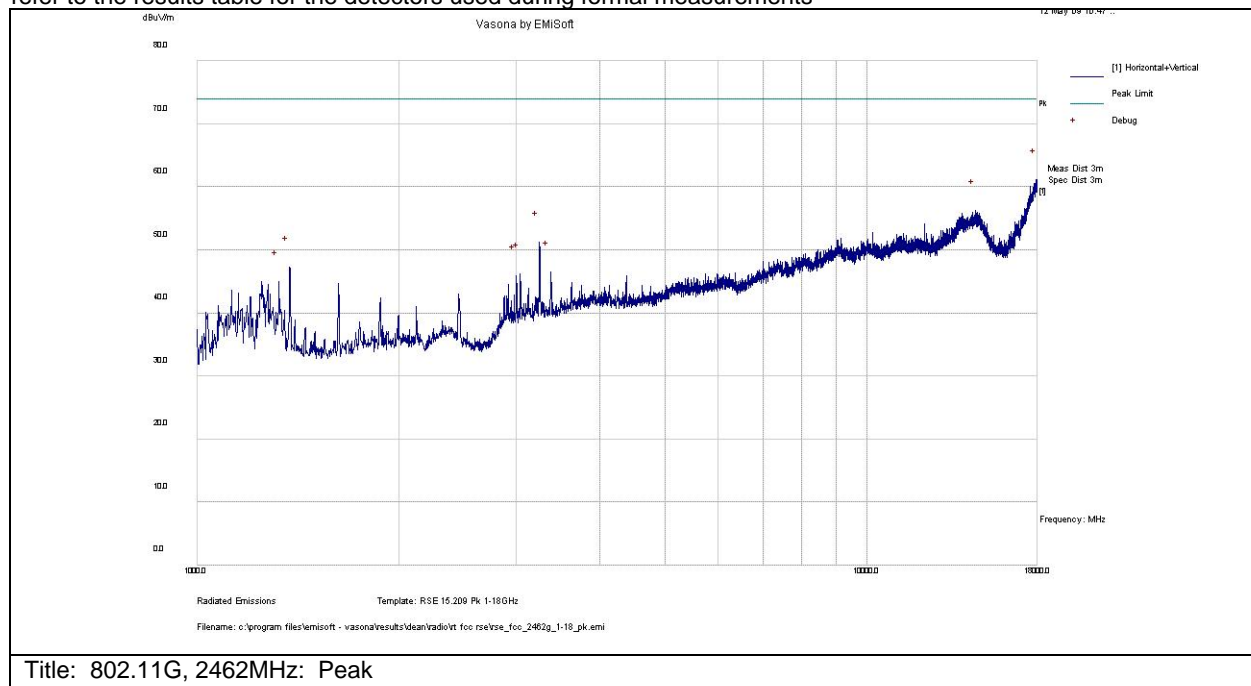
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
17994.546	26.4	12.4	11.9	50.7	Av	H	99	47	54	-3.3	Pass	
1152.063	46	2.9	-8.3	40.6	Av	V	99	13	54	-13.4	Pass	
1375.249	44.3	3.2	-7.8	39.6	Av	V	140	159	54	-14.4	Pass	
1124.974	42.7	2.9	-8.4	37.2	Av	V	144	195	54	-16.8	Pass	
1199.986	42	3	-8.2	36.9	Av	V	100	17	54	-17.1	Pass	
1249.976	41.6	3	-8	36.7	Av	H	150	227	54	-17.3	Pass	



Subtest Number: 35896 - 11		Subtest Date: 26-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions: 802.11G		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Test Results Table

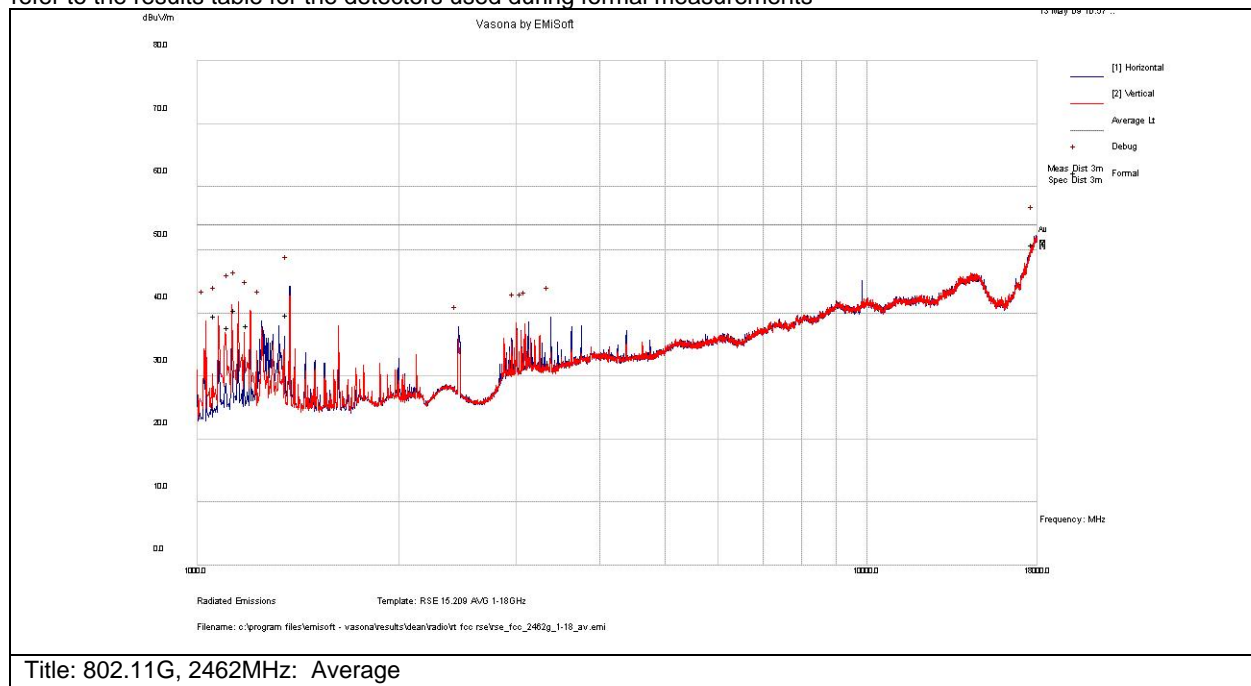
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
17992.046	36.9	12.4	11.9	61.2	NA	H	100	0	74	-12.8	Pass	
14561.291	39.1	11.1	6.1	56.3	NA	H	100	0	74	-17.7	Pass	
3248.284	50.4	5	-4.2	51.2	NA	H	125	0	74	-22.8	Pass	
1373.83	51.9	3.2	-7.8	47.2	NA	H	100	0	74	-26.8	Pass	
3372.895	45.9	5.1	-4.5	46.5	NA	H	100	0	74	-27.5	Pass	
3038.833	45.9	4.9	-4.6	46.2	NA	H	100	0	74	-27.8	Pass	



Subtest Number: 35896 - 12		Subtest Date: 26-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions: 802.11G		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Test Results Table

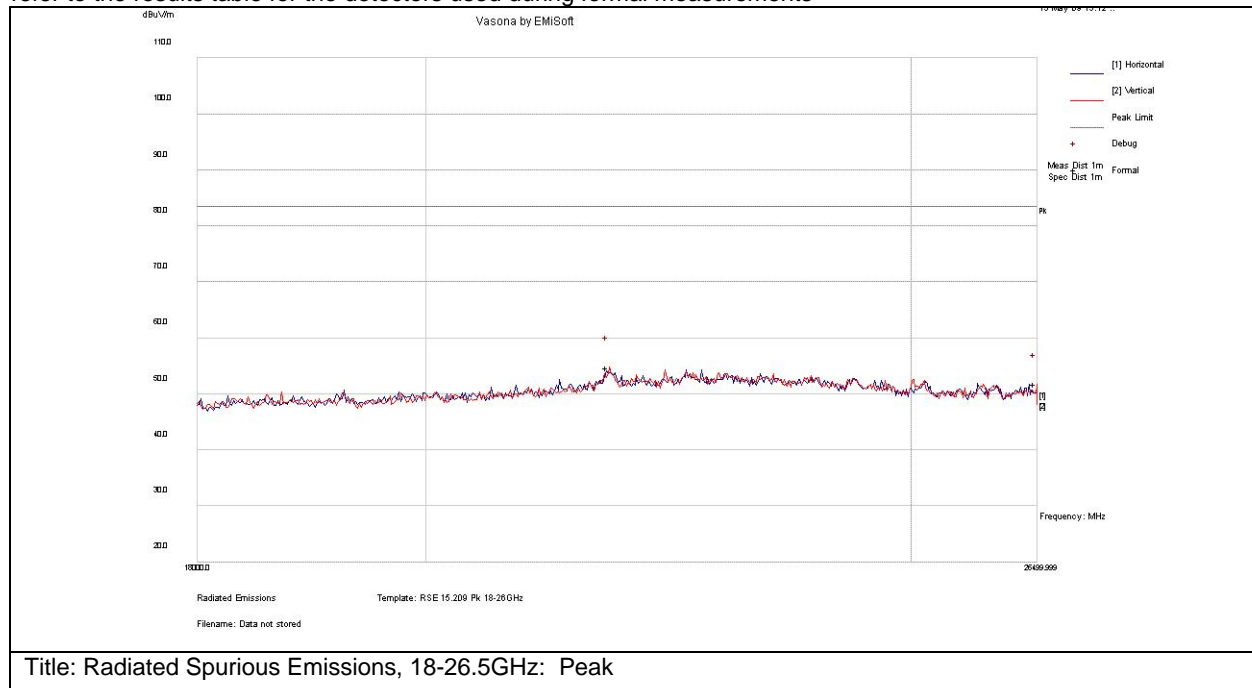
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
17905.832	26.8	12.4	11.7	50.9	Av	H	100	292	54	-3.1	Pass	Noise Floor
1152.002	45.8	2.9	-8.3	40.4	Av	V	155	0	54	-13.6	Pass	
1375.069	44.4	3.2	-7.8	39.7	Av	H	100	234	54	-14.3	Pass	
1075.041	45.4	2.8	-8.7	39.5	Av	V	166	13	54	-14.5	Pass	
1199.983	43.2	3	-8.2	38	Av	V	103	352	54	-16	Pass	
1125.047	43.2	2.9	-8.4	37.7	Av	V	100	195	54	-16.3	Pass	



Subtest Number: 35896 - 14		Subtest Date: 27-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions, 18-26.5GHz		
Subtest Result	Pass		
Highest Frequency	26499.999		
Lowest Frequency	18000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	
Comments:			
Equipment used:			
Equipment No	Manufacturer	Model	Description
CIS005691	Miteq	NSP1800-25-S1	Broadband Preamplifier (1-18GHz)
CIS028072	Cisco	1840	18-40GHz EMI Test Head/Verification Fixture

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table



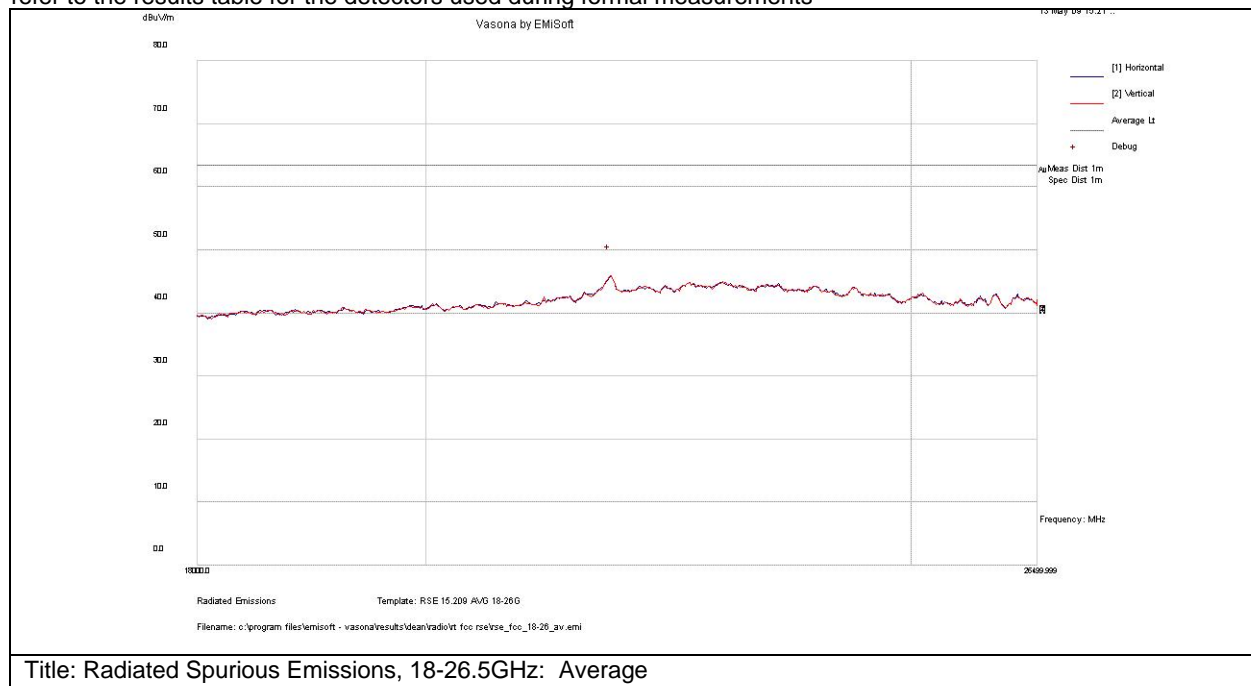
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
21764.086	37.3	0	17.4	54.8	NA	V	100	0	83.5	-28.7	Pass	
26499.561	33.9	0	17.9	51.8	NA	V	100	0	83.5	-31.8	Pass	



Subtest Number: 35896 - 15		Subtest Date: 27-May-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Radiated Spurious Emissions, 18-26.5GHz		
Subtest Result	Pass		
Highest Frequency	26499.999		
Lowest Frequency	18000.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

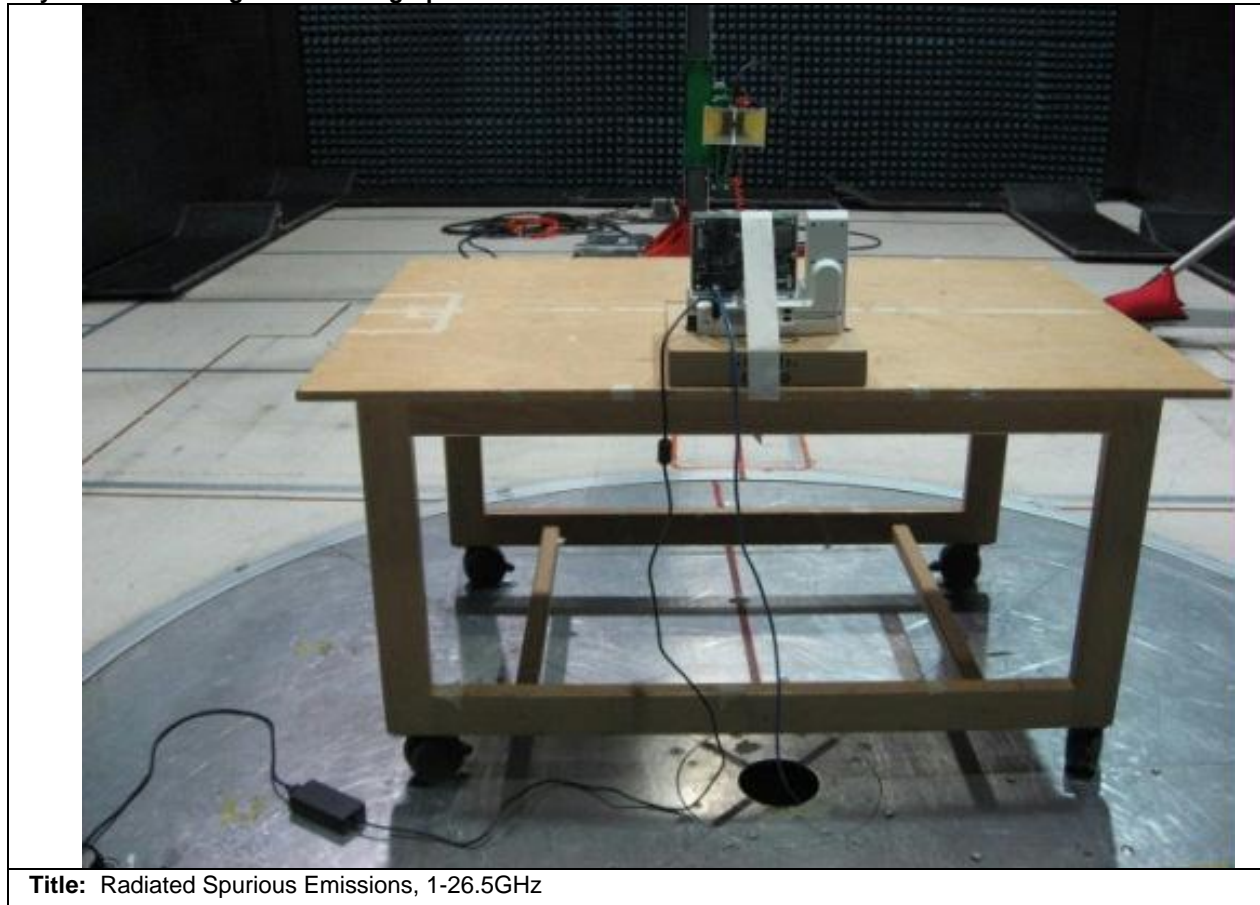
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
21781.118	28.5	0	17.4	45.8	NA	V	100	0	63.5	-17.6	Pass	

Physical Test arrangement Photograph:



Title: Radiated Spurious Emissions, 1-26.5GHz



Radiated Band Edge Measurements

15.205 & RSS-210 sec2.7:

Radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a).

Test Number: 35752 Spec ID: 648				
Basic Standard	Applied to	Class	Freq Range	Test Details / Comments
Restricted Bandedge Measurements	Enclosure	B	2.4GHz - 5.825GHz	CFR47 Part 15.205, CFR47 Part 15.209, LP002, RSS210HKTA1039
Operating Mode	Mode : 1, 802.11B/G Test Mode			
Power Input	48, DC (+/-20%)			
Overall Result	Pass			
Comments	No further comments			
Deviation	There were no deviations from the specification			

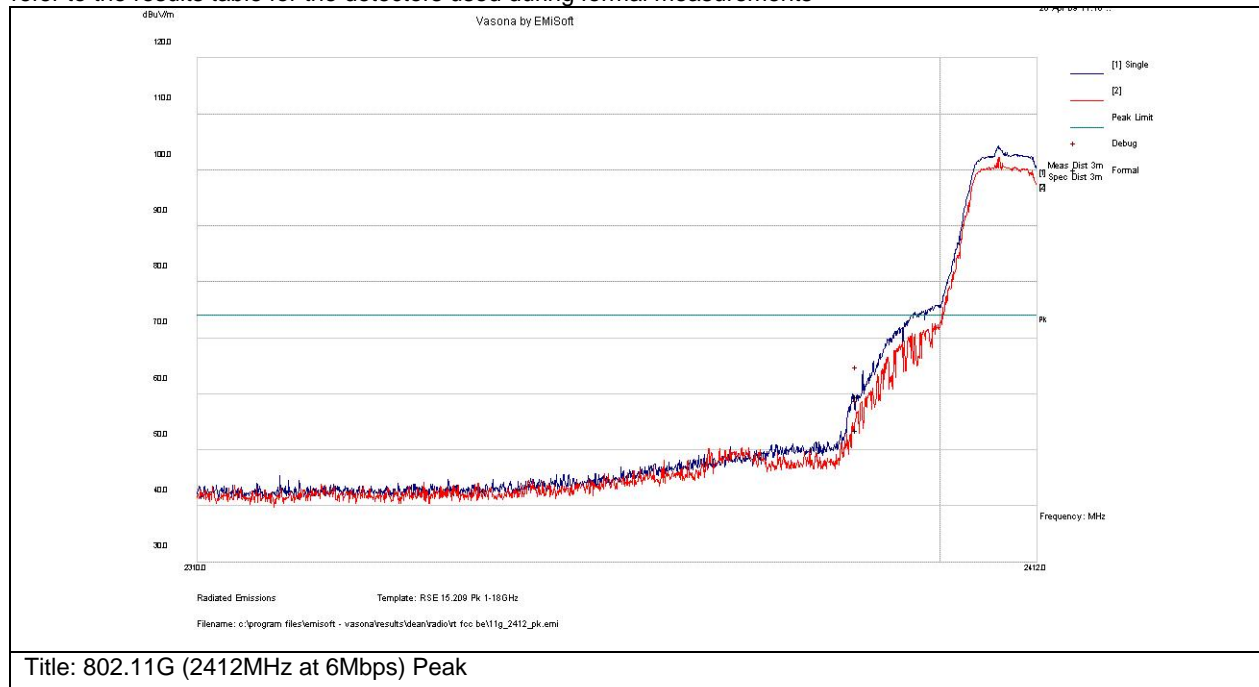
System Number	Description	Samples	System under test	Support equipment
1	WiFi Radio test sample	S01	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Subtest Number: 35752 - 1		Subtest Date: 30-Apr-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Peak Bandedge Results for 802.11G (2412MHz)		
Subtest Result	Pass		
Highest Frequency	2412.0		
Lowest Frequency	2310.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:	Yes		
Humidity: between 10 and 75%:	Yes		



Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

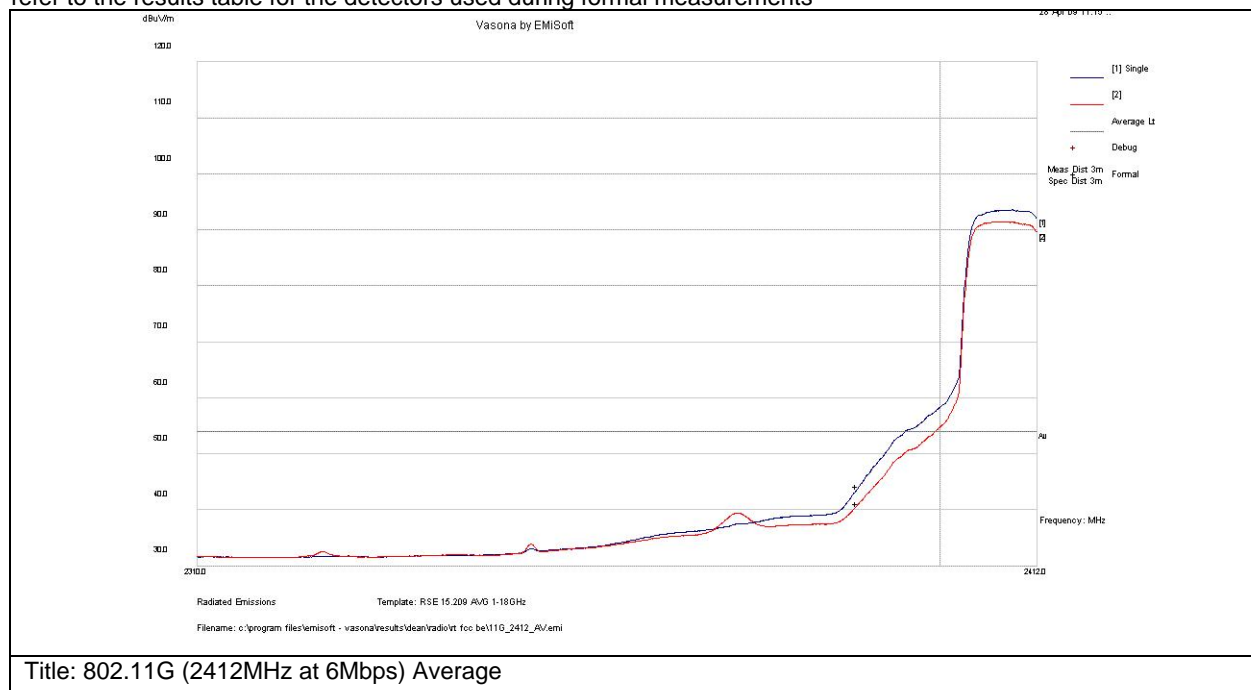
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2390	60.2	4.3	-5	59.6	Peak(Scan)	H	104	215	74	-14.4	Pass	
2390	54.2	4.3	-5	53.6	Peak(Scan)	V	160	188	74	-20.4	Pass	



Subtest Number: 35752 - 2		Subtest Date: 30-Apr-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Average Bandedge for 802.11G (2412MHz)		
Subtest Result	Pass		
Highest Frequency	2412.0		
Lowest Frequency	2310.0		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

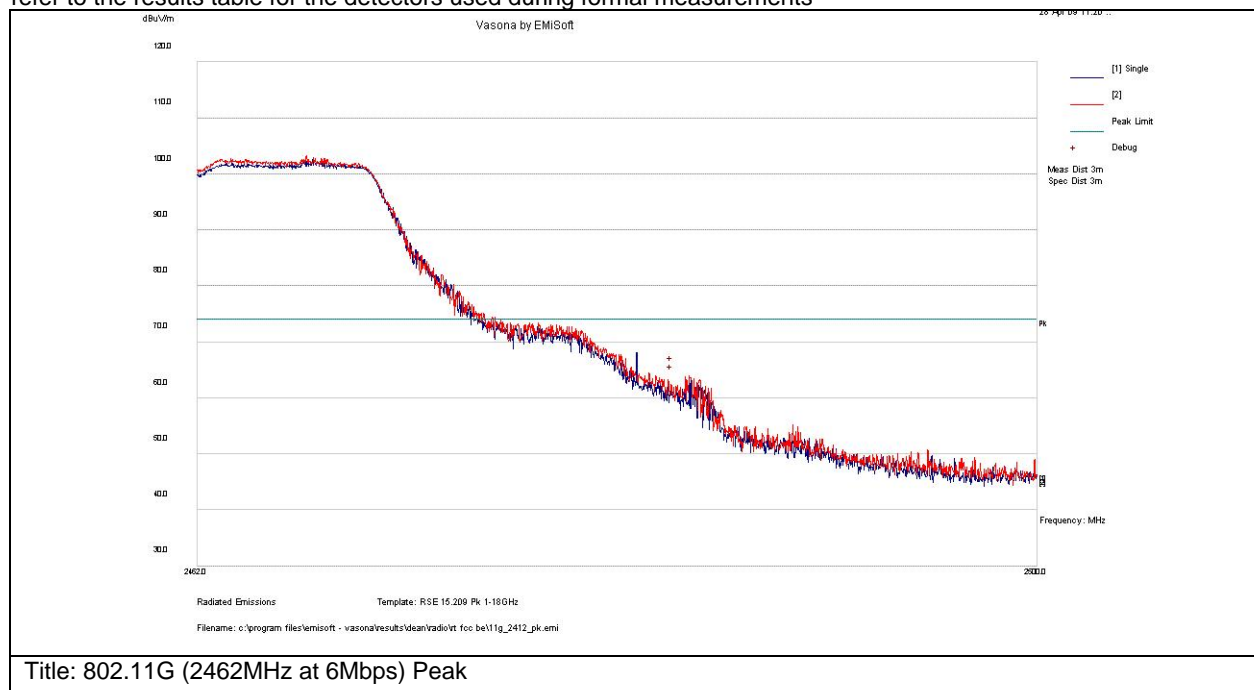
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2390	44.9	4.3	-5	44.2	Av	H	104	215	54	-9.8	Pass	
2390	41.9	4.3	-5	41.2	Av	V	160	188	54	-12.8	Pass	



Subtest Number: 35752 - 3		Subtest Date: 30-Apr-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Peak Bandedge Results for 802.11G (2462MHz)		
Subtest Result	Pass		
Highest Frequency	2500.0		
Lowest Frequency	2462.0		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

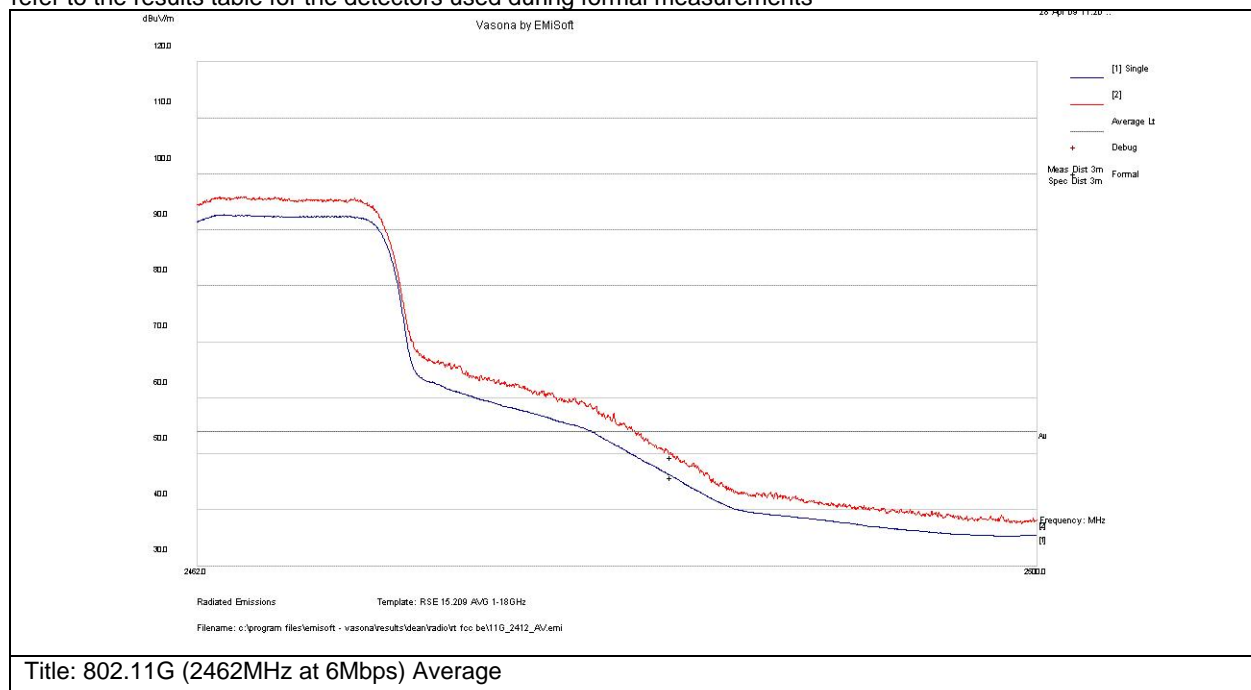
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2483.5	62.4	4.4	-4.9	61.9	Peak(Scan)	H	123	221	74	-12.1	Pass	
2483.5	60.8	4.4	-4.9	60.3	Peak(Scan)	V	127	177	74	-13.7	Pass	



Subtest Number: 35752 - 4		Subtest Date: 30-Apr-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Average Bandedge Results for 802.11G (2462MHz)		
Subtest Result	Pass		
Highest Frequency	2500.0		
Lowest Frequency	2462.0		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

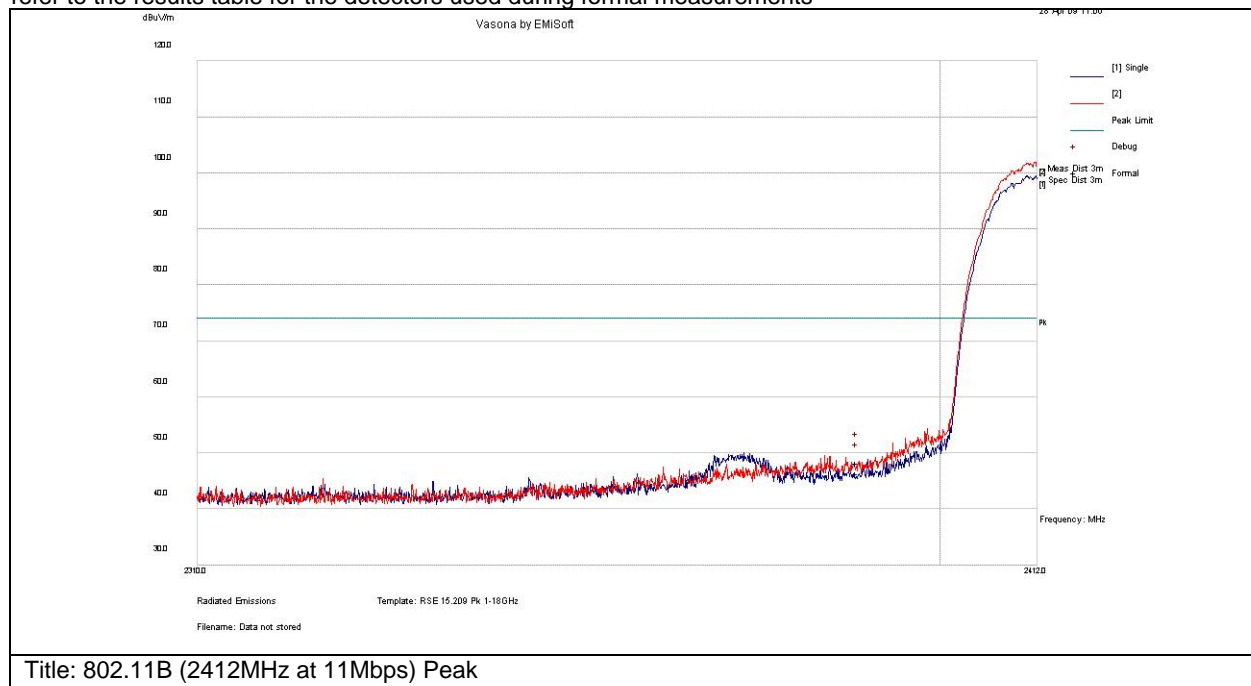
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2483.5	50	4.4	-4.9	49.5	Av	H	123	221	54	-4.5	Pass	
2483.5	46.3	4.4	-4.9	45.7	Av	V	127	177	54	-8.3	Pass	



Subtest Number: 35752 - 5		Subtest Date: 30-Apr-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Peak Bandedge Results for 802.11B (2412MHz)		
Subtest Result	Pass		
Highest Frequency	2412.0		
Lowest Frequency	2310.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

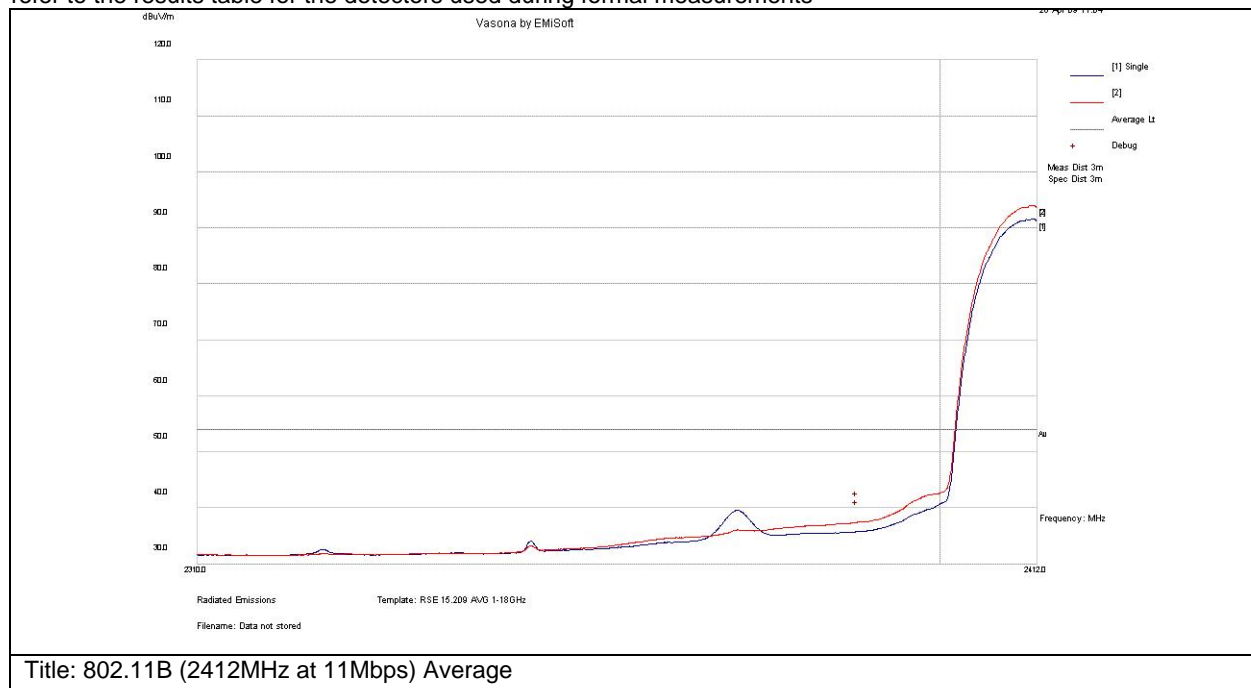
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2390	46.9	4.3	-5	46.2	Peak(Scan)	V	157	184	74	-27.8	Pass	
2390	48.8	4.3	-5	48.2	Peak(Scan)	H	105	215	74	-25.8	Pass	



Subtest Number: 35752 - 6		Subtest Date: 30-Apr-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Average Bandedge Results for 802.11B (2412MHz)		
Subtest Result	Pass		
Highest Frequency	2412.0		
Lowest Frequency	2310.0		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

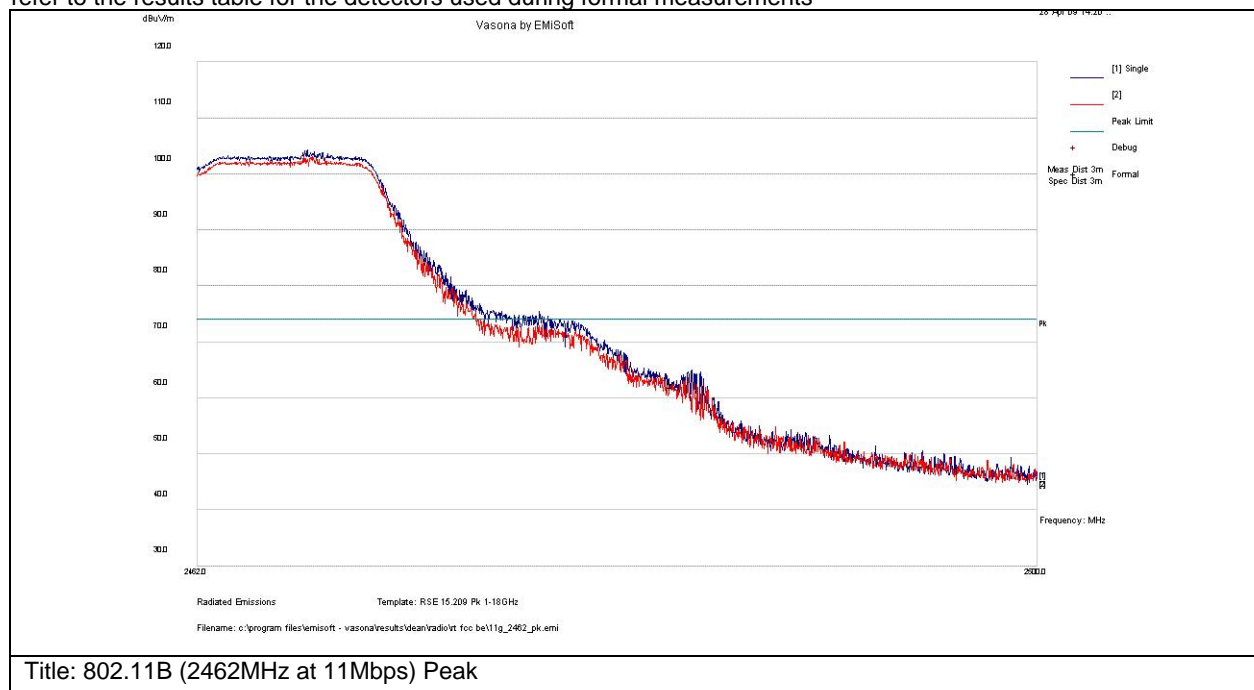
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2390	36.4	4.3	-5	35.8	Av	V	157	184	54	-18.2	Pass	
2390	38.1	4.3	-5	37.4	Av	H	105	215	54	-16.6	Pass	



Subtest Number: 35752 - 7		Subtest Date: 30-Apr-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Peak Bandedge Results for 802.11B (2462MHz)		
Subtest Result	Pass		
Highest Frequency	2500.0		
Lowest Frequency	2462.0		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

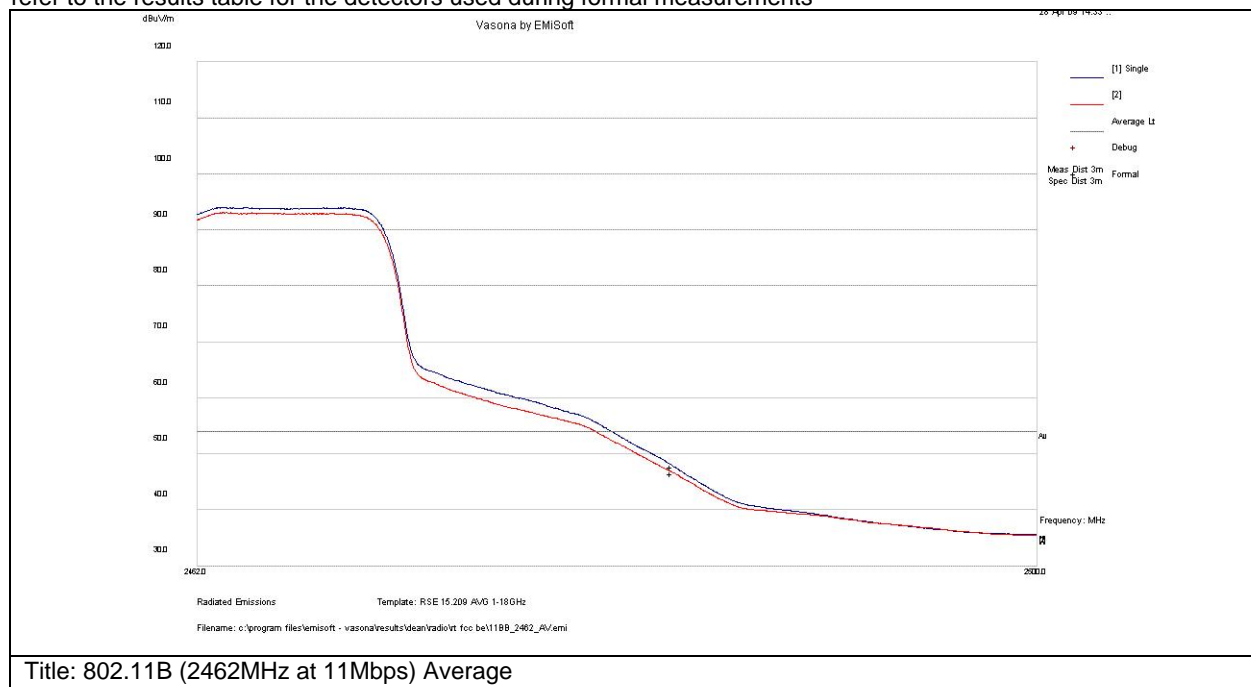
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2483.5	63.2	4.4	-4.9	62.7	Peak(Scan)	H	119	109	74	-11.3	Pass	
2483.5	62.5	4.4	-4.9	61.9	Peak(Scan)	V	99	79	74	-12.1	Pass	



Subtest Number: 35752 - 8		Subtest Date: 30-Apr-2009	
Engineer	Dean Yarza		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Average Bandedge Results for 802.11B (2462MHz)		
Subtest Result	Pass		
Highest Frequency	2500.0		
Lowest Frequency	2462.0		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:	Yes		
Humidity: between 10 and 75%:	Yes		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2483.5	48.2	4.4	-4.9	47.6	Av	H	119	109	54	-6.4	Pass	
2483.5	47.1	4.4	-4.9	46.6	Av	V	99	79	54	-7.4	Pass	

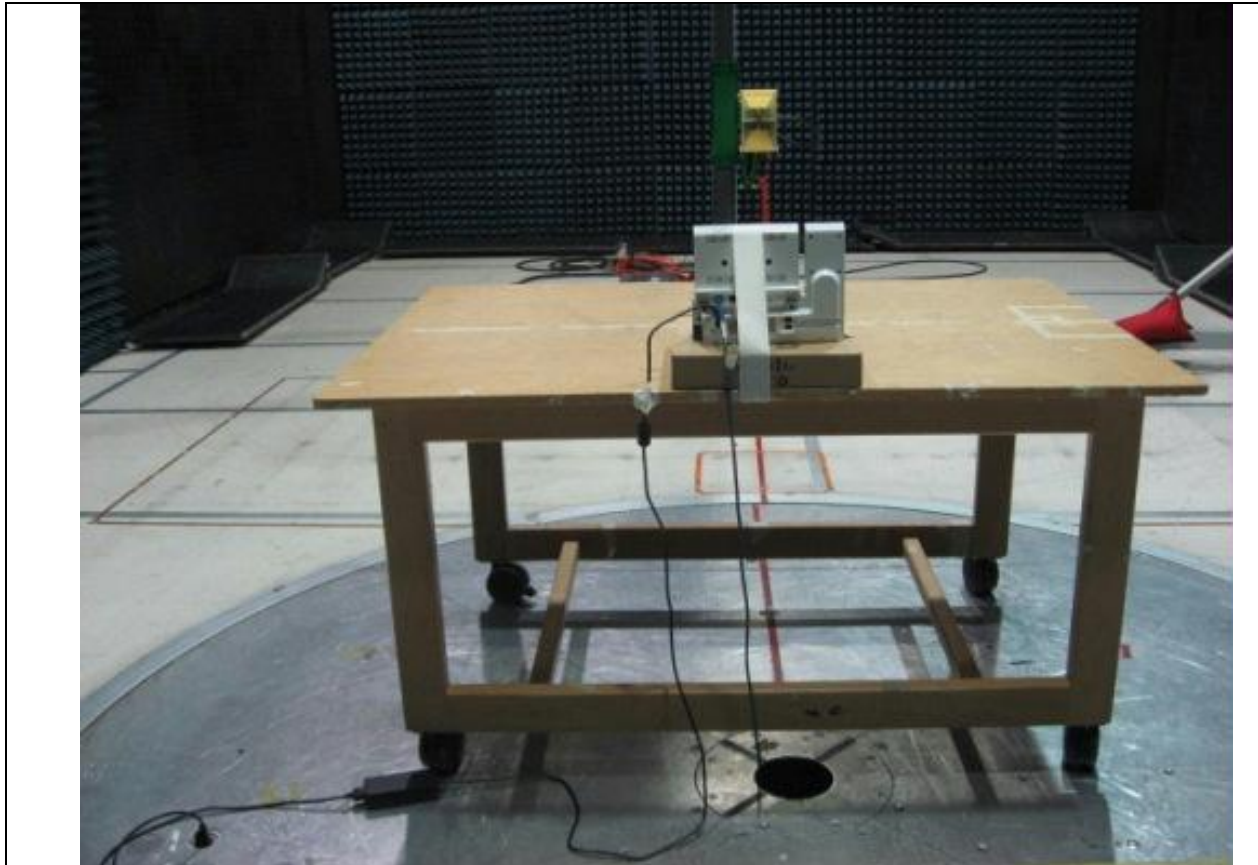
Physical Test arrangement Photograph:



Title: Bandedge Test Configuration (Front View)

Comments on the above Photograph:

No further comments



Title: Bandedge Test Configuration (Rear View)

Comments on the above Photograph:

No further comments



Co-Locator Radiated Spurious Emissions

15.205 & RSS-210 sec2.7:

Radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a).

Test Number: 36457 Spec ID: 441				
Basic Standard	Basic Standard	Class	Freq Range	Test Details / Comments
Co-Located Transmitters	Co-Located Transmitters	N/A	30MHz-40GHz	Compliance based upon meeting the emission levels for radiated spurious emissions as stated in RSS-210, FCC part 15.209 and HKTA1039. CISPR limits are not applicable for this test
Operating Mode	Operating Mode 2, Co-locator Test Mode			
Power Input	Power Input 48, DC (+/-20%)			
Overall Result	Overall Result Pass			
Comments	Comments No further comments			
Deviation	Deviation There were no deviations from the specification			

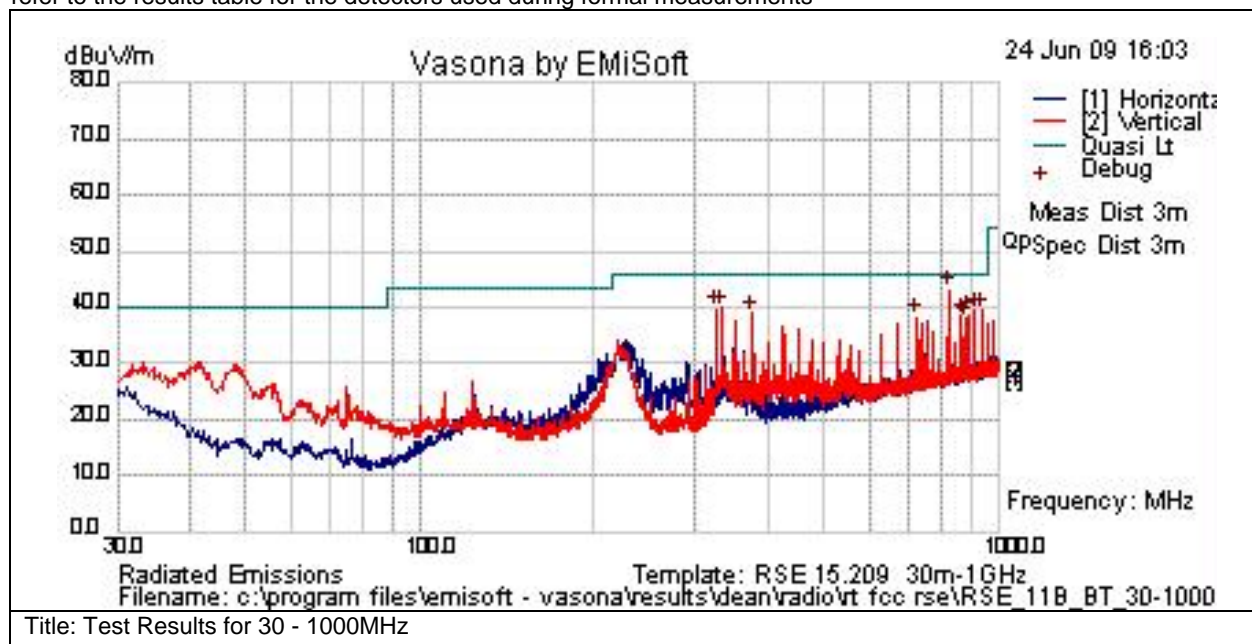
System Number	Description	Samples	System under test	Support equipment
1	WiFi Radio test sample	S01	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Subtest Number: 36457 - 1		Subtest Date: 25-Jun-2009	
Engineer	Phillip Carranco		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Co-Locator Spurious Emissions Results		
Subtest Result	Pass		
Highest Frequency	1000.0		
Lowest Frequency	30.0		
Comments on the above Test Results	No further comments		
Environmental Conditions:			
Temperature: within range of 54 to 95 F:		Yes	
Humidity: between 10 and 75%:		Yes	



Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

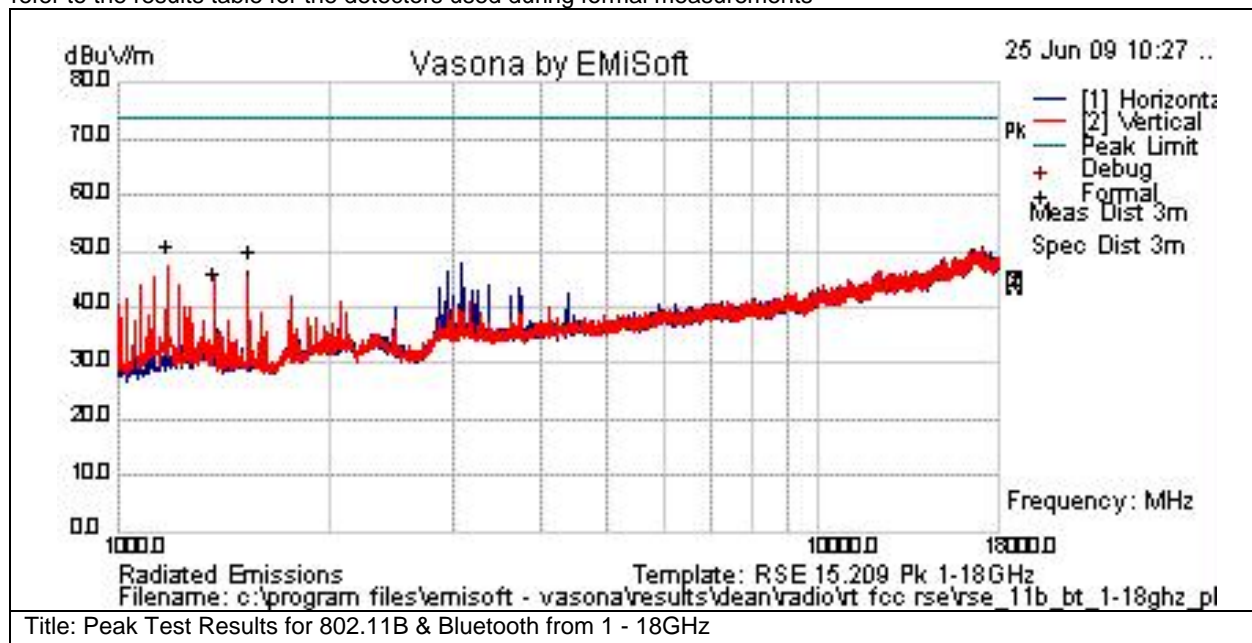
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
333.31	24.4	1.5	14	40	Qp	V	147	251	46	-6	Pass	
912.001	14	2.6	22.3	38.9	Qp	V	102	315	46	-7.1	Pass	
935.997	13.7	2.6	22.6	38.9	Qp	V	100	310	46	-7.1	Pass	
324.984	22.7	1.5	14	38.2	Qp	V	154	230	46	-7.8	Pass	
375.165	16.7	1.6	15	33.3	Qp	V	100	300	46	-12.7	Pass	
824.942	2.9	2.4	21.7	27.1	Qp	V	126	328	46	-18.9	Pass	



Subtest Number: 36457 - 2		Subtest Date: 25-Jun-2009
Engineer	Phillip Carranco	
Lab Information	Building I, 5m Anechoic	
Subtest Results		
Subtest Title	Bluetooth & 802.11B 1-18GHz Radiated Spurious Emissions	
Subtest Result	Pass	
Highest Frequency	18000.0	
Lowest Frequency	1000.0	
Comments on the above Test Results	No further comments	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

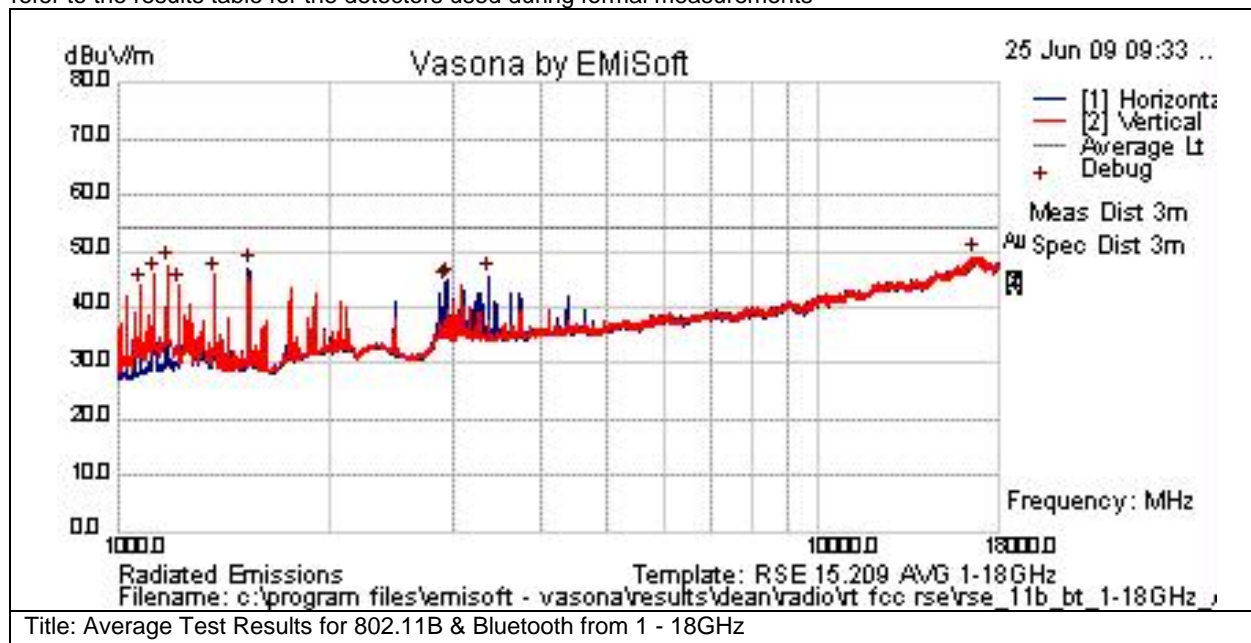
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1176.006	52	3.2	-4.4	50.8	Pk	V	100	185	74	-23.2	Pass	
1536.609	50.6	3.6	-4.2	50	Pk	H	113	340	74	-24	Pass	
1374.946	46	3.4	-3.6	45.8	Pk	H	137	70	74	-28.2	Pass	



Subtest Number: 36457 - 3		Subtest Date: 25-Jun-2009
Engineer	Phillip Carranco	
Lab Information	Building I, 5m Anechoic	
Subtest Results		
Subtest Title	Bluetooth & 802.11B Radiated Spurious Emissions	
Subtest Result	Pass	
Highest Frequency	18000.0	
Lowest Frequency	1000.0	
Comments on the above Test Results	No further comments	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

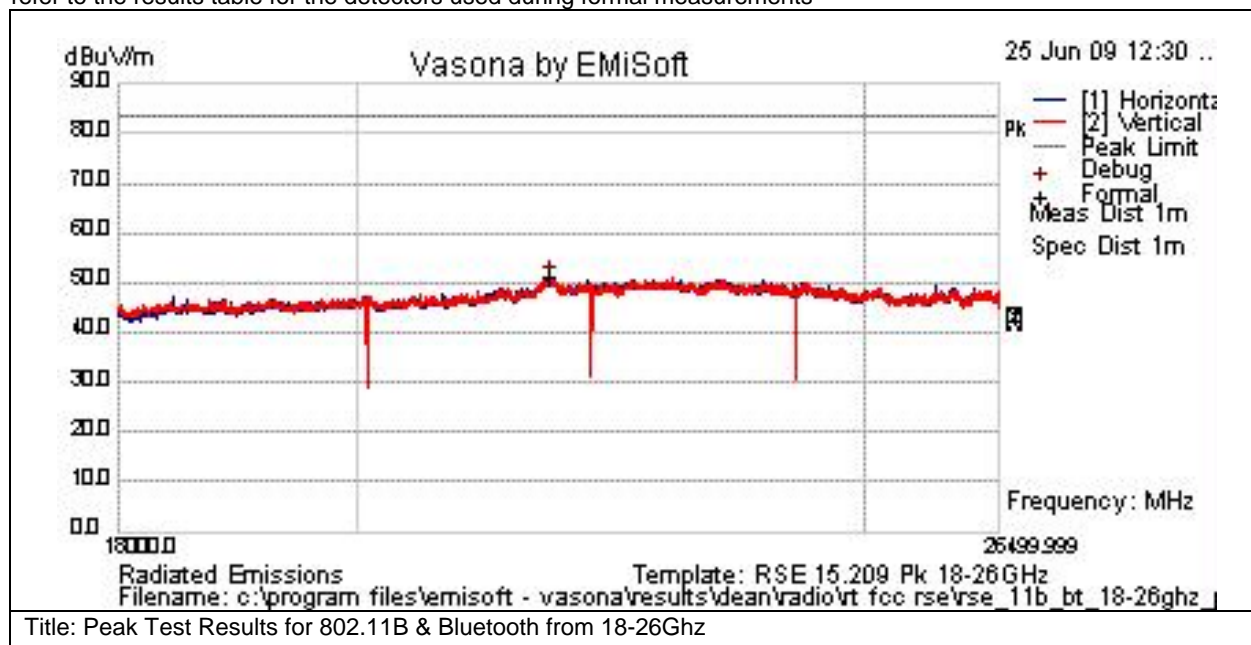
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
16655.802	28.9	13.2	6.9	49	NA	H	100	0	54	-5	Pass	Noise Floor
1536.578	48.6	3.6	-4.2	48	Av	H	106	31	54	-6	Pass	
1175.978	47.6	3.2	-4.4	46.4	Av	V	153	182	54	-7.6	Pass	
1128.08	46.5	3.1	-4.8	44.8	Av	V	104	170	54	-9.2	Pass	
1374.83	42.9	3.4	-3.6	42.8	Av	V	148	10	54	-11.2	Pass	



Subtest Number: 36457 - 4		Subtest Date: 25-Jun-2009
Engineer	Phillip Carranco	
Lab Information	Building I, 5m Anechoic	
Subtest Results		
Subtest Title	Bluetooth & 802.11B Peak Radiated Spurious Emissions	
Subtest Result	Pass	
Highest Frequency	26499.999	
Lowest Frequency	18000.0	
Comments on the above Test Results	No Signal within 10dB of the Limit were observed.	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

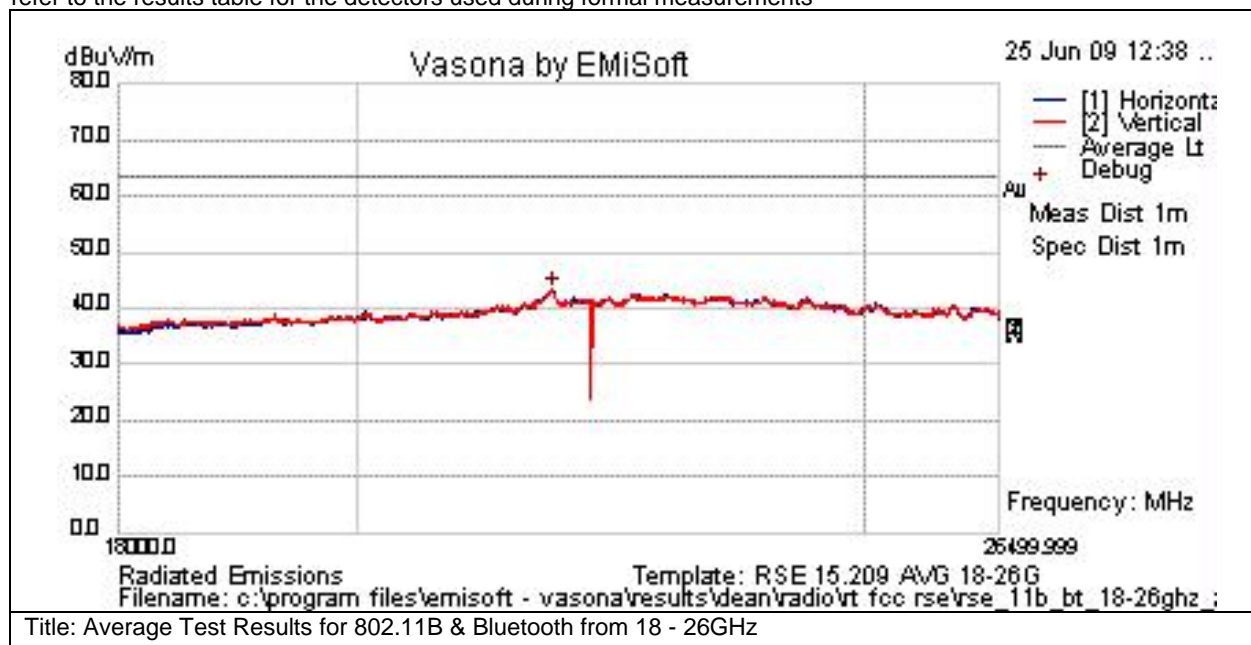
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
21775.884	33.6	0	17.4	51	Peak(Scan)	H	101	0	83.5	-32.5	Pass	Noise Floor



Subtest Number: 36457 - 5		Subtest Date: 25-Jun-2009
Engineer	Phillip Carranco	
Lab Information	Building I, 5m Anechoic	
Subtest Results		
Subtest Title	Bluetooth & 802.11B Average Radiated Spurious Emissions	
Subtest Result	Pass	
Highest Frequency	26499.999	
Lowest Frequency	18000.0	
Comments on the above Test Results	No Signal within 10dB of the Limit were observed.	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

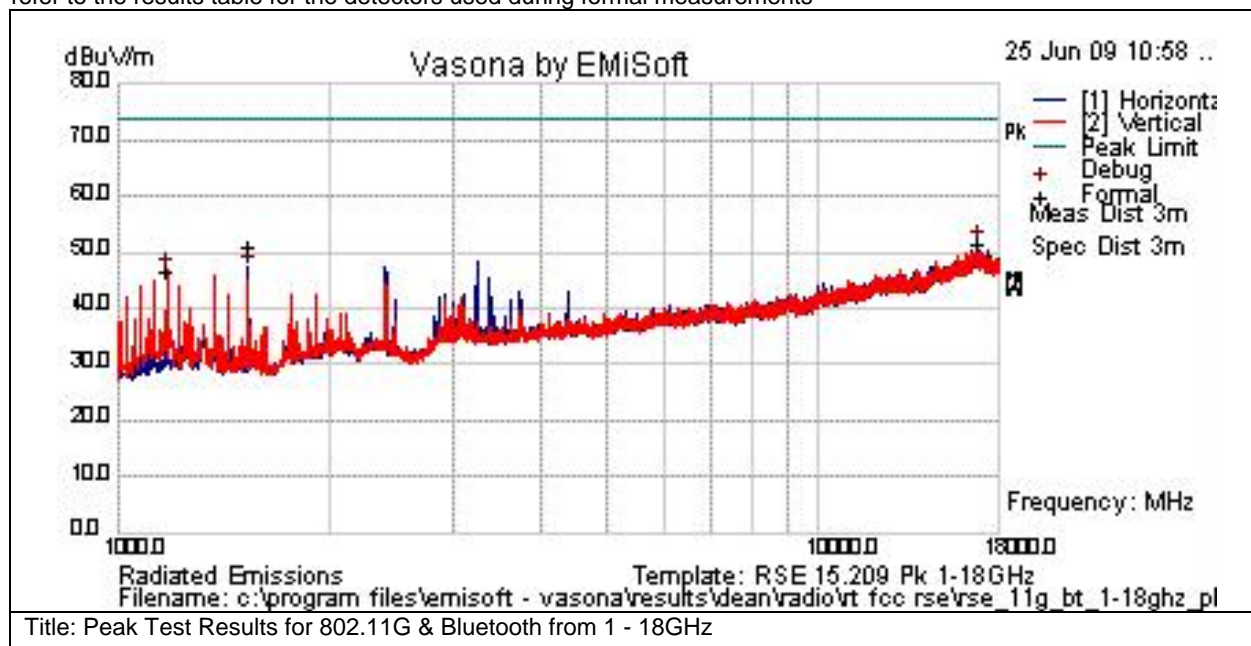
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
21789.697	26	0	17.4	43.4	Peak(Scan)	H	101	-1	63.5	-20.1	Pass	Noise Floor



Subtest Number: 36457 - 6		Subtest Date: 25-Jun-2009	
Engineer	Phillip Carranco		
Lab Information	Building I, 5m Anechoic		
Subtest Results			
Subtest Title	Bluetooth & 802.11G Peak Radiated Spurious Emissions		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	No further comments		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

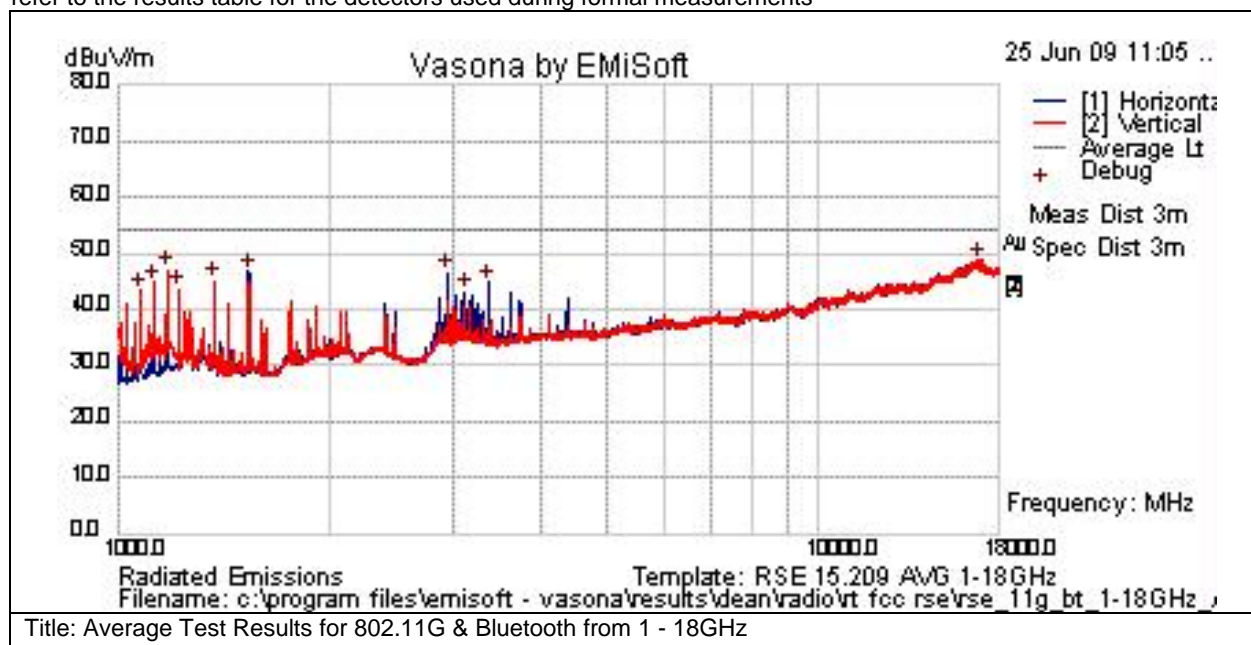
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
16844.181	31.4	13.2	6.7	51.3	Peak(Scan)	H	100	361	74	-22.7	Pass	Noise Floor
1536.668	51.3	3.6	-4.2	50.8	Pk	H	112	30	74	-23.2	Pass	
1175.995	51.4	3.2	-4.4	50.1	Pk	V	102	180	74	-23.9	Pass	



Subtest Number: 36457 - 7		Subtest Date: 25-Jun-2009
Engineer	Phillip Carranco	
Lab Information	Building I, 5m Anechoic	
Subtest Results		
Subtest Title	Bluetooth & 802.11G Average Radiated Spurious Emissions	
Subtest Result	Pass	
Highest Frequency	18000.0	
Lowest Frequency	1000.0	
Comments on the above Test Results	No further comments	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

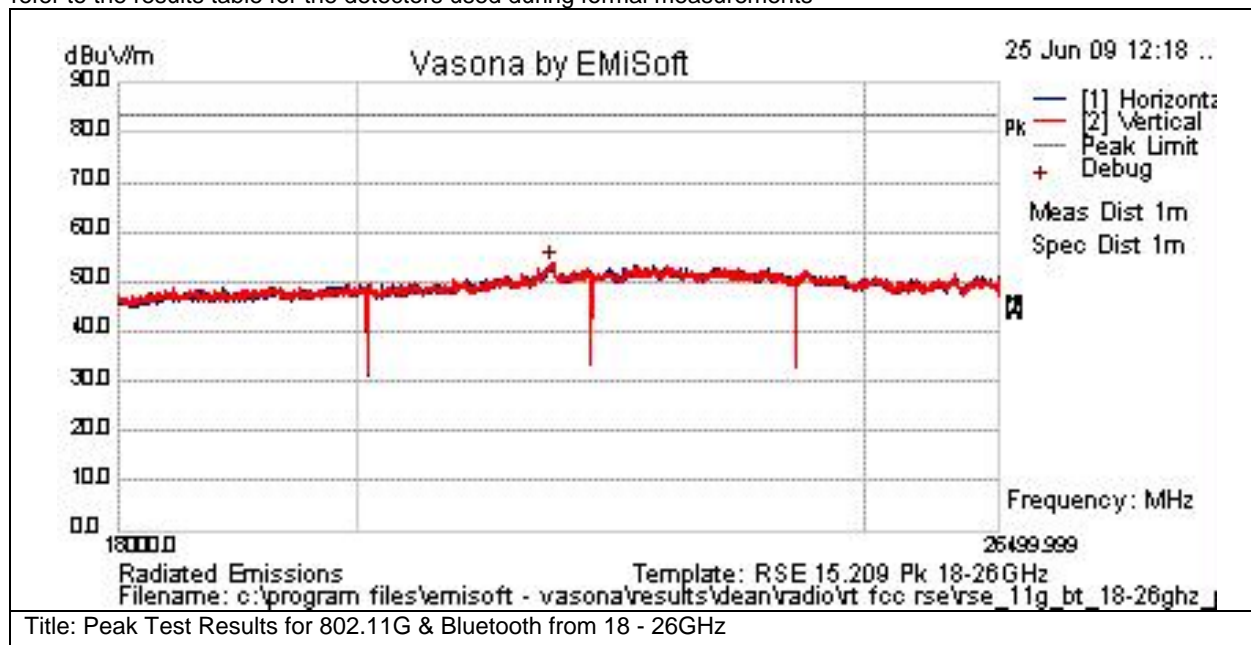
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
16844.042	28.8	13.2	6.7	48.7	NA	V	100	0	54	-5.3	Pass	Noise Floor
1536.617	48.1	3.6	-4.2	47.6	Av	H	114	341	54	-6.4	Pass	
1175.912	47.5	3.2	-4.4	46.3	Av	V	99	190	54	-7.7	Pass	
1375.208	41.4	3.4	-3.6	41.2	Av	V	102	360	54	-12.8	Pass	



Subtest Number: 36457 - 8		Subtest Date: 25-Jun-2009
Engineer	Phillip Carranco	
Lab Information	Building I, 5m Anechoic	
Subtest Results		
Subtest Title	Bluetooth & 802.11G Peak Radiated Spurious Emissions	
Subtest Result	Pass	
Highest Frequency	26499.999	
Lowest Frequency	18000.0	
Comments on the above Test Results	No Signal within 10dB of the Limit were observed.	

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

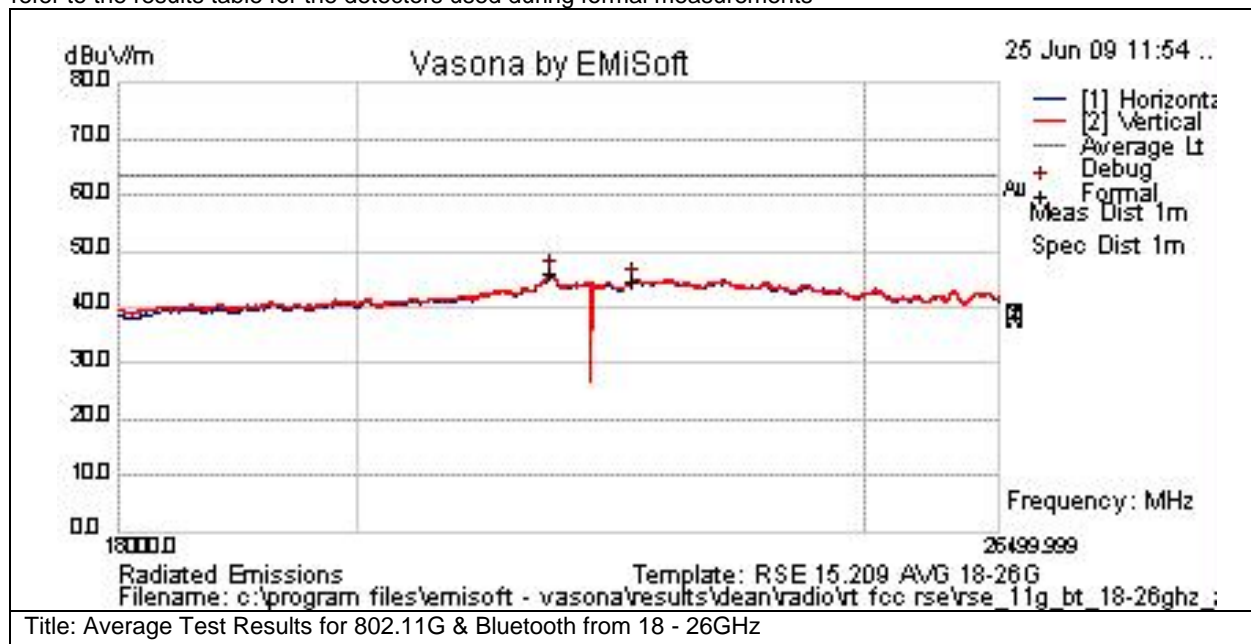
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
21777.034	36.3	0	17.4	53.7	Peak(Scan)	V	101	-1	83.5	-29.8	Pass	Noise Floor



Subtest Number: 36457 - 9		Subtest Date: 25-Jun-2009
Engineer	Phillip Carranco	
Lab Information	Building I, 5m Anechoic	
Subtest Results		
Subtest Title	Bluetooth & 802.11G Average Radiated Spurious Emissions	
Subtest Result	Pass	
Highest Frequency	26499.999	
Lowest Frequency	18000.0	
Comments on the above Test Results	No Signal within 10dB of the Limit were observed.	

Graphical Test Results

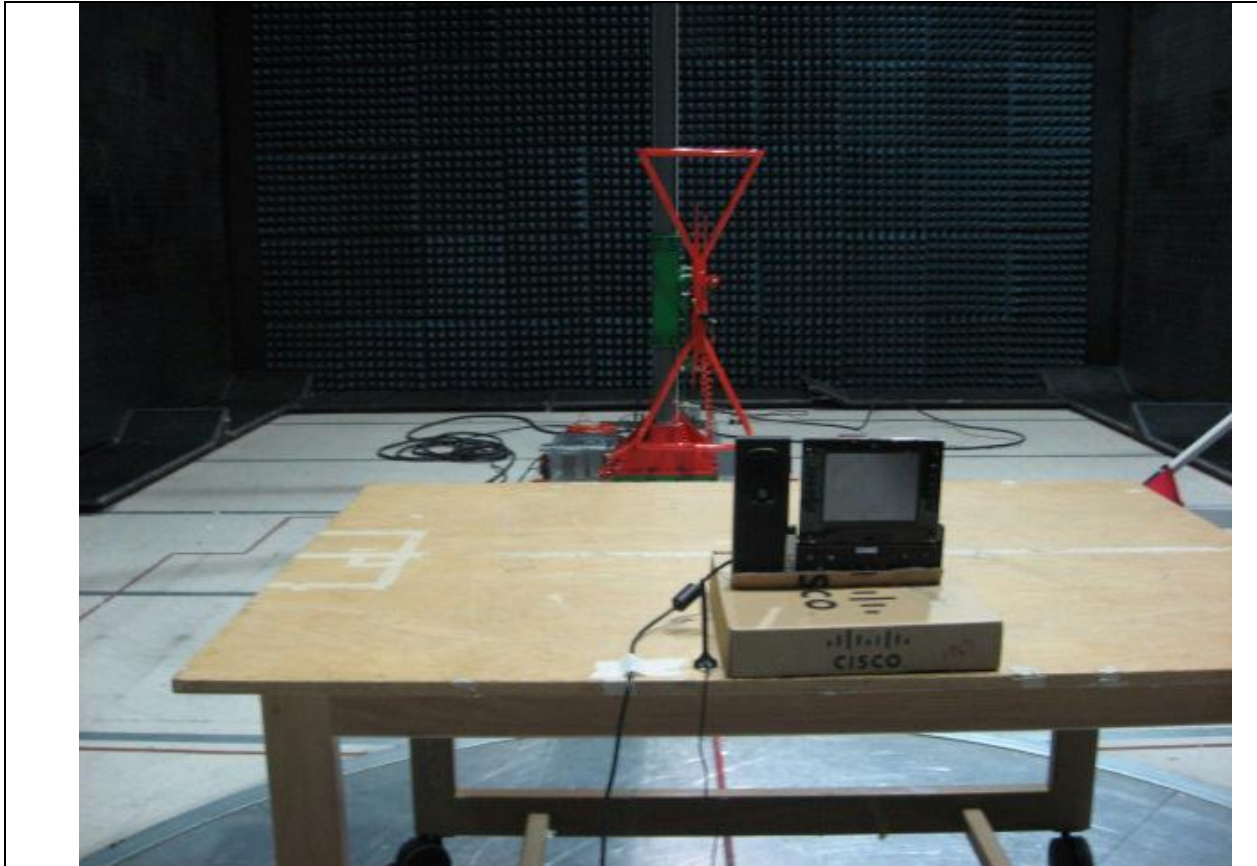
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



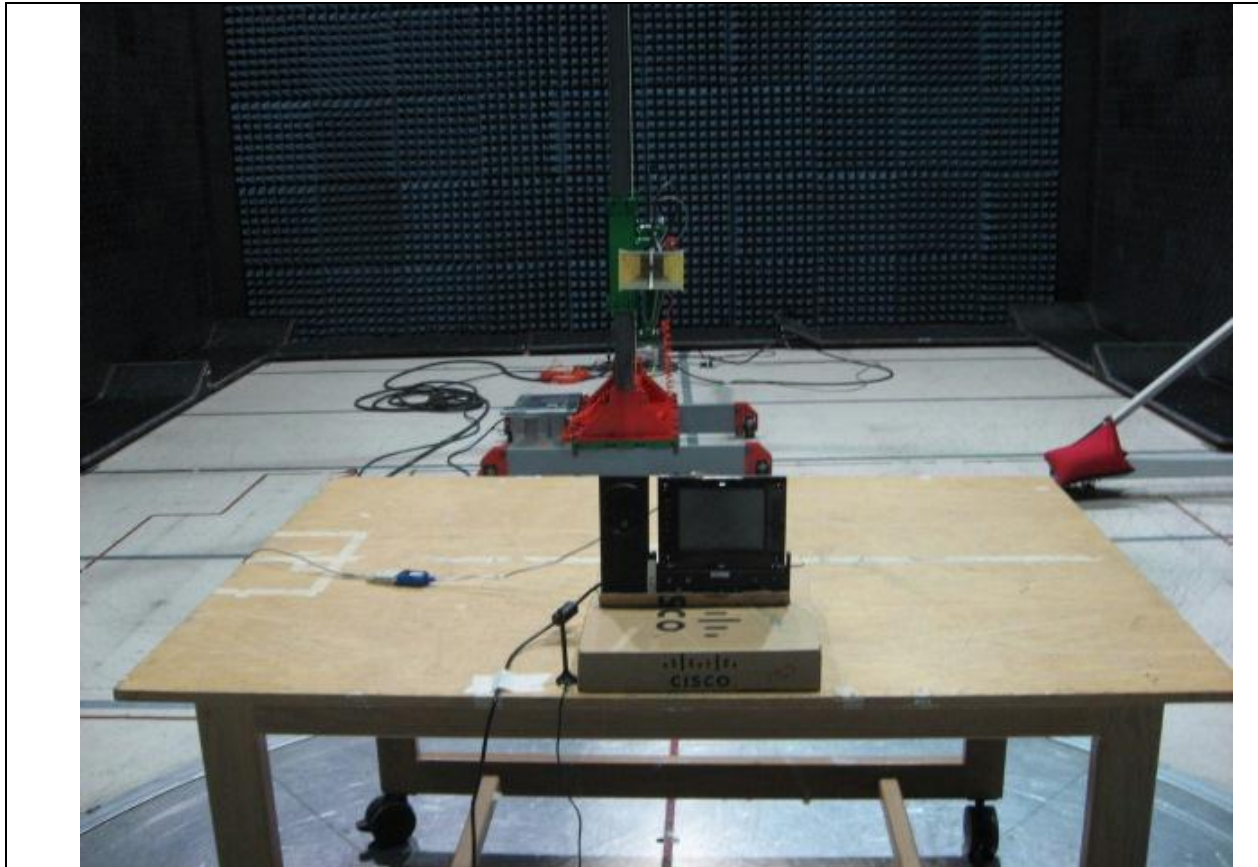
Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
21764.529	28.7	0	17.4	46.2	NA	V	100	0	63.5	-17.3	Pass	Noise floor
22565.056	27.4	0	17.4	44.8	NA	V	100	0	63.5	-18.7	Pass	Noise Floor

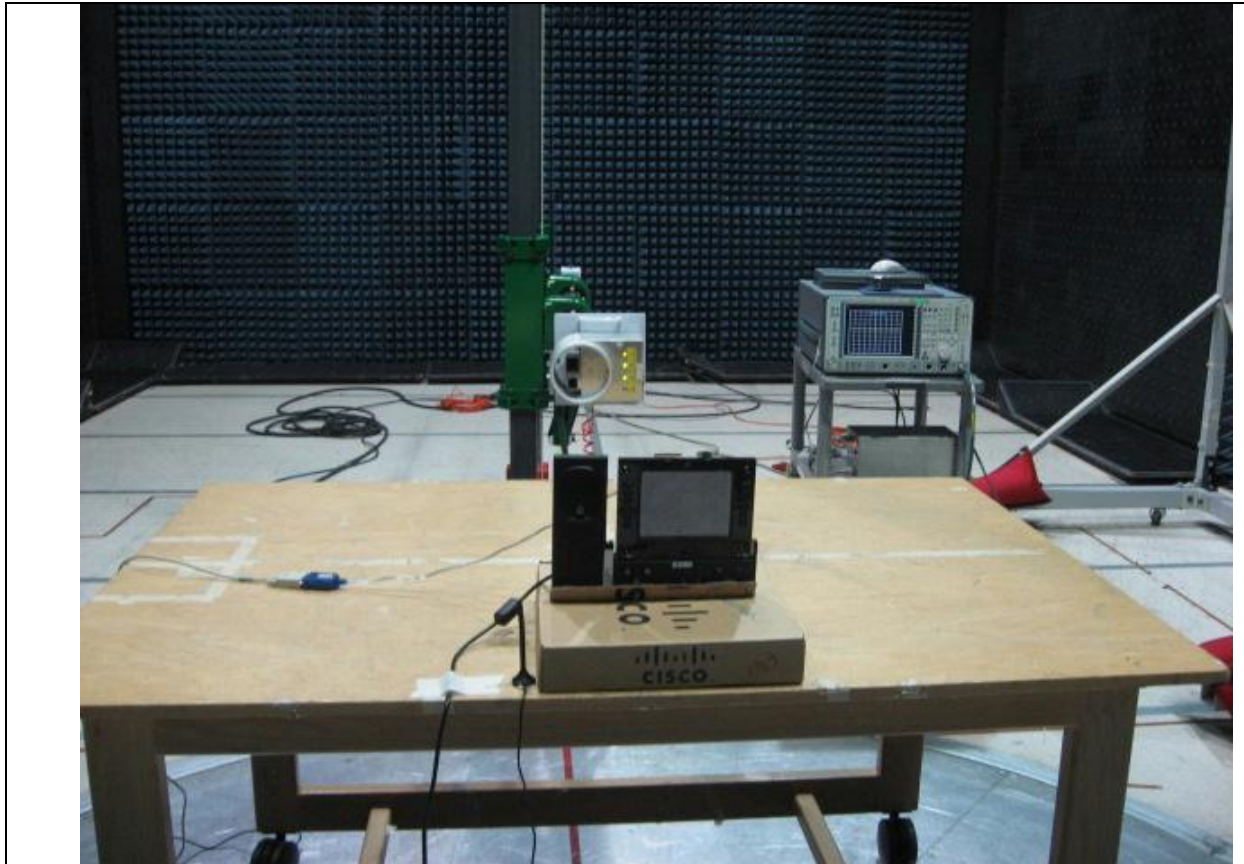
Physical Test arrangement Photograph:



Title: Co-Locator Spurious Emissions Test Configuration from 30 - 1000MHz



Title: Co-Locator Spurious Emissions Test Configuration from 1- 18GHz



Title: Co-Locator Spurious Emissions Test Configuration from 18 - 26GHz



Appendix B: Abbreviation Key and Definitions

The following table defines abbreviations used within this test report.

Abbreviation	Description	Abbreviation	Description
EMC	Electro Magnetic Compatibility	°F	Degrees Fahrenheit
EMI	Electro Magnetic Interference	°C	Degrees Celsius
EUT	Equipment Under Test	Temp	Temperature
ITE	Information Technology Equipment	S/N	Serial Number
TAP	Test Assessment Schedule	Qty	Quantity
ESD	Electro Static Discharge	emf	Electromotive force
EFT	Electric Fast Transient	RMS	Root mean square
EDCS	Engineering Document Control System	Qp	Quasi Peak
Config	Configuration	Av	Average
CIS#	Cisco Number (unique identification number for Cisco test equipment)	Pk	Peak
Cal	Calibration	kHz	Kilohertz (1×10^3)
EN	European Norm	MHz	MegaHertz (1×10^6)
IEC	International Electro technical Commission	GHz	Gigahertz (1×10^9)
CISPR	International Special Committee on Radio Interference	H	Horizontal
CDN	Coupling/Decoupling Network	V	Vertical
LISN	Line Impedance Stabilization Network	dB	decibel
PE	Protective Earth	V	Volt
GND	Ground	kV	Kilovolt (1×10^3)
L1	Line 1	μ V	Microvolt (1×10^{-6})
L2	Line2	A	Amp
L3	Line 3	μ A	Micro Amp (1×10^{-6})
DC	Direct Current	mS	Milli Second (1×10^{-3})
RAW	Uncorrected measurement value, as indicated by the measuring device	μ S	Micro Second (1×10^{-6})
RF	Radio Frequency	μ S	Micro Second (1×10^{-6})
SLCE	Signal Line Conducted Emissions	m	Meter
Meas dist	Measurement distance	Spec dist	Specification distance
N/A or NA	Not Applicable	SL	Signal Line (or Telecom Line)
P	Power Line	L	Live Line
N	Neutral Line	R	Return
S	Supply	AC	Alternating Current



Appendix C: Test Equipment Used to perform the test

Equip#	Manufacturer/ Model	Description	Last Cal	Next Due
041987	Murata Electronics MXGS83RK3000	Special Radio Test Adaptor Cable	10-MAY-08	10-MAY-09
034974	Midwest Microwave ATT-0640-20-29M-02	Attenuator, 20dB, DC-40GHz	15-MAY-08	15-MAY-09
036716	Cisco RF Coaxial Cable-SMA	Radio Test Cable, SMA-SMA	14-Dec-08	14-Dec-09
040514	Agilent E4440A	Precision Spectrum Analyzer	16-Apr-08	16-Apr-09
008024	Huber + Suhner SF106A	3 meter Sucoflex cable	13-Nov-08	13-Nov-09
030443	Micro-Coax UFB311A-0-1560-520520	RF Coaxial Cable, to 18GHz, 156 In.	13-Nov-08	13-Nov-09
033602	Midwest Microwave CSY-NMNM-80-273001	RF Coaxial Cable, 27ft. to 18GHz	13-Nov-08	13-Nov-09
039114	Sunol Sciences JB1	Combination Antenna	19-Dec-08	19-Dec-09
040523	Rohde & Schwarz ESCI	EMI Test Receiver	26-Jun-08	26-Jun-09
002119	EMC Test Systems 3115	Double Ridged Guide Horn Antenna	03-Jun-08	03-Jun-09
008081	Huber + Suhner SF106A	1m Sucoflex cable	13-Nov-08	13-Nov-09
005691	Miteq NSP1800-25-S1	Broadband Preamplifier (1-18GHz)	09-Oct-08	09-Oct-09
035613	Micro-Tronics BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz	12-Jun-08	12-Jun-09
042000	Agilent E4440A	Spectrum Analyzer	04-Jun-08	04-Jun-09
024201	Rohde & Schwarz FSEK30	EMI Test Receiver	20-Nov-07	20-Nov-08
028072	CISCO 1840	18-40GHz EMI Test Fixture	03-Oct-07	03-Oct-08
021608	Micro-Coax UFB142A-1-1572-200-200	RF Coax Cable to 40GHz, 157.2in	03-Oct-07	03-Oct-08
043023	Anritsu MT8852B	Bluetooth Test Set	04-Aug-08	04-Aug-09
001937	Cisco/ NSA 5m Chamber	NSA 5m Chamber	06-DEC-08	06-DEC-09
002119	EMC Test Systems/ 3115	Double Ridged Guide Horn Antenna	03-JUN-08	03-JUN-09
002383	Omega/ CT485B	Temp/Humidity Recorder	31-JUL-08	31-JUL-09
002395	Omega/ CT485B	Temp/Humidity Recorder	11-JUL-08	11-JUL-09
005691	Miteq/ NSP1800-25-S1	Broadband Preamplifier (1-18GHz)	09-OCT-08	09-OCT-09
008022	Huber + Suhner/ SF106A	1 meter Sucoflex cable	03-DEC-08	03-DEC-09
008024	Huber + Suhner/ SF106A	3 meter Sucoflex cable	11-NOV-08	11-NOV-09
008103	Cisco/ Unifield 5m Chamber	Unifield 5m Chamber	17-DEC-08	17-DEC-09
018314	EMC Test Systems/ 3115	Double Ridged Guide Horn Antenna	Cal Not Required	N/A



027235	York/ CNE V	Comparison Noise Emitter	Cal Not Required	N/A
030443	Micro-Coax/ UFB311A-0-1560-520520	RF Coaxial Cable, to 18GHz, 156 In.	11-NOV-08	11-NOV-09
033602	Midwest Microwave/ CSY-NMNM-80-273001	RF Coaxial Cable, 27ft. to 18GHz	11-NOV-08	11-NOV-09
034074	Schaffner/ RSG 2000	Reference Spectrum Generator, 1- 18GHz	Cal Not Required	N/A
037023	Panashield/ 5m Chamber	5m Anechoic Chamber	Cal Not Required	N/A
037235	JFW/ 50CB-015	Control Box, GPIB	Cal Not Required	N/A
039114	Sunol Sciences/ JB1	Combination Antenna	29-DEC-08	29-DEC-09
039130	Cisco/ TH0118-PS	Power Supply for TH0118 1-18GHz Preamplifier	19-MAY-08	19-MAY-09
040523	Rohde & Schwarz/ ESCI	EMI Test Receiver	26-JUN-08	26-JUN-09
041991	Cisco/ TH0118	Mast Mount Preamplifier Array, 1-18GHz	19-MAY-08	19-MAY-09
042000	Agilent/ E4440A	Spectrum Analyzer	04-JUN-08	04-JUN-09

Appendix D: Test Procedures

Measurements were made in accordance with

- FCC docket #:DA 00-0705,
- ET docket 96-8, KDB Publication No. 558074
- measurement method of spurious emission tolerance to the International Telecommunication Union (ITU) Recommendation SM329.
- ANSI PC63.10
- ANSI C63.4

Test procedures are summarized below

6dB Bandwidth	EDCS # - 422115
26dB Bandwidth	EDCS # - 422115
Co-Located Transmitter	EDCS # - 422118
Conducted Spurious Test	EDCS # - 422119
Peak Transmit Power Measurement	EDCS # - 422123
Power Spectral Density	EDCS # - 422113
Radiated Band Edge	EDCS # - 422124
Radiated Spurious Test	EDCS # - 422125