Radio Intentional EMC Test Report: EDCS - 1391499

For

CP-8861

2.4GHz WLAN Radio 802.11 b/g/n

FCC ID: LDK88611057

IC ID : 2461B-88611057

Against the following Specifications :

47 CFR 15.247

RSS-210

RSS-102

RSS-GEN

Cisco Systems

EMC Laboratory

170 West Tasman Drive

San Jose, CA 95134

ACCREDITED

Testing - Certificate Number : 1178-01

Author: Jose Aguirre
Approved By: Dilip Patel
Title: Manager

This report replaces any previously entered test report under EDCS - 1391499

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

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
RSS-GEN

Notes:

1) Measurements were made in accordance with KDB Publication No. 558074 & ANSI C63.10

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

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 E, along with further details.

2.2 Start Date of Testing

Jan 16, 2014

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 #: 2461N-2
Building P, 5m Chamber	Company #: 2461N-1
Building I, 5m Chamber	Company #: 2461M-1

Test Engineers

Jose Aguirre

2.5 Equipment Assessed (EUT)

CP-8861

2.6 EUT Description

The CP-8861 802.11AC IP Phone supports the following modes of operation. The modes are further defined in the radio Theory of Operation. The modes included in this report represent the worst case data for all modes.

This specification is applied to the IEEE802.11a/b/g/n/ac W-LAN + Bluetooth 3.0/HS.

- Broadcom BCM4339 inside
- Compliant with IEEE802.11a/b/g/n/ac
- Compliant with Bluetooth specification v3.0+HS
- Supports standard SDIO v3.0 host interface
- Interface support for Bluetooth is Host Controller Interface (HCI)
- RoHS compliant

802.11A , Legacy OFDM, Non HT-20, 6 to 54 Mbps (6Mbps worst case)
802.11N, HT-20, Single Antenna, M0 to M7 (M0 worst Case)
802.11N, HT-40, Single Antenna, M0 to M7 (M0 worst Case)
802.11AC, HT-80, Single Antennas, M0 to M9 (M0 worst Case)

The following Antenna(s) are supported by this product

Frequency	Part number	Antenna Type	Antenna Gain (dBi)
2400-2483.5MHz	Internal	Omni-directional	3.11
5150-5250MHz	Internal	Omni-directional	3.62
5250-5350MHz	Internal	Omni-directional	3.66
5470–5725MHz	Internal	Omni-directional	3.10
5725-5850MHz	Internal	Omni-directional	3.79

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 D 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:

Emission level [dBuV] = Indicated voltage level [dBuV] + Cable Loss [dB] + 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:-

Level in uV/m = Common Antilogarithm [(X dBuV/m)/20] = Y uV/m

Average detection—Average detection with a spectrum analyzer is obtained by reducing the video bandwidth until no further smoothing of the displayed signal is observed. The sweep time must be increased with reductions in video bandwidth to maintain amplitude calibration. For measurements in accordance with CISPR 16-1-1:2006 the video bandwidth shall be set to a 10 Hz value to ensure that the proper integration time is realized. For such measurements, the instrument shall be used in the linear mode of the detector. After linear detection is made, the signal may be processed logarithmically for display, in which case the value is corrected even though it is the logarithm of the linearly detected signal.

2.9 Report Template Control No.

EDCS#: 703456

Section 3: Result Summary

3.1 Results Summary Table

Conducted emissions

Basic Standard	Test Procedure	Test Details / Comments	Result
Power Spectral Density	ANSI C63.10 KDB 558074	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	ANSI C63.10 KDB 558074	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	ANSI C63.10 KDB 558074	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	ANSI C63.10 KDB 558074	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
Band Edge Measurements	ANSI C63.10 KDB 558074	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

AC conducted Emissions:	ANSI C63.10	**AC conducted Emissions:** Except when the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply, either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table in these sections. The more stringent limit applies at the frequency range boundaries. FCC 15.207 /RSS-Gen 7.2.4	Pass

Radiated emissions

Basic Standard	Test Procedure	Test Details / Comments	Result
Radiated Spurious and Harmonic Emissions	ANSI C63.10 KDB 558074	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
RX Spurious Emissions	ANSI C63.10	**RX Spurious Emissions:** Spurious emissions from the receivers shall not exceed the radiated limits of receiver spurious emissions shown in table 2 in section 6.1. RSS-Gen 4.10	Pass

* MPE measurements reported in separate report.

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. Please also refer to the "Justification for worst Case test Configuration" section of this report for further details on the selection of EUT samples.

4.1 Sample Details

Sample No.	Equipment Details	Part Number	Manufacturer	Serial Number
S01	2.4GHz WLAN Radio	68-5283-01	Cisco Systems	FCH18018us0
S02	Laptop PC	59359084	Lenovo	

4.2 System Details

System #	Description	Samples
1	2.4GHz WLAN radio	S01
2	Support Host	S02

4.3 Mode of Operation Details

Description	Comments
802.11b	1Mbps – 11Mbps rate (worst case mode 1Mbps)
802.11g	6Mbps – 54Mbps rate (worst case mode 6Mbps)
802.11N	M0 – M7 rate (worst case mode 1Mbps)

4.4 Antenna(s) supported

Frequency	Part Number	Antenna Type	Antenna Gain (dBi)
2.4 GHz	internal	Omni	3.11

Section 5: Modifications

5.1 Sample Modifications Performed During Assessment

No modifications were performed during assessment.

Appendix A: Formal Test Results

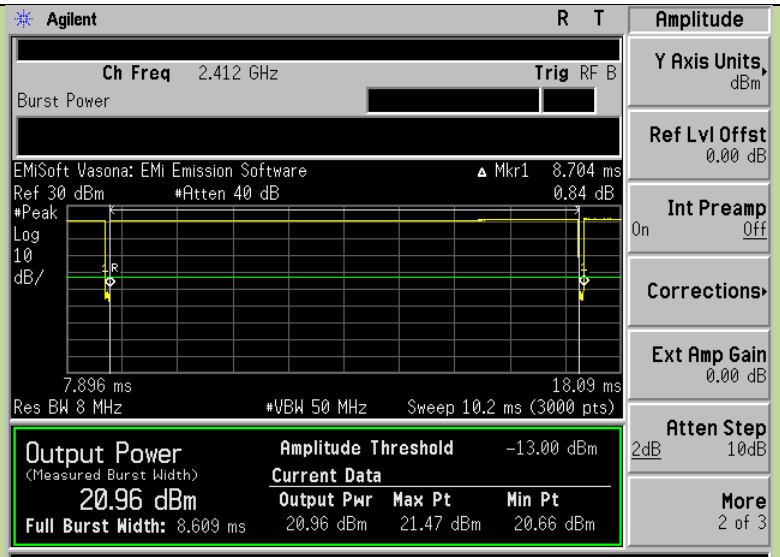
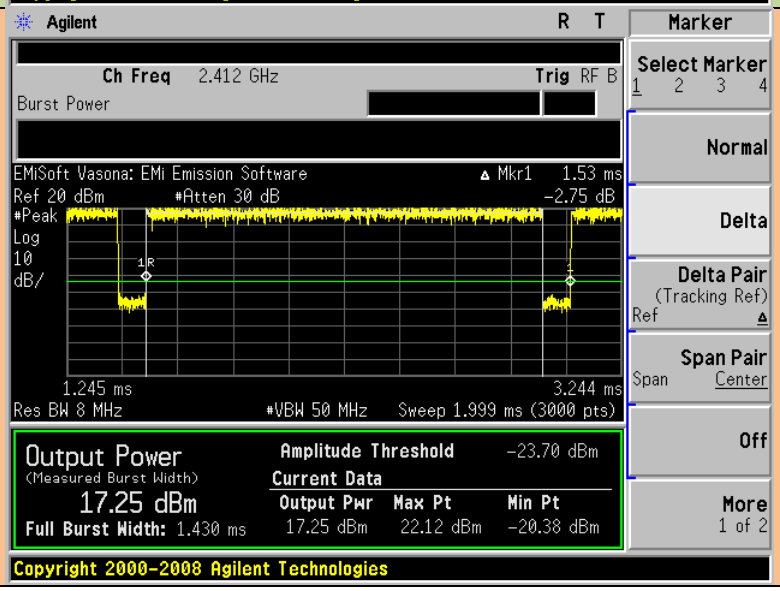
Target Maximum Channel Power

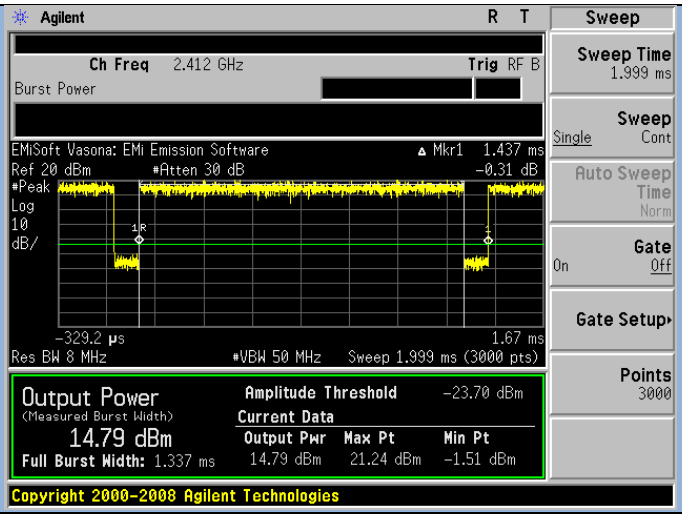
The following Table details t maximum supported total channel power for all operating modes

Operating modes	Maximum Channel Power (dBm)		
	Frequency (MHz)		
	2412	2437	2462
IEEE 802.11 b (1-11Mbps)	16	16	16
IEEE 802.11 g (6-54Mbps)	15	15	15
IEEE 802.11 N (6.5-65Mbps)	13	13	13

Duty Cycle

The zero-span mode on a spectrum analyzer or EMI receiver ,if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ EBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average.

Description	Plot
802.11B 1Mbps rate Worst case Duty Cycle (x) = Tx on/ Tx period Tx on = 8.609mS Tx period = 8.704mS x = 8.609/8.704 = 0.99 *Greater than 98% DCCF = 0 Duty Cycle Correction Factor (DCCF) =10Log(1/x) = **0.0dB**	
802.11G 6Mbps Worst case Duty Cycle (x) = Tx on/ Tx period Tx on = 1.430mS Tx period = 1.53mS x = 1.43/1.53 = 0.94 Duty Cycle Correction Factor (DCCF) =10Log(1/x) = **0.3dB**	

802.11N HT20 mcs M0 worst case Duty Cycle (x) = Tx on/ Tx period Tx on = 1.337mS Tx period = 1.437mS x = 1.337/1.437 = 0.93 Duty Cycle Correction Factor (DCCF) =10Log(1/x) = **0.31dB**	

- Worst case data rate

6 dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

Connect the antenna port(s) to the spectrum analyzer input. Using the spectrum analyzer Channel Bandwidth mode, configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer). Place the radio in continuous transmit mode

Center Frequency:	Frequency from table below
Span:	2 x Nominal Bandwidth (e.g. 40MHz for a 20MHz channel)
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	5 s
Resolution Bandwidth:	100 kHz
Video Bandwidth:	300 kHz
X dB Bandwidth:	6 dB
Detector:	Peak
Trace:	Max Hold

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (*i.e.*, RBW = 100 kHz, VBW ≥ 3´RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

Frequency (MHz)	Mode	Data Rate (Mbps)	6dB BW (MHz)	Limit (MHz)	Margin (MHz)
2412	802.11B	1Mbps	**7.59**	0.5	-7.09
2436	802.11B	1Mbps	**7.54**	0.5	-7.04
2462	802.11B	1Mbps	**8.03**	0.5	-7.53
2412	802.11G	6Mbps	**16.31**	0.5	-15.81
2436	802.11G	6Mbps	**16.31**	0.5	-15.81
2462	802.11G	6Mbps	**16.31**	0.5	-15.81
2412	802.11N	M0	**17.31**	0.5	-16.81
2436	802.11N	M0	**17.54**	0.5	-17.04
2462	802.11N	M0	**17.54**	0.5	-17.04

26dB Bandwidth & 99% Bandwidth

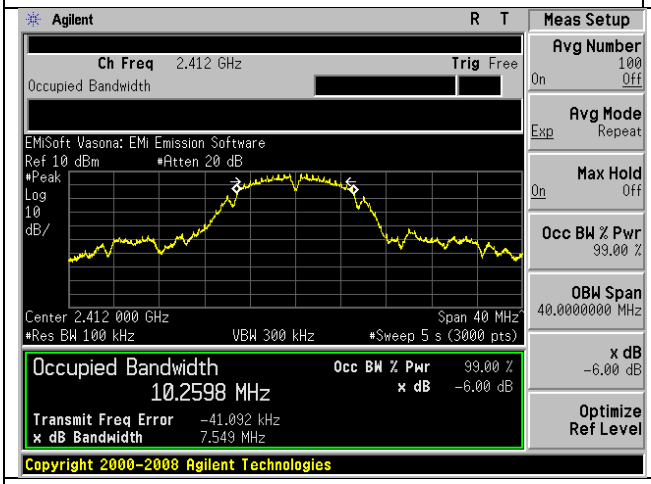
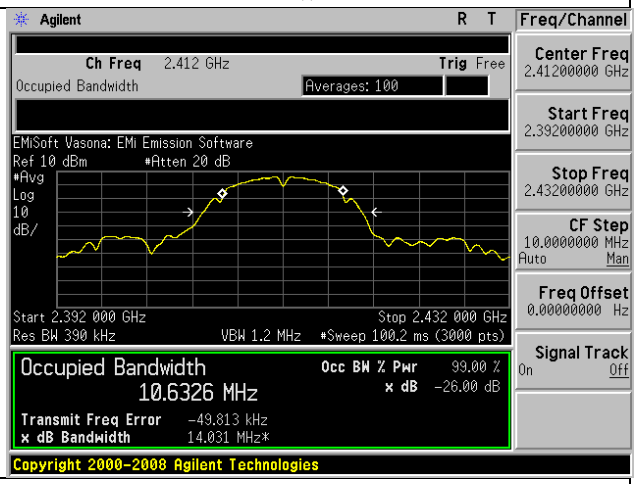
Connect the antenna port(s) to the spectrum analyzer input. Using the spectrum analyzer Channel Bandwidth mode, configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).

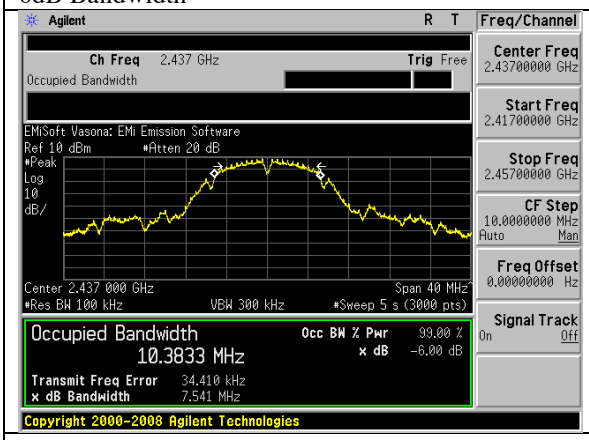
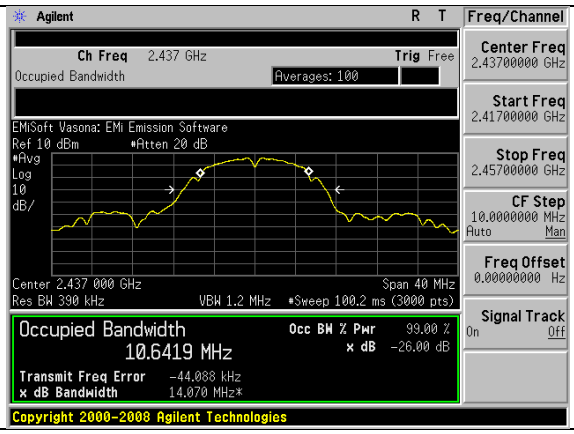
Center Frequency:	Frequency from table below
Span:	2 x Nominal Bandwidth (e.g. 40MHz for a 20MHz channel)
Reference Level:	10 dBm
Attenuation:	10 dB
Sweep Time:	5 s
Resolution Bandwidth:	1% - 3% of 26dB Bandwidth
Video Bandwidth:	≥ Resolution Bandwidth
X dB Bandwidth:	26 dB
Occ BW % :	99%
Detector:	Peak
Trace:	Single Max Hold

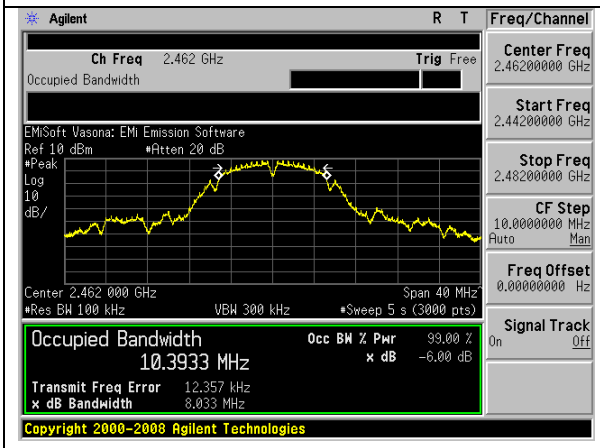
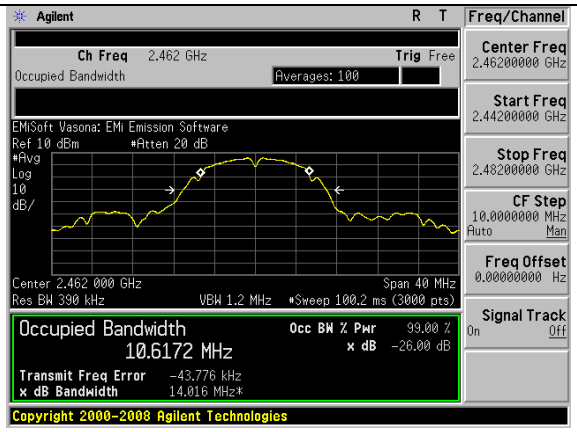
Place the radio in continuous transmit mode. View the transmitter waveform on the spectrum analyzer, and record the pertinent measurements:

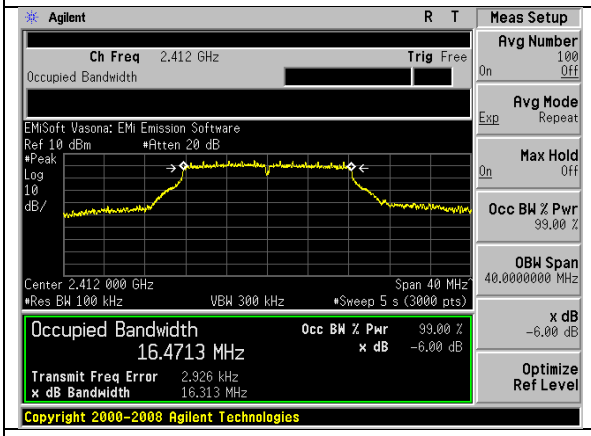
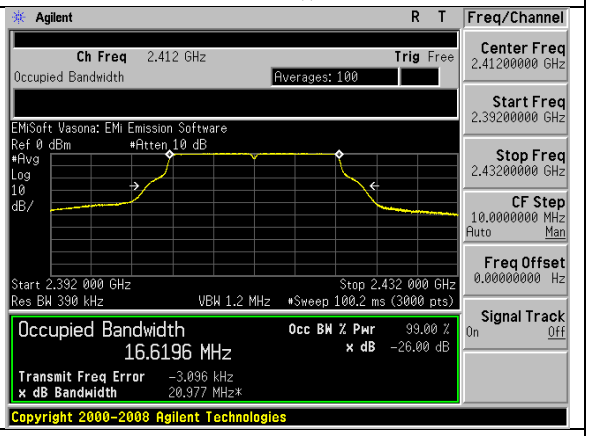
Frequency (MHz)	Mode	Data Rate (Mbps)	26dB BW (MHz)	99% BW (MHz)
2412	802.11B	1Mbps	14.031	10.633
2436	802.11B	1Mbps	14.070	10.642
2462	802.11B	1Mbps	14.016	10.617
2412	802.11G	6Mbps	20.977	16.620
2436	802.11G	6Mbps	20.983	16.622
2462	802.11G	6Mbps	20.947	16.622
2412	802.11N	M0	21.210	17.800
2436	802.11N	M0	21.173	17.802
2462	802.11N	M0	21.205	17.799

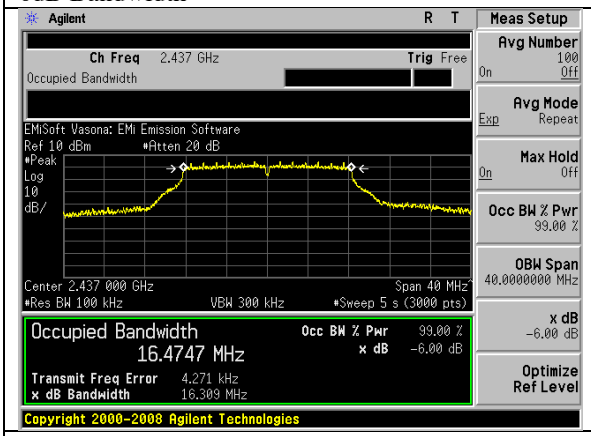
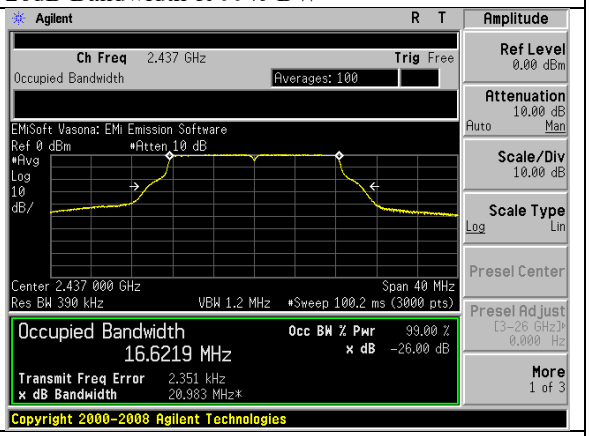
Graphical Test Results

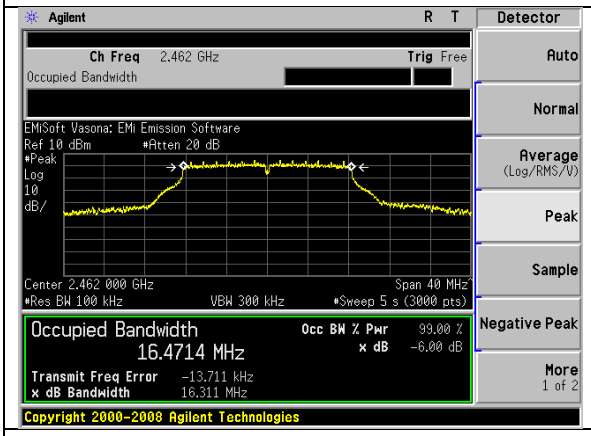
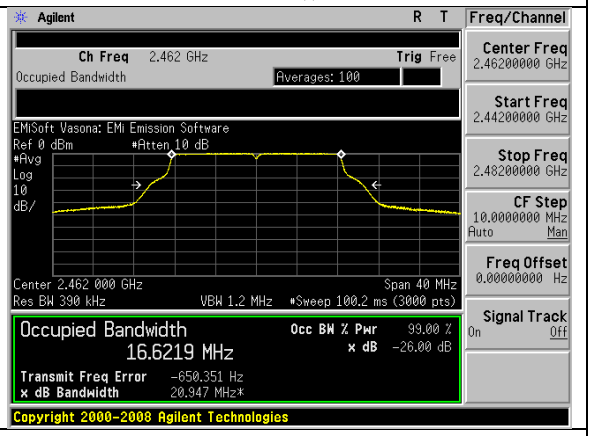
6dB Bandwidth	26dB Bandwidth & 99% BW
	
2412MHz (1Mpbs rate) 802.11B	

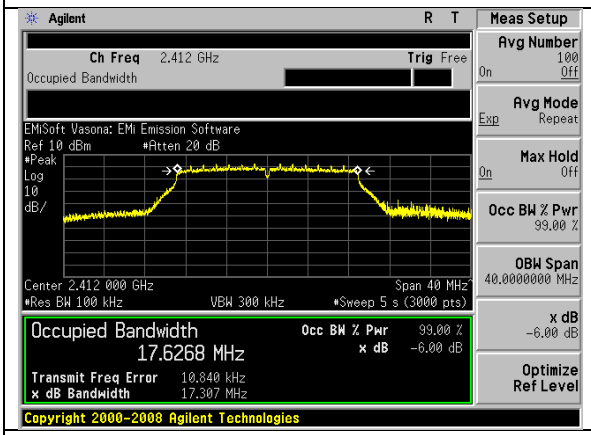
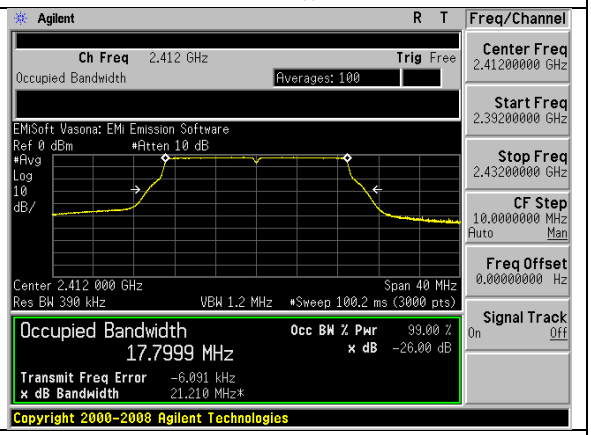
6dB Bandwidth	26dB Bandwidth & 99% BW
	
2437MHz (1Mpbs rate) 802.11B	

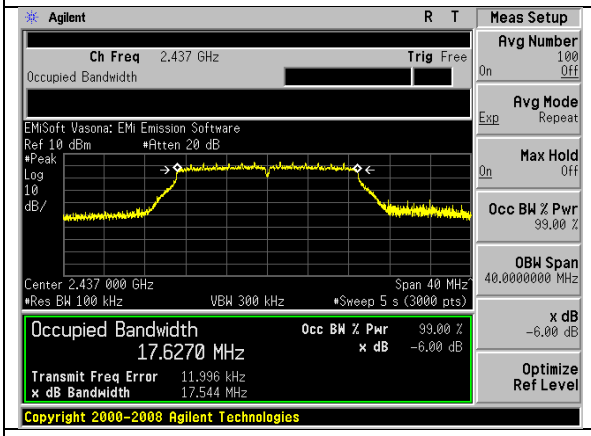
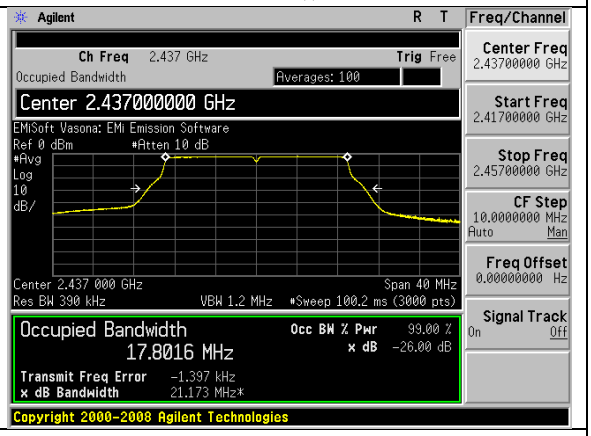
6dB Bandwidth	26dB Bandwidth & 99% BW
	
2462MHz (1Mpbs rate) 802.11B	

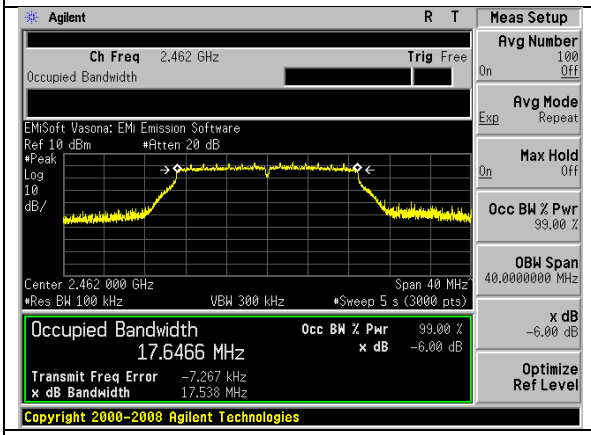
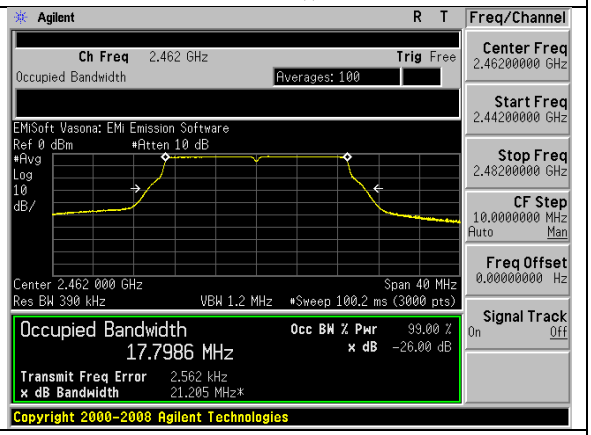
6dB Bandwidth	26dB Bandwidth & 99% BW
	
2412MHz (6Mpbs rate) 802.11G	

6dB Bandwidth	26dB Bandwidth & 99% BW
	
2437MHz (6Mpbs rate) 802.11G	

6dB Bandwidth	26dB Bandwidth & 99% BW
	
2462MHz (6Mpbs rate) 802.11G	

6dB Bandwidth	26dB Bandwidth & 99% BW
	
2412MHz (MCS M0) 802.11N	

6dB Bandwidth	26dB Bandwidth & 99% BW
	
2437MHz (MCS M0) 802.11N	

6dB Bandwidth	26dB Bandwidth & 99% BW
	
2462MHz (MCS M0) 802.11N	

Maximum Conducted (average) 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.

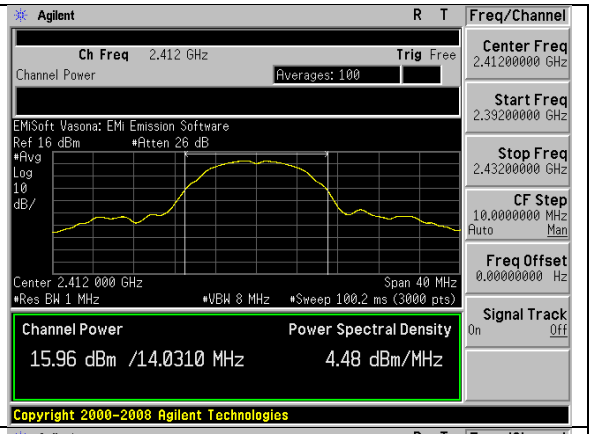
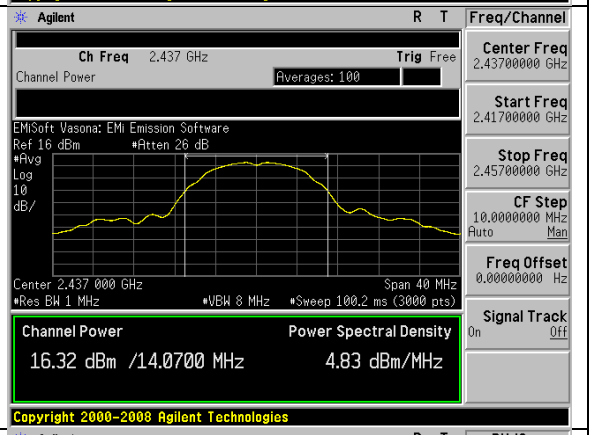
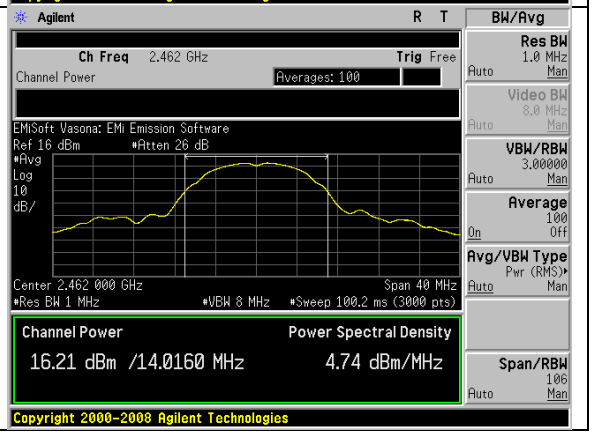
The maximum supported antenna gain is 3.11 dBi.

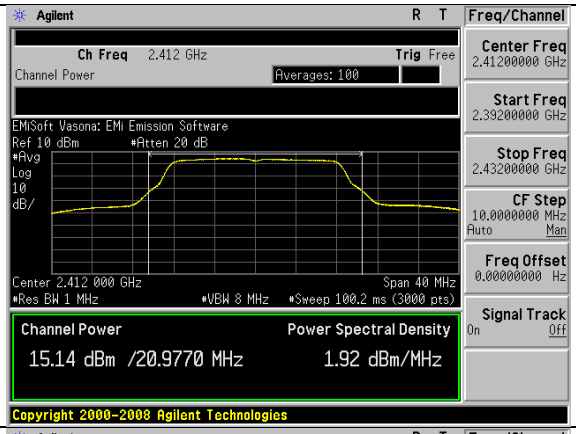
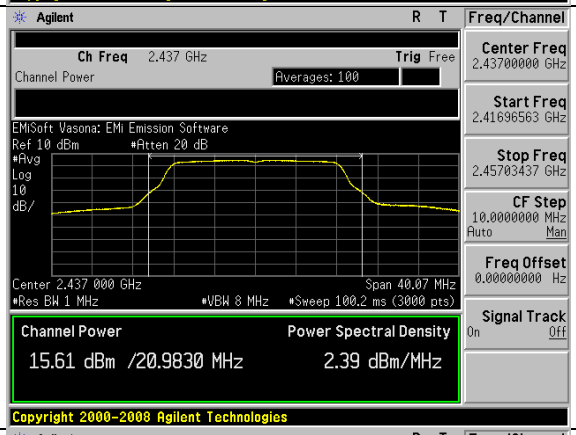
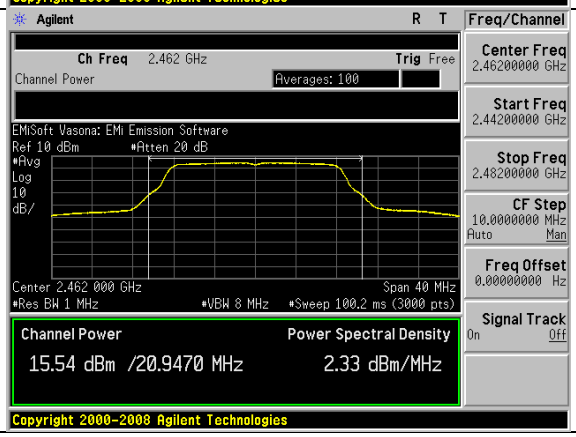
Procedures KDB 558074 sec 9.2.2.4 Method AVGSA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction)

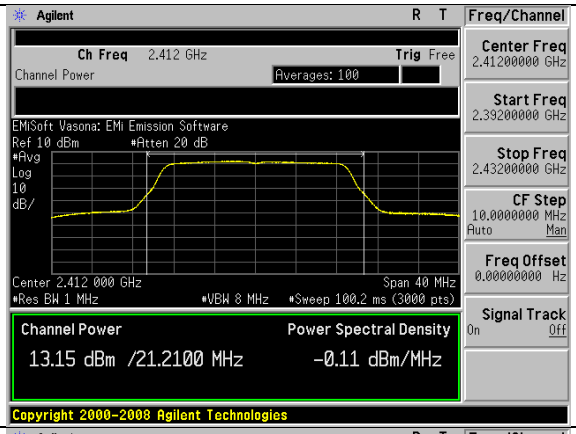
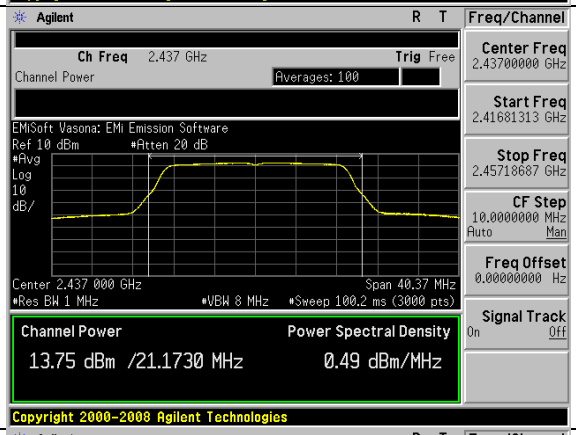
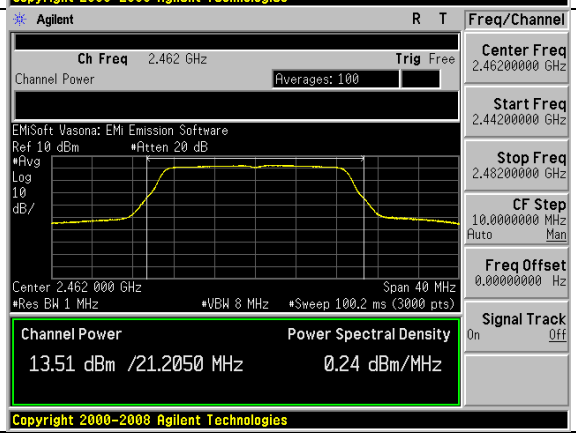
Connect the antenna port(s) to the spectrum analyzer input. Place the radio in continuous transmit mode.
Configure the spectrum analyzer as shown below.
Enable "Channel Power" function of analyzer
Center Frequency: Channel under test
Span: At least 1.5 x OBW
Reference Level: 10 dBm
Attenuation: 20 dB
Sweep Time: 100ms, Single sweep
Resolution Bandwidth: 1 MHz
Video Bandwidth: 3 MHz
Detector: Sample
Trace: Trace Average 100 traces in Power Averaging Mode
Integration BW: =26 dB BW from 26 dB Bandwidth Data

. Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times

Frequency (MHz)	Mode	Data Rate (Mbps)	Output Power (dBm)	Limit (dBm)	Duty Cycle CF (dB)	Margin (dB)
2412	802.11B	1Mbps	**15.96**	30	0	-14.04
2437	802.11B	1Mbps	**16.32**	30	0	-13.68
2462	802.11B	1Mbps	**16.21**	30	0	-13.79
2412	802.11G	6Mbps	**15.14**	30	0.3	-14.56
2437	802.11G	6Mbps	**15.61**	30	0.3	-14.09
2462	802.11G	6Mbps	**15.54**	30	0.3	-14.16
2412	802.11N	M0	**13.15**	30	0.31	-16.54
2437	802.11N	M0	**13.75**	30	0.31	-15.94
2462	802.11N	M0	**13.51**	30	0.31	-16.18

Output Power 2412MHz (1Mpbs rate) 802.11B	
Output Power 2437MHz (1Mpbs rate) 802.11B	
Output Power 2462MHz (1Mpbs rate) 802.11B	

Output power 2412MHz (6Mpbs rate) 802.11G	
Output power 2437MHz (6Mpbs rate) 802.11G	
Output power 2462MHz (6Mpbs rate) 802.11G	

Output power 2412MHz (MCS M0 rate) 802.11N	
Output power 2437MHz (MCS M0 rate) 802.11N	
Output power 2462MHz (MCS M0 rate) 802.11N	

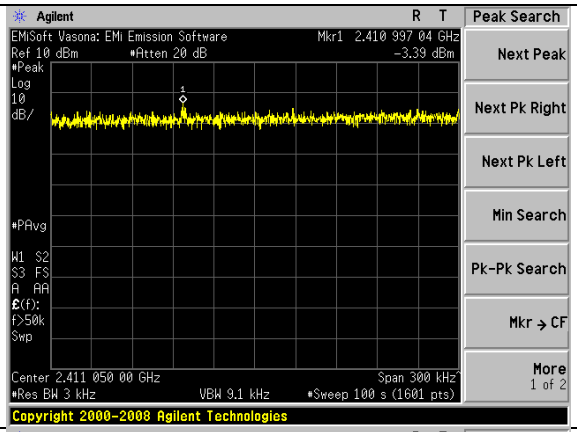
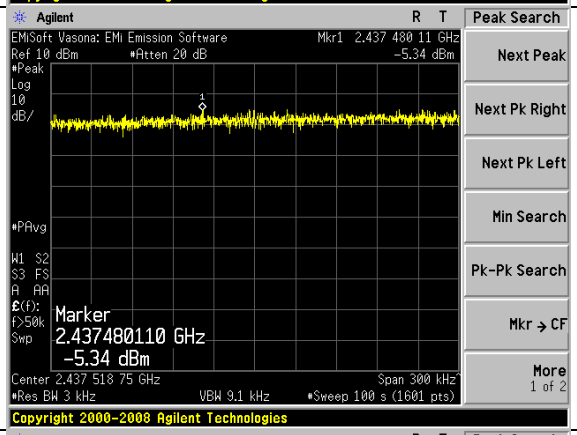
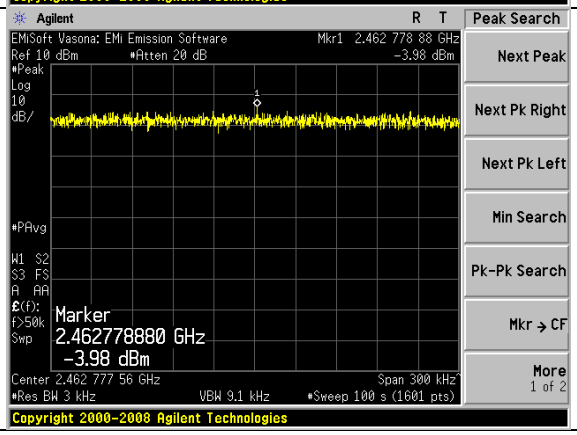
Power Spectral Density

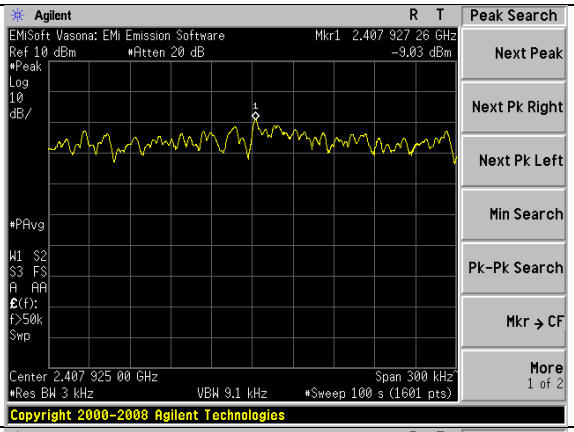
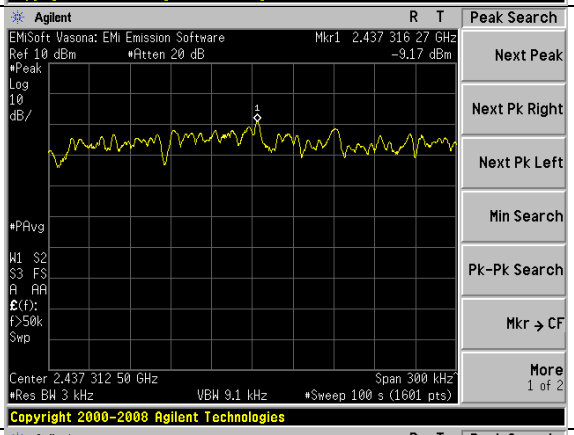
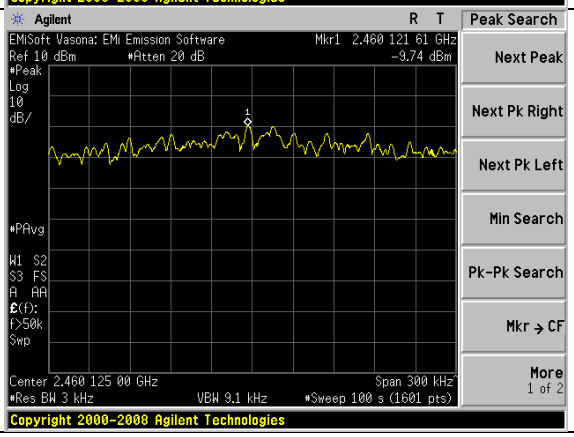
15.247 & RSS-210 A8.2:

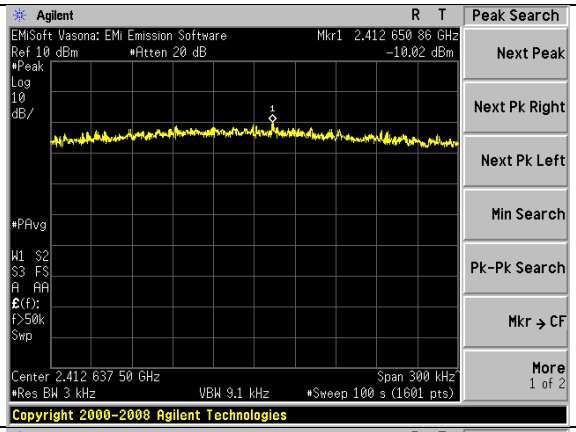
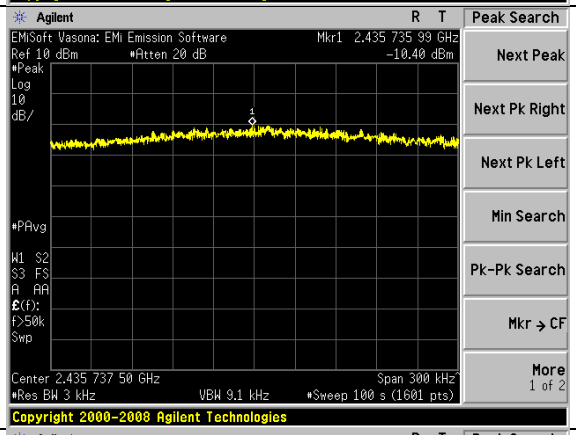
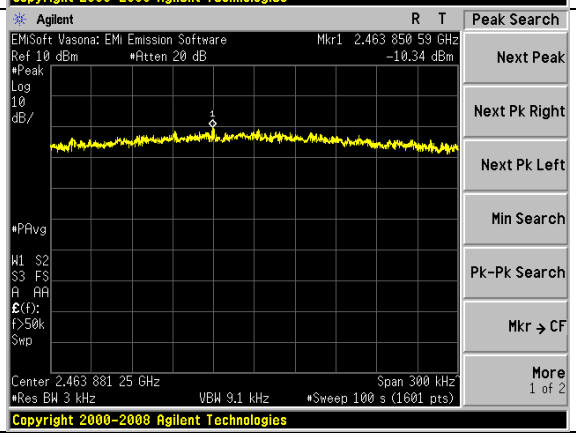
For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission

Frequency (MHz)	Mode	Data Rate (Mbps)	PSD (dBm/MHz)	Duty Cylce CF (dB)	Limit (dBm/MHz)	Margin (dB)
2412	802.11B	1Mbps	**-3.39**	0	8	-11.39
2437	802.11B	1Mbps	**-5.34**	0	8	-13.34
2462	802.11B	1Mbps	**-3.98**	0	8	-11.98
2412	802.11G	6Mbps	**-9.03**	0.3	8	-16.73
2437	802.11G	6Mbps	**-9.17**	0.3	8	-16.87
2462	802.11G	6Mbps	**-9.74**	0.3	8	-17.44
2412	802.11N	M0	**-10.02**	0.31	8	-17.71
2437	802.11N	M0	**-10.4**	0.31	8	-18.09
2462	802.11N	M0	**-10.34**	0.31	8	-18.03

Graphical Test Results

PSD 2412MHz (1Mpbs rate) 802.11B	
PSD 2437MHz (1Mpbs rate) 802.11B	
PSD 2462MHz (1Mpbs rate) 802.11B	

PSD 2412MHz (6Mpbs rate) 802.11G		
PSD 2437MHz (6Mpbs rate) 802.11G		
PSD 2462MHz (6Mpbs rate) 802.11G		

PSD 2412MHz (rate) 802.11N		
PSD 2437MHz (s rate) 802.11N		
PSD 2462MHz (rate) 802.11N		

Conducted Spurious emissions

15.247 & RSS-210 A8.5:

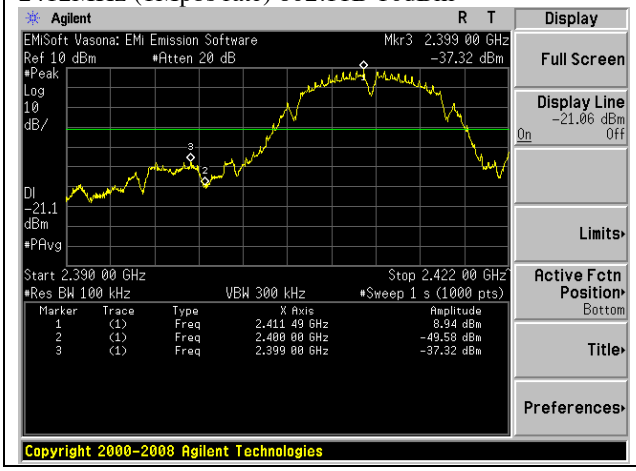
In any 100 kHz bandwidth outside the frequency band in which the digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dBc below that in the 100 kHz bandwidth within the band that contains the highest level of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

KDB : 558074 D01 DTS Meas Guidance v03r01 section 12.2.2 © add the max antenna gain + ground reflection factor (4.7 dB for frequencies between 30 MHz and 1000 MHz, and 0 dB for frequencies > 1000 MHz).
The maximum supported antenna gain is 3.11dBi.

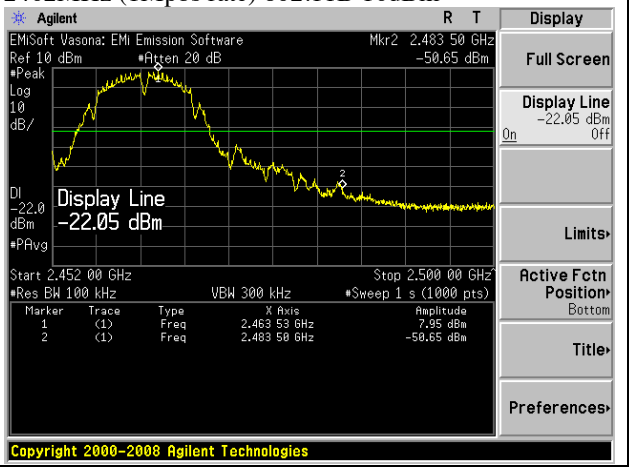
All measurements are greater than -30dBc below the limit. By visual inspection, transmitter complies

Test Results

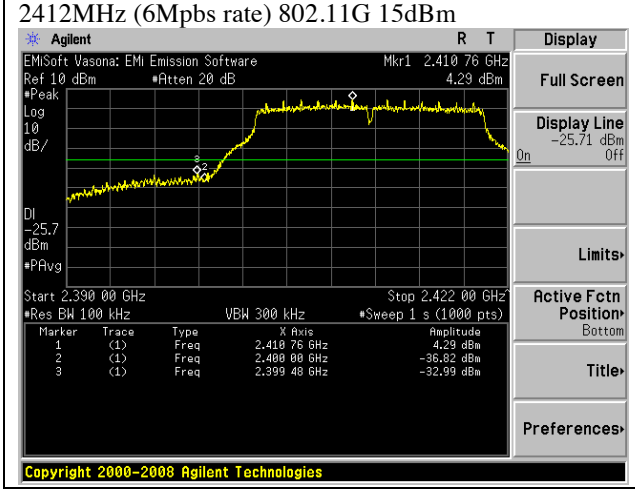
CSE at authorized bandedge (30dBc in any 100kHz)
2412MHz (1Mpbs rate) 802.11B 16dBm



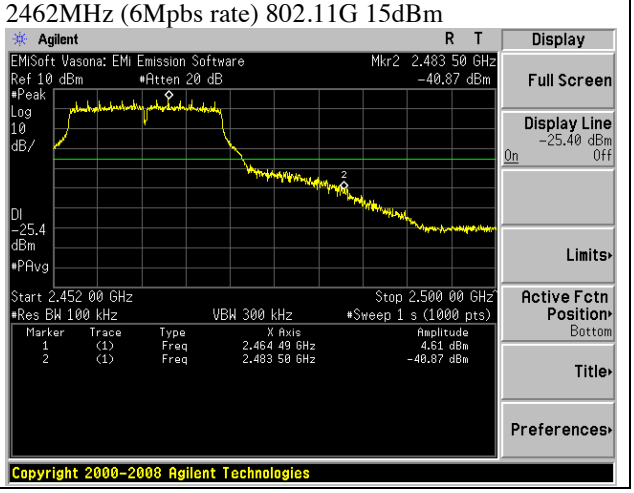
CSE at authorized bandedge (30dBc in any 100kHz)
2462MHz (1Mpbs rate) 802.11B 16dBm



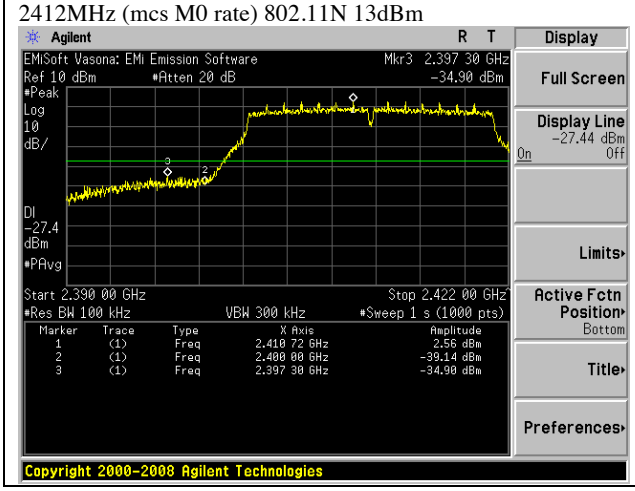
CSE at authorized bandedge (30dBc in any 100kHz)
2412MHz (6Mpbs rate) 802.11G 15dBm



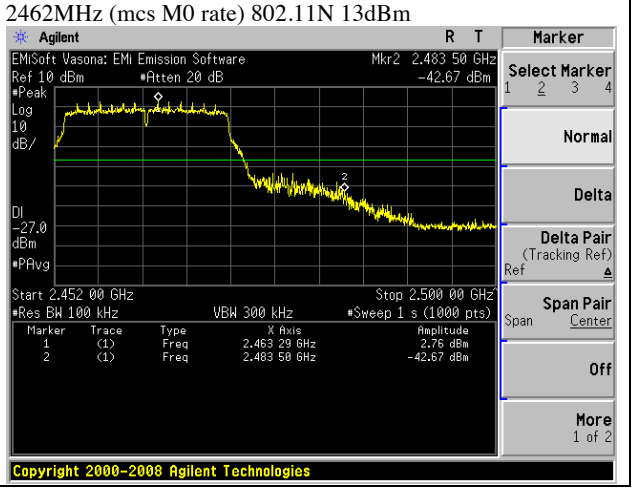
CSE at authorized bandedge (30dBc in any 100kHz)
2462MHz (6Mpbs rate) 802.11G 15dBm



CSE at authorized bandedge (30dBc in any 100kHz)
2412MHz (mcs M0 rate) 802.11N 13dBm



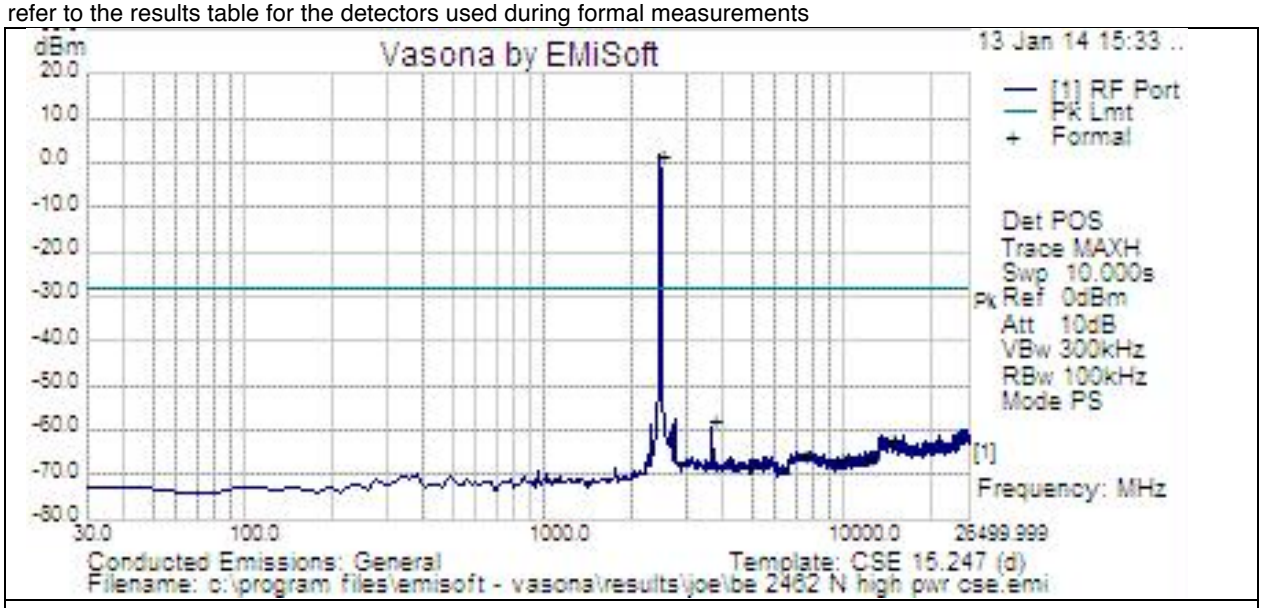
CSE at authorized bandedge (30dBc in any 100kHz)
2462MHz (mcs M0 rate) 802.11N 13dBm



Engineer	Jose Aguirre
Lab Information	Building B, Radio Area
Subtest Results	
Line Under Test	[B] Antenna port
Transducer	Direct
Subtest Result	Pass
Highest Frequency	26499.999
Lowest Frequency	30.0
Comments on the above Test Results	802.11N channel 11 at MCS=0 (6.5Mbps)

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



802.11N channel 11 at MCS=0 (6.5Mbps)

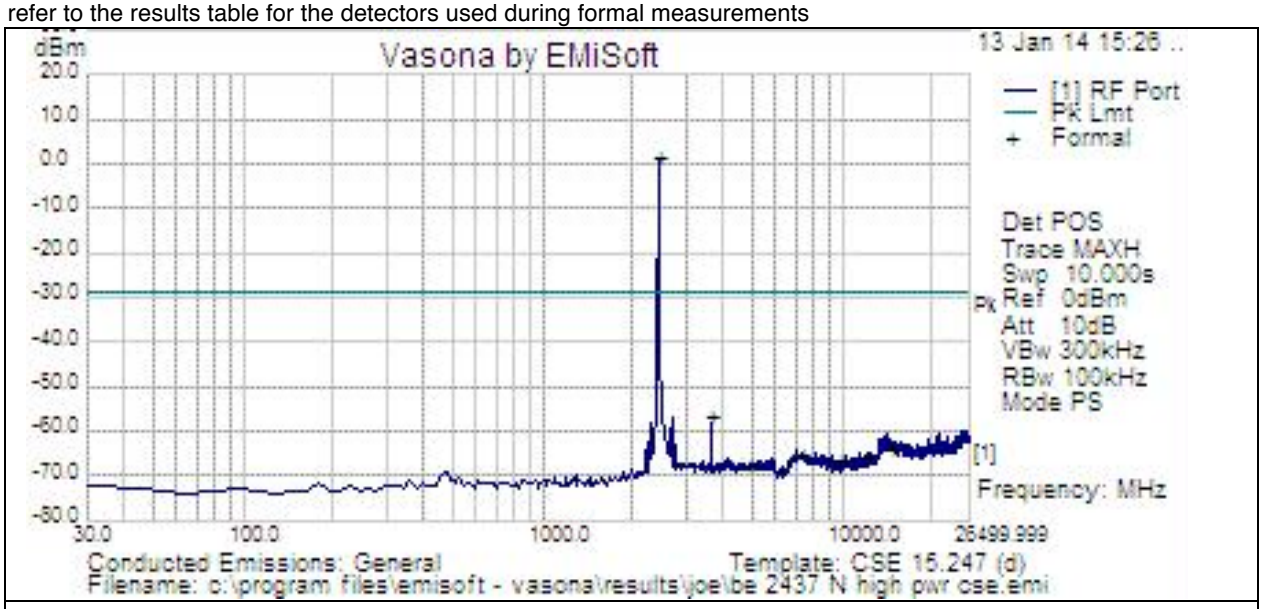
Test Results Table

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
2461.931	-12.7	14.4	0	1.7	Peak	RF	-28.3	30	NA	
4924	-84.3	15.9	0	-68.4	Peak	RF	-28.3	-40	Pass	
7384.88	-80	14.4	0	-65.7	Peak	RF	-28.3	-37.3	Pass	
9847.84	-80.9	14.2	0	-66.6	Peak	RF	-28.3	-38.3	Pass	
12309.94	-81	14.4	0	-66.7	Peak	RF	-28.3	-38.3	Pass	
14772.06	-77	14.6	0	-62.4	Peak	RF	-28.3	-34.1	Pass	
3692.99	-72.8	15.1	0	-57.6	Peak	RF	-28.3	-29.3	Pass	

Engineer	Jose Aguirre
Lab Information	Building B, Radio Area
Subtest Results	
Line Under Test	[B] Antenna port
Transducer	Direct
Subtest Result	Pass
Highest Frequency	26499.999
Lowest Frequency	30.0
Comments on the above Test Results	802.11N channel 6 at MCS=0 (6.5Mbps)

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



802.11N channel 6 at MCS=0 (6.5Mbps)

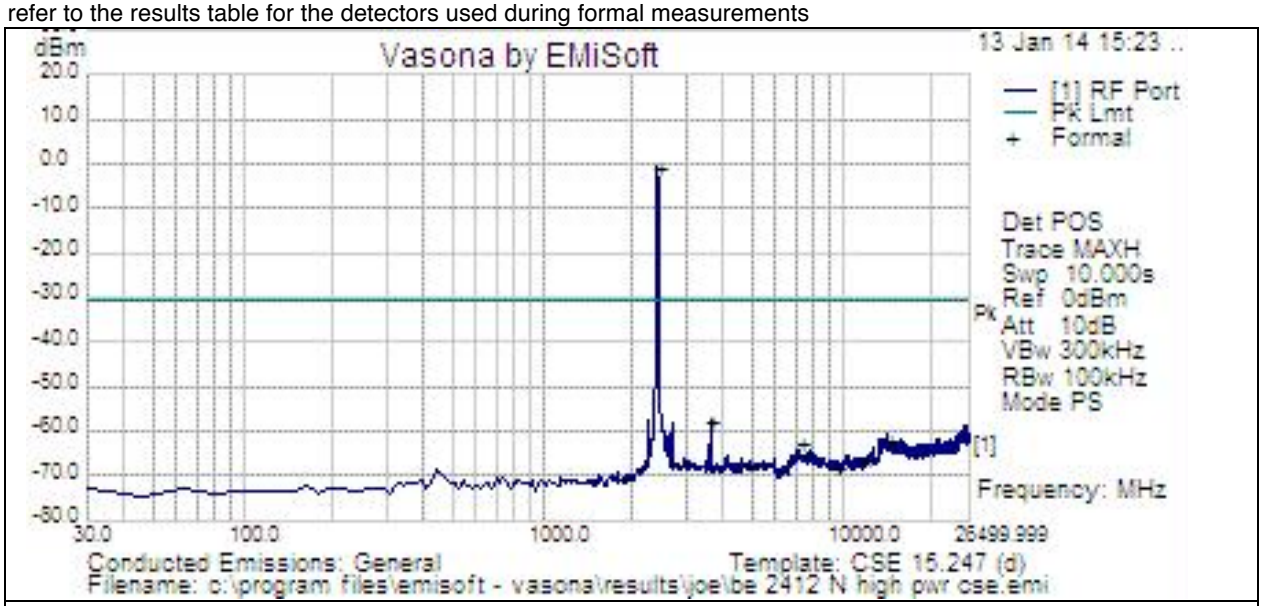
Test Results Table

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
2445.387	-12.8	14.3	0	1.5	Peak	RF	-28.5	30	N/A	
4874	-83.5	15.9	0	-67.6	Peak	RF	-28.5	-39.1	Pass	
7311	-79.7	14.4	0	-65.3	Peak	RF	-28.5	-36.8	Pass	
9748	-81	14.3	0	-66.8	Peak	RF	-28.5	-38.2	Pass	
12185	-80.1	14.4	0	-65.7	Peak	RF	-28.5	-37.2	Pass	
14622	-78.5	14.6	0	-63.9	Peak	RF	-28.5	-35.4	Pass	
3655.5	-72	15.1	0	-56.9	Peak	RF	-28.5	-28.4	Pass	

Engineer	Jose Aguirre
Lab Information	Building B, Radio Area
Subtest Results	
Line Under Test	[B] Antenna port
Transducer	Direct
Subtest Result	Pass
Highest Frequency	26499.999
Lowest Frequency	30.0
Comments on the above Test Results	802.11N channel 1 at MCS=0 (6.5Mbps)

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



802.11N channel 1 at MCS=0 (6.5Mbps)

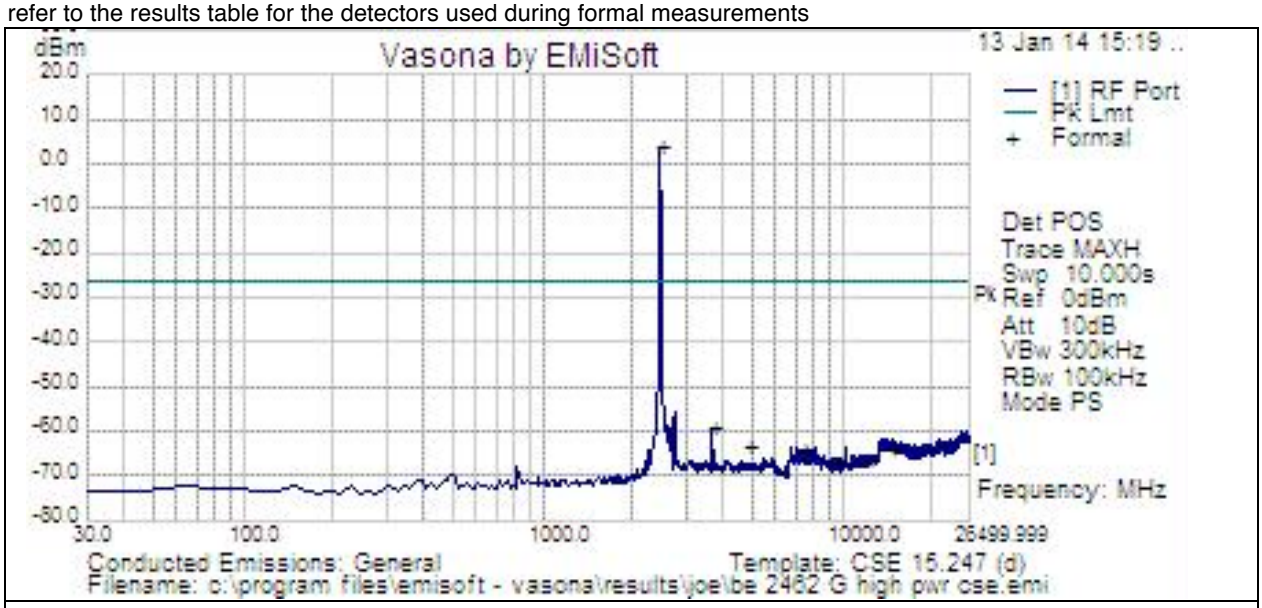
Test Results Table

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
2412.3	-15	14.3	0	-0.7	Peak	RF	-30.7	30	N/A	
3619.719	-73	15.1	0	-58	Peak	RF	-30.7	-27.2	Pass	
4824	-83.7	15.9	0	-67.8	Peak	RF	-30.7	-37.1	Pass	
7236	-77.4	14.4	0	-63	Peak	RF	-30.7	-32.2	Pass	
9648	-82.8	14.3	0	-68.6	Peak	RF	-30.7	-37.8	Pass	
12060	-80.9	14.4	0	-66.6	Peak	RF	-30.7	-35.9	Pass	
14472	-77.1	14.6	0	-62.4	Peak	RF	-30.7	-31.7	Pass	

Engineer	Jose Aguirre
Lab Information	Building B, Radio Area
Subtest Results	
Line Under Test	[B] Antenna port
Transducer	Direct
Subtest Result	Pass
Highest Frequency	26499.999
Lowest Frequency	30.0
Comments on the above Test Results	802.11G channel 11 at 6Mbps

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



802.11G channel 11 at 6Mbps

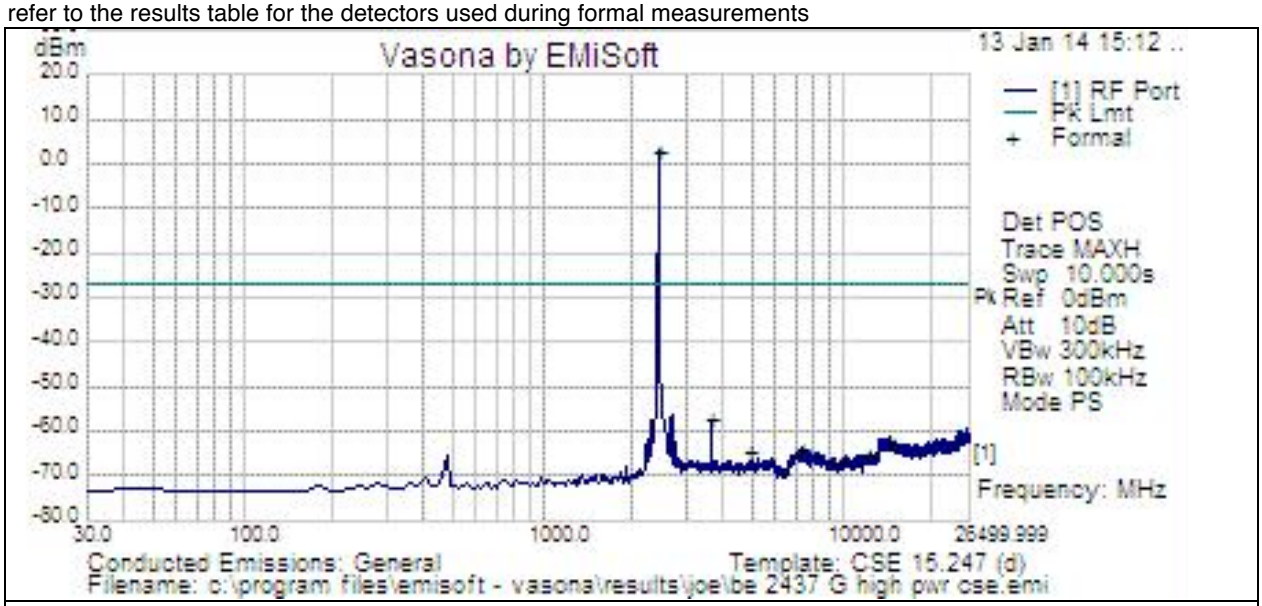
Test Results Table

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
2461.931	-10.4	14.4	0	3.9	Peak	RF	-26.1	30	N/A	
3686.15	-74.3	15.1	0	-59.2	Peak	RF	-26.1	-33.1	Pass	
4925.25	-79.2	15.9	0	-63.2	Peak	RF	-26.1	-37.1	Pass	
7386	-78.4	14.4	0	-64	Peak	RF	-26.1	-38	Pass	
9848	-81.5	14.2	0	-67.2	Peak	RF	-26.1	-41.1	Pass	
12310	-81.2	14.4	0	-66.8	Peak	RF	-26.1	-40.7	Pass	
14772	-78.6	14.6	0	-64	Peak	RF	-26.1	-37.9	Pass	

Engineer	Jose Aguirre
Lab Information	Building B, Radio Area
Subtest Results	
Line Under Test	[B] Antenna port
Transducer	Direct
Subtest Result	Pass
Highest Frequency	26499.999
Lowest Frequency	30.0
Comments on the above Test Results	802.11G channel 6 at 6Mbps

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



802.11G channel 6 at 6Mbps

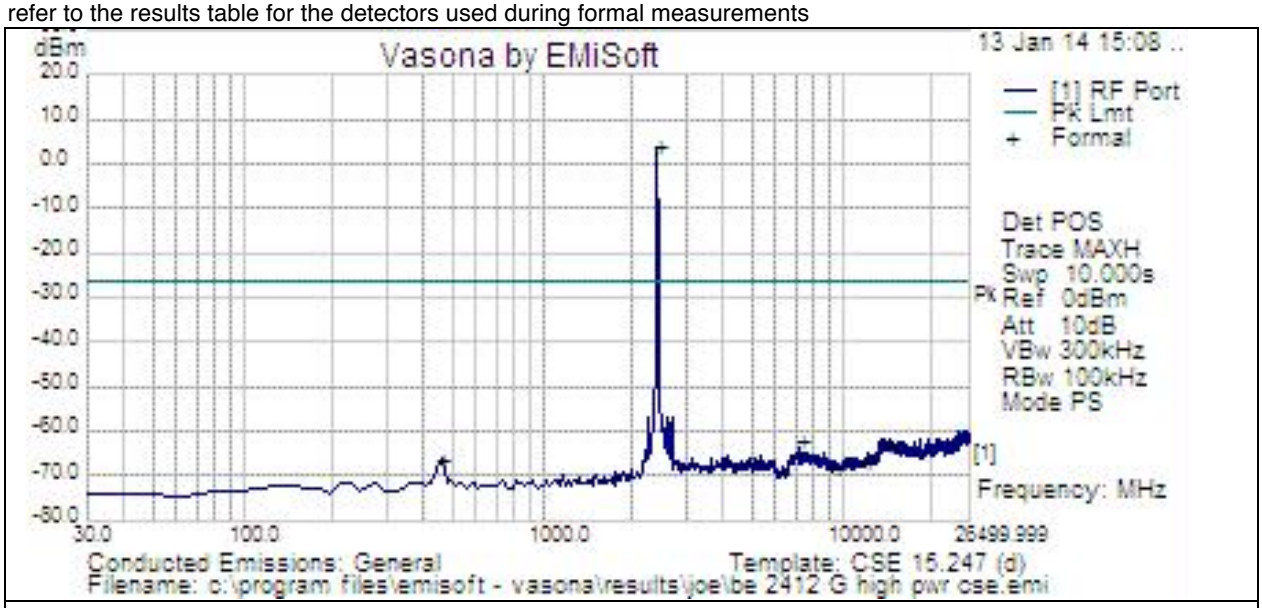
Test Results Table

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
2445.387	-11.4	14.3	0	3	Peak	RF	-27	30	N/A	
4872.75	-80.5	15.9	0	-64.6	Peak	RF	-27	-37.6	Pass	
7311	-78.7	14.4	0	-64.3	Peak	RF	-27	-37.3	Pass	
9748	-81.6	14.3	0	-67.3	Peak	RF	-27	-40.3	Pass	
12185	-79.5	14.4	0	-65.1	Peak	RF	-27	-38.1	Pass	
14622	-77.1	14.6	0	-62.5	Peak	RF	-27	-35.5	Pass	
3655.46	-72.2	15.1	0	-57.1	Peak	RF	-27	-30.1	Pass	

Engineer	Jose Aguirre
Lab Information	Building B, Radio Area
Subtest Results	
Line Under Test	[B] Antenna port
Transducer	Direct
Subtest Result	Pass
Highest Frequency	26499.999
Lowest Frequency	30.0
Comments on the above Test Results	802.11G channel 1 at 6Mbps

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



802.11G channel 1 at 6Mbps

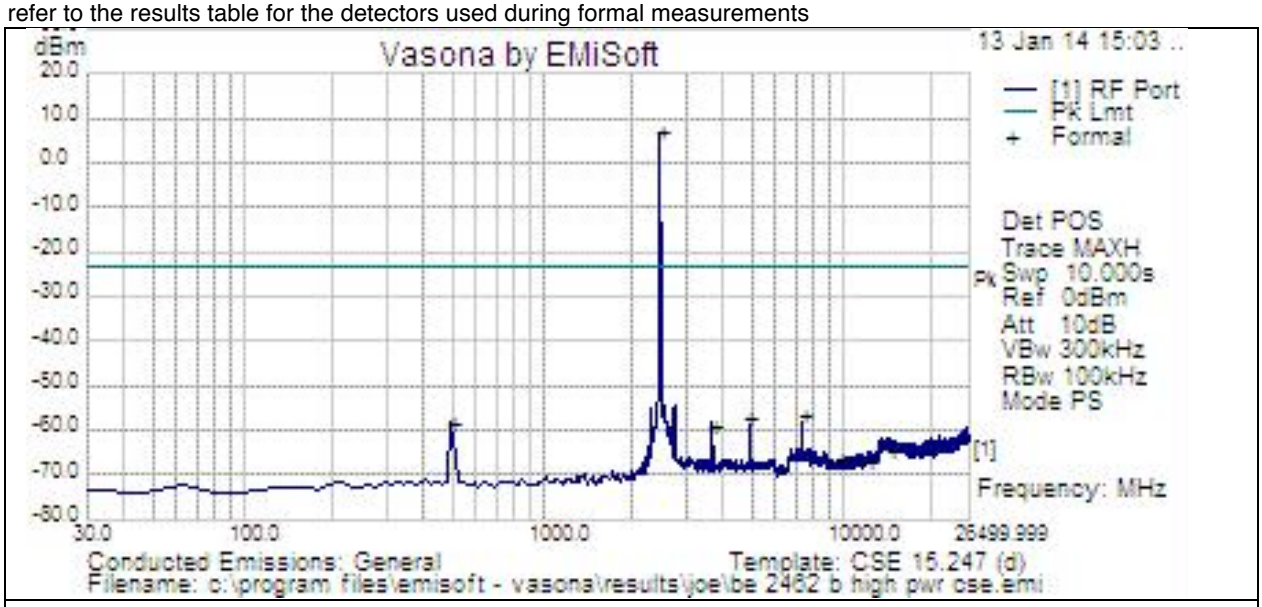
Test Results Table

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
461.753	-79.5	12.7	0	-66.8	Peak	RF	-26.1	-40.6	Pass	
2412.3	-10.4	14.3	0	3.9	Peak	RF	-26.1	30	N/A	
4824	-83	15.9	0	-67.1	Peak	RF	-26.1	-41	Pass	
7236	-76.4	14.4	0	-62	Peak	RF	-26.1	-35.9	Pass	
9648	-82.4	14.3	0	-68.1	Peak	RF	-26.1	-42	Pass	
12060.12	-81.2	14.4	0	-66.9	Peak	RF	-26.1	-40.8	Pass	
14471.94	-78	14.6	0	-63.3	Peak	RF	-26.1	-37.2	Pass	

Engineer	Jose Aguirre
Lab Information	Building B, Radio Area
Subtest Results	
Line Under Test	[B] Antenna port
Transducer	Direct
Subtest Result	Pass
Highest Frequency	26499.999
Lowest Frequency	30.0
Comments on the above Test Results	802.11B channel 11 at 1Mbps

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



802.11B channel 11 at 1Mbps

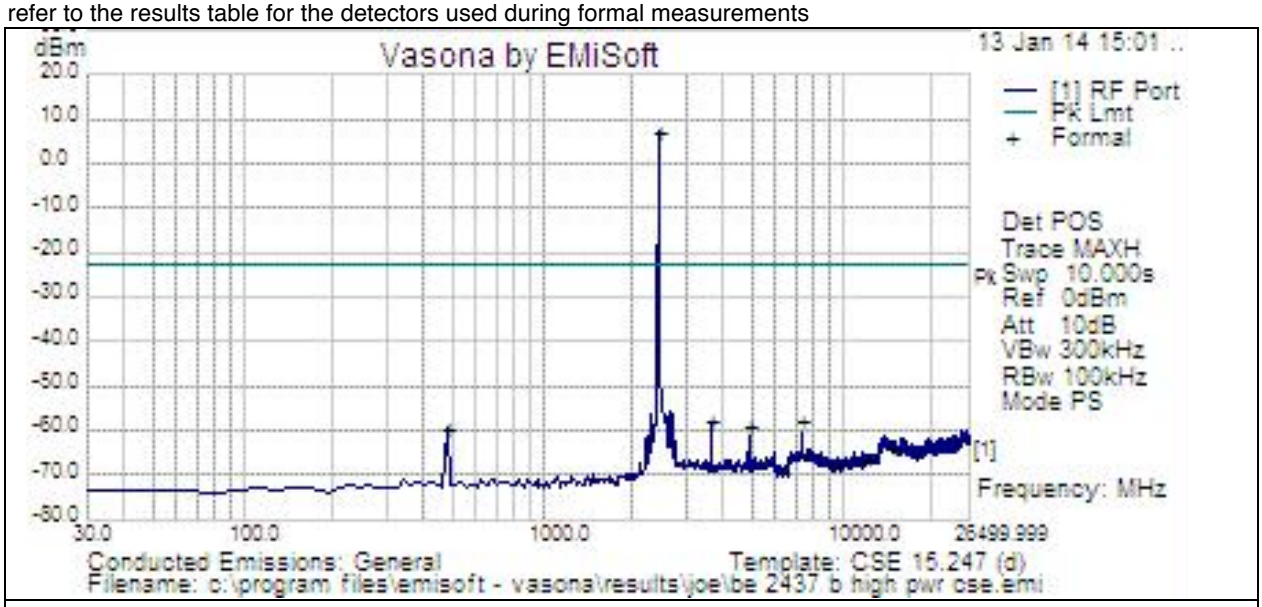
Test Results Table

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
494.601	-71.5	12.8	0	-58.7	Peak	RF	-23.1	-35.6	Pass	
2461.931	-7.5	14.4	0	6.9	Peak	RF	-23.1	30	N/A	
3687.197	-74.1	15.1	0	-59	Peak	RF	-23.1	-36	Pass	
4923.97	-73.1	15.9	0	-57.2	Peak	RF	-23.1	-34	Pass	
7385.44	-70.8	14.4	0	-56.5	Peak	RF	-23.1	-33.4	Pass	
9848	-80.8	14.2	0	-66.6	Peak	RF	-23.1	-43.5	Pass	
12310	-81.3	14.4	0	-66.9	Peak	RF	-23.1	-43.8	Pass	
14772	-79	14.6	0	-64.4	Peak	RF	-23.1	-41.3	Pass	

Engineer	Jose Aguirre
Lab Information	Building B, Radio Area
Subtest Results	
Line Under Test	[B] Antenna port
Transducer	Direct
Subtest Result	Pass
Highest Frequency	26499.999
Lowest Frequency	30.0
Comments on the above Test Results	802.11B channel 6 at 1Mbps

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



802.11B channel 6 at 1Mbps

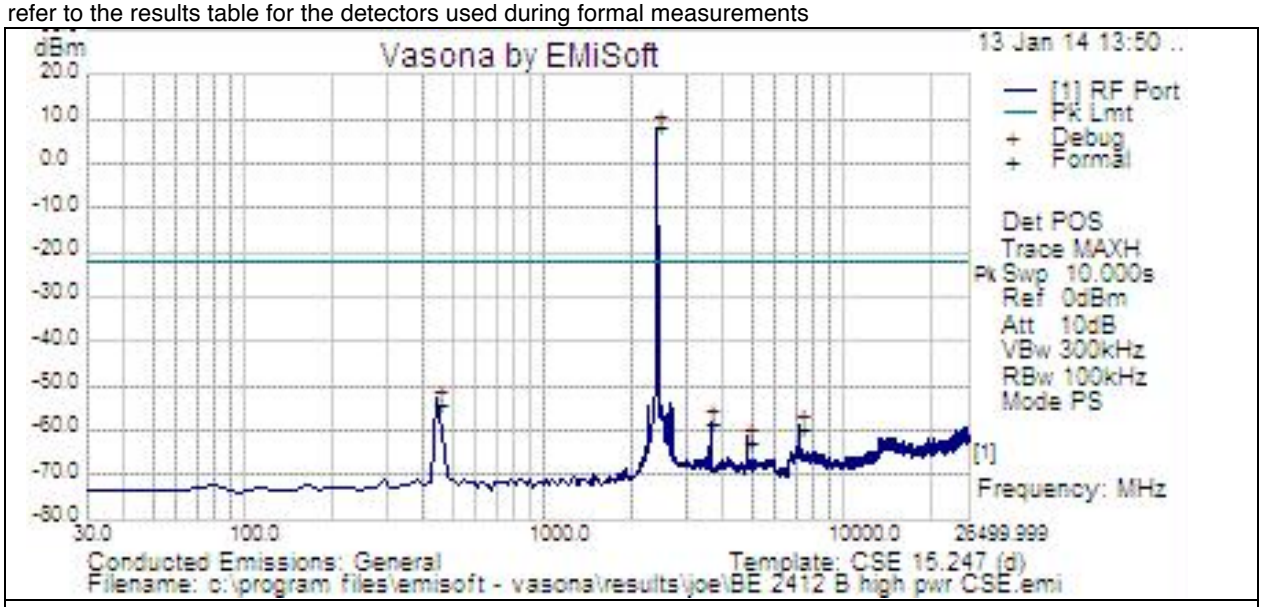
Test Results Table

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
2438.844	-7.3	14.3	0	7	Peak	RF	-23	30	N/A	
4873.97	-75	15.9	0	-59.1	Peak	RF	-23	-36.1	Pass	
7311.5	-72.6	14.4	0	-58.2	Peak	RF	-23	-35.2	Pass	
9748	-81.7	14.3	0	-67.4	Peak	RF	-23	-44.5	Pass	
12185	-81.1	14.4	0	-66.7	Peak	RF	-23	-43.8	Pass	
14622	-78.7	14.6	0	-64.1	Peak	RF	-23	-41.2	Pass	
3652.858	-73.2	15.1	0	-58.2	Peak	RF	-23	-35.2	Pass	
477.126	-72.6	12.7	0	-59.8	Peak	RF	-23	-36.9	Pass	

Engineer	Jose Aguirre
Lab Information	Building B, Radio Area
Subtest Results	
Line Under Test	[B] Antenna port
Transducer	Direct
Subtest Result	Pass
Highest Frequency	26499.999
Lowest Frequency	30.0
Comments on the above Test Results	802.11B channel 1 at 1Mbps

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



802.11B channel 1 at 1Mbps

Test Results Table

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
2412.3	-6.3	14.3	0	8	Peak	RF	-22	30	N/A	
7235.798	-74.1	14.4	0	-59.7	Peak	RF	-22	-37.7	Pass	
4831.42	-78.9	15.9	0	-63	Peak	RF	-22	-41	Pass	
3620.558	-73.7	15.1	0	-58.6	Peak	RF	-22	-36.6	Pass	
446.842	-66.9	12.7	0	-54.2	Peak	RF	-22	-32.2	Pass	

Band Edge Measurements in Restricted Bands

15.205 & RSS-210 sec2.7:

Conducted 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).

Use to substitute conducted measurements in place of radiated measurements.
Connect the antenna port(s) to the spectrum analyzer input. Place the radio in continuous transmit mode.
Be sure to enter all losses between the transmitter output and the spectrum analyzer.

ANSI C63.10 sec 6.9.2 © add the max antenna gain + ground reflection factor (0 dB for frequencies > 1000 MHz)

Average Plot, Limit= -41.25 dBm eirp (54dBuV/m @3m) -3.11dBi (max ant gain) - 0 (Ground reflection) = -44.65dBm eirp
Peak plot, Limit = -21.25 dBm eirp (74dBuV/m @3m)) -3.11dBi (max ant gain) - 0 (Ground reflection) = -24.65dBm eirp

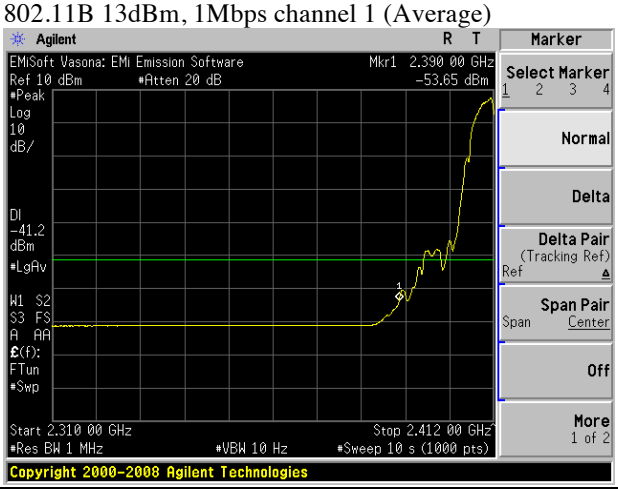
Reference Level:	20 dBm
Attenuation:	30 dB
Sweep Time:	Coupled
Resolution Bandwidth:	1MHz
Video Bandwidth:	1 MHz for peak, 10 Hz for average
Detector:	Peak

Place a marker at the end of the restricted band closest to the transmit frequency to show compliance.
Also measure any emissions in the restricted bands.

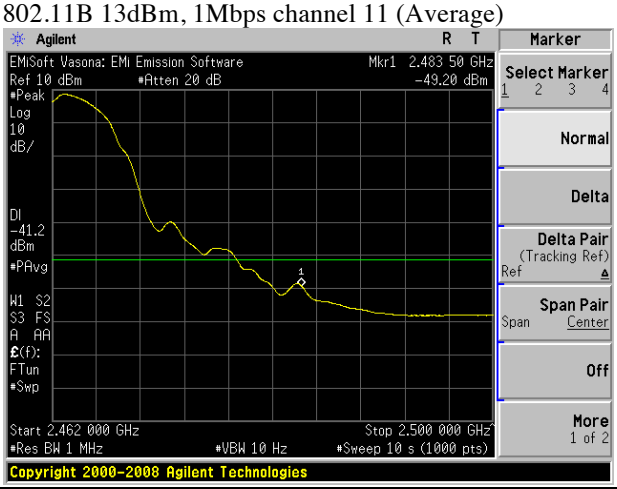
NOTE: ALL Modes were evaluated but ONLY worse case was reported.

Band Edge (Average measurements)

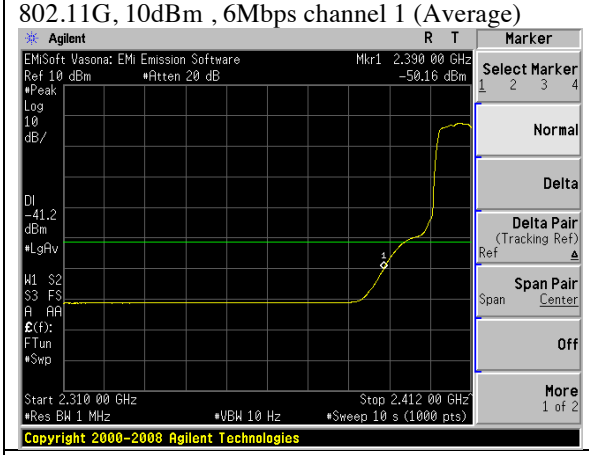
802.11B 13dBm, 1Mbps channel 1 (Average)



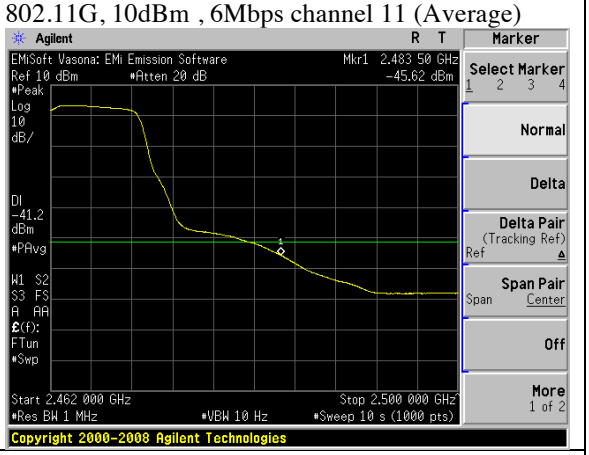
802.11B 13dBm, 1Mbps channel 11 (Average)



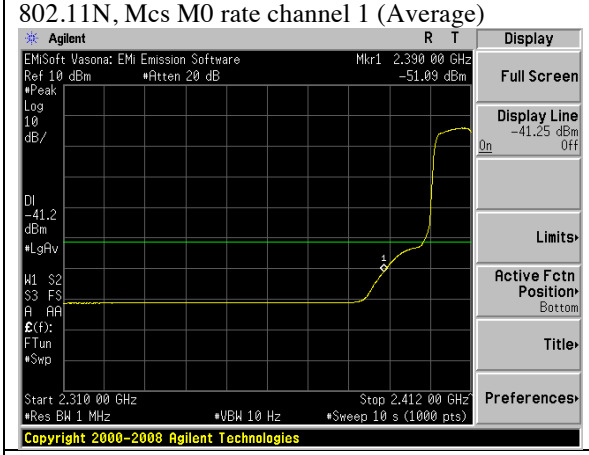
802.11G, 10dBm , 6Mbps channel 1 (Average)



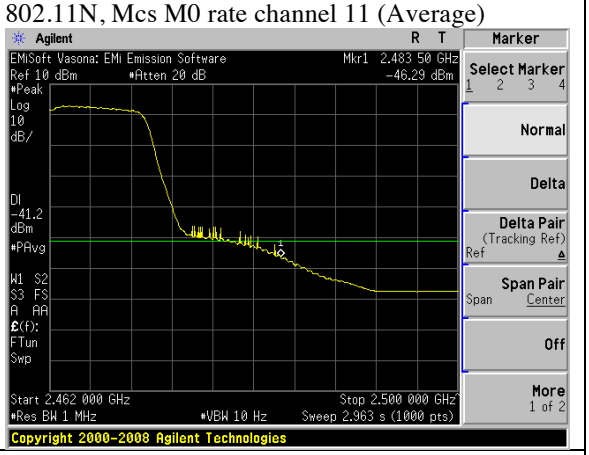
802.11G, 10dBm , 6Mbps channel 11 (Average)



802.11N, Mcs M0 rate channel 1 (Average)

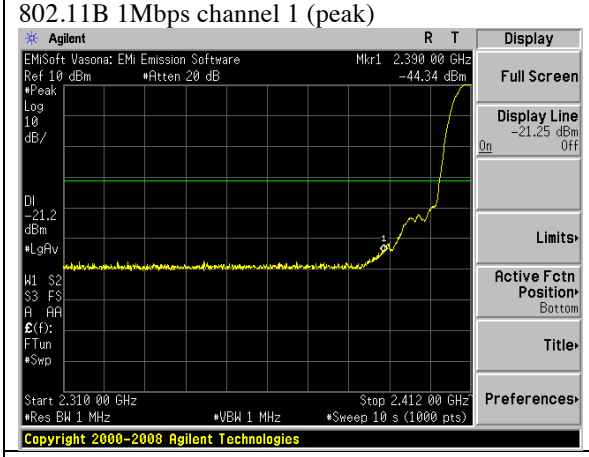


802.11N, Mcs M0 rate channel 11 (Average)

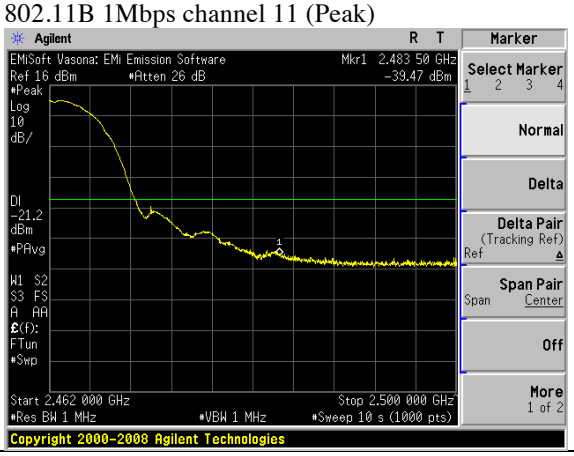


Band Edge (Peak measurements)

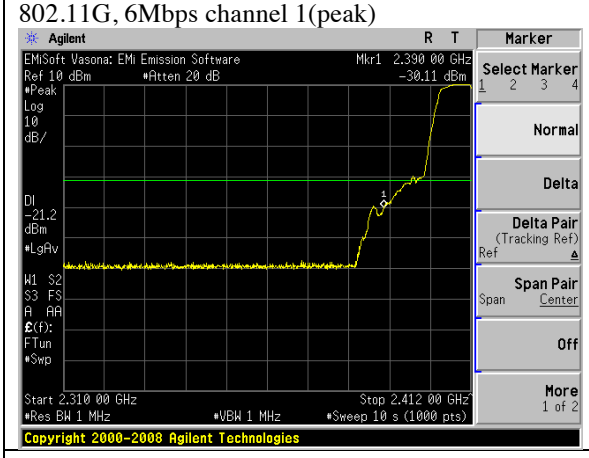
802.11B 1Mbps channel 1 (peak)



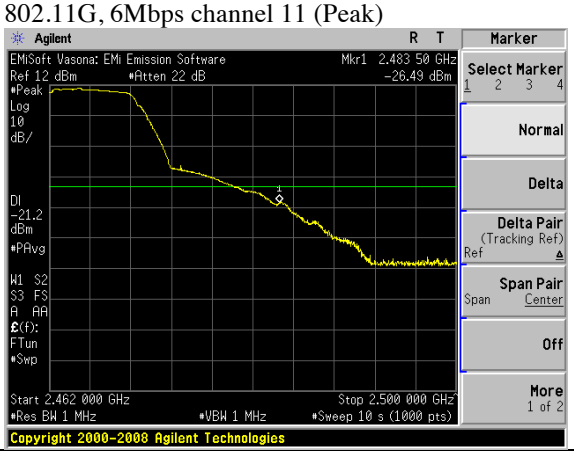
802.11B 1Mbps channel 11 (Peak)



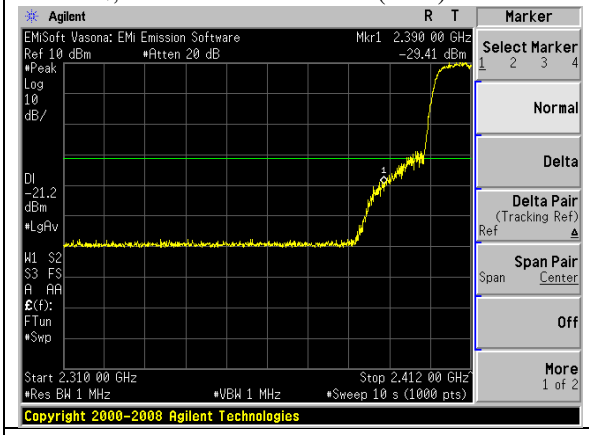
802.11G, 6Mbps channel 1(peak)



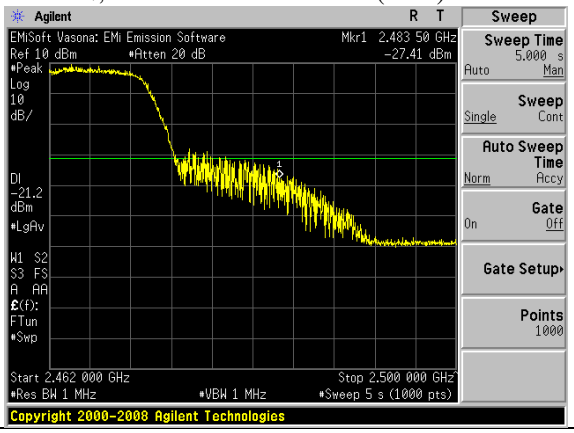
802.11G, 6Mbps channel 11 (Peak)



802.11N, Mcs M0 rate channel 1 (Peak)



802.11N, Mcs M0 rate channel 11 (Peak)



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).

Note 1: All 3-axis (X,Y, Z) were evaluated during preliminary testing and the worst case orientation was for all formal testing shown below.

Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in continuous transmit mode.

Span:	1GHz – 18 GHz
Reference Level:	80 dBuV
Attenuation:	10 dB
Sweep Time:	Coupled
Resolution Bandwidth:	1MHz
Video Bandwidth:	1 MHz for peak, 10Hz for average
Detector:	Peak

Terminate the access Point RF ports with 50 ohm loads.

Maximize Turntable (find worst case table angle), Maximize Antenna (find worst case height)

Save 2 plots: 1) Average Plot (Vertical and Horizontal), Limit= 54dBuV/m @3m
2) Peak plot (Vertical and Horizontal), Limit = 74dBuV/m @3m

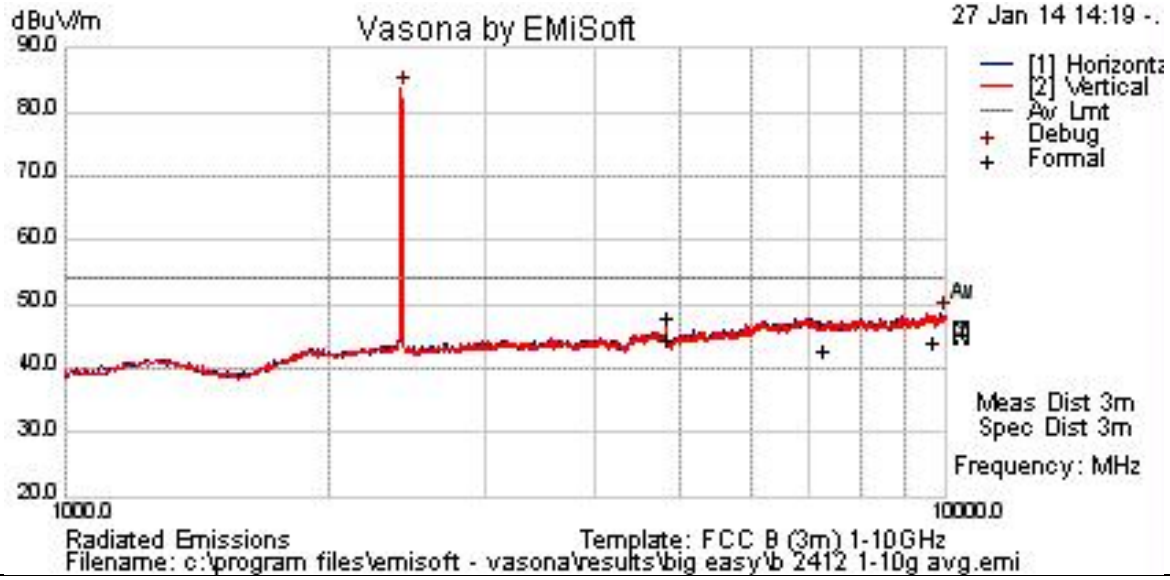
This report represents the worst case data for all supported operating modes and antennas. System was evaluated up to 40GHz but there were no measurable emissions above 15 GHz.

Transmitter Spurious Emissions 1-10GHz, Channel 1 , 802.11 B (1 Mbps) at 16dBm (Average measurement)

Subtest Number: 157031 - 1	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11B ch1 at 1Mbps (Average)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11B ch1 at 1Mbps (Average)

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



Title: 802.11B ch1 at 1Mbps (Average)

Test Results Table

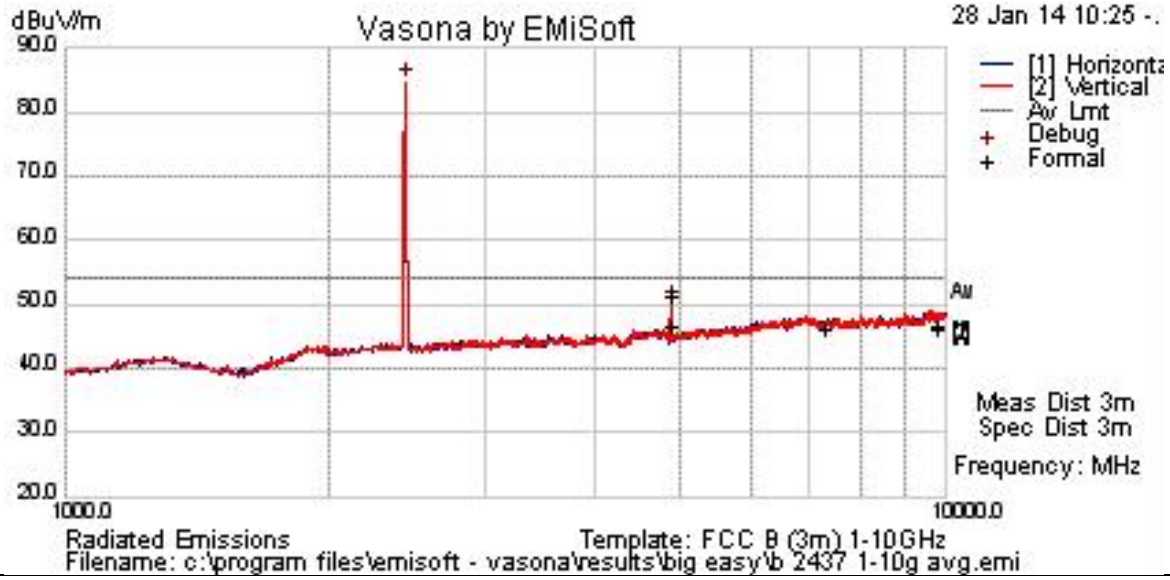
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4824	36.8	17.4	-6.2	48	Av	V	134	12	54	-6	Pass	
7236	27.2	18.7	-3.4	42.6	Av	V	134	12	54	-11.4	Pass	
9648	26.4	19.6	-1.9	44.1	Av	V	134	12	54	-9.9	Pass	
4824.055	33.1	17.4	-6.2	44.3	Av	H	162	329	54	-9.7	Pass	
7236	27.4	18.7	-3.4	42.7	Av	H	162	329	54	-11.3	Pass	
9648	26.5	19.6	-1.9	44.2	Av	H	162	329	54	-9.8	Pass	

Transmitter Spurious Emissions 1-10GHz, Channel 6 , 802.11 B (1 Mbps) at 16dBm (Average Measurement)

Subtest Number: 157031 - 2	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11B ch6 at 1Mbps (Average)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11B ch6 at 1Mbps (Average)

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



Title: 802.11B ch6 at 1Mbps (Average)

Test Results Table

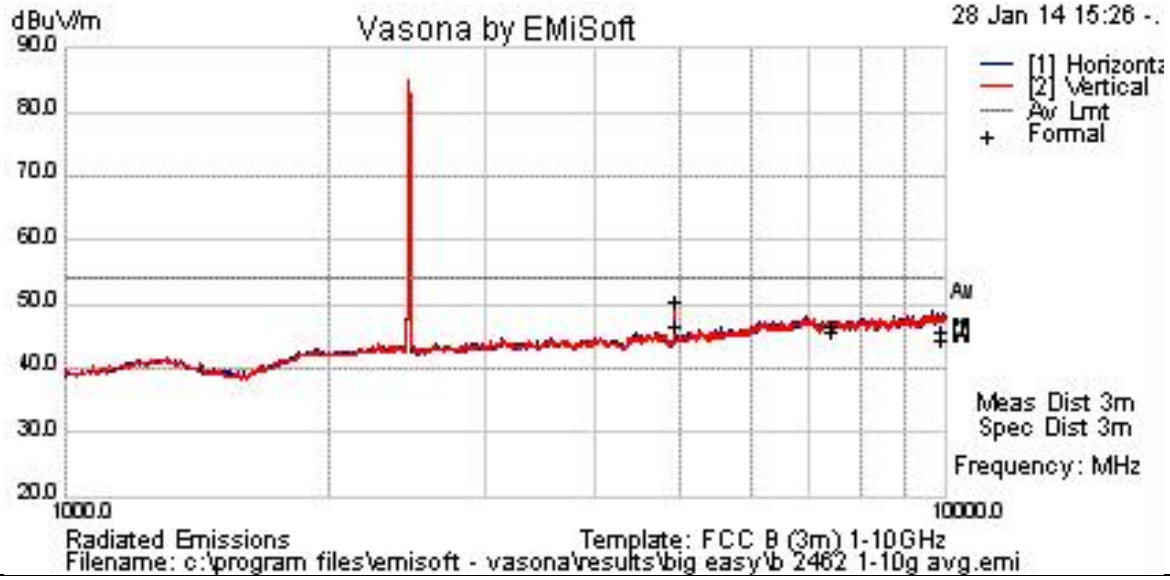
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4874	40.5	17.4	-6.5	51.3	Av	V	102	353	54	-2.7	Pass	
7311	30.2	18.7	-2.9	46	Av	V	102	353	54	-8	Pass	
9748	28.1	19.7	-1.5	46.3	Av	V	102	353	54	-7.7	Pass	
4874	35.7	17.4	-6.5	46.5	Av	H	128	329	54	-7.5	Pass	
7311	30.3	18.7	-2.9	46.1	Av	H	128	329	54	-7.9	Pass	
9748	28.2	19.7	-1.5	46.4	Av	H	128	329	54	-7.6	Pass	

Transmitter Spurious Emissions 1-10GHz, Channel 11 , 802.11 B (1 Mbps) at 16dBm (Average Measurement)

Subtest Number: 157031 - 3	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11B ch11 at 1Mbps (Average)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11B ch11 at 1Mbps (Average)

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



Title: 802.11B ch11 at 1Mbps (Average)

Test Results Table

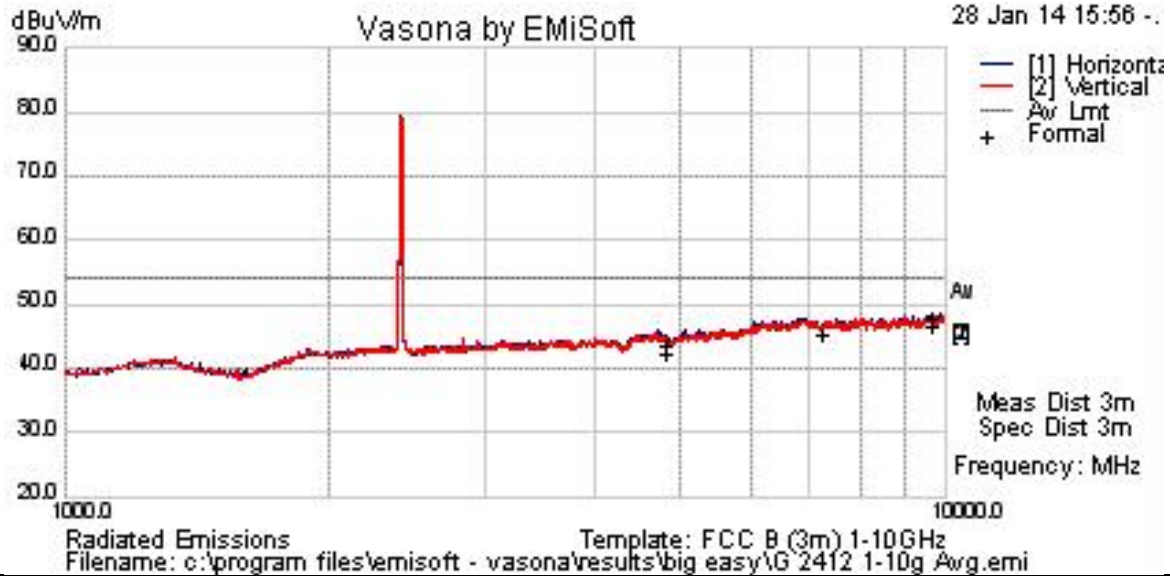
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4924	39.7	17.3	-6.5	50.6	Av	V	127	7	54	-3.4	Pass	
7386	30.6	18.7	-3.5	45.9	Av	V	127	7	54	-8.1	Pass	
9848	26.3	19.7	-1.4	44.6	Av	V	127	7	54	-9.4	Pass	
4924	35.9	17.3	-6.4	46.8	Av	H	126	336	54	-7.2	Pass	
7386	31.2	18.8	-3.5	46.5	Av	H	126	336	54	-7.5	Pass	
9848	27.4	19.7	-1.4	45.7	Av	H	126	336	54	-8.3	Pass	

Transmitter Spurious Emissions 1-10GHz, Channel 1 , 802.11 G (6 Mbps) at 15dBm (Average Measurement)

Subtest Number: 157031 - 4	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11G ch1 at 6Mbps (Average)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11G ch1 at 6Mbps (Average)

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



Title: 802.11G ch1 at 6Mbps (Average)

Test Results Table

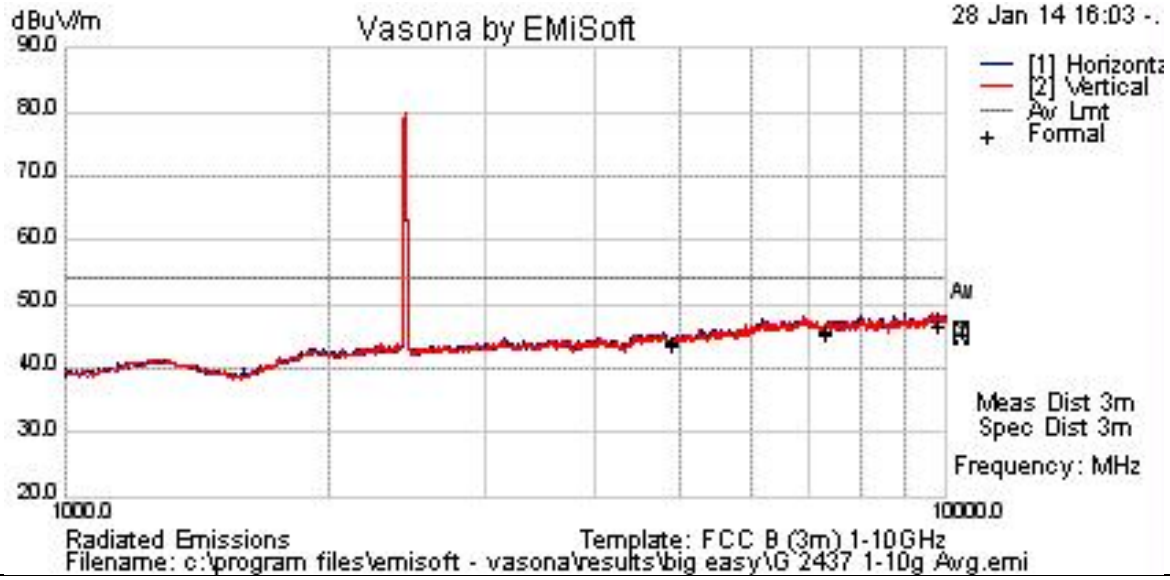
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4824	31	17.4	-6.2	42.2	Av	V	127	14	54	-11.8	Pass	
7236	30	18.7	-3.4	45.3	Av	V	127	14	54	-8.7	Pass	
9648	30.3	19.6	-1.9	48	Av	V	127	14	54	-6	Pass	
4824	32.6	17.4	-6.2	43.7	Av	H	161	348	54	-10.3	Pass	
7236	30.1	18.7	-3.4	45.4	Av	H	161	348	54	-8.6	Pass	
9648	28.8	19.6	-1.9	46.5	Av	H	161	348	54	-7.5	Pass	

Transmitter Spurious Emissions 1-10GHz, Channel 6 , 802.11 G (6 Mbps) at 15dBm (Average Measurement)

Subtest Number: 157031 - 5	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11G ch6 at 6Mbps (Average)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11G ch6 at 6Mbps (Average)

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



Title: 802.11G ch6 at 6Mbps (Average)

Test Results Table

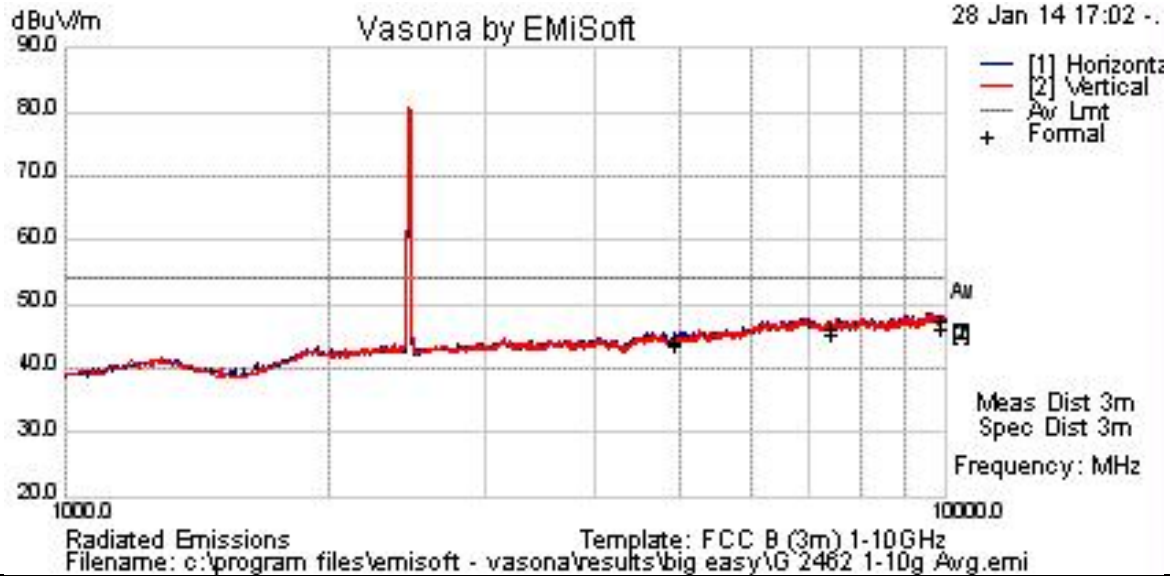
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4874	32.7	17.4	-6.5	43.5	Av	V	125	337	54	-10.5	Pass	
7311	29.3	18.7	-2.9	45.1	Av	V	125	337	54	-8.9	Pass	
9748	28.6	19.7	-1.5	46.8	Av	V	125	337	54	-7.2	Pass	
4874	33.4	17.4	-6.5	44.2	Av	H	153	35	54	-9.8	Pass	
7311	29.9	18.7	-2.9	45.7	Av	H	153	35	54	-8.3	Pass	
9748	28.6	19.7	-1.5	46.7	Av	H	153	35	54	-7.3	Pass	

Transmitter Spurious Emissions 1-10GHz, Channel 11 , 802.11 G (6 Mbps) at 15dBm (Average Measurement)

Subtest Number: 157031 - 6	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11G ch11 at 6Mbps (Average)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11G ch11 at 6Mbps (Average)

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



Title: 802.11G ch11 at 6Mbps (Average)

Test Results Table

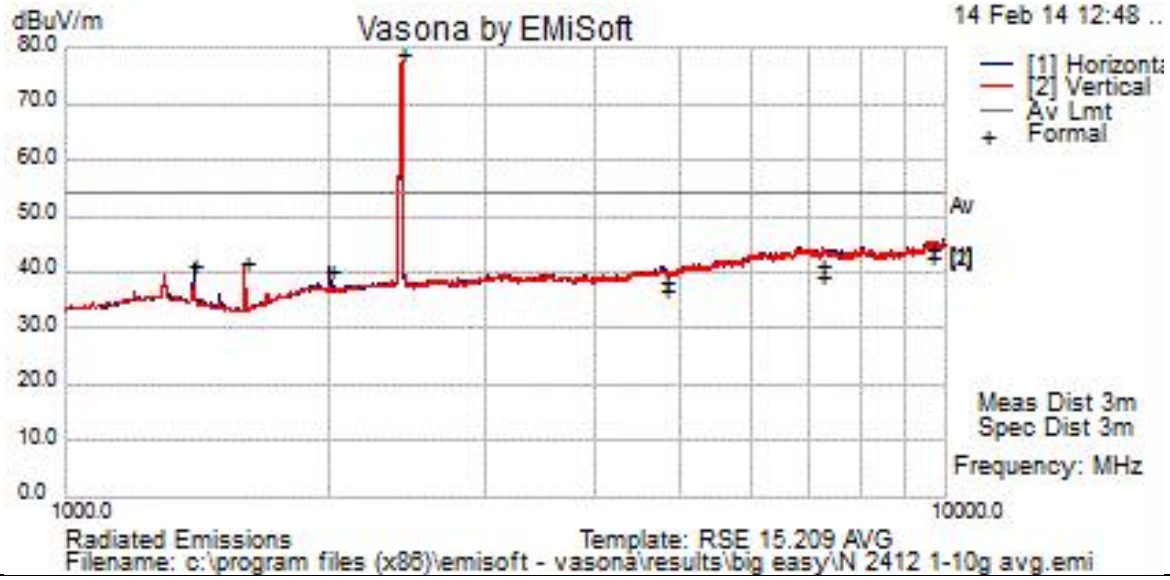
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4924	33.2	17.3	-6.4	44.1	Av	V	127	348	54	-9.9	Pass	
7386	29.9	18.8	-3.5	45.1	Av	V	127	348	54	-8.9	Pass	
9848	28.9	19.7	-1.4	47.3	Av	V	127	348	54	-6.7	Pass	
4924	32.6	17.3	-6.4	43.5	Av	H	156	24	54	-10.5	Pass	
7386	31.1	18.8	-3.5	46.4	Av	H	156	24	54	-7.6	Pass	
9848	28	19.7	-1.4	46.3	Av	H	156	24	54	-7.7	Pass	

Transmitter Spurious Emissions 1-10GHz, Channel 1 , 802.11 N (mcs M0) at 13dBm (Average measurement)

Subtest Number: 157031 - 7	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11N ch1 at M0 (Average)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11N ch1 at M0 (Average)

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



Title: 802.11N ch1 at M0 (Average)

Test Results Table

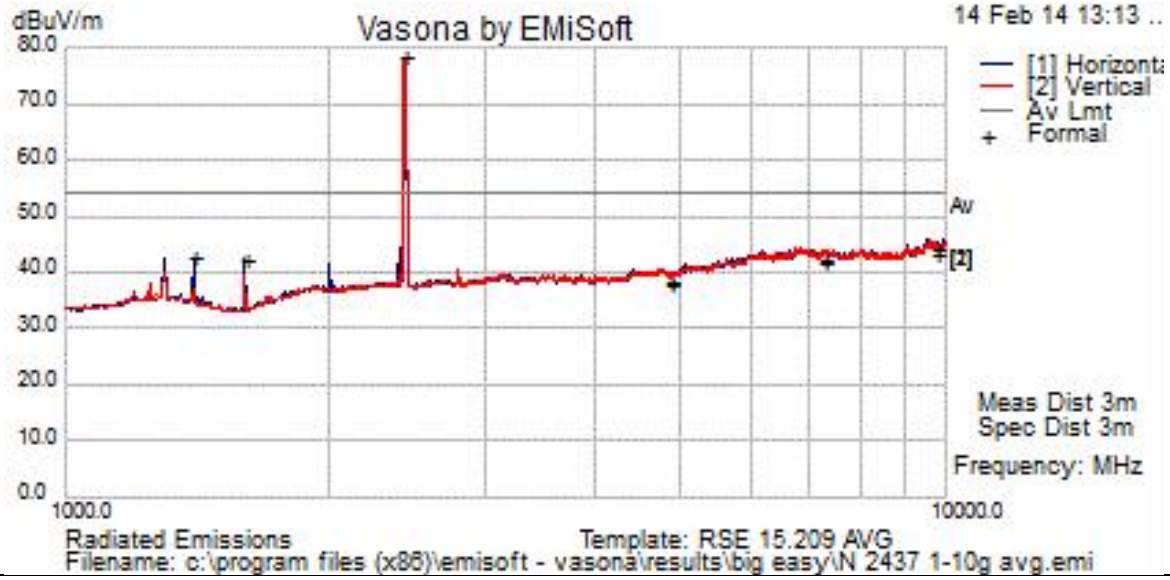
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4824	30.8	12.4	-6.2	36.9	Avg	V	114	183	54	-17.1	Pass	
4824	31.9	12.4	-6.2	38	Avg	H	123	325	54	-16	Pass	
7236	28.6	14	-3.4	39.3	Avg	V	114	183	54	-14.7	Pass	
7236	30.5	14	-3.4	41.1	Avg	H	123	325	54	-12.9	Pass	
9648	30.8	15.2	-1.9	44.1	Avg	V	114	183	54	-9.9	Pass	
9648	29.5	15.2	-1.9	42.8	Avg	H	123	325	54	-11.2	Pass	

Transmitter Spurious Emissions 1-10GHz, Channel 6 , 802.11 N (mcs M0) at 13dBm (Average Measurement)

Subtest Number: 157031 - 8	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11N ch6 at M0 (Average)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11N ch6 at M0 (Average)

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



Title: 802.11N ch6 at M0 (Average)

Test Results Table

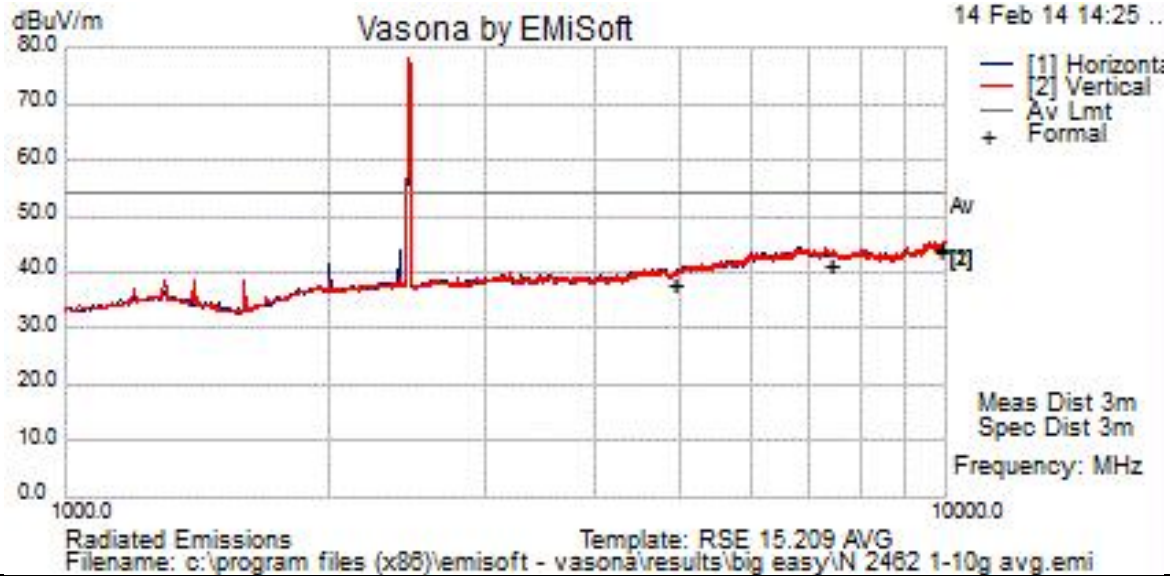
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4874	31.9	12.3	-6.5	37.7	Avg	H	131	233	54	-16.3	Pass	
4874	32.5	12.3	-6.5	38.2	Avg	V	139	183	54	-15.8	Pass	
7311	30.8	14	-2.9	41.9	Avg	H	131	233	54	-12.1	Pass	
7311	30.8	14	-2.9	42	Avg	V	139	183	54	-12	Pass	
9748	30.3	15.2	-1.5	43.9	Avg	H	131	233	54	-10.1	Pass	
9748	29.7	15.2	-1.5	43.3	Avg	V	139	183	54	-10.7	Pass	

Transmitter Spurious Emissions 1-10GHz, Channel 11 , 802.11 N (mcs M0) at 13dBm (Average Measurement)

Subtest Number: 157031 - 9	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11N ch11 at M0 (Average)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11N ch11 at M0 (Average)

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



Title: 802.11N ch11 at M0 (Average)

Test Results Table

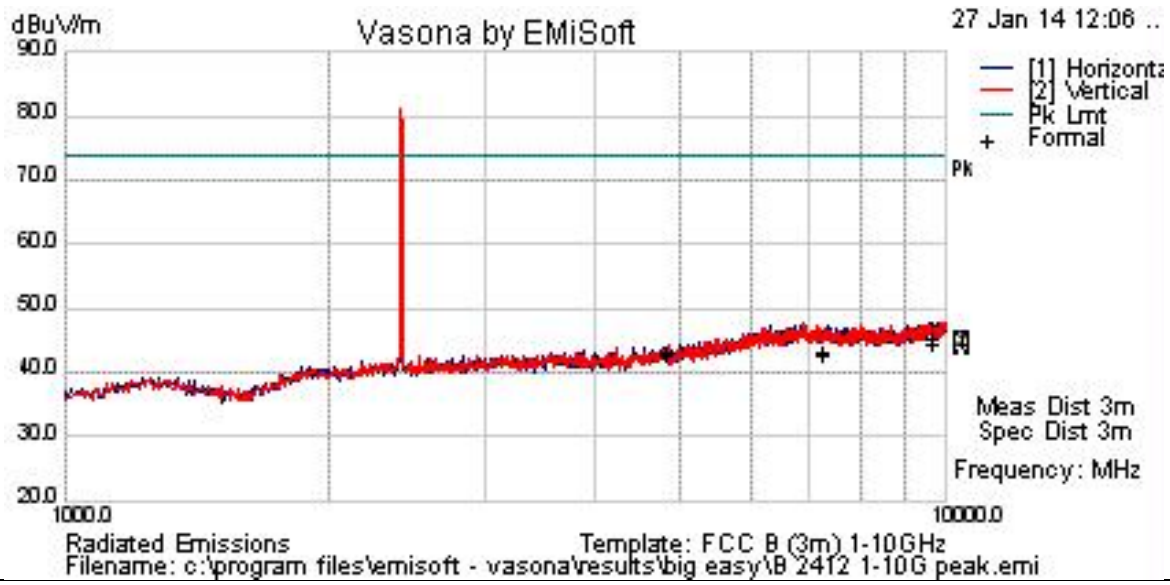
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4924	31.9	12.3	-6.4	37.8	Avg	V	136	181	54	-16.2	Pass	
7386	30.8	14.1	-3.5	41.3	Avg	V	136	181	54	-12.7	Pass	
9848	30.4	15.2	-1.4	44.2	Avg	V	136	181	54	-9.8	Pass	
4924	32.1	12.3	-6.4	38	Avg	H	134	303	54	-16	Pass	
7386	30.7	14.1	-3.5	41.3	Avg	H	134	303	54	-12.7	Pass	
9848	29.9	15.2	-1.4	43.7	Avg	H	134	303	54	-10.3	Pass	

Transmitter Spurious Emissions 1-18GHz, Channel 1 , 802.11 B (1 Mbps) at 16dBm (Peak Measurement)

Subtest Number: 157032 - 1	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11B ch1 at 1Mbps (Peak measurement)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11B ch1 at 1Mbps (Peak measurement)

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



Title: 802.11B ch1 at 1Mbps (Peak measurement)

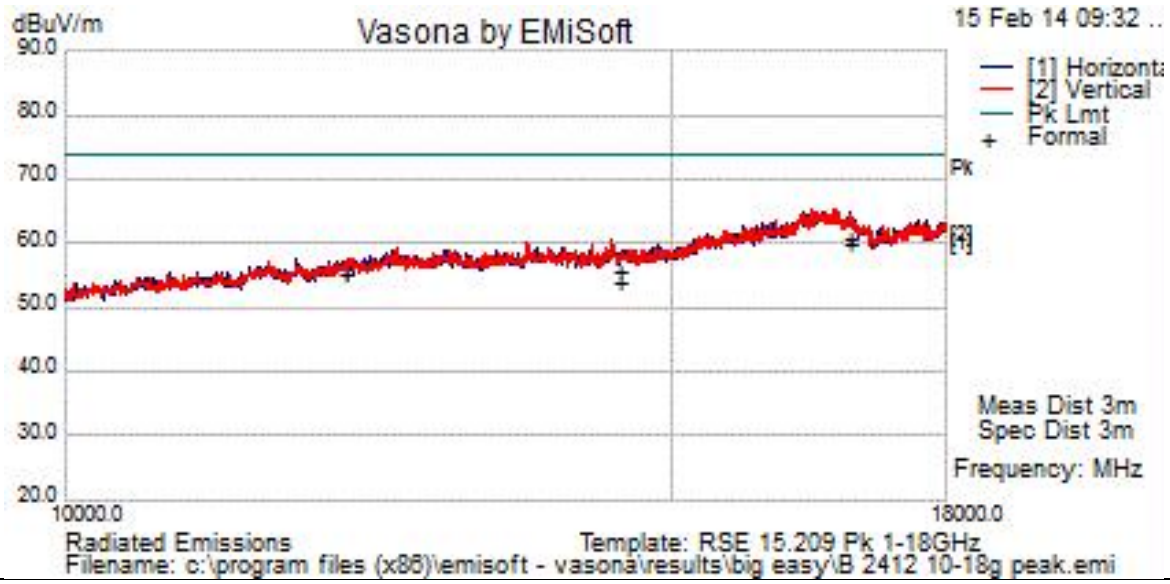
Test Results Table

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
4824	43.7	5.4	-6.2	42.9	Pk	V	102	360	74	-31.1	Pass	
7236	39.5	6.7	-3.4	42.8	Pk	V	102	360	74	-31.2	Pass	
9648	39	7.6	-1.9	44.7	Pk	V	102	360	74	-29.3	Pass	
4824	43.8	5.4	-6.2	43	Pk	H	240	29	74	-31	Pass	
7236	40	6.7	-3.4	43.3	Pk	H	240	29	74	-30.7	Pass	
9648	39.4	7.6	-1.9	45.2	Pk	H	240	29	74	-28.8	Pass	

Subtest Number: 157032 - 16	**Subtest Date:** 15-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11B ch1 at 1Mbps (Peak measurement)
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Comments on the above Test Results	802.11B ch1 at 1Mbps (Peak measurement)

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



Title: 802.11B ch1 at 1Mbps (Peak measurement)

Test Results Table

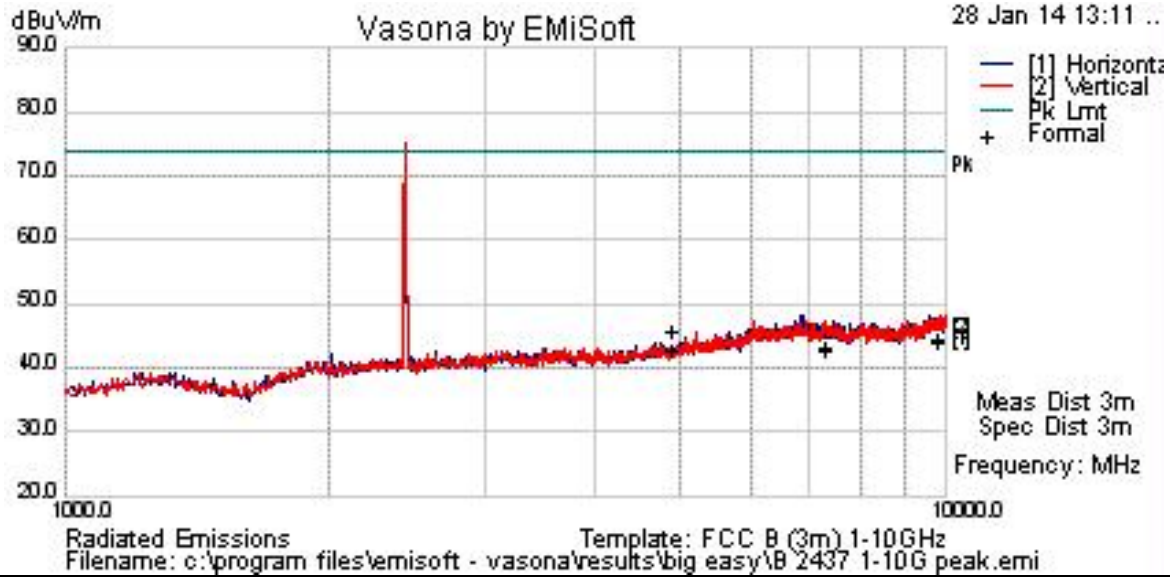
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
12060	48	16.1	-8.9	55.2	Pk	V	102	363	74	-18.8	Pass	
14472	47.8	17.4	-9.7	55.4	Pk	V	102	363	74	-18.6	Pass	
16884	50.2	19.1	-8.4	61	Pk	V	102	363	74	-13	Pass	
12060	47.8	16.1	-8.9	55	Pk	H	240	26	74	-19	Pass	
14472	46.4	17.4	-9.7	54.1	Pk	H	240	26	74	-19.9	Pass	
16884	49.3	19.1	-8.4	60	Pk	H	240	26	74	-14	Pass	

Transmitter Spurious Emissions 1-18GHz, Channel 6 , 802.11 B (1 Mbps) at 16dBm (Peak Measurement)

Subtest Number: 157032 - 2	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11B ch6 at 1Mbps (Peak measurement)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11B ch6 at 1Mbps (Peak measurement)

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



Title: 802.11B ch6 at 1Mbps (Peak measurement)

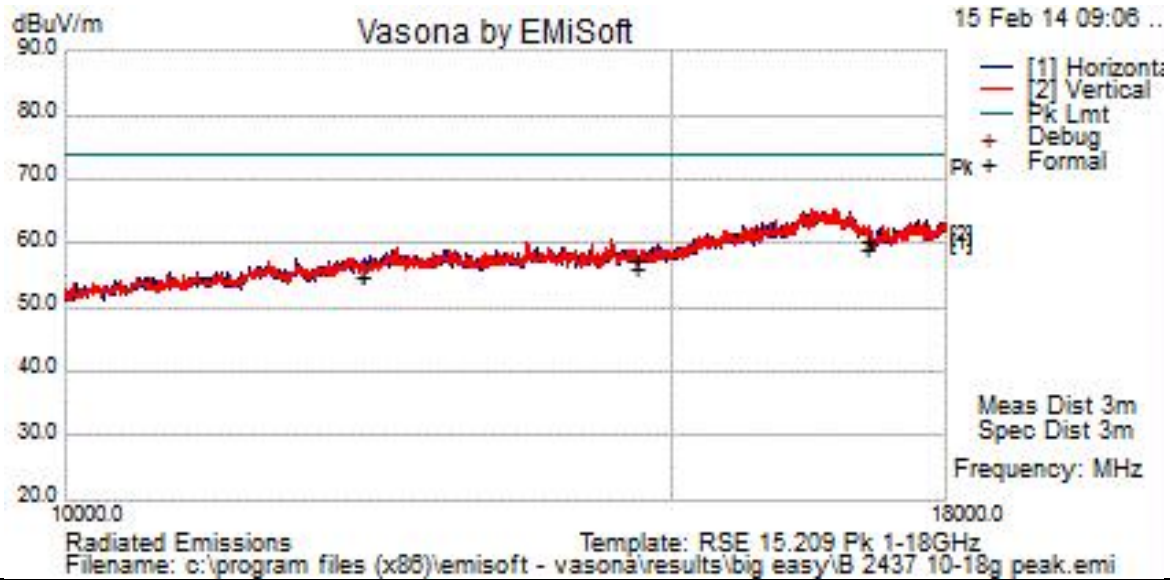
Test Results Table

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
4874	46.7	5.4	-6.5	45.5	Pk	V	102	353	74	-28.5	Pass	
7311	39	6.7	-2.9	42.7	Pk	V	102	353	74	-31.3	Pass	
9748	38	7.7	-1.5	44.2	Pk	V	102	353	74	-29.8	Pass	
4874	44.1	5.4	-6.5	43	Pk	H	128	329	74	-31	Pass	
7311	39.3	6.7	-2.9	43.1	Pk	H	128	329	74	-30.9	Pass	
9748	38.1	7.7	-1.5	44.3	Pk	H	128	329	74	-29.7	Pass	

Subtest Number: 157032 - 17	**Subtest Date:** 15-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11B ch6 at 1Mbps (Peak measurement)
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Comments on the above Test Results	802.11B ch6 at 1Mbps (Peak measurement)

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



Title: 802.11B ch6 at 1Mbps (Peak measurement)

Test Results Table

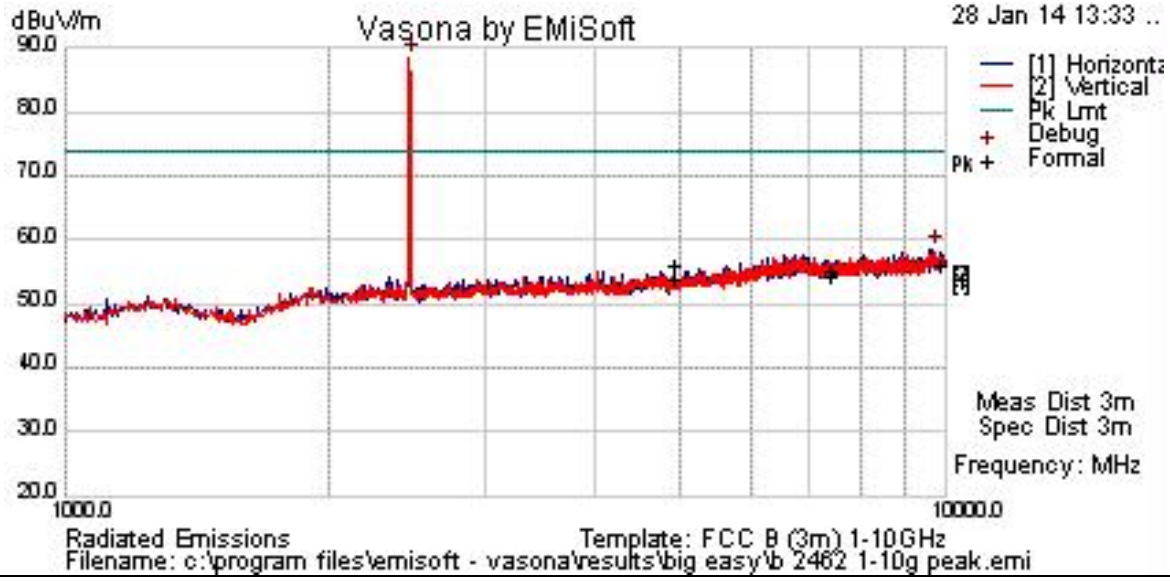
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
12185	47.6	16.4	-9.1	54.9	Pk	V	102	356	74	-19.1	Pass	
14622	49.1	17.7	-9.5	57.2	Pk	V	102	356	74	-16.8	Pass	
17059	50.3	19.2	-9.3	60.2	Pk	V	102	356	74	-13.8	Pass	
12185	47.6	16.4	-9.1	54.9	Pk	H	128	326	74	-19.1	Pass	
14622	48	17.7	-9.5	56.2	Pk	H	128	326	74	-17.8	Pass	
17059	49.2	19.2	-9.3	59.1	Pk	H	128	326	74	-14.9	Pass	

Transmitter Spurious Emissions 1-18GHz, Channel 11 , 802.11 B (1 Mbps) at 16dBm (Peak Measurement)

Subtest Number: 157032 - 3	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11B ch11 at 1Mbps (Peak measurement)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11B ch11 at 1Mbps (Peak measurement)

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



Title: 802.11B ch11 at 1Mbps (Peak measurement)

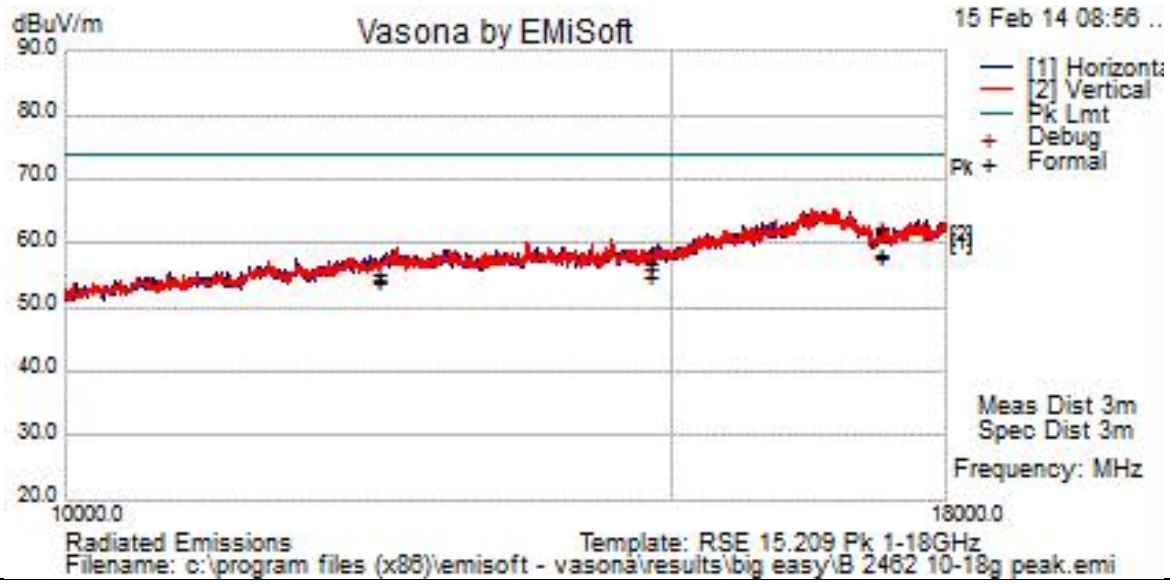
Test Results Table

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
4925.138	42.9	17.4	-6.4	53.8	Pk	V	127	7	74	-20.2	Pass	
7386	39.9	18.8	-3.5	55.2	Pk	V	127	7	74	-18.8	Pass	
9848	37.8	19.7	-1.4	56.2	Pk	V	127	7	74	-17.8	Pass	
4924	45.1	17.3	-6.4	56	Pk	H	126	336	74	-18	Pass	
7386	39	18.8	-3.5	54.3	Pk	H	126	336	74	-19.7	Pass	
9848	37.6	19.7	-1.4	55.9	Pk	H	126	336	74	-18.1	Pass	

Subtest Number: 157032 - 18	**Subtest Date:** 15-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11B ch11 at 1Mbps (Peak measurement)
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Comments on the above Test Results	802.11B ch11 at 1Mbps (Peak measurement)

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



Title: 802.11B ch11 at 1Mbps (Peak measurement)

Test Results Table

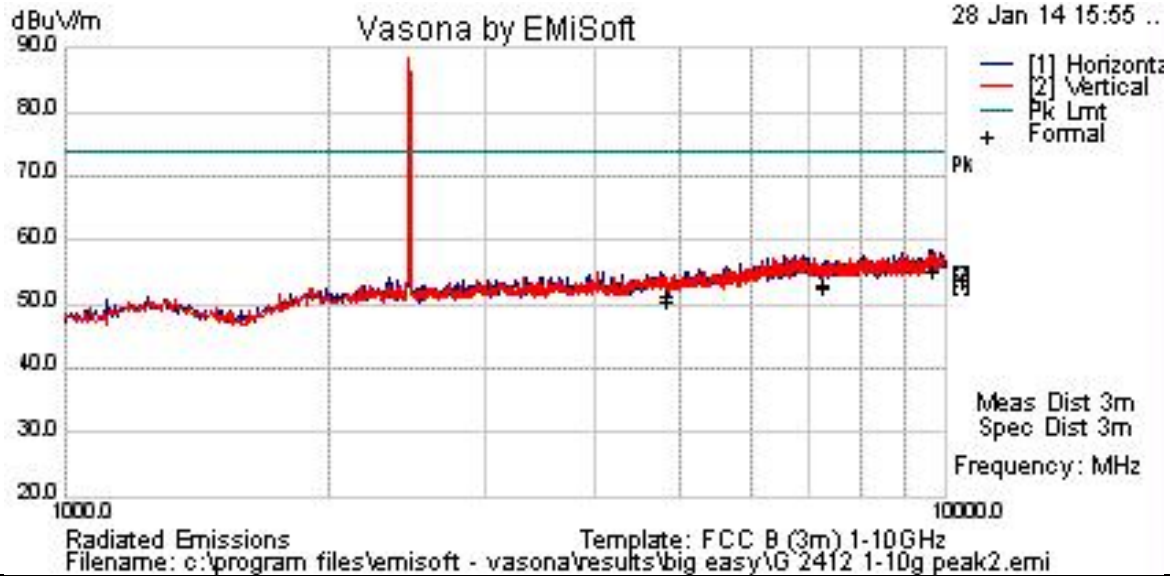
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
12310	48.1	16.5	-9.3	55.2	Pk	V	127	4	74	-18.8	Pass	
14772	49	17.6	-9.7	56.8	Pk	V	127	4	74	-17.2	Pass	
17234	47.3	19.3	-8.9	57.8	Pk	V	127	4	74	-16.2	Pass	
12310	46.7	16.5	-9.3	53.8	Pk	H	126	339	74	-20.2	Pass	
14772	46.8	17.6	-9.7	54.6	Pk	H	126	339	74	-19.4	Pass	
17234	47.8	19.3	-8.9	58.2	Pk	H	126	339	74	-15.8	Pass	

Transmitter Spurious Emissions 1-18GHz, Channel 1 , 802.11 G (6 Mbps) at 15dBm (Peak Measurement)

Subtest Number: 157032 - 4	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11G ch1 at 6Mbps (Peak measurement)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11G ch1 at 6Mbps (Peak measurement)

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



Title: 802.11G ch1 at 6Mbps (Peak measurement)

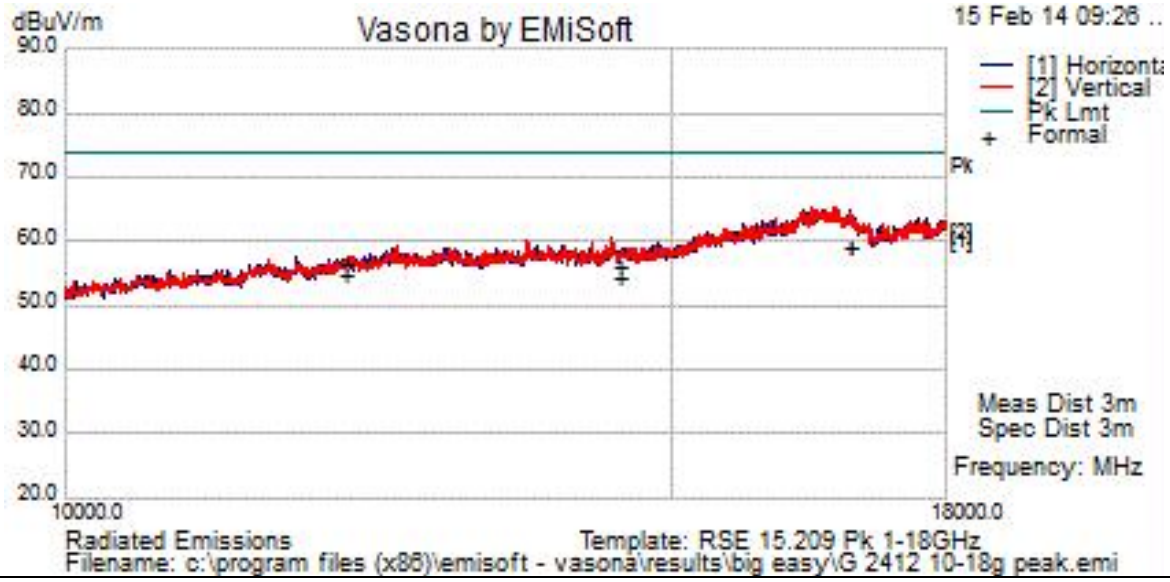
Test Results Table

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
4824	40.1	17.4	-6.2	51.3	Pk	V	127	14	74	-22.7	Pass	
7236	37.6	18.7	-3.4	52.9	Pk	V	127	14	74	-21.1	Pass	
9648	37.4	19.6	-1.9	55.1	Pk	V	127	14	74	-18.9	Pass	
4824	39.2	17.4	-6.2	50.4	Pk	H	161	348	74	-23.6	Pass	
7236	37.1	18.7	-3.4	52.4	Pk	H	161	348	74	-21.6	Pass	
9648	37.5	19.6	-1.9	55.2	Pk	H	161	348	74	-18.8	Pass	

Subtest Number: 157032 - 13	**Subtest Date:** 15-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11G ch1 at 6Mbps (Peak measurement)
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Comments on the above Test Results	802.11G ch1 at 6Mbps (Peak measurement)

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



Title: 802.11G ch1 at 6Mbps (Peak measurement)

Test Results Table

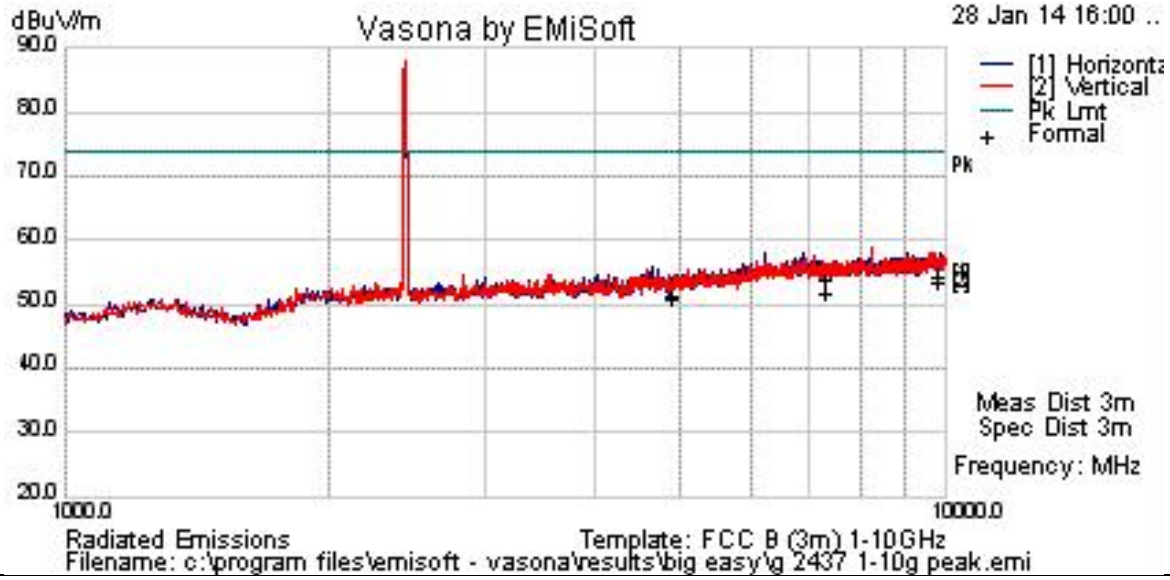
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
12060	47.4	16.1	-8.9	54.6	Pk	V	127	11	74	-19.4	Pass	
14472	48.4	17.4	-9.7	56	Pk	V	127	11	74	-18	Pass	
16884	48.3	19.1	-8.4	59	Pk	V	127	11	74	-15	Pass	
12060	49.2	16.1	-8.9	56.5	Pk	H	161	351	74	-17.5	Pass	
14472	46.8	17.4	-9.7	54.5	Pk	H	161	351	74	-19.5	Pass	
16884	48.2	19.1	-8.4	58.9	Pk	H	161	351	74	-15.1	Pass	

Transmitter Spurious Emissions 1-18GHz, Channel 6 , 802.11 G (6 Mbps) at 15dBm (Peak Measurement)

Subtest Number: 157032 - 5	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11G ch6 at 6Mbps (Peak measurement)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11G ch6 at 6Mbps (Peak measurement)

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



Title: 802.11G ch6 at 6Mbps (Peak measurement)

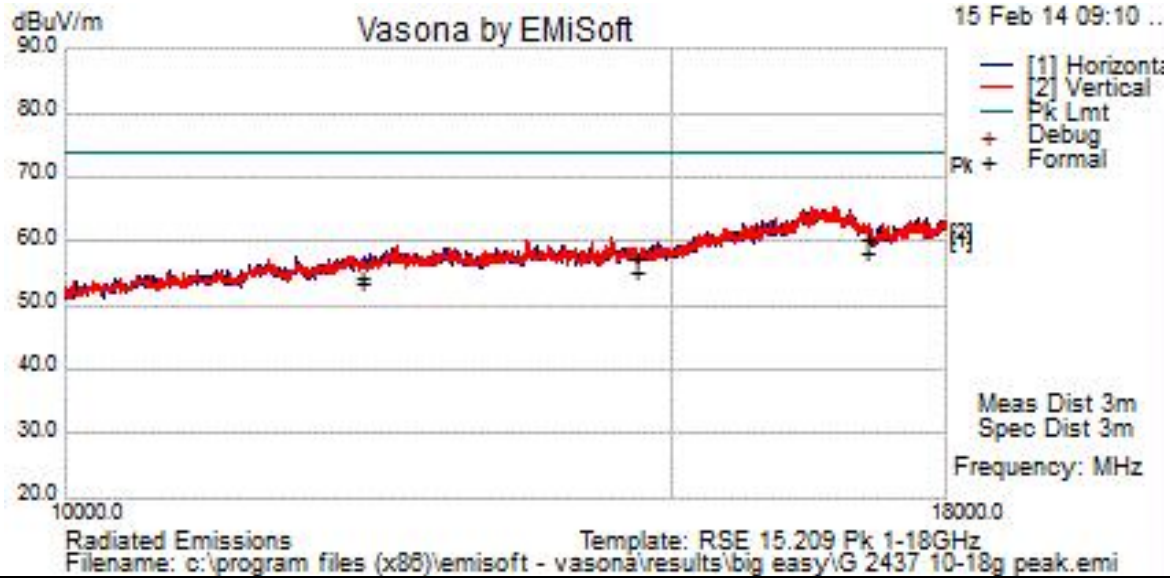
Test Results Table

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
4874	40.6	17.4	-6.5	51.5	Pk	V	125	337	74	-22.5	Pass	
7311	38.2	18.7	-2.9	54	Pk	V	125	337	74	-20	Pass	
9748	35.2	19.7	-1.5	53.3	Pk	V	125	337	74	-20.7	Pass	
4874	40	17.4	-6.5	50.9	Pk	H	153	35	74	-23.1	Pass	
7311	36.1	18.7	-2.9	51.9	Pk	H	153	35	74	-22.1	Pass	
9748	36	19.7	-1.5	54.2	Pk	H	153	35	74	-19.8	Pass	

Subtest Number: 157032 - 14	**Subtest Date:** 15-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11G ch6 at 6Mbps (Peak measurement)
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Comments on the above Test Results	802.11G ch6 at 6Mbps (Peak measurement)

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



Title: 802.11G ch6 at 6Mbps (Peak measurement)

Test Results Table

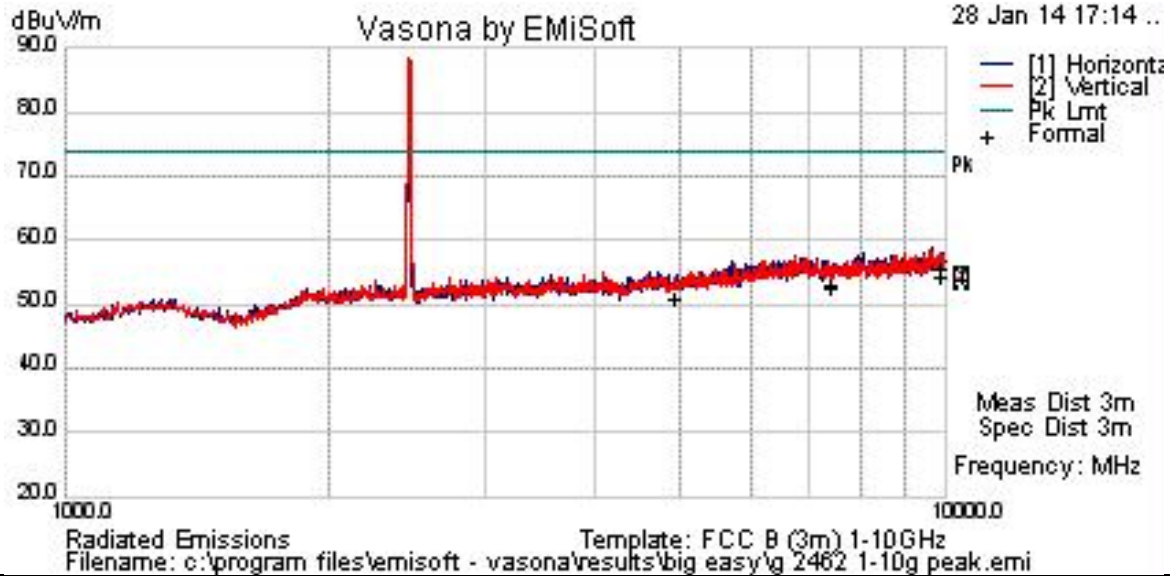
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
14622	49.3	17.7	-9.5	57.4	Pk	H	153	32	74	-16.6	Pass	
12185	46.9	16.4	-9.1	54.2	Pk	H	153	32	74	-19.8	Pass	
17059	50.3	19.2	-9.3	60.2	Pk	H	153	32	74	-13.8	Pass	
17059	48.2	19.2	-9.3	58.1	Pk	V	125	340	74	-15.9	Pass	
12185	46	16.4	-9.1	53.3	Pk	V	125	340	74	-20.7	Pass	
14622	47.2	17.7	-9.5	55.3	Pk	V	125	340	74	-18.7	Pass	

Transmitter Spurious Emissions 1-18GHz, Channel 11 , 802.11 G (6 Mbps) at 15dBm (Peak Measurement)

Subtest Number: 157032 - 6	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11G ch11 at 6Mbps (Peak measurement)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11G ch11 at 6Mbps (Peak measurement)

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



Title: 802.11G ch11 at 6Mbps (Peak measurement)

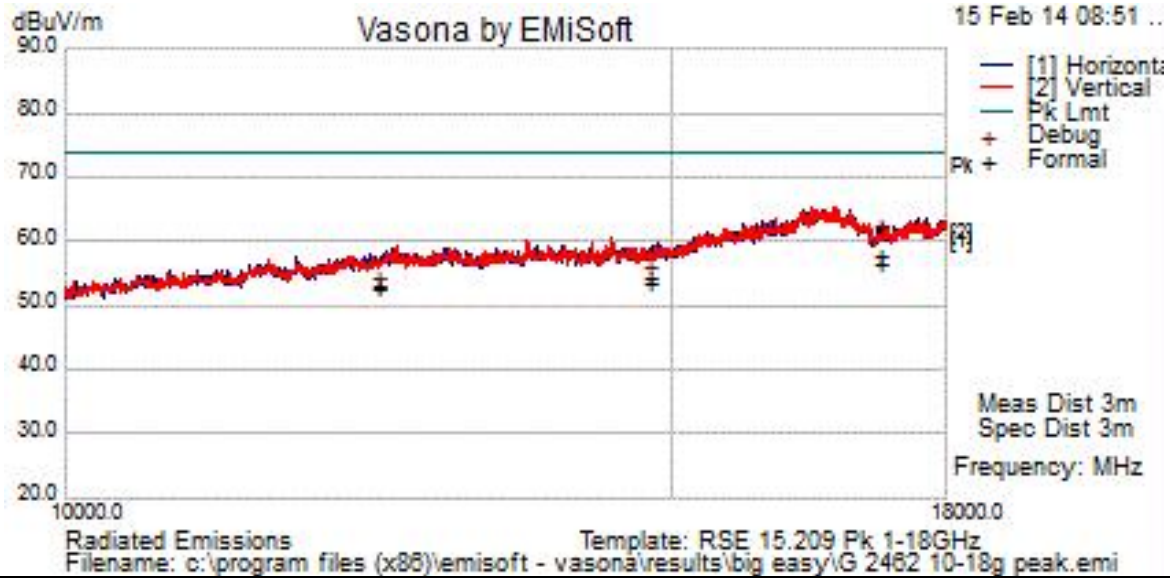
Test Results Table

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
4924	40.1	17.3	-6.4	51	Pk	V	127	348	74	-23	Pass	
7386	37.7	18.8	-3.5	53	Pk	V	127	348	74	-21	Pass	
9848	37.3	19.7	-1.4	55.6	Pk	V	127	348	74	-18.4	Pass	
4924	40.1	17.3	-6.4	51	Pk	H	156	24	74	-23	Pass	
7386	37.2	18.8	-3.5	52.4	Pk	H	156	24	74	-21.6	Pass	
9848	35.8	19.7	-1.4	54.1	Pk	H	156	24	74	-19.9	Pass	

Subtest Number: 157032 - 15	**Subtest Date:** 15-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11G ch11 at 6Mbps (Peak measurement)
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Comments on the above Test Results	802.11G ch11 at 6Mbps (Peak measurement)

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



Title: 802.11G ch11 at 6Mbps (Peak measurement)

Test Results Table

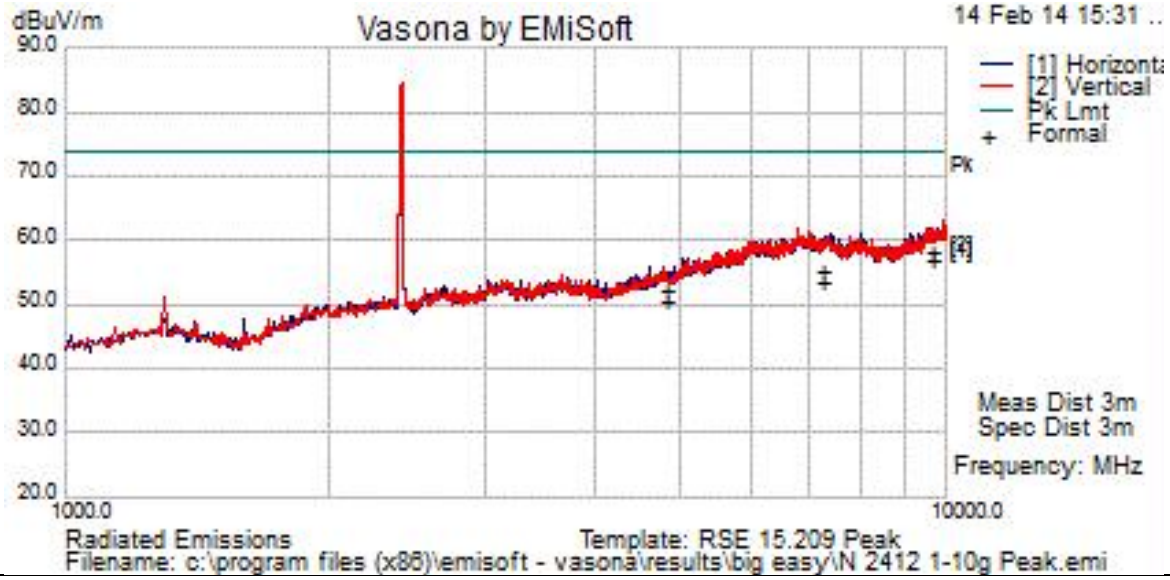
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
12310	45.4	16.5	-9.3	52.6	Pk	V	127	351	74	-21.4	Pass	
14772	45.6	17.6	-9.7	53.4	Pk	V	127	351	74	-20.6	Pass	
17234	46	19.3	-8.9	56.4	Pk	V	127	351	74	-17.6	Pass	
12310	46	16.5	-9.3	53.2	Pk	H	156	21	74	-20.8	Pass	
14772	46.5	17.6	-9.7	54.3	Pk	H	156	21	74	-19.7	Pass	
17234	47.3	19.3	-8.9	57.8	Pk	H	156	21	74	-16.2	Pass	

Transmitter Spurious Emissions 1-18GHz, Channel 1 , 802.11 N (mcs M0) at 13dBm (Peak Measurement)

Subtest Number: 157032 - 7	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11N ch1 at M0 (Peak measurement)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11N ch1 at M0 (Peak measurement)

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



Title: 802.11N ch1 at M0 (Peak measurement)

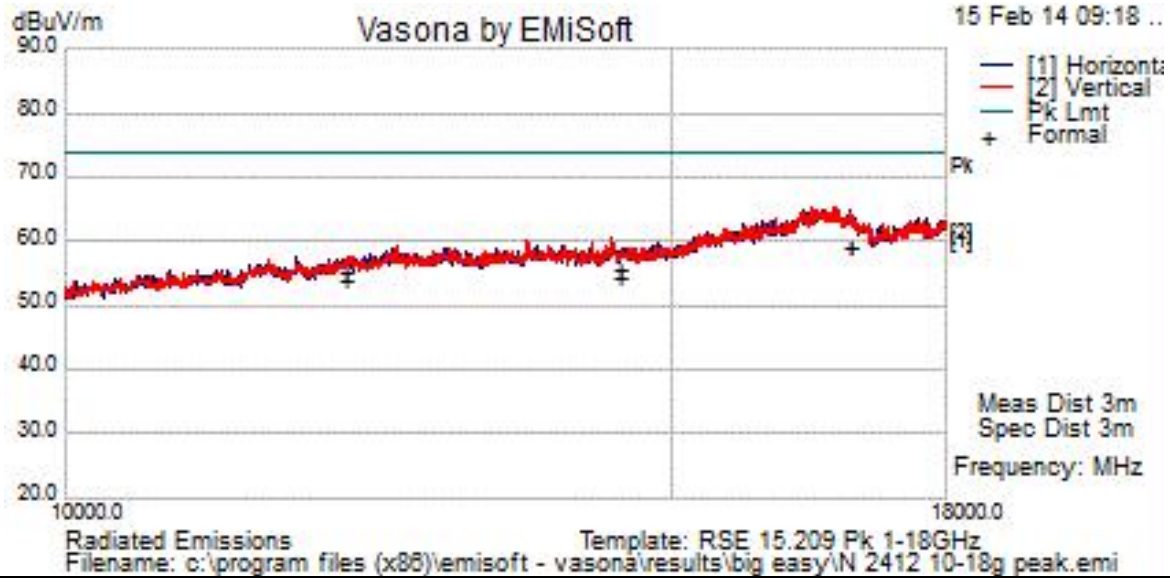
Test Results Table

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
4824	44.2	12.4	-6.2	50.3	Peak(Scan)	V	152	176	54	-3.7	Pass	
7236	44.5	14	-3.4	55.1	Peak(Scan)	V	152	176	54	1.1	Fail	
9648	43.6	15.2	-1.9	56.8	Peak(Scan)	V	152	176	54	2.8	Fail	
4824	46	12.4	-6.2	52.1	Peak(Scan)	H	126	263	54	-1.9	Pass	
7236	42.8	14	-3.4	53.4	Peak(Scan)	H	126	263	54	-0.6	Pass	
9648	44.8	15.2	-1.9	58.1	Peak(Scan)	H	126	263	54	4.1	Fail	

Subtest Number: 157032 - 12	**Subtest Date:** 15-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11N ch1 at M0 (Peak measurement)
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Comments on the above Test Results	802.11N ch1 at M0 (Peak measurement)

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



Title: 802.11N ch1 at M0 (Peak measurement)

Test Results Table

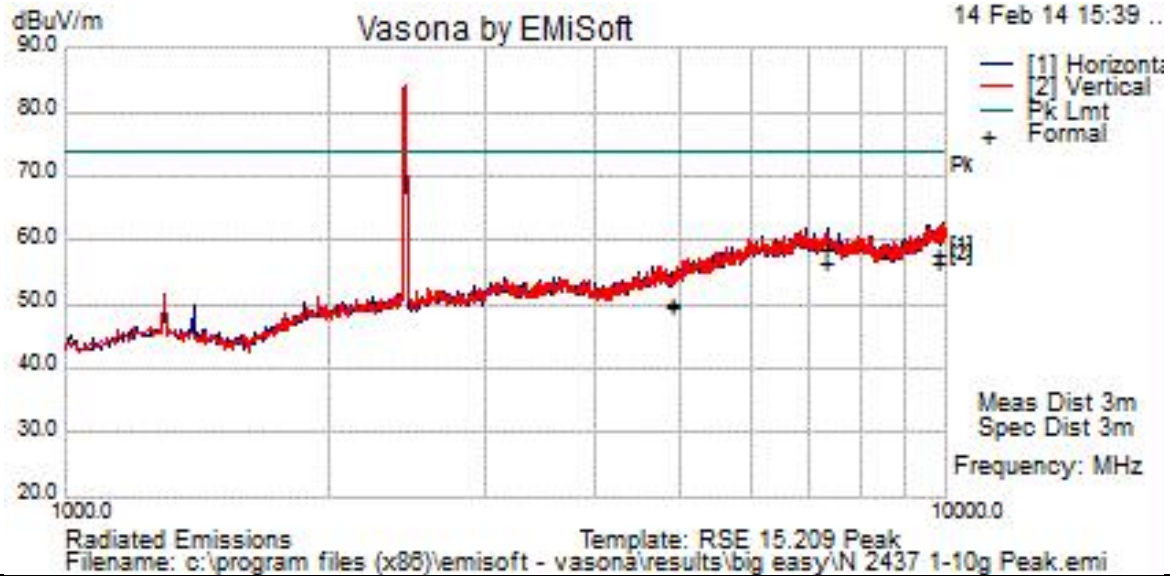
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
12060	46.9	16.1	-8.9	54.1	Pk	V	152	179	74	-19.9	Pass	
14472	48.1	17.4	-9.7	55.7	Pk	V	152	179	74	-18.3	Pass	
16884	48.3	19.1	-8.4	59.1	Pk	V	152	179	74	-14.9	Pass	
12060	47.9	16.1	-8.9	55.1	Pk	H	126	266	74	-18.9	Pass	
14472	46.5	17.4	-9.7	54.2	Pk	H	126	266	74	-19.8	Pass	
16884	48.5	19.1	-8.4	59.2	Pk	H	126	266	74	-14.8	Pass	

Transmitter Spurious Emissions 1-18GHz, Channel 6 , 802.11 N (mcs M0) at 13dBm (Peak Measurement)

Subtest Number: 157032 - 8	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11N ch6 at M0 (Peak measurement)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11N ch6 at M0 (Peak measurement)

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



Title: 802.11N ch6 at M0 (Peak measurement)

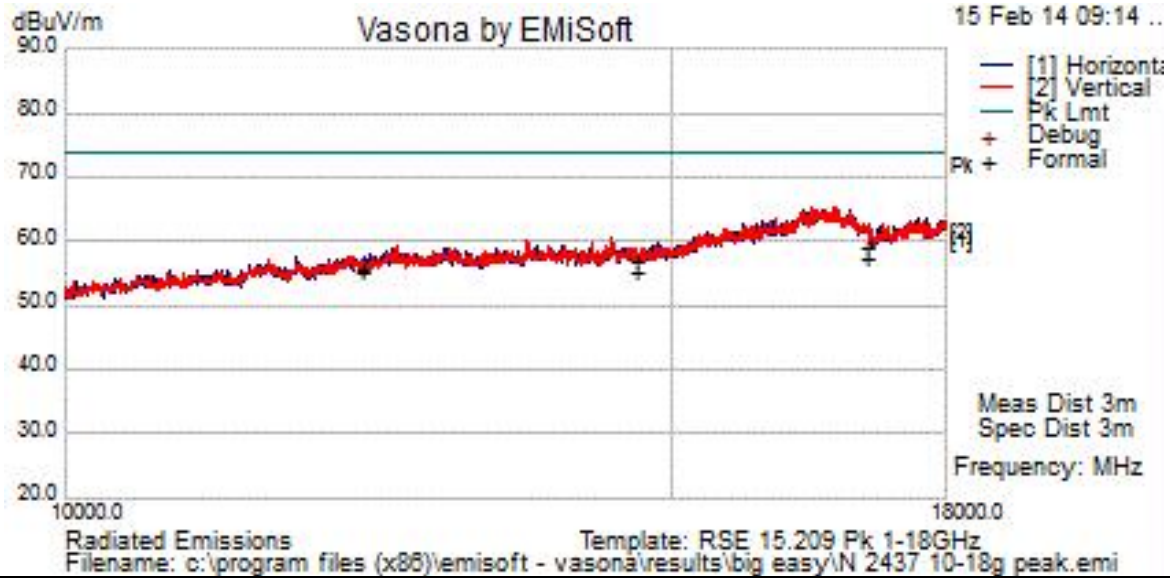
Test Results Table

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
4874	44.2	12.3	-6.5	50	Peak(Scan)	H	122	131	54	-4	Pass	
7311	45.4	14	-2.9	56.5	Peak(Scan)	H	122	131	54	2.5	Fail	
9748	43	15.2	-1.5	56.6	Peak(Scan)	H	122	131	54	2.6	Fail	
4874	44	12.3	-6.5	49.8	Peak(Scan)	V	146	135	54	-4.2	Pass	
7311	47.6	14	-2.9	58.8	Peak(Scan)	V	146	135	54	4.8	Fail	
9748	44.2	15.2	-1.5	57.9	Peak(Scan)	V	146	135	54	3.9	Fail	

Subtest Number: 157032 - 11	**Subtest Date:** 15-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11N ch6 at M0 (Peak measurement)
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Comments on the above Test Results	802.11N ch6 at M0 (Peak measurement)

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



Title: 802.11N ch6 at M0 (Peak measurement)

Test Results Table

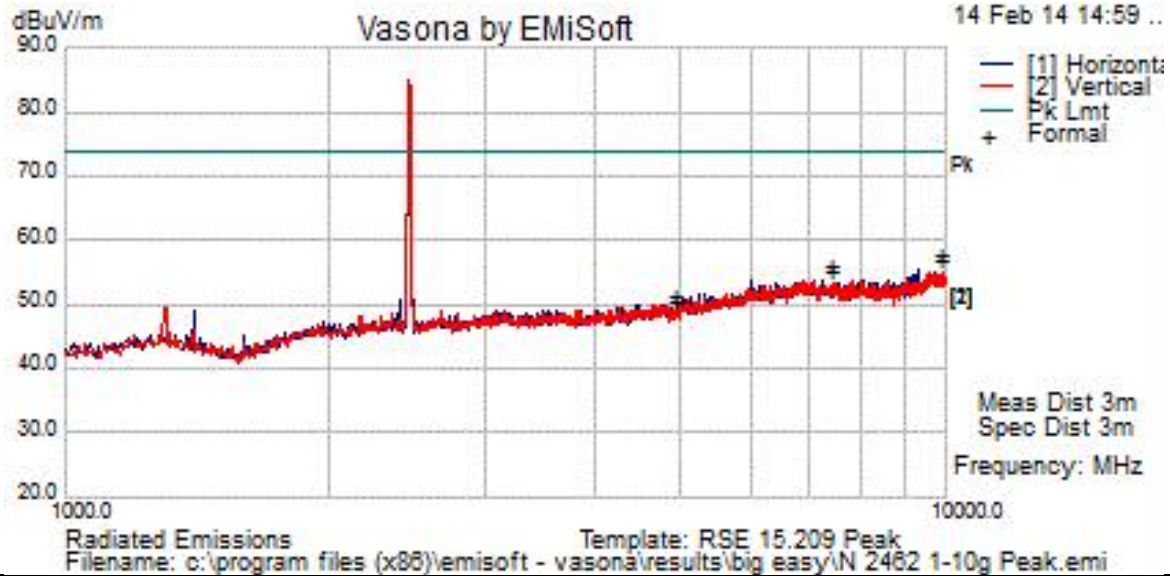
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
12185	48.3	16.4	-9.1	55.6	Pk	H	122	134	74	-18.4	Pass	
14622	48.8	17.7	-9.5	57	Pk	H	122	134	74	-17	Pass	
17059	49	19.2	-9.3	59	Pk	H	122	134	74	-15	Pass	
12185	48	16.4	-9.1	55.3	Pk	V	146	136	74	-18.7	Pass	
14622	47.3	17.7	-9.5	55.4	Pk	V	146	136	74	-18.6	Pass	
17059	47.2	19.2	-9.3	57.2	Pk	V	146	136	74	-16.8	Pass	

Transmitter Spurious Emissions 1-18GHz, Channel 11 , 802.11 N (mcs M0) at 13dBm (Peak Measurement)

Subtest Number: 157032 - 9	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11N ch11 at M0 (Peak measurement)
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Comments on the above Test Results	802.11N ch11 at M0 (Peak measurement)

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



Title: 802.11N ch11 at M0 (Peak measurement)

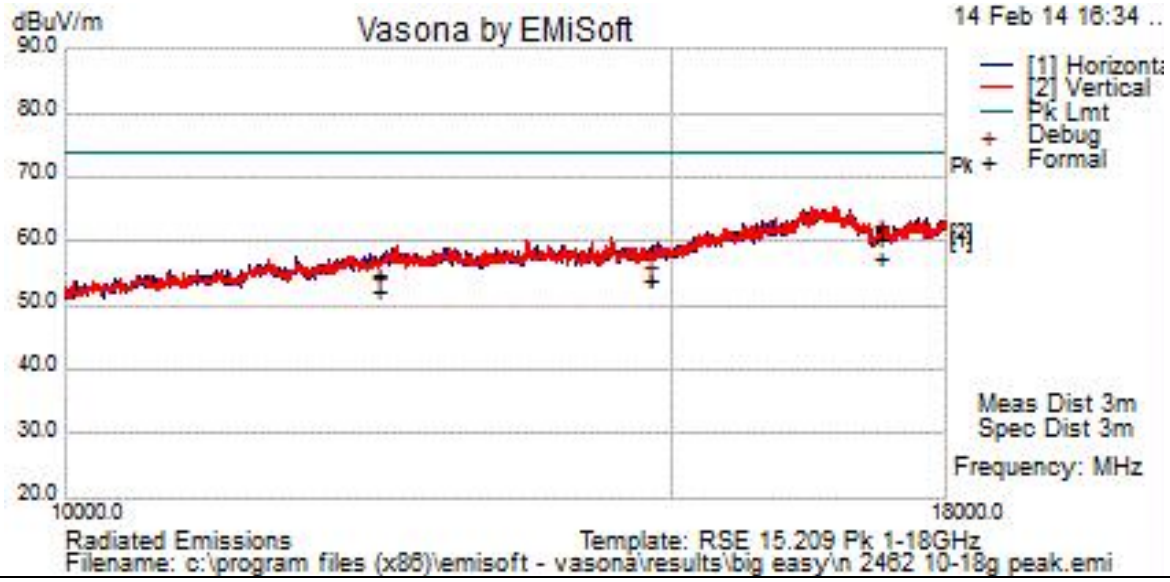
Test Results Table

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
4924	44.5	12.3	-6.4	50.4	Peak(Scan)	V	139	146	54	-3.6	Pass	
7386	44.6	14.1	-3.5	55.2	Peak(Scan)	V	139	146	54	1.2	Fail	
9848	43.2	15.2	-1.4	57	Peak(Scan)	V	139	146	54	3	Fail	
4924	45.6	12.3	-6.4	51.4	Peak(Scan)	H	142	93	54	-2.6	Pass	
7386	45.6	14.1	-3.5	56.2	Peak(Scan)	H	142	93	54	2.2	Fail	
9848	44.1	15.2	-1.4	57.9	Peak(Scan)	H	142	93	54	3.9	Fail	

Subtest Number: 157032 - 10	**Subtest Date:** 14-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	802.11N ch11 at M0 (Peak measurement)
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Comments on the above Test Results	802.11N ch11 at M0 (Peak measurement)

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



Title: 802.11N ch11 at M0 (Peak measurement)

Test Results Table

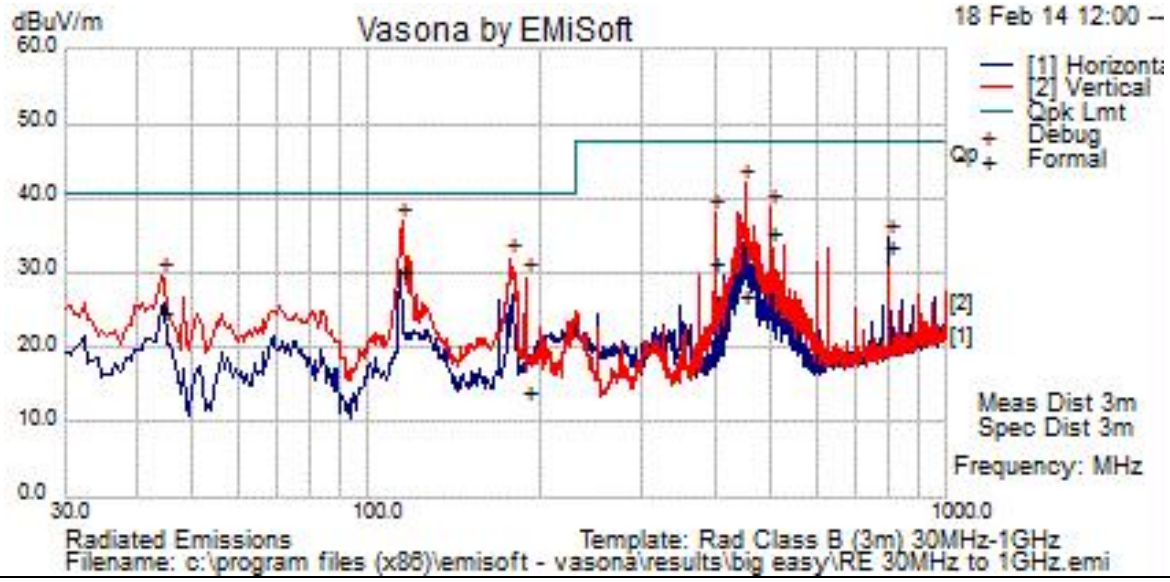
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
12310	47.7	16.5	-9.3	54.8	Peak(Scan)	V	136	184	74	-19.2	Pass	
14772	46	17.6	-9.7	53.8	Peak(Scan)	V	136	184	74	-20.2	Pass	
17234	46.9	19.3	-8.9	57.4	Peak(Scan)	V	136	184	74	-16.6	Pass	
12310	45.1	16.5	-9.3	52.3	Peak(Scan)	H	134	306	74	-21.7	Pass	
14772	46.1	17.6	-9.7	54	Peak(Scan)	H	134	306	74	-20	Pass	
17234	50	19.3	-8.9	60.4	Peak(Scan)	H	134	306	74	-13.6	Pass	

Transmitter Spurious Emissions 30MHz to 1GHz

Subtest Number: 157293 - 1	**Subtest Date:** 18-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	Radiated Emissions 30Mhz to 1GHz
Subtest Result	Pass
Highest Frequency	1000.0
Lowest Frequency	30.0
Comments on the above Test Results	Radiated Emissions 30Mhz to 1GHz

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



Title: Radiated Emissions 30Mhz to 1GHz

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
114.994	43.6	0.4	-14	30	Qp	V	132	296	40.5	-10.4	Pass	
499.975	45.2	0.9	-10.8	35.3	Qp	V	101	359	47.5	-12.2	Pass	
800.048	39.8	1.1	-7.2	33.6	Qp	H	103	170	47.5	-13.8	Pass	
44.244	41.2	0.3	-16.9	24.6	Qp	V	298	360	40.5	-15.9	Pass	
400.025	42.3	0.8	-12	31.1	Qp	V	291	0	47.5	-16.4	Pass	
450.106	37.2	0.9	-11.3	26.8	Qp	V	140	221	47.5	-20.7	Pass	
190.006	29.5	0.6	-16	14.1	Qp	V	119	70	40.5	-26.4	Pass	

Receiver Spurious Emissions

RSS-Gen section 4.10 & 6.1

The receiver shall be operated in the normal receive mode near the mid-point of the band in which the receiver is designed to operate.

For either method, the search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator frequency, intermediate or carrier frequency), Or 30 MHz, whichever is higher, to at least 3 times the highest tuneable or local oscillator frequency whichever is higher, without exceeding 40 GHz.

For emissions below 1000 MHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. As an alternative to CISPR quasi-peak measurement, compliance with the emission limit can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization as required, with an equal or greater measurement bandwidth relative to the applicable CISPR quasi-peak bandwidth.

Above 1000 MHz, measurements shall be performed using an average detector with a minimum resolution bandwidth of 1 MHz.

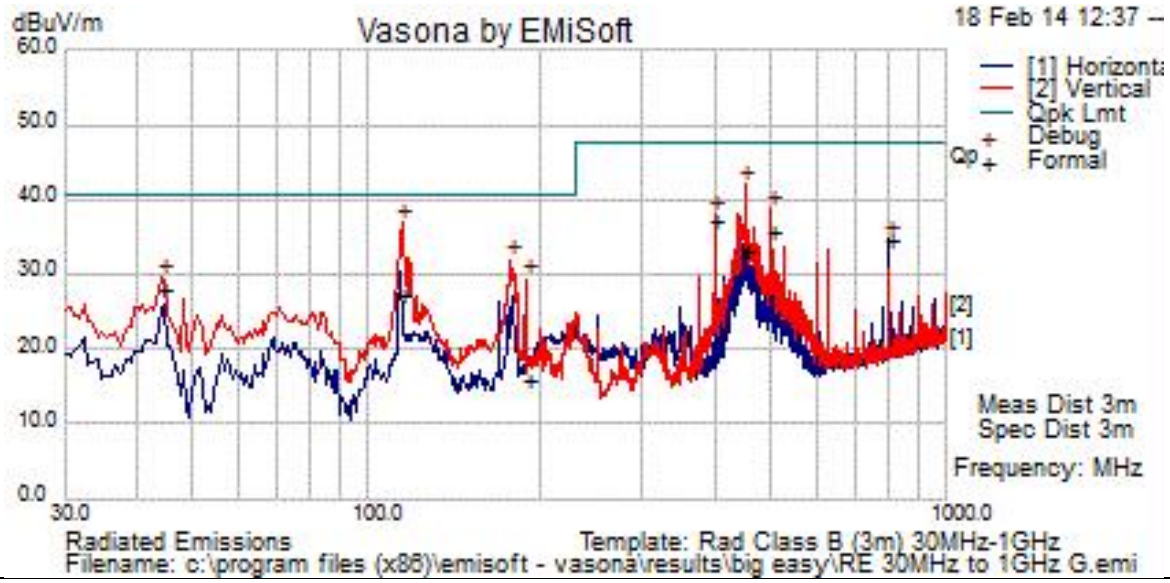
Spurious emissions from receivers shall not exceed the radiated limits shown in the table 2 in section 6.1 of RSS-Gen.

No emissions seen above 15GHz

Subtest Number: 157293 - 2	**Subtest Date:** 18-Feb-2014
Engineer	Jose Aguirre
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	Receiver Spurious Emissions 30Mhz to 1GHz
Subtest Result	Pass
Highest Frequency	1000.0
Lowest Frequency	30.0
Comments on the above Test Results	**Receiver Spurious Emissions 30Mhz to 1GHz**

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



Title: **Receiver Spurious Emissions 30Mhz to 1GHz**

Test Results Table

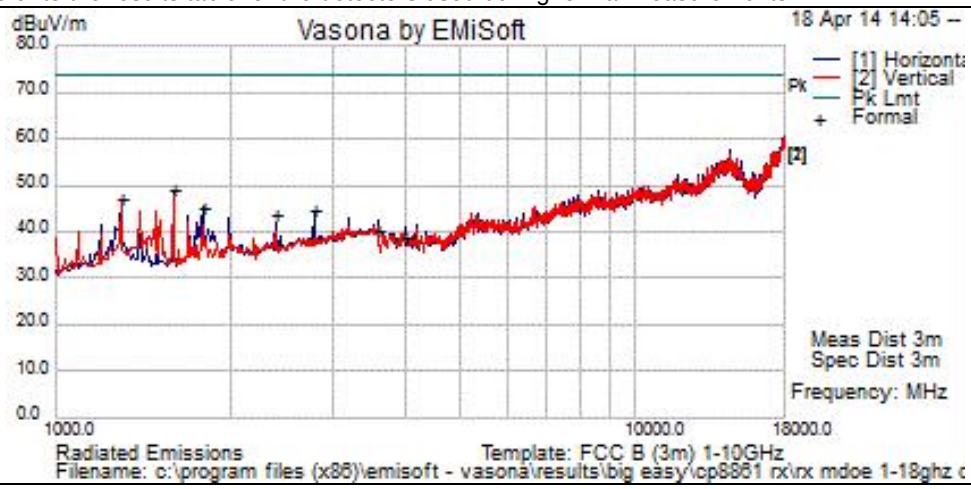
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
115.091	40.9	0.4	-14	27.3	Qp	V	177	72	40.5	-13.2	Pass	
499.984	45.5	0.9	-10.8	35.6	Qp	V	123	359	47.5	-11.9	Pass	
800.034	40.6	1.1	-7.2	34.5	Qp	H	101	168	47.5	-13	Pass	
44.24	44.7	0.3	-16.9	28.1	Qp	V	100	310	40.5	-12.4	Pass	
400.011	48.5	0.8	-12	37.3	Qp	V	168	6	47.5	-10.2	Pass	
449.865	43.6	0.9	-11.3	33.2	Qp	V	144	24	47.5	-14.3	Pass	
190.6	31.2	0.6	-15.9	15.8	Qp	V	125	228	40.5	-24.7	Pass	

Receiver Spurious emissions 1GHz to 18GHz range

Subtest Number: 164252 - 11	**Subtest Date:** 18-Apr-2014
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Results	
Subtest Title	Rx mode 2.4GHz WLAN 2437MHz Peak plot
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0
Comments on the above Test Results	**Rx mode 2.4GHz WLAN 2437MHz Peak plot**

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



Rx mode 2.4GHz WLAN 2437MHz Peak plot

Test Results Table

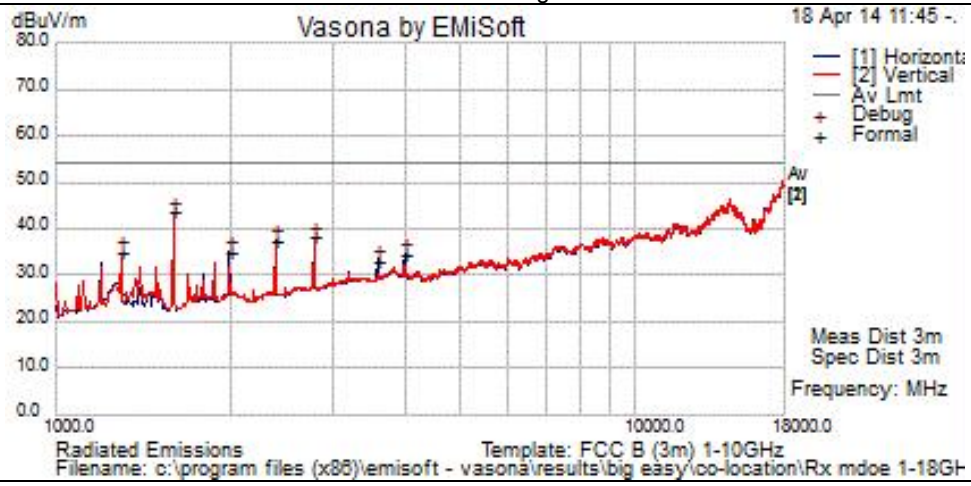
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1299.337	51.8	3.9	-8.8	46.9	Pk	V	166	299	74	-27.1	Pass	
1599.925	52.5	4.4	-8.1	48.8	Pk	V	127	54	74	-25.2	Pass	
1800.028	47.9	4.6	-7.2	45.3	Pk	H	150	50	74	-28.7	Pass	
2400.193	44.4	5.4	-6.1	43.6	Pk	H	166	25	74	-30.4	Pass	
2800.085	44.9	5.8	-5.9	44.8	Pk	H	145	80	74	-29.2	Pass	
3600.139	38.2	6.7	-4.8	40.1	Pk	H	120	160	74	-33.9	Pass	
4000.116	35.4	7.1	-3.7	38.7	Pk	H	120	220	74	-35.3	Pass	

No emissions seen above 15GHz

Subtest Number: 164252 - 2	**Subtest Date:** 18-Apr-2014
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Results	
Subtest Title	Rx mode 2.4GHz WLAN 2437MHz
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0
Comments on the above Test Results	**Rx mode 2.4GHz WLAN 2437MHz Average Plot**

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



Rx mode 2.4GHz WLAN 2437MHz

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
1297.5	39.6	3.9	-8.8	34.7	Av	V	100	270	54	-19.3	Pass	
1595	47.1	4.4	-8	43.4	Av	V	100	90	54	-10.6	Pass	
1994.5	35.3	4.9	-5.3	34.9	Av	H	100	270	54	-19.1	Pass	
2394	38.1	5.4	-6.1	37.4	Av	H	100	90	54	-16.6	Pass	
2793.5	38.1	5.8	-5.8	38	Av	H	100	90	54	-16	Pass	
3594.983	31.3	6.7	-4.8	33.1	Av	H	101	360	54	-20.9	Pass	
4001.144	31.1	7.1	-3.7	34.4	Av	H	101	360	54	-19.6	Pass	

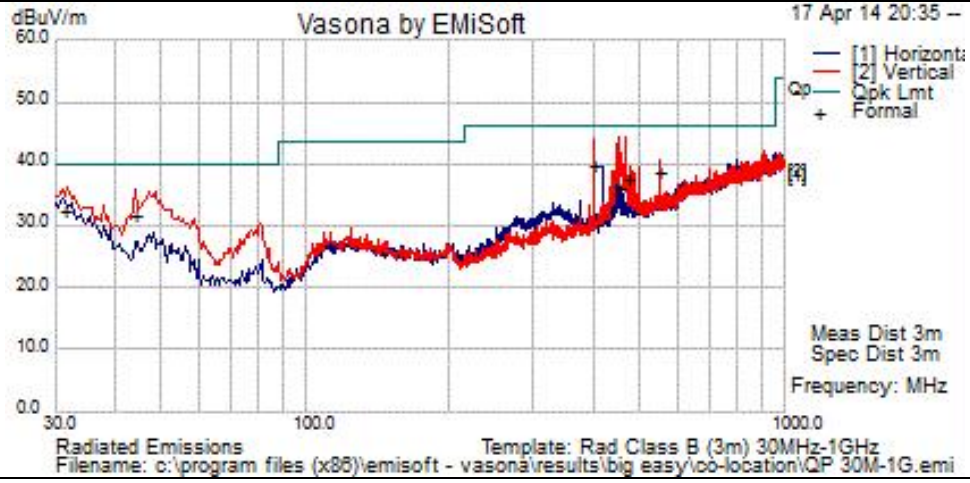
No emissions seen above 15GHz

Co-Location Radiated Emissions Bluetooth and 2.4GHz WLAN

Subtest Number: 164061 - 11	**Subtest Date:** 17-Apr-2014
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Results	
Subtest Title	2.4GHz WLAN radio with Bluetooth radio QP 30M-1GHz
Subtest Result	Pass
Highest Frequency	1000.0
Lowest Frequency	30.0
Comments on the above Test Results	2.4GHz WLAN radio with Bluetooth radio QP 30M-1GHz B

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



2.4GHz WLAN radio with Bluetooth radio QP 30M-1GHz

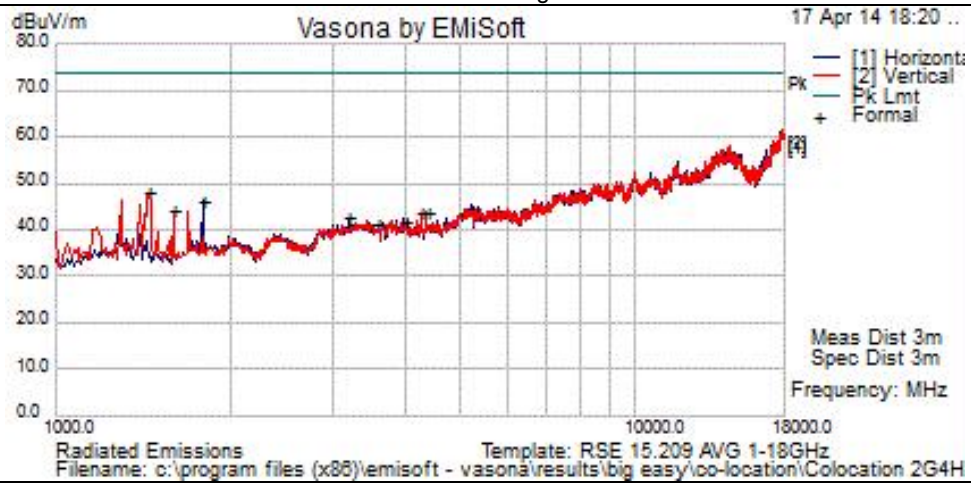
Test Results Table

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
31.4	12.5	0.6	19.3	32.4	Qp	V	172	44	40	-7.6	Pass	
44.009	20.1	0.7	10.9	31.7	Qp	V	136	194	40	-8.3	Pass	
400.029	21.8	2.1	15.7	39.6	Qp	V	115	133	46	-6.4	Pass	
450.01	17	2.3	16.8	36.1	Qp	V	136	125	46	-9.9	Pass	
468.922	17.7	2.3	17.4	37.4	Qp	V	165	154	46	-8.6	Pass	
550.59	17.8	2.5	18.4	38.7	Qp	V	177	86	46	-7.3	Pass	

Subtest Number: 164061 - 10	**Subtest Date:** 17-Apr-2014
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Results	
Subtest Title	2.4GHz WLAN radio with Bluetooth radio Peak
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0
Comments on the above Test Results	2.4GHz WLAN radio with Bluetooth radio Peak

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



2.4GHz WLAN radio with Bluetooth radio Peak

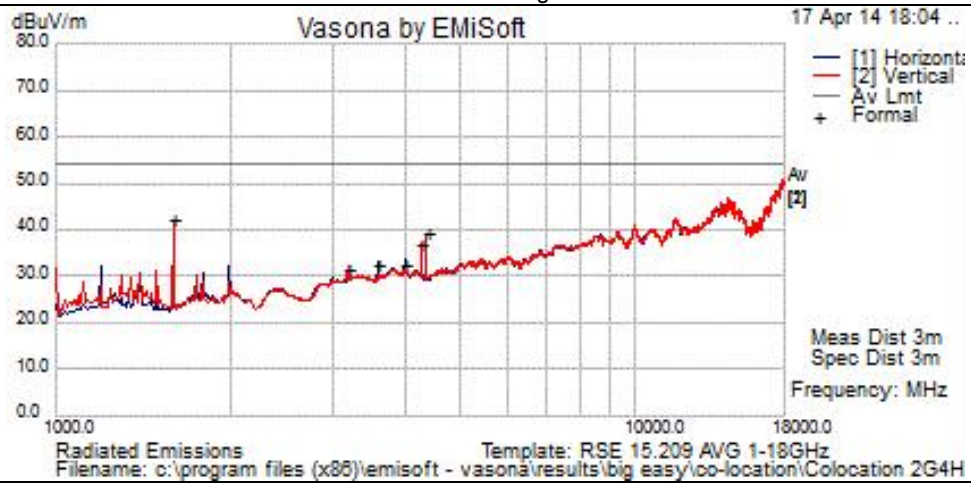
Test Results Table

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
1595	47.8	4.3	-8	44.1	Pk	V	100	0	74	-29.9	Pass	
4357.5	40.7	7.4	-4.7	43.4	Pk	V	100	264	74	-30.6	Pass	
4272.5	40.5	7.3	-4.2	43.5	Pk	V	100	242	74	-30.5	Pass	
3602.872	39.4	6.7	-4.7	41.4	Pk	H	101	304	74	-32.6	Pass	
3997.809	38.6	7.1	-3.8	41.9	Pk	H	101	286	74	-32.1	Pass	
3199.278	40.6	6.2	-4.3	42.5	Pk	V	101	174	74	-31.5	Pass	
1799	48.9	4.6	-7.2	46.3	Pk	H	100	181	74	-27.7	Pass	
1442	51.4	4.1	-7.5	48	Pk	V	100	188	74	-26	Pass	

Subtest Number: 164061 - 1	**Subtest Date:** 17-Apr-2014
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Results	
Subtest Title	2.4GHz WLAN radio with Bluetooth radio Average
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0
Comments on the above Test Results	2.4GHz WLAN radio with Bluetooth radio Average

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



2.4GHz WLAN radio with Bluetooth radio Average

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
1595	45.8	4.4	-8	42.1	Av	V	100	0	54	-11.9	Pass	
4357.5	36.4	7.4	-4.7	39.1	Av	V	100	264	54	-14.9	Pass	
4272.5	33.8	7.3	-4.2	36.8	Av	V	100	242	54	-17.2	Pass	
3602.872	30.2	6.7	-4.7	32.2	Av	H	101	304	54	-21.8	Pass	
3997.809	29.3	7.1	-3.8	32.6	Av	H	101	286	54	-21.4	Pass	
3199.278	29.4	6.2	-4.3	31.3	Av	V	101	174	54	-22.7	Pass	

AC Mains Conducted Spurious Emissions

15.207 & RSS GEN sec 7.2.4
(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

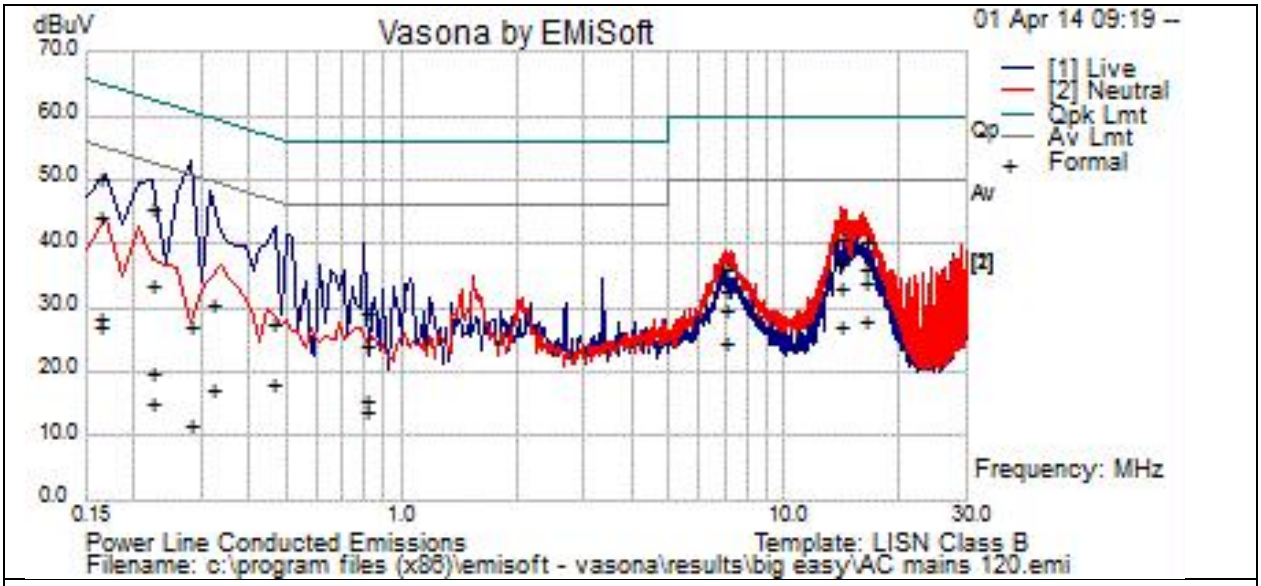
Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in continuous transmit mode.

Span:	150kHz – 30Hz
Reference Level:	70 dBuV
Attenuation:	10 dB
Sweep Time:	Auto
Resolution Bandwidth:	9Hz
Video Bandwidth:	30kHz
Detector:	Quasi-Peak

This report represents the worst case data for all supported operating modes and antennas.

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



Conducted Emissions on AC mains

Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.164	23	21.3	0	44.4	Qp	N	65.3	-20.9	Pass	
0.164	7	21.3	0	28.3	Av	L	55.3	-26.9	Pass	
0.164	5.9	21.3	0	27.2	Av	N	55.3	-28.1	Pass	
0.164	28.8	21.3	0	50.2	Qp	L	65.3	-15.1	Pass	
0.224	-1.4	20.9	0	19.6	Av	L	52.7	-33.1	Pass	
0.224	-6	20.9	0	15	Av	N	52.7	-37.7	Pass	
0.224	24.5	20.9	0	45.5	Qp	L	62.7	-17.2	Pass	
0.224	12.4	20.9	0	33.4	Qp	N	62.7	-29.3	Pass	
0.280594	6.1	20.6	0.1	26.8	Qp	N	60.8	-34	Pass	
0.280594	-9.1	20.6	0.1	11.6	Av	N	50.8	-39.2	Pass	
0.321	-3.2	20.5	0.1	17.3	Av	N	49.7	-32.4	Pass	
0.321	9.8	20.5	0.1	30.4	Qp	N	59.7	-29.3	Pass	
0.464	-2	20.1	0.1	18.2	Av	N	46.6	-28.4	Pass	
0.464	7.1	20.1	0.1	27.3	Qp	N	56.6	-29.4	Pass	
0.801	8.9	20.1	0.1	29.1	Qp	L	56	-26.9	Pass	
0.801	-4.7	20.1	0.1	15.5	Av	N	46	-30.5	Pass	
0.801	3.8	20.1	0.1	24	Qp	N	56	-32	Pass	
0.801	-6.3	20.1	0.1	13.9	Av	L	46	-32.1	Pass	
7.027	12.6	20.1	0	32.7	Qp	L	60	-27.3	Pass	
7.027	15.9	20.1	0	36	Qp	N	60	-24	Pass	

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
7.027	9.6	20.1	0	29.8	Av	N	50	-20.2	Pass	
7.027	4.4	20.1	0	24.6	Av	L	50	-25.4	Pass	
14.045	12.5	20.3	0.1	32.9	Av	N	50	-17.1	Pass	
14.045	6.5	20.3	0.1	26.9	Av	L	50	-23.1	Pass	
14.045	20.3	20.3	0.1	40.6	Qp	N	60	-19.4	Pass	
14.045	16.4	20.3	0.1	36.7	Qp	L	60	-23.3	Pass	
16.138	7.4	20.4	0.2	28	Av	L	50	-22	Pass	
16.138	15.5	20.4	0.2	36.1	Qp	L	60	-23.9	Pass	
16.138	13.1	20.4	0.2	33.7	Av	N	50	-16.3	Pass	
16.138	20	20.4	0.2	40.5	Qp	N	60	-19.5	Pass	

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 ($1x10^3$)
EN	European Norm	MHz	MegaHertz ($1x10^6$)
IEC	International Electro technical Commission	GHz	Gigahertz ($1x10^9$)
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 ($1x10^3$)
L1	Line 1	μV	Microvolt ($1x10^{-6}$)
L2	Line2	A	Amp
L3	Line 3	μA	Micro Amp ($1x10^{-6}$)
DC	Direct Current	mS	Milli Second ($1x10^{-3}$)
RAW	Uncorrected measurement value, as indicated by the measuring device	μS	Micro Second ($1x10^{-6}$)
RF	Radio Frequency	μS	Micro Second ($1x10^{-6}$)
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

Equipment No	Manufacturer	Model	Description	Last Cal	Next Cal Due Date
CIS004882	EMC Test Systems	3115	Double Ridged Guide Horn Antenna	28-JUN-13	28-JUN-14
CIS005691	Miteq	NSP1800-25-S1	Broadband Preamplifier (1-18GHz)	27-JAN-14	27-JAN-15
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber	03-OCT-13	03-OCT-14
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in	23-AUG-13	23-AUG-14
CIS025658	Micro-Coax	UFB311A-1-0840-504504	RF Coaxial Cable, to 18GHz, 84 in	14-FEB-14	14-FEB-15
CIS025662	Micro-Coax	UFB311A-1-0840-504504	RF Coaxial Cable, to 18GHz, 84 in	27-FEB-14	27-FEB-15
CIS030654	Sunol Sciences	JB1	Combination Antenna, 30MHz-2GHz	31-OCT-13	31-OCT-14
CIS035605	Micro-Tronics	BRC50704-02	Notch Filter, SB:5.470-5.725GHz, to 12GHz	20-MAR-14	20-MAR-15
CIS040641	Rohde & Schwarz	ESU26	EMI Test Receiver	24-JUN-13	24-JUN-14
CIS041935	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	01-APR-14	01-APR-15
CIS047284	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector	30-MAY-13	30-MAY-14
CIS047286	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector	30-MAY-13	30-MAY-14
CIS049443	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz	20-MAR-14	20-MAR-15
CIS049447	Micro-Tronics	BRC50705-02	Band Reject Filter	20-MAR-14	20-MAR-15
CIS049563	Huber + Suhner	Sucoflex 106A	N Type Cable 18GHz	23-AUG-13	23-AUG-14

Appendix D: Test Procedures

Measurements were made in accordance with

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

Test procedures are summarized below

Document Reference	Scope of Document
EDCS #: 420238	Internal Radio Test Procedures
ERAT Job Number: 5965	Test Plan

Appendix E: Scope of Accreditation: A2LA certificate number 1178-01

The scope of accreditation of Cisco Systems, Inc. can be found on the A2LA web page at:

http://www.a2la.org/scopepdf/1178-01.pdf

Previous versions of the scope of accreditation are archived under EDCS 1010411. The actual scope of accreditation that was current at the time of testing performed under this report can be obtained upon request.